FCC RF Test Report

APPLICANT	:	ZTE CORPORATION
EQUIPMENT	:	LTE/WCDMA/GSM(GPRS) Dual-Mode Digital Mobile Phone
BRAND NAME	:	ZTE
MODEL NAME	:	Z833
FCC ID	:	SRQ-Z833
STANDARD	:	FCC 47 CFR Part 2, 22(H), 24(E), 27(L)
CLASSIFICATION	:	PCS Licensed Transmitter Held to Ear (PCE)

The product was received on Jul. 04, 2016 and testing was completed on Aug. 03, 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.

Prepared by: Ken Chen / Manager

Approved by: Jones Tsai / Manager

Testing Laboratory
2353

SPORTON INTERNATIONAL (SHENZHEN) INC.

1F & 2F, Building A, Morning Business Center, No. 4003 ShiGu Rd., Xili Town, Nanshan District, Shenzhen, Guangdong, P. R. China

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG670403A	Rev. 01	Initial issue of report	Aug. 19, 2016

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.4	§2.1046	Conducted Output Power	Reporting Only	PASS	-
	§22.913(a)(2)	Effective Radiated Power	< 7 Watts	PASS	-
	§24.232(c)	Equivalent Isotropic Radiated Power	< 2 Watts	PASS	-
	§27.50(d)(4)	Equivalent Isotropic Radiated Power	< 1 Watts	PASS	-
3.5	§24.232(d)	Peak-to-Average Ratio	< 13 dB	PASS	-
3.6	§2.1049 §22.917(b) §24.238(b) §27.53(g)	Occupied Bandwidth	Reporting Only	PASS	-
3.7	§2.1051 §22.917(a) §24.238(a) §27.53(h)	Band Edge Measurement	< 43+10log10(P[Watts])	PASS	-
3.8	§2.1051 §22.917(a) §24.238(a) §27.53(h)	Conducted Emission	< 43+10log10(P[Watts])	PASS	-
3.9	§2.1055 §22.355	Frequency Stability for Temperature & Voltage	< 2.5 ppm for Part 22	PASS	-
	§2.1055 §24.235 §27.54		Within Authorized Band		
4.4	§22.913(a)(2)	Effective Radiated Power	< 7 Watts	PASS	-
	§24.232(c)	Equivalent Isotropic Radiated Power	< 2 Watts	PASS	-
	§27.50(d)(4)	Equivalent Isotropic Radiated Power	< 1 Watts	PASS	-
4.5	§2.1053 §22.917(a) §24.238(a) §27.53(h)	Field Strength of Spurious Radiation	< 43+10log10(P[Watts])	PASS	Under limit 30.42 dB at 3465.200 MHz

1 General Description

1.1 Applicant

ZTE CORPORATION

ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

1.2 Manufacturer

ZTE CORPORATION

ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	LTE/WCDMA/GSM(GPRS) Dual-Mode Digital Mobile Phone
Brand Name	ZTE
Model Name	Z833
FCC ID	SRQ-Z833
EUT supports Radios application	GSM/GPRS/EGPRS/WCDMA/HSPA/ HSPA+(16QAM uplink is not supported)/LTE/ WLAN 2.4GHz 802.11b/g/n HT20 Bluetooth v3.0 + EDR/Bluetooth v4.0 LE
IMEI Code	Conducted: 004401783975184 Radiation: 004401783976554 ERP/EIRP: N/A
HW Version	Z833HW1.0
SW Version	Z833_MPCSV1.0.0B04
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 Band IV: 1712.4 MHz ~ 1752.6 MHz
Rx Frequency	**GSM/GPRS/EDGE:** 850: 869.2 MHz ~ 893.8 MHz 1900: 1930.2 MHz ~ 1989.8 MHz **WCDMA:** Band V: 871.4 MHz ~ 891.6 MHz Band II: 1932.4 MHz ~ 1987.6 MHz Band IV: 2112.4 MHz ~ 2152.6 MHz
Maximum Output Power to Antenna	**GSM/GPRS/EDGE:** 850: 32.92 dBm 1900: 30.18 dBm **WCDMA:** Band V: 23.13 dBm Band II: 22.93 dBm Band IV: 23.09 dBm
Antenna Type	PIFA Antenna
Type of Modulation	GSM: GMSK GPRS: GMSK EDGE: GMSK / 8PSK WCDMA : QPSK (Uplink) HSDPA/DC-HSDPA : QPSK (Uplink) HSUPA : QPSK (Uplink) HSPA+ : 16QAM (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	0.8340	0.0143 ppm	243KGXW
Part 22	GSM850 EDGE class 8	8PSK	0.1881	0.0084 ppm	237KG7W
Part 22	WCDMA Band V RMC 12.2Kbps	QPSK	0.1070	0.0191 ppm	4M15F9W
Part 24	GSM1900 GSM	GMSK	0.8261	0.0080 ppm	245KGXW
Part 24	GSM1900 EDGE class 8	8PSK	0.3217	0.0037 ppm	240KG7W
Part 24	WCDMA Band II RMC 12.2Kbps	QPSK	0.1892	0.0179 ppm	4M13F9W
Part 27	WCDMA Band IV RMC 12.2Kbps	QPSK	0.2849	0.0085 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.**
	03CH03-SZ	565805

1.8 Applicable Standards

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

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

Remark:

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

2 Test Configuration of Equipment Under Test

2.1 Test Mode

Antenna port conducted and radiated test items were performed according to KDB 971168 D01 Power Meas. License Digital Systems v02r02 with maximum output power.

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

Radiated emissions were investigated as following frequency range:

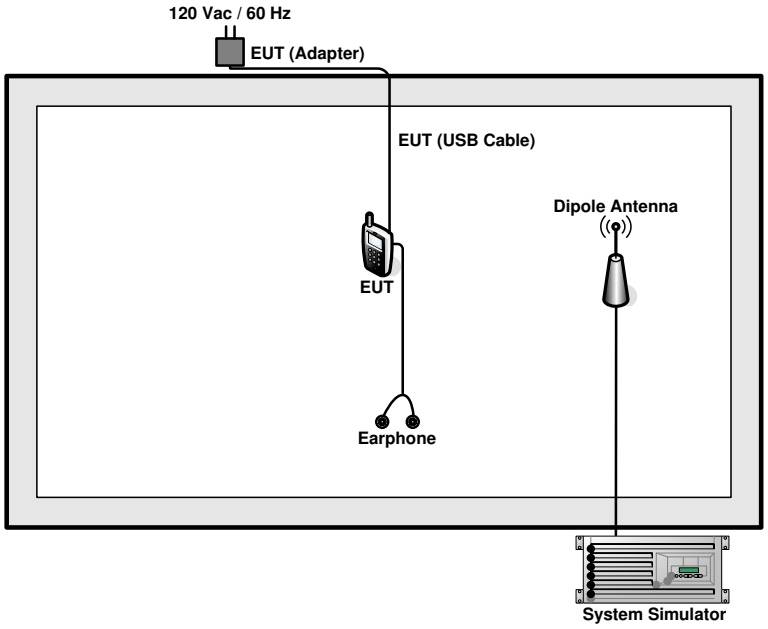
1. 30 MHz to 9000 MHz for GSM850 and WCDMA Band V.
2. 30 MHz to 18000 MHz for WCDMA Band IV.
3. 30 MHz to 19100 MHz for GSM1900 and WCDMA Band II.

All modes and data rates and positions were investigated.

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

Test Modes		
Band	**Radiated TCs**	**Conducted TCs**
GSM 850	■ GSM Link ■ EDGE class 8 Link	■ GSM 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
WCDMA Band IV	■ 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	GPD-2303S	N/A	N/A	Unshielded, 1.8 m
3.	Earphone	Apple	N/A	N/A	Shielded, 1.0 m	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 4.5 dB and a 10dB attenuator.

Example :

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

= 4.5 + 10 = 14.5 (dB)

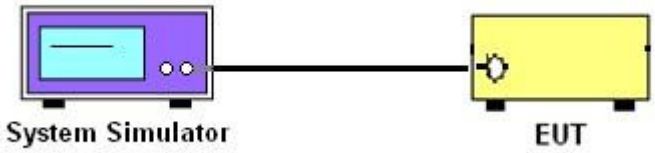
3 Conducted Test Result

3.1 Measuring Instruments

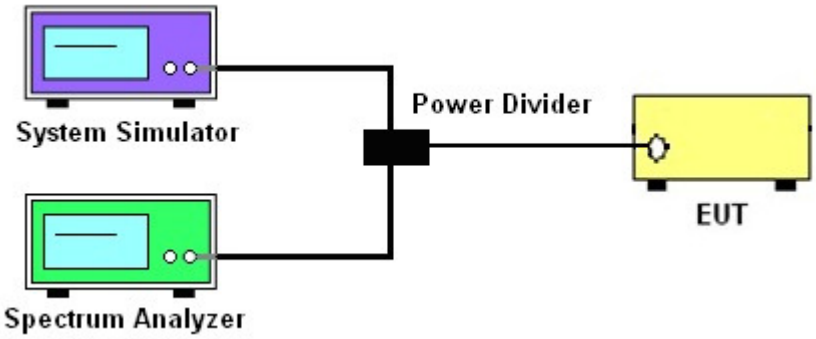
See list of measuring instruments of this test report.

3.2 Test Setup

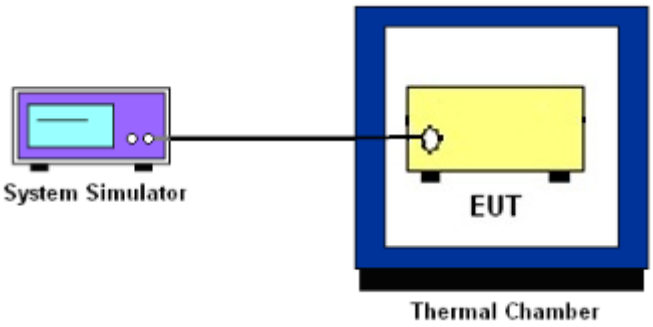
3.2.1 Conducted Output Power



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 20±5° C and connected with the system simulator.
3. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.
4. The variation in frequency was measured for the worst case.

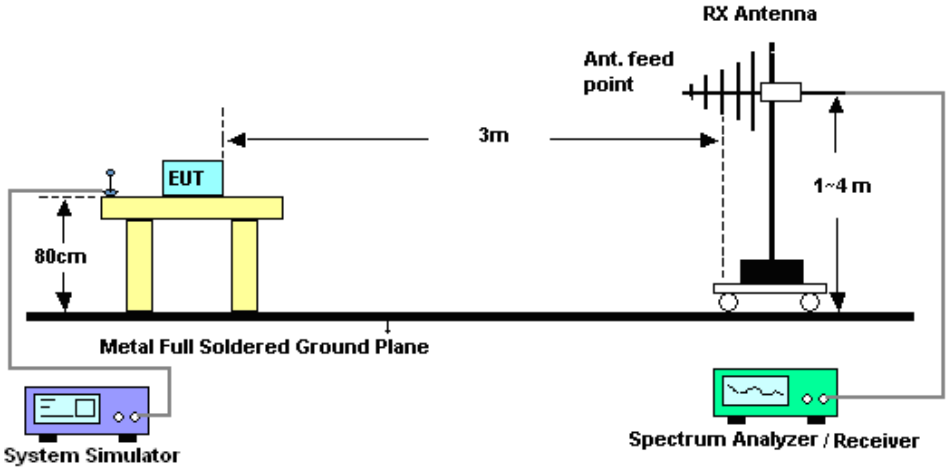
4 Radiated Test Items

4.1 Measuring Instruments

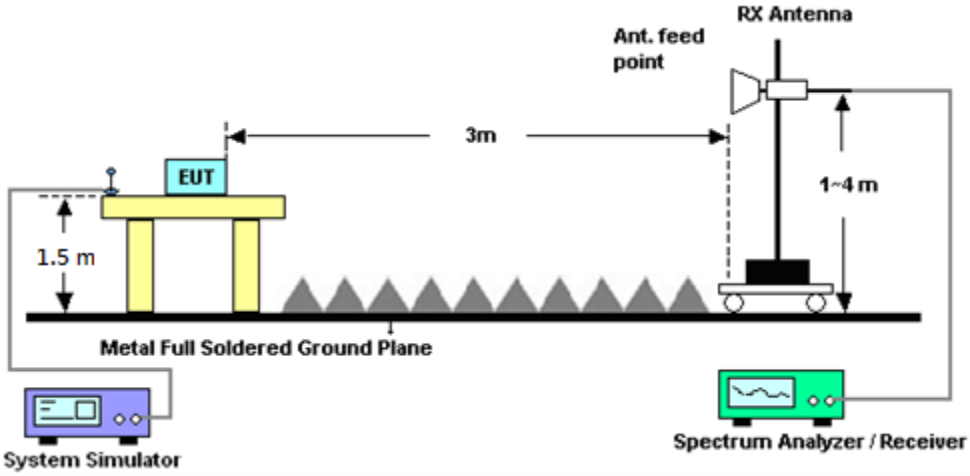
See list of measuring instruments of this test report.

4.2 Test Setup

4.2.1 For radiated test from 30MHz to 1GHz



4.2.2 For radiated test above 1GHz



4.3 Test Result of Radiated Test

Please refer to Appendix B.

4.4 Effective Radiated Power and Effective Isotropic Radiated Power Measurement

4.4.1 Description of the ERP/EIRP Measurement

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

4.4.2 Test Procedures

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

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

4.5 Field Strength of Spurious Radiation Measurement

4.5.1 Description of Field Strength of Spurious Radiated Measurement

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

4.5.2 Test Procedures

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

    = 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	101078	9kHz~40GHz	May 07, 2016	Jul. 18, 2016~ Jul. 28, 2016	May 06, 2017	Conducted (TH01-SZ)
Spectrum Analyzer	R&S	FSP30	101400	9kHz~40GHz	Jan. 12, 2016	Jul. 18, 2016~ Jul. 28, 2016	Jan. 11, 2017	Conducted (TH01-SZ)
Thermal Chamber	Ten Billion Hongzhangroup	LP-150U	H2014081803	-40~+150°C	Jul. 16, 2016	Jul. 18, 2016~ Jul. 28, 2016	Jul. 15, 2017	Conducted (TH01-SZ)
EMI Test Receiver&SA	KEYSIGHT	N9038A	MY54450083	20Hz~8.4GHz	May 07, 2016	Aug. 01, 2016~ Aug. 03, 2016	May 06, 2017	Radiation (03CH03-SZ)
EXA Spectrum Anaiyzer	KEYSIGHT	N9010A	MY55150246	10Hz~44GHz	May 07, 2016	Aug. 01, 2016~ Aug. 03, 2016	May 06, 2017	Radiation (03CH03-SZ)
Bilog Antenna	TeseQ	CBL6112D	35408	30MHz~2GHz	May 21, 2016	Aug. 01, 2016~ Aug. 03, 2016	May 20, 2017	Radiation (03CH03-SZ)
Double Ridge Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-1355	1GHz~18GHz	May 07, 2016	Aug. 01, 2016~ Aug. 03, 2016	May 06, 2017	Radiation (03CH03-SZ)
SHF-EHF Horn	com-power	AH-840	101071	18GHz~40GHz	Aug.19, 2015	Aug. 01, 2016~ Aug. 03, 2016	Aug. 18, 2016	Radiation (03CH03-SZ)
Amplifier	Burgeon	BPA-530	102210	0.01Hz ~3000MHz	Oct. 20, 2015	Aug. 01, 2016~ Aug. 03, 2016	Oct. 19, 2016	Radiation (03CH03-SZ)
Amplifier	Agilent Technologies	83017A	MY39501302	500MHz~26.5GHz	Jan. 12, 2016	Aug. 01, 2016~ Aug. 03, 2016	Jan. 11, 2017	Radiation (03CH03-SZ)
HF Amplifier	MITEQ	TTA1840-35-HG	1871923	18GHz~40GHz	Jul. 16, 2016	Aug. 01, 2016~ Aug. 03, 2016	Jul. 15, 2017	Radiation (03CH03-SZ)
AC Power Source	Chroma	61601	616010001985	N/A	NCR	Aug. 01, 2016~ Aug. 03, 2016	NCR	Radiation (03CH03-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Aug. 01, 2016~ Aug. 03, 2016	NCR	Radiation (03CH03-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	Aug. 01, 2016~ Aug. 03, 2016	NCR	Radiation (03CH03-SZ)

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))	5.0dB

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.0dB

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		32.55	32.71	32.92	30.18	30.16	30.06
GPRS class 8		32.52	32.63	32.86	30.16	30.13	29.96
GPRS class 10		30.92	31.05	31.39	28.31	28.28	28.62
GPRS class 11		29.81	29.85	30.16	27.47	27.15	27.51
GPRS class 12		28.52	28.70	28.55	26.29	26.25	26.19
EGPRS class 8		26.21	26.23	26.38	25.97	25.75	25.99
EGPRS class 10		24.65	24.62	24.81	24.34	24.07	24.38
EGPRS class 11		23.54	23.50	23.70	23.19	22.91	23.24
EGPRS class 12		22.40	22.37	22.45	22.01	21.77	22.06
DTM 5 (2Tx slots)	GSM 1 Tx slot	32.01	31.56	31.60	28.94	28.76	28.96
	GPRS 1 Tx slot	31.64	31.20	31.26	28.66	28.49	28.69
DTM 9 (2Tx slots)	GSM 1 Tx slot	32.08	31.64	31.66	28.90	28.73	28.89
	GPRS 1 Tx slot	31.70	31.28	31.31	28.62	28.44	28.64
DTM 11 (3Tx slots)	GSM 1 Tx slot	30.41	30.32	30.19	27.40	27.50	27.79
	GPRS 2 Tx slots	29.78	29.81	29.82	27.13	27.23	27.52
DTM 5 (2Tx slots)	GSM 1 Tx slot	32.11	32.04	31.82	28.51	28.60	28.52
	EDGE 1 Tx slot	24.76	24.49	24.37	24.06	23.59	24.08
DTM 9 (2Tx slots)	GSM 1 Tx slot	32.18	31.72	31.71	28.80	28.91	28.80
	EDGE 1 Tx slot	24.44	24.20	24.05	23.77	23.69	23.78
DTM 11 (3Tx slots)	GSM 1 Tx slot	30.91	30.86	30.49	27.07	27.14	27.10
	EDGE 2 Tx slots	23.51	23.29	23.13	22.83	22.76	22.83

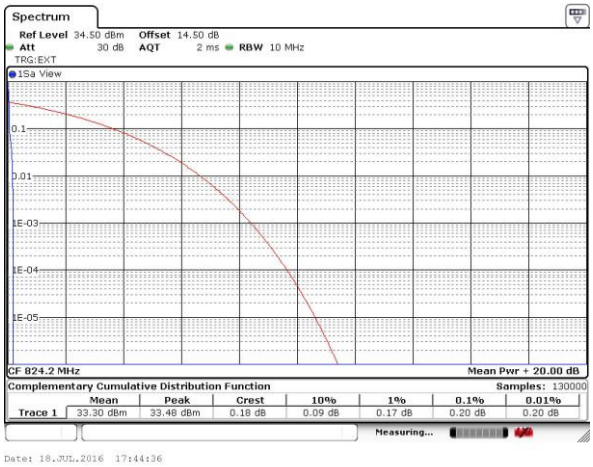
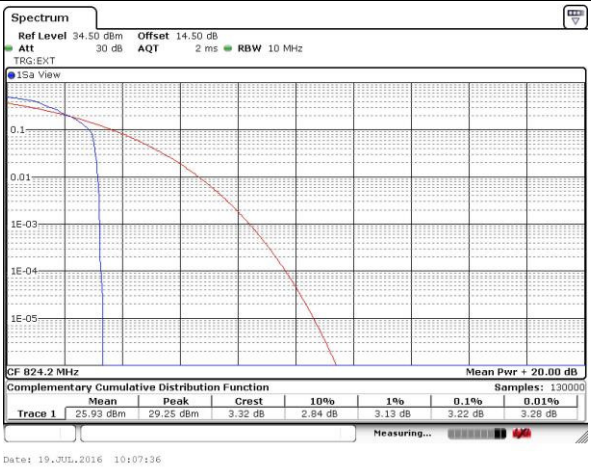
Conducted Power (*Unit: dBm)									
Band	WCDMA Band V			WCDMA Band II			WCDMA Band IV		
Channel	4132	4182	4233	9262	9400	9538	1312	1413	1513
Frequency	826.4	836.4	846.6	1852.4	1880	1907.6	1712.4	1732.6	1752.6
AMR 12.2K	23.11	23.00	23.12	22.69	22.63	22.71	23.07	23.01	22.80
RMC 12.2K	23.12	23.03	23.13	22.71	22.85	22.93	23.09	23.03	22.83
HSDPA Subtest-1	22.17	22.03	22.26	21.66	21.58	21.80	22.16	21.90	21.88
HSDPA Subtest-2	22.15	22.01	22.24	21.62	21.57	21.77	22.10	21.82	21.83
HSDPA Subtest-3	21.62	21.55	21.64	21.12	21.10	21.30	21.51	21.35	21.33
HSDPA Subtest-4	21.60	21.54	21.66	21.16	21.09	21.23	21.54	21.34	21.30
DC-HSDPA Subtest-1	21.91	21.76	21.10	21.57	21.54	21.68	21.54	21.47	22.44
DC-HSDPA Subtest-2	22.02	21.76	21.83	21.49	21.65	21.72	21.47	21.40	22.37
DC-HSDPA Subtest-3	21.80	21.63	21.74	21.21	21.23	21.54	21.63	21.52	22.53
DC-HSDPA Subtest-4	20.91	21.87	21.90	21.40	21.20	21.93	21.57	21.50	22.47
HSUPA Subtest-1	21.70	21.65	21.73	21.01	20.98	21.11	21.17	21.19	21.14
HSUPA Subtest-2	20.68	20.63	20.72	20.38	20.36	21.43	20.85	20.82	20.82
HSUPA Subtest-3	20.23	20.15	20.33	20.33	20.26	20.40	20.56	20.51	20.57
HSUPA Subtest-4	21.41	21.36	21.46	21.11	21.10	21.16	20.81	20.80	20.80
HSUPA Subtest-5	21.03	20.98	21.10	20.25	20.14	20.23	20.74	20.73	20.77

Peak-to-Average Ratio

Mode	GSM850(dB)		Limit: 13dB
Mod.	GSM	EDGE class 8	Result
Lowest CH	0.20	3.22	PASS
Middle CH	0.12	3.16	
Highest CH	0.14	3.59	

Mode	GSM1900(dB)		Limit: 13dB
Mod.	GSM	EDGE class 8	Result
Lowest CH	0.17	3.07	PASS
Middle CH	0.14	3.36	
Highest CH	0.17	3.36	

Mode	WCDMA Band V(dB)	WCDMA Band II(dB)	WCDMA Band IV(dB)	Limit: 13dB
Mod.	RMC 12.2Kbps	RMC 12.2Kbps	RMC 12.2Kbps	Result
Lowest CH	2.29	2.93	2.93	PASS
Middle CH	2.99	2.96	2.99	
Highest CH	2.58	2.49	2.99	

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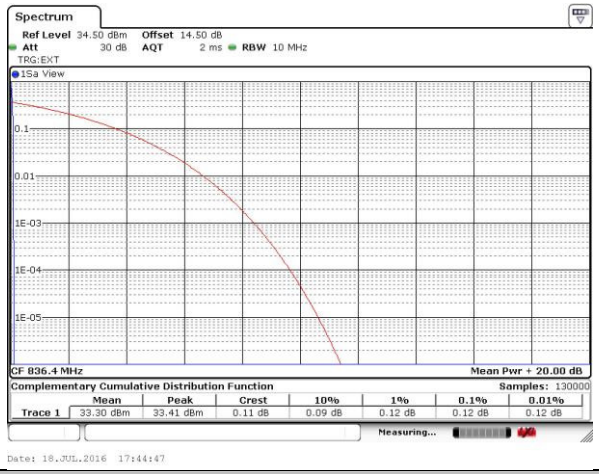
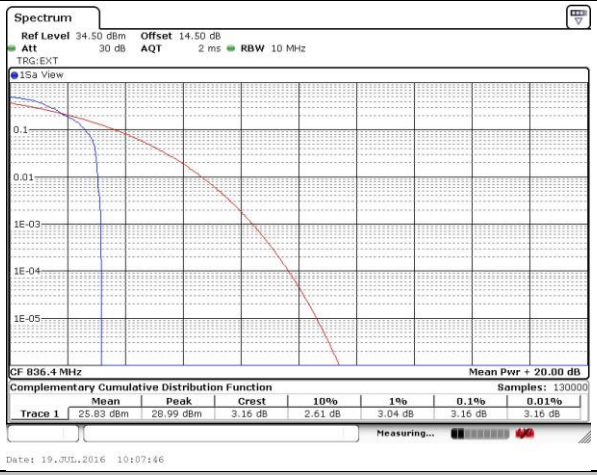
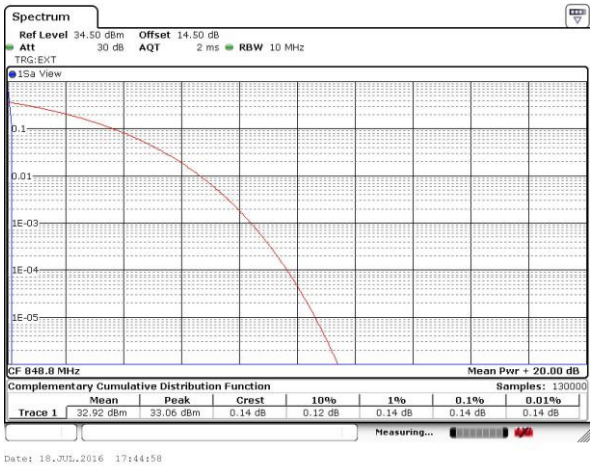
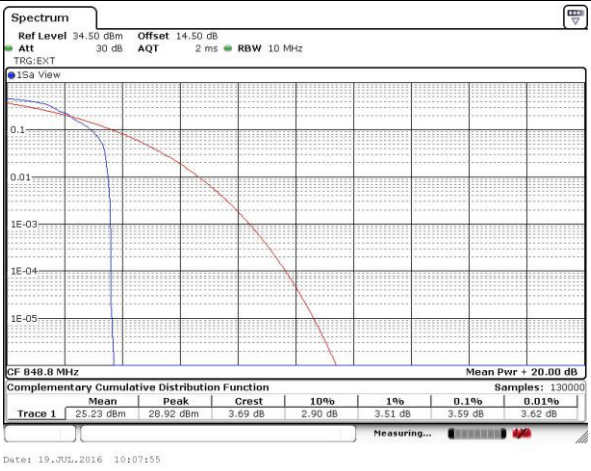
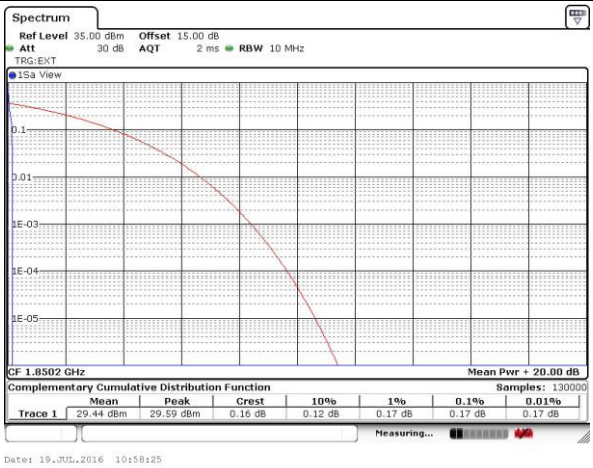
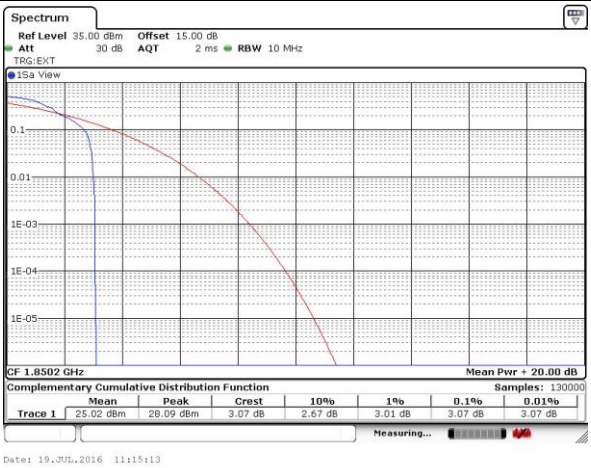
	
Highest Channel	**Highest Channel**
	

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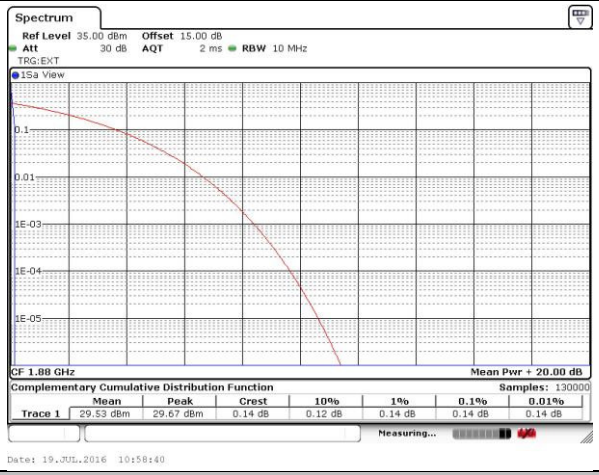
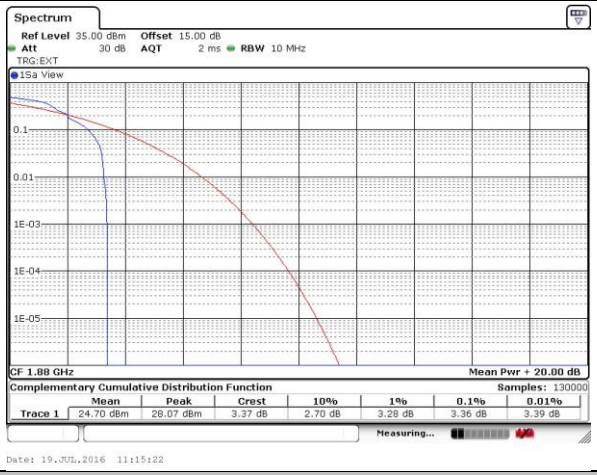
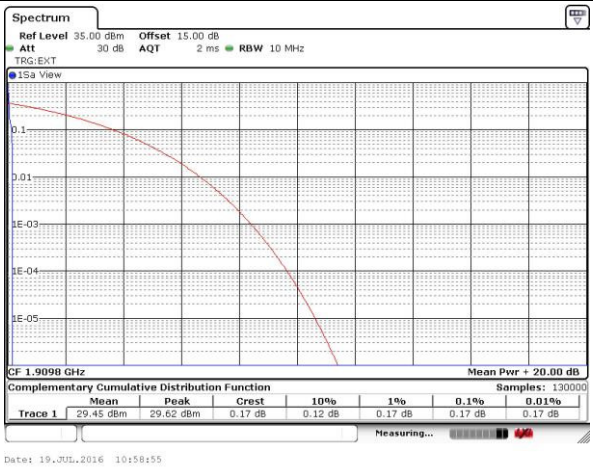
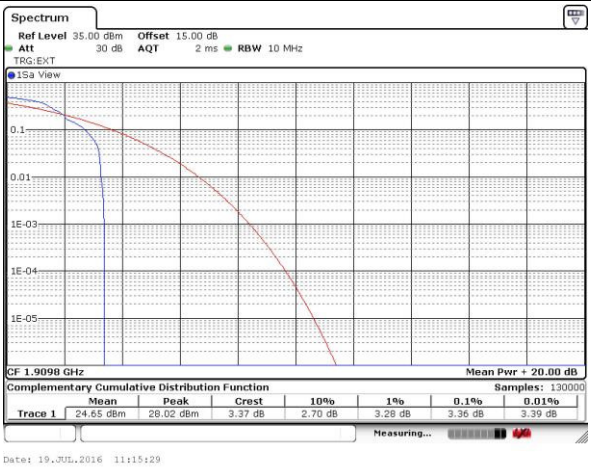
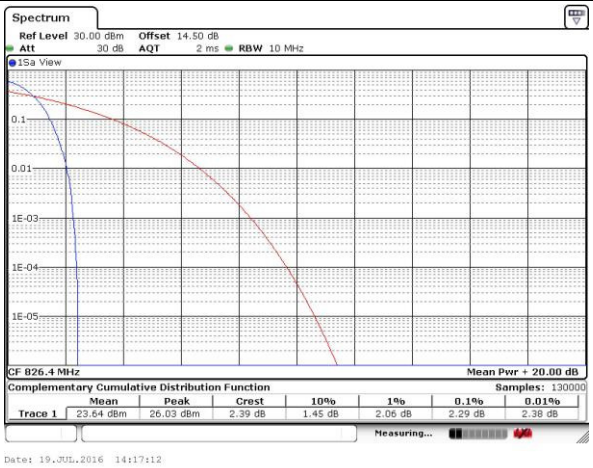
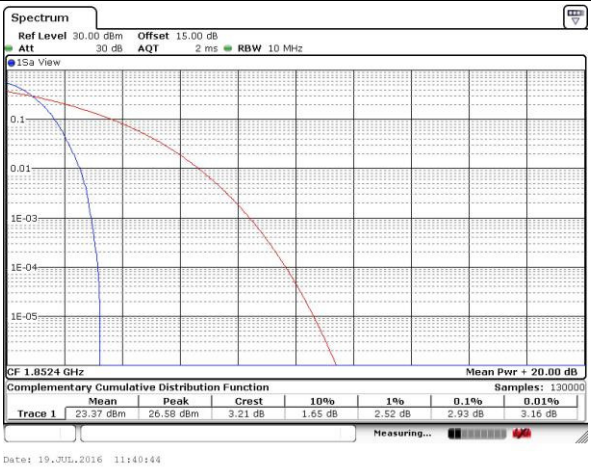
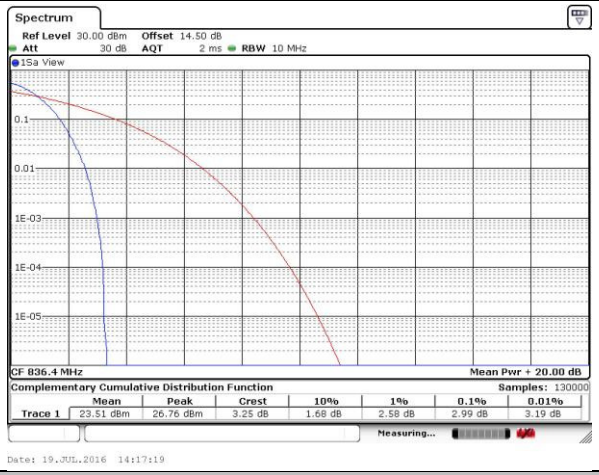
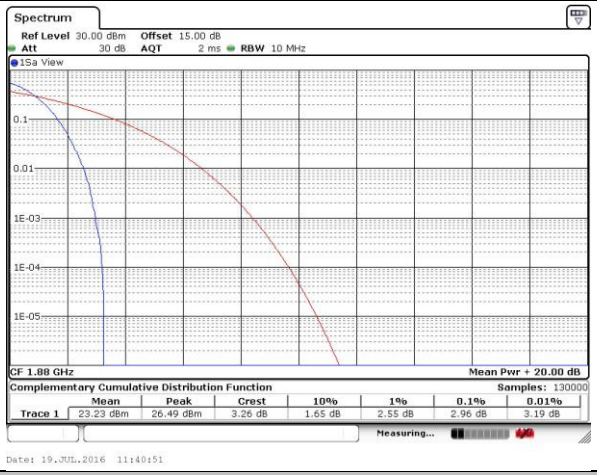
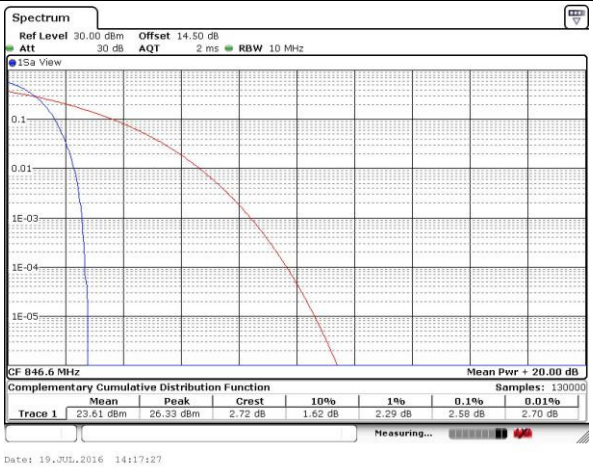
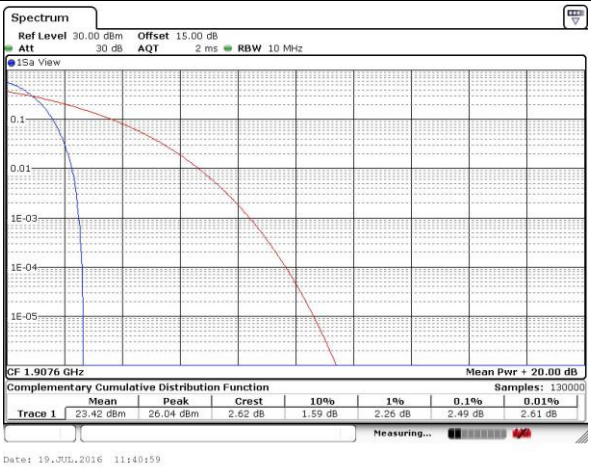
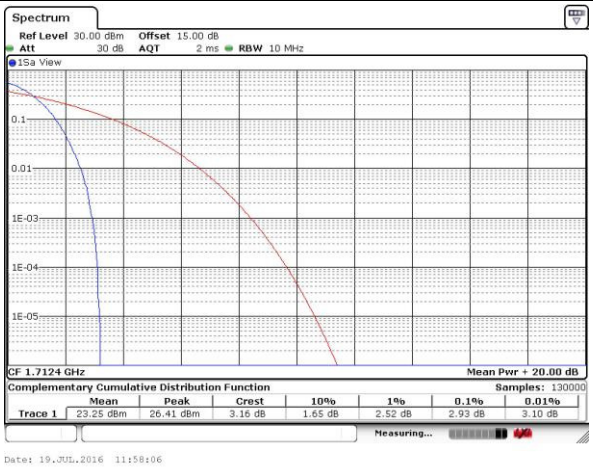
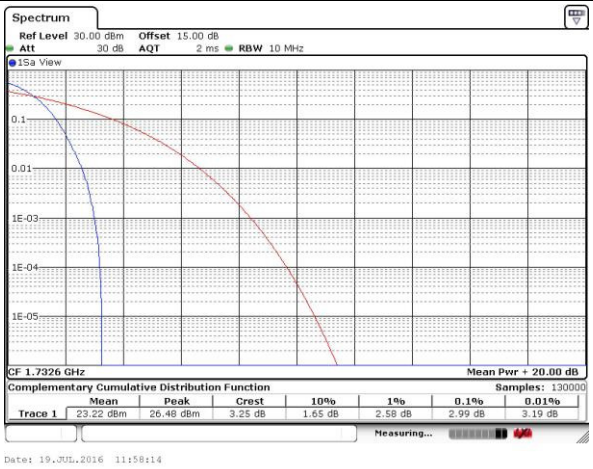
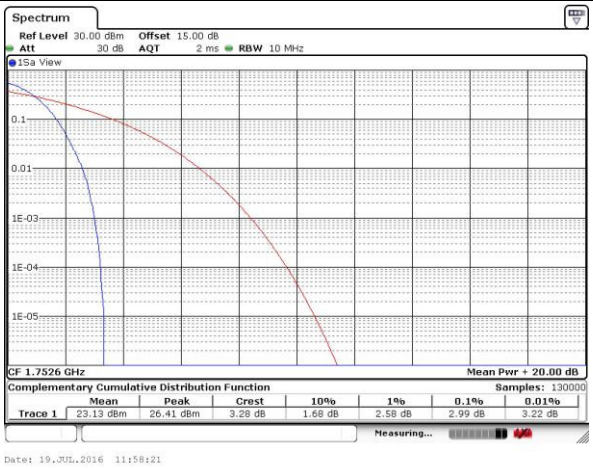
	
Highest Channel	**Highest Channel**
	

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

WCDMA Band IV (RMC 12.2Kbps)	
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

26dB Bandwidth

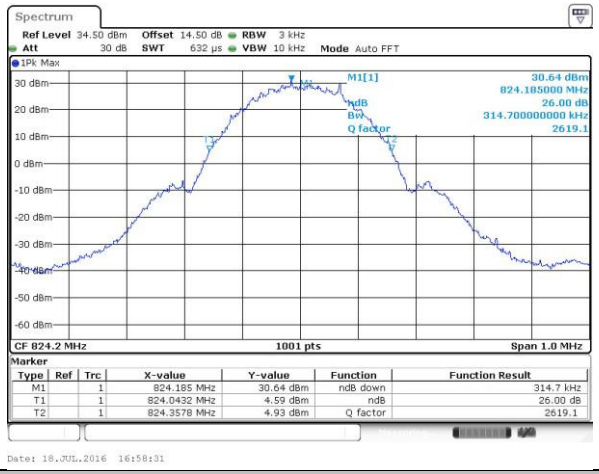
Mode	GSM850(MHz)	
Mod.	GSM	EDGE class 8
Lowest CH	0.315	0.303
Middle CH	0.318	0.303
Highest CH	0.316	0.315

Mode	GSM1900(MHz)	
Mod.	GSM	EDGE class 8
Lowest CH	0.317	0.314
Middle CH	0.316	0.314
Highest CH	0.314	0.311

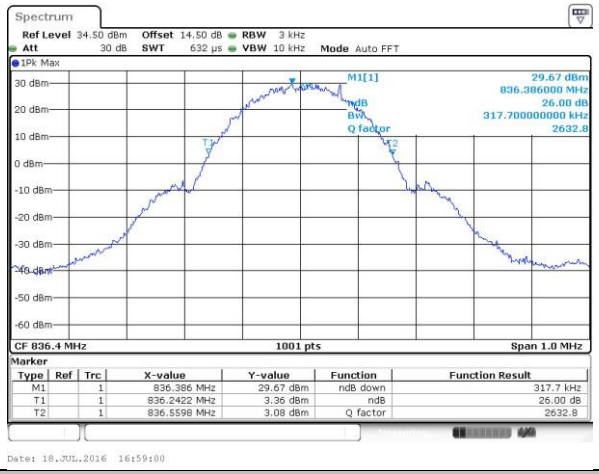
Mode	WCDMA Band V(MHz)	WCDMA Band II(MHz)	WCDMA Band IV(MHz)
Mod.	RMC 12.2Kbps	RMC 12.2Kbps	RMC 12.2Kbps
Lowest CH	4.78	4.72	4.71
Middle CH	4.72	4.71	4.71
Highest CH	4.74	4.72	4.71

GSM850 (GSM)

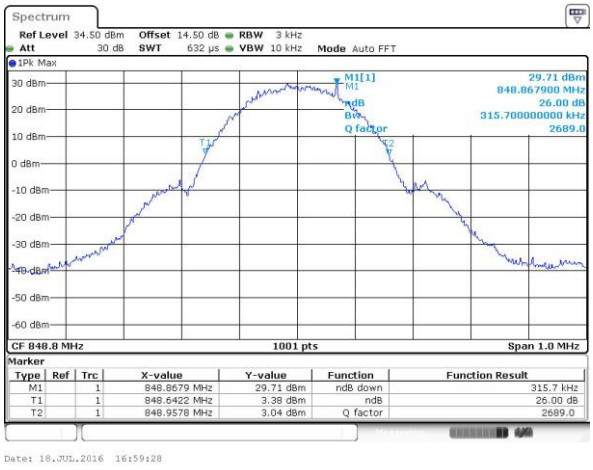
Lowest Channel



Middle Channel

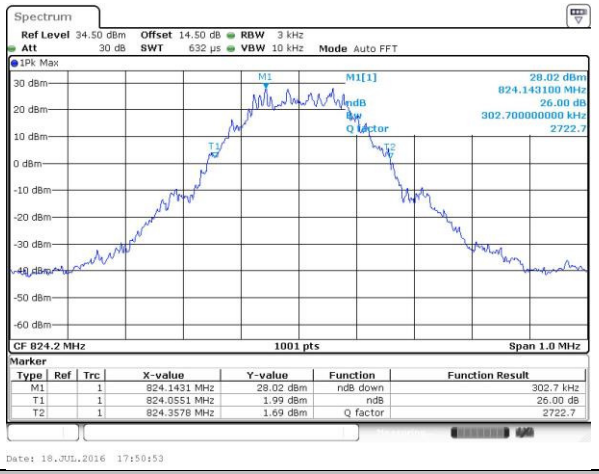


Highest Channel

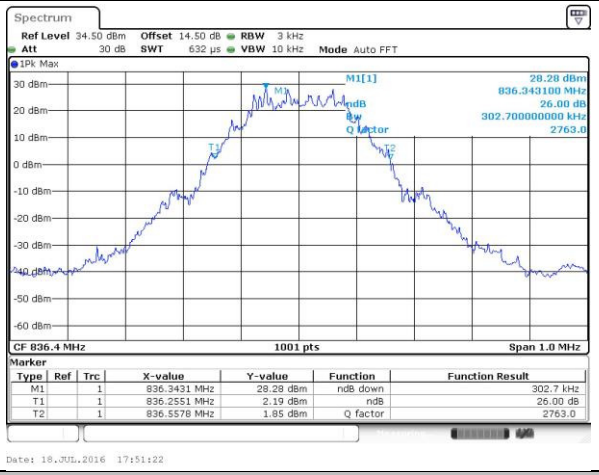


GSM850 (EDGE class 8)

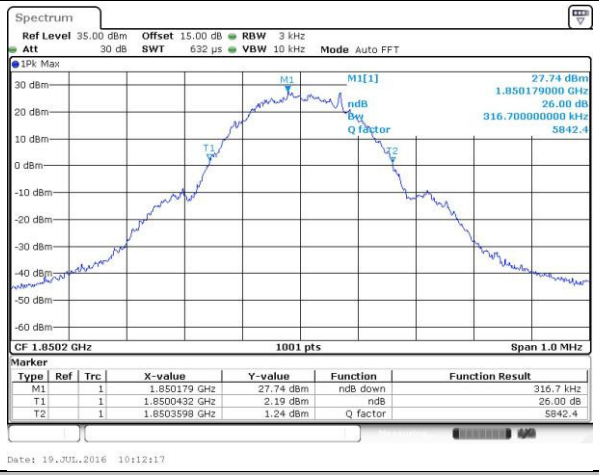
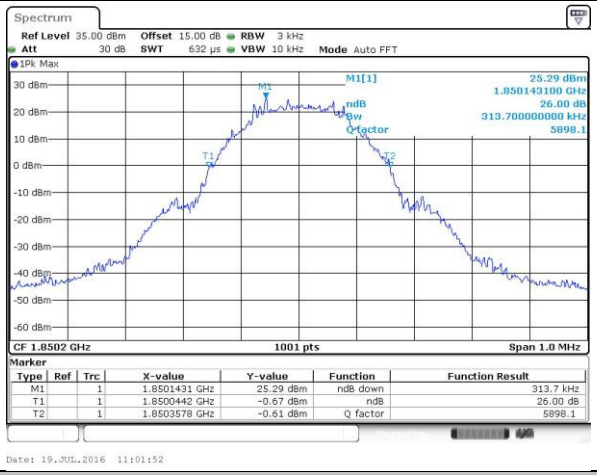
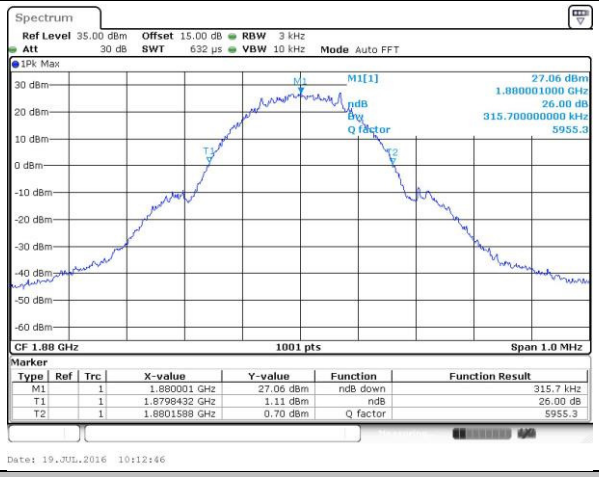
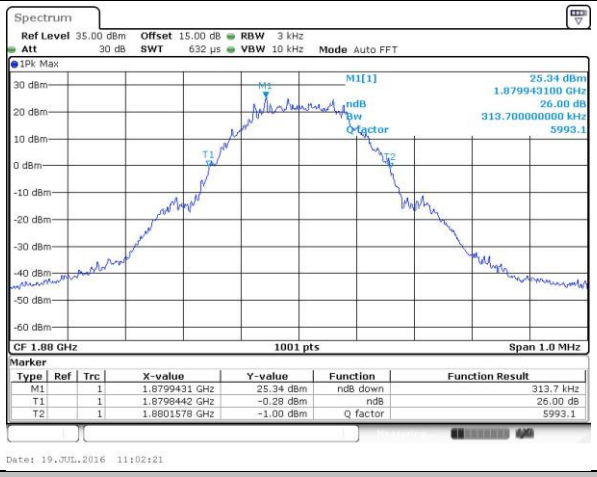
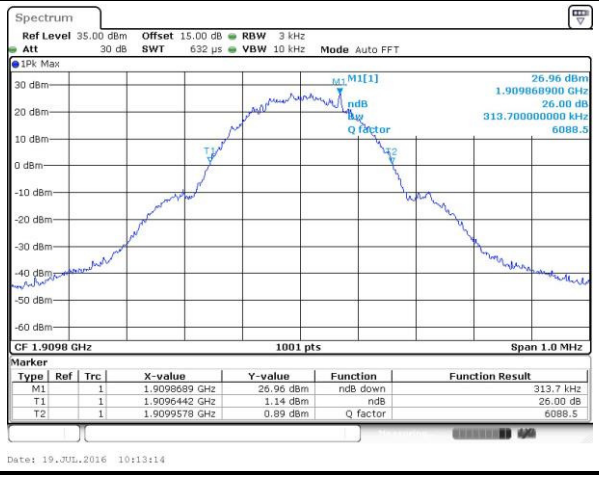
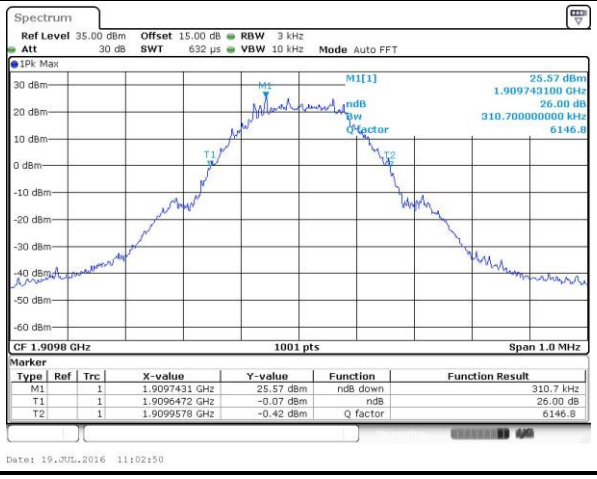
Lowest Channel

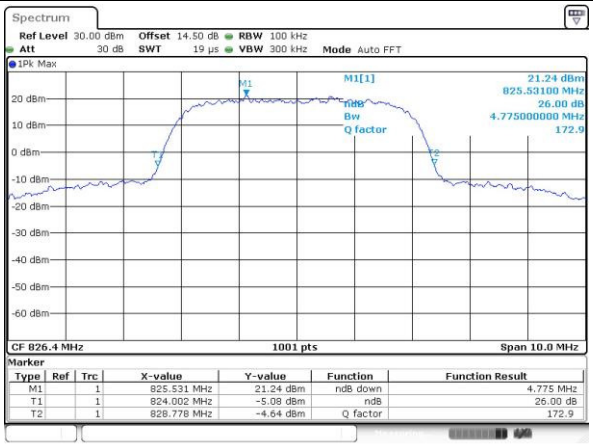
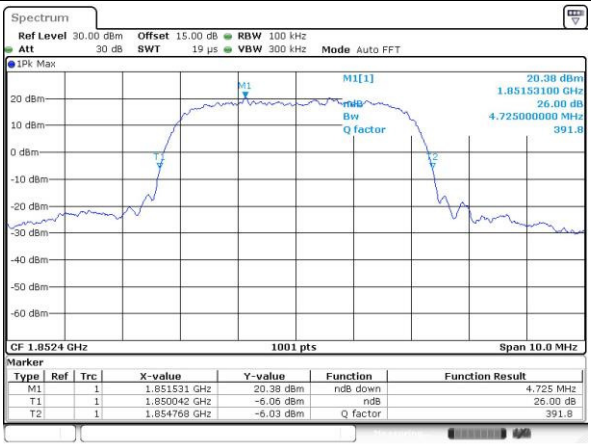
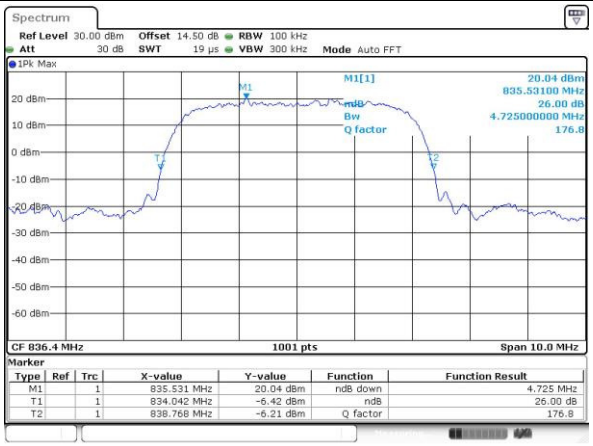
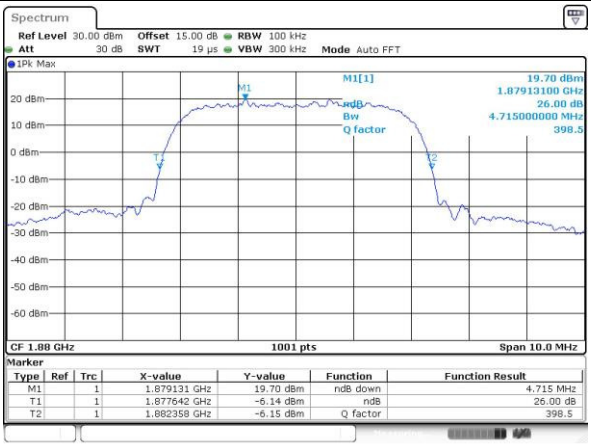
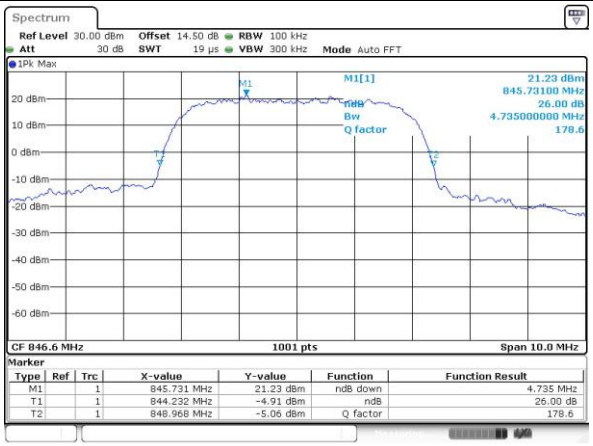
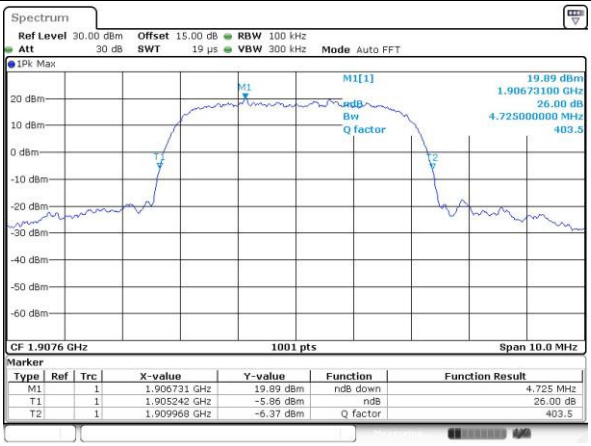


Middle Channel



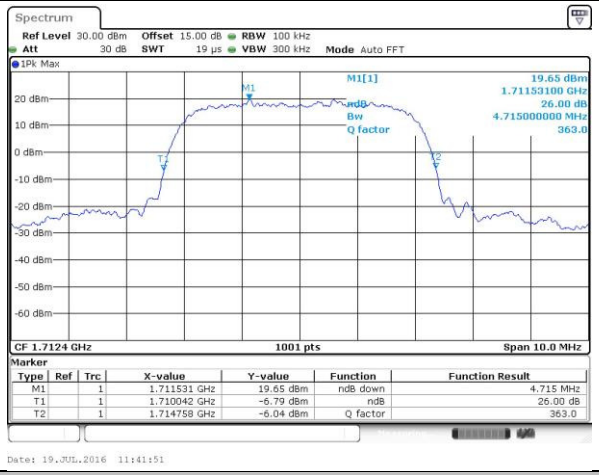
Highest Channel

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

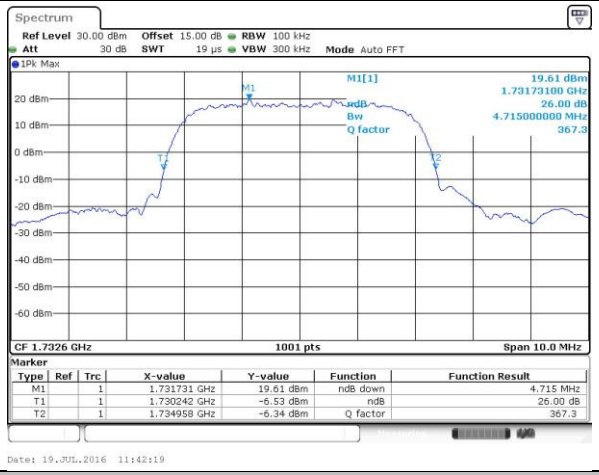
WCDMA Band V (RMC 12.2Kbps)	WCDMA Band II (RMC 12.2Kbps)
Lowest Channel	**Lowest Channel**
	
Middle Channel	**Middle Channel**
	
Highest Channel	**Highest Channel**
	

WCDMA Band IV (RMC 12.2Kbps)

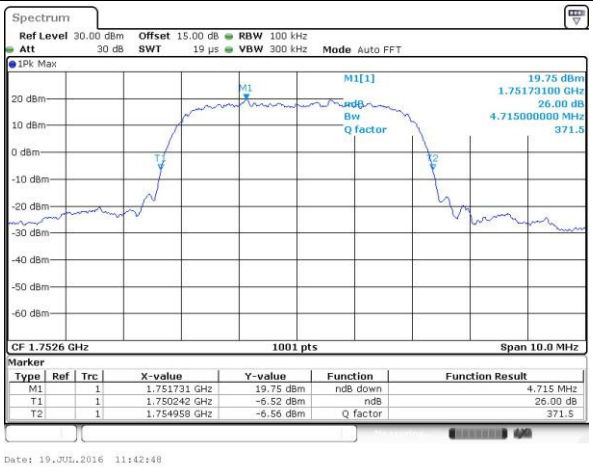
Lowest Channel



Middle Channel



Highest Channel

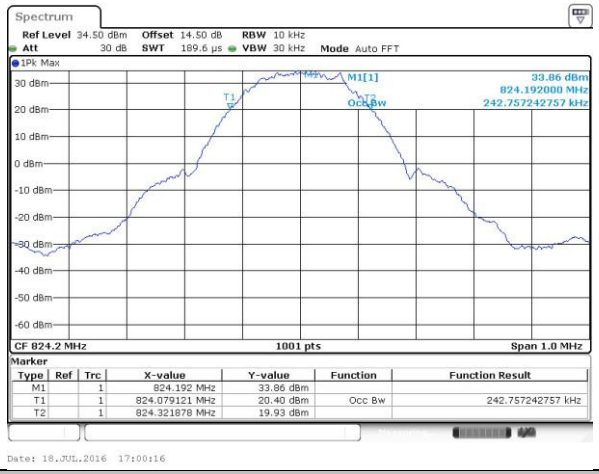
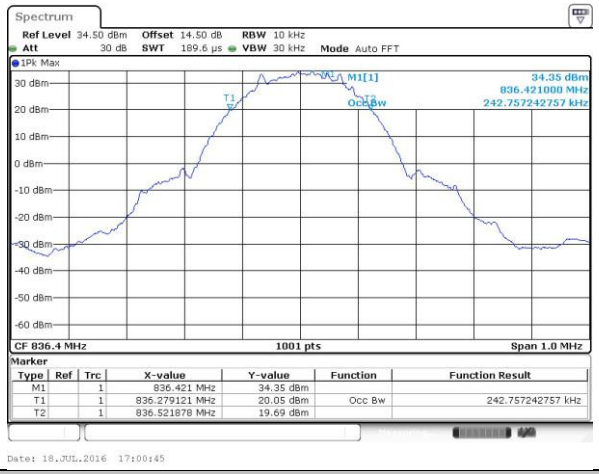
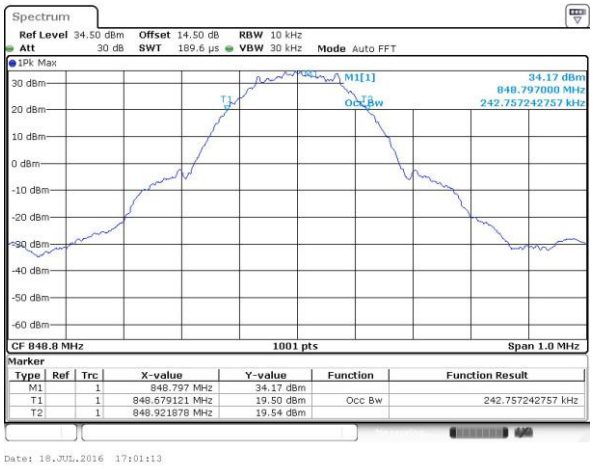


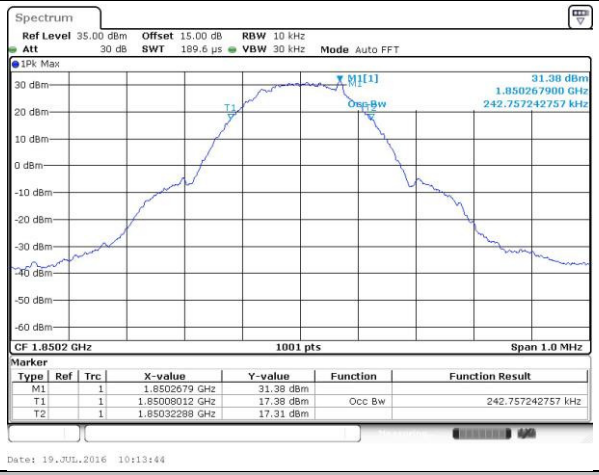
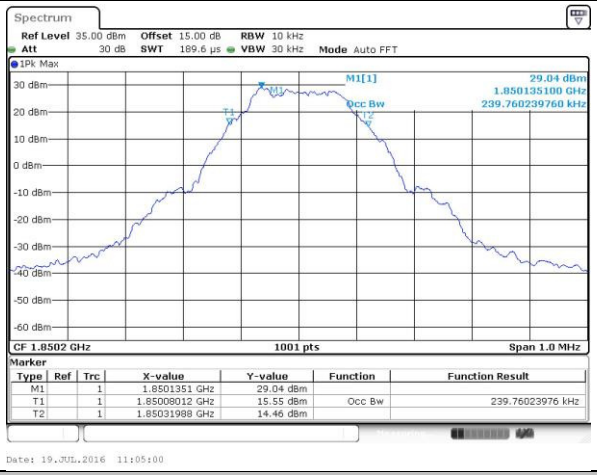
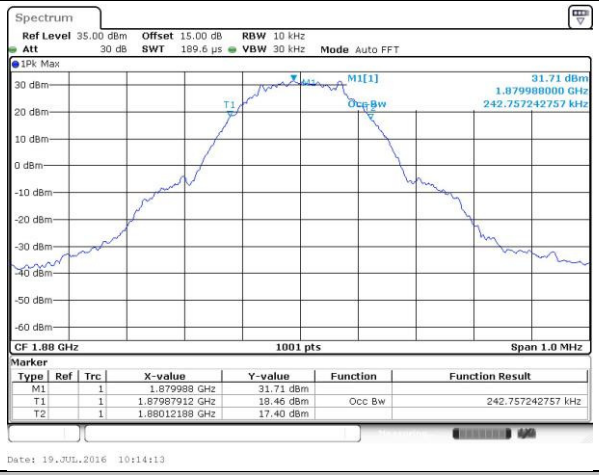
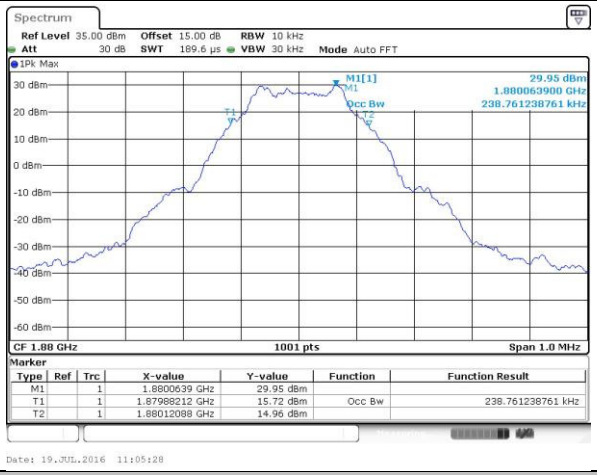
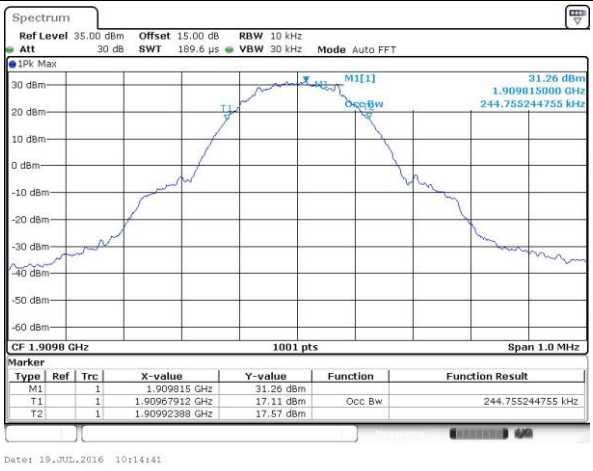
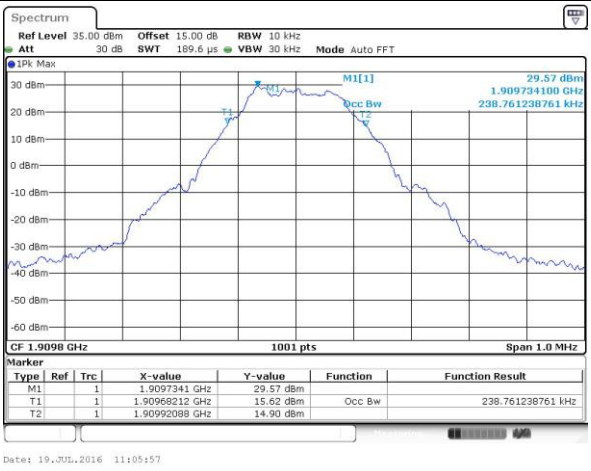
Occupied Bandwidth

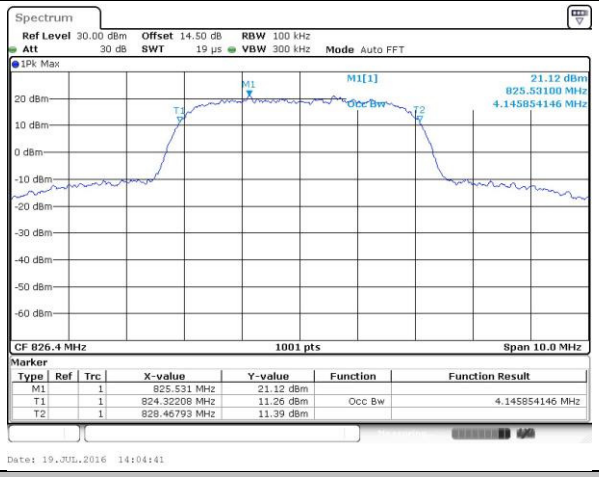
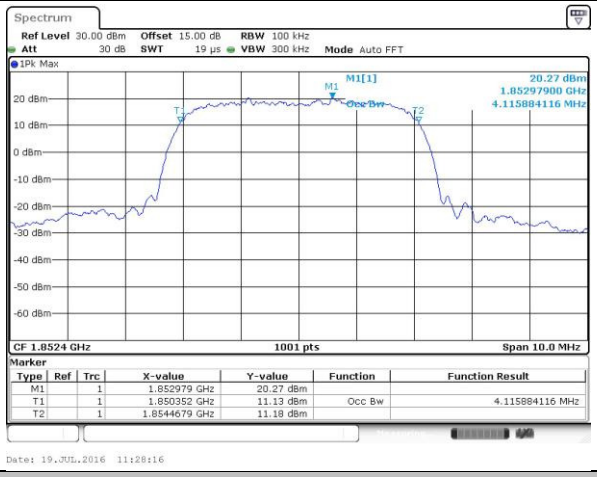
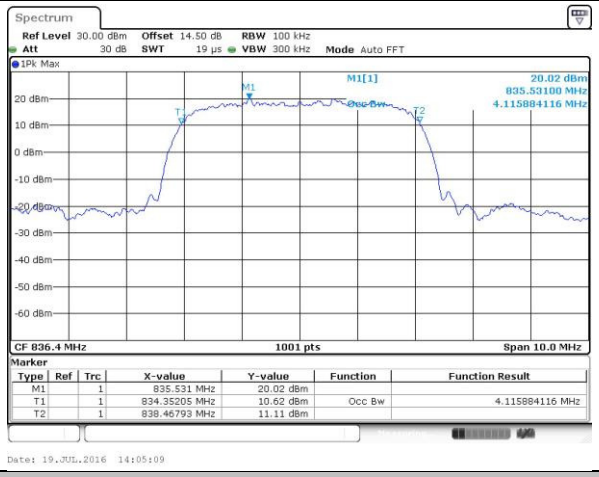
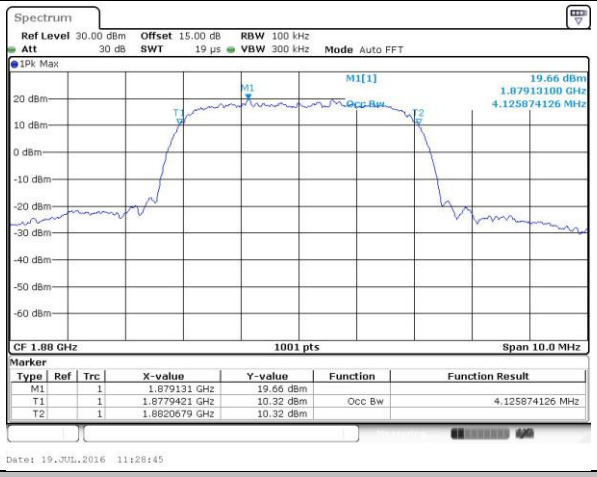
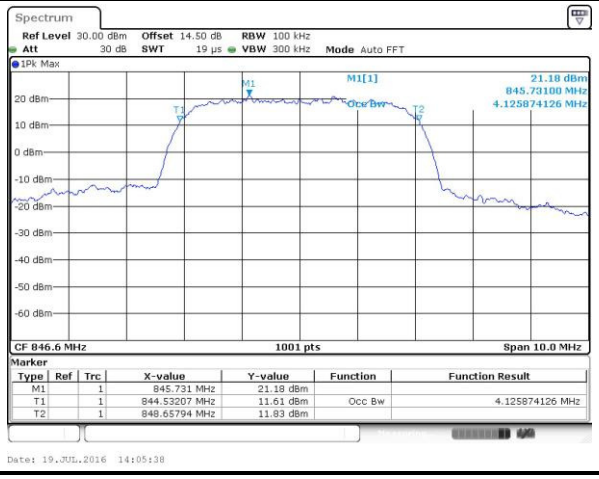
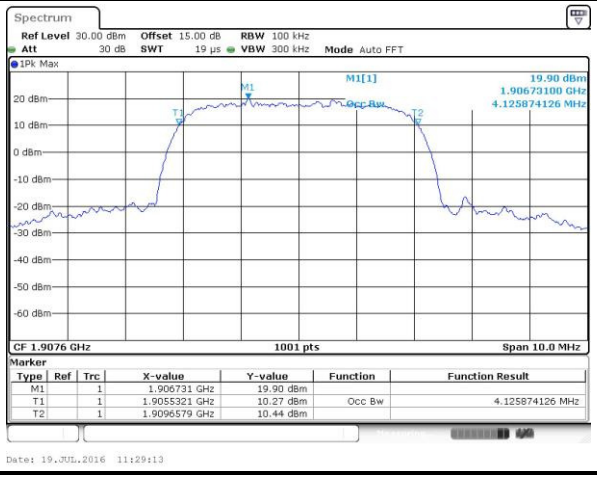
Mode	GSM850(MHz)	
Mod.	GSM	EDGE class 8
Lowest CH	0.243	0.235
Middle CH	0.243	0.235
Highest CH	0.243	0.237

Mode	GSM1900(MHz)	
Mod.	GSM	EDGE class 8
Lowest CH	0.243	0.240
Middle CH	0.243	0.239
Highest CH	0.245	0.239

Mode	WCDMA Band V(MHz)	WCDMA Band II(MHz)	WCDMA Band IV(MHz)
Mod.	RMC 12.2Kbps	RMC 12.2Kbps	RMC 12.2Kbps
Lowest CH	4.15	4.12	4.12
Middle CH	4.12	4.13	4.13
Highest CH	4.13	4.13	4.12

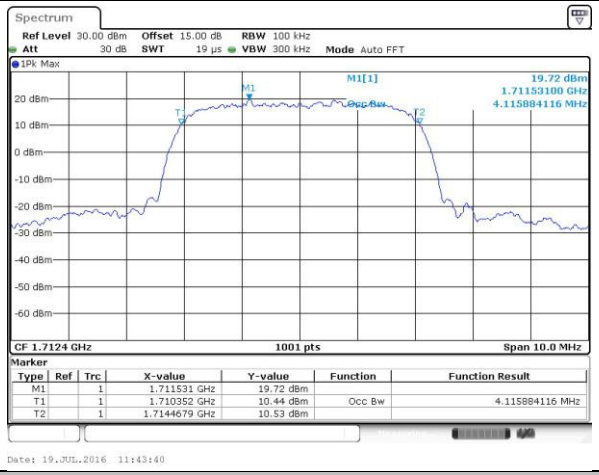
GSM850 (GSM)	GSM850 (EDGE class 8)
Lowest Channel	**Lowest Channel**
	
Middle Channel	**Middle Channel**
	
Highest Channel	**Highest Channel**
	

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

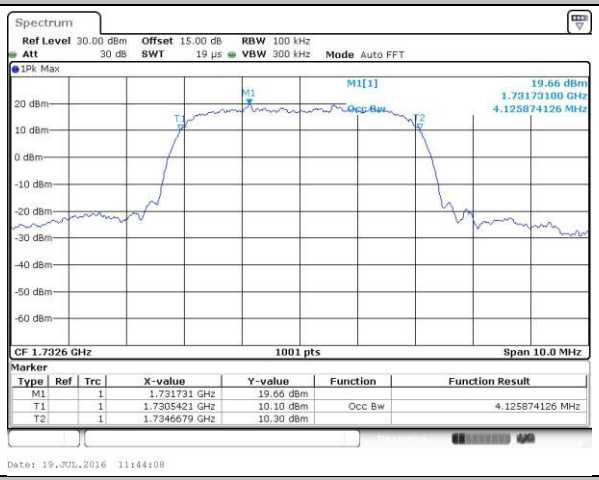
WCDMA Band V (RMC 12.2Kbps)	WCDMA Band II (RMC 12.2Kbps)
Lowest Channel	**Lowest Channel**
	
Middle Channel	**Middle Channel**
	
Highest Channel	**Highest Channel**
	

WCDMA Band IV (RMC 12.2Kbps)

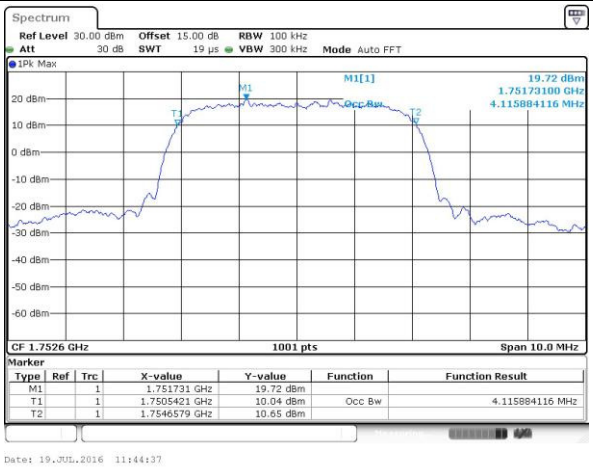
Lowest Channel



Middle Channel



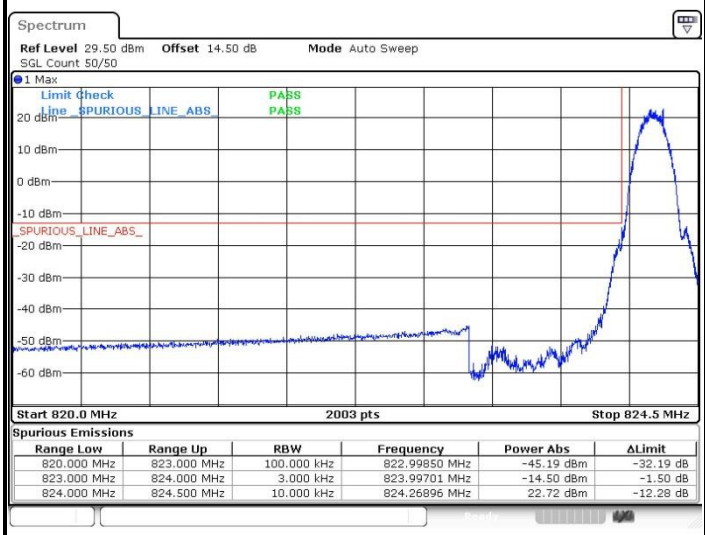
Highest Channel



Conducted Band Edge

GSM850 (GSM)

Lowest Band Edge

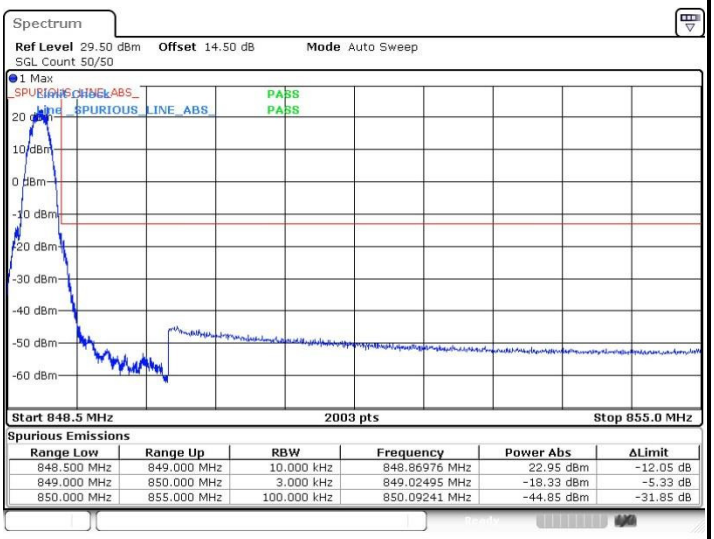


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
820.000 MHz	823.000 MHz	100.000 kHz	822.99850 MHz	-45.19 dBm	-32.19 dB
823.000 MHz	824.000 MHz	3.000 kHz	823.99701 MHz	-14.50 dBm	-1.50 dB
824.000 MHz	824.500 MHz	10.000 kHz	824.26896 MHz	22.72 dBm	-12.28 dB

Date: 28.JUL.2016 07:09:24

Highest Band Edge



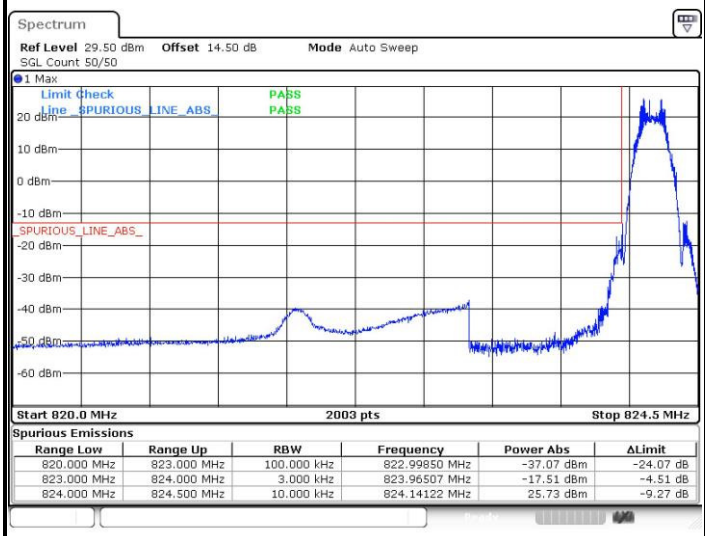
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
848.500 MHz	849.000 MHz	10.000 kHz	848.86976 MHz	22.95 dBm	-12.05 dB
849.000 MHz	850.000 MHz	3.000 kHz	849.02495 MHz	-18.33 dBm	-5.33 dB
850.000 MHz	855.000 MHz	100.000 kHz	850.09241 MHz	-44.85 dBm	-31.85 dB

Date: 28.JUL.2016 07:10:52

GSM850 (EDGE class 8)

Lowest Band Edge

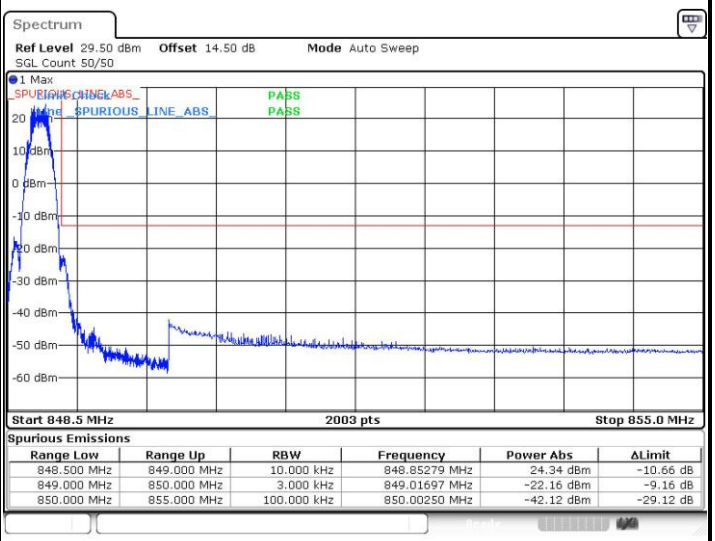


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
820.000 MHz	823.000 MHz	100.000 kHz	822.99850 MHz	-37.07 dBm	-24.07 dB
823.000 MHz	824.000 MHz	3.000 kHz	823.96507 MHz	-17.51 dBm	-4.51 dB
824.000 MHz	824.500 MHz	10.000 kHz	824.14122 MHz	25.73 dBm	-9.27 dB

Date: 19.JUL.2016 09:58:23

Highest Band Edge



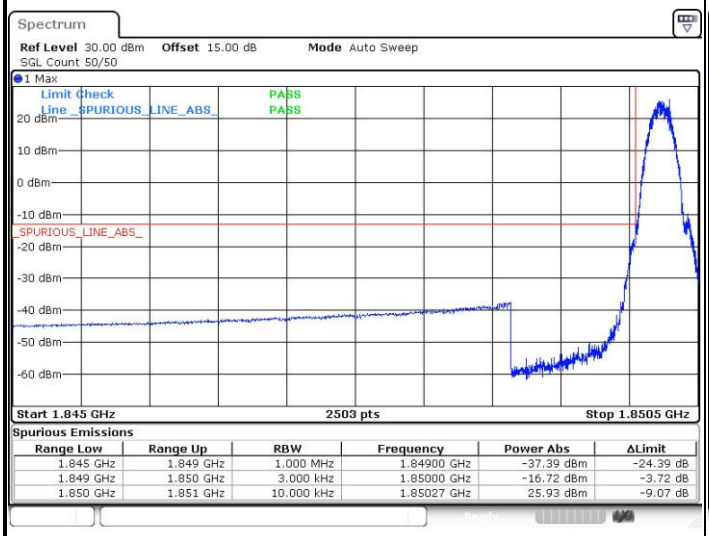
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
848.500 MHz	849.000 MHz	10.000 kHz	848.85279 MHz	24.34 dBm	-10.66 dB
849.000 MHz	850.000 MHz	3.000 kHz	849.01697 MHz	-22.16 dBm	-9.16 dB
850.000 MHz	855.000 MHz	100.000 kHz	850.00250 MHz	-42.12 dBm	-29.12 dB

Date: 19.JUL.2016 09:59:52

GSM1900 (GSM)

Lowest Band Edge

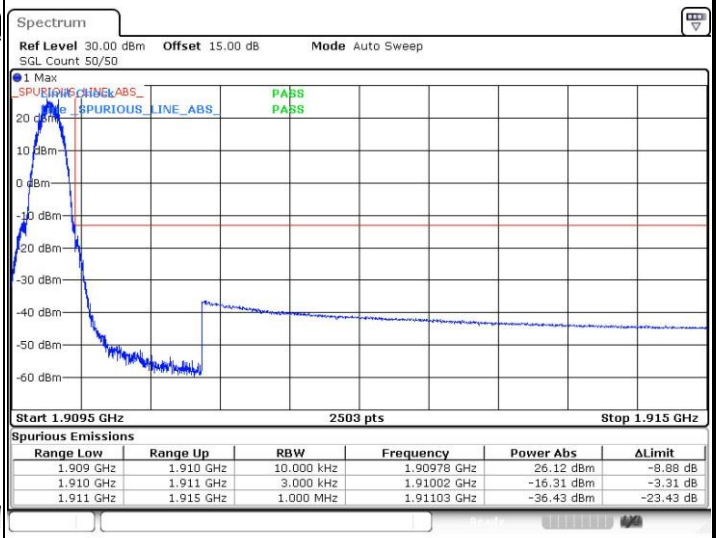


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.845 GHz	1.849 GHz	1.000 MHz	1.84900 GHz	-37.39 dBm	-24.39 dB
1.849 GHz	1.850 GHz	3.000 kHz	1.85000 GHz	-16.72 dBm	-3.72 dB
1.850 GHz	1.851 GHz	10.000 kHz	1.85027 GHz	25.93 dBm	-9.07 dB

Date: 19.JUL.2016 10:16:12

Highest Band Edge



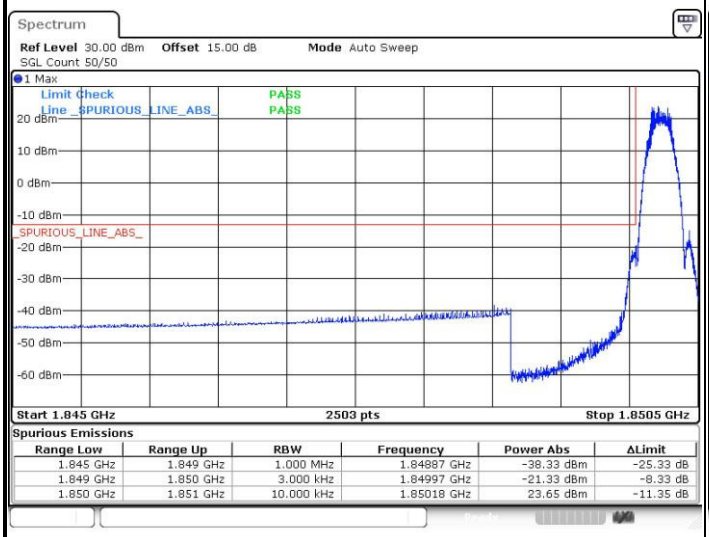
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.909 GHz	1.910 GHz	10.000 kHz	1.90978 GHz	26.12 dBm	-8.88 dB
1.910 GHz	1.911 GHz	3.000 kHz	1.91002 GHz	-16.31 dBm	-3.31 dB
1.911 GHz	1.915 GHz	1.000 MHz	1.91103 GHz	-36.43 dBm	-23.43 dB

Date: 19.JUL.2016 10:17:41

GSM1900 (EDGE class 8)

Lowest Band Edge

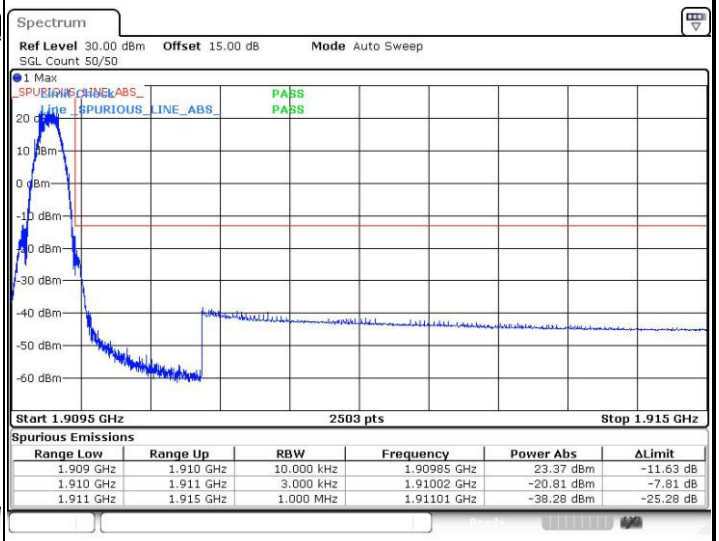


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.845 GHz	1.849 GHz	1.000 MHz	1.84887 GHz	-38.33 dBm	-25.33 dB
1.849 GHz	1.850 GHz	3.000 kHz	1.84997 GHz	-21.33 dBm	-8.33 dB
1.850 GHz	1.851 GHz	10.000 kHz	1.85018 GHz	23.65 dBm	-11.35 dB

Date: 19.JUL.2016 11:07:27

Highest Band Edge



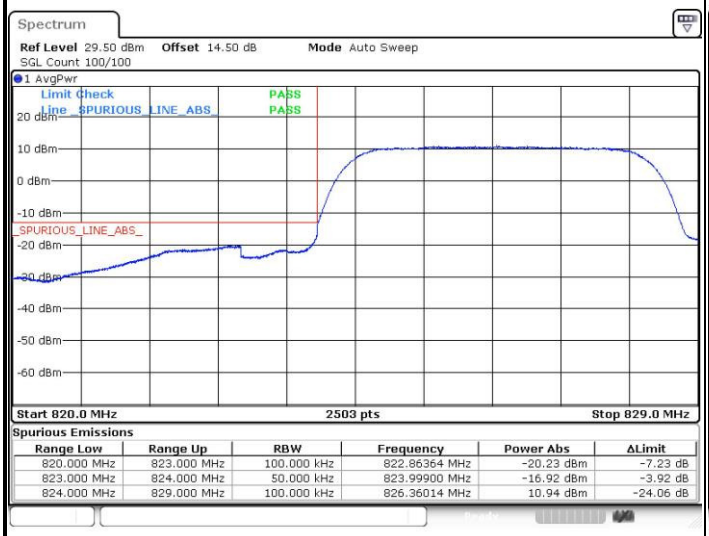
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.909 GHz	1.910 GHz	10.000 kHz	1.90985 GHz	23.37 dBm	-11.63 dB
1.910 GHz	1.911 GHz	3.000 kHz	1.91002 GHz	-20.81 dBm	-7.81 dB
1.911 GHz	1.915 GHz	1.000 MHz	1.91101 GHz	-38.28 dBm	-25.28 dB

Date: 19.JUL.2016 11:08:57

WCDMA Band V (RMC 12.2Kbps)

Lowest Band Edge

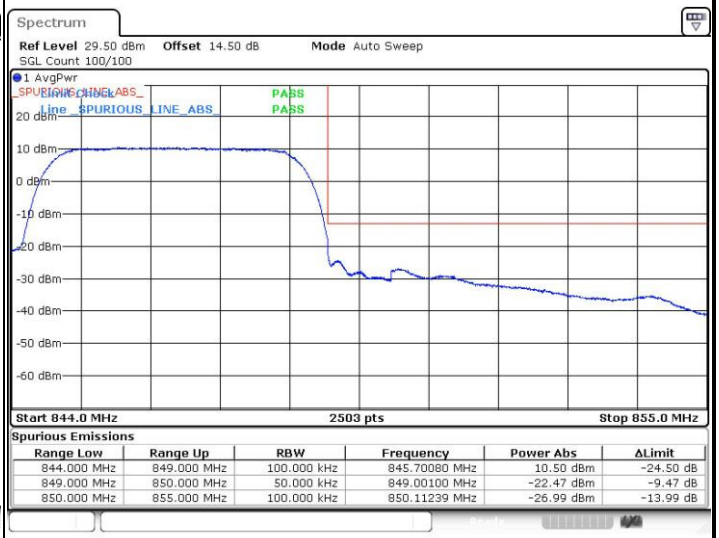


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
820.000 MHz	823.000 MHz	100.000 kHz	822.86364 MHz	-20.23 dBm	-7.23 dB
823.000 MHz	824.000 MHz	50.000 kHz	823.99900 MHz	-16.92 dBm	-3.92 dB
824.000 MHz	829.000 MHz	100.000 kHz	826.36014 MHz	10.94 dBm	-24.06 dB

Date: 19.JUL.2016 14:08:26

Highest Band Edge



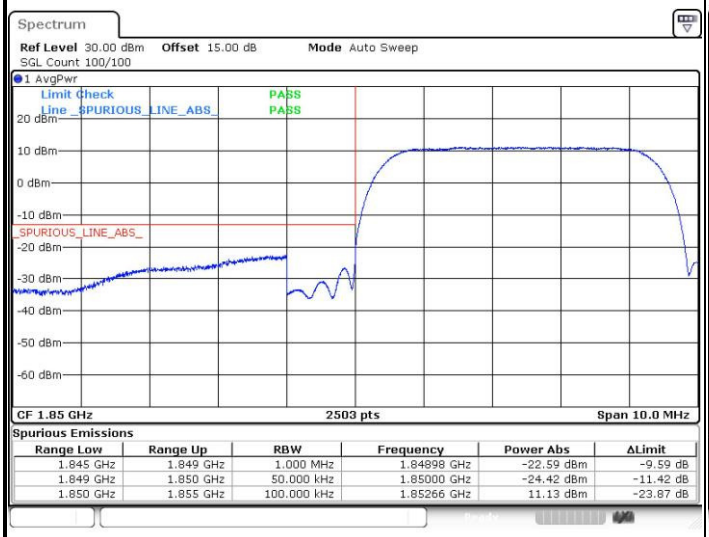
Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
844.000 MHz	849.000 MHz	100.000 kHz	845.70080 MHz	10.50 dBm	-24.50 dB
849.000 MHz	850.000 MHz	50.000 kHz	849.00100 MHz	-22.47 dBm	-9.47 dB
850.000 MHz	855.000 MHz	100.000 kHz	850.11239 MHz	-26.99 dBm	-13.99 dB

Date: 19.JUL.2016 14:11:08

WCDMA Band II (RMC 12.2Kbps)

Lowest Band Edge

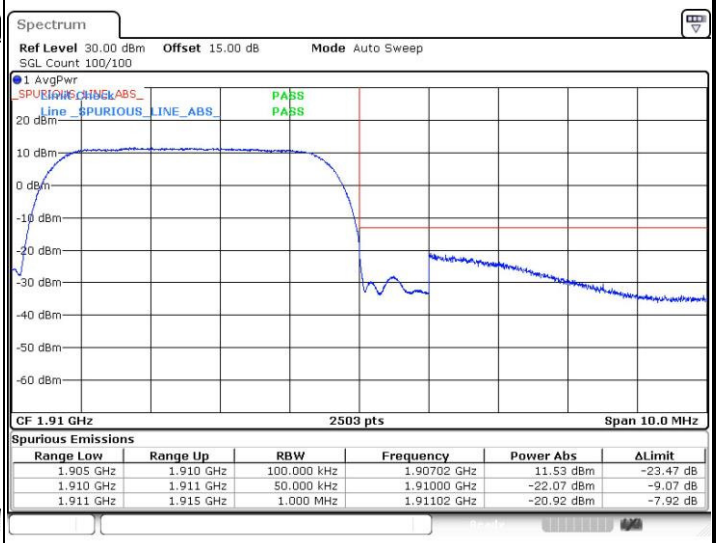


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.845 GHz	1.849 GHz	1.000 MHz	1.84898 GHz	-22.59 dBm	-9.59 dB
1.849 GHz	1.850 GHz	50.000 kHz	1.85000 GHz	-24.42 dBm	-11.42 dB
1.850 GHz	1.855 GHz	100.000 kHz	1.85266 GHz	11.13 dBm	-23.87 dB

Date: 19.JUL.2016 11:32:36

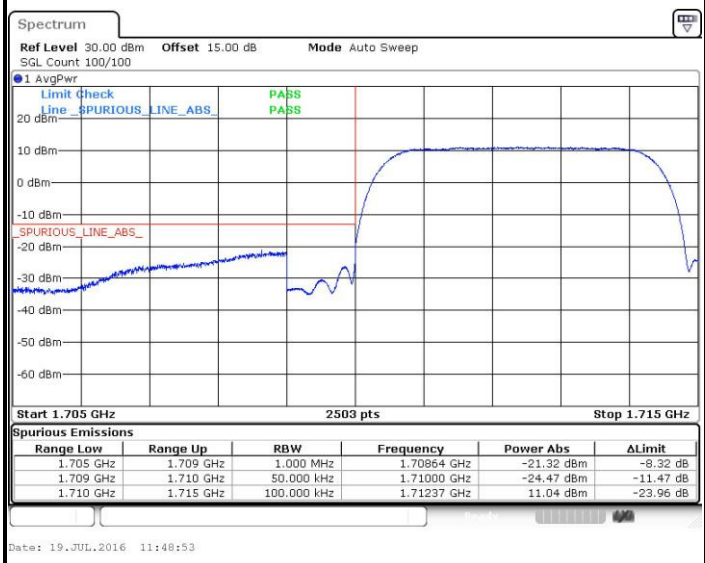
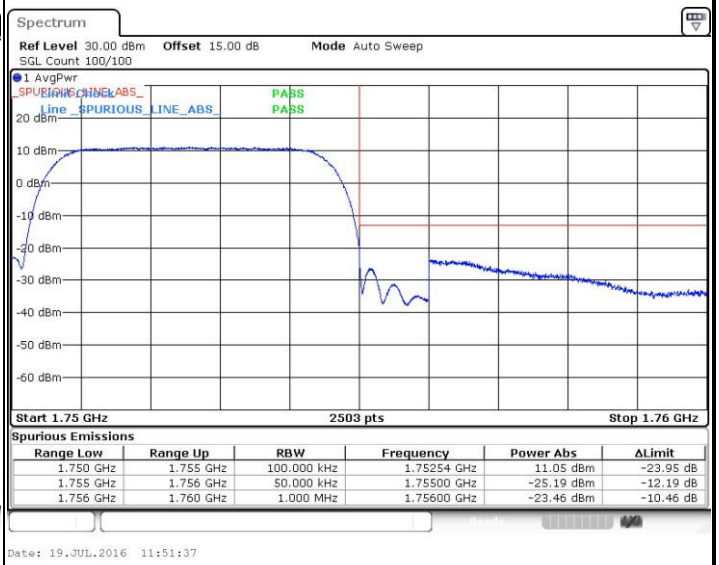
Highest Band Edge



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.905 GHz	1.910 GHz	100.000 kHz	1.90702 GHz	11.53 dBm	-23.47 dB
1.910 GHz	1.911 GHz	50.000 kHz	1.91000 GHz	-22.07 dBm	-9.07 dB
1.911 GHz	1.915 GHz	1.000 MHz	1.91102 GHz	-20.92 dBm	-7.92 dB

Date: 19.JUL.2016 11:35:21

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

Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.705 GHz	1.709 GHz	1.000 MHz	1.70864 GHz	-21.32 dBm	-8.32 dB
1.709 GHz	1.710 GHz	50.000 kHz	1.71000 GHz	-24.47 dBm	-11.47 dB
1.710 GHz	1.715 GHz	100.000 kHz	1.71237 GHz	11.04 dBm	-23.96 dB

Date: 19.JUL.2016 11:48:53

Spurious Emissions

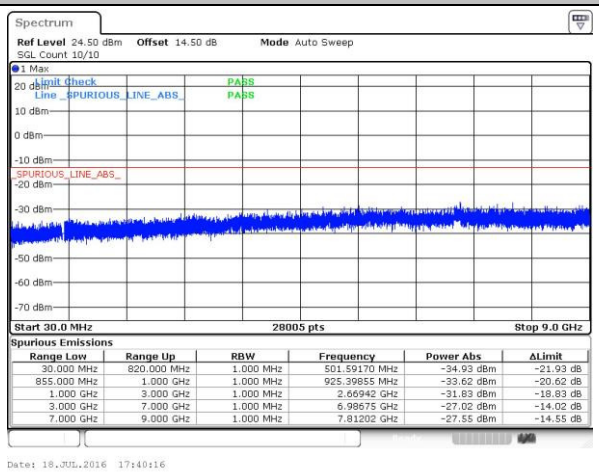
Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
1.750 GHz	1.755 GHz	100.000 kHz	1.75254 GHz	11.05 dBm	-23.95 dB
1.755 GHz	1.756 GHz	50.000 kHz	1.75500 GHz	-25.19 dBm	-12.19 dB
1.756 GHz	1.760 GHz	1.000 MHz	1.75600 GHz	-23.46 dBm	-10.46 dB

Date: 19.JUL.2016 11:51:37

Conducted Spurious Emission

GSM850 (GSM)

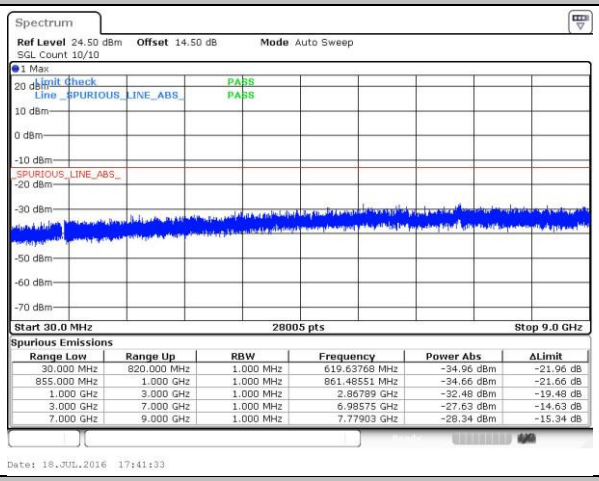
Lowest Channel



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	820.000 MHz	1.000 MHz	501.59170 MHz	-34.93 dBm	-21.93 dB
855.000 MHz	1.000 GHz	1.000 MHz	925.39855 MHz	-33.62 dBm	-20.62 dB
1.000 GHz	3.000 GHz	1.000 MHz	2.66942 GHz	-31.83 dBm	-18.83 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.98675 GHz	-27.02 dBm	-14.02 dB
7.000 GHz	9.000 GHz	1.000 MHz	7.81202 GHz	-27.55 dBm	-14.55 dB

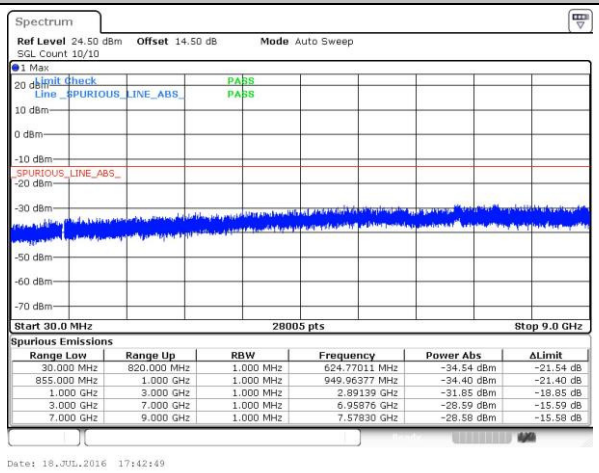
Middle Channel



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	820.000 MHz	1.000 MHz	619.63768 MHz	-34.96 dBm	-21.96 dB
855.000 MHz	1.000 GHz	1.000 MHz	861.48551 MHz	-34.66 dBm	-21.66 dB
1.000 GHz	3.000 GHz	1.000 MHz	2.86789 GHz	-32.48 dBm	-19.48 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.98575 GHz	-27.63 dBm	-14.63 dB
7.000 GHz	9.000 GHz	1.000 MHz	7.77903 GHz	-28.34 dBm	-15.34 dB

Highest Channel

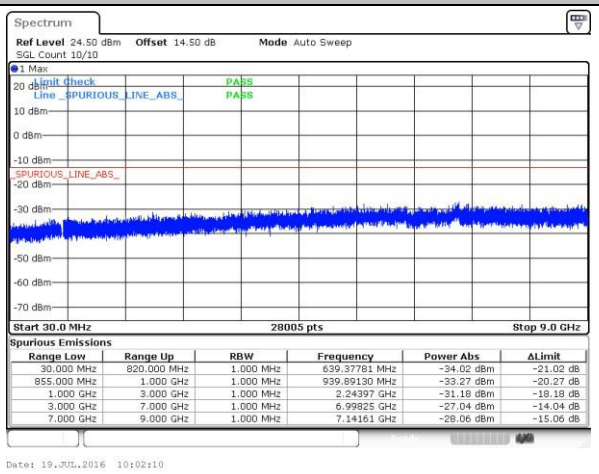


Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	820.000 MHz	1.000 MHz	624.77011 MHz	-34.54 dBm	-21.54 dB
855.000 MHz	1.000 GHz	1.000 MHz	949.96377 MHz	-34.40 dBm	-21.40 dB
1.000 GHz	3.000 GHz	1.000 MHz	2.89139 GHz	-31.85 dBm	-18.85 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.95876 GHz	-28.59 dBm	-15.59 dB
7.000 GHz	9.000 GHz	1.000 MHz	7.57830 GHz	-28.58 dBm	-15.58 dB

GSM850 (EDGE class 8)

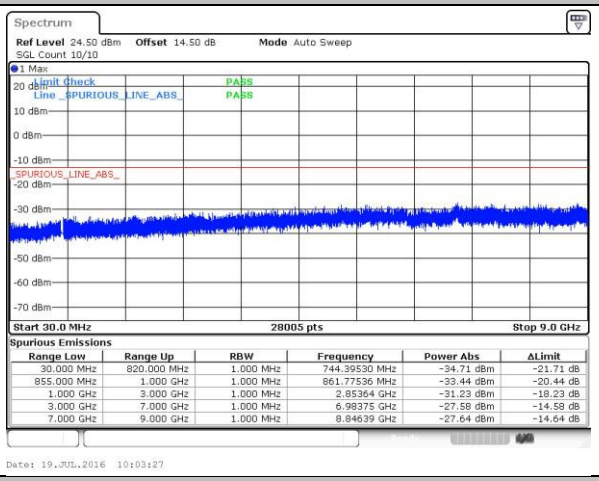
Lowest Channel



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	820.000 MHz	1.000 MHz	639.37781 MHz	-34.02 dBm	-21.02 dB
855.000 MHz	1.000 GHz	1.000 MHz	939.89130 MHz	-33.27 dBm	-20.27 dB
1.000 GHz	3.000 GHz	1.000 MHz	2.24397 GHz	-31.18 dBm	-18.18 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.99825 GHz	-27.04 dBm	-14.04 dB
7.000 GHz	9.000 GHz	1.000 MHz	7.14161 GHz	-28.06 dBm	-15.06 dB

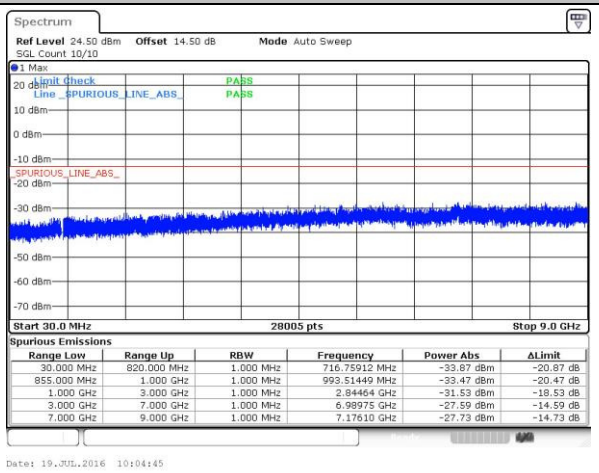
Middle Channel



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	820.000 MHz	1.000 MHz	744.39530 MHz	-34.71 dBm	-21.71 dB
855.000 MHz	1.000 GHz	1.000 MHz	861.77536 MHz	-33.44 dBm	-20.44 dB
1.000 GHz	3.000 GHz	1.000 MHz	2.85364 GHz	-31.23 dBm	-18.23 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.98375 GHz	-27.58 dBm	-14.58 dB
7.000 GHz	9.000 GHz	1.000 MHz	8.84639 GHz	-27.64 dBm	-14.64 dB

Highest Channel



Spurious Emissions

Range Low	Range Up	RBW	Frequency	Power Abs	ΔLimit
30.000 MHz	820.000 MHz	1.000 MHz	716.75912 MHz	-33.87 dBm	-20.87 dB
855.000 MHz	1.000 GHz	1.000 MHz	993.51449 MHz	-33.47 dBm	-20.47 dB
1.000 GHz	3.000 GHz	1.000 MHz	2.84464 GHz	-31.53 dBm	-18.53 dB
3.000 GHz	7.000 GHz	1.000 MHz	6.98975 GHz	-27.59 dBm	-14.59 dB
7.000 GHz	9.000 GHz	1.000 MHz	7.17610 GHz	-27.73 dBm	-14.73 dB