

**FCC 47 CFR PART 22 SUBPART H AND PART 24 SUBPART E
+
INDUSTRY CANADA RSS-132 & RSS-133**

TEST REPORT

For

ICG

Model: ICG-100-NA-R, ICG-100-NA-C

Trade Name: Intwine connect

Issued to

**Foxconn International Inc
NO 2 ZIYOU ST TUCHENG DISTRICT
NEW TAIPEI
236**

Issued by

**Compliance Certification Services Inc.
Wugu Laboratory
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Issued Date: March 29, 2017**



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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	March 29, 2017	Initial Issue	ALL	Doris Chu
01	June 7, 2017	1. Modify section 4.2 2. Added section 7.4 3. Modify setup photo.	P.7 P.22~26 P.58	Angel Cheng

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1. TEST RESULT CERTIFICATION

Applicant: Foxconn International Inc
NO 2 ZIYOU ST TUCHENG DISTRICT
NEW TAIPEI
236

Manufacturer: Foxconn International Inc
NO 2 ZIYOU ST TUCHENG DISTRICT
NEW TAIPEI
236

Equipment Under Test: ICG

Trade Name: Intwine connect

Model Number: ICG-100-NA-R, ICG-100-NA-C

Date of Test: March 1 ~ 29, 2017

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR Part 22 Subpart H & Part 24 Subpart E + RSS-132 issue 3 and RSS-133 issue 6	No non-compliance noted

We hereby certify that:

The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in TIA/EIA-603-D: 2010 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rule FCC PART 22 Subpart H and PART 24 Subpart E and IC RSS-132 Issue 3 and IC RSS-133 Issue 6.

The test results of this report relate only to the tested sample identified in this report.

Approved by:



Sam Chuang
Manager
Compliance Certification Services Inc.

Tested by:



Timmy Wang
Engineer
Compliance Certification Services Inc.

2. EUT DESCRIPTION

Product	ICG
Trade Name	Intwine connect
Model Number	ICG-100-NA-R, ICG-100-NA-C
Model Discrepancy	ICG-100-NA-R: Plastic ICG-100-NA-C: Metal
Received Date	January 13, 2017
Power Supply	VDC from Power Adapter For ICG-100-NA-R 1. DVE / DSA-18PFM-12FUS I/P: 100-240Vac, 0.6A, 50-60Hz O/P: 12Vdc, 1.5A 2. MEAN WELL / GST18U12 I/P: 100-240Vac, 0.5A, 50-60Hz O/P: 12Vdc, 1.5A For ICG-100-NA-C 1. DVE / DSA-18PFM-12FUS I/P: 100-240Vac, 0.6A, 50-60Hz O/P: 12Vdc, 1.5A
Frequency Range	WCDMA / HSDPA / HSUPA Band II: 1852.4 ~ 1907.6 MHz WCDMA / HSDPA / HSUPA Band V: 826.4 ~ 846.6MHz
Antenna Specification	Dipole Antenna taoglas / Gain 3 dBi(Worse) FIT / Gain 1.59 dBi

Remark:

1. The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.
2. For test mode WCDMA, HSUPA and HSDPA were pretest. The worst case was WCDMA in this test report

Emission Designator					
System	Band	Frequency Range(MHz)	Emission Designator (99% OBW)	Maximum ERP (W)	Maximum EIRP (W)
WCDMA 12.2K RMC	II	1852.4MHz ~1907.6MHz	4M18F9W	N/A	0.5957
	V	826.4MHz ~ 846.6MHz	4M16F9W	0.9683	N/A

3. TEST METHODOLOGY

Both conducted and radiated testing were performed according to TIA/EIA-603-D: 2010 and FCC CFR 47, Part 2, Part 22 Subpart H and Part 24 Subpart E

The tests documented in this report were performed in accordance with IC RSS-132, SPSR503, RSS-133, SPSR510 and ANSI C63.26: 2015.

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

3.2 DESCRIPTION OF TEST MODES

The EUT (model: ICG-100-NA-R) had been tested under operating condition.

The EUT be set in maximum power transmission via call box during testing.

3.2.1 The worst mode of measurement

Radiated Emission Measurement Above 1G	
Test Condition	Band edge, Emission for Unwanted and Fundamental
Voltage/Hz	120V/60Hz
Test Mode	Mode 1:EUT power by AC adapter via power cable.
Worst Mode	☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4
Worst Position	☐ Placed in fixed position. ☐ Placed in fixed position at X-Plane (E2-Plane) ☒ Placed in fixed position at Y-Plane (E1-Plane) ☐ Placed in fixed position at Z-Plane (H-Plane)

Remark:

1. The worst mode was record in this test report.
2. EUT pre-scanned in ICG-100-NA-Cand ICG-100-NA-R for below 1GHz radiated measurement. The worst case ICG-100-NA-R were recorded in this report.

4. INSTRUMENT CALIBRATION

4.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

4.2 MEASUREMENT EQUIPMENT USED

Equipment Used for Emissions Measurement

Remark: Each piece of equipment is scheduled for calibration once a year.

Conducted Emissions Test Site					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Base Station	R&S	CMU 200	101245	07/29/2016	07/28/2017

Wugu Fully Chamber B					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Signal Analyzer	Agilent	E4407B	MY44212686	04/09/2016	04/08/2017
Pre-Amplifier	MITEQ	AFS44-00102 650-42-10P-4 4	1042473	07/06/2016	07/05/2017
Bilog Antenna	Sunol Sciences	JB3	A030105	07/03/2016	07/02/2017
Horn Antenna	EMCO	3115	9602-4659	06/01/2016	05/31/2017
Pre-Amplifier	EMEC	EM330	60609	06/08/2016	06/07/2017
Horn Antenna	ETC	MCTD 1209	DRH13M02003	09/02/2016	09/01/2017
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R	N.C.R
Turn Table	CCS	CC-T-1F	N/A	N.C.R	N.C.R
Software	EZ-EMC (CCS-3A1RE)				

4.3 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
3M Semi Anechoic Chamber / 30M~200M	+/- 4.0138
3M Semi Anechoic Chamber / 200M~1000M	+/- 3.9483
3M Semi Anechoic Chamber / 1G~8G	+/- 2.5975
3M Semi Anechoic Chamber / 8G~18G	+/- 2.6112
3M Semi Anechoic Chamber / 18G~26G	+/- 2.7389
3M Semi Anechoic Chamber / 26G~40G	+/- 2.9683

Remark: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

☐ No.199, Chunghsen Road, Hsintien City, Taipei Hsien, Taiwan, R.O.C.

Tel: 886-2-2217-0894 / Fax: 886-2-2217-1029

☒ No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan. (R.O.C.)

Tel: 886-2-2299-9720 / Fax: 886-2-2298-4045

☐ No.81-1, Lane 210, Bade 2nd Rd., Lujhu Township, Taoyuan County 33841, TAIWAN, R.O.C.

Tel: 886-3-324-0332 / Fax: 886-3-324-5235

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

5.3 TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3M Semi Anechoic Chamber (FCC MRA: TW1039) to perform FCC Part 15 measurements	 FCC MRA: TW1039
Taiwan	TAF	LP0002, RTTE01, FCC Method-47 CFR Part 15 Subpart C, D, E, RSS-210, RSS-310 IDA TS SRD, AS/NZS 4268, AS/NZS 4771, TS 12.1 & 12.2, ETSI EN 300 440-1, ETSI EN 300 440-2, ETSI EN 300 328, ETSI EN 300 220-1, ETSI EN 300 220-2, ETSI EN 301 893, ETSI EN 301 489-1/3/7/17 FCC OET Bulletin 65 + Supplement C, EN 50360, EN 50361, EN 50371, RSS 102, EN 50383, EN 50385, EN 50392, IEC 62209, CNS 14958-1, CNS 14959 FCC Method -47 CFR Part 15 Subpart B IEC / EN 61000-3-2, IEC / EN 61000-3-3, IEC / EN 61000-4-2/3/4/5/6/8/11	 Testing Laboratory 1309
Canada	Industry Canada	3M Semi Anechoic Chamber (IC 2324G-1 / IC 2324G-2) to perform	 IC 2324G-1 IC 2324G-2

* No part of this report may be used to claim or imply product endorsement by A2LA or any agency of the US Government.

6. SETUP OF EQUIPMENT UNDER TEST

6.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix I for the actual connections between EUT and support equipment.

6.2 SUPPORT EQUIPMENT

No	Equipment	Brand	Model	Series No.	FCC ID	Data Cable	Power Cord
1	Notebook	Acer	Aspire 4320 series	N/A	QDS-BRCM1018	N/A	N/A

Remark:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

7. TEST REQUIREMENTS

7.1 AVERAGE POWER

Test Procedures

CONDUCTED POWER MEASUREMENT:

1. The transmitter output power was connected to the call box.
2. Set EUT at maximum output power via call box.
3. Set Call box at lowest, middle and highest channels for each band and modulation.

No non-compliance noted.

Test Data

WCDMA 12.2K RMC

Band	Mode	Frequency (MHz)	CH	AVG Power (dBm)	Output Power (W)
II	WCDMA 12.2K RMC	1852.40	9262	23.21	0.20941
		1880.00	9400	23.38	0.21777
		1907.60	9538	23.49	0.22336
V		826.40	4132	23.28	0.21281
		836.60	4183	23.36	0.21677
		846.60	4233	23.42	0.21979

HSDPA**Band II**

Band	Mode	Frequency (MHz)	CH	AVG Power (dBm)	Output Power (W)
II	Subtest 1	1852.40	9262	23.18	0.20797
		1880.00	9400	23.34	0.21577
		1907.60	9538	23.41	0.21928
	Subtest 2	1852.40	9262	22.75	0.18836
		1880.00	9400	22.89	0.19454
		1907.60	9538	23.01	0.19999
	Subtest 3	1852.40	9262	22.22	0.16672
		1880.00	9400	22.52	0.17865
		1907.60	9538	22.58	0.18113
	Subtest 4	1852.40	9262	22.26	0.16827
		1880.00	9400	22.49	0.17742
		1907.60	9538	22.56	0.18030

Band V

Band	Mode	Frequency (MHz)	CH	AVG Power (dBm)	Output Power (W)
V	Subtest 1	826.40	4132	23.19	0.20845
		836.40	4182	23.32	0.21478
		846.60	4233	23.35	0.21627
	Subtest 2	826.40	4132	22.79	0.19011
		836.40	4182	22.91	0.19543
		846.60	4233	22.98	0.19861
	Subtest 3	826.40	4132	22.45	0.17579
		836.40	4182	22.39	0.17338
		846.60	4233	22.52	0.17865
	Subtest 4	826.40	4132	22.31	0.17022
		836.40	4182	22.41	0.17418
		846.60	4233	22.52	0.17865

HSUPA**Band II**

Band	Mode	Frequency(MHz)	CH	AVG Power(dBm)	Output Power(W)
II	Subtest 1	1852.40	9262	23.18	0.20797
		1880.00	9400	23.31	0.21429
		1907.60	9538	23.44	0.22080
	Subtest 2	1852.40	9262	21.25	0.13335
		1880.00	9400	21.48	0.14060
		1907.60	9538	21.55	0.14289
	Subtest 3	1852.40	9262	22.25	0.16788
		1880.00	9400	22.39	0.17338
		1907.60	9538	22.51	0.17824
	Subtest 4	1852.40	9262	21.25	0.13335
		1880.00	9400	21.39	0.13772
		1907.60	9538	21.52	0.14191
	Subtest 5	1852.40	9262	23.15	0.20654
		1880.00	9400	23.35	0.21627
		1907.60	9538	23.41	0.21928

Band V

Band	Mode	Frequency(MHz)	CH	AVG Power(dBm)	Output Power(W)
V	Subtest 1	826.40	4132	23.20	0.20893
		836.40	4182	23.32	0.21478
		846.60	4233	23.36	0.21677
	Subtest 2	826.40	4132	21.34	0.13614
		836.40	4182	21.39	0.13772
		846.60	4233	21.56	0.14322
	Subtest 3	826.40	4132	22.36	0.17219
		836.40	4182	22.41	0.17418
		846.60	4233	22.52	0.17865
	Subtest 4	826.40	4132	21.36	0.13677
		836.40	4182	21.39	0.13772
		846.60	4233	21.43	0.13900
	Subtest 5	826.40	4132	23.25	0.21135
		836.40	4182	23.30	0.21380
		846.60	4233	23.35	0.21627

Remark: The value of factor includes both the loss of cable and external attenuator.

7.2 ERP & EIRP MEASUREMENT

LIMIT

According to FCC 22.913(a): The Effective Radiated Power (ERP) of mobile transmitters must not exceed 7 Watts.

According to FCC 24.232(b): The equivalent Isotropic Radiated Power (EIRP) must not exceed 2 Watts.

RSS-132, section 5.4

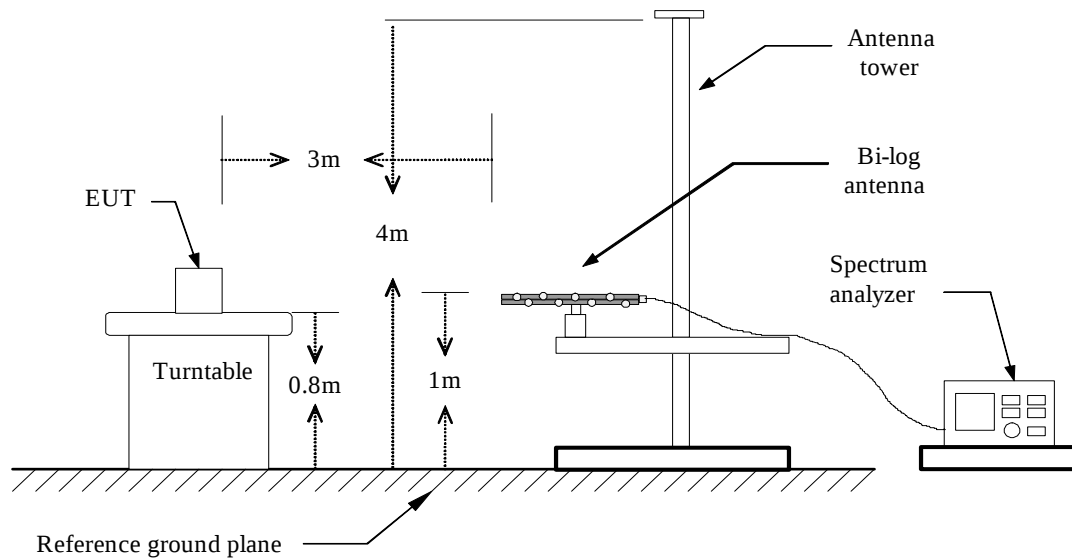
The transmitter output power shall be measured in terms of average power. The equivalent isotropically radiated power (e.i.r.p.) for mobile equipment shall not exceed 11.5 watts. Refer to SRSP-503 for base station e.i.r.p. limits.

RSS-133, section 6.4

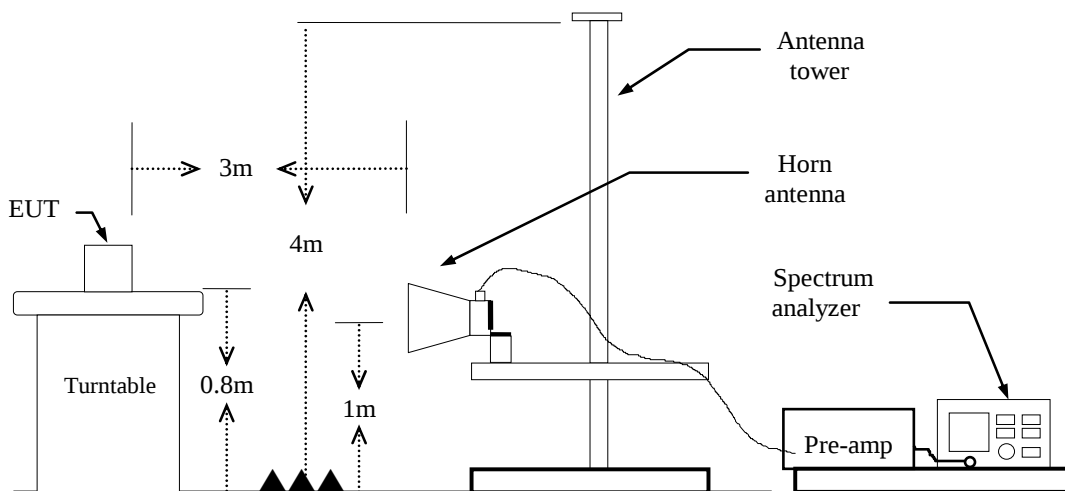
The equivalent isotropically radiated power (e.i.r.p.) for transmitters shall not exceed the limits given in SRSP-510. Moreover, base station transmitters operating in the band 1930-1995 MHz shall not have output power exceeding 100 watts.

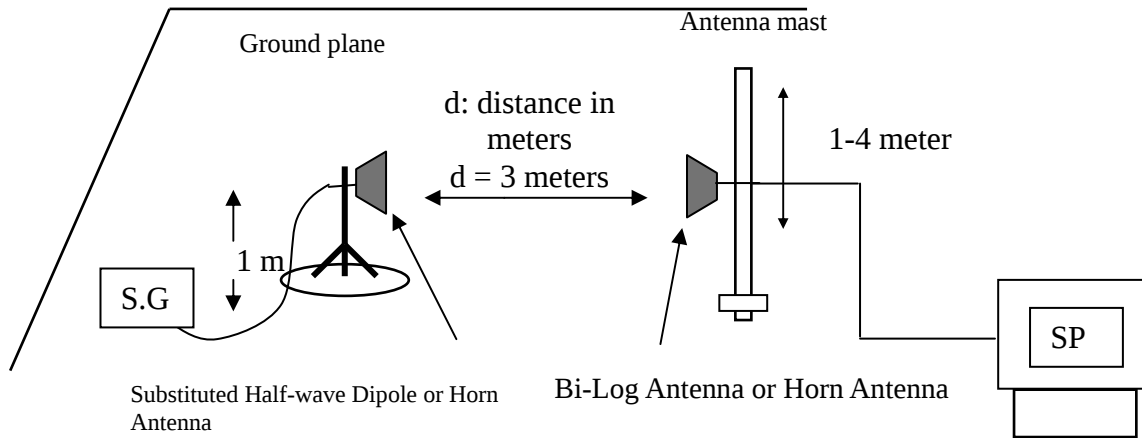
Test Configuration

Below 1 GHz



Above 1 GHz



For Substituted Method Test Set-UP**TEST PROCEDURE**

1. The EUT was placed on a non-conductive rotating platform (0.8m for below 1G and above 1G) in a semi-chamber. The radiated emission at the fundamental frequency was measured at 3m and SA with RMS detector per section 5, KDB 971168 D01.
2. During the measurement, the call box parameters were set to get the maximum output power of the EUT. The maximum emission was recorded from spectrum analyzer power level (LVL) from 360 degrees rotation of turntable and the test antenna raised and lowered over a range from 1m to 4m in both horizontally and vertically polarized orientations.
3. EIRP was measured method according to TIA/EIA-603-D:2010. The EUT was replaced by the substitution antenna at same location, and then record the maximum Analyzer reading through raised and lowered the test antenna.

$$\text{ERP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBi)} - \text{Cable (dB)} - 2.15$$

$$\text{EIRP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBi)} - \text{Cable (dB)}$$

TEST RESULTS

No non-compliance noted.

WCDMA 12.2K RMC

Test Mode	Channel	Vertical		Horizontal	
		EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
WCDMA 12.2K RMC (Band II)	Lowest	*27.75	0.5957	18.64	0.0731
	Middle	26.98	0.4989	15.94	0.0393
	Highest	24.80	0.3020	16.85	0.0484

Test Mode	Channel	Vertical		Horizontal	
		ERP(dBm)	ERP(W)	ERP(dBm)	ERP(W)
WCDMA 12.2K RMC (Band V)	Lowest	28.25	0.6683	22.92	0.1959
	Middle	*29.86	0.9683	25.44	0.3499
	Highest	27.79	0.6012	23.64	0.2312

7.3 OCCUPIED BANDWIDTH MEASUREMENT

Limits

For Reporting purpose only.

TEST PROCEDURES

KDB 971168 v02r02 - Section 4.2

1. The occupied bandwidth was measured with the spectrum analyzer at the lowest, middle and highest channels in each band and different modulation. The 99% and -26dB bandwidth was measured and recorded.
2. RBW = 1-5% of the expected OBW
3. VBW $\geq 3 \times$ RBW
4. Detector = Peak
5. Trace mode = max. hold

TEST RESULTS

No non-compliance noted

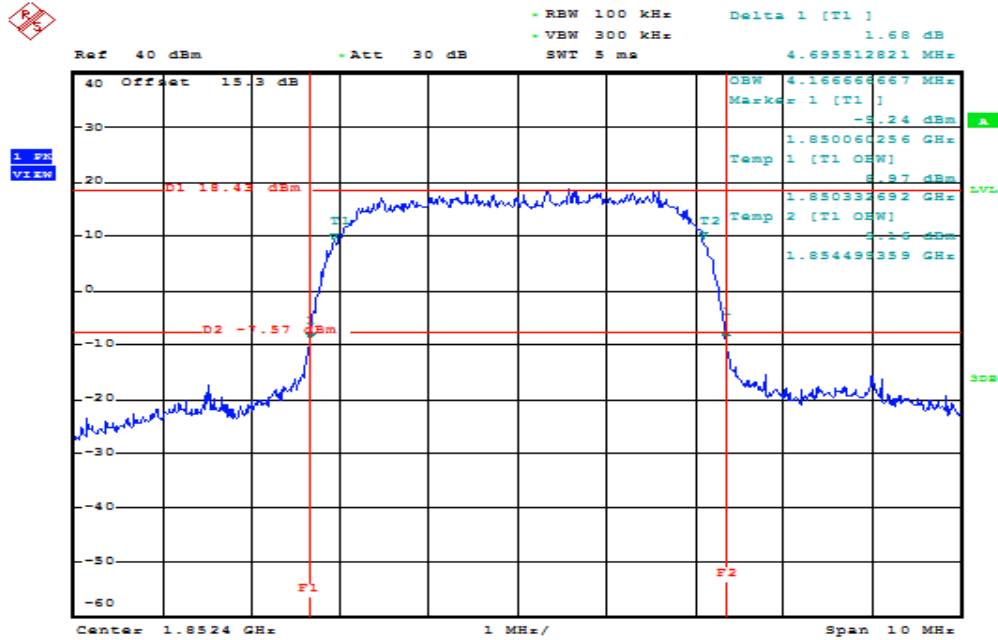
Test Data

Test Mode	CH	Frequency (MHz)	99% Bandwidth (MHz)	26 dB Bandwidth (MHz)
WCDMA 12.2k RMC (Band II)	Lowest	1852.4	4.1666	4.6955
	Middle	1880.0	*4.1826	4.6794
	Highest	1907.6	4.1666	4.6794
WCDMA 12.2k RMC (Band V)	Lowest	826.4	*4.1666	4.6794
	Middle	836.4	4.1666	4.6634
	Highest	846.6	4.1666	4.6794

Test Plot

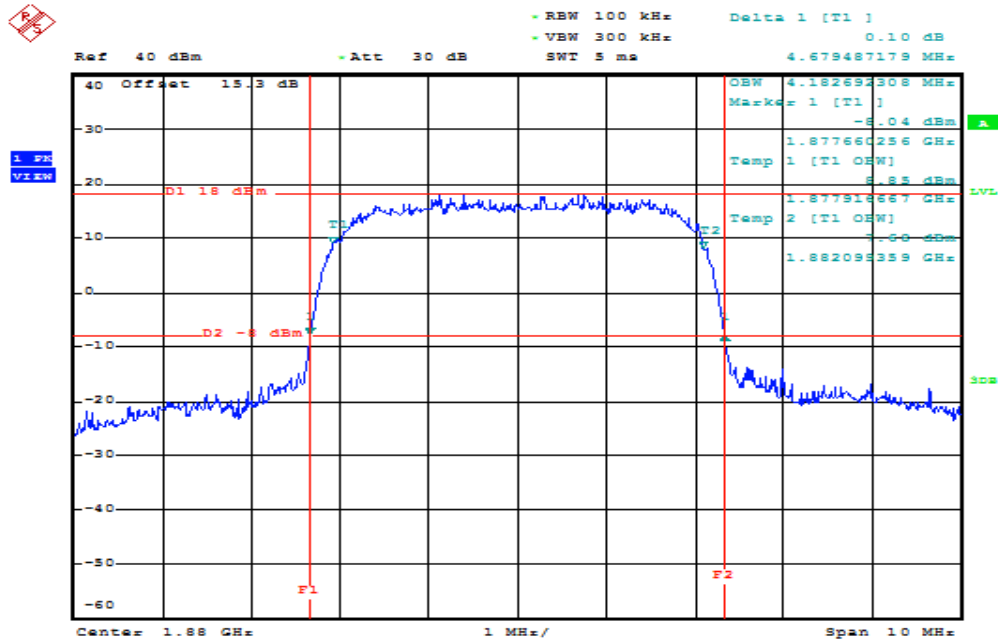
WCDMA 12.2k RMC (Band II)

Low CH



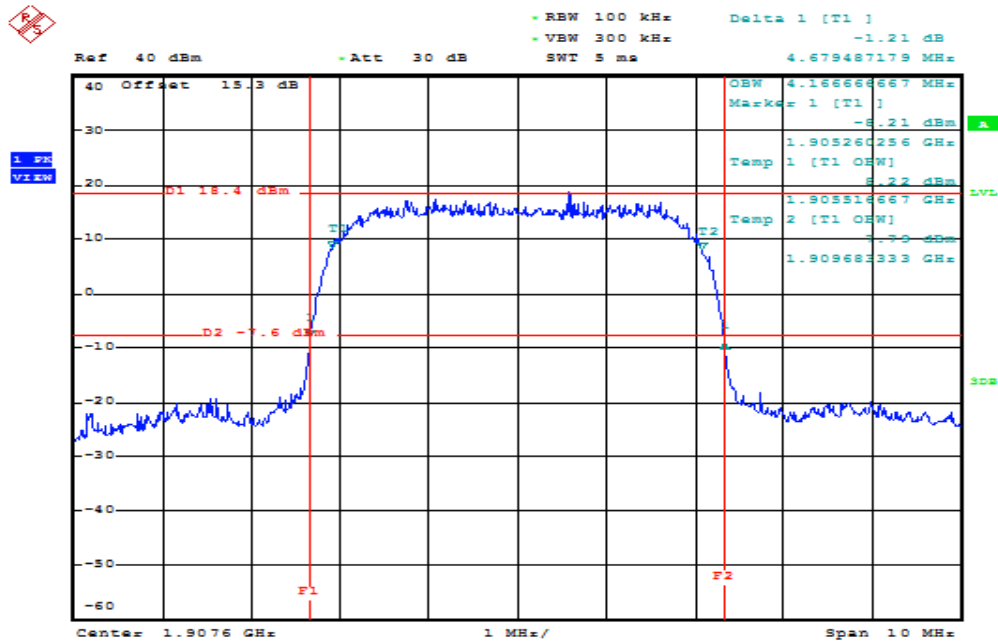
Date: 29.MAR.2017 18:21:02

Mid CH



Date: 29.MAR.2017 18:23:57

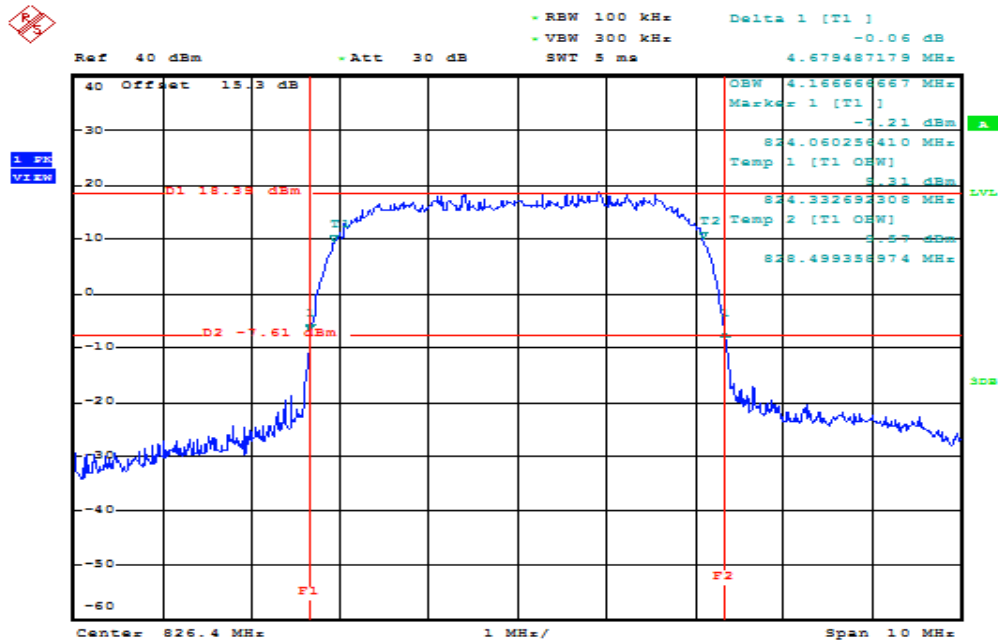
High CH



Date: 29.MAR.2017 18:26:02

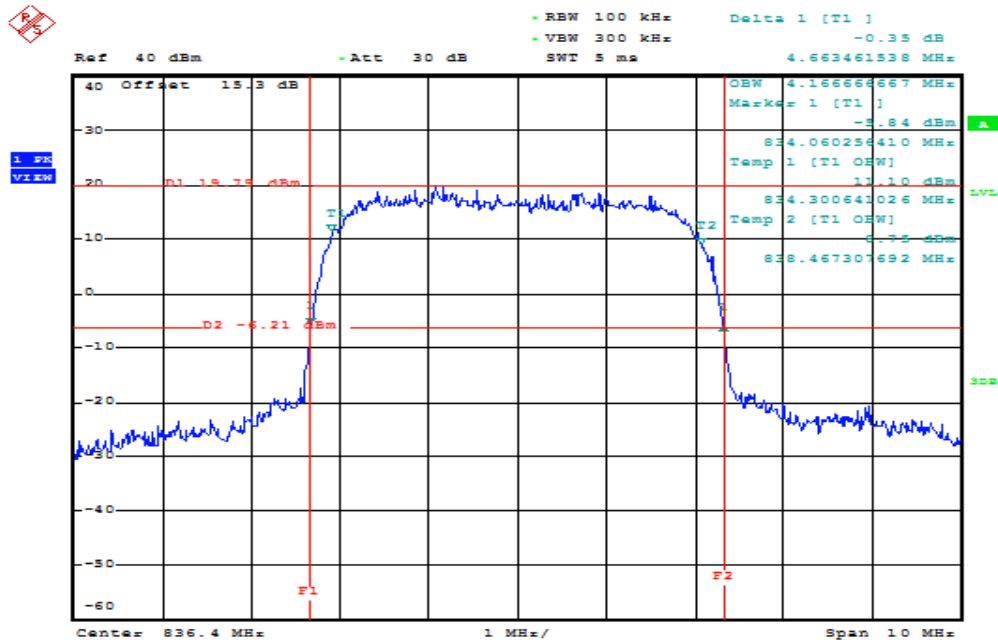
WCDMA 12.2k RMC (Band V)

Low CH



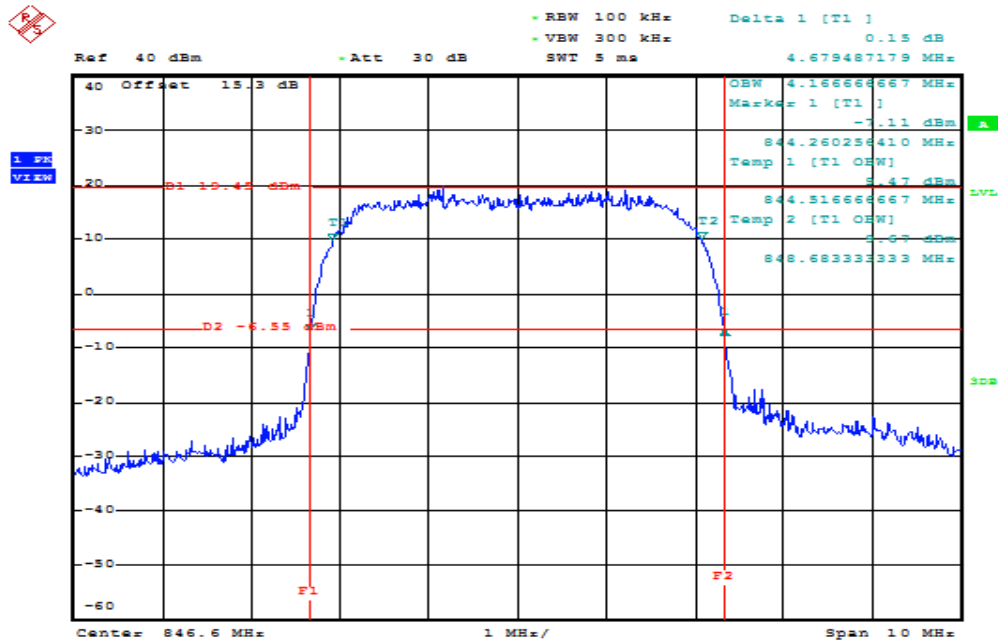
Date: 29.MAR.2017 18:35:44

Mid CH



Date: 29.MAR.2017 18:37:42

High CH



Date: 29.MAR.2017 18:39:26

7.4 PEAK TO AVERAGE POWER RATIO

Limit

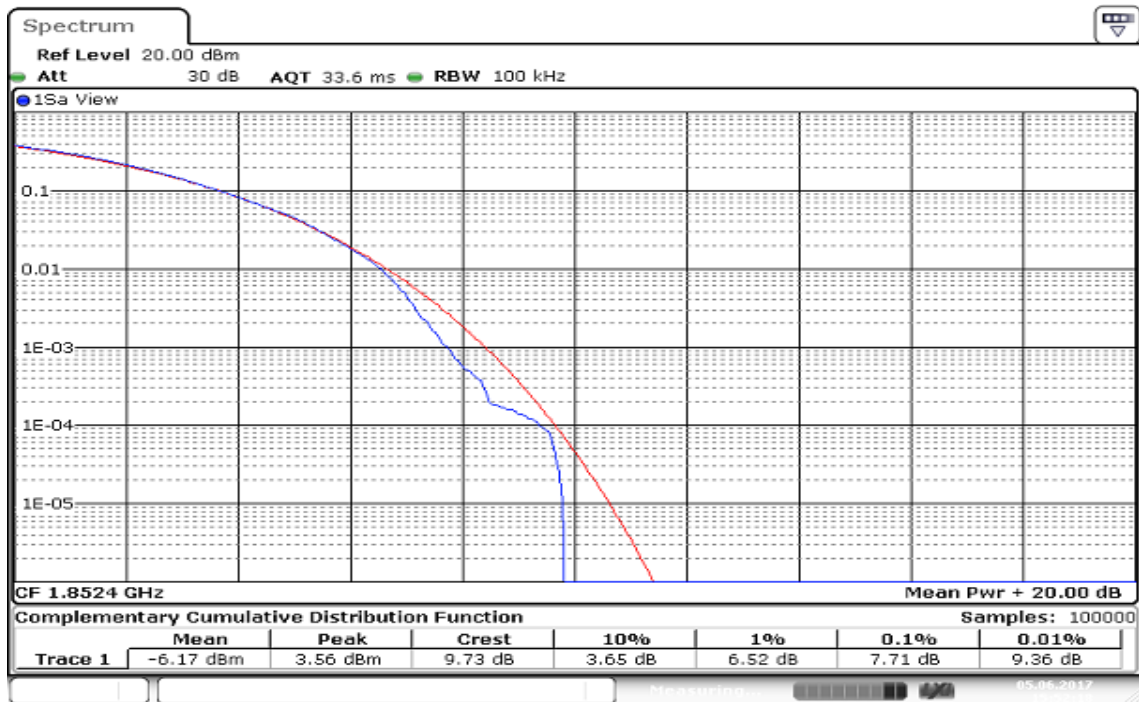
In measuring transmissions in this band using an average power technique, peak-to-average power ratio (PAPR) of the transmission may not exceed 13 dB.

Test Procedures

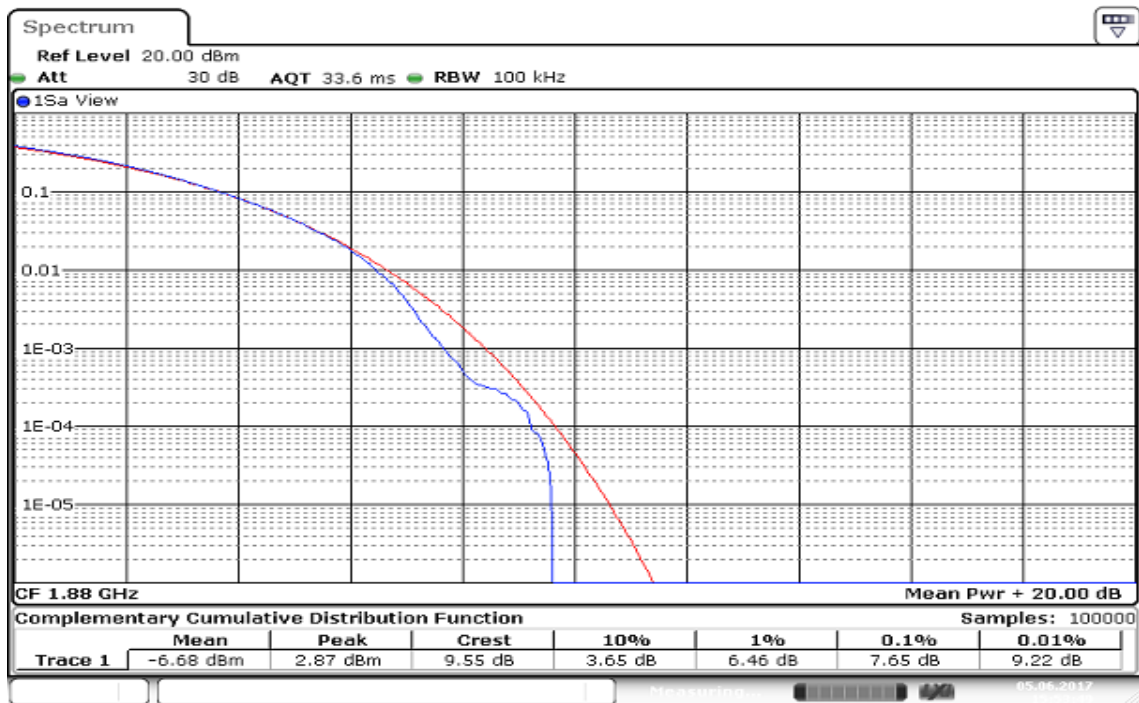
1. According to KDB 971168 D01, section. 5.7.1
2. The EUT was connect to spectrum analyzer and call box.
3. Set the CCDF function in spectrum analyzer.
4. The highest RF output power were measured and recorded the maximum PAPR level associated with a probability of 0.1%.
5. Record the Peak to Average Power Ratio.

WCDMA 12.2k RMC (Band II)

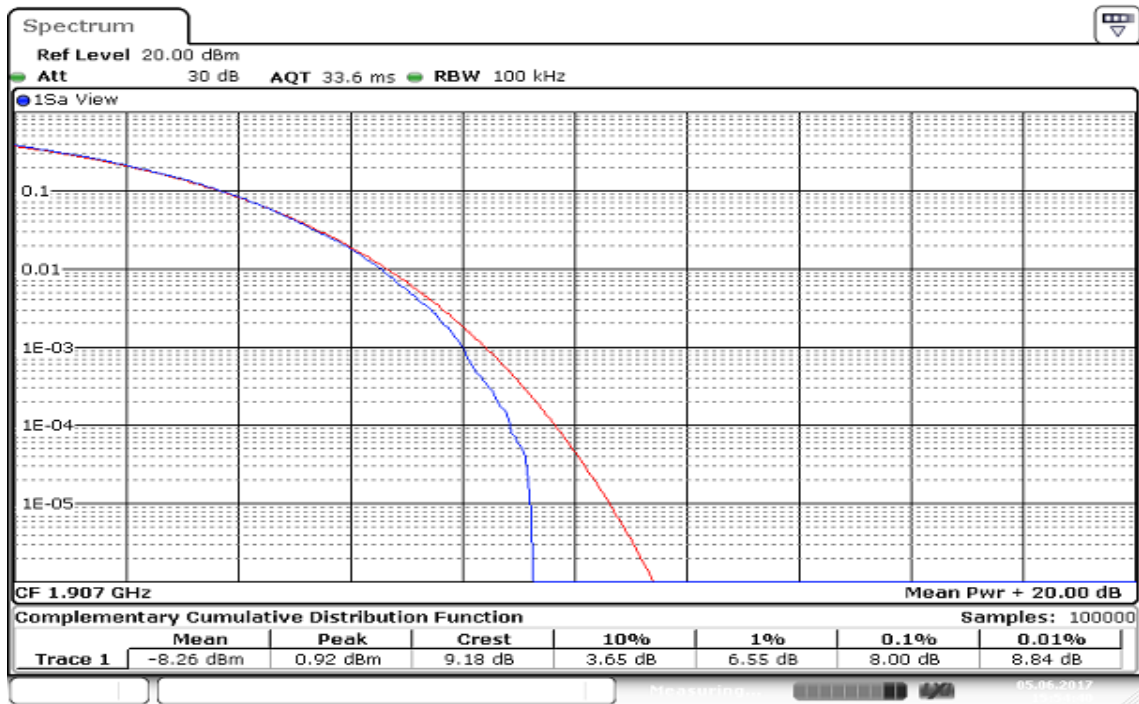
Low CH



Mid CH



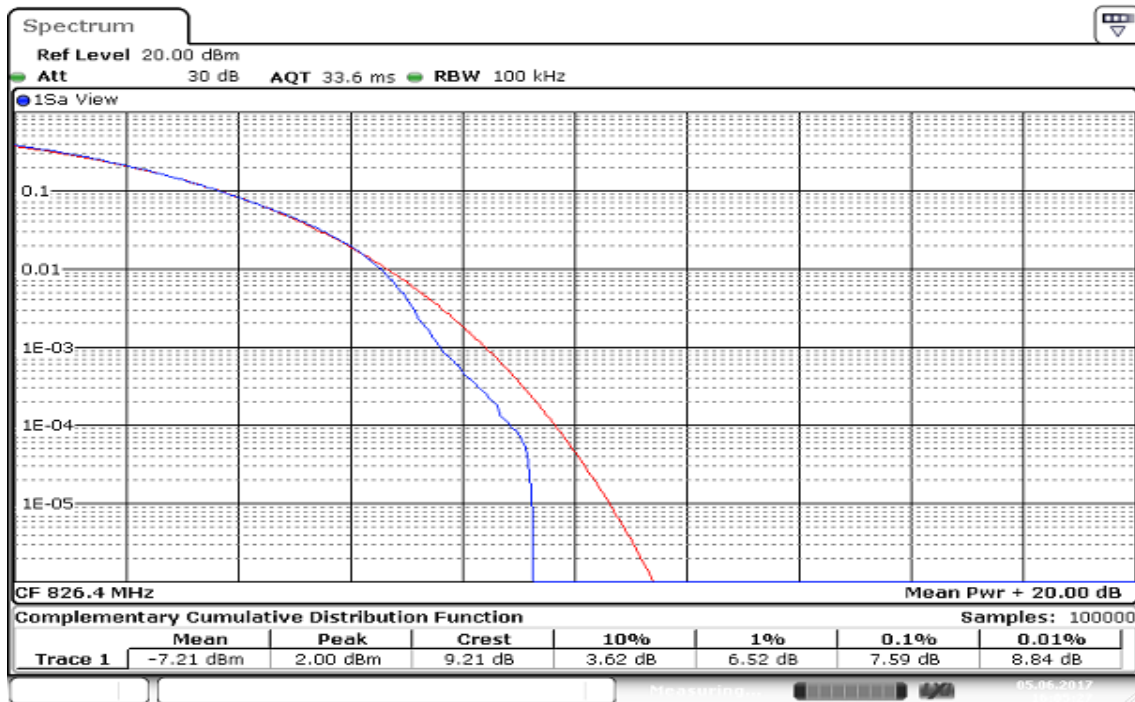
High CH



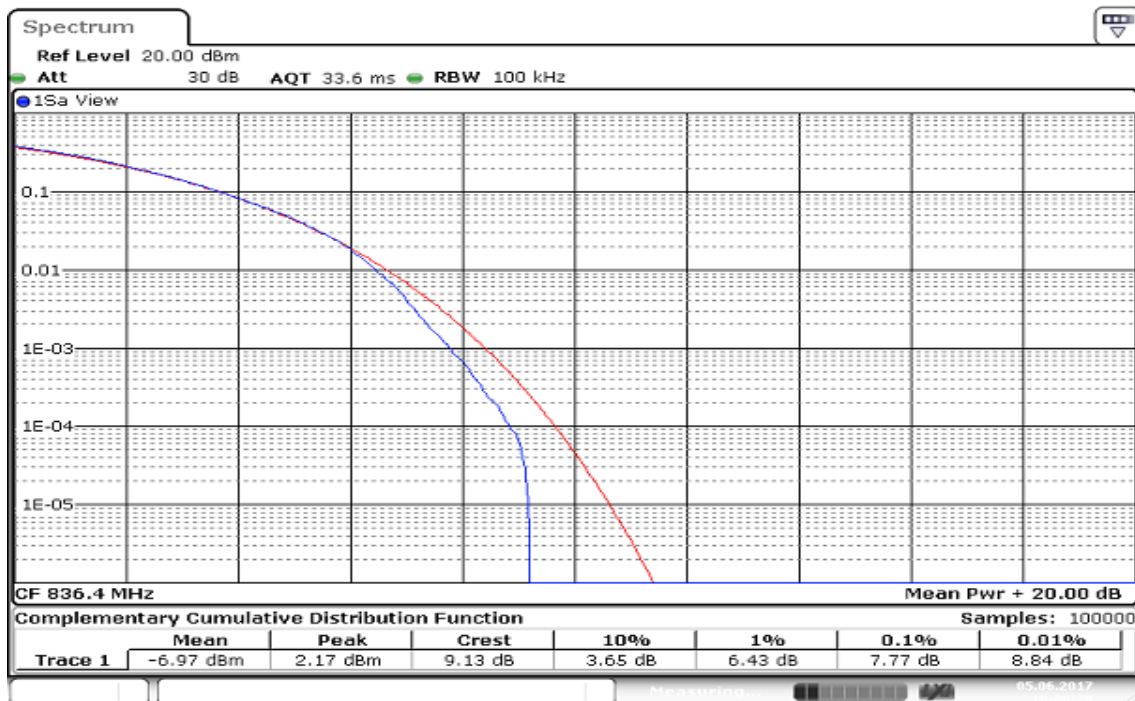
Date: 5 JUN 2017 15:54:39

WCDMA 12.2k RMC (Band V)

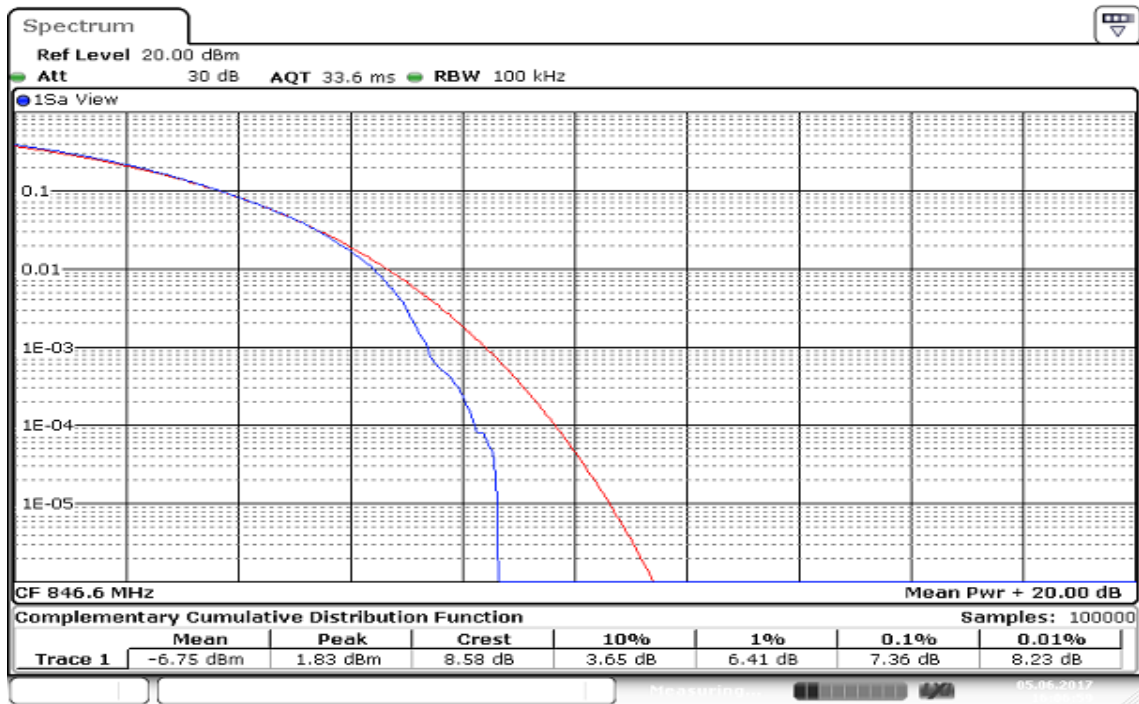
Low CH



Mid CH



High CH



Date: 5 JUN 2017 16:06:59

7.5 CONDUCTED BAND EDGE MEASUREMENT

Limit

FCC §22.917(a), Band 5

For operations in the 824-849 MHz band, out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

FCC §24.238(a), Band 2

For operations in the 1850-1910 and 1930-1950 MHz band, out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

RSS-132 section 5.5 and RSS-133 section 6.5

In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands specified in Section 5.1, the power of emissions per any 1% of the occupied bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10} p$ (watts).

TEST PROCEDURE

According to KDB 971168 D01, section 6.0

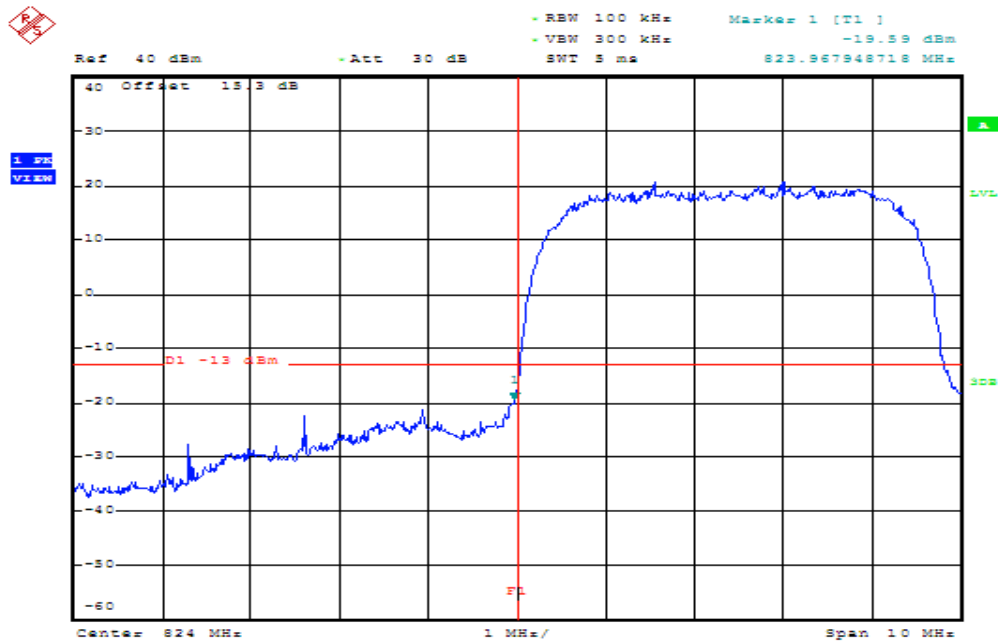
1. The EUT was connected to spectrum analyzer and call box.
2. The RF output of EUT was connected to the spectrum analyzer.
3. Start and stop frequency were set such that the band edge would be placed in the center of the plot
4. Span was set large enough so as to capture all out of band emissions near the band edge
5. Set the spectrum analyzer, RBW=100kHz, VBW=300kHz.
6. Record the Band edge emission.

TEST RESULTS

No non-compliance noted.

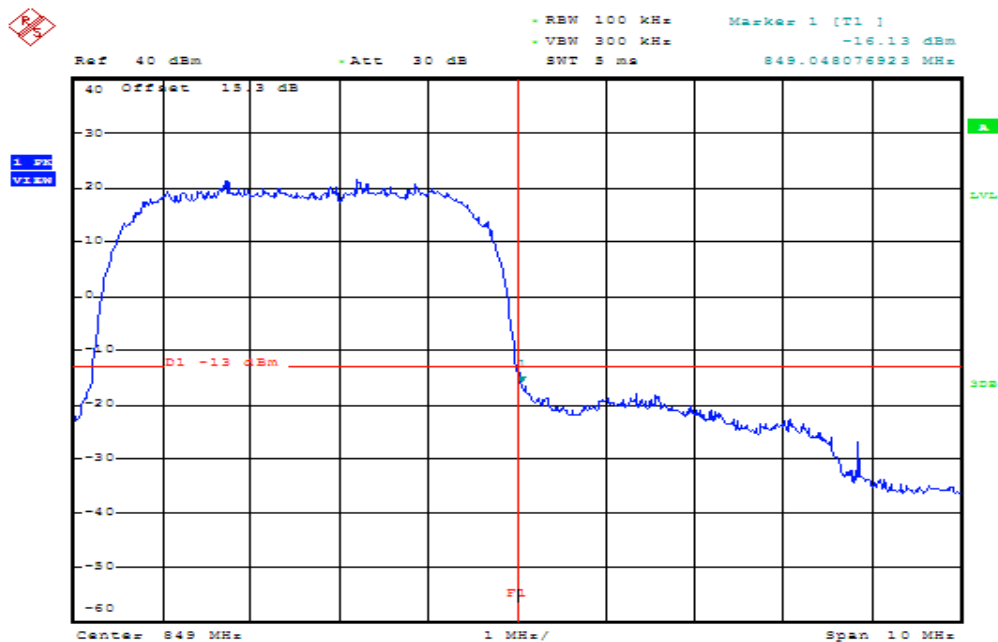
WCDMA 12.2k RMC (Band V)

Low CH



Date: 1.MAR.2017 14:10:49

High CH



Date: 1.MAR.2017 14:18:52

7.6 CONDUCTED SPURIOUS EMISSIONS

Limit

FCC §22.917(a), Band 5

For operations in the 824-849 MHz band, out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

FCC §24.238(a), Band 2

For operations in the 1850-1910 and 1930-1950 MHz band, out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

RSS-132 section 5.5 and RSS-133 section 6.5

In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands specified in Section 5.1, the power of emissions per any 1% of the occupied bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10} p$ (watts).

Test Procedures

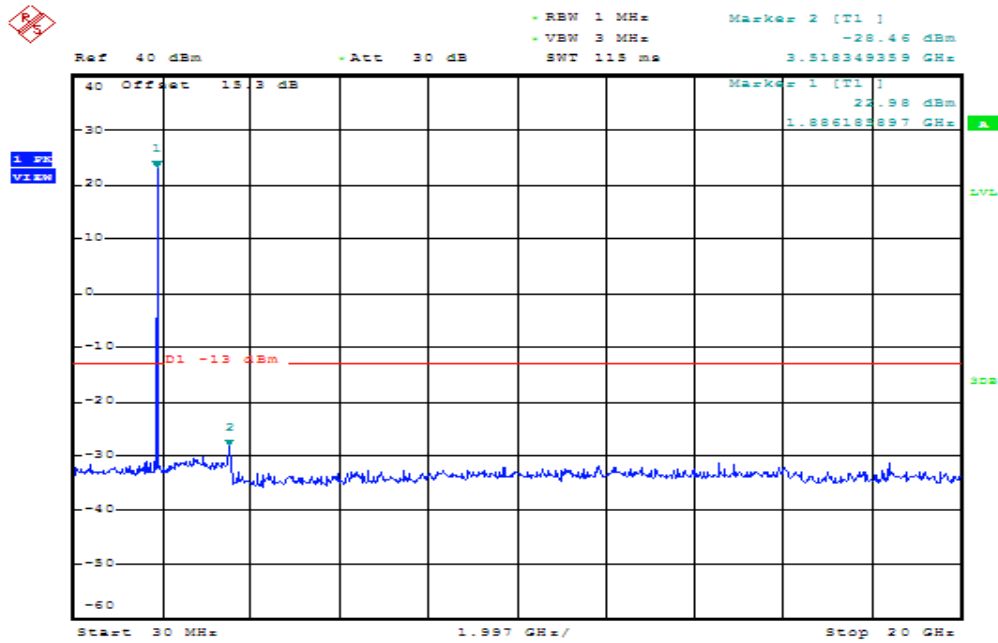
According to KDB 971168 D01, section 6.0

1. The EUT was connected to spectrum analyzer and call box.
2. The RF output of EUT was connected to the spectrum analyzer.
3. Set the spectrum analyzer, RBW=1MHz, VBW=3MHz.
4. Record the maximum spurious emission.
5. The fundamental frequency should be excluded against the limit in operating band.

TEST RESULTS

No non-compliance noted

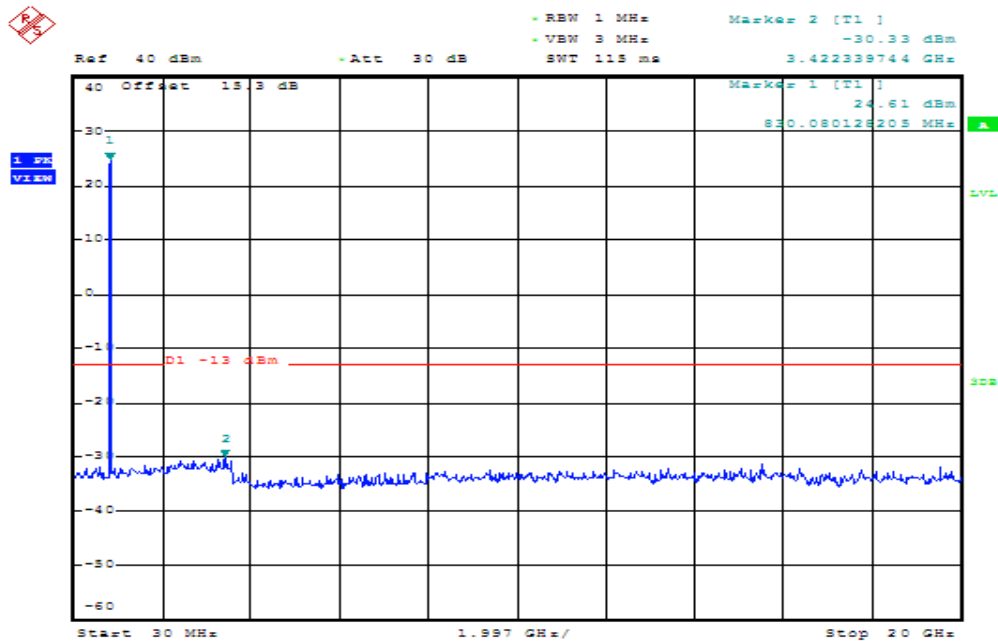
High CH



Date: 1.MAR.2017 13:50:35

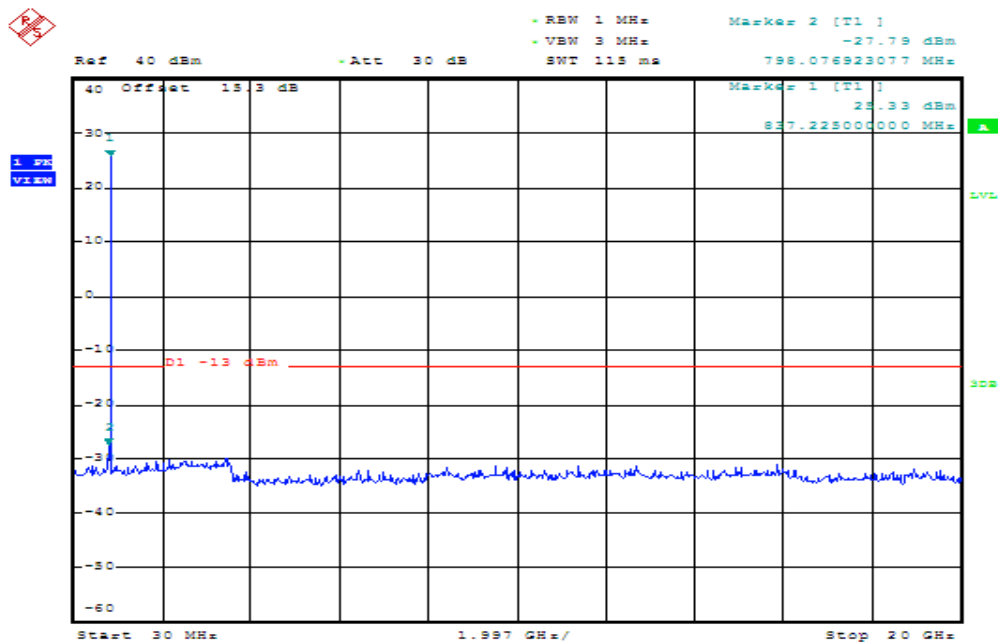
WCDMA 12.2k RMC (Band V)

Low CH



Date: 1.MAR.2017 14:11:47

Mid CH



Date: 1.MAR.2017 14:14:26

7.7 SPURIOUS RADIATION MEASUREMENT

Limit

FCC §22.917(a), Band 5

For operations in the 824-849 MHz band, out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

FCC §24.238(a), Band 2

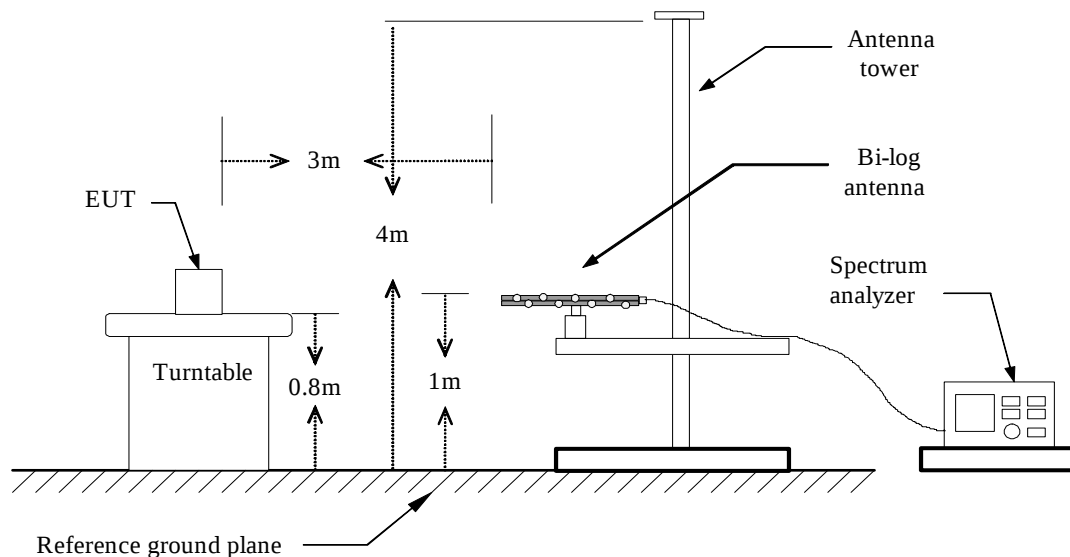
For operations in the 1850-1910 and 1930-1950 MHz band, out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

RSS-132 section 5.5 and RSS-133 section 6.5

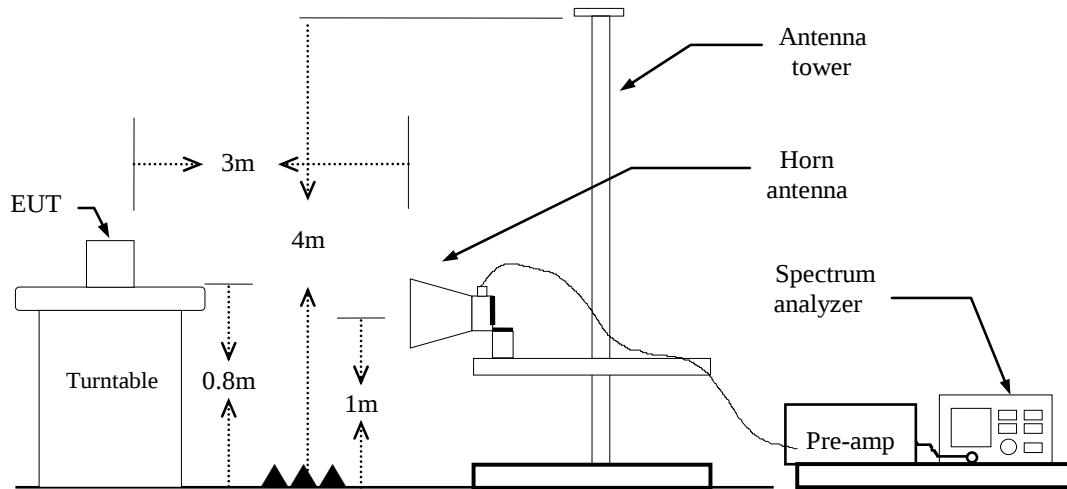
In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands specified in Section 5.1, the power of emissions per any 1% of the occupied bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10} p$ (watts).

Test Configuration

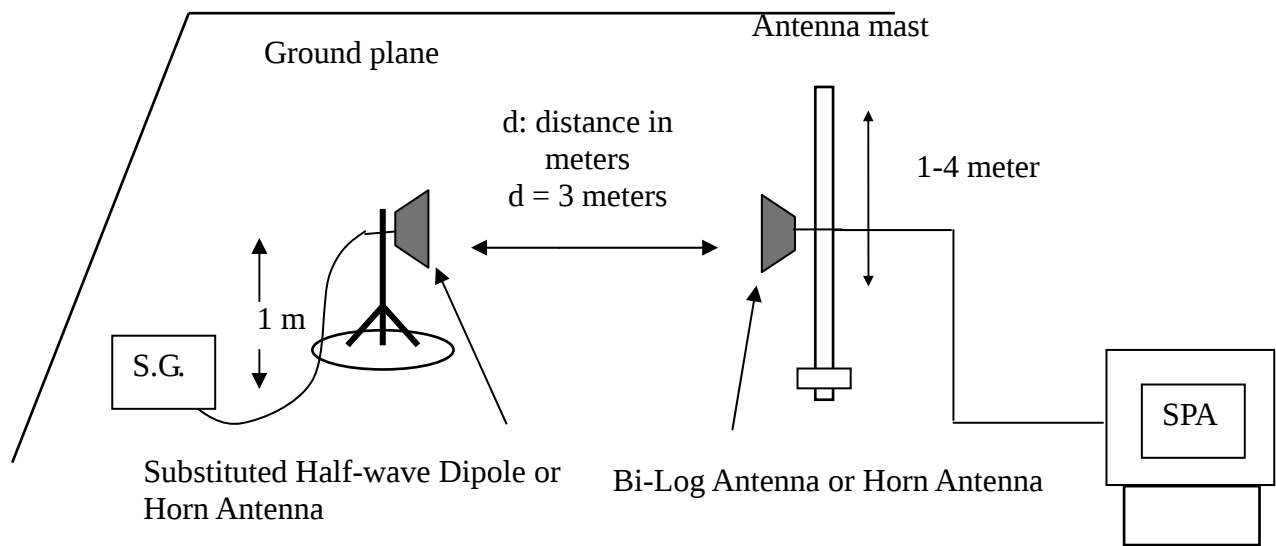
Below 1 GHz



Above 1 GHz



Substituted Method Test Set-up



TEST PROCEDURE

1. According to KDB 971168 D01. section 5.8 and TIA-603-D:2010 section 2.2.12.
2. The EUT was placed on a turntable
 - (1) Below 1G : 0.8m
 - (2) Above 1G : 0.8m
 - (3) EUT set 3m from the receiving antenna
 - (4) The table was rotated 360 degrees of the highest spurious emission to determine the position.
3. Set the spectrum analyzer , RBW=1MHz, VBW=3MHz.
4. A horn antenna was driven by a signal generator.
5. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission

ERP = S.G. output (dBm) + Antenna Gain (dBd) – Cable (dB)

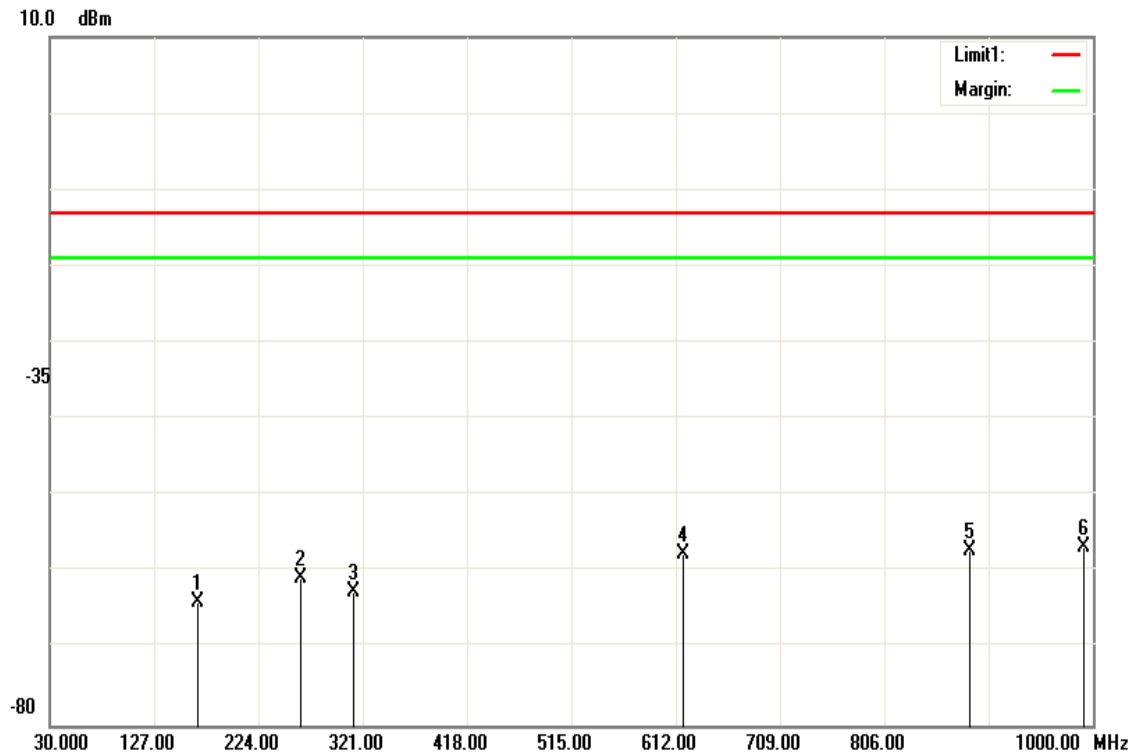
EIRP = S.G. output (dBm) + Antenna Gain (dBi) – Cable (dB)

TEST RESULTS

Refer to the attached tabular data sheets.

Radiated Spurious Emission Measurement Result / Below 1GHz

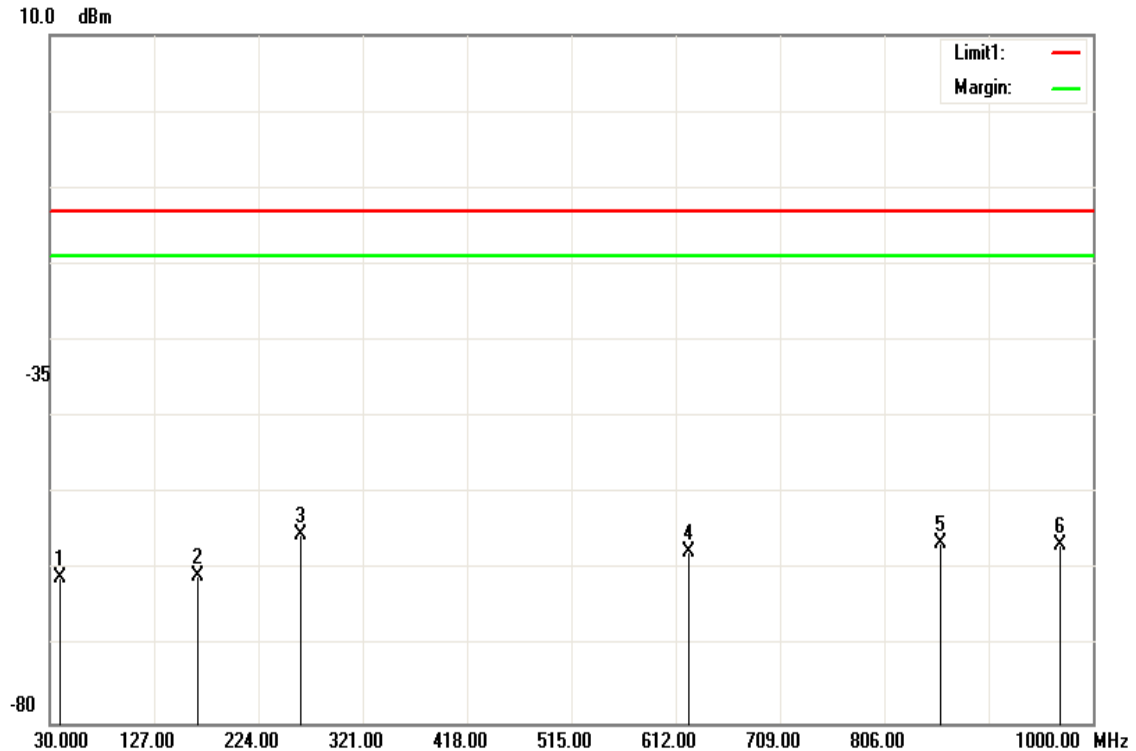
Operation Mode: WCDMA 12.2k RMC
 Band II / TX /Mid CH **Test Date:** March 6, 2017
Temperature: 22.6°C **Tested by:** Timmy Wang
Humidity: 57.2 % RH **Polarity:** Ver.



Frequency (MHz)	S.G. (dBm)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
167.7400	-65.09	1.22	-63.87	-13.00	-50.87	V
263.7700	-68.02	7.26	-60.76	-13.00	-47.76	V
312.2700	-69.44	6.95	-62.49	-13.00	-49.49	V
618.7900	-57.04	-0.5	-57.54	-13.00	-44.54	V
885.5400	-58.52	1.37	-57.15	-13.00	-44.15	V
991.2700	-62.39	5.68	-56.71	-13.00	-43.71	V

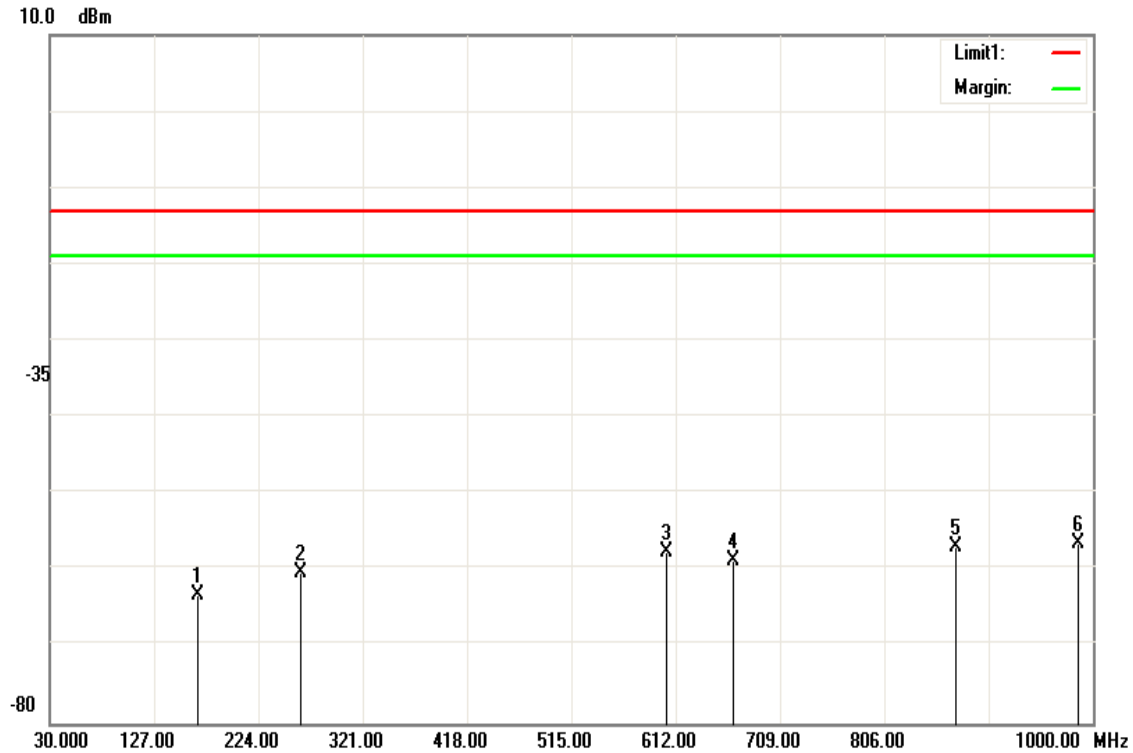
Operation Mode: WCDMA 12.2k RMC
Band II / TX /Mid CH
Temperature: 22.6°C
Humidity: 57.2 % RH

Test Date: March 6, 2017
Tested by: Timmy Wang
Polarity: Hor.



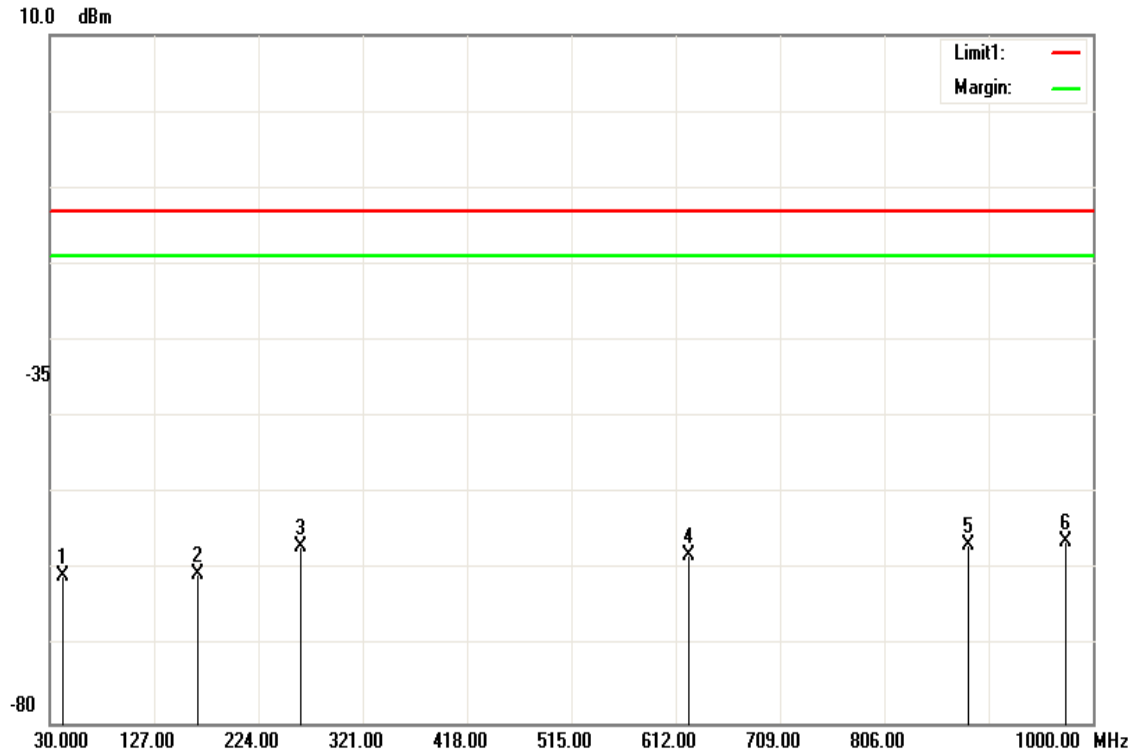
Frequency (MHz)	S.G. (dBm)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
39.7000	-55.14	-5.91	-61.05	-13.00	-48.05	H
167.7400	-62.02	1.22	-60.80	-13.00	-47.80	H
263.7700	-62.72	7.26	-55.46	-13.00	-42.46	H
624.6100	-57.36	-0.17	-57.53	-13.00	-44.53	H
858.3800	-57.68	1.22	-56.46	-13.00	-43.46	H
969.9300	-60.03	3.42	-56.61	-13.00	-43.61	H

Operation Mode: WCDMA 12.2k RMC
Band V / TX /Mid CH
Test Date: March 6, 2017
Temperature: 22.6°C
Tested by: Timmy Wang
Humidity: 57.2 % RH
Polarity: Ver.



Frequency (MHz)	S.G. (dBm)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
167.7400	-64.43	1.22	-63.21	-13.00	-50.21	V
263.7700	-67.68	7.26	-60.42	-13.00	-47.42	V
603.2700	-56.17	-1.39	-57.56	-13.00	-44.56	V
665.3500	-60.24	1.52	-58.72	-13.00	-45.72	V
872.9300	-58.34	1.3	-57.04	-13.00	-44.04	V
986.4200	-61.6	5.16	-56.44	-13.00	-43.44	V

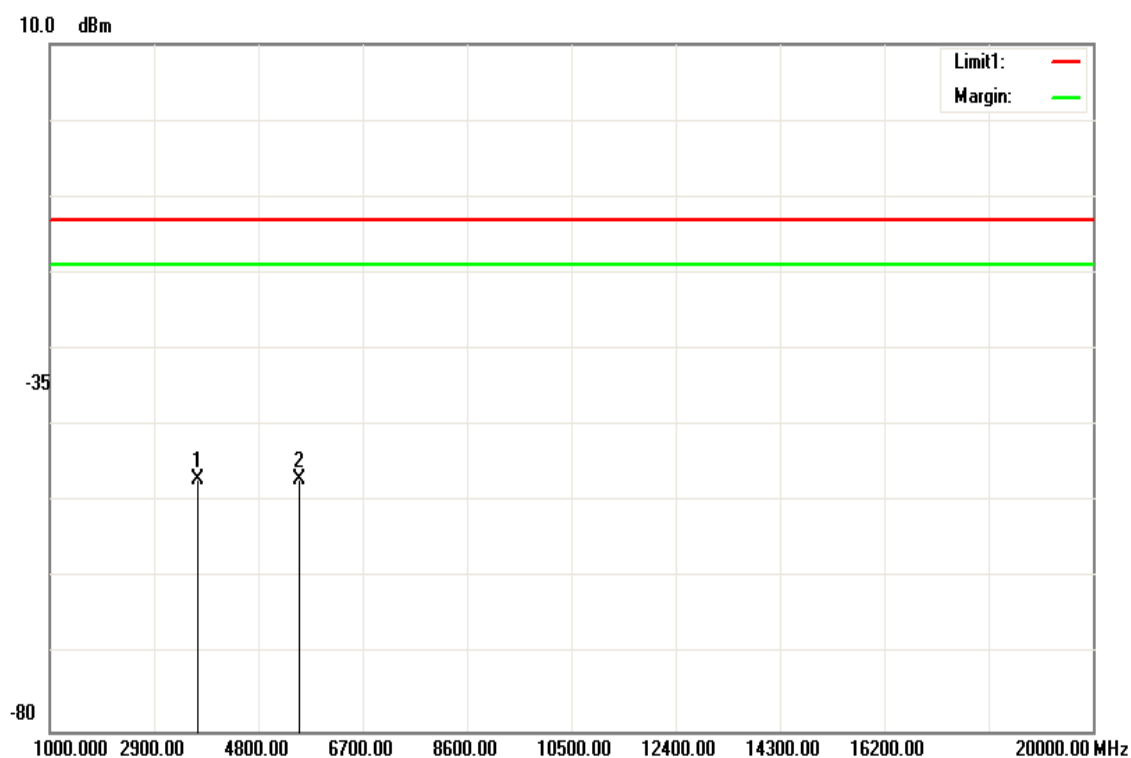
Operation Mode: WCDMA 12.2k RMC
Band V / TX /Mid CH
Test Date: March 6, 2017
Temperature: 22.6°C
Tested by: Timmy Wang
Humidity: 57.2 % RH
Polarity: Hor.



Frequency (MHz)	S.G. (dBm)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
41.6400	-55.44	-5.43	-60.87	-13.00	-47.87	H
167.7400	-61.79	1.22	-60.57	-13.00	-47.57	H
263.7700	-64.14	7.26	-56.88	-13.00	-43.88	H
624.6100	-57.91	-0.17	-58.08	-13.00	-45.08	H
884.5700	-58.15	1.36	-56.79	-13.00	-43.79	H
974.7800	-60.3	3.93	-56.37	-13.00	-43.37	H

Above 1GHz

Operation Mode: WCDMA 12.2k RMC
 Band II / TX / Low CH
 Test Date: March 6, 2017
Temperature: 22.6°C
 Tested by: Timmy Wang
Humidity: 57.2 % RH
 Polarity: Ver.

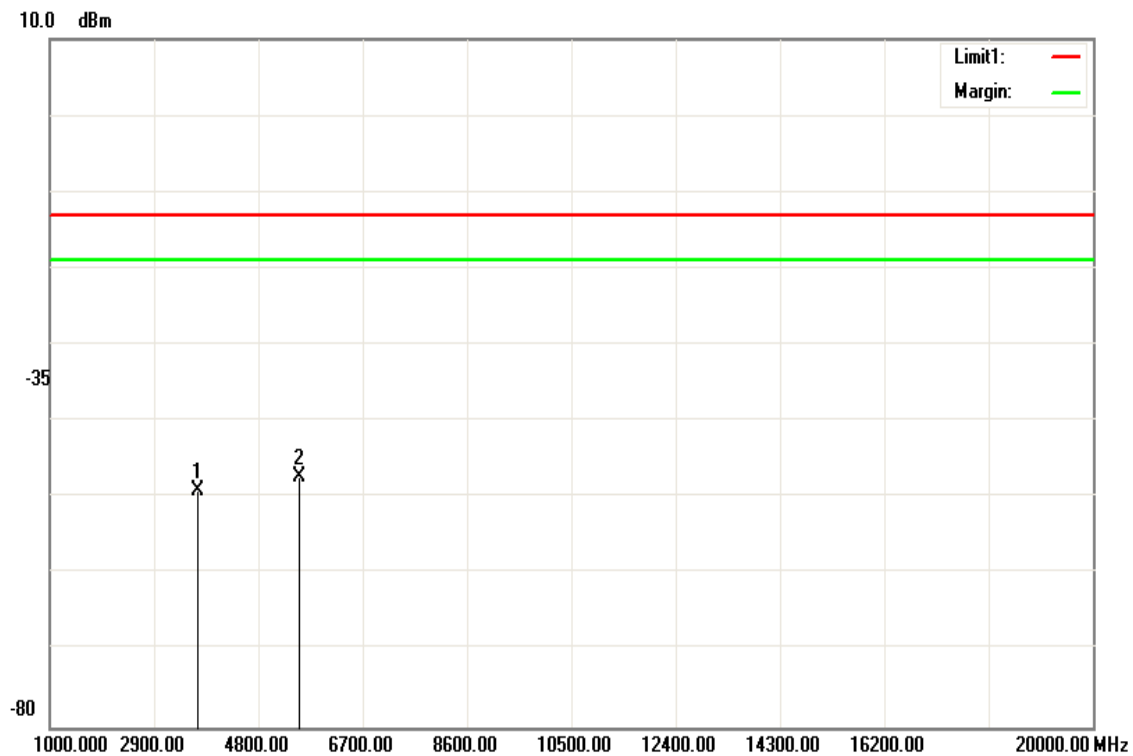


Frequency (MHz)	S.G. (dBm)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
3704.000	-59.58	12.54	-47.04	-13.00	-34.04	V
5557.000	-59.82	12.88	-46.94	-13.00	-33.94	V
N/A						

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Operation Mode: WCDMA 12.2k RMC
 Band II / TX / Low CH **Test Date:** March 6, 2017
Temperature: 22.6°C **Tested by:** Timmy Wang
Humidity: 57.2 % RH **Polarity:** Hor.

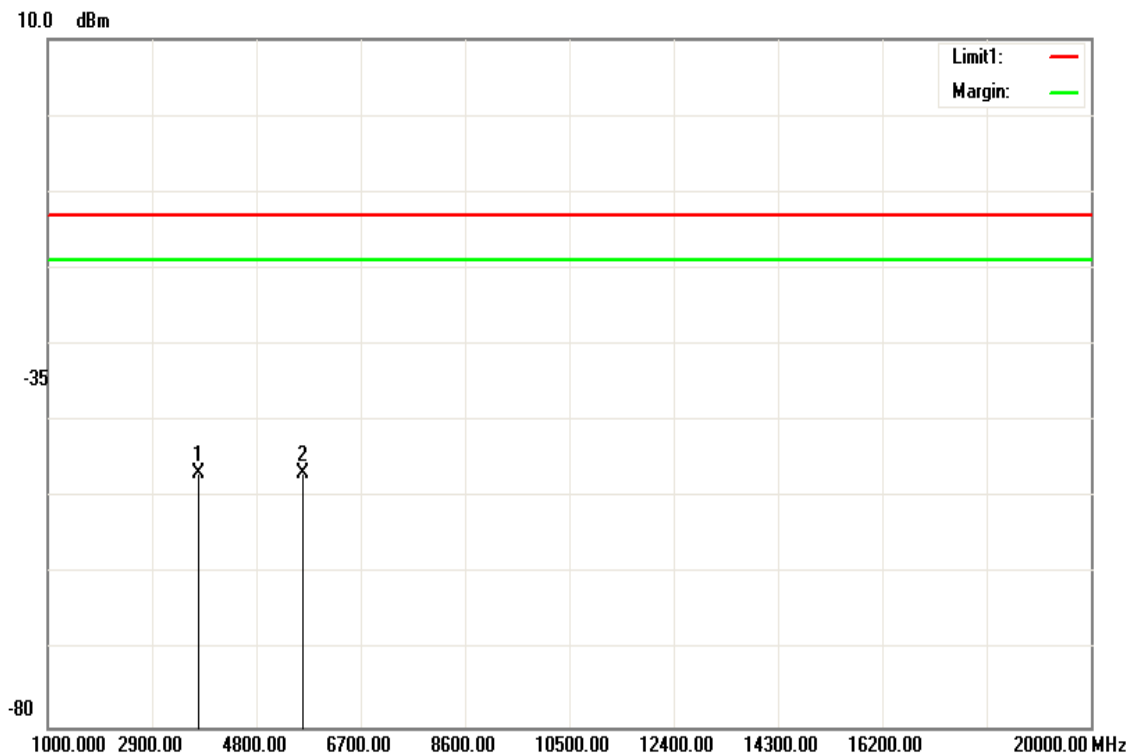


Frequency (MHz)	S.G. (dBm)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
3704.000	-61.56	12.54	-49.02	-13.00	-36.02	H
5557.000	-60.17	12.88	-47.29	-13.00	-34.29	H
N/A						

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Operation Mode: WCDMA 12.2k RMC
 Band II / TX / Mid CH **Test Date:** March 6, 2017
Temperature: 22.6°C **Tested by:** Timmy Wang
Humidity: 57.2 % RH **Polarity:** Ver.

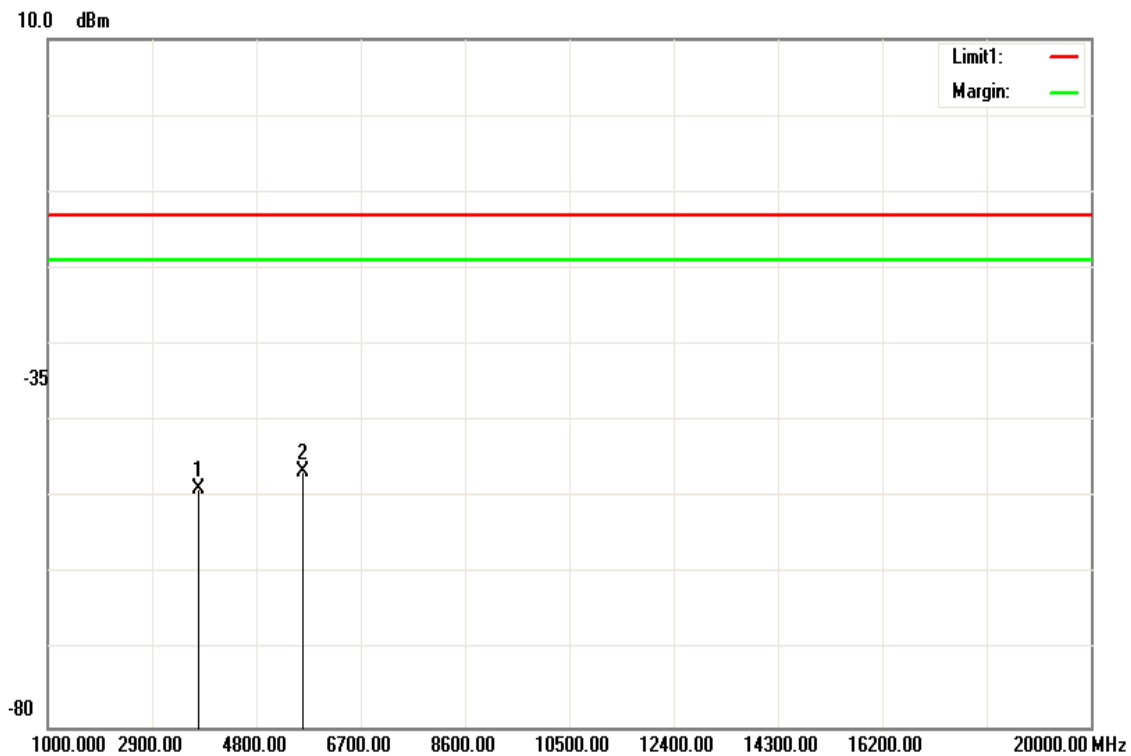


Frequency (MHz)	S.G. (dBm)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
3760.000	-59.43	12.55	-46.88	-13.00	-33.88	V
5640.000	-59.7	12.84	-46.86	-13.00	-33.86	V
N/A						

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Operation Mode: WCDMA 12.2k RMC
 Band II / TX / Mid CH **Test Date:** March 6, 2017
Temperature: 22.6°C **Tested by:** Timmy Wang
Humidity: 57.2 % RH **Polarity:** Hor.

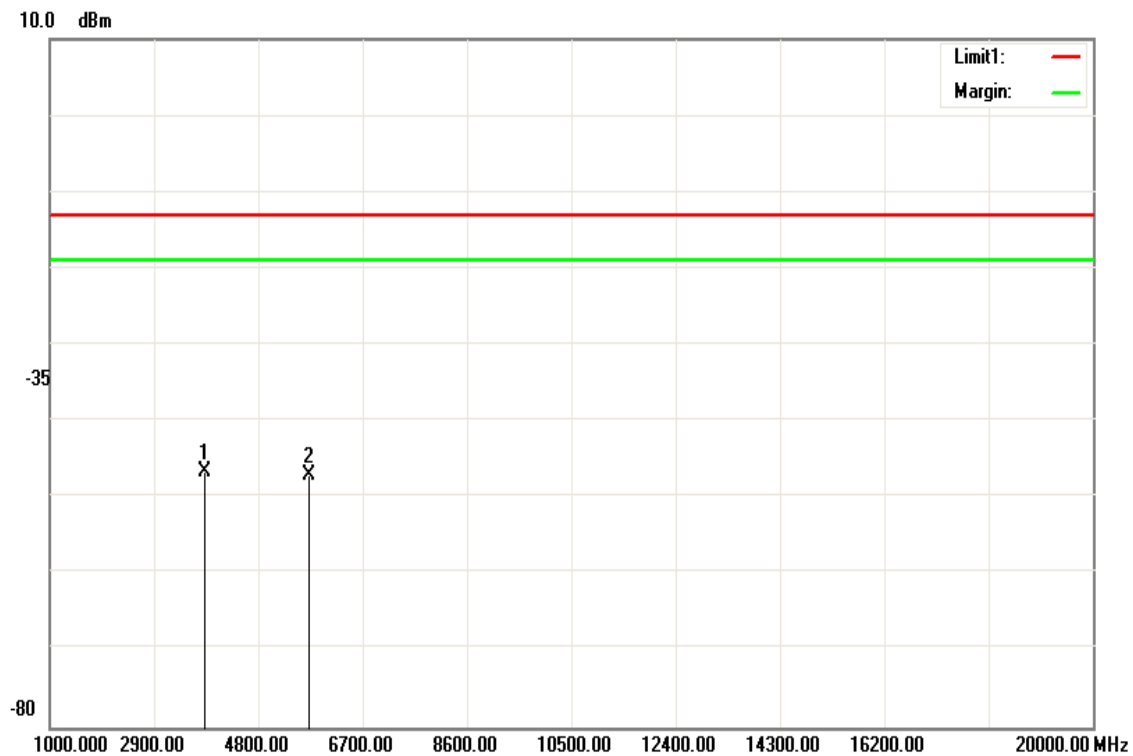


Frequency (MHz)	S.G. (dBm)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
3760.000	-61.28	12.55	-48.73	-13.00	-35.73	H
5640.000	-59.41	12.84	-46.57	-13.00	-33.57	H
N/A						

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Operation Mode: WCDMA 12.2k RMC
 Band II / TX / High CH **Test Date:** March 6, 2017
Temperature: 22.6°C **Tested by:** Timmy Wang
Humidity: 57.2 % RH **Polarity:** Ver.

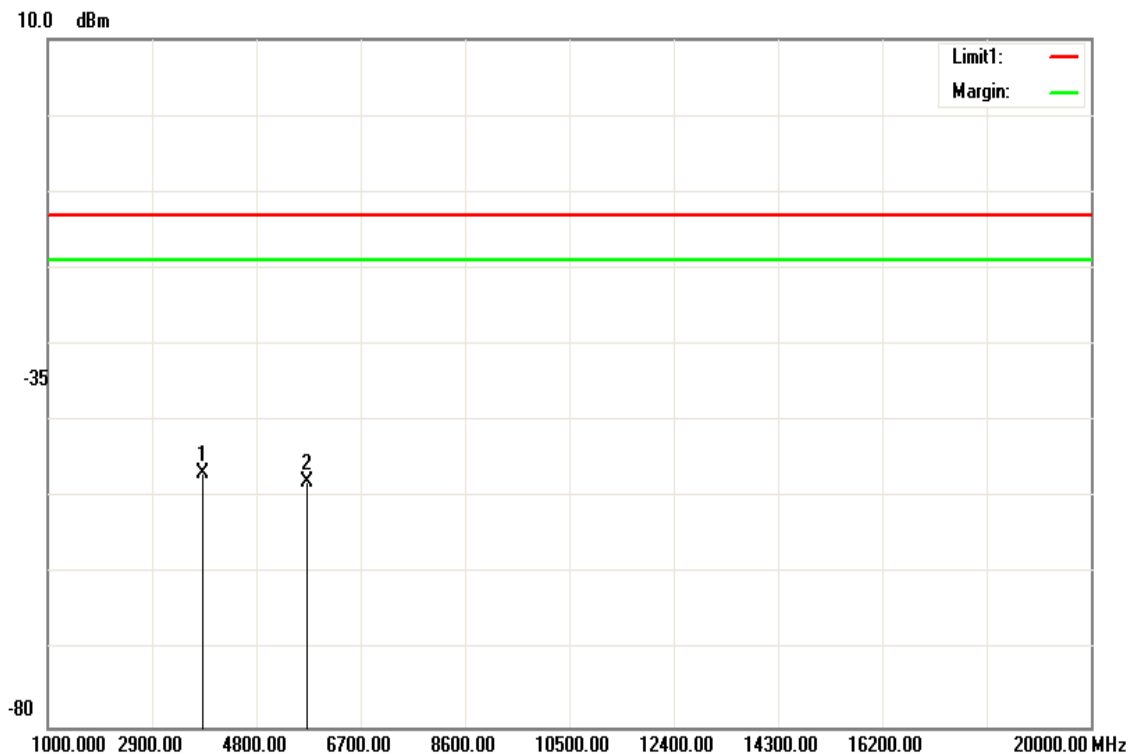


Frequency (MHz)	S.G. (dBm)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
3814.000	-59.15	12.56	-46.59	-13.00	-33.59	V
5721.000	-59.78	12.81	-46.97	-13.00	-33.97	V
N/A						

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Operation Mode: WCDMA 12.2k RMC
 Band II / TX / High CH **Test Date:** March 6, 2017
Temperature: 22.6°C **Tested by:** Timmy Wang
Humidity: 57.2 % RH **Polarity:** Hor.

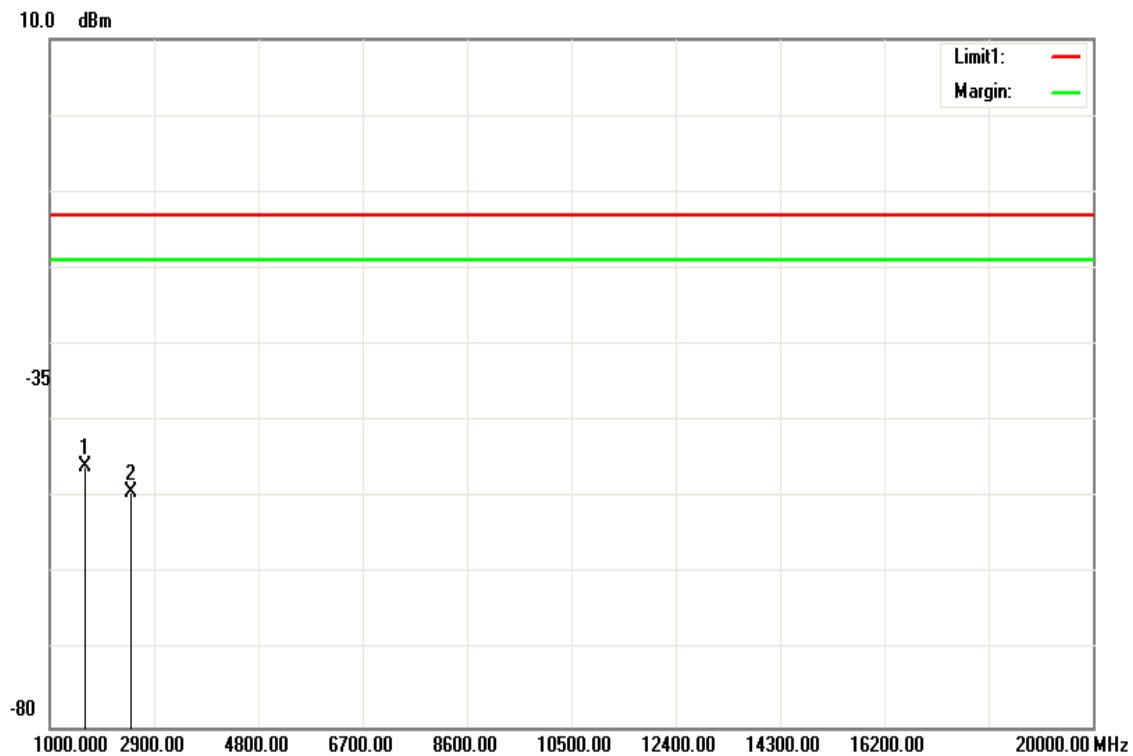


Frequency (MHz)	S.G. (dBm)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
3814.000	-59.28	12.56	-46.72	-13.00	-33.72	H
5721.000	-60.7	12.81	-47.89	-13.00	-34.89	H
N/A						

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Operation Mode: WCDMA 12.2k RMC
 Band V / TX / Low CH **Test Date:** March 6, 2017
Temperature: 22.6°C **Tested by:** Timmy Wang
Humidity: 57.2 % RH **Polarity:** Ver.

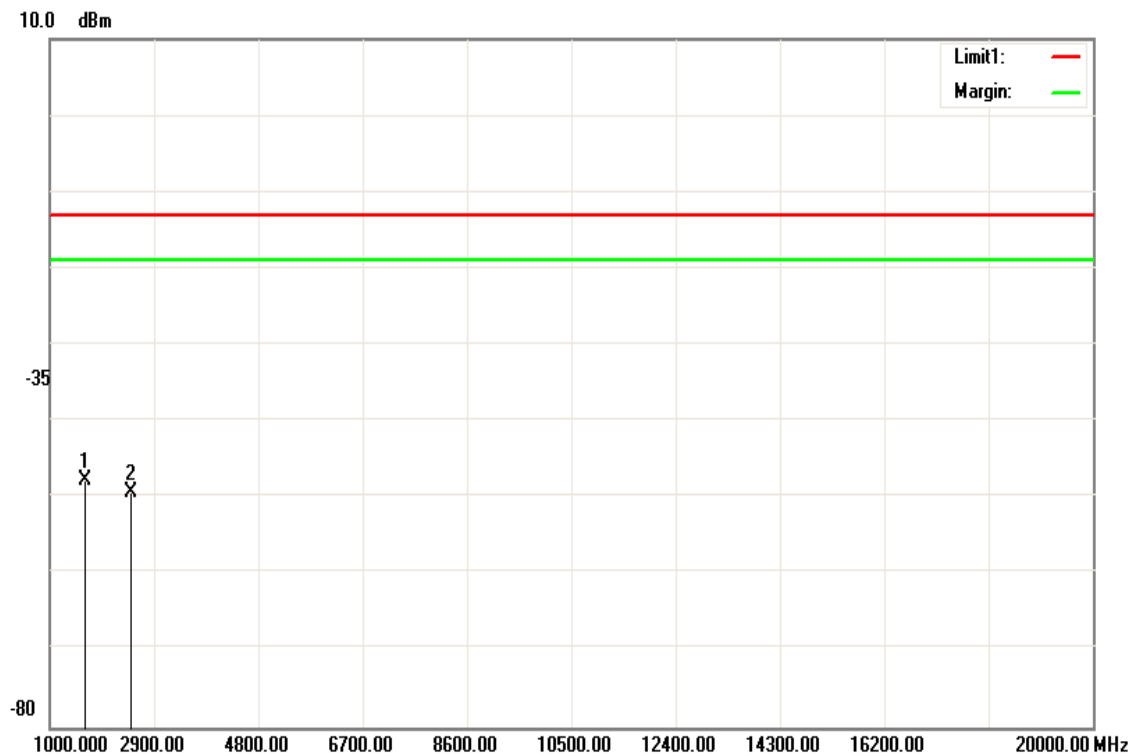


Frequency (MHz)	S.G. (dBm)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
1652.000	-47.44	1.52	-45.92	-13.00	-32.92	V
2479.000	-51.15	1.83	-49.32	-13.00	-36.32	V
N/A						

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Operation Mode: WCDMA 12.2k RMC
 Band V / TX / Low CH **Test Date:** March 6, 2017
Temperature: 22.6°C **Tested by:** Timmy Wang
Humidity: 57.2 % RH **Polarity:** Hor.

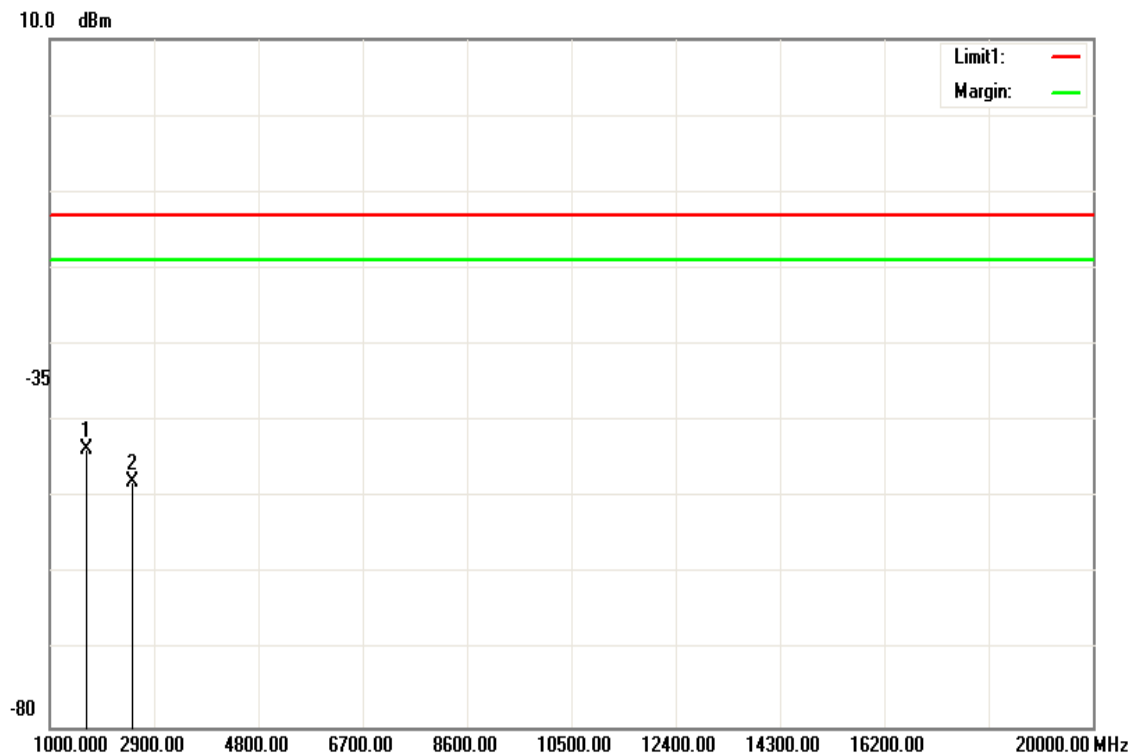


Frequency (MHz)	S.G. (dBm)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
1652.000	-49.19	1.52	-47.67	-13.00	-34.67	H
2479.000	-51.1	1.83	-49.27	-13.00	-36.27	H
N/A						

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Operation Mode: WCDMA 12.2k RMC
 Band V / TX / Mid CH **Test Date:** March 6, 2017
Temperature: 22.6°C **Tested by:** Timmy Wang
Humidity: 57.2 % RH **Polarity:** Ver.

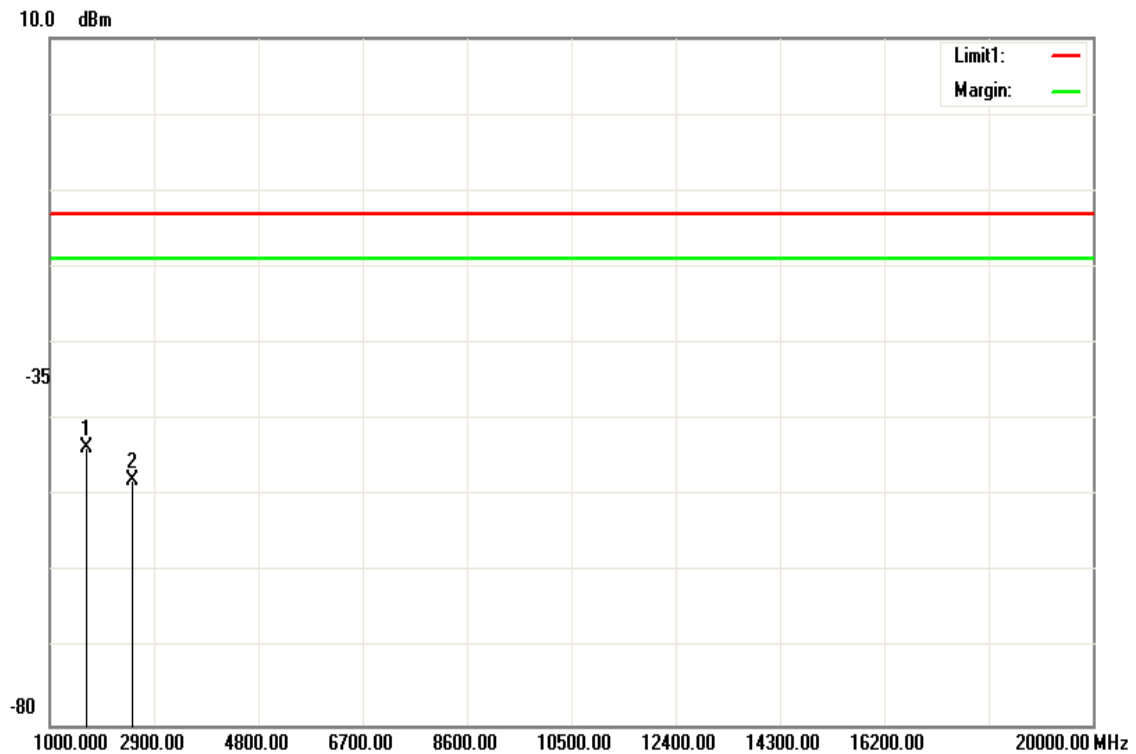


Frequency (MHz)	S.G. (dBm)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
1672.000	-44.38	1.52	-42.86	-13.00	-39.45	V
2509.000	-49.94	2.02	-47.92	-13.00	-34.92	V
N/A						

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Operation Mode: WCDMA 12.2k RMC
 Band V / TX / Mid CH 4182
Test Date: March 6, 2017
Temperature: 22.6°C
Tested by: Timmy Wang
Humidity: 57.2 % RH
Polarity: Hor.

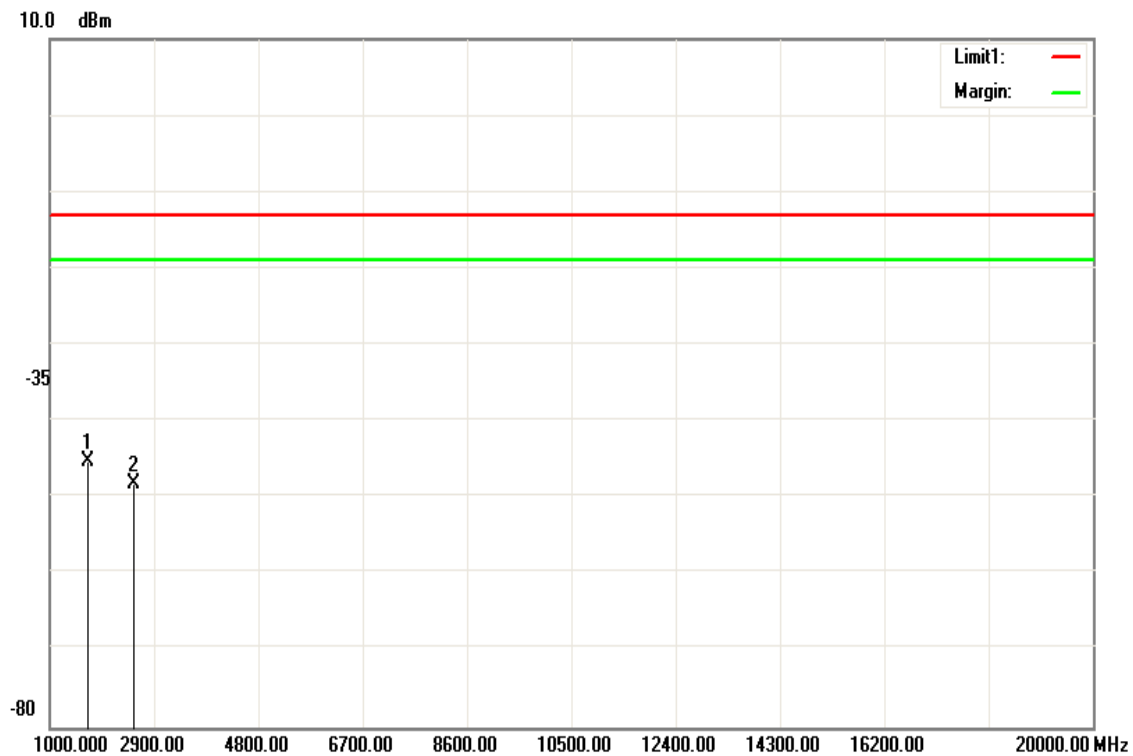


Frequency (MHz)	S.G. (dBm)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
1672.000	-45.23	1.52	-43.71	-13.00	-30.71	H
2509.000	-49.94	2.02	-47.92	-13.00	-34.92	H
N/A						

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Operation Mode: WCDMA 12.2k RMC
 Band V / TX /High CH **Test Date:** March 6, 2017
Temperature: 22.6°C **Tested by:** Timmy Wang
Humidity: 57.2 % RH **Polarity:** Ver.

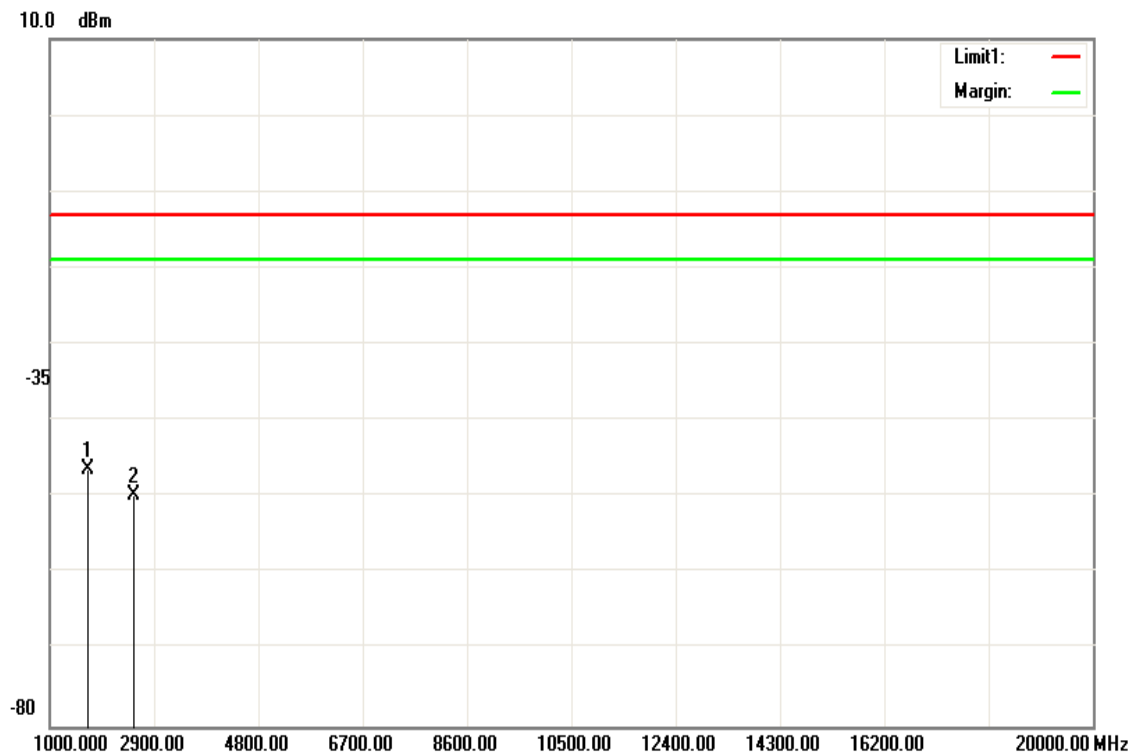


Frequency (MHz)	S.G. (dBm)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
1693.000	-46.74	1.51	-45.23	-13.00	-32.23	V
2539.000	-50.74	2.58	-48.16	-13.00	-35.16	V
N/A						

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

Operation Mode: WCDMA 12.2k RMC
 Band V / TX /High CH **Test Date:** March 6, 2017
Temperature: 22.6°C **Tested by:** Timmy Wang
Humidity: 57.2 % RH **Polarity:** Hor.



Frequency (MHz)	S.G. (dBm)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
1693.000	-47.88	1.51	-46.37	-13.00	-33.37	H
2539.000	-52.32	2.58	-49.74	-13.00	-36.74	H
N/A						

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.

7.8 FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT

LIMIT

According to FCC §2.1055, FCC §22.355, .FCC §24.235.

RSS-132 section 5.3 and RSS-133 section 6.3

The carrier frequency shall not depart from the reference frequency in excess of ± 2.5 ppm.

Test Procedure

Use Anritsu 8820 with frequency Error measurement capability.

Temp = -30 to +50°C , Voltage= 85% to 115% of the nominal value for AC powered equipment. Frequency Tolerance: 2.5 ppm

NOTE: *The frequency error was recorded frequency error from the communication simulator.*

TEST RESULTS*No non-compliance noted.*

Reference Frequency: WCDMA 12.2k RMC Band II Mid Channel 1880 MHz at 20(°C)				
Limit: 2.5 ppm = 4700 Hz				
Power Supply (Vac)	Environment Temperature (°C)	BW: 20M Frequency Error(Hz)	Frequency Error (ppm)	Limit (ppm)
120	50	-7.00	-0.0037	+/- 2.5
120	40	-8.00	-0.0043	
120	30	-8.00	-0.0043	
120	20	-7.00	-0.0037	
120	10	-6.00	-0.0032	
120	0	-5.00	-0.0027	
120	-10	-5.00	-0.0027	
120	-20	-2.00	-0.0011	

Reference Frequency: WCDMA 12.2k RMC Band V Mid Channel 836.6 MHz at 20(°C)				
Limit: 2.5 ppm = 2091.5 Hz				
Power Supply (Vac)	Environment Temperature (°C)	BW: 20M Frequency Error(Hz)	Frequency Error (ppm)	Limit (ppm)
120	50	0.00	0.0000	+/- 2.5
120	40	1.00	0.0012	
120	30	0.00	0.0000	
120	20	1.00	0.0012	
120	10	0.00	0.0000	
120	0	1.00	0.0012	
120	-10	0.00	0.0000	
120	-20	3.00	0.0036	

FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT:

Reference Frequency: WCDMA 12.2k RMC Band II Mid Channel 1880 MHz at 20(°C)				
Limit: 2.5 ppm = 4700Hz				
Power Supply (Vac)	Environment Temperature (°C)	BW: 20M Frequency Error(Hz)	Frequency Error (ppm)	Limit (ppm)
102	20	-7.00	-0.0037	+/- 2.5
120		-7.00	-0.0037	
138		-6.00	-0.0032	

Reference Frequency: WCDMA 12.2k RMC Band V Mid Channel 836.6 MHz at 20(°C)				
Limit: 2.5 ppm = 2091.25Hz				
Power Supply (Vac)	Environment Temperature (°C)	BW: 20M Frequency Error(Hz)	Frequency Error (ppm)	Limit (ppm)
102	20	0.00	0.0000	+/- 2.5
120		1.00	0.0012	
138		0.00	0.0000	