

RF Test Report

Applicant : D-Link Corporation
Product Type : Wireless AC1200 4G LTE Router
Trade Name : D-Link
Model Number : DWR-961
Test Specification : FCC 47 CFR PART 90S
ANSI/TIA-603-E 2016
Receive Date : Mar. 30, 2018
Test Period : Apr. 02 ~ Apr. 10, 2018
Issue Date : Apr. 18, 2018

Issue by

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American Association for Laboratory Accreditation number: 3464.02

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Revision History

Rev.	Issue Date	Revisions	Revised By
00	Apr. 18, 2018	Initial Issue	Nina Lin



Verification of Compliance

Issued Date: Apr. 18, 2018

Applicant : D-Link Corporation
Product Type : Wireless AC1200 4G LTE Router
Trade Name : D-Link
Model Number : DWR-961
FCC ID : KA2WR961C1
EUT Rated Voltage : DC 12.0V, 1.5A
Test Voltage : 120 Vac / 60 Hz
Applicable Standard : FCC 47 CFR PART 90S
ANSI/TIA-603-E 2016
Test Result : Complied



Performing Lab. : A Test Lab Techno Corp.
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American Association for Laboratory Accreditation number:
3464.02

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. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.



Approved By :  (Manager) Reviewed By :  (Testing Engineer)
(Hai Wang) (Mick Zhang)



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1 General Information

1.1. EUT Description

Applicant	D-Link Corporation 17595 Mt. Herrmann, Fountain Valley, California, 92708, United States		
Manufacturer	CAMEO COMMUNICATIONS, INC. 5F, No.158, Ruihu St., Neihu Dist., Taipei City 114, Taiwan (R.O.C.)		
Product Type	Wireless AC1200 4G LTE Router		
Trade Name	D-Link		
Model Number	DWR-961		
FCC ID	KA2WR961C1		
Class II Permissive Change	Add LTE B13/25/26/41 bands by software change, and make a change to the different external design with the same materials.		
IMEI No.	359073060231420		
Operate Band	Frequency Range (MHz)	Modulation	Channel Bandwidth
LTE Band 26	UL: 814.7 ~ 823.3	QPSK, 16QAM	1.4M, 3M, 5MHz, 10MHz,
	DL: 861.5 ~ 891.5	QPSK, 16QAM	
LTE Band2A+13A_DL CA LTE Band4A+13A_DL CA LTE Band41A+41A_DL CA			
Type of Antenna	External Antenna		
Antenna Gain	Main	LTE Band 26	-0.26 dBi
	Diversity	LTE Band 26	0.59 dBi
Operate Temp. Range	0 ~ 40 °C		



Band	Channel Bandwidth	Modulation	Max. RF Output Power	E.R.P. /E.I.R.P.
			(W)	(W)
LTE Band26	1.4MHz	QPSK	0.187	0.142
LTE Band26	1.4MHz	16QAM	0.157	0.091
LTE Band26	3MHz	QPSK	0.194	0.142
LTE Band26	3MHz	16QAM	0.158	0.092
LTE Band26	5MHz	QPSK	0.188	0.136
LTE Band26	5MHz	16QAM	0.156	0.093
LTE Band26	10MHz	QPSK	0.189	0.133
LTE Band26	10MHz	16QAM	0.152	0.090

Band	Channel Bandwidth	Modulation	Emission Designator Occupied Bandwidth (MHz)	
LTE Band26	1.4MHz	QPSK	1.0765	1M08G7D
LTE Band26	1.4MHz	16QAM	1.0768	1M08W7D
LTE Band26	3MHz	QPSK	2.6877	2M69G7D
LTE Band26	3MHz	16QAM	2.6882	2M69W7D
LTE Band26	5MHz	QPSK	4.4737	4M47G7D
LTE Band26	5MHz	16QAM	4.4918	4M49W7D
LTE Band26	10MHz	QPSK	8.9311	8M93G7D
LTE Band26	10MHz	16QAM	8.9430	8M94W7D



1.2. Mode of Operation

Three channels had been tested for each channel bandwidth.

LTE Band 26				
Channel Bandwidth	1.4MHz		3MHz	
	Channel	Frequency (MHz)	Channel	Frequency (MHz)
Low CH	26697	814.7	26705	815.5
Middle CH	26740	819.0	26740	819.0
High CH	26783	823.3	26775	822.5
Channel Bandwidth	5MHz		10MHz	
	Channel	Frequency (MHz)	Channel	Frequency (MHz)
Low CH	26715	816.5	26740	819.0
Middle CH	26740	819.0		
High CH	26765	821.5		



During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission.

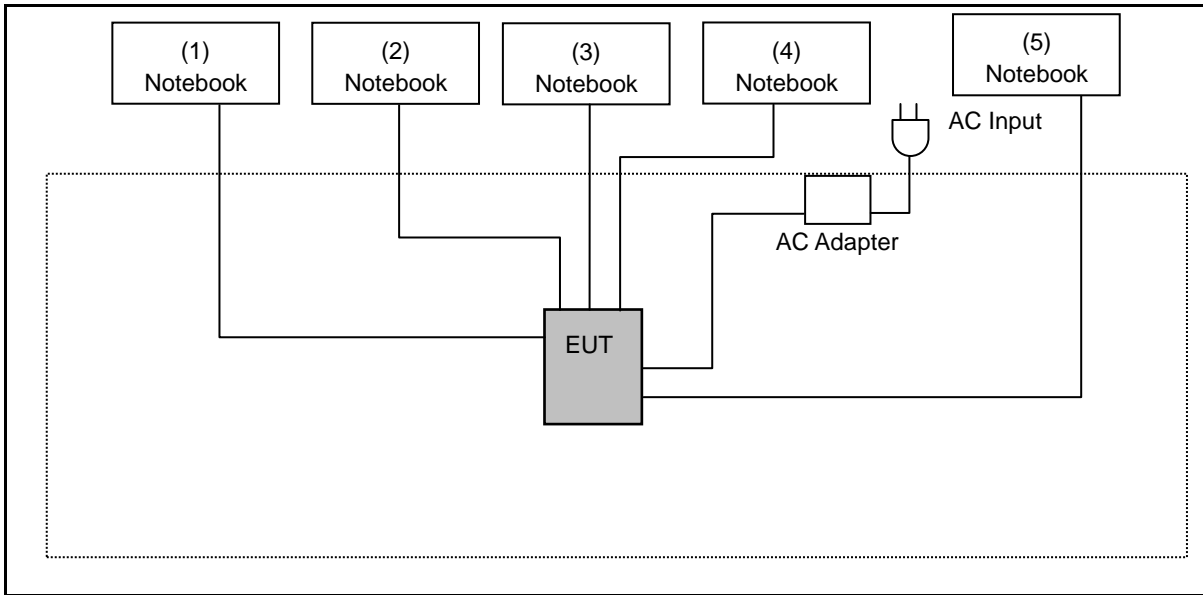
Frequency range investigated for radiated emission: 30MHz to 26.5 GHz.

Band	Channel Bandwidth	Test Modes	
LTE Band 26	1.4 MHz	<input type="checkbox"/> LTE(RB Size 1, RB Offset 0) Link <input type="checkbox"/> LTE(RB Size 1, RB Offset 2) Link <input checked="" type="checkbox"/> LTE(RB Size 1, RB Offset 5) Link <input type="checkbox"/> LTE(RB Size 3, RB Offset 0) Link <input type="checkbox"/> LTE(RB Size 3, RB Offset 1) Link <input type="checkbox"/> LTE(RB Size 3, RB Offset 3) Link <input type="checkbox"/> LTE(RB Size 6, RB Offset 0) Link	QPSK
	3 MHz	<input type="checkbox"/> LTE(RB Size 1, RB Offset 0) Link <input checked="" type="checkbox"/> LTE(RB Size 1, RB Offset 7) Link <input type="checkbox"/> LTE(RB Size 1, RB Offset 14) Link <input type="checkbox"/> LTE(RB Size 8, RB Offset 0) Link <input type="checkbox"/> LTE(RB Size 8, RB Offset 3) Link <input type="checkbox"/> LTE(RB Size 8, RB Offset 7) Link <input type="checkbox"/> LTE(RB Size 15, RB Offset 0) Link	QPSK
	5 MHz	<input checked="" type="checkbox"/> LTE(RB Size 1, RB Offset 0) Link <input type="checkbox"/> LTE(RB Size 1, RB Offset 12) Link <input type="checkbox"/> LTE(RB Size 1, RB Offset 24) Link <input type="checkbox"/> LTE(RB Size 12, RB Offset 0) Link <input type="checkbox"/> LTE(RB Size 12, RB Offset 6) Link <input type="checkbox"/> LTE(RB Size 12, RB Offset 13) Link <input type="checkbox"/> LTE(RB Size 25, RB Offset 0) Link	QPSK
	10 MHz	<input checked="" type="checkbox"/> LTE(RB Size 1, RB Offset 0) Link <input type="checkbox"/> LTE(RB Size 1, RB Offset 24) Link <input type="checkbox"/> LTE(RB Size 1, RB Offset 49) Link <input type="checkbox"/> LTE(RB Size 25, RB Offset 0) Link <input type="checkbox"/> LTE(RB Size 25, RB Offset 12) Link <input type="checkbox"/> LTE(RB Size 25, RB Offset 25) Link <input type="checkbox"/> LTE(RB Size 50, RB Offset 0) Link	QPSK

1.3. EUT Exercise Software

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

1.4. Configuration of Test System Details



Devices Description					
	Product	Manufacturer	Model Number	Serial Number	Power Cord
(1)	Notebook	Lenovo	B490	WB12542618	Non-Shielded, 1.8m
(2)	Notebook	Lenovo	X260	SL10K74503 JS	Non-Shielded, 1.8m
(3)	Notebook	Lenovo	E450	0B95180	Non-Shielded, 1.8m
(4)	Notebook	Lenovo	T460	SL10K61104 JS	Non-Shielded, 1.8m
(5)	Notebook	Lenovo	X260	SL10K74503 JS	Non-Shielded, 1.8m



1.5. Test Instruments

For Conducted

Test Period: Apr. 10, 2018

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Cycle
Radio Communication Analyzer	Anritsu	MT8820C	6201144493	09/19/2017	1 year
Spectrum Analyzer (10Hz~26.5GHz)	Agilent	N9020A	MY53420615	09/19/2017	1 year
Programmable temp &humi chamber	ETAI	9712A	647	09/19/2017	1 year

For Spurious Radiation

Test Period: Apr. 02 ~ Apr.05, 2018

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Cycle
Preamplifier (10kHz~3GHz)	EMCI	EMC001330	980300	09/19/2017	1 year
Preamplifier (0.1GHz~26.5GHz)	EMCI	EMC012645SE	980318	09/19/2017	1 year
Preamplifier (26.5GHz~40GHz)	EMCI	EMC2654045	980028	08/29/2017	1 year
Bilog Antenna (30MHz~1.4GHz)	Schwarzbeck	VULB 9168	672	11/15/2017	1 year
Horn Antenna (1GHz~18GHz)	ETS	3117	00204949	11/16/2017	1 year
Horn Antenna (18GHz~26.5GHz)	ETS	3160-09	00202549	11/16/2017	1 year
Horn Antenna (18GHz~40GHz)	ETS	3116	00086467	12/29/2017	1 year
Receiver (3Hz~26.5GHz)	Keysight	N9038A	MY51210179	09/19/2017	1 year
Spectrum Analyzer (3Hz~43GHz)	Keysight	N9030A	MY55410268	09/19/2017	1 year
Cable (30MHz~1GHz)	EMCI	N/A	1066LFC	09/19/2017	1 year
Cable (1GHz~18GHz)	EMCI	N/A	160719	09/19/2017	1 year
Cable (1GHz~18GHz)	EMCI	N/A	160324	09/19/2017	1 year
Cable (1GHz~18GHz)	EMCI	N/A	160322	09/19/2017	1 year
Loop Antenna	EMCI	LPA600	272	02/07/2018	1 year
Test Site	OuHeng	MFAC3M	RE-026	03/15/2018	1 year

Note: N.C.R. = No Calibration Request.



1.6. Test Site Environment

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	26
Humidity (%RH)	25-75	60
Barometric pressure (mbar)	860-1060	950

Test Setting Condition		
L.V.	Low Voltage	AC 102V
N.V.	Normal Voltage	AC 120V
H.V.	High Voltage	AC 138V
L.T.	Low Temperature	0 °C
N.T.	Normal Temperature	+25 °C
H.T.	High Temperature	+40 °C

1.7. Summary of Test Result

FCC Rule	Description	Result
§2.1046	Conducted Output Average Power	Pass
§90.635	Equivalent Isotropic Radiated Power / Equivalent Radiated Power	Pass
§2.1055	Frequency Stability	Pass
§2.1049	Emission Bandwidth & Occupied Bandwidth	Pass
KDB 971168	Peak to average ratio	Pass
§2.1051 §90.543	Band Edge	Pass
§2.1051 §90.543	Conducted Spurious Emissions	Pass
§2.1053 §90.543	Radiated Spurious Emissions	Pass

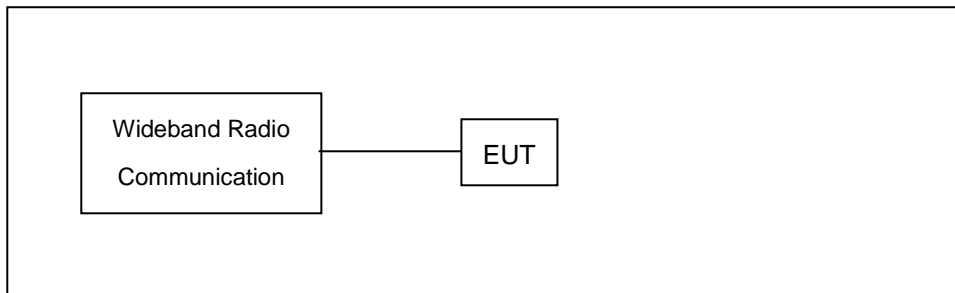
2 Measurement Procedure

2.1. Conducted Output Average Power Test

- **Limit**

N/A

- **Test Setup**



- **Test Procedure**

- The EUT was set up for the maximum power 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 Conducted Power measurement is 1.2 dB.

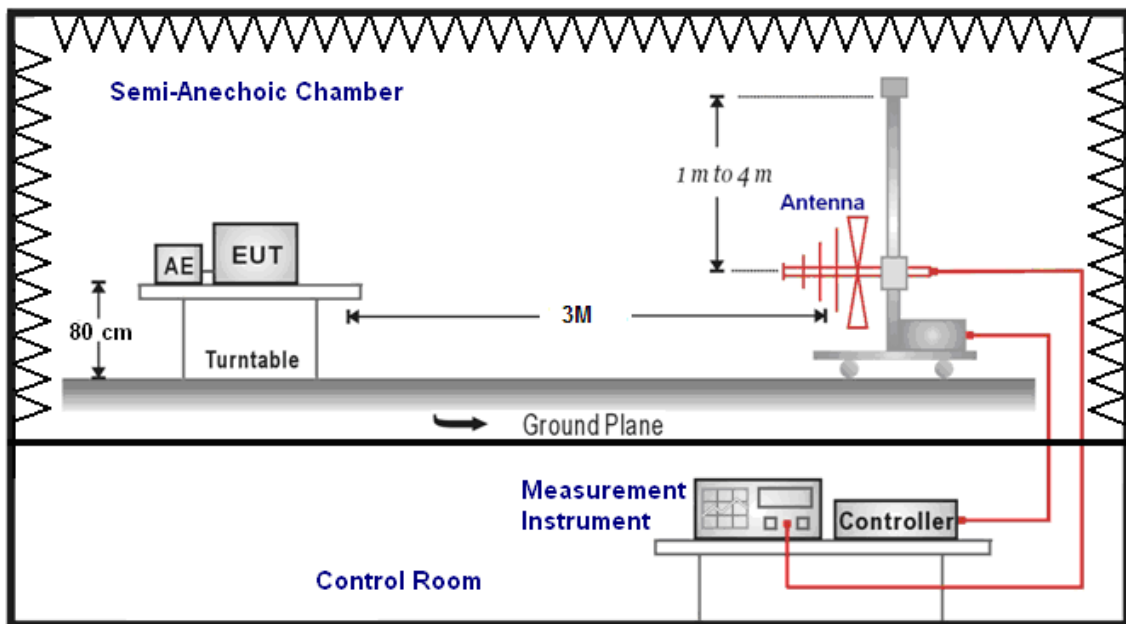
2.2. Effective Radiated Power / Equivalent Isotropic Radiated Power Test

■ Limit

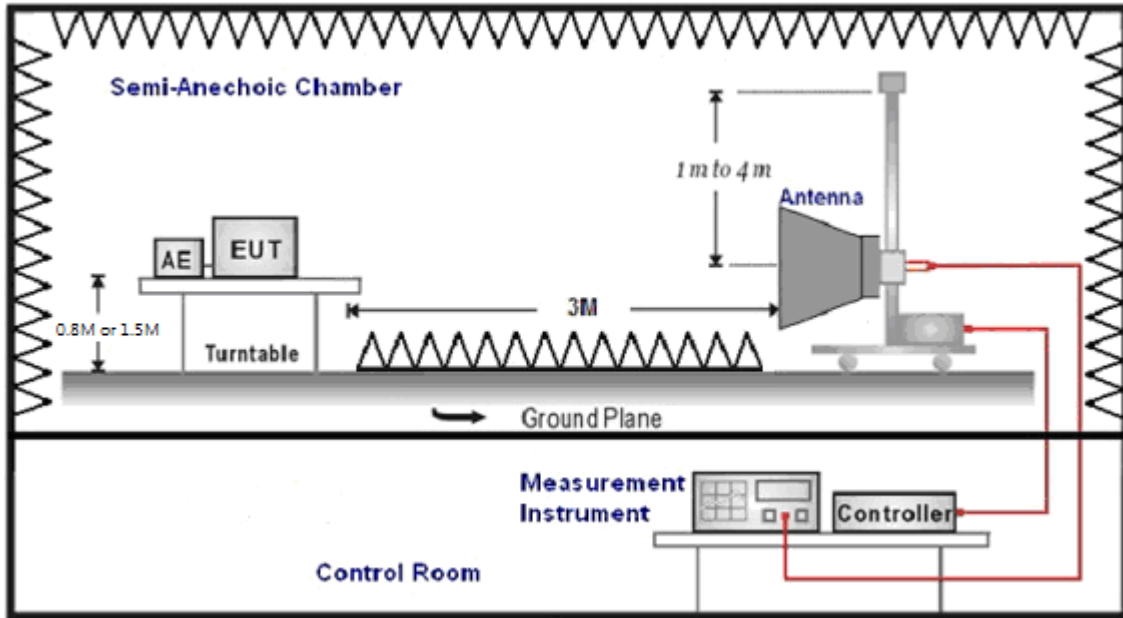
For FCC Part 90.635: Mobile stations in the 806-824 MHz band is limited to 100 watts(20dBw) ERP

■ Test Setup

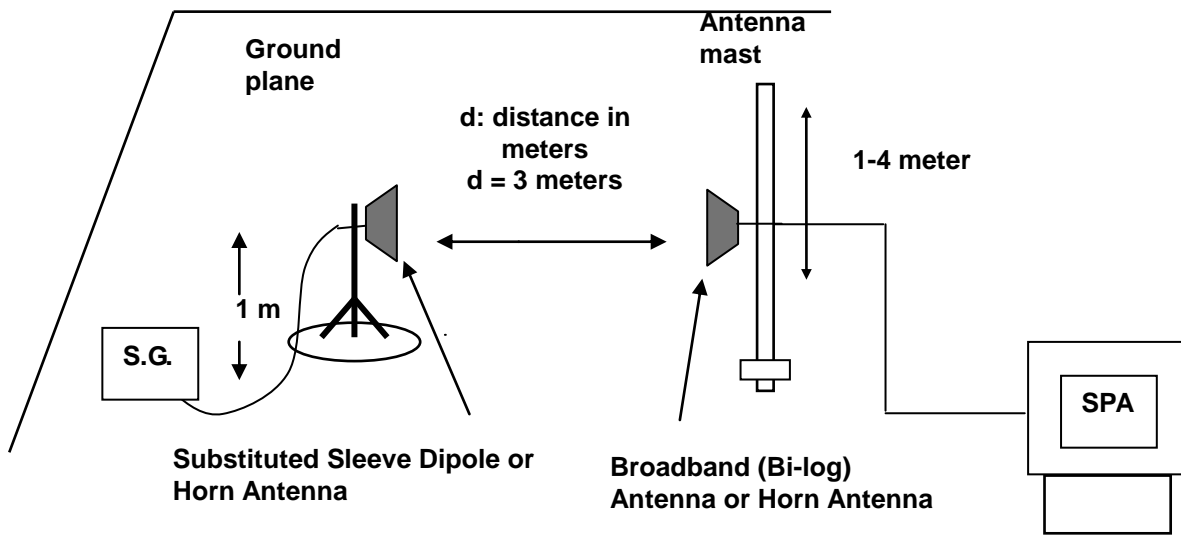
Below 1 GHz



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 0.8m 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 1m to 4m 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

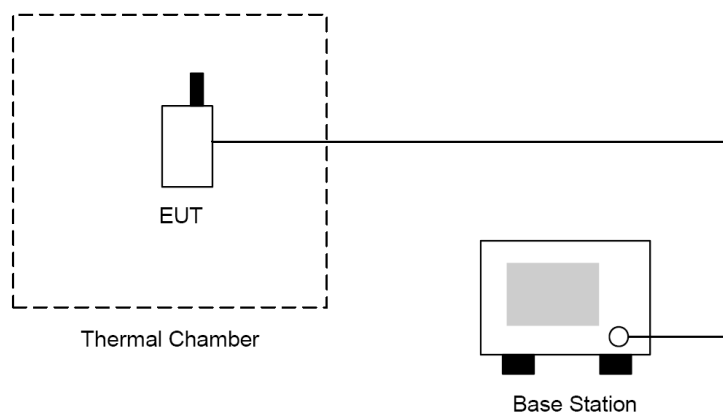
The measurement uncertainty is defined as for Field Strength of Spurious Radiation measurement is $\pm 3.072 \text{ dB}$.

2.3. Frequency Stability Test

■ Limit

According to the FCC rule shall be tested the frequency stability. The rule is defined that” The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation. The test extreme voltage is according to the 2.1055(d)(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment and the extreme temperature rule is comply with the 2.1055(a)(1) $-30^{\circ}\text{C} \sim 50^{\circ}\text{C}$.

■ Setup



■ Test Procedure

1. The EUT and test equipment were set up as shown on the following section.
2. With all power removed, the temperature was decreased to -30°C and permitted to stabilize for three hours. Power was applied and the maximum change in frequency was note within one minute.
3. With power OFF, the temperature was raised in 10°C steps. The sample was permitted to stabilize at each step for at least one-half hour. Power was applied and the maximum frequency change was noted within one minute.
4. The EUT was placed in a temperature chamber at $25 \pm 5^{\circ}\text{C}$ and connected as the following section.
5. The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT.
6. The temperature tests were performed for the worst case.
7. Test data was recorded.

■ Uncertainty

The measurement uncertainty is defined as for Frequency Stability measurement is $\pm 10\text{Hz}$.

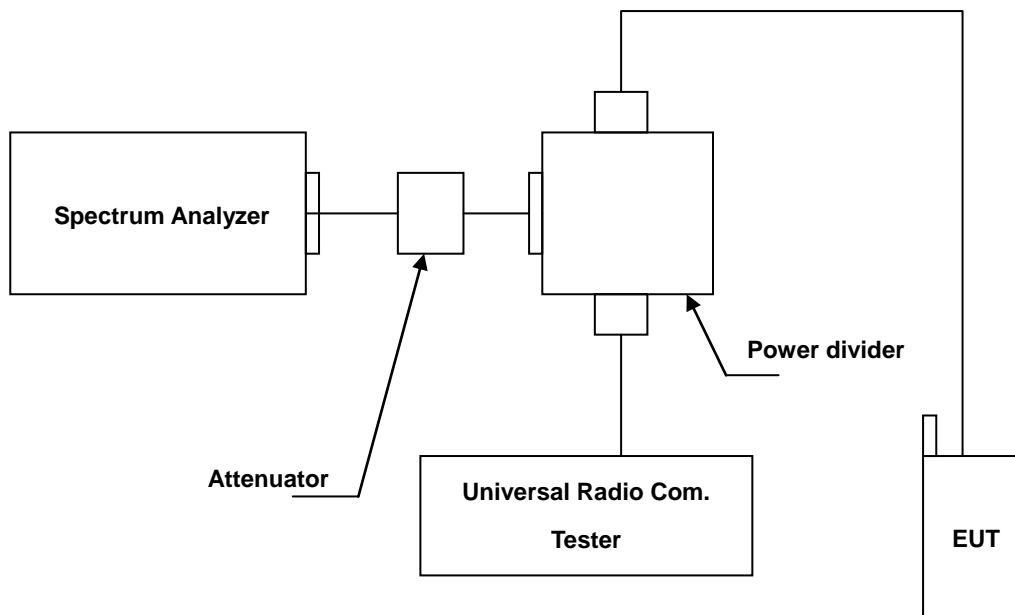
2.4. Emission Bandwidth & Occupied Bandwidth Test

■ Limit

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 power of a given emission.

The emission bandwidth is defined as the width of the signal between two points, located at the 2 sides of the carrier frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

■ Setup



■ Test Procedure

- The EUT makes a phone call to the communication simulator. The power was measured with Spectrum Analyzer. All measurements were done at 3 channels. (low, middle and high operational frequency range.)
- The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

■ Uncertainty

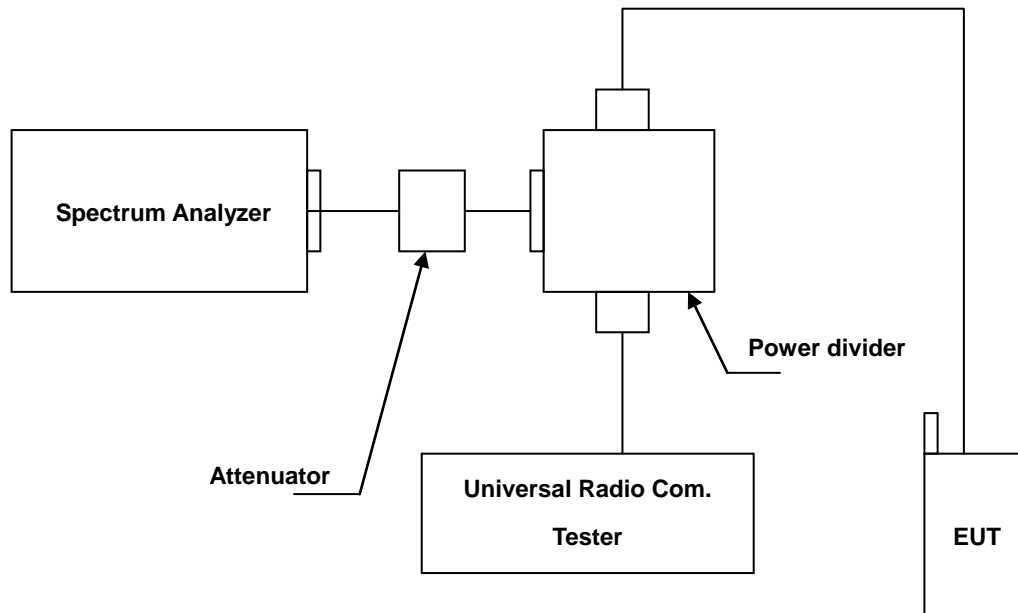
The measurement uncertainty is defined as $\pm 10\text{Hz}$

2.5. Peak to Average Ratio Test

■ Limit

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

■ Setup



■ Test Procedure

- Set resolution/measurement bandwidth = signal's occupied bandwidth;
- Set the number of counts to a value that stabilizes the measured CCDF curve;
- Record the maximum PAPR level associated with a probability of 0.1%.

■ Uncertainty

The measurement uncertainty is defined as for Conducted Power measurement is 1.2 dB.

2.6. Band Edge Test

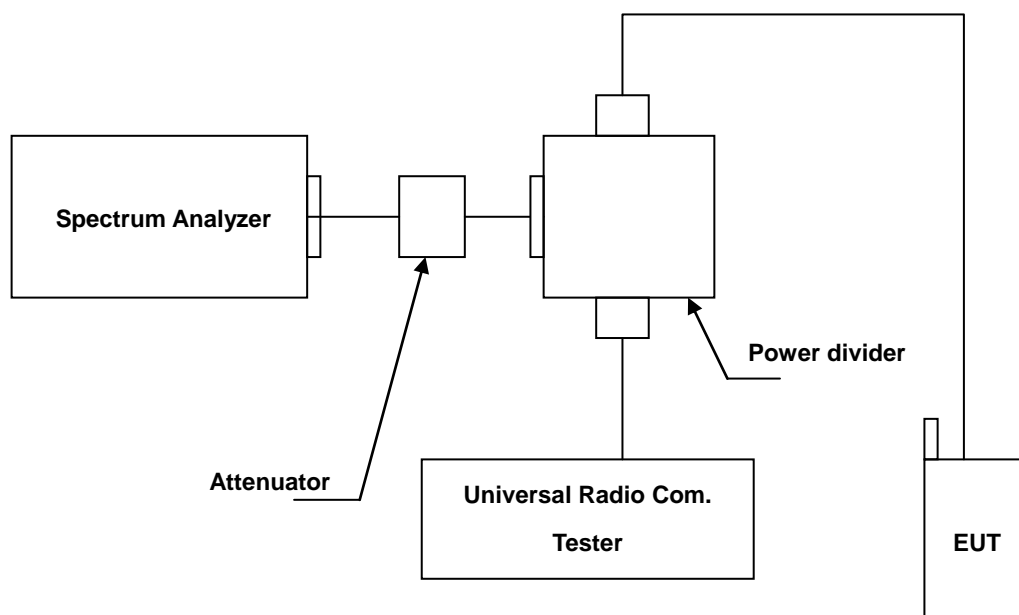
■ Limit

The Band Edge Limit:

§90.691

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 $50 + 10\log_{10}(P[\text{Watts}])$ at Band Edge and for all out-of-band emissions within 37.5Khz of Block Edge.

■ Setup



■ Test Procedure

- The EUT was set up for the maximum peak power with WWAN link data modulation. The power was measured with Spectrum Analyzer. All measurements were done at 2 channels (low and high operational frequency range.)
- The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer. This splitter loss and cable loss are the worst loss in the transmitted path track.
- The center frequency of spectrum is the band edge frequency. RB of the resolution bandwidth of at least one percent of the emission bandwidth.
- Record the max trace plot into the test report.

■ Uncertainty

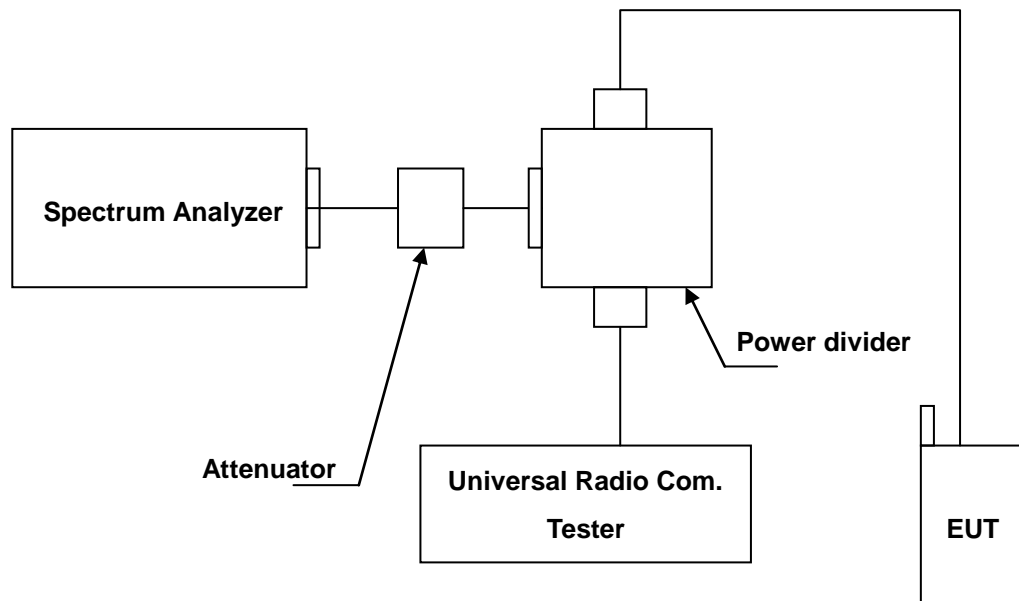
The measurement uncertainty is defined as for Conducted Power measurement is 1.2 dB.

2.7. Conducted Spurious Emission Test

■ Limit

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB. The limit of emission equal to -13dBm

■ Setup



■ Test Procedure

- The EUT was set up for the maximum peak 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.).
- The conducted spurious emission used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- When the spectrum scanned from 10MHz to 10^{th} harmonic. The spectrum set RB=1MHz, VB=3MHz.

■ Uncertainty

The measurement uncertainty is evaluated as ± 2.24 dB.

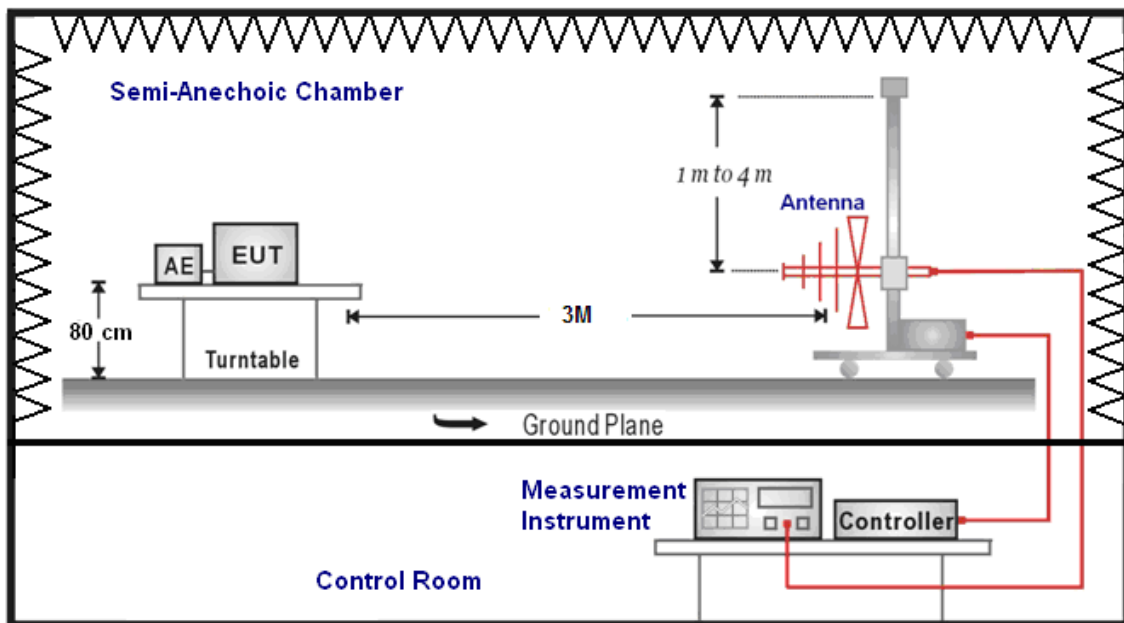
2.8. Radiated Emission Test

■ Limit

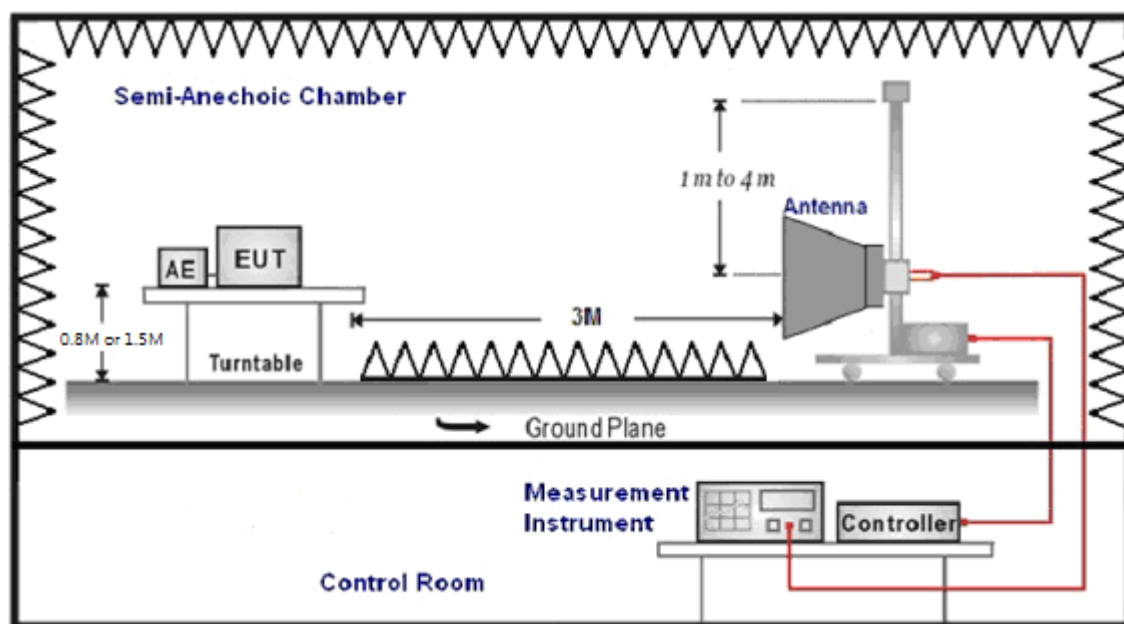
The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB. The limit of emission equal to -13dBm

■ Setup

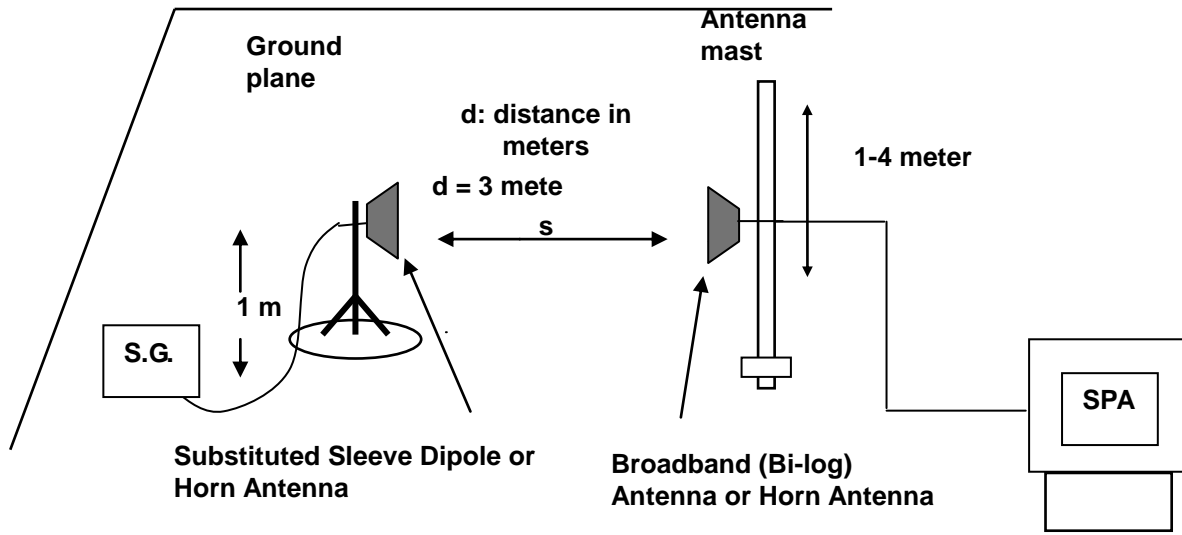
Below 1GHz



Above 1GHz



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. Radiation Emission measurement. In the semi-anechoic chamber, EUT placed on the 0.8m 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 1m to 4m 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 Antenn

■ Uncertainty

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



3 Test Results

Conducted Output Average Power

Band	Channel Bandwidth	Modulation	Channel	Frequency (MHz)	RB Configuration		Average Power	
					Size	Offset	(dBm)	(W)
LTE Band26	1.4MHz	QPSK	26697	814.7	1	0	22.64	0.184
					1	2	22.67	0.185
					1	5	22.61	0.182
					3	0	22.54	0.179
					3	1	22.72	0.187
					3	3	22.58	0.181
			6	0	21.58	0.144		
			26740	819.0	1	0	22.52	0.179
					1	2	22.64	0.184
					1	5	22.55	0.180
					3	0	22.44	0.175
					3	1	22.55	0.180
					3	3	22.46	0.176
			6	0	21.36	0.137		
			26783	823.3	1	0	22.57	0.181
					1	2	22.51	0.178
					1	5	22.45	0.176
					3	0	22.36	0.172
		3			1	22.51	0.178	
		3			3	22.37	0.173	
		6	0	21.37	0.137			
		16QAM	26697	814.7	1	0	21.96	0.157
					1	2	21.92	0.156
					1	5	21.88	0.154
					3	0	21.74	0.149
					3	1	21.86	0.153
					3	3	21.72	0.149
			6	0	20.93	0.124		
			26740	819.0	1	0	21.72	0.149
					1	2	21.75	0.150
					1	5	21.81	0.152
					3	0	21.48	0.141
					3	1	21.52	0.142
					3	3	21.43	0.139
			6	0	20.87	0.122		
			26783	823.3	1	0	21.88	0.154
1	2				21.67	0.147		
1	5				21.80	0.151		
3	0				21.54	0.143		
3	1	21.60			0.145			
3	3	21.48			0.141			
6	0	20.88	0.122					



Band	Channel Bandwidth	Modulation	Channel	Frequency (MHz)	RB Configuration		Average Power	
					Size	Offset	(dBm)	(W)
LTE Band26	3MHz	QPSK	26705	815.5	1	0	22.69	0.186
					1	7	22.87	0.194
					1	14	22.68	0.185
					8	0	21.66	0.147
					8	3	21.68	0.147
					8	7	21.67	0.147
			15	0	21.66	0.147		
			26740	819.0	1	0	22.53	0.179
					1	7	22.59	0.182
					1	14	22.45	0.176
					8	0	21.50	0.141
					8	3	21.48	0.141
					8	7	21.45	0.140
			15	0	21.47	0.140		
			26775	822.5	1	0	22.58	0.181
					1	7	22.66	0.185
					1	14	22.49	0.177
					8	0	21.58	0.144
		8			3	21.49	0.141	
		8			7	21.47	0.140	
		15	0	21.48	0.141			
		16QAM	26705	815.5	1	0	21.91	0.155
					1	7	21.88	0.154
					1	14	21.88	0.154
					8	0	20.67	0.117
					8	3	20.67	0.117
					8	7	20.70	0.117
			15	0	20.61	0.115		
			26740	819.0	1	0	21.79	0.151
					1	7	21.98	0.158
1	14				21.67	0.147		
8	0				20.55	0.114		
8	3				20.52	0.113		
8	7	20.53			0.113			
15	0	20.40	0.110					
26775	822.5	1	0	21.86	0.153			
		1	7	21.95	0.157			
		1	14	21.71	0.148			
		8	0	20.63	0.116			
		8	3	20.50	0.112			
		8	7	20.53	0.113			
15	0	20.40	0.110					



Band	Channel Bandwidth	Modulation	Channel	Frequency (MHz)	RB Configuration		Average Power	
					Size	Offset	(dBm)	(W)
LTE Band26	5MHz	QPSK	26715	816.5	1	0	22.74	0.188
					1	12	22.64	0.184
					1	24	22.61	0.182
					12	0	21.78	0.151
					12	6	21.81	0.152
					12	13	21.59	0.144
			25	0	21.66	0.147		
			1	0	22.66	0.185		
			1	12	22.44	0.175		
			1	24	22.56	0.180		
			12	0	21.40	0.138		
			12	6	21.49	0.141		
			12	13	21.39	0.138		
			25	0	21.50	0.141		
			1	0	22.71	0.187		
			1	12	22.65	0.184		
			1	24	22.65	0.184		
			12	0	21.80	0.151		
		12	6	21.85	0.153			
		12	13	21.64	0.146			
		25	0	21.71	0.148			
		1	0	21.87	0.154			
		1	12	21.74	0.149			
		1	24	21.66	0.147			
		12	0	20.74	0.119			
		12	6	20.74	0.119			
		12	13	20.61	0.115			
		25	0	20.67	0.117			
		1	0	21.88	0.154			
		1	12	21.85	0.153			
1	24	21.81	0.152					
12	0	20.44	0.111					
12	6	20.50	0.112					
12	13	20.43	0.110					
25	0	20.50	0.112					
1	0	21.92	0.156					
1	12	21.85	0.153					
1	24	21.74	0.149					
12	0	20.78	0.120					
12	6	20.78	0.120					
12	11	20.62	0.115					
25	0	20.67	0.117					



Band	Channel Bandwidth	Modulation	Channel	Frequency (MHz)	RB Configuration		Average Power	
					Size	Offset	(dBm)	(W)
LTE Band26	10MHz	QPSK	26740	819	1	0	22.77	0.189
					1	24	22.59	0.182
					1	49	22.5	0.178
					25	0	21.58	0.144
					25	12	21.5	0.141
					25	25	21.44	0.139
					50	0	21.54	0.143
	16QAM	26740	819	1	0	21.81	0.152	
				1	24	21.83	0.152	
				1	49	21.67	0.147	
				25	0	20.59	0.115	
				25	12	20.5	0.112	
				25	25	20.45	0.111	
				50	0	20.54	0.113	



Effective Radiated Power / Equivalent Isotropic Radiated Power

Band 26								
Channel Bandwidth	Modulation	Frequency (MHz)	Ant. Polar.	Read Level (dBm)	Correction Factor (dBm)	E.R.P.		Limit (W)
						(dBm)	(W)	
1.4M	QPSK	814.7	H	8.69	10.43	19.12	0.082	< 100
			V	11.09	10.43	21.52	0.142	< 100
		819.0	H	9.03	10.49	19.52	0.090	< 100
			V	10.71	10.49	21.20	0.132	< 100
		823.3	H	8.78	10.54	19.32	0.086	< 100
			V	10.91	10.54	21.45	0.140	< 100
16QAM	819.0	H	6.94	10.50	17.44	0.055	< 100	
		V	9.10	10.49	19.59	0.091	< 100	
3M	QPSK	815.5	H	9.01	10.43	19.44	0.088	< 100
			V	11.09	10.43	21.52	0.142	< 100
		819.0	H	8.98	10.49	19.47	0.089	< 100
			V	10.86	10.49	21.35	0.136	< 100
		822.5	H	8.75	10.52	19.27	0.085	< 100
			V	10.89	10.52	21.41	0.138	< 100
16QAM	819.0	H	7.15	10.48	17.63	0.058	< 100	
		V	9.16	10.49	19.65	0.092	< 100	
5M	QPSK	816.5	H	8.77	10.43	19.20	0.083	< 100
			V	10.87	10.43	21.30	0.135	< 100
		819.0	H	8.96	10.47	19.43	0.088	< 100
			V	10.66	10.47	21.13	0.130	< 100
		821.5	H	8.81	10.49	19.30	0.085	< 100
			V	10.85	10.49	21.34	0.136	< 100
16QAM	819.0	H	7.28	10.46	17.74	0.059	< 100	
		V	9.21	10.47	19.68	0.093	< 100	
10M	QPSK	819.0	H	8.71	10.43	19.14	0.082	< 100
			V	10.81	10.43	21.24	0.133	< 100
	16QAM	819.0	H	6.95	10.43	17.38	0.055	< 100
			V	9.13	10.43	19.56	0.090	< 100



Radiated Emission

Standard:	Part 90S	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	814.7MHz	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4G_BAND 26_1.4M_QPSK_CH26697		
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1629.400	-67.42	7.15	-60.27	-13.00	-47.27	peak

Standard:	Part 90S	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	814.7MHz	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4G_BAND 26_1.4M_QPSK_CH26697		
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1629.400	-69.22	7.15	-62.07	-13.00	-49.07	peak



Standard:	Part 90S	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	819MHz	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4G_BAND 26_1.4M_QPSK_CH26740		
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1638.000	-68.65	7.18	-61.47	-13.00	-48.47	peak

Standard:	Part 90S	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	819MHz	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4G_BAND 26_1.4M_QPSK_CH26740		
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1638.000	-68.81	7.18	-61.63	-13.00	-48.63	peak



Standard:	Part 90S	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	823.3MHz	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4G_BAND 26_1.4M_QPSK_CH26783		
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1646.600	-68.84	7.21	-61.63	-13.00	-48.63	peak

Standard:	Part 90S	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	823.3MHz	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4G_BAND 26_1.4M_QPSK_CH26783		
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1646.600	-68.29	7.21	-61.08	-13.00	-48.08	peak



Standard:	Part 90S	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	819MHz	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4G_BAND 26_1.4M-16QAM_CH26740		
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1638.000	-67.94	7.18	-60.76	-13.00	-47.76	peak

Standard:	Part 90S	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	819MHz	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4G_BAND 26_1.4M-16QAM_CH26740		
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1638.000	-69.23	7.18	-62.05	-13.00	-49.05	peak



Standard:	Part 90S	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	815.5MHz	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4G_BAND 26_3M_QPSK_CH26705		
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1631.000	-70.06	7.15	-62.91	-13.00	-49.91	peak

Standard:	Part 90S	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	815.5MHz	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4G_BAND 26_3M_QPSK_CH26705		
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1631.000	-68.27	7.15	-61.12	-13.00	-48.12	peak



Standard:	Part 90S	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	819MHz	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4G_BAND 26_3M_QPSK_CH26740		
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1638.000	-69.79	7.18	-62.61	-13.00	-49.61	peak

Standard:	Part 90S	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	819MHz	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4G_BAND 26_3M_QPSK_CH26740		
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1638.000	-68.28	7.18	-61.10	-13.00	-48.10	peak



Standard:	Part 90S	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	822.5MHz	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4G_BAND 26_3M_QPSK_CH26775		
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1645.000	-69.26	7.22	-62.04	-13.00	-49.04	peak

Standard:	Part 90S	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	822.5MHz	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4G_BAND 26_3M_QPSK_CH26775		
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1645.000	-69.73	7.22	-62.51	-13.00	-49.51	peak



Standard:	Part 90S	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	819MHz	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4G_BAND 26_3M-16QAM_CH26740		
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1645.000	-69.09	7.22	-61.87	-13.00	-48.87	peak

Standard:	Part 90S	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	819MHz	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4G_BAND 26_3M-16QAM_CH26740		
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1638.000	-68.32	7.18	-61.14	-13.00	-48.14	peak



Standard:	Part 90S	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	816.5MHz	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4G_BAND 26_5M_QPSK_CH26715		
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1633.000	-68.17	7.16	-61.01	-13.00	-48.01	peak

Standard:	Part 90S	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	816.5MHz	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4G_BAND 26_5M_QPSK_CH26715		
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1633.000	-67.94	7.16	-60.78	-13.00	-47.78	peak



Standard:	Part 90S	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	819MHz	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4G_BAND 26_5M_QPSK_CH26740		
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1638.000	-68.38	7.18	-61.20	-13.00	-48.20	peak

Standard:	Part 90S	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	819MHz	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4G_BAND 26_5M_QPSK_CH26740		
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1638.000	-68.56	7.18	-61.38	-13.00	-48.38	peak



Standard:	Part 90S	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	821.5MHz	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4G_BAND 26_5M_QPSK_CH26765		
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1643.000	-68.04	7.20	-60.84	-13.00	-47.84	peak

Standard:	Part 90S	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	821.5MHz	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4G_BAND 26_5M_QPSK_CH26765		
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1643.000	-69.51	7.20	-62.31	-13.00	-49.31	peak



Standard:	Part 90S	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	819MHz	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4G_BAND 26_5M-16QAM_CH26740		
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1638.000	-68.30	7.18	-61.12	-13.00	-48.12	peak

Standard:	Part 90S	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	819MHz	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4G_BAND 26_5M-16QAM_CH26740		
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1638.000	-69.52	7.18	-62.34	-13.00	-49.34	peak



Standard:	Part 90S	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	819MHz	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4G_BAND 26_10M_QPSK_CH26740		
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1638.000	-67.66	7.18	-60.48	-13.00	-47.48	peak

Standard:	Part 90S	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	819MHz	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4G_BAND 26_10M_QPSK_CH26740		
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1638.000	-68.72	7.18	-61.54	-13.00	-48.54	peak



Standard:	Part 90S	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	819MHz	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4G_BAND 26_10M-16QAM_CH26740		
Ant.Polar.:	Horizontal		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1638.000	-69.08	7.18	-61.90	-13.00	-48.90	peak

Standard:	Part 90S	Test Distance:	3m
Test item:	Harmonic	Power:	AC 120V/60Hz
Frequency:	819MHz	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	4G_BAND 26_10M-16QAM_CH26740		
Ant.Polar.:	Vertical		

No.	Frequency (MHz)	Reading (dBm)	Correct Factor (dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	1638.000	-70.05	7.18	-62.87	-13.00	-49.87	peak



Appendix : Frequency Stability/ Emission Bandwidth & Occupied Bandwidth/ Peak to Average Ratio/ Band Edge/ Conducted Spurious Emission

The equipment passed the requirement of this clause, the detail results refer to "Test Results_ Band26