



FCC RADIO TEST REPORT

FCC ID : APYHRO00331
Equipment : Smart phone
Brand Name : SHARP
Model Name : APYHRO00331
Applicant : SHARP CORPORATION
1 Takumi-cho, Sakai-ku, Sakai City, Osaka 590-8522, Japan
Manufacturer : SHARP CORPORATION
1 Takumi-cho, Sakai-ku, Sakai City, Osaka 590-8522, Japan
Standard : FCC 47 CFR Part 2, 22(H), 24(E)

The product was received on Mar. 11, 2024 and testing was performed from Apr. 09, 2024 to Apr. 13, 2024. We, Sporton International Inc. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA-603-E and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval from Sporton International Inc. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Louis Wu

Approved by: Louis Wu

Sporton International Inc. EMC & Wireless Communications Laboratory

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)



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History of this test report

Report No.	Version	Description	Issue Date
FG3D2225A	01	Initial issue of report	May 09, 2024



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.2	§2.1046	Conducted Output Power	Pass	-
	§22.913 (a)(5)	Effective Radiated Power (GSM850) (WCDMA Band V)		
	§24.232 (c)	Equivalent Isotropic Radiated Power (GSM1900)		
3.3	§24.232 (d)	Peak-to-Average Ratio	Pass	-
3.4	§2.1049 §22.917 (b) §24.238 (b)	Occupied Bandwidth (GSM850) (WCDMA Band V) (GSM1900)	Pass	-
3.5	§2.1051 §22.917 (a) §24.238 (a)	Band Edge Measurement (GSM850) (WCDMA Band V) (GSM1900)	Pass	-
3.6	§2.1051 §22.917 (a) §24.238 (a)	Conducted Emission (GSM850) (WCDMA Band V) (GSM1900)	Pass	-
3.7	§2.1055 §22.355 §24.235	Frequency Stability Temperature & Voltage	Pass	-
4.4	§2.1053 §22.917 (a) §24.238 (a)	Field Strength of Spurious Radiation (GSM850) (WCDMA Band V) (GSM1900)	Pass	27.21 dB under the limit at 1697.00 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.

Reviewed by: Keven Cheng

Report Producer: Lucy Wu



1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature	
General Specs	GSM/WCDMA/LTE, Bluetooth, Wi-Fi 2.4GHz 802.11b/g/n/ac, Wi-Fi 5GHz 802.11a/n/ac, NFC, and GNSS.
Antenna Type	WWAN: <Ant. 0>: Monopole Antenna <Ant. 1>: PIFA Antenna <Ant. 2>: Monopole Antenna WLAN: Loop Antenna Bluetooth: Loop Antenna GPS / Glonass / BDS / Galileo: PIFA Antenna NFC: Loop Antenna

Antenna information(dBi)			
Band	Ant0	Ant1	Main Ant. #
GSM850	-4.62		0
GSM1900		-0.68	1
WCDMA B5	-4.62		0

Remark: The EUT's information above is declared by manufacturer. Please refer to Disclaimer in report summary.

Item	Main		2nd Source			
	Main Sample		Sample 2		Sample 3	
	Vendor	Model Number	Vendor	Model Number	Vendor	Model Number
Memory	SAMSUNG	SA05P91D010	Hynix	SA0QG9G5010	Micron	SA0D81SF010
PA	QORVO	SA07048B020 (QM77048B)	QORVO	SA077048020 (QM77048)	QORVO	SA077048020 (QM77048)
FPC_USB	PBH	MESX314004A	SUNFLEX	MESX114012A	SUNFLEX	MESX114012A
FPC_AJ	PBH	MESX314003A	SUNFLEX	MESX114013A	SUNFLEX	MESX114013A
FPC_Main	PBH	MESX414001A	SUNFLEX	MESX414011A	SUNFLEX	MESX414011A
FPC_SPK	AKM	MESX414004A	SUNFLEX	MESX114015A	SUNFLEX	MESX114015A
FPC_Side_Key	PBH	MESX414002A	AKM	MESX414012A	AKM	MESX414012A
FPC_flashlight	PBH	MESX414003A	SUNFLEX	MESX414013A	SUNFLEX	MESX414013A
rear housing	DY	MESX461130A	COXON	MESX461131A	COXON	MESX461131A
Battery	SCUD	BPSX400001S (SX4)	EVE	BPSX400002S (X4)	EVE	BPSX400002S (X4)
Display	DJN	SLX1462BX00	CPT	SLX65WM2X00	CPT	SLX65WM2X00
Camera 50M	Shinotech	S0CNN72B000	Union Image	S0C50A350A0	Union Image	S0C50A350A0
Camera 8M	Shinotech	S0CF891B060	Union Image	S0C8F357060	Union Image	S0C8F357060
E-compass	MEMSIC	SA0C56030A0	QST	SA0C6308130	QST	SA0C6308130
DPDT	MAXSCEND	SA08546C020	CANAANTEK	SA01122N080	CANAANTEK	SA01122N080
Switch	MAXSCEND	SA08621E080	Richwave	SA086102080	Richwave	SA086102080
P-sensor	EMINENT	SA0MN789080	Sensortek	SA033562020	Sensortek	SA033562020
G- sensor	TDK	SA042670020	Bosch	SA0MI320020	Bosch	SA0MI320020



1.2 Modification of EUT

No modifications made to the EUT during the testing.

1.3 Testing Location

Test Site	Sporton International Inc. EMC & Wireless Communications Laboratory
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978
Test Site No.	Sporton Site No. TH03-HY
Test Engineer	Eric Wu
Temperature (°C)	20.5~22.5
Relative Humidity (%)	43.2~45.2

Test Site	Sporton International Inc. Wensan Laboratory
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	Sporton Site No. 03CH11-HY (TAF Code: 3786)
Test Engineer	Yuan Lee, Sam Chou and Troye Hsieh
Temperature (°C)	20~21.2
Relative Humidity (%)	53.1~66.8
Remark	The Radiated Spurious Emission Test Item subcontracted to Sporton International Inc. Wensan Laboratory.

Note: The test site complies with ANSI C63.4 2014 requirement.

FCC Designation No.: TW1190 and TW3786



1.4 Applicable Standards

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

- ♦ ANSI C63.26-2015
- ♦ ANSI / TIA-603-E
- ♦ FCC 47 CFR Part 2, 22(H), 24(E)
- ♦ FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- ♦ FCC KDB 412172 D01 Determining ERP and EIRP v01r01
- ♦ FCC KDB 414788 D01 Radiated Test Site v01r01

Remark:

1. All the test items were validated and recorded in accordance with the standards without any modification during the testing.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.
3. The TAF code is not including all the FCC KDB listed without accreditation.

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.

For radiated measurement, the measured emission level of the EUT was maximized by rotating the EUT on a turntable, adjusting the orientation of the EUT and EUT antenna in three orthogonal axis (X: flat, Y: portrait, Z: landscape), and adjusting the measurement antenna orientation, following C63.26 exploratory test procedures and only the worst case emissions were reported in this report.

Radiated emissions were investigated as following frequency range:

1. 30 MHz to 9000 MHz for GSM850 and WCDMA Band V
2. 30 MHz to 19100 MHz for GSM1900

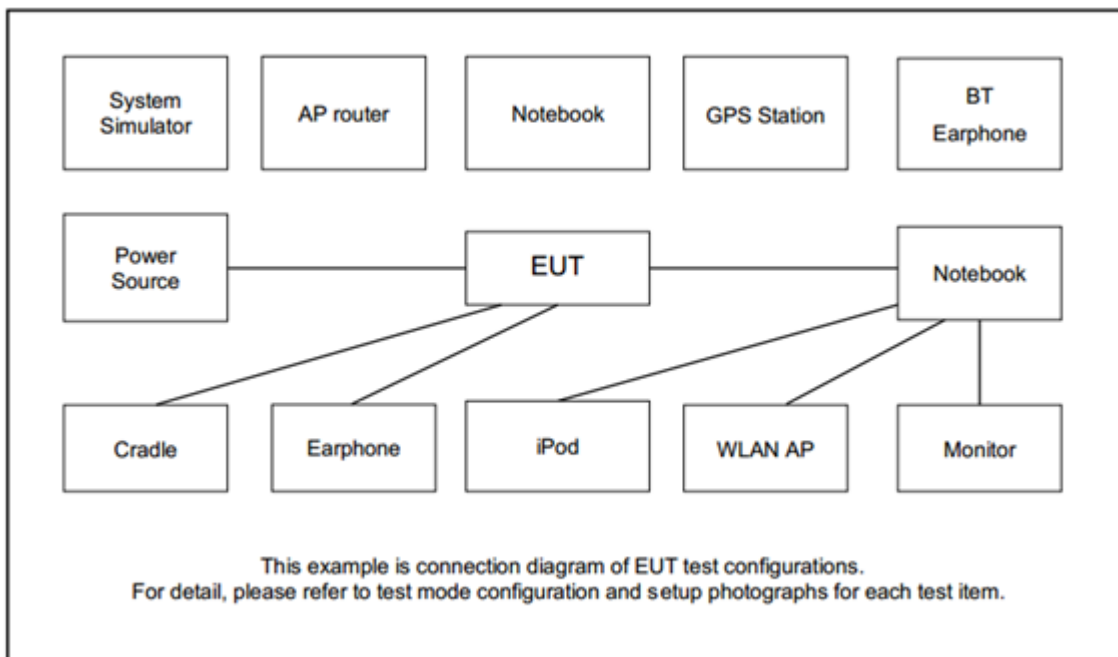
All modes, data rates and positions were investigated.

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

Test Modes		
Band	Radiated TCs	Conducted TCs
GSM850	■ GPRS Class 8 Link	■ GPRS Class 8 Link
GSM1900	■ GPRS Class 8 Link	■ GPRS Class 8 Link
WCDMA Band V	■ RMC 12.2Kbps Link	■ RMC 12.2Kbps Link

Remark: All the radiated test cases were performed with Battery 1 and Main Sample.

2.2 Connection Diagram of Test System





2.3 Support Unit used in test configuration

Item	Equipment	Brand Name	Model No.	FCC ID	Data Cable	Power Cord
1.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
2.	Earphone	NOKIA	WH-108	N/A	Unshielded, 1.5 m	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 4.2 dB and a 10 dB attenuator.

Example:

$$\begin{aligned} \text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)} \\ &= 4.2 + 10 = 14.2 \text{ (dB)} \end{aligned}$$

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

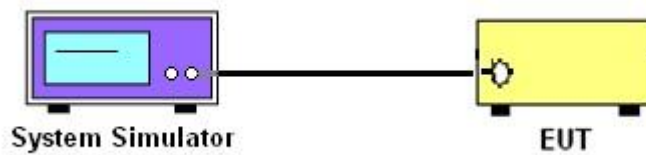
3 Conducted Test Result

3.1 Measuring Instruments

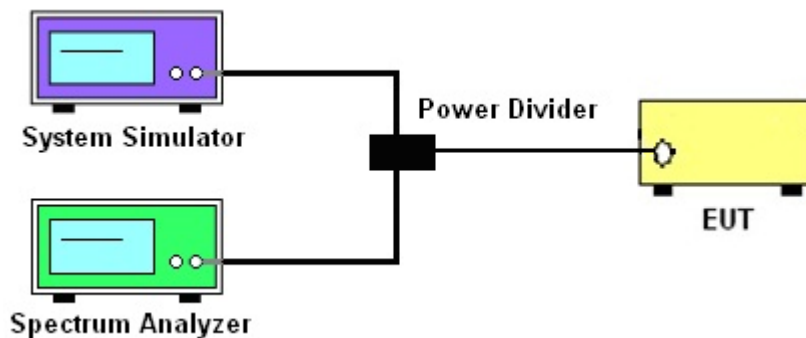
Please refer to the measuring equipment list in this test report.

3.1.1 Test Setup

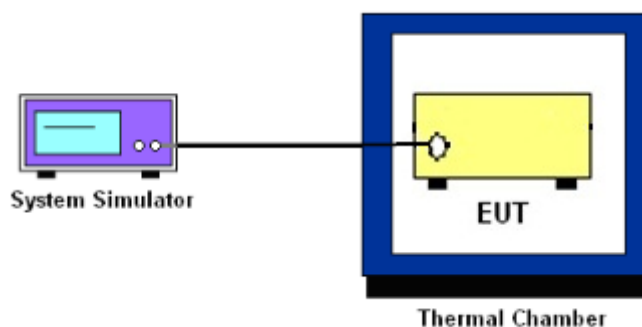
3.1.2 Conducted Output Power



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



3.1.4 Frequency Stability



3.1.5 Test Result of Conducted Test

Please refer to Appendix A.



3.2 Conducted Output Power and ERP/EIRP

3.2.1 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

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

3.2.2 Test Procedures

1. The transmitter output port is connected to the system simulator.
2. Set EUT at maximum power through system simulator.
3. Select the lowest, middle, and the highest channels for each band and different modulation.
4. Measure the maximum burst average power for GSM and maximum average power for other modulation signal.



3.3 Peak-to-Average Ratio

3.3.1 Description of the PAR Measurement

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

3.3.2 Test Procedures

The testing follows ANSI C63.26-2015 Section 5.2.6

1. The EUT is connected to spectrum analyzer and system simulator via a power divider.
2. Set EUT to transmit at maximum output power.
3. When the duty cycle is less than 98%, then signal gating will be implemented on the spectrum analyzer by triggering from the system simulator.
4. Set the CCDF (Complementary Cumulative Distribution Function) option of the spectrum analyzer.
5. Record the maximum PAPR level associated with a probability of 0.1%.



3.4 99% Occupied Bandwidth and 26dB Bandwidth Measurement

3.4.1 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.

3.4.2 Test Procedures

The testing follows ANSI C63.26-2015 Section 5.4.3 (26dB) and Section 5.4.4 (99OB)

1. The EUT is connected to spectrum analyzer and system simulator via a power divider.
2. 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.
3. 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.
4. Set the detection mode to peak, and the trace mode to max hold.
5. 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)
6. Determine the “-26 dB down amplitude” as equal to (Reference Value – X).
7. 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.
8. Use the 99 % power bandwidth function of the spectrum analyzer and report the measured bandwidth.



3.5 Conducted Band Edge

3.5.1 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.

3.5.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 6.1.

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



3.6 Conducted Spurious Emission

3.6.1 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 10th harmonic.

3.6.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 6.1.

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



3.7 Frequency Stability

3.7.1 Description of Frequency Stability Measurement

22.355

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 $\pm 0.00025\%$ ($\pm 2.5\text{ppm}$) of the center frequency.

24.235

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

3.7.2 Test Procedures for Temperature Variation

The testing follows FCC KDB 971168 D01 v03r01 Section 9.0.

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

3.7.3 Test Procedures for Voltage Variation

The testing follows FCC KDB 971168 D01 v03r01 Section 9.0.

1. The EUT is placed in a temperature chamber at $20\pm 5^{\circ}\text{C}$ and connected with the system simulator.
2. The power supply voltage to the EUT is varied from 85% to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency is measured for the worst case.

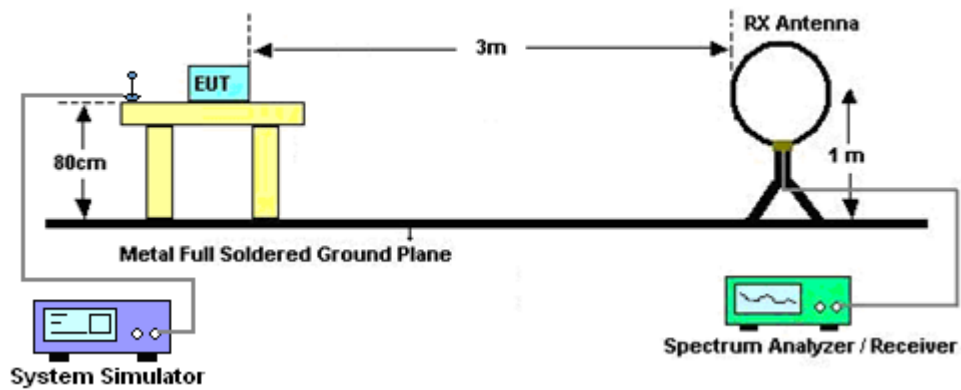
4 Radiated Test Items

4.1 Measuring Instruments

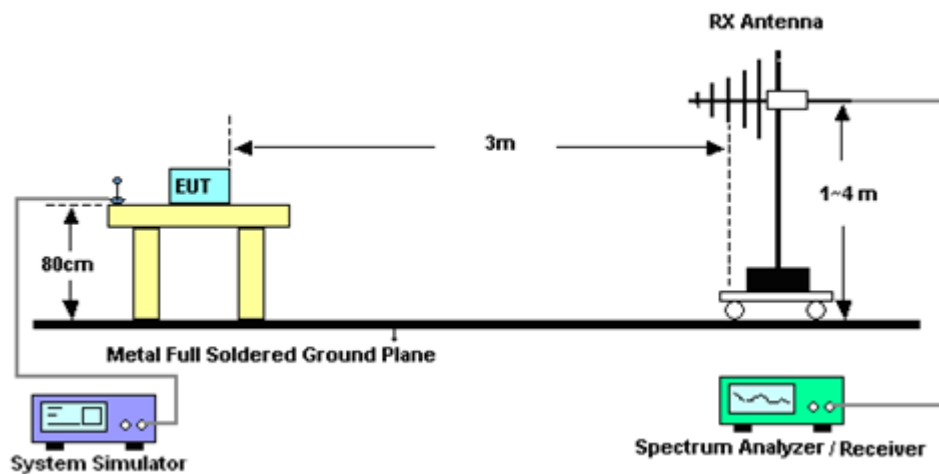
Please refer to the measuring equipment list in this test report.

4.2 Test Setup

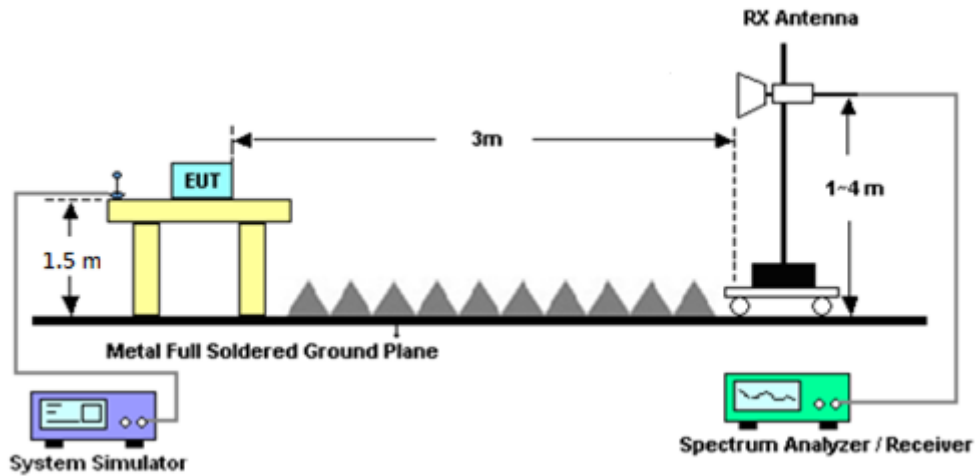
For radiated test below 30MHz



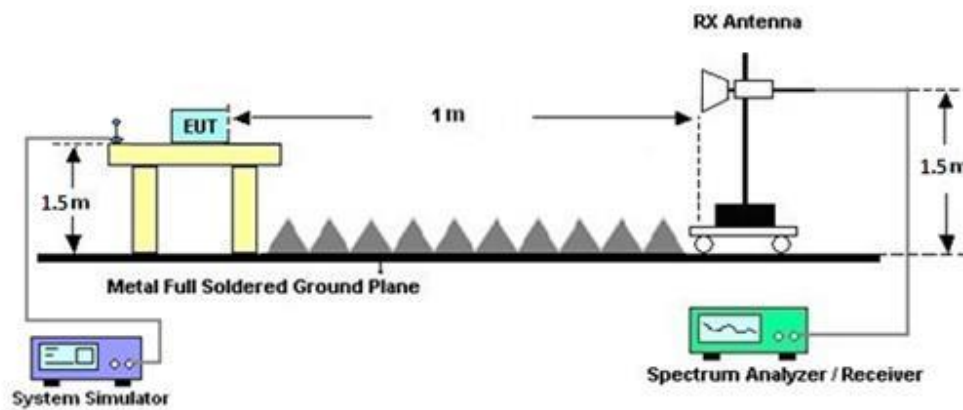
For radiated test from 30MHz to 1GHz



For radiated test from 1GHz to 18GHz



For radiated test above 18GHz



4.3 Test Result of Radiated Test

Please refer to Appendix B.

Note:

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

There is adequate comparison measurement of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result came out very similar.



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

The testing follows FCC KDB 971168 D01 v03r01 Section 7 and ANSI C63.26-2015 section 5.5.4 Radiated measurement using the field strength method.

1. The EUT is placed on a rotatable wooden table 0.8 meters for frequency below 1 GHz and 1.5 meter for frequency above 1 GHz above the ground.
2. The EUT is set 3 meters away from the receiving antenna, which is mounted on the antenna tower.
3. The table is rotated 360 degrees to determine the position of the highest spurious emission.
4. 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.
5. Make the measurement with the spectrum analyzer's RBW = 1 MHz, VBW = 3 MHz, taking record of maximum spurious emission.
6. To convert spectrum reading E(dBuV/m) to EIRP(dBm)
$$\text{EIRP(dBm)} = \text{Level (dBuV/m)} + 20\log(d) - 104.77,$$
where d is the distance at which field strength limit is specified in the rules
7. Field Strength Level (dBm) = Spectrum Reading (dBm) + Antenna Factor + Cable Loss + Read Level - Preamp Factor.
8. ERP (dBm) = EIRP (dBm) - 2.15
9. The RF fundamental frequency shall be excluded against the limit line in the operating frequency band.



5 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Bilog Antenna	TESEQ	CBL 6111D & N-6-06	35414 & AT-N0602	30MHz~1GHz	Oct. 07, 2023	Apr. 09, 2024~ Apr. 13, 2024	Oct. 06, 2024	Radiation (03CH11-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Sep. 12, 2023	Apr. 09, 2024~ Apr. 13, 2024	Sep. 11, 2024	Radiation (03CH11-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-01620	1GHz~18GHz	Aug. 17, 2023	Apr. 09, 2024~ Apr. 13, 2024	Aug. 16, 2024	Radiation (03CH11-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	1223	18GHz~40GHz	Jul. 10, 2023	Apr. 09, 2024~ Apr. 13, 2024	Jul. 09, 2024	Radiation (03CH11-HY)
Amplifier	SONOMA	310N	187312	9kHz~1GHz	Dec. 08, 2023	Apr. 09, 2024~ Apr. 13, 2024	Dec. 07, 2024	Radiation (03CH11-HY)
Preamplifier	Keysight	83017A	MY53270080	1GHz~26.5GHz	Mar. 25, 2024	Apr. 09, 2024~ Apr. 13, 2024	Mar. 24, 2025	Radiation (03CH11-HY)
Preamplifier	Jet-Power	JPA0118-55-303	1710001800055007	1GHz~18GHz	Jun. 14, 2023	Apr. 09, 2024~ Apr. 13, 2024	Jun. 13, 2024	Radiation (03CH11-HY)
Preamplifier	EMEC	EM18G40G	060801	18GHz~40GHz	Jun. 27, 2023	Apr. 09, 2024~ Apr. 13, 2024	Jun. 26, 2024	Radiation (03CH11-HY)
Spectrum Analyzer	Keysight	N9010A	MY54200486	10Hz~44GHz	Oct. 05, 2023	Apr. 09, 2024~ Apr. 13, 2024	Oct. 04, 2024	Radiation (03CH11-HY)
Controller	EMEC	EM 1000	N/A	Control Turn table & Ant Mast	N/A	Apr. 09, 2024~ Apr. 13, 2024	N/A	Radiation (03CH11-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1~4m	N/A	Apr. 09, 2024~ Apr. 13, 2024	N/A	Radiation (03CH11-HY)
Turn Table	EMEC	TT 2000	N/A	0~360 Degree	N/A	Apr. 09, 2024~ Apr. 13, 2024	N/A	Radiation (03CH11-HY)
Software	Audix	E3 6.2009-8-24	RK-001053	N/A	N/A	Apr. 09, 2024~ Apr. 13, 2024	N/A	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY1595/2	30MHz~40GHz	Mar. 06, 2024	Apr. 09, 2024~ Apr. 13, 2024	Mar. 05, 2025	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY2859/2	30MHz~40GHz	Mar. 06, 2024	Apr. 09, 2024~ Apr. 13, 2024	Mar. 05, 2025	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	803951/2	9K~30M	Mar. 06, 2024	Apr. 09, 2024~ Apr. 13, 2024	Mar. 05, 2025	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	803951/2	30M~40G	Mar. 06, 2024	Apr. 09, 2024~ Apr. 13, 2024	Mar. 05, 2025	Radiation (03CH11-HY)
Filter	Wainwright	WHKX12-900-1000-15000-60SS	SN12	1GHz High Pass Filter	Sep. 11, 2023	Apr. 09, 2024~ Apr. 13, 2024	Sep. 10, 2024	Radiation (03CH11-HY)
Filter	Wainwright	WHKX12-2700-3000-18000-60SS	SN3	3GHz High Pass Filter	Sep. 11, 2023	Apr. 09, 2024~ Apr. 13, 2024	Sep. 10, 2024	Radiation (03CH11-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP30	101329	9kHz~30GHz	Sep. 20, 2023	Apr. 10, 2024~ Apr. 11, 2024	Sep. 19, 2024	Conducted (TH03-HY)
Base Station (Measure)	Rohde & Schwarz	CMU200	117995	GSM / GPRS / WCDMA / CDMA	Aug. 06, 2023	Apr. 10, 2024~ Apr. 11, 2024	Aug. 05, 2024	Conducted (TH03-HY)
Thermal Chamber	ESPEC	SU-241	92003713	-30°C ~95°C	May 17, 2023	Apr. 10, 2024~ Apr. 11, 2024	May 16, 2024	Conducted (TH03-HY)
Hygrometer	TECPEL	DTM-303A	TP201996	N/A	Nov. 07, 2023	Apr. 10, 2024~ Apr. 11, 2024	Nov. 06, 2024	Conducted (TH03-HY)
Programmable Power Supply	GW Instek	PSS-2005	EL890001	1V~20V 0.5A~4A	Sep. 12, 2023	Apr. 10, 2024~ Apr. 11, 2024	Sep. 11, 2024	Conducted (TH03-HY)



6 Measurement Uncertainty

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.22 dB
-------------------------------------------------------------------------	---------

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.53 dB
-------------------------------------------------------------------------	---------

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.61 dB
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Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power) & ERP / EIRP

GSM850 Maximum Average Power [dBm] (GT - LC = -4.62 dB)					
Channel	128	189	251	ERP (dBm)	ERP (W)
Frequency	824.2	836.4	848.8		
GSM	32.54	32.55	32.43	25.81	0.3811
GPRS class 8	32.57	32.58	32.47		
GPRS class 10	30.48	30.50	30.43		
GPRS class 11	29.00	29.00	28.89		
GPRS class 12	26.90	26.92	26.85		
Limit	ERP < 7W			Result	Pass

GSM1900 Maximum Average Power [dBm] (GT - LC = -0.68 dB)					
Channel	512	661	810	EIRP (dBm)	EIRP (W)
Frequency	1850.2	1880	1909.8		
GSM	29.47	29.59	29.70	25.10	0.3236
GPRS class 8	29.48	29.62	29.72		
GPRS class 10	26.00	26.11	26.24		
GPRS class 11	24.51	24.61	24.74		
GPRS class 12	23.39	23.56	23.69		
Limit	EIRP < 2W			Result	Pass



WCDMA Band V Maximum Average Power [dBm] (GT - LC = -4.62 dB)							
Channel	4132	4182	4233	ERP (dBm)	ERP (W)		
Frequency	826.4	836.4	846.6				
RMC 12.2K	22.10	22.16	22.09	15.39	0.0346		
HSDPA Subtest-1	21.06	21.07	21.01				
HSDPA Subtest-2	21.02	21.07	20.99				
HSDPA Subtest-3	20.55	20.59	20.53				
HSDPA Subtest-4	20.52	20.56	20.52				
HSUPA Subtest-1	18.98	19.03	18.95				
HSUPA Subtest-2	18.99	19.01	18.99				
HSUPA Subtest-3	20.03	20.07	19.97				
HSUPA Subtest-4	18.53	18.58	18.54				
HSUPA Subtest-5	20.00	20.00	19.90				
Limit	ERP < 7W					Result	Pass

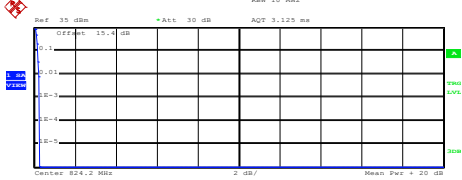
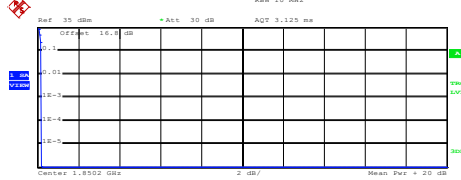
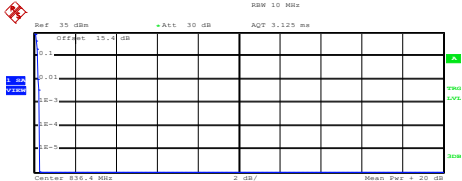
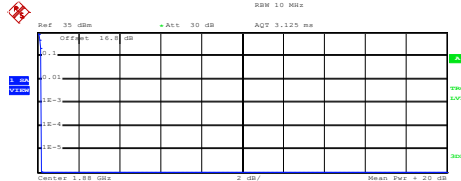
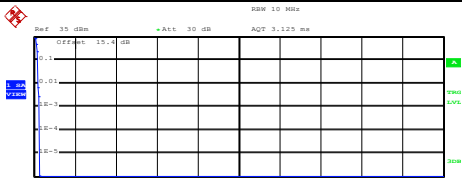
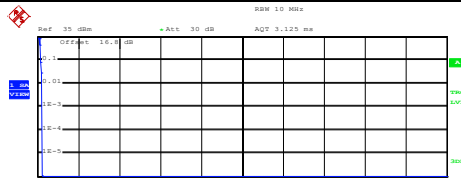


A1. GSM

Peak-to-Average Ratio

Mode	GSM850	GSM1900	Limit: 13dB
Mod.	GPRS class 8	GPRS class 8	Result
Lowest CH	0.28	0.20	PASS
Middle CH	0.28	0.20	
Highest CH	0.28	0.24	

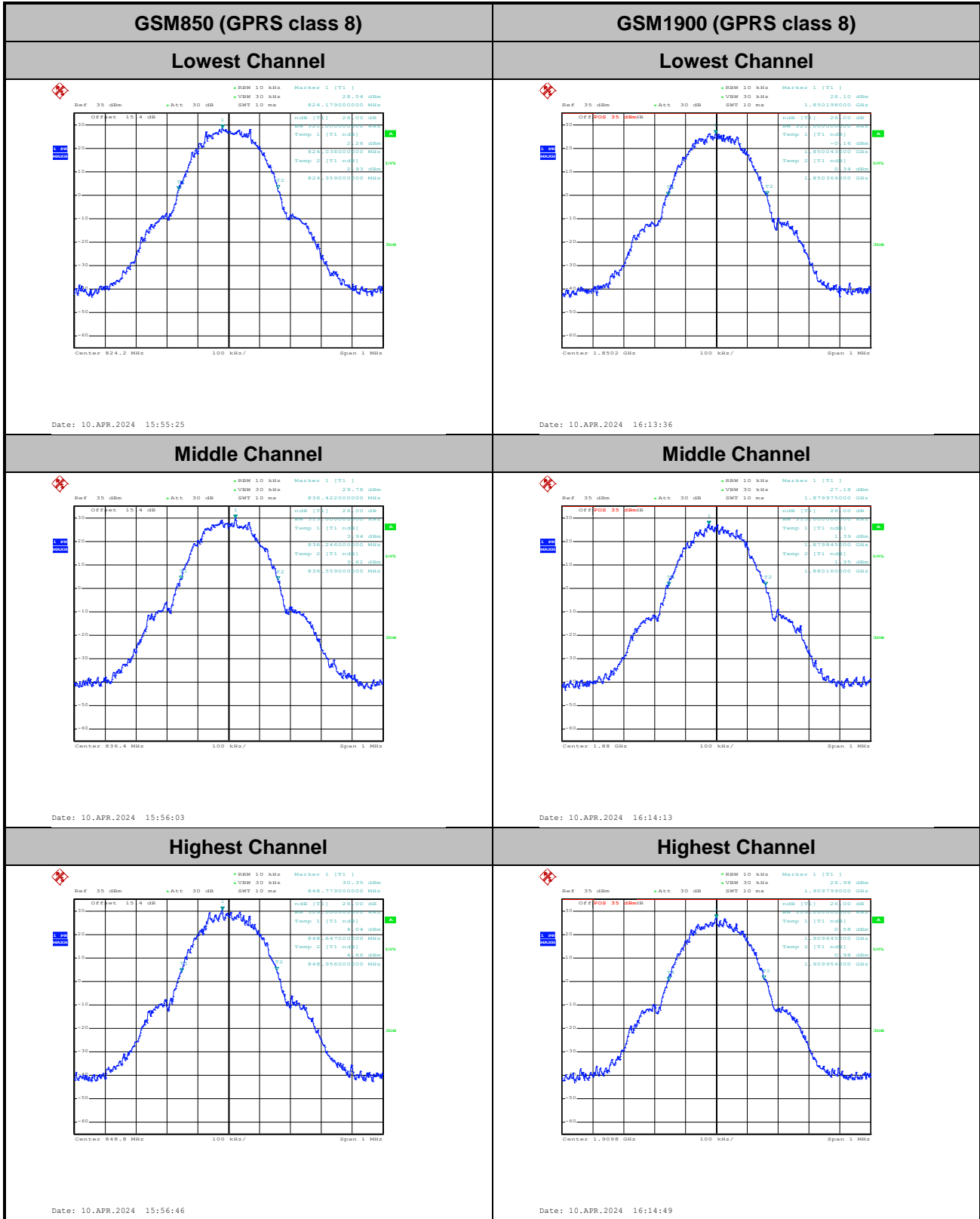


GSM850 (GPRS class 8)	GSM1900 (GPRS class 8)																
<p align="center">Lowest Channel</p>  <p>Center 824.2 MHz 2 dB/ Mean Pwr + 20 dB</p> <p>Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean 31.96 dBm Peak 32.22 dBm Crest 0.25 dB</p> <table border="0"> <tr><td>10 %</td><td>0.20 dB</td></tr> <tr><td>1 %</td><td>0.24 dB</td></tr> <tr><td>.1 %</td><td>0.28 dB</td></tr> <tr><td>.01 %</td><td>0.28 dB</td></tr> </table> <p>Date: 10.APR.2024 16:06:28</p>	10 %	0.20 dB	1 %	0.24 dB	.1 %	0.28 dB	.01 %	0.28 dB	<p align="center">Lowest Channel</p>  <p>Center 1.8502 GHz 2 dB/ Mean Pwr + 20 dB</p> <p>Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean 29.13 dBm Peak 29.32 dBm Crest 0.20 dB</p> <table border="0"> <tr><td>10 %</td><td>0.20 dB</td></tr> <tr><td>1 %</td><td>0.20 dB</td></tr> <tr><td>.1 %</td><td>0.20 dB</td></tr> <tr><td>.01 %</td><td>0.20 dB</td></tr> </table> <p>Date: 10.APR.2024 16:26:25</p>	10 %	0.20 dB	1 %	0.20 dB	.1 %	0.20 dB	.01 %	0.20 dB
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1 %	0.24 dB																
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1 %	0.20 dB																
.1 %	0.20 dB																
.01 %	0.20 dB																
<p align="center">Middle Channel</p>  <p>Center 836.4 MHz 2 dB/ Mean Pwr + 20 dB</p> <p>Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean 31.96 dBm Peak 32.22 dBm Crest 0.26 dB</p> <table border="0"> <tr><td>10 %</td><td>0.20 dB</td></tr> <tr><td>1 %</td><td>0.20 dB</td></tr> <tr><td>.1 %</td><td>0.28 dB</td></tr> <tr><td>.01 %</td><td>0.28 dB</td></tr> </table> <p>Date: 10.APR.2024 16:06:51</p>	10 %	0.20 dB	1 %	0.20 dB	.1 %	0.28 dB	.01 %	0.28 dB	<p align="center">Middle Channel</p>  <p>Center 1.85 GHz 2 dB/ Mean Pwr + 20 dB</p> <p>Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean 29.13 dBm Peak 29.32 dBm Crest 0.20 dB</p> <table border="0"> <tr><td>10 %</td><td>0.20 dB</td></tr> <tr><td>1 %</td><td>0.20 dB</td></tr> <tr><td>.1 %</td><td>0.20 dB</td></tr> <tr><td>.01 %</td><td>0.20 dB</td></tr> </table> <p>Date: 10.APR.2024 16:26:45</p>	10 %	0.20 dB	1 %	0.20 dB	.1 %	0.20 dB	.01 %	0.20 dB
10 %	0.20 dB																
1 %	0.20 dB																
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1 %	0.20 dB																
.1 %	0.20 dB																
.01 %	0.20 dB																
<p align="center">Highest Channel</p>  <p>Center 848.8 MHz 2 dB/ Mean Pwr + 20 dB</p> <p>Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean 32.02 dBm Peak 32.29 dBm Crest 0.27 dB</p> <table border="0"> <tr><td>10 %</td><td>0.20 dB</td></tr> <tr><td>1 %</td><td>0.20 dB</td></tr> <tr><td>.1 %</td><td>0.28 dB</td></tr> <tr><td>.01 %</td><td>0.28 dB</td></tr> </table> <p>Date: 10.APR.2024 16:07:11</p>	10 %	0.20 dB	1 %	0.20 dB	.1 %	0.28 dB	.01 %	0.28 dB	<p align="center">Highest Channel</p>  <p>Center 1.9098 GHz 2 dB/ Mean Pwr + 20 dB</p> <p>Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean 29.10 dBm Peak 29.32 dBm Crest 0.22 dB</p> <table border="0"> <tr><td>10 %</td><td>0.16 dB</td></tr> <tr><td>1 %</td><td>0.24 dB</td></tr> <tr><td>.1 %</td><td>0.24 dB</td></tr> <tr><td>.01 %</td><td>0.24 dB</td></tr> </table> <p>Date: 10.APR.2024 16:27:04</p>	10 %	0.16 dB	1 %	0.24 dB	.1 %	0.24 dB	.01 %	0.24 dB
10 %	0.20 dB																
1 %	0.20 dB																
.1 %	0.28 dB																
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26dB Bandwidth

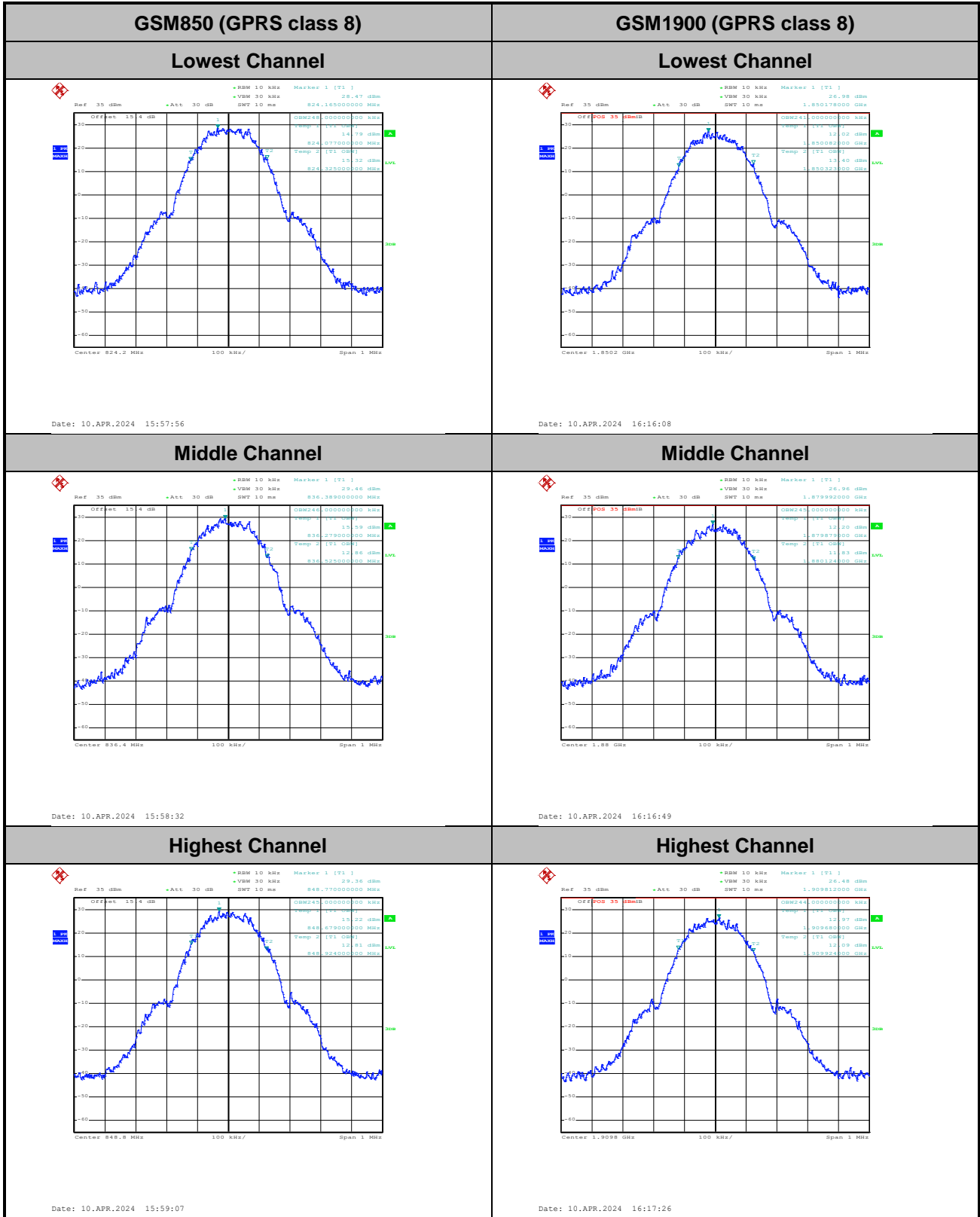
Mode	GSM850 : 26dB BW(MHz)	GSM1900 : 26dB BW(MHz)
Mod.	GPRS class 8	GPRS class 8
Lowest CH	0.321	0.321
Middle CH	0.313	0.315
Highest CH	0.309	0.309





Occupied Bandwidth

Mode	GSM850 : 99%OBW(MHz)	GSM1900 : 99%OBW(MHz)
Mod.	GPRS class 8	GPRS class 8
Lowest CH	0.248	0.241
Middle CH	0.246	0.245
Highest CH	0.245	0.244



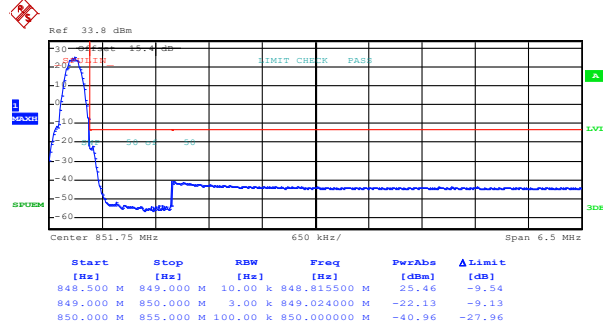
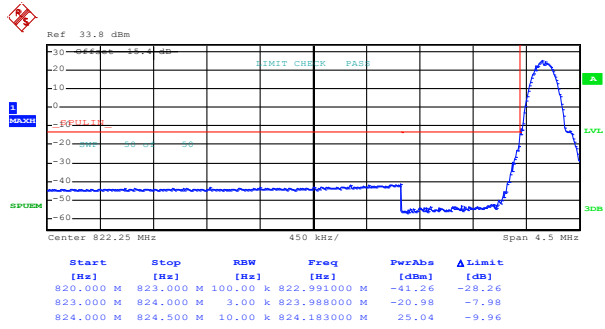


Conducted Band Edge

GSM850 (GPRS class 8)

Lowest Band Edge

Highest Band Edge



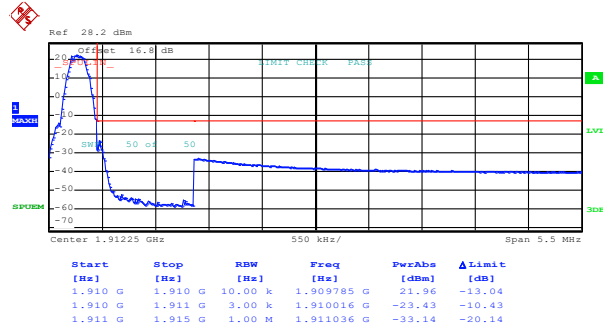
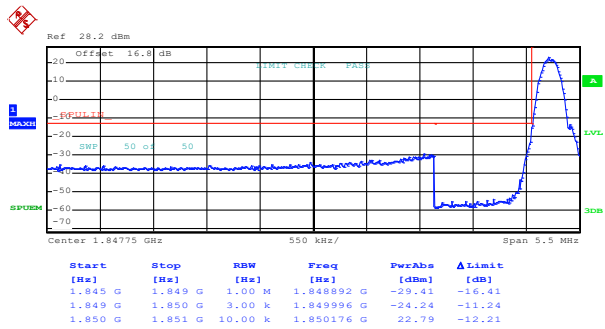
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GSM1900 (GPRS class 8)

Lowest Band Edge

Highest Band Edge

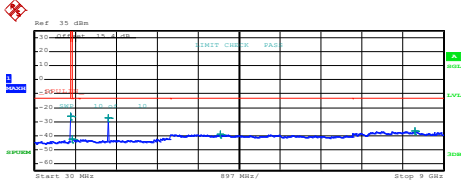
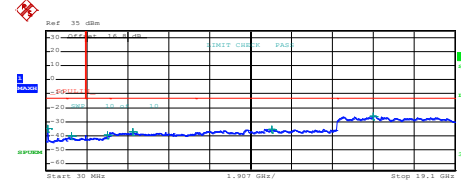
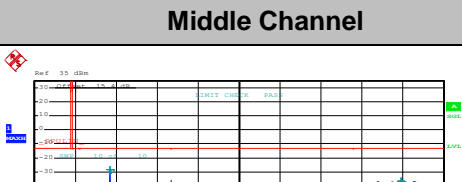
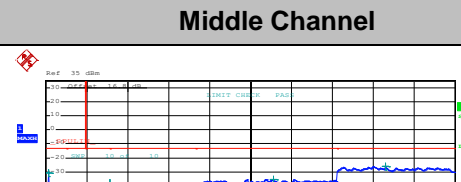
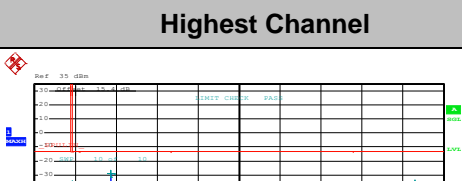
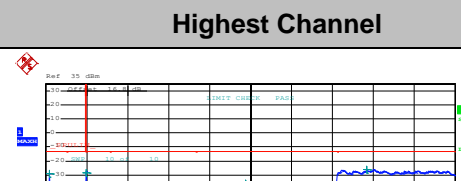


Date: 10.APR.2024 16:19:31

Date: 10.APR.2024 16:21:09



Conducted Spurious Emission

GSM850 (GPRS class 8)	GSM1900 (GPRS class 8)																																																																																										
Lowest Channel	Lowest Channel																																																																																										
 <table border="1" data-bbox="207 660 670 739"> <thead> <tr> <th>Start</th> <th>Stop</th> <th>RBW</th> <th>Freq</th> <th>PeakAbs</th> <th>ΔLimit</th> </tr> <tr> <th>[Hz]</th> <th>[Hz]</th> <th>[Hz]</th> <th>[Hz]</th> <th>[dBm]</th> <th>[dB]</th> </tr> </thead> <tbody> <tr> <td>30,000 M</td> <td>820,000 M</td> <td>1,000 M</td> <td>810,000000 M</td> <td>-26.24</td> <td>-13.24</td> </tr> <tr> <td>850,000 M</td> <td>1,000 G</td> <td>1,000 M</td> <td>850,712500 M</td> <td>-42.49</td> <td>-29.49</td> </tr> <tr> <td>1,000 G</td> <td>3,000 G</td> <td>1,000 M</td> <td>1,6000000 G</td> <td>-27.52</td> <td>-24.52</td> </tr> <tr> <td>3,000 G</td> <td>7,000 G</td> <td>1,000 M</td> <td>4,0000000 G</td> <td>-39.27</td> <td>-26.27</td> </tr> <tr> <td>7,000 G</td> <td>9,000 G</td> <td>1,000 M</td> <td>8,3780000 G</td> <td>-36.82</td> <td>-23.82</td> </tr> </tbody> </table> <p>Date: 10.APR.2024 16:03:58</p>	Start	Stop	RBW	Freq	PeakAbs	ΔLimit	[Hz]	[Hz]	[Hz]	[Hz]	[dBm]	[dB]	30,000 M	820,000 M	1,000 M	810,000000 M	-26.24	-13.24	850,000 M	1,000 G	1,000 M	850,712500 M	-42.49	-29.49	1,000 G	3,000 G	1,000 M	1,6000000 G	-27.52	-24.52	3,000 G	7,000 G	1,000 M	4,0000000 G	-39.27	-26.27	7,000 G	9,000 G	1,000 M	8,3780000 G	-36.82	-23.82	 <table border="1" data-bbox="845 660 1308 739"> <thead> <tr> <th>Start</th> <th>Stop</th> <th>RBW</th> <th>Freq</th> <th>PeakAbs</th> <th>ΔLimit</th> </tr> <tr> <th>[Hz]</th> <th>[Hz]</th> <th>[Hz]</th> <th>[Hz]</th> <th>[dBm]</th> <th>[dB]</th> </tr> </thead> <tbody> <tr> <td>30,000 M</td> <td>1,000 G</td> <td>1,000 M</td> <td>111,000000 M</td> <td>-35.09</td> <td>-22.09</td> </tr> <tr> <td>1,000 G</td> <td>3,000 G</td> <td>1,000 M</td> <td>1,221813 G</td> <td>-39.96</td> <td>-26.96</td> </tr> <tr> <td>3,000 G</td> <td>7,000 G</td> <td>1,000 M</td> <td>2,8000000 G</td> <td>-39.69</td> <td>-26.69</td> </tr> <tr> <td>7,000 G</td> <td>13,600 G</td> <td>1,000 M</td> <td>10,573900 G</td> <td>-35.45</td> <td>-22.45</td> </tr> <tr> <td>13,600 G</td> <td>19,100 G</td> <td>1,000 M</td> <td>15,209250 G</td> <td>-26.16</td> <td>-13.16</td> </tr> </tbody> </table> <p>Date: 10.APR.2024 16:23:04</p>	Start	Stop	RBW	Freq	PeakAbs	ΔLimit	[Hz]	[Hz]	[Hz]	[Hz]	[dBm]	[dB]	30,000 M	1,000 G	1,000 M	111,000000 M	-35.09	-22.09	1,000 G	3,000 G	1,000 M	1,221813 G	-39.96	-26.96	3,000 G	7,000 G	1,000 M	2,8000000 G	-39.69	-26.69	7,000 G	13,600 G	1,000 M	10,573900 G	-35.45	-22.45	13,600 G	19,100 G	1,000 M	15,209250 G	-26.16	-13.16						
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7,000 G	13,600 G	1,000 M	10,573900 G	-35.45	-22.45																																																																																						
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 <table border="1" data-bbox="207 1131 670 1209"> <thead> <tr> <th>Start</th> <th>Stop</th> <th>RBW</th> <th>Freq</th> <th>PeakAbs</th> <th>ΔLimit</th> </tr> <tr> <th>[Hz]</th> <th>[Hz]</th> <th>[Hz]</th> <th>[Hz]</th> <th>[dBm]</th> <th>[dB]</th> </tr> </thead> <tbody> <tr> <td>30,000 M</td> <td>820,000 M</td> <td>1,000 M</td> <td>754,232500 M</td> <td>-43.59</td> <td>-30.59</td> </tr> <tr> <td>850,000 M</td> <td>1,000 G</td> <td>1,000 M</td> <td>997,780000 M</td> <td>-42.92</td> <td>-29.92</td> </tr> <tr> <td>1,000 G</td> <td>3,000 G</td> <td>1,000 M</td> <td>1,6700000 G</td> <td>-28.60</td> <td>-15.60</td> </tr> <tr> <td>3,000 G</td> <td>7,000 G</td> <td>1,000 M</td> <td>3,0270000 G</td> <td>-38.30</td> <td>-25.30</td> </tr> <tr> <td>7,000 G</td> <td>9,000 G</td> <td>1,000 M</td> <td>8,0630000 G</td> <td>-36.78</td> <td>-23.78</td> </tr> </tbody> </table> <p>Date: 10.APR.2024 16:04:54</p>	Start	Stop	RBW	Freq	PeakAbs	ΔLimit	[Hz]	[Hz]	[Hz]	[Hz]	[dBm]	[dB]	30,000 M	820,000 M	1,000 M	754,232500 M	-43.59	-30.59	850,000 M	1,000 G	1,000 M	997,780000 M	-42.92	-29.92	1,000 G	3,000 G	1,000 M	1,6700000 G	-28.60	-15.60	3,000 G	7,000 G	1,000 M	3,0270000 G	-38.30	-25.30	7,000 G	9,000 G	1,000 M	8,0630000 G	-36.78	-23.78	 <table border="1" data-bbox="845 1131 1308 1209"> <thead> <tr> <th>Start</th> <th>Stop</th> <th>RBW</th> <th>Freq</th> <th>PeakAbs</th> <th>ΔLimit</th> </tr> <tr> <th>[Hz]</th> <th>[Hz]</th> <th>[Hz]</th> <th>[Hz]</th> <th>[dBm]</th> <th>[dB]</th> </tr> </thead> <tbody> <tr> <td>30,000 M</td> <td>1,000 G</td> <td>1,000 M</td> <td>141,792500 M</td> <td>-31.08</td> <td>-18.08</td> </tr> <tr> <td>1,000 G</td> <td>3,000 G</td> <td>1,000 M</td> <td>1,0800000 G</td> <td>-41.33</td> <td>-28.33</td> </tr> <tr> <td>3,000 G</td> <td>7,000 G</td> <td>1,000 M</td> <td>2,910750 G</td> <td>-40.61</td> <td>-27.61</td> </tr> <tr> <td>7,000 G</td> <td>13,600 G</td> <td>1,000 M</td> <td>3,0000000 G</td> <td>-37.62</td> <td>-24.62</td> </tr> <tr> <td>13,600 G</td> <td>19,100 G</td> <td>1,000 M</td> <td>15,852937 G</td> <td>-26.03</td> <td>-13.03</td> </tr> </tbody> </table> <p>Date: 10.APR.2024 16:24:34</p>	Start	Stop	RBW	Freq	PeakAbs	ΔLimit	[Hz]	[Hz]	[Hz]	[Hz]	[dBm]	[dB]	30,000 M	1,000 G	1,000 M	141,792500 M	-31.08	-18.08	1,000 G	3,000 G	1,000 M	1,0800000 G	-41.33	-28.33	3,000 G	7,000 G	1,000 M	2,910750 G	-40.61	-27.61	7,000 G	13,600 G	1,000 M	3,0000000 G	-37.62	-24.62	13,600 G	19,100 G	1,000 M	15,852937 G	-26.03	-13.03						
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1,000 G	3,000 G	1,000 M	1,6700000 G	-28.60	-15.60																																																																																						
3,000 G	7,000 G	1,000 M	3,0270000 G	-38.30	-25.30																																																																																						
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Start	Stop	RBW	Freq	PeakAbs	ΔLimit																																																																																						
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Frequency Stability

Test Conditions	Middle Channel	GSM850 (GPRS class 8)	Limit 2.5ppm
Temperature (°C)	Voltage (Volt)	Deviation (ppm)	Result
50	Normal Voltage	0.0012	PASS
40	Normal Voltage	0.0072	
30	Normal Voltage	0.0012	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0024	
0	Normal Voltage	0.0120	
-10	Normal Voltage	0.0191	
-20	Normal Voltage	0.0167	
-30	Normal Voltage	0.0024	
20	Maximum Voltage	0.0132	
20	Normal Voltage	0.0096	
20	Battery End Point	0.0143	

Test Conditions	Middle Channel	GSM1900 (GPRS class 8)	Limit Note 2.
Temperature (°C)	Voltage (Volt)	Deviation (ppm)	Result
50	Normal Voltage	0.0021	PASS
40	Normal Voltage	0.0032	
30	Normal Voltage	0.0021	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0128	
0	Normal Voltage	0.0176	
-10	Normal Voltage	0.0059	
-20	Normal Voltage	0.0160	
-30	Normal Voltage	0.0016	
20	Maximum Voltage	0.0383	
20	Normal Voltage	0.0293	
20	Battery End Point	0.0335	

Note:

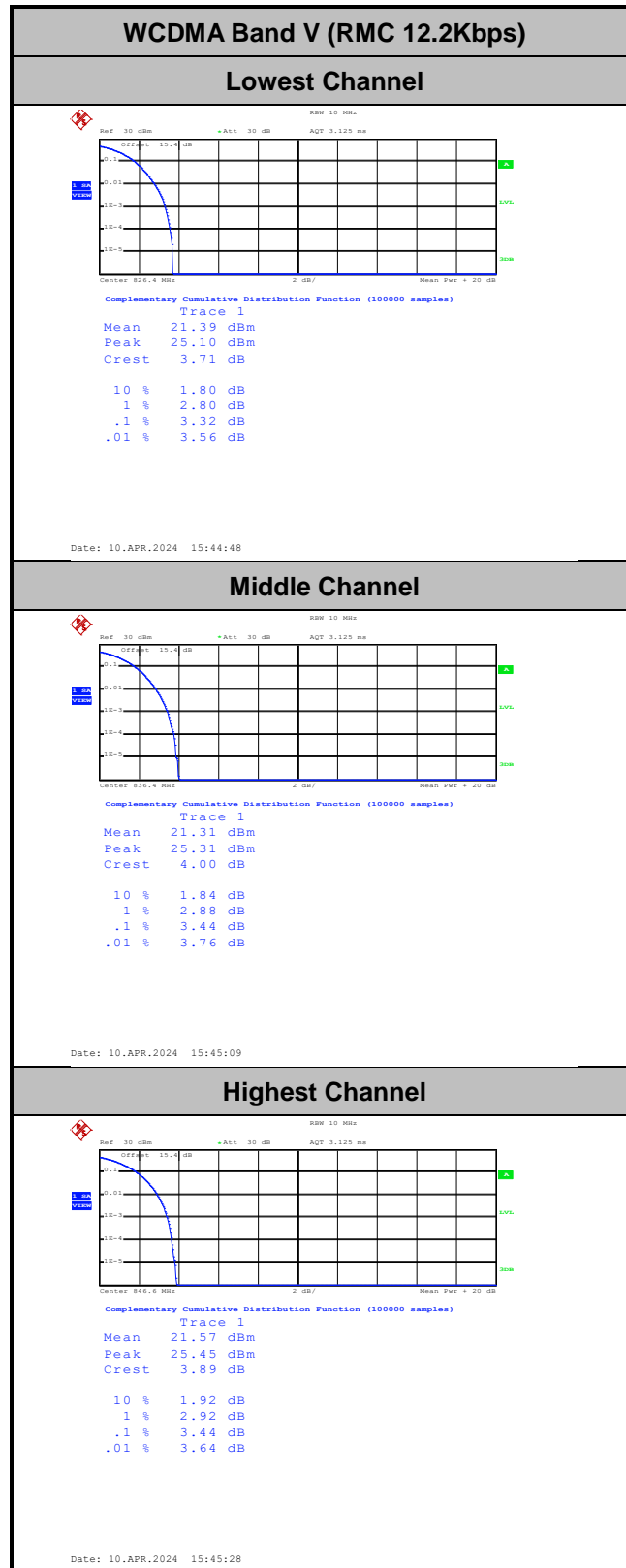
1. Normal Voltage = 3.87V. ; Battery End Point (BEP) = 3.6 V. ; Maximum Voltage =4.2 V
2. The frequency fundamental emissions stay within the authorized frequency block.



A2. WCDMA

Peak-to-Average Ratio

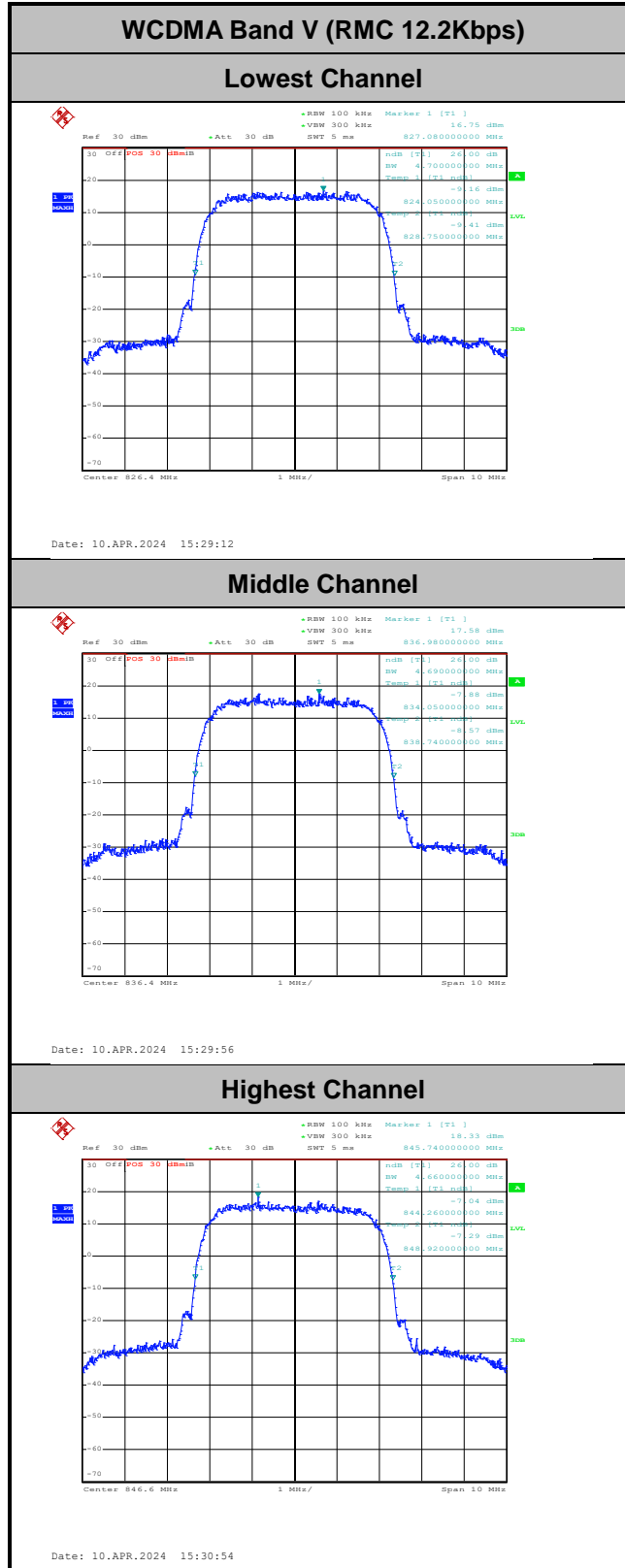
Mode	WCDMA Band V	Limit: 13dB
Mod.	RMC 12.2Kbps	Result
Lowest CH	3.32	PASS
Middle CH	3.44	
Highest CH	3.44	





26dB Bandwidth

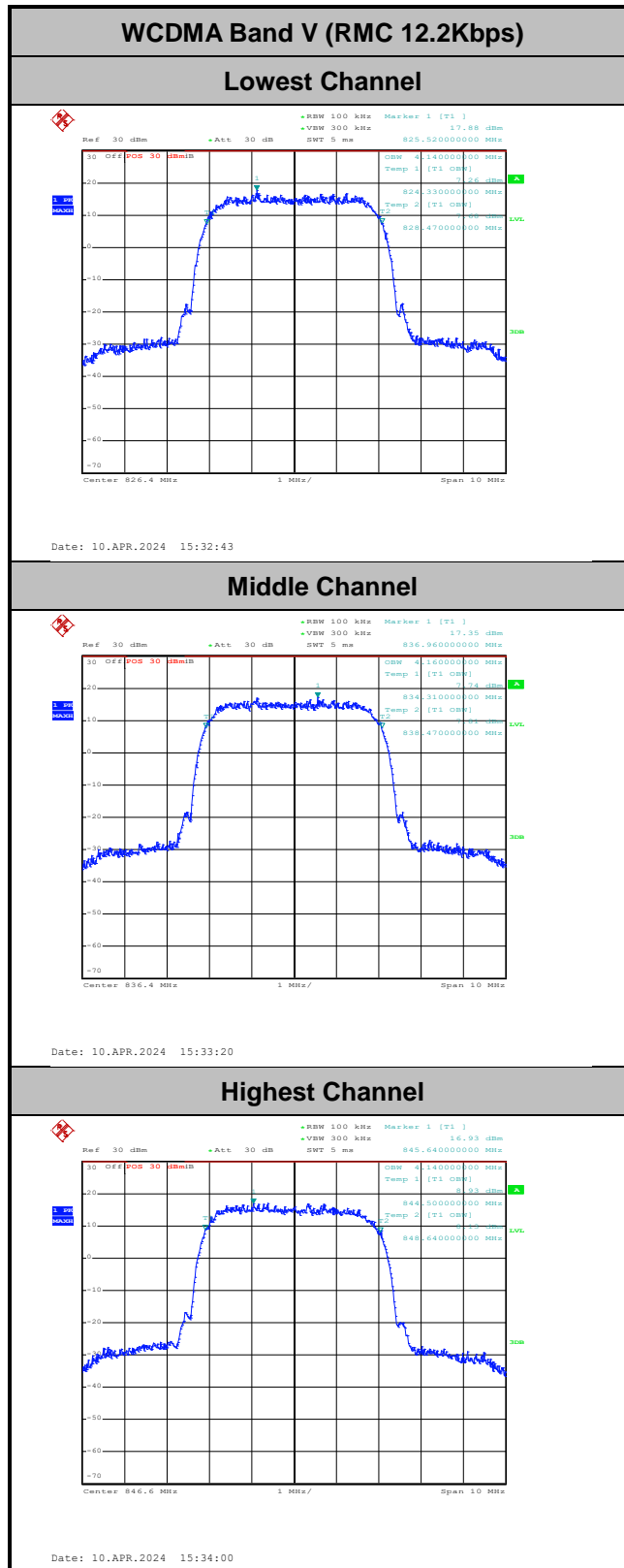
Mode	WCDMA Band V 26dB BW(MHz)
Mod.	RMC 12.2Kbps
Lowest CH	4.70
Middle CH	4.69
Highest CH	4.66





Occupied Bandwidth

Mode	WCDMA Band V 99%OBW(MHz)
Mod.	RMC 12.2Kbps
Lowest CH	4.14
Middle CH	4.16
Highest CH	4.14

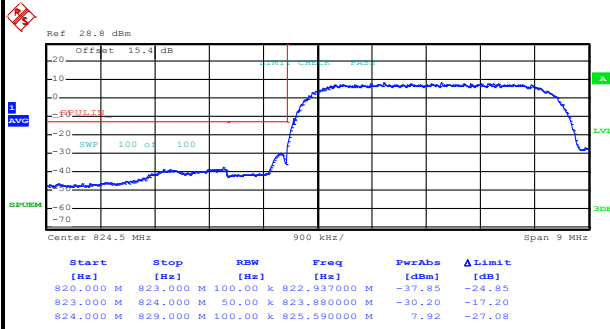




Conducted Band Edge

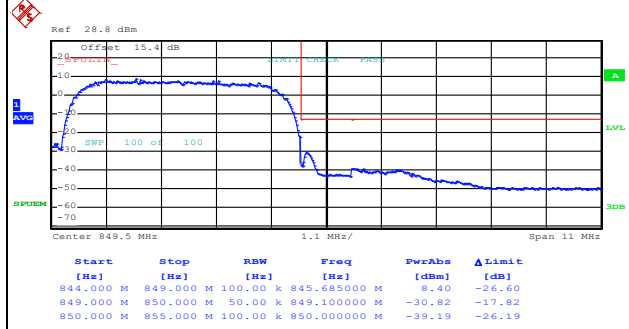
WCDMA Band V (RMC 12.2Kbps)

Lowest Band Edge



Date: 10.APR.2024 15:37:26

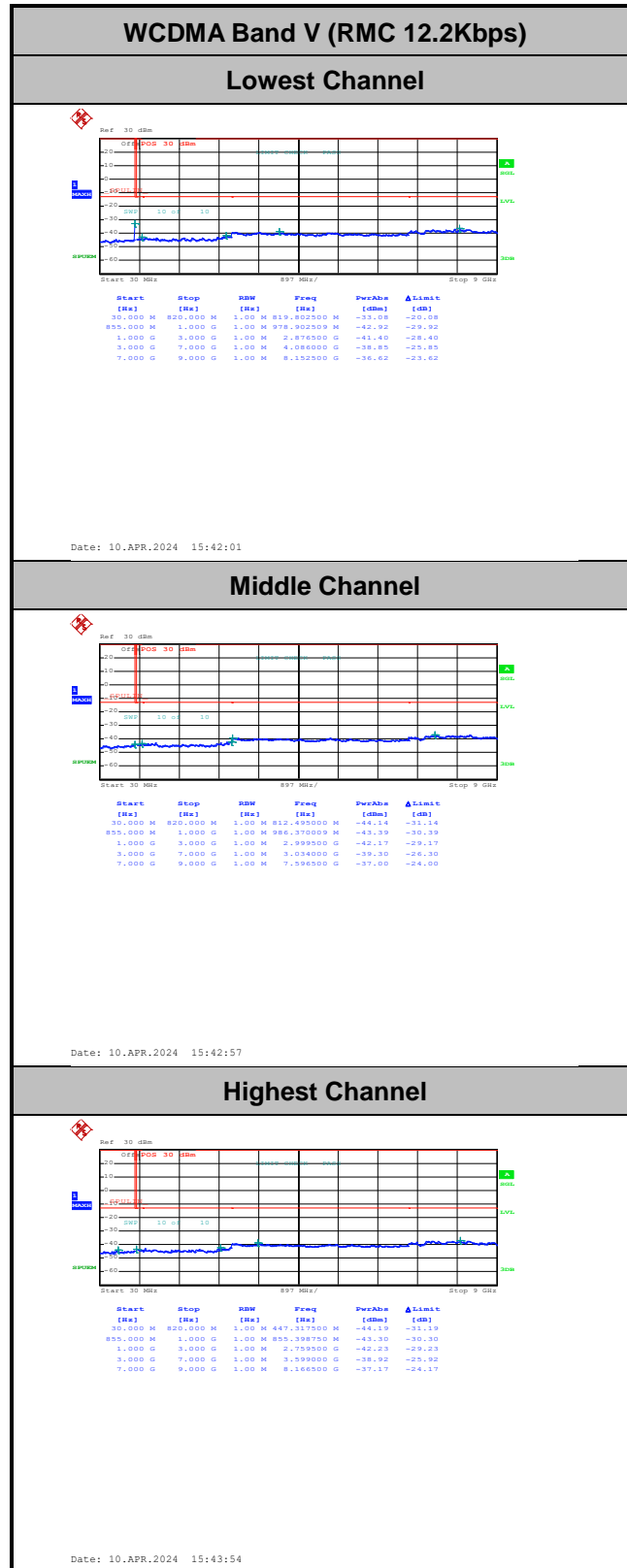
Highest Band Edge



Date: 10.APR.2024 15:40:18



Conducted Spurious Emission





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	0.0179	PASS
40	Normal Voltage	0.0060	
30	Normal Voltage	0.0036	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0048	
0	Normal Voltage	0.0120	
-10	Normal Voltage	0.0191	
-20	Normal Voltage	0.0155	
-30	Normal Voltage	0.0132	
20	Maximum Voltage	0.0179	
20	Normal Voltage	0.0143	
20	Battery End Point	0.0036	

Note: Normal Voltage = 3.87V. ; Battery End Point (BEP) = 3.6 V. ; Maximum Voltage =4.2 V



Appendix B. Test Results of Radiated Test

B1. Summary of each worse mode

Mode	Part	Band	Ch	Freq (MHz)	Level (dBm)	Det	Ant Factor (dB)	Amp\Cbl (dB)	Filter (dB)	EIRPCF (dB)	Reading (dBuV)	Limit (dBm)	Margin (dB)	Pol	Ant
1	Part 22H	GSM 850	H	1697	-40.21	RMS	25.12	-28.28	0.31	-95.23	57.87	-13.00	-27.21	V	0
2	Part 22H	WCDMA B5	H	3386	-58.09	RMS	29.53	-24.96	0.23	-95.23	32.34	-13.00	-45.09	H	0
1	Part 24E	GSM 1900	L	5550	-48.78	RMS	32.90	-29.91	0.51	-95.23	42.95	-13.00	-35.78	V	1

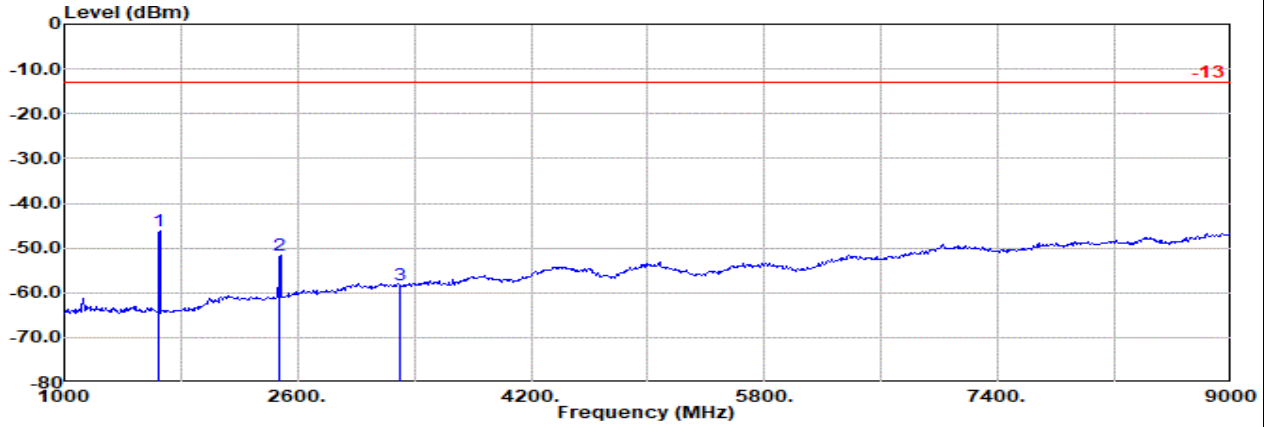


Ant0

Part 22H Mode 1

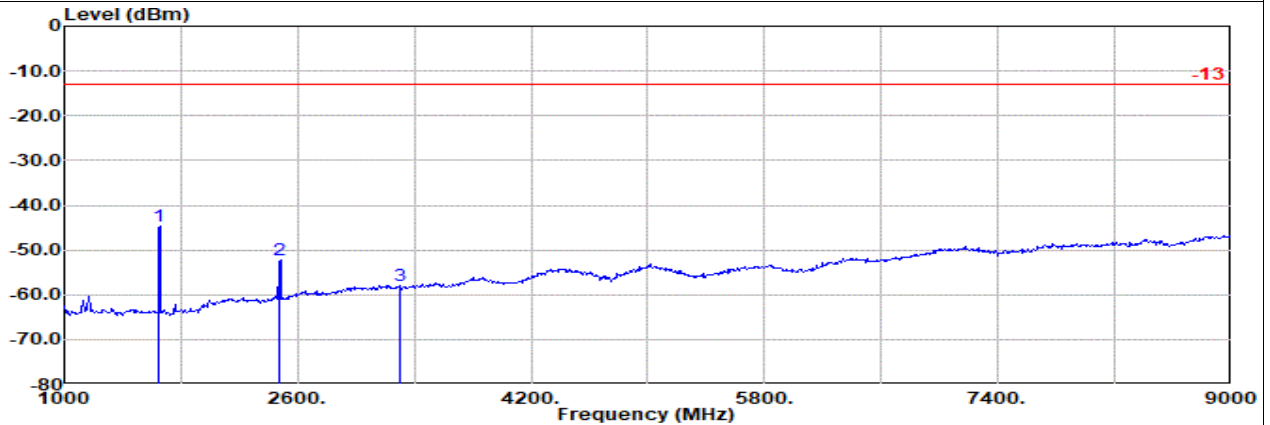
GSM 850 Ch128

L



Site : 03CH11-HY
 Condition: -13 3m 9120D_01620_230817 Horizontal
 : GSM 850 CH128

	Freq MHz	Level dBm	Detector	Ant Amp\Cb		Filter	EIRPCF	Readin g	Limit dBm	Margin dB	Pol
				Factor	1						
1	1648.40	-46.18	RMS	25.22	-28.42	0.35	-95.23	51.90	-13.00	-33.18	Horizontal
2	2472.60	-51.63	RMS	27.63	-26.39	0.22	-95.23	42.14	-13.00	-38.63	Horizontal
3	3296.80	-58.31	RMS	29.61	-25.11	0.26	-95.23	32.16	-13.00	-45.31	Horizontal



Site : 03CH11-HY
 Condition: -13 3m 9120D_01620_230817 Vertical
 : GSM 850 CH128

	Freq MHz	Level dBm	Detector	Ant Amp\Cb		Filter	EIRPCF	Readin g	Limit dBm	Margin dB	Pol
				Factor	1						
1	1648.40	-44.54	RMS	25.22	-28.42	0.35	-95.23	53.54	-13.00	-31.54	Vertical
2	2472.60	-52.14	RMS	27.63	-26.39	0.22	-95.23	41.63	-13.00	-39.14	Vertical
3	3296.80	-58.04	RMS	29.61	-25.11	0.26	-95.23	32.43	-13.00	-45.04	Vertical

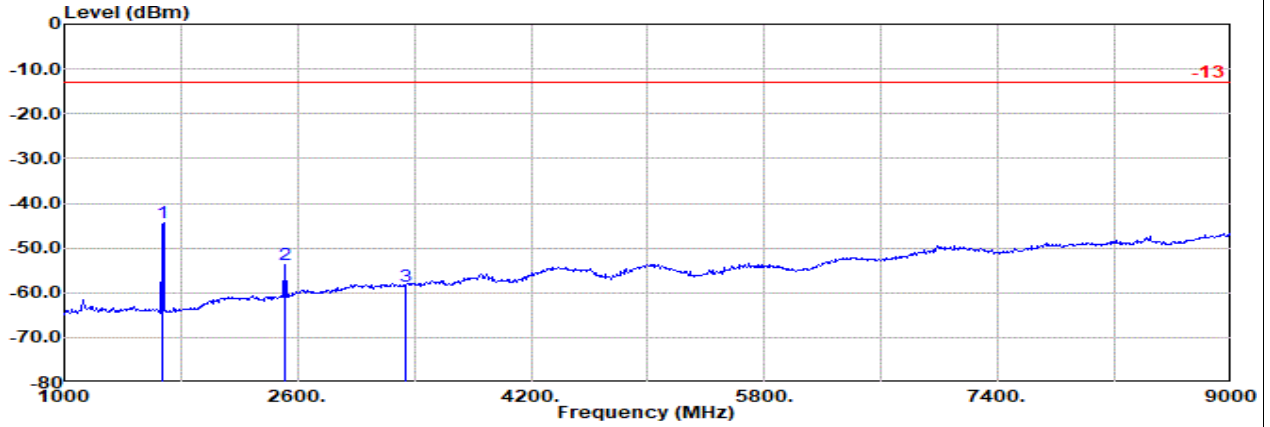


Ant0

Part 22H Mode 1

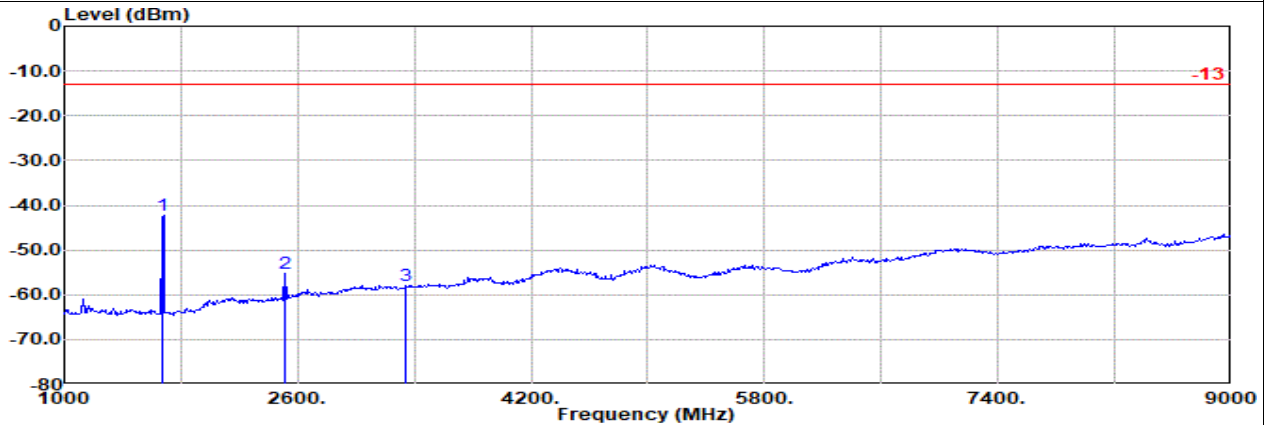
GSM 850 Ch189

M



Site : 03CH11-HY
 Condition: -13 3m 9120D_01620_230817 Horizontal
 : GSM 850 CH189

Freq	Level	Detector	Ant Amp\Cb		Filter	EIRPCF	Readin	Limit	Margin	Pol
			Factor	1						
1672.80	-44.34	RMS	25.30	-28.35	0.33	-95.23	53.61	-13.00	-31.34	Horizontal
2509.20	-53.66	RMS	27.79	-26.32	0.21	-95.23	39.89	-13.00	-40.66	Horizontal
3345.60	-58.42	RMS	29.60	-25.03	0.24	-95.23	32.00	-13.00	-45.42	Horizontal



Site : 03CH11-HY
 Condition: -13 3m 9120D_01620_230817 Vertical
 : GSM 850 CH189

Freq	Level	Detector	Ant Amp\Cb		Filter	EIRPCF	Readin	Limit	Margin	Pol
			Factor	1						
1672.80	-42.22	RMS	25.30	-28.35	0.33	-95.23	55.73	-13.00	-29.22	Vertical
2509.20	-55.38	RMS	27.79	-26.32	0.21	-95.23	38.17	-13.00	-42.38	Vertical
3345.60	-57.98	RMS	29.60	-25.03	0.24	-95.23	32.44	-13.00	-44.98	Vertical

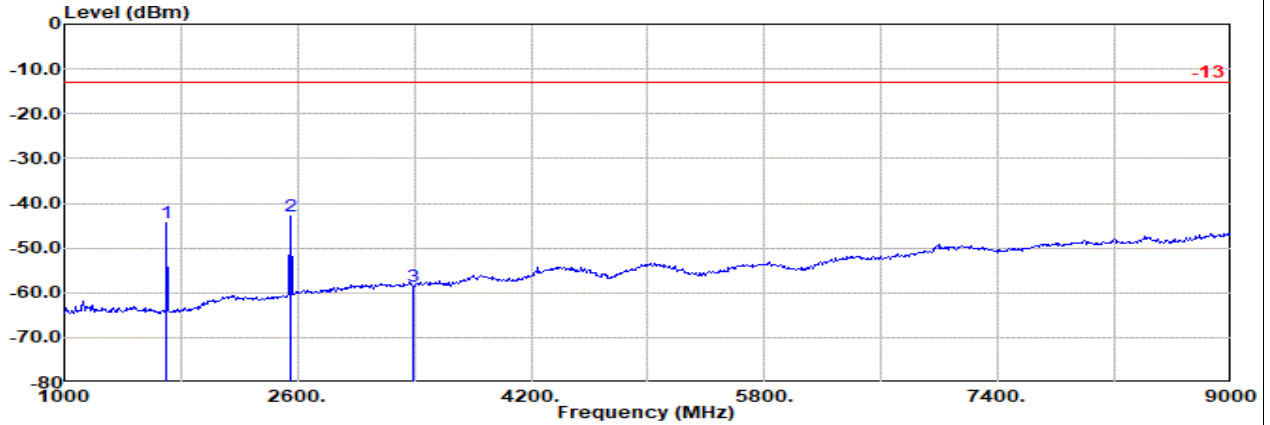


Ant0

Part 22H Mode 1

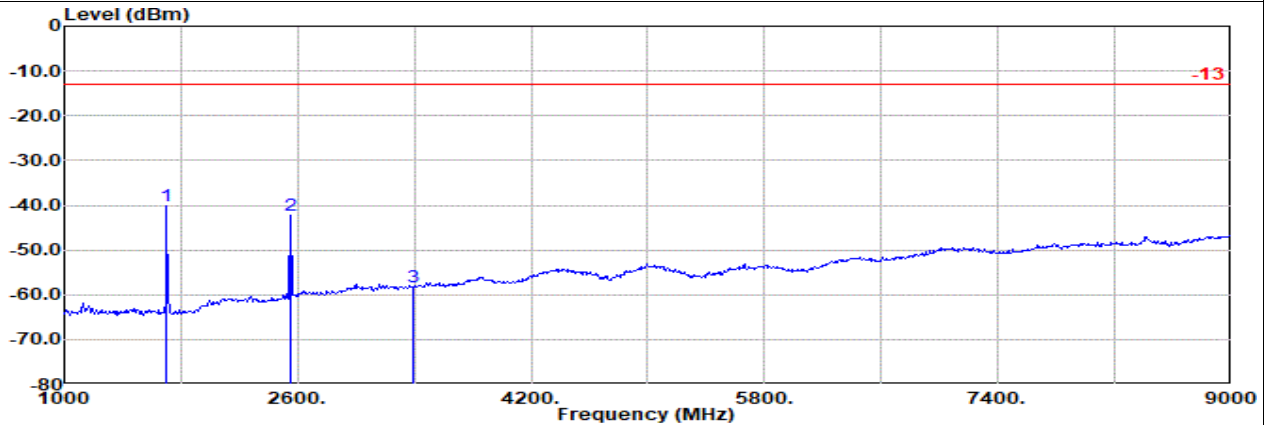
GSM 850 Ch251

H



Site : 03CH11-HY
 Condition: -13 3m 9120D_01620_230817 Horizontal
 : GSM 850 CH251

	Freq MHz	Level dBm	Detector	Ant Amp\Cb		Filter	EIRPCF	Readin g	Limit dBm	Margin dB	Pol
				Factor	1						
1	1697.60	-44.34	RMS	25.12	-28.28	0.31	-95.23	53.74	-13.00	-31.34	Horizontal
2	2546.40	-42.85	RMS	28.00	-26.27	0.21	-95.23	50.44	-13.00	-29.85	Horizontal
3	3395.20	-58.47	RMS	29.51	-24.94	0.23	-95.23	31.96	-13.00	-45.47	Horizontal



Site : 03CH11-HY
 Condition: -13 3m 9120D_01620_230817 Vertical
 : GSM 850 CH251

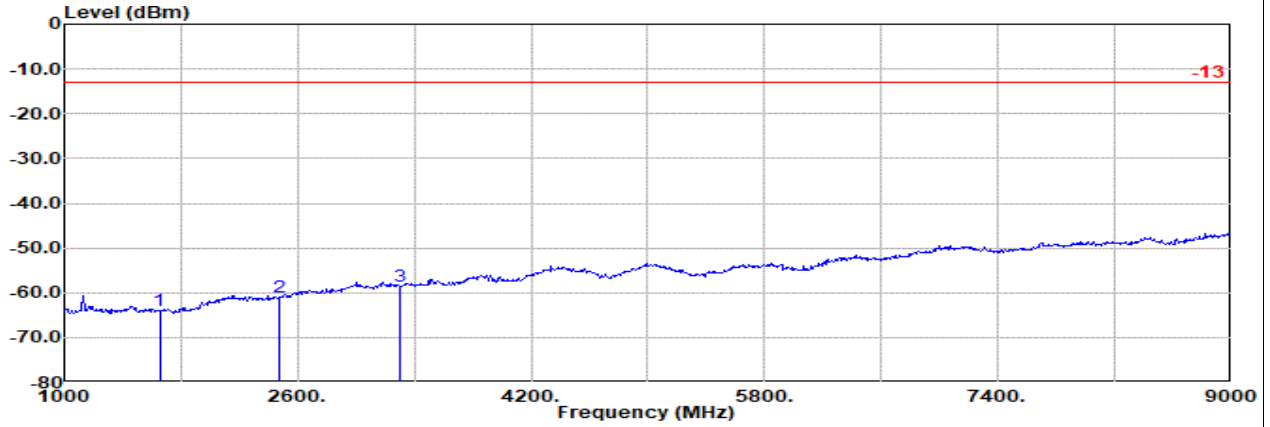
	Freq MHz	Level dBm	Detector	Ant Amp\Cb		Filter	EIRPCF	Readin g	Limit dBm	Margin dB	Pol
				Factor	1						
1	1697.60	-40.21	RMS	25.12	-28.28	0.31	-95.23	57.87	-13.00	-27.21	Vertical
2	2546.40	-42.39	RMS	28.00	-26.27	0.21	-95.23	50.90	-13.00	-29.39	Vertical
3	3395.20	-58.18	RMS	29.51	-24.94	0.23	-95.23	32.25	-13.00	-45.18	Vertical



Ant0

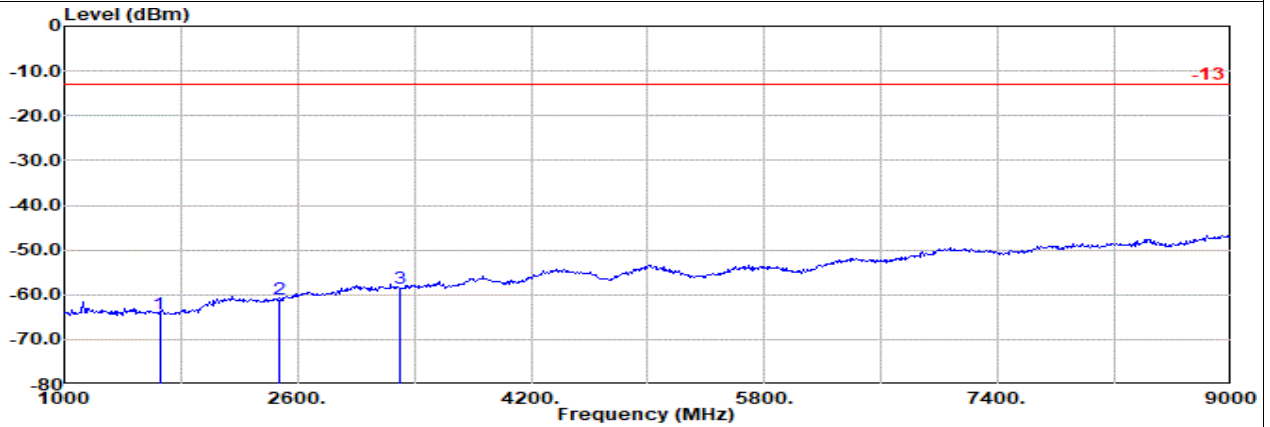
Part 22H Mode 2
WCDMA B5 Ch4132

L



Site : 03CH11-HY
Condition: -13 3m 9120D_01620_230817 Horizontal
: WCDMA 850 CH4132

	Freq MHz	Level dBm	Detector	Ant Amp\Cb		Filter	EIRPCF	Readin g	Limit dBm	Margin dB	Pol
				Factor	1						
1	1652.80	-64.02	RMS	25.20	-28.41	0.35	-95.23	34.07	-13.00	-51.02	Horizontal
2	2479.20	-60.96	RMS	27.69	-26.38	0.22	-95.23	32.74	-13.00	-47.96	Horizontal
3	3305.60	-58.64	RMS	29.60	-25.09	0.25	-95.23	31.83	-13.00	-45.64	Horizontal



Site : 03CH11-HY
Condition: -13 3m 9120D_01620_230817 Vertical
: WCDMA 850 CH4132

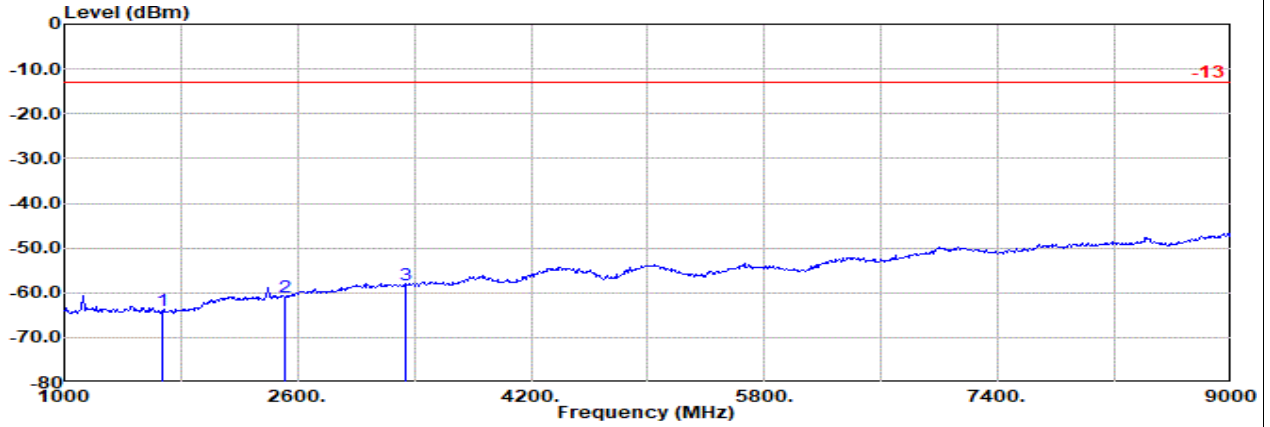
	Freq MHz	Level dBm	Detector	Ant Amp\Cb		Filter	EIRPCF	Readin g	Limit dBm	Margin dB	Pol
				Factor	1						
1	1652.80	-64.23	RMS	25.20	-28.41	0.35	-95.23	33.86	-13.00	-51.23	Vertical
2	2479.20	-60.96	RMS	27.69	-26.38	0.22	-95.23	32.74	-13.00	-47.96	Vertical
3	3305.60	-58.46	RMS	29.60	-25.09	0.25	-95.23	32.01	-13.00	-45.46	Vertical



Ant0

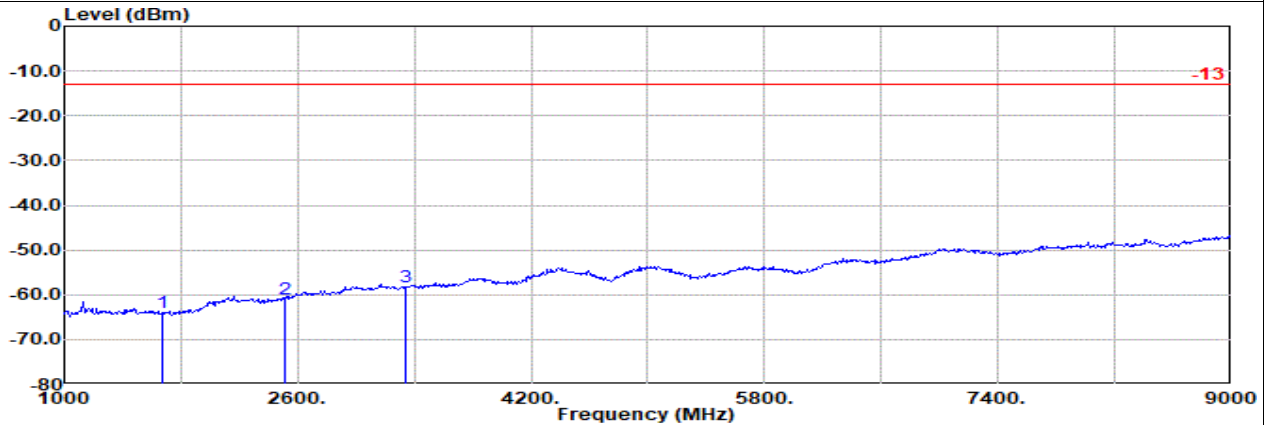
Part 22H Mode 2
WCDMA B5 Ch4183

M



Site : 03CH11-HY
Condition: -13 3m 9120D_01620_230817 Horizontal
: WCDMA 850 CH4183

	Freq MHz	Level dBm	Detector	Ant Amp\Cb		Filter	EIRPCF	Readin g	Limit dBm	Margin dB	Pol
				Factor	1						
1	1672.80	-64.14	RMS	25.30	-28.35	0.33	-95.23	33.81	-13.00	-51.14	Horizontal
2	2509.20	-60.85	RMS	27.79	-26.32	0.21	-95.23	32.70	-13.00	-47.85	Horizontal
3	3345.60	-58.34	RMS	29.60	-25.03	0.24	-95.23	32.08	-13.00	-45.34	Horizontal



Site : 03CH11-HY
Condition: -13 3m 9120D_01620_230817 Vertical
: WCDMA 850 CH4183

	Freq MHz	Level dBm	Detector	Ant Amp\Cb		Filter	EIRPCF	Readin g	Limit dBm	Margin dB	Pol
				Factor	1						
1	1672.80	-64.07	RMS	25.30	-28.35	0.33	-95.23	33.88	-13.00	-51.07	Vertical
2	2509.20	-60.97	RMS	27.79	-26.32	0.21	-95.23	32.58	-13.00	-47.97	Vertical
3	3345.60	-58.19	RMS	29.60	-25.03	0.24	-95.23	32.23	-13.00	-45.19	Vertical

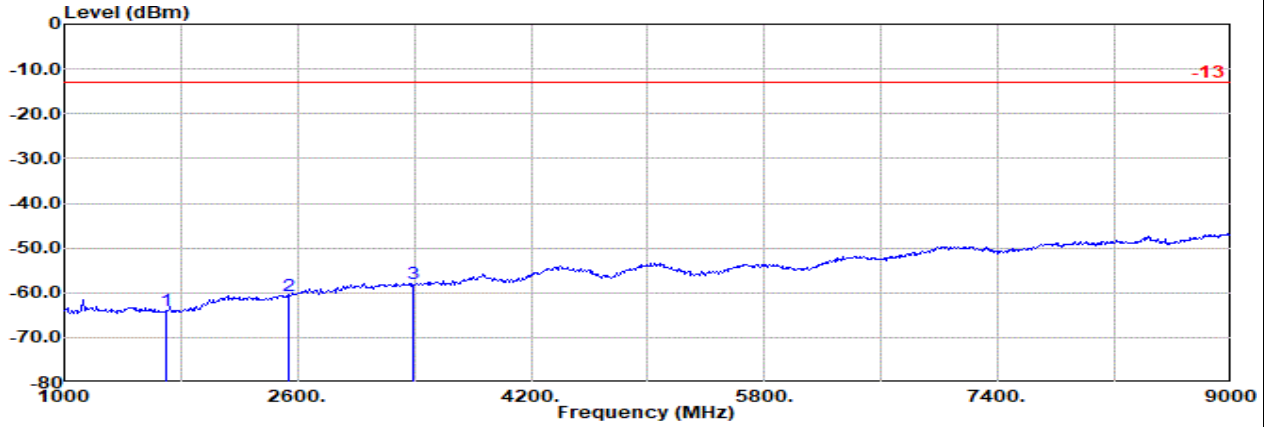


Ant0

Part 22H Mode 2

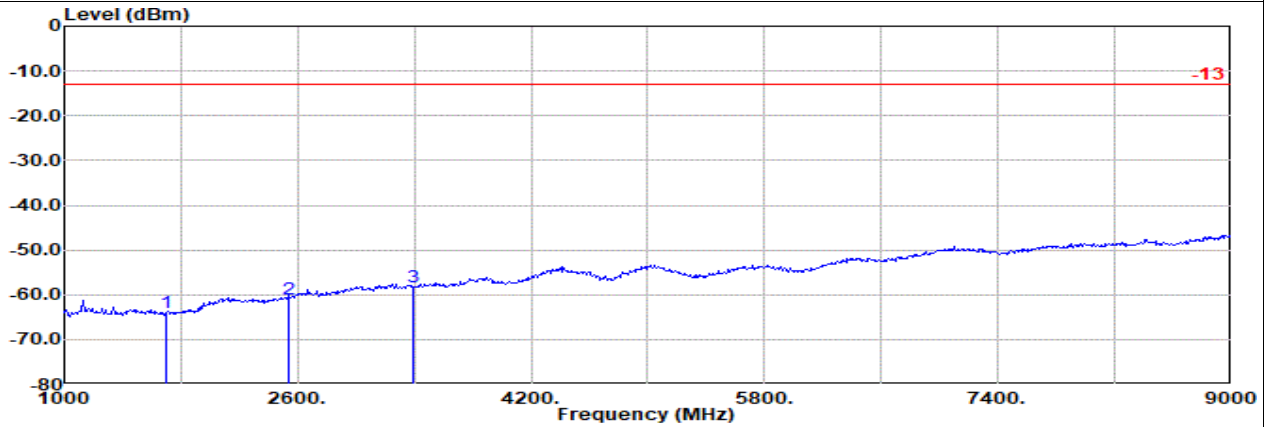
WCDMA B5 Ch4233

H



Site : 03CH11-HY
 Condition: -13 3m 9120D_01620_230817 Horizontal
 : WCDMA 850 CH4233

	Freq MHz	Level dBm	Detector	Ant Amp\Cb		Filter	EIRPCF	Readin g	Limit dBm	Margin dB	Pol
				Factor	1						
1	1693.20	-64.04	RMS	25.17	-28.29	0.31	-95.23	34.00	-13.00	-51.04	Horizontal
2	2539.80	-60.68	RMS	28.00	-26.28	0.21	-95.23	32.62	-13.00	-47.68	Horizontal
3	3386.40	-58.09	RMS	29.53	-24.96	0.23	-95.23	32.34	-13.00	-45.09	Horizontal



Site : 03CH11-HY
 Condition: -13 3m 9120D_01620_230817 Vertical
 : WCDMA 850 CH4233

	Freq MHz	Level dBm	Detector	Ant Amp\Cb		Filter	EIRPCF	Readin g	Limit dBm	Margin dB	Pol
				Factor	1						
1	1693.20	-64.13	RMS	25.17	-28.29	0.31	-95.23	33.91	-13.00	-51.13	Vertical
2	2539.80	-60.96	RMS	28.00	-26.28	0.21	-95.23	32.34	-13.00	-47.96	Vertical
3	3386.40	-58.20	RMS	29.53	-24.96	0.23	-95.23	32.23	-13.00	-45.20	Vertical

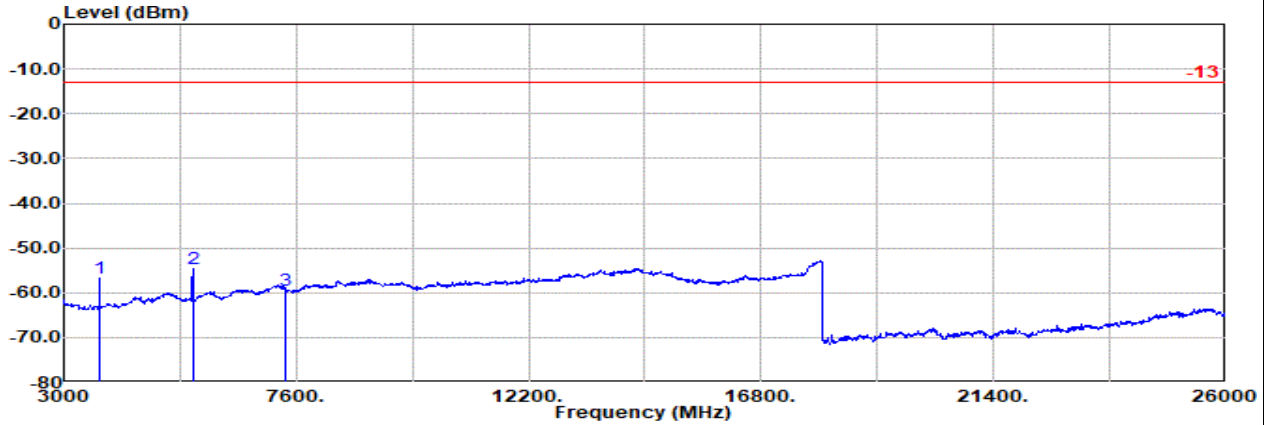


Ant1

Part 24E Mode 1

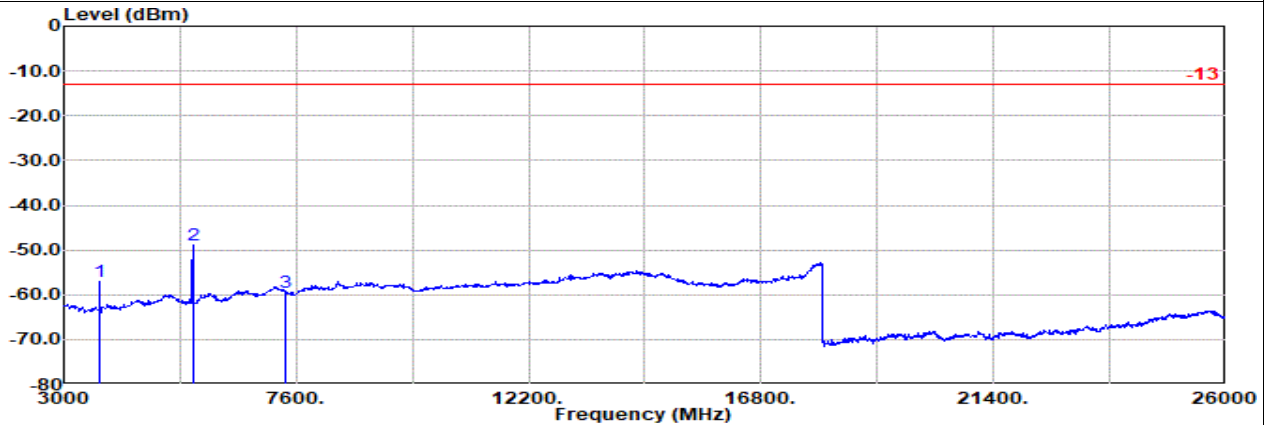
GSM 1900 Ch512

L



Site : 03CH11-HY
 Condition: -13 1m SHF_1224_230710 Horizontal
 : GSM 1900 Ch512

	Freq MHz	Level dBm	Detector	Ant Amp\Cb Filter		EIRPCF	Readin g	Limit g	Margin	Pol	
				Factor	1						dB
1	3700.40	-56.75	RMS	29.60	-30.88	0.76	-95.23	39.00	-13.00	-43.75	Horizontal
2	5550.60	-54.53	RMS	32.90	-29.91	0.51	-95.23	37.20	-13.00	-41.53	Horizontal
3	7400.80	-59.51	RMS	36.40	-31.33	0.65	-95.23	30.00	-13.00	-46.51	Horizontal



Site : 03CH11-HY
 Condition: -13 1m SHF_1224_230710 Vertical
 : GSM 1900 Ch512

	Freq MHz	Level dBm	Detector	Ant Amp\Cb Filter		EIRPCF	Readin g	Limit g	Margin	Pol	
				Factor	1						dB
1	3700.40	-57.12	RMS	29.60	-30.88	0.76	-95.23	38.63	-13.00	-44.12	Vertical
2	5550.60	-48.78	RMS	32.90	-29.91	0.51	-95.23	42.95	-13.00	-35.78	Vertical
3	7400.80	-59.51	RMS	36.40	-31.33	0.65	-95.23	30.00	-13.00	-46.51	Vertical

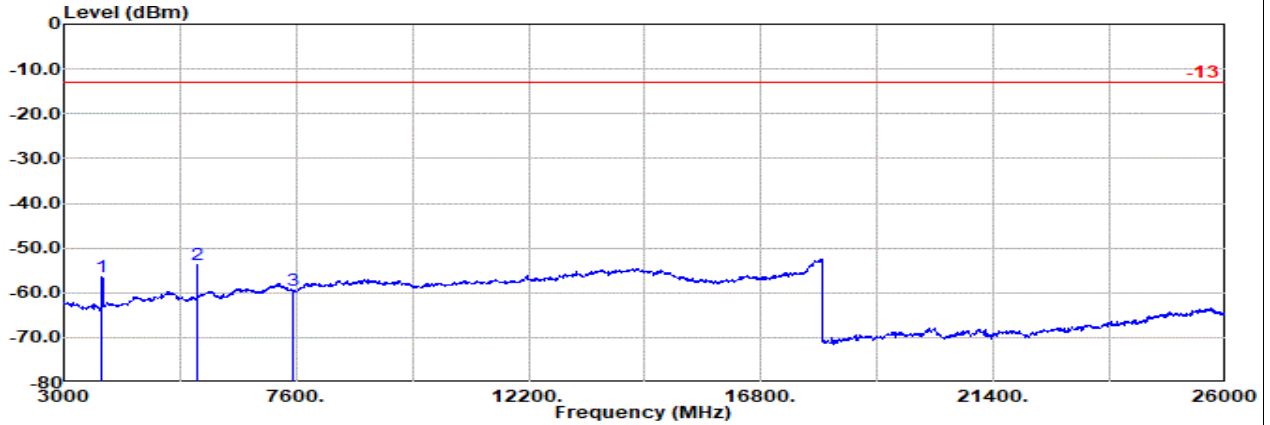


Ant1

Part 24E Mode 1

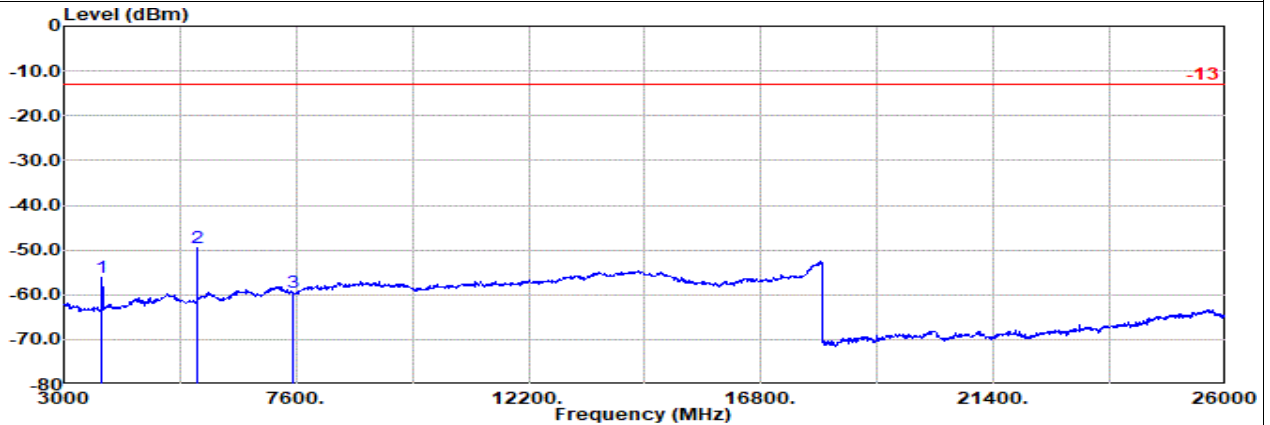
GSM 1900 Ch661

M



Site : 03CH11-HY
 Condition: -13 1m SHF_1224_230710 Horizontal
 : GSM 1900 Ch661

	Freq MHz	Level dBm	Detector	Ant Amp\Cb Filter			EIRPCF	Reading	Limit	Margin	Pol
				Factor	dB/m	dB					
1	3760.00	-56.44	RMS	30.10	-30.86	0.69	-95.23	38.86	-13.00	-43.44	Horizontal
2	5640.00	-53.88	RMS	33.08	-29.95	0.49	-95.23	37.73	-13.00	-40.88	Horizontal
3	7520.00	-59.33	RMS	36.12	-31.38	0.58	-95.23	30.58	-13.00	-46.33	Horizontal



Site : 03CH11-HY
 Condition: -13 1m SHF_1224_230710 Vertical
 : GSM 1900 Ch661

	Freq MHz	Level dBm	Detector	Ant Amp\Cb Filter			EIRPCF	Reading	Limit	Margin	Pol
				Factor	dB/m	dB					
1	3760.00	-56.24	RMS	30.10	-30.86	0.69	-95.23	39.06	-13.00	-43.24	Vertical
2	5640.00	-49.36	RMS	33.08	-29.95	0.49	-95.23	42.25	-13.00	-36.36	Vertical
3	7520.00	-59.45	RMS	36.12	-31.38	0.58	-95.23	30.46	-13.00	-46.45	Vertical

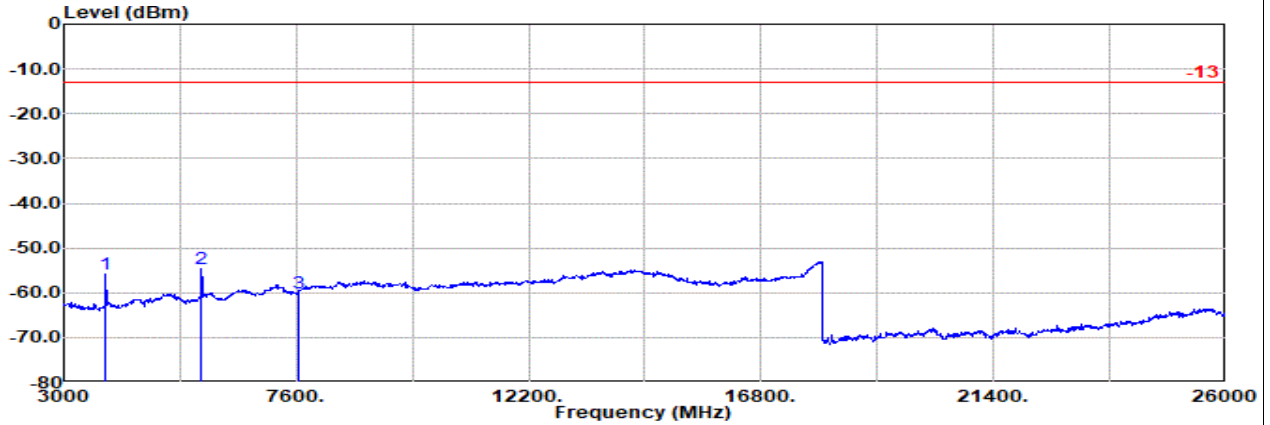


Ant1

Part 24E Mode 1

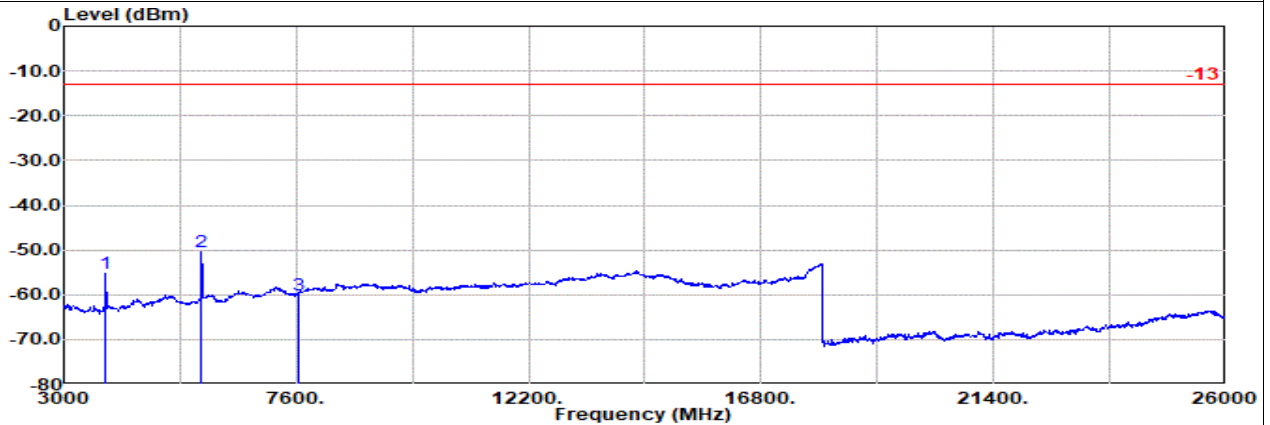
GSM 1900 Ch810

H



Site : 03CH11-HY
 Condition: -13 1m SHF_1224_230710 Horizontal
 : GSM 1900 Ch810

	Freq MHz	Level dBm	Detector	Ant Amp\Cb Filter			EIRPCF	Readin g	Limit g	Margin Pol	
				Factor	dB/m	dB				dB	dB
1	3819.60	-55.87	RMS	30.66	-30.83	0.66	-95.23	38.87	-13.00	-42.87	Horizontal
2	5729.40	-54.49	RMS	33.62	-29.99	0.50	-95.23	36.61	-13.00	-41.49	Horizontal
3	7639.20	-60.01	RMS	36.26	-31.38	0.55	-95.23	29.79	-13.00	-47.01	Horizontal



Site : 03CH11-HY
 Condition: -13 1m SHF_1224_230710 Vertical
 : GSM 1900 Ch810

	Freq MHz	Level dBm	Detector	Ant Amp\Cb Filter			EIRPCF	Readin g	Limit g	Margin Pol	
				Factor	dB/m	dB				dB	dB
1	3819.60	-55.14	RMS	30.66	-30.83	0.66	-95.23	39.60	-13.00	-42.14	Vertical
2	5729.40	-50.46	RMS	33.62	-29.99	0.50	-95.23	40.64	-13.00	-37.46	Vertical
3	7639.20	-59.98	RMS	36.26	-31.38	0.55	-95.23	29.82	-13.00	-46.98	Vertical

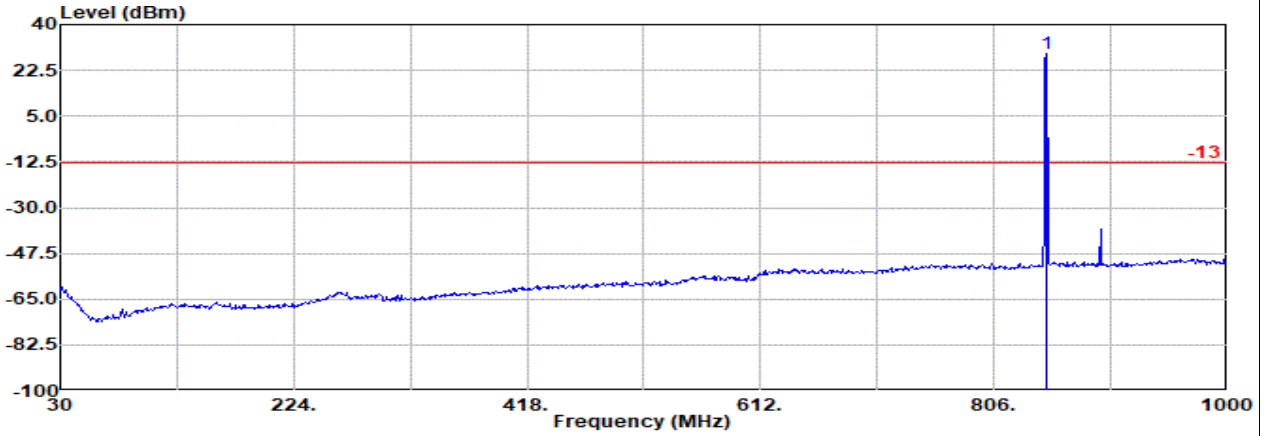


Ant1

Part 22H Mode 1

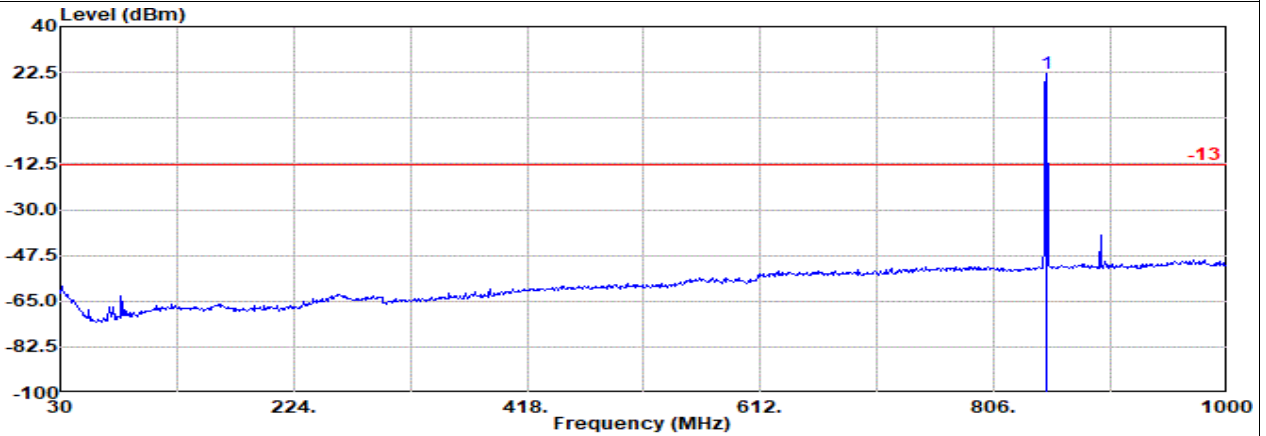
GSM 850 Ch251

H



Site : 03CH11-HY
 Condition: -13 3m Bilog_35414_231007 Horizontal
 : GSM 850 CH251
 : #1 is fundamental signal which can be ignored.

1	Freq MHz	Level dBm	Detector	Ant Factor	Amp dB/m	\Cb dB	Filter dB	EIRPCF dB	Readin dBuV	Limit dBm	Margin dB	Pol
1	849.65	28.74	RMS	28.98	3.73	0.00	-95.23	91.26	-----	-----	-----	Horizontal



Site : 03CH11-HY
 Condition: -13 3m Bilog_35414_231007 Vertical
 : GSM 850 CH251
 : #1 is fundamental signal which can be ignored.

1	Freq MHz	Level dBm	Detector	Ant Factor	Amp dB/m	\Cb dB	Filter dB	EIRPCF dB	Readin dBuV	Limit dBm	Margin dB	Pol
1	849.65	22.27	RMS	28.98	3.73	0.00	-95.23	84.79	-----	-----	-----	Vertical

Remark: #1 is fundamental signal which can be ignored.