

FCC TEST REPORT

(PART 27)

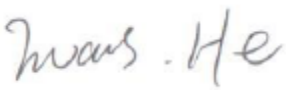
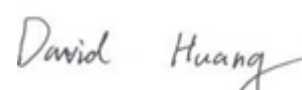
Applicant:	PAX Technology Limited
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Manufacturer or Supplier:	PAX Computer Technology (Shenzhen) Co., Ltd.
Address:	4/F, No.3 Building, Software Park, Second Central Science-Tech Road, High-Tech industrial Park, Shenzhen, Guangdong, P.R.C.
Product:	Smart Mobile Payment Terminal
Brand Name:	PAX
Model Name:	A920Pro
FCC ID:	V5PA920PRO
Date of tests:	Apr. 01, 2020~ May 15, 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: May 18, 2020	Date: May 18, 2020

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF200327S003-3	Original release	May 18, 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 -13.21dB at 1569MHz.

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, 19	Jun. 29, 20
SHF-EHF Horn	Schwarzbeck	BBHA9170	BBHA9170147	Jun. 30, 19	Jun. 29, 20
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, GREGT/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	Smart Mobile Payment Terminal	
MODEL NAME	A920Pro	
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
	LTE Band 13 Channel Bandwidth: 5MHz	779.5MHz ~ 784.5MHz
	LTE Band 13 Channel Bandwidth: 10MHz	782.0MHz
EMISSION DESIGNATOR	LTE Band 4 Channel Bandwidth: 1.4MHz	QPSK: 1M09G7D 16QAM: 1M09W7D
	LTE Band 4 Channel Bandwidth: 3MHz	QPSK: 2M69G7D 16QAM: 2M69W7D
	LTE Band 4 Channel Bandwidth: 5MHz	QPSK: 4M47G7D 16QAM: 4M48W7D
	LTE Band 4 Channel Bandwidth: 10MHz	QPSK: 8M94G7D 16QAM: 8M95W7D
	LTE Band 4 Channel Bandwidth: 15MHz	QPSK: 13M42G7D 16QAM: 13M43W7D



**BUREAU
VERITAS**

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	LTE Band 4	QPSK: 17M94G7D
	Channel Bandwidth: 20MHz	16QAM: 17M89W7D
EMISSION DESIGNATOR	LTE Band 12	QPSK: 1M09G7D
	Channel Bandwidth: 1.4MHz	16QAM: 1M09W7D
	LTE Band 12	QPSK: 2M68G7D
	Channel Bandwidth: 3MHz	16QAM: 2M68W7D
	LTE Band 12	QPSK: 4M49G7D
	Channel Bandwidth: 5MHz	16QAM: 4M49W7D
	LTE Band 12	QPSK: 8M94G7D
MAX. ERP/EIRP POWER	Channel Bandwidth: 10MHz	16QAM: 8M96W7D
	LTE Band 13	QPSK: 4M47G7D
	Channel Bandwidth: 5MHz	16QAM: 4M49W7D
	LTE Band 13	QPSK: 9M02G7D
	Channel Bandwidth: 10MHz	16QAM: 9M02W7D
	LTE Band 4	316.23mW
	Channel Bandwidth: 1.4MHz	
	LTE Band 4	315.5mW
	Channel Bandwidth: 3MHz	
	LTE Band 4	319.15mW
	Channel Bandwidth: 5MHz	
	LTE Band 4	321.37mW
	Channel Bandwidth: 10MHz	
	LTE Band 4	308.32mW
	Channel Bandwidth: 15MHz	
	LTE Band 4	313.33mW
	Channel Bandwidth: 20MHz	
	LTE Band 12	179.47mW
	Channel Bandwidth: 1.4MHz	
	LTE Band 12	179.47mW
	Channel Bandwidth: 3MHz	
	LTE Band 12	187.07mW
	Channel Bandwidth: 5MHz	
	LTE Band 12	189.67mW
	Channel Bandwidth: 10MHz	
	LTE Band 13	167.49mW
	Channel Bandwidth: 5MHz	
	LTE Band 13	161.44mW
	Channel Bandwidth: 10MHz	
ANTENNA TYPE	LTE Band 4	PIFA Antenna with 1.5dBi



**BUREAU
VERITAS**

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	LTE Band 12/ LTE Band 13	FPC Antenna with 1dBi
HW VERSION	N/A	
SW VERSION	N/A	
ACCESSORY DEVICE	Refer to note as below	
DATA CABLE	USB cable: non-shielded, detachable, 1.0m	
EUT STAGE	Production Unit	

NOTE:

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

2. The EUT was powered by the following adapter:

ADAPTER	
BRAND:	N/A
MODEL:	GLH50D2000HW
INPUT:	100-240V~50/60Hz 0.40A
OUTPUT:	5.0V --- 2000mA

3. The EUT matched the following USB cable:

USB CABLE	
BRAND:	N/A
MODEL:	N/A
SIGNAL LINE:	1.0 METER

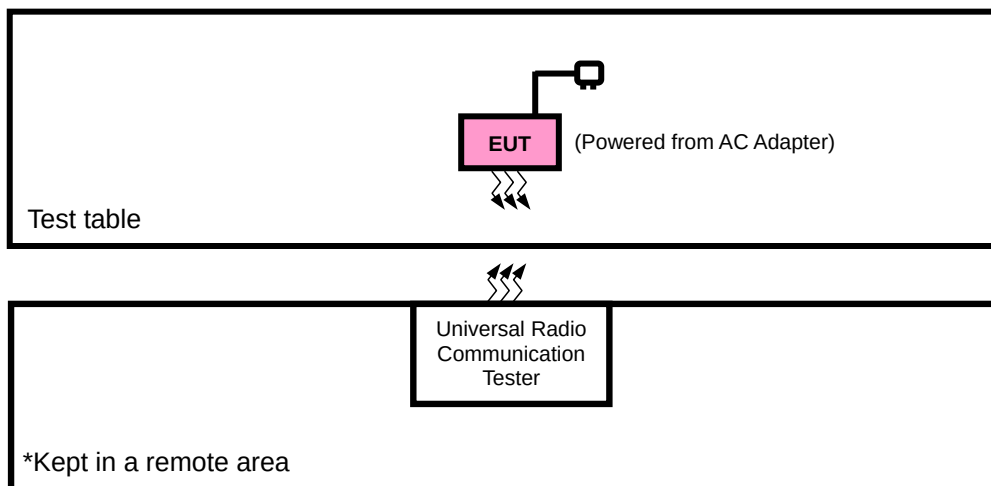
4. The EUT was powered by the following Battery:

ADAPTER	
BRAND:	VEKEN
MODEL:	YW-008
POWER RATING:	3.7V --- 5150mAh 19.05Wh

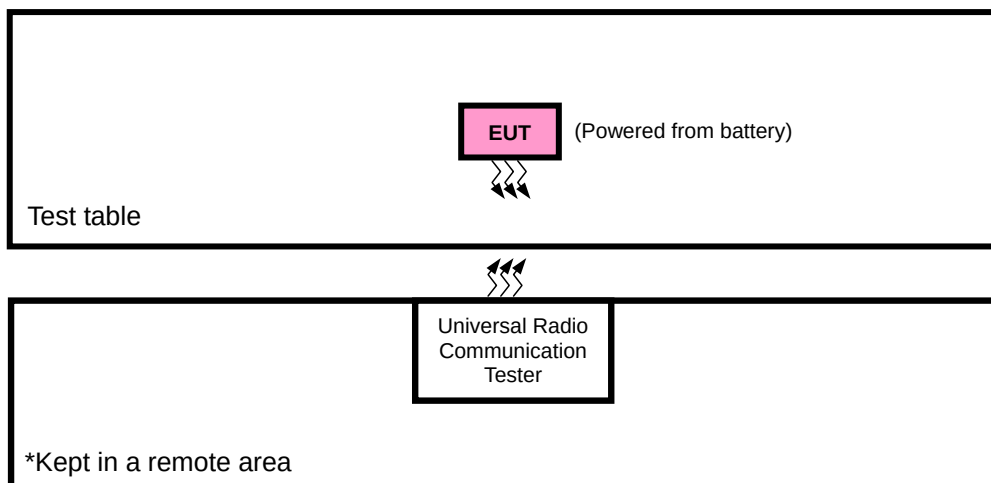
5. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

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
			20000	10MHz	QPSK	1 RB / 0 RB Offset
						50 RB / 0 RB Offset
			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
	20300	20MHz	QPSK	1 RB / 99 RB Offset		
						100 RB / 0 RB Offset
B	CONDCUDED EMISSION	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
		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
A	RADIATED EMISSION	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
			23173	1.4MHz	QPSK	1 RB / 5 RB Offset
						6 RB / 0 RB Offset
		23025 to 23165	23025	3MHz	QPSK	1 RB / 0 RB Offset
						15 RB / 0 RB Offset
			23165	3MHz	QPSK	1 RB / 14 RB Offset
						15 RB / 0 RB Offset
		23035 to 23155	23035	5MHz	QPSK	1 RB / 0 RB Offset
						25 RB / 0 RB Offset
			23155	5MHz	QPSK	1 RB / 24 RB Offset
						25 RB / 0 RB Offset
B	CONDCUDED 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

LTE BAND 13

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
B	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	23205 to 23255	23205, 23255	5MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		23230	23230	10MHz	QPSK, 16QAM	1 RB / 0 RB Offset
B	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
B	PEAK TO AVERAGE RATIO	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	BAND EDGE	23205 to 23255	23205	5MHz	QPSK	1 RB / 0 RB Offset
			23255	5MHz	QPSK	25 RB / 0 RB Offset
		23230	23230	10MHz	QPSK	1 RB / 24 RB Offset
						25 RB / 0 RB Offset
			23230	10MHz	QPSK	1 RB / 0 RB Offset
						50 RB / 0 RB Offset
B	CONDCUDED EMISSION	23205 to 23255	23205, 23230, 23255	5MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		23230	23230	10MHz	QPSK, 16QAM	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.

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	DC 3.4V/3.7V/4.2V	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



Test Report No.: RF200327S003-3

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.

27.50(b)(10) Portable stations (hand-held devices) transmitting in the 776-788 MHz, bands 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);

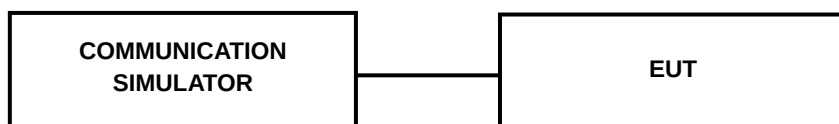
L_C = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

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).



**BUREAU
VERITAS**

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

LTE Band 13							
BW	Modulation	RB Size	RB Offset	Low CH 23205	Mid CH 23230	High CH 23255	MPR
				Frequency 779.5 MHz	Frequency 782.0 MHz	Frequency 784.5 MHz	
5 MHz	QPSK	1	0	23.22	23.39	23.12	0
		1	12	23.14	23.29	23.08	0
		1	24	23.23	23.19	23.24	0
		12	0	22.44	22.2	22.4	1
		12	6	22.31	22.28	22.36	1
		12	13	22.13	22.5	22.31	1
		25	0	22.23	22.29	22.34	1
	16QAM	1	0	22.3	22.07	22.27	1
		1	12	22.27	22.14	22.43	1
		1	24	22.3	22.16	22.26	1
		12	0	21.58	21.23	21.45	2
		12	6	21.3	21.23	21.42	2
		12	13	21.33	21.52	21.24	2
		25	0	21.22	21.16	21.4	2

LTE Band 13					
BW	Modulation	RB Size	RB Offset	CH 23230	MPR
				Frequency 782.0 MHz	
10 MHz	QPSK	1	0	23.23	0
		1	24	23.17	0
		1	49	23.16	0
		25	0	22.34	1
		25	12	22.28	1
		25	25	22.37	1
		50	0	22.3	1
	16QAM	1	0	22.51	1
		1	24	22.53	1
		1	49	22.56	1
		25	0	21.34	2
		25	12	21.35	2
		25	25	21.61	2
		50	0	21.06	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	1.5	24.95	312.61	1
20175	1732.5	23.48	1.5	24.98	314.77	1
20393	1754.3	23.5	1.5	25	316.23	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	1.5	24.44	277.97	1
20175	1732.5	22.93	1.5	24.43	277.33	1
20393	1754.3	22.79	1.5	24.29	268.53	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	1.5	24.75	298.54	1
20175	1732.5	23.38	1.5	24.88	307.61	1
20385	1753.5	23.49	1.5	24.99	315.5	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	1.5	23.76	237.68	1
20175	1732.5	23.17	1.5	24.67	293.09	1
20385	1753.5	22.9	1.5	24.4	275.42	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	1.5	24.75	298.54	1
20175	1732.5	23.54	1.5	25.04	319.15	1
20375	1752.5	23.15	1.5	24.65	291.74	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	1.5	23.57	227.51	1
20175	1732.5	22.19	1.5	23.69	233.88	1
20375	1752.5	21.92	1.5	23.42	219.79	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	1.5	24.74	297.85	1
20175	1732.5	23.32	1.5	24.82	303.39	1
20350	1750	23.57	1.5	25.07	321.37	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	1.5	23.72	235.5	1
20175	1732.5	22.7	1.5	24.2	263.03	1
20350	1750	23	1.5	24.5	281.84	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	1.5	24.75	298.54	1
20175	1732.5	23.34	1.5	24.84	304.79	1
20325	1747.5	23.39	1.5	24.89	308.32	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	1.5	23.81	240.44	1
20175	1732.5	22.67	1.5	24.17	261.22	1
20325	1747.5	22.81	1.5	24.31	269.77	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	1.5	24.96	313.33	1
20175	1732.5	23.34	1.5	24.84	304.79	1
20300	1745	23.46	1.5	24.96	313.33	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	1.5	23.89	244.91	1
20175	1732.5	22.5	1.5	24	251.19	1
20300	1745	23.24	1.5	24.74	297.85	1

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

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	1	22.54	179.47	3
23095	707.5	23.55	1	22.4	173.78	3
23171	715.3	23.66	1	22.51	178.24	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	1	22.19	165.58	3
23095	707.5	23.23	1	22.08	161.44	3
23171	715.3	23.01	1	21.86	153.46	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	1	22.42	174.58	3
23095	707.5	23.52	1	22.37	172.58	3
23165	714.5	23.69	1	22.54	179.47	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	1	21.82	152.05	3
23095	707.5	22.99	1	21.84	152.76	3
23165	714.5	23.07	1	21.92	155.6	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	1	22.5	177.83	3
23095	707.5	23.87	1	22.72	187.07	3
23155	713.5	23.56	1	22.41	174.18	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	1	21.51	141.58	3
23095	707.5	22.62	1	21.47	140.28	3
23155	713.5	22.6	1	21.45	139.64	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	1	22.32	170.61	3
23095	707.5	23.55	1	22.4	173.78	3
23130	811	23.93	1	22.78	189.67	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	1	21.74	149.28	3
23095	707.5	23.01	1	21.86	153.46	3
23130	811	23.14	1	21.99	158.12	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

LTE BAND 13

CHANNEL BANDWIDTH: 5MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _c (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23205	779.5	23.23	1	22.08	161.44	3
23230	782	23.39	1	22.24	167.49	3
23255	784.5	23.24	1	22.09	161.81	3

CHANNEL BANDWIDTH: 5MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _c (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23205	779.5	22.3	1	21.15	130.32	3
23230	782	22.16	1	21.01	126.18	3
23255	784.5	22.43	1	21.28	134.28	3

LTE BAND 13

CHANNEL BANDWIDTH: 10MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _c (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23230	782	23.23	1	22.08	161.44	3

CHANNEL BANDWIDTH: 10MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _c (dB)	ERP (dBm)	ERP (mW)	Limit (W)
23230	782	22.56	1	21.41	138.36	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

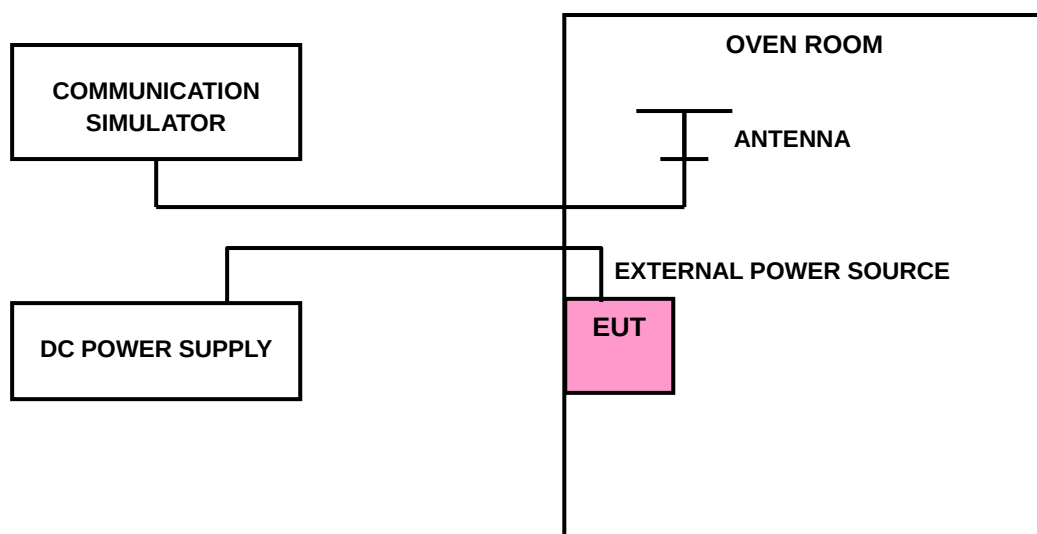
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

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	
3.8	0.1028	0.104	2.5
3.55(BEP)	0.1168	0.1063	2.5
4.35	0.1215	0.1053	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	0.1198	0.1064	2.5
-20	0.1132	0.1051	2.5
-10	0.1018	0.0906	2.5
0	0.0979	0.0879	2.5
10	0.1128	0.077	2.5
20	0.1269	0.0789	2.5
30	0.127	0.0898	2.5
40	0.1185	0.0807	2.5
50	0.1189	0.0827	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	3MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
3.8	0.0915	0.1049	2.5
3.55(BEP)	0.0831	0.0949	2.5
4.35	0.0841	0.1068	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	0.0967	0.089	2.5
-20	0.1086	0.0908	2.5
-10	0.1189	0.0888	2.5
0	0.1122	0.077	2.5
10	0.1026	0.0797	2.5
20	0.0919	0.0856	2.5
30	0.0802	0.0746	2.5
40	0.0715	0.0671	2.5
50	0.0567	0.0538	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	5MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
3.8	0.1111	0.1157	2.5
3.55(BEP)	0.1032	0.1262	2.5
4.35	0.0989	0.1349	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	0.0909	0.1257	2.5
-20	0.0881	0.1345	2.5
-10	0.0801	0.1488	2.5
0	0.095	0.1521	2.5
10	0.08	0.139	2.5
20	0.076	0.1299	2.5
30	0.0906	0.1252	2.5
40	0.0895	0.1239	2.5
50	0.0967	0.1256	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	10MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
3.8	0.1084	0.1014	2.5
3.55(BEP)	0.1202	0.096	2.5
4.35	0.1136	0.1077	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	0.1349	0.1103	2.5
-20	0.1235	0.1221	2.5
-10	0.1135	0.1124	2.5
0	0.124	0.1218	2.5
10	0.1251	0.1145	2.5
20	0.1201	0.1248	2.5
30	0.1285	0.1279	2.5
40	0.1364	0.1242	2.5
50	0.1217	0.1372	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	15MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
3.8	0.1055	0.0967	2.5
3.55(BEP)	0.1131	0.1073	2.5
4.35	0.1135	0.1148	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	0.1047	0.1126	2.5
-20	0.1142	0.1084	2.5
-10	0.1163	0.1178	2.5
0	0.1173	0.1137	2.5
10	0.1285	0.1091	2.5
20	0.1371	0.0993	2.5
30	0.1256	0.0946	2.5
40	0.1125	0.0828	2.5
50	0.0987	0.0679	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	20MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
3.8	0.0007	0.0009	2.5
3.55(BEP)	0.0156	0.0054	2.5
4.35	0.0208	0.0011	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	0.0146	0.0199	2.5
-20	0.0196	0.0201	2.5
-10	0.0156	0.0147	2.5
0	0.0119	0.0014	2.5
10	0.0232	-0.0073	2.5
20	0.0278	0.007	2.5
30	0.029	0.0054	2.5
40	0.0169	0.0027	2.5
50	0.0171	0.0104	2.5

LTE BAND 12

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	1.4MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
3.8	0.1061	0.0969	2.5
3.55(BEP)	0.1015	0.0976	2.5
4.35	0.1144	0.1068	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	0.1137	0.0935	2.5
-20	0.1156	0.0862	2.5
-10	0.1186	0.074	2.5
0	0.1082	0.0718	2.5
10	0.1045	0.063	2.5
20	0.0904	0.0745	2.5
30	0.1044	0.0756	2.5
40	0.1064	0.0626	2.5
50	0.1144	0.0651	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	3MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
3.8	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	-0.0107	0.0093	2.5
-20	0.0025	0.019	2.5
-10	0.0002	0.0291	2.5
0	0.0143	0.0177	2.5
10	0.0103	0.0085	2.5
20	0.0234	0.0057	2.5
30	0.025	0.009	2.5
40	0.0237	-0.0045	2.5
50	0.0308	-0.0144	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	5MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
3.8	0.1156	0.1001	2.5
3.55(BEP)	0.1191	0.1116	2.5
4.35	0.1158	0.1232	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	0.1337	0.0975	2.5
-20	0.1407	0.0916	2.5
-10	0.1456	0.0974	2.5
0	0.1364	0.1082	2.5
10	0.1255	0.0998	2.5
20	0.1338	0.1119	2.5
30	0.1299	0.1171	2.5
40	0.143	0.1275	2.5
50	0.1339	0.1242	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	10MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
3.8	0.1183	0.107	2.5
3.55(BEP)	0.1202	0.1212	2.5
4.35	0.1322	0.1293	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	0.1119	0.1222	2.5
-20	0.1181	0.112	2.5
-10	0.1109	0.1117	2.5
0	0.1238	0.1059	2.5
10	0.1335	0.1025	2.5
20	0.1373	0.0971	2.5
30	0.1467	0.1066	2.5
40	0.1476	0.0994	2.5
50	0.1538	0.0969	2.5

LTE BAND 13

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	5MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
3.8	0.0908	0.1044	2.5
3.55(BEP)	0.0847	0.1142	2.5
4.35	0.0763	0.1038	2.5

NOTE: The applicant defined the normal working voltage of the battery is from 3.5Vdc to 4.2Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	5MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	0.0975	0.1185	2.5
-20	0.1057	0.1198	2.5
-10	0.1132	0.1156	2.5
0	0.1257	0.1073	2.5
10	0.1282	0.1069	2.5
20	0.1175	0.0966	2.5
30	0.1271	0.1063	2.5
40	0.1304	0.1079	2.5
50	0.1199	0.1147	2.5
60	0.0975	0.1185	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	10MHz	LIMIT (ppm)
	FREQUENCY ERROR (ppm)	
	Channel 23230	
3.8	0.0949	2.5
3.55(BEP)	0.089	2.5
4.35	0.0995	2.5

NOTE: The applicant defined the normal working voltage of the battery is from 3.5Vdc to 4.2Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

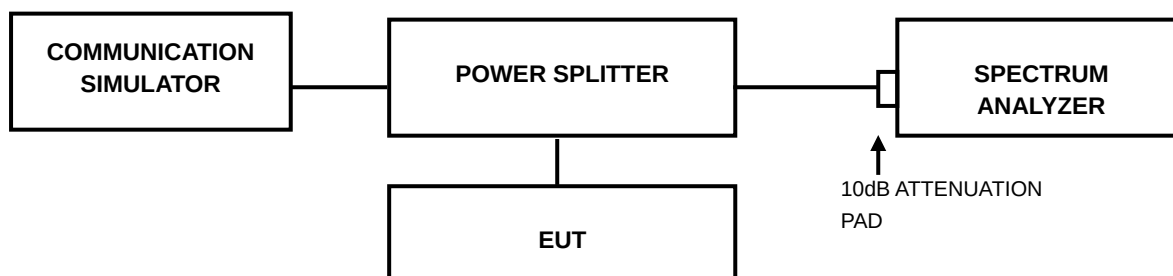
TEMP. (°C)	10MHz	LIMIT (ppm)
	FREQUENCY ERROR (ppm)	
	Channel 23230	
-30	0.0896	2.5
-20	0.0966	2.5
-10	0.0964	2.5
0	0.0957	2.5
10	0.1077	2.5
20	0.0983	2.5
30	0.1096	2.5
40	0.1119	2.5
50	0.0991	2.5
60	0.0896	2.5

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



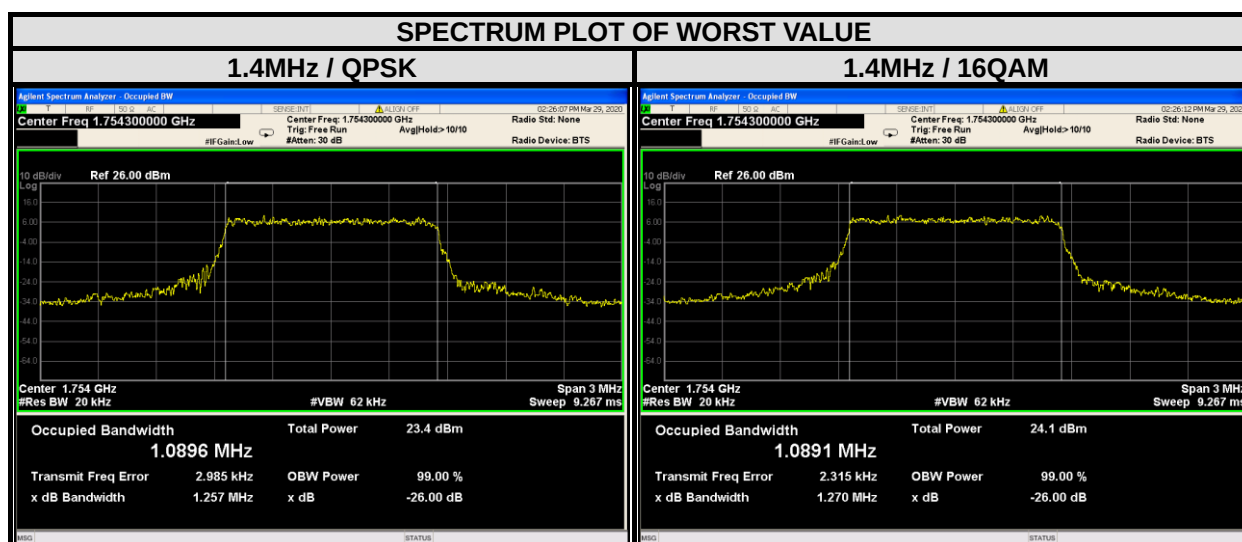
3.3.3 TEST PROCEDURES

- 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

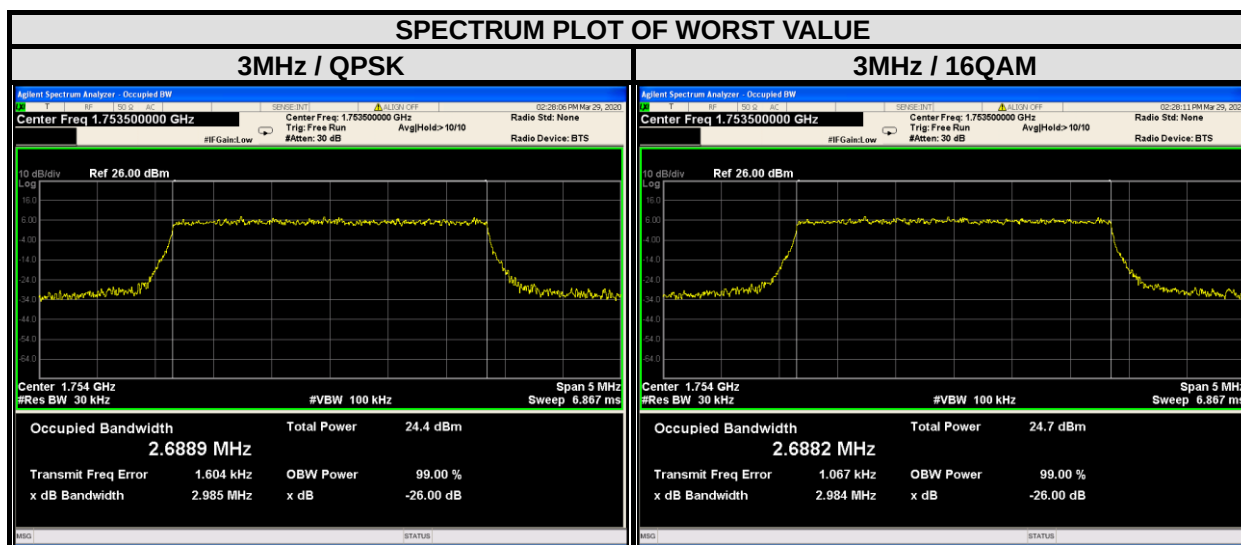
LTE BAND 4

CHANNEL BANDWIDTH: 1.4MHz							
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (kHz)		CHANNEL	Frequency (MHz)	26dB Bandwidth (kHz)	
		QPSK	16QAM			QPSK	16QAM
19957	1710.7	1.0873	1.081	19957	1710.7	1.276	1.267
20175	1732.5	1.0803	1.0838	20175	1732.5	1.248	1.276
20393	1754.3	1.0896	1.0891	20393	1754.3	1.257	1.27



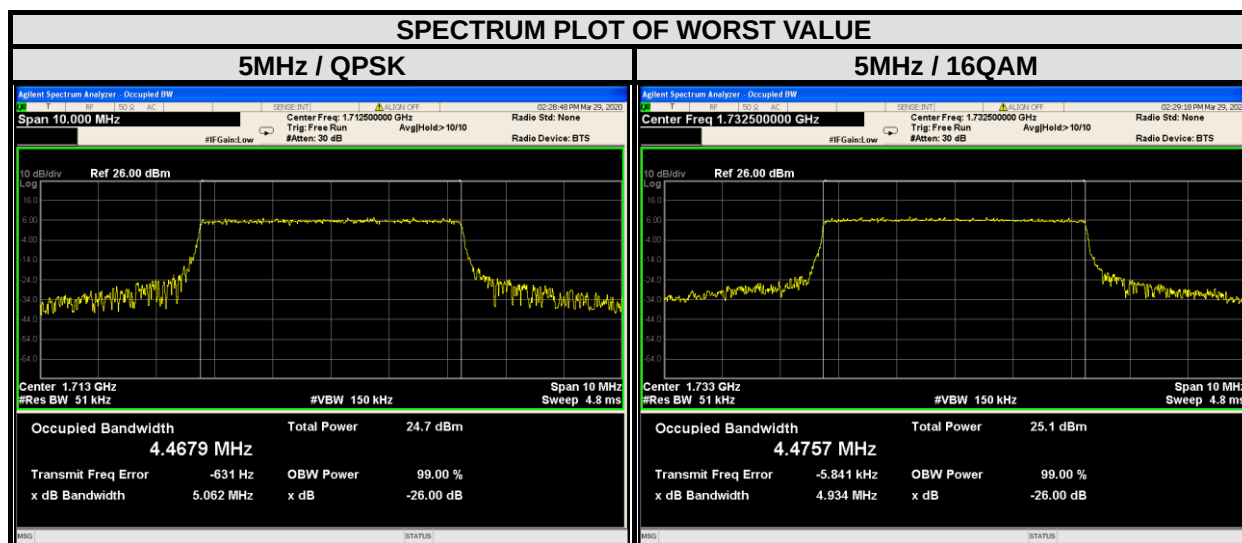
LTE BAND 4

CHANNEL BANDWIDTH: 3MHz							
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (kHz)		CHANNEL	Frequency (MHz)	26dB Bandwidth (kHz)	
		QPSK	16QAM			QPSK	16QAM
19965	1711.5	2.6846	2.684	19965	1711.5	2.966	3.017
20175	1732.5	2.6810	2.6836	20175	1732.5	2.998	2.995
20385	1753.5	2.6889	2.6882	20385	1753.5	2.985	2.984



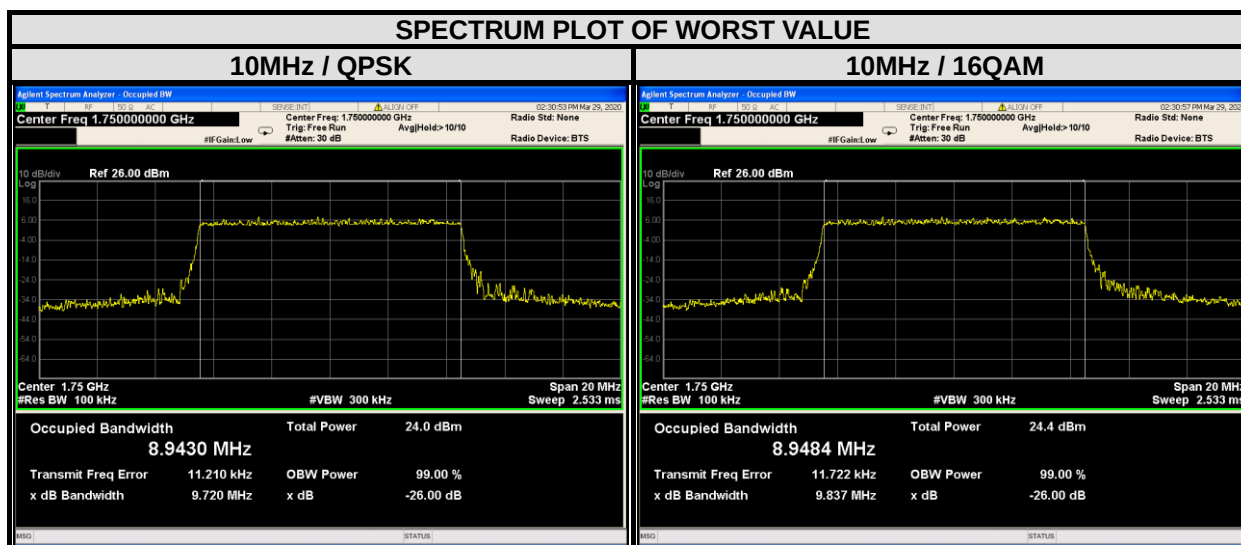
LTE BAND 4

CHANNEL BANDWIDTH: 5MHz							
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (kHz)		CHANNEL	Frequency (MHz)	26dB Bandwidth (kHz)	
		QPSK	16QAM			QPSK	16QAM
19975	1712.5	4.4679	4.4706	19975	1712.5	5.062	5.096
20175	1732.5	4.4657	4.4757	20175	1732.5	4.964	4.934
20375	1752.5	4.4578	4.4666	20375	1752.5	4.977	5.144



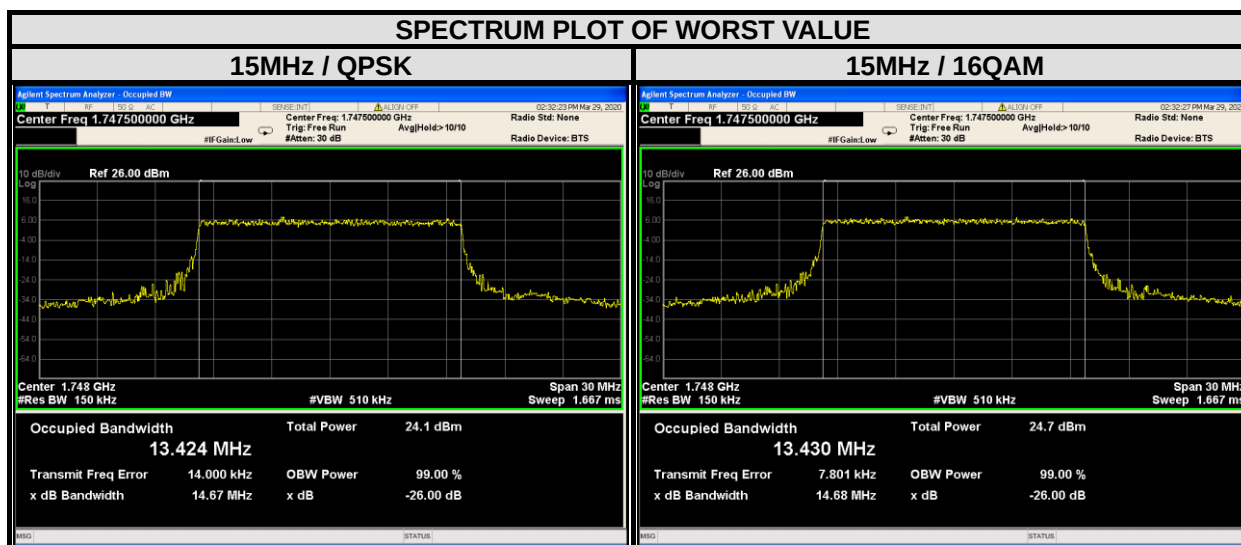
LTE BAND 4

CHANNEL BANDWIDTH: 10MHz							
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (kHz)		CHANNEL	Frequency (MHz)	26dB Bandwidth (kHz)	
		QPSK	16QAM			QPSK	16QAM
20000	1715	8.9402	8.9469	20000	1715	9.65	9.719
20175	1732.5	8.9327	8.9386	20175	1732.5	9.783	9.784
20350	1750	8.9430	8.9484	20350	1750	9.72	9.837



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	13.411	13.408	20025	14.7	14.76	14.7
20175	1732.5	13.387	13.369	20175	14.77	14.91	14.77
20325	1747.5	13.424	13.430	20325	14.67	14.68	14.67



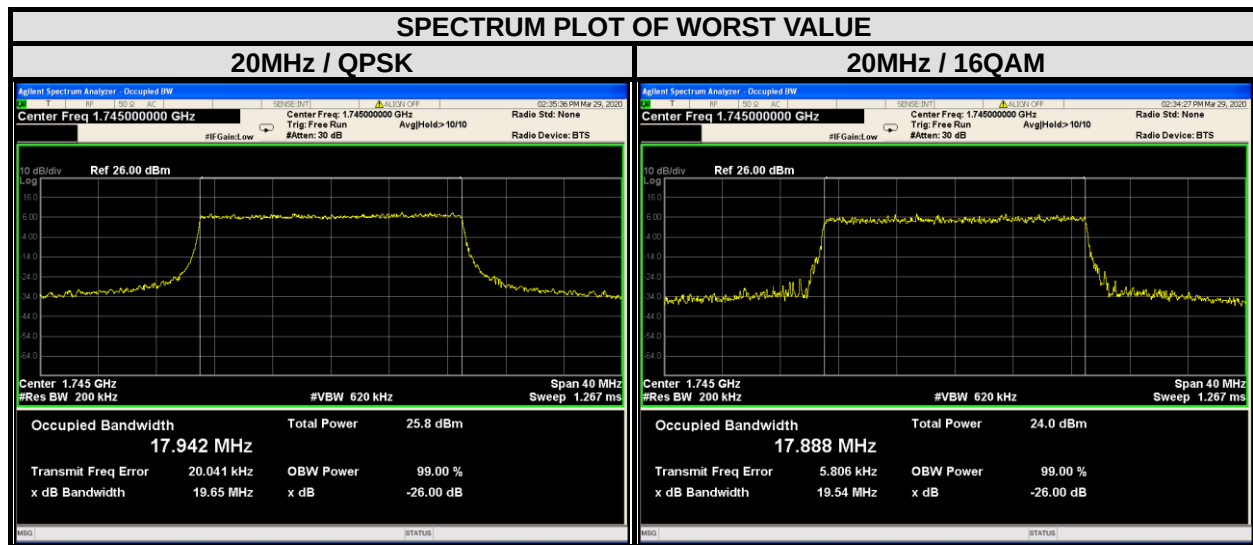


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Test Report No.: RF200327S003-3

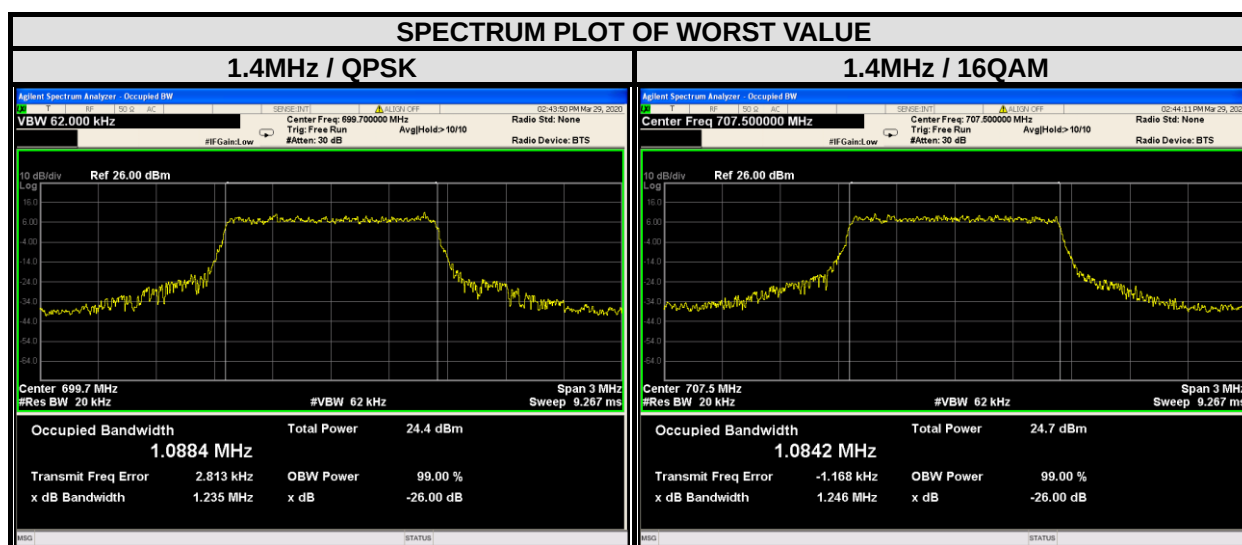
LTE BAND 4

CHANNEL BANDWIDTH: 20MHz							
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (kHz)		CHANNEL	Frequency (MHz)	26dB Bandwidth (kHz)	
		QPSK	16QAM			QPSK	16QAM
20050	1720	17.851	17.846	20050	1720	19.13	18.99
20175	1732.5	17.859	17.854	20175	1732.5	19.2	19.2
20300	1745	17.942	17.888	20300	1745	19.65	19.54



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	1.0884	1.0905	23017	699.7	1.235	1.26
23095	707.5	1.0839	1.0842	23095	707.5	1.246	1.246
23173	715.3	1.0840	1.0839	23173	715.3	1.271	1.271



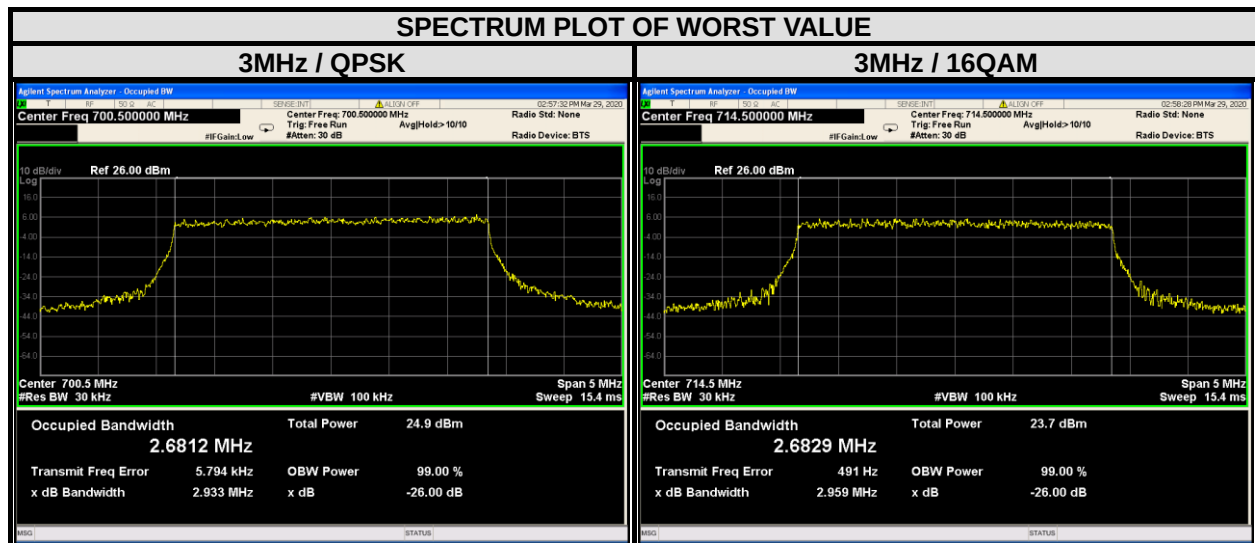


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Test Report No.: RF200327S003-3

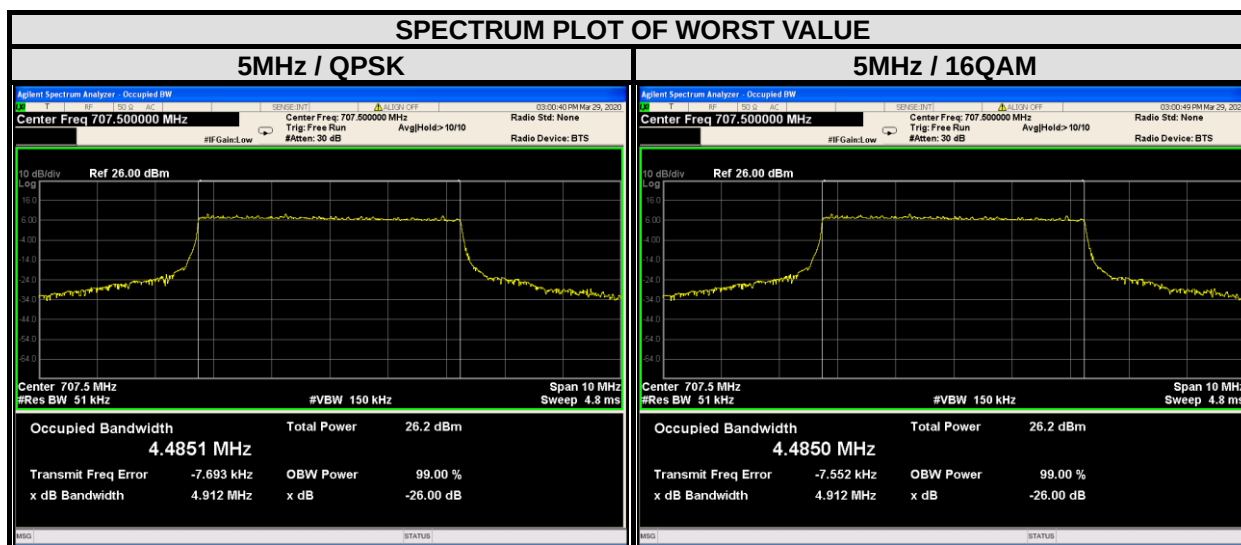
LTE BAND 12

CHANNEL BANDWIDTH: 3MHz							
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (kHz)		CHANNEL	Frequency (MHz)	26dB Bandwidth (kHz)	
		QPSK	16QAM			QPSK	16QAM
23025	700.5	2.6812	2.6816	23025	700.5	2.933	2.921
23095	707.5	2.6808	2.6819	23095	707.5	2.942	2.929
23165	714.5	2.6806	2.6829	23165	714.5	2.938	2.959



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	4.4790	4.4788	23035	701.5	5.001	5.001
23095	707.5	4.4851	4.4850	23095	707.5	4.912	4.912
23155	713.5	4.4503	4.4537	23155	713.5	5.034	5.037



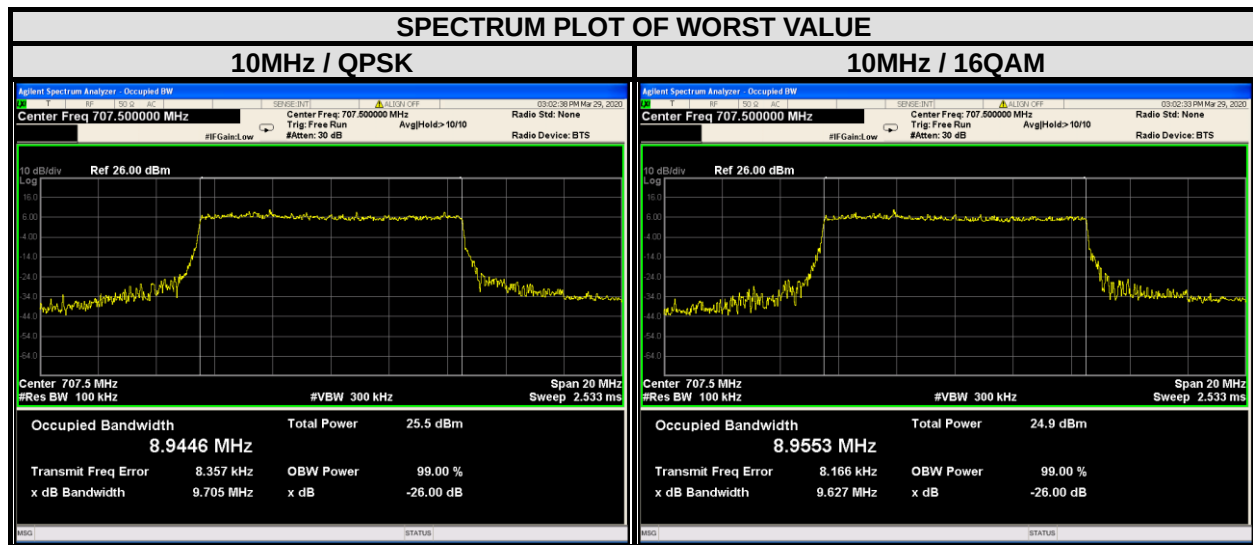


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VERITAS**

Test Report No.: RF200327S003-3

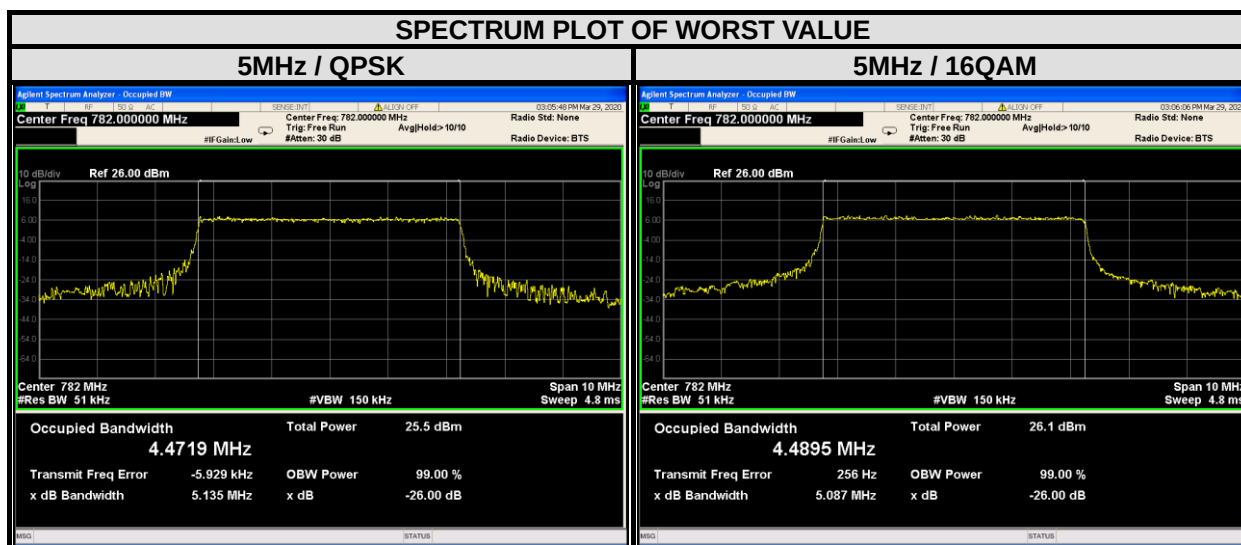
LTE BAND 12

CHANNEL BANDWIDTH: 10MHz							
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (kHz)		CHANNEL	Frequency (MHz)	26dB Bandwidth (kHz)	
		QPSK	16QAM			QPSK	16QAM
23060	704	8.9002	8.9017	23060	704	9.651	9.543
23095	707.5	8.9446	8.9553	23095	707.5	9.705	9.627
23130	711	8.9417	8.9477	23130	711	9.779	9.746



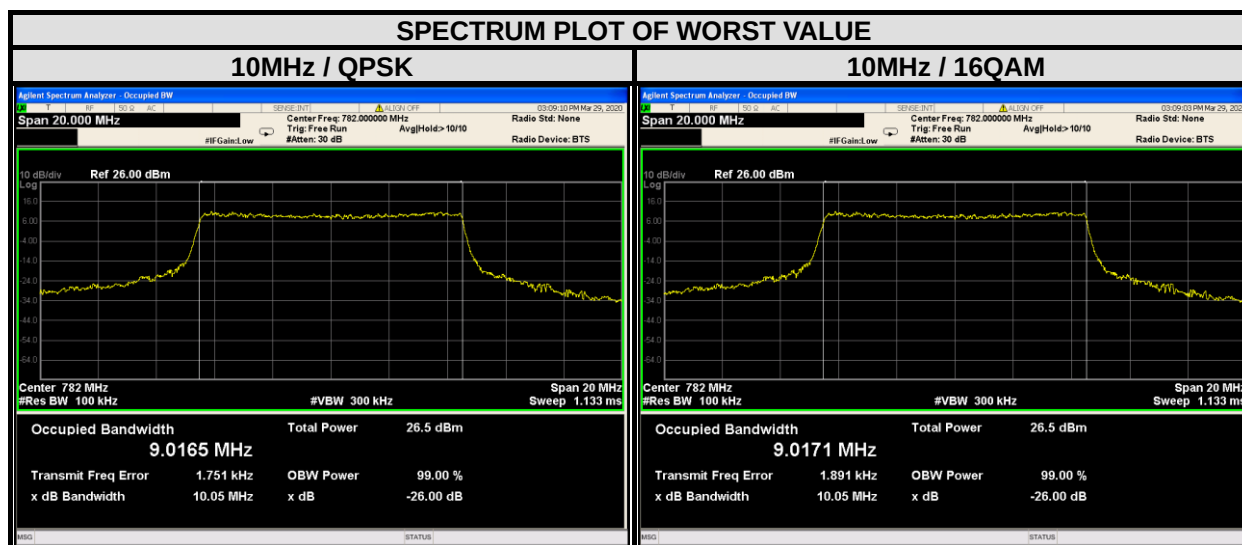
LTE BAND 13

CHANNEL BANDWIDTH: 5MHz							
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (kHz)		CHANNEL	Frequency (MHz)	26dB Bandwidth (kHz)	
		QPSK	16QAM			QPSK	16QAM
23205	779.5	4.4572	4.4665	23205	779.5	5.007	5.164
23230	782	4.4719	4.4895	23230	782	5.135	5.087
23255	784.5	4.4638	4.4731	23255	784.5	4.91	4.944



LTE BAND 13

CHANNEL BANDWIDTH: 10MHz							
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (kHz)		CHANNEL	Frequency (MHz)	26dB Bandwidth (kHz)	
		QPSK	16QAM			QPSK	16QAM
-	-	-	-	-	-	-	-
23230	782	9.0165	9.0171	23230	782	10.05	10.05
-	-	-	-	-	-	-	-

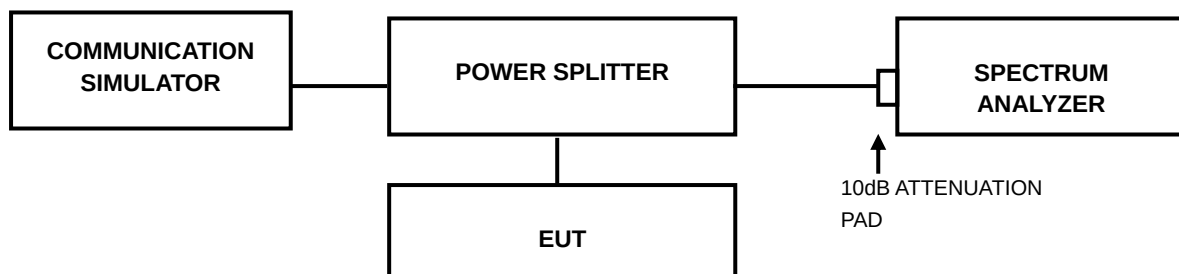


3.4 PEAK TO AVERAGE RATIO

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	5.29	6.06	19965	1711.5	5.46	6.23
20175	1732.5	4.64	5.44	20175	1732.5	4.86	6.14
20393	1754.3	4.7	5.43	20385	1753.5	4.66	5.88

