



RF Test Report

For


Applicant Name: Zhibotong (Shenzhen) Electronics Co.,Ltd.
Address: Bldg A,Kangmai Science&Technology Industrial Park,Renmin Rd,
Guanlan,Longhua District,Shenzhen,China
EUT Name: Wireless Router
Brand Name: Wireless Router
Model Number: Z8102A,Z8102,Z8102C,Z8102D,Z8102E,Z8102F,Z8102G,Z8102H,Z8102I
,Z8102J,Z8102K,Z8102L,Z8102M

Issued By

Company Name: **BTF Testing Lab (Shenzhen) Co., Ltd.**
Address: F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park,
Tantou Community, Songgang Street, Bao'an District, Shenzhen,
China

Report Number: BTF231212R00201
FCC CFR Title 47 Part 2
FCC CFR Title 47 Part22
Test Standards: FCC CFR Title 47 Part24
FCC CFR Title 47 Part27
FCC CFR Title 47 Part90
FCC ID: 2AH9T-Z8102A
Test Conclusion: Pass
Test Date: 2023-11-26 to 2023-12-13
Date of Issue: 2023-12-26

Prepared By: 
Chris Liu / Project Engineer
Date: 2023-12-26

Approved By: 
Ryan.CJ / EMC Manager
Date: 2023-12-26

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Revision History		
Version	Issue Date	Revisions Content
R_V0	2023-12-26	Original
<i>Note:</i>	<i>Once the revision has been made, then previous versions reports are invalid.</i>	

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1. Introduction

1.1 Identification of Testing Laboratory

Company Name:	BTF Testing Lab (Shenzhen) Co., Ltd.
Address:	F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China
Phone Number:	+86-0755-23146130
Fax Number:	+86-0755-23146130

1.2 Identification of the Responsible Testing Location

Test Location:	BTF Testing Lab (Shenzhen) Co., Ltd.
Address:	F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China
Description:	All measurement facilities used to collect the measurement data are located at F101,201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China
FCC Registration Number:	518915
Designation Number:	CN1330

1.3 Laboratory Condition

Ambient Temperature:	20°C to 35°C
Ambient Relative Humidity:	45% to 55%
Ambient Pressure:	100 kPa to 102 kPa

1.4 Announcement

- (1) The test report reference to the report template version v0.
- (2) The test report is invalid if not marked with the signatures of the persons responsible for preparing, reviewing and approving the test report.
- (3) The test report is invalid if there is any evidence and/or falsification.
- (4) This document may not be altered or revised in any way unless done so by BTF and all revisions are duly noted in the revisions section.
- (5) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.
- (6) The laboratory is only responsible for the data released by the laboratory, except for the part provided by the applicant.

2. Product Information

2.1 Application Information

Company Name:	Zhibotong (Shenzhen) Electronics Co.,Ltd.
Address:	Bldg A,Kangmai Science&Technology Industrial Park,Renmin Rd, Guanlan,Longhua District,Shenzhen,China

2.2 Manufacturer Information

Company Name:	Zhibotong (Shenzhen) Electronics Co.,Ltd.
Address:	Bldg A,Kangmai Science&Technology Industrial Park,Renmin Rd, Guanlan,Longhua District,Shenzhen,China

2.3 Factory Information

Company Name:	Zhibotong (Shenzhen) Electronics Co.,Ltd.
Address:	Bldg A,Kangmai Science&Technology Industrial Park,Renmin Rd, Guanlan,Longhua District,Shenzhen,China

2.4 General Description of Equipment under Test (EUT)

EUT Name	Wireless Router
Under Test Model Name	Z8102A
Hardware Version	N/A
Software and Firmware Version	N/A

2.5 Technical Information

The requirement for the following technical information of the EUT was tested in this report:

Model/Type reference:	Z8102A,Z8102,Z8102C,Z8102D,Z8102E,Z8102F,Z8102G,Z8102H,Z8102I,Z8102J,Z8102K,Z8102L,Z8102M
Model differences:	Our production units bearing the following model numbers are identical in circuitry and electrical, mechanical and physical construction;The difference is only in model names. we finally have Z8102A as test model.
Hardware Version:	N/A
Software Version:	N/A
Tx Frequency:	LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 13: 777 MHz ~787 MHz LTE Band 14: 788 MHz ~798 MHz LTE Band 66: 1710 MHz -1780 MHz LTE Band 71: 663 MHz ~698 MHz
Rx Frequency:	LTE Band 2: 1930 MHz ~ 1990 MHz LTE Band 4: 2110 MHz ~ 2155 MHz LTE Band 5: 869 MHz ~ 894 MHz LTE Band 12: 729 MHz ~ 746 MHz LTE Band 13: 764 MHz ~756 MHz LTE Band 14: 758 MHz ~768 MHz LTE Band 66: 2110 MHz -2180 MHz LTE Band 71: 617 MHz ~652 MHz
Bandwidth:	LTE Band 2: 1.4MHz /3MHz /5MHz /10MHz /15MHz /20MHz LTE Band 4: 1.4MHz /3MHz /5MHz /10MHz /15MHz /20MHz LTE Band 5: 1.4MHz /3MHz /5MHz /10MHz LTE Band 12: 1.4MHz /3MHz /5MHz /10MHz LTE Band 13: 5MHz /10MHz LTE Band 14: 5MHz /10MHz LTE Band 66 :1.4MHz /3MHz /5MHz /10MHz /15MHz /20MHz LTE Band 71 : 5MHz /10MHz /15MHz /20MHz
Maximum Output Power to Antenna:	LTE Band 2: 23.17 dBm LTE Band 4: 23.45 dBm LTE Band 5: 23.46 dBm LTE Band 12: 23.64 dBm LTE Band 13: 23.66 dBm LTE Band 14: 23.96dBm LTE Band 66: 22.09 dBm LTE Band 71: 23.32dBm
99% Occupied Bandwidth:	LTE Band 2: 17M9G7D LTE Band 4: 18M0W7D LTE Band 5: 8M99W7D LTE Band 12: 9M00G7D LTE Band 13: 9M96G7D LTE Band 14: 9M96G7D LTE Band 66: 17M9G7D LTE Band 71: 17M9G7D

Type of Modulation:	QPSK/16QAM
Antenna Type:	External antenna
Antenna Gain:	LTE Band 2: 0.83 dBi
	LTE Band 4: 2.73dBi
	LTE Band 5: 0.32dBi
	LTE Band 12: -0.07dBi
	LTE Band 13: 3.64dBi
	LTE Band 14: 0.48 dBi
	LTE Band 66: 2.5 dBi
Ratings:	LTE Band 71: -1.41 dBi
	DC12V

3. Summary of Test Results

3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 2	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
2	47 CFR Part 22 Subpart H	Cellular Radiotelephone Service
3	47 CFR Part 24 Subpart E	Broadband PCS
4	47 CFR Part 27	Miscellaneous Wireless Communications Services
5	47 CFR Part 90	Private Land Mobile Radio Services
6	ANSI/TIA-603-E-2016	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
7	KDB 971168 D01 v03r01	Measurement Guidance for Certification of Licensed Digital Transmitters
8	ANSI C63.26:2015	IEEE/ANSI Standard for Compliance Testing of Transmitters Used in Licens12/26/2023ed Radio Services

3.2 Summary of Test Result

No.	Test Parameter	Clause No	Results
1	RF Exposure	§1.1307, §2.1093	PASS
2	RF Output Power	§2.1046; §22.913; §22.913 (a) §24.232(c); §27.50(d); §27.50(c); §27.50(b); §90.542	PASS
3	Peak-to-average Ratio(PAR) of Transmitter	§22.913 §2.1046; §24.232(d) §27.50(d); §27.50(c); §27.50(b);	PASS
4	Emission Bandwidth	§22.917 (b) §2.1049; §24.238(b); §27.53;	PASS
5	Spurious Emissions at Antenna Terminal	§22.917 (a), §24.238 (a), §27.53(g), §27.53(h), §90.543(e),	PASS
6	Spurious Radiation Emissions	§22.917 (a) §2.1051; §22.917(a); §27.53(h); §27.53(g); §27.53(c); §24.238(a); §90.543(e),	PASS
7	Out of Band Emissions	§22.917 (a) §2.1051; §22.917(a); §27.53(h); §27.53(c); §27.53(g); §24.238(a); §90.543(e),	PASS
8	Frequency Stability	§2.1055; §22.355; §27.54; §24.235; §90.213	PASS

3.3 Uncertainty of Test

The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2 and TR100 028-1/-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

Measurement	Value
RF output power, conducted	0.63 dB
Conducted spurious emissions	0.94 dB
Radiated emissions (<1 GHz)	4.12 dB
Radiated emissions (>1 GHz)	4.16 dB
Occupied Channel Bandwidth	69 KHz
Frequency Stability	0.4 KHz
Temperature	0.82 °C
Humidity	4.1 %

4. Test Configuration

4.1 Environment Condition

During the measurement, the environmental conditions were within the listed ranges:

Test Voltage of the EUT	NV (Normal Voltage)	12 V
	LV (Low Voltage)	11.8 V
	HV (High Voltage)	12.2 V
Test Temperature of the EUT	NT (Normal Temperature)	+25 °C
	LT (Low Temperature)	-30 °C
	HT (High Temperature)	+50 °C

4.2 Test Equipment List

Conducted Method Test						
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due	Use
MXA Signal Analyzer	KEYSIGHT	N9020A	MY50410020	2023.11.16	2024.11.15	☑
WIDEBAND RADIO COMMUNICATION TESTER	Rohde & Schwarz	CMW500	161997	2023.11.16	2024.11.15	☑
Adjustable Direct Current Regulated Power Supply	Dongguan Tongmen Electronic Technology Co., LTD	etm-6050c	20211026123	2023.11.16	2024.11.15	☑
Programmable constant temperature and humidity box	ZZCKONG	ZZ-K02A	20210928007	2023.11.16	2024.11.15	☑
RF Sensor Unit	Techy	TR1029-2	/	2023.11.16	2024.11.15	☑
RF Control Unit	Techy	TR1029-1	/	2023.11.16	2024.11.15	☑
RFTest software	/	V1.00	/	/	/	☑

Radiated Method Test						
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due	Use
SIGNAL ANALYZER	ROHDE&SCHWARZ	FSQ40	100010	2023.11.16	2024.11.15	☑
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI7	101032	2023.11.16	2024.11.15	☑
Log periodic antenna	SCHWARZBECK	VULB 9168	01328	2023.11.16	2024.11.15	☑
Horn Antenna	SCHWARZBECK	BBHA9170	01157	2023.11.16	2024.11.15	☑
POSITIONAL CONTROLLER	SKET	PCI-GPIB	/	/	/	☑
RE Cable	REBES Talent	UF2-NMNM-10m	21101570	2023.11.16	2024.11.15	☑

RE Cable	REBES Talent	UF1-SMASMAM-10m	21101566	2023.11.16	2024.11.15	☒
RE Cable	REBES Talent	UF2-NMNM-2.5m	21101573	2023.11.16	2024.11.15	☒
RE Cable	REBES Talent	UF2-NMNM-1m	21101576	2023.11.16	2024.11.15	☒
RE Cable	REBES Talent	UF1-SMASMAM-1m	21101568	2023.11.16	2024.11.15	☒
RE Cable	REBES Talent	UF2-NMNM-10m	21101570	2023.11.16	2024.11.15	☒
RE Cable	REBES Talent	UF1-SMASMAM-10m	21101566	2023.11.16	2024.11.15	☒
Preamplifier	SCHWARZBECK	BBV9744	00246	2023.11.16	2024.11.15	☒
Horn Antenna	Schwarzbeck	BBHA9120D	2597	2023.3.26	2024.3.25	☒
Low Noise Pre-amplifier	Sket	LNPA_1840G-50	SK2022032902	2023.3.26	2024.3.25	☒
Coaxial cable Multiflex 141	Schwarzbeck	N/SMA 0.5m	517386	2023.3.26	2024.3.25	☒
Broadband Preamplifier	Schwarzbeck	BBV9718D	00008	2023.3.26	2024.3.25	☒

4.3 Test Auxiliary Equipment

Item	Shielded Type	Ferrite Core	Length	Note
C-1	N/A	N/A	1M	DC cable unshielded

12/26/2023

4.4 Test Configurations

Test Items	Band	Bandwidth (MHz)						Modulation		RB#			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	1	Half	Full	L	M	H
Max.Output Power	2	v	v	v	v	v	v	v	v	v	v	v	v	v	v
	4	v	v	v	v	v	v	v	v	v	v	v	v	v	v
	5	v	v	v	v	-	-	v	v	v	v	v	v	v	v
	12	v	v	v	v	-	-	v	v	v	v	v	v	v	v
	13	-	-	v	v	-	-	v	v				-	v	-
	14	-	-	v	v	-	-	v	v				-	v	-
	66	v	v	v	v	v	v	v	v	v	v	v	v	v	v
	71	-	-	v	v	v	v	v	v						
Peak-to-Average Ratio	2	v	v	v	v	v	v	v	v	v	v	v	v	v	v
	4	v	v	v	v	v	v	v	v	v	v	v	v	v	v
	5	v	v	v	v	-	-	v	v	v	v	v	v	v	v
	12	v	v	v	v	-	-	v	v	v	v	v	v	v	v
	13							v	v						
	14							v	v						
	66	v	v	v	v	v	v	v	v	v	v	v	v	v	v
	71							v	v						
26dB and 99% Bandwidth	2	v	v	v	v	v	v	v	v	v	v	v	v	v	v
	4	v	v	v	v	v	v	v	v	v	v	v	v	v	v
	5	v	v	v	v	-	-	v	v	v	v	v	v	v	v
	12	v	v	v	v	-	-	v	v	v	v	v	v	v	v
	13	-	-	v	v	-	-	v	v						
	14	-	-	v	v	-	-	v	v						
	66	v	v	v	v	v	v	v	v	v	v	v	v	v	v
	71	-	-	v	v	v	v	v	v						
Conducted Band Edge	2	v	v	v	v	v	v	v	v	v	v	v	v	-	v
	4	v	v	v	v	v	v	v	v	v	v	v	v	-	v
	5	v	v	v	v	-	-	v	v	v	v	v	v	-	v
	12	v	v	v	v	-	-	v	v	v	v	v	v	v	v

	13							v	v						
	14							v	v						
	66	v	v	v	v	v	v	v	v	v	v	v	v	-	v
	71							v	v						
Conducted Spurious Emission	2	v	v	v	v	v	v	v	v	v	-	-	v	v	v
	4	v	v	v	v	v	v	v	v	v	-	-	v	v	v
	5	v	v	v	v	-	-	v	v	v	-	-	v	v	v
	12	v	v	v	v	-	-	v	v	v	v	v	v	v	v
	13							v	v						
	14							v	v						
	66	v	v	v	v	v	v	v	v	v	-	-	v	v	v
71							v	v							
Frequency stability	2	v	-	-	-	-	-	v	v	v	-	-	v	v	v
	4	v	-	-	-	-	-	v	v	v	-	-	v	v	v
	5	v	-	-	-	-	-	v	v	v	-	-	v	v	v
	12	v	-	-	-	-	-	v	v	v	-	-	v	v	v
	13							v	v						
	14							v	v						
	66	v	-	-	-	-	-	v	v	v	-	-	v	v	v
71							v	v							
E.R.P./ E.I.R.P.	2	v	v	v	v	v	v	v	v	v	v	v	v	v	v
	4	v	v	v	v	v	v	v	v	v	v	v	v	v	v
	5	v	v	v	v	-	-	v	v	v	v	v	v	v	v
	12	v	v	v	v	-	-	v	v	v	v	v	v	v	v
	13	-	-	v	v	-	-	v	v						
	14	-	-	v	v	-	-	v	v						
	66	v	v	v	v	v	v	v	v	v	v	v	v	v	v
71	-	-	v	v	v	v	v	v							
Radiated Spurious Emission	2	v	-	-	-	-	-	v	v	v	-	-	v	v	v
	4	v	-	-	-	-	-	v	v	v	-	-	v	v	v
	5	v	-	-	-	-	-	v	v	v	-	-	v	v	v
	12	v	-	-	-	-	-	v	v	v	-	-	v	v	v

	13						v	v						
	14						v	v						
	66	v	-	-	-	-	v	v	v	-	-	v	v	v
	71						v	v						
Note	1.The mark “v “ means that this configuration is chosen for testing 2.The mark “-“ means that this bandwidth is not supported.													

LTE Band 2(1.4MHz)		LTE Band 2(3MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
18607	1850.7	18615	1851.5
18900	1880	18900	1880
19193	1909.3	19185	1908.5
LTE Band 2(5MHz)		LTE Band 2(10MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
18625	1852.5	18650	1855
18900	1880	18900	1880
19175	1907.5	19150	1905
LTE Band 2(15MHz)		LTE Band 2(20MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
18675	1857.5	18700	1860
18900	1880	18900	1880
19125	1902.5	19100	1900

LTE Band 4(1.4MHz)		LTE Band 4(3MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
19957	1710.7	19965	1711.5
20175	1732.5	20175	1732.5
20393	1754.3	20385	1753.5
LTE Band 4(5MHz)		LTE Band 4(10MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
19975	1712.5	20000	1715
20175	1732.5	20175	1732.5
20375	1752.5	20350	1750
LTE Band 4(15MHz)		LTE Band 4(20MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
20025	1717.5	20050	1720
20175	1732.5	20175	1732.5
20325	1747.5	20300	1745

LTE Band 5(1.4MHz)		LTE Band 5(3MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
20407	824.7	20415	825.5
20525	836.5	20525	836.5
20643	848.3	20635	847.5
LTE Band 5(5MHz)		LTE Band 5(10MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
20425	826.5	20450	829
20525	836.5	20525	836.5
20625	846.5	20600	844

LTE Band 12(1.4MHz)		LTE Band 12(3MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
23017	699.7	23025	700.5
23095	707.5	23095	707.5
23173	715.3	23165	714.5
LTE Band 12(5MHz)		LTE Band 12(10MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
23035	701.5	23060	704
23095	707.5	23095	707.5
23155	713.5	23130	711

LTE Band 13(5MHz)		LTE Band 13(10MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
23205	779.5	23230	782
23230	782		
23255	784.5		

LTE Band 14(5MHz)		LTE Band 14(10MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
23305	790.5	23330	793
23330	793.0		
23355	795.5		

LTE Band 66(1.4MHz)		LTE Band 66(3MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
131979	1710.7	131987	1711.5
132322	1745	132322	1745
132665	1779.3	132657	1778.5
LTE Band 66(5MHz)		LTE Band 66(10MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
131997	1712.5	132022	1715
132322	1745	132322	1745
132647	1777.5	132622	1775
LTE Band 66(15MHz)		LTE Band 66(20MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
132047	1717.5	132072	1720
132322	1745	132322	1745
132597	1772.5	132572	1770

LTE Band 71(5MHz)		LTE Band 71(10MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
133147	665.5	133172	668
133297	680.5	133297	680.5
133447	695.5	133422	693
LTE Band 71(15MHz)		LTE Band 71(20MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
133197	670.5	133222	673
133297	680.5	133322	683
133397	690.5	133372	688

Emission Designator

LTE Band 2	QPSK		16QAM	
BW(MHz)	Emission Designator (99%OBW)	Maximum EIRP(W)	Emission Designator (99%OBW)	Maximum EIRP(W)
1.4	1M10G7D	0.20	1M10W7D	0.16
3	2M70G7D	0.20	2M70W7D	0.16
5	4M51G7D	0.20	4M51W7D	0.17
10	8M98G7D	0.20	8M98W7D	0.17
15	13M4G7D	0.20	13M4W7D	0.16
20	17M8G7D	0.20	17M9W7D	0.19

LTE Band 4	QPSK		16QAM	
BW(MHz)	Emission Designator (99%OBW)	Maximum EIRP(W)	Emission Designator (99%OBW)	Maximum EIRP(W)
1.4	1M09G7D	0.21	1M09W7D	0.17
3	2M71G7D	0.22	2M70W7D	0.16
5	4M52G7D	0.21	4M52W7D	0.16
10	8M99G7D	0.20	9M00W7D	0.16
15	13M5G7D	0.21	13M5W7D	0.16
20	18M0G7D	0.20	18M0W7D	0.15

LTE Band 5	QPSK		16QAM	
BW(MHz)	Emission Designator (99%OBW)	Maximum ERP(W)	Emission Designator (99%OBW)	Maximum ERP(W)
1.4	1M10G7D	0.21	1M10W7D	0.17
3	2M71G7D	0.22	2M71W7D	0.16
5	4M52G7D	0.21	4M53W7D	0.17
10	9M00G7D	0.21	8M99W7D	0.16

LTE Band 12	QPSK		16QAM	
BW(MHz)	Emission Designator (99%OBW)	Maximum ERP(W)	Emission Designator (99%OBW)	Maximum ERP(W)
1.4	1M09G7D	0.22	1M09W7D	0.18
3	2M71G7D	0.23	2M71W7D	0.18
5	4M51G7D	0.22	4M52W7D	0.17
10	9M00G7D	0.22	9M00W7D	0.18

LTE Band 13	QPSK		16QAM	
BW(MHz)	Emission Designator (99%OBW)	Maximum ERP(W)	Emission Designator (99%OBW)	Maximum ERP(W)
5	4M52G7D	0.23	4M51W7D	0.18
10	8M96G7D	0.22	8M94W7D	0.17

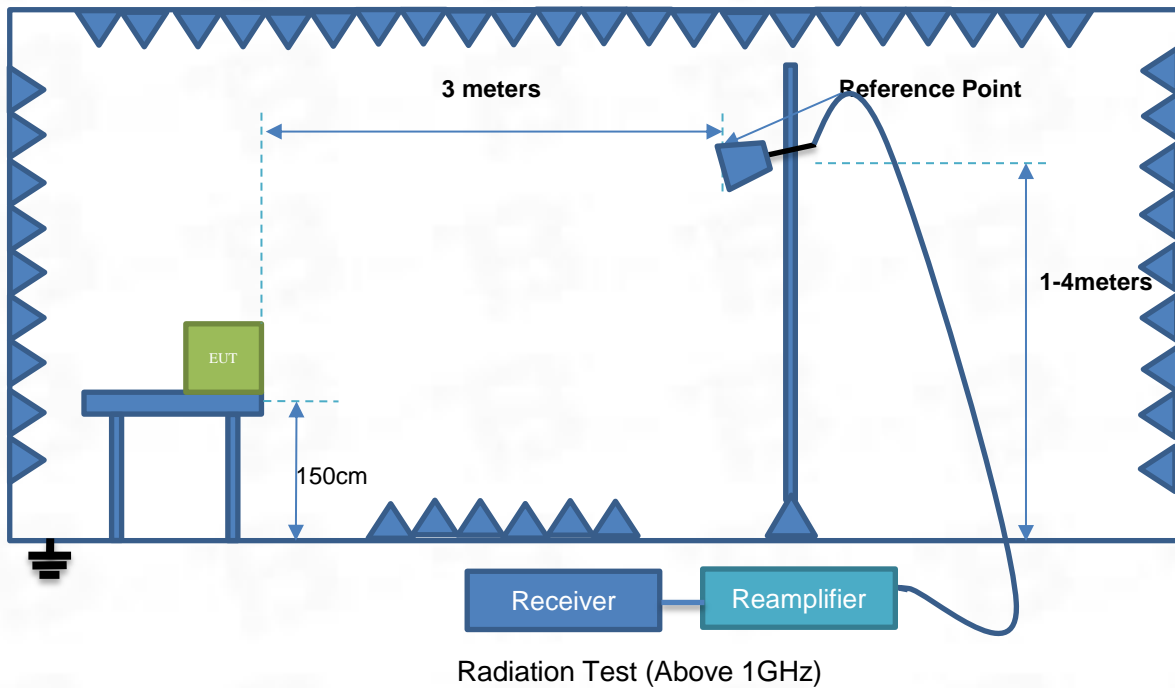
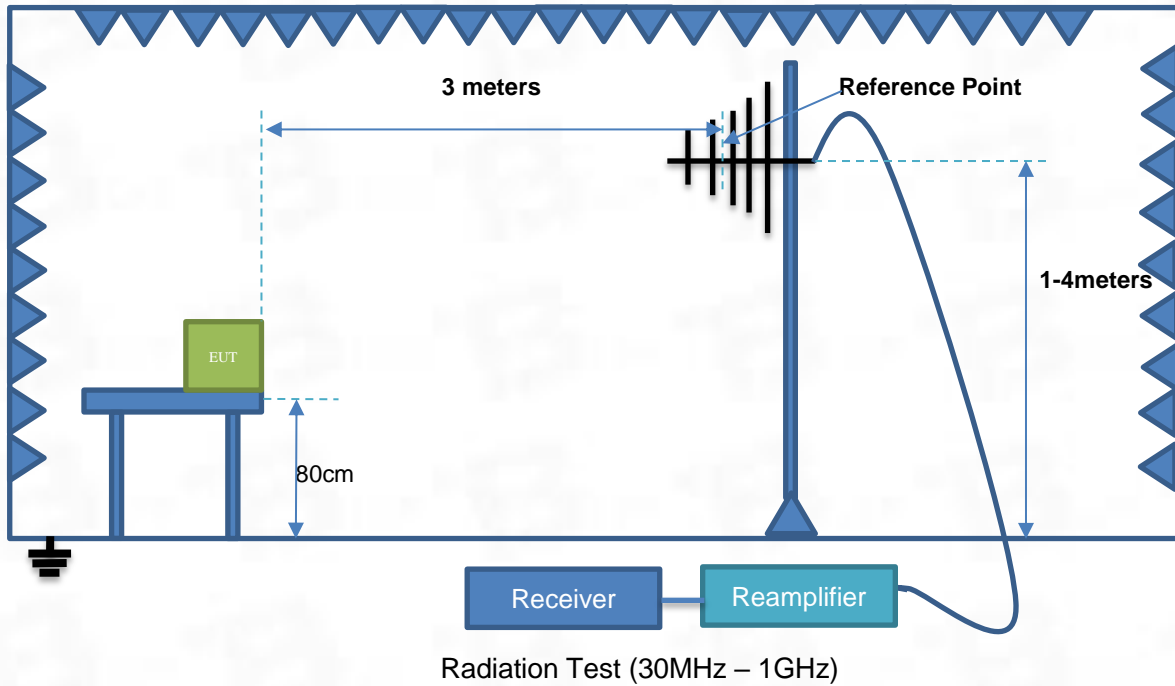
LTE Band 14	QPSK		16QAM	
BW(MHz)	Emission Designator (99%OBW)	Maximum ERP(W)	Emission Designator (99%OBW)	Maximum ERP(W)
5	4M51G7D	0.24	4M51W7D	0.19
10	8M96G7D	0.23	8M93W7D	0.18

LTE Band 66	QPSK		16QAM	
BW(MHz)	Emission Designator (99%OBW)	Maximum ERP(W)	Emission Designator (99%OBW)	Maximum ERP(W)
1.4	1M10G7D	0.16	1M10W7D	0.13
3	2M70G7D	0.19	2M71W7D	0.14
5	4M52G7D	0.16	4M51W7D	0.14
10	8M97G7D	0.15	8M97W7D	0.13
15	13M4G7D	0.15	13M4W7D	0.13
20	17M9G7D	0.15	17M8W7D	0.13

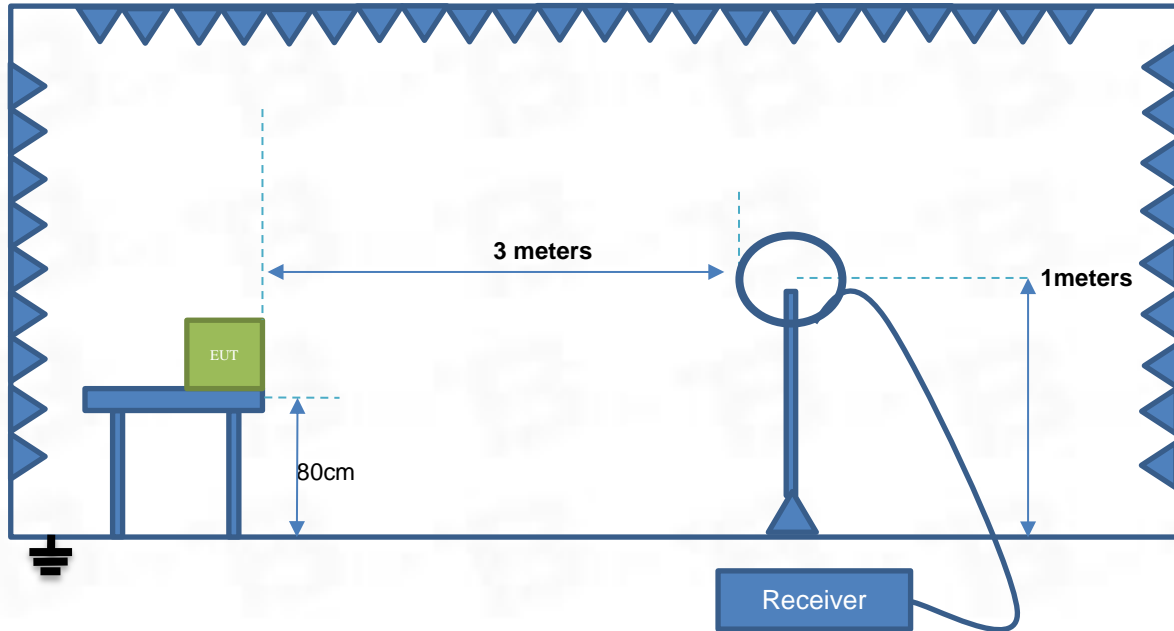
LTE Band 71	QPSK		16QAM	
BW(MHz)	Emission Designator (99%OBW)	Maximum ERP(W)	Emission Designator (99%OBW)	Maximum ERP(W)
5	4M52G7D	0.20	4M53W7D	0.16
10	9M02G7D	0.21	9M00W7D	0.16
15	13M4G7D	0.21	13M4W7D	0.16
20	17M9G7D	0.21	17M9W7D	0.16

4.5 Test Setup

Test Setup 1

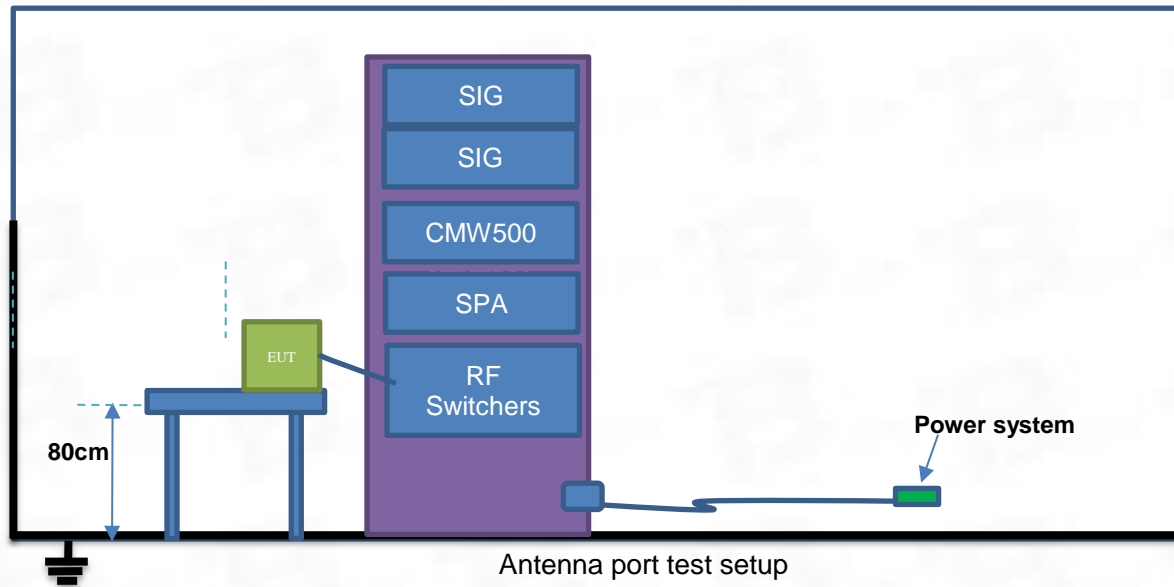


Test Setup 2



Radiation Test (9k - 30MHz)

Test Setup 3



Antenna port test setup

5. Test Items

5.1 Transmitter Radiated Power (EIRP/ERP)

5.1.1 Limit

According to §22.913(a)(2), The ERP of mobile and portable stations transmitters and auxiliary test transmitters must not exceed 7 Watts.

According to §24.232 (c), Mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

According to §27.50(d)(4), Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.

According to §90.542(a)(7), Portable stations (hand-held devices) transmitting in the 758–768 MHz band and the 788–798 MHz band are limited to 3 watts ERP.

5.1.2 Test Procedure

Radiated power test method:

1. The setup of EUT is according with per ANSI/TIA Standard 603D and ANSI C63.4-2014 measurement procedure.
2. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.
3. The frequency range up to tenth harmonic of the fundamental frequency was investigated.
4. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

5.1.3 Test Result

Max Radiated Power:

FDD-LTE Band 2

Channel Bandwidth: 1.4MHz			
Modulation	Channel	E.I.R.P.(dBm)	Verdict
QPSK	LCH	22.58	PASS
	MCK	23.01	PASS
	HCH	23.00	PASS
16QAM	LCH	21.72	PASS
	MCK	22.27	PASS
	HCH	22.15	PASS
Channel Bandwidth: 3MHz			
Modulation	Channel	E.I.R.P.(dBm)	Verdict
QPSK	LCH	22.61	PASS

	MCK	23.03	PASS
	HCH	23.01	PASS
16QAM	LCH	22.04	PASS
	MCK	22.29	PASS
	HCH	21.95	PASS
Channel Bandwidth: 5MHz			
Modulation	Channel	E.I.R.P(dBm)	Verdict
QPSK	LCH	22.73	PASS
	MCK	23.17	PASS
	HCH	23.05	PASS
16QAM	LCH	22.19	PASS
	MCK	22.54	PASS
	HCH	22.42	PASS
Channel Bandwidth: 10MHz			
Modulation	Channel	E.I.R.P(dBm)	Verdict
QPSK	LCH	22.75	PASS
	MCK	23.07	PASS
	HCH	23.13	PASS
16QAM	LCH	22.21	PASS
	MCK	22.31	PASS
	HCH	21.99	PASS
Channel Bandwidth: 15MHz			
Modulation	Channel	E.I.R.P(dBm)	Verdict
QPSK	LCH	22.82	PASS
	MCK	23.02	PASS
	HCH	23.13	PASS
16QAM	LCH	22.29	PASS
	MCK	22.28	PASS
	HCH	22.18	PASS
Channel Bandwidth: 20MHz			
Modulation	Channel	E.I.R.P(dBm)	Verdict
QPSK	LCH	22.96	PASS
	MCK	23.15	PASS
	HCH	23.03	PASS
16QAM	LCH	22.38	PASS
	MCK	22.37	PASS
	HCH	22.39	PASS

FDD-LTE Band 4

Channel Bandwidth: 1.4MHz			
Modulation	Channel	E.I.R.P(dBm)	Verdict
QPSK	LCH	23.22	PASS
	MCK	23.25	PASS
	HCH	23.28	PASS
16QAM	LCH	22.06	PASS
	MCK	22.18	PASS
	HCH	22.33	PASS
Channel Bandwidth: 3MHz			
Modulation	Channel	E.I.R.P(dBm)	Verdict
QPSK	LCH	23.21	PASS
	MCK	23.45	PASS
	HCH	23.23	PASS
16QAM	LCH	22.01	PASS
	MCK	22.24	PASS
	HCH	22.14	PASS
Channel Bandwidth: 5MHz			
Modulation	Channel	E.I.R.P(dBm)	Verdict
QPSK	LCH	23.18	PASS
	MCK	23.32	PASS
	HCH	23.22	PASS
16QAM	LCH	21.90	PASS
	MCK	22.20	PASS
	HCH	22.15	PASS
Channel Bandwidth: 10MHz			
Modulation	Channel	E.I.R.P(dBm)	Verdict
QPSK	LCH	23.18	PASS
	MCK	23.11	PASS
	HCH	23.20	PASS
16QAM	LCH	21.94	PASS
	MCK	22.05	PASS
	HCH	22.02	PASS
Channel Bandwidth: 15MHz			
Modulation	Channel	E.I.R.P(dBm)	Verdict
QPSK	LCH	23.39	PASS
	MCK	23.19	PASS
	HCH	22.98	PASS
16QAM	LCH	22.06	PASS
	MCK	21.95	PASS
	HCH	22.17	PASS
Channel Bandwidth: 20MHz			
Modulation	Channel	E.I.R.P(dBm)	Verdict
QPSK	LCH	23.00	PASS
	MCK	23.16	PASS
	HCH	22.94	PASS
16QAM	LCH	21.86	PASS
	MCK	21.87	PASS
	HCH	21.70	PASS

FDD-LTE Band 5

Channel Bandwidth: 1.4MHz			
Modulation	Channel	E.R.P(dBm)	Verdict
QPSK	LCH	23.31	PASS
	MCK	23.17	PASS
	HCH	23.37	PASS
16QAM	LCH	22.27	PASS
	MCK	22.32	PASS
	HCH	22.23	PASS
Channel Bandwidth: 3MHz			
Modulation	Channel	E.R.P(dBm)	Verdict
QPSK	LCH	23.25	PASS
	MCK	23.40	PASS
	HCH	23.46	PASS
16QAM	LCH	22.24	PASS
	MCK	22.29	PASS
	HCH	22.22	PASS
Channel Bandwidth: 5MHz			
Modulation	Channel	E.R.P(dBm)	Verdict
QPSK	LCH	23.20	PASS
	MCK	23.40	PASS
	HCH	23.37	PASS
16QAM	LCH	22.00	PASS
	MCK	22.28	PASS
	HCH	22.37	PASS
Channel Bandwidth: 10MHz			
Modulation	Channel	E.R.P(dBm)	Verdict
QPSK	LCH	23.33	PASS
	MCK	23.24	PASS
	HCH	23.26	PASS
16QAM	LCH	22.20	PASS
	MCK	22.06	PASS
	HCH	22.14	PASS

FDD-LTE Band 12

Channel Bandwidth: 1.4MHz			
Modulation	Channel	E.R.P(dBm)	Verdict
QPSK	LCH	23.41	PASS
	MCK	23.49	PASS
	HCH	23.56	PASS
16QAM	LCH	22.54	PASS
	MCK	22.57	PASS
	HCH	22.54	PASS
Channel Bandwidth: 3MHz			
Modulation	Channel	E.R.P(dBm)	Verdict
QPSK	LCH	23.57	PASS
	MCK	23.64	PASS
	HCH	23.56	PASS
16QAM	LCH	22.57	PASS
	MCK	22.61	PASS
	HCH	22.46	PASS
Channel Bandwidth: 5MHz			
Modulation	Channel	E.R.P(dBm)	Verdict
QPSK	LCH	23.54	PASS
	MCK	23.51	PASS
	HCH	23.33	PASS
16QAM	LCH	22.30	PASS
	MCK	22.43	PASS
	HCH	22.26	PASS
Channel Bandwidth: 10MHz			
Modulation	Channel	E.R.P(dBm)	Verdict
QPSK	LCH	23.45	PASS
	MCK	23.34	PASS
	HCH	23.49	PASS
16QAM	LCH	22.42	PASS
	MCK	22.39	PASS
	HCH	22.57	PASS

FDD-LTE Band 13

Channel Bandwidth: 5MHz			
Modulation	Channel	E.R.P(dBm)	Verdict
QPSK	LCH	23.41	PASS
	MCK	23.66	PASS
	HCH	23.66	PASS
16QAM	LCH	22.26	PASS
	MCK	22.11	PASS
	HCH	22.57	PASS
Channel Bandwidth: 10MHz			
Modulation	Channel	E.R.P(dBm)	Verdict
QPSK	/	/	PASS
	23230	23.55	PASS
	/	/	PASS
16QAM	/	/	PASS
	23230	22.43	PASS
	/	/	PASS

FDD-LTE Band 14

Channel Bandwidth: 5MHz			
Modulation	Channel	E.R.P(dBm)	Verdict
QPSK	LCH	23.72	PASS
	MCK	23.79	PASS
	HCH	23.96	PASS
16QAM	LCH	22.67	PASS
	MCK	22.72	PASS
	HCH	22.86	PASS
Channel Bandwidth: 10MHz			
Modulation	Channel	E.R.P(dBm)	Verdict
QPSK	/	/	PASS
	23330	23.79	PASS
	/	/	PASS
16QAM	/	/	PASS
	23330	22.70	PASS
	/	/	PASS

FDD-LTE Band 66

Channel Bandwidth: 1.4MHz			
Modulation	Channel	E.R.P(dBm)	Verdict
QPSK	LCH	22.09	PASS
	MCK	21.69	PASS
	HCH	21.74	PASS
16QAM	LCH	21.17	PASS
	MCK	20.94	PASS
	HCH	20.98	PASS
Channel Bandwidth: 3MHz			
Modulation	Channel	E.R.P(dBm)	Verdict
QPSK	LCH	21.96	PASS
	MCK	21.70	PASS
	HCH	21.75	PASS
16QAM	LCH	21.47	PASS
	MCK	20.96	PASS
	HCH	20.69	PASS
Channel Bandwidth: 5MHz			
Modulation	Channel	E.R.P(dBm)	Verdict
QPSK	LCH	22.08	PASS
	MCK	21.76	PASS
	HCH	21.73	PASS
16QAM	LCH	21.58	PASS
	MCK	21.19	PASS
	HCH	21.09	PASS
Channel Bandwidth: 10MHz			
Modulation	Channel	E.R.P(dBm)	Verdict
QPSK	LCH	21.97	PASS
	MCK	21.80	PASS
	HCH	21.79	PASS
16QAM	LCH	21.44	PASS
	MCK	21.01	PASS
	HCH	20.68	PASS
Channel Bandwidth: 15MHz			
Modulation	Channel	E.R.P(dBm)	Verdict
QPSK	LCH	21.90	PASS
	MCK	21.75	PASS
	HCH	21.73	PASS
16QAM	LCH	21.39	PASS
	MCK	21.00	PASS
	HCH	20.74	PASS
Channel Bandwidth: 20MHz			
Modulation	Channel	E.R.P(dBm)	Verdict
QPSK	LCH	21.87	PASS
	MCK	21.83	PASS
	HCH	21.65	PASS
16QAM	LCH	21.30	PASS
	MCK	21.00	PASS
	HCH	20.91	PASS

FDD-LTE Band 71

Channel Bandwidth: 5MHz			
Modulation	Channel	E.R.P(dBm)	Verdict
QPSK	LCH	23.07	PASS
	MCK	23.20	PASS
	HCH	23.16	PASS
16QAM	LCH	21.85	PASS
	MCK	22.28	PASS
	HCH	21.84	PASS
Channel Bandwidth: 10MHz			
Modulation	Channel	E.R.P(dBm)	Verdict
QPSK	LCH	22.91	PASS
	MCK	23.05	PASS
	HCH	23.26	PASS
16QAM	LCH	21.81	PASS
	MCK	22.01	PASS
	HCH	22.15	PASS
Channel Bandwidth: 15MHz			
Modulation	Channel	E.R.P(dBm)	Verdict
QPSK	LCH	23.01	PASS
	MCK	23.32	PASS
	HCH	23.18	PASS
16QAM	LCH	22.12	PASS
	MCK	22.13	PASS
	HCH	22.27	PASS
Channel Bandwidth: 20MHz			
Modulation	Channel	E.R.P(dBm)	Verdict
QPSK	LCH	22.87	PASS
	MCK	23.23	PASS
	HCH	23.09	PASS
16QAM	LCH	21.86	PASS
	MCK	22.03	PASS
	HCH	22.00	PASS

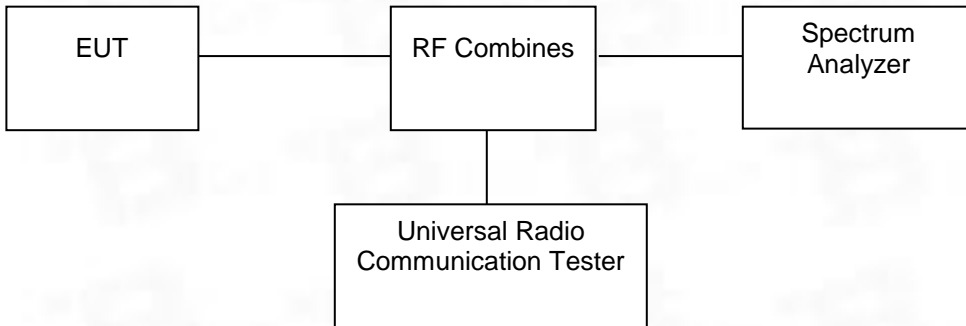
Max Conducted output Power:

Please refer to appendix A: Conducted Output Power

Test Result: Pass

5.2 Peak-To-Average Ratio(PAR) Of Transmitter

5.2.1 Block Diagram Of Test Setup



5.2.1 Limit

According to §24.232(d), Power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (e) of this section. In both instances, equipment employed must be authorized in accordance with the provisions of §24.51. 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.

According to §27.50(B), the peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB. The PAPR measurements should be made using either an instrument with complementary cumulative distribution function (CCDF) capabilities to determine that PAPR will not exceed 13 dB for more than 0.1 percent of the time or other Commission approved procedure. The measurement must be performed using a signal corresponding to the highest PAPR expected during periods of continuous transmission.

5.2.2 Test procedure

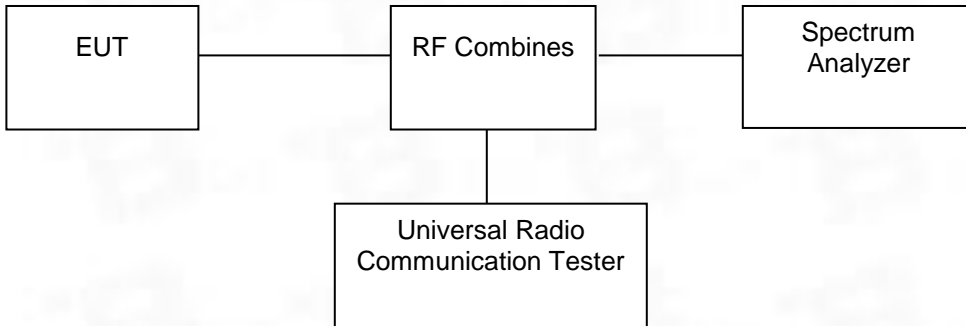
The RF output terminal of the transmitter was connected to the input of the spectrum analyzer via a suitable attenuation. The RBW of the spectrum analyzer was set to 30kHz and the peak-to-average ratio (PAR) of the transmission was recorded. Record the maximum PAPR level associated with a probability of 0.1%.

5.2.4 Test Result

Please refer to Appendix 3: Peak-to-Average Ratio
Test Result: Pass

5.3 Emission Bandwidth

5.3.1 Block Diagram Of Test Setup



5.3.2 Standard Applicable

According to §22.917(b), The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

According to §24.238(b), The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

According to §27.53, The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

5.3.3 Test procedure

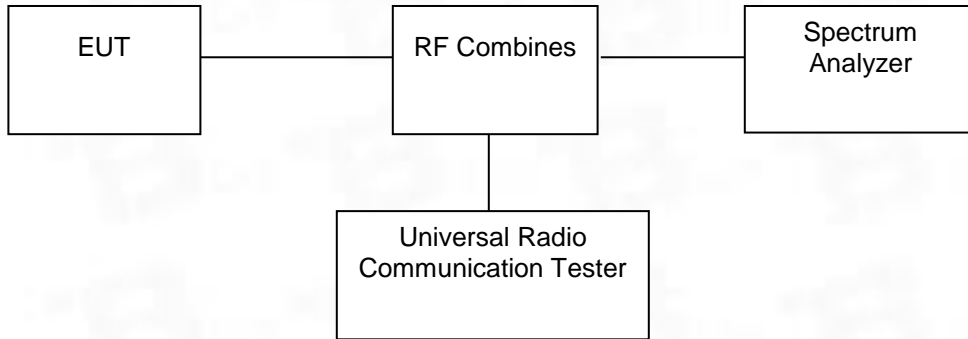
1. The testing follows FCC KDB 971168 D01v03 Section 4.2.
2. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
3. The RF output of the EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
4. The 99% occupied bandwidth were measured, set RBW= 1% of OBW, VBW= 3*RBW, sample detector, trace maximum hold.
5. The 26dB bandwidth were measured, set RBW= 1% of EBW, VBW= 3*RBW, peak detector, trace maximum hold.

5.3.4 Test Result

Please refer to Appendix 4: Occupied BandWidth
Test Result: Pass

5.4 Out of Band Emissions at Antenna Terminal

5.4.1 Block Diagram Of Test Setup



5.4.2 Limit

According to §22.917(a), the power of any emissions 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.

According to §24.238(a), the power of any emissions 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.

According to §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.

According to §90.543 (e),

For operations in the 758–768 MHz and the 788–798 MHz bands, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

- (1) On all frequencies between 769–775 MHz and 799–805 MHz, by a factor not less than $76 + 10 \log(P)$ dB in a 6.25 kHz band segment, for base and fixed stations.
- (2) On all frequencies between 769–775 MHz and 799–805 MHz, by a factor not less than $65 + 10 \log(P)$ dB in a 6.25 kHz band segment, for mobile and portable stations.
- (3) On any frequency between 775–788 MHz, above 805 MHz, and below 758 MHz, by at least $43 + 10 \log(P)$ dB.
- (4) Compliance with the provisions of paragraphs (e)(1) and (2) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.
- (5) Compliance with the provisions of paragraph (e)(3) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of 30 kHz may be employed.

5.4.3 Test procedure

The RF output terminal of the transmitter was connected to the input of the spectrum analyzer via a suitable attenuation. The RBW of the spectrum analyzer was set to 100kHz and 1MHz for the scan frequency from 30MHz to 1GHz and the scan frequency from 1GHz to up to 10th harmonic.

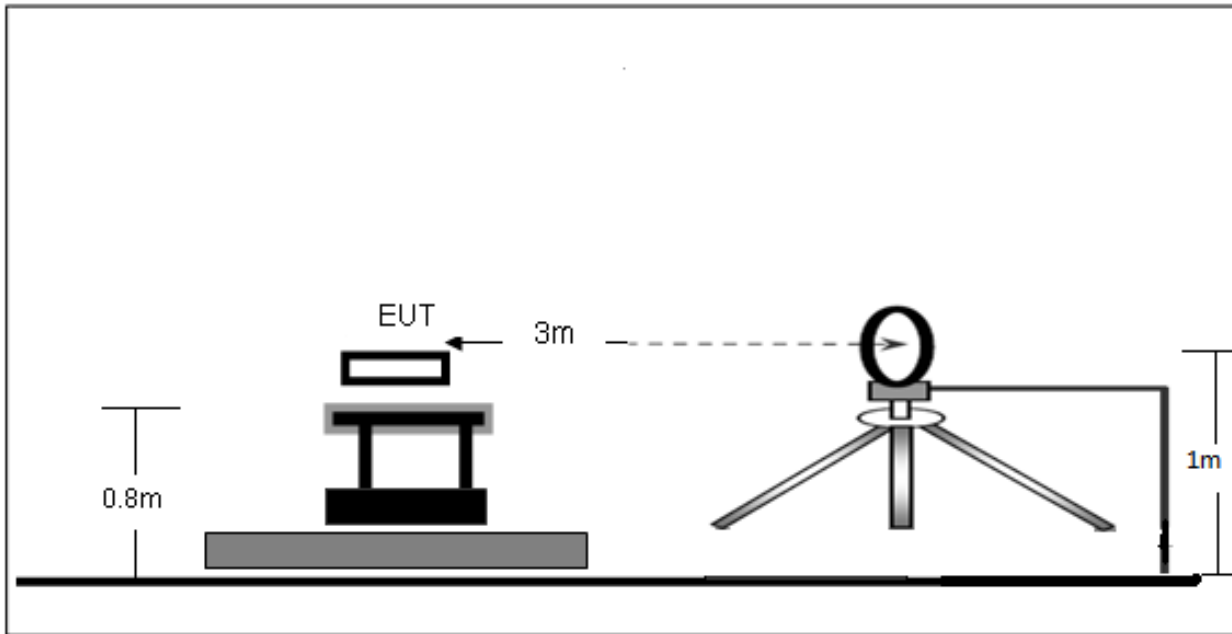
5.4.4 Test Result

Please refer to Appendix 5: Band Edge & Appendix 6: Out-of-band Emissions
Test Result: Pass

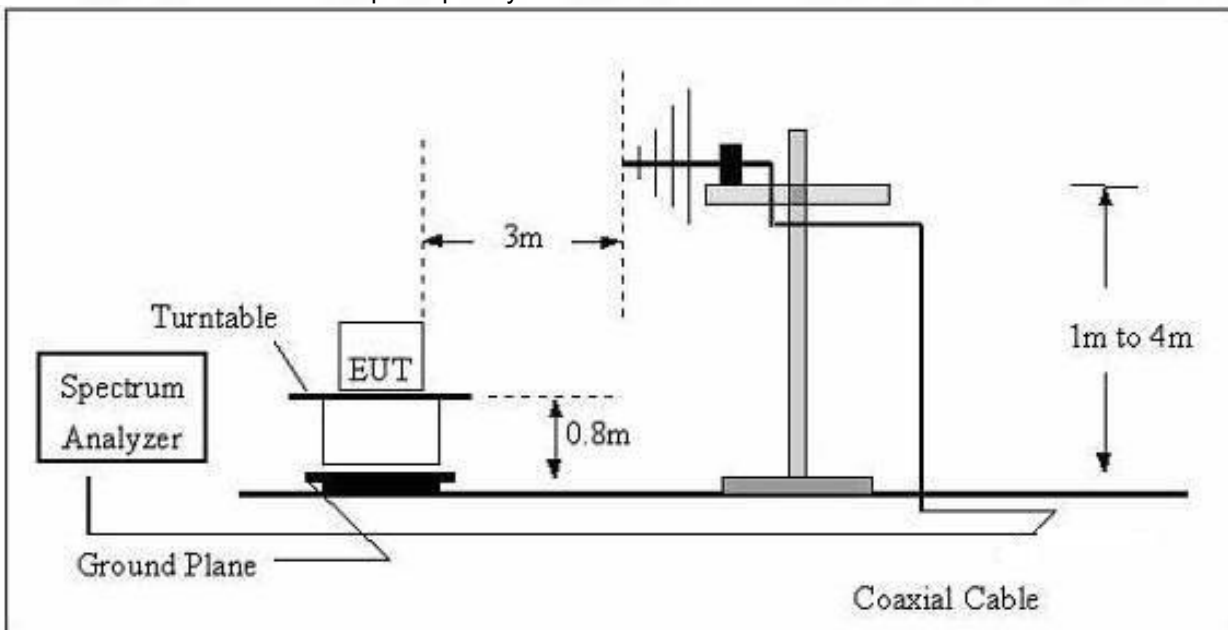
5.5 Spurious Radiated Emissions

5.5.1 Block Diagram Of Test Setup

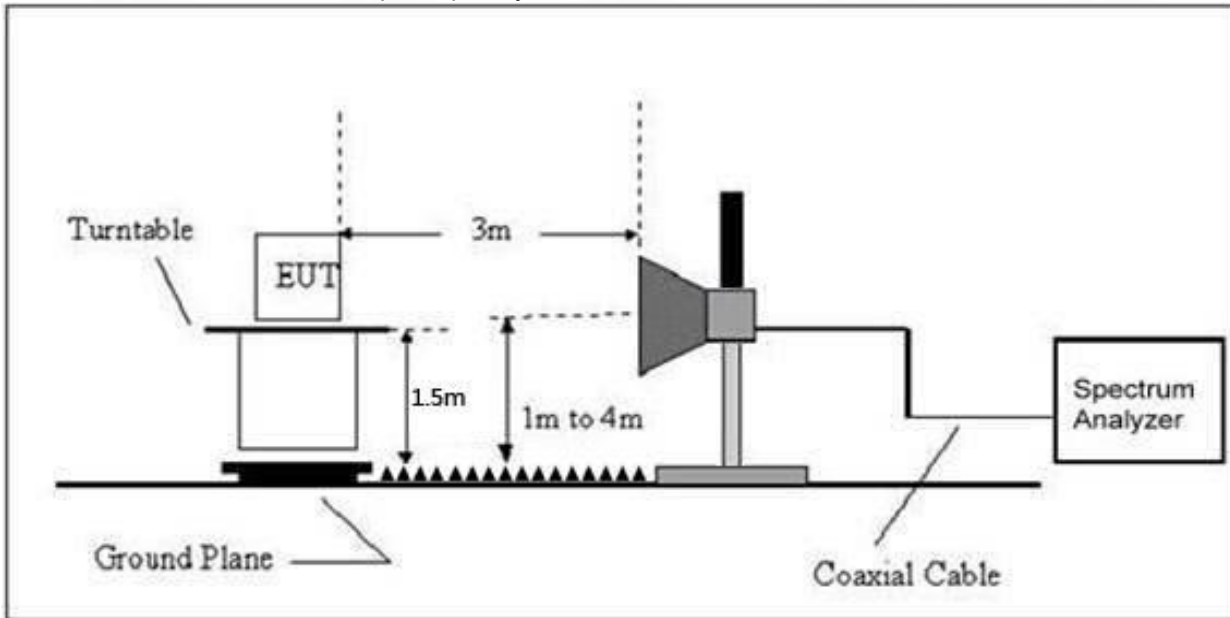
(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



(C) Radiated Emission Test-Up Frequency Above 1GHz



5.5.2 Limit

According to §22.917(a), the power of any emissions 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.

According to §24.238(a), the power of any emissions 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.

According to §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.

According to §90.543 (e),

For operations in the 758–768 MHz and the 788–798 MHz bands, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

- (1) On all frequencies between 769–775 MHz and 799–805 MHz, by a factor not less than $76 + 10 \log(P)$ dB in a 6.25 kHz band segment, for base and fixed stations.
- (2) On all frequencies between 769–775 MHz and 799–805 MHz, by a factor not less than $65 + 10 \log(P)$ dB in a 6.25 kHz band segment, for mobile and portable stations.
- (3) On any frequency between 775–788 MHz, above 805 MHz, and below 758 MHz, by at least $43 + 10 \log(P)$ dB.
- (4) Compliance with the provisions of paragraphs (e)(1) and (2) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.
- (5) Compliance with the provisions of paragraph (e)(3) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of 30 kHz may be employed.

5.5.3 Test procedure

1. The setup of EUT is according with per ANSI/TIA Standard 603D and ANSI C63.4-2014 measurement procedure.
2. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.
3. The frequency range up to tenth harmonic of the fundamental frequency was investigated.
4. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious attenuation limit in dB

$=43+10 \text{ Log}_{10} (\text{power out in Watts})$

5.5.4 Test Result

For FDD-LTE Band 2 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (1852.5MHz)						
72.55	-42.41	-15.59	-58.00	-13.00	-45.00	H
3704.80	-18.09	-22.93	-41.02	-13.00	-28.02	H
5557.20	-26.79	-22.45	-49.24	-13.00	-36.24	H
72.55	-44.34	-15.59	-59.92	-13.00	-46.92	V
3704.80	-21.51	-22.93	-44.44	-13.00	-31.44	V
5557.20	-24.32	-22.45	-46.77	-13.00	-33.77	V
Middle Channel (1880MHz)						
72.55	-44.62	-15.59	-60.20	-13.00	-47.20	H
3760.00	-19.38	-22.87	-42.25	-13.00	-29.25	H
5640.00	-26.91	-22.50	-49.41	-13.00	-36.41	H
72.55	-42.56	-15.59	-58.15	-13.00	-45.15	V
3760.00	-18.45	-22.87	-41.32	-13.00	-28.32	V
5640.00	-25.43	-22.50	-47.93	-13.00	-34.93	V
High Channel (1907.5MHz)						
72.55	-41.09	-15.59	-56.68	-13.00	-43.68	H
3815.00	-21.67	-22.79	-44.46	-13.00	-31.46	H
5722.50	-26.19	-22.56	-48.75	-13.00	-35.75	H
72.55	-44.82	-15.59	-60.40	-13.00	-47.40	V
3815.00	-21.29	-22.79	-44.08	-13.00	-31.08	V
5722.50	-25.67	-22.56	-48.23	-13.00	-35.23	V

For FDD-LTE Band 4 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (1710.7MHz)						
72.55	-41.45	-15.59	-57.04	-13.00	-44.04	H
3421.40	-27.28	-17.47	-44.75	-13.00	-31.75	H
5132.10	-29.26	-11.76	-41.02	-13.00	-28.02	H
72.55	-44.03	-15.59	-59.62	-13.00	-46.62	V
3421.40	-29.46	-17.47	-46.93	-13.00	-33.93	V
5132.10	-29.67	-11.76	-41.43	-13.00	-28.43	V
Middle Channel (1732.5MHz)						
72.55	-41.69	-15.59	-57.28	-13.00	-44.28	H
3465.00	-27.06	-16.98	-44.04	-13.00	-31.04	H
5197.50	-29.57	-11.33	-40.90	-13.00	-27.90	H
72.55	-44.48	-15.59	-60.07	-13.00	-47.07	V
3465.00	-26.98	-16.98	-43.96	-13.00	-30.96	V
5197.50	-30.48	-11.33	-41.81	-13.00	-28.81	V
High Channel (1754.3MHz)						
72.55	-43.17	-15.59	-58.76	-13.00	-45.76	H
3508.60	-24.60	-16.49	-41.09	-13.00	-28.09	H
5262.90	-29.54	-10.90	-40.44	-13.00	-27.44	H
72.55	-41.00	-15.59	-56.59	-13.00	-43.59	V
3508.60	-27.15	-16.49	-43.64	-13.00	-30.64	V
5262.90	-29.57	-10.90	-40.47	-13.00	-27.47	V

For FDD-LTE Band 5 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (824.7MHz)						
72.55	-41.15	-15.59	-56.74	-13.00	-43.74	H
1649.40	-21.63	-22.93	-44.56	-13.00	-31.56	H
2474.10	-26.33	-22.45	-48.78	-13.00	-35.78	H
72.55	-44.55	-15.59	-60.14	-13.00	-47.14	V
1649.40	-21.95	-22.93	-44.88	-13.00	-31.88	V
2474.10	-23.23	-22.45	-45.68	-13.00	-32.68	V
Middle Channel (836.5MHz)						
72.55	-42.94	-15.59	-58.53	-13.00	-45.53	H
1673.00	-18.59	-22.87	-41.46	-13.00	-28.46	H
2509.50	-26.32	-22.50	-48.82	-13.00	-35.82	H
72.55	-42.04	-15.59	-57.63	-13.00	-44.63	V
1673.00	-18.63	-22.87	-41.50	-13.00	-28.50	V
2509.50	-23.59	-22.50	-46.09	-13.00	-33.09	V
High Channel (848.3MHz)						
72.55	-44.80	-15.59	-60.39	-13.00	-47.39	H
3508.60	-19.26	-22.79	-42.05	-13.00	-29.05	H
5262.90	-26.63	-22.56	-49.19	-13.00	-36.19	H
72.55	-43.11	-15.59	-58.69	-13.00	-45.69	V
3508.60	-20.26	-22.79	-43.05	-13.00	-30.05	V
5262.90	-23.95	-22.56	-46.51	-13.00	-33.51	V

For FDD-LTE Band 12 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (699.7MHz)						
72.55	-43.92	-15.59	-59.51	-13.00	-46.51	H
1399.40	-18.65	-22.93	-41.58	-13.00	-28.58	H
2099.10	-24.50	-22.45	-46.95	-13.00	-33.95	H
72.55	-41.41	-15.59	-57.00	-13.00	-44.00	V
1399.40	-21.30	-22.93	-44.23	-13.00	-31.23	V
2099.10	-24.94	-22.45	-47.39	-13.00	-34.39	V
Middle Channel (707.5MHz)						
72.55	-41.30	-15.59	-56.89	-13.00	-43.89	H
1415.00	-21.91	-22.87	-44.78	-13.00	-31.78	H
2122.50	-26.64	-22.50	-49.14	-13.00	-36.14	H
72.55	-41.43	-15.59	-57.01	-13.00	-44.01	V
1415.00	-18.44	-22.87	-41.31	-13.00	-28.31	V
2122.50	-23.43	-22.50	-45.93	-13.00	-32.93	V
High Channel (715.3MHz)						
72.55	-41.39	-15.59	-56.98	-13.00	-43.98	H
1430.60	-20.21	-22.79	-43.00	-13.00	-30.00	H
2145.90	-25.01	-22.56	-47.57	-13.00	-34.57	H
72.55	-43.18	-15.59	-58.77	-13.00	-45.77	V
1430.60	-18.64	-22.79	-41.43	-13.00	-28.43	V
2145.90	-23.05	-22.56	-45.61	-13.00	-32.61	V

For FDD-LTE Band 13 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (779.5MHz)						
72.55	-41.07	-15.59	-56.66	-13.00	-43.66	H
1559.00	-19.77	-22.93	-42.70	-13.00	-29.70	H
2338.50	-26.07	-22.45	-48.52	-13.00	-35.52	H
72.55	-41.87	-15.59	-57.46	-13.00	-44.46	V
1559.00	-20.89	-22.93	-43.82	-13.00	-30.82	V
2338.50	-25.48	-22.45	-47.93	-13.00	-34.93	V
Middle Channel (782MHz)						
72.55	-42.85	-15.59	-58.44	-13.00	-45.44	H
1564.00	-21.72	-22.87	-44.59	-13.00	-31.59	H
2346.00	-25.27	-22.50	-47.77	-13.00	-34.77	H
72.55	-41.57	-15.59	-57.16	-13.00	-44.16	V
1564.00	-21.72	-22.87	-44.59	-13.00	-31.59	V
2346.00	-24.63	-22.50	-47.13	-13.00	-34.13	V
High Channel (784.5MHz)						
72.55	-43.88	-15.59	-59.46	-13.00	-46.46	H
1569.00	-19.63	-22.79	-42.42	-13.00	-29.42	H
2353.50	-23.98	-22.56	-46.54	-13.00	-33.54	H
72.55	-44.47	-15.59	-60.05	-13.00	-47.05	V
1569.00	-20.65	-22.79	-43.44	-13.00	-30.44	V
2353.50	-23.43	-22.56	-45.99	-13.00	-32.99	V

For FDD-LTE Band 14 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (790.5MHz)						
72.55	-42.66	-15.59	-58.25	-13.00	-45.25	H
1559.00	-20.14	-22.93	-43.07	-13.00	-30.07	H
2338.50	-24.92	-22.45	-47.37	-13.00	-34.37	H
72.55	-44.78	-15.59	-60.36	-13.00	-47.36	V
1559.00	-20.25	-22.93	-43.18	-13.00	-30.18	V
2338.50	-25.03	-22.45	-47.48	-13.00	-34.48	V
Middle Channel (793.0MHz)						
72.55	-43.17	-15.59	-58.76	-13.00	-45.76	H
1564.00	-19.26	-22.87	-42.13	-13.00	-29.13	H
2346.00	-26.50	-22.50	-49.00	-13.00	-36.00	H
72.55	-41.54	-15.59	-57.12	-13.00	-44.12	V
1564.00	-20.04	-22.87	-42.91	-13.00	-29.91	V
2346.00	-25.23	-22.50	-47.73	-13.00	-34.73	V
High Channel (795.5MHz)						
72.55	-44.76	-15.59	-60.35	-13.00	-47.35	H
1569.00	-21.71	-22.79	-44.50	-13.00	-31.50	H
2353.50	-26.45	-22.56	-49.01	-13.00	-36.01	H
72.55	-44.85	-15.59	-60.44	-13.00	-47.44	V
1569.00	-19.49	-22.79	-42.28	-13.00	-29.28	V
2353.50	-26.33	-22.56	-48.89	-13.00	-35.89	V

For FDD-LTE Band 66 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (1710.7MHz)						
72.55	-44.69	-15.59	-60.28	-13.00	-47.28	H
3421.40	-26.50	-17.47	-43.97	-13.00	-30.97	H
5132.10	-32.10	-11.76	-43.86	-13.00	-30.86	H
72.55	-42.07	-15.59	-57.66	-13.00	-44.66	V
3421.40	-29.79	-17.47	-47.26	-13.00	-34.26	V
5132.10	-28.46	-11.76	-40.22	-13.00	-27.22	V
Middle Channel (1745MHz)						
72.55	-43.48	-15.59	-59.07	-13.00	-46.07	H
3490.00	-24.89	-16.98	-41.87	-13.00	-28.87	H
5235.00	-30.34	-11.33	-41.67	-13.00	-28.67	H
72.55	-43.98	-15.59	-59.57	-13.00	-46.57	V
3490.00	-27.50	-16.98	-44.48	-13.00	-31.48	V
5235.00	-31.30	-11.33	-42.63	-13.00	-29.63	V
High Channel (1779.3MHz)						
72.55	-43.12	-15.59	-58.71	-13.00	-45.71	H
3558.60	-25.13	-16.49	-41.62	-13.00	-28.62	H
5337.90	-29.18	-10.90	-40.08	-13.00	-27.08	H
72.55	-44.05	-15.59	-59.64	-13.00	-46.64	V
3558.60	-28.68	-16.49	-45.17	-13.00	-32.17	V
5337.90	-28.63	-10.90	-39.53	-13.00	-26.53	V

For FDD-LTE Band 71 Mode

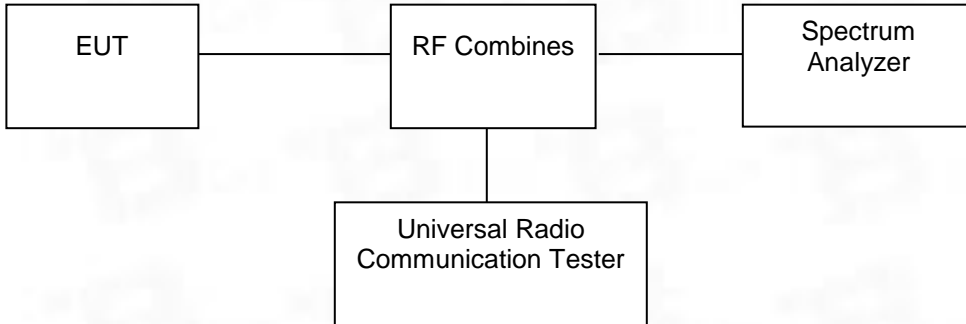
Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (665.5MHz)						
72.55	-43.12	-15.59	-58.71	-13.00	-45.71	H
1331.00	-20.50	-22.93	-43.43	-13.00	-30.43	H
1996.50	-26.92	-22.45	-49.37	-13.00	-36.37	H
72.55	-41.88	-15.59	-57.47	-13.00	-44.47	V
1331.00	-21.63	-22.93	-44.56	-13.00	-31.56	V
1996.50	-26.34	-22.45	-48.79	-13.00	-35.79	V
Middle Channel (680.5MHz)						
72.55	-44.25	-15.59	-59.83	-13.00	-46.83	H
1361.00	-18.57	-22.87	-41.44	-13.00	-28.44	H
2041.50	-24.93	-22.50	-47.43	-13.00	-34.43	H
72.55	-43.80	-15.59	-59.39	-13.00	-46.39	V
1361.00	-18.41	-22.87	-41.28	-13.00	-28.28	V
2041.50	-26.03	-22.50	-48.53	-13.00	-35.53	V
High Channel (695.5MHz)						
72.55	-44.13	-15.59	-59.72	-13.00	-46.72	H
1391.00	-19.06	-22.79	-41.85	-13.00	-28.85	H
2086.50	-26.38	-22.56	-48.94	-13.00	-35.94	H
72.55	-41.86	-15.59	-57.45	-13.00	-44.45	V
1391.00	-19.10	-22.79	-41.89	-13.00	-28.89	V
2086.50	-24.36	-22.56	-46.92	-13.00	-33.92	V

Note: Result=Reading+ Correct, Margin= Result- Limit

Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, other than listed in the table above are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5.6 Frequency Stability

5.6.1 Block Diagram Of Test Setup



5.6.2 Limit

±2.5 ppm

5.6.3 Test procedure

Test Procedures for Temperature Variation

1. The testing follows FCC KDB 971168 D01v03 Section 9.0.
2. The EUT was set up in the thermal chamber and connected with the system simulator.
3. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
4. With power OFF, the temperature was raised in 10°C steps up to 50°C. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

Test Procedures for Voltage Variation

1. The testing follows FCC KDB 971168 D01v03 Section 9.0.
2. The EUT was placed in a temperature chamber at 25±5° C and connected with the system simulator.
3. The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT.
4. The variation in frequency was measured for the worst case.
5. The worst case(worst bandwidth) for frequency stability reported in the Test Data.

5.6.4 Test Result

Please refer to Appendix 2: Frequency Stability

Test Result: Pass

ANNEX B TEST SETUP PHOTOS

Band edge emissions (Radiated)
Emissions in frequency bands (above 1GHz)



Emissions in frequency bands (below 1GHz)





Test Report Number: BTF231212R00201



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