**DECREE OF THE DIRECTOR GENERAL OF POST AND TELECOMMUNICATION**

**NUMBER : 173/DIRJEN/2009**

**ON**

**TECHNICAL REQUIREMENTS OF TOOLS AND EQUIIPMENT OF *WIDEBAND CODE DIVISION MULTIPLE ACCESS* (WCDMA) TERMINAL**

**BY THE GRACE OF GOD THE ALMIGHTY**

**DIRECTOR GENERAL OF POST AND TELECOMMUNICATION**

Considering: a. that the Decision of the Minister of Communication

 Number: KM 3 Year 2001 on Technical Requirements

 of Telecommunication Tools and Equipment stipulates

 that every telecommunication tool and equipment shall fulfil

 the technical requirements;

1. that in line with the provision of Article 2 paragraph 1 of the Decree of the Minister of Communication and Information Technology Number: 29/PER/M.KOMINFO/09/2008 on Certification of Telecommunication Tools and Equipment, any telecommunication tools and equipment manufactured, assembled, imported for trade and or for use in the territory of the Republic of Indonesia shall fulfil the technical requirements;
2. that based on considerations mentioned in points a and b above, it is considered necessary to ratify a Decree of the Director General of Post and Telecommunication on Technical Requirements of Tools and Equipment of *Wideband Code Division Multiple Access* (WCDMA) Terminal.

 Bearing in mind: 1. Law of the Republic of Indonesia Number 36 Year 1999 on

 Telecommunication (State Gazette of the Republic of Indonesia

 of Indonesia Number 154 Year 1999, Additional State Gazette

 of the Republic of Indonesia Number 3881);

1. Government Regulation of the Republic of Indonesia Number 52 Year 2000 on Provision of Telecommunication (State Gazette of the Republic of Indonesia Number 107 Year 2000, Additional State Gazette of the Republic of Indonesia Number 3980);
2. Government Regulation of the Republic of Indonesia Number 53 Year 2000 on Use of Radio Frequency Spectrum and Satellite Orbit (State Gazette of the Republic of Indonesia Number 108 Year 2000, Additional State Gazette of the Republic of Indonesia Number 3981);
3. Decree of the President of the Republic of Indonesia Number 9 Year 2005 on Positions, Duties, Functions, Organizational Structure and Work Method of State Ministries of the Republic of Indonesia as amended latest by the Decree of the President of the Republic of Indonesia Number 20 Year 2008; ;
4. Decree of the President of the Republic of Indonesia Number 10 Year 2005 on Organizational Units and Duties of Echelon I of State Ministries of the Republic of Indonesia as amended latest by the Decree of the President of the Republic of Indonesia Number 21 Year 2008;
5. Decision of the Minister of Communication Number KM.3 Year 2001 on Technical Requirements of Telecommunication Tools and Equipment;
6. Decree of the Minister of Communication and Information Technology Number 25/P/M.KOMINFO/7/2008 on Organization and Work Method of the Department of Communication and Information Technology;
7. Decree of the Minister of Communication and Information Technology Number 29/PER/M.KOMINFO/09/2008 on Certification of Telecommunication Tools and Equipment.

**DECIDES**

**To ratify** : **DECREE OF THE DIRECTOR GENERAL OF POST AND TELECOMMUNICATION ON TECHNICAL REQUIREMENTS OF TOOLS AND EQUIPMENT OF *WIDEBAND CODE DIVISION MULTIPLE ACCESS* (WCDMA) TERMINAL**

Article 1

Tools and Equipment of *Wideband Code Division Multiple Access* (WCDMA) shall fulfil the technical requirements as stipulated in the Attachment of this Decree.

Article 2

The implementation of Certification of Tools and Equipment of *Wideband Code Division Multiple Access* (WCDMA) shall fulfil the technical requirements referred to in Article 1.

Article 3

This Decree shall come into force on the date of its ratification.

 Done at: JAKARTA

 On : July 15, 2009

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**DIRECTOR GENERAL OF POST AND TELECOMMUNICATION,**

Signed

**BASUKI YUSUF ISKANDAR**

**COPIES of this Decree are sent to:**

1. Minister of Communication and Information Technology;
2. Secretary of the Directorate General of Post and Telecommunication;
3. Directors within the Directorate General of Post and Telecommunication;
4. Head of Office of Telecommunication Equipment Testing Laboratory.

 **ATTACHMENT: DECREE OF THE DIRECTOR GENERAL**

 **OF POST AND TELECOMMUNICATION**

 **NUMBER : 173/DIRJEN/2009**

 **DATE : July 15, 2009**

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**TECHNICAL REQUIREMENTS OF TOOLS AND EQUIPMENT OF *WIDEBAND CODE DIVISION MULTIPLE ACCESS* (WCDMA) TERMINAL**

**CHAPTER I**

**GENERAL PROVISIONS**

1. **Scope**

These technical requirements are the ones for tools and equipment of *Wideband Code Division Multiple Access* (WCDMA) Including WCDMA Terminal that has HSDPA facilities.

These technical requirements comprise:

a. General Provisions (scope, definition, abbreviations);

b. Technical Requirements (general, transmitter, receiver, function) ;

c. Testing Requirements;

d. Marking and Packaging

1. **Definition**

WCDMA terminal is a telephone terminal which in its operation can be connected to telecommunication network of WCDMA system. WCDMA is a technology of modulation and method of multiple access that works based on *spread spectrum* technology,particularly *Direct Sequence Spread Spectrum.* With this technology, information signal is transmitted through the field of frequency which is far wider than the field of frequency of information signal, or in other word, information signal is transmitted through the process of spreading of information signal by disperser code into wide frequency field.

**3. Abbreviations**

ACLR : *Adjacent Channel Leaked Power Ratio*

ACS : *Adjacent Channel Selectivity*

BER : *Bit Error Rate*

BLER : *Block Error Rate*

BS : *Base Station*

CW :*Continuous Wave (unmodulated signal)*

DL : *Down Link (Forward Link)*

EVM : *Error Vector Magnitude*

FDD : *Frequency Division Duplexing*

Fuw : *Frequency of unwanted signal*

MS : *Mobile Station*

PCDE : *Peak Code Domain Error*

PPM : *Part Per Million*

RBS : *Radio Base Station*

TDD : *Time Division Duplexing*

TPC : *Transmit Power Control*

UE : *User Equipment*

UL *: Up Link*

UMTS : *Universal Mobile Telecommunication System*

UTRA : *UMTS Terrestrial Radio Access*

UTRAN : *UMTS Terrestrial Radio Access Network*

W-CDMA : *Wideband Code Division Multiple Access*

**CHAPTER II**

**TECHNICAL REQUIREMENTS**

**1. GENERAL REQUIREMENTS**

**1.1. FREQUENCY RANGE & SEPARATION (Tx-Rx)**

UTRA/FDD depend on frequency band used :

|  |  |  |  |
| --- | --- | --- | --- |
| **Freq.****Band** | **Uplink Freq.****UE (Tx) – Node B (Rx)** | **Uplink Freq.** **UE (Rx) – Node B (Rx)** | **Separation** **Tx – Rx** |
| 1 | 1920 – 1980 MHz | 2110 – 2170 MHz | 190 MHz |

**1.2. *CHANNELING***

Canal Space : 5MHz

Canal Raster : 200 kHz

Carrier frequency in line with UTRA *Absolute Radio Frequency Channel Number*

(UARFCN) adapted to Frequency Band. The value of UARFCN is defined with the formula :

 Uplink Nu = 5\* (FuL- FuL\_offset), Carrier frequency FuL\_low≤FuL≤FuL\_\_high

 Dowlink ND = 5\*(FDL-FDL offset), Carrier frequency FDL low≤FDL≤FDL \_\_ high

|  |  |  |
| --- | --- | --- |
| **Band** | **Uplink (UL)****UE transmit, Node B receive**  | **Downlink (DL)****UE receive, Node B transmit** |
|  |
|  | **General** | **Additional** | **General** | **Additional** |
| **l** | 9612 to 9888 |  | 10562 to 10838 |  |

**2. TRANSMITTER REQUIREMENT**

Measurement of characteristics is done by undertaking direct connection to antenna connector in UE (*User Equipment*).

**2.1 *MAXIMUM CHANNEL POWER***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Operating**Band | **Power Class 1** | **Power Class 2** | **Power Class 3** | **Power Class 4** | **Power Class 5** |
| **Power****(dBm)** | **Tol****(dB)** | **Power****(dBm)** | **Tol****(dB)** | **Power****(dBm)** | **Tol****(dB)** | **Power****(dBm)** | **Tol****(dB)** | **Power****(dBm)** | **Tol****(dB)** |
| Band 1 | +33 | +1/-3 | +27 | +1/-3 | +24 | +1/-3 | - | - | +21 | +2/-2 |

\*) Measurement is done at the time of multi-code DPDCH transmission mode.

**2.2 FREQUENCY ERROR**

Measurement of frequency error is done by making comparison between measured frequency on UE against Node B and the interval 3904 chip or < 25 s

Frequency error allowed is ± 0.1 ppm.

**2.3 *OUTPUT SPECTRUM EMISSION***

**2.3.1 OBW (*Occupied Bandwidth*)**

OBW measurement is done at 99 % of the total WCDMA power that has bandwidth of 5 MHz. OBW value must be less than 5 MHz (OBW <5 MHz).

**2.3.2 *EMISSIN MASK***

|  |  |  |  |
| --- | --- | --- | --- |
| **f in MHz****(Note 1)** | **Minimum requirement (Note 2)** | **Additional requirements Band II, IV, V, X****(Note 3)** | **Measurement Bandwidth****(Note 6)**  |
| **Relative requirement** | **Absolute requirement** |
| 2.5 – 3.5 | -35-15.((f/MHz)-2.5) dBc | -71.1 dBm | -15 dBm | 30 kHz(Note 4) |
| 3.5 – 7.5 | -35-1. ( (f/ MHz)- 3.5) dBc | -55.8 dBm | -13 dBm | 1 MHz(Note 5) |
| 7.5 -8.5 | -35-15. ( (f/ MHz)- 7.5) dBc | -55.8 dBm | -13 dBm | 1 MHz(Note 5) |
| 8.5 – 12.5 | -49 dBc | -55.8 dBm | -13 dBm | 1 MHz(Note 5) |
| No. 1: is the separation between the carrier frequency and the centre of the measurement bandwidthNo. 2 :The minimum requirement is calculated from the relative requirement or the absolute requirement, whichever is the  higher power  |

**2.3.3 *ADJACENT CHANNEL CHANNEL LEAKAGE POWER RATIO***

|  |  |  |
| --- | --- | --- |
| **Power Class** | **Adjacent channel frequency relative to assigned channel frequency** | **ACRL limit** |
| 3 | + 5 MHz or – 5 MHz | 33 dB |
| 3 | + 10 MHz or – 10 MHz | 43 dB |
| 4 | + 5 MHz or – 5 MHz | 33 dB |
| 4 | + 10 MHz or – 10 MHz | 43 dB |

**2.4 *SPURIOUS***

Spurious measurement is done on 4 frequency ranges where each range uses different RBW/VBW.

|  |  |  |
| --- | --- | --- |
| **Frequency bandwidth** | **Measurement Bandwidth** | **Minimum requirement** |
| 9 kHz ≤ f 150 kHz | 1 kHz | -36dBm |
| 150 kHz ≤ f < 30 MHz | 10 kHz | -36dBm |
| 30 MHz ≤ f < 1000 MHz | 100 kHz | -36dBm |
| 1 GHz ≤ f < 12.75 GHz | 1 MHz | -30dBm |

**2.5 *INTERMODULATION***

This measurement is done in order to know the capability of transmitter when there is a signal generation due to the existence of the desired signal influence and signal interference, where maximum interference that emerges as follows :

|  |  |  |
| --- | --- | --- |
| Interference signal Frequency Offset | 5MHz | 10MHz |
| Interference CW Signal Level |  -40dBc |
| Intemodulation Product | -31dBc | -41dBc |

Parameters for EVM and PCDE measurement are as follows :

|  |  |  |
| --- | --- | --- |
| **Parameter** | **Unit** | **Level** |
| UE Output Power | dBm | ≥ -20 |
| Operating conditions  |  | Normal conditions  |
| Power control step size  | dB | 1 |
| MeasurementPeriod(Note 1) | PRACH | Chips  | 3904 |
| Any DPCH | From 1280 to 2560(Note 2) |
| Note 1 : Less any 25 s transient periodsNote 2 : The longest period over which the nominal power remains constant  |

**2.5.1 EVM (*Error Vector Magnitude*)**

Measurement of Error Vector Magnitude is done by comparing reference wave

vis-à-vis measured wave where EVM allowed is < 17.5%.

**2.5.2. PCDE (*Peak Code Domain Error*)**

The value of Peak Code Domain Error (PCDE) is obtained from *Error vector* calculation and *code domain* from specific factor of spreading . Where PCDE must < -15 dB.

**3. RECEIVER REQUIREMENT**

**3.1. SENSITIVITY**

Sensitivity measurement is done at the level of reference -106.7 dBm and maximum BER allowed is 0.001%

|  |  |  |  |
| --- | --- | --- | --- |
| **Operating Band** | **Unit** | **DPCH\_Ec<REFSENS>** | **<REFLor>** |
| L | dBm/3.84 MHz | -117 | - 106.7 |
| NOTE 1 For Power class 3 and 3bis shall be at the maximum output powerNOTE 2 For Power class 4 this shall be at the maximum output power |

**4. FUNCTIONAL REQUIREMENT**

**4.1.** Terminal must be able to apply features owned by WCDMA 3G system and maximum data speed of 384 Kbps.

**4.2.** In the event that terminal supports HSDPA 3.5G facilities, maximum data speed is 3.6 Mbps.

**4.**3. Terminal must be able to perform handoff to GSM.

**CHAPTER III**

**TESTING REQUIREMENT**

**1. Method of Sampling**

Sampling of test materials is done at random according to prevailing testing procedure.

**2. Test Method**

Testing method is determined by testing institution that must be able to show in a qualitative and quantitative manner that the tested materials are measured according to testing procedure and requirement in this standard.

**3. Condition for Passing the Test**

The testing result is declared PASS THE TEST, if all the tested materials comply with the provisions indicated in these technical requirements.

If the tested materials are declared NOT PASS THE TEST, all the groups included in the tested materials are also declared not pass the test

**4. Condition for Safety and Health**

The prescribed Tools and Equipment must be reengineered in such a way that users are protected from electrical and electromagnetic disturbances.

**5. Condition for Electromagnetic Compatibility**

Refer to CISPR-22 and CISPR-24 Standards.

**CHAPTER IV**

**MARKING AND PACKAGING**

**1.** Any tool and equipment of WCDMA Terminal that has been declared to pass the test shall be marked with the name of manufacturer, manufacturing country, brand, type, and serial number in accordance with certification provision.

**2.** Packaging must take into account elements of safety, endurance against weather, aesthetics, and space efficiency.

**DIRECTOR GENERAL OF POST AND TELECOMMUNICATION,**

Signed

**BASUKI YUSUF ISKANDAR**