



FCC RADIO TEST REPORT

FCC ID : IHDT56YC1
Equipment : Mobile Cellular Phone
Brand Name : Motorola
Model Name : XT2010-1
Applicant : Motorola Mobility LLC
222 W, Merchandise Mart Plaza, Chicago IL 60654 USA
Manufacturer : Motorola Mobility LLC
222 W, Merchandise Mart Plaza, Chicago IL 60654 USA
Standard : 47 CFR Part 2, 22(H), 24(E), 27(L)

The product was received on Apr. 26, 2019 and testing was started from May 07, 2019 and completed on May 13, 2019. 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 report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Jones Tsai

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

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



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History of this test report

Report No.	Version	Description	Issued Date
FG942629A	01	Initial issue of report	Jun. 06, 2019

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)(2)	Effective Radiated Power		
	§24.232 (c)	Equivalent Isotropic Radiated Power		
	§27.50 (d)(4)	Equivalent Isotropic Radiated Power		
3.3	§24.232 (d)	Peak-to-Average Ratio	Pass	-
3.4	§2.1049 §22.917 (b) §24.238 (b) §27.53 (g)	Occupied Bandwidth	Pass	-
3.5	§2.1051 §22.917 (a) §24.238 (a) §27.53 (g)	Band Edge Measurement	Pass	-
3.6	§2.1051 §22.917 (a) §24.238 (a) §27.53 (g)	Conducted Emission	Pass	-
3.7	§2.1055 §22.355	Frequency Stability Temperature & Voltage	Pass	-
	§2.1055 §24.235 §27.54			-
4.4	§2.1053 §22.917 (a) §24.238 (a) §27.53 (h)	Field Strength of Spurious Radiation	Pass	Under limit 18.99 dB at 5730.000 MHz

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Wii Chang

Report Producer: Elise Chang



1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature	
Equipment	Mobile Cellular Phone
Brand Name	Motorola
Model Name	XT2010-1
FCC ID	IHDT56YC1
Sample 1	Single SIM
Sample 2	Dual SIM
IMEI Code	Conducted: 354156100004854 Radiation: 354156100005851
EUT supports Radios application	GSM/EGPRS/WCDMA/HSPA/LTE/GNSS/NFC/FM WLAN 11b/g/n HT20 WLAN 11a/n HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE
HW Version	DVT1B
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer.

Accessory List	
AC Adapter 1 (US)	Brand Name : Motorola
	Model Name : SC-51
	Manufacturer : Salom
AC Adapter 1 (EU)	Brand Name : Motorola
	Model Name : SC-52
	Manufacturer : Salom
AC Adapter 1 (UK)	Brand Name : Motorola
	Model Name : SC-53
	Manufacturer : Salom
AC Adapter 1 (AR)	Brand Name : Motorola
	Model Name : SC-56
	Manufacturer : Salom
AC Adapter 1 (BR)	Brand Name : Motorola
	Model Name : SC-57
	Manufacturer : Salom
AC Adapter 2 (US)	Brand Name : Motorola
	Model Name : SC-51
	Manufacturer : Chenyang
AC Adapter 2 (EU)	Brand Name : Motorola
	Model Name : SC-52
	Manufacturer : Chenyang
AC Adapter 2 (UK)	Brand Name : Motorola
	Model Name : SC-53
	Manufacturer : Chenyang
AC Adapter 2 (AR)	Brand Name : Motorola
	Model Name : SC-56
	Manufacturer : Chenyang
AC Adapter 3 (BR)	Brand Name : Motorola
	Model Name : SC-57
	Manufacturer : Flex
AC Adapter 4 (BR)	Brand Name : Motorola
	Model Name : SC-57
	Manufacturer : Cliptech
Battery 1	Brand Name : Motorola
	Model Name : KP50
	Manufacturer : SCUD
Earphone 1	Brand Name : Motorola
	Model Name : SH38C37773
	Manufacturer : Lianyun
Earphone 2	Brand Name : Motorola
	Model Name : SH38C44959
	Manufacturer : Cosonic
USB Cable 1	Brand Name : Luxshare
	Model Name : SC18C24368
USB Cable 2	Brand Name : Saibao
	Model Name : SC18C24367

1.2 Modification of EUT

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

1.3 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	GSM/GPRS/EDGE: 850: 824.2 MHz ~ 848.8 MHz 1900: 1850.2 MHz ~ 1909.8 MHz WCDMA: Band V: 826.4 MHz ~ 846.6 MHz Band II: 1852.4 MHz ~ 1907.6 MHz Band IV: 1712.4 MHz ~ 1752.6 MHz
Rx Frequency	GSM/GPRS/EDGE: 850: 869.2 MHz ~ 893.8 MHz 1900: 1930.2 MHz ~ 1989.8 MHz WCDMA: Band V: 871.4 MHz ~ 891.6 MHz Band II: 1932.4 MHz ~ 1987.6 MHz Band IV: 2112.4 MHz ~ 2152.6 MHz
Maximum Output Power to Antenna	GSM/GPRS/EDGE: 850: 32.79 dBm 1900: 29.35 dBm WCDMA: Band V: 22.80 dBm Band II: 22.74 dBm Band IV: 22.68 dBm
Antenna Type	Dipole Antenna
Antenna Gain	Cellular Band: -3 dBi PCS Band: -1 dBi AWS Band: 1 dBi
Type of Modulation	GSM: GMSK GPRS: GMSK EDGE: GMSK / 8PSK WCDMA: BPSK (Uplink) HSDPA: 64QAM (Downlink) HSUPA: QPSK (Uplink)

1.4 Maximum ERP/EIRP Power, Frequency Tolerance, and Emission Designator

FCC Rule	Frequency Range (MHz)	System	Type of Modulation	Maximum ERP/EIRP (W)	Frequency Tolerance (ppm)	Emission Designator
Part 22	824.2 ~848.8	GSM850 GPRS class 8	GMSK	0.5808	0.0155 ppm	245KGXW
Part 22	824.2 ~848.8	GSM850 EDGE class 8	8PSK	0.1312	0.0502 ppm	249KG7W
Part 22	826.4 ~846.6	WCDMA Band V RMC 12.2Kbps	BPSK	0.0582	0.0203 ppm	4M14F9W
Part 24	1850.2 ~1909.8	GSM1900 GPRS class 8	GMSK	0.6839	0.0213 ppm	245KGXW
Part 24	1850.2 ~1909.8	GSM1900 EDGE class 8	8PSK	0.2698	0.0500 ppm	248KG7W
Part 24	1852.4 ~ 1907.6	WCDMA Band II RMC 12.2Kbps	BPSK	0.1493	0.0053 ppm	4M13F9W
Part 27	1712.4 ~ 1752.6	WCDMA Band IV RMC 12.2Kbps	BPSK	0.2333	0.0231 ppm	4M13F9W



1.5 Testing Location

Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978
Test Site No.	Sporton Site No. TH03-HY
Test Engineer	Louis Chung
Temperature	21~24°C
Relative Humidity	51~55%

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

Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	Sporton Site No. 03CH11-HY
Test Engineer	Hao Shu, Ken Wu, and Fu Chen
Temperature	24.2~25.3°C
Relative Humidity	53~57%

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

FCC Designation No.: TW1190 and TW0007

1.6 Applicable Standards

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

- ♦ ANSI C63.26-2015
- ♦ ANSI / TIA-603-E
- ♦ 47 CFR Part 2, 22(H), 24(E), 27(L)
- ♦ FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- ♦ FCC KDB 412172 D01 Determining ERP and EIRP v01r01

Remark:

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

2 Test Configuration of Equipment Under Test

2.1 Test Mode

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

For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (X plane for AWS Band, Y plane for PCS Band, and Z plane for Cellular Band) were recorded 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 18000 MHz for WCDMA Band IV.
3. 30 MHz to 19100 MHz for GSM1900 and WCDMA Band II.

All modes and data rates and positions were investigated.

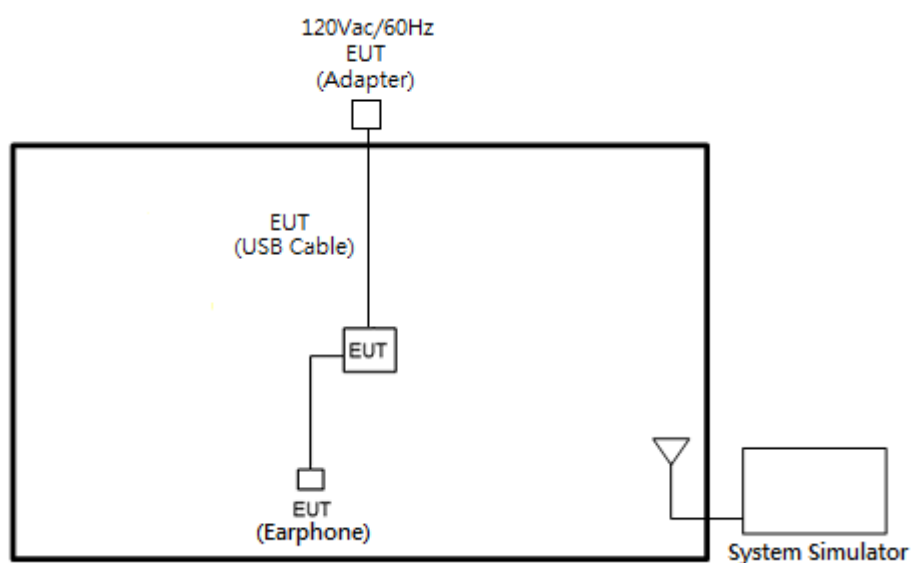
Test modes are chosen to be reported as the worst case configuration below:

Test Modes		
Band	Radiated TCs	Conducted TCs
GSM 850	■ GPRS Class 12 Link ■ EDGE Class 12 Link	■ GPRS Class 12 Link ■ EDGE Class 12 Link
GSM 1900	■ GPRS Class 12 Link ■ EDGE Class 12 Link	■ GPRS Class 12 Link ■ EDGE Class 12 Link
WCDMA Band V	■ RMC 12.2Kbps Link	■ RMC 12.2Kbps Link
WCDMA Band II	■ RMC 12.2Kbps Link	■ RMC 12.2Kbps Link
WCDMA Band IV	■ RMC 12.2Kbps Link	■ RMC 12.2Kbps Link

Remark: For Radiated Test Cases of Cellular Band and AWS Band, the tests were performed with AC Adapter 1 (Salom_US), Earphone 1, USB Cable 1, and Sample 1, and for PCS Band the tests were performed with Sample 1 only.

2.2 Connection Diagram of Test System

<EUT with Accessory for Cellular Band and AWS Band>



<EUT without Accessory for PCS Band>



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.	System Simulator	Anritsu	MT8820C	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 4.2 dB and a 10dB 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
WCDMA Band II	Channel	9262	9400	9538
	Frequency	1852.4	1880.0	1907.6
WCDMA Band IV	Channel	1312	1413	1513
	Frequency	1712.4	1732.6	1752.6

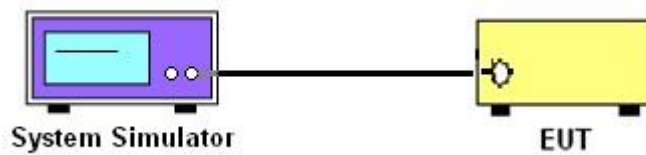
3 Conducted Test Result

3.1 Measuring Instruments

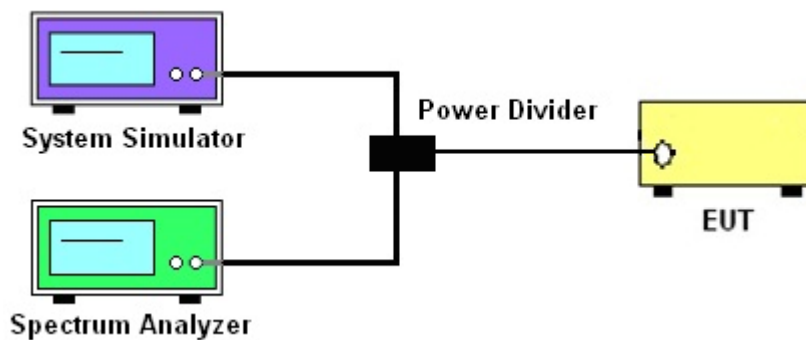
See list of measuring instruments of this test report.

3.1.1 Test Setup

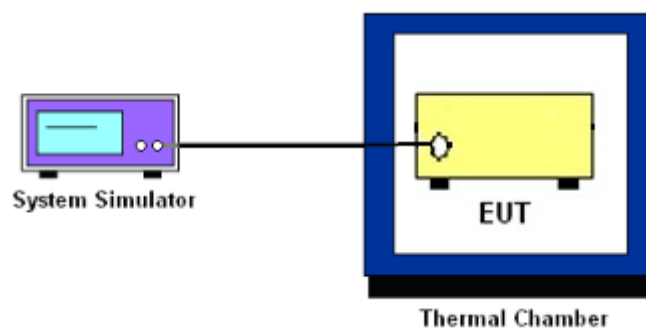
3.1.2 Conducted Output Power



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

3.2.1 Description of the Conducted Output Power

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

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

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

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

According to KDB 412172 D01 Power Approach,

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

P_T = transmitter output power in dBm

G_T = gain of the transmitting antenna in dBi

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

3.2.2 Test Procedures

1. The transmitter output port was connected to the system simulator.
2. Set EUT at maximum power through system simulator.
3. Select lowest, middle, and 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 was 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 was 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 was connected to the spectrum analyzer and system simulator via a power divider.
2. 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.
3. The band edges of low and high channels for the highest RF powers were measured.
4. The RF fundamental frequency should 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 was connected to the spectrum analyzer and system simulator via a power divider.
2. 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.
3. The middle channel for the highest RF power within the transmitting frequency was measured.
4. The conducted spurious emission for the whole frequency range was taken.
5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
6. The limit line is derived from $43 + 10\log(P)$ 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 & 27.54

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 was set up in the thermal chamber and connected with the system simulator.
2. 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.
3. With power OFF, the temperature was raised in 10°C steps 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.

3.7.3 Test Procedures for Voltage Variation

The testing follows FCC KDB 971168 D01 v03r01 Section 9.0.

1. The EUT was 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 was varied from 85% to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency was measured for the worst case.

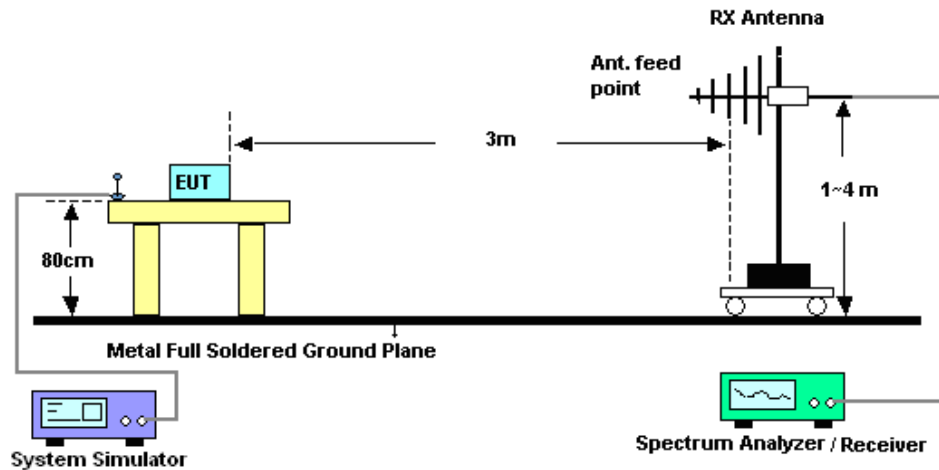
4 Radiated Test Items

4.1 Measuring Instruments

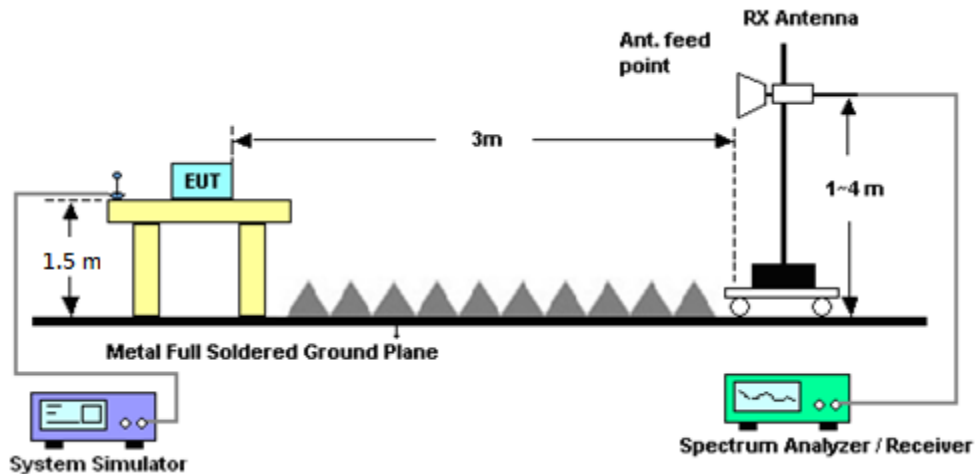
See list of measuring instruments of this test report.

4.2 Test Setup

For radiated test from 30MHz to 1GHz



For radiated test above 1GHz



4.3 Test Result of Radiated Test

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

The testing follows FCC KDB 971168 D01 v03r01 Section 7 and ANSI / TIA-603-E Section 2.2.12.

1. 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.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was 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 = 1MHz, VBW = 3MHz, taking record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. $EIRP \text{ (dBm)} = S.G. \text{ Power} - Tx \text{ Cable Loss} + Tx \text{ Antenna Gain}$
11. $ERP \text{ (dBm)} = EIRP - 2.15$
12. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
13. The limit line is derived from $43 + 10\log(P)$ 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	Rohde & Schwarz	FSP30	101329	9kHz~30GHz	Jun. 29, 2018	May 11, 2019~ May 13, 2019	Jun. 28, 2019	Conducted (TH03-HY)
Temperature Chamber	ESPEC	SU-641	92013721	-30℃ ~70℃	Dec. 06, 2017	May 11, 2019~ May 13, 2019	Dec. 05, 2019	Conducted (TH03-HY)
Programmable Power Supply	GW Instek	PSS-2005	EL883644	Voltage:0~20V; Current:0~5A	Dec. 06, 2017	May 11, 2019~ May 13, 2019	Dec. 05, 2019	Conducted (TH03-HY)
Base Station (Measure)	Rohde & Schwarz	CMU200	117995	GSM / GPRS / WCDMA / CDMA	Aug. 10, 2018	May 11, 2019~ May 13, 2019	Aug. 09, 2019	Conducted (TH03-HY)
Amplifier	MITEQ	TTA1840-35-HG	1871923	18GHz~40GHz, VSWR : 2.5:1 max	Jul. 16, 2018	May 07, 2019~ May 09, 2019	Jul. 15, 2019	Radiation (03CH11-HY)
Amplifier	SONOMA	310N	187312	9kHz~1GHz	Dec. 04, 2018	May 07, 2019~ May 09, 2019	Dec. 03, 2019	Radiation (03CH11-HY)
Bilog Antenna	TESEQ	CBL 6111D&N-6-0 6	35414&AT- N0602	30MHz~1GHz	Oct. 13, 2018	May 07, 2019~ May 09, 2019	Oct. 12, 2019	Radiation (03CH11-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-132 6	1GHz ~ 18GHz	Oct. 15, 2018	May 07, 2019~ May 09, 2019	Oct. 14, 2019	Radiation (03CH11-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-132 8	1GHz ~ 18GHz	Nov. 09, 2018	May 07, 2019~ May 09, 2019	Nov. 08, 2019	Radiation (03CH11-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Nov. 23, 2017	May 07, 2019~ May 09, 2019	Nov. 22, 2019	Radiation (03CH11-HY)
Preamplifier	Keysight	83017A	MY532701 48	1GHz~26.5GHz	Nov. 14, 2018	May 07, 2019~ May 09, 2019	Nov. 13, 2019	Radiation (03CH11-HY)
Spectrum Analyzer	Keysight	N9010A	MY542004 86	10Hz ~ 44GHz	Oct. 18, 2018	May 07, 2019~ May 09, 2019	Oct. 17, 2019	Radiation (03CH11-HY)
Filter	Wainwright	WHKX12-108 0-1200-1500- 60SS	SN2	1.2G High Pass	Sep. 17, 2018	May 07, 2019~ May 09, 2019	Sep. 16, 2019	Radiation (03CH11-HY)
Filter	Wainwright	WHKX12-270 0-3000-18000 -60SS	SN3	2.7G High Pass	Sep. 17, 2018	May 07, 2019~ May 09, 2019	Sep. 16, 2019	Radiation (03CH11-HY)
Antenna Mast	EMEC	AM-BS-4500- B	N/A	1~4m	N/A	May 07, 2019~ May 09, 2019	N/A	Radiation (03CH11-HY)
Turn Table	EMEC	TT 2000	N/A	0~360 Degree	N/A	May 07, 2019~ May 09, 2019	N/A	Radiation (03CH11-HY)
EMI Test Receiver	Keysight	N9038A(MXE)	MY532900 45	20MHz~8.4GHz	Jan. 19, 2019	May 07, 2019~ May 09, 2019	Jan. 18, 2020	Radiation (03CH11-HY)
Signal Generator	Rohde & Schwarz	SMF100A	101107	100kHz~40GHz	May 22, 2018	May 07, 2019~ May 09, 2019	May 21, 2019	Radiation (03CH11-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170 584	18GHz- 40GHz	Dec. 05, 2018	May 07, 2019~ May 09, 2019	Dec. 04, 2019	Radiation (03CH11-HY)
Software	Audix	E3 6.2009-8-24	RK-00104 2	N/A	N/A	May 07, 2019~ May 09, 2019	N/A	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4 PE	9kHz-30MHz	Mar. 13, 2019	May 07, 2019~ May 09, 2019	Mar. 12, 2020	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY2859/2	30MHz-40GHz	Mar. 13, 2019	May 07, 2019~ May 09, 2019	Mar. 12, 2020	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4 PE	30M-18G	Mar. 13, 2019	May 07, 2019~ May 09, 2019	Mar. 12, 2020	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY4274/2	30MHz-40GHz	Mar. 13, 2019	May 07, 2019~ May 09, 2019	Mar. 12, 2020	Radiation (03CH11-HY)

6 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.37
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.67
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Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.03
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Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power)

Conducted Power (*Unit: dBm)						
Band	GSM850			GSM1900		
Channel	128	189	251	512	661	810
Frequency	824.2	836.4	848.8	1850.2	1880	1909.8
GSM	32.71	32.54	32.48	29.02	29.31	29.22
GPRS class 8	32.79	32.55	32.50	29.05	29.35	29.24
GPRS class 10	31.63	31.28	31.40	27.88	28.08	28.01
GPRS class 11	29.79	29.46	29.39	26.13	26.29	26.31
GPRS class 12	27.79	27.86	27.43	24.46	24.53	24.63
EGPRS class 8	26.33	26.20	26.02	25.18	25.28	25.31
EGPRS class 10	25.16	25.26	24.78	24.08	24.19	24.26
EGPRS class 11	23.48	23.39	23.27	22.14	22.21	22.37
EGPRS class 12	21.96	21.81	21.57	20.47	20.50	20.51

Conducted Power (*Unit: dBm)						
Band	WCDMA Band V			WCDMA Band II		
Channel	4132	4182	4233	9262	9400	9538
Frequency	826.4	836.4	846.6	1852.4	1880	1907.6
RMC 12.2K	22.80	22.71	22.62	22.64	22.66	22.74
HSDPA Subtest-1	21.77	21.73	21.60	21.62	21.66	21.71
HSDPA Subtest-2	21.73	21.62	21.58	21.62	21.64	21.68
HSDPA Subtest-3	21.26	21.26	21.10	21.12	21.16	21.21
HSDPA Subtest-4	21.25	21.24	21.08	21.10	21.12	21.18
HSUPA Subtest-1	21.79	21.71	21.60	21.60	21.64	21.72
HSUPA Subtest-2	19.71	19.68	19.61	19.59	19.66	19.71
HSUPA Subtest-3	20.70	20.65	20.60	20.55	20.60	20.68
HSUPA Subtest-4	19.68	19.65	19.58	19.57	19.63	19.69
HSUPA Subtest-5	21.79	21.72	21.60	21.67	21.67	21.74



Conducted Power (*Unit: dBm)			
Band	WCDMA Band IV		
Channel	1312	1413	1513
Frequency	1712.4	1732.6	1752.6
RMC 12.2K	22.68	22.56	22.58
HSDPA Subtest-1	21.68	21.53	21.54
HSDPA Subtest-2	21.65	21.50	21.52
HSDPA Subtest-3	21.10	21.05	21.04
HSDPA Subtest-4	21.09	21.04	21.03
HSUPA Subtest-1	21.68	21.54	21.58
HSUPA Subtest-2	19.61	19.53	19.55
HSUPA Subtest-3	20.58	20.50	20.52
HSUPA Subtest-4	19.58	19.52	19.51
HSUPA Subtest-5	21.70	21.56	21.59



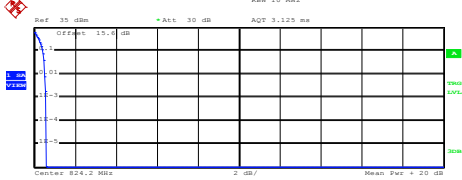
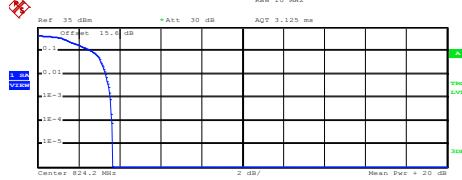
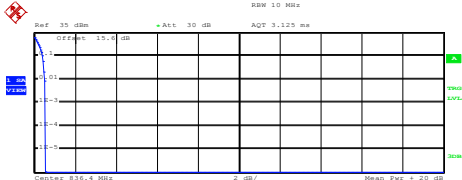
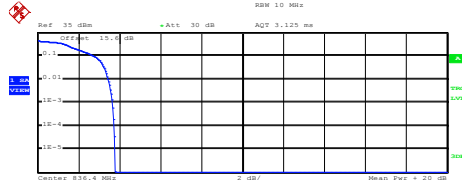
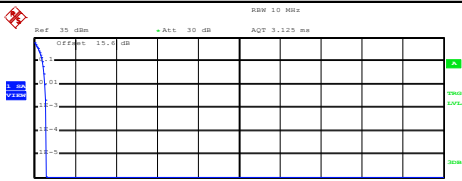
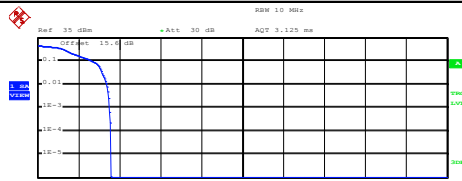
A2. GSM

Peak-to-Average Ratio

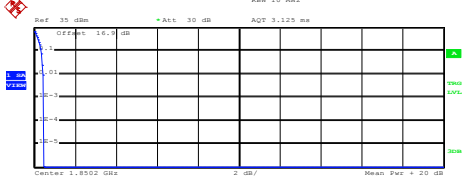
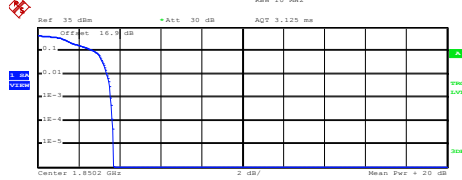
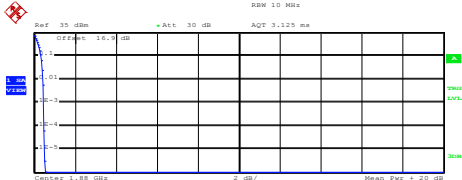
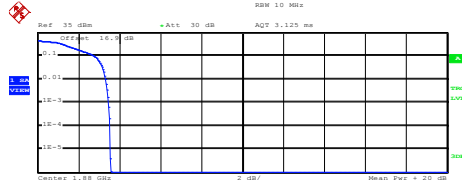
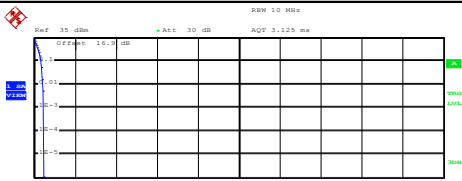
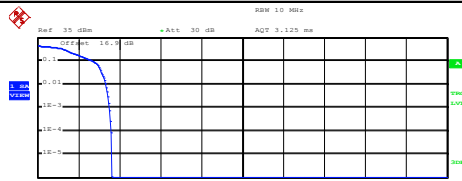
Mode	GSM850		Limit: 13dB
Mod.	GPRS class 8	EDGE class 8	Result
Lowest CH	0.56	3.56	PASS
Middle CH	0.56	3.64	
Highest CH	0.60	3.52	

Mode	GSM1900		Limit: 13dB
Mod.	GPRS class 8	EDGE class 8	Result
Lowest CH	0.48	3.56	PASS
Middle CH	0.48	3.48	
Highest CH	0.48	3.52	



GSM850 (GPRS class 8)		GSM850 (EDGE class 8)	
Lowest Channel		Lowest Channel	
 Ref: 35 dBm Att: 30 dB AQT: 3.125 ms Center: 824.2 MHz 2 dB/ Mean: 31.06 dBm Peak: 31.65 dBm Crest: 0.59 dB 10 % 0.40 dB 1 % 0.52 dB .1 % 0.56 dB .01 % 0.60 dB Date: 11.MAY.2019 10:13:37		 Ref: 35 dBm Att: 30 dB AQT: 3.125 ms Center: 824.2 MHz 2 dB/ Mean: 24.60 dBm Peak: 28.26 dBm Crest: 3.66 dB 10 % 2.64 dB 1 % 3.32 dB .1 % 3.56 dB .01 % 3.64 dB Date: 11.MAY.2019 10:42:22	
Middle Channel		Middle Channel	
 Ref: 35 dBm Att: 30 dB AQT: 3.125 ms Center: 835.4 MHz 2 dB/ Mean: 31.10 dBm Peak: 31.65 dBm Crest: 0.55 dB 10 % 0.40 dB 1 % 0.52 dB .1 % 0.56 dB .01 % 0.56 dB Date: 11.MAY.2019 10:14:21		 Ref: 35 dBm Att: 30 dB AQT: 3.125 ms Center: 835.4 MHz 2 dB/ Mean: 24.36 dBm Peak: 28.12 dBm Crest: 3.76 dB 10 % 2.76 dB 1 % 3.44 dB .1 % 3.64 dB .01 % 3.76 dB Date: 11.MAY.2019 10:42:48	
Highest Channel		Highest Channel	
 Ref: 35 dBm Att: 30 dB AQT: 3.125 ms Center: 849.8 MHz 2 dB/ Mean: 30.87 dBm Peak: 31.44 dBm Crest: 0.57 dB 10 % 0.40 dB 1 % 0.52 dB .1 % 0.60 dB .01 % 0.60 dB Date: 11.MAY.2019 10:14:36		 Ref: 35 dBm Att: 30 dB AQT: 3.125 ms Center: 849.8 MHz 2 dB/ Mean: 24.27 dBm Peak: 27.84 dBm Crest: 3.58 dB 10 % 2.72 dB 1 % 3.36 dB .1 % 3.52 dB .01 % 3.60 dB Date: 11.MAY.2019 10:43:04	

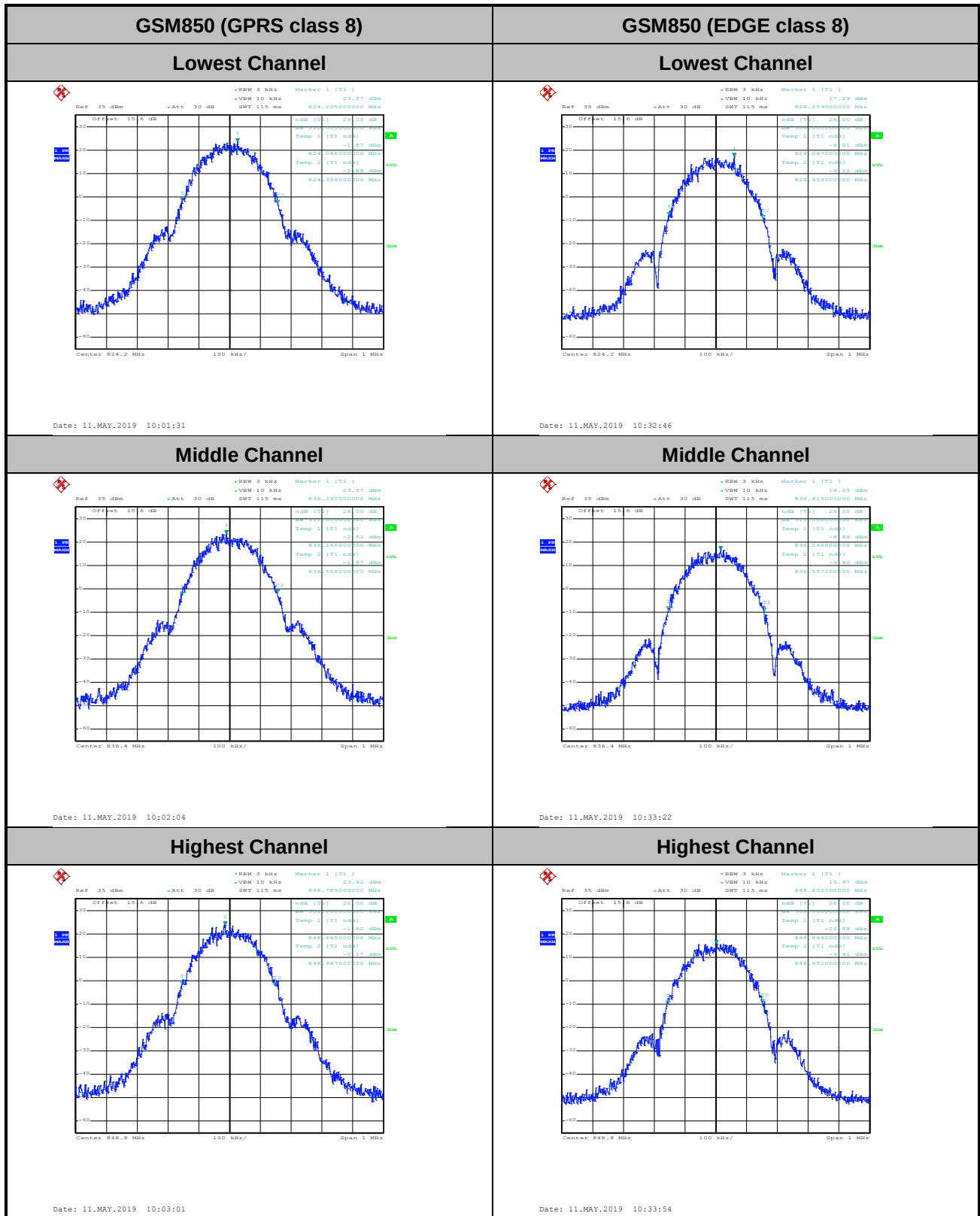


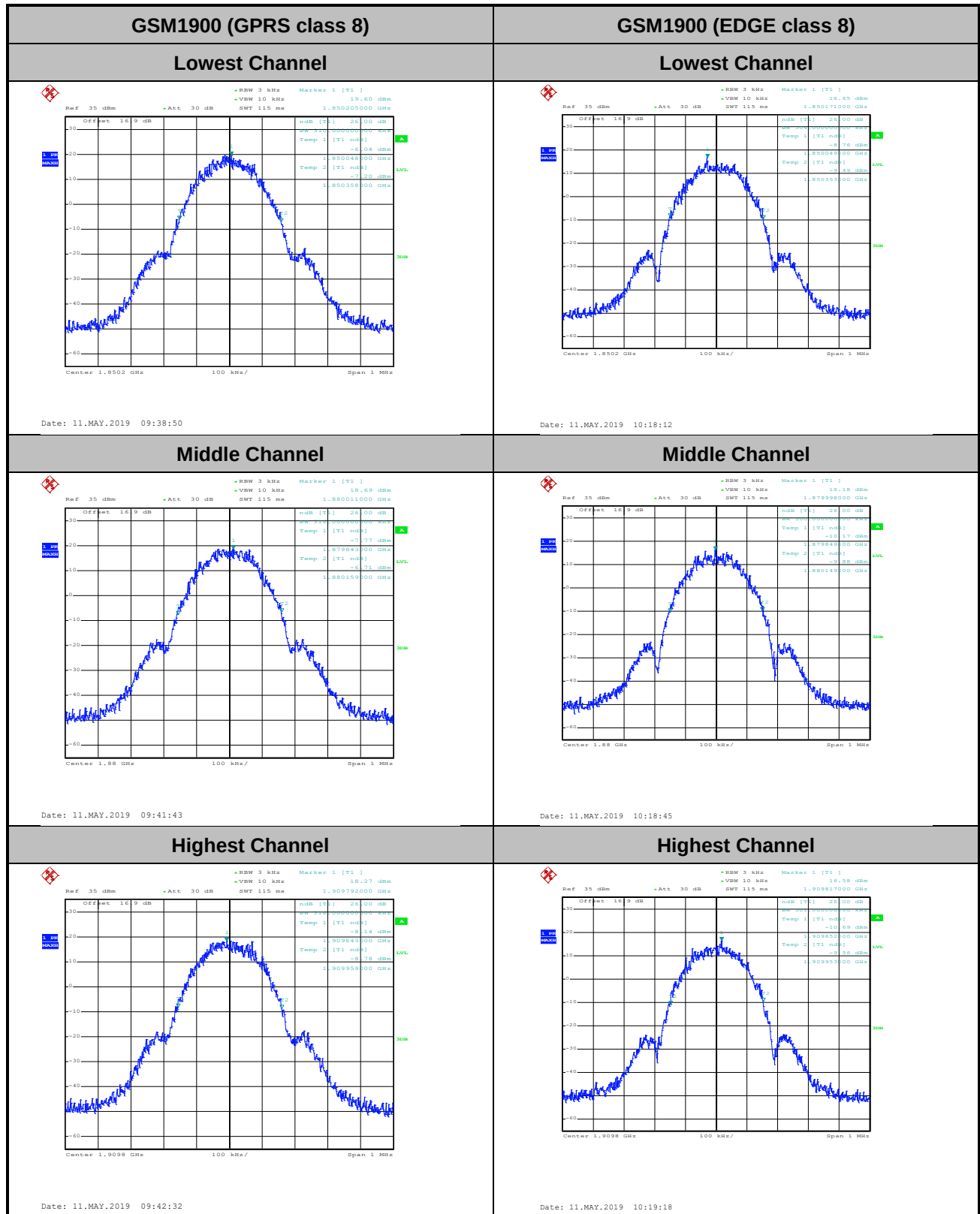
GSM1900 (GPRS class 8)		GSM1900 (EDGE class 8)	
Lowest Channel		Lowest Channel	
 Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean 27.01 dBm Peak 27.49 dBm Crest 0.48 dB 10 % 0.36 dB 1 % 0.44 dB .1 % 0.48 dB .01 % 0.48 dB Date: 11.MAY.2019 09:58:42		 Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean 23.08 dBm Peak 26.78 dBm Crest 3.70 dB 10 % 2.76 dB 1 % 3.36 dB .1 % 3.56 dB .01 % 3.64 dB Date: 11.MAY.2019 10:29:02	
Middle Channel		Middle Channel	
 Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean 27.25 dBm Peak 27.77 dBm Crest 0.52 dB 10 % 0.32 dB 1 % 0.44 dB .1 % 0.48 dB .01 % 0.48 dB Date: 11.MAY.2019 09:59:52		 Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean 23.30 dBm Peak 26.85 dBm Crest 3.55 dB 10 % 2.80 dB 1 % 3.32 dB .1 % 3.48 dB .01 % 3.56 dB Date: 11.MAY.2019 10:30:17	
Highest Channel		Highest Channel	
 Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean 27.17 dBm Peak 27.63 dBm Crest 0.46 dB 10 % 0.32 dB 1 % 0.44 dB .1 % 0.48 dB .01 % 0.48 dB Date: 11.MAY.2019 10:00:10		 Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean 23.22 dBm Peak 26.85 dBm Crest 3.63 dB 10 % 2.72 dB 1 % 3.32 dB .1 % 3.52 dB .01 % 3.60 dB Date: 11.MAY.2019 10:30:38	

**26dB Bandwidth**

Mode	GSM850	
Mod.	GPRS class 8	EDGE class 8
Lowest CH	0.310	0.306
Middle CH	0.311	0.311
Highest CH	0.302	0.308

Mode	GSM1900	
Mod.	GPRS class 8	EDGE class 8
Lowest CH	0.310	0.304
Middle CH	0.316	0.300
Highest CH	0.316	0.301

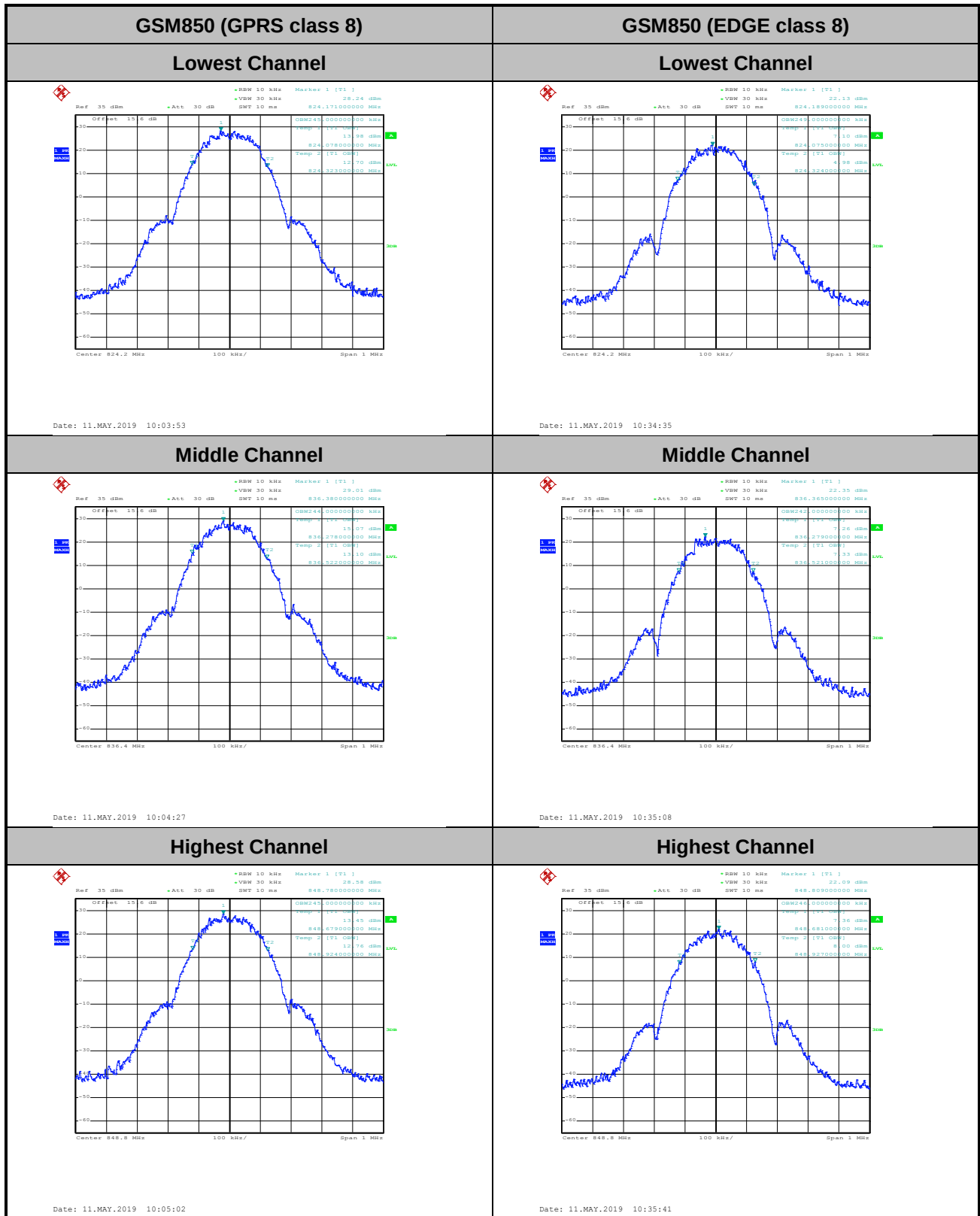


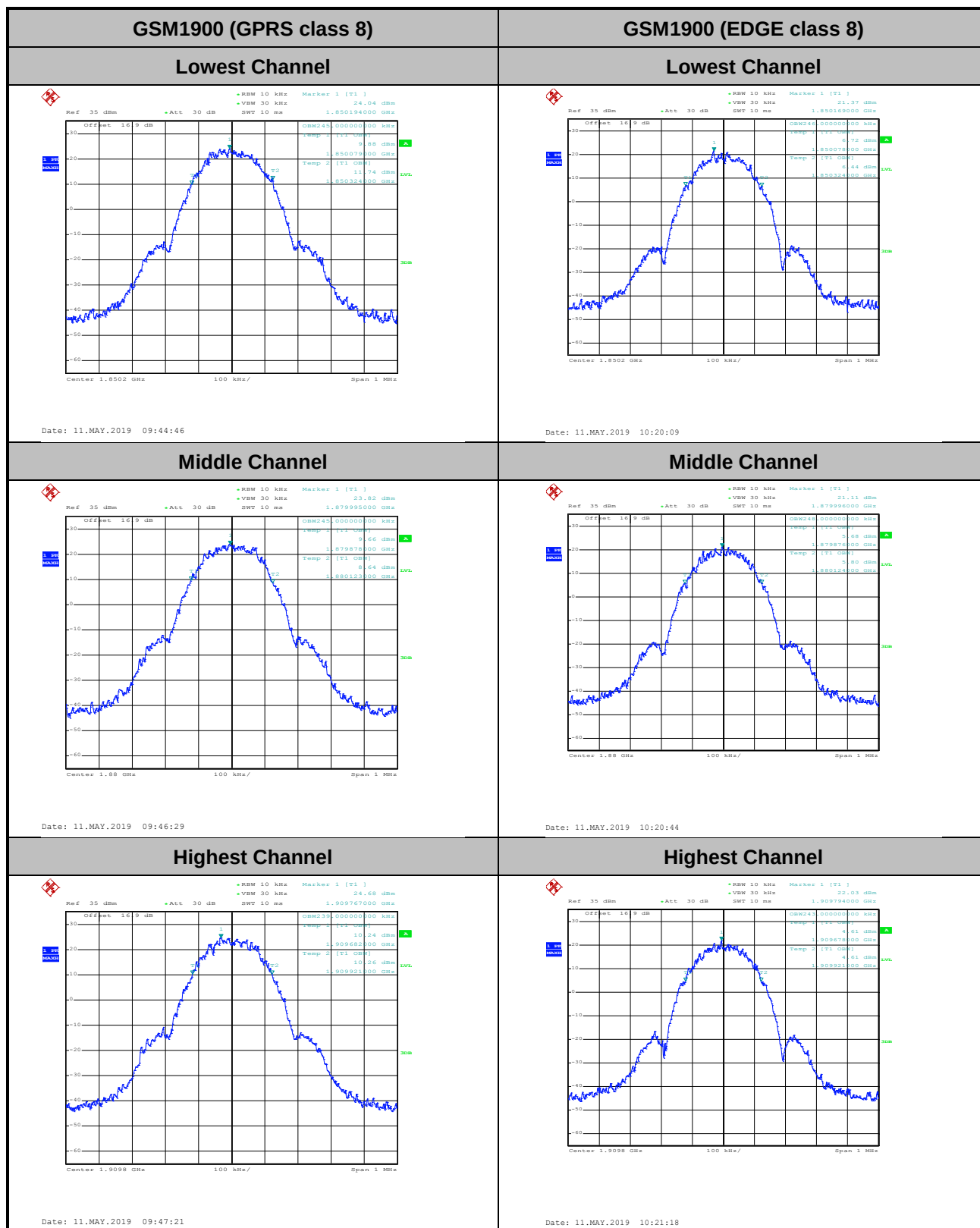


**Occupied Bandwidth**

Mode	GSM850	
Mod.	GPRS class 8	EDGE class 8
Lowest CH	0.245	0.249
Middle CH	0.244	0.242
Highest CH	0.245	0.246

Mode	GSM1900	
Mod.	GPRS class 8	EDGE class 8
Lowest CH	0.245	0.246
Middle CH	0.245	0.248
Highest CH	0.239	0.243



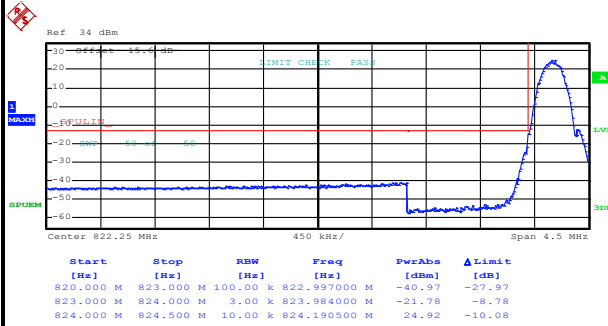




Conducted Band Edge

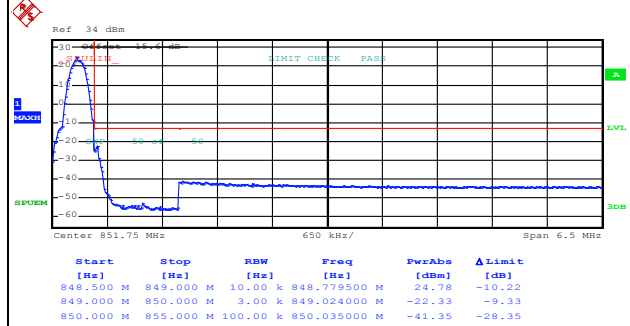
GSM850 (GPRS class 8)

Lowest Band Edge



Date: 11.MAY.2019 10:06:44

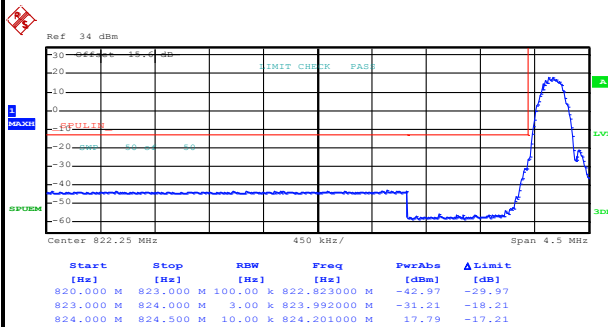
Highest Band Edge



Date: 11.MAY.2019 10:08:19

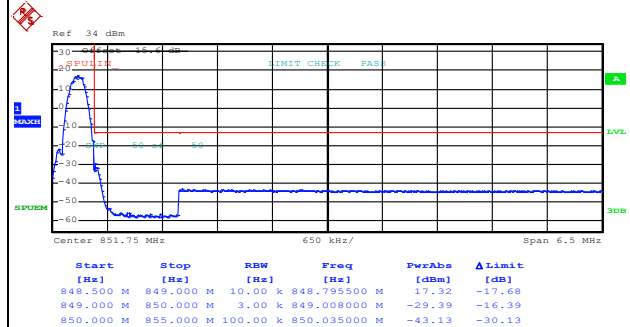
GSM850 (EDGE class 8)

Lowest Band Edge



Date: 11.MAY.2019 10:37:14

Highest Band Edge

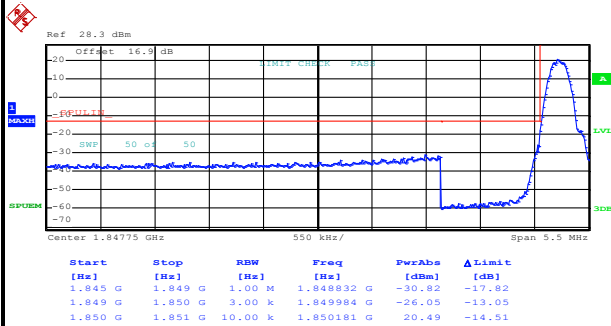


Date: 11.MAY.2019 10:38:47



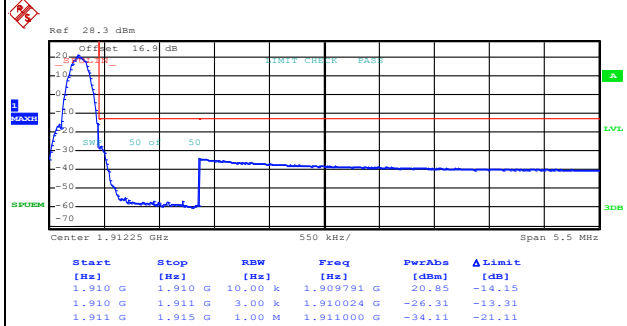
GSM1900 (GPRS class 8)

Lowest Band Edge



Date: 11.MAY.2019 09:49:26

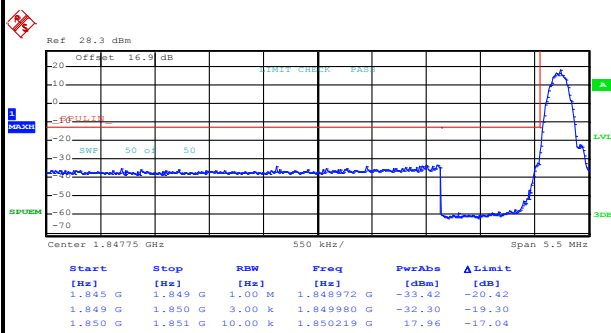
Highest Band Edge



Date: 11.MAY.2019 09:52:37

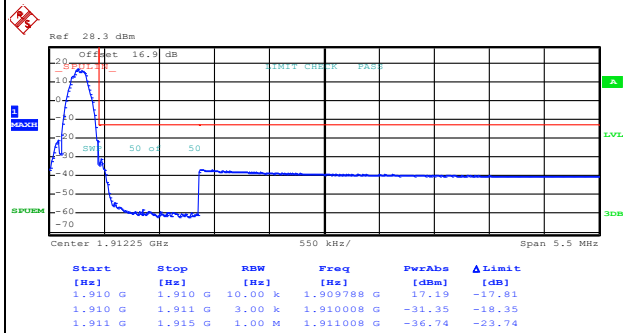
GSM1900 (EDGE class 8)

Lowest Band Edge



Date: 11.MAY.2019 10:22:58

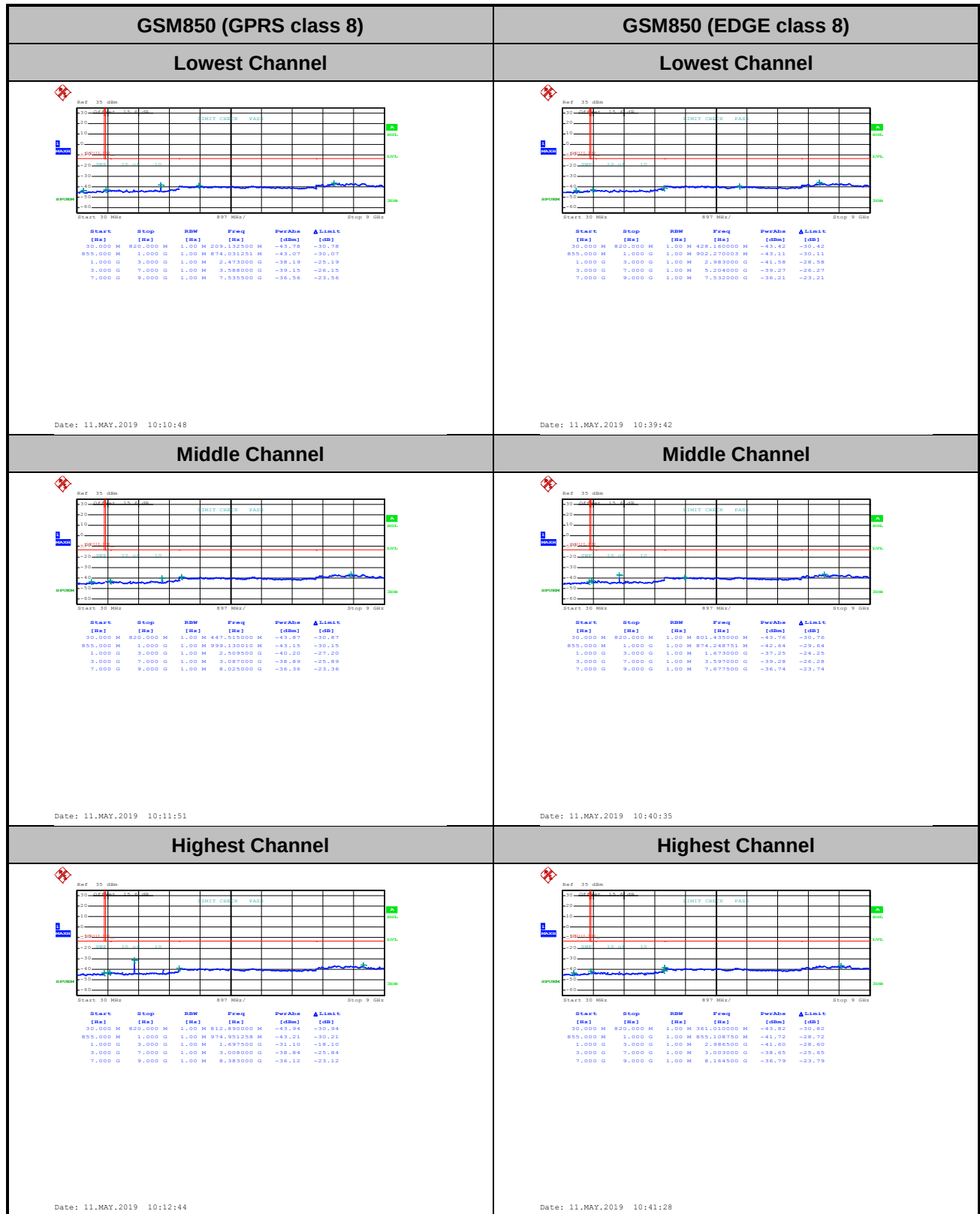
Highest Band Edge



Date: 11.MAY.2019 10:24:33



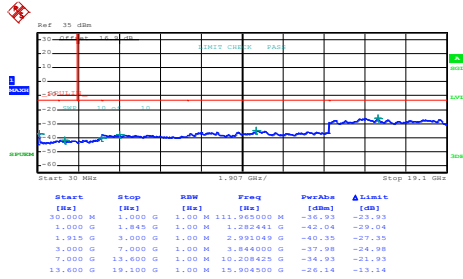
Conducted Spurious Emission





GSM1900 (GPRS class 8)

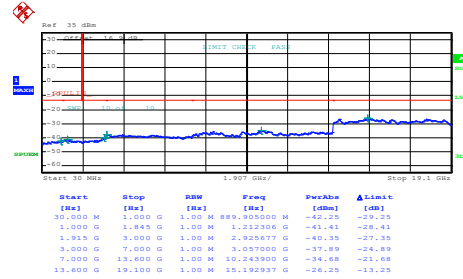
Lowest Channel



Date: 11.MAY.2019 09:53:37

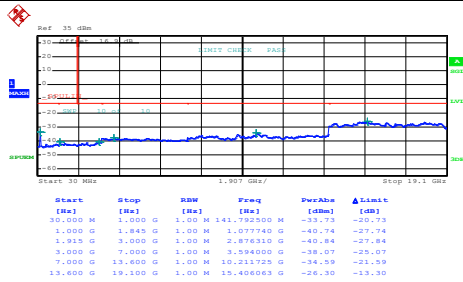
GSM1900 (EDGE class 8)

Lowest Channel



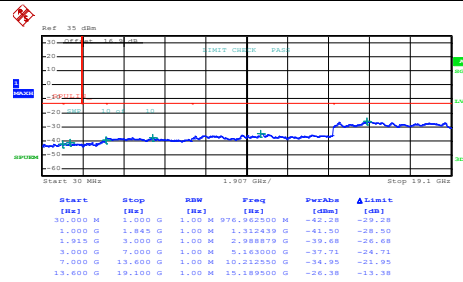
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Middle Channel



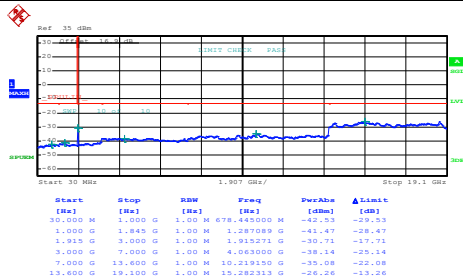
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Middle Channel



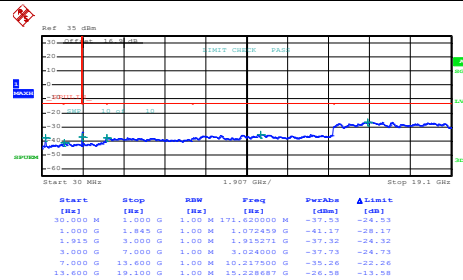
Date: 11.MAY.2019 10:26:36

Highest Channel



Date: 11.MAY.2019 09:56:37

Highest Channel



Date: 11.MAY.2019 10:27:46

Frequency Stability

Test Conditions	Middle Channel	GSM850 (GPRS class 8)	GSM850 (EDGE class 8)	Limit 2.5ppm
Temperature (°C)	Voltage (Volt)	Deviation (ppm)		Result
50	Normal Voltage	0.0024	0.0096	PASS
40	Normal Voltage	0.0000	0.0072	
30	Normal Voltage	0.0012	0.0024	
20(Ref.)	Normal Voltage	0.0000	0.0000	
10	Normal Voltage	0.0024	0.0000	
0	Normal Voltage	0.0084	0.0012	
-10	Normal Voltage	0.0060	0.0024	
-20	Normal Voltage	0.0155	0.0502	
-30	Normal Voltage	0.0155	0.0502	
20	Maximum Voltage	0.0000	0.0024	
20	Normal Voltage	0.0000	0.0000	
20	Battery End Point	0.0000	0.0012	

Test Conditions	Middle Channel	GSM1900 (GPRS class 8)	GSM1900 (EDGE class 8)	Limit Note 2.
Temperature (°C)	Voltage (Volt)	Deviation (ppm)		Result
50	Normal Voltage	0.0000	0.0309	PASS
40	Normal Voltage	0.0016	0.0298	
30	Normal Voltage	0.0005	0.0021	
20(Ref.)	Normal Voltage	0.0000	0.0000	
10	Normal Voltage	0.0027	0.0016	
0	Normal Voltage	0.0000	0.0059	
-10	Normal Voltage	0.0027	0.0032	
-20	Normal Voltage	0.0186	0.0500	
-30	Normal Voltage	0.0213	0.0500	
20	Maximum Voltage	0.0016	0.0005	
20	Normal Voltage	0.0000	0.0000	
20	Battery End Point	0.0005	0.0000	

Note:

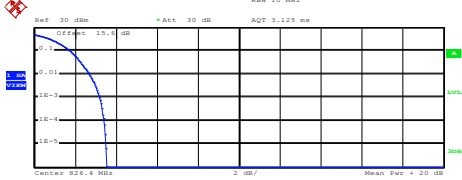
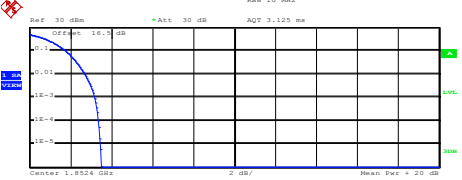
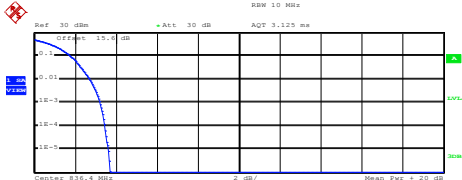
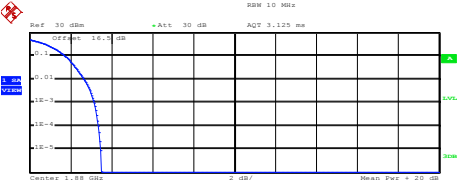
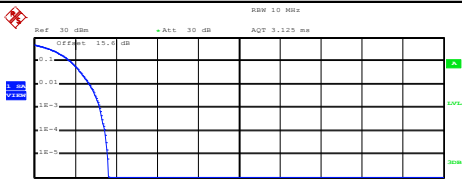
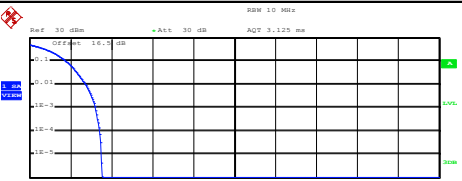
1. Normal Voltage = 3.8V. ; Battery End Point (BEP) = 3.6 V. ; Maximum Voltage =4.4 V
2. The frequency fundamental emissions stay within the authorized frequency block.

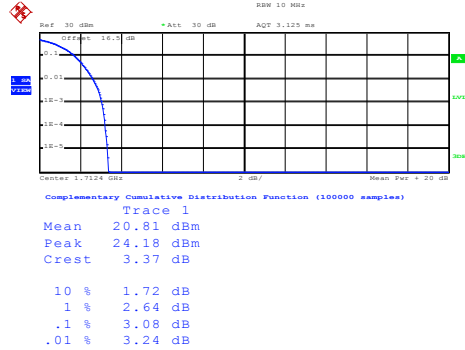


A3. WCDMA

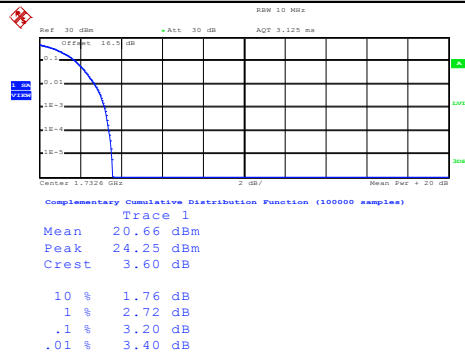
Peak-to-Average Ratio

Mode	WCDMA Band V	WCDMA Band II	WCDMA Band IV	Limit: 13dB
Mod.	RMC 12.2Kbps	RMC 12.2Kbps	RMC 12.2Kbps	Result
Lowest CH	3.20	3.20	3.08	PASS
Middle CH	3.24	3.16	3.20	
Highest CH	3.20	3.20	2.92	

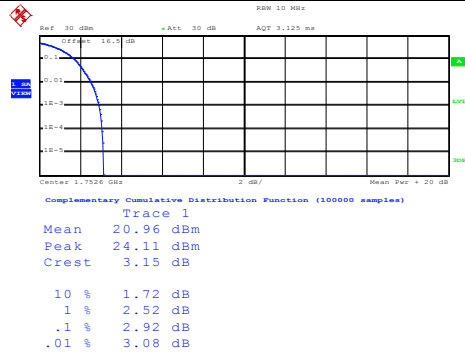
WCDMA Band V (RMC 12.2Kbps)	WCDMA Band II (RMC 12.2Kbps)
Lowest Channel	Lowest Channel
 Center 826.4 MHz Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean 21.96 dBm Peak 25.52 dBm Crest 3.56 dB 10 % 1.76 dB 1 % 2.68 dB .1 % 3.20 dB .01 % 3.44 dB Date: 11.MAY.2019 11:37:19	 Center 1.8524 GHz Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean 20.69 dBm Peak 24.18 dBm Crest 3.50 dB 10 % 1.76 dB 1 % 2.72 dB .1 % 3.20 dB .01 % 3.36 dB Date: 11.MAY.2019 11:02:57
Middle Channel	Middle Channel
 Center 836.4 MHz Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean 21.76 dBm Peak 25.45 dBm Crest 3.70 dB 10 % 1.76 dB 1 % 2.72 dB .1 % 3.24 dB .01 % 3.44 dB Date: 11.MAY.2019 11:37:34	 Center 1.85 GHz Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean 20.75 dBm Peak 24.25 dBm Crest 3.51 dB 10 % 1.72 dB 1 % 2.68 dB .1 % 3.16 dB .01 % 3.36 dB Date: 11.MAY.2019 11:03:21
Highest Channel	Highest Channel
 Center 846.6 MHz Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean 21.60 dBm Peak 25.24 dBm Crest 3.64 dB 10 % 1.76 dB 1 % 2.72 dB .1 % 3.20 dB .01 % 3.44 dB Date: 11.MAY.2019 11:37:47	 Center 1.9076 GHz Complementary Cumulative Distribution Function (100000 samples) Trace 1 Mean 20.94 dBm Peak 24.46 dBm Crest 3.52 dB 10 % 1.80 dB 1 % 2.72 dB .1 % 3.20 dB .01 % 3.44 dB Date: 11.MAY.2019 11:03:34

WCDMA Band IV (RMC 12.2Kbps)
Lowest Channel


Date: 11.MAY.2019 11:22:57

Middle Channel


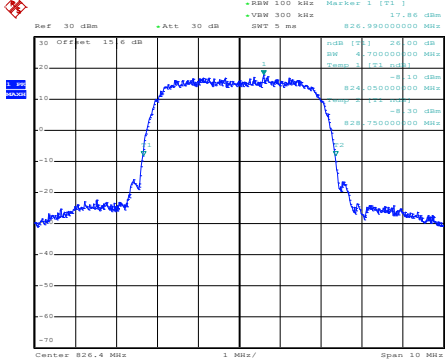
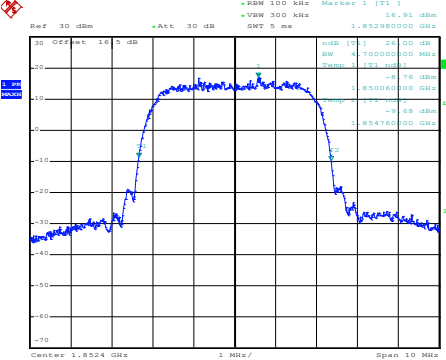
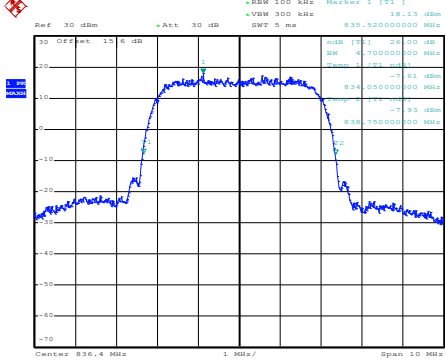
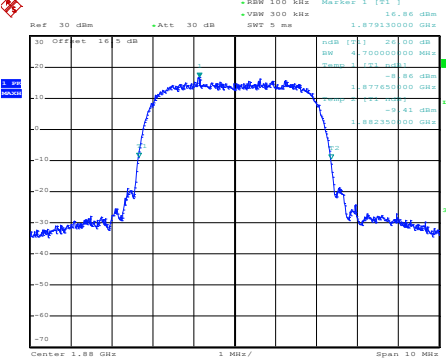
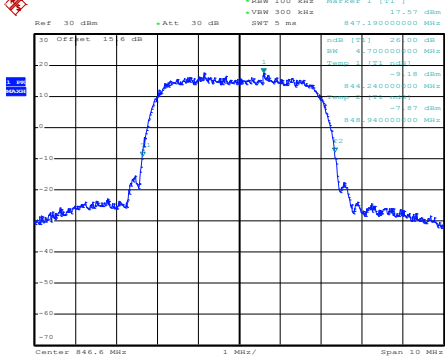
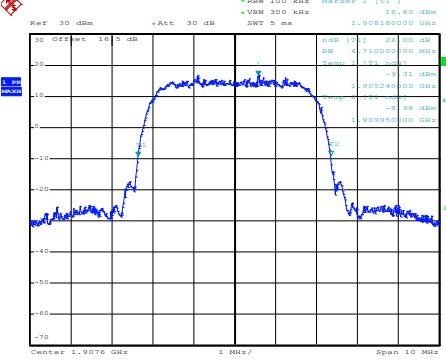
Date: 11.MAY.2019 11:23:13

Highest Channel


Date: 11.MAY.2019 11:23:38

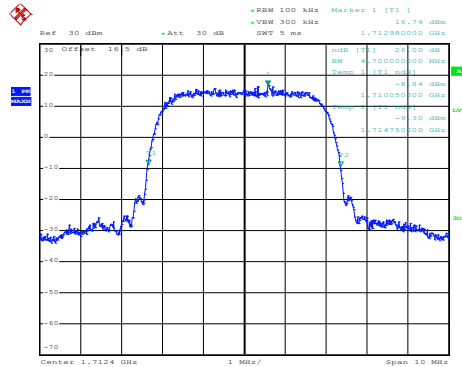
**26dB Bandwidth**

Mode	WCDMA Band V	WCDMA Band II	WCDMA Band IV
Mod.	RMC 12.2Kbps	RMC 12.2Kbps	RMC 12.2Kbps
Lowest CH	4.70	4.70	4.70
Middle CH	4.70	4.70	4.70
Highest CH	4.70	4.71	4.71

WCDMA Band V (RMC 12.2Kbps)	WCDMA Band II (RMC 12.2Kbps)
Lowest Channel	Lowest Channel
 Date: 11.MAY.2019 11:25:25	 Date: 11.MAY.2019 10:47:07
Middle Channel	Middle Channel
 Date: 11.MAY.2019 11:25:59	 Date: 11.MAY.2019 10:48:28
Highest Channel	Highest Channel
 Date: 11.MAY.2019 11:26:34	 Date: 11.MAY.2019 10:49:32

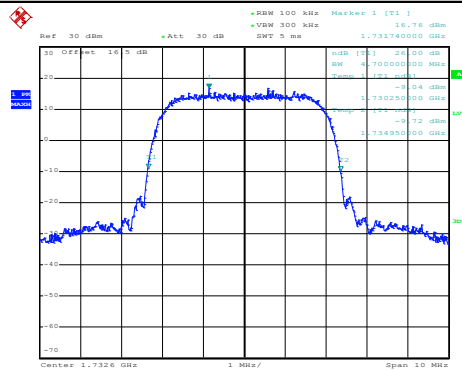
WCDMA Band IV (RMC 12.2Kbps)

Lowest Channel



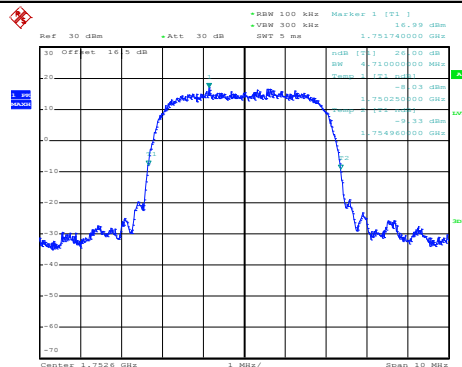
Date: 11.MAY.2019 11:04:37

Middle Channel



Date: 11.MAY.2019 11:05:32

Highest Channel



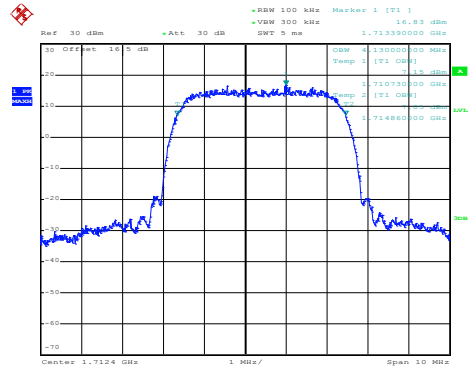
Date: 11.MAY.2019 11:07:25

**Occupied Bandwidth**

Mode	WCDMA Band V	WCDMA Band II	WCDMA Band IV
Mod.	RMC 12.2Kbps	RMC 12.2Kbps	RMC 12.2Kbps
Lowest CH	4.14	4.13	4.13
Middle CH	4.14	4.13	4.13
Highest CH	4.13	4.13	4.13

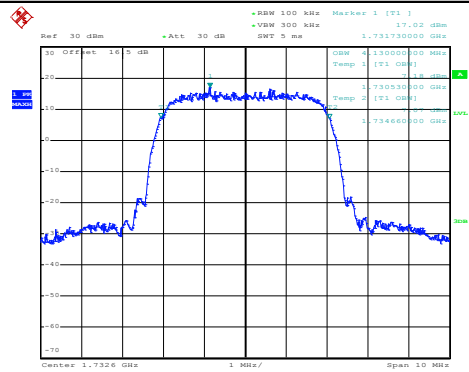
WCDMA Band IV (RMC 12.2Kbps)

Lowest Channel



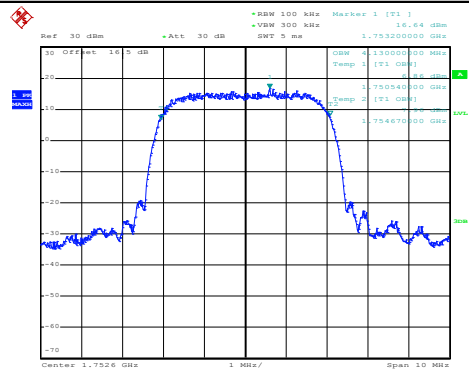
Date: 11.MAY.2019 11:08:36

Middle Channel



Date: 11.MAY.2019 11:09:11

Highest Channel



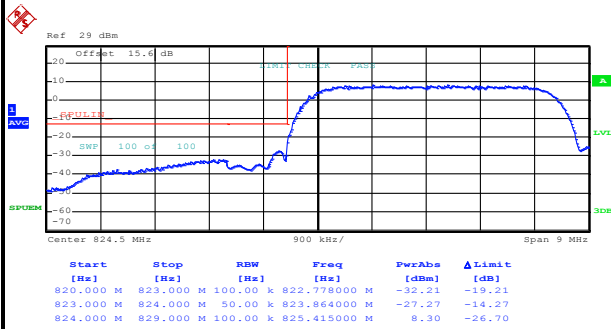
Date: 11.MAY.2019 11:11:36



Conducted Band Edge

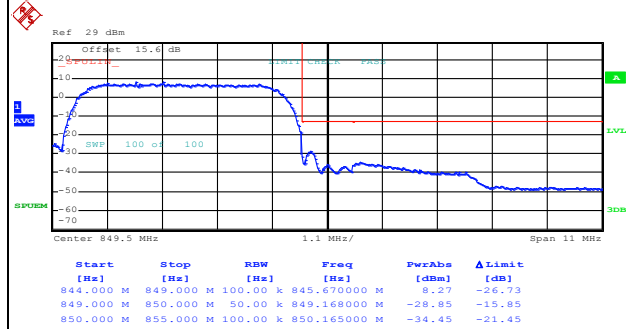
WCDMA Band V (RMC 12.2Kbps)

Lowest Band Edge



Date: 11.MAY.2019 11:31:19

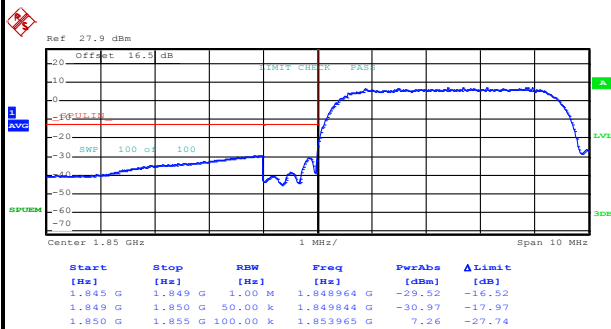
Highest Band Edge



Date: 11.MAY.2019 11:34:10

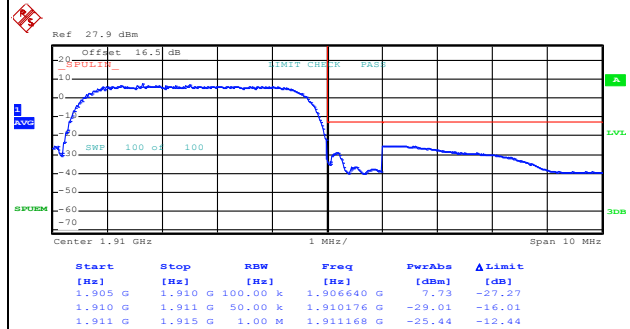
WCDMA Band II (RMC 12.2Kbps)

Lowest Band Edge



Date: 11.MAY.2019 10:54:28

Highest Band Edge

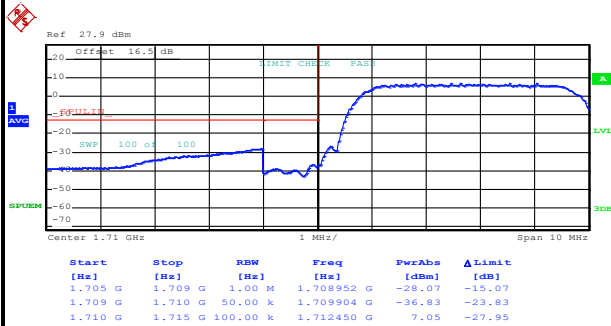


Date: 11.MAY.2019 10:59:32



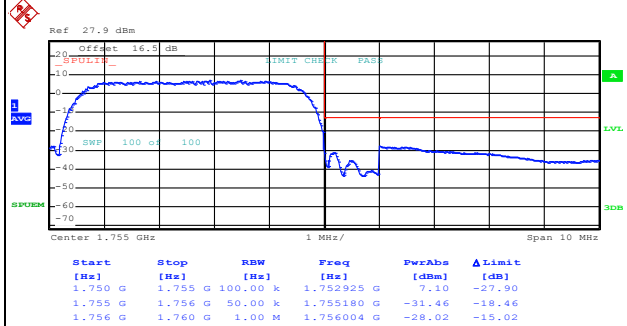
WCDMA Band IV (RMC 12.2Kbps)

Lowest Band Edge



Date: 11.MAY.2019 11:15:23

Highest Band Edge



Date: 11.MAY.2019 11:18:16

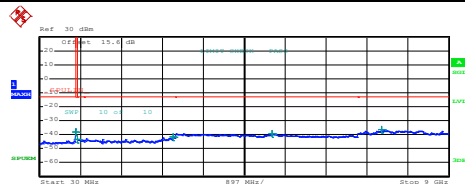


Conducted Spurious Emission



WCDMA Band V (RMC 12.2Kbps)

Lowest Channel

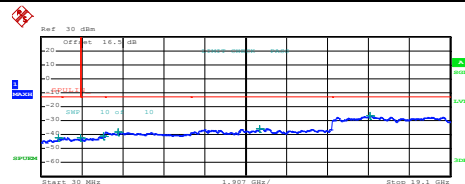


Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30,000 M	820,000 M	1,000 M	819,407500 M	-38.39	-23.39
850,000 M	1,000 G	1,000 M	862,830001 M	-43.44	-30.44
1,000 G	3,000 G	1,000 M	2,9625000 G	-42.80	-28.80
3,000 G	7,000 G	1,000 M	5,1320000 G	-39.33	-24.33
7,000 G	9,000 G	1,000 M	7,5235000 G	-36.48	-23.48

Date: 11.MAY.2019 11:35:11

WCDMA Band II (RMC 12.2Kbps)

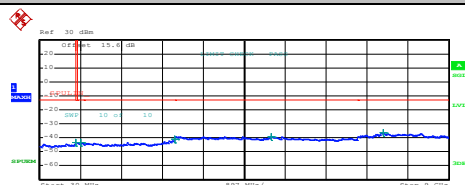
Lowest Channel



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30,000 M	1,000 G	1,000 M	831,947500 M	-42.45	-29.45
1,000 G	1,845 G	1,000 M	1,844578 G	-42.10	-29.10
1,915 G	3,000 G	1,000 M	2,937884 G	-41.05	-28.05
3,000 G	7,000 G	1,000 M	5,3629000 G	-38.09	-25.09
7,000 G	13,600 G	1,000 M	10,209250 G	-35.53	-22.53
13,600 G	19,100 G	1,000 M	15,366188 G	-26.69	-13.69

Date: 11.MAY.2019 11:00:40

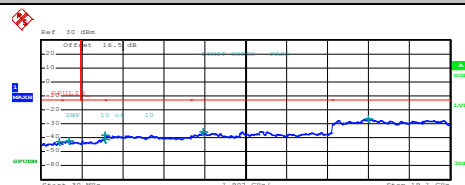
Middle Channel



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30,000 M	820,000 M	1,000 M	819,802500 M	-43.19	-30.19
850,000 M	1,000 G	1,000 M	926,000000 M	-43.39	-30.39
1,000 G	3,000 G	1,000 M	2,9990000 G	-41.34	-28.34
3,000 G	7,000 G	1,000 M	5,1140000 G	-39.28	-26.28
7,000 G	9,000 G	1,000 M	7,5620000 G	-36.56	-23.56

Date: 11.MAY.2019 11:36:04

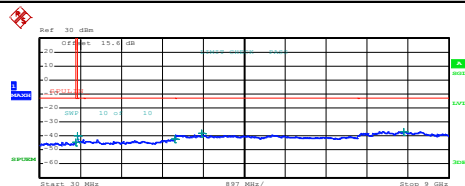
Middle Channel



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30,000 M	1,000 G	1,000 M	870,990000 M	-43.05	-30.05
1,000 G	1,845 G	1,000 M	1,8317220 G	-42.41	-29.41
1,915 G	3,000 G	1,000 M	2,996745 G	-40.85	-27.85
3,000 G	7,000 G	1,000 M	3,007000 G	-38.38	-25.38
7,000 G	13,600 G	1,000 M	7,586100 G	-35.54	-22.54
13,600 G	19,100 G	1,000 M	15,302250 G	-26.67	-13.67

Date: 11.MAY.2019 11:01:44

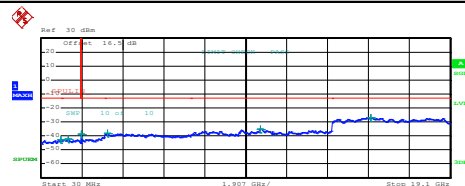
Highest Channel



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30,000 M	820,000 M	1,000 M	810,813000 M	-44.58	-31.58
850,000 M	1,000 G	1,000 M	855,108750 M	-39.70	-26.70
1,000 G	3,000 G	1,000 M	2,9990000 G	-41.86	-28.86
3,000 G	7,000 G	1,000 M	3,5900000 G	-38.41	-25.41
7,000 G	9,000 G	1,000 M	8,0190000 G	-36.75	-23.75

Date: 11.MAY.2019 11:36:57

Highest Channel

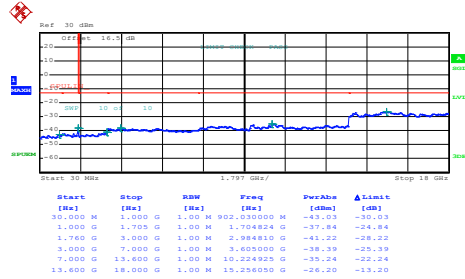


Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30,000 M	1,000 G	1,000 M	938,850000 M	-42.53	-29.53
1,000 G	1,845 G	1,000 M	1,275893 G	-42.36	-29.36
1,915 G	3,000 G	1,000 M	1,935542 G	-38.82	-25.82
3,000 G	7,000 G	1,000 M	3,105000 G	-38.41	-25.41
7,000 G	13,600 G	1,000 M	10,236475 G	-35.14	-22.14
13,600 G	19,100 G	1,000 M	15,410187 G	-26.59	-13.59

Date: 11.MAY.2019 11:02:35

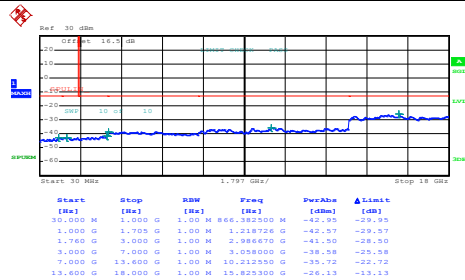
WCDMA Band IV (RMC 12.2Kbps)

Lowest Channel



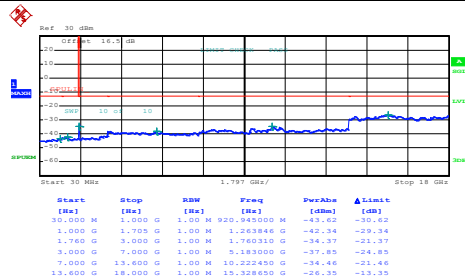
Date: 11.MAY.2019 11:19:12

Middle Channel



Date: 11.MAY.2019 11:20:45

Highest Channel



Date: 11.MAY.2019 11:22:18

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	0.0024	PASS
40	Normal Voltage	0.0024	
30	Normal Voltage	0.0024	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0000	
0	Normal Voltage	0.0000	
-10	Normal Voltage	0.0000	
-20	Normal Voltage	0.0191	
-30	Normal Voltage	0.0203	
20	Maximum Voltage	0.0143	
20	Normal Voltage	0.0000	
20	Battery End Point	0.0000	

Test Conditions	Middle Channel	WCDMA Band II (RMC 12.2Kbps)	Limit Note 2.
Temperature (°C)	Voltage (Volt)	Deviation (ppm)	Result
50	Normal Voltage	0.0016	PASS
40	Normal Voltage	0.0021	
30	Normal Voltage	0.0005	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0021	
0	Normal Voltage	0.0048	
-10	Normal Voltage	0.0043	
-20	Normal Voltage	0.0037	
-30	Normal Voltage	0.0053	
20	Maximum Voltage	0.0011	
20	Normal Voltage	0.0000	
20	Battery End Point	0.0011	

Test Conditions	Middle Channel	WCDMA Band IV (RMC 12.2Kbps)	Limit Note 2.
Temperature (°C)	Voltage (Volt)	Deviation (ppm)	Result
50	Normal Voltage	0.0046	PASS
40	Normal Voltage	0.0000	
30	Normal Voltage	0.0017	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0006	
0	Normal Voltage	0.0012	
-10	Normal Voltage	0.0156	
-20	Normal Voltage	0.0185	
-30	Normal Voltage	0.0231	
20	Maximum Voltage	0.0012	
20	Normal Voltage	0.0000	
20	Battery End Point	0.0017	

Note:

1. Normal Voltage = 3.8V. ; Battery End Point (BEP) = 3.6 V. ; Maximum Voltage =4.4 V
2. The frequency fundamental emissions stay within the authorized frequency block.

**Appendix B. Test Results of ERP/EIRP and Radiated Test****ERP/EIRP**

Channel	Mode	Conducted		ERP	
		Power (dBm)	Power (Watts)	ERP(dBm)	ERP(W)
Lowest	GSM850 GPRS class 8 (GT - LC = -3 dB)	32.79	1.9011	27.64	0.5808
Middle		32.55	1.7989	27.40	0.5495
Highest		32.50	1.7783	27.35	0.5433
Lowest	GSM850 EDGE class 8 (GT - LC = -3 dB)	26.33	0.4295	21.18	0.1312
Middle		26.20	0.4169	21.05	0.1274
Highest		26.02	0.3999	20.87	0.1222
Lowest	WCDMA Band V RMC 12.2Kbps (GT - LC = -3 dB)	22.80	0.1905	17.65	0.0582
Middle		22.71	0.1866	17.56	0.0570
Highest		22.62	0.1828	17.47	0.0558
Limit	ERP < 7W	Result		PASS	

Channel	Mode	Conducted		EIRP	
		Power (dBm)	Power (Watts)	EIRP(dBm)	EIRP(W)
Lowest	GSM1900 GPRS class 8 (GT - LC = -1 dB)	29.05	0.8035	28.05	0.6383
Middle		29.35	0.8610	28.35	0.6839
Highest		29.24	0.8395	28.24	0.6668
Lowest	GSM1900 EDGE class 8 (GT - LC = -1 dB)	25.18	0.3296	24.18	0.2618
Middle		25.28	0.3373	24.28	0.2679
Highest		25.31	0.3396	24.31	0.2698
Lowest	WCDMA Band II RMC 12.2Kbps (GT - LC = -1 dB)	22.64	0.1837	21.64	0.1459
Middle		22.66	0.1845	21.66	0.1466
Highest		22.74	0.1879	21.74	0.1493
Limit	EIRP < 2W	Result		PASS	

Channel	Mode	Conducted		EIRP	
		Power (dBm)	Power (Watts)	EIRP(dBm)	EIRP(W)
Lowest	WCDMA Band IV RMC 12.2Kbps (GT - LC = 1 dB)	22.68	0.1854	23.68	0.2333
Middle		22.56	0.1803	23.56	0.2270
Highest		22.58	0.1811	23.58	0.2280
Limit	EIRP < 1W	Result		PASS	

**Radiated Spurious Emission****Part 22H GPRS 850**

GPRS 850									
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	1648	-41.80	-13	-28.80	-51.68	-48.75	0.53	9.63	H
	2472	-38.66	-13	-25.66	-52.12	-46.64	0.65	10.78	H
	3296	-57.90	-13	-44.90	-74.01	-66.98	0.76	11.99	H
	4120	-54.01	-13	-41.01	-71.43	-63.35	0.86	12.35	H
	1648	-50.65	-13	-37.65	-60.24	-57.6	0.53	9.63	V
	2472	-35.22	-13	-22.22	-49.17	-43.2	0.65	10.78	V
	3296	-53.74	-13	-40.74	-69.82	-62.82	0.76	11.99	V
	4120	-54.83	-13	-41.83	-73.43	-64.17	0.86	12.35	V
Middle	1675	-49.34	-13	-36.34	-59.51	-56.34	0.53	9.69	H
	2510	-37.68	-13	-24.68	-51.13	-45.68	0.66	10.81	H
	3345	-53.37	-13	-40.37	-69.57	-62.59	0.76	12.14	H
	4180	-54.66	-13	-41.66	-72.12	-64	0.84	12.33	H
	1675	-47.22	-13	-34.22	-56.89	-54.22	0.53	9.69	V
	2510	-37.12	-13	-24.12	-50.98	-45.12	0.66	10.81	V
	3345	-49.17	-13	-36.17	-65.18	-58.39	0.76	12.14	V
	4180	-54.67	-13	-41.67	-73.36	-64.01	0.84	12.33	V
Highest	1696	-47.76	-13	-34.76	-58.09	-54.81	0.53	9.73	H
	2544	-44.08	-13	-31.08	-57.58	-52.09	0.67	10.83	H
	3392	-49.52	-13	-36.52	-65.83	-58.88	0.77	12.28	H
	4248	-56.81	-13	-43.81	-74.45	-66.12	0.84	12.30	H
	1696	-48.49	-13	-35.49	-58.2	-55.54	0.53	9.73	V
	2544	-37.01	-13	-24.01	-50.88	-45.02	0.67	10.83	V
	3392	-57.87	-13	-44.87	-73.77	-67.23	0.77	12.28	V
	4248	-55.22	-13	-42.22	-74.13	-64.53	0.84	12.30	V

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

Part 22H EDGE 850

EDGE 850									
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	1648	-51.72	-13	-38.72	-61.6	-58.67	0.53	9.63	H
	2472	-51.10	-13	-38.10	-64.56	-59.08	0.65	10.78	H
	3296	-58.43	-13	-45.43	-74.54	-67.51	0.76	11.99	H
	1648	-56.14	-13	-43.14	-65.73	-63.09	0.53	9.63	V
	2472	-45.71	-13	-32.71	-59.66	-53.69	0.65	10.78	V
	3296	-58.60	-13	-45.60	-74.68	-67.68	0.76	11.99	V
Middle	1672	-53.73	-13	-40.73	-63.77	-60.73	0.53	9.68	H
	2512	-51.61	-13	-38.61	-65.06	-59.61	0.66	10.81	H
	3352	-58.01	-13	-45.01	-74.24	-67.25	0.76	12.16	H
	1672	-54.90	-13	-41.90	-64.54	-61.9	0.53	9.68	V
	2512	-49.64	-13	-36.64	-63.5	-57.64	0.66	10.81	V
	3352	-58.62	-13	-45.62	-74.59	-67.86	0.76	12.16	V
Highest	1696	-55.06	-13	-42.06	-65.39	-62.11	0.53	9.73	H
	2544	-49.67	-13	-36.67	-63.17	-57.68	0.67	10.83	H
	3392	-58.45	-13	-45.45	-74.76	-67.81	0.77	12.28	H
	1696	-55.86	-13	-42.86	-65.57	-62.91	0.53	9.73	V
	2544	-51.39	-13	-38.39	-65.26	-59.4	0.67	10.83	V
	3392	-58.71	-13	-45.71	-74.61	-68.07	0.77	12.28	V

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

**Part 22H WCDMA 850**

WCDMA 850									
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	1656	-61.98	-13	-48.98	-71.87	-68.95	0.53	9.64	H
	2480	-58.66	-13	-45.66	-72.12	-66.64	0.65	10.78	H
	3304	-58.65	-13	-45.65	-74.77	-67.75	0.76	12.01	H
	1656	-62.83	-13	-49.83	-72.43	-69.8	0.53	9.64	V
	2480	-57.22	-13	-44.22	-71.17	-65.2	0.65	10.78	V
	3304	-58.72	-13	-45.72	-74.81	-67.82	0.76	12.01	V
Middle	1672	-62.74	-13	-49.74	-72.78	-69.74	0.53	9.68	H
	2512	-59.34	-13	-46.34	-72.79	-67.34	0.66	10.81	H
	3344	-58.54	-13	-45.54	-74.74	-67.76	0.76	12.13	H
	1672	-63.56	-13	-50.56	-73.2	-70.56	0.53	9.68	V
	2512	-58.33	-13	-45.33	-72.19	-66.33	0.66	10.81	V
	3344	-58.84	-13	-45.84	-74.85	-68.06	0.76	12.13	V
Highest	1696	-62.91	-13	-49.91	-73.24	-69.96	0.53	9.73	H
	2536	-58.70	-13	-45.70	-72.18	-66.71	0.66	10.82	H
	3384	-57.96	-13	-44.96	-74.27	-67.29	0.77	12.25	H
	1696	-62.91	-13	-49.91	-72.62	-69.96	0.53	9.73	V
	2536	-58.29	-13	-45.29	-72.15	-66.3	0.66	10.82	V
	3384	-59.06	-13	-46.06	-74.96	-68.39	0.77	12.25	V

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

**Part 24E GPRS 1900**

GPRS 1900									
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	3702	-51.36	-13	-38.36	-68.34	-63.15	0.72	12.52	H
	5550	-41.54	-13	-28.54	-63.35	-53.71	1.00	13.17	H
	7404	-52.71	-13	-39.71	-77.79	-62.1	1.18	10.57	H
	3702	-49.28	-13	-36.28	-67.43	-61.07	0.72	12.52	V
	5550	-35.17	-13	-22.17	-57.07	-47.34	1.00	13.17	V
	7404	-51.80	-13	-38.80	-76.67	-61.19	1.18	10.57	V
Middle	3762	-48.03	-13	-35.03	-65.16	-59.84	0.69	12.50	H
	5640	-33.89	-13	-20.89	-55.6	-46.02	0.98	13.12	H
	7518	-52.58	-13	-39.58	-77.5	-61.85	1.18	10.45	H
	3762	-44.62	-13	-31.62	-62.96	-56.43	0.69	12.50	V
	5640	-32.96	-13	-19.96	-54.84	-45.09	0.98	13.12	V
	7518	-52.32	-13	-39.32	-77.29	-61.59	1.18	10.45	V
Highest	3822	-49.36	-13	-36.36	-66.61	-61.14	0.69	12.47	H
	5730	-31.99	-13	-18.99	-53.7	-44.06	0.99	13.06	H
	7644	-51.98	-13	-38.98	-77.17	-61.6	1.18	10.80	H
	3822	-46.33	-13	-33.33	-64.8	-58.11	0.69	12.47	V
	5730	-33.25	-13	-20.25	-55.17	-45.32	0.99	13.06	V
	7644	-52.14	-13	-39.14	-77.11	-61.76	1.18	10.80	V

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

**Part 24E EDGE 1900**

EDGE 1900									
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	3702	-48.87	-13	-35.87	-65.85	-60.66	0.72	12.52	H
	5550	-47.61	-13	-34.61	-69.42	-59.78	1.00	13.17	H
	7404	-52.68	-13	-39.68	-77.76	-62.07	1.18	10.57	H
	3702	-46.16	-13	-33.16	-64.31	-57.95	0.72	12.52	V
	5550	-41.48	-13	-28.48	-63.38	-53.65	1.00	13.17	V
	7404	-52.61	-13	-39.61	-77.48	-62	1.18	10.57	V
Middle	3762	-52.88	-13	-39.88	-70.01	-64.69	0.69	12.50	H
	5640	-38.96	-13	-25.96	-60.67	-51.09	0.98	13.12	H
	7518	-52.34	-13	-39.34	-77.26	-61.61	1.18	10.45	H
	3762	-50.98	-13	-37.98	-69.32	-62.79	0.69	12.50	V
	5640	-38.23	-13	-25.23	-60.11	-50.36	0.98	13.12	V
	7518	-52.43	-13	-39.43	-77.4	-61.7	1.18	10.45	V
Highest	3822	-50.08	-13	-37.08	-67.33	-61.86	0.69	12.47	H
	5730	-39.25	-13	-26.25	-60.96	-51.32	0.99	13.06	H
	7644	-51.80	-13	-38.80	-76.99	-61.42	1.18	10.80	H
	3822	-51.29	-13	-38.29	-69.76	-63.07	0.69	12.47	V
	5730	-36.29	-13	-23.29	-58.21	-48.36	0.99	13.06	V
	7644	-51.79	-13	-38.79	-76.76	-61.41	1.18	10.80	V

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

**Part 24E WCDMA 1900**

WCDMA 1900									
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	3708	-56.58	-13	-43.58	-73.61	-68.38	0.72	12.52	H
	5562	-54.28	-13	-41.28	-76.06	-66.45	1.00	13.16	H
	7416	-52.55	-13	-39.55	-77.59	-61.92	1.18	10.55	H
	3708	-54.06	-13	-41.06	-72.26	-65.86	0.72	12.52	V
	5562	-52.01	-13	-39.01	-73.91	-64.18	1.00	13.16	V
	7416	-52.62	-13	-39.62	-77.51	-61.99	1.18	10.55	V
Middle	3762	-54.84	-13	-41.84	-71.97	-66.65	0.69	12.50	H
	5640	-53.64	-13	-40.64	-75.35	-65.77	0.98	13.12	H
	7518	-52.53	-13	-39.53	-77.45	-61.8	1.18	10.45	H
	3762	-53.95	-13	-40.95	-72.29	-65.76	0.69	12.50	V
	5640	-47.59	-13	-34.59	-69.47	-59.72	0.98	13.12	V
	7518	-52.45	-13	-39.45	-77.42	-61.72	1.18	10.45	V
Highest	3816	-54.51	-13	-41.51	-71.76	-66.3	0.69	12.47	H
	5724	-49.82	-13	-36.82	-71.53	-61.89	0.99	13.07	H
	7632	-51.85	-13	-38.85	-77.02	-61.44	1.18	10.77	H
	3816	-52.73	-13	-39.73	-71.2	-64.52	0.69	12.47	V
	5724	-50.53	-13	-37.53	-72.45	-62.6	0.99	13.07	V
	7632	-52.34	-13	-39.34	-77.26	-61.93	1.18	10.77	V

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

**Part 27L WCDMA 1700**

WCDMA 1700									
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	3426	-57.73	-13	-44.73	-74.9	-69.33	0.77	12.38	H
	5142	-55.58	-13	-42.58	-76.17	-67.09	0.97	12.48	H
	6852	-54.23	-13	-41.23	-77.84	-65.02	0.83	11.63	H
	3426	-57.56	-13	-44.56	-74.54	-69.16	0.77	12.38	V
	5142	-55.82	-13	-42.82	-76.58	-67.33	0.97	12.48	V
	6852	-53.60	-13	-40.60	-77.66	-64.39	0.83	11.63	V
Middle	3468	-57.68	-13	-44.68	-74.88	-69.41	0.78	12.50	H
	5196	-56.57	-13	-43.57	-77.26	-68.17	0.99	12.59	H
	6930	-53.36	-13	-40.36	-77.1	-63.81	1.01	11.45	H
	3468	-57.26	-13	-44.26	-74.85	-68.99	0.78	12.50	V
	5196	-56.74	-13	-43.74	-77.59	-68.34	0.99	12.59	V
	6930	-53.06	-13	-40.06	-77.18	-63.51	1.01	11.45	V
Highest	3504	-57.95	-13	-44.95	-75.18	-69.77	0.78	12.60	H
	5256	-57.04	-13	-44.04	-77.92	-68.74	1.01	12.71	H
	7008	-52.48	-13	-39.48	-76.34	-62.6	1.17	11.29	H
	3504	-56.77	-13	-43.77	-74.97	-68.59	0.78	12.60	V
	5256	-56.74	-13	-43.74	-77.76	-68.44	1.01	12.71	V
	7008	-52.02	-13	-39.02	-76.18	-62.14	1.17	11.29	V

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

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