

RF Test Report

Applicant : Getac Technology Corporation

Product Type : Wireless Module

Trade Name : Getac

Model Number : EM7455

Test Specification : FCC 47 CFR PART 22H
FCC 47 CFR PART 24E
FCC 47 CFR PART 27L
ANSI C63.26

Receive Date : Mar. 06, 2019

Test Period : Mar. 16 ~ Mar. 17, 2019

Issue Date : May 07, 2019

Issue by

A Test Lab Techno Corp.
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Taiwan Accreditation Foundation accreditation number: 1330

Test Firm MRA designation number: TW0010

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Revision History

Rev.	Issue Date	Revisions	Revised By
00	Apr. 15, 2019	Initial Issue	Nina Lin
01	May 07, 2019	Page 5 Revised Class II Permissive Change description Page 17 Revised Test Procedure description	Nina Lin

Verification of Compliance

Issued Date: May 07, 2019

Applicant : Getac Technology Corporation
Product Type : Wireless Module
Trade Name : Getac
Model Number : EM7455
FCC ID : QYLEM7455U
EUT Rated Voltage : DC 3.7 V
Test Voltage : 120 Vac, 60 Hz
Applicable Standard : FCC 47 CFR PART 22H
FCC 47 CFR PART 24E
FCC 47 CFR PART 27L
ANSI C63.26

Test Result : Complied

Performing Lab. : A Test Lab Techno Corp.

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<http://www.atl-lab.com.tw/e-index.htm>

A Test Lab Techno Corp. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by A Test Lab Techno Corp. based on interpretations and/or observations of test results. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Approved By :



(Manager)

(Fly Lu)

Reviewed By :



(Testing Engineer)

(Eric Ou Yang)



TABLE OF CONTENTS

1	General Information	5
1.1.	EUT Description	5
1.2.	Mode of Operation.....	6
1.3.	EUT Test Step.....	6
1.4.	Configuration of Test System Details	7
1.5.	Test Instruments	9
1.6.	Test Site Environment.....	9
1.7.	Summary of Test Result.....	10
2	Measurement Procedure	11
2.1.	RF Output Power Test	11
2.2.	Effective Radiated Power / Equivalent Isotropic Radiated Power Test	12
2.3.	Field Strength of Spurious Radiation Test	15
3	Test Results.....	18
	Appendix A: Conducted Output Power	18
	Appendix B: Effective Radiated Power / Equivalent Isotropic Radiated Power Test	20
	Appendix C: Field Strength of Spurious Radiation	21

1 General Information

1.1. EUT Description

Applicant	Getac Technology Corporation 5F., Building A, No.209, Sec.1, Nangang Rd., Nangang Dist., Taipei City, 11568, Taiwan			
Manufacturer	Sierra Wireless Inc. 13811 Wireless Way, Richmond, BC, V6V 3A4, Canada			
Product Type	Wireless Module			
Trade Name	Getac			
Model Number	EM7455			
FCC ID	QYLEM7455U			
Class II Permissive Change	This is to request a Class II permissive change for FCC ID:QYLEM7455U , originally granted on 2019/4/9 The major change filed under this application is: Change #1: Additional Chassis added, Getac, model number: UX10 #2: Addition one antenna, the antenna type is same, the antenna gain is low than the original application. #3: Disable LTE band 30 by software.			
Host Information	Product Type: Tablet Trade Name: Getac Model Name: UX10			
IMEI No.	353431080191380			
Mode	Band	UL Frequency (MHz)	DL Frequency (MHz)	Modulation
WCDMA(RMC12.2K)/ HSDPA/ HSUPA	II	1852.4 ~ 1907.6	1932.4 ~ 1987.6	QPSK
	V	826.4 ~ 846.6	871.4 ~ 891.6	QPSK
	IV	1712.4 ~ 1752.6	2112.4 ~ 2152.6	QPSK
Antenna information	ANT	Type	Max. Gain (dBi)	
	MAIN	FPC Antenna	WCDMA/ HSDPA/ HSUPA Band II	3.01
			WCDMA/ HSDPA/ HSUPA Band V	0.47
			WCDMA/ HSDPA/ HSUPA Band IV	2.90
	AUX	FPC Antenna	WCDMA/ HSDPA/ HSUPA Band II	3.23
			WCDMA/ HSDPA/ HSUPA Band V	0.30
			WCDMA/ HSDPA/ HSUPA Band IV	0.95
Operate Temp. Range	-40 ~ 85 °C			

Frequency Band	Max. RF Output Power (W)	E.R.P. /E.I.R.P. (W)	
WCDMA/ HSDPA/ HSUPA Band II	0.497	---	(E.I.R.P.)
WCDMA/ HSDPA/ HSUPA Band V	0.500	---	(E.R.P.)
WCDMA/ HSDPA/ HSUPA Band IV	0.509	0.546	(E.I.R.P.)

1.2. Mode of Operation

ATL has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode
WCDMA Band II Link Mode
WCDMA Band V Link Mode
WCDMA Band IV Link Mode

Note: Regards to the frequency band operation: the lowest, middle and highest frequency of channel were selected to perform the test, then shown on this report.

By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that "X axis" position was the worst, then the final test was executed the worst condition and test data were recorded in this report.

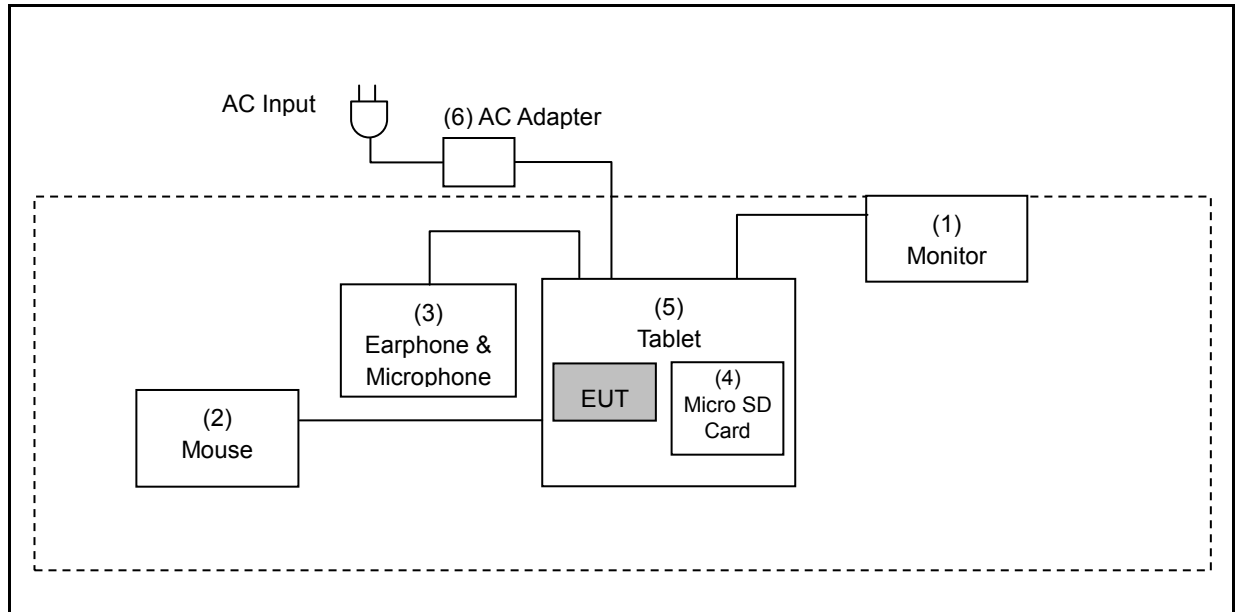
1.3. EUT Test Step

1	Setup the EUT shown on "Configuration of Test System Details".
2	Turn on the power of all equipment.

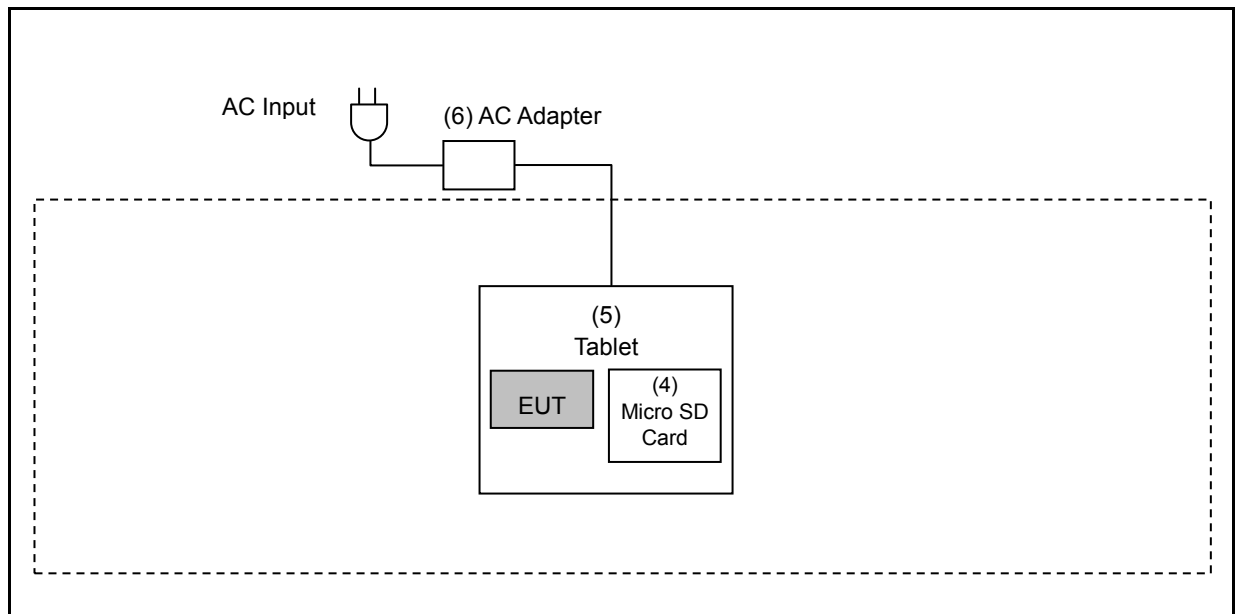
Measurement Software			
No.	Description	Software	Version
1	Radiated Emission	EZ EMC	1.1.4.4

1.4. Configuration of Test System Details

Radiated Emission_ Below 1 GHz



Radiated Emission_ Above 1 GHz





Devices Description					
Product		Manufacturer	Model Number	Serial Number	Power Cord
(1)	Monitor	DELL	P2415Qb	CN-0D3C8Y-74261-523-0HUL	---
(2)	Mouse	Logitech	M-UAG96B	---	---
(3)	Earphone & Microphone	HTC	---	---	---
(4)	Micro SD Card	Transcend	---	---	---
(5)	Tablet	Getac	UX10	---	---
(6)	AC adapter	FSP	FSP065-RBBN3	---	---

1.5. Test Instruments

For Conducted

Test Period: Mar. 16 ~ Mar. 17, 2019

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Period
Universal Radio Communication Tester	Agilent	E5515C	MY47511156	09/11/2018	1 year
Universal Radio Communication Tester	R&S	CMU200	112387	03/11/2019	1 year
Power Supply	KEITHLEY	2303	4045290	02/12/2019	1 year

For Radiated Emissions

Test Period: Mar. 16, 2019

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Period
EXA Signal Analyzer (10 Hz~44 GHz)	Keysight	N9010A	MY52221312	01/14/2019	1 year
Pre Amplifier (1~26.5 GHz)	Agilent	8449B	3008A02237	10/16/2018	1 year
Pre Amplifier (100 kHz~1.3 GHz)	Agilent	8447D	2944A11119	01/14/2019	1 year
Trilog Broadband Antenna	Schwarzbeck Mess-Elektronik	VULB9168	416	10/23/2018	1 year
Horn Antenna (1~18 GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	9120D-550	08/23/2018	1 year
RF Cable	EMCI	EMC104-N-N-6000	TE01-1	02/20/2019	1 year
Microwave Cable	EMCI	EMC104-SM-SM-13000	170814	10/30/2018	1 year
Microwave Cable	EMCI	EMC102-KM-KM-14000	151001	02/20/2019	1 year

1.6. Test Site Environment

Items	Required (IEC 60068-1)	Actual
Temperature (°C)	15-35	26
Humidity (%RH)	25-75	60
Barometric pressure (mbar)	860-1060	990

Test Setting Condition		
N.V.	Normal Voltage	AC 120 V
N.T.	Normal Temperature	+25 °C



1.7. Summary of Test Result

FCC Rule	Description	Result
§2.1046	Conducted Output Power	Pass
§22.913(a)(5)	Effective Radiated Power	N/A (Note2)
§24.232(c) §27.50(d)(4)	Equivalent Isotropic Radiated Power	Pass (Note2)
§24.232(d) §27.50 KDB 971168 D01 (5.7.1)	Peak to average ratio	N/A (Note1)
§2.1049 §22.917(a) §24.238(a) §27.53(g)	Emission Bandwidth & Occupied Bandwidth	N/A (Note1)
§2.1051 §22.917(a) §24.238(a) §27.53(h)	Band Edge Measurement	N/A (Note1)
§2.1051 §22.917(a) §24.238(a) §27.53(h)	Conducted Spurious Emission	N/A (Note1)
§2.1053 §22.917(a) §24.238(a) §27.53(h)	Field Strength of Spurious Radiation	Pass (Note2)
§2.1055 §22.355 §24.235 §27.54	Frequency Stability for Temperature & Voltage	N/A (Note1)

Note1: Class II permissive change. No need for verification.

Note2: Effective Radiated Power / Equivalent Isotropic Radiated Power and Field Strength of Spurious Radiation is tested using the worst Conducted Output Power.

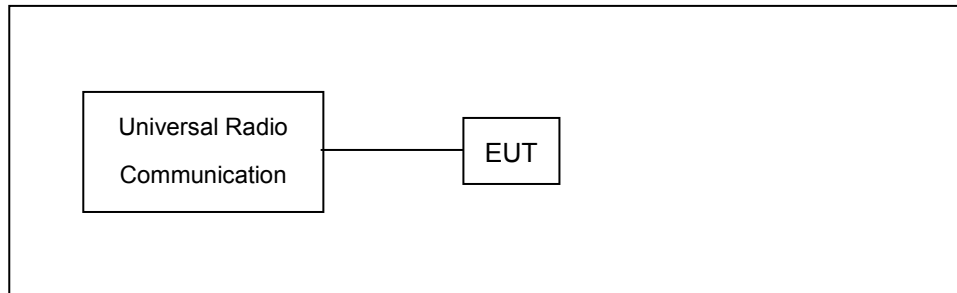
2 Measurement Procedure

2.1. RF Output Power Test

■ Limit

N/A

■ Test Setup



■ Test Procedure

- The EUT was set up for the maximum power with with simulator.
- Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

■ Uncertainty

The measurement uncertainty is defined as for RF output power measurement is 1.2 dB.

2.2. Effective Radiated Power / Equivalent Isotropic Radiated Power Test

■ Limit

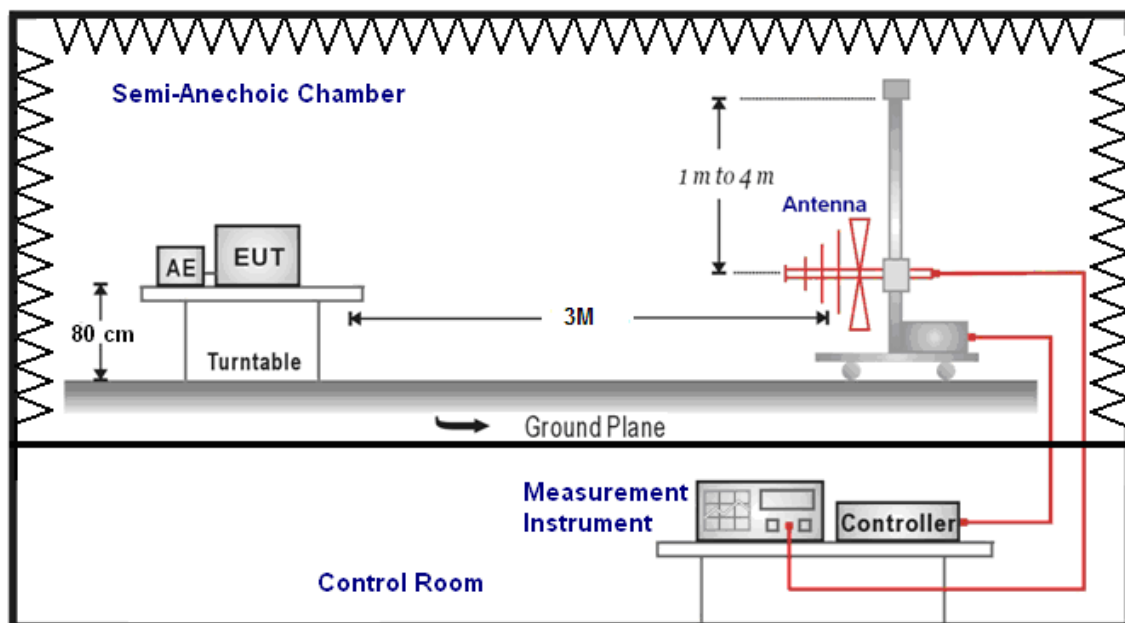
For FCC Part 22.913(a)(5): The E.R.P. of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

For FCC Part 24.232(c): The E.I.R.P. of Mobile and portable stations test transmitters must not exceed 2 Watts.

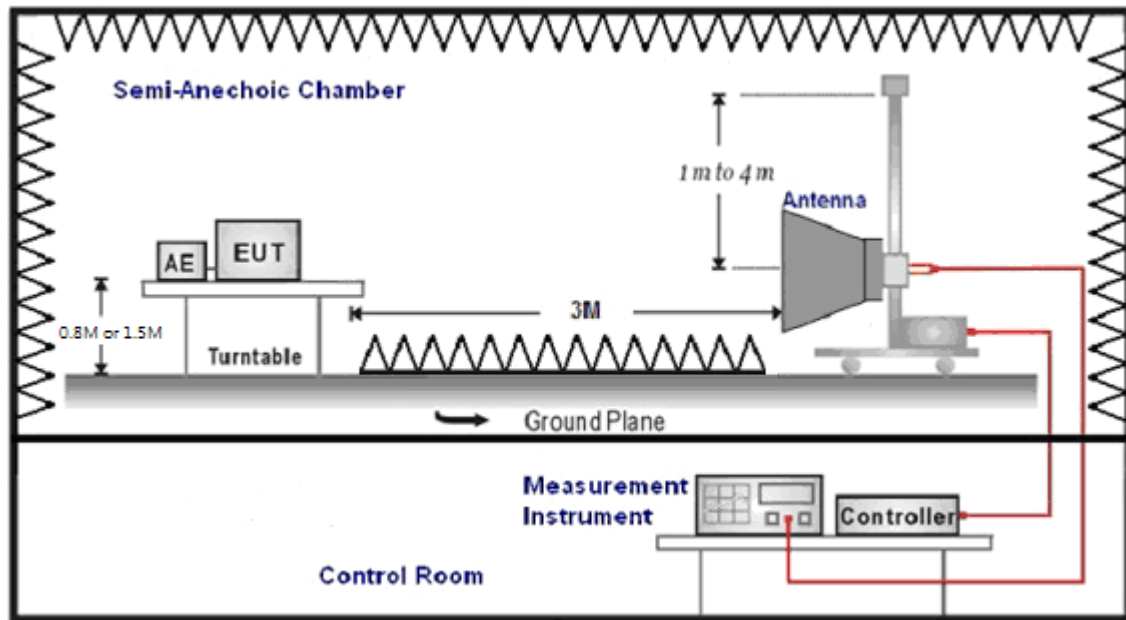
For FCC Part 27.50(d)(4): The EIRP of Mobile and portable stations transmitters are limited to 1 watt for 1710~1755 MHz.

■ Setup

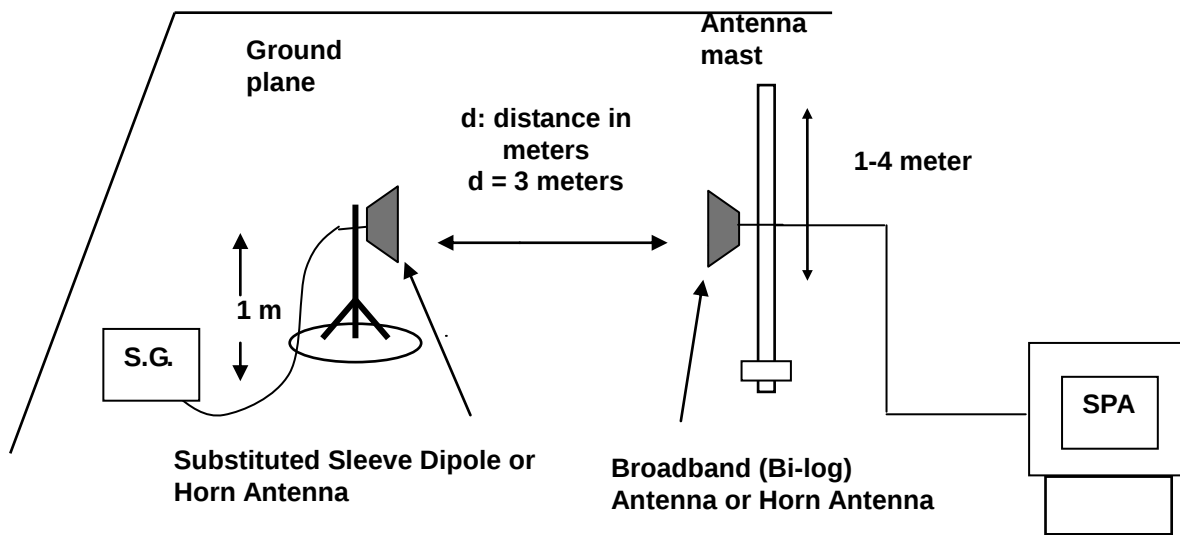
Below 1 GHz



Above 1 GHz



For Substituted Method Test Set-UP



■ Test Procedure

- a. The EUT was set up for the maximum power with wwan link data modulation. The power was measured with Spectrum Analyzer. All measurements were done at 3 channels (low, middle and high operational frequency range).
- b. E.I.R.P power measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m (1.5 m for above 1 GHz) height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1 m to 4 m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- c. The substitution antenna (Note:1 & 2) is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value" of step a. Record the power level of S.G.
- d. $E.I.R.P. = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}$
- e. $E.R.P. = E.I.R.P. - 2.15 \text{ dB}$

Note: 1. Below 1 GHz Substituted Method Test : Sleeve dipole antenna to Bi-Log Antenna

2. Above 1 GHz Substituted Method Test : Horn antenna to Horn Antenna

■ Uncertainty

The measurement uncertainty is defined as for Field Strength of Spurious Radiation measurement is $\pm 3.072 \text{ dB}$.

2.3. Field Strength of Spurious Radiation Test

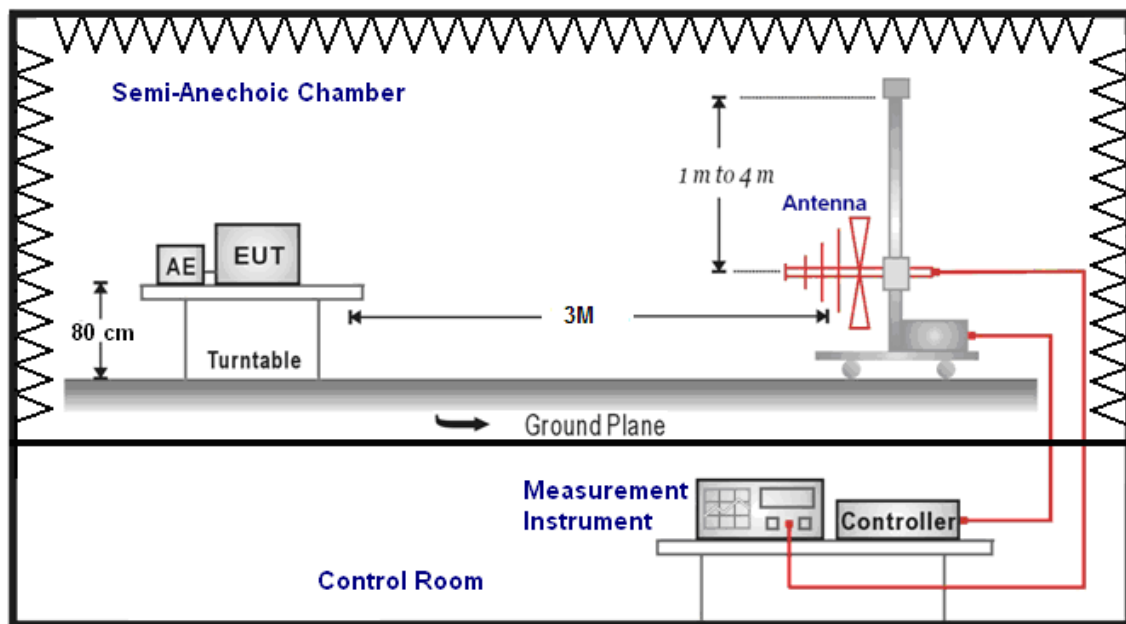
■ Limit

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.

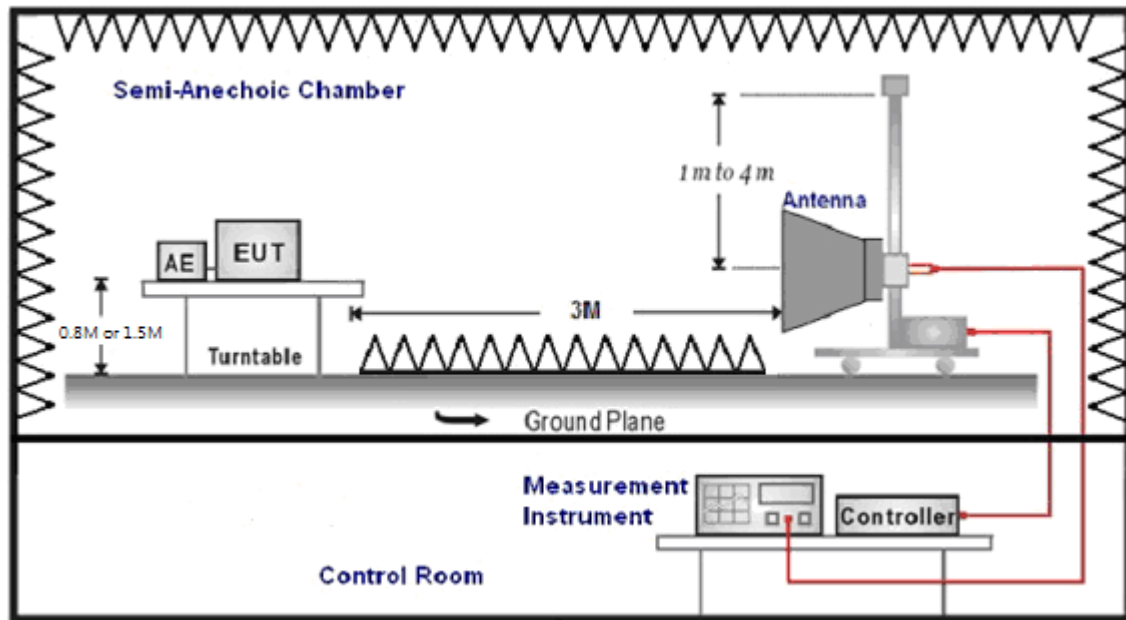
It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

■ Setup

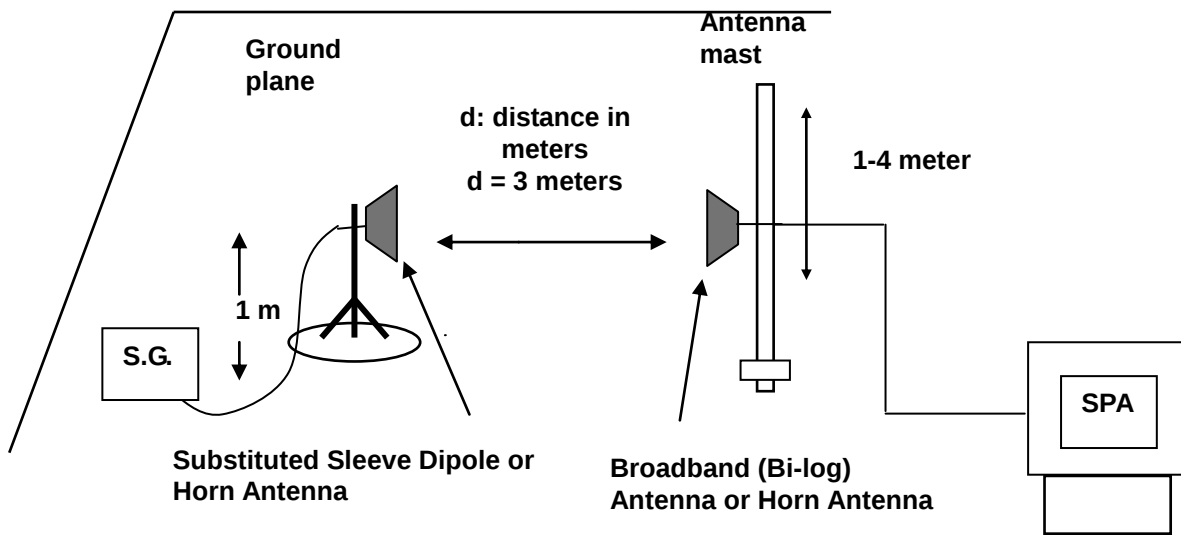
Below 1 GHz



Above 1 GHz



For Substituted Method Test Set-UP



■ Test Procedure

For FCC

- a. The EUT was set up for the maximum power with wwan link data modulation. The power was measured with Spectrum Analyzer. All measurements were done at 3 channels (low, middle and high operational frequency range).
- b. E.I.R.P power measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m (1.5 m for above 1 GHz) height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1 m to 4 m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- c. The substitution antenna (Note:1 & 2) is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value" of step a. Record the power level of S.G.
- d. E.I.R.P. = Output power level of S.G - TX cable loss + Antenna gain of substitution horn
- e. E.R.P. = E.I.R.P.- 2.15 dB
- f. Measurement range 9 kHz - 10 th Harmonic

3 Test Results

Appendix A: Conducted Output Power

Bands	Modulation Type	Sub-Test	Frequency (MHz)	Burst Average Power		Peak Power	
				(dBm)	(W)	(dBm)	(W)
WCDMA Band II	QPSK	-----	1852.4	23.58	0.228	26.95	0.495
			1880.0	23.53	0.225	26.91	0.491
			1907.6	23.57	0.228	26.96	0.497
HSDPA Band II	QPSK	1	1852.4	22.73	0.187	26.05	0.403
			1880.0	22.67	0.185	25.88	0.387
			1907.6	22.71	0.187	25.99	0.397
		2	1852.4	22.12	0.163	25.44	0.350
			1880.0	22.13	0.163	25.41	0.348
			1907.6	22.15	0.164	25.43	0.349
		3	1852.4	22.11	0.163	25.29	0.338
			1880.0	22.05	0.160	25.29	0.338
			1907.6	22.13	0.163	25.40	0.347
		4	1852.4	22.56	0.180	25.74	0.375
			1880.0	22.44	0.175	25.76	0.377
			1907.6	22.53	0.179	25.77	0.378
HSUPA Band II	QPSK	1	1852.4	22.14	0.164	25.32	0.340
			1880.0	22.08	0.161	25.28	0.337
			1907.6	22.12	0.163	25.28	0.337
		2	1852.4	20.07	0.102	23.38	0.218
			1880.0	20.06	0.101	23.36	0.217
			1907.6	20.10	0.102	23.26	0.212
		3	1852.4	21.06	0.128	24.22	0.264
			1880.0	20.99	0.126	24.31	0.270
			1907.6	21.07	0.128	24.30	0.269
		4	1852.4	20.09	0.102	23.32	0.215
			1880.0	20.04	0.101	23.31	0.214
			1907.6	20.00	0.100	23.26	0.212
		5	1852.4	21.94	0.156	25.23	0.333
			1880.0	21.86	0.153	25.03	0.318
			1907.6	21.89	0.155	25.07	0.321

Note: The peak power testing result was used peak detector.

Bands	Modulation Type	Sub-Test	Frequency (MHz)	Burst Average Power		Peak Power	
				(dBm)	(W)	(dBm)	(W)
WCDMA Band V	QPSK	-----	826.4	23.75	0.237	26.97	0.498
			836.6	23.73	0.236	26.99	0.500
			846.6	23.74	0.237	26.99	0.500
HSDPA Band V	QPSK	1	826.4	22.90	0.195	26.12	0.409
			836.6	22.86	0.193	26.10	0.407
			846.6	22.88	0.194	26.13	0.410
		2	826.4	22.29	0.169	25.55	0.359
			836.6	22.27	0.169	25.46	0.352
			846.6	22.26	0.168	25.44	0.350
		3	826.4	22.32	0.171	25.54	0.358
			836.6	22.30	0.170	25.50	0.355
			846.6	22.31	0.170	25.50	0.355
		4	826.4	22.72	0.187	25.89	0.388
			836.6	22.63	0.183	25.93	0.392
			846.6	22.67	0.185	26.01	0.399
HSUPA Band V	QPSK	1	826.4	22.31	0.170	25.62	0.365
			836.6	22.29	0.169	25.48	0.353
			846.6	22.27	0.169	25.49	0.354
		2	826.4	20.27	0.106	23.56	0.227
			836.6	20.27	0.106	23.56	0.227
			846.6	20.23	0.105	23.38	0.218
		3	826.4	21.25	0.133	24.52	0.283
			836.6	21.23	0.133	24.55	0.285
			846.6	21.17	0.131	24.49	0.281
		4	826.4	20.21	0.105	23.55	0.226
			836.6	20.24	0.106	23.38	0.218
			846.6	20.22	0.105	23.46	0.222
		5	826.4	22.11	0.163	25.26	0.336
			836.6	22.12	0.163	25.29	0.338
			846.6	22.10	0.162	25.27	0.337

Note: The peak power testing result was used peak detector.

Bands	Modulation Type	Sub-Test	Frequency (MHz)	Burst Average Power		Peak Power	
				(dBm)	(W)	(dBm)	(W)
WCDMA Band IV	QPSK	-----	1712.4	23.66	0.232	26.97	0.498
			1732.6	23.61	0.230	27.07	0.509
			1752.6	23.59	0.229	26.96	0.497
HSDPA Band IV	QPSK	1	1712.4	22.73	0.187	25.91	0.390
			1732.6	22.80	0.191	26.03	0.401
			1752.6	22.71	0.187	25.90	0.389
		2	1712.4	22.20	0.166	25.39	0.346
			1732.6	22.23	0.167	25.55	0.359
			1752.6	22.16	0.164	25.33	0.341
		3	1712.4	22.19	0.166	25.44	0.350
			1732.6	22.18	0.165	25.50	0.355
			1752.6	22.16	0.164	25.43	0.349
		4	1712.4	22.55	0.180	25.72	0.373
			1732.6	22.63	0.183	25.81	0.381
			1752.6	22.49	0.177	25.63	0.366
HSUPA Band IV	QPSK	1	1712.4	22.18	0.165	25.36	0.344
			1732.6	22.22	0.167	25.51	0.356
			1752.6	22.12	0.163	25.29	0.338
		2	1712.4	20.07	0.102	23.35	0.216
			1732.6	20.15	0.104	23.40	0.219
			1752.6	20.09	0.102	23.41	0.219
		3	1712.4	21.14	0.130	24.41	0.276
			1732.6	21.17	0.131	24.35	0.272
			1752.6	21.01	0.126	24.27	0.267
		4	1712.4	20.10	0.102	23.36	0.217
			1732.6	20.12	0.103	23.41	0.219
			1752.6	20.02	0.100	23.22	0.210
		5	1712.4	22.03	0.160	25.21	0.332
			1732.6	22.06	0.161	25.23	0.333
			1752.6	21.97	0.157	25.12	0.325

Note: The peak power testing result was used peak detector.

Appendix B: Effective Radiated Power / Equivalent Isotropic Radiated Power Test

Band 4								
Band	Modulation	Frequency (MHz)	Ant. Polar.	Read Level (dBm)	Correction Factor (dBm)	E.I.R.P.		Limit (W)
						(dBm)	(W)	
WCDMA	QPSK	1732.6	H	19.19	8.18	27.37	0.546	< 1
			V	17.67	8.18	25.85	0.385	< 1



Appendix C: Field Strength of Spurious Radiation

Standard:	Part 22H&24E&27	Test Distance:	3 m
Test item:	Harmonic	Power:	AC 120 V/60 Hz
Frequency:	1732.6 MHz	Temp.(°C)/Hum.(%RH):	26(°C)/60 %RH
Mode:	3 G_BAND 4_CH1413_H		
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	3465.200	-71.87	13.36	-58.51	-13.00	-45.51	peak
2	5197.800	-69.64	18.01	-51.63	-13.00	-38.63	peak

Standard:	Part 22H&24E&27	Test Distance:	3 m
Test item:	Harmonic	Power:	AC 120 V/60 Hz
Frequency:	1732.6 MHz	Temp.(°C)/Hum.(%RH):	26(°C)/60 %RH
Mode:	3 G_BAND 4_CH1413_V		
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	3465.200	-70.10	13.36	-56.74	-13.00	-43.74	peak
2	5197.800	-71.85	18.01	-53.84	-13.00	-40.84	peak