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Technical Specification

3rd Generation Partnership Project (3GPP); Technical Specification Group (TSG) RAN WG4; UTRA (BS) TDD; Radio transmission and Reception

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Contents

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Foreword

This Technical Specification has been produced by the 3GPP.

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of this TS, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version 3.y.z

where:

- x the first digit:
  - 1 presented to TSG for information;
  - 2 presented to TSG for approval;
  - 3 Indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the specification;

1 Scope

This document establishes the minimum RF characteristics of the TDD mode of UTRA.

2 References

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

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the definitions apply.

Power Setting - The value of the control signal, which determines the desired transmitter, output Power. Typically, the power setting would be altered in response to power control commands

Maximum Power Setting - The highest value of the Power control setting which can be used.

Maximum output Power This refers to the measure of power when averaged over the transmit timeslot at the maximum power setting.

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

Maximum peak power - The peak power observed when operating at a given maximum output power.

Average Power - The average transmitter output power obtained over any specified time interval, including periods with no transmission. *<Editors: This definition would be relevant when considering realistic deployment scenarios where the power control setting may vary. >*

Maximum average power The average transmitter output power obtained over any specified time interval, including periods with no transmission, when the transmit time slots are at the maximum power setting. *<Editors: The average power at the maximum power setting would also be consistent with defining a long term average power>*

3.2 Symbols

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

<symbol> <Explanation>

3.3 Abbreviations

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

ACIR	Adjacent Channel Interference Ratio
ACLR	Adjacent Channel Leakage power Ratio
ACS	Adjacent Channel Selectivity
BER	Bit Error Rate
BS	Base Station
CW	Continuous wave (unmodulated signal)
DL	Down link (forward link)
EIRP	Effective Isotropic Radiated Power
FDD	Frequency Division Duplexing
FER	Frame Error Rate
PPM	Parts Per Million
RSSI	Received Signal Strength Indicator
SIR	Signal to Interference ratio
TDD	Time Division Duplexing
TPC	Transmit Power Control
UE	User Equipment
UL	Up link (reverse link)
UTRA	UMTS Terrestrial Radio Access

4 General

4.1 Measurement uncertainty

The requirements given in this specification do not include measurement uncertainties related to conformance testing as used e.g. in regulatory testing or production testing. Conformance testing is specified in [reference to the appropriate document].

4.2 Base station classes

The requirements in this specification apply to base station intended for general-purpose applications.

In the future further classes of base stations may be defined; the requirements for these may be different than for general-purpose applications.

5 Frequency bands and channel arrangement

This section is identical to section 5 of ~~S4.02A~~TS 25.102 on “Frequency bands and Channel arrangement”.

6 Transmitter characteristics

6.1 General

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

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

~~The m~~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 +TBD dB and –TBD dB of the manufacturer's rated power.

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

~~6.3 Base station output power~~

~~The 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.~~

6.3 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 ± [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 loop power control

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

For closed loop correction on the Downlink Channel (with respect to the open loop estimate), the base station adjust its mean output power level in response to each valid power control bit received from the UE on the Uplink Traffic Channel.

6.4.2 Power control steps

The power control step is the minimum 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 - 3 dB]

Tolerance ffs.

<Need to define the transmitter power as “code domain power”. This is ffs.>

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 [x dB]

<Definition needs clarification.>

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 [Maximum output power – 30dB]

<The maximum output power definition is ffs.>

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.

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.>

6.5 Transmit ON/OFF ratio

Transmit ON/OFF ratio is defined as the ratio of the maximum output transmit power within the channel bandwidth with the transmitter ON and OFF.

6.5.1 Minimum Requirement

The minimum requirement of transmitting ON/OFF ratio is [–x dBm /4.096MHz].

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 4.096 Mcps.

<Needs to be reviewed for the conformance specification.>

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 ~~can be~~is specified in terms of a spectrum emission mask ~~or~~ and adjacent channel power ratio for the transmitter.

6.6.2.1 Spectrum emission mask

The emission mask of the base station is an item for further study.

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 with a filter response that is [normally rectangular] with a noise power bandwidth equal to the chip rate.~~from one carrier within a reference bandwidth of [4.096 MHz] to the power measured within a reference bandwidth of [4.096 MHz] centered on the adjacent(s) channel(s).~~

6.6.2.2.1 Minimum Requirement

Table 1, BS ACLR

BS channel	ACLR limit
± First adjacent channel	[ ] dB~~c~~
± Second adjacent channel	[ ] dB~~c~~

~~Table 4, BS ACLR~~

Note

In order to ensure that switching transients do not degrade the ACLR value the reference measurements conditions are an item for further study.

6.6.2.3 Protection outside a licensee's frequency block

This requirement is applicable if protection is required outside a licensee's defined frequency block.

6.6.2.3.1 Minimum requirement

This requirement applies for frequencies outside the licensee's frequency block, up to an offset of [12.5MHz] from a carrier frequency.

The power of any emission shall be attenuated below the transmit power (P) by at least 43 + 10 log (P)dB.

Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1MHz or greater. However, in the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier centre frequency and one above the carrier centre frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power.

When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges, both upper and lower, as the design permits.

The measurements of emission power shall be mean power.

6.6.3 Spurious emissions

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 frequency boundary and the detailed transitions of the limits between the requirement for out band emissions and spectrum emissions is an item for further study. Guidance can be taken from the applicable tables from ITU-R Recommendations SM.329,ERC Recommendations and regulatory input from other regions.~~

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

6.6.3.1 Mandatory Requirements

The requirements of either subclause 6.6.3.1.1 or subclause 6.6.3.1.2 shall apply.

Either requirement applies at frequencies within the specified frequency ranges which are more than [12.5MHz] from a [carrier frequency].

6.6.3.1.1 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.329-7 [1], are applied.

6.6.3.1.1.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 2: BS Mandatory spurious emissions limits, Category A

Band	Minimum requirement	Measurement Bandwidth	Note
9kHz – 150kHz	43 + 10logP (dBc)	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 – [11GHz]		1 MHz	Upper frequency as in ITU SM.329-7, s2.6

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

6.6.3.1.2 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.329-7 [1], are applied.

6.6.3.1.2 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 3: BS Mandatory spurious emissions limits

Band	Maximum Level	Measurement Bandwidth	Note
9kHz – 150kHz	-36dBm	1 kHz	Bandwidth as in ITU SM.329-7, s4.1
150kHz – 30MHz	- 36 dBm	10 kHz	Bandwidth as in ITU SM.329-7, s4.1
30MHz – 1GHz	-36 dBm	100 kHz	Bandwidth as in ITU SM.329-7, s4.1
1GHz – [11GHz]	-30 dBm	1 MHz	Upper frequency as in ITU SM.329-7, s2.6

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 4: 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	

6.6.3.3.2 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.

6.6.3.3.2.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 5: BS Spurious emissions limits for protection of the BS receiver

Band	Maximum Level	Measurement Bandwidth	Note
921 – 960MHz	- –[98]dBm	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: BS Spurious emissions limits for BS in geographic coverage area of DCS 1800

Band	Maximum Level	Measurement Bandwidth	Note
1805 – 1880MHz	[-57] dBm	100 kHz	

6.6.3.4.2 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.

6.6.3.4.2.1 Minimum Requirement

The power of any spurious emission shall not exceed:

Table 7: BS Spurious emissions limits for BS co-located with DCS 1800 BTS

Band	Maximum Level	Measurement Bandwidth	Note
1805 – 1880MHz	-[98]dBm	100 kHz	

~~6.6.3.1 Minimum Requirement~~

~~{From ARIB Vol. 5; Section 6.1.1.4; Note: This ARIB content partly maps also on XX.06 sections 6.6.1 and 6.6.2, because of somewhat different definitions of spurious emissions.}~~

~~The spurious emission level against the mean output power of the base station in the Transmission band shall not exceed the limits specified below.~~

~~In the (a) Concerned Operator's System Bands and the (b) Other Bands Within Cellular Band, the spurious emission level within a [**]kHz bandwidth shall not exceed a level Specified in the Table 6.1.1.4-2. In the (c) Other Bands, the spurious emission level within a 1MHz bandwidth shall not exceed a level specified in the Table 6.1.1.4-2. Each transmission band is defined as follows:~~

~~(a)Concerned Operator's System Bands: The bands of the concerned operator's system used for this CDMA system.~~

~~(b)Other Bands Within Cellular Band: The 2.0G-band including other operator's cellular system bands, but excluding the (a) Concerned Operator's System Bands.~~

~~(c)Other Bands: Other bands entirely consisting of all frequencies, but excluding the above bands (a) and (b).~~

~~Table 6.1.1.4-2. Spurious Emission Limits When Transmitting.~~

~~Measurement Band~~	~~Maximum Spurious Emission Level~~
~~Concerned Operator's System Bands~~	~~Shown the Adjacent channel leakage power in 6.1.1.3~~
~~Other Bands Within Cellular Band~~	~~-[**]dB/[**]kHz or [**] μW(-[**]dBm)/[**]kHz, whichever the level is smaller.~~
~~Other Bands~~	~~If the mean transmission power is no more than 25W:~~ ~~[25μW(-16dBm)/1MHz or less.]~~ ~~If the mean transmission power is more than 25W:~~ ~~[-60dBc/1MHz or less, and 20mW(+13dBm)/1MHz or less.]~~ ~~[current rules in each country shall apply.]~~

6.7 Transmit intermodulation

The transmit intermodulation performance is a measure of the capability of the transmitter to inhibit the generation of signals in its non linear elements caused by presence of the wanted signal and an interfering signal reaching the transmitter via the antenna.
The transmit intermodulation shall be defined by the ratio of the output power of subject transmitted signal to the output power of intermodulation product when an interference signal (that differs from frequency of subject signal) is added at a level [**]dB lower than that of the subject signal. The frequency of the interference signal shall be [**]MHz or more

off the subject signal, however, as for interference signal whose frequency is in the range of 5MHz to 10MHz off the subject signal, adjacent channel leakage power is used instead of the output of intermodulation product.

6.7.1. Minimum Requirement

The Transmit intermodulation level against the mean output power per carrier of the base station shall not exceed the limits specified below.

[If the mean transmission power is no more than 25W : 25μW(-16dBm) / 1MHz or less.]

[If the mean transmission power is more than 25W : -60dBc/1MHz or less, and 20mW (+13dBm) / 1MHz or less.]

<This is based on ARIB input. Further input for co-located cellular systems is needed.>

6.8 Transmit modulation

6.8.1 Transmit pulse shape filter

The transmit pulse-shaping filter is a root-raised cosine (RRC) with roll-off α =0.22 in the frequency domain. The impulse response of the chip impulse filter $RC_0(t)$ is

$$RC_0(t) = \frac{\sin\left(\pi \frac{t}{T_C}(1-\alpha)\right) + 4\alpha \frac{t}{T_C}\cos\left(\pi \frac{t}{T_C}(1+\alpha)\right)}{\pi \frac{t}{T_C}\left(1-\left(4\alpha \frac{t}{T_C}\right)^2\right)}$$

Where the roll-off factor α =0.22 and the chip duration: $T_c = \frac{1}{chiprate} = 0.24414\mu s$

6.8.2 Modulation Accuracy

The modulation accuracy is a measure of the difference between the measured waveform and the theoretical modulated waveform (the error vector). It is the square root of the ratio of the mean error vector power to the mean reference signal power expressed as %. The measurement interval is one timeslot.

6.8.2.1 Minimum Requirement

The Modulation accuracy shall not be worse than [12.5] %.

7 Receiver characteristics

7.1 General

Unless detailed the receiver characteristic are specified at each antenna connector of the BS.

<Definition of requirements for antenna diversity is ffs.>

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 7.3.1. The signal power is equally applied to each antenna connector for diversity.

7.2.1 ~~BS reference sensitivity level~~Minimum Requirement

For the different services with corresponding data rates, the reference sensitivity level of the BS shall be specified in table 8 below.

Table 8, BS reference sensitivity levels

Data rate	BS reference sensitivity level (dBm)	[FER/BER]

~~Table 8, BS reference sensitivity levels~~

7.2.2 Maximum Frequency Deviation for Receiver Performance

The need for such a requirement is for further study.

7.3 Dynamic range

The receiver dynamic range is the input power range at each BS antenna connector over which the [FER/BER] does not exceed a specific rate.

The static [BER/FER] reference performance as specified in clause 7.3.1 should be met over a receiver input range of [30] dB above the specified reference sensitivity level for [channel type ffs].

<The effect of applying mast head LNAs to the dynamic range specification is ffs.>

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 static reference performance as specified in clause 7.3.1 should be met when the following signals are applied to the receiver;

- A wanted signal at the assigned channel frequency, 3 dB above the static reference level.

- A modulated interfering adjacent channel signal with a level of [ ] dBm.

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; without this unwanted input signal causing a degradation of the performance of the receiver beyond a specified limit. The blocking performance shall apply at all frequencies except those at which a spurious response occur.

The static reference performance as specified in clause 7.3.1 should be met when the following signals are applied to the receiver;

- A wanted signal at the assigned channel frequency, 3 dB above the static reference level.
- An interfering signal at [frequency(s)] offset from the nominal assigned channel below a level of [ ] dBm.

< Editor The frequency range (in band/out of band) and level of the interfering signal is an item for further study>

<The definition of the exemptions needs to be reconsidered, since it is unclear.>

7.6 Spurious response

Spurious response is a measure of the receiver's ability to receive a wanted signal on its assigned channel frequency without exceeding a given degradation due to the presence of an unwanted CW interfering signal at any other frequency at which a response is obtained i.e. for which the blocking limit is not met.

The static reference performance as specified in clause 7.3.1 should be met when the following signals are applied to the receiver;

- A wanted signal at the assigned channel frequency, 3 dB above the static reference level.
- A CW interfering signal below a level of [ ] dBm.
- The number of allowed spurious responses is an item for further study.

7.7 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 7.3.1 should be met when the following signals are applied to the receiver;

- A wanted signal at the assigned channel frequency, 3 dB above the static reference level.
- A CW interfering signal at frequency [10 MHz] and a [CW] signal at frequency [20.1 MHz] with a level of [ ] dBm.

7.8 Spurious emissions

<Text to be added.>

8 Performance requirement

8.1 General

Performance requirements are specified for a number of test environments and multi-path channel classes.

8.2 Dynamic reference sensitivity performance

The minimum required dynamic reference sensitivity performance is specified according to the traffic rate and the propagation conditions.

8.2.1 Performance in AWGN channel

The performance requirement in AWGN channel is determined by the Eb/I0 required for BER=10-3, 10-6. The BER is calculated for each of the possible data services.

8.2.1.1 Single link performance

The required Eb/I0 is described in Table XXX.

Table XXX E_b/I_0 required for BER=10^{-3}, 10^{-6}

Data services (BER)	Data rates (kbps)	Required E_b/I_0
Speech (10^{-3})	8	T.B.D.
Long Constrained Delay data bearer services (10^{-6})	64 2048	T.B.D. T.B.D.
Unconstrained Delay Data bearer services (10^{-6})	64 2048	T.B.D. T.B.D.

8.2.1.2 Multi link performance

The required Eb/I0 is described in Table XXX.

Table XXX E_b/I_0 required for BER=10^{-3}, 10^{-6}

Data services (BER)	Number of active links	Data rates (kbps)	Required E_b/I_0
Speech (10^{-3})	N	8	T.B.D.

< The definition of the multi-link performance requirement is for further study >

8.2.2 Performance in multipath fading channels

The performance requirement of reverse link with/without TPC in multipath fading channels is determined by the Eb/I0 required for BER=10-3, 10-6. The BER is calculated for each of the possible data services.

8.2.2.1 Single link performance

8.2.2.1.1 Performance without TPC

The required Eb/I0 is described in Table XXX.

Table XXX E_b/I_0 required for BER=10^{-3}, 10^{-6}

Data services (BER)	Indoor (A), 3km/h		Pedestrian (A), 3km/h		Vehicular (A), 120km/h	
	Data rates	Required E_b/I_0	Data rates	Required E_b/I_0	Data rates	Required E_b/I_0
Speech (10^{-3})	8kbps	T.B.D.	8kbps	T.B.D.	8kbps	T.B.D.
Long Constrained Delay data bearer services (10^{-6})	64kbps 2048kbps	T.B.D. T.B.D.	64kbps 384kbps	T.B.D. T.B.D.	64kbps 144kbps 384kbps	T.B.D. T.B.D. T.B.D.
Unconstrained Delay Data bearer services (10^{-6})	64kbps 2048kbps	T.B.D. T.B.D.	64kbps 384kbps	T.B.D. T.B.D.	64kbps 144kbps 384kbps	T.B.D. T.B.D. T.B.D.

8.2.2.1.2 Performance with TPC

The required Eb/I0 is described in Table XXX.

Table XXX E_b/I_0 required for BER=10^{-3}, 10^{-6}

Data services (BER)	Indoor (A), 3km/h		Pedestrian (A), 3km/h		Vehicular (A), 120km/h	
	Data rates	Required E_b/I_0	Data rates	Required E_b/I_0	Data rates	Required E_b/I_0
Speech (10^{-3})	8kbps	T.B.D.	8kbps	T.B.D.	8kbps	T.B.D.

Long Constrained Delay data bearer services (10^{-6})	64kbps 2048kbps	T.B.D. T.B.D.	64kbps 384kbps	T.B.D. T.B.D.	64kbps 144kbps 384kbps	T.B.D. T.B.D. T.B.D.
Unconstrained Delay Data bearer services (10^{-6})	64kbps 2048kbps	T.B.D. T.B.D.	64kbps 384kbps	T.B.D. T.B.D.	64kbps 144kbps 384kbps	T.B.D. T.B.D. T.B.D.

8.2.2.2 Multi link performance

The required Eb/I0 is described in Table XXX.

Table XXX E_b/I_0 required for BER=10^{-3}, 10^{-6}

Data services (BER)	Number of active links	Data rates (kbps)	Required E_b/I_0
Speech (10^{-3})	N	8	T.B.D.

< The definition of the multi-link performance requirement is for further study >

Annex A (normative): Transmit power levels versus time

Annex B (normative): Propagation conditions

Annex C (normative): Environmental conditions

Annex D (informative): Open items

Section number	Section description	Status

History

Document history		
V0.0.1	1999-02-19	Document created based on S4.01B v0.0.2 “UTRA (BS) FDD, radio transmission and reception”
V0.0.2	1999-02-25	Editorial update after WG4#2 for distribution on the e-mail reflector.
V1.0.0	1999-03-02	Version presented to TSG RAN for information (identical to version 0.0.2)
V1.0.1	1999-04-13	Update according to decisions in TSG RAN WG4#3 in Tokyo, Japan, sent to WG4 e-mail reflector for comments
TS 25.105 V1.0.0	1999-04-22	Noted by TSG-RAN as TS 25.105 V1.0.0
V1.1.0	1999-06-11	Incorporation of changes from WG4#4 Meeting in Kista.

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