

FCC TEST REPORT

(PART 27)

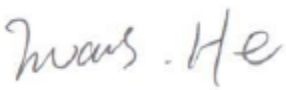
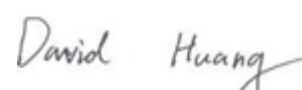
Applicant:	Jethro Trading LTD.
Address:	505 - 8840 210TH STREET, #231 Langley, Canada V1M2Y2

Manufacturer or Supplier:	Ying Tai Electronics Co., Ltd
Address:	ROOM 803,CHEVALIER HOUSE 45-51 CHATHAM ROAD SOUTH, TSIM SHA TSUI,KOWLOON,HONG KONG
Product:	Jethro 4G Simple Phone
Brand Name:	Jethro
Model Name:	SC490
FCC ID:	2AAWJSC490
Date of tests:	Jun. 04, 2020~ Aug. 05, 2020

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

- ☒ FCC Part 27, Subpart C, L ☒ 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 Evans He Engineer / Mobile Department	Approved by David Huang Manager / Mobile Department
	
Date: Aug. 05, 2020	Date: Aug. 05, 2020

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4	APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB	108
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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF200512S004-6	Original release	Aug. 05, 2020

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	REMARK
2.1046 27.50(d)(4)	Maximum Peak Output Power	PASS	Meet the requirement of limit.
2.1055 27.54	Frequency Stability	PASS	Meet the requirement of limit.
2.1049 27.53(h)	Occupied Bandwidth	PASS	Meet the requirement of limit.
27.50(d)(5)	Peak to average ratio	PASS	Meet the requirement of limit.
27.53(h)	Band Edge Measurements	PASS	Meet the requirement of limit.
2.1051 27.53(h)	Conducted Spurious Emissions	PASS	Meet the requirement of limit.
2.1053 27.53(h)	Radiated Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -7.26dB at 44.9006MHz.

1.1 MEASUREMENT 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	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz~30MHz	2.70dB
Radiated emissions	9KHz ~ 30MHz	2.16dB
	30MHz ~ 1GMHz	3.74dB
	1GHz ~ 18GHz	4.66dB
	18GHz ~ 40GHz	4.67dB

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

1.2 TEST SITE AND INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESL6	1300.5001K06-10 0262-eQ	Mar. 24,20	Mar. 24,21
Bilog Antenna	Sunol Sciences	JB6	A110712	Apr. 08, 20	Apr. 07, 21
Active Antenna	CMO-POWER	AL-130	121031	Mar. 27, 20	Mar. 26, 21
Signal Amplifier	HP	8447E	443008	Mar. 24, 20	Mar. 24, 21
Spectrum	Agilent	E4446A	MY46180622	Mar. 24, 20	Mar. 24, 21
MXA signal analyzer	Agilent	N9020A	MY49100060	Mar. 22, 20	Mar. 21, 21
Horn Antenna	COM-POWER	HAH-118	71259	Mar. 20, 20	Mar. 19, 21
Horn Antenna	COM-POWER	HAH-118	71283	Jun. 30, 20	Jun. 29, 21
SHF-EHF Horn	Schwarzbeck	BBHA9170	BBHA9170147	Jun. 30, 20	Jun. 29, 21
SHF-EHF Horn	Schwarzbeck	BBHA9170	BBHA9170242	Mar. 24, 20	Mar. 24, 21
AMPLIFIER	EM Electornic Corporation	EM01G26G	60613	Jan. 04, 20	Jan. 03,21
AMPLIFIER	Emc Instruments Corporation	Emc012645	980077	Oct. 18,18	Oct. 17,21
3m Semi-anechoic Chamber	SAEMC	9m*6m*6m	N/A	Mar. 24, 20	Mar. 24, 21
Test Software	EZ-EMC	ICP-03A1	N/A	N/A	N/A
Wireless Connectivity Tester	R&S	CMW270	1201.0002K75	Dec. 18, 19	Dec. 17, 20
MXA VEXTOR SIGNAL	Agilent	n5182a	MY50140530	Mar. 24,20	Mar. 24,21
MXA signal analyzer	Agilent	n9020a	MY49100060	Mar. 24,20	Mar. 24,21
RF Control Unit	Tonscend	JS0806-2	188060112	Mar. 24,20	Mar. 24,21
Signal Generation	Agilent	E4421B	US40051152	Dec. 18, 19	Dec. 17, 20
DC Power Supply	Agilent	E3640A	MY40004013	Mar. 28,20	Mar. 27,21
Programmable Temperature & Humidity Chamber	Hongjin	HYC-TH-225D H	DG-180746	Mar. 24,20	Mar. 24,21
Test System	Tonscend	JS 1120-3	N/A	N/A	N/A
Power Splitter	Weinschel	1580-1	TL177	Mar. 20,20	Mar. 19,21
Universal Radio Communication	ROHDE&SCHW ARZ	CMU200	112012	Mar. 24,20	Mar. 24,21
Universal Radio Communication	ROHDE&SCHW ARZ	CMU200	121393	Mar. 28,20	Mar. 27,21
Wireless Communication Test Set	ROHDE&SCHW ARZ	CMW500	1201.0002K500-1 55842-Gd	Nov. 1, 19	Oct. 31, 20

- NOTE:** 1. The calibration interval of the above test instruments is 12 months (except 3m Semi-anechoic Chamber). 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 535293.

2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Jethro 4G Simple Phone	
MODEL NAME	SC490	
POWER SUPPLY	5.0Vdc (adapter or host equipment) 3.7Vdc (Li-ion, ion battery)	
MODULATION TECHNOLOGY	LTE	QPSK, 16QAM
FREQUENCY RANGE	LTE Band 4 Channel Bandwidth: 1.4MHz	1710.7MHz ~ 1754.3MHz
	LTE Band 4 Channel Bandwidth: 3MHz	1711.5MHz ~ 1753.5MHz
	LTE Band 4 Channel Bandwidth: 5MHz	1712.5MHz ~ 1752.5MHz
	LTE Band 4 Channel Bandwidth: 10MHz	1715.0MHz ~ 1750.0MHz
	LTE Band 4 Channel Bandwidth: 15MHz	1717.5MHz ~ 1747.5MHz
	LTE Band 4 Channel Bandwidth: 20MHz	1720.0MHz ~ 1745.0MHz
	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	704.0MHz ~ 711.0MHz
EMISSION DESIGNATOR	LTE Band 4 Channel Bandwidth: 1.4MHz	QPSK: 1M86G7D 16QAM: 1M09W7D
	LTE Band 4 Channel Bandwidth: 3MHz	QPSK: 2M68G7D 16QAM: 2M68W7D
	LTE Band 4 Channel Bandwidth: 5MHz	QPSK: 4M47G7D 16QAM: 4M49W7D
	LTE Band 4 Channel Bandwidth: 10MHz	QPSK: 8M95G7D 16QAM: 8M96W7D
	LTE Band 4 Channel Bandwidth: 15MHz	QPSK: 13M42G7D 16QAM: 13M44W7D
	LTE Band 4 Channel Bandwidth: 20MHz	QPSK: 17M91G7D 16QAM: 17M88W7D



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EMISSION DESIGNATOR	LTE Band 12 Channel Bandwidth: 1.4MHz	QPSK: 1M09G7D 16QAM: 1M09W7D
	LTE Band 12 Channel Bandwidth: 3MHz	QPSK: 2M68G7D 16QAM: 2M68W7D
	LTE Band 12 Channel Bandwidth: 5MHz	QPSK: 4M48G7D 16QAM: 4M50W7D
	LTE Band 12 Channel Bandwidth: 10MHz	QPSK: 8M98G7D 16QAM: 8M98W7D
MAX. ERP/EIRP POWER	LTE Band 4 Channel Bandwidth: 1.4MHz	251.19mW
	LTE Band 4 Channel Bandwidth: 3MHz	250.61mW
	LTE Band 4 Channel Bandwidth: 5MHz	250.51mW
	LTE Band 4 Channel Bandwidth: 10MHz	255.27mW
	LTE Band 4 Channel Bandwidth: 15MHz	244.91mW
	LTE Band 4 Channel Bandwidth: 20MHz	248.89mW
	LTE Band 12 Channel Bandwidth: 1.4MHz	159.96mW
	LTE Band 12 Channel Bandwidth: 3MHz	159.96mW
	LTE Band 12 Channel Bandwidth: 5MHz	166.72mW
	LTE Band 12 Channel Bandwidth: 10MHz	169.04mW
ANTENNA TYPE	LTE Band 4	PIFA Antenna with 0.5dBi gain
	LTE Band 12	PIFA Antenna with 0.5dBi gain
HW VERSION	L831-MB-V2.2	
SW VERSION	4.4.95 Sat Jul 18 19:54:38 CST 2020	
ACCESSORY DEVICE	Refer to note as below	
DATA CABLE	USB cable: Unshielded, detachable, 1.0m	

NOTE:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.



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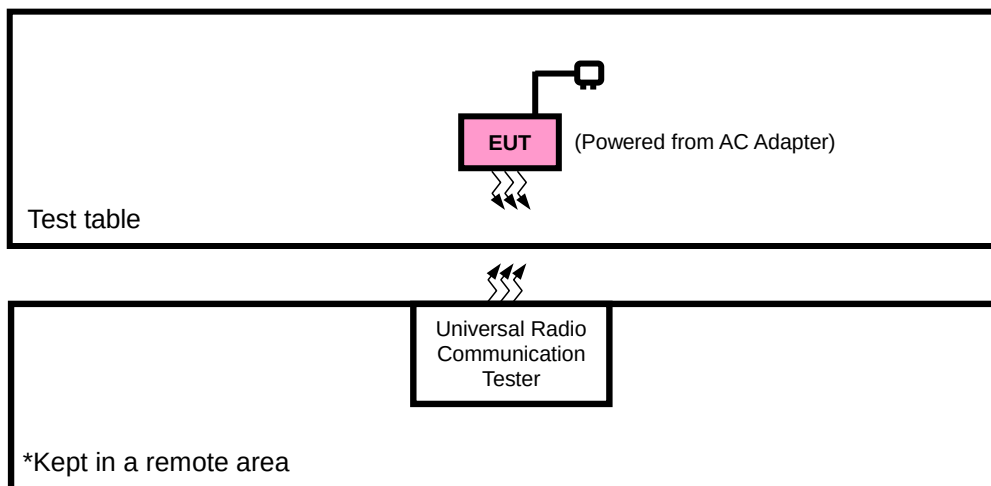
2. The EUT was powered by the following adapter:

ADAPTER	
BRAND:	N/A
MODEL:	HJ-0500600E1-US
INPUT:	100-240V~50/60Hz 0.2A
OUTPUT:	5.0V --- 600mA

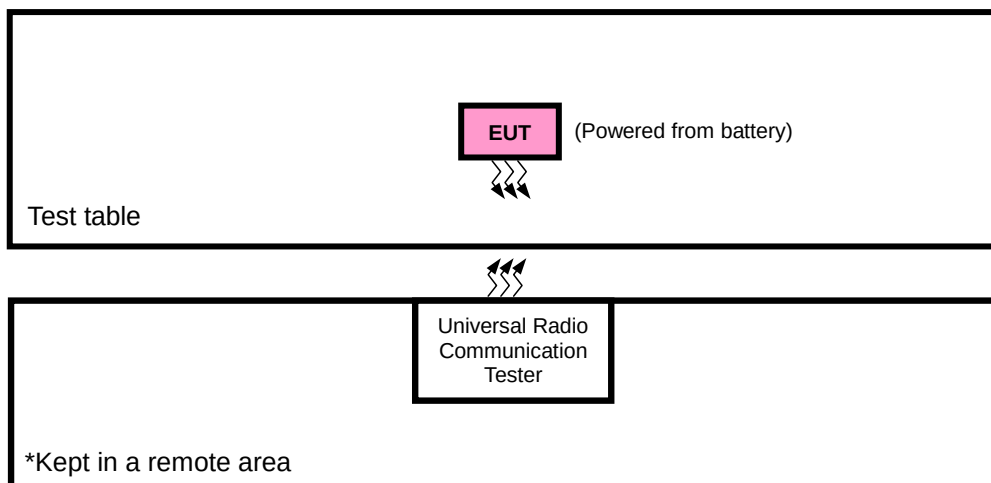
3. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

2.2 CONFIGURATION OF SYSTEM UNDER TEST

FOR RADIATION EMISSION TEST



FOR CONDUCTED & E.R.P./E.I.R.P 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	N/A	N/A	N/A	N/A	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	N/A

2.4 DESCRIPTION OF TEST MODES

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 in ERP/EIRP and radiated emission was found when positioned on X-plane for LTE. 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 + Battery with LTE link

LTE BAND 4

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
B	EIRP	19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		19965 to 20385	19965, 20175, 20385	3MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM	1 RB / 0 RB Offset
B	FREQUENCY STABILITY	19957 to 20393	19957, 20393	1.4MHz	QPSK	1 RB / 0 RB Offset
		19965 to 20385	19965, 20385	3MHz	QPSK	1 RB / 0 RB Offset
		19975 to 20375	19975, 20375	5MHz	QPSK	1 RB / 0 RB Offset
		20000 to 20350	20000, 20350	10MHz	QPSK	1 RB / 0 RB Offset
		20025 to 20325	20025, 20325	15MHz	QPSK	1 RB / 0 RB Offset
		20050 to 20300	20050, 20300	20MHz	QPSK	1 RB / 0 RB Offset
B	OCCUPIED BANDWIDTH	19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK, 16QAM	6 RB / 0 RB Offset
		19965 to 20385	19965, 20175, 20385	3MHz	QPSK, 16QAM	15 RB / 0 RB Offset
		19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM	25 RB / 0 RB Offset
		20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM	50 RB / 0 RB Offset
		20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM	75 RB / 0 RB Offset
		20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM	100 RB / 0 RB Offset
B	PEAK TO AVERAGE RATIO	19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		19965 to 20385	19965, 20175, 20385	3MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM	1 RB / 0 RB Offset
B	BAND EDGE	19957 to 20393	19957	1.4MHz	QPSK	1 RB / 0 RB Offset
						6 RB / 0 RB Offset
		19965 to 20385	20393	1.4MHz	QPSK	1 RB / 5 RB Offset
						6 RB / 0 RB Offset
		19975 to 20375	19965	3MHz	QPSK	1 RB / 0 RB Offset
						15 RB / 0 RB Offset
		20000 to 20350	20385	3MHz	QPSK	1 RB / 14 RB Offset
						15 RB / 0 RB Offset
		20025 to 20325	19975	5MHz	QPSK	1 RB / 0 RB Offset
						25 RB / 0 RB Offset
		20050 to 20300	20375	5MHz	QPSK	1 RB / 24 RB Offset
						25 RB / 0 RB Offset
		20075 to 20275	20000	10MHz	QPSK	1 RB / 0 RB Offset
						50 RB / 0 RB Offset
		20025 to 20325	20350	10MHz	QPSK	1 RB / 49 RB Offset
						50 RB / 0 RB Offset

B	BAND EDGE	20025 to 20325	20025	15MHz	QPSK	1 RB / 0 RB Offset
						75 RB / 0 RB Offset
		20050 to 20300	20325	15MHz	QPSK	1 RB / 74 RB Offset
						75 RB / 0 RB Offset
			20050	20MHz	QPSK	1 RB / 0 RB Offset
						100 RB / 0 RB Offset
B	CONDCUDED EMISSION	20050 to 20300	20300	20MHz	QPSK	1 RB / 99 RB Offset
						100 RB / 0 RB Offset
		19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK	1 RB / 0 RB Offset
		19965 to 20385	19965, 20175, 20385	3MHz	QPSK	1 RB / 0 RB Offset
		19975 to 20375	19975, 20175, 20375	5MHz	QPSK	1 RB / 0 RB Offset
		20000 to 20350	20000, 20175, 20350	10MHz	QPSK	1 RB / 0 RB Offset
A	RADIATED EMISSION	20025 to 20325	20025, 20175, 20325	15MHz	QPSK	1 RB / 0 RB Offset
		20050 to 20300	20050, 20175, 20300	20MHz	QPSK	1 RB / 0 RB Offset
		19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK	1 RB / 0 RB Offset
		19965 to 20385	20175	3MHz	QPSK	1 RB / 0 RB Offset
		19975 to 20375	20175	5MHz	QPSK	1 RB / 0 RB Offset
		20000 to 20350	20175	10MHz	QPSK	1 RB / 0 RB Offset
		20025 to 20325	20175	15MHz	QPSK	1 RB / 0 RB Offset
		20050 to 20300	20175	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

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



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TEST CONDITION:

TEST ITEM	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
EIRP(ERP)	24deg. C, 60%RH	3.7Vdc from Battery	Aaron Liang
FREQUENCY STABILITY	24deg. C, 60%RH	3.7Vdc from Battery	Aaron Liang
OCCUPIED BANDWIDTH	24deg. C, 60%RH	3.7Vdc from Battery	Aaron Liang
PEAK TO AVERAGE RATIO	24deg. C, 60%RH	3.7Vdc from Battery	Aaron Liang
BAND EDGE	24deg. C, 60%RH	3.7Vdc from Battery	Aaron Liang
CONDCUDED EMISSION	24deg. C, 60%RH	3.7Vdc from Battery	Aaron Liang
RADIATED EMISSION	25deg. C, 59%RH	5Vdc from adapter	Aaron Liang



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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 v03

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

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

27.50(c)(10) Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

3.1.2 TEST PROCEDURES

EIRP / ERP 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 determining the ERP or EIRP from the conducted RF output power measured using the guidance provided above is:

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

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);

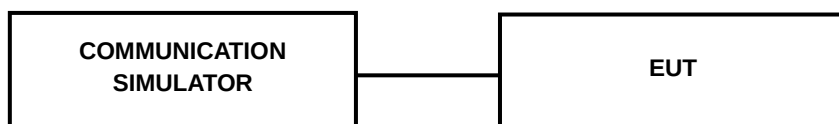
L_C = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

CONDUCTED POWER MEASUREMENT:

- The EUT was set up for the maximum power with LTE link data modulation and link up with simulator.
- 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).



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Test Report No.: RF200327S003-3

3.1.4 TEST RESULTS

AVERAGE CONDUCTED OUTPUT POWER (dBm)

LTE Band 4							
BW	Modulation	RB Size	RB Offset	Low CH 19957	Mid CH 20175	High CH 20393	MPR
				Frequency 1710.7 MHz	Frequency 1732.5 MHz	Frequency 1754.3 MHz	
1.4MHz	QPSK	1	0	23.44	23.44	23.46	0
		1	2	23.38	23.44	23.5	0
		1	5	23.45	23.38	23.47	0
		3	0	23.28	23.39	23.27	0
		3	1	23.36	23.4	23.33	0
		3	3	23.29	23.48	23.38	0
		6	0	22.31	22.42	22.49	1
	16QAM	1	0	22.94	22.93	22.48	1
		1	2	22.94	22.91	22.53	1
		1	5	22.94	22.93	22.53	1
		3	0	22.7	22.55	22.73	1
		3	1	22.69	22.54	22.73	1
		3	3	22.7	22.51	22.79	1
		6	0	21.63	21.52	21.51	2
BW	Modulation	RB Size	RB Offset	Low CH 19965	Mid CH 20175	High CH 20385	MPR
				Frequency 1711.5 MHz	Frequency 1732.5 MHz	Frequency 1753.5 MHz	
3 MHz	QPSK	1	0	23.25	23.37	23.49	0
		1	7	23.21	23.37	23.44	0
		1	14	23.21	23.38	23.43	0
		8	0	22.29	22.38	22.4	1
		8	3	22.35	22.41	22.41	1
		8	7	22.32	22.33	22.34	1
		15	0	22.29	22.36	22.39	1
	16QAM	1	0	22.21	23.17	22.85	1
		1	7	22.26	23.16	22.9	1
		1	14	22.25	23.14	22.88	1
		8	0	21.5	21.59	21.85	2
		8	3	21.32	21.39	21.4	2
		8	7	21.3	21.31	21.33	2
		15	0	21.27	21.34	21.37	2

LTE Band 4							
BW	Modulation	RB Size	RB Offset	Low CH 19975	Mid CH 20175	High CH 20375	MPR
				Frequency 1712.5 MHz	Frequency 1732.5 MHz	Frequency 1752.5 MHz	
5 MHz	QPSK	1	0	23.25	23.54	23.05	0
		1	12	23.21	23.52	23.08	0
		1	24	23.2	23.51	23.15	0
		12	0	22.25	22.36	22.42	1
		12	6	22.43	22.46	22.43	1
		12	13	22.34	22.45	22.35	1
		25	0	22.29	22.31	22.39	1
	16QAM	1	0	22.07	22.13	21.92	1
		1	12	22.07	22.19	21.84	1
		1	24	22.05	22.18	21.88	1
		12	0	21.52	21.4	21.25	2
		12	6	21.46	21.49	21.26	2
		12	13	21.43	21.43	21.23	2
		25	0	21.51	21.43	21.5	2
BW	Modulation	RB Size	RB Offset	Low CH 20000	Mid CH 20175	High CH 20350	MPR
				Frequency 1715 MHz	Frequency 1732.5 MHz	Frequency 1750 MHz	
10 MHz	QPSK	1	0	23.21	23.28	23.53	0
		1	24	23.23	23.31	23.52	0
		1	49	23.24	23.32	23.57	0
		25	0	22.25	22.39	22.3	1
		25	12	22.29	22.43	22.38	1
		25	25	22.38	22.32	22.46	1
		50	0	22.29	22.43	22.28	1
	16QAM	1	0	22.2	22.67	23	1
		1	24	22.16	22.7	22.92	1
		1	49	22.22	22.69	22.93	1
		25	0	21.46	21.56	21.7	2
		25	12	21.53	21.49	21.68	2
		25	25	21.59	21.54	21.69	2
		50	0	21.38	21.43	21.54	2

LTE Band 4							
BW	Modulation	RB Size	RB Offset	Low CH 20025	Mid CH 20175	High CH 20325	MPR
				Frequency 1717.5 MHz	Frequency 1732.5 MHz	Frequency 1747.5 MHz	
15 MHz	QPSK	1	0	23.25	23.22	23.38	0
		1	37	23.22	23.29	23.33	0
		1	74	23.25	23.34	23.39	0
		36	0	22.23	22.4	22.46	1
		36	19	22.32	22.33	22.33	1
		36	39	22.32	22.39	22.29	1
		75	0	22.4	22.29	22.31	1
	16QAM	1	0	22.16	22.66	22.79	1
		1	37	22.25	22.66	22.81	1
		1	74	22.31	22.67	22.73	1
		36	0	21.48	21.45	21.51	2
		36	19	21.51	21.5	21.55	2
		36	39	21.53	21.43	21.5	2
		75	0	21.5	21.46	21.44	2
BW	Modulation	RB Size	RB Offset	Low CH 20050	Mid CH 20175	High CH 20300	MPR
				Frequency 1720 MHz	Frequency 1732.5 MHz	Frequency 1745 MHz	
20MHz	QPSK	1	0	23.36	23.31	23.43	0
		1	50	23.38	23.3	23.45	0
		1	99	23.46	23.34	23.46	0
		50	0	22.22	22.36	22.45	1
		50	25	22.43	22.45	22.35	1
		50	50	22.43	22.34	22.46	1
		100	0	22.33	22.39	22.26	1
	16QAM	1	0	22.3	22.45	23.22	1
		1	50	22.37	22.5	23.24	1
		1	99	22.39	22.46	23.21	1
		50	0	21.45	21.58	21.43	2
		50	25	21.48	21.54	21.38	2
		50	50	21.53	21.56	21.43	2
		100	0	22.33	22.27	22.26	2

LTE Band 12							
BW	Modulation	RB Size	RB Offset	Low CH 23017	Mid CH 23095	High CH 23173	MPR
				Frequency 699.7 MHz	Frequency 707.5 MHz	Frequency 715.3 MHz	
1.4 MHz	QPSK	1	0	23.66	23.41	23.65	0
		1	2	23.64	23.5	23.59	0
		1	5	23.69	23.55	23.63	0
		3	0	23.58	23.45	23.51	0
		3	1	23.6	23.53	23.48	0
		3	3	23.55	23.5	23.66	0
		6	0	22.7	22.47	22.43	1
	16QAM	1	0	23.26	23.15	23.01	1
		1	2	23.34	23.23	23.01	1
		1	5	23.33	23.19	23	1
		3	0	22.88	22.72	22.6	1
		3	1	22.83	22.68	22.74	1
		3	3	22.9	22.69	22.76	1
		6	0	22.05	22.07	21.86	2
LTE Band 12							
BW	Modulation	RB Size	RB Offset	Low CH 23025	Mid CH 23095	High CH 23165	MPR
				Frequency 700.5 MHz	Frequency 707.5 MHz	Frequency 714.5 MHz	
3 MHz	QPSK	1	0	23.53	23.47	23.69	0
		1	7	23.55	23.52	23.68	0
		1	14	23.57	23.47	23.59	0
		8	0	22.56	22.51	22.47	1
		8	3	22.7	22.42	22.54	1
		8	7	22.58	22.73	22.42	1
		15	0	22.56	22.78	22.63	1
	16QAM	1	0	22.91	22.89	23.07	1
		1	7	22.97	22.99	23.07	1
		1	14	22.85	22.98	22.99	1
		8	0	22.03	21.93	21.48	2
		8	3	21.71	21.57	21.43	2
		8	7	21.54	21.7	21.39	2
		15	0	21.64	21.74	21.6	2

LTE Band 12							
BW	Modulation	RB Size	RB Offset	Low CH 23035	Mid CH 23095	High CH 23155	MPR
				Frequency 701.5 MHz	Frequency 707.5 MHz	Frequency 713.5 MHz	
5 MHz	QPSK	1	0	23.58	23.53	23.49	0
		1	12	23.65	23.58	23.56	0
		1	24	23.58	23.87	23.53	0
		12	0	22.74	22.59	22.59	1
		12	6	22.6	22.64	22.5	1
		12	13	22.58	22.54	22.42	1
		25	0	22.52	22.67	22.58	1
	16QAM	1	0	22.66	22.33	22.55	1
		1	12	22.61	22.36	22.6	1
		1	24	22.49	22.62	22.39	1
		12	0	21.92	21.79	21.61	2
		12	6	21.59	21.67	21.62	2
		12	13	21.56	21.7	21.55	2
		25	0	21.5	21.76	21.65	2
LTE Band 12							
BW	Modulation	RB Size	RB Offset	Low CH 23060	Mid CH 23095	High CH 23130	MPR
				Frequency 704 MHz	Frequency 707.5 MHz	Frequency 711 MHz	
10 MHz	QPSK	1	0	23.46	23.53	23.64	0
		1	24	23.47	23.55	23.93	0
		1	49	23.46	23.41	23.72	0
		25	0	22.52	22.54	22.7	1
		25	12	22.66	22.63	22.71	1
		25	25	22.6	22.75	22.55	1
		50	0	22.57	22.66	22.68	1
	16QAM	1	0	22.89	22.9	23.01	1
		1	24	22.82	23.01	23.14	1
		1	49	22.86	22.84	22.91	1
		25	0	21.59	21.9	21.89	2
		25	12	21.86	21.81	21.95	2
		25	25	21.84	21.78	21.92	2
		50	0	21.63	21.72	21.75	2

EIRP

LTE BAND 4

CHANNEL BANDWIDTH: 1.4MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
19957	1710.7	23.45	0.5	23.95	248.31	1
20175	1732.5	23.48	0.5	23.98	250.03	1
20393	1754.3	23.5	0.5	24.00	251.19	1

CHANNEL BANDWIDTH: 1.4MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
19957	1710.7	22.94	0.5	23.44	220.80	1
20175	1732.5	22.93	0.5	23.43	220.29	1
20393	1754.3	22.79	0.5	23.29	213.30	1

LTE BAND 4

CHANNEL BANDWIDTH: 3MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
19965	1711.5	23.25	0.5	23.75	237.14	1
20175	1732.5	23.38	0.5	23.88	244.34	1
20385	1753.5	23.49	0.5	23.99	250.61	1

CHANNEL BANDWIDTH: 3MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
19965	1711.5	22.26	0.5	22.76	188.80	1
20175	1732.5	23.17	0.5	23.67	232.81	1
20385	1753.5	22.9	0.5	23.40	218.78	1

LTE BAND 4

CHANNEL BANDWIDTH: 5MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
19975	1712.5	23.25	0.5	23.75	237.14	1
20175	1732.5	23.54	0.5	24.04	253.51	1
20375	1752.5	23.15	0.5	23.65	231.74	1

CHANNEL BANDWIDTH: 5MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
19975	1712.5	22.07	0.5	22.57	180.72	1
20175	1732.5	22.19	0.5	22.69	185.78	1
20375	1752.5	21.92	0.5	22.42	174.58	1

LTE BAND 4

CHANNEL BANDWIDTH: 10MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20000	1715	23.24	0.5	23.74	236.59	1
20175	1732.5	23.32	0.5	23.82	240.99	1
20350	1750	23.57	0.5	24.07	255.27	1

CHANNEL BANDWIDTH: 10MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20000	1715	22.22	0.5	22.72	187.07	1
20175	1732.5	22.7	0.5	23.2	208.93	1
20350	1750	23	0.5	23.5	223.87	1

LTE BAND 4

CHANNEL BANDWIDTH: 15MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20025	1717.5	23.25	0.5	23.75	237.14	1
20175	1732.5	23.34	0.5	23.84	242.10	1
20325	1747.5	23.39	0.5	23.89	244.91	1

CHANNEL BANDWIDTH: 15MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20025	1717.5	22.31	0.5	22.81	190.99	1
20175	1732.5	22.67	0.5	23.17	207.49	1
20325	1747.5	22.81	0.5	23.31	214.29	1

LTE BAND 4

CHANNEL BANDWIDTH: 20MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20050	1720	23.46	0.5	23.96	248.89	1
20175	1732.5	23.34	0.5	23.84	242.10	1
20300	1745	23.46	0.5	23.96	248.89	1

CHANNEL BANDWIDTH: 20MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20050	1720	22.39	0.5	22.89	194.54	1
20175	1732.5	22.5	0.5	23	199.53	1
20300	1745	23.24	0.5	23.74	236.59	1

REMARKS: 1. EIRP Output Power (dBm) = SPA LVL (dBm) + Correction Factor (dB).

2. Correction factor (dB) = Free Space Loss + Antenna Factor + Cable Loss



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LTE BAND 12

CHANNEL BANDWIDTH: 1.4MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23017	699.7	23.69	0.5	22.04	159.96	3
23095	707.5	23.55	0.5	21.9	154.88	3
23171	715.3	23.66	0.5	22.01	158.85	3

CHANNEL BANDWIDTH: 1.4MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23017	699.7	23.34	0.5	21.69	147.57	3
23095	707.5	23.23	0.5	21.58	143.88	3
23171	715.3	23.01	0.5	21.36	136.77	3

LTE BAND 12

CHANNEL BANDWIDTH: 3MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23025	700.5	23.57	0.5	21.92	155.60	3
23095	707.5	23.52	0.5	21.87	153.82	3
23165	714.5	23.69	0.5	22.04	159.96	3

CHANNEL BANDWIDTH: 3MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23025	700.5	22.97	0.5	21.32	135.52	3
23095	707.5	22.99	0.5	21.34	136.14	3
23165	714.5	23.07	0.5	21.42	138.68	3

LTE BAND 12

CHANNEL BANDWIDTH: 5MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23035	701.5	23.65	0.5	22	158.49	3
23095	707.5	23.87	0.5	22.22	166.72	3
23155	713.5	23.56	0.5	21.91	155.24	3

CHANNEL BANDWIDTH: 5MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23035	701.5	22.66	0.5	21.01	126.18	3
23095	707.5	22.62	0.5	20.97	125.03	3
23155	713.5	22.6	0.5	20.95	124.45	3

LTE BAND 12

CHANNEL BANDWIDTH: 10MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23060	804	23.47	0.5	21.82	152.05	3
23095	707.5	23.55	0.5	21.9	154.88	3
23130	811	23.93	0.5	22.28	169.04	3

CHANNEL BANDWIDTH: 10MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23060	804	22.89	0.5	21.24	133.05	3
23095	707.5	23.01	0.5	21.36	136.77	3
23130	811	23.14	0.5	21.49	140.93	3

REMARKS: 1. ERP Output Power (dBm) = SPA LVL (dBm) + Correction Factor (dB) -2.15(dB).
: 2. Correction factor (dB) = Free Space Loss + Antenna Factor + Cable Loss

3.2 FREQUENCY STABILITY MEASUREMENT

3.2.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

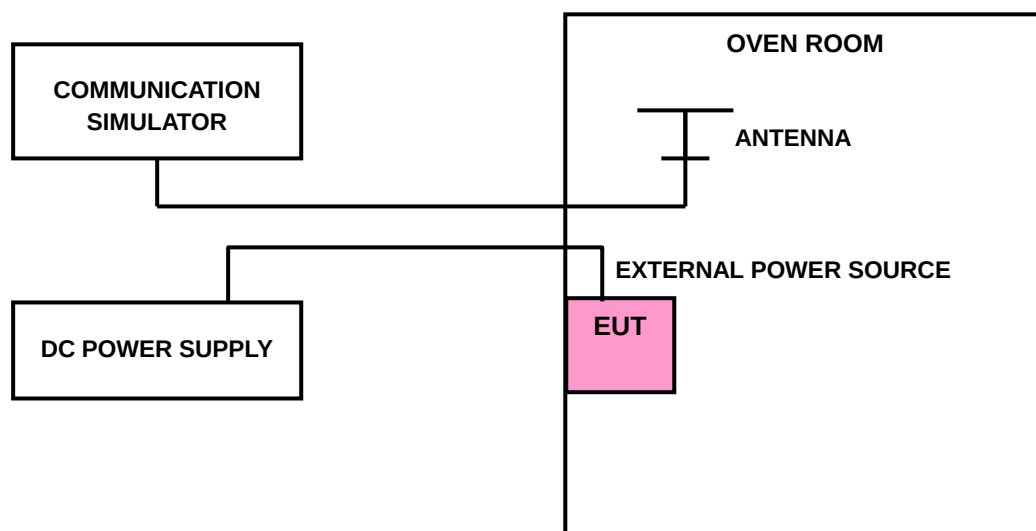
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

3.2.2 TEST PROCEDURE

- 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.
- 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.
- The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the $\pm 0.5^{\circ}\text{C}$ 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.

3.2.3 TEST SETUP



3.2.4 TEST RESULTS

LTE BAND 4

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	1.4MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
3.7	0.1028	0.104	2.5
3.55(BEP)	0.1176	0.1056	2.5
4.35	0.1251	0.1050	2.5

NOTE: The applicant defined the normal working voltage of the battery is from 3.55Vdc to 4.35Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	1.4MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	0.1083	0.1099	2.5
-20	0.1224	0.1106	2.5
-10	0.1269	0.108	2.5
0	0.1357	0.1075	2.5
10	0.1400	0.1163	2.5
20	0.1462	0.1236	2.5
30	0.1583	0.1146	2.5
40	0.1639	0.1261	2.5
50	0.1672	0.1223	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	3MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
3.7	0.0915	0.1049	2.5
3.55(BEP)	0.0981	0.1011	2.5
4.35	0.0990	0.1062	2.5

NOTE: The applicant defined the normal working voltage of the battery is from 3.55Vdc to 4.35Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	3MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	0.0866	0.1061	2.5
-20	0.0796	0.1043	2.5
-10	0.0698	0.1075	2.5
0	0.077	0.1018	2.5
10	0.0876	0.0991	2.5
20	0.0998	0.1106	2.5
30	0.0946	0.1095	2.5
40	0.1021	0.1011	2.5
50	0.0987	0.1023	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	5MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
3.7	0.1111	0.1157	2.5
3.55(BEP)	0.1151	0.1054	2.5
4.35	0.1248	0.1002	2.5

NOTE: The applicant defined the normal working voltage of the battery is from 3.55Vdc to 4.35Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	5MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	0.1177	0.1182	2.5
-20	0.1194	0.1262	2.5
-10	0.1146	0.1366	2.5
0	0.1173	0.1497	2.5
10	0.1202	0.1377	2.5
20	0.1136	0.1253	2.5
30	0.122	0.1356	2.5
40	0.1168	0.1483	2.5
50	0.1268	0.1468	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	10MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
3.7	0.1084	0.1014	2.5
3.55(BEP)	0.1142	0.0942	2.5
4.35	0.115	0.0953	2.5

NOTE: The applicant defined the normal working voltage of the battery is from 3.55Vdc to 4.35Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	10MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	0.1031	0.0858	2.5
-20	0.0921	0.0727	2.5
-10	0.0869	0.0755	2.5
0	0.0982	0.0728	2.5
10	0.1124	0.0857	2.5
20	0.1074	0.0927	2.5
30	0.1111	0.0823	2.5
40	0.1082	0.08	2.5
50	0.1022	0.084	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	15MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
3.7	0.1055	0.0967	2.5
3.55(BEP)	0.0908	0.0875	2.5
4.35	0.0791	0.0827	2.5

NOTE: The applicant defined the normal working voltage of the battery is from 3.55Vdc to 4.35Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	15MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	0.0768	0.0935	2.5
-20	0.0792	0.087	2.5
-10	0.079	0.0772	2.5
0	0.0737	0.0773	2.5
10	0.0817	0.0841	2.5
20	0.0914	0.0755	2.5
30	0.0907	0.0804	2.5
40	0.0999	0.0887	2.5
50	0.0951	0.1012	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	20MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
3.7	0.0007	0.0009	2.5
3.55(BEP)	-0.0001	0.0098	2.5
4.35	0.0052	0.0075	2.5

NOTE: The applicant defined the normal working voltage of the battery is from 3.55Vdc to 4.35Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	20MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	-0.0066	0.0071	2.5
-20	-0.0195	0.0095	2.5
-10	-0.0224	0.0078	2.5
0	-0.0185	0.0129	2.5
10	-0.0184	0.0091	2.5
20	-0.0065	0.0016	2.5
30	-0.0125	0.0089	2.5
40	-0.0222	0.021	2.5
50	-0.0114	0.0325	2.5

LTE BAND 12

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	1.4MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
3.7	0.1061	0.0969	2.5
3.55(BEP)	0.0914	0.0890	2.5
4.35	0.0920	0.1038	2.5

NOTE: The applicant defined the normal working voltage of the battery is from 3.55Vdc to 4.35Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	1.4MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	0.0915	0.0828	2.5
-20	0.0828	0.0684	2.5
-10	0.0832	0.077	2.5
0	0.0978	0.091	2.5
10	0.0908	0.0969	2.5
20	0.0916	0.1108	2.5
30	0.1048	0.1181	2.5
40	0.1154	0.1189	2.5
50	0.1239	0.1289	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	3MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
3.7	0.1047	0.1042	2.5
3.55(BEP)	-0.0011	-0.0011	2.5
4.35	0.0009	0.001	2.5

NOTE: The applicant defined the normal working voltage of the battery is from 3.55Vdc to 4.35Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	3MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	0.004	-0.0143	2.5
-20	0.0155	-0.0288	2.5
-10	0.0138	-0.0222	2.5
0	0.0215	-0.0344	2.5
10	0.0095	-0.0475	2.5
20	-0.0023	-0.037	2.5
30	-0.0012	-0.0506	2.5
40	-0.0136	-0.0411	2.5
50	-0.0238	-0.0383	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	5MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
3.7	0.1156	0.1001	2.5
3.55(BEP)	0.1280	0.1102	2.5
4.35	0.1336	0.0996	2.5

NOTE: The applicant defined the normal working voltage of the battery is from 3.55Vdc to 4.35Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	5MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	0.1425	0.0988	2.5
-20	0.1525	0.1023	2.5
-10	0.1615	0.1165	2.5
0	0.1655	0.1222	2.5
10	0.1563	0.1332	2.5
20	0.1528	0.1187	2.5
30	0.1571	0.1327	2.5
40	0.1458	0.1386	2.5
50	0.1312	0.1241	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	10MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
3.7	0.1183	0.107	2.5
3.55(BEP)	0.1155	0.1175	2.5
4.35	0.1109	0.1218	2.5

NOTE: The applicant defined the normal working voltage of the battery is from 3.55Vdc to 4.35Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

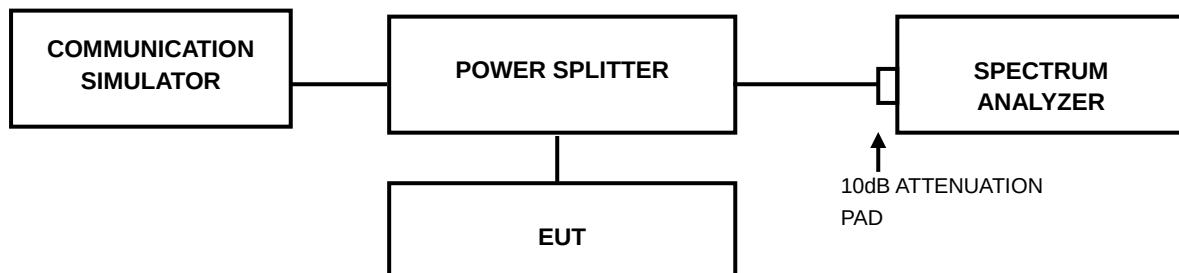
TEMP. (°C)	10MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	0.1134	0.1151	2.5
-20	0.1003	0.1124	2.5
-10	0.0907	0.1243	2.5
0	0.0818	0.137	2.5
10	0.0874	0.1313	2.5
20	0.0998	0.1315	2.5
30	0.1016	0.1443	2.5
40	0.1141	0.1548	2.5
50	0.1085	0.1563	2.5

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



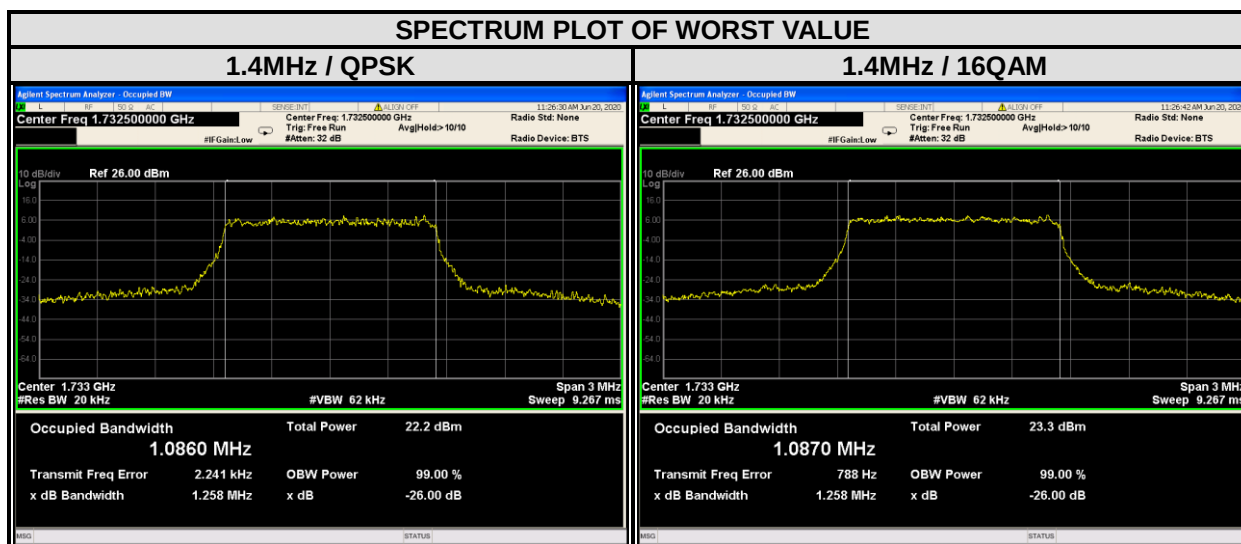
3.3.3 TEST PROCEDURES

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

3.3.4 TEST RESULTS

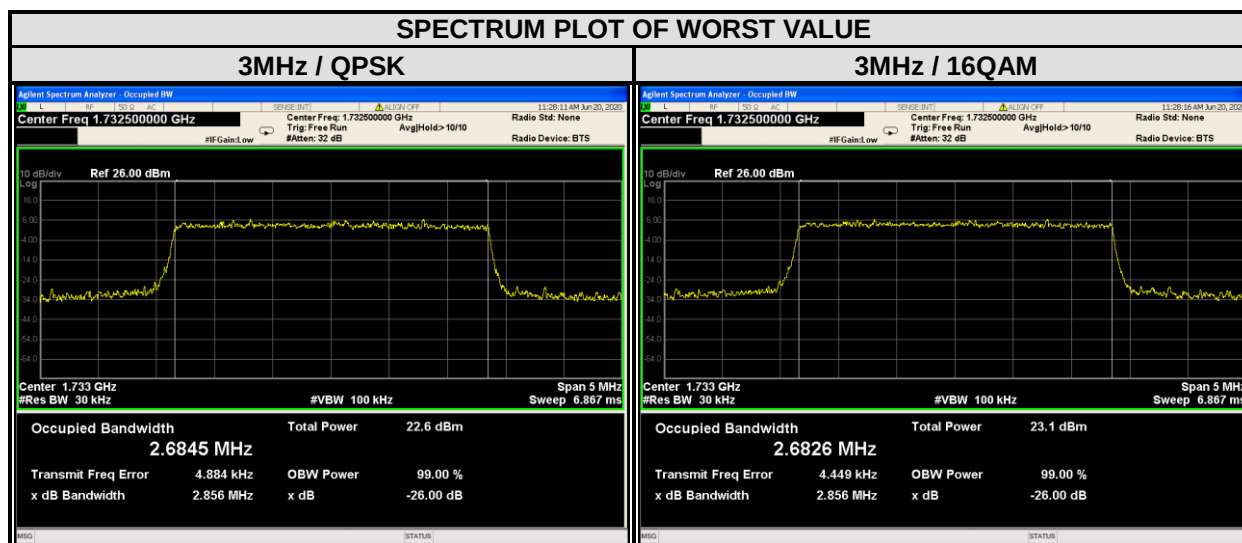
LTE BAND 4

CHANNEL BANDWIDTH: 1.4MHz							
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (kHz)		CHANNEL	Frequency (MHz)	26dB Bandwidth (kHz)	
		QPSK	16QAM			QPSK	16QAM
19957	1710.7	1.0812	1.0814	19957	1710.7	1.268	1.268
20175	1732.5	1.0860	1.0870	20175	1732.5	1.258	1.258
20393	1754.3	1.0841	1.0832	20393	1754.3	1.249	1.25



LTE BAND 4

CHANNEL BANDWIDTH: 3MHz							
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (kHz)		CHANNEL	Frequency (MHz)	26dB Bandwidth (kHz)	
		QPSK	16QAM			QPSK	16QAM
19965	1711.5	2.6706	2.6737	19965	1711.5	2.837	2.85
20175	1732.5	2.6845	2.6826	20175	1732.5	2.856	2.856
20385	1753.5	2.6777	2.6753	20385	1753.5	2.861	2.856



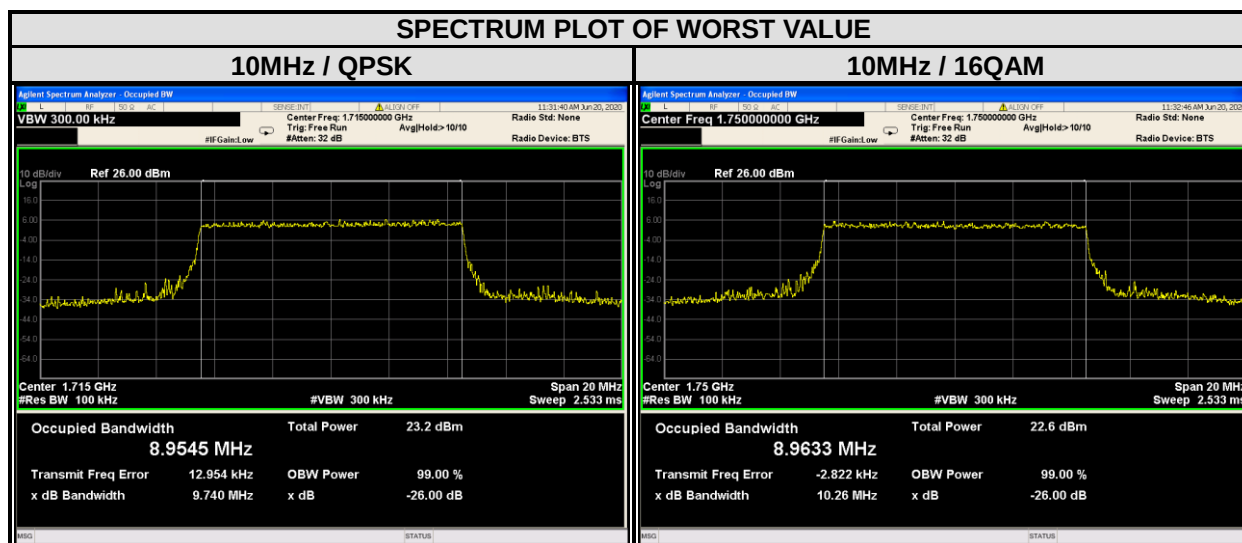
LTE BAND 4

CHANNEL BANDWIDTH: 5MHz							
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (kHz)		CHANNEL	Frequency (MHz)	26dB Bandwidth (kHz)	
		QPSK	16QAM			QPSK	16QAM
19975	1712.5	4.4670	4.4881	19975	1712.5	4.953	5.037
20175	1732.5	4.4683	4.4686	20175	1732.5	4.958	4.994
20375	1752.5	4.4728	4.4871	20375	1752.5	4.996	5.152



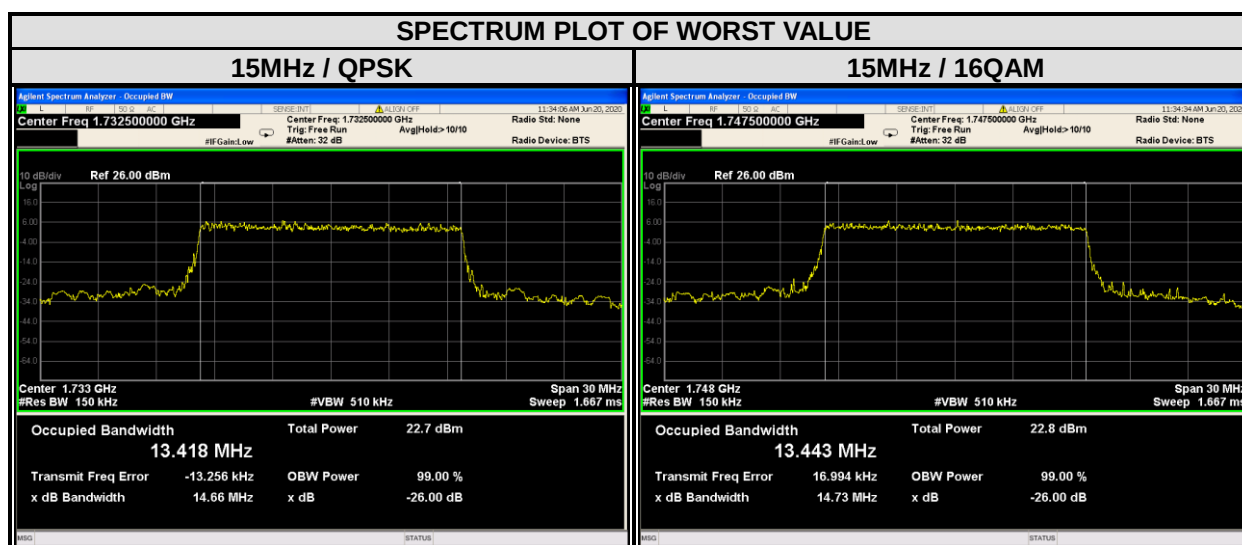
LTE BAND 4

CHANNEL BANDWIDTH: 10MHz							
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (kHz)		CHANNEL	Frequency (MHz)	26dB Bandwidth (kHz)	
		QPSK	16QAM			QPSK	16QAM
20000	1715	8.9545	8.9557	20000	1715	9.74	9.787
20175	1732.5	8.9451	8.9433	20175	1732.5	9.63	9.817
20350	1750	8.9543	8.9633	20350	1750	9.841	10.26



LTE BAND 4

CHANNEL BANDWIDTH: 15MHz							
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (kHz)		CHANNEL	Frequency (MHz)	26dB Bandwidth (kHz)	
		QPSK	16QAM			QPSK	16QAM
20025	1717.5	13.397	13.382	20025	14.7	14.81	15.04
20175	1732.5	13.418	13.429	20175	14.77	14.66	14.65
20325	1747.5	13.418	13.443	20325	14.67	14.47	14.73





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Test Report No.: RF200327S003-3

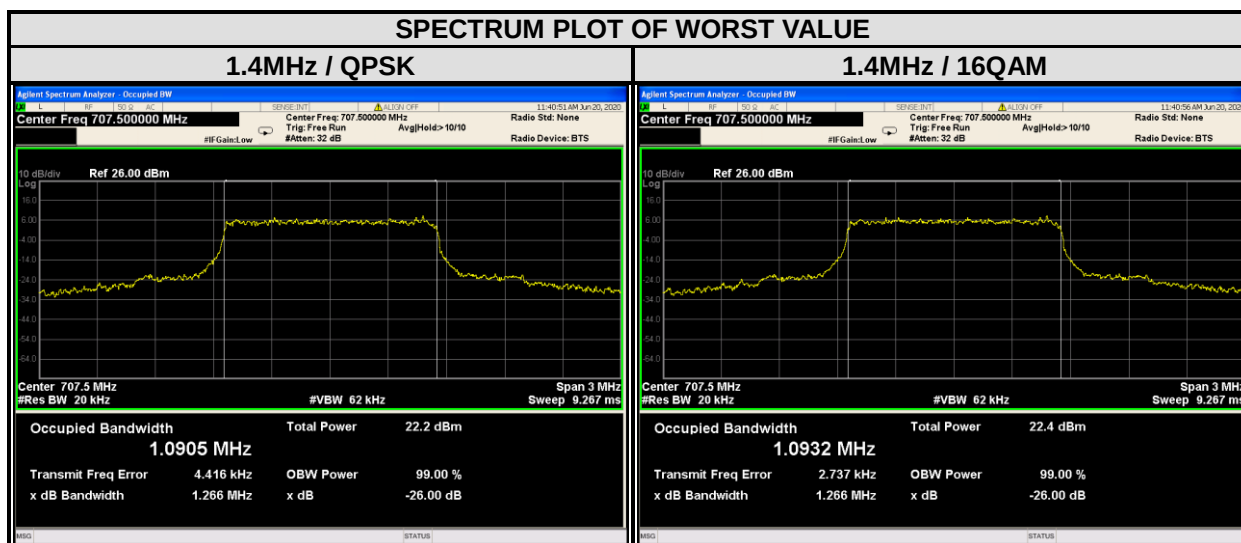
LTE BAND 4

CHANNEL BANDWIDTH: 20MHz							
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (kHz)		CHANNEL	Frequency (MHz)	26dB Bandwidth (kHz)	
		QPSK	16QAM			QPSK	16QAM
20050	1720	17.907	17.874	20050	1720	19.4	19.21
20175	1732.5	17.865	17.876	20175	1732.5	19.25	18.97
20300	1745	17.906	17.872	20300	1745	19.24	19.25



LTE BAND 12

CHANNEL BANDWIDTH: 1.4MHz							
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (kHz)		CHANNEL	Frequency (MHz)	26dB Bandwidth (kHz)	
		QPSK	16QAM			QPSK	16QAM
23017	699.7	1.0859	1.0890	23017	699.7	1.337	1.396
23095	707.5	1.0905	1.0932	23095	707.5	1.266	1.266
23173	715.3	1.0814	1.0844	23173	715.3	1.258	1.264



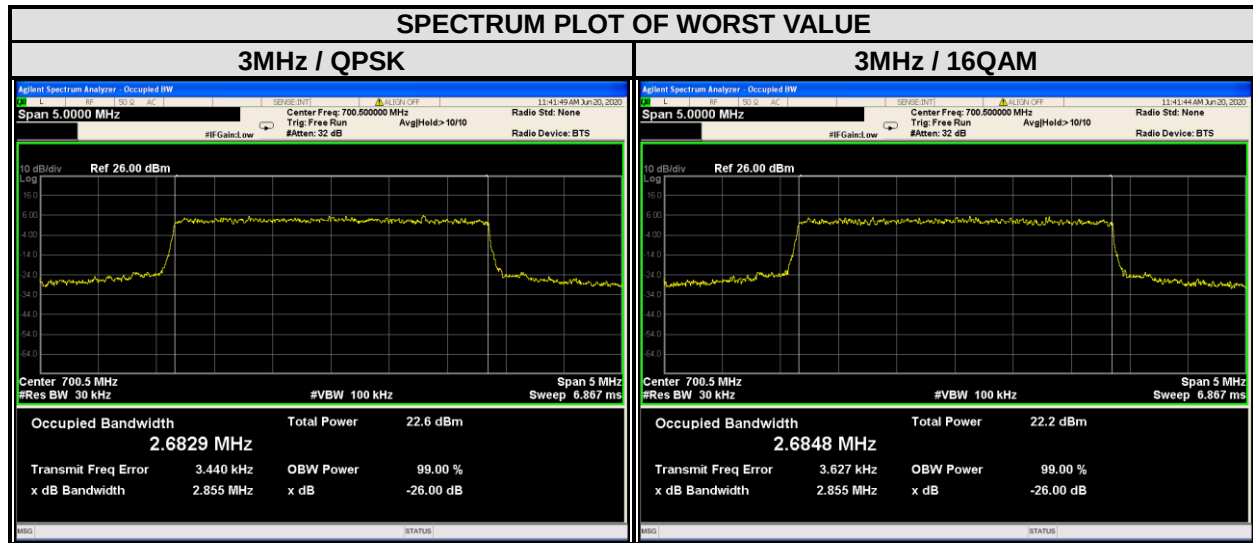


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Test Report No.: RF200327S003-3

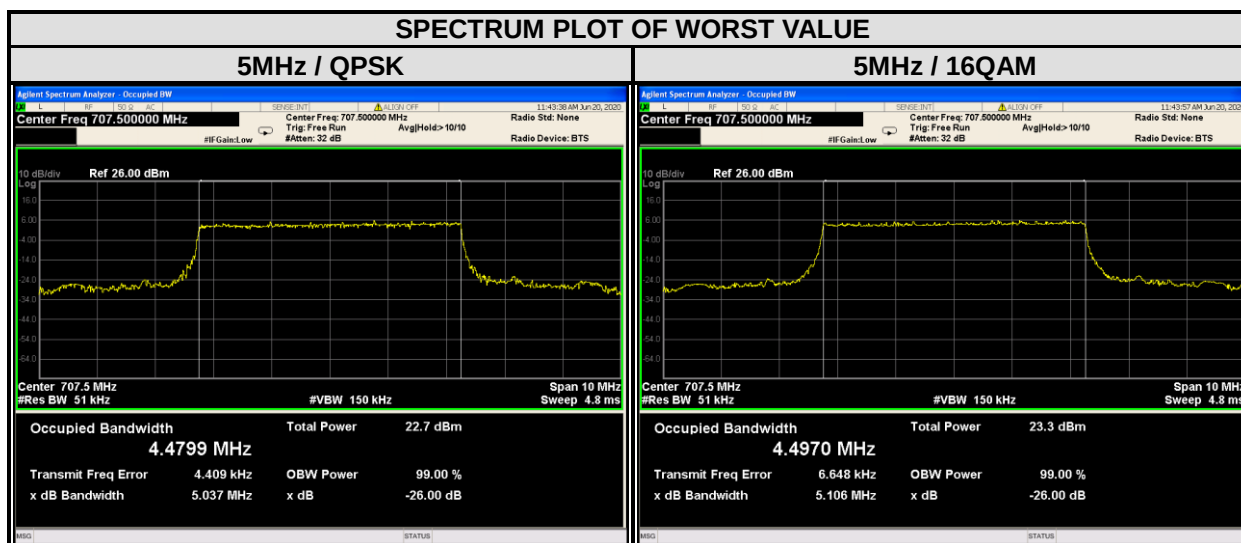
LTE BAND 12

CHANNEL BANDWIDTH: 3MHz							
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (kHz)		CHANNEL	Frequency (MHz)	26dB Bandwidth (kHz)	
		QPSK	16QAM			QPSK	16QAM
23025	700.5	2.6829	2.6848	23025	700.5	2.855	2.855
23095	707.5	2.6794	2.6765	23095	707.5	2.888	2.86
23165	714.5	2.6795	2.6797	23165	714.5	2.859	2.858



LTE BAND 12

CHANNEL BANDWIDTH: 5MHz							
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (kHz)		CHANNEL	Frequency (MHz)	26dB Bandwidth (kHz)	
		QPSK	16QAM			QPSK	16QAM
23035	701.5	4.4720	4.4726	23035	701.5	4.998	5.017
23095	707.5	4.4799	4.4970	23095	707.5	5.037	5.106
23155	713.5	4.4767	4.4882	23155	713.5	4.961	4.97





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Test Report No.: RF200327S003-3

LTE BAND 12

CHANNEL BANDWIDTH: 10MHz							
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (kHz)		CHANNEL	Frequency (MHz)	26dB Bandwidth (kHz)	
		QPSK	16QAM			QPSK	16QAM
23060	704	8.9676	8.9802	23060	704	10.05	9.848
23095	707.5	8.9504	8.9569	23095	707.5	9.845	9.837
23130	711	8.9779	8.9748	23130	711	9.851	9.779

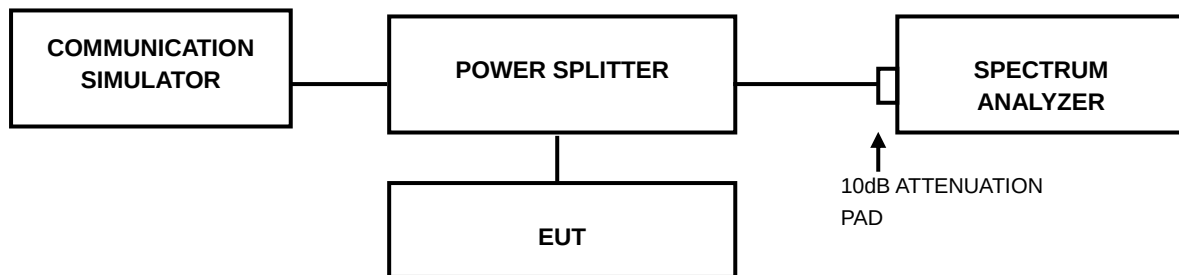


3.4 PEAK TO AVERAGE RATIO

3.4.1 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

3.4.2 TEST SETUP



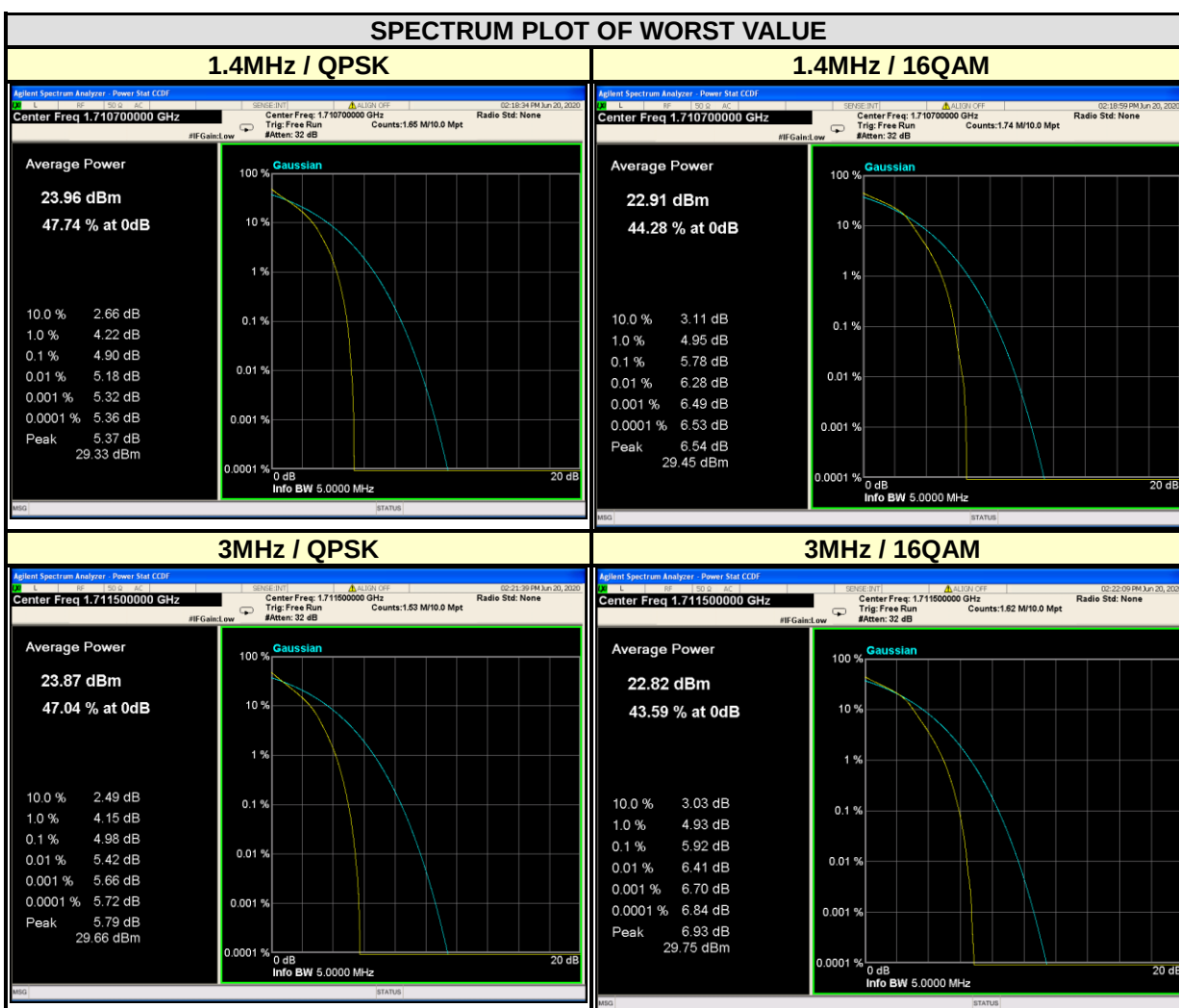
3.4.3 TEST PROCEDURES

1. Set resolution/measurement bandwidth $\geq$ 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%.

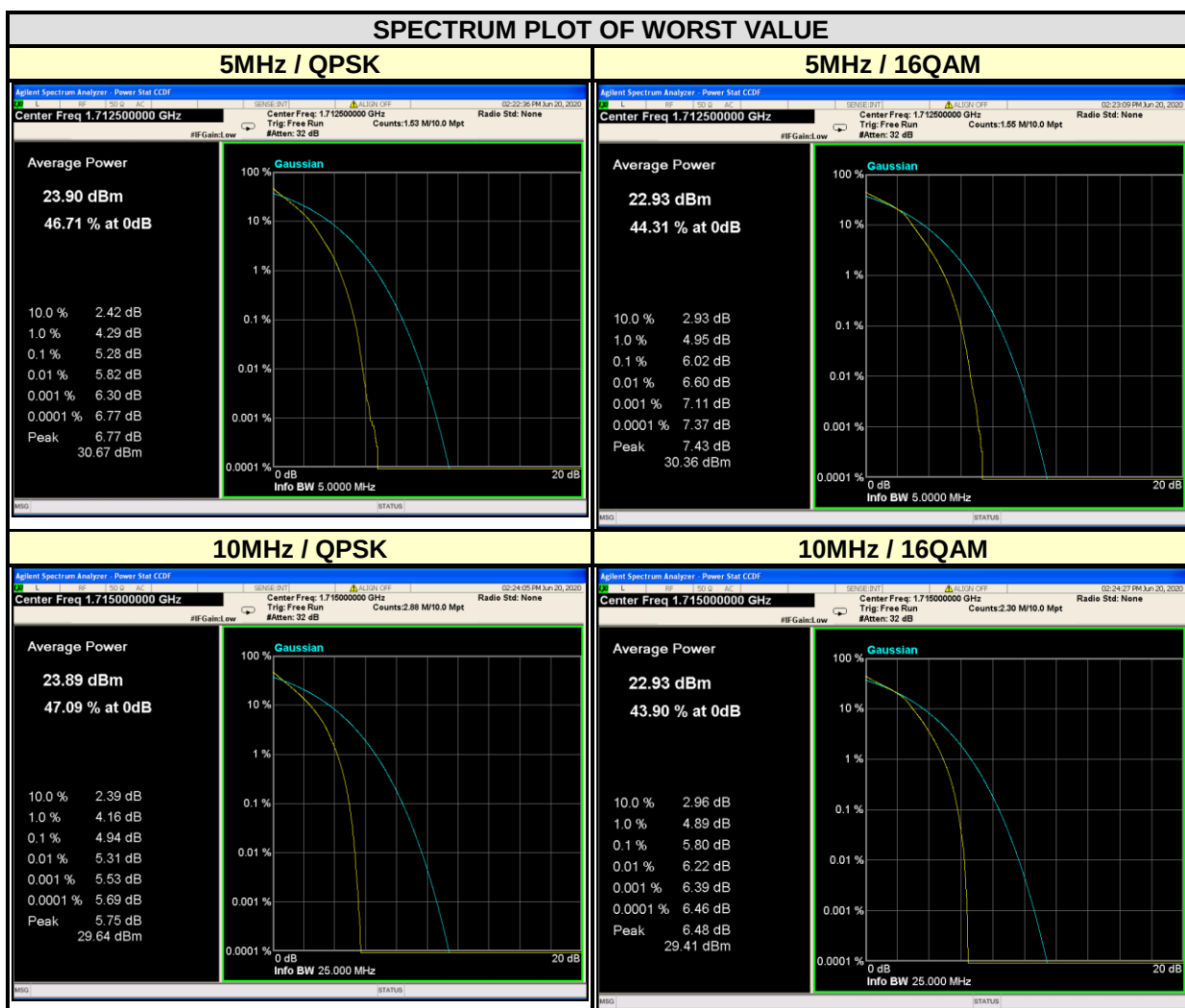
3.4.4 TEST RESULTS

LTE BAND 4

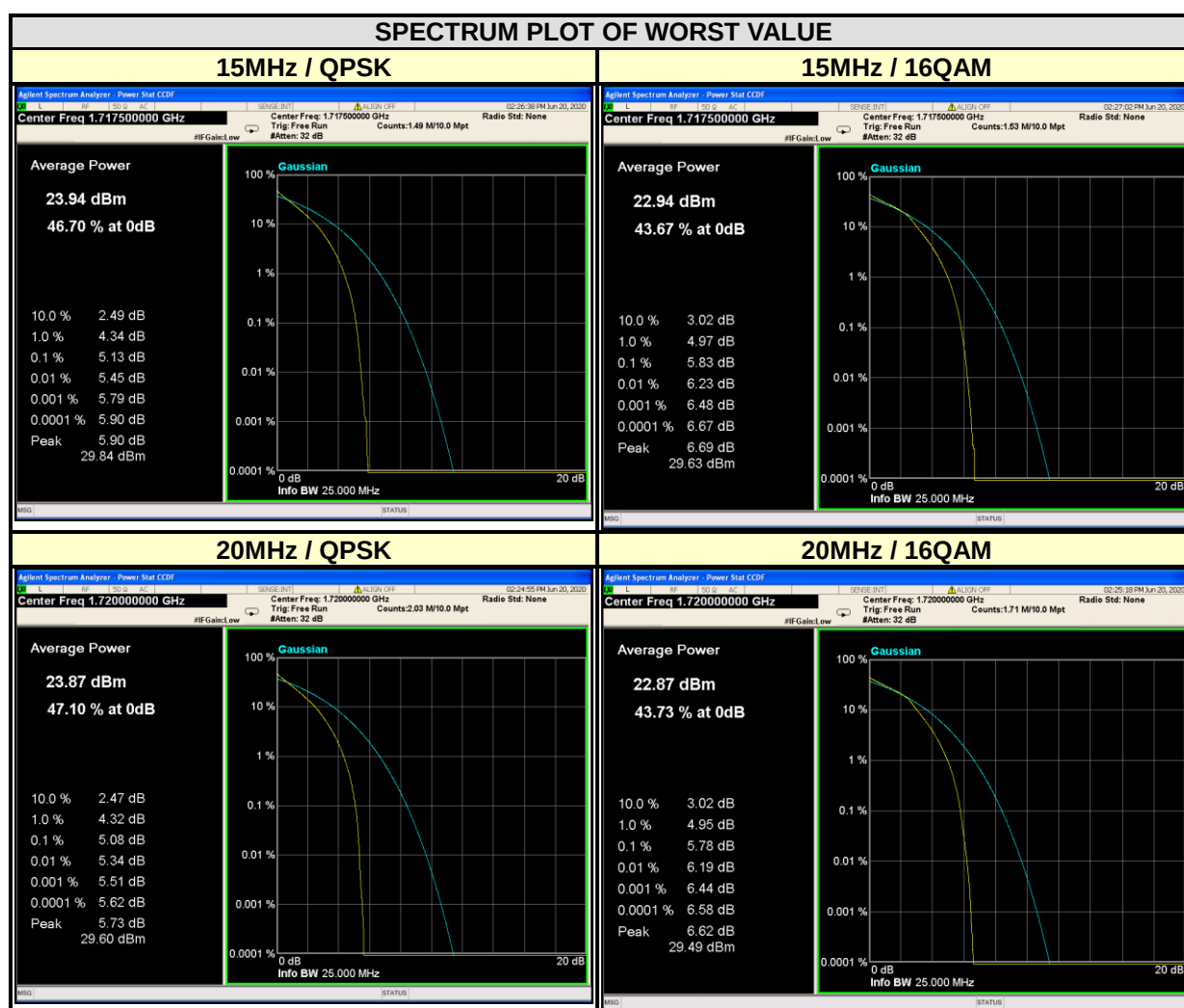
CHANNEL BANDWIDTH: 1.4MHz				CHANNEL BANDWIDTH: 3MHz			
CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)		CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM			QPSK	16QAM
19957	1710.7	4.90	5.78	19965	1711.5	4.98	5.92
20175	1732.5	4.55	5.42	20175	1732.5	4.37	5.87
20393	1754.3	4.03	4.92	20385	1753.5	4.20	5.54



CHANNEL BANDWIDTH: 5MHz				CHANNEL BANDWIDTH: 10MHz			
CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)		CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM			QPSK	16QAM
19975	1712.5	5.28	6.02	20000	1715	4.94	5.8
20175	1732.5	4.78	5.93	20175	1732.5	4.38	5.7
20375	1752.5	4.59	5.67	20350	1750	4.13	5.35

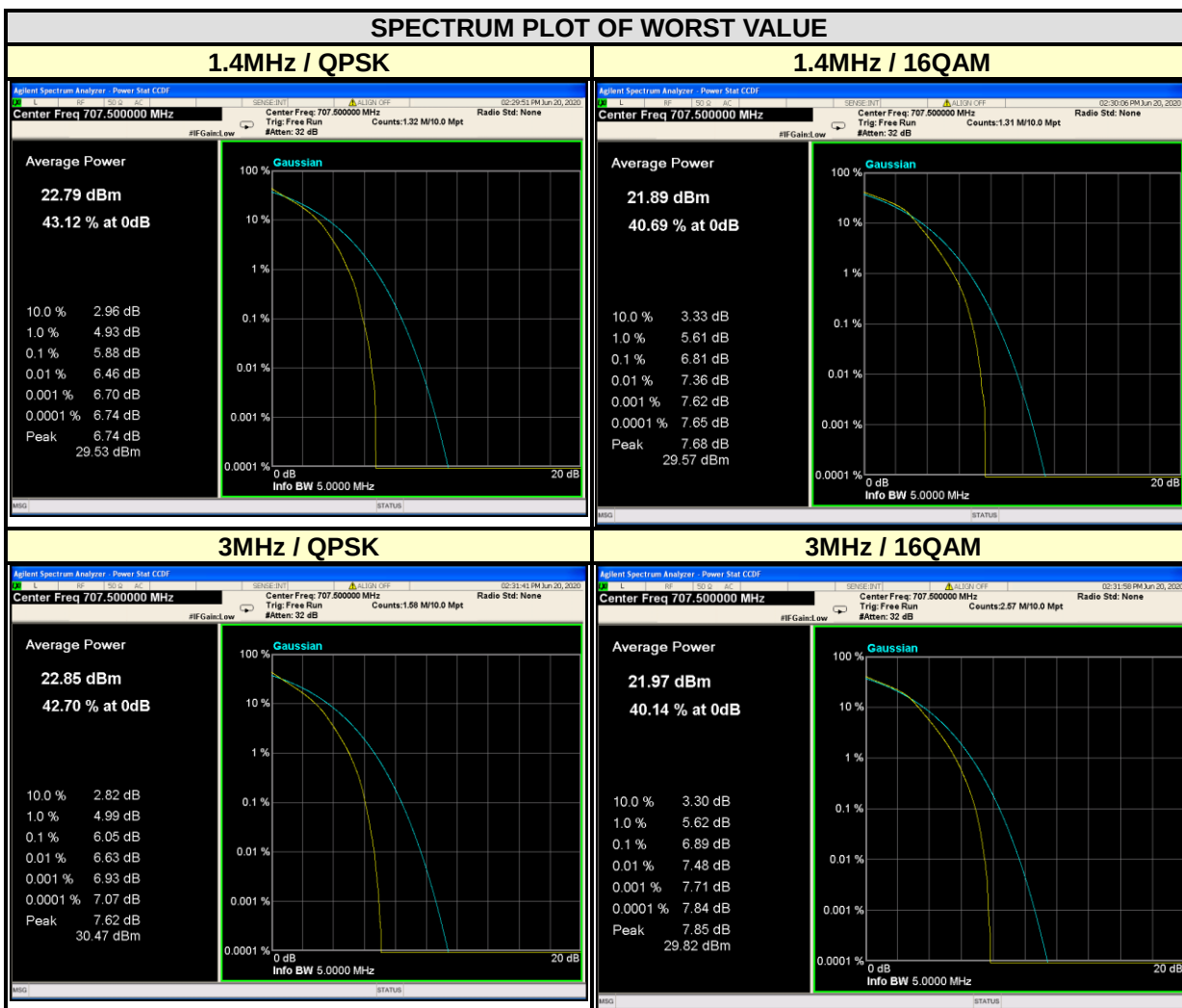


CHANNEL BANDWIDTH: 15MHz				CHANNEL BANDWIDTH: 20MHz			
CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)		CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM			QPSK	16QAM
20025	1717.5	5.13	5.83	20050	1720	5.08	5.78
20175	1732.5	4.59	5.76	20175	1732.5	4.58	5.73
20325	1747.5	4.34	5.48	20300	1745	4.41	5.44

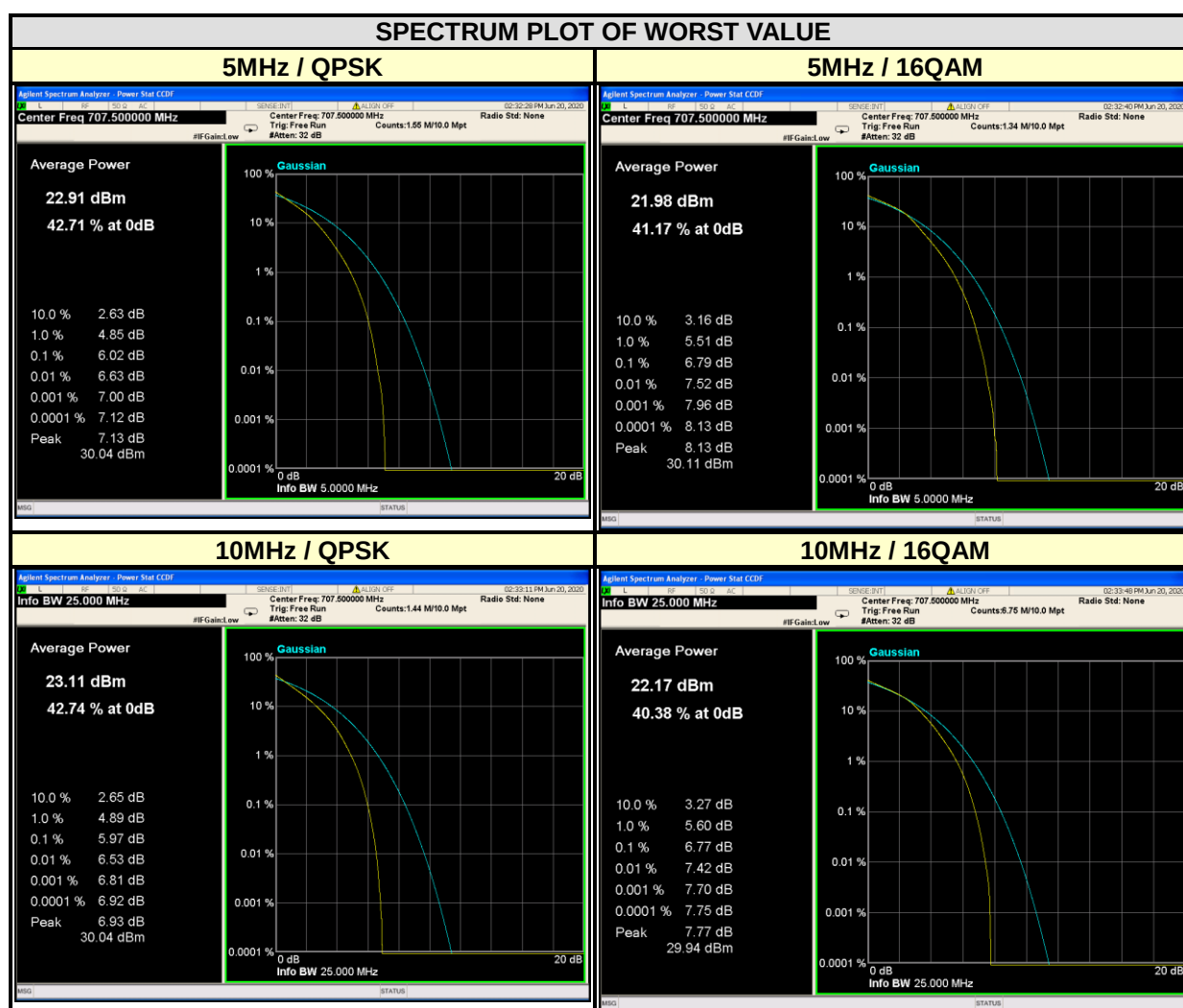


LTE BAND 12

CHANNEL BANDWIDTH: 1.4MHz				CHANNEL BANDWIDTH: 3MHz			
CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)		CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM			QPSK	16QAM
23017	699.7	5.46	6.29	23025	700.5	5.93	6.65
23095	707.5	5.88	6.81	23095	707.5	6.05	6.89
23173	715.3	5.40	6.34	23165	714.5	5.42	6.24



CHANNEL BANDWIDTH: 5MHz				CHANNEL BANDWIDTH: 10MHz			
CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)		CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM			QPSK	16QAM
23035	701.5	5.87	6.49	23060	704	5.86	6.44
23095	707.5	6.02	6.79	23095	707.5	5.97	6.77
23155	713.5	5.38	6.18	23130	711	5.34	6.16



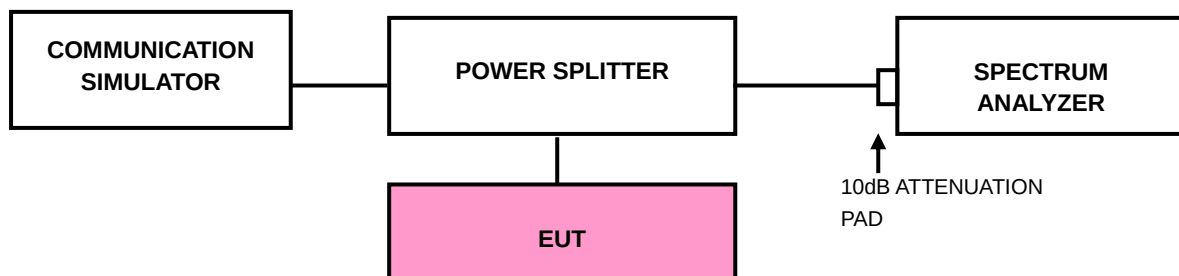
3.5 BAND EDGE MEASUREMENT

3.5.1 LIMITS OF BAND EDGE MEASUREMENT

The power of any emission outside a 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, by at least $43 + 10 \log (P)$ dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater.

However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

3.5.2 TEST SETUP



3.5.3 TEST PROCEDURES

- a. The EUT was set up for the maximum peak power with LTE link data modulation. The power was measured with R&S Spectrum Analyzer. All measurements were done at 2 channels (low and high operational frequency range.).
- b. The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- c. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 30kHz and VBW of the spectrum is 100 kHz. (LTE bandwidth 1.4MHz)
- d. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 30kHz and VBW of the spectrum is 100kHz. (LTE bandwidth 3MHz)
- e. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 50kHz and VBW of the spectrum is 200kHz. (LTE bandwidth 5MHz)
- f. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 100kHz and VBW of the spectrum is 300kHz. (LTE bandwidth 10MHz)
- g. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 200kHz and VBW of the spectrum is 1MHz. (LTE bandwidth 15MHz)
- h. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 200kHz and VBW of the spectrum is 1MHz. (LTE bandwidth 20MHz)
- i. Record the max trace plot into the test report.