FCC RF Test Report

APPLICANT	:	Motorola Mobility LLC
EQUIPMENT	:	Mobile Cellular Phone
BRAND NAME	:	Motorola
MODEL NAME	:	XT2421-3
FCC ID	:	IHDT56AR2
STANDARD	:	47 CFR Part 2, 22(H)
CLASSIFICATION	:	Licensed Non-Broadcast Transmitter Held toEar(TNE)
TEST DATE(S)	:	Sep. 28, 2023 ~ Nov. 07, 2023

We, Sporton International Inc. (Kunshan), 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. (Kunshan), the test report shall not be reproduced except in full.

Jason Jia

Approved by: Jason Jia

ACCREDITED Cert #5145.02

Sporton International Inc. (Kunshan)
No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300
People's Republic of China

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG381718A	Rev. 01	Initial issue of report	Nov. 28, 2023

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	-
3.5	N/A	Peak-to-Average Ratio	< 13 dB	PASS	-
3.6	§2.1049	Occupied Bandwidth	Reporting Only	PASS	-
3.7	§2.1051 §22.917(a)	Band Edge Measurement	< 43+10log10(P[Watts])	PASS	-
3.8	§2.1051 §22.917(a)	Conducted Emission	< 43+10log10(P[Watts])	PASS	-
3.9	§2.1055 §22.355	Frequency Stability for Temperature & Voltage	< 2.5 ppm for Part 22	PASS	-
4.4	§2.1053; §22.917(a)	Field Strength of Spurious Radiation	< 43+10log10(P[Watts])	PASS	Under limit 30.47 dB at 2512.00 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	XT2421-3
FCC ID	IHDT56AR2
IMEI Code	Conducted: 359058510002855/359058510002863 Radiation: 359058510028157/359058510028165
HW Version	DVT2
SW Version	ULA34.53
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:** 850: 824 MHz ~ 849 MHz **WCDMA:** Band V: 824 MHz ~ 849 MHz
Rx Frequency	**GSM/GPRS/EDGE:** 850: 869 MHz ~ 894 MHz **WCDMA:** Band V: 869 MHz ~ 894 MHz
Maximum Output Power to Antenna	**GSM/GPRS/EDGE:** 850: 32.40 dBm **WCDMA:** Band V: 22.50 dBm
Antenna Type	PIFA Antenna
Antenna Gain	Cellular Band: -3.9 dBi
Type of Modulation	GSM/GPRS: GMSK EDGE: GMSK / 8PSK WCDMA: BPSK HSPA: QPSK HSPA+: 16QAM (Uplink is not supported)

1.5 Modification of EUT

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

1.6 Maximum ERP Power and Emission Designator

FCC Rule	Frequency Band	Frequency Range (MHz)	Type of Modulation	Maximum ERP (W)	Emission Designator
Part 22	GSM850 (GSM)	824.2 ~ 848.8	GMSK	0.4315	242KGXW
Part 22	GSM850 (EDGE)	824.2 ~ 848.8	8PSK	0.1202	239KG7W
Part 22	WCDMA Band V	826.4 ~ 846.6	BPSK	0.0442	4M15F9W

1.7 Testing Location

Sporton International Inc. (Kunshan) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Test Firm	Sporton International Inc. (Kunshan)		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158		
Test Site No.	**Sporton Site No.**	**FCC Designation No.**	**FCC Test Firm Registration No.**
	03CH04-KS TH01-KS	CN1257	314309

1.8 Test Software

Item	Site	Manufacturer	Name	Version
1.	TH01-KS	SPORTON	Part2224_Ver5.0 200330	5.0
2.	03CH04-KS	AUDIX	E3	210616

1.9 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)
- 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.

1.10 Specification of Accessory

Specification of Accessory				
AC Adapter 1(US)	**Brand Name**	Motorola (Salcomp)	**Model Name**	MC-101
AC Adapter 1(EU)	**Brand Name**	Motorola (Salcomp)	**Model Name**	MC-102
AC Adapter 1(UK)	**Brand Name**	Motorola (Salcomp)	**Model Name**	MC-103
AC Adapter 1(AU)	**Brand Name**	Motorola (Salcomp)	**Model Name**	MC-105
AC Adapter 1(CHILE)	**Brand Name**	Motorola (Salcomp)	**Model Name**	MC-109
AC Adapter 2(US)	**Brand Name**	Motorola (Chenyang)	**Model Name**	MC-101
AC Adapter 2(EU)	**Brand Name**	Motorola (Chenyang)	**Model Name**	MC-102
AC Adapter 2(UK)	**Brand Name**	Motorola (Chenyang)	**Model Name**	MC-103
AC Adapter 2(AU)	**Brand Name**	Motorola (Chenyang)	**Model Name**	MC-105
AC Adapter 3(US)	**Brand Name**	Motorola (Aohai)	**Model Name**	MC-101
AC Adapter 3(EU)	**Brand Name**	Motorola (Aohai)	**Model Name**	MC-102
AC Adapter 3(UK)	**Brand Name**	Motorola (Aohai)	**Model Name**	MC-103
AC Adapter 3(AU)	**Brand Name**	Motorola (Aohai)	**Model Name**	MC-105
Battery 1	**Brand Name**	Motorola (ATL)	**Model Name**	QF50
Battery 2	**Brand Name**	Motorola (sunwoda)	**Model Name**	QF50
Battery 3	**Brand Name**	Motorola (SCUD)	**Model Name**	QF50
Earphone 1	**Brand Name**	Motorola (New leader)	**Model Name**	NLD-EM313A-20SF
Earphone 2	**Brand Name**	Motorola (JWELL)	**Model Name**	JWEP1205-L20H
USB Cable 1	**Brand Name**	Motorola (JWELL)	**Model Name**	JWUB1631-L20H
USB Cable 2	**Brand Name**	Motorola (saibao)	**Model Name**	SLQ-A238A

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.

Radiated emissions were investigated as following frequency range:

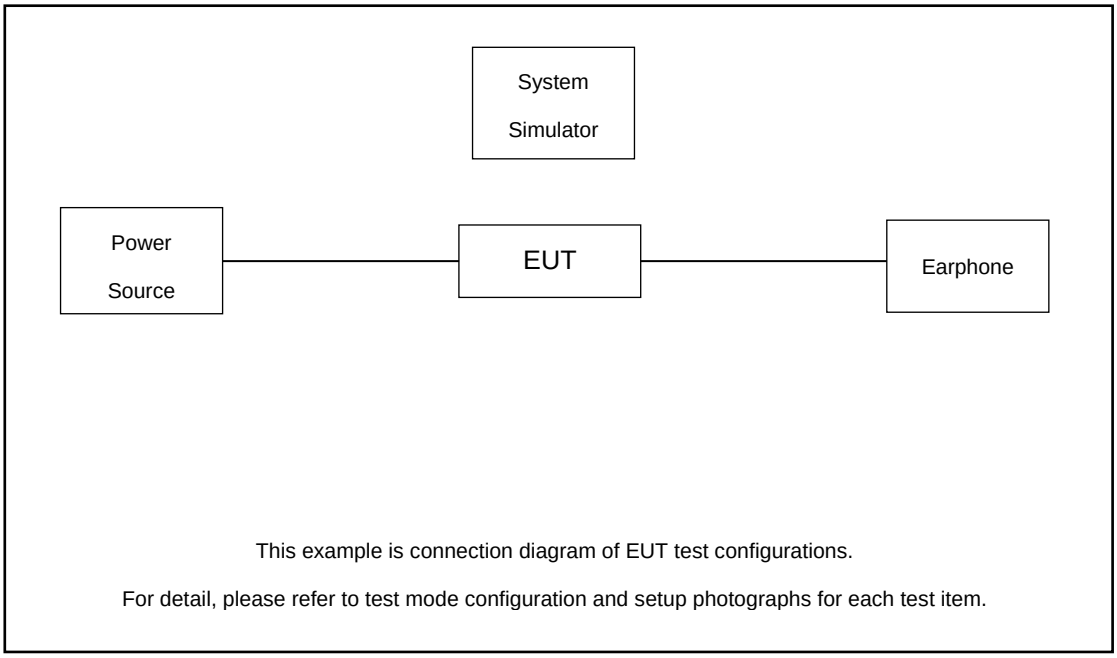
1. 30 MHz to 9000 MHz for GSM850 and WCDMA Band V.

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 ■ EDGE 1 Tx slots Link	■ GSM Link ■ EDGE 1 Tx slots Link
WCDMA Band V	■ 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

2.4 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 4.8 dB and a 10dB attenuator.

Example :

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

= 4.8 + 10 = 14.8 (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

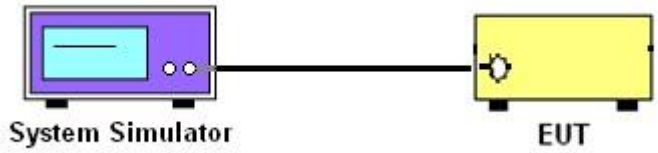
3 Conducted Test Result

3.1 Measuring Instruments

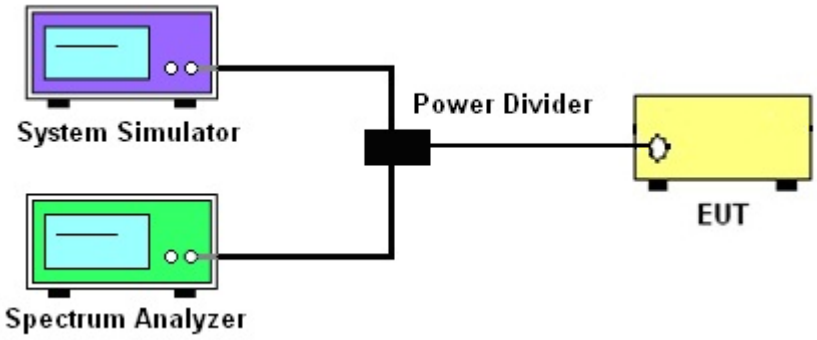
See list of measuring instruments of this test report.

3.2 Test Setup

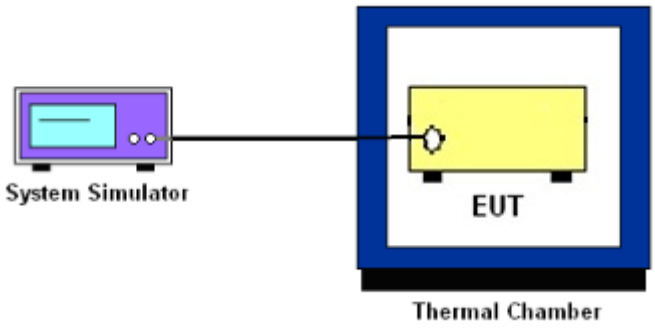
3.2.1 Conducted Output Power



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

3.4.1 Description of the Conducted Output Power and ERP

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.

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.

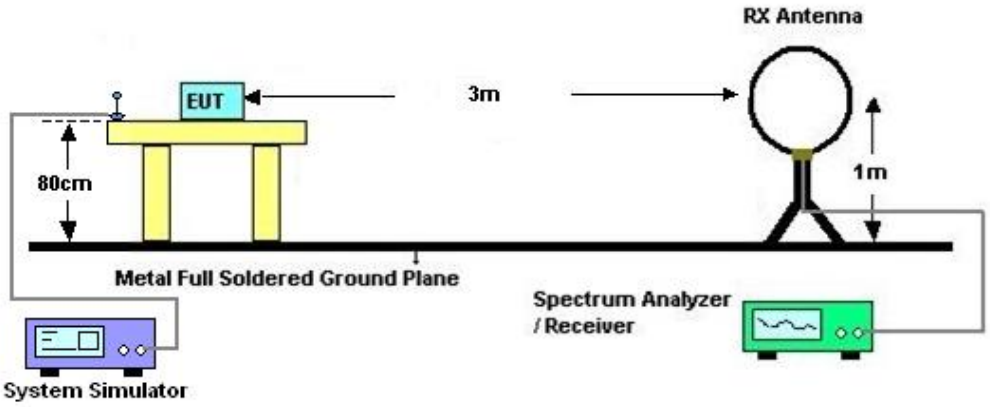
4 Radiated Test Items

4.1 Measuring Instruments

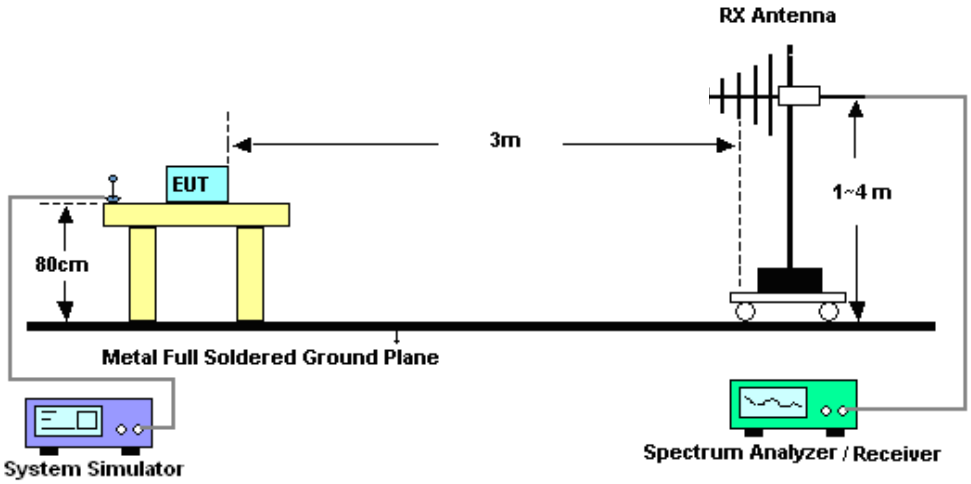
See list of measuring instruments of this test report.

4.2 Test Setup

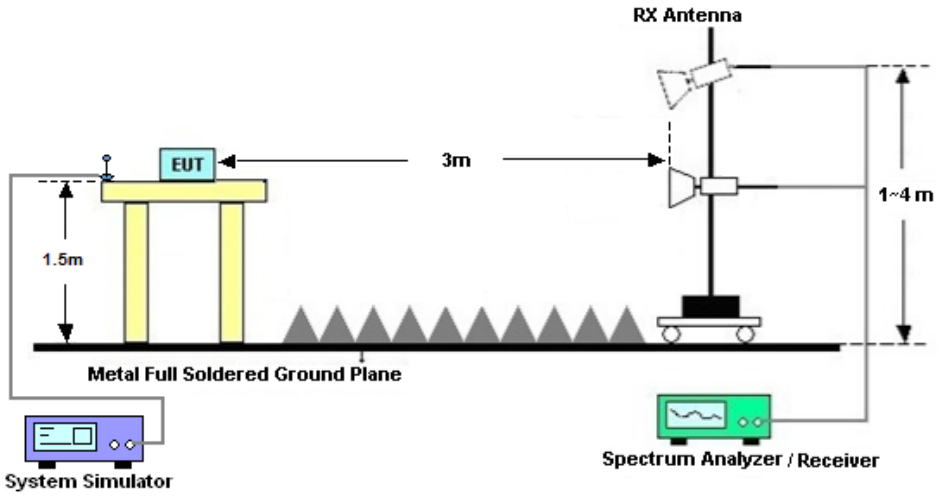
4.2.1 For radiated test below 30MHz



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	101040	10Hz~40GHz	Oct. 12, 2022	Sep. 28, 2023	Oct. 11, 2023	Conducted (TH01-KS)
Power divider	STI	STI08-0055	-	0.5~40GHz	NCR	Sep. 28, 2023	NCR	Conducted (TH01-KS)
Temperature & humidity chamber	Hongzhan	LP-150U	H2014011440	-40~+150°C 20%~95%RH	Jul. 06, 2023	Sep. 28, 2023	Jul. 05, 2024	Conducted (TH01-KS)
EXA Spectrum Analyzer	Keysight	N9010B	MY57471079	10Hz-44G,MAX 30dB	Oct. 10, 2023	Nov. 07, 2023	Oct. 09, 2024	Radiation (03CH04-KS)
Loop Antenna	R&S	HFH2-Z2E	101125	9kHz~30MHz	Sep. 11, 2023	Nov. 07, 2023	Sep. 10, 2024	Radiation (03CH04-KS)
Bilog Antenna	TeseQ	CBL6111D	49922	30MHz-1GHz	Apr. 09, 2023	Nov. 07, 2023	Apr. 08, 2024	Radiation (03CH04-KS)
Horn Antenna	Schwarzbeck	BBHA9120D	1284	1GHz~18GHz	Oct. 10, 2023	Nov. 07, 2023	Oct. 09, 2024	Radiation (03CH04-KS)
SHF-EHF Horn	Com-power	AH-840	101070	18GHz~40GHz	Jan. 08, 2023	Nov. 07, 2023	Jan. 07, 2024	Radiation (03CH04-KS)
Amplifier	SONOMA	310N	380827	9KHz-1GHz	Jul. 06, 2023	Nov. 07, 2023	Jul. 05, 2024	Radiation (03CH04-KS)
Amplifier	MITEQ	EM18G40GGA	060728	18~40GHz	Jan. 05, 2023	Nov. 07, 2023	Jan. 04, 2024	Radiation (03CH04-KS)
high gain Amplifier	EM	EM01G18GA	060840	1Ghz-18Ghz	Oct. 10, 2023	Nov. 07, 2023	Oct. 09, 2024	Radiation (03CH04-KS)
Amplifier	Agilent	8449B	3008A02370	1Ghz-18Ghz	Oct. 10, 2023	Nov. 07, 2023	Oct. 09, 2024	Radiation (03CH04-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Nov. 07, 2023	NCR	Radiation (03CH04-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Nov. 07, 2023	NCR	Radiation (03CH04-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Nov. 07, 2023	NCR	Radiation (03CH04-KS)

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

Conducted Spurious Emission & Bandedge	**±2.26 dB**
Occupied Channel Bandwidth	**±0.1%**
Conducted Power	**±0.46 dB**
Peak to Average Ratio	**±0.46 dB**
Frequency Stability	**±0.4 Hz**

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.82dB**

Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.56dB**

Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.54dB**

---------- THE END ----------

Appendix A. Test Results of Conducted Test

Test Engineer :	Simle Wang	Temperature :	22~23℃
		Relative Humidity :	40~42%

Conducted Output Power(Average power) and ERP

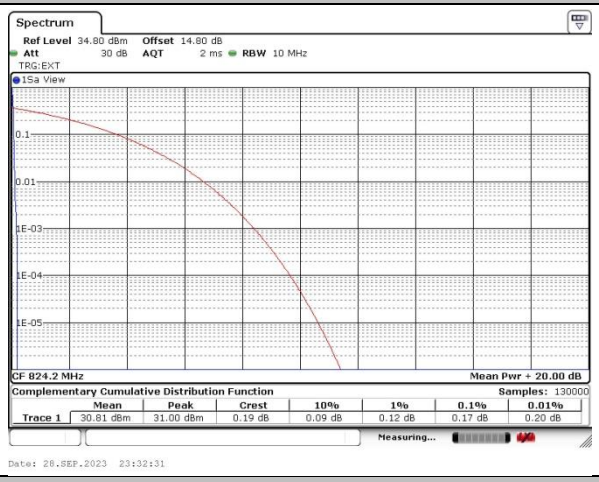
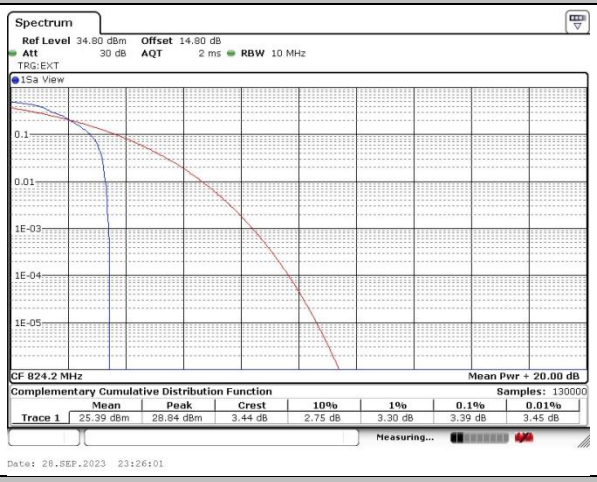
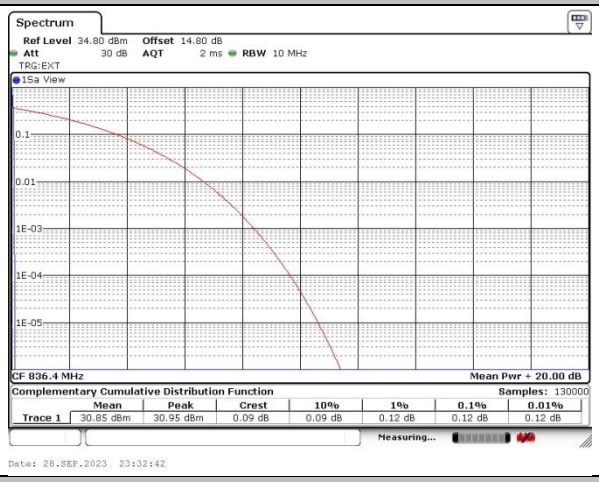
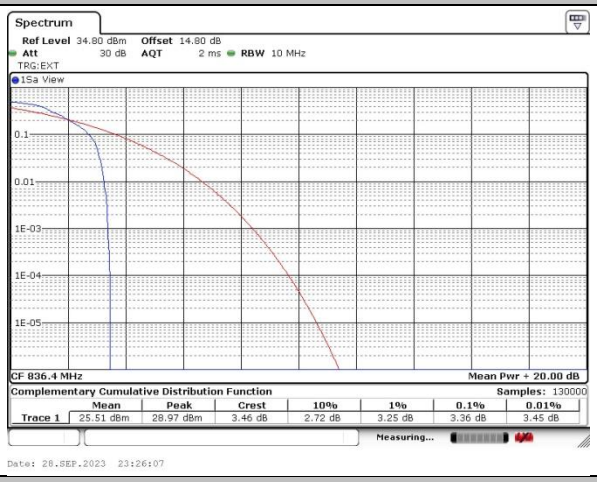
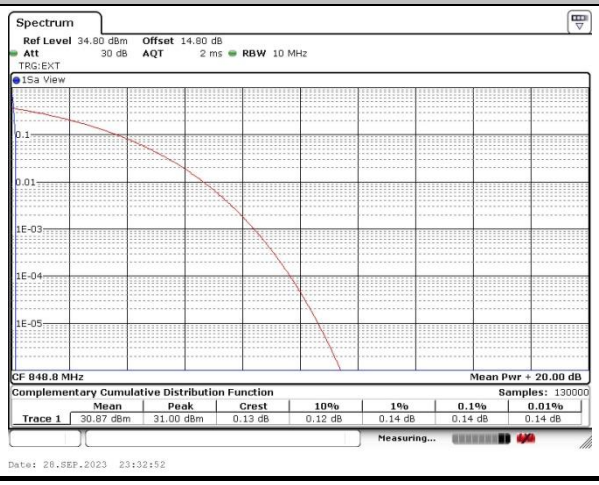
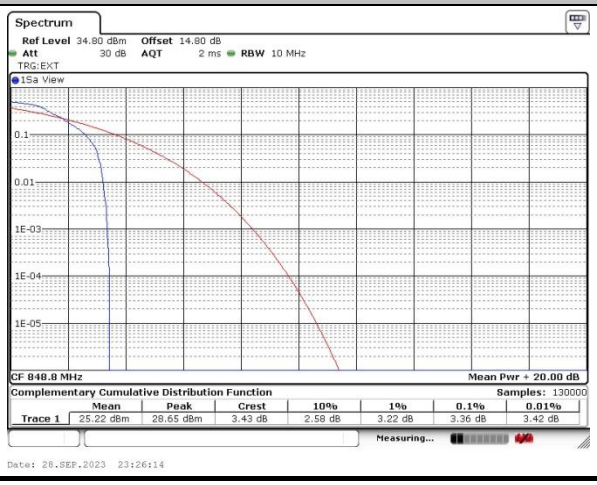
GSM850	Burst Average Power (dBm)			ERP(W)		
TX Channel	128	189	251			
Frequency (MHz)	824.2	836.4	848.8	L	M	H
GSM 1 Tx slot	32.26	32.40	32.33	0.4178	0.4315	0.4246
GPRS 1 Tx slot	32.24	32.38	32.29	0.4159	0.4295	0.4207
GPRS 2 Tx slots	30.75	30.75	30.69	0.2951	0.2951	0.2911
GPRS 3 Tx slots	28.81	28.87	28.77	0.1888	0.1914	0.1871
GPRS 4 Tx slots	26.74	26.77	26.59	0.1172	0.1180	0.1132
EDGE 1 Tx slot	26.81	26.85	26.74	0.1191	0.1202	0.1172
EDGE 2 Tx slots	24.72	24.93	24.89	0.0736	0.0773	0.0766
EDGE 3 Tx slots	22.82	22.84	22.67	0.0475	0.0478	0.0459
EDGE 4 Tx slots	21.33	21.45	21.32	0.0337	0.0347	0.0337

Band		WCDMA Band V			ERP(W)		
TX Channel		4132	4182	4233			
Rx Channel		4357	4407	4458			
Frequency (MHz)		826.4	836.4	846.6	L	M	H
3GPP Rel 99	AMR 12.2Kbps	22.33	22.40	22.36	0.0425	0.0432	0.0428
3GPP Rel 99	RMC 12.2Kbps	22.43	22.50	22.49	0.0435	0.0442	0.0441
3GPP Rel 6	HSDPA Subtest-1	21.29	21.40	21.54	0.0334	0.0343	0.0354
3GPP Rel 6	HSDPA Subtest-2	21.50	21.62	21.35	0.0351	0.0361	0.0339
3GPP Rel 6	HSDPA Subtest-3	20.74	20.92	20.91	0.0294	0.0307	0.0306
3GPP Rel 6	HSDPA Subtest-4	20.93	21.07	21.00	0.0308	0.0318	0.0313
3GPP Rel 8	DC-HSDPA Subtest-1	21.35	21.53	21.32	0.0339	0.0353	0.0337
3GPP Rel 8	DC-HSDPA Subtest-2	21.51	21.45	21.45	0.0352	0.0347	0.0347
3GPP Rel 8	DC-HSDPA Subtest-3	20.74	21.04	21.04	0.0294	0.0316	0.0316
3GPP Rel 8	DC-HSDPA Subtest-4	20.96	20.97	20.85	0.0310	0.0310	0.0302
3GPP Rel 6	HSUPA Subtest-1	21.39	21.61	21.35	0.0342	0.0360	0.0339
3GPP Rel 6	HSUPA Subtest-2	19.49	19.49	19.29	0.0221	0.0221	0.0211
3GPP Rel 6	HSUPA Subtest-3	20.31	20.40	20.38	0.0267	0.0272	0.0271
3GPP Rel 6	HSUPA Subtest-4	19.50	19.55	19.44	0.0221	0.0224	0.0218
3GPP Rel 6	HSUPA Subtest-5	21.48	21.60	21.48	0.0349	0.0359	0.0349

A1. GSM

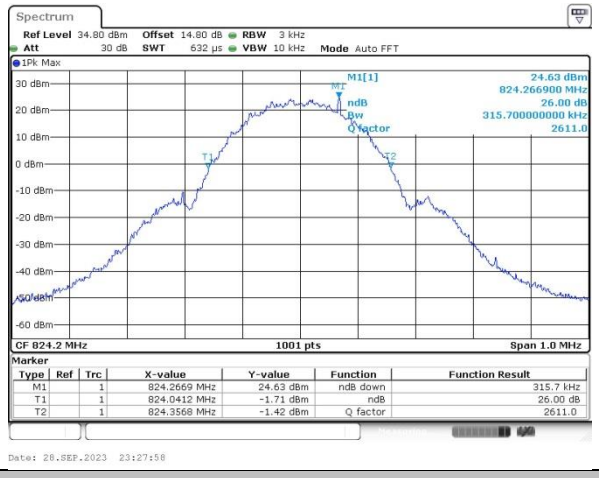
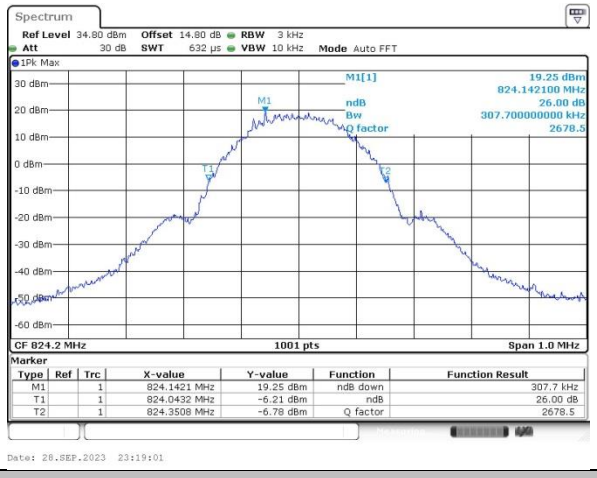
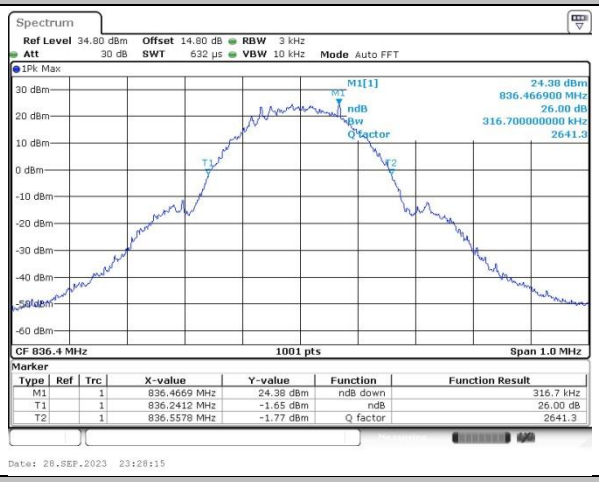
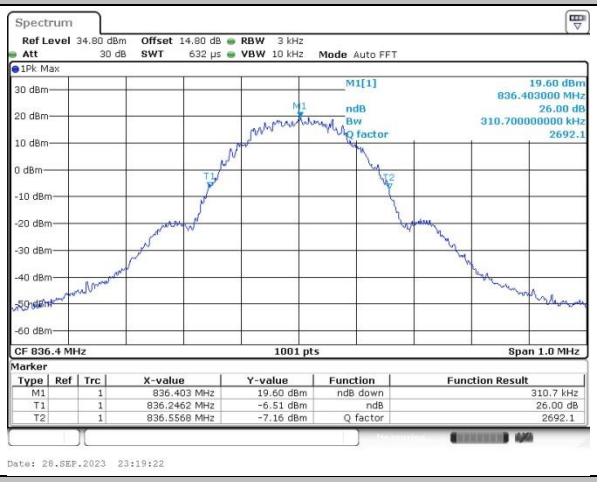
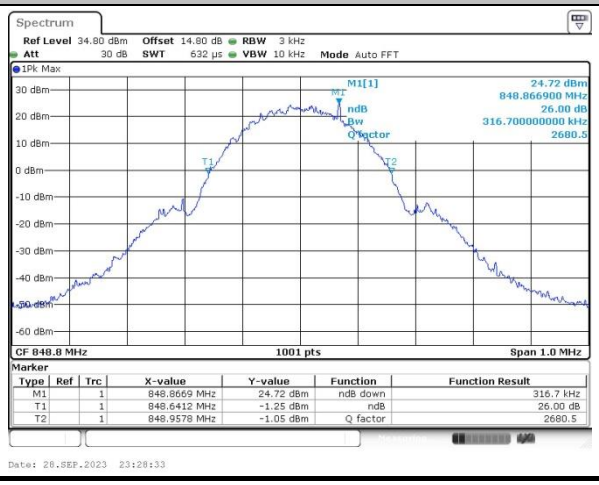
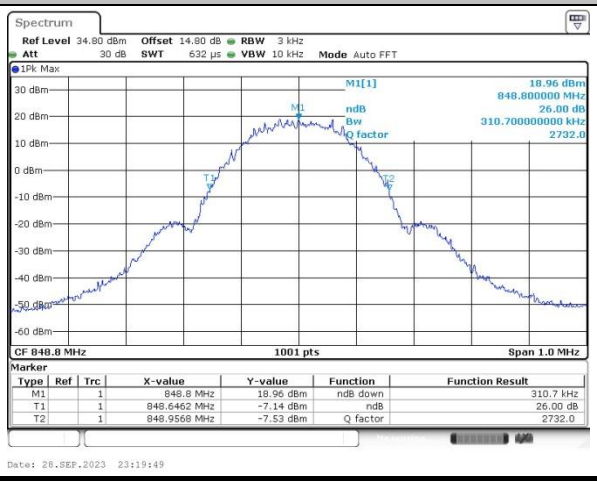
Peak-to-Average Ratio

Mode	GSM850		Limit: 13dB
Mod.	GSM	EDGE class 8	Result
Lowest CH	0.17	3.39	PASS
Middle CH	0.12	3.36	
Highest CH	0.14	3.36	

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

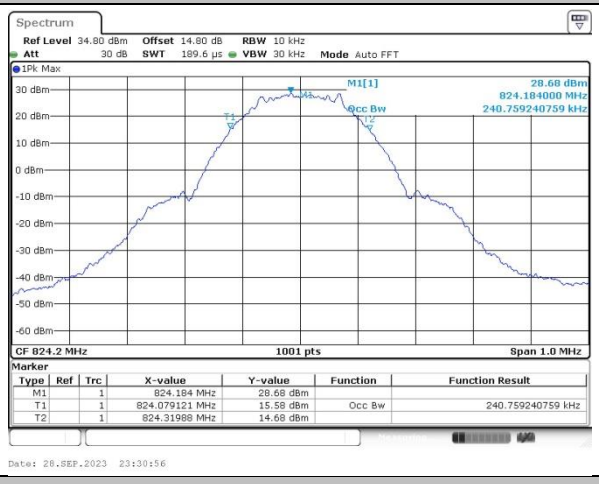
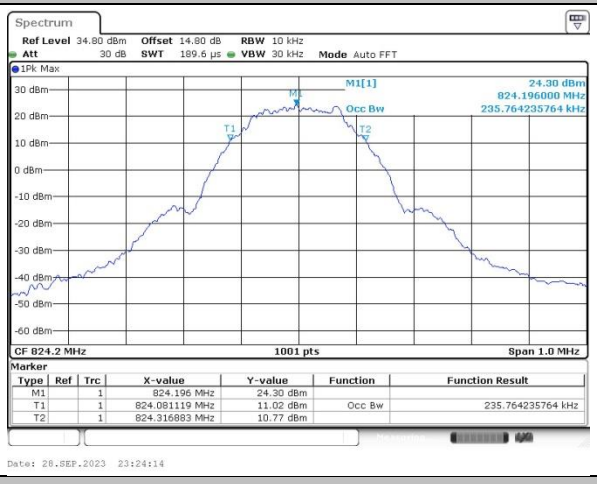
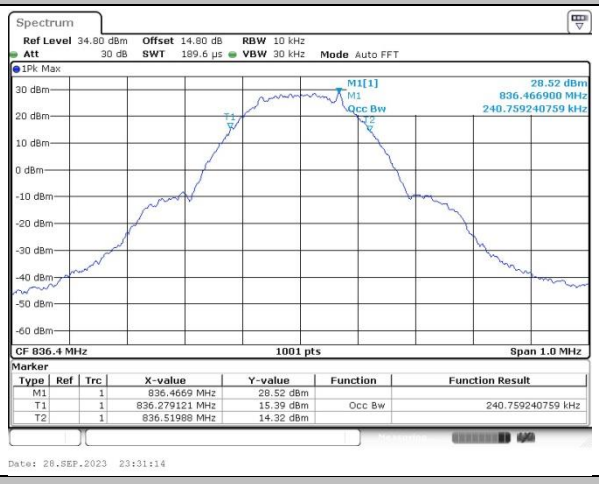
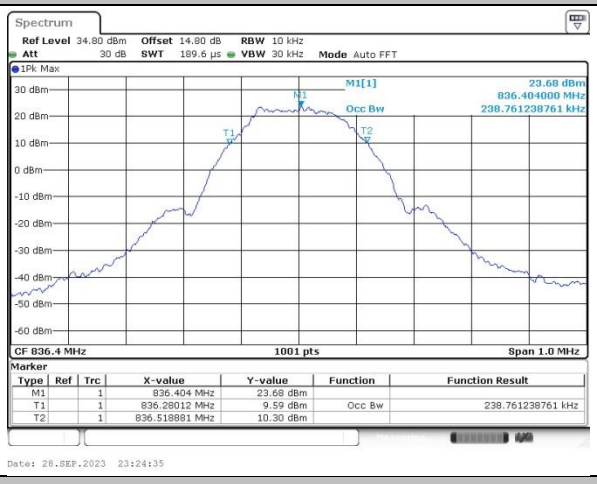
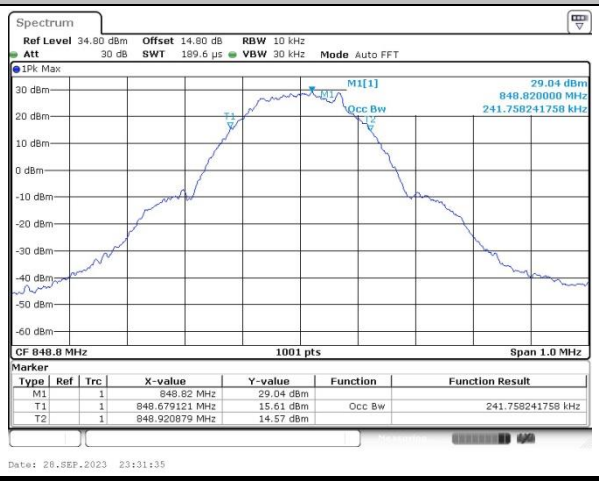
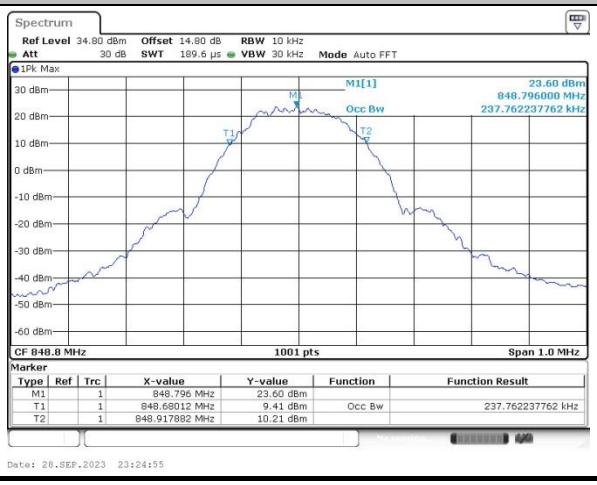
26dB Bandwidth

Mode	GSM850(MHz)	
Mod.	GSM	EDGE class 8
Lowest CH	0.312	0.308
Middle CH	0.317	0.311
Highest CH	0.317	0.311

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

Occupied Bandwidth

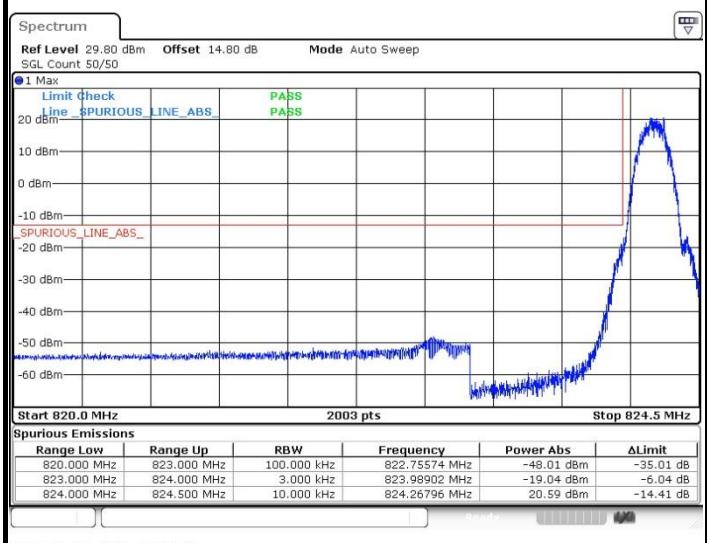
Mode	GSM850(MHz)	
Mod.	GSM	EDGE class 8
Lowest CH	0.241	0.236
Middle CH	0.241	0.239
Highest CH	0.242	0.238

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

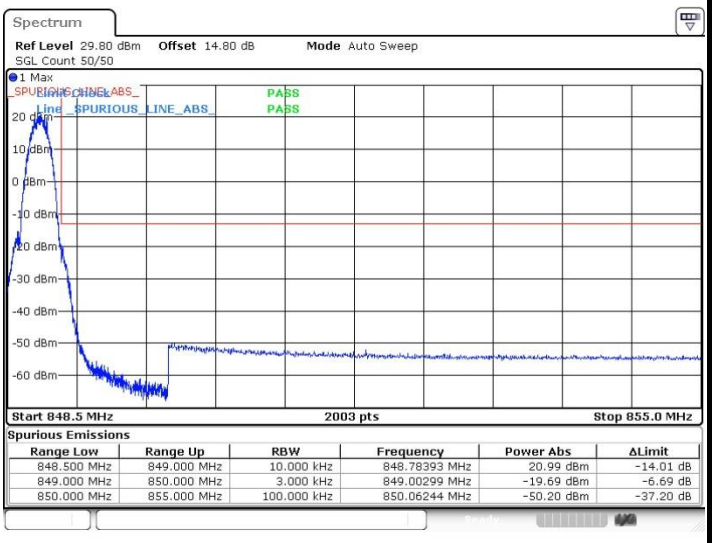
Conducted Band Edge

GSM850 (GSM)

Lowest Band Edge

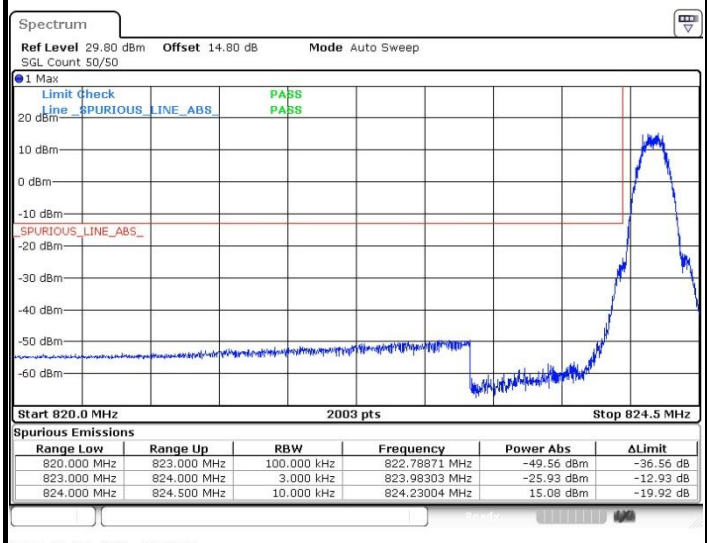


Highest Band Edge

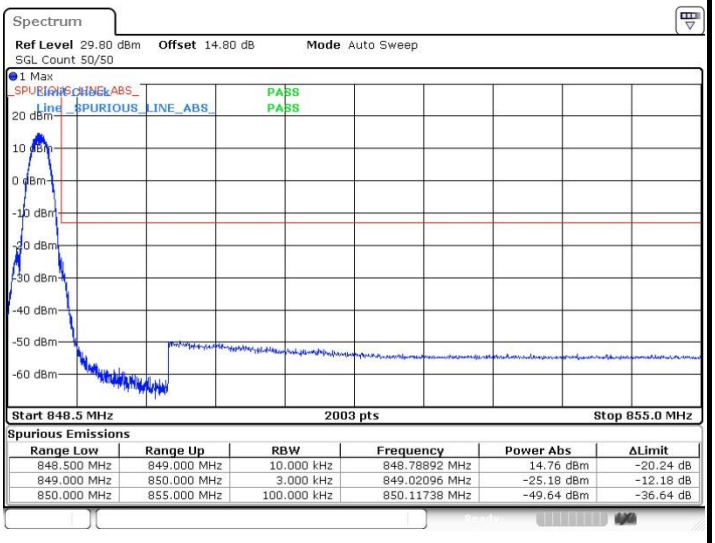


GSM850 (EDGE class 8)

Lowest Band Edge



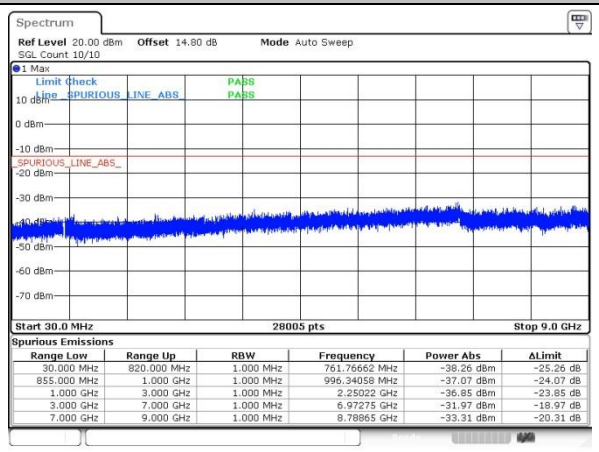
Highest Band Edge



Conducted Spurious Emission

GSM850 (GSM)

Lowest Channel

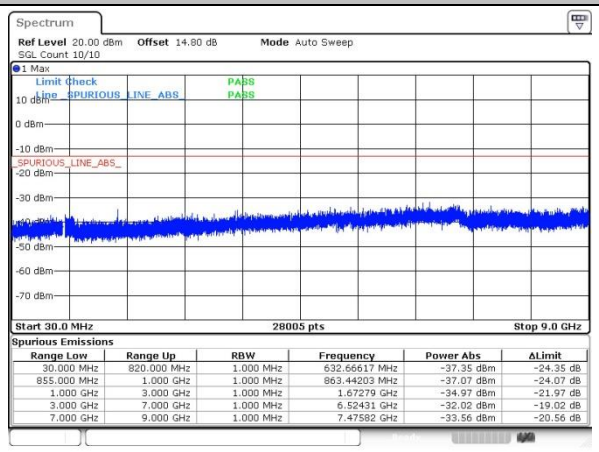


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	820.000 MHz	1.000 MHz	761.76662 MHz	-38.26 dBm	-25.26 dB
855.000 MHz	1.000 GHz	1.000 MHz	996.34058 MHz	-37.07 dBm	-24.07 dB
1.000 GHz	3.000 GHz	1.000 MHz	2.25022 GHz	-36.85 dBm	-23.85 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.97275 GHz	-31.97 dBm	-18.97 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.78865 GHz	-33.31 dBm	-20.31 dB

Date: 28.SEP.2023 23:29:59

Middle Channel

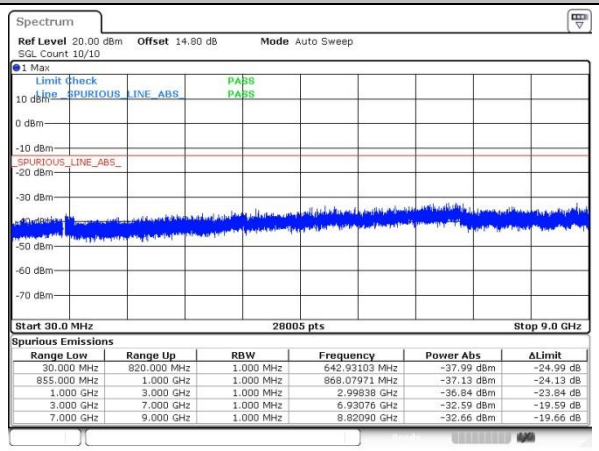


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	820.000 MHz	1.000 MHz	632.66617 MHz	-37.35 dBm	-24.35 dB
855.000 MHz	1.000 GHz	1.000 MHz	863.44203 MHz	-37.07 dBm	-24.07 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.67279 GHz	-34.97 dBm	-21.97 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.52431 GHz	-32.02 dBm	-19.02 dB
7.000 GHz	9.000 GHz	1.000 MHz	7.47582 GHz	-33.56 dBm	-20.56 dB

Date: 28.SEP.2023 23:30:17

Highest Channel



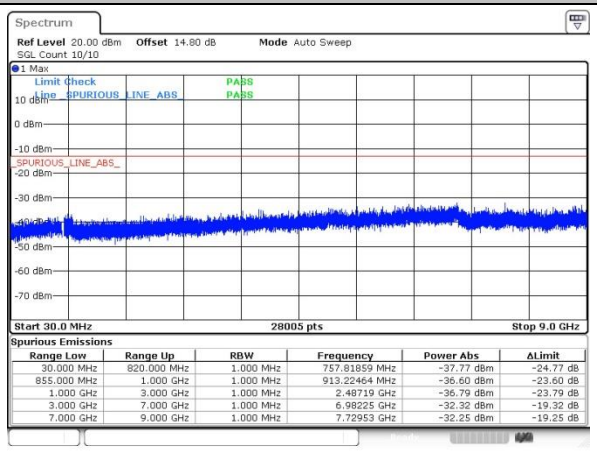
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	820.000 MHz	1.000 MHz	642.93103 MHz	-37.99 dBm	-24.99 dB
855.000 MHz	1.000 GHz	1.000 MHz	868.07971 MHz	-37.13 dBm	-24.13 dB
1.000 GHz	3.000 GHz	1.000 MHz	2.99838 GHz	-36.84 dBm	-23.84 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.93076 GHz	-32.59 dBm	-19.59 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.82090 GHz	-32.66 dBm	-19.66 dB

Date: 28.SEP.2023 23:30:30

GSM850 (EDGE class 8)

Lowest Channel

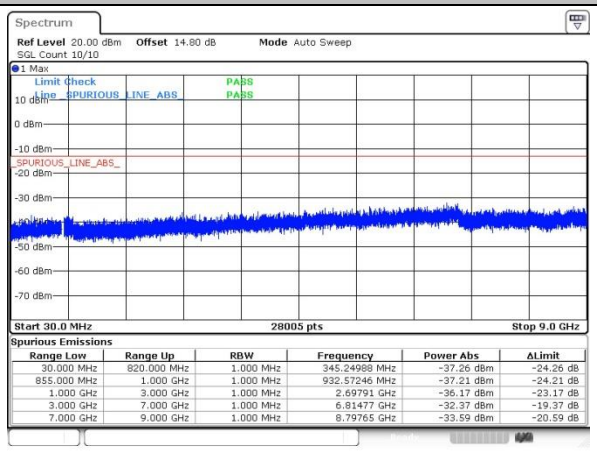


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	820.000 MHz	1.000 MHz	757.81859 MHz	-37.77 dBm	-24.77 dB
855.000 MHz	1.000 GHz	1.000 MHz	913.22464 MHz	-36.60 dBm	-23.60 dB
1.000 GHz	3.000 GHz	1.000 MHz	2.48719 GHz	-36.79 dBm	-23.79 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.98225 GHz	-32.32 dBm	-19.32 dB
7.000 GHz	9.000 GHz	1.000 MHz	7.72953 GHz	-32.25 dBm	-19.25 dB

Date: 28.SEP.2023 23:25:22

Middle Channel

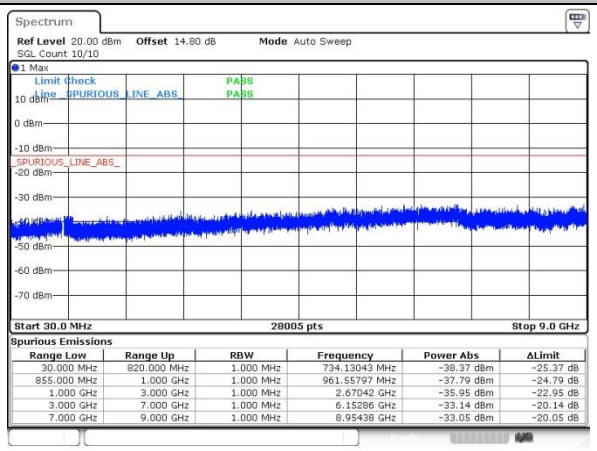


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	820.000 MHz	1.000 MHz	345.24988 MHz	-37.26 dBm	-24.26 dB
855.000 MHz	1.000 GHz	1.000 MHz	932.57246 MHz	-37.21 dBm	-24.21 dB
1.000 GHz	3.000 GHz	1.000 MHz	2.69791 GHz	-36.17 dBm	-23.17 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.81477 GHz	-32.37 dBm	-19.37 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.79765 GHz	-33.59 dBm	-20.59 dB

Date: 28.SEP.2023 23:25:35

Highest Channel



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	820.000 MHz	1.000 MHz	734.13043 MHz	-38.37 dBm	-25.37 dB
855.000 MHz	1.000 GHz	1.000 MHz	961.55797 MHz	-37.79 dBm	-24.79 dB
1.000 GHz	3.000 GHz	1.000 MHz	2.67042 GHz	-35.95 dBm	-22.95 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.15286 GHz	-33.14 dBm	-20.14 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.95438 GHz	-33.05 dBm	-20.05 dB

Date: 28.SEP.2023 23:25:49

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	0.0044	0.0031	PASS
40	Normal Voltage	0.0531	0.0124	
30	Normal Voltage	0.0069	0.0422	
20(Ref.)	Normal Voltage	0.0000	0.0000	
10	Normal Voltage	0.0042	0.0331	
0	Normal Voltage	0.0125	0.0457	
-10	Normal Voltage	0.0045	0.0439	
-20	Normal Voltage	0.0244	0.0154	
-30	Normal Voltage	0.0361	0.0461	
20	Maximum Voltage	0.0422	0.0236	
20	Normal Voltage	0.0116	0.0150	
20	Battery End Point	0.0068	0.0089	

Note: Normal Voltage = 3.91V ; Battery End Point (BEP) =3.4V. ; Maximum Voltage =4.5V

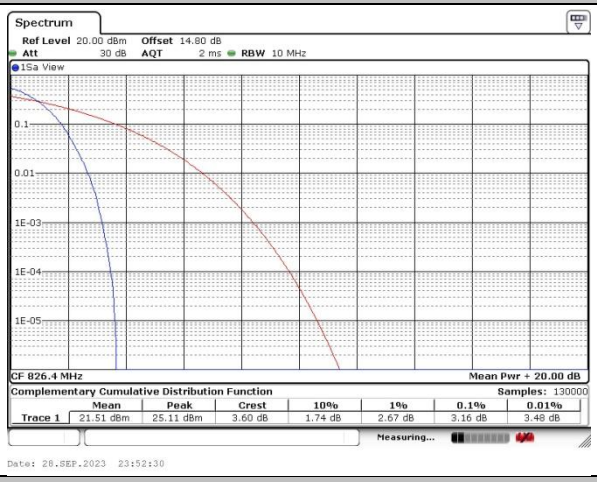
A2. WCDMA

Peak-to-Average Ratio

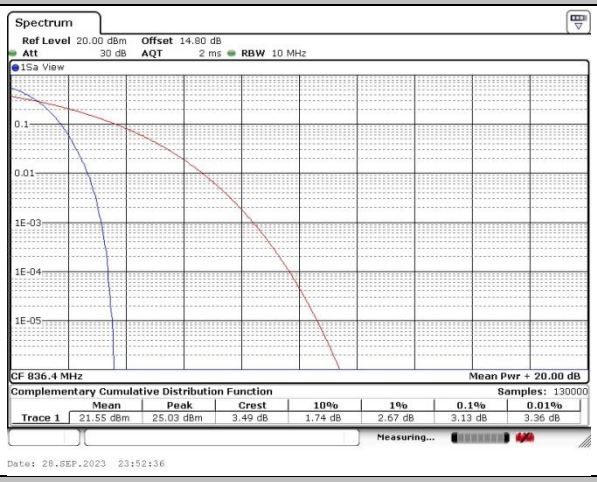
Mode	WCDMA Band V	Limit: 13dB
Mod.	RMC 12.2Kbps	Result
Lowest CH	3.16	PASS
Middle CH	3.13	
Highest CH	3.04	

WCDMA Band V (RMC 12.2Kbps)

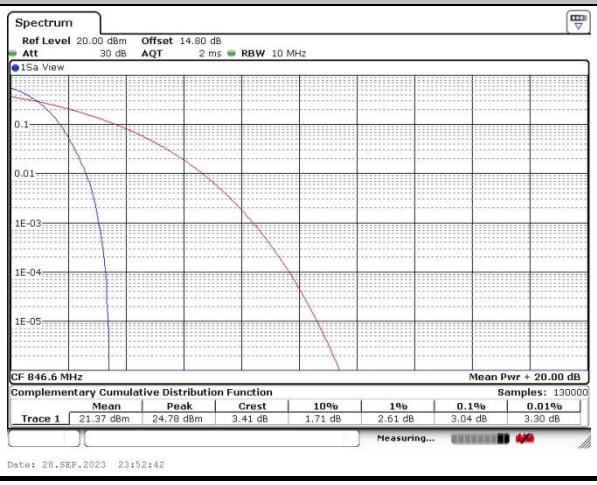
Lowest Channel



Middle Channel



Highest Channel

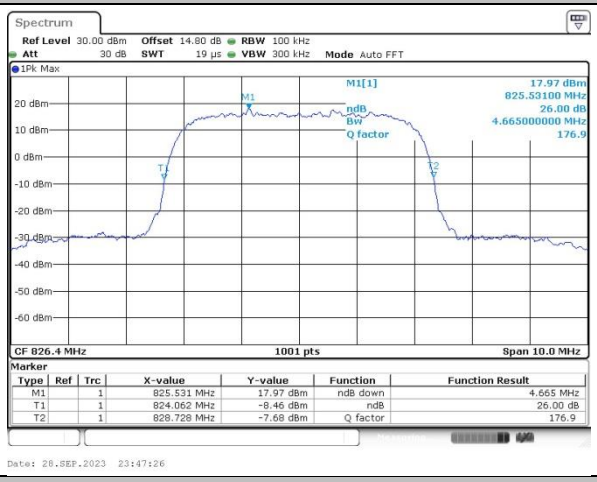


26dB Bandwidth

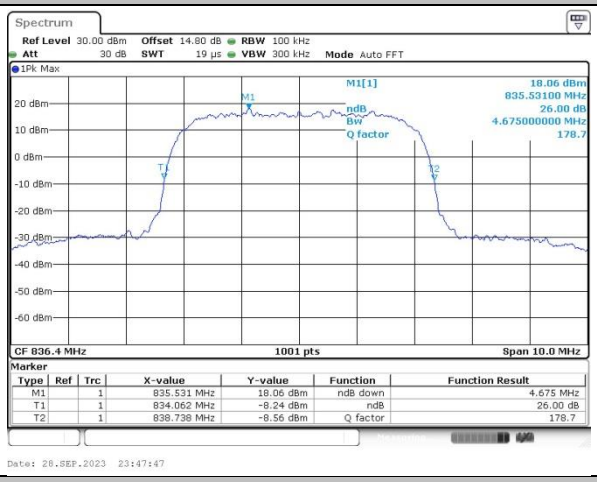
Mode	WCDMA Band V(MHz)
Mod.	RMC 12.2Kbps
Lowest CH	4.665
Middle CH	4.675
Highest CH	4.665

WCDMA Band V (RMC 12.2Kbps)

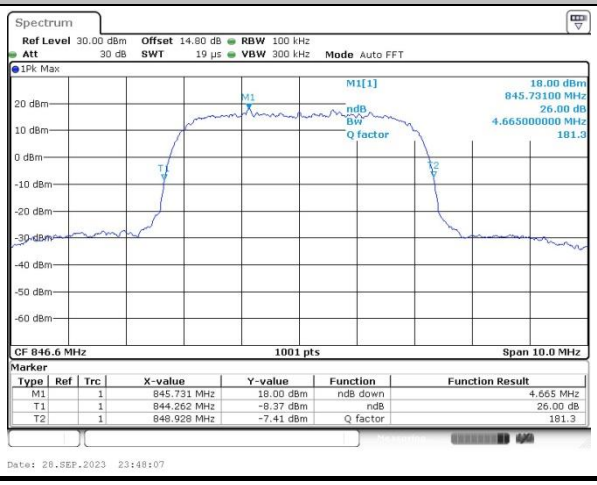
Lowest Channel



Middle Channel



Highest Channel

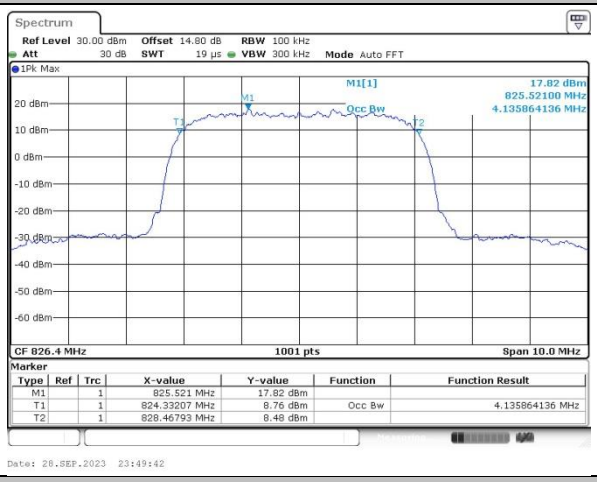


Occupied Bandwidth

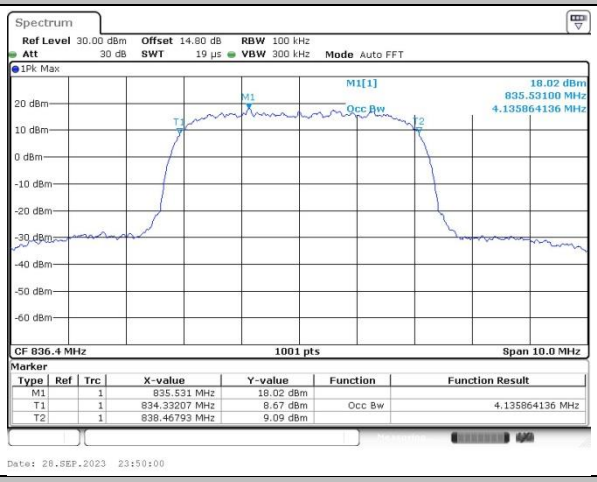
Mode	WCDMA Band V(MHz)
Mod.	RMC 12.2Kbps
Lowest CH	4.136
Middle CH	4.136
Highest CH	4.146

WCDMA Band V (RMC 12.2Kbps)

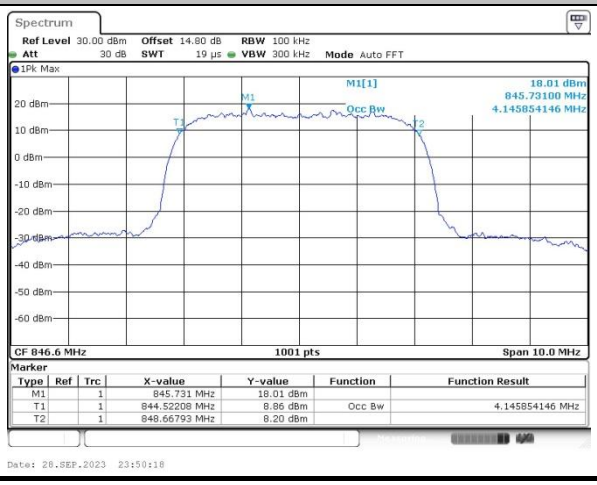
Lowest Channel



Middle Channel

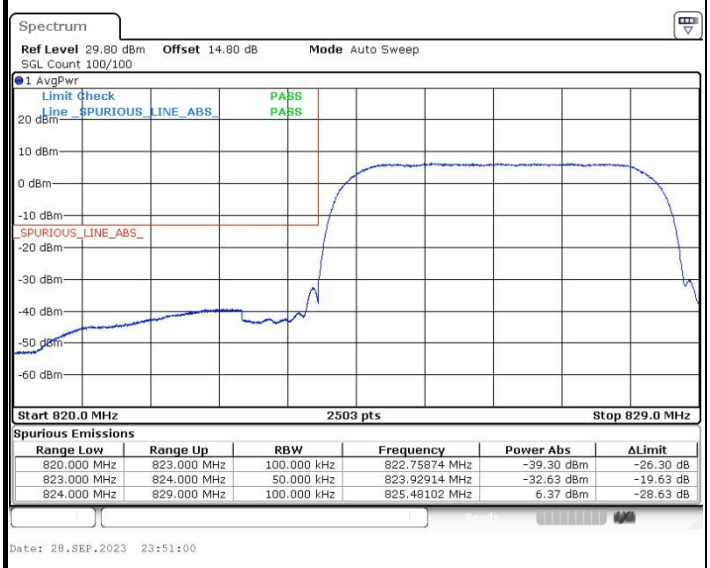


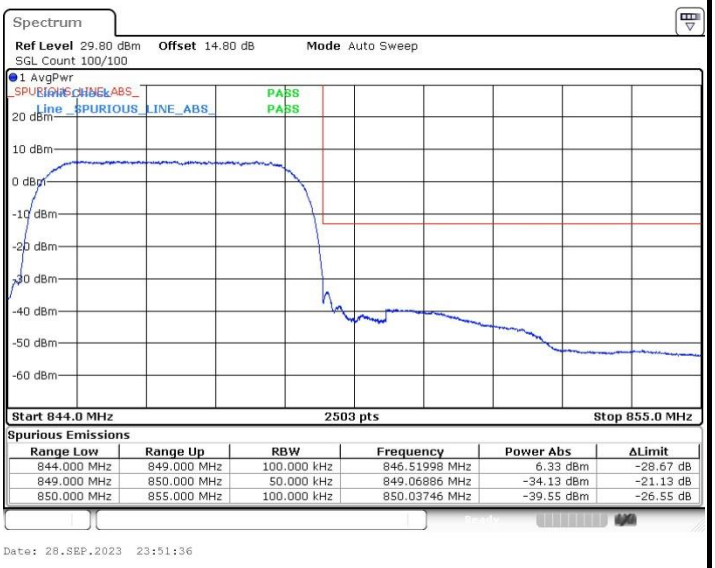
Highest Channel



Conducted Band Edge

WCDMA Band V (RMC 12.2Kbps)	
Lowest Band Edge	**Highest Band Edge**

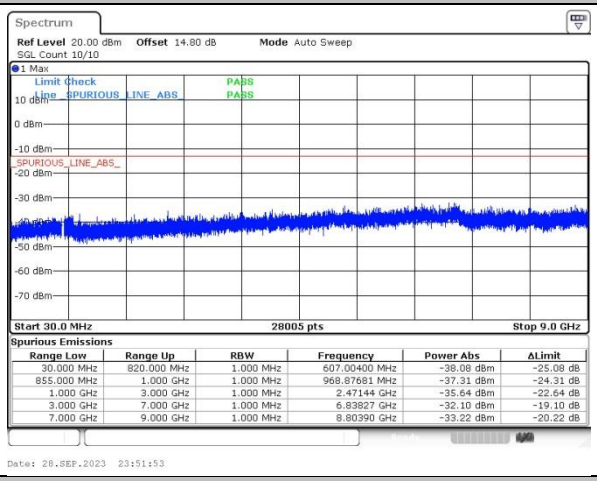




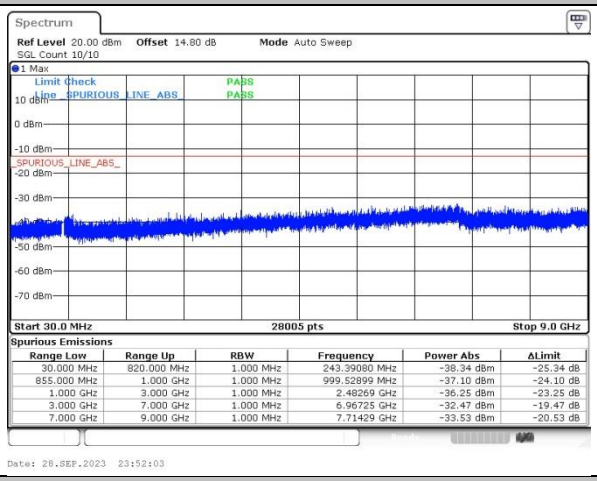
Conducted Spurious Emission

WCDMA Band V (RMC 12.2Kbps)

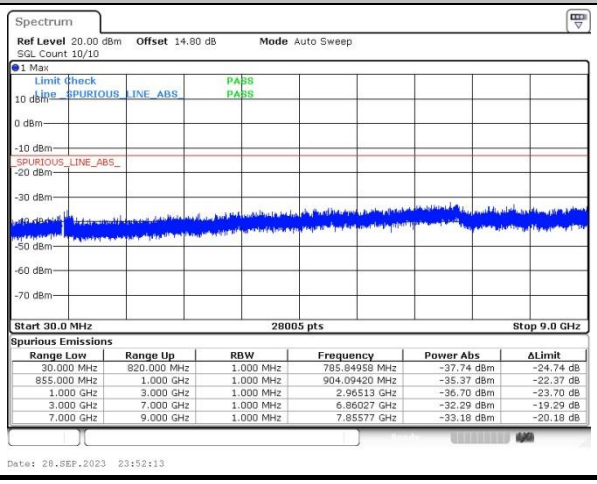
Lowest Channel



Middle Channel



Highest Channel



Frequency Stability

Test Conditions	Middle Channel	WCDMA Band V (RMC 12.2Kbps)	Limit 2.5ppm
Temperature (°C)	Voltage (Volt)	Deviation (ppm)	Result
50	Normal Voltage	0.0056	PASS
40	Normal Voltage	0.0049	
30	Normal Voltage	0.0118	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0131	
0	Normal Voltage	0.0166	
-10	Normal Voltage	0.0228	
-20	Normal Voltage	0.0192	
-30	Normal Voltage	0.0302	
20	Maximum Voltage	0.0411	
20	Normal Voltage	0.0139	
20	Battery End Point	0.0088	

Note: Normal Voltage = 3.91V ; Battery End Point (BEP) =3.4V. ; Maximum Voltage =4.5V

Appendix B. Test Results of Radiated Test

Radiated Spurious Emission

Test Engineer :	Carl Ni	Temperature :	23~25℃
		Relative Humidity :	41~42%

GSM850 (GSM)								
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	1672	-61.17	-13	-48.17	-68.14	1.58	10.70	H
	2512	-43.47	-13	-30.47	-51.72	2.10	12.50	H
	3344	-58.53	-13	-45.53	-67.42	2.86	13.90	H
	1672	-52.73	-13	-39.73	-59.70	1.58	10.70	V
	2512	-51.67	-13	-38.67	-59.92	2.10	12.50	V
	3344	-53.81	-13	-40.81	-62.70	2.86	13.90	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

GSM850 (EDGE 1 Tx slots)								
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	1672	-60.48	-13	-47.48	-67.45	1.58	10.70	H
	2512	-52.89	-13	-39.89	-61.14	2.10	12.50	H
	3344	-57.17	-13	-44.17	-66.06	2.86	13.90	H
	1672	-57.03	-13	-44.03	-64.00	1.58	10.70	V
	2512	-56.14	-13	-43.14	-64.39	2.10	12.50	V
	3344	-58.03	-13	-45.03	-66.92	2.86	13.90	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

WCDMA Band V(RMC 12.2Kbps)								
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	1672	-65.46	-13	-52.46	-72.43	1.58	10.70	H
	2512	-60.92	-13	-47.92	-69.17	2.10	12.50	H
	3344	-61.33	-13	-48.33	-70.22	2.86	13.90	H
	1672	-63.54	-13	-50.54	-70.51	1.58	10.70	V
	2512	-60.50	-13	-47.50	-68.75	2.10	12.50	V
	3344	-61.14	-13	-48.14	-70.03	2.86	13.90	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.