FCC RF Test Report

APPLICANT	:	Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd
EQUIPMENT	:	Smartphone
BRAND NAME	:	Coolpad
MODEL NAME	:	cp3636a
MARKETING NAME	:	Coolpad Canvas
FCC ID	:	R38YL3636A
STANDARD	:	FCC 47 CFR Part 2, 22(H), 24(E)
CLASSIFICATION	:	PCS Licensed Transmitter Held to Ear (PCE)

The product was received on Sep. 30, 2016 and testing was completed on Dec. 01, 2016. We, SPORTON INTERNATIONAL (SHENZHEN) 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 (SHENZHEN) INC., the test report shall not be reproduced except in full.

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Testing Laboratory
2353

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG693006A	Rev. 01	Initial issue of report	Feb. 23, 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)	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 22	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 12.82 dB at 1672.800 MHz

1 General Description

1.1 Applicant

Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd
Coolpad Information Harbor, High-tech Industrial Park (North), Nanshan District, Shenzhen, P.R.C.

1.2 Manufacturer

Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd
Coolpad Information Harbor, High-tech Industrial Park (North), Nanshan District, Shenzhen, P.R.C.

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Smartphone
Brand Name	Coolpad
Model Name	cp3636a
Marketing Name	Coolpad Canvas
FCC ID	R38YL3636A
EUT supports Radios application	GSM/GPRS/EGPRS/WCDMA/HSPA/ HSPA+(16QAM uplink is not supported)/LTE WLAN2.4GHz 802.11b/g/n HT20 Bluetooth v2.1+EDR Bluetooth v4.0/4.1 LE
IMEI Code	Conducted: 863515030006509 Radiation: 863515030002995 ERP/EIRP: 863515030005378
HW Version	P1
SW Version	091.11.170119
EUT Stage	Production Unit

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: 33.70 dBm 1900: 30.37 dBm **WCDMA:** Band V: 24.29 dBm Band II: 24.10 dBm
Antenna Type	PIFA Antenna
Antenna Gain	Cellular Band: -0.60 dBi PCS Band: 1.80 dBi
Type of Modulation	GSM: GMSK GPRS: GMSK EDGE: GMSK / 8PSK WCDMA: BPSK (Uplink) HSDPA: QPSK (Uplink) HSUPA: QPSK (Uplink) HSPA+: 16QAM (Uplink is not supported)

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	0.7430	0.0311 ppm	242KGXW
Part 22	GSM850 EDGE class 8	8PSK	0.1791	0.0526 ppm	234KG7W
Part 22	WCDMA Band V RMC 12.2Kbps	BPSK	0.1371	0.0143 ppm	4M13F9W
Part 24	GSM1900 GSM	GMSK	0.8017	0.0239 ppm	243KGXW
Part 24	GSM1900 EDGE class 8	8PSK	0.4256	0.0261 ppm	246KG7W
Part 24	WCDMA Band II RMC 12.2Kbps	BPSK	0.2173	0.0197 ppm	4M13F9W

1.7 Testing Location

Test Site	SPORTON INTERNATIONAL (SHENZHEN) INC.
Test Site Location	1F & 2F,Building A, Morning Business Center, No. 4003 ShiGu Rd., Xili Town, Nanshan District, Shenzhen, Guangdong, P. R. China TEL: +86-755-8637-9589 FAX: +86-755-8637-9595
Test Site No.	**Sporton Site No.**
	TH01-SZ

Test Site	SPORTON INTERNATIONAL (SHENZHEN) INC.	
Test Site Location	No. 3 Building, the third floor of south, Shahe River west, Fengzeyuan warehouse, Nanshan District, Shenzhen, Guangdong, P. R. China TEL: +86-755- 3320-2398	
Test Site No.	**Sporton Site No.**	**FCC Registration No.**
	03CH02-SZ	566869

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)
- 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:

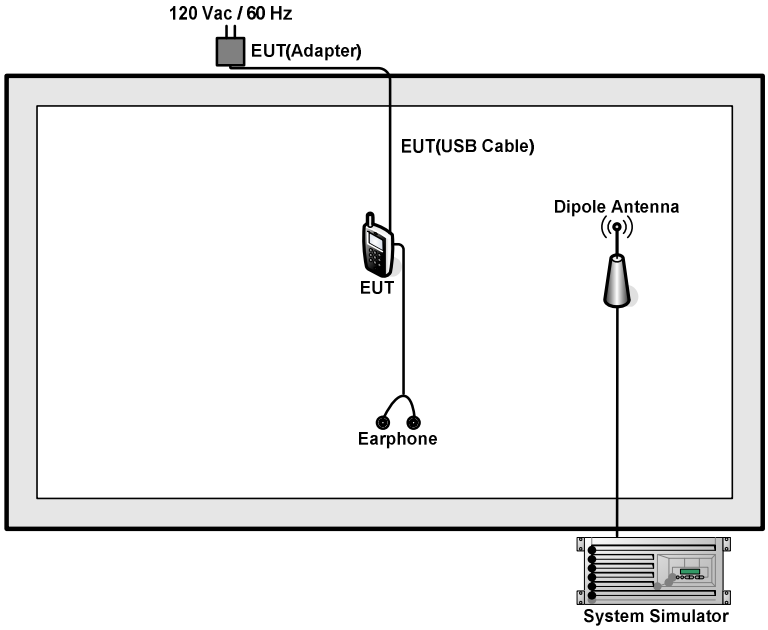
1. 30 MHz to 10th harmonic for GSM850 and WCDMA Band V.
2. 30 MHz to 10th harmonic for GSM1900 and WCDMA Band II.

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
3.	Earphone	Apple	MC690ZP/A	N/A	Shielded, 1.0m	N/A

2.4 Measurement Results Explanation Example

For all conducted test items:

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

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

Offset = RF cable loss + attenuator factor.

The following shows an offset computation example with RF cable loss 4.0 dB and a 10dB attenuator.

Example :

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

= 4.0 + 10 = 14.0 (dB)

3 Conducted Test Result

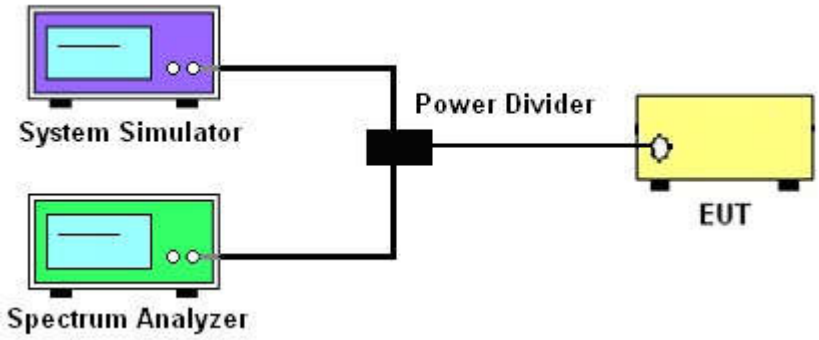
3.1 Measuring Instruments

See list of measuring instruments of this test report.

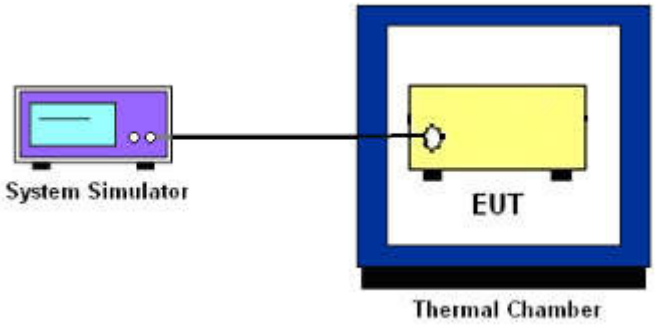
3.2 Test Setup

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 10^{th} 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 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.

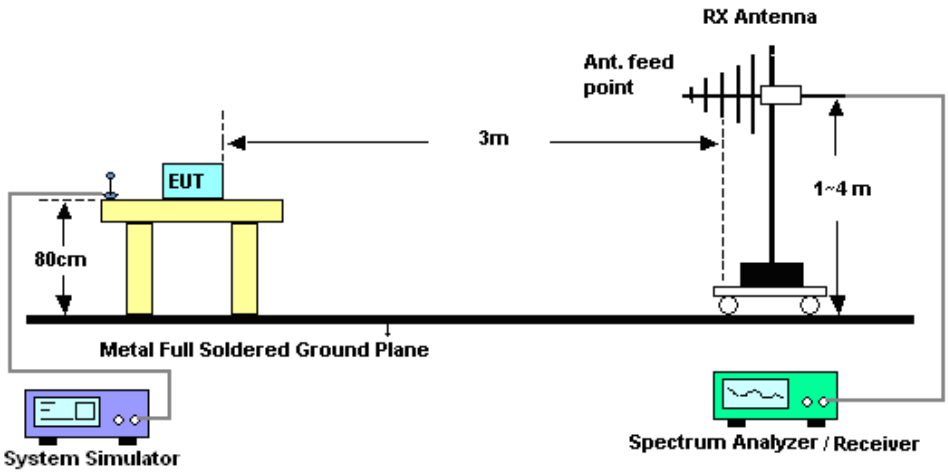
4 Radiated Test Items

4.1 Measuring Instruments

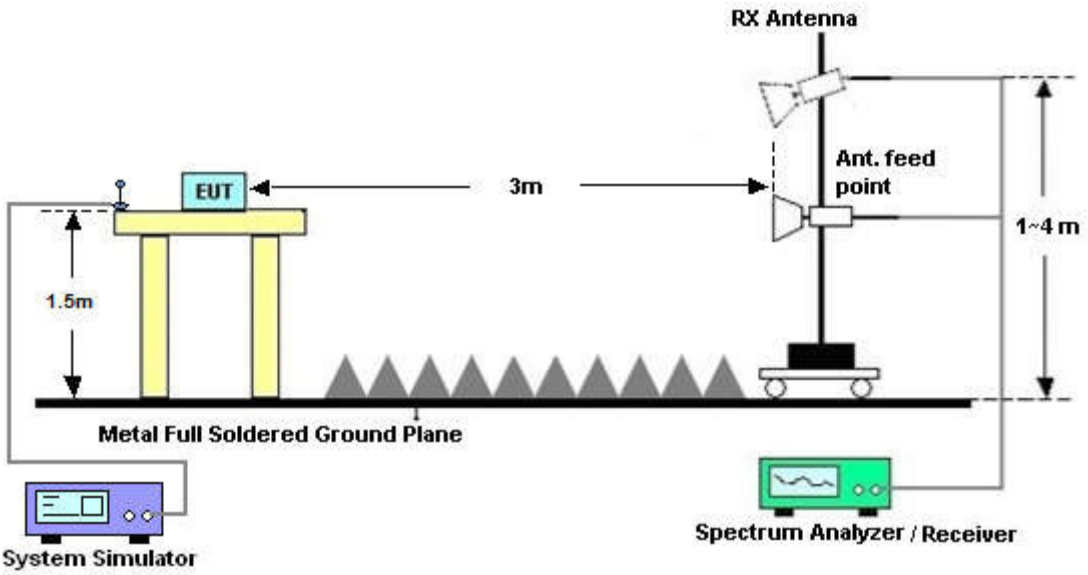
See list of measuring instruments of this test report.

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).

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)

    = 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
Radio Communicatio	Anritsu	MT8820C	6201563777	2G/3G/4G (CDMA)	Jan. 02, 2016	Nov. 22, 2016~ Nov. 23, 2016	Jan. 03, 2017	Conducted (TH01-SZ)
Spectrum Analyzer	R&S	FSV40	101078	9kHz~40GHz	May 07,2016	Nov. 22, 2016~ Nov. 23, 2016	May 06,2017	Conducted (TH01-SZ)
Thermal Chamber	Ten Billion Hongzhangroup	LP-150U	H2014081803	-40~+150°C	Jul. 16, 2016	Nov. 22, 2016~ Nov. 23, 2016	Jul. 15, 2017	Conducted (TH01-SZ)
Spectrum Analyzer	R&S	FSV40	101041	10kHz~40GHz;Max 30dBm	Oct. 11, 2016	Dec. 01, 2016	Oct. 10, 2017	Radiation (03CH02-SZ)
Bilog Antenna	TeseQ	CBL6112D	35407	30MHz~2GHz	May 21, 2016	Dec. 01, 2016	May 20, 2017	Radiation (03CH02-SZ)
Double Ridge Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1285	1GHz~18GHz	Jan. 11, 2016	Dec. 01, 2016	Jan. 10, 2017	Radiation (03CH02-SZ)
SHF-EHF Horn	com-power	AH-840	101071	18GHz~40GHz	Aug. 10, 2016	Dec. 01, 2016	Aug. 09, 2017	Radiation (03CH02-SZ)
Amplifier	HP	8447F	3113A04622	9kHz~1300MHz / 30 dB	Jul. 16, 2016	Dec. 01, 2016	Jul. 15, 2017	Radiation (03CH02-SZ)
HF Amplifier	MITEQ	AMF-7D-00 101800-30-1	1707137	1GHz~18GHz	Oct. 11, 2016	Dec. 01, 2016	Oct. 10, 2017	Radiation (03CH02-SZ)
Amplifier	Agilent	8449B	3008A01023	1GHz~26.5GHz	Oct. 11, 2016	Dec. 01, 2016	Oct. 10, 2017	Radiation (03CH02-SZ)
AC Power Source	Chroma	61601	616010002470	N/A	NCR	Dec. 01, 2016	NCR	Radiation (03CH02-SZ)
Turn Table	Chaintek	T-200	N/A	0~360 degree	NCR	Dec. 01, 2016	NCR	Radiation (03CH02-SZ)
Antenna Mast	Chaintek	MBS-400	N/A	1 m~4 m	NCR	Dec. 01, 2016	NCR	Radiation (03CH02-SZ)

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))	**2.5 dB**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.3 dB**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.7 dB**

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	33.60	33.70	33.30	30.36	30.37	30.13
GPRS class 8	33.59	33.68	33.32	30.34	30.35	30.11
GPRS class 10	30.46	30.25	30.20	27.43	27.56	27.52
GPRS class 11	29.07	28.93	28.99	26.52	26.62	26.43
GPRS class 12	28.72	28.70	28.53	24.00	24.10	23.93
EGPRS class 8	26.39	26.62	26.83	26.14	26.08	25.95
EGPRS class 10	25.39	25.50	25.89	24.50	24.38	24.11
EGPRS class 11	22.97	22.80	22.91	21.87	21.80	21.38
EGPRS class 12	22.78	22.84	22.98	21.08	21.02	20.89

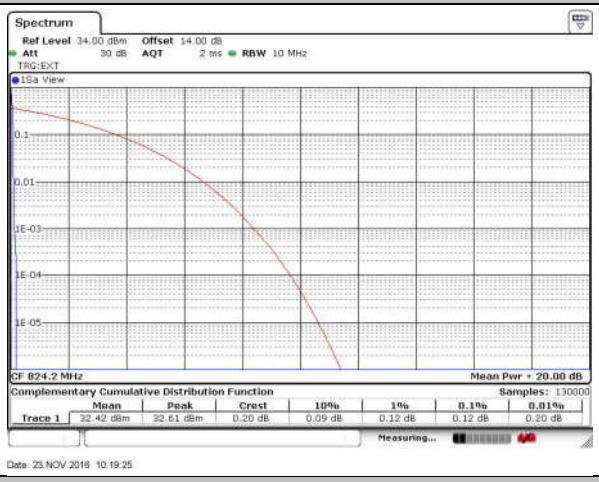
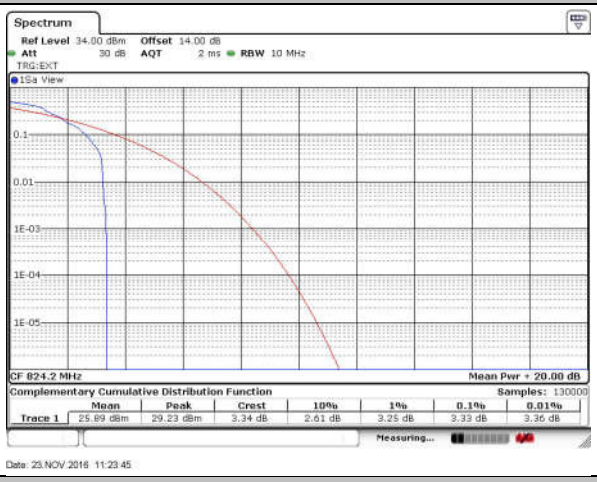
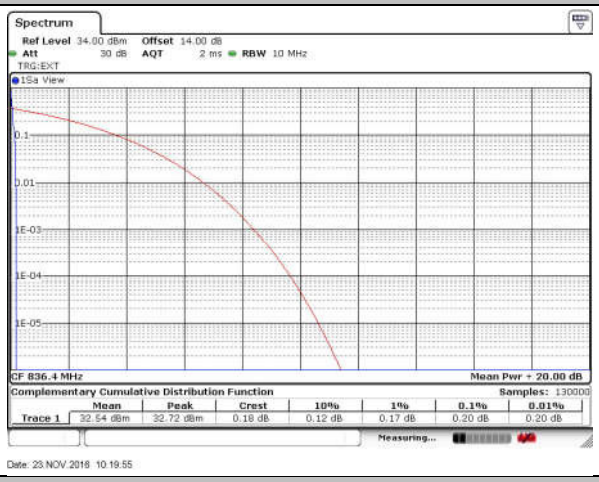
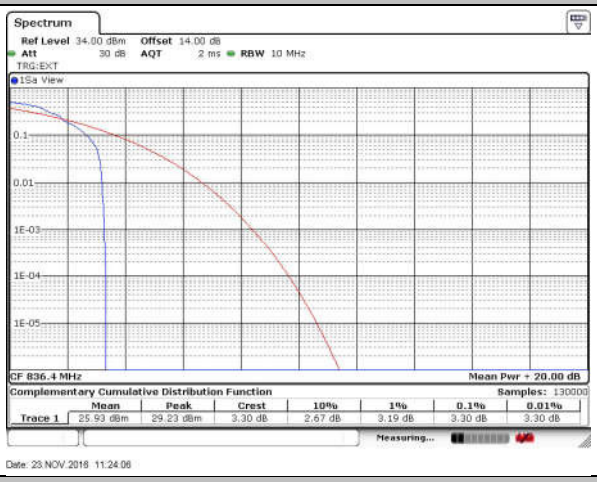
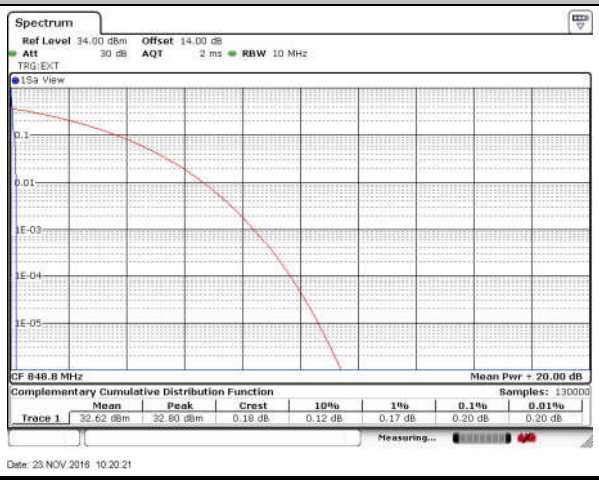
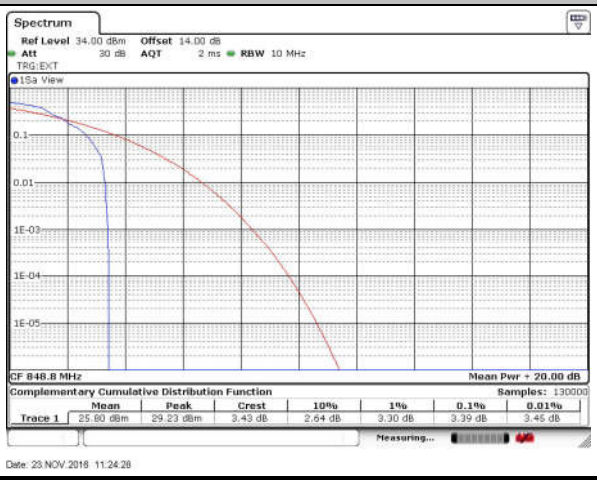
Conducted Power (*Unit: dBm)						
Band	WCDMA Band V			WCDMA Band II		
Channel	4132	4182	4233	9262	9400	9538
Frequency	826.4	836.4	846.6	1852.4	1880	1907.6
AMR 12.2K	24.25	24.27	24.24	24.08	24.00	24.03
RMC 12.2K	24.27	24.29	24.26	24.10	24.01	24.04
HSDPA Subtest-1	23.10	23.02	23.01	22.81	22.75	22.72
HSDPA Subtest-2	23.13	23.13	23.04	22.87	22.84	22.74
HSDPA Subtest-3	22.67	22.68	22.58	22.49	22.40	22.30
HSDPA Subtest-4	22.68	22.69	22.58	22.47	22.40	22.30
HSUPA Subtest-1	22.83	22.35	22.31	22.41	22.73	21.98
HSUPA Subtest-2	22.00	21.98	22.01	21.84	21.45	21.44
HSUPA Subtest-3	21.60	21.59	21.56	21.49	21.48	21.39
HSUPA Subtest-4	22.42	22.15	21.91	22.39	21.72	21.63
HSUPA Subtest-5	22.50	23.00	23.00	22.80	22.70	22.60

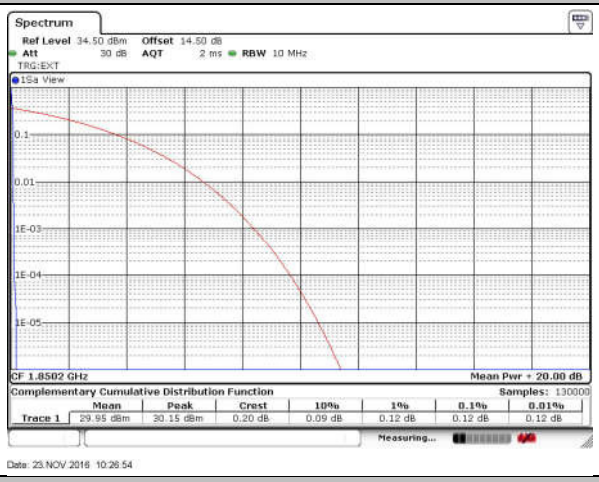
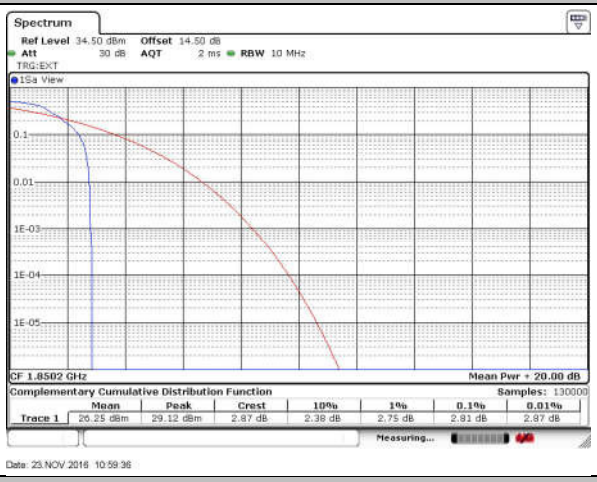
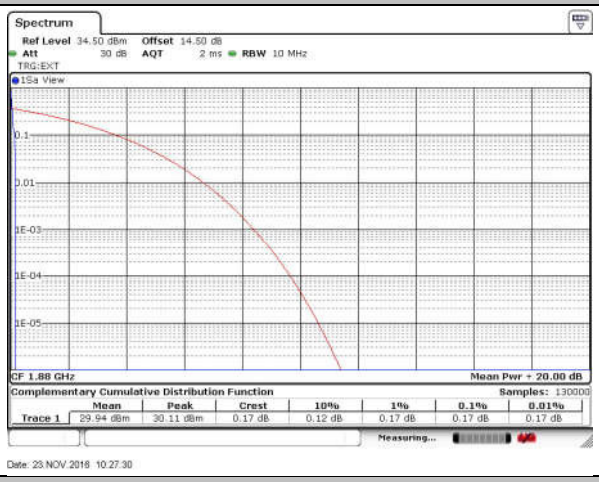
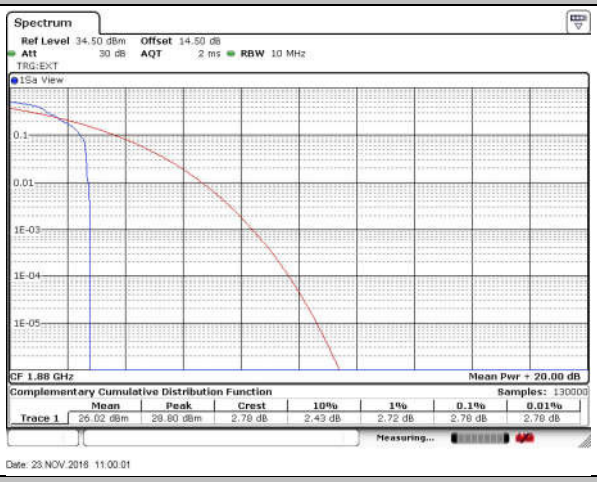
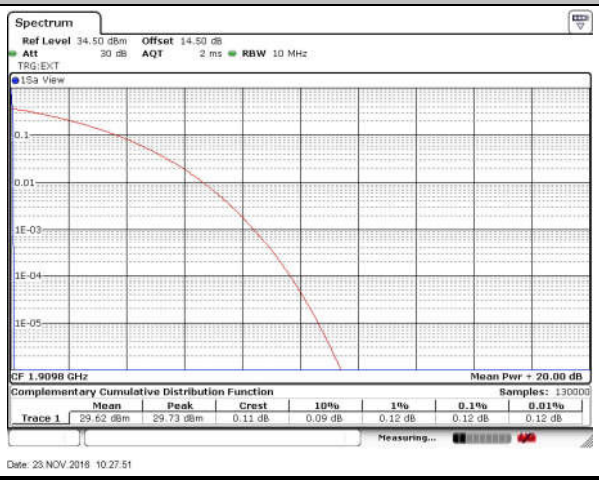
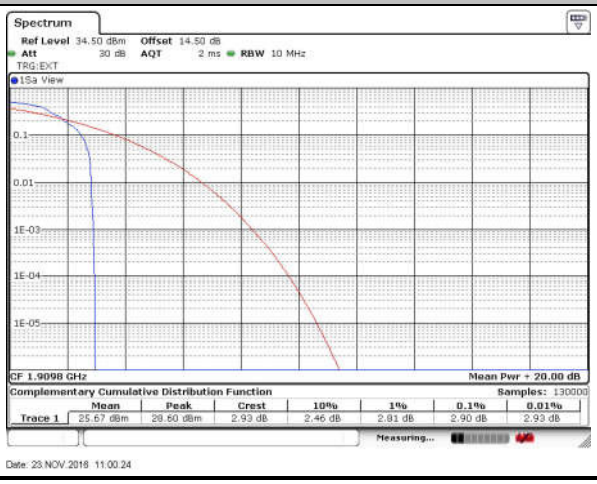
Peak-to-Average Ratio

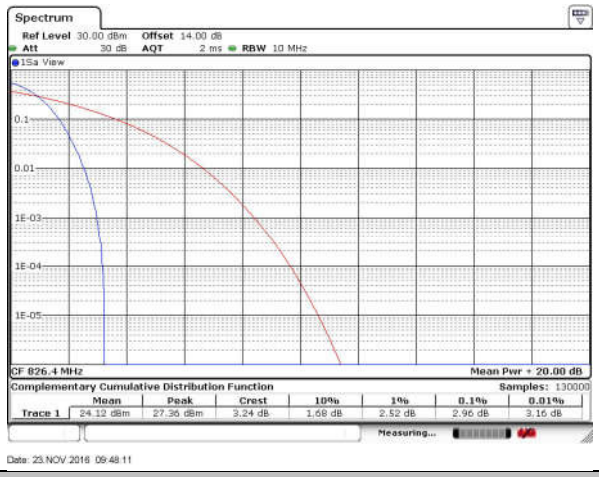
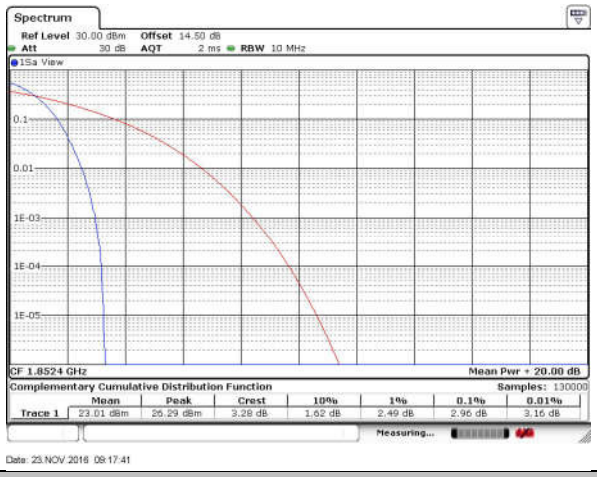
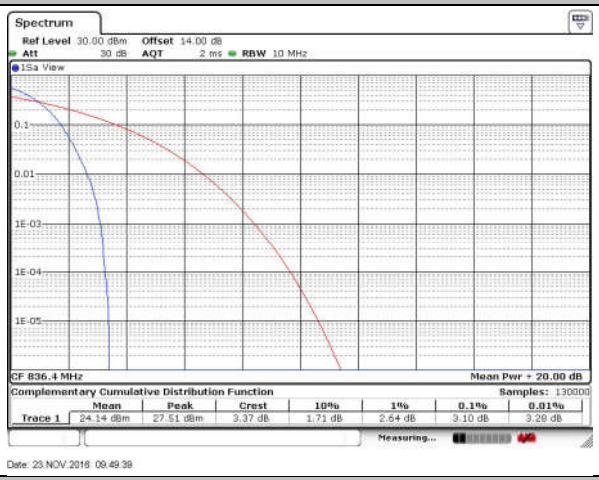
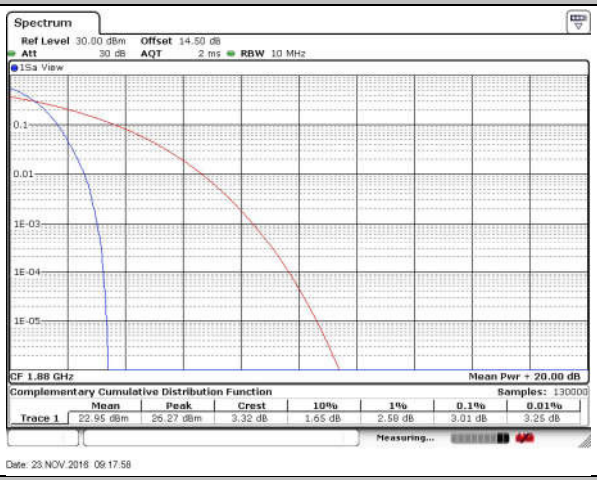
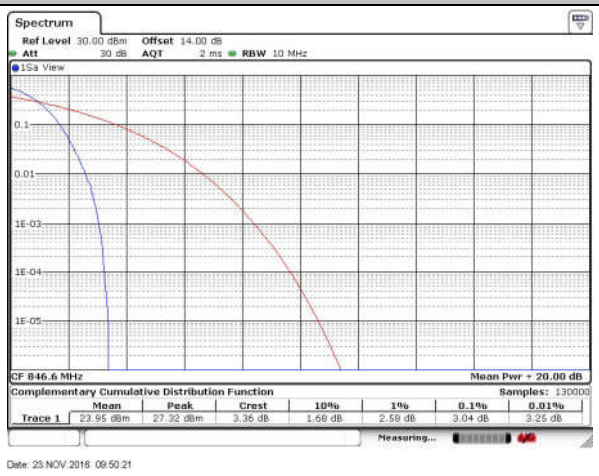
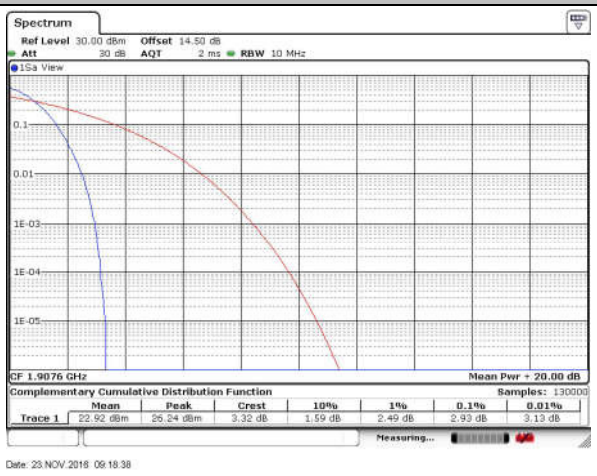
Mode	GSM850(dB)		Limit: 13dB
Mod.	GSM	EDGE class 8	Result
Lowest CH	0.12	3.33	PASS
Middle CH	0.20	3.30	
Highest CH	0.20	3.39	

Mode	GSM1900(dB)		Limit: 13dB
Mod.	GSM	EDGE class 8	Result
Lowest CH	0.12	2.81	PASS
Middle CH	0.17	2.78	
Highest CH	0.12	2.90	

Mode	WCDMA Band V(dB)	WCDMA Band II(dB)	Limit: 13dB
Mod.	RMC 12.2Kbps	RMC 12.2Kbps	Result
Lowest CH	2.96	2.96	PASS
Middle CH	3.10	3.01	
Highest CH	3.04	2.93	

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**
	

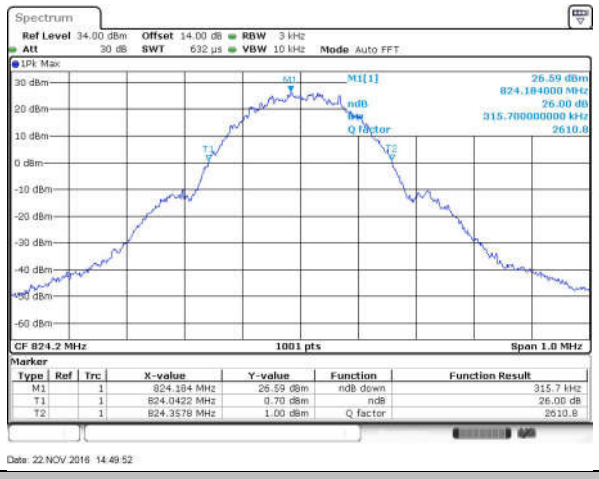
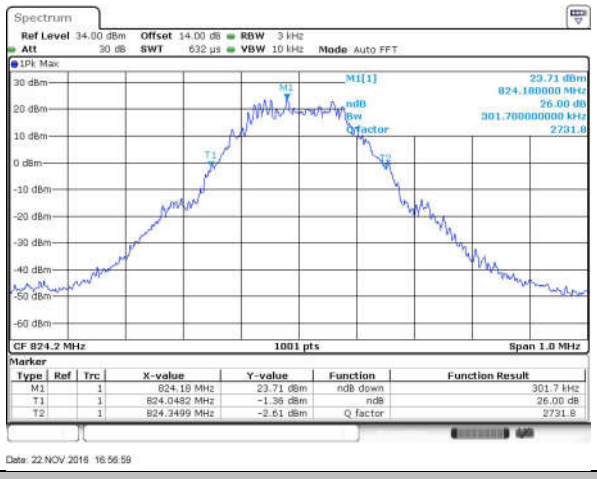
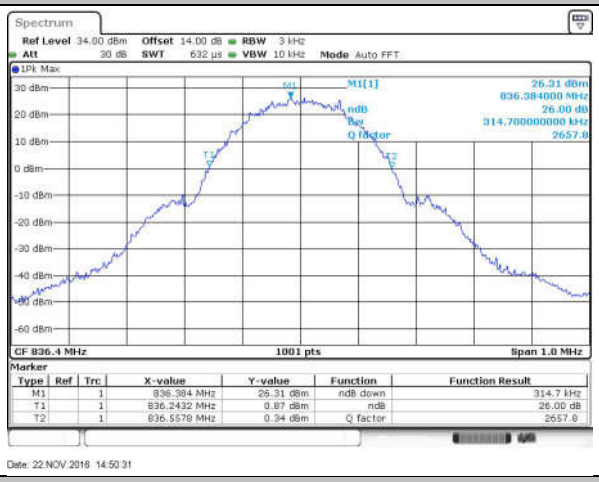
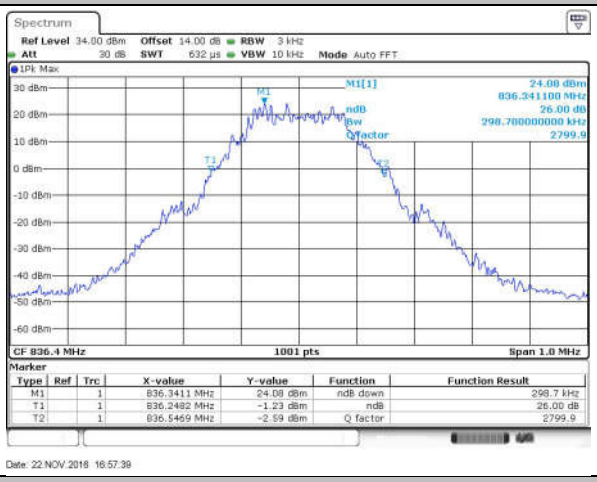
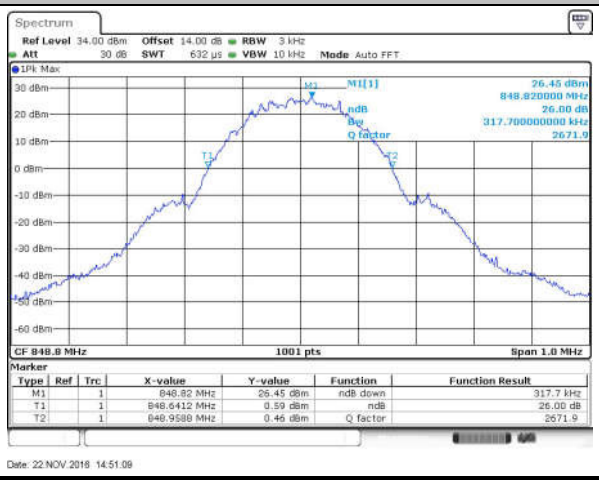
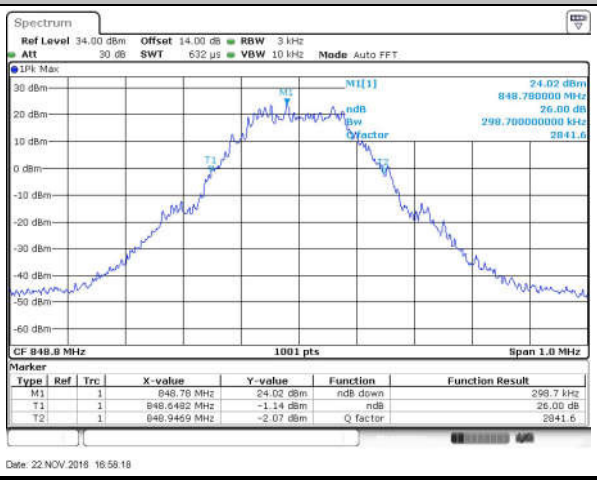
WCDMA Band V (RMC 12.2Kbps)	WCDMA Band II (RMC 12.2Kbps)
Lowest Channel	**Lowest Channel**
	
Middle Channel	**Middle Channel**
	
Highest Channel	**Highest Channel**
	

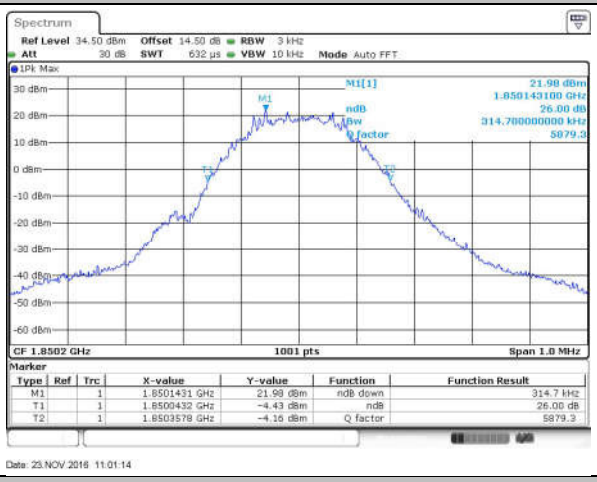
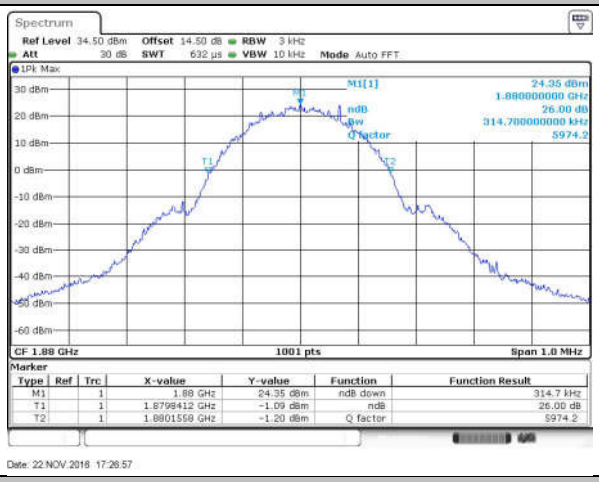
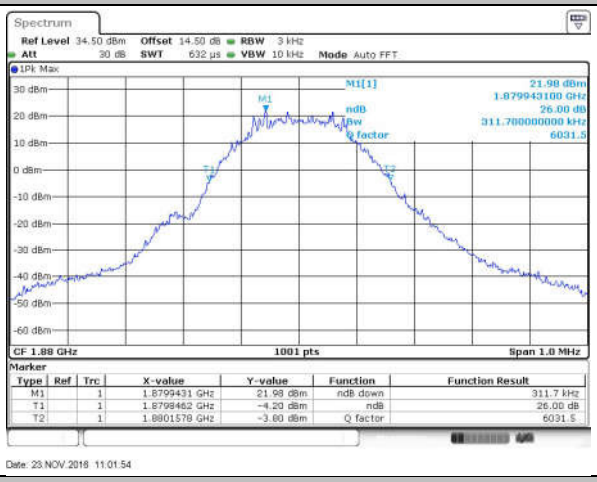
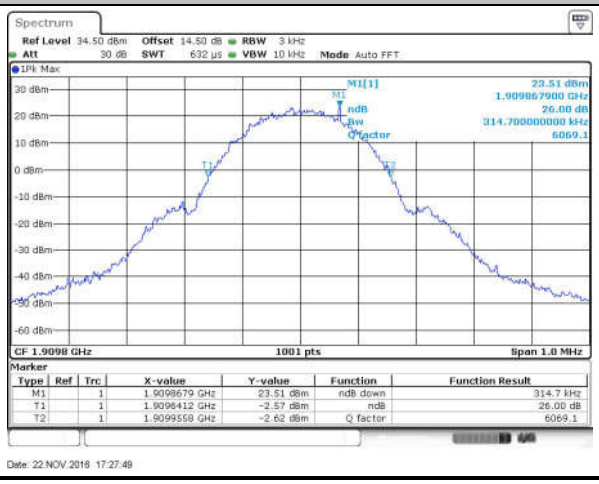
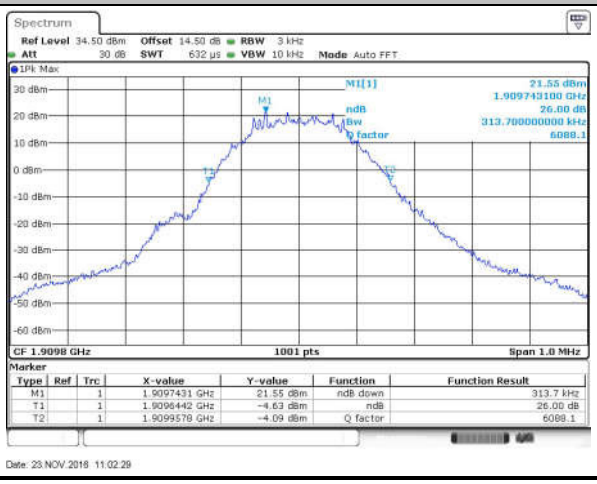
26dB Bandwidth

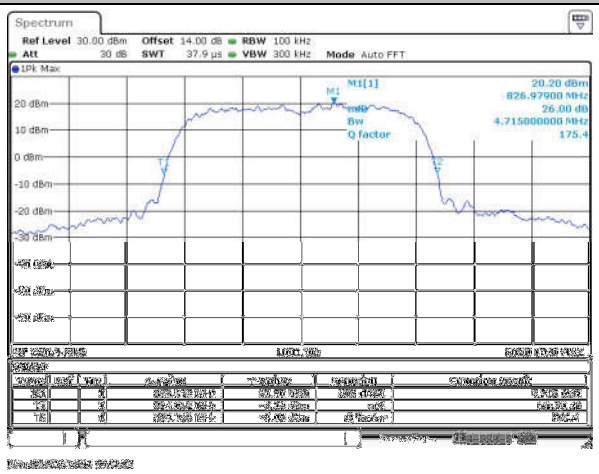
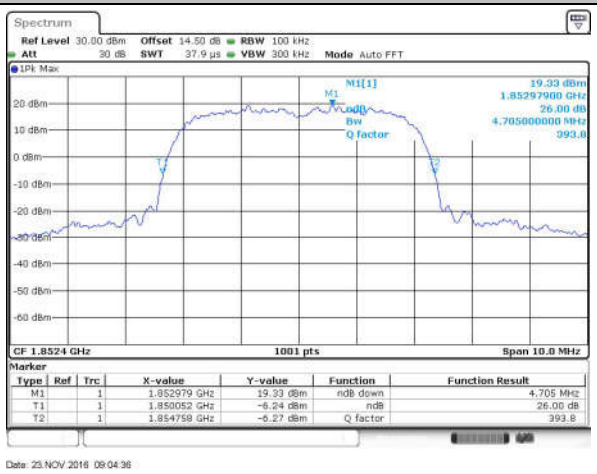
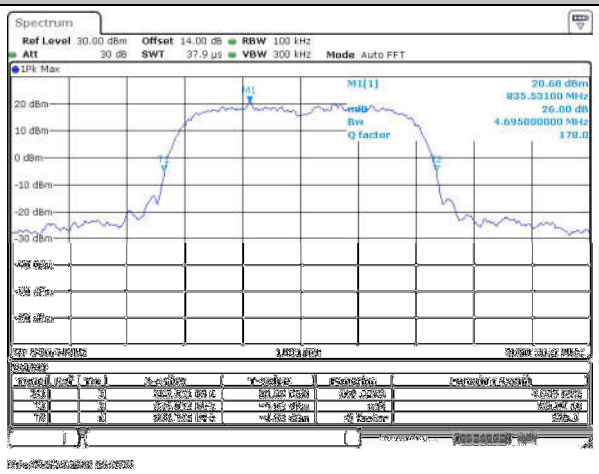
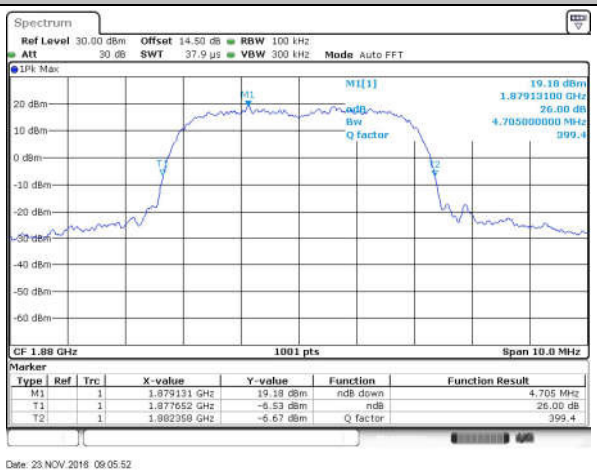
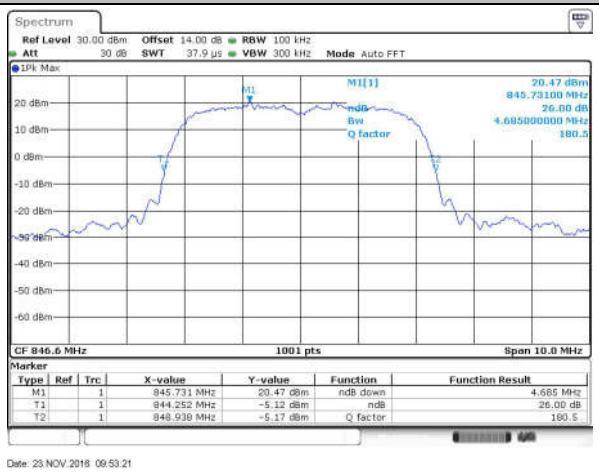
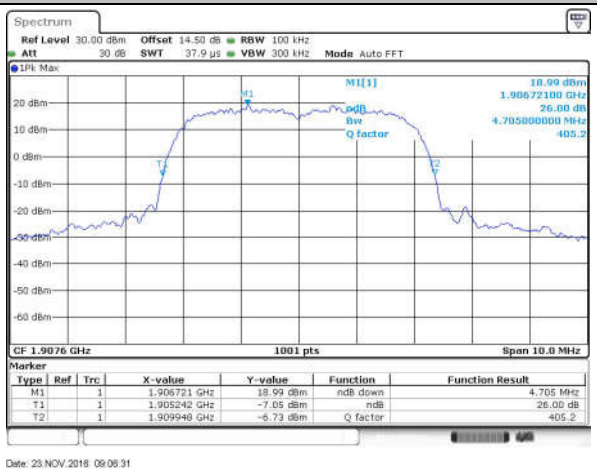
Mode	GSM850(MHz)	
Mod.	GSM	EDGE class 8
Lowest CH	0.316	0.302
Middle CH	0.315	0.299
Highest CH	0.318	0.299

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

Mode	WCDMA Band V(MHz)	WCDMA Band II(MHz)
Mod.	RMC 12.2Kbps	RMC 12.2Kbps
Lowest CH	4.72	4.71
Middle CH	4.70	4.71
Highest CH	4.69	4.71

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**
	

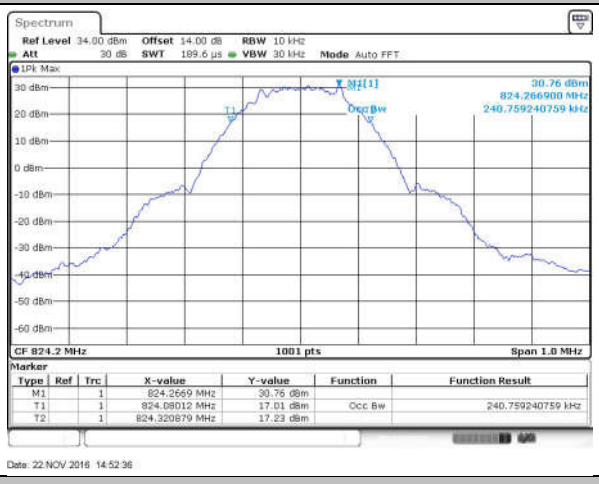
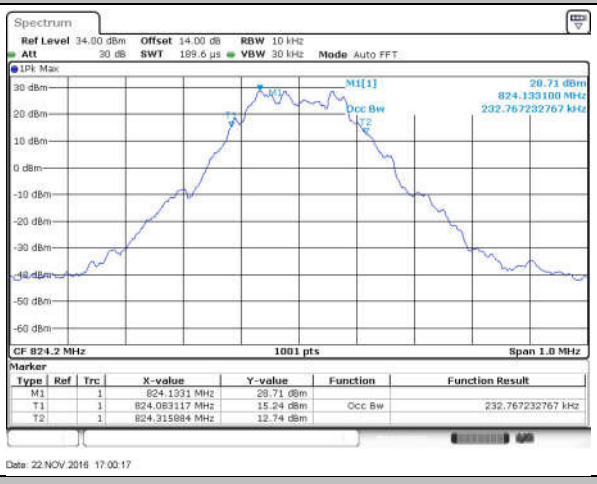
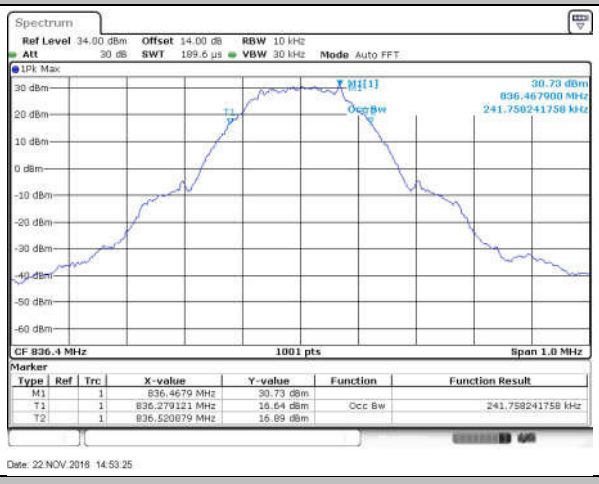
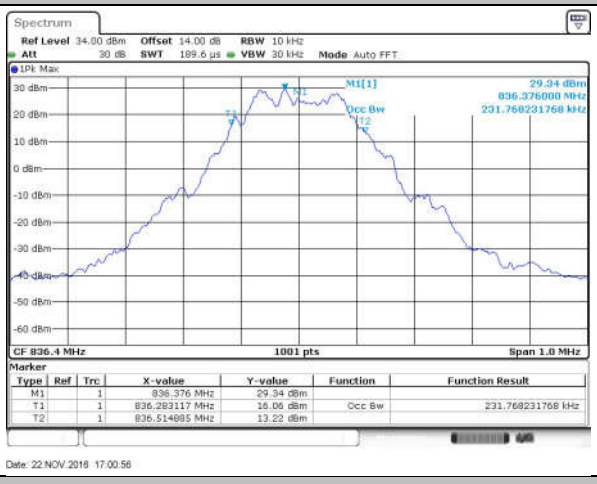
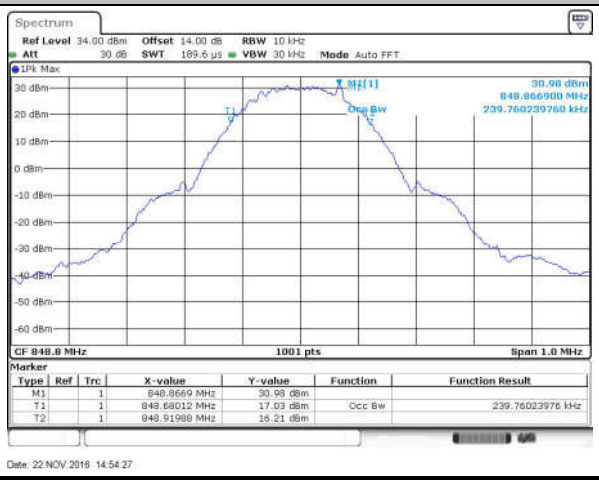
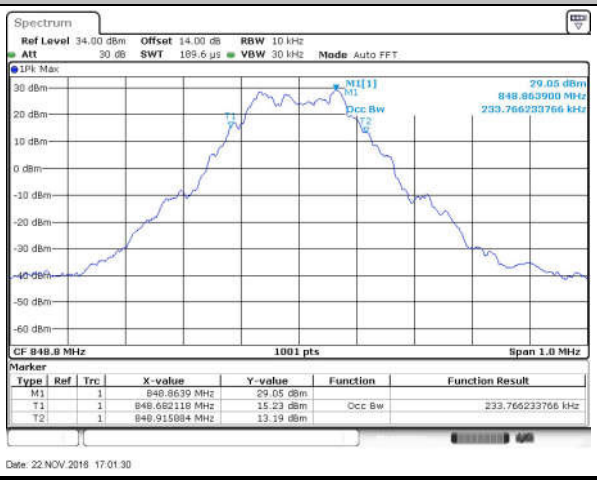
WCDMA Band V (RMC 12.2Kbps)	WCDMA Band II (RMC 12.2Kbps)
Lowest Channel	**Lowest Channel**
	
Middle Channel	**Middle Channel**
	
Highest Channel	**Highest Channel**
	

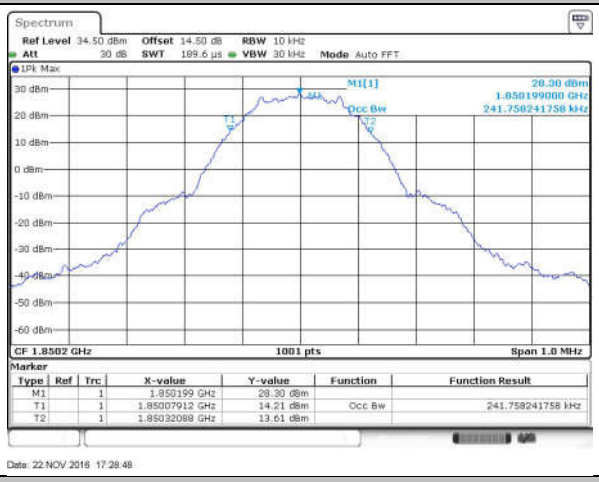
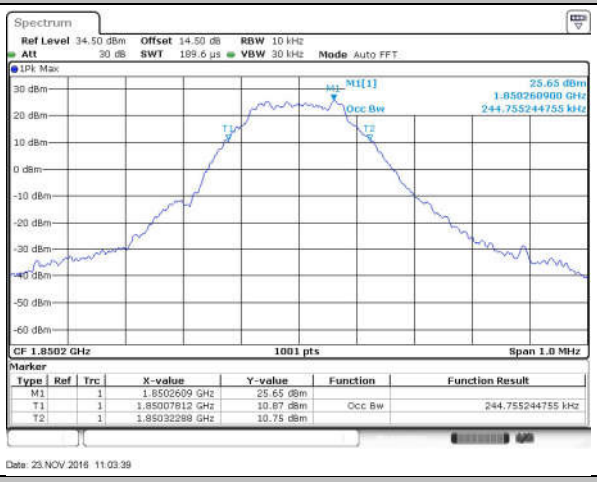
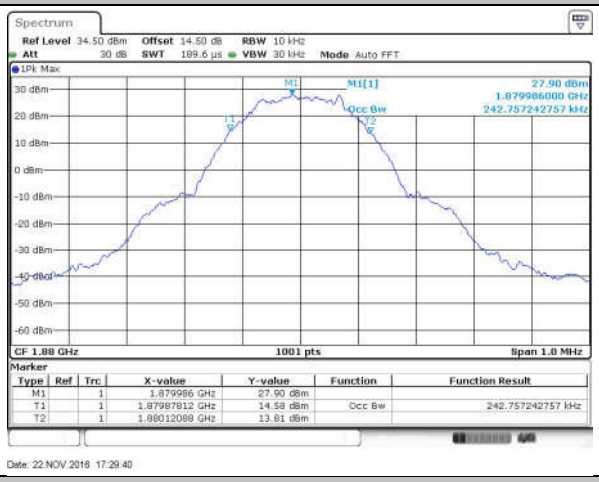
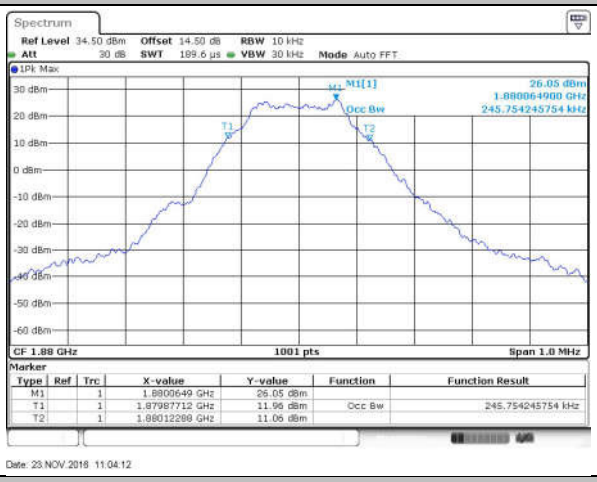
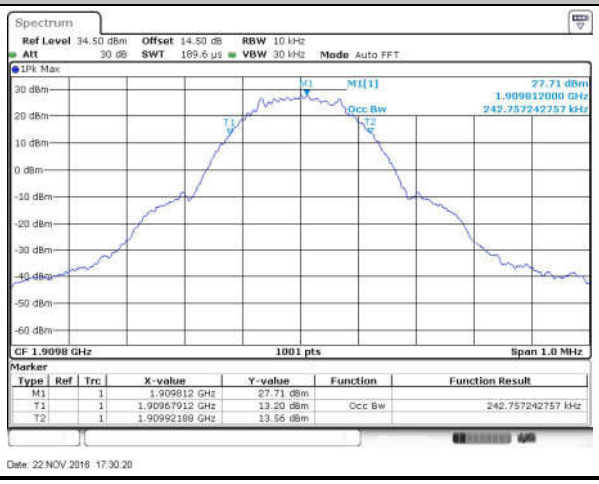
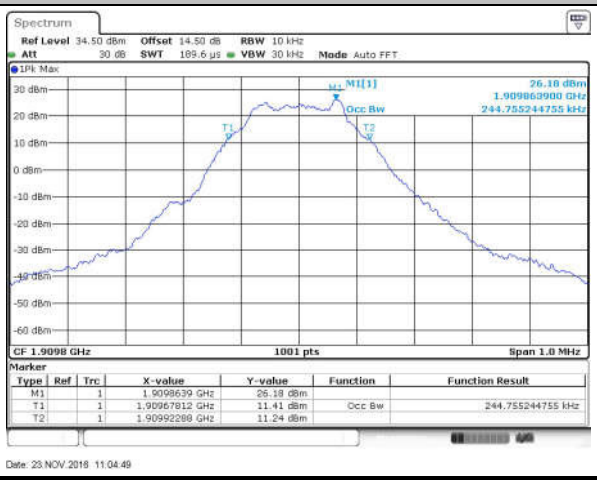
Occupied Bandwidth

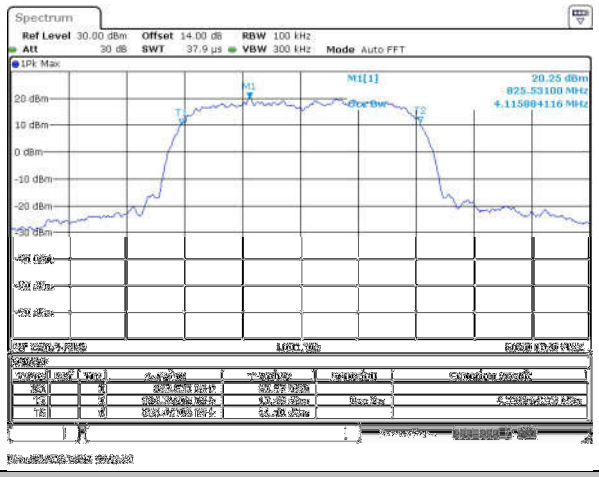
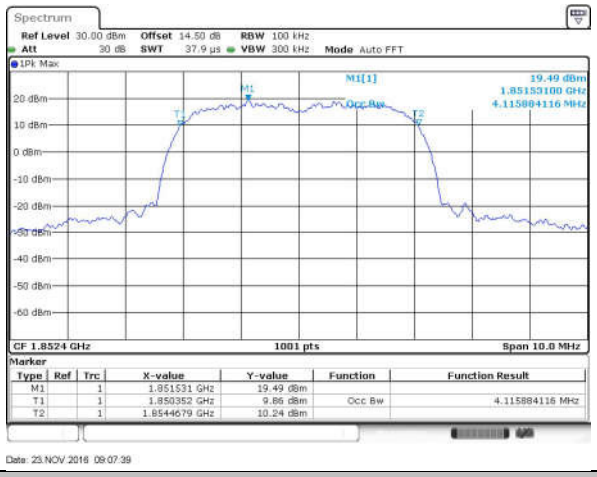
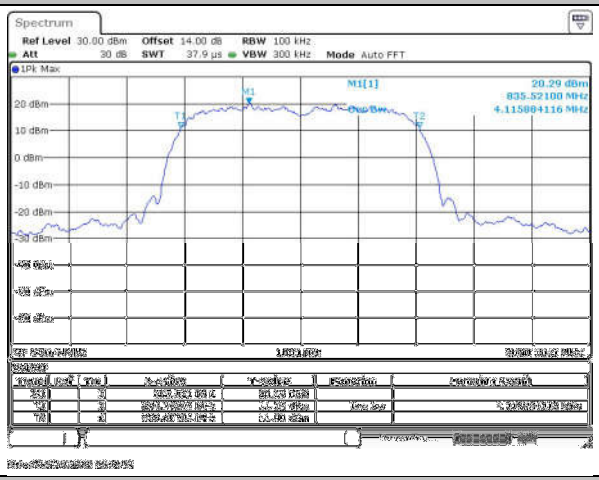
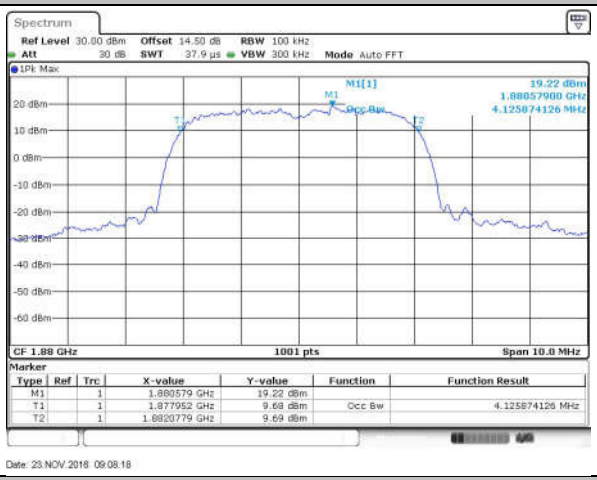
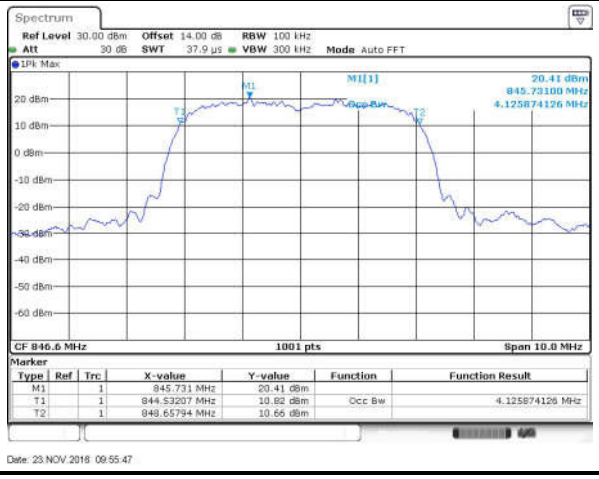
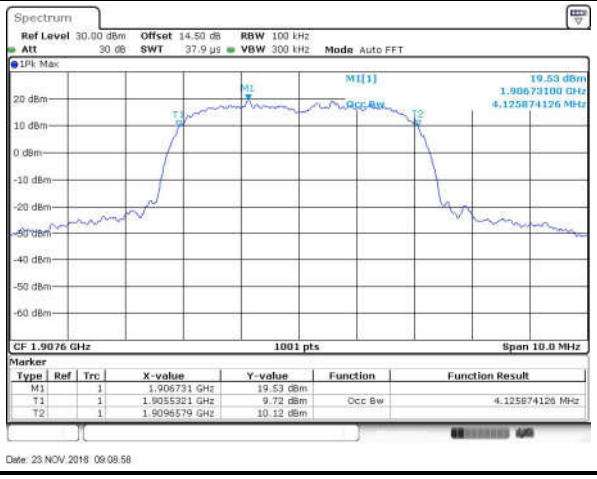
Mode	GSM850(MHz)	
Mod.	GSM	EDGE class 8
Lowest CH	0.241	0.233
Middle CH	0.242	0.232
Highest CH	0.240	0.234

Mode	GSM1900(MHz)	
Mod.	GSM	EDGE class 8
Lowest CH	0.242	0.245
Middle CH	0.243	0.246
Highest CH	0.243	0.245

Mode	WCDMA Band V(MHz)	WCDMA Band II(MHz)
Mod.	RMC 12.2Kbps	RMC 12.2Kbps
Lowest CH	4.12	4.12
Middle CH	4.12	4.13
Highest CH	4.13	4.13

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

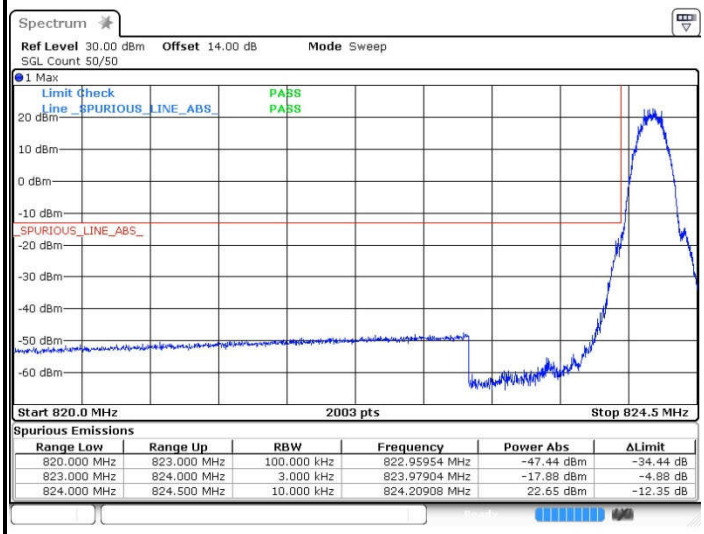
GSM1900 (GSM)	GSM1900 (EDGE class 8)
Lowest Channel	**Lowest Channel**
	
Middle Channel	**Middle Channel**
	
Highest Channel	**Highest Channel**
	

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

GSM850 (GSM)

Lowest Band Edge

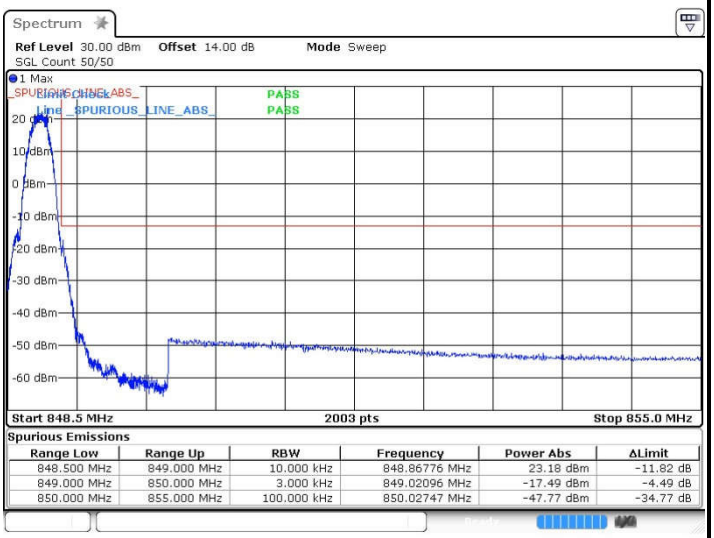


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
820.000 MHz	823.000 MHz	100.000 kHz	822.95954 MHz	-47.44 dBm	-34.44 dB
823.000 MHz	824.000 MHz	3.000 kHz	823.97904 MHz	-17.88 dBm	-4.88 dB
824.000 MHz	824.500 MHz	10.000 kHz	824.20908 MHz	22.65 dBm	-12.35 dB

Date: 22.NOV.2016 16:24:13

Highest Band Edge



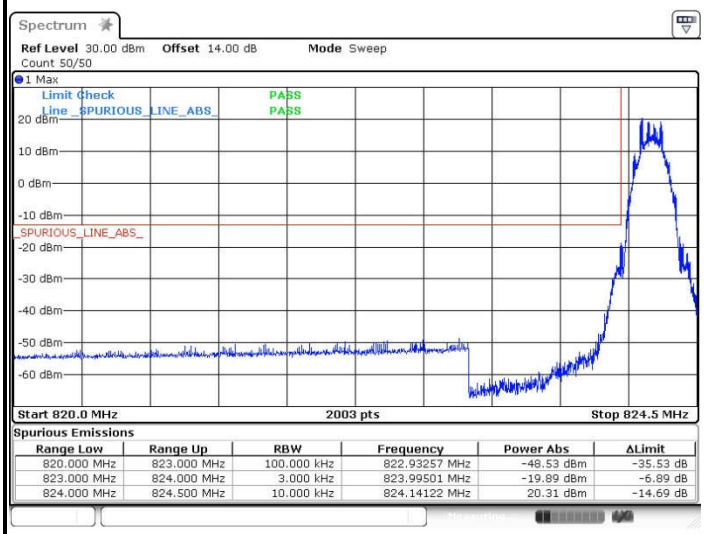
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
848.500 MHz	849.000 MHz	10.000 kHz	848.86776 MHz	23.18 dBm	-11.82 dB
849.000 MHz	850.000 MHz	3.000 kHz	849.02096 MHz	-17.49 dBm	-4.49 dB
850.000 MHz	855.000 MHz	100.000 kHz	850.02747 MHz	-47.77 dBm	-34.77 dB

Date: 22.NOV.2016 16:44:04

GSM850 (EDGE class 8)

Lowest Band Edge

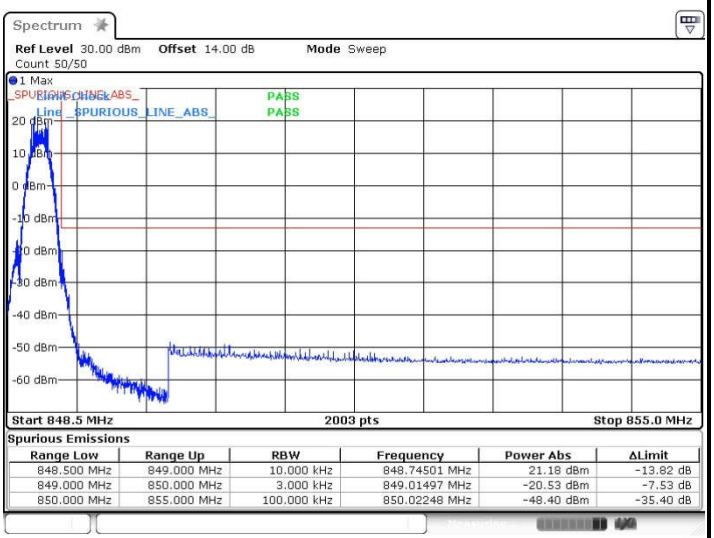


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
820.000 MHz	823.000 MHz	100.000 kHz	822.93257 MHz	-48.53 dBm	-35.53 dB
823.000 MHz	824.000 MHz	3.000 kHz	823.99501 MHz	-19.89 dBm	-6.89 dB
824.000 MHz	824.500 MHz	10.000 kHz	824.14122 MHz	20.31 dBm	-14.69 dB

Date: 22.NOV.2016 17:05:39

Highest Band Edge



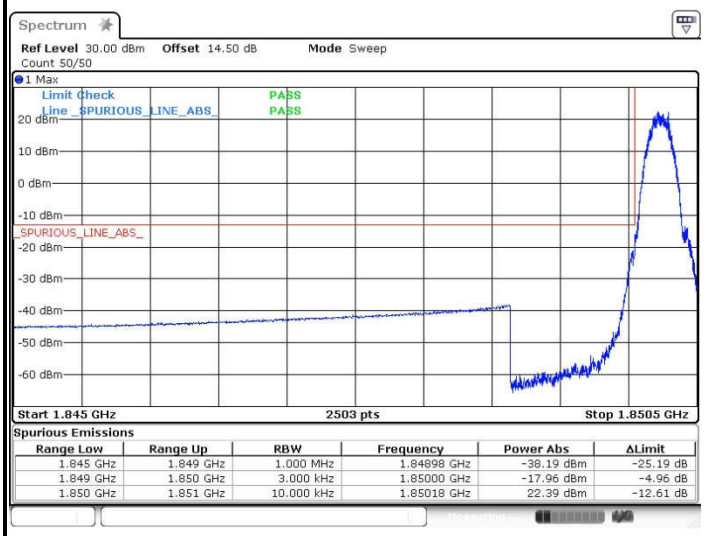
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
848.500 MHz	849.000 MHz	10.000 kHz	848.74501 MHz	21.18 dBm	-13.82 dB
849.000 MHz	850.000 MHz	3.000 kHz	849.01497 MHz	-20.53 dBm	-7.53 dB
850.000 MHz	855.000 MHz	100.000 kHz	850.02248 MHz	-48.40 dBm	-35.40 dB

Date: 22.NOV.2016 17:08:02

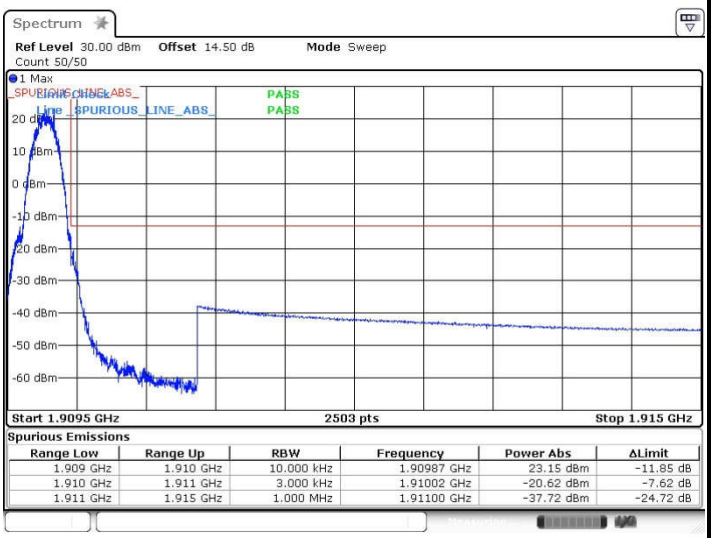
GSM1900 (GSM)

Lowest Band Edge



Date: 23.NOV.2016 10:38:13

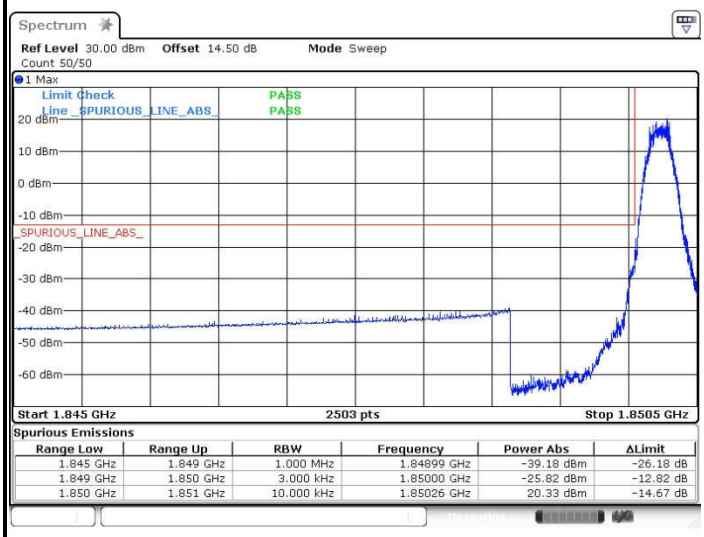
Highest Band Edge



Date: 23.NOV.2016 10:40:24

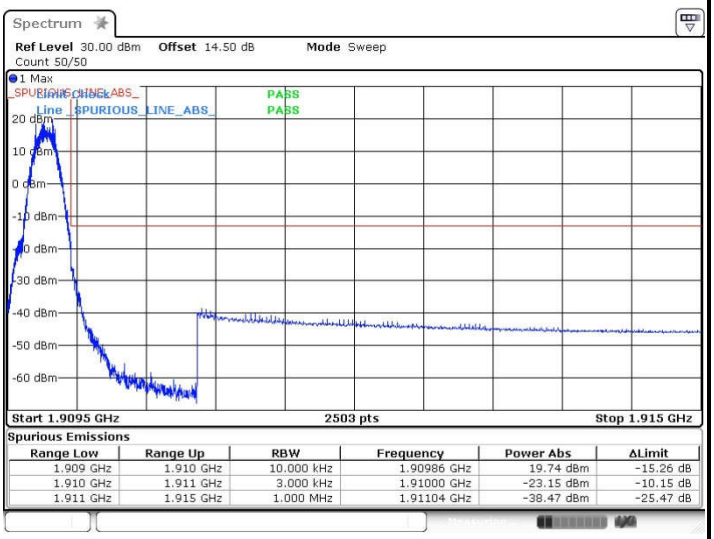
GSM1900 (EDGE class 8)

Lowest Band Edge

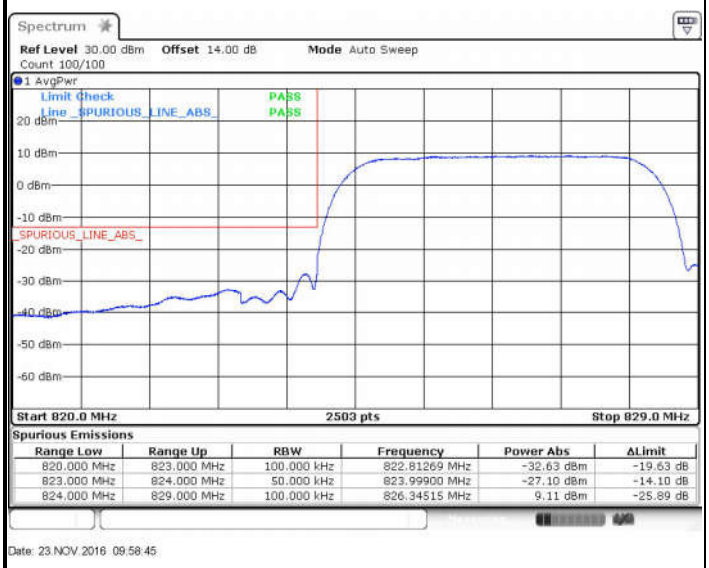
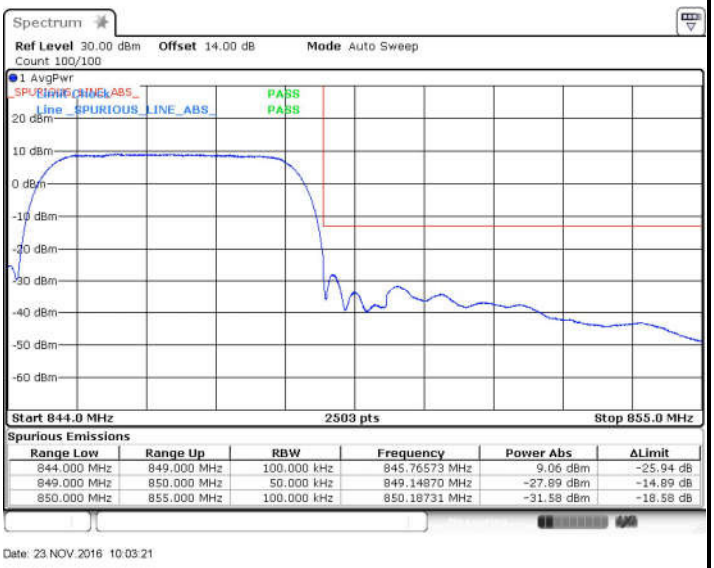


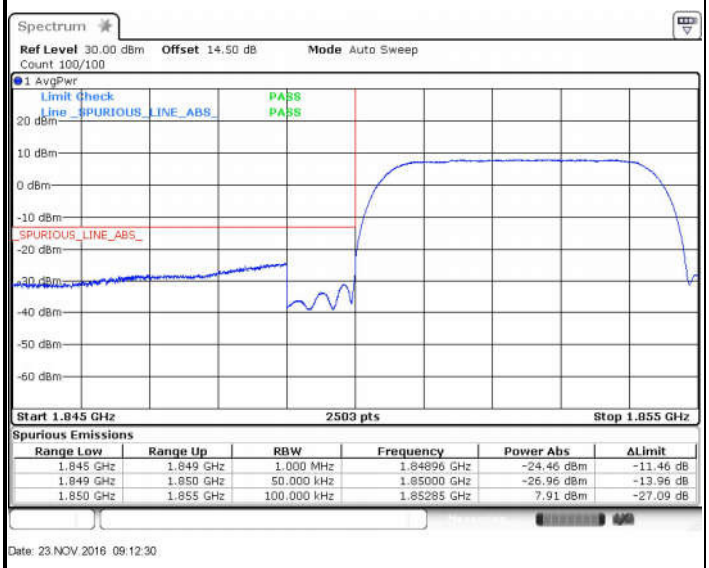
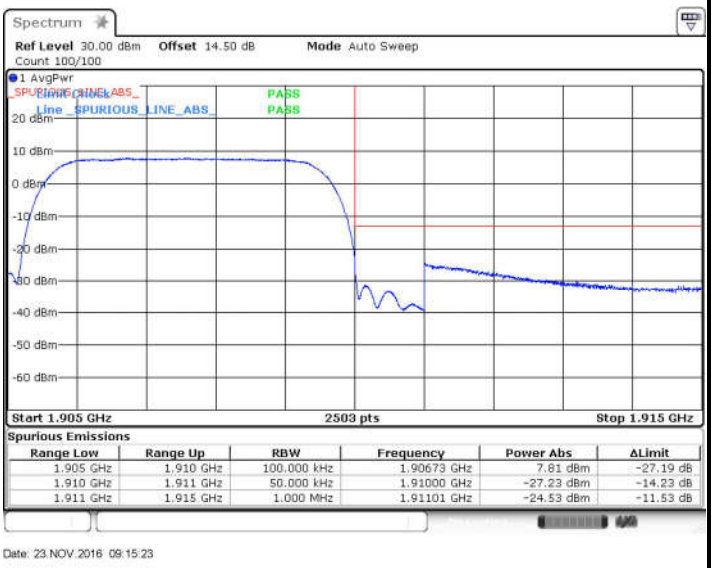
Date: 23.NOV.2016 11:10:17

Highest Band Edge

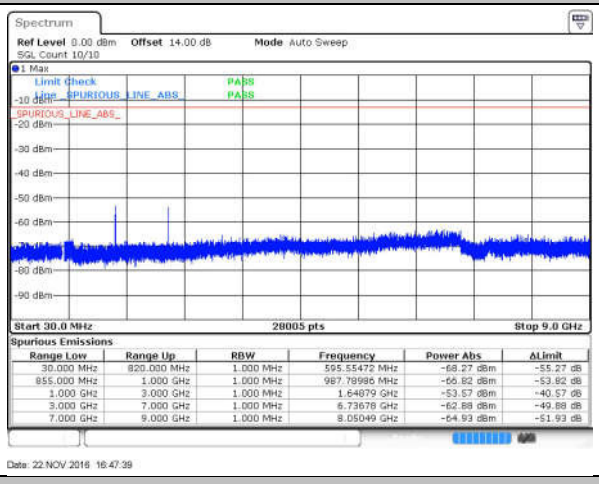
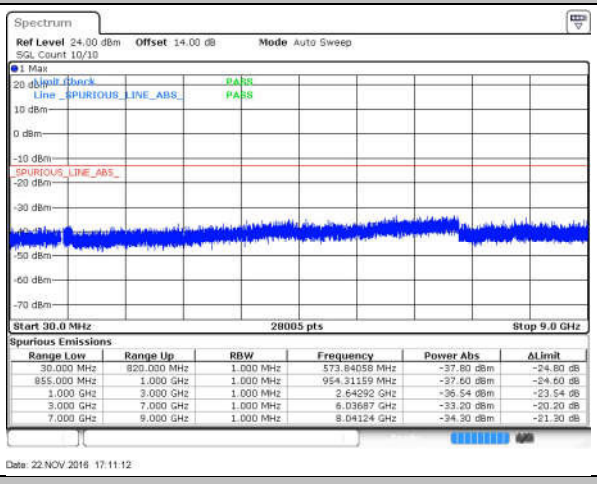
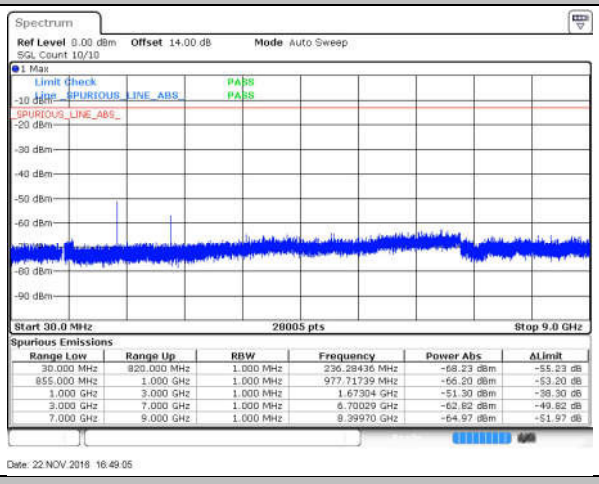
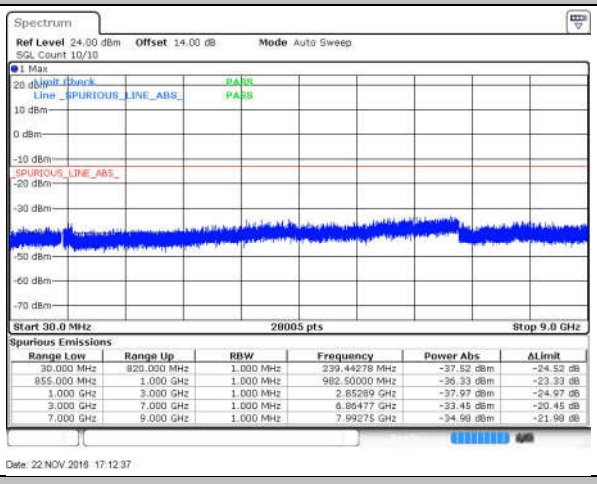
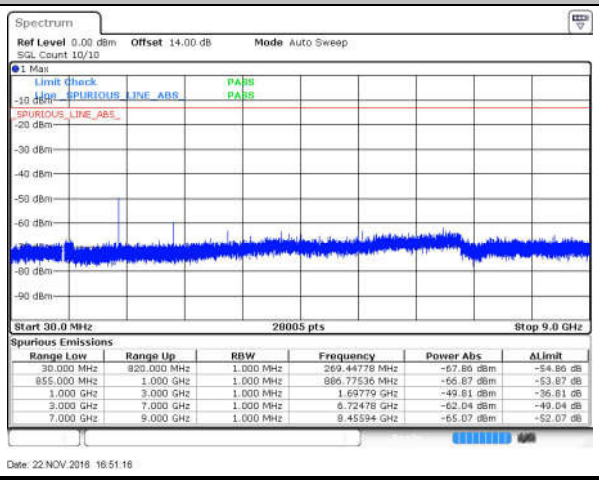
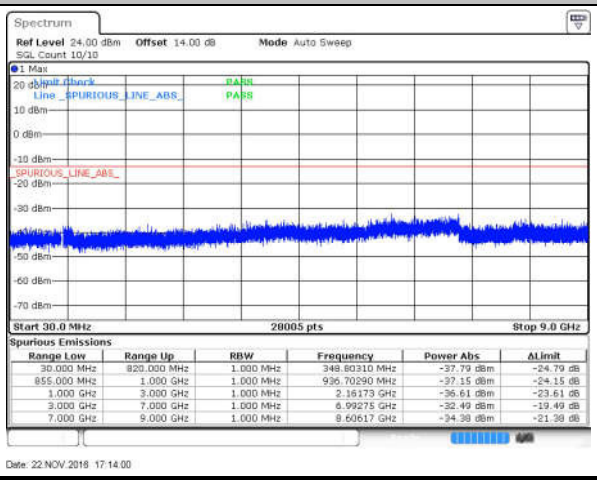


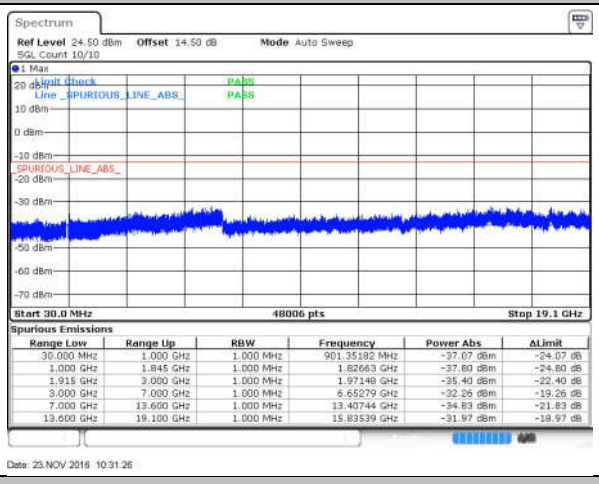
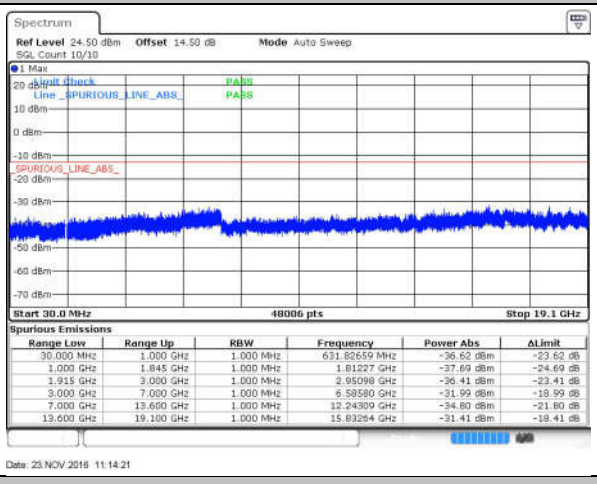
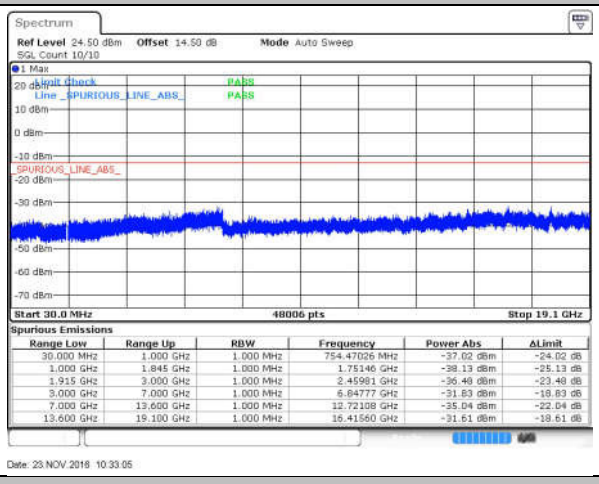
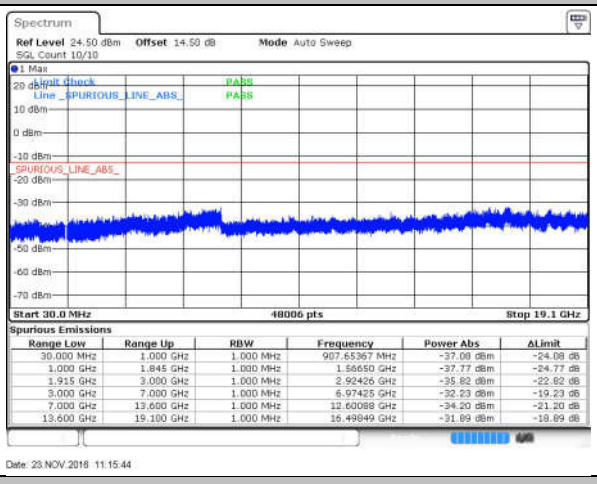
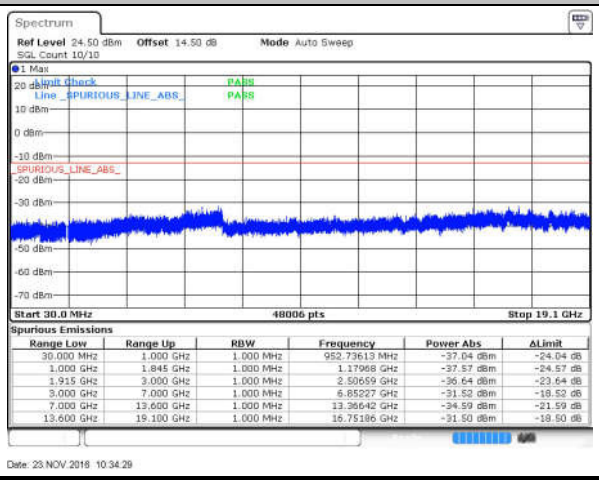
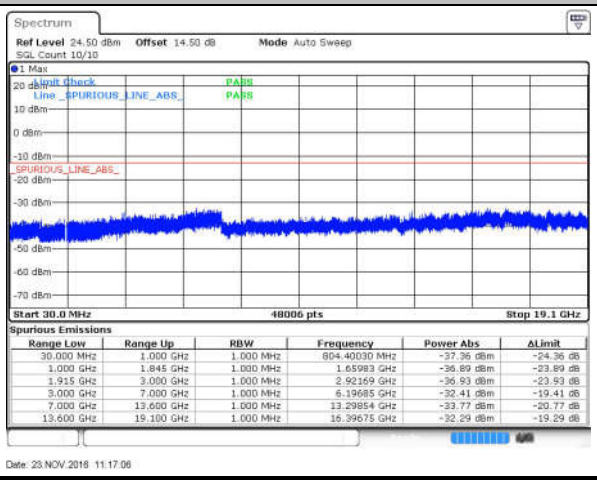
Date: 23.NOV.2016 11:12:03

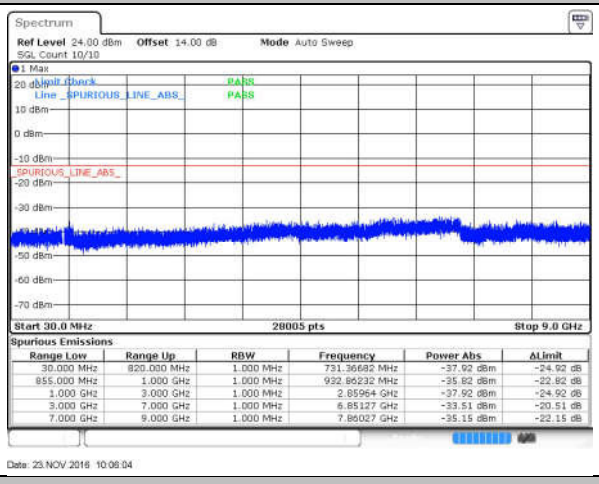
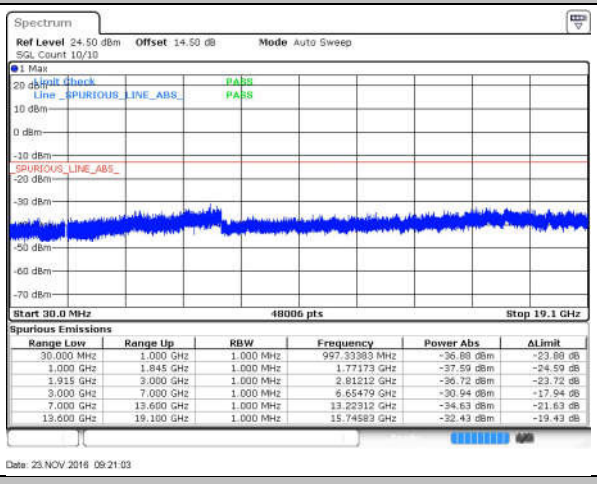
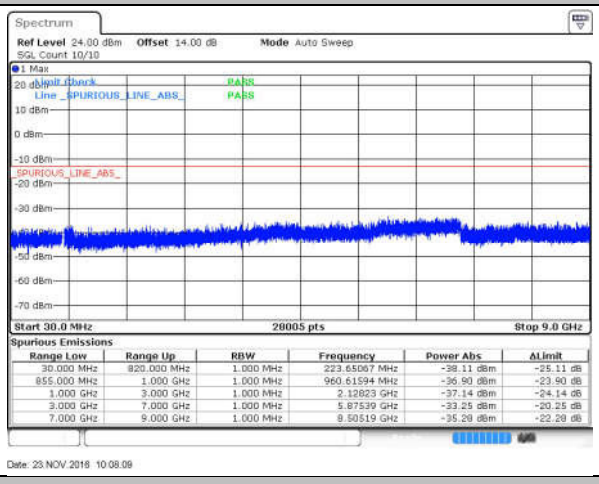
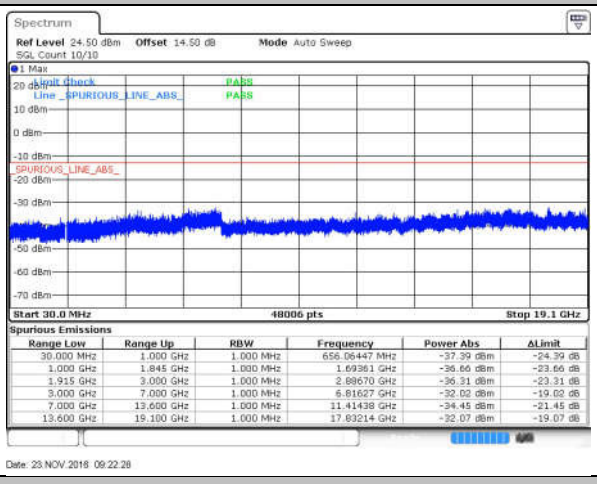
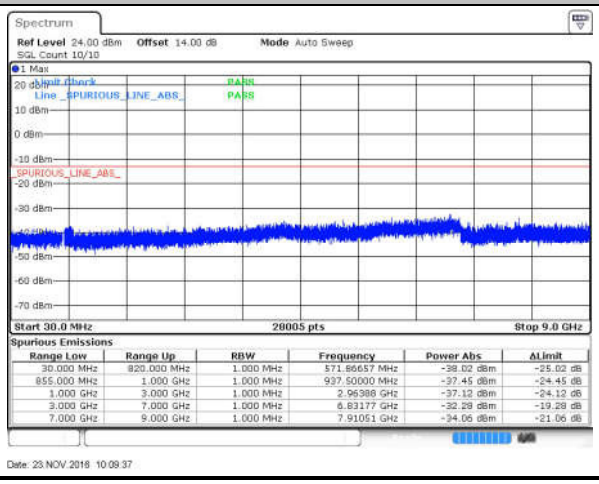
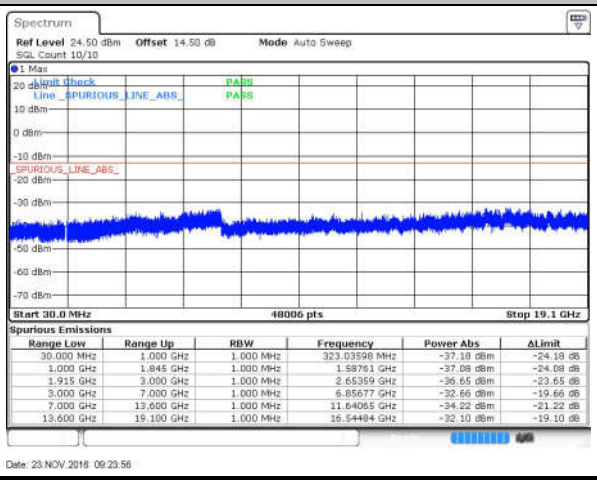
WCDMA Band V (RMC 12.2Kbps)	
Lowest Band Edge	**Highest Band Edge**
	

WCDMA Band II (RMC 12.2Kbps)	
Lowest Band Edge	**Highest Band Edge**
	

Conducted Spurious Emission

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**
	

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

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	0.0012	0.0072	PASS
40	Normal Voltage	0.0287	0.0036	
30	Normal Voltage	0.0036	0.0012	
20(Ref.)	Normal Voltage	0.0000	0.0000	
10	Normal Voltage	0.0012	0.0036	
0	Normal Voltage	0.0311	0.0012	
-10	Normal Voltage	0.0024	0.0526	
-20	Normal Voltage	0.0060	0.0024	
-30	Normal Voltage	0.0275	0.0048	
20	Maximum Voltage	0.0024	0.0036	
20	Normal Voltage	0.0000	0.0000	
20	Battery End Point	0.0012	0.0072	

Test Conditions	Middle Channel	GSM1900 (GSM)	GSM1900 (EDGE class 8)	Limit Note 2.
Temperature (°C)	Voltage (Volt)	Deviation (ppm)		Result
50	Normal Voltage	0.0053	0.0005	PASS
40	Normal Voltage	0.0037	0.0011	
30	Normal Voltage	0.0016	0.0255	
20(Ref.)	Normal Voltage	0.0000	0.0000	
10	Normal Voltage	0.0027	0.0234	
0	Normal Voltage	0.0011	0.0016	
-10	Normal Voltage	0.0000	0.0261	
-20	Normal Voltage	0.0239	0.0005	
-30	Normal Voltage	0.0202	0.0016	
20	Maximum Voltage	0.0027	0.0016	
20	Normal Voltage	0.0000	0.0000	
20	Battery End Point	0.0037	0.0027	

Note:

1. Normal Voltage = 3.85V. ；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.

Test Conditions	Middle Channel	WCDMA Band V (RMC 12.2Kbps)	Limit 2.5ppm
Temperature (°C)	Voltage (Volt)	Deviation (ppm)	Result
50	Normal Voltage	0.0012	PASS
40	Normal Voltage	0.0000	
30	Normal Voltage	0.0012	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0096	
0	Normal Voltage	0.0012	
-10	Normal Voltage	0.0143	
-20	Normal Voltage	0.0012	
-30	Normal Voltage	0.0096	
20	Maximum Voltage	0.0012	
20	Normal Voltage	0.0000	
20	Battery End Point	0.0024	

Test Conditions	Middle Channel	WCDMA Band II (RMC 12.2Kbps)	Limit Note 2.
Temperature (°C)	Voltage (Volt)	Deviation (ppm)	Result
50	Normal Voltage	0.0005	PASS
40	Normal Voltage	0.0176	
30	Normal Voltage	0.0165	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0011	
0	Normal Voltage	0.0191	
-10	Normal Voltage	0.0181	
-20	Normal Voltage	0.0000	
-30	Normal Voltage	0.0197	
20	Maximum Voltage	0.0016	
20	Normal Voltage	0.0000	
20	Battery End Point	0.0011	

Note:

1. Normal Voltage = 3.85V. ；Battery End Point (BEP) = 3.55V.；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	28.49	0.7063	27.53	0.5662
Middle		28.71	0.7430	21.83	0.1524
Highest		28.55	0.7161	22.83	0.1919
Lowest	GSM850 EDGE class 8	22.53	0.1791	13.79	0.0239
Middle		21.83	0.1524	14.48	0.0281
Highest		21.59	0.1442	15.20	0.0331
Lowest	WCDMA Band V RMC 12.2Kbps	20.57	0.1140	12.39	0.0173
Middle		21.10	0.1288	13.00	0.0200
Highest		21.37	0.1371	13.11	0.0205
Limit	ERP < 7W	Result		PASS	

Channel	Mode	Horizontal		Vertical	
		EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	GSM1900 GSM	28.55	0.7161	29.04	0.8017
Middle		27.02	0.5035	27.56	0.5702
Highest		26.32	0.4285	26.33	0.4295
Lowest	GSM1900 EDGE class 8	26.29	0.4256	25.90	0.3890
Middle		25.08	0.3221	25.23	0.3334
Highest		23.78	0.2388	24.62	0.2897
Lowest	WCDMA Band II RMC 12.2Kbps	22.90	0.1950	23.37	0.2173
Middle		22.00	0.1585	22.37	0.1726
Highest		20.66	0.1164	20.74	0.1186
Limit	EIRP < 2W	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	1672.8	-27.54	-13	-14.54	-34.67	-34.23	0.56	9.40	H
	2509.2	-30.46	-13	-17.46	-41.85	-38.17	0.74	10.60	H
	3345.6	-42.69	-13	-29.69	-55.97	-52.29	0.85	12.60	H
	4182	-49.67	-13	-36.67	-66.08	-59.23	0.89	12.60	H
	5018.4	-46.04	-13	-33.04	-65.37	-55.65	0.94	12.70	H
	5854.8	-48.72	-13	-35.72	-68.51	-58.46	1.11	13.00	H
	6691.2	-47.13	-13	-34.13	-68.27	-55.46	1.22	11.70	H
	7527.6	-42.33	-13	-29.33	-65.92	-49.79	1.69	11.30	H
	1672.8	-25.82	-13	-12.82	-32.95	-32.51	0.56	9.40	V
	2509.2	-27.43	-13	-14.43	-38.42	-35.14	0.74	10.60	V
	3345.6	-38.98	-13	-25.98	-52.49	-48.58	0.85	12.60	V
	4182	-46.74	-13	-33.74	-63.39	-56.30	0.89	12.60	V
	5018.4	-43.63	-13	-30.63	-63.80	-53.24	0.94	12.70	V
	5854.8	-47.07	-13	-34.07	-67.73	-56.81	1.11	13.00	V
	6691.2	-48.09	-13	-35.09	-69.97	-56.42	1.22	11.70	V
	7527.6	-44.49	-13	-31.49	-68.13	-51.95	1.69	11.30	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	1672.8	-51.33	-13	-38.33	-58.46	-58.02	0.56	9.40	H
	2509.2	-51.64	-13	-38.64	-63.03	-59.35	0.74	10.60	H
	3345.6	-54.08	-13	-41.08	-67.36	-63.68	0.85	12.60	H
	1672.8	-52.80	-13	-39.80	-59.93	-59.49	0.56	9.40	V
	2509.2	-49.85	-13	-36.85	-60.84	-57.56	0.74	10.60	V
	3345.6	-54.58	-13	-41.58	-68.09	-64.18	0.85	12.60	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	3760	-42.49	-13	-29.49	-57.77	-48.53	6.56	12.60	H
	5640	-32.02	-13	-19.02	-51.37	-37.12	8.00	13.10	H
	7520	-46.04	-13	-33.04	-69.63	-47.77	9.57	11.30	H
	3760	-45.00	-13	-32.00	-60.55	-51.04	6.56	12.6	V
	5640	-45.08	-13	-32.08	-65	-50.18	8.00	13.1	V
	7520	-44.89	-13	-31.89	-68.53	-46.62	9.57	11.3	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	3760	-42.06	-13	-29.06	-57.34	-48.10	6.56	12.60	H
	5640	-45.46	-13	-32.46	-64.81	-50.56	8.00	13.10	H
	7520	-44.76	-13	-31.76	-68.35	-46.49	9.57	11.30	H
	3760	-45.35	-13	-32.35	-60.9	-51.39	6.56	12.6	V
	5640	-46.90	-13	-33.90	-66.82	-52.00	8.00	13.1	V
	7520	-45.29	-13	-32.29	-68.93	-47.02	9.57	11.3	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	1672.8	-56.26	-13	-43.26	-63.39	-62.95	0.56	9.40	H
	2509.2	-55.67	-13	-42.67	-67.06	-63.38	0.74	10.60	H
	3345.6	-54.02	-13	-41.02	-67.30	-63.62	0.85	12.60	H
	1672.8	-57.75	-13	-44.75	-64.88	-64.44	0.56	9.40	V
	2509.2	-55.23	-13	-42.23	-66.22	-62.94	0.74	10.60	V
	3345.6	-54.27	-13	-41.27	-67.78	-63.87	0.85	12.60	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	3760	-46.51	-13	-33.51	-61.79	-52.55	6.56	12.60	H
	5640	-49.58	-13	-36.58	-68.93	-54.68	8.00	13.10	H
	7520	-46.20	-13	-33.20	-69.79	-47.93	9.57	11.30	H
	3760	-44.52	-13	-31.52	-60.07	-50.56	6.56	12.6	V
	5640	-48.81	-13	-35.81	-68.73	-53.91	8.00	13.1	V
	7520	-45.64	-13	-32.64	-69.28	-47.37	9.57	11.3	V

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