TSG RAN Meeting #19 **RP-030028**
Birmingham, United Kingdom, 11 - 14 March, 2003

Title **CRs (R'99 and Rel-4/Rel-5 Category A) to TS 25.142**
Source **TSG RAN WG4**
Agenda Item **8.4.3**

RAN4 Tdoc	Spec	CR	R	Cat	Rel	Curr Ver	Title	Work Item
R4-020036	25.142	159		F	R99	3.12.0	Spurious emission requirements for unsynchronized TDD operation	TEI
R4-020037	25.142	160		F	Rel-4	4.7.0	Spurious emission requirements for unsynchronized TDD operation	TEI; LCRTDD-RF
R4-020038	25.142	161		F	Rel-5	5.3.0	Spurious emission requirements for unsynchronized TDD operation	TEI; LCRTDD-RF; RInImp-BSClass-TDD

3GPP TSG RAN WG4 (Radio) Meeting #26 **R4-030036**

Madrid, Spain 17 - 22 February, 2003

CR-Form-v7

CHANGE REQUEST

⌘ **25.142** **CR** **159** ⌘ **rev** ⌘ Current version: **3.12.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Spurious emission requirements for unsynchronized TDD operation
Source:	⌘	RAN WG4
Work item code:	⌘	TEI
Date:	⌘	05/03/2003
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
F *(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)*
Rel-6	*(Release 6)*

Reason for change:	⌘	The test of spurious emissions for co-existence with unsynchronized TDD according to the requirements in TS 25.105 section 6.6.3.5 is missing.
Summary of change:	⌘	The test requirement for co-existence with unsynchronized TDD is added. Manufacturer declarations and tables of regional requirements are updated accordingly
Consequences if not approved:	⌘	The spurious emission test will be incomplete and not aligned to TS 25.105. This leads to unsufficient protection of the BS receiver in case of unsynchronized TDD operation. **Isolated impact analysis:** Correction of a missing requirement. Proposed corrrections in this CR will not affect NodeB-UE interworking.

Clauses affected:	⌘	5.7.5 (new); 5.15; 5.17; 6.6.3.2.5 (new)

Other specs affected:	⌘	Y	N		⌘
			X	Other core specifications	
			X	Test specifications	
			X	O&M Specifications	

Other comments:	⌘	The corresponding changes to Rel-4 and Rel-5 are incorporated in CR 160 for Rel-4 and CR 161 for Rel-5, therefore no associated Cat A CR are needed.

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.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://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 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.

5.7 Tx spurious emissions

5.7.1 Category of spurious emissions limit

The manufacturer shall declare one of the following:

a) the BS shall be tested against Category A limits for spurious emissions, as defined in ITU-R Recommendation SM.329-8 [6].

or

b) the BS shall be tested against Category B limits for spurious emissions, as defined in ITU-R Recommendation SM.329-8 [6].

If the manufacturer declares Category A limits to be applicable, conformance with the spurious emissions requirements specified in subclause 6.6.3.2.1.1 is mandatory, and the requirements specified in subclause 6.6.3.2.1.2 need not to be tested.

If the manufacturer declares Category B limits to be applicable, conformance with the spurious emissions requirements specified in subclause 6.6.3.2.1.2 is mandatory, and the requirements specified in subclause 6.6.3.2.1.1 need not to be tested.

5.7.2 Co-existence with GSM

The manufacturer shall declare:

whether the BS under test is intended to operate in geographic areas in which also GSM 900 is deployed. If so, compliance with the conformance requirement specified in subclause 6.6.3.2.2.1 is mandatory; otherwise, this requirement needs not to be tested.

whether the BS under test is intended to operate co-located with a GSM 900 BTS. If so, compliance with the conformance requirement specified in subclause 6.6.3.2.2.2 is mandatory; otherwise, this requirement needs not to be tested.

5.7.3 Co-existence with DCS 1800

The manufacturer shall declare:

whether the BS under test is intended to operate in geographic areas in which also DCS 1800 is deployed. If so, compliance with the conformance requirement specified in subclause 6.6.3.2.3.1 is mandatory; otherwise, this requirement needs not to be tested.

whether the BS under test is intended to operate co-located with a DCS 1800 BTS. If so, compliance with the conformance requirement specified in subclause 6.6.3.2.3.2 is mandatory; otherwise, this requirement needs not to be tested.

5.7.4 Co-existence with UTRA FDD

The manufacturer shall declare:

whether the BS under test is intended to operate in geographic areas in which also UTRA FDD is deployed. If so, compliance with the conformance requirement specified in subclause 6.6.3.2.4.1 is mandatory; otherwise, this requirement needs not to be tested.

whether the BS under test is intended to operate co-located with a UTRA FDD BS. If so, compliance with the conformance requirement specified in subclause 6.6.3.2.4.2 is mandatory; otherwise, this requirement needs not to be tested.

5.7.5 Co-existence with unsynchronised TDD

The manufacturer shall declare:

- whether the BS under test is intended to operate in geographic areas in which also unsynchronised TDD is deployed. If so, compliance with the conformance requirement specified in subclause 6.6.3.2.5.1 is mandatory; otherwise, this requirement needs not to be tested.

- whether the BS under test is intended to operate co-located with a unsynchronised TDD BS. If so, compliance with the conformance requirement specified in subclause 6.6.3.2.5.2 is mandatory; otherwise, this requirement needs not to be tested.

5.8 Blocking characteristics

--- next changed section ---

5.15 Overview of the conformance test requirements

Tables 5.9, 5.10 and 5.11 give an overview of the conformance test requirements for the transmitter, the receiver and system performance, respectively.

Table 5.9: Overview of the conformance tests requirements for the transmitter

Parameter	Subclause	Note
Maximum output power	6.2	manufacturer's declaration required
Frequency stability	6.3	manufacturer's declaration required
Output power dynamics	6.4	
Inner loop power control	6.4.1	
Power control steps	6.4.2	
Power control dynamic range	6.4.3	
Minimum output power	6.4.4	
Primary CCPCH power	6.4.5	
Transmit OFF power	6.5.1	
Transmit ON/OFF time mask	6.5.2	
Output RF spectrum emissions	6.6	
Occupied bandwidth	6.6.1	
Out-of-band emission	6.6.2	
Spectrum emission mask	6.6.2.1	manufacturer's declaration required
Adjacent Channel Leakage power Ratio (ACLR)	6.6.2.2	manufacturer's declaration required
Spurious emissions	6.6.3	
Mandatory requirements	6.6.3.2.1	manufacturer's declaration required
Co-existence with GSM 900	6.6.3.2.2	manufacturer's declaration required
Co-existence with DCS 1800	6.6.3.2.3	manufacturer's declaration required
Co-existence with UTRA FDD	6.6.3.2.4	manufacturer's declaration required
Co-existence with unsynchronised TDD	6.6.3.2.5	manufacturer's declaration required
Transmit intermodulation	6.7	
Transmit modulation	6.8	
Modulation accuracy	6.8.1	
Peak code domain error	6.8.2	

Table 5.10: Overview of the conformance tests requirements for the receiver

Parameter	Subclause	Note
Reference sensitivity level	7.2	
Dynamic range	7.3	
Adjacent Channel Selectivity (ACS)	7.4	
Blocking characteristics	7.5	manufacturer's declaration required
Intermodulation characteristics	7.6	
Spurious emissions	7.7	

Table 5.11: Overview of the conformance test requirements for system performance

Parameter	Subclause	Note
Demodulation in static propagation conditions	8.2	
Demodulation of DCH	8.2.1	
Demodulation of DCH in multipath fading conditions	8.3	
Multipath fading Case 1	8.3.1	
Multipath fading Case 2	8.3.2	
Multipath fading Case 3	8.3.3	

--- next changed section ---

5.17 Regional requirements

Some requirements in this specification may only apply in certain regions. Table 5.12 lists all requirements that may be applied differently in different regions.

Table 5.12: List of regional requirements

Subclause number	Requirement	Comments
4.2	Frequency bands	Some bands may be applied regionally.
6.2.2	Maximum output power	In certain regions, the minimum requirement for normal conditions may apply also for some conditions outside the ranges defined for the Normal test environment in subclause 5.8.1
6.6.2.1.	Spectrum emission mask	The mask specified may be mandatory in certain regions. In other regions this mask may not be applied.
6.6.3.2.1.1	Spurious emissions (Category A)	These requirements shall be met in cases where Category A limits for spurious emissions, as defined in ITU-R Recommendation SM.329-8 [6], are applied.
6.6.3.2.1.2	Spurious emissions (Category B)	These requirements shall be met in cases where Category B limits for spurious emissions, as defined in ITU-R Recommendation SM.329-8 [6], are applied.
6.6.3.2.2.1	Co-existence with GSM900 – Operation in the same geographic area	This requirement may be applied for the protection of GSM 900 MS in geographic areas in which both GSM 900 and UTRA are deployed.
6.6.3.2.2.2	Co-existence with GSM900 – Co-located base stations	This requirement may be applied for the protection of GSM 900 BTS receivers when GSM 900 BTS and UTRA BS are co-located.
6.6.3.2.3.1	Co-existence with DCS1800 – Operation in the same geographic area	This requirement may be applied for the protection of DCS 1800 MS in geographic areas in which both DCS 1800 and UTRA are deployed.
6.6.3.2.3.2	Co-existence with DCS1800 – Co-located base stations	This requirement may be applied for the protection of DCS 1800 BTS receivers when DCS 1800 BTS and UTRA BS are co-located.
6.6.3.2.4.1	Co-existence with UTRA FDD – Operation in the same geographic area	This requirement may be applied to geographic areas in which both UTRA-TDD and UTRA-FDD are deployed.
6.6.3.2.4.2	Co-existence with UTRA FDD – Co-located base stations	This requirement may be applied for the protection of UTRA-FDD BS receivers when UTRA-TDD BS and UTRA FDD BS are co-located.
6.6.3.2.5.1	Co-existence with unsynchronised TDD – Operation in the same geographic area	This requirement may be applied for the protection of TDD BS receivers in geographic areas in which unsynchronised TDD is deployed.
6.6.3.2.5.2	Co-existence with unsynchronised TDD – Co-located base stations	This requirement may be applied for the protection of TDD BS receivers when unsynchronised TDD BS are co-located.
7.5	Blocking characteristic	The requirement is applied according to what frequency bands in subclause 4.2 that are supported by the BS.
7.5	Blocking characteristics	This requirement may be applied for the protection of UTRA TDD BS receivers when UTRA TDD BS and GSM 900/DCS1800 BS are co-located.

--- next changed section ---

6.6.3 Spurious emissions

6.6.3.1 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. This is measured at the base station RF output port.

The requirements shall apply whatever the type of transmitter considered (single carrier or multiple carrier). It applies for all transmission modes foreseen by the manufacturer's specification.

Either requirement applies at frequencies within the specified frequency ranges which are more than 12,5 MHz under the first carrier frequency used or more than 12,5 MHz above the last carrier frequency used.

The requirements in this subclause shall apply to base stations intended for general-purpose applications.

6.6.3.2 Minimum Requirements

6.6.3.2.1 Mandatory requirements

The requirements of either subclause 6.6.3.2.1.1 or subclause 6.6.3.2.1.2 shall apply.

6.6.3.2.1.1 Spurious emissions (Category A)

The following requirements shall be met in cases where Category A limits for spurious emissions, as defined in ITU-R Recommendation SM.329-8 [6], are applied.

The power of any spurious emission shall not exceed the maximum level given in Table 6.29.

Table 6.29: BS Mandatory spurious emissions limits, Category A

Band	Maximum level	Measurement bandwidth	Note
9 kHz – 150 kHz	-13 dBm	1 kHz	Bandwidth as in ITU-R SM.329-8, s4.1
150 kHz – 30 MHz		10 kHz	Bandwidth as in ITU-R SM.329-8, s4.1
30 MHz – 1 GHz		100 kHz	Bandwidth as in ITU-R SM.329-8, s4.1
1 GHz – 12,75 GHz		1 MHz	Upper frequency as in ITU-R SM.329-8, s2.5 table 1

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.1.1.1.

6.6.3.2.1.2 Spurious emissions (Category B)

The following requirements shall be met in cases where Category B limits for spurious emissions, as defined in ITU-R Recommendation SM.329-8 [6], are applied.

The power of any spurious emission shall not exceed the maximum levels given in Table 6.30.

Table 6.30: BS Mandatory spurious emissions limits, Category B

Band	Maximum level	Measurement bandwidth	Note
9 kHz – 150 kHz	-36 dBm	1 kHz	Bandwidth as in ITU-R SM.329-8, s4.1
150 kHz – 30 MHz	-36 dBm	10 kHz	Bandwidth as in ITU-R SM.329-8, s4.1
30 MHz – 1 GHz	-36 dBm	100 kHz	Bandwidth as in ITU-R SM.329-8, s4.1
1 GHz – Fc1 - 60 MHz or Fl - 10 MHz *whichever is the higher*	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-8, s4.1
Fc1 - 60 MHz or Fl - 10 MHz *whichever is the higher* – Fc1 - 50 MHz or Fl -10 MHz *whichever is the higher*	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329-8, s4.3 and Annex 7
Fc1 - 50 MHz or Fl -10 MHz *whichever is the higher* – Fc2 + 50 MHz or Fu +10 MHz *whichever is the lower*	-15 dBm	1 MHz	Specification in accordance with ITU-R SM.329-8, s4.3 and Annex 7
Fc2 + 50 MHz or Fu + 10 MHz *whichever is the lower* – Fc2 + 60 MHz or Fu + 10 MHz *whichever is the lower*	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329-8, s4.3 and Annex 7
Fc2 + 60 MHz or Fu + 10 MHz *whichever is the lower* – 12,75 GHz	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-8, s4.1. Upper frequency as in ITU-R SM.329-8, s2.5 table 1

Fc1: Center frequency of emission of the first carrier transmitted by the BS

Fc2: Center frequency of emission of the last carrier transmitted by the BS

Fl : Lower frequency of the band in which TDD operates

Fu : Upper frequency of the band in which TDD operates

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.1.2.1.

6.6.3.2.2 Co-existence with GSM

6.6.3.2.2.1 Operation in the same geographic area

This requirement may be applied for the protection of GSM 900 MS in geographic areas in which both GSM 900 and UTRA are deployed.

The power of any spurious emission shall not exceed the maximum level given in Table 6.31.

Table 6.31: BS Spurious emissions limits for BS in geographic coverage area of GSM 900 MS receiver

Band	Maximum level	Measurement bandwidth	Note
921 MHz – 960 MHz	-57 dBm	100 kHz	

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.2.1.1.

6.6.3.2.2.2 Co-located base stations

This requirement may be applied for the protection of GSM 900 BTS receivers when GSM 900 BTS and UTRA BS are co-located.

The power of any spurious emission shall not exceed the maximum level given in table 6.32.

Table 6.32: BS Spurious emissions limits for protection of the GSM 900 BTS receiver

Band	Maximum level	Measurement bandwidth	Note
876 MHz – 915 MHz	–98 dBm	100 kHz	

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.2.2.1.

6.6.3.2.3 Co-existence with DCS 1800

6.6.3.2.3.1 Operation in the same geographic area

This requirement may be applied for the protection of DCS 1800 MS in geographic areas in which both DCS 1800 and UTRA are deployed.

The power of any spurious emission shall not exceed the maximum level given in table 6.33.

Table 6.33: BS Spurious emissions limits for BS in geographic coverage area of DCS 1800 MS receiver

Band	Maximum level	Measurement bandwidth	Note
1805 MHz – 1880 MHz	-47 dBm	100 kHz	

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.3.1.1.

6.6.3.2.3.2 Co-located base stations

This requirement may be applied for the protection of DCS 1800 BTS receivers when DCS 1800 BTS and UTRA BS are co-located.

The power of any spurious emission shall not exceed the maximum level given in table 6.34.

Table 6.34: BS Spurious emissions limits for BS co-located with DCS 1800 BTS

Band	Maximum level	Measurement bandwidth	Note
1710 MHz – 1785 MHz	-98 dBm	100 kHz	

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.3.3.1.

6.6.3.2.4 Co-existence with UTRA FDD

6.6.3.2.4.1 Operation in the same geographic area

This requirement may be applied to geographic areas in which both UTRA TDD and UTRA FDD are deployed.

For TDD base stations which use carrier frequencies within the band 2010 – 2025 MHz the requirements applies at all frequencies within the specified frequency bands in table 6.35. For TDD base stations which use a carrier frequency within the band 1900 – 1920 MHz the requirements applies at frequencies within the specified frequency range which are more than 12,5 MHz above the last carrier used in the frequency band 1900 – 1920 MHz.

The power of any spurious emission shall not exceed the maximum level given in table 6.35.

Table 6.35: BS Spurious emissions limits for BS in geographic coverage area of UTRA FDD

Band	Maximum Level	Measurement Bandwidth	Note
1920 – 1980 MHz	-43 dBm (*)	3,84 MHz	
2110 – 2170 MHz	-52 dBm	1 MHz	
(*) The requirement shall be measured with the lowest center frequency of measurement at 1922,6 MHz or 15 MHz above the last TDD carrier used whichever is higher.			

NOTE: The requirements in table 6.35 are based on a coupling loss of 67 dB between the TDD and FDD base stations. The scenarios leading to these requirements are addressed in TR 25.942 [9].

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.4.1.1.

6.6.3.2.4.2 Co-located base stations

This requirement may be applied for the protection of UTRA FDD BS receivers when UTRA TDD BS and UTRA FDD BS are co-located.

For TDD base stations which use carrier frequencies within the band 2010 – 2025 MHz the requirements applies at all frequencies within the specified frequency bands in table 6.36. For TDD base stations which use a carrier frequency within the band 1900 – 1920 MHz the requirements applies at frequencies within the specified frequency range which are more than 12,5 MHz above the last carrier used in the frequency band 1900 – 1920 MHz.

The power of any spurious emission shall not exceed the maximum level given in table 6.36.

Table 6.36: BS Spurious emissions limits for BS co-located with UTRA FDD

Band	Maximum Level	Measurement Bandwidth	Note
1920 – 1980 MHz	-80 dBm (*)	3,84 MHz	
2110 – 2170 MHz	-52 dBm	1 MHz	
(*) The requirement shall be measured with the lowest center frequency of measurement at 1922,6 MHz or 15 MHz above the last TDD carrier used whichever is higher.			

NOTE: The requirements in table 6.36 are based on a coupling loss of 30 dB between the TDD and FDD base stations.

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.4.2.1.

6.6.3.2.5 Co-existence with unsynchronised TDD

6.6.3.2.5.1 Operation in the same geographic area

This requirement may be applied for the protection of TDD BS receivers in geographic areas in which unsynchronised TDD is deployed.

The power of any spurious emission shall not exceed the maximum level given in table 6.36A.

Table 6.36A: BS Spurious emissions limits for operation in same geographic area with unsynchronised TDD

Band	Maximum Level	Measurement Bandwidth
1900 – 1920 MHz	–39 dBm	3,84 MHz
2010 – 2025 MHz	–39 dBm	3,84 MHz

NOTE: The requirements in Table 6.36A are based on a minimum coupling loss of 67 dB between unsynchronised TDD base stations. The scenarios leading to these requirements are addressed in TR25.942 [9].

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.5.1.1.

6.6.3.2.5.2 Co-located base stations

This requirement may be applied for the protection of TDD BS receivers when unsynchronised TDD BS are co-located.

The power of any spurious emission shall not exceed the maximum level given in table 6.36B.

Table 6.36B: BS Spurious emissions limits for co-locatation with unsynchronised TDD

Band	Maximum Level	Measurement Bandwidth
1900 – 1920 MHz	–76 dBm	3,84 MHz
2010 – 2025 MHz	–76 dBm	3,84 MHz

NOTE: The requirements in Table 6.36B are based on a minimum coupling loss of 30 dB between unsynchronised TDD base stations.

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.5.2.1.

6.6.3.3 Test purpose

The test purpose is to verify the ability of the BS to limit the interference caused by unwanted transmitter effects to other systems operating at frequencies which are more than 12,5 MHz away from of the UTRA band used.

6.6.3.4 Method of test

6.6.3.4.1 Initial conditions

Test environment: normal; see subclause 5.9.1.

RF channels to be tested: B, M and T with multiple carriers if supported; see subclause 5.3.

(1) Connect the measuring equipment to the antenna connector of the BS under test.

(2) Set the parameters of the BS transmitted signal according to table 6.37.

Table 6.37: Parameters of the BS transmitted signal for spurious emissions testing

Parameter	Value/description
TDD Duty Cycle	TS i; i = 0, 1, 2, ..., 14: transmit, if i is even; receive, if i is odd.
BS output power setting	PRAT
Number of DPCH in each active TS	9
Power of each DPCH	1/9 of Base Station output power
Data content of DPCH	real life (sufficient irregular)

6.6.3.4.2 Procedure

Measure the power of the spurious emissions by applying measurement filters with bandwidths as specified in the relevant tables of subclause 6.6.3.2. The characteristic of the filters shall be approximately Gaussian (typical spectrum analyzer filters). The center frequency of the filter shall be stepped in contiguous steps over the frequency bands as given in the tables. The step width shall be equal to the respective measurement bandwidth. The time duration of each step shall be sufficiently long to capture one active time slot.

6.6.3.5 Test Requirements

The spurious emissions measured according to subclause 6.6.3.4.2 shall not exceed the limits specified in the relevant tables of 6.6.3.2.

NOTE: If the above Test Requirement differs from the Minimum Requirement, then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 5.11 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex D.

3GPP TSG RAN WG4 (Radio) Meeting #26 **R4-030037**

Madrid, Spain 17 - 22 February, 2003

CR-Form-v7

CHANGE REQUEST

⌘ **25.142** **CR** **160** ⌘ **rev** ⌘ Current version: **4.7.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Spurious emission requirements for unsynchronized TDD operation
Source:	⌘	RAN WG4
Work item code:	⌘	TEI; LCRTDD-RF
Date:	⌘	05/03/2003
Category:	⌘	**F**
Release:	⌘	Rel-4

Use one of the following categories:
F *(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)*
Rel-6	*(Release 6)*

Reason for change:	⌘	The test of spurious emissions for co-existence with unsynchronized TDD according to the requirements in TS 25.105 section 6.6.3.5 is missing.
Summary of change:	⌘	The test requirement for co-existence with unsynchronized TDD is added. Manufacturer declarations and tables of regional requirements are updated accordingly
Consequences if not approved:	⌘	The spurious emission test will be incomplete and not aligned to TS 25.105. This leads to unsufficient protection of the BS receiver in case of unsynchronized TDD operation. **Isolated impact analysis:** Correction of a missing requirement. Proposed corrrections in this CR will not affect NodeB-UE interworking.
Clauses affected:	⌘	5.7.5 (new); 5.15; 5.17; 6.6.3.2.5 (new)

	Y	N		
Other specs affected: ⌘		X	Other core specifications	⌘
		X	Test specifications	
		X	O&M Specifications	

Other comments:	⌘	The corresponding changes to Rel-5 are incorporated in CR 161 for Rel-5, therefore no associated Cat A CR is needed.

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.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://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 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.

5.7 Tx spurious emissions

5.7.1 Category of spurious emissions limit

The manufacturer shall declare one of the following:

a) the BS shall be tested against Category A limits for spurious emissions, as defined in ITU-R Recommendation SM.329-9 [6].

or

b) the BS shall be tested against Category B limits for spurious emissions, as defined in ITU-R Recommendation SM.329-9 [6].

If the manufacturer declares Category A limits to be applicable, conformance with the spurious emissions requirements specified in subclause 6.6.3.2.1.1 is mandatory, and the requirements specified in subclause 6.6.3.2.1.2 need not to be tested.

If the manufacturer declares Category B limits to be applicable, conformance with the spurious emissions requirements specified in subclause 6.6.3.2.1.2 is mandatory, and the requirements specified in subclause 6.6.3.2.1.1 need not to be tested.

5.7.2 Co-existence with GSM

The manufacturer shall declare:

whether the BS under test is intended to operate in geographic areas in which also GSM 900 is deployed. If so, compliance with the conformance requirement specified in subclause 6.6.3.2.2.1 is mandatory; otherwise, this requirement needs not to be tested.

- whether the BS under test is intended to operate co-located with a GSM 900 BTS. If so, compliance with the conformance requirement specified in subclause 6.6.3.2.2.2 is mandatory; otherwise, this requirement needs not to be tested.

5.7.3 Co-existence with DCS 1800

The manufacturer shall declare:

whether the BS under test is intended to operate in geographic areas in which also DCS 1800 is deployed. If so, compliance with the conformance requirement specified in subclause 6.6.3.2.3.1 is mandatory; otherwise, this requirement needs not to be tested.

- whether the BS under test is intended to operate co-located with a DCS 1800 BTS. If so, compliance with the conformance requirement specified in subclause 6.6.3.2.3.2 is mandatory; otherwise, this requirement needs not to be tested.

5.7.4 Co-existence with UTRA FDD

The manufacturer shall declare:

whether the BS under test is intended to operate in geographic areas in which also UTRA FDD is deployed. If so, compliance with the conformance requirement specified in subclause 6.6.3.2.4.1 is mandatory; otherwise, this requirement needs not to be tested.

- whether the BS under test is intended to operate co-located with a UTRA FDD BS. If so, compliance with the conformance requirement specified in subclause 6.6.3.2.4.2 is mandatory; otherwise, this requirement needs not to be tested.

5.7.5 Co-existence with unsynchronised TDD

The manufacturer shall declare:

- whether the BS under test is intended to operate in geographic areas in which also unsynchronised TDD is deployed. If so, compliance with the conformance requirement specified in subclause 6.6.3.2.5.1 is mandatory; otherwise, this requirement needs not to be tested.

- whether the BS under test is intended to operate co-located with a unsynchronised TDD BS. If so, compliance with the conformance requirement specified in subclause 6.6.3.2.5.2 is mandatory; otherwise, this requirement needs not to be tested.

5.8 Blocking characteristics

--- next changed section ---

5.15 Overview of the conformance test requirements

Tables 5.9, 5.10 and 5.11 give an overview of the conformance test requirements for the transmitter, the receiver and system performance, respectively.

Table 5.9: Overview of the conformance tests requirements for the transmitter

Parameter	Subclause	Note
Maximum output power	6.2	manufacturer's declaration required
Frequency stability	6.3	manufacturer's declaration required
Output power dynamics	6.4	
Inner loop power control	6.4.1	
Power control steps	6.4.2	
Power control dynamic range	6.4.3	
Minimum output power	6.4.4	
Primary CCPCH power	6.4.5	
Differential accuracy of Primary CCPCH power	6.4.6	
Transmit OFF power	6.5.1	
Transmit ON/OFF time mask	6.5.2	
Output RF spectrum emissions	6.6	
Occupied bandwidth	6.6.1	
Out-of-band emission	6.6.2	
Spectrum emission mask	6.6.2.1	manufacturer's declaration required
Adjacent Channel Leakage power Ratio (ACLR)	6.6.2.2	manufacturer's declaration required
Spurious emissions	6.6.3	
Mandatory requirements	6.6.3.2.1	manufacturer's declaration required
Co-existence with GSM 900	6.6.3.2.2	manufacturer's declaration required
Co-existence with DCS 1800	6.6.3.2.3	manufacturer's declaration required
Co-existence with UTRA FDD	6.6.3.2.4	manufacturer's declaration required
Co-existence with unsynchronised TDD	6.6.3.2.5	manufacturer's declaration required
Transmit intermodulation	6.7	
Transmit modulation	6.8	
Modulation accuracy	6.8.1	
Peak code domain error	6.8.2	

Table 5.10: Overview of the conformance tests requirements for the receiver

Parameter	Subclause	Note
Reference sensitivity level	7.2	
Dynamic range	7.3	
Adjacent Channel Selectivity (ACS)	7.4	
Blocking characteristics	7.5	manufacturer's declaration required
Intermodulation characteristics	7.6	
Spurious emissions	7.7	

Table 5.11: Overview of the conformance test requirements for system performance

Parameter	Subclause	Note
Demodulation in static propagation conditions	8.2	
Demodulation of DCH	8.2.1	
Demodulation of DCH in multipath fading conditions	8.3	
Multipath fading Case 1	8.3.1	
Multipath fading Case 2	8.3.2	
Multipath fading Case 3	8.3.3	

--- next changed section ---

5.17 Regional requirements

Some requirements in this specification may only apply in certain regions. Table 5.12 lists all requirements that may be applied differently in different regions.

Table 5.12: List of regional requirements

Subclause number	Requirement	Comments
4.2	Frequency bands	Some bands may be applied regionally.
6.2.2	Maximum output power	In certain regions, the minimum requirement for normal conditions may apply also for some conditions outside the ranges defined for the Normal test environment in subclause 5.8.1
6.6.2.1.	Spectrum emission mask	The mask specified may be mandatory in certain regions. In other regions this mask may not be applied.
6.6.3.2.1.1	Spurious emissions (Category A)	These requirements shall be met in cases where Category A limits for spurious emissions, as defined in ITU-R Recommendation SM.329-9 [6], are applied.
6.6.3.2.1.2	Spurious emissions (Category B)	These requirements shall be met in cases where Category B limits for spurious emissions, as defined in ITU-R Recommendation SM.329-9 [6], are applied.
6.6.3.2.2.1	Co-existence with GSM900 – Operation in the same geographic area	This requirement may be applied for the protection of GSM 900 MS in geographic areas in which both GSM 900 and UTRA are deployed.
6.6.3.2.2.2	Co-existence with GSM900 – Co-located base stations	This requirement may be applied for the protection of GSM 900 BTS receivers when GSM 900 BTS and UTRA BS are co-located.
6.6.3.2.3.1	Co-existence with DCS1800 – Operation in the same geographic area	This requirement may be applied for the protection of DCS 1800 MS in geographic areas in which both DCS 1800 and UTRA are deployed.
6.6.3.2.3.2	Co-existence with DCS1800 – Co-located base stations	This requirement may be applied for the protection of DCS 1800 BTS receivers when DCS 1800 BTS and UTRA BS are co-located.
6.6.3.2.4.1	Co-existence with UTRA FDD – Operation in the same geographic area	This requirement may be applied to geographic areas in which both UTRA-TDD and UTRA-FDD are deployed.
6.6.3.2.4.2	Co-existence with UTRA FDD – Co-located base stations	This requirement may be applied for the protection of UTRA-FDD BS receivers when UTRA-TDD BS and UTRA FDD BS are co-located.
6.6.3.2.5.1	Co-existence with unsynchronised TDD – Operation in the same geographic area	This requirement may be applied for the protection of TDD BS receivers in geographic areas in which unsynchronised TDD is deployed.
6.6.3.2.5.2	Co-existence with unsynchronised TDD – Co-located base stations	This requirement may be applied for the protection of TDD BS receivers when unsynchronised TDD BS are co-located.
7.5	Blocking characteristic	The requirement is applied according to what frequency bands in subclause 4.2 that are supported by the BS.
7.5	Blocking characteristics	This requirement may be applied for the protection of UTRA TDD BS receivers when UTRA TDD BS and GSM 900/DCS1800 BS are co-located.

--- next changed section ---

6.6.3 Spurious emissions

6.6.3.1 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. This is measured at the base station RF output port.

The requirements shall apply whatever the type of transmitter considered (single carrier or multiple carrier). It applies for all transmission modes foreseen by the manufacturer's specification.

For 3.84 Mcps TDD option, either requirement applies at frequencies within the specified frequency ranges which are more than 12,5 MHz under the first carrier frequency used or more than 12,5 MHz above the last carrier frequency used.

For 1,28 Mcps TDD option, either requirement applies at frequencies within the specified frequency ranges which are more than 4 MHz under the first carrier frequency used or more than 4 MHz above the last carrier frequency used.

Unless otherwise stated, all requirements are measured as mean power.

The requirements in this subclause shall apply to base stations intended for general-purpose applications.

6.6.3.2 Minimum Requirements

6.6.3.2.1 Mandatory requirements

The requirements of either subclause 6.6.3.2.1.1 or subclause 6.6.3.2.1.2 shall apply.

6.6.3.2.1.1 Spurious emissions (Category A)

The following requirements shall be met in cases where Category A limits for spurious emissions, as defined in ITU-R Recommendation SM.329-9 [6], are applied.

6.6.3.2.1.1.1 3,84 Mcps TDD option

The power of any spurious emission shall not exceed the maximum level given in Table 6.29.

Table 6.29: BS Mandatory spurious emissions limits, Category A

Band	Maximum level	Measurement bandwidth	Note
9 kHz – 150 kHz	-13 dBm	1 kHz	Bandwidth as in ITU-R SM.329-9, s4.1
150 kHz – 30 MHz		10 kHz	Bandwidth as in ITU-R SM.329-9, s4.1
30 MHz – 1 GHz		100 kHz	Bandwidth as in ITU-R SM.329-9, s4.1
1 GHz – 12,75 GHz		1 MHz	Upper frequency as in ITU-R SM.329-9, s2.5 table 1

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.1.1.1.1.

6.6.3.2.1.1.2 1,28 Mcps TDD option

The power of any spurious emission shall not exceed the maximum level given in Table 6.29A.

Table 6.29A: BS Mandatory spurious emissions limits, Category A

Band	Maximum level	Measurement bandwidth	Note
9 kHz – 150 kHz	-13 dBm	1 kHz	Bandwidth as in ITU-R SM.329-9, s4.1
150 kHz – 30 MHz		10 kHz	Bandwidth as in ITU-R SM.329-9, s4.1
30 MHz – 1 GHz		100 kHz	Bandwidth as in ITU-R SM.329-9, s4.1
1 GHz – 12,75 GHz		1 MHz	Upper frequency as in ITU-R SM.329-9, s2.5 table 1

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.1.1.1.2.

6.6.3.2.1.2 Spurious emissions (Category B)

The following requirements shall be met in cases where Category B limits for spurious emissions, as defined in ITU-R Recommendation SM.329-9 [6], are applied.

6.6.3.2.1.2.1 3,84 Mcps TDD option

The power of any spurious emission shall not exceed the maximum levels given in Table 6.30.

Table 6.30: BS Mandatory spurious emissions limits, Category B

Band	Maximum level	Measurement bandwidth	Note
9 kHz – 150 kHz	-36 dBm	1 kHz	Bandwidth as in ITU-R SM.329-9, s4.1
150 kHz – 30 MHz	-36 dBm	10 kHz	Bandwidth as in ITU-R SM.329-9, s4.1
30 MHz – 1 GHz	-36 dBm	100 kHz	Bandwidth as in ITU-R SM.329-9, s4.1
1 GHz – Fc1 - 60 MHz or Fl - 10 MHz *whichever is the higher*	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-9, s4.1
Fc1 - 60 MHz or Fl - 10 MHz *whichever is the higher* – Fc1 - 50 MHz or Fl -10 MHz *whichever is the higher*	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329-9, s4.3 and Annex 7
Fc1 - 50 MHz or Fl -10 MHz *whichever is the higher* – Fc2 + 50 MHz or Fu +10 MHz *whichever is the lower*	-15 dBm	1 MHz	Specification in accordance with ITU-R SM.329-9, s4.3 and Annex 7
Fc2 + 50 MHz or Fu + 10 MHz *whichever is the lower* – Fc2 + 60 MHz or Fu + 10 MHz *whichever is the lower*	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329-9, s4.3 and Annex 7
Fc2 + 60 MHz or Fu + 10 MHz *whichever is the lower* – 12,75 GHz	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-9, s4.1. Upper frequency as in ITU-R SM.329-9, s2.5 table 1

Fc1: Center frequency of emission of the first carrier transmitted by the BS

Fc2: Center frequency of emission of the last carrier transmitted by the BS

Fl : Lower frequency of the band in which TDD operates

Fu : Upper frequency of the band in which TDD operates

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.1.2.1.1.

6.6.3.2.1.2.2 1,28 Mcps TDD option

The power of any spurious emission shall not exceed the maximum levels given in Table 6.30A.

Table 6.30A: BS Mandatory spurious emissions limits, Category B for 1,28 Mcps TDD

Band	Maximum Level	Measurement Bandwidth	Note
9kHz – 150kHz	-36 dBm	1 kHz	Bandwidth as in ITU SM.329-9, s4.1
150kHz – 30MHz	- 36 dBm	10 kHz	Bandwidth as in ITU SM.329-9, s4.1
30MHz – 1GHz	-36 dBm	100 kHz	Bandwidth as in ITU SM.329-9, s4.1
1GHz ↔ Fc1-19,2 MHz or Fl –10 MHz *whichever is the higher*	-30 dBm	1 MHz	Bandwidth as in ITU SM.329-9, s4.1
Fc1 – 19,2 MHz or Fl -10 MHz *whichever is the higher* ↔ Fc1 - 16 MHz or Fl –10 MHz *whichever is the higher*	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329-9, s4.1
Fc1 - 16 MHz or Fl –10 MHz *whichever is the higher* ↔ Fc2 + 16 MHz or Fu +10 MHz *whichever is the lower*	-15 dBm	1 MHz	Specification in accordance with ITU-R SM.329-9, s4.1
Fc2 + 16 MHz or Fu + 10 MHz *whichever is the lower* ↔ Fc2 +19,2 MHz or Fu + 10 MHz *whichever is the lower*	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329-9, s4.1
Fc2 + 19,2 MHz or Fu +10 MHz *whichever is the lower* ↔ 12,75 GHz	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-9, s4.1. Upper frequency as in ITU-R SM.329-9, s2.5 table 1

Fc1: Center frequency of emission of the first carrier transmitted by the BS

Fc2: Center frequency of emission of the last carrier transmitted by the BS

Fl : Lower frequency of the band in which TDD operates

Fu : Upper frequency of the band in which TDD operates

The reference for this requirement is TS 25.105 subclause 6.6.3.1.2.1.2.

6.6.3.2.2 Co-existence with GSM

6.6.3.2.2.1 Operation in the same geographic area

This requirement may be applied for the protection of GSM 900 MS in geographic areas in which both GSM 900 and UTRA are deployed.

The power of any spurious emission shall not exceed the maximum level given in Table 6.31.

Table 6.31: BS Spurious emissions limits for BS in geographic coverage area of GSM 900 MS receiver

Band	Maximum level	Measurement bandwidth	Note
921 MHz – 960 MHz	-57 dBm	100 kHz	

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.2.1.1.

6.6.3.2.2.2 Co-located base stations

This requirement may be applied for the protection of GSM 900 BTS receivers when GSM 900 BTS and UTRA BS are co-located.

The power of any spurious emission shall not exceed the maximum level given in table 6.32.

Table 6.32: BS Spurious emissions limits for protection of the GSM 900 BTS receiver

Band	Maximum level	Measurement bandwidth	Note
876 MHz – 915 MHz	–98 dBm	100 kHz	

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.2.2.1.

6.6.3.2.3 Co-existence with DCS 1800

6.6.3.2.3.1 Operation in the same geographic area

This requirement may be applied for the protection of DCS 1800 MS in geographic areas in which both DCS 1800 and UTRA are deployed.

The power of any spurious emission shall not exceed the maximum level given in table 6.33.

Table 6.33: BS Spurious emissions limits for BS in geographic coverage area of DCS 1800 MS receiver

Band	Maximum level	Measurement bandwidth	Note
1805 MHz – 1880 MHz	-47 dBm	100 kHz	

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.3.1.1.

6.6.3.2.3.2 Co-located base stations

This requirement may be applied for the protection of DCS 1800 BTS receivers when DCS 1800 BTS and UTRA BS are co-located.

The power of any spurious emission shall not exceed the maximum level given in table 6.34.

Table 6.34: BS Spurious emissions limits for BS co-located with DCS 1800 BTS

Band	Maximum level	Measurement bandwidth	Note
1710 MHz – 1785 MHz	-98 dBm	100 kHz	

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.3.2.1.

6.6.3.2.4 Co-existence with UTRA FDD

6.6.3.2.4.1 Operation in the same geographic area

This requirement may be applied to geographic areas in which both UTRA TDD and UTRA FDD are deployed.

For TDD base stations which use carrier frequencies within the band 2010 – 2025 MHz the requirements applies at all frequencies within the specified frequency bands in table 6.35. For 3,84 Mcps TDD option base stations which use a carrier frequency within the band 1900-1920 MHz, the requirement applies at frequencies within the specified frequency range which are more than 12,5 MHz above the last carrier used in the frequency band 1900-1920 MHz. For 1,28 Mcps TDD option base stations which use carrier frequencies within the band 1900-1920 MHz, the requirement

applies at frequencies within the specified frequency range which are more than 4 MHz above the last carrier used in the frequency band 1900-1920 MHz.

The power of any spurious emission shall not exceed the maximum level given in table 6.35.

Table 6.35: BS Spurious emissions limits for BS in geographic coverage area of UTRA FDD

Band	Maximum Level	Measurement Bandwidth	Note
1920 – 1980 MHz	-43 dBm (*)	3,84 MHz	
2110 – 2170 MHz	-52 dBm	1 MHz	
Note *: For 3,84 Mcps TDD option base stations, the requirement shall be measured with the lowest center frequency of measurement at 1922,6 MHz or 15 MHz above the last TDD carrier used, whichever is higher. For 1,28 Mcps TDD option base stations, the requirement shall be measured with the lowest center frequency of measurement at 1922,6 MHz or 6,6 MHz above the last TDD carrier used, whichever is higher.			

NOTE: The requirements in table 6.35 are based on a coupling loss of 67dB between the TDD and FDD base stations. The scenarios leading to these requirements are addressed in TR 25.942 [9].

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.4.1.1.

6.6.3.2.4.2 Co-located base stations

This requirement may be applied for the protection of UTRA FDD BS receivers when UTRA TDD BS and UTRA FDD BS are co-located.

For TDD base stations which use carrier frequencies within the band 2010 – 2025 MHz the requirements applies at all frequencies within the specified frequency bands in table 6.36. For 3,84 Mcps TDD option base stations which use a carrier frequency within the band 1900-1920 MHz, the requirement applies at frequencies within the specified frequency range which are more than 12,5 MHz above the last carrier used in the frequency band 1900-1920 MHz. For 1,28 Mcps TDD option base stations which use carrier frequencies within the band 1900-1920 MHz, the requirement applies at frequencies within the specified frequency range which are more than 4 MHz above the last carrier used in the frequency band 1900-1920 MHz.

The power of any spurious emission shall not exceed the maximum level given in table 6.36.

Table 6.36: BS Spurious emissions limits for BS co-located with UTRA FDD

Band	Maximum Level	Measurement Bandwidth	Note
1920 – 1980 MHz	-80 dBm (*)	3,84 MHz	
2110 – 2170 MHz	-52 dBm	1 MHz	
Note *: For 3,84 Mcps TDD option base stations, the requirement shall be measured with the lowest center frequency of measurement at 1922,6 MHz or 15 MHz above the last TDD carrier used, whichever is higher. For 1,28 Mcps TDD option base stations, the requirement shall be measured with the lowest center frequency of measurement at 1922,6 MHz or 6,6 MHz above the last TDD carrier used, whichever is higher.			

NOTE: The requirements in table 6.36 are based on a minimum coupling loss of 30 dB between base stations.

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.4.2.1.

6.6.3.2.5 Co-existence with unsynchronised TDD

6.6.3.2.5.1 Operation in the same geographic area

This requirement may be applied for the protection of TDD BS receivers in geographic areas in which unsynchronised TDD is deployed.

6.6.3.2.5.1.1 3,84 Mcps TDD option

The power of any spurious emission shall not exceed the maximum level given in table 6.36A.

Table 6.36A: BS Spurious emissions limits for operation in same geographic area with unsynchronised TDD

Band	Maximum Level	Measurement Bandwidth
1900 – 1920 MHz	–39 dBm	3,84 MHz
2010 – 2025 MHz	–39 dBm	3,84 MHz

NOTE: The requirements in Table 6.36A are based on a minimum coupling loss of 67 dB between unsynchronised TDD base stations. The scenarios leading to these requirements are addressed in TR25.942 [9].

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.5.1.1.1.

6.6.3.2.5.1.2 1,28 Mcps TDD option

In geographic areas where only 1,28 Mcps TDD is deployed, the power of any spurious emission shall not exceed the maximum level given in table 6.36A1, otherwise the limits in table 6.36A2 shall apply.

Table 6.36A1: BS Spurious emissions limits for operation in same geographic area with unsynchronised 1,28 Mcps TDD

Band	Maximum Level	Measurement Bandwidth
1900 – 1920 MHz	–39 dBm	1,28 MHz
2010 – 2025 MHz	–39 dBm	1,28 MHz

Table 6.36A2: BS Spurious emissions limits for operation in same geographic area with unsynchronised TDD

Band	Maximum Level	Measurement Bandwidth
1900 – 1920 MHz	–39 dBm	3,84 MHz
2010 – 2025 MHz	–39 dBm	3,84 MHz

NOTE: The requirements in Table 6.36A1 and 6.36A2 are based on a minimum coupling loss of 67 dB between unsynchronised TDD base stations. The scenarios leading to these requirements are addressed in TR25.942 [9].

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.5.1.1.2.

6.6.3.2.5.2 Co-located base stations

This requirement may be applied for the protection of TDD BS receivers when unsynchronised TDD BS are co-located.

6.6.3.2.5.2.1 3,84 Mcps TDD option

The power of any spurious emission shall not exceed the maximum level given in table 6.36B.

Table 6.36B: BS Spurious emissions limits for co-location with unsynchronised TDD

Band	Maximum Level	Measurement Bandwidth
1900 – 1920 MHz	–76 dBm	3,84 MHz
2010 – 2025 MHz	–76 dBm	3,84 MHz

NOTE: The requirements in Table 6.36B are based on a minimum coupling loss of 30 dB between unsynchronised TDD base stations.

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.5.2.1.1.

6.6.3.2.5.2.2 1,28 Mcps TDD option

In geographic areas where only 1,28 Mcps TDD is deployed, the power of any spurious emission in case of co-location shall not exceed the maximum level given in table 6.36B1, otherwise the limits in table 6.36B2 shall apply.

Table 6.36B1: BS Spurious emissions limits for co-location with unsynchronised 1,28 Mcps TDD

Band	Maximum Level	Measurement Bandwidth
1900 – 1920 MHz	–76 dBm	1,28 MHz
2010 – 2025 MHz	–76 dBm	1,28 MHz

Table 6.36B2: BS Spurious emissions limits for co-location with unsynchronised TDD

Band	Maximum Level	Measurement Bandwidth
1900 – 1920 MHz	–76 dBm	3,84 MHz
2010 – 2025 MHz	–76 dBm	3,84 MHz

NOTE: The requirements in Table 6.36B1 and 6.36B2 are based on a minimum coupling loss of 30 dB between unsynchronised TDD base stations.

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.5.2.1.2.

6.6.3.3 Test purpose

6.6.3.3.1 3,84 Mcps TDD option

The test purpose is to verify the ability of the BS to limit the interference caused by unwanted transmitter effects to other systems operating at frequencies which are more than 12,5 MHz away from of the UTRA band used.

6.6.3.3.2 1,28 Mcps TDD option

The test purpose is to verify the ability of the BS to limit the interference caused by unwanted transmitter effects to other systems operating at frequencies which are more than 4 MHz away from of the UTRA band used.

6.6.3.4 Method of test

6.6.3.4.1 Initial conditions

6.6.3.4.1.0 General test conditions

Test environment: normal; see subclause 5.9.1.

RF channels to be tested: B, M and T with multiple carriers if supported; see subclause 5.3.

6.6.3.4.1.1 3,84 Mcps TDD option

(1) Connect the measuring equipment to the antenna connector of the BS under test.

(2) Set the parameters of the BS transmitted signal according to table 6.37.

Table 6.37: Parameters of the BS transmitted signal for spurious emissions testing

Parameter	Value/description
TDD Duty Cycle	TS i; i = 0, 1, 2, ..., 14: transmit, if i is even; receive, if i is odd.
Time slot carrying SCH	TS0
Time slots under test	TS i, i even and non zero
BS output power setting	PRAT
Number of DPCH in each time slot under test	9
Power of each DPCH	1/9 of Base Station output power
Data content of DPCH	real life (sufficient irregular)

6.6.3.4.1.2 1,28 Mcps TDD option

(1) Connect the measuring equipment to the antenna connector of the BS under test.

(2) Set the parameters of the BS transmitted signal according to table 6.37A.

Table 6.37A: Parameters of the BS transmitted signal for spurious emissions testing for 1,28 Mcps TDD

Parameter	Value/description
TDD Duty Cycle	TS i; i = 0, 1, 2, 3, 4, 5, 6: transmit, if i is 0,4,5,6; receive, if i is 1,2,3.
Time slots under test	TS4, TS5 and TS6
BS output power setting	PRAT
Number of DPCH in each time slot under test	8
Power of each DPCH	1/8 of Base Station output power
Data content of DPCH	real life (sufficient irregular)

6.6.3.4.2 Procedure

Measure the power of the spurious emissions by applying measurement filters with bandwidths as specified in the relevant tables of subclause 6.6.3.2. The characteristic of the filters shall be approximately Gaussian (typical spectrum analyzer filters). The center frequency of the filter shall be stepped in contiguous steps over the frequency bands as given in the tables. The step width shall be equal to the respective measurement bandwidth. The time duration of each step shall be sufficiently long to capture one active time slot.

6.6.3.5 Test Requirements

NOTE: If the Test Requirement below differs from the Minimum Requirement, then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 5.11 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex D.

The spurious emissions measured according to subclause 6.6.3.4.2 shall not exceed the limits specified in the relevant tables of 6.6.3.2.

3GPP TSG RAN WG4 (Radio) Meeting #26 **R4-030038**

Madrid, Spain 17 - 22 February, 2003

CR-Form-v7

CHANGE REQUEST

⌘ **25.142** **CR** **161** ⌘ **rev** ⌘ Current version: **5.3.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Spurious emission requirements for unsynchronized TDD operation
Source:	⌘	RAN WG4
Work item code:	⌘	TEI; LCRTDD-RF; RInImp-BSClass-TDD
Date:	⌘	05/03/2003
Category:	⌘	**F**
Release:	⌘	Rel-5

Use one of the following categories:
F *(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)*
Rel-6	*(Release 6)*

Reason for change:	⌘	The test of spurious emissions for co-existence with unsynchronized TDD according to the requirements in TS 25.105 section 6.6.3.5 is missing.
Summary of change:	⌘	The test requirement for co-existence with unsynchronized TDD is added. Manufacturer declarations and tables of regional requirements are updated accordingly
Consequences if not approved:	⌘	The spurious emission test will be incomplete and not aligned to TS 25.105. This leads to unsufficient protection of the BS receiver in case of unsynchronized TDD operation.

Clauses affected:	⌘	5.7.5 (new); 5.15; 5.17; 6.6.3.2.5 (new)

Other specs affected: ⌘	Y	N	
		X	Other core specifications
		X	Test specifications
		X	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/specs/CR.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://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 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.

5.7 Tx spurious emissions

5.7.1 Category of spurious emissions limit

The manufacturer shall declare one of the following:

a) the BS shall be tested against Category A limits for spurious emissions, as defined in ITU-R Recommendation SM.329-9 [6].

or

b) the BS shall be tested against Category B limits for spurious emissions, as defined in ITU-R Recommendation SM.329-9 [6].

If the manufacturer declares Category A limits to be applicable, conformance with the spurious emissions requirements specified in subclause 6.6.3.2.1.1 is mandatory, and the requirements specified in subclause 6.6.3.2.1.2 need not to be tested.

If the manufacturer declares Category B limits to be applicable, conformance with the spurious emissions requirements specified in subclause 6.6.3.2.1.2 is mandatory, and the requirements specified in subclause 6.6.3.2.1.1 need not to be tested.

5.7.2 Co-existence with GSM

The manufacturer shall declare:

whether the BS under test is intended to operate in geographic areas in which also GSM 900 is deployed. If so, compliance with the conformance requirement specified in subclause 6.6.3.2.2.1 is mandatory; otherwise, this requirement needs not to be tested.

- whether the BS under test is intended to operate co-located with a GSM 900 BTS. If so, compliance with the conformance requirement specified in subclause 6.6.3.2.2.2 is mandatory; otherwise, this requirement needs not to be tested.

5.7.3 Co-existence with DCS 1800

The manufacturer shall declare:

whether the BS under test is intended to operate in geographic areas in which also DCS 1800 is deployed. If so, compliance with the conformance requirement specified in subclause 6.6.3.2.3.1 is mandatory; otherwise, this requirement needs not to be tested.

- whether the BS under test is intended to operate co-located with a DCS 1800 BTS. If so, compliance with the conformance requirement specified in subclause 6.6.3.2.3.2 is mandatory; otherwise, this requirement needs not to be tested.

5.7.5 Co-existence with unsynchronised TDD

The manufacturer shall declare:

whether the BS under test is intended to operate in geographic areas in which also unsynchronised TDD is deployed. If so, compliance with the conformance requirement specified in subclause 6.6.3.2.5.1 is mandatory; otherwise, this requirement needs not to be tested.

whether the BS under test is intended to operate co-located with a unsynchronised TDD BS. If so, compliance with the conformance requirement specified in subclause 6.6.3.2.5.2 is mandatory; otherwise, this requirement needs not to be tested.

5.7.4 Co-existence with UTRA FDD

The manufacturer shall declare:

whether the BS under test is intended to operate in geographic areas in which also UTRA FDD is deployed. If so, compliance with the conformance requirement specified in subclause 6.6.3.2.4.1 is mandatory; otherwise, this requirement needs not to be tested.

- whether the BS under test is intended to operate co-located with a UTRA FDD BS. If so, compliance with the conformance requirement specified in subclause 6.6.3.2.4.2 is mandatory; otherwise, this requirement needs not to be tested.

5.8 Blocking characteristics

--- next changed section ---

5.15 Overview of the conformance test requirements

Tables 5.9, 5.10 and 5.11 give an overview of the conformance test requirements for the transmitter, the receiver and system performance, respectively.

Table 5.9: Overview of the conformance tests requirements for the transmitter

Parameter	Subclause	Note
Maximum output power	6.2	manufacturer's declaration required
Frequency stability	6.3	manufacturer's declaration required
Output power dynamics	6.4	
Inner loop power control	6.4.1	
Power control steps	6.4.2	
Power control dynamic range	6.4.3	
Minimum output power	6.4.4	
Primary CCPCH power	6.4.5	
Differential accuracy of Primary CCPCH power	6.4.6	
Transmit OFF power	6.5.1	
Transmit ON/OFF time mask	6.5.2	
Output RF spectrum emissions	6.6	
Occupied bandwidth	6.6.1	
Out-of-band emission	6.6.2	
Spectrum emission mask	6.6.2.1	manufacturer's declaration required
Adjacent Channel Leakage power Ratio (ACLR)	6.6.2.2	manufacturer's declaration required
Spurious emissions	6.6.3	
Mandatory requirements	6.6.3.2.1	manufacturer's declaration required
Co-existence with GSM 900	6.6.3.2.2	manufacturer's declaration required
Co-existence with DCS 1800	6.6.3.2.3	manufacturer's declaration required
Co-existence with UTRA FDD	6.6.3.2.4	manufacturer's declaration required
Co-existence with unsynchronised TDD	6.6.3.2.5	manufacturer's declaration required
Transmit intermodulation	6.7	
Transmit modulation	6.8	
Modulation accuracy	6.8.1	
Peak code domain error	6.8.2	

Table 5.10: Overview of the conformance tests requirements for the receiver

Parameter	Subclause	Note
Reference sensitivity level	7.2	
Dynamic range	7.3	
Adjacent Channel Selectivity (ACS)	7.4	
Blocking characteristics	7.5	manufacturer's declaration required
Intermodulation characteristics	7.6	
Spurious emissions	7.7	

Table 5.11: Overview of the conformance test requirements for system performance

Parameter	Subclause	Note
Demodulation in static propagation conditions	8.2	
Demodulation of DCH	8.2.1	
Demodulation of DCH in multipath fading conditions	8.3	
Multipath fading Case 1	8.3.1	
Multipath fading Case 2	8.3.2	
Multipath fading Case 3	8.3.3	

--- next changed section ---

5.17 Regional requirements

Some requirements in this specification may only apply in certain regions. Table 5.12 lists all requirements that may be applied differently in different regions.

Table 5.12: List of regional requirements

Subclause number	Requirement	Comments
4.2	Frequency bands	Some bands may be applied regionally.
6.2.2	Maximum output power	In certain regions, the minimum requirement for normal conditions may apply also for some conditions outside the ranges defined for the Normal test environment in subclause 5.8.1
6.6.2.1.	Spectrum emission mask	The mask specified may be mandatory in certain regions. In other regions this mask may not be applied.
6.6.3.2.1.1	Spurious emissions (Category A)	These requirements shall be met in cases where Category A limits for spurious emissions, as defined in ITU-R Recommendation SM.329-9 [6], are applied.
6.6.3.2.1.2	Spurious emissions (Category B)	These requirements shall be met in cases where Category B limits for spurious emissions, as defined in ITU-R Recommendation SM.329-9 [6], are applied.
6.6.3.2.2.1	Co-existence with GSM900 – Operation in the same geographic area	This requirement may be applied for the protection of GSM 900 MS in geographic areas in which both GSM 900 and UTRA are deployed.
6.6.3.2.2.2	Co-existence with GSM900 – Co-located base stations	This requirement may be applied for the protection of GSM 900 BTS receivers when GSM 900 BTS and UTRA BS are co-located.
6.6.3.2.3.1	Co-existence with DCS1800 – Operation in the same geographic area	This requirement may be applied for the protection of DCS 1800 MS in geographic areas in which both DCS 1800 and UTRA are deployed.
6.6.3.2.3.2	Co-existence with DCS1800 – Co-located base stations	This requirement may be applied for the protection of DCS 1800 BTS receivers when DCS 1800 BTS and UTRA BS are co-located.
6.6.3.2.4.1	Co-existence with UTRA FDD – Operation in the same geographic area	This requirement may be applied to geographic areas in which both UTRA-TDD and UTRA-FDD are deployed.
6.6.3.2.4.2	Co-existence with UTRA FDD – Co-located base stations	This requirement may be applied for the protection of UTRA-FDD BS receivers when UTRA-TDD BS and UTRA FDD BS are co-located.
6.6.3.2.5.1	Co-existence with unsynchronised TDD – Operation in the same geographic area	This requirement may be applied for the protection of TDD BS receivers in geographic areas in which unsynchronised TDD is deployed.
6.6.3.2.5.2	Co-existence with unsynchronised TDD – Co-located base stations	This requirement may be applied for the protection of TDD BS receivers when unsynchronised TDD BS are co-located.
7.5	Blocking characteristic	The requirement is applied according to what frequency bands in subclause 4.2 that are supported by the BS.
7.5	Blocking characteristics	This requirement may be applied for the protection of UTRA TDD BS receivers when UTRA TDD BS and GSM 900/DCS1800 BS are co-located.

--- next changed section ---

6.6.3 Spurious emissions

6.6.3.1 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. This is measured at the base station RF output port.

The requirements shall apply whatever the type of transmitter considered (single carrier or multiple carrier). It applies for all transmission modes foreseen by the manufacturer's specification.

For 3.84 Mcps TDD option, either requirement applies at frequencies within the specified frequency ranges which are more than 12,5 MHz under the first carrier frequency used or more than 12,5 MHz above the last carrier frequency used.

For 1,28 Mcps TDD option, either requirement applies at frequencies within the specified frequency ranges which are more than 4 MHz under the first carrier frequency used or more than 4 MHz above the last carrier frequency used.

Unless otherwise stated, all requirements are measured as mean power.

The requirements in this subclause shall apply to both Wide Area BS and Local Area BS, with the exception of the requirements which may be applied for co-existence with UTRA FDD; in this case, different requirements shall apply to Wide Area BS and Local Area BS.

6.6.3.2 Minimum Requirements

6.6.3.2.1 Mandatory requirements

The requirements of either subclause 6.6.3.2.1.1 or subclause 6.6.3.2.1.2 shall apply.

6.6.3.2.1.1 Spurious emissions (Category A)

The following requirements shall be met in cases where Category A limits for spurious emissions, as defined in ITU-R Recommendation SM.329-9 [6], are applied.

6.6.3.2.1.1.1 3,84 Mcps TDD option

The power of any spurious emission shall not exceed the maximum level given in Table 6.29.

Table 6.29: BS Mandatory spurious emissions limits, Category A

Band	Maximum level	Measurement bandwidth	Note
9 kHz – 150 kHz	-13 dBm	1 kHz	Bandwidth as in ITU-R SM.329-9, s4.1
150 kHz – 30 MHz		10 kHz	Bandwidth as in ITU-R SM.329-9, s4.1
30 MHz – 1 GHz		100 kHz	Bandwidth as in ITU-R SM.329-9, s4.1
1 GHz – 12,75 GHz		1 MHz	Upper frequency as in ITU-R SM.329-9, s2.5 table 1

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.1.1.1.1.

6.6.3.2.1.1.2 1,28 Mcps TDD option

The power of any spurious emission shall not exceed the maximum level given in Table 6.29A.

Table 6.29A: BS Mandatory spurious emissions limits, Category A

Band	Maximum level	Measurement bandwidth	Note
9 kHz – 150 kHz	-13 dBm	1 kHz	Bandwidth as in ITU-R SM.329-9, s4.1
150 kHz – 30 MHz		10 kHz	Bandwidth as in ITU-R SM.329-9, s4.1
30 MHz – 1 GHz		100 kHz	Bandwidth as in ITU-R SM.329-9, s4.1
1 GHz – 12,75 GHz		1 MHz	Upper frequency as in ITU-R SM.329-9, s2.5 table 1

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.1.1.1.2.

6.6.3.2.1.2 Spurious emissions (Category B)

The following requirements shall be met in cases where Category B limits for spurious emissions, as defined in ITU-R Recommendation SM.329-9 [6], are applied.

6.6.3.2.1.2.1 3,84 Mcps TDD option

The power of any spurious emission shall not exceed the maximum levels given in Table 6.30.

Table 6.30: BS Mandatory spurious emissions limits, Category B

Band	Maximum level	Measurement bandwidth	Note
9 kHz – 150 kHz	-36 dBm	1 kHz	Bandwidth as in ITU-R SM.329-9, s4.1
150 kHz – 30 MHz	-36 dBm	10 kHz	Bandwidth as in ITU-R SM.329-9, s4.1
30 MHz – 1 GHz	-36 dBm	100 kHz	Bandwidth as in ITU-R SM.329-9, s4.1
1 GHz – Fc1 - 60 MHz or Fl - 10 MHz *whichever is the higher*	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-9, s4.1
Fc1 - 60 MHz or Fl - 10 MHz *whichever is the higher* – Fc1 - 50 MHz or Fl -10 MHz *whichever is the higher*	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329-9, s4.3 and Annex 7
Fc1 - 50 MHz or Fl -10 MHz *whichever is the higher* – Fc2 + 50 MHz or Fu +10 MHz *whichever is the lower*	-15 dBm	1 MHz	Specification in accordance with ITU-R SM.329-9, s4.3 and Annex 7
Fc2 + 50 MHz or Fu + 10 MHz *whichever is the lower* – Fc2 + 60 MHz or Fu + 10 MHz *whichever is the lower*	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329-9, s4.3 and Annex 7
Fc2 + 60 MHz or Fu + 10 MHz *whichever is the lower* – 12,75 GHz	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-9, s4.1. Upper frequency as in ITU-R SM.329-9, s2.5 table 1

Fc1: Center frequency of emission of the first carrier transmitted by the BS

Fc2: Center frequency of emission of the last carrier transmitted by the BS

Fl : Lower frequency of the band in which TDD operates

Fu : Upper frequency of the band in which TDD operates

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.1.2.1.1.

6.6.3.2.1.2.2 1,28 Mcps TDD option

The power of any spurious emission shall not exceed the maximum levels given in Table 6.30A.

Table 6.30A: BS Mandatory spurious emissions limits, Category B for 1,28 Mcps TDD

Band	Maximum Level	Measurement Bandwidth	Note
9kHz – 150kHz	-36 dBm	1 kHz	Bandwidth as in ITU SM.329-9, s4.1
150kHz – 30MHz	- 36 dBm	10 kHz	Bandwidth as in ITU SM.329-9, s4.1
30MHz – 1GHz	-36 dBm	100 kHz	Bandwidth as in ITU SM.329-9, s4.1
1GHz ↔ Fc1-19,2 MHz or Fl –10 MHz *whichever is the higher*	-30 dBm	1 MHz	Bandwidth as in ITU SM.329-9, s4.1
Fc1 – 19,2 MHz or Fl -10 MHz *whichever is the higher* ↔ Fc1 - 16 MHz or Fl –10 MHz *whichever is the higher*	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329-9, s4.1
Fc1 - 16 MHz or Fl –10 MHz *whichever is the higher* ↔ Fc2 + 16 MHz or Fu +10 MHz *whichever is the lower*	-15 dBm	1 MHz	Specification in accordance with ITU-R SM.329-9, s4.1
Fc2 + 16 MHz or Fu + 10 MHz *whichever is the lower* ↔ Fc2 +19,2 MHz or Fu + 10 MHz *whichever is the lower*	-25 dBm	1 MHz	Specification in accordance with ITU-R SM.329-9, s4.1
Fc2 + 19,2 MHz or Fu +10 MHz *whichever is the lower* ↔ 12,75 GHz	-30 dBm	1 MHz	Bandwidth as in ITU-R SM.329-9, s4.1. Upper frequency as in ITU-R SM.329-9, s2.5 table 1

Fc1: Center frequency of emission of the first carrier transmitted by the BS

Fc2: Center frequency of emission of the last carrier transmitted by the BS

Fl : Lower frequency of the band in which TDD operates

Fu : Upper frequency of the band in which TDD operates

The reference for this requirement is TS 25.105 subclause 6.6.3.1.2.1.2.

6.6.3.2.2 Co-existence with GSM

6.6.3.2.2.1 Operation in the same geographic area

This requirement may be applied for the protection of GSM 900 MS in geographic areas in which both GSM 900 and UTRA are deployed.

The power of any spurious emission shall not exceed the maximum level given in Table 6.31.

Table 6.31: BS Spurious emissions limits for BS in geographic coverage area of GSM 900 MS receiver

Band	Maximum level	Measurement bandwidth	Note
921 MHz – 960 MHz	-57 dBm	100 kHz	

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.2.1.1.

6.6.3.2.2.2 Co-located base stations

This requirement may be applied for the protection of GSM 900 BTS receivers when GSM 900 BTS and UTRA BS are co-located.

The power of any spurious emission shall not exceed the maximum level given in table 6.32.

Table 6.32: BS Spurious emissions limits for protection of the GSM 900 BTS receiver

Band	Maximum level	Measurement bandwidth	Note
876 MHz – 915 MHz	–98 dBm	100 kHz	

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.2.2.1.

6.6.3.2.3 Co-existence with DCS 1800

6.6.3.2.3.1 Operation in the same geographic area

This requirement may be applied for the protection of DCS 1800 MS in geographic areas in which both DCS 1800 and UTRA are deployed.

The power of any spurious emission shall not exceed the maximum level given in table 6.33.

Table 6.33: BS Spurious emissions limits for BS in geographic coverage area of DCS 1800 MS receiver

Band	Maximum level	Measurement bandwidth	Note
1805 MHz – 1880 MHz	-47 dBm	100 kHz	

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.3.1.1.

6.6.3.2.3.2 Co-located base stations

This requirement may be applied for the protection of DCS 1800 BTS receivers when DCS 1800 BTS and UTRA BS are co-located.

The power of any spurious emission shall not exceed the maximum level given in table 6.34.

Table 6.34: BS Spurious emissions limits for BS co-located with DCS 1800 BTS

Band	Maximum level	Measurement bandwidth	Note
1710 MHz – 1785 MHz	-98 dBm	100 kHz	

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.3.2.1.

6.6.3.2.4 Co-existence with UTRA FDD

6.6.3.2.4.1 Operation in the same geographic area

This requirement may be applied to geographic areas in which both UTRA TDD and UTRA FDD are deployed.

For TDD base stations which use carrier frequencies within the band 2010 – 2025 MHz the requirements applies at all frequencies within the specified frequency bands in table 6.35. For 3,84 Mcps TDD option base stations which use a carrier frequency within the band 1900-1920 MHz, the requirement applies at frequencies within the specified frequency range which are more than 12,5 MHz above the last carrier used in the frequency band 1900-1920 MHz. For 1,28 Mcps TDD option base stations which use carrier frequencies within the band 1900-1920 MHz, the requirement

applies at frequencies within the specified frequency range which are more than 4 MHz above the last carrier used in the frequency band 1900-1920 MHz.

The power of any spurious emission shall not exceed the maximum level given in table 6.35.

Table 6.35: BS Spurious emissions limits for BS in geographic coverage area of UTRA FDD

BS Class	Band	Maximum Level	Measurement Bandwidth	Note
Wide Area BS	1920 – 1980 MHz	-43 dBm (*)	3,84 MHz	
Wide Area BS	2110 – 2170 MHz	-52 dBm	1 MHz	
Local Area BS	1920 – 1980 MHz	-40 dBm (*)	3,84 MHz	
Local Area BS	2110 – 2170 MHz	-52 dBm	1 MHz	
Note *: For 3,84 Mcps TDD option base stations, the requirement shall be measured with the lowest center frequency of measurement at 1922,6 MHz or 15 MHz above the last TDD carrier used, whichever is higher. For 1,28 Mcps TDD option base stations, the requirement shall be measured with the lowest center frequency of measurement at 1922,6 MHz or 6,6 MHz above the last TDD carrier used, whichever is higher.				

NOTE: The requirements for Wide Area BS in Table 6.35 are based on a coupling loss of 67 dB between the TDD and FDD base stations. The requirements for Local Area BS in Table 6.35 are based on a coupling loss of 70 dB between TDD and FDD Wide Area base stations. The scenarios leading to these requirements are addressed in TR 25.942 [9].

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.4.1.1.

6.6.3.2.4.2 Co-located base stations

This requirement may be applied for the protection of UTRA FDD BS receivers when UTRA TDD BS and UTRA FDD BS are co-located.

For TDD base stations which use carrier frequencies within the band 2010 – 2025 MHz the requirements applies at all frequencies within the specified frequency bands in table 6.36. For 3,84 Mcps TDD option base stations which use a carrier frequency within the band 1900-1920 MHz, the requirement applies at frequencies within the specified frequency range which are more than 12,5 MHz above the last carrier used in the frequency band 1900-1920 MHz. For 1,28 Mcps TDD option base stations which use carrier frequencies within the band 1900-1920 MHz, the requirement applies at frequencies within the specified frequency range which are more than 4 MHz above the last carrier used in the frequency band 1900-1920 MHz.

The power of any spurious emission shall not exceed the maximum level given in table 6.36.

Table 6.36: BS Spurious emissions limits for BS co-located with UTRA FDD

BS Class	Band	Maximum Level	Measurement Bandwidth	Note
Wide Area BS	1920 – 1980 MHz	-80 dBm (*)	3,84 MHz	
Wide Area BS	2110 – 2170 MHz	-52 dBm	1 MHz	
Note *: For 3,84 Mcps TDD option base stations, the requirement shall be measured with the lowest center frequency of measurement at 1922,6 MHz or 15 MHz above the last TDD carrier used, whichever is higher. For 1,28 Mcps TDD option base stations, the requirement shall be measured with the lowest center frequency of measurement at 1922,6 MHz or 6,6 MHz above the last TDD carrier used, whichever is higher.				

NOTE: The requirements in table 6.36 are based on a minimum coupling loss of 30 dB between base stations. The co-location of different base station classes is not considered. A co-location requirement for the Local Area TDD BS is intended to be part of a later release.

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.4.2.1.

6.6.3.2.5 Co-existence with unsynchronised TDD

6.6.3.2.5.1 Operation in the same geographic area

This requirement may be applied for the protection of TDD BS receivers in geographic areas in which unsynchronised TDD is deployed.

6.6.3.2.5.1.1 3,84 Mcps TDD option

The power of any spurious emission shall not exceed the maximum level given in table 6.36A.

Table 6.36A: BS Spurious emissions limits for operation in same geographic area with unsynchronised TDD

BS Class	Band	Maximum Level	Measurement Bandwidth
Wide Area BS	1900 – 1920 MHz	–39 dBm	3,84 MHz
Wide Area BS	2010 – 2025 MHz	–39 dBm	3,84 MHz
Local Area BS	1900 – 1920 MHz	–36 dBm	3,84 MHz
Local Area BS	2010 – 2025 MHz	–36 dBm	3,84 MHz

NOTE: The requirements in Table 6.36A for the Wide Area BS are based on a minimum coupling loss of 67 dB between unsynchronised TDD base stations. The requirements in Table 6.36A for the Local Area BS are based on a coupling loss of 70 dB between unsynchronised Wide Area and Local Area TDD base stations. The scenarios leading to these requirements are addressed in TR25.942 [9].

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.5.1.1.1.

6.6.3.2.5.1.2 1,28 Mcps TDD option

In geographic areas where only 1,28 Mcps TDD is deployed, the power of any spurious emission shall not exceed the maximum level given in table 6.36A1, otherwise the limits in table 6.36A2 shall apply.

Table 6.36A1: BS Spurious emissions limits for operation in same geographic area with unsynchronised 1,28 Mcps TDD

BS Class	Band	Maximum Level	Measurement Bandwidth
Wide Area BS	1900 – 1920 MHz	–39 dBm	1,28 MHz
Wide Area BS	2010 – 2025 MHz	–39 dBm	1,28 MHz
Local Area BS	1900 – 1920 MHz	–36 dBm	1,28 MHz
Local Area BS	2010 – 2025 MHz	–36 dBm	1,28 MHz

Table 6.36A2: BS Spurious emissions limits for operation in same geographic area with unsynchronised TDD

BS Class	Band	Maximum Level	Measurement Bandwidth
Wide Area BS	1900 – 1920 MHz	–39 dBm	3,84 MHz
Wide Area BS	2010 – 2025 MHz	–39 dBm	3,84 MHz
Local Area BS	1900 – 1920 MHz	–36 dBm	3,84 MHz
Local Area BS	2010 – 2025 MHz	–36 dBm	3,84 MHz

NOTE: The requirements in Table 6.36A1 and 6.36A2 for the Wide Area BS are based on a minimum coupling loss of 67 dB between unsynchronised TDD base stations. The requirements in Table 6.36A1 and 6.36A2 for the Local Area BS are based on a coupling loss of 70 dB between unsynchronised Wide Area and Local Area TDD base stations. The scenarios leading to these requirements are addressed in TR25.942 [9].

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.5.1.1.2.

6.6.3.2.5.2 Co-located base stations

This requirement may be applied for the protection of TDD BS receivers when unsynchronised TDD BS are co-located.

6.6.3.2.5.2.1 3,84 Mcps TDD option

The power of any spurious emission shall not exceed the maximum level given in table 6.36B.

Table 6.36B: BS Spurious emissions limits for co-location with unsynchronised TDD

BS Class	Band	Maximum Level	Measurement Bandwidth
Wide Area BS	1900 – 1920 MHz	–76 dBm	3,84 MHz
Wide Area BS	2010 – 2025 MHz	–76 dBm	3,84 MHz
Local Area BS	1900 – 1920 MHz	–36 dBm	3,84 MHz
Local Area BS	2010 – 2025 MHz	–36 dBm	3,84 MHz

NOTE: The requirements in Table 6.36B for the Wide Area BS are based on a minimum coupling loss of 30 dB between unsynchronised TDD base stations. The requirements in Table 6.36B for the Local Area BS are based on a minimum coupling loss of 45 dB between unsynchronised Local Area base stations. The co-location of different base station classes is not considered.

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.5.2.1.1.

6.6.3.2.5.2.2 1,28 Mcps TDD option

In geographic areas where only 1,28 Mcps TDD is deployed, the power of any spurious emission in case of co-location shall not exceed the maximum level given in table 6.36B1, otherwise the limits in table 6.36B2 shall apply.

Table 6.36B1: BS Spurious emissions limits for co-location with unsynchronised 1,28 Mcps TDD

BS Class	Band	Maximum Level	Measurement Bandwidth
Wide Area BS	1900 – 1920 MHz	–76 dBm	1,28 MHz
Wide Area BS	2010 – 2025 MHz	–76 dBm	1,28 MHz
Local Area BS	1900 – 1920 MHz	–37 dBm	1,28 MHz
Local Area BS	2010 – 2025 MHz	–37 dBm	1,28 MHz

Table 6.36B2: BS Spurious emissions limits for co-location with unsynchronised TDD

BS Class	Band	Maximum Level	Measurement Bandwidth
Wide Area BS	1900 – 1920 MHz	–76 dBm	3,84 MHz
Wide Area BS	2010 – 2025 MHz	–76 dBm	3,84 MHz
Local Area BS	1900 – 1920 MHz	–36 dBm	3,84 MHz
Local Area BS	2010 – 2025 MHz	–36 dBm	3,84 MHz

NOTE: The requirements in Table 6.36B1 and 6.36B2 for the Wide Area BS are based on a minimum coupling loss of 30 dB between unsynchronised TDD base stations. The requirements in Table 6.36B1 and 6.36B2 for the Local Area BS are based on a minimum coupling loss of 45 dB between unsynchronised Local Area base stations. The co-location of different base station classes is not considered.

The normative reference for this requirement is TS 25.105 [1] subclause 6.6.3.5.2.1.2.

6.6.3.3 Test purpose

6.6.3.3.1 3,84 Mcps TDD option

The test purpose is to verify the ability of the BS to limit the interference caused by unwanted transmitter effects to other systems operating at frequencies which are more than 12,5 MHz away from of the UTRA band used.

6.6.3.3.2 1,28 Mcps TDD option

The test purpose is to verify the ability of the BS to limit the interference caused by unwanted transmitter effects to other systems operating at frequencies which are more than 4 MHz away from of the UTRA band used.

6.6.3.4 Method of test

6.6.3.4.1 Initial conditions

For 3,84 Mcps BS supporting 16QAM, the spurious requirements shall be tested with the general test set up specified in section 6.6.3.4.1.1 and also with the special test set up for 16QAM capable BS specified in section 6.6.3.4.1.4.

For 1,28 Mcps BS supporting 16QAM, the spurious requirements shall be tested with the general test set up specified in section 6.6.3.4.1.2 and also with the special test set up for 16QAM capable BS specified in section 6.6.3.4.1.3.

6.6.3.4.1.0 General test conditions

Test environment: normal; see subclause 5.9.1.

RF channels to be tested: B, M and T with multiple carriers if supported; see subclause 5.3.

6.6.3.4.1.1 3,84 Mcps TDD option – General test set up

(1) Connect the measuring equipment to the antenna connector of the BS under test.

(2) Set the parameters of the BS transmitted signal according to table 6.37.

Table 6.37: Parameters of the BS transmitted signal for spurious emissions testing

Parameter	Value/description
TDD Duty Cycle	TS i; i = 0, 1, 2, ..., 14: transmit, if i is even; receive, if i is odd.
Time slot carrying SCH	TS0
Time slots under test	TS i, i even and non zero
BS output power setting	PRAT
Number of DPCH in each time slot under test	9
Power of each DPCH	1/9 of Base Station output power
Data content of DPCH	real life (sufficient irregular)

6.6.3.4.1.2 1,28 Mcps TDD option– General test set up

(1) Connect the measuring equipment to the antenna connector of the BS under test.

(2) Set the parameters of the BS transmitted signal according to table 6.37A.

Table 6.37A: Parameters of the BS transmitted signal for spurious emissions testing for 1,28 Mcps TDD

Parameter	Value/description
TDD Duty Cycle	TS i; i = 0, 1, 2, 3, 4, 5, 6: transmit, if i is 0,4,5,6; receive, if i is 1,2,3.
Time slots under test	TS4, TS5 and TS6
BS output power setting	PRAT
Number of DPCH in each each time slot under test	8
Power of each DPCH	1/8 of Base Station output power
Data content of DPCH	real life (sufficient irregular)

6.6.3.4.1.3 1,28 Mcps TDD option – Special test set up for 16QAM capable BS

This test set up only applies for 16QAM capable BS.

(1) Connect the measuring equipment to the antenna connector of the BS under test.

(2) Set the parameters of the BS transmitted signal according to table 6.37B.

Table 6.37B: Parameters of the BS transmitted signal for spurious emissions testing for 1,28 Mcps TDD – 16QAM capable BS

Parameter	Value/description
TDD Duty Cycle	TS i; i = 0, 1, 2, 3, 4, 5, 6: transmit, if i is 0,4,5,6; receive, if i is 1,2,3.
Time slots under test	TS4, TS5 and TS6
BS output power setting	PRAT
HS-PDSCH modulation	16QAM
Number of HS-PDSCH in each time slot under test	8
Power of each HS-PDSCH	1/8 of Base Station output power
Data content of HS-PDSCH	real life (sufficient irregular)
Spreading factor	16

6.6.3.4.1.4 3,84 Mcps TDD option – Special test set up for 16QAM capable BS

This test set up only applies for 16QAM capable BS.

(1) Connect the measuring equipment to the antenna connector of the BS under test.

(2) Set the parameters of the BS transmitted signal according to table 6.37C.

Table 6.37C: Parameters of the BS transmitted signal for spurious emissions testing – 16QAM capable BS

Parameter	Value/description
TDD Duty Cycle	TS i; i = 0, 1, 2, ..., 14: transmit, if i is even; receive, if i is odd.
Time slot carrying SCH	TS0
Time slots under test	TS i, i even and non zero
BS output power setting	PRAT
HS-PDSCH modulation	16QAM
Number of HS-PDSCH in each time slot under test	9
Power of each HS-PDSCH	1/9 of Base Station output power
Data content of HS-PDSCH	real life (sufficient irregular)
Spreading factor	16

6.6.3.4.2 Procedure

Measure the power of the spurious emissions by applying measurement filters with bandwidths as specified in the relevant tables of subclause 6.6.3.2. The characteristic of the filters shall be approximately Gaussian (typical spectrum analyzer filters). The center frequency of the filter shall be stepped in contiguous steps over the frequency bands as given in the tables. The step width shall be equal to the respective measurement bandwidth. The time duration of each step shall be sufficiently long to capture one active time slot.

6.6.3.5 Test Requirements

NOTE: If the Test Requirement below differs from the Minimum Requirement, then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 5.11 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex D.

The spurious emissions measured according to subclause 6.6.3.4.2 shall not exceed the limits specified in the relevant tables of 6.6.3.2.

For 3,84 Mcps TDD BS supporting 16QAM, the measured spurious emissions shall not exceed the limits specified for 3,84 Mcps TDD option in section 6.6.3.2.

For 1,28 Mcps TDD BS supporting 16QAM, the measured spurious emissions shall not exceed the limits specified for 1,28 Mcps TDD option in section 6.6.3.2.