

FCC RF Test Report

APPLICANT : ZTE CORPORATION
EQUIPMENT : LTE uFi
BRAND NAME : ZTE
MODEL NAME : MF97B_T
FCC ID : SRQ-MF97B-T
STANDARD : FCC 47 CFR Part 2, 22(H), 24(E), 27(L)
CLASSIFICATION : PCS Licensed Transmitter (PCB)

The product was completed and tested on Mar. 15, 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.



Reviewed by: James Huang / Manager



Approved by: Jones Tsai / Manager



SPORTON INTERNATIONAL (KUNSHAN) INC.
No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P. R. China



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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
FG4O2101-02A	Rev. 01	Initial issue of report	Mar. 16, 2016

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.4	§2.1046	Conducted Output Power	Reporting Only	PASS	-
3.5	§24.232(d)	Peak-to-Average Ratio	< 13 dB	PASS	-
3.6	§2.1049 §22.917(b) §24.238(b) §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	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		
	§27.50(d)(4)	Equivalent Isotropic Radiated Power	< 1 Watts		
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 33.06 dB at 7520.000 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 uFi
Brand Name	ZTE
Model Name	MF97B_T
FCC ID	SRQ-MF97B-T
EUT supports Radios application	WCDMA/HSPA/ HSPA+(16QAM uplink is not supported)/DC-HSDPA/LTE/ WLAN 2.4GHz 802. 11b/g/n HT20/HT40/ WLAN 5GHz 802. 11n HT20/HT40/ Bluetooth v2.1 + EDR/Bluetooth v4.0 LE
IMEI Code	Conducted: 860985030001938 Radiation: N/A ERP&EIRP: N/A
HW Version	d96C
SW Version	SPRO2BV1.0.0B01
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 subjective to this standard

Product Specification subjective to this standard	
Tx Frequency	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	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	WCDMA: Band V: 23.25 dBm Band II: 23.84 dBm Band IV: 23.44 dBm
Antenna Type	IFA Antenna
Type of Modulation	WCDMA: QPSK (Uplink) HSDPA/DC-HSDPA : QPSK (Uplink) HSUPA : QPSK (Uplink) HSPA+ : 16QAM uplink is not supported DC-HSDPA : 64QAM

1.5 Modification of EUT

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

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

FCC Rule	System	Type of Modulation	Maximum ERP/EIRP (W)	Frequency Tolerance (ppm)	Emission Designator
Part 22	WCDMA Band V RMC 12.2Kbps	QPSK	0.1648	0.0276 ppm	4M15F9W
Part 24	WCDMA Band II RMC 12.2Kbps	QPSK	0.4656	0.0117 ppm	4M15F9W
Part 27	WCDMA Band IV RMC 12.2Kbps	QPSK	0.3148	0.0142 ppm	4M17F9W

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 Registration No.
	03CH01-SZ	831040

Note: The test site complies with ANSI C63.4 2009 requirement.

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.

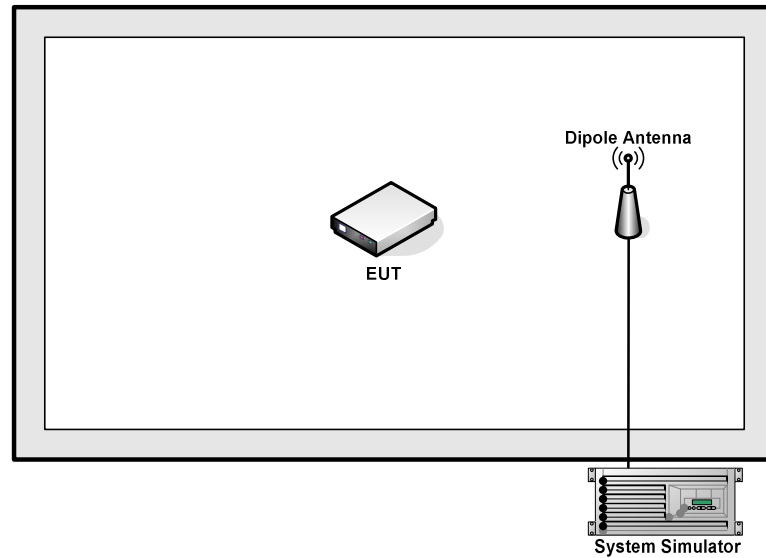
Radiated emissions were investigated from 30 MHz to 10th harmonic.

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
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	TOPWORD	3303DR	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 :

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

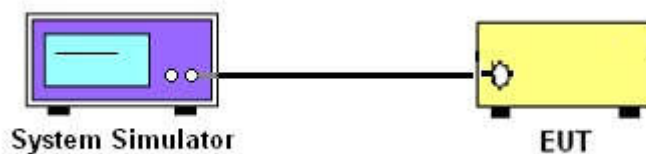
3 Conducted Test Result

3.1 Measuring Instruments

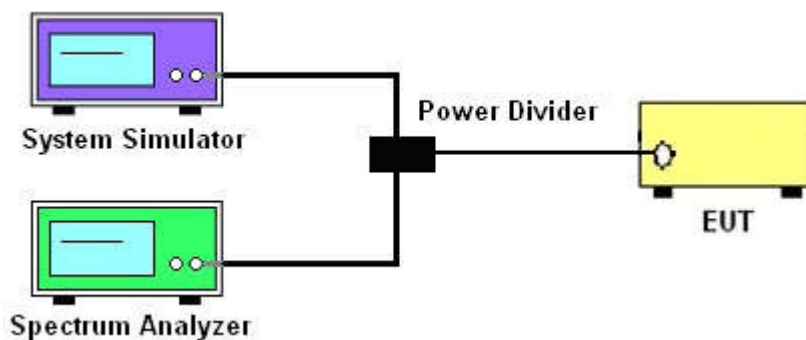
See list of measuring instruments of this test report.

3.2 Test Setup

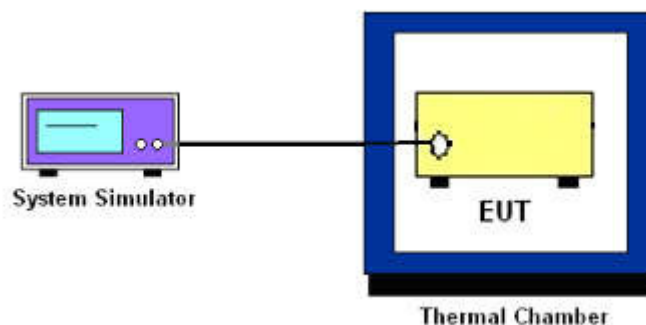
3.2.1 Conducted Output Power



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

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 v02r02 Section 5.7.1.
2. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
3. For GSM/GPRS operating modes:
 - a. Set EUT in maximum power output.
 - b. Set the RBW = 1MHz, VBW = 3MHz, Peak detector on spectrum analyzer for first trace.
 - c. Set the RBW = 1MHz, VBW = 3MHz, RMS detector on spectrum analyzer for second trace.
 - d. The wanted burst signal is triggered by spectrum analyzer, and measured respectively the peak level and Mean level without burst-off time, after system simulator has synchronized with the spectrum analyzer.
4. For UMTS operating modes:
 - a. Set the CCDF (Complementary Cumulative Distribution Function) option on the spectrum analyzer.
 - b. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.
5. Record the deviation as Peak to Average Ratio.

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.

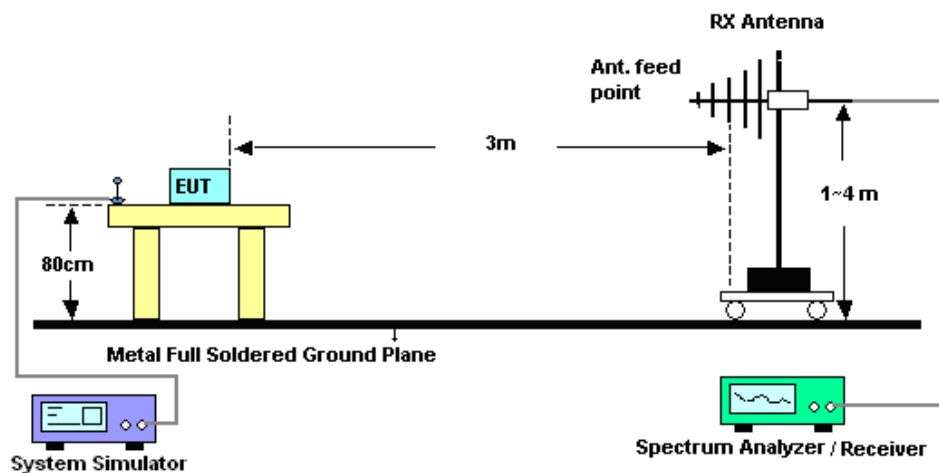
4 Radiated Test Items

4.1 Measuring Instruments

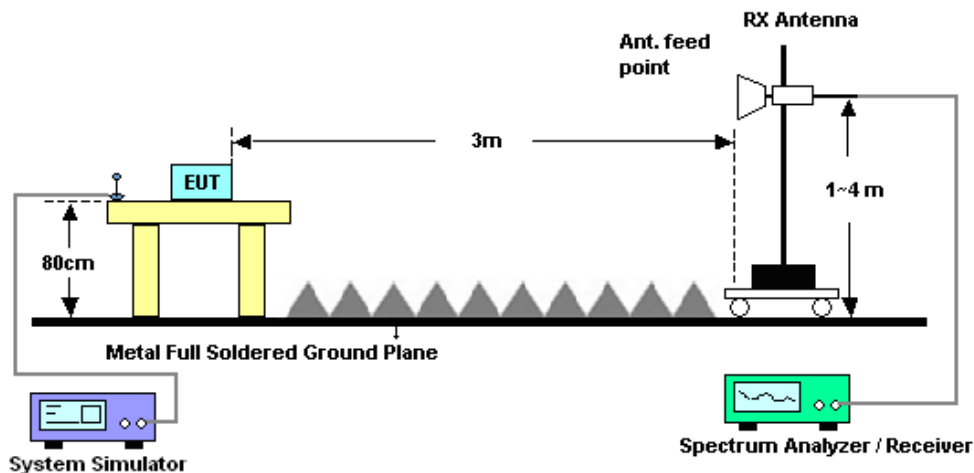
See list of measuring instruments of this test report.

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 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 high in a semi-anechoic chamber. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and a spectrum analyzer with RMS detector per section 5. of KDB 971168 D01.
3. During the measurement, the system simulator parameters were set to force the EUT transmitting at maximum output power. The maximum emission was recorded from analyzer power level (LVL) from the 360 degrees rotation of the turntable and the test antenna raised and lowered over a range from 1 to 4 meters in both horizontally and vertically polarized orientations.
4. Effective Isotropic Radiated Power (EIRP) was measured by substitution method according to TIA/EIA-603-D. The EUT was replaced by the substitution antenna at same location, and then a known power from S.G. was applied into the dipole antenna through a Tx cable, and then recorded the maximum Analyzer reading through raised and lowered the test antenna. The correction factor (in dB) = S.G. - Tx Cable loss + Substitution antenna gain - Analyzer reading. Then the EUT's EIRP was calculated with the correction factor, $EIRP = LVL + \text{Correction factor}$ and $ERP = EIRP - 2.15$. Take the record of the output power at substitution antenna.



	WCDMA/HSPA
SPAN	10MHz
RBW	100kHz
VBW	300kHz
Detector	RMS
Trace	Average
Average Type	Power
Sweep Count	100

4.5 Field Strength of Spurious Radiation Measurement

4.5.1 Description of Field Strength of Spurious Radiated Measurement

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

4.5.2 Test Procedures

1. The testing follows FCC KDB 971168 D01 v02r02 Section 5.8 and ANSI / TIA-603-D-2010 Section 2.2.12.
2. The EUT was placed on a rotatable wooden table 0.8 meters above the ground.
3. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
4. The table was rotated 360 degrees to determine the position of the highest spurious emission.
5. The height of the receiving antenna is varied between one meter and four meters to search for the maximum spurious emission for both horizontal and vertical polarizations.
6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking record of maximum spurious emission.
7. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
8. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
9. Taking the record of output power at antenna port.
10. Repeat step 7 to step 8 for another polarization.
11. $EIRP \text{ (dBm)} = S.G. \text{ Power} - Tx \text{ Cable Loss} + Tx \text{ Antenna Gain}$
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	FSV30	101338	9kHz~30GHz	May 04, 2015	Mar. 02, 2016~ Mar. 15, 2016	May 03, 2016	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	-40~+150°C	Oct. 24, 2015	Mar. 02, 2016~ Mar. 15, 2016	Oct. 23, 2016	Conducted (TH01-KS)
EMI Test Receiver&SA	Agilent Technologies	N9038A	MY52260185	20Hz~26.5GHz	May 26, 2015	Mar. 01, 2016	May 25, 2016	Radiation (03CH01-SZ)
Spectrum Analyzer	KEYSIGHT	N9010A	MY55150213	10Hz~44GHz; Max 30dBm	Jun. 07, 2015	Mar. 01, 2016	Jun. 06, 2016	Radiation (03CH01-SZ)
Bilog Antenna	TeseQ	CBL6112D	23188	30MHz~2GHz	Oct. 17, 2015	Mar. 01, 2016	Oct. 16, 2016	Radiation (03CH01-SZ)
Double Ridge Horn Antenna	ETS Lindgren	3117	00119436	1GHz~18GHz	Oct. 17, 2015	Mar. 01, 2016	Oct. 16, 2016	Radiation (03CH01-SZ)
SHF-EHF Horn	com-power	AH-840	101071	18GHz~40GHz	Aug. 19, 2015	Mar. 01, 2016	Aug. 18, 2016	Radiation (03CH01-SZ)
Amplifier	HP	8447F	3113A04622	9kHz~1300MHz / 30 dB	Aug. 07, 2015	Mar. 01, 2016	Aug. 06, 2016	Radiation (03CH01-SZ)
Amplifier	Agilent Technologies	83017A	MY39501302	500MHz~26.5GHz	Jan. 12, 2016	Mar. 01, 2016	Jan. 11, 2017	Radiation (03CH01-SZ)
HF Amplifier	MITEQ	TTA1840-3 5-HG	1871923	18GHz~40GHz	Jul. 18, 2015	Mar. 01, 2016	Jul. 17, 2016	Radiation (03CH01-SZ)
AC Power Source	Chroma	61601	616010001985	N/A	NCR	Mar. 01, 2016	NCR	Radiation (03CH01-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Mar. 01, 2016	NCR	Radiation (03CH01-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	Mar. 01, 2016	NCR	Radiation (03CH01-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% ($U = 2Uc(y)$)	4.8 dB
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Appendix A. Test Results of Conducted Test

Conducted Output Power (Average power)

Conducted Power (*Unit: dBm)						
Band	WCDMA Band V			WCDMA Band II		
Channel	4132	4182	4233	9262	9400	9538
Frequency	826.4	836.4	846.6	1852.4	1880	1907.6
RMC 12.2Kbps	23.17	23.19	23.25	23.71	23.84	23.83
HSDPA Subtest-1	22.03	22.12	22.22	22.49	22.64	22.66
HSDPA Subtest-2	22.08	22.06	22.24	22.55	22.63	22.68
HSDPA Subtest-3	21.60	21.59	21.67	22.01	22.21	22.23
HSDPA Subtest-4	21.47	21.58	21.76	22.09	22.19	22.21
DC-HSDPA Subtest-1	21.86	21.95	21.93	22.68	22.76	22.80
DC-HSDPA Subtest-2	22.05	22.11	21.89	22.53	22.68	22.73
DC-HSDPA Subtest-3	21.49	21.58	21.53	22.06	22.28	22.21
DC-HSDPA Subtest-4	21.55	21.54	21.56	22.04	22.24	22.25
HSUPA Subtest-1	21.29	21.49	21.45	22.18	22.27	22.53
HSUPA Subtest-2	20.79	20.90	20.85	21.54	21.68	21.36
HSUPA Subtest-3	20.76	20.03	20.93	21.47	21.02	21.42
HSUPA Subtest-4	21.25	21.42	21.32	22.18	22.31	21.79
HSUPA Subtest-5	21.93	21.92	22.13	22.64	22.85	22.86

Conducted Power (*Unit: dBm)			
Band	WCDMA Band IV		
Channel	1312	1413	1513
Frequency	1712.4	1732.6	1752.6
RMC 12.2Kbps	23.25	23.44	23.39
HSDPA Subtest-1	22.08	22.31	22.28
HSDPA Subtest-2	22.05	22.25	22.27
HSDPA Subtest-3	21.57	21.78	21.70
HSDPA Subtest-4	21.56	21.77	21.68
DC-HSDPA Subtest-1	22.16	22.41	22.46
DC-HSDPA Subtest-2	22.11	22.31	22.39
DC-HSDPA Subtest-3	21.55	21.76	21.77
DC-HSDPA Subtest-4	21.52	21.73	21.89
HSUPA Subtest-1	22.04	21.66	22.30
HSUPA Subtest-2	20.74	21.23	20.92
HSUPA Subtest-3	21.16	21.19	21.42
HSUPA Subtest-4	21.13	21.66	21.41
HSUPA Subtest-5	22.26	22.45	22.42

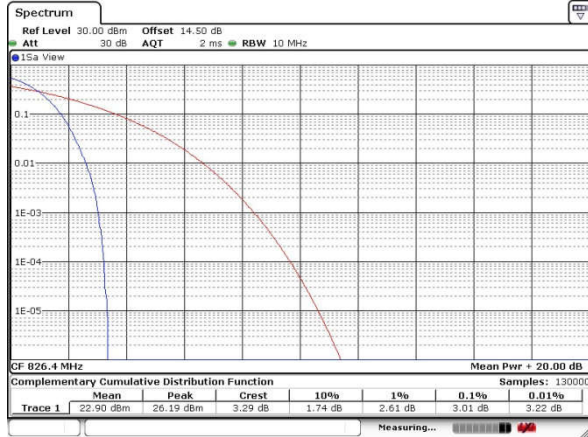
**Peak-to-Average Ratio**

Mode	WCDMA Band V	WCDMA Band II	WCDMA Band IV	Limit: 13dB
Mod.	RMC 12.2Kbps	RMC 12.2Kbps	RMC 12.2Kbps	Result
Lowest CH	3.01	3.10	3.13	PASS
Middle CH	3.13	3.10	2.90	
Highest CH	2.67	2.70	3.07	



WCDMA Band V (RMC 12.2Kbps)

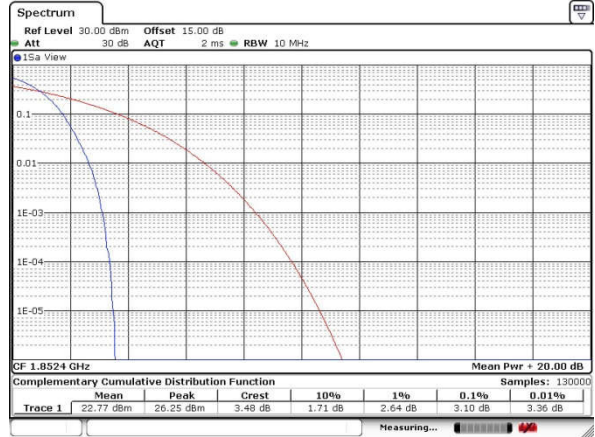
Lowest Channel



Date: 2 MAR 2016 22:11:20

WCDMA Band II (RMC 12.2Kbps)

Lowest Channel



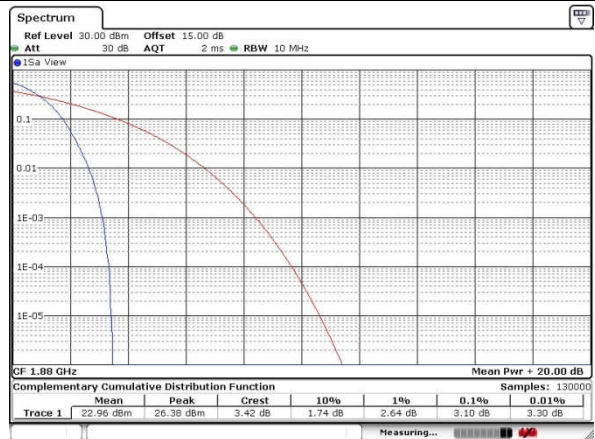
Date: 2 MAR 2016 22:32:46

Middle Channel



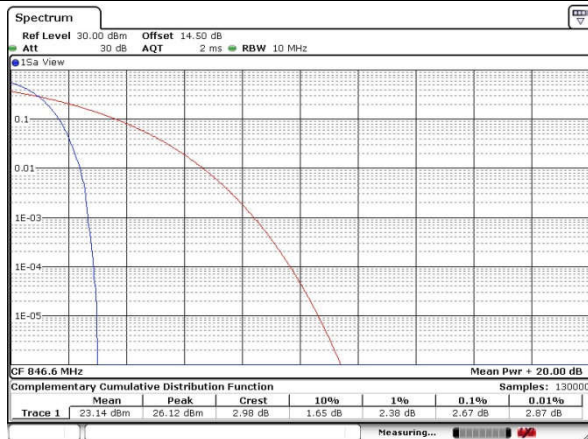
Date: 2 MAR 2016 22:11:29

Middle Channel



Date: 2 MAR 2016 22:32:53

Highest Channel



Date: 2 MAR 2016 22:11:37

Highest Channel

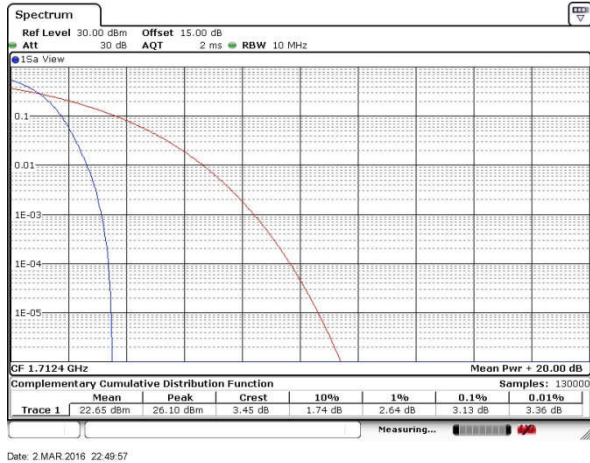


Date: 2 MAR 2016 22:33:01

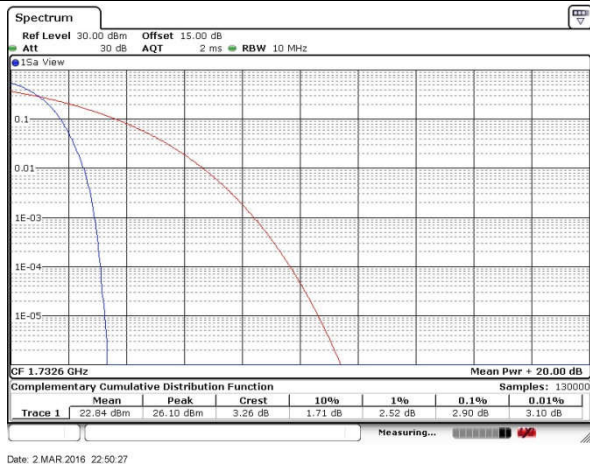


WCDMA Band IV (RMC 12.2Kbps)

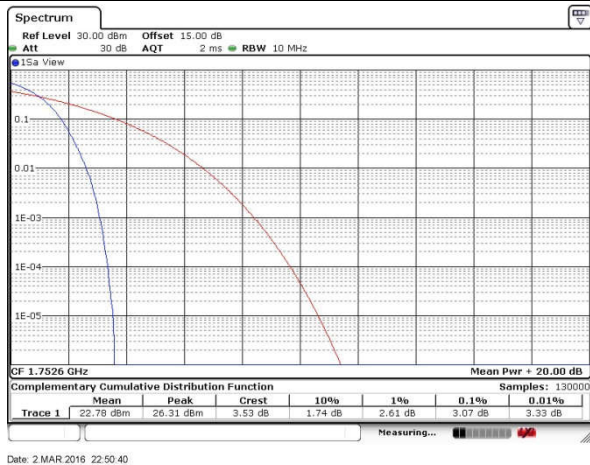
Lowest Channel



Middle Channel



Highest Channel



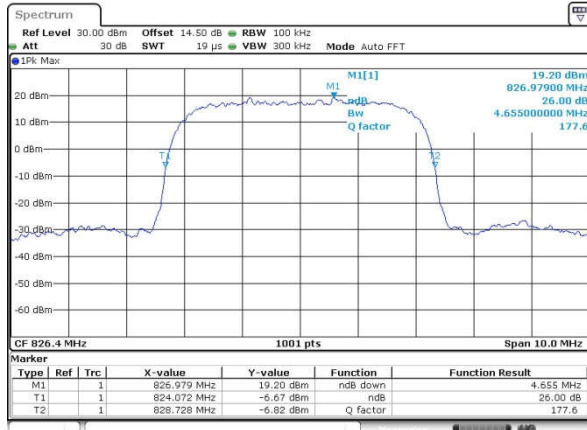
**26dB Bandwidth**

Mode	WCDMA Band V	WCDMA Band II	WCDMA Band IV
Mod.	RMC 12.2Kbps	RMC 12.2Kbps	RMC 12.2Kbps
Lowest CH	4.655	4.655	4.675
Middle CH	4.655	4.655	4.665
Highest CH	4.665	4.655	4.665



WCDMA Band V (RMC 12.2Kbps)

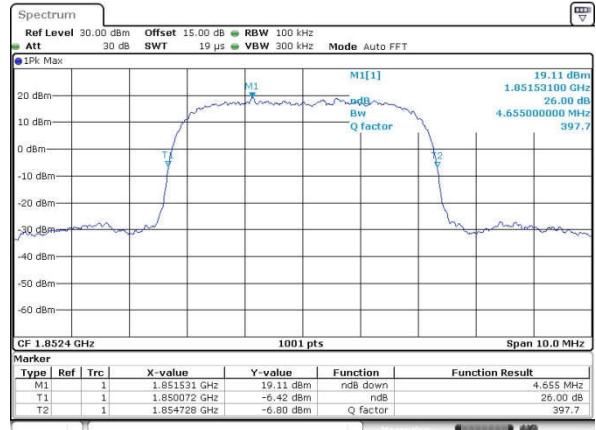
Lowest Channel



Date: 2 MAR 2016 21:55:47

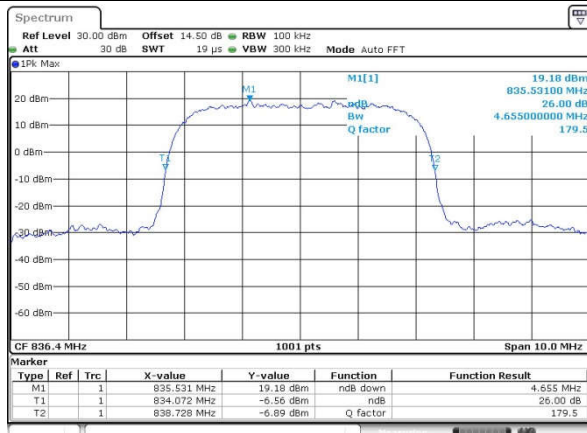
WCDMA Band II (RMC 12.2Kbps)

Lowest Channel



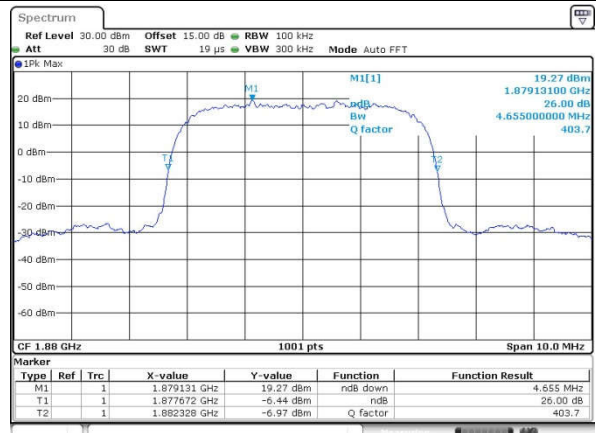
Date: 2 MAR 2016 22:18:32

Middle Channel



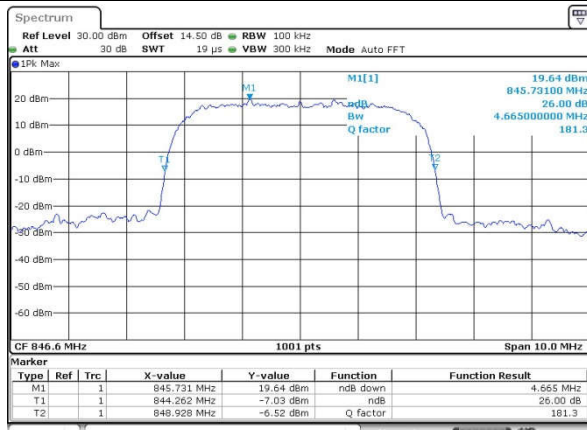
Date: 2 MAR 2016 21:56:16

Middle Channel



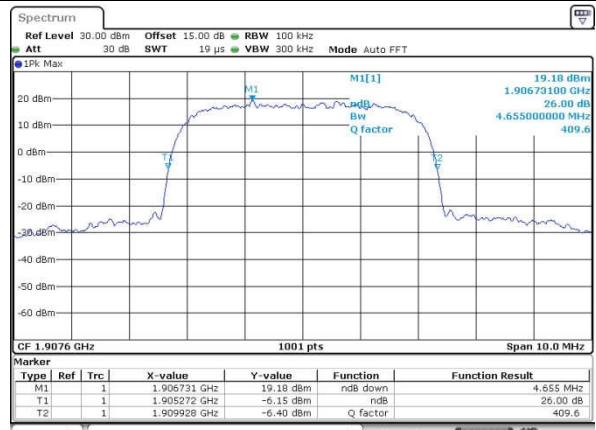
Date: 2 MAR 2016 22:19:00

Highest Channel

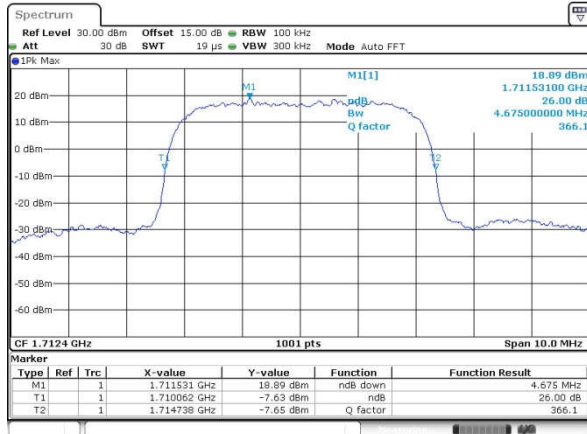


Date: 2 MAR 2016 21:56:44

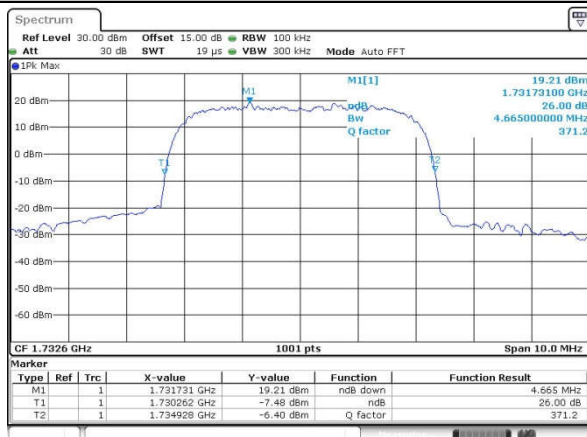
Highest Channel



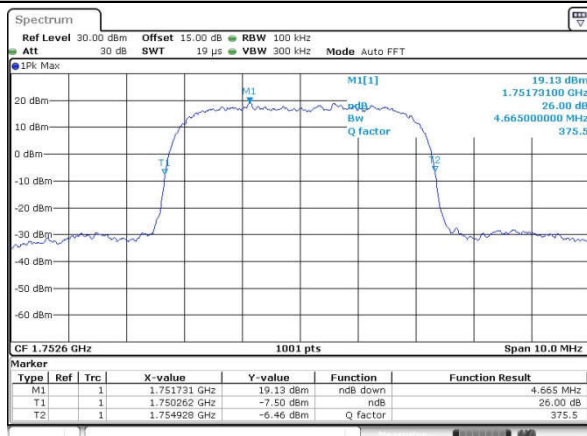
Date: 2 MAR 2016 22:19:28

**WCDMA Band IV (RMC 12.2Kbps)****Lowest Channel**

Date: 2 MAR 2016 22:34:16

Middle Channel

Date: 2 MAR 2016 22:34:44

Highest Channel

Date: 2 MAR 2016 22:35:13

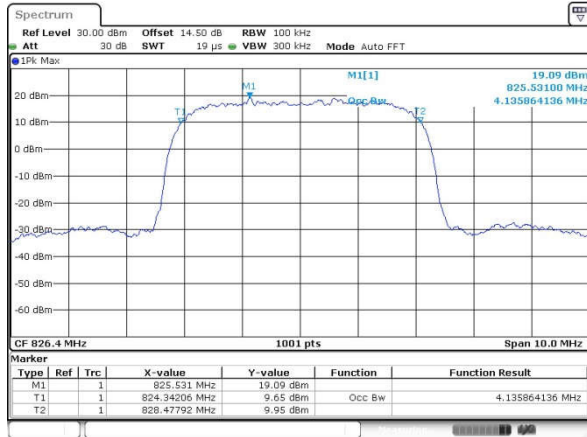
**Occupied Bandwidth**

Mode	WCDMA Band V	WCDMA Band II	WCDMA Band IV
Mod.	RMC 12.2Kbps	RMC 12.2Kbps	RMC 12.2Kbps
Lowest CH	4.136	4.136	4.156
Middle CH	4.146	4.146	4.156
Highest CH	4.136	4.136	4.166



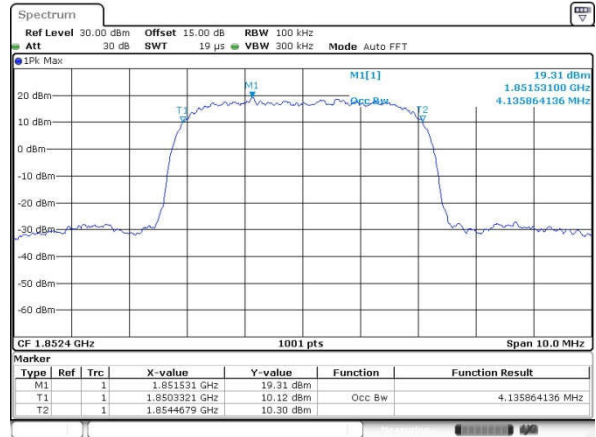
WCDMA Band V (RMC 12.2Kbps)

Lowest Channel

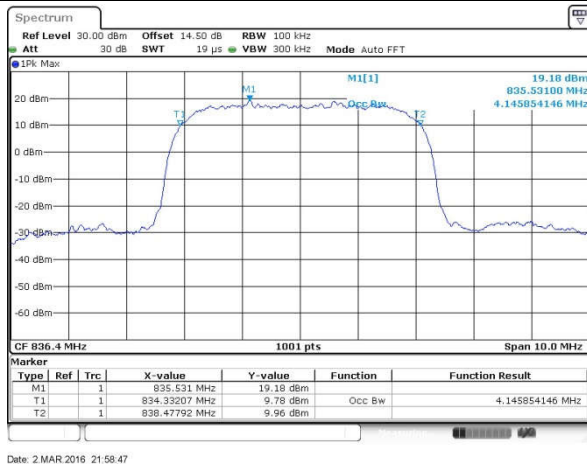


WCDMA Band II (RMC 12.2Kbps)

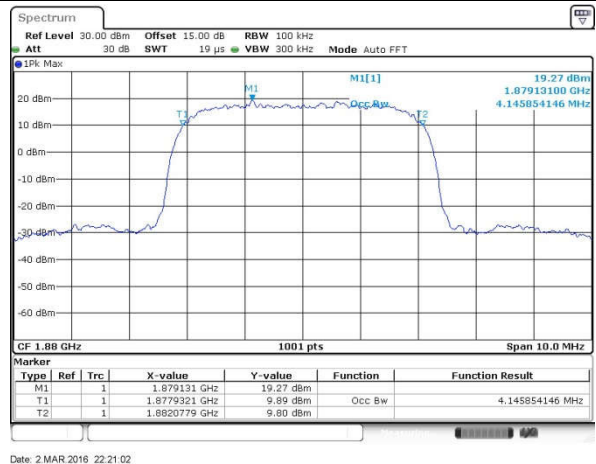
Lowest Channel



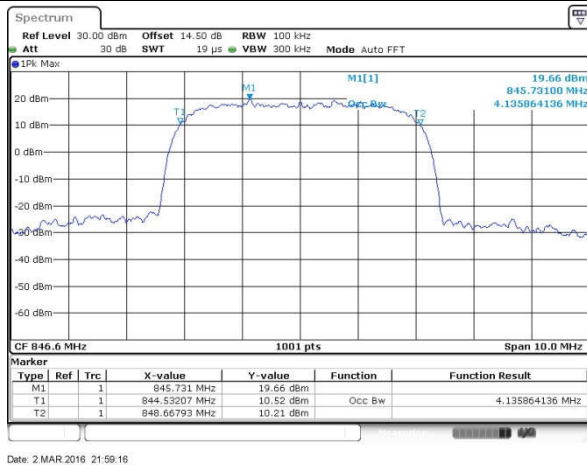
Middle Channel



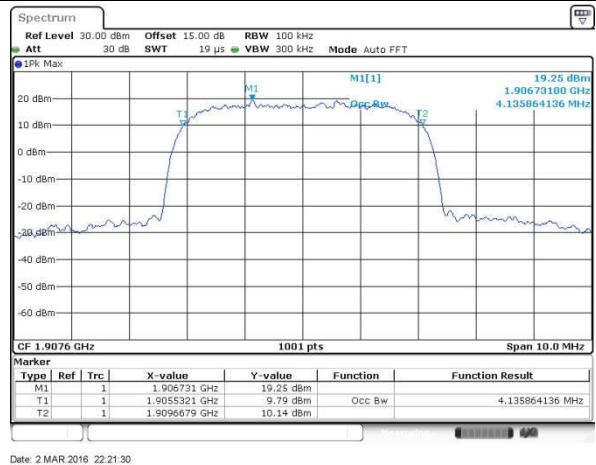
Middle Channel

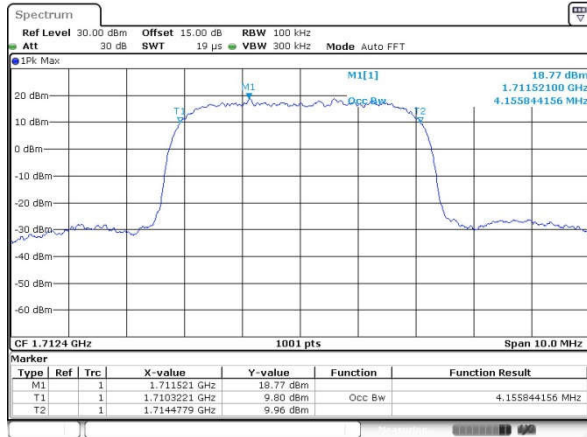
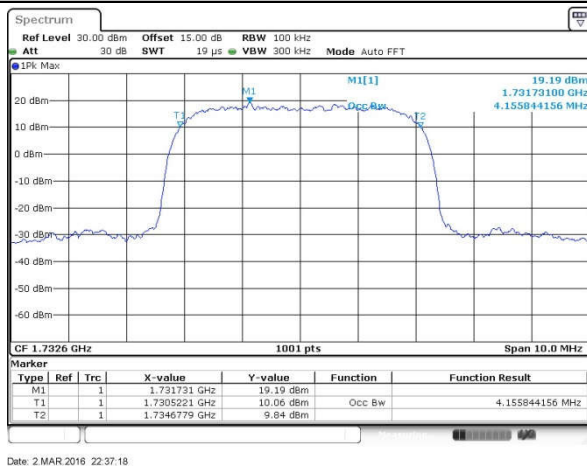
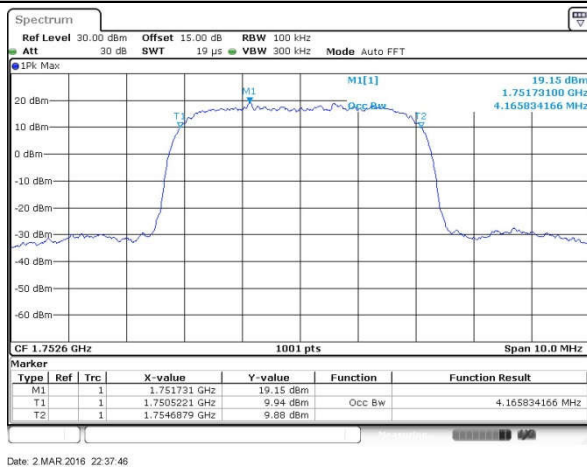


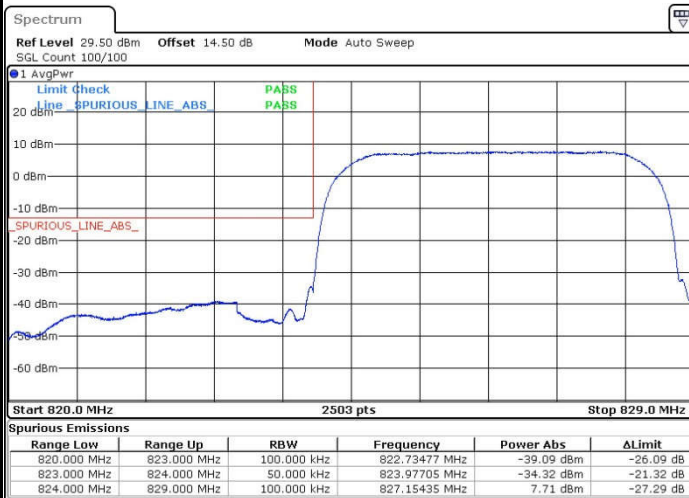
Highest Channel



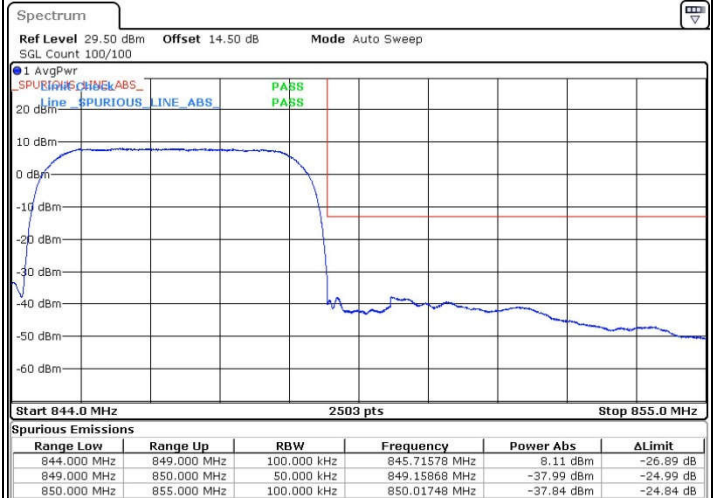
Highest Channel



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

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

Date: 2 MAR 2016 22:02:24

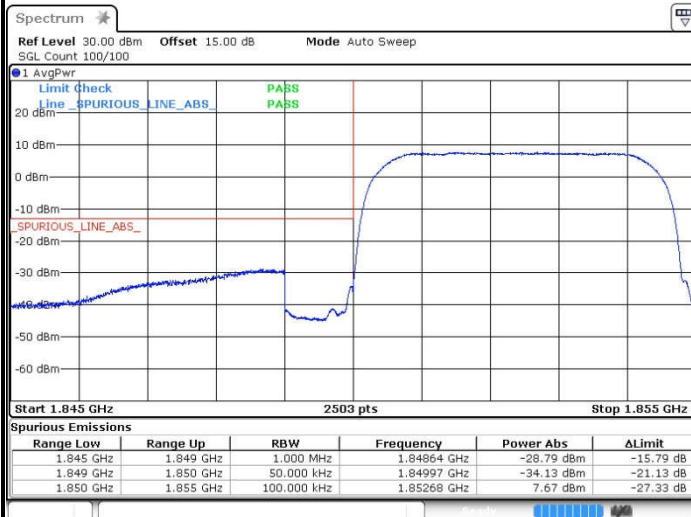
Highest Band Edge

Date: 2 MAR 2016 22:05:04

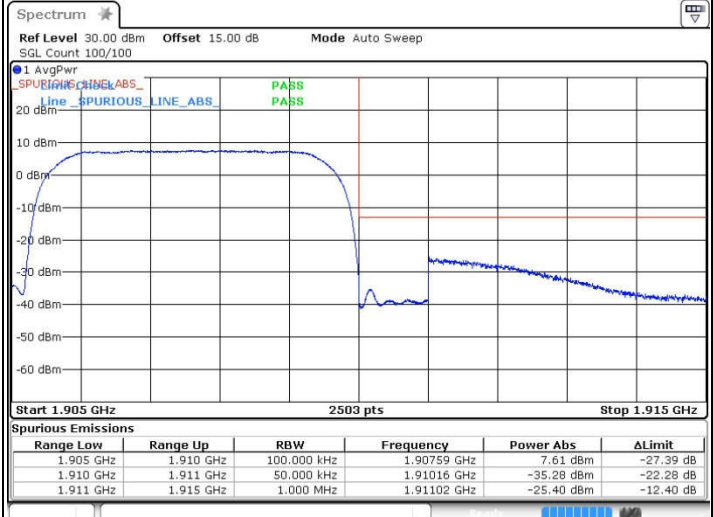


WCDMA Band II (RMC 12.2Kbps)

Lowest Band Edge



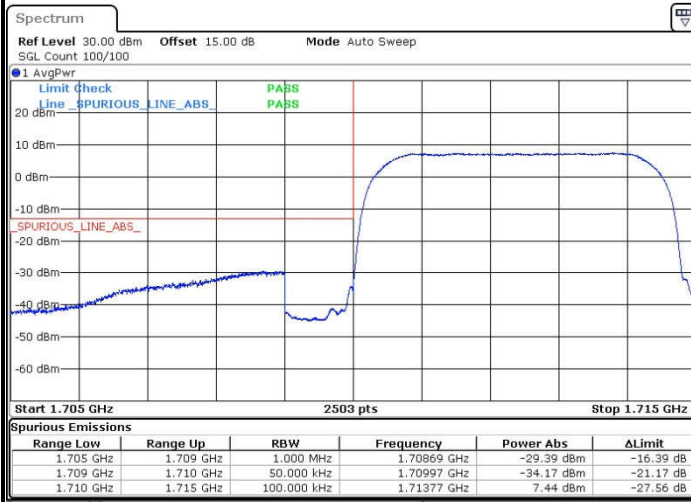
Highest Band Edge





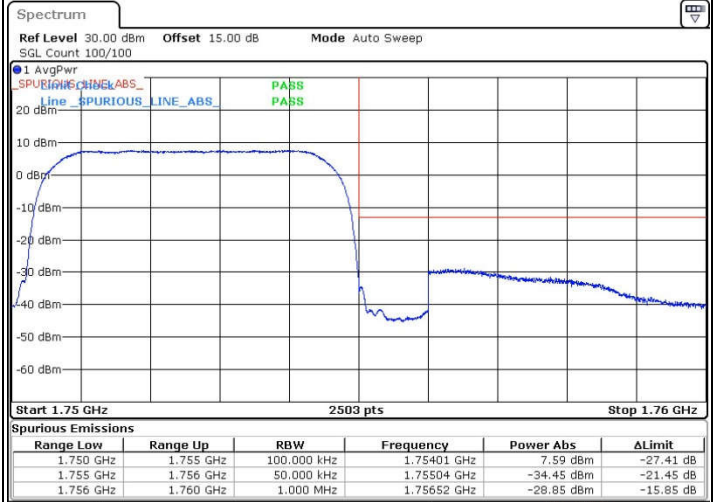
WCDMA Band IV (RMC 12.2Kbps)

Lowest Band Edge



Date: 2 MAR 2016 22:40:48

Highest Band Edge



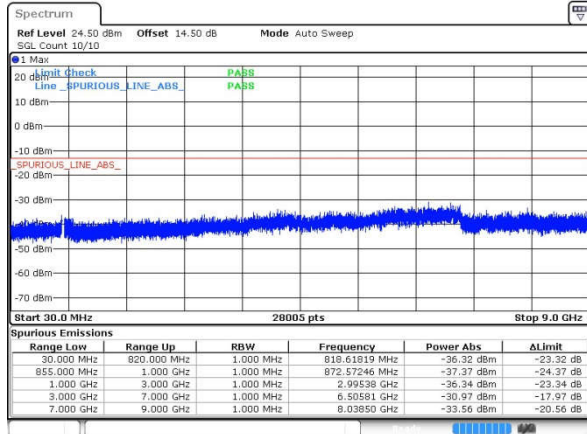
Date: 2 MAR 2016 22:43:29



Conducted Spurious Emission

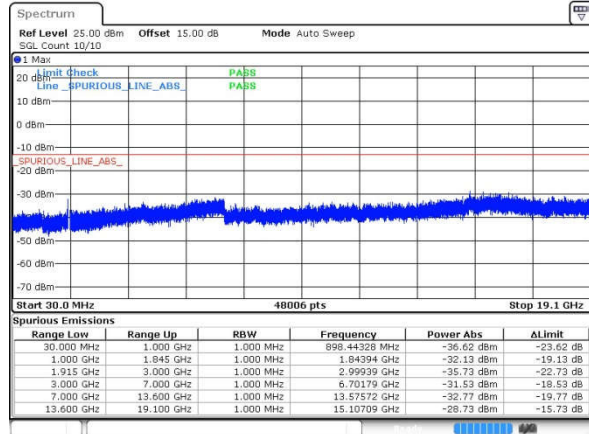
WCDMA Band V (RMC 12.2Kbps)

Lowest Channel

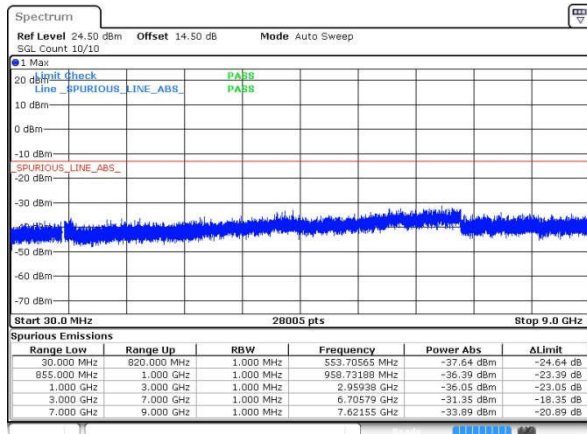


WCDMA Band II (RMC 12.2Kbps)

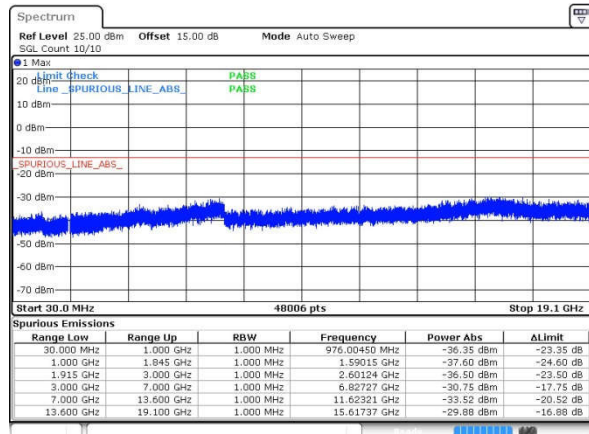
Lowest Channel



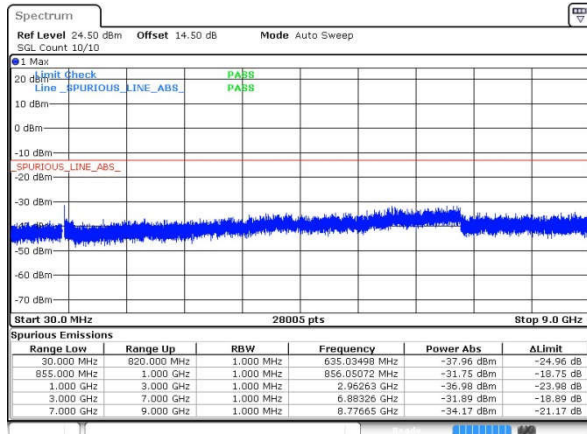
Middle Channel



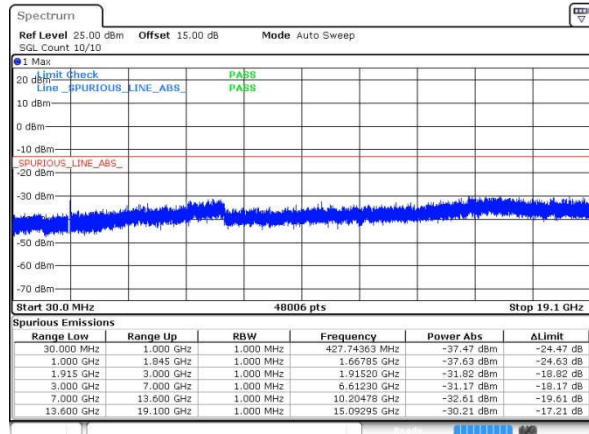
Middle Channel

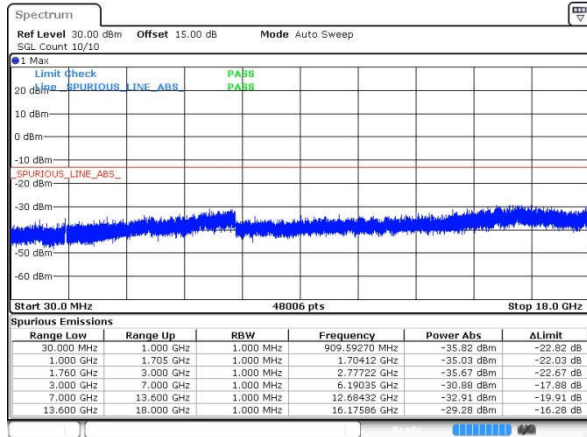
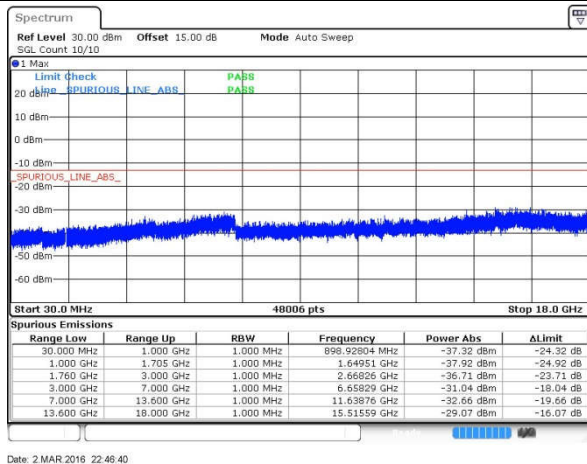
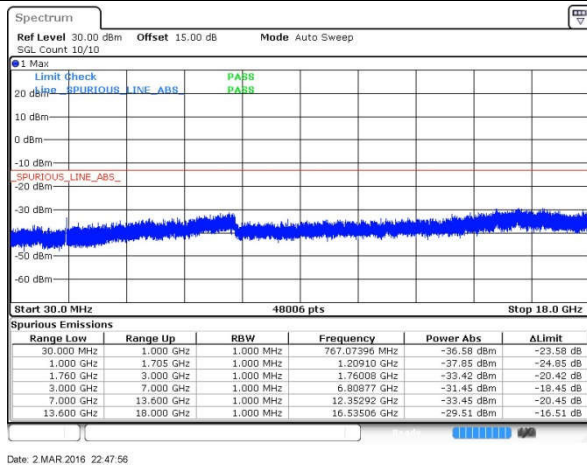


Highest Channel



Highest Channel



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

**Frequency Stability**

Test Conditions	Middle Channel	WCDMA Band V (RMC 12.2KbpsRMC 12.2Kbps)	Limit 2.5ppm
Temperature (°C)	Voltage (Volt)	Deviation (ppm)	Result
50	Normal Voltage	0.0062	PASS
40	Normal Voltage	0.0038	
30	Normal Voltage	0.0106	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0096	
0	Normal Voltage	0.0254	
-10	Normal Voltage	0.0155	
-20	Normal Voltage	0.0050	
-30	Normal Voltage	0.0012	
20	Maximum Voltage	0.0140	
20	Normal Voltage	0.0171	
20	Battery End Point	0.0276	

Note:

1. Normal Voltage = 3.8V. ; Battery End Point (BEP) = 3.5 V. ; Maximum Voltage =4.2 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 II (RMC 12.2Kbps)	Limit Note 2.
Temperature (°C)	Voltage (Volt)	Deviation (ppm)	Result
50	Normal Voltage	0.0117	PASS
40	Normal Voltage	0.0054	
30	Normal Voltage	0.0059	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0093	
0	Normal Voltage	0.0036	
-10	Normal Voltage	0.0032	
-20	Normal Voltage	0.0090	
-30	Normal Voltage	0.0115	
20	Maximum Voltage	0.0085	
20	Normal Voltage	0.0043	
20	Battery End Point	0.0074	

Note:

1. Normal Voltage = 3.8V. ; Battery End Point (BEP) = 3.5 V. ; Maximum Voltage =4.2 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	0.0032	PASS
40	Normal Voltage	0.0072	
30	Normal Voltage	0.0024	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0074	
0	Normal Voltage	0.0068	
-10	Normal Voltage	0.0084	
-20	Normal Voltage	0.0093	
-30	Normal Voltage	0.0084	
20	Maximum Voltage	0.0019	
20	Normal Voltage	0.0142	
20	Battery End Point	0.0012	

Note:

1. Normal Voltage = 3.8V. ; Battery End Point (BEP) = 3.5 V. ; Maximum Voltage =4.2 V.
2. The frequency fundamental emissions stay within the authorized frequency block based on the frequency deviation measured is small.



Appendix B. Test Results of Radiated Test

ERP/EIRP

Channel	Mode	Horizontal		Vertical	
		ERP(dBm)	ERP(W)	ERP(dBm)	ERP(W)
Lowest	WCDMA Band V RMC 12.2Kbps	22.17	0.1648	21.48	0.1406
Middle		21.92	0.1556	21.43	0.1390
Highest		22.09	0.1618	21.31	0.1352
Limit	ERP < 7W	Result		PASS	

Channel	Mode	Horizontal		Vertical	
		EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	WCDMA Band II RMC 12.2Kbps	25.83	0.3828	26.68	0.4656
Middle		25.82	0.3819	26.51	0.4477
Highest		26.09	0.4064	26.43	0.4395
Limit	EIRP < 2W	Result		PASS	

Channel	Mode	Horizontal		Vertical	
		EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
Lowest	WCDMA Band IV RMC 12.2Kbps	24.41	0.2761	24.54	0.2844
Middle		24.51	0.2825	24.68	0.2938
Highest		24.93	0.3112	24.98	0.3148
Limit	EIRP < 1W	Result		PASS	

**Radiated Spurious Emission**

WCDMA Band V(RMC 12.2Kbps)									
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	1673.04	-61.71	-13	-48.71	-64.02	-60.14	4.92	5.50	H
	2509.56	-52.53	-13	-39.53	-58.82	-50.07	6.11	5.80	H
	3346.08	-56.63	-13	-43.63	-65.35	-55.25	7.33	8.10	H
	1673.04	-61.77	-13	-48.77	-64.25	-60.20	4.92	5.50	V
	2509.56	-47.20	-13	-34.20	-55.00	-44.74	6.11	5.80	V
	3346.08	-57.92	-13	-44.92	-66.15	-56.54	7.33	8.10	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	-51.58	-13	-38.58	-66.08	-51.95	7.73	8.10	H
	5640	-49.20	-13	-36.20	-67.21	-50.10	9.5	10.40	H
	7520	-46.06	-13	-33.06	-66.47	-46.68	11.08	11.70	H
	3760	-50.84	-13	-37.84	-65.93	-51.21	7.73	8.1	V
	5640	-48.69	-13	-35.69	-66.96	-49.59	9.5	10.4	V
	7520	-46.56	-13	-33.56	-67.06	-47.18	11.08	11.7	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)
Middle	3465.2	-50.85	-13	-37.85	-65.60	-56.12	7.33	12.60	H
	5197.8	-48.45	-13	-35.45	-66.45	-52.00	9.15	12.70	H
	6930.4	-47.68	-13	-34.68	-66.49	-48.74	10.64	11.70	H
	3465.2	-54.54	-13	-41.54	-66.12	-59.81	7.33	12.60	V
	5197.8	-52.22	-13	-39.22	-65.97	-55.77	9.15	12.70	V
	6930.4	-48.02	-13	-35.02	-66.11	-49.08	10.64	11.70	V

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