Source: **T1**

Title: **CR's to TS 34.121 v3.2.0 for approval**

Agenda item: **6.1**

Document for: **Approval**

This document contains 18 CRs to TS 34.121 v3.2.0. These CRs have been agreed by T1 and are put forward to TSG T for approval.

CRs due to editorial changes only:

Spec	CR	Rev	Phase	Subject	Cat	Version-Current	Version-New	Doc-2nd-Level
34.121	038		R99	Corrections to Chapter 3 "Definitions, symbols, abbreviations and equations"	D	3.2.0	3.3.0	T1-000247
34.121	039		R99	Vocabulary Corrections	D	3.2.0	3.3.0	T1-000253

CRs due to changes in the core specifications:

Spec	CR	Rev	Phase	Subject	Cat	Version-Current	Version-New	Doc-2nd-Level
34.121	040		R99	Reference Measurement Channels in Annex C	F	3.2.0	3.3.0	T1-000238
34.121	041		R99	Inclusion of OCNS definition for performance tests	F	3.2.0	3.3.0	T1-000241
34.121	042		R99	Handling of measurement uncertainties in UE conformance testing (FDD)	F	3.2.0	3.3.0	T1-000250
34.121	043		R99	Update of Idle mode test cases	F	3.2.0	3.3.0	T1-000252
34.121	044		R99	UE emission mask measurement filter definition correction	F	3.2.0	3.3.0	T1-000254
34.121	045		R99	New structure of TS 34.121	F	3.2.0	3.3.0	T1-000255

CRs on modifications of test specifications (including due to changes of core specifications):

Spec	CR	Rev	Phase	Subject	Cat	Version-Current	Version-New	Doc-2nd-Level
34.121	046		R99	Test for combining TPC commands in soft handover	F	3.2.0	3.3.0	T1-000239
34.121	047		R99	Corrections to power control tests	F	3.2.0	3.3.0	T1-000240
34.121	048		R99	Correction to Open Loop Power Control in Uplink	F	3.2.0	3.3.0	T1-000242
34.121	049		R99	Correction to Transmit ON/OFF Time mask	F	3.2.0	3.3.0	T1-000243r
34.121	050		R99	Correction to Spurious Emission test	F	3.2.0	3.3.0	T1-000244
34.121	051		R99	Correction of spurious emission measurement procedure	F	3.2.0	3.3.0	T1-000245
34.121	052		R99	Out-of-synchronization handling of output power	F	3.2.0	3.3.0	T1-000246
34.121	053		R99	Clarification of test procedure and test requirement for receiver blocking and spurious response.	F	3.2.0	3.3.0	T1-000248
34.121	054		R99	Subclause 7.8 Power control in downlink	F	3.2.0	3.3.0	T1-000249
34.121	055		R99	Downlink compressed mode	F	3.2.0	3.3.0	T1-000251

TSG-T WG1 meeting #9
Redondo Beach, USA, 16th-17th November 2000

Document T1-000238
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

34.121	CR	040	Current Version:	3.2.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	T1#9	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [X] UTRAN / Radio [ ] Core Network [ ]

Source: TSG-T1/RF SWG **Date:** 2000-11-16

Subject: CR on Reference Measurement Channels in Annex C

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: Modifications are needed in order to keep consistency with the core specification, TS25.101 v3.4.0.

Clauses affected: C.2, C.3 and C.4

Other specs affected:

Other 3G core specifications	[ ]	→ List of CRs:
Other GSM core specifications	[ ]	→ List of CRs:
MS test specifications	[ ]	→ List of CRs:
BSS test specifications	[ ]	→ List of CRs:
O&M specifications	[ ]	→ List of CRs:

Other comments:

help.doc

<--------- double-click here for help and instructions on how to create a CR.

Annex C (normative): Measurement channels

C.1 General

The measurement channels in this annex are defined to derive the requirements in clauses 5, 6 and 7. The measurement channels represent example configuration of radio access bearers for different data rates.

The measurement channel for 12.2 kbps shall be supported by any UE both in up- and downlink. Support for other measurement channels is depending on the UE Radio Access capabilities.

C.2 UL reference measurement channel

C.2.1 UL reference measurement channel (12.2 kbps)

The parameters for the 12.2 kbps UL reference measurement channel are specified in Table C.2.1.1 and Table C.2.1.2. The channel coding for information is shown in Figure C.2.1

Table C.2.1.1: UL reference measurement channel physical parameters (12.2 kbps)

Parameter	Level	Unit
Information bit rate	12.2	kbps
DPDCH	60	kbps
DPCCH	15	kbps
DPCCH Slot Format #i	0	-
DPCCH/DPDCH power ratio	–5.46	dB
TFCI	On	-
Repetition	23	%
NOTE: Slot Format #2 is used for closed loop tests in subclause 7.6.2.		

Table C.2.1.2: UL reference measurement channel, transport channel parameters (12.2 kbps)

Parameters	DTCH	DCCH
Transport Channel Number	1	2
Transport Block Size	244	100
Transport Block Set Size	244	100
Transmission Time Interval	20 ms	40 ms
Type of Error Protection	Convolution Coding	Convolution Coding
Coding Rate	1/3	1/3
~~Static~~ Rate Matching ~~parameter~~attribute	~~1.0~~256	~~1.0~~256
Size of CRC	16	12

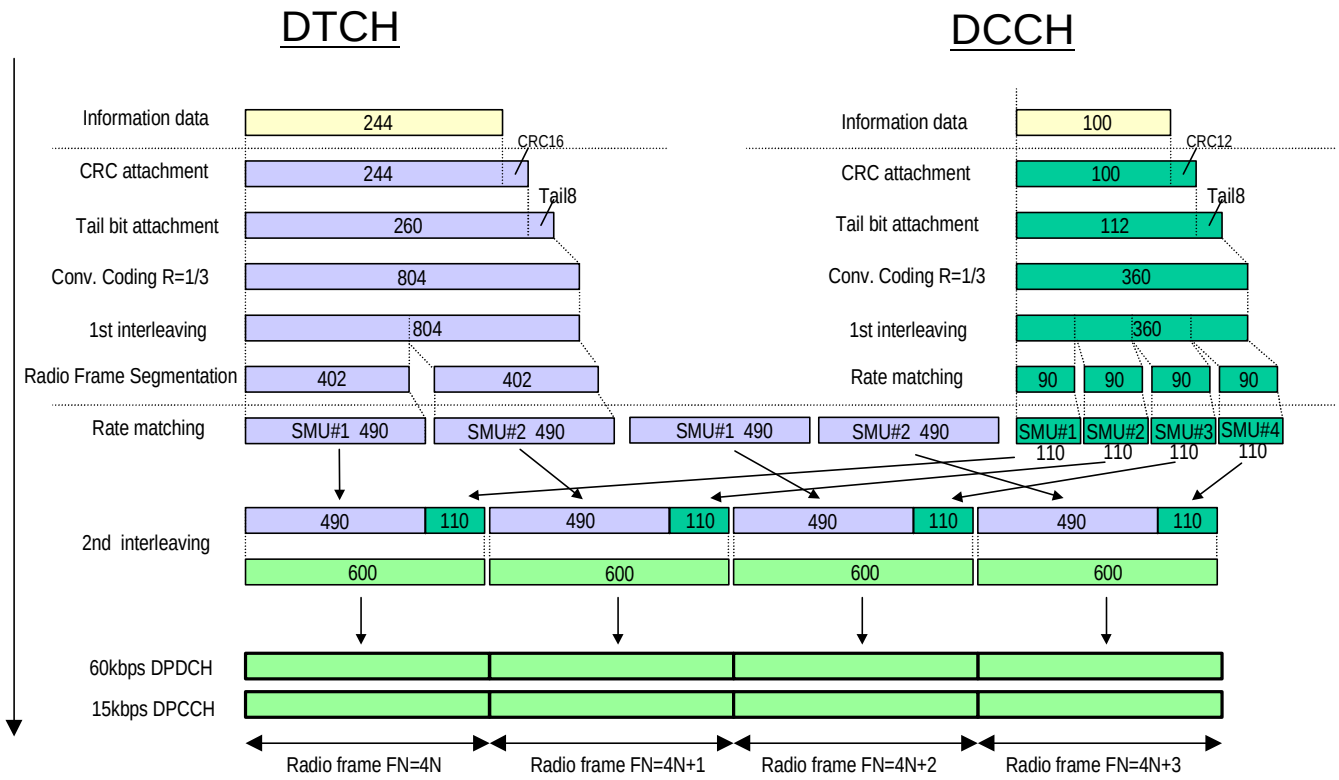


Figure C.2.1 (Informative): Channel coding of UL reference measurement channel (12.2 kbps)

C.2.2 UL reference measurement channel (64 kbps)

The parameters for the 64 kbps UL reference measurement channel are specified in Table C.2.2.1 and Table C.2.2.2. The channel coding for information is shown in Figure C.2.2. This measurement channel is not currently used in the present document but can be used for future requirements.

Table C.2.2.1: UL reference measurement channel (64 kbps)

Parameter	Level	Unit
Information bit rate	64	kbps
DPDCH	240	kbps
DPCCH	15	kbps
DPCCH Slot Format #i	0	-
DPCCH/DPDCH	–9.54	dB
TFCI	On	-
Repetition	18	%

Table C.2.2.2: UL reference measurement channel, transport channel parameters (64 kbps)

Parameter	DTCH	DCCH
Transport Channel Number	1	2
Transport Block Size	1280	100
Transport Block Set Size	1280	100
Transmission Time Interval	20 ms	40 ms
Type of Error Protection	Turbo Coding	Convolution Coding
Coding Rate	1/3	1/3
~~Static~~ Rate Matching ~~parameter~~attribute	~~1.0~~256	~~1.0~~256
Size of CRC	16	12

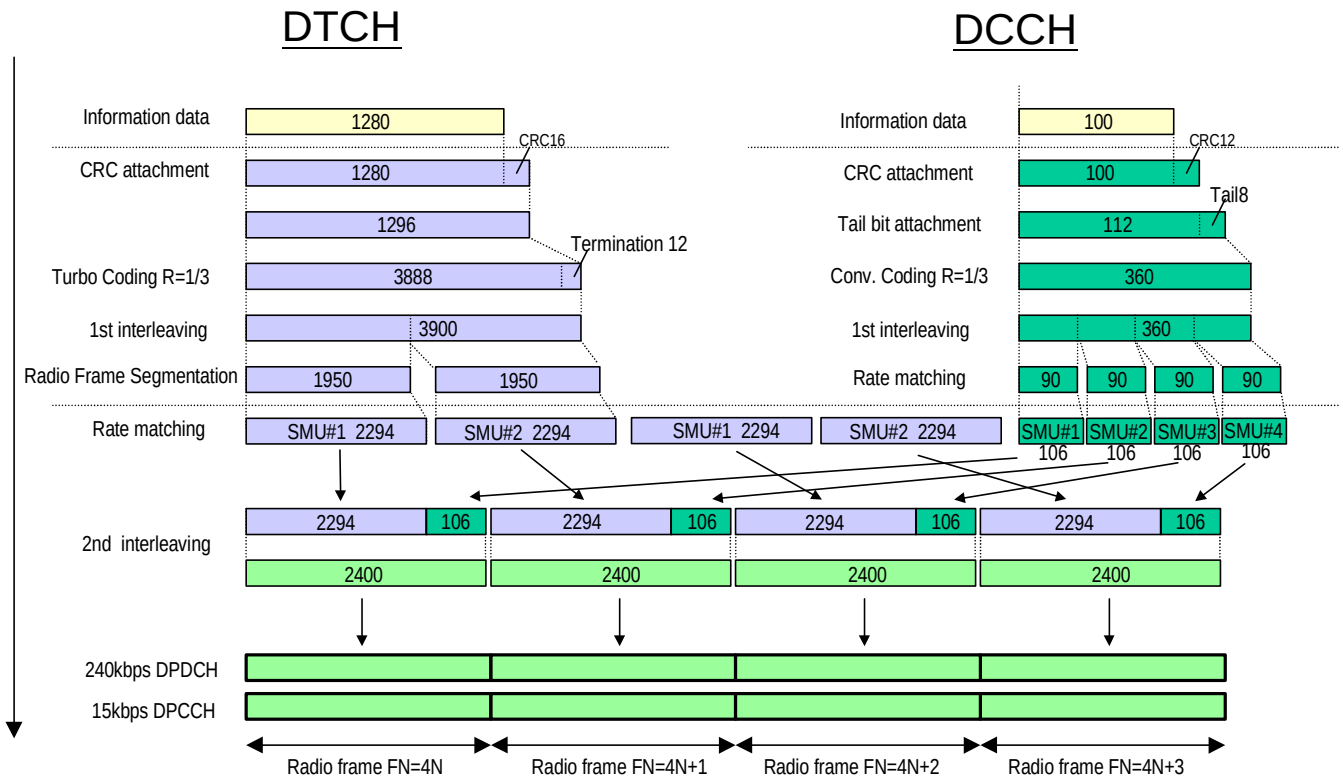


Figure C.2.2 (Informative): Channel coding of UL reference measurement channel (64 kbps)

C.2.3 UL reference measurement channel (144 kbps)

The parameters for the 144 kbps UL reference measurement channel are specified in Table C.2.3.1 and Table C.2.3.2. The channel coding for information is shown in Figure C.2.3. This measurement channel is not currently used in the present document but can be used for future requirements.

Table C.2.3.1: UL reference measurement channel (144 kbps)

Parameter	Level	Unit
Information bit rate	144	kbps
DPDCH	480	kbps
DPCCH	15	kbps
DPCCH Slot Format #i	0	-
DPCCH/DPDCH power ratio	–11.48	dB
TFCI	On	-
Repetition	8	%

Table C.2.3.2: UL reference measurement channel, transport channel parameters (144 kbps)

Parameters	DTCH	DCCH
Transport Channel Number	1	2
Transport Block Size	2880	100
Transport Block Set Size	2880	100
Transmission Time Interval	20 ms	40 ms
Type of Error Protection	Turbo Coding	Convolution Coding
Coding Rate	1/3	1/3
~~Static~~ Rate Matching ~~parameter~~attribute	~~1.0~~256	~~1.0~~256
Size of CRC	16	12

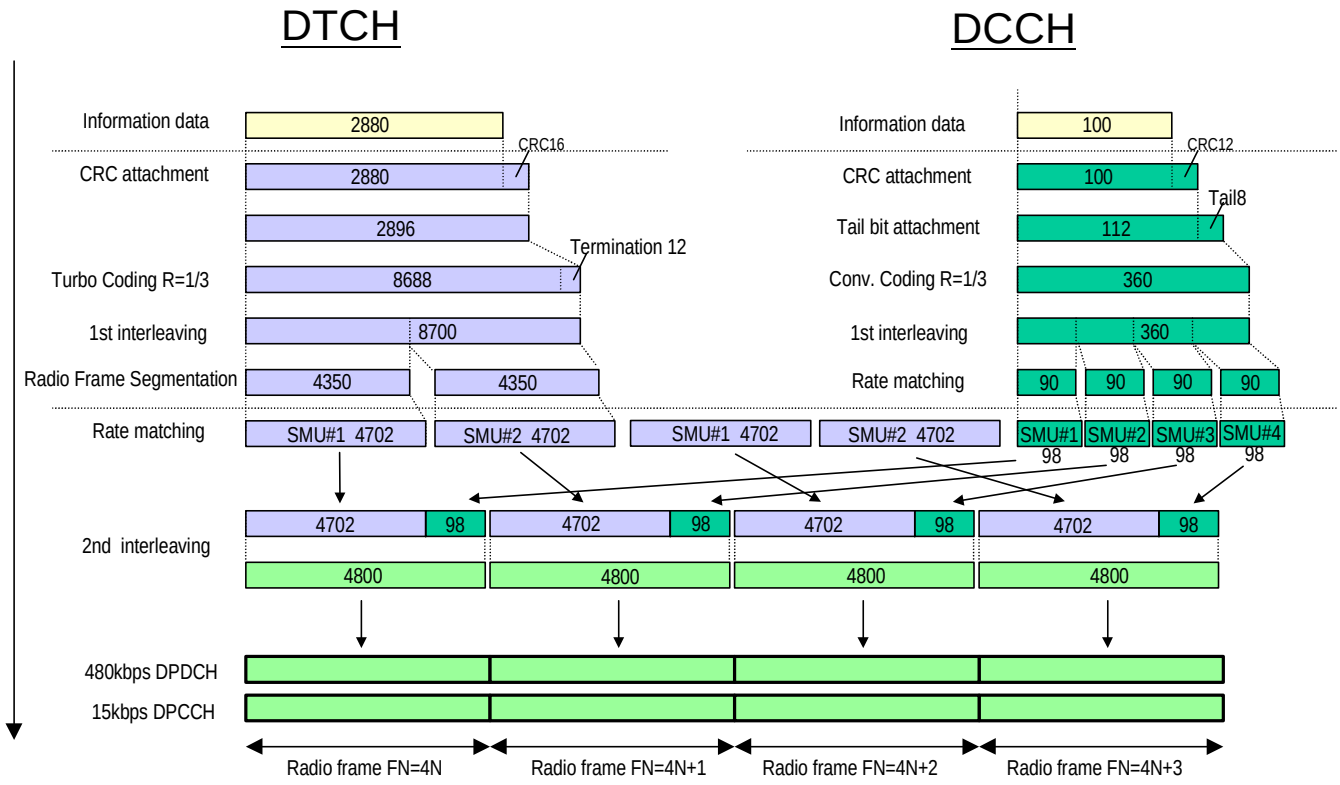


Figure C.2.3 (Informative): Channel coding of UL reference measurement channel (144 kbps)

C.2.4 UL reference measurement channel (384 kbps, 20ms TTI)

The parameters for the 384 kbps UL reference measurement channel (TTI-20ms) are specified in Table C.2.4.1 and Table C.2.4.2. The channel coding for information is shown in Figure C.2.4. This measurement channel is not currently used in the present document but can be used for future requirements.

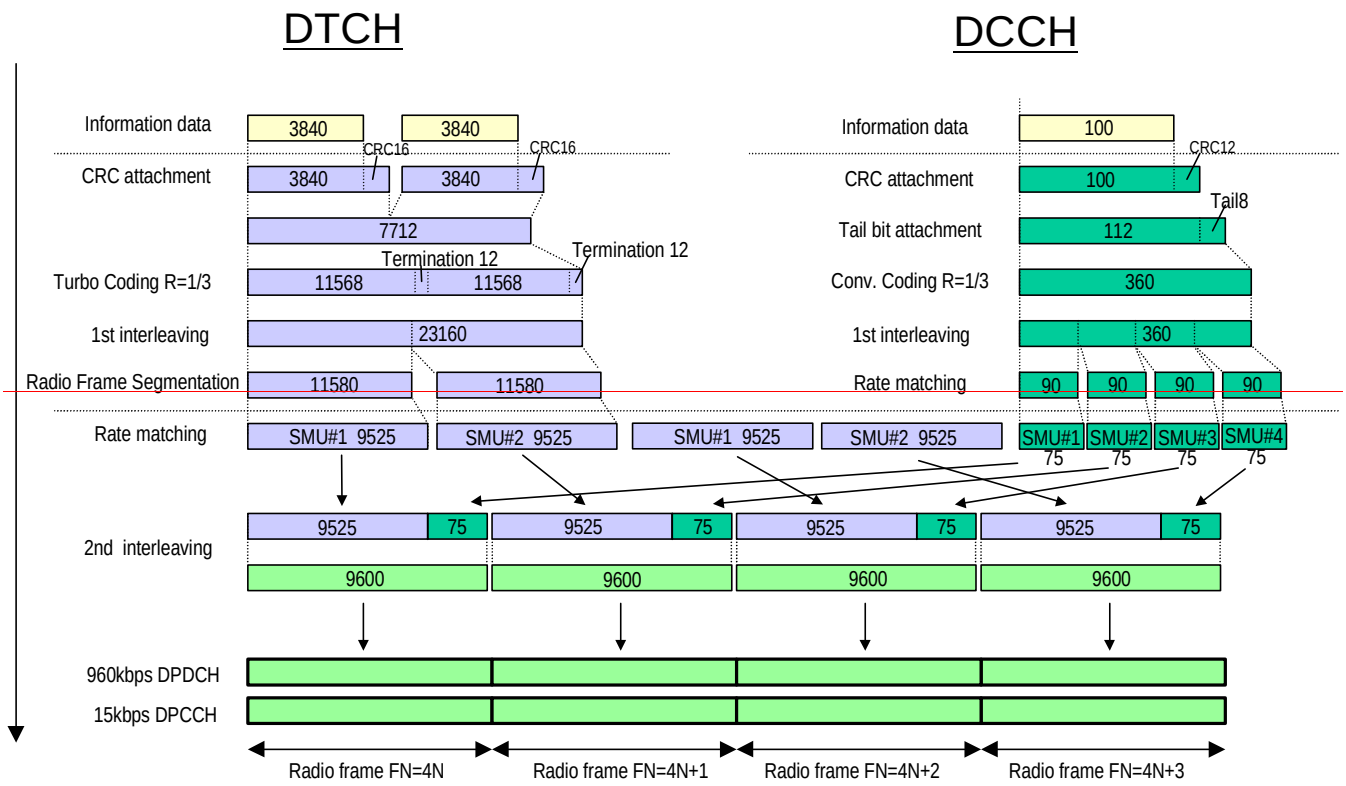
NOTE: The measurement channel for 384kbps with 20ms TTI will be deleted, and the new 384kbps measurement channel defined in subclause C.2.5 will be used.

Table C.2.4.1: UL reference measurement channel (384 kbps, 20ms TTI)

Parameter	Level	Unit
Information bit rate	384	kbps
DPDCH	960	kbps
DPCCH	15	kbps
DPCCH Slot Format #i	0	-
DPCCH/DPDCH power ratio	–11.48	dB
TFCI	On	-
Puncturing	18	%

Table C.2.4.2: UL reference measurement channel, transport channel parameters (384 kbps, 20ms TTI)

Parameter	DTCH	DCCH
Transport Channel Number	1	2
Transport Block Size	3840	100
Transport Block Set Size	7680	100
Transmission Time Interval	20 ms	40 ms
Type of Error Protection	Turbo Coding	Convolution Coding
Coding Rate	1/3	1/3
Static Rate Matching parameter	1.0	1.0
Size of CRC	16	12



~~Figure C.2.4 (Informative): Channel coding of UL reference measurement channel (384 kbps, 20ms TTI)~~

C.2.~~4~~5 UL reference measurement channel (384 kbps)

The parameters for the 384 kbps UL reference measurement channel are specified in Table C.2.~~4~~5.1 and Table C.2.~~4~~5.2. The channel coding for information is shown in Figure C.2.~~4~~5. This measurement channel is not currently used in the present document but can be used for future requirements.

Table C.2.~~4~~5.1: UL reference measurement channel (384 kbps)

Parameter	Level	Unit
Information bit rate	384	kbps
DPDCH	960	kbps
DPCCH	15	kbps
DPCCH/DPDCH power ratio	-11.48	dB
TFCI	On	-
Puncturing	18	%

Table C.2.~~4~~5.2: UL reference measurement channel, transport channel parameters (384 kbps)

Parameter	DTCH	DCCH
Transport Channel Number	1	2
Transport Block Size	3840	100
Transport Block Set Size	3840	100
Transmission Time Interval	10 ms	40 ms
Type of Error Protection	Turbo Coding	Convolution Coding
Coding Rate	1/3	1/3
~~Static~~ Rate Matching ~~parameter~~attribute	~~1.0~~256	~~1.0~~256
Size of CRC	16	12

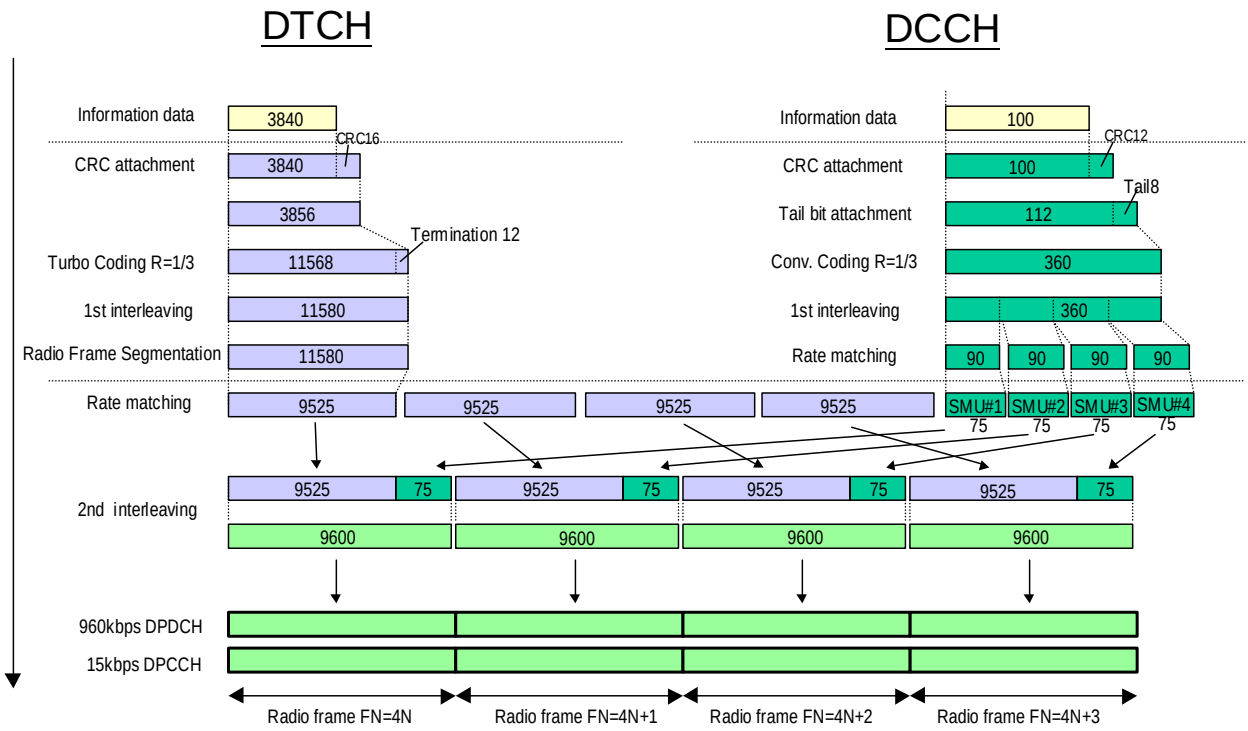


Figure C.2.45 (Informative): Channel coding of UL reference measurement channel (384 kbps)

C.2.56 UL reference measurement channel (768 kbps)

The parameters for the UL measurement channel for 768 kbps are specified in Table C.2.56.1 and Table C.2.56.2.

Table C.2.56.1: UL reference measurement channel, physical parameters (768 kbps)

Parameter	Level	Unit
Information bit rate	2*384	kbps
$DPDCH_1$	960	kbps
$DPDCH_2$	960	kbps
DPCCH	15	kbps
DPCCH/DPDCH power ratio	-11.48	dB
TFCI	On	-
Puncturing	18	%

Table C.2.56.2: UL reference measurement channel, transport channel parameters (768 kbps)

Parameter	DTCH	DCCH
Transport Channel Number	1	2
Transport Block Size	3840	100
Transport Block Set Size	7680	100
Transmission Time Interval	10 ms	40 ms
Type of Error Protection	Turbo Coding	Convolution Coding
Coding Rate	1/3	1/3
Static Rate Matching parameterattribute	1.0256	1.0256
Size of CRC	16	12

C.3 DL reference measurement channel

C.3.1 DL reference measurement channel (12.2 kbps)

The parameters for the 12.2 kbps DL reference measurement channel are specified in Table C.3.1 and Table C.3.2. The channel coding is detailed in Figure C.3.1.

Table C.3.1: DL reference measurement channel (12.2 kbps)

Parameter	Level	Unit
Information bit rate	12.2	kbps
DPCH	30	ksps
Slot Format #i	11	-
TFCI	On	
Power offsets PO1, PO2 and PO3	0	dB
Puncturing	14.514.7	%

Table C.3.2: DL reference measurement channel, transport channel parameters (12.2 kbps)

Parameter	DTCH	DCCH
Transport Channel Number	1	2
Transport Block Size	244	100
Transport Block Set Size	244	100
Transmission Time Interval	20 ms	40 ms
Type of Error Protection	Convolution Coding	Convolution Coding
Coding Rate	1/3	1/3
~~Static~~ Rate Matching ~~parameter~~attribute	~~1.0~~256	~~1.0~~256
Size of CRC	16	12
Position of TrCH in radio frame	fixed	fixed

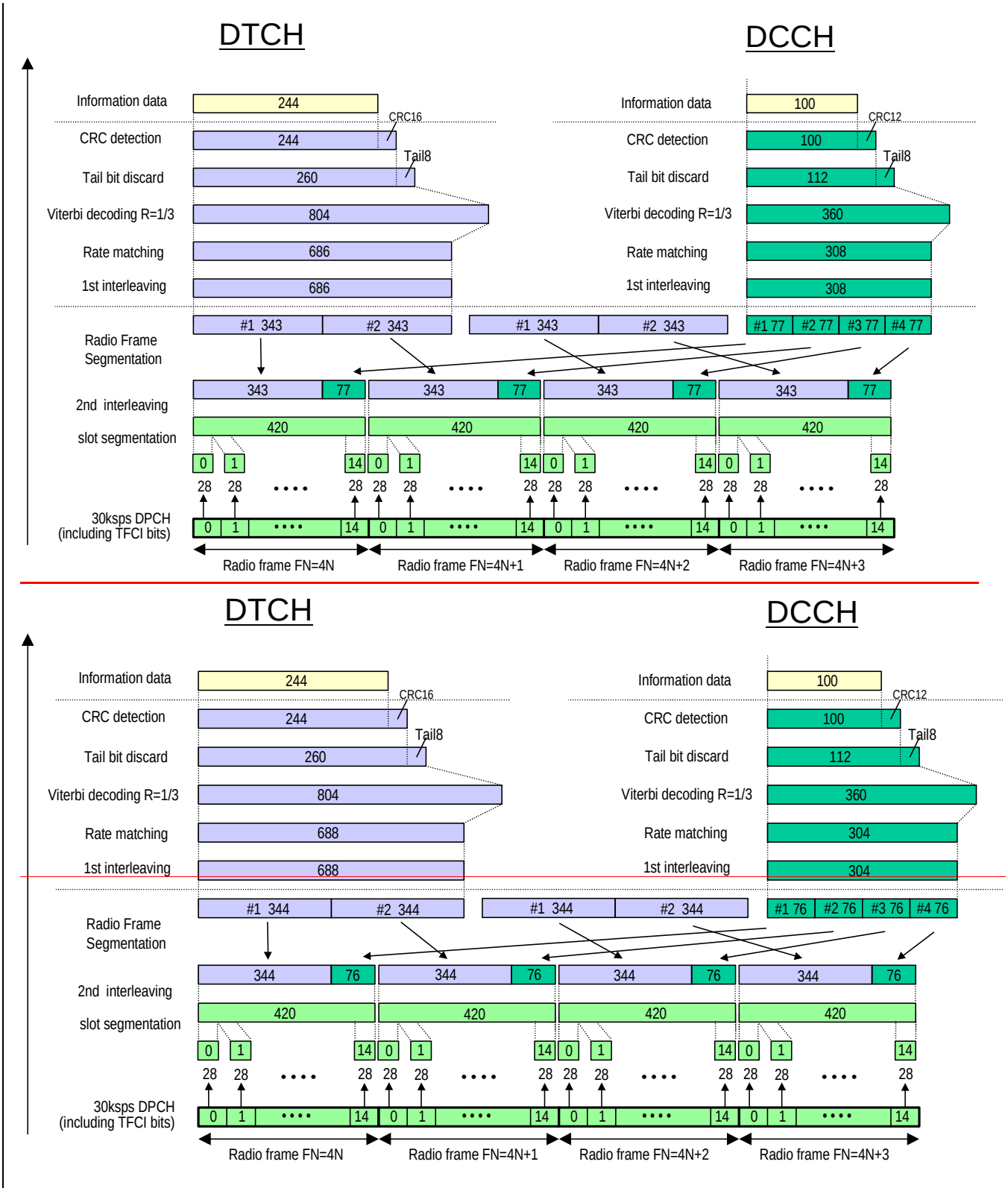


Figure C.3.1 (Informative): Channel coding of DL reference measurement channel (12.2 kbps)

C.3.2 DL reference measurement channel (64 kbps)

The parameters for the DL reference measurement channel for 64 kbps are specified in Table C.3.3 and Table C.3.4. The channel coding is detailed in Figure C.3.2.

Table C.3.3: DL reference measurement channel (64 kbps)

Parameter	Level	Unit
Information bit rate	64	kbps
DPCH	120	ksps
Slot Format #i	13	-
TFCI	On	-
Power offsets PO1, PO2 and PO3	0	dB
Repetition	2.9	%

Table C.3.4: DL reference measurement channel, transport channel parameters (64 kbps)

Parameter	DTCH	DCCH
Transport Channel Number	1	2
Transport Block Size	1280	100
Transport Block Set Size	1280	100
Transmission Time Interval	20 ms	40 ms
Type of Error Protection	Turbo Coding	Convolution Coding
Coding Rate	1/3	1/3
~~Static~~ Rate Matching ~~parameter~~attribute	~~1.0~~256	~~1.0~~256
Size of CRC	16	12
Position of TrCH in radio frame	fixed	fixed

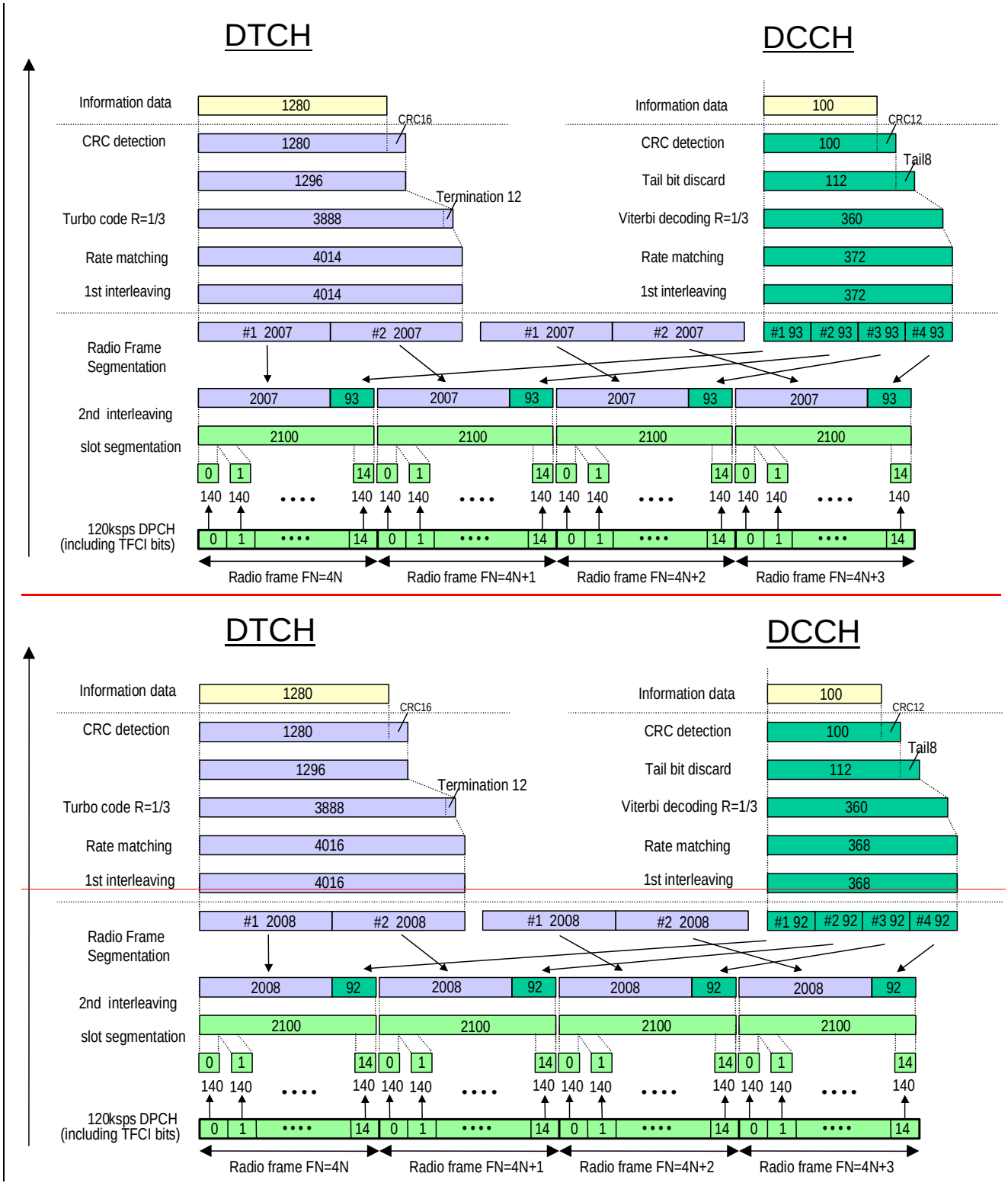


Figure C.3.2 (Informative): Channel coding of DL reference measurement channel (64 kbps)

C.3.3 DL reference measurement channel (144 kbps)

The parameters for the DL reference measurement channel for 144 kbps are specified in Table C.3.5 and Table C.3.6. The channel coding is detailed in Figure C.3.3.

Table C.3.5: DL reference measurement channel (144kbps)

Parameter	Level	Unit
Information bit rate	144	kbps
DPCH	240	ksps
Slot Format #i	14	-
TFCI	On	
Power offsets PO1, PO2 and PO3	0	dB
Puncturing	2.7	%

Table C.3.6: DL reference measurement channel, transport channel parameters (144 kbps)

Parameter	DTCH	DCCH
Transport Channel Number	1	2
Transport Block Size	2880	100
Transport Block Set Size	2880	100
Transmission Time Interval	20 ms	40 ms
Type of Error Protection	Turbo Coding	Convolution Coding
Coding Rate	1/3	1/3
~~Static~~ Rate Matching ~~parameter~~attribute	~~1.0~~256	~~1.0~~256
Size of CRC	16	12
Position of TrCH in radio frame	fixed	fixed

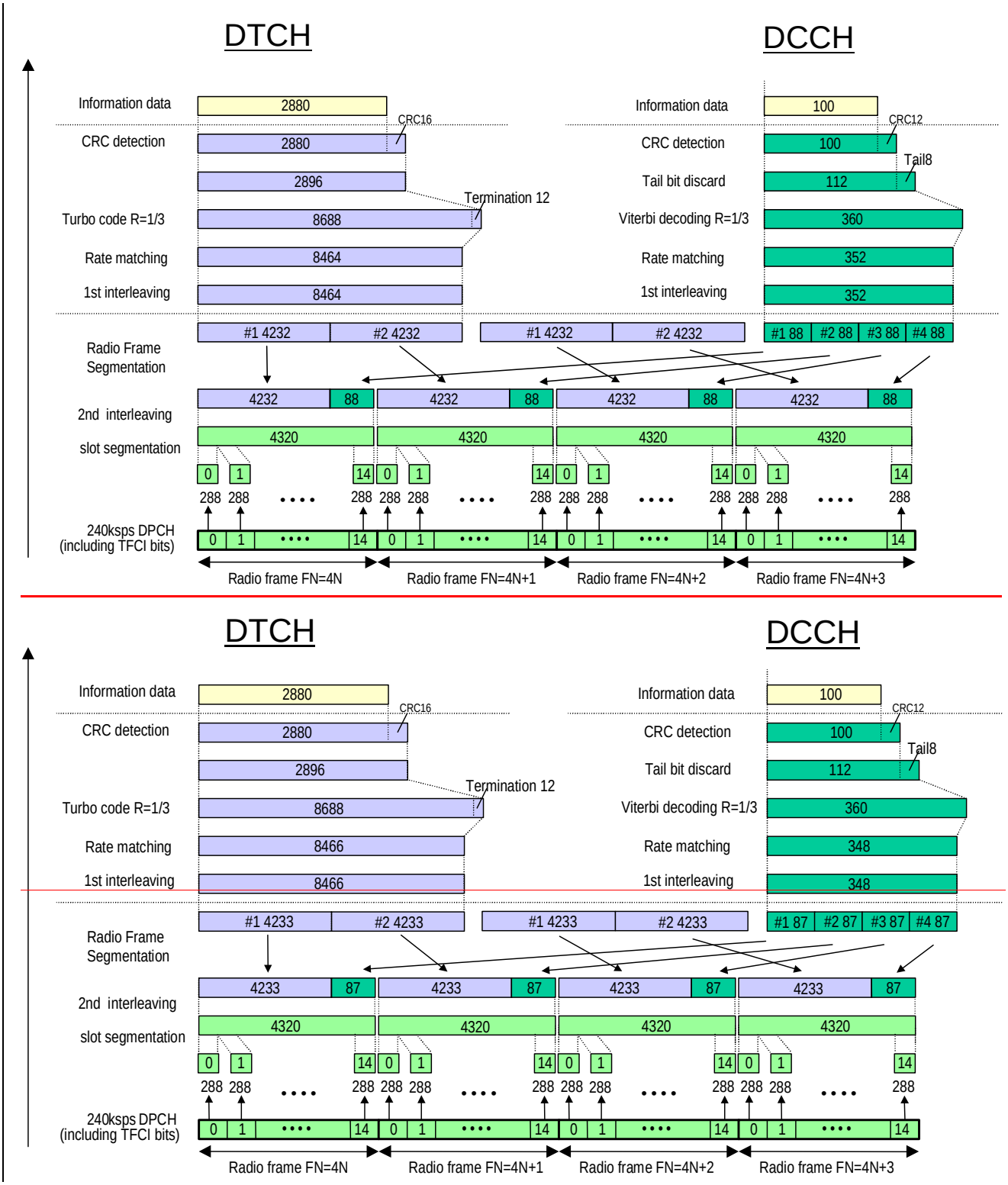


Figure C.3.3 (Informative): Channel coding of DL reference measurement channel (144 kbps)

C.3.4 DL reference measurement channel (384 kbps, 20ms TTI)

The parameters for the DL reference measurement channel for 384 kbps (20ms TTI) are specified in Table C.3.7 and Table C.3.8. The channel coding is detailed in Figure C.3.4.

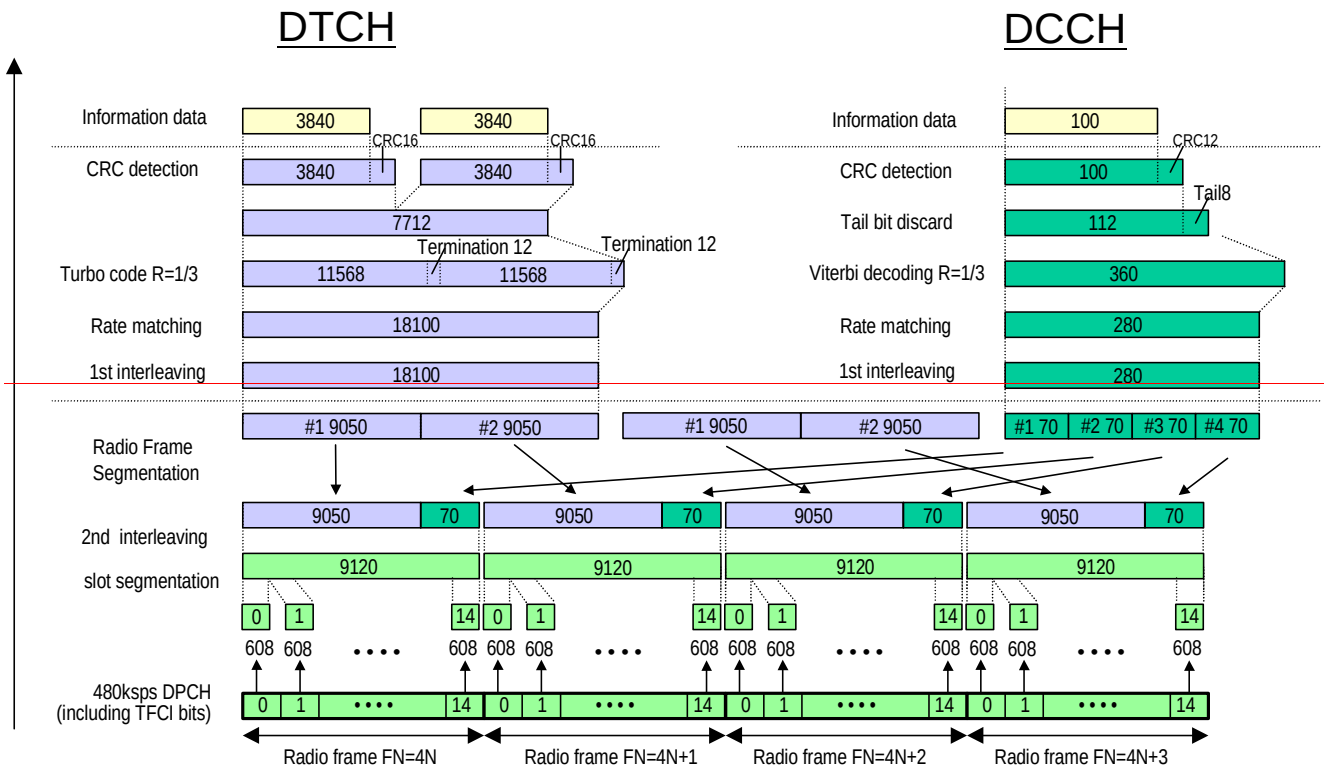
NOTE: The measurement channel for 384 kbps with 20ms-TTI will be deleted, and new 384kbps measurement channel defined in subclause C.3.5 will be used.

Table C.3.7: DL reference measurement channel (384kbps, 20ms TTI)

Parameter	Level	Unit
Information bit rate	384	kbps
DPCH	480	ksps
Slot Format #i	15	-
TFCI	On	
Power offsets PO1, PO2 and PO3	0	dB
Puncturing	22	%

Table C.3.8: DL reference measurement channel, transport channel parameters (384 kbps, 20ms TTI)

Parameter	DTCH	DCCH
Transport Channel Number	1	2
Transport Block Size	3840	100
Transport Block Set Size	7680	100
Transmission Time Interval	20 ms	40 ms
Type of Error Protection	Turbo Coding	Convolution Coding
Coding Rate	1/3	1/3
Static Rate Matching parameter	1.0	1.0
Size of CRC	16	12
Position of TrCH in radio frame	fixed	fixed



~~Figure C.3.4 (Informative): Channel coding of DL reference measurement channel (384 kbps, 20ms TTI))~~

C.3.~~4~~5 DL reference measurement channel (384 kbps)

The parameters for the DL reference measurement channel for 384 kbps are specified in Table C.3.~~4~~5.1 and Table C.3.~~4~~5.2. The channel coding is shown for information in Figure C3.~~4~~5.

Table C.3.~~4~~5.1: DL reference measurement channel, physical parameters (384 kbps)

Parameter	Level	Unit
Information bit rate	384	kbps
DPCH	480	ksps
TFCI	On	-
Puncturing	22	%

Table C.3.~~4~~5.2: DL reference measurement channel, transport channel parameters (384 kbps)

Parameter	DTCH	DCCH
Transport Channel Number	1	2
Transport Block Size	3840	100
Transport Block Set Size	3840	100
Transmission Time Interval	10 ms	40 ms
Type of Error Protection	Turbo Coding	Convolution Coding
Coding Rate	1/3	1/3
~~Static~~ Rate Matching ~~parameter~~attribute	~~1.0~~256	~~1.0~~256
Size of CRC	16	12
Position of TrCH in radio frame	fixed	Fixed

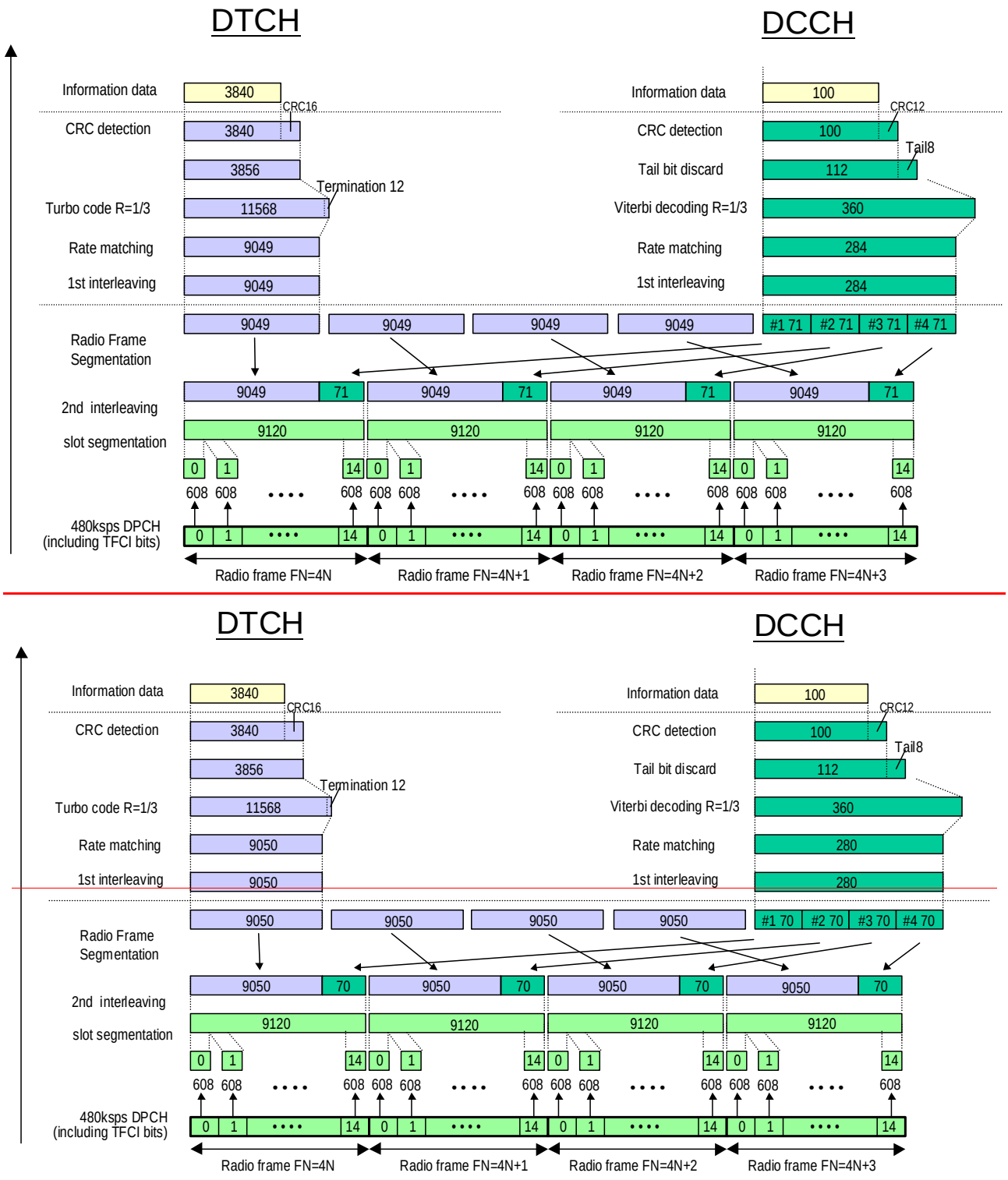


Figure C.3.45 (Informative): Channel coding of DL reference measurement channel (384 kbps)

C.4 Reference measurement channel for BTFD performance requirements

C.4.1 UL reference measurement channel for BTFD performance requirements

The parameters for UL reference measurement channel for BTFD are specified in Table C.4.1, Table C.4.2 and Table C.4.2.A.

Table C.4.1: UL reference measurement channel physical parameters for BTFD

Parameter	Level									Unit
Information bit rate	Rate1	Rate2	Rate3	Rate4	Rate5	Rate6	Rate7	Rate8	Rate9	kbps
	12.8k	10.8k	8.55	8.0k	7.3k	6.5k	5.75k	5.35k	2.55k	
DPCCH	15									kbps
DPCCH Slot Format #i	0									-
DPCCH/DPDCH power ratio	-5.46	-5.46	-5.46	-5.46	-5.46	-2.69	-2.69	-2.69	-2.69	dB
TFCI	On									-

Table C.4.2: UL reference measurement channel, transport channel parameters for BTFD

Parameters	DTCH									DCCH
	Rate1	Rate2	Rate3	Rate4	Rate5	Rate6	Rate7	Rate8	Rate9	
Transport Channel Number	1									2
Transport Block Size	256	216	171	160	146	130	115	107	51	100
Transport Block Set Size	256	216	171	160	146	130	115	107	51	100
Transmission Time Interval	20 ms									40 ms
Type of Error Protection	Convolution Coding									Convolution Coding
Coding Rate	1/3									1/3
Rate Matching Attribute	256									256
Size of CRC	0									12

Table C.4.2.A: Physical channel parameters

Min spreading factor	64
Max number of DPDCH data bits/radio frame	600
Puncturing Limit	1

C.4.2 DL reference measurement channel for BTFD performance requirements

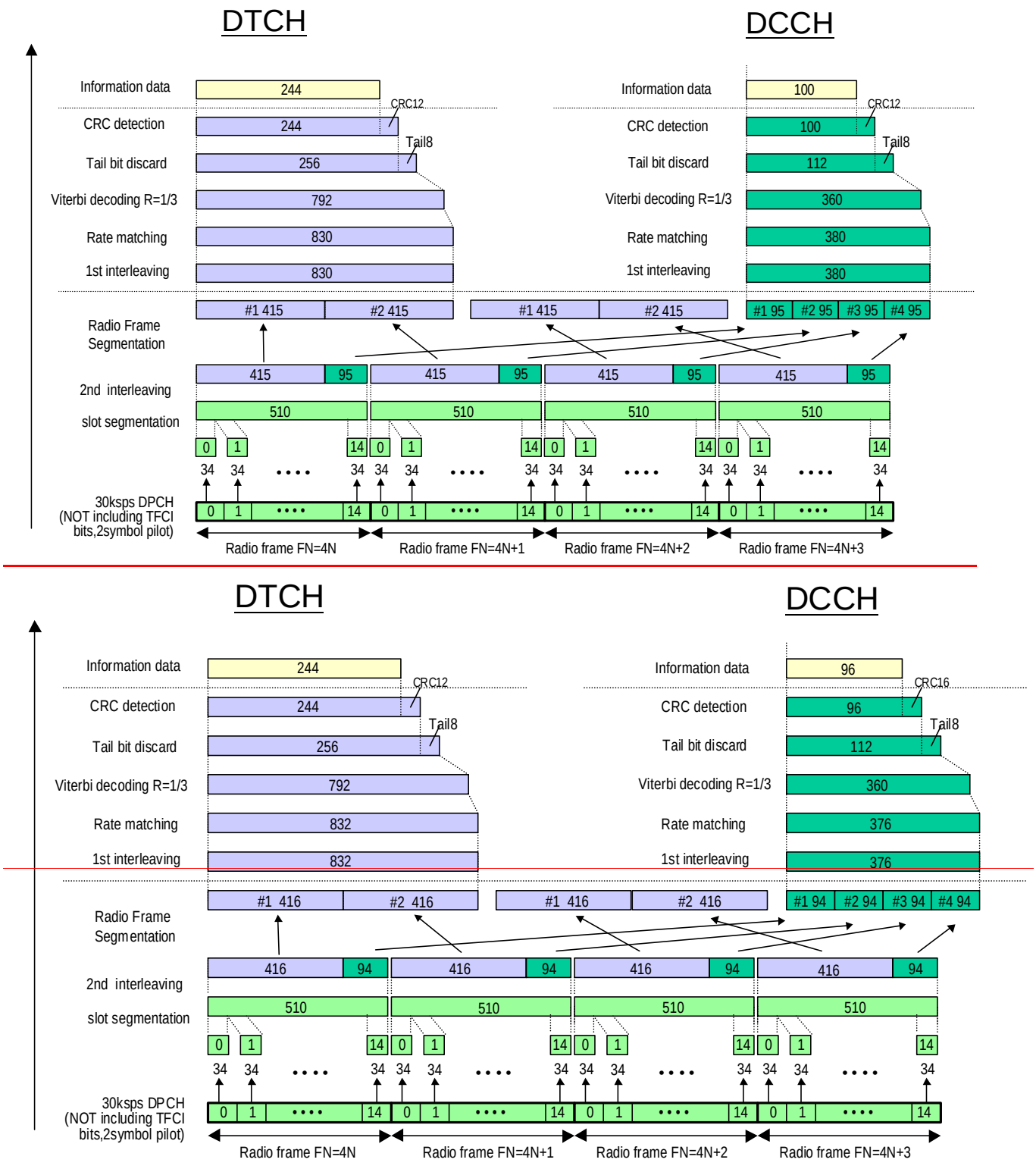
The parameters for DL reference measurement channel for BTFD are specified in Table C.4.3 and Table C.4.4. The channel coding for information is shown in Figures C.4.1, C.4.2, and C.4.3.

Table C.4.3: DL reference measurement channel physical parameters for BTFD

Parameter	Rate 1	Rate 2	Rate 3	Unit
Information bit rate	12.2	7.95	1.95	kbps
DPCH	30			ksps
TFCI	Off			-
Repetition	5			%

Table C.4.4: DL reference measurement channel, transport channel parameters for BTFD

Parameter	DTCH			DCCH
	Rate 1	Rate 2	Rate 3	
Transport Channel Number	1			2
Transport Block Size	244	159	39	~~96~~100
Transport Block Set Size	244	159	39	~~96~~100
Transmission Time Interval	20 ms			40 ms
Type of Error Protection	Convolution Coding			Convolution Coding
Coding Rate	1/3			1/3
~~Static~~ Rate Matching ~~parameter~~attribute	~~1.0~~256			~~1.0~~256
Size of CRC	12			~~16~~12
Position of TrCH in radio frame	fixed			fixed



FigureC.4.1 (Informative): Channel coding of DL reference measurement channel for BTFD (Rate 1)

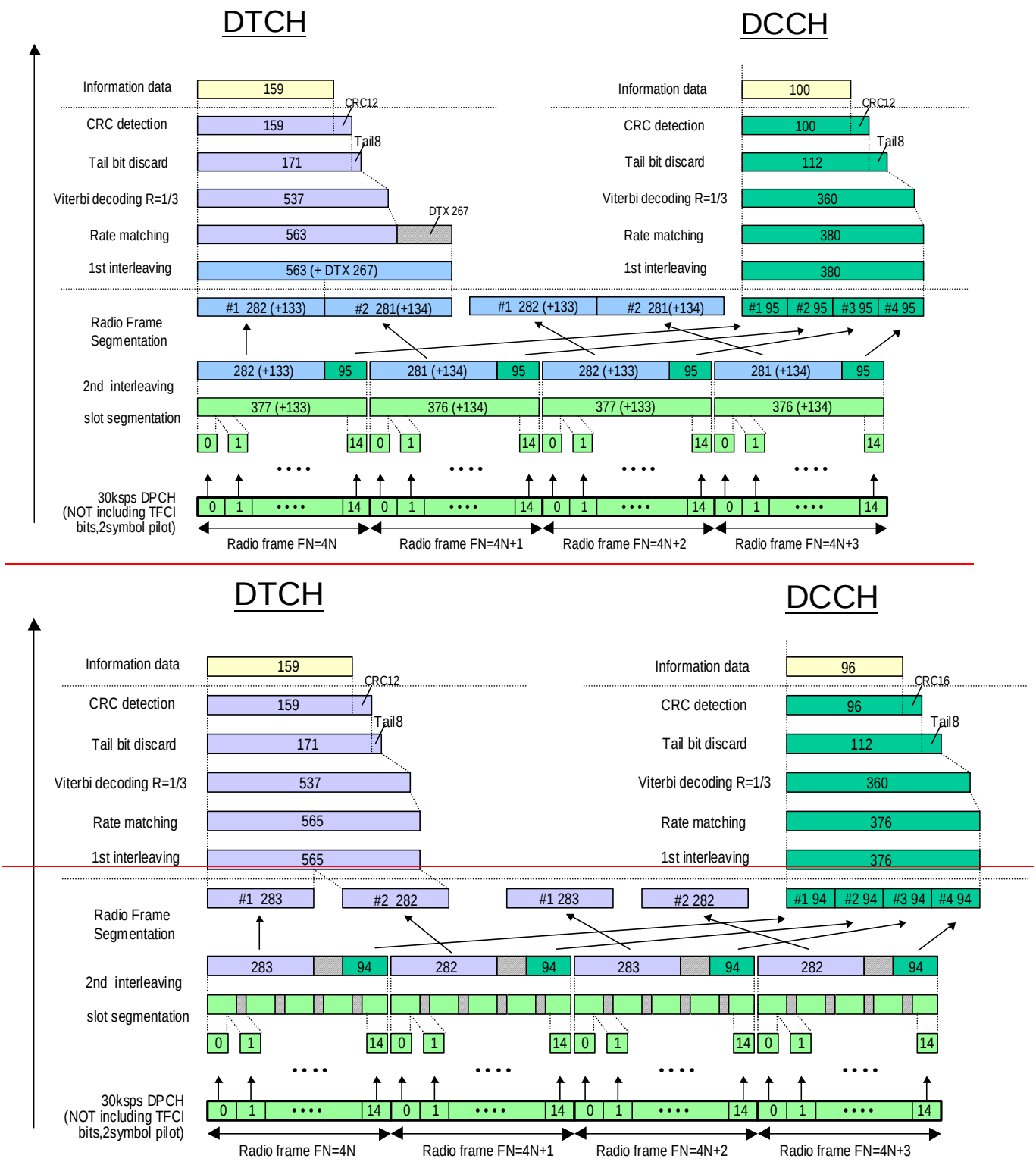


Figure C.4.2 (Informative): Channel coding of DL reference measurement channel for BTFD (Rate 2)

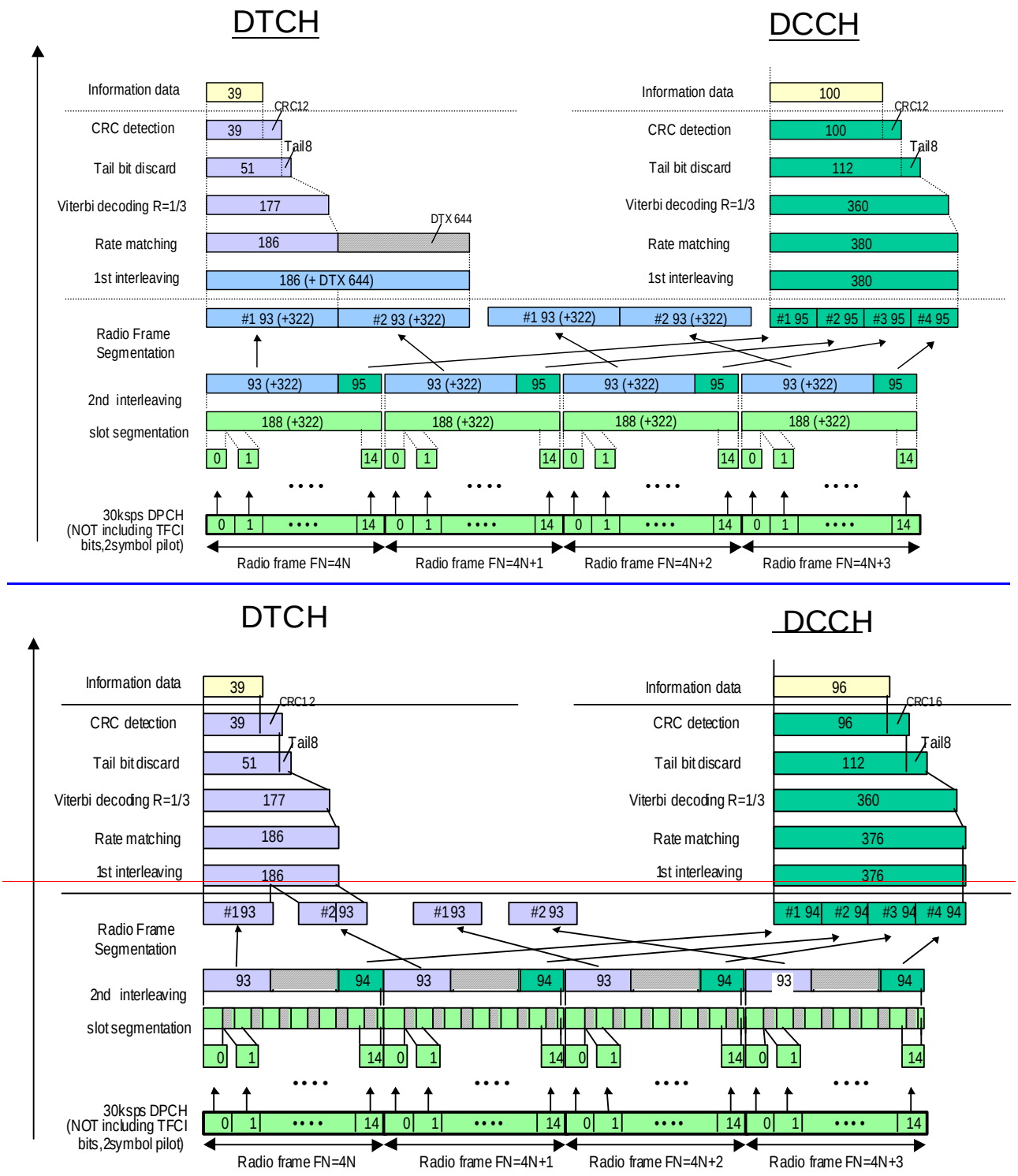


Figure C.4.3 (Informative): Channel coding of DL reference measurement channel for BTFD (Rate 3)

C.5 DL reference compressed mode parameters

Table C.5.1: Compressed mode reference pattern 1 parameters

Parameter	1.1	1.2	Note
TGSN (Transmission Gap Starting Slot Number)	11	11	
TGL1 (Transmission Gap Length 1)	7	7	
TGL2 (Transmission Gap Length 2)	-	-	Only one gap in use.
TGD (Transmission Gap Distance)	-	-	Only one gap in use.
TGPL1 (Transmission Gap Pattern Length)	2	4	
TGPL2 (Transmission Gap Pattern Length)	-	-	Only one pattern in use.
TGPRC (Transmission Gap Pattern Repetition Count)	NA	NA	Defined by higher layers
TGCFN (Transmission Gap Connection Frame Number):	NA	NA	Defined by higher layers
UL/DL compressed mode selection	DL & UL	DL & UL	2 configurations possible DL &UL / DL
UL compressed mode method	SF/2	SF/2	
DL compressed mode method	SF/2	Puncturing	
Downlink frame type and Slot format	11B	11A	
Scrambling code change	No	No	
RPP (Recovery period power control mode)	0	0	
ITP (Initial transmission power control mode)	0	0	

Table C.5.2: Compressed mode reference pattern 2 parameters

Parameter	2.1	2.2	Note
TGSN (Transmission Gap Starting Slot Number)	4	4	
TGL1 (Transmission Gap Length 1)	7	7	
TGL2 (Transmission Gap Length 2)	-	-	Only one gap in use.
TGD (Transmission Gap Distance)	-	135	
TGPL1 (Transmission Gap Pattern Length)	3	12	
TGPL2 (Transmission Gap Pattern Length)	-	-	Only one pattern in use.
TGPRC (Transmission Gap Pattern Repetition Count)	NA	NA	Defined by higher layers
TGCFN (Transmission Gap Connection Frame Number):	NA	NA	Defined by higher layers
UL/DL compressed mode selection	DL & UL	DL & UL	2 configurations possible. DL & UL / DL
UL compressed mode method	SF/2	SF/2	
DL compressed mode method	SF/2	SF/2	
Downlink frame type and Slot format	11B	11B	
Scrambling code change	No	No	
RPP (Recovery period power control mode)	0	0	

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or for SMG, use the format P-99-xxx

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34.121	CR	046	Current Version:	3.2.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	T1 #9	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [X] UTRAN / Radio [ ] Core Network [ ]

Source: TSG-T1/RF SWG **Date:** 2000-11-16

Subject: Test for combining TPC commands in soft handover

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: Completion of test following changes to core specification.

Clauses affected: 7.7.2

Other specs affected:

Other 3G core specifications		→ List of CRs:	
Other GSM core specifications		→ List of CRs:	
MS test specifications		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments:

help.doc

<--------- double-click here for help and instructions on how to create a CR.

7.7.2 Combining of TPC commands ~~not known to be the same~~from radio links of different radio link sets

7.7.2.1 Definition and applicability

When a UE is in soft handover, multiple TPC commands may be received in each slot from different cells in the active set. In general, the TPC commands transmitted in the same slot in the different cells may be different and need to be combined to give TPC_cmd as specified in [5] TS25.214, in order to determine the required uplink power step.

The requirements and this test apply to all types of UTRA for the FDD UE.

~~*[TBD]*~~

7.7.2.2 Conformance requirements

Test parameters are specified in Table 7.7.2.1. The delay profiles of the signals received from the different cells are the same but time-shifted by 10 chips.

For Test 1, the uplink power changes between adjacent slots shall be as shown in Table 7.7.2.2 over the 4 consecutive slots. Note that this case is without an additional noise source I_{oc}.

For Test 2, the Cell1 and Cell2 TPC patterns are repeated ~~15~~a number of times. ~~i.e., over 4 frames. Transmitted power of UE in relative uplink slots is recorded.~~ If the transmitted power of a given slot is increased compared to ~~a~~the previous slot, then a variable "Transmitted power UP" is increased by one, otherwise a variable "Transmitted power DOWN" is increased by one. The requirements for "Transmitted power UP" and "Transmitted power DOWN" are shown in Table 7.7.2.~~2~~3. ~~Note that test is done without additional noise source Ioc.~~

Table 7.7.2.1: Parameters for TPC command combining ~~(Static conditions)~~

Parameter	Test 1	Test 2	Unit
~~Initial power in uplink~~	~~–5~~		~~dBm~~
Phase reference	P-CPICH		-
DPCH_Ec/Ior	–12		dB
~~$\hat{I}_{or1}/I_{oc}$~~ $\hat{I}_{or1}$ and ~~$\hat{I}_{or2}/I_{oc}$~~ $\hat{I}_{or2}$	–60		dBm / 3.84 MHz
I_{oc}	-	-60	dBm / 3.84 MHz
Power-Control-Algorithm	Algorithm 1		-
Cell 1 TPC commands over 4 slots	{0,0~~,~~1~~,~~1}		-
Cell 2 TPC commands over 4 slots	{0,1,0,1}		-
Information Data Rate	12.2		kbps
Propagation condition	Static without AWGN source I_{oc}	Multi-path fading case 3	-

Table 7.7.2.2: Requirements for Test 1

Test Number	Required power changes over the 4 consecutive slots
1	Down, Down, Down, Up

Table 7.7.2.~~23~~: ~~Test r~~Requirements for ~~TPC command combining~~Test 2

Test Number	Ratio (Transmitted power UP) / (Total number of slots)	Ratio (Transmitted power DOWN) / (Total number of slots)
~~1~~2	~~[~~≥0.25~~15]~~	~~[~~≥0.5~~30]~~

The reference for this requirement is [1] TS 25.101 subclause 8.7.2.1.

7.7.2.3 Test purpose

To verify that the combining of TPC commands received in soft handover results in TPC_cmd being derived so as to meet the requirements stated in Tables 7.7.2.2 and 7.7.2.3.

~~*[TBD]*~~

7.7.2.4 Method of test

7.7.2.4.1 Initial conditions

(1) Connect two SS's to the UE antenna connector as shown in Figure A.13.

(2) Set the test parameters as specified in Table 7.7.2.1 for Test 1, and other RF parameters according to Annex E.

(3) Set up a call according to the Generic Call Setup procedure.

(4) Signal the uplink DPCH power control parameters to use Algorithm 1 and a step size of 1dB.

(5) Enter the UE into loopback test mode and start the loopback test.

See [3] TS 34.108 and [4] TS 34.109 for details regarding the generic call setup procedure and loopback test.

~~*[TBD]*~~

7.7.2.4.2 Procedures

(1) Before proceeding with paragraph (2), set the output power of the UE, measured at the UE antenna connector, to be in the range –10±9dBm. This may be achieved by setting the downlink signal ($\hat{I}_{or}$) to yield an appropriate open loop output power and/or by generating suitable downlink TPC commands from the SSs.

(2) Send the following sequences of TPC commands in the downlink from each SS over a period of 5 timeslots:

	Downlink TPC commands				
	Slot #0	Slot #1	Slot #2	Slot #3	Slot #4
SS1	0	0	0	1	1
SS2	0	0	1	0	1

(3) Measure the average output power at the UE antenna connector in timeslots # 0, 1, 2, 3 and 4, not including the 25μs transient periods at the start and end of each slot.

(4) End test 1 and disconnect UE.

(5) Connect two SS's and an AWGN source to the UE antenna connector as shown in Figure A.11.

(6) Initialise variables "Transmitted power UP" and "Transmitted power DOWN" to zero.

(7) Set the test parameters as specified in Table 7.7.2.1 for Test 2, and other RF parameters according to Annex E

(8) Set up a call according to the Generic Call Setup procedure.

(9) Signal the uplink DPCH power control parameters to use Algorithm 1 and a step size of 1dB.

(10) Enter the UE into loopback test mode and start the loopback test.

(11) Perform the following steps (a) to (d) [15] times:

(a) Before proceeding with step (b), set the output power of the UE, measured at the UE antenna connector, to be in the range –10±9dBm. This may be achieved by generating suitable downlink TPC commands from the SSs.

(b) Send the following sequences of TPC commands in the downlink from each SS over a period of 33 timeslots:

	Downlink TPC commands
SS1	1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1
SS2	1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1

(c) Measure the average output power at the UE antenna connector in each timeslot, not including the 25µs transient periods at the start and end of each slot.

(d) For each timeslot from the 2nd timeslot to the 33rd timeslot inclusive:

- if the average power in that timeslot is greater than or equal to the average power in the previous timeslot plus 0.5dB, increment "Transmitted power UP" by 1;
- if the average power in that timeslot is less than or equal to the average power in the previous timeslot minus 0.5dB, increment "Transmitted power DOWN" by 1.

~~*[TBD]*~~

7.7.2.5 Test requirements

(1) In Step (2) of subclause 7.7.2.4.2, the average power in slot #1 shall be less than or equal to the average power in slot #0 minus 0.5dB.

(2) In Step (2) of subclause 7.7.2.4.2, the average power in slot #2 shall be less than or equal to the average power in slot #1 minus 0.5dB.

(3) In Step (2) of subclause 7.7.2.4.2, the average power in slot #3 shall be less than or equal to the average power in slot #2 minus 0.5dB.

(4) In Step (2) of subclause 7.7.2.4.2, the average power in slot #4 shall be greater than or equal to the average power in slot #3 plus 0.5dB.

(5) At the end of the test, "Transmitted power UP" shall be greater than or equal to [95] and "Transmitted power DOWN" shall be greater than or equal to [210].

NOTE: The test limits in requirements (4) and (5) have been computed to give a confidence level of [99.7]% that a UE which follows the core requirements will pass. The number of timeslots has been chosen to get a good compromise between the test time and the risk of passing a bad UE.

~~*[TBD]*~~

7.8 Power control in downlink

Annex A (informative): Connection Diagrams

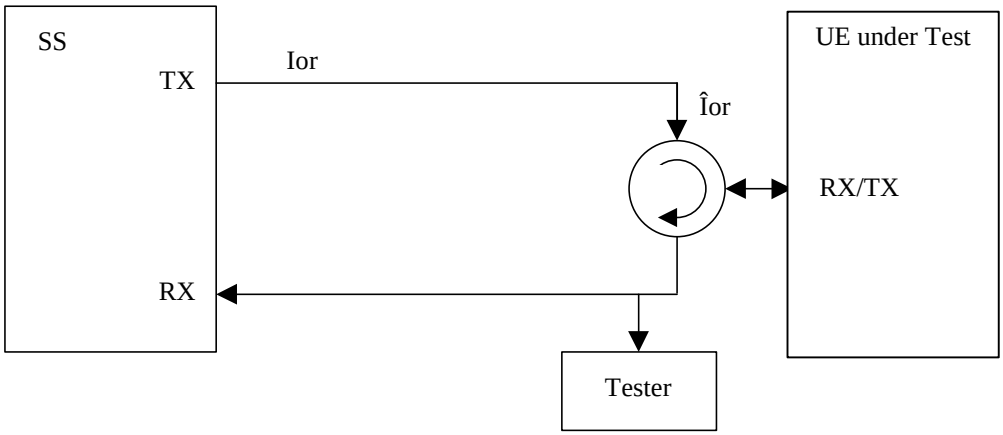

Figure A.1: Connection for Basic TX Test

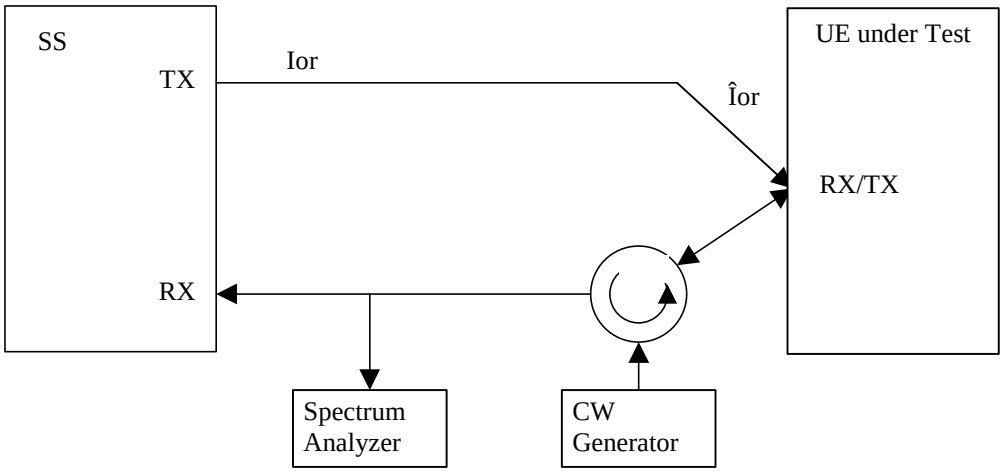

Figure A.2: Connection for TX Intermodulation Test

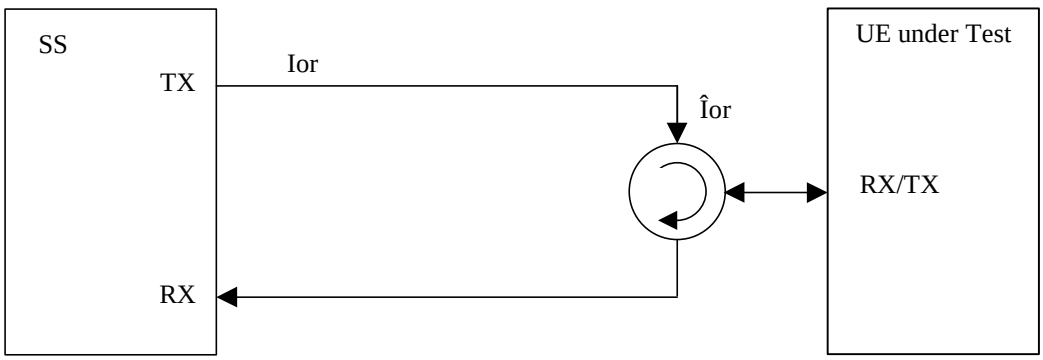

Figure A.3: Connection for Basic RX Test

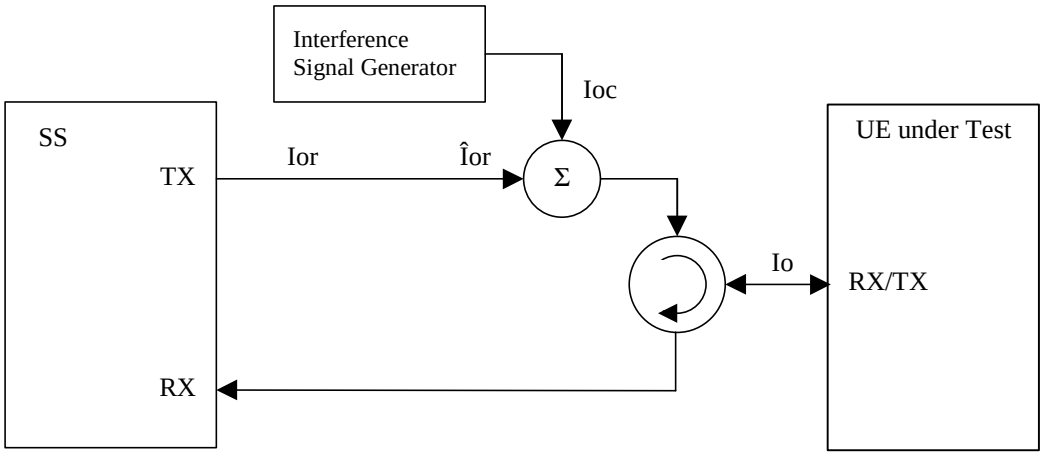

Figure A.4: Connection for RX Test with Interference

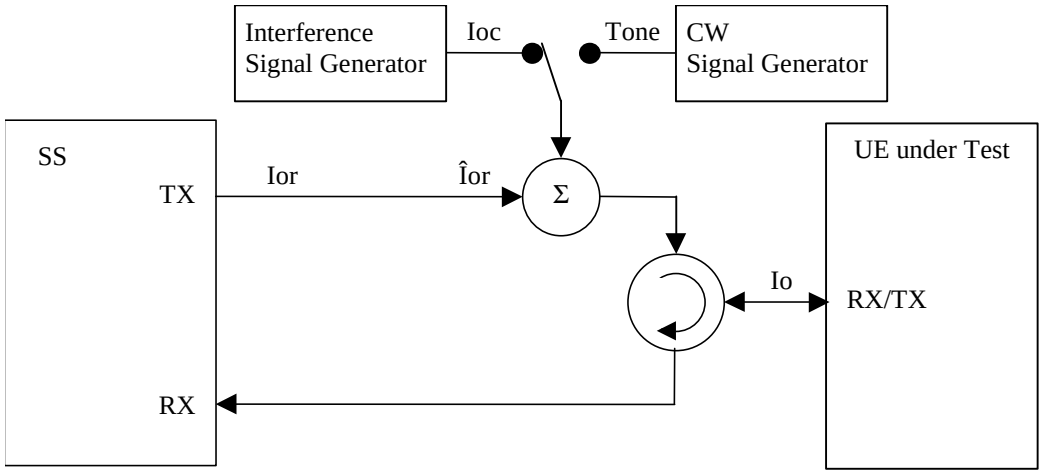

Figure A.5: Connection for RX Test with Interference or additional CW

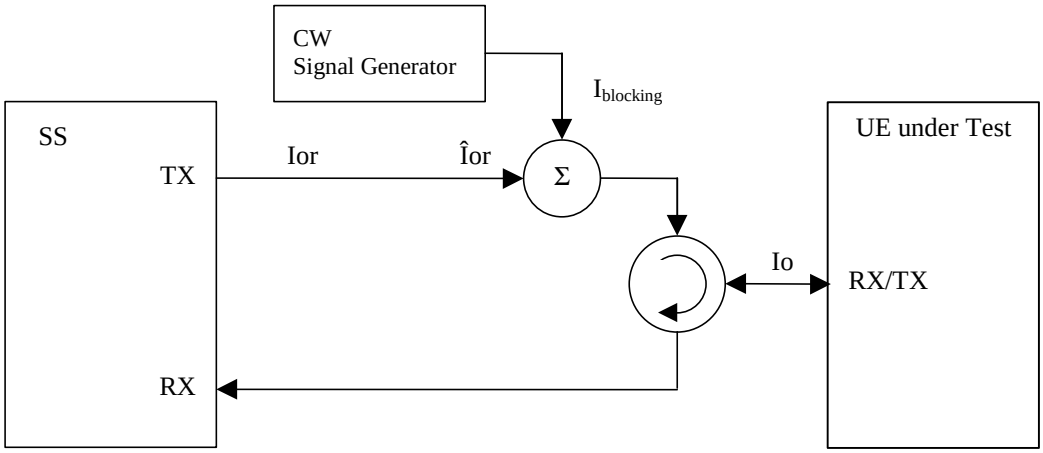

Figure A.6: Connection for RX Test with additional CW

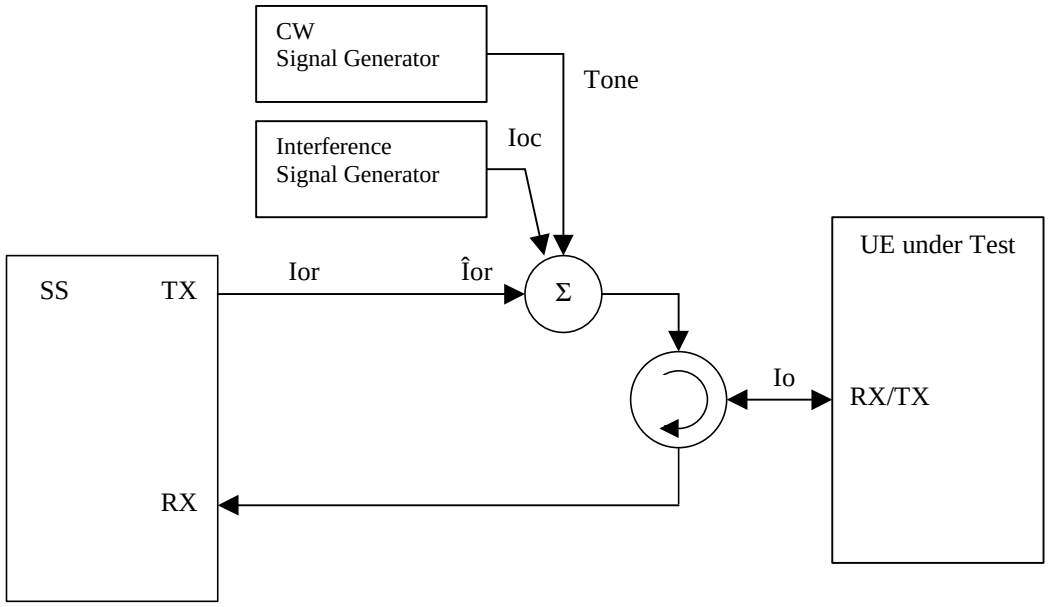

Figure A.7: Connection for RX Test with both Interference and additional CW

Figure A.8: Connection for Spurious Emission Test

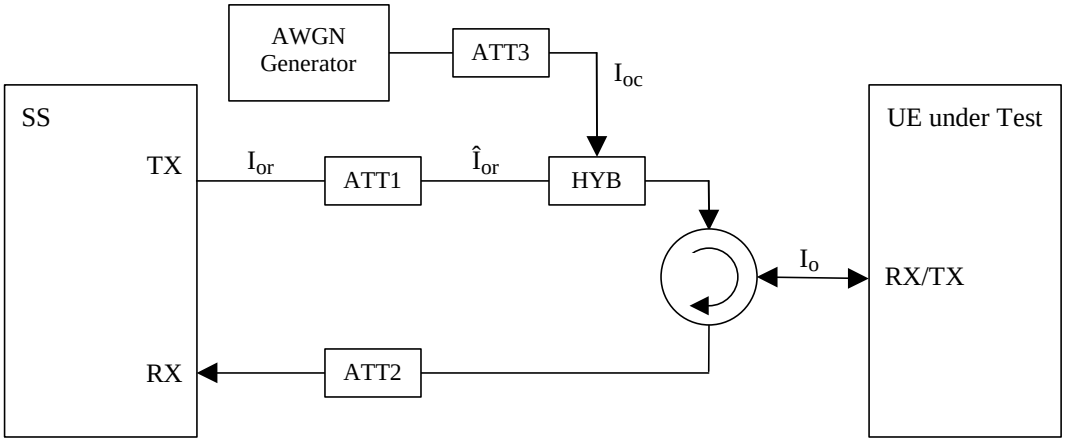

Figure A.9: Connection for Static Propagation Test

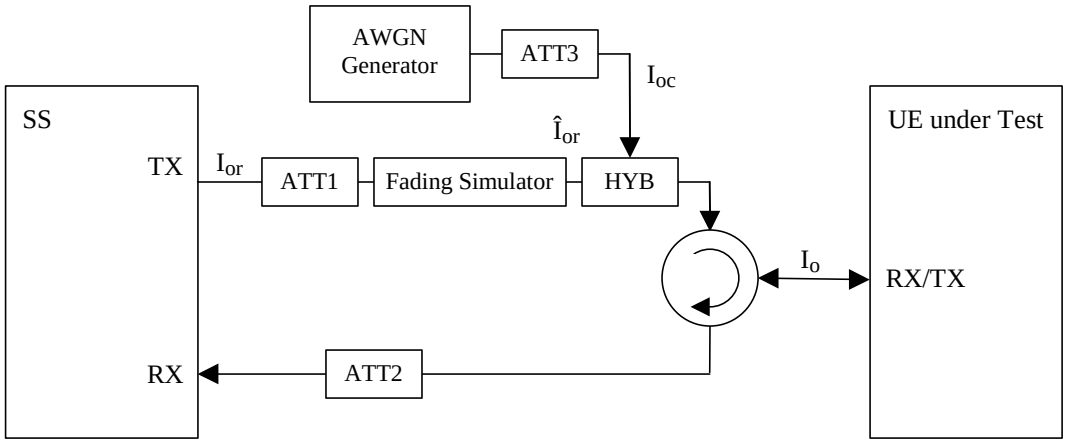

Figure A.10: Connection for Multi-path Fading Propagation Test

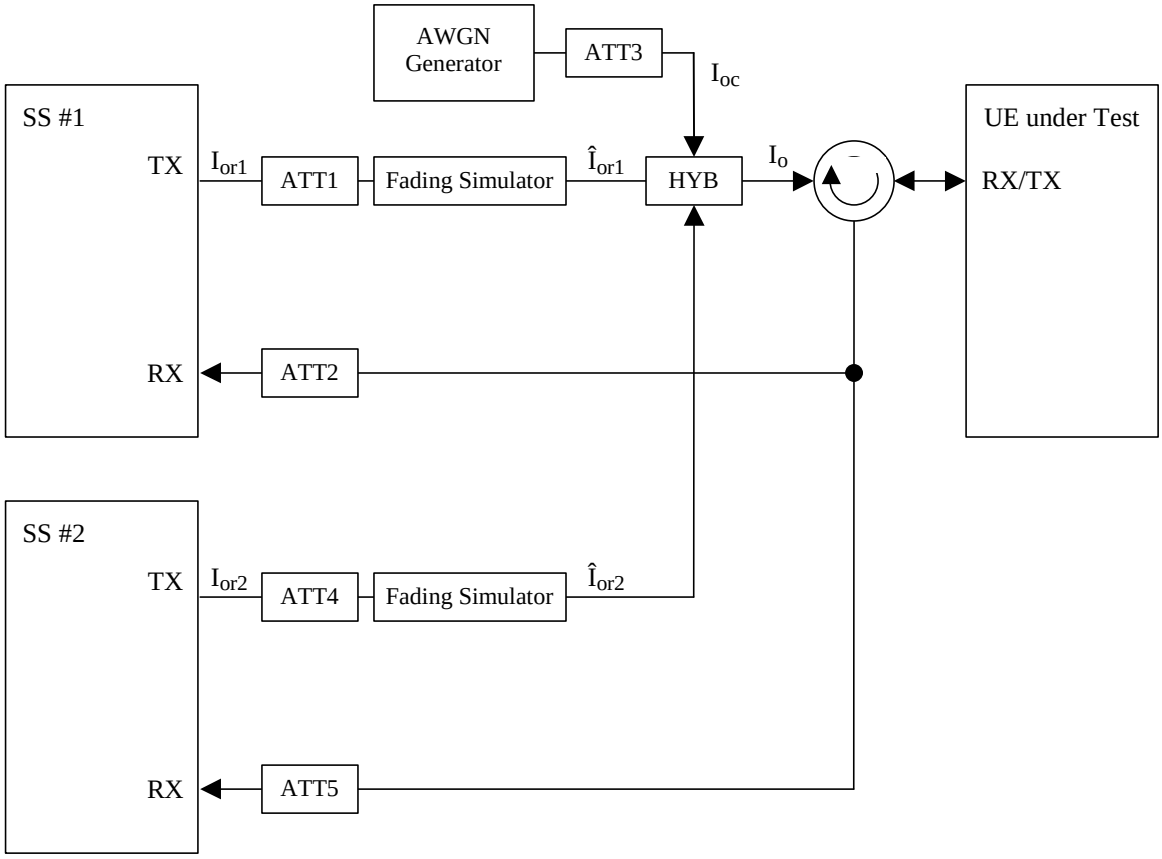

Figure A.11: Connection for Inter-Cell Soft Handover Test

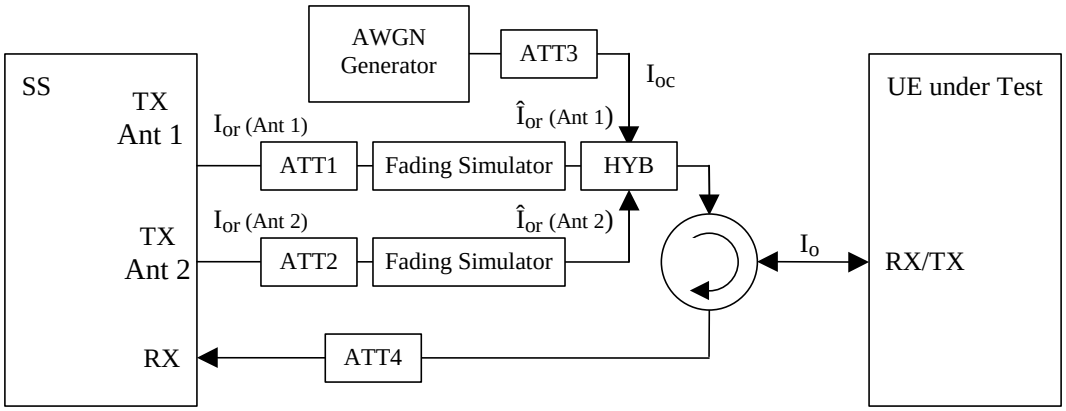

Figure A.12: Connection for Demodulation of DCH in open and closed loop transmit diversity modes

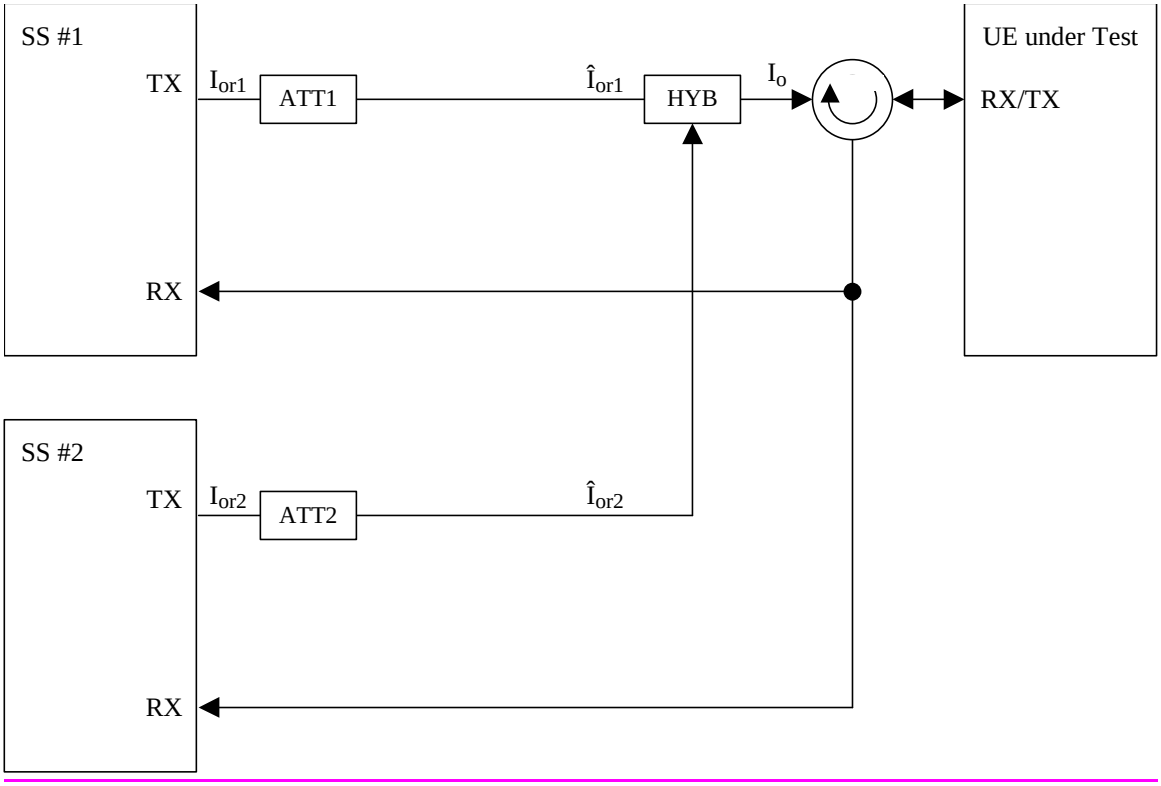

Figure A.13: Connection for Combining of TPC commands in Soft Handover Test 1

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or for SMG, use the format P-99-xxx

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34.121	CR	047	Current Version:	3.2.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	T1 #9	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [X] UTRAN / Radio [ ] Core Network [ ]

Source: TSG-T1/RF SWG **Date:** 2000-11-16

Subject: Corrections to power control tests

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change:

- A note is required for clarification of table 5.4.2.1.
- Downlink TPC commands may be used to ensure correct UE Tx power setting at the start of tests.

Clauses affected: 5.4.2.2, 5.4.2.4.2, 5.7.4.2

Other specs affected:

Other 3G core specifications	[ ]	→ List of CRs:	
Other GSM core specifications	[ ]	→ List of CRs:	
MS test specifications	[ ]	→ List of CRs:	
BSS test specifications	[ ]	→ List of CRs:	
O&M specifications	[ ]	→ List of CRs:	

Other comments:

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5.4.2 Inner Loop Power Control in the Uplink

5.4.2.1 Definition and applicability

Inner loop power control in the uplink is the ability of the UE transmitter to adjust its output power in accordance with one or more TPC commands received in the downlink.

The power control step is the change in the UE transmitter output power in response to a single TPC command, TPC_cmd, derived at the UE.

This clause does not cover all the requirements of compressed mode or soft handover.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.4.2.2 Conformance requirements

The UE transmitter shall have the capability of changing the output power with a step size of 1, 2 and 3 dB according to the value of Δ_{TPC} or $\Delta_{RP\text{-}TPC}$, in the slot immediately after the TPC_cmd can be derived.

a) The transmitter output power step due to inner loop power control shall be within the range shown in Table 5.4.2.1. The Maximum power threshold is defined as the lowest permissible maximum output power for the UE power class, as defined in Table 5.2.1. The Minimum power threshold is defined as –50 dBm.

b) When the transmitter output power is between the Minimum and Maximum power thresholds, the transmitter average output power step due to inner loop power control shall be within the range shown in Table 5.4.2.2. Here a TPC_cmd group is a set of TPC_cmd values derived from a corresponding sequence of TPC commands of the same duration.

NOTE: 3dB inner loop power control steps are only used in compressed mode.

The inner loop power step is defined as the relative power difference between the average power of the original (reference) timeslot and the average power of the target timeslot, not including the transient duration. The transient duration is from 25μs before the slot boundary to 25μs after the slot boundary. The power is measured with a filter that has a Root-Raised Cosine (RRC) filter response with a roll off $\alpha = 0.22$ and a bandwidth equal to the chip rate.

Table 5.4.2.1: Transmitter power control tolerance

TPC_cmd	Transmitter power control range (all units are in dB)					
	1 dB step size		2 dB step size		3 dB step size	
	Lower	Upper	Lower	Upper	Lower	Upper
+ 1	+0.5	+1.5	+1	+3	+1.5	+4.5
0	–0.5	+0.5	–0.5	+0.5	–0.5	+0.5
– 1	–0.5	–1.5	–1	–3	–1.5	–4.5
+ 1 at or above max power threshold	–0.5	+1.5	–0.5	+3	–0.5	+4.5
– 1 at or below min power threshold	+0.5	–1.5	+0.5	–3	+0.5	–4.5

NOTE: The requirements for TPC_cmd = +1 at or above max power threshold and for TPC_cmd = -1 at or below min power threshold are included to avoid ambiguity in the required test behaviour. These requirements are not explicitly included in [1] but are consistent with [1] and [5].

Table 5.4.2.2: Transmitter average power control tolerance

TPC_cmd group	Transmitter power control range after 10 equal TPC_cmd group (all units are in dB)				Transmitter power control range after 7 equal TPC_cmd groups (all units are in dB)	
	1 dB step size		2 dB step size		3 dB step size	
	Lower	Upper	Lower	Upper	Lower	Upper
+ 1	+8	+12	+16	+24	+16	+26
0	–1	+1	–1	+1	–1	+1
– 1	–8	–12	–16	–24	–16	–26
0,0,0,0,+1	+6	+14	N/A	N/A	N/A	N/A
0,0,0,0,–1	–6	–14	N/A	N/A	N/A	N/A

The reference for this requirement is [1] TS 25.101 subclause 6.4.2.1.1.

The requirements for the derivation of TPC_cmd are detailed in TS 25.214 subclauses 5.1.2.2.2 and 5.1.2.2.3.

5.4.2.3 Test purpose

- To verify that the UE inner loop power control size and response is meet to the described value shown in subclause 5.4.2.2.
- To verify that TPC_cmd is correctly derived from received TPC commands.

An excess error of the inner loop power control decreases the system capacity.

5.4.2.4 Method of test

5.4.2.4.1 Initial conditions

1) Connect the SS to the UE antenna connector as shown in Figure A.1.
2) A call is set up according to the Generic call setup procedure. The Uplink DPCH Power Control Info shall specify the Power Control Algorithm as algorithm 2 for interpreting TPC commands.
3) Enter the UE into loopback test mode and start the loopback test.

See [3] TS 34.108 and [4] TS 34.109 for details regarding generic call setup procedure and loopback test.

5.4.2.4.2 Procedure

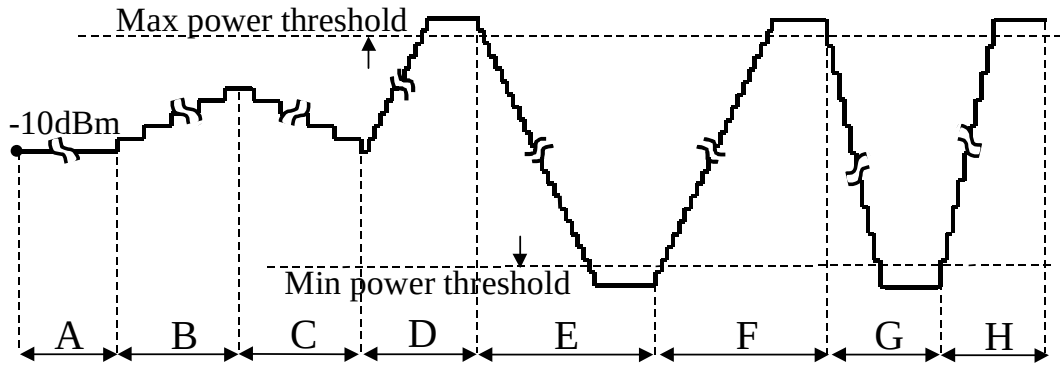

Figure 5.4.2.4 Inner Loop Power Control Test Steps

1) Before proceeding with paragraph (2) (Step A) below, set the output power of the UE, measured at the UE antenna connector, to be in the range –10±9dBm. This may be achieved by ~~S~~setting the downlink signal ($\hat{I}_{or}$) to yield an appropriate open loop output power and/or by generating suitable downlink TPC commands from the SS, ~~measured at the UE antenna connector, of -10±9 dBm~~.

2) Step A: Transmit a sequence of at least 30 and no more than 60 TPC commands, which shall commence at a frame boundary and last for a whole number of frames, and which shall contain:

   - no sets of 5 consecutive "0" or "1" commands which commence in the 1st, 6th or 11th slots of a frame;
   - at least one set of 5 consecutive "0" commands which does not commence in the 1st, 6th or 11th slots of a frame;
   - at least one set of 5 consecutive "1" commands which does not commence in the 1st, 6th or 11th slots of a frame.

   The following is an example of a suitable sequence of TPC commands:

   1000001010101011111010000010101010111110100000101010101111 10

3) Step B: Transmit a sequence of 50 TPC commands with the value 1.

4) Step C: Transmit a sequence of 50 TPC commands with the value 0.

5) Step D: Reconfigure the uplink channel to set the Power Control Algorithm to algorithm 1, and the TPC step size to 1 dB. When the reconfiguration is complete, t~~T~~ransmit a sequence of ~~90~~[1] –TPC commands with the value 1 until the UE output power is above the maximum power threshold.

6) Step E: Transmit a sequence of 150[1] TPC commands with the value 0.

7) Step F: Transmit a sequence of 150[1] TPC commands with the value 1.

8) Step G: Reconfigure the uplink channel to set the TPC step size to 2 dB (with the Power Control Algorithm remaining as algorithm 1). When the reconfiguration is complete, transmit a sequence of TPC commands with the value 1 until the UE output power is above the maximum power threshold. Transmit a sequence of 75[1] TPC commands with the value 0.

9) Step H: Transmit a sequence of 75[1] TPC commands with the value 1.

10) During steps A to H the mean output power of every slot shall be measured, with the following exceptions:

- In steps D and F, measurement of the output power is not required in slots after the 10th slot after the mean output power has exceeded the maximum power threshold;
- In steps E and G, measurement of the output power is not required in slots after the 10th slot after the mean output power has fallen below the minimum power threshold.

The transient periods of 25μs before each slot boundary and 25μs after each slot boundary shall not be included in the power measurements.

[1] NOTE: These numbers of TPC commands are given as examples. The actual number of TPC commands transmitted in these steps shall be at least 10 more than the number required to ensure that the UE reaches the relevant maximum or minimum power threshold in each step, as shown in Figure 5.4.2.4.

5.4.2.5 Test requirements

a) During Step A, the difference in mean output power between adjacent slots shall be within the prescribed range for a TPC_cmd of 0, as given in Table 5.4.2.1.

b) During Step A, the change in mean output power over 10 consecutive slots shall be within the prescribed range for a TPC_cmd group of 0, as given in Table 5.4.2.2.

c) During Step B, the difference in mean output power between adjacent slots shall be within the prescribed range given in Table 5.4.2.1, given that every 5th TPC_cmd should have the value + 1, with a step size of 1 dB, and all other TPC_cmd should have the value 0.

d) During Step B, the change in mean output power over 50 consecutive slots shall be within the prescribed range for a TPC_cmd group of {0,0,0,0,+1}, as given in Table 5.4.2.2.

e) During Step C, the difference in mean output power between adjacent slots shall be within the prescribed range given in Table 5.4.2.1, given that every 5th TPC_cmd should have the value – 1, with a step size of 1 dB, and all other TPC_cmd should have the value 0.

f) During Step C, the change in mean output power over 50 consecutive slots shall be within the prescribed range for a TPC_cmd group of {0,0,0,0,-1}, as given in Table 5.4.2.2.

~~g) During Step D, the difference in mean output power between adjacent slots shall be within the prescribed range given in Table 5.4.2.1 for a TPC_cmd of + 1 and step size of 1 dB, until the output power reaches (Maximum power threshold – 0.5 dB). When the output power is between the values of (Maximum power threshold – 0.5 dB) and (Maximum power threshold), the difference in mean output power between adjacent slots shall be at least sufficient to increase the output power to the Maximum power threshold, but shall not exceed + 1.5 dB. Once the output power is at or above the Maximum power threshold, the relevant condition in Table 5.4.2.1 shall be met.~~

~~h) During Step D, the change in mean output power over 10 consecutive slots shall be within the prescribed range for a TPC_cmd group of + 1 and step size of 1 dB as given in Table 5.4.2.2, until the output power reaches (Maximum power threshold – 0.5 dB).~~

~~i~~g) During Step E, the difference in mean output power between adjacent slots shall be within the prescribed range given in Table 5.4.2.1 for a TPC_cmd of – 1 and step size of 1 dB, until the output power reaches (Minimum power threshold + 0.5 dB). When the output power is between the values of (Minimum power threshold + 0.5 dB) and (Minimum power threshold), the difference in mean output power between adjacent slots shall be at least sufficient to decrease the output power to the Minimum power threshold, but shall not exceed – 1.5 dB. Once the output power is at or below the Minimum power threshold, the relevant condition in Table 5.4.2.1 shall be met.

~~j~~h) During Step E, the change in mean output power over 10 consecutive slots shall be within the prescribed range for a TPC_cmd group of – 1, and step size of 1 dB as given in Table 5.4.2.2, until the output power reaches (Minimum power threshold + 0,5 dB).

~~k~~i) During Step F, the difference in mean output power between adjacent slots shall be within the prescribed range given in Table 5.4.2.1 for a TPC_cmd of + 1 and step size of 1 dB, until the output power reaches (Maximum power threshold – 0,5 dB). When the output power is between the values of (Maximum power threshold –

0,5 dB) and (Maximum power threshold), the difference in mean output power between adjacent slots shall be at least sufficient to increase the output power to the Maximum power threshold, but shall not exceed + 1,5 dB. Once the output power is at or above the Maximum power threshold, the relevant condition in Table 5.4.2.1 shall be met.

~~i~~j) During Step F, the change in mean output power over 10 consecutive slots shall be within the prescribed range for a TPC_cmd group of + 1, and step size of 1 dB as given in Table 5.4.2.2, until the output power reaches (Maximum power threshold – 0,5 dB).

~~l~~k) During Step G, the difference in mean output power between adjacent slots shall be within the prescribed range given in Table 5.4.2.1 for a TPC_cmd of – 1 and step size of 2 dB, until the output power reaches (Minimum power threshold + 1 dB). When the output power is between the values of (Minimum power threshold + 1 dB) and (Minimum power threshold), the difference in mean output power between adjacent slots shall be at least sufficient to decrease the output power to the Minimum power threshold, but shall not exceed – 3 dB. Once the output power is at or below the Minimum power threshold, the relevant condition in Table 5.4.2.1 shall be met.

~~k~~l) During Step G, the change in mean output power over 10 consecutive slots shall be within the prescribed range for a TPC_cmd group of – 1, and step size of 2 dB as given in Table 5.4.2.2, until the output power reaches (Minimum power threshold +1 dB).

~~n~~m) During Step H, the difference in mean output power between adjacent slots shall be within the prescribed range given in Table 5.4.2.1 for a TPC_cmd of + 1 and step size of 2 dB, until the output power reaches (Maximum power threshold –1 dB). When the output power is between the values of (Maximum power threshold –1 dB) and (Maximum power threshold), the difference in mean output power between adjacent slots shall be at least sufficient to increase the output power to the Maximum power threshold, but shall not exceed + 3 dB. Once the output power is at or above the Maximum power threshold, the relevant condition in Table 5.4.2.1 shall be met.

~~m~~n) During Step H, the change in mean output power over 10 consecutive slots shall be within the prescribed range for a TPC_cmd group of + 1, and step size of 2 dB as given in Table 5.4.2.2, until the output power reaches (Maximum power threshold – 1 dB).

5.7 Power setting in uplink compressed mode

5.7.1 Definition and applicability

Compressed mode in uplink means that the power in uplink is changed.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.7.2 Conformance requirements

A change of output power is required during uplink compressed frames since the transmission of data is performed in a shorter interval. The ratio of the amplitude between the DPDCH codes and the DPCCH code will also vary. The power step due to compressed mode shall be calculated in the UE so that the energy transmitted on the pilot bits during each transmitted slot shall follow the inner loop power control.

Thereby, the power during compressed mode, and immediately afterwards, shall be such that the power on the DPCCH follows the steps due to inner loop power control combined with additional steps of $10Log_{10}(N_{pilot.prev} / N_{pilot.curr})$ dB where $N_{pilot.prev}$ is the number of pilot bits in the previously transmitted slot, and $N_{pilot.curr}$ is the current number of pilot bits per slot.

The resulting step in total transmitted power (DPCCH +DPDCH) shall then be rounded to the closest integer dB value. A power step exactly half-way between two integer values shall be rounded to the closest integer of greatest magnitude. The accuracy of the power step, given the step size, is specified in Table 5.6.1 in subclause 5.6.2. The power step is defined as the relative power difference between the average power of the original (reference) timeslot and the average power of the target timeslot, when neither the original timeslot nor the reference timeslot are in a transmission gap. The transient duration is not included, and is from 25μs before the slot boundary to 25μs after the slot boundary. The relative power is measured with a filter that has a Root-Raised Cosine (RRC) filter response with a roll off $\alpha = 0.22$ and a bandwidth equal to the chip rate.

In addition to any power change due to the ratio $N_{pilot.prev} / N_{pilot.curr,}$ the average power of the DPCCH in the first slot after a compressed mode transmission gap shall differ from the average power in the last slot before the transmission gap by an amount Δ_{RESUME}, where Δ_{RESUME} is calculated as described in subclause 5.1.2.3 of [5] TS 25.214.

The resulting difference in the total transmitted power (DPCCH + DPDCH) shall then be rounded to the closest integer dB value. A power difference exactly half-way between two integer values shall be rounded to the closest integer of greatest magnitude. The accuracy of the resulting difference in the total transmitted power (DPCCH + DPDCH) after a transmission gap of up to 14 slots shall be as specified in Table 5.7.1.

Table 5.7.1: Transmitter power difference tolerance after a transmission gap of up to 14 slots

Tolerance on required difference in total transmitter power after a transmission gap
+/- 3 dB

The power difference is defined as the relative power difference between the average power of the original (reference) timeslot before the transmission gap and the average power of the target timeslot after the transmission gap, not including the transient durations. The transient durations at the start and end of the transmission gaps are each from 25μs before the slot boundary to 25μs after the slot boundary. The relative power is measured with a filter that has a Root-Raised Cosine (RRC) filter response with a roll off $\alpha = 0.22$ and a bandwidth equal to the chip rate.

The transmit power levels versus time shall meet the mask specified in Figure 5.7.1.

The reference for this requirement is [1] TS 25.101 subclause 6.5.4.1.

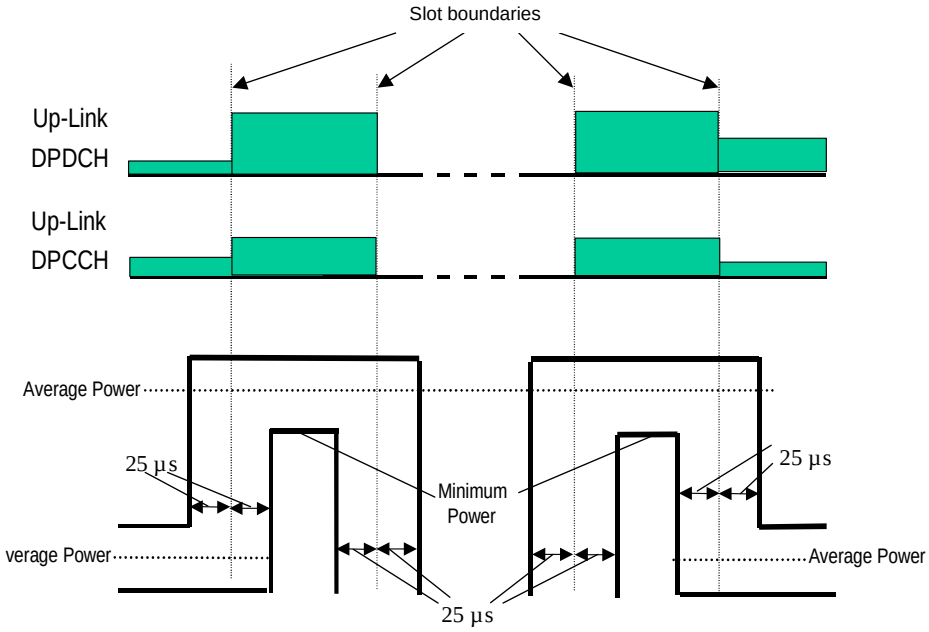

Figure 5.7.1: Transmit template during Compressed mode

The mean power in the transmission gaps, not including the transition periods, shall be less than –56 dBm. The reference for this requirement is [1] TS 25.101 subclause 6.5.1.1.

For RPL (Recovery Period Length) slots after the transmission gap, where RPL is the minimum out of the transmission gap length and 7 slots, the UE shall use the power control algorithm and step size specified by the signalled Recovery Period Power Control Mode (RPP), as detailed in TS 25.214 subclause 5.1.2.3.

When nominal 3 dB power control steps are used in the recovery period, the transmitter output power steps due to inner loop power control shall be within the range shown in Table 5.7.2, and the transmitter average output power step due to inner loop power control shall be within the range shown in Table 5.7.3, excluding any other power changes due, for example, to changes in spreading factor or number of pilot bits.

Table 5.7.2: Transmitter power control range for 3dB step size

TPC_cmd	Transmitter power control range for 3dB step size	
	Lower	Upper
+ 1	+1.5 dB	+4.5 dB
0	–0.5 dB	+0.5 dB
– 1	–1.5 dB	–4.5 dB

Table 5.7.3: Transmitter average power control range for 3dB step size

TPC_cmd group	Transmitter power control range after 7 equal TPC_cmd groups	
	Lower	Upper
+ 1	+16 dB	+26 dB
0	–1 dB	+1 dB
– 1	–16 dB	–26 dB

The reference for this requirement is [1] TS 25.101 subclause 6.4.2.1.1.

5.7.3 Test purpose

To verify that the changes in uplink transmit power in compressed mode are within the prescribed tolerances.

Excess error in transmit power setting in compressed mode increases the interference to other channels, or increases transmission errors in the uplink.

5.7.4 Method of test

5.7.4.1 Initial conditions

1) Connect the SS to the UE antenna connector as shown in Figure A.1.

2) A call is set up according to the Generic call setup procedure. The 12.2 kbps UL reference measurement channel is used, with gain factors β_c = 0.5333 and β_d = 1.0 in non-compressed frames. Slot formats 0, 0A and 0B are used on the uplink DPCCH.

3) Enter the UE into loopback test mode and start the loopback test.

See [3] TS 34.108 and [4] TS 34.109 for details regarding generic call setup procedure and loopback test.

5.7.4.2 Procedure

NOTE: CFNs are given in this procedure for reference as examples only. A fixed offset may be applied to the CFNs.

1) Before proceeding with paragraph (4) below, set the output power of the UE, measured at the UE antenna connector, to be in the range –34±9dBm. This may be achieved by Ssetting the ~~attenuation in the~~ downlink signal ($\hat{I}$or) to yield an appropriate open loop output power and/or by generating suitable downlink TPC commands from the SS.~~, measured at the UE antenna connector, of –34±9 dBm at the start of the test.~~

2) Signal the uplink power control parameters to use Algorithm 1 and a step size of 2 dB.

3) Signal the set of compressed mode parameters shown in Table 5.7.5. This set of compressed mode parameters defines the compressed mode pattern which is used to test the implementation of 3dB output power steps and the implementation of a power change when resuming transmission after a compressed mode gap.

Table 5.7.5: Parameters for pattern A for compressed mode test

Parameter	Meaning	Value
TGPRC	Number of transmission gap patterns within the Transmission Gap Pattern Sequence	1
TGCFN	Connection Frame Number of the first frame of the first pattern within the Transmission Gap Pattern Sequence	0
TGSN	Slot number of the first transmission gap slot within the TGCFN	10
TGL1	Length of first transmission gap within the transmission gap pattern	10 slots
TGL2	Length of second transmission gap within the transmission gap pattern	5 slots
TGD	Duration between the starting slots of two consecutive transmission gaps within a transmission gap pattern	20 slots
TGPL1	Duration of transmission gap pattern 1	3 frames
TGPL2	Duration of transmission gap pattern 2	Omit
RPP	Recovery Period Power Control Mode	Mode 1
ITP	Initial Transmit Power Mode	Mode 1
UL/DL Mode	Defines whether only DL, only UL, or combined UL/DL compressed mode is used	UL/DL
Downlink Compressed Mode Method	Method for generating downlink compressed mode gap	SF/2
Uplink Compressed Mode Method	Method for generating uplink compressed mode gap	SF/2
Scrambling code change	Indicates whether the alternative scrambling code is used	No code change
Downlink frame type	Downlink compressed frame structure	A
DeltaSIR	Delta in DL SIR target value to be set in the UE during compressed frames	0
DeltaSIRafter	Delta in DL SIR target value to be set in the UE one frame after the compressed frames	0

The resulting compressed mode pattern is shown in Figure 5.7.2.

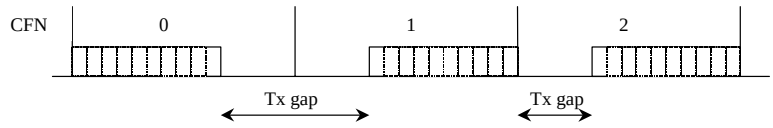

Figure 5.7.2: Pattern A for compressed mode test

4) Transmit TPC commands on the downlink as shown in Table 5.7.6:

Table 5.7.6: TPC commands transmitted in downlink

CFN	TPC commands in downlink
0	1 1 1 1 1 1 1 1 1 1 - - - - -
1	- - - - - 1 1 1 1 1 1 1 1 0 0
2	- - - - - 0 1 0 1 0 1 0 1 0 1

5) Measure the mean output power in the following slots, not including the 25µs transient periods at the start and end of each slot:

CFN 1: Slots # 5,6,7,8,9,10,11,12,14
CFN 2: Slot # 5

Also measure the mean output power in each transmission gap, not including the 25µs transient periods at the start and end of each transmission gap.

6) Re-start the test. Before proceeding with step (8) below, set the output power of the UE, measured at the UE antenna connector, to be in the range 3±9dBm. This may be achieved by, ssetting the attenuation in the downlink signal (Îor) to yield an appropriate open loop output power and/or by generating suitable downlink TPC commands from the SS., measured at the UE antenna connector, of 3±9 dBm.

7) Repeat steps (2) and, (3) and 4) above, with the exception that TGCFN = 3.

8) Transmit TPC commands on the downlink as shown in Table 5.7.7:

Table 5.7.7: TPC commands transmitted in downlink

CFN	TPC commands in downlink
3	0 0 0 0 0 0 0 0 0 0 - - - - -
4	- - - - - 0 0 0 0 0 0 0 0 1 1
5	- - - - - 1 0 1 0 1 0 1 0 1 0

9) Measure the mean output power in the following slots, not including the 25µs transient periods at the start and end of each slot:

CFN 4: Slots # 5,6,7,8,9,10,11,12,14
CFN 5: Slot # 5

Also measure the mean output power in each transmission gap, not including the 25µs transient periods at the start and end of each transmission gap.

10) Re-start the test. Before proceeding with step (13) below, set the output power of the UE, measured at the UE antenna connector, to be in the range –10±9dBm. This may be achieved by, setting the attenuation in the downlink signal (Îor) to yield an appropriate open loop output power and/or by generating suitable downlink TPC commands from the SS., measured at the UE antenna connector, of –10±9 dBm.

11) Signal the uplink power control parameters to use Algorithm 1 and a step size of 1 dB.

12) Signal the set of compressed mode parameters shown in Table 5.7.8. This set of compressed mode parameters defines the compressed mode pattern which is used to test the implementation of power steps at the start and end of compressed frames, and the implementation of a zero power change when resuming transmission after a compressed mode gap.

Table 5.7.8: Parameters for pattern B for compressed mode test

Parameter	Meaning	Value
TGPRC	Number of transmission gap patterns within the Transmission Gap Pattern Sequence	1
TGCFN	Connection Frame Number of the first frame of the first pattern within the Transmission Gap Pattern Sequence	7
TGSN	Slot number of the first transmission gap slot within the TGCFN	8
TGL1	Length of first transmission gap within the transmission gap pattern	14 slots
TGL2	Length of second transmission gap within the transmission gap pattern	omit
TGD	Duration between the starting slots of two consecutive transmission gaps within a transmission gap pattern	0
TGPL1	Duration of transmission gap pattern 1	4 frames
TGPL2	Duration of transmission gap pattern 2	Omit
RPP	Recovery Period Power Control Mode	Mode 0
ITP	Initial Transmit Power Mode	Mode 0
UL/DL Mode	Defines whether only DL, only UL, or combined UL/DL compressed mode is used	UL/DL
Downlink Compressed Mode Method	Method for generating downlink compressed mode gap	SF/2
Uplink Compressed Mode Method	Method for generating uplink compressed mode gap	SF/2
Scrambling code change	Indicates whether the alternative scrambling code is used	No code change
Downlink frame type	Downlink compressed frame structure	A
DeltaSIR	Delta in DL SIR target value to be set in the UE during compressed frames	0
DeltaSIRafter	Delta in DL SIR target value to be set in the UE one frame after the compressed frames	0

The resulting compressed mode pattern is shown in Figure 5.7.3.

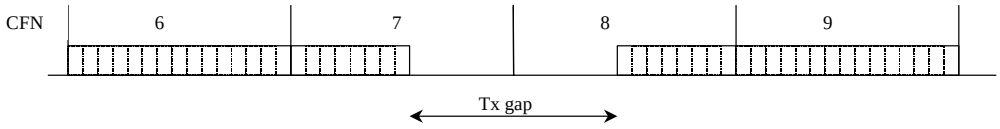

Figure 5.7.3: Pattern B for compressed mode test

13) Transmit TPC commands on the downlink as shown in Table 5.7.8:

Table 5.7.8: TPC commands transmitted in downlink

CFN	TPC commands in downlink
6	0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1
7	1 1 1 1 1 1 1 1 - - - - - - -
8	- - - - - - - 0 0 0 0 0 0 0 0
9	0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1

14) Measure the mean output power in the following slots, not including the 25μs transient periods at the start and end of each slot:

CFN 6: Slot # 14
CFN 7: Slots # 0 and 7
CFN 8: Slots # 7 and 14

CFN 9: Slot # 0

Also measure the mean output power in the transmission gap, not including the 25μs transient periods at the start and end of the transmission gap.

5.7.5 Test requirements

For ease of reference, the following uplink output power measurements are defined in Figure 5.7.4. In this figure:

- P_g is the mean power in an uplink transmission gap, excluding the 25 μs transient periods.
- P_a is the mean power in the last slot before a compressed frame (or pair of compressed frames), excluding the 25 μs transient periods.
- P_b is the mean power in the first slot of a compressed frame, excluding the 25 μs transient periods.
- P_c is the mean power in the last slot before a transmission gap, excluding the 25 μs transient periods.
- P_d is the mean power in the first slot after a transmission gap, excluding the 25 μs transient periods.
- P_e is the mean power in the last slot of a compressed frame, excluding the 25 μs transient periods.
- P_f is the mean power in the first slot after a compressed frame (or pair of compressed frames), excluding the 25 μs transient periods.

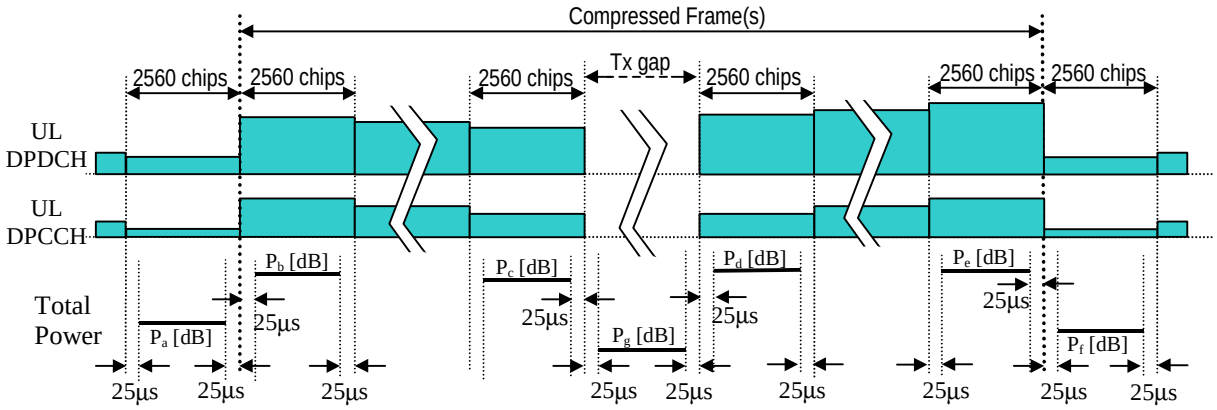

Figure 5.7.4: Uplink transmit power in uplink compressed mode

1. At the boundary between CFN 6 and CFN 7, $P_b - P_a$ shall be within the range +4 ± 2 dB.
2. In slot #5 of CFN 2, the power difference $P_d - P_c$ from the power in slot #14 of CFN 1 shall be within the range -6 ± 3 dB.
3. In slot #5 of CFN 5, the power difference $P_d - P_c$ from the power in slot #14 of CFN 4 shall be within the range +6 ± 3 dB.
4. In slot #7 of CFN 8, the power difference $P_d - P_c$ from the power in slot #7 of CFN 7 shall be within the range 0 ± 3 dB.
5. In CFNs 0, 1, 2, 3, 4, 5, 7 and 8, P_g shall be less than –56 dBm.
6. At the boundary between CFN 8 and CFN 9, $P_f - P_e$ shall be within the range -4 ± 2 dB.
7. In the slots between slot #6 of CFN 1 and slot #12 of CFN 1 inclusive, the change in mean output power from the previous slot shall be within the range given in Table 5.7.2 for TPC_cmd = +1.
8. The aggregate change in mean output power from slot #5 of CFN 1 to slot #12 of CFN 1 shall be within the range given in Table 5.7.3 for TPC_cmd = +1.

9. In the slots between slot #6 of CFN 4 and slot #12 of CFN 4 inclusive, the change in mean output power from the previous slot shall be within the range given in Table 5.7.2 for TPC_cmd = -1.

10. The aggregate change in mean output power from slot #5 of CFN 4 to slot #12 of CFN 4 shall be within the range given in Table 5.7.3 for TPC_cmd = -1.

5.8 Occupied Bandwidth (OBW)

TSG-T WG1 meeting #9
Redondo Beach, USA, 16th-17th November 2000

Document T1-000241
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

34.121	CR	041	Current Version:	3.2.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	T1#9	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [X] UTRAN / Radio [ ] Core Network [ ]

Source: TSG-T1/RF SWG **Date:** 2000-11-16

Subject: Inclusion of OCNS definition for performance tests

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: The note in subclause 7.4.1 of TS25.101 was modified and definition of OCNS was moved to Annex C.3.

Clauses affected: 6.3, Annex E

Other specs affected:

Other 3G core specifications		→ List of CRs:
Other GSM core specifications		→ List of CRs:
MS test specifications		→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments:


help.doc

<--------- double-click here for help and instructions on how to create a CR.

See [3] TS 34.108 and [4] TS 34.109 for details regarding generic call setup procedure and loopback test.

Table 6.2: Test parameters for Reference Sensitivity Level

Parameter	Level / Status	Unit
$\hat{I}_{or}$	–106. 7	dBm / 3.84 MHz
DPCH_Ec	–117	dBm / 3.84 MHz
Tx output power	UE maximum power	

6.2.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.

2) Measure the BER of DCH received from the UE at the SS.

6.2.5 Test requirements

The measured BER, derived in step 2), shall not exceed 0.001.

6.3 Maximum Input Level

6.3.1 Definition and applicability

This is defined as the maximum receiver input power at the UE antenna port which does not degrade the specified BER performance.

The requirements and this test apply to all types of UTRA for the FDD UE.

6.3.2 Conformance requirements

The BER shall not exceed 0.001 for the parameters specified in Table 6.3.

The reference for this requirement is [1] TS 25.101 subclause 7.4.1.

NOTE: Since the spreading factor is large (10log(SF)=21dB), the majority of the total input signal consists of the OCNS interference. The structure of OCNS signal is defined in Annex E.3.2. ~~The OCNS interference consists of 16 dedicated data channels. The channelisation codes for data channels are chosen optimally to reduce peak to average ratio (PAR). All dedicated channels user data is uncorrelated to each other.~~

6.3.3 Test purpose

To verify that the UE BER does not exceed 0.001 for the parameters specified in Table 6.3.

The lack of the maximum input level decreases the coverage area at the near side from BS.

6.3.4 Method of test

6.3.4.1 Initial conditions

1) Connect the SS to the UE antenna connector as shown in Figure A.3.

2) A call is set up according to the Generic call setup procedure, and RF parameters are set up according to Table 6.3.

3) Enter the UE into loopback test mode and start the loopback test.

See [3] TS 34.108 and [4] TS 34.109 for details regarding generic call setup procedure and loopback test.

Table 6.3: Test parameters for Maximum Input Level

Parameter	Level / Status	Unit
$\hat{I}_{or}$	–25	dBm / 3.84MHz
$\frac{DPCH\_E_c}{I_{or}}$	–19	dB

6.3.4.2 Procedure

1) Measure the BER of DCH received from the UE at the SS.

6.3.5 Test requirements

The measured BER, derived in step 1), shall not exceed 0.001.

Annex E (normative): Downlink Physical Channels

E.1 General

This Normative annex specifies the downlink physical channels that are needed for setting a connection and channels that are needed during a connection.

E.2 Connection Set-up

Table E.2.1 describes the downlink Physical Channels that are required for connection set up.

Table E.2.1: Downlink Physical Channels required for connection set-up

Physical Channel
CPICH
PCCPCH
SCH
SCCPCH
PICH
AICH
DPCH

E.3 During connection

The following clauses describe the downlink Physical Channels that are transmitted during a connection i.e., when measurements are done. For these measurements the offset between DPCH and SCH shall be zero chips at base station meaning that SCH is overlapping with the first symbols in DPCH in the beginning of DPCH slot structure.

E.3.1 Measurement of Tx Characteristics

Table E.3.1 is applicable for measurements on the Transmitter Characteristics (clause 5) with the exception of subclauses 5.3 (Frequency Stability), 5.4.1 (Open Loop Power Control in the Uplink), and 5.5.2 (Transmit ON/OFF Time mask). For these cases, the power levels of Îor and DPCH are defined individually.

NOTE: Applicability to subclause 5.7 (Power setting in uplink compressed mode) is FFS.

Table E.3.1: Downlink Physical Channels transmitted during a connection

Physical Channel	Power	
Îor	–93 dBm / 3.84MHz	
CPICH	CPICH_Ec / DPCH_Ec	= 7 dB
PCCPCH	PCCPCH_Ec / DPCH_Ec	= 5 dB
SCH	SCH_Ec / DPCH_Ec	= 5 dB
PICH	PICH_Ec / DPCH_Ec	= 2 dB
DPCH	–103.3 dBm / 3.84MHz	

E.3.2 Measurement of Rx Characteristics

Table E.3.2 is applicable for measurements on the Receiver Characteristics (clause 6) with the exception of subclause 6.3 (Maximum input level).

Table E.3.2: Downlink Physical Channels transmitted during a connection

Physical Channel	Power
CPICH	CPICH_Ec / DPCH_Ec = 7 dB
PCCPCH	PCCPCH_Ec / DPCH_Ec = 5 dB
SCH	SCH_Ec / DPCH_Ec = 5 dB
PICH	PICH_Ec / DPCH_Ec = 2 dB
DPCH	Test dependent power

E.3.3 Measurement of Performance requirements

Table E.3.3 is applicable for measurements on the Performance requirements (clause 7), including subclause 6.3 (Maximum input level), excluding subclauses 7.6.1 (Demodulation of DCH in open loop transmit diversity mode) and 7.6.2 (Demodulation of DCH in closed loop transmit diversity mode).

Table E.3.3: Downlink Physical Channels transmitted during a connection[1]

Physical Channel	Power	Note
P-CPICH	P-CPICH_Ec/Ior = –10 dB	Use of P-CPICH or S-CPICH as phase reference is specified for each requirement and is also set by higher layer signalling.
S-CPICH	S-CPICH_Ec/Ior = –10 dB	When S-CPICH is the phase reference in a test condition, the phase of S-CPICH shall be 180 degrees offset from the phase of P-CPICH. When S-CPICH is not the phase reference, it is not transmitted.
PCCPCH	PCCPCH_Ec/Ior = –12 dB	
SCH	SCH_Ec/Ior = –12 dB	This power shall be divided equally between Primary and Secondary Synchronous channels
PICH	PICH_Ec/Ior = –15 dB	
DPCH	Test dependent power	When S-CPICH is the phase reference in a test condition, the phase of DPCH shall be 180 degrees offset from the phase of P-CPICH.
OCNS	Necessary power so that total transmit power spectral density of Node B~~BS~~ (Ior) adds to one	OCNS interference consists of 16 dedicated data channels. The channelisation codes for data channels are chosen optimally to reduce peak to average ratio (PAR). All dedicated channels user data is uncorrelated to each other.

E.3.4 Connection with open-loop transmit diversity mode

Table E.3.4 is applicable for measurements for subclause 7.6.1(Demodulation of DCH in open loop transmit diversity mode)

[1] Power levels are based on the assumption that multipath propagation conditions and noise source representing interference from other cells Ioc are turned on after the call set-up phase.

Table E.3.4: Downlink Physical Channels transmitted during a connection[2]

Physical Channel	Power	Note
P-CPICH (antenna 1)	P-CPICH_E_{c1}/I_{or} = –13 dB	1. Total P-CPICH_E_c/I_{or} = –10 dB
P-CPICH (antenna 2)	P-CPICH_E_{c2}/I_{or} = –13 dB	
PCCPCH (antenna 1)	PCCPCH_E_{c1}/I_{or} = –15 dB	1. STTD applied 2. Total PCCPCH_E_c/I_{or} = –12 dB
PCCPCH (antenna 2)	PCCPCH_E_{c2}/I_{or} = –15 dB	
SCH (antenna 1 / 2)	SCH_E_c/I_{or} = –12 dB	1. TSTD applied. 2. This power shall be divided equally between Primary and Secondary Synchronous channels
PICH (antenna 1)	PICH_E_{c1}/I_{or} = –18 dB	1. STTD applied 2. Total PICH_E_c/I_{or} = –15 dB
PICH (antenna 2)	PICH_E_{c2}/I_{or} = –18 dB	
DPCH	Test dependent power	1. STTD applied 2. Total power from both antennas
OCNS	Necessary power so that total transmit power spectral density of Node B~~S~~ (I_{or}) adds to one	1. ~~1.~~ This power shall be divided equally between antennas 2. OCNS interference consists of 16 dedicated data channels. The channelisation codes for data channels are chosen optimally to reduce peak to average ratio (PAR). All dedicated channels user data is uncorrelated to each other.

E.3.5 Connection with closed loop transmit diversity mode

Table E.3.5 is applicable for measurements for subclause 7.6.2 (Demodulation of DCH in closed loop transmit diversity mode)

Table E.3.5: Downlink Physical Channels transmitted during a connection[3]

Physical Channel	Power	Note
P-CPICH (antenna 1)	P-CPICH_Ec1/Ior= –13 dB	1. Total P-CPICH_Ec/Ior = –10 dB
P-CPICH (antenna 2)	P-CPICH_Ec2/Ior= –13 dB	
PCCPCH (antenna 1)	PCCPCH_Ec1/Ior = –15 dB	1. STTD applied
PCCPCH (antenna 2)	PCCPCH_Ec2/Ior = –15 dB	1. STTD applied, total PCCPCH_Ec/Ior = –12 dB
SCH (antenna 1 / 2)	SCH_Ec/Ior = –12 dB	1. TSTD applied
PICH (antenna 1)	PICH_Ec1/Ior = –18 dB	1. STTD applied 2. STTD applied, total PICH_Ec/Ior = –15 dB
PICH (antenna 2)	PICH_Ec2/Ior = –18 dB	
DPCH	Test dependent power	1. Total power from both antennas
OCNS	Necessary power so that total transmit power spectral density of Node B~~S~~ (Ior) adds to one	1. ~~1.~~ This power shall be divided equally between antennas 2. OCNS interference consists of 16 dedicated data channels. The channelisation codes for data channels are chosen optimally to reduce peak to average ratio (PAR). All dedicated channels user data is uncorrelated to each other.

[2] Power levels are based on the assumption that multipath propagation conditions and noise source representing interference from other cells Ioc are turned on after the call set-up phase.

[3] Power levels are based on the assumption that multipath propagation conditions and noise source representing interference from other cells Ioc are turned on after the call set-up phase.

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34.121	**CR**	**048**	Current Version:	3.2.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

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Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [X] UTRAN / Radio [ ] Core Network [ ]

Source: TSG-T1/RF SWG **Date:** 2000-11-16

Subject: Correction to Open Loop Power Control in Uplink

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: The test parameters of open loop power control in uplink don't reflect the minimum requirements of minimum transmit output power in TS25.101. And, there are some mistakes in open loop power control in uplink.
one core specification document, TS 25.331, is added to the chapter 2 References.

Clauses affected: 2, 5.4.1

Other specs affected:

Other 3G core specifications	[ ]	→ List of CRs:
Other GSM core specifications	[ ]	→ List of CRs:
MS test specifications	[ ]	→ List of CRs:
BSS test specifications	[ ]	→ List of CRs:
O&M specifications	[ ]	→ List of CRs:

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1 Scope

The present document specifies the measurement procedures for the conformance test of the user equipment (UE) that contain transmitting characteristics, receiving characteristics and performance requirements in FDD mode.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

[1] 3GPP TS 25.101 "UE Radio transmission and reception (FDD)".

[2] 3GPP TS 25.133 "Requirements for Support of Radio Resource Management (FDD)".

[3] 3GPP TS 34.108 "Common Test Environments for User Equipment (UE) Conformance Testing".

[4] 3GPP TS 34.109 "Logical Test Interface; Special conformance testing functions".

[5] 3GPP TS 25.214 "Physical layer procedures (FDD)".

[6] 3GPP TR 21.905 "Vocabulary for 3GPP Specifications".

[7] 3GPP TR 25.990 "Vocabulary".

[8] 3G TS 25.331: "Radio Resource Control (RRC) Protocol Specification".

3 Definitions, symbols, abbreviations and equations

5.3.2 Conformance requirements

The UE modulated carrier frequency shall be accurate to within ±0.1 ppm compared to the carrier frequency received from the BS.

The reference for this requirement is [1] TS 25.101 subclause 6.3.

5.3.3 Test purpose

To verify that the UE carrier frequency error does not exceed ±0.1 ppm.

An excess error of the carrier frequency increases the transmission errors in the up link own channel.

This test verifies the ability of receiver to derive correct frequency information for transmitter.

5.3.4 Method of test

5.3.4.1 Initial conditions

1) Connect the SS to the UE antenna connector as shown in Figure A.1.

2) A call is set up according to the Generic call setup procedure, and RF parameters are set up according to Table 5.3.

3) Enter the UE into loopback test mode and start the loopback test.

See [3] TS 34.108 and [4] TS 34.109 for details regarding generic call setup procedure and loopback test.

Table 5.3: Test parameters for Frequency Error

Parameter	Level / Status	Unit
DPCH_Ec	–117	dBm / 3.84 MHz
$\hat{I}_{or}$	–106.7	dBm / 3.84 MHz

5.3.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.

2) Measure the frequency error delta f, at the UE antenna connector by Tester using Global In-Channel-Tx-test (Annex B). Since counter method leads an incorrect result, EVM method shall be used.

5.3.5 Test requirements

For all measured bursts, the frequency error, derived in step 1), shall not exceed ±0.1 ppm.

5.4 Output Power Dynamics in the Uplink

Power control is used to limit the interference level.

5.4.1 Open Loop Power Control in the Uplink

5.4.1.1 Definition and applicability

Open loop power control in the uplink is the ability of the UE transmitter to set its output power to a specific value. This function is used for PRACH transmission and based on the information from BS using BCCH and the downlink received signal power level of the ~~PCCPCH~~CPICH. The information from BS includes transmission power of CPICH~~PCCPCH~~ and uplink interference power level.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.4.1.2 Conformance requirements

The UE open loop power is defined as the average power in a timeslot or ON power duration, whichever is available, and they are measured with a filter that has a Root-Raised Cosine (RRC) filter response with a roll off $\alpha = 0.22$ and a bandwidth equal to the chip rate.

The UE open loop power control tolerance is given in Table 5.4.1.1.

Table 5.4.1.1: Open loop power control tolerance

Normal conditions	± 9 dB
Extreme conditions	± 12 dB

The reference for this requirement is [1] TS 25.101 subclause 6.4.1.

5.4.1.3 Test purpose

The power of the received signal and the BCCH information control the power of the transmitted signal with the target to transmit at lowest power acceptable for proper communication.

The test stresses the ability of the receiver to measure the received power correctly over the receiver dynamic range.

The test purpose is to verify that the UE open loop power control tolerance does not exceed the described value shown in Table 5.4.1.1.

An excess error of the open loop power control decreases the system capacity.

5.4.1.4 Method of test

~~This test is also covered by subclause 5.5.2 Transmit ON/OFF Time mask.~~

5.4.1.4.1 Initial conditions

1) Connect the SS to the UE antenna connector as shown in Figure A.1.

2) A call is set up according to the Generic call setup procedure, and RF parameters are set up according to Table 5.4.1.2.
The RACH procedure within the call setup is used for the test.

See [3] TS 34.108 for details regarding generic call setup procedure.

Table 5.4.1.2: Test parameters for Open Loop Power Control (UE)

Parameter	Level / Status	Unit
$\hat{I}_{or}$	See Table 5.4.1.3	dBm / 3.84 MHz

Table 5.4.1.3: Test parameters for Open Loop Power Control (SS)

Parameter	RX-Upper dynamic ~~range~~end	RX-middle	RX-Sensitivity level
$\hat{I}_{or}$ 3)	~~[~~–25.0 dBm / 3.84 MHz~~]~~	~~[~~–65.7 dBm / 3.84 MHz~~]~~	~~[~~–106.7 dBm / 3.84 MHz~~]~~
CPICH_RSCP 3),4)	~~[~~–28.3 dBm~~]~~	~~[~~–69 dBm~~]~~	~~[~~–110 dBm~~]~~
Primary CPICH DL TX power	~~[+25 dBm]~~+19dBm	~~[+31 dBm]~~+28dBm	~~[~~+19 dBm~~]~~
Simulated path loss = Primary CPICH DL TX power – CPICH_RSCP	~~[+53.3 dB]~~+47.3dBm	~~[+100 dB]~~+97dB	~~[~~+129 dB~~]~~
UL interference	~~[~~–75 dBm~~]~~	~~[~~–101 dBm~~]~~	~~[~~–110 dBm~~]~~
Constant Value	~~[~~–10 dB~~]~~	~~[~~–10 dB~~]~~	~~[~~–10 dB~~]~~
Expected nominal UE TX power 5)	~~[–31.7 dBm]~~-37.7dBm	~~[–11 dBm]~~-14dBm	~~[~~+9 dBm~~]~~ 2)

NOTE 1: While the SS transmit power shall cover the receiver input dynamic range, the logical parameters: Primary CPICH DL TX power~~broadcasted transmit power~~, UL interference~~I_{BTS}~~, Constant Value ~~constant factor~~ are chosen to achieve a UE TX power, located within the TX output power dynamic range of a class 4 UE.

NOTE 2: Nominal TX output power 9 dBm allows to check the open loop power algorithm within the entire tolerance range (9 dBm ± 12 dB; 9 dBm + 12 dB = 21 dBm = max power class 4).

NOTE 3: The power level of SCCPCH should be defined because SCCPCH is transmitted instead of DPCH during Preamble RACH transmission period. Currently, it is assumed that Table E.3.1 is utilised for DL physical channel condition. The power level of SCCPCH is temporarily set to the same as DL DPCH. However, it is necessary to check whether the above SCCPCH level is enough to establish a connection with the reference measurement channels.

NOTE 4: The purpose of this parameter is to calculate the Expected nominal UE TX power.

NOTE5: The Expected nominal UE TX power is calculated by using the equation in the clause 8.5.9 Open Loop Power Control of [8]TS25.331.

5.4.1.4.2 Procedure

1) Set the TX output level of the SS to obtain $\hat{I}_{or}$ at the UE antenna connector. $\hat{I}_{or}$ shall be according to Table 5.4.1.3 (~~[~~–25 dBm / 3.84 MHz~~]~~).

2) Measure the ~~RACH~~ first RACH preamble output power of the UE according to Annex B.

3) Repeat the above measurement for all SS levels in Table 5.4.1.3.

5.4.1.5 Test requirements

The deviation with respect to the Expected nominal UE TX power (Table 5.4.1.3), derived in step 2), shall not exceed the prescribed tolerance in Table 5.4.1.1.

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Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [X] UTRAN / Radio [ ] Core Network [ ]

Source: TSG-T1/RF SWG **Date:** 2000-11-16

Subject: Correction to Transmit ON/OFF Time mask

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: The test parameters don't reflect the minimum requirements of transmit ON/OFF time mask in TS25.101. One core specification document, TS 25.331, is added to the chapter 2 References.

Clauses affected: 2, 5.5.2

Other specs affected:

Other 3G core specifications	[ ]	→ List of CRs:
Other GSM core specifications	[ ]	→ List of CRs:
MS test specifications	[ ]	→ List of CRs:
BSS test specifications	[ ]	→ List of CRs:
O&M specifications	[ ]	→ List of CRs:

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1 Scope

The present document specifies the measurement procedures for the conformance test of the user equipment (UE) that contain transmitting characteristics, receiving characteristics and performance requirements in FDD mode.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
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[1] 3GPP TS 25.101 "UE Radio transmission and reception (FDD)".

[2] 3GPP TS 25.133 "Requirements for Support of Radio Resource Management (FDD)".

[3] 3GPP TS 34.108 "Common Test Environments for User Equipment (UE) Conformance Testing".

[4] 3GPP TS 34.109 "Logical Test Interface; Special conformance testing functions".

[5] 3GPP TS 25.214 "Physical layer procedures (FDD)".

[6] 3GPP TR 21.905 "Vocabulary for 3GPP Specifications".

[7] 3GPP TR 25.990 "Vocabulary".

[8] 3G TS 25.331: "Radio Resource Control (RRC) Protocol Specification".

3 Definitions, symbols, abbreviations and equations

5.5.1.4.1 Initial conditions

1) Connect the SS to the UE antenna connector as shown in Figure A.1.

2) A call is set up according to the Generic call setup procedure, and RF parameters are set up according to Annex E.3.1.

3) Enter the UE into loopback test mode and start the loopback test.

See [3] TS 34.108 and [4] TS 34.109 for details regarding generic call setup procedure and loopback test.

5.5.1.4.2 Procedure

1) Send release message to the UE to stop transmitting.

2) Measure the leakage power within the transmission band from the UE by the Tester.

5.5.1.5 Test requirements

The measured leakage power, derived in step 2), shall be below –56 dBm.

5.5.2 Transmit ON/OFF Time mask

5.5.2.1 Definition and applicability

The time mask for transmit ON/OFF defines the ramping time allowed for the UE between transmit OFF power and transmit ON power. Possible ON/OFF scenarios are PRACH, CPCH or uplink compressed mode.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.5.2.2 Conformance requirements

The transmit power levels versus time shall meet the mask specified in Figure 5.5.1 for PRACH preambles, and the mask in Figure 5.5.2 for all other cases. The signal is measured with a filter that has a Root-Raised Cosine (RRC) filter response with a roll off $\alpha = 0.22$ and a bandwidth equal to the chip rate.

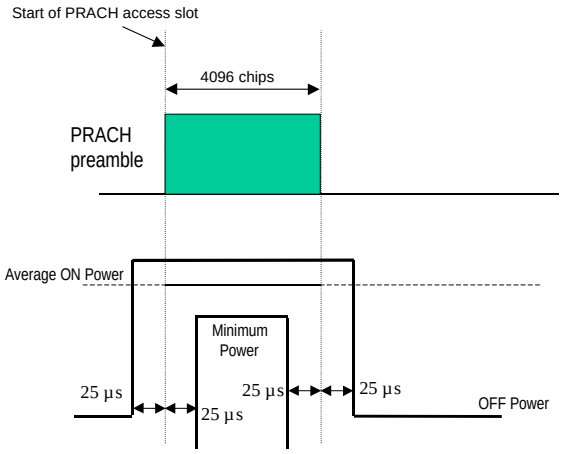

Figure 5.5.1: Transmit ON/OFF template for PRACH preambles

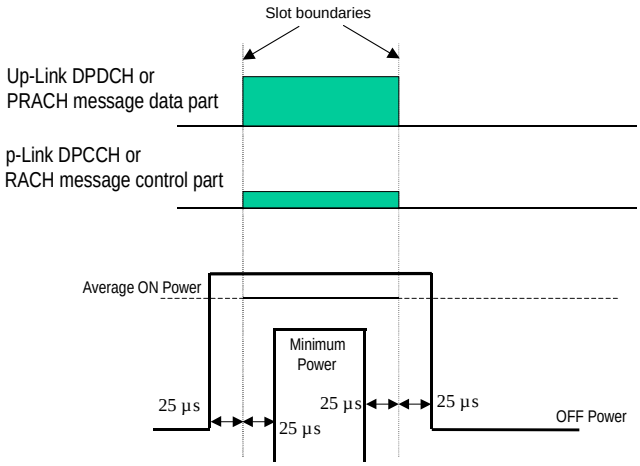

Figure 5.5.2: Transmit ON/OFF template for all other On/Off cases

OFF Power is defined in 5.5.1.

ON power is defined as either case as follows. The specification depends on each possible case.

- First preamble of PRACH: Open loop accuracy (Table 5.4.1.1).
- During preamble ramping of the RACH and between final RACH preamble and RACH message part: Accuracy depending on size of the required power difference (Table 5.5.2.1).
- After transmission gaps in compressed mode: Accuracy as in Table 5.7.1.
- Power step to Maximum Power: Maximum power accuracy (Table 5.2.1).

Table 5.5.2.1: Transmitter power difference tolerance for RACH preamble ramping, and between final RACH preamble and RACH message part

Power difference size ΔP [dB]	Transmitter power difference tolerance [dB]
0	+/- 1 dB
1	+/- 1 dB
2	+/- 1.5 dB
3	+/- 2 dB
$4 \leq \Delta P \leq 10$	+/- 2.5 dB
$11 \leq \Delta P \leq 15$	+/- 3.5 dB
$16 \leq \Delta P \leq 20$	+/- 4.5 dB
$21 \leq \Delta P$	+/- 6.5 dB

The reference for this requirement is [1] TS 25.101 subclause 6.5.2.1.

This is tested using PRACH operation.

The minimum requirement for ON power is defined in subclause 5.4.1.2.

The minimum requirement for OFF power is defined in subclause 5.5.1.2.

Note: The main objective for this test case is to check the ramp-up/down power shape. A test case using the first preamble of PRACH is enough to cover the objective.

5.5.2.3 Test purpose

To verify that the UE transmit ON/OFF power levels versus time meets the described mask shown in Figure 5.5.1 and Figure 5.5.2.

An excess error of transmit ON/OFF response increases the interference to other channels, or increases transmission errors in the up link own channel.

5.5.2.4 Method of test

5.5.2.4.1 Initial conditions

1) Connect the SS to the UE antenna connector as shown in Figure A.1.

2) A call is set up according to the Generic call setup procedure, and RF parameters are set up according to Table 5.5.2.2.

The RACH procedure within the call setup is used for the test.

See [3] TS 34.108 for details regarding generic call setup procedure.

Table 5.5.2.2: Test parameters for Transmit ON/OFF Time mask (UE)

Parameter	Level / Status	Unit
$\hat{I}_{or}$	See Table 5.5.2.2	dBm / 3.84 MHz

Table 5.5.2.3: Test parameters for Transmit ON/OFF Time mask (SS)

~~Parameter~~	~~Upper dynamic range~~	~~middle~~	~~Sensitivity level~~
~~$\hat{I}_{or}$ 3)~~	~~[–25.0 dBm / 3.84 MHz]~~	~~[–65.7 dBm / 3.84 MHz]~~	~~[–106.7 dBm / 3.84 MHz]~~
~~CPICH_RSCP 3),4)~~	~~[–28.3 dBm]~~	~~[–69 dBm]~~	~~[–110 dBm]~~
~~Primary CPICH DL TX power~~	~~[+25 dBm]~~	~~[+31 dBm]~~	~~[+19 dBm]~~
~~Simulated path loss = Primary CPICH DL TX power – CPICH_RSCP~~	~~[+53.3 dB]~~	~~[+100 dB]~~	~~[+129 dB]~~
~~UL interference~~	~~[–75 dB]~~	~~[–101 dB]~~	~~[–110 dB]~~
~~Constant Value~~	~~[–10 dB]~~	~~[–10 dB]~~	~~[–10 dB]~~
~~Expected nominal UE TX power~~	~~[–31.7 dBm]~~	~~[–11 dBm]~~	~~[+9 dBm] 2)~~

Parameter	**Power Class 1**	**Power Class 2**	**Power Class 3**	**Power Class 4**
$\hat{I}_{or}$ 1)	–106.7 dBm / 3.84 MHz	–106.7 dBm / 3.84 MHz	–106.7 dBm / 3.84 MHz	–106.7 dBm / 3.84 MHz
CPICH_RSCP 1),2)	–110 dBm	–110 dBm	–110 dBm	–110 dBm
Primary CPICH DL TX power	+19 dBm	+19 dBm	+19 dBm	+19 dBm
Simulated path loss = Primary CPICH DL TX power – CPICH_RSCP	+129 dB	+129 dB	+129 dB	+129 dB
UL interference	–86 dBm	–92 dBm	–95 dBm	–98 dBm
Constant Value	–10dB	–10dB	–10dB	–10dB
Expected nominal UE TX power 3)	+33dBm	+27dBm	+24dBm	+21dBm

~~NOTE 1: While the SS transmit power shall cover the receiver input dynamic range, the logical parameters: broadcasted transmit power, I_{BTS}, constant factor are chosen to achieve a UE TX power, located within the TX output power dynamic range of a class 4 UE.~~

~~NOTE 2: Nominal TX output power 9 dBm allows to check the open loop power algorithm within the entire tolerance range (9 dBm ± 12 dB; 9dBm + 12dB = 21dBm = max power class 4).~~

NOTE ~~3~~1: The power level of SCCPCH should be defined because SCCPCH is transmitted instead of DPCH during Preamble RACH transmission period. Currently, it is assumed that Table E.3.1 is utilised for DL physical channel condition. The power level of SCCPCH is temporarily set to the same as DL DPCH. However, it is necessary to check whether the above SCCPCH level is enough to establish a connection with the reference measurement channels.

NOTE 42:The purpose of this parameter is to calculate the Expected nominal UE TX power.

NOTE3: The Expected nominal UE TX power is calculated by using the equation in the clause 8.5.9 Open Loop Power Control of [8]TS25.331.

5.5.2.4.2 Procedure

1) Set the TX output level of the SS to obtain $\hat{I}_{or}$ at the UE antenna connector and select the test parameters of Table 5.5.2.3 according to the power class. $\hat{I}_{or}$ shall be according to Table 5.5.2.3 (–106.7 dBm / 3.84 MHz [–25 dBm / 3.84 MHz]).

2) Measure the first RACH preamble output power (ON power) of the UE. The measurements shall not include the transient periods.

3) Measure the OFF power immediately before and after the first RACH preamble (ON power). The measurements shall not include the transient periods.

4) Repeat the above measurement for all SS levels in Table 5.5.2.3.

5.5.2.5 Test requirements

The deviation with respect to the Expected nominal UE TX power (Table 5.5.2.3), derived in step 2), shall not exceed the prescribed upper tolerance in Table 5.2.1 (Subclause 5.2.2) and lower tolerance in Table 5.4.1.1. (Subclause 5.4.1.2).

The measured leakage power, derived in step 3), shall be below –56 dBm. (Subclause 5.5.1.2).

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Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [X] UTRAN / Radio [ ] Core Network [ ]

Source: TSG-T1/RF SWG **Date:** 2000-11-16

Subject: Correction to Spurious Emission test

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: System Simulator (SS) is missing from the connection diagram in Annex A.
Same connection can be used in transmit spurious emission test in 5.11.

Clauses affected: 5.11, Annex A

Other specs affected:

Other 3G core specifications	[ ]	→ List of CRs:
Other GSM core specifications	[ ]	→ List of CRs:
MS test specifications	[ ]	→ List of CRs:
BSS test specifications	[ ]	→ List of CRs:
O&M specifications	[ ]	→ List of CRs:

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5.11 Spurious Emissions

5.11.1 Definition and applicability

Spurious emissions are emissions which are caused by unwanted transmitter effects such as harmonics emission, parasitic emission, intermodulation products and frequency conversion products, but exclude out of band emissions.

The frequency boundary and the detailed transitions of the limits between the requirement for out band emissions and spectrum emissions are based on ITU-R Recommendations SM.329.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.11.2 Conformance requirements

These requirements are only applicable for frequencies, which are greater than 12.5 MHz away from the UE centre carrier frequency.

Table 5.11.1a: General spurious emissions requirements

Frequency Bandwidth	Resolution Bandwidth	Minimum requirement
9 kHz ≤ f < 150 kHz	1 kHz	–36 dBm
150 kHz ≤ f < 30 MHz	10 kHz	–36 dBm
30 MHz ≤ f < 1000 MHz	100 kHz	–36 dBm
1 GHz ≤ f < 12.75 GHz	1 MHz	–30 dBm

Table 5.11.1b: Additional spurious emissions requirements

Frequency Bandwidth	Resolution Bandwidth	Minimum requirement
1893.5 MHz < f < 1919.6 MHz	300 kHz	–41 dBm
925 MHz ≤ f ≤ 935 MHz	100 kHz	–67 dBm *
935 MHz < f ≤ 960 MHz	100 kHz	–79 dBm *
1805 MHz ≤ f ≤ 1880 MHz	100 kHz	–71 dBm *

*NOTE: The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in Table 5.11.1a are permitted for each UARFCN used in the measurement.

The reference for this requirement is [1] TS 25.101 subclause 6.6.3.1.

5.11.3 Test purpose

To verify that the UE spurious emissions do not exceed described value shown in Table 5.11.1a and Table 5.11.1b.

Excess spurious emissions increase the interference to other systems.

5.11.4 Method of test

5.11.4.1 Initial conditions

1) Connect the SS to the UE antenna connector as shown in Figure A.~~1~~8.

2) A call is set up according to the Generic call setup procedure.

3) Enter the UE into loopback test mode and start the loopback test.

See [3] TS 34.108 and [4] TS 34.109 for details regarding generic call setup procedure and loopback test.

5.11.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.

2) Sweep the spectrum analyzer (or equivalent equipment) over a frequency range and measure the average power of spurious emission.

5.11.5 Test requirements

The measured average power of spurious emission, derived in step 2), shall not exceed the described value in Table 5.11.1a and 5.11.1b.

Annex A (informative): Connection Diagrams

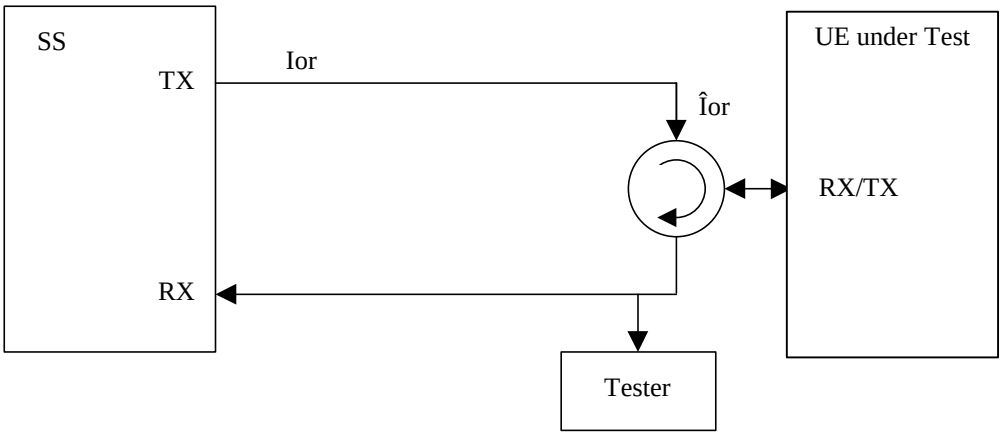

Figure A.1: Connection for Basic TX Test

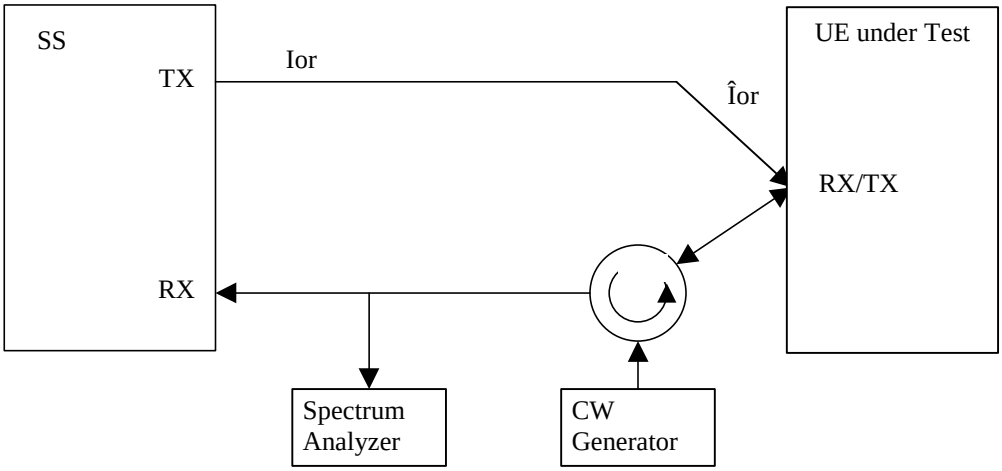

Figure A.2: Connection for TX Intermodulation Test

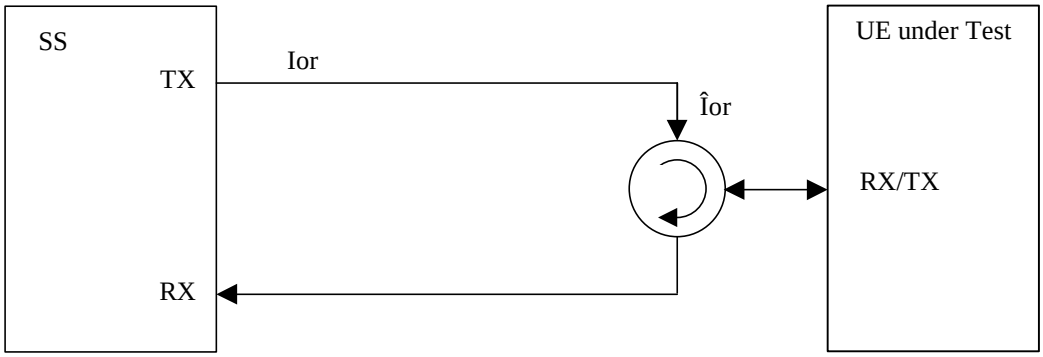

Figure A.3: Connection for Basic RX Test

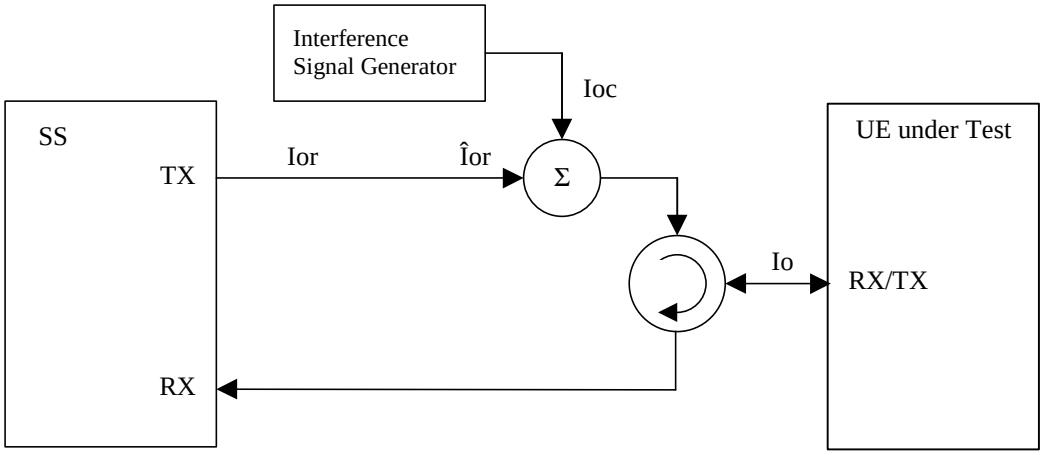

Figure A.4: Connection for RX Test with Interference

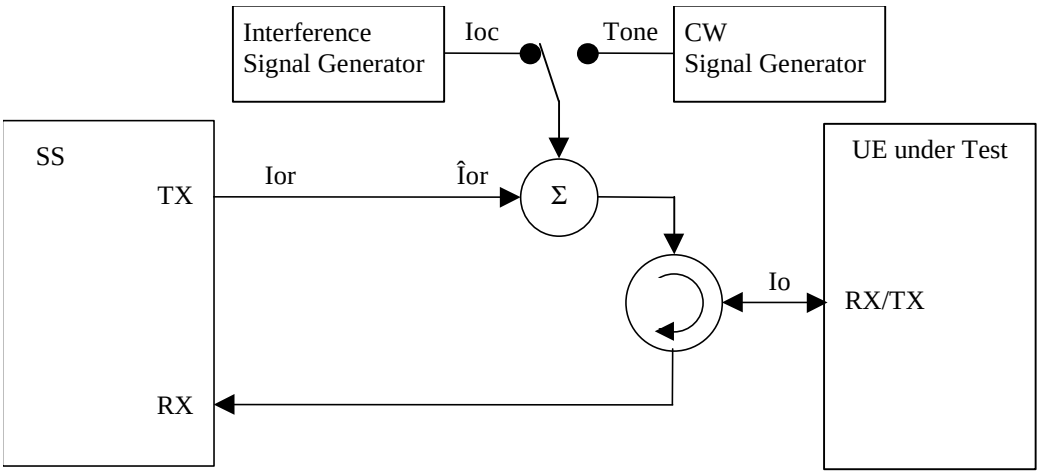

Figure A.5: Connection for RX Test with Interference or additional CW

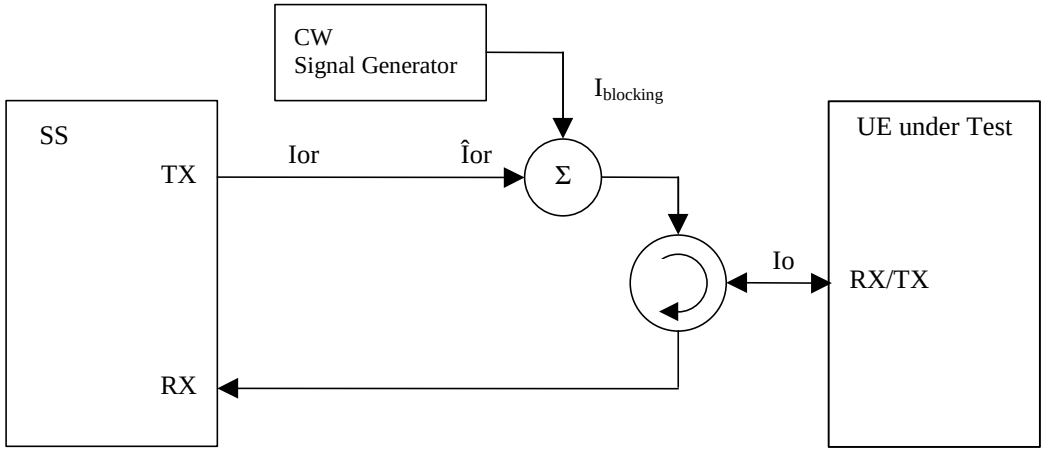

Figure A.6: Connection for RX Test with additional CW

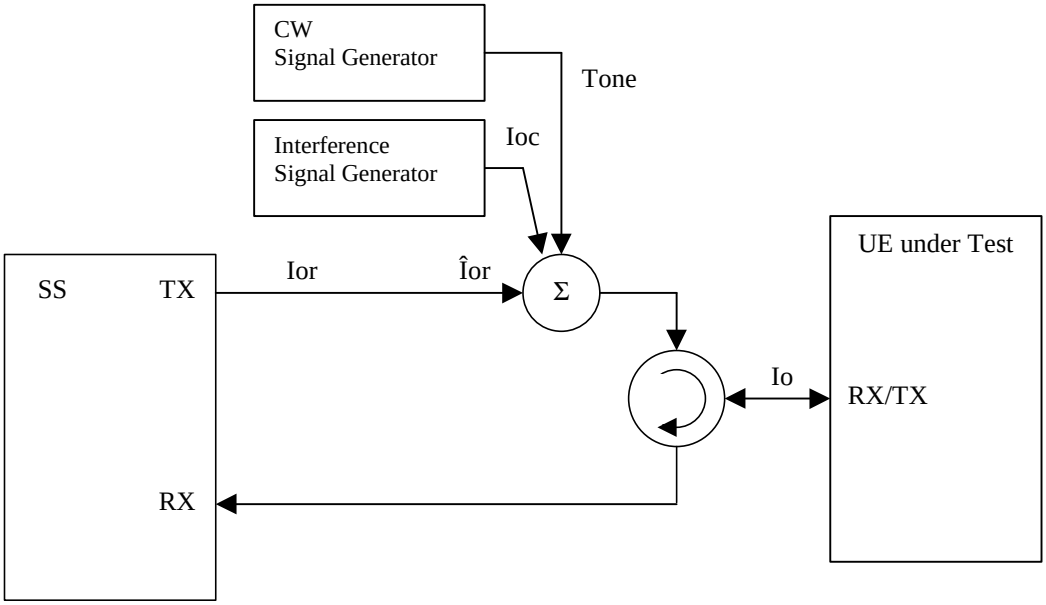

Figure A.7: Connection for RX Test with both Interference and additional CW

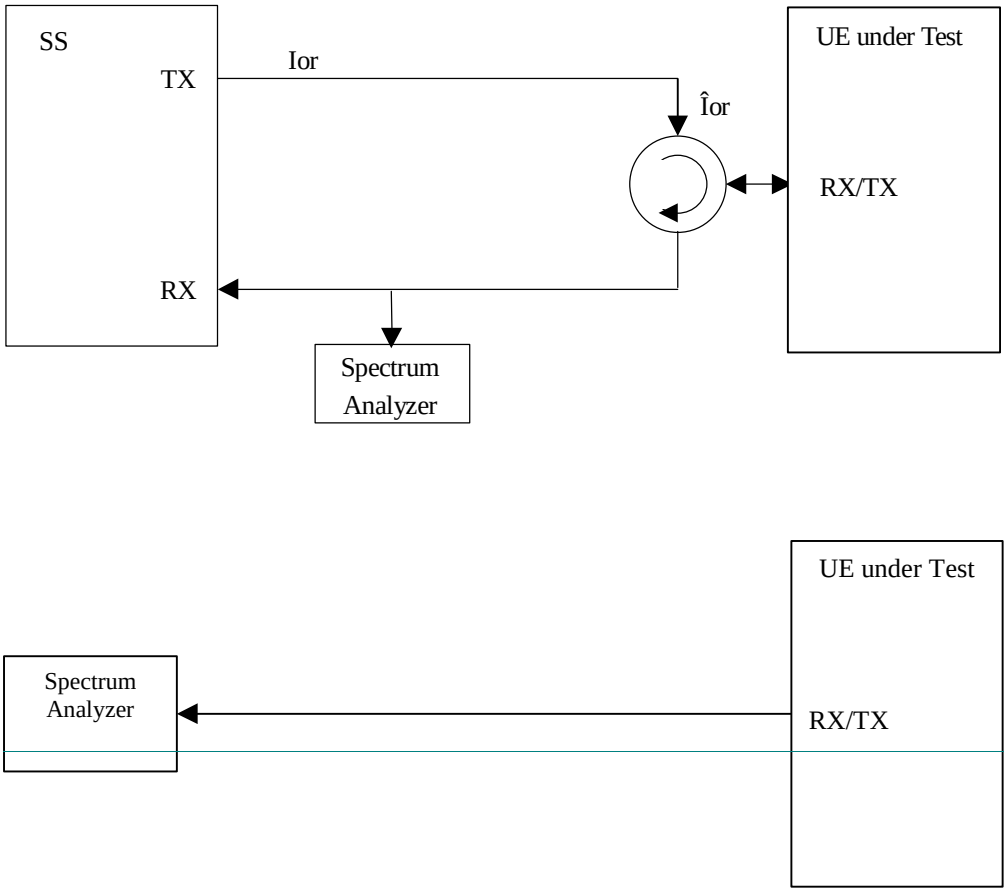

Figure A.8: Connection for Spurious Emission Test

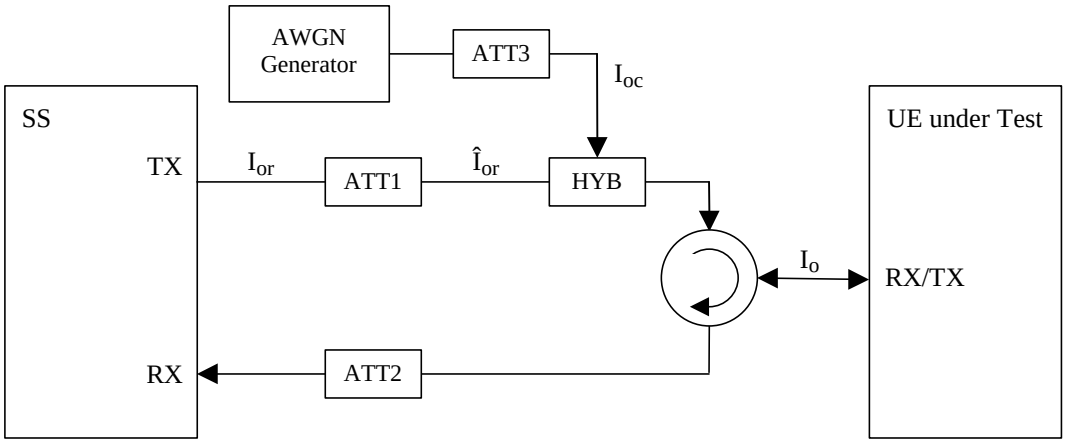

Figure A.9: Connection for Static Propagation Test

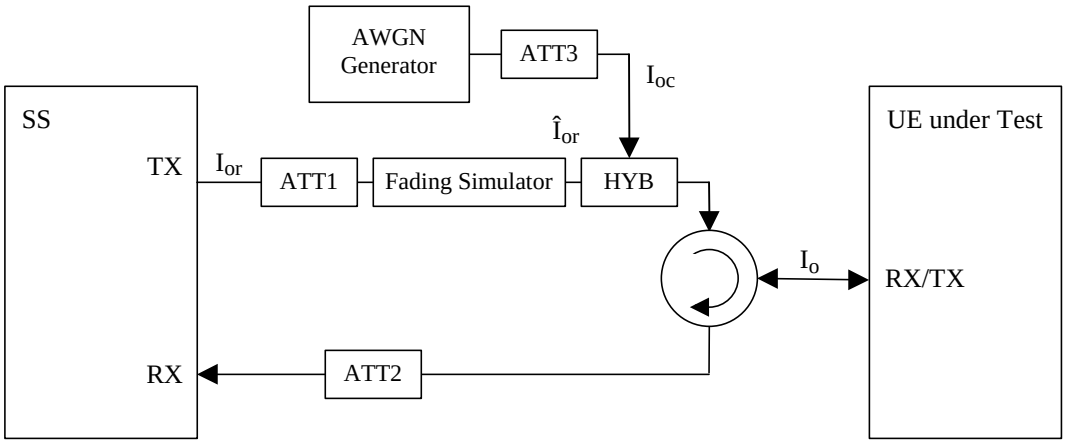

Figure A.10: Connection for Multi-path Fading Propagation Test

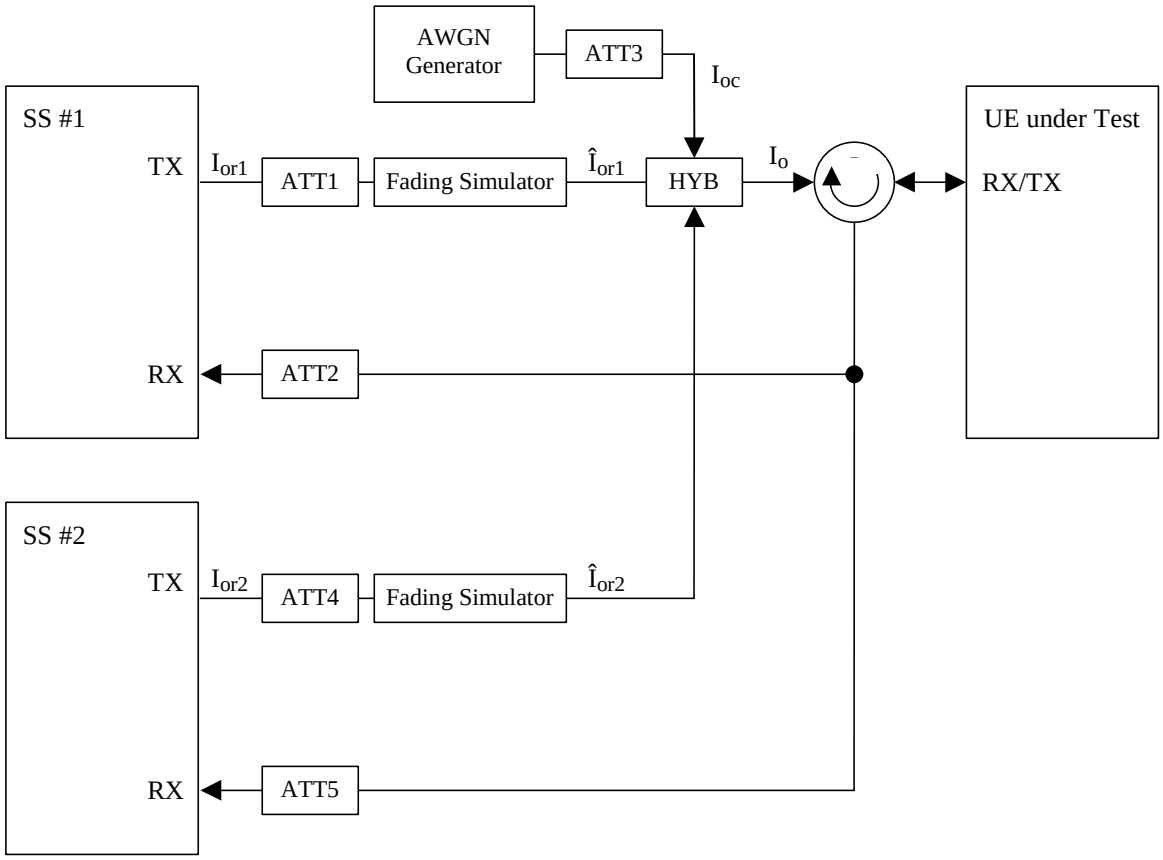

Figure A.11: Connection for Inter-Cell Soft Handover Test

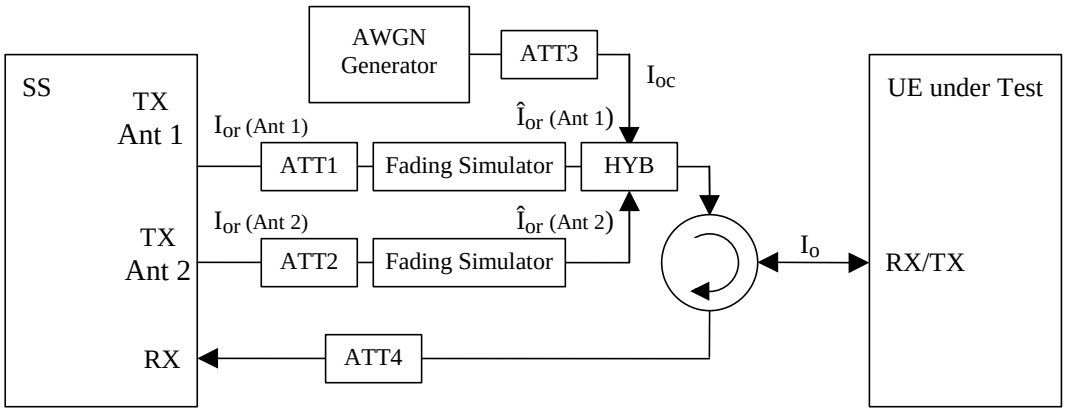

Figure A.12: Connection for Demodulation of DCH in open and closed loop transmit diversity modes

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Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [X] UTRAN / Radio [ ] Core Network [ ]

Source: TSG-T1/RF SWG **Date:** 2000-11-16

Subject: Correction of spurious emission measurement procedure

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: To align measurement procedure with core requirement.

Clauses affected: 6.8.4.2

Other specs affected:

Other 3G core specifications		→ List of CRs:	
Other GSM core specifications		→ List of CRs:	
MS test specifications	X	→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments:

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6.8 Spurious Emissions

6.8.1 Definition and applicability

The spurious emissions power is the power of emissions generated or amplified in a receiver that appear at the UE antenna connector.
The requirements and this test apply to all types of UTRA for the FDD UE.

6.8.2 Conformance requirements

The spurious emission shall be:

a) Less than –60 dBm / 3,84 MHz at the UE antenna connector, for frequencies within the UE receive band. In URA_PCH-, Cell_PCH- and IDLE- stage the requirement applies also for UE transmit band.

b) Less than –57 dBm / 100 kHz at the UE antenna connector, for frequencies band from 9 kHz to 1 GHz.

c) Less than –47 dBm / 100 kHz at the UE antenna connector, for frequencies band from 1 GHz to 12.75 GHz.

The reference for this requirement is [1] TS 25.101 subclause 7.9.1.

6.8.3 Test purpose

To verify that the UE spurious emission meets the specifications described in subclause 6.8.2.
Excess spurious emissions increase the interference to other systems.

6.8.4 Method of test

6.8.4.1 Initial conditions

1) Connect a spectrum analyzer (or other suitable test equipment) to the UE antenna connector as shown in Figure A.8.

2) UE shall be camped on a cell

3) UE shall perform Location Registration (LR) before the test procedure in subclause 6.8.4.2, but not during it.

4) Neighbour cell list shall be empty.

5) Paging repetition period and DRX cycle shall be set to minimum (shortest possible time interval).

6.8.4.2 Procedure

1) Sweep the spectrum analyzer (or equivalent equipment) over a frequency range and measure the average power of spurious emission.~~Sweep the spectrum analyzer (or other suitable test equipment) over a frequency range from the lowest intermediate frequency or lowest oscillator frequency used in the receiver or 1 MHz, whichever is lowest to at least 3 times the carrier frequency.~~

6.8.5 Test requirements

The all measured spurious emissions, derived in step 1), shall be:

a) Less than −60 dBm / 3,84 MHz at the UE antenna connector, for frequencies within the UE receive band. In URA_PCH-, Cell_PCH- and IDLE- state the requirement applies also for UE transmit band.

b) Less than −57 dBm / 100 kHz at the UE antenna connector, for frequencies band from 9 kHz to 1 GHz.

c) Less than –47 dBm / 100 kHz at the UE antenna connector, for frequencies band from 1 GHz to 12.75 GHz.

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Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [X] UTRAN / Radio [ ] Core Network [ ]

Source: TSG-T1/RF SWG **Date:** 2000-11-16

Subject: Out-of-synchronization handling of output power

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X
A	Corresponds to a correction in an earlier release	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Release:

Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	X
Release 00	

Reason for change: The test purpose, test method and test requirements have not been defined in previous versions of TS34.121.

Clauses affected: 5.4

Other specs affected:

Other 3G core specifications	[ ]	→ List of CRs:
Other GSM core specifications	[ ]	→ List of CRs:
MS test specifications	[ ]	→ List of CRs:
BSS test specifications	[ ]	→ List of CRs:
O&M specifications	[ ]	→ List of CRs:

Other comments:

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5.4.4 Out-of-synchronisation handling of output power

5.4.4.1 Definition and applicability

The UE shall monitor the DPCCH quality in order to detect a loss of the signal on Layer 1, as specified in [5] TS 25.214. The thresholds Q_{out} and Q_{in} specify at what DPCCH quality levels the UE shall shut its power off and when it shall turn its power on respectively. The thresholds are not defined explicitly, but are defined by the conditions under which the UE shall shut its transmitter off and turn it on, as stated in this clause.

5.4.4.2 Conformance requirements

The parameters in Table 5.4.4.1 are defined using the DL reference measurement channel (12.2 kbps) specified in Annex C.3.1 and with static propagation conditions.

Table 5.4.4.1: DCH parameters for test of Out-of-synch handling

Parameter	Value	Unit
$\hat{I}_{or}/I_{oc}$	–1	dB
I_{oc}	–60	dBm / 3.84 MHz
$\frac{DPDCH\_E_c}{I_{or}}$	See Figure 5.4.4.1: Before point A –16.6 After point A Not defined	dB
$\frac{DPCCH\_E_c}{I_{or}}$	See Figure 5.4.4.1	dB
Information Data Rate	12.2	kbps
TFCI	on	-

The conditions for when the UE shall shut its transmitter off and when it shall turn it on are defined by the parameters in Table 5.4.4.1 together with the DPCH power level as defined in Figure 5.4.4.1.

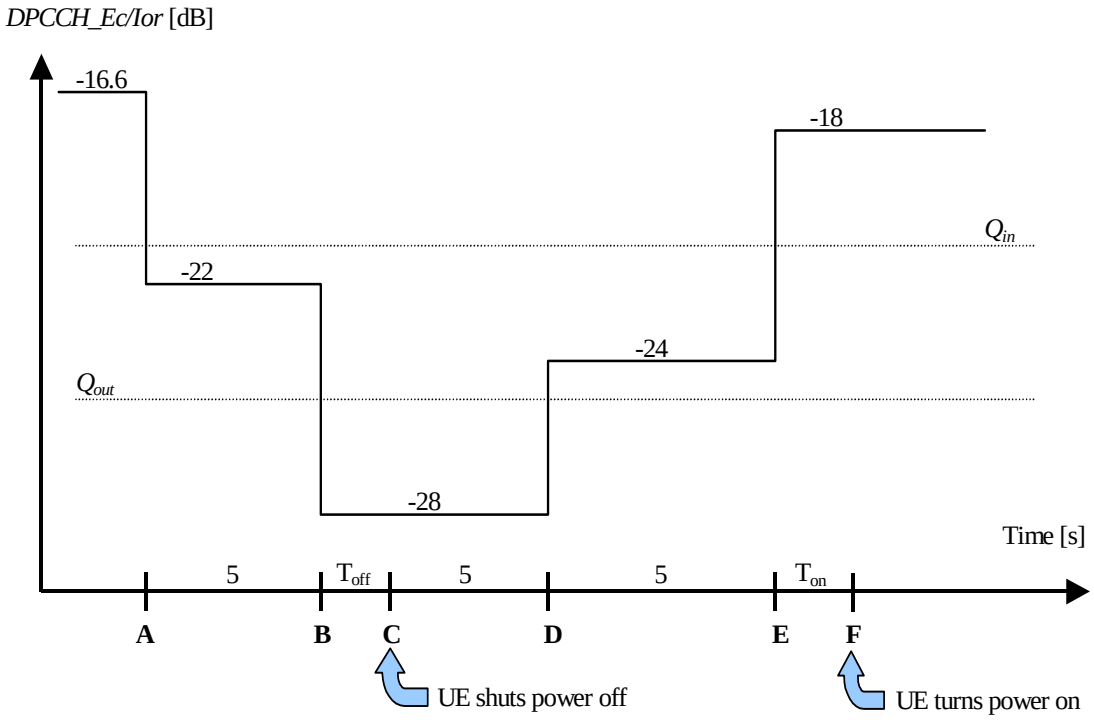

Figure 5.4.4.1: Conditions for out-of-synch handling in the UE. The indicated thresholds Q_{out} andQ_{in} are only informative.

The requirements for the UE are that

1. The UE shall not shut its transmitter off before point B.
2. The UE shall shut its transmitter off before point C, which is Toff = ~~[~~200~~]~~ ms after point B.
3. The UE shall not turn its transmitter on between points C and E.
4. The UE ~~may~~shall turn its transmitter on before point F , which is Ton=200ms after point E.

The reference for this requirement is [1] TS 25.101 sub-clause 6.4.4.1.

5.4.4.3 Test purpose

~~[TBD]~~

To verify that the UE monitors the DPCCH quality and turns its transmitter on or off according to DPCCH level diagram specified in Figure 5.4.4.1.

5.4.4.4 Method of test

5.4.4.4.1 Initial conditions

1) Connect the SS to the UE antenna connector as shown in Figure A.1.

2) A call is set up according to the Generic call set-up~~,~~ procedure and DCH ~~RF~~ parameters are set up according to Table 5.4.4.~~2~~1 with DPCCH_Ec/Ior ratio level at –16.6dB.

3) Enter the UE into loopback test mode and start the loopback test.

See [3] TS 34.108 and [4] TS 34.109 for details regarding generic call set-up procedure and loopback test.

Table 5.4.4.2: Test parameters for test of Out-of-synch handling

Parameter	Level	Unit
DPCCH_Ec/Ior Dmidle	-22.0	dB
DPCCH_Ec/Ior bottom	-28.0	dB
DPCCH_Ec/Ior Umidle	-24.0	dB
DPCCH_Ec/Ior top	-18.0	dB

DPCCH Levels seen in Table 5.4.4.2 are referred to Figure 5.4.4.1.

5.4.4.4.2 Procedure

~~[TBD]~~

1) Set and send continuously Up power control commands to the UE until the UE transmitter power shall be maximum level=Pmax.

2) Switch DPCCH_Ec/Ior ratio level to DPCCH_Ec/Ior Dmidle and record the UE transmitter power =Pon for 5ms after this change.

3) Switch DPCCH_Ec/Ior ratio level to DPCCH_Ec/Ior bottom and record the UE transmitter power for 205ms after this change. Measure duration of time =Tturnoff in ms from this change until when the UE transmitter power is lower than Pmax-[TBD]dB. The recorded UE transmitter power is reassigned to Pon before Tturnoff and Poff after Tturnoff.

4) Switch DPCCH_Ec/Ior ratio level to DPCCH_Ec/Ior Umidle and record the UE transmitter power =Poff for 5ms after this change.

5) Switch DPCCH_Ec/Ior ratio level to DPCCH_Ec/Ior top and record the UE transmitter power for 200ms after this change. Measure duration of time =Tturnon in ms from this change until when the UE transmitter power is within Pmax +/-[TBD]dB. The recorded UE transmitter power is reassigned to Poff before Tturnon and Pon after Tturnon.

5.4.4.5 Test requirements

~~[TBD]~~

The measured data shall be in the range given in Table 5.4.4.3.

Table 5.4.4.3: Test requirements for Out-of-synch handling

Parameter	Level	Unit
Poff-Pmax	< -[TBD]	dB
|Pon-Pmax|	< [TBD]	dB
Tturnoff	< 200	ms
Tturnon	< 200	ms

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Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [X] UTRAN / Radio [ ] Core Network [ ]

Source: TSG-T1/RF SWG **Date:** 2000-11-16

Subject: Corrections to Chaper 3 "Definitions, symbols, abbreviations and equations"

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction		**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification	X		Release 99	X
				Release 00	

Reason for change: Some vocabularies in TS 34.121 are not listed in the reference documents, or are differently defined from the reference documents.
(The reference documents: TR 21.905 and TR 25.990)

Clauses affected: 3

Other specs affected:

Other 3G core specifications		→ List of CRs:	
Other GSM core specifications		→ List of CRs:	
MS test specifications		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

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1 Scope

The present document specifies the measurement procedures for the conformance test of the user equipment (UE) that contain transmitting characteristics, receiving characteristics and performance requirements in FDD mode.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

[1] 3GPP TS 25.101 "UE Radio transmission and reception (FDD)".

[2] 3GPP TS 25.133 "Requirements for Support of Radio Resource Management (FDD)".

[3] 3GPP TS 34.108 "Common Test Environments for User Equipment (UE) Conformance Testing".

[4] 3GPP TS 34.109 "Logical Test Interface; Special conformance testing functions".

[5] 3GPP TS 25.214 "Physical layer procedures (FDD)".

[6] 3GPP TR 21.905 "Vocabulary for 3GPP Specifications".

[7] 3GPP TR 25.990 "Vocabulary".

3 Definitions, symbols, abbreviations and equations

Definitions, symbols, abbreviations and equations used in the present document are listed in TR 21.905 [5] and TR 25.990 [6].

Terms are listed in alphabetical order in this clause.

3.1 Definitions

For the purpose of the present document, the following additional terms and definitions apply:

Average power: *[TBD]*

~~**Maximum average power:** average transmitter output power obtained over any specified time interval, including periods with no transmission, when the transmit time slots are at the maximum power setting~~

~~**Peak Power:** The instantaneous power of the RF envelope which is not expected to be exceeded for 99.9% of the time~~

3.2 Symbols

For the purposes of the present document, the following symbols apply:

[…]**:** Values included in square bracket must be considered for further studies, because it means that a decision about that value was not taken;

3.3 Abbreviations

For the purpose of the present document, the following additional abbreviations apply:

AFC: Automatic Frequency Control

ASD: Acceleration Spectral Density

ATT: Attenuator

BER: Bit Error Ratio

BLER: Block Error Ratio

BTFD: Blind Transport Format Detection

EVM: Error Vector Magnitude

FDR: False transmit format Detection Ratio

HYB: Hybrid

IM: Intermodulation

ITP: Initial Transmission Power control mode

OBW: Occupied Bandwidth

OCNS: Orthogonal Channel Noise Simulator, a mechanism used to simulate the users or control signals on the other orthogonal channels of a downlink

PAR: Peak to Average Ratio

P-CCPCH: Primary Common Control Physical Channel

P-CPICH: Primary Common Pilot Channel

PCDE: Peak Code Domain Error

RBW: Resolution Bandwidth

RRC: Root-Raised Cosine

S-CCPCH: Secondary Common Control Physical Channel

S-CPICH: Secondary Common Pilot Channel

SCH: Synchronisation Channel consisting of Primary and Secondary synchronisation channels

SS: System Simulator

TGCFN: Transmission Gap Connection Frame Number

TGD: Transmission Gap Distance

TGL: Transmission Gap Length

TGPL: Transmission Gap Pattern Length

TGPRC: Transmission Gap Pattern Repetition Count

TGSN: Transmission Gap Starting Slot Number

3.4 Equations

For the purpose of the present document, the following additional equations apply:

$\frac{CPICH\_E_c}{I_{or}}$ The ratio of the received energy per PN chip of the CPICH to the total transmit power spectral density at the Node B ~~BS~~ (SS) antenna connector.

$\frac{DPCH\_E_c}{I_{or}}$ The ratio of the transmit energy per PN chip of the DPCH to the total transmit power spectral density at the Node B ~~BS~~ (SS) antenna connector.

$\frac{DPCCH\_E_c}{I_{or}}$ The ratio of the transmit energy per PN chip of the DPCCH to the total transmit power spectral density at the Node B (SS) antenna connector.

$\frac{DPDCH\_E_c}{I_{or}}$ The ratio of the transmit energy per PN chip of the DPDCH to the total transmit power spectral density at the Node B (SS) antenna connector.

F_{uw} Frequency of unwanted signal. This is specified in bracket in terms of an absolute frequency(s) or a frequency offset from the assigned channel frequency.

$I_{Node\_B\sout{TS}}$ Interference signal power level at Node B ~~BTS~~ in dBm, which is broadcasted on BCH.

I_{oac} The power spectral density of the adjacent frequency channel as measured at the UE antenna connector.

I_{oc} The power spectral density of a band limited white noise source (simulating interference from cells, which are not defined in a test procedure) as measured at the UE antenna connector.

I_{or} The received power spectral density of the down link as measured at the UE antenna connector.

I_{ouw} Unwanted signal power level.

P-CCPCH_E_c Average* energy per PN chip for P-CCPCH.

$P-CCPCH\frac{E_c}{I_o}$ The ratio of the received P-CCPCH energy per chip to the total received power spectral density at the UE antenna connector.

$\frac{P-CCPCH\_E_c}{I_{or}}$ The ratio of the average* transmit energy per PN chip for the P-CCPCH to the total transmit power spectral density.

P-CPICH_E_c Average* energy per PN chip for P-CPICH.

PICH_E_c Average* energy per PN chip for PICH.

$\frac{PICH\_E_c}{I_{or}}$ The ratio of the received energy per PN chip of the PICH to the total transmit power spectral density at the Node B ~~BS~~ (SS) antenna connector.

SCH_E_c Average* energy per PN chip for SCH.

S-CPICH_E_c Average* energy per PN chip for S-CPICH.

*Note: Averaging period for energy/power of discontinuously transmitted channels should be defined.

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Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [X] UTRAN / Radio [ ] Core Network [ ]

Source: TSG-T1/RF SWG **Date:** 2000-11-16

Subject: Clarification of test procedure and test requirement for receiver blocking and spurious response.

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: To clarify test procedure and requirement for receiver blocking. To clarify test procedure for spurious response.

Clauses affected: 6.5.4.2, 6.5.5, 6.6.4.2

Other specs affected:

Other 3G core specifications		→ List of CRs:	
Other GSM core specifications		→ List of CRs:	
MS test specifications	X	→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments:

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<--------- double-click here for help and instructions on how to create a CR.

6.5 Blocking Characteristics

6.5.1 Definition and applicability

The blocking characteristic is a measure of the receiver's ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the spurious response or the adjacent channels, without this unwanted input signal causing a degradation of the performance of the receiver beyond a specified limit. The blocking performance shall apply at all frequencies except those at which a spurious response occur.
The requirements and this test apply to all types of UTRA for the FDD UE.

6.5.2 Conformance requirements

The BER shall not exceed 0.001 for the parameters specified in Table 6.5.1 and Table 6.5.2. For Table 6.5.2 up to (24) exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size.
The reference for this requirement is [1] TS 25.101 subclause 7.6.1.

Note: $I_{blocking}$ (modulated) consists of common channels and 16 dedicated data channels. The channelisation codes for data channels are chosen optimally to reduce peak to average ratio (PAR). All dedicated channels user data is uncorrelated to each other.

6.5.3 Test purpose

To verify that the UE BER does not exceed 0.001 for the parameters specified in Table 6.5.1 and Table 6.5.2. For Table 6.5.2 up to (24) exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1 MHz step size.
The lack of the blocking ability decreases the coverage area when other transmitter exists (except in the adjacent channels and spurious response).

6.5.4 Method of test

6.5.4.1 Initial conditions

1) Connect the SS to the UE antenna connector as shown in Figure A.5.

2) A call is set up according to the Generic call setup procedure, and RF parameters are set up according to Table 6.5.1 and Table 6.5.2.

3) Enter the UE into loopback test mode and start the loopback test.

See [3] TS 34.108 and [4] TS 34.109 for details regarding generic call setup procedure and loopback test.

Table 6.5.1: Test parameters for In-band blocking characteristics

Parameter	10 MHz offset	15 MHz offset	Unit
DPCH_Ec	–114	–114	dBm / 3.84 MHz
$\hat{I}_{or}$	–103.7	–103.7	dBm / 3.84 MHz
$I_{blocking}$ (modulated)	–56	–44	dBm / 3.84 MHz
F_{uw} (offset)	+10 or –10	+15 or –15	MHz

Table 6.5.2: Test parameters for Out of band blocking characteristics

Parameter	Band 1	Band 2	Band 3	Unit
DPCH_Ec	–114	–114	–114	dBm / 3.84MHz
$\hat{I}_{or}$	–103.7	–103.7	–103.7	dBm / 3.84MHz
$I_{blocking}$ (CW)	–44	–30	–15	dBm
F_{uw} For operation in frequency bands as defined in subclause 4.2(a)	2050 < f < 2095 2185 < f < 2230	2025 < f < 2050 2230 < f < 2255	1 < f < 2025 2255 < f < 12750	MHz
F_{uw} For operation in frequency bands as defined in subclause 4.2(b)	1870 < f < 1915 2005 < f < 2050	1845 < f < 1870 2050 < f < 2075	1 < f < 1845 2075 < f < 12750	MHz

NOTE:

1. For operation in bands referenced in 4.2(a), from 2095 < f < 2110 MHz and 2170 < f < 2185 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4.2 shall be applied.

2. For operation in bands referenced in 4.2(b), 1915 < f < 1930 MHz and 1990 < f < 2005 MHz, the appropriate in-band blocking or adjacent channel selectivity in subclause 6.4.2 shall be applied.

6.5.4.2 Procedure

1) Set the parameters of the CW generator or the interference signal generator as shown in Table 6.5.1 and Table 6.5.2. For Table 6.5.2, the frequency step size is 1 MHz.

2) Measure the BER of DCH received from the UE at the SS.

3) For Table 6.5.2, record the frequencies for which BER exceed the test requirements.

6.5.5 Test requirements

For Table 6.5.1, ~~T~~the measured BER, derived in step 2)~~,~~ shall not exceed 0.001. For Table 6.5.2, the measured BER, derived in step 2) shall not exceed 0.001 except for the spurious response frequencies, recorded in step 3). The number of spurious response frequencies, recorded in step 3) shall not exceed 24.

6.6 Spurious Response

6.6.1 Definition and applicability

Spurious response is a measure of the receiver's ability to receive a wanted signal on its assigned channel frequency without exceeding a given degradation due to the presence of an unwanted CW interfering signal at any other frequency at which a response is obtained i.e. for which the blocking limit is not met.
The requirements and this test apply to all types of UTRA for the FDD UE.

6.6.2 Conformance requirements

The BER shall not exceed 0.001 for the parameters specified in Table 6.6.1.
The reference for this requirement is [1] TS 25.101 subclause 7.7.1.

6.6.3 Test purpose

To verify that the UE BER does not exceed 0.001 for the parameters specified in Table 6.6.1.
The lack of the spurious response ability decreases the coverage area when other unwanted interfering signal exists at any other frequency.

6.6.4 Method of test

6.6.4.1 Initial conditions

1) Connect the SS to the UE antenna connector as shown in Figure A.6.

2) A call is set up according to the Generic call setup procedure, and RF parameters are set up according to Table 6.6.1.

3) Enter the UE into loopback test mode and start the loopback test.

See [3] TS 34.108 and [4] TS 34.109 for details regarding generic call setup procedure and loopback test.

Table 6.6.1: Test parameters for Spurious Response

Parameter	Level	Unit
DPCH_Ec	–114	dBm / 3.84MHz
$\hat{I}_{or}$	–103.7	dBm / 3.84MHz
$I_{blocking}$(CW)	–44	dBm
F_{uw}	Spurious response frequencies	MHz

6.6.4.2 Procedure

1) Set the parameter of the CW generator as shown in Table 6.6.1. The spurious response frequencies are determined in step 3 of section 6.5.4.2.
2) Measure the BER of DCH received from the UE at the SS.

6.6.5 Test requirements

The measured BER, derived in step 2), shall not exceed 0.001.

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Document T1-000249
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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34.121	CR	054	Current Version:	3.2.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	T1#9	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [X] UTRAN / Radio [ ] Core Network [ ]

Source: TSG-T1/RF SWG **Date:** 2000-11-16

Subject: CR for subclause 7.8 Power control in downlink

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: The minimum requirements for Downlink power control test case were changed inTS25.101.

Clauses affected: 2, 7.8

Other specs affected:

Other 3G core specifications		→ List of CRs:	
Other GSM core specifications		→ List of CRs:	
MS test specifications		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments:

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1 Scope

The present document specifies the measurement procedures for the conformance test of the user equipment (UE) that contain transmitting characteristics, receiving characteristics and performance requirements in FDD mode.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

[1] 3GPP TS 25.101 "UE Radio transmission and reception (FDD)".

[2] 3GPP TS 25.133 "Requirements for Support of Radio Resource Management (FDD)".

[3] 3GPP TS 34.108 "Common Test Environments for User Equipment (UE) Conformance Testing".

[4] 3GPP TS 34.109 "Logical Test Interface; Special conformance testing functions".

[5] 3GPP TS 25.214 "Physical layer procedures (FDD)".

[6] 3GPP TR 21.905 "Vocabulary for 3GPP Specifications".

[7] 3GPP TR 25.990 "Vocabulary".

[8] 3GPP TS 25.433 "UTRAN Iub Interface NBAP Signalling".

3 Definitions, symbols, abbreviations and equations

Definitions, symbols, abbreviations and equations used in the present document are listed in TR 21.905 [5] and TR 25.990 [6].

Terms are listed in alphabetical order in this clause.

3.1 Definitions

For the purpose of the present document, the following additional terms and definitions apply:

Average power: *[TBD]*

Maximum average power: average transmitter output power obtained over any specified time interval, including periods with no transmission, when the transmit time slots are at the maximum power setting

Peak Power: The instantaneous power of the RF envelope which is not expected to be exceeded for 99.9% of the time

3.2 Symbols

For the purposes of the present document, the following symbols apply:

[…]**:** Values included in square bracket must be considered for further studies, because it means that a decision about that value was not taken;

7.7.2.4 Method of test

7.7.2.4.1 Initial conditions

[TBD]

7.7.2.4.2 Procedures

[TBD]

7.7.2.5 Test requirements

[TBD]

7.8 Power control in downlink

Power control in the downlink is the ability of the UE receiver to converge to required link quality set by the network while using as low power as possible in downlink . If a BLER target has been assigned to a DCCH (See Annex C.3), then it has to be such that outer loop is based on DTCH and not on DCCH.

7.8.1 Power control in the downlink, constant BLER target

7.8.1.1 Definition and applicability

Power control in the downlink is the ability of the UE receiver to converge to required link quality set by the network while using as low power as possible in downlink. If a BLER target has been assigned to a DCCH (See Annex C.3), then it has to be such that outer loop is based on DTCH and not on DCCH. The requirements and this test apply to all types of UTRA for the FDD UE.

7.8.1.2 Conformance requirements

For the parameters specified in Table 7.8.1.1 the ~~average~~ downlink $\frac{DPCH\_E_c}{I_{or}}$ power measured values, which are averaged over one slot, shall be below the specified value in Table 7.8.1.2 more than 90% of the time. ~~for the~~ BLER shall be as shown in Table 7.8.1.2. Power control in downlink is ON during the test.

Table 7.8.1.1: Test parameter for downlink power control, constant BLER target

Parameter	Test 1	Test 2	Unit
$\hat{I}_{or}/I_{oc}$	9	-1	dB
I_{oc}	–60		dBm / 3.84 MHz
Information Data Rate	12.2		kbps
Target quality on DTCH	0.01		BLER
Propagation condition	Case 4		
Maximum_DL_Power *	7		dB
Minimum_DL_Power *	-18		dB
Limited_Power_Raise_Used	"Not used"		-

Note *: Power is compared to P-CPICH as specified in [8].

Table 7.8.1.2: Requirements in downlink power control, constant BLER target

Parameter	Test 1	Test 2	Unit
$\frac{DPCH\_E_c}{I_{or}}$	-16.0	-9.0	dB
Measured quality on DTCH	0.01±30%	0.01±30%	BLER
~~Confidence level for measured quality and~~ $\frac{DPCH\_E_c}{I_{or}}$	~~90~~		~~%~~

The reference for this requirement is [1] TS 25.101 subclause 8.8.1.1.

7.8.1.3 Test purpose

To verify that the UE receiver is capable of converging to required link quality set by network while using as low power as possible.

7.8.1.4 Method of test

7.8.1.4.1 Initial conditions

1) Connect SS, multipath fading simulator and an AWGN source to the UE antenna connector as shown in Figure A.10.

2) Set up a call according to the Generic call setup procedure.

3) RF parameters are set up according to Table 7.8.1.1 and Table E.3.3.

4) Enter the UE into loopback test mode and start the loopback test.

5) SS signals to UE target quality value on DTCH as specified in Table 7.8.1.1. SS will vary the physical channel power in downlink according to the TPC commands from UE. SS response time for UE TPC commands shall be one slot. At the same time BLER is measured. This is continued until the target quality value on DTCH is met, within the minimum accuracy requirement.

See [3] TS 34.108 and [4] TS 34.109 for details regarding generic call setup procedure and loopback test.

7.8.1.4.2 Procedure

1) After the target quality on DTCH is met, BLER is measured. Simultaneously the ~~average~~ downlink $\frac{DPCH\_E_c}{I_{or}}$ power averaged over one slot is measured. This is repeated until adequate amount of measurements is done to reach the required confidence level.

2) The measured quality on DTCH (BLER) and the measured ~~average~~ downlink $\frac{DPCH\_E_c}{I_{or}}$ power values averaged over one slot are compared to limits in Table 7.8.1.2.

7.8.1.5 Test Requirements

a) The measured quality on DTCH does not exceed the values in Table 7.8.1.2.

b) The ~~average measured~~ downlink $\frac{DPCH\_E_c}{I_{or}}$ power values, which are averaged over one slot, shall be below the values in Table 7.8.1.2 more than 90% of the time.~~does not exceed the values in Table 7.8.1.2.~~

7.8.2 Power control in the downlink, initial convergence

7.8.2.1 Definition and applicability

This requirement verifies that DL power control works properly during the first seconds after DPCH connection is established. The requirements and this test apply to all types of UTRA for the FDD UE.

7.8.2.2 Conformance requirements

For the parameters specified in Table 7.8.2.1 the downlink DPCH_Ec/Ior power measured values, which are~~is~~ averaged over [50 ms], shall be within the range specified in Table 7.8.2.2 more than 90% of the time. T1 equals to [500 ms] and it starts [10 ms] after the DPDCH connection is initiated. T2 equals to [500 ms] and it starts when T1 has expired. Power control is ON during the test.

Table 7.8.2.1: Test parameters for downlink power control, initial convergence

Parameter	Test 1	Test 2	Test 3	Test 4	Unit
Target quality value on DTCH	0.01	0.01	0.1	0.1	BLER
Initial DPCH_Ec/Ior	-5.9	-25.9	-2.1	-22.1	dB
Information Data Rate	12.2	12.2	64	64	kbps
$\hat{I}_{or}/I_{oc}$	-1				dB
I_{oc}	-60				dBm/3.84 MHz
Propagation condition	[Static]				
Maximum_DL_Power *	7				dB
Minimum_DL_Power *	-18				dB
Limited_Power_Raise_Used	"Not used"				-

Note *: Power is compared to P-CPICH as specified in [8]

Table 7.8.2.2: Requirements in downlink power control, initial convergence

Parameter	Test 1 and Test 2	Test 3 and Test 4	Unit
$\frac{DPCH\_E_c}{I_{or}}$ during T1	[-18.9 ≤ DPCH_Ec/Ior ≤ -11.9]	[-15.1 ≤ DPCH_Ec/Ior ≤ -8.1]	dB
$\frac{DPCH\_E_c}{I_{or}}$ during T2	[-18.9 ≤ DPCH_Ec/Ior ≤ -14.9]	[-15.1 ≤ DPCH_Ec/Ior ≤ -11.1]	dB
~~Confidence level for measured~~ $\frac{DPCH\_E_c}{I_{or}}$	~~[90]~~		~~%~~

The reference for this requirement is [1] TS 25.101 subclause 8.8.2.1.

7.8.2.3 Test purpose

To verify that DL power control works properly during the first seconds after DPCH connection is established.

7.8.2.4 Method of test

7.8.2.4.1 Initial conditions

1) Connect SS, multipath fading simulator and an AWGN source to the UE antenna connector as shown in Figure A.10.

7.8.2.4.2 Procedure

1) Set up call using test parameters according to Table 7.8.2.1.

2) Measure $\frac{DPCH\_E_c}{I_{or}}$ power averaged over [50 ms] during T1. T1 starts [10 ms] after DPDCH connection is initiated and T1 equals to [500 ms]

3) Measure $\frac{DPCH\_E_c}{I_{or}}$ power averaged over [50 ms] during T2. T2 starts, when T1 has expired and T2 equals to [500 ms]

7.8.2.5 Test Requirements

a) The ~~measured~~ downlink $\frac{DPCH\_E_c}{I_{or}}$ power values shall be within the range specified in Table 7.8.2.2 during T1 more than 90% of the time.~~with 90% confidence level.~~

b) The ~~measured~~ downlink $\frac{DPCH\_E_c}{I_{or}}$ power values shall be within the range specified in Table 7.8.2.2 during T2 more than 90% of the time.~~with 90% confidence level.~~

7.8.3 Power control in the downlink, wind up effects

7.8.3.1 Definition and applicability

This requirement verifies that, after the downlink maximum power is limited in the UTRAN and it has been released again, the downlink power control in the UE does not have a wind up effect, i.e. the required DL power has increased during time period the DL power was limited. ~~Stage 1 is used for the power control to converge, during Stage 2 the maximum downlink power is limited by UTRAN and during Stage 3 the downlink power is released free and the downlink power is measured to detect that the power is lower than specified.~~ The requirements and this test apply to all types of UTRA for the FDD UE.

7.8.3.2 Conformance requirements

This test is run in three stages where stage 1 is for convergence of the power control loop, in stage two the maximum downlink power for the dedicated channel is limited not to be higher than the parameter specified in Table 7.8.3.1. All parameters used in the three stages are specified in Table 7.8.3.1. The downlink $\frac{DPCH\_E_c}{I_{or}}$ power measured values, which are averaged over one slot, during stage 3 shall ~~during 90 % of the time~~ be lower than the value specified in Table 7.8.3.2 more than 90% of the time. Power control of the UE is ON during the test.

Table 7.8.3.1: Test parameter for downlink power control, wind-up effects

Parameter	Test 1			Unit
	Stage 1	Stage 2	Stage 3	
Time in each stage	>15	5	0.5	s
$\hat{I}_{or}/I_{oc}$	5			dB

I_{oc}	-60			dBm/3.84 MHz
Information Data Rate	12.2			kbps
~~Max downlink~~ $\frac{DPCH\_E_c}{I_{or}}$	~~No limitation~~	~~[-15.7]~~	~~No limitation~~	~~dB~~
Quality target on DTCH	0.01			BLER
Propagation condition	Case 4			
Maximum_DL_Power *	7	-6.2	7	dB
Minimum_DL_Power *	-18			dB
Limited_Power_Raise_Used	"Not used"			-

Note *: Power is compared to P-CPICH as specified in [8]

Table 7.8.3.2: Requirements in downlink power control, wind-up effects

Parameter	Test 1, stage 3	Unit
$\frac{DPCH\_E_c}{I_{or}}$	[~~-12.9~~-13.3]	dB
~~Confidence level for~~ $\frac{DPCH\_E_c}{I_{or}}$	~~[90]~~	~~%~~

The reference for this requirement is [1] TS 25.101 subclause 8.8.3.1.

7.8.3.3 Test purpose

To verify that the UE downlink power control does not require too high downlink power during a period after the downlink power is limited by the UTRAN.

7.8.3.4 Method of test

7.8.3.4.1 Initial conditions

1) Connect SS, multipath fading simulator and an AWGN source to the UE antenna connector as shown in Figure A.10.

2) Set up a call according to the Generic call setup procedure.

3) ~~3)~~ Enter the UE into loopback test mode and start the loopback test.

4) RF parameters are set up according to Table 7.8.3.1. Stage 1 is used for the power control to converge and during Stage 2 the maximum downlink power is limited by UTRAN.

See [3] TS 34.108 and [4] TS 34.109 for details regarding generic call setup procedure and loopback test.

7.8.3.4.2 Procedure

1) Measure $\frac{DPCH\_E_c}{I_{or}}$ power during stage 3 according to Table 7.8.3.1.

7.8.3.5 Test Requirements

The ~~measured~~ downlink $\frac{DPCH\_E_c}{I_{or}}$ power values, which are averaged over one slot, shall be lower than the level specified in table 7.8.3.2 during stage 3 more than 90% of the time.~~with 90% confidence level.~~

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34.121	**CR**	**042**	Current Version:	3.2.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	T1#9	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: (U)SIM [ ] ME [X] UTRAN / Radio [ ] Core Network [ ]
(at least one should be marked with an X)

Source: TSG-T1/RF SWG **Date:** 2000-11-16

Subject: Handling of measurement uncertainties in UE conformance testing (FDD)

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: Alignment with core specifications (25.101) and with draft ITU/R recommendation on handling of measurement uncertainties for a global circulation of terminals

Clauses affected: Annex F

Other specs affected:

Other 3G core specifications		→ List of CRs:	
Other GSM core specifications		→ List of CRs:	
MS test specifications		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments:

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Annex F (normative):
~~Requirement of Test Equipment~~General test conditions and declarations

~~*[TBD]*~~

The requirements of this clause apply to all tests in the present document, when applicable.

Many of the tests in the present document measure a parameter relative to a value which is not fully specified in the UE specifications. For these tests, the conformance requirement is determined relative to a nominal value specified by the manufacturer.

When specified in a test, the manufacturer shall declare the nominal value of a parameter, or whether an option is supported.

In order to be consistent with industry practise, the shared risk principle shall be used for all tests. It may be decided to relax the core specification value by a certain relaxation value (hereby named "Test Tolerance") that should be evaluated on a case per case basis taking into account different factors such as test equipment uncertainty, mismatch, and criticality for system performance .

In all the relevant subclauses in this clause all Bit Error Ratio (BER), Block Error Ratio (BLER), False transmit format Detection Ratio (FDR) measurements shall be carried out according to the general rules for statistical testing in annex F.4.

F.1 Acceptable uncertainty of measurement equipment

The maximum acceptable uncertainty of measurement equipment is specified separately for each test, where appropriate. The measurement equipment shall enable the stimulus signals in the test case to be adjusted to within the specified range, and the conformance requirement to be measured with an uncertainty not exceeding the specified values. All ranges and uncertainties are absolute values, and are valid for a confidence level of 95 %, unless otherwise stated.

It should be noted that the stated uncertainties in subclause F.1 apply to the test equipment only and do not include system effects due to mismatch between the DUT and the test equipment.

F.1.1 Transmitter

Subclause 5.2, UE maximum output power:

- UE maximum output power ±[] dB.

Subclause 5.3, Frequency stability:

- carrier frequency ±[] Hz.

Subclause 5.4.1, Open loop power control in the uplink:

- UE output power ±[] dB.

Subclause 5.4.2, Inner loop power control in the uplink:

- transmitter power control step (relative 1 dB step) ±[] dB;
- transmitter average power control step (relative 10×1 dB steps) ±[] dB.

Subclause 5.4.3, Minimum Output Power:

- UE minimum output power ±[] dB.

Subclause 5.4.4, Out-of-synchronisation handling of output power:

- $\frac{DPDCH\_E_c}{I_{or}}$ ±[] dB.
- transmit ON/OFF time ±[] s.

Subclause 5.5, Transmit ON/OFF Power:

- UE minimum output power ±[] dB.

- transmit ON/OFF time ±[] s.

Subclause 5.6, Change of TFC:

- power control step size ±[] dB.

- timing ±[] s.

Subclause 5.7, Power setting in uplink compressed mode:

- UE output power ±[] dB.

Subclause 5.8, Occupied bandwidth:

- occupied channel bandwidth ±[] kHz.

Subclause 5.9, Spectrum emission mask:

- emission power:

Table F.1: Uncertainty for Spectrum emission mask measurement

Frequency offset from carrier Δf	Uncertainty
2.5 - 3.5 MHz	±[ ] dB
3.5 - 7.5 MHz	±[ ] dB
7.5 - 8.5 MHz	±[ ] dB
8.5 - 12.5 MHz	±[ ] dB

Subclause 5.10, Adjacent Channel Leakage power Ratio (ACLR):

- ACLR ± 5 MHz (Relative carrier power) ±[] dB;

- ACLR ± 10 MHz (Relative carrier power) ±[] dB.

Subclause 5.11, Spurious emissions:

- emission power:

Table F.2: Uncertainty for General spurious emissions requirements

Frequency Bandwidth	Uncertainty
9 kHz ≤ f < 150 kHz	±[ ] dB
150 kHz ≤ f < 30 MHz	±[ ] dB
30 MHz ≤ f < 1000 MHz	±[ ] dB
1 GHz ≤ f < 12.75 GHz	±[ ] dB

Table F.3: Uncertainty for Additional spurious emissions requirements

Frequency Bandwidth	Uncertainty
1893.5 MHz < f < 1919.6 MHz	±[ ] dB
925 MHz ≤ f ≤ 935 MHz	±[ ] dB
935 MHz < f ≤ 960 MHz	±[ ] dB
1805 MHz ≤ f ≤ 1880 MHz	±[ ] dB

Subclause 5.12, Transmit intermodulation:

Table F.4: Uncertainty for Transmit Intermodulation

CW Signal Frequency Offset from Transmitting Carrier	5MHz	10MHz
Interference CW Signal Level	±[ ] dB	
Intermodulation Product	±[ ] dB	±[ ] dB

Subclause 5.13, Transmit modulation:

- modulation accuracy (EVM) ±[ ] % RMS.

- peak code domain error ±[ ] dB.

F.1.2 Receiver

Subclause 6.2, Reference sensitivity level:
- test signal power ±[] dB;

Subclause 6.3, maximum input level:
- test signal power ±[] dB.

Subclause 6.4, Adjacent Channel Selectivity (ACS):
- test signal power ±[] dB;

- interfering signal power (Relative to the test signal) ±[] dB;

Subclause 6.5, Blocking characteristics:

Table F.5: Uncertainty for In-band blocking characteristics

Parameter	10 MHz offset	15 MHz offset	Unit
DPCH_Ec	±[ ]	±[ ]	dB
$\hat{I}_{or}$	±[ ]	±[ ]	dB
$I_{blocking}$ (modulated)	±[ ]	±[ ]	dB
F_{uw} (offset)	+10 or –10	+15 or –15	MHz

Table F.6: Uncertainty for Out of band blocking characteristics

Parameter	Band 1	Band 2	Band 3	Unit
DPCH_Ec	±[ ]	±[ ]	±[ ]	dB
$\hat{I}_{or}$	±[ ]	±[ ]	±[ ]	dB
$I_{blocking}$ (CW)	±[ ]	±[ ]	±[ ]	dB
F_{uw} For operation in frequency bands as defined in subclause 4.2(a)	2050 < f < 2095 2185 < f < 2230	2025 < f < 2050 2230 < f < 2255	1 < f < 2025 2255 < f < 12750	MHz
F_{uw} For operation in frequency bands as defined in subclause 4.2(b)	1870 < f < 1915 2005 < f < 2050	1845 < f < 1870 2050 < f < 2075	1 < f < 1845 2075 < f < 12750	MHz

Subclause 6.6, Spurious response:
- test signal power ±[] dB;

- interfering signal power (Relative to the test signal) ±[] dB;

Subclause 6.7, Intermodulation characteristics:
- test signal power ±[] dB;

- interfering signals power ±[] dB;

Subclause 6.8, Spurious emissions:
- emission power:

  UE receive band ±[] dB;

  9 kHz < f ≤ 1 GHz ±[] dB;

  1 GHz < f ≤ 12,75 GHz ±[] dB;

F.1.3 Performance requirement

Subclause 7.2, Demodulation in Static Propagation Condition:

- $\hat{I}_{or}/I_{oc}$ ±[] dB;
- I_{oc} ±[] dB;
- $\frac{DPCH\_E_c}{I_{or}}$ ±[] dB.

Subclause 7.3, Demodulation of DCH in Multiplath Fading Propagation conditions:

- $\hat{I}_{or}/I_{oc}$ ±[] dB;
- I_{oc} ±[] dB;
- $\frac{DPCH\_E_c}{I_{or}}$ ±[] dB.

Subclause 7.4, Demodulation of DCH in Moving Propagation conditions:

- $\hat{I}_{or}/I_{oc}$ ±[] dB;
- I_{oc} ±[] dB;
- $\frac{DPCH\_E_c}{I_{or}}$ ±[] dB.

Subclause 7.5, Demodulation of DCH in Birth-Death Propagation conditions:

- $\hat{I}_{or}/I_{oc}$ ±[] dB;
- I_{oc} ±[] dB;
- $\frac{DPCH\_E_c}{I_{or}}$ ±[] dB.

Subclause 7.6, Demodulation of DCH in Base Station Transmit diversity modes:

- $\hat{I}_{or}/I_{oc}$ ±[] dB;
- I_{oc} ±[] dB;
- $\frac{DPCH\_E_c}{I_{or}}$ ±[] dB.

Subclause 7.7, Demodulation in Handover conditions:

- $\hat{I}_{or}/I_{oc}$ ±[] dB;
- I_{oc} ±[] dB;
- $\frac{DPCH\_E_c}{I_{or}}$ ±[] dB.

Subclause 7.8, Power control in downlink:

- $\hat{I}_{or}/I_{oc}$ ±[] dB;
- I_{oc} ±[] dB;

- $\frac{DPCH\_E_c}{I_{or}}$ ±[] dB.

- timing ±[] s.

Subclause 7.9, Downlink compressed mode:

- $\hat{I}_{or}/I_{oc}$ ±[] dB;

- I_{oc} ±[] dB;

- $\frac{DPCH\_E_c}{I_{or}}$ ±[] dB.

Subclause 7.10, Blind transport format detection:

- $\hat{I}_{or}/I_{oc}$ ±[] dB;

- I_{oc} ±[] dB;

- $\frac{DPCH\_E_c}{I_{or}}$ ±[] dB.

F.1.4 Requirements for support of RRM

TBD

F.2 Test tolerances

The following values may be increased only on a test by test basis. The test tolerances should not be increased to take account of commonly known test system errors (such as mismatch, cable loss, etc.).

F.2.1 Transmitter

Subclause 5.2, UE maximum output power:

- UE maximum output power ±[] dB.

Subclause 5.3, Frequency stability:

- carrier frequency ±[] Hz.

Subclause 5.4.1, Open loop power control in the uplink:

- UE output power ±[] dB.

Subclause 5.4.2, Inner loop power control in the uplink:

- transmitter power control step (relative 1 dB step) ±[] dB;

- transmitter average power control step (relative 10×1 dB steps) ±[] dB.

Subclause 5.4.3, Minimum Output Power:

- UE minimum output power ±[] dB.

Subclause 5.4.4, Out-of-synchronisation handling of output power:

- transmit ON/OFF time ±[] s.

Subclause 5.5, Transmit ON/OFF Power:

- UE minimum output power ±[] dB.

- transmit ON/OFF time ±[] s.

Subclause 5.6, Change of TFC:

- power control step size ±[] dB.

  timing ±[] s.

Subclause 5.7, Power setting in uplink compressed mode:

- UE output power ±[] dB.

Subclause 5.8, Occupied bandwidth:

- occupied channel bandwidth ±[] kHz.

Subclause 5.9, Spectrum emission mask:

- emission power:

Table F.7: Tolerance for Spectrum emission mask measurement

Frequency offset from carrier Δf	Tolerance
2.5 - 3.5 MHz	±[ ] dB
3.5 - 7.5 MHz	±[ ] dB
7.5 - 8.5 MHz	±[ ] dB
8.5 – 12.5 MHz	±[ ] dB

Subclause 5.10, Adjacent Channel Leakage power Ratio (ACLR):

- ACLR ± 5 MHz (Relative carrier power) ±[] dB;

  ACLR ± 10 MHz (Relative carrier power) ±[] dB.

Subclause 5.11, Spurious emissions:

- emission power:

Table F.8: Tolerance for General spurious emissions requirements

Frequency Bandwidth	Tolerance
9 kHz ≤ f < 150 kHz	±[0] dB
150 kHz ≤ f < 30 MHz	±[0] dB
30 MHz ≤ f < 1000 MHz	±[0] dB
1 GHz ≤ f < 12.75 GHz	±[0] dB

Table F.9: Tolerance for Additional spurious emissions requirements

Frequency Bandwidth	Tolerance
1893.5 MHz < f < 1919.6 MHz	±[0] dB
925 MHz ≤ f ≤ 935 MHz	±[0] dB
935 MHz < f ≤ 960 MHz	±[0] dB
1805 MHz ≤ f ≤ 1880 MHz	±[0] dB

Subclause 5.12, Transmit intermodulation:

Table F.10: Tolerance for Transmit Intermodulation

CW Signal Frequency Offset from Transmitting Carrier	5MHz	10MHz
Intermodulation Product	±[ ] dB	±[ ] dB

Subclause 5.13, Transmit modulation:

- modulation accuracy (EVM) ±[] % RMS.

  peak code domain error ±[] dB.

F.2.2 Receiver

Subclause 6.2, Reference sensitivity level:

- UE BER ±[] %.

Subclause 6.3, maximum input level:

- UE BER ±[] %.

Subclause 6.4, Adjacent Channel Selectivity (ACS):

- UE BER ±[] %.

Subclause 6.5, Blocking characteristics:

- UE BER ±[] %.

Subclause 6.6, Spurious response:

- UE BER ±[] %.

Subclause 6.7, Intermodulation characteristics:

- UE BER ±[] %.

Subclause 6.8, Spurious emissions:

- emission power:

  UE receive band ±[0] dB;

  9 kHz < f ≤ 1 GHz ±[0] dB;

  1 GHz < f ≤ 12,75 GHz ±[0] dB;

F.2.3 Performance requirements

Subclause 7.2, Demodulation in Static Propagation Condition:

- UE BLER ±[] %.

Subclause 7.3, Demodulation of DCH in Multiplath Fading Propagation conditions:

- UE BLER ±[] %.

Subclause 7.4, Demodulation of DCH in Moving Propagation conditions:

- UE BLER ±[] %.

Subclause 7.5, Demodulation of DCH in Birth-Death Propagation conditions:

- UE BLER ±[] %.

Subclause 7.6, Demodulation of DCH in Base Station Transmit diversity modes:

- UE BLER ±[] %.

Subclause 7.7, Demodulation in Handover conditions:

- UE BLER ±[] %.

Subclause 7.8, Power control in downlink:

- $\frac{DPCH\_E_c}{I_{or}}$ ±[] dB.

- UE BLER ±[] %.

Subclause 7.9, Downlink compressed mode:

- UE BLER ±[] %.

Subclause 7.10, Blind transport format detection:

- UE BLER ±[] %.

- UE FDR ±[] %.

F.2.4 Requirements for support of RRM

TBD

F.3 Interpretation of measurement results

Compliance with the requirement is determined by comparing the measured value (or derived value from the measured one) with the test limit. The test limit shall be calculated by relaxing the specified limit in the core requirement using only the test tolerance as specified in subclause F.2 [see section 4.1 in TS25.101]. The actual measurement uncertainty of the test equipment for the measurement of each parameter shall be included in the test report. The recorded value for the test equipment uncertainty shall be, for each measurement, equal to or lower than the appropriate figure in subclause F.1 of the present document.

If the test equipment for a test is known to have a measurement uncertainty greater than that specified in subclause F.1, it is still permitted to use this apparatus provided that an adjustment is made to the measured value as follows.

The initial test limit is derived as above. Any additional uncertainty in the test equipment over and above that specified in subclause F.1 shall be used to tighten the test limit. This procedure will ensure that test equipment not compliant with subclause F.1does not increase the chance of passing a device under test where that device would otherwise have failed the test if test equipment compliant with subclause F.1 had been used.

F.4 General rules for statistical testing

[TBD]

TSG-T WG1 meeting #9
Redondo Beach, USA, 16th-17th November 2000

Document T1-000251
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

34.121	CR	055	Current Version:	3.2.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	T1#9	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [X] UTRAN / Radio [ ] Core Network [ ]

Source: TSG-T1/RF SWG **Date:** 2000-11-16

Subject: Downlink compressed mode

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: The minimum requirements for Downlink compressed mode test case were changed inTS25.101. The test method and test requirements have not been defined in previous versions of TS34.121.

Clauses affected: 2, 7.9, Annex C.5

Other specs affected:

Other 3G core specifications	[ ]	→ List of CRs:
Other GSM core specifications	[ ]	→ List of CRs:
MS test specifications	[ ]	→ List of CRs:
BSS test specifications	[ ]	→ List of CRs:
O&M specifications	[ ]	→ List of CRs:

Other comments:

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1 Scope

The present document specifies the measurement procedures for the conformance test of the user equipment (UE) that contain transmitting characteristics, receiving characteristics and performance requirements in FDD mode.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

[1] 3GPP TS 25.101 "UE Radio transmission and reception (FDD)".

[2] 3GPP TS 25.133 "Requirements for Support of Radio Resource Management (FDD)".

[3] 3GPP TS 34.108 "Common Test Environments for User Equipment (UE) Conformance Testing".

[4] 3GPP TS 34.109 "Logical Test Interface; Special conformance testing functions".

[5] 3GPP TS 25.214 "Physical layer procedures (FDD)".

[6] 3GPP TR 21.905 "Vocabulary for 3GPP Specifications".

[7] 3GPP TR 25.990 "Vocabulary".

[8] 3GPP TS25.433 ”UTRAN Iub Interface NBAP Signalling”

Propagation condition	Case 4	

Table 7.8.3.2: Requirements in downlink power control, wind-up effects

Parameter	Test 1, stage 3	Unit
$\frac{DPCH\_E_c}{I_{or}}$	[-12.9]	dB
Confidence level for $\frac{DPCH\_E_c}{I_{or}}$	[90]	%

The reference for this requirement is [1] TS 25.101 subclause 8.8.3.1.

7.8.3.3 Test purpose

To verify that the UE downlink power control does not require too high downlink power during a period after the downlink power is limited by the UTRAN.

7.8.3.4 Method of test

7.8.3.4.1 Initial conditions

1) Connect SS, multipath fading simulator and an AWGN source to the UE antenna connector as shown in Figure A.10.

2) Set up a call according to the Generic call setup procedure.

3) Enter the UE into loopback test mode and start the loopback test.

See [3] TS 34.108 and [4] TS 34.109 for details regarding generic call setup procedure and loopback test.

7.8.3.4.2 Procedure

1) Measure $\frac{DPCH\_E_c}{I_{or}}$ power during stage 3 according to Table 7.8.3.1.

7.8.3.5 Test Requirements

The measured downlink $\frac{DPCH\_E_c}{I_{or}}$ power shall be lower than the level specified in table 7.8.3.2 during stage 3 with 90% confidence level.

7.9 Downlink compressed mode

Downlink compressed mode is used to create gaps in the downlink transmission, to allow the UE to make measurements on other frequencies.

7.9.1 Single link performance

7.9.1.1 Definition and applicability

The receiver single link performance of the Dedicated Traffic Channel (DCH) in compressed mode is determined by the Block Error Ratio (BLER) and transmitted DPCH_Ec/Ior power in the downlink.

The compressed mode parameters are given in clause C.5. Tests 1 and 2 are using Set 1 compressed mode pattern parameters from Table C.5.1~~21~~ in clause C.5 while tests 3 and 4 are using Set 2 compressed mode patterns from the same table.

The requirements and this test apply to all types of UTRA for the FDD UE.

7.9.1.2 Conformance requirements

For the parameters specified in Table 7.9.1 the downlink $\frac{DPCH\_E_c}{I_{or}}$ power measured values, which are averaged over one slot, shall be below the specified value in Table 7.9.2 more than 90% of the time. ~~and t~~ The measured quality on DTCH shall be as required in Table 7.9.2.

Downlink power control is ON during the test. Uplink TPC commands shall be error free. System simulator shall increase the transmitted power during compressed frames by the same amount that UE is expected to increase its SIR target during those frames.

Table 7.9.1: Test parameter for downlink compressed mode

Parameter	Test 1	Test 2	Test 3	Test 4	Unit
Delta SIR1	0		0	[3]	dB
Delta SIR after1	0		0	[3]	dB
Delta SIR2	0	0	0	0	dB
Delta SIR after2	0	0	0	0	dB
$\hat{I}_{or}/I_{oc}$	9				dB
I_{oc}	–60				dBm / 3.84 MHz
Information Data Rate	12.2				kbps
Propagation condition	Case 2				
Target quality value on DTCH	0.01				BLER
Maximum DL Power *	7				dB
Minimum DL Power *	-18				dB
Limited Power Raise Used	"Not used"				-

Note *: Power is compared to P-CPICH as specified in [8].

Table 7.9.2: Requirements in downlink compressed mode

Parameter	Test 1	Test 2	Test 3	Test 4	Unit
$\frac{DPCH\_E_c}{I_{or}}$			[-15.5]	No requirements	dB
Measured quality of compressed and recovery frames			No requirements	<0.001	BLER
Measured quality on DTCH	0.01 ± 30 %				BLER
~~Confidence level for measured quality and DPCH_Ec/Ior~~	~~[90]~~				~~%~~

The reference for this requirement is [1] TS 25.101 subclause 8.9.1.1.

7.9.1.3 Test purpose

The purpose of this test is to verify the reception of DPCH in a UE while downlink is in a compressed mode. The UE needs to preserve the BLER using sufficient low DL power. It is also verified that UE applies the Delta SIR values, which are signaled from network, in its outer loop power control algorithm.~~It is the purpose of the test, to verify, that,~~

~~due to temporary dynamic re-organisation of certain parameters in the DL compressed mode the BLER at the UE is preserved.~~

~~As the inner loop power control is running, controlling the DL power, it is furtheron verified, whether the preserved BLER is achieved by a sufficient low average DL power.~~

7.9.1.4 Method of test

7.9.1.4.1 Initial conditions

~~*[TBD]*~~

1) Connect SS, multipath fading simulator and an AWGN source to the UE antenna connector as shown in Figure A.10.

2) Set up a call according to the Generic call setup procedure.

3) RF parameters are set up according to Table 7.9.1 and Table E.3.3. SS shall increase the transmitted power during compressed mode frames by the same amount that UE is expected to increase its SIR target during those frames

4) Set compressed mode parameters according to Table C.5.1. Tests 1 and 2 are using Set 1 compressed mode pattern parameters and while tests 3 and 4 are using Set 2 compressed mode pattern parameters.

5) Enter the UE into loopback test mode and start the loopback test.

6) SS signals to UE target quality value on DTCH as specified in Table 7.9.1. Uplink TPC commands shall be error free. SS will vary the physical channel power in downlink according to the TPC commands from UE. SS response time for UE TPC commands shall be one slot. At the same time BLER is measured. This is continued until the target quality value on DTCH is met, within the minimum accuracy requirement.

See [3] TS 34.108 and [4] TS 34.109 for details regarding generic call setup procedure and loopback test.

7.9.1.4.2 Procedure

~~*[TBD]*~~

1) Test 1:

2) Test 2:

3) Test 3: Measure quality on DTCH and $\frac{DPCH\_E_c}{I_{or}}$ power values averaged over one slot.

4) Test 4: Measure quality on DTCH and quality of compressed and recovery frames.

7.9.1.5 Test requirements

~~*[TBD]*~~

a) Test 1:

b) Test 2:

c) Test3: The downlink $\frac{DPCH\_E_c}{I_{or}}$ power values averaged over one slot shall be below the values in Table 7.9.2 more than 90% of the time. The measured quality on DTCH shall be as required in Table 7.9.2.

d) Test 4: Measured quality on DTCH and measured quality of compressed and recovery frames do not exceed the values in Table 7.9.2.

C.5 DL reference compressed mode parameters

Parameters described in Table C.5.1 are used in some test specified in TS 25.101 while parameters described in Table C.5.2 are used in some tests specified in TS 25.133.

Set 1 parameters in Table C.5.1 are applicable when compressed mode by spreading factor reduction is used in downlink. Set 2 parameters in Table C.5.1 are applicable when compressed mode by puncturing is used in downlink.

Table C.5.1: Compressed mode reference pattern 1 parameters

Parameter	Set 11.1	Set 21.2	Note
TGSN (Transmission Gap Starting Slot Number)	11	11	
TGL1 (Transmission Gap Length 1)	7	7	
TGL2 (Transmission Gap Length 2)	-	-	Only one gap in use.
TGD (Transmission Gap Distance)	0-	0-	Only one gap in use.
TGPL1 (Transmission Gap Pattern Length)	2	4	
TGPL2 (Transmission Gap Pattern Length)	-	-	Only one pattern in use.
TGPRC (Transmission Gap Pattern Repetition Count)	NA	NA	Defined by higher layers
TGCFN (Transmission Gap Connection Frame Number):	NA	NA	Defined by higher layers
UL/DL compressed mode selection	DL & UL	DL & UL	2 configurations possible DL &UL / DL
UL compressed mode method	SF/2	SF/2	
DL compressed mode method	SF/2	Puncturing	
Downlink frame type and Slot format	11B	11A	
Scrambling code change	No	No	
RPP (Recovery period power control mode)	0	0	
ITP (Initial transmission power control mode)	0	0	

Table C.5.2: Compressed mode reference pattern 2 parameters

Parameter	Set 12.1	Set 22.2	Note
TGSN (Transmission Gap Starting Slot Number)	4	4	
TGL1 (Transmission Gap Length 1)	7	7	
TGL2 (Transmission Gap Length 2)	-	-	Only one gap in use.
TGD (Transmission Gap Distance)	0-	0135	
TGPL1 (Transmission Gap Pattern Length)	3	12	
TGPL2 (Transmission Gap Pattern Length)	-	-	Only one pattern in use.
TGPRC (Transmission Gap Pattern Repetition Count)	NA	NA	Defined by higher layers
TGCFN (Transmission Gap Connection Frame Number):	NA	NA	Defined by higher layers
UL/DL compressed mode selection	DL & UL	DL & UL	2 configurations possible. DL & UL / DL
UL compressed mode method	SF/2	SF/2	
DL compressed mode method	SF/2	SF/2	
Downlink frame type and Slot format	11B	11B	
Scrambling code change	No	No	
RPP (Recovery period power control mode)	0	0	
ITP (Initial transmission power control mode)	0	0	

TSG-T WG1 meeting #9 ***Tdoc T1-000252***
Redondo Beach, USA, 16th-17th November 2000

CR-Form-v3

CHANGE REQUEST

⌘	34.121	CR	043	⌘ rev	-	⌘ Current version:	3.2.0	⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘	(U)SIM		ME/UE	X	Radio Access Network		Core Network	

Title: ⌘	Update of Idle mode test cases		
Source: ⌘	TSG-T1/RF SWG		
Work item code: ⌘		***Date:*** ⌘	2000-11-16
Category: ⌘	F	***Release:*** ⌘	R99

Use one of the following categories:	*Use one of the following releases:*
F *(essential correction)*	*2 (GSM Phase 2)*
A *(corresponds to a correction in an earlier release)*	*R96 (Release 1996)*
B *(Addition of feature),*	*R97 (Release 1997)*
C *(Functional modification of feature)*	*R98 (Release 1998)*
D *(Editorial modification)*	*R99 (Release 1999)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.	*REL-4 (Release 4)*
	REL-5 (Release 5)

Reason for change: ⌘	TS 34.121, clause 8.2.1 and 8.2.2 has been modified according to new version of TS 25.133, V3.3.0 (2000-09). In addition, test case: "8.2.3 UTRAN to GSM Cell Re-Selection" has been included.
Summary of change: ⌘	Idle mode test cases updated to new version of 25.133 and new test case added
Consequences if not approved: ⌘	
Clauses affected: ⌘	8.2.1-8.2.3

Other specs affected: ⌘		Other core specifications ⌘	
		Test specifications	
		O&M Specifications	
Other comments: ⌘			

8 Requirements for support of RRM

8.1 General

8.2 Idle Mode Tasks

~~8.2.1 Introduction~~

8.2.1~~2~~ ~~RF~~ Cell Selection ~~Scenario~~

8.2.1.1 Cell Selection; the cells in the neighbour list belong to different frequencies

8.2.1.1.1 Definition and applicability

Test to verify that the UE is capable of selecting a suitable cell and camp on it within [X] seconds from switch on with stored information of the last registered PLMN. The stored information cell selection delay is then defined as the time the UE needs for sending the preamble for RRC Connection Request for Location Registration to UTRAN after the power has been switched on with a valid USIM and PIN is disabled. The test environment contains multiple cells.

This test is applicable for all UEs.

8.2.1.1.2 Conformance requirement

The stored information cell selection delay shall be equal or less than [X] seconds when the cells in the neighbour list belong to less than [3] frequencies. This shall be verified in more than [X%] of the cases with a confidence level of [Y%] [FFS]

The reference for this requirement is [2] TS 25.133 subclause 4.1.2.1.1 and A.4.1.1.2.

8.2.1.1.3 Test purpose

To verify that the UE meets the conformance requirement.

8.2.1.1.4 Method of test

8.2.1.1.4.1 Initial conditions

This scenario implies the presence of 2 carriers and 6 cells (3 cells per carrier) as given in Table 8.2.1 and 8.2.2.

The stored information of the last registered PLMN is used in this test. The stored information includes one of the UTRA RF CHANNEL NUMBERs used in the test. All the cells in the test are given in the measurement control information of each cell, which are on the RF carrier stored in the UE.

Table 8.2.1: General test parameters for Cell Selection in Multi carrier case

Parameter		Unit	Value	Comment
Initial condition	Stored RF channel		Channel1	
	Neighbour cells of Cell1		Cell2, Cell3,Cell4, Cell5, Cell6	
	Neighbour cells of Cell2		Cell1, Cell3,Cell4, Cell5, Cell6	
	Neighbour cells of Cell3		Cell1, Cell2,Cell4, Cell5, Cell6	
Final condition	Active cell		Cell5	

The relative RF signal to total interference ratio at the UE (*CPICH_Ec/Io*) between the cells is shown in Table 8.2.2 and shall be:

Cell 5 > Cell 1 > Cell 2 > Cell 4 > Cell 3 > Cell 6

The absolute signal level of each cell can be obtained from the values of $\hat{I}_{or}/I_{oc}$ in table 8.2.2.

Table 8.2.2: Test parameters for Cell selection multi carrier multi cell

Parameter	Unit	Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6
UTRA RF Channel Number		Channel 1	Channel 1	Channel 1	Channel 2	Channel 2	Channel 2
CPICH_Ec/Ior	dB	-10	-10	-10	-10	-10	-10
PCCPCH_Ec/Ior	dB	-12	-12	-12	-12	-12	-12
SCH_Ec/Ior	dB	-12	-12	-12	-12	-12	-12
PICH_Ec/Ior	dB	-15	-15	-15	-15	-15	-15
OCNS_Ec/Ior	dB	-0.941	-0.941	-0.941	-0.941	-0.941-	-0.941
$\hat{I}_{or}/I_{oc}$	dB	5.3	2.3	-1.7	6.3	14.3	2.3
I_{oc}	dBm/3.84 MHz	-70			-70		
CPICH_Ec/Io	dB	-13	-16	-20	-19	-11	-23
Propagation Condition		AWGN			AWGN		
Qqualmin	dB	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Qrxlevmin	dBm	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
UE_TXPWR_MAX_RACH	dBm	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
$Qoffset_{s,n}$	dB	C1, C2: [ ] C1, C3: [ ] C1, C4: [ ] C1, C5: [ ] C1, C6: [ ]	C2, C1: [ ] C2, C3: [ ] C2, C4: [ ] C2, C5: [ ] C2, C6: [ ]	C3, C1: [ ] C3, C2: [ ] C3, C4: [ ] C3, C5: [ ] C3, C6: [ ]	C4, C1: [ ] C4, C2: [ ] C4, C3: [ ] C4, C5: [ ] C4, C6: [ ]	C5, C1: [ ] C5, C2: [ ] C5, C3: [ ] C5, C4: [ ] C5, C6: [ ]	C6, C1: [ ] C6, C2: [ ] C6, C3: [ ] C6, C4: [ ] C6, C5: [ ]

8.2.1.1.4.2 Procedures

a) The SS activates cell 1-6 and monitors cell 5, 1 and 2 for random access requests from the UE

b) The UE is switched on.

c) The SS waits for random access request from the UE

d) The UE is switched off.

e) The SS monitors cell 5, 1 and 2 for random access requests from the UE

f) The UE is switched on

g) The SS waits for random access request from the UE

h) Repeat step d) to g) [TBD] times

8.2.1.1.5 Test requirements

1) In step c), the UE shall respond on cell 5 within [FFS seconds]

[Editor's note: LS of proposed timeout values sent to CN1/RAN2 to get acceptance]

2) In step g), the UE shall respond on cell 5 within [X] seconds in more than [X%] of the cases.

[Editor's note: The test must be executed a number of times as indirectly set by the Conformance Requirement The number is for FFS]

8.2.1.2~~2.1~~ Cell Selection; no cell is present in the neighbour list~~Cell Selection single carrier single cell case~~

8.2.1.2.1~~2.1.1~~ Definition and applicability

Test to verify that the UE is capable of selecting a suitable cell and camp on it within [5] seconds from switch on with stored information of the last registered PLMN. The~~is~~ stored information cell selection delay is then defined as the time the UE needs for sending the preamble for RRC Connection Request for Location Registration to UTRAN after the power has been switched on with a valid USIM and PIN is disabled. The test environment contains only one cell.

This test is applicable for all UE~~'~~s.

8.2.1.2.2~~2.1.2~~ Conformance requirement

The stored information cell selection delay shall be equal or less than [5] seconds. This shall be verified in more than [X%] of the cases with a confidence level of [Y%] [FFS]

~~Cell selection shall be correct in more than [X%] of the cases. Cell selection is correct if within [5] seconds the UE camps on the cell. The confidence level is set to [Y%]. (Annex [FFS])~~

The reference for this requirement is [2] TS 25.133 subclause ~~4.2.1.3.~~ 4.1.2.1.2 and A.4.1.2.2.

8.2.1.2.3~~2.1.3~~ Test purpose

To verify that the UE meets the conformance requirement.

8.2.1.2.4~~2.1.4~~ Method of test

8.2.1.2.4.1~~2.1.4.1~~ Initial conditions

This scenario implies the presence of 1 carrier and 1 cell.

The stored information of the last registered PLMN is used in this test. The stored information includes the UTRA RF CHANNEL NUMBER. The active cell in the test does not contain any neighbour cells in its measurement control information.

The absolute signal level of the~~each~~ cell can be obtained from the values of $\hat{I}_{or}/I_{oc}$ in table 8.2.3~~1~~.

~~Parameters changed from default values in table TS 34.123-1, 6.1.3.1.~~

Table 8.2.31: Test parameters for Cell selection single carrier single cell

Parameter	Unit	Cell 1
UTRA RF Channel Number		Channel 1
CPICH_Ec/Ior	dB	-10
PCCPCH_Ec/Ior	dB	-12
SCH_Ec/Ior	dB	-12
PICH_Ec/Ior	dB	-15
OCNS_Ec/Ior	dB	-0.941
$\hat{I}_{or}/I_{oc}$	dB	0
I_{oc}	dBm/3.84 MHz	-70
CPICH_Ec/Io	dB	-13
Propagation Condition		AWGN
Qqualmin	dB	[ ]
Qrxlevmin	dBm	[ ]
UE_TXPWR_MAX_RACH	dBm	[ ]

8.2.1.2.4.22.1.4.2 Procedures

a) The SS activates cell 1 and monitors cell 1 for random access request ~~RA-request~~ from the UE

b) The UE is switched on

c) The SS waits for random access request ~~RA-request~~ from the UE

d) The UE is switched off

e) The SS monitors cell 1 for random access request ~~RA-request~~ from the UE

f) The UE is switched on

g) The SS waits for random access request ~~RA-request~~ from the UE

h) Repeat step d) to g) [TBD] times

8.2.1.2.52.1.5 Test requirements

1) In step c), the UE shall respond on cell 1 within [FFS seconds]

[Editor's note: LS of proposed timeout values sent to CN1/RAN2 to get acceptance]

2) In step g), the UE shall respond on cell 1 within [5] seconds in more than [X%] of the cases.

[Editor's note: The test must be executed a number of times as indirectly set by the Conformance Requirement. The number is for FFS]

~~8.2.2.2 Cell Selection multi carrier multi cell case~~

~~8.2.2.2.1 Definition and applicability~~

~~Test to verify that the UE is capable of selecting a suitable cell within [5+x] seconds from switch on with stored information of the last registered PLMN. The cell is selected among a group of cells with different relative RF signal levels. The cell selection delay is defined as the time the UE needs for sending RRC Connection Request for Location Registration to UTRAN after the power has been switched on with a valid USIM and PIN is disabled.~~

~~This test is applicable for all UEs.~~

8.2.2.2.2 Conformance requirement

Cell selection shall be correct in more than [X%] of the cases. Cell selection is correct if within [5+x] seconds the UE camps on the cell, which fulfils the cell selection criteria. The confidence level is set to [Y%]. (Annex [FFS])

The reference for this requirement is [2] TS 25.133 subclause 4.2.2.3.

8.2.2.2.3 Test purpose

To verify that the UE meets the conformance requirement.

8.2.2.2.4 Method of test

8.2.2.2.4.1 Initial conditions

The relative RF signal to total interference ratio at the UE (*CPICH_Ec/Io*) between the cells is shown in Table 8.2.2 and shall be:

Cell 5 > Cell 1 > Cell 2 > Cell 4 > Cell 3 > Cell 6

The absolute signal level of each cell can be obtained from the values of $\hat{I}_{or}/I_{oc}$ in table 8.2.2.

Parameters changed from default values in table TS 34.123-1, 6.1.3.1.

Table 8.2.2: Test parameters for Cell selection multi carrier multi cell

Parameter	Unit	Cell 1	Cell 2	Cell 3	Cell 4	Cell 5	Cell 6
UTRA RF Channel Number		Channel 1	Channel 1	Channel 1	Channel 2	Channel 2	Channel 2
CPICH_Ec/Ior	dB	-10	-10	-10	-10	-10	-10
PCCPCH_Ec/Ior	dB	-12	-12	-12	-12	-12	-12
SCH_Ec/Ior	dB	-12	-12	-12	-12	-12	-12
PICH_Ec/Ior	dB	-15	-15	-15	-15	-15	-15
OCNS_Ec/Ior	dB	-0.941	-0.941	-0.941	-0.941	-0.941	-0.941
$\hat{I}_{or}/I_{oc}$	dB	5.3	2.3	-1.7	6.3	14.3	2.3
I_{oc}	dBm/3.84 MHz	-70			-70		
CPICH_Ec/Io	dB	-13	-16	-20	-19	-11	-23
Propagation Condition		AWGN			AWGN		
Qmin	dB	[]	[]	[]	[]	[]	[]
UE_TXPWR_MAX_RACH	dBm	[]	[]	[]	[]	[]	[]

8.2.2.2.4.2 Procedures

a) The SS activates cell 1-6 and monitors cell 5, 1 and 2 for RA-request from the UE

b) The UE is switched on.

c) The SS waits for RA-request from the UE

d) The UE is switched off.

e) The SS monitors cell 5, 1 and 2 for RA requests from the UE

f) The UE is switched on

g) The SS waits for RA-request from the UE

h) Repeat step d) to g) [TBD] times

~~8.2.2.2.5 Test requirements~~

~~1) In step c), the UE shall respond on cell 5 within [FFS seconds]~~

~~[Editor's note: LS of proposed timeout values sent to CN1/RAN2 to get acceptance]~~

~~2) In step g), the UE shall respond on cell 5 within [5+x] seconds in more than [X%] of the cases.~~

~~[Editor's note: The test must be executed a number of times as indirectly set by the Conformance Requirement The number is for FFS]~~

8.2.23 ~~RF~~ Cell Re-Selection ~~Scenario~~

8.2.23.1 Cell Re-Selection; single carrier ~~multi cell~~ case

8.2.23.1.1 Definition and applicability

Test to verify that the UE is capable of re-selecting a new cell within [5] seconds from it becoming a cell to be reselected according to the cell re-selection criteria. ~~The cells, which are possible to be re-reselected during the test are belonging to different location areas. The cell re-selection delay is then defined as a time from when CPICH_Ec/Io is changed on cell 1 and 2 to the moment in time when the UE starts sending the RRC Connection request for Location Update message to the UTRAN.~~The cell re-selection delay is then defined as the time between the occurence of any event which will trigger Cell Reselection Evaluation process and the moment in time when the UE starts sending the preamble for RRC Connection request for Location Update message to the UTRAN.

This test is applicable for all UEs.

8.2.23.1.2 Conformance requirement

The cell re-selection delay shall be equal or less than [5] seconds. This shall be verified in more than [X%] of the cases with a confidence level of [Y%] [FFS]~~Cell re-selection shall be correct in more than [X%] of the cases. Cell re-selection is correct if within [5] seconds the UE re-reselects a new cell, which fulfils the cell re-selection criteria. The confidence level is set to [Y%]. (Annex [FFS])~~

The reference for this requirement is [2] TS 25.133 subclause 4.2.2.2.1~~4.3.1.3.~~ and A.4.2.1.2.

8.2.23.1.3 Test purpose

To verify that the UE meets the conformance requirement.

8.2.23.1.4 Method of test

8.2.23.1.4.1 Initial conditions

This scenario implies the presence of 1 carrier and 6 cells as given in Table 8.2.4 and 8.2.5.

Table 8.2.4: General test parameters for Cell Re-selection single carrier multi-cell case

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell2	
	Neighbour cells		Cell1, Cell3,Cell4, Cell5, Cell6	
Final condition	Active cell		Cell1	
T1		s		T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s		T2 need to be defined so that cell re-selection reaction time is taken into account.

The relative RF signal to total interference ratio at the UE (*CPICH_Ec/Io*) between the cells is shown in Table 8.2.53 and shall be:

T1: Cell 2 > Cell 1 > Cell 3 = Cell 4 = Cell 5 = Cell 6

T2: Cell 1 > Cell 2 > Cell 3 = Cell 4 = Cell 5 = Cell 6

The absolute signal level of each cell can be obtained from the values of $\hat{I}_{or}/I_{oc}$ in table 8.2.53.

~~Parameters changed from default values in table TS 34.123-1, 6.1.3.1.~~

Table 8.2.53: Test parameters for Cell re-selection single carrier multi cell

Parameter	Unit	Cell 1		Cell 2		Cell 3		Cell 4		Cell 5		Cell 6	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1	
CPICH_Ec/Ior	dB	-10		-10		-10		-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15		-15		-15		-15	
OCNS_Ec/Ior	dB	-0.941		-0.941		-0.941		-0.941		-0.941		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	7.3	10.27	10.27	7.3	0.27		0.27		0.27		0.27	
I_{oc}	dBm / 3.84 MHz	-70											
CPICH_Ec/Io	dB	-16	-13	-13	-16	-23		-23		-23		-23	
Propagation Condition		AWGN											
Cell_selection_and_reselection_quality_measure		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0	
Qqualmin	dB	[]		[]		[]		[]		[]		[]	
Qrxlevmin	dBm	[]		[]		[]		[]		[]		[]	
UE_TXPWR_MAX_RACH	dB	[]		[]		[]		[]		[]		[]	
$Qoffset2_{s,n}$	dB	C1, C2: [] C1, C3: [] C1, C4: [] C1, C5: [] C1, C6: []		C2, C1: [] C2, C3: [] C2, C4: [] C2, C5: [] C2, C6: []		C3, C1: [] C3, C2: [] C3, C4: [] C3, C5: [] C3, C6: []		C4, C1: [] C4, C2: [] C4, C3: [] C4, C5: [] C4, C6: []		C5, C1: [] C5, C2: [] C5, C3: [] C5, C4: [] C5, C6: []		C6, C1: [] C6, C2: [] C6, C3: [] C6, C4: [] C6, C5: []	
Qhyst2	dB	[]		[]		[]		[]		[]		[]	
PENALTY_TIME	s	[]		[]		[]		[]		[]		[]	
TEMP_OFFSET2	dB	[]		[]		[]		[]		[]		[]	
Treselection	s	[]		[]		[]		[]		[]		[]	
Sintrasearch	dB	[]		[]		[]		[]		[]		[]	

~~Time T1 is X seconds and T2 is Y seconds.~~

~~Note: T1 and T2 need to be defined so that cell re-selection reaction time is taken into account.~~

8.2.23.1.4.2 Procedures

a) The SS activates cell 1-6 with T1 defined parameters and monitors cell 1 and 2 for random access requests ~~RA requests~~ from the UE

b) The UE is switched on

c) The SS waits for random access request ~~RA request~~ from the UE ~~cell 2~~

d) After [T1] seconds from switch on, the parameters are changed as described for T2

e) The SS waits for random access request ~~RA request~~ from the UE ~~on cell 1~~

f) After [T2] seconds from switch on, the parameters are changed as described for T1

g) Repeat step c) to f) [TBD] times

8.2.23.1.5 Test requirements

1) In step c), the UE shall respond on cell 2 within [FFS seconds]

[Editor's note: LS of proposed timeout values sent to CN1/RAN2 to get acceptance]

2) In step e), the UE shall respond on cell 1 within [5] seconds in more than [X%] of the cases.

[Editor's note: The test must be executed a number of times as indirectly set by the Conformance Requirement The number is for FFS]

8.2.23.2 Cell Re-Selection; multi carrier ~~multi cell~~ case

8.2.23.2.1 Definition and applicability

Test to verify that the UE is capable of re-selecting a new cell within [Nt~~TBD: Tres~~] seconds from it becoming a cell to be reselected according to the cell re-selection criteria. ~~The cells, which are possible to be re-reselected during the test are transmitting on different frequencies and are belonging to different location areas. The cell re-selection delay is then defined as a time from when CPICH_Ec/Io is changed on cell 1 and 2 to the moment in time when the UE starts sending the RRC Connection request for Location Update message to the UTRAN.~~ The cell re-selection delay is then defined as the time between the occurence of any event which will trigger Cell Reselection Evaluation process and the moment in time when the UE starts sending the preamble for RRC Connection request for Location Update message to the UTRAN.

This test is applicable for all UEs.

8.2.23.2.2 Conformance requirement

The cell re-selection delay shall be equal or less than [Nt] seconds. This shall be verified in more than [90%] of the cases with a confidence level of [Y%] [FFS]~~Cell re-selection shall be correct in more than [TBD: 90%] of the cases. Cell re-selection is correct if within [TBD: Nt] seconds the UE re-reselects a new cell, which fulfills the cell re-selection criteria. The confidence level is set to [Y%]. (Annex [FFS])~~

The reference for this requirement is [2] TS 25.133 subclause 4.2.2.2.2~~4.3.2.3.~~ and A.4.2.2.2.

8.2.23.2.3 Test purpose

To verify that the UE meets the conformance requirement.

8.2.23.2.4 Method of test

8.2.23.2.4.1 Initial conditions

This scenario implies the presence of 2 carriers and 6 cells as given in Table 8.2.6 and 8.2.7.

Table 8.2.6: General test parameters for Cell Re-selection in Multi carrier case

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell2	
	Neighbour cells		Cell1, Cell3,Cell4, Cell5, Cell6	
Final condition	Active cell		Cell1	
T1		s		T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s		T2 need to be defined so that cell re-selection reaction time is taken into account.

The relative RF signal to total interference ratio at the UE (*CPICH_Ec/Io*) between the cells is shown in Table 8.2.74 and shall be:

T1: Cell 2 > Cell 1 > Cell 3 = Cell 4 = Cell 5 = Cell 6

T2: Cell 1 > Cell 2 > Cell 3 = Cell 4 = Cell 5 = Cell 6

The absolute signal level of each cell can be obtained from the values of $\hat{I}_{or}/I_{oc}$ in table 8.2.74.

~~Parameters changed from default values in table TS 34.123-1, 6.1.3.1.~~

Table 8.2.74: Test parameters for Cell re-selection multi carrier multi cell

Parameter	Unit	Cell 1		Cell 2		Cell 3		Cell 4		Cell 5		Cell 6	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1		Channel 2		Channel 1		Channel 1		Channel 2		Channel 2	
CPICH_Ec/Ior	dB	-10		-10		-10		-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15		-15		-15		-15	
OCNS_Ec/Ior	dB	-0.941		-0.941		-0.941		-0.941		-0.941		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	-3.4	2.2	2.2	-3.4	-7.4	-4.8	-7.4	-4.8	-4.8	-7.4	-4.8	-7.4
I_{oc}	dBm / 3.84 MHz	-70											
CPICH_Ec/Io	dB	-16	-13	-13	-16	-20		-20		-20		-20	
Propagation Condition		AWGN											
Cell_selection_and_reselection_quality_measure		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0		CPICH E_c/N_0	
Qqualmin	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Qrxlevmin	dBm	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
UE_TXPWR_MAX_RACH	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
$Qoffset_{s,n}$	dB	C1, C2: [ ] C1, C3: [ ] C1, C4: [ ] C1, C5: [ ] C1, C6: [ ]		C2, C1: [ ] C2, C3: [ ] C2, C4: [ ] C2, C5: [ ] C2, C6: [ ]		C3, C1: [ ] C3, C2: [ ] C3, C4: [ ] C3, C5: [ ] C3, C6: [ ]		C4, C1: [ ] C4, C2: [ ] C4, C3: [ ] C4, C5: [ ] C4, C6: [ ]		C5, C1: [ ] C5, C2: [ ] C5, C3: [ ] C5, C4: [ ] C5, C6: [ ]		C6, C1: [ ] C6, C2: [ ] C6, C3: [ ] C6, C4: [ ] C6, C5: [ ]	
Qhyst	dB	[2]		[2]		[2]		[2]		[2]		[2]	
PENALTY_TIME	s	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
TEMP_OFFSET	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
Treselection	s	[5]		[5]		[5]		[5]		[5]		[5]	
$intrasearch	dB	[ ]		[ ]		[ ]		[ ]		[ ]		[ ]	
$intersearch	dB	[-8]		[-8]		[-8]		[-8]		[-8]		[-8]	

~~Time T1 is X seconds and T2 is Y seconds.~~

~~Note: T1 and T2 need to be defined so that cell re-selection reaction time is taken into account.~~

8.2.23.2.4.2 Procedures

a) The SS activates cell 1-6 with T1 defined parameters and monitors cell 1 and 2 for random access requests ~~RA requests~~ from the UE

b) The UE is switched on

c) The SS waits for random access request ~~RA request~~ from the UE ~~cell 2~~

d) After [T1] seconds from switch on, the parameters are changed as described for T2

e) The SS waits for random access request ~~RA request~~ from the UE ~~on cell 1~~

f) After [T2] seconds from switch on, the parameters are changed as described for T1

g) Repeat step c) to f) [TBD] times

8.2.2~~3~~.2.5 Test requirements

1) In step c), the UE shall respond on cell 2 within [FFS seconds]

[Editor's note: LS of proposed timeout values sent to CN1/RAN2 to get acceptance]

2) In step e), the UE shall respond on cell 1 within [Nt~~TBD~~] seconds in more than [90~~X~~%] of the cases.

[Editor's note: The test must be executed a number of times as indirectly set by the Conformance Requirement The number is for FFS]

8.2.3.~~3~~ ~~Requirements for~~ UTRAN to GSM Cell Re-Selection

8.2.3.~~3~~.1 Definition and applicability~~Cell re-selection delay~~

Test to verify that a UE camped on a UTRAN cell is capable of re-selecting a GSM cell within [X] seconds from it becoming a cell to be reselected according to the cell re-selection criteria. The cell re-selection delay is then defined as the time between the occurence of any event which will trigger Cell Reselection Evaluation process and the moment in time when the UE starts sending the RR Channel Request message for location update to GSM.

This test is applicable for UEs supporting both UTRAN and GSM.

8.2.3.~~3~~.2 Conformance requirement~~Test Parameters~~

The UTRAN to GSM cell re-selection delay shall be equal or less than [x] seconds. This shall be verified in more than [90%] of the cases with a confidence level of [Y%] [FFS]

The reference for this requirement is [2] TS 25.133 subclause 4.3.2.1 and A.4.3.1.2.

8.2.3.3 Test purpose

To verify that the UE meets the conformance requirement.

8.2.3.4 Method of test

8.2.3.4.1 Initial conditions

This scenario implies the presence of 1 UTRAN serving cell, and 1 GSM cell to be re-selected.

Table 8.2.8: General test parameters for UTRAN to GSM Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cell		Cell2	
Final condition	Active cell		Cell2	
T1		s		T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s		T2 need to be defined so that cell re-selection reaction time is taken into account.

Table 8.2.9: Cell re-selection UTRAN to GSM cell case (cell 1)

Parameter	Unit	Cell 1 (UTRA)	
		T1	T2
UTRA RF Channel Number		Channel 1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
OCNS_Ec/Ior	dB	-0.941	
$\hat{I}_{or}/I_{oc}$	dB	10.3	7.3
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io	dB	-13	-16
CPICH_RSCP	dBm	[L1]	[L2]
Propagation Condition		AWGN	
Cell_selection_and_reselection_quality_measure		CPICH E_C/N_0	
Qqualmin	dB	[ ]	
Qrxlevmin	dBm	[ ]	
UE_TXPWR_MAX_RACH	dBm	[ ]	
$Qoffset1_{s,n}$	dB	C1, C2: [ ]	
Qhyst1	dB	[ ]	
PENALTY_TIME	s	C2: [ ]	
TEMP_OFFSET1	dB	C2: [ ]	
Treselection	s	[ ]	
$Ssearch_{RAT}$	dB	[ ]	

Table 8.2.10: Cell re-selection UTRAN to GSM cell case (cell 2)

Parameter	Unit	Cell 2 (GSM)	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-70	-60
RXLEV_ACCESS_MIN	dBm	[ ]	
MS_TXPWR_MAX_CCH	dBm	[ ]	

8.2.3.4.2 Procedures

a) The SS activates cell 1 and 2 with T1 defined parameters and monitors cell 1 and 2 for random access requests from the UE

b) The UE is switched on

c) The SS waits for random access request from the UE

d) After [T1] seconds from switch on, the parameters are changed as described for T2

e) The SS waits for random access request from the UE

f) After [T2] seconds from switch on, the parameters are changed as described for T1

g) Repeat step c) to f) [TBD] times

8.2.3.5 Test requirements

1) In step c), the UE shall respond on cell 1 within [TBD] seconds

[Editor's note: LS of proposed timeout values sent to CN1/RAN2 to get acceptance]

2) In step e), the UE shall respond on cell 2 within [X] seconds in more than [90%] of the cases.

[Editor's note: The test must be executed a number of times as indirectly set by the Conformance Requirement. The number is for FFS]

TSG-T WG1 meeting #9
Redondo Beach, USA, 16th-17th November 2000

Tdoc T1-000253

CR-Form-v3

CHANGE REQUEST

⌘ **34.121 CR 039** ⌘ rev **-** ⌘ Current version: **3.2.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	**Vocabulary Corrections**
Source:	⌘	**TSG-T1/RF SWG**
Work item code:	⌘	***Date:*** ⌘ 2000-11-16
Category:	⌘	**D** ***Release:*** ⌘ R99

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	To keep consistency with the core spec
Summary of change:	⌘	Replace the vocabularies with latest wording.
Consequences if not approved:	⌘	

Clauses affected:	⌘	5.3, 5.4.1, 5.5.2, 5.12, 6.2, 6.3, 7.1, 7.6.1, 7.6.2, 7.6.3, 7.7.1, Annex B, Annex E
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications ⌘
Other comments:	⌘	

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.
3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

Table 5.2.1: Maximum Output Power

Power Class	Maximum output power	Tolerance
1	+33 dBm	+1/–3 dB
2	+27 dBm	+1/–3 dB
3	+24 dBm	+1/–3 dB
4	+21 dBm	± 2 dB

The reference for this requirement is [1] TS 25.101 subclause 6.2.1.

5.2.3 Test purpose

To verify that the error of the UE maximum output power does not exceed the prescribed tolerance in Table 5.2.1.

An excess maximum output power has the possibility to interfere to other channels or other systems. A small maximum output power decreases the coverage area.

5.2.4 Method of test

5.2.4.1 Initial conditions

1) Connect the SS to the UE antenna connector as shown in Figure A.1.
2) A call is set up according to the Generic call setup procedure.
3) Enter the UE into loopback test mode and start the loopback test.

See [3] TS 34.108 and [4] TS 34.109 for details regarding generic call setup procedure and loopback test.

5.2.4.2 Procedure

1) Set and send continuously Up power control commands to the UE.
2) Measure the output power of the UE by Tester. The output power shall be averaged over the transmit one timeslot.

5.2.5 Test requirements

The error of measured output power, derived in step 2), shall not exceed the prescribed tolerance in Table 5.2.1.

5.3 Frequency Error

5.3.1 Definition and applicability

The frequency error is the difference between the RF modulated carrier frequency transmitted from the UE with AFC ON and assigned frequency. The UE transmitter tracks to the RF carrier frequency received from the ~~BS~~Node B. These signals will have an apparent error due to ~~BS~~Node B frequency error and Doppler shift. In the later case, signals from the ~~BS~~Node B must be averaged over sufficient time that errors due to noise or interference are allowed for within the above ±0.1PPM figure.

The UE shall use the same frequency source for both RF frequency generation and the chip clock.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.3.2 Conformance requirements

The UE modulated carrier frequency shall be accurate to within ±0.1 ppm compared to the carrier frequency received from the ~~BS~~Node B.

The reference for this requirement is [1] TS 25.101 subclause 6.3.

5.3.3 Test purpose

To verify that the UE carrier frequency error does not exceed ±0.1 ppm.

An excess error of the carrier frequency increases the transmission errors in the up link own channel.

This test verifies the ability of receiver to derive correct frequency information for transmitter.

5.3.4 Method of test

5.3.4.1 Initial conditions

1) Connect the SS to the UE antenna connector as shown in Figure A.1.

2) A call is set up according to the Generic call setup procedure, and RF parameters are set up according to Table 5.3.

3) Enter the UE into loopback test mode and start the loopback test.

See [3] TS 34.108 and [4] TS 34.109 for details regarding generic call setup procedure and loopback test.

Table 5.3: Test parameters for Frequency Error

Parameter	Level / Status	Unit
DPCH_Ec	–117	dBm / 3.84 MHz
$\hat{I}_{or}$	–106.7	dBm / 3.84 MHz

5.3.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.

2) Measure the frequency error delta f, at the UE antenna connector by Tester using Global In-Channel-Tx-test (Annex B). Since counter method leads an incorrect result, EVM method shall be used.

5.3.5 Test requirements

For all measured bursts, the frequency error, derived in step 1), shall not exceed ±0.1 ppm.

5.4 Output Power Dynamics in the Uplink

Power control is used to limit the interference level.

5.4.1 Open Loop Power Control in the Uplink

5.4.1.1 Definition and applicability

Open loop power control in the uplink is the ability of the UE transmitter to set its output power to a specific value. This function is used for PRACH transmission and based on the information from ~~BS~~Node B using BCCH and the downlink received signal power level of the PCCPCH. The information from ~~BS~~Node B includes transmission power of PCCPCH and uplink interference power level.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.4.1.2 Conformance requirements

The UE open loop power is defined as the average power in a timeslot or ON power duration, whichever is available, and they are measured with a filter that has a Root-Raised Cosine (RRC) filter response with a roll off $\alpha = 0.22$ and a bandwidth equal to the chip rate.

The UE open loop power control tolerance is given in Table 5.4.1.1.

Table 5.4.1.1: Open loop power control tolerance

Normal conditions	± 9 dB
Extreme conditions	± 12 dB

The reference for this requirement is [1] TS 25.101 subclause 6.4.1.

5.4.1.3 Test purpose

The power of the received signal and the BCCH information control the power of the transmitted signal with the target to transmit at lowest power acceptable for proper communication.

The test stresses the ability of the receiver to measure the received power correctly over the receiver dynamic range.

The test purpose is to verify that the UE open loop power control tolerance does not exceed the described value shown in Table 5.4.1.1.

An excess error of the open loop power control decreases the system capacity.

5.4.1.4 Method of test

This test is also covered by subclause 5.5.2 Transmit ON/OFF Time mask.

5.4.1.4.1 Initial conditions

1) Connect the SS to the UE antenna connector as shown in Figure A.1.

2) A call is set up according to the Generic call setup procedure, and RF parameters are set up according to Table 5.4.1.2.
The RACH procedure within the call setup is used for the test.

See [3] TS 34.108 for details regarding generic call setup procedure.

Table 5.4.1.2: Test parameters for Open Loop Power Control (UE)

Parameter	Level / Status	Unit
$\hat{I}_{or}$	See Table 5.4.1.3	dBm / 3.84 MHz

Table 5.4.1.3: Test parameters for Open Loop Power Control (SS)

Parameter	Upper dynamic range	middle	Sensitivity level
$\hat{I}_{or}$ 3)	[–25.0 dBm / 3.84 MHz]	[–65.7 dBm / 3.84 MHz]	[–106.7 dBm / 3.84 MHz]
CPICH_RSCP 3),4)	[–28.3 dBm]	[–69 dBm]	[–110 dBm]
Primary CPICH DL TX power	[+25 dBm]	[+31 dBm]	[+19 dBm]
Simulated path loss = Primary CPICH DL TX power – CPICH_RSCP	[+53.3 dB]	[+100 dB]	[+129 dB]
UL interference	[–75 dB]	[–101 dB]	[–110 dB]
Constant Value	[–10 dB]	[–10 dB]	[–10 dB]
Expected nominal UE TX power	[–31.7 dBm]	[–11 dBm]	[+9 dBm] 2)

NOTE 1: While the SS transmit power shall cover the receiver input dynamic range, the logical parameters: broadcasted transmit power, I_{BTS}, constant factor are chosen to achieve a UE TX power, located within the TX output power dynamic range of a class 4 UE.

NOTE 2: Nominal TX output power 9 dBm allows to check the open loop power algorithm within the entire tolerance range (9 dBm ± 12 dB; 9 dBm + 12 dB = 21 dBm = max power class 4).

NOTE 3: The power level of ~~SCCPCH~~S-CCPCH should be defined because ~~SCCPCH~~S-CCPCH is transmitted instead of DPCH during Preamble RACH transmission period. Currently, it is assumed that Table E.3.1 is utilised for DL physical channel condition. The power level of ~~SCCPCH~~S-CCPCH is temporarily set to the same as DL DPCH. However, it is necessary to check whether the above ~~SCCPCH~~S-CCPCH level is enough to establish a connection with the reference measurement channels.

NOTE 4: The purpose of this parameter is to calculate the Expected nominal UE TX power.

5.4.1.4.2 Procedure

1) Set the TX output level of the SS to obtain $\hat{I}_{or}$ at the UE antenna connector. $\hat{I}_{or}$ shall be according to Table 5.4.1.3 ([–25 dBm / 3.84 MHz]).

2) Measure the RACH output power of the UE according to Annex B.

3) Repeat the above measurement for all SS levels in Table 5.4.1.3.

5.4.1.5 Test requirements

The deviation with respect to the Expected nominal UE TX power (Table 5.4.1.3), derived in step 2), shall not exceed the prescribed tolerance in Table 5.4.1.1.

5.4.2 Inner Loop Power Control in the Uplink

5.4.2.1 Definition and applicability

Inner loop power control in the uplink is the ability of the UE transmitter to adjust its output power in accordance with one or more TPC commands received in the downlink.

The power control step is the change in the UE transmitter output power in response to a single TPC command, TPC_cmd, derived at the UE.

This clause does not cover all the requirements of compressed mode or soft handover.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.4.2.2 Conformance requirements

The UE transmitter shall have the capability of changing the output power with a step size of 1, 2 and 3 dB according to the value of Δ_{TPC} or $\Delta_{RP\text{-}TPC}$, in the slot immediately after the TPC_cmd can be derived.

5.5.1.4.1 Initial conditions

1) Connect the SS to the UE antenna connector as shown in Figure A.1.
2) A call is set up according to the Generic call setup procedure, and RF parameters are set up according to Annex E.3.1.
3) Enter the UE into loopback test mode and start the loopback test.

See [3] TS 34.108 and [4] TS 34.109 for details regarding generic call setup procedure and loopback test.

5.5.1.4.2 Procedure

1) Send release message to the UE to stop transmitting.
2) Measure the leakage power within the transmission band from the UE by the Tester.

5.5.1.5 Test requirements

The measured leakage power, derived in step 2), shall be below –56 dBm.

5.5.2 Transmit ON/OFF Time mask

5.5.2.1 Definition and applicability

The time mask for transmit ON/OFF defines the ramping time allowed for the UE between transmit OFF power and transmit ON power. Possible ON/OFF scenarios are PRACH, CPCH or uplink compressed mode.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.5.2.2 Conformance requirements

The transmit power levels versus time shall meet the mask specified in Figure 5.5.1 for PRACH preambles, and the mask in Figure 5.5.2 for all other cases. The signal is measured with a filter that has a Root-Raised Cosine (RRC) filter response with a roll off $\alpha = 0.22$ and a bandwidth equal to the chip rate.

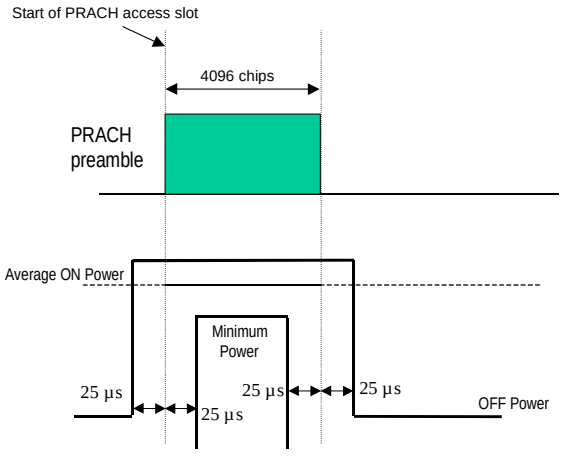

Figure 5.5.1: Transmit ON/OFF template for PRACH preambles

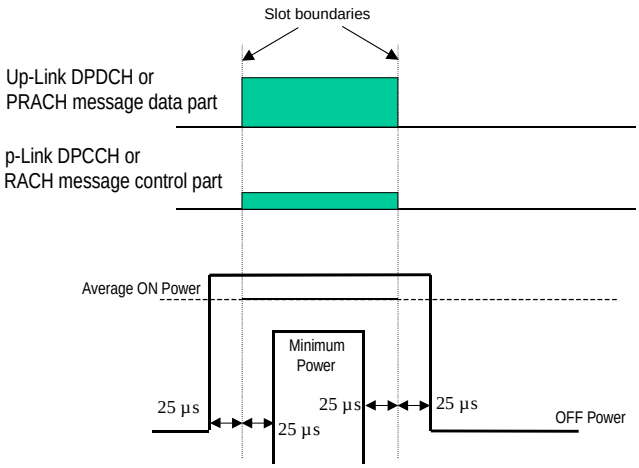

Figure 5.5.2: Transmit ON/OFF template for all other On/Off cases

OFF Power is defined in 5.5.1.

ON power is defined as either case as follows. The specification depends on each possible case.

- First preamble of PRACH: Open loop accuracy (Table 5.4.1.1).
- During preamble ramping of the RACH and between final RACH preamble and RACH message part: Accuracy depending on size of the required power difference (Table 5.5.2.1).
- After transmission gaps in compressed mode: Accuracy as in Table 5.7.1.
- Power step to Maximum Power: Maximum power accuracy (Table 5.2.1).

Table 5.5.2.1: Transmitter power difference tolerance for RACH preamble ramping, and between final RACH preamble and RACH message part

Power difference size ΔP [dB]	Transmitter power difference tolerance [dB]
0	+/- 1 dB
1	+/- 1 dB
2	+/- 1.5 dB
3	+/- 2 dB
4 ≤ ΔP ≤ 10	+/- 2.5 dB
11 ≤ ΔP ≤ 15	+/- 3.5 dB
16 ≤ ΔP ≤ 20	+/- 4.5 dB
21 ≤ ΔP	+/- 6.5 dB

The reference for this requirement is [1] TS 25.101 subclause 6.5.2.1.

This is tested using PRACH operation.

The minimum requirement for ON power is defined in subclause 5.4.1.2.

The minimum requirement for OFF power is defined in subclause 5.5.1.2.

Note: The main objective for this test case is to check the ramp-up/down power shape. A test case using the first preamble of PRACH is enough to cover the objective.

5.5.2.3 Test purpose

To verify that the UE transmit ON/OFF power levels versus time meets the described mask shown in Figure 5.5.1 and Figure 5.5.2.

An excess error of transmit ON/OFF response increases the interference to other channels, or increases transmission errors in the up link own channel.

5.5.2.4 Method of test

5.5.2.4.1 Initial conditions

1) Connect the SS to the UE antenna connector as shown in Figure A.1.

2) A call is set up according to the Generic call setup procedure, and RF parameters are set up according to Table 5.5.2.2.

   The RACH procedure within the call setup is used for the test.

See [3] TS 34.108 for details regarding generic call setup procedure.

Table 5.5.2.2: Test parameters for Transmit ON/OFF Time mask (UE)

Parameter	Level / Status	Unit
$\hat{I}_{or}$	See Table 5.5.2.2	dBm / 3.84 MHz

Table 5.5.2.3: Test parameters for Transmit ON/OFF Time mask (SS)

Parameter	Upper dynamic range	middle	Sensitivity level
$\hat{I}_{or}$ 3)	[–25.0 dBm / 3.84 MHz]	[–65.7 dBm / 3.84 MHz]	[–106.7 dBm / 3.84 MHz]
CPICH_RSCP 3),4)	[–28.3 dBm]	[–69 dBm]	[–110 dBm]
Primary CPICH DL TX power	[+25 dBm]	[+31 dBm]	[+19 dBm]
Simulated path loss = Primary CPICH DL TX power – CPICH_RSCP	[+53.3 dB]	[+100 dB]	[+129 dB]
UL interference	[–75 dB]	[–101 dB]	[–110 dB]
Constant Value	[–10 dB]	[–10 dB]	[–10 dB]
Expected nominal UE TX power	[–31.7 dBm]	[–11 dBm]	[+9 dBm] 2)

NOTE 1: While the SS transmit power shall cover the receiver input dynamic range, the logical parameters: broadcasted transmit power, I_{BTS}, constant factor are chosen to achieve a UE TX power, located within the TX output power dynamic range of a class 4 UE.

NOTE 2: Nominal TX output power 9 dBm allows to check the open loop power algorithm within the entire tolerance range (9 dBm ± 12 dB; 9dBm + 12dB = 21dBm = max power class 4).

NOTE 3: The power level of ~~SCCPCH~~S-CCPCH should be defined because ~~SCCPCH~~S-CCPCH is transmitted instead of DPCH during Preamble RACH transmission period. Currently, it is assumed that Table E.3.1 is utilised for DL physical channel condition. The power level of ~~SCCPCH~~S-CCPCH is temporarily set to the same as DL DPCH. However, it is necessary to check whether the above ~~SCCPCH~~S-CCPCH level is enough to establish a connection with the reference measurement channels.

NOTE 4: The purpose of this parameter is to calculate the Expected nominal UE TX power.

5.5.2.4.2 Procedure

1) Set the TX output level of the SS to obtain $\hat{I}_{or}$ at the UE antenna connector. $\hat{I}_{or}$ shall be according to Table 5.5.2.3 ([–25 dBm / 3.84 MHz]).

2) Measure the first RACH preamble output power (ON power) of the UE. The measurements shall not include the transient periods.

3) Measure the OFF power immediately before and after the first RACH preamble (ON power). The measurements shall not include the transient periods.

4) Repeat the above measurement for all SS levels in Table 5.5.2.3.

5.5.2.5 Test requirements

The deviation with respect to the Expected nominal UE TX power (Table 5.5.2.3), derived in step 2), shall not exceed the prescribed tolerance in Table 5.4.1.1. (Subclause 5.4.1.2).

The measured leakage power, derived in step 3), shall be below –56 dBm. (Subclause 5.5.1.2).

5.6 Change of TFC

5.6.1 Definition and applicability

A change of TFC (Transport Format Combination) in uplink means that the power in the uplink varies according to the change in data rate. DTX, where the DPCH is turned off, is a special case of variable data, which is used to minimise the interference between UE(s) by reducing the UE transmit power when voice, user or control information is not present.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.6.2 Conformance requirements

A change of output power is required when the TFC, and thereby the data rate, is changed. The ratio of the amplitude between the DPDCH codes and the DPCCH code will vary. The power step due to a change in TFC shall be calculated in the UE so that the power transmitted on the DPCCH shall follow the inner loop power control. The step in total transmitted power (DPCCH + DPDCH) shall then be rounded to the closest integer dB value. A power step exactly half-way between two integer values shall be rounded to the closest integer of greater magnitude. The accuracy of the power step, given the step size is specified in Table 5.6.1. The power change due to a change in TFC is defined as the relative power difference between the average power of the original (reference) timeslot and the average power of the target timeslot, not including the transient duration. The transient duration is from 25μs before the slot boundary to 25μs after the slot boundary. The power is measured with a filter that has a Root-Raised Cosine (RRC) filter response with a roll off $\alpha = 0.22$ and a bandwidth equal to the chip rate.

Table 5.6.1: Transmitter power step tolerance

Power control step size (Up or down) ΔP [dB]	Transmitter power step tolerance
0	+/– 0.5 dB
1	+/– 0.5 dB
2	+/– 1.0 dB
3	+/– 1.5 dB
$4 \le \Delta P \le 10$	+/– 2.0 dB
$11 \le \Delta P \le 15$	+/– 3.0 dB
$16 \le \Delta P \le 20$	+/– 4.0 dB
$21 \le \Delta P$	+/– 6.0 dB

Clause C.2.1 defines the UL reference measurement channels (12,2 kbps) for TX test and the power ratio between DPCCH and DPDCH as –5.46 dB. Therefore, only one power control step size is selected as minimum requirement from Table 5.6.1. The accuracy of the power step, given the step size is specified in Table 5.6.2.

Table 5.6.2: Transmitter power step tolerance for test

Quantized amplitude ratios β_c and β_d	Power control step size (Up or down) ΔP [dB]	Transmitter power step tolerance
$\beta_c = 0.5333$, $\beta_d = 1.0$	7	+/– 2 dB

The transmit power levels versus time shall meet the mask specified in Figure 5.6.1.

5.11.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.

2) Sweep the spectrum analyzer (or equivalent equipment) over a frequency range and measure the average power of spurious emission.

5.11.5 Test requirements

The measured average power of spurious emission, derived in step 2), shall not exceed the described value in Table 5.11.1a and 5.11.1b.

5.12 Transmit Intermodulation

5.12.1 Definition and applicability

The transmit intermodulation performance is a measure of the capability of the transmitter to inhibit the generation of signals in its non linear elements caused by presence of the wanted signal and an interfering signal reaching the transmitter via the antenna.

UE(s) transmitting in close vicinity of each other can produce intermodulation products, which can fall into the UE, or ~~BS~~Node B receive band as an unwanted interfering signal. The UE transmit intermodulation attenuation is defined by the ratio of the output power of the wanted signal to the output power of the intermodulation product when an interfering CW signal is added at a level below the wanted signal. Both the wanted signal power and the IM product power are measured with a filter that has a Root-Raised Cosine (RRC) filter response with roll-off $\alpha = 0,22$ and a bandwidth equal to the chip rate.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.12.2 Conformance requirements

The UE transmit intermodulation shall not exceed the described value in Table 5.12.1.

Table 5.12.1: Transmit Intermodulation

CW Signal Frequency Offset from Transmitting Carrier	5MHz	10MHz
Interference CW Signal Level	–40 dBc	
Intermodulation Product	–31 dBc	–41 dBc

The reference for this requirement is [1] TS 25.101 subclause 6.7.1.

5.12.3 Test purpose

To verify that the UE transmit intermodulation does not exceed the described value in Table 5.12.1.

An excess transmit intermodulation increases transmission errors in the up link own channel when other transmitter exists nearby.

5.12.4 Method of test

5.12.4.1 Initial conditions

1) Connect the SS to the UE antenna connector as shown in Figure A.2.

2) A call is set up according to the Generic call setup procedure.

3) Enter the UE into loopback test mode and start the loopback test.

See [3] TS 34.108 and [4] TS 34.109 for details regarding generic call setup procedure and loopback test.

5.12.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.
2) Set the frequency of the CW generator to the offset 1 or offset 2 as shown in Table 5.12.1.
3) Measure the average output power of the UE by spectrum analyzer (or equivalent equipment) through RRC filter.
4) Search the intermodulation product signal, then measure the average power of transmitting intermodulation through RRC filter, and calculate the ratio to the average output power of UE.
5) Repeat the measurement with another tone offset.

5.12.5 Test requirements

The measured average power of transmit intermodulation, derived in step 4), shall not exceed the described value in Table 5.12.1.

5.13 Transmit Modulation

5.13.1 Error Vector Magnitude (EVM)

5.13.1.1 Definition and applicability

The Error Vector Magnitude (EVM) is a measure of the difference between the measured waveform and the theoretical modulated waveform (the error vector). It is the square root of the ratio of the mean error vector power to the mean reference signal power expressed as a %. The measurement interval is one power control group (timeslot).

The requirements and this test apply to all types of UTRA for the FDD UE.

5.13.1.2 Conformance requirements

The EVM shall not exceed 17.,5 % for the parameters specified in Table 5.13.1.

Table 5.13.1: Parameters for EVM

Parameter	Level / Status	Unit
Output power	≥ –20	dBm
Operating conditions	Normal conditions	
Power control step size	1	dB

The reference for this requirement is [1] TS 25.101 clause 6.8.2.1.

channel, the UE provides special function for testing that is called Logical Test Interface and the UE is tested using this function (Refer to [4] TS 34.109)

Transmitting or receiving bit/symbol rate for test channel is shown in Table 6.1.

Table 6.1: Bit / Symbol rate for Test Channel

Type of User Information	User bit rate	DL DPCH symbol rate	UL DPCH bit rate	Remarks
12.2 kbps reference measurement channel	12.2 kbps	30 ksps	60 kbps	Standard Test

Unless otherwise stated the receiver characteristics are specified at the antenna connector of the UE. For UE(s) with an integral antenna only, a reference antenna with a gain of 0 dBi is assumed. UE with an integral antenna may be taken into account by converting these power levels into field strength requirements, assuming a 0 dBi gain antenna. Receiver characteristics for UE(s) with multiple antennas/antenna connectors are FFS.

The UE antenna performance has a significant impact on system performance, and minimum requirements on the antenna efficiency are therefore intended to be included in future versions of this specification. It is recognised that different requirements and test methods are likely to be required for the different types of UE.

All the parameters in clause 6 are defined using the DL reference measurement channel (12.2 kbps) specified in subclause C.3.1 and unless stated otherwise, with DL power control OFF.

The common RF test conditions are defined in Annex E, and each test conditions in this clause should refer Annex E. An individual test conditions are defined in the paragraph of each test.

6.2 Reference Sensitivity Level

6.2.1 Definition and applicability

The reference sensitivity is the minimum receiver input power measured at the antenna port at which the Bit Error Ratio (BER) does not exceed a specific value

The requirements and this test apply to all types of UTRA for the FDD UE.

6.2.2 Conformance requirements

The BER shall not exceed 0.001 for the parameters specified in Table 6.2.

The reference for this requirement is [1] TS 25.101 subclause 7.3.1.

6.2.3 Test purpose

To verify that the UE BER does not exceed 0.001 for the parameters specified in Table 6.2.

The lack of the reception sensitivity decreases the coverage area at the far side from ~~BS~~Node B.

6.2.4 Method of test

6.2.4.1 Initial conditions

1) Connect the SS to the UE antenna connector as shown in Figure A.3.

2) A call is set up according to the Generic call setup procedure, and RF parameters are set up according to Table 6.2.

3) Enter the UE into loopback test mode and start the loopback test.

See [3] TS 34.108 and [4] TS 34.109 for details regarding generic call setup procedure and loopback test.

Table 6.2: Test parameters for Reference Sensitivity Level

Parameter	Level / Status	Unit
$\hat{I}_{or}$	–106. 7	dBm / 3.84 MHz
DPCH_Ec	–117	dBm / 3.84 MHz
Tx output power	UE maximum power	

6.2.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.

2) Measure the BER of DCH received from the UE at the SS.

6.2.5 Test requirements

The measured BER, derived in step 2), shall not exceed 0.001.

6.3 Maximum Input Level

6.3.1 Definition and applicability

This is defined as the maximum receiver input power at the UE antenna port which does not degrade the specified BER performance.

The requirements and this test apply to all types of UTRA for the FDD UE.

6.3.2 Conformance requirements

The BER shall not exceed 0.001 for the parameters specified in Table 6.3.

The reference for this requirement is [1] TS 25.101 subclause 7.4.1.

NOTE: Since the spreading factor is large (10log(SF)=21dB), the majority of the total input signal consists of the OCNS interference. The OCNS interference consists of 16 dedicated data channels. The channelisation codes for data channels are chosen optimally to reduce peak to average ratio (PAR). All dedicated channels user data is uncorrelated to each other.

6.3.3 Test purpose

To verify that the UE BER does not exceed 0.001 for the parameters specified in Table 6.3.

The lack of the maximum input level decreases the coverage area at the near side from ~~BS~~Node B.

6.3.4 Method of test

6.3.4.1 Initial conditions

1) Connect the SS to the UE antenna connector as shown in Figure A.3.

2) A call is set up according to the Generic call setup procedure, and RF parameters are set up according to Table 6.3.

3) Enter the UE into loopback test mode and start the loopback test.

See [3] TS 34.108 and [4] TS 34.109 for details regarding generic call setup procedure and loopback test.

Table 6.3: Test parameters for Maximum Input Level

Parameter	Level / Status	Unit
$\hat{I}_{or}$	–25	dBm / 3.84MHz
$\frac{DPCH\_E_c}{I_{or}}$	–19	dB

6.3.4.2 Procedure

1) Measure the BER of DCH received from the UE at the SS.

6.3.5 Test requirements

The measured BER, derived in step 1), shall not exceed 0.001.

6.4 Adjacent Channel Selectivity (ACS)

6.4.1 Definition and applicability

Adjacent Channel Selectivity (ACS) is a measure of a receiver's ability to receive a W-CDMA signal at its assigned channel frequency in the presence of an adjacent channel signal at a given frequency offset from the centre frequency of the assigned channel. ACS is the ratio of the receive filter attenuation on the assigned channel frequency to the receive filter attenuation on the adjacent channel(s).

The requirements and this test apply to all types of UTRA for the FDD UE.

6.4.2 Conformance requirements

For the UE of power class 3 and 4, the BER shall not exceed 0.001 for the parameters specified in Table 6.4. This test condition is equivalent to the ACS value 33 dB.

The reference for this requirement is [1] TS 25.101 subclause 7.5.1.

Note: The I_{oac} (modulated) signal consists of common channels needed for tests and 16 dedicated data channels. The channelisation codes for data channels are chosen optimally to reduce peak to average ratio (PAR). All dedicated channels user data is uncorrelated to each other.

6.4.3 Test purpose

To verify that the UE BER does not exceed 0.001 for the test parameters specified in Table 6.4.

The lack of the ACS decreases the coverage area when other transmitter exists in the adjacent channel.

6.4.4 Method of test

6.4.4.1 Initial conditions

1) Connect the SS to the UE antenna connector as shown in Figure A.4.

2) A call is set up according to the Generic call setup procedure, and RF parameters are set up according to Table 6.4.

3) Enter the UE into loopback test mode and start the loopback test.

See [3] TS 34.108 and [4] TS 34.109 for details regarding generic call setup procedure and loopback test.

6.8.2 Conformance requirements

The spurious emission shall be:

a) Less than –60 dBm / 3,84 MHz at the UE antenna connector, for frequencies within the UE receive band. In URA_PCH-, Cell_PCH- and IDLE- stage the requirement applies also for UE transmit band.

b) Less than –57 dBm / 100 kHz at the UE antenna connector, for frequencies band from 9 kHz to 1 GHz.

c) Less than –47 dBm / 100 kHz at the UE antenna connector, for frequencies band from 1 GHz to 12.75 GHz.

The reference for this requirement is [1] TS 25.101 subclause 7.9.1.

6.8.3 Test purpose

To verify that the UE spurious emission meets the specifications described in subclause 6.8.2.

Excess spurious emissions increase the interference to other systems.

6.8.4 Method of test

6.8.4.1 Initial conditions

1) Connect a spectrum analyzer (or other suitable test equipment) to the UE antenna connector as shown in Figure A.8.

2) UE shall be camped on a cell

3) UE shall perform Location Registration (LR) before the test procedure in subclause 6.8.4.2, but not during it.

4) Neighbour cell list shall be empty.

5) Paging repetition period and DRX cycle shall be set to minimum (shortest possible time interval).

6.8.4.2 Procedure

1) Sweep the spectrum analyzer (or other suitable test equipment) over a frequency range from the lowest intermediate frequency or lowest oscillator frequency used in the receiver or 1 MHz, whichever is lowest to at least 3 times the carrier frequency.

6.8.5 Test requirements

The all measured spurious emissions, derived in step 1), shall be:

a) Less than –60 dBm / 3,84 MHz at the UE antenna connector, for frequencies within the UE receive band. In URA_PCH-, Cell_PCH- and IDLE- state the requirement applies also for UE transmit band.

b) Less than –57 dBm / 100 kHz at the UE antenna connector, for frequencies band from 9 kHz to 1 GHz.

c) Less than –47 dBm / 100 kHz at the UE antenna connector, for frequencies band from 1 GHz to 12.75 GHz.

7 Performance requirements

7.1 General

The performance requirements for the UE in this clause are specified for the measurement channels specified in Annex C and Table 7.1.1, the propagation conditions specified in 7.1.2 and the Down link Physical channels specified in Annex D. Unless stated otherwise, DL power control is OFF.

The method for Block Error Ratio (BLER) measurement is specified in [4] TS 34.109.

Table 7.1.1: Bit / Symbol rate for Test Channel

Type of User Information	User bit rate	DL DPCH symbol rate	UL DPCH bit rate
12.2 kbps reference measurement channel	12.2 kbps	30 ksps	60 kbps
64/144/384 kbps reference measurement channel	64 kbps	120 ksps	240 kbps
	144 kbps	240 ksps	480 kbps
	384 kbps	480 ksps	960 kbps

7.1.1 Measurement Configurations

In all measurements UE should transmit with maximum power while receiving signals from ~~BS~~Node B. Transmission Power Control is always disable during the measurements. Chip Rate is specified to be 3.84 MHz.

It as assumed that fields inside DPCH have the same energy per PN chip. Also, if the power of ~~SCCPCH~~S-CCPCH is not specified in the test parameter table, it should be set to zero. The power of OCNS should be adjusted that the power ratios (E_c/I_{or}) of all specified forward channels add up to one.

Measurement configurations for different scenarios are shown in Figure A.9, Figure A.10 and Figure A.11.

7.2 Demodulation in Static Propagation conditions

7.2.1 Demodulation of Dedicated Channel (DCH)

7.2.1.1 Definition and applicability

The receive characteristic of the Dedicated Channel (DCH) in the static environment is determined by the Block Error Ratio (BLER). BLER is specified for each individual data rate of the DCH. DCH is mapped into the Dedicated Physical Channel (DPCH).

The UE shall be tested only according to the data rate, supported. The data-rate-corresponding requirements shall apply to the UE.

7.2.1.2 Conformance requirements

For the parameters specified in Table 7.2.1.1 the average downlink $\frac{DPCH\_E_c}{I_{or}}$ power shall be below the specified value for the BLER shown in Table 7.2.1.2. These requirements are applicable for TFCS size 16.

Table 7.2.1.1: DCH parameters in static propagation conditions

Parameter	Test 1	Test 2	Test 3	Test 4	Unit
Phase reference	P-CPICH				
$\hat{I}_{or}/I_{oc}$	–1				dB
I_{oc}	–60				dBm / 3.84 MHz
Information Data Rate	12,2	64	144	384	kbps

7.6 Demodulation of DCH in Base Station Transmit diversity modes

7.6.1 Demodulation of DCH in open-loop transmit diversity mode

7.6.1.1 Definition and applicability

The receive characteristic of the Dedicated Channel (DCH) in open loop transmit diversity mode is determined by the Block Error Ratio (BLER). DCH is mapped into in Dedicated Physical Channel (DPCH).

The requirements and this test apply to all types of UTRA for the FDD UE.

7.6.1.2 Conformance requirements

For the parameters specified in Table 7.6.1.1 the average downlink $\frac{DPCH\_E_c}{I_{or}}$ power shall be below the specified value for the BLER shown in Table 7.6.1.2.

Table 7.6.1.1: Test parameters for DCH reception in a open-loop transmit diversity scheme (Propagation condition: Case 1)

Parameter	Test 1	Unit
Phase reference	P-CPICH	
$\hat{I}_{or}/I_{oc}$	9	dB
I_{oc}	–60	dBm / 3.84 MHz
Information data rate	12.2	kbps

Table 7.6.1.2: Test requirements for DCH reception in open-loop transmit diversity scheme

Test Number	$\frac{DPCH\_E_c}{I_{or}}$ **(antenna 1/2)**	BLER
1	[–16.8 dB]	10^{-2}

The reference for this requirement is [1] TS 25.101 subclause 8.6.1.1.

7.6.1.3 Test purpose

To verify that UE reliably demodulates the DPCH of the ~~BS~~Node B while open loop transmit diversity is enabled during the connection.

7.6.1.4 Method of test

7.6.1.4.1 Initial conditions

1) Connect SS, multi-path fading simulators and an AWGN source to the UE antenna connector as shown in Figure A.12.

2) Set up a call according to the Generic call setup procedure.

3) RF parameters are set up according to Table 7.6.1.1 and Table E 3.4.

4) Enter the UE into loopback test mode and start the loopback test.

5) Activate open loop Tx diversity function.

6) Set up fading simulators as fading condition case 1, which is described in Table D.2.2.1.

See [3] TS 34.108 and [4] TS 34.109 for details regarding generic call setup procedure and loopback test.

7.6.1.4.2 Procedure

1) Measure BLER in points specified in Table 7.6.1.2.

7.6.1.5 Test Requirements

For the parameters specified in Table 7.6.1.1 the BLER shall not exceed the value at the DPCH_Ec/Ior specified in Table 7.6.1.2.

7.6.2 Demodulation of DCH in closed loop transmit diversity mode

7.6.2.1 Definition and applicability

The receive characteristic of the dedicated channel (DCH) in closed loop transmit diversity mode is determined by the Block Error Ratio (BLER). DCH is mapped into in Dedicated Physical Channel (DPCH).

The requirements and this test apply to all types of UTRA for the FDD UE.

7.6.2.2 Conformance requirements

For the parameters specified in Table 7.6.2.1 the average downlink $\frac{DPCH\_E_c}{I_{or}}$ power shall be below the specified value for the BLER shown in Table 7.6.2.2.

Table 7.6.2.1: Test Parameters for DCH Reception in closed loop transmit diversity mode (Propagation condition: Case 1)

Parameter	Test 1 (Mode 1)	Test 2 (Mode 2)	Unit
$\hat{I}_{or}/I_{oc}$	9	9	dB
I_{oc}	–60	–60	dBm / 3.84 MHz
Information data rate	12.2	12.2	kbps
Feedback error ratio	4	4	%

Table 7.6.2.2: Test requirements for DCH reception in feedback transmit diversity mode

Test Number	$\frac{DPCH\_E_c}{I_{or}}$ (see note)	BLER
1	–18.0 dB	10^{-2}
2	–18.3 dB	10^{-2}
Note: This is the total power from both antennas. Power sharing between antennas are closed loop mode dependent as specified in TS25.214.		

The reference for this requirement is [1] TS 25.101 subclause 8.6.2.1.

7.6.2.3 Test purpose

To verify that UE reliably demodulates the DPCH of the ~~BS~~Node B while closed loop transmit diversity is enabled during the connection.

7.6.2.4 Method of test

7.6.2.4.1 Initial conditions

1) Connect SS, multi-path fading simulators and an AWGN source to the UE antenna connector as shown in Figure A.12.
2) Set up a call according to the Generic call setup procedure.
3) RF parameters are set up according to Table 7.6.2.1 and Table E 3.5.
4) Enter the UE into loopback test mode and start the loopback test.
5) Activate closed loop Tx diversity function.
6) Set up fading simulators as fading condition case 1, which is described in Table D.2.2.1.

See [3] TS 34.108 and [4] TS 34.109 for details regarding generic call setup procedure and loopback test.

7.6.2.4.2 Procedure

1) Measure BLER in points specified in Table 7.6.2.2.

7.6.2.5 Test Requirements

For the parameters specified in Table 7.6.2.1 the BLER shall not exceed the value at the DPCH_Ec/Ior specified in Table 7.6.2.2.

7.6.3 Demodulation of DCH in Site Selection Diversity Transmission Power Control mode

7.6.3.1 Definition and applicability

The bit error characteristics of UE receiver is determined in Site Selection Diversity Transmission Power Control (SSDT) mode. Two ~~BS~~Node B emulators are required for this performance test. The delay profiles of signals received from different base stations are assumed to be the same but time shifted by 10 chip periods.

The requirements and this test apply to all types of UTRA for the FDD UE.

7.6.3.2 Conformance requirements

The downlink physical channels and their relative power to Ior are the same as those specified in clause E.3.2 irrespective of ~~BS~~Node Bs and the test cases. DPCH_Ec/Ior value applies whenever DPDCH in the cell is transmitted. In Test 1 and Test 3, the received powers at UE from two ~~BS~~Node Bs are the same, while 3dB offset is given to one that comes from one of ~~BS~~Node Bs for Test 2 and Test 4 as specified in Table 7.6.3.1.

For the parameters specified in Table 7.6.3.1 the average downlink $\frac{DPCH\_E_c}{I_{or}}$ power shall be below the specified value for the BLER shown in Table 7.6.3.2.

Table 7.6.3.1: DCH parameters in multi-path propagation conditions during SSDT mode (Propagation condition: Case 1)

Parameter	Test 1	Test 2	Test 3	Test 4	Unit
Phase reference	P-CPICH				
$\hat{I}_{or1}/I_{oc}$	0	-3	0	0	dB
$\hat{I}_{or2}/I_{oc}$	0	0	0	-3	dB
I_{oc}	–60				dBm / 3.84 MHz
Information Data Rate	12.2	12.2	12.2	12.2	kbps
Feedback error rate*	4	4	4	4	%
Number of FBI bits assigned to "S" Field	1	1	2	2	
Code word Set	Long	Long	Short	Short	

*NOTE: Feedback error rate is defined as FBI bit error rate.

Table 7.6.3.2: DCH requirements in multi-path propagation conditions during SSDT Mode

Test Number	$\frac{DPCH\_E_c}{I_{or}}$	BLER
1	–7.5 dB	10^{-2}
2	–6.5 dB	10^{-2}
3	–10.5 dB	10^{-2}
4	–9.2 dB	10^{-2}

The reference for this requirement is [1] TS 25.101 subclause 8.6.3.1.

7.6.3.3 Test purpose

To verify that UE reliably demodulates the DPCH of the selected ~~BS~~Node B while site selection diversity is enabled during soft handover.

7.6.3.4 Method of test

7.6.3.4.1 Initial conditions

1) Connect two SS's, multi-path fading simulators and an AWGN source to the UE antenna connector as shown in Figure A.11.

2) Set up a call according to the Generic call setup procedure, and RF parameters are set up according to Table 7.6.3.1 and Table 7.6.3.2.

3) Enter the UE into loopback test mode and start the loopback test.

4) Activate SSDT function.

5) Set up fading simulators as fading condition case 1, which is described in Table D.2.2.1.

7.6.3.4.2 Procedure

Measure BLER in points specified in Table 7.6.3.2..

7.6.3.5 Test Requirements

BLER shall not exceed the value at the DPCH_Ec/Ior specified in Table 7.6.3.2.

7.7 Demodulation in Handover conditions

7.7.1 Demodulation of DCH in Inter-Cell Soft Handover

7.7.1.1 Definition and applicability

The bit error ratio characteristics of UE is determined during an inter-cell soft handover. During the soft handover a UE receives signals from different Base Stations. A UE has to be able to demodulate two ~~PCCPCH~~P-CCPCH channels and to combine the energy of DCH channels. Delay profiles of signals received from different Base Stations are assumed to be the same but time shifted by 10 chips.

The receive characteristics of the different channels during inter-cell handover are determined by the Block Error Ratio (BLER) values.

The UE shall be tested only according to the data rate, supported. The data-rate-corresponding requirements shall apply to the UE.

7.7.1.2 Conformance requirements

For the parameters specified in Table 7.7.1.1 the average downlink $\frac{DPCH\_E_c}{I_{or}}$ power shall be below the specified value for the BLER shown in Table 7.7.1.2.

Table 7.7.1.1: DCH parameters in multi-path propagation conditions during Soft Handoff (Case 3)

Parameter	Test 1	Test 2	Test 3	Test 4	Unit
Phase reference	P-CPICH				
$\hat{I}_{or1}/I_{oc}$ and $\hat{I}_{or2}/I_{oc}$	0	0	3	6	dB
I_{oc}	-60				dBm / 3.84 MHz
Information Data Rate	12.2	64	144	384	kbps

Table 7.7.1.2: DCH requirements in multi-path propagation conditions during Soft Handoff (Case 3)

Test Number	$\frac{DPCH\_E_c}{I_{or}}$	BLER
1	–15.2 dB	10^{-2}
2	–11.8 dB	10^{-1}
	–11.3 dB	10^{-2}
3	–9.6 dB	10^{-1}
	–9.2 dB	10^{-2}
4	–6.0 dB	10^{-1}
	–5.5 dB	10^{-2}

The reference for this requirement is [1] TS 25.101 subclause 8.7.1.1.

7.7.1.3 Test purpose

To verify that the BLER does not exceed the value at the DPCH_Ec/Ior specified in Table 7.7.1.2.

7.7.1.4 Method of test

7.7.1.4.1 Initial conditions

[TBD]

7.7.1.4.2 Procedures

1) Connect the SS, multi-path fading simulator and an AWGN noise source to the UE antenna connector as shown in Figure A.11.

2) Set up the call.

3) Set the test parameters for test 1-5 as specified in Table 7.7.1.1.

4) Count, at the SS, the number of information blocks transmitted and the number of correctly received information blocks at the UE.

5) Measure BLER of DCH channel.

7.7.1.5 Test requirements

For the parameters specified in Table 7.7.1.1 the BLER shall not exceed the value at the DPCH_Ec/Ior specified in Table 7.7.1.2.

7.7.2 Combining of TPC commands not known to be the same

7.7.2.1 Definition and applicability

[TBD]

7.7.2.2 Conformance requirements

Test parameters are specified in Table 7.7.2.1. Cell1 and Cell2 TPC patterns are repeated 15 times i.e., over 4 frames. Transmitted power of UE in relative uplink slots is recorded. If the transmitted power of a given slot is increased compared to a previous slot, then a variable "Transmitted power UP" is increased by one, otherwise a variable "Transmitted power DOWN" is increased by one. The requirements for "Transmitted power UP" and "Transmitted power DOWN" are shown in Table 7.7.2.2. Note that test is done without additional noise source Ioc.

Table 7.7.2.1: Parameters for TPC command combining (Static conditions)

Parameter	Test 1	Unit
Initial power in uplink	–5	dBm
DPCH_Ec/Ior	–12	dB
$\hat{I}_{or1}/I_{oc}$ and $\hat{I}_{or2}/I_{oc}$	–60	dBm / 3.84 MHz
Power-Control-Algorithm	Algorithm 1	-
Cell 1 TPC commands over 4 slots	{0,0.1.1}	-
Cell 2 TPC commands over 4 slots	{0,1,0,1}	-
Information Data Rate	12.2	kbps

Table 7.7.2.2: Test requirements for TPC command combining

Test Number	Transmitted power UP	Transmitted power DOWN
1	[≥15]	[≥30]

The reference for this requirement is [1] TS 25.101 subclause 8.7.2.1.

7.7.2.3 Test purpose

[TBD]

Annex B (normative): Global In-Channel TX-Test

B.1 General

The global in-channel Tx test enables the measurement of all relevant parameters that describe the in-channel quality of the output signal of the Tx under test in a single measurement process.

The objective of this Annex is to list the results that shall be available from the Global In-Channel TX-Test. To aid understanding, an example algorithmic description of the measurement process is provided. It is not intended that this particular method is required. It is however required that any algorithm that is used for In-Channel TX tests should deliver the required results with the required accuracy.

All notes referred in the various subclauses of B.2 are put together in B.3

B.2 Definition of the process

B.2.1 Basic principle

The process is based on the comparison of the actual **output signal of the TX under test**, received by an ideal receiver, with a **reference signal**, that is generated by the measuring equipment and represents an ideal error free received signal. All signals are represented as equivalent (generally complex) baseband signals.

B.2.2 Output signal of the TX under test

The output signal of the TX under test is acquired by the measuring equipment, filtered by a matched filter (RRC 0.22, correct in shape and in position on the frequency axis) and stored at one sample per chip at the Inter-Symbol-Interference free instants.

The following form represents the physical signal in the entire measurement interval:

one vector **Z**, containing N = ns x sf + ma complex samples;

with

ns: number of symbols in the measurement interval;

sf: number of chips per symbol. (sf: spreading factor) (see Note: Symbol length)

ma: number of midamble chips (only in TDD)

B.2.3 Reference signal

The reference signal is constructed by the measuring equipment according to the relevant TX specifications.

It is filtered by the same matched filter, mentioned in B.2.2., and stored at the Inter-Symbol-Interference free instants. The following form represents the reference signal in the entire measurement interval:

one vector **R**, containing N = ns x sf + ma complex samples;

ns, sf, ma: see B.2.2

B.2.4 void

B.2.5 Classification of measurement results

The measurement results achieved by the global in-channel TX test can be classified into two types:

- Results of type “deviation”, where the error-free parameter has a non-zero magnitude. (These are the parameters that quantify the integral physical characteristic of the signal).These parameters are:

  RF Frequency

  Power (in case of single code)

  Code Domain Power (in case of multi code)

  Timing (only for UE)

  (Additional parameters: see Note: Deviation)

- Results of type “residual”, where the error-free parameter has value zero. (These are the parameters that quantify the error values of the measured signal, whose ideal magnitude is zero). These parameters are:

  Error Vector Magnitude (EVM);

  Peak Code Domain Error (PCDE).

  (Additional parameters: see Note residual)

B.2.6 Process definition to achieve results of type “deviation”

The reference signal (**R**; see subclause B.2.3) is varied with respect to the parameters mentioned in subclause B.2.5 under "results of type deviation" in order to achieve best fit with the recorded signal under test (**Z**; see subclause B.2.2). Best fit is achieved when the RMS difference value between the signal under test and the varied reference signal is an absolute minimum. The varied reference signal, after the best fit process, will be called **R’.**

The varying parameters, leading to **R’** represent directly the wanted results of type “deviation”. These measurement parameters are expressed as deviation from the reference value with units same as the reference value.

In case of multi code, the type-“deviation”-parameters (frequency, timing and (RF-phase)) are varied commonly for all codes such that the process returns one frequency-deviation, one timing deviation, (one RF-phase –deviation).

(These parameters are <u>not</u> varied on the individual codes signals such that the process returns k frequency errors... . (k: number of codes)).

The only type-“deviation”-parameters varied individually are code powers such that the process returns k code power deviations (k: number of codes).

B.2.7 Process definition to achieve results of type “residual”

The difference between the varied reference signal (**R’**; see subclauseB.2.6.) and the TX signal under test (**Z**; see subclauseB.2.2) is the error vector **E** versus time:

E = **Z** – **R’.**

Depending on the parameter to be evaluated, it is appropriate to represent **E** in one of the following two different forms:

<u>Form EVM</u> (representing the physical error signal in the entire measurement interval)

One vector **E**, containing N = ns x sf + ma complex samples;

ns, sf, ma: see B.2.2

<u>Form PCDE</u> (derived from Form EVM by separating the samples into symbol intervals)

ns time-sequential vectors **e** with sf complex samples comprising one symbol interval.

E gives results of type “residual” applying the two algorithms defined in subclauses B 2.7.1 and B 2.7.2.

B.2.7.1 Error Vector Magnitude (EVM)

The Error Vector Magnitude EVM is calculated according to the following steps:

1) Take the error vector **E** defined in subclause B.2.7 (Form EVM) and calculate the RMS value of **E**; the result will be called RMS(**E**).

2) Take the varied reference vector **R’** defined in subclause B.2.6 and calculate the RMS value of **R’**; the result will be called RMS(**R’**).

3) Calculate EVM according to:

$$EVM = \frac{RMS(E)}{RMS(R')} \times 100\%$$ (here, EVM is relative and expressed in %)

(see note TDD)

B.2.7.2 Peak Code Domain Error (PCDE)

The Peak Code Domain Error is calculated according to the following steps:

1) Take the error vectors **e** defined in subclause B.2.7 (Form PCDE)

2) Take the orthogonal vectors of the channelisation code set **C** (all codes belonging to one spreading factor) as defined in TS 25.213 and TS 25.223 (range +1, -1). (see Note: Symbol length)

3) To achieve meaningful results it is necessary to descramble **e,** leading to **e’** (see Note1: Scrambling code)

4) Calculate the inner product of **e’** with **C**. Do this for all symbols of the measurement interval and for all codes in the code space.
This gives an array of format k x ns, each value representing an error-vector representing a specific symbol and a specific code, which can be exploited in a variety of ways.

   k: number of codes

   ns: number of symbols in the measurement interval

5) Calculate k RMS values, each RMS value unifying ns symbols within one code.
(These values can be called "*Absolute CodeEVMs*" [Volt].)

6) Find the peak value among the k "*Absolute CodeEVMs*".
(This value can be called "*Absolute PeakCodeEVM*" [Volt].)

7) Calculate PCDE according to:

$$10 * \lg \frac{(\text{“}Absolute\ PeakCodeEVM\text{”})^2}{(RMS(\mathbf{R'}))^2}\ dB$$ (a relative value in dB).

(see Note: Denominator)

(see Note2: Scrambling code)

(see Note IQ)

(see Note TDD)

(see Note Synch channel)

B.3 Notes

Note: Symbol length)

A general code multiplexed signal is multicode and multirate. In order to avoid unnecessary complexity, the measurement applications use a unique symbol-length, corresponding to a spreading factor, regardless of the really intended spreading factor. Nevertheless the complexity with a multicode / multirate signal can be mastered by introducing appropriate definitions.

Note: Deviation)

It is conceivable to regard more parameters as type „deviation“ e.g. Chip frequency and RF-phase.

As chip-frequency and RF-frequency are linked together by a statement in the core specifications [1] it is sufficient to process RF frequency only.

A parameter RF-phase must be varied within the best fit process (B 2.6.). Although necessary, this parameter-variation doesn't describe any error, as the modulation schemes used in the system don't depend on an absolute RF-phase.

Note: residual)

It is conceivable to regard more parameters as type „residual“ e.g. IQ origin offset. As it is not the intention of the test to separate for different error sources, but to quantify the quality of the signal, all such parameters are not extracted by the best fit process, instead remain part of EVM and PCDE.

Note: Denominator)

If the denominator stems from mutual time shifted signals of different code powers, (e.g. ~~BS~~Node B, FDD) the measurement result PCDE should be expressed absolutely instead.

Note1: Scrambling Code)

In general a TX signal under test can use more than one scrambling code. Note that PCDE is processed regarding the unused channelisation - codes as well. In order to know which scrambling code shall be applied on unused channelisation -codes, it is necessary to restrict the test conditions: TX signal under test shall use exactly one scrambling code.

Note2 Scrambling Code)

To interpret the measurement results in practice it should be kept in mind that erroneous code power on unused codes is generally de-scrambled differently under test conditions and under real life conditions, whereas erroneous code power on used codes is generally de-scrambled equally under test conditions and under real life conditions. It might be indicated if a used or unused code hits PCDE.

Note IQ)

As in FDD/uplink each code can be used twice, on the I and on the Q channel, the measurement result may indicate on which channel (I or Q) PCDE occurs.

Note TDD)

EVM covers the midamble part as well as the data part; however PCDE disregards the midamble part.

Note: Synch Channel)

A ~~BS~~Node B signal contains a physical synch channel, which is non orthogonal, related to the other DPCHs. In this context note: The code channel bearing the result of PCDE is exactly one of the DPCHs (never the synch channel). The origin of PCDE (erroneous code power) can be any DPCH and/or the synch channel.

Annex E (normative): Downlink Physical Channels

E.1 General

This Normative annex specifies the downlink physical channels that are needed for setting a connection and channels that are needed during a connection.

E.2 Connection Set-up

Table E.2.1 describes the downlink Physical Channels that are required for connection set up.

Table E.2.1: Downlink Physical Channels required for connection set-up

Physical Channel
CPICH
~~PCCPCH~~P-CCPCH
SCH
~~SCCPCH~~S-CCPCH
PICH
AICH
DPCH

E.3 During connection

The following clauses describe the downlink Physical Channels that are transmitted during a connection i.e., when measurements are done. For these measurements the offset between DPCH and SCH shall be zero chips at base station meaning that SCH is overlapping with the first symbols in DPCH in the beginning of DPCH slot structure.

E.3.1 Measurement of Tx Characteristics

Table E.3.1 is applicable for measurements on the Transmitter Characteristics (clause 5) with the exception of subclauses 5.3 (Frequency Stability), 5.4.1 (Open Loop Power Control in the Uplink), and 5.5.2 (Transmit ON/OFF Time mask). For these cases, the power levels of Îor and DPCH are defined individually.

NOTE: Applicability to subclause 5.7 (Power setting in uplink compressed mode) is FFS.

Table E.3.1: Downlink Physical Channels transmitted during a connection

Physical Channel	Power
Îor	–93 dBm / 3.84MHz
CPICH	CPICH_Ec / DPCH_Ec = 7 dB
~~PCCPCH~~P-CCPCH	~~PCCPCH_Ec~~P-CCPCH_Ec / DPCH_Ec = 5 dB
SCH	SCH_Ec / DPCH_Ec = 5 dB
PICH	PICH_Ec / DPCH_Ec = 2 dB
DPCH	–103.3 dBm / 3.84MHz

E.3.2 Measurement of Rx Characteristics

Table E.3.2 is applicable for measurements on the Receiver Characteristics (clause 6) with the exception of subclause 6.3 (Maximum input level).

Table E.3.2: Downlink Physical Channels transmitted during a connection

Physical Channel	Power
CPICH	CPICH_Ec / DPCH_Ec = 7 dB
~~PCCPCH~~P-CCPCH	~~PCCPCH_Ec~~P-CCPCH_Ec / DPCH_Ec = 5 dB
SCH	SCH_Ec / DPCH_Ec = 5 dB
PICH	PICH_Ec / DPCH_Ec= 2 dB
DPCH	Test dependent power

E.3.3 Measurement of Performance requirements

Table E.3.3 is applicable for measurements on the Performance requirements (clause 7), including subclause 6.3 (Maximum input level), excluding subclauses 7.6.1 (Demodulation of DCH in open loop transmit diversity mode) and 7.6.2 (Demodulation of DCH in closed loop transmit diversity mode).

Table E.3.3: Downlink Physical Channels transmitted during a connection[1]

Physical Channel	Power	Note
P-CPICH	P-CPICH_Ec/Ior = –10 dB	Use of P-CPICH or S-CPICH as phase reference is specified for each requirement and is also set by higher layer signalling.
S-CPICH	S-CPICH_Ec/Ior = –10 dB	When S-CPICH is the phase reference in a test condition, the phase of S-CPICH shall be 180 degrees offset from the phase of P-CPICH. When S-CPICH is not the phase reference, it is not transmitted.
~~PCCPCH~~P-CCPCH	~~PCCPCH_Ec~~P-CCPCH_Ec/Ior = –12 dB	
SCH	SCH_Ec/Ior = –12 dB	This power shall be divided equally between Primary and Secondary Synchronous channels
PICH	PICH_Ec/Ior = –15 dB	
DPCH	Test dependent power	When S-CPICH is the phase reference in a test condition, the phase of DPCH shall be 180 degrees offset from the phase of P-CPICH.
OCNS	Necessary power so that total transmit power spectral density of ~~BS~~Node B (Ior) adds to one	

E.3.4 Connection with open-loop transmit diversity mode

Table E.3.4 is applicable for measurements for subclause 7.6.1(Demodulation of DCH in open loop transmit diversity mode)

[1] Power levels are based on the assumption that multipath propagation conditions and noise source representing interference from other cells Ioc are turned on after the call set-up phase.

Table E.3.4: Downlink Physical Channels transmitted during a connection[2]

Physical Channel	Power	Note
P-CPICH (antenna 1)	P-CPICH_E_{c1}/I_{or} = –13 dB	1. Total P-CPICH_E_c/I_{or} = –10 dB
P-CPICH (antenna 2)	P-CPICH_E_{c2}/I_{or} = –13 dB	
~~PCCPCH~~P-CCPCH (antenna 1)	~~PCCPCH_E~~P-CCPCH_Ec_1/I_{or} = –15 dB	1. STTD applied 2. Total ~~PCCPCH_E~~P-CCPCH_Ec/I_{or} = –12 dB
~~PCCPCH~~P-CCPCH (antenna 2)	~~PCCPCH_E~~P-CCPCH_Ec_2/I_{or} = –15 dB	
SCH (antenna 1 / 2)	SCH_E_c/I_{or} = –12 dB	1. TSTD applied. 2. This power shall be divided equally between Primary and Secondary Synchronous channels
PICH (antenna 1)	PICH_E_{c1}/I_{or} = –18 dB	1. STTD applied 2. Total PICH_E_c/I_{or} = –15 dB
PICH (antenna 2)	PICH_E_{c2}/I_{or} = –18 dB	
DPCH	Test dependent power	1. STTD applied 2. Total power from both antennas
OCNS	Necessary power so that total transmit power spectral density of ~~BS~~Node B (I_{or}) adds to one	1. This power shall be divided equally between antennas

E.3.5 Connection with closed loop transmit diversity mode

Table E.3.5 is applicable for measurements for subclause 7.6.2 (Demodulation of DCH in closed loop transmit diversity mode)

Table E.3.5: Downlink Physical Channels transmitted during a connection[3]

Physical Channel	Power	Note
P-CPICH (antenna 1)	P-CPICH_Ec1/Ior = –13 dB	1. Total P-CPICH_Ec/Ior = –10 dB
P-CPICH (antenna 2)	P-CPICH_Ec2/Ior = –13 dB	
~~PCCPCH~~P-CCPCH (antenna 1)	~~PCCPCH_Ec~~P-CCPCH_Ec1/Ior = –15 dB	1. STTD applied
~~PCCPCH~~P-CCPCH (antenna 2)	~~PCCPCH_Ec~~P-CCPCH_Ec2/Ior = –15 dB	1. STTD applied, total ~~PCCPCH_Ec~~P-CCPCH_Ec/Ior = –12 dB
SCH (antenna 1 / 2)	SCH_Ec/Ior = –12 dB	1. TSTD applied
PICH (antenna 1)	PICH_Ec1/Ior = –18 dB	1. STTD applied 2. STTD applied, total PICH_Ec/Ior = –15 dB
PICH (antenna 2)	PICH_Ec2/Ior = –18 dB	
DPCH	Test dependent power	1. Total power from both antennas
OCNS	Necessary power so that total transmit power spectral density of ~~BS~~Node B (Ior) adds to one	1. This power shall be divided equally between antennas

[2] Power levels are based on the assumption that multipath propagation conditions and noise source representing interference from other cells Ioc are turned on after the call set-up phase.

[3] Power levels are based on the assumption that multipath propagation conditions and noise source representing interference from other cells Ioc are turned on after the call set-up phase.

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Redondo Beach, USA, 16th-17th November 2000

Tdoc T1-000254

CR-Form-v3

CHANGE REQUEST

⌘ **34.121** **CR** **044** ⌘ rev **-** ⌘ Current version: **3.2.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network ☐ Core Network ☐

Title:	⌘	UE emission mask measurement filter definition correction
Source:	⌘	TSG-T1/RF SWG
Work item code:	⌘	***Date:*** ⌘ 2000-11-16
Category:	⌘	**F** ***Release:*** ⌘ R99

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	UE emission mask measurement filter definition was corrected in TS25.101 and TS25.141
Summary of change:	⌘	1) Subclause 5.9.2 of TS34.121 is modified according to TS25.101 2) The test procedure (subclause 5.9.4.2) is modified
Consequences if not approved:	⌘	The measurement accuracy, sensitivity and efficiency may get worse, if 50 kHz or narrower resolution bandwitdh is not used for 1 MHz measurement bandwidth. TS25.101 and TS34.121 are inconsistent.

Clauses affected:	⌘	5.9
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

Excess occupied channel bandwidth increases the interference to other channels or to other systems.

5.8.4 Method of test

5.8.4.1 Initial conditions

1) Connect the SS to the UE antenna connector as shown in Figure A.1.
2) A call is set up according to the Generic call setup procedure
3) Enter the UE into loopback test mode and start the loopback test.

See [3] TS 34.108 and [4] TS 34.109 for details regarding generic call setup procedure and loopback test.

5.8.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.
2) Measure the power spectrum distribution within two times or more range over the requirement for Occupied Bandwidth specification centring on the current carrier frequency with 30 kHz or less RBW. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyzer filter).
3) Calculate the total power within the range of all frequencies measured in ‘2)’ and save this value as "Total Power".
4) Sum up the power upward from the lower boundary of the measured frequency range in ‘2)’ and seek the limit frequency point by which this sum becomes 0.5 % of "Total Power" and save this point as "Lower Frequency".
5) Sum up the power downward from the upper boundary of the measured frequency range in ‘2)’ and seek the limit frequency point by which this sum becomes 0.5 % of "Total Power" and save this point as "Upper Frequency".

Calculate the difference ("Upper Frequency" – "Lower Frequency" = "Occupied Bandwidth") between two limit frequencies obtained in ‘4)’ and ‘5)’.

5.8.5 Test requirements

The measured Occupied Bandwidth, derived in step 6), shall not exceed 5 MHz.

5.9 Spectrum emission mask

5.9.1 Definition and applicability

The spectrum emission mask of the UE applies to frequencies, which are between 2.5 MHz and 12.5 MHz away from the UE centre carrier frequency. The out of channel emission is specified relative to the UE output power measured in a 3.84 MHz bandwidth.

The requirements and this test apply to all types of UTRA for the FDD UE.

5.9.2 Conformance requirements

The power of any UE emission shall not exceed the levels specified in Table 5.9.1.

Table 5.9.1: Spectrum Emission Mask Requirement

Frequency offset from carrier Δf	Minimum requirement	Measurement bandwidth
2.5 - 3.5 MHz	–35 – 15*(Δf – 2.5) dBc	30 kHz *
3.5 - 7.5 MHz	–35 – 1*(Δf – 3.5) dBc	1 MHz *
7.5 - 8.5 MHz	–39 – 10*(Δf – 7.5) dBc	1 MHz *
8.5 - 12.5 MHz	–49 dBc	1 MHz *

NOTE*:

1. The first and last measurement position with a 30 kHz filter is 2.515 MHz and 3.485 MHz.
2. The first and last measurement position with a 1 MHz filter is 4 MHz and 12 MHz. As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. To improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be different from the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth.
3. The lower limit shall be –50 dBm / 3.84 MHz or which ever is higher.

The reference for this requirement is [1] TS 25.101 subclause 6.6.2.1.1.

5.9.3 Test purpose

To verify that the power of UE emission does not exceed the prescribed limits shown in Table 5.9.1.

Excess emission increases the interference to other channels or to other systems.

5.9.4 Method of test

5.9.4.1 Initial conditions

1) Connect the SS to the UE antenna connector as shown in Figure A.1.
2) A call is set up according to the Generic call setup procedure.
3) Enter the UE into loopback test mode and start the loopback test.

See [3] TS 34.108 and [4] TS 34.109 for details regarding generic call setup procedure and loopback test.

5.9.4.2 Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.
2) Measure the power of the transmitted signal with a measurement filter of bandwidths according to Table 5.9.1. Measurements with an offset from the carrier centre frequency between 2.515 MHz and 3.485 MHz shall use a 30 kHz measurement filter. Measurements with an offset from the carrier centre frequency between 4 MHz and 12 MHz shall use 1 MHz measurement bandwidth and the result may be calculated by integrating multiple 50 kHz or narrower filter measurements. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyzer filter). The centre frequency of the filter shall be stepped in contiguous steps according to Table 5.9.1. The measured power shall be recorded for each step.
3) Measure the wanted output power according to Annex B.
4) Calculate the ratio of the power 2) with respect to 3) in dBc.

5.9.5 Test requirements

The result of 5.9.4.2 step 4) shall fulfil the requirements of Table 5.9.1.

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CHANGE REQUEST

⌘	34.121	CR	045	⌘ rev	-	⌘ Current version:	3.2.0	⌘

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Proposed change affects: ⌘	(U)SIM		ME/UE	X	Radio Access Network		Core Network	

Title: ⌘	New structure of TS 34.121		
Source: ⌘	TSG-T1/RF SWG		
Work item code: ⌘		***Date:*** ⌘	2000-11-16
Category: ⌘	F	***Release:*** ⌘	R99

Use one of the following categories: ***F*** *(essential correction)* ***A*** *(corresponds to a correction in an earlier release)* ***B*** *(Addition of feature),* ***C*** *(Functional modification of feature)* ***D*** *(Editorial modification)* Detailed explanations of the above categories can be found in 3GPP TR 21.900.	*Use one of the following releases:* *2 (GSM Phase 2)* *R96 (Release 1996)* *R97 (Release 1997)* *R98 (Release 1998)* *R99 (Release 1999)* *REL-4 (Release 4)* *REL-5 (Release 5)*

Reason for change: ⌘	The structure of TS 25.133 has been changed by removing test parameters to Annex-A. Therefore, TS 34.121, clause 8 should be modified accordingly.
Summary of change: ⌘	New structure of TS 34.121 according to restructured TS 25.133
Consequences if not approved: ⌘	
Clauses affected: ⌘	8, Annex-J

Other specs affected: ⌘		Other core specifications ⌘	
		Test specifications	
		O&M Specifications	
Other comments: ⌘			

8 Requirements for support of RRM

8.1 General

8.2 Idle Mode Tasks

8.2.1 Introduction

8.2.2 RF Cell Selection Scenario

8.2.2.1 Cell Selection single carrier single cell case

8.2.2.1.1 Definition and applicability

Test to verify that the UE is capable of selecting a suitable cell within [5] seconds from switch on with stored information of the last registered PLMN. This cell selection delay is defined as the time the UE needs for sending RRC Connection Request for Location Registration to UTRAN after the power has been switched on with a valid USIM and PIN is disabled.

This test is applicable for all UE's.

8.2.2.1.2 Conformance requirement

Cell selection shall be correct in more than [X%] of the cases. Cell selection is correct if within [5] seconds the UE camps on the cell. The confidence level is set to [Y%]. (Annex [FFS])

The reference for this requirement is [2] TS 25.133 subclause 4.2.1.3.

8.2.2.1.3 Test purpose

To verify that the UE meets the conformance requirement.

8.2.2.1.4 Method of test

8.2.2.1.4.1 Initial conditions

The absolute signal level of each cell can be obtained from the values of $\hat{I}_{or}/I_{oc}$ in table 8.2.1.

Parameters changed from default values in table TS 34.123-1, 6.1.3.1.

Table 8.2.1: Test parameters for Cell selection single carrier single cell

Parameter	Unit	Cell 1
UTRA RF Channel Number		Channel 1
CPICH_Ec/Ior	dB	-10
PCCPCH_Ec/Ior	dB	-12
SCH_Ec/Ior	dB	-12
PICH_Ec/Ior	dB	-15
OCNS_Ec/Ior	dB	-0.941
$\hat{I}_{or}/I_{oc}$	dB	0
I_{oc}	dBm/3.84 MHz	-70
CPICH_Ec/Io	dB	-13
Propagation Condition		AWGN
Qmin	dB	[ ]
UE_TXPWR_MAX_RACH	dBm	[ ]

8.2.2.1.4.2 Procedures

a) The SS activates cell 1 and monitors cell 1 for RA-request from the UE

b) The UE is switched on

c) The SS waits for RA-request from the UE

d) The UE is switched off

e) The SS monitors cell 1 for RA-request from the UE

f) The UE is switched on

g) The SS waits for RA-request from the UE

h) Repeat step d) to g) [TBD] times

8.2.2.1.5 Test requirements

1) In step c), the UE shall respond on cell 1 within [FFS seconds]

[Editor's note: LS of proposed timeout values sent to CN1/RAN2 to get acceptance]

2) In step g), the UE shall respond on cell 1 within [5] seconds in more than [X%] of the cases.

[Editor's note: The test must be executed a number of times as indirectly set by the Conformance Requirement. The number is for FFS]

8.2.2.2 Cell Selection multi carrier multi cell case

8.2.2.2.1 Definition and applicability

Test to verify that the UE is capable of selecting a suitable cell within [5+x] seconds from switch on with stored information of the last registered PLMN. The cell is selected among a group of cells with different relative RF signal levels. The cell selection delay is defined as the time the UE needs for sending RRC Connection Request for Location Registration to UTRAN after the power has been switched on with a valid USIM and PIN is disabled.

This test is applicable for all UEs.

~~8.2.2.2.2 Conformance requirement~~

~~Cell selection shall be correct in more than [X%] of the cases. Cell selection is correct if within [5+x] seconds the UE camps on the cell, which fulfils the cell selection criteria. The confidence level is set to [Y%]. (Annex [FFS])~~

~~The reference for this requirement is [2] TS 25.133 subclause 4.2.2.3.~~

~~8.2.2.2.3 Test purpose~~

~~To verify that the UE meets the conformance requirement.~~

~~8.2.2.2.4 Method of test~~

~~8.2.2.2.4.1 Initial conditions~~

~~The relative RF signal to total interference ratio at the UE (*CPICH_Ec/Io*) between the cells is shown in Table 8.2.2 and shall be:~~

~~Cell 5 > Cell 1 > Cell 2 > Cell 4 > Cell 3 > Cell 6~~

~~The absolute signal level of each cell can be obtained from the values of $\hat{I}_{or}/I_{oc}$ in table 8.2.2.~~

~~Parameters changed from default values in table TS 34.123-1, 6.1.3.1.~~

~~Table 8.2.2: Test parameters for Cell selection multi carrier multi cell~~

~~Parameter~~	~~Unit~~	~~Cell 1~~	~~Cell 2~~	~~Cell 3~~	~~Cell 4~~	~~Cell 5~~	~~Cell 6~~
~~UTRA RF Channel Number~~		~~Channel 1~~	~~Channel 1~~	~~Channel 1~~	~~Channel 2~~	~~Channel 2~~	~~Channel 2~~
~~CPICH_Ec/Ior~~	~~dB~~	~~-10~~	~~-10~~	~~-10~~	~~-10~~	~~-10~~	~~-10~~
~~PCCPCH_Ec/Ior~~	~~dB~~	~~-12~~	~~-12~~	~~-12~~	~~-12~~	~~-12~~	~~-12~~
~~SCH_Ec/Ior~~	~~dB~~	~~-12~~	~~-12~~	~~-12~~	~~-12~~	~~-12~~	~~-12~~
~~PICH_Ec/Ior~~	~~dB~~	~~-15~~	~~-15~~	~~-15~~	~~-15~~	~~-15~~	~~-15~~
~~OCNS_Ec/Ior~~	~~dB~~	~~-0.941~~	~~-0.941~~	~~-0.941~~	~~-0.941~~	~~-0.941~~	~~-0.941~~
~~$\hat{I}_{or}/I_{oc}$~~	~~dB~~	~~5.3~~	~~2.3~~	~~-1.7~~	~~6.3~~	~~14.3~~	~~2.3~~
~~I_{oc}~~	~~dBm/3.84 MHz~~	~~-70~~			~~-70~~		
~~CPICH_Ec/Io~~	~~dB~~	~~-13~~	~~-16~~	~~-20~~	~~-19~~	~~-11~~	~~-23~~
~~Propagation Condition~~		~~AWGN~~			~~AWGN~~		
~~Qmin~~	~~dB~~	~~[]~~	~~[]~~	~~[]~~	~~[]~~	~~[]~~	~~[]~~
~~UE_TXPWR_MAX_RACH~~	~~dBm~~	~~[]~~	~~[]~~	~~[]~~	~~[]~~	~~[]~~	~~[]~~

~~8.2.2.2.4.2 Procedures~~

~~a) The SS activates cell 1-6 and monitors cell 5, 1 and 2 for RA-request from the UE~~

~~b) The UE is switched on.~~

~~c) The SS waits for RA-request from the UE~~

~~d) The UE is switched off.~~

~~e) The SS monitors cell 5, 1 and 2 for RA requests from the UE~~

~~f) The UE is switched on~~

~~g) The SS waits for RA-request from the UE~~

~~h) Repeat step d) to g) [TBD] times~~

8.2.2.2.5 Test requirements

1) In step c), the UE shall respond on cell 5 within [FFS seconds]

[Editor's note: LS of proposed timeout values sent to CN1/RAN2 to get acceptance]

2) In step g), the UE shall respond on cell 5 within [5+x] seconds in more than [X%] of the cases.

[Editor's note: The test must be executed a number of times as indirectly set by the Conformance Requirement The number is for FFS]

8.2.3 RF Cell Re-Selection Scenario

8.2.3.1 Cell Re-Selection single carrier multi cell case

8.2.3.1.1 Definition and applicability

Test to verify that the UE is capable of re-selecting a new cell within [5] seconds from it becoming a cell to be reselected according to the cell re-selection criteria. The cells, which are possible to be re-reselected during the test are belonging to different location areas. The cell re-selection delay is then defined as a time from when CPICH_Ec/Io is changed on cell 1 and 2 to the moment in time when the UE starts sending the RRC Connection request for Location Update message to the UTRAN.

This test is applicable for all UEs.

8.2.3.1.2 Conformance requirement

Cell re-selection shall be correct in more than [X%] of the cases. Cell re-selection is correct if within [5] seconds the UE re-reselects a new cell, which fulfils the cell re-selection criteria. The confidence level is set to [Y%]. (Annex [FFS])

The reference for this requirement is [2] TS 25.133 subclause 4.3.1.3.

8.2.3.1.3 Test purpose

To verify that the UE meets the conformance requirement.

8.2.3.1.4 Method of test

8.2.3.1.4.1 Initial conditions

The relative RF signal to total interference ratio at the UE (*CPICH_Ec/Io*) between the cells is shown in Table 8.2.3 and shall be:

T1: Cell 2 > Cell 1 > Cell 3 = Cell 4 = Cell 5 = Cell 6

T2: Cell 1 > Cell 2 > Cell 3 = Cell 4 = Cell 5 = Cell 6

The absolute signal level of each cell can be obtained from the values of $\hat{I}_{or}/I_{oc}$ in table 8.2.3.

Parameters changed from default values in table TS 34.123-1, 6.1.3.1.

Table 8.2.3: Test parameters for Cell re-selection single carrier multi cell

Parameter	Unit	Cell 1		Cell 2		Cell 3		Cell 4		Cell 5		Cell 6	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1		Channel 1	
CPICH_Ec/Ior	dB	-10		-10		-10		-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15		-15		-15		-15	
OCNS_Ec/Ior	dB	-0.941		-0.941		-0.941		-0.941		-0.941		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	7.3	10.27	10.27	7.3	0.27		0.27		0.27		0.27	
I_{oc}	dBm/ 3.84 MHz	-70											
CPICH_Ec/Io	dB	-16	-13	-13	-16	-23		-23		-23		-23	
Propagation Condition		AWGN											
Qoffset		[]		[]		[]		[]		[]		[]	
Qhyst	dBm	[]		[]		[]		[]		[]		[]	
Treselection		[]		[]		[]		[]		[]		[]	
Qintrasearch	dB	[]		[]		[]		[]		[]		[]	

Time T1 is X seconds and T2 is Y seconds.

Note: T1 and T2 need to be defined so that cell re-selection reaction time is taken into account.

8.2.3.1.4.2 Procedures

a) The SS activates cell 1-6 with T1 defined parameters and monitors cell 1 and 2 for RA requests from the UE

b) The UE is switched on

c) The SS waits for RA request from the UE cell 2

d) After [T1] seconds from switch on, the parameters are changed as described for T2

e) The SS waits for RA request from the UE on cell 1

f) After [T2] seconds from switch on, the parameters are changed as described for T1

g) Repeat step c) to f) [TBD] times

8.2.3.1.5 Test requirements

1) In step c), the UE shall respond on cell 2 within [FFS seconds]

[Editor's note: LS of proposed timeout values sent to CN1/RAN2 to get acceptance]

2) In step e), the UE shall respond on cell 1 within [5] seconds in more than [X%] of the cases.

[Editor's note: The test must be executed a number of times as indirectly set by the Conformance Requirement The number is for FFS]

~~8.2.3.2 Cell Re-Selection multi carrier multi cell case~~

~~8.2.3.2.1 Definition and applicability~~

~~Test to verify that the UE is capable of re-selecting a new cell within [TBD: Tres] seconds from it becoming a cell to be reselected according to the cell re-selection criteria. The cells, which are possible to be re-reselected during the test are transmitting on different frequencies and are belonging to different location areas. The cell re-selection delay is then defined as a time from when CPICH_Ec/Io is changed on cell 1 and 2 to the moment in time when the UE starts sending the RRC Connection request for Location Update message to the UTRAN.~~

~~This test is applicable for all UEs.~~

~~8.2.3.2.2 Conformance requirement~~

~~Cell re-selection shall be correct in more than [TBD: 90%] of the cases. Cell re-selection is correct if within [TBD: Nt] seconds the UE re-reselects a new cell, which fulfills the cell re-selection criteria. The confidence level is set to [Y%]. (Annex [FFS])~~

~~The reference for this requirement is [2] TS 25.133 subclause 4.3.2.3.~~

~~8.2.3.2.3 Test purpose~~

~~To verify that the UE meets the conformance requirement.~~

~~8.2.3.2.4 Method of test~~

~~8.2.3.2.4.1 Initial conditions~~

~~The relative RF signal to total interference ratio at the UE (*CPICH_Ec/Io*) between the cells is shown in Table 8.2.4 and shall be:~~

~~T1: Cell 2 > Cell 1 > Cell 3 = Cell 4 = Cell 5 = Cell 6~~

~~T2: Cell 1 > Cell 2 > Cell 3 = Cell 4 = Cell 5 = Cell 6~~

~~The absolute signal level of each cell can be obtained from the values of $\hat{I}_{or}/I_{oc}$ in table 8.2.4.~~

~~Parameters changed from default values in table TS 34.123-1, 6.1.3.1.~~

Table 8.2.4: Test parameters for Cell re-selection multi carrier multi cell

Parameter	Unit	Cell 1		Cell 2		Cell 3		Cell 4		Cell 5		Cell 6	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1		Channel 2		Channel 1		Channel 1		Channel 2		Channel 2	
CPICH_Ec/Ior	dB	-10		-10		-10		-10		-10		-10	
PCCPCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
SCH_Ec/Ior	dB	-12		-12		-12		-12		-12		-12	
PICH_Ec/Ior	dB	-15		-15		-15		-15		-15		-15	
OCNS_Ec/Ior	dB	-0.941		-0.941		-0.941		-0.941		-0.941		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	-3.4	2.2	2.2	-3.4	-7.4	-4.8	-7.4	-4.8	-4.8	-7.4	-4.8	-7.4
I_{oc}	dBm/ 3.84 MHz	-70											
CPICH_Ec/Io	dB	-16	-13	-13	-16	-20		-20		-20		-20	
Propagation Condition		AWGN											
Qoffset		[0]		[0]		[0]		[0]		[0]		[0]	
Qhyst	dB	[2]		[2]		[2]		[2]		[2]		[2]	
Treselection		[5]		[5]		[5]		[5]		[5]		[5]	
Qintersearch	dB	[-8]		[-8]		[-8]		[-8]		[-8]		[-8]	

Time T1 is X seconds and T2 is Y seconds.

Note: T1 and T2 need to be defined so that cell re-selection reaction time is taken into account.

8.2.3.2.4.2 Procedures

a) The SS activates cell 1-6 with T1 defined parameters and monitors cell 1 and 2 for RA requests from the UE

b) The UE is switched on

c) The SS waits for RA request from the UE cell 2

d) After [T1] seconds from switch on, the parameters are changed as described for T2

e) The SS waits for RA request from the UE on cell 1

f) After [T2] seconds from switch on, the parameters are changed as described for T1

g) Repeat step c) to f) [TBD] times

8.2.3.2.5 Test requirements

1) In step c), the UE shall respond on cell 2 within [FFS seconds]

[Editor's note: LS of proposed timeout values sent to CN1/RAN2 to get acceptance]

2) In step e), the UE shall respond on cell 1 within [TBD] seconds in more than [X%] of the cases.

[Editor's note: The test must be executed a number of times as indirectly set by the Conformance Requirement The number is for FFS]

~~8.2.3.3 Requirements for UTRAN to GSM Cell Re-Selection~~

~~8.2.3.3.1 Cell re-selection delay~~

~~8.2.3.3.2 Test Parameters~~

~~8.3 RRC Connection mobility~~

~~8.3.1 Handover~~

~~8.3.1.1 Introduction~~

~~8.3.1.2 Handover 3G to 3G~~

~~8.3.1.2.1 FDD Soft/Softer Handover~~

~~8.3.1.2.1.1 Maximum number of cells to be reported~~

~~8.3.1.2.1.2 Measurement reporting delay~~

~~8.3.1.2.1.3 Test parameters~~

~~8.3.1.2.1.3.1 Minimum Requirements~~

~~8.3.1.2.1.3.2 Event triggered reporting of multiple neighbours in AWGN propagation condition~~

~~8.3.1.2.1.3.3 Correct reporting of neighbours in Fading propagation condition~~

~~8.3.1.2.1.3.3.1 Minimum Requirement8.3.1.2.1.3.4 CPICH_Ec/Io measurement accuracy and incorrect reporting of neighbours in AWGN propagation condition~~

~~8.3.1.2.1.3.4.1 Minimum Requirement~~

~~8.3.1.2.1.4 Active set dimension~~

~~8.3.1.2.1.5 Active set update delay~~

~~8.3.1.2.2 FDD Hard Handover~~

~~8.3.1.2.2.1 Requirements~~

~~8.3.1.2.2.1.1 Maximum number of cells/frequencies to be monitored on other frequencies~~

~~8.3.1.2.2.1.2 Measurement reporting delay~~

~~8.3.1.2.2.1.2.1 Test Parameters for DL compressed mode~~

~~8.3.1.2.2.1.2.1.1 CPICH_Ec/Io measurement accuracy and correct reporting of neighbours in AWGN propagation condition~~

~~8.3.1.2.2.1.2.2 Minimum Requirements~~

8.3.1.2.2.1.3 Correct reporting of neighbours in Fading propagation condition

8.3.1.2.2.1.3.1 Minimum Requirements

8.3.1.2.2.1.4 Hard Handover Delay

8.3.1.2.3 FDD/TDD Handover

8.3.1.2.3.1 Requirements

8.3.1.2.3.1.1 Maximum number of cells/frequencies to be monitored on other frequencies

8.3.1.2.3.1.2 Measurement reporting delay

8.3.1.2.3.1.2.1 Test parameters for DL compressed mode

8.3.1.2.3.1.2.2 Correct reporting of TDD neighbours in AWGN propagation condition

8.3.1.2.3.1.2.3 Minimum Requirements

8.3.1.2.3.1.3 Handover Delay

8.3.1.3 Handover 3G to 2G

8.3.1.3.1 Handover to GSM

8.3.1.3.1.1 Requirements

8.3.1.3.1.2 RF Parameters

8.3.2 Radio Link Management

8.3.2.1 Link adaptation

8.3.2.1.1 Definition of the function

8.3.2.1.2 Link adaptation delay minimum requirement

8.3.2.1.3 Link adaptation maximum delay requirement

8.4 RRC Connection Control

8.4.1 Requirements for RRC Re-establishment

8.4.1.1 RRC Re-establishment delay

8.4.1.2 Test Parameters

8.4.1.2.1 Test 1 - Target Cell known by UE

8.4.1.2.2 Test 2 - Target cell not known by UE

8.4.1.2.3 Performance Requirements

8.4.2 Radio Access Bearer Control

8.5 Timing characteristics

8.5.1 Synchronization performance

8.5.1.1 Search of other Cells

8.5.1.1.1 Definition and applicability

Search for other cells is used to check whether the UE correctly searches and measures other BS(s) during the specified operation.

<Editor's Note: The applicability for this test whether it is mandatory or not should be clarified.>

8.5.1.1.2 Conformance requirements

[TBD]

Table 8.5.1.1.1: Test Parameters for the Search of other Cells

Parameter	Channel 1		Channel 2		Unit
	Time 1	Time 2	Time 1	Time 2	
$PCCPCH\frac{E_c}{I_{or}}$					dB
$\hat{I}_{or}/I_{oc}$					dB
I_{oc}	−60				dBm / 3.84 MHz
$PCCPCH\frac{E_c}{I_o}$					dB

The reference for this requirement is [2] TS 25.133 subclause 7.1.1.1.

8.5.1.1.3 Test purpose

[TBD]

8.5.1.1.4 Method of test

The measuring configuration is shown in Figure A.9.

8.5.1.1.4.1 Initial conditions

[TBD]

8.5.1.1.4.2 Procedures

1. Setup the equipment as shown in Figure A.11 (without fading channel blocks).
2. Set the test parameters as specified in Table 8.5.1.1.1.
3. Turn UE on.
4. TBD

8.5.1.1.5 Test requirements

[TBD]

8.5.2 spare

8.5.3 UE Transmit Timing

8.5.3.1 Initial transmission timing, Maximum timing adjustment size and Maximum timing adjustment rate

8.5.3.1.1 Definition and applicability

The UE shall have capability to follow the frame timing change of the connected Node B. UE initial transmit timing accuracy, maximum amount of timing change in one adjustment, and maximum adjustment rate are defined in the following requirements.

<Editor's Note: The applicability for this test whether it is mandatory or not should be clarified.>

8.5.3.1.2 Conformance requirements

For parameters specified in Table 8.5.3.1.1, UE initial transmission timing error shall be less than or equal to ±1,5 Chip. The reference point for the UE initial transmit timing control requirement shall be the first significant path of the corresponding downlink DPCCH/DPDCH frame.

The UE shall be capable of changing the transmission timing according the received downlink DPCCH/DPDCH frame. The maximum amount of the timing change in one adjustment shall be 1/4 Chip.

The maximum adjustment rate shall be 1/4 chip per 280 ms. In particular, within any given 280 ms period, the UE transmit timing shall not change in excess of +-1/4 chip from the timing at the beginning of this 280 ms period.

Table 8.5.3.1.1: Test parameters for Transmission timing requirement.

Parameter	Cell 1 and 2 level	Unit
DPCH_Ec/ Ior	–17	dB
$\hat{I}_{or,}$ Cell 1	–96	dBm / 3.84 MHz
$\hat{I}_{or,}$ Cell 2	–97	dBm / 3.84 MHz
Information data rate	12.2	kbps
TFCI	On	-
Propagation condition	AWGN	

a) Cell 2 starts transmission 5 seconds after call has been initiated. UE shall maintain it's original timing properties.

b) Cell 1 stop transmission 5 seconds after cell 2 has started transmission. UE shall adjust transmission timing with a maximum change of 1/4 chip per adjustment, and maximum timing adjustment rate of 1/4 chip per 280 ms.

The reference for this requirement is [2] TS 25.133 subclause 7.3.1.1.

8.5.3.1.3 Test purpose

[TBD]

8.5.3.1.4 Method of test

8.5.3.1.4.1 Initial conditions

[TBD]

8.5.3.1.4.2 Procedures

[TBD]

8.5.3.1.5 Test requirements

[TBD]

8.5.4 Reception Timing

8.5.4.1 Definition and applicability

The reception timing of the UE is determined during the specified operation.

<Editor's Note: The applicability for this test whether it is mandatory or not should be clarified.>

8.5.4.2 Conformance requirements

[TBD]

The reference for this requirement is [2] TS 25.133 subclause 7.4.1.

8.5.4.3 Test purpose

[TBD]

8.5.4.4 Method of test

The measuring configuration is shown in Figure A.9.

8.5.4.4.1 Initial conditions

[TBD]

8.5.4.4.2 Procedures

[TBD]

8.5.4.5 Test requirements

[TBD]

~~8.5.5 Signalling requirements~~

~~8.5.5.1 Signalling response delay~~

~~8.5.5.2 Test Parameters~~

~~8.5.5.3 Performance requirements~~

~~8.5.5.4 Signalling processing~~

~~8.5.5.5 Test parameters~~

~~8.5.5.6 Performance requirements~~

~~8.6 Measurements Performance Requirements~~

~~8.6.1 Common pilot measurements~~

~~8.6.1.1 Intra frequency test parameters~~

~~8.6.1.2 Inter frequency test parameters~~

~~8.6.2 CPICH RSCP~~

~~8.6.2.1 Intra frequency measurements accuracy~~

~~8.6.2.1.1 Absolute accuracy requirement~~

~~8.6.2.1.2 Relative accuracy requirement~~

~~8.6.2.2 Inter frequency measurement relative accuracy requirement~~

~~8.6.3 CPICH Ec/Io~~

~~8.6.3.1 Intra frequency measurements accuracy~~

~~8.6.3.1.1 Absolute accuracy requirement~~

~~8.6.3.1.2 Relative accuracy requirement~~

~~8.6.3.2 Inter frequency measurement relative accuracy requirement~~

~~8.6.4 Dedicated channel measurements~~

~~8.6.4.1 Test parameters~~

~~8.6.5 SIR~~

~~8.6.5.1 Absolute accuracy requirement~~

~~8.6.6 UTRA carrier RSSI~~

~~8.6.6.1 Test parameters for requirement~~

~~8.6.6.2 Absolute accuracy requirement~~

~~8.6.6.3 Relative accuracy requirement~~

~~8.6.7 GSM carrier RSSI~~

~~8.6.8 Transport channel BLER~~

~~8.6.8.1 BLER measurement requirement~~

~~8.6.9 UE transmitted power~~

~~8.6.10 CFN-SFN observed time difference~~

~~8.6.11 SFN-SFN observed time difference~~

~~8.6.12 UE Rx-Tx time difference~~

~~8.6.13 Observed time difference to GSM cell~~

~~8.6.14 Primary common control physical channel measurements~~

~~8.6.14.1 Inter frequency test parameters~~

~~8.6.15 P-CCPCH RSCP~~

~~8.6.15.1 Absolute accuracy requirements~~

~~8.7 UE parallel measurements~~

~~8.7.1 General~~

~~8.7.2 Parallel Measurement Requirements~~

8 Requirements for support of RRM

8.1 General

8.2 Idle Mode Tasks

8.2.1 Cell Selection

8.2.1.1 Cell Selection; the cells in the neighbour list belong to different frequencies

8.2.1.2 Cell Selection; no cell is present in the neighbour list

8.2.2 Cell Re-Selection

8.2.2.1 Cell Re-Selection; single carrier case

8.2.2.2 Cell Re-Selection; multi carrier case

8.2.3 UTRAN to GSM Cell Re-Selection

8.3 UTRAN Connected mode mobility

8.3.1 FDD/FDD Soft Handover

8.3.1.1 Active set dimension

8.3.1.2 Active set update delay

8.3.2 FDD/FDD Hard Handover

8.3.2.1 Hard handover delay

8.3.2.2 Interruption time

8.3.3 FDD/TDD Handover

8.3.3.1 Hard handover delay

8.3.3.2 Interruption time

8.3.4 FDD/GSM Handover

8.3.4.1 Inter-system handover delay

8.3.4.2 Interruption time

8.3.5 Cell Re-selection in CELL_FACH

8.3.5.1 All cells in the neighbour list belong to the same frequency

8.3.5.2 The cells in the neighbour list belong to different frequencies

8.3.6 Cell Re-selection in CELL_PCH

8.3.6.1 All cells in the neighbour list belong to the same frequency

8.3.6.2 The cells in the neighbour list belong to different frequencies

8.3.7 Cell Re-selection in URA_PCH

8.3.7.1 All cells in the neighbour list belong to the same frequency

8.3.7.2 The cells in the neighbour list belong to different frequencies

8.4 RRC Connection Control

8.4.1 RRC Re-establishment

8.4.1.1 Target cell known by UE

8.4.1.2 Target cell not known by UE

8.4.2 Spare

8.4.3 Random Access

8.4.3.1 Correct behaviour when receiving an ACK

8.4.3.2 Correct behaviour when receiving an NACK

8.4.3.3 Correct behaviour at Time-out

8.4.3.4 Correct behaviour when reaching maximum transmit power

8.4.4 Transport format combination selection in UE

8.5 Timing and Signalling characteristics

8.5.1 UE Transmit Timing

8.5.1.1 Initial transmission timing, Maximum timing adjustment size and Maximum timing adjustment rate

8.5.1.1.1 Definition and applicability

The UE shall have capability to follow the frame timing change of the connected Node B. UE initial transmit timing accuracy, maximum amount of timing change in one adjustment, and maximum adjustment rate are defined in the following requirements.

<Editor's Note: The applicability for this test whether it is mandatory or not should be clarified.>

8.5.1.1.2 Conformance requirements

For parameters specified in Table 8.5.3.1.1, UE initial transmission timing error shall be less than or equal to ±1,5 Chip. The reference point for the UE initial transmit timing control requirement shall be the first significant path of the corresponding downlink DPCCH/DPDCH frame.

The UE shall be capable of changing the transmission timing according the received downlink DPCCH/DPDCH frame. The maximum amount of the timing change in one adjustment shall be 1/4 Chip.

The maximum adjustment rate shall be 1/4 chip per 280 ms. In particular, within any given 280 ms period, the UE transmit timing shall not change in excess of +-1/4 chip from the timing at the beginning of this 280 ms period.

Table 8.5.3.1.1: Test parameters for Transmission timing requirement.

Parameter	Cell 1 and 2 level	Unit
DPCH_Ec/ Ior	–17	dB
$\hat{I}_{or}$, Cell 1	–96	dBm / 3.84 MHz
$\hat{I}_{or}$, Cell 2	–97	dBm / 3.84 MHz
Information data rate	12.2	kbps
TFCI	On	-
Propagation condition	AWGN	

a) Cell 2 starts transmission 5 seconds after call has been initiated. UE shall maintain it's original timing properties.

b) Cell 1 stop transmission 5 seconds after cell 2 has started transmission. UE shall adjust transmission timing with a maximum change of 1/4 chip per adjustment, and maximum timing adjustment rate of 1/4 chip per 280 ms.

The reference for this requirement is [2] TS 25.133 subclause 7.3.1.1.

8.5.1.1.3 Test purpose

[TBD]

8.5.1.1.4 Method of test

8.5.1.1.4.1 Initial conditions

[TBD]

8.5.1.1.4.2 Procedures

[TBD]

8.5.1.1.5 Test requirements

[TBD]

8.5.2 Signalling Response Delay

8.5.3 Signalling Processing

8.6 UE Measurements Procedures

8.6.1 Measurements in CELL_DCH State

8.6.1.1 FDD intra frequency measurements

8.6.1.1.1 Identification of a new cell

8.6.1.1.2 UE CPICH measurement capability

8.6.1.1.3 Periodic Reporting

8.6.1.1.4 Event Triggered Periodic Reporting

8.6.1.1.5 Event Triggered Reporting

8.6.1.2 FDD inter frequency measurements

8.6.1.2.1 Identification of a new cell

8.6.1.2.2 Measurement period

8.6.1.2.3 Periodic Reporting

8.6.1.2.4 Event Triggered Reporting

8.6.1.3 TDD measurements

8.6.1.3.1 Periodic Reporting

8.6.1.3.2 Event Triggered Reporting

8.6.1.4 GSM measurements

8.6.1.4.1 GSM carrier RSSI

8.6.1.4.2 BSIC verification

8.6.1.4.2.1 Initial BSIC verification

8.6.1.4.2.2 BSIC re-confirmation

8.6.2 Parallel Measurements in CELL_DCH State

8.6.3 Measurements in CELL_FACH State

8.7 Measurements Performance Requirements

8.7.1 CPICH RSCP

8.7.1.1 Intra frequency measurements accuracy

8.7.1.1.1 Absolute accuracy requirement

8.7.1.1.2 Relative accuracy requirement

8.7.1.2 Inter frequency measurement accuracy

8.7.1.2.1 Relative accuracy requirement

8.7.1.3 CPICH RSCP measurement report mapping

8.7.2 CPICH Ec/Io

8.7.2.1 Intra frequency measurements accuracy

8.7.2.1.1 Absolute accuracy requirement

8.7.2.1.2 Relative accuracy requirement

8.7.2.2 Inter frequency measurement accuracy

8.7.2.2.1 Relative accuracy requirement

8.7.2.3 CPICH Ec/Io measurement report mapping

8.7.3 UTRA Carrier RSSI

8.7.3.1 Absolute accuracy requirement

8.7.3.2 Relative accuracy requirement

8.7.3.3 UTRA Carrier RSSI measurement report mapping

8.7.4 GSM carrier RSSI

8.7.5 Transport channel BLER

8.7.5.1 BLER measurement requirement

8.7.5.2 Transport channel BLER measurement report mapping

8.7.6 UE transmitted power

8.7.12.1 UE GPS timing of Cell Frames for LCS measurement report mapping

Annex J (informative)
Test cases requiring evaluation for applicability

J.1 General

This annex contains test cases that were removed from 34.121 V3.2.0 (2000-09), clause 8 when it was restructured according to core requirements in 25.133 V3.3.0 (2000-09). The test cases were left out because no corresponding core requirement existed. This, however, does not mean that there will not be any corresponding core requirements in future versions of 25.133. Therefore, to preserve the content for future enhancements, it has been decided to move these test specifications to this annex.

J.2 Synchronization performance

8.5.1 Synchronization performance

8.5.1.1 Search of other Cells

8.5.1.1.1 Definition and applicability

Search for other cells is used to check whether the UE correctly searches and measures other BS(s) during the specified operation.

<Editor's Note: The applicability for this test whether it is mandatory or not should be clarified.>

8.5.1.1.2 Conformance requirements

[TBD]

Table 8.5.1.1.1: Test Parameters for the Search of other Cells

Parameter	Channel 1		Channel 2		Unit
	Time 1	Time 2	Time 1	Time 2	
$PCCPCH\ \frac{E_c}{I_{or}}$					dB
$\hat{I}_{or}/I_{oc}$					dB
I_{oc}	−60				dBm / 3.84 MHz
$PCCPCH\ \frac{E_c}{I_o}$					dB

The reference for this requirement is [2] TS 25.133 subclause 7.1.1.1.

8.5.1.1.3 Test purpose

[TBD]

8.5.1.1.4 Method of test

The measuring configuration is shown in Figure A.9.

8.5.1.1.4.1 Initial conditions

[TBD]

8.5.1.1.4.2 Procedures

1. Setup the equipment as shown in Figure A.11 (without fading channel blocks).
2. Set the test parameters as specified in Table 8.5.1.1.1.
3. Turn UE on.
4. TBD

8.5.1.1.5 Test requirements

[TBD]

J.3 Reception timing

8.5.4 Reception Timing

8.5.4.1 Definition and applicability

The reception timing of the UE is determined during the specified operation.

<Editor's Note: The applicability for this test whether it is mandatory or not should be clarified.>

8.5.4.2 Conformance requirements

[TBD]

The reference for this requirement is [2] TS 25.133 subclause 7.4.1.

8.5.4.3 Test purpose

[TBD]

8.5.4.4 Method of test

The measuring configuration is shown in Figure A.9.

8.5.4.4.1 Initial conditions

[TBD]

8.5.4.4.2 Procedures

[TBD]

8.5.4.5 Test requirements

[TBD]