# FCC RF Test Report

| | | |
|---|---|---|
| APPLICANT | : | Motorola Mobility LLC |
| EQUIPMENT | : | Mobile Cellular Phone |
| BRAND NAME | : | Motorola |
| MODEL NAME | : | XT2347-1 |
| FCC ID | : | IHDT56AN1 |
| STANDARD | : | 47 CFR Part 2, 22(H), 24(E), 27(L) |
| CLASSIFICATION | : | PCS Licensed Transmitter Held to Ear (PCE) |
| TEST DATE(S) | : | Jun. 20, 2023 ~ Jul. 06, 2023 |

**We, Sporton International Inc. (ShenZhen), would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.26-2015 and shown compliance with the applicable technical standards.**

**The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. (ShenZhen), the test report shall not be reproduced except in full.**

Jason Jia

**Approved by: Jason Jia**

ACCREDITED
Cert #5145.01

***Sporton International Inc. (ShenZhen)***

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***People's Republic of China***

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# REVISION HISTORY

| REPORT NO. | VERSION | DESCRIPTION | ISSUED DATE |
|---|---|---|---|
| FG352602A | Rev. 01 | Initial issue of report | Jul. 13, 2023 |
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# SUMMARY OF TEST RESULT

| Report Section | FCC Rule | Description | Limit | Result | Remark |
|---|---|---|---|---|---|
| 3.4 | §2.1046 | Conducted Output Power | - | Report Only | - |
| | §22.913(a)(5) | Effective Radiated Power | < 7 Watts | PASS | - |
| | §24.232(c) | Equivalent Isotropic Radiated Power | < 2 Watts | PASS | - |
| | §27.50(d)(4) | Equivalent Isotropic Radiated Power | < 1 Watts | PASS | - |
| 3.5 | §24.232(d) | Peak-to-Average Ratio | < 13 dB | PASS | - |
| 3.6 | §2.1049 | Occupied Bandwidth | Reporting Only | PASS | - |
| 3.7 | §2.1051<br>§22.917(a)<br>§24.238(a)<br>§27.53(h) | Band Edge Measurement | < 43+10log10(P[Watts]) | PASS | - |
| 3.8 | §2.1051<br>§22.917(a)<br>§24.238(a)<br>§27.53(h) | Conducted Emission | < 43+10log10(P[Watts]) | PASS | - |
| 3.9 | §2.1055<br>§22.355 | Frequency Stability for Temperature & Voltage | < 2.5 ppm for Part 22 | PASS | - |
| | §2.1055<br>§24.235<br>§27.54 | | Within Authorized Band | | |
| 4.4 | §2.1053; §22.917(a); §24.238(a); §27.53(h) | Field Strength of Spurious Radiation | < 43+10log10(P[Watts]) | PASS | Under limit 39.85 dB at 7520.000 MHz |

**Conformity Assessment Condition:**

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacturer who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
2. The measurement uncertainty please refer to each test result in the section “Measurement Uncertainty”

**Disclaimer:**

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.

# 1 General Description

## 1.1 Applicant

**Motorola Mobility LLC**
222 W, Merchandise Mart Plaza, Chicago IL 60654 USA

## 1.2 Manufacturer

**Motorola Mobility LLC**
222 W, Merchandise Mart Plaza, Chicago IL 60654 USA

## 1.3 Product Feature of Equipment Under Test

| Product Feature | |
|---|---|
| **Equipment** | Mobile Cellular Phone |
| **Brand Name** | Motorola |
| **Model Name** | XT2347-1 |
| **FCC ID** | IHDT56AN1 |
| **IMEI Code** | Conducted: 357231700047152/357231700047160<br>Radiation: 357231700039373/357231700039381 |
| **HW Version** | DVT2 |
| **SW Version** | T3TC33.12 |
| **EUT Stage** | Identical Prototype |

**Remark:** The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

## 1.4 Product Specification of Equipment Under Test

| Standards-related Product Specification | |
|---|---|
| **Tx Frequency** | **GSM/GPRS/EDGE:**<br>850: 824 MHz ~ 849 MHz<br>1900: 1850MHz ~ 1910MHz<br>**WCDMA:**<br>Band V: 824 MHz ~ 849 MHz<br>Band II: 1850 MHz ~ 1910 MHz<br>Band IV: 1710 MHz ~ 1755 MHz |
| **Rx Frequency** | **GSM/GPRS/EDGE:**<br>850: 869 MHz ~ 894 MHz<br>1900: 1930 MHz ~ 1990 MHz<br>**WCDMA:**<br>Band V: 869 MHz ~ 894 MHz<br>Band II: 1930 MHz ~ 1990 MHz<br>Band IV: 2110 MHz ~ 2155 MHz |
| **Maximum Output Power to Antenna** | **GSM/GPRS/EDGE:**<br>850: 32.30 dBm<br>1900: 29.33 dBm<br>**WCDMA:**<br>Band V: 22.70 dBm<br>Band II: 22.58 dBm<br>Band IV: 22.69 dBm |
| **Antenna Type** | PIFA Antenna |
| **Antenna Gain** | **<Ant.0>:**<br>Cellular Band: -3.80 dBi<br>PCS Band: -2.80 dBi<br>AWS Band: -3.0 dBi |
| **Type of Modulation** | GSM: GMSK<br>GPRS: GMSK<br>EDGE: GMSK / 8PSK<br>WCDMA : BPSK (Uplink)<br>HSDPA : QPSK (Uplink)<br>HSUPA : QPSK (Uplink)<br>HSPA+ : 16QAM<br>DC-HSDPA : 64QAM |

## 1.5 Modification of EUT

No modifications are made to the EUT during all test items.

## 1.6 Maximum ERP/EIRP, and Emission Designator

| FCC Rule | Frequency Band | Frequency Range (MHz) | Type of Modulation | Maximum ERP/EIRP (W) | Emission Designator |
|---|---|---|---|---|---|
| Part 22 | GSM850 (GSM) | 824.2 ~ 848.8 | GMSK | 0.4315 | 242KGXW |
| Part 22 | GSM850 (EDGE) | 824.2 ~ 848.8 | 8PSK | 0.0955 | 246KG7W |
| Part 22 | WCDMA Band V | 826.4 ~ 846.6 | BPSK | 0.0473 | 4M15F9W |
| Part 24 | GSM1900 (GSM) | 1850.2 ~ 1909.8 | GMSK | 0.4498 | 242KGXW |
| Part 24 | GSM1900 (EDGE) | 1850.2 ~ 1909.8 | 8PSK | 0.1660 | 248KG7W |
| Part 24 | WCDMA Band II | 1852.4 ~ 1907.6 | BPSK | 0.0951 | 4M15F9W |
| Part 27 | WCDMA Band IV | 1712.4 ~ 1752.6 | BPSK | 0.0931 | 4M15F9W |

## 1.7 Specification of Accessory

| Specification of Accessory | | | | |
|---|---|---|---|---|
| **AC Adapter 1(US)** | **Brand Name** | Motorola(Salcomp) | **Model Name** | MC-331 |
| **AC Adapter 1(EU)** | **Brand Name** | Motorola(Salcomp) | **Model Name** | MC-332 |
| **AC Adapter 1(UK)** | **Brand Name** | Motorola(Salcomp) | **Model Name** | MC-333 |
| **AC Adapter 1(AR)** | **Brand Name** | Motorola(Salcomp) | **Model Name** | MC-336 |
| **AC Adapter 1(BR)** | **Brand Name** | Motorola(Salcomp) | **Model Name** | MC-337 |
| **AC Adapter 1(CHILE)** | **Brand Name** | Motorola(Salcomp) | **Model Name** | MC-339 |
| **AC Adapter 2(US)** | **Brand Name** | Motorola(Chenyang) | **Model Name** | MC-331 |
| **AC Adapter 2(EU)** | **Brand Name** | Motorola(Chenyang) | **Model Name** | MC-332 |
| **AC Adapter 2(AR)** | **Brand Name** | Motorola(Chenyang) | **Model Name** | MC-336 |
| **AC Adapter 2(BR)** | **Brand Name** | Motorola(Chenyang) | **Model Name** | MC-337 |
| **AC Adapter 2(BR Local)** | **Brand Name** | Motorola(Cliptech) | **Model Name** | MC-337 |
| **AC Adapter 3(US)** | **Brand Name** | Motorola(AOHAI) | **Model Name** | MC-331 |
| **AC Adapter 3(EU)** | **Brand Name** | Motorola(AOHAI) | **Model Name** | MC-332 |
| **AC Adapter 3(UK)** | **Brand Name** | Motorola(AOHAI) | **Model Name** | MC-333 |
| **Battery 1** | **Brand Name** | Motorola(sunwoda) | **Model Name** | QB50 |
| **Battery 2** | **Brand Name** | Motorola(cosmx) | **Model Name** | QB50 |
| **Bluetooth Earphone** | **Brand Name** | Motorola(SGW) | **Model Name** | Moto earbuds 135 |
| **USB Cable 1** | **Brand Name** | Motorola(Juwei) | **Model Name** | JWUB1580-T03H |
| **USB Cable 2** | **Brand Name** | Motorola(Saibao) | **Model Name** | STN-A121A |
| **USB Cable 3** | **Brand Name** | Motorola(ISHENG) | **Model Name** | SC18D38574 |

## 1.8 Testing Location

Sporton International Inc. (ShenZhen) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

| | | | |
|---|---|---|---|
| **Test Firm** | Sporton International Inc. (ShenZhen) | | |
| **Test Site Location** | 1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055 People's Republic of China<br>TEL: +86-755-86379589<br>FAX: +86-755-86379595 | | |
| **Test Site No.** | **Sporton Site No.** | **FCC Designation No.** | **FCC Test Firm Registration No.** |
| | TH01-SZ | CN1256 | 421272 |

| | | | |
|---|---|---|---|
| **Test Firm** | Sporton International Inc. (ShenZhen) | | |
| **Test Site Location** | 101, 1st Floor, Block B, Building 1, No. 2, Tengfeng 4th Road, Fenghuang Community, Fuyong Street, Baoan District, Shenzhen City Guangdong Province China 518103<br>TEL: +86-755-33202398 | | |
| **Test Site No.** | **Sporton Site No.** | **FCC Designation No.** | **FCC Test Firm Registration No.** |
| | 03CH02-SZ<br>03CH04-SZ | CN1256 | 421272 |

## 1.9 Test Software

| Item | Site | Manufacturer | Name | Version |
|---|---|---|---|---|
| 1. | 03CH02-SZ | AUDIX | E3 | 6.2009-8-24a |
| 2. | 03CH04-SZ | AUDIX | E3 | 6.2009-8-24 |

## 1.10 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR Part 2, 22(H), 24(E), 27(L)
- ANSI C63.26-2015
- FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- FCC KDB 412172 D01 Determining ERP and EIRP v01r01

**Remark:**

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

# 2 Test Configuration of Equipment Under Test

## 2.1 Test Mode

Antenna port conducted and radiated test items were performed according to KDB 971168 D01 Power Meas. License Digital Systems v03r01 with maximum output power.

Radiated measurements were performed with rotating EUT in different three orthogonal test planes to find the maximum emission(Y/Z plane).

Radiated emissions were investigated as following frequency range:

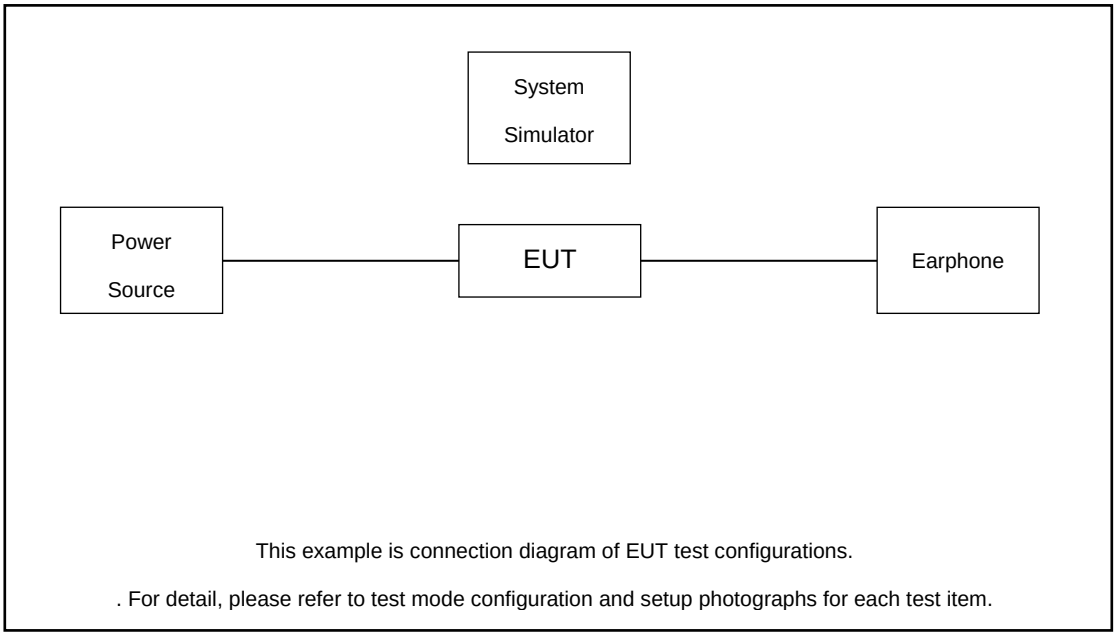
1. 30 MHz to 10th harmonic for GSM850 and WCDMA Band V.
2. 30 MHz to 10th harmonic for WCDMA Band IV.
3. 30 MHz to 10th harmonic for GSM1900 and WCDMA Band II.

All modes and data rates and positions were investigated.

Test modes are chosen to be reported as the worst case configuration below:

| Test Modes | | |
|---|---|---|
| **Band** | **Radiated TCs** | **Conducted TCs** |
| **GSM 850** | ■ GSM Link<br>■ EDGE 1 Tx slots Link | ■ GSM Link<br>■ EDGE 1 Tx slots Link |
| **GSM 1900** | ■ GSM Link<br>■ EDGE 1 Tx slots Link | ■ GSM Link<br>■ EDGE 1 Tx slots Link |
| **WCDMA Band V** | ■ RMC 12.2Kbps Link | ■ RMC 12.2Kbps Link |
| **WCDMA Band II** | ■ RMC 12.2Kbps Link | ■ RMC 12.2Kbps Link |
| **WCDMA Band IV** | ■ RMC 12.2Kbps Link | ■ RMC 12.2Kbps Link |

## 2.2 Connection Diagram of Test System




The EUT has been configuration operated in a manner tended to maximize its emission characteristics in a typical application.

## 2.3 Support Unit used in test configuration

| Item | Equipment | Trade Name | Model No. | FCC ID | Data Cable | Power Cord |
|---|---|---|---|---|---|---|
| 1. | System Simulator | R&S | CMU 200 | N/A | N/A | Unshielded, 1.8 m |
| 2. | Base Station | Anritsu | MT8820C | Fcc DoC | N/A | Shielded, 1.5m |
| 3. | Earphone | Apple | MC690ZP/A | N/A | Shielded, 1.0m | N/A |

## 2.4 Measurement Results Explanation Example

**For all conducted test items:**

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between RF conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level will be exactly the RF output level.

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

*Offset = RF cable loss + attenuator factor.*

The following shows an offset computation example with RF cable loss 4.0 dB and a 10dB attenuator.

Example :

*Offset(dB) = RF cable loss(dB) + attenuator factor(dB).*

= 4.0 + 10 = 14.0 (dB)

## 2.5 Frequency List of Low/Middle/High Channels

| Frequency List | | | | |
|---|---|---|---|---|
| **Band** | **Channel/Frequency(MHz)** | **Lowest** | **Middle** | **Highest** |
| GSM850 | Channel | 128 | 189 | 251 |
| | Frequency | 824.2 | 836.4 | 848.8 |
| WCDMA Band V | Channel | 4132 | 4182 | 4233 |
| | Frequency | 826.4 | 836.4 | 846.6 |
| GSM1900 | Channel | 512 | 661 | 810 |
| | Frequency | 1850.2 | 1880.0 | 1909.8 |
| WCDMA Band II | Channel | 9262 | 9400 | 9538 |
| | Frequency | 1852.4 | 1880.0 | 1907.6 |
| WCDMA Band IV | Channel | 1312 | 1413 | 1513 |
| | Frequency | 1712.4 | 1732.6 | 1752.6 |

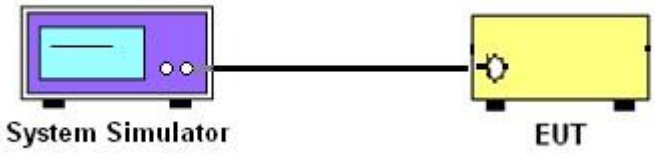
# 3 Conducted Test Result

## 3.1 Measuring Instruments

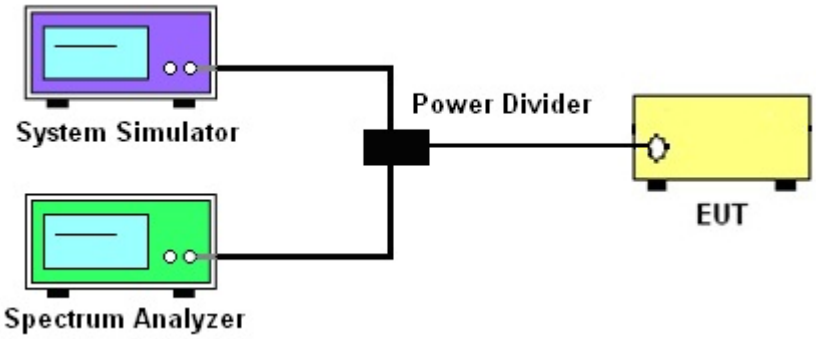
See list of measuring instruments of this test report.

## 3.2 Test Setup

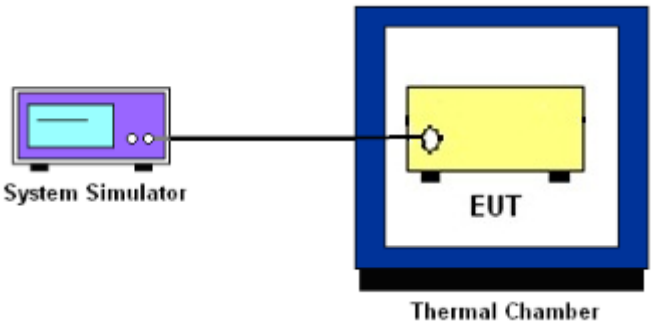
### 3.2.1 Conducted Output Power




### 3.2.2 Peak-to-Average Ratio, Occupied Bandwidth, Conducted Band-Edge and Conducted Spurious Emission




### 3.2.3 Frequency Stability




## 3.3 Test Result of Conducted Test

Please refer to Appendix A.

## 3.4 Conducted Output Power and ERP/EIRP

### 3.4.1 Description of the Conducted Output Power and ERP/EIRP

A system simulator was used to establish communication with the EUT. Its parameters were set to enforce EUT transmitting at the maximum power. The measured power in the radio frequency on the transmitter output terminals shall be reported.

The ERP of mobile transmitters must not exceed 7 Watts for GSM850 and WCDMA Band V.

The EIRP of mobile transmitters must not exceed 2 Watts for GSM1900 and WCDMA Band II.

The EIRP of mobile transmitters must not exceed 1 Watts for WCDMA Band IV.

According to KDB 412172 D01 Power Approach,

EIRP = $P_T + G_T – L_C$, ERP = EIRP -2.15, where

$P_T$ = transmitter output power in dBm

$G_T$ = gain of the transmitting antenna in dBi

$L_C$ = signal attenuation in the connecting cable between the transmitter and antenna in dB

### 3.4.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.2
2. The transmitter output port was connected to the system simulator.
3. Set EUT at maximum power through the system simulator.
4. Select lowest, middle, and highest channels for each band and different modulation.
5. Measure and record the power level from the system simulator.

## 3.5 Peak-to-Average Ratio

### 3.5.1 Description of the PAR Measurement

The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

### 3.5.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.2.3.4 (CCDF).
2. The EUT was connected to spectrum and system simulator via a power divider.
3. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
4. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.
5. Record the deviation as Peak to Average Ratio.

## 3.6 99% Occupied Bandwidth and 26dB Bandwidth Measurement

### 3.6.1 Description of 99% Occupied Bandwidth and 26dB Bandwidth Measurement

The occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean transmitted power.

The 26 dB emission bandwidth is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated 26 dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth equal to approximately 1.0% of the emission bandwidth.

### 3.6.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.4
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be between two and five times the anticipated OBW.
4. The nominal resolution bandwidth (RBW) shall be in the range of 1 to 5 % of the anticipated OBW, and the VBW shall be at least 3 times the RBW.
5. Set the detection mode to peak, and the trace mode to max hold.
6. Determine the reference value: Set the EUT to transmit a modulated signal. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace. (this is the reference value)
7. Determine the “-26 dB down amplitude” as equal to (Reference Value – X).
8. Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display such that each marker is at or slightly below the “–X dB down amplitude” determined in step 6. If a marker is below this “-X dB down amplitude” value it shall be placed as close as possible to this value. The OBW is the positive frequency difference between the two markers.
9. Use the 99 % power bandwidth function of the spectrum analyzer and report the measured bandwidth.

# 3.7 Conducted Band Edge

## 3.7.1 Description of Conducted Band Edge Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.

## 3.7.2 Test Procedures

1. The testing follows ANSI C63.26 section 5.7
2. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
3. The RF output of EUT was connected to the spectrum analyzer by an RF cable and attenuator. The path loss was compensated to the results for each measurement.
4. The band edges of low and high channels for the highest RF powers were measured.
5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
6. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts)

## 3.8 Conducted Spurious Emission

### 3.8.1 Description of Conducted Spurious Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.

It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its $10^{th}$ harmonic.

### 3.8.2 Test Procedures

1. The testing follows ANSI C63.26 section 5.7
2. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
3. The RF output of EUT was connected to the spectrum analyzer by an RF cable and attenuator. The path loss was compensated to the results for each measurement.
4. The middle channel for the highest RF power within the transmitting frequency was measured.
5. The conducted spurious emission for the whole frequency range was taken.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
7. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts)

## 3.9 Frequency Stability

### 3.9.1 Description of Frequency Stability Measurement

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5ppm) of the center frequency.

### 3.9.2 Test Procedures for Temperature Variation

1. The testing follows ANSI C63.26 section 5.6.4
2. The EUT was set up in the thermal chamber and connected with the system simulator.
3. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
4. With power OFF, the temperature was raised in 10°C step up to 50°C. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

### 3.9.3 Test Procedures for Voltage Variation

1. The testing follows ANSI C63.26 section 5.6.5
2. The EUT was placed in a temperature chamber at 20±5°C and connected with the system simulator.
3. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value for other than hand carried battery equipment.
4. For hand carried, battery powered equipment, reduce the primary ac or dc supply voltage to the battery operating end point, which shall be specified by the manufacturer.
5. The variation in frequency was measured for the worst case.

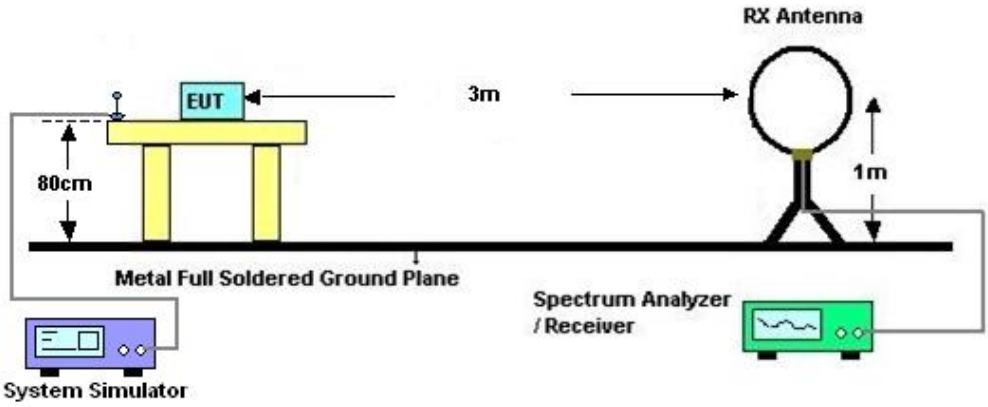
# 4 Radiated Test Items

## 4.1 Measuring Instruments

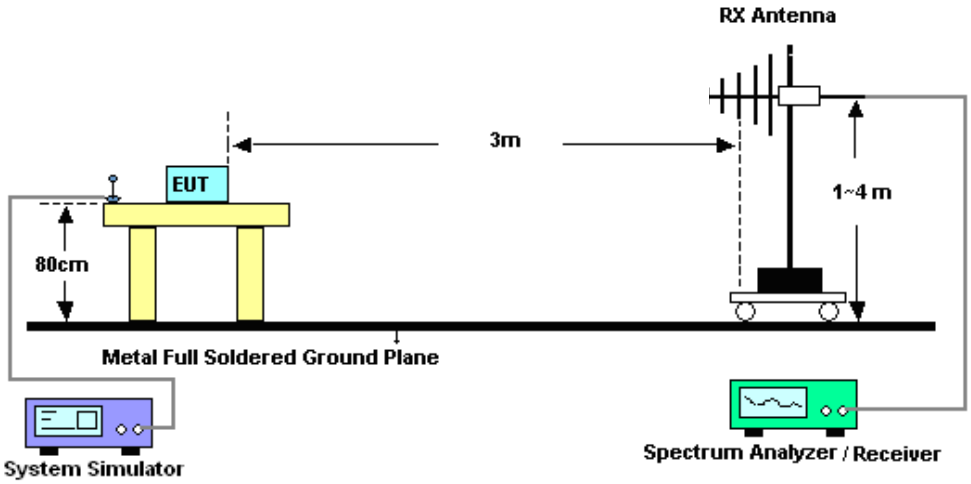
See list of measuring instruments of this test report.

## 4.2 Test Setup

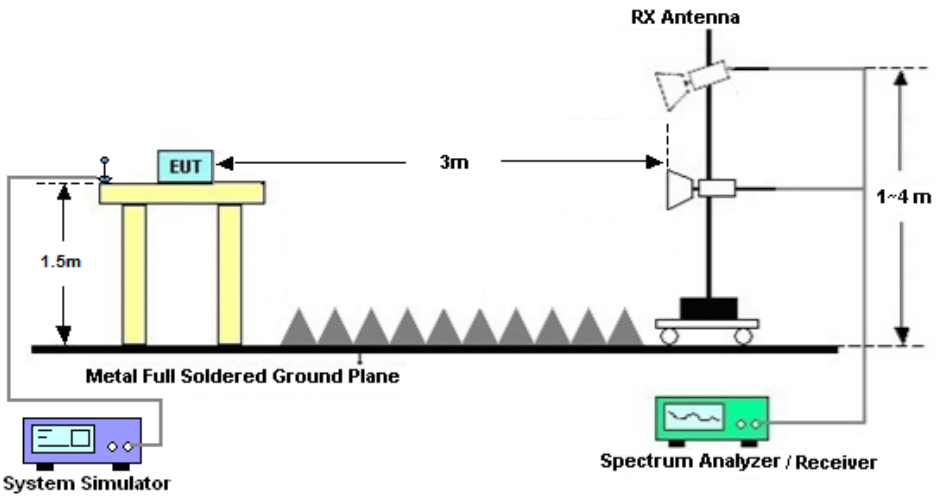
### 4.2.1 For radiated test below 30MHz




### 4.2.2 For radiated test from 30MHz to 1GHz



### 4.2.3 For radiated test above 1GHz




## 4.3 Test Result of Radiated Test

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

Please refer to Appendix B.

## 4.4 Field Strength of Spurious Radiation Measurement

### 4.4.1 Description of Field Strength of Spurious Radiated Measurement

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

### 4.4.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.5
2. The EUT was placed on a rotatable wooden table 0.8 meters for frequency below 1GHz and 1.5 meter for frequency above 1GHz above the ground.
3. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
4. The table was rotated 360 degrees to determine the position of the highest spurious emission.
5. The height of the receiving antenna is varied between one meter and four meters to search for the maximum spurious emission for both horizontal and vertical polarizations.
6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking record of maximum spurious emission.
7. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
8. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
9. Taking the record of output power at antenna port.
10. Repeat step 7 to step 8 for another polarization.
11. EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
12. ERP (dBm) = EIRP - 2.15
13. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
14. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts)

# 5 List of Measuring Equipment

| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Test Date | Due Date | Remark |
|---|---|---|---|---|---|---|---|---|
| Spectrum Analyzer | R&S | FSV40 | 101078 | 10Hz~40GHz | Apr. 06, 2023 | Jun. 20, 2023~ Jun. 27, 2023 | Apr. 05, 2024 | Conducted (TH01-SZ) |
| Power Divider | TOJOIN | PS-2SM-04 265 | 60.06.020.007 7 | 0.4GHz~26.5GHz | Dec. 25, 2022 | Jun. 20, 2023~ Jun. 27, 2023 | Dec. 24, 2023 | Conducted (TH01-SZ) |
| Thermal Chamber | Ten Billion Hongzhangroup | LP-150U | H2014081803 | -40~+150°C | Jul. 07, 2022 | Jun. 20, 2023~ Jun. 27, 2023 | Jul. 06, 2023 | Conducted (TH01-SZ) |
| EXA Spectrum Analyzer | KEYSIGHT | N9010A | MY55150213 | 10Hz~44GHz | Jul. 07, 2022 | Jul. 04, 2023~ Jul. 06, 2023 | Jul. 06, 2023 | Radiation (03CH02-SZ) |
| Bilog Antenna | TeseQ | CBL6112D | | 30MHz-2GHz | Oct. 19, 2022 | Jul. 04, 2023~ Jul. 06, 2023 | Oct. 18, 2023 | Radiation (03CH02-SZ) |
| Double Ridge Horn Antenna | ETS-Lindgren | 3117 | 00119436 | 1GHz~18GHz | Jul. 07, 2022 | Jul. 04, 2023~ Jul. 06, 2023 | Jul. 06, 2023 | Radiation (03CH02-SZ) |
| HF Amplifier | MITEQ | TTA1840-35 -HG | 1871923 | 18GHz~40GHz | Jul. 07, 2022 | Jul. 04, 2023~ Jul. 06, 2023 | Jul. 06, 2023 | Radiation (03CH02-SZ) |
| SHF-EHF Horn | com-power | AH-840 | 101071 | 18Ghz-40GHz | Apr. 08, 2023 | Jul. 04, 2023~ Jul. 06, 2023 | Apr. 07, 2024 | Radiation (03CH02-SZ) |
| LF Amplifier | Burgeon | BPA-530 | 102211 | 0.01~3000Mhz | Oct. 19, 2022 | Jul. 04, 2023~ Jul. 06, 2023 | Oct. 18, 2023 | Radiation (03CH02-SZ) |
| HF Amplifier | KEYSIGHT | 83017A | MY53270105 | 0.5GHz~26.5Ghz | Oct. 19, 2022 | Jul. 04, 2023~ Jul. 06, 2023 | Oct. 18, 2023 | Radiation (03CH02-SZ) |
| AC Power Source | Chroma | 61601 | 61601000304 3 | N/A | Nov. 10, 2022 | Jul. 04, 2023~ Jul. 06, 2023 | Nov. 10, 2023 | Radiation (03CH02-SZ) |
| Turn Table | Chaintek | T-200 | N/A | 0~360 degree | NCR | Jul. 04, 2023~ Jul. 06, 2023 | NCR | Radiation (03CH02-SZ) |
| Antenna Mast | Chaintek | MBS-400 | N/A | 1 m~4 m | NCR | Jul. 04, 2023~ Jul. 06, 2023 | NCR | Radiation (03CH02-SZ) |
| EMI Test Receiver | R&S | ESR7 | 101404 | 9kHz~7GHz | Oct. 19, 2022 | Jul. 04, 2023 | Oct. 18, 2023 | Radiation (03CH04-SZ) |
| EXA Spectrum Analyzer | KEYSIGHT | N9010A | MY55150213 | 10Hz~44GHz | Jul. 07, 2022 | Jul. 04, 2023 | Jul. 06, 2023 | Radiation (03CH04-SZ) |
| Loop Antenna | R&S | HFH2-Z2 | 100354 | 9kHz~30MHz | Jun. 28, 2022 | Jul. 04, 2023 | Jun. 27, 2024 | Radiation (03CH04-SZ) |
| Bilog Antenna | TeseQ | CBL6111D | 41909 | 30MHz~1GHz | May 14, 2023 | Jul. 04, 2023 | May 13, 2024 | Radiation (03CH04-SZ) |
| Double Ridge Horn Antenna | SCHWARZBECK | BBHA9120D | 9120D-1474 | 1GHz~18GHz | Jul. 07, 2022 | Jul. 04, 2023 | Jul. 06, 2023 | Radiation (03CH04-SZ) |
| Horn Antenna | SCHWARZBECK | BBHA9170 | 9170#679 | 15GHz~40GHz | Jul. 07, 2022 | Jul. 04, 2023 | Jul. 06, 2023 | Radiation (03CH04-SZ) |
| Amplifier | Burgeon | BPA-530 | 102211 | 0.01Hz ~3000MHz | Oct. 19, 2022 | Jul. 04, 2023 | Oct. 18, 2023 | Radiation (03CH04-SZ) |
| HF Amplifier | MITEQ | AMF-7D-00 101800-30-1 0P-R | 1943528 | 1GHz~18GHz | Oct. 19, 2022 | Jul. 04, 2023 | Oct. 18, 2023 | Radiation (03CH04-SZ) |
| HF Amplifier | MITEQ | TTA1840-35 -HG | 1871923 | 18GHz~40GHz | Jul. 06, 2022 | Jul. 04, 2023 | Jul. 05, 2023 | Radiation (03CH04-SZ) |
| Amplifier | Agilent Technologies | 83017A | MY57280136 | 500MHz~26.5GHz | Sep. 30, 2022 | Jul. 04, 2023 | Sep. 29, 2023 | Radiation (03CH04-SZ) |
| AC Power Source | APC | AFV-S-600B | F119050019 | N/A | Nov. 10, 2022 | Jul. 04, 2023 | Nov. 09, 2023 | Radiation (03CH04-SZ) |
| Turn Table | EM | EM1000 | N/A | 0~360 degree | NCR | Jul. 04, 2023 | NCR | Radiation (03CH04-SZ) |
| Antenna Mast | EM | EM1000 | N/A | 1 m~4 m | NCR | Jul. 04, 2023 | NCR | Radiation (03CH04-SZ) |

NCR: No Calibration Required

# 6 Measurement Uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.26-2015. All the measurement uncertainty value were shown with a coverage K=2 to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

**Uncertainty of Conducted Measurement**

| Test Item | Uncertainty |
|---|---|
| Conducted Power | ±1.34 dB |
| Conducted Emissions | ±1.34 dB |
| Occupied Channel Bandwidth | ±0.13 % |

**Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz) for 03CH02-SZ**

| | |
|---|---|
| Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y)) | 2.47dB |

**Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz) for 03CH02-SZ**

| | |
|---|---|
| Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y)) | 3.31dB |

**Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz) for 03CH02-SZ**

| | |
|---|---|
| Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y)) | 3.72dB |

**Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz) for 03CH04-SZ**

| | |
|---|---|
| Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y)) | 2.8dB |

**Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz) for 03CH04-SZ**

| | |
|---|---|
| Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y)) | 3.1dB |

**Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz) for 03CH04-SZ**

| | |
|---|---|
| Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y)) | 3.9dB |

**---------- THE END ----------**

# Appendix A. Test Results of Conducted Test

| Test Engineer : | Liu Qiu Qiu | Temperature : | 24~26℃ |
|---|---|---|---|
| | | Relative Humidity : | 50~53% |

## Conducted Output Power(Average power)

| Conducted Power (*Unit: dBm) | | | | | | |
|---|---|---|---|---|---|---|
| Band | GSM850 | | | GSM1900 | | |
| Channel | 128 | 189 | 251 | 512 | 661 | 810 |
| Frequency | 824.2 | 836.4 | 848.8 | 1850.2 | 1880.0 | 1909.8 |
| GSM | 32.28 | 32.30 | 32.25 | 29.17 | 29.33 | 29.20 |
| GPRS 1 Tx slots | 32.20 | 32.22 | 32.18 | 29.10 | 29.30 | 29.15 |
| GPRS 2 Tx slots | 30.15 | 30.22 | 30.21 | 26.96 | 27.10 | 27.02 |
| GPRS 3 Tx slots | 27.58 | 27.70 | 27.62 | 24.92 | 25.00 | 24.88 |
| GPRS 4 Tx slots | 25.51 | 25.68 | 25.65 | 22.38 | 22.55 | 22.45 |
| EGPRS 1 Tx slots | 25.67 | 25.75 | 25.70 | 24.87 | 25.00 | 24.92 |
| EGPRS 2 Tx slots | 23.41 | 23.50 | 23.44 | 22.90 | 22.98 | 22.88 |
| EGPRS 3 Tx slots | 21.37 | 21.43 | 21.38 | 20.67 | 20.70 | 20.64 |
| EGPRS 4 Tx slots | 18.60 | 18.69 | 18.57 | 18.58 | 18.66 | 18.62 |

| Conducted Power (*Unit: dBm) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Band | WCDMA Band V | | | WCDMA Band II | | | WCDMA Band IV | | |
| Channel | 4132 | 4182 | 4233 | 9262 | 9400 | 9538 | 1312 | 1413 | 1513 |
| Frequency | 826.4 | 836.4 | 846.6 | 1852.4 | 1880 | 1907.6 | 1712.4 | 1732.6 | 1752.6 |
| AMR 12.2K | 22.62 | 22.66 | 22.54 | 22.39 | 22.45 | 22.35 | 22.51 | 22.62 | 22.58 |
| RMC 12.2K | 22.69 | 22.70 | 22.67 | 22.54 | 22.58 | 22.49 | 22.64 | 22.69 | 22.60 |
| HSDPA Subtest-1 | 21.70 | 21.76 | 21.66 | 21.53 | 21.52 | 21.56 | 21.54 | 21.69 | 21.69 |
| HSDPA Subtest-2 | 21.72 | 21.75 | 21.67 | 21.49 | 21.55 | 21.58 | 21.56 | 21.75 | 21.72 |
| HSDPA Subtest-3 | 21.22 | 21.25 | 21.15 | 21.01 | 21.00 | 21.07 | 21.04 | 21.22 | 20.88 |
| HSDPA Subtest-4 | 21.24 | 21.27 | 21.13 | 20.98 | 21.05 | 21.12 | 21.04 | 21.20 | 21.27 |
| HSUPA Subtest-1 | 21.72 | 21.76 | 21.67 | 21.53 | 21.59 | 21.68 | 21.58 | 21.75 | 21.75 |
| HSUPA Subtest-2 | 19.69 | 19.73 | 19.66 | 19.52 | 19.58 | 19.70 | 19.59 | 19.77 | 19.76 |
| HSUPA Subtest-3 | 20.75 | 20.71 | 20.67 | 20.51 | 20.58 | 20.70 | 20.57 | 20.77 | 20.77 |
| HSUPA Subtest-4 | 19.72 | 19.74 | 19.71 | 19.52 | 19.56 | 19.67 | 19.63 | 19.77 | 19.79 |
| HSUPA Subtest-5 | 21.70 | 21.80 | 21.70 | 21.50 | 21.60 | 21.70 | 21.60 | 21.80 | 21.80 |
| HSPA+ (16QAM) Subtest-1 | 19.77 | 19.80 | 19.69 | 20.16 | 20.25 | 20.22 | 20.05 | 20.22 | 20.16 |

# ERP/EIRP

| GSM850 ($G_T$ - $L_C$= -3.80 dB) | | | |
|---|---|---|---|
| Channel | 128 | 189 | 251 |
| | (Low) | (Mid) | (High) |
| Frequency (MHz) | 824.2 | 836.4 | 848.8 |
| Conducted Power (dBm) | 32.28 | 32.30 | 32.25 |
| Conducted Power (Watts) | 1.6904 | 1.6982 | 1.6788 |
| ERP(dBm) | 26.33 | 26.35 | 26.30 |
| ERP(Watts) | 0.4295 | 0.4315 | 0.4266 |

| EDGE850 ($G_T$ - $L_C$= -3.80 dB) | | | |
|---|---|---|---|
| Channel | 128 | 189 | 251 |
| | (Low) | (Mid) | (High) |
| Frequency (MHz) | 824.2 | 836.4 | 848.8 |
| Conducted Power (dBm) | 25.67 | 25.75 | 25.70 |
| Conducted Power (Watts) | 0.3690 | 0.3758 | 0.3715 |
| ERP(dBm) | 19.72 | 19.80 | 19.75 |
| ERP(Watts) | 0.0938 | 0.0955 | 0.0944 |

| GSM1900 ($G_T$ - $L_C$= -2.80 dB) | | | |
|---|---|---|---|
| Channel | 512 | 661 | 810 |
| | (Low) | (Mid) | (High) |
| Frequency (MHz) | 1850.2 | 1880 | 1909.8 |
| Conducted Power (dBm) | 29.17 | 29.33 | 29.20 |
| Conducted Power (Watts) | 0.8260 | 0.8570 | 0.8318 |
| EIRP(dBm) | 26.37 | 26.53 | 26.40 |
| EIRP(Watts) | 0.4335 | 0.4498 | 0.4365 |

| EDGE1900 ($G_T$ - $L_C$= -2.80 dB) | | | |
|---|---|---|---|
| Channel | 512 | 661 | 810 |
| | (Low) | (Mid) | (High) |
| Frequency (MHz) | 1850.2 | 1880 | 1909.8 |
| Conducted Power (dBm) | 24.87 | 25.00 | 24.92 |
| Conducted Power (Watts) | 0.3069 | 0.3162 | 0.3105 |
| EIRP(dBm) | 22.07 | 22.20 | 22.12 |
| EIRP(Watts) | 0.1611 | 0.1660 | 0.1629 |

| WCDMA Band V ($G_T$ - $L_C$ = -3.80 dB) | | | |
|---|---|---|---|
| Channel | 4132 | 4182 | 4233 |
| | (Low) | (Mid) | (High) |
| Frequency (MHz) | 826.4 | 836.4 | 846.6 |
| Conducted Power (dBm) | 22.69 | 22.70 | 22.67 |
| Conducted Power (Watts) | 0.1858 | 0.1862 | 0.1849 |
| ERP(dBm) | 16.74 | 16.75 | 16.72 |
| ERP(Watts) | 0.0472 | 0.0473 | 0.0470 |

| WCDMA Band II ($G_T$ - $L_C$ = -2.80 dB) | | | |
|---|---|---|---|
| Channel | 9262 | 9400 | 9538 |
| | (Low) | (Mid) | (High) |
| Frequency (MHz) | 1852.4 | 1880 | 1907.6 |
| Conducted Power (dBm) | 22.54 | 22.58 | 22.49 |
| Conducted Power (Watts) | 0.1795 | 0.1811 | 0.1774 |
| EIRP(dBm) | 19.74 | 19.78 | 19.69 |
| EIRP(Watts) | 0.0942 | 0.0951 | 0.0931 |

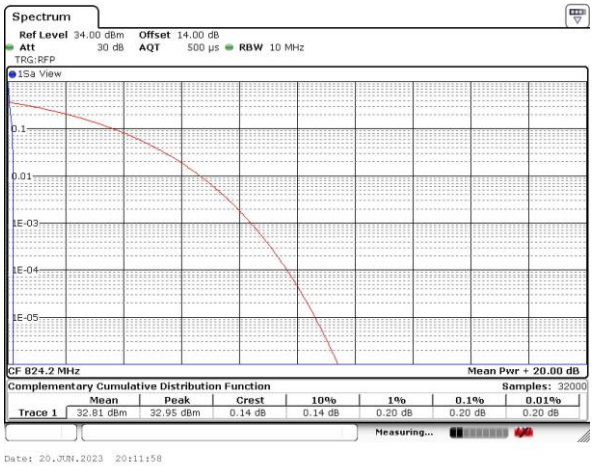
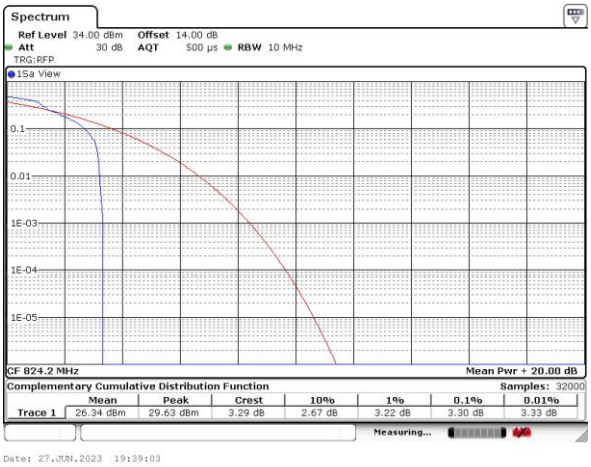
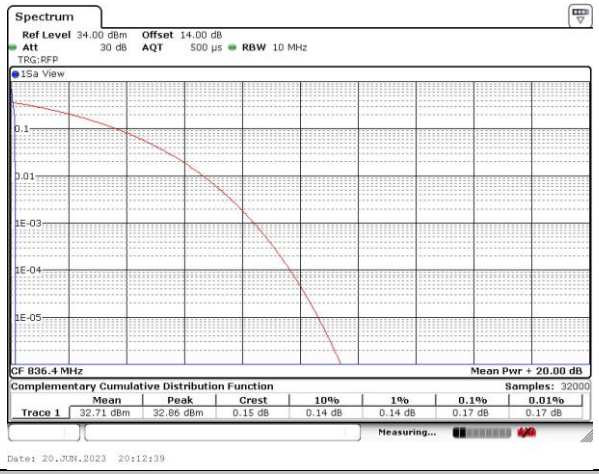
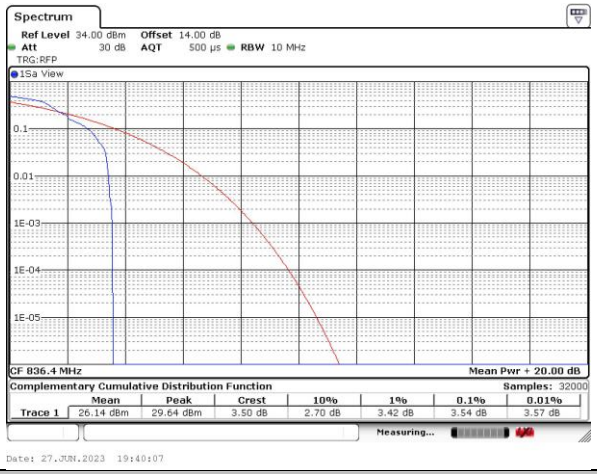
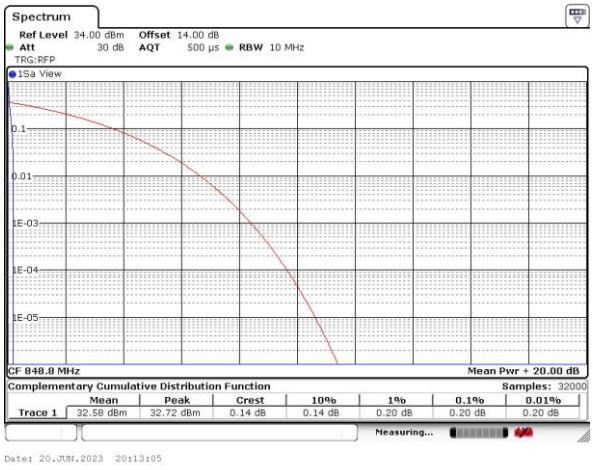
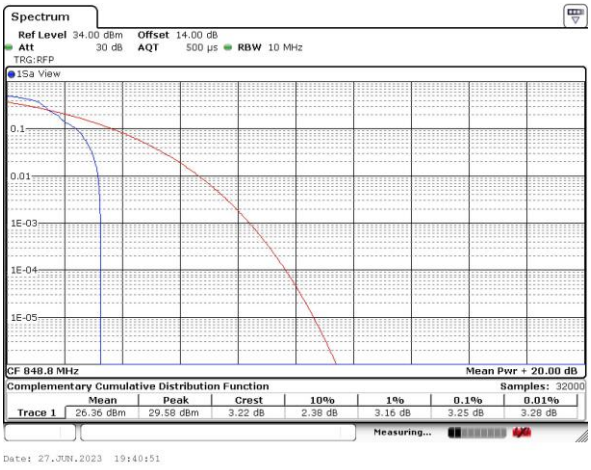
| WCDMA Band IV ($G_T$ - $L_C$ = -3.0 dB) | | | |
|---|---|---|---|
| Channel | 1312 | 1413 | 1513 |
| | (Low) | (Mid) | (High) |
| Frequency (MHz) | 1712.4 | 1732.6 | 1752.6 |
| Conducted Power (dBm) | 22.64 | 22.69 | 22.60 |
| Conducted Power (Watts) | 0.1837 | 0.1858 | 0.1820 |
| EIRP(dBm) | 19.64 | 19.69 | 19.60 |
| EIRP(Watts) | 0.0920 | 0.0931 | 0.0912 |

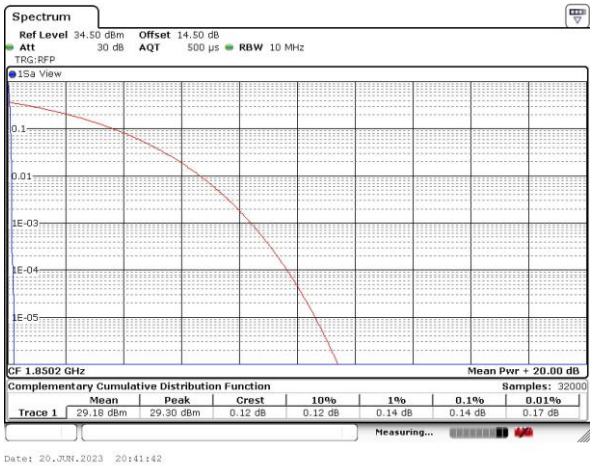
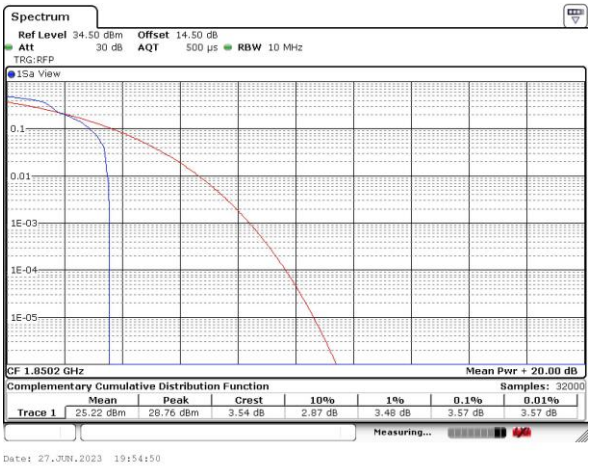
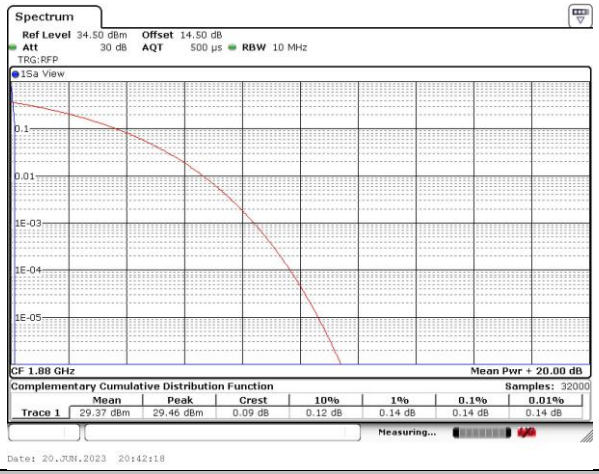
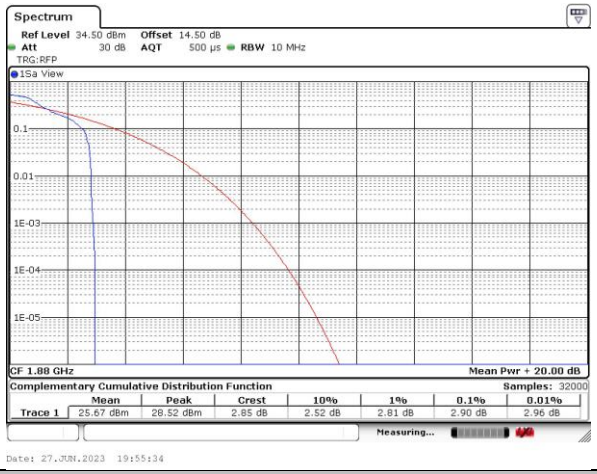
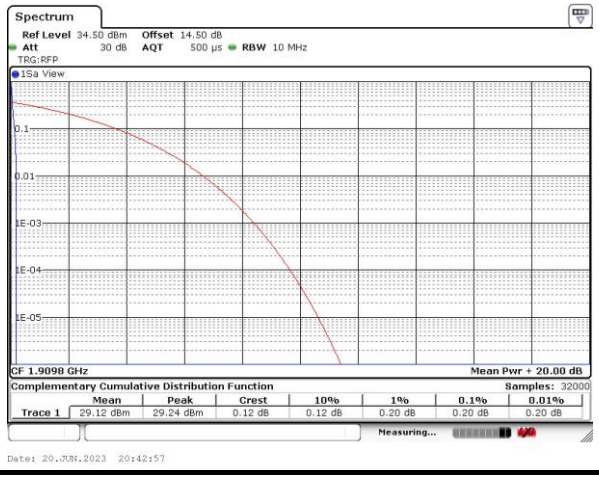
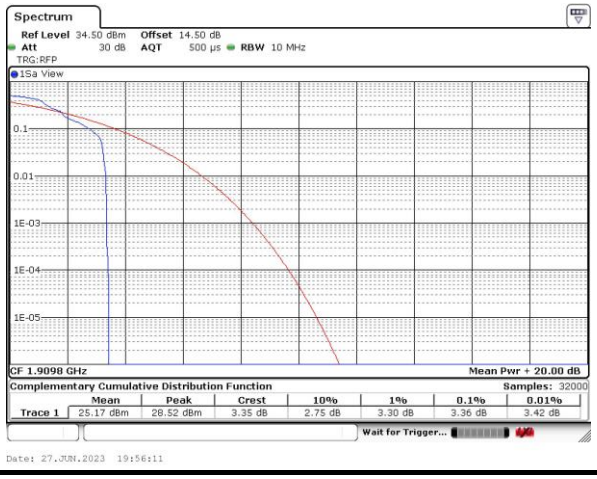
# GSM

## Peak-to-Average Ratio

| Mode | GSM850(dB) | | Limit: 13dB |
|---|---|---|---|
| Mod. | GSM | EDGE class 8 | Result |
| Lowest CH | 0.20 | 3.30 | PASS |
| Middle CH | 0.17 | 3.54 | |
| Highest CH | 0.20 | 3.25 | |

| Mode | GSM1900(dB) | | Limit: 13dB |
|---|---|---|---|
| Mod. | GSM | EDGE class 8 | Result |
| Lowest CH | 0.14 | 3.57 | PASS |
| Middle CH | 0.14 | 2.90 | |
| Highest CH | 0.20 | 3.36 | |

| GSM850 (GSM) | GSM850 (EDGE class 8) |
|---|---|
| **Lowest Channel** | **Lowest Channel** |
|  |  |
| **Middle Channel** | **Middle Channel** |
|  |  |
| **Highest Channel** | **Highest Channel** |
|  |  |

| GSM1900 (GSM) | GSM1900 (EDGE class 8) |
|---|---|
| **Lowest Channel** | **Lowest Channel** |
|  |  |
| **Middle Channel** | **Middle Channel** |
|  |  |
| **Highest Channel** | **Highest Channel** |
|  |  |

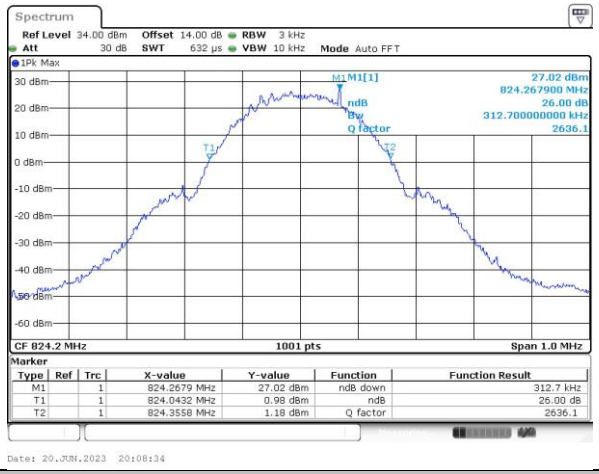
# 26dB Bandwidth

| Mode | GSM850(MHz) | |
|---|---|---|
| Mod. | GSM | EDGE class 8 |
| Lowest CH | 0.31 | 0.31 |
| Middle CH | 0.31 | 0.31 |
| Highest CH | 0.31 | 0.31 |

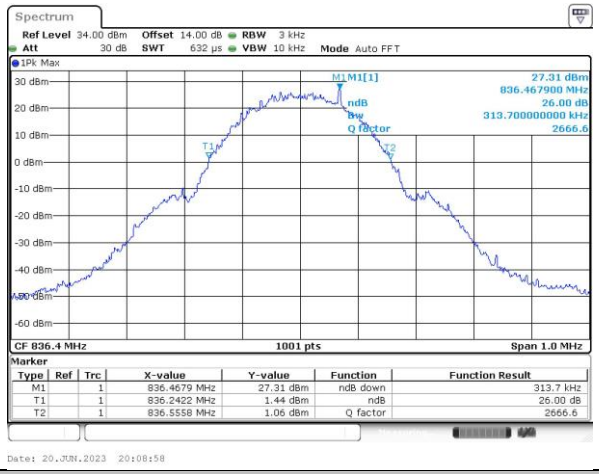
| Mode | GSM1900(MHz) | |
|---|---|---|
| Mod. | GSM | EDGE class 8 |
| Lowest CH | 0.31 | 0.31 |
| Middle CH | 0.32 | 0.31 |
| Highest CH | 0.31 | 0.31 |

## GSM850 (GSM)

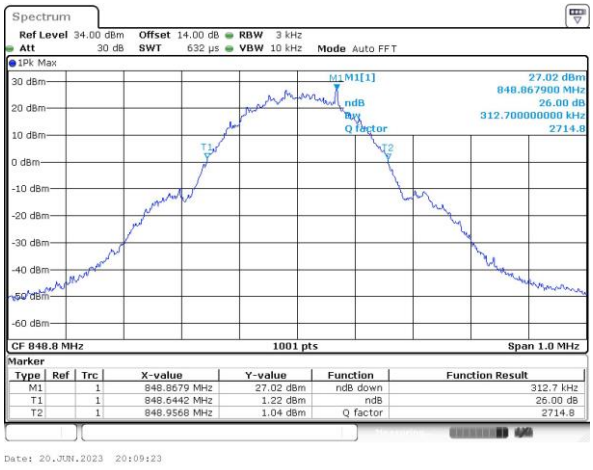
### Lowest Channel




### Middle Channel

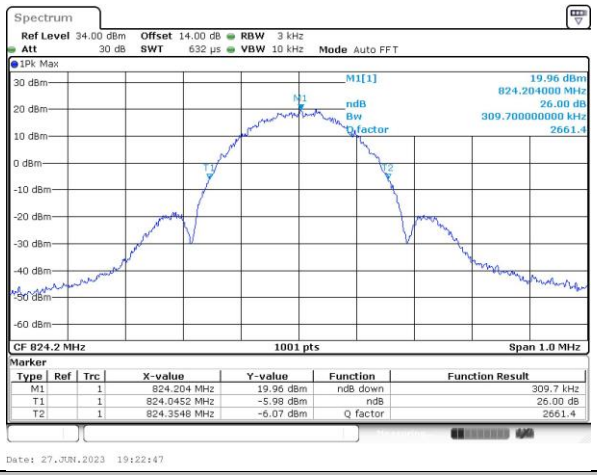



### Highest Channel

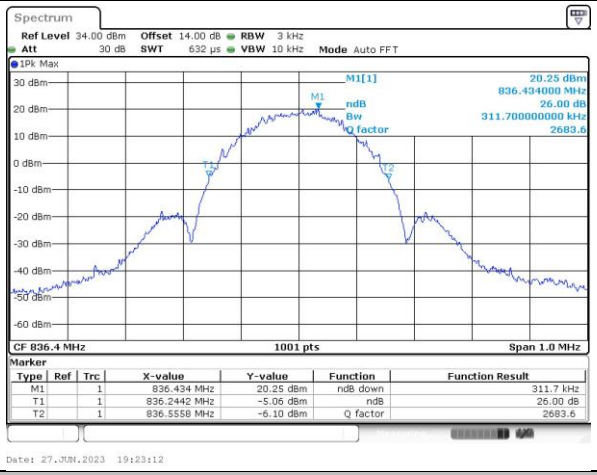



## GSM850 (EDGE class 8)

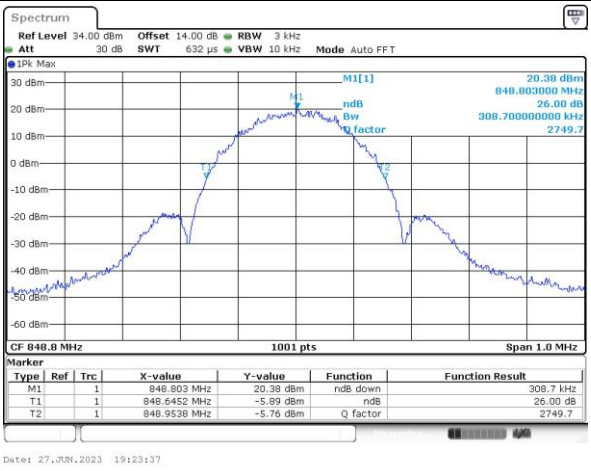
### Lowest Channel




### Middle Channel

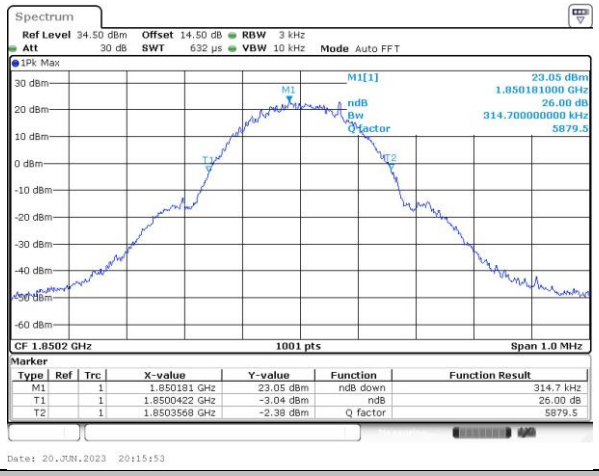



### Highest Channel

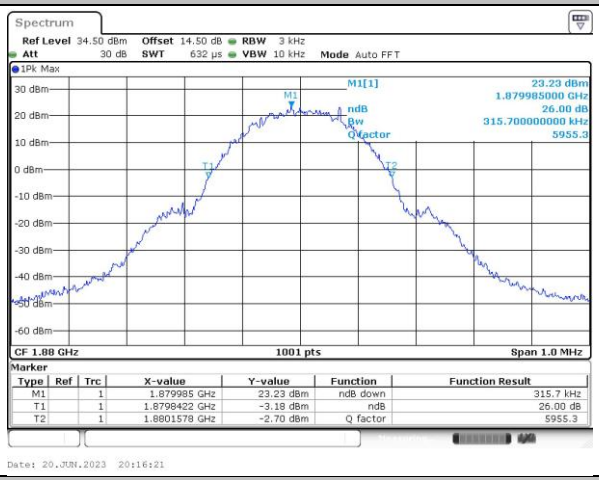


## GSM1900 (GSM)

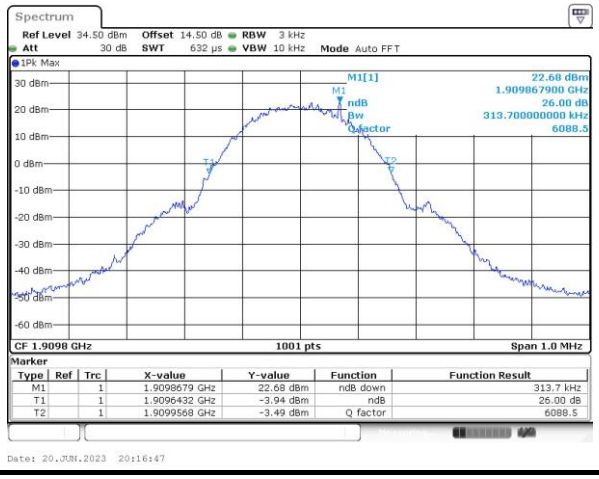
### Lowest Channel




### Middle Channel

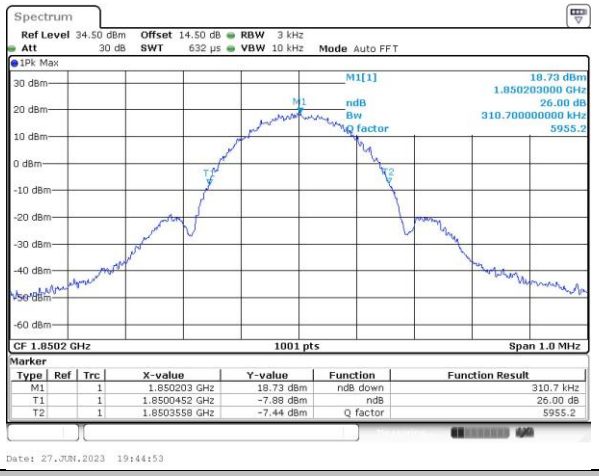



### Highest Channel

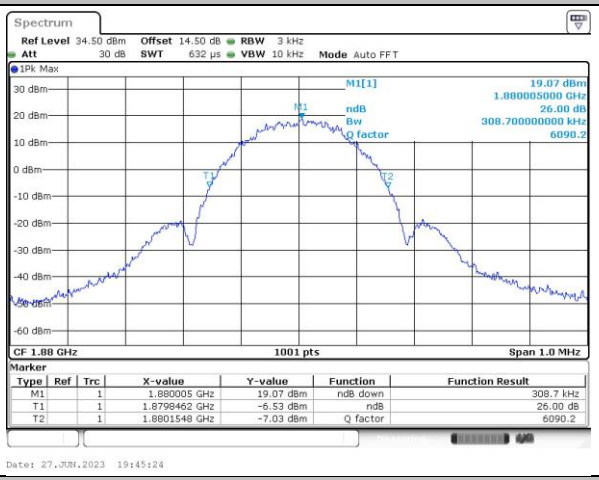



## GSM1900 (EDGE class 8)

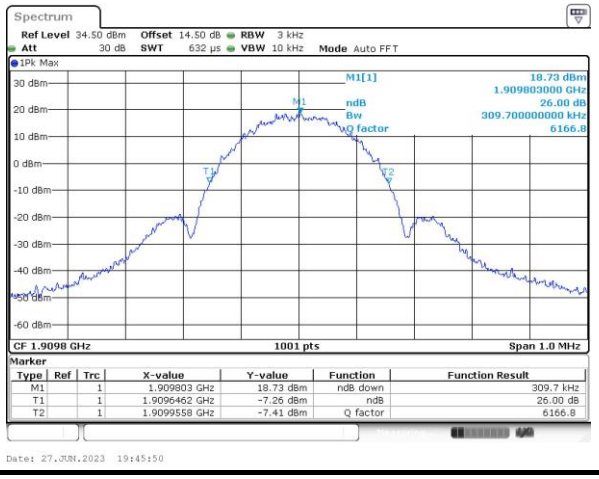
### Lowest Channel




### Middle Channel



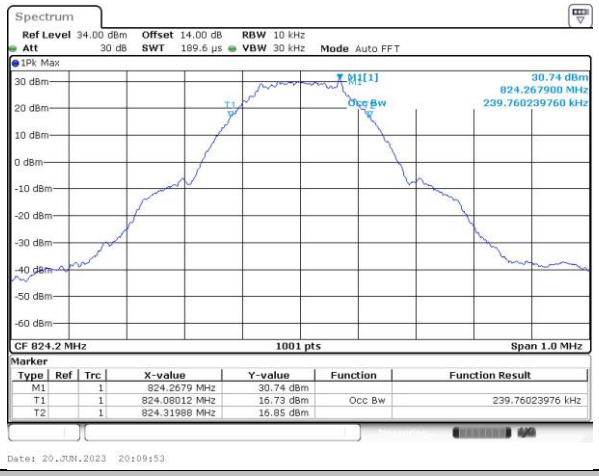
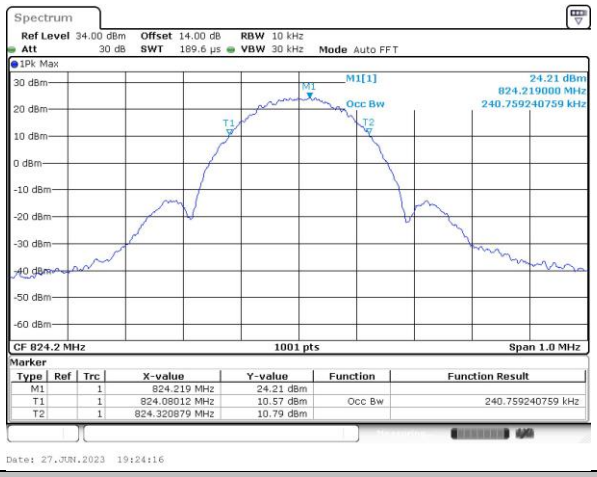
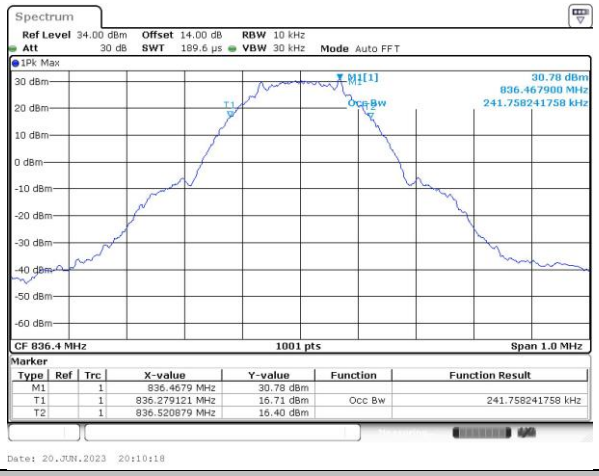
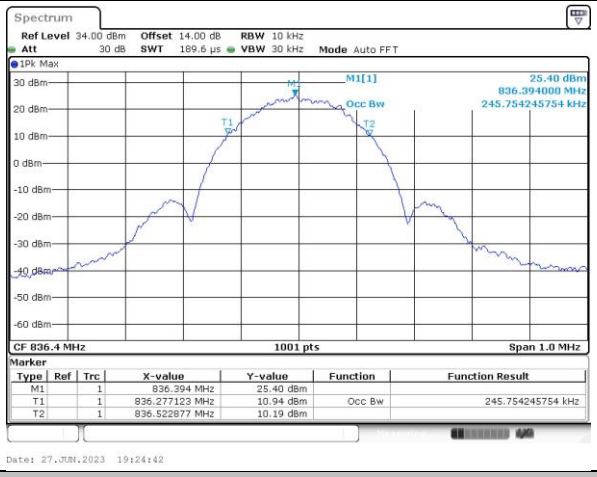
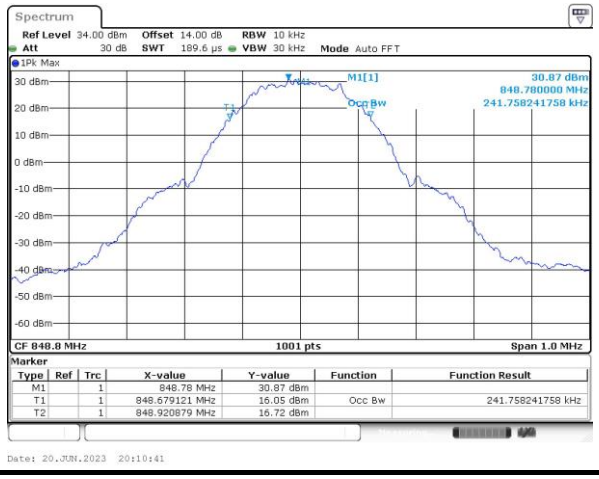
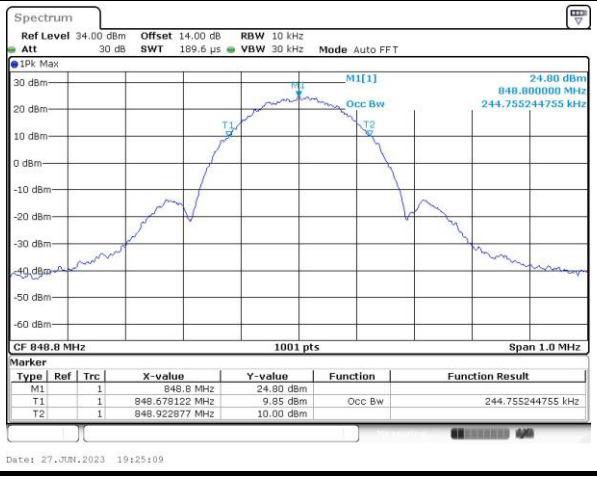

### Highest Channel

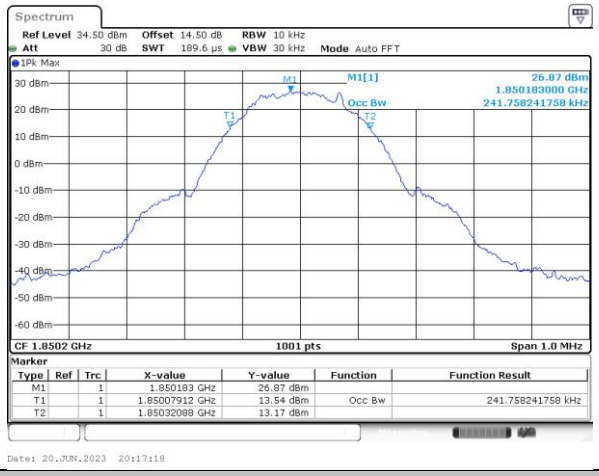
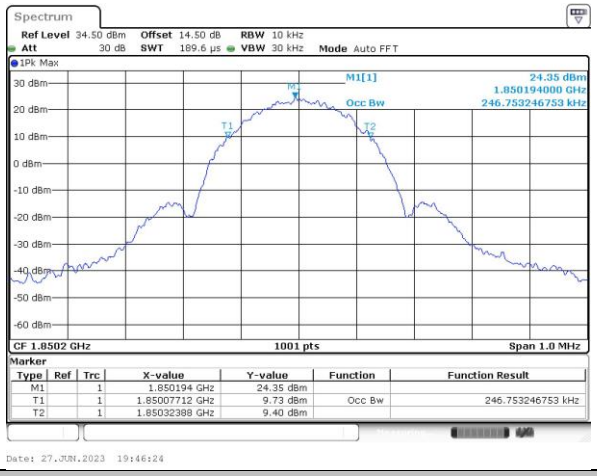
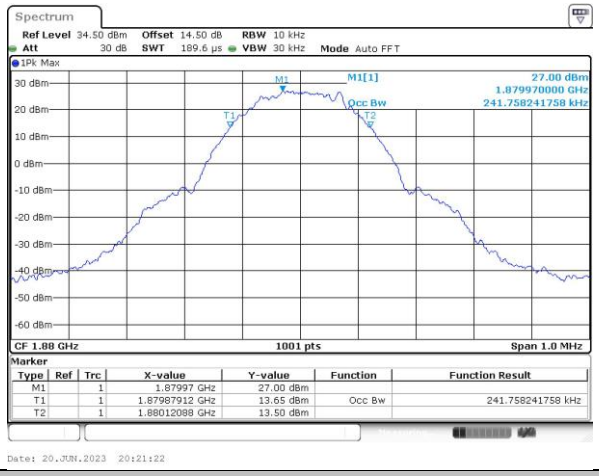
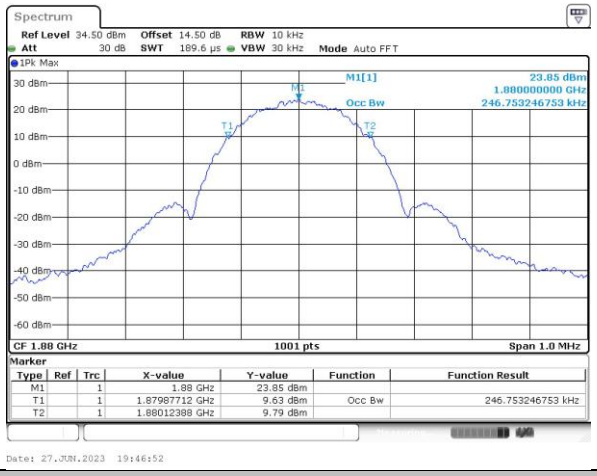
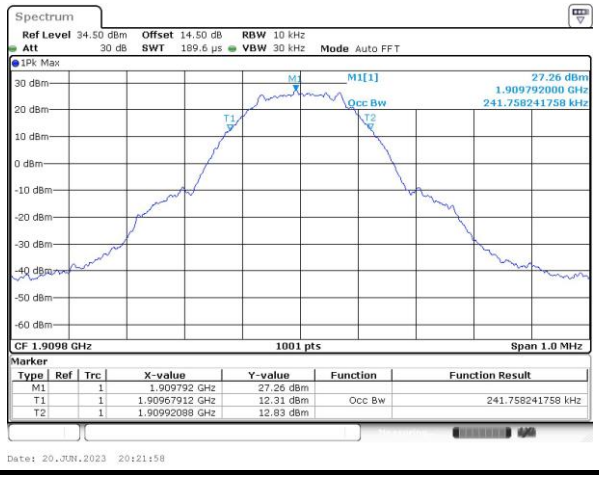
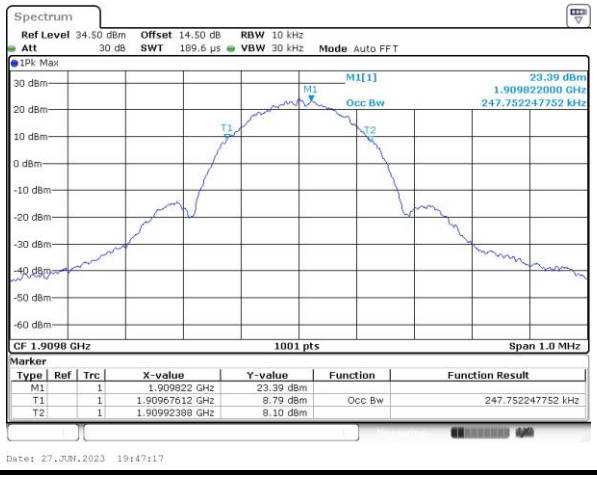


# Occupied Bandwidth

| Mode | GSM850(MHz) | |
|---|---|---|
| Mod. | GSM | EDGE class 8 |
| Lowest CH | 0.240 | 0.241 |
| Middle CH | 0.242 | 0.246 |
| Highest CH | 0.242 | 0.245 |

| Mode | GSM1900(MHz) | |
|---|---|---|
| Mod. | GSM | EDGE class 8 |
| Lowest CH | 0.242 | 0.247 |
| Middle CH | 0.242 | 0.247 |
| Highest CH | 0.242 | 0.248 |

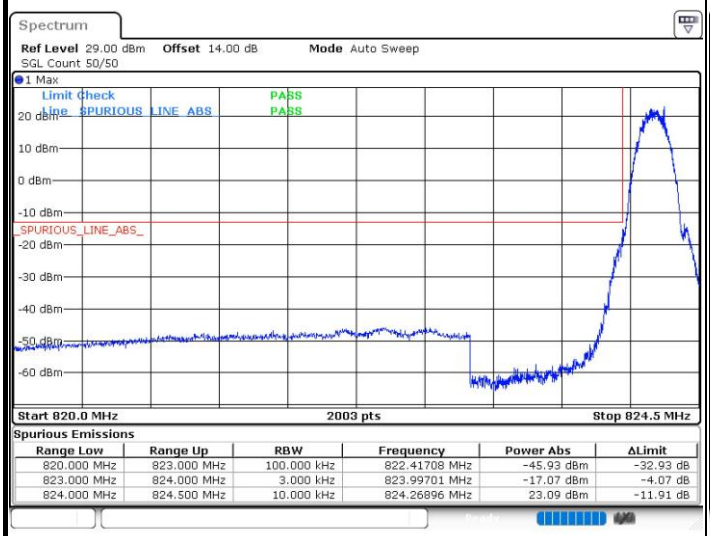
| GSM850 (GSM) | GSM850 (EDGE class 8) |
|---|---|
| **Lowest Channel** | **Lowest Channel** |
|  |  |
| **Middle Channel** | **Middle Channel** |
|  |  |
| **Highest Channel** | **Highest Channel** |
|  |  |

| GSM1900 (GSM) | GSM1900 (EDGE class 8) |
|---|---|
| **Lowest Channel** | **Lowest Channel** |
|  |  |
| **Middle Channel** | **Middle Channel** |
|  |  |
| **Highest Channel** | **Highest Channel** |
|  |  |

# Conducted Band Edge

## GSM850 (GSM)

### Lowest Band Edge

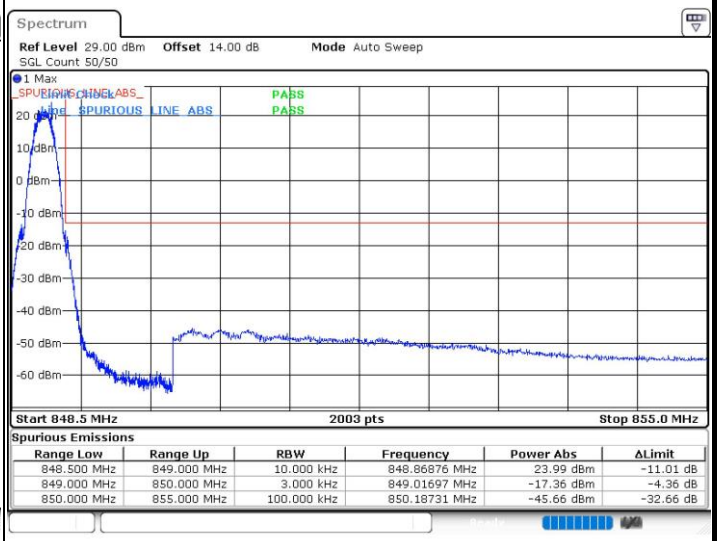



Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 820.000 MHz | 823.000 MHz | 100.000 kHz | 822.41708 MHz | -45.93 dBm | -32.93 dB |
| 823.000 MHz | 824.000 MHz | 3.000 kHz | 823.99701 MHz | -17.07 dBm | -4.07 dB |
| 824.000 MHz | 824.500 MHz | 10.000 kHz | 824.26896 MHz | 23.09 dBm | -11.91 dB |

Date: 20.JUN.2023 20:03:25

### Highest Band Edge



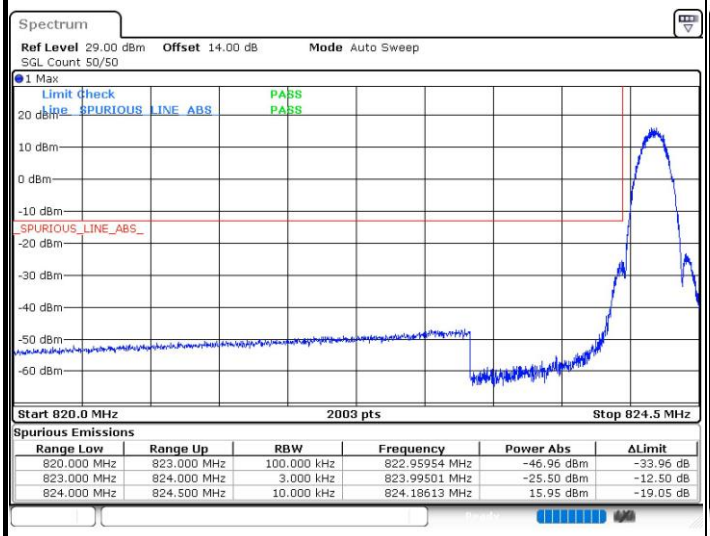

Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 848.500 MHz | 849.000 MHz | 10.000 kHz | 848.86876 MHz | 23.99 dBm | -11.01 dB |
| 849.000 MHz | 850.000 MHz | 3.000 kHz | 849.01697 MHz | -17.36 dBm | -4.36 dB |
| 850.000 MHz | 855.000 MHz | 100.000 kHz | 850.18731 MHz | -45.66 dBm | -32.66 dB |

Date: 20.JUN.2023 20:06:02

## GSM850 (EDGE class 8)

### Lowest Band Edge

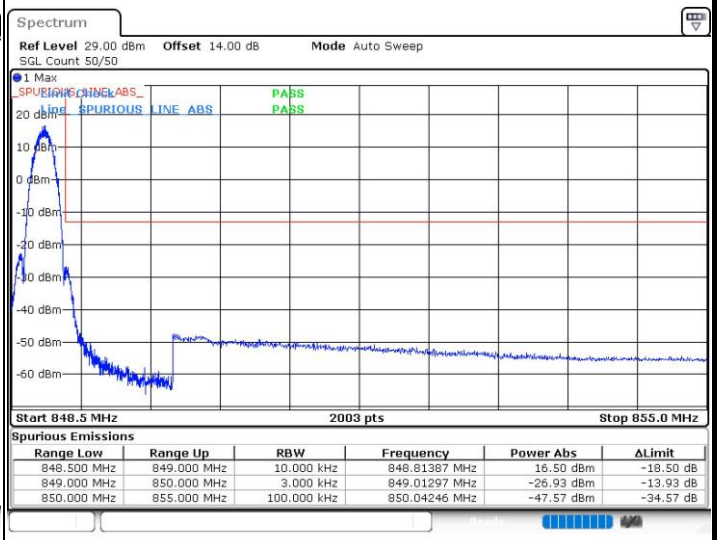



Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 820.000 MHz | 823.000 MHz | 100.000 kHz | 822.95954 MHz | -46.96 dBm | -33.96 dB |
| 823.000 MHz | 824.000 MHz | 3.000 kHz | 823.99501 MHz | -25.50 dBm | -12.50 dB |
| 824.000 MHz | 824.500 MHz | 10.000 kHz | 824.18613 MHz | 15.95 dBm | -19.05 dB |

Date: 27.JUN.2023 19:32:29

### Highest Band Edge



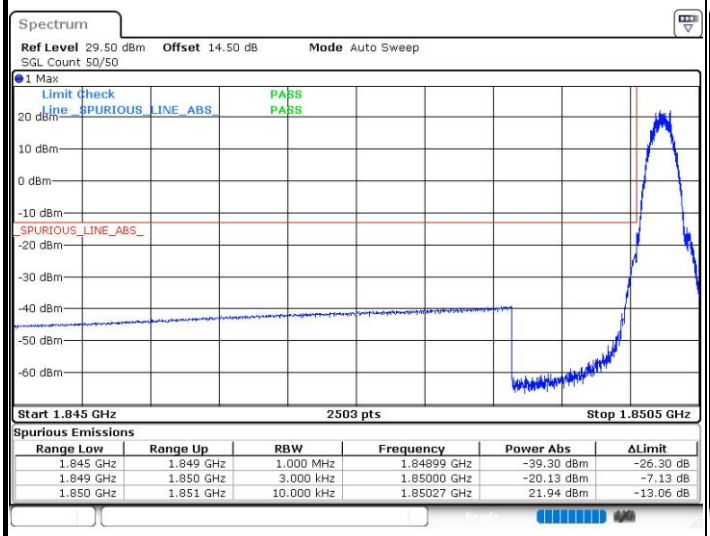

Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 848.500 MHz | 849.000 MHz | 10.000 kHz | 848.81387 MHz | 16.50 dBm | -18.50 dB |
| 849.000 MHz | 850.000 MHz | 3.000 kHz | 849.01297 MHz | -26.93 dBm | -13.93 dB |
| 850.000 MHz | 855.000 MHz | 100.000 kHz | 850.04246 MHz | -47.57 dBm | -34.57 dB |

Date: 27.JUN.2023 19:34:23

## GSM1900 (GSM)

### Lowest Band Edge

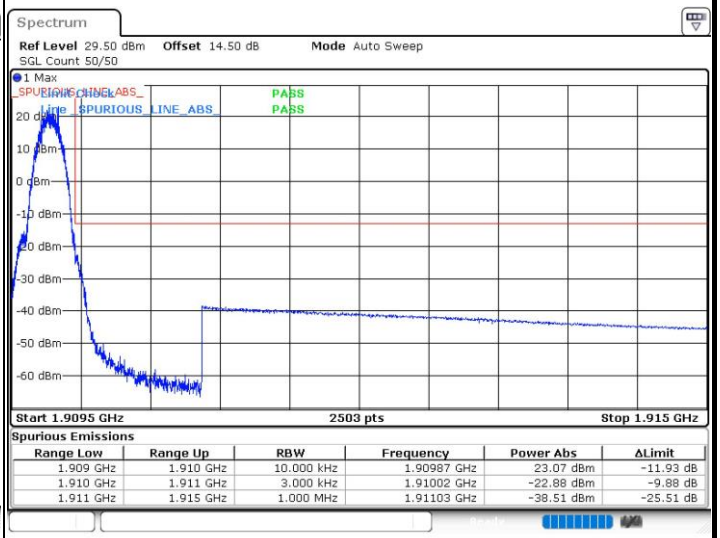



Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 1.845 GHz | 1.849 GHz | 1.000 MHz | 1.84899 GHz | -39.30 dBm | -26.30 dB |
| 1.849 GHz | 1.850 GHz | 3.000 kHz | 1.85000 GHz | -20.13 dBm | -7.13 dB |
| 1.850 GHz | 1.851 GHz | 10.000 kHz | 1.85027 GHz | 21.94 dBm | -13.06 dB |

Date: 20.JUN.2023 20:24:37

### Highest Band Edge



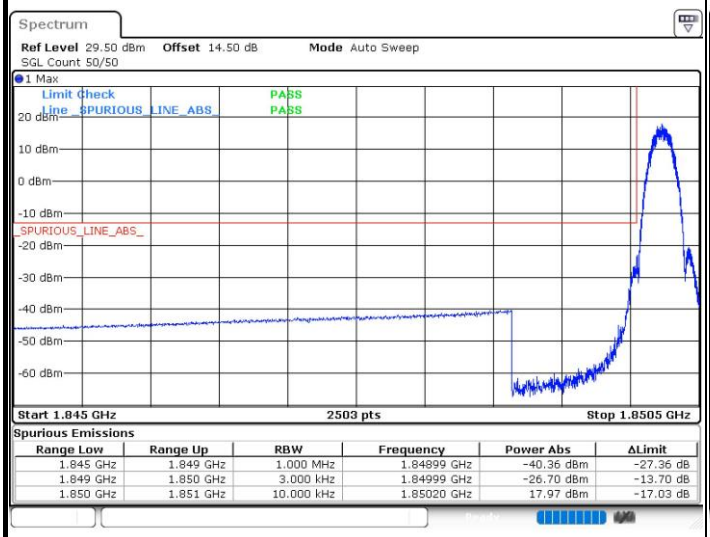

Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 1.909 GHz | 1.910 GHz | 10.000 kHz | 1.90987 GHz | 23.07 dBm | -11.93 dB |
| 1.910 GHz | 1.911 GHz | 3.000 kHz | 1.91002 GHz | -22.88 dBm | -9.88 dB |
| 1.911 GHz | 1.915 GHz | 1.000 MHz | 1.91103 GHz | -38.51 dBm | -25.51 dB |

Date: 20.JUN.2023 20:26:43

## GSM1900 (EDGE class 8)

### Lowest Band Edge

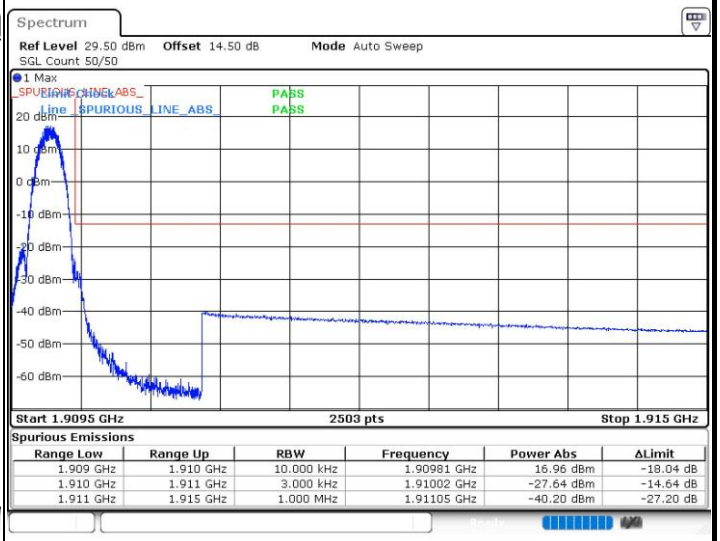



Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 1.845 GHz | 1.849 GHz | 1.000 MHz | 1.84899 GHz | -40.36 dBm | -27.36 dB |
| 1.849 GHz | 1.850 GHz | 3.000 kHz | 1.84999 GHz | -26.70 dBm | -13.70 dB |
| 1.850 GHz | 1.851 GHz | 10.000 kHz | 1.85020 GHz | 17.97 dBm | -17.03 dB |

Date: 27.JUN.2023 19:49:35

### Highest Band Edge




Spurious Emissions

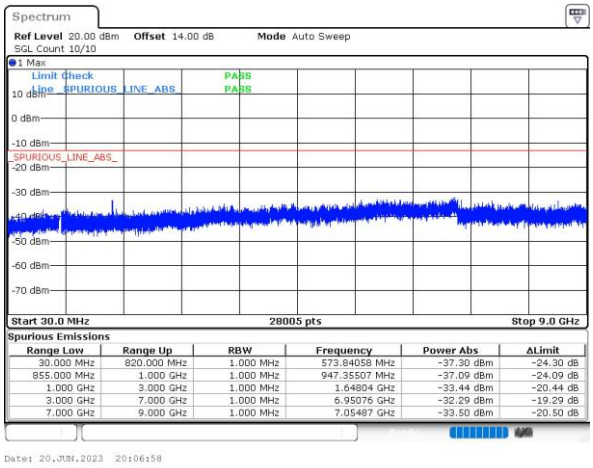
| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 1.909 GHz | 1.910 GHz | 10.000 kHz | 1.90981 GHz | 16.96 dBm | -18.04 dB |
| 1.910 GHz | 1.911 GHz | 3.000 kHz | 1.91002 GHz | -27.64 dBm | -14.64 dB |
| 1.911 GHz | 1.915 GHz | 1.000 MHz | 1.91105 GHz | -40.20 dBm | -27.20 dB |

Date: 27.JUN.2023 19:51:32

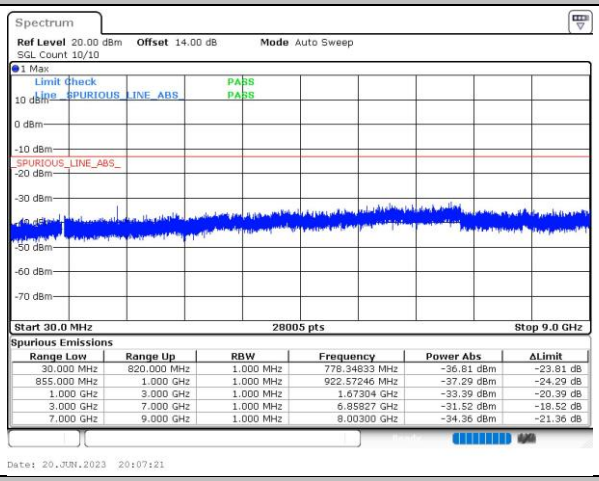
# Conducted Spurious Emission

## GSM850 (GSM)

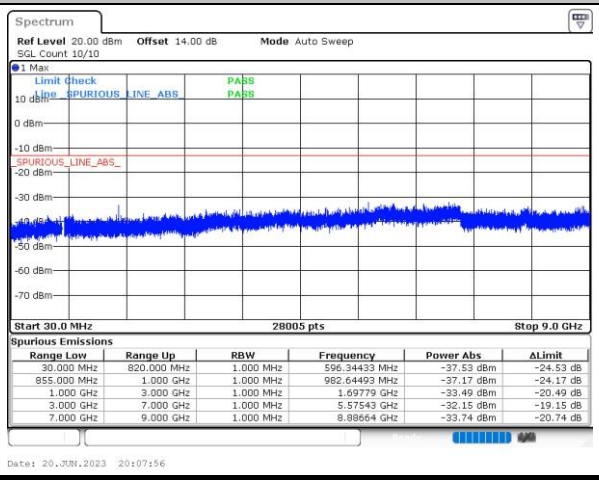
### Lowest Channel




### Middle Channel

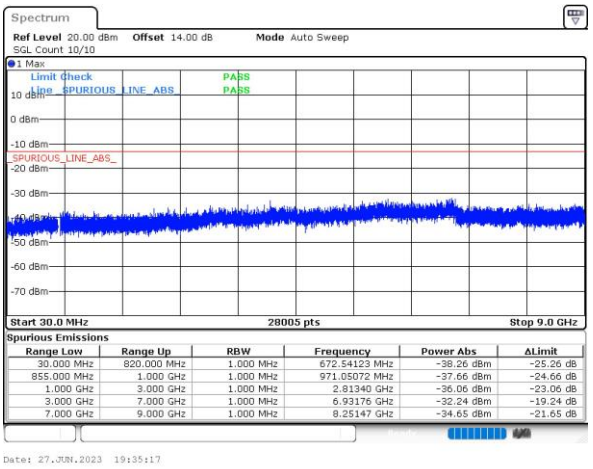



### Highest Channel

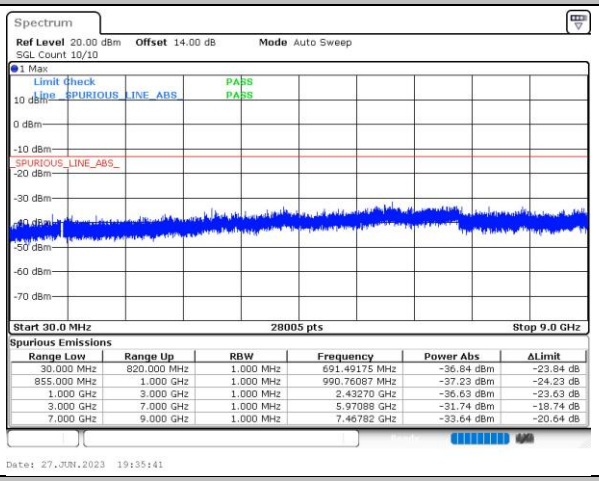



## GSM850 (EDGE class 8)

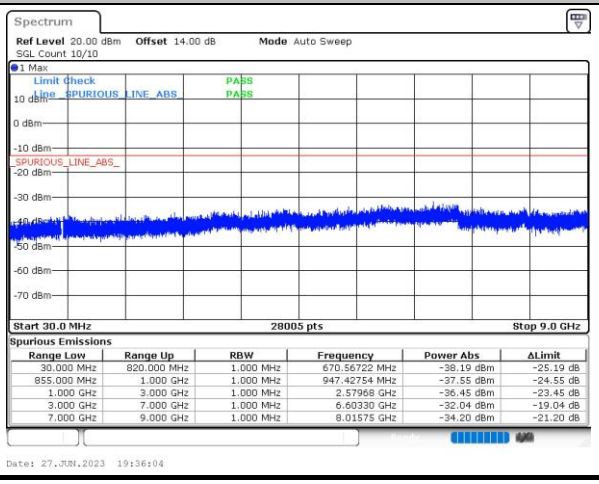
### Lowest Channel




### Middle Channel

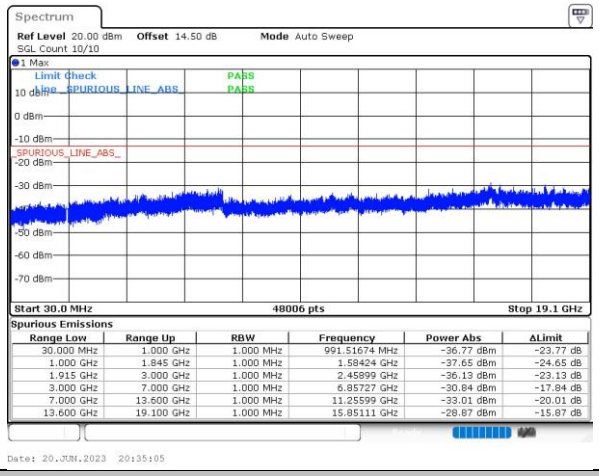



### Highest Channel



## GSM1900 (GSM)

### Lowest Channel

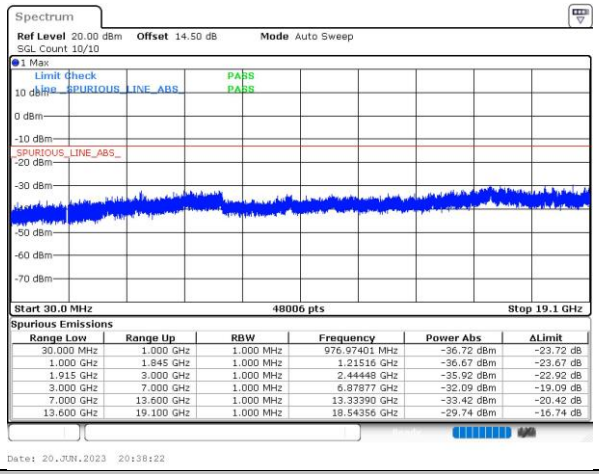



Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 30.000 MHz | 1.000 GHz | 1.000 MHz | 991.51674 MHz | -36.77 dBm | -23.77 dB |
| 1.000 GHz | 1.845 GHz | 1.000 MHz | 1.58424 GHz | -37.65 dBm | -24.65 dB |
| 1.915 GHz | 3.000 GHz | 1.000 MHz | 2.45899 GHz | -36.13 dBm | -23.13 dB |
| 3.000 GHz | 7.000 GHz | 1.000 MHz | 6.85727 GHz | -30.84 dBm | -17.84 dB |
| 7.000 GHz | 13.600 GHz | 1.000 MHz | 11.25599 GHz | -33.01 dBm | -20.01 dB |
| 13.600 GHz | 19.100 GHz | 1.000 MHz | 15.85111 GHz | -28.87 dBm | -15.87 dB |

Date: 20.JUN.2023 20:35:05

### Middle Channel

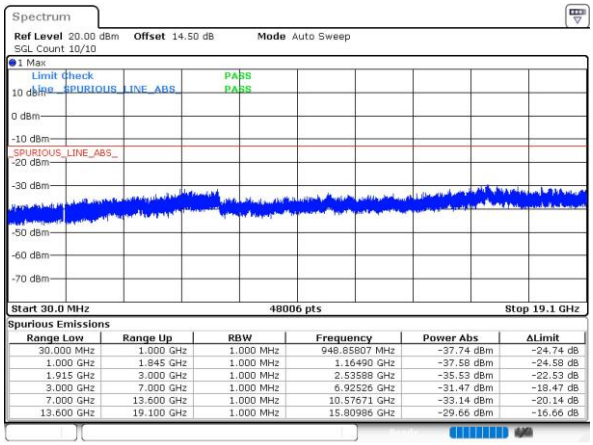



Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 30.000 MHz | 1.000 GHz | 1.000 MHz | 976.97401 MHz | -36.72 dBm | -23.72 dB |
| 1.000 GHz | 1.845 GHz | 1.000 MHz | 1.21516 GHz | -36.67 dBm | -23.67 dB |
| 1.915 GHz | 3.000 GHz | 1.000 MHz | 2.44448 GHz | -35.92 dBm | -22.92 dB |
| 3.000 GHz | 7.000 GHz | 1.000 MHz | 6.87877 GHz | -32.09 dBm | -19.09 dB |
| 7.000 GHz | 13.600 GHz | 1.000 MHz | 13.33390 GHz | -33.42 dBm | -20.42 dB |
| 13.600 GHz | 19.100 GHz | 1.000 MHz | 18.54356 GHz | -29.74 dBm | -16.74 dB |

Date: 20.JUN.2023 20:38:22

### Highest Channel



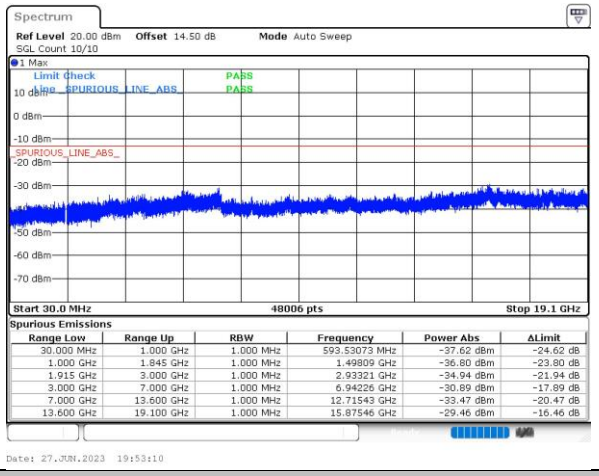

Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 30.000 MHz | 1.000 GHz | 1.000 MHz | 948.85807 MHz | -37.74 dBm | -24.74 dB |
| 1.000 GHz | 1.845 GHz | 1.000 MHz | 1.16490 GHz | -37.58 dBm | -24.58 dB |
| 1.915 GHz | 3.000 GHz | 1.000 MHz | 2.53588 GHz | -35.53 dBm | -22.53 dB |
| 3.000 GHz | 7.000 GHz | 1.000 MHz | 6.92526 GHz | -31.47 dBm | -18.47 dB |
| 7.000 GHz | 13.600 GHz | 1.000 MHz | 10.57671 GHz | -33.14 dBm | -20.14 dB |
| 13.600 GHz | 19.100 GHz | 1.000 MHz | 15.80986 GHz | -29.66 dBm | -16.66 dB |

Date: 20.JUN.2023 20:40:19

## GSM1900 (EDGE class 8)

### Lowest Channel




Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 30.000 MHz | 1.000 GHz | 1.000 MHz | 593.53073 MHz | -37.62 dBm | -24.62 dB |
| 1.000 GHz | 1.845 GHz | 1.000 MHz | 1.49809 GHz | -36.80 dBm | -23.80 dB |
| 1.915 GHz | 3.000 GHz | 1.000 MHz | 2.93321 GHz | -34.94 dBm | -21.94 dB |
| 3.000 GHz | 7.000 GHz | 1.000 MHz | 6.94226 GHz | -30.89 dBm | -17.89 dB |
| 7.000 GHz | 13.600 GHz | 1.000 MHz | 12.71543 GHz | -33.47 dBm | -20.47 dB |
| 13.600 GHz | 19.100 GHz | 1.000 MHz | 15.87546 GHz | -29.46 dBm | -16.46 dB |

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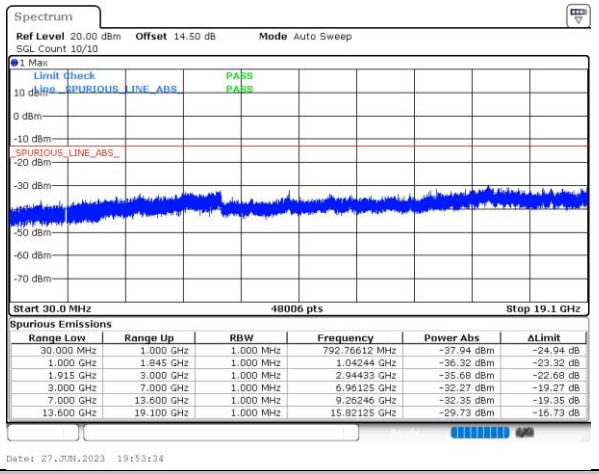
### Middle Channel




Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 30.000 MHz | 1.000 GHz | 1.000 MHz | 792.76612 MHz | -37.94 dBm | -24.94 dB |
| 1.000 GHz | 1.845 GHz | 1.000 MHz | 1.04244 GHz | -36.32 dBm | -23.32 dB |
| 1.915 GHz | 3.000 GHz | 1.000 MHz | 2.94433 GHz | -35.68 dBm | -22.68 dB |
| 3.000 GHz | 7.000 GHz | 1.000 MHz | 6.96125 GHz | -32.27 dBm | -19.27 dB |
| 7.000 GHz | 13.600 GHz | 1.000 MHz | 9.26246 GHz | -32.35 dBm | -19.35 dB |
| 13.600 GHz | 19.100 GHz | 1.000 MHz | 15.82125 GHz | -29.73 dBm | -16.73 dB |

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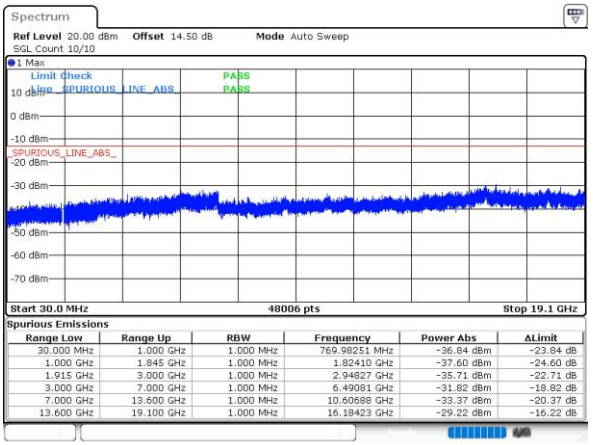
### Highest Channel




Spurious Emissions

| Range Low | Range Up | RBW | Frequency | Power Abs | ΔLimit |
|---|---|---|---|---|---|
| 30.000 MHz | 1.000 GHz | 1.000 MHz | 769.98251 MHz | -36.84 dBm | -23.84 dB |
| 1.000 GHz | 1.845 GHz | 1.000 MHz | 1.82410 GHz | -37.60 dBm | -24.60 dB |
| 1.915 GHz | 3.000 GHz | 1.000 MHz | 2.94827 GHz | -35.71 dBm | -22.71 dB |
| 3.000 GHz | 7.000 GHz | 1.000 MHz | 6.49081 GHz | -31.82 dBm | -18.82 dB |
| 7.000 GHz | 13.600 GHz | 1.000 MHz | 10.60688 GHz | -33.37 dBm | -20.37 dB |
| 13.600 GHz | 19.100 GHz | 1.000 MHz | 16.18423 GHz | -29.22 dBm | -16.22 dB |

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# Frequency Stability

| Test Conditions | Middle Channel | GSM850 (GSM) | GSM850 (EDGE class 8) | Limit 2.5ppm |
|---|---|---|---|---|
| Temperature (°C) | Voltage (Volt) | Deviation (ppm) | | Result |
| 50 | Normal Voltage | 0.0003 | 0.0010 | PASS |
| 40 | Normal Voltage | 0.0024 | 0.0035 | |
| 30 | Normal Voltage | 0.0007 | 0.0005 | |
| 20(Ref.) | Normal Voltage | 0.0000 | 0.0000 | |
| 10 | Normal Voltage | 0.0015 | 0.0016 | |
| 0 | Normal Voltage | 0.0017 | 0.0018 | |
| -10 | Normal Voltage | 0.0012 | 0.0011 | |
| -20 | Normal Voltage | 0.0005 | 0.0006 | |
| -30 | Normal Voltage | 0.0018 | 0.0017 | |
| 20 | Maximum Voltage | 0.0014 | 0.0015 | |
| 20 | Normal Voltage | 0.0000 | 0.0000 | |
| 20 | Battery End Point | 0.0018 | 0.0030 | |

**Note:** Normal Voltage = 3.91V. ; Battery End Point (BEP) = 3.40V. ; Maximum Voltage =4.50 V

| Test Conditions | Middle Channel | GSM1900 (GSM) | GSM1900 (EDGE class 8) | Limit Note 2. |
|---|---|---|---|---|
| Temperature (°C) | Voltage (Volt) | Deviation (ppm) | | Result |
| 50 | Normal Voltage | 0.0007 | 0.0005 | PASS |
| 40 | Normal Voltage | 0.0004 | 0.0003 | |
| 30 | Normal Voltage | 0.0010 | 0.0006 | |
| 20(Ref.) | Normal Voltage | 0.0000 | 0.0000 | |
| 10 | Normal Voltage | 0.0003 | 0.0004 | |
| 0 | Normal Voltage | 0.0005 | 0.0005 | |
| -10 | Normal Voltage | 0.0008 | 0.0009 | |
| -20 | Normal Voltage | 0.0010 | 0.0005 | |
| -30 | Normal Voltage | 0.0011 | 0.0010 | |
| 20 | Maximum Voltage | 0.0006 | 0.0006 | |
| 20 | Normal Voltage | 0.0000 | 0.0000 | |
| 20 | Battery End Point | 0.0002 | 0.0003 | |

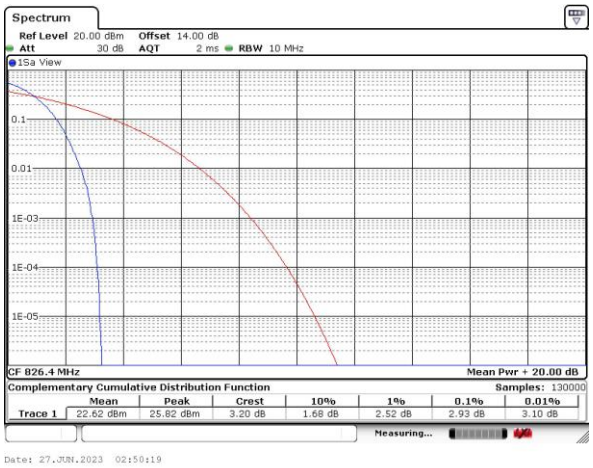
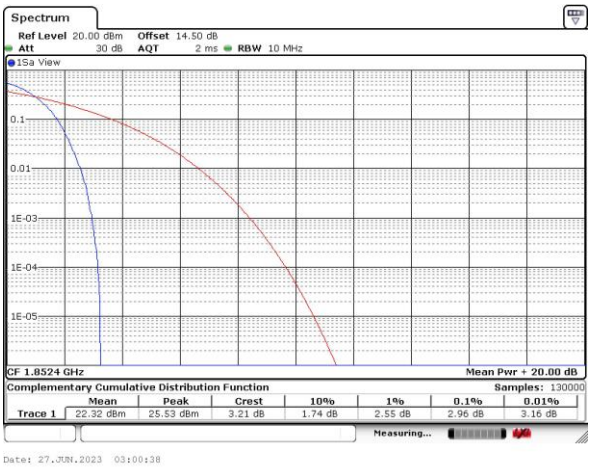
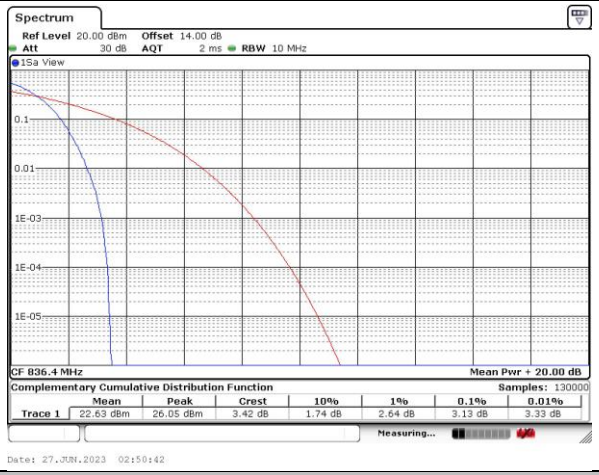
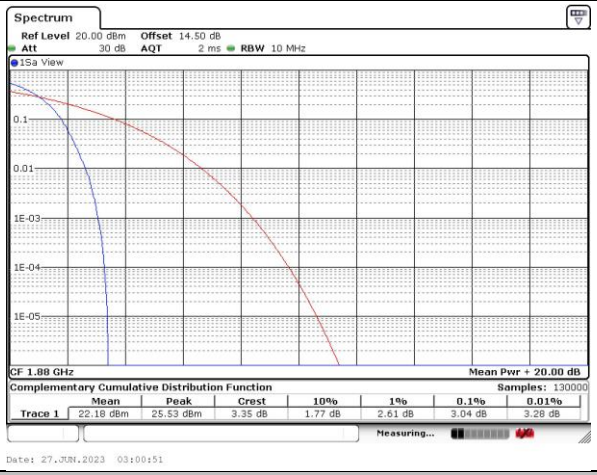
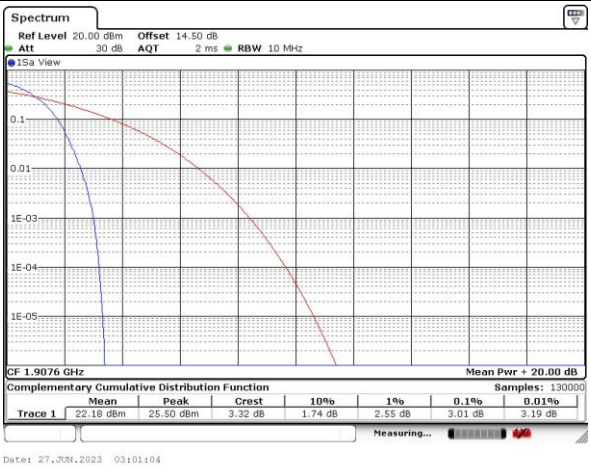
**Note:**

1. Normal Voltage = 3.91V. ; Battery End Point (BEP) = 3.40V. ; Maximum Voltage =4.50 V
2. The frequency fundamental emissions stay within the authorized frequency block based on the frequency deviation measured is small.

# WCDMA

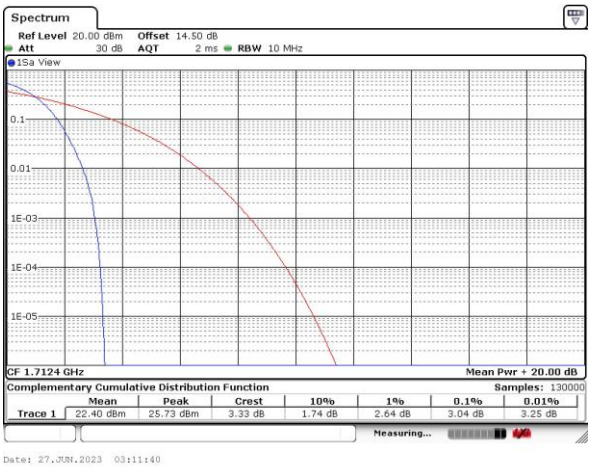
## Peak-to-Average Ratio

| Mode | WCDMA Band V(dB) | WCDMA Band II(dB) | WCDMA Band IV(dB) | Limit: 13dB |
|---|---|---|---|---|
| Mod. | RMC 12.2Kbps | RMC 12.2Kbps | RMC 12.2Kbps | Result |
| Lowest CH | 2.93 | 2.96 | 3.04 | PASS |
| Middle CH | 3.13 | 3.04 | 2.96 | |
| Highest CH | 3.16 | 3.01 | 3.04 | |

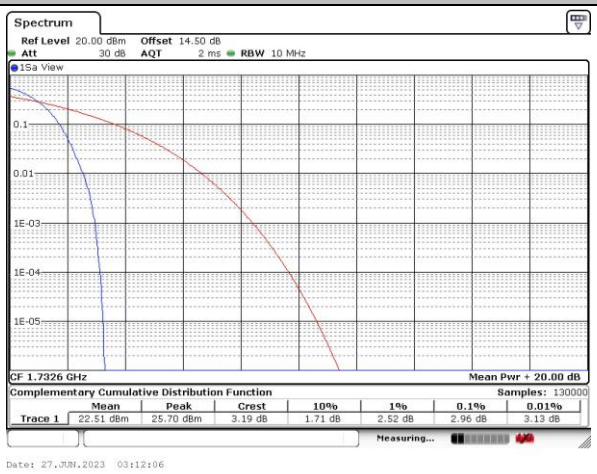
| WCDMA Band V (RMC 12.2Kbps) | WCDMA Band II (RMC 12.2Kbps) |
|---|---|
| **Lowest Channel** | **Lowest Channel** |
|  |  |
| **Middle Channel** | **Middle Channel** |
|  |  |
| **Highest Channel** | **Highest Channel** |
| |  |

## WCDMA Band IV (RMC 12.2Kbps)

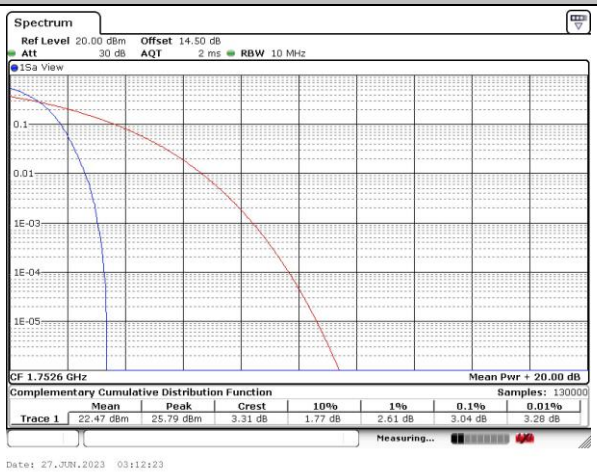
### Lowest Channel




### Middle Channel




### Highest Channel

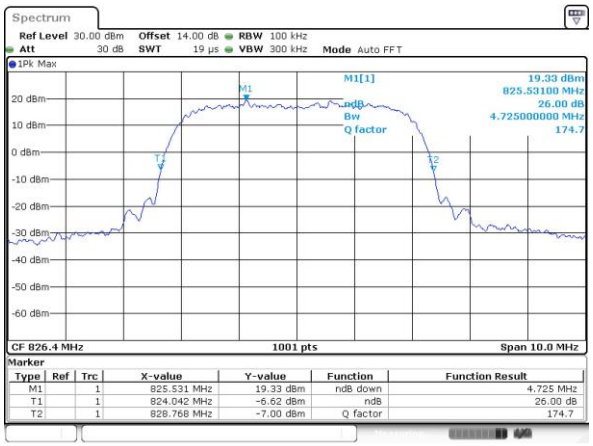


# 26dB Bandwidth

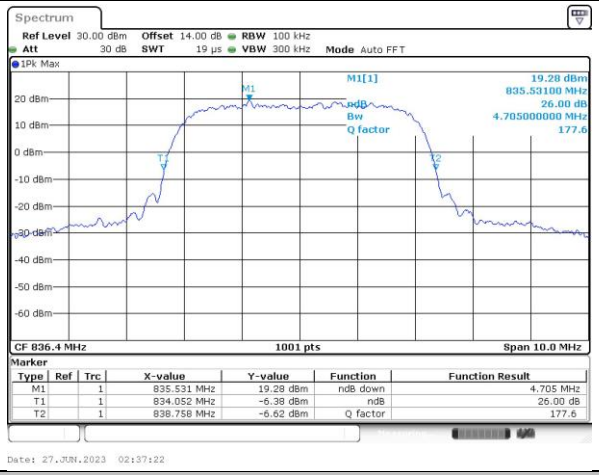
| Mode | WCDMA Band V(MHz) | WCDMA Band II(MHz) | WCDMA Band IV(MHz) |
|---|---|---|---|
| Mod. | RMC 12.2Kbps | RMC 12.2Kbps | RMC 12.2Kbps |
| Lowest CH | 4.73 | 4.73 | 4.72 |
| Middle CH | 4.71 | 4.72 | 4.73 |
| Highest CH | 4.72 | 4.74 | 4.73 |

## WCDMA Band V (RMC 12.2Kbps)

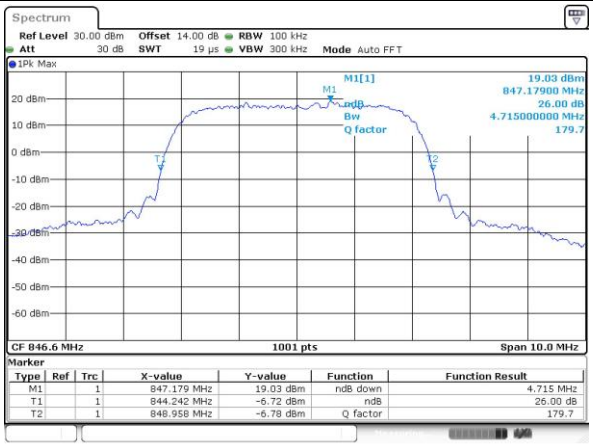
### Lowest Channel




### Middle Channel

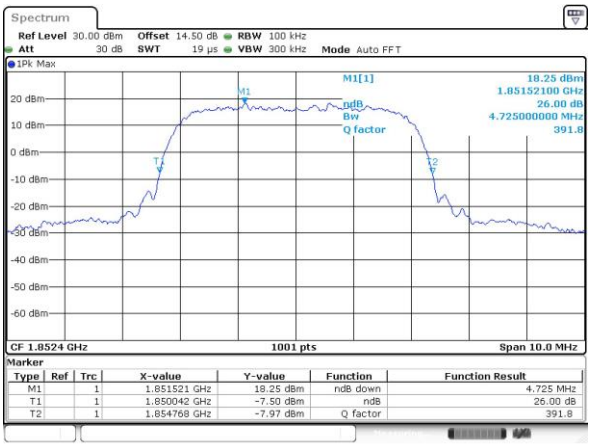



### Highest Channel

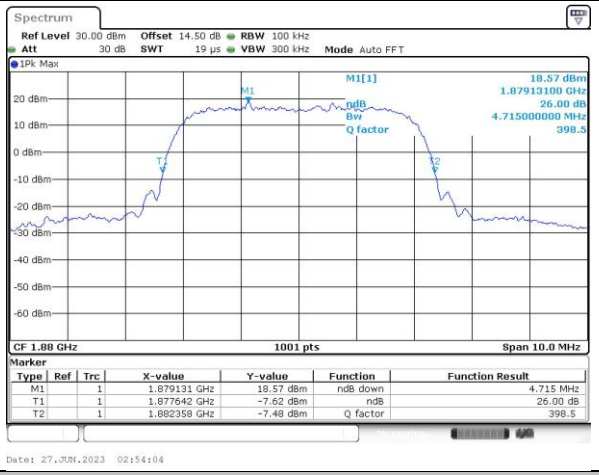



## WCDMA Band II (RMC 12.2Kbps)

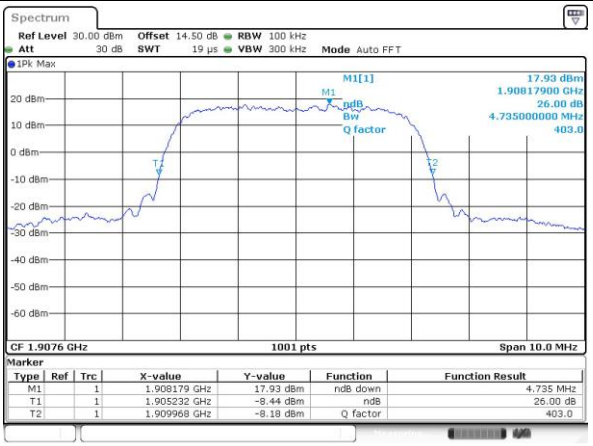
### Lowest Channel




### Middle Channel

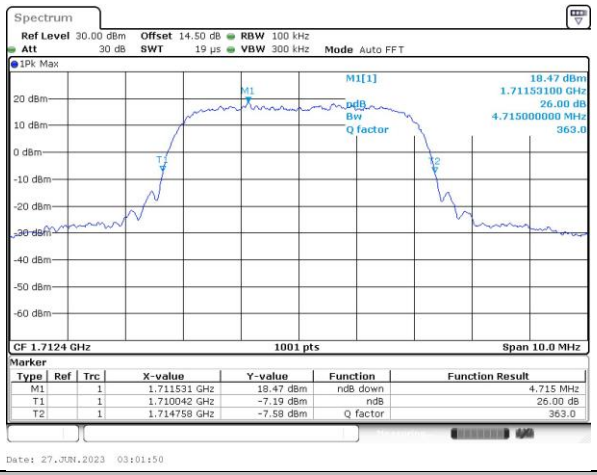



### Highest Channel

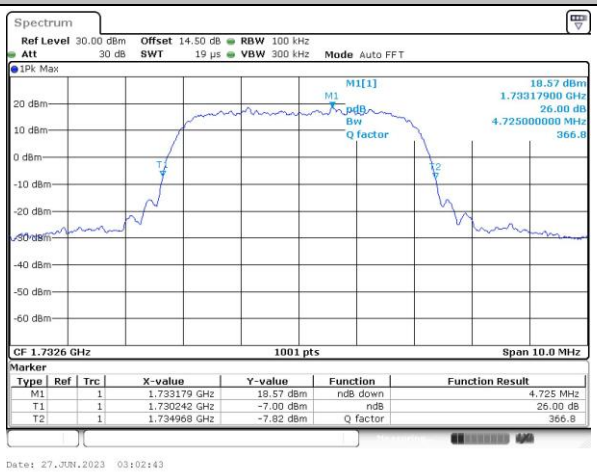


## WCDMA Band IV (RMC 12.2Kbps)

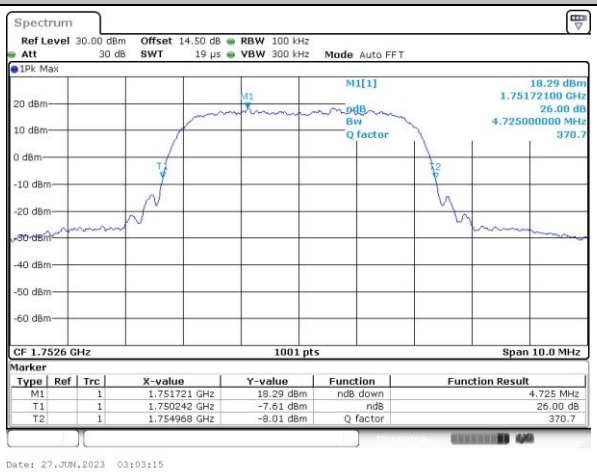
### Lowest Channel




### Middle Channel

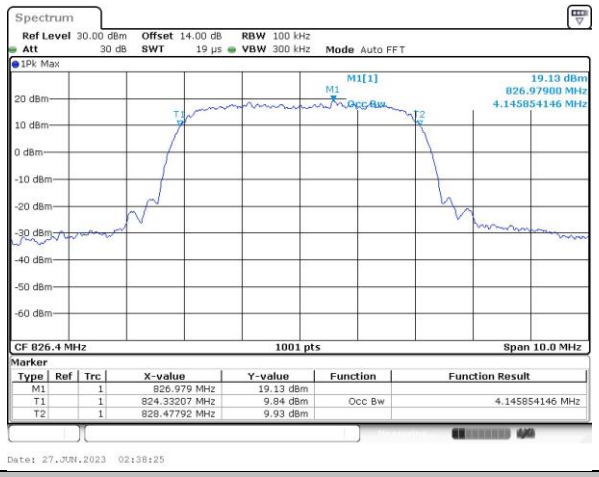
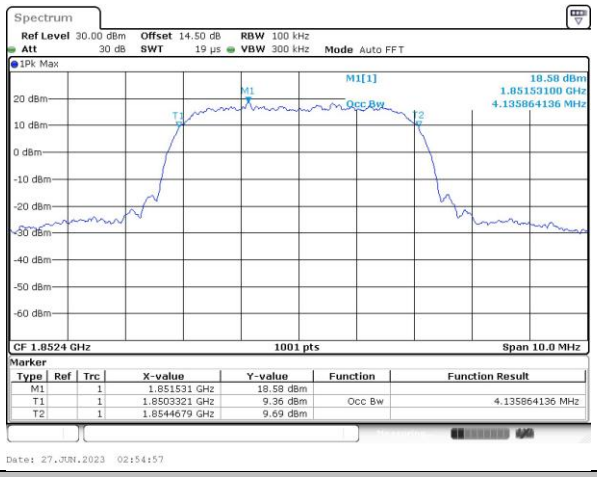
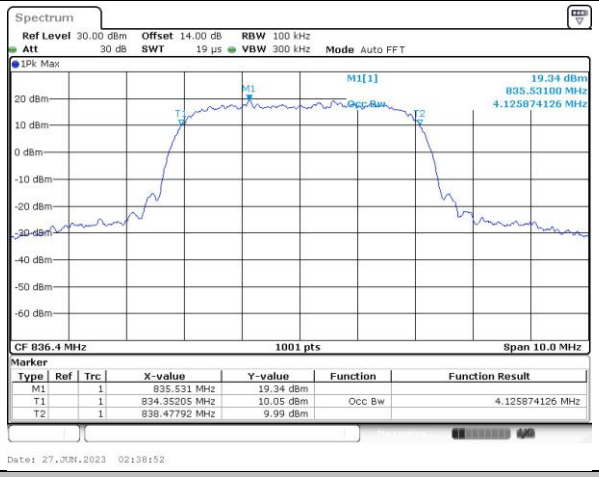
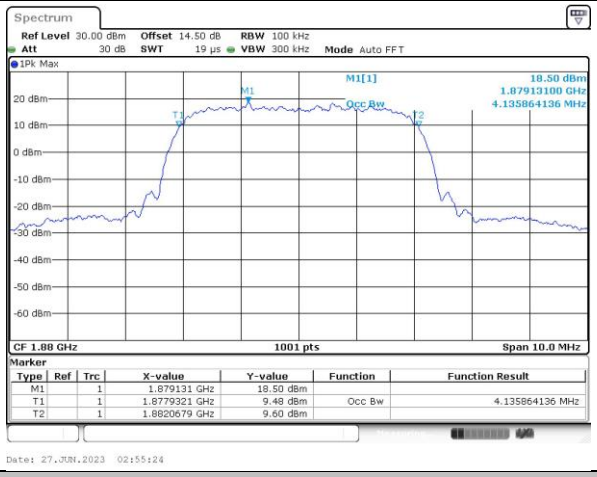
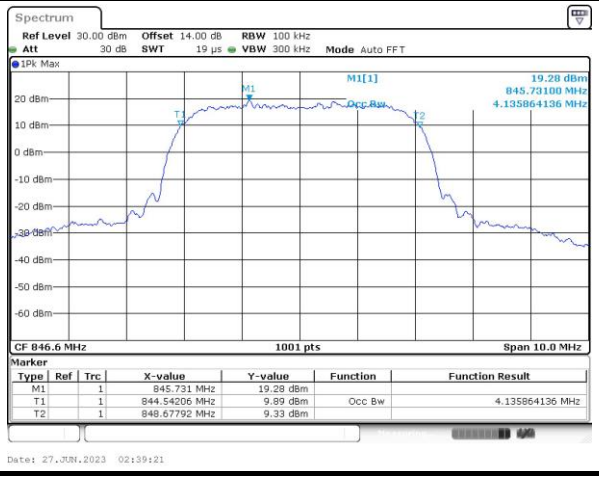
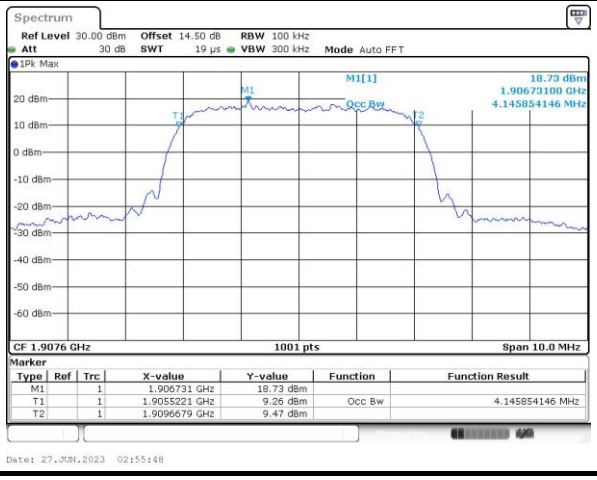



### Highest Channel



# Occupied Bandwidth

| Mode | WCDMA Band V(MHz) | WCDMA Band II(MHz) | WCDMA Band IV(MHz) |
|---|---|---|---|
| Mod. | RMC 12.2Kbps | RMC 12.2Kbps | RMC 12.2Kbps |
| Lowest CH | 4.15 | 4.14 | 4.15 |
| Middle CH | 4.13 | 4.14 | 4.14 |
| Highest CH | 4.14 | 4.15 | 4.14 |

| WCDMA Band V (RMC 12.2Kbps) | WCDMA Band II (RMC 12.2Kbps) |
|---|---|
| **Lowest Channel** | **Lowest Channel** |
|  |  |
| **Middle Channel** | **Middle Channel** |
|  |  |
| **Highest Channel** | **Highest Channel** |
|  |  |