Certificate #6613.01

FCC TEST REPORT

(PART 27)

Applicant:	InHand Networks, Inc.
Address:	43671 Trade Center Place, Suite 100, Dulles, VA 20166 United States

Manufacturer or Supplier:	InHand Networks, Inc.
Address:	43671 Trade Center Place, Suite 100, Dulles, VA 20166 United States
Product:	Edge Computer
Brand Name:	inhand
Model Name:	EC3320, EC3310, EC3340,
FCC ID:	2BPWU-EC3320
Date of tests:	Mar. 31, 2025 ~Apr.30, 2025

The tests have been carried out according to the requirements of the following standard:

☒ **FCC Part 27** ☒ **ANSI/TIA/EIA-603-D**
☒ **FCC Part 2** ☒ **ANSI/TIA/EIA-603-E** ☒ **ANSI C63.26-2015**

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

Prepared by Hanwen Xu Engineer / Mobile Department	Approved by Peibo Sun Manager / Mobile Department
Date: Apr.30, 2025	

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
PSU-NQN2504020112RF03	Original release	Apr.30, 2025

1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 27 & PART 2			
STANDARD SECTION	**TEST TYPE AND LIMIT**	**RESULT**	**TEST LAB***
§2.1046	Conducted Output Power	Compliance	A
§27.50(b)(10) §27.50(c)(10)	Effective Radiated Power (Band 12) (Band 13) (Band 17) (Band 71)	Compliance	A
§27.50(d)(4) §27.50(h)(2) §27.50(a)(3)	Equivalent Isotropically Radiated Power (Band 7) (Band 30)	Compliance	A
§2.1055 §27.54	Frequency Stability	See Note	A
§2.1049	Occupied Bandwidth	See Note	A
§2.1051 §27.53(c)(2)(4) §27.53(g) §27.53(h) §27.53(m)(4)(6) §27.53(a)(4)	Conducted Band Edge Measurements (Band 7) (Band 12) (Band 13) (Band 17) (Band 30) (Band 71)	See Note	A
§2.1051 §27.53(c)(2)(4) §27.53(g) §27.53(h) §27.53(m)(4)(6) §27.53(a)(4)	Conducted Spurious Emissions (Band 7) (Band 12) (Band 13) (Band 17) (Band 30) (Band 71)	See Note	A
§2.1053 §27.53(c)(2)(4) §27.53(f) §27.53(g) §27.53(h) §27.53(m)(4)(6) §27.53(a)(4)	Radiated Spurious Emissions (Band 7) (Band 12) (Band 13) (Band 17) (Band 30) (Band 71)	See Note	A
NA	Peak to average ratio	See Note	A

Note: Please Refer to module EM060K-GL and EM120K-GL report.

For module EM060K-GL: Report No.: 2309RSU052-U1

FCC ID：XMR2022EM060KGL

For module EM120K-GL: Report No.: 2203RSU046-U2

FCC ID：XMR2022EM120KGL

Test Model No.: EC3320

Series Model No.: EC3310, EC3340

These models are the same in these:appearance,PCB layout and basic software function;The only difference is that the products are used in different markets.

***Test Lab Information Reference**

Lab A:

Huarui 7Layers High Technology (Suzhou) Co., Ltd.

Lab Address:

Tower N, Innovation Center, 88 Zuyi Road, High-tech District, Suzhou City, Anhui Province

Accredited Test Lab Cert 6613.01

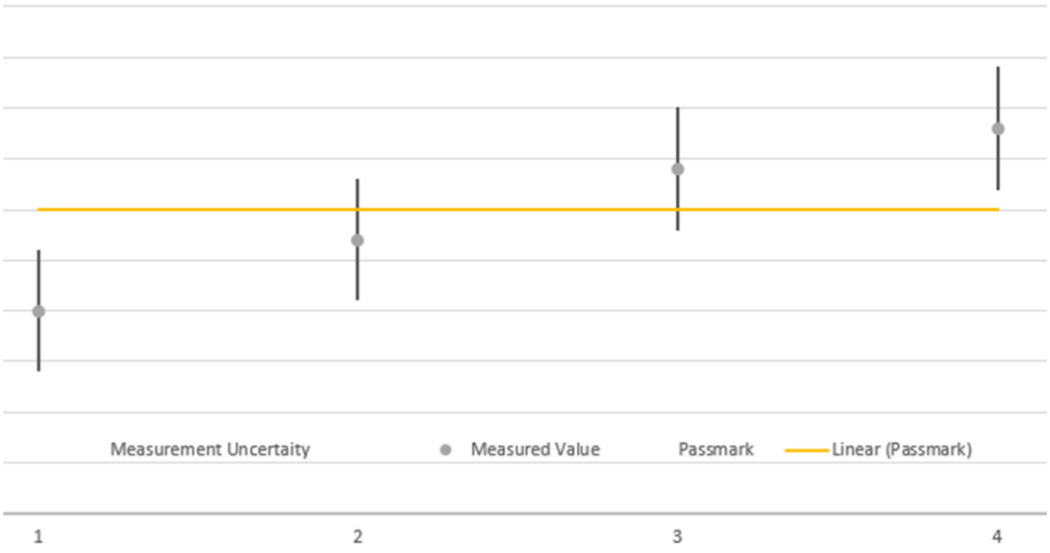
The FCC Site Registration No. is 434559; The Designation No. is CN1325.

1.1 MEASREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

MEASUREMENT	UNCERTAINTY
Frequency Stability	±76.97Hz
Radiated emissions (9KHz~30MHz)	±2.68dB
Radiated emissions & Radiated Power (30MHz~1GHz)	±4.98dB
Radiated emissions & Radiated Power (1GHz ~6GHz)	±4.70dB
Radiated emissions (6GHz ~18GHz)	±4.60dB
Radiated emissions (18GHz ~40GHz)	±4.12dB
Conducted emissions	±4.01dB
Occupied Channel Bandwidth	±43.58KHz
Conducted Output power	±2.06dB
Band Edge Measurements	±4.70dB

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



The verdicts in this test report are given according the above diagram:

Case	Measured Value	Uncertainty Range	Verdict
1	below pass mark	below pass mark	Passed
2	below pass mark	within pass mark	Passed
3	above pass mark	within pass mark	Failed
4	above pass mark	above pass mark	Failed

That means, the laboratory applies, as decision rule (see ISO/IEC 17025:2017), the so-called shared risk principle.

1.2 TEST SITE AND INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Pre-Amplifier	R&S	SCU18F1	100815	Aug.30,23	Aug.29,25
Pre-Amplifier	R&S	SCU08F1	101028	Jan.22,24	Jan.21,26
Vector Signal Generator	R&S	SMBV100B	102176	Mar.29,24	Mar.28,26
Signal Generator	R&S	SMB100A	182185	Mar.29,24	Mar.28,26
3m Fully-anechoic Chamber	TDK	9m*6m*6m	HRSW-SZ-EMC-01Chamber	Nov.25,22	Nov.24,25
3m Semi-anechoic Chamber	TDK	9m*6m*6m	HRSW-SZ-EMC-02Chamber	Nov.25,22	Nov.24,25
EMI TEST Receiver	R&S	ESR26	101734	Mar.28,24	Mar.27,26
EMI TEST Receiver	R&S	ESW44	101973	Mar.28,24	Mar.27,26
Bilog Antenna	SCHWARZBECK	VULB 9163	1264	Dec.26,23	Dec.25,25
Horn Antenna	ETS-LINDGREN	3117	227836	Aug.22,23	Aug.21,25
Horn Antenna (18GHz-40GHz)	Steatite Q-par Antennas	QMS 00880	23486	Jul.15,24	Jul.14,26
Horn Antenna	Steatite Q-par Antennas	QMS 00208	23485	Aug.22,23	Aug.21,25
Loop Antenna	SCHWARZ	HFH2-Z2/Z2E	100976	Feb.23,25	Feb.22,27
WIDEBANDRADIO COMMUNICATION TESTER	R&S	CMW500	169399	Jun.19,24	Jun.18,26
Test Software	EMC32	EMC32	N/A	N/A	N/A
6DB attenuator	Tonscend Technology Co., Ltd	N/A	23062787	N/A	N/A
Test Software	ELEKTRA	ELEKTRA4.32	N/A	N/A	N/A
Open Switch and Control Unit	R&S	OSP220	101964	N/A	N/A
DC Source	HYELEC	HY3010B	551016	Aug.31,23	Aug.30,25
Hygrothermograph	DELI	20210528	SZ014	Sep.06,23	Sep.05,25
PC	LENOVO	E14	HRSW0024	N/A	N/A
TMC-AMI18843A(CABLE)	R&S	HF290-NMNM-7.00M	N/A	N/A	N/A
TMC-AMI18843A(CABLE)	R&S	HF290-NMNM-4.00M	N/A	N/A	N/A
CABLE	R&S	W13.02	N/A	Apr.27,25	Apr.26,26
CABLE	R&S	W12.14	N/A	Apr.27,25	Apr.26,26
CABLE	R&S	J12J103539-00-1	SEP-03-20-069	Apr.27,25	Apr.26,26
CABLE	R&S	J12J103539-00-1	SEP-03-20-070	Apr.27,25	Apr.26,26
Temperature Chamber	votsch	VT4002	58566078100050	May.30,24	May.29,26

NOTE: 1. The calibration interval of the above test instruments is 12 / 24/ 36 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

2. The test was performed in 3m Semi-anechoic Chamber and RF Oven Room.

3. The horn antenna is used only for the measurement of emission frequency above 1GHz if tested.

4. The FCC Site Registration No. is 434559; The Designation No. is CN1325.

2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT*	Edge Computer	
BRAND NAME**	inhand	
MODEL NAME*	EC3320, EC3310, EC3340,	
NOMINAL VOLTAGE*	12.0Vdc	
MODULATION TECHNOLOGY*	**LTE**	QPSK
FREQUENCY RANGE	**LTE Band 7 Channel Bandwidth: 5MHz**	2502.5MHz ~ 2567.5MHz
	LTE Band 7 Channel Bandwidth: 10MHz	2505MHz ~ 2565MHz
	LTE Band 7 Channel Bandwidth: 15MHz	2507.5MHz ~ 2562.5MHz
	LTE Band 7 Channel Bandwidth: 20MHz	2510MHz ~ 2560MHz
	LTE Band 12 Channel Bandwidth: 1.4MHz	699.7MHz ~ 715.3MHz
	LTE Band 12 Channel Bandwidth: 3MHz	700.5MHz ~ 714.5MHz
	LTE Band 12 Channel Bandwidth: 5MHz	701.5MHz ~ 713.5MHz
	LTE Band 12 Channel Bandwidth: 10MHz	704MHz ~ 711MHz
	LTE Band 13 Channel Bandwidth: 5MHz	779.5MHz ~ 784.5MHz
	LTE Band 13 Channel Bandwidth: 10MHz	782MHz
	LTE Band 17 Channel Bandwidth: 5MHz	706.5MHz ~ 713.5MHz
	LTE Band 17 Channel Bandwidth: 10MHz	709MHz ~ 711 MHz
	LTE Band 30 Channel Bandwidth: 5MHz	2307.5MHz ~ 2312.5MHz
	LTE Band 30 Channel Bandwidth: 10MHz	2310MHz
	LTE Band 71 Channel Bandwidth: 5MHz	665.5MHz ~ 695.5MHz
	LTE Band 71 Channel Bandwidth: 10MHz	668MHz ~ 693MHz
	LTE Band 71 Channel Bandwidth: 15MHz	670.5MHz ~ 690.5MHz
	LTE Band 71 Channel Bandwidth: 20MHz	673MHz ~ 688MHz

MAX. EIRP POWER	**LTE Band 7 Channel Bandwidth: 15MHz**	391.94mW
	LTE Band 12/17 Channel Bandwidth: 5MHz	161.44mW
	LTE Band 13 Channel Bandwidth: 5MHz	158.85mW
	LTE Band 30 Channel Bandwidth: 10MHz	370.68mW
	LTE Band 71 Channel Bandwidth: 20MHz	162.56mW
ANTENNA TYPE*	Sucker Antenna with 2.6 dBi gain for LTE B7/30 Sucker Antenna with 1.25 dBi gain for LTE B12/13/17/71	
HW VERSION	V2.2	
SW VERSION**	V2.0	
I/O PORTS*	Refer to user's manual	
EXTREME TEMPERATURE*	-20°C~60 °C	
EXTREME VOLTAGE*	9 Vdc~36Vdc	

NOTE1: This product uses the module model EM060K-GL and supports LTE frequency bands 2/4/5/7/12/13/14/17/25/26/30/38/41/42/48/66/71. Therefore, for this product, we referred to the test data reported by the EM060K-GL module and revaluated the spectrum of radiated emissions and EIRP.

For module EM060K-GL: Report No.: 2309RSU052-U1, 2309RSU052-U4

FCC ID：XMR2022EM060KGL

EM060K-GL and EM120K-GL support the same bands, use the same chips, share the same software and hardware design. The data of EM060K-GL is cited from the data of EM120K-GL.

For module EM120K-GL: Report No.: 2203RSU046-U2, 2203RSU046-U5

FCC ID：XMR2022EM120KGL

NOTE2:

1. ***Since the above data and/or information is provided by the client relevant results or conclusions of this report are only made for these data and/or information, Test Lab is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion.

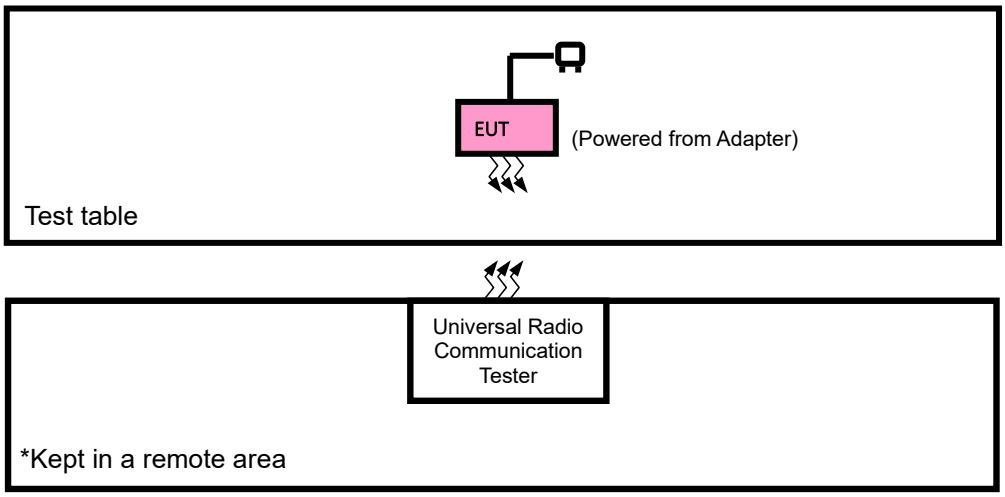
2. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
3. The EUT incorporates a SISO function. Physically, the EUT provides one completed transmitter and one receiver.

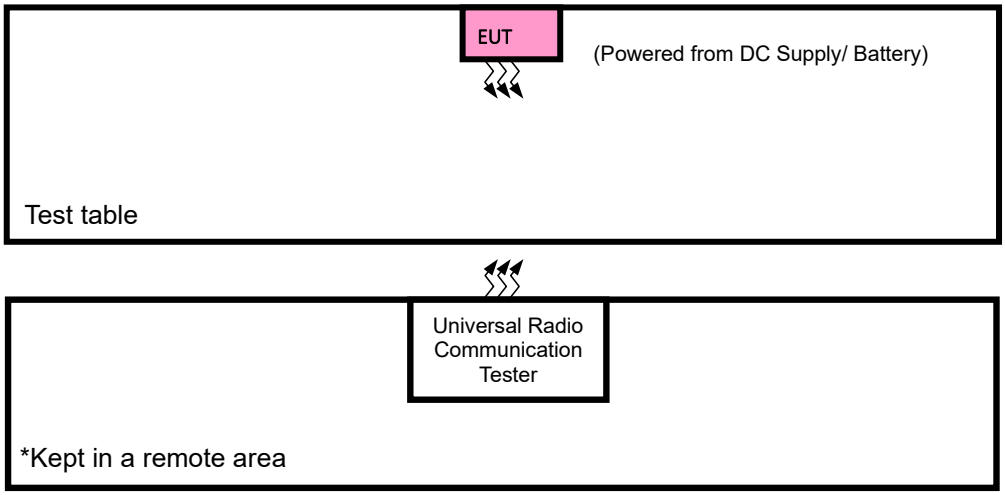
MODULATION MODE	TX FUNCTION
LTE	1TX/1RX

4. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.
5. Antenna gain and EUT conducted cable loss are provided by the customer, and the laboratory will record the results based on these items that involve these two parameters.

2.2 CONFIGURATION OF SYSTEM UNDER TEST

FOR RADIATION EMISSION TEST





2.3 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	DC Source	HYELEC	HY3010B	551016	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	DC Line: Unshielded, Detachable 1.8m

2.4 TEST ITEM AND TEST CONFIGURATION

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports The worst case was found when positioned on Y-plane for EIRP and X-axis for radiated emission. Following channel(s) was (were) selected for the final test as listed below:

EUT CONFIGURE MODE	DESCRIPTION
A	EUT + Adapter + USB Cable with LTE link
B	EUT + DC Supply with LTE link

LTE BAND 7 MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
A	EIRP	20775 to 21425	20775, 21100, 21425	5MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		20800 to 21400	20800, 21100, 21400	10MHz	QPSK, 16QAM, 64QAM	1 RB / 0RB Offset
		20825 to 21375	20825, 21100, 21375	15MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		20850 to 21350	20850, 21100, 21350	20MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
B	FREQUENCY STABILITY	20800 to 21400	20800, 21100, 21400	10MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset
A	OCCUPIED BANDWIDTH	20775 to 21425	20775, 21100, 21425	5MHz	QPSK, 16QAM, 64QAM	25 RB / 0 RB Offset
		20800 to 21400	20800, 21100, 21400	10MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset
		20825 to 21375	20825, 21100, 21375	15MHz	QPSK, 16QAM, 64QAM	75 RB / 0 RB Offset
		20850 to 21350	20850, 21100, 21350	20MHz	QPSK, 16QAM, 64QAM	100 RB / 0 RB Offset
A	PEAK TO AVERAGE RATIO	20850 to 21350	20850, 21100, 21350	20MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset 100 RB / 0 RB Offset
A	BAND EDGE	20775 to 21425	20775	5MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
						25 RB / 0 RB Offset
			21425	5MHz	QPSK, 16QAM, 64QAM	1 RB / 24 RB Offset
						25 RB / 0 RB Offset

		20800 to 21400	20800	10MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
						50 RB / 0 RB Offset
			21400	10MHz	QPSK, 16QAM, 64QAM	1 RB / 49 RB Offset
						50 RB / 0 RB Offset
		20825 to 21375	20825	15MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
						75 RB / 0 RB Offset
			21375	15MHz	QPSK, 16QAM, 64QAM	1 RB / 74 RB Offset
						75 RB / 0 RB Offset
		20850 to 21350	20850	20MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
						100 RB / 0 RB Offset
			21350	20MHz	QPSK, 16QAM, 64QAM	1 RB / 99 RB Offset
						100 RB / 0 RB Offset
A	CONDUCTED EMISSION	20775 to 21425	20775, 21100, 21425	5MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		20800 to 21400	20800, 21100, 21400	10MHz	QPSK, 16QAM, 64QAM	1 RB / 0RB Offset
		20825 to 21375	20825, 21100, 21375	15MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		20850 to 21350	20850, 21100, 21350	20MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
A	RADIATED EMISSION	20775 to 21425	20775, 21100, 21425	5MHz	QPSK	1 RB / 0 RB Offset
		20800 to 21400	21100	10MHz	QPSK	1 RB / 0 RB Offset
		20825 to 21375	21100	15MHz	QPSK	1 RB / 0 RB Offset
		20850 to 21350	21100	20MHz	QPSK	1 RB / 0 RB Offset

Note: This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

LTE BAND 12 MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
A	ERP	23017 to 23173	23017, 23095 , 23173	1.4MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		23025 to 23165	23025, 23095 ,23165	3MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		23035 to 23155	23035, 23095 ,23155	5MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		23060 to 23130	23060, 23095 ,23130	10MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
B	FREQUENCY STABILITY	23060 to 23130	23060, 23095 ,23130	10MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset
A	OCCUPIED BANDWIDTH	23017 to 23173	23017, 23095 , 23173	1.4MHz	QPSK, 16QAM, 64QAM	6 RB / 0 RB Offset
		23025 to 23165	23025, 23095 ,23165	3MHz	QPSK, 16QAM, 64QAM	15 RB / 0 RB Offset
		23035 to 23155	23035, 23095 ,23155	5MHz	QPSK, 16QAM, 64QAM	25 RB / 0 RB Offset
		23060 to 23130	23060, 23095 ,23130	10MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset
A	PEAK TO AVERAGE RATIO	23060 to 23130	23060, 23095 ,23130	10MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset 50 RB / 0 RB Offset
A	BAND EDGE	23017 to 23173	23017	1.4MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
						6 RB / 0 RB Offset
			23173	1.4MHz	QPSK, 16QAM, 64QAM	1 RB / 5 RB Offset
						6 RB / 0 RB Offset
		23025 to 23165	23025	3MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
						15 RB / 0 RB Offset
			23165	3MHz	QPSK, 16QAM, 64QAM	1 RB / 14 RB Offset
						15 RB / 0 RB Offset
		23035 to 23155	23035	5MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
						25 RB / 0 RB Offset
			23155	5MHz	QPSK, 16QAM, 64QAM	1 RB / 24 RB Offset
						25 RB / 0 RB Offset
		23060 to 23130	23060	10MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
						50 RB / 0 RB Offset
			23130	10MHz	QPSK, 16QAM, 64QAM	1 RB / 49 RB Offset
						50 RB / 0 RB Offset
A	CONDUCTED EMISSION	23017 to 23173	23017, 23095 , 23173	1.4MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		23025 to 23165	23025, 23095 ,23165	3MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		23035 to 23155	23035, 23095 ,23155	5MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		23060 to 23130	23060, 23095 ,23130	10MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
A	RADIATED EMISSION	23017 to 23173	23095	1.4MHz	QPSK	1 RB / 0 RB Offset
		23025 to 23165	23095	3MHz	QPSK	1 RB / 0 RB Offset
		23035 to 23155	23095	5MHz	QPSK	1 RB / 0 RB Offset
		23060 to 23130	23060, 23095 ,23130	10MHz	QPSK	1 RB / 0 RB Offset

Note: This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

LTE BAND 13 MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
A	ERP	23205 to 23255	23205, 23230, 23255	5MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
		23230	23230	10MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
B	FREQUENCY STABILITY	23230	23230	10MHz	QPSK,16QAM,64QAM	50 RB / 0 RB Offset
A	OCCUPIED BANDWIDTH	23205 to 23255	23205, 23230, 23255	5MHz	QPSK,16QAM,64QAM	25 RB / 0 RB Offset
		23230	23230	10MHz	QPSK,16QAM,64QAM	50 RB / 0 RB Offset
A	PEAK TO AVERAGE RATIO	23230	23230	10MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset 50 RB / 0 RB Offset
A	BAND EDGE	23205 to 23255	23205	5MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
						25 RB / 0 RB Offset
			23255	5MHz	QPSK,16QAM, 64QAM	1 RB / 24 RB Offset
						25 RB / 0 RB Offset
		23230	23230	10MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
						1 RB / 49 RB Offset
						50 RB / 0 RB Offset
A	CONDUCTED EMISSION	23205 to 23255	23205, 23230, 23255	5MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
		23230	23230	10MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
A	RADIATED EMISSION	23205 to 23255	23230	5MHz	QPSK	1 RB / 0 RB Offset
		23230	23230	10MHz	QPSK	1 RB / 0 RB Offset

Note: This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

LTE BAND 17 MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
A	ERP	23755 to 23825	23755, 23790, 23825	5MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
		23780 to 23800	23780, 23790, 23800	10MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset

Note: 1.This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

2. LTE Band 17 are covered by LTE Band 12, Because it is a subset of LTE Band 12 with the same output power and supported bandwidths, So the conducted test data and RSE test data please refer to LTE Band 12

LTE BAND 30

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
A	ERP	27685 to 27735	27685, 27710, 27735	5MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
		27710	27710	10MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
B	FREQUENCY STABILITY	27710	27710	10MHz	QPSK,16QAM,64QAM	50 RB / 0 RB Offset
A	OCCUPIED BANDWIDTH	27685 to 27735	27685, 27710, 27735	5MHz	QPSK,16QAM,64QAM	25 RB / 0 RB Offset
		27710	27710	10MHz	QPSK,16QAM,64QAM	50 RB / 0 RB Offset

A	PEAK TO AVERAGE RATIO	27710	27710	10MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset 50 RB / 0 RB Offset
A	BAND EDGE	27685 to 27735	27685	5MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
						25 RB / 0 RB Offset
			27735	5MHz	QPSK,16QAM,64QAM	1 RB / 24 RB Offset
						25 RB / 0 RB Offset
		27710	27710	10MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
						50 RB / 0 RB Offset
						1 RB / 49 RB Offset
						/
A	CONDUCTED EMISSION	27685 to 27735	27685, 27710, 27735	5MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
		27710	27710	10MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
A	RADIATED EMISSION	27685 to 27735	27685, 27710, 27735	5MHz	QPSK	1 RB / 0 RB Offset
		27710	27710	10MHz	QPSK	1 RB / 0 RB Offset

Note: This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

LTE BAND 71

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
A	ERP	133147 to 133447	133147, 133297, 133447	5MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
		133172 to 133422	133172, 133297 133422	10MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
		133197 to 133397	133197, 133297, 133397	15MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
		133222 to 133372	133222, 133322, 133372	20MHz	QPSK,16QAM,64QAM	1 RB / 0 RB Offset
B	FREQUENCY STABILITY	133172 to 133422	133172, 133297 133422	10MHz	QPSK,16QAM,64QAM	50 RB / 0 RB Offset
A	OCCUPIED BANDWIDTH	133147 to 133447	133147, 133297, 133447	5MHz	QPSK,16QAM,64QAM	25 RB / 0 RB Offset
		133172 to 133422	133172, 133297 133422	10MHz	QPSK,16QAM,64QAM	50 RB / 0 RB Offset
		133197 to 133397	133197, 133297, 133397	15MHz	QPSK,16QAM,64QAM	75 RB / 0 RB Offset
		133222 to 133372	133222, 133322, 133372	20MHz	QPSK,16QAM,64QAM	100 RB / 0 RB Offset
A	PEAK TO AVERAGE RATIO	133222 to 133372	133222, 133322, 133372	20MHz	QPSK, 16QAM,64QAM	1 RB / 0 RB Offset 100 RB / 0 RB Offset
A	BAND EDGE	133147 to 133447	133147	5MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
						25 RB / 0 RB Offset
			133447	5MHz	QPSK,16QAM, 64QAM	1 RB / 24 RB Offset
						25 RB / 0 RB Offset
		133172 to 133422	133172	10MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
						50 RB / 0 RB Offset
			133422	10MHz	QPSK,16QAM, 64QAM	1 RB / 49 RB Offset
						50 RB / 0 RB Offset
		133197 to 133397	133197	15MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
						75 RB / 0 RB Offset
			133397	15MHz	QPSK,16QAM, 64QAM	1 RB / 74 RB Offset

						75 RB / 0 RB Offset
		133222 to 133372	133222	20MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
						100 RB / 0 RB Offset
			133372	20MHz	QPSK,16QAM, 64QAM	1 RB / 99 RB Offset
						100 RB / 0 RB Offset
A	CONDUCTED EMISSION	133147 to 133447	133147, 133297, 133447	5MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
		133172 to 133422	133172, 133297 133422	10MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
		133197 to 133397	133197, 133297, 133397	15MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
		133222 to 133372	133222, 133322, 133372	20MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
A	RADIATED EMISSION	133147 to 133447	133297	5MHz	QPSK	1 RB / 0 RB Offset
		133172 to 133422	133172, 133297 133422	10MHz	QPSK	1 RB / 0 RB Offset
		133197 to 133397	133297	15MHz	QPSK	1 RB / 0 RB Offset
		133222 to 133372	133322	20MHz	QPSK	1 RB / 0 RB Offset

Note: This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

TEST CONDITION:

TEST ITEM	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
ERP&EIRP	23deg. C, 70%RH	DC 12V By Adapter	Hanwen Xu
FREQUENCY STABILITY	23deg. C, 70%RH	DC 12V By Adapter	Hanwen Xu
OCCUPIED BANDWIDTH	23deg. C, 70%RH	DC 12V By Adapter	Hanwen Xu
BAND EDGE	23deg. C, 70%RH	DC 12V By Adapter	Hanwen Xu
CONDUCTED EMISSION	23deg. C, 70%RH	DC 12V By Adapter	Hanwen Xu
RADIATED EMISSION	23deg. C, 70%RH	DC 12V By Adapter	Hanwen Xu
PEAK TO AVERAGE RATIO	23deg. C, 70%RH	DC 12V By Adapter	Hanwen Xu

2.5 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC 47 CFR Part 2

FCC 47 CFR Part 27

KDB 971168 D01 Power Meas License Digital Systems v03r01

ANSI/TIA/EIA-603-D

ANSI/TIA/EIA-603-E

ANSI C63.26-2015

NOTE: All test items have been performed and recorded as per the above standards.

3 TEST TYPES AND RESULTS

3.1 OUTPUT POWER MEASUREMENT

3.1.1 LIMITS OF OUTPUT POWER MEASUREMENT

The radiated peak output power shall be according to the specific rule Part 27.50(h)(2) that “User stations are limited to 2 watts” and 27.50(i) specific that “Peak transmit power must be measure over any interval of continuous transmission using instrumentation calibration in terms of rms-equivalent voltage.”

According to the specific rule Part 27.50(b)(10) and 27.50(c)(10) Fixed, mobile, and Portable stations (hand-held devices) transmitting in the 698-746 MHz, 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP.

For mobile and portable stations transmitting in the 2305-2315 MHz band or the 2350-2360 MHz band, the average EIRP must not exceed 50 milliwatts within any 1 megahertz of authorized bandwidth, except that for mobile and portable stations compliant with 3GPP LTE standards or another advanced mobile broadband protocol that avoids concentrating energy at the edge of the operating band the average EIRP must not exceed 250 milliwatts within any 5 megahertz of authorized bandwidth but may exceed 50 milliwatts within any 1 megahertz of authorized bandwidth.For mobile and portable stations using time division duplexing (TDD) technology, the duty cycle must not exceed 38 percent in the 2305-2315 MHz and 2350-2360 MHz bands. Mobile and portable stations using FDD technology are restricted to transmitting in the 2305-2315 MHz band. Power averaging shall not include intervals in which the transmitter is off.

3.1.2 TEST PROCEDURES

EIRP MEASUREMENT:

Per KDB 971168 D01 Power Meas License Digital Systems v03r01 or subclause 5.2.5.5 of ANSI C63.26-2015, the relevant equation for determing the ERP or EIRP from the conducted RF output power measured using the guidance provided above is:

$ERP\ or\ EIRP = P_{Meas} + G_T - L_C$

Where:

ERP or EIRP = effective radiated power or equivalent isotropically radiated power, respectively (expressed in the same units as P_{Meas}, typically dBW or dBm);

P_{Meas} = measured transmitter output power or PSD, in dBm or dBW;

G_T = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);

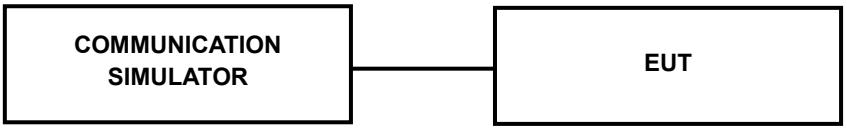
L_C = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

CONDUCTED POWER MEASUREMENT:

a. The EUT was set up for the maximum power with LTE link data modulation and link up with simulator.
b. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

3.1.3 TEST SETUP

CONDUCTED POWER MEASUREMENT:



For the actual test configuration, please refer to the attached file (Test Setup Photo).

3.1.4 TEST RESULTS

LTE Band 7

Channel Bandwidth (MHz)	Frequency (MHz)	RB Size	RB Offset	Output Power (dBm)	EIRP (dBm)	Limit (dBm)
QPSK						
5	2502.5	1	0	22.85	25.45	< 33.01
	2535			23.09	25.69	< 33.01
	2567.5			23	25.6	< 33.01
5	2502.5	1	12	22.76	25.36	< 33.01
	2535			23.11	25.71	< 33.01
	2567.5			23.04	25.64	< 33.01
5	2502.5	1	24	22.82	25.42	< 33.01
	2535			23.07	25.67	< 33.01
	2567.5			22.94	25.54	< 33.01
5	2502.5	25	0	21.92	24.52	< 33.01
	2535			22.13	24.73	< 33.01
	2567.5			22.01	24.61	< 33.01
10	2505	1	0	23.02	25.62	< 33.01
	2535			23.19	25.79	< 33.01
	2565			22.96	25.56	< 33.01
10	2505	1	24	22.93	25.53	< 33.01
	2535			23.12	25.72	< 33.01
	2565			22.97	25.57	< 33.01
10	2505	1	49	23.17	25.77	< 33.01
	2535			23.05	25.65	< 33.01
	2565			23.02	25.62	< 33.01
10	2505	50	0	22.08	24.68	< 33.01
	2535			22.19	24.79	< 33.01
	2565			22	24.6	< 33.01
15	2507.5	1	0	23	25.6	< 33.01
	2535			23.13	25.73	< 33.01
	2562.5			23.03	25.63	< 33.01
15	2507.5	1	37	22.99	25.59	< 33.01
	2535			23.22	25.82	< 33.01
	2562.5			22.94	25.54	< 33.01
15	2507.5	1	74	23.07	25.67	< 33.01
	2535			23.14	25.74	< 33.01
	2562.5			22.99	25.59	< 33.01
15	2507.5	75	0	22.08	24.68	< 33.01
	2535			22.2	24.8	< 33.01

	2562.5			22.04	24.64	< 33.01
20	2510	1	0	22.85	25.45	< 33.01
	2535			23.21	25.81	< 33.01
	2560			23.07	25.67	< 33.01
20	2510	1	49	22.95	25.55	< 33.01
	2535			23.04	25.64	< 33.01
	2560			22.95	25.55	< 33.01
20	2510	1	99	23.03	25.63	< 33.01
	2535			23.05	25.65	< 33.01
	2560			22.97	25.57	< 33.01
20	2510	100	0	21.87	24.47	< 33.01
	2535			22.2	24.8	< 33.01
	2560			21.97	24.57	< 33.01

Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Output Power (dBm)	EIRP (dBm)	Limit (dBm)
16QAM						
2502.5	5	1	0	22.07	24.67	< 33.01
2535				22.52	25.12	< 33.01
2567.5				22.31	24.91	< 33.01
2502.5	5	1	12	22.1	24.7	< 33.01
2535				22.41	25.01	< 33.01
2567.5				22.16	24.76	< 33.01
2502.5	5	1	24	22.15	24.75	< 33.01
2535				22.36	24.96	< 33.01
2567.5				22.02	24.62	< 33.01
2502.5	5	25	0	20.87	23.47	< 33.01
2535				21.12	23.72	< 33.01
2567.5				20.98	23.58	< 33.01
2505	10	1	0	22.08	24.68	< 33.01
2535				22.18	24.78	< 33.01
2565				22.01	24.61	< 33.01
2505	10	1	24	22.04	24.64	< 33.01
2535				22.14	24.74	< 33.01
2565				22.05	24.65	< 33.01
2505	10	1	49	22.12	24.72	< 33.01
2535				22.16	24.76	< 33.01
2565				22.12	24.72	< 33.01
2505	10	50	0	21.02	23.62	< 33.01
2535				21.11	23.71	< 33.01
2565				20.97	23.57	< 33.01

2507.5	15	1	0	22.14	24.74	< 33.01
2535				22.37	24.97	< 33.01
2562.5				22.21	24.81	< 33.01
2507.5	15	1	37	22.18	24.78	< 33.01
2535				22.2	24.8	< 33.01
2562.5				22.07	24.67	< 33.01
2507.5	15	1	74	22.21	24.81	< 33.01
2535				22.37	24.97	< 33.01
2562.5				22.24	24.84	< 33.01
2507.5	15	75	0	21.06	23.66	< 33.01
2535				21.12	23.72	< 33.01
2562.5				20.91	23.51	< 33.01
2510	20	1	0	22.17	24.77	< 33.01
2535				22.52	25.12	< 33.01
2560				22.29	24.89	< 33.01
2510	20	1	49	22.18	24.78	< 33.01
2535				22.51	25.11	< 33.01
2560				22.01	24.61	< 33.01
2510	20	1	99	22.17	24.77	< 33.01
2535				22.17	24.77	< 33.01
2560				22.34	24.94	< 33.01
2510	20	100	0	20.95	23.55	< 33.01
2535				21.15	23.75	< 33.01
2560				20.95	23.55	< 33.01
64QAM						
2502.5	5	1	0	20.97	23.57	< 33.01
2535				21.27	23.87	< 33.01
2567.5				21.05	23.65	< 33.01
2502.5	5	1	12	20.98	23.58	< 33.01
2535				21.17	23.77	< 33.01
2567.5				21.04	23.64	< 33.01
2502.5	5	1	24	20.92	23.52	< 33.01
2535				21.24	23.84	< 33.01
2567.5				21.15	23.75	< 33.01
2502.5	5	25	0	19.91	22.51	< 33.01
2535				20.17	22.77	< 33.01
2567.5				20.01	22.61	< 33.01
2505	10	1	0	21.07	23.67	< 33.01
2535				21.32	23.92	< 33.01
2565				21.1	23.7	< 33.01
2505	10	1	24	21.09	23.69	< 33.01
2535				21.23	23.83	< 33.01
2565				21.03	23.63	< 33.01
2505				21.13	23.73	< 33.01

2535	10	1	49	21.21	23.81	< 33.01
2565				21.19	23.79	< 33.01
2505	10	50	0	20.02	22.62	< 33.01
2535				20.19	22.79	< 33.01
2565				20.04	22.64	< 33.01
2507.5	15	1	0	21.19	23.79	< 33.01
2535				21.28	23.88	< 33.01
2562.5				21.1	23.7	< 33.01
2507.5	15	1	37	21.11	23.71	< 33.01
2535				21.19	23.79	< 33.01
2562.5				21.03	23.63	< 33.01
2507.5	15	1	74	21.14	23.74	< 33.01
2535				21.25	23.85	< 33.01
2562.5				21.08	23.68	< 33.01
2507.5	15	75	0	20.11	22.71	< 33.01
2535				20.19	22.79	< 33.01
2562.5				20.01	22.61	< 33.01
2510	20	1	0	21.05	23.65	< 33.01
2535				21.24	23.84	< 33.01
2560				21.22	23.82	< 33.01
2510	20	1	49	20.97	23.57	< 33.01
2535				21.23	23.83	< 33.01
2560				21.04	23.64	< 33.01
2510	20	1	99	21.05	23.65	< 33.01
2535				21.16	23.76	< 33.01
2560				21.06	23.66	< 33.01
2510	20	100	0	19.87	22.47	< 33.01
2535				20.21	22.81	< 33.01
2560				20.04	22.64	< 33.01
Note: The EIRP (dBm) = Output Power (dBm) + Antenna Gain (dBi)						

LTE Band 12/17

Channel Bandwidth (MHz)	Frequency (MHz)	RB Size	RB Offset	Output Power (dBm)	ERP (dBm)	Limit (dBm)
QPSK						
1.4	699.7	1	0	22.86	21.96	< 34.77
	707.5			22.81	21.91	< 34.77
	715.3			22.71	21.81	< 34.77
1.4	699.7	1	2	22.88	21.98	< 34.77
	707.5			22.9	22	< 34.77
	715.3			22.79	21.89	< 34.77
1.4	699.7	1	6	22.81	21.91	< 34.77
	707.5			22.8	21.9	< 34.77
	715.3			22.65	21.75	< 34.77
1.4	699.7	6	0	21.82	20.92	< 34.77
	707.5			21.91	21.01	< 34.77
	715.3			21.84	20.94	< 34.77
3	700.5	1	0	22.88	21.98	< 34.77
	707.5			22.88	21.98	< 34.77
	714.5			22.76	21.86	< 34.77
3	700.5	1	7	22.96	22.06	< 34.77
	707.5			22.98	22.08	< 34.77
	714.5			22.92	22.02	< 34.77
3	700.5	1	14	22.82	21.92	< 34.77
	707.5			22.84	21.94	< 34.77
	714.5			22.78	21.88	< 34.77
3	700.5	15	0	21.9	21	< 34.77
	707.5			21.95	21.05	< 34.77
	714.5			21.8	20.9	< 34.77
5	701.5	1	0	22.88	21.98	< 34.77
	707.5			22.84	21.94	< 34.77
	713.5			22.79	21.89	< 34.77
5	701.5	1	12	22.83	21.93	< 34.77
	707.5			22.85	21.95	< 34.77
	713.5			22.81	21.91	< 34.77
5	701.5	1	24	22.84	21.94	< 34.77
	707.5			22.79	21.89	< 34.77
	713.5			22.65	21.75	< 34.77
5	701.5	25	0	22.02	21.12	< 34.77
	707.5			21.9	21	< 34.77
	713.5			21.85	20.95	< 34.77
10	704	1	0	22.77	21.87	< 34.77
	707.5			22.87	21.97	< 34.77
	711			22.85	21.95	< 34.77

10	704	1	24	22.84	21.94	< 34.77
	707.5			22.88	21.98	< 34.77
	711			22.84	21.94	< 34.77
10	704	1	49	22.85	21.95	< 34.77
	707.5			22.74	21.84	< 34.77
	711			22.71	21.81	< 34.77
10	704	50	0	22	21.1	< 34.77
	707.5			21.97	21.07	< 34.77
	711			21.9	21	< 34.77

Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Output Power (dBm)	ERP (dBm)	Limit (dBm)
16QAM						
699.7	1.4	1	0	22.03	21.13	< 34.77
707.5				21.93	21.03	< 34.77
715.3				21.84	20.94	< 34.77
699.7	1.4	1	2	22.03	21.13	< 34.77
707.5				21.98	21.08	< 34.77
715.3				21.86	20.96	< 34.77
699.7	1.4	1	6	21.81	20.91	< 34.77
707.5				21.94	21.04	< 34.77
715.3				21.81	20.91	< 34.77
699.7	1.4	6	0	20.84	19.94	< 34.77
707.5				20.95	20.05	< 34.77
715.3				20.75	19.85	< 34.77
700.5	3	1	0	22.1	21.2	< 34.77
707.5				22.05	21.15	< 34.77
714.5				22.12	21.22	< 34.77
700.5	3	1	7	22.18	21.28	< 34.77
707.5				22.29	21.39	< 34.77
714.5				22.2	21.3	< 34.77
700.5	3	1	14	22.07	21.17	< 34.77
707.5				22.1	21.2	< 34.77
714.5				21.93	21.03	< 34.77
700.5	3	15	0	20.92	20.02	< 34.77
707.5				20.91	20.01	< 34.77
714.5				20.85	19.95	< 34.77
701.5	5	1	0	22.19	21.29	< 34.77
707.5				22.01	21.11	< 34.77
713.5				22.22	21.32	< 34.77
701.5				22.18	21.28	< 34.77

707.5	5	1	12	22.23	21.33	< 34.77
713.5				22.1	21.2	< 34.77
701.5	5	1	24	22.15	21.25	< 34.77
707.5				21.99	21.09	< 34.77
713.5				21.82	20.92	< 34.77
701.5	5	25	0	20.95	20.05	< 34.77
707.5				20.95	20.05	< 34.77
713.5				20.86	19.96	< 34.77
704	10	1	0	22.09	21.19	< 34.77
707.5				21.98	21.08	< 34.77
711				22.15	21.25	< 34.77
704	10	1	24	22.09	21.19	< 34.77
707.5				22.15	21.25	< 34.77
711				21.92	21.02	< 34.77
704	10	1	49	21.82	20.92	< 34.77
707.5				22	21.1	< 34.77
711				21.87	20.97	< 34.77
704	10	50	0	21.01	20.11	< 34.77
707.5				20.98	20.08	< 34.77
711				20.91	20.01	< 34.77
64QAM						
699.7	1.4	1	0	21.08	20.18	< 34.77
707.5				21.07	20.17	< 34.77
715.3				20.98	20.08	< 34.77
699.7	1.4	1	2	21.03	20.13	< 34.77
707.5				21.16	20.26	< 34.77
715.3				21	20.1	< 34.77
699.7	1.4	1	6	20.93	20.03	< 34.77
707.5				20.95	20.05	< 34.77
715.3				20.89	19.99	< 34.77
699.7	1.4	6	0	19.87	18.97	< 34.77
707.5				19.88	18.98	< 34.77
715.3				19.76	18.86	< 34.77
700.5	3	1	0	21.07	20.17	< 34.77
707.5				21.09	20.19	< 34.77
714.5				20.95	20.05	< 34.77
700.5	3	1	7	21.2	20.3	< 34.77
707.5				21.18	20.28	< 34.77
714.5				21.12	20.22	< 34.77
700.5	3	1	14	21.1	20.2	< 34.77
707.5				21.12	20.22	< 34.77
714.5				21.04	20.14	< 34.77
700.5				19.87	18.97	< 34.77

707.5	3	15	0	19.93	19.03	< 34.77
714.5				19.84	18.94	< 34.77
701.5	5	1	0	21.03	20.13	< 34.77
707.5				21.04	20.14	< 34.77
713.5				21	20.1	< 34.77
701.5	5	1	12	21.12	20.22	< 34.77
707.5				21.04	20.14	< 34.77
713.5				21.02	20.12	< 34.77
701.5	5	1	24	21.04	20.14	< 34.77
707.5				20.96	20.06	< 34.77
713.5				20.93	20.03	< 34.77
701.5	5	25	0	20.01	19.11	< 34.77
707.5				19.93	19.03	< 34.77
713.5				19.86	18.96	< 34.77
704	10	1	0	21.17	20.27	< 34.77
707.5				21.12	20.22	< 34.77
711				21.21	20.31	< 34.77
704	10	1	24	21.11	20.21	< 34.77
707.5				21.16	20.26	< 34.77
711				21.03	20.13	< 34.77
704	10	1	49	21.04	20.14	< 34.77
707.5				20.98	20.08	< 34.77
711				20.95	20.05	< 34.77
704	10	50	0	20	19.1	< 34.77
707.5				19.99	19.09	< 34.77
711				19.95	19.05	< 34.77
Note: The ERP (dBm) = Output Power (dBm) + Antenna Gain (dBi) - 2.15						

LTE Band 13

Channel Bandwidth (MHz)	Frequency (MHz)	RB Size	RB Offset	Output Power (dBm)	ERP (dBm)	Limit (dBm)
QPSK						
5	779.5	1	0	22.71	21.81	< 34.77
	782			22.71	21.81	< 34.77
	784.5			22.76	21.86	< 34.77
5	779.5	1	12	22.77	21.87	< 34.77
	782			22.82	21.92	< 34.77
	784.5			22.91	22.01	< 34.77
5	779.5	1	24	22.69	21.79	< 34.77
	782			22.86	21.96	< 34.77
	784.5			22.9	22	< 34.77
5	779.5	25	0	21.96	21.06	< 34.77
	782			21.86	20.96	< 34.77
	784.5			21.86	20.96	< 34.77
10	782	1	0	22.7	21.8	< 34.77
	782	1	24	22.8	21.9	< 34.77
	782	1	49	22.83	21.93	< 34.77
	782	50	0	21.95	21.05	< 34.77

Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Output Power (dBm)	ERP (dBm)	Limit (dBm)
16QAM						
779.5	5	1	0	21.94	21.04	< 34.77
782				22.21	21.31	< 34.77
784.5				22.25	21.35	< 34.77
779.5	5	1	12	22.16	21.26	< 34.77
782				22.17	21.27	< 34.77
784.5				22.35	21.45	< 34.77
779.5	5	1	24	22.15	21.25	< 34.77
782				22.21	21.31	< 34.77
784.5				22.13	21.23	< 34.77
779.5	5	25	0	20.87	19.97	< 34.77
782				20.85	19.95	< 34.77
784.5				20.87	19.97	< 34.77
782	10	1	0	21.78	20.88	< 34.77
782		1	24	22.07	21.17	< 34.77
782		1	49	22.06	21.16	< 34.77

782		50	0	20.94	20.04	< 34.77
64QAM						
779.5	5	1	0	20.83	19.93	< 34.77
782				20.96	20.06	< 34.77
784.5				21.08	20.18	< 34.77
779.5	5	1	12	20.97	20.07	< 34.77
782				21.12	20.22	< 34.77
784.5				21.1	20.2	< 34.77
779.5	5	1	24	20.97	20.07	< 34.77
782				21.09	20.19	< 34.77
784.5				21.09	20.19	< 34.77
779.5	5	25	0	19.89	18.99	< 34.77
782				19.9	19	< 34.77
784.5				19.83	18.93	< 34.77
782	10	1	0	20.85	19.95	< 34.77
782		1	24	21.11	20.21	< 34.77
782		1	49	21.17	20.27	< 34.77
782		50	0	19.93	19.03	< 34.77
Note: The ERP (dBm) = Output Power (dBm) + Antenna Gain (dBi) - 2.15						

LTE Band 30

Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Power Density (dBm/5MHz)	EIRP Density (dBm/5MHz)	Limit (dBm /5MHz)
QPSK						
2307.5	5	1	0	22.93	25.53	< 23.98
2310.0				22.98	25.58	< 23.98
2312.5				22.81	25.41	< 23.98
2307.5	5	1	12	22.93	25.53	< 23.98
2310.0				22.89	25.49	< 23.98
2312.5				22.77	25.37	< 23.98
2307.5	5	1	24	23.09	25.69	< 23.98
2310.0				22.85	25.45	< 23.98
2312.5				22.76	25.36	< 23.98
2307.5	5	25	0	22.00	24.6	< 23.98
2310.0				22.05	24.65	< 23.98
2312.5				21.95	24.55	< 23.98
2310.0	10	1	0	22.94	25.54	< 23.98
		1	24	23.02	25.62	< 23.98
		1	49	22.91	25.51	< 23.98
		50	0	19.64	22.24	< 23.98
Note: The EIRP Density (dBm/5MHz) = Power Density (dBm/5MHz) + Antenna Gain (dBi)						

Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Power Density (dBm/5MHz)	EIRP Density (dBm/5MHz)	Limit (dBm /5MHz)
16QAM						
2307.5	5	1	0	22.21	24.81	< 23.98
2310				22.12	24.72	< 23.98
2312.5				22.07	24.67	< 23.98
2307.5	5	1	12	22.3	24.9	< 23.98
2310				22.15	24.75	< 23.98
2312.5				22.05	24.65	< 23.98
2307.5	5	1	24	22.23	24.83	< 23.98
2310				22.22	24.82	< 23.98
2312.5				22.08	24.68	< 23.98
2307.5	5	25	0	21.05	23.65	< 23.98
2310				20.97	23.57	< 23.98

2312.5				20.93	23.53	< 23.98
2310	10	1	0	22.21	24.81	< 23.98
		1	24	22.22	24.82	< 23.98
		1	49	22.22	24.82	< 23.98
		50	0	18.61	21.21	< 23.98
64QAM						
2307.5	5	1	0	21.1	23.7	< 23.98
2310				21.14	23.74	< 23.98
2312.5				21.01	23.61	< 23.98
2307.5	5	1	12	21.16	23.76	< 23.98
2310				21.16	23.76	< 23.98
2312.5				20.92	23.52	< 23.98
2307.5	5	1	24	21.23	23.83	< 23.98
2310				21.24	23.84	< 23.98
2312.5				20.97	23.57	< 23.98
2307.5	5	25	0	20.03	22.63	< 23.98
2310				20.08	22.68	< 23.98
2312.5				19.91	22.51	< 23.98
2310	10	1	0	21.17	23.77	< 23.98
		1	24	21.2	23.8	< 23.98
		1	49	21.2	23.8	< 23.98
		50	0	17.69	20.29	< 23.98
Note: The EIRP Density (dBm/5MHz) = Power Density (dBm/5MHz) + Antenna Gain (dBi)						

LTE Band 71

Channel Bandwidth (MHz)	Frequency (MHz)	RB Size	RB Offset	Output Power (dBm)	ERP (dBm)	Limit (dBm)
QPSK						
5	665.5	1	0	22.64	21.74	< 34.77
	680.5			22.92	22.02	< 34.77
	695.5			22.97	22.07	< 34.77
5	665.5	1	12	22.69	21.79	< 34.77
	680.5			22.92	22.02	< 34.77
	695.5			22.9	22	< 34.77
5	665.5	1	24	22.59	21.69	< 34.77
	680.5			22.84	21.94	< 34.77
	695.5			22.84	21.94	< 34.77
5	665.5	25	0	21.75	20.85	< 34.77
	680.5			21.91	21.01	< 34.77
	695.5			21.92	21.02	< 34.77
10	668	1	0	22.65	21.75	< 34.77
	680.5			22.85	21.95	< 34.77
	693			22.97	22.07	< 34.77
10	668	1	24	22.77	21.87	< 34.77
	680.5			22.92	22.02	< 34.77
	693			22.85	21.95	< 34.77
10	668	1	49	22.71	21.81	< 34.77
	680.5			22.78	21.88	< 34.77
	693			22.79	21.89	< 34.77
10	668	50	0	21.85	20.95	< 34.77
	680.5			21.99	21.09	< 34.77
	693			22.02	21.12	< 34.77
15	670.5	1	0	22.72	21.82	< 34.77
	680.5			22.89	21.99	< 34.77
	690.5			22.96	22.06	< 34.77
15	670.5	1	37	22.7	21.8	< 34.77
	680.5			22.95	22.05	< 34.77
	690.5			22.95	22.05	< 34.77
15	670.5	1	74	22.85	21.95	< 34.77
	680.5			22.83	21.93	< 34.77
	690.5			22.84	21.94	< 34.77
15	670.5	75	0	21.93	21.03	< 34.77
	680.5			21.95	21.05	< 34.77
	690.5			21.91	21.01	< 34.77
20	673	1	0	22.78	21.88	< 34.77
	683			22.95	22.05	< 34.77
	688			22.98	22.08	< 34.77

20	673	1	49	22.88	21.98	< 34.77
	683			22.79	21.89	< 34.77
	688			23.01	22.11	< 34.77
20	673	1	99	22.78	21.88	< 34.77
	683			22.93	22.03	< 34.77
	688			22.81	21.91	< 34.77
20	673	100	0	21.89	20.99	< 34.77
	683			21.96	21.06	< 34.77
	688			21.97	21.07	< 34.77

Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Output Power (dBm)	ERP (dBm)	Limit (dBm)
16QAM						
665.5	5	1	0	22.06	21.16	< 34.77
680.5				22.34	21.44	< 34.77
695.5				22.39	21.49	< 34.77
665.5	5	1	12	21.87	20.97	< 34.77
680.5				22.34	21.44	< 34.77
695.5				22.17	21.27	< 34.77
665.5	5	1	24	21.79	20.89	< 34.77
680.5				22.12	21.22	< 34.77
695.5				22.07	21.17	< 34.77
665.5	5	25	0	20.74	19.84	< 34.77
680.5				20.91	20.01	< 34.77
695.5				20.97	20.07	< 34.77
668	10	1	0	21.79	20.89	< 34.77
680.5				22.16	21.26	< 34.77
693				22.22	21.32	< 34.77
668	10	1	24	21.79	20.89	< 34.77
680.5				22.09	21.19	< 34.77
693				22.07	21.17	< 34.77
668	10	1	49	21.91	21.01	< 34.77
680.5				21.98	21.08	< 34.77
693				22.05	21.15	< 34.77
668	10	50	0	20.78	19.88	< 34.77
680.5				21.01	20.11	< 34.77
693				20.98	20.08	< 34.77
670.5	15	1	0	21.88	20.98	< 34.77
680.5				22.28	21.38	< 34.77
690.5				22.12	21.22	< 34.77
670.5				22.06	21.16	< 34.77

680.5	15	1	37	22.16	21.26	< 34.77
690.5				22.29	21.39	< 34.77
670.5	15	1	74	22.11	21.21	< 34.77
680.5				22.12	21.22	< 34.77
690.5				22.07	21.17	< 34.77
670.5	15	75	0	20.93	20.03	< 34.77
680.5				20.96	20.06	< 34.77
690.5				20.94	20.04	< 34.77
673	20	1	0	22.06	21.16	< 34.77
683				22.4	21.5	< 34.77
688				22.27	21.37	< 34.77
673	20	1	49	22.06	21.16	< 34.77
683				22.1	21.2	< 34.77
688				22.42	21.52	< 34.77
673	20	1	99	22.08	21.18	< 34.77
683				22.29	21.39	< 34.77
688				22.24	21.34	< 34.77
673	20	100	0	20.91	20.01	< 34.77
683				20.97	20.07	< 34.77
688				20.89	19.99	< 34.77
64QAM						
665.5	5	1	0	20.89	19.99	< 34.77
680.5				21.13	20.23	< 34.77
695.5				21.07	20.17	< 34.77
665.5	5	1	12	20.93	20.03	< 34.77
680.5				21.12	20.22	< 34.77
695.5				21.17	20.27	< 34.77
665.5	5	1	24	20.73	19.83	< 34.77
680.5				20.98	20.08	< 34.77
695.5				21.06	20.16	< 34.77
665.5	5	25	0	19.73	18.83	< 34.77
680.5				19.91	19.01	< 34.77
695.5				19.92	19.02	< 34.77
668	10	1	0	20.87	19.97	< 34.77
680.5				21.02	20.12	< 34.77
693				21.19	20.29	< 34.77
668	10	1	24	20.93	20.03	< 34.77
680.5				21.12	20.22	< 34.77
693				21.2	20.3	< 34.77
668	10	1	49	20.91	20.01	< 34.77
680.5				21.04	20.14	< 34.77
693				21.03	20.13	< 34.77
668				19.8	18.9	< 34.77

680.5	10	50	0	20.03	19.13	< 34.77
693				19.97	19.07	< 34.77
670.5	15	1	0	21.05	20.15	< 34.77
680.5				21.23	20.33	< 34.77
690.5				21.15	20.25	< 34.77
670.5	15	1	37	20.9	20	< 34.77
680.5				21.16	20.26	< 34.77
690.5				21.24	20.34	< 34.77
670.5	15	1	74	21.12	20.22	< 34.77
680.5				21.01	20.11	< 34.77
690.5				21.12	20.22	< 34.77
670.5	15	75	0	19.94	19.04	< 34.77
680.5				19.97	19.07	< 34.77
690.5				19.93	19.03	< 34.77
673	20	1	0	21	20.1	< 34.77
683				21.1	20.2	< 34.77
688				21.28	20.38	< 34.77
673	20	1	49	21.06	20.16	< 34.77
683				21.13	20.23	< 34.77
688				21.17	20.27	< 34.77
673	20	1	99	21.07	20.17	< 34.77
683				21.12	20.22	< 34.77
688				21.11	20.21	< 34.77
673	20	100	0	19.89	18.99	< 34.77
683				19.98	19.08	< 34.77
688				19.9	19	< 34.77
Note: The ERP (dBm) = Output Power (dBm) + Antenna Gain (dBi) - 2.15						

3.2 RADIATED EMISSION MEASUREMENT

3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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. The emission limit equal to –13dBm.

For: LTE Band7/ Band41

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 55 +10 log10(P) dB. The limit of emission is equal to -25dBm.

.

3.2.2 TEST PROCEDURES

a. Substitution method is used for E.I.R.P 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.
b. The substitution horn antenna 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.
c. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.
d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power - 2.15dBi.

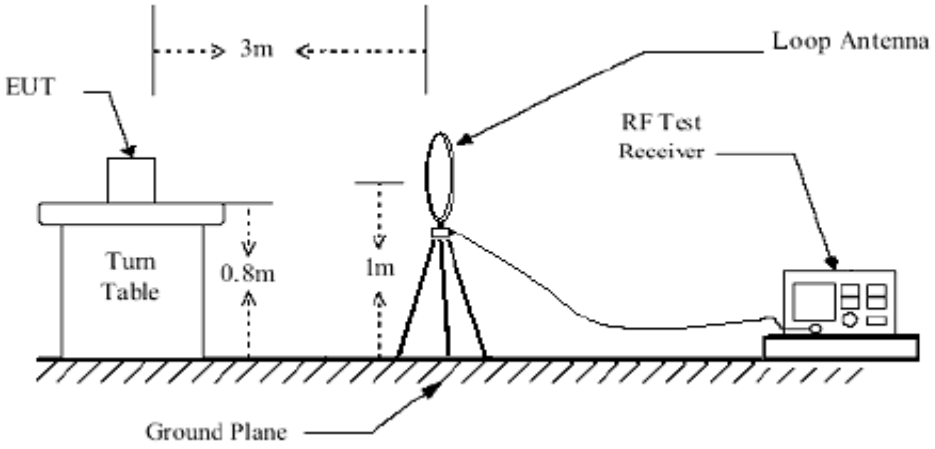
NOTE: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

3.2.3 DEVIATION FROM TEST STANDARD

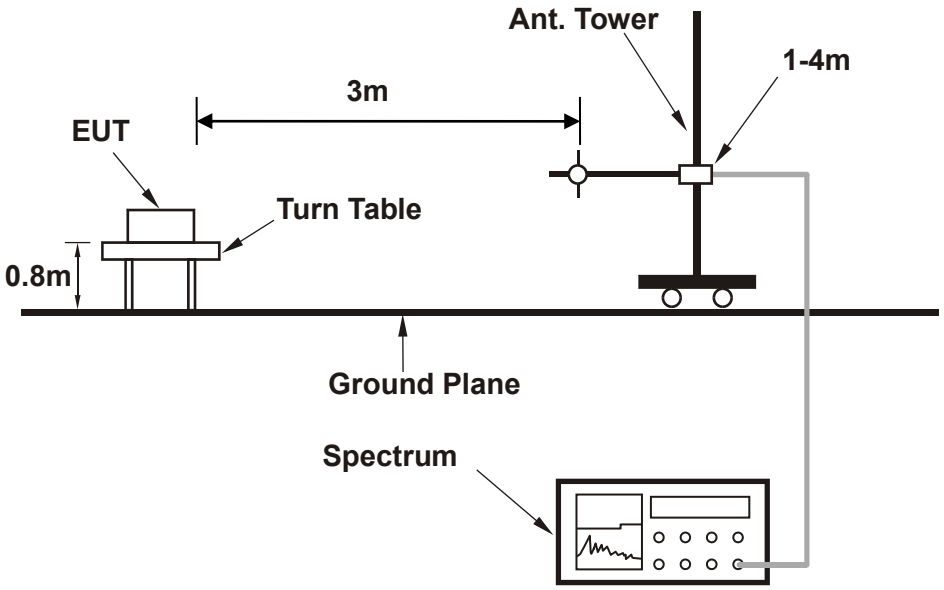
No deviation

3.2.4 TEST SETUP

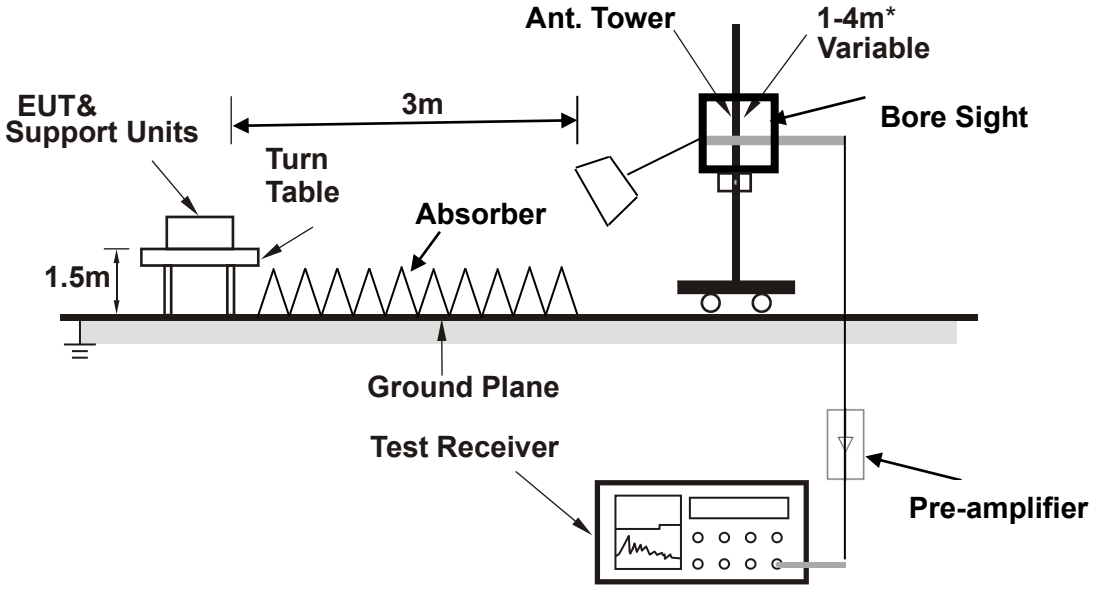
< Frequency Range below 30MHz >



< Frequency Range 30MHz~1GHz >



<Frequency Range above 1GHz>



Note: Above 1G is a directional antenna depends on the EUT height and the antenna 3dB beamwidth both, refer to section 7.3 of CISPR 16-2-3.

For the actual test configuration, please refer to the attached file (Test Setup Photo).

3.2.5 TEST RESULTS

NOTE1: The 9K~30MHz amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required in the report.

NOTE2: The measurement range is 30M to the tenth harmonic of the highest fundamental frequency, For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

LTE-B7

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
1183.40	-80.91	-25	PV
1513.80	-77.23	-25	PV
2185.80	-83.24	-25	PV
3114.00	-82.94	-25	PV
3567.00	-81.12	-25	PV
4686.00	-87.82	-25	PV

LTE-B12

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
1154.00	-80.86	-13	PV
1406.00	-69.55	-13	PV
2480.24	-64.77	-13	PV
3150.00	-83.11	-13	PV
3531.00	-81.09	-13	PV
4215.00	-89.11	-13	PV

LTE-B13

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
1191.80	-81.06	-13	PV
1555.80	-75.22	-13	PV
2456.45	-63.33	-13	PV
3114.00	-82.94	-13	PV
3489.00	-81.20	-13	PV
4320.00	-89.13	-13	PV

LTE-B17

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
1154.00	-80.87	-13	PV
1494.20	-77.40	-13	PV
2467.97	-68.09	-13	PV
3078.00	-83.28	-13	PV
3567.00	-81.12	-13	PV
4428.00	-89.04	-13	PV

LTE-B30

Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
766.51	-80.64	-13	PV
1140.00	-81.28	-13	PV
1483.00	-77.37	-13	PV
3108.00	-83.08	-13	PV
3519.00	-81.25	-13	PV
4215.00	-89.11	-13	PV

LTE-B71

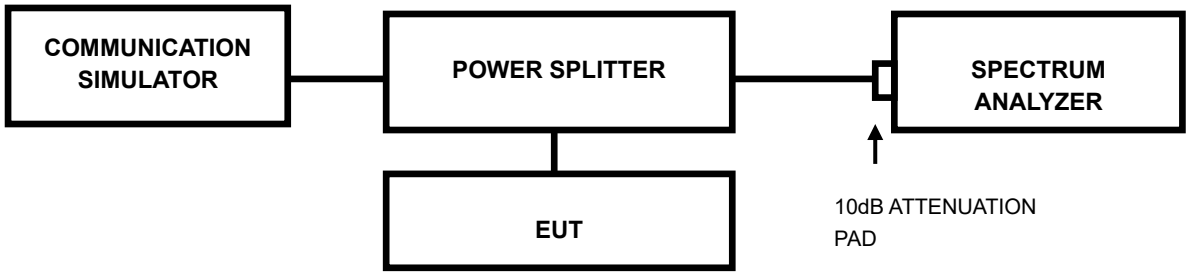
Frequency (MHz)	Power (dBm)	Limited (dBm)	Polarization
1385.00	-79.58	-13	PV
1876.40	-83.82	-13	PV
2479.91	-62.88	-13	PV
3096.00	-82.88	-13	PV
3540.00	-81.21	-13	PV
4179.00	-89.27	-13	PV

3.3 OCCUPIED BANDWIDTH MEASUREMENT

3.3.1 LIMITS OF OCCUPIED BANDWIDTH MEASUREMENT

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.

3.3.2 TEST SETUP



3.3.3 TEST PROCEDURES

a. The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
b. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

3.3.4 TEST RESULTS

Please Refer to module EM060K-GL and EM120K-GL report.
For module EM060K-GL: Report No.: 2309RSU052-U1
FCC ID：XMR2022EM060KGL
For module EM120K-GL: Report No.: 2203RSU046-U2
FCC ID：XMR2022EM120KGL

3.4 FREQUENCY STABILITY MEASUREMENT

3.4.1 LIMITS OF FREQUENCY STABILIITY MEASUREMENT

1.5 ppm is for base and fixed station. 2.5 ppm is for mobile station.

3.4.2 TEST PROCEDURE

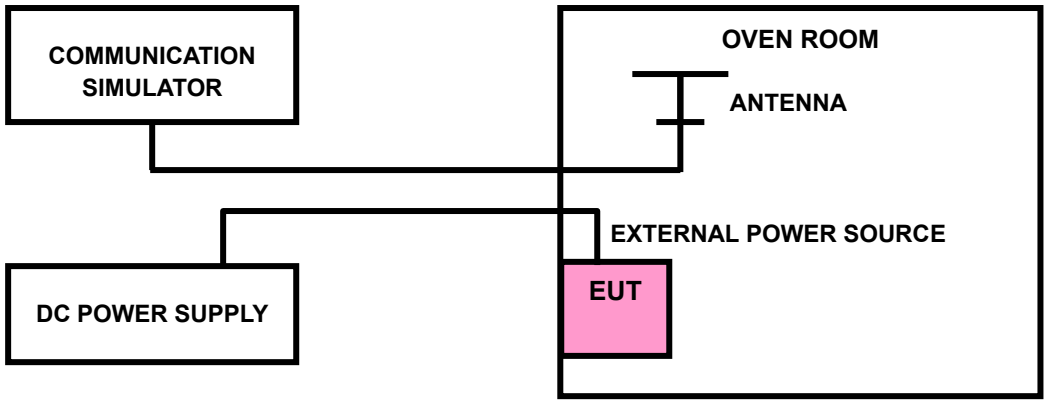
a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.

b. EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.

c. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ±0.5℃ during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

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

3.4.3 TEST SETUP



3.4.4 TEST RESULTS

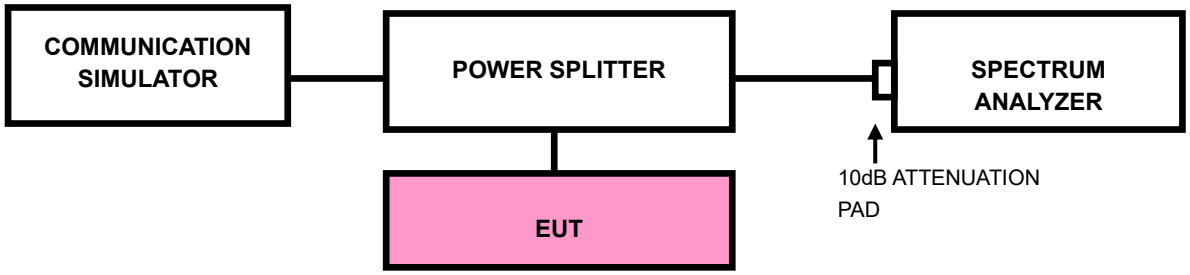
Please Refer to module EM060K-GL and EM120K-GL report.
For module EM060K-GL: Report No.: 2309RSU052-U1
FCC ID：XMR2022EM060KGL
For module EM120K-GL: Report No.: 2203RSU046-U2
FCC ID：XMR2022EM120KGL

3.5 BAND EDGE MEASUREMENT

3.5.1 LIMITS OF BAND EDGE MEASUREMENT

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. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

3.5.2 TEST SETUP



3.5.3 TEST PROCEDURES

a) All measurements were done at low and high operational frequency range

b) Connect the transmitter to the spectrum analyzer via coaxial cable while ensuring proper impedance matching.

c) Tune the analyzer to the nominal center frequency of the emission bandwidth (EBW)

d) .Set the resolution bandwidth (RBW) ≧ 1% EBW in the 1MHz band immediately outside and adjacent to the band edge.

e) Beyond the 1MHz band from the band edge, RBW=1MHz was used.

f) Set the video bandwidth (VBW) to ≧3 x RBW.

g) Select the average power (RMS) display detector.

h) Set the number of measurement points to ≧ 1001.

i) Use auto-coupled sweep time.

j) Perform the measurement over an interval of time when the transmission is continuous and at its maximum power level.

k) The RF fundamental frequency should be excluded against the limit line in the operating frequency band and use RBW is 10KHz or 100KHz.

l) Record the max trace plot into the test report.

3.5.4 TEST RESULTS

Please Refer to module EM060K-GL and EM120K-GL report.
For module EM060K-GL: Report No.: 2309RSU052-U1
FCC ID：XMR2022EM060KGL
For module EM120K-GL: Report No.: 2203RSU046-U2
FCC ID：XMR2022EM120KGL

3.6 CONDUCTED SPURIOUS EMISSIONS

3.6.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

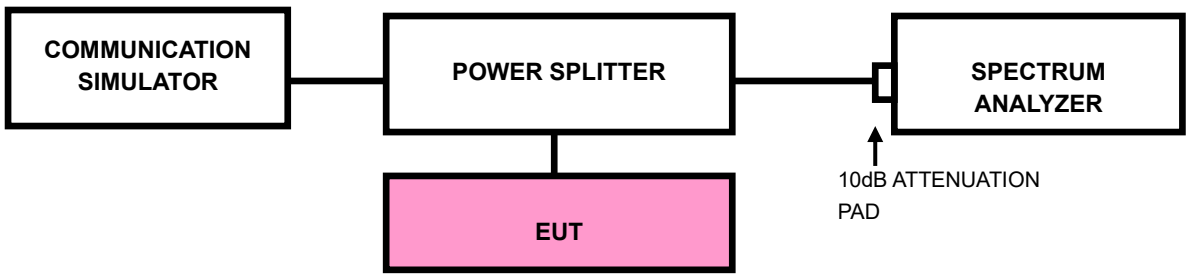
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. The emission limit equal to –13dBm.

3.6.2 TEST PROCEDURE

a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.

b. Measuring frequency range is from 9kHz up to a frequency including its 10 th harmonic. 10dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.

3.6.3 TEST SETUP



3.6.4 TEST RESULTS

NOTE：The 9K~30MHz amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required in the report.

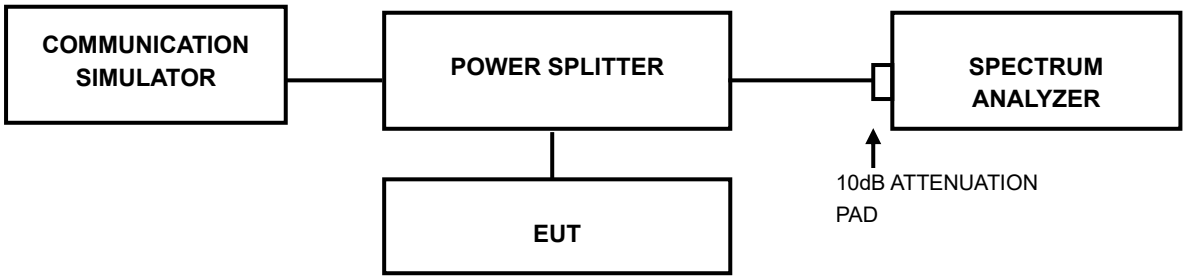
Please Refer to module EM060K-GL and EM120K-GL report.
For module EM060K-GL: Report No.: 2309RSU052-U1
FCC ID：XMR2022EM060KGL
For module EM120K-GL: Report No.: 2203RSU046-U2
FCC ID：XMR2022EM120KGL

3.7 PEAK TO AVERAGE RATIO

3.7.1 LIMITS OF PEAK TO AVERAGE RATIO MEASUREMENT

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

3.7.2 TEST SETUP



3.7.3 TEST PROCEDURES

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

3.7.4 TEST RESULTS

Please Refer to module EM060K-GL and EM120K-GL report.
For module EM060K-GL: Report No.: 2309RSU052-U1
FCC ID：XMR2022EM060KGL
For module EM120K-GL: Report No.: 2203RSU046-U2
FCC ID：XMR2022EM120KGL

4 INFORMATION ON THE TESTING LABORATORIES

We, Huarui 7layers High Technology (Suzhou) Co., Ltd. ,were founded in 2020 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

Huarui 7Layers High Technology (Suzhou) Co., Ltd.
Lab Address:
Tower N, Innovation Center, 88 Zuyi Road, High-tech District, Suzhou City, Anhui Province
Accredited Test Lab Cert 6613.01

If you have any comments, please feel free to contact us at the following:

Suzhou EMC/RF Lab:
Tel: +86 (0557) 368 1008

5 MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

6 APPENDIX

Please Refer to module EM060K-GL and EM120K-GL report.
For module EM060K-GL: Report No.: 2309RSU052-U1
FCC ID：XMR2022EM060KGL
For module EM120K-GL: Report No.: 2203RSU046-U2
FCC ID：XMR2022EM120KGL

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