FCC Test Report

Report No.: AGC00065201101FE07

FCC ID	:	2AYETMT-10
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	Tablet PC
BRAND NAME	:	TJD
MODEL NAME	:	MT-1010OF, MT-705QW, MT-707OF, MT-710OF, MT-717OF, MT-718OF, MT-719OF, MT-792OF, MT-805QW, MT-815QW , MT-816OF, MT-817OF, MT-818OF, MT-970OF, MT-972OF, MT-1011OF, MT-1008QW, MT-1018QW, MT-1019QW, MT-1020QW, MT-1021QW,MT-1025OF, MT-1026OF, MT-1027OF, MT-1028OF, MT-1029OF, MT-1030OF
APPLICANT	:	Shenzhen Mingzhi Integrated Corporation Co., Ltd.
DATE OF ISSUE	:	Dec. 30, 2020
STANDARD(S)	:	FCC Part 24 Rules FCC Part 27 Rules
REPORT VERSION	:	V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd.

REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Dec. 30, 2020	Valid	Initial Release

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VERIFICATION OF COMPLIANCE

Applicant	Shenzhen Mingzhi Integrated Corporation Co., Ltd.
Address	516 Building C, New Retail Digital Industrial Park, Nanchang Community, Xixiang Street,Baoan District,Shenzhen.
Manufacturer	DongGuan Mingzhi Precision Manufacturing Co.,LTD
Address	NO.4 3th floor North JiZhi Road JiZhi High-Tech Park HuMen DongGuan GuangDong China
Factory	DongGuan Mingzhi Precision Manufacturing Co.,LTD
Address	No.4 3th floor North Jizhi Road JiZhi High-Tech Park HuMen DongGuan GuangDong China
Product Designation	Tablet PC
Brand Name	TJD
Test Model	MT-1010OF
Serial Number	201123039
Series Model	MT-705QW, MT-707OF, MT-710OF, MT-717OF, MT-718OF, MT-719OF, MT-792OF, MT-805QW, MT-815QW , MT-816OF, MT-817OF, MT-818OF, MT-970OF, MT-972OF, MT-1011OF, MT-1008QW, MT-1018QW, MT-1019QW, MT-1020QW, MT-1021QW,MT-1025OF, MT-1026OF, MT-1027OF, MT-1028OF, MT-1029OF, MT-1030OF
Difference Description	All the same except the model name
Date of test	Oct. 10, 2020~Dec. 30, 2020
Deviation	No any deviation from the test method.
Condition of Test Sample	Normal

WE HEREBY CERTIFY THAT:

The above equipment was tested by Attestation of Global Compliance(Shenzhen) Co., Ltd. The data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI/TIA-603-E-2016. The sample tested as described in this report is in compliance with the FCC Rules Part 27. The test results of this report relate only to the tested sample identified in this report.

Prepared By — Donjon Huang (Project Engineer) — Dec. 30, 2020

Reviewed By — Calvin Liu (Reviewer) — Dec. 30, 2020

Approved By — Forrest Lei (Authorized Officer) — Dec. 30, 2020

1. GENERAL INFORMATION

1.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Radio System Type:	LTE FUNCTION			
Frequency Bands:	☐FDD Band 2	☒FDD Band 4	☐FDD Band 5	☒FDD Band 7
	☐FDD Band 12	☐FDD Band 13	☐FDD Band 14	☐FDD Band 17
	☐FDD Band 30	☐TDD Band 40	☐TDD Band 41	☐TDD Band 66
	☐FDD Band 71	(U.S. Bands)		
	☐FDD Band 1	☐FDD Band 3	☐FDD Band 8	☐FDD Band 19
	☐FDD Band 20	☒FDD Band 28	☐TDD Band 38	☐TDD Band 39
	(Non-U.S. Bands)			
Transmission Frequency Range:	**LTE-Band 4**	1710.7 MHz – 1754.3 MHz---(1.4MHz)		
		1711.5 MHz – 1753.5 MHz---(3.0MHz)		
		1712.5 MHz – 1752.5 MHz---(5.0MHz)		
		1715.0 MHz – 1750.0 MHz---(10.0MHz)		
		1717.5 MHz – 1747.5 MHz---(15.0MHz)		
		1720.0 MHz – 1745.0 MHz---(20.0MHz)		
	LTE-Band 7	2502.5 MHz – 2567.5 MHz---(5.0MHz)		
		2505.0 MHz – 2565.0 MHz---(10.0MHz)		
		2507.5 MHz – 2562.5 MHz---(15.0MHz)		
		2510.0 MHz – 2560.0 MHz---(20.0MHz)		
Hardware Version:	S863-9863A-V1.0			
Software Version:	ANDROID 10			
Antenna Type:	PIFA Antenna			
Type of Modulation:	QPSK/16QAM			
Antenna gain:	Band 4:1.05dBi Band 7:1.89dBi			
Power Supply:	DC 3.7V by battery			
Single Card:	GSM/WCDMA/LTE Card Slot			
Power Class:	3			
Extreme Vol. Limits:	DC3.15V to 4.2V (Normal: DC 3.7V)			
Temperature range:	-10 °C to +40 °C			
Note1: The High Voltage DC4.2V and Low Voltage DC3.15V were declared by manufacturer, The EUT couldn't be operating normally with higher or lower voltage..				

1.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID:2AYETMT-10** , filing to comply with the FCC Part 24 and Pant 27 requirements

1.3 TEST METHODOLOGY

The tests were performed according to following standards:
FCC Part 27 Miscellaneous Wireless Communications Services.
FCC Part 2 Frequency allocations and radio treaty matters, general rules and regulations.
TIA/EIA 603 E: March 2016 Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.
ANSI-C63.26:2015 American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services
KDB971168 D01 v03r01 Measurement Guidance For Certification Of Licensed Digital Transmitters

1.4 DEVICE CAPABILITIES

This device contains the following capabilities:
850/1900 GSM/GPRS/EGPRS,850/1900 WCDMA/HSPA, Multi-Band LTE,802.11 b/g/n for WLAN ,Bluetooth (1X,EDR,LE)
This device uses a tuner circuit that dynamically updates the antenna impedance parameters to optimize ante nna performance for certain bands and modes of operation. The tuner for this device was set to simulate a "fre e space"condition where the transmit antenna is matched to the medium into which it is transmitting and, thus, the power isat its maximum level.
For emissions from 1GHz – 18GHz, low, mid, and high channels were tested with highest power and worst case configuration.
The emissions below 1GHz and above 18GHz were tested with the highest transmitting power channel and the worst case configuration.
The EUT was manipulated through three orthogonal planes of X-orientation (flatbed), Y-orientation (landscape),and Z-orientation (portrait) during the testing. Only the worst case emissions were reported in this test report.

1.5 ADDRESS OF THE TEST LABORATORY

Laboratory: Attestation of Global Compliance (Shenzhen) Co., Ltd

Address: 1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

1.6 TEST FACILITY

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L5488

Attestation of Global Compliance (Shenzhen) Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2017 General Requirements) for the Competence of Testing and Calibration Laboratories

A2LA-Lab Cert. No.: 5054.02

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC-Registration No.: 975832

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files with Registration 975832.

IC-Registration No.: 24842

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the Certification and Engineering Bureau of Industry Canada. The acceptance letter from the IC is maintained in our files with Registration 24842

1.7 ENVIRONMENTAL CONDITIONS

	NORMAL CONDITIONS	EXTREME CONDITIONS
Temperature range	15~35℃	-10℃~40℃
Humidty range	15~35℃	-10℃~40℃
Pressure range	86-106kPa	86-106kPa
Power supply	DC 3.7V	DC3.15V or 4.2V
Note: The Extreme Temperature and Extreme Voltages declared by the manufacturer.		

1.8 MEASUREMENT UNCERTAINTY

Test	Measurement Uncertainty	Notes
Transmitter power conducted	±0.57 dB	(1)
Transmitter power Radiated	±2.20 dB	(1)
Conducted spurious emission 9KHz-40 GHz	±2.20 dB	(1)
Occupied Bandwidth	±0.01ppm	(1)
Radiated Emission 30~1000MHz	±4.10dB	(1)
Radiated Emission Above 1GHz	±4.32dB	(1)
Conducted Disturbance0.15~30MHz	±3.20dB	(1)
Radio Frequency	± 6.5 x 10-8	(1)
RF Power, Conducted	± 0.9 dB	(1)

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

1.9 SPECIAL ACCESSORIES

The battery was supplied by the applicant were used as accessories and being tested with EUT intended for FCC grant together.

1.10 EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

2. SYSTEM TEST CONFIGURATION

2.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT EXERCISE

The Transmitter was operated in the maximum output power mode through Communication Tester. The TX frequency was fixed which was for the purpose of the measurements.

2.3 CONFIGURATION OF EUT SYSTEM

Fig. 2-1 Configuration of EUT System

Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Remark
1	Tablet PC	MT-1010OF	2AYETMT-10	EUT
2	Adapter	K-T100502000U	DC 5V 2A	AE
3	Battery	HBT-3070190	DC 3.7V 5000mAh	AE
4	USB Cable	N/A	N/A	AE

Note:

1. All the accessories have been used during the test. The following "EUT" in setup diagram means EUT system.
2. The battery is full-charged during the test

3. SUMMARY OF TEST RESULTS

3.1 TEST CONDITION : CONDUCTED TEST

Item	Test Description	FCC Rules	Result
1	Occupied Bandwidth	§2.1049	Pass
2	Band Edge / Spurious and Harmonic Emissions at Antenna Terminal	§2.1051, §27.53(m)(4), §27.53(h)	Pass
3	Conducted Output Power	§2.1046	Pass
4	Frequency stability / variation of ambient temperature	§2.1055,§27.54	Pass
5	Peak- to- Average Ratio	27.50(d)(5)	Pass

3.2 TEST CONDITION : RADIATED TEST

Item	Test Description	FCC Rules	Result
1	Effective Radiated Power Equivalent Isotropic Radiated Power	§27.50(h)(2), §27.50(d)(4)	Pass
2	Radiated Spurious and Harmonic Emissions	§2.1053, §27.53(m)(4), §27.53(h)	Pass

4. DESCRIPTION OF TEST MODES

During the testing, the EUT was controlled via Rhode & Schwarz Digital Radio Communication Tester (CMW 500) to ensure max power transmission and proper modulation. Three channels (The top channel, the middle channel and the bottom channel) were chosen for testing on both LTE frequency band.

The worst condition was recorded in the test report if no other modes test data.

Test Mode	Test Modes Description
LTE BAND 4	LTE system, QPSK modulation
	LTE system, 16QAM modulation
LTE BAND 7	LTE system, QPSK modulation
	LTE system, 16QAM modulation

ACCORDING TO 3GPP 36.521 SUB-CLAUSE 6.2.3.3, THE MAXIMUM OUTPUT POWER IS ALLOWED TO BE REDUCED BY FOLLOWING THE TABLE.

TABLE 6.2.3.3-1: MAXIMUM POWER REDUCTION (MPR) FOR POWER CLASS 3

Modulation	Channel bandwidth / Transmission bandwidth configuration [RB]						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2

The device supports MPR to solve linearity issues (ACLR or SEM) due to the higher peak-to average ratios (PAR) of the HSUPA signal. This prevents saturating the full range of the TX DAC inside of device and provides a reduced power output to the RF transceiver chip according to the Cubic Metric (For PRACH, PUCCH and SRS transmission, the allowed MPR is according to that specified for PUSCH QPSK modulation for the corresponding transmission bandwidth.).

When PRACH, PUCCH are present the beta gains on those channels are reduced firsts to try to get the power under the allowed limit. If the beta gains are lowered as far as possible, then a hard limiting is applied at the maximum allowed level.

For each subframe, the MPR is evaluated per slot and given by the maximum value taken over the transmission(s) within the slot, the maximum MPR over the two slots is then applied for the entire subframe.

For the UE maximum output power modified by MPR, the power limits specified in subclause 6.2.5.3 apply. The normative reference for this requirement is TS 36.101 clause 6.2.3.

The end effect is that the DUT output power is identical to the case where there is no MPR in the device.

4.1 EMISSION DESIGNATOR

GSM Emission Designator

Emission Designator = 249KGXW
GSM BW = 249 kHz
G = Phase Modulation
X = Cases not otherwise covered
W = Combination (Audio/Data)

WCDMA Emission Designator

Emission Designator = 4M17F9W
WCDMA BW = 4.17 MHz
F = Frequency Modulation
9 = Composite Digital Info
W = Combination (Audio/Data)

QAM Modulation

Emission Designator = 4M48W7D
LTE BW = 4.48 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data transmission; telemetry; telecommand

EDGE Emission Designator

Emission Designator = 249KG7W
GSM BW = 249 kHz
G = Phase Modulation
7 = Quantized/Digital Info
W = Combination (Audio/Data)

QPSK Modulation

Emission Designator = 4M48G7D
LTE BW = 4.48 MHz
G = Phase Modulation
7 = Quantized/Digital Info
D = Data transmission; telemetry; telecommand

5. LIST OF TEST EQUIPMENT

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESPI	101206	May 15, 2020	May 14, 2021
LISN	R&S	ESH2-Z5	100086	Jul. 03, 2020	Jul. 02, 2021
TEST RECEIVER	R&S	ESCI	10096	May 15, 2020	May 14, 2021
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Dec.07, 2020	Dec.06, 2021
EXA Signal Analyzer	Aglient	N9020B	MY56101792	Jul. 15, 2020	Jul. 14, 2021
Horn antenna	SCHWARZBECK	BBHA 9170	768	Oct. 09, 2019	Oct. 08, 2021
preamplifier	ChengYi	EMC184045SE	980508	Sep. 21, 2020	Sep. 20, 2021
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	May. 17, 2019	May. 16, 2021
Broadband Preamplifier	SCHWARZBECK	00073	BBHA 9120 J	Sep. 27, 2019	Sep. 26, 2021
ANTENNA	SCHWARZBECK	VULB9168	D69250	Sep.20, 2019	Sep.19, 2021
SIGNAL ANALYZER	Agilent	N9020A	MY52090123	Sep. 03, 2020	Sep. 02, 2021
USB Wideband Power Sensor	Agilent	U2021XA	MY54110007	Jun. 08, 2020	Jun. 07, 2021
Wireless communicationtest	R&S	CMW500	120909	Oct. 24, 2020	Oct. 23, 2021
Power Splitter	Agilent	11636A	34	Jun.10, 2020	Jun.09, 2021
Attenuator	JFW	50FHC-006-50	N/A	Jun.10, 2020	Jun.09, 2021

6. CONDUCTED OUTPUT POWER

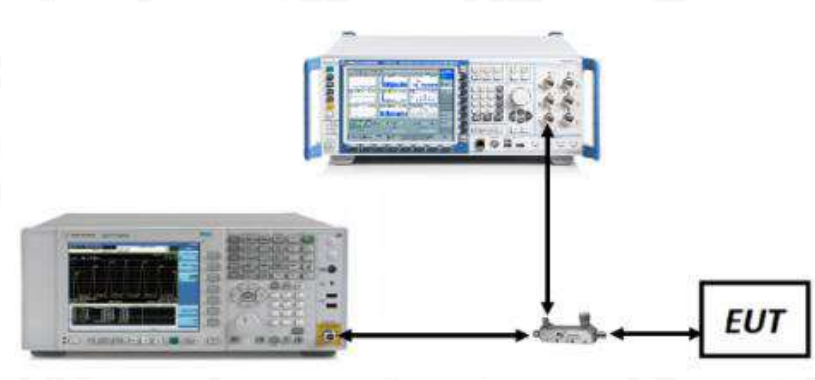
6.1 MEASUREMENT OVERVIEW

The conduction test is carried out in a shielded room.
According to the test, connect the device under test to the antenna port on the non-conductive platform directly to the test device for evaluation and measurement (ANSI-C63.26-2015 Clause 5.4)

6.2 MEASUREMENT METHOD

-The transmitter output port was connected to base station.
-Set EUT at maximum power through base station.
-Select lowest, middle, and highest channels for each band and different test mode.

6.3 MEASUREMENT SETUP



6.4 MEASUREMENT RESULT

LTE Band 4

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
20MHz	20050	1720.0	QPSK	1	0	0	24.05
				1	49	0	23.73
				1	99	0	24.22
				50	0	1	22.78
				50	25	1	22.79
				50	49	1	22.58
				100	0	1	22.72
			16QAM	1	0	1	22.89
				1	49	1	22.85
				1	99	1	23.13
				50	0	2	21.74
				50	25	2	21.85
				50	49	2	21.84
				100	0	2	21.68
	20175	1732.5	QPSK	1	0	0	23.33
				1	49	0	23.01
				1	99	0	23.10
				50	0	1	21.82
				50	25	1	21.92
				50	49	1	22.02
				100	0	1	21.91
			16QAM	1	0	1	21.98
				1	49	1	22.37
				1	99	1	22.20
				50	0	2	21.01
				50	25	2	21.22
				50	49	2	20.91
				100	0	2	21.00
	20300	1745.0	QPSK	1	0	0	23.36
				1	49	0	23.12
				1	99	0	22.99
				50	0	1	22.05
				50	25	1	22.04
				50	49	1	21.98
				100	0	1	21.97
			16QAM	1	0	1	22.74
				1	49	1	22.41
				1	99	1	22.33
				50	0	2	21.05
				50	25	2	21.04
				50	49	2	21.09
				100	0	2	21.06

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
15MHz	20025	1717.5	QPSK	1	0	0	23.40
				1	37	0	24.06
				1	74	0	23.58
				36	0	1	22.25
				36	16	1	22.54
				36	35	1	22.47
				75	0	1	22.56
			16QAM	1	0	1	23.05
				1	37	1	22.22
				1	74	1	22.43
				36	0	2	22.55
				36	16	2	22.24
				36	35	2	22.53
				75	0	2	21.69
	20175	1732.5	QPSK	1	0	0	23.23
				1	37	0	22.97
				1	74	0	22.92
				36	0	1	21.51
				36	16	1	21.66
				36	35	1	21.45
				75	0	1	21.93
			16QAM	1	0	1	21.89
				1	37	1	22.14
				1	74	1	22.00
				36	0	2	21.44
				36	16	2	21.52
				36	35	2	21.65
				75	0	2	21.08
	20325	1747.5	QPSK	1	0	0	22.88
				1	37	0	23.20
				1	74	0	21.99
				36	0	1	22.16
				36	16	1	21.97
				36	35	1	21.96
				75	0	1	22.09
			16QAM	1	0	1	22.09
				1	37	1	22.24
				1	74	1	21.99
				36	0	2	22.15
				36	16	2	21.98
				36	35	2	21.79
				75	0	2	21.07

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
10MHz	20000	1715.0	QPSK	1	0	0	23.98
				1	24	0	23.64
				1	49	0	23.20
				25	0	1	22.81
				25	12	1	22.82
				25	25	1	22.41
				50	0	1	22.60
			16QAM	1	0	1	22.67
				1	24	1	22.41
				1	49	1	22.92
				25	0	2	21.85
				25	12	2	21.84
				25	25	2	21.47
				50	0	2	21.58
	20175	1732.5	QPSK	1	0	0	23.02
				1	24	0	23.05
				1	49	0	23.12
				25	0	1	21.95
				25	12	1	21.95
				25	25	1	22.09
				50	0	1	22.00
			16QAM	1	0	1	22.32
				1	24	1	22.14
				1	49	1	22.08
				25	0	2	20.96
				25	12	2	21.02
				25	25	2	21.11
				50	0	2	21.08
	20350	1750.0	QPSK	1	0	0	23.02
				1	24	0	23.00
				1	49	0	22.88
				25	0	1	21.90
				25	12	1	22.02
				25	25	1	22.00
				50	0	1	21.96
			16QAM	1	0	1	21.79
				1	24	1	21.85
				1	49	1	21.75
				25	0	2	21.13
				25	12	2	21.22
				25	25	2	21.22
				50	0	2	20.98

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
5MHz	19975	1712.5	QPSK	1	0	0	23.82
				1	12	0	23.85
				1	24	0	23.86
				12	0	1	22.84
				12	6	1	22.84
				12	11	1	22.74
				25	0	1	22.73
			16QAM	1	0	1	22.86
				1	12	1	22.74
				1	24	1	22.73
				12	0	2	21.60
				12	6	2	21.89
				12	11	2	21.89
				25	0	2	21.81
	20175	1732.5	QPSK	1	0	0	23.05
				1	12	0	23.06
				1	24	0	23.05
				12	0	1	22.01
				12	6	1	22.02
				12	11	1	21.98
				25	0	1	22.03
			16QAM	1	0	1	21.96
				1	12	1	21.44
				1	24	1	21.88
				12	0	2	21.20
				12	6	2	20.96
				12	11	2	21.00
				25	0	2	21.13
	20375	1752.5	QPSK	1	0	0	22.87
				1	12	0	23.21
				1	24	0	23.25
				12	0	1	21.91
				12	6	1	21.91
				12	11	1	22.07
				25	0	1	21.96
			16QAM	1	0	1	21.90
				1	12	1	22.15
				1	24	1	22.08
				12	0	2	21.05
				12	6	2	21.14
				12	11	2	21.22
				25	0	2	21.12

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
3MHz	19965	1711.5	QPSK	1	0	0	23.85
				1	7	0	23.94
				1	14	0	24.03
				8	0	1	22.78
				8	4	1	22.88
				8	7	1	22.88
				15	0	1	22.87
			16QAM	1	0	1	23.04
				1	7	1	22.76
				1	14	1	23.02
				8	0	2	21.96
				8	4	2	21.86
				8	7	2	21.96
				15	0	2	21.83
	20175	1732.5	QPSK	1	0	0	21.90
				1	7	0	21.85
				1	14	0	21.69
				8	0	1	21.20
				8	4	1	21.23
				8	7	1	21.17
				15	0	1	21.04
			16QAM	1	0	1	23.05
				1	7	1	23.06
				1	14	1	23.05
				8	0	2	22.01
				8	4	2	22.02
				8	7	2	21.98
				15	0	2	22.03
	20385	1753.5	QPSK	1	0	0	23.00
				1	7	0	22.95
				1	14	0	23.11
				8	0	1	21.85
				8	4	1	21.84
				8	7	1	21.95
				15	0	1	21.99
			16QAM	1	0	1	21.91
				1	7	1	21.93
				1	14	1	21.62
				8	0	2	21.08
				8	4	2	21.04
				8	7	2	20.81
				15	0	2	20.99

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
1.4MHz	19957	1710.7	QPSK	1	0	0	24.06
				1	2	0	24.18
				1	5	0	23.92
				3	0	0	23.97
				3	1	0	23.97
				3	2	0	23.84
				6	0	1	22.88
			16QAM	1	0	1	23.21
				1	2	1	23.00
				1	5	1	23.16
				3	0	1	22.69
				3	1	1	22.69
				3	2	1	22.66
				6	0	2	21.82
	20175	1732.5	QPSK	1	0	0	23.14
				1	2	0	23.49
				1	5	0	23.24
				3	0	0	23.18
				3	1	0	23.24
				3	2	0	23.07
				6	0	1	22.08
			16QAM	1	0	1	22.18
				1	2	1	22.23
				1	5	1	22.51
				3	0	1	21.81
				3	1	1	21.98
				3	2	1	21.90
				6	0	2	20.99
	20393	1754.3	QPSK	1	0	0	23.03
				1	2	0	23.02
				1	5	0	22.98
				3	0	0	23.17
				3	1	0	23.08
				3	2	0	23.17
				6	0	1	22.17
			16QAM	1	0	1	22.12
				1	2	1	21.97
				1	5	1	21.89
				3	0	1	22.06
				3	1	1	22.15
				3	2	1	21.92
				6	0	2	21.13

LTE Band 7

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
20MHz	20850	2510	QPSK	1	0	0	23.60
				1	49	0	23.09
				1	99	0	23.14
				50	0	1	21.87
				50	25	1	21.88
				50	49	1	22.25
				100	0	1	21.91
			16QAM	1	0	1	22.82
				1	49	1	22.54
				1	99	1	22.50
				50	0	2	21.25
				50	25	2	21.09
				50	49	2	21.08
				100	0	2	21.15
	21100	2535	QPSK	1	0	0	23.09
				1	49	0	23.17
				1	99	0	22.96
				50	0	1	22.02
				50	25	1	22.01
				50	49	1	22.00
				100	0	1	22.05
			16QAM	1	0	1	22.35
				1	49	1	22.20
				1	99	1	22.08
				50	0	2	21.35
				50	25	2	21.24
				50	49	2	21.26
				100	0	2	21.10
	21350	2560	QPSK	1	0	0	22.01
				1	49	0	22.11
				1	99	0	22.26
				50	0	1	20.94
				50	25	1	21.04
				50	49	1	21.03
				100	0	1	21.00
			16QAM	1	0	1	20.78
				1	49	1	20.62
				1	99	1	20.99
				50	0	2	20.16
				50	25	2	20.23
				50	49	2	20.25
				100	0	2	20.13

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
15MHz	20825	2507.5	QPSK	1	0	0	23.05
				1	37	0	22.97
				1	74	0	23.30
				36	0	1	22.31
				36	16	1	22.30
				36	35	1	22.38
				75	0	1	21.81
			16QAM	1	0	1	22.30
				1	37	1	22.29
				1	74	1	22.39
				36	0	2	22.27
				36	16	2	22.31
				36	35	2	22.39
				75	0	2	21.09
	21100	2535	QPSK	1	0	0	22.96
				1	37	0	23.03
				1	74	0	22.97
				36	0	1	22.81
				36	16	1	22.73
				36	35	1	22.76
				75	0	1	22.04
			16QAM	1	0	1	22.35
				1	37	1	22.33
				1	74	1	22.77
				36	0	2	22.77
				36	16	2	22.83
				36	35	2	22.73
				75	0	2	21.12
	21375	2562.5	QPSK	1	0	0	21.99
				1	37	0	21.78
				1	74	0	21.83
				36	0	1	20.71
				36	16	1	20.76
				36	35	1	21.05
				75	0	1	20.96
			16QAM	1	0	1	20.67
				1	37	1	20.72
				1	74	1	20.97
				36	0	2	20.72
				36	16	2	20.73
				36	35	2	20.88
				75	0	2	20.08

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
10MHz	20800	2505	QPSK	1	0	0	22.95
				1	24	0	23.02
				1	49	0	23.06
				25	0	1	21.98
				25	12	1	21.96
				25	25	1	21.93
				50	0	1	21.92
			16QAM	1	0	1	21.31
				1	24	1	21.46
				1	49	1	21.44
				25	0	2	21.16
				25	12	2	21.23
				25	25	2	21.17
				50	0	2	21.04
	21100	2535	QPSK	1	0	0	22.94
				1	24	0	22.92
				1	49	0	22.94
				25	0	1	22.14
				25	12	1	22.07
				25	25	1	21.95
				50	0	1	21.91
			16QAM	1	0	1	22.12
				1	24	1	22.13
				1	49	1	22.21
				25	0	2	21.24
				25	12	2	21.23
				25	25	2	21.25
				50	0	2	21.15
	21400	2565	QPSK	1	0	0	21.87
				1	24	0	21.72
				1	49	0	22.03
				25	0	1	20.87
				25	12	1	20.99
				25	25	1	20.87
				50	0	1	21.05
			16QAM	1	0	1	21.15
				1	24	1	20.61
				1	49	1	21.47
				25	0	2	20.04
				25	12	2	19.93
				25	25	2	20.11
				50	0	2	20.11

BW (MHz)	Ch	Freq. (MHz)	Mode	UL RB Allocation	UL RB Offset	MPR	Average power (dBm)
5MHz	20775	2502.5	QPSK	1	0	0	23.17
				1	12	0	23.12
				1	24	0	23.14
				12	0	1	22.04
				12	6	1	21.85
				12	13	1	21.86
				25	0	1	21.78
			16QAM	1	0	1	21.45
				1	12	1	21.22
				1	24	1	21.37
				12	0	2	21.04
				12	6	2	21.03
				12	13	2	21.02
				25	0	2	21.08
	21100	2535	QPSK	1	0	0	22.93
				1	12	0	22.95
				1	24	0	22.96
				12	0	1	21.95
				12	6	1	21.98
				12	13	1	21.98
				25	0	1	21.98
			16QAM	1	0	1	21.65
				1	12	1	21.72
				1	24	1	22.23
				12	0	2	21.26
				12	6	2	21.19
				12	13	2	21.09
				25	0	2	21.00
	21425	2567.5	QPSK	1	0	0	22.36
				1	12	0	22.09
				1	24	0	22.24
				12	0	1	20.89
				12	6	1	20.93
				12	13	1	21.04
				25	0	1	21.03
			16QAM	1	0	1	20.38
				1	12	1	20.40
				1	24	1	20.52
				12	0	2	20.10
				12	6	2	19.98
				12	13	2	20.19
				25	0	2	20.20

7. RADIATED POWER

7.1 MEASUREMENT OVERVIEW

The radiation test is carried out in a semi-anechoic chamber.

According to the test, put the device under test on a non-conductive platform 3 meters away from the receiving antenna (ANSI/TIA-603-E-2016 Article 2.2.17).

The following rules are for the maximum radiated power limit requirements of the product:

Mode	Nominal Peak Power
LTE Band 4	< 1 Watts max. EIRP (30dBm)
LTE Band 7	< 2 Watts max. EIRP (33dBm)

7.2 MEASUREMENT METHOD

1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation.
2. RBW = 1 – 5% of the expected OBW, not to exceed 1MHz
3. VBW ≥ 3 x RBW
4. Span = 1.5 times the OBW
5. No. of sweep points > 2 x span / RBW
6. Detector = RMS
7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto".
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation.
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize.

Radiation Construction Method：

1. The turntable is rotated through 360 degrees, and the receiving antenna scans in order to determine the level of the maximized emission.
2. A half wave dipole is then substituted in place of the EUT. For emissions above 1GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator and the previously recorded signal was duplicated.

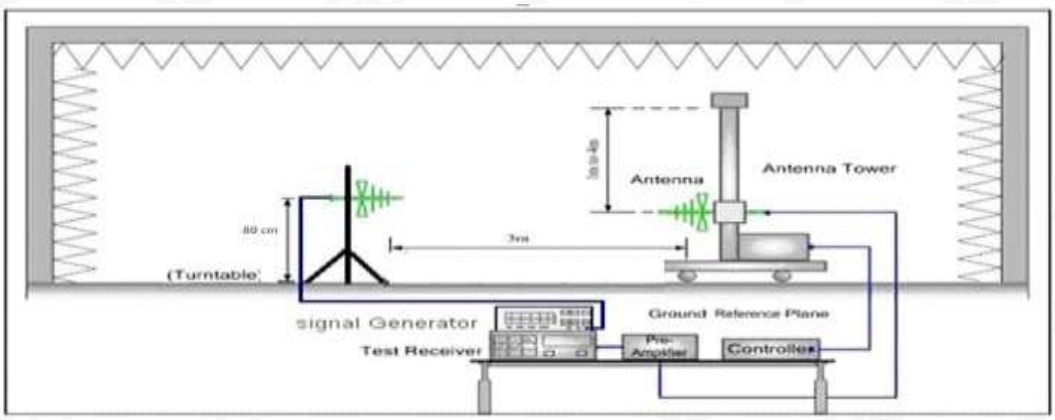
   The power is calculated by the following formula：

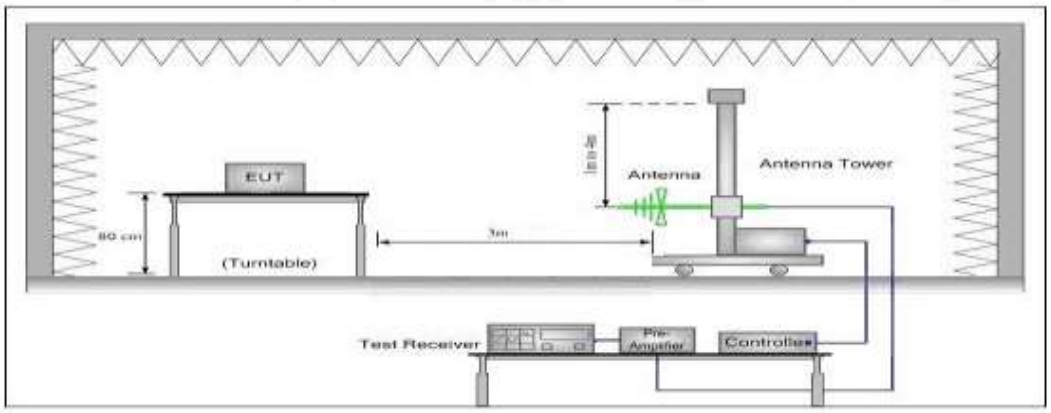
   Pd(dBm) = Pg(dBm) – cable loss (dB) + antenna gain (dB)

   Where: Pd is the dipole equivalent power and Pg is the generator output power into the substitution antenna.
3. The maximum value is calculated by adding the forward power to the calibrated source plus its appropriate gain value. These steps are repeated with the receiving antenna in both vertical and horizontal polarization. the difference between the gain of the horn and an isotropic antenna are taken into consideration
4. The EUT was tested in three orthogonal planes (X, Y, Z) and in all possible test configurations and positioning.
5. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

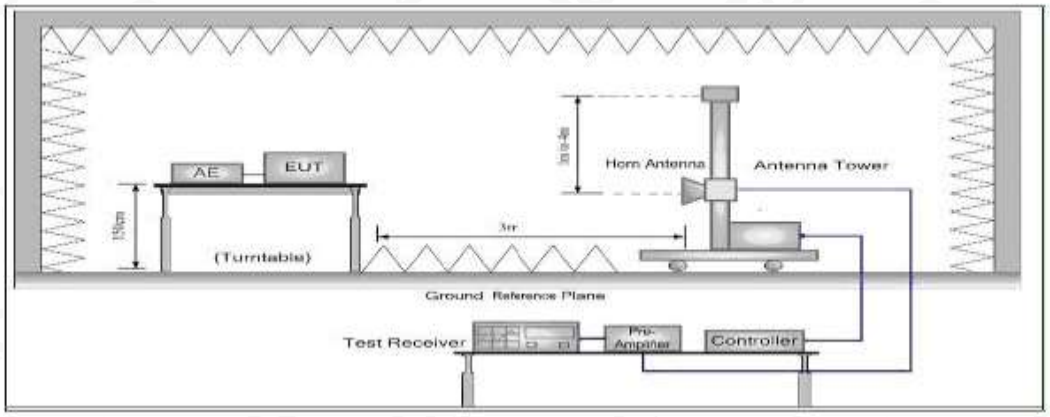
7.3 MEASUREMENT SETUP

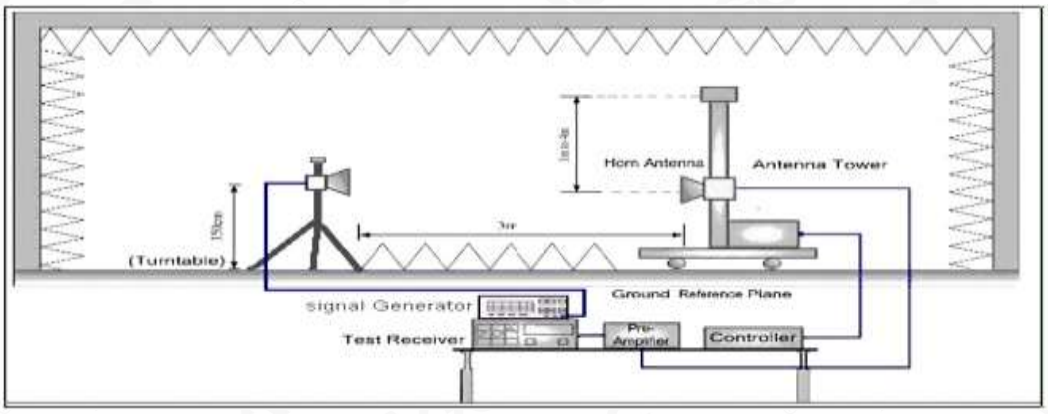
Radiated Below1GHz





Radiated Above 1 GHz





7.4 MEASUREMENT RESULT

EIRP for LTE Band 4

Frequency	Channel Bandwidth	Mode.	RB	Substituted level	Antenna Polarization	Antenna Gain correction	Cable Loss	Absolute Level	Limit (dBm)
1710.7	1.4	QPSK	1/0	14.39	V	7.95	0.79	21.55	30
1732.5	1.4	QPSK	1/0	13.07	V	7.95	0.79	20.23	30
1754.3	1.4	QPSK	1/0	13.68	V	7.95	0.79	20.84	30
1710.7	1.4	QPSK	1/0	15.64	H	7.95	0.79	22.80	30
1732.5	1.4	QPSK	1/0	15.32	H	7.95	0.79	22.48	30
1754.3	1.4	QPSK	1/0	15.81	H	7.95	0.79	22.97	30
1710.7	1.4	16-QAM	1/5	12.50	V	7.95	0.79	19.66	30
1732.5	1.4	16-QAM	1/0	12.34	V	7.95	0.79	19.5	30
1754.3	1.4	16-QAM	1/0	12.40	V	7.95	0.79	19.56	30
1710.7	1.4	16-QAM	1/5	14.48	H	7.95	0.79	21.64	30
1732.5	1.4	16-QAM	1/0	14.44	H	7.95	0.79	21.6	30
1754.3	1.4	16-QAM	1/0	14.72	H	7.95	0.79	21.88	30
1711.5	3	QPSK	1/0	12.50	V	7.95	0.79	19.66	30
1732.5	3	QPSK	1/0	12.25	V	7.95	0.79	19.41	30
1753.5	3	QPSK	1/0	12.28	V	7.95	0.79	19.44	30
1711.5	3	QPSK	1/0	14.92	H	7.95	0.79	22.08	30
1732.5	3	QPSK	1/0	14.60	H	7.95	0.79	21.76	30
1753.5	3	QPSK	1/0	14.69	H	7.95	0.79	21.85	30
1711.5	3	16-QAM	1/0	11.46	V	7.95	0.79	18.62	30
1732.5	3	16-QAM	1/0	11.49	V	7.95	0.79	18.65	30
1753.5	3	16-QAM	1/0	11.42	V	7.95	0.79	18.58	30
1711.5	3	16-QAM	1/0	13.57	H	7.95	0.79	20.73	30
1732.5	3	16-QAM	1/0	13.96	H	7.95	0.79	21.12	30
1753.5	3	16-QAM	1/0	13.79	H	7.95	0.79	20.95	30
1712.5	5	QPSK	1/0	10.60	V	7.95	0.79	17.76	30
1732.5	5	QPSK	1/0	12.78	V	7.95	0.79	19.94	30
1752.5	5	QPSK	1/24	12.37	V	7.95	0.79	19.53	30
1712.5	5	QPSK	1/0	12.59	H	7.95	0.79	19.75	30
1732.5	5	QPSK	1/0	14.95	H	7.95	0.79	22.11	30
1752.5	5	QPSK	1/24	14.71	H	7.95	0.79	21.87	30
1712.5	5	16-QAM	1/0	12.01	V	7.95	0.79	19.17	30
1732.5	5	16-QAM	1/0	11.30	V	7.95	0.79	18.46	30
1752.5	5	16-QAM	1/24	11.19	V	7.95	0.79	18.35	30
1712.5	5	16-QAM	1/0	14.58	H	7.95	0.79	21.74	30
1732.5	5	16-QAM	1/0	13.64	H	7.95	0.79	20.8	30

1752.5	5	16-QAM	1/24	13.63	H	7.95	0.79	20.79	30
1715	10	QPSK	1/0	11.97	V	7.95	0.79	19.13	30
1732.5	10	QPSK	1/49	11.58	V	7.95	0.79	18.74	30
1750	10	QPSK	1/0	11.61	V	7.95	0.79	18.77	30
1715	10	QPSK	1/0	14.33	H	7.95	0.79	21.49	30
1732.5	10	QPSK	1/49	14.00	H	7.95	0.79	21.16	30
1750	10	QPSK	1/0	13.92	H	7.95	0.79	21.08	30
1715	10	16-QAM	1/0	12.57	V	7.95	0.79	19.73	30
1732.5	10	16-QAM	1/49	13.21	V	7.95	0.79	20.37	30
1750	10	16-QAM	1/0	12.83	V	7.95	0.79	19.99	30
1715	10	16-QAM	1/0	14.99	H	7.95	0.79	22.15	30
1732.5	10	16-QAM	1/49	15.65	H	7.95	0.79	22.81	30
1750	10	16-QAM	1/0	15.17	H	7.95	0.79	22.33	30
1717.5	15	QPSK	1/0	11.57	V	7.95	0.79	18.73	30
1732.5	15	QPSK	1/74	12.30	V	7.95	0.79	19.46	30
1747.5	15	QPSK	1/0	11.40	V	7.95	0.79	18.56	30
1717.5	15	QPSK	1/0	14.15	H	7.95	0.79	21.31	30
1732.5	15	QPSK	1/74	14.64	H	7.95	0.79	21.8	30
1747.5	15	QPSK	1/0	13.81	H	7.95	0.79	20.97	30
1717.5	15	16-QAM	1/0	12.46	V	7.95	0.79	19.62	30
1732.5	15	16-QAM	1/74	12.19	V	7.95	0.79	19.35	30
1747.5	15	16-QAM	1/0	12.18	V	7.95	0.79	19.34	30
1717.5	15	16-QAM	1/0	14.82	H	7.95	0.79	21.98	30
1732.5	15	16-QAM	1/74	14.56	H	7.95	0.79	21.72	30
1747.5	15	16-QAM	1/0	14.51	H	7.95	0.79	21.67	30
1720	20	QPSK	1/99	11.09	V	7.95	0.79	18.25	30
1732.5	20	QPSK	1/99	11.26	V	7.95	0.79	18.42	30
1745	20	QPSK	1/0	10.93	V	7.95	0.79	18.09	30
1720	20	QPSK	1/99	13.48	H	7.95	0.79	20.64	30
1732.5	20	QPSK	1/99	13.73	H	7.95	0.79	20.89	30
1745	20	QPSK	1/0	13.59	H	7.95	0.79	20.75	30
1720	20	16-QAM	1/99	10.13	V	7.95	0.79	17.29	30
1732.5	20	16-QAM	1/99	12.11	V	7.95	0.79	19.27	30
1745	20	16-QAM	1/0	12.35	V	7.95	0.79	19.51	30
1720	20	16-QAM	1/99	12.67	H	7.95	0.79	19.83	30
1732.5	20	16-QAM	1/99	14.47	H	7.95	0.79	21.63	30
1745	20	16-QAM	1/0	14.79	H	7.95	0.79	21.95	30

EIRP for LTE Band 7

Frequency	Channel Bandwidth	Mode.	RB	Substituted level	Antenna Polarization	Antenna Gain correction	Cable Loss	Absolute Level	Limit (dBm)
2502.5	5	QPSK	1/0	12.30	V	8.23	1.12	19.41	33
2535	5	QPSK	1/0	12.11	V	8.23	1.12	19.22	33
2567.5	5	QPSK	1/24	12.05	V	8.23	1.12	19.16	33
2502.5	5	QPSK	1/0	14.85	H	8.23	1.12	21.96	33
2535	5	QPSK	1/0	14.8	H	8.23	1.12	21.91	33
2567.5	5	QPSK	1/24	14.82	H	8.23	1.12	21.93	33
2502.5	5	16-QAM	1/0	10.67	V	8.23	1.12	17.78	33
2535	5	16-QAM	1/0	10.34	V	8.23	1.12	17.45	33
2567.5	5	16-QAM	1/24	10.31	V	8.23	1.12	17.42	33
2502.5	5	16-QAM	1/0	13.13	H	8.23	1.12	20.24	33
2535	5	16-QAM	1/0	12.90	H	8.23	1.12	20.01	33
2567.5	5	16-QAM	1/24	13.05	H	8.23	1.12	20.16	33
2505	10	QPSK	1/0	12.27	V	8.23	1.12	19.38	33
2535	10	QPSK	1/49	11.87	V	8.23	1.12	18.98	33
2565	10	QPSK	1/0	11.51	V	8.23	1.12	18.62	33
2505	10	QPSK	1/0	14.63	H	8.23	1.12	21.74	33
2535	10	QPSK	1/49	14.64	H	8.23	1.12	21.75	33
2565	10	QPSK	1/0	13.63	H	8.23	1.12	20.74	33
2505	10	16-QAM	1/0	11.68	V	8.23	1.12	18.79	33
2535	10	16-QAM	1/49	11.08	V	8.23	1.12	18.19	33
2565	10	16-QAM	1/0	10.97	V	8.23	1.12	18.08	33
2505	10	16-QAM	1/0	13.91	H	8.23	1.12	21.02	33
2535	10	16-QAM	1/49	13.66	H	8.23	1.12	20.77	33
2565	10	16-QAM	1/0	13.33	H	8.23	1.12	20.44	33
2507.5	15	QPSK	1/0	11.52	V	8.23	1.12	18.63	33
2535	15	QPSK	1/74	11.30	V	8.23	1.12	18.41	33
2562.5	15	QPSK	1/0	11.23	V	8.23	1.12	18.34	33
2507.5	15	QPSK	1/0	14.04	H	8.23	1.12	21.15	33
2535	15	QPSK	1/74	13.77	H	8.23	1.12	20.88	33
2562.5	15	QPSK	1/0	13.92	H	8.23	1.12	21.03	33
2507.5	15	16-QAM	1/0	10.5	V	8.23	1.12	17.61	33
2535	15	16-QAM	1/74	10.58	V	8.23	1.12	17.69	33
2562.5	15	16-QAM	1/0	9.87	V	8.23	1.12	16.98	33
2507.5	15	16-QAM	1/0	12.72	H	8.23	1.12	19.83	33
2535	15	16-QAM	1/74	12.71	H	8.23	1.12	19.82	33
2562.5	15	16-QAM	1/0	12.06	H	8.23	1.12	19.17	33

2510	20	QPSK	1/99	11.69	V	8.23	1.12	18.80	33
2535	20	QPSK	1/99	10.97	V	8.23	1.12	18.08	33
2560	20	QPSK	1/0	10.05	V	8.23	1.12	17.16	33
2510	20	QPSK	1/99	13.71	H	8.23	1.12	20.82	33
2535	20	QPSK	1/99	13.33	H	8.23	1.12	20.44	33
2560	20	QPSK	1/0	12.57	H	8.23	1.12	19.68	33
2510	20	16-QAM	1/99	12.41	V	8.23	1.12	19.52	33
2535	20	16-QAM	1/99	12.63	V	8.23	1.12	19.74	33
2560	20	16-QAM	1/0	12.16	V	8.23	1.12	19.27	33
2510	20	16-QAM	1/99	14.63	H	8.23	1.12	21.74	33
2535	20	16-QAM	1/99	14.7	H	8.23	1.12	21.81	33
2560	20	16-QAM	1/0	14.74	H	8.23	1.12	21.85	33

Note: Above is the worst mode data.

8. PEAK-TO-AVERAGE RATIO

8.1 PROVISIONS APPLICABLE

① CCDF Procedure for PAPR :

1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Set the measurement interval as follows:

-for continuous transmissions, set to 1 ms,

-or burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize and set the measurement interval to a time

that is less than or equal to the burst duration.

4. Record the maximum PAPR level associated with a probability of 0.1%.

② Alternate Procedure for PAPR:

Use one of the procedures presented in 5.2(ANSI C63.26-2015) to measure the total peak power and record as P_{Pk}. Use one of the applicable procedures presented 5.2(ANSI C63.26-2015) to measure the total average power and recordas PAvg. Determine the P.A.R. from:

P.A.R(dB) = PPk (dBm) – PAvg (dBm) (PAvg = Average Power + Duty cycle Factor)

8.2 MEASUREMENT METHOD

Test Settings(Peak Power):

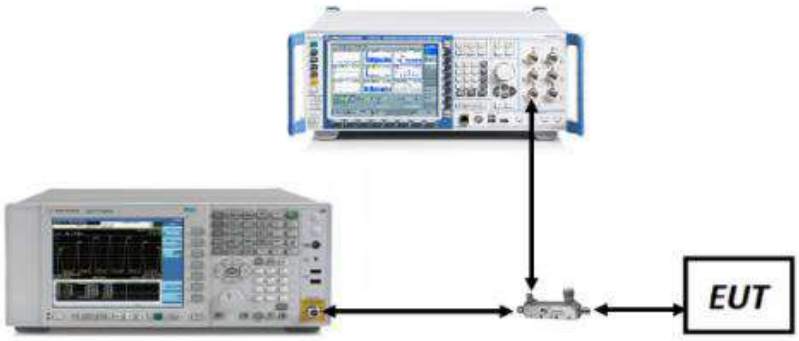
The measurement instrument must have a RBW that is greater than or equal to the OBW of the signal to be measured and a VBW ≥ 3 × RBW.

1. Set the RBW ≥ OBW.
2. Set VBW ≥ 3 × RBW.
3. Set span ≥ 2 × OBW.
4. Sweep time ≥ 10 × (number of points in sweep) × (transmission symbol period).
5. Detector = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use the peak marker function to determine the peak amplitude level.

Test Settings(Average Power)

1. Set span to 2 × to 3 × the OBW.
2. Set RBW ≥ OBW.
3. Set VBW ≥ 3 × RBW.
4. Set number of measurement points in sweep ≥ 2 × span / RBW.
5. Sweep time: Set ≥ [10 × (number of points in sweep) × (transmission period)] for single sweep (automation-compatible) measurement. The transmission period is the (on + off) time.
6. Detector = power averaging (rms).
7. Set sweep trigger to “free run.”
8. Trace average at least 100 traces in power averaging (rms) mode if sweep is set to auto-couple. (To accurately determine the average power over the on and off period of the transmitter, it can be necessary to increase the number of traces to be averaged above 100 or, if using a manually configured sweep time, increase the sweep time.)
9. Use the peak marker function to determine the maximum amplitude level.
10. Add [10 log (1/duty cycle)] to the measured maximum power level to compute the average power during continuous transmission. For example, add [10 log (1/0.25)] = 6 dB if the duty cycle is a constant 25%.

8.3 MEASUREMENT SETUP



8.4 MEASUREMENT RESULT

LTE Band 4

Mode	Bandwidth	Modulation	Channel	RB Configuration	Result(dB)	Limit(dB)	Verdict
Band4	1.4MHz	QPSK	19957	6RB#0	5.46	13	PASS
Band4	1.4MHz	QPSK	20175	6RB#0	5.68	13	PASS
Band4	1.4MHz	QPSK	20393	6RB#0	4.55	13	PASS
Band4	1.4MHz	16QAM	19957	6RB#0	5.18	13	PASS
Band4	1.4MHz	16QAM	20175	6RB#0	5.28	13	PASS
Band4	1.4MHz	16QAM	20393	6RB#0	5.75	13	PASS
Band4	3MHz	QPSK	19965	15RB#0	6.26	13	PASS
Band4	3MHz	QPSK	20175	15RB#0	6.40	13	PASS
Band4	3MHz	QPSK	20385	15RB#0	5.31	13	PASS
Band4	3MHz	16QAM	19965	15RB#0	5.96	13	PASS
Band4	3MHz	16QAM	20175	15RB#0	5.98	13	PASS
Band4	3MHz	16QAM	20385	15RB#0	6.45	13	PASS
Band4	5MHz	QPSK	19975	25RB#0	5.44	13	PASS
Band4	5MHz	QPSK	20175	25RB#0	5.78	13	PASS
Band4	5MHz	QPSK	20375	25RB#0	4.45	13	PASS
Band4	5MHz	16QAM	19975	25RB#0	5.15	13	PASS
Band4	5MHz	16QAM	20175	25RB#0	5.31	13	PASS
Band4	5MHz	16QAM	20375	25RB#0	5.79	13	PASS
Band4	10MHz	QPSK	20000	50RB#0	6.60	13	PASS
Band4	10MHz	QPSK	20175	50RB#0	6.52	13	PASS
Band4	10MHz	QPSK	20350	50RB#0	5.41	13	PASS
Band4	10MHz	16QAM	20000	50RB#0	5.99	13	PASS
Band4	10MHz	16QAM	20175	50RB#0	6.05	13	PASS
Band4	10MHz	16QAM	20350	50RB#0	6.49	13	PASS
Band4	15MHz	QPSK	20025	75RB#0	5.51	13	PASS
Band4	15MHz	QPSK	20175	75RB#0	5.75	13	PASS
Band4	15MHz	QPSK	20325	75RB#0	4.64	13	PASS
Band4	15MHz	16QAM	20025	75RB#0	5.31	13	PASS
Band4	15MHz	16QAM	20175	75RB#0	5.59	13	PASS
Band4	15MHz	16QAM	20325	75RB#0	5.71	13	PASS
Band4	20MHz	QPSK	20050	100RB#0	5.94	13	PASS
Band4	20MHz	QPSK	20175	100RB#0	6.39	13	PASS
Band4	20MHz	QPSK	20300	100RB#0	5.60	13	PASS
Band4	20MHz	16QAM	20050	100RB#0	6.06	13	PASS
Band4	20MHz	16QAM	20175	100RB#0	6.24	13	PASS
Band4	20MHz	16QAM	20300	100RB#0	6.45	13	PASS

LTE Band 7

Band	Bandwidth	Modulation	Channel	RB Configuration	Result(dB)	Limit(dB)	Verdict
Band7	5MHz	QPSK	20775	1RB#0	4.71	13	PASS
Band7	5MHz	QPSK	20775	25RB#0	5.55	13	PASS
Band7	5MHz	QPSK	21100	1RB#0	5.15	13	PASS
Band7	5MHz	QPSK	21100	25RB#0	5.73	13	PASS
Band7	5MHz	QPSK	21425	1RB#0	4.78	13	PASS
Band7	5MHz	QPSK	21425	25RB#0	5.59	13	PASS
Band7	5MHz	16QAM	20775	1RB#0	5.96	13	PASS
Band7	5MHz	16QAM	20775	25RB#0	6.25	13	PASS
Band7	5MHz	16QAM	21100	1RB#0	6.14	13	PASS
Band7	5MHz	16QAM	21100	25RB#0	6.47	13	PASS
Band7	5MHz	16QAM	21425	1RB#0	6.00	13	PASS
Band7	5MHz	16QAM	21425	25RB#0	6.32	13	PASS
Band7	10MHz	QPSK	20800	1RB#0	5.03	13	PASS
Band7	10MHz	QPSK	20800	50RB#0	5.59	13	PASS
Band7	10MHz	QPSK	21100	1RB#0	5.09	13	PASS
Band7	10MHz	QPSK	21100	50RB#0	5.79	13	PASS
Band7	10MHz	QPSK	21400	1RB#0	5.03	13	PASS
Band7	10MHz	QPSK	21400	50RB#0	5.64	13	PASS
Band7	10MHz	16QAM	20800	1RB#0	5.71	13	PASS
Band7	10MHz	16QAM	20800	50RB#0	6.39	13	PASS
Band7	10MHz	16QAM	21100	1RB#0	6.10	13	PASS
Band7	10MHz	16QAM	21100	50RB#0	6.58	13	PASS
Band7	10MHz	16QAM	21400	1RB#0	5.46	13	PASS
Band7	10MHz	16QAM	21400	50RB#0	6.39	13	PASS
Band7	15MHz	QPSK	20825	1RB#0	5.06	13	PASS
Band7	15MHz	QPSK	20825	75RB#0	5.87	13	PASS
Band7	15MHz	QPSK	21100	1RB#0	4.85	13	PASS
Band7	15MHz	QPSK	21100	75RB#0	6.09	13	PASS
Band7	15MHz	QPSK	21375	1RB#0	5.12	13	PASS
Band7	15MHz	QPSK	21375	75RB#0	5.99	13	PASS
Band7	15MHz	16QAM	20825	1RB#0	6.02	13	PASS
Band7	15MHz	16QAM	20825	75RB#0	6.43	13	PASS
Band7	15MHz	16QAM	21100	1RB#0	5.94	13	PASS
Band7	15MHz	16QAM	21100	75RB#0	6.63	13	PASS
Band7	15MHz	16QAM	21375	1RB#0	5.45	13	PASS
Band7	15MHz	16QAM	21375	75RB#0	6.54	13	PASS
Band7	20MHz	QPSK	20850	1RB#0	4.85	13	PASS
Band7	20MHz	QPSK	20850	100RB#0	5.67	13	PASS

Band7	20MHz	QPSK	21100	1RB#0	5.14	13	PASS
Band7	20MHz	QPSK	21100	100RB#0	5.86	13	PASS
Band7	20MHz	QPSK	21350	1RB#0	5.24	13	PASS
Band7	20MHz	QPSK	21350	100RB#0	5.81	13	PASS
Band7	20MHz	16QAM	20850	1RB#0	5.80	13	PASS
Band7	20MHz	16QAM	20850	100RB#0	6.42	13	PASS
Band7	20MHz	16QAM	21100	1RB#0	6.00	13	PASS
Band7	20MHz	16QAM	21100	100RB#0	6.59	13	PASS
Band7	20MHz	16QAM	21350	1RB#0	5.96	13	PASS
Band7	20MHz	16QAM	21350	100RB#0	6.55	13	PASS

9. SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL

9.1 PROVISIONS APPLICABLE

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

9.2 MEASUREMENT METHOD

For Band 4:
The minimum permissible attenuation level of any spurious emission is 43 + log10(P[Watts]), where P is the transmitter power in Watts.
For Band 7:
(i) 40 + 10 log10 p from the channel edges to 5 MHz away
(ii) 43 + 10 log10 p between 5 MHz and X MHz from the channel edges, and
(iii) 55 + 10 log10 p at X MHz and beyond from the channel edges

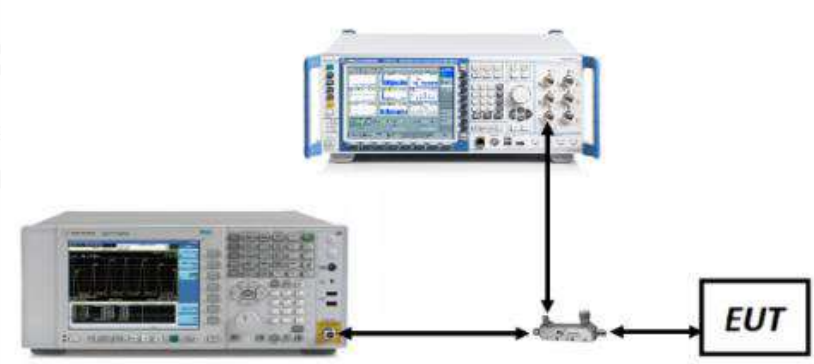
Test Settings

1. Start frequency was set to 30MHz and stop frequency was set to at least 10 * the fundamental frequency (separated into at least two plots per channel)
1. RBW = 1 MHz
2. VBW ≥ 3 MHz
3. Detector = RMS
4. Trace Mode = Average
5. Sweep time = auto
6. Number of points in sweep ≥ 2 * Span / RBW

Test Note

Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for frequencies less than 1 GHz and 1 MHz or greater for frequencies greater than 1 GHz. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

9.3 MEASUREMENT SETUP



9.4 MEASUREMENT RESULT

Please refer to: appendix a test plots for spurious and harmonic emissions at antenna terminal

Note: 1. No transmission signal is found in standby or receiving mode, and the default value is lower than the limit of 20dB, which is not recorded in this report.

10 RADIATED SPURIOUS EMISSION

10.1.PROVISIONS APPLICABLE

(A) On any frequency outside a licensee's frequency block (e.g. A, D, B, etc.) within the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log(P) dB. The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm.

At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

(B) For specific criteria, please refer to the description in section 9.2 of the report for corresponding evaluation.

10.2. MEASUREMENT PROCEDURE

1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that

means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High - Low scan is not required in this case.
11. For spurious emissions above 1GHz, a horn antenna is substituted in place of the EUT.
    The substitute antenna is driven by a signal generator and the previously recorded signal was duplicated.
    The spurious emissions is calculated by the following formula;

    Result(dBm) = Pg(dBm) +Factor(dB)

    Factor(dB) = Ant Gain(dB)-Cable Loss(dB) + Power Splitter(dB) (Above 1GHz)

    Factor(dB) = Ant Gain(dB)-Cable Loss(dB) (Below 1GHz)

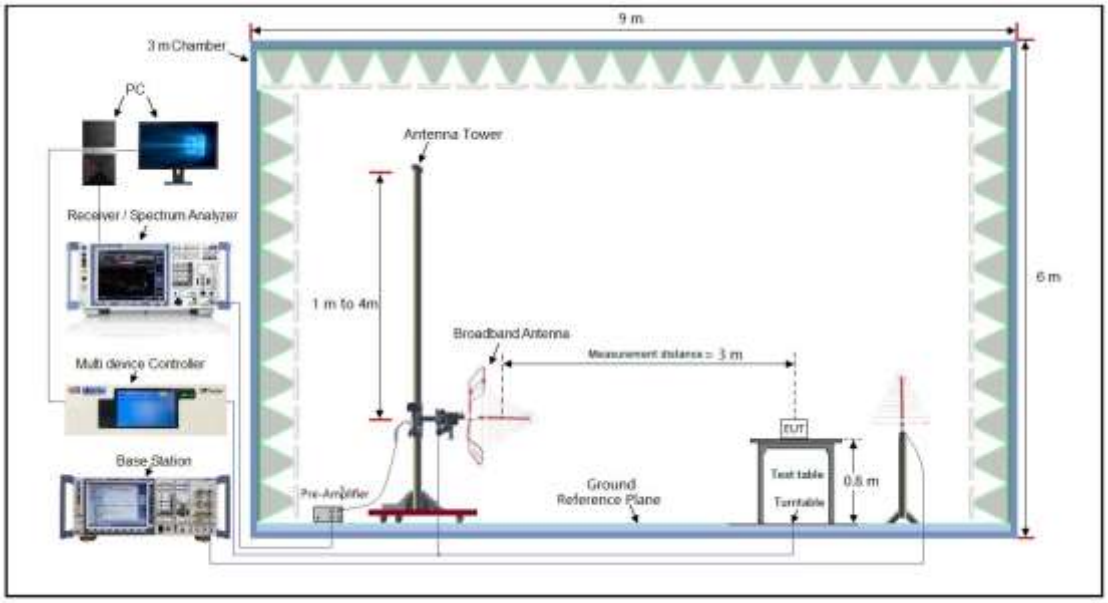
    Where: Pgis the generator output power into the substitution antenna.
    If the fundalmatal frequency is below 1GHz, RF output power has been converted to EIRP.

    EIRP(dBm) = ERP(dBm) + 2.15
12. Examples of Factor parameters for testing radiation spurious:

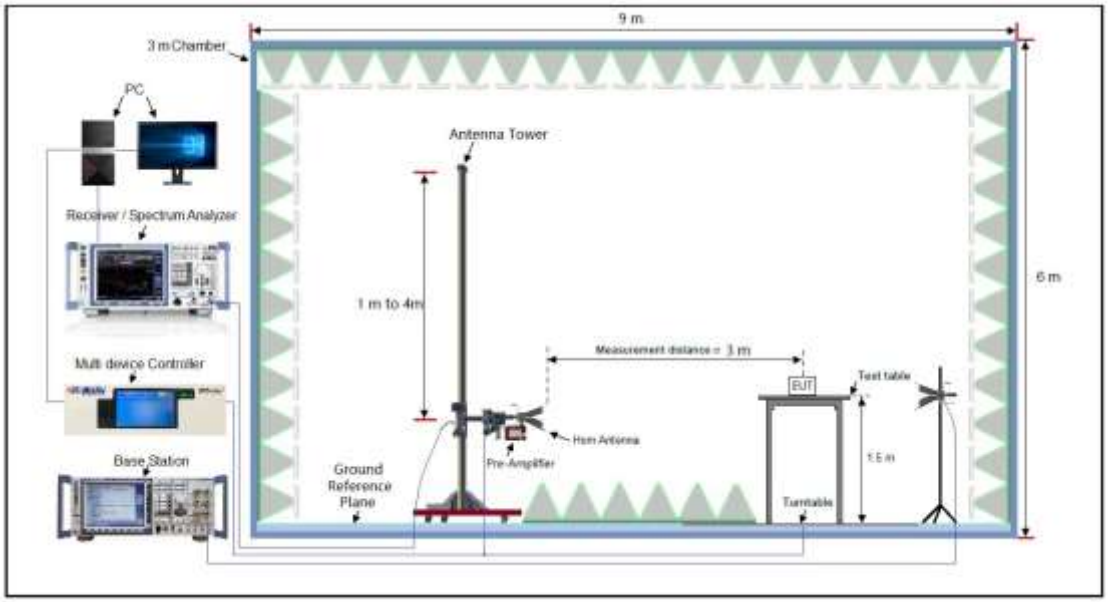
Frequency Range(MHz)	Factor(dB)
30-500	6.18
500-1000	9.37
1000-1500	27.56
1500-2000	28.27
2000-3000	29.45
3000-5000	30.15
5000-10000	31.26
10000-15000	32.78
15000-20000	33.99
Above 20GHz	35.04

10.3. MEASUREMENT SETUP

Radiated Emissions 30MHz to 1GHz Test setup



Radiated Emissions Above 1GHz Test setup



10.4 MEASUREMENT RESULT

LTE Band 4
Low channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
5160	V	-40.25	-13	-27.25
3440	V	-39.36	-13	-26.36
745.5	V	-44.58	-13	-31.58
528.1	V	-48.11	-13	-35.11
5160	H	-38.99	-13	-25.99
3440	H	-40.06	-13	-27.06
520.5	H	-46.60	-13	-33.60
395.8	H	-43.73	-13	-30.73

Middle channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
5197.5	V	-39.43	-13	-26.43
3465	V	-39.29	-13	-26.29
669.4	V	-45.73	-13	-32.73
512.5	V	-48.57	-13	-35.57
5197.5	H	-39.99	-13	-26.99
3465	H	-39.35	-13	-26.35
569.4	H	-47.34	-13	-34.34
469.3	H	-45.70	-13	-32.70

High channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
5235	V	-39.23	-13	-26.23
3490	V	-40.45	-13	-27.45
711.1	V	-47.46	-13	-34.46
528.7	V	-47.01	-13	-34.01
5235	H	-38.05	-13	-25.05
3490	H	-38.66	-13	-25.66
612.5	H	-46.25	-13	-33.25
553.9	H	-45.03	-13	-32.03

LTE Band 7
Low channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
7507.5	V	-38.84	-25	-25.84
5005	V	-39.63	-25	-26.63
925.	V	-47.67	-25	-34.67
634.1	V	-47.90	-25	-34.90
7507.5	H	-38.58	-25	-25.58
5005	H	-38.63	-25	-25.63
899.5	H	-46.24	-25	-33.24
632.8	H	-45.91	-25	-32.91

Middle channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBc)	Margin (dB)
7605	V	-40.75	-25	-27.75
5070	V	-39.92	-25	-26.92
857.4	V	-48.59	-25	-35.59
537.2	V	-46.92	-25	-33.92
7605	H	-38.32	-25	-25.32
5070	H	-38.32	-25	-25.32
864.4	H	-45.54	-25	-32.54
577.3	H	-45.71	-25	-32.71

High channel

Frequency (MHz)	Polarity (H/V)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
7702.5	V	-40.39	-25	-27.39
5135	V	-41.34	-25	-28.34
786.1	V	-48.72	-25	-35.72
509.7	V	-47.15	-25	-34.15
7702.5	H	-39.14	-25	-26.14
5135	H	-39.26	-25	-26.26
711.9	H	-45.39	-25	-32.39
515.9	H	-46.08	-25	-33.08

Note: 1. Margin (dB) = Emission Level(dBm) -Limit(dBm)
Emission Level(dBm)= Measurement Reading(dBm)+Factor(dB)
Factor(dB) = ANT Gain -Cable Loss + Power Splitter

2. The test refers to the value of Factor, please refer to the results listed in the test method in this section of the report.
3. Radiated Spurious Emissions was Tested QPSK Modulation, Resource Block Size 1 and Resource Block Offset 0.
4. Below 30MHz, no spurious emission was found, and only the worst mode data above 30MHz is recorded in the report.

11. FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

11.1 PROVISIONS APPLICABLE

11.1.1 For Hand carried battery powered equipment

Frequency stability testing is performed in accordance with the guidelines of ANSI/TIA-603-E-2016. The frequency stability of the transmitter is measured by:

a.) Temperature: The temperature is varied from -10°C to +40°C in 10°C increments using an environmental chamber.

b.) Primary Supply Voltage: The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

For Part 22, the frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5 ppm) of the center frequency. For Part 24 and Part 27, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

11.1.2 For equipment powered by primary supply voltage

1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
2. The equipment is turned on in a “standby” condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
3. Frequency measurements are made at 10°C intervals ranging from -10°C to +40°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

11.2 MEASUREMENT METHOD

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a “call mode”. This is accomplished with the use of R&S CMW500 DIGITAL RADIO COMMUNICATION TESTER.

1 Measure the carrier frequency at room temperature.

2 Subject the EUT to overnight soak at -10℃. With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on channel 20175 for LTE band 4 measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.

3 Repeat the above measurements at 10℃ increments from -10℃ to +40℃. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.

4 Re-measure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments re-measuring carrier frequency at each voltage. Pause at nominal voltage for 1 1/2 hours unpowered, to allow any self-heating to stabilize, before continuing.

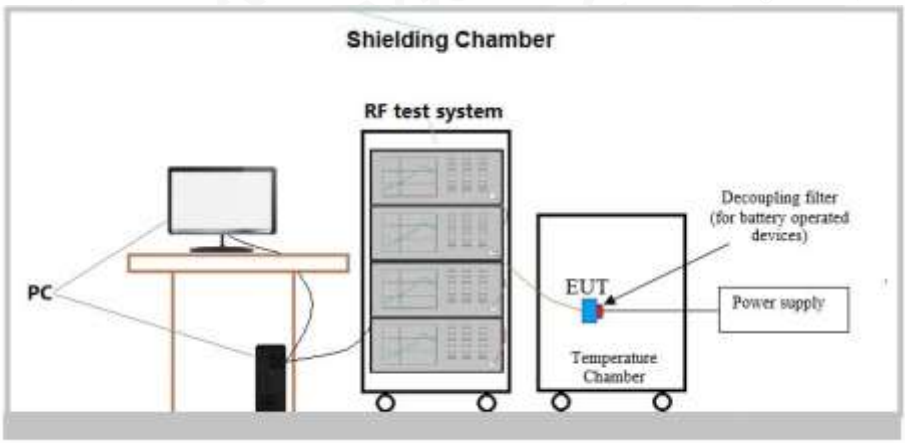
5 Subject the EUT to overnight soak at +50℃.

6 With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on the centre channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.

7 Repeat the above measurements at 10℃ increments from +50℃ to -20℃. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.

8 At all temperature levels hold the temperature to +/- 0.5℃ during the measurement procedure.

11.3 MEASUREMENT SETUP



-

11.4 MEASUREMENT RESULT

LTE Band 4

Middle Channel, f_O = 1732.5 MHz			
Temperature (℃)	Power Supplied (VDC)	Frequency Error (Hz)	Frequency Error (ppm)
-20	3.7	-10.41	-0.006085
-10		-28.91	-0.016900
0		-16.99	-0.009932
10		-15.81	-0.009242
20		12.32	0.007111
30		17.14	0.009893
40		29.45	0.016999
50		41.58	0.024000
25	4.2	16.34	0.009431
	3.15	-40.78	-0.023246

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is detemined to remain operating in band over the temperature and voltage range as tested.

LTE Band 7

Middle Channel, f_O = 2535 MHz			
Temperature (℃)	Power Supplied (VDC)	Frequency Error (Hz)	Frequency Error (ppm)
-10	3.7	-15.82	-0.006322
0		-38.85	-0.015524
10		5.38	0.002150
20		-15.78	-0.006306
30		-39.75	-0.015884
40		-35.29	-0.013921
25	4.40	-45.26	-0.017854
	3.27	4.31	0.001700

Note: Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very samll. As such it is determined that channels at the band edge would remain in-band when the maximum measured frequency deviation noted duing the frequency stability tests is applied. Therefore the device is detemined to remain operating in band over the temperture and voltage range as tested.

Note: 1. The device under test maintains the minimum and maximum operating temperature and the required limit voltage according to the manufacturer's requirements.

2. Only the worst working mode data is recorded in the report.

12. OCCUPIED BANDWIDTH

12.1 PROVISIONS APPLICABLE

The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.

The EUT makes a call to the communication simulator.

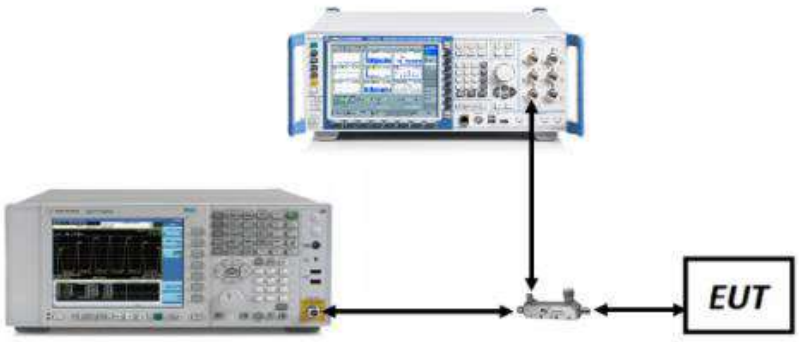
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth

12.2 MEASUREMENT METHOD

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth and the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 1 – 5% of the expected OBW
3. VBW ≥ 3 x RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. The trace was allowed to stabilize
8. If necessary, steps 2 – 7 were repeated after changing the RBW such that it would be within 1 – 5% of the 99% occupied bandwidth observed in Step 7

12.3 MEASUREMENT SETUP



12.4 MEASUREMENT RESULT

LTE Band 4

Channel Bandwidth: 1.4 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	6	0	1.0897	1.238	PASS
	MCH	6	0	1.0871	1.238	PASS
	HCH	6	0	1.0937	1.243	PASS
16QAM	LCH	6	0	1.0925	1.241	PASS
	MCH	6	0	1.0921	1.238	PASS
	HCH	6	0	1.0915	1.255	PASS

Channel Bandwidth: 3 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	15	0	2.6966	2.949	2.6966
	MCH	15	0	2.6929	2.943	2.6929
	HCH	15	0	2.6975	2.961	2.6975
16QAM	LCH	15	0	2.6892	2.959	2.6892
	MCH	15	0	2.6889	2.952	2.6889
	HCH	15	0	2.6958	2.983	2.6966

Channel Bandwidth: 5 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	25	0	4.4997	4.965	PASS
	MCH	25	0	4.4985	4.926	PASS
	HCH	25	0	4.5023	4.971	PASS
16QAM	LCH	25	0	4.5045	4.945	PASS
	MCH	25	0	4.5016	4.944	PASS
	HCH	25	0	4.5006	4.972	PASS

Channel Bandwidth: 10 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	50	0	8.9955	9.561	PASS
	MCH	50	0	8.9799	9.576	PASS
	HCH	50	0	8.9983	9.607	PASS
16QAM	LCH	50	0	8.9958	9.603	PASS
	MCH	50	0	8.9699	9.568	PASS
	HCH	50	0	8.9925	9.618	PASS

Channel Bandwidth: 15 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	75	0	13.489	14.27	PASS
	MCH	75	0	13.430	14.24	PASS
	HCH	75	0	13.498	14.38	PASS
16QAM	LCH	75	0	13.472	14.24	PASS
	MCH	75	0	13.416	14.27	PASS
	HCH	75	0	13.491	14.35	PASS

Channel Bandwidth: 20 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	100	0	17.932	18.96	PASS
	MCH	100	0	17.891	18.94	PASS
	HCH	100	0	18.031	19.05	PASS
16QAM	LCH	100	0	17.913	18.93	PASS
	MCH	100	0	17.891	18.94	PASS
	HCH	100	0	18.045	19.04	PASS

LTE Band 7

Channel Bandwidth: 5 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	25	0	4.4992	4.950	PASS
	MCH	25	0	4.4978	4.978	PASS
	HCH	25	0	4.4992	4.946	PASS
16QAM	LCH	25	0	4.5013	4.957	PASS
	MCH	25	0	4.4994	5.008	PASS
	HCH	25	0	4.5028	4.905	PASS

Channel Bandwidth: 10 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	50	0	8.9969	9.568	PASS
	MCH	50	0	8.9869	9.634	PASS
	HCH	50	0	8.9872	9.557	PASS
16QAM	LCH	50	0	8.9804	9.617	PASS
	MCH	50	0	8.9860	9.615	PASS
	HCH	50	0	8.9689	9.587	PASS

Channel Bandwidth: 15 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	75	0	13.482	14.31	PASS
	MCH	75	0	13.472	14.33	PASS
	HCH	75	0	13.484	14.36	PASS
16QAM	LCH	75	0	13.467	14.31	PASS
	MCH	75	0	13.463	14.35	PASS
	HCH	75	0	13.461	14.33	PASS

Channel Bandwidth: 20 MHz						
Modulation	Channel	RB Configuration		Occupied Bandwidth (MHz)	-26dB Bandwidth (MHz)	Verdict
		Size	Offset			
QPSK	LCH	100	0	17.961	18.98	PASS
	MCH	100	0	17.976	19.03	PASS
	HCH	100	0	17.992	19.02	PASS
16QAM	LCH	100	0	17.947	18.98	PASS
	MCH	100	0	17.985	19.02	PASS
	HCH	100	0	17.992	19.03	PASS

Note: Please refers to Appendix B for compliance test plots for emission bandwidth (-26dBc)

13. BAND EDGE

13.1 MEASUREMENT OVERVIEW

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

13.2 MEASUREMENT METHOD

1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW > 1% of the emission bandwidth
4. VBW > 3 x RBW
5. Detector = RMS
6. Number of sweep points ≥ 2 x Span/RBW
7. Trace mode = trace average
8. Sweep time = auto couple
9. The trace was allowed to stabilize

TEST NOTE

§27.53(m)& §27.53(h)

Equipment shall comply with the following unwanted emission limits:

a) for base station and fixed subscriber equipment, the power of any unwanted emissions measured as above shall be attenuated (in dB) below the transmitter power, P (dBW), by at least 43 + 10 log10 p

b) for mobile subscriber equipment, the power of any unwanted emissions measured as above shall be attenuated (in dB) below the transmitter power, P (dBW), by at least:

40 + 10 log10 p from the channel edges to 5 MHz away

43 + 10 log10 p between 5 MHz and X MHz from the channel edges, and

55 + 10 log10 p at X MHz and beyond from the channel edges

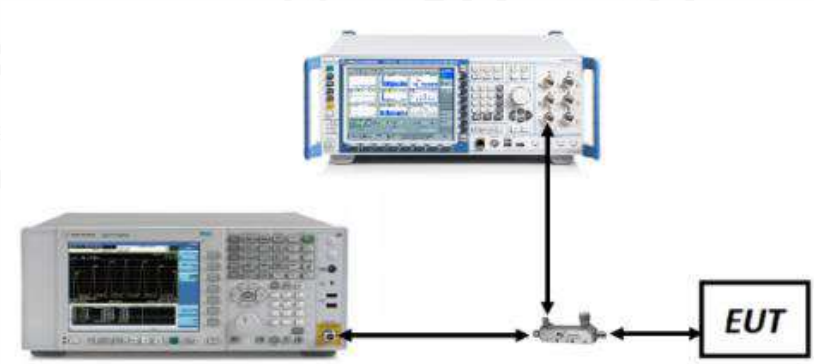
In addition, the attenuation shall not be less than 43 + 10 log10 p on all frequencies between 2490.5 MHz and 2496 MHz, and 55 + 10 log10 p at or below 2490.5 MHz.

In (a) and (b), p is the transmitter power measured in watts and X is 6 MHz or the equipment occupied bandwidth, whichever is greater.

According to FCC 27.53 specified that power of any emission outside of The authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. All measurements were done at 2 channels(low and high operational frequency range.)

The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

13.3 MEASUREMENT METHOD

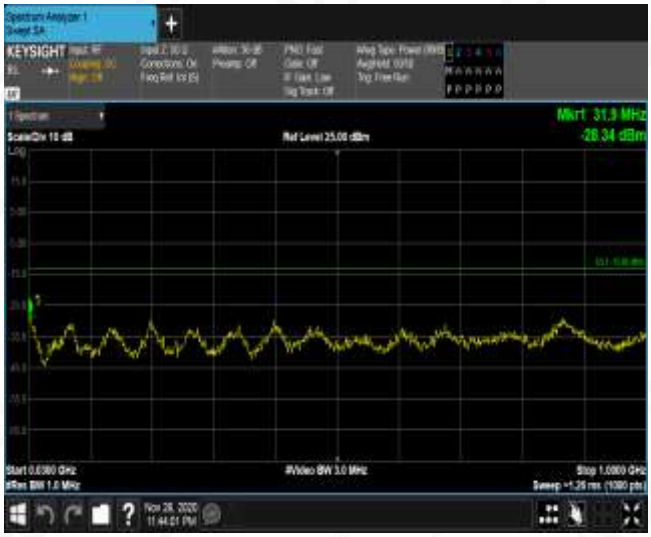
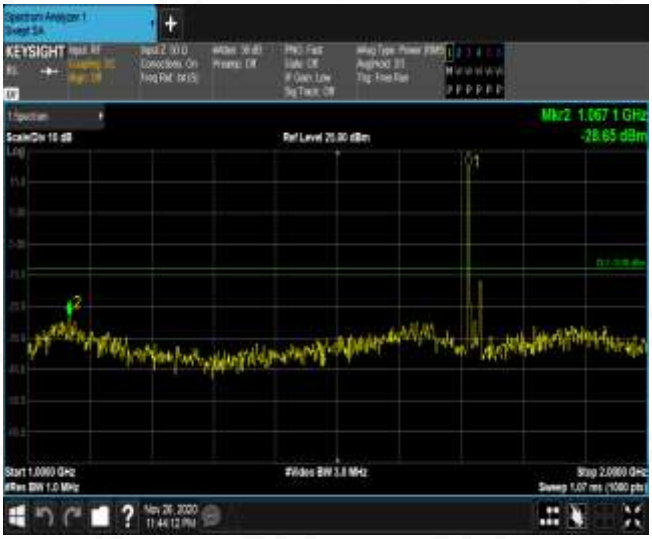


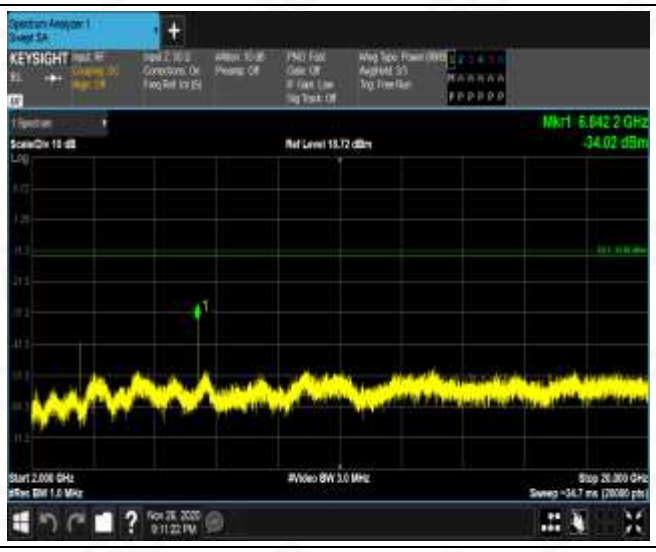
13.4 MEASUREMENT RESULT

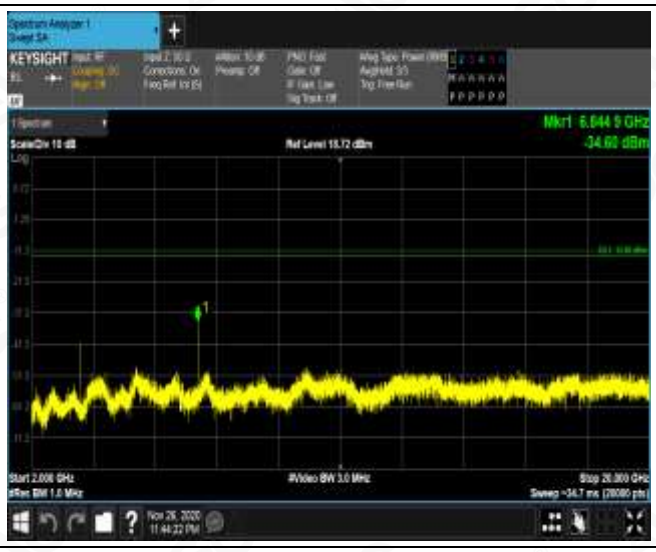
NOTE: Please refers to Appendix C for compliance test plots for band edge

APPENDIX A TEST PLOTS FOR SPURIOUS EMISSIONS AT ANTENNA TERMINALS

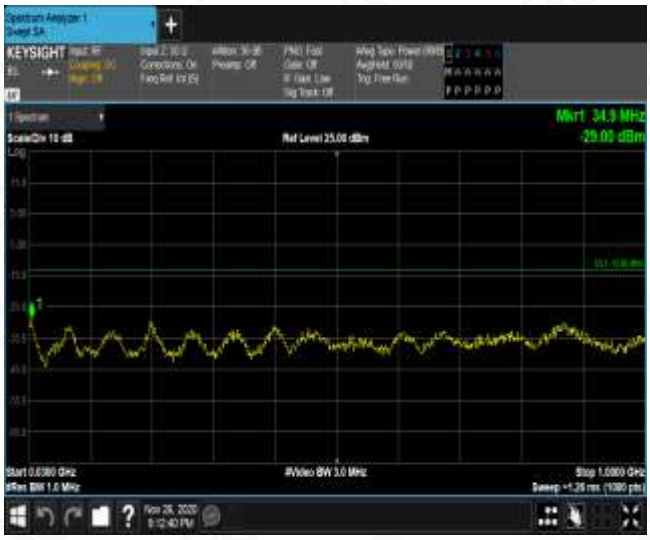
LTE BAND 4

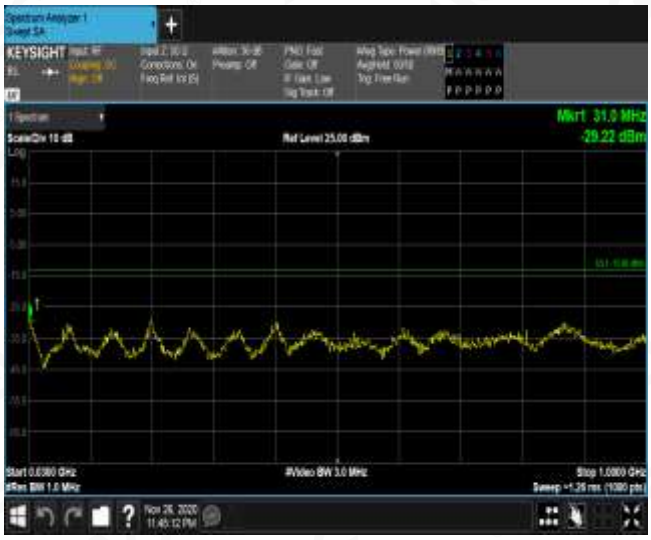
1.4MHz_LCH_QPSK_1RB#0	20MHz_LCH_QPSK_1RB#0
	
	

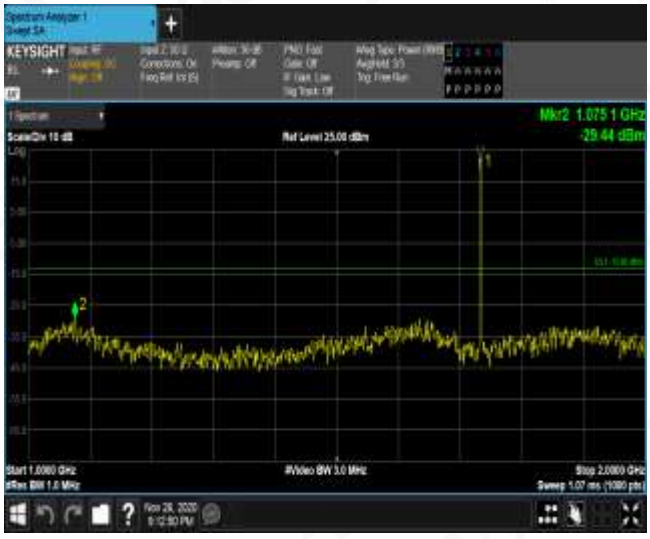


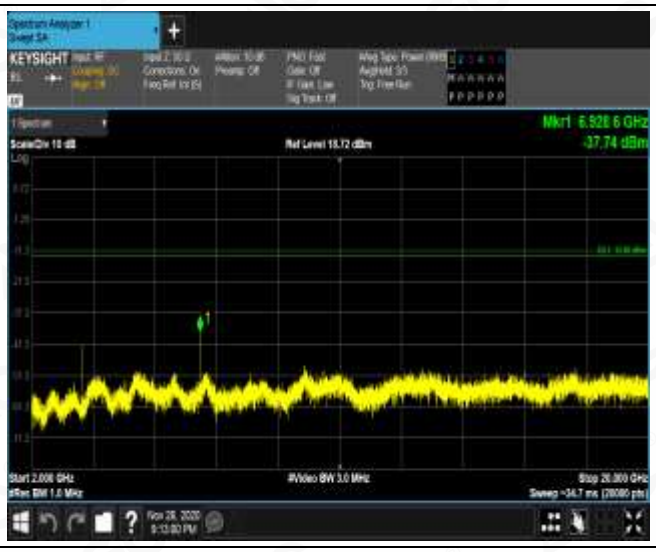


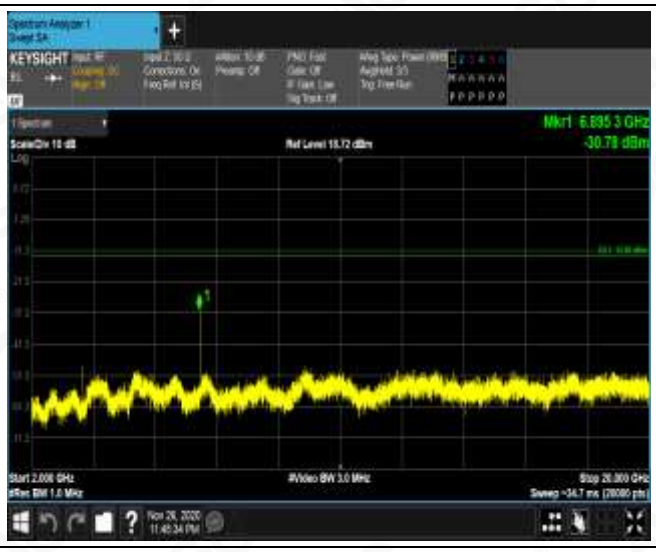
1.4MHz_MCH_QPSK_1RB#0	20MHz_MCH_QPSK_1RB#0



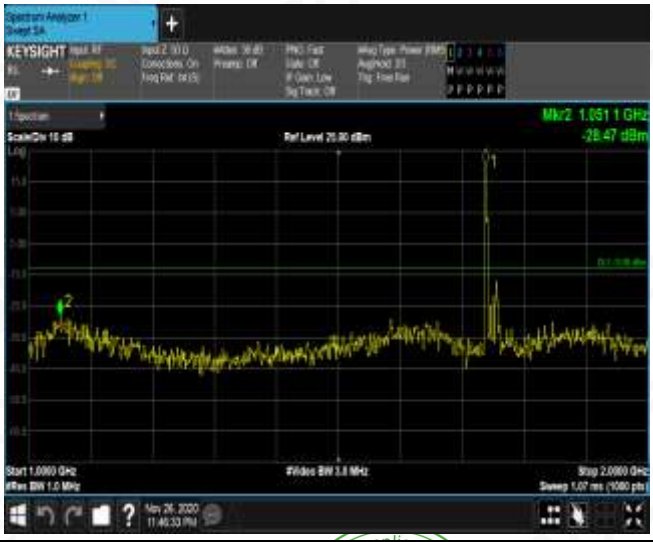


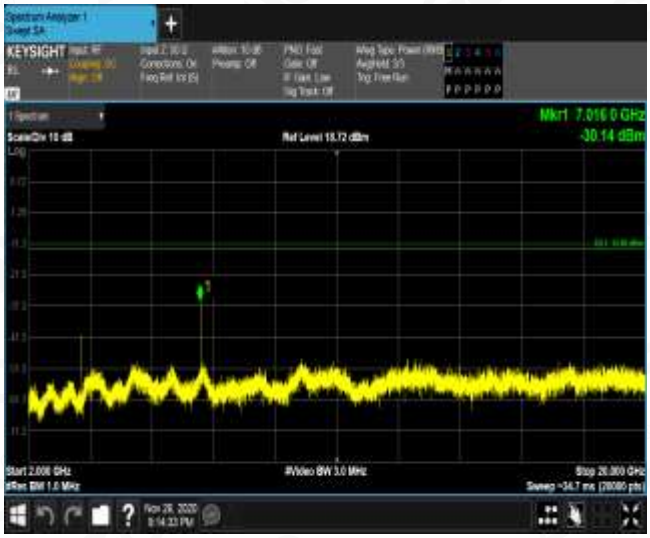


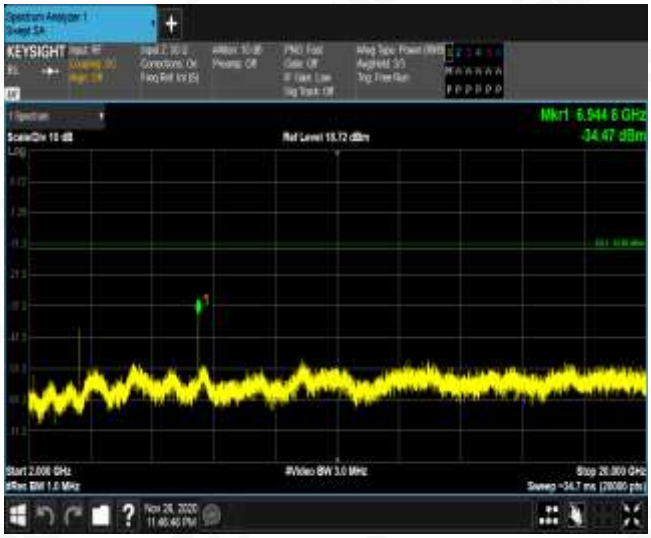




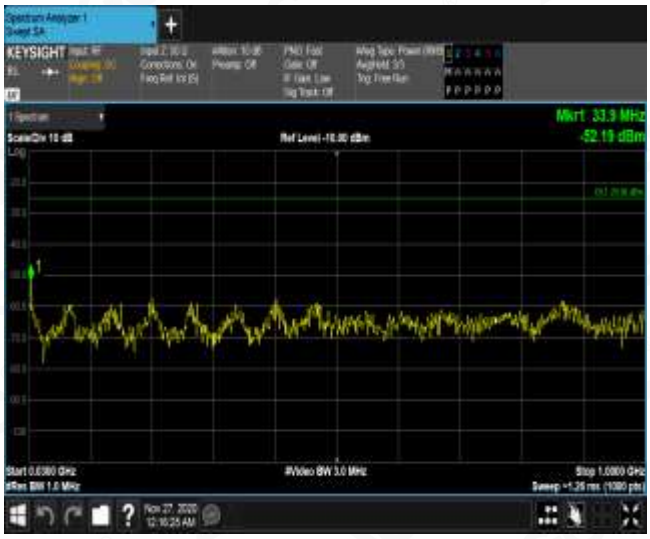
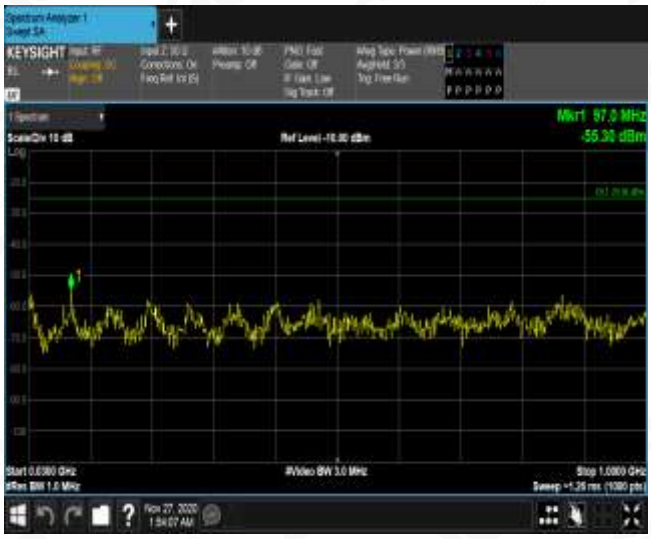
1.4MHz_HCH_QPSK_1RB#0	20MHz_HCH_QPSK_1RB#0

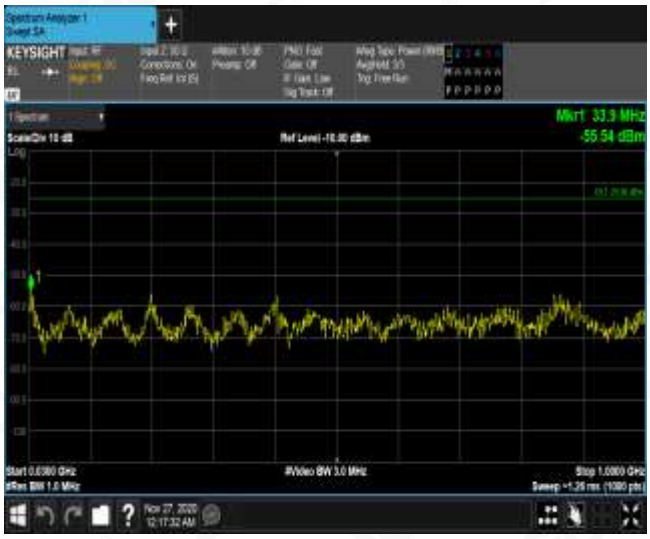
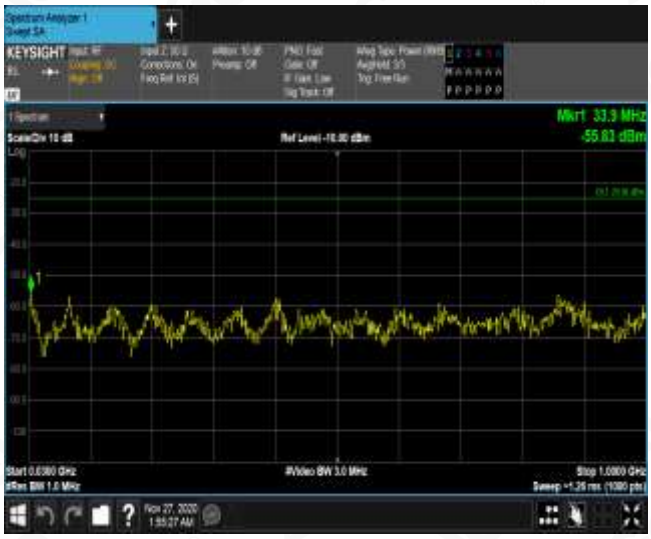


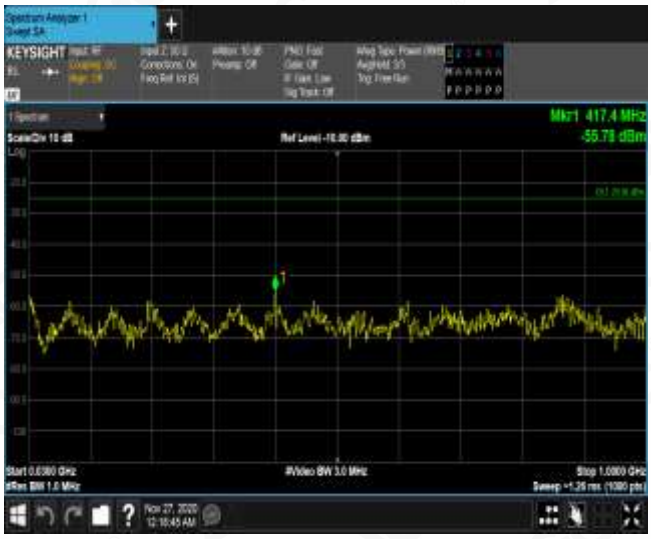
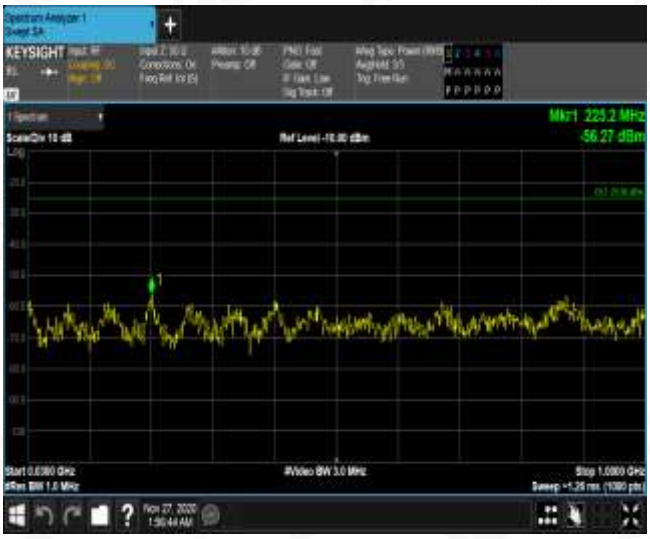




LTE BAND 7

5MHz_LCH_QPSK_1RB#0	20MHz_LCH_QPSK_1RB#0
	
	
	

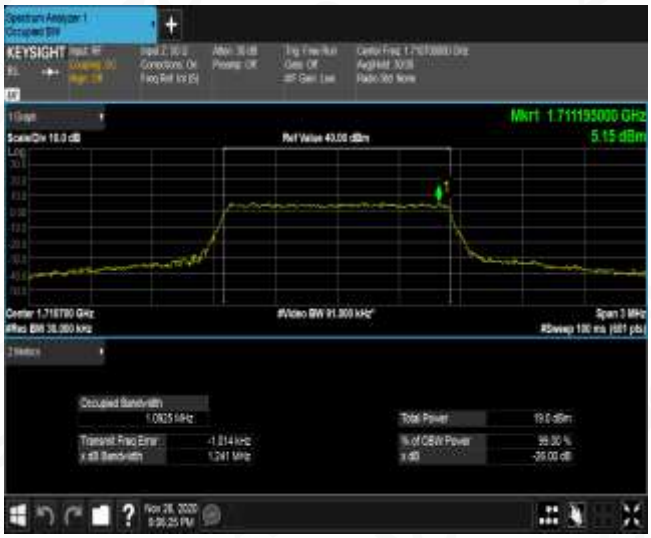
5MHz_MCH_QPSK_1RB#0	20MHz_MCH_QPSK_1RB#0
	
	
	

5MHz_HCH_QPSK_1RB#0	20MHz_HCH_QPSK_1RB#0
	
	
	

APPENDIX B TEST PLOTS FOR OCCUPIED BANDWIDTH&EMISSION BANDWIDTH

LTE Band 4

Channel Bandwidth: 1.4 MHz

LCH_QPSK_6RB#0	LCH_16QAM_6RB#0
	

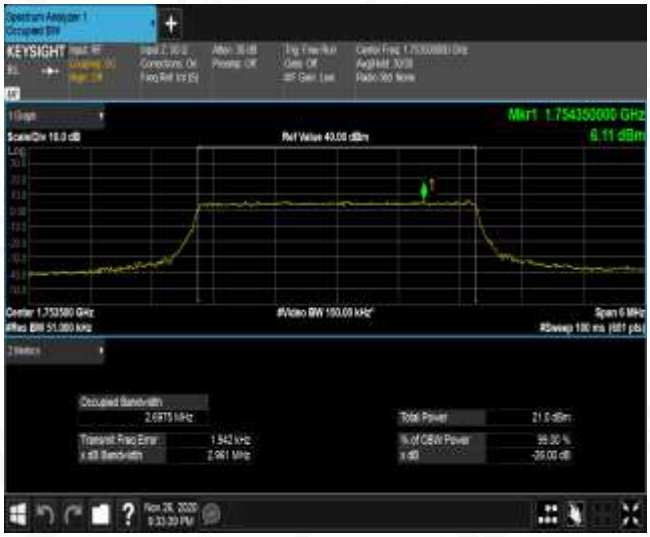
MCH_QPSK_6RB#0	MCH_16QAM_6RB#0
	

HCH_QPSK_6RB#0	HCH_16QAM_6RB#0
	

Channel Bandwidth: 3 MHz

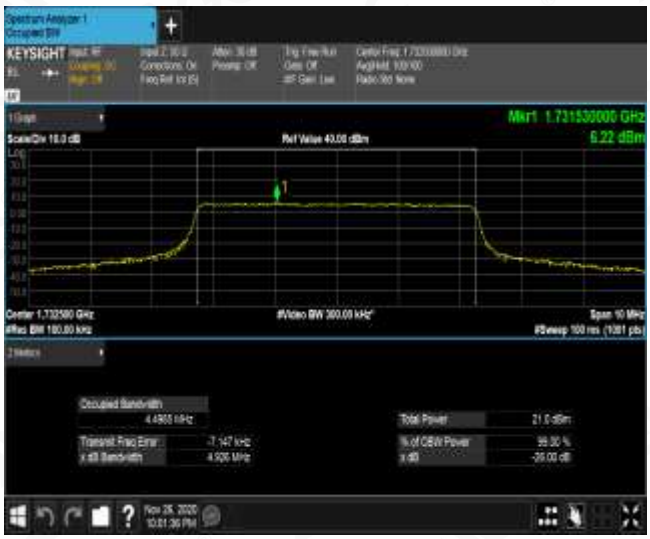
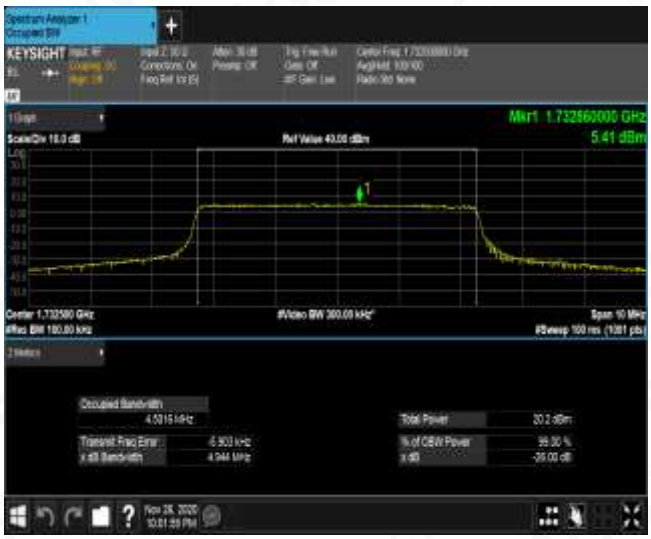
LCH_QPSK_15RB#0	LCH_16QAM_15RB#0
	

MCH_QPSK_15RB#0	MCH_16QAM_15RB#0
	

HCH_QPSK_15RB#0	HCH_16QAM_15RB#0
	

Channel Bandwidth: 5 MHz

LCH_QPSK_25RB#0	LCH_16QAM_25RB#0
	

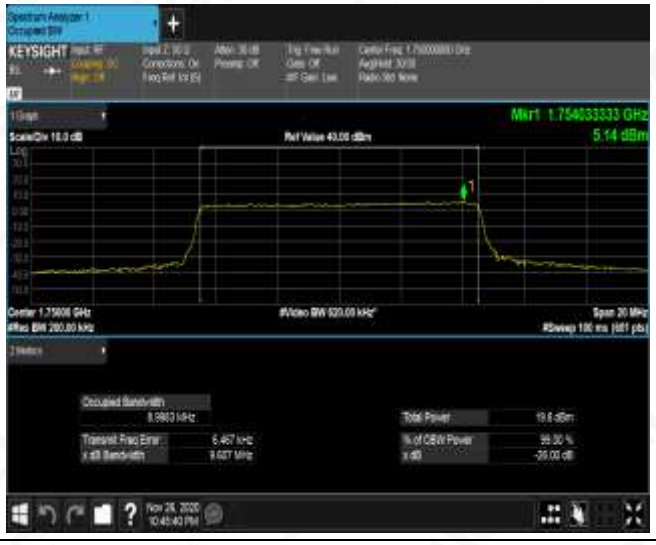
MCH_QPSK_25RB#0	MCH_16QAM_25RB#0
	

HCH_QPSK_25RB#0	HCH_16QAM_25RB#0
	

Channel Bandwidth: 10 MHz

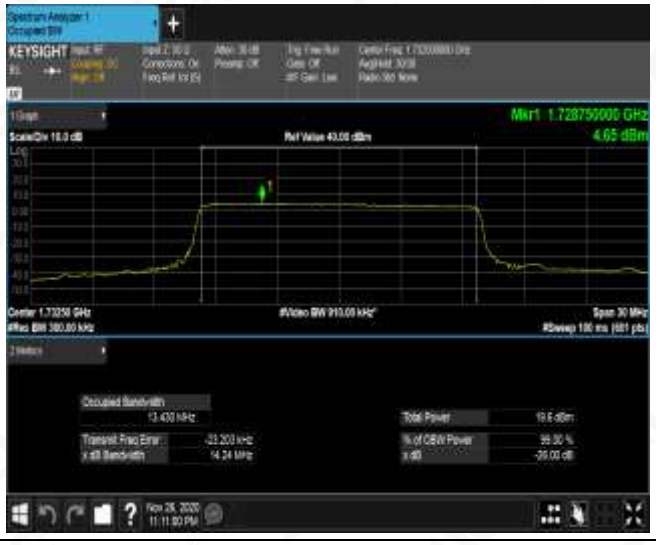
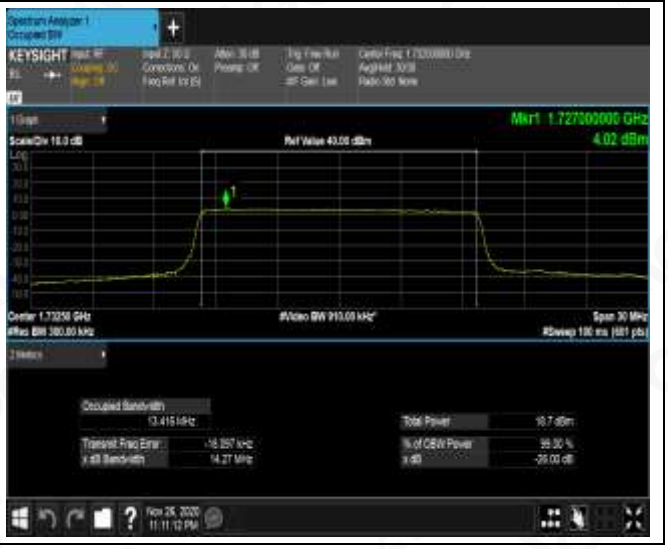
LCH_QPSK_50RB#0	LCH_16QAM_50RB#0
	

MCH_QPSK_50RB#0	MCH_16QAM_50RB#0
	

HCH_QPSK_50RB#0	HCH_16QAM_50RB#0
	

Channel Bandwidth: 15 MHz

LCH_QPSK_75RB#0	LCH_16QAM_75RB#0
	

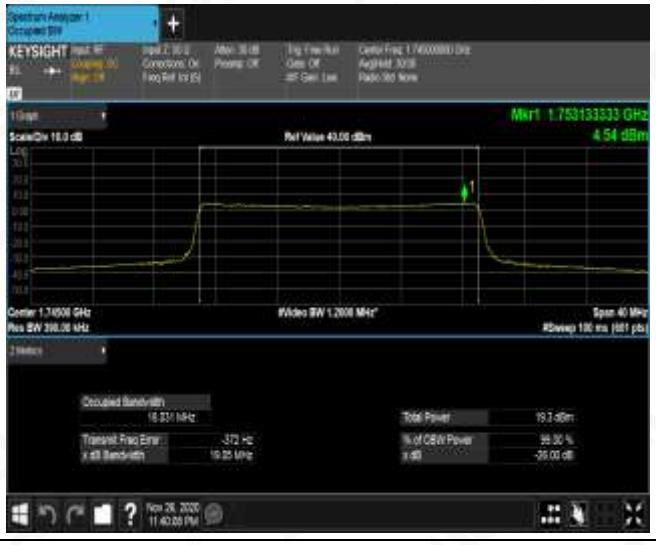
MCH_QPSK_75RB#0	MCH_16QAM_75RB#0
	

HCH_QPSK_75RB#0	HCH_16QAM_75RB#0
	

Channel Bandwidth: 20 MHz

LCH_QPSK_100RB#0	LCH_16QAM_100RB#0
	

MCH_QPSK_100RB#0	MCH_16QAM_100RB#0
	

HCH_QPSK_100RB#0	HCH_16QAM_100RB#0
	

LTE Band 7

Channel Bandwidth: 5MHz

LCH_QPSK_25RB#0	LCH_16QAM_25RB#0
	

MCH_QPSK_25RB#0	MCH_16QAM_25RB#0
	

HCH_QPSK_25RB#0	HCH_16QAM_25RB#0
	

Channel Bandwidth: 10 MHz

LCH_QPSK_50RB#0	LCH_16QAM_50RB#0
	

MCH_QPSK_50RB#0	MCH_16QAM_50RB#0
	

HCH_QPSK_50RB#0	HCH_16QAM_50RB#0
	

Channel Bandwidth: 15 MHz

LCH_QPSK_75RB#0	LCH_16QAM_75RB#0
	

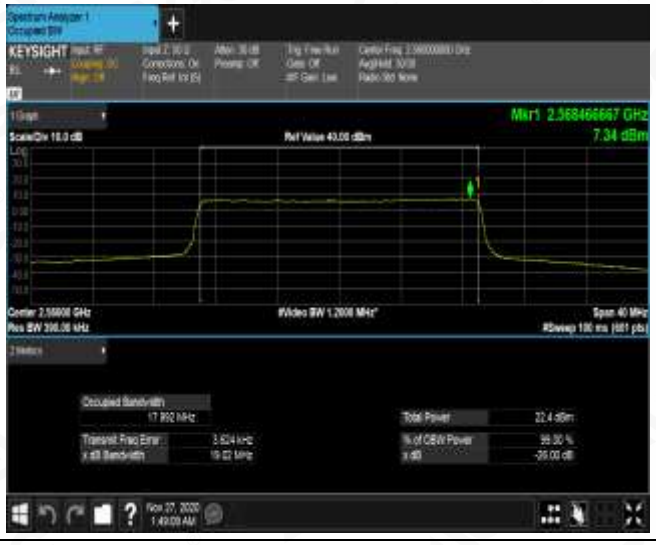
MCH_QPSK_75RB#0	MCH_16QAM_75RB#0
	

HCH_QPSK_75RB#0	HCH_16QAM_75RB#0
	

Channel Bandwidth: 20 MHz

LCH_QPSK_100RB#0	LCH_16QAM_100RB#0
	

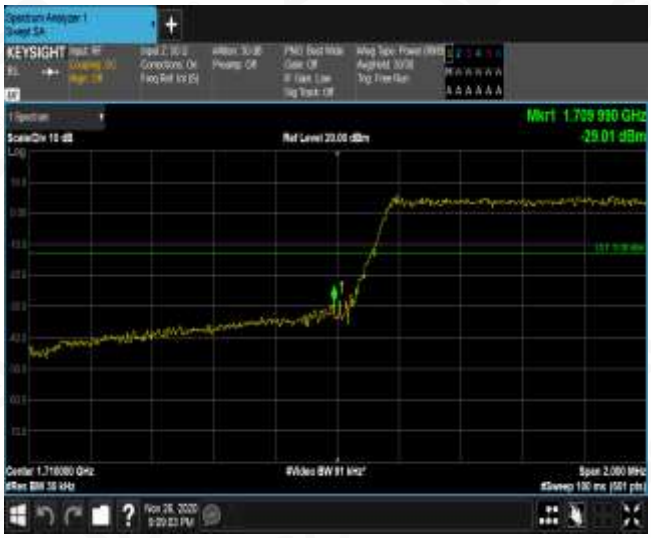
MCH_QPSK_100RB#0	MCH_16QAM_100RB#0
	

HCH_QPSK_100RB#0	HCH_16QAM_100RB#0
	

APPENDIX C TEST PLOTS FOR BAND EDGES

LTE BAND 4

Channel Bandwidth: 1.4 MHz

LCH_QPSK_6RB#0	LCH_16QAM_6RB#0
	

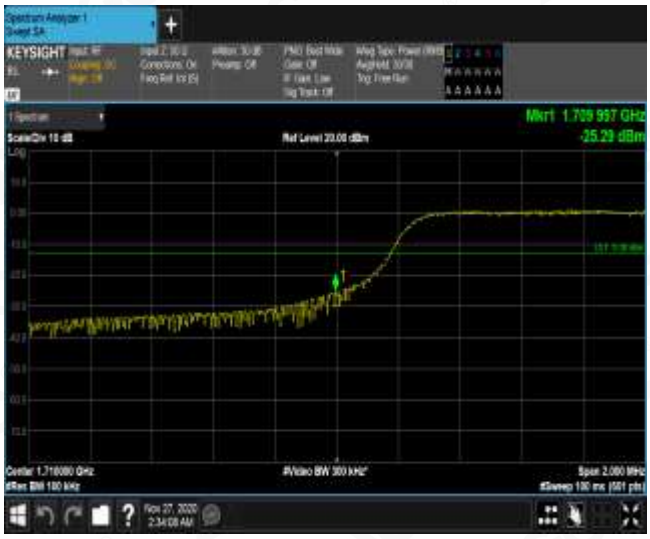
HCH_QPSK_6RB#0	HCH_16QAM_6RB#0
	

Channel Bandwidth: 3 MHz

LCH_QPSK_15RB#0	LCH_16QAM_15RB#0
	

HCH_QPSK_15RB#0	HCH_16QAM_15RB#0
	

Channel Bandwidth: 5 MHz

LCH_QPSK_25RB#0	LCH_16QAM_25RB#0
	

HCH_QPSK_25RB#0	HCH_16QAM_25RB#0