



FCC ID: M82-AIM8IEM
Report No.: T181123D04-RP3

ISED No: 9404A-AIM8IEM

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**FCC 47 CFR PART 27 SUBPART L
&
INDUSTRY CANADA RSS-139**

Computer

FCC Model No.: AIM8IEM; AIM8IEMxxxxxxxxxxxxxxxx (where "x" may be any alphanumeric character, "-" or blank for marketing purpose and no impact safety related critical components and constructions)

IC Model No: AIM8IEM

Trade Name: ADVANTECH

Issued to

**Advantech Co.Ltd.
No.1, Alley 20, Lane 26, Rueiguang Road, Neihu District, Taipei 114,
Taiwan, R.O.C.**

Issued by

**Compliance Certification Services Inc.
Wugu Laboratory
No.11, Wugong 6th Rd., Wugu Dist.,
New Taipei City 24891, Taiwan. (R.O.C.)
Issued Date: January 3, 2019**

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.
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Revision History

Rev.		Issue Date		Revisions	Effect Page	Revised By
00		January 3, 2019		Initial Issue	ALL	Allison Chen



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1 TEST RESULT CERTIFICATION

Applicant: Advantech Co.Ltd.
No.1, Alley 20, Lane 26, Rueiguang Road, Neihu District,
Taipei 114, Taiwan, R.O.C.

Manufacturer: Advantech Co.Ltd.
No.1, Alley 20, Lane 26, Rueiguang Road, Neihu District,
Taipei 114, Taiwan, R.O.C.

Equipment Under Test: Computer

Trade Name: ADVANTECH

FCC Model No.: AIM8IEM; AIM8IEMxxxxxxxxxxxxxxxx (where "x" may be any alphanumeric character, "-" or blank for marketing purpose and no impact safety related critical components and constructions)

IC Model No.: AIM8IEM

Date of Test: December 4 ~ 7, 2018

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR PART 27 SUBPART L & RSS-139 Issue 3 July 2015	No non-compliance noted

We hereby certify that:

The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in TIA-603-E and the energy emitted by the sample EUT tested as described in this report is in compliance with radiated emission limits of FCC Rule FCC PART 27 Subpart L.

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:



Jerry Chuang
Engineer
Compliance Certification Services Inc.



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2 EUT DESCRIPTION

Product	Computer
FCC Model No.	AIM8IEM; AIM8IEMxxxxxxxxxxxxxxxx (where "x" may be any alphanumeric character, "-" or blank for marketing purpose and no impact safety related critical components and constructions)
IC Model No.	AIM8IEM
Model Discrepancy	All the above models are identical except for the designation of model numbers. The suffix of (where "x" may be any alphanumeric character, "-" or blank for marketing purpose and no impact safety related critical components and constructions) on model number is just for marketing purpose only.
Trade Name	ADVANTECH
Received Date	November 23, 2018
Power Supply	1. VDC from Power Adapter Chicony / A16-018N1A I/P: 100-240Vac, 1A, 50-60Hz O/P: 5.15Vdc, 3A, 9.1Vdc, 2A, 18W 2. Battery ADVANTECH / AIM-BAT-8 Rating: 3.8V, 4900, 18.62Wh
Frequency Range	WCDMA / HSDPA / HSUPA Band IV: 1712.4-1752.6 MHz
Transmit Power (EIRP Power)	WCDMA 12.2k RMC Band IV: 26.04dBm
Antenna Gain	Dipole Antenna WCDMA band IV: 0.9dBi

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



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3 TEST SUMMARY

FCC Standard Section	IC Standard Section	Report Section	Test Item	Result
-	-	2	Antenna Requirement	Pass
2.1046	RSS-GEN 6.12	8.1	Average Power	Pass
27.50(d)	RSS-139 section 6.5	8.2	EIRP Measurement	Pass
2.1049	RSS-GEN 6.7	8.3	Occupied Bandwidth Measurement	Pass
27.53(h)	RSS-139 section 6.6	8.4	Conducted Band Edge	Pass
27.53(h)	RSS-139 section 6.5	8.5	Conducted Spurious Emission	Pass
27.50(a)	RSS-139 section 6.6	8.6	Peak to Average Ratio	Pass
27.53(h)	RSS-139 section 6.6	8.7	Spurious Radiation Measurement	Pass
2.1055, 27.54	RSS-139 section 6.4	8.8	Frequency Stability v.s. temperature measurement	Pass

4 TEST METHODOLOGY

Both conducted and radiated testing were performed according to the procedures document on TIA-603-E and FCC CFR 47, Part 27 Subpart L, KDB 971168 D01 Power Meas License Digital Systems.

Both conducted and radiated testing were performed according to the procedures document on ANSI C63.26: 2016 and RSS-139.

4.1 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.

4.2 DESCRIPTION OF TEST MODES

The EUT (model: AIM8IEM) had been tested under operating condition.

EUT staying in continuous transmitting mode was programmed.

After verification, all tests carried out are with the worst-case test modes as shown below except radiated spurious emission below 1GHz and power line conducted emissions below 30MHz, which worst case was in normal link mode and receiving radiated spurious emission above 1GHz, which worst case was in CH Mid mode only.

WCDMA Band IV:

Channel Low (CH1312), Channel Mid (CH1413) and Channel High (CH1513) were chosen for full testing.

HSDPA Band IV:

Channel Low (CH1312), Channel Mid (CH1413) and Channel High (CH1513) were chosen for full testing.

HSUPA Band IV:

Channel Low (CH1312), Channel Mid (CH1413) and Channel High (CH1513) were chosen for full testing.

4.3 THE WORST MODE OF MEASUREMENT

Radiated Emission Measurement	
Test Condition	Emission for Unwanted and Fundamental
Power supply Mode	Mode 1: EUT Power by Power Adapter Mode 2: EUT Power by battery.
Worst Mode	☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4
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. The EUT pre-scanned in three axis ,X,Y, Z and two polarity, Horizontal and Vertical for radiated measurement. The worst case (X-Plane) were recorded in this report.

5 INSTRUMENT CALIBRATION

5.1 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.

5.2 MEASUREMENT EQUIPMENT USED

Equipment Used for Emissions Measurement

Wugu fully Chamber					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Bilog Antenna	Sunol Sciences	JB1	A052609	03/14/2018	03/13/2019
Cable	HUBER SUHNER	SUCOFLEX 104PEA	23452	06/29/2018	06/28/2019
Cable	HUBER SUHNER	SUCOFLEX 104PEA	33960	06/29/2018	06/28/2019
Digital Radio Communication Tester	R&S	CMU200	116604	07/19/2018	07/18/2019
Digital Thermo-Hygro Meter	WISEWIND	1110	D06	02/08/2018	02/07/2019
Horn Antenna	SCHWARZBECK	BBHA 9120D	779	03/14/2018	03/13/2019
Pre-Amplifier	Anritsu	MH648A	M89145	06/29/2018	06/28/2019
Pre-Amplifier	EMEC	EM01G26G	060570	06/29/2018	06/28/2019
Signal Analyzer	Agilent	N9010A	MY52220817	03/22/2018	03/21/2019
Wideband Radio Communication Tester	R&S	CMW 500	116875	04/20/2018	04/19/2019
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

Conducted Emissions Test Site					
Name of Equipment	Manufacturer	Model	Serial Number	Cal Date	Cal Due
Coaxial Cable	Woken	WC12	CC001	06/29/2018	06/28/2019
Coaxial Cable	Woken	WC12	CC002	06/29/2018	06/28/2019
Power Divider	Solvang Technology	STI08-0015	008	07/27/2018	07/26/2019
Signal Analyzer	R&S	FSV 40	101073	09/27/2018	09/26/2019
Wireless Communication Test Set	Agilent	8960/E5515C	MY48363204	07/23/2018	07/22/2019



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5.3 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 $k=2$.



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6 FACILITIES AND ACCREDITATIONS

6.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

- ☐ No.199, Chunghsen Road, Hsintien City, Taipei Hsien, Taiwan, R.O.C.
- ☒ No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan, R.O.C

6.2 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."



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7 SETUP OF EQUIPMENT UNDER TEST

7.1 SETUP CONFIGURATION OF EUT

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

7.2 SUPPORT EQUIPMENT

No	Equipment	Brand	Model	Series No.	FCC ID	Data Cable
	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.



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8 FCC PART 27 REQUIREMENTS INDUSTRY CANADA RSS-139

8.1 AVERAGE POWER

LIMIT

For reporting purposes only.

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.

Test results

No non-compliance noted.

TEST DATA

WCDMA 12.2K RMC

Band	Data Rate or Sub-test	UL/DL Channel No.	Frequency(MHz)	Average power(dBm)	Output Power (W)
WCDMA Band IV	RMC 12.2Kbps	1312/1537	1712.4	22.9	0.19498
		1413/1638	1732.6	22.9	0.19454
		1513/1738	1752.6	23.0	0.19724



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HSUPA

Band	Data Rate or Sub-test	UL/DL Channel No.	Frequency(MHz)	Average power(dBm)	Output Power (W)
HSUPA IV	1	1312/1537	1712.4	20.7	0.11776
		1413/1638	1732.6	20.7	0.11668
		1513/1738	1752.6	20.6	0.11508
	2	1312/1537	1712.4	18.8	0.07568
		1413/1638	1732.6	18.7	0.07447
		1513/1738	1752.6	18.7	0.07362
	3	1312/1537	1712.4	20.6	0.11455
		1413/1638	1732.6	20.5	0.11324
		1513/1738	1752.6	25.5	0.35645
	4	1312/1537	1712.4	18.9	0.07674
		1413/1638	1732.6	18.8	0.07534
		1513/1738	1752.6	18.8	0.07516
	5	1312/1537	1712.4	21.4	0.13868
		1413/1638	1732.6	21.4	0.13804
		1513/1738	1752.6	21.5	0.14028

8.2 EIRP MEASUREMENT

LIMIT

FCC Part 27.50(d)(4)

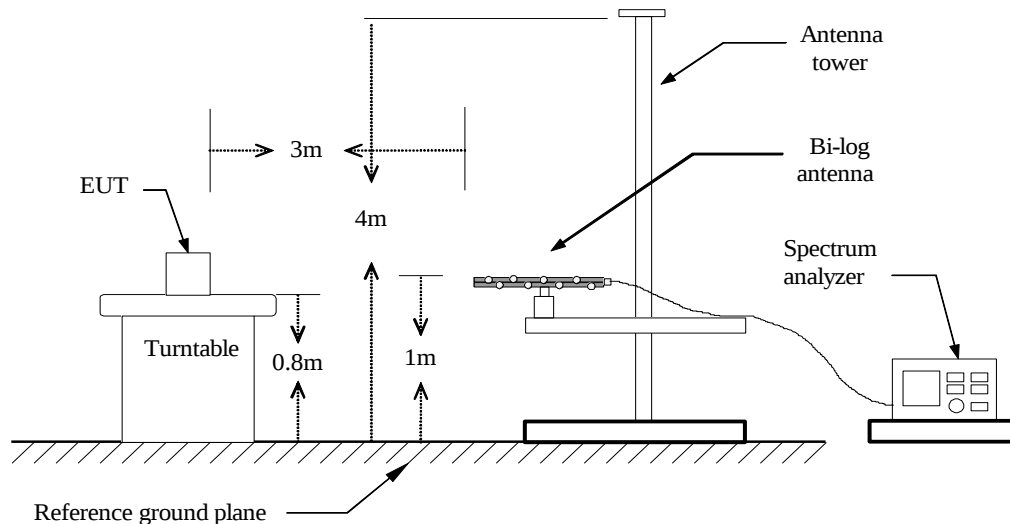
Fixed, mobile, and portable (handheld) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.

RSS-139 section 6.5

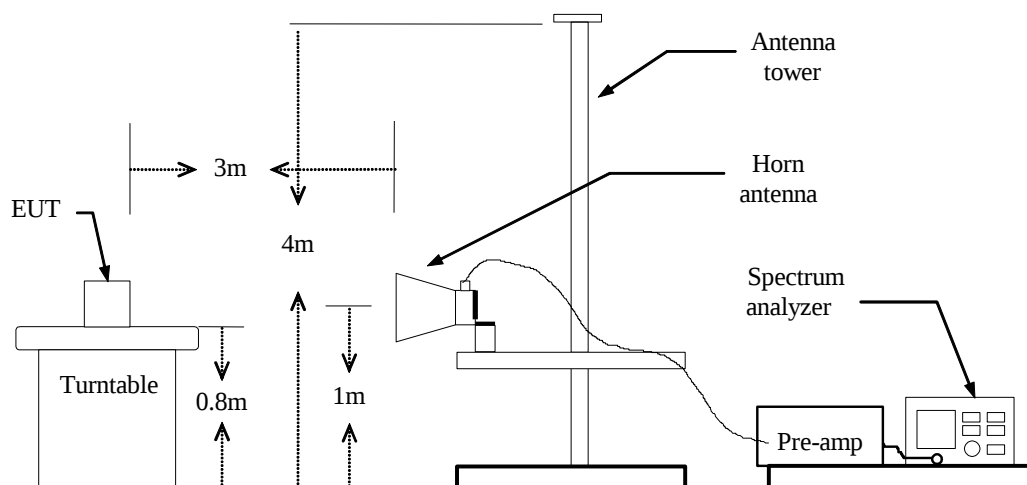
The equivalent isotropically radiated power (e.i.r.p.) for mobile and portable transmitters shall not exceed one watt. The e.i.r.p. for fixed and base stations in the band 1710-1780 MHz shall not exceed 1 watt.

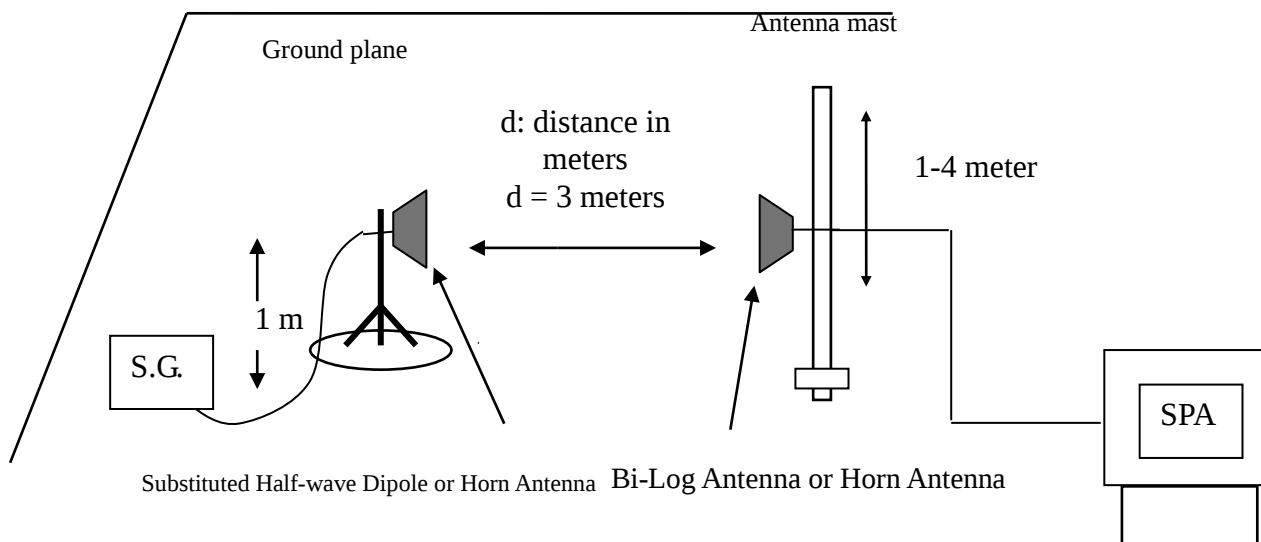
Test Configuration

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 Power Meas License Digital Systems.

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-E. 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.

TEST DATA**WCDMA 12.2K RMC**

Test Mode	Channel	Vertical		Horizontal	
		EIRP(dBm)	EIRP(W)	EIRP(dBm)	EIRP(W)
WCDMA 12.2K RMC (Band IV)	Lowest	11.68	0.0147	25.15	0.3273
	Middle	11.23	0.0133	25.32	0.3404
	Highest	12.99	0.0199	26.04	0.4018



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8.3 OCCUPIED BANDWIDTH MEASUREMENT

LIMIT

For Reporting purpose only.

TEST PROCEDURE

KDB 971168 D01.

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

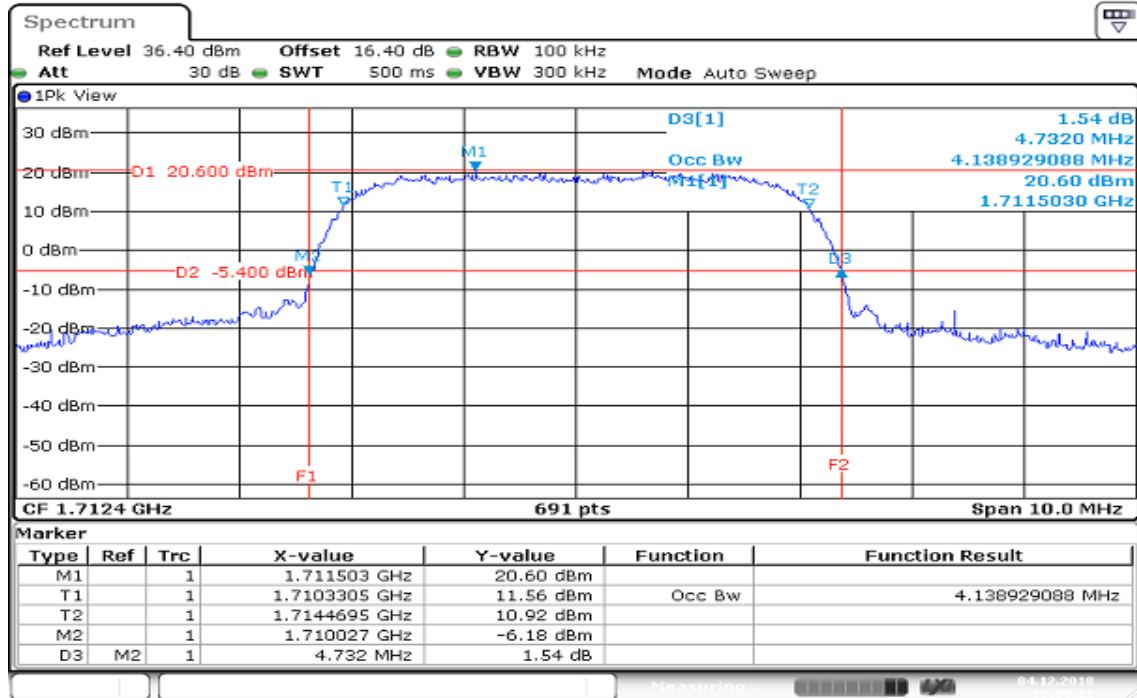
Test Data

Test Mode	CH	Frequency (MHz)	99% Bandwidth (MHz)	26 dB Bandwidth (MHz)
WCDMA 12.2k RMC (Band IV)	Lowest	1712.4	4.1389	4.732
	Middle	1732.6	4.1244	4.703
	Highest	1752.6	4.1389	4.689

Test Plot

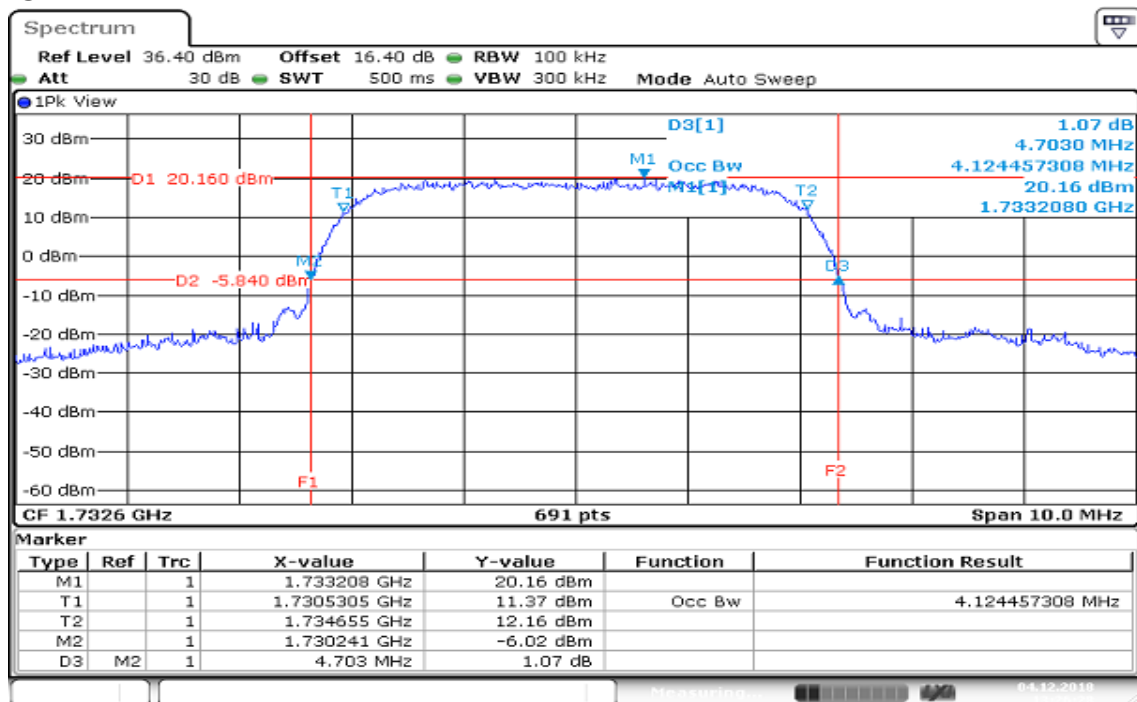
WCDMA 12.2k RMC (Band IV)

Low CH



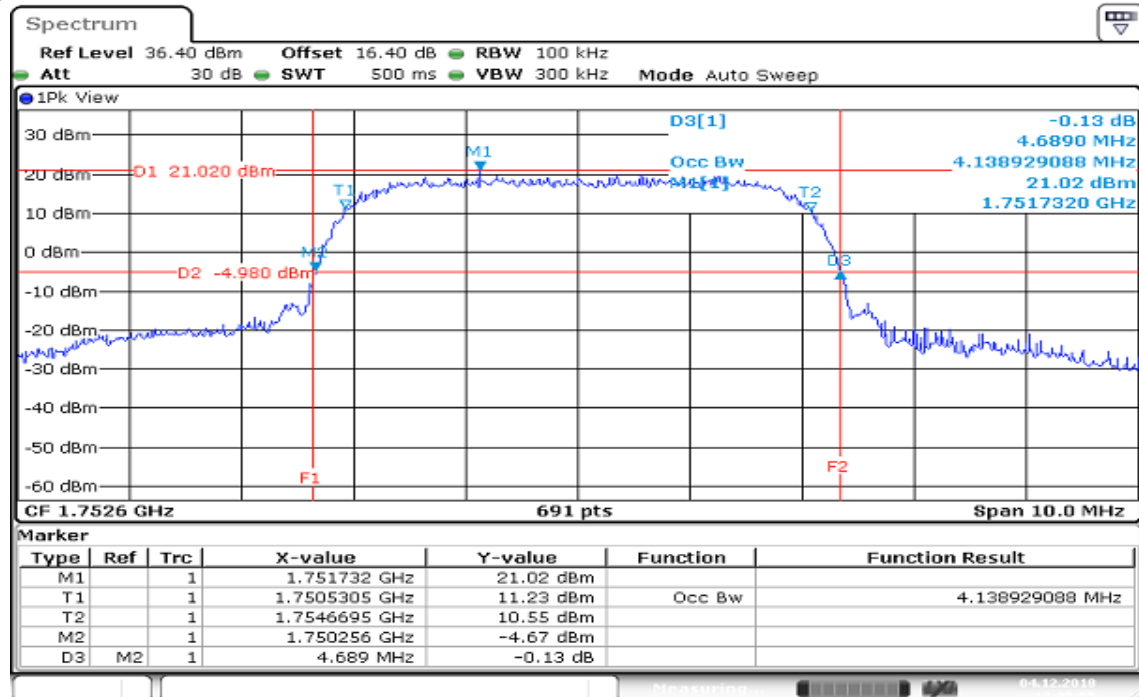
Date: 4 DEC 2018 13:09:12

Mid CH



Date: 4 DEC 2018 13:26:28

High CH



Date: 4 DEC 2018 13:25:56



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8.4 CONDUCTED BAND EDGE MEASUREMENT

Limit

FCC §27.53 (h)

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10} (P)$ dB.

TEST PROCEDURE

According to KDB 971168 D01.

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.

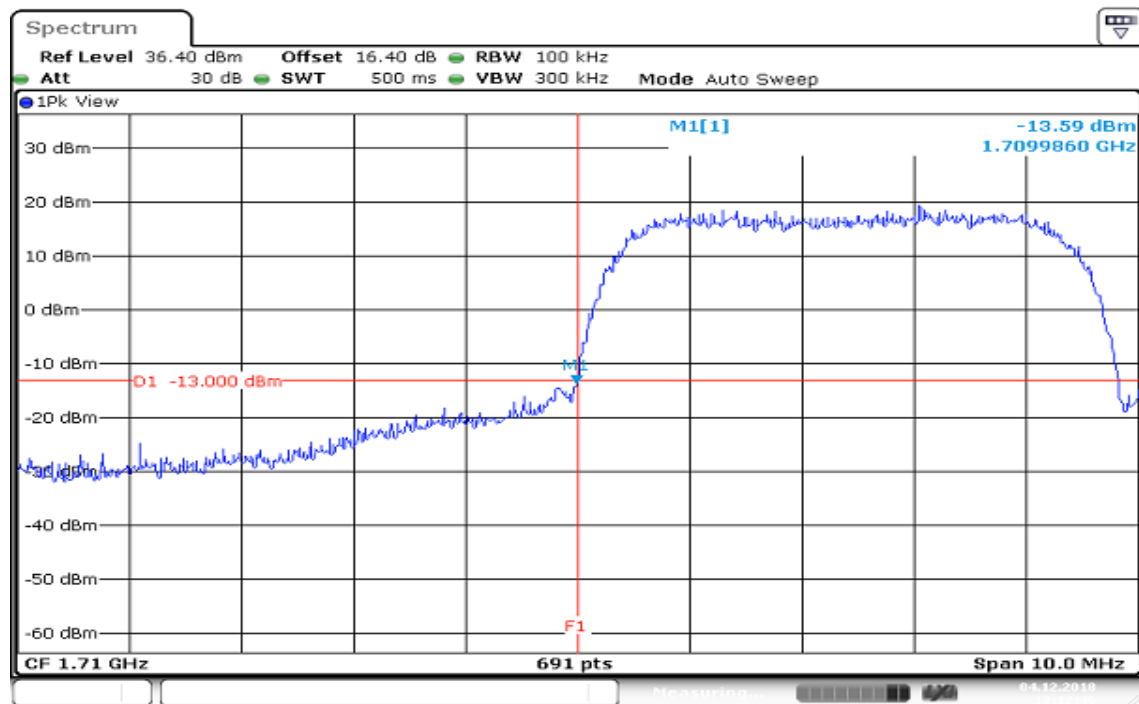
TEST RESULTS

No non-compliance noted.

Test Plot

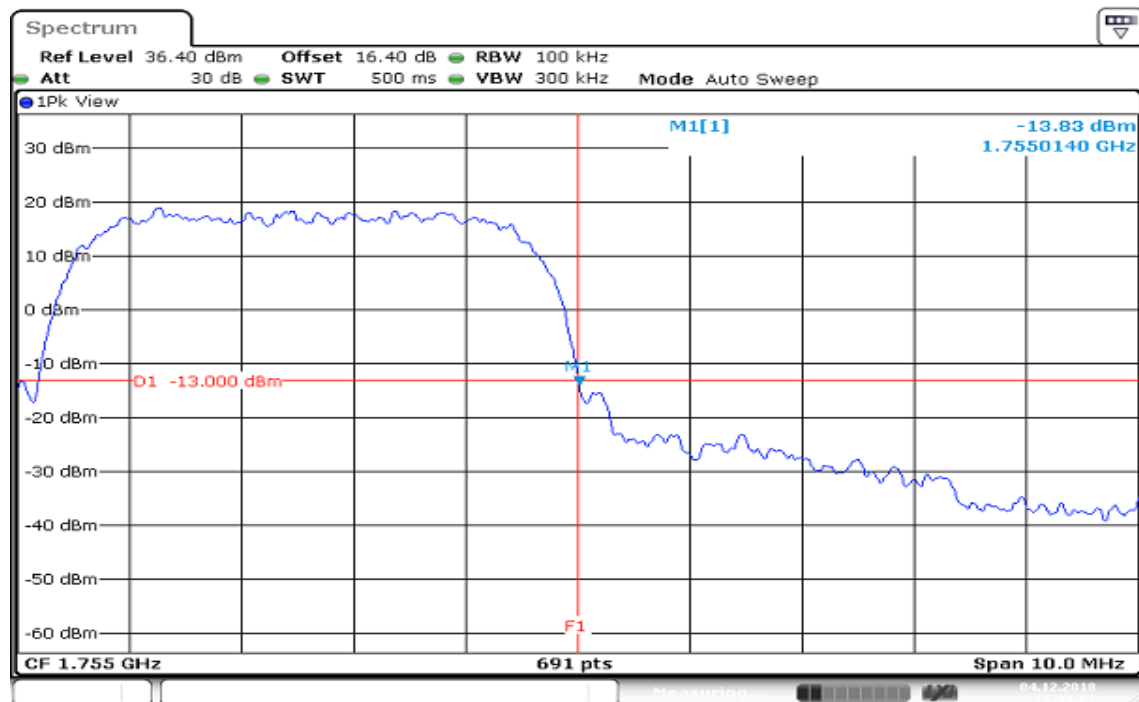
WCDMA 12.2K RMC (BAND IV)

CH Low



Date: 4 DEC 2018 13:12:47

CH High



Date: 4 DEC 2018 13:29:07

8.5 CONDUCTED SPURIOUS EMISSIONS

LIMIT

FCC §27.53 (h)

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10} (P)$ dB.

TEST PROCEDURE

According to KDB 971168 D01.

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.

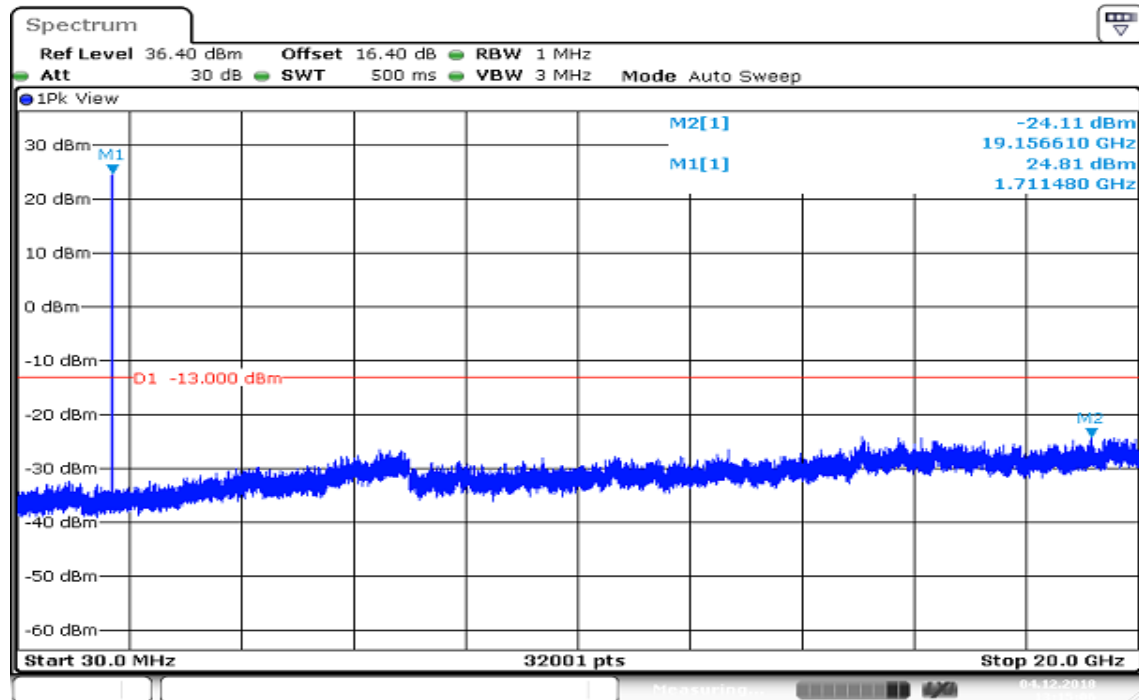
TEST RESULTS

No non-compliance noted.

Test Data

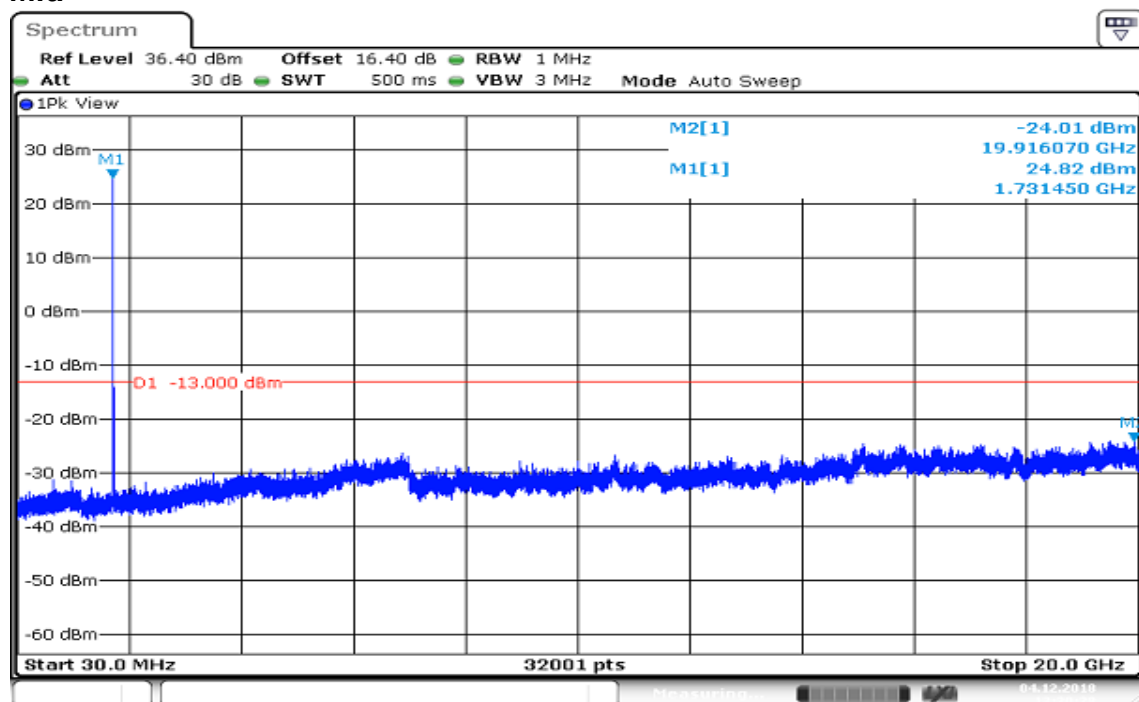
WCDMA 12.2K RMC (BAND IV)

CH Low



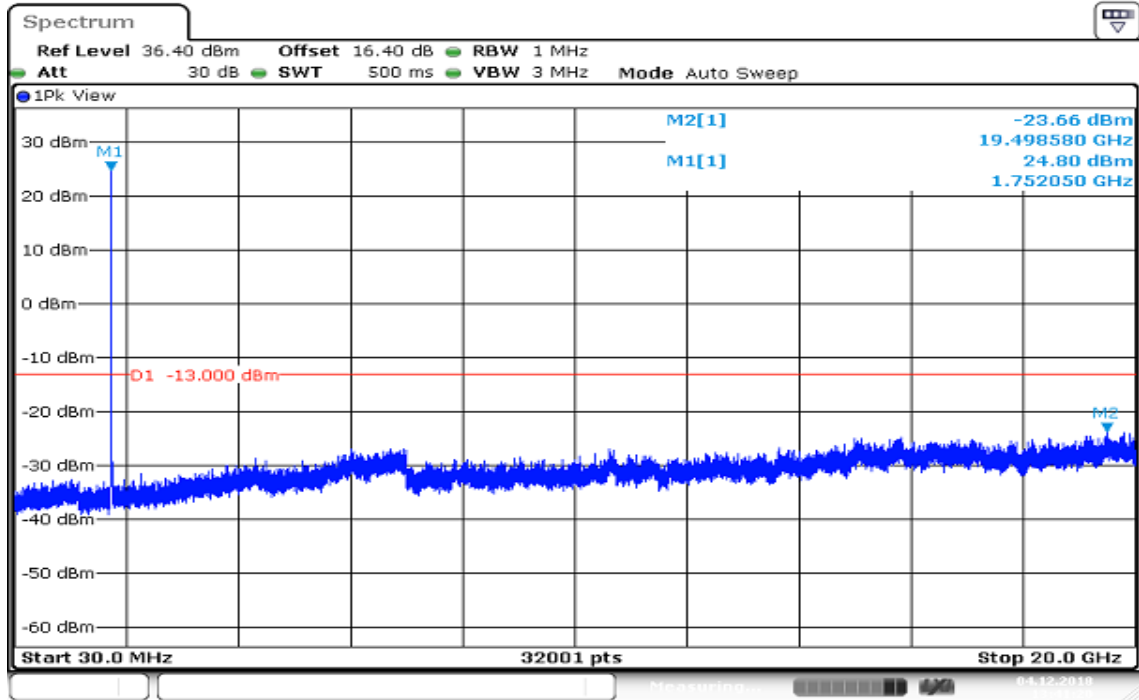
Date: 4 DEC 2018 13:15:07

CH Mid



Date: 4 DEC 2018 13:30:29

CH High



Date: 4 DEC 2018 13:41:20



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8.6 PEAK TO AVERAGE POWER RATIO

Limit

FCC §27.50(a)

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.
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.

Test Results

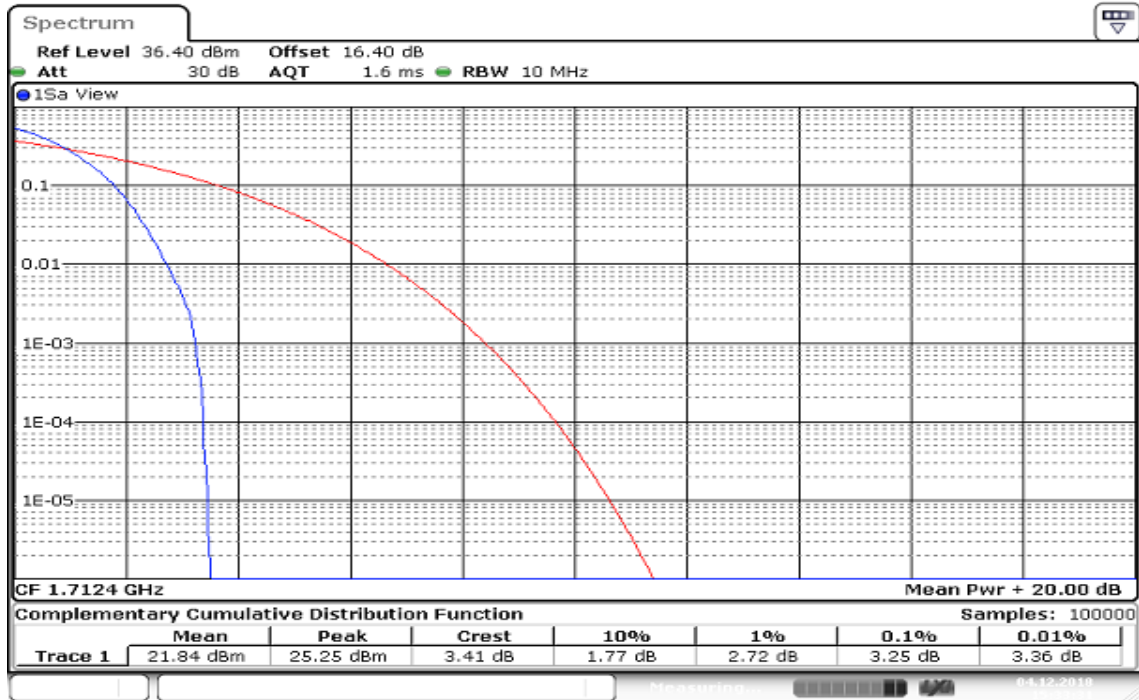
WCDMA 12.2K RMC (BAND IV)

Channel	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
Low CH	1712.4	3.25
Mid CH	1732.6	1.97
High CH	1752.6	3.33

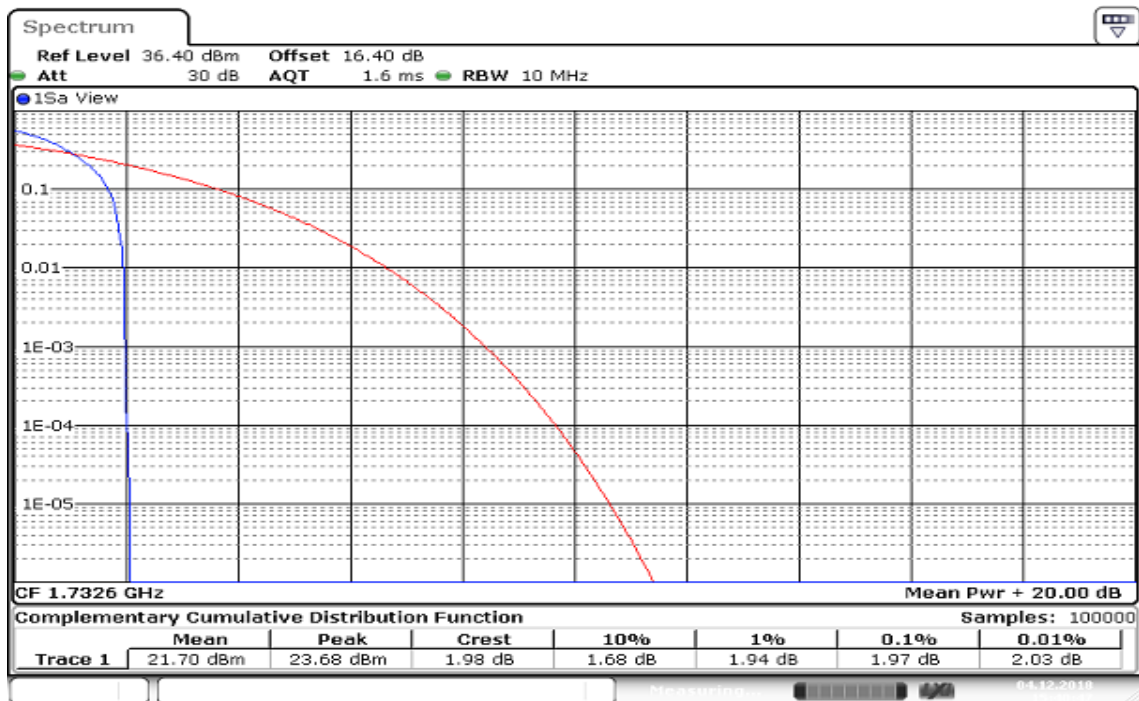
Test Data

WCDMA 12.2K RMC (BAND IV)

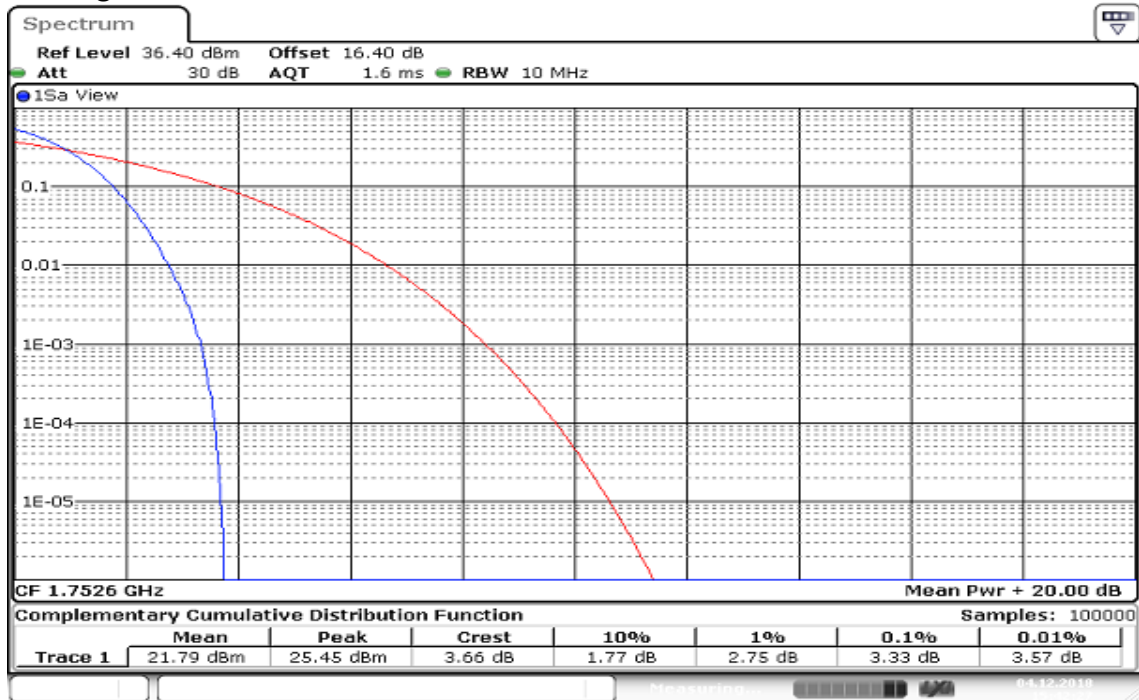
CH Low



CH Mid



CH High



Date: 4 DEC 2018 15:42:28

8.7 FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT

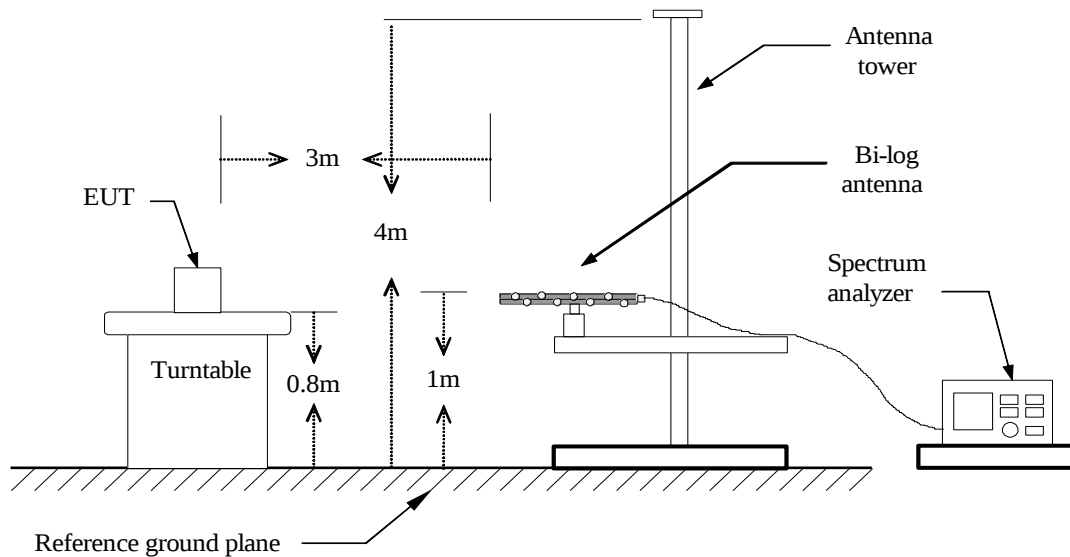
LIMIT

FCC §27.53 (h)

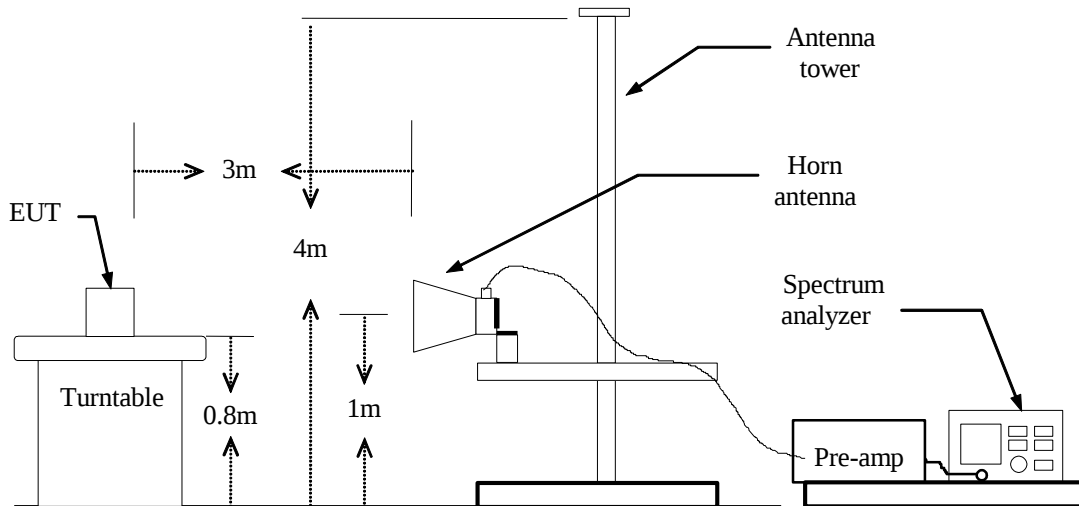
The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10} (P)$ dB.

Test Configuration

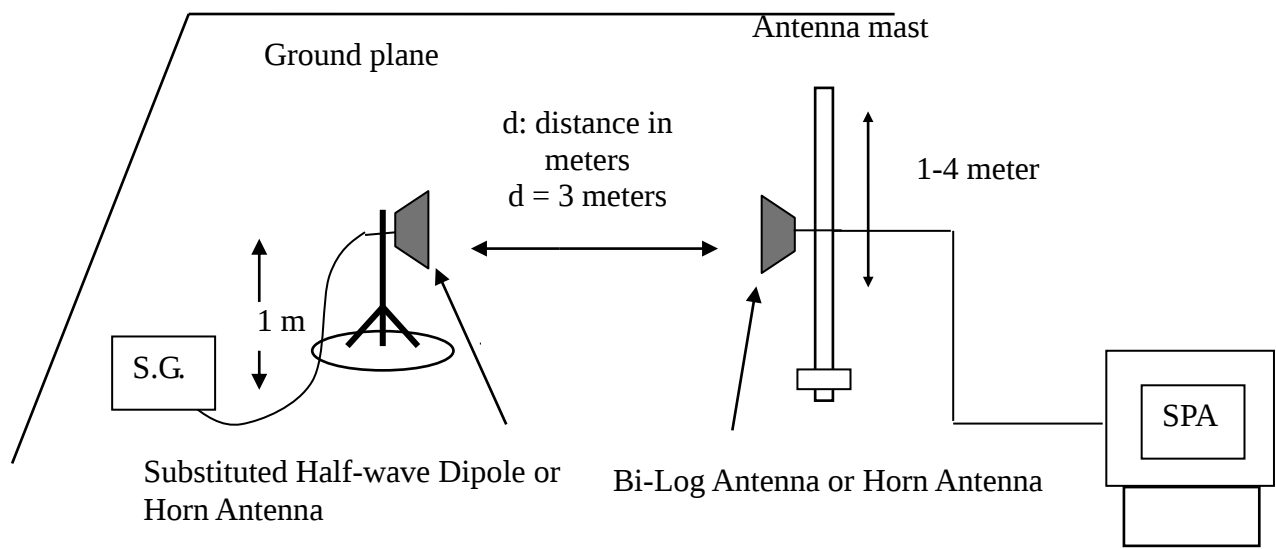
Below 1 GHz



Above 1 GHz



Substituted Method Test Set-up





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TEST PROCEDURE

1. According to KDB 971168 D01.
2. The EUT was placed on a turntable
 - (1) Below 1G : 0.8m
 - (2) Above 1G : 1.5m
 - (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

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

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

For test result, the S.G. value is including antenna gain and cable loss.

Limit Line: -13dBm

TEST RESULTS

Refer to the attached tabular data sheets.

Below 1GHz

Operation Mode: WCDMA 12.2k RMC Band IV / TX /Mid CH

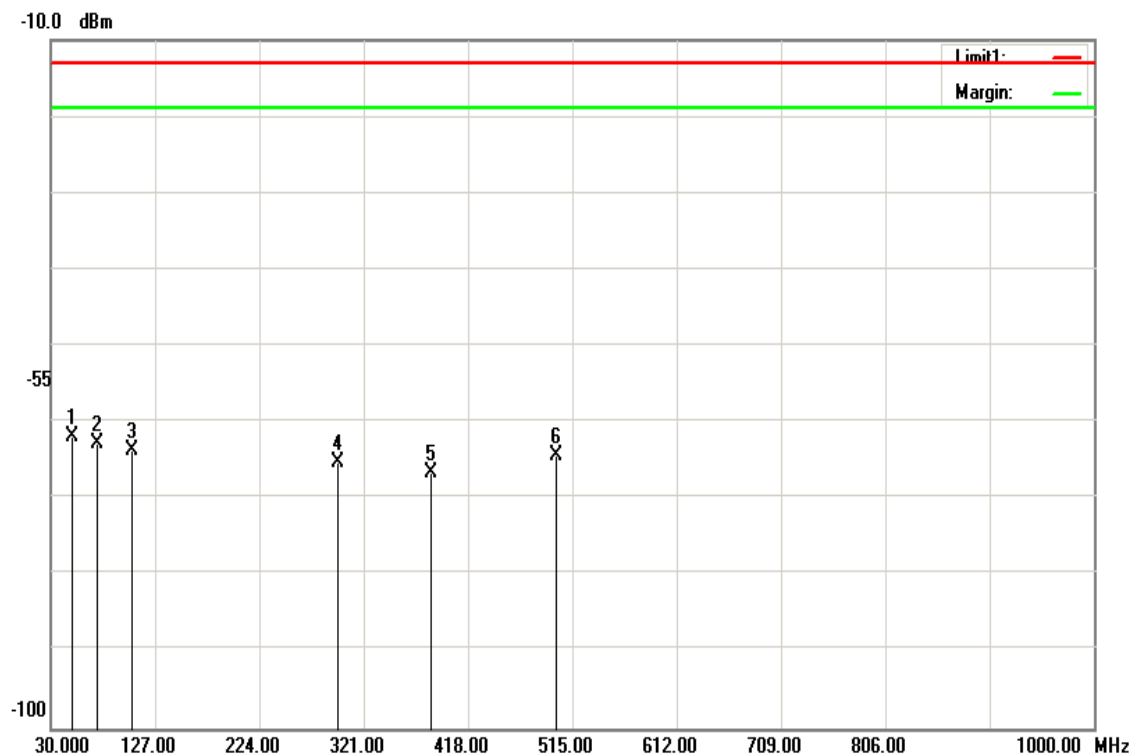
Test Date: December 6, 2018

Temperature: 22°C

Tested by: Jerry Chuang

Humidity: 48 % RH

Polarity: Ver.



Frequency (MHz)	S.G. (dBm)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
124.0900	-86.64	1.11	-89.90	-13.00	-76.90	V
199.2650	-85.94	1.4	-89.49	-13.00	-76.49	V
371.9250	-85.78	1.93	-89.86	-13.00	-76.86	V
471.8350	-79.92	2.18	-84.25	-13.00	-71.25	V
680.3850	-77.63	2.64	-82.42	-13.00	-69.42	V
873.9000	-75.73	3.01	-80.89	-13.00	-67.89	V

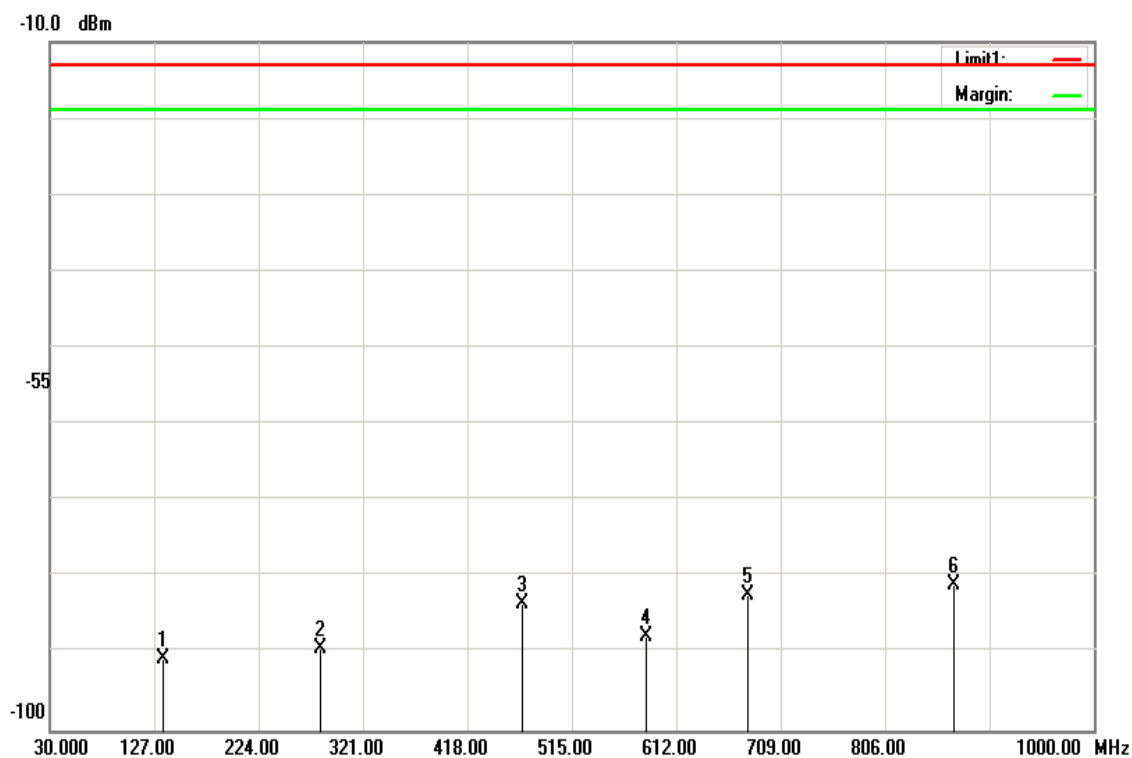
Operation Mode: WCDMA 12.2k RMC Band IV / TX /Mid CH

Test Date: December 6, 2018

Temperature: 22°C

Tested by: Jerry Chuang

Humidity: 48 % RH

Polarity: Hor.


Frequency (MHz)	S.G. (dBm)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
134.7600	-87.31	1.15	-90.61	-13.00	-77.61	H
281.7150	-85.4	1.67	-89.22	-13.00	-76.22	H
469.4100	-79.21	2.18	-83.54	-13.00	-70.54	H
583.8700	-83.15	2.43	-87.73	-13.00	-74.73	H
678.9300	-77.53	2.63	-82.31	-13.00	-69.31	H
870.5050	-75.86	3.01	-81.02	-13.00	-68.02	H



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Above 1GHz

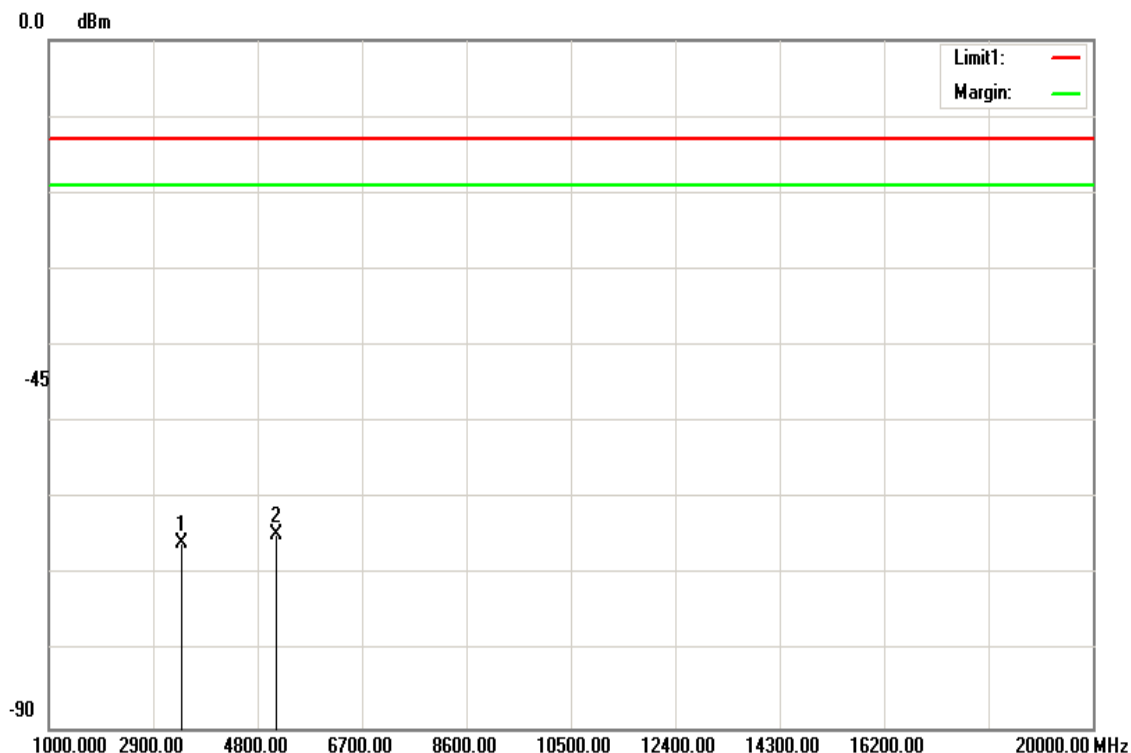
Operation Mode: WCDMA 12.2k RMC Band IV / TX /Low CH**Test Date:** December 6, 2018

Temperature: 21°C

Tested by: Jerry Chuang

Humidity: 48 % RH

Polarity: Ver.



Frequency (MHz)	S.G. (dBm)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
3429.000	-59.35	6.36	-65.71	-13.00	-52.71	V
5133.500	-56.84	7.92	-64.76	-13.00	-51.76	V
N/A						

Remark:

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



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Operation Mode: WCDMA 12.2k RMC Band IV / TX /Low CH

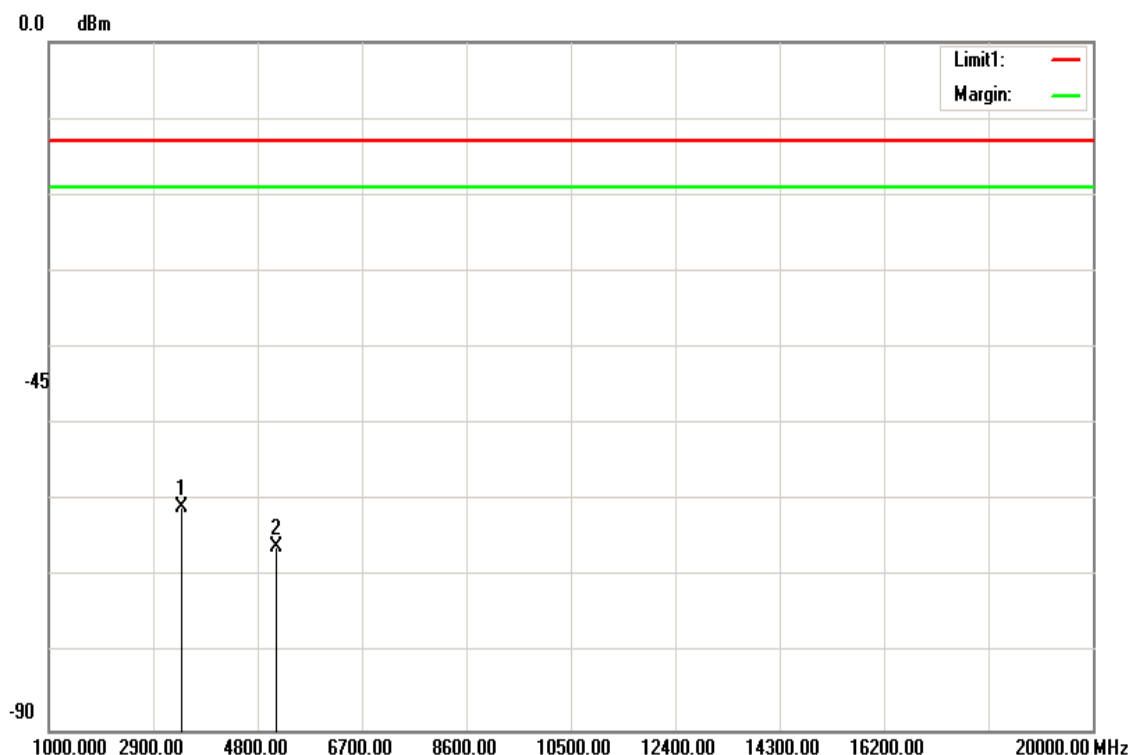
Test Date: December 6, 2018

Temperature: 21°C

Tested by: Jerry Chuang

Humidity: 48 % RH

Polarity: Hor.



Frequency (MHz)	S.G. (dBm)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
3425.500	-54.48	6.35	-60.83	-13.00	-47.83	H
5133.500	-58.16	7.92	-66.08	-13.00	-53.08	H
N/A						

Remark:

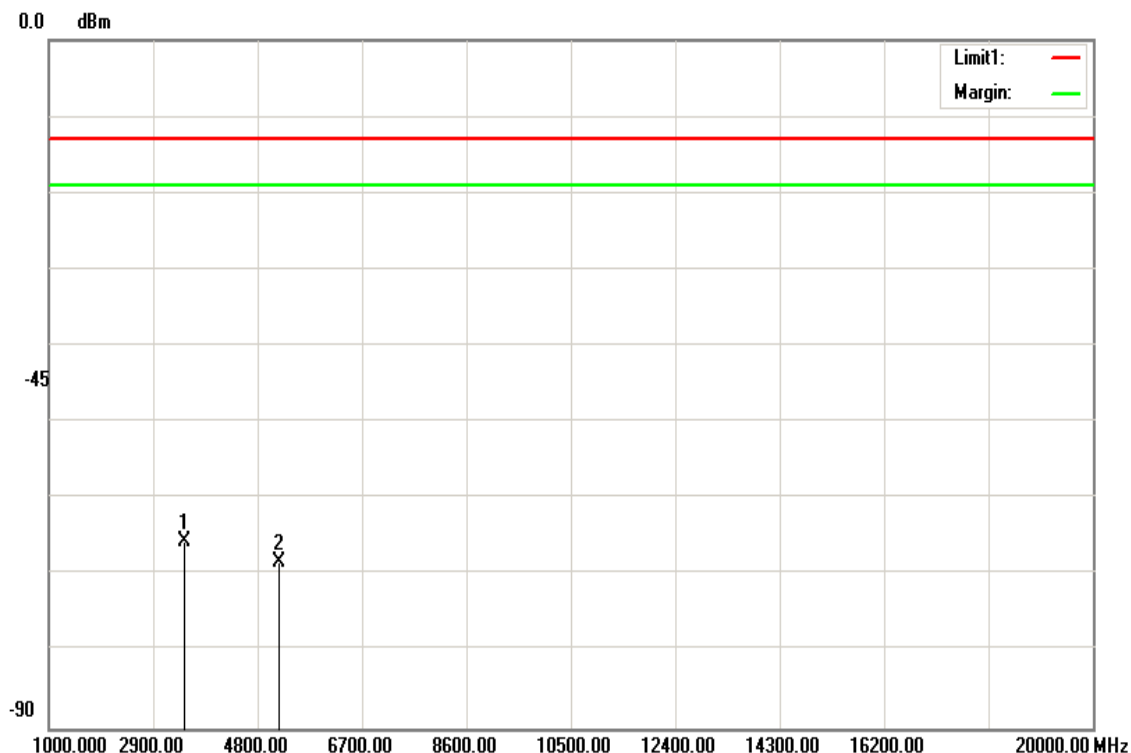
1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.



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Operation Mode: WCDMA 12.2k RMC Band IV / TX/Mid CH **Test Date:** December 6, 2018
Temperature: 21°C **Tested by:** Jerry Chuang
Humidity: 48 % RH **Polarity:** Ver.



Frequency (MHz)	S.G. (dBm)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
3464.000	-59.18	6.39	-65.57	-13.00	-52.57	V
5200.000	-60.32	7.98	-68.30	-13.00	-55.30	V
N/A						

Remark:

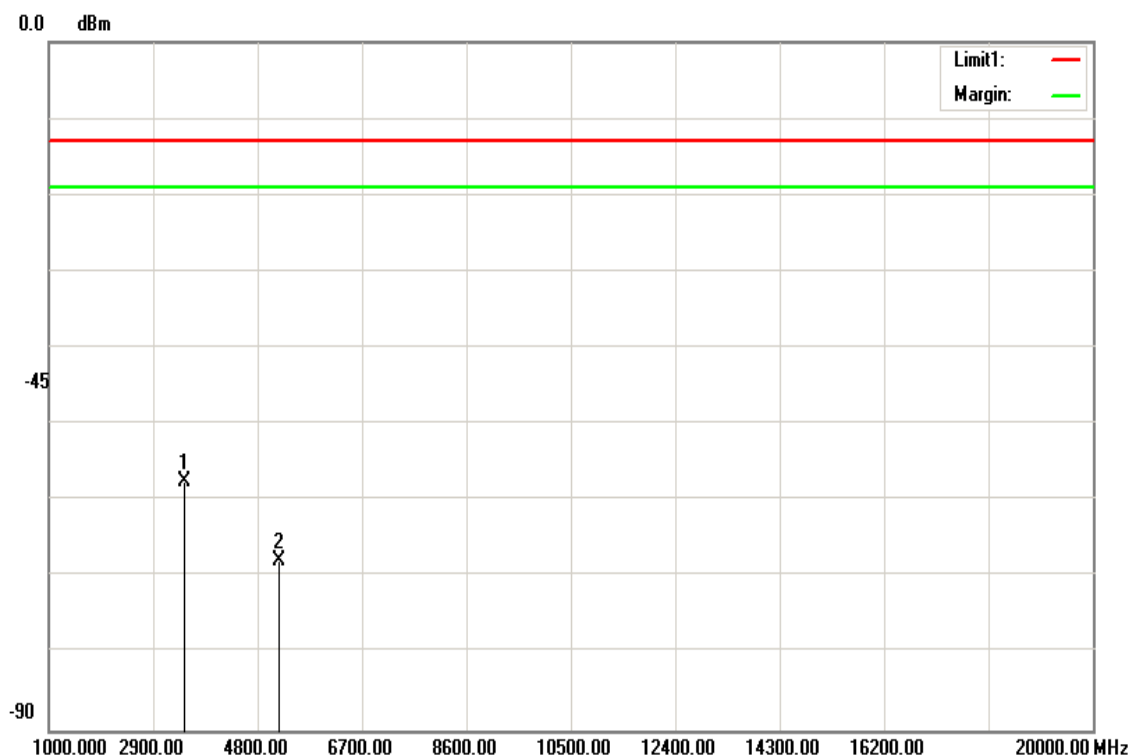
1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.



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Operation Mode: WCDMA 12.2k RMC Band IV / TX/Mid CH **Test Date:** December 6, 2018
Temperature: 21°C **Tested by:** Jerry Chuang
Humidity: 48 % RH **Polarity:** Hor.



Frequency (MHz)	S.G. (dBm)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
3464.000	-51.18	6.39	-57.57	-13.00	-44.57	H
5200.000	-59.83	7.98	-67.81	-13.00	-54.81	H
N/A						

Remark:

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



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Operation Mode: WCDMA 12.2k RMC Band IV / TX /High CH

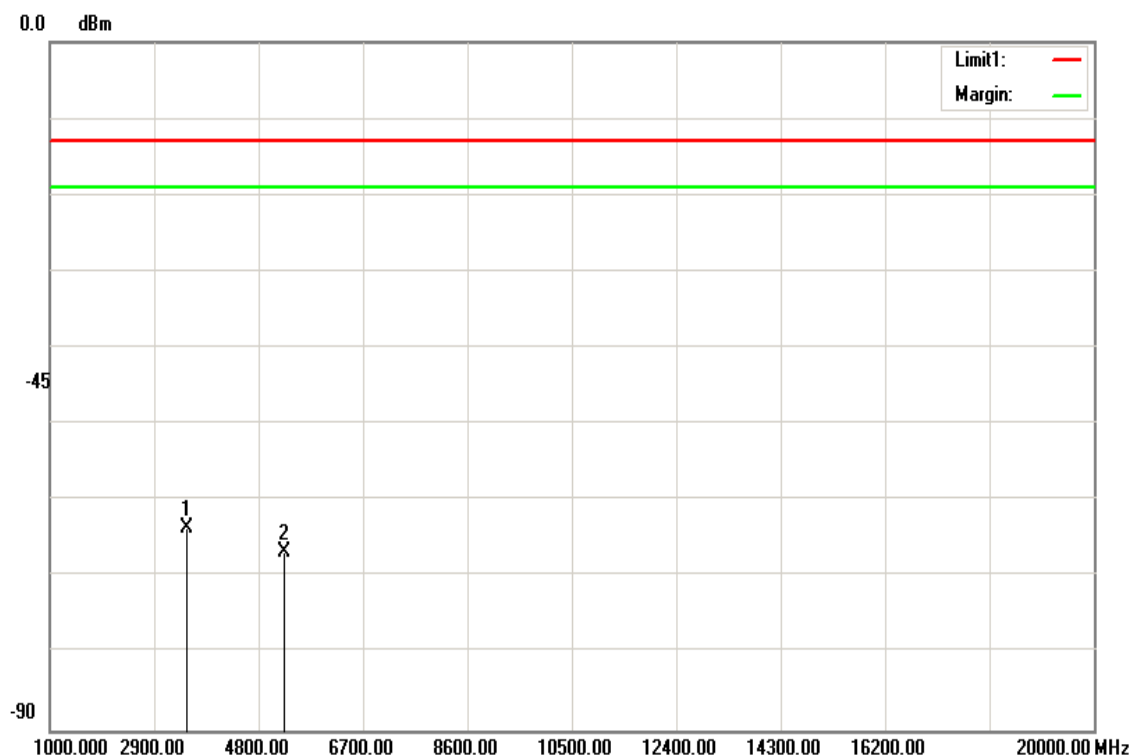
Test Date: December 6, 2018

Temperature: 21°C

Tested by: Jerry Chuang

Humidity: 48 % RH

Polarity: Ver.



Frequency (MHz)	S.G. (dBm)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
3502.500	-57.24	6.43	-63.67	-13.00	-50.67	V
5256.000	-58.67	8.03	-66.70	-13.00	-53.70	V
N/A						

Remark:

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



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Operation Mode: WCDMA 12.2k RMC Band IV / TX /High CH

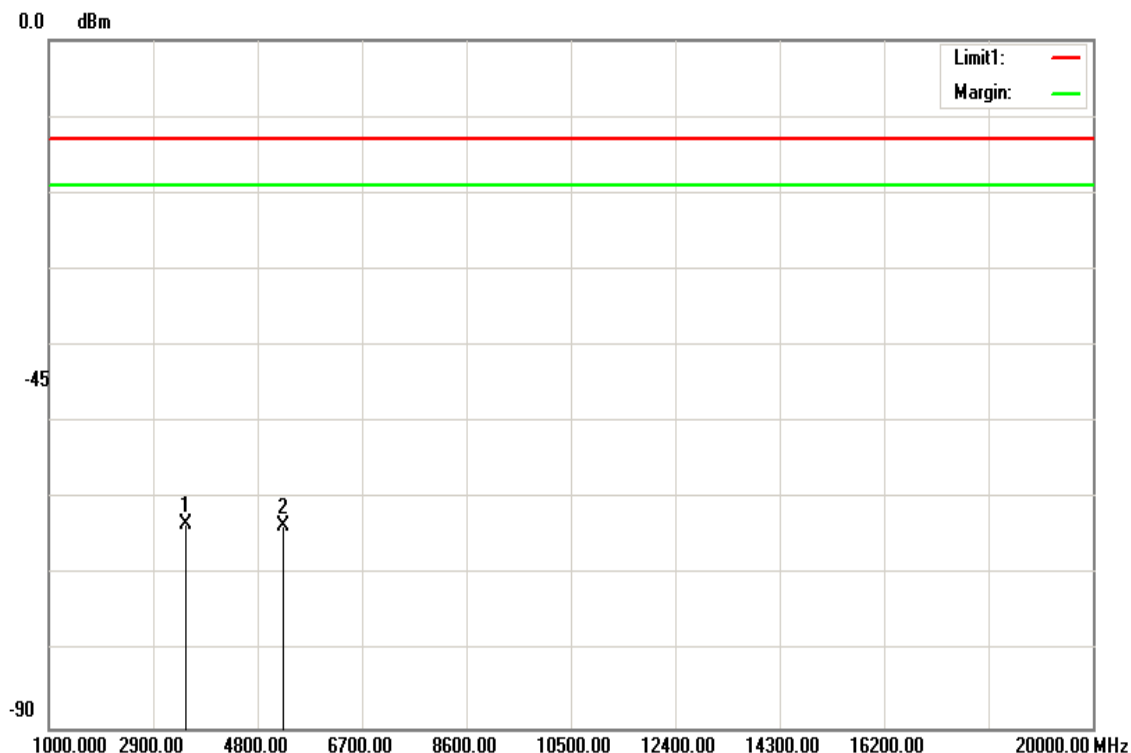
Test Date: December 6, 2018

Temperature: 21°C

Tested by: Jerry Chuang

Humidity: 48 % RH

Polarity: Hor.



Frequency (MHz)	S.G. (dBm)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)	Antenna Polarization (V/H)
3502.500	-56.8	6.43	-63.23	-13.00	-50.23	H
5256.000	-55.52	8.03	-63.55	-13.00	-50.55	H
N/A						

Remark:

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

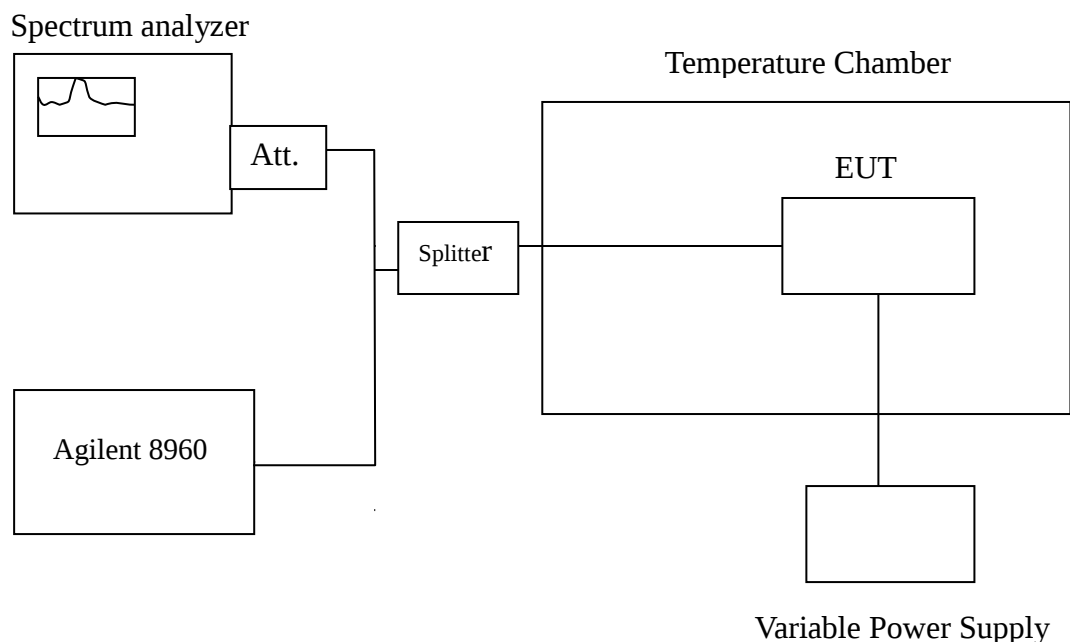
8.8 FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT

LIMIT

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

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test Configuration



Remark: Measurement setup for testing on Antenna connector

TEST PROCEDURE

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -20°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.



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TEST RESULTS

No non-compliance noted.

Reference Frequency: WCDMA 12.2k RMC Band IV Low Channel 1712.4 MHz		
Limit: 1712.4-1752.6 MHz		
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Error(Hz)
120	50	3.00
120	40	-1.00
120	30	0.00
120	20	-2.00
120	10	1.00
120	0	0.00
120	-10	-1.00
120	-20	2.00

Reference Frequency: WCDMA 12.2k RMC Band IV Mid Channl 1732.6 MHz		
Limit: 1712.4-1752.6 MHz		
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Error(Hz)
120	50	2.00
120	40	-2.00
120	30	0.00
120	20	1.00
120	10	1.00
120	0	-2.00
120	-10	-3.00
120	-20	-4.00



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Reference Frequency: WCDMA 12.2k RMC Band IV High Channel 1752.6 MHz		
Limit: 1712.4-1752.6 MHz		
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Error(Hz)
120	50	-3.00
120	40	1.00
120	30	-2.00
120	20	0.00
120	10	2.00
120	0	-3.00
120	-10	-1.00
120	-20	-3.00

8.9 FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT

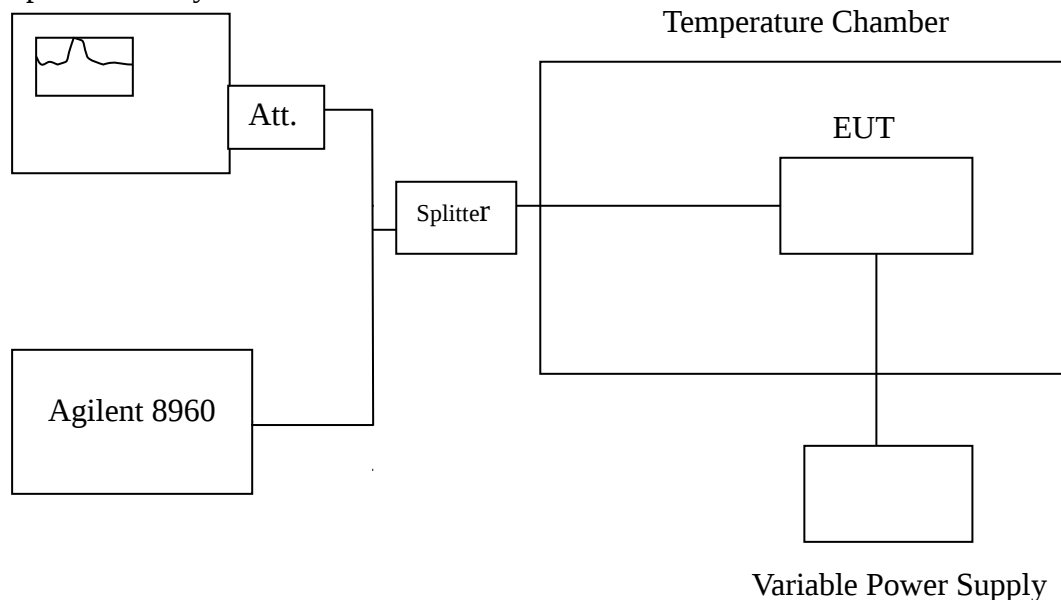
LIMIT

According to FCC §2.1055, FCC§27.54.

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

Test Configuration

Spectrum analyzer



Remark: Measurement setup for testing on Antenna connector.

TEST PROCEDURE

Set chamber temperature to 20°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to specify extreme voltage variation ($\pm 15\%$) and endpoint, record the maximum frequency change.



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TEST RESULTS

No non-compliance noted.

Reference Frequency: WCDMA 12.2k RMC Band IV Low Channel 1712.4 MHz		
Limit: 1712.4-1752.6 MHz		
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Error(Hz)
108	20	-1.00
120		-2.00
132		-3.00

Reference Frequency: WCDMA 12.2k RMC Band IV Mid Channel 1732.6 MHz		
Limit: 1712.4-1752.6 MHz		
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Error(Hz)
108	20	-1.00
120		1.00
132		0.00

Reference Frequency: WCDMA 12.2k RMC Band IV High Channel 1752.6 MHz		
Limit: 1712.4-1752.6 MHz		
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Error(Hz)
108	20	-1.00
120		0.00
132		2.00

-- End of Test Report --