Technical Specifications for Mobile Telecommunications Terminal Equipment

(Unofficial Translation*)

National Communications Commission

September 25 2020

*Should there be any discrepancy between the English and Chinese versions, the Chinese version shall prevail.

Technical Specifications for New Radio Broadband Terminal Equipment of Mobile Broadband Business

1. Legal Basis

The Specifications are promulgated pursuant to on Paragraph 1, Article 44 of the Telecommunications Management Act.

2. Definitions, symbols and abbreviations

2.1 Definitions

2.1.1 Handheld: A terminal that is used on the move in the normal operating mode with the transmission source less than 20 cm from human body.

2.1.2 Portable(or Vehecular) terminal: A terminal that is used on the move at a non-specific location in the normal operating mode with the transmission source more than 20 cm from human body.

2.1.3 Fixed wireless access terminal: A terminal that is used at a specific fixed location in the normal operating mode.

2.1.4 Narrow Band Terminal: classified by its transmission source as handheld and portable; also classified by its transmission bandwidth as LTE Machine Type Communications (LTE-M1) and Narrow-Band IoT (NB-IoT).

2.1.5 LTE-M1 terminal equipment: Refers to terminal equipment that receives network services through the mobile broadband network; the channel bandwidth shall be no more than 1.08 MHz(including).

2.1.6 NB-IoT terminal equipment: Refers to terminal equipment that receives network services through the mobile broadband network; the channel bandwidth shall be 180 kHz.

2.2 Abbreviations

ACLR： Adjacent Channel Leakage Ratio

EIRP：Effective Isotropic Radiated Power

ERP：Effective Radiated Power

FDD：Frequency Division Duplex

FR：Frequency Range

GSM： Global System for Mobile Communications

HPUE： High Power User Equipment

LTE： Long Term Evolution

NR： New Radio

PLMN： Public Land Mobile Network

TDD： Time Division Duplex

TT： Test Tolerance

UTRA： Universal Terrestrial Radio Access

WCDMA： Wideband Code Division Multiple Access

3. Scope of Application

3.1 NR Terminal (PLMN12): applies to the type approval for the handheld or mobile broadband terminals for new radio (NR) of mobile broadband services and fixed wireless access terminals of mobile broadband services. Depending on terminal duplexing, the frequency division duplex (FDD) and time division duplex (TDD) are available. The Frequency bands:

3.1.1 Frequency Division Duplex (FDD):

3.1.1.1 Frequency range 1 (FR1):

700 megahertz (MHz hereafter) band (703 MHz～748 MHz for uplink and 758 MHz～803 MHz for downlink),

900 MHz band (885 MHz ～ 915 MHz for uplink and 930 MHz ～ 960 MHz for downlink),

1800 MHz band (1710 MHz～1785 MHz for uplink and 1805 MHz～1880 MHz for downlink),

2100 MHz band (1920 MHz～1980 MHz for uplink and 2110 MHz～2170 MHz for downlink),
2500 MHz and 2600 MHz bands (2500 MHz～2570 MHz for uplink and 2620 MHz～2690MHz for downlink).

3.1.2 Time Division Duplex (TDD):

3.1.2.1 Frequency range 1 (FR1):

2500 MHz and 2600 MHz bands (2500 MHz～2690 MHz),
3500 MHz band (3300 MHz～3570 MHz).

3.1.2.2 Frequency range 2 (FR2):

28000 MHz band (27000 MHz～29500MHz).

3.2 Narrow Band Terminal (PLMN11): applies to LTE-M1 Terminal and NB-IoT Terminal.

3.2.1 LTE-M1 Terminal can be classified as FDD and TDD. The frequency bands are as follows:

3.2.1.1 FDD:

700 MHz band (703 MHz～748 MHz for uplink； 758 MHz～803 MHz for downlink),
900 MHz band (885 MHz～915 MHz for uplink； 930 MHz～960 MHz for downlink),
1800 MHz band (1710 MHz～1785 MHz for uplink； 1805 MHz～1880 MHz for downlink) ,
2100 MHz band (1920 MHz～1980 MHz for uplink；2110 MHz～2170 MHz for downlink) ,
2500 MHz and 2600 MHz band(2500 MHz～2570 for uplink； 2620 MHz～2690 MHz for downlink)。

3.2.1.2 TDD：

2500 MHz and 2600 MHz band (2500 MHz～2690 MHz)。

3.2.2 NB-IoT Terminal only applies to FDD mode. The frequency bands are as follows:

700 MHz band (703 MHz～748 MHz for uplink； 758 MHz～803 MHz for downlink)、
900 MHz band (885 MHz～915 MHz for uplink； 930 MHz～960 MHz for downlink）、
1800 MHz band (1710 MHz～1785 MHz for uplink； 1805 MHz～1880 MHz for downlink)、
2100 MHz band (1920 MHz～1980 MHz for uplink ；2110 MHz～2170 MHz for downlink)。

3.3 LTE Terminal (PLMN10): applies to mobile type-approved devices. According to its properties, equipment is categorized as either Frequency Division Duplex (FDD) or Time Division Duplex (TDD). The relevant frequency bands are as follows:

3.3.1 FDD：

700 MHz (uplink 703 MHz-748 MHz ; downlink 758 MHz-803 MHz),
900 MHz (uplink 885MHz-915 MHz; downlink 930 MHz-960 MHz),
1800 MHz (uplink 1710 MHz-1785 MHz; downlink 1805 MHz-1880 MHz),
2100 MHz (uplink 1920 MHz-1980 MHz; downlink 2110 MHz-2170 MHz),
2500 MHz and 2600 MHz (uplink 2500 MHz-2570 MHz; downlink 2620 MHz-2690 MHz) bands.

3.3.2 TDD：

2500 MHz and 2600 MHz bands (2500 MHz -2690 MHz).

3.4 WCDMA FDD Terminal (PLMN08)：The relevant frequency bands are as follows:

Band 1 (uplink 1920 MHz-1980 MHz；downlink 2110MHz-2170 MHz),
Band 3 (uplink 1710 MHz-1785 Hz；downlink 1805 MHz-1880 MHz),
Band 7 (uplink 2500 MHz-2570 MHz；downlink 2620 MHz-2690 MHz）,
Band 8 (uplink 885 MHz-915 MHz；downlink 930 MHz-960 MHz）.

3.5 GSM900 Terminal (PLMN01)：

*Should there be any discrepancy between the English and Chinese versions, the Chinese version shall prevail.

The relevant frequency bands are : uplink 890MHz-915MHz; downlink 935MHz-960MHz.

4. Technical Standards

The Specifications are established by referencing the National Standards, including CNS14958-1, CNS14959, CNS14336-1, CNS13438, CNS15285, CNS15364, 3GPP , 3GPP2 and other applicable international technical standards.

5. Conditions for Test Environment

5.1 Temperature and Relative Humidity for Test Items in Article 6:

5.1.1 Normal environment: Temperature: +15℃to +35℃, Relative Humidity: 25% to 75%

5.1.2 Extreme environment: Temperature: -10℃to +55℃, IEC 60068-2-1 and IEC 60068-2-2 shall be met for additional requirements.

5.1.3 At extreme temperature range, the terminal, if powered on, shall not make ineffective use of the radio frequency band in Article 3.

5.2 Voltage:

The voltage of power to a terminal shall be between lower and higher extreme voltages. The applicant for terminal type approval shall declare the nominal voltage, lower extreme voltage, higher extreme voltage and shutdown voltage. In case that a terminal is capable of operating one or more power sources, the lower extreme voltage shall not be higher than the limits shown in the table below and the higher extreme voltage shall not be lower than the limits shown in the table below.

Power source	Lower extreme voltage	Higher extreme voltage	Normal conditions voltage
AC mains	0.9 × nominal	1.1 × nominal	nominal
Regulated lead acid battery	0.9 × nominal	1.3 × nominal	1.1 × nominal
Non regulated batteries:			
Leclanché	0.85 × nominal	nominal	nominal
Lithium	0.95 × nominal	1.1 × nominal	1.1 × nominal
Mercury/nickel & cadmium	0.90 × nominal	1.1 × nominal	nominal

For the voltage of power source lower than the lower extreme voltage shown in the table above or higher than the higher extreme voltage shown in the table above, the terminal, if powered on, shall not make ineffective use of the radio frequency band in Article 3.

In particular, the terminal shall inhibit all RF transmissions when the power supply voltage is below the manufacturer declared shutdown voltage.

6. Testing items and eligibility criteria

6.1. NR Terminal

6.1.1 Transmitter power:

6.1.1.1 FR1:

6.1.1.1.1 Terminal maximum output power:

6.1.1.1.1.1 Terminal power class 2: 26 dBm;

6.1.1.1.1.2 Terminal power class 3: 23 dBm;

6.1.1.1.1.3 The frequency bands applicable for power classes shall meet Table 1, where the test tolerances (TTs) are shown in Table 2.

6.1.1.1.2 Test method: in accordance with Table 3.

6.1.1.2 FR2:

6.1.1.2.1 Effective isotropic radiated power (EIRP) limits:

6.1.1.2.1.1 The limit is 43 dBm for handheld terminals;

6.1.1.2.1.2 The limit is 43 dBm for portable terminals;

6.1.1.2.1.3 The limit is 55 dBm for fixed wireless access terminals.

6.1.2.2 Test method: in accordance with Table 4.

*Should there be any discrepancy between the English and Chinese versions, the Chinese version shall prevail.

6.1.2 Frequency Error:
6.1.2.1 FR1:
6.1.2.1.1 Limits:
The carrier frequency shall be within ±0.1 parts per million (ppm) of the carrier frequency received from the NR gNB.
6.1.2.1.2 Test method: in accordance with Table 5.
6.1.2.2 FR2:
6.1.2.2.1 Limits:
The carrier frequency shall be within ±0.1 PPM of the carrier frequency received from the NR gNB .
6.1.2.2.2 Test method: in accordance with Table 6.
6.1.3 Adjacent channel leakage ratio (ACLR)
6.1.3.1 FR1:
6.1.3.1.1 NR adjacent channel leakage power ratio (NR_{ACLR}) is the ratio of the filtered mean power centered on the assigned NR channel frequency to the filtered mean power centered on an adjacent NR channel frequency at nominal channel spacing.
6.1.3.1.1.1 Limits: if the measured adjacent channel power is greater than -50 dBm then the measured NR ACLR shall be higher than the limits in Table 7, where the test tolerances (TT) are shown in Table 8.
6.1.3.1.1.2 Test method:
The measurement bandwidth is specified in Table 9. A rectangular filter is used. The test is performed according to Table 10.
6.1.3.1.2 UTRA adjacent channel leakage power ratio ($UTRA_{ACLR}$) is the ratio of the filtered mean power centered on the assigned NR channel frequency to the filtered mean power centered on an adjacent(s) UTRA channel frequency.
6.1.3.1.2.1 Limits: if the measured adjacent channel power is greater than -50 dBm, then the measured UTRA ACLR shall be higher than the limits in Table 11.
6.1.3.1.2.2 Test method:
The UTRA channel power is measured with an RRC(Root Raised Cosine) filter with roll-off factor α=0.22 and bandwidth of 3.84MHz. The assigned NR channel power is measured with a rectangular filter with measurement bandwidth specified in Table 9. The test is performed according to Table 10.
6.1.3.2 FR2:
6.1.3.2.1 Limits:
If the measured adjacent channel power is greater than -35 dBm then the NR_{ACLR} shall be higher than the value specified in Table 12, where the test tolerances (TT) are shown in Table 13.
6.1.3.2.2 Test method:
The assigned NR channel power and adjacent NR channel power are measured with rectangular filters. The test is performed according to Table 14.
6.1.4 Spectrum emission mask
6.1.4.1 FR1:
6.1.4.1.1 Limits:
The specified values for spectrum mask in Table 15 shall be met, where the test tolerances (TT) are shown in Table 16.
6.1.4.1.2 Test method:
6.1.4.1.2.1 The spectrum emission limits vary depending on the Δ frequency of out-of-band emission (Δf_{OOB}). For measurement, the resolution bandwidth shall not be smaller than the settings in Table 15.
6.1.4.1.2.2 The test is performed according to Table 17.
6.1.4.2 FR2:
6.1.4.2.1 Limits:
The general specified values for NR spectrum emission mask in Table 18 for FR2 shall be met, where the test tolerances (TT) are shown in Table 19.
6.1.4.2.2 Test method:

6.1.4.2.2.1 The resolution bandwidth for measurement shall not be smaller the settings in Table 18. The measurement is performed for total radiated power.

6.1.4.2.2.2 The test is performed Table 20.

6.1.5 Spurious emissions

6.1.5.1 FR1:

6.1.5.1.1 Limits:

The limits for spurious emission shall meet those limits shown in Table 21.

6.1.5.1.2 Test method:

6.1.5.1.2.1 The spurious emission limits apply for the frequency ranges that are more than F_{OOB} (MHz) in Table 22 from the edge of the channel bandwidth. For measurement, the resolution bandwidth shall not be smaller than the settings in Table 21. F_{OOB} is the boundary between the NR out of band emission and spurious emission domains.

6.1.5.1.2.2 The test is performed according to Table 23.

6.1.5.2 FR2:

6.1.5.2.1 Limits:

6.1.5.2.1.1 General limits:

The limits for spurious emission shall meet those shown in Table 24.

6.1.5.2.1.2 Spurious emissions Terminal co-existence limits:

The limits for spurious emission in the co-existence in terminals shall meet the limits shown in Table 25.

6.1.5.2.1.3 Additional limits: the requirements for additional spurious emission shall be met for the applications of area broadcasting, for example. The limits for additional spurious emission shall meet those shown in Table 26.

6.1.5.2.2 Test method:

6.1.5.2.2.1 General limits:

6.1.5.2.2.1.1 The Δf_{OOB} in Table 18 is not included in the measurement frequency range. For measurement, the resolution bandwidth shall not be smaller than the settings in Table 24. The measurement is performed for total radiated power.

6.1.5.2.2.1.2 The test is performed according to Table 27.

6.1.5.2.2.2 Limits for co-existing bandwidths in terminals:

6.1.5.2.2.2.1 The spurious emission in the co-existing bandwidths in terminals shall meet the limits shown in Table 25. However, the Δf_{OOB} in Table 18 is not included. The measurement is performed for total radiated power.

6.1.5.2.2.2.2 The test is performed according to Table 27.

6.1.5.2.2.3 Additional limits:

6.1.5.2.2.3.1 The limits for additional spurious emission shall meet the limits shown in Table 26. The measurement is performed for total radiated power.

6.1.5.2.2.3.2 The test is performed according to Table 27.

6.2 Narrow Band Terminal

6.2.1 General Test Items and eligibility criteria

6.2.1.1 Frequency error:

Under normal temperature/supply voltage, lower extreme temperature/ voltage, lower extreme temperature/higher extreme voltage, higher extreme temperature/lower extreme voltage and higher extreme temperature/ higher extreme voltage (as specified in Article 5), results of the measurements shall be taken in increments of 0/2/5/10 minutes; the frequency should be maintained within 0.1ppm of the main wave frequency of the channel.

6.2.1.2 If the terminal is equipped with charging function, it should conform to 6.9.

6.2.1.3 If the terminal is equipped with Public Warning System, is should conform to 6.10.

6.2.2. LTE-M1 Test Items and eligibility criteria:

6.2.2.1 Power limits:

6.2.2.1.1 Emission power limit:

6.2.2.1.1.1 Effective Radiated power (ERP)

1 W for handheld terminal equipment.

2 W for portable terminal equipment.

6.2.2.1.1.2 Conducted output power limit:

Class 3: 23 dBm +2.7/-3.2 dB.

Class 5: 20 dBm +2.7/-3.2 dB.

6.2.2.1.2 Testing methods:

6.2.2.1.2.1 When measuring the emission power, devices must be used with RMS (root mean square) equivalent voltage to measure any continuous transmission time. The measurement results shall be used to adjust the emission power based on the responding time, resolution bandwidth capability and sensitivity of the device.

6.2.2.1.2.2 The test is performed according to Table 28.

6.2.2.2 Spectrum emission mask:

6.2.2.2.1 Limits of the spectrum emission mask: Shall comply with the spectrum emission mask values prescribed in Table 29.

6.2.2.2.2 Testing methods:

6.2.2.2.2.1 The spectrum emission mask limit values vary according to the bandwidth and Δf_OOB. The resolution bandwidth (RBW) during the measurement shall not be smaller than the set values prescribed in Table 29.

6.2.2.2.2.2 Testing shall be conducted with the provisions of Table 30.

6.2.2.3 Radiation emission limit outside the conduction band:

6.2.2.3.1 Shall comply with specification values of the out-of-band radiation with the provisions of Table 31.

6.2.2.3.2 Testing methods:

6.2.2.3.2.1 Frequency range of the out-of-band radiation measurement does not include Δf_OOB stated in 6.2.2.2.1. During the measurement, the resolution bandwidth shall not smaller than the set value with the provisions of Table 31.

6.2.2.3.2.2 Testing shall be conducted with the provisions of Table 32.

6.2.2.4 Adjacent channel leakage ratio (ACLR):

6.2.2.4.1 Shall comply with the ACLR specification values prescribed in Table 33.

6.2.2.4.2 Testing Methods:

6.2.2.4.2.1 Measure the averaged power of the testing and adjacent channels to calculate the ACLR. During the measurement, the measurement bandwidth of the channels shall adhere to specification values of Table 33.

6.2.2.4.2.2 Testing shall be conducted with the provisions of Table 34.

6.2.2.5 Emission within non-resource blocks:

6.2.2.5.1 Shall comply with specification values of non-resource blocks as prescribed in Table 35.

6.2.2.5.2 Testing methods: Tests for the 5 MHz bandwidth shall be conducted according to Table 36.

6.2.3 Testing items and eligibility criteria for NB-IoT terminal equipment

6.2.3.1 Power limits:

6.2.3.1.1 Emission power limit:

6.2.3.1.1.1 Effective radiated power (ERP)

1 W for handheld terminal equipment.

2 W for portable terminal equipment.

6.2.3.1.1.2 Conducted output power limit:

Class 3: 23dBm +2.7/-2.7dB.

Class 5: 20 dBm +2.7/-2.7dB.

6.2.3.1.2 Testing methods:

6.2.3.1.2.1 When measuring the emission power, devices must be used with RMS (root mean square) equivalent voltage to measure any continuous transmission time. The measurement results shall be used to adjust the emission power based

on the responding time, resolution bandwidth capability and sensitivity of the device.

6.2.3.1.2.2 Tests shall be conducted according to Table 37.

6.2.3.2 Spectrum emission mask:

6.2.3.2.1 Limits of the spectrum emission mask: Shall comply with the spectrum emission mask values prescribed in Table 38.

6.2.3.2.2 Testing methods:

6.2.3.2.2.1 The spectrum emission mask limit values vary according to the bandwidth and Δf_OOB. The resolution bandwidth (RBW) during the measurement shall not be smaller than the set values prescribed in Table 38.

6.2.3.2.2.2 Tests shall be conducted according to Table 39.

6.2.3.3 Radiation emission limit outside the conduction band:

6.2.3.3.1 Shall comply with specification values of the out-of-band radiation with the provisions of Table 40.

6.2.3.3.2 Testing methods:

6.2.3.3.2.1 Frequency range of the out-of-band radiation measurement does not include Δf_OOB at 1.7MHz. During the measurement, the resolution bandwidth shall not smaller than the set value prescribed in Table 40.

6.2.3.3.2.2 Tests shall be conducted according to Table 41.

6.2.3.4 Adjacent channel leakage ratio (ACLR):

6.2.3.4.1 Shall comply with the ACLR specification values prescribed in Table 42.

6.2.3.4.2 Testing methods:

6.2.3.4.2.1 Measure the averaged power of the testing and adjacent channels to calculate the ACLR. During the measurement, the measurement bandwidth of the channels shall adhere to specification values of Table 42.

6.2.3.4.2.2 Tests shall be conducted according to Table 43.

6.2.3.5 Emission within non-resource blocks:

6.2.3.5.1 Shall comply with specification values of non-resource blocks as prescribed in Table 44.

6.2.3.5.2 Testing methods: Tests shall be conducted according to Table 45.

6.3 LTE Terminal:

6.3.1 Power limits:

6.3.1.1 Emission power limit:

6.3.1.1.1 Effective radiated power (ERP)

1W for handheld station devices.

2W for portable station devices.

6.3.1.1.2 The conducted output power limit.

FDD: 23 dBm +2.7/-3.2 dB.

TDD: 23 dBm +2.7/-2.7 dB. If the device is a high power user equipment (HPUE),the conducted output power limit is 26 dBm +2.7/-2.7 dB.

6.3.1.2 Testing methods:

6.3.1.2.1 During the measurement of emission power, devices must be used with RMS (root mean square) equivalent voltage to measure any continuous transmission time. The results of the measurement shall be used to adjust the correct emission power based on the responding time, resolution bandwidth capability and sensitivity of the device.

6.3.1.2.2 Testing shall be conducted with the provisions of Table 46.

6.3.2 Spectrum emission mask:

6.3.2.1 Limits of the spectrum emission mask: Shall comply with the spectrum emission mask specification values with the provisions of Table 47.

6.3.2.2 Testing methods:

6.3.2.2.1 The spectrum emission mask limit values vary according to the bandwidth and Δf_OOB. The resolution bandwidth (RBW) during the measurement shall not be smaller than the set values with the provisions of Table 47.

6.3.2.2.2 Testing shall be conducted with the provisions of Table 48.

6.3.3 Radiation emission limit outside the conduction band:

6.3.3.1 The radiation emission outside the operating band shall comply with specification values of the out-of-band radiation with the provisions of Table 49.

6.3.3.2 Testing methods:

6.3.3.2.1 Frequency range of the out-of-band radiation measurement does not include Δf_OOB stated in 6.3.2.1. During the measurement, the resolution bandwidth shall not smaller than the set value with the provisions of Table 49.

6.3.3.2.2 Testing shall be conducted with the provisions of Table 50.

6.3.4 The adjacent channel leakage ratio (ACLR) :

6.3.4.1 The ACLR limit value is 29.2 dB. If the device is a HPUE, the ACLR limit value is 30.2 dB.

6.3.4.2 Testing Methods:

6.3.4.2.1 The ACLR is to detect the power ratio of the channel and its adjacent channel. During the measurement, the measurement bandwidth of the channels shall adhere to specification values with the provisions of Table 51. If the device is a HPUE, the measurement bandwidth shall adhere to Table 52.

6.3.4.2.2 Testing shall be conducted with the provisions of Table 53.

6.3.5 Frequency error:

Under normal temperature/supply voltage, lower extreme temperature/ voltage, lower extreme temperature/higher extreme voltage, higher extreme temperature/lower extreme voltage and higher extreme temperature/ higher extreme voltage (as specified in Article 5), results of the measurements shall be taken in increments of 0/2/5/10 minutes; the frequency should be maintained within 0.1PPM of the main wave frequency of the channel.

6.4 WCDMA FDD Terminal

6.4.1 Frequency bands and channel spacing shall comply with Table 54.

6.4.2 Maximum output power shall comply with Table 55.

6.4.3 Frequency error : Under normal temperature/supply voltage, lower extreme temperature/ voltage, lower extreme temperature/higher extreme voltage, higher extreme temperature/lower extreme voltage and higher extreme temperature/ higher extreme voltage (as specified in Article 5), results of the measurements shall be taken in increments of 0/2/5/10 minutes; the frequency should be maintained within 0.1ppm of the main wave frequency of the channel.

6.4.4 Minimum controlled output power: ≦ -50 dBm (in one time slot).

6.4.5 occupied bandwidth: ≦ 5 MHz.

6.4.6 Spectrum emissions mask: shall comply with Table 56.

6.4.7 ACLR(Power class 3、4)

6.4.7.1 Adjacent Channel Offset ±5 MHz ：ACLR limit 33 dB；

6.4.7.2 Adjacent Channel Offset ±10 MHz ：ACLR limit 43 dB；

6.4.8 Spurious emission:

6.4.8.1 Band 1：shall comply with Table 57 and Table 58

6.4.8.2 Band 3：shall comply with Table 57 and Table 59

6.4.8.3 Band 7：shall comply with Table 57 and Table 60

6.4.8.4 Band 8：shall comply with Table 57 and Table 61

6.4.9 For test items from 6.4.2 to 6.4.8, the UE should be operated at low, mid, and high frequency. The test method refer to the latest method of measurement of 3GPP TS34.121 and TS34.124.

6.5 GSM900 Terminal

6.5.1 Operating bands:

Uplink: 890 + 0.2 × n MHz

Downlink: 935 MHz + 0.2 × n MHz (n=1 至 124)

6.5.1.1 Test purpose:

To verify that the UE uplink frequency from 890MHz to 915MHz and downlink frequencies 935MHz to 960MHz. The carrier spacing is 200kHz. Each carrier occupied

200kHz.

6.5.1.2 Conformance requirement:

GSM900 uplink frequency band shall be within 890 + n × 0.2MHz (where n=1 to 124) range and downlink frequencies shall be within 935 + n × 0.2MHz (where n=1 to 124) range, where n is Absolute Radio Frequency Channel Number (ARFCN).

6.5.2 Maximum Transmitter Output Power:

6.5.2.1 Test purpose: To verify that the maximum transmitter output power of the UE shall comply with the required operating frequency range.

6.5.2.2 The UE power class:

Power class 2：8W (39dBm)。

Power class 3：5W (37dBm)。

Power class 4：2W (33dBm)。

Power class 5：0.8W (29dBm)。

6.5.2.2.1: Conformance requirement

6.5.2.2.1.1 The transmitter output power, under every combination of normal and extreme test conditions, for normal bursts and access bursts, at each frequency and for each power control level applicable to the MS power class, shall be at the relevant level shown in following table within the tolerances also shown in following Table 62. (Remark：The lowest nominal output power for all classes of GSM900 MS is 5dBm，When the power control level corresponds to the power class of the MS, then the tolerances shall be 2.0 dB under normal test conditions)

6.5.2.2.1.2 The transmitter power level relative to time for a normal burst shall be within the power/time template as shown in Figure 1.

6.5.2.2.1.3 The power/time relationship of the measured samples for access bursts shall be within the limits of the power time template at each frequency, under every combination of normal and at each power control level measured, as in Figure 2.

6.5.3 Duplex Spacing: 45MHz.

6.5.4 Channel Spacing:200kHz

6.5.5 Spurious Emissions

6.5.5.1 As Table 63 measurement ≤-36 dBm

6.5.5.2 As Table 64 measurement:

9KHz ~ 1GHz: ≤-36 dBm

1GHz ~ 12.75GHz: ≤-30 dBm

6.5.5.3 In idle，100KHz bandwidth measurement：

9KHz ~ 880 MHz: ≤-57 dBm

880MHz ~ 915 MHz: ≤-59 dBm

915MHz ~ 1,000 MHz: ≤-57 dBm

1,000MHz ~ 1,710 MHz: ≤-47 dBm

1,710MHz ~ 1,785 MHz: ≤-53 dBm

1,785MHz ~ 12.75GHz: ≤-47 dBm

6.5.6 Frequency Error:

Under normal temperature/supply voltage, lower extreme temperature/ voltage, lower extreme temperature/higher extreme voltage, higher extreme temperature/lower extreme voltage and higher extreme temperature/ higher extreme voltage (as specified in Article 5), results of the measurements shall be taken in increments of 0/2/5/10 minutes; the frequency should be maintained within 0.1ppm of the main wave frequency of the channel.

6.5.7 Output RF Spectrum: As Table 65 and Table 66.

6.6 Limits for Electromagnetic Exposure

6.6.1 This test applies to handheld terminals.

6.6.1.1 FR1:

The standard values of specific absorption rate (SAR) for electromagnetic energy shall meet CNS14959. The limit for SAR for the use of a terminal close to head is 2 W/kg.

The measurement procedure specified in IEC 62209-1 shall be used.

6.6.1.2 FR2:

The limits for power density (PD) shall meet the requirement of 1.0 mW/cm². The measurement procedure specified in IEC TR 63170 shall be used.

6.6.2 This test applies to portable or fixed wireless access terminals.

6.6.2.1 Limits for Maximum Permissible Exposure (MPE):

0.35 mW/cm² for 700 MHz band;
0.45 mW/cm² for 900 MHz band;
0.9 mW/cm² for 1800 MHz band;
1.0 mW/cm² for 2100 MHz, 2500 MHz, 2600 MHz, 3500MHz and 28GHz bands.

The measurement is performed at a distance of 20 cm or the distance claimed by the terminal manufacturer for human activities in the vicinity of the terminal antenna.

6.7 Electromagnetic Compatibility (EMC)

CNS13438 or any other applicable standards established by the competent authority shall be met.

6.8 Electrical Safety

CNS14336-1 or any other applicable standards established by the competent authority shall be met.

6.9 Handheld Terminal Connection Interface, Power Adaptor Connection Interface, Charging Cord and Power Adaptor

6.9.1 This test applies to mobile phones.

6.9.2 The basic structure shown in Figure B.1 of CNS15285 shall be used for the connection interface. An adapting charging cord or adaptor shall be used for mobile phones with a socket for a specific mobile terminal in Figure B.1.

6.9.3 The rated charging current range for the power adaptor shall meet CNS15285 B.2.1(c).

6.9.4 Handheld terminal connection interface, power adaptor connection interface, charging cord and power adaptor shall meet the general characteristics in CNS15285 B.2.2. The no-load power consumption of power adaptor shall be smaller than 0.15W.

6.9.5 Rechargeable batteries shall be used in mobile phones. CNS 15364 shall be met.

6.9.6 The insulation materials used on handheld terminal connection interface and power adaptor connection interface shall meet IEC 60695-11-10 or be of Class V-2 or higher in UL 94.

6.9.7 The fire rating of the charging cord materials shall meet IEC 60332-1 or be of Class VW-1 or higher in UL 1581.

6.10 Message Reception from Public Warning System

6.10.1 This test applies to handheld terminals that are equipped with access to voice service provided a mobile broadband service provider.

6.10.2 The public warning system (PWS) refers to a system that transmits CBS message identifier and contents from a base station to a certain area using the cell broadcast service (CBS) of mobile communication system.

6.10.3 A terminal shall be provided with functions to receive message identifiers and display message contents, such as:

6.10.3.1 The language of the contents PWS alerts, message identifier, classification, preset receiving on or off, and the options of users, etc shall comply with the provisions of Table 67.

6.10.3.2 When a terminal set to receive messages receives a PWS message, the content of the message shall be displayed explicitly with the classification of message identifier shown at the title of the message content; see Figure 3 for an example.

6.10.3.3 The message identifier shall be tested together with the following message contents: 6.10.3.3.1 and 6.10.3.3.3 shall be tested; 6.10.3.3.2 shall be tested starting from January 1 2021; however, the test may be scheduled on an earlier day if such a request is made by the applicant for the type approval of terminal.

6.10.3.3.1 For a terminal with an interface in Chinese, the message content shall be: [本訊息為災防告警訊息測試]業者配合政府政策，已建置細胞廣播系統，目前在發送測試用災防告警細胞廣播訊息，造成不便，敬請見諒，國家通訊傳播委員會

關心您。

6.10.3.3.2 For a terminal with an interface in Chinese and English, the message content shall be shown in both Chinese and English, as follows: [災防告警測試]業者依照政府政策，測試災防告警，造成不便，敬請見諒，國家通訊傳播委員會關心您。 [Public warning testing] Your mobile phone operator complies with government policies and tests public warning. We apologize for any inconvenience and appreciate your kind understanding. National Communications Commission

6.10.3.3.3 For a terminal with an interface in English, the message content shall be: [The message is for public warning message testing] Your mobile phone operator has set up cell broadcasting systems for transmitting public warning messages. Now this service is still in trial. We apologize for any inconvenience it may cause and appreciate your kind understanding.
National Communications Commission

6.10.3.4 The terminal shall allow user to view the content of previous message received.

6.10.3.5 Users are not allowed to forward a PWS message received by the terminal or edit the content of the message.

6.10.4 Audio signals:

6.10.4.1 The audio signal shall be categorized into two kinds of signal: audio attention signal and audio general signal:

6.10.4.1.1 Audio attention signal:

6.10.4.1.1.1 The audio attention signal shall consist of a special audio frequency and interval, and the audio attention signal shall not be set up by the user or modified:

6.10.4.1.1.1.1 Special audio frequency: for the function of audio mixing, the signal shall be generated by mixing the fundamental frequencies of 853 hertz (Hz) and 960 Hz; for the function of monotone, the signal shall be generated using a single tone of 960 Hz.

6.10.4.1.1.1.2 Special interval: the audio attention signal consists of two sections with an interval of 0.5 seconds in between; the composition of the signal is a sound lasting 2 seconds + a second sound lasting 1 second with an interval of 0.5 second between the sounds.

6.10.4.1.1.1.3 The pattern of the audio attention signal is provided in Figure 4.

6.10.4.1.1.2 The audio alert signal is used only for PWS broadcasting.

6.10.4.1.2 General audio signal: the general audio signal contains no special audio frequency and interval and can be defined or altered by users; i.e. the audio signals generated by the terminal when a typical message is received.

6.10.4.2 When to generate: for a terminal set to receive message identifiers, when a PWS message is received, an audio signal shall be generated corresponding to the message identifier and user's definitions, as shown in Table 68.

6.10.4.3 The default shall be that the audio signals are activated, and the user is allowed to deactivate or activate.

6.10.4.4 When the terminal generates an audio signal, the user may terminate the signal before it ends.

6.10.5 Vibration cadence:

6.10.5.1 For vibration cadence, there are vibration attention cadence and general vibration cadence:

6.10.5.1.1 Vibration attention cadence:

6.10.5.1.1.1 An vibration attention cadence shall be provided with a special interval. The vibration attention cadence shall not be set up by the user or modified:

6.10.5.1.1.1.1 Special interval: the vibration attention cadence consists of two sections of vibrations with an interval of 0.5 second in between. Every section of vibration is made up of one vibration of 2 seconds, followed by two vibrations of 1 second with an interval of 0.5 second between vibrations.

6.10.5.1.1.1.2 The temporal pattern of vibration attention cadence in Figure 5.

6.10.5.1.1.2 The vibration attention cadence is used only for PWS broadcasting.

6.10.5.1.1.3 The vibration attention cadence and audio attention signal does not need

to be synchronized.

6.10.5.1.2 General vibration signal: The general vibration cadence shall not have special interval of vibration when a general message is received by the terminal.

6.10.5.2 When to generate: for a terminal set to receive message identifiers, when a PWS message is received, a vibration shall be generated corresponding to the message identifier and user's definitions, as shown in Table 68.

6.10.5.3 The vibration cadence is considered to be an opt-out by the user with the initial default configuration being that all emergency alerts are enabled.

6.10.5.4 When the terminal generates a vibration signal, the user may terminate the signal before it ends.

6.10.6 The presentation of the received PWS alert message should take priority over other mobile device functions. The PWS alert message shall not preempt an active voice or data session.

6.10.7 The processing of receiving the duplicate PWS message:

6.10.7.1 Duplicate PWS alert message refers to PWS alert messages with the same message identifier and serial number, indicating that they have been sent repeated. The definition of serial number shall refer to the technical standard 3GPP TS 23.041.

6.10.7.2 Where the equipment receives duplicate PWS alert message from the base station, it shall not show the message content or generate signal and vibration.

6.11 IMEI Number and Guarantee of uniqueness

The IMEI number is read and recorded by test instrument. The applicant shall submit the guarantee of IMEI uniqueness.

7. Test Requirements

7.1 NR Terminal

7.1.1 For the test procedures and limits specified in the Specifications, the requirements in the latest version of 3GPP TS 38.101-1, 3GPP TS 38.101-2, 3GPP TS 38.521-1 and 3GPP TS 38.521-2, if any, may be adopted.

7.1.2 Unless otherwise specified in the Specifications, Article 6 of the Technical Specifications for Low-Power Radio Frequency Machines shall apply to the test methods for the tests specified in 6.1.1, 6.1.2 and 6.1.5. For test procedures, the reference procedure for transmitter test in Appendix 1 of the Technical Specifications for Low-Power Radio Frequency Machines shall apply.

7.2 Narrow Band Terminal

Except as otherwise provided in 6.2 of the technical specifications, testing methods for examining emission power, out-of-band radiation emission and frequency stability shall all be processed based on the inspection requirements stated in Point 6 of the Low-power Radio-frequency Devices Technical Specifications (LPRFD Technical Requirements). The inspection procedures shall be processed in accordance of the Appendix 1 "Referential Procedures of Inspecting Transmitters" of the Low-power Radio-frequency Devices Technical Specifications.

7.3 LTE Terminal

Except as otherwise provided in 6.2 of the technical specifications, testing methods for 6.3.1.1, 6.3.3 and 6.3.5 shall be processed based on the inspection requirements stated in Point 6 of the Low-power Radio-frequency Devices Technical Specifications (LPRFD Technical Requirements). The inspection procedures shall be processed in accordance of the Appendix 1 "Referential Procedures of Inspecting Transmitters" of the Low-power Radio-frequency Devices Technical Specifications.

7.4 WCDMA FDD Terminal

For the test procedures and limits specified in the Specifications, the requirements in the latest version of 3GPP TS 25.101、TS25.102、TS 34.121、TS 34.122、TS 34.124 及 3GPP2 C.S0011-A（TIA/EIA-98-D）, if any, may be adopted.

7.5 GSM900 Terminal

For the test procedures and limits specified in the Specifications, the requirements in the latest version of ETSI ETS 300 607-1（GSM11.10 -1）及 ETSI TS 151 010-1, if any, may be adopted.

7.6 6.7 through 6.9 of the Specifications shall be performed jointly with power adaptor and charging cord; however, for the submitted power adaptor and charging cord for which the type approval has been obtained, the tests for power adaptor and charging cord specified in 6.9 of the Specifications may be waived with the presence of approval certificate and test report.

8. Warning indication

8.1 Electromagnetic warning indication

8.1.1 The content of warning shall be similar to: “Use with caution to minimize electromagnetic impacts.”

8.1.2 Indication: the warning shall be labeled visibly on the body of terminal and indicated on the outer package of terminal and in the user’s instructions.

8.2 Warning Indication for Electromagnetic Exposure

8.2.1 For Handheld Terminals

8.2.1.1 The content of warning for 6GHz or lower shall be similar to: “Standard SAR value: ____ W/kg, actual value measured on product: ____ W/kg.”

8.2.1.2 The content of warning for 6GHz or higher shall be similar to: “Standard PD: 1.0 mW/cm^2, actual value measured on product: ____ mW/cm^2.”

8.2.2 For Vehicular, portable or Fixed Wireless Access Terminals

The content of warning shall be similar to: “Standard MPE: ____ mW/cm^2, actual value measured on product: ____ mW/cm^2; it is advised to keep the antenna at least ____ cm away from human body when using the device.”

8.2.3 Indication: the warning shall be labeled visibly on the body of terminal and indicated on the outer package of terminal and in the user’s instructions.

*Should there be any discrepancy between the English and Chinese versions, the Chinese version shall prevail.

Table 1 FR1 Maximum Output Power test requirement (see 3GPP TS 38.521-1 Table 6.2.1.5-1 and Table 6.2.1.5-2)

NR uplink frequency band (MHz)	Class 2 (dBm)	Tolerance (dB)	Class 3 (dBm)	Tolerance (dB)
1920～1980			23	+2+TT/-2-TT
1710～1785			23	+2+TT/-2-TT (note)
2500～2570			23	+2+TT/-2-TT (note)
885～915			23	+2+TT/-2-TT (note)
703～748			23	+2/-2.5
2500～2690	26	+2+TT/-3-TT (note)	23	+2+TT/-2-TT (note)
3300～3570	26	+2+TT/-3-TT	23	+2+TT/-3-TT
Note: Refers to the transmission bandwidths confined within F_{UL_low} and F_{UL_low} + 4 MHz or F_{UL_high} – 4 MHz and F_{UL_high}, the maximum output power requirement is relaxed by reducing the lower tolerance limit by 1.5 dB				

Table 2 Test tolerance (TT) for FR1 Terminal maximum output power (see 3GPP 38.521-1 Table 6.2.1.5-3)

	f ≤ 3.0GHz	3.0GHz < f ≤ 4.2GHz	4.2GHz < f ≤ 6.0GHz
Channel bandwidth ≤ 40MHz	0.7 dB	1.0 dB	1.0 dB
40MHz < channel bandwidth ≤ 100MHz	1.0 dB	1.0 dB	1.0 dB

Table 3 Test Configuration Table for FR1 transmitter output power (see 3GPP 38.521-1 Table 6.2.1.4.1-1)

Initial conditions			
Test environment	Normal		
Test Frequencies	Low range, Mid range, High range		
Test channel bandwidth	Lowest, Mid, Highest		
Subcarrier spacing	Lowest, Highest		
Test parameters			
Test ID	Downlink Configuration	Uplink Configuration	
	Not applicable	Modulation (note 2)	RB allocation (note 1)
1		DFT-s-OFDM PI/2 BPSK	Inner Full
2		DFT-s-OFDM PI/2 BPSK	Inner 1RB Left

*Should there be any discrepancy between the English and Chinese versions, the Chinese version shall prevail.

3		DFT-s-OFDM PI/2 BPSK	Inner 1RB Right
4		DFT-s-OFDM QPSK	Inner Full
5		DFT-s-OFDM QPSK	Inner 1RB Left
6		DFT-s-OFDM QPSK	Inner 1RB Right
Note 1: The specific configuration of each resource block (RB) distribution is defined in 3GPP TS 38.521-1 Table 6.1-1. Note 2: DFT-s-OFDM PI/2 BPSK test applies only for terminals which supports half Pi BPSK in FR1.			

Table 4 Test Configuration Table for FR2 effective isotropic radiated power (see 3GPP 38.521-2 Table 6.2.1.1.4.1-1)

Default conditions					
Test environment			Normal		
Test Frequencies			Low range, Mid Range, High range		
Test channel bandwidths			Lowest, 100MHz, highest		
Subcarrier spacing			120 kHz		
	Test parameters				
Test ID	Channel bandwidth	Subcarrier spacing	Downlink Configuration	Uplink Configuration	
		Default	Not applicable	Modulation	RB allocation (note)
1	50 MHz			DFT-s-OFDM QPSK	Inner_Full
2	100 MHz				
3	200 MHz				
4	400 MHz				
Note: The specific configuration of each RF allocation is defined in 3GPP TS 38.521-2 Table 6.1-1.					

Table 5 Test Configuration Table for FR1 frequency error (see 3GPP TS 38.521-1 Table 6.4.1.4.1-1)

Initial conditions	
Test environment	Normal environment + normal voltage, lower extreme temperature + lower extreme voltage, lower extreme temperature + higher extreme voltage, higher extreme temperature + lower extreme voltage, higher extreme temperature + higher extreme voltage
Test Frequencies	Mid range
Test channel bandwidth	Highest
Subcarrier spacing	Lowest
Test parameters	

	Downlink Configuration		Uplink Configuration	
Test ID	Modulation	RB allocation	Modulation	RB allocation
1	CP-OFDM QPSK	Full RB (note 1)	DFT-s-OFDM QPSK	REFSENS (note 2)
Note 1: Full RB allocation shall be used per each SCS and channel BW as specified in 3GPP 38.521-1 Table 7.3.2.4.1-2. Note 2: The reference sensitivity (REFSENS) refers to 3GPP 38.521-1 Table 7.3.2.4.1-3 which defines uplink RB configuration and start RB location for each SCS, channel BW and NR band.				

Table 6 Test Configuration Table for FR2 frequency error (see 3GPP TS 38.521-2 Table 6.4.1.4.1-1)

Initial conditions				
Test environment			Normal environment + normal voltage, lower extreme temperature + normal voltage, higher extreme temperature + normal voltage	
Test Frequencies			Mid range	
Test channel bandwidth			Highest	
Test SCS			Lowest	
Test parameters				
Test ID	Downlink Configuration		Uplink Configuration	
	Modulation	RB allocation	Modulation	RB allocation
1	CP-OFDM QPSK	Full RB (note 1)	DFT-s-OFDM QPSK	REFSENS (note 2)
Note 1: Full RB allocation shall be used per each SCS and channel BW as specified in 3GPP 38.521-1 Table 7.3.2.4.1-2. Note 2: The reference sensitivity (REFSENS) refers to 3GPP 38.521-1 Table 7.3.2.4.1-3 which defines uplink RB configuration and start RB location for each SCS, channel BW and NR band.				

Table 7 NR ACLR requirement for FR1 (see 3GPP TS 38.521-1 Table 6.5.2.4.1.5-2)

	Terminal power class 2	Terminal power class 3
NR ACLR	31 - TT dB	30 - TT dB

Table 8 Test tolerance (TT) of FR1 NR ACLR (see 3GPP TS 38.521-1 Table 6.5.2.4.1.5-3)

	$f \leq 3.0$GHz	3.0GHz $< f \leq$ 4.2GHz	4.2GHz $< f \leq$ 6.0GHz
BW $\leq$ 100MHz	0.8 dB	0.8 dB	0.8 dB

*Should there be any discrepancy between the English and Chinese versions, the Chinese version shall prevail.

Table 9 FR1 NR_{ACLR} measurement bandwidth (see 3GPP 38.521-1 Table 6.5.2.4.1.5-1)

NR Channel bandwidth / NR ACLR measurement bandwidth												
	5 MHz	10 MHz	15 MHz	20 MHz	25 MHz	30 MHz	40 MHz	50 MHz	60 MHz	80 MHz	90 MHz	100 MHz
NR ACLR measurement bandwidth (MHz)	4.515	9.375	14.235	19.095	23.955	28.815	38.895	48.615	58.35	78.15	88.23	98.31

Table 10 FR1 ACLR Test Configuration Table (see 3GPP TS 38.521-1 Table 6.5.2.4.1.4.1-1)

Initial conditions						
Test environment		Normal environment + normal voltage				
Test Frequencies		Low range, High range				
Test channel bandwidths		Lowest, Highest				
Subcarrier spacing		Lowest and highest				
Channel bandwidth test parameters						
Test ID	Frequency	Channel bandwidth	Subcarrier spacing	Downlink Configuration	Uplink Configuration	
		Default	Default	N/A for Adjacent Channel Leakage Ratio test case	Modulation (note 2)	RB allocation (note 1)
1 (note 3)	Default				DFT-s-OFDM PI/2 BPSK	Inner_Full
2 (note 3)	Low channel				DFT-s-OFDM PI/2 BPSK	Edge_1RB_Left
3 (note 3)	High channel				DFT-s-OFDM PI/2 BPSK	Edge_1RB_Right
4 (note 3)	Default				DFT-s-OFDM PI/2 BPSK	Outer_Full
5 (note 4)	Default				DFT-s-OFDM PI/2 BPSK	Inner_Full
6 (note 4)	Low channel				DFT-s-OFDM PI/2 BPSK	Edge_1RB_Left
7 (note 4)	High channel				DFT-s-OFDM PI/2 BPSK	Edge_1RB_Right
8 (note 4)	Default				DFT-s-OFDM PI/2 BPSK	Outer_Full

9	Default		DFT-s-OFDM QPSK	Inner_Full
10	Low channel		DFT-s-OFDM QPSK	Edge_1RB_Left
11	High channel		DFT-s-OFDM QPSK	Edge_1RB_Right
12	Default		DFT-s-OFDM QPSK	Outer_Full
13	Default		DFT-s-OFDM 16 QAM	Inner_Full
14	Low channel		DFT-s-OFDM 16 QAM	Edge_1RB_Left
15	High channel		DFT-s-OFDM 16 QAM	Edge_1RB_Right
16	Default		DFT-s-OFDM 16 QAM	Outer_Full
17	Low channel		DFT-s-OFDM 64 QAM	Edge_1RB_Left
18	High channel		DFT-s-OFDM 64 QAM	Edge_1RB_Right
19	Default		DFT-s-OFDM 64 QAM	Outer_Full
20	Low channel		DFT-s-OFDM 256 QAM	Edge_1RB_Left
21	High channel		DFT-s-OFDM 256 QAM	Edge_1RB_Right
22	Default		DFT-s-OFDM 256 QAM	Outer_Full
23	Default		CP-OFDM QPSK	Inner_Full
24	Low channel		CP-OFDM QPSK	Edge_1RB_Left
25	High channel		CP-OFDM QPSK	Edge_1RB_Right
26	Default		CP-OFDM QPSK	Outer_Full
27	Default		CP-OFDM 16 QAM	Inner_Full
28	Low channel		CP-OFDM 16 QAM	Edge_1RB_Left
29	High channel		CP-OFDM 16 QAM	Edge_1RB_Right
30	Default		CP-OFDM 16 QAM	Outer_Full
31	Low channel		CP-OFDM 64 QAM	Edge_1RB_Left
32	High		CP-OFDM 64 QAM	Edge_1RB_Right

	channel					
33	Default				CP-OFDM 64 QAM	Outer_Full
34	Low channel				CP-OFDM 256 QAM	Edge_1RB_Left
35	High channel				CP-OFDM 256 QAM	Edge_1RB_Right
36	Default				CP-OFDM 256 QAM	Outer_Full

Note 1: The specific configuration of each RF allocation is defined in 3GPP TS 38.521-1 Table 6.1-1.

Note 2: DFT-s-OFDM PI/2 BPSK test applies only for terminals which supports half Pi BPSK in FR1.

Note 3: For Power Class 3 testing, terminal operating in TDD mode with PI/2 BPSK modulation, and UE indicating support for UE capability powerBoosting-pi2BPSK, the IE powerBoostPi2BPSK is set to 1 for frequency band at 2500-2690 MHz (n41)/3300-3570 MHz (n78).

Note 4: For Power Class 3 testing, terminal operating in FDD mode, or in TDD mode in bands other than 2500-2690 MHz (n41)/3300-3570 MHz (n78) , or in TDD mode the IE powerBoostPi2BPSK is set to 0 for bands 3300-3570 MHz (n78).

Table 11 UTRA ACLR requirement for FR1 ($UTRA_{ACLR}$) (see 3GPP 38.521-1 Table 6.5.2.4.2.5-2)

	Terminal power class 3 (note 1)
$UTRA_{ACLR1}$ (note 2)	33 dB - TT
$UTRA_{ACLR2}$ (note 3)	36 dB - TT

Note 1: TT = 0.8 dB。

Note 2: $UTRA_{ACLR1}$ is first adjacent UTRA channel ($UTRA_{ACLR1}$) which centre frequency is ± 2.5 MHz from NR channel edge.

Note 3: $UTRA_{ACLR2}$ is the 2nd adjacent UTRA channel ($UTRA_{ACLR2}$) which centre frequency is ± 7.5 MHz from NR channel edge.

Table 12 General requirements for NR adjacent channel leakage ratio(NR_{ACLR}) for FR2 (see 3GPP TS 38.521-2 Table 6.5.2.3.5-1)

	Channel bandwidth			
	50 MHz	100 MHz	200 MHz	400 MHz
NR ACLR limits	17+TT dB	17+TT dB	17+TT dB	17+TT dB
NR channel measurement bandwidth	47.52 MHz	95.04 MHz	190.08 MHz	380.16 MHz
Adjacent channel centre frequency offset	±50 MHz	±100 MHz	±200 MHz	±400 MHz

Table 13 Test tolerance (TT) for NR adjacent channel leakage ratio for FR2 (see 3GPP TS 38.521-2 Table 6.5.2.3.5-1a)

Test environment (Test Metric)	23.45GHz ≤ f ≤ 30.3GHz
Indirect far field (IFF) (quiet zone size ≤ 30 cm)	4.6 dB

Table 14 Channel bandwidth test parameters for FR2 NR_{ACLR} (see 3GPP TS 38.521-2 Table 6.5.2.3.4.1-1)

Default Conditions						
Test environment		Normal environment + normal voltage				
Test Frequencies		Low range, High range				
Test channel bandwidths		Lowest, Mid, Highest				
Subcarrier spacing		Lowest and highest				
Test parameters						
Test ID	Frequency	Channel bandwidth	SCS	Downlink Configuration	Uplink Configuration	
		Default	Default	Not applicable	Modulation	RB allocation (note)
1	Low channel				DFT-s-OFDM PI/2 BPSK	Outer_1RB_Left
2	High channel				DFT-s-OFDM PI/2 BPSK	Outer_1RB_Right
3	Default				DFT-s-OFDM PI/2 BPSK	Outer_Full
4	Low channel				DFT-s-OFDM QPSK	Outer_1RB_Left
5	High channel				DFT-s-OFDM QPSK	Outer_1RB_Right
6	Default				DFT-s-OFDM QPSK	Outer_Full
7	Low channel				DFT-s-OFDM 16 QAM	Outer_1RB_Left
8	High channel				DFT-s-OFDM 16 QAM	Outer_1RB_Right
9	Default				DFT-s-OFDM 16 QAM	Outer_Full
10	Default				DFT-s-OFDM 64 QAM	Outer_Full
11	Low channel				CP-OFDM QPSK	Outer_1RB_Left
12	High channel				CP-OFDM QPSK	Outer_1RB_Right
13	Default				CP-OFDM QPSK	Outer_Full
Note: The specific configuration of each RF allocation is defined in 3GPP TS 38.521-2 Table 6.1-1.						

Table 15 FR1 spectrum emission mask specifications (see 3GPP TS 38.521-1 Table 6.5.2.2.5-1)

Spectrum emission limit (dBm)/Channel bandwidth													
Δf_{OOB} (MHz)	5 MHz	10 MHz	15 MHz	20 MHz	25 MHz	30 MHz	40 MHz	50 MHz	60 MHz	80 MHz	90 MHz	100 MHz	**Resolution bandwidth**
± 0-1	-13 +TT	-13 +TT	-13 +TT	-13 +TT	-13 +TT	-13 +TT	-13 +TT						1 % of Channel bandwidth
± 0-1								-24 +TT	-24 +TT	-24 +TT	-24 +TT	-24 +TT	30 kHz (note 1)
± 1-5	-10 +TT	-10 +TT	-10 +TT	-10 +TT	-10 +TT	-10 +TT	-10 +TT	-10 +TT	-10 +TT	-10 +TT	-10 +TT	-10 +TT	1 MHz (note 2)
± 5-6	-13 +TT	-13 +TT	-13 +TT	-13 +TT	-13 +TT	-13 +TT	-13 +TT	-13 +TT	-13 +TT	-13 +TT	-13 +TT	-13 +TT	
± 6-10	-25 +TT												
± 10-15		-25 +TT											
± 15-20			-25 +TT										
± 20-25				-25 +TT									
± 25-30					-25 +TT								
± 30-35						-25 +TT							
± 35-40													
± 40-45							-25 +TT						
± 45-50													
± 50-55								-25 +TT					
± 55-60													
± 60-65									-25 +TT				
± 65-80													
± 80-85										-25			

*Should there be any discrepancy between the English and Chinese versions, the Chinese version shall prevail.

										+TT			
± 85-90													
± 90-95											-25 +TT		
± 95-100													
± 100-105												-25 +TT	

Note 1: The first and last measurement position with a 30 kHz filter is at Δf_{OOB} equals to 0.015 MHz and 0.985 MHz.

Note 2: At the boundary of spectrum emission limit, the first and last measurement position with a 1 MHz filter is the inside of +0.5MHz and -0.5MHz, respectively.

Note 3: The measurements are to be performed above the upper edge of the channel and below the lower edge of the channel specified in Article 2 of the Specifications for applicable frequency bands.

Note 4: Test Tolerance(TT) for each frequency and channel bandwidth is specified in Table 16.

Table 16 Test tolerance (TT) for FR1 spectrum emission mask (see 3GPP TS 38.521-1 Table 6.5.2.2.5-2)

	f ≤ 3.0GHz	3.0GHz < f ≤ 4.2GHz	4.2GHz < f ≤ 6.0GHz
BW ≤ 100MHz	1.5 dB	1.8 dB	1.8 dB

Table 17 Channel bandwidth test parameters for FR1 spectrum emission mask (see 3GPP TS 38.521-1 Table 6.5.2.2.4.1-1)

Default Conditions						
Test environment	Normal environment + normal voltage					
Test Frequencies	Low range, High range					
Test channel bandwidths	Lowest and highest					
Subcarrier spacing	Lowest and highest					
Test ID	Test Parameters for Channel Bandwidths					
	Frequency	Channel bandwidth	Subcarrier spacing	Downlink Configuration	Uplink Configuration	
		Default	Default	Not applicable	Modulation (note 2)	RB allocation (note 1)
1 (note 3)	Low channel				DFT-s-OFDM PI/2 BPSK	Edge_1RB_Left
2 (note 3)	High channel				DFT-s-OFDM PI/2 BPSK	Edge_1RB_Right
3 (note 3)	Default				DFT-s-OFDM PI/2 BPSK	Outer_Full
4	Low channel				DFT-s-OFDM QPSK	Edger_1RB_Left
5	High channel				DFT-s-OFDM QPSK	Edge_1RB_Right
6	Default				DFT-s-OFDM QPSK	Outer_Full
7	Low channel				DFT-s-OFDM 16 QAM	Edge_1RB_Left
8	High channel				DFT-s-OFDM 16 QAM	Edge_1RB_Right
9	Default				DFT-s-OFDM 16 QAM	Outer_Full
10	Low channel				DFT-s-OFDM 64 QAM	Edge_1RB_Left
11	High channel				DFT-s-OFDM 64 QAM	Edge_1RB_Right
12	Default				DFT-s-OFDM 64 QAM	Outer_Full
13	Low channel				DFT-s-OFDM 256 QAM	Edge_1RB_Left

14	High channel				DFT-s-OFDM 256 QAM	Edge_1RB_Right
15	Default				DFT-s-OFDM 256 QAM	Outer_Full
16	Low channel				CP-OFDM QPSK	Edge_1RB_Left
17	High channel				CP-OFDM QPSK	Edge_1RB_Right
18	Default				CP-OFDM QPSK	Outer_Full
19	Low channel				CP-OFDM 16 QAM	Edge_1RB_Left
20	High channel				CP-OFDM 16 QAM	Edge_1RB_Right
21	Default				CP-OFDM 16 QAM	Outer_Full
22	Low channel				CP-OFDM 64 QAM	Edge_1RB_Left
23	High channel				CP-OFDM 64 QAM	Edge_1RB_Right
24	Default				CP-OFDM 64 QAM	Outer_Full
25	Low channel				CP-OFDM 256 QAM	Edge_1RB_Left
26	High channel				CP-OFDM 256 QAM	Edge_1RB_Right
27	Default				CP-OFDM 256 QAM	Outer_Full

Note 1: The specific configuration of each RF allocation is defined in 3GPP TS 38.521-1 Table 6.1-1.

Note 2: DFT-s-OFDM PI/2 BPSK test applies only for terminals which supports half Pi BPSK in FR1..

Note 3: For Power Class 3 testing, include two steps for terminals operating on 2500-2690 MHz (n41) / 3300-3570 MHz (n78) , with IE *powerBoostPi2BPSK* set to 1 and 0 separately.

Table 18 General NR spectrum emission mask specifications for FR2 (see 3GPP TS 38.521-2 Table 6.5.2.1.5-1)

Spectrum Emission limits (dBm) / Channel bandwidth					
Δf_{OOB} (MHz)	50MHz	100MHz	200MHz	400MHz	Measurement bandwidth
± 0-5	-5+TT	-5+TT	-5+TT	-5+TT	1 MHz
± 5-10	-13+TT	-5+TT	-5+TT	-5+TT	1 MHz
± 10-20	-13+TT	-13+TT	-5+TT	-5+TT	1 MHz
± 20-40	-13+TT	-13+TT	-13+TT	-5+TT	1 MHz

± 40-100	-13+TT	-13+TT	-13+TT	-13+TT	1 MHz
± 100-200		-13+TT	-13+TT	-13+TT	1 MHz
± 200-400			-13+TT	-13+TT	1 MHz
± 400-800				-13+TT	1 MHz

Note 1: see Table 19 for test tolerance (TT).

Note 2: At the boundary of spectrum emission limit, the first and last measurement position with a 1 MHz filter is the inside of +0.5MHz and -0.5MHz, respectively.

Note 3: The measurements are to be performed above the upper edge of the channel and below the lower edge of the channel, specified in Article 2 of the Specifications for applicable frequency bands.

Table 19 Test tolerance (TT) for general NR spectrum emission mask specifications for FR2 (see 3GPP TS 38.521-2 Table 6.5.2.1.5-1a)

Test environment (Test Metric)	23.45GHz ≤ f ≤ 32.125GHz
Indirect far field (IFF) (quiet zone size ≤ 30 cm)	3.21 dB

Table 20 Test Configuration for FR2 spectrum emission mask (see 3GPP TS 38.521-2 Table 6.5.2.1.4.1-1)

Initial Conditions			
Test environment		Normal environment + normal voltage	
Test Frequencies		Mid range	
Test channel bandwidths		Lowest, Mid, Highest	
Subcarrier spacing		Lowest and highest	
Test parameters			
Test ID	Downlink Configuration	Uplink Configuration	
	Not applicable	Modulation	RB allocation (note)
1		DFT-s-OFDM PI/2 BPSK	Outer_1RB_Left
2		DFT-s-OFDM PI/2 BPSK	Outer_1RB_Right
3		DFT-s-OFDM PI/2 BPSK	Outer_Full
4		DFT-s-OFDM QPSK	Outer_1RB_Left
5		DFT-s-OFDM QPSK	Outer_1RB_Right
6		DFT-s-OFDM QPSK	Outer_Full
7		DFT-s-OFDM 16 QAM	Outer_1RB_Left
8		DFT-s-OFDM 16 QAM	Outer_1RB_Right
9		DFT-s-OFDM 16 QAM	Outer_Full
10		DFT-s-OFDM 64 QAM	Outer_1RB_Left
11		DFT-s-OFDM 64 QAM	Outer_1RB_Right
12		DFT-s-OFDM 64 QAM	Outer_Full
13		CP-OFDM QPSK	Outer_1RB_Left
14		CP-OFDM QPSK	Outer_1RB_Right
15		CP-OFDM QPSK	Outer_Full
Note: The specific configuration of each RF allocation is defined in 3GPP TS 38.521-1 Table 6.1-1.			

Table 21 Limits for spurious emission for FR1 (see 3GPP TS 38.521-1 Table 6.5.3.1.3-2)

Frequency range	**Maximum level**	**Resolution bandwidth**	**Note**
9 kHz ≤ f < 150 kHz	-36 dBm	1 kHz	
150 kHz ≤ f < 30 MHz	-36 dBm	10 kHz	
30 MHz ≤ f < 1000 MHz	-36 dBm	100 kHz	
1 GHz ≤ f < 12.75 GHz	-30 dBm	1 MHz	

	-25 dBm	1 MHz	3
12.75GHz≤f< 5 x highest harmonics of the maximum UL operating frequency, in GHz	-30 dBm	1 MHz	1
12.75 GHz < f < 26 GHz	-30 dBm	1 MHz	2
Note 1: Applies for Band that the upper frequency edge of the UL Band more than 2.69 GHz Note 2: Applies for Band that the upper frequency edge of the UL Band more than 5.2 GHz Note 3: Applies for 2500-2690 MHz (n41 band)			

Table 22 Boundary between FR1 NR out of band and general spurious emission domain (see 3GPP TS 38.521-1 Table 6.5.3.1.3-1)

Channel bandwidth	OOB boundary F_{OOB} (MHz)
$BW_{Channel}$	$BW_{Channel}$ + 5

Table 23 Spurious emissions Test Configuration Table for FR1 (see 3GPP TS 38.521-1 Table 6.5.3.1.4.1-1)

Initial Conditions		
Test environment	Normal environment + normal voltage	
Test Frequencies	Low range, Mid range, High range	
Test channel bandwidths	Lowest, Mid, Highest	
Subcarrier spacing	Lowest	
Test parameters		
Downlink Configuration	Uplink Configuration	
Not applicable	Modulation	RB allocation (note)
	CP-OFDM QPSK	OuterFull
	CP-OFDM QPSK	Edge_1RB_Left
	CP-OFDM QPSK	Edge_1RB_Right
Note: The specific configuration of each RB allocation is defined in 3GPP TS 38.521-1 Table 6.1-1.		

Table 24 Spurious emissions limits for FR2 (see 3GPP TS 38.521-2 Table 6.5.3.1.3-2)

Frequency range	Maximum level	Resolution bandwidth	Note
30 MHz ≤ f < 1000 MHz	-36 dBm	100 kHz	
1 GHz ≤ f < 12.75 GHz	-30 dBm	1 MHz	
12.75 GHz ≤ f ≤ 2nd harmonic of the upper frequency edge of the UL operating band in GHz	-13 dBm	1 MHz	

Table 25 Spurious emissions Terminal co-existence limits for FR2 (see 3GPP TS 38.521-2 Table 6.5.3.2.3-1 and Table 5.2-1)

NR band	Spurious emission					
	Protected band / frequency range	Frequency range (MHz)		Maximum level (dBm)	Resolution bandwidth (MHz)	Note
28000 MHz band	NR Band n260	F_{DL_low}	- F_{DL_high}(4	-2	100	

*Should there be any discrepancy between the English and Chinese versions, the Chinese version shall prevail.

(27000 MHz-29500 MHz)	(37000-40000MHz)	(37000)		0000)			
	Frequency range (MHz)	57000	-	66000	2	100	
Note: F_{DL_low} and F_{DL_high} refer to each NR frequency band specified in 3GPP TS 38.521-2 Table 5.2-1.							

Table 26 Limits for additional spurious emission for FR2 (see 3GPP TS 38.521-2 Table 6.5.3.3.3-1)

Frequency range (GHz)	Maximum level (dBm) / Channel bandwidth				Measurement bandwidth	Note
	50MHz	100 MHz	200 MHz	400 MHz		
$23.6 \leq f \leq 24$	-8	-8	-8	-8	200 MHz	1
Note 1: The protection of frequency range from 23.6 to 24 GHz is meant for protection of satellite passive services.						

Table 27 Test Configuration for FR2 spectrum emission mask (see 3GPP TS 38.521-2 Table 6.5.3.1.4.1-1)

Initial Conditions			
Test environment		Normal environment + normal voltage	
Test Frequencies		Low range, High range (note 2)	
Test channel bandwidth		Highest	
Subcarrier spacing		120kHz	
Test parameters			
Test ID	Downlink Configuration	Uplink Configuration	
	Not applicable	Modulation	RB allocation (note 1)
1		DFT-s -OFDM QPSK	Inner_Full
2		DFT-s -OFDM QPSK	Inner_1RB (note 3)
Note 1: The specific configuration of each RB allocation is defined in 3GPP TS 38.521-2 Table 6.1-1. Note 2: When testing Low range test only in Frequency Range lower than ($F_{UL\_low} - \Delta f_{OOB}$) and when testing High range test only in Frequency Range higher than ($F_{UL\_high} + \Delta f_{OOB}$). Note 3: When testing Low range configure uplink RB to Inner_1RB_Left and when testing High range configure uplink RB to Inner_1RB_Right.			

Table 28 Test Parameters for Channel Bandwidth of Emission Power for LTE-M1 Terminal Equipment.

Initial Conditions				
Test environment	Normal environment + normal voltage			
Test Frequencies	Low range, Mid range, High range			
Test channel bandwidths	Highest			
Test parameters				
	Downlink Configuration	Uplink Configuration		
Channel Bandwidth	Not applicable for the maximum emission power	Modulation	Resource Block Allocation	
			FDD and HD-FDD	TDD
5MHz		QPSK	1	1
5MHz		QPSK	(Class 5) 3	(Class 5) 3
10MHz		QPSK	1	1
10MHz		QPSK	(Class 3) 4 (Class 5) 5	(Class 3) 4 (Class 5) 5
15MHz		QPSK	1	1
15MHz		QPSK	6	6
20MHz		QPSK	1	1
20MHz		QPSK	6	6

Note: The test method of the RB offset setting value and testing items adhere to 3GPP TS 36.521-1 technical standards.

Table 29. Set Value of Spectrum Emission Mask of LTE-M1 Terminal Equipment

Emission Limit (dBm)							Measurement Bandwidth
Channel Bandwidth Δf_OOB (MHz)	1.4MHz	3MHz	5MHz	10MHz	15MHz	20MHz	
±0 to 1	-8.5	-11.5	-13.5	-16.5	-18.5	-19.5	30kHz
±1 to 2.5	-8.5	-8.5	-8.5	-8.5	-8.5	-8.5	1MHz
±2.5 to 2.8	-23.5	-8.5	-8.5	-8.5	-8.5	-8.5	1MHz
±2.8 to 5		-8.5	-8.5	-8.5	-8.5	-8.5	1MHz
±5 to 6		-23.5	-11.5	-11.5	-11.5	-11.5	1MHz
±6 to 10			-23.5	-11.5	-11.5	-11.5	1MHz
±10 to 15				-23.5	-11.5	-11.5	1MHz
±15 to 20					-23.5	-11.5	1MHz
±20 to 25						-23.5	1MHz

*Should there be any discrepancy between the English and Chinese versions, the Chinese version shall prevail.

Note: Δf_OOB refers to the frequency offset out-of-band (Δ Frequency of Out-of-band emission)

Table 30. Test Parameters for Channel Bandwidth of Spectrum Emission Mask for LTE-M1 Terminal Equipment

Initial Conditions					
Test environment	Normal environment + normal voltage				
Test Frequencies	Low range, Mid range, High range				
Test channel bandwidths	Highest,5 MHz,10 MHz, and 15 MHz				
Test parameters					
	Downlink Configuration	Uplink Configuration			
Channel Bandwidth	N/A for SEM testing	Modulation	Resource Block Allocation		
			FDD and HD-FDD	TDD	Narrowband Index (Note 1)
Low and medium channels					
1.4MHz		QPSK	2	2	0
1.4MHz		QPSK	5	5	0
1.4MHz		QPSK	6	6	0
1.4MHz		16QAM	2	2	0
1.4MHz		16QAM	5	5	0
3MHz		QPSK	2	2	0
3MHz		QPSK	5	5	0
3MHz		QPSK	6	6	0
3MHz		16QAM	2	2	0
3MHz		16QAM	5	5	0
5MHz		QPSK	6	6	0
5MHz (Note 3)		16QAM	1	1	0
5MHz		16QAM	3	3	0
5MHz		16QAM	5	5	0
10MHz (Note 3)		QPSK	4	4	0
10MHz		QPSK	6	6	0
10MHz (Note 3)		16QAM	3	3	0
10MHz		16QAM	5	5	0
15MHz		QPSK	6	6	0
15MHz		16QAM	5	5	0
High channel					
1.4MHz		QPSK	2	2	0
1.4MHz		QPSK	5	5	0
1.4MHz		QPSK	6	6	0
1.4MHz		16QAM	2	2	0
1.4MHz		16QAM	5	5	0
3MHz		QPSK	2	2	1
3MHz		QPSK	5	5	1
3MHz		QPSK	6	6	1
3MHz		16QAM	2	2	1
3MHz		16QAM	5	5	1
5MHz		QPSK	6	6	3

*Should there be any discrepancy between the English and Chinese versions, the Chinese version shall prevail.

5MHz (Note 3)	16QAM	1	1	3
5MHz	16QAM	3	3	3
5MHz	16QAM	5	5	3
10MHz (Note 3)	QPSK	4	4	7
10MHz	QPSK	6	6	7
10MHz (Note 3)	16QAM	3	3	7
10MHz	16QAM	5	5	7
15MHz	QPSK	6	6	11
15MHz	16QAM	5	5	11

Note :

1.The definitino of “Narrowband Index” shall refer to 5.2.4 of 3GPP TS 36.211.

2.The testing method of the RB offset setting value and testing items adhere to 3GPP TS 36.521-1 technical standards. The RB offset value and testing methods for inspection items shall refer to technical specifications of 3GPP TS 36.521.

3.Only applicable to user equipment of Power Class 3.

Table 31. Out-of-band Radiation Value for LTE-M1 Terminal Equipment.

Frequency Range	Maximum Level	Measurement Bandwidth
9kHz ≤ f < 150kHz	-36 dBm	1kHz
150kHz ≤ f < 30MHz	-36 dBm	10kHz
30MHz ≤ f < 1GHz	-36 dBm	100kHz
1GHz ≤ f < 12.75GHz	-30 dBm	1MHz

Table 32.Test Parameters for Channel Bandwidth of Out-of-band Radiation

Initial Conditions					
Test environment	Normal environment + normal voltage				
Test Frequencies	Low range, Mid range, High range				
Test channel bandwidths	Lowest				
Test parameters					
	Downlink Configuration	Uplink Configuration			
Channel Bandwidth	Not applicable for out-of-band radiation tests	Modulation	Resource Block Allocation		
			FDD and HD-FDD	TDD	Narrowband Index (Note)
Low and medium channels					
1.4MHz		QPSK	1	1	0
1.4MHz		QPSK	6	6	0
3MHz		QPSK	1	1	0
3MHz		QPSK	6	6	0
5MHz		QPSK	1	1	0
5MHz		QPSK	6	6	0
High channel					
1.4MHz		QPSK	1	1	0
1.4MHz		QPSK	6	6	0
3MHz		QPSK	1	1	1
3MHz		QPSK	6	6	1
5MHz		QPSK	1	1	3
5MHz		QPSK	6	6	3

Note: The definitino of “Narrowband Index” shall refer to 5.2.4 of 3GPP TS 36.211.

Table 33.ACLR specification values for LTE-M1 terminal equipment

E-UTRA						
	Channel Bandwidth					
	1.4MHz	3MHz	5MHz	10MHz	15MHz	20MHz
E-UTRA $_{ACLR1}$	29.2 dB					
UE channel	±1.4MHz	±3MHz	±5MHz	±10MHz	±15MHz	±20MHz
E-UTRA Channel Measurement Bandwidth	1.08 MHz	2.7 MHz	4.5 MHz	9.0 MHz	13.5 MHz	18 MHz

UTRA						
	Channel Bandwidth					
	1.4MHz	3MHz	5MHz	10MHz	15MHz	20MHz
UTRA $_{ACLR1}$	32.2 dB					
Adjacent Channel Centre Frequency Offset (MHz)	0.7+BW_{UTRA}/2 / -0.7-BW_{UTRA}/2	1.5+BW_{UTRA}/2 / -1.5-BW_{UTRA}/2	2.5+BW_{UTRA}/2 / -2.5-BW_{UTRA}/2	5+BW_{UTRA}/2 / -5-BW_{UTRA}/2	7.5+BW_{UTRA}/2 / -7.5-BW_{UTRA}/2	10+BW_{UTRA}/2 / -10-BW_{UTRA}/2
UTRA $_{ACLR2}$			35.2 dB			
Adjacent Channel Centre Frequency Offset (MHz)			2.5+3*BW_{UTRA}/2 / -2.5-3*BW_{UTRA}/2	5+3*BW_{UTRA}/2 / -5-3*BW_{UTRA}/2	7.5+3*BW_{UTRA}/2 / -7.5-3*BW_{UTRA}/2	10+3*BW_{UTRA}/2 / -10-3*BW_{UTRA}/2
E-UTRA Channel Measurement Bandwidth	1.08MHz	2.7MHz	4.5MHz	9.0MHz	13.5MHz	18MHz
UTRA 5MHz Channel Measurement Bandwidth (Note 1)	3.84 MHz					
UTRA 1.6MHz Channel Measurement Bandwidth (Note 1)	1.28 MHz					

Note:

1.Applicable to E-UTRA FDD co-existed with UTRA FDD in paired frequency spectrum.
2.Applicable to E-UTRA FDD co-existed with UTRA FDD in non-paired frequency spectrum.

3.The BW_{UTRA} of UTRA FDD is 5 MHz; the $BW_{UTRA}$of UTRA TDD is 1.6 MHz。

Table 34. Test Parameters for Channel Bandwidth of ACLR for LTE-M1 Terminal Equipment

Initial Conditions					
Test environment	Normal environment + normal voltage				
Test Frequencies	Low range, Mid range, High range				
Test channel bandwidths	Lowest,5 MHz,10 MHz, and Highest				
Test parameters					
		Downlink Configuration	Uplink Configuration		
Configuration ID	Channel Bandwidth	Not applicable to ACLR test.	Modulation	Resource Block Allocation	
				FDD AND HD-FDD	Narrowband Index (Note 1)
Low and medium channels					
1	1.4MHz		QPSK	2	0
2	1.4MHz		QPSK	5	0
3	1.4MHz		QPSK	6	0
4	1.4MHz		16QAM	2	0
5	1.4MHz		16QAM	5	0
6	3MHz		QPSK	2	0
7	3MHz		QPSK	5	0
8	3MHz		QPSK	6	0
9	3MHz		16QAM	2	0
10	3MHz		16QAM	5	0
11	5MHz		QPSK	6	0
12 (Note 2)	5MHz		16QAM	1	0
13	5MHz		16QAM	3	0
14	5MHz		16QAM	5	0
15 (Note 2)	10MHz		QPSK	4	0
16	10MHz		QPSK	6	0
17 (Note 2)	10MHz		16QAM	3	0
18	10MHz		16QAM	5	0
19	15MHz		QPSK	6	0
20	15MHz		16QAM	5	0
21	20MHz		16QAM	5	0
High channel					
1	1.4MHz		QPSK	2	0
2	1.4MHz		QPSK	5	0
3	1.4MHz		QPSK	6	0
4	1.4MHz		16QAM	2	0
5	1.4MHz		16QAM	5	0
6	3MHz		QPSK	2	1
7	3MHz		QPSK	5	1
8	3MHz		QPSK	6	1
9	3MHz		16QAM	2	1
10	3MHz		16QAM	5	1
11	5MHz		QPSK	6	3
12 (Note 2)	5MHz		16QAM	1	3
13	5MHz		16QAM	3	3
14	5MHz		16QAM	5	3
15 (Note 2)	10MHz		QPSK	4	7
16	10MHz		QPSK	6	7
17 (Note 2)	10MHz		16QAM	3	7
18	10MHz		16QAM	5	7

*Should there be any discrepancy between the English and Chinese versions, the Chinese version shall prevail.

19	15MHz		QPSK	6	11
20	15MHz		16QAM	5	11
21	20MHz		16QAM	5	15

Note:
1.The definitino of "Narrowband Index" shall refer to 5.2.4 of 3GPP TS 36.211.
2.Only applicable to user equipment of Power Class 3.

Table 35.Radiation Set Value within Non-Allocated Resource Block of LTE-M1Terminal Equipment

Parameter Descriptions	Unit	Limit		Applicable Frequency
General	dB	max{－25－10・$\log_{10}$（N_{RB}/L_{CRB}），20・$\log_{10}$EVM－3－5・（｜Δ_{RB}｜－1）/ L_{CRB}，＋0.8 -57dBm/180kHz-P_{RB}}		All non-allocated
IQ Image	dB	-27.2	When the image frequency is the carrier center frequency, which is smaller than 1GHz, and the output power is more than 10dBm	Image Frequency
		-24.2	When the image frequency is the carrier center frequency, which is smaller than 1GHz, and the output power is less than 10dBm.	
		-24.2	When the image frequency is the carrier center frequency, which is bigger than or equals to 1GHz.	
Carrier leakage	dBc	-27.2	Output power is >10dBm, and carrier center frequency＜1GHz	Carrier frequency
		-24.2	Output power is >10dBm, and carrier center frequency≧1GHz	
		-24.2	0dBm≦Output power≦10dBm	
		-19.2	-30dBm≦Output power≦0dBm	
		-9.2	-40dBm≦Output power＜-30dBm	

Note:
1.The RB offset value and testing methods for inspection items shall refer to technical specifications of 3GPP TS 36.521-1.
2.The definition of parameters in Table 8 shall refer to Table 6.5.2.3EA.5-1 of 3GPP TS 36.521-1.

Table 36. Test Parameters for Channel Bandwidth of radiation within the non-allocated resource block for LTE-M1 terminal equipment

	Downlink Configuration				Uplink Configuration			
PUSCH								
Channel Bandwidth	Not applicable to radiation within the non-allocated resource block.				Modulation	Resource Block Allocation		
						FDD AND HD-FDD	TDD	Narrowband Index (Note)
5MHz					QPSK	1	1	0
PUCCH								
Channel Bandwidth	Modulation	Resource Block Allocation			FDD：PUCCH format=Format 1a TDD：PUCCH format=Format 1a/1b			
		FDD	TDD	narrowband Index				

*Should there be any discrepancy between the English and Chinese versions, the Chinese version shall prevail.

5MHz	QPSK	4@0	4@0	0

Note: The definitino of “Narrowband Index” shall refer to 5.2.4 of 3GPP TS 36.211.

Table 37. Test Parameters for Channel Bandwidth of Emission Power for NB-IoT

Configuration ID	Downlink Configuration	Uplink Configuration		
	Not applicable for maximum emission power	Modulation	N_{tones}	Sub-carrier Spacing (kHz)
1(Note 2)		BPSK	1@0	3.75
2 (Note 2)		BPSK	1@47	3.75
3 (Note 2)		QPSK	1@0	15
4 (Note 3)		QPSK	1@11	15
5(Note 1)		QPSK	3@3	15

Note:

1.Applicable to terminal equipment that supports multi-tone transmissions.
2.Only applicable to low channel.
3.Only applicable to high channel.

Table 38. Spectrum Emission Mask Value for NB-IoT Terminal Equipment.

Δf_OOB (kHz)	Spectrum Emission Limit (dBm)	Measurement Bandwidth
±0 to 100	$(27.5 + (F - 0) \times \frac{-3.5 - 27.5}{100 - 0})$	30 kHz
±100 to 150	$(-3.5 + (F - 100) \times \frac{-6.5 - (-3.5)}{150 - 100})$	30 kHz
±150 to 300	$(-6.5 + (F - 150) \times \frac{-27.5 - (-6.5)}{300 - 150})$	30 kHz
±300 to 500	$(-27.5 + (F - 300) \times \frac{-33.5 - (-27.5)}{500 - 300})$	30 kHz
±500 to 1700	-33.5	30 kHz

Note: Δf_OOB is the off-set amount outside the emsision frequency band (ΔFrequency of Out-of-band emission).

Table 39. Test Paramater for Bandwidth Frequency of Spectrum Emission Mask for NB-IoT Terminal Equipment

Configuration ID	Downlink Configuration	Uplink Configuration		
	Not applicable to spectrum emission mask.	Modulation	N_{tones}	Sub-carrier Spacing (kHz)
1		QPSK	1@0	3.75
2		QPSK	1@47	3.75
3		QPSK	1@0	15
4		QPSK	1@11	15
5(Note)		QPSK	3@0	15
6 (Note)		QPSK	3@3	15
7 (Note)		QPSK	3@9	15
8 (Note)		QPSK	6@0	15
9 (Note)		QPSK	6@6	15
10 (Note)		QPSK	12@0	15

Note: the maximum power (MPR) of maximum emission power of terminal equipment shall refer to 6.2.3F.3 of 3GPP TS 36.521-1.

Table 40. Out-of-band Radiation Value for NB-IoT Terminal Equipment.

Frequency Range	Maximum Level	Measurement Bandwidth
9kHz ≤ f < 150kHz	-36 dBm	1kHz
150kHz ≤ f < 30MHz	-36 dBm	10kHz
30MHz ≤ f < 1GHz	-36 dBm	100kHz
1GHz ≤ f < 12.75GHz	-30 dBm	1MHz

Table 41. Test Parameters for Channel Broadband of Out-of-band Radiation for NB-IoT Terminal Equipment.

Configuration ID	Downlink Configuration	Uplink Configuration		
	Not applicable to out-of-band radiation tests.	Modulation	N_{tones}	Sub-carrier Spacing (kHz)
1		QPSK	1@0	3.75
2		QPSK	1@47	3.75
3		BPSK	1@0	15
4		BPSK	1@11	15
5(Note)		QPSK	12@0	15

Note: Applicable to terminal equipment that supports multi-tone transmissions.

Table 42. Test Parameters for Channel Bandwidth of ACLR for NB-IoT Terminal Equipment

	GSM_{ACLR}	$UTRA_{ACLR}$
ACLR limit	19.2dB	36.2dB
Adjacent Channel Centre Frequency Offset from NB Channel Edge	±200kHz	±2.5MHz
Adjacent Channel Measurement Bandwidth	180kHz	3.84MHz
Measurement Filter	Rectangular Filter	Root-Raised Cosine Filter α=0.22
Channel Measurement Bandwidth	180kHz	180kHz
Channel Measurement Filter	Rectangular Filter	Rectangular Filter

Table 43. Test Parameter for Channel Broadband of ACLR for NB-IoT Terminal Equipment.

Configuration ID	Downlink Configuration	Uplink Configuration		
	Not applicable to ACLR tests.	Modulation	N_{tones}	Sub-carrier Spacing (kHz)
1		QPSK	1@0	3.75
2		QPSK	1@47	3.75
3		QPSK	1@0	15
4		QPSK	1@11	15
5 (Note)		QPSK	3@0	15
6 (Note)		QPSK	3@3	15
7 (Note)		QPSK	3@9	15
8 (Note)		QPSK	6@0	15
9 (Note)		QPSK	6@6	15
10 (Note)		QPSK	12@0	15

Note: Applicable to terminal equipment that supports multi-tone transmissions.

Table 44. Radiation Set Value within Non-Allocated Resource Block of NB-IoT Terminal Equipment

Parameter Descriptions	Unit	Limit		Applicable Frequency
General	dB	max{－15－10・$\log_{10}$（N_{tone}/L_{Ctone}）， －18－5・（｜Δ_{RB}｜－1）/ L_{Ctone}，＋0.8 -57dBm/（3.75kHz or 15kHz）-P_{tone}}		All non-allocated
IQ Image	dB	-24.2		Image Frequency
Carrier leakage	dBc	－24.2	0 dBm≦Output power f≦3.0GHz：3.2dBm±3.2dB	Carrier frequency
		－19.2	-30 dBm≦Output power≦0 dBm f≦3.0GHz：-26.8dBm±3.2dB	
		－9.2	-40 dBm≦Output power≦-30 dBm f≦3.0GHz：-36.8dBm±3.2dB	

Note:
1. The tone offset set value and testing methods of testing items shall refer to technical specifications of 3GPP TS 36.521-1.
2. The definition of parameters as described in Table 17 shall refer to Table 6.5.2.3F.5-1 of 3GPP TS 36.521-1.

Table 45. Test Parameter for Channel Broadband of Radiations within Non-allocated Resource Block for NB-IoT Terminal Equipment

Configuration ID	Downlink Configuration	Uplink Configuration		
	Not applicable to tests of radiations within non-allocated resource block.	Modulation	N_{tones}	Sub-carrier Spacing (kHz)
1		QPSK	1@0	3.75
2		QPSK	1@47	3.75
3		QPSK	1@0	15
4		QPSK	1@11	15

Table 46: Test Parameters for Emission Power of the Channel Bandwidth

Initial Conditions				
Test environment	Normal environment + normal voltage			
Test Frequencies	Low range, Mid range, High range			
Test channel bandwidths	Lowest,5 MHz, and Highest			
Test parameters				
	Downlink Configuration	Uplink Configuration		
Ch BW	N/A for Max UE output power testing	Mod'n	RB allocation	
			FDD	TDD
1.4MHz		QPSK	1	1
1.4MHz		QPSK	5	5
3MHz		QPSK	1	1
3MHz		QPSK	4	4
5MHz		QPSK	1	1
5MHz		QPSK	8	8
10MHz		QPSK	1	1
10MHz		QPSK	12	12
15MHz		QPSK	1	1
15MHz		QPSK	16	16
20MHz		QPSK	1	1
20MHz		QPSK	18	18

Note: The test method of the RB offset setting value and testing items adhere to 3GPP TS 36.521 technical standards.

Table 47: Set Value of Spectrum Emission Mask

Emission Limit Value (dB)							Resolution Bandwidth (RBW)
Bandwidth Δf_OOB (MHz)	1.4MHz	3MHz	5MHz	10MHz	15MHz	20MHz	
±0 to 1	-8.5	-11.5	-13.5	-16.5	-18.5	-19.5	30kHz
±1 to 2.5	-8.5	-8.5	-8.5	-8.5	-8.5	-8.5	1MHz
±2.5 to 2.8	-23.5	-8.5	-8.5	-8.5	-8.5	-8.5	1MHz
±2.8 to 5		-8.5	-8.5	-8.5	-8.5	-8.5	1MHz
±5 to 6		-23.5	-11.5	-11.5	-11.5	-11.5	1MHz
±6 to 10			-23.5	-11.5	-11.5	-11.5	1MHz
±10 to 15				-23.5	-11.5	-11.5	1MHz
±15 to 20					-23.5	-11.5	1MHz
±20 to 25						-23.5	1MHz

Remarks: Δf_OOB refers to the frequency offset out-of-band (Δ Frequency of Out-of-band emission)

Table 48: Test Parameters for Spectrum Emission Mask of the Channel Bandwidth

Initial Conditions					
Test environment	Normal environment + normal voltage				
Test Frequencies	Low range, Mid range, High range				
Test channel bandwidths	Lowest, 5MHz, 10MHz,and Highest				
Test parameters					
	Downlink Configuration		Uplink Configuration		
Ch BW	N/A for SEM testing		Mod'n	RB allocation	
				FDD	TDD
1.4MHz			QPSK	6	6
1.4MHz			QPSK	5	5
1.4MHz			16QAM	5	5
1.4MHz			16QAM	6	6
3MHz			QPSK	15	15
3MHz			QPSK	4	4
3MHz			16QAM	4	4
3MHz			16QAM	15	15
5MHz			QPSK	25	25
5MHz			QPSK	8	8
5MHz			16QAM	8	8

*Should there be any discrepancy between the English and Chinese versions, the Chinese version shall prevail.

5MHz		16QAM	25	25
10MHz		QPSK	50	50
10MHz		QPSK	12	12
10MHz		16QAM	12	12
10MHz		16QAM	50(Note 1)	50(Note 1)
15MHz		QPSK	75	75
15MHz		QPSK	16	16
15MHz		16QAM	16	16
15MHz		16QAM	75(Note 1)	75(Note 1)
20MHz		QPSK	100	100
20MHz		QPSK	18	18
20MHz		16QAM	18	18
20MHz		16QAM	100(Note 1)	100(Note 1)

Note 1: Applies only to UE-Categories ≥2

Note 2: The testing method of the RB offset setting value and testing items adhere to 3GPP TS 36.521 technical standards.

Table 49: Specification Values of the Out-of-Band Radiation

Frequency Range	Maximum Level	Resolution Bandwidth (RBW)
9kHz ≤ f < 150kHz	-36 dBm	1kHz
150kHz ≤ f < 30MHz	-36 dBm	10kHz
30MHz ≤ f < 1GHz	-36 dBm	100kHz
1GHz ≤ f < 12.75GHz	-30 dBm	1MHz

Table 50: Test parameters for Out-of-Band Radiation of the Channel Bandwidth

Initial Conditions	
Test environment	Normal environment + normal voltage
Test Frequencies	Low range, Mid range, High range
Test channel bandwidths	Lowest, 5MHz,and Highest

Test parameters						
	Downlink Configuration			Uplink Configuration		
Ch BW	Mod'n	RB allocation		Mod'n	RB allocation	
		FDD	TDD		FDD	TDD
1.4MHz	N/A for Spurious Emissions testing			QPSK	6	6
1.4MHz				QPSK	1	1
3MHz				QPSK	15	15
3MHz				QPSK	1	1
5MHz				QPSK	25	25
5MHz				QPSK	1	1
10MHz				QPSK	50	50
10MHz				QPSK	1	1
15MHz				QPSK	75	75
15MHz				QPSK	1	1
20MHz				QPSK	100	100
20MHz				QPSK	1	1

Note: The testing method of the RB offset setting value and testing items adhere to 3GPP TS 36.521 technical standards.

Table 51: Specification Values of the Adjacent Channel Leakage Ratio (ACLR)

	Bandwidth					
	1.4MHz	3MHz	5MHz	10MHz	15MHz	20MHz
Adjacent Frequency Offset	±1.4MHz	±3MHz	±5MHz	±10MHz	±15MHz	±20MHz
Channel Measurement Bandwidth	1.08 MHz	2.7 MHz	4.5 MHz	9.0 MHz	13.5 MHz	18 MHz
Limit Value of the Adjacent Channel Leakage Ratio	29.2dB					

Table 52: Specification Values of the Adjacent Channel Leakage Ratio (For HPUE)

	Bandwidth					
	1.4MHz	3MHz	5MHz	10MHz	15MHz	20MHz
Adjacent Frequency Offset	N/A	N/A	±5MHz	±10MHz	±15MHz	±20MHz

Channel Measurement Bandwidth	N/A	N/A	4.5 MHz	9.0 MHz	13.5 MHz	18 MHz
Limit Value of the Adjacent Channel Leakage Ratio	N/A	N/A	30.2dB			

Table 53: Test Parameters for Adjacent Channel Leakage Ratio of the Channel Bandwidth

Initial Conditions	
Test environment	Normal environment + normal voltage
Test Frequencies	Low range, Mid range, High range
Test channel bandwidths	Lowest, 5MHz, 10MHz,and Highest
Test parameters	

	Downlink Configuration			Uplink Configuration		
Ch BW	Mod'n	RB allocation		Mod'n	RB allocation	
		FDD	TDD		FDD	TDD
1.4MHz	N/A for ACLR testing			QPSK	6	6
1.4MHz				QPSK	5	5
1.4MHz				16QAM	6	6
1.4MHz				16QAM	5	5
3MHz				QPSK	15	15
3MHz				QPSK	4	4
3MHz				16QAM	15	15
3MHz				16QAM	4	4
5MHz				QPSK	25	25
5MHz				QPSK	8	8
5MHz				16QAM	25	25
5MHz				16QAM	8	8
10MHz				QPSK	50	50
10MHz				QPSK	12	12
10MHz				16QAM	50(Note 1)	50(Note 1)
10MHz				16QAM	12	12
15MHz				QPSK	75	75
15MHz				QPSK	16	16

15MHz		16QAM	75(Note 1)	75(Note 1)
15MHz		16QAM	16	16
20MHz		QPSK	100	100
20MHz		QPSK	18	18
20MHz		16QAM	100(Note 1)	100(Note 1)
20MHz		16QAM	18	18

Note 1: Applies only to UE-Categories 2-5

Note 2: The testing method of the RB offset setting value and testing items adhere to 3GPP TS 36.521 technical standards.

.

Table 54 WCDMA FDD frequency bands and channel spacing

Test Items	Band 1	Band 3	Band 7	Band 8
Frequency bands	Tx：1920 MHz-1980 MHz Rx：2110 MHz-2170 MHz	Tx：1710 MHz-1785 MHz Rx：1805 MHz-1880 MHz	Tx：2500 MHz-2570 MHz Rx：2620 MHz-2690 MHz	Tx：885 MHz-915 MHz Rx：930 MHz-960 MHz
TX-RX frequency separation	190 MHz	95 MHz	120 MHz	45 MHz
Channel spacing	5 MHz			

Table 55：WCDMA FDD Maximum Output Power

Maximum Output Power	Band 1	Band 3	Band 7	Band 8
Power class 1	33 dBm +1.7/-3.7 dB	-	-	-
Power class 2	27 dBm +1.7/-3.7 dB	-	-	-
Power class 3	24 dBm +1.7/-3.7 dB			
Power class 4	21 dBm +2.7/-2.7 dB			

Table 56：WCDMA FDD Spectrum Mask

Separation between the carrier frequency and the center of the measuring filter Δf（MHz）	Minimum Requirement		Measurement Bandwidth
	Realtive requirement（dBc）	Absolute requirement（dBm）	
2.5 – 3.5	$\left\{-35-15\cdot\left(\frac{\Delta f}{MHz}-2.5\right)\right\}dBc$	-71.1	30 kHz
3.5 – 7.5	$\left\{-35-1\cdot\left(\frac{\Delta f}{MHz}-3.5\right)\right\}dBc$	-55.8	1 MHz

7.5 – 8.5	$\left\{-39-10\cdot\left(\frac{\Delta f}{MHz}-7.5\right)\right\}dBc$	-55.8	1 MHz
8.5 – 12.5	-49 dBc	-55.8	1 MHz

Note: Minimum requirement is the lager one between realtive requirement and absolute requirement.

Table 57：WCDMA FDD Spurious Emission Limit

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

Table 58：WCDMA FDD Band 1 Spurious Emission Limit

Frequency Bandwidth	Measurement Bandwidth	Minimum requirement
462.5 MHz ≦ f ≦ 467.5 MHz	1 MHz	-50 dBm
703 MHz ≦ f ≦ 803 MHz	1 MHz	-50 dBm
791 MHz ≦ f ≦ 821 MHz	3.84 MHz	-60 dBm
852 MHz ≦ f ≦ 859 MHz	1 MHz	-50 dBm
859 MHz ≦ f ≦ 894 MHz	3.84 MHz	-60 dBm
921 MHz ≦ f < 925 MHz	100 kHz	-60 dBm
925 MHz ≦ f ≦ 935 MHz	100 kHz 3.84 MHz	-67 dBm -60 dBm
935 MHz < f ≦ 960 MHz	100 kHz 3.84 MHz	-79 dBm -60 dBm
1447 MHz ≦ f ≦ 1467 MHz	1 MHz	-50 dBm
1452 MHz ≦ f ≦ 1510.9 MHz	3.84 MHz	-60 dBm
1805 MHz ≦ f ≦ 1880 MHz	100 kHz 3.84 MHz	-71 dBm -60 dBm
1839.9 MHz ≦ f ≦ 1879.9 MHz	3.84 MHz	-60 dBm
1884.5 MHz < f < 1915.7 MHz	300 kHz	-41 dBm
2010 MHz < f < 2025 MHz	3.84 MHz	-60 dBm
2110 MHz ≦ f ≦ 2170 MHz	3.84 MHz	-60 dBm
2170 MHz ≦ f ≦ 2200 MHz	1 MHz	-50 dBm
2300 MHz ≦ f ≦ 2400 MHz	3.84 MHz	-60 dBm
2496 MHz ≦ f ≦ 2570 MHz	1 MHz	-50 dBm
2570 MHz ≦ f ≦ 2690 MHz	3.84 MHz	-60 dBm

3510 MHz ≦ f ≦ 3590 MHz	3.84 MHz	-60 dBm
3400 MHz ≦ f ≦ 3800 MHz	1 MHz	-50 dBm

Table 59：WCDMA FDD Band 3 Spurious Emission Limit

Frequency Bandwidth	Measurement Bandwidth	Minimum requirement
462.5 MHz ≦ f ≦ 467.5 MHz	1 MHz	-50 dBm
703 MHz ≦ f ≦ 803 MHz	1 MHz	-50 dBm
791 MHz ≦ f ≦ 821 MHz	3.84 MHz	-60 dBm
852 MHz ≦ f ≦ 859 MHz	1 MHz	-50 dBm
859 MHz ≦ f ≦ 894 MHz	3.84 MHz	-60 dBm (Note)
921 MHz ≦ f < 925 MHz	100 kHz	-60 dBm
925 MHz ≦ f ≦ 935 MHz	100 kHz 3.84 MHz	-67 dBm -60 dBm
935 MHz < f ≦ 960 MHz	100 kHz 3.84 MHz	-79 dBm -60 dBm
1447 MHz ≦ f ≦ 1467 MHz	1 MHz	-50 dBm
1452 MHz ≦ f ≦ 1496 MHz	3.84 MHz	-60 dBm
1475.9 MHz ≦ f ≦ 1510.9 MHz	3.84 MHz	-60 dBm (Note)
1805 MHz ≦ f ≦ 1880 MHz	3.84 MHz	-60 dBm
1880MHz ≦ f ≦ 1920 MHz	3.84 MHz	-60 dBm
1884.5 MHz ≦ f ≦ 1915.7 MHz	300 kHz	-41 dBm (Note)
2010 MHz < f < 2025 MHz	3.84 MHz	-60 dBm
2110 MHz ≦ f ≦ 2170 MHz	3.84 MHz	-60 dBm
2170 MHz ≦ f ≦ 2200 MHz	1 MHz	-50 dBm
2300 MHz ≦ f ≦ 2400 MHz	3.84 MHz	-60 dBm
2496 MHz ≦ f ≦ 2570 MHz	1 MHz	-50 dBm
2570 MHz ≦ f ≦ 2690 MHz	3.84 MHz	-60 dBm
3510 MHz ≦ f ≦ 3590 MHz	3.84 MHz	-60 dBm
3400 MHz ≦ f ≦ 3800 MHz	1 MHz	-50 dBm

Note: Only available for transmissions in 1744.9 MHz to 1784.9 MHz.

Table 60：WCDMA FDD Band 7 Spurious Emission Limit

Frequency Bandwidth	Measurement Bandwidth	Minimum requirement
462.5 MHz ≦ f ≦ 467.5 MHz	1 MHz	-50 dBm
717 MHz ≦ f ≦ 728 MHz	1 MHz	-50 dBm
729 MHz ≦ f ≦ 746 MHz	3.84 MHz	-60 dBm

738 MHz ≦ f ≦ 758 MHz	1 MHz	-50 dBm
746 MHz ≦ f ≦ 756 MHz	3.84 MHz	-60 dBm
758 MHz ≦ f ≦ 768 MHz	3.84 MHz	-60 dBm
768 MHz ≦ f ≦ 791 MHz	1 MHz	-50 dBm
791 MHz ≦ f ≦ 821 MHz	3.84 MHz	-60 dBm
852 MHz ≦ f ≦ 859 MHz	1 MHz	-50 dBm
859 MHz ≦ f ≦ 894 MHz	3.84 MHz	-60 dBm
921 MHz ≦ f < 925 MHz	100 kHz	-60 dBm
925 MHz ≦ f ≦ 935 MHz	100 kHz 3.84 MHz	-67 dBm -60 dBm
935 MHz < f ≦ 960 MHz	100 kHz 3.84 MHz	-79 dBm -60 dBm
1452 MHz < f ≦ 1496 MHz	3.84 MHz	-60 dBm
1805 MHz ≦ f ≦ 1880 MHz	100 kHz 3.84 MHz	-71 dBm -60 dBm
1900 MHz ≦ f ≦ 1920 MHz	3.84 MHz	-60 dBm
1930 MHz ≦ f ≦ 1995 MHz	3.84 MHz	-60 dBm
2010 MHz < f < 2025 MHz	3.84 MHz	-60 dBm
2110 MHz ≦ f ≦ 2170 MHz	3.84 MHz	-60 dBm
2170 MHz ≦ f ≦ 2200 MHz	1 MHz	-50 dBm
2300 MHz < f < 2400 MHz	3.84 MHz	-60 dBm
2350 MHz ≦ f ≦ 2360 MHz	1 MHz	-50 dBm
2620 MHz ≦ f ≦ 2690 MHz	3.84 MHz	-60 dBm
2595 MHz ≦ f ≦ 2620 MHz	1 MHz	-40 dBm
3510 MHz ≦ f ≦ 3590 MHz	3.84 MHz	-60 dBm
3400 MHz ≦ f ≦ 3800 MHz	1 MHz	-50 dBm

Table 61：WCDMA FDD Band 8 Spurious Emission Limit

Frequency Bandwidth	Measurement Bandwidth	Minimum requirement
462.5 MHz ≦ f ≦ 467.5 MHz	1 MHz	-50 dBm
703 MHz ≦ f ≦ 803 MHz	1 MHz	-50 dBm
791 MHz ≦ f ≦ 821 MHz	3.84 MHz	-60 dBm
860 MHz ≦ f ≦ 890 MHz	1 MHz	-37 dBm (Note)
925 MHz ≦ f ≦ 935 MHz	100 kHz 3.84 MHz	-67 dBm -60 dBm
935 MHz < f ≦ 960 MHz	100 kHz 3.84 MHz	-79 dBm -60 dBm

1447 MHz ≦ f ≦ 1467 MHz	1 MHz	-50 dBm
1452 MHz ≦ f ≦ 1496 MHz	3.84 MHz	-60 dBm
1475.9 MHz ≦ f ≦ 1510.9 MHz	3.84 MHz	-60 dBm (Note)
1805 MHz < f ≦ 1830 MHz	100 kHz 3.84 MHz	-71 dBm -60 dBm
1830 MHz < f ≦ 1880 MHz	100 kHz 3.84 MHz	-71 dBm -60 dBm
1880MHz ≦ f ≦ 1920 MHz	3.84 MHz	-60 dBm
1884.5 MHz ≦ f ≦ 1915.7 MHz	300 kHz	-41 dBm (Note)
2010 MHz ≦ f ≦ 2025 MHz	3.84 MHz	-60 dBm
2110 MHz ≦ f ≦ 2170 MHz	3.84 MHz	-60 dBm
2170 MHz ≦ f ≦ 2200 MHz	1 MHz	-50 dBm
2300 MHz < f < 2400 MHz	3.84 MHz	-60 dBm
2496 MHz ≦ f ≦ 2570 MHz	1 MHz	-50 dBm
2570 MHz ≦ f ≦ 2640 MHz	3.84 MHz	-60 dBm
2640 MHz < f ≦ 2690 MHz	3.84 MHz	-60 dBm
3510 MHz ≦ f ≦ 3590 MHz	3.84 MHz	-60 dBm
3400 MHz ≦ f ≦ 3800 MHz	1 MHz	-50 dBm

Note: Only available for transmissions in 900 MHz to 915 MHz.

Table 62 GSM900 transmitter output power for different power classes

Power class				Power control level	Transmitter output power	Tolerances for conditions	
2	3	4	5		dBm	normal (dB)	extreme (dB)
•				2	39	±2	±2.5
•	•			3	37	±3 *)	±4*)
•	•			4	35	±3	±4
•	•	•		5	33	±3 *)	±4 *)
•	•	•		6	31	±3	±4
•	•	•	•	7	29	±3 *)	±4 *)
•	•	•	•	8	27	±3	±4
•	•	•	•	9	25	±3	±4
•	•	•	•	10	23	±3	±4
•	•	•	•	11	21	±3	±4
•	•	•	•	12	19	±3	±4
•	•	•	•	13	17	±3	±4
•	•	•	•	14	15	±3	±4
•	•	•	•	15	13	±3	±4
•	•	•	•	16	11	±5	±6
•	•	•	•	17	9	±5	±6
•	•	•	•	18	7	±5	±6
•	•	•	•	19	5	±5	±6

*) When the power control level corresponds to the power class of the MS, then the tolerances shall be 2.0 dB under normal test conditions and 2.5 dB under extreme test conditions.

Table 63 :GSM900 Spurious Emission Limit

Frequency range	Frequency (MHz) offset(from carrier)	Limit(dBm)	Resolution Bandwidth
relevant TX band: :890 to 915MHz	1.8 to 6.0MHz	-36	30kHz
	Above 6.0MHz		100kHz

Note: Allocated a channel

Table 64 : GSM900 Spurious Emission Limit

Frequency band	Offset from relevant	Measurement bandwidth

	TX edge	
100MHz–50MHz	—	10KHz
50MHz–500MHz	—	100KHz
>500MHz, outside Table 63 band	≥ 2MHz ≥ 5MHz ≥10MHz ≥20MHz ≥30MHz	30KHz 100KHz 300KHz 1MHz 3MHz

Note: Allocated a channel

Table 65:GSM900 Spectrum due to the modulation:

Power level (dBm)		Frequency Offset from the Carrier (KHz) the Maximum Allowed Level (dB)								
		30KHz (Measurement bandwidth)						100KHz (measurement bandwidth)		
		100	200	250	400	600~<1200	1200~<1800	1800~<3000	3000~<6000	≥6000
GSM900	≥39	+0.5	−30	−33	−60	−66	−66	−69	−71	−77
	37	+0.5	−30	−33	−60	−64	−64	−67	−69	−75
	35	+0.5	−30	−33	−60	−62	−62	−65	−67	−73
	≤33	+0.5	−30	−33	−60	−60	−60	−63	−65	−71

Remark:

(a) in the combined range 600KHz to 6MHz above and below the carrier, in up to three bands of 200KHz width centered on a frequency which is an integer multiple of 200KHz, exceptions at up to –36dBm

(b) above 6MHz offset from the carrier in up to 12 bands of 200KHz width centered on a frequency which is an integer multiple of 200KHz, exceptions at up to -36dBm are allowed. For the BTS only one transmitter is active for this test.

(c) for EUT measured below 600KHz from the carrier, if the limit according to the above table is below –36dBm, a value of –36dBm shall be used instead. For 600KHz up to less than 1800KHz this limit shall be –56dBm for DCS1800, and –51dBm for GSM900. At 1800KHz and beyond, this limit shall be –51dBm for DCS1800, and –46dBm for GSM900.

Table 66 GSM900 Spectrum due to switching transients

Power level	Maximum level measured for various carrier frequencies			
	400KHz	600KHz	1200KHz	1800KHz
39dBm	− 13dBm	− 21dBm	− 21dBm	− 24dBm
37dBm	− 15dBm	− 21dBm	− 21dBm	− 24dBm
35dBm	− 17dBm	− 21dBm	− 21dBm	− 24dBm

33dBm	− 19dBm	− 21dBm	− 21dBm	− 24dBm
31dBm	− 21dBm	− 23dBm	− 23dBm	− 26dBm
29dBm	− 23dBm	− 25dBm	− 25dBm	− 28dBm
27dBm	− 23dBm	− 26dBm	− 27dBm	− 30dBm
25dBm	− 23dBm	− 26dBm	− 29dBm	− 32dBm
23dBm	− 23dBm	− 26dBm	− 31dBm	− 34dBm
≤21dBm	− 23dBm	− 26dBm	− 32dBm	− 36dBm

Table 67 The Language of PWS Alert Contents of Message Identifier, Classification, Preset Receiving On or Off, and Options of Users, etc.

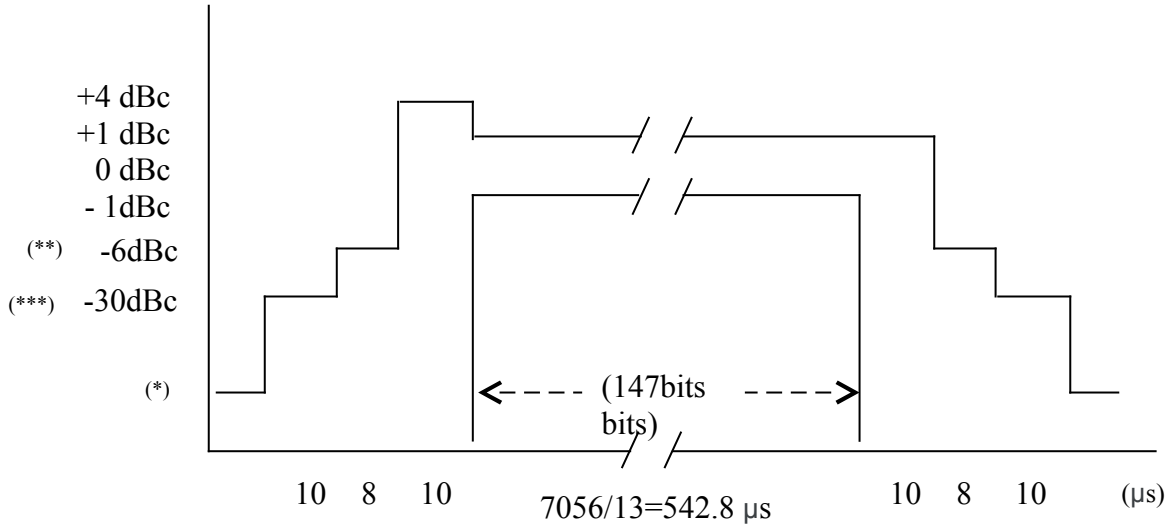
Message identifier /Language of PWS alert contents		Classification	Preset receiving on or off	Options of Users
911/Chinese	919/English	Alert Message	Preset receiving on	Yes
4370/Chinese	4383/English	Presidential Alert	Preset receiving on	No
4371/Chinese	4384/English	Emergency Alert	Preset receiving on	Yes
4372/Chinese	4385/English	Emergency Alert	Preset receiving on	Yes
4373/Chinese	4386/English	Emergency Alert	Preset receiving on	Yes
4374/Chinese	4387/English	Emergency Alert	Preset receiving on	Yes
4375/Chinese	4388/English	Emergency Alert	Preset receiving on	Yes
4376/Chinese	4389/English	Emergency Alert	Preset receiving on	Yes
4377/Chinese	4390/English	Emergency Alert	Preset receiving on	Yes
4378/Chinese	4391/English	Emergency Alert	Preset receiving on	Yes
4379/Chinese	4392/English	Emergency Alert	Preset receiving on	Yes
4380/Chinese	4393/English	Required Monthly Test	Preset receiving off	Yes

*Should there be any discrepancy between the English and Chinese versions, the Chinese version shall prevail.

Table 68 Device should produce corresponding audio signal and vibration cadence in accordance with the message identifier (MI) and the user's setting.

<table>
<tr><td colspan="2" rowspan="2">Message identifier</td><td colspan="4">User's setting</td></tr>
<tr><td>Deactivate sound</td><td>Activate sound</td><td>Deactivate vibration</td><td>Activate vibration</td></tr>
<tr><td>911</td><td>919</td><td rowspan="12">Can not produce audio signal</td><td>Produce audio general signal</td><td rowspan="12">Can not produce vibration cadence</td><td>Produce vibration general cadence</td></tr>
<tr><td>4370</td><td>4383</td><td rowspan="11">Produce audio attention signal</td><td rowspan="11">Produce vibration attention cadence</td></tr>
<tr><td>4371</td><td>4384</td></tr>
<tr><td>4372</td><td>4385</td></tr>
<tr><td>4373</td><td>4386</td></tr>
<tr><td>4374</td><td>4387</td></tr>
<tr><td>4375</td><td>4388</td></tr>
<tr><td>4376</td><td>4389</td></tr>
<tr><td>4377</td><td>4390</td></tr>
<tr><td>4378</td><td>4391</td></tr>
<tr><td>4379</td><td>4392</td></tr>
<tr><td>4380</td><td>4393</td></tr>
</table>

*Should there be any discrepancy between the English and Chinese versions, the Chinese version shall prevail.

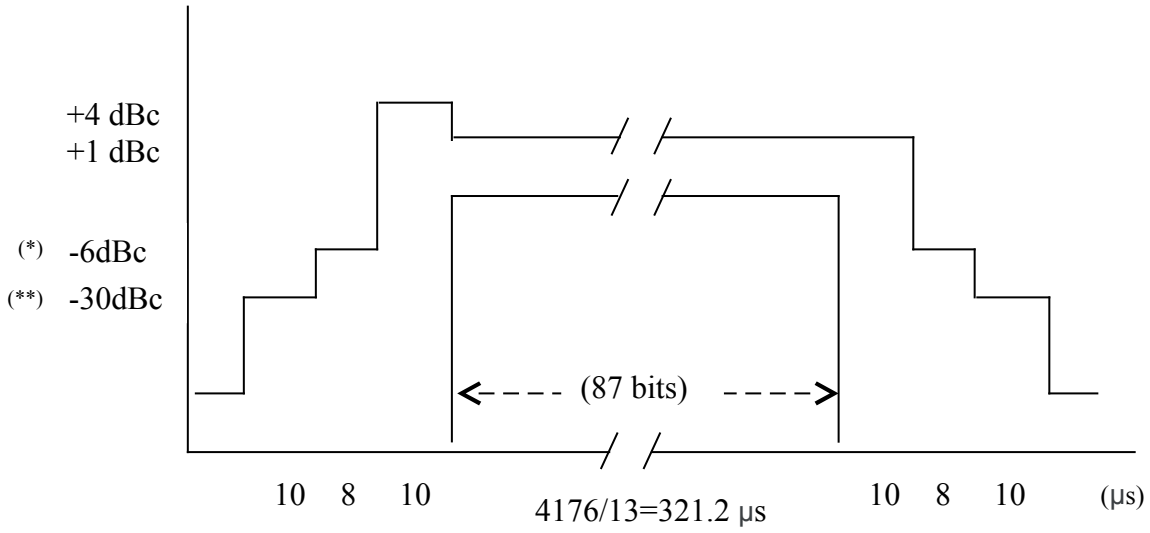


(*)GSM900 MS -59dBc or -54dBm, whichever is the highest, except for the time slot preceding the active slot, for which the allowed value is equal to -59dBc or –36dBm, whichever is the highest.

(**)GSM900 MS -4dBc for power control level 16
-2dBc for power control level 17
-1dBc for power control level 18 and 19

(***)GSM900 MS -30dBc or -17dBm, whichever is the highe
(Refer to ETSI EST 300 607-1, 13.3.2 Conformance requirement)

Figure 1: Power / time template for normal bursts (NB, FB, DB & SB)



(*) For GSM900 MS: -4dBc for power control level 16
-2dBc for power control level 17
-1dBc for power control levels 18 and 19

(**) For GSM900 MS: -30dBc or -17dBm, whichever is the higher

Figure2: Power / time template for access burst

Figure 3 Example of PWS Alert Content and Headers

*Should there be any discrepancy between the English and Chinese versions, the Chinese version shall prevail.

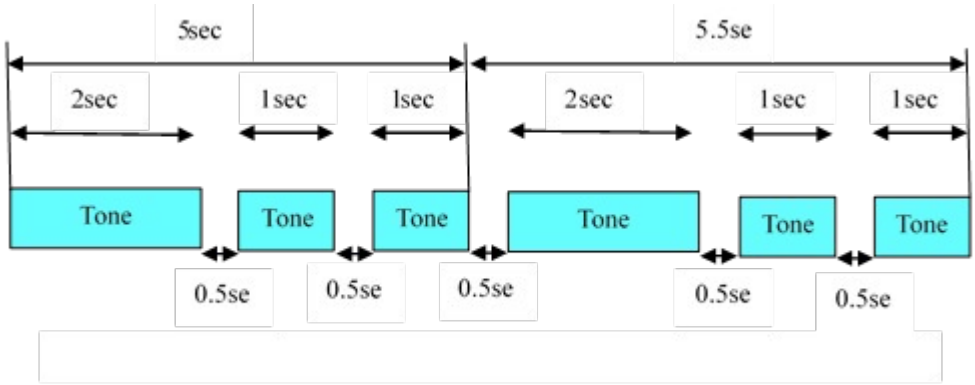


Figure 4 Pattern of Audio Attention Signal

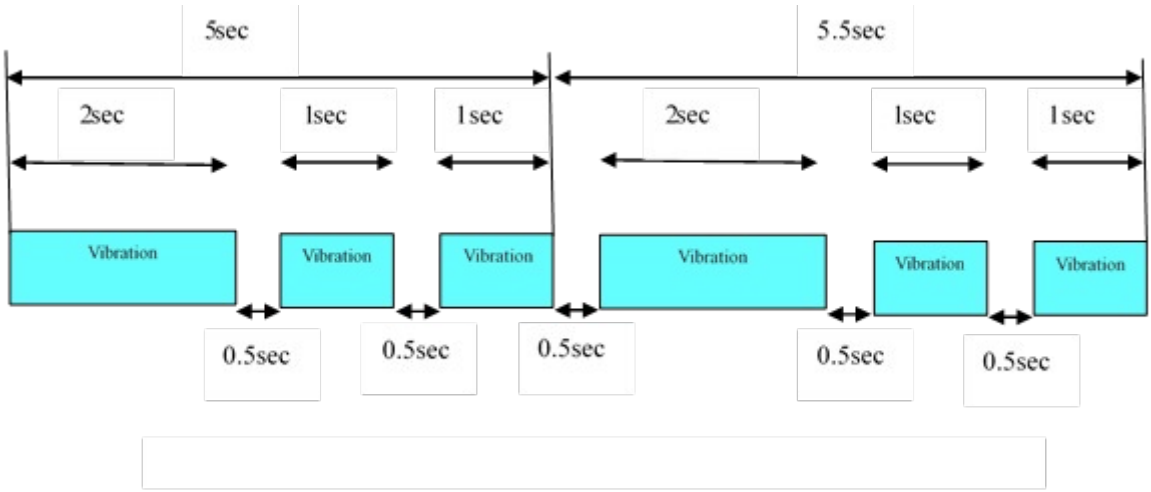


Figure 5 Pattern of Vibration Attention Signal