

FCC RF Test Report

APPLICANT : Lemobile Information Technology (Beijing) Co., Ltd.
EQUIPMENT : Mobile phone
BRAND NAME : LeEco
MODEL NAME : LEX727
FCC ID : 2AFWMLEX727
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 Aug. 30, 2016 and testing was completed on Sep. 18, 2016. We, SPORTON INTERNATIONAL (KUNSHAN) INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA / EIA-603-D-2010 and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL (KUNSHAN) INC., the test report shall not be reproduced except in full.



Prepared by: James Huang / Manager



Approved by: Jones Tsai / Manager



SPORTON INTERNATIONAL (KUNSHAN) INC.

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



TABLE OF CONTENTS

1	GENERAL DESCRIPTION	5
1.1	Applicant.....	5
1.2	Manufacturer	5
1.3	Product Feature of Equipment Under Test	5
1.4	Product Specification of Equipment Under Test	6
1.5	Modification of EUT	7
1.6	Maximum ERP/EIRP Power, Frequency Tolerance, and Emission Designator	7
1.7	Testing Location	8
1.8	Applicable Standards	8
2	TEST CONFIGURATION OF EQUIPMENT UNDER TEST	9
2.1	Test Mode.....	9
2.2	Connection Diagram of Test System	10
2.3	Support Unit used in test configuration	13
2.4	Measurement Results Explanation Example	13
3	CONDUCTED TEST RESULT	14
3.1	Measuring Instruments.....	14
3.2	Test Setup	14
3.3	Test Result of Conducted Test.....	14
3.4	Conducted Output Power and ERP/EIRP	15
3.5	Peak-to-Average Ratio	16
3.6	99% Occupied Bandwidth and 26dB Bandwidth Measurement.....	17
3.7	Conducted Band Edge	18
3.8	Conducted Spurious Emission	19
3.9	Frequency Stability.....	20
4	RADIATED TEST ITEMS	21
4.1	Measuring Instruments.....	21
4.2	Test Setup	21
4.3	Test Result of Radiated Test.....	21
4.4	Field Strength of Spurious Radiation Measurement	22
5	LIST OF MEASURING EQUIPMENT	23
6	UNCERTAINTY OF EVALUATION	24
APPENDIX A. TEST RESULTS OF CONDUCTED TEST		
APPENDIX B. TEST RESULTS OF RADIATED TEST		
APPENDIX C. TEST SETUP PHOTOGRAPHS		



REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG683002A	Rev. 01	Initial issue of report	Oct. 10, 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 22H	PASS	-
	§2.1055 §24.235 §27.54		Within Authorized Band		
4.4	§2.1053 §22.917(a) §24.238(a) §27.53(h)	Field Strength of Spurious Radiation	< 43+10log10(P[Watts])	PASS	Under limit 20.51 dB at 3760.000 MHz

1 General Description

1.1 Applicant

Lemobile Information Technology (Beijing) Co., Ltd.

Wenhuaying North (No.1, Linkong 2nd St), Gaoliying, Shunyi District, Beijing

1.2 Manufacturer

Lemobile Information Technology (Beijing) Co., Ltd.

Wenhuaying North (No.1, Linkong 2nd St), Gaoliying, Shunyi District, Beijing

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Mobile phone
Brand Name	LeEco
Model Name	LEX727
FCC ID	2AFWMLEX727
EUT supports Radios application	GSM/GPRS/EGPRS/WCDMA/HSPA/DC-HSDPA/ HSPA+(16QAM uplink is not supported)/LTE/NFC WLAN 2.4GHz 802.11b/g/n HT20 WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac VHT20/VHT40/VHT80 Bluetooth v3.0 + EDR/Bluetooth v4.0 LE/Bluetooth v4.2 LE
IMEI Code	Conducted: 862524030000166 Radiation: 862524030000281 for Top Antenna 862524030000471 for Bottom Antenna
HW Version	HW_1.0.0
SW Version	zl1_cert_fcc
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 Top Antenna	GSM/GPRS/EDGE: 850: 28.95 dBm 1900: 26.03 dBm WCDMA: Band V: 20.06 dBm Band II: 17.61 dBm Band IV: 19.66 dBm
Antenna Gain to Top Antenna	Cellular Band: -4.50 dBi PCS Band: -3.00 dBi AWS Band: -3.60 dBi
Maximum Output Power to Bottom Antenna	GSM/GPRS/EDGE: 850: 33.75 dBm 1900: 31.05 dBm WCDMA: Band V: 23.37 dBm Band II: 23.39 dBm Band IV: 23.31 dBm
Antenna Gain to Bottom Antenna	Cellular Band: -3.70 dBi PCS Band: -2.70 dBi AWS Band: -2.50 dBi
Antenna Type	IFA Antenna
Type of Modulation	GSM: GMSK GPRS: GMSK EDGE: GMSK / 8PSK WCDMA: BPSK (Uplink) HSDPA/DC-HSDPA: QPSK (Uplink) HSUPA: QPSK (Uplink) HSPA+: 16QAM uplink is not supported DC-HSDPA: 64QAM

1.5 Modification of EUT

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

1.6 Maximum ERP/EIRP Power, Frequency Tolerance, and Emission Designator

FCC Rule	System	Type of Modulation	Maximum ERP/EIRP (W)		Frequency Tolerance (ppm)	Emission Designator
			Top	Bottom		
Part 22H	GSM850 GSM	GMSK	0.1698	0.6166	0.0096 ppm	243KGXW
Part 22H	GSM850 EDGE class 8	8PSK	0.0783	0.1253	0.0191 ppm	242KG7W
Part 22H	WCDMA Band V RMC 12.2Kbps	BPSK	0.0219	0.0565	0.0275 ppm	4M14F9W
Part 24E	GSM1900 GSM	GMSK	0.2009	0.6839	0.0085 ppm	243KGXW
Part 24E	GSM1900 EDGE class 8	8PSK	0.1346	0.2118	0.0186 ppm	246KG7W
Part 24E	WCDMA Band II RMC 12.2Kbps	BPSK	0.0289	0.1172	0.0101 ppm	4M15F9W
Part 27L	WCDMA Band IV RMC 12.2Kbps	BPSK	0.0404	0.1205	0.0063 ppm	4M13F9W



1.7 Testing Location

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

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/IC Registration No.
	03CH02-SZ	566869/4086F

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
- ♦ FCC KDB 412172 D01 Determining ERP and EIRP v01r01

Remark:

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

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 WCDMA Band IV.
3. 30 MHz to 10th harmonic for GSM1900 and WCDMA Band II.

All modes and data rates and positions were investigated.

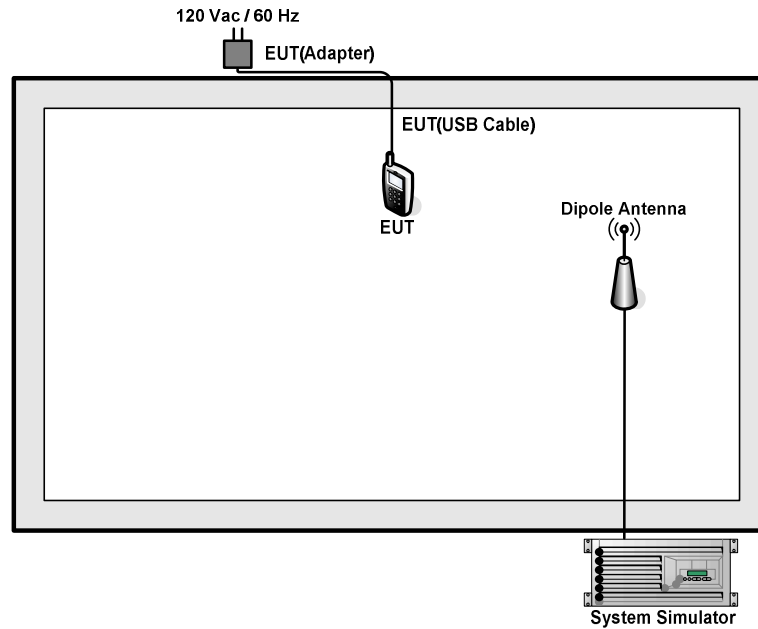
Test modes are chosen to be reported as the worst case configuration below:

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
WCDMA Band IV	■ RMC 12.2Kbps Link	■ RMC 12.2Kbps Link

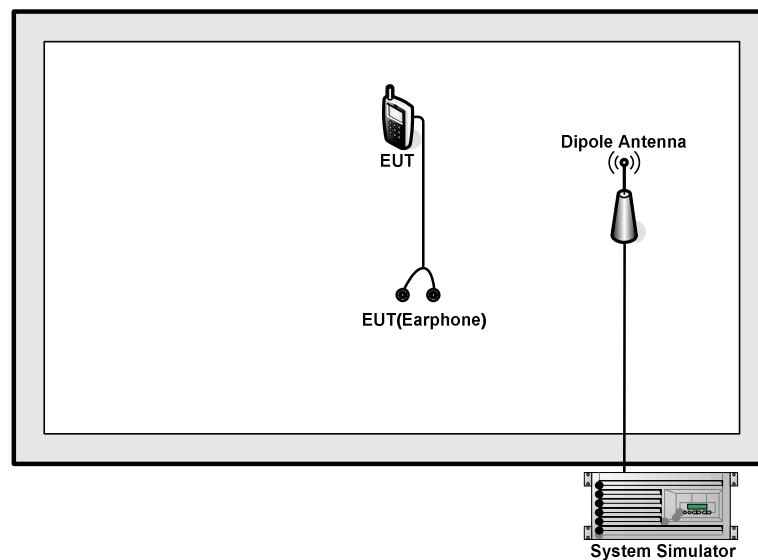
2.2 Connection Diagram of Test System

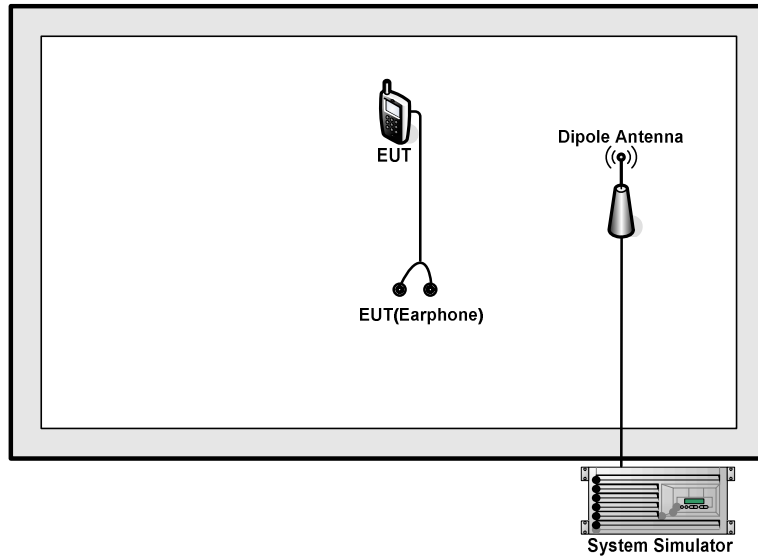
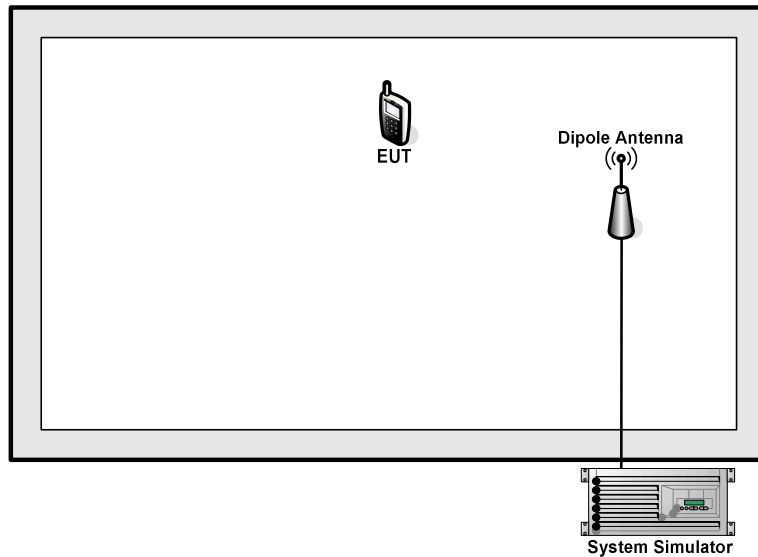
Top Antenna

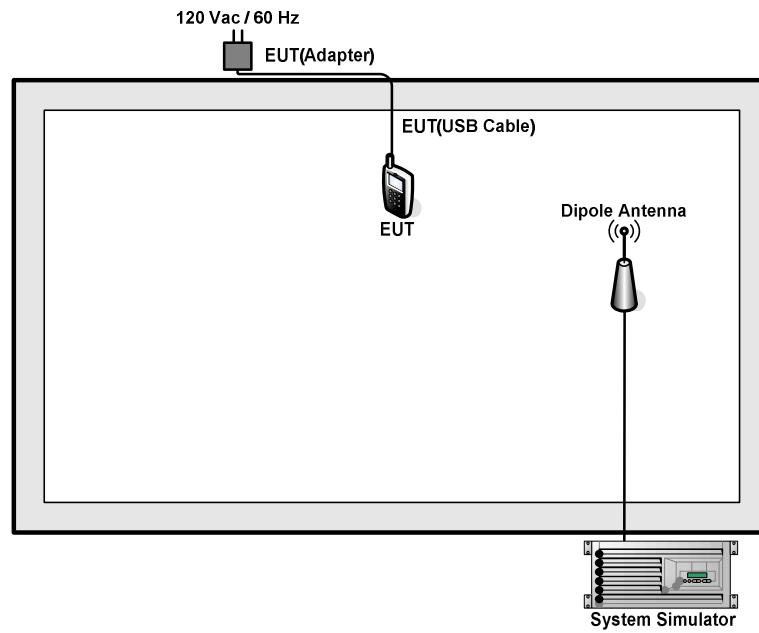
22H/24E



27L



Bottom Antenna**22H****24E**

27L



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.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8m
3.	DC Power Supply	GW INSTEK	GPS-3030D	N/A	N/A	Unshielded, 1.8 m

2.4 Measurement Results Explanation Example

For all conducted test items:

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

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

Offset = RF cable loss + attenuator factor.

The following shows an offset computation example with RF cable loss 4.5 dB and a 10dB attenuator.

Example :

$$\begin{aligned}\text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)} \\ &= 4.5 + 10 = 14.5 \text{ (dB)}\end{aligned}$$

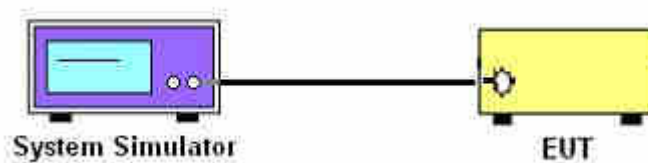
3 Conducted Test Result

3.1 Measuring Instruments

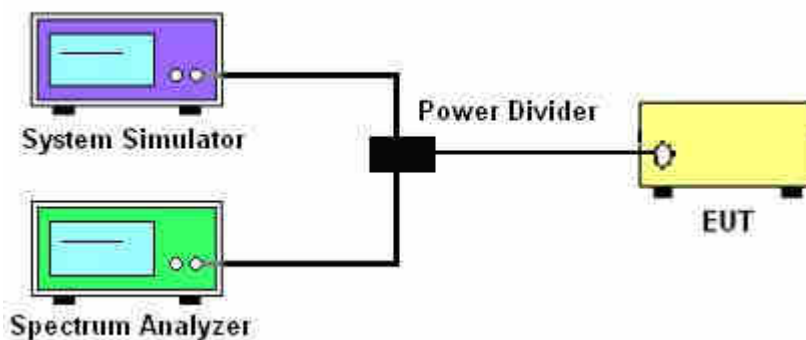
See list of measuring instruments of this test report.

3.2 Test Setup

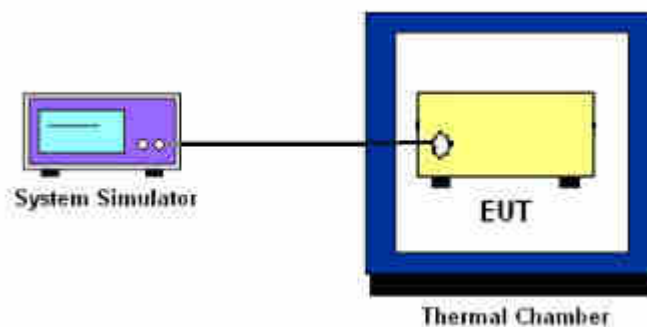
3.2.1 Conducted Output Power



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 and ERP/EIRP

3.4.1 Description of the Conducted Output Power and ERP/EIRP

A system simulator was used to establish communication with the EUT. Its parameters were set to enforce EUT transmitting at the maximum power. The measured power in the radio frequency on the transmitter output terminals shall be reported.

The ERP of mobile transmitters must not exceed 7 Watts for GSM850 and WCDMA Band V.

The EIRP of mobile transmitters must not exceed 2 Watts for GSM1900 and WCDMA Band II.

The EIRP of mobile transmitters must not exceed 1 Watts for WCDMA Band IV.

According to KDB 412172 D01 Power Approach,

$EIRP = P_T + G_T - L_C$, $ERP = EIRP - 2.15$, where

P_T = transmitter output power in dBm

G_T = gain of the transmitting antenna in dBi

L_C = signal attenuation in the connecting cable between the transmitter and antenna in dB

3.4.2 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 $43 + 10\log(P)$ dB below the transmitter power P(Watts)
$$= P(W) - [43 + 10\log(P)] \text{ (dB)}$$
$$= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$$
$$= -13\text{dBm}.$$

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 $43 + 10\log(P)$ dB below the transmitter power P(Watts)
= $P(W) - [43 + 10\log(P)]$ (dB)
= $[30 + 10\log(P)]$ (dBm) - $[43 + 10\log(P)]$ (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 $\pm 0.00025\%$ ($\pm 2.5\text{ppm}$) of the center frequency.

3.9.2 Test Procedures for Temperature Variation

1. The testing follows FCC KDB 971168 D01 v02r02 Section 9.0.
2. The EUT was set up in the thermal chamber and connected with the system simulator.
3. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
4. With power OFF, the temperature was raised in 10°C steps up to 50°C . The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

3.9.3 Test Procedures for Voltage Variation

1. The testing follows FCC KDB 971168 D01 v02r02 Section 9.0.
2. The EUT was placed in a temperature chamber at $25\pm 5^{\circ}\text{C}$ 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.

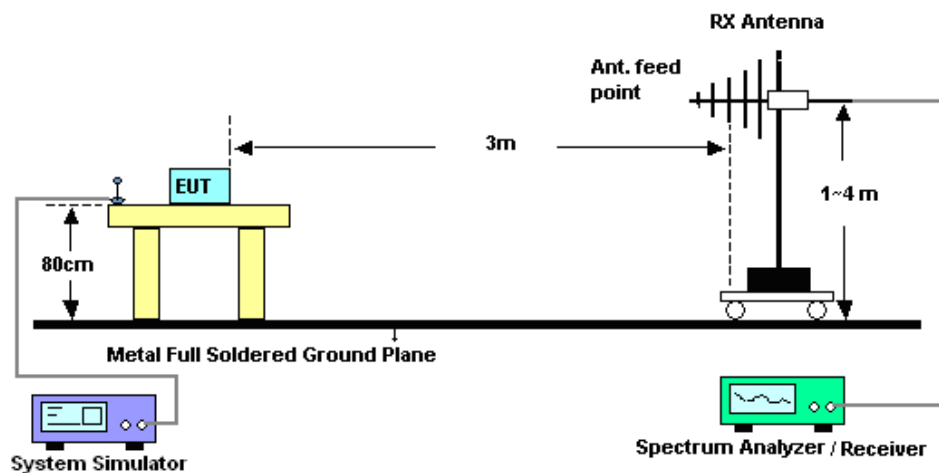
4 Radiated Test Items

4.1 Measuring Instruments

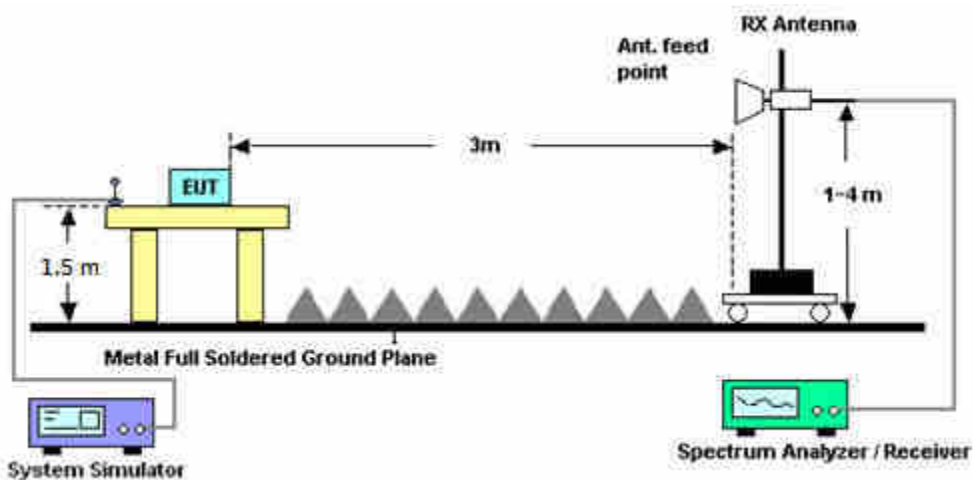
See list of measuring instruments of this test report.

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 Field Strength of Spurious Radiation Measurement

4.4.1 Description of Field Strength of Spurious Radiated Measurement

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

4.4.2 Test Procedures

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. $EIRP \text{ (dBm)} = S.G. \text{ Power} - Tx \text{ Cable Loss} + Tx \text{ Antenna Gain}$
12. $ERP \text{ (dBm)} = EIRP - 2.15$
13. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
14. The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)
 $= P(W) - [43 + 10\log(P)] \text{ (dB)}$
 $= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$
 $= -13\text{dBm}.$



5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Aug. 09, 2016	Sep. 16, 2016	Aug. 08, 2017	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	-40~+150°C	Oct. 24, 2015	Sep. 16, 2016	Oct. 23, 2016	Conducted (TH01-KS)
Spectrum Analyzer	R&S	FSV40	101041	10kHz~40GHz;Max 30dBm	Oct. 20, 2015	Sep. 14, 2016~ Sep. 18, 2016	Oct. 19, 2016	Radiation (03CH02-SZ)
Bilog Antenna	TeseQ	CBL6112D	35407	30MHz~2GHz	May 21, 2016	Sep. 14, 2016~ Sep. 18, 2016	May 20, 2017	Radiation (03CH02-SZ)
Double Ridge Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1285	1GHz~18GHz	Jan. 11, 2016	Sep. 14, 2016~ Sep. 18, 2016	Jan. 10, 2017	Radiation (03CH02-SZ)
SHF-EHF Horn	com-power	AH-840	101071	18GHz~40GHz	Aug. 10, 2016	Sep. 14, 2016~ Sep. 18, 2016	Aug. 09, 2017	Radiation (03CH02-SZ)
Amplifier	Agilent	8449B	3008A01023	1GHz~26.5GHz	Oct. 20, 2015	Sep. 14, 2016~ Sep. 18, 2016	Oct. 19, 2016	Radiation (03CH02-SZ)
Amplifier	HP	8447F	3113A04622	9kHz~1300MHz / 30 dB	Jul. 16, 2016	Sep. 14, 2016~ Sep. 18, 2016	Jul. 15, 2017	Radiation (03CH02-SZ)
AC Power Source	Chroma	61601	616010002470	N/A	NCR	Sep. 14, 2016~ Sep. 18, 2016	NCR	Radiation (03CH02-SZ)
Turn Table	Chaintek	T-200	N/A	0~360 degree	NCR	Sep. 14, 2016~ Sep. 18, 2016	NCR	Radiation (03CH02-SZ)
Antenna Mast	Chaintek	MBS-400	N/A	1 m~4 m	NCR	Sep. 14, 2016~ Sep. 18, 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% ($U = 2Uc(y)$)	2.5dB
---	-------

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

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

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

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



Appendix A. Test Results of Conducted Test

Conducted Output Power(Average power)

Top Antenna

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	28.39	28.43	28.95	25.42	25.87	26.03
GPRS class 8	28.38	28.41	28.94	25.41	25.85	26.01
GPRS class 10	25.58	25.29	25.62	23.60	23.69	23.85
GPRS class 11	24.33	24.30	24.63	22.50	22.69	22.83
GPRS class 12	22.17	21.81	22.08	20.33	20.48	20.64
EGPRS class 8	25.41	25.49	25.59	24.14	24.22	24.29
EGPRS class 10	24.73	24.56	24.68	22.60	22.43	22.56
EGPRS class 11	23.65	23.64	23.78	21.44	21.42	21.49
EGPRS class 12	22.13	21.75	21.89	21.44	21.42	21.49



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	20.00	20.03	20.04	17.60	17.43	17.46	19.64	19.23	19.24
RMC 12.2K	20.02	20.05	20.06	17.61	17.45	17.49	19.66	19.25	19.25
HSDPA Subtest-1	19.35	19.38	19.40	17.12	17.08	17.11	19.08	18.98	18.92
HSDPA Subtest-2	19.34	19.34	19.37	17.09	17.04	17.09	19.03	19.00	18.97
HSDPA Subtest-3	18.86	18.92	18.88	16.61	16.58	16.61	18.56	18.52	18.47
HSDPA Subtest-4	18.86	18.88	18.91	16.65	16.61	16.62	18.58	18.53	18.46
DC-HSDPA Subtest-1	19.32	19.38	19.41	17.11	17.06	17.13	19.05	19.01	18.99
DC-HSDPA Subtest-2	19.34	19.32	19.38	17.06	17.02	17.09	19.01	19.05	18.91
DC-HSDPA Subtest-3	18.86	18.91	18.87	16.58	16.56	16.63	18.55	18.51	18.53
DC-HSDPA Subtest-4	18.81	18.83	18.92	16.61	16.48	16.51	18.42	18.41	18.50
HSUPA Subtest-1	19.33	19.39	19.41	17.14	17.11	17.10	19.03	18.99	18.95
HSUPA Subtest-2	17.32	17.47	17.40	15.20	15.10	15.11	17.10	17.00	16.99
HSUPA Subtest-3	18.35	18.44	18.43	16.10	16.10	16.09	18.10	18.03	17.98
HSUPA Subtest-4	17.35	17.45	17.43	15.18	15.05	15.11	17.12	17.00	16.98
HSUPA Subtest-5	19.40	19.40	19.40	17.20	17.10	17.20	19.10	19.00	19.00



Bottom Antenna

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	33.75	33.60	33.55	30.49	30.63	31.05
GPRS class 8	33.74	33.58	33.53	30.48	30.61	31.03
GPRS class 10	30.21	29.70	29.62	27.98	28.23	28.30
GPRS class 11	28.68	28.90	28.93	26.34	27.15	27.24
GPRS class 12	26.68	26.38	26.28	24.75	25.01	25.03
EGPRS class 8	26.79	26.83	26.79	25.46	25.68	25.96
EGPRS class 10	24.96	24.82	24.73	25.24	25.11	25.12
EGPRS class 11	23.73	23.75	24.05	23.94	24.17	24.11
EGPRS class 12	22.48	22.08	22.04	22.67	22.54	22.50

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	23.35	23.31	23.11	23.30	23.32	23.37	23.29	23.25	23.30
RMC 12.2K	23.37	23.33	23.14	23.31	23.34	23.39	23.30	23.27	23.31
HSDPA Subtest-1	22.25	22.25	22.06	22.27	22.27	22.31	22.27	22.33	22.22
HSDPA Subtest-2	22.28	21.98	22.10	22.25	22.27	22.30	22.28	22.36	22.26
HSDPA Subtest-3	21.82	21.77	21.63	21.83	21.83	21.87	21.82	21.86	21.79
HSDPA Subtest-4	21.83	21.75	21.61	21.76	21.79	21.81	21.82	21.84	21.77
DC-HSDPA Subtest-1	22.23	22.21	22.12	22.13	22.25	22.35	22.25	22.31	22.18
DC-HSDPA Subtest-2	22.25	21.99	22.08	22.22	22.21	22.28	22.21	22.28	22.23
DC-HSDPA Subtest-3	21.81	21.73	21.58	21.82	21.73	21.85	21.81	21.78	21.76
DC-HSDPA Subtest-4	21.82	21.79	21.55	21.81	21.82	21.79	21.80	21.80	21.78
HSUPA Subtest-1	22.35	22.24	22.15	22.26	22.28	22.33	22.30	22.33	22.28
HSUPA Subtest-2	20.37	20.32	20.16	20.31	20.24	20.36	20.28	20.30	20.25
HSUPA Subtest-3	21.35	21.33	21.14	21.24	21.30	21.32	21.29	21.35	21.33
HSUPA Subtest-4	20.38	20.31	20.17	20.34	20.30	20.34	20.28	20.44	20.29
HSUPA Subtest-5	22.40	22.30	22.20	22.30	22.30	22.30	22.30	22.40	22.30

**ERP/EIRP****Top Antenna**

Cellular Band ($G_T - L_C = -4.50$ dB)									
Modes	GSM850 (GSM)			GSM850 (EDGE class 8)			WCDMA Band V (RMC 12.2Kbps)		
Channel	128 (Low)	189 (Mid)	251 (High)	128 (Low)	189 (Mid)	251 (High)	4132 (Low)	4182 (Mid)	4233 (High)
Frequency (MHz)	824.2	836.4	848.8	824.2	836.4	848.8	826.4	836.4	846.6
Conducted Power (dBm)	28.39	28.43	28.95	25.41	25.49	25.59	20.02	20.05	20.06
Conducted Power (Watts)	0.6902	0.6966	0.7852	0.3475	0.3540	0.3622	0.1005	0.1012	0.1014
ERP(dBm)	21.74	21.78	22.30	18.76	18.84	18.94	13.37	13.40	13.41
ERP(Watts)	0.1493	0.1507	0.1698	0.0752	0.0766	0.0783	0.0217	0.0219	0.0219

PCS Band ($G_T - L_C = -3.00$ dB)									
Modes	GSM1900 (GSM)			GSM1900 (EDGE class 8)			WCDMA Band II (RMC 12.2Kbps)		
Channel	512 (Low)	661 (Mid)	810 (High)	512 (Low)	661 (Mid)	810 (High)	9262 (Low)	9400 (Mid)	9538 (High)
Frequency (MHz)	1850.2	1880	1909.8	1850.2	1880	1909.8	1852.4	1880	1907.6
Conducted Power (dBm)	25.42	25.87	26.03	24.14	24.22	24.29	17.61	17.45	17.49
Conducted Power (Watts)	0.3483	0.3864	0.4009	0.2594	0.2642	0.2685	0.0577	0.0556	0.0561
EIRP(dBm)	22.42	22.87	23.03	21.14	21.22	21.29	14.61	14.45	14.49
EIRP(Watts)	0.1746	0.1936	0.2009	0.1300	0.1324	0.1346	0.0289	0.0279	0.0281



AWS Band ($G_T - L_C = -3.60$ dB)			
Modes	WCDMA Band IV (RMC 12.2Kbps)		
Channel	1312 (Low)	1413 (Mid)	1513 (High)
Frequency (MHz)	1712.4	1732.6	1752.6
Conducted Power (dBm)	19.66	19.25	19.25
Conducted Power (Watts)	0.0925	0.0841	0.0841
EIRP(dBm)	16.06	15.65	15.65
EIRP(Watts)	0.0404	0.0367	0.0367

**Bottom Antenna**

Cellular Band ($G_T - L_C = -3.70$ dB)									
Modes	GSM850 (GSM)			GSM850 (EDGE class 8)			WCDMA Band V (RMC 12.2Kbps)		
Channel	128 (Low)	189 (Mid)	251 (High)	128 (Low)	189 (Mid)	251 (High)	4132 (Low)	4182 (Mid)	4233 (High)
Frequency (MHz)	824.2	836.4	848.8	824.2	836.4	848.8	826.4	836.4	846.6
Conducted Power (dBm)	33.75	33.60	33.55	26.79	26.83	26.79	23.37	23.33	23.14
Conducted Power (Watts)	2.3714	2.2909	2.2646	0.4775	0.4819	0.4775	0.2173	0.2153	0.2061
ERP(dBm)	27.90	27.75	27.70	20.94	20.98	20.94	17.52	17.48	17.29
ERP(Watts)	0.6166	0.5957	0.5888	0.1242	0.1253	0.1242	0.0565	0.0560	0.0536

PCS Band ($G_T - L_C = -2.70$ dB)									
Modes	GSM1900 (GSM)			GSM1900 (EDGE class 8)			WCDMA Band II (RMC 12.2Kbps)		
Channel	512 (Low)	661 (Mid)	810 (High)	512 (Low)	661 (Mid)	810 (High)	9262 (Low)	9400 (Mid)	9538 (High)
Frequency (MHz)	1850.2	1880	1909.8	1850.2	1880	1909.8	1852.4	1880	1907.6
Conducted Power (dBm)	30.49	30.63	31.05	25.46	25.68	25.96	23.31	23.34	23.39
Conducted Power (Watts)	1.1194	1.1561	1.2735	0.3516	0.3698	0.3945	0.2143	0.2158	0.2183
EIRP(dBm)	27.79	27.93	28.35	22.76	22.98	23.26	20.61	20.64	20.69
EIRP(Watts)	0.6012	0.6209	0.6839	0.1888	0.1986	0.2118	0.1151	0.1159	0.1172



AWS Band ($G_T - L_C = -2.50$ dB)			
Modes	WCDMA Band IV (RMC 12.2Kbps)		
Channel	1312 (Low)	1413 (Mid)	1513 (High)
Frequency (MHz)	1712.4	1732.6	1752.6
Conducted Power (dBm)	23.30	23.27	23.31
Conducted Power (Watts)	0.2143	0.2123	0.2143
EIRP(dBm)	20.80	20.77	20.81
EIRP(Watts)	0.1202	0.1194	0.1205

**Peak-to-Average Ratio**

Mode	GSM850(dB)		Limit: 13dB
Mod.	GSM	EDGE class 8	Result
Lowest CH	0.23	3.33	PASS
Middle CH	0.23	3.19	
Highest CH	0.26	3.39	

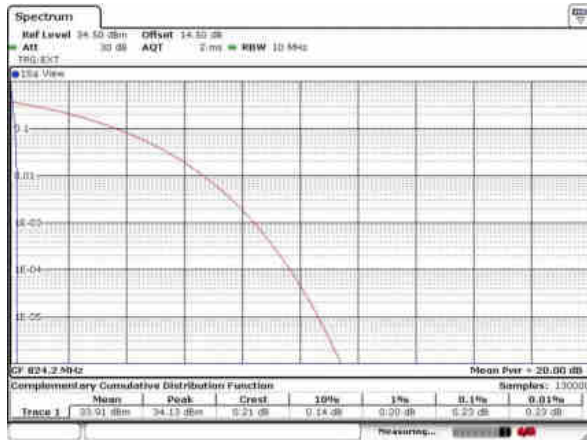
Mode	GSM1900(dB)		Limit: 13dB
Mod.	GSM	EDGE class 8	Result
Lowest CH	0.17	3.45	PASS
Middle CH	0.14	3.45	
Highest CH	0.20	3.33	

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	3.07	3.04	3.45	PASS
Middle CH	3.45	3.07	3.25	
Highest CH	3.28	3.22	3.57	



GSM850 (GSM)

Lowest Channel



Date: 16 SEP 2016 10:34:54

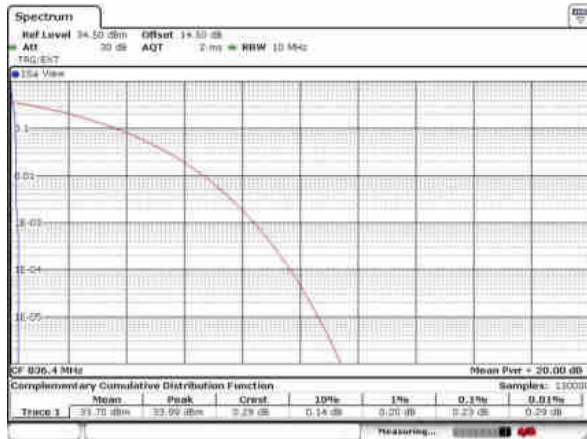
GSM850 (EDGE class 8)

Lowest Channel



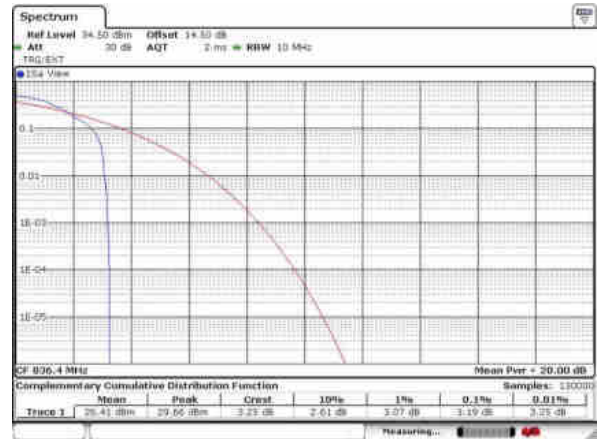
Date: 16 SEP 2016 10:26:47

Middle Channel



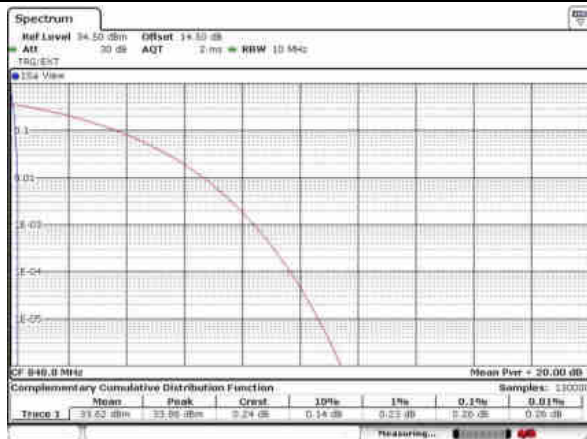
Date: 16 SEP 2016 10:35:02

Middle Channel



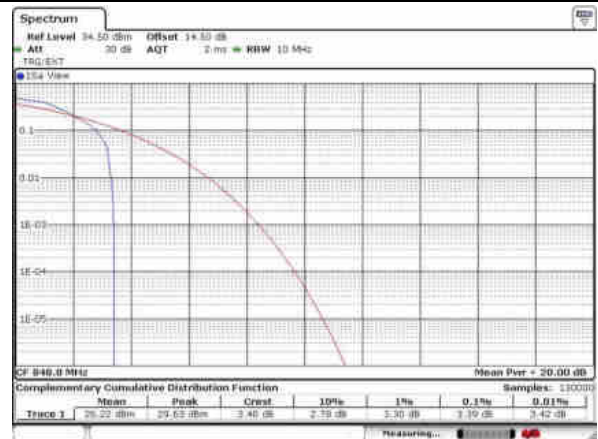
Date: 16 SEP 2016 15:21:56

Highest Channel



Date: 16 SEP 2016 10:35:11

Highest Channel

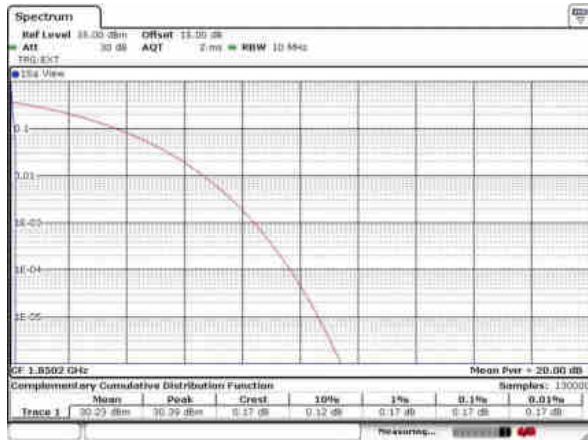


Date: 16 SEP 2016 15:21:16



GSM1900 (GSM)

Lowest Channel

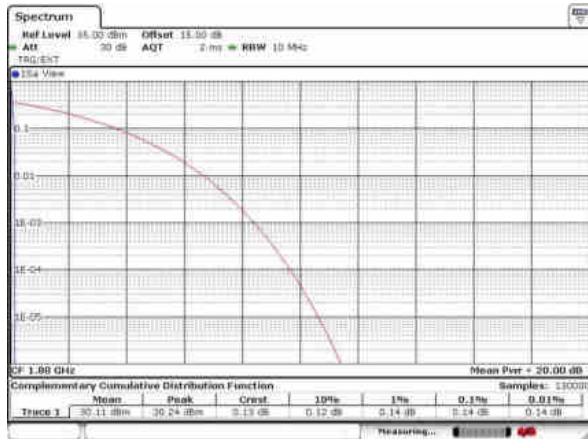


GSM1900 (EDGE class 8)

Lowest Channel



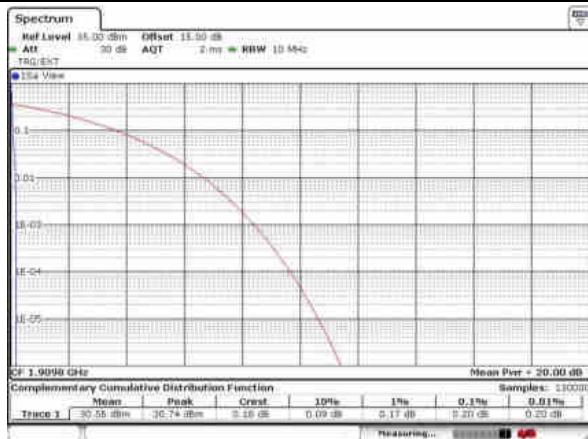
Middle Channel



Middle Channel



Highest Channel



Highest Channel





WCDMA Band V (RMC 12.2Kbps)

Lowest Channel



Date: 16 SEP 2016 14:16:30

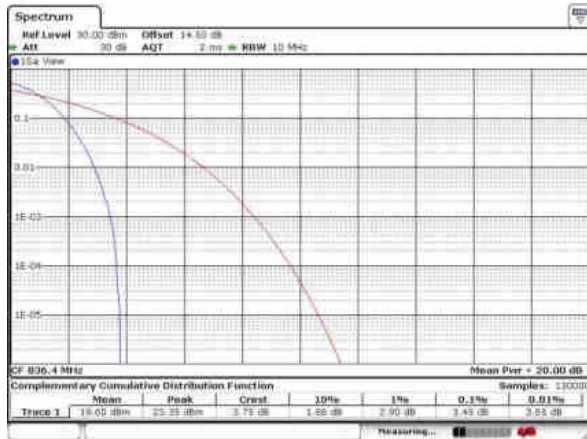
WCDMA Band II (RMC 12.2Kbps)

Lowest Channel



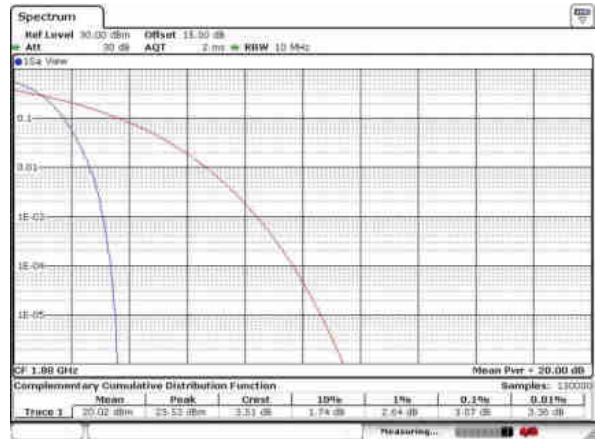
Date: 16 SEP 2016 14:35:40

Middle Channel



Date: 16 SEP 2016 14:16:40

Middle Channel



Date: 16 SEP 2016 14:36:24

Highest Channel



Date: 16 SEP 2016 14:16:56

Highest Channel

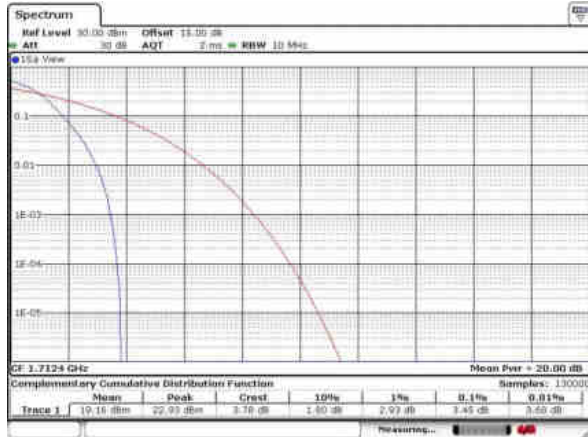


Date: 16 SEP 2016 14:36:57



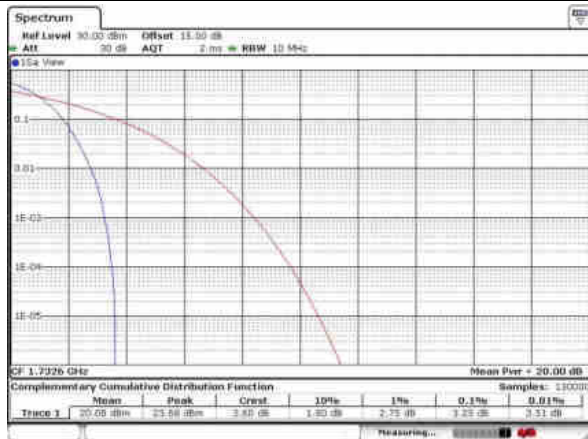
WCDMA Band IV (RMC 12.2Kbps)

Lowest Channel



Date: 16 SEP 2016 14:56:20

Middle Channel



Date: 16 SEP 2016 14:56:22

Highest Channel



Date: 16 SEP 2016 14:56:30

**26dB Bandwidth**

Mode	GSM850(MHz)	
Mod.	GSM	EDGE class 8
Lowest CH	0.314	0.315
Middle CH	0.313	0.313
Highest CH	0.317	0.314

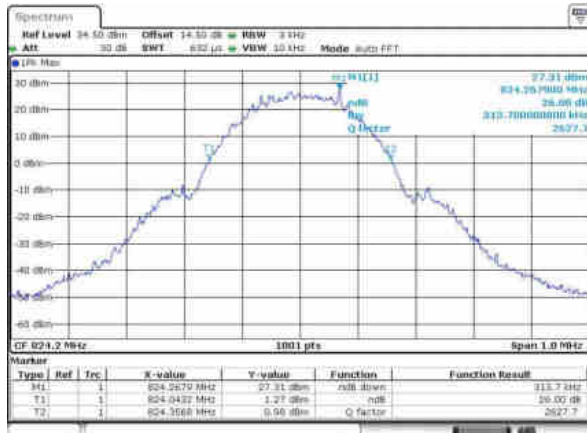
Mode	GSM1900(MHz)	
Mod.	GSM	EDGE class 8
Lowest CH	0.318	0.310
Middle CH	0.315	0.314
Highest CH	0.315	0.309

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	4.81	4.71	4.70
Middle CH	4.70	4.72	4.70
Highest CH	4.70	4.70	4.70



GSM850 (GSM)

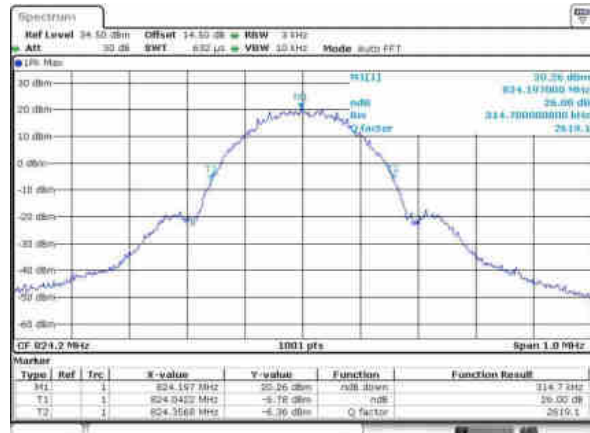
Lowest Channel



Date: 16 SEP 2016 10:12:21

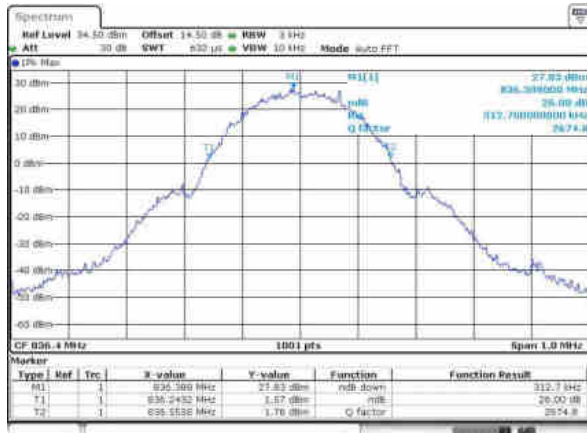
GSM850 (EDGE class 8)

Lowest Channel



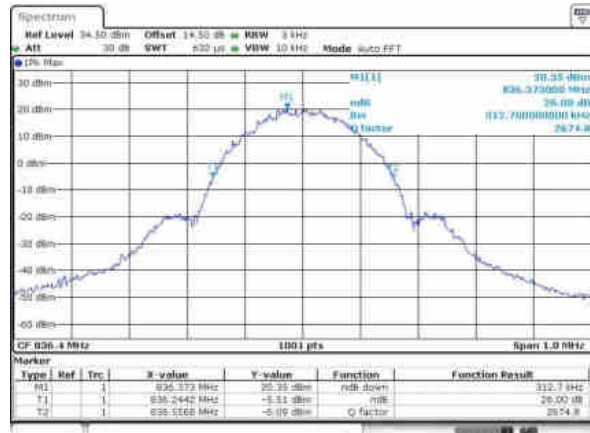
Date: 16 SEP 2016 10:37:03

Middle Channel



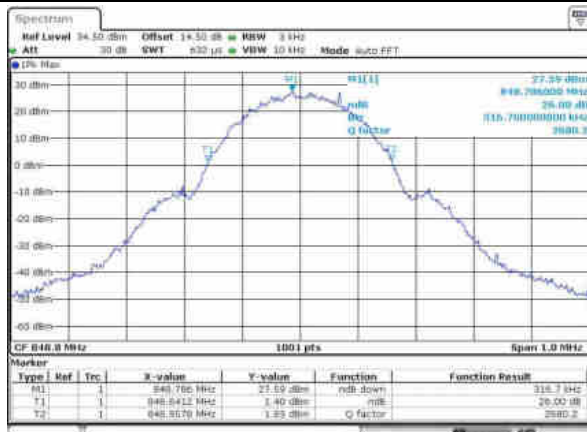
Date: 16 SEP 2016 10:15:05

Middle Channel



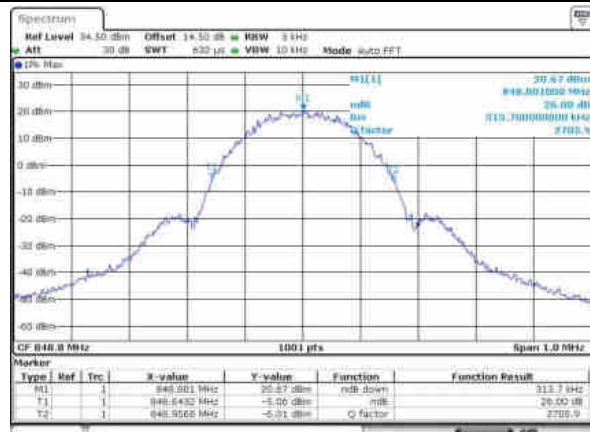
Date: 16 SEP 2016 10:37:30

Highest Channel



Date: 16 SEP 2016 10:15:34

Highest Channel



Date: 16 SEP 2016 10:39:27



GSM1900 (GSM)

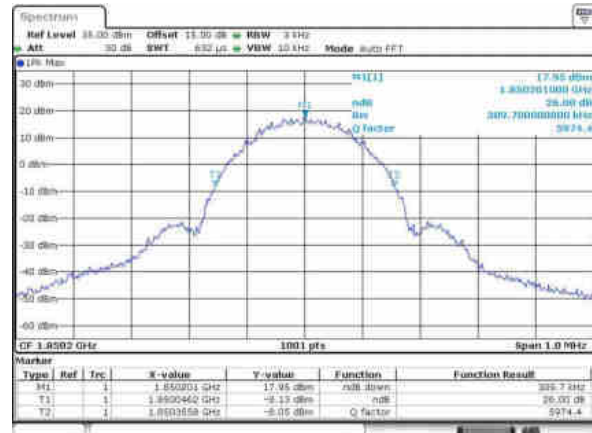
Lowest Channel



Date: 16 SEP 2016 11:06:25

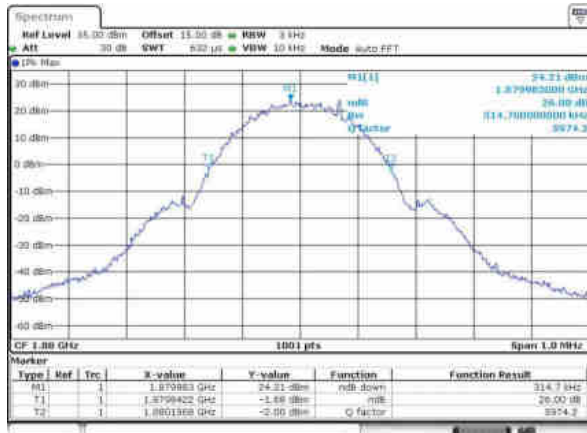
GSM1900 (EDGE class 8)

Lowest Channel



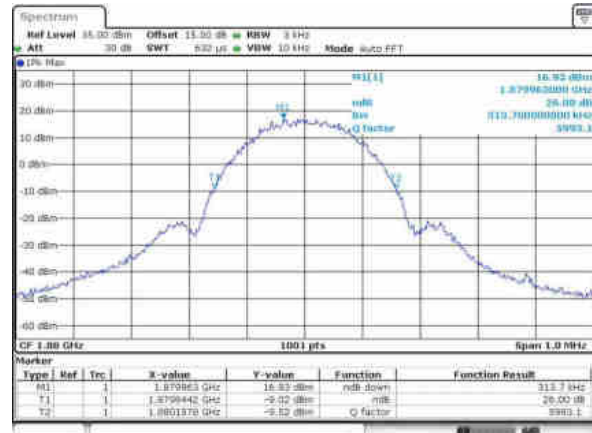
Date: 16 SEP 2016 13:48:21

Middle Channel



Date: 16 SEP 2016 11:06:32

Middle Channel



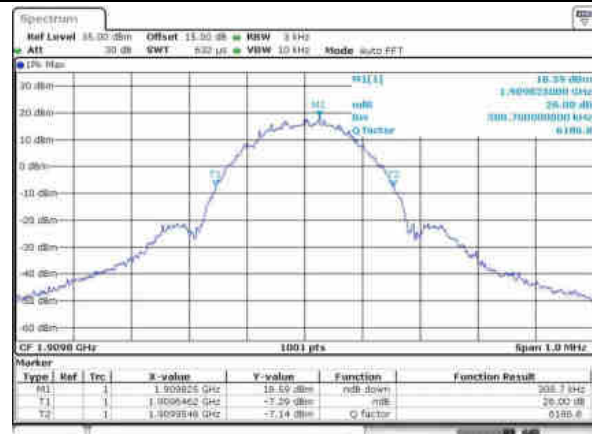
Date: 16 SEP 2016 16:21:54

Highest Channel



Date: 16 SEP 2016 11:07:30

Highest Channel

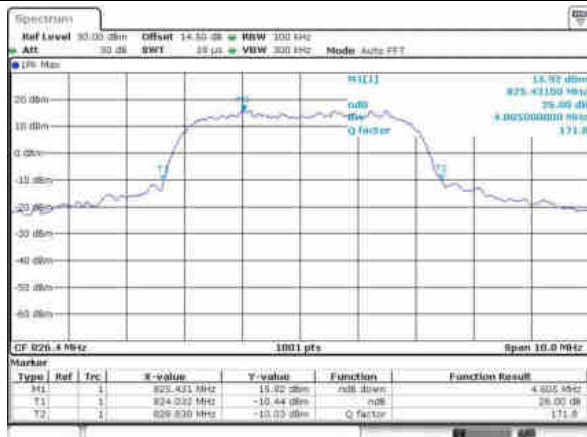


Date: 16 SEP 2016 13:49:40



WCDMA Band V (RMC 12.2Kbps)

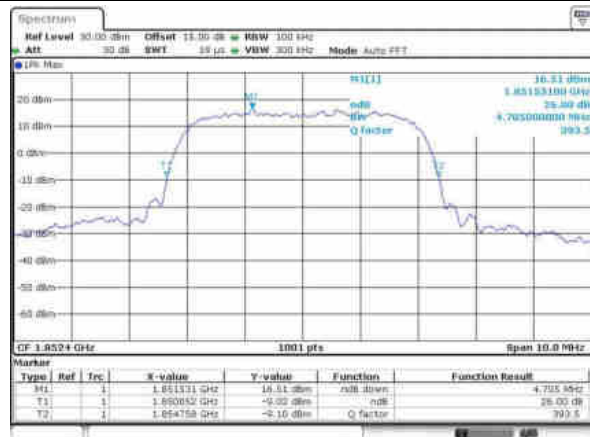
Lowest Channel



Date: 16 SEP 2016 14:07:04

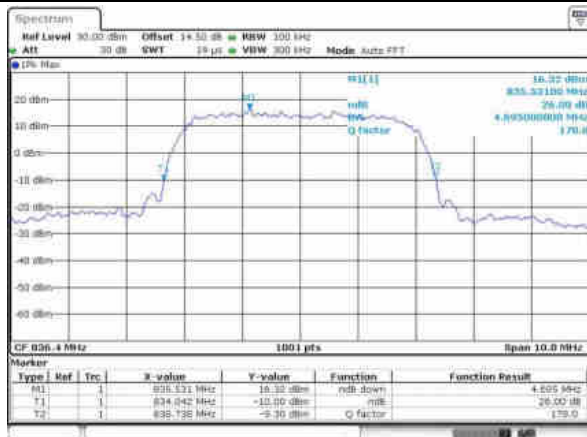
WCDMA Band II (RMC 12.2Kbps)

Lowest Channel



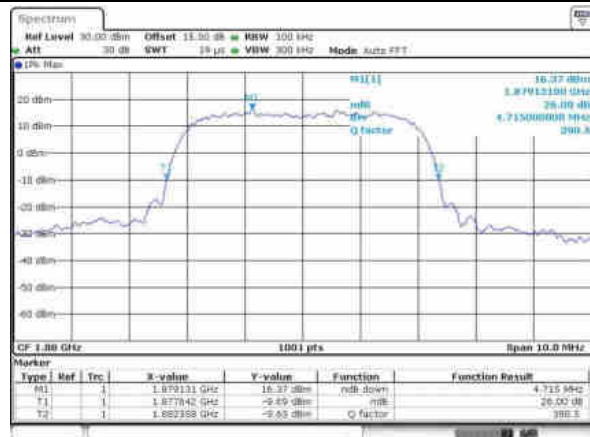
Date: 16 SEP 2016 14:20:10

Middle Channel



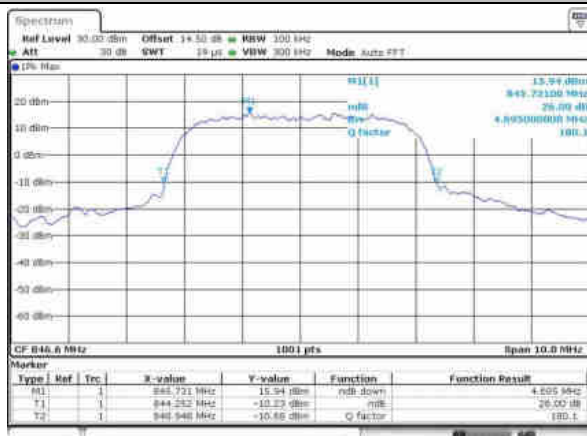
Date: 16 SEP 2016 14:06:22

Middle Channel



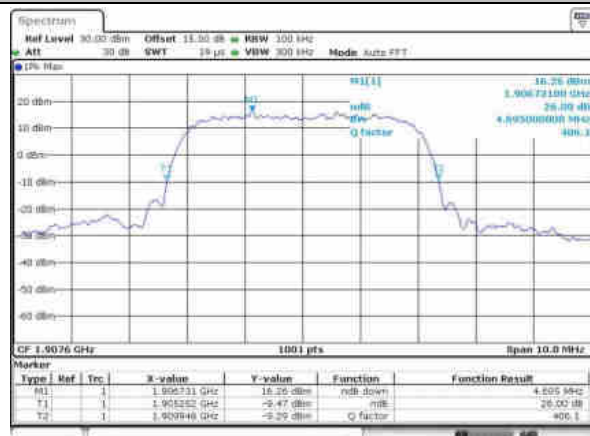
Date: 16 SEP 2016 14:20:38

Highest Channel



Date: 16 SEP 2016 14:06:51

Highest Channel

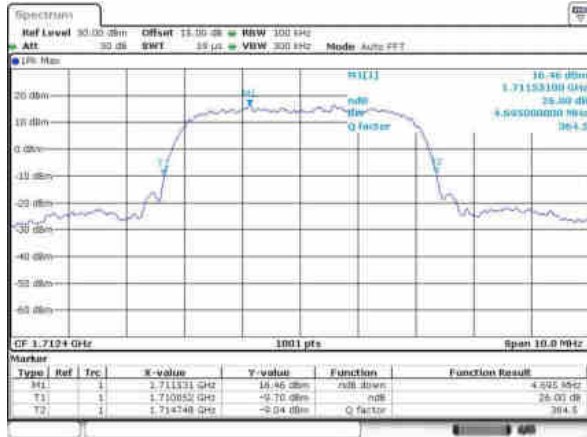


Date: 16 SEP 2016 14:21:07



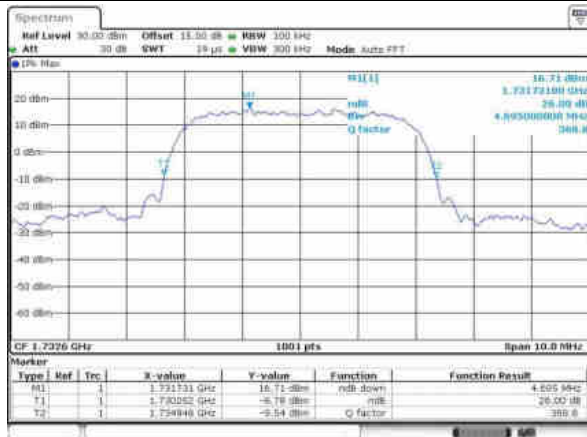
WCDMA Band IV (RMC 12.2Kbps)

Lowest Channel



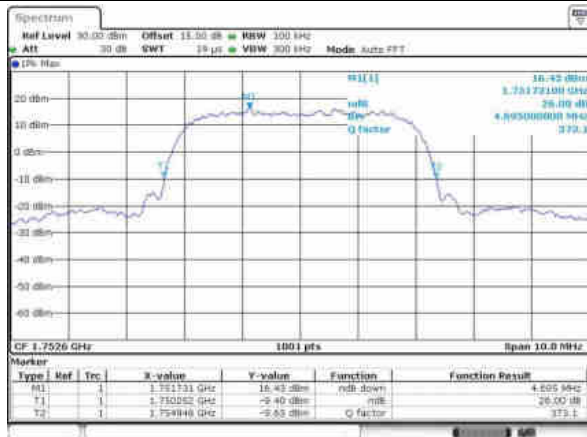
Date: 16 SEP 2016 14:37:32

Middle Channel



Date: 16 SEP 2016 14:38:00

Highest Channel



Date: 16 SEP 2016 14:38:26

**Occupied Bandwidth**

Mode	GSM850(MHz)	
Mod.	GSM	EDGE class 8
Lowest CH	0.242	0.241
Middle CH	0.241	0.242
Highest CH	0.243	0.242

Mode	GSM1900(MHz)	
Mod.	GSM	EDGE class 8
Lowest CH	0.243	0.246
Middle CH	0.242	0.244
Highest CH	0.241	0.244

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	4.14	4.14	4.12
Middle CH	4.14	4.15	4.13
Highest CH	4.14	4.13	4.13



GSM850 (GSM)

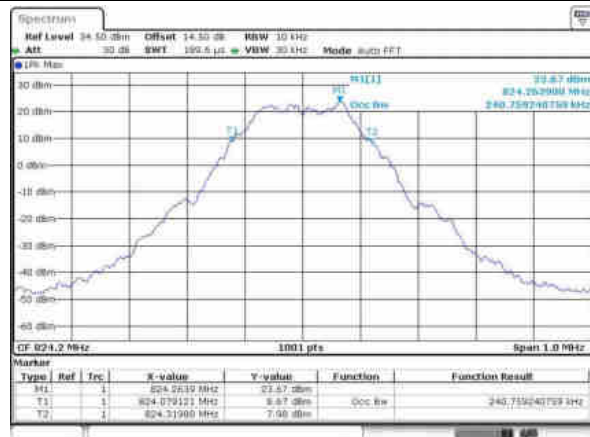
Lowest Channel



Date: 16 SEP 2016 10:18:46

GSM850 (EDGE class 8)

Lowest Channel



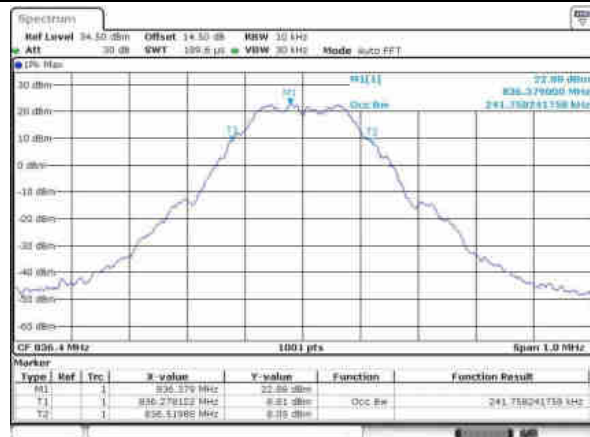
Date: 16 SEP 2016 10:49:30

Middle Channel



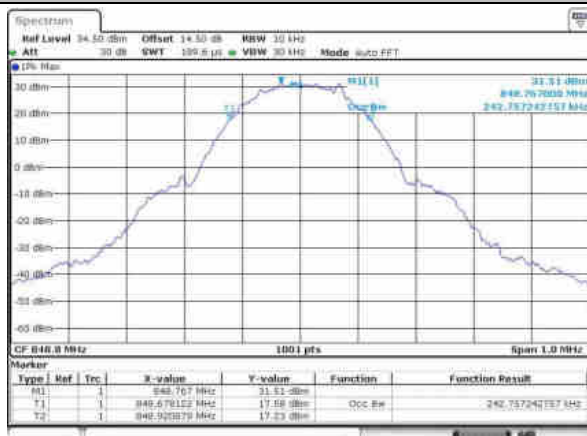
Date: 16 SEP 2016 10:19:14

Middle Channel



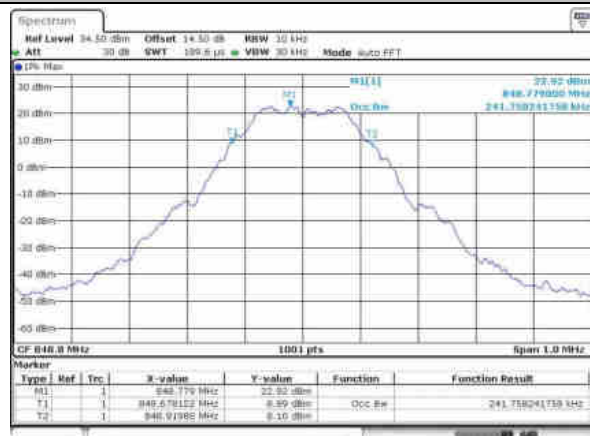
Date: 16 SEP 2016 10:50:06

Highest Channel



Date: 16 SEP 2016 10:19:43

Highest Channel



Date: 16 SEP 2016 10:50:42



GSM1900 (GSM)

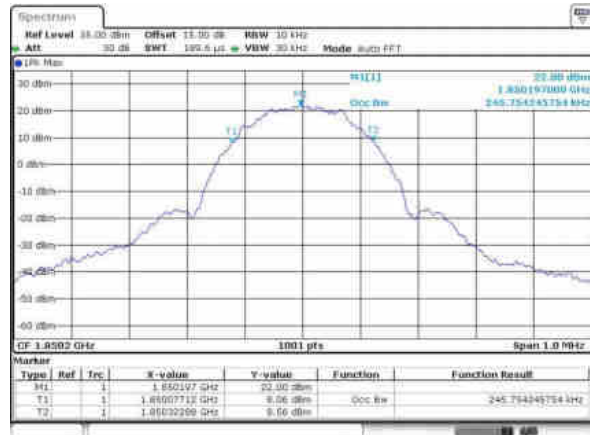
Lowest Channel



Date: 16 SEP 2016 11:10:09

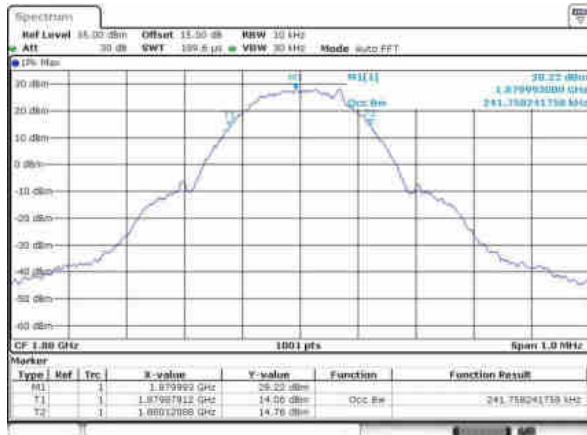
GSM1900 (EDGE class 8)

Lowest Channel



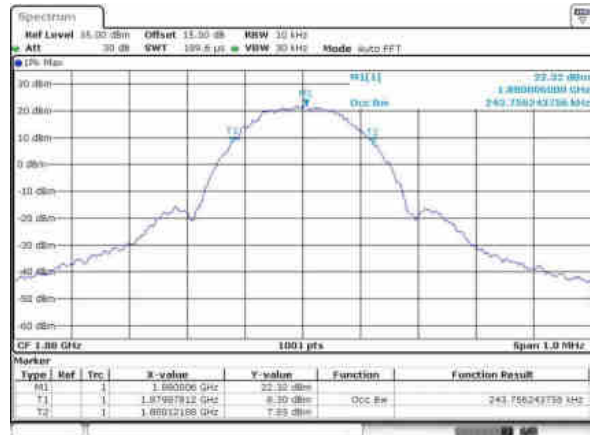
Date: 16 SEP 2016 13:54:24

Middle Channel



Date: 16 SEP 2016 11:10:37

Middle Channel



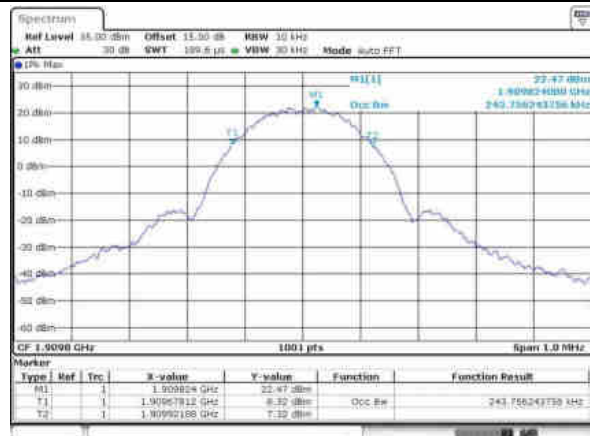
Date: 16 SEP 2016 13:54:58

Highest Channel



Date: 16 SEP 2016 11:11:00

Highest Channel

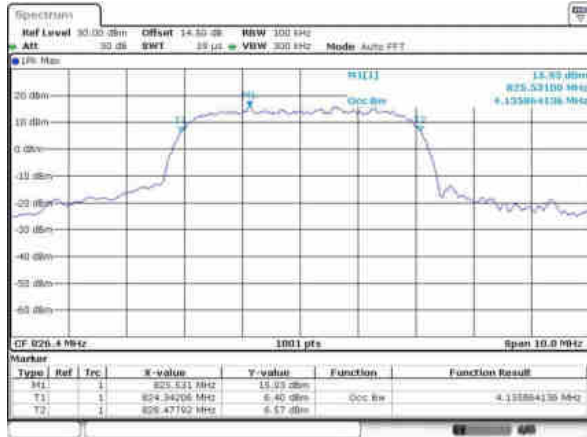


Date: 16 SEP 2016 13:55:31



WCDMA Band V (RMC 12.2Kbps)

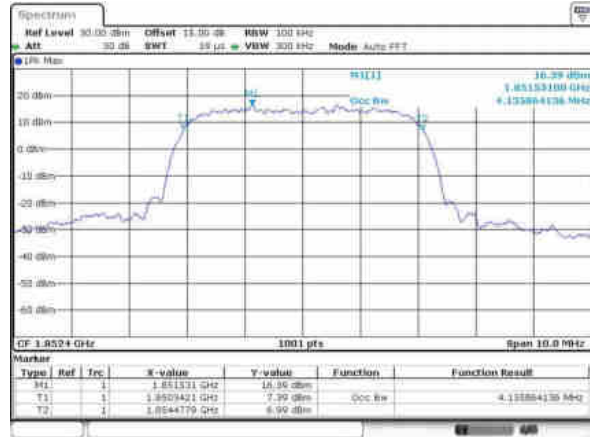
Lowest Channel



Date: 16 SEP 2016 14:11:27

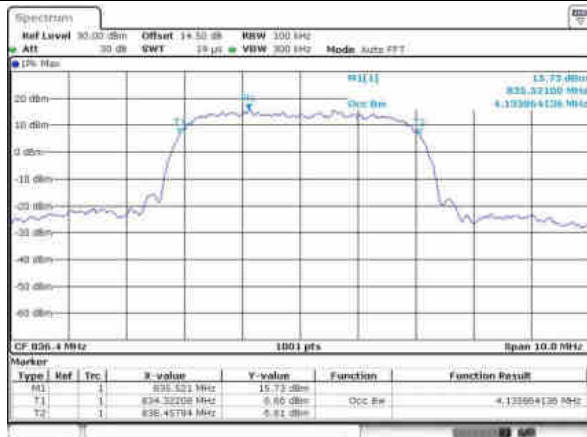
WCDMA Band II (RMC 12.2Kbps)

Lowest Channel

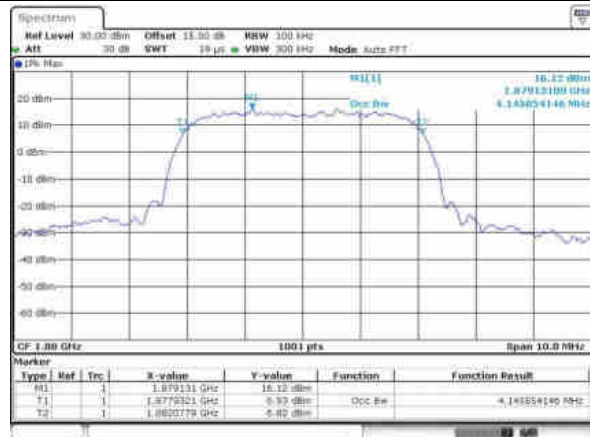


Date: 16 SEP 2016 14:23:29

Middle Channel



Date: 16 SEP 2016 14:11:55

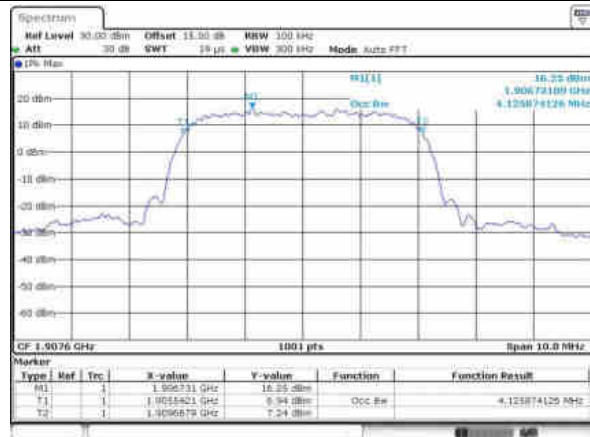


Date: 16 SEP 2016 14:25:58

Highest Channel



Date: 16 SEP 2016 14:12:35

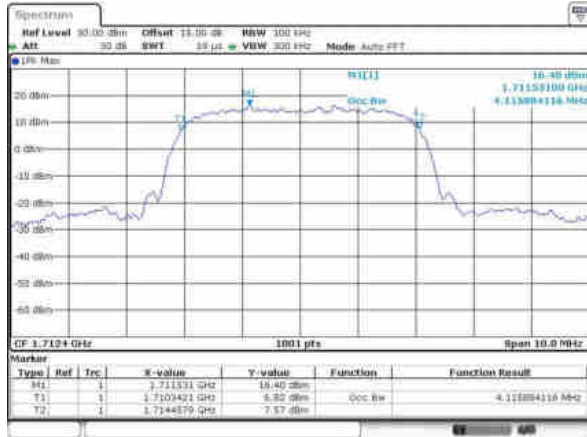


Date: 16 SEP 2016 14:24:26



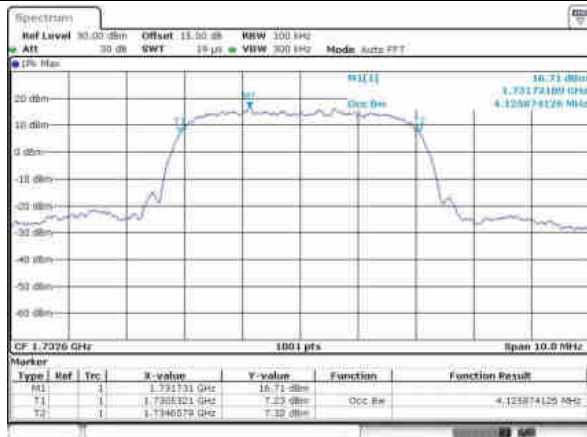
WCDMA Band IV (RMC 12.2Kbps)

Lowest Channel



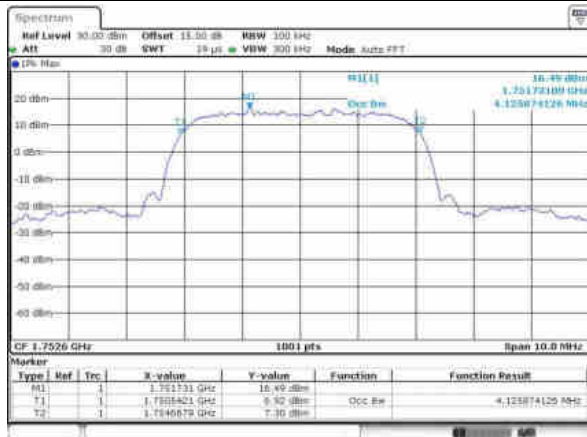
Date: 16 SEP 2016 14:39:20

Middle Channel

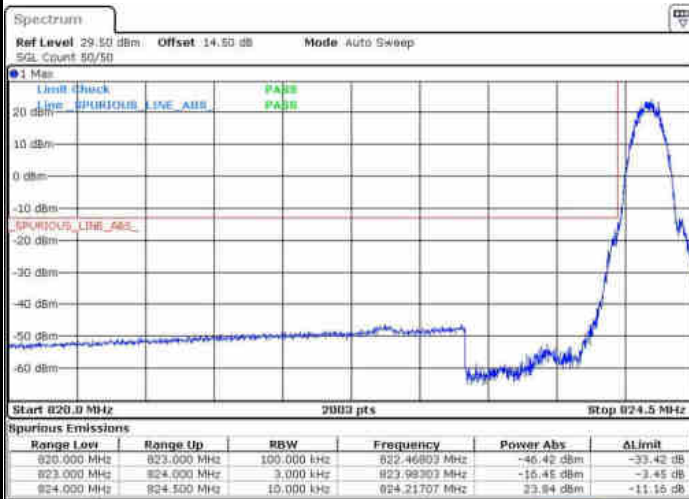
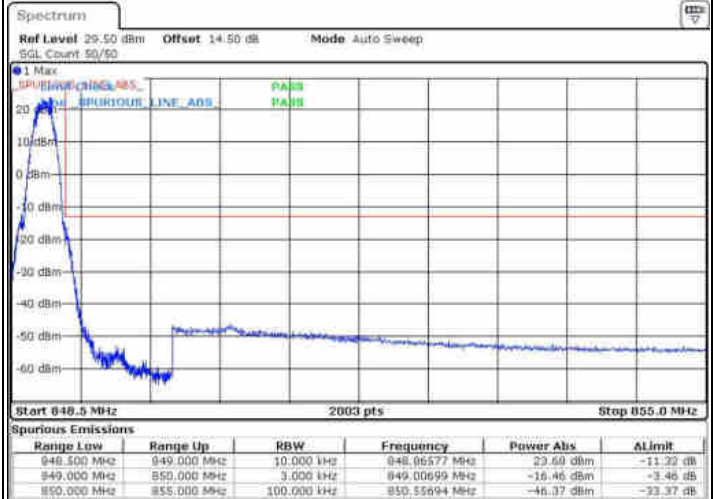
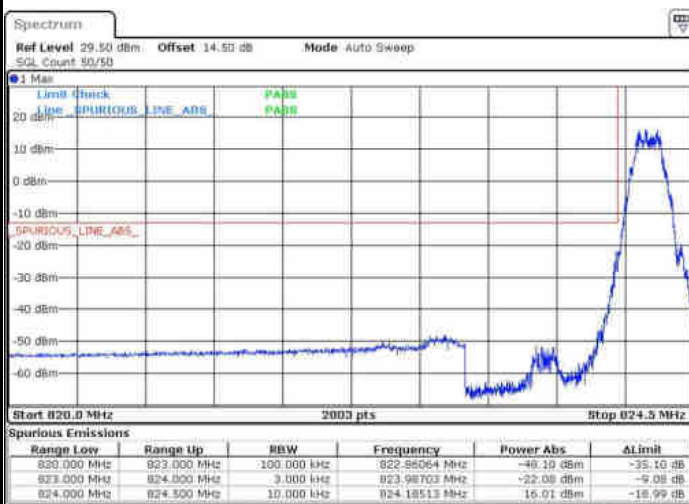
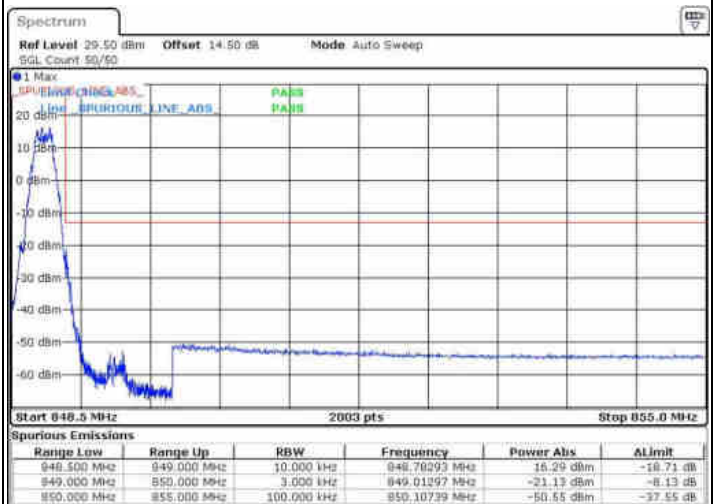


Date: 16 SEP 2016 14:39:54

Highest Channel



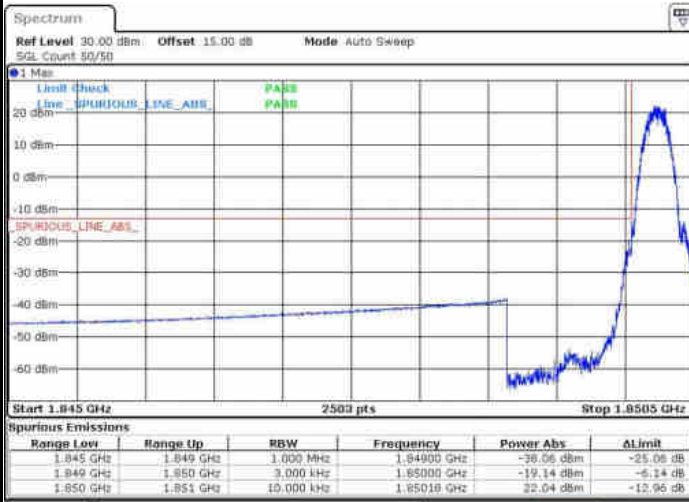
Date: 16 SEP 2016 14:40:22

**Conducted Band Edge****GSM850 (GSM)****Lowest Band Edge****Highest Band Edge****GSM850 (EDGE class 8)****Lowest Band Edge****Highest Band Edge**



GSM1900 (GSM)

Lowest Band Edge



Date: 16 SEP 2016 11:12:34

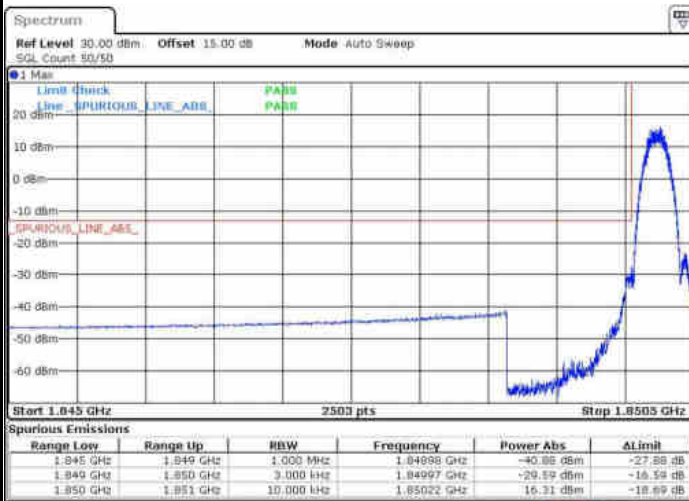
Highest Band Edge



Date: 16 SEP 2016 11:14:00

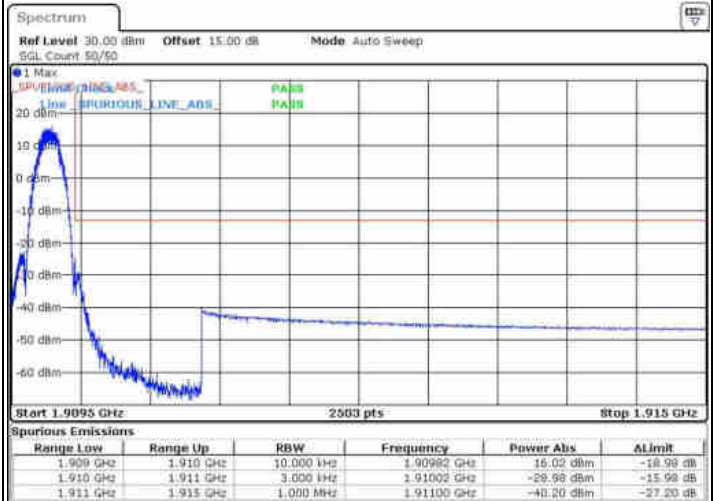
GSM1900 (EDGE class 8)

Lowest Band Edge



Date: 16 SEP 2016 13:57:07

Highest Band Edge

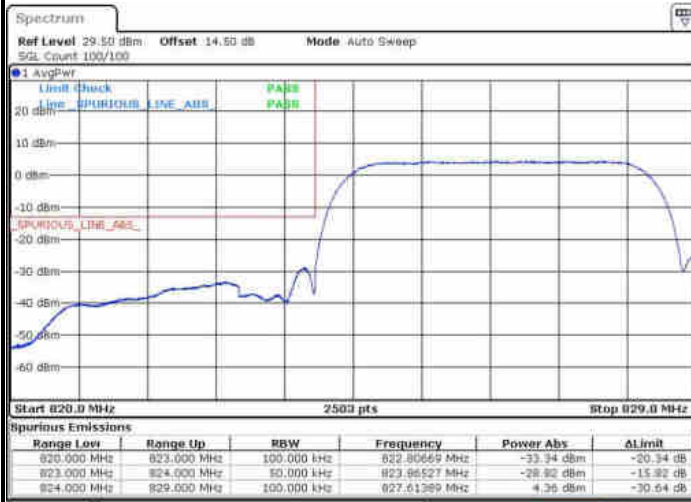


Date: 16 SEP 2016 13:58:34



WCDMA Band V (RMC 12.2Kbps)

Lowest Band Edge



Date: 16 SEP 2016 14:15:10

Highest Band Edge



Date: 16 SEP 2016 14:17:51

WCDMA Band II (RMC 12.2Kbps)

Lowest Band Edge



Date: 16 SEP 2016 14:27:10

Highest Band Edge

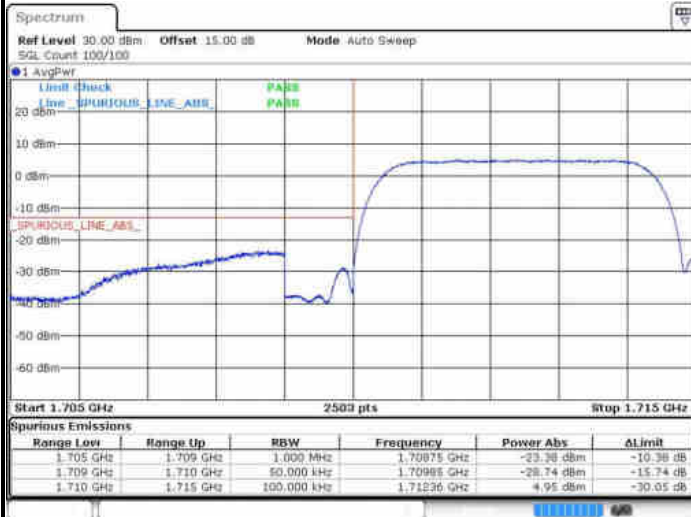


Date: 16 SEP 2016 14:29:51

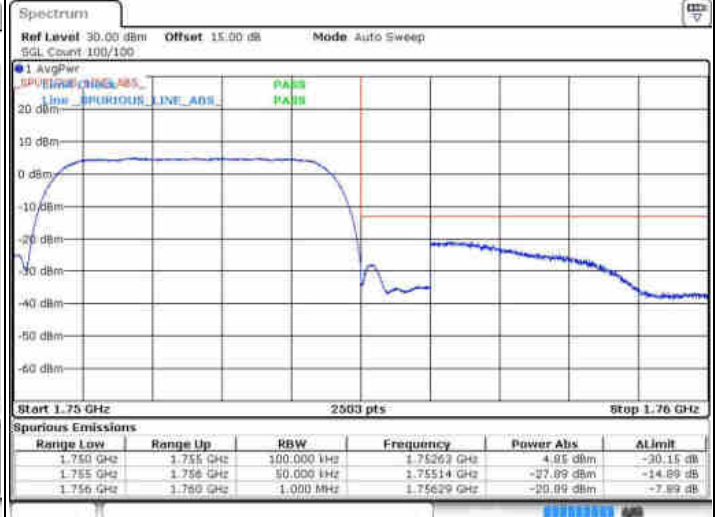


WCDMA Band IV (RMC 12.2Kbps)

Lowest Band Edge



Highest Band Edge

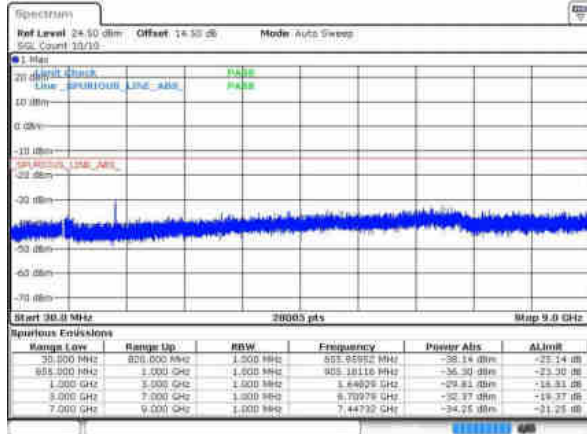




Conducted Spurious Emission

GSM850 (GSM)

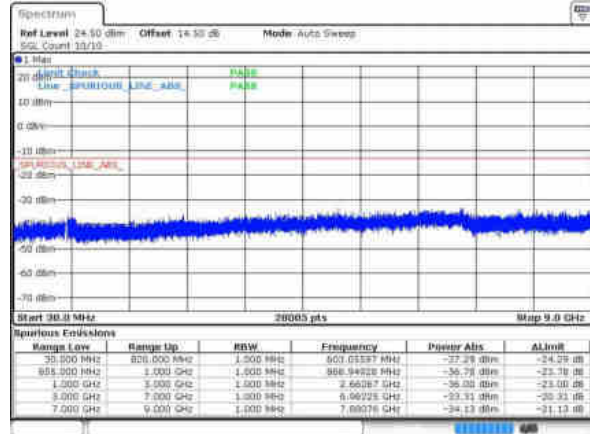
Lowest Channel



Date: 16 SEP 2016 10:24:17

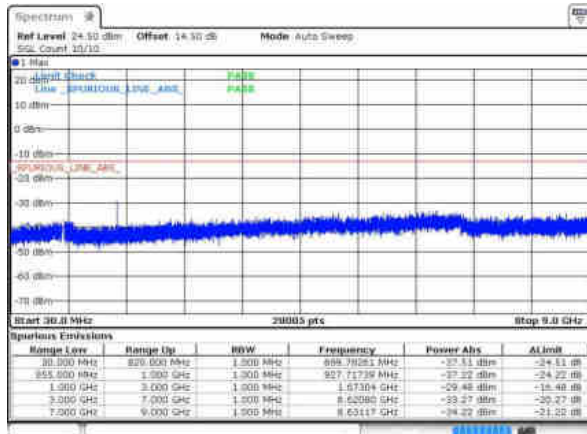
GSM850 (EDGE class 8)

Lowest Channel



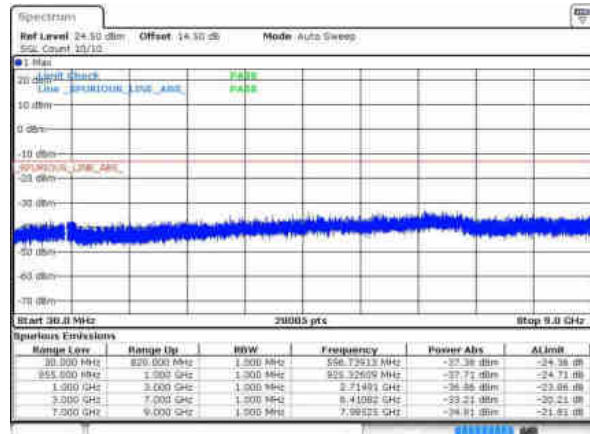
Date: 16 SEP 2016 10:06:17

Middle Channel



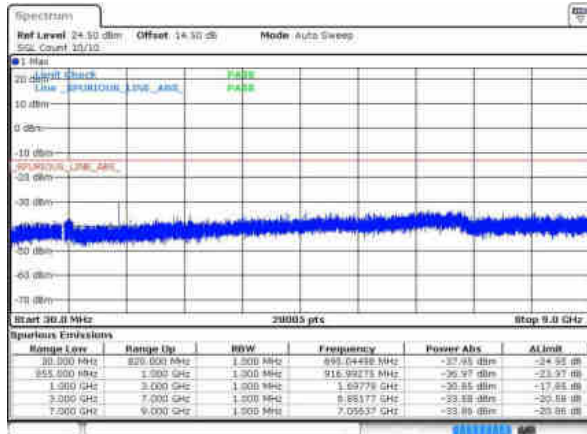
Date: 16 SEP 2016 10:26:33

Middle Channel



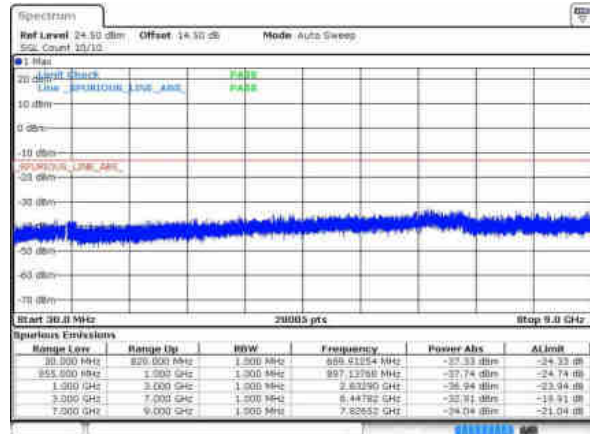
Date: 16 SEP 2016 10:58:20

Highest Channel



Date: 16 SEP 2016 10:26:48

Highest Channel

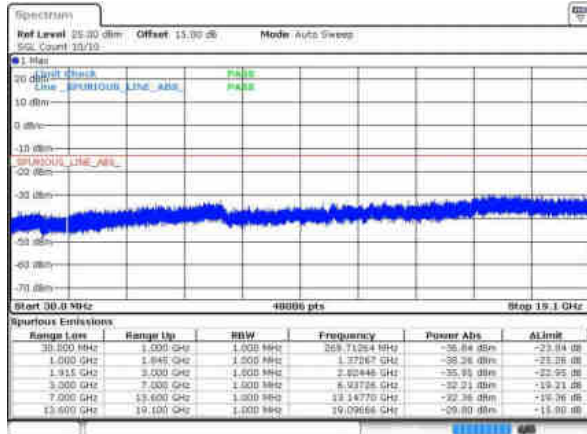


Date: 16 SEP 2016 10:59:48



GSM1900 (GSM)

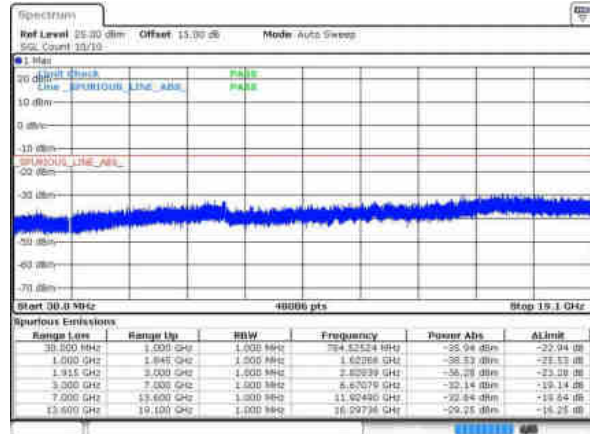
Lowest Channel



Date: 16 SEP 2016 11:15:22

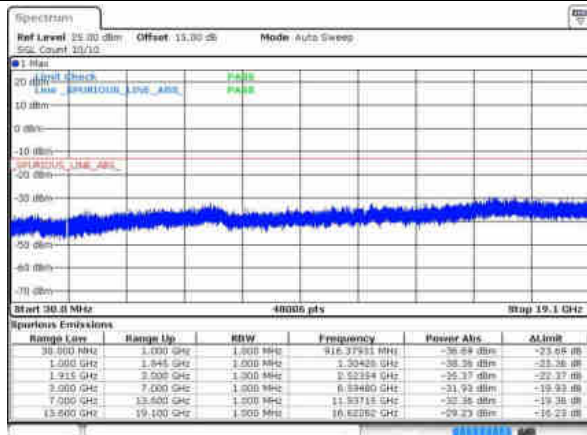
GSM1900 (EDGE class 8)

Lowest Channel

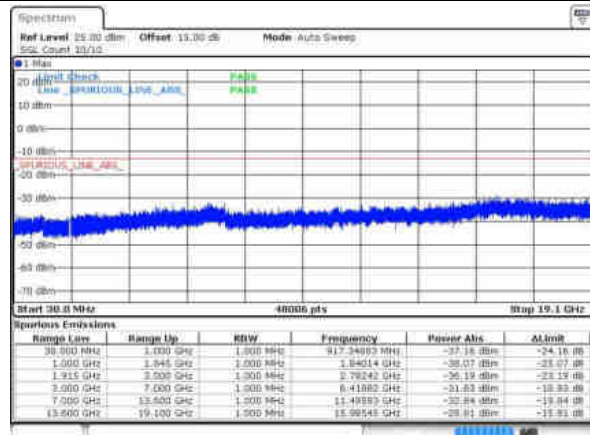


Date: 16 SEP 2016 14:00:07

Middle Channel

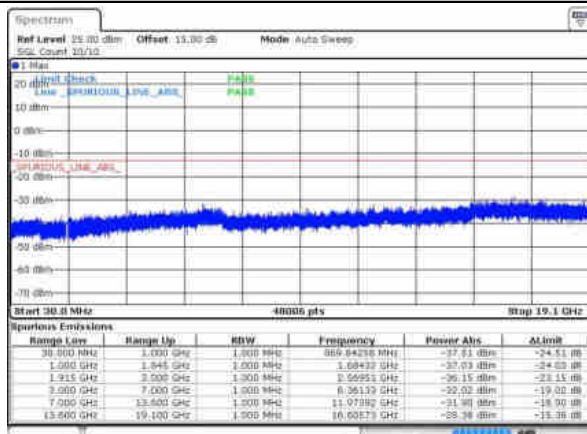


Date: 16 SEP 2016 11:16:35

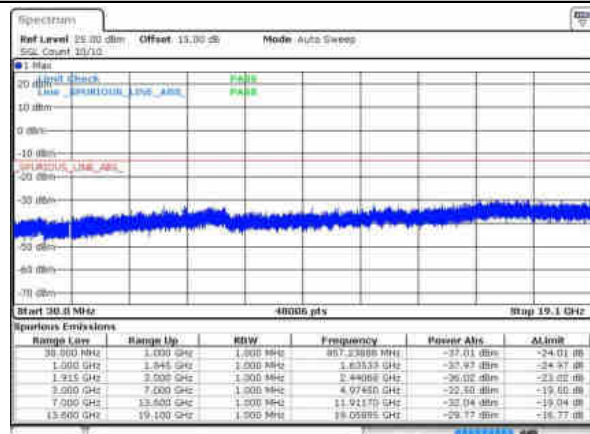


Date: 16 SEP 2016 14:01:37

Highest Channel



Date: 16 SEP 2016 11:17:55

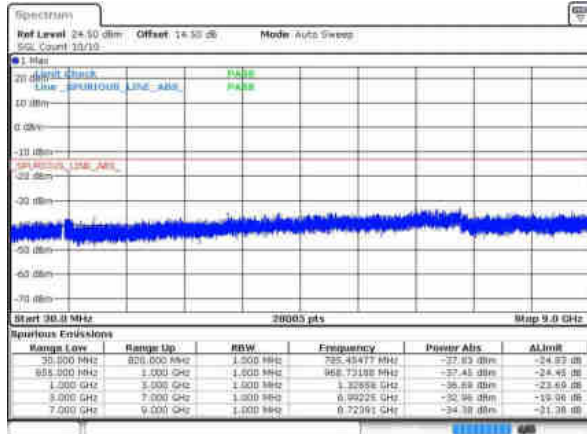


Date: 16 SEP 2016 14:03:30



WCDMA Band V (RMC 12.2Kbps)

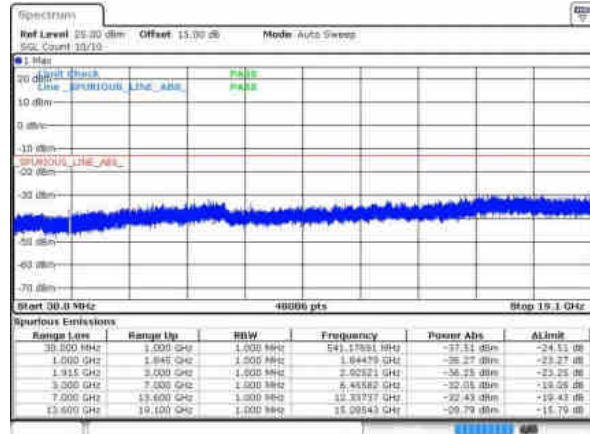
Lowest Channel



Date: 16 SEP 2016 16:28:01

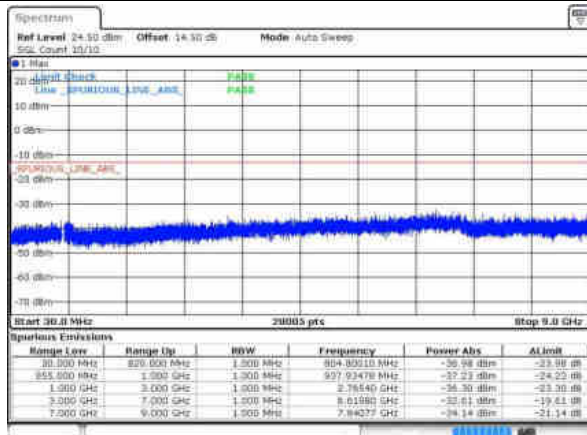
WCDMA Band II (RMC 12.2Kbps)

Lowest Channel



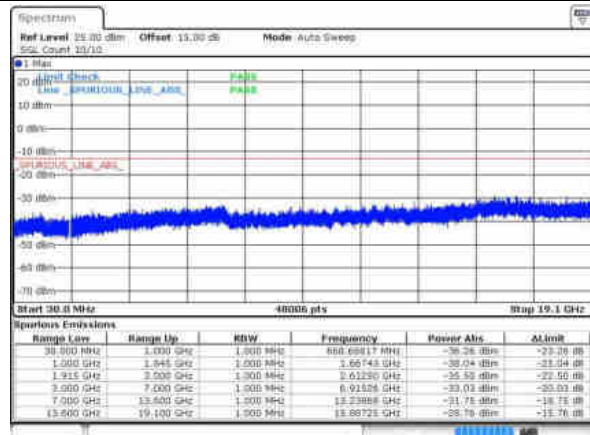
Date: 16 SEP 2016 14:31:10

Middle Channel



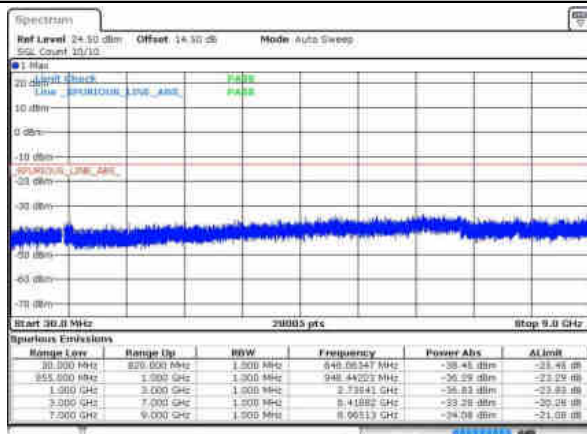
Date: 16 SEP 2016 16:30:07

Middle Channel



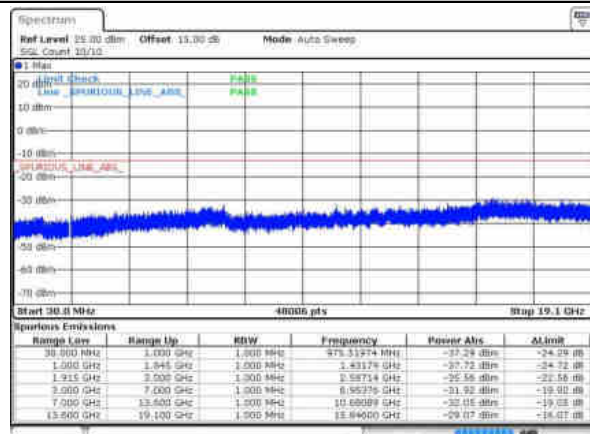
Date: 16 SEP 2016 14:32:27

Highest Channel



Date: 16 SEP 2016 16:31:25

Highest Channel

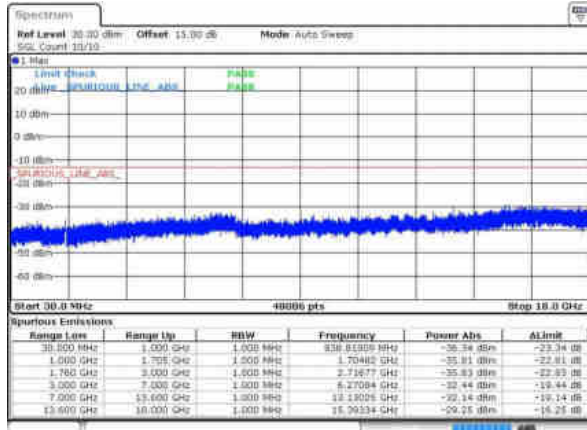


Date: 16 SEP 2016 14:33:43



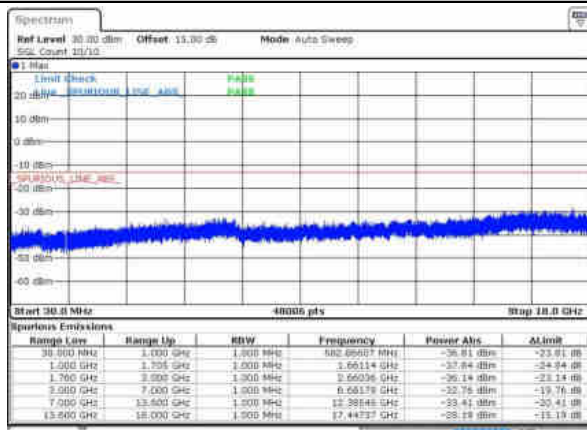
WCDMA Band IV (RMC 12.2Kbps)

Lowest Channel



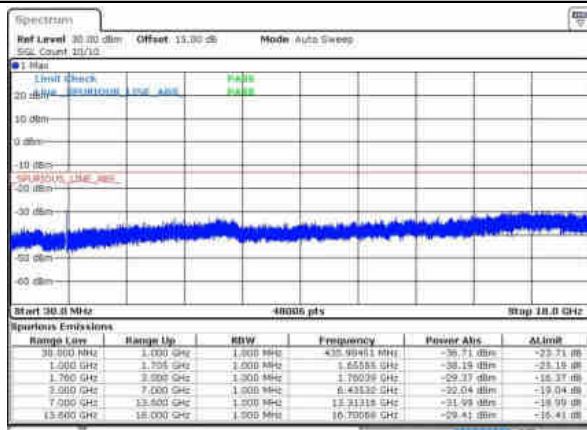
Date: 16 SEP 2016 14:51:34

Middle Channel



Date: 16 SEP 2016 14:52:51

Highest Channel



Date: 16 SEP 2016 14:54:06

**Frequency Stability**

Test Conditions	Middle Channel	GSM850 (GSM)	GSM850 (EDGE class 8)	Limit 2.5ppm
Temperature (°C)	Voltage (Volt)	Deviation (ppm)		Result
50	Normal Voltage	0.0036	0.0024	PASS
40	Normal Voltage	0.0024	0.0012	
30	Normal Voltage	0.0084	0.0024	
20(Ref.)	Normal Voltage	0.0000	0.0000	
10	Normal Voltage	0.0048	0.0036	
0	Normal Voltage	0.0048	0.0072	
-10	Normal Voltage	0.0072	0.0060	
-20	Normal Voltage	0.0012	0.0012	
-30	Normal Voltage	0.0036	0.0084	
20	Maximum Voltage	0.0000	0.0060	
20	Normal Voltage	0.0096	0.0096	
20	Battery End Point	0.0072	0.0191	

Note: Normal Voltage = 3.85V. ; Battery End Point (BEP) = 3.7V. ; Maximum Voltage =4.35V



Test Conditions	Middle Channel	GSM1900 (GSM)	GSM1900 (EDGE class 8)	Limit Note 2.
Temperature (°C)	Voltage (Volt)	Deviation (ppm)		Result
50	Normal Voltage	0.0085	0.0133	PASS
40	Normal Voltage	0.0069	0.0144	
30	Normal Voltage	0.0021	0.0165	
20(Ref.)	Normal Voltage	0.0000	0.0000	
10	Normal Voltage	0.0005	0.0160	
0	Normal Voltage	0.0074	0.0021	
-10	Normal Voltage	0.0032	0.0117	
-20	Normal Voltage	0.0043	0.0128	
-30	Normal Voltage	0.0080	0.0176	
20	Maximum Voltage	0.0005	0.0186	
20	Normal Voltage	0.0064	0.0122	
20	Battery End Point	0.0021	0.0059	

Note:

1. Normal Voltage = 3.85 V. ; Battery End Point (BEP) = 3.7 V. ; Maximum Voltage =4.35 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	0.0024	
30	Normal Voltage	0.0096	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0084	
0	Normal Voltage	0.0060	
-10	Normal Voltage	0.0120	
-20	Normal Voltage	0.0143	
-30	Normal Voltage	0.0179	
20	Maximum Voltage	0.0191	
20	Normal Voltage	0.0275	
20	Battery End Point	0.0108	

Note: Normal Voltage = 3.85V. ; Battery End Point (BEP) = 3.7V. ; Maximum Voltage =4.35V

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	0.0011	
30	Normal Voltage	0.0011	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0016	
0	Normal Voltage	0.0032	
-10	Normal Voltage	0.0101	
-20	Normal Voltage	0.0037	
-30	Normal Voltage	0.0021	
20	Maximum Voltage	0.0011	
20	Normal Voltage	0.0000	
20	Battery End Point	0.0032	

Note:

1. Normal Voltage = 3.85V. ; Battery End Point (BEP) = 3.7 V. ; Maximum Voltage =4.35 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 IV (RMC 12.2Kbps)	Limit Note 2.
Temperature (°C)	Voltage (Volt)	Deviation (ppm)	Result
50	Normal Voltage	0.0023	PASS
40	Normal Voltage	0.0012	
30	Normal Voltage	0.0017	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0006	
0	Normal Voltage	0.0006	
-10	Normal Voltage	0.0040	
-20	Normal Voltage	0.0006	
-30	Normal Voltage	0.0040	
20	Maximum Voltage	0.0052	
20	Normal Voltage	0.0012	
20	Battery End Point	0.0063	

Note:

1. Normal Voltage = 3.85V. ; Battery End Point (BEP) = 3.7 V. ; Maximum Voltage =4.35V
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

Radiated Spurious Emission

Top Antenna

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)
High	1697.6	-55.85	-13	-42.85	-58.68	-62.54	0.56	9.40	H
	2546.4	-44.81	-13	-31.81	-53.07	-52.52	0.74	10.60	H
	3395.2	-53.54	-13	-40.54	-62.35	-63.14	0.85	12.60	H
	1697.6	-56.67	-13	-43.67	-58.33	-63.36	0.56	9.40	V
	2546.4	-47.12	-13	-34.12	-54.22	-54.83	0.74	10.60	V
	3395.2	-57.49	-13	-44.49	-65.63	-67.09	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	-48.83	-13	-35.83	-62.38	-54.87	6.56	12.60	H
	5640	-50.32	-13	-37.32	-66.26	-55.42	8	13.10	H
	7520	-47.02	-13	-34.02	-65.76	-48.75	9.57	11.30	H
	3760	-47.74	-13	-34.74	-61.09	-53.78	6.56	12.6	V
	5640	-49.41	-13	-36.41	-66.76	-54.51	8	13.1	V
	7520	-47.17	-13	-34.17	-65.57	-48.90	9.57	11.3	V

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

WCDMA Band IV(RMC 12.2Kbps)									
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Low	3424.8	-45.11	-13	-32.11	-59.86	-51.53	6.18	12.60	H
	5137.2	-49.11	-13	-36.11	-67.11	-54.07	7.74	12.70	H
	6849.6	-48.91	-13	-35.91	-67.72	-51.61	9	11.70	H
	3424.8	-54.50	-13	-41.50	-65.45	-60.92	6.18	12.60	V
	5137.2	-54.11	-13	-41.11	-67.11	-59.07	7.74	12.70	V
	6849.6	-50.76	-13	-37.76	-67.47	-53.46	9	11.70	V

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



Bottom Antenna

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)
Low	1648.4	-56.34	-13	-43.34	-59.17	-63.03	0.56	9.40	H
	2472.6	-47.90	-13	-34.90	-55.17	-55.61	0.74	10.60	H
	3296.8	-56.68	-13	-43.68	-65.49	-66.28	0.85	12.60	H
	4121	-53.12	-13	-40.12	-64.64	-62.68	0.89	12.60	H
	1648.4	-54.40	-13	-41.40	-56.41	-61.09	0.56	9.40	V
	2472.6	-44.62	-13	-31.62	-52.55	-52.33	0.74	10.60	V
	3296.8	-50.57	-13	-37.57	-58.71	-60.17	0.85	12.60	V
	4121	-55.03	-13	-42.03	-66.15	-64.59	0.89	12.60	V
Middle	1672	-55.67	-13	-42.67	-58.50	-62.36	0.56	9.40	H
	2510	-45.74	-13	-32.74	-53.80	-53.45	0.74	10.60	H
	3346	-54.07	-13	-41.07	-62.88	-63.67	0.85	12.60	H
	1672	-51.31	-13	-38.31	-54.52	-58.00	0.56	9.40	V
	2510	-47.53	-13	-34.53	-54.60	-55.24	0.74	10.60	V
	3346	-48.04	-13	-35.04	-56.86	-57.64	0.85	12.60	V
High	1697.6	-50.39	-13	-37.39	-54.21	-57.08	0.56	9.40	H
	2546.4	-45.73	-13	-32.73	-53.79	-53.44	0.74	10.60	H
	3395.2	-53.71	-13	-40.71	-62.52	-63.31	0.85	12.60	H
	1697.6	-56.11	-13	-43.11	-57.77	-62.80	0.56	9.40	V
	2546.4	-44.32	-13	-31.32	-52.31	-52.03	0.74	10.60	V
	3395.2	-50.10	-13	-37.10	-58.24	-59.70	0.85	12.60	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)
Low	1648.4	-54.97	-13	-41.97	-57.80	-61.66	0.56	9.40	H
	2472.6	-50.82	-13	-37.82	-57.03	-58.53	0.74	10.60	H
	3296.8	-56.10	-13	-43.10	-64.91	-65.70	0.85	12.60	H
	4121	-53.83	-13	-40.83	-65.35	-63.39	0.89	12.60	H
	1648.4	-56.14	-13	-43.14	-57.80	-62.83	0.56	9.40	V
	2472.6	-46.70	-13	-33.70	-53.91	-54.41	0.74	10.60	V
	3296.8	-50.67	-13	-37.67	-58.81	-60.27	0.85	12.60	V
	4121	-55.77	-13	-42.77	-66.89	-65.33	0.89	12.60	V
Middle	1672	-52.84	-13	-39.84	-55.78	-59.53	0.56	9.40	H
	2510	-48.34	-13	-35.34	-55.46	-56.05	0.74	10.60	H
	3346	-56.09	-13	-43.09	-64.90	-65.69	0.85	12.60	H
	4182	-53.36	-13	-40.36	-64.88	-62.92	0.89	12.60	H
	1672	-53.56	-13	-40.56	-55.88	-60.25	0.56	9.40	V
	2510	-48.24	-13	-35.24	-55.03	-55.95	0.74	10.60	V
	3346	-48.50	-13	-35.50	-57.27	-58.10	0.85	12.60	V
	4182	-55.44	-13	-42.44	-66.56	-65.00	0.89	12.60	V
High	1697.6	-52.98	-13	-39.98	-55.85	-59.67	0.56	9.40	H
	2546.4	-44.48	-13	-31.48	-52.74	-52.19	0.74	10.60	H
	3395.2	-53.84	-13	-40.84	-62.65	-63.44	0.85	12.60	H
	1697.6	-55.74	-13	-42.74	-57.40	-62.43	0.56	9.40	V
	2546.4	-43.41	-13	-30.41	-51.52	-51.12	0.74	10.60	V
	3395.2	-49.21	-13	-36.21	-57.81	-58.81	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)
Low	3700.4	-33.52	-13	-20.52	-48.88	-39.56	6.56	12.60	H
	5550.6	-43.85	-13	-30.85	-59.79	-48.95	8	13.10	H
	7400.8	-49.17	-13	-36.17	-67.91	-50.90	9.57	11.30	H
	3700.4	-42.72	-13	-29.72	-56.07	-48.76	6.56	12.6	V
	5550.6	-39.65	-13	-26.65	-57.1	-44.75	8	13.1	V
	7400.8	-50.18	-13	-37.18	-68.58	-51.91	9.57	11.3	V
Middle	3760	-35.26	-13	-22.26	-50.44	-41.30	6.56	12.60	H
	5640	-43.21	-13	-30.21	-59.15	-48.31	8	13.10	H
	7520	-48.22	-13	-35.22	-66.96	-49.95	9.57	11.30	H
	3760	-44.02	-13	-31.02	-57.37	-50.06	6.56	12.6	V
	5640	-41.90	-13	-28.90	-59.25	-47.00	8	13.1	V
	7520	-49.52	-13	-36.52	-67.92	-51.25	9.57	11.3	V
High	3819.6	-34.64	-13	-21.64	-49.92	-40.68	6.56	12.60	H
	5729.4	-44.56	-13	-31.56	-60.50	-49.66	8	13.10	H
	7639.2	-48.89	-13	-35.89	-67.63	-50.62	9.57	11.30	H
	3819.6	-43.05	-13	-30.05	-56.4	-49.09	6.56	12.6	V
	5729.4	-41.07	-13	-28.07	-58.42	-46.17	8	13.1	V
	7639.2	-49.21	-13	-36.21	-67.61	-50.94	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)
Low	3700.4	-42.57	-13	-29.57	-56.12	-48.61	6.56	12.60	H
	5550.6	-46.32	-13	-33.32	-62.26	-51.42	8	13.10	H
	7400.8	-49.74	-13	-36.74	-68.48	-51.47	9.57	11.30	H
	3700.4	-50.37	-13	-37.37	-63.72	-56.41	6.56	12.6	V
	5550.6	-44.87	-13	-31.87	-62.22	-49.97	8	13.1	V
	7400.8	-50.04	-13	-37.04	-68.44	-51.77	9.57	11.3	V
Middle	3760	-39.38	-13	-26.38	-53.63	-45.42	6.56	12.60	H
	5640	-45.81	-13	-32.81	-61.75	-50.91	8	13.10	H
	7520	-49.33	-13	-36.33	-68.07	-51.06	9.57	11.30	H
	3760	-47.54	-13	-34.54	-60.89	-53.58	6.56	12.6	V
	5640	-45.21	-13	-32.21	-62.56	-50.31	8	13.1	V
	7520	-49.99	-13	-36.99	-68.39	-51.72	9.57	11.3	V
High	3819.6	-43.45	-13	-30.45	-57.00	-49.49	6.56	12.60	H
	5729.4	-46.03	-13	-33.03	-61.97	-51.13	8	13.10	H
	7639.2	-49.22	-13	-36.22	-67.96	-50.95	9.57	11.30	H
	3819.6	-47.89	-13	-34.89	-61.24	-53.93	6.56	12.6	V
	5729.4	-45.09	-13	-32.09	-62.44	-50.19	8	13.1	V
	7639.2	-49.47	-13	-36.47	-67.87	-51.20	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)
Low	1652.8	-54.44	-13	-41.44	-57.27	-61.13	0.56	9.40	H
	2479.2	-57.20	-13	-44.20	-62.94	-64.91	0.74	10.60	H
	3305.6	-54.91	-13	-41.91	-63.72	-64.51	0.85	12.60	H
	1652.8	-54.14	-13	-41.14	-56.30	-60.83	0.56	9.40	V
	2479.2	-52.70	-13	-39.70	-58.38	-60.41	0.74	10.60	V
	3305.6	-53.93	-13	-40.93	-62.07	-63.53	0.85	12.60	V
Middle	1672	-54.74	-13	-41.74	-57.57	-61.43	0.56	9.40	H
	2510	-56.71	-13	-43.71	-62.45	-64.42	0.74	10.60	H
	3346	-56.59	-13	-43.59	-65.40	-66.19	0.85	12.60	H
	1672	-55.19	-13	-42.19	-56.85	-61.88	0.56	9.40	V
	2510	-49.62	-13	-36.62	-56.15	-57.33	0.74	10.60	V
	3346	-54.78	-13	-41.78	-62.92	-64.38	0.85	12.60	V
High	1693.2	-52.36	-13	-39.36	-55.54	-59.05	0.56	9.40	H
	2539.8	-55.63	-13	-42.63	-61.37	-63.34	0.74	10.60	H
	3386.4	-57.72	-13	-44.72	-66.53	-67.32	0.85	12.60	H
	1693.2	-55.33	-13	-42.33	-56.99	-62.02	0.56	9.40	V
	2539.8	-50.32	-13	-37.32	-56.59	-58.03	0.74	10.60	V
	3386.4	-55.97	-13	-42.97	-64.11	-65.57	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)
Low	3704.8	-34.55	-13	-21.55	-49.84	-40.59	6.56	12.60	H
	5557.2	-45.45	-13	-32.45	-61.39	-50.55	8	13.10	H
	7409.6	-49.34	-13	-36.34	-68.08	-51.07	9.57	11.30	H
	3704.8	-44.15	-13	-31.15	-57.5	-50.19	6.56	12.6	V
	5557.2	-45.21	-13	-32.21	-62.56	-50.31	8	13.1	V
	7409.6	-49.84	-13	-36.84	-68.24	-51.57	9.57	11.3	V
Middle	3760	-33.51	-13	-20.51	-48.87	-39.55	6.56	12.60	H
	5640	-43.11	-13	-30.11	-59.05	-48.21	8	13.10	H
	7520	-49.61	-13	-36.61	-68.35	-51.34	9.57	11.30	H
	3760	-42.72	-13	-29.72	-56.07	-48.76	6.56	12.6	V
	5640	-43.33	-13	-30.33	-60.68	-48.43	8	13.1	V
	7520	-49.38	-13	-36.38	-67.78	-51.11	9.57	11.3	V
High	3815.2	-34.64	-13	-21.64	-49.92	-40.68	6.56	12.60	H
	5722.8	-43.10	-13	-30.10	-59.04	-48.20	8	13.10	H
	7630.4	-49.17	-13	-36.17	-67.91	-50.90	9.57	11.30	H
	3815.2	-40.63	-13	-27.63	-54.79	-46.67	6.56	12.6	V
	5722.8	-41.81	-13	-28.81	-59.16	-46.91	8	13.1	V
	7630.4	-49.96	-13	-36.96	-68.36	-51.69	9.57	11.3	V

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



WCDMA Band IV(RMC 12.2Kbps)									
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Low	3424.8	-43.43	-13	-30.43	-58.18	-49.85	6.18	12.60	H
	5137.2	-40.10	-13	-27.10	-58.10	-45.06	7.74	12.70	H
	6849.6	-48.86	-13	-35.86	-67.67	-51.56	9	11.70	H
	3424.8	-38.00	-13	-25.00	-52.26	-44.42	6.18	12.60	V
	5137.2	-50.77	-13	-37.77	-63.77	-55.73	7.74	12.70	V
	6849.6	-48.93	-13	-35.93	-65.64	-51.63	9	11.70	V
Middle	3465	-43.16	-13	-30.16	-57.91	-49.58	6.18	12.60	H
	5197.5	-46.76	-13	-33.76	-64.76	-51.72	7.74	12.70	H
	6930	-49.44	-13	-36.44	-68.25	-52.14	9	11.70	H
	3465	-39.07	-13	-26.07	-52.61	-45.49	6.18	12.60	V
	5197.5	-52.64	-13	-39.64	-65.64	-57.60	7.74	12.70	V
	6930	-50.87	-13	-37.87	-67.58	-53.57	9	11.70	V
High	3505.2	-44.28	-13	-31.28	-59.03	-50.70	6.18	12.60	H
	5257.8	-40.02	-13	-27.02	-58.02	-44.98	7.74	12.70	H
	7010.4	-49.07	-13	-36.07	-67.88	-51.77	9	11.70	H
	3505.2	-39.48	-13	-26.48	-53.14	-45.90	6.18	12.60	V
	5257.8	-48.35	-13	-35.35	-61.35	-53.31	7.74	12.70	V
	7010.4	-50.48	-13	-37.48	-67.19	-53.18	9	11.70	V

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