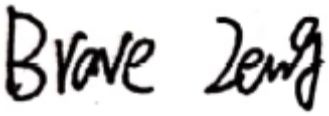
# TEST REPORT

| | |
|---|---|
| Report No.: | BCTC2504708272-9E |
| Applicant: | Shenzhen Huafurui Technology Co., Ltd. |
| Product Name: | Smartphone |
| Test Model: | P90 |
| Tested Date: | 2025-04-07 to 2025-05-09 |
| Issued Date: | 2025-05-21 |

**Shenzhen BCTC Testing Co., Ltd.**

| | |
|---|---|
| Product Name: | Smartphone |
| Trademark: | CUBOT |
| Model/Type reference: | P90 |
| Prepared For: | Shenzhen Huafurui Technology Co., Ltd. |
| Address: | Unit 601-03, 6/F, Block A, Building 1, Ganfeng Technology Building, No. 993 Jiaxian Road, Xiangjiaotang Community, Bantian Street, Longgang District, Shenzhen, P.R. China |
| Manufacturer: | Shenzhen Huafurui Technology Co., Ltd. |
| Address: | Unit 601-03, 6/F, Block A, Building 1, Ganfeng Technology Building, No. 993 Jiaxian Road, Xiangjiaotang Community, Bantian Street, Longgang District, Shenzhen, P.R. China |
| Prepared By: | Shenzhen BCTC Testing Co., Ltd. |
| Address: | 1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Zhancheng, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China |
| Sample Received Date: | 2025-04-07 |
| Sample tested Date: | 2025-04-07 to 2025-05-09 |
| Issue Date: | 2025-05-21 |
| Report No.: | BCTC2504708272-9E |
| Test Standards: | ETSI EN 301 908-1 V15.2.1 (2023-01)<br>ETSI EN 301 908-2 V13.1.1 (2020-06) |
| Test Results: | PASS |
| Remark: | This is WCDMA radio test report. |

Tested by:



Brave Zeng/ Project Handler

Approved by:

Zero Zhou/Reviewer

The test report is effective only with both signature and specialized stamp. This result(s) shown in this report refer only to the sample(s) tested. Without written approval of Shenzhen BCTC Testing Co., Ltd, this report can't be reproduced except in full. The tested sample(s) and the sample information are provided by the client.

Table Of Content

(Note: N/A Means Not Applicable)

## 1. Version

| Report No. | Issue Date | Description | Approved |
|---|---|---|---|
| BCTC2504708272-9E | 2025-05-21 | Original | Valid |
| | | | |

## 2. Test Summary

The Product has been tested according to the following specifications:

| No. | Test Parameter | Clause No. | Results |
|---|---|---|---|
| **ETSI EN 301 908-1** | | | |
| 1 | Radiated emissions (UE) | 4.2.2 | PASS |
| 2 | Control and monitoring functions (UE) | 4.2.4 | PASS |
| **ETSI EN 301 908-2** | | | |
| 3 | Transmitter maximum output power | 4.2.2 | PASS |
| 4 | Transmitter spectrum emission mask | 4.2.3 | PASS |
| 5 | Transmitter spurious emissions | 4.2.4 | PASS |
| 6 | Transmitter minimum output power | 4.2.5 | PASS |
| 7 | Receiver Adjacent Channel Selectivity (ACS) | 4.2.6 | PASS |
| 8 | Receiver blocking characteristics | 4.2.7 | PASS |
| 9 | Receiver spurious response | 4.2.8 | PASS |
| 10 | Receiver intermodulation characteristics | 4.2.9 | PASS |
| 11 | Receiver spurious emissions | 4.2.10 | PASS |
| 12 | Out-of-synchronization handling of output power | 4.2.11 | PASS |
| 13 | Transmitter adjacent channel leakage power ratio | 4.2.12 | PASS |
| 14 | Receiver Reference Sensitivity level | 4.2.13 | PASS |
| 15 | Receiver Total Radiated Sensitivity | 4.2.14 | PASS |
| 16 | Total Radiated Power | 4.2.15 | PASS |

Remark:
N/A is an abbreviation for Not Applicable and means this test item is not applicable for this device according to the technology characteristic of device.

## 3. Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

| No. | Item | Uncertainty |
|---|---|---|
| 1 | 3m camber Radiated spurious emission(30MHz-1GHz) | U=4.3dB |
| 2 | 3m chamber Radiated spurious emission(1GHz-18GHz) | U=4.5dB |
| 3 | 3m chamber Radiated spurious emission(18GHz-40GHz) | U=3.34dB |
| 4 | Conducted Adjacent channel power | U=1.38dB |
| 5 | Conducted output power uncertainty Above 1G | U=1.0dB |
| 6 | Conducted output power uncertainty below 1G | U=0.9dB |
| 7 | humidity uncertainty | U=5.3% |
| 8 | Temperature uncertainty | U=0.59℃ |
| 9 | Radiated disturbance(30MHz-1000MHz) | U=4.8dB |
| 10 | Radiated disturbance(1GHz- 6GHz) | U=4.9dB |
| 11 | Radiated disturbance(1GHz- 18GHz) | U=5.0dB |

# 4. Product Information And Test Setup

## 4.1 Product Information

| | |
|---|---|
| Model/Type reference: | P90 |
| Model differences: | N/A |
| WCDMA Band(s): | FDD Band I/VIII |
| Hardware Version: | 3368D-MC-V1.1 |
| Software Version: | CUBOT_P90_F021C_V01 |
| Operation Frequency: | WCDMA Band I: Tx: 1920-1980MHz, Rx: 2110-2170MHz<br>WCDMA Band VIII: Tx: 880-915MHz, Rx: 925-960MHz |
| Max. RF output power: | WCDMA Band I: 23.94 dBm<br>WCDMA Band VIII: 22.82 dBm |
| Type of Modulation: | WCDMA: QPSK, 16QAM, 64QAM, BPSK |
| Antenna Type: | Internal antenna |
| Antenna Gain: | WCDMA Band I: -1.25 dBi<br>WCDMA Band VIII: -1.35 dBi<br>Remark:<br>☒ The antenna gain of the product comes from the antenna report provided by the customer, and the test data is affected by the customer information.<br>☐ The antenna gain of the product is provided by the customer, and the test data is affected by the customer information. |
| Ratings: | DC 9V from adapter/DC 3.87V from battery |
| Adapter 1 Information: | Model: HJ-PD18W-EU<br>Input: 100-240V~ 50/60Hz 0.6A<br>Output: 5.0V ⎓ 3.0A 15.0W OR 9.0V ⎓ 2.0A 18.0W OR 12.0V ⎓ 1.5A 18.0W MAX |
| Adapter 2 Information: | Model: TPD-203A120167VF01<br>Input: 100-240V~ 50/60Hz 0.6A<br>Output: 5.0V ⎓ 3.0A 15.0W or 9.0V ⎓ 2.22A 19.98W or 12.0V ⎓ 1.67A 20.04W |

Cable of Product

| No. | Cable Type | Quantity | Provider | Length (m) | Shielded | Note |
|---|---|---|---|---|---|---|
| 1 | -- | -- | Applicant | --- | Yes/No | With a ferrite ring in mid Detachable |
| 2 | -- | -- | BCTC | -- | Yes/No | -- |

## 4.2 Test Setup Configuration

See test photographs attached in EUT TEST SETUP Photographs for the actual connections between Product and support equipment.

## 4.3 Support Equipment

| No. | Device Type | Brand | Model | Series No. | Note |
|---|---|---|---|---|---|
| 1. | Adapter | / | TPD-203A120167 VF01 | --- | --- |
| 2. | Adapter | / | HJ-PD18W-EU | --- | --- |
| 3. | TF card | SanDisk | 32G | --- | --- |

Notes:
1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

## 4.4 Channel List

N/A

## 4.5 Test Mode

All test mode(s) and condition(s) mentioned were considered and evaluated respectively by performing full tests, the worst data were recorded and reported.

| Test Mode | | Channel Frequency | Channel Number |
|---|---|---|---|
| Tx | WCDMA Band I | 1922.4 MHz | 9612 |
| | | 1950.0 MHz | 9750 |
| | | 1977.6 MHz | 9888 |
| | WCDMA Band VIII | 882.4 MHz | 2712 |
| | | 897.4MHz | 2787 |
| | | 912.6 MHz | 2863 |
| Rx | WCDMA Band I | 2112.4 MHz | 10562 |
| | | 2140.0 MHz | 10700 |
| | | 2167.6 MHz | 10838 |
| | WCDMA Band VIII | 927.4 MHz | 2937 |
| | | 924.6 MHz | 3013 |
| | | 957.6 MHz | 3088 |

## 4.6 Test Environment

1. Normal Test Conditions:

| | |
|---|---|
| Humidity (%): | 55 |
| Atmospheric Pressure(kPa): | 101.1 |
| Temperature(℃): | 25 |
| Test Voltage(DC): | 3.87V |

2. Extreme Test Conditions:

For tests at extreme temperatures, measurements shall be made over the extremes of the operating temperature range as declared by the manufacturer.

For tests at extreme voltages, measurements shall be made over the extremes of the power source voltage range as declared by the manufacturer.

| **Test Conditions** | **LTLV** | **LTHV** | **HTLV** | **HTHV** |
|---|---|---|---|---|
| Temperature (℃) | -10 | -10 | 45 | 45 |
| Test Voltage (DC) | 3.48 | 4.26 | 3.48 | 4.26 |

# 5. Test Facility And Test Instrument Used

## 5.1 Test Facility

All measurement facilities used to collect the measurement data are located at Shenzhen BCTC Testing Co., Ltd. Address: 1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Zhancheng, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-1 other equivalent standards.

## 5.2 Test Instrument Used

| Item | Equipment | Manufacturer | Type No. | Serial No. | Last calibration | Calibrated until |
|---|---|---|---|---|---|---|
| 1 | 966 chamber | ChengYu | 966 Room | 966 | May 15, 2023 | May 14, 2026 |
| 2 | Receiver | R&S | ESR | 102075 | May 16, 2024 | May 15, 2025 |
| 3 | Receiver | R&S | ESRP | 101154 | May 16, 2024 | May 15, 2025 |
| 4 | Amplifier | Schwarzbeck | BBV9744 | 9744-0037 | May 16, 2024 | May 15, 2025 |
| 5 | TRILOG Broadband Antenna | Schwarzbeck | VULB 9163 | 942 | May 21, 2024 | May 20, 2025 |
| 6 | Loop Antenna | Schwarzbeck | FMZB1519B | 00014 | May 21, 2024 | May 20, 2025 |
| 7 | Amplifier | SKET | LAPA_01G18G-45dB | SK2021040901 | May 16, 2024 | May 15, 2025 |
| 8 | Horn Antenna | Schwarzbeck | BBHA9120D | 1541 | May 21, 2024 | May 20, 2025 |
| 9 | Preamplifier | MITEQ | TTA1840-35-HG | 2034381 | May 16, 2024 | May 15, 2025 |
| 10 | Horn antenna | Schwarzbeck | BBHA9170 | 00822 | May 21, 2024 | May 20, 2025 |
| 11 | Spectrum Analyzer 9kHz-40GHz | R&S | FSP 40 | 100363 | May 16, 2024 | May 15, 2025 |
| 12 | Software | Frad | EZ-EMC | FA-03A2 RE | \ | \ |
| 13 | Spectrum Analyzer | Keysight | N9020A | MY49100060 | May 16, 2024 | May 15, 2025 |
| 14 | Signal Generator | Keysight | N5182B | MY56200519 | May 16, 2024 | May 15, 2025 |
| 15 | Signal Generator | Keysight | 83711B | US37100131 | May 16, 2024 | May 15, 2025 |
| 16 | Communication test set | R&S | CMW500 | 126173 | Nov. 11. 2024 | Nov. 10, 2025 |
| 17 | band rejection filter | ZBSF | ZBSF-C2441.5 | 1706003606 | May 16, 2024 | May 15, 2025 |
| 18 | Programmable constant temperature and humidity test chamber | DGBELL | BTKS5-150C | \ | Jul. 01, 2024 | Jun. 30, 2025 |
| 19 | Radio frequency control box | MAIWEI | MW200-RFCB | \ | \ | \ |
| 20 | Software | MAIWEI | MTS 8200 | \ | \ | \ |

# 6. Radiated emissions (UE)

## 6.1 Definition

This test assesses the ability of radio communications equipment and ancillary equipment to limit unwanted emissions from the enclosure port.
This test is applicable to radio communications equipment and ancillary equipment.
This test shall be performed on the radio communications equipment and/or a representative configuration of the ancillary equipment.

## 6.2 Limit

| Frequency | Minimum requirement (e.r.p.)/ reference bandwidth idle mode | Minimum requirement (e.r.p.)/ reference bandwidth traffic mode | Applicability |
|---|---|---|---|
| 30 MHz ≤ f < 1 000 MHz | -57 dBm/100 kHz | -36 dBm/100 kHz | All |
| 1 GHz ≤ f < 12,75 GHz | -47 dBm/1 MHz | -30 dBm/1 MHz | All |
| fc - 2,5 × 5 MHz < f < fc + 2,5 × 5 MHz | | Not defined | UTRA FDD, UTRA TDD, 3,84 Mcps option, cdma2000, spreading rate 3 |
| fc - 2,5 × $BW_{Channel}$ MHz < f < fc +2,5 × $BW_{Channel}$ MHz | | Not defined | E-UTRA FDD, E-UTRA TDD, Mobile WiMAX, UMB |
| fc - 2,5 × 10 MHz < f < fc1 + 2,5 ×10 MHz | | Not defined | UTRA TDD, 7,68 Mcps option |
| fc - 4 MHz < f < fc + 4 MHz | | Not defined | UTRA TDD, 1,28 Mcps option cdma2000, spreading rate 1 |
| fc - 500 kHz < f < fc + 500 kHz | | Not defined | UWC 136, 200 kHz option |
| fc - 250 kHz < f < fc + 250 kHz | | Not defined | UWC 136, 30 kHz option |
| NOTE: fc is the UE transmit centre frequency. | | | |

## 6.3 EUT Operation Condition

The EUT was programmed to be in continuously transmitting mode.

## 6.4 Test Method

Whenever possible the test site should be a fully anechoic chamber simulating the free-space conditions. EUT shall be placed on a non-conducting support. Mean power of any spurious components shall be detected by the test antenna and measuring receiver (e.g. a spectrum analyzer).
At each frequency at which a component is detected, the EUT shall be rotated to obtain maximum response, and the effective radiated power (e.r.p.) of that component determined by a substitution measurement, which shall be the reference method. The measurement shall be repeated with the test antenna in the orthogonal polarization plane. Test systems are allowed to be pre-substituted by carrying out the substitution measurement for each frequency and by recording the obtained value into test system software as a correction factor.
NOTE: Effective radiated power (e.r.p.) refers to the radiation of a half wave tuned dipole instead of an isotropic antenna. There is a constant difference of 2,15 dB between e.i.r.p. and e.r.p.
e.r.p. (dBm) = e.i.r.p. (dBm) - 2,15 (ITU-R Recommendation SM.329-12 [3], annex 1).
Measurements are made with a tuned dipole antenna or a reference antenna with a known gain referenced to an isotropic antenna. Unless otherwise stated, all measurements are done as mean power (RMS).
If a different test site or method is used, this shall be stated in the test report. The results shall be converted to the reference method values and the validity of the conversion shall be demonstrated.

## 6.5 Measurement Record

WCDMA Band I
Idle Mode

| Frequency | Receiver Reading | Turn table Angle | RX Antenna | | Correct Factor | Absolute Level | Result | |
|---|---|---|---|---|---|---|---|---|
| | | | Height | Polar | | | Limit | Margin |
| (MHz) | (dBm) | Degree | (m) | (H/V) | (dB) | (dBm) | (dBm) | (dB) |
| Low Channel(1922.4MHz) | | | | | | | | |
| 276.55 | -34.35 | 138 | 1.7 | H | -29.23 | -63.57 | -57.00 | -6.57 |
| 276.55 | -35.07 | 324 | 1.0 | V | -29.23 | -64.29 | -57.00 | -7.29 |
| 3137.72 | -39.13 | 345 | 1.0 | H | -23.32 | -62.45 | -47.00 | -15.45 |
| 3137.72 | -40.18 | 130 | 1.1 | V | -23.32 | -63.51 | -47.00 | -16.51 |
| Middle Channel(1950.0MHz) | | | | | | | | |
| 276.55 | -37.74 | 329 | 1.3 | H | -29.23 | -66.97 | -57.00 | -9.97 |
| 276.55 | -39.58 | 12 | 1.7 | V | -29.23 | -68.81 | -57.00 | -11.81 |
| 3137.72 | -37.27 | 207 | 1.4 | H | -23.32 | -60.59 | -47.00 | -13.59 |
| 3137.72 | -41.83 | 278 | 1.8 | V | -23.32 | -65.15 | -47.00 | -18.15 |
| High Channel(1977.6MHz) | | | | | | | | |
| 276.55 | -35.85 | 267 | 1.9 | H | -29.23 | -65.07 | -57.00 | -8.07 |
| 276.55 | -35.93 | 278 | 1.5 | V | -29.23 | -65.15 | -57.00 | -8.15 |
| 3137.72 | -41.26 | 186 | 1.0 | H | -23.32 | -64.59 | -47.00 | -17.59 |
| 3137.72 | -41.61 | 323 | 1.5 | V | -23.32 | -64.94 | -47.00 | -17.94 |

Traffic Mode

| Frequency | Receiver Reading | Turn table Angle | RX Antenna | | Correct Factor | Absolute Level | Result | |
|---|---|---|---|---|---|---|---|---|
| | | | Height | Polar | | | Limit | Margin |
| (MHz) | (dBm) | Degree | (m) | (H/V) | (dB) | (dBm) | (dBm) | (dB) |
| Low Channel(1922.4MHz) | | | | | | | | |
| 550.11 | -35.15 | 311 | 2.0 | H | -27.96 | -63.11 | -36.00 | -27.11 |
| 550.11 | -35.69 | 212 | 1.7 | V | -27.96 | -63.65 | -36.00 | -27.65 |
| 3844.80 | -25.47 | 77 | 1.9 | H | -21.91 | -47.38 | -30.00 | -17.38 |
| 3844.80 | -23.26 | 220 | 1.5 | V | -21.91 | -45.17 | -30.00 | -15.17 |
| 5767.20 | -35.65 | 291 | 1.4 | H | -19.22 | -54.87 | -30.00 | -24.87 |
| 5767.20 | -40.04 | 313 | 1.2 | V | -19.22 | -59.26 | -30.00 | -29.26 |
| Middle Channel(1950.0MHz) | | | | | | | | |
| 550.11 | -34.74 | 74 | 1.9 | H | -27.96 | -62.70 | -36.00 | -26.70 |
| 550.11 | -33.86 | 143 | 1.4 | V | -27.96 | -61.82 | -36.00 | -25.82 |
| 3900.00 | -25.06 | 212 | 1.8 | H | -21.80 | -46.86 | -30.00 | -16.86 |
| 3900.00 | -23.71 | 79 | 2.0 | V | -21.80 | -45.51 | -30.00 | -15.51 |
| 5850.00 | -35.15 | 60 | 1.2 | H | -19.18 | -54.33 | -30.00 | -24.33 |
| 5850.00 | -40.15 | 90 | 1.1 | V | -19.18 | -59.33 | -30.00 | -29.33 |
| High Channel(1977.6MHz) | | | | | | | | |
| 550.11 | -33.45 | 295 | 1.2 | H | -27.96 | -61.40 | -36.00 | -25.40 |
| 550.11 | -35.97 | 298 | 1.9 | V | -27.96 | -63.93 | -36.00 | -27.93 |
| 3955.20 | -24.42 | 276 | 1.2 | H | -21.69 | -46.11 | -30.00 | -16.11 |
| 3955.20 | -19.72 | 86 | 1.8 | V | -21.69 | -41.41 | -30.00 | -11.41 |
| 5932.80 | -39.17 | 162 | 1.6 | H | -19.13 | -58.30 | -30.00 | -28.30 |
| 5932.80 | -41.88 | 9 | 1.8 | V | -19.13 | -61.01 | -30.00 | -31.01 |

WCDMA Band VIII
Idle Mode

| Frequency | Receiver Reading | Turn table Angle | RX Antenna | | Correct Factor | Absolute Level | Result | |
|---|---|---|---|---|---|---|---|---|
| | | | Height | Polar | | | Limit | Margin |
| (MHz) | (dBm) | Degree | (m) | (H/V) | (dBm) | (dBm) | (dBm) | (dB) |
| Low Channel(882.4MHz) | | | | | | | | |
| 266.20 | -37.69 | 332 | 1.9 | H | -29.30 | -66.99 | -57.00 | -9.99 |
| 266.20 | -36.84 | 72 | 1.4 | V | -29.30 | -66.14 | -57.00 | -9.14 |
| 3065.55 | -41.91 | 296 | 1.4 | H | -23.47 | -65.38 | -47.00 | -18.38 |
| 3065.55 | -43.06 | 29 | 1.0 | V | -23.47 | -66.53 | -47.00 | -19.53 |
| Middle Channel(897.4MHz) | | | | | | | | |
| 266.20 | -36.77 | 223 | 1.8 | H | -29.30 | -66.07 | -57.00 | -9.07 |
| 266.20 | -39.75 | 54 | 1.9 | V | -29.30 | -69.05 | -57.00 | -12.05 |
| 3065.55 | -40.70 | 23 | 1.8 | H | -23.47 | -64.17 | -47.00 | -17.17 |
| 3065.55 | -40.02 | 90 | 1.7 | V | -23.47 | -63.49 | -47.00 | -16.49 |
| High Channel(912.6MHz) | | | | | | | | |
| 266.20 | -35.34 | 326 | 1.1 | H | -29.30 | -64.64 | -57.00 | -7.64 |
| 266.20 | -36.25 | 278 | 1.1 | V | -29.30 | -65.55 | -57.00 | -8.55 |
| 3065.55 | -40.55 | 113 | 1.2 | H | -23.47 | -64.02 | -47.00 | -17.02 |
| 3065.55 | -39.96 | 42 | 1.5 | V | -23.47 | -63.43 | -47.00 | -16.43 |

Traffic Mode

| Frequency | Receiver Reading | Turn table Angle | RX Antenna | | Correct Factor | Absolute Level | Result | |
|---|---|---|---|---|---|---|---|---|
| | | | Height | Polar | | | Limit | Margin |
| (MHz) | (dBm) | Degree | (m) | (H/V) | (dB) | (dBm) | (dBm) | (dB) |
| Low Channel(882.4MHz) | | | | | | | | |
| 548.73 | -34.24 | 137 | 1.3 | H | -27.96 | -62.20 | -36.00 | -26.20 |
| 548.73 | -35.15 | 307 | 1.7 | V | -27.96 | -63.11 | -36.00 | -27.11 |
| 1764.80 | -23.34 | 163 | 1.7 | H | -27.12 | -50.46 | -30.00 | -20.46 |
| 1764.80 | -22.99 | 69 | 1.4 | V | -27.12 | -50.11 | -30.00 | -20.11 |
| 2647.20 | -30.94 | 116 | 1.3 | H | -24.66 | -55.60 | -30.00 | -25.60 |
| 2647.20 | -28.89 | 60 | 1.2 | V | -24.66 | -53.55 | -30.00 | -23.55 |
| Middle Channel(897.4MHz) | | | | | | | | |
| 548.73 | -33.51 | 25 | 1.3 | H | -27.96 | -61.48 | -36.00 | -25.48 |
| 548.73 | -32.01 | 212 | 1.1 | V | -27.96 | -59.97 | -36.00 | -23.97 |
| 1794.80 | -23.98 | 154 | 1.5 | H | -27.05 | -51.03 | -30.00 | -21.03 |
| 1794.80 | -19.76 | 11 | 1.5 | V | -27.05 | -46.81 | -30.00 | -16.81 |
| 2692.20 | -26.04 | 66 | 1.1 | H | -24.52 | -50.56 | -30.00 | -20.56 |
| 2692.20 | -29.58 | 125 | 1.5 | V | -24.52 | -54.10 | -30.00 | -24.10 |
| High Channel(912.6MHz) | | | | | | | | |
| 548.73 | -32.71 | 334 | 1.7 | H | -27.96 | -60.68 | -36.00 | -24.68 |
| 548.73 | -33.06 | 194 | 1.2 | V | -27.96 | -61.03 | -36.00 | -25.03 |
| 1825.20 | -25.06 | 66 | 1.4 | H | -26.98 | -52.04 | -30.00 | -22.04 |
| 1825.20 | -25.81 | 304 | 1.0 | V | -26.98 | -52.79 | -30.00 | -22.79 |
| 2737.80 | -31.17 | 253 | 1.5 | H | -24.39 | -55.56 | -30.00 | -25.56 |
| 2737.80 | -31.67 | 121 | 1.8 | V | -24.39 | -56.06 | -30.00 | -26.06 |

# 7. Control And Monitoring Functions (UE)

## 7.1 Definition

This requirement, together with other control and monitoring technical requirements identified in the table of cross references in the applicable part, verifies that the control and monitoring functions of the UE prevent it from transmitting in the absence of a valid network.
This test is applicable to radio communications equipment and ancillary equipment in the operating band defined in the applicable part of this multipart harmonized standard.
This test shall be performed on the radio communications equipment and/or a representative configuration of the ancillary equipment.

## 7.2 Limit

The maximum measured power during the duration of the test shall not exceed -30 dBm.

## 7.3 EUT Operation Condition

Refer to section 6.2.4.

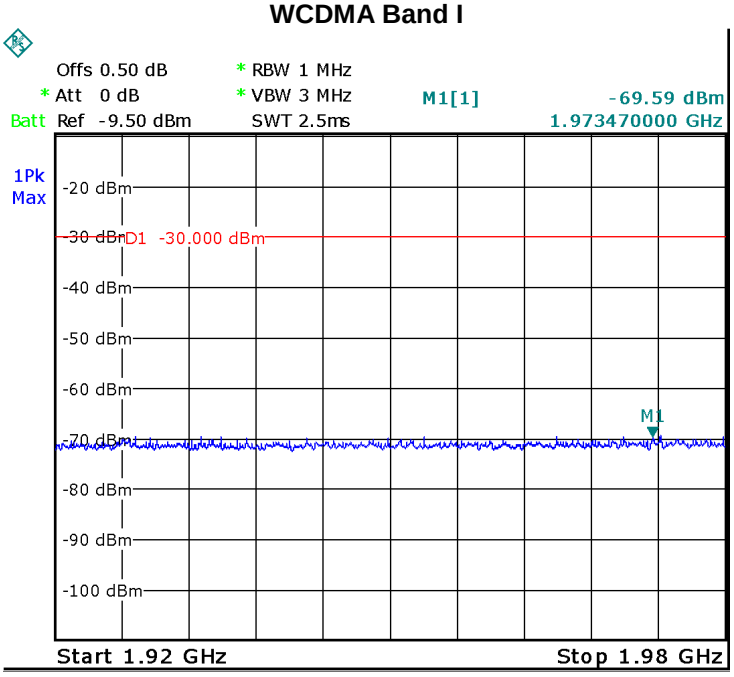
## 7.4 Test Method

a) At the start of the test, the UE shall be switched off. The UE antenna connector shall be connected to a power measuring equipment, with the following characteristics:
- the RF bandwidth shall exceed the total operating transmit frequency range of the UE for operation with an applicable part;
- the response time of the power measuring equipment shall be such that the measured power has reached within 1 dB of its steady state value within 100 µs of a CW signal being applied;
- it shall record the maximum power measured.

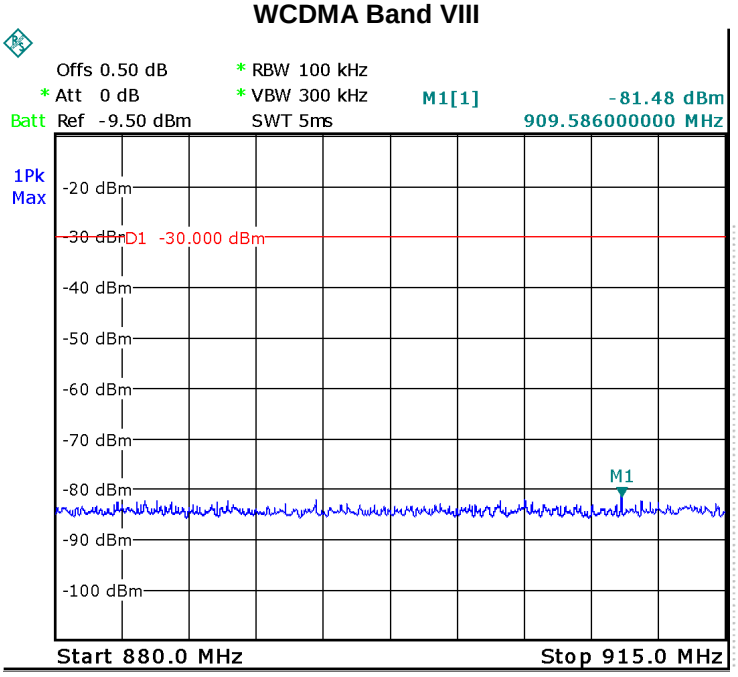
NOTE: The equipment may include a video low pass filter to minimize its response to transients or Gaussian noise peaks.
b) The UE shall be switched on for a period of approximately fifteen minutes, and then switched off.
c) The EUT shall remain switched off for a period of at least thirty seconds, and shall then be switched on for a period of approximately one minute.
d) The maximum power emitted from the UE throughout the duration of the test shall be recorded.

## 7.5 Measurement Record

**WCDMA Band I**




**WCDMA Band VIII**



# 8. Transmitter Maximum Output Power

## 8.1 Definition

The nominal maximum output power and its tolerance are defined according to the power class of the UE. The nominal power defined is the broadband transmit power of the UE, i.e. the power in a bandwidth of at least (1 + α) times the chip rate of the radio access mode. The period of measurement shall be at least one timeslot.

## 8.2 Limit

| Operating Band | Power Class 3 | | Power Class 3bis | | Power Class 4 | |
|---|---|---|---|---|---|---|
| | Power (dBm) | Tol (dB) | Power (dBm) | Tol (dB) | Power (dBm) | Tol (dB) |
| Band I | +24 | +1,7/-3,7 | | | +21 | +2,7/-2,7 |
| Band III | +24 | +1,7/-3,7 | | | +21 | +2,7/-2,7 |
| Band VII | +24 | +1,7/-3,7 | +23 | +2,7/-2,7 | +21 | +2,7/-2,7 |
| Band VIII | +24 | +1,7/-3,7 | +23 | +2,7/-2,7 | +21 | +2,7/-2,7 |
| Band XV | +24 | +1,7/-3,7 | +23 | +2,7/-2,7 | +21 | +2,7/-1,7 |
| Band XVI | +24 | +1,7/-3,7 | +23 | +2,7/-2,7 | +21 | +2,7/-1,7 |
| Band XX | +24 | +1,7/-3,7 | +23 | +2,7/-2,7 | +21 | +2,7/-2,7 |
| Band XXII | +24 | +1,7/-5.2 | +23 | +2,7/-4.2 | +21 | +2.7/-4.2 |

## 8.3 EUT Operation Condition

The EUT was programmed to be in continuously transmitting mode.

## 8.4 Test Procedure

1) Set and send continuously Up power control commands to the UE.
2) Measure the mean power of the UE in a bandwidth of at least (1 + α) times the chip rate of the radio access mode. The mean power shall be averaged over at least one timeslot.

## 8.5 Measurement Record

Please refer to
Appendix 1. Transmitter maximum output power &
Appendix 6. Transmitter Maximum Output Power with HS-DPCCH &
Appendix 9. Transmitter Maximum Output Power with HS-DPCCH and E-DCH
Test Result: Pass

# 9. Transmitter Spectrum Emission Mask

## 9.1 Definition

The spectrum emission mask of the UE applies to frequencies, which are between 2,5 MHz and 12,5 MHz away from the UE centre carrier frequency. The out of channel emission is specified relative to the RRC filtered mean power of the UE carrier.

## 9.2 Limit

| Δf in MHz (note 1) | Minimum requirement (note 2) | | Measurement bandwidth (note 5) |
|---|---|---|---|
| | Relative requirement | Absolute requirement(in measurement bandwidth) | |
| 2,5 MHz to 3,5 MHz | $\left\{-33.5-15*\left(\frac{\Delta f}{MHz}-2.5\right)\right\}dBc$ | -69,6 dBm | 30 kHz (see note 3) |
| 3,5 MHz to 7,5 MHz | $\left\{-33.5-1*\left(\frac{\Delta f}{MHz}-3.5\right)\right\}dBc$ | -54,3 dBm | 1 MHz (see note 4) |
| 7,5 MHz to 8,5 MHz | $\left\{-37.5-10*\left(\frac{\Delta f}{MHz}-7.5\right)\right\}dBc$ | -54,3 dBm | 1 MHz (see note 4) |
| 8,5 MHz to 12,5 MHz | -47,5 dBc | -54,3 dBm | 1 MHz (see note 4) |

NOTE 1: Δf is the separation between the carrier frequency and the centre of the measurement bandwidth.
NOTE 2: The minimum requirement is calculated from the relative requirement or the absolute requirement, whichever is the higher power.
NOTE 3: The first and last measurement position with a 30 kHz filter is at Δf equals to 2,515 MHz and 3,485 MHz.
NOTE 4: The first and last measurement position with a 1 MHz filter is at Δf equals to 4 MHz and 12 MHz.
NOTE 5: As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. However, to improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth may be smaller than the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.

## 9.3 EUT Operation Condition

The EUT was programmed to be in continuously transmitting mode.

## 9.4 Test Procedure

1. Set and send continuously Up power control commands to the UE until the UE output power shall be at the maximum level.
2. Measure the power of the transmitted signal with a measurement filter of bandwidths according to table 4.2.3.2-1. Measurements with an offset from the carrier centre frequency between 2,515 MHz and 3,485MHz shall use a 30 kHz measurement filter. Measurements with an offset from the carrier centre frequency between 4 MHz and 12 MHz shall use 1 MHz measurement bandwidth and the result may be calculated by integrating multiple 50 kHz or narrower filter measurements. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyzer filter). The centre frequency of the filter shall be stepped in contiguous steps according to table 4.2.3.2-1. The measured power shall be recorded for each step.
3. Measure the RRC filtered mean power centred on the assigned channel frequency.
4. Calculate the ratio of the power 2) with respect to 3) in dBc.

## 9.5 Measurement Record

Please refer to
Appendix 2. Transmitter spectrum emission mask &
Appendix 7. Transmitter Spectrum Emission Mask with HS-DPCCH &
Appendix 10. Transmitter Spectrum Emission Mask with E-DCH
Test Result: Pass

# 10. Transmitter spurious emissions

## 10.1 Definition

Spurious emissions are emissions, which are caused by unwanted transmitter effects such as harmonics emission, parasitic emission, intermodulation products and frequency conversion products, but exclude out-of-band emissions.

## 10.2 Limit

Table 4.2.4.1.2-1: General spurious emissions requirements

| 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 < 1 000 MHz | 100 kHz | -36 dBm |
| 1 GHz ≤ f < 12,75 GHz | 1 MHz | -30 dBm |
| 12,75 GHz ≤ f < 5th harmonic of the upper frequency edge of the UL operating band in GHz | 1 MHz | −30 dBm (note) |
| NOTE: Applies only for Band XXII. | | |

Table 4.2.4.1.2-2: Additional spurious emissions requirements

| Operating band | Frequency bandwidth | Measurement bandwidth | Minimum requirement |
|---|---|---|---|
| I | 791 MHz ≤ f ≤ 821 MHz<br>921 MHz ≤ f < 925 MHz<br>925 MHz ≤ f ≤ 935 MHz<br>935 MHz < f ≤ 960 MHz<br>1 805 MHz ≤ f ≤ 1 880 MHz<br>2 110 MHz ≤ f ≤ 2 170 MHz<br>2 585 MHz ≤ f ≤ 2 690 MHz | 3,84 MHz<br>100 kHz<br>100 kHz<br>100 kHz<br>100 kHz<br>3,84 MHz<br>3,84 MHz | -60 dBm<br>-60 dBm (note 1)<br>-67 dBm (note 1)<br>-79 dBm (note 1)<br>-71 dBm (note 1)<br>-60 dBm<br>-60 dBm |
| VIII | 791 MHz ≤ f ≤ 821 MHz<br>925 MHz ≤ f ≤ 935 MHz<br>935 MHz < f ≤ 960 MHz<br>1 805 MHz < f ≤ 1 830 MHz<br>1 830 MHz < f ≤ 1 880 MHz<br>2 110 MHz ≤ f ≤ 2 170 MHz<br>2 585 MHz ≤ f ≤ 2 640 MHz<br>2 640 MHz ≤ f ≤ 2 690 MHz | 3,84 MHz<br>100 kHz<br>3,84 MHz<br>100 kHz<br>3,84 MHz<br>100 kHz<br>3,84 MHz<br>100 kHz<br>3,84 MHz<br>3,84 MHz<br>3,84 MHz<br>3,84 MHz | -60 dBm<br>-67 dBm (note 1)<br>-60 dBm<br>-79 dBm (note 1)<br>-60 dBm<br>-71 dBm (notes 1 and 2)<br>-60 dBm (note 2)<br>-71 dBm (note 1)<br>-60 dBm<br>-60 dBm<br>-60 dBm<br>-60 dBm (note 2) |

## 10.3 EUT Operation Condition

The EUT was programmed to be in continuously transmitting mode.

## 10.4 Test Procedure

1. Set and send continuously up power control commands to the UE until the UE output power shall be maximum level.
2. Sweep the spectrum analyzer (or equivalent equipment) over a frequency range and measure the average power of spurious emission.

## 10.5 Measurement Record

Please refer to Appendix 3. Transmitter spurious emissions
Test Result: Pass

# 11. Transmitter Minimum Output Power

## 11.1 Definition

The minimum controlled output power of the UE is when the power is set to a minimum value. This is when both the inner loop and open loop power control indicate a minimum transmit output power is required. The minimum transmit power is defined as a mean power in one time slot.

## 11.2 Limit

The minimum output power shall be less than -49 dBm.

## 11.3 EUT Operation Condition

The EUT was programmed to be in continuously transmitting mode.

## 11.4 Test Procedure

1) Set and send continuously down power control commands to the UE.
2) Measure the mean power of the UE.

## 11.5 Measurement Record

Please refer to Appendix 4. Transmitter minimum output power
Test Result: Pass

# 12. Receiver Adjacent Channel Selectivity (ACS)

## 12.1 Definition

Adjacent Channel Selectivity (ACS) is a measure of a receiver's ability to receive a WCDMA signal at its assigned channel frequency in the presence of an adjacent channel signal at a given frequency offset from the centre frequency of the assigned channel. ACS is the ratio of the receive filter attenuation on the assigned channel frequency to the receive filter attenuation on the adjacent channel(s).

## 12.2 Limit

| Parameter | Unit | Case 1 | Case 2 |
|---|---|---|---|
| DPCH_Ec | dBm/3,84MHz | <REFSENS> + 14dB | <REFSENS> + 41dB |
| $\hat{I}_{or}$ | dBm/3,84MHz | <REF$\hat{I}_{or}$> + 14dB | <REF$\hat{I}_{or}$> + 41dB |
| $I_{oac}$ mean power (modulated) | dBm | -52 | -25 |
| $F_{uw}$ (offset) | MHz | +5 or -5 | +5 or -5 |
| UE transmitted mean power | dBm | 20 (for Power class 3)<br>18 (for Power class 4) | 20 (for Power class 3)<br>18 (for Power class 4) |
| NOTE 1: <REFSENS> and <REF$\hat{I}_{or}$> as specified in TS 134 121-1 [2].<br>NOTE 2: The $I_{oac}$ (modulated) signal consists of the common channels and the 16 dedicated data channels as specified in TS 125 101 [5]. | | | |

## 12.3 EUT Operation Condition

The EUT was programmed to be in Loopback mode.

## 12.4 Test Procedure

1) Set the parameters of the interference signal generator as shown in table 4.2.6.2-1 case 1.
2) Set the power level of UE according to the table 4.2.6.2-1 case 1 with ±1 dB tolerance.
3) Measure the BER of DCH received from the UE at the SS.
4) Set the parameters of the interference signal generator as shown in table 4.2.6.2-1 case 2.
5) Set the power level of UE according to the table 4.2.6.2-1 case 2 with ±1 dB tolerance.
6) Measure the BER of DCH received from the UE at the SS.

## 12.5 Measurement Record

WCDMA Band I:

| Test Case | BER | Limit | Result |
|---|---|---|---|
| Case 1 | 0.000% | 0.01% | PASS |
| Case 2 | 0.000% | 0.01% | |

WCDMA Band VIII:

| Test Case | BER | Limit | Result |
|---|---|---|---|
| Case 1 | 0.000% | 0.01% | PASS |
| Case 2 | 0.000% | 0.01% | |

# 13. Receiver Blocking Characteristics

## 13.1 Definition

The blocking characteristic is a measure of the receiver's ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the spurious response or the adjacent channels, without this unwanted input signal causing a degradation of the performance of the receiver beyond a specified limit. The blocking performance shall apply at all frequencies except those at which a spurious response occur.

## 13.2 Limit

Table 4.2.7.2-1: Test parameters for in-band blocking characteristics

| **Parameter** | **Unit** | **Level** | |
|---|---|---|---|
| DPCH_Ec | dBm/3,84 MHz | <REFSENS> + 3 dB | |
| $\hat{I}_{or}$ | dBm/3,84 MHz | <REF$\hat{I}_{or}$> + 3 dB | |
| $I_{blocking}$ mean power (modulated) | dBm | -56 (for $F_{uw}$ offset ±10 MHz) | -44 (for $F_{uw}$ offset ±15 MHz) |
| $F_{uw}$ (Band I operation) | MHz | 2 102,4 ≤ f ≤ 2 177,6 | 2 095 ≤ f ≤ 2 185 |
| $F_{uw}$ (Band VIII operation) | MHz | 917,4 ≤ f ≤ 967,6 | 910 ≤ f ≤ 975 |
| UE transmitted mean power | dBm | 20 (for Power class 3)<br>18 (for Power class 4)<br>(note 3) | |
| NOTE 1: <REFSENS> and <REFÎor> as specified in TS 134 121-1 [2].<br>NOTE 2: The Iblocking (modulated) signal consists of the common channels and the 16 dedicated data channels as specified in TS 125 101 [5].<br>NOTE 3: The UE transmitted mean power shall be reduced by 0,5 dB for a UE operating in band XXII. | | | |

Table 4.2.7.2-2: Test parameters for out-of-band blocking characteristics

| **Parameter** | **Unit** | **Frequency range 1** | **Frequency range 2** | **Frequency range 3** |
|---|---|---|---|---|
| DPCH_Ec | dBm/3,84 MHz | <REFSENS> + 3 dB | <REFSENS> + 3 dB | <REFSENS> + 3 dB |
| $\hat{I}_{or}$ | dBm/3,84 MHz | <REF$\hat{I}_{or}$> + 3 dB | <REF$\hat{I}_{or}$> + 3 dB | <REF$\hat{I}_{or}$> + 3 dB |
| $I_{blocking}$ (CW) | dBm | -44 | -30 | -15 |
| Fuw(Band I operation) | MHz | 2 050 < f < 2 095<br>2 185 < f < 2 230 | 2 025 < f ≤ 2 050<br>2 230 ≤ f < 2 255 | 1 < f ≤ 2 025<br>2 255 ≤ f < 12 750 |
| Fuw (Band VIII operation) | MHz | 865 < f < 910<br>975 < f < 1 020 | 840 < f < 865<br>1 020 ≤ f < 1 045 | 1 < f ≤ 840<br>1 045 ≤ f < 12 750 |
| UE transmitted mean power | dBm | 20 (for Power class 3)<br>18 (for Power class 4) | | |
| Band I operation | For 2 095 MHz ≤ f ≤ 2 185 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 4.2.6 and table 4.2.7.2-1 shall be applied. | | | |
| Band VIII operation | For 910 MHz ≤ f ≤ 975 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 4.2.6 and table 4.2.7.2-1 shall be applied. | | | |
| NOTE 1: <REFSENS> and <REFÎor> as specified in TS 134 121-1 [2].<br>NOTE 2: The UE transmitted mean power shall be reduced by 0,5 dB for a UE operating in band XXII. | | | | |

Table 4.2.7.2-3: Test parameters for narrow band blocking

| Parameter | Unit | Band III, VIII |
|---|---|---|
| DPCH_Ec | dBm/3,84 MHz | <REFSENS> + 10 dB |
| $\hat{I}_{or}$ | dBm/3,84 MHz | <REF$\hat{I}_{or}$> + 10 dB |
| $I_{blocking}$ (GMSK) | dBm | -56 |
| $F_{uw}$ (offset) | MHz | 2,8 |
| UE transmitted mean power | dBm | 20 (for Power class 3)<br>18 (for Power class 4) |
| NOTE 1: <REFSENS> and <REFÎor> as specified in TS 134 121-1 [2].<br>NOTE 2: Iblocking (GMSK) is an interfering signal as defined in TS 145 004 [9]. It is a continuous GMSK modulated carrier following the structure of the GSM signals, but with all modulating bits (including the midamble period) derived directly from a random or any pseudo random data stream. | | |

## 13.3 EUT Operation Condition

The EUT was programmed to be in Loopback mode.

## 13.4 Test Procedure

1. Set the parameters of the CW generator or the interference signal generator as shown in tables 4.2.7.2-1,4.2.7.2-2 and 4.2.7.2-3. For table 4.2.7.2-2 the frequency step size is 1 MHz.
2. Set the power level of the UE according to tables 4.2.7.2-1, 4.2.7.2-2 and 4.2.7.2-3 with a ±1 dB tolerance.
3. Measure the BER of DCH received from the UE at the SS.
4. For table 4.2.7.2-2, record the frequencies for which the BER exceeds the test requirements.

## 13.5 Measurement Record

WCDMA Band I

| Frequency Range | Interfering Frequency (MHz) | Interfering Level (dBm) | BER |
|---|---|---|---|
| Frequency Range 1 | 2050 | -44 | 0.0001 |
| | 2072 | -44 | 0.0002 |
| | 2095 | -44 | 0.0000 |
| | 2185 | -44 | 0.0003 |
| | 2207 | -44 | 0.0001 |
| | 2230 | -44 | 0.0004 |
| Frequency Range 2 | 2025 | -30 | 0.0005 |
| | 2037 | -30 | 0.0001 |
| | 2050 | -30 | 0.0002 |
| | 2230 | -30 | 0.0003 |
| | 2242 | -30 | 0.0001 |
| | 2255 | -30 | 0.0002 |
| Frequency Range 3 | 2255 | -15 | 0.0001 |
| | 2620 | -15 | 0.0002 |
| | 2650 | -15 | 0.0005 |
| | 2690 | -15 | 0.0001 |
| | 12750 | -15 | 0.0001 |

WCDMA Band VIII

| Frequency Range | Interfering Frequency (MHz) | Interfering Level (dBm) | BER |
|---|---|---|---|
| Frequency Range 1 | 865 | -44 | 0.0001 |
| | 890 | -44 | 0.0002 |
| | 908 | -44 | 0.0001 |
| | 975 | -44 | 0.0003 |
| | 1000 | -44 | 0.0001 |
| | 1020 | -44 | 0.0001 |
| Frequency Range 2 | 840 | -30 | 0.0005 |
| | 855 | -30 | 0.0003 |
| | 865 | -30 | 0.0001 |
| | 1020 | -30 | 0.0002 |
| | 1035 | -30 | 0.0001 |
| | 1045 | -30 | 0.0001 |
| Frequency Range 3 | 1045 | -15 | 0.0004 |
| | 1520 | -15 | 0.0002 |
| | 1550 | -15 | 0.0003 |
| | 1590 | -15 | 0.0001 |
| | 12750 | -15 | 0.0001 |

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# 14. Receiver Spurious Response

## 14.1 Definition

Spurious response is a measure of the receiver's ability to receive a wanted signal on its assigned channel frequency without exceeding a given degradation due to the presence of an unwanted CW interfering signal at any other frequency at which a response is obtained i.e. for which the out-of-band blocking limit as specified in table 4.2.7.2-2 is not met.

## 14.2 Limit

The BER shall not exceed 0,001 for the parameters specified in table 4.2.8.2-1.

| **Parameter** | **Level** | **Unit** |
|---|---|---|
| DPCH_Ec | <REFSENS> + 3 dB | dBm/3,84 MHz |
| $\hat{I}_{or}$ | <REF$\hat{I}_{or}$> + 3 dB | dBm/3,84 MHz |
| $I_{blocking}$(CW) | -44 | dBm |
| $F_{uw}$ | Spurious response frequencies | MHz |
| UE transmitted mean power | 20 (for Power class 3)<br>18 (for Power class 4)<br>(note 2) | dBm |
| NOTE 1: <REFSENS> and <REF$\hat{I}$or> as specified in TS 134 121-1 [2].<br>NOTE 2: The UE transmitted mean power shall be reduced by 0,5 dB, for a UE operating in band XXII. | | |

## 14.3 Test Procedure

1. Set the parameter of the CW generator as shown in table 4.2.8.2-1. The spurious response frequencies are determined in step 4) of clause 5.3.6.1.2.
2. Set the power level of the UE according to table 4.2.8.2-1 with a ±1 dB tolerance.
3. Measure the BER of DCH received from the UE at the SS.

## 14.4 EUT Operation Condition

The EUT was programmed to be in Loopback mode.

## 14.5 Measurement Record

WCDMA Band I:

| **Test Case** | **BER** | **Limit** | **Result** |
|---|---|---|---|
| Intermodulation | 0.000% | 0.01% | PASS |

WCDMA Band VIII:

| **Test Case** | **BER** | **Limit** | **Result** |
|---|---|---|---|
| Intermodulation | 0.000% | 0.01% | PASS |

# 15. Receiver Reference Sensitivity level

## 15.1 Definition

The reference sensitivity level <REFSENS> is the minimum mean power received at the UE antenna port at which the Bit Error Ratio (BER) shall not exceed a specific value.

## 15.2 Limits

The measured BER shall not exceed 0,001 for the parameters specified in table 4.2.13.2-1:

| Operating Band | Unit | DPCH_Ec <REFSENS> | <REFÎor> |
|---|---|---|---|
| I | dBm/3,84 MHz | -116,3 | -106 |
| III | dBm/3,84 MHz | -113,3 | -103 |
| VII | dBm/3,84 MHz | -114,3 | -104 |
| VIII | dBm/3,84 MHz | -113,3 | -103 |
| XX | dBm/3,84 MHz | -113,3 | -103 |
| XXII | dBm/3,84 MHz | -113,3 | -103 |
| NOTE 1: For Power class 3 and 3bis this shall be at the maximum output power.<br>NOTE 2: For Power class 4 this shall be at the maximum output power. | | | |

## 15.3 EUT Operation Condition

The EUT was programmed to be in Loopback mode.

## 15.4 Test Procedure

1) Set and send continuously Up power control commands to the UE until the UE output power shall be maximum level.
2) Measure the BER of DCH received from the UE at the SS.
Details of initial conditions for UEs supporting UTRA FDD can be found in ETSI TS 134 121-1 [1], clause 6.2.

## 15.5 Measurement Record

WCDMA Band I:

| Test Case | BER | Limit | Result |
|---|---|---|---|
| Intermodulation | 0.000% | 0.01% | PASS |

WCDMA Band VIII:

| Test Case | BER | Limit | Result |
|---|---|---|---|
| Intermodulation | 0.000% | 0.01% | PASS |

# 16. Receiver Intermodulation Characteristics

## 16.1 Definition

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

## 16.2 Limit

Table 4.2.9.2-1: Receive intermodulation characteristics

| Parameter | Level | | Unit |
|---|---|---|---|
| DPCH_Ec | <REFSENS> + 3 dB | | dBm/3,84 MHz |
| $\hat{I}_{or}$ | <REF$\hat{I}_{or}$> + 3 dB | | dBm/3,84 MHz |
| $I_{ouw1}$ (CW) | -46 | | dBm |
| $I_{ouw2}$ mean power (modulated) | -46 | | dBm |
| $F_{uw1}$ (offset) | 10 | -10 | MHz |
| $F_{uw2}$ (offset) | 20 | -20 | MHz |
| UE transmitted mean power | 20 (for Power class 3)<br>18 (for Power class 4)<br>(note 3) | | dBm |
| NOTE 1: Iouw2 (modulated) consists of the common channels and the 16 dedicated data channels as specified in TS 125 101 [5].<br>NOTE 2: <REFSENS> and <REFÎor> as specified in TS 134 121-1 [2].<br>NOTE 3: The UE transmitted mean power shall be reduced by 0,5 dB for a UE operating in band XXII. | | | |

Table 4.2.9.2-2: Test parameters for narrow band intermodulation characteristics

| Parameter | Unit | Band III, VIII | |
|---|---|---|---|
| DPCH_Ec | dBm/3,84 MHz | <REFSENS> + 10 dB | |
| $\hat{I}_{or}$ | dBm/3,84 MHz | <REF$\hat{I}_{or}$> + 10 dB | |
| $I_{ouw1}$ (CW) | dBm | -43 | |
| $I_{ouw2}$ (GMSK) | dBm | -43 | |
| $F_{uw1}$ (offset) | MHz | 3,6 | - 3,6 |
| $F_{uw2}$ (offset) | MHz | 6,0 | - 6,0 |
| UE transmitted mean power | dBm | 20 (for Power class 3)<br>18 (for Power class 4) | |
| NOTE 1: <REFSENS> and <REFÎor> as specified in TS 134 121-1 [2].<br>NOTE 2: Iouw2 (GMSK) is an interfering signal as defined in TS 145 004 [9]. It is a continuous GMSK modulated carrier following the structure of the GSM signals, but with all modulating bits (including the midamble period) derived directly from a random or any pseudo random data stream. | | | |

## 16.3 EUT Operation Condition

The EUT was programmed to be in Loopback mode.

## 16.4 Test Procedure

1) Set the parameters of the CW generator and interference generator as shown in tables 4.2.9.2-1 and 4.2.9.2-2.
2) Set the power level of the UE according to tables 4.2.9.2-1 and 4.2.9.2-2 with a ±1 dB tolerance.
3) Measure the BER of DCH received from the UE at the SS.

## 16.5 Measurement Record

WCDMA Band I:

| Test Case | BER | Limit | Result |
|---|---|---|---|
| Intermodulation | 0.000% | 0.01% | PASS |

WCDMA Band VIII:

| Test Case | BER | Limit | Result |
|---|---|---|---|
| Intermodulation | 0.000% | 0.01% | PASS |

# 17. Receiver Spurious Emissions

## 17.1 Definition

The spurious emissions power is the power of emissions, generated or amplified in a receiver, which appear at the UE antenna connector. The requirements in UE transmit bands are valid in URA_PCH, Cell_PCH and idle state.

## 17.2 Limit

Table 4.2.10.2-1: General receiver spurious emission requirements

| Frequency band | Measurement bandwidth | Maximum level |
|---|---|---|
| 30 MHz ≤ f < 1 GHz | 100 kHz | -57 dBm |
| 1 GHz ≤ f ≤ 12,75 GHz | 1 MHz | -47 dBm |

Table 4.2.10.2-2: Additional receiver spurious emission requirements

| Operating band | Frequency bandwidth | Measurement bandwidth | Minimum requirement |
|---|---|---|---|
| I | 791 MHz ≤ f ≤ 821 MHz<br>921 MHz ≤ f < 925 MHz<br>925 MHz ≤ f ≤ 935 MHz<br>935 MHz < f ≤ 960 MHz<br>1 805 MHz ≤ f ≤ 1 880 MHz<br>1 920 MHz ≤ f ≤ 1 980 MHz<br>2 110 MHz ≤ f ≤ 2 170 MHz<br>2 585 MHz ≤ f ≤ 2 690 MHz | 3,84 MHz<br>100 kHz<br>100 kHz<br>100 kHz<br>100 kHz<br>3,84 MHz<br>3,84 MHz<br>3,84 MHz | -60 dBm<br>-60 dBm (see note )<br>-67 dBm (see note)<br>-79 dBm (see note)<br>-71 dBm (see note)<br>-60 dBm<br>-60 dBm<br>-60 dBm |
| VIII | 791 MHz ≤ f < 821 MHz<br>880 MHz ≤ f ≤ 915 MHz<br>921 MHz ≤ f < 925 MHz<br>925 MHz ≤ f ≤ 935 MHz<br>935 MHz < f < 960 MHz<br>1 805 MHz < f ≤ 1 880 MHz<br>2 110 MHz ≤ f ≤ 2 170 MHz<br>2 585 MHz ≤ f ≤ 2 690 MHz | 3,84 MHz<br>3,84 MHz<br>100 kHz<br>100 kHz<br>3,84 MHz<br>100 kHz<br>3,84 MHz<br>3,84 MHz<br>3,84 MHz | -60 dBm<br>-60 dBm<br>-60 dBm (see note)<br>-67 dBm (see note)<br>-60 dBm<br>-79 dBm (see note)<br>-60 dBm<br>-60 dBm<br>-60 dBm<br>-60 dBm |

## 17.3 EUT Operation Condition

The EUT was programmed to be in receiving mode.

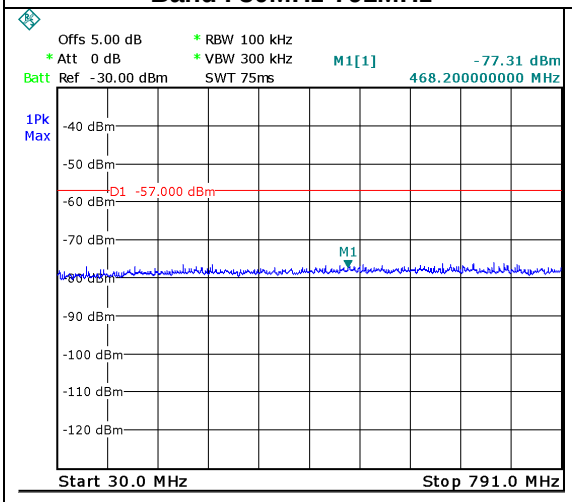
## 17.4 Test Procedure

Sweep the spectrum analyzer (or other suitable test equipment) over a frequency range from 30 MHz to 12.75 GHz and measure the average power of the spurious emissions.

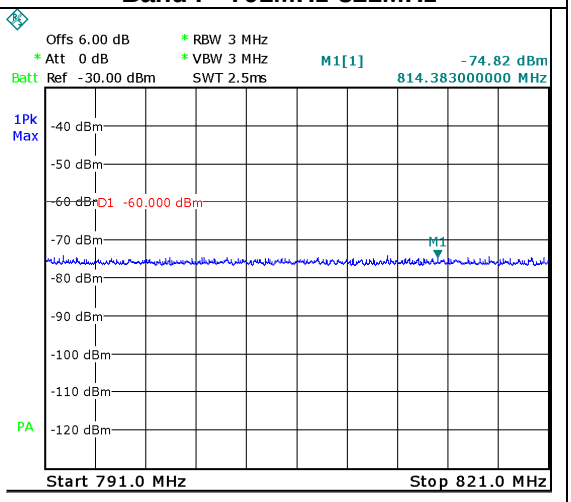
## 17.5 Measurement Record

**Test plots**

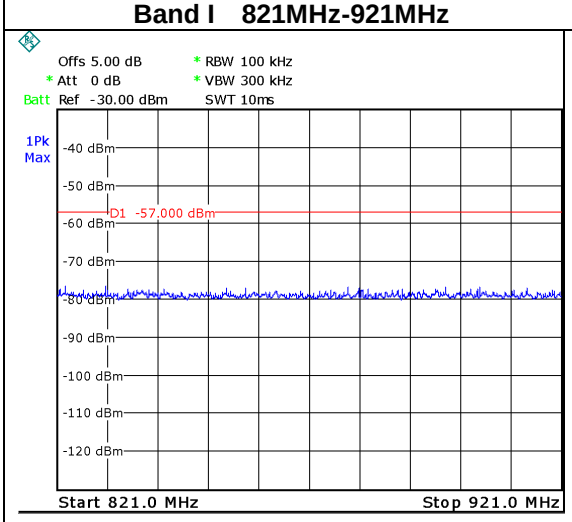
**Band I 30MHz-791MHz**



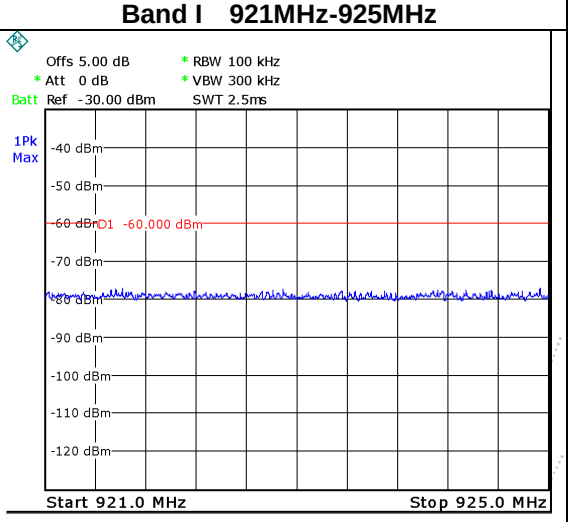

**Band I 791MHz-821MHz**



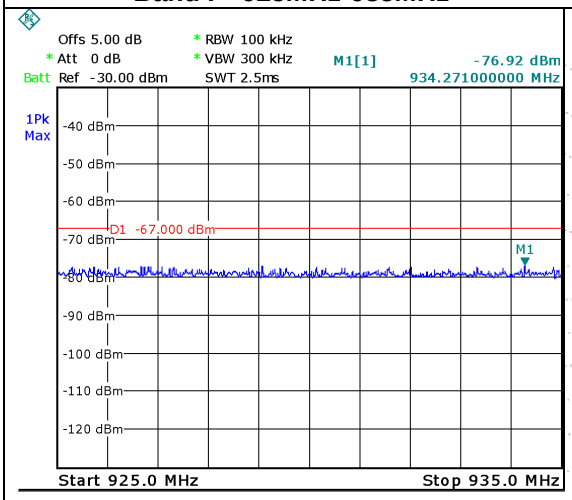

**Band I 821MHz-921MHz**



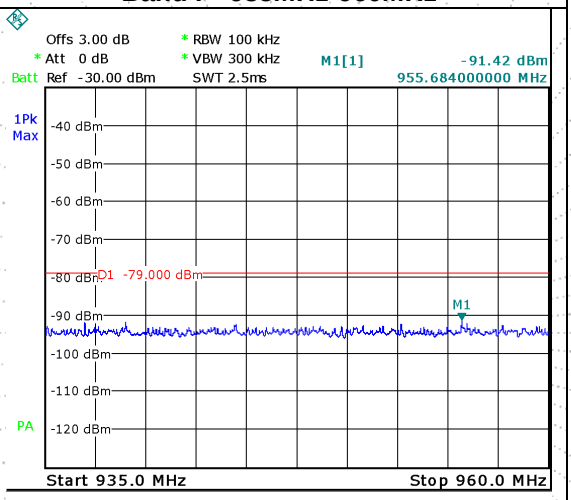

**Band I 921MHz-925MHz**



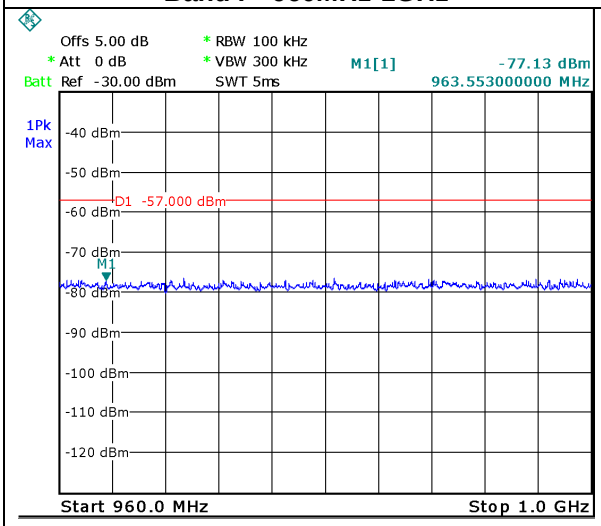

**Band I 925MHz-935MHz**



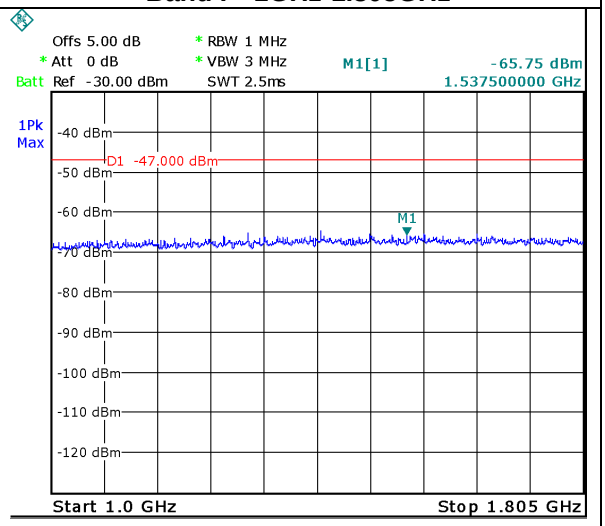

**Band I 935MHz-960MHz**



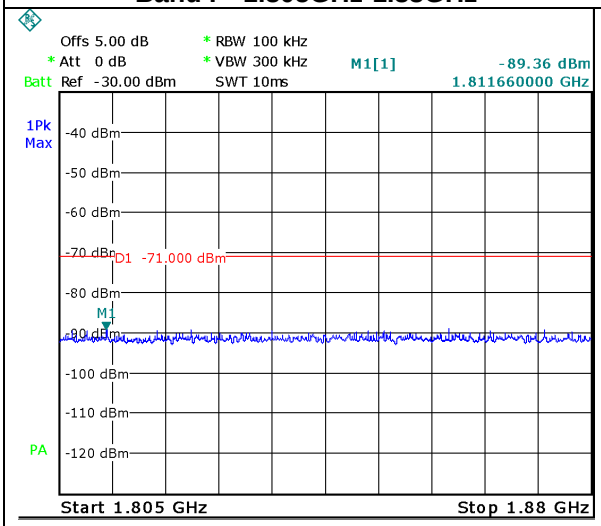
**Band I 960MHz-1GHz**



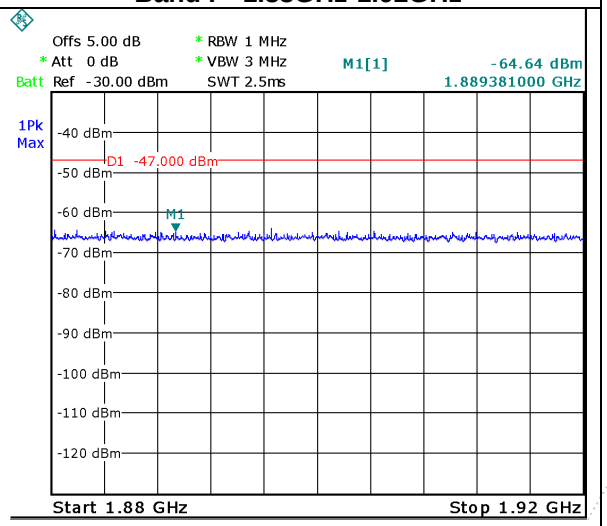

**Band I 1GHz-1.805GHz**



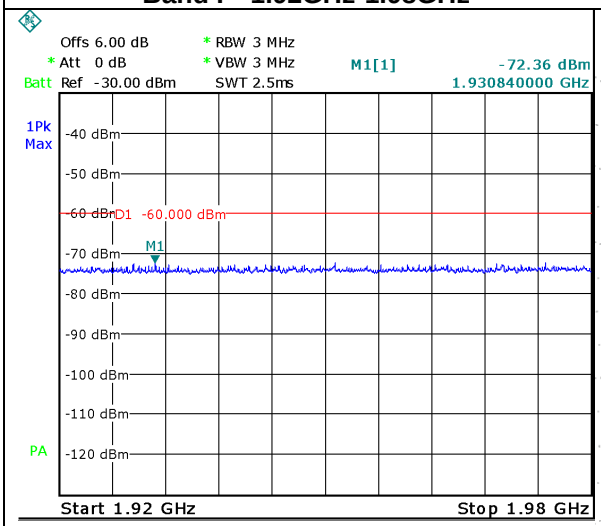

**Band I 1.805GHz-1.88GHz**



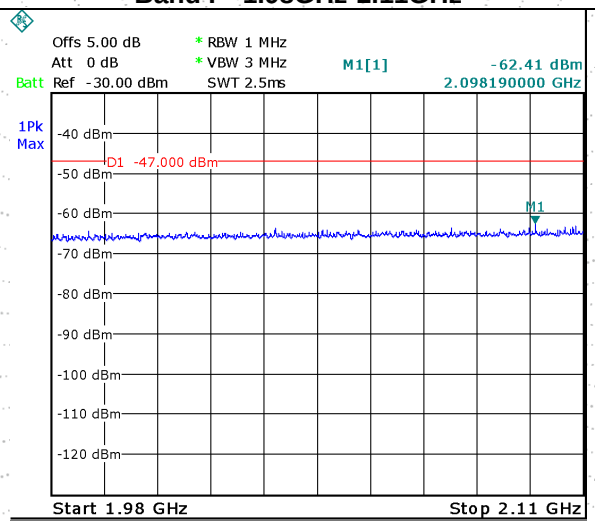

**Band I 1.88GHz-1.92GHz**



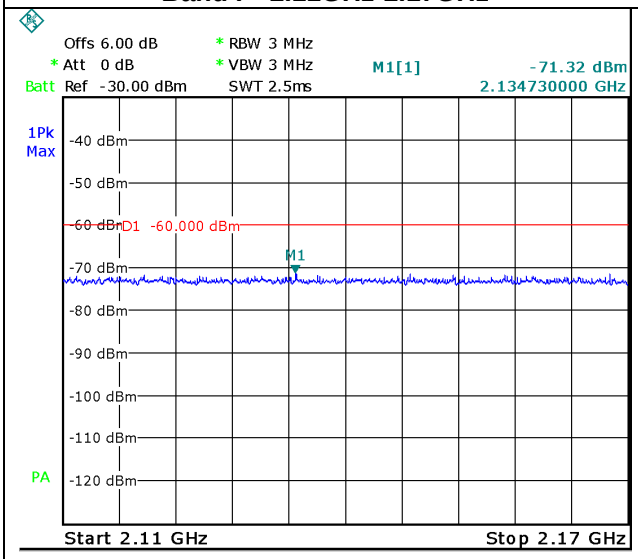

**Band I 1.92GHz-1.98GHz**



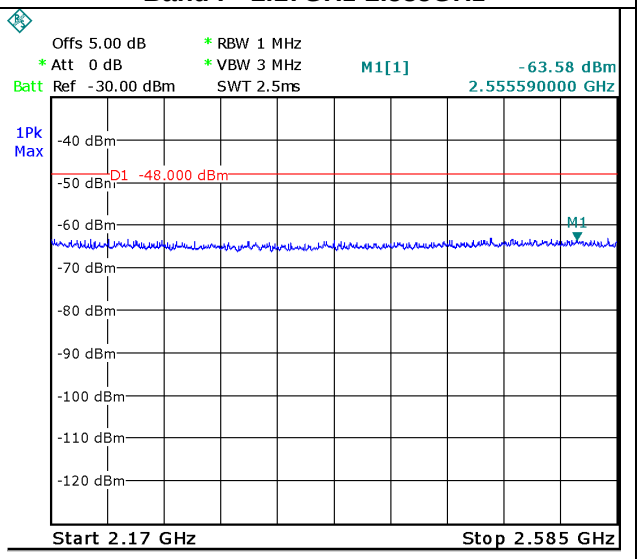

**Band I 1.98GHz-2.11GHz**



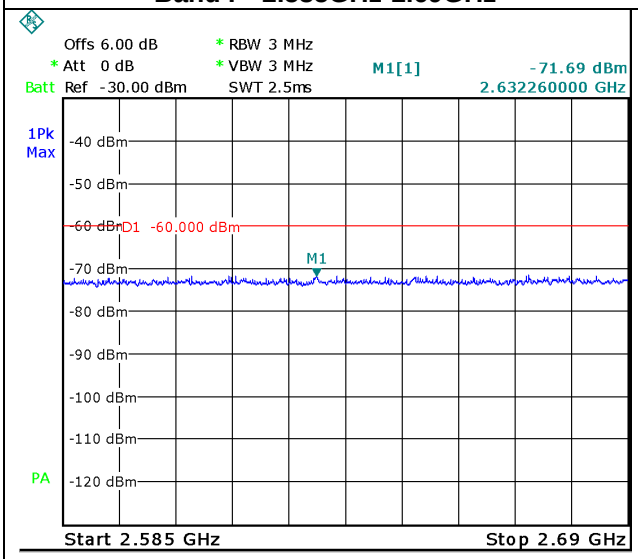
**Band I 2.11GHz-2.17GHz**



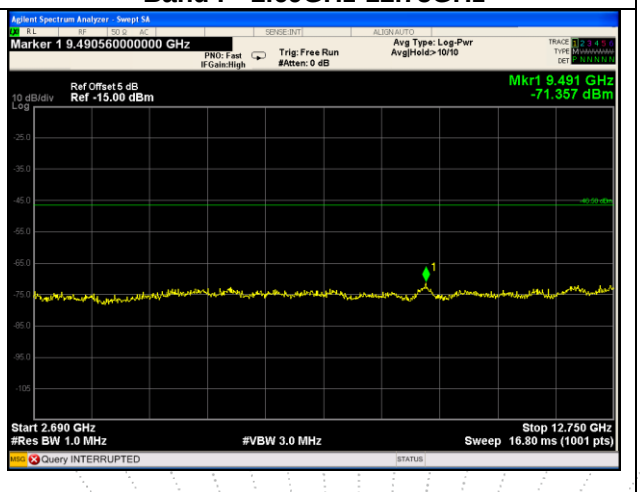

**Band I 2.17GHz-2.585GHz**



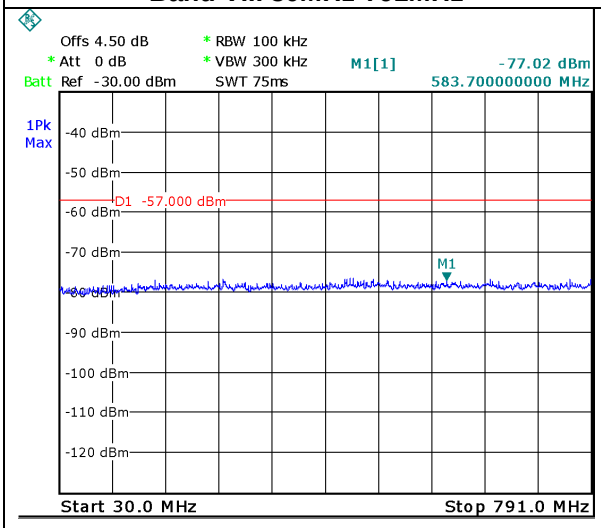

**Band I 2.585GHz-2.69GHz**



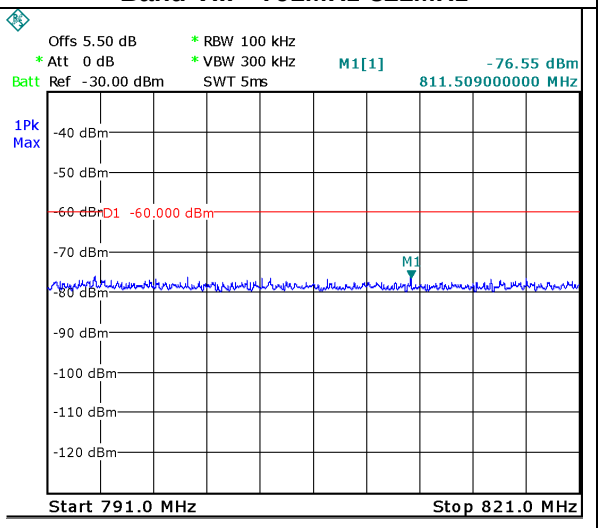

**Band I 2.69GHz-12.75GHz**



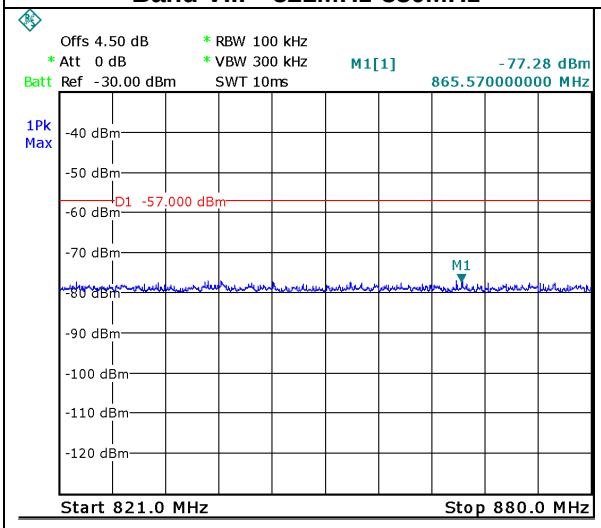
**Band VIII 30MHz-791MHz**



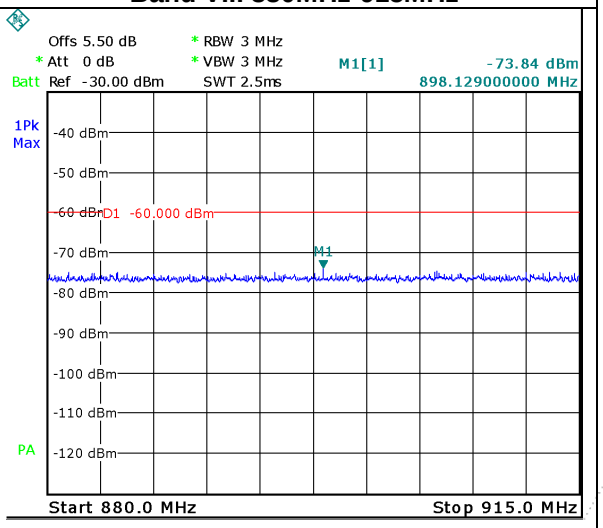

**Band VIII 791MHz-821MHz**



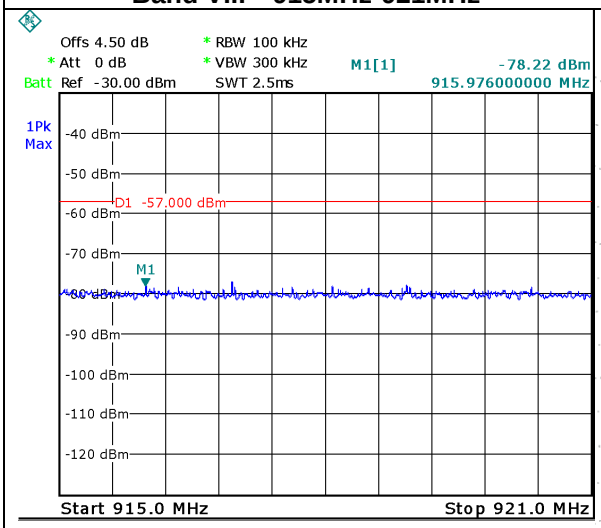

**Band VIII 821MHz-880MHz**



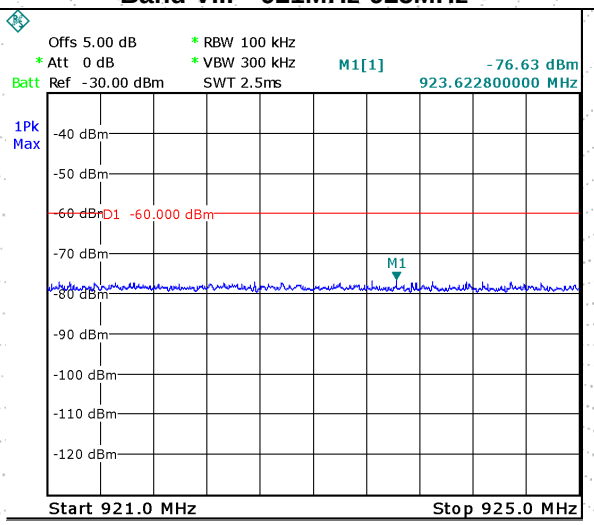

**Band VIII 880MHz-915MHz**



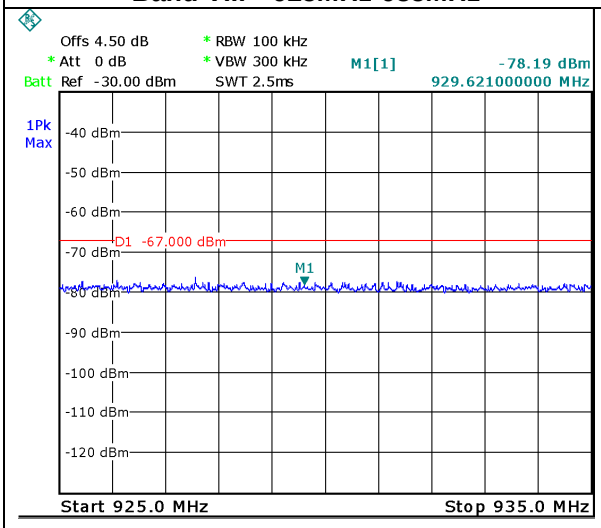

**Band VIII 915MHz-921MHz**



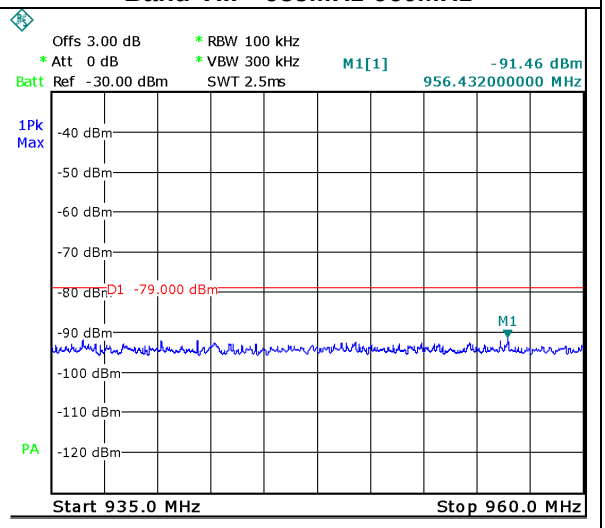

**Band VIII 921MHz-925MHz**



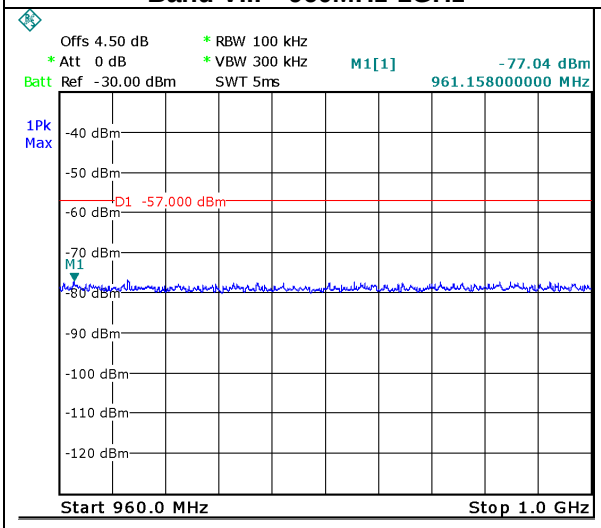
**Band VIII 925MHz-935MHz**



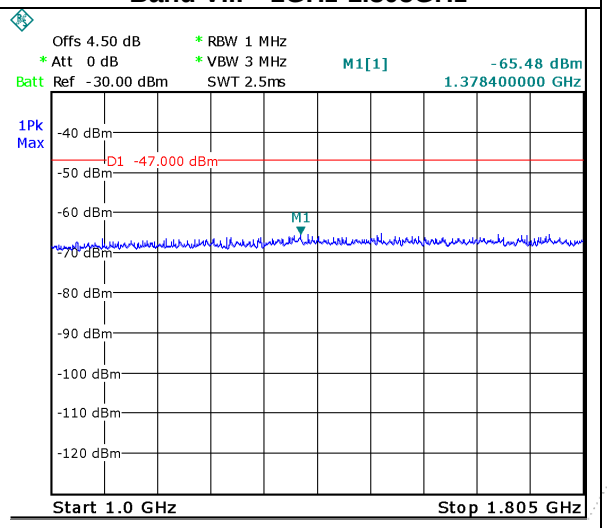

**Band VIII 935MHz-960MHz**



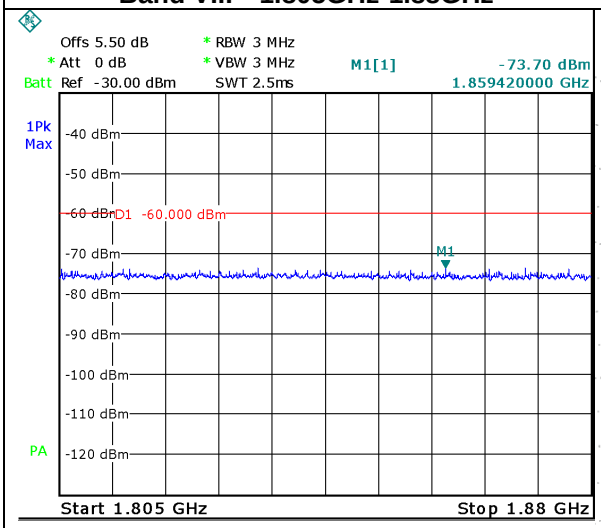

**Band VIII 960MHz-1GHz**



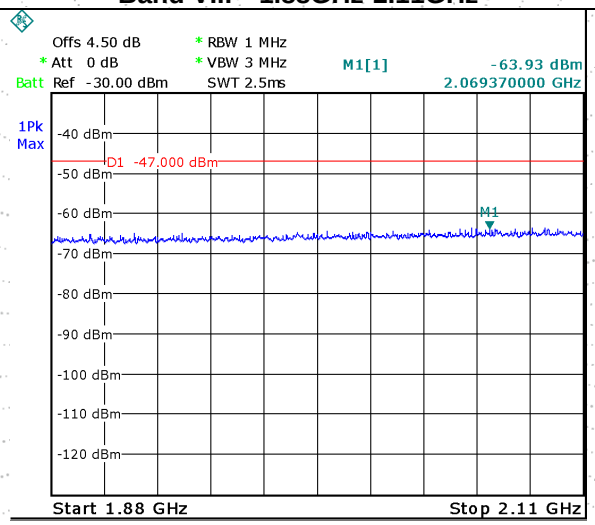

**Band VIII 1GHz-1.805GHz**



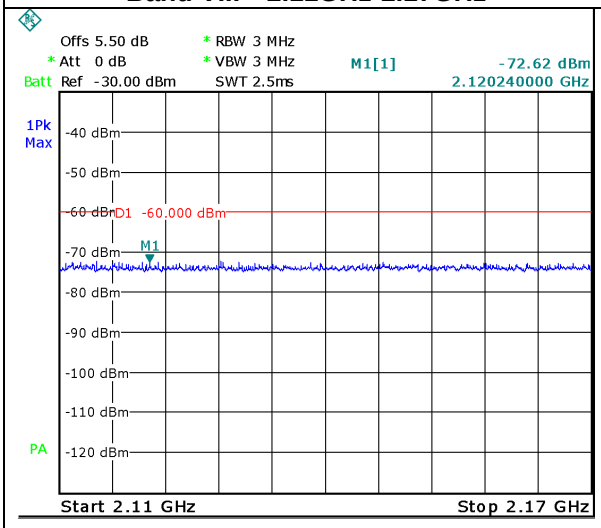

**Band VIII 1.805GHz-1.88GHz**



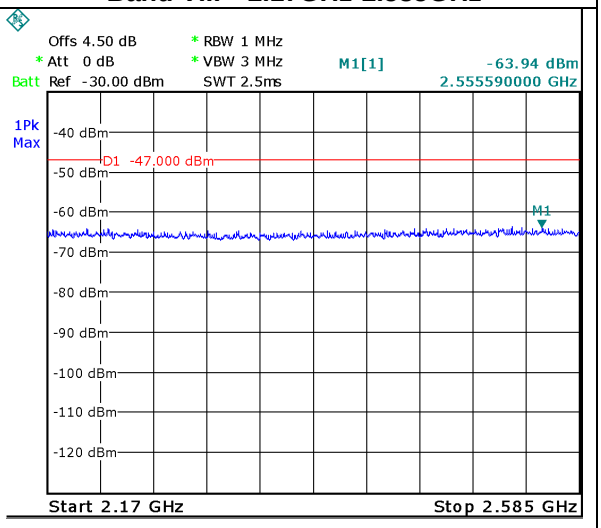

**Band VIII 1.88GHz-2.11GHz**



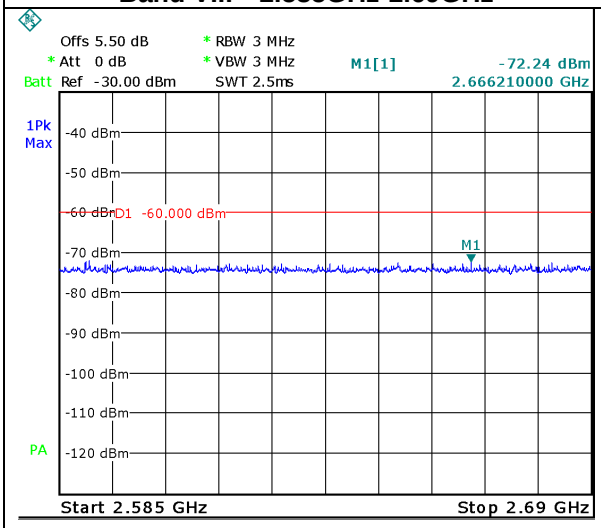
**Band VIII 2.11GHz-2.17GHz**



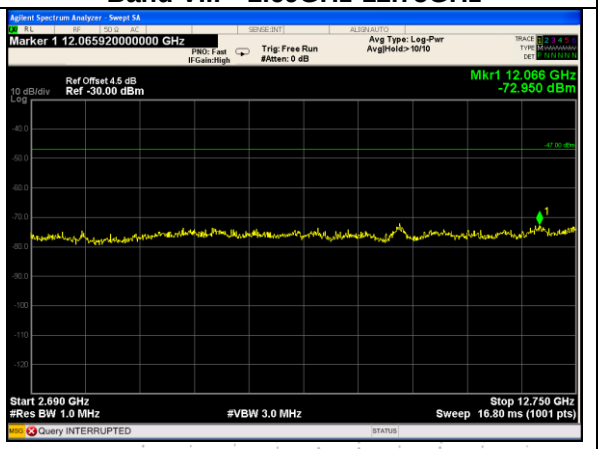

**Band VIII 2.17GHz-2.585GHz**




**Band VIII 2.585GHz-2.69GHz**




**Band VIII 2.69GHz-12.75GHz**



# 18. Out-Of-Synchronization Handling Of Output Power

## 18.1 Definition

The UE shall monitor the DPCCH quality in order to detect a loss of the signal on Layer 1. The threshold Qout specifies at what DPCCH quality levels the UE shall shut its power off. The threshold is not defined explicitly, but is defined by the conditions under which the UE shall shut its transmitter off, as stated in this clause.

The DPCCH quality shall be monitored in the UE and compared to the threshold Qout for the purpose of monitoring synchronization. The threshold Qout should correspond to a level of DPCCH quality where no reliable detection of the TPC commands transmitted on the downlink DPCCH can be made. This can be at a TPC command error ratio level of e.g. 20 %.

## 18.2 Limit

When the UE estimates the DPCCH quality over the last 160 ms period to be worse than a threshold Qout, the UE shall shut its transmitter off within 40 ms.

The quality level at the thresholds Qoutcorrespond to different signal levels depending on the downlink conditions DCH parameters. For the conditions in table 4.2.11.2-1, a signal with the quality at the level Qout can be generated by a DPCCH_Ec/Ior ratio of -25 dB. The DL reference measurement channel 12,2 kbit/s is specified in TS 134 121-1 [2] and with static propagation conditions. The downlink physical channels, other than those specified in table 4.2.11.2-1, are as specified in TS 134 121-1 [2].

Table 4.2.11.2-1: DCH parameters for test of out-of-synchronization handling

| Parameter | Value | Unit |
|---|---|---|
| $\hat{I}_{or}/I_{oc}$ | -1 | dB |
| $I_{oc}$ | -60 | dBm/3,84 MHz |
| $\frac{DPDCH\_E_c}{I_{or}}$ | See figure 4.2.11.2-1:<br>Before point A:<br>-16,6 for UEs not supporting enhanced performance type 1 for DCH<br>-19,6 for UEs supporting enhanced performance type 1 for DCH<br>After point A not defined | dB |
| $\frac{DPCCH\_E_c}{I_{or}}$ | See figure 4.2.11.2-1 | dB |
| Information Data Rate | 12,2 | kbit/s |

Figure 4.2.11.2-1 and table 4.2.11.2-2 show an example scenario where the DPCCH_Ec/Ior ratio varies from a level where the DPCH is demodulated under normal conditions, down to a level below Qout where the UE shall shut its power off.

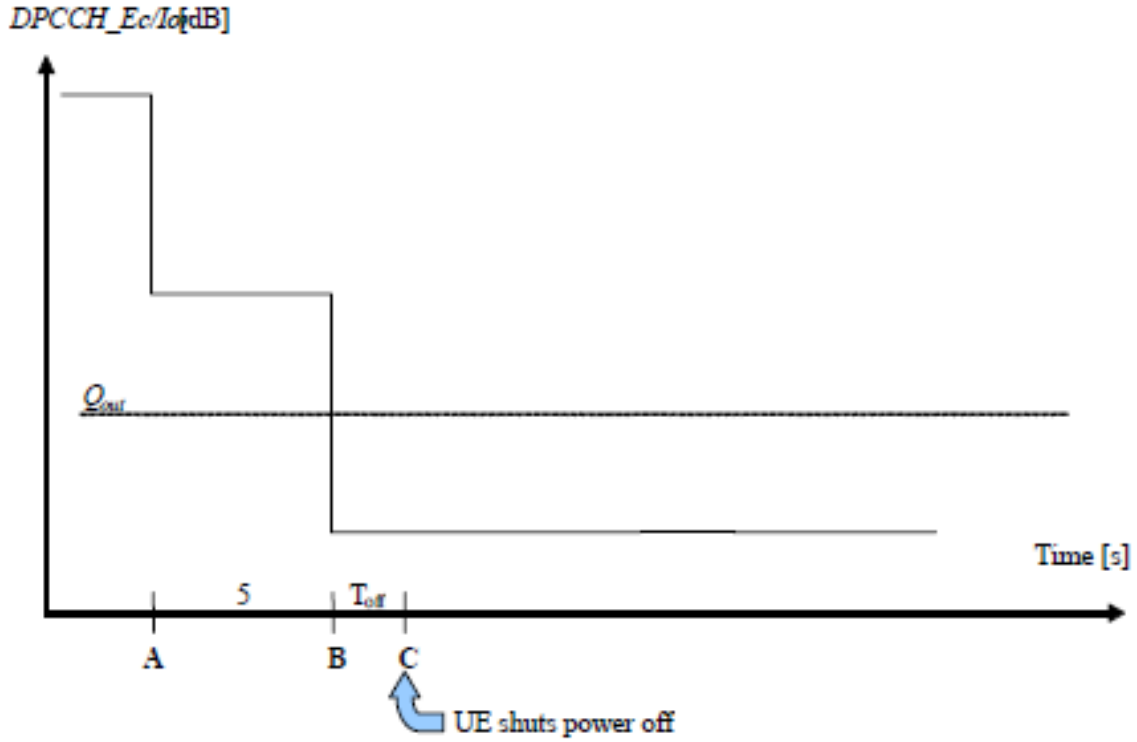



Figure 4.2.11.2-1: Conditions for out-of-synchronization handling in the UE

Table 4.2.11.2-2: Conditions for out-of-synchronization handling in the UE

| Clause from figure 4.2.11.2-1 | DPCCH_Ec/Ior (UE, not supporting enhanced performance requirements type 1 for DCH) | DPCCH_Ec/Ior (UE, supporting enhanced performance requirements type 1 for DCH) | Unit |
|---|---|---|---|
| Before A | -16.6 | -19.6 | dB |
| A to B | -21.6 | -24.6 | dB |
| After B | -28.4 | -31.4 | dB |

The requirements for the UE are that it shall shut its transmitter off before point C.
The UE transmitter is considered to be OFF if the measured RRC filtered mean power is less than -55 dBm.

## 18.3 EUT Operation Condition

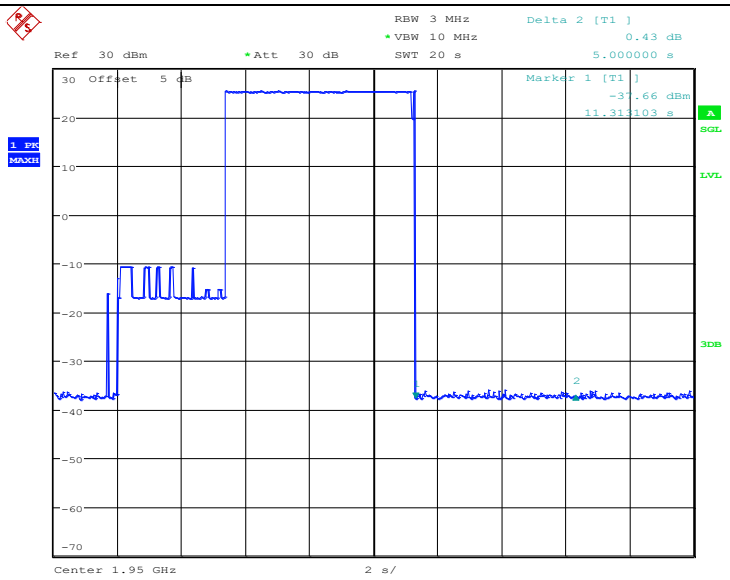
The EUT was programmed to be in transmitting mode.

## 18.4 Test Procedure

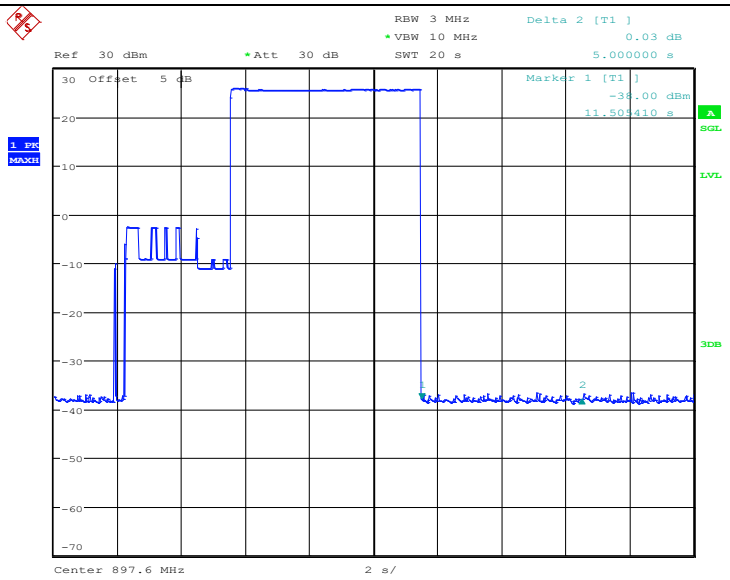
1. The SS sends continuously up power control commands to the UE until the UE transmitter power reach maximum level.
2. The SS controls the DPCCH_Ec/Ior ratio level according to table 4.2.11.2-2, 'A to B'.
3. The SS controls the DPCCH_Ec/Ior ratio level according to table 4.2.11.2-2, 'after B'. The SS waits 200ms and then verifies that the UE transmitter has been switched off.
4. The SS monitors the UE transmitted power for 5 s and verifies that the UE transmitter is not switched on during this time.

## 18.5 Measurement Record

| WCDMA Band I |
|---|




| WCDMA Band VIII |
|---|



# 19. Transmitter Adjacent Channel Leakage Power Ratio (ACLR)

## 19.1 Definition

Adjacent Channel Leakage power Ratio (ACLR) is the ratio of the RRC filtered mean power centred on the assigned channel frequency to the RRC filtered mean power centred on an adjacent channel frequency.

## 19.2 Limit

If the adjacent channel power is greater than -50 dBm then the ACLR shall be higher than the value specified in table 4.2.12.1.2-1.The requirements are applicable for all for the values of βc, βd, βhs, βec and βed defined in TS 125 214 [8].

Table 4.2.12.1.2-1: UE ACLR

| Power Class | Adjacent channel frequency relative to assigned channel frequency | ACLR limit |
|---|---|---|
| 3 | +5MHz or -5MHz | 32,2dB |
| 3 | +10MHz or -10MHz | 42,2dB |
| 4 | +5MHz or -5MHz | 32,2dB |
| 4 | +10MHz or -10MHz | 42,2dB |
| NOTE 1: The requirement shall still be met in the presence of switching transients.<br>NOTE 2: The ACLR requirements reflect what can be achieved with present state of the art technology.<br>NOTE 3: Requirement on the UE shall be reconsidered when the state of the art technology progresses. | | |

## 19.3 EUT Operation Condition

The EUT was programmed to be in Loopback mode.

## 19.4 Test Procedure

1. The SS sends continuously Up power control commands to the UE until the UE transmitter power reaches maximum level.
2. Measure the RRC filtered mean power.
3. Measure the RRC filtered mean power of the first adjacent channels and the second adjacent channels.
4. Calculate the ratio of the power between the values measured in 2) and 3) above.

## 19.5 Measurement Record

Please refer to
Appendix 5. Transmitter Adjacent Channel Leakage power Ratio
Appendix 8. Transmitter Adjacent Channel Leakage Power Ratio (ACLR) with HS-DPCCH
Appendix 11. Transmitter Adjacent Channel Leakage Power Ratio (ACLR) with E-DCH
Test Result: Pass

# 20. Receiver Total Radiated Sensitivity

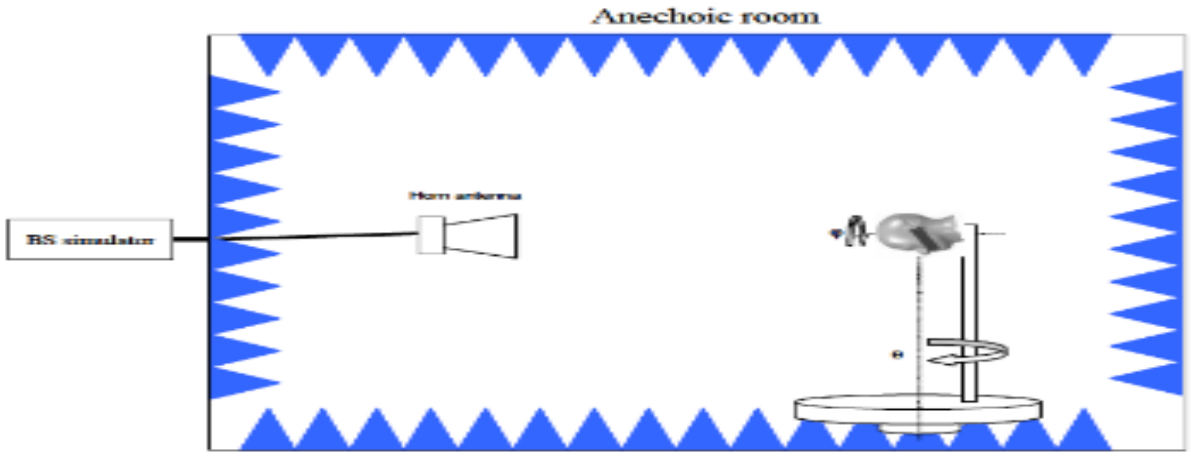
## 20.1 Test Requirement

ETSI EN 301 908-2 clause 5.3.13.2

## 20.2 Test Method

ETSI EN 301 908-2 clause 5.3.13.1

## 20.3 Test Setup




## 20.4 Limit

The average measured total radiated sensitivity (TRS) of low, mid and high channel for handheld UE shall be lower than the average TRS requirement specified in table 4.2.14.2-1. The averaging shall be done in linear scale for the TRS results of both right and left side of the phantom head. Average TRS requirement is shown in the column "Average" on the requirement tables.

$$TRS_{average} = 10\log\left[6\Big/\left(\frac{1}{10^{P_{left\_low}/10}}+\frac{1}{10^{P_{left\_mid}/10}}+\frac{1}{10^{P_{left\_high}/10}}+\frac{1}{10^{P_{right\_low}/10}}+\frac{1}{10^{P_{right\_mid}/10}}+\frac{1}{10^{P_{right\_high}/10}}\right)\right]$$

**Table 4.2.14.2-1: TRS minimum requirements for UTRA FDD bands in the speech position Beside Head Hand Left and Beside Head Hand Right (BHHL/BHHR) for the primary mechanical mode**

| Operating band | Unit | <REFÎ$_{or}$> |
|---|---|---|
| | | Average |
| I | dBm/3,84 MHz | -100,1 |
| VIII | dBm/3,84 MHz | -95,85 |
| NOTE 1: For power class 3, 3bis and 4 this shall be achieved at the maximum output power.<br>NOTE 2: Applicable for dual-mode GSM/UMTS.<br>NOTE 3: Not applicable for devices supporting CDMA or carrier aggregation. | | |

## 20.5 Test Procedure

1) Position the UE according to the DUT positioning for speech mode.
2) Set the SS downlink physical channels.
3) Power on the UE.
4) A call is set up according to the Generic call setup procedure. The power control algorithm shall be set to Power Control Algorithm 2. Compressed mode shall be set to OFF.
5) Enter the UE into loopback test mode 2 and start the loopback test.
6) Send continuously Up power control commands to the UE.
7) As the UE reaches maximum power, start sending PN15 data pattern.
8) Measure EIS from one measurement point. EIS is the power transmitted from one specific direction to the UE causing BER value of 1% ± 0.2% using 20000 or more bits; see Annex E.20.
NOTE: To meet BER value target DL power level can be changed using user's freely selectable algorithm.
9) Measure the EIS for every direction of selected sampling gird using two orthogonal polarizations to obtain TRS.
10) Calculate TRS using equations.

## 20.6 Test Result

Note: This product does not meet the size required by the standard.

# 21. Total Radiated Power

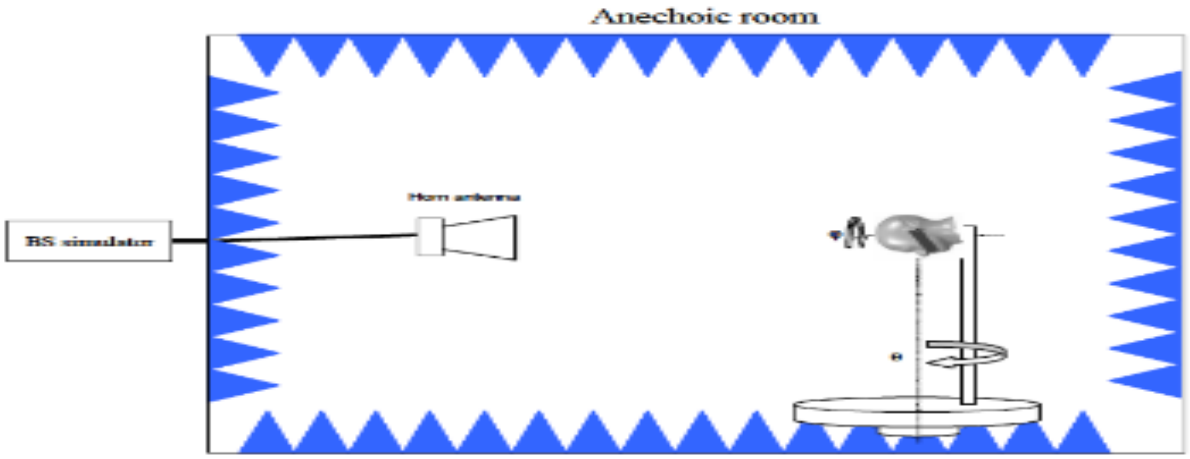
## 21.1 Test Requirement

ETSI EN 301 908-2 clause 5.3.14.2

## 21.2 Test Method

ETSI EN 301 908-2 clause 5.3.14.1

## 21.3 Test Setup




## 21.4 Limit

The average TRP of low, mid and high channel in beside head position shall be higher than minimum performance requirements for roaming bands shown in table 4.2.15.2-1. The averaging shall be done in linear scale for the TRP results of both right and left side of the phantom head.

$$TRP_{average} = 10\log\left[\frac{10^{P_{left\_low}/10} + 10^{P_{left\_mid}/10} + 10^{P_{left\_high}/10} + 10^{P_{right\_low}/10} + 10^{P_{right\_mid}/10} + 10^{P_{right\_high}/10}}{6}\right]$$

**Table 4.2.15.2-1: TRP minimum performance requirement for UTRA FDD bands in the speech position Beside Head Hand Left and Beside Head Hand Right (BHHL/BHHR) for primary mechanical mode**

| Operating band | Power Class 3 |
|---|---|
| | Power (dBm) |
| | Average |
| I | 12,55 |
| VIII | 8,70 |
| NOTE 1: Applicable for dual-mode GSM/UMTS.<br>NOTE 2: Not applicable for devices supporting CDMA or carrier aggregation. | |

## 21.5 Test Procedure

1) Set the SS downlink physical channels.
2) Power on the UE.
3) A call is set up according to the Generic call setup procedure. The power control algorithm shall be set to Power Control Algorithm 2. Compressed mode shall be set to OFF.
4) Enter the UE into loopback test mode 2 and start the loopback test.
5) Send continuously Up power control commands to the UE.
6) As the UE reaches maximum power, start sending PN15 data pattern.
7) Position the UE according to the DUT positioning for speech mode specified in Subclause 4.3.3.
4) Measure the $EIRP_{\theta}$ and $EIRP_{\phi}$ with a sample step of 15° in theta (θ) and phi (φ) directions using a test system having characteristics as described in Annex A.
5) Calculate TRP using equations from Subclause 6.1.3.1.
NOTE 1: The measurement procedure is based on the measurement of the spherical radiation pattern of the DUT. The power radiated by the DUT is sampled in far field in a group of points located on a spherical surface enclosing the DUT. The EIRP samples are taken using a constant sample step of 15° both in theta (θ) and phi (φ) directions. In some cases a different sampling grid may be used to speed up the measurements (See Subclause 4.4). All the EIRP samples are taken with two orthogonal polarizations, θ - and ϕ-polarisations.
NOTE 2: The noise floor of the measurement receiver shall not disturb the power measurement.
NOTE 3: Non Standard settings: To speed up sensitivity measurements, power measurements may be done with non standard modulation. However to obtain TRP result the measured EIRP figures shall be normalized by

$$\Delta\overline{EIRP} = \frac{1}{n}\sum_{i=1}^{n}\left(EIRPstd_i - EIRPnstd_i\right)$$

where $EIRPstd_i$ is power measurement done with standard setting. $EIRPnstd_i$ is power measurement done with non standard modulation. n is amount of reference measurement points.

## 21.6 Test Result

Note: This product does not meet the size required by the standard.

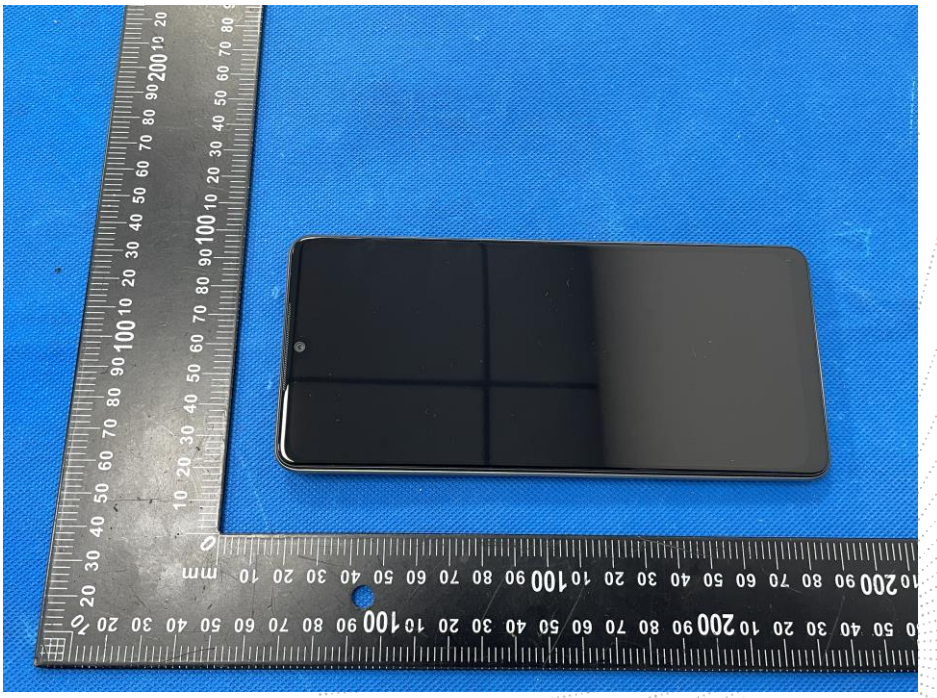
## 22. EUT Photographs

**EUT Photo 1**

**EUT Photo 2**

**EUT Photo 3**

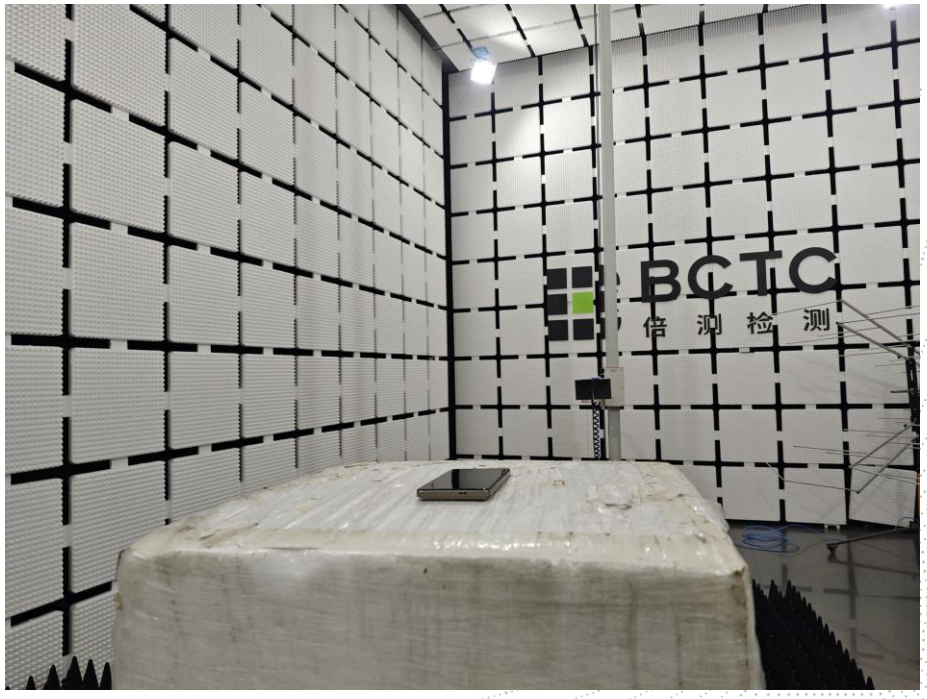

**EUT Photo 4**



NOTE: Appendix-Photographs Of EUT Constructional Details

## 23. EUT Test Setup Photographs

Spurious emissions

# STATEMENT

1. The equipment lists are traceable to the national reference standards.

2. The test report can not be partially copied unless prior written approval is issued from our lab.

3. The test report is invalid without the "special seal for inspection and testing".

4. The test report is invalid without the signature of the approver.

5. The test process and test result is only related to the Unit Under Test.

6. Sample information is provided by the client and the laboratory is not responsible for its authenticity.

7. The quality system of our laboratory is in accordance with ISO/IEC17025.

8. If there is any objection to this test report, the client should inform issuing laboratory within 15 days from the date of receiving test report.

Address:
1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Zhancheng, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China

TEL: 400-788-9558

P.C.: 518103

FAX: 0755-33229357

Website: http://www.chnbctc.com

Consultation E-mail: bctc@bctc-lab.com.cn

Complaint/Advice E-mail: advice@bctc-lab.com.cn

※※※※※ END ※※※※※