



FCC RADIO TEST REPORT

FCC ID : PY7-08372L
Equipment : GSM/WCDMA/LTE Phone with BT, DTS/UNII
a/b/g/n/ac/ax, GPS, and NFC
Brand Name : Sony
Applicant : Sony Mobile Communications Inc.
4-12-3 Higashi-Shinagawa, Shinagawa-ku,
Tokyo, 140-0002, Japan
Manufacturer : Sony Mobile Communications Inc.
4-12-3 Higashi-Shinagawa, Shinagawa-ku,
Tokyo, 140-0002, Japan
Standard : FCC 47 CFR Part 2, 22(H), 24(E)

The product was received on Jul. 01, 2020 and testing was started from Jul. 20, 2020 and completed on Aug. 06, 2020. 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 of 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, Taiwan (R.O.C.)



Table of Contents

History of this test report.....	3
Summary of Test Result.....	4
1 General Description	5
1.1 Product Feature of Equipment Under Test	5
1.2 Modification of EUT	5
1.3 Maximum ERP/EIRP Power, Frequency Tolerance, and Emission Designator	6
1.4 Testing Location	6
1.5 Applicable Standards	7
2 Test Configuration of Equipment Under Test	8
2.1 Test Mode.....	8
2.2 Connection Diagram of Test System	9
2.3 Support Unit used in test configuration	9
2.4 Measurement Results Explanation Example	10
2.5 Frequency List of Low/Middle/High Channels	10
3 Conducted Test Result	11
3.1 Measuring Instruments.....	11
3.2 Conducted Output Power and ERP/EIRP	12
3.3 Peak-to-Average Ratio	13
3.4 99% Occupied Bandwidth and 26dB Bandwidth Measurement.....	14
3.5 Conducted Band Edge	15
3.6 Conducted Spurious Emission	16
3.7 Frequency Stability	17
4 Radiated Test Items	18
4.1 Measuring Instruments.....	18
4.2 Test Setup	18
4.3 Test Result of Radiated Test.....	19
4.4 Field Strength of Spurious Radiation Measurement	20
5 List of Measuring Equipment.....	21
6 Uncertainty of Evaluation	23
Appendix A. Test Results of Conducted Test	
Appendix B. Test Results of ERP/EIRP and Radiated Test	



History of this test report

Report No.	Version	Description	Issued Date
FG042242-02A	01	Initial issue of report	Aug. 13, 2020
FG042242-02A	02	Revise 26dB BW test data for GSM 1900 middle channel Edge class 8.	Aug. 24, 2020

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 (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	Under limit 20.04 dB at 2512.000 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: Yimin Ho



1 General Description

1.1 Product Feature of Equipment Under Test

GSM/WCDMA/LTE, Bluetooth, DTS/UNII a/b/g/n/ac/ax, FM Receiver, NFC, and GNSS.

Product Specification subjective to this standard	
Antenna Type	Loop Antenna

EUT Information List			
HW Version	SW Version	S/N	Performed Test Item
A	10.38	QV7100GT40	Conducted Measurement
		QV71009W40	Radiated Spurious Emission
		BH950070JR	ERP/EIRP Test

Accessory List	
AC Adapter	Model Name : UCH32
	S/N: 6218W30200005
Earphone	Model Name.: STH40D
	S/N : N/A
USB Cable	Model Name.: UCB24
	S/N : N/A

Note:

1. Above EUT list used are electrically identical per declared by manufacturer.
2. Above the accessories list are used to exercise the EUT during test, and the serial number of each type of accessories is listed in each section of this report. .
3. For other wireless features of this EUT, test report will be issued separately.

1.2 Modification of EUT

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

1.3 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	0.2218	0.0825 ppm	247KGXW
Part 22	824.2 ~848.8	GSM850 EDGE class 8	8PSK	0.0589	0.0012 ppm	250KG7W
Part 22	826.4 ~846.6	WCDMA Band V RMC 12.2Kbps	QPSK	0.0325	0.0167 ppm	4M16F9W
Part 24	1850.2 ~1909.8	GSM1900 GPRS class 8	GMSK	0.2339	0.0154 ppm	247KGXW
Part 24	1850.2 ~1909.8	GSM1900 EDGE class 8	8PSK	0.1531	0.0229 ppm	250KG7W

1.4 Testing Location

Test Site	SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
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	Oscar Chi
Temperature	22.8~23.1 °C
Relative Humidity	52.7~58.8 %

Test Site	SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
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. 03CH12-HY
Test Engineer	Jack Cheng, Lance Chiang, and Chuan Chu
Temperature	23.8~26.2 °C
Relative Humidity	56.5~68.6 %

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

FCC Designation No.: TW1190 and TW0007



1.5 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
- ♦ 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 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.
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, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Z Plane for Cellular Band and Z Plane with Accessory for PCS 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 19100 MHz for GSM1900

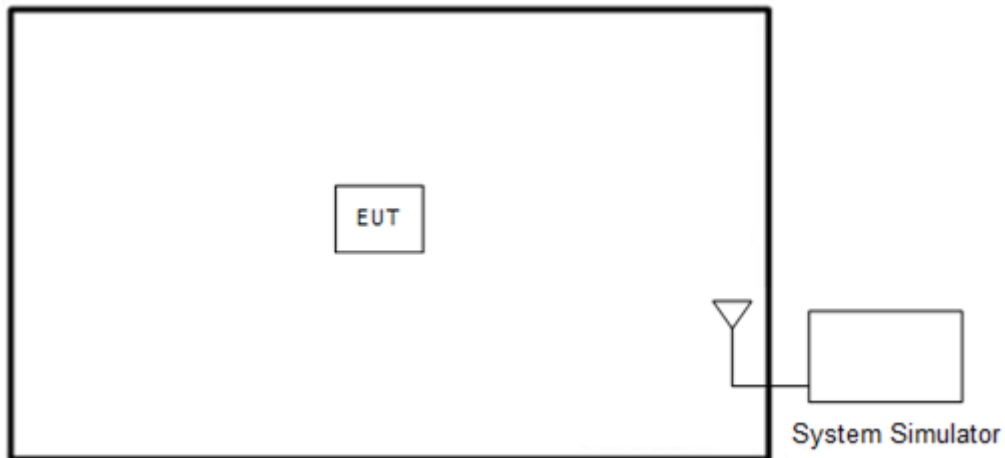
All modes and data rates and positions were investigated.

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

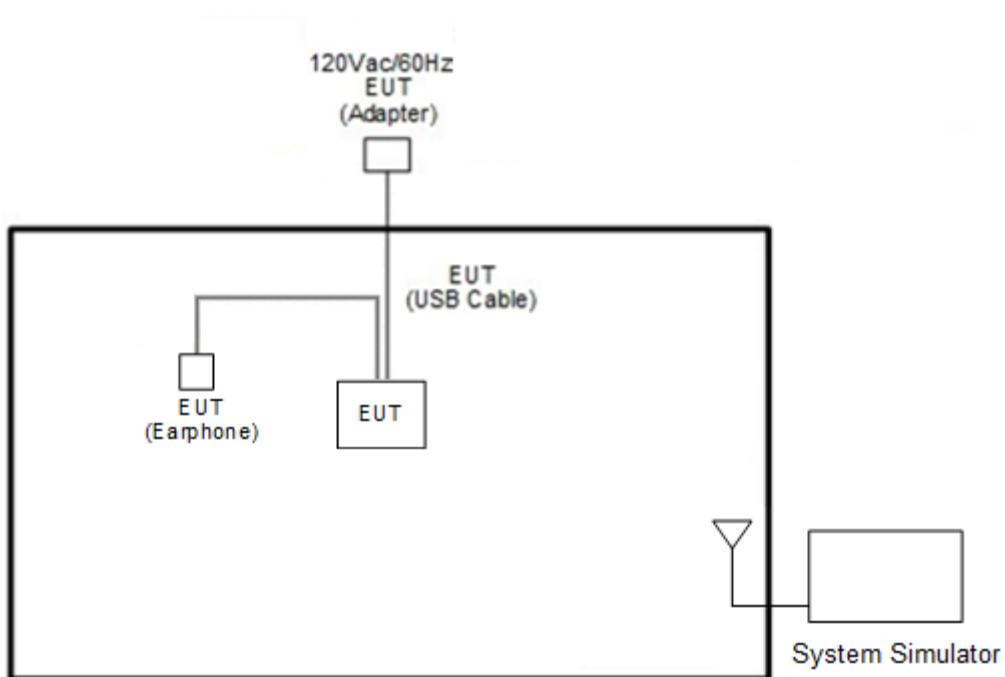
Test Modes		
Band	Radiated TCs	Conducted TCs
GSM850	■ GPRS Class 8 Link	■ GPRS Class 8 Link
	■ EDGE Class 8 Link	■ EDGE Class 8 Link
GSM1900	■ GPRS Class 8 Link	■ GPRS Class 8 Link
	■ EDGE Class 8 Link	■ EDGE Class 8 Link
WCDMA Band V	■ RMC 12.2Kbps Link	■ RMC 12.2Kbps Link

2.2 Connection Diagram of Test System

<EUT without Accessory>



<EUT with Accessory>



2.3 Support Unit used in test configuration

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m

2.4 Measurement Results Explanation Example

For all conducted test items:

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

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

Offset = RF cable loss + attenuator factor.

The following shows an offset computation example with RF cable loss 4.2 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

3 Conducted Test Result

3.1 Measuring Instruments

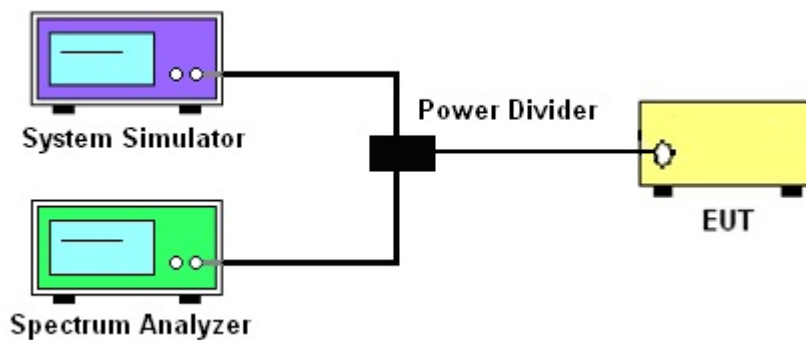
See list of measuring instruments of this test report.

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 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 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

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.

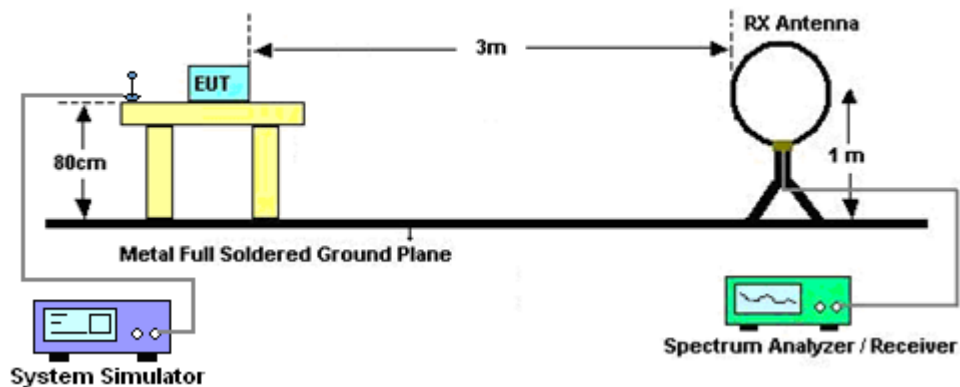
4 Radiated Test Items

4.1 Measuring Instruments

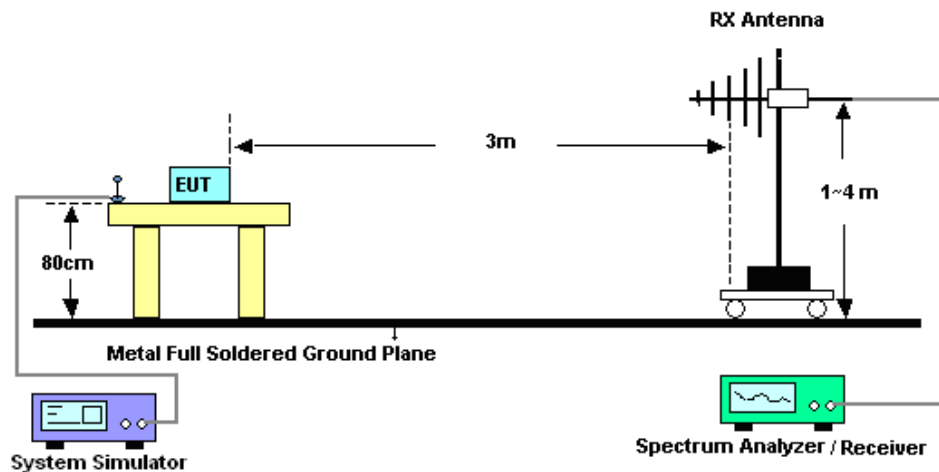
See list of measuring instruments of this test report.

4.2 Test Setup

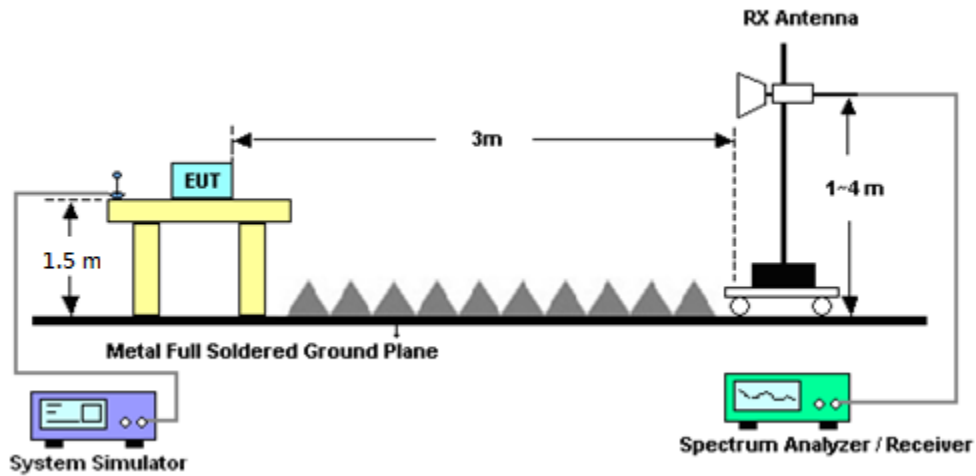
For radiated emissions below 30MHz



For radiated test from 30MHz to 1GHz



For radiated test above 1GHz



4.3 Test Result of Radiated Test

Please refer to Appendix B.

Note:

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

There is a comparison data 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 / 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
Hygrometer	Testo	608-H1	34893241	N/A	Mar. 26, 2020	Jul. 20, 2020~ Jul. 21, 2020	Mar. 25, 2021	Conducted (TH03-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP30	101329	9kHz~30GHz	Sep. 04, 2019	Jul. 20, 2020~ Jul. 21, 2020	Sep. 03, 2020	Conducted (TH03-HY)
Temperature Chamber	ESPEC	SU-641	92013721	-30℃ ~70℃	Nov. 26, 2019	Jul. 20, 2020~ Jul. 21, 2020	Nov. 25, 2020	Conducted (TH03-HY)
Programmable Power Supply	GW Instek	PSS-2005	EL890001	1V~20V 0.5A~4A	Oct. 09, 2019	Jul. 20, 2020~ Jul. 21, 2020	Oct. 08, 2020	Conducted (TH03-HY)
Base Station (Measure)	Rohde & Schwarz	CMU200	117995	GSM / GPRS / WCDMA / CDMA	Aug. 23, 2019	Jul. 20, 2020~ Jul. 21, 2020	Aug. 22, 2020	Conducted (TH03-HY)
Power Divider	Warison	WCOU-0.4-26. 5S-20	#A	N/A	Nov. 06, 2019	Jul. 20, 2020~ Jul. 21, 2020	Nov. 05, 2020	Conducted (TH03-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Dec. 26, 2019	Jul. 25, 2020~ Jul. 28, 2020	Dec. 25, 2020	Radiation (03CH12-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N -06	37059 & 01	30MHz~1GHz	Oct. 12, 2019	Jul. 25, 2020~ Jul. 28, 2020	Oct. 11, 2020	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	9120D-1328	1GHz~18GHz	Nov. 14, 2019	Jul. 25, 2020~ Jul. 28, 2020	Nov. 13, 2020	Radiation (03CH12-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA917058 4	18GHz~40GHz	Dec. 10, 2019	Jul. 25, 2020~ Jul. 28, 2020	Dec. 09, 2020	Radiation (03CH12-HY)
Preamplifier	COM-POWER	PA-103	161075	10MHz~1GHz	Mar. 25, 2020	Jul. 25, 2020~ Jul. 28, 2020	Mar. 24, 2021	Radiation (03CH12-HY)
Preamplifier	Agilent	8449B	3008A02375	1GHz~26.5GHz	Mar. 26, 2020	Jul. 25, 2020~ Jul. 28, 2020	Mar. 25, 2021	Radiation (03CH12-HY)
Preamplifier	Jet-Power	JPA0118-55-3 03K	1710001800 054002	1GHz~18GHz	Feb. 07, 2020	Jul. 25, 2020~ Jul. 28, 2020	Feb. 06, 2021	Radiation (03CH12-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz~40GHz	Dec. 13, 2019	Jul. 25, 2020~ Jul. 28, 2020	Dec. 12, 2020	Radiation (03CH12-HY)
Spectrum Analyzer	Rohde & Schwarz	FSV30	103738	10Hz~30GHz	May 14, 2020	Jul. 25, 2020~ Jul. 28, 2020	May 13, 2021	Radiation (03CH12-HY)
Spectrum Analyzer	Rohde & Schwarz	FSV40	101408	10Hz~40GHz	Aug. 13, 2019	Jul. 25, 2020~ Jul. 28, 2020	Aug. 12, 2020	Radiation (03CH12-HY)
Signal Generator	Rohde & Schwarz	SMB100A	101107	100kHz~40GHz	Aug. 27, 2019	Jul. 25, 2020~ Jul. 28, 2020	Aug. 26, 2020	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126E	0058/126E	30MHz~18GHz	Dec. 12, 2019	Jul. 25, 2020~ Jul. 28, 2020	Dec. 11, 2020	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30MHz~40GHz	Feb. 25, 2020	Jul. 25, 2020~ Jul. 28, 2020	Feb. 24, 2021	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	800740/2	30MHz~40GHz	Feb. 25, 2020	Jul. 25, 2020~ Jul. 28, 2020	Feb. 24, 2021	Radiation (03CH12-HY)
Hygrometer	TECPEL	DTM-303B	TP140349	N/A	Oct. 25, 2019	Jul. 25, 2020~ Jul. 28, 2020	Oct. 24, 2020	Radiation (03CH12-HY)



Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Controller	EMEC	EM1000	N/A	Control Turn table & Ant Mast	N/A	Jul. 25, 2020~ Jul. 28, 2020	N/A	Radiation (03CH12-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	Jul. 25, 2020~ Jul. 28, 2020	N/A	Radiation (03CH12-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Jul. 25, 2020~ Jul. 28, 2020	N/A	Radiation (03CH12-HY)
Software	Audix	E3 6.2009-8-24	RK-000989	N/A	N/A	Jul. 25, 2020~ Jul. 28, 2020	N/A	Radiation (03CH12-HY)
Filter	Wainwright	WLKS1200-12 SS	SN2	1.2GHz Low Pass Filter	Mar. 21, 2020	Jul. 31, 2020~ Aug. 06, 2020	Mar. 20, 2021	Radiation (03CH12-HY)
Filter	Wainwright	WHKX12-2700 -3000-18000-6 0ST	SN2	3GHz High Pass Filter	Jul. 14, 2020	Jul. 31, 2020~ Aug. 06, 2020	Jul. 13, 2021	Radiation (03CH12-HY)
Filter	Wainwright	WHKX8-5872. 5-6750-18000- 40ST	SN2	6.75GHz High Pass Filter	Mar. 18, 2020	Aug. 01, 2020~ Aug. 05, 2020	Mar. 17, 2021	Radiation (03CH12-HY)



6 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.07
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.21
--	------

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.80
--	------



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	31.98	32.18	32.05	27.30	27.74	27.67
GPRS class 8	32.00	32.21	32.07	27.33	27.79	27.67
GPRS class 10	30.05	29.98	30.05	24.54	24.70	24.65
GPRS class 11	27.96	27.88	27.82	22.47	22.72	22.57
GPRS class 12	26.47	26.37	26.67	21.34	21.55	21.40
EGPRS class 8	26.42	26.32	26.45	25.72	25.95	25.51
EGPRS class 10	25.11	25.00	25.02	23.85	24.16	23.94
EGPRS class 11	22.70	23.06	23.02	22.05	22.11	21.91
EGPRS class 12	21.63	22.08	21.25	20.83	20.90	20.77

Conducted Power (*Unit: dBm)			
Band	WCDMA Band V		
Channel	4132	4182	4233
Frequency	826.4	836.4	846.6
RMC 12.2K	23.78	23.79	23.87
HSDPA Subtest-1	22.78	22.86	22.88
HSDPA Subtest-2	22.77	22.81	22.89
HSDPA Subtest-3	22.25	22.30	22.37
HSDPA Subtest-4	22.26	22.29	22.36
HSUPA Subtest-1	22.80	22.81	22.85
HSUPA Subtest-2	20.78	20.81	20.82
HSUPA Subtest-3	21.78	21.83	21.87
HSUPA Subtest-4	20.78	20.84	20.72
HSUPA Subtest-5	22.80	22.90	22.90



A2. GSM

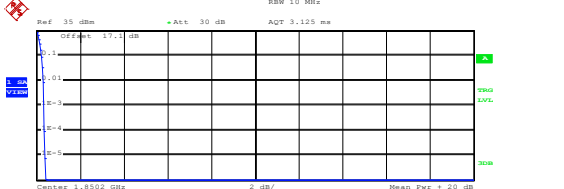
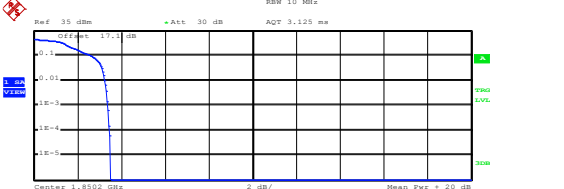
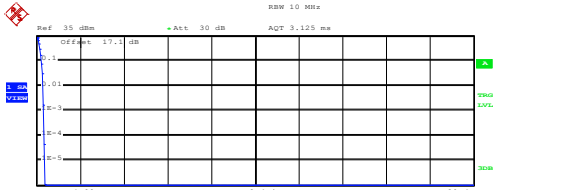
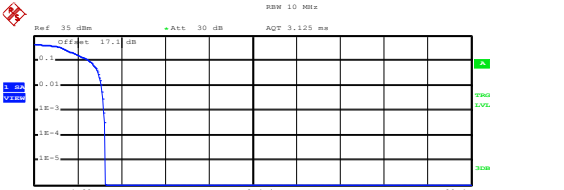
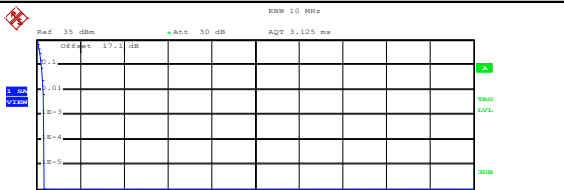
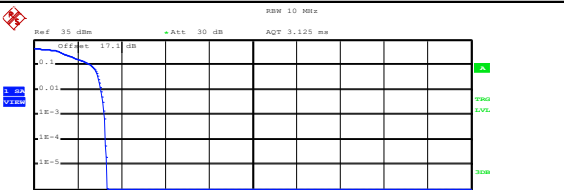
Peak-to-Average Ratio

Mode	GSM850		Limit: 13dB
Mod.	GPRS class 8	EDGE class 8	Result
Lowest CH	0.24	3.48	PASS
Middle CH	0.28	3.08	
Highest CH	0.32	3.16	

Mode	GSM1900		Limit: 13dB
Mod.	GPRS class 8	EDGE class 8	Result
Lowest CH	0.36	3.40	PASS
Middle CH	0.32	3.20	
Highest CH	0.36	3.24	



GSM850 (GPRS class 8)		GSM850 (EDGE class 8)	
Lowest Channel		Lowest Channel	
</			

GSM1900 (GPRS class 8)	GSM1900 (EDGE class 8)																												
Lowest Channel	Lowest Channel																												
 Ref: 35 dBm Att: 30 dB AGT: 3.125 ms Center: 1.8502 GHz 2 dB/ Mean Pwr: +20 dB Complementary Cumulative Distribution Function (100000 samples) Trace 1 <table border="1"> <tr><td>Mean</td><td>28.99 dBm</td></tr> <tr><td>Peak</td><td>29.40 dBm</td></tr> <tr><td>Crest</td><td>0.40 dB</td></tr> </table> <table border="1"> <tr><td>10 %</td><td>0.24 dB</td></tr> <tr><td>1 %</td><td>0.32 dB</td></tr> <tr><td>.1 %</td><td>0.36 dB</td></tr> <tr><td>.01 %</td><td>0.36 dB</td></tr> </table> Date: 21.JUL.2020 10:22:57	Mean	28.99 dBm	Peak	29.40 dBm	Crest	0.40 dB	10 %	0.24 dB	1 %	0.32 dB	.1 %	0.36 dB	.01 %	0.36 dB	 Ref: 35 dBm Att: 30 dB AGT: 3.125 ms Center: 1.8502 GHz 2 dB/ Mean Pwr: +20 dB Complementary Cumulative Distribution Function (100000 samples) Trace 1 <table border="1"> <tr><td>Mean</td><td>25.47 dBm</td></tr> <tr><td>Peak</td><td>28.97 dBm</td></tr> <tr><td>Crest</td><td>3.50 dB</td></tr> </table> <table border="1"> <tr><td>10 %</td><td>2.64 dB</td></tr> <tr><td>1 %</td><td>3.24 dB</td></tr> <tr><td>.1 %</td><td>3.40 dB</td></tr> <tr><td>.01 %</td><td>3.48 dB</td></tr> </table> Date: 21.JUL.2020 10:40:45	Mean	25.47 dBm	Peak	28.97 dBm	Crest	3.50 dB	10 %	2.64 dB	1 %	3.24 dB	.1 %	3.40 dB	.01 %	3.48 dB
Mean	28.99 dBm																												
Peak	29.40 dBm																												
Crest	0.40 dB																												
10 %	0.24 dB																												
1 %	0.32 dB																												
.1 %	0.36 dB																												
.01 %	0.36 dB																												
Mean	25.47 dBm																												
Peak	28.97 dBm																												
Crest	3.50 dB																												
10 %	2.64 dB																												
1 %	3.24 dB																												
.1 %	3.40 dB																												
.01 %	3.48 dB																												
Middle Channel	Middle Channel																												
 Ref: 35 dBm Att: 30 dB AGT: 3.125 ms Center: 1.88 GHz 2 dB/ Mean Pwr: +20 dB Complementary Cumulative Distribution Function (100000 samples) Trace 1 <table border="1"> <tr><td>Mean</td><td>29.21 dBm</td></tr> <tr><td>Peak</td><td>29.61 dBm</td></tr> <tr><td>Crest</td><td>0.39 dB</td></tr> </table> <table border="1"> <tr><td>10 %</td><td>0.24 dB</td></tr> <tr><td>1 %</td><td>0.32 dB</td></tr> <tr><td>.1 %</td><td>0.32 dB</td></tr> <tr><td>.01 %</td><td>0.36 dB</td></tr> </table> Date: 21.JUL.2020 10:23:10	Mean	29.21 dBm	Peak	29.61 dBm	Crest	0.39 dB	10 %	0.24 dB	1 %	0.32 dB	.1 %	0.32 dB	.01 %	0.36 dB	 Ref: 35 dBm Att: 30 dB AGT: 3.125 ms Center: 1.88 GHz 2 dB/ Mean Pwr: +20 dB Complementary Cumulative Distribution Function (100000 samples) Trace 1 <table border="1"> <tr><td>Mean</td><td>25.78 dBm</td></tr> <tr><td>Peak</td><td>29.04 dBm</td></tr> <tr><td>Crest</td><td>3.26 dB</td></tr> </table> <table border="1"> <tr><td>10 %</td><td>2.56 dB</td></tr> <tr><td>1 %</td><td>3.08 dB</td></tr> <tr><td>.1 %</td><td>3.20 dB</td></tr> <tr><td>.01 %</td><td>3.28 dB</td></tr> </table> Date: 21.JUL.2020 10:41:07	Mean	25.78 dBm	Peak	29.04 dBm	Crest	3.26 dB	10 %	2.56 dB	1 %	3.08 dB	.1 %	3.20 dB	.01 %	3.28 dB
Mean	29.21 dBm																												
Peak	29.61 dBm																												
Crest	0.39 dB																												
10 %	0.24 dB																												
1 %	0.32 dB																												
.1 %	0.32 dB																												
.01 %	0.36 dB																												
Mean	25.78 dBm																												
Peak	29.04 dBm																												
Crest	3.26 dB																												
10 %	2.56 dB																												
1 %	3.08 dB																												
.1 %	3.20 dB																												
.01 %	3.28 dB																												
Highest Channel	Highest Channel																												
 Ref: 35 dBm Att: 30 dB AGT: 3.125 ms Center: 1.9038 GHz 2 dB/ Mean Pwr: +20 dB Complementary Cumulative Distribution Function (100000 samples) Trace 1 <table border="1"> <tr><td>Mean</td><td>28.78 dBm</td></tr> <tr><td>Peak</td><td>29.11 dBm</td></tr> <tr><td>Crest</td><td>0.33 dB</td></tr> </table> <table border="1"> <tr><td>10 %</td><td>0.24 dB</td></tr> <tr><td>1 %</td><td>0.32 dB</td></tr> <tr><td>.1 %</td><td>0.36 dB</td></tr> <tr><td>.01 %</td><td>0.36 dB</td></tr> </table> Date: 21.JUL.2020 10:23:22	Mean	28.78 dBm	Peak	29.11 dBm	Crest	0.33 dB	10 %	0.24 dB	1 %	0.32 dB	.1 %	0.36 dB	.01 %	0.36 dB	 Ref: 35 dBm Att: 30 dB AGT: 3.125 ms Center: 1.9038 GHz 2 dB/ Mean Pwr: +20 dB Complementary Cumulative Distribution Function (100000 samples) Trace 1 <table border="1"> <tr><td>Mean</td><td>25.43 dBm</td></tr> <tr><td>Peak</td><td>28.76 dBm</td></tr> <tr><td>Crest</td><td>3.33 dB</td></tr> </table> <table border="1"> <tr><td>10 %</td><td>2.60 dB</td></tr> <tr><td>1 %</td><td>3.08 dB</td></tr> <tr><td>.1 %</td><td>3.24 dB</td></tr> <tr><td>.01 %</td><td>3.28 dB</td></tr> </table> Date: 21.JUL.2020 10:41:28	Mean	25.43 dBm	Peak	28.76 dBm	Crest	3.33 dB	10 %	2.60 dB	1 %	3.08 dB	.1 %	3.24 dB	.01 %	3.28 dB
Mean	28.78 dBm																												
Peak	29.11 dBm																												
Crest	0.33 dB																												
10 %	0.24 dB																												
1 %	0.32 dB																												
.1 %	0.36 dB																												
.01 %	0.36 dB																												
Mean	25.43 dBm																												
Peak	28.76 dBm																												
Crest	3.33 dB																												
10 %	2.60 dB																												
1 %	3.08 dB																												
.1 %	3.24 dB																												
.01 %	3.28 dB																												

**26dB Bandwidth**

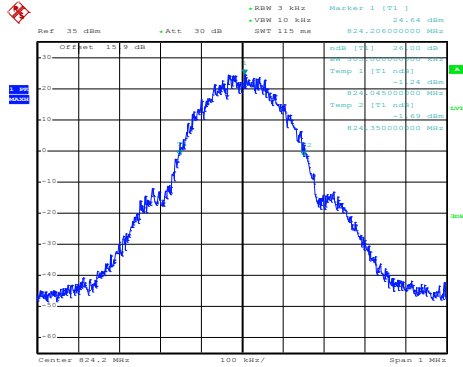
Mode	GSM850: 26dB BW (MHz)	
Mod.	GPRS class 8	EDGE class 8
Lowest CH	0.305	0.298
Middle CH	0.306	0.309
Highest CH	0.304	0.305

Mode	GSM1900: 26dB BW (MHz)	
Mod.	GPRS class 8	EDGE class 8
Lowest CH	0.302	0.305
Middle CH	0.305	0.309
Highest CH	0.305	0.307



GSM850 (GPRS class 8)

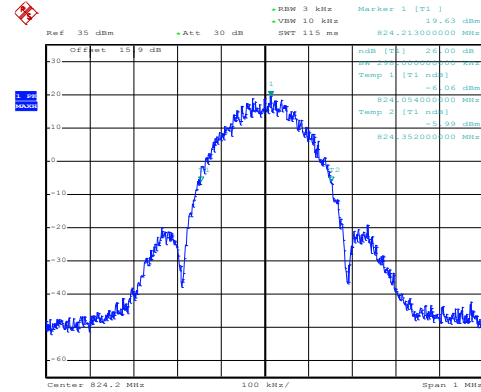
Lowest Channel



Date: 20.JUL.2020 18:52:46

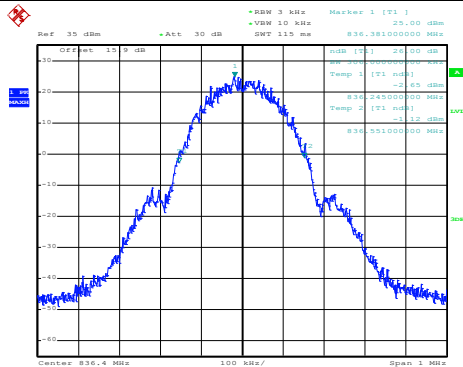
GSM850 (EDGE class 8)

Lowest Channel



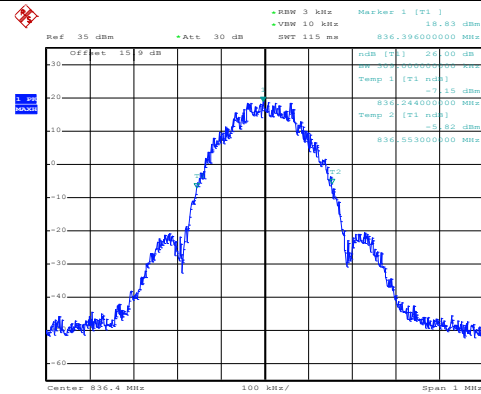
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Middle Channel



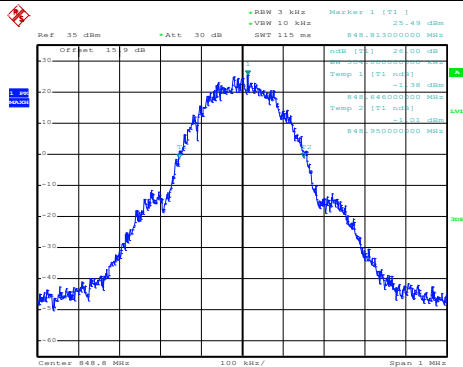
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Middle Channel



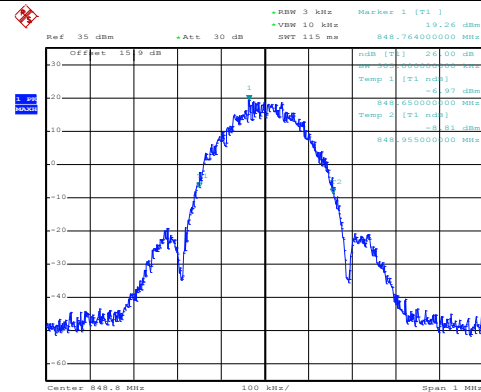
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Highest Channel

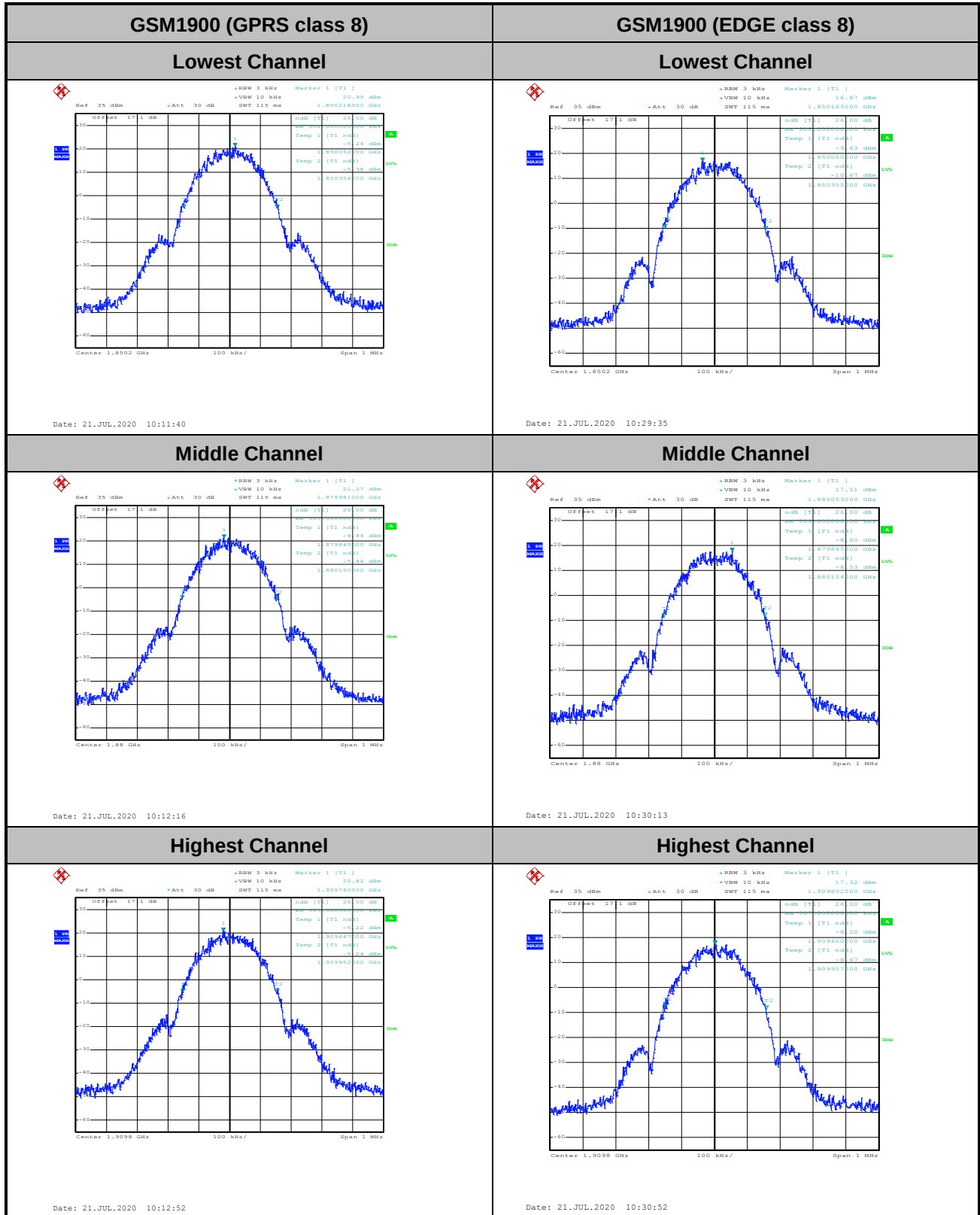


Date: 20.JUL.2020 18:53:58

Highest Channel



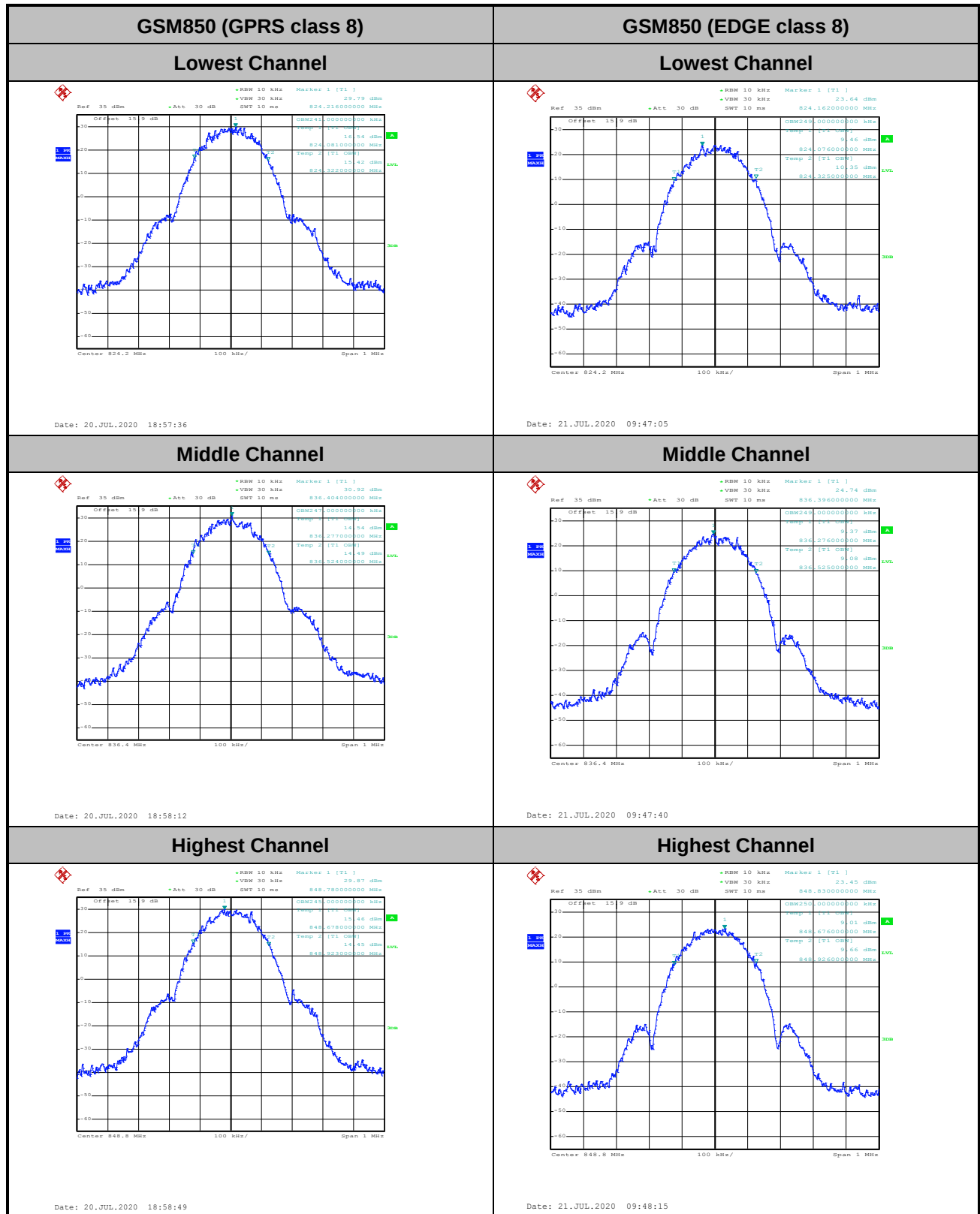
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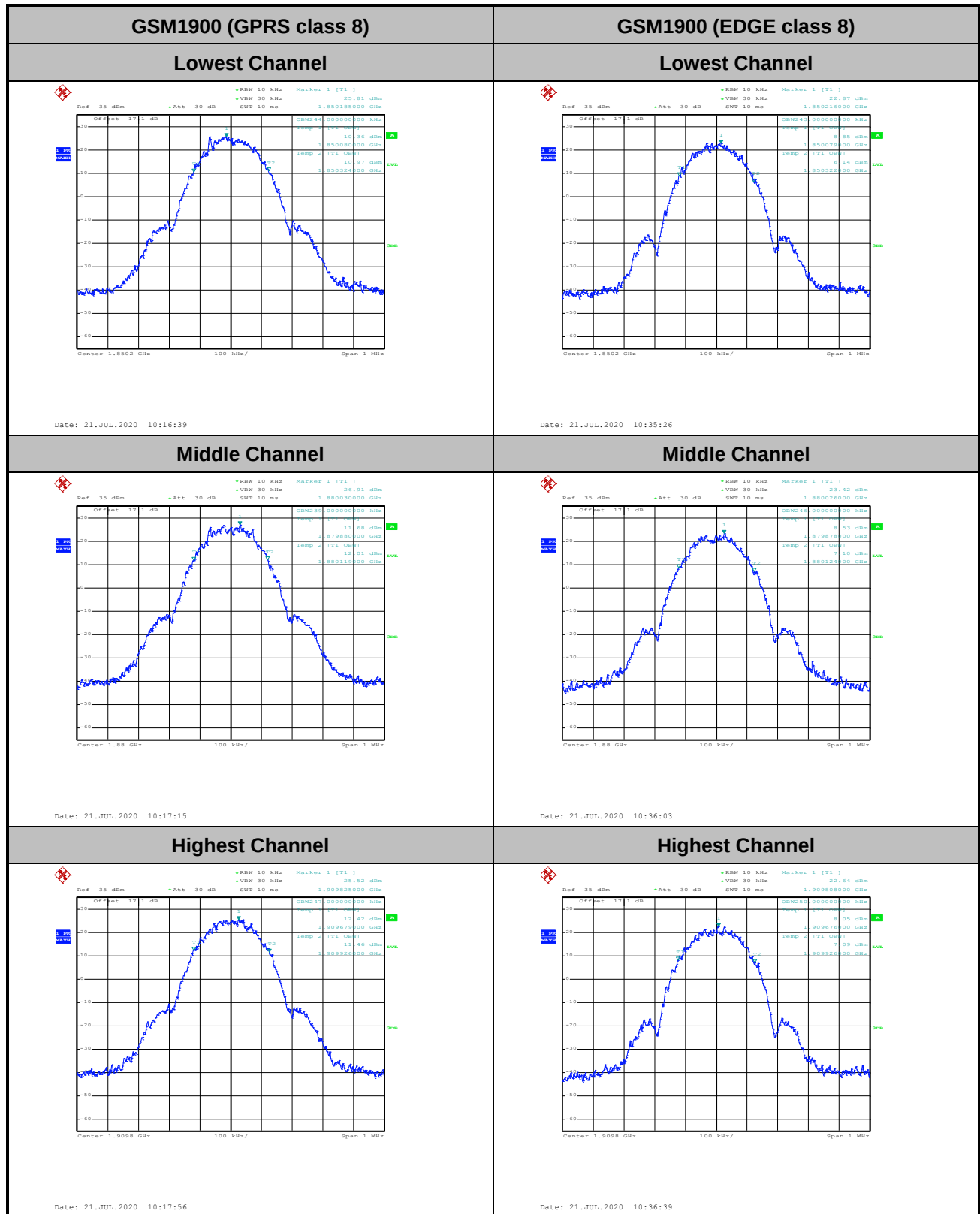


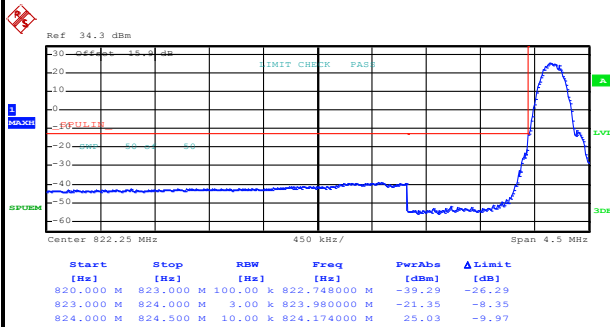
**Occupied Bandwidth**

Mode	GSM850: 99% BW (MHz)	
Mod.	GPRS class 8	EDGE class 8
Lowest CH	0.241	0.249
Middle CH	0.247	0.249
Highest CH	0.245	0.250

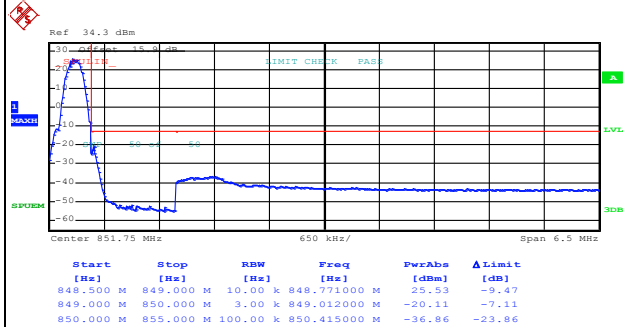
Mode	GSM1900: 99% BW (MHz)	
Mod.	GPRS class 8	EDGE class 8
Lowest CH	0.244	0.243
Middle CH	0.239	0.246
Highest CH	0.247	0.250





**Conducted Band Edge****GSM850 (GPRS class 8)****Lowest Band Edge**

Date: 20.JUL.2020 19:00:31

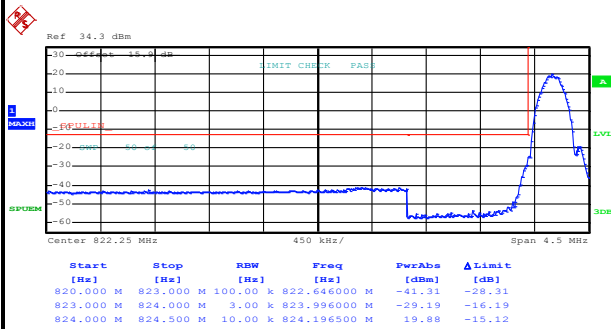
Highest Band Edge

Date: 20.JUL.2020 19:02:08



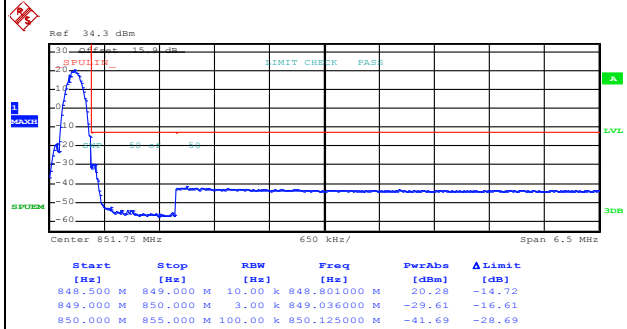
GSM850 (EDGE class 8)

Lowest Band Edge



Date: 21.JUL.2020 09:49:56

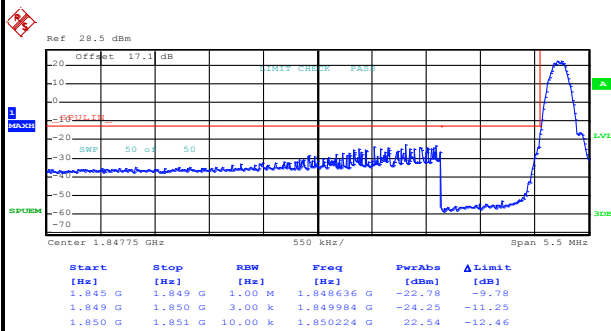
Highest Band Edge



Date: 21.JUL.2020 09:51:34

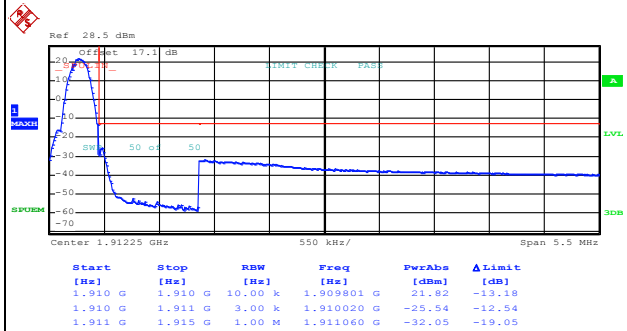
GSM1900 (GPRS class 8)

Lowest Band Edge



Date: 21.JUL.2020 10:19:36

Highest Band Edge

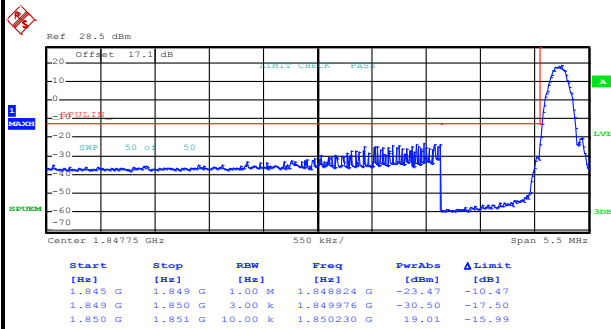


Date: 21.JUL.2020 10:21:19



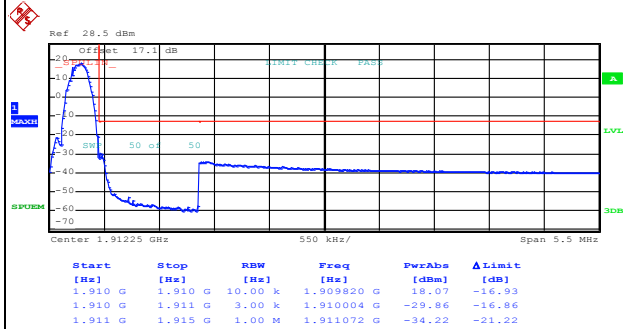
GSM1900 (EDGE class 8)

Lowest Band Edge



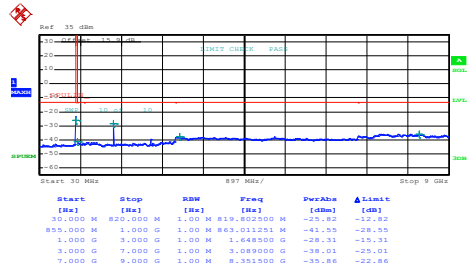
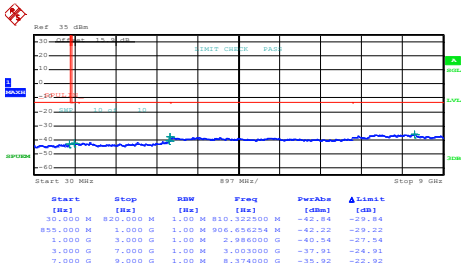
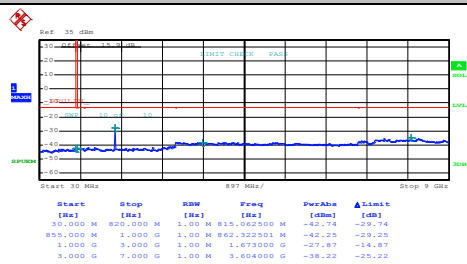
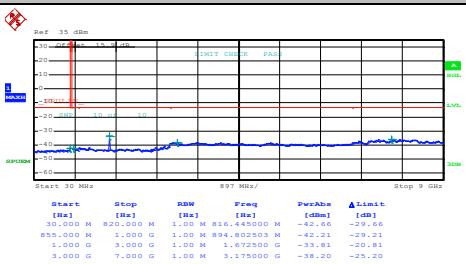
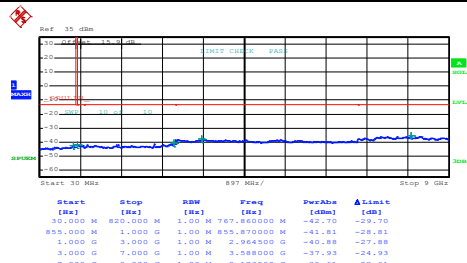
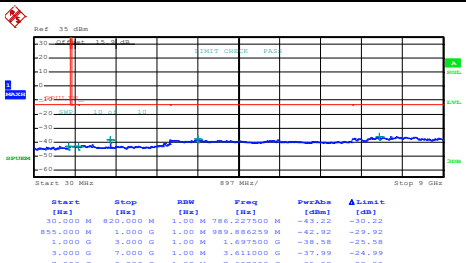
Date: 21.JUL.2020 10:38:24

Highest Band Edge



Date: 21.JUL.2020 10:39:59

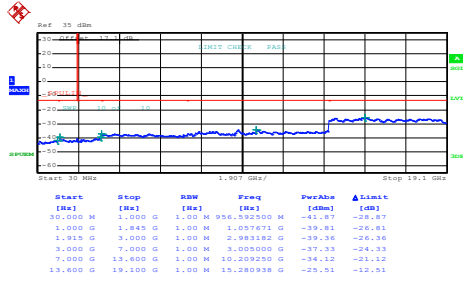
**Conducted Spurious Emission**

GSM850 (GPRS class 8)		GSM850 (EDGE class 8)																																																																																					
Lowest Channel		Lowest Channel																																																																																					
<table><tr><th>Start</th><th>Stop</th><th>RBW</th><th>Freq</th><th>PwrAve</th><th>Limit</th></tr><tr><th>[Hz]</th><th>[Hz]</th><th>[Hz]</th><th>[Hz]</th><th>[dBm]</th><th>[dB]</th></tr><tr><td>30,000 M</td><td>820,000 M</td><td>1,00 M</td><td>819,802500 M</td><td>-25.82</td><td>-12.82</td></tr><tr><td>855,000 M</td><td>1,000 G</td><td>1,00 M</td><td>863,011251 M</td><td>-41.55</td><td>-28.55</td></tr><tr><td>1,000 G</td><td>3,000 G</td><td>1,00 M</td><td>1,4685000 G</td><td>-28.31</td><td>-15.31</td></tr><tr><td>3,000 G</td><td>7,000 G</td><td>1,00 M</td><td>3,0890000 G</td><td>-38.01</td><td>-25.01</td></tr><tr><td>7,000 G</td><td>9,000 G</td><td>1,00 M</td><td>8,3515000 G</td><td>-35.86</td><td>-22.86</td></tr></table> Date: 20.JUL.2020 18:55:03		Start	Stop	RBW	Freq	PwrAve	Limit	[Hz]	[Hz]	[Hz]	[Hz]	[dBm]	[dB]	30,000 M	820,000 M	1,00 M	819,802500 M	-25.82	-12.82	855,000 M	1,000 G	1,00 M	863,011251 M	-41.55	-28.55	1,000 G	3,000 G	1,00 M	1,4685000 G	-28.31	-15.31	3,000 G	7,000 G	1,00 M	3,0890000 G	-38.01	-25.01	7,000 G	9,000 G	1,00 M	8,3515000 G	-35.86	-22.86	<table><tr><th>Start</th><th>Stop</th><th>RBW</th><th>Freq</th><th>PwrAve</th><th>Limit</th></tr><tr><th>[Hz]</th><th>[Hz]</th><th>[Hz]</th><th>[Hz]</th><th>[dBm]</th><th>[dB]</th></tr><tr><td>30,000 M</td><td>820,000 M</td><td>1,00 M</td><td>810,322500 M</td><td>-42.84</td><td>-29.84</td></tr><tr><td>855,000 M</td><td>1,000 G</td><td>1,00 M</td><td>908,656254 M</td><td>-42.22</td><td>-29.22</td></tr><tr><td>1,000 G</td><td>3,000 G</td><td>1,00 M</td><td>2,9860000 G</td><td>-40.34</td><td>-27.34</td></tr><tr><td>3,000 G</td><td>7,000 G</td><td>1,00 M</td><td>3,0030000 G</td><td>-37.91</td><td>-24.91</td></tr><tr><td>7,000 G</td><td>9,000 G</td><td>1,00 M</td><td>8,3740000 G</td><td>-35.92</td><td>-22.92</td></tr></table> Date: 21.JUL.2020 09:53:24		Start	Stop	RBW	Freq	PwrAve	Limit	[Hz]	[Hz]	[Hz]	[Hz]	[dBm]	[dB]	30,000 M	820,000 M	1,00 M	810,322500 M	-42.84	-29.84	855,000 M	1,000 G	1,00 M	908,656254 M	-42.22	-29.22	1,000 G	3,000 G	1,00 M	2,9860000 G	-40.34	-27.34	3,000 G	7,000 G	1,00 M	3,0030000 G	-37.91	-24.91	7,000 G	9,000 G	1,00 M	8,3740000 G	-35.92	-22.92
Start	Stop	RBW	Freq	PwrAve	Limit																																																																																		
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7,000 G	9,000 G	1,00 M	8,3515000 G	-35.86	-22.86																																																																																		
Start	Stop	RBW	Freq	PwrAve	Limit																																																																																		
[Hz]	[Hz]	[Hz]	[Hz]	[dBm]	[dB]																																																																																		
30,000 M	820,000 M	1,00 M	810,322500 M	-42.84	-29.84																																																																																		
855,000 M	1,000 G	1,00 M	908,656254 M	-42.22	-29.22																																																																																		
1,000 G	3,000 G	1,00 M	2,9860000 G	-40.34	-27.34																																																																																		
3,000 G	7,000 G	1,00 M	3,0030000 G	-37.91	-24.91																																																																																		
7,000 G	9,000 G	1,00 M	8,3740000 G	-35.92	-22.92																																																																																		
Middle Channel		Middle Channel																																																																																					
<table><tr><th>Start</th><th>Stop</th><th>RBW</th><th>Freq</th><th>PwrAve</th><th>Limit</th></tr><tr><th>[Hz]</th><th>[Hz]</th><th>[Hz]</th><th>[Hz]</th><th>[dBm]</th><th>[dB]</th></tr><tr><td>30,000 M</td><td>820,000 M</td><td>1,00 M</td><td>815,062500 M</td><td>-42.74</td><td>-29.74</td></tr><tr><td>855,000 M</td><td>1,000 G</td><td>1,00 M</td><td>862,322501 M</td><td>-42.25</td><td>-29.25</td></tr><tr><td>1,000 G</td><td>3,000 G</td><td>1,00 M</td><td>1,6730000 G</td><td>-27.87</td><td>-14.87</td></tr><tr><td>3,000 G</td><td>7,000 G</td><td>1,00 M</td><td>3,0640000 G</td><td>-38.22</td><td>-25.22</td></tr><tr><td>7,000 G</td><td>9,000 G</td><td>1,00 M</td><td>8,1680000 G</td><td>-35.09</td><td>-22.09</td></tr></table> Date: 20.JUL.2020 18:55:57		Start	Stop	RBW	Freq	PwrAve	Limit	[Hz]	[Hz]	[Hz]	[Hz]	[dBm]	[dB]	30,000 M	820,000 M	1,00 M	815,062500 M	-42.74	-29.74	855,000 M	1,000 G	1,00 M	862,322501 M	-42.25	-29.25	1,000 G	3,000 G	1,00 M	1,6730000 G	-27.87	-14.87	3,000 G	7,000 G	1,00 M	3,0640000 G	-38.22	-25.22	7,000 G	9,000 G	1,00 M	8,1680000 G	-35.09	-22.09	<table><tr><th>Start</th><th>Stop</th><th>RBW</th><th>Freq</th><th>PwrAve</th><th>Limit</th></tr><tr><th>[Hz]</th><th>[Hz]</th><th>[Hz]</th><th>[Hz]</th><th>[dBm]</th><th>[dB]</th></tr><tr><td>30,000 M</td><td>820,000 M</td><td>1,00 M</td><td>816,445000 M</td><td>-42.66</td><td>-29.66</td></tr><tr><td>855,000 M</td><td>1,000 G</td><td>1,00 M</td><td>894,802503 M</td><td>-42.21</td><td>-29.21</td></tr><tr><td>1,000 G</td><td>3,000 G</td><td>1,00 M</td><td>1,6725000 G</td><td>-33.81</td><td>-20.81</td></tr><tr><td>3,000 G</td><td>7,000 G</td><td>1,00 M</td><td>3,1750000 G</td><td>-38.20</td><td>-25.20</td></tr><tr><td>7,000 G</td><td>9,000 G</td><td>1,00 M</td><td>7,8750000 G</td><td>-35.97</td><td>-22.97</td></tr></table> Date: 21.JUL.2020 09:54:52		Start	Stop	RBW	Freq	PwrAve	Limit	[Hz]	[Hz]	[Hz]	[Hz]	[dBm]	[dB]	30,000 M	820,000 M	1,00 M	816,445000 M	-42.66	-29.66	855,000 M	1,000 G	1,00 M	894,802503 M	-42.21	-29.21	1,000 G	3,000 G	1,00 M	1,6725000 G	-33.81	-20.81	3,000 G	7,000 G	1,00 M	3,1750000 G	-38.20	-25.20	7,000 G	9,000 G	1,00 M	7,8750000 G	-35.97	-22.97
Start	Stop	RBW	Freq	PwrAve	Limit																																																																																		
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7,000 G	9,000 G	1,00 M	8,1680000 G	-35.09	-22.09																																																																																		
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7,000 G	9,000 G	1,00 M	7,6070000 G	-35.98	-22.98																																																																																		



GSM1900 (GPRS class 8)

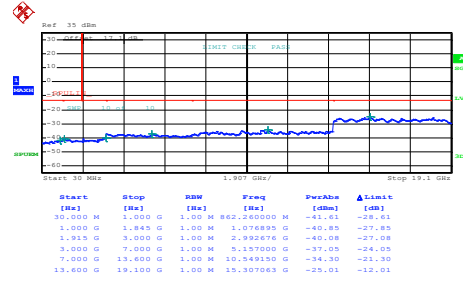
Lowest Channel



Date: 21.JUL.2020 10:13:55

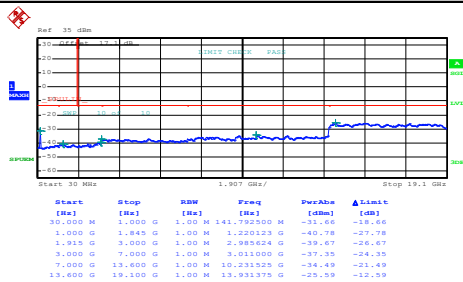
GSM1900 (EDGE class 8)

Lowest Channel



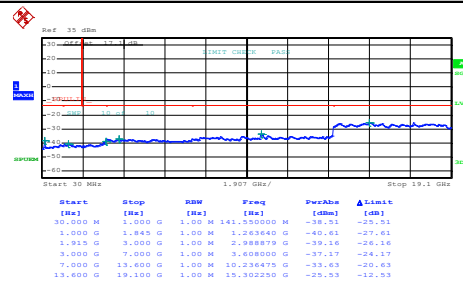
Date: 21.JUL.2020 10:32:13

Middle Channel



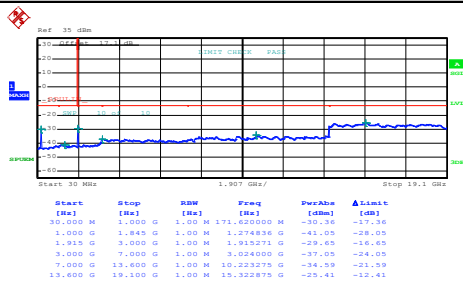
Date: 21.JUL.2020 10:14:47

Middle Channel



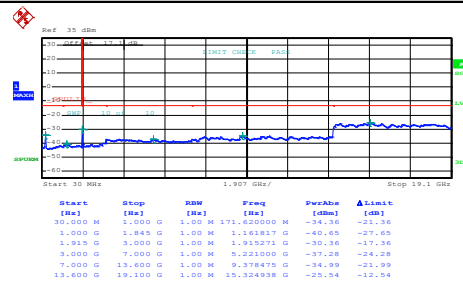
Date: 21.JUL.2020 10:33:13

Highest Channel



Date: 21.JUL.2020 10:15:41

Highest Channel



Date: 21.JUL.2020 10:34:20

**Frequency Stability**

Test Conditions	Middle Channel	GSM850 (GPRS class 8)	GSM850 (EDGE class 8)	Limit
Temperature (°C)	Voltage (Volt)	Deviation (ppm)		2.5ppm
50	Normal Voltage	0.0024	0.0012	PASS
40	Normal Voltage	0.0036	0.0000	
30	Normal Voltage	0.0012	0.0012	
20(Ref.)	Normal Voltage	0.0000	0.0000	
10	Normal Voltage	0.0646	0.0012	
0	Normal Voltage	0.0586	0.0000	
-10	Normal Voltage	0.0717	0.0012	
-20	Normal Voltage	0.0753	0.0012	
-30	Normal Voltage	0.0825	0.0012	
20	Maximum Voltage	0.0646	0.0012	
20	Normal Voltage	0.0000	0.0000	
20	Battery End Point	0.0048	0.0012	



Test Conditions Temperature (°C)	Middle Channel Voltage (Volt)	GSM1900 (GPRS class 8)	GSM1900 (EDGE class 8)	Limit Note 2.
		Deviation (ppm)		Result
50	Normal Voltage	0.0037	0.0011	PASS
40	Normal Voltage	0.0032	0.0005	
30	Normal Voltage	0.0011	0.0011	
20(Ref.)	Normal Voltage	0.0000	0.0000	
10	Normal Voltage	0.0011	0.0005	
0	Normal Voltage	0.0043	0.0000	
-10	Normal Voltage	0.0053	0.0011	
-20	Normal Voltage	0.0069	0.0016	
-30	Normal Voltage	0.0112	0.0090	
20	Maximum Voltage	0.0053	0.0059	
20	Normal Voltage	0.0000	0.0000	
20	Battery End Point	0.0154	0.0229	

Note:

1. Normal Voltage = 3.85V. ; Battery End Point (BEP) = 3.65 V. ; Maximum Voltage =4.25 V
2. The frequency fundamental emissions stay within the authorized frequency block.



A3. WCDMA

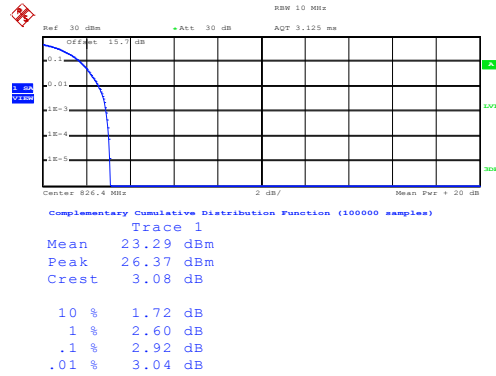
Peak-to-Average Ratio

Mode	WCDMA Band V	Limit: 13dB
Mod.	RMC 12.2Kbps	Result
Lowest CH	2.92	PASS
Middle CH	2.88	
Highest CH	2.88	



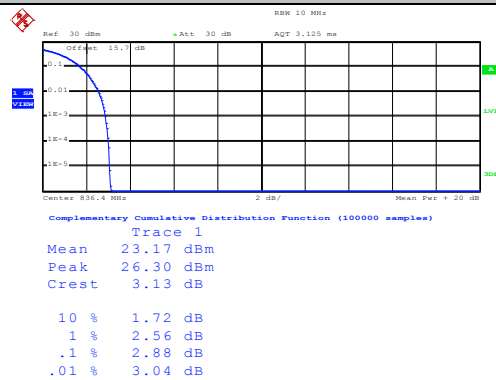
WCDMA Band V (RMC 12.2Kbps)

Lowest Channel



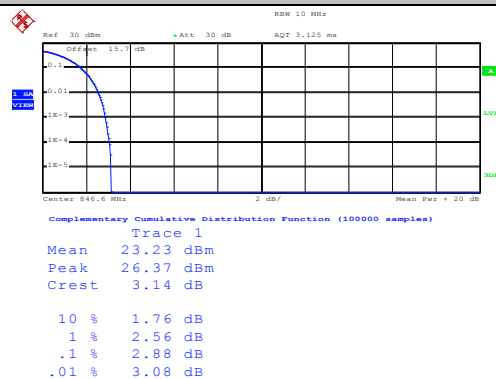
Date: 21.JUL.2020 11:01:16

Middle Channel



Date: 21.JUL.2020 11:01:38

Highest Channel



Date: 21.JUL.2020 11:02:07



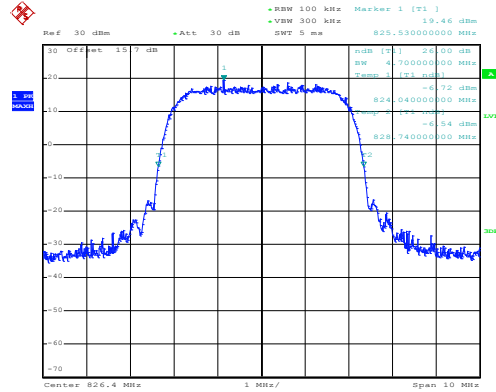
26dB Bandwidth

Mode	WCDMA Band V: 26dB BW (MHz)
Mod.	RMC 12.2Kbps
Lowest CH	4.70
Middle CH	4.72
Highest CH	4.72



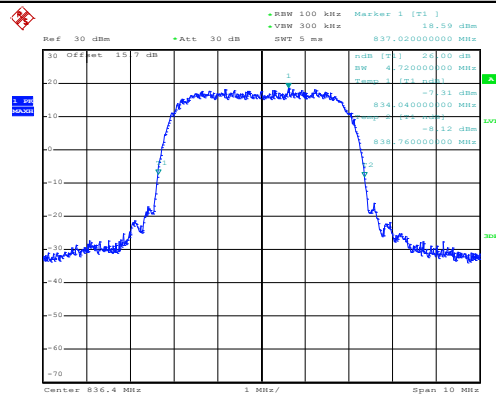
WCDMA Band V (RMC 12.2Kbps)

Lowest Channel



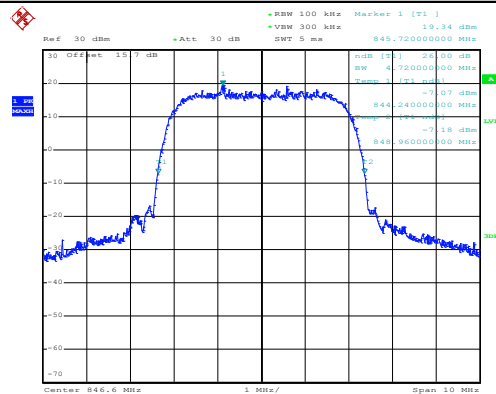
Date: 21.JUL.2020 10:47:58

Middle Channel



Date: 21.JUL.2020 10:48:38

Highest Channel



Date: 21.JUL.2020 10:49:20



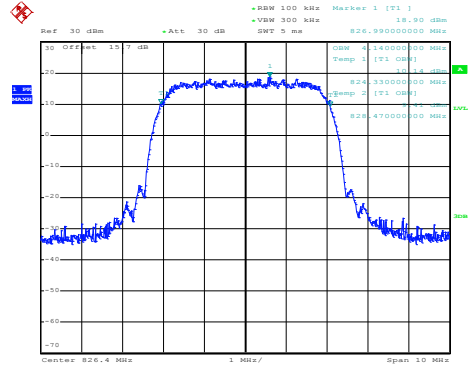
Occupied Bandwidth

Mode	WCDMA Band V: 99% BW (MHz)
Mod.	RMC 12.2Kbps
Lowest CH	4.14
Middle CH	4.16
Highest CH	4.15



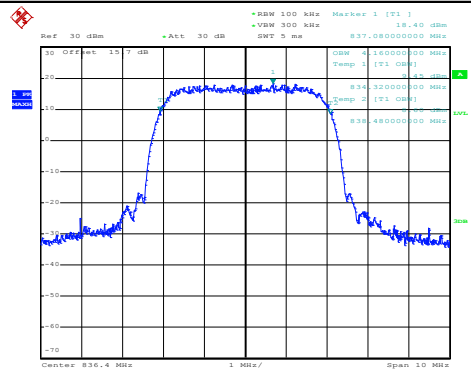
WCDMA Band V (RMC 12.2Kbps)

Lowest Channel



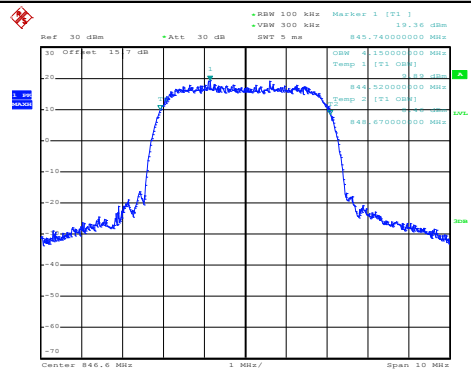
Date: 21.JUL.2020 10:53:13

Middle Channel



Date: 21.JUL.2020 10:53:52

Highest Channel



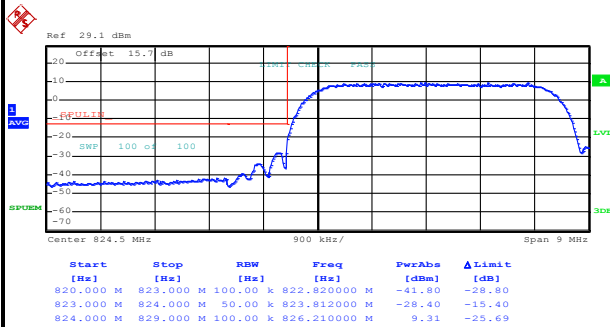
Date: 21.JUL.2020 10:54:34



Conducted Band Edge

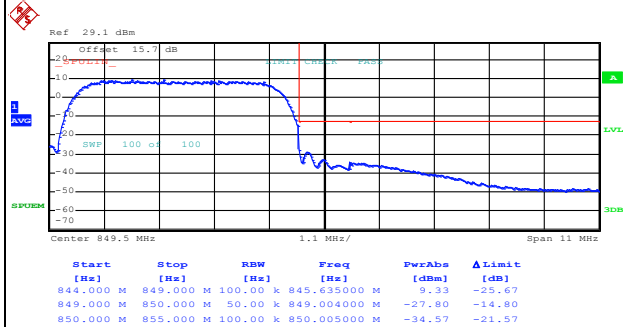
WCDMA Band V (RMC 12.2Kbps)

Lowest Band Edge



Date: 21.JUL.2020 10:57:43

Highest Band Edge



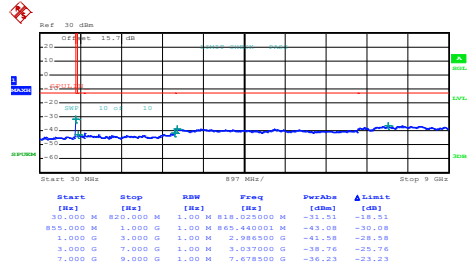
Date: 21.JUL.2020 11:00:37



Conducted Spurious Emission

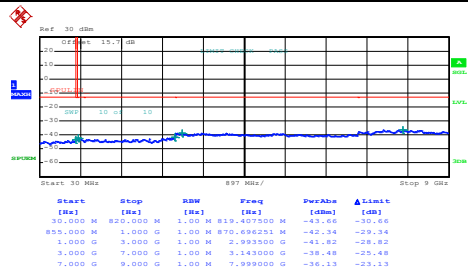
WCDMA Band V (RMC 12.2Kbps)

Lowest Channel



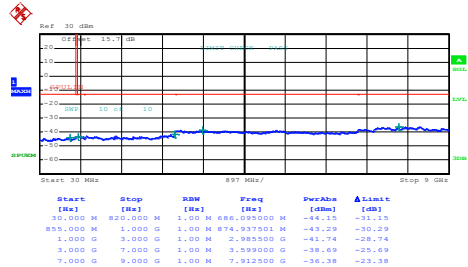
Date: 21.JUL.2020 10:50:26

Middle Channel



Date: 21.JUL.2020 10:51:24

Highest Channel



Date: 21.JUL.2020 10:52:24

**Frequency Stability**

Test Conditions	Middle Channel	WCDMA Band V (RMC 12.2Kbps)	Limit
Temperature (°C)	Voltage (Volt)	Deviation (ppm)	2.5ppm
50	Normal Voltage	0.0155	PASS
40	Normal Voltage	0.0155	
30	Normal Voltage	0.0036	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0012	
0	Normal Voltage	0.0012	
-10	Normal Voltage	0.0012	
-20	Normal Voltage	0.0012	
-30	Normal Voltage	0.0012	
20	Maximum Voltage	0.0167	
20	Normal Voltage	0.0000	
20	Battery End Point	0.0155	

Note:

1. Normal Voltage = 3.85V. ; Battery End Point (BEP) = 3.65 V. ; Maximum Voltage =4.25 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 = -6.6 dB)	32.00	1.5849	23.25	0.2113
Middle		32.21	1.6634	23.46	0.2218
Highest		32.07	1.6106	23.32	0.2148
Lowest	GSM850 EDGE class 8 (GT - LC = -6.6 dB)	26.42	0.4385	17.67	0.0585
Middle		26.32	0.4285	17.57	0.0571
Highest		26.45	0.4416	17.70	0.0589
Lowest	WCDMA Band V RMC 12.2Kbps (GT - LC = -6.6 dB)	23.78	0.2388	15.03	0.0318
Middle		23.79	0.2393	15.04	0.0319
Highest		23.87	0.2438	15.12	0.0325
Limit	ERP < 7W	Result		PASS	

Channel	Mode	Conducted		EIRP	
		Power (dBm)	Power (Watts)	EIRP(dBm)	EIRP(W)
Lowest	GSM1900 GPRS class 8 (GT - LC = -4.1 dB)	27.33	0.5408	23.23	0.2104
Middle		27.79	0.6012	23.69	0.2339
Highest		27.67	0.5848	23.57	0.2275
Lowest	GSM1900 EDGE class 8 (GT - LC = -4.1 dB)	25.72	0.3733	21.62	0.1452
Middle		25.95	0.3936	21.85	0.1531
Highest		25.51	0.3556	21.41	0.1384
Limit	EIRP < 2W	Result		PASS	

**Radiated Spurious Emission****GPRS850**

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	-55.05	-13	-42.05	-64.72	-60.64	0.92	8.66	H
	2472	-45.00	-13	-32.00	-58.85	-52.37	1.14	10.66	H
	3298	-55.49	-13	-42.49	-70.91	-64.03	1.32	12.02	H
									H
									H
									H
	1648	-47.00	-13	-34.00	-56.14	-52.59	0.92	8.66	V
	2472	-43.70	-13	-30.70	-57.7	-51.07	1.14	10.66	V
	3298	-54.81	-13	-41.81	-70.71	-63.35	1.32	12.02	V
									V
									V
									V
Middle	1672	-52.80	-13	-39.80	-62.52	-58.48	0.93	8.75	H
	2512	-40.07	-13	-27.07	-53.93	-47.48	1.15	10.71	H
	3346	-54.92	-13	-41.92	-70.23	-63.57	1.33	12.13	H
									H
									H
									H
	1672	-52.85	-13	-39.85	-61.94	-58.53	0.93	8.75	V
	2512	-33.04	-13	-20.04	-47.09	-40.45	1.15	10.71	V
	3346	-54.80	-13	-41.80	-70.56	-63.45	1.33	12.13	V
									V
									V
									V



Highest	1696	-55.65	-13	-42.65	-65.41	-61.41	0.94	8.84	H
	2544	-42.57	-13	-29.57	-56.41	-50.01	1.16	10.75	H
	3393	-55.69	-13	-42.69	-70.87	-64.44	1.34	12.24	H
									H
									H
									H
	1696	-50.07	-13	-37.07	-59.12	-55.83	0.94	8.84	V
	2544	-39.42	-13	-26.42	-53.37	-46.86	1.16	10.75	V
	3393	-55.26	-13	-42.26	-70.88	-64.01	1.34	12.24	V
									V
									V
									V

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

**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	-54.09	-13	-41.09	-63.76	-59.68	0.92	8.66	H
	2472	-53.26	-13	-40.26	-67.11	-60.63	1.14	10.66	H
	3296	-55.75	-13	-42.75	-71.18	-64.29	1.32	12.01	H
									H
									H
									H
	1648	-54.57	-13	-41.57	-63.71	-60.16	0.92	8.66	V
	2472	-51.88	-13	-38.88	-65.88	-59.25	1.14	10.66	V
	3296	-55.23	-13	-42.23	-71.12	-63.77	1.32	12.01	V
									V
									V
									V
Middle	1672	-59.60	-13	-46.60	-69.32	-65.28	0.93	8.75	H
	2512	-54.08	-13	-41.08	-67.94	-61.49	1.15	10.71	H
	3344	-55.51	-13	-42.51	-70.81	-64.15	1.33	12.13	H
									H
									H
									H
	1672	-55.04	-13	-42.04	-64.13	-60.72	0.93	8.75	V
	2512	-44.35	-13	-31.35	-58.4	-51.76	1.15	10.71	V
	3344	-55.15	-13	-42.15	-70.91	-63.79	1.33	12.13	V
									V
									V
									V



Highest	1696	-59.67	-13	-46.67	-69.43	-65.43	0.94	8.84	H
	2544	-53.74	-13	-40.74	-67.58	-61.18	1.16	10.75	H
	3393	-55.91	-13	-42.91	-71.09	-64.66	1.34	12.24	H
									H
									H
									H
	1696	-56.57	-13	-43.57	-65.62	-62.33	0.94	8.84	V
	2544	-49.03	-13	-36.03	-62.98	-56.47	1.16	10.75	V
	3393	-55.38	-13	-42.38	-71	-64.13	1.34	12.24	V
									V
									V
									V

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

**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	1648	-60.75	-13	-47.75	-70.42	-66.34	0.92	8.66	H
	2474	-57.01	-13	-44.01	-70.86	-64.38	1.14	10.66	H
	3298	-55.63	-13	-42.63	-71.05	-64.17	1.32	12.02	H
									H
									H
									H
	1648	-60.92	-13	-47.92	-70.06	-66.51	0.92	8.66	V
	2474	-56.78	-13	-43.78	-70.78	-64.15	1.14	10.66	V
	3298	-55.21	-13	-42.21	-71.11	-63.75	1.32	12.02	V
									V
									V
									V
Middle	1672	-60.62	-13	-47.62	-70.34	-66.30	0.93	8.75	H
	2509	-56.62	-13	-43.62	-70.48	-64.03	1.15	10.71	H
	3345	-55.81	-13	-42.81	-71.11	-64.46	1.33	12.13	H
									H
									H
									H
	1672	-61.53	-13	-48.53	-70.62	-67.21	0.93	8.75	V
	2509	-56.04	-13	-43.04	-70.1	-63.45	1.15	10.71	V
	3345	-55.42	-13	-42.42	-71.18	-64.07	1.33	12.13	V
									V
									V
									V



Highest	1696	-60.91	-13	-47.91	-70.67	-66.67	0.94	8.84	H
	2544	-57.37	-13	-44.37	-71.21	-64.81	1.16	10.75	H
	3393	-56.13	-13	-43.13	-71.31	-64.88	1.34	12.24	H
									H
									H
									H
	1696	-61.59	-13	-48.59	-70.64	-67.35	0.94	8.84	V
	2544	-57.13	-13	-44.13	-71.08	-64.57	1.16	10.75	V
	3393	-55.53	-13	-42.53	-71.14	-64.28	1.34	12.24	V
									V
									V
									V

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

**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	3707	-52.71	-13	-39.71	-70.69	-63.92	1.41	12.62	H
	5555	-47.51	-13	-34.51	-70.41	-59.07	1.74	13.30	H
	7409	-42.65	-13	-29.65	-69.7	-51.95	1.94	11.25	H
									H
									H
									H
	3707	-52.30	-13	-39.30	-70.43	-63.51	1.41	12.62	V
	5555	-47.97	-13	-34.97	-70.41	-59.53	1.74	13.30	V
	7409	-42.78	-13	-29.78	-69.67	-52.08	1.94	11.25	V
									V
									V
									V
Middle	3760	-52.39	-13	-39.39	-70.57	-63.62	1.43	12.66	H
	5639	-47.83	-13	-34.83	-70.74	-59.40	1.73	13.30	H
	7522	-44.46	-13	-31.46	-70.95	-53.57	1.99	11.10	H
									H
									H
									H
	3760	-52.07	-13	-39.07	-70.47	-63.30	1.43	12.66	V
	5639	-48.33	-13	-35.33	-70.84	-59.90	1.73	13.30	V
	7522	-44.46	-13	-31.46	-70.91	-53.57	1.99	11.10	V
									V
									V
									V



Highest	3819	-52.22	-13	-39.22	-70.56	-63.47	1.44	12.69	H
	5726	-47.36	-13	-34.36	-70.66	-58.93	1.73	13.30	H
	7635	-44.44	-13	-31.44	-70.5	-53.56	2.01	11.13	H
									H
									H
									H
	3819	-51.67	-13	-38.67	-70.25	-62.92	1.44	12.69	V
	5726	-48.35	-13	-35.35	-71.02	-59.92	1.73	13.30	V
	7635	-45.04	-13	-32.04	-71.01	-54.16	2.01	11.13	V
									V
									V
									V

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

**EDGE1900**

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	3707	-52.42	-13	-39.42	-70.4	-63.63	1.41	12.62	H
	5557	-47.82	-13	-34.82	-70.71	-59.38	1.74	13.30	H
	7409	-43.15	-13	-30.15	-70.2	-52.45	1.94	11.25	H
									H
									H
									H
	3707	-52.34	-13	-39.34	-70.47	-63.55	1.41	12.62	V
	5557	-47.98	-13	-34.98	-70.42	-59.54	1.74	13.30	V
	7409	-42.85	-13	-29.85	-69.74	-52.15	1.94	11.25	V
									V
									V
									V
Middle	3763	-52.25	-13	-39.25	-70.43	-63.48	1.43	12.66	H
	5640	-47.77	-13	-34.77	-70.69	-59.34	1.73	13.30	H
	7522	-44.45	-13	-31.45	-70.94	-53.56	1.99	11.10	H
									H
									H
									H
	3763	-51.84	-13	-38.84	-70.24	-63.07	1.43	12.66	V
	5640	-48.08	-13	-35.08	-70.59	-59.65	1.73	13.30	V
	7522	-44.50	-13	-31.50	-70.96	-53.61	1.99	11.10	V
									V
									V
									V



Highest	3819	-52.26	-13	-39.26	-70.63	-63.51	1.44	12.69	H
	5726	-47.66	-13	-34.66	-70.96	-59.23	1.73	13.30	H
	7635	-44.95	-13	-31.95	-71.01	-54.07	2.01	11.13	H
									H
									H
									H
	3819	-51.85	-13	-38.85	-70.43	-63.10	1.44	12.69	V
	5726	-48.07	-13	-35.07	-70.74	-59.64	1.73	13.30	V
	7635	-44.67	-13	-31.67	-70.64	-53.79	2.01	11.13	V
									V
									V
									V

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

————THE END————