TSG-RAN Meeting #6 Nice, France, 13 – 15 December 1999

TSGRP#6(99)780

Agreed CRs of category "C" (Modifications) and "F" (Corrections) to TS 25.105 Title:

Source: TSG-RAN WG4

Agenda item: 5.4.3

TSG_DOC	SPEC	CR	RE	3G_P	SUBJECT	CAT	VERS_CU	VERS_NE
R4-99695	25.105	001		R99	Corrections to 25.105 version 3.0.0	ш	3.0.0	3.1.0
R4-99763	25.105	004		R99	Receiver spurious emissions for BS TDD	ပ	3.0.0	3.1.0
R4-99764	25.105	005		R99	Power control in UTRA TDD	ပ	3.0.0	3.1.0
R4-99864	25.105	002	2	R99	TDD Base station power accuracy of PCCPCH (remove [])	ပ	3.0.0	3.1.0
R4-99866	25.105	007		R99	Change of propagation conditions recommendations	υ	3.0.0	3.1.0
R4-99884	25.105	008		R99	Timing Advance Requirements	ш	3.0.0	3.1.0
R4-99892	25.105	011		R99	Corrections for BS TDD Blocking Characteristics	L	3.0.0	3.1.0
R4-99898	25.105	012		R99	Corrections to 25.105 v.3.0.0 (change ME to BTS)	L	3.0.0	3.1.0
R4-99944	25.105	013		R99	Synchronization Requirement	ပ	3.0.0	3.1.0
R4-99961	25.105	014		R99	Update of ITU Region 2 Specific Specifications and proposed universal channel numbering	ပ	3.0.0	3.1.0
R4-99971	25.105	015		R99	Clarification of Antenna Diversity receiver requirements	L	3.0.0	3.1.0
R4-99973	25.105	016		R99	Spurious Emission in 25.105	ш	3.0.0	3.1.0
R4-99980	25.105	017		R99	ACLR	ပ	3.0.0	3.1.0

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Subject:	Corrections	to 25.105 v.3.0.0						
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# 6.5.1 Minimum Requirement

The requirement of transmit\_OFF -power shall be better than -33dBm 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.

## 6.6.3.1.1.1 Minimum Requirement

The power of any spurious emission shall not exceed:

#### Table 6.3: BS Mandatory spurious emissions limits, Category A

Band	Minimum requirement	Measurement Bandwidth	Note
9kHz – 150kHz	-13 dBm	1 kHz	Bandwidth as in ITU SM.329-7, s4.1
150kHz – 30MHz		10 kHz	Bandwidth as in ITU SM.329-7, s4.1
30MHz – 1GHz		100 kHz	Bandwidth as in ITU SM.329-7, s4.1
1GHz – 12.75 GHz		1 MHz	Upper frequency as in ITU SM.329-7, s2.6

P = Mean power (W) where P < 500W

The power of any spurious emission shall not exceed:

Table 6.6: BS Spurious emissions limits for protection of the BS receiver

Band	Maximum Level	Measurement Bandwidth	Note
<del>921 960<u>876 - 915</u> MHz</del>	-[98]dBm	100 kHz	

#### A.2.5.2 RACH mapped to 1 code SF8



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# 6.4.7 Perch channel Primary CCPCH power

<The name and the use of the common control channel may need to be adapted , subject to WG1 definition.>

Primary CCPCH power is the transmission power of the common control physical channel averaged over the transmit timeslot. Primary CCPCH power is signalled over the BCH.

The error between the BCH-broadcast value of the Primary CCPCH power and the Primary CCPCH power shall not exceed the values in table 6.x

Table 6.x: Errors between Primary CCPCH power and the broadcast value

Total power in slot, dB	PCCPCH power tolerance
$\underline{Pmax-3 < P \le Pmax}$	[+/- 2.5 dB]
$\underline{Pmax-6 < P \le Pmax-3}$	[+/- 3.5 dB]
$\underline{Pmax-13} < \underline{P} \leq \underline{Pmax-6}$	[+/- 5 dB]

# 6.5 Transmit OFF power

The transmit OFF power state is when the BS does not transmit. This parameter is defined as maximum output transmit power within the channel bandwidth when the transmitter is OFF.

# 6.5.1 Minimum Requirement

The requirement of transmitOFF power shall be better than -33dBm 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.

# 6.6 Output RF spectrum emissions

# 6.6.1 Occupied bandwidth

Occupied bandwidth is a measure of the bandwidth containing 99% of the total integrated power for transmitted spectrum and is centered on the assigned channel frequency. The occupied channel bandwidth is less than 5 MHz based on a chip rate of 3.84 Mcps.

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# 6 Transmitter characteristics

# 6.1 General

Unless detailed the transmitter characteristic are specified at the antenna connector.

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# 6.2 Base station output power

Output power, Pout, of the base station is the mean power of one carrier delivered to a load with resistance equal to the nominal load impedance of the transmitter during one slot.

# 6.2.1 Base station maximum output power

Maximum output power, Pmax, of the base station is the mean power level per carrier that the manufacturers has declared to be available at the antenna connector.

#### 6.2.1.1 Minimum Requirement

In normal conditions, the base station maximum output power shall remain within +2 dB and -2 dB of the manufacturer's rated power.

In extreme conditions, the Base station maximum output power shall remain within +2.5 dB and -2.5 dB of the manufacturer's rated power.

# 6.3 Frequency stability

Frequency stability is ability of the BS to transmit at the assigned carrier frequency.

# 6.3.1 Minimum Requirement

The modulated carrier frequency of the BS shall be accurate to within  $\pm 0.05$  PPM for RF frequency generation.

# 6.4 Output power dynamics

Power control is used to limit the interference level. The transmitter uses a quality-based power control on the downlink.

# 6.4.1 Closed Inner loop power control

<u>Closed Inner</u> loop power control is the ability of the BS transmitter to adjust its output power in response to the UL received signal.

For <u>closed Inner</u> loop correction on the Downlink Channel-(with respect to the open loop estimate), the base station adjusts its mean output power level in response to each valid power control bit received from the UE on the Uplink Traffic Channel. Inner loop control is based on SIR measurements at the UE receiver and the corresponding TPC commands are generated by the UE

# 6.4.2 Power control steps

The power control step is the step change in the DL transmitter output power in response to a TPC message from the UE.

#### 6.4.2.1 Minimum Requirement

Down link (DL) 1, 2, 3 dB

The tolerance of the transmitter output power and the greatest average rate of change in mean power due to the power control step shall be within the range shown in Table 6.1.

12

Step size	Tolerance	Range of average mean power per 10	rate of change in ) steps
		minimum	maximum
1dB	+/-0.5dB	+/-8dB	+/-12dB
2dB	+/-0.75dB	+/-16dB	+/-24dB
3dB	+/-1dB	+/-24dB	+/-36dB

#### Table 6.1: power control step size tolerance

## 6.4.3 Power control dynamic range

The power control dynamic range is the difference between the maximum and the minimum transmit output power for a specified reference condition

#### 6.4.3.1 Minimum Requirement

Down link (DL) power control dynamic range 30 dB

## 6.4.4 Minimum transmit power

The minimum controlled output power of the BS is when the power control setting is set to a minimum value. This is when the power control indicates a minimum transmit output power is required.

#### 6.4.4.1 Minimum Requirement

Down link (DL) minimum transmit power is set to: Maximum output power - 30dB

## 6.4.5 Total power dynamic range

The power control dynamic range is difference between the maximum and the minimum transmit output power for a specified reference condition

#### 6.4.5.1 Minimum Requirement

Down link (DL) total dynamic range 30 dB

<This requirement is redundant, since 6.4.4 defines the same dynamic range by a minimum transmit power.>

## 6.4.6 Power control cycles per second

The rate of change for DL transmitter power control step.

#### 6.4.6.1 Minimum Requirement

The rate of change for the DL transmitter power control step is a s follows: 100 800 Hz.

The minimum rate of [100] Hz is to ensure that every frame is power controlled. The maximum rate may differ for open and closed loop power control due to frame configuration.

# 6.4.7 Perch channel power

<The name and the use of the common control channel may need to be adapted , subject to WG1 definition.>

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# 6 Transmitter characteristics

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Unless detailed the transmitter characteristic are specified at the antenna connector.

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# 6.2.1 Base station maximum output power

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#### 6.2.1.1 Minimum Requirement

In normal conditions, the base station maximum output power shall remain within +2 dB and -2 dB of the manufacturer's rated power.

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# 6.3.1 Minimum Requirement

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# 6.4 Output power dynamics

Power control is used to limit the interference level. The transmitter uses a quality-based power control on the downlink.

# 6.4.1 Closed Inner loop power control

<u>Closed Inner</u> loop power control is the ability of the BS transmitter to adjust its output power in response to the UL received signal.

For <u>closed Inner</u> loop correction on the Downlink Channel-(with respect to the open loop estimate), the base station adjusts its mean output power level in response to each valid power control bit received from the UE on the Uplink Traffic Channel. Inner loop control is based on SIR measurements at the UE receiver and the corresponding TPC commands are generated by the UE

# 6.4.2 Power control steps

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#### 6.4.2.1 Minimum Requirement

Down link (DL) 1, 2, 3 dB

The tolerance of the transmitter output power and the greatest average rate of change in mean power due to the power control step shall be within the range shown in Table 6.1.

12

Step size	Tolerance	Range of average mean power per 10	rate of change in ) steps
		minimum	maximum
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2dB	+/-0.75dB	+/-16dB	+/-24dB
3dB	+/-1dB	+/-24dB	+/-36dB

#### Table 6.1: power control step size tolerance

## 6.4.3 Power control dynamic range

The power control dynamic range is the difference between the maximum and the minimum transmit output power for a specified reference condition

#### 6.4.3.1 Minimum Requirement

Down link (DL) power control dynamic range 30 dB

## 6.4.4 Minimum transmit power

The minimum controlled output power of the BS is when the power control setting is set to a minimum value. This is when the power control indicates a minimum transmit output power is required.

#### 6.4.4.1 Minimum Requirement

Down link (DL) minimum transmit power is set to: Maximum output power - 30dB

## 6.4.5 Total power dynamic range

The power control dynamic range is difference between the maximum and the minimum transmit output power for a specified reference condition

#### 6.4.5.1 Minimum Requirement

Down link (DL) total dynamic range 30 dB

<This requirement is redundant, since 6.4.4 defines the same dynamic range by a minimum transmit power.>

## 6.4.6 Power control cycles per second

The rate of change for DL transmitter power control step.

#### 6.4.6.1 Minimum Requirement

The rate of change for the DL transmitter power control step is a s follows: 100 800 Hz.

The minimum rate of [100] Hz is to ensure that every frame is power controlled. The maximum rate may differ for open and closed loop power control due to frame configuration.

# 6.4.7 Perch channel power

<The name and the use of the common control channel may need to be adapted , subject to WG1 definition.>

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# Annex B (normative): Propagation conditions

# B.1 Static propagation condition

The propagation for the static performance measurement is an Additive White Gaussian Noise (AWGN) environment. No fading and multi-paths exist for this propagation model.

# B.2 Multi-path fading propagation conditions

Table B1 shows propagation conditions that are used for the performance measurements in multi-path fading environment. All taps have classical Doppler spectrum.

	Case 1, speed 3km/h		Case 2, s	peed 3 km/h	Case 3, 120 km/h		
	Relative Delay [ns]	Average Power [dB]	Relative Delay [ns]	Average Power [dB]	Relative Delay [ns]	Average Power [dB]	
	0	0	0	0	0	0	
	976	-10	976	0	260	-3	
1			<u>12000</u> 20000	0	521	-6	
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Table B1: Propagation Conditions for Multi path Fading Environments

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# 7.7 Spurious emissions

The spurious emissions power is the power of emissions generated or amplified in a receiver that appear at the BS receiver antenna connector.

## 7.7.1 Minimum Requirement

The spurious emission shall be:

- (a) Less than [-78] dBm/3.84 MHz at the BS receiver antenna connector, for frequencies within the BS receive band.
- (b) Less than [-57] dBm/100 kHz at the BS receiver antenna connector, for frequencies bands from 9kHz to 1GHz.
- (c) Less than [-47] dBm/100 kHz at the BS receiver antenna connector, for frequencies bands from 1GHz to 12.75GHz.

# 7.8 Timing Advance (TA) Requirements

The conditions under the requirements which must be met shall be 3dB below reference sensitivity level in section 7.2.

On request the BS shall measure the delay of the received signal relative to the expected signal from an UE at zero
distance under static channel conditions (see Annex B). This delay, called the timing advance, shall be rounded to
the nearest value corresponding to 4 chips period. The delay shall be assessed in such a way that the measurement
error (due to noise and interference) is less than 2 chips periods for stationary UE.

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# 7.5 Blocking characteristics

The blocking characteristics is a measure of the receiver ability to receive a wanted signal at is assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the spurious response or the adjacent channels. The blocking performance shall apply at all frequencies as specified in the table below, using a <u>1MHz step size</u>.

The static reference performance as specified in clause 7.2.1 should be met with a wanted and an interfering signal coupled to BS antenna input using the following parameters.

Center Frequency of Interfering Signal	Interfering Signal Level	Wanted Signal Level	Minimum Offset of Interfering Signal	Type of Interfering Signal
1900 – 1920 MHz, 2010 – 2025 MHz	-40 dBm	<refsens> + 6 dB</refsens>	10 MHz	WCDMA signal with one code
2010 2023 MIL				
1880 – 1900 MHz,	-40 dBm	<refsens>+6 dB</refsens>	10 MHz	WCDMA signal with one code
1990 – 2010 MHz,				
2025 – 2045 MHz				
1920 – 1980 MHz	-40 dBm	<refsens>+6 dB</refsens>	10 MHz	WCDMA signal with one code
<u>1</u> < <u>1880 MHz</u> ,	-15 dBm	<refsens> + 6 dB</refsens>		CW carrier
1980 – 1990 MHz,				
→2045 MHz < <u>12750 MHz</u>				

 Table 7.3 : Blocking requirements

# 7.6 Intermodulation characteristics

Third and higher order mixing of the two interfering RF signals can produce an interfering signal in the band of the desired channel. Intermodulation response rejection is a measure of the capability of the receiver to receiver a wanted signal on its assigned channel frequency in the presence of two or more interfering signals which have a specific frequency relationship to the wanted signal.

The static reference performance as specified in clause 7.2.1 should be met when the following signals are coupled to BS antenna input.

- □ A wanted signal at the assigned channel frequency, 6 dB above the static reference level.
- **D** Two interfering signals with the following parameters.

Interfering Signal Level	Offset	Type of Interfering Signal
- 48 dBm	10 MHz	CW signal
- 48 dBm	20 MHz	WCDMA signal with one code

**Table 12 : Intermodulation requirement** 

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# 8 Performance requirement

# 8.1 General

Performance requirements for the BS are specified for the measurement channels defined in Annex A and the propagation conditions in Annex B. The requirements only apply to those measurement channels that are supported by the base station.

The requirements only apply to a base station with dual receiver antenna diversity. The required  $E_b/N_0$  shall be applied separately at each antenna port.

		•	-		
Physical channel	Measurement channel	Static	Multi-path Case 1	Multi-path Case 2	Multi-path Case 3
			Perform	ance metric	
	12.2 kbps				
	64 kbps				
DCH	144 kbps				
	384 kbps				
	2048 kbps				-
RACH					

 Table 8.1: Summary of Base Station performance targets

# 8.2 Demodulation in static propagation conditions

## 8.2.1 Demodulation of DCH

The performance requirement of DCH in static propagation conditions is determined by the maximum Block Error Rate (BLER) allowed when the receiver input signal is at a specified  $E_b/N_0$  limit. The BLER is calculated for each of the measurement channels supported by the base station.

#### 8.2.1.1 Minimum requirement

The BLER should not exceed the limit for the  $E_b/N_0$  specified in Table 8.2.

Measurement channel	Required E <sub>b</sub> /N <sub>0</sub>	Required E <sub>b</sub> /N <sub>0</sub>
12.2 kbps		
64 kbps		
144 kbps		
384 kbps		
2048 kbps		

 Table 8.2: Performance requirements in AWGN channel.

## 8.2.2 Demodulation of RACH

#### 8.2.2.1 Minimum requirement

# 8.3 Demodulation of DCH in multipath fading conditions

## 8.3.1 Multipath fading Case 1

The performance requirement of DCH in multipath fading Case 1 is determined by the maximum Block Error Rate (BLER) allowed when the receiver input signal is at a specified  $E_b/N_0$  limit. The BLER is calculated for each of the measurement channels supported by the base station.

#### 8.3.1.1 Minimum requirement

The BLER should not exceed the limit for the  $E_b/N_0$  specified in Table 8.3.

Measurement channel	Required E <sub>b</sub> /N <sub>0</sub>	Required E <sub>b</sub> /N <sub>0</sub>
12.2 kbps		
64 kbps		
144 kbps		
384 kbps		
2048 kbps		

#### Table 8.3: Performance requirements in multipath Case 1 channel.

## 8.3.2 Multipath fading Case 2

The performance requirement of DCH in multipath fading Case 2 is determined by the maximum Block Error Rate (BLER) allowed when the receiver input signal is at a specified  $E_b/N_0$  limit. The BLER is calculated for each of the measurement channels supported by the base station.

#### 8.3.2.1 Minimum requirement

The BLER should not exceed the limit for the  $E_b/N_0$  specified in Table 8.4.

Table 8.4: Performance	e requirements in	n multipath	Case 2 channel.
------------------------	-------------------	-------------	-----------------

Measurement channel	Required E <sub>b</sub> /N <sub>0</sub>	Required E <sub>b</sub> /N <sub>0</sub>
	BLER < $10^{-1}$	BLER < $10^{-2}$
12.2 kbps	n.a.	
64 kbps		
144 kbps		
384 kbps		

# 8.3.3 Multipath fading Case 3

The performance requirement of DCH in multipath fading Case 3 is determined by the maximum Block Error Rate (BLER) allowed when the receiver input signal is at a specified  $E_b/N_0$  limit. The BLER is calculated for each of the measurement channels supported by the base station.

#### 8.3.3.1 Minimum requirement

The BLER should not exceed the limit for the  $E_b/N_0$  specified in Table 8.5.

Table 8.5:	Performance	requirements	in multipath	Case 3 channel.
------------	-------------	--------------	--------------	-----------------

Measurement channel	Required E <sub>b</sub> /N <sub>0</sub>	Required E <sub>b</sub> /N <sub>0</sub>	Required E <sub>b</sub> /N <sub>0</sub>
12.2 kbps	n.a.		
64 kbps			
144 kbps			
384 kbps			

# 8.4 Demodulation of RACH in multipath fading conditions

8.4.1 Multipath fading Case 1

8.4.1.1 Minimum requirement

# 8.5 BS synchronisation performance

## 8.5.1 Minimum Requirement

The timing error of BSs synchronised to each other shall be less than  $[5\mu s]$ .

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# 8.5 BS synchronisation performance 8.5.1 Minimum Requirement

The timing error of BSs synchronised to each other shall be less than [5µs].

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# 5.2 Frequency bands

UTRA/TDD is designed to operate in the following bands;

- a) 1900 1920 MHz: Uplink and downlink transmission 2010 – 2025 MHz Uplink and downlink transmission
- b)\* 1850 1910 MHz: Uplink and downlink transmission 1930 – 1990 MHz: Uplink and downlink transmission

Note: Appropriate adjustment is required for the parameters in the specified band

c)\* 1910 – 1930 MHz: Uplink and downlink transmission Note: Appropriate adjustment is required for the parameters in the specified band

\* Used in ITU Region 2

Additional allocations in ITU region 2 are FFS.

Deployment in existing and other frequency bands is not precluded.

The co-existence of TDD and FDD in the same bands is still under study in WG4.

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# 5.4 Channel arrangement

## 5.4.1 Channel spacing

The nominal channel spacing is 5 MHz, but this can be adjusted to optimise performance in a particular deployment scenario.

# 5.4.2 Channel raster

The channel raster is 200 kHz, which means that the carrier frequency must be a multiple of 200 kHz.

# 5.4.3 Channel number

The carrier frequency is designated by the UTRA absolute radio frequency channel number (UARFCN). The value of the UARFCN in the IMT2000 band is defined as follows:

Lower IMT 2000 band:

```
N_t = 5 * (F MHz - 1885.2) 1885.2
2024.8
```

 $\frac{1885.2 \text{ } 0.0}{2024 \text{ } 8} \leq F \leq \frac{3276.6 \text{ MHz}}{2024 \text{ } 8}$  where F is the carrier frequency in MHz

# 7.5 Blocking characteristics

The blocking characteristics is a measure of the receiver ability to receive a wanted signal at is assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the spurious response or the adjacent channels. The blocking performance shall apply at all frequencies as specified in the table below.

The static reference performance as specified in clause 7.2.1 should be met with a wanted and an interfering signal coupled to BS antenna input using the following parameters.

Center Frequency of	Interfering	Wanted Signal Level	Minimum Offset of	Type of Interfering Signal
Interfering Signal	Signal Level	C C	Interfering Signal	
interioring Signal	Signal Level		interrering signal	
1000 1020 MHz	40 dBm	$\angle PEESENS + 6 dB$	10 MH7	WCDMA signal with one code
1900 = 1920 WHIZ,	-40 uDiii	<repsens>+0 dB</repsens>	10 10112	WCDWA Signal with one code
2010 2025 MHz				
2010 = 2023 MHz				
1990 1000 MIL-	40 JD		10 MII-	WCDMA signal with any as do
1880 – 1900 MHZ,	-40 dBm	$\langle \text{REFSENS} \rangle + 0 \text{ dB}$	10 MHZ	wCDMA signal with one code
1000 2010 MI				
1990 – 2010 MHz,				
2025 – 2045 MHz				
1920 – 1980 MHz	-40 dBm	$\langle \text{REFSENS} \rangle + 6 \text{ dB}$	10 MHz	WCDMA signal with one code
<1880,	-15 dBm	$\langle REFSENS \rangle + 6 dB$	—	CW carrier
1980 – 1990 MHz,				
> 2045 MHz				

 Table 7.3(a)
 Blocking requirements for operating bands defined in 5.2(a)

#### Table 7.3(b) : Blocking requirements for operating bands defined in 5.2(b,c)

Center Frequency of	Interfering	Wanted Signal Level	Minimum Offset of	Type of Interfering Signal
Interfering Signal	Signal Level		Interfering Signal	
<u>1850 – 1990 MHz</u>	<u>-40 dBm</u>	$\leq \text{REFSENS} > + 6 \text{ dB}$	<u>10 MHz</u>	WCDMA signal with one code
1830 – 1850 MHz	-40 dBm	$\langle REFSENS \rangle + 6 dB$	10 MHz	WCDMA signal with one code
1990 – 2010 MHz				
1920 – 1980 MHz	-40 dBm	$\langle REFSENS \rangle + 6 dB$	10 MHz	WCDMA signal with one code
<1830.	-15 dBm	$\langle REFSENS \rangle + 6 dB$		CW carrier
1930 – 2000 MHz.				
,				
> 2045 MHz				

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# 7 Receiver characteristics

# 7.1 General

Unless detailed the receiver characteristic are specified at each antenna connector of the BS. The requirements in this sub-clauses detailed the receiver is not equipped with diversity. For receivers with diversity, the requirements apply to each antenna connector separately, with the other one(s) terminated or disabled .The requirements are otherwise unchanged.

# 7.2 Reference sensitivity level

The reference sensitivity is the minimum receiver input power measured at the antenna connector at which the FER/BER does not exceed the specific value indicated in section 7.2.1. The signal power is equally applied to each antenna connector for diversity.

## 7.2.1 Minimum Requirement

For the measurement channel specified in Annex A, the reference sensitivity level and performance of the BS shall be as specified in table 7.1 below.

Data rate	BS reference sensitivity level (dBm)	FER/BER
12.2 kbps	-110 dBm	BER shall not exceed 0.001

#### Table 7.1: BS reference sensitivity levels

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#### 6.6.3.2 Co-existence with GSM 900

#### 6.6.3.2.1 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.

[This requirement assumes the scenario described in 25.942.] For different scenarios, the manufacturer may declare a different requirement.

#### 6.6.3.2.1.1 Minimum Requirement

The power of any spurious emission shall not exceed:

#### Table 6.5: BS Spurious emissions limits for BS in geographic coverage area of GSM 900

Band	Maximum Level	Measurement Bandwidth	Note
921 – 960MHz	-47 dBm	100 kHz	

#### 6.6.3.2.2 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.

[This requirement assumes the scenario described in 25.942.] For different scenarios, the manufacturer may declare a different requirement.

#### 6.6.3.2.2.1 Minimum Requirement

The power of any spurious emission shall not exceed:

#### Table 6.6: BS Spurious emissions limits for protection of the BS receiver

Band	Maximum Level	Measurement Bandwidth	Note
921 – 960MHz	- <mark>[98]dBm</mark> - <u>98 dBm</u>	100 kHz	

#### 6.6.3.3 Co-existence with DCS 1800

#### 6.6.3.3.1 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.

[This requirement assumes the scenario described in 25.942.] For different scenarios, the manufacturer may declare a different requirement.

#### 6.6.3.3.1.1 Minimum Requirement

The power of any spurious emission shall not exceed:

#### Table 6.7: BS Spurious emissions limits for BS in geographic coverage area of DCS 1800

Band	Maximum	Measurement	Note
	Level	Bandwidth	

1805 – 1880MHz -57 dBm 100 kHz				
	1805 – 1880MHz	-57 dBm	100 kHz	

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#### 6.6.3.3.2 Co-located basestations

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

[This requirement assumes the scenario described in 25.942.] For different scenarios, the manufacturer may declare a different requirement.

#### 6.6.3.3.2.1 Minimum Requirement

The power of any spurious emission shall not exceed:

#### Table 6.8: BS Spurious emissions limits for BS co-located with DCS 1800 BTS

Band	Maximum Level	Measurement Bandwidth	Note
1710 – 1785 MHz	<del>-[98]dBm</del> - <u>-98 dBm</u>	100 kHz	

# 3GPP TSG RAN WG4 Meeting #9 Bath, UK, 7 - 10 December 1999

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comments:

# 6.5 Transmit OFF power

The transmit OFF power state is when the BS does not transmit. This parameter is defined as maximum output transmit power within the channel bandwidth when the transmitter is OFF.

## 6.5.1 Minimum Requirement

The requirement of transmitOFF power shall be better than -33dBm 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.

# 6.6 Output RF spectrum emissions

## 6.6.1 Occupied bandwidth

Occupied bandwidth is a measure of the bandwidth containing 99% of the total integrated power for transmitted spectrum and is centered on the assigned channel frequency. The occupied channel bandwidth is less than 5 MHz based on a chip rate of 3.84 Mcps.

# 6.6.2 Out of band emission

Out of band emissions are unwanted emissions immediately outside the [channel] bandwidth resulting from the modulation process and non-linearity in the transmitter but excluding spurious emissions. This out of band emission limit is specified in terms of a spectrum emission mask and adjacent channel power ratio for the transmitter.

## 6.6.2.1 — Spectrum emission mask

The mask defined in Table 6.3 to 6.6 below may be mandatory in certain regions. In other regions this mask may not be applied.

For regions where this clause applies, the requirement shall be met by a base station transmitting on a single RF carrier configured in accordance with the manufacturer's specification. Emissions shall not exceed the maximum level specified by the mask in the frequency range with offset  $\Delta f$  from 2.5 MHz to  $\Delta f_{max}$  from the carrier frequency. The maximum offset  $\Delta f_{max}$  is 12.5 MHz.



<u>Frequency offset Δf</u>	Maximum level	<u>Measurement</u> <u>bandwidth</u>
$\underline{2.5 \le \Delta f < 2.7 \text{ MHz}}$	<u>-14 dBm</u>	$30 \text{ kHz}^{-1}$
$\underline{2.7 \le \Delta f < 3.5 \text{ MHz}}$	<u>- 14 - 15·(Δf - 2.7) dBm</u>	$30 \text{ kHz}^{-1}$
$\underline{3.5 \le \Delta f \le \Delta f_{max} MHz}$	<u>-13 dBm</u>	<u>1 MHz <sup>2</sup></u>

Table 6.3: Spectrum emission mask values, BS maximum output power  $P \ge 43$  dBm

#### Table 6.4: Spectrum emission mask values, BS maximum output power 39 ≤ P < 43 dBm

<u>Frequency offset Δf</u>	<u>Maximum level</u>	<u>Measurement</u> <u>bandwidth</u>
$\underline{2.5 \le \Delta f < 2.7 \text{ MHz}}$	<u>-14 dBm</u>	<u>30 kHz <sup>1</sup></u>
$\underline{2.7 \le \Delta f < 3.5 \text{ MHz}}$	<u>-14 - 15·(Δf - 2.7) dBm</u>	$\frac{30 \text{ kHz}^{-1}}{2}$
$\underline{3.5 \le \Delta f < 7.5 \text{ MHz}}$	<u>-13 dBm</u>	<u>1 MHz<sup>2</sup></u>
$\underline{7.5 \le \Delta f \le \Delta f_{max} MHz}$	<u>P - 56 dBm</u>	<u>1 MHz <sup>2</sup></u>

#### Table 6.5: Spectrum emission mask values, BS maximum output power 31 ≤ P < 39 dBm

<u>Frequency offset Δf</u>	Maximum level	<u>Measurement</u> <u>bandwidth</u>
$\underline{2.5 \le \Delta f < 2.7 \text{ MHz}}$	<u>P - 53 dBm</u>	<u>30 kHz <sup>1</sup></u>
$\underline{2.7 \le \Delta f < 3.5 \text{ MHz}}$	<u>P - 53 - 15·(Δf - 2.7) dBm</u>	<u>30 kHz <sup>1</sup></u>
$\underline{3.5 \le \Delta f < 7.5 \text{ MHz}}$	<u>P - 52 dBm</u>	<u>1 MHz</u> <sup>2</sup>
$\underline{7.5 \le \Delta f \le \Delta f_{max} MHz}$	<u>P - 56 dBm</u>	<u>1 MHz <sup>2</sup></u>

#### Table 6.6: Spectrum emission mask values, BS maximum output power P < 31 dBm

<u>Frequency offset <math>\Delta f</math></u>	<u>Maximum level</u>	<u>Measurement</u> <u>bandwidth</u>
$\underline{2.5 \le \Delta f < 2.7 \text{ MHz}}$	<u>-22 dBm</u>	<u>30 kHz <sup>1</sup></u>
$\underline{2.7 \le \Delta f < 3.5 \text{ MHz}}$	<u>-22 - 15·(Δf - 2.7) dBm</u>	$30 \text{ kHz}^{-1}$
$\underline{3.5 \le \Delta f < 7.5 \text{ MHz}}$	<u>-21 dBm</u>	$1 \text{ MHz}^2$
$\frac{7.5 \le \Delta f \le \Delta f_{max} MHz}{}$	<u>-25 dBm</u>	<u>1 MHz <sup>2</sup></u>

#### Notes:

1. The first and last measurement positions with a 30 kHz filter are 2.515 MHz and 3.485 MHz

2. The first and last measurement positions with a 1 MHz filter are 4 MHz and ( $\Delta f_{max} - 500 \text{ kHz}$ )

#### 6.6.2.2 Adjacent Channel Leakage power Ratio (ACLR)

Adjacent Channel Leakage power Ratio (ACLR) is the ratio of the transmitted power to the power measured after a receive filter in the adjacent channel(s). Both the transmitted and the received power are measured through a matched filter (Root Raised Cosine and roll-off 0.22) with a noise power bandwidth equal to the chip rate.

#### 6.6.2.2.1 Minimum Requirement

The ACLR shall be better than the value specified in Table 6.6.

#### Table 6.6: BS ACLR

BS adjacent channel offset	ACLR limit
$\pm 5 \text{ MHz}$	<mark>[-</mark> 45-] dB
$\pm 10 \text{ MHz}$	<mark>-</mark> -55- <mark>-</mark> ] dB

# 6.6.2.2.2 Requirement in case of operation in proximity to TDD BS or FDD BS operating on an adjacent frequency

In case the equipment is operated in proximity to another TDD BS or FDD BS on an adjacent frequency, the ACLR shall be better than the value specified in Table 6.7.

#### Table 6.7: BS ACLR in case of operation in proximity

BS adjacent channel offset	ACLR limit
<u>± 5 MHz</u>	<u>70 dB</u>
<u>± 10 MHz</u>	<u>70 dB</u>

The requirement is based on the assumption that the coupling loss between the base stations is at least 84dB.

# 6.6.2.2.3 Requirement in case of co-siting with TDD BS or FDD BS operating on an adjacent frequency

In case the equipment is co-sited to another TDD BS or FDD BS on an andjacent frequency, the ACLR is specified in terms of the absolute transmit power level of the BS. The maximum power level shall not exceed the limit in Table 6.8.

#### Table 6.8: BS ACLR in case of co-siting

BS adjacent channel offset	Maximum Level	Measurement Bandwidth
<u>± 5 MHz</u>	<u>-80 dBm</u>	<u>3.84 MHz</u>
<u>± 10 MHz</u>	<u>80 dB</u>	<u>3.84 MHz</u>

# 7.4 Adjacent Channel Selectivity (ACS)

Adjacent channel selectivity (ACS) is a measure of the receiver ability to receive a wanted signal at is assigned channel frequency in the presence of an adjacent channel signal at a given frequency offset from the center frequency of the assigned channel. ACS is the ratio of the receiver filter attenuation on the assigned channel frequency to the receive filter attenuation on the adjacent channel(s).

## 7.4.1 Minimum Requirement

The BER shall not exceed 0.001 for the parameters specified in table 7.2.

Parameter	Level	Unit
Data rate	12.2	kbps
Wanted signal	Evel + 6dB	dBm
Interfering signal	<u></u>	dBm
Fuw (Modulated)	5	MHz