FCC RF Test Report

APPLICANT	:	BlackBerry Ltd.
EQUIPMENT	:	GSM Quad-band / UMTS Penta-band / LTE Deca-band mobile phone
BRAND NAME	:	BlackBerry
MODEL NAME	:	STH100-2 (RJD211LW)
FCC ID	:	L6ARLD210LW
STANDARD	:	FCC 47 CFR Part 2, 22(H), 24(E)
CLASSIFICATION	:	PCS Licensed Transmitter Held to Ear (PCE)

The product was received on Apr. 29, 2016 and testing was completed on Jun. 02, 2016. We, SPORTON INTERNATIONAL (KUNSHAN) 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 (KUNSHAN) INC., the test report shall not be reproduced except in full.

James Huang

Prepared by: James Huang / Manager

Jones Tsai

Approved by: Jones Tsai / Manager

Testing Laboratory 2627

SPORTON INTERNATIONAL (KUNSHAN) INC.

No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P. R. China

TABLE OF CONTENTS

1 GENERAL DESCRIPTION 5

1.1 Applicant 5
1.2 Manufacturer 5
1.3 Product Feature of Equipment Under Test 5
1.4 Product Specification of Equipment Under Test 6
1.5 Modification of EUT 6
1.6 Maximum ERP/EIRP Power, Frequency Tolerance, and Emission Designator 7
1.7 Specification of Accessory 7
1.8 Testing Location 8
1.9 Applicable Standards 8

2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST 9

2.1 Test Mode 9
2.2 Connection Diagram of Test System 10
2.3 Support Unit used in test configuration 10
2.4 Measurement Results Explanation Example 10

3 CONDUCTED TEST RESULT 11

3.1 Measuring Instruments 11
3.2 Test Setup 11
3.3 Test Result of Conducted Test 11
3.4 Conducted Output Power 12
3.5 Peak-to-Average Ratio 13
3.6 99% Occupied Bandwidth and 26dB Bandwidth Measurement 14
3.7 Conducted Band Edge 15
3.8 Conducted Spurious Emission 16
3.9 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 18
4.4 Effective Radiated Power and Effective Isotropic Radiated Power Measurement 19
4.5 Field Strength of Spurious Radiation Measurement 21

5 LIST OF MEASURING EQUIPMENT 22

6 UNCERTAINTY OF EVALUATION 23

APPENDIX A. TEST RESULTS OF CONDUCTED TEST

APPENDIX B. TEST RESULTS OF RADIATED TEST

APPENDIX C. TEST SETUP PHOTOGRAPHS

REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG642912A	Rev. 01	Initial issue of report	Jun. 24, 2016

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)	Occupied Bandwidth	Reporting Only	PASS	-
3.7	§2.1051 §22.917(a) §24.238(a)	Band Edge Measurement	< 43+10log10(P[Watts])	PASS	-
3.8	§2.1051 §22.917(a) §24.238(a)	Conducted Emission	< 43+10log10(P[Watts])	PASS	-
3.9	§2.1055 §22.355	Frequency Stability for Temperature & Voltage	< 2.5 ppm for Part 22H	PASS	-
	§2.1055 §24.235		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	-
4.5	§2.1053 §22.917(a) §24.238(a)	Field Strength of Spurious Radiation	< 43+10log10(P[Watts])	PASS	Under limit 16.46 dB at 1674.000 MHz

1 General Description

1.1 Applicant

BlackBerry Ltd.
2200 University Ave E., Waterloo, ON, CAN. N2K0A7

1.2 Manufacturer

TCL Communication Ltd.
5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park, Pudong Area Shanghai, P.R. China. 201203

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	GSM Quad-band / UMTS Penta-band / LTE Deca-band mobile phone
Brand Name	BlackBerry
Model Name	STH100-2 (RJD211LW)
FCC ID	L6ARLD210LW
EUT supports Radios application	GSM/GPRS/EGPRS/WCDMA/HSPA/DC-HSDPA/ HSPA+(16QAM uplink is not supported)/LTE/NFC/ WLAN 2.4GHz 802.11b/g/n HT20/ WLAN 5GHz 802.11a/n HT20/HT40/ WLAN 5GHz 802.11ac VHT20/VHT40/VHT80/ Bluetooth v3.0+EDR/Bluetooth v4.0 LE/ Bluetooth v4.2 LE
IMEI Code	Conducted: 004402243119934 Radiation: 004402243119942 ERP/EIRP: 004402243119959
HW Version	PIO
SW Version	AAF155
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	**GSM/GPRS/EDGE:** 850: 824.2 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
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
Maximum Output Power to Antenna	**GSM/GPRS/EDGE:** 850: 33.69 dBm 1900: 29.91 dBm **WCDMA:** Band V: 22.95 dBm Band II: 22.80 dBm
Antenna Type	IFA Antenna
Type of Modulation	GSM: GMSK GPRS: GMSK EDGE: GMSK / 8PSK WCDMA : QPSK (Uplink) HSDPA/DC-HSDPA : QPSK (Uplink) HSUPA : QPSK (Uplink) HSPA+ : 16QAM uplink is not supported DC-HSDPA : 64QAM

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	System	Type of Modulation	Maximum ERP/EIRP (W)	Frequency Tolerance (ppm)	Emission Designator
Part 22	GSM850 GSM	GMSK	0.5702	0.0155 ppm	243KGXW
Part 22	GSM850 EDGE class 8	8PSK	0.1371	0.0132 ppm	253KG7W
Part 22	WCDMA Band V RMC 12.2Kbps	QPSK	0.0561	0.0120 ppm	4M11F9W
Part 24	GSM1900 GSM	GMSK	1.5524	0.0053 ppm	244KGXW
Part 24	GSM1900 EDGE class 8	8PSK	0.5284	0.0043 ppm	248KG7W
Part 24	WCDMA Band II RMC 12.2Kbps	QPSK	0.3365	0.0043 ppm	4M12F9W

1.7 Specification of Accessory

Specification of Accessory				
AC Adapter	**Brand Name**	N/A	**Model Name**	UC13US
	Power Rating	I/P: 100 - 240Vac 0.5A, O/P:5V 2.0A		
	Manufacturer	BYD		
	S/N	CBA0059AG4C1		
Battery 1	**Brand Name**	N/A	**Model Name**	TLp026EJ
	Power Rating	3.85V 2610mAh		
	Manufacturer	COSLIGHT		
	P/N	C2610010CJ		
Battery 2	**Brand Name**	N/A	**Model Name**	TLp026E2
	Power Rating	3.84V 2610mAh		
	Manufacturer	SCUD		
	P/N	C2610011C2		
USB Cable 1	**Brand Name**	NA	**Model Name**	NA
	Signal Line Type	1.0 meter, shielded cable, without ferrite core		
	P/N	CDA0000043C8		
USB Cable 2	**Brand Name**	NA	**Model Name**	NA
	Signal Line Type	1.0 meter, shielded cable, without ferrite core		
	P/N	CDA0000043C2		
Earphone	**Brand Name**	NA	**Model Name**	NA
	Signal Line Type	1.25 meter, non-shielded cable, without ferrite core		
	P/N	CCB0045A15C3		

1.8 Testing Location

Test Site	SPORTON INTERNATIONAL (KUNSHAN) INC.		
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P. R. China TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958		
Test Site No.	Sporton Site No.		FCC Registration No.
	TH01-KS	03CH02-KS	418269

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

1.9 Applicable Standards

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

- 47 CFR Part 2, 22(H), 24(E)
- 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:

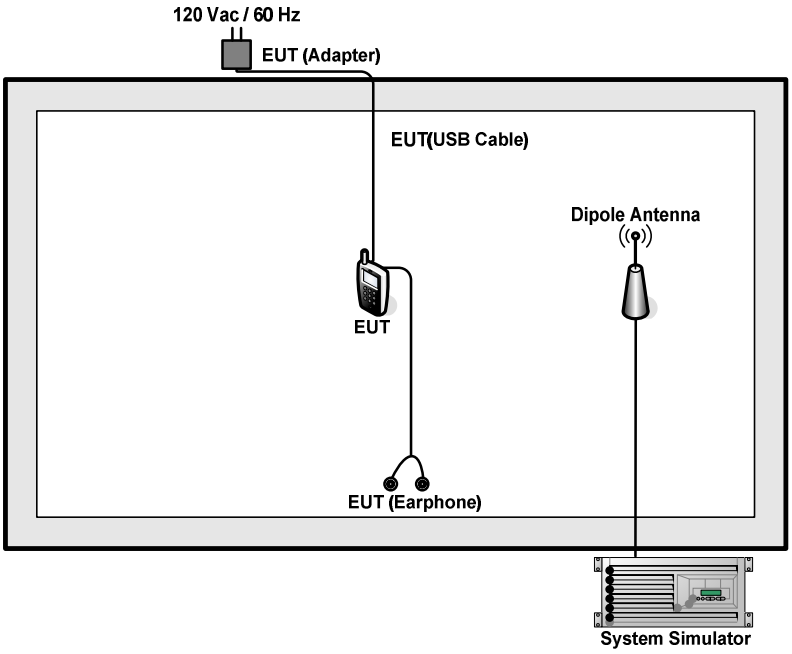
1. 30 MHz to 10th harmonic for GSM850 and WCDMA Band V.
2. 30 MHz to 10th harmonic for GSM1900 and WCDMA Band II.

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 Link ■ EDGE class 8 Link
GSM 1900	■ GSM Link ■ EDGE class 8 Link	■ GSM 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

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.	DC Power Supply	GW INSTEK	GPS-3030D	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 4.5 dB and a 10dB attenuator.

Example :

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

= 4.5 + 10 = 14.5 (dB)

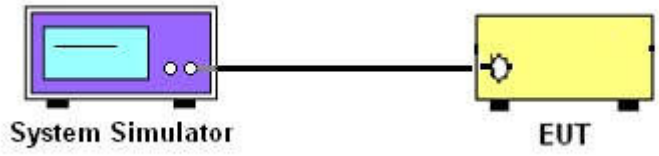
3 Conducted Test Result

3.1 Measuring Instruments

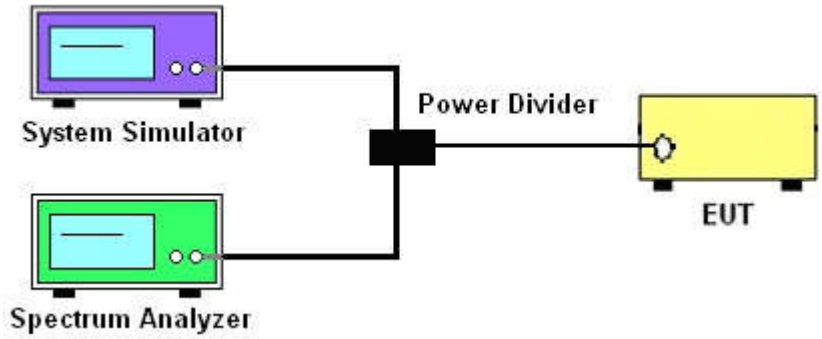
See list of measuring instruments of this test report.

3.2 Test Setup

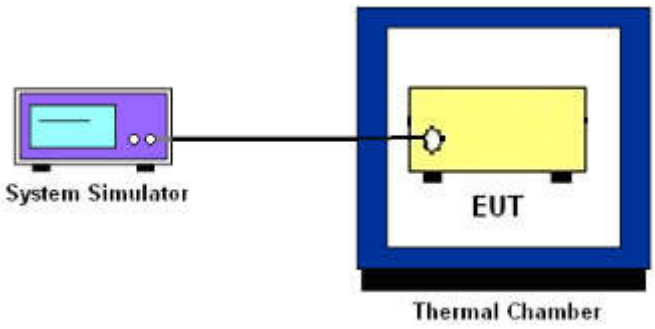
3.2.1 Conducted Output Power



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)
   = P(W) - [43 + 10log(P)] (dB)
   = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)
   = -13dBm.

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)

= P(W) - [43 + 10log(P)] (dB)

= [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)

= -13dBm.

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 25±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.

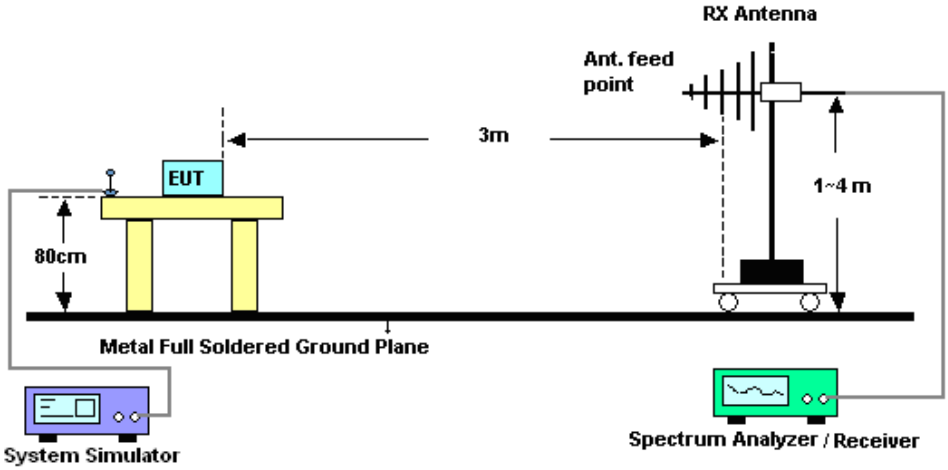
4 Radiated Test Items

4.1 Measuring Instruments

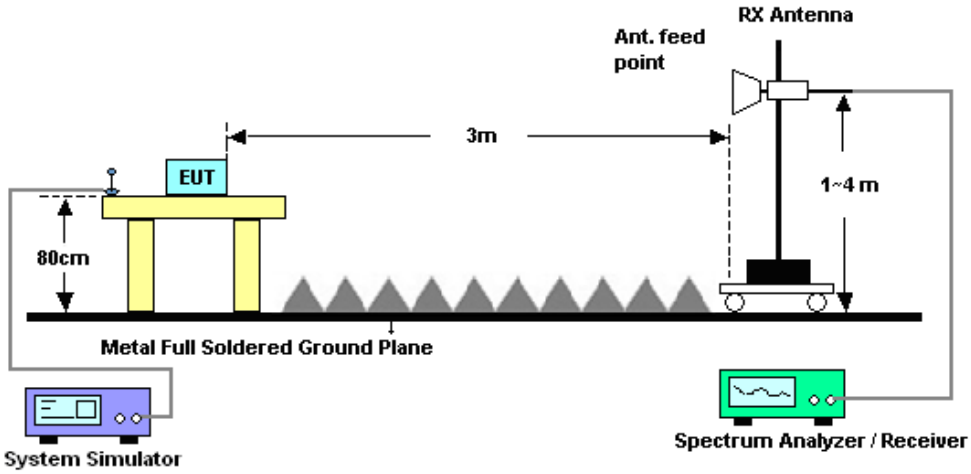
See list of measuring instruments of this test report.

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).

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 high 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 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)

    = P(W) - [43 + 10log(P)] (dB)

    = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)

    = -13dBm.

5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Sep. 10, 2015	Jun. 01, 2016~ Jun. 02, 2016	Sep. 09, 2016	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	-40~+150°C	Oct. 24, 2015	Jun. 01, 2016~ Jun. 02, 2016	Oct. 23, 2016	Conducted (TH01-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150208	10Hz~44GHz; Max 30dB	Apr. 22, 2016	May 22, 2016	Apr. 21, 2017	Radiation (03CH02-KS)
Bilog Antenna	TeseQ	CBL6112D	37879	30MHz~2GHz	Sep. 12, 2015	May 22, 2016	Sep. 11, 2016	Radiation (03CH02-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75957	1GHz~18GHz	Nov. 07, 2015	May 22, 2016	Nov. 06, 2016	Radiation (03CH02-KS)
SHF-EHF Horn	com-power	AH-840	101070	18GHz~40GHz	Oct. 10, 2015	May 22, 2016	Oct. 09, 2016	Radiation (03CH02-KS)
Amplifier	com-power	PA-103A	161069	1kHz~1000MHz / 32 dB	Apr. 22, 2016	May 22, 2016	Apr. 21, 2017	Radiation (03CH02-KS)
Amplifier	Agilent	8449B	3008A02384	1~26.5GHz Gain 30dB	Oct. 24, 2015	May 22, 2016	Oct. 23, 2016	Radiation (03CH02-KS)
AC Power Source	Chroma	61601	616010002473	N/A	NCR	May 22, 2016	NCR	Radiation (03CH02-KS)
Turn Table	MF	MF7802	N/A	0~360 degree	NCR	May 22, 2016	NCR	Radiation (03CH02-KS)
Antenna Mast	MF	MF7802	N/A	1 m~4 m	NCR	May 22, 2016	NCR	Radiation (03CH02-KS)

NCR: No Calibration Required

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))	5.1dB

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.5dB

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.1dB

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	1880.0	1909.8
GSM	33.32	33.56	33.69	29.61	29.73	29.91
GPRS class 8	33.33	33.54	33.68	29.59	29.71	29.88
GPRS class 10	31.11	31.17	31.10	27.64	27.80	28.07
GPRS class 11	29.17	29.19	29.34	26.02	26.15	26.40
GPRS class 12	27.80	28.01	28.95	24.76	24.92	25.20
EGPRS class 8	26.50	26.53	26.63	25.21	25.30	25.52
EGPRS class 10	25.43	25.48	25.56	24.05	24.14	24.41
EGPRS class 11	23.70	23.71	23.62	22.43	22.48	22.71
EGPRS class 12	22.28	22.12	22.17	20.71	20.82	21.08

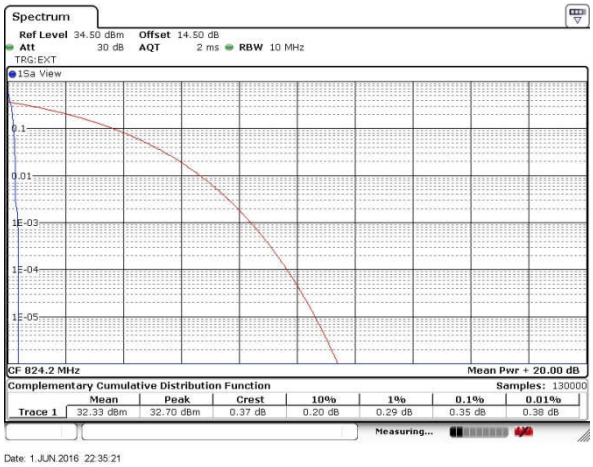
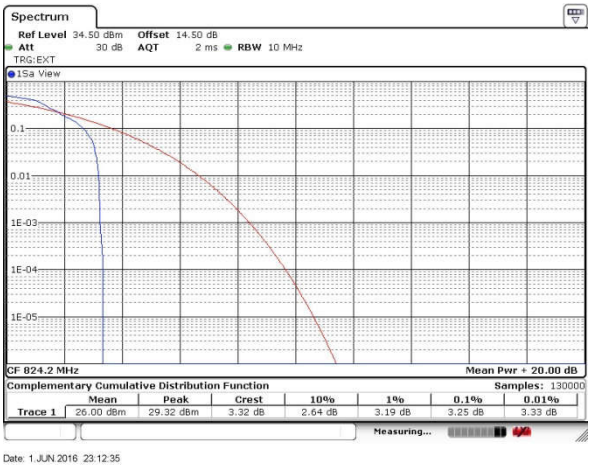
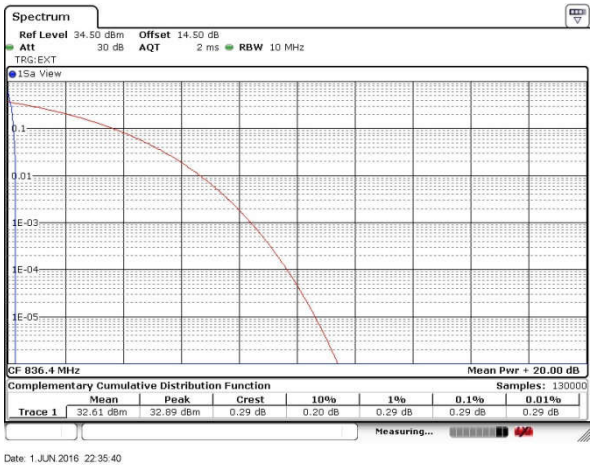
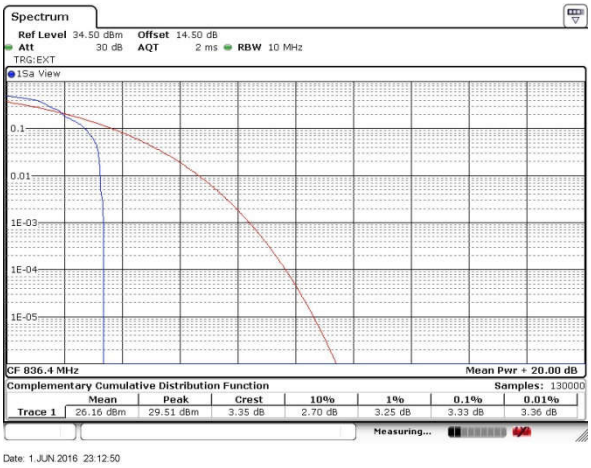
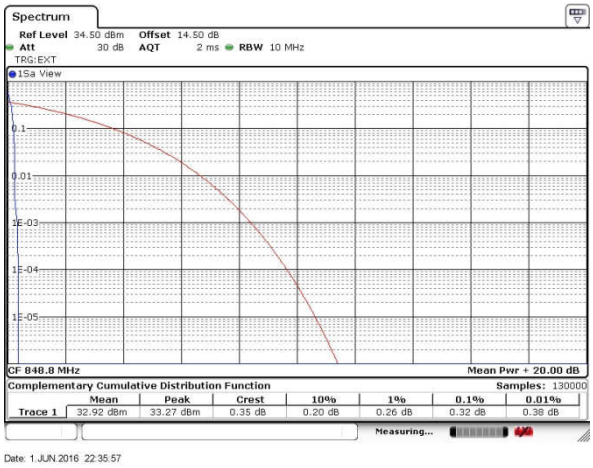
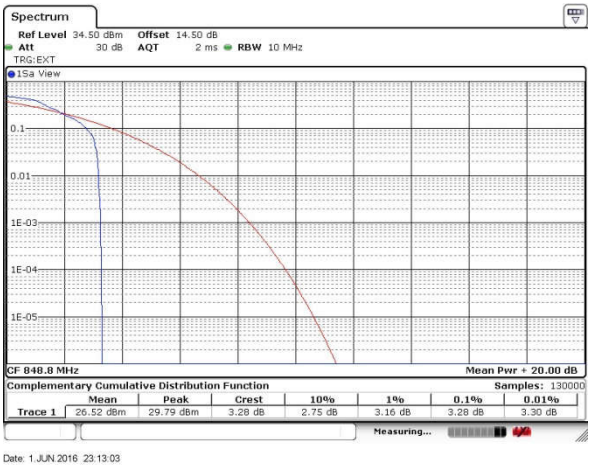
Conducted Power (*Unit: dBm)						
Band	WCDMA Band V			WCDMA Band II		
Channel	4132	4182	4233	9262	9400	9538
Frequency	826.4	836.4	846.6	1852.4	1880	1907.6
AMR 12.2Kbps	22.72	22.92	22.76	22.66	22.60	22.77
RMC 12.2Kbps	22.74	22.95	22.79	22.68	22.62	22.80
HSDPA Subtest-1	21.93	22.05	21.89	21.52	21.56	21.61
HSDPA Subtest-2	21.97	22.12	21.95	21.55	21.53	21.60
HSDPA Subtest-3	21.49	21.60	21.44	21.17	21.09	21.12
HSDPA Subtest-4	21.45	21.58	21.42	21.08	21.05	21.11
DC-HSDPA Subtest-1	21.92	22.08	21.91	21.58	21.53	21.60
DC-HSDPA Subtest-2	21.98	22.13	21.92	21.56	21.51	21.62
DC-HSDPA Subtest-3	21.48	21.62	21.43	21.12	21.03	21.19
DC-HSDPA Subtest-4	21.51	21.58	21.49	21.04	21.09	21.11
HSUPA Subtest-1	21.89	22.07	22.03	21.83	21.79	21.89
HSUPA Subtest-2	20.01	20.06	19.97	19.76	19.71	19.83
HSUPA Subtest-3	20.94	21.12	20.98	20.85	20.76	20.84
HSUPA Subtest-4	20.02	20.04	19.95	19.85	19.82	19.94
HSUPA Subtest-5	21.92	22.00	21.83	21.76	21.69	21.85

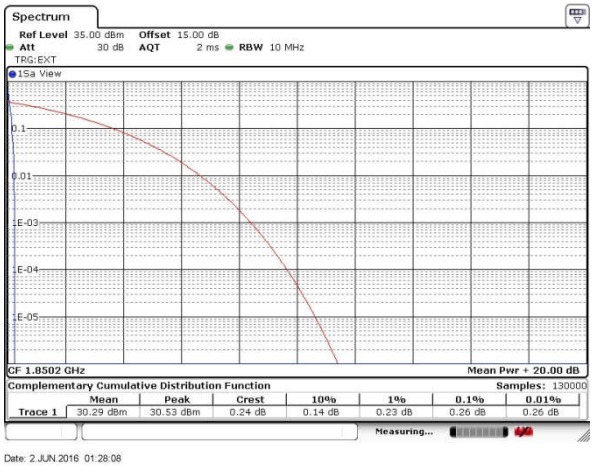
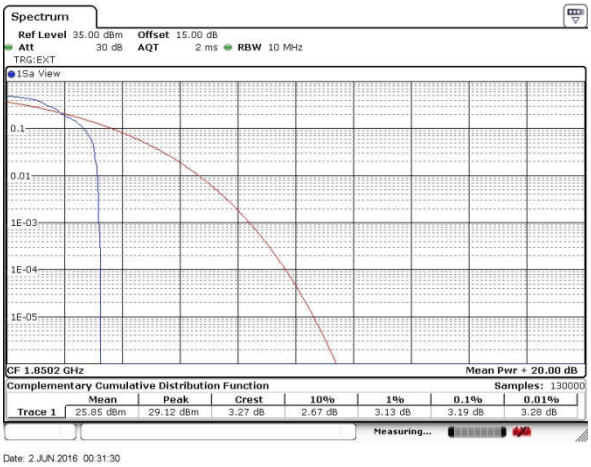
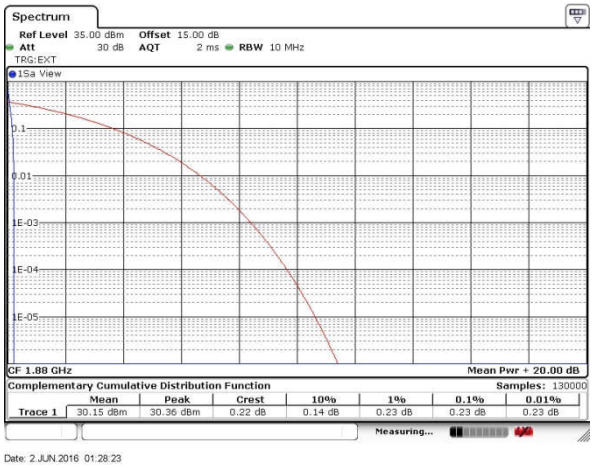
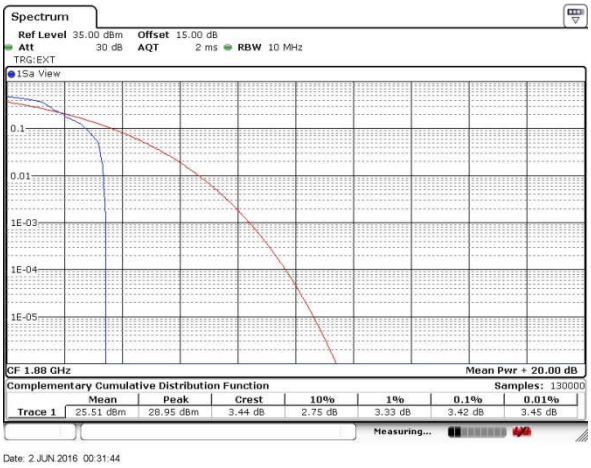
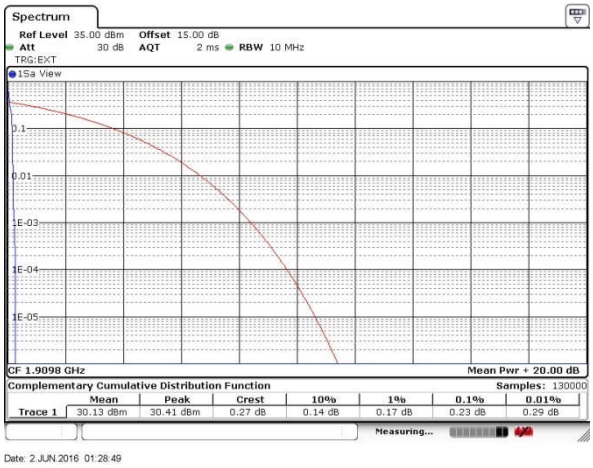
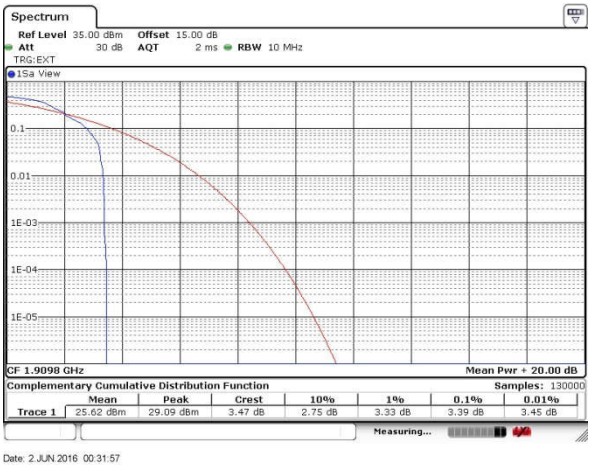
A1. GSM

Peak-to-Average Ratio

Mode	GSM850		Limit: 13dB
Mod.	GSM	EDGE class 8	Result
Lowest CH	0.35	3.25	PASS
Middle CH	0.29	3.33	
Highest CH	0.32	3.28	

Mode	GSM1900		Limit: 13dB
Mod.	GSM	EDGE class 8	Result
Lowest CH	0.26	3.19	PASS
Middle CH	0.23	3.42	
Highest CH	0.23	3.39	

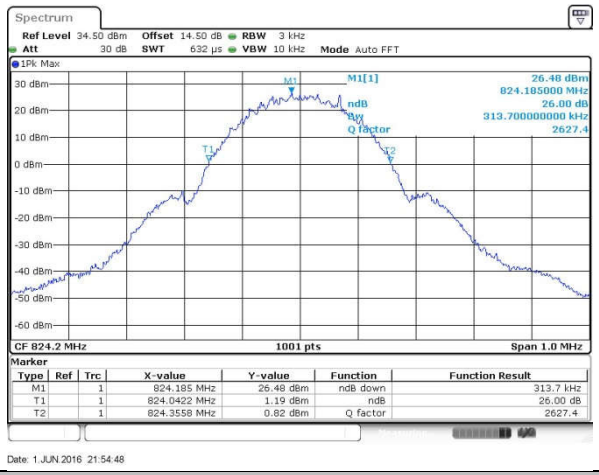
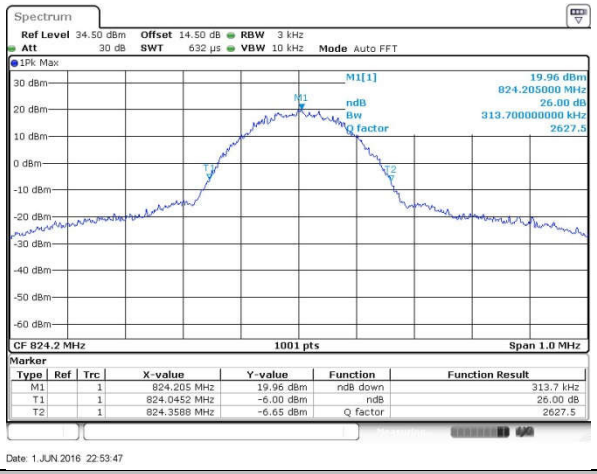
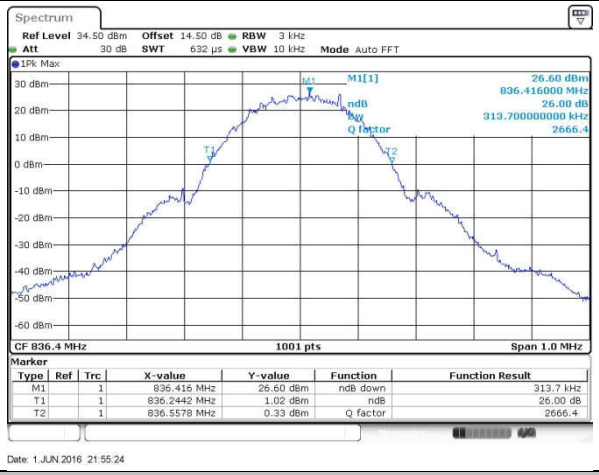
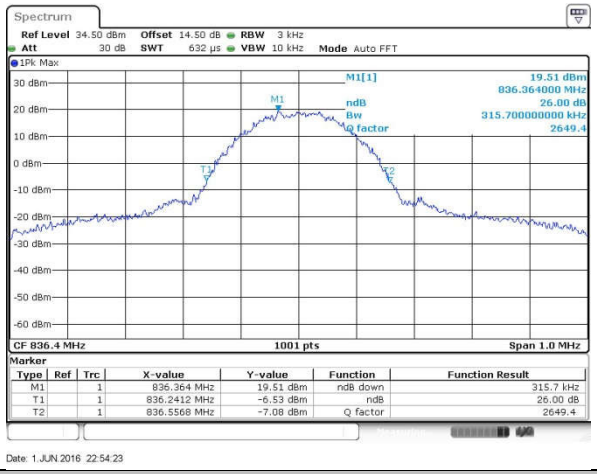
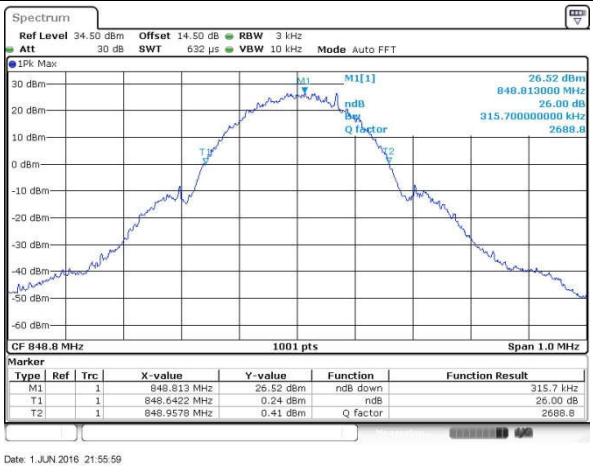
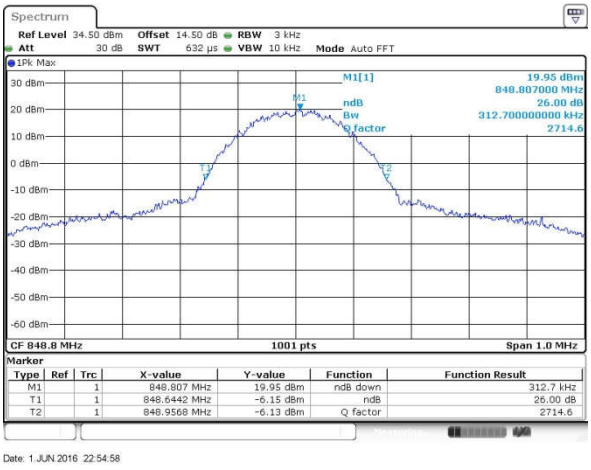
GSM850 (GSM)	GSM850 (EDGE class 8)
Lowest Channel	**Lowest Channel**
	
Middle Channel	**Middle Channel**
	
Highest Channel	**Highest Channel**
	

GSM1900 (GSM)	GSM1900 (EDGE class 8)
Lowest Channel	**Lowest Channel**
	
Middle Channel	**Middle Channel**
	
Highest Channel	**Highest Channel**
	

26dB Bandwidth

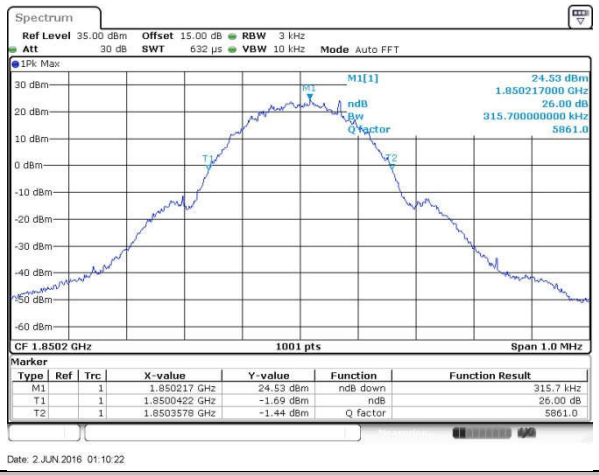
Mode	GSM850 (MHz)	
Mod.	GSM	EDGE class 8
Lowest CH	0.314	0.314
Middle CH	0.314	0.316
Highest CH	0.316	0.313

Mode	GSM1900 (MHz)	
Mod.	GSM	EDGE class 8
Lowest CH	0.316	0.314
Middle CH	0.312	0.314
Highest CH	0.315	0.311

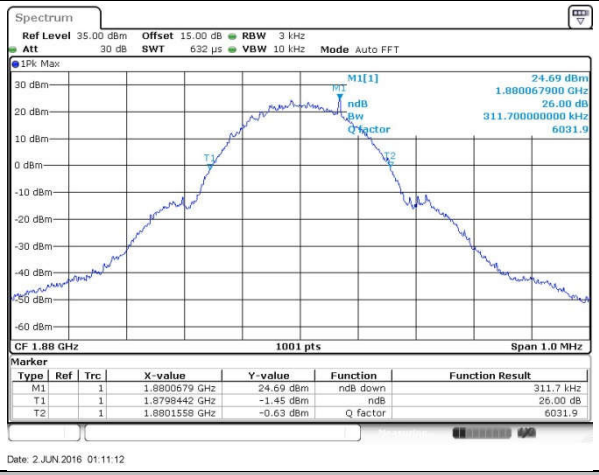
GSM850 (GSM)	GSM850 (EDGE class 8)
Lowest Channel	**Lowest Channel**
	
Middle Channel	**Middle Channel**
	
Highest Channel	**Highest Channel**
	

GSM1900 (GSM)

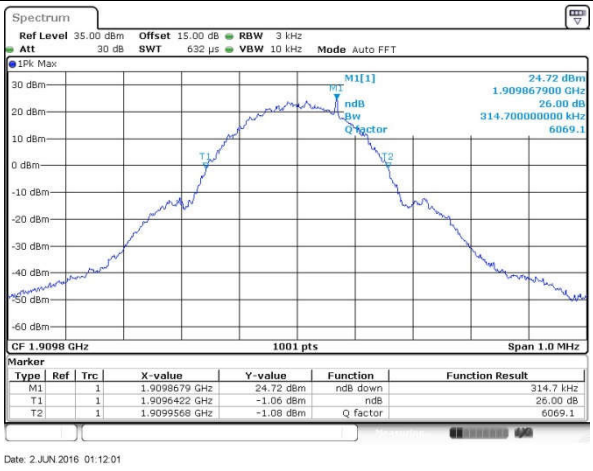
Lowest Channel



Middle Channel

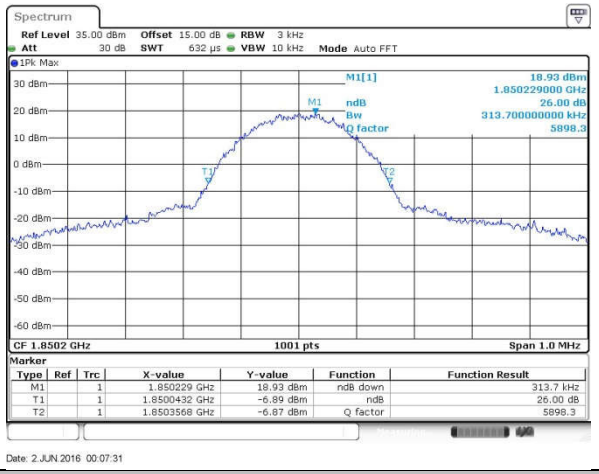


Highest Channel

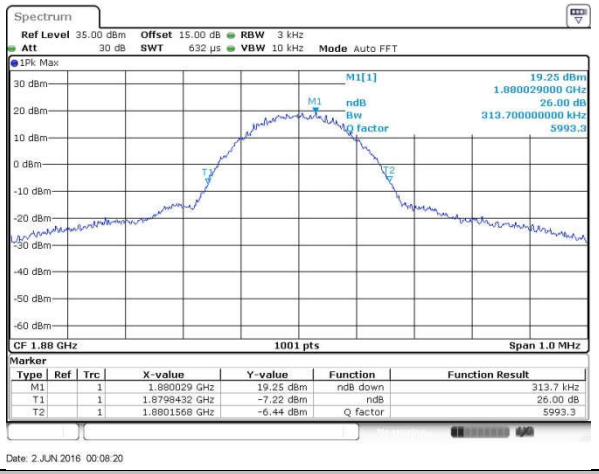


GSM1900 (EDGE class 8)

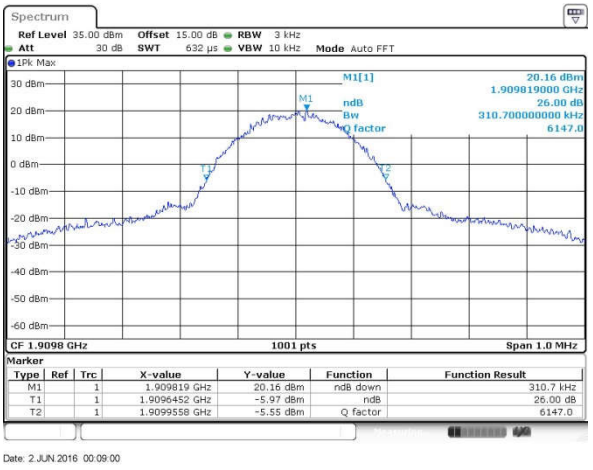
Lowest Channel



Middle Channel



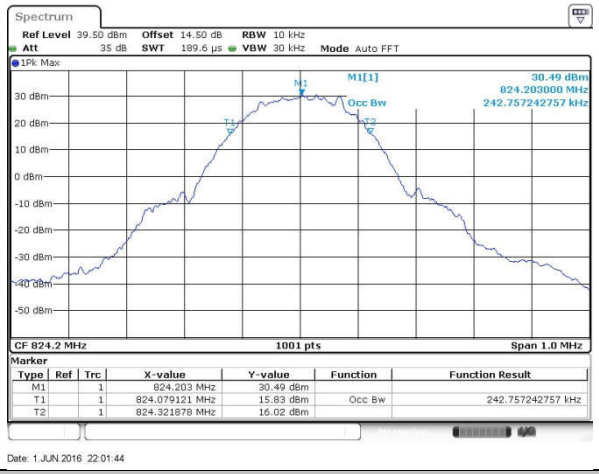
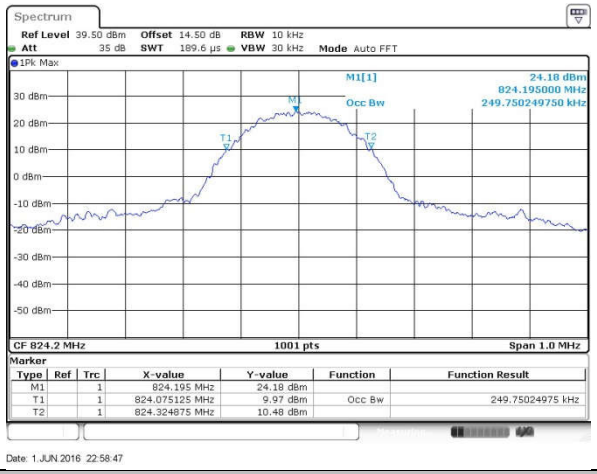
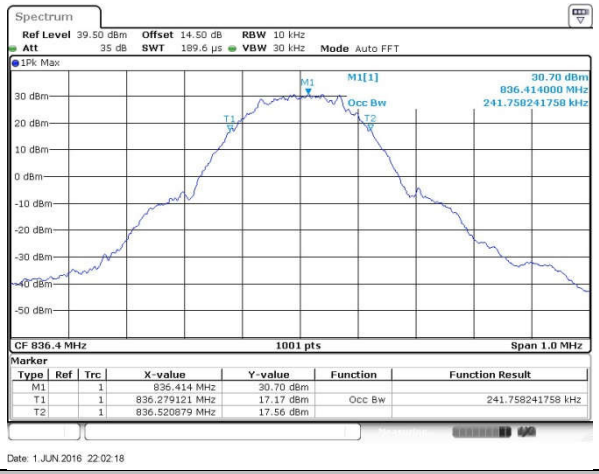
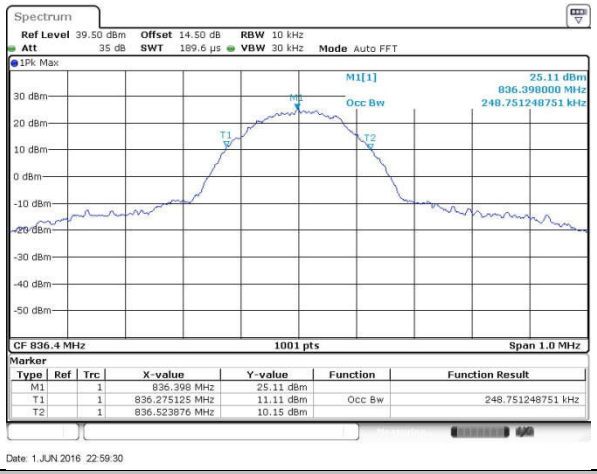
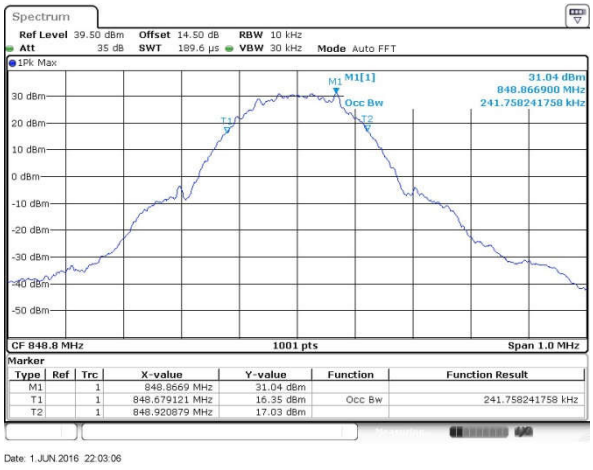
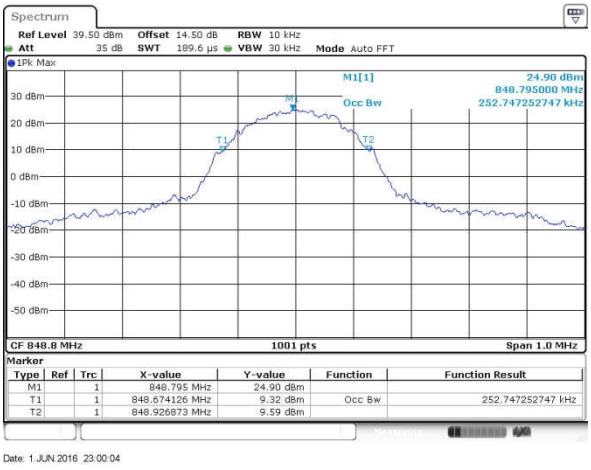
Highest Channel



Occupied Bandwidth

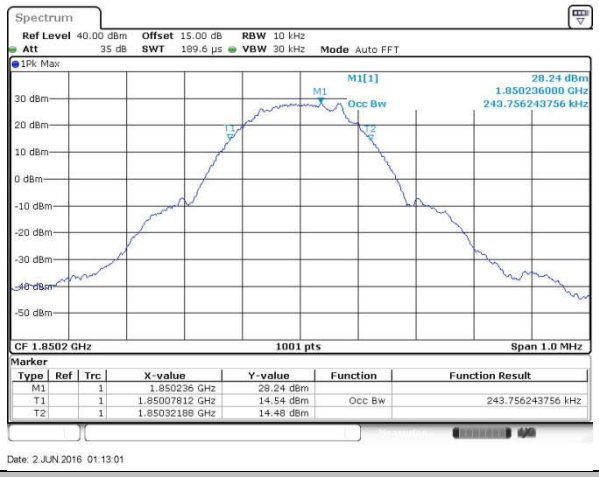
Mode	GSM850 (MHz)	
Mod.	GSM	EDGE class 8
Lowest CH	0.243	0.250
Middle CH	0.242	0.249
Highest CH	0.242	0.253

Mode	GSM1900 (MHz)	
Mod.	GSM	EDGE class 8
Lowest CH	0.244	0.247
Middle CH	0.243	0.248
Highest CH	0.243	0.247

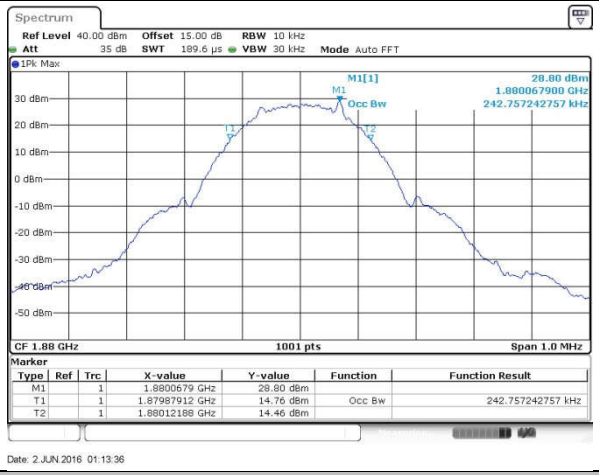
GSM850 (GSM)	GSM850 (EDGE class 8)
Lowest Channel	**Lowest Channel**
	
Middle Channel	**Middle Channel**
	
Highest Channel	**Highest Channel**
	

GSM1900 (GSM)

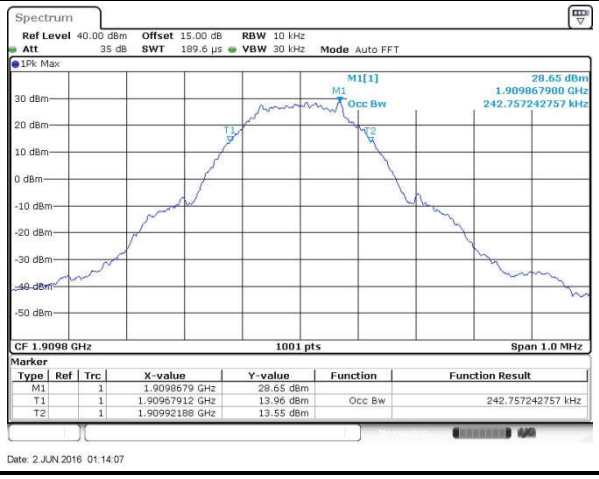
Lowest Channel



Middle Channel

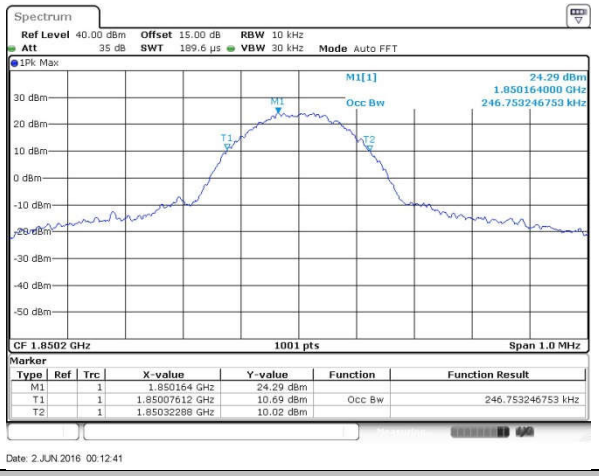


Highest Channel

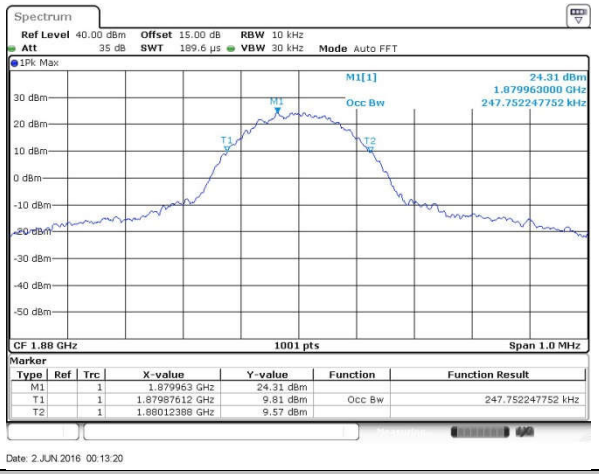


GSM1900 (EDGE class 8)

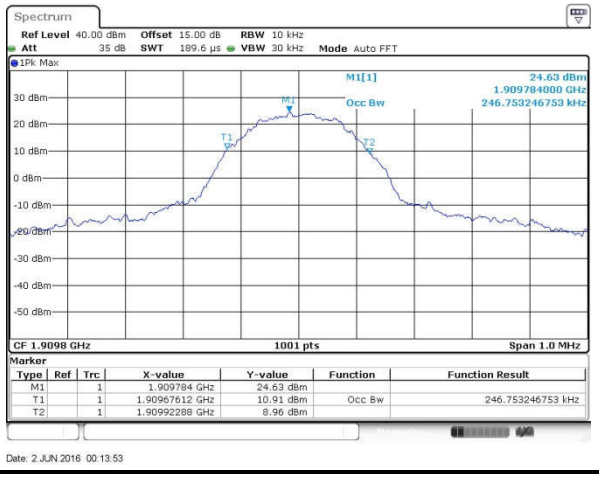
Lowest Channel



Middle Channel



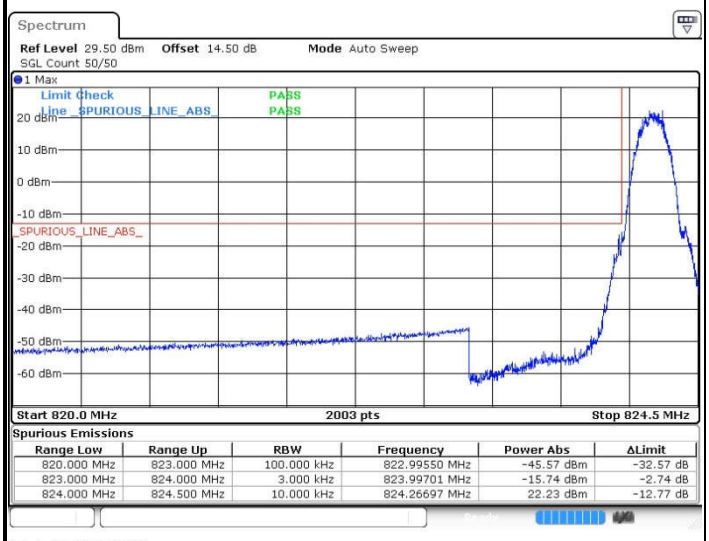
Highest Channel



Conducted Band Edge

GSM850 (GSM)

Lowest Band Edge

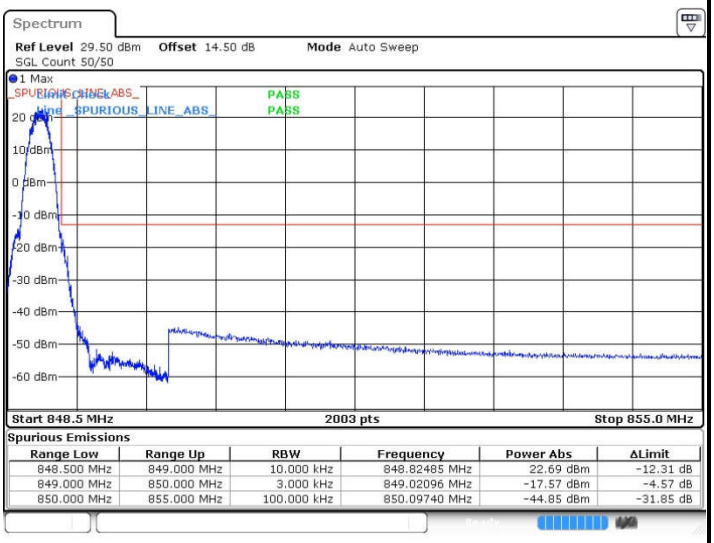


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
820.000 MHz	823.000 MHz	100.000 kHz	822.99550 MHz	-45.57 dBm	-32.57 dB
823.000 MHz	824.000 MHz	3.000 kHz	823.99701 MHz	-15.74 dBm	-2.74 dB
824.000 MHz	824.500 MHz	10.000 kHz	824.26697 MHz	22.23 dBm	-12.77 dB

Date: 1.JUN.2016 22:13:51

Highest Band Edge



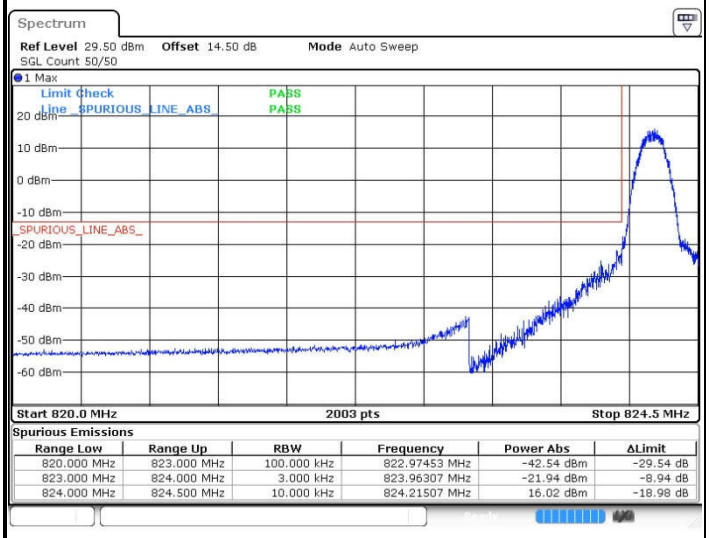
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
848.500 MHz	849.000 MHz	10.000 kHz	848.82485 MHz	22.69 dBm	-12.31 dB
849.000 MHz	850.000 MHz	3.000 kHz	849.02096 MHz	-17.57 dBm	-4.57 dB
850.000 MHz	855.000 MHz	100.000 kHz	850.09740 MHz	-44.85 dBm	-31.85 dB

Date: 1.JUN.2016 22:15:36

GSM850 (EDGE class 8)

Lowest Band Edge

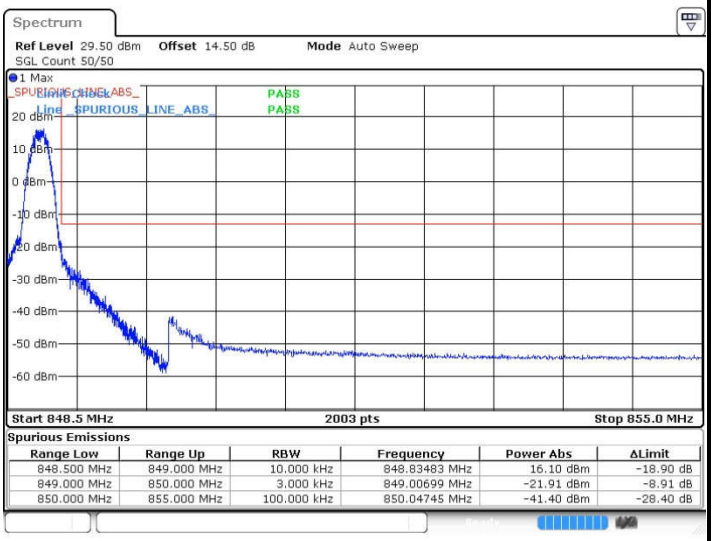


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
820.000 MHz	823.000 MHz	100.000 kHz	822.97453 MHz	-42.54 dBm	-29.54 dB
823.000 MHz	824.000 MHz	3.000 kHz	823.96307 MHz	-21.94 dBm	-8.94 dB
824.000 MHz	824.500 MHz	10.000 kHz	824.21507 MHz	16.02 dBm	-18.98 dB

Date: 1.JUN.2016 23:02:01

Highest Band Edge



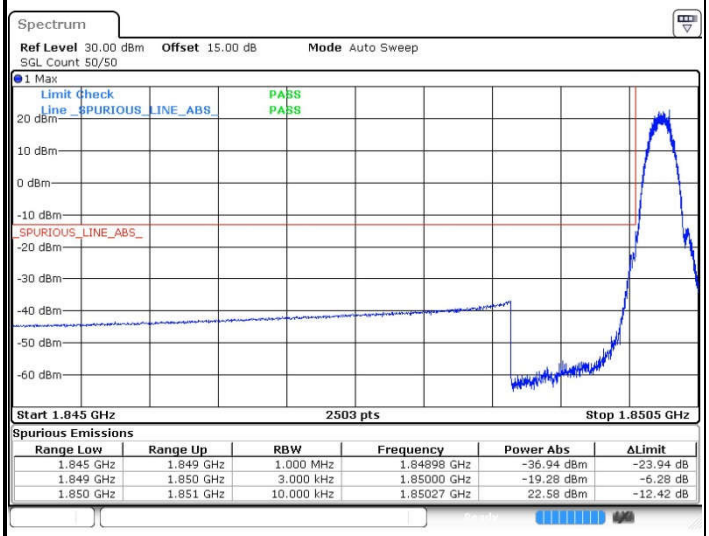
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
848.500 MHz	849.000 MHz	10.000 kHz	848.83483 MHz	16.10 dBm	-18.90 dB
849.000 MHz	850.000 MHz	3.000 kHz	849.00699 MHz	-21.91 dBm	-8.91 dB
850.000 MHz	855.000 MHz	100.000 kHz	850.04745 MHz	-41.40 dBm	-28.40 dB

Date: 1.JUN.2016 23:03:37

GSM1900 (GSM)

Lowest Band Edge

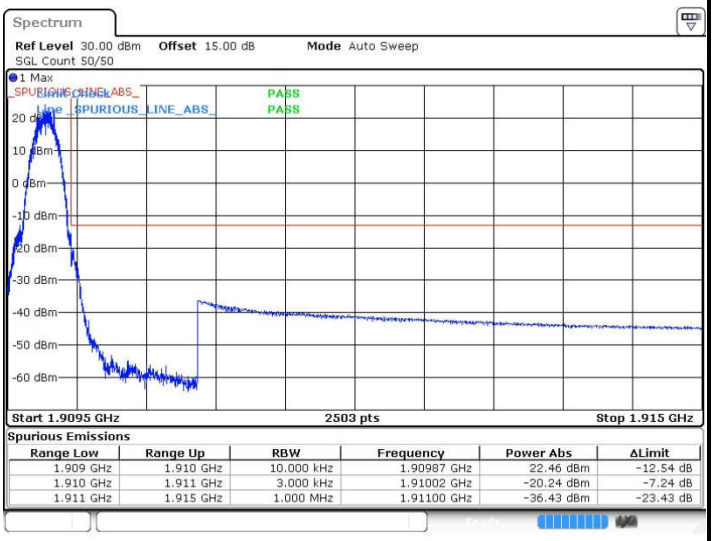


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.845 GHz	1.849 GHz	1.000 MHz	1.84898 GHz	-36.94 dBm	-23.94 dB
1.849 GHz	1.850 GHz	3.000 kHz	1.85000 GHz	-19.28 dBm	-6.28 dB
1.850 GHz	1.851 GHz	10.000 kHz	1.85027 GHz	22.58 dBm	-12.42 dB

Date: 2.JUN.2016 01:19:46

Highest Band Edge



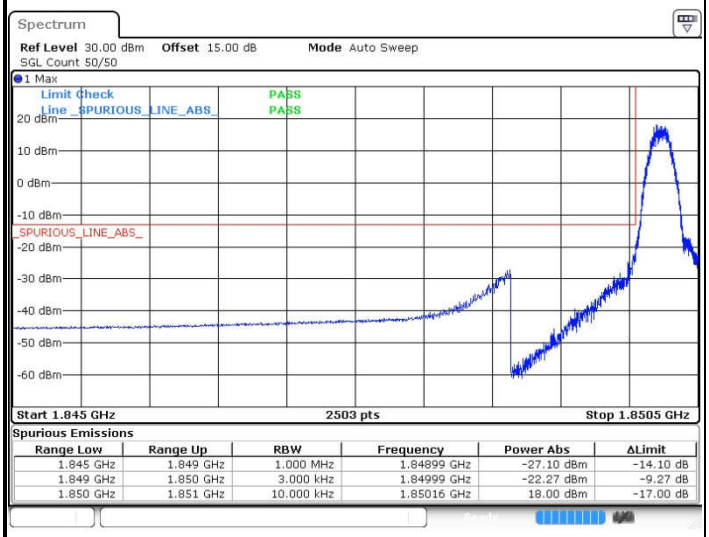
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.909 GHz	1.910 GHz	10.000 kHz	1.90987 GHz	22.46 dBm	-12.54 dB
1.910 GHz	1.911 GHz	3.000 kHz	1.91002 GHz	-20.24 dBm	-7.24 dB
1.911 GHz	1.915 GHz	1.000 MHz	1.91100 GHz	-36.43 dBm	-23.43 dB

Date: 2.JUN.2016 01:21:38

GSM1900 (EDGE class 8)

Lowest Band Edge

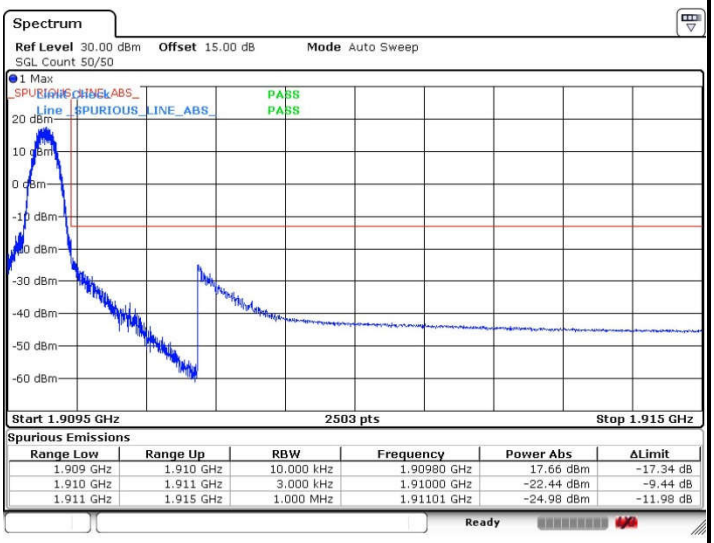


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.845 GHz	1.849 GHz	1.000 MHz	1.84899 GHz	-27.10 dBm	-14.10 dB
1.849 GHz	1.850 GHz	3.000 kHz	1.84999 GHz	-22.27 dBm	-9.27 dB
1.850 GHz	1.851 GHz	10.000 kHz	1.85016 GHz	18.00 dBm	-17.00 dB

Date: 2.JUN.2016 00:15:51

Highest Band Edge



Spurious Emissions

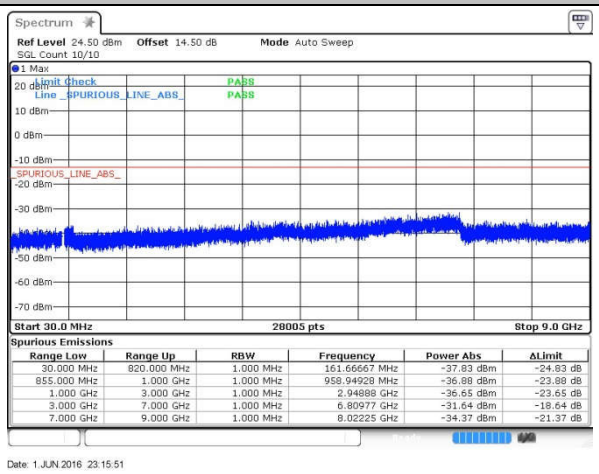
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.909 GHz	1.910 GHz	10.000 kHz	1.90980 GHz	17.66 dBm	-17.34 dB
1.910 GHz	1.911 GHz	3.000 kHz	1.91000 GHz	-22.44 dBm	-9.44 dB
1.911 GHz	1.915 GHz	1.000 MHz	1.91101 GHz	-24.98 dBm	-11.98 dB

Date: 2.JUN.2016 00:19:13

Conducted Spurious Emission

GSM850 (GSM)

Lowest Channel

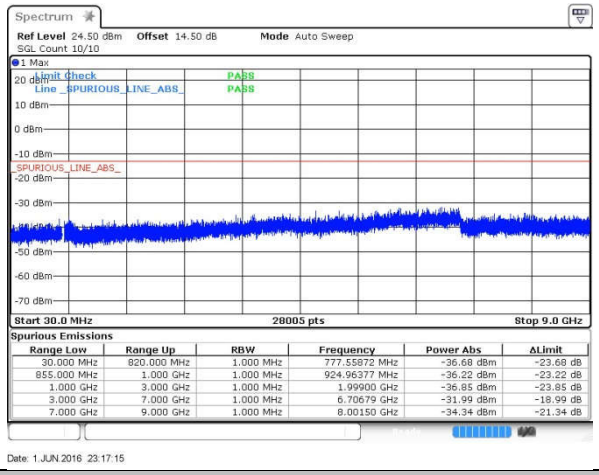


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	820.000 MHz	1.000 MHz	161.66667 MHz	-37.83 dBm	-24.83 dB
855.000 MHz	1.000 GHz	1.000 MHz	958.94928 MHz	-36.88 dBm	-23.88 dB
1.000 GHz	3.000 GHz	1.000 MHz	2.94888 GHz	-36.65 dBm	-23.65 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.80977 GHz	-31.64 dBm	-18.64 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.02225 GHz	-34.37 dBm	-21.37 dB

Date: 1.JUN.2016 23:15:51

Middle Channel

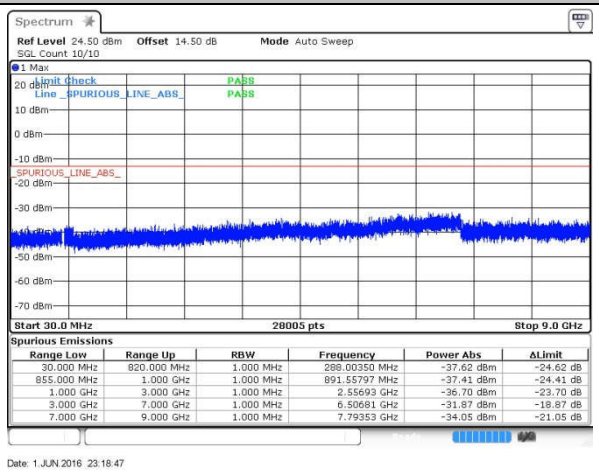


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	820.000 MHz	1.000 MHz	777.55872 MHz	-36.68 dBm	-23.68 dB
855.000 MHz	1.000 GHz	1.000 MHz	924.96377 MHz	-36.22 dBm	-23.22 dB
1.000 GHz	3.000 GHz	1.000 MHz	1.99900 GHz	-36.85 dBm	-23.85 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.70679 GHz	-31.99 dBm	-18.99 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.00150 GHz	-34.34 dBm	-21.34 dB

Date: 1.JUN.2016 23:17:15

Highest Channel



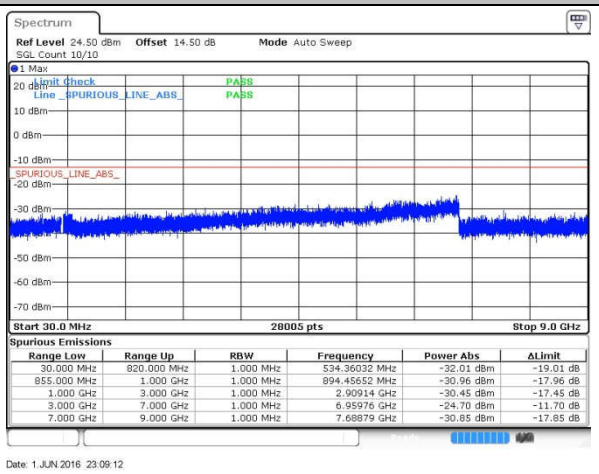
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	820.000 MHz	1.000 MHz	288.00350 MHz	-37.62 dBm	-24.62 dB
855.000 MHz	1.000 GHz	1.000 MHz	891.55797 MHz	-37.41 dBm	-24.41 dB
1.000 GHz	3.000 GHz	1.000 MHz	2.55693 GHz	-36.70 dBm	-23.70 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.50681 GHz	-31.87 dBm	-18.87 dB
7.000 GHz	9.000 GHz	1.000 MHz	7.79353 GHz	-34.05 dBm	-21.05 dB

Date: 1.JUN.2016 23:18:47

GSM850 (EDGE class 8)

Lowest Channel

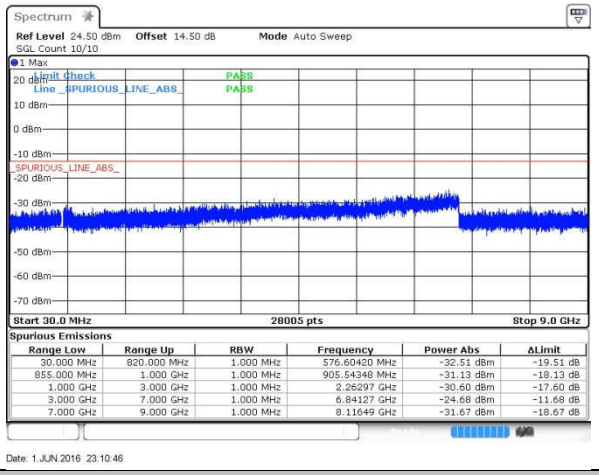


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	820.000 MHz	1.000 MHz	534.36032 MHz	-32.01 dBm	-19.01 dB
855.000 MHz	1.000 GHz	1.000 MHz	894.45652 MHz	-30.96 dBm	-17.96 dB
1.000 GHz	3.000 GHz	1.000 MHz	2.90914 GHz	-30.45 dBm	-17.45 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.95976 GHz	-24.70 dBm	-11.70 dB
7.000 GHz	9.000 GHz	1.000 MHz	7.68879 GHz	-30.85 dBm	-17.85 dB

Date: 1.JUN.2016 23:09:12

Middle Channel

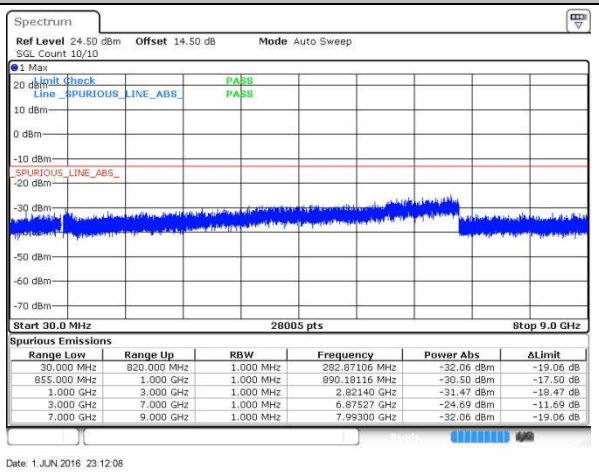


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	820.000 MHz	1.000 MHz	576.60420 MHz	-32.51 dBm	-19.51 dB
855.000 MHz	1.000 GHz	1.000 MHz	905.54348 MHz	-31.13 dBm	-18.13 dB
1.000 GHz	3.000 GHz	1.000 MHz	2.26297 GHz	-30.60 dBm	-17.60 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.84127 GHz	-24.68 dBm	-11.68 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.11649 GHz	-31.67 dBm	-18.67 dB

Date: 1.JUN.2016 23:10:46

Highest Channel



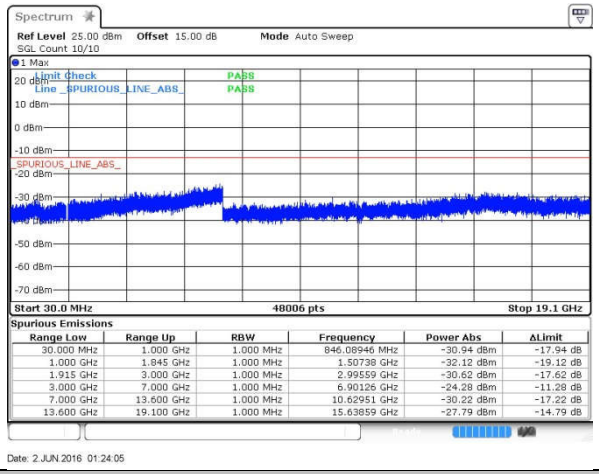
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	820.000 MHz	1.000 MHz	282.87106 MHz	-32.06 dBm	-19.06 dB
855.000 MHz	1.000 GHz	1.000 MHz	890.18116 MHz	-30.50 dBm	-17.50 dB
1.000 GHz	3.000 GHz	1.000 MHz	2.82140 GHz	-31.47 dBm	-18.47 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.87527 GHz	-24.69 dBm	-11.69 dB
7.000 GHz	9.000 GHz	1.000 MHz	7.99300 GHz	-32.06 dBm	-19.06 dB

Date: 1.JUN.2016 23:12:08

GSM1900 (GSM)

Lowest Channel

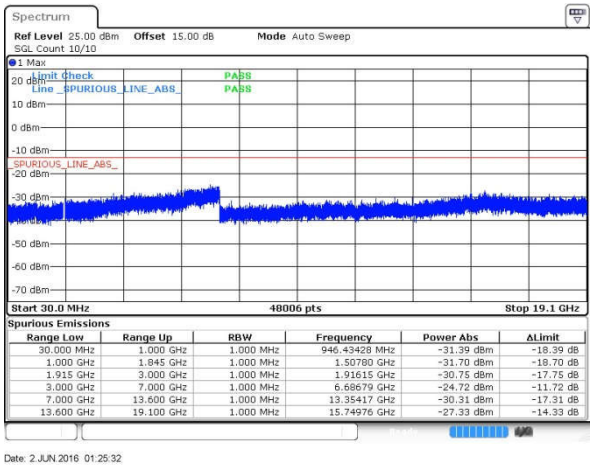


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	846.08946 MHz	-30.94 dBm	-17.94 dB
1.000 GHz	1.845 GHz	1.000 MHz	1.50738 GHz	-32.12 dBm	-19.12 dB
1.915 GHz	3.000 GHz	1.000 MHz	2.99559 GHz	-30.62 dBm	-17.62 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.90126 GHz	-24.28 dBm	-11.28 dB
7.000 GHz	13.600 GHz	1.000 MHz	10.62951 GHz	-30.22 dBm	-17.22 dB
13.600 GHz	19.100 GHz	1.000 MHz	15.63859 GHz	-27.79 dBm	-14.79 dB

Date: 2.JUN.2016 01:24:05

Middle Channel

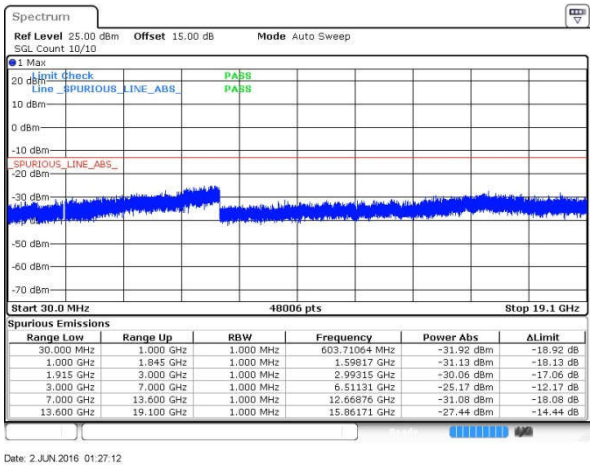


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	946.43428 MHz	-31.39 dBm	-18.39 dB
1.000 GHz	1.845 GHz	1.000 MHz	1.50780 GHz	-31.70 dBm	-18.70 dB
1.915 GHz	3.000 GHz	1.000 MHz	1.91615 GHz	-30.75 dBm	-17.75 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.68679 GHz	-24.72 dBm	-11.72 dB
7.000 GHz	13.600 GHz	1.000 MHz	13.35417 GHz	-30.31 dBm	-17.31 dB
13.600 GHz	19.100 GHz	1.000 MHz	15.74976 GHz	-27.33 dBm	-14.33 dB

Date: 2.JUN.2016 01:25:32

Highest Channel



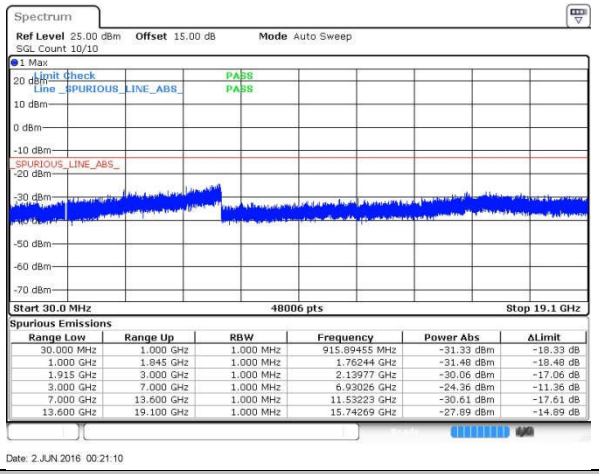
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	603.71064 MHz	-31.92 dBm	-18.92 dB
1.000 GHz	1.845 GHz	1.000 MHz	1.59817 GHz	-31.13 dBm	-18.13 dB
1.915 GHz	3.000 GHz	1.000 MHz	2.99315 GHz	-30.06 dBm	-17.06 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.51131 GHz	-25.17 dBm	-12.17 dB
7.000 GHz	13.600 GHz	1.000 MHz	12.66876 GHz	-31.08 dBm	-18.08 dB
13.600 GHz	19.100 GHz	1.000 MHz	15.86171 GHz	-27.44 dBm	-14.44 dB

Date: 2.JUN.2016 01:27:12

GSM1900 (EDGE class 8)

Lowest Channel

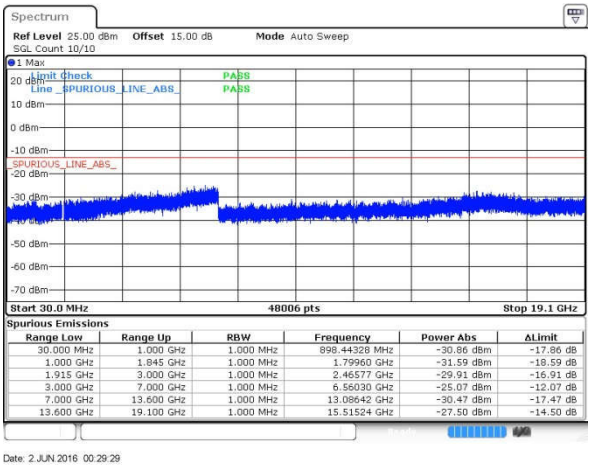


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	915.89455 MHz	-31.33 dBm	-18.33 dB
1.000 GHz	1.845 GHz	1.000 MHz	1.76244 GHz	-31.48 dBm	-18.48 dB
1.915 GHz	3.000 GHz	1.000 MHz	2.13977 GHz	-30.06 dBm	-17.06 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.93026 GHz	-24.36 dBm	-11.36 dB
7.000 GHz	13.600 GHz	1.000 MHz	11.53223 GHz	-30.61 dBm	-17.61 dB
13.600 GHz	19.100 GHz	1.000 MHz	15.74269 GHz	-27.89 dBm	-14.89 dB

Date: 2.JUN.2016 00:21:10

Middle Channel

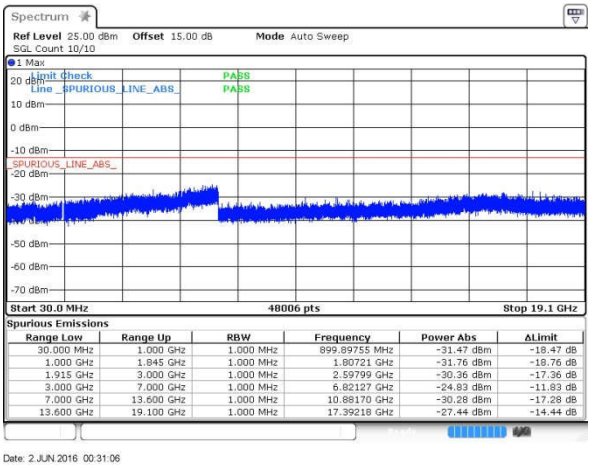


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	898.44328 MHz	-30.86 dBm	-17.86 dB
1.000 GHz	1.845 GHz	1.000 MHz	1.79960 GHz	-31.59 dBm	-18.59 dB
1.915 GHz	3.000 GHz	1.000 MHz	2.46577 GHz	-29.91 dBm	-16.91 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.56030 GHz	-25.07 dBm	-12.07 dB
7.000 GHz	13.600 GHz	1.000 MHz	13.08642 GHz	-30.47 dBm	-17.47 dB
13.600 GHz	19.100 GHz	1.000 MHz	15.51524 GHz	-27.50 dBm	-14.50 dB

Date: 2.JUN.2016 00:29:29

Highest Channel



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	899.89755 MHz	-31.47 dBm	-18.47 dB
1.000 GHz	1.845 GHz	1.000 MHz	1.80721 GHz	-31.76 dBm	-18.76 dB
1.915 GHz	3.000 GHz	1.000 MHz	2.59799 GHz	-30.36 dBm	-17.36 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.82127 GHz	-24.83 dBm	-11.83 dB
7.000 GHz	13.600 GHz	1.000 MHz	10.88170 GHz	-30.28 dBm	-17.28 dB
13.600 GHz	19.100 GHz	1.000 MHz	17.39218 GHz	-27.44 dBm	-14.44 dB

Date: 2.JUN.2016 00:31:06

Frequency Stability

Test Conditions	Middle Channel	GSM850 (GSM)	GSM850 (EDGE class 8)	Limit 2.5ppm
Temperature (°C)	Voltage (Volt)	Deviation (ppm)		Result
50	Normal Voltage	0.0155	0.0048	PASS
40	Normal Voltage	0.0143	0.0108	
30	Normal Voltage	0.0036	0.0072	
20(Ref.)	Normal Voltage	0.0000	0.0000	
10	Normal Voltage	0.0084	0.0084	
0	Normal Voltage	0.0108	0.0024	
-10	Normal Voltage	0.0060	0.0060	
-20	Normal Voltage	0.0096	0.0012	
-30	Normal Voltage	0.0132	0.0096	
20	Maximum Voltage	0.0048	0.0132	
20	Normal Voltage	0.0012	0.0036	
20	Battery End Point	0.0072	0.0012	

Test Conditions	Middle Channel	GSM1900 (GSM)	GSM1900 (EDGE class 8)	Limit Note 2.
Temperature (°C)	Voltage (Volt)	Deviation (ppm)		Result
50	Normal Voltage	0.0016	0.0043	PASS
40	Normal Voltage	0.0048	0.0005	
30	Normal Voltage	0.0053	0.0021	
20(Ref.)	Normal Voltage	0.0000	0.0000	
10	Normal Voltage	0.0043	0.0005	
0	Normal Voltage	0.0037	0.0027	
-10	Normal Voltage	0.0021	0.0037	
-20	Normal Voltage	0.0011	0.0016	
-30	Normal Voltage	0.0016	0.0011	
20	Maximum Voltage	0.0027	0.0016	
20	Normal Voltage	0.0032	0.0037	
20	Battery End Point	0.0005	0.0011	

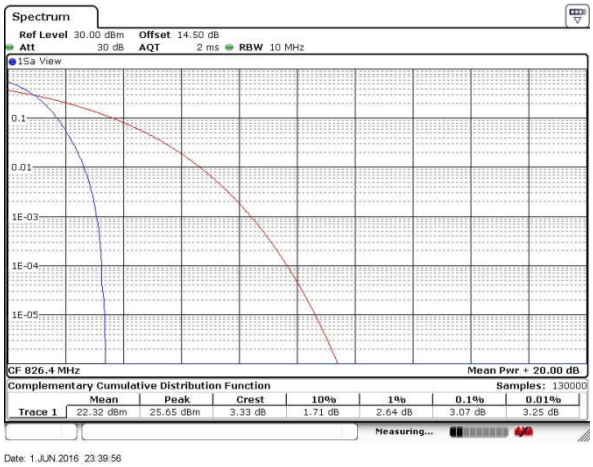
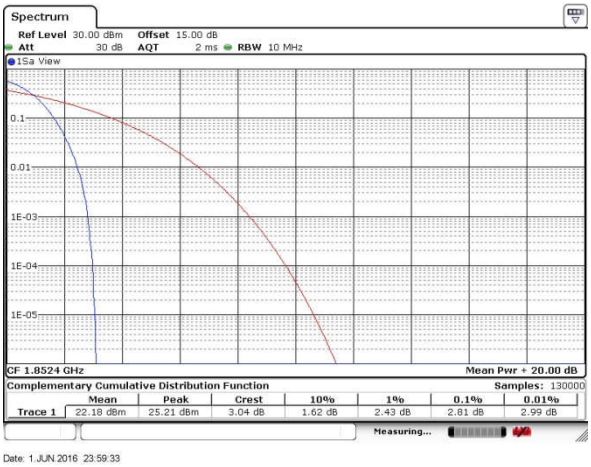
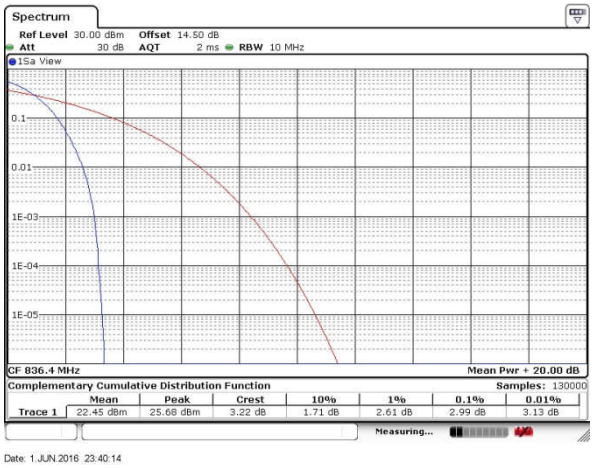
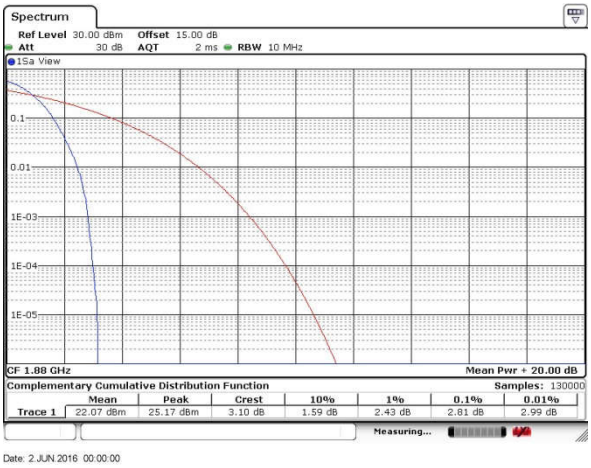
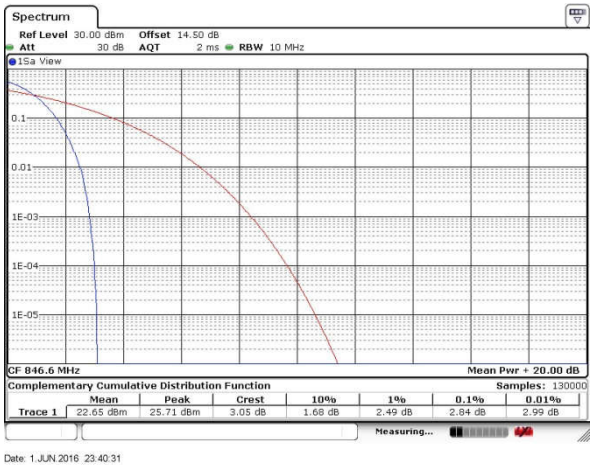
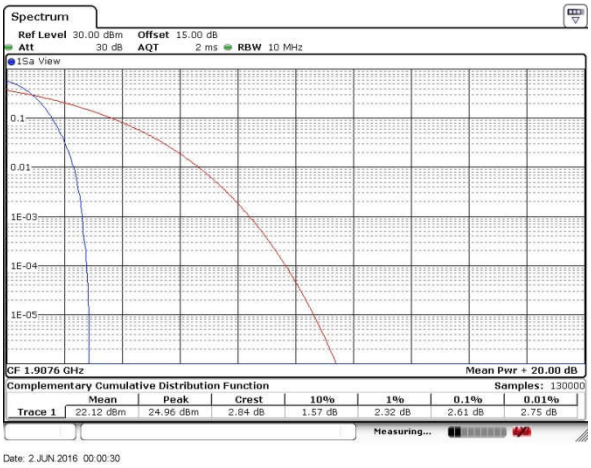
Note:

1. Normal Voltage = 3.9V. ；Battery End Point (BEP) = 3.55 V.；Maximum Voltage =4.4 V
2. The frequency fundamental emissions stay within the authorized frequency block based on the frequency deviation measured is small.

A2. WCDMA

Peak-to-Average Ratio

Mode	WCDMA Band V	WCDMA Band II	Limit: 13dB
Mod.	RMC 12.2Kbps	RMC 12.2Kbps	Result
Lowest CH	3.07	2.81	PASS
Middle CH	2.99	2.81	
Highest CH	2.84	2.61	

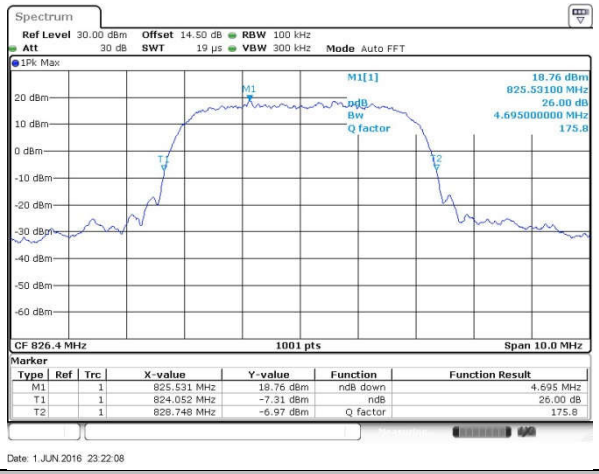
WCDMA Band V (RMC 12.2Kbps)	WCDMA Band II (RMC 12.2Kbps)
Lowest Channel	**Lowest Channel**
	
Middle Channel	**Middle Channel**
	
Highest Channel	**Highest Channel**
	

26dB Bandwidth

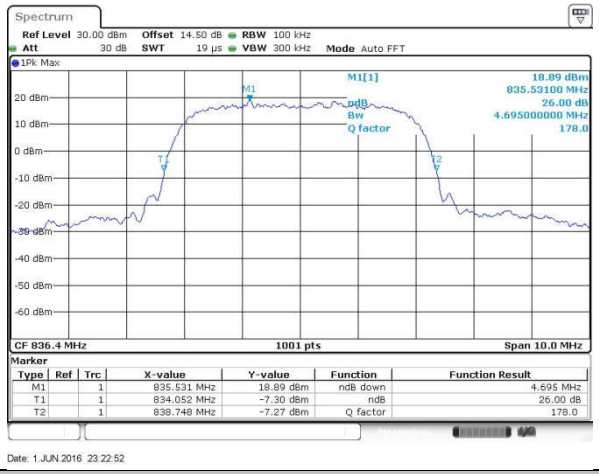
Mode	WCDMA Band V (MHz)	WCDMA Band II (MHz)
Mod.	RMC 12.2Kbps	RMC 12.2Kbps
Lowest CH	4.70	4.72
Middle CH	4.70	4.71
Highest CH	4.71	4.72

WCDMA Band V (RMC 12.2Kbps)

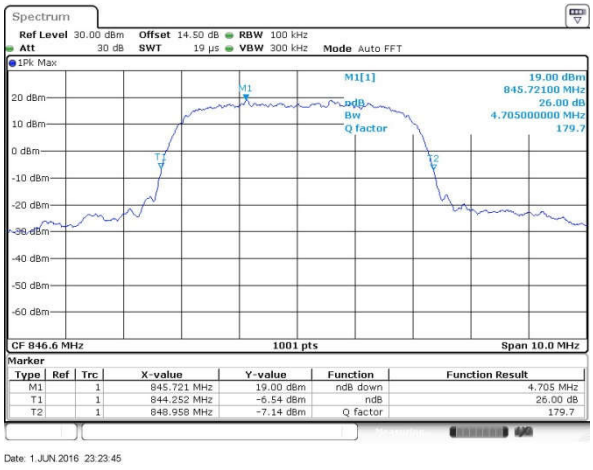
Lowest Channel



Middle Channel

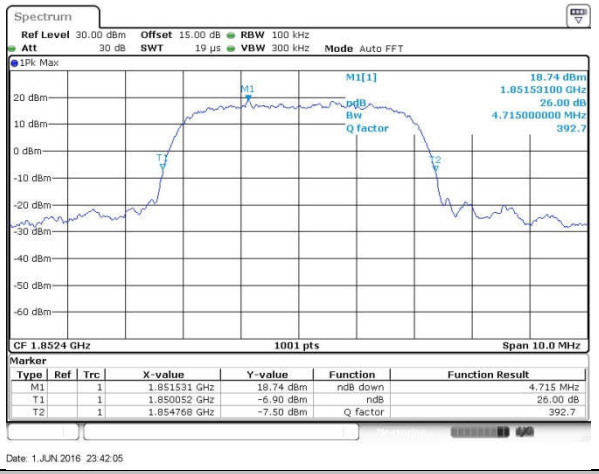


Highest Channel

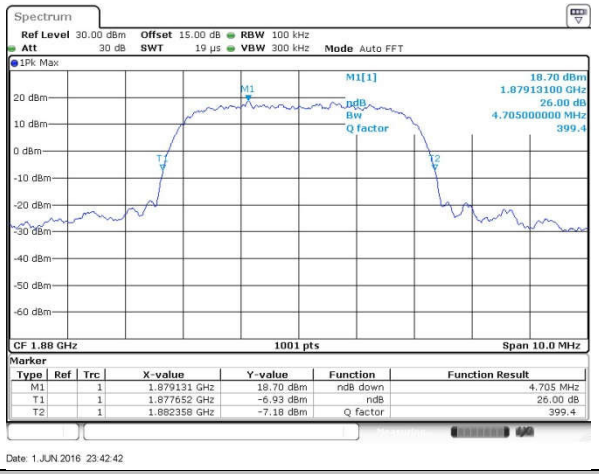


WCDMA Band II (RMC 12.2Kbps)

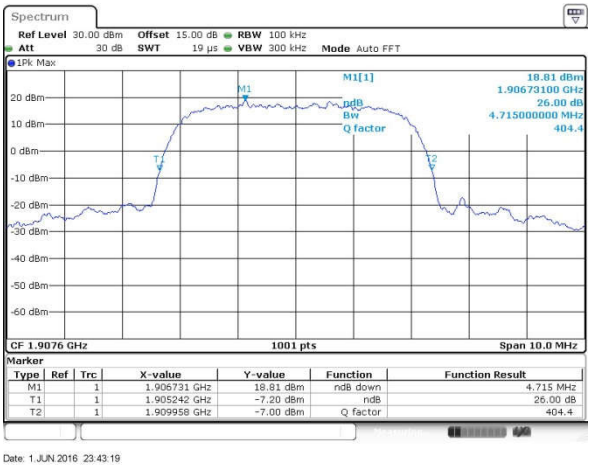
Lowest Channel



Middle Channel

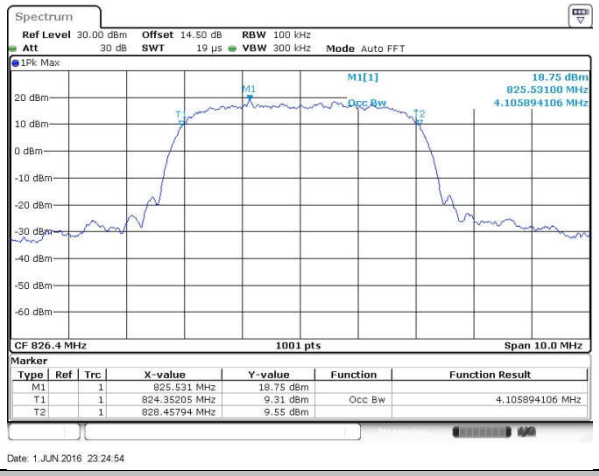
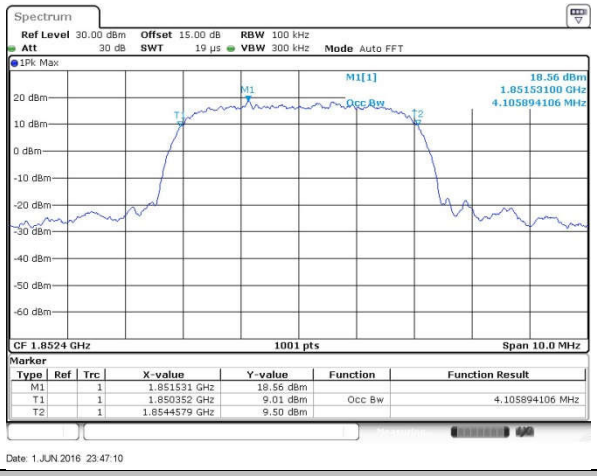
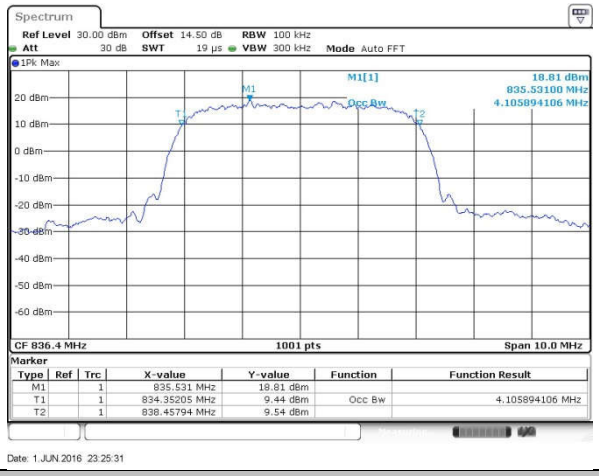
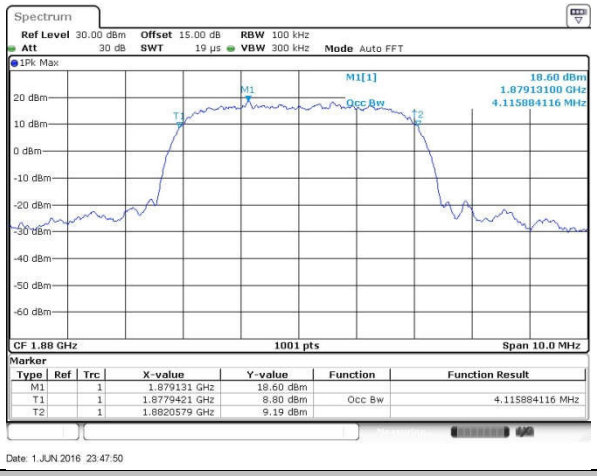
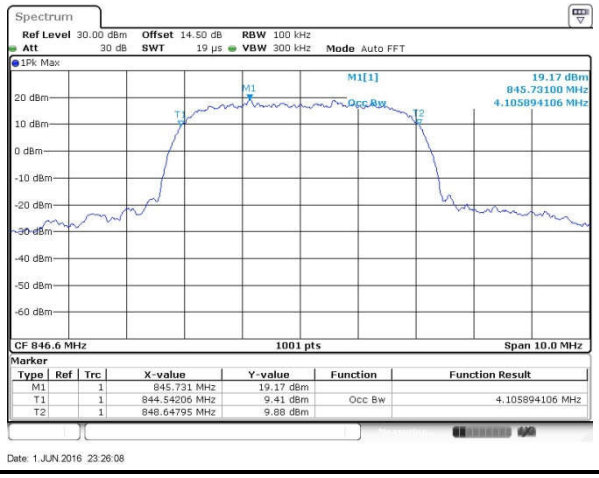
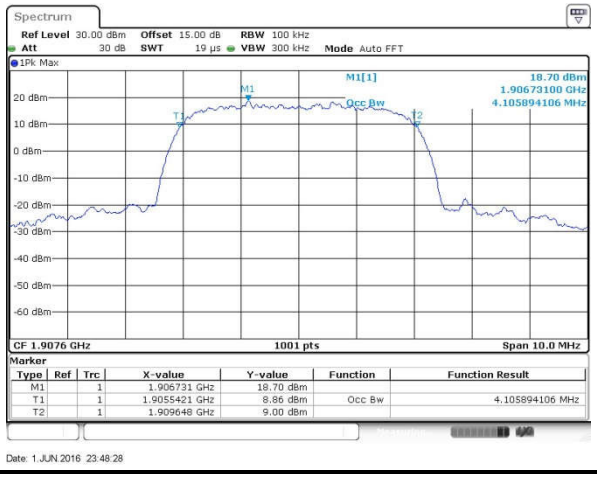


Highest Channel



Occupied Bandwidth

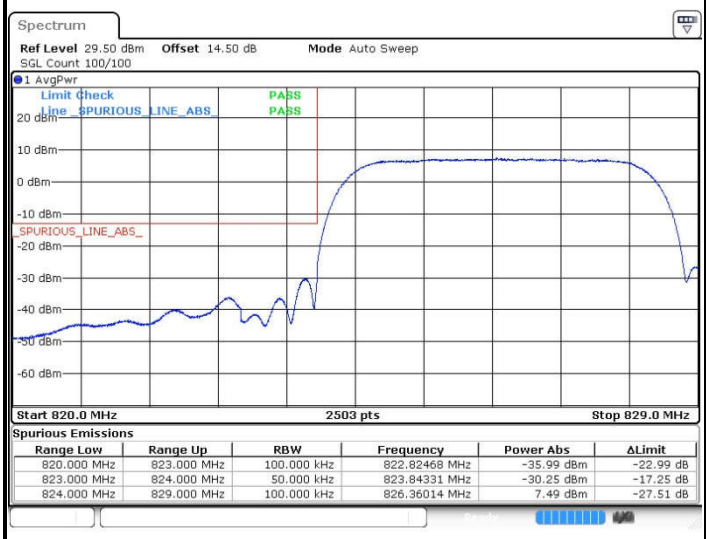
Mode	WCDMA Band V (MHz)	WCDMA Band II (MHz)
Mod.	RMC 12.2Kbps	RMC 12.2Kbps
Lowest CH	4.11	4.11
Middle CH	4.11	4.12
Highest CH	4.11	4.11

WCDMA Band V (RMC 12.2Kbps)	WCDMA Band II (RMC 12.2Kbps)
Lowest Channel	**Lowest Channel**
	
Middle Channel	**Middle Channel**
	
Highest Channel	**Highest Channel**
	

Conducted Band Edge

WCDMA Band V (RMC 12.2Kbps)

Lowest Band Edge

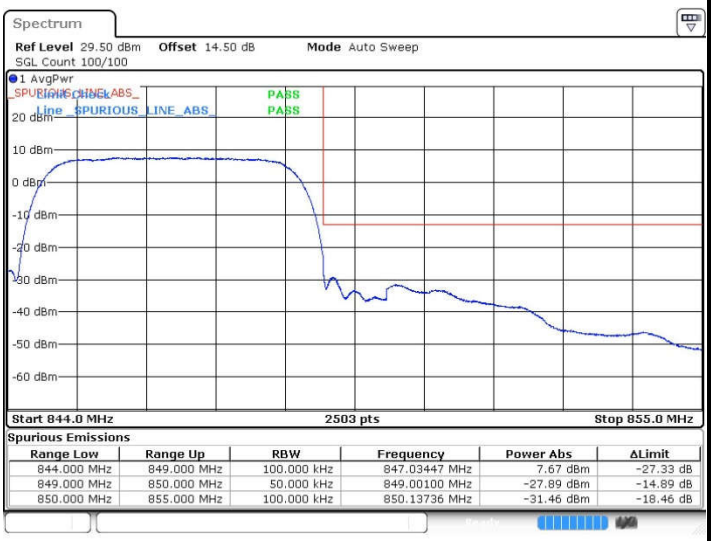


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
820.000 MHz	823.000 MHz	100.000 kHz	822.82468 MHz	-35.99 dBm	-22.99 dB
823.000 MHz	824.000 MHz	50.000 kHz	823.84331 MHz	-30.25 dBm	-17.25 dB
824.000 MHz	829.000 MHz	100.000 kHz	826.36014 MHz	7.49 dBm	-27.51 dB

Date: 1.JUN.2016 23:32:05

Highest Band Edge



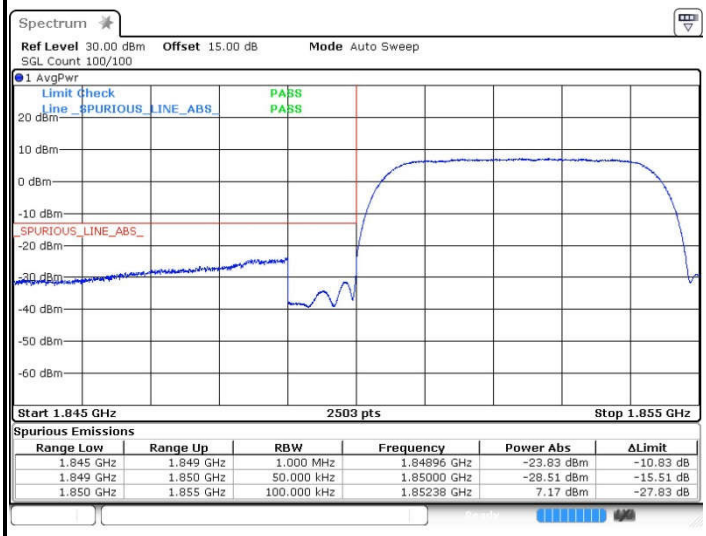
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
844.000 MHz	849.000 MHz	100.000 kHz	847.03447 MHz	7.67 dBm	-27.33 dB
849.000 MHz	850.000 MHz	50.000 kHz	849.00100 MHz	-27.89 dBm	-14.89 dB
850.000 MHz	855.000 MHz	100.000 kHz	850.13736 MHz	-31.46 dBm	-18.46 dB

Date: 1.JUN.2016 23:34:57

WCDMA Band II (RMC 12.2Kbps)

Lowest Band Edge

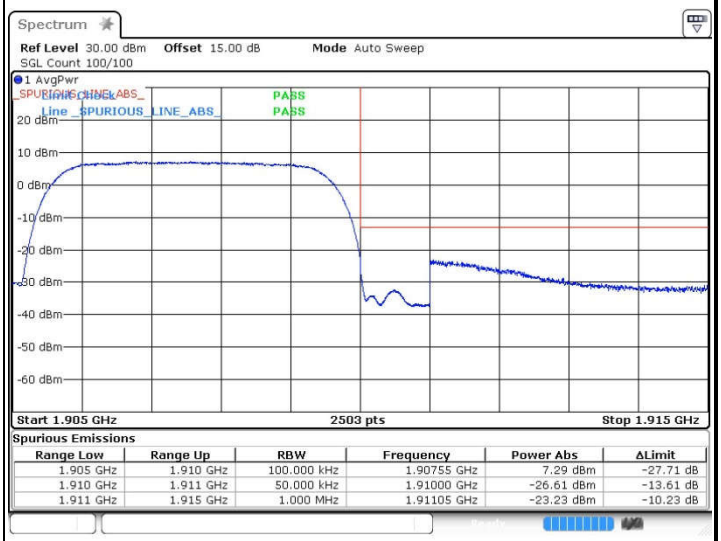


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.845 GHz	1.849 GHz	1.000 MHz	1.84896 GHz	-23.83 dBm	-10.83 dB
1.849 GHz	1.850 GHz	50.000 kHz	1.85000 GHz	-28.51 dBm	-15.51 dB
1.850 GHz	1.855 GHz	100.000 kHz	1.85238 GHz	7.17 dBm	-27.83 dB

Date: 1.JUN.2016 23:51:29

Highest Band Edge



Spurious Emissions

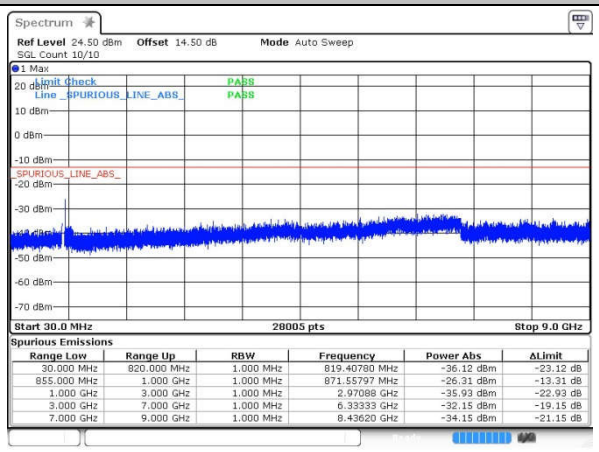
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.905 GHz	1.910 GHz	100.000 kHz	1.90755 GHz	7.29 dBm	-27.71 dB
1.910 GHz	1.911 GHz	50.000 kHz	1.91000 GHz	-26.61 dBm	-13.61 dB
1.911 GHz	1.915 GHz	1.000 MHz	1.91105 GHz	-23.23 dBm	-10.23 dB

Date: 1.JUN.2016 23:54:21

Conducted Spurious Emission

WCDMA Band V (RMC 12.2Kbps)

Lowest Channel

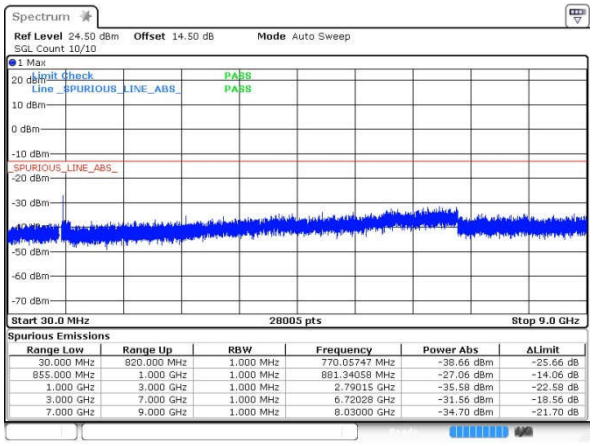


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	820.000 MHz	1.000 MHz	819.40780 MHz	-36.12 dBm	-23.12 dB
855.000 MHz	1.000 GHz	1.000 MHz	871.55797 MHz	-26.31 dBm	-13.31 dB
1.000 GHz	3.000 GHz	1.000 MHz	2.97089 GHz	-35.93 dBm	-22.93 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.33333 GHz	-32.15 dBm	-19.15 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.43620 GHz	-34.15 dBm	-21.15 dB

Date: 1.JUN.2016 23:36:30

Middle Channel

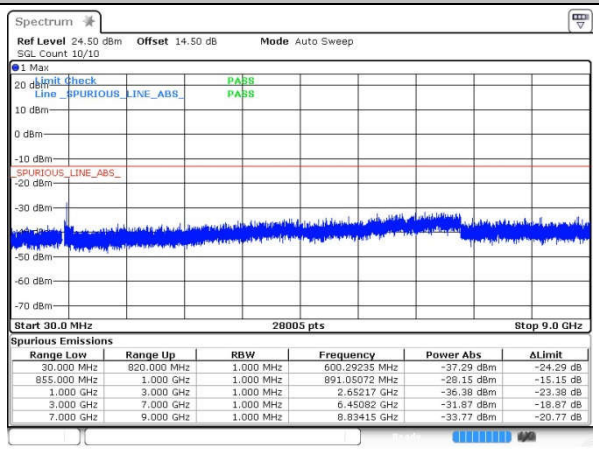


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	820.000 MHz	1.000 MHz	770.05747 MHz	-38.66 dBm	-25.66 dB
855.000 MHz	1.000 GHz	1.000 MHz	881.34058 MHz	-27.06 dBm	-14.06 dB
1.000 GHz	3.000 GHz	1.000 MHz	2.79015 GHz	-35.58 dBm	-22.58 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.72028 GHz	-31.56 dBm	-18.56 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.03000 GHz	-34.70 dBm	-21.70 dB

Date: 1.JUN.2016 23:37:57

Highest Channel



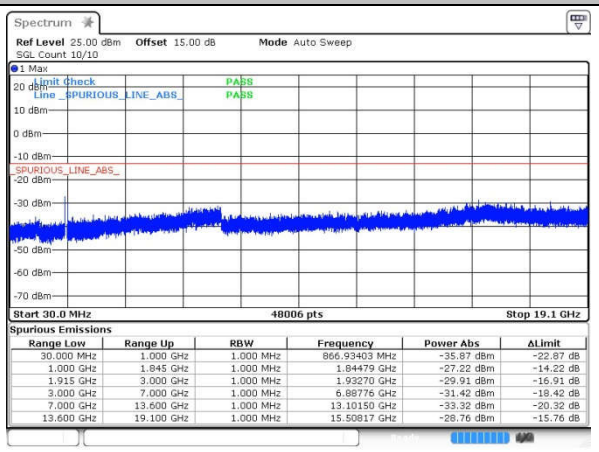
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	820.000 MHz	1.000 MHz	600.29235 MHz	-37.29 dBm	-24.29 dB
855.000 MHz	1.000 GHz	1.000 MHz	891.05072 MHz	-28.15 dBm	-15.15 dB
1.000 GHz	3.000 GHz	1.000 MHz	2.65217 GHz	-36.38 dBm	-23.38 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.45082 GHz	-31.87 dBm	-18.87 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.83415 GHz	-33.77 dBm	-20.77 dB

Date: 1.JUN.2016 23:39:21

WCDMA Band II (RMC 12.2Kbps)

Lowest Channel

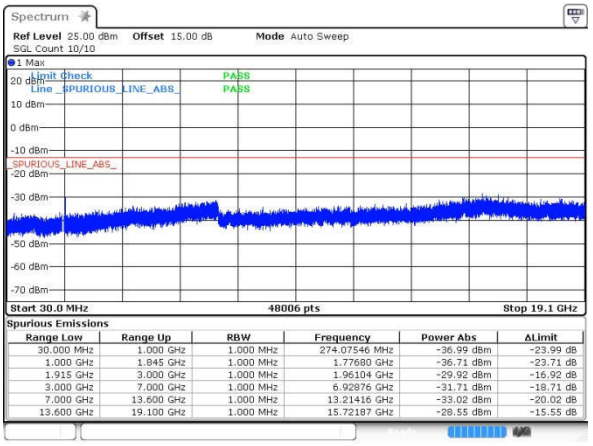


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	866.93403 MHz	-35.87 dBm	-22.87 dB
1.000 GHz	1.845 GHz	1.000 MHz	1.84479 GHz	-27.22 dBm	-14.22 dB
1.915 GHz	3.000 GHz	1.000 MHz	1.93270 GHz	-29.91 dBm	-16.91 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.88776 GHz	-31.42 dBm	-18.42 dB
7.000 GHz	13.600 GHz	1.000 MHz	13.10150 GHz	-33.32 dBm	-20.32 dB
13.600 GHz	19.100 GHz	1.000 MHz	15.50817 GHz	-28.76 dBm	-15.76 dB

Date: 1.JUN.2016 23:55:55

Middle Channel

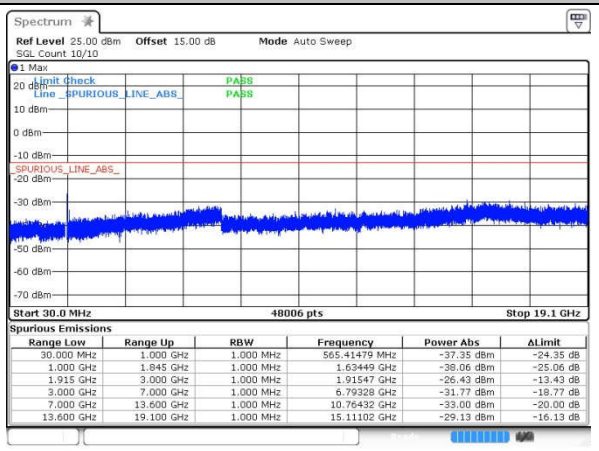


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	274.07546 MHz	-36.99 dBm	-23.99 dB
1.000 GHz	1.845 GHz	1.000 MHz	1.77680 GHz	-36.71 dBm	-23.71 dB
1.915 GHz	3.000 GHz	1.000 MHz	1.96104 GHz	-29.92 dBm	-16.92 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.92876 GHz	-31.71 dBm	-18.71 dB
7.000 GHz	13.600 GHz	1.000 MHz	13.21416 GHz	-33.02 dBm	-20.02 dB
13.600 GHz	19.100 GHz	1.000 MHz	15.72187 GHz	-28.55 dBm	-15.55 dB

Date: 1.JUN.2016 23:57:17

Highest Channel



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	1.000 GHz	1.000 MHz	565.41479 MHz	-37.35 dBm	-24.35 dB
1.000 GHz	1.845 GHz	1.000 MHz	1.63449 GHz	-38.06 dBm	-25.06 dB
1.915 GHz	3.000 GHz	1.000 MHz	1.91547 GHz	-26.43 dBm	-13.43 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.79328 GHz	-31.77 dBm	-18.77 dB
7.000 GHz	13.600 GHz	1.000 MHz	10.76432 GHz	-33.00 dBm	-20.00 dB
13.600 GHz	19.100 GHz	1.000 MHz	15.11102 GHz	-29.13 dBm	-16.13 dB

Date: 1.JUN.2016 23:58:44

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	0.0060	PASS
40	Normal Voltage	0.0120	
30	Normal Voltage	0.0048	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0072	
0	Normal Voltage	0.0012	
-10	Normal Voltage	0.0012	
-20	Normal Voltage	0.0036	
-30	Normal Voltage	0.0060	
20	Maximum Voltage	0.0024	
20	Normal Voltage	0.0084	
20	Battery End Point	0.0036	

Test Conditions	Middle Channel	WCDMA Band II (RMC 12.2Kbps)	Limit Note 2.
Temperature (°C)	Voltage (Volt)	Deviation (ppm)	Result
50	Normal Voltage	0.0032	PASS
40	Normal Voltage	0.0032	
30	Normal Voltage	0.0027	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0005	
0	Normal Voltage	0.0011	
-10	Normal Voltage	0.0021	
-20	Normal Voltage	0.0037	
-30	Normal Voltage	0.0027	
20	Maximum Voltage	0.0016	
20	Normal Voltage	0.0043	
20	Battery End Point	0.0016	

Note:

1. Normal Voltage = 3.9V. ；Battery End Point (BEP) = 3.55 V.；Maximum Voltage =4.4 V
2. The frequency fundamental emissions stay within the authorized frequency block based on the frequency deviation measured is small.

Appendix B. Test Results of Radiated Test

ERP/EIRP

Channel	Mode	Horizontal		Vertical	
		ERP(dBm)	ERP(W)	ERP(dBm)	ERP(W)
Lowest	GSM850 GSM	26.48	0.4446	18.16	0.0655
Middle		27.31	0.5383	18.33	0.0681
Highest		27.56	0.5702	18.39	0.0690
Lowest	GSM850 EDGE class 8	18.74	0.0748	10.49	0.0112
Middle		20.28	0.1067	11.49	0.0141
Highest		21.37	0.1371	12.12	0.0163
Lowest	WCDMA Band V RMC 12.2Kbps	15.57	0.0361	7.04	0.0051
Middle		16.42	0.0439	7.19	0.0052
Highest		17.49	0.0561	7.99	0.0063
Limit	ERP < 7W	Result		PASS	

Channel	Mode	Horizontal		Vertical	
		EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	GSM1900 GSM	31.91	1.5524	31.40	1.3804
Middle		31.69	1.4757	31.32	1.3552
Highest		31.25	1.3335	31.61	1.4488
Lowest	GSM1900 EDGE class 8	27.23	0.5284	26.80	0.4786
Middle		26.99	0.5000	26.82	0.4808
Highest		26.77	0.4753	27.14	0.5176
Lowest	WCDMA Band II RMC 12.2Kbps	24.48	0.2805	23.93	0.2472
Middle		24.75	0.2985	24.60	0.2884
Highest		25.06	0.3206	25.27	0.3365
Limit	EIRP < 2W	Result		PASS	

Radiated Spurious Emission

For USB Cable 1, Battery 1

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	1674	-38.37	-13	-25.37	-44.82	-40.26	1.86	5.90	H
	2510	-44.18	-13	-31.18	-56.42	-46.52	2.31	6.80	H
	3345	-53.46	-13	-40.46	-66.09	-55.86	2.85	7.40	H
	1674	-36.86	-13	-23.86	-43.44	-38.75	1.86	5.90	V
	2510	-41.70	-13	-28.70	-55.79	-44.04	2.31	6.80	V
	3345	-50.16	-13	-37.16	-64.14	-52.56	2.85	7.40	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	1674	-54.63	-13	-41.63	-56.81	-56.52	1.86	5.90	H
	2510	-53.76	-13	-40.76	-62.79	-56.10	2.31	6.80	H
	3345	-54.33	-13	-41.33	-66.96	-56.73	2.85	7.40	H
	1674	-47.80	-13	-34.80	-51.36	-49.69	1.86	5.90	V
	2510	-51.80	-13	-38.80	-62.77	-54.14	2.31	6.80	V
	3345	-53.48	-13	-40.48	-67.46	-55.88	2.85	7.40	V

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

GSM1900 (GSM)									
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)
Middle	3759	-51.05	-13	-38.05	-65.25	-55.65	3	7.60	H
	5640	-45.34	-13	-32.34	-59.13	-51.60	3.84	10.10	H
	7521	-44.76	-13	-31.76	-64.54	-52.26	4.43	11.93	H
	3760	-53.41	-13	-40.41	-65.9	-58.01	3	7.60	V
	5640	-47.46	-13	-34.46	-59.87	-53.72	3.84	10.10	V
	7521	-47.04	-13	-34.04	-64.83	-54.54	4.43	11.93	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)
Middle	3759	-52.11	-13	-39.11	-66.31	-56.71	3	7.60	H
	5640	-49.56	-13	-36.56	-63.35	-55.82	3.84	10.10	H
	7521	-43.54	-13	-30.54	-63.32	-51.04	4.43	11.93	H
	3759	-53.89	-13	-40.89	-66.38	-58.49	3	7.60	V
	5640	-50.18	-13	-37.18	-62.59	-56.44	3.84	10.10	V
	7521	-46.37	-13	-33.37	-64.16	-53.87	4.43	11.93	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)
Middle	1672	-56.28	-13	-43.28	-58.46	-58.17	1.86	5.90	H
	2509	-53.94	-13	-40.94	-62.97	-56.28	2.31	6.80	H
	3345	-55.08	-13	-42.08	-67.71	-57.48	2.85	7.40	H
	1672	-59.56	-13	-46.56	-58.42	-61.45	1.86	5.90	V
	2509	-52.75	-13	-39.75	-63.72	-55.09	2.31	6.80	V
	3345	-53.38	-13	-40.38	-67.36	-55.78	2.85	7.40	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)
Middle	3759	-52.54	-13	-39.54	-66.74	-57.14	3	7.60	H
	5640	-49.49	-13	-36.49	-63.28	-55.75	3.84	10.10	H
	7521	-44.61	-13	-31.61	-64.39	-52.11	4.43	11.93	H
	3759	-53.74	-13	-40.74	-66.23	-58.34	3	7.60	V
	5640	-50.19	-13	-37.19	-62.6	-56.45	3.84	10.10	V
	7521	-46.89	-13	-33.89	-64.68	-54.39	4.43	11.93	V

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

For USB Cable 2, Battery 2

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	1674	-34.03	-13	-21.03	-41.08	-35.92	1.86	5.90	H
	2510	-35.82	-13	-22.82	-50.35	-38.16	2.31	6.80	H
	3345	-51.79	-13	-38.79	-64.42	-54.19	2.85	7.40	H
	1674	-29.46	-13	-16.46	-36.65	-31.35	1.86	5.90	V
	2510	-33.58	-13	-20.58	-50.03	-35.92	2.31	6.80	V
	3345	-48.58	-13	-35.58	-62.56	-50.98	2.85	7.40	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)
Middle	3759	-52.84	-13	-39.84	-67.04	-57.44	3	7.60	H
	5640	-48.08	-13	-35.08	-61.87	-54.34	3.84	10.10	H
	7521	-44.45	-13	-31.45	-64.23	-51.95	4.43	11.93	H
	3759	-53.90	-13	-40.90	-66.39	-58.50	3	7.60	V
	5640	-50.45	-13	-37.45	-62.86	-56.71	3.84	10.10	V
	7521	-46.21	-13	-33.21	-64	-53.71	4.43	11.93	V

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