FCC RF Test Report

APPLICANT	:	Motorola Mobility, LLC
EQUIPMENT	:	Mobile Cellular Phone
BRAND NAME	:	Motorola
MODEL NAME	:	10062 (Single SIM), 10060 (Dual SIM)
FCC ID	:	IHDT56WA4
STANDARD	:	FCC 47 CFR Part 2, 22(H), 24(E), 27(L)
CLASSIFICATION	:	PCS Licensed Transmitter Held to Ear (PCE)

This is a variant report which is only valid together with the original test report. The product was received on Feb. 03, 2017 and testing was completed on Mar. 10, 2017. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA / EIA-603-D-2010 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., the test report shall not be reproduced except in full.

Reviewed by: Joseph Lin / Supervisor

Approved by: Jones Tsai / Manager

Testing Laboratory
1190

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG720310-02A	Rev. 01	Initial issue of report	Mar. 20, 2017

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.4	§2.1046	Conducted Output Power	Reporting Only	PASS	-
3.5	§24.232(d)	Peak-to-Average Ratio	< 13 dB	PASS	-
3.6	§2.1049 §22.917(b) §24.238(b) §27.53(g)	Occupied Bandwidth	Reporting Only	PASS	-
3.7	§2.1051 §22.917(a) §24.238(a) §27.53(h)	Band Edge Measurement	< 43+10log10(P[Watts])	PASS	-
3.8	§2.1051 §22.917(a) §24.238(a) §27.53(h)	Conducted Emission	< 43+10log10(P[Watts])	PASS	-
3.9	§2.1055 §22.355	Frequency Stability for Temperature & Voltage	< 2.5 ppm for Part 22	PASS	-
	§2.1055 §24.235 §27.54		Within Authorized Band		
4.4	§22.913(a)(2)	Effective Radiated Power	< 7 Watts	PASS	-
	§24.232(c)	Equivalent Isotropic Radiated Power	< 2 Watts	PASS	-
	§27.50(d)(4)	Equivalent Isotropic Radiated Power	< 1 Watts	PASS	-
4.5	§2.1053 §22.917(a) §24.238(a) §27.53(h)	Field Strength of Spurious Radiation	< 43+10log10(P[Watts])	PASS	Under limit 26.43 dB at 1672.000 MHz

1 General Description

1.1 Applicant

Motorola Mobility, LLC
222 W Merchandise Mart Plaza, Suite 1800, Chicago, IL 60654, United States

1.2 Manufacturer

Motorola Mobility, LLC
222 W Merchandise Mart Plaza, Suite 1800, Chicago, IL 60654, United States

1.3 Product Feature of Equipment Under Test

Product Feature		
Equipment	Mobile Cellular Phone	
Brand Name	Motorola	
Model Name	10062 (Single SIM), 10060 (Dual SIM)	
FCC ID	IHDT56WA4	
IMEI Code	Conduction:	IMEI 1 : 351889080006316 IMEI 2 : 351889080006324
	Radiation:	IMEI 1 : 351889080006456 IMEI 2 : 351889080006464
EUT supports Radios application	GSM/EGPRS/WCDMA/HSPA/LTE/NFC/FM WLAN 11b/g/n HT20 WLAN 11a/n HT20/HT40 Bluetooth BR/EDR/LE	
HW Version	DVT2	
EUT Stage	Identical Prototype	

Remark:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. This is a variant report. Except conducted output power, GSM1900, WCDMA Band 2 and WCDMA Band 5, FG720310-02A report reuses test data from the FG720310A report.

Accessory List	
AC Adapter 1	Brand Name : Motorola
	Model Name : SPN5970A
AC Adapter 2	Brand Name : Motorola
	Model Name : SPN5993A
AC Adapter 3	Brand Name : Motorola
	Model Name : SPN5978A
Battery 1	Brand Name : Motorola
	Model Name : SNN5983A
Battery 2	Brand Name : Motorola
	Model Name : SNN5985A
Earphone	Brand Name : Motorola
	Model Name : SH38C16618
USB Cable	Brand Name : Motorola
	Model Name : SKN6473A

1.4 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 ~ 1909.8MHz **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: 32.38 dBm 1900: 29.32 dBm **WCDMA:** Band V: 22.78 dBm Band II: 22.79 dBm Band IV: 22.85 dBm
Antenna Type	Coupling type (LDS) Antenna
Type of Modulation	GSM: GMSK GPRS: GMSK EDGE: GMSK / 8PSK WCDMA: BPSK (Uplink) HSDPA: 64QAM (Downlink) HSUPA: QPSK (Uplink)

1.5 Modification of EUT

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

1.6 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 GSM	GMSK	0.3357	-	-
Part 22	824.2 ~848.8	GSM850 EDGE class 8	8PSK	0.1413	-	-
Part 22	826.4 ~846.6	WCDMA Band V RMC 12.2Kbps	BPSK	0.0984	0.0239 ppm	4M14F9W
Part 24	1850.2 ~1909.8	GSM1900 GPRS class 8	GMSK	1.2190	0.0069 ppm	249KGXW
Part 24	1850.2 ~1909.8	GSM1900 EDGE class 8	8PSK	0.2924	0.0064 ppm	243KG7W
Part 24	1852.4 ~ 1907.6	WCDMA Band II RMC 12.2Kbps	BPSK	0.2317	0.0133 ppm	4M15F9W
Part 27	1712.4 ~ 1752.6	WCDMA Band IV RMC 12.2Kbps	BPSK	0.2716	-	-

1.7 Testing Location

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW1190 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

Test Site	SPORTON INTERNATIONAL INC.	
Test Site Location	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978	
Test Site No.	**Sporton Site No.**	
	TH03-HY	03CH07-HY

1.8 Applicable Standards

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

- 47 CFR Part 2, 22(H), 24(E), 27(L)
- ANSI / TIA / EIA-603-D-2010
- FCC KDB 971168 D01 Power Meas. License Digital Systems v02r02

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 v02r02 with maximum output power.

Radiated measurements were performed with rotating EUT in different three orthogonal test planes to find the maximum emission.

Radiated emissions were investigated as following frequency range:

1. 30 MHz to 9000 MHz for GSM850 and WCDMA Band V.
2. 30 MHz to 18000 MHz for WCDMA Band IV.
3. 30 MHz to 19100 MHz for GSM1900 and WCDMA Band II.

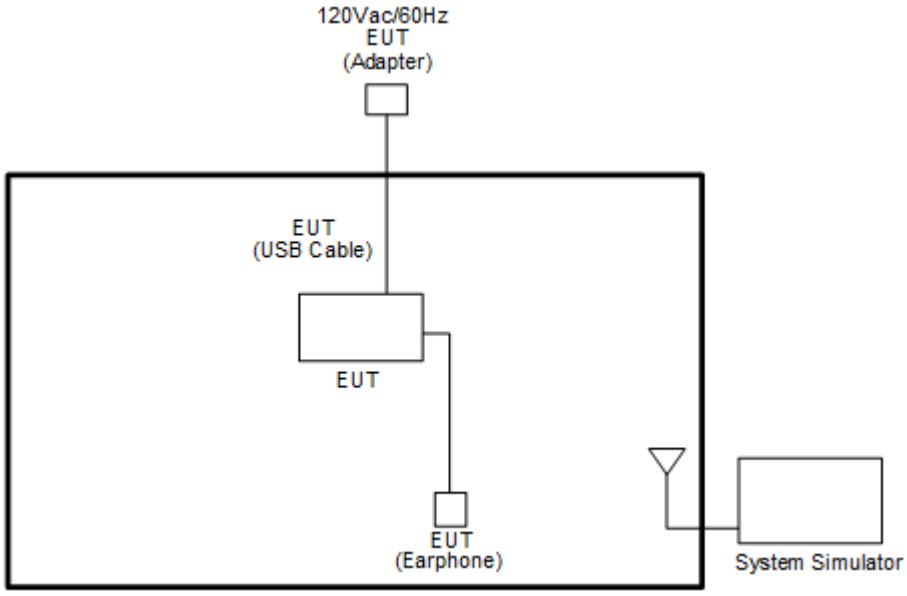
All modes and data rates and positions were investigated.

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

Test Modes		
Band	**Radiated TCs**	**Conducted TCs**
GSM 850	■ GSM Link ■ EDGE class 8 Link	-
GSM 1900	■ GPRS class 8 Link ■ EDGE class 8 Link	■ GPRS class 8 Link ■ EDGE class 8 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	-

Remark: All the radiated test cases were performance with Adapter 1 and Battery 1.

2.2 Connection Diagram of Test System



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 :

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

= 4.2 + 10 = 14.2 (dB)

2.5 Frequency List of Low/Middle/High Channels

Frequency List				
Band	**Channel/Frequency(MHz)**	**Lowest**	**Middle**	**Highest**
GSM850	Channel	128	189	-
	Frequency	824.2	836.4	-
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	-	-	1513
	Frequency	-	-	1752.6

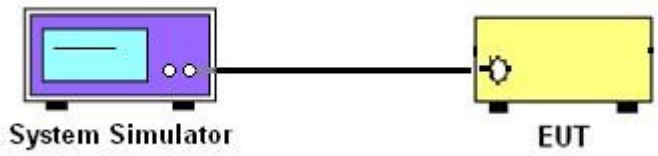
3 Conducted Test Result

3.1 Measuring Instruments

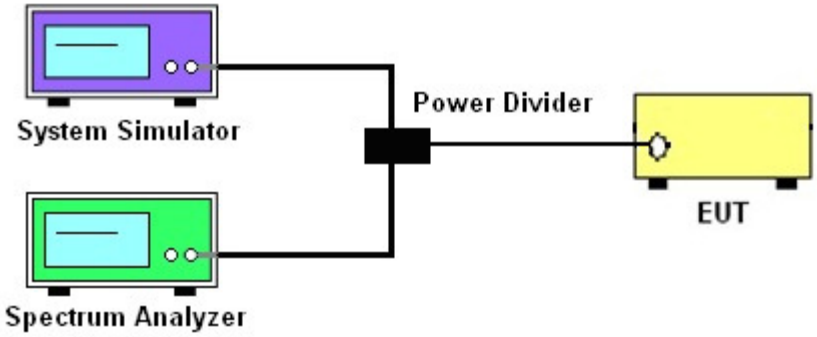
See list of measuring instruments of this test report.

3.2 Test Setup

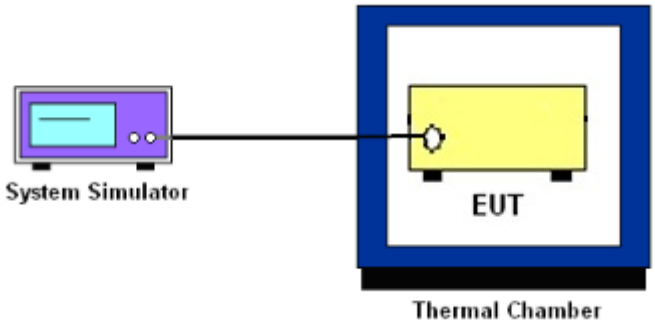
3.2.1 Conducted Output Power



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



3.2.3 Frequency Stability



3.3 Test Result of Conducted Test

Please refer to Appendix A.

3.4 Conducted Output Power

3.4.1 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.

3.4.2 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.

3.5 Peak-to-Average Ratio

3.5.1 Description of the PAR Measurement

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

3.5.2 Test Procedures

1. The testing follows FCC KDB 971168 D01 v02r02 Section 5.7.1.
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. Set EUT to transmit at maximum output power.
4. When the duty cycle is less than 98%, then signal gating will be implemented on the spectrum analyzer by triggering from the system simulator.
5. Set the CCDF (Complementary Cumulative Distribution Function) option of the spectrum analyzer.

Record the maximum PAPR level associated with a probability of 0.1%.

3.6 99% Occupied Bandwidth and 26dB Bandwidth Measurement

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

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

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

3.6.2 Test Procedures

1. The testing follows FCC KDB 971168 v02r02 Section 4.2.
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be between two and five times the anticipated OBW.
4. The nominal resolution bandwidth (RBW) shall be in the range of 1 to 5 % of the anticipated OBW, and the VBW shall be at least 3 times the RBW.
5. Set the detection mode to peak, and the trace mode to max hold.
6. Determine the reference value: Set the EUT to transmit a modulated signal. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace.
   (this is the reference value)
7. Determine the “-26 dB down amplitude” as equal to (Reference Value – X).
8. Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display such that each marker is at or slightly below the “–X dB down amplitude” determined in step 6. If a marker is below this “-X dB down amplitude” value it shall be placed as close as possible to this value. The OBW is the positive frequency difference between the two markers.
9. Use the 99 % power bandwidth function of the spectrum analyzer and report the measured bandwidth.

3.7 Conducted Band Edge

3.7.1 Description of Conducted Band Edge Measurement

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

3.7.2 Test Procedures

1. The testing follows FCC KDB 971168 D01 v02r02 Section 6.0.
2. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
3. The RF output of EUT was connected to the spectrum analyzer by an RF cable and attenuator. The path loss was compensated to the results for each measurement.
4. The band edges of low and high channels for the highest RF powers were measured.
5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
6. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts)

3.8 Conducted Spurious Emission

3.8.1 Description of Conducted Spurious Emission Measurement

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

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

3.8.2 Test Procedures

1. The testing follows FCC KDB 971168 D01 v02r02 Section 6.0.
2. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
3. The RF output of EUT was connected to the spectrum analyzer by an RF cable and attenuator. The path loss was compensated to the results for each measurement.
4. The middle channel for the highest RF power within the transmitting frequency was measured.
5. The conducted spurious emission for the whole frequency range was taken.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
7. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts)

3.9 Frequency Stability

3.9.1 Description of Frequency Stability Measurement

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

3.9.2 Test Procedures for Temperature Variation

1. The testing follows FCC KDB 971168 D01 v02r02 Section 9.0.
2. The EUT was set up in the thermal chamber and connected with the system simulator.
3. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
4. With power OFF, the temperature was raised in 10°C 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.

3.9.3 Test Procedures for Voltage Variation

1. The testing follows FCC KDB 971168 D01 v02r02 Section 9.0.
2. The EUT was placed in a temperature chamber at 20±5° C and connected with the system simulator.
3. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.
4. The variation in frequency was measured for the worst case.

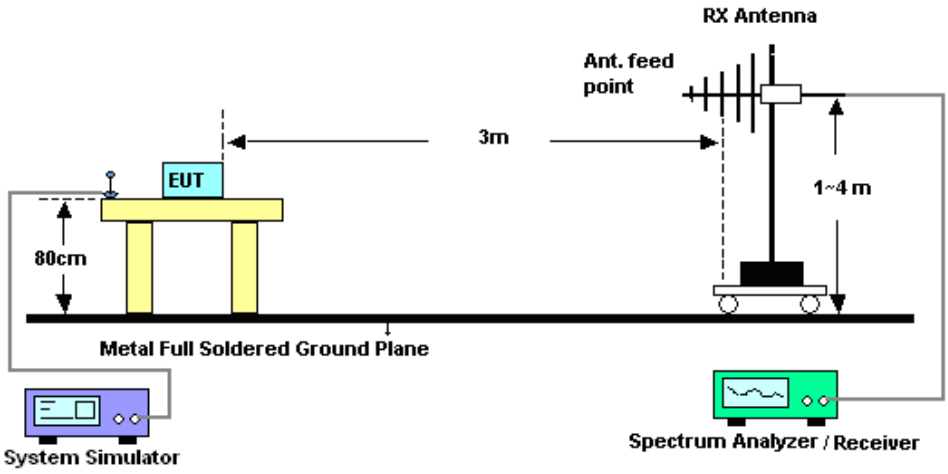
4 Radiated Test Items

4.1 Measuring Instruments

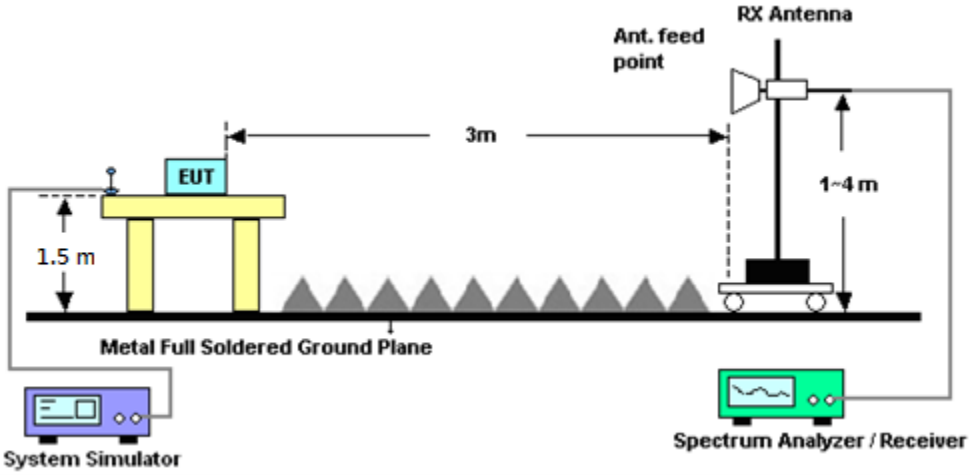
See list of measuring instruments of this test report.

4.2 Test Setup

4.2.1 For radiated test from 30MHz to 1GHz



4.2.2 For radiated test above 1GHz



4.3 Test Result of Radiated Test

Please refer to Appendix B.

4.4 Effective Radiated Power and Effective Isotropic Radiated Power Measurement

4.4.1 Description of the ERP/EIRP Measurement

The substitution method, in ANSI / TIA / EIA-603-D-2010, was used for ERP/EIRP measurement, and the spectrum analyzer configuration follows KDB 971168 D01 Power Meas. License Digital Systems v02r02. The ERP of mobile transmitters must not exceed 7 Watts (Cellular Band) and the EIRP of mobile transmitters are limited to 2 Watts (PCS Band) and 1 Watts (AWS Band).

4.4.2 Test Procedures

1. The testing follows FCC KDB 971168 D01 v02r02 Section 5.2.1. (for CDMA/WCDMA), Section 5.2.2.2 (for GSM/GPRS/EDGE) and ANSI / TIA-603-D-2010 Section 2.2.17.
2. The EUT was placed on a non-conductive rotating platform (0.8 meters for frequency below 1GHz and 1.5 meter for frequency above 1GHz) in a semi-anechoic chamber. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and a spectrum analyzer with RMS detector per section 5. of KDB 971168 D01.
3. During the measurement, the system simulator parameters were set to force the EUT transmitting at maximum output power. The maximum emission was recorded from analyzer power level (LVL) from the 360 degrees rotation of the turntable and the test antenna raised and lowered over a range from 1 to 4 meters in both horizontally and vertically polarized orientations.
4. Effective Isotropic Radiated Power (EIRP) was measured by substitution method according to TIA/EIA-603-D. The EUT was replaced by the substitution antenna at same location, and then a known power from S.G. was applied into the dipole antenna through a Tx cable, and then recorded the maximum Analyzer reading through raised and lowered the test antenna. The correction factor (in dB) = S.G. - Tx Cable loss + Substitution antenna gain - Analyzer reading. Then the EUT's EIRP was calculated with the correction factor, EIRP = LVL + Correction factor and ERP = EIRP - 2.15. Take the record of the output power at substitution antenna.

	GSM/GPRS/EDGE	WCDMA/HSPA
SPAN	500kHz	10MHz
RBW	10kHz	100kHz
VBW	30kHz	300kHz
Detector	RMS	RMS
Trace	Average	Average
Average Type	Power	Power
Sweep Count	100	100

4.5 Field Strength of Spurious Radiation Measurement

4.5.1 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.

4.5.2 Test Procedures

1. The testing follows FCC KDB 971168 D01 v02r02 Section 5.8 and ANSI / TIA-603-D-2010 Section 2.2.12.
2. The EUT was placed on a rotatable wooden table 0.8 meters for frequency below 1GHz and 1.5 meter for frequency above 1GHz above the ground.
3. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
4. The table was rotated 360 degrees to determine the position of the highest spurious emission.
5. The height of the receiving antenna is varied between one meter and four meters to search for the maximum spurious emission for both horizontal and vertical polarizations.
6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking record of maximum spurious emission.
7. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
8. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
9. Taking the record of output power at antenna port.
10. Repeat step 7 to step 8 for another polarization.
11. EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
12. ERP (dBm) = EIRP - 2.15
13. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
14. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts)

5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	Rohde & Schwarz	FSP30	101329	9kHz~30GHz	Jun. 27, 2016	Feb. 17, 2017	Jun. 26, 2017	Conducted (TH03-HY)
Temperature Chamber	ESPEC	SU-641	92013721	-30℃ ~70℃	Nov. 16, 2016	Feb. 17, 2017	Nov. 15, 2017	Conducted (TH03-HY)
Programmable Power Supply	GW Instek	PSS-2005	EL883644	Voltage:0~20V;Current:0~5A	Nov. 22, 2016	Feb. 17, 2017	Nov. 21, 2017	Conducted (TH03-HY)
Base Station (Measure)	Rohde & Schwarz	CMU200	117997	GSM / GPRS / WCDMA / CDMA	Aug. 05, 2016	Feb. 17, 2017	Aug. 04, 2017	Conducted (TH03-HY)
Bilog Antenna	TESEQ	CBL 6111D&0080	35419&03	30MHz to 1GHz	Jan. 07, 2017	Feb. 19, 2017 ~ Mar. 10, 2017	Jan. 06, 2018	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Aug. 19, 2016	Feb. 19, 2017 ~ Mar. 10, 2017	Aug. 18, 2017	Radiation (03CH07-HY)
EMI Test Receiver	Keysight	N9038A(MXE)	MY54130085	20Hz ~ 8.4GHz	Oct. 26, 2016	Feb. 19, 2017 ~ Mar. 10, 2017	Oct. 25, 2017	Radiation (03CH07-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Sep. 02, 2015	Feb. 19, 2017 ~ Mar. 10, 2017	Sep. 01, 2017	Radiation (03CH07-HY)
Preamplifier	MITEQ	AMF-7D-00101800-30-10	1590075	1GHz ~ 18GHz	Apr. 15, 2016	Feb. 19, 2017 ~ Mar. 10, 2017	Apr. 14, 2017	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10MHz-1GHz	Mar. 18, 2016	Feb. 19, 2017 ~ Mar. 10, 2017	Mar. 17, 2017	Radiation (03CH07-HY)
Spectrum Analyzer	Agilent	N9030A	MY52350276	3Hz~44GHz	Mar. 21, 2016	Feb. 19, 2017 ~ Mar. 10, 2017	Mar. 20, 2017	Radiation (03CH07-HY)
Antenna Mast	Max-Full	MFA520BS	N/A	1m~4m	N/A	Feb. 19, 2017 ~ Mar. 10, 2017	N/A	Radiation (03CH07-HY)
Turn Table	ChainTek	Chaintek 3000	N/A	0~360 Degree	N/A	Feb. 19, 2017 ~ Mar. 10, 2017	N/A	Radiation (03CH07-HY)
Preamplifier	MITEQ	JS44-18004000-33-8P	1840917	18GHz ~ 40GHz	Jun. 14, 2016	Feb. 19, 2017 ~ Mar. 10, 2017	Jun. 13, 2017	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170584	18GHz- 40GHz	Nov. 08, 2016	Feb. 19, 2017 ~ Mar. 10, 2017	Nov. 07, 2017	Radiation (03CH07-HY)
Signal Generator	Anritsu	MG3694C	163401	0.1Hz~40GHz	Jan. 04, 2017	Feb. 19, 2017 ~ Mar. 10, 2017	Jan. 03, 2018	Radiation (03CH07-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))	5.7

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.5

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.2

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	32.38	32.34	32.33	29.08	29.31	29.26
GPRS class 8	32.37	32.35	32.34	29.11	29.32	29.29
GPRS class 10	29.08	29.14	29.20	26.06	26.38	26.32
GPRS class 11	27.05	27.01	27.03	24.00	24.36	24.34
GPRS class 12	25.61	25.58	25.68	23.10	23.42	23.36
EGPRS class 8	26.29	26.23	26.29	25.28	25.61	25.59
EGPRS class 10	26.09	26.07	26.16	23.27	23.52	23.48
EGPRS class 11	24.70	24.67	24.75	21.17	21.43	21.40
EGPRS class 12	23.36	23.31	23.34	20.07	20.33	20.30

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	22.77	22.78	22.69	22.79	22.69	22.78
HSDPA Subtest-1	21.76	21.78	21.60	21.75	21.67	21.79
HSDPA Subtest-2	21.75	21.77	21.60	21.75	21.66	21.77
HSDPA Subtest-3	21.28	21.27	21.16	21.27	21.19	21.25
HSDPA Subtest-4	21.28	21.28	21.17	21.25	21.19	21.24
HSUPA Subtest-1	21.78	21.75	21.64	21.79	21.65	21.76
HSUPA Subtest-2	19.76	19.70	19.66	19.78	19.67	19.77
HSUPA Subtest-3	20.78	20.74	20.69	20.82	20.67	20.79
HSUPA Subtest-4	19.80	19.77	19.71	19.78	19.68	19.79
HSUPA Subtest-5	21.77	21.76	21.65	21.78	21.65	21.78

Conducted Power (*Unit: dBm)			
Band	WCDMA Band IV		
Channel	1312	1413	1513
Frequency	1712.4	1732.6	1752.6
RMC 12.2K	22.85	22.76	22.83
HSDPA Subtest-1	21.87	21.77	21.83
HSDPA Subtest-2	21.86	21.77	21.82
HSDPA Subtest-3	21.38	21.29	21.34
HSDPA Subtest-4	21.35	21.25	21.31
HSUPA Subtest-1	21.87	21.76	21.83
HSUPA Subtest-2	19.85	19.75	19.80
HSUPA Subtest-3	20.87	20.78	20.86
HSUPA Subtest-4	19.88	19.79	19.82
HSUPA Subtest-5	21.88	21.76	21.83

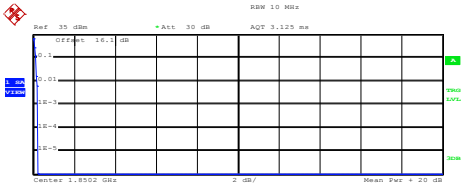
A2. GSM

Peak-to-Average Ratio

Mode	GSM1900		Limit: 13dB
Mod.	GPRS class 8	EDGE class 8	Result
Lowest CH	0.24	3.24	PASS
Middle CH	0.24	3.00	
Highest CH	0.20	3.24	

GSM1900 (GPRS class 8)

Lowest Channel



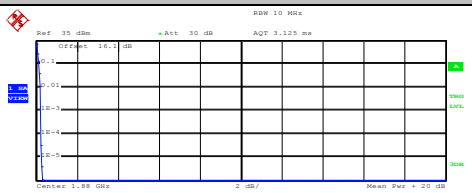
Complementary Cumulative Distribution Function (100000 samples)

Trace 1

Mean	27.97 dBm
Peak	28.20 dBm
Crest	0.23 dB
10 %	0.12 dB
1 %	0.20 dB
.1 %	0.24 dB
.01 %	0.24 dB

Date: 17.FEB.2017 10:20:42

Middle Channel



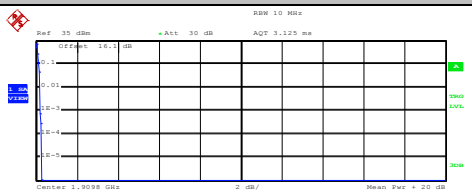
Complementary Cumulative Distribution Function (100000 samples)

Trace 1

Mean	28.05 dBm
Peak	28.34 dBm
Crest	0.29 dB
10 %	0.12 dB
1 %	0.20 dB
.1 %	0.24 dB
.01 %	0.24 dB

Date: 17.FEB.2017 10:21:03

Highest Channel



Complementary Cumulative Distribution Function (100000 samples)

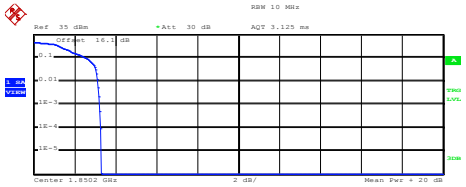
Trace 1

Mean	27.44 dBm
Peak	27.70 dBm
Crest	0.26 dB
10 %	0.12 dB
1 %	0.20 dB
.1 %	0.20 dB
.01 %	0.28 dB

Date: 17.FEB.2017 10:21:27

GSM1900 (EDGE class 8)

Lowest Channel



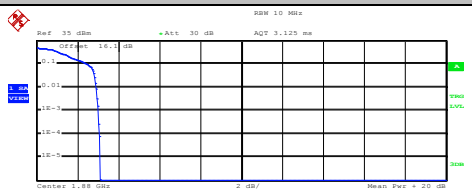
Complementary Cumulative Distribution Function (100000 samples)

Trace 1

Mean	23.72 dBm
Peak	27.00 dBm
Crest	3.28 dB
10 %	2.56 dB
1 %	3.12 dB
.1 %	3.24 dB
.01 %	3.28 dB

Date: 17.FEB.2017 10:32:11

Middle Channel



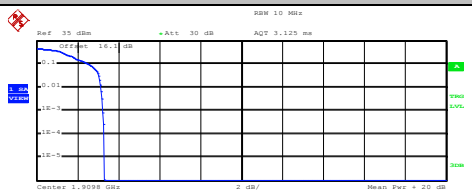
Complementary Cumulative Distribution Function (100000 samples)

Trace 1

Mean	24.05 dBm
Peak	27.14 dBm
Crest	3.09 dB
10 %	2.48 dB
1 %	2.92 dB
.1 %	3.00 dB
.01 %	3.08 dB

Date: 17.FEB.2017 10:32:34

Highest Channel



Complementary Cumulative Distribution Function (100000 samples)

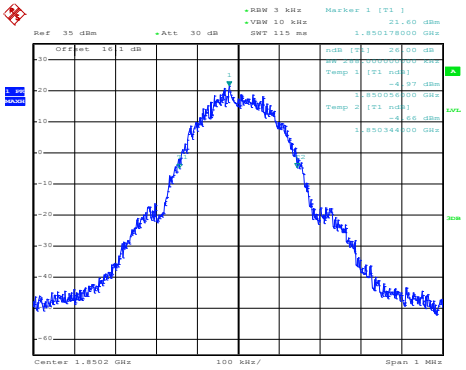
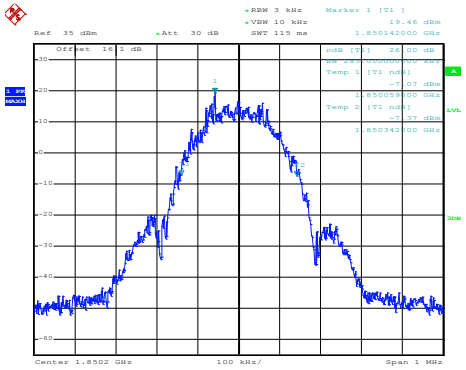
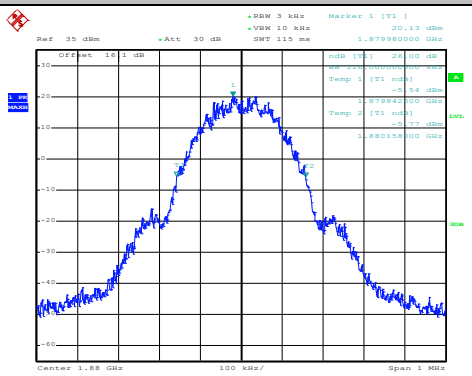
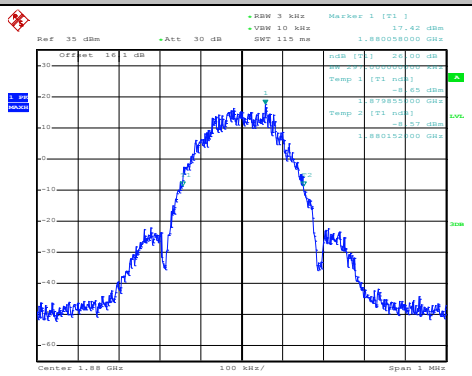
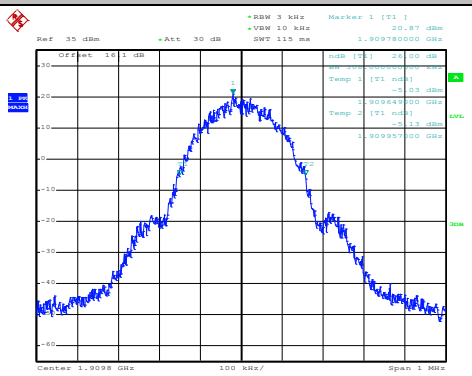
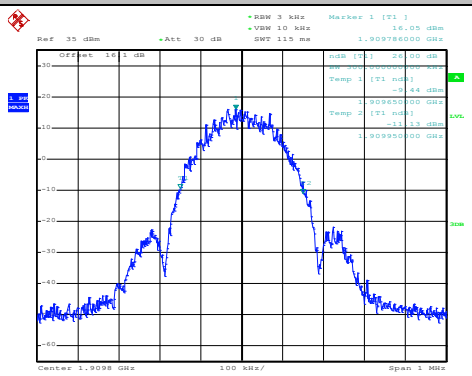
Trace 1

Mean	23.49 dBm
Peak	26.79 dBm
Crest	3.29 dB
10 %	2.56 dB
1 %	3.16 dB
.1 %	3.24 dB
.01 %	3.32 dB

Date: 17.FEB.2017 10:32:57

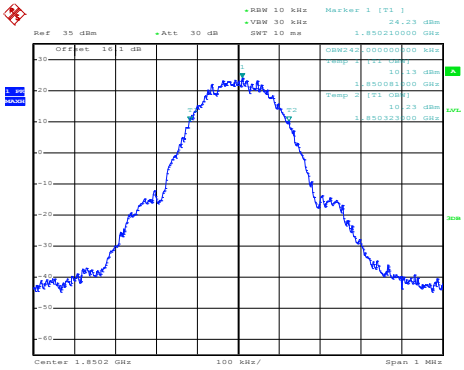
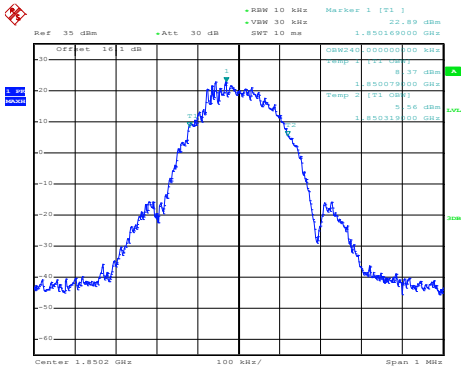
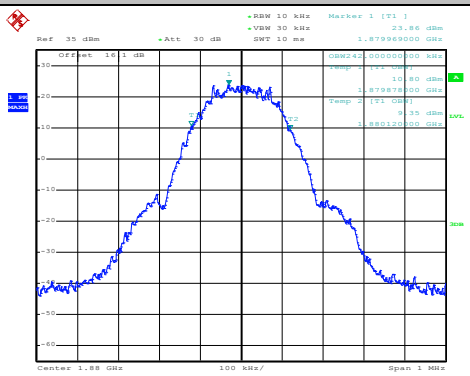
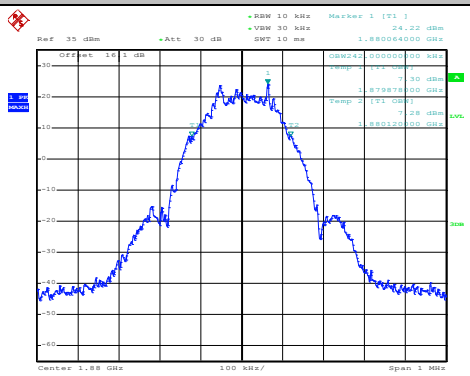
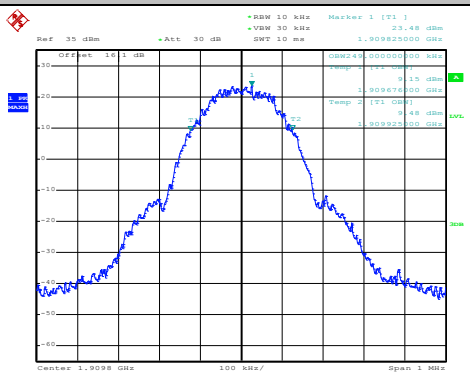
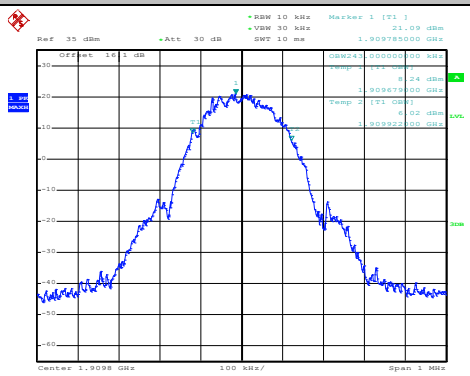
26dB Bandwidth

Mode	GSM1900	
Mod.	GPRS class 8	EDGE class 8
Lowest CH	0.288	0.283
Middle CH	0.316	0.297
Highest CH	0.308	0.300

GSM1900 (GPRS class 8)	GSM1900 (EDGE class 8)
Lowest Channel	**Lowest Channel**
 Date: 17.FEB.2017 10:11:54	 Date: 17.FEB.2017 10:22:56
Middle Channel	**Middle Channel**
 Date: 17.FEB.2017 10:12:23	 Date: 17.FEB.2017 10:23:24
Highest Channel	**Highest Channel**
 Date: 17.FEB.2017 10:12:51	 Date: 17.FEB.2017 10:23:52

Occupied Bandwidth

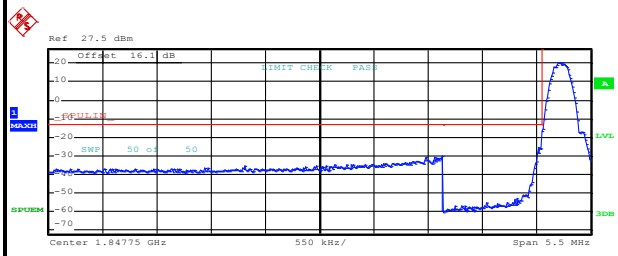
Mode	GSM1900	
Mod.	GPRS class 8	EDGE class 8
Lowest CH	0.242	0.240
Middle CH	0.242	0.242
Highest CH	0.249	0.243

GSM1900 (GPRS class 8)	GSM1900 (EDGE class 8)
Lowest Channel	**Lowest Channel**
 Date: 17.FEB.2017 11:17:25	 Date: 17.FEB.2017 10:24:37
Middle Channel	**Middle Channel**
 Date: 17.FEB.2017 11:17:53	 Date: 17.FEB.2017 10:25:06
Highest Channel	**Highest Channel**
 Date: 17.FEB.2017 11:18:21	 Date: 17.FEB.2017 10:25:34

Conducted Band Edge

GSM1900 (GPRS class 8)

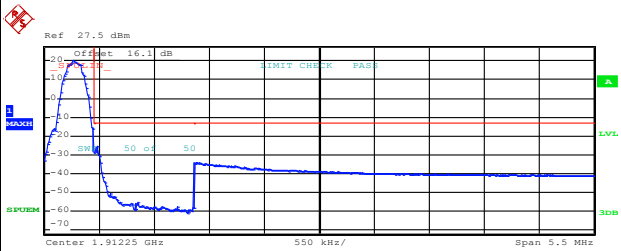
Lowest Band Edge



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
1.845 G	1.849 G	1.00 M	1.848988 G	-29.82	-16.82
1.849 G	1.850 G	3.00 k	1.849972 G	-25.65	-12.65
1.850 G	1.851 G	10.00 k	1.850178 G	20.09	-14.91

Date: 17.FEB.2017 10:14:35

Highest Band Edge

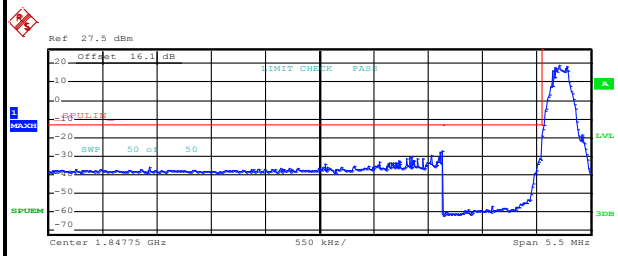


Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
1.910 G	1.910 G	10.00 k	1.909782 G	19.94	-15.06
1.910 G	1.911 G	3.00 k	1.910024 G	-25.43	-12.43
1.911 G	1.915 G	1.00 M	1.911000 G	-34.09	-21.09

Date: 17.FEB.2017 10:16:02

GSM1900 (EDGE class 8)

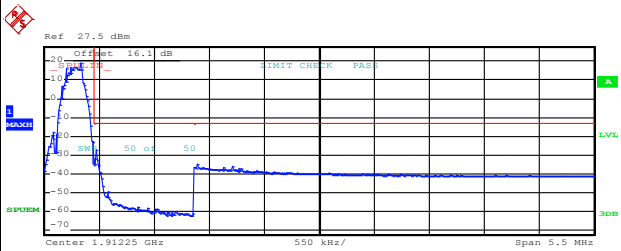
Lowest Band Edge



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
1.845 G	1.849 G	1.00 M	1.848984 G	-27.34	-14.34
1.849 G	1.850 G	3.00 k	1.849980 G	-31.21	-18.21
1.850 G	1.851 G	10.00 k	1.850182 G	18.83	-16.17

Date: 17.FEB.2017 10:27:22

Highest Band Edge



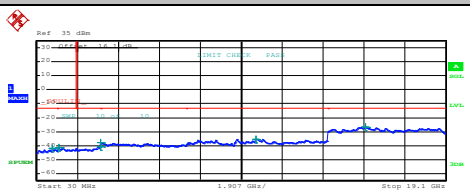
Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
1.910 G	1.910 G	10.00 k	1.909858 G	18.73	-16.27
1.910 G	1.911 G	3.00 k	1.910012 G	-27.07	-14.07
1.911 G	1.915 G	1.00 M	1.911028 G	-34.73	-21.73

Date: 17.FEB.2017 10:28:49

Conducted Spurious Emission

GSM1900 (GPRS class 8)

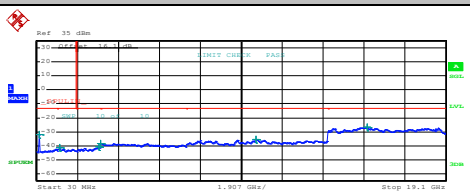
Lowest Channel



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	1.000 G	1.00 M	746.345000 M	-41.87	-28.87
1.000 G	1.845 G	1.00 M	1.068023 G	-41.42	-28.42
1.915 G	3.000 G	1.00 M	2.995118 G	-40.95	-27.95
3.000 G	7.000 G	1.00 M	3.022000 G	-38.07	-25.07
7.000 G	13.600 G	1.00 M	10.239775 G	-35.40	-22.40
13.600 G	19.100 G	1.00 M	15.357250 G	-26.68	-13.68

Date: 17.FEB.2017 10:18:31

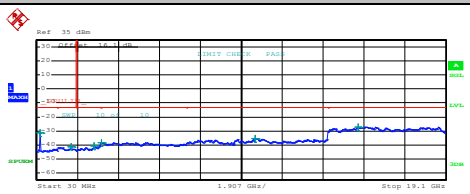
Middle Channel



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	1.000 G	1.00 M	141.792500 M	-32.14	-19.14
1.000 G	1.845 G	1.00 M	1.082388 G	-41.37	-28.37
1.915 G	3.000 G	1.00 M	2.926763 G	-40.81	-27.81
3.000 G	7.000 G	1.00 M	3.008000 G	-38.34	-25.34
7.000 G	13.600 G	1.00 M	10.233175 G	-35.68	-22.68
13.600 G	19.100 G	1.00 M	15.445937 G	-26.71	-13.71

Date: 17.FEB.2017 10:19:16

Highest Channel

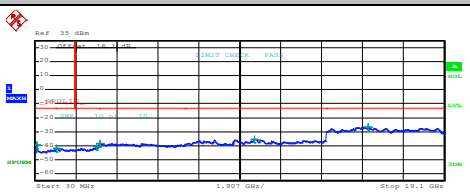


Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	1.000 G	1.00 M	171.620000 M	-31.23	-18.23
1.000 G	1.845 G	1.00 M	1.630159 G	-41.39	-28.39
1.915 G	3.000 G	1.00 M	2.717357 G	-40.63	-27.63
3.000 G	7.000 G	1.00 M	3.037000 G	-38.19	-25.19
7.000 G	13.600 G	1.00 M	10.212550 G	-35.59	-22.59
13.600 G	19.100 G	1.00 M	15.024500 G	-27.08	-14.08

Date: 17.FEB.2017 10:20:02

GSM1900 (EDGE class 8)

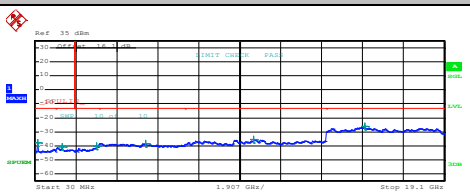
Lowest Channel



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	1.000 G	1.00 M	112.207500 M	-39.37	-26.37
1.000 G	1.845 G	1.00 M	1.006338 G	-42.07	-29.07
1.915 G	3.000 G	1.00 M	2.873055 G	-40.82	-27.82
3.000 G	7.000 G	1.00 M	3.036000 G	-38.13	-25.13
7.000 G	13.600 G	1.00 M	10.246375 G	-35.23	-22.23
13.600 G	19.100 G	1.00 M	15.539438 G	-26.76	-13.76

Date: 17.FEB.2017 10:29:47

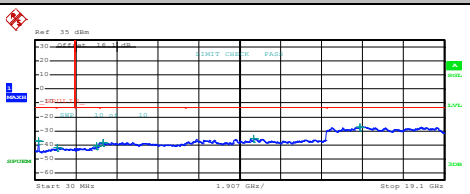
Middle Channel



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	1.000 G	1.00 M	141.792500 M	-37.76	-24.76
1.000 G	1.845 G	1.00 M	1.302299 G	-40.80	-27.80
1.915 G	3.000 G	1.00 M	2.887160 G	-39.94	-26.94
3.000 G	7.000 G	1.00 M	5.170000 G	-38.19	-25.19
7.000 G	13.600 G	1.00 M	10.208425 G	-35.76	-22.76
13.600 G	19.100 G	1.00 M	15.397125 G	-26.13	-13.13

Date: 17.FEB.2017 10:30:33

Highest Channel



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	1.000 G	1.00 M	171.377500 M	-37.38	-24.38
1.000 G	1.845 G	1.00 M	1.048165 G	-42.17	-29.17
1.915 G	3.000 G	1.00 M	2.892585 G	-40.81	-27.81
3.000 G	7.000 G	1.00 M	3.202000 G	-38.39	-25.39
7.000 G	13.600 G	1.00 M	10.218325 G	-35.63	-22.63
13.600 G	19.100 G	1.00 M	15.177813 G	-27.08	-14.08

Date: 17.FEB.2017 10:31:19

Frequency Stability

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	0.0005	0.0016	PASS
40	Normal Voltage	0.0021	0.0032	
30	Normal Voltage	0.0016	0.0043	
20(Ref.)	Normal Voltage	0.0000	0.0000	
10	Normal Voltage	0.0027	0.0016	
0	Normal Voltage	0.0005	0.0037	
-10	Normal Voltage	0.0048	0.0064	
-20	Normal Voltage	0.0005	0.0027	
-30	Normal Voltage	0.0069	0.0053	
20	Maximum Voltage	0.0027	0.0027	
20	Normal Voltage	0.0000	0.0000	
20	Battery End Point	0.0016	0.0037	

Note:

1. Normal Voltage = 3.9V. ；Battery End Point (BEP) = 3.4 V.；Maximum Voltage =4.35 V
2. The frequency fundamental emissions stay within the authorized frequency block.

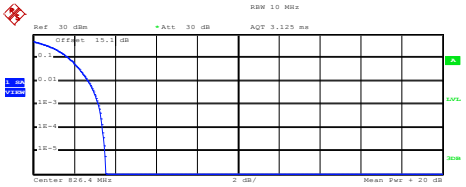
A3. WCDMA

Peak-to-Average Ratio

Mode	WCDMA Band V	WCDMA Band II	Limit: 13dB
Mod.	RMC 12.2Kbps	RMC 12.2Kbps	Result
Lowest CH	3.20	2.96	PASS
Middle CH	3.28	3.16	
Highest CH	3.08	3.08	

WCDMA Band V (RMC 12.2Kbps)

Lowest Channel

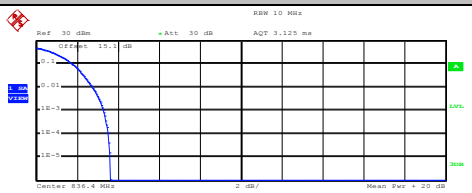


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	22.06 dBm
Peak	25.60 dBm
Crest	3.54 dB
10 %	1.72 dB
1 %	2.68 dB
.1 %	3.20 dB
.01 %	3.40 dB

Date: 17.FEB.2017 09:53:19

Middle Channel

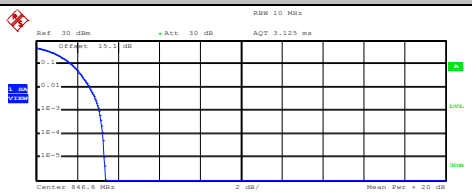


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	21.70 dBm
Peak	25.31 dBm
Crest	3.62 dB
10 %	1.76 dB
1 %	2.76 dB
.1 %	3.28 dB
.01 %	3.52 dB

Date: 17.FEB.2017 09:53:29

Highest Channel



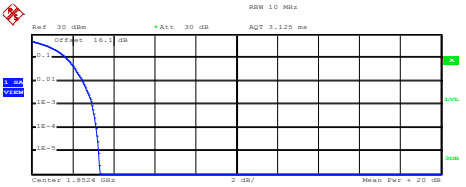
Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	21.58 dBm
Peak	24.96 dBm
Crest	3.38 dB
10 %	1.72 dB
1 %	2.60 dB
.1 %	3.08 dB
.01 %	3.24 dB

Date: 17.FEB.2017 09:53:41

WCDMA Band II (RMC 12.2Kbps)

Lowest Channel

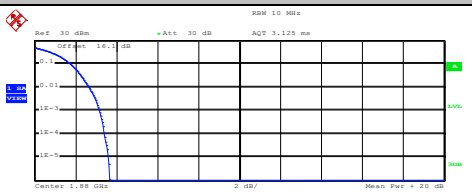


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	21.49 dBm
Peak	24.82 dBm
Crest	3.33 dB
10 %	1.68 dB
1 %	2.48 dB
.1 %	2.96 dB
.01 %	3.16 dB

Date: 17.FEB.2017 10:08:52

Middle Channel

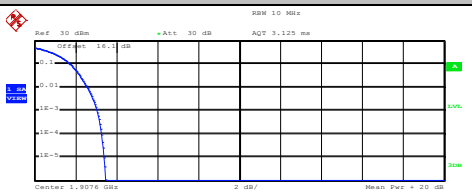


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	21.43 dBm
Peak	25.10 dBm
Crest	3.67 dB
10 %	1.76 dB
1 %	2.68 dB
.1 %	3.16 dB
.01 %	3.40 dB

Date: 17.FEB.2017 10:09:01

Highest Channel



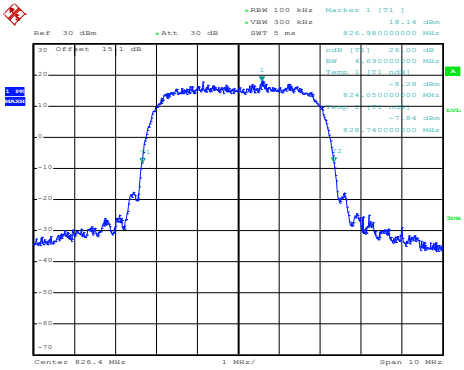
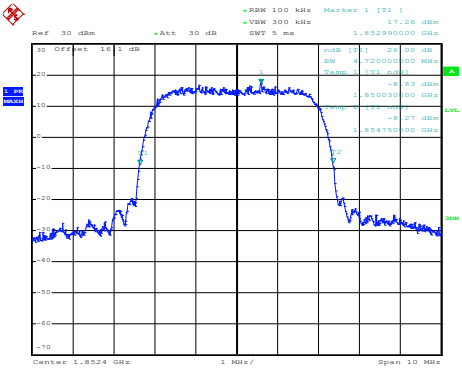
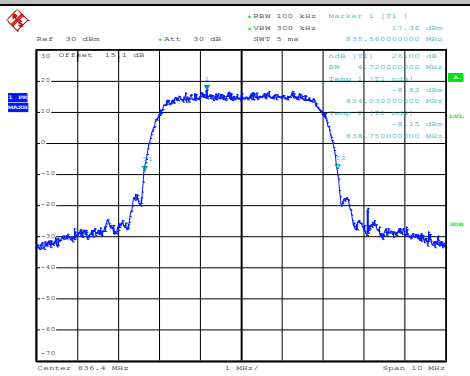
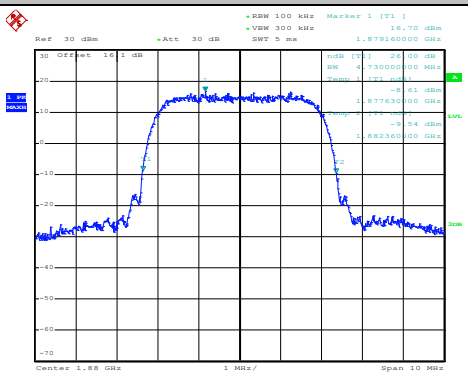
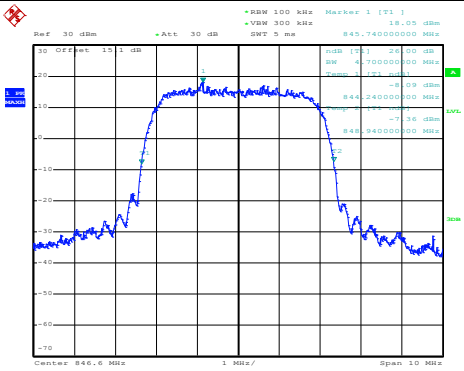
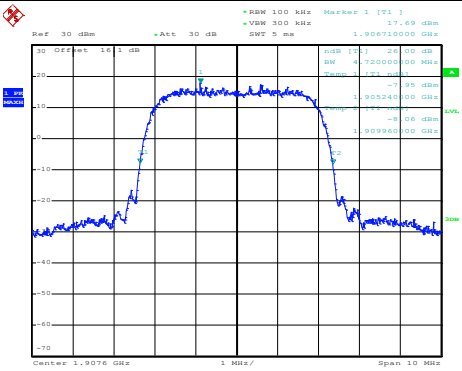
Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	21.57 dBm
Peak	25.03 dBm
Crest	3.46 dB
10 %	1.76 dB
1 %	2.56 dB
.1 %	3.08 dB
.01 %	3.28 dB

Date: 17.FEB.2017 10:09:11

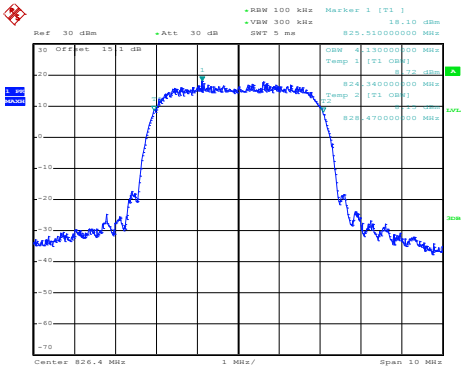
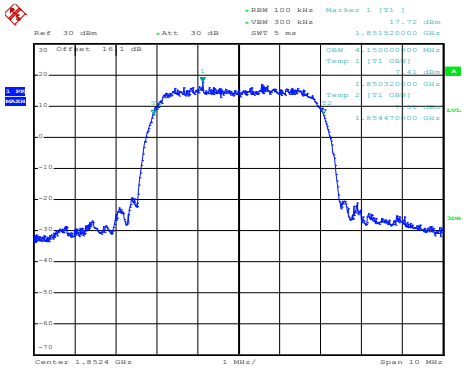
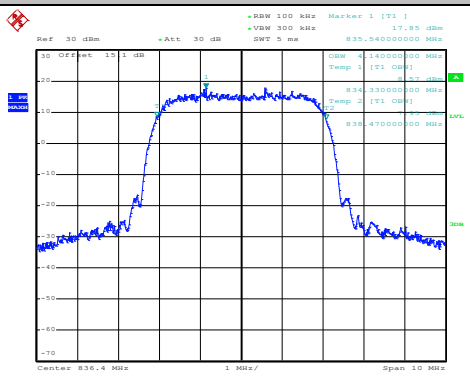
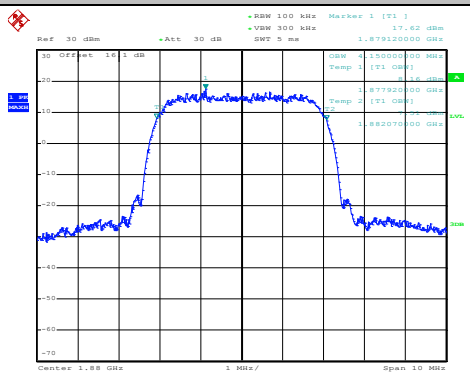
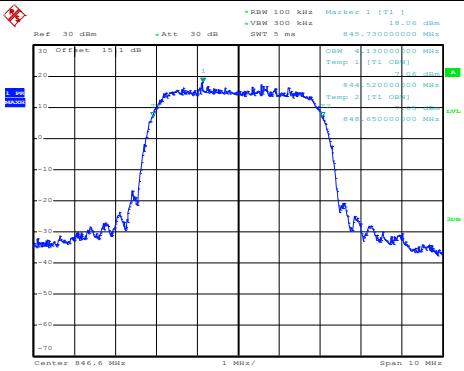
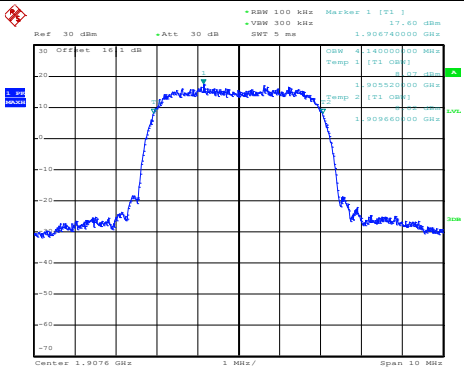
26dB Bandwidth

Mode	WCDMA Band V	WCDMA Band II
Mod.	RMC 12.2Kbps	RMC 12.2Kbps
Lowest CH	4.69	4.72
Middle CH	4.72	4.73
Highest CH	4.70	4.72

WCDMA Band V (RMC 12.2Kbps)	WCDMA Band II (RMC 12.2Kbps)
Lowest Channel	**Lowest Channel**
 Date: 17.FEB.2017 09:42:27	 Date: 17.FEB.2017 09:57:09
Middle Channel	**Middle Channel**
 Date: 17.FEB.2017 09:42:55	 Date: 17.FEB.2017 09:57:37
Highest Channel	**Highest Channel**
 Date: 17.FEB.2017 09:43:23	 Date: 17.FEB.2017 09:58:05

Occupied Bandwidth

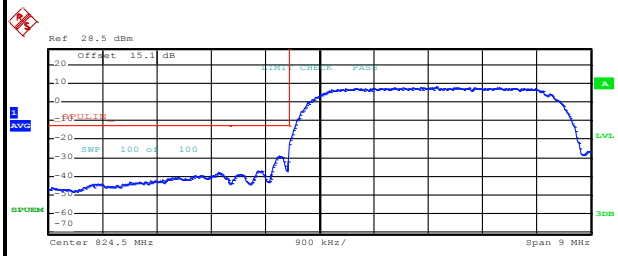
Mode	WCDMA Band V	WCDMA Band II
Mod.	RMC 12.2Kbps	RMC 12.2Kbps
Lowest CH	4.13	4.15
Middle CH	4.14	4.15
Highest CH	4.13	4.14

WCDMA Band V (RMC 12.2Kbps)	WCDMA Band II (RMC 12.2Kbps)
Lowest Channel	**Lowest Channel**
	
Date: 17.FEB.2017 09:43:59	Date: 17.FEB.2017 09:58:37
Middle Channel	**Middle Channel**
	
Date: 17.FEB.2017 09:44:27	Date: 17.FEB.2017 09:59:05
Highest Channel	**Highest Channel**
	
Date: 17.FEB.2017 09:44:55	Date: 17.FEB.2017 09:59:33

Conducted Band Edge

WCDMA Band V (RMC 12.2Kbps)

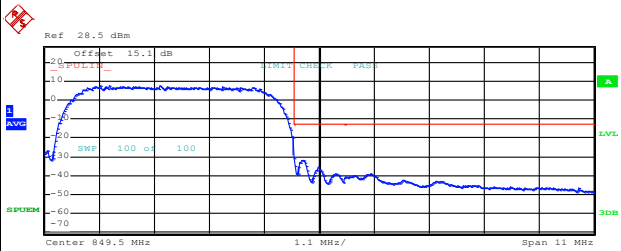
Lowest Band Edge



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
820.000 M	823.000 M	100.00 k	822.823000 M	-38.11	-25.11
823.000 M	824.000 M	50.00 k	823.836000 M	-29.22	-16.22
824.000 M	829.000 M	100.00 k	826.440000 M	8.28	-26.72

Date: 17.FEB.2017 09:47:39

Highest Band Edge

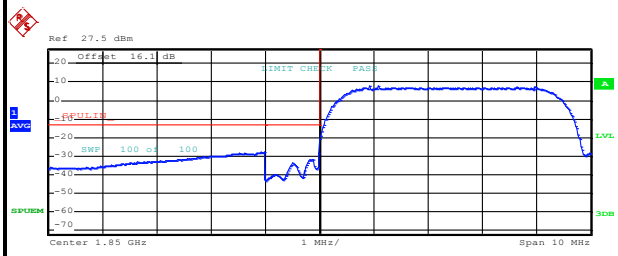


Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
844.000 M	849.000 M	100.00 k	846.295000 M	7.52	-27.48
849.000 M	850.000 M	50.00 k	849.004000 M	-31.63	-18.63
850.000 M	855.000 M	100.00 k	850.530000 M	-38.96	-25.96

Date: 17.FEB.2017 09:50:21

WCDMA Band II (RMC 12.2Kbps)

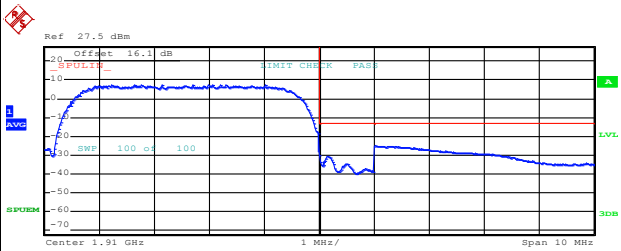
Lowest Band Edge



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
1.845 G	1.849 G	1.00 M	1.848972 G	-27.84	-14.84
1.849 G	1.850 G	50.00 k	1.849996 G	-29.79	-16.79
1.850 G	1.855 G	100.00 k	1.851085 G	7.66	-27.34

Date: 17.FEB.2017 10:02:24

Highest Band Edge



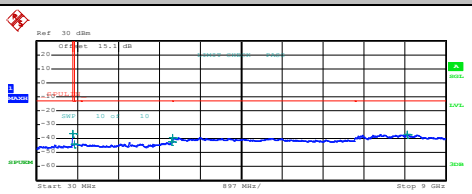
Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
1.905 G	1.910 G	100.00 k	1.906760 G	7.37	-27.63
1.910 G	1.911 G	50.00 k	1.910004 G	-29.57	-16.57
1.911 G	1.915 G	1.00 M	1.911020 G	-25.02	-12.02

Date: 17.FEB.2017 10:05:06

Conducted Spurious Emission

WCDMA Band V (RMC 12.2Kbps)

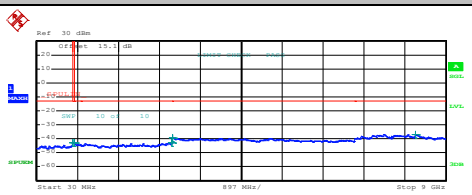
Lowest Channel



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	820.000 M	1.00 M	819.407500 M	-36.32	-23.32
855.000 M	1.000 G	1.00 M	855.870000 M	-43.80	-30.80
1.000 G	3.000 G	1.00 M	2.989500 G	-42.30	-29.30
3.000 G	7.000 G	1.00 M	3.010000 G	-39.36	-26.36
7.000 G	9.000 G	1.00 M	8.164500 G	-36.81	-23.81

Date: 17.FEB.2017 09:51:20

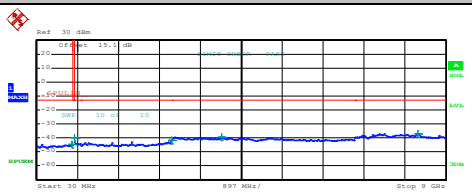
Middle Channel



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	820.000 M	1.00 M	817.630000 M	-42.53	-29.53
855.000 M	1.000 G	1.00 M	855.471250 M	-42.87	-29.87
1.000 G	3.000 G	1.00 M	2.992500 G	-42.71	-29.71
3.000 G	7.000 G	1.00 M	3.014000 G	-39.15	-26.15
7.000 G	9.000 G	1.00 M	8.329500 G	-36.99	-23.99

Date: 17.FEB.2017 09:52:05

Highest Channel

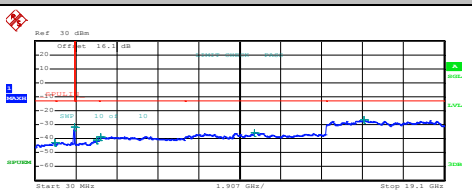


Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	820.000 M	1.00 M	802.422500 M	-44.60	-31.60
855.000 M	1.000 G	1.00 M	855.036250 M	-39.73	-26.73
1.000 G	3.000 G	1.00 M	2.999000 G	-41.75	-28.75
3.000 G	7.000 G	1.00 M	4.088000 G	-39.51	-26.51
7.000 G	9.000 G	1.00 M	8.394500 G	-36.93	-23.93

Date: 17.FEB.2017 09:52:50

WCDMA Band II (RMC 12.2Kbps)

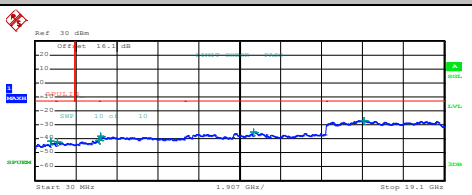
Lowest Channel



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	1.000 G	1.00 M	964.110000 M	-42.86	-29.86
1.000 G	1.845 G	1.00 M	1.843099 G	-31.83	-18.83
1.915 G	3.000 G	1.00 M	2.890144 G	-41.22	-28.22
3.000 G	7.000 G	1.00 M	3.094000 G	-38.50	-25.50
7.000 G	13.600 G	1.00 M	10.236475 G	-35.51	-22.51
13.600 G	19.100 G	1.00 M	15.368937 G	-26.67	-13.67

Date: 17.FEB.2017 10:06:21

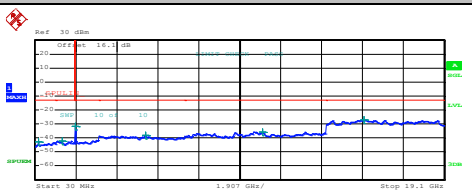
Middle Channel



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	1.000 G	1.00 M	747.072500 M	-41.49	-28.49
1.000 G	1.845 G	1.00 M	1.054080 G	-42.35	-29.35
1.915 G	3.000 G	1.00 M	2.997288 G	-41.18	-28.18
3.000 G	7.000 G	1.00 M	3.096000 G	-38.16	-25.16
7.000 G	13.600 G	1.00 M	10.215850 G	-35.35	-22.35
13.600 G	19.100 G	1.00 M	15.373750 G	-26.86	-13.86

Date: 17.FEB.2017 10:07:07

Highest Channel



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	1.000 G	1.00 M	168.710000 M	-42.58	-29.58
1.000 G	1.845 G	1.00 M	1.282441 G	-42.08	-29.08
1.915 G	3.000 G	1.00 M	1.915542 G	-31.79	-18.79
3.000 G	7.000 G	1.00 M	5.194000 G	-38.13	-25.13
7.000 G	13.600 G	1.00 M	10.628350 G	-35.81	-22.81
13.600 G	19.100 G	1.00 M	15.369625 G	-27.14	-14.14

Date: 17.FEB.2017 10:07:53

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	0.0239	PASS
40	Normal Voltage	0.0227	
30	Normal Voltage	0.0036	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0012	
0	Normal Voltage	0.0191	
-10	Normal Voltage	0.0024	
-20	Normal Voltage	0.0048	
-30	Normal Voltage	0.0036	
20	Maximum Voltage	0.0239	
20	Normal Voltage	0.0000	
20	Battery End Point	0.0012	

Test Conditions	Middle Channel	WCDMA Band II (RMC 12.2Kbps)	Limit Note 2.
Temperature (°C)	Voltage (Volt)	Deviation (ppm)	Result
50	Normal Voltage	0.0021	PASS
40	Normal Voltage	0.0011	
30	Normal Voltage	0.0027	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0133	
0	Normal Voltage	0.0117	
-10	Normal Voltage	0.0101	
-20	Normal Voltage	0.0106	
-30	Normal Voltage	0.0112	
20	Maximum Voltage	0.0117	
20	Normal Voltage	0.0000	
20	Battery End Point	0.0005	

Note:

1. Normal Voltage = 3.9V. ；Battery End Point (BEP) = 3.4 V.；Maximum Voltage =4.35 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	Horizontal		Vertical	
		ERP(dBm)	ERP(W)	ERP(dBm)	ERP(W)
Lowest	GSM850 GSM	23.44	0.2208	25.26	0.3357
Middle	GSM850 EDGE class 8	20.07	0.1016	21.50	0.1413
Lowest	WCDMA Band V AMR 12.2Kbps	18.57	0.0719	19.93	0.0984
Middle		18.49	0.0706	19.82	0.0959
Highest		18.27	0.0671	19.49	0.0889
Limit	ERP < 7W	Result		PASS	

Channel	Mode	Horizontal		Vertical	
		EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	GSM1900 GPRS class 8	30.50	1.1220	29.60	0.9120
Middle		30.86	1.2190	30.12	1.0280
Highest		30.67	1.1668	30.27	1.0641
Lowest	GSM1900 EDGE class 8	24.66	0.2924	23.63	0.2307
Middle		24.58	0.2871	24.30	0.2692
Highest		23.90	0.2455	24.07	0.2553
Lowest	WCDMA Band II AMR 12.2Kbps	23.09	0.2037	22.25	0.1679
Middle		23.50	0.2239	22.53	0.1791
Highest		23.65	0.2317	22.93	0.1963
Limit	EIRP < 2W	Result		PASS	

Channel	Mode	Horizontal		Vertical	
		EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Highest	WCDMA Band IV AMR 12.2Kbps	24.34	0.2716	23.38	0.2178
Limit	EIRP < 1W	Result		PASS	

Radiated Spurious Emission

GSM850 (GSM)									
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)
Middle	1672	-41.01	-13	-28.01	-28.99	-42.69	0.99	4.82	H
	2512	-56.65	-13	-43.65	-49.96	-58.62	1.29	5.41	H
	3345	-65.15	-13	-52.15	-60.42	-68.76	1.56	7.32	H
	1672	-39.41	-13	-26.41	-27.89	-41.09	0.99	4.82	V
	2512	-54.02	-13	-41.02	-47.83	-55.99	1.29	5.41	V
	3344	-65.15	-13	-52.15	-60.67	-68.76	1.56	7.31	V

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

GSM850 (EDGE class 8)									
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)
Middle	1672	-39.84	-13	-26.84	-27.77	-41.52	0.99	4.82	H
	2512	-53.25	-13	-40.25	-46.51	-55.22	1.29	5.41	H
	3345	-64.45	-13	-51.45	-59.66	-68.06	1.56	7.32	H
	1672	-39.43	-13	-26.43	-27.89	-41.11	0.99	4.82	V
	2512	-54.86	-13	-41.86	-48.59	-56.83	1.29	5.41	V
	3344	-63.64	-13	-50.64	-59.33	-67.25	1.56	7.31	V

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

GSM1900 (GPRS class 8)									
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	-48.82	-13	-35.82	-44.61	-55.39	1.67	8.24	H
	5550	-59.95	-13	-46.95	-62.57	-67.02	2.65	9.72	H
	7409	-63.61	-13	-50.61	-67.46	-72.77	2.46	11.62	H
	11100	-52.72	-13	-39.72	-63.84	-62.49	2.69	12.46	H
	3702	-50.15	-13	-37.15	-45.9	-56.72	1.67	8.24	V
	5550	-61.08	-13	-48.08	-63.49	-68.15	2.65	9.72	V
	7409	-63.02	-13	-50.02	-67.36	-72.18	2.46	11.62	V
	11100	-46.24	-13	-33.24	-57	-56.01	2.69	12.46	V
Middle	3762	-40.81	-13	-27.81	-36.47	-47.44	1.69	8.31	H
	5640	-56.01	-13	-43.01	-58.92	-63.06	2.71	9.76	H
	7518	-50.32	-13	-37.32	-54.36	-59.71	2.42	11.81	H
	11278	-51.66	-13	-38.66	-63.4	-61.36	2.68	12.39	H
	3762	-45.86	-13	-32.86	-41.48	-52.49	1.69	8.31	V
	5640	-57.96	-13	-44.96	-60.91	-65.01	2.71	9.76	V
	7518	-54.16	-13	-41.16	-58.52	-63.55	2.42	11.81	V
	11278	-46.51	-13	-33.51	-58.14	-56.21	2.68	12.39	V
Highest	3822	-47.34	-13	-34.34	-42.89	-54.02	1.71	8.39	H
	5730	-58.41	-13	-45.41	-61.86	-65.44	2.76	9.79	H
	7638	-61.27	-13	-48.27	-65.81	-70.77	2.38	11.88	H
	11457	-52.73	-13	-39.73	-65	-62.36	2.68	12.32	H
	3762	-47.38	-13	-34.38	-42.89	-54.01	1.69	8.31	V
	5730	-62.75	-13	-49.75	-65.93	-69.78	2.76	9.79	V
	7638	-62.51	-13	-49.51	-67.28	-72.01	2.38	11.88	V
	11278	-44.49	-13	-31.49	-56.08	-54.19	2.68	12.39	V

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

GSM1900 (EDGE class 8)									
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	-64.94	-13	-51.94	-60.68	-71.51	1.67	8.24	H
	5557	-62.71	-13	-49.71	-65.15	-69.77	2.66	9.72	H
	7409	-63.59	-13	-50.59	-67.55	-72.75	2.46	11.62	H
	3702	-62.87	-13	-49.87	-58.52	-69.44	1.67	8.24	V
	5557	-62.66	-13	-49.66	-64.93	-69.72	2.66	9.72	V
	7409	-63.05	-13	-50.05	-67.31	-72.21	2.46	11.62	V
Middle	3762	-58.06	-13	-45.06	-53.66	-64.69	1.69	8.31	H
	5640	-59.54	-13	-46.54	-62.39	-66.59	2.71	9.76	H
	7520	-63.38	-13	-50.38	-67.4	-72.77	2.42	11.81	H
	3762	-51.72	-13	-38.72	-47.32	-58.35	1.69	8.31	V
	5640	-62.67	-13	-49.67	-65.51	-69.72	2.71	9.76	V
	7520	-62.89	-13	-49.89	-67.24	-72.28	2.42	11.81	V
	11278	-47.07	-13	-34.07	-58.63	-56.77	2.68	12.39	V
Highest	3822	-58.34	-13	-45.34	-53.74	-65.02	1.71	8.39	H
	5726	-62.32	-13	-49.32	-65.66	-69.36	2.76	9.79	H
	7635	-63.02	-13	-50.02	-67.6	-72.52	2.39	11.88	H
	3822	-57.54	-13	-44.54	-53.22	-64.22	1.71	8.39	V
	5726	-62.61	-13	-49.61	-65.89	-69.65	2.76	9.79	V
	7635	-62.79	-13	-49.79	-67.66	-72.29	2.39	11.88	V
	11278	-46.72	-13	-33.72	-58.4	-56.42	2.68	12.39	V

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

WCDMA Band V(RMC 12.2Kbps)									
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Lowest	1648	-55.88	-13	-42.88	-43.47	-57.64	0.98	4.89	H
	2480	-60.82	-13	-47.82	-53.85	-62.73	1.28	5.34	H
	3305	-65.06	-13	-52.06	-60.21	-68.51	1.54	7.14	H
	1648	-54.87	-13	-41.87	-42.89	-56.63	0.98	4.89	V
	2480	-60.43	-13	-47.43	-53.89	-62.34	1.28	5.34	V
	3305	-64.96	-13	-51.96	-60.4	-68.41	1.54	7.14	V
Middle	1672	-56.58	-13	-43.58	-44.42	-58.26	0.99	4.82	H
	2504	-63.67	-13	-50.67	-56.78	-65.63	1.29	5.40	H
	3345	-64.88	-13	-51.88	-60.15	-68.49	1.56	7.32	H
	1672	-55.16	-13	-42.16	-43.5	-56.84	0.99	4.82	V
	2504	-63.27	-13	-50.27	-56.85	-65.23	1.29	5.40	V
	3345	-64.92	-13	-51.92	-60.4	-68.53	1.56	7.32	V
Highest	1696	-54.57	-13	-41.57	-42.54	-56.17	1.00	4.75	H
	2536	-60.33	-13	-47.33	-53.54	-62.31	1.30	5.43	H
	3393	-64.67	-13	-51.67	-60.13	-68.48	1.57	7.53	H
	1696	-53.48	-13	-40.48	-41.92	-55.08	1.00	4.75	V
	2536	-58.47	-13	-45.47	-52.11	-60.45	1.30	5.43	V
	3393	-64.72	-13	-51.72	-60.24	-68.53	1.57	7.53	V

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

WCDMA Band II(RMC 12.2Kbps)									
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	-64.92	-13	-51.92	-60.65	-71.49	1.67	8.24	H
	5557	-62.37	-13	-49.37	-64.96	-69.43	2.66	9.72	H
	7409	-63.39	-13	-50.39	-67.29	-72.55	2.46	11.62	H
	11121	-56.82	-13	-43.82	-67.96	-66.59	2.69	12.45	H
	3702	-64.72	-13	-51.72	-60.46	-71.29	1.67	8.24	V
	5557	-62.66	-13	-49.66	-64.99	-69.72	2.66	9.72	V
	7409	-63.36	-13	-50.36	-67.46	-72.52	2.46	11.62	V
	11121	-54.24	-13	-41.24	-65.15	-64.01	2.69	12.45	V
Middle	3762	-64.06	-13	-51.06	-59.6	-70.69	1.69	8.31	H
	5640	-62.49	-13	-49.49	-65.47	-69.54	2.71	9.76	H
	7520	-63.67	-13	-50.67	-67.65	-73.06	2.42	11.81	H
	11278	-54.63	-13	-41.63	-67.37	-64.33	2.68	12.39	H
	3762	-64.06	-13	-51.06	-59.77	-70.69	1.69	8.31	V
	5640	-62.52	-13	-49.52	-65.33	-69.57	2.71	9.76	V
	7520	-63.25	-13	-50.25	-67.66	-72.64	2.42	11.81	V
	11278	-53.96	-13	-40.96	-65.57	-63.66	2.68	12.39	V
Highest	3816	-62.91	-13	-49.91	-58.37	-69.59	1.70	8.38	H
	5726	-62.32	-13	-49.32	-65.7	-69.36	2.76	9.79	H
	7635	-62.91	-13	-49.91	-67.5	-72.41	2.39	11.88	H
	3816	-63.13	-13	-50.13	-58.64	-69.81	1.70	8.38	V
	5726	-62.32	-13	-49.32	-65.69	-69.36	2.76	9.79	V
	7635	-62.84	-13	-49.84	-67.5	-72.34	2.39	11.88	V

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

WCDMA Band IV(RMC 12.2Kbps)									
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)
Highest	3504	-62.49	-13	-49.49	-58.42	-68.89	1.61	8.00	H
	5257	-62.85	-13	-49.85	-63.88	-70.06	2.49	9.70	H
	10522	-58.73	-13	-45.73	-67.71	-68.44	2.69	12.40	H
	3504	-64.12	-13	-51.12	-60.03	-70.52	1.61	8.00	V
	5257	-63.36	-13	-50.36	-64.19	-70.57	2.49	9.70	V
	10522	-55.98	-13	-42.98	-64.82	-65.69	2.69	12.40	V

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

Appendix C. Original Report

Please refer to Sporton report number FG720310A.