FCC TEST REPORT

Product Name:	Smart Phone
Trade Mark:	BLU
Model No.:	ADVANCE L5
Add. Model No.:	N/A
Report Number:	200916004RFM-2
Test Standards:	FCC 47 CFR Part 22 FCC 47 CFR Part 24 FCC 47 CFR Part 27
FCC ID:	YHLBLUADL5
Test Result:	PASS
Date of Issue:	October 10, 2020

Prepared for:

BLU Products, Inc.
10814 NW 33rd St # 100 Doral, FL 33172 ,USA

Prepared by:

Shenzhen UnionTrust Quality and Technology Co., Ltd.
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Prepared by: Ryan Zhou — Ryan Zhou, Senior Project Engineer

Reviewed by: Kevin Liang, Assistant Manager

Approved by: Billy Li, Technical Director

Date: October 10, 2020

Version

Version No.	Date	Description
V1.0	October 10, 2020	Original

CONTENTS

1. GENERAL INFORMATION

1.1 CLIENT INFORMATION

Applicant:	BLU Products, Inc.
Address of Applicant:	10814 NW 33rd St # 100 Doral, FL 33172 ,USA
Manufacturer:	BLU Products, Inc.
Address of Manufacturer:	10814 NW 33rd St # 100 Doral, FL 33172 ,USA

1.2 EUT INFORMATION

1.2.1 General Description of EUT

Product Name:	Smart Phone	
Model No.:	ADVANCE L5	
Trade Mark:	BLU	
DUT Stage:	Identical Prototype	
EUT Supports Function:	GSM Bands:	GSM850/PCS1900
	UTRA Bands:	Band II/ Band V
	E-UTRA Bands:	FDD Band 2/ Band 4/ Band 5/ Band 7
	2.4 GHz ISM Band:	IEEE 802.11b/g/n
		Bluetooth V4.2
Sample Received Date:	September 16, 2020	
Sample Tested Date:	September 20, 2020 to September 30, 2020	

1.2.2 Description of Accessories

Adapter	
Model No.:	US-AR-0500
Input:	100-240 V~50/60 Hz 0.15 A
Output:	5.0 V ⎓ 500 mA
DC Cable:	1.0 Meter, Unshielded without ferrite
Manufacturer:	Chongqing lianmao Electronic Co., Ltd.

Battery	
Model No.:	C348246140L
Battery Type:	Lithium-ion Polymer Rechargeable Battery
Rated Voltage:	3.7 Vdc
Limited Charge Voltage:	4.2 Vdc
Rated Capacity:	1400 mAh
Manufacturer:	Shenzhen Truepower New Energy Co.,Ltd.

Cable	
Description:	USB Micro-B Plug Cable
Cable Type:	Unshielded without ferrite
Length:	1.0 Meter

1.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD

Support Networks:	LTE	
Type of Modulation:	LTE Band 2/4/5/7	QPSK, 16QAM
Antenna Type:	PIFA Antenna	
Antenna Gain:	LTE Band 2:	0.81dBi
	LTE Band 4:	0.89 dBi
	LTE Band 5:	-0.96 dBi
	LTE Band 7:	0.98 dBi
Normal Test Voltage:	3.7 Vdc	
Extreme Test Voltage:	3.4 to 4.2Vdc	
Extreme Test Temperature:	-5 °C to +55 °C	

Summary of Results:

Bands	BW (MHz)	Modulation	Frequency Range (MHz)	Max RF Output Power (dBm) Conducted (Average)	Max RF Output Power (dBm) ERP/EIRP (Average)	EIRP (W)	99% BW (MHz)	Emission Designator
2	1.4	QPSK	1850.7-1909.3	24.85	25.66	0.36813	1.1080	1M11G7D
		16QAM		24.07	24.88	0.30761	1.1078	1M11W7D
	3	QPSK	1851.5-1908.5	24.35	25.16	0.32810	2.7169	2M72G7D
		16QAM		23.65	24.46	0.27925	2.7214	2M72W7D
	5	QPSK	1852.5-1907.5	24.34	25.13	0.32584	4.5385	4M54G7D
		16QAM		23.69	24.50	0.28184	4.5673	4M57W7D
	10	QPSK	1855.0-1905.0	24.38	25.19	0.33037	9.0059	9M00G7D
		16QAM		23.79	24.60	0.28840	9.0231	9M02W7D
	15	QPSK	1857.5-1902.5	24.37	25.18	0.32961	13.538	13M5G7D
		16QAM		23.75	24.56	0.28576	13.526	13M5W7D
	20	QPSK	1860.0-1900.0	24.40	25.21	0.33189	18.068	18M1G7D
		16QAM		23.82	24.63	0.29040	18.045	18M0W7D

Summary of Results:								
Bands	BW (MHz)	Modulation	Frequency Range (MHz)	Max RF Output Power (dBm)		EIRP (W)	99% BW (MHz)	Emission Designator
				Conducted (Average)	ERP/EIRP (Average)			
4	1.4	QPSK	1710.7-1754.3	22.90	23.79	0.23933	1.1080	1M11G7D
		16QAM		22.77	23.66	0.23227	1.1081	1M11W7D
	3	QPSK	1711.5-1753.5	22.89	23.78	0.23878	2.7146	2M71G7D
		16QAM		21.87	22.76	0.18880	2.7239	2M72W7D
	5	QPSK	1712.5-1752.5	22.93	23.82	0.24099	4.5438	4M54G7D
		16QAM		21.90	22.79	0.19011	4.5662	4M57W7D
	10	QPSK	1715-1750	22.93	23.82	0.24099	9.0154	9M02G7D
		16QAM		21.92	22.81	0.19099	9.0250	9M03W7D
	15	QPSK	1717.5-1747.5	22.85	23.74	0.23659	13.532	13M5G7D
		16QAM		21.90	22.79	0.19011	13.541	13M5W7D
	20	QPSK	1720-1745	22.96	23.85	0.24266	18.073	18M1G7D
		16QAM		21.98	22.87	0.19364	18.086	18M1W7D
5	1.4	QPSK	824.7-848.3	23.03	19.92	0.09817	1.1070	1M11G7D
		16QAM		22.10	18.99	0.07925	1.1075	1M11W7D
	3	QPSK	825.5-847.5	22.39	19.28	0.08472	2.7167	2M72G7D
		16QAM		22.01	18.90	0.07762	2.7232	2M72W7D
	5	QPSK	826.5-846.5	22.42	19.31	0.08531	4.5544	4M55G7D
		16QAM		22.06	18.95	0.07852	4.5592	4M56W7D
	10	QPSK	829-844	22.48	19.37	0.08650	9.0358	9M04G7D
		16QAM		22.13	19.02	0.07980	9.0265	9M03W7D
7	5	QPSK	2502.5-2567.5	24.14	25.12	0.32509	4.5502	4M55G7D
		16QAM		23.61	24.59	0.28774	4.5648	4M56W7D
	10	QPSK	2505-2565	24.28	25.26	0.33574	9.0421	9M04G7D
		16QAM		23.56	24.54	0.28445	9.0383	9M04W7D
	15	QPSK	2507.5-2562.5	24.18	25.16	0.32810	13.583	13M6G7D
		16QAM		23.66	24.64	0.29107	13.583	13M6W7D
	20	QPSK	2510-2560	24.29	25.27	0.33651	18.152	18M2G7D
		16QAM		23.67	24.65	0.29174	18.127	18M1W7D

1.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested with associated equipment below.

1) Support Equipment

Description	Manufacturer	Model No.	Serial Number	Supplied by
- -	- -	- -	- -	- -

2) Support Cable

Cable No.	Description	Connector	Length	Supplied by
1	Antenna Cable	SMA	0.30 Meter	UnionTrust

1.5 TEST LOCATION

Shenzhen UnionTrust Quality and Technology Co., Ltd.

Address: 16/F, Block A, Building 6, Baoneng Science and Technology Park, Qingxiang Road No.1, Longhua New District, Shenzhen, China 518109
Telephone: +86 (0) 755 2823 0888
Fax: +86 (0) 755 2823 0886

1.6 TEST FACILITY

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

CNAS-Lab Code: L9069
The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable under the ISO/IEC/EN 17025 to international or national standards. Equipment has been calibrated by accredited calibration laboratories.

A2LA-Lab Certificate No.: 4312.01
Shenzhen UnionTrust Quality and Technology Co., Ltd. has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

ISED Wireless Device Testing Laboratories
CAB identifier: CN0032

FCC Accredited Lab.
Designation Number: CN1194
Test Firm Registration Number: 259480

1.7 DEVIATION FROM STANDARDS

None.

1.8 ABNORMALITIES FROM STANDARD CONDITIONS

None.

1.9 OTHER INFORMATION REQUESTED BY THE CUSTOMER

None.

1.10 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

No.	Item	Measurement Uncertainty
1	Conducted emission 9KHz-150KHz	±3.8 dB
2	Conducted emission 150KHz-30MHz	±3.4 dB
3	Radiated emission 9KHz-30MHz	±4.9 dB
4	Radiated emission 30MHz-1GHz	±4.7 dB
5	Radiated emission 1GHz-18GHz	±5.1 dB
6	Radiated emission 18GHz-26GHz	±5.2 dB
7	Radiated emission 26GHz-40GHz	±5.2 dB

2. TEST SUMMARY

FCC 47 CFR Part 24 Test Cases (Band 2)			
Test Item	**Test Requirement**	**Test Method**	**Result**
Equivalent Isotropic Radiated Power (EIRP)	FCC 47 CFR Part 2.1046(a) & FCC 47 CFR Part 24.232(c)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Conducted Output Power	FCC 47 CFR Part 2.1046(a) & FCC 47 CFR Part 24.232(c)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Peak-to-average ratio	FCC 47 CFR Part 24.232(d)	KDB 971168 D01v03r01	PASS
99%&26dB Bandwidth	FCC 47 CFR Part 2.1049(h) & FCC 47 CFR Part 24.238(b)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Band Edge at antenna terminals	FCC 47 CFR Part 2.1051 & FCC 47 CFR Part 24.238(a)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Spurious emissions at antenna terminals	FCC 47 CFR Part 2.1051 & FCC 47 CFR Part 24.238(a)(b)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Field strength of spurious radiation	FCC 47 CFR Part 2.1053 & FCC 47 CFR Part 24.238(a)(b)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Frequency stability	FCC 47 CFR Part 2.1055 & FCC 47 CFR Part 24.235	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS

FCC 47 CFR Part 27 Test Cases (LTE Band 4)			
Test Item	**Test Requirement**	**Test Method**	**Result**
Equivalent Isotropic Radiated Power (EIRP)	FCC 47 CFR Part 2.1046(a) & FCC 47 CFR Part 27.50(d)(4)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Conducted Output Power	FCC 47 CFR Part 2.1046(a) & FCC 47 CFR Part 27.50(d)(4)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Peak-to-average ratio	FCC 47 CFR Part 27.50(d)(5)	KDB 971168 D01v03r01	PASS
99%&26dB Bandwidth	FCC 47 CFR Part 2.1049(h) FCC 47 CFR Part 27.53(h)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Band Edge at antenna terminals	FCC 47 CFR Part 27.53(h)(1)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Spurious emissions at antenna terminals	FCC 47 CFR Part 2.1051 & FCC 47 CFR Part 27.53(h)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Field strength of spurious radiation	FCC 47 CFR Part 2.1053 & FCC 47 CFR Part 27.53(h)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Frequency stability	FCC 47 CFR Part 2.1055 & FCC 47 CFR Part 27.54	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS

FCC 47 CFR Part 22 Test Cases (Band 5)			
Test Item	**Test Requirement**	**Test Method**	**Result**
Effective Radiated Power (ERP)	FCC 47 CFR Part 2.1046(a) & FCC 47 CFR Part 22.913(a)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Conducted Output Power	FCC 47 CFR Part 2.1046(a) & FCC 47 CFR Part 22.913(a)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Peak-to-average ratio	FCC 47 CFR Part 22.913(a)	KDB 971168 D01v03r01	PASS
99%&26dB Bandwidth	FCC 47 CFR Part 2.1049(h)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Band Edge at antenna terminals	FCC 47 CFR Part 2.1051 & FCC 47 CFR Part 22.917(a)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Spurious emissions at antenna terminals	FCC 47 CFR Part 2.1051 & FCC 47 CFR Part 22.917(a)(b)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Field strength of spurious radiation	FCC 47 CFR Part 2.1053 & FCC 47 CFR Part 22.917(a)(b)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Frequency stability	FCC 47 CFR Part 2.1055 & FCC 47 CFR Part 22.355	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS

FCC 47 CFR Part 27 Test Cases (LTE Band 7 & Band 38)			
Test Item	**Test Requirement**	**Test Method**	**Result**
Equivalent Isotropic Radiated Power (EIRP)	FCC 47 CFR Part 2.1046(a) & FCC 47 CFR Part 27.50(h)(2)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Conducted Output Power	FCC 47 CFR Part 2.1046(a) & FCC 47 CFR Part 27.50(h)(2)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Peak-to-average ratio	FCC 47 CFR Part 27.50(d)(5)	KDB 971168 D01v03r01	PASS
99%&26dB Bandwidth	FCC 47 CFR Part 2.1049(h)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Band Edge at antenna terminals	FCC 47 CFR Part 27.53(m)(4)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Spurious emissions at antenna terminals	FCC 47 CFR Part 2.1051 & FCC 47 CFR Part 27.53(m)(4)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Field strength of spurious radiation	FCC 47 CFR Part 2.1053 & FCC 47 CFR Part 27.53(m)(4)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Frequency stability	FCC 47 CFR Part 2.1055 & FCC 47 CFR Part 27.54	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS

3. EQUIPMENT LIST

Radiated Emission Test Equipment List						
Used	**Equipment**	**Manufacturer**	**Model No.**	**Serial Number**	**Cal. date (mm dd, yyyy)**	**Cal. Due date (mm dd, yyyy)**
☒	3M Chamber & Accessory Equipment	ETS-LINDGREN	3M	N/A	Dec. 03, 2018	Dec. 03, 2021
☒	Receiver	R&S	ESIB26	100114	Nov. 24, 2019	Nov. 23, 2020
☐	Loop Antenna	ETS-LINDGREN	6502	00202525	Nov. 16, 2019	Nov. 15, 2020
☒	Broadband Antenna	ETS-LINDGREN	3142E	00201566	Nov. 16, 2019	Nov. 15, 2020
☒	6dB Attenuator	Talent	RA6A5-N-18	18103001	Nov. 16, 2019	Nov. 15, 2020
☒	Preamplifier	HP	8447F	2805A02960	Nov. 24, 2019	Nov. 23, 2020
☐	Broadband Antenna (Pre-amplifier)	ETS-LINDGREN	3142E-PA	00201891	May. 30, 2020	May. 29, 2021
☐	6dB Attenuator	Talent	RA6A5-N-18	18103002	Nov. 24, 2019	Nov. 23, 2020
☐	Horn Antenna	ETS-LINDGREN	3117	00164202	Nov. 16, 2019	Nov. 15, 2020
☒	Horn Antenna (Pre-amplifier)	ETS-LINDGREN	3117-PA	00201874	May. 30, 2020	May. 29, 2021
☐	Horn Antenna	ETS-LINDGREN	3116C	00200180	Jun. 19, 2020	Jun. 18, 2021
☒	Horn Antenna (Pre-amplifier)	ETS-LINDGREN	3116C-PA	00202652	Nov. 16, 2019	Nov. 15, 2020
☒	Multi device Controller	ETS-LINDGREN	7006-001	00160105	N/A	N/A
☒	Test Software	Audix	e3	Software Version: 9.160323		

RF Test Equipment List						
Used	**Equipment**	**Manufacturer**	**Model No.**	**Serial Number**	**Cal. date (mm dd, yyyy)**	**Cal. Due date (mm dd, yyyy)**
☒	Wideband Radio Communication Tester	R&S	CMW500	119583	July 20, 2020	July 19, 2021
☒	Signal Generator	R&S	SMF 100A	100691	May 14, 2020	May 13, 2021
☒	Vector Signal Generator	R&S	SMU200A	101638	May 14, 2020	May 13, 2021
☒	Spectrum Analyzer	R&S	FSP13	1164.6391.13	June 11, 2020	June 10, 2021
☒	Temp Humidity chamber	Votisch	VT4002	58566133290020	May 11, 2020	May 10, 2021
☒	Shielding room	ETS-Lindgren	333	Euroshiedpn-TJ2343-S1608	June 5, 2020	June 4, 2021
☒	Temperature & Humidity Datalogger	CEM	DT-172	200408605	July 24, 2020	July 23, 2021
☒	RF Box	ECIT	M4300	20170501	N/A	N/A
☒	Test Software	AutomationTest System	ECIT	Software Version: 1.0659.27819		

4. TEST CONFIGURATION

4.1 ENVIRONMENTAL CONDITIONS FOR TESTING

Test Environment	Selected Values During Tests		
Test Condition	Ambient		
	Temperature (°C)	Voltage (V)	Relative Humidity (%)
TN/VN	+15 to +35	3.7	20 to 75
TL/VL	-5	3.4	20 to 75
TH/VL	+55	3.4	20 to 75
TL/VH	-5	4.2	20 to 75
TH/VH	+55	4.2	20 to 75

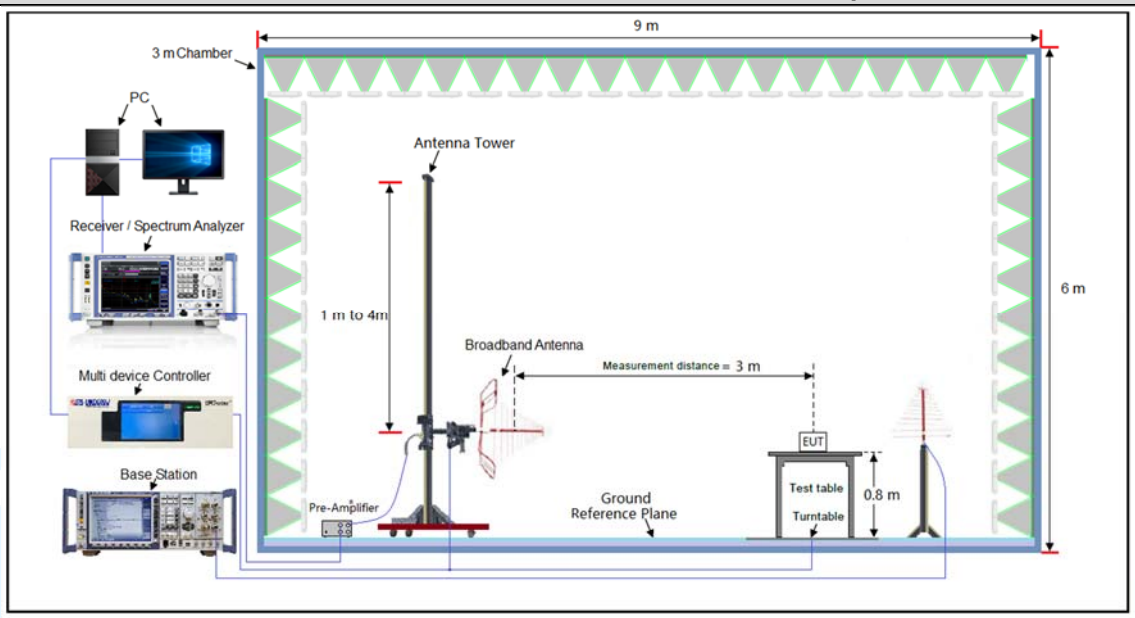
Remark:

1) The EUT just work in such extreme temperature of -5 °C to +55 °C and the extreme voltage of 3.4 V to 4.2 V, so here the EUT is tested in the temperature of -5 °C to +55 °C and the voltage of 3.4 V to 4.2 V.
2) VN: Normal Voltage; TN: Normal Temperature;
TL: Low Extreme Test Temperature; TH: High Extreme Test Temperature;
VL: Low Extreme Test Voltage; VH: High Extreme Test Voltage.

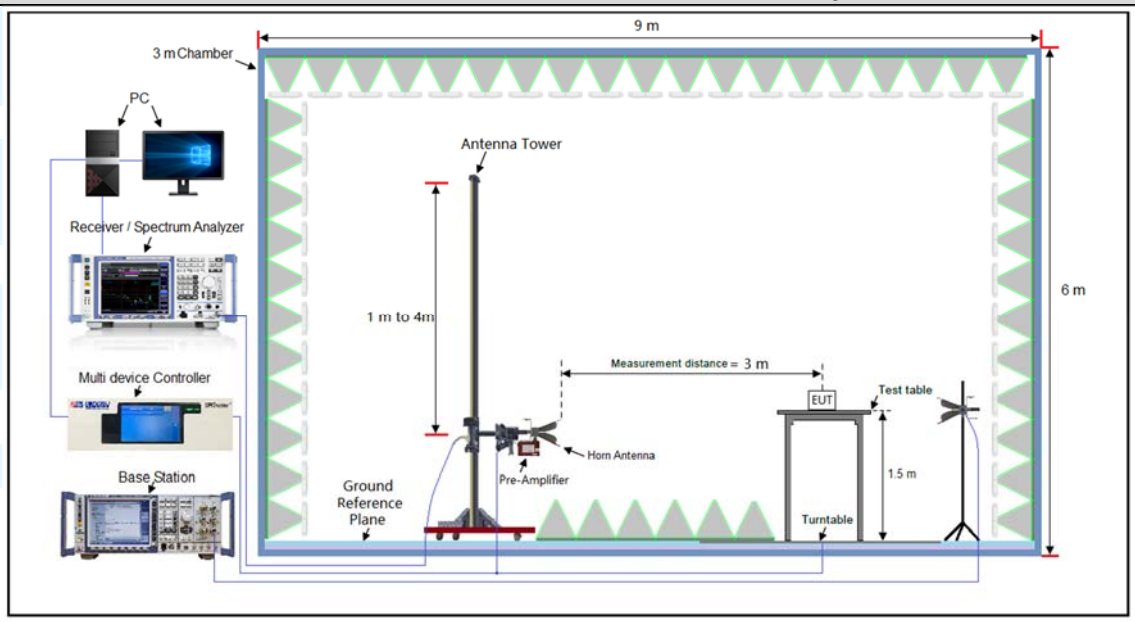
4.2 TEST SETUP

4.2.1 For Radiated Emissions test setup

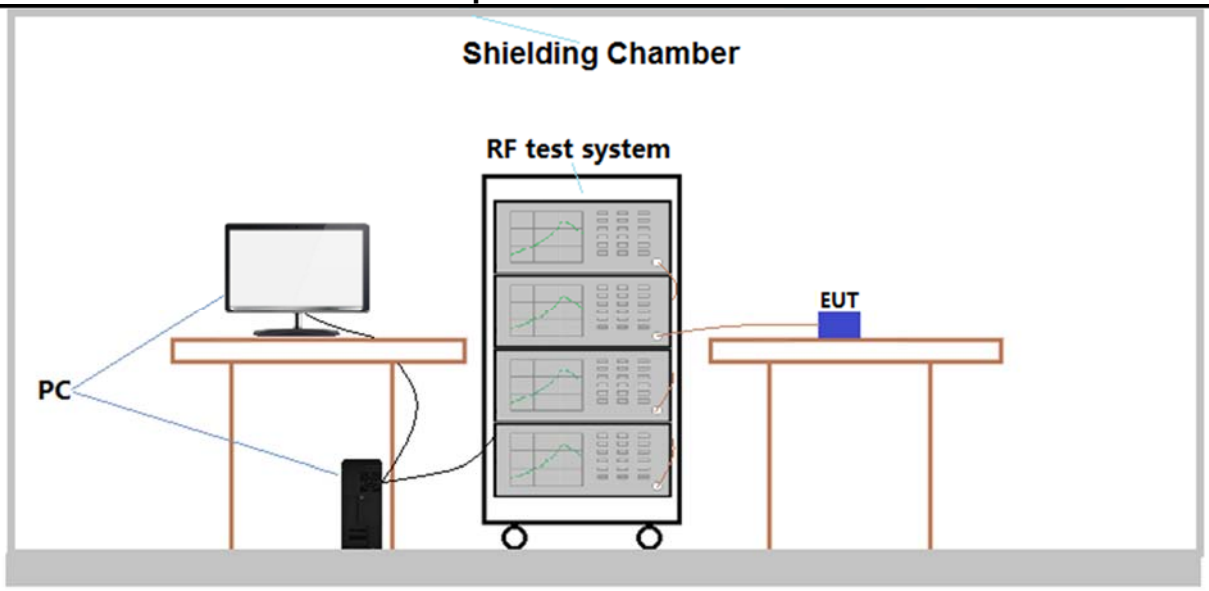
Radiated Emissions 30MHz to 1GHz Test setup



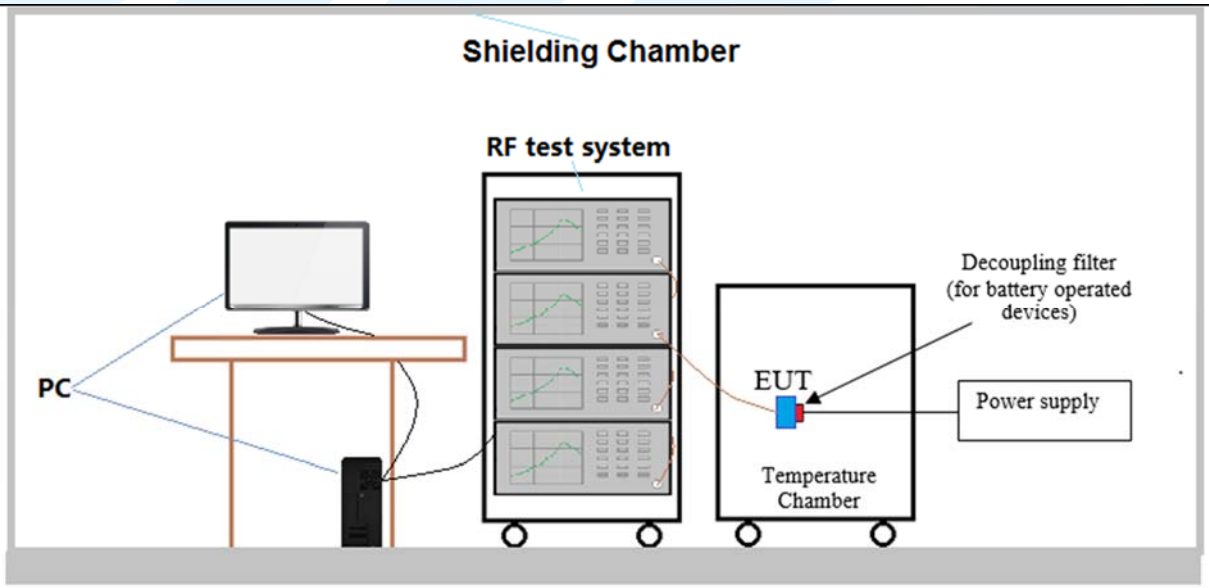
Radiated Emissions Above 1GHz Test setup



4.2.2 For Conducted RF test setup



Normal Environment



Extreme Environment

4.3 TEST CHANNELS

Band	Test Frequency ID	Bandwidth (MHz)	Number [UL]	Frequency of Uplink (MHz)
LTE Band 2 TX: 1850-1910MHz	Low Range	1.4	18607	1850.7
		3	18615	1851.5
		5	18625	1852.5
		10	18650	1855
		15	18675	1857.5
		20	18700	1860
	Middle Range	1.4/3/5/10/15/20	18900	1880
	High Range	1.4	19193	1909.3
		3	19185	1908.5
		5	19175	1907.5
		10	19150	1905
		15	19125	1902.5
		20	19100	1900
LTE Band 4 TX: 1710-1755MHz	Low Range	1.4	19957	1710.7
		3	19965	1711.5
		5	19975	1712.5
		10	20000	1715
		15	20025	1717.5
		20	20050	1720
	Middle Range	1.4/3/5/10/ 15/20	20175	1732.5
	High Range	1.4	20393	1754.3
		3	20385	1753.5
		5	20375	1752.5
		10	20350	1750
		15	20325	1747.5
		20	20300	1745
LTE band 5 TX: 824–849MHz	Low Range	1.4	20407	824.7
		3	20415	825.5
		5	20425	826.5
		10	20450	829
	Middle Range	1.4/3/5/10	20525	836.5
	High Range	1.4	20643	848.3
		3	20635	847.5
		5	20625	846.5
		10	20600	844

Band	Test Frequency ID	Bandwidth (MHz)	Number [UL]	Frequency of Uplink (MHz)
LTE Band 7 TX: 2500-2570MHz	Low Range	5	20775	2502.5
		10	20800	2505
		15	20825	2507.5
		20	20850	2510
	Middle Range	5/10/15/20	21100	2535
	High Range	5	21425	2567.5
		10	21400	2565
		15	21375	2562.5
		20	21350	2560

4.4 SYSTEM TEST CONFIGURATION

For emissions testing, the equipment under test (EUT) setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, radiated emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario. It was powered by a 3.7V battery. Only the worst case data were recorded in this test report.

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, X/Y/Z axis, and antenna ports.
The worst case was found when positioned as the table below.

Band	Mode	Antenna Port	Worst-case axis positioning
LTE Band 2	1TX	Chain 0	Y axis
LTE Band 4	1TX	Chain 0	Y axis
LTE Band 5	1TX	Chain 0	Y axis
LTE Band 7	1TX	Chain 0	Y axis
LTE Band 38	1TX	Chain 0	Y axis

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000MHz. The resolution is 1 MHz or greater for frequencies above 1000MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

Radiated emission measurement were performed from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

4.5 PRE-SCAN

Pre-scan under all rate at lowest middle and highest channel, find the transmitter power as below.

4.5.1 LTE Band 2

LTE Band 2 Maximum Average Power (dBm)										
Modulation	RB		Test Channel			RB		Test Channel		
	Size	Offset	Low	Mid	High	Size	Offset	Low	Mid	High
	Channel Bandwidth: 1.4 MHz					Channel Bandwidth: 3 MHz				
QPSK	1	0	23.97	24.23	24.14	1	0	23.86	24.12	24.06
	1	2	24.03	24.39	24.35	1	7	24.01	24.34	24.25
	1	5	24.02	24.12	24.18	1	14	24.09	24.09	24.35
	3	0	24.38	24.77	24.57	8	0	23.45	23.78	23.62
	3	1	24.52	24.81	24.85	8	3	23.50	23.63	23.78
	3	3	24.68	24.83	24.77	8	7	23.57	23.94	23.75
	6	0	23.61	23.73	23.69	15	0	23.55	23.71	23.63
16QAM	1	0	23.15	23.45	23.38	1	0	23.24	23.48	23.39
	1	2	23.37	23.29	23.81	1	7	23.41	23.38	23.65
	1	5	23.61	23.19	23.54	1	14	23.52	23.24	23.62
	3	0	23.70	23.89	23.79	8	0	22.67	22.89	22.84
	3	1	23.69	23.82	24.03	8	3	22.55	22.71	23.00
	3	3	23.63	23.78	24.07	8	7	22.66	22.90	23.03
	6	0	22.72	22.78	23.02	15	0	22.60	22.79	22.95
	Channel Bandwidth: 5 MHz					Channel Bandwidth: 10 MHz				
QPSK	1	0	23.88	24.13	24.15	1	0	24.02	24.13	24.16
	1	12	24.01	24.34	24.32	1	24	23.86	24.38	24.24
	1	24	24.02	24.17	24.31	1	49	24.05	24.25	24.21
	12	0	23.51	23.70	23.75	25	0	23.41	23.88	23.63
	12	6	23.57	23.66	23.89	25	12	23.44	23.65	23.72
	12	13	23.51	23.79	23.88	25	25	23.69	23.85	23.80
	25	0	23.49	23.72	23.76	50	0	23.49	23.77	23.72
16QAM	1	0	23.15	23.49	23.36	1	0	23.18	23.36	23.36
	1	12	23.26	23.22	23.69	1	24	23.41	23.33	23.79
	1	24	23.62	23.28	23.58	1	49	23.49	23.24	23.64
	12	0	22.65	22.74	22.85	25	0	22.61	22.83	22.73
	12	6	22.59	22.74	22.91	25	12	22.54	22.76	23.04
	12	13	22.70	22.81	22.96	25	25	22.68	22.79	22.96
	25	0	22.66	22.81	23.02	50	0	22.57	22.71	22.99
	Channel Bandwidth: 15 MHz					Channel Bandwidth: 20 MHz				
QPSK	1	0	23.95	24.09	24.17	1	0	24.04	24.24	24.22
	1	37	23.99	24.37	24.34	1	50	24.03	**24.40**	24.38
	1	74	24.04	24.20	24.29	1	99	24.13	24.26	24.37
	37	0	23.36	23.76	23.74	50	0	23.55	23.89	23.75
	37	19	23.53	23.77	23.87	50	25	23.64	23.81	23.90
	37	39	23.61	23.80	23.87	50	50	23.70	23.95	23.93
	75	0	23.59	23.76	23.78	100	0	23.63	23.88	23.83
16QAM	1	0	23.18	23.36	23.39	1	0	23.32	23.53	23.55
	1	37	23.32	23.39	23.75	1	50	23.43	23.42	23.82
	1	74	23.50	23.20	23.59	1	99	23.66	23.33	23.65
	37	0	22.68	22.88	22.89	50	0	22.75	22.89	22.92
	37	19	22.67	22.89	23.07	50	25	22.71	22.89	23.09
	37	39	22.75	22.84	22.92	50	50	22.78	22.92	23.07
	75	0	22.63	22.78	22.94	100	0	22.75	22.86	23.04

4.5.2 LTE Band 4

LTE Band 4 Maximum Average Power (dBm)										
Modulation	RB		Test Channel			RB		Test Channel		
	Size	Offset	Low	Mid	High	Size	Offset	Low	Mid	High
Channel Bandwidth: 1.4 MHz						Channel Bandwidth: 3 MHz				
QPSK	1	0	22.55	22.63	22.78	1	0	22.68	22.66	22.73
	1	2	22.72	22.70	22.70	1	7	22.60	22.79	22.77
	1	5	22.70	22.90	22.74	1	14	22.79	22.85	22.89
	3	0	22.89	22.80	22.82	8	0	21.74	21.85	21.76
	3	1	22.68	22.73	22.80	8	3	21.74	21.81	21.74
	3	3	22.88	22.88	21.87	8	7	21.86	21.75	21.02
	6	0	21.78	21.77	21.75	15	0	21.79	21.80	21.75
16QAM	1	0	21.52	21.54	21.97	1	0	21.46	21.43	21.87
	1	2	21.41	21.60	21.80	1	7	21.54	21.61	21.87
	1	5	21.42	21.68	21.88	1	14	21.52	21.76	21.87
	3	0	22.35	22.40	22.59	8	0	21.37	21.36	21.56
	3	1	22.29	22.54	22.71	8	3	21.43	21.58	21.70
	3	3	22.45	22.54	22.77	8	7	21.54	21.56	21.75
	6	0	21.43	21.42	21.50	15	0	21.31	21.40	21.57
Channel Bandwidth: 5 MHz						Channel Bandwidth: 10 MHz				
QPSK	1	0	22.63	22.66	22.87	1	0	22.60	22.67	22.73
	1	12	22.77	22.77	22.83	1	24	22.75	22.77	22.83
	1	24	22.79	22.93	22.78	1	49	22.81	22.93	22.85
	12	0	21.84	21.78	21.80	25	0	21.72	21.83	21.77
	12	6	21.76	21.81	21.76	25	12	21.72	21.92	21.79
	12	13	21.85	21.85	21.02	25	25	21.82	21.77	21.06
	25	0	21.66	21.77	21.74	50	0	21.81	21.79	21.69
16QAM	1	0	21.48	21.42	21.90	1	0	21.39	21.47	21.92
	1	12	21.50	21.56	21.80	1	24	21.50	21.51	21.82
	1	24	21.50	21.62	21.81	1	49	21.35	21.68	21.80
	12	0	21.31	21.49	21.68	25	0	21.30	21.42	21.59
	12	6	21.36	21.62	21.60	25	12	21.31	21.56	21.56
	12	13	21.60	21.64	21.73	25	25	21.56	21.64	21.71
	25	0	21.40	21.44	21.59	50	0	21.34	21.48	21.53
Channel Bandwidth: 15 MHz						Channel Bandwidth: 20 MHz				
QPSK	1	0	22.68	22.57	22.75	1	0	22.75	22.77	22.87
	1	37	22.61	22.75	22.76	1	50	22.77	22.81	22.90
	1	74	22.69	22.85	22.77	1	99	22.86	**22.96**	22.93
	37	0	21.73	21.80	21.89	50	0	21.90	21.96	21.95
	37	19	21.72	21.84	21.85	50	25	21.77	21.93	21.93
	37	39	21.79	21.82	21.03	50	50	21.90	21.92	21.07
	75	0	21.67	21.81	21.80	100	0	21.86	21.89	21.88
16QAM	1	0	21.44	21.41	21.90	1	0	21.58	21.60	21.98
	1	37	21.40	21.65	21.81	1	50	21.55	21.68	21.95
	1	74	21.37	21.61	21.79	1	99	21.55	21.77	21.90
	37	0	21.27	21.48	21.57	50	0	21.44	21.56	21.75
	37	19	21.43	21.47	21.68	50	25	21.48	21.67	21.74
	37	39	21.54	21.57	21.67	50	50	21.63	21.66	21.83
	75	0	21.33	21.43	21.53	100	0	21.50	21.54	21.68

4.5.3 LTE Band 5

LTE Band 5 Maximum Average Power (dBm)										
Modulation	RB		Test Channel			RB		Test Channel		
	Size	Offset	Low	Mid	High	Size	Offset	Low	Mid	High
Channel Bandwidth: 1.4 MHz						Channel Bandwidth: 3 MHz				
QPSK	1	0	22.30	22.37	22.24	1	0	22.37	22.39	22.33
	1	2	22.39	22.31	22.30	1	7	22.26	22.33	22.20
	1	5	22.28	22.33	22.36	1	14	22.37	22.27	22.34
	3	0	22.92	22.94	22.94	8	0	22.00	21.80	21.92
	3	1	23.00	22.88	22.65	8	3	21.97	21.77	21.75
	3	3	23.03	22.93	23.03	8	7	21.95	21.94	21.87
	6	0	21.86	21.81	21.85	15	0	21.81	21.82	21.79
16QAM	1	0	22.10	21.94	21.95	1	0	21.94	21.82	21.91
	1	2	21.82	21.84	21.78	1	7	21.92	22.01	21.96
	1	5	21.96	21.87	21.95	1	14	21.99	21.88	21.98
	3	0	22.04	21.94	21.72	8	0	20.92	20.91	20.81
	3	1	21.83	21.89	22.00	8	3	20.76	20.88	20.95
	3	3	21.98	21.86	21.90	8	7	20.95	20.91	20.92
	6	0	20.82	20.99	20.96	15	0	20.89	21.02	21.08
Channel Bandwidth: 5 MHz						Channel Bandwidth: 10 MHz				
QPSK	1	0	22.27	22.27	22.41	1	0	22.45	22.42	22.41
	1	12	22.33	22.39	22.30	1	24	22.41	**22.48**	22.40
	1	24	22.35	22.32	22.42	1	49	22.39	22.37	22.47
	12	0	22.06	21.89	21.85	25	0	22.09	21.94	22.02
	12	6	21.90	21.91	21.69	25	12	22.06	21.95	21.85
	12	13	22.01	22.02	21.89	25	25	22.07	22.10	22.03
	25	0	21.71	21.83	21.90	50	0	21.91	21.95	21.92
16QAM	1	0	22.04	21.88	21.88	1	0	22.11	22.02	22.07
	1	12	21.93	21.87	21.95	1	24	21.98	22.04	21.97
	1	24	21.97	21.91	22.06	1	49	22.00	21.97	22.13
	12	0	21.00	20.92	20.78	25	0	21.10	21.00	20.87
	12	6	20.86	20.82	21.06	25	12	20.91	21.01	21.15
	12	13	21.01	20.81	20.97	25	25	21.05	20.92	21.05
	25	0	20.72	21.03	21.09	50	0	20.91	21.10	21.12

4.5.4 LTE Band 7

LTE Band 7 Maximum Average Power (dBm)										
Modulation	RB		Test Channel			RB		Test Channel		
	Size	Offset	Low	Mid	High	Size	Offset	Low	Mid	High
Channel Bandwidth: 5 MHz						Channel Bandwidth: 10 MHz				
QPSK	1	0	23.85	24.03	24.14	1	0	23.87	23.93	24.20
	1	12	23.85	24.00	24.02	1	24	23.96	23.99	24.06
	1	24	24.13	24.21	24.06	1	49	24.12	24.28	24.19
	12	0	23.36	23.61	23.72	25	0	23.44	23.63	23.66
	12	6	23.50	23.80	23.83	25	12	23.51	23.71	23.76
	12	13	23.55	23.72	23.80	25	25	23.54	23.71	23.84
	25	0	23.57	23.78	23.68	50	0	23.61	23.64	23.81
16QAM	1	0	23.20	23.41	23.29	1	0	23.24	23.31	23.34
	1	12	23.32	23.31	23.61	1	24	23.21	23.31	23.49
	1	24	23.43	23.52	23.57	1	49	23.40	23.53	23.41
	12	0	23.11	23.42	23.31	25	0	23.09	23.33	23.41
	12	6	23.18	23.48	23.60	25	12	23.28	23.44	23.44
	12	13	23.38	23.28	23.56	25	25	23.37	23.36	23.56
	25	0	23.18	23.25	23.45	50	0	23.12	23.38	23.39
Channel Bandwidth: 15 MHz						Channel Bandwidth: 20 MHz				
QPSK	1	0	23.81	23.97	24.18	1	0	24.00	24.09	24.21
	1	37	23.85	24.10	24.13	1	50	24.03	24.11	24.22
	1	74	24.17	24.15	24.16	1	99	24.17	**24.29**	24.25
	37	0	23.43	23.55	23.78	50	0	23.54	23.63	23.80
	37	19	23.63	23.74	23.76	50	25	23.64	23.80	23.88
	37	39	23.69	23.73	23.87	50	50	23.72	23.90	23.87
	75	0	23.51	23.66	23.65	100	0	23.62	23.84	23.83
16QAM	1	0	23.35	23.35	23.33	1	0	23.36	23.45	23.44
	1	37	23.31	23.47	23.66	1	50	23.35	23.48	23.67
	1	74	23.36	23.57	23.46	1	99	23.47	23.63	23.59
	37	0	23.08	23.42	23.46	50	0	23.24	23.46	23.50
	37	19	23.32	23.44	23.55	50	25	23.32	23.50	23.63
	37	39	23.40	23.30	23.38	50	50	23.43	23.46	23.57
	75	0	23.11	23.25	23.42	100	0	23.19	23.40	23.50

Pre-scan all bandwidth and RB, find worse case mode are chosen to the report, the LTE worse case mode applicability and tested channel detail as below:

Item	Band	Bandwidth(MHz)						Modulation			RB			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	64QAM	1	Half	Full	L	M	H
ERP/EIRP	2	☒	☒	☒	☒	☒	☒	☒	☒	☐	☒	☐	☐	☒	☒	☒
	4	☒	☒	☒	☒	☒	☒	☒	☒	☐	☒	☐	☐	☒	☒	☒
	5	☒	☒	☒	☒	--	--	☒	☒	☐	☒	☐	☐	☒	☒	☒
	7	-	-	☒	☒	☒	☒	☒	☒	☐	☒	☐	☐	☒	☒	☒
Conducted output power	2	☒	☒	☒	☒	☒	☒	☒	☒	☐	☒	☒	☒	☒	☒	☒
	4	☒	☒	☒	☒	☒	☒	☒	☒	☐	☒	☒	☒	☒	☒	☒
	5	☒	☒	☒	☒	--	--	☒	☒	☐	☒	☒	☒	☒	☒	☒
	7	-	-	☒	☒	☒	☒	☒	☒	☐	☒	☒	☒	☒	☒	☒
99%&26dB Bandwidth	2	☒	☒	☒	☒	☒	☒	☒	☒	☐	☐	☐	☒	☒	☒	☒
	4	☒	☒	☒	☒	☒	☒	☒	☒	☐	☐	☐	☒	☒	☒	☒
	5	☒	☒	☒	☒	--	--	☒	☒	☐	☐	☐	☒	☒	☒	☒
	7	-	-	☒	☒	☒	☒	☒	☒	☐	☐	☐	☒	☒	☒	☒
peak-to-average ratio	2	☐	☐	☐	☐	☐	☒	☒	☒	☐	☒	☐	☒	☒	☐	☒
	4	☐	☐	☐	☐	☐	☒	☒	☒	☐	☒	☐	☒	☒	☐	☒
	5	☐	☐	☐	☒	--	--	☒	☒	☐	☒	☐	☒	☒	☐	☒
	7	-	-	☐	☐	☐	☒	☒	☒	☐	☒	☐	☒	☒	☐	☒

Item	Band	Bandwidth(MHz)						Modulation			RB			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	64QAM	1	Half	Full	L	M	H
Band Edge at antenna terminals	2	☒	☒	☒	☒	☒	☒	☒	☒	☐	☒	☐	☒	☒	☐	☒
	4	☒	☒	☒	☒	☒	☒	☒	☒	☐	☒	☐	☒	☒	☐	☒
	5	☒	☒	☒	☒	--	--	☒	☒	☐	☒	☐	☒	☒	☐	☒
	7	-	-	☒	☒	☒	☒	☒	☒	☐	☒	☐	☒	☒	☐	☒
Spurious emissions at antenna terminals	2	☒	☒	☒	☒	☒	☒	☒	☒	☐	☒	☐	☐	☒	☒	☒
	4	☒	☒	☒	☒	☒	☒	☒	☒	☐	☒	☐	☐	☒	☒	☒
	5	☒	☒	☒	☒	--	--	☒	☒	☐	☒	☐	☐	☒	☒	☒
	7	-	-	☒	☒	☒	☒	☒	☒	☐	☒	☐	☐	☒	☒	☒
Field strength of spurious radiation	2	☐	☐	☐	☐	☐	☒	☒	☐	☐	☒	☐	☐	☒	☒	☒
	4	☐	☐	☐	☐	☐	☒	☒	☐	☐	☒	☐	☐	☒	☒	☒
	5	☐	☐	☐	☒	--	--	☒	☐	☐	☒	☐	☐	☒	☒	☒
	7	-	-	☐	☐	☐	☒	☒	☐	☐	☒	☐	☐	☒	☒	☒
Frequency stability	2	☐	☐	☐	☐	☐	☒	☒	☐	☐	☐	☐	☒	☐	☒	☐
	4	☐	☐	☐	☐	☐	☒	☒	☐	☐	☐	☐	☒	☐	☒	☐
	5	☐	☐	☐	☒	--	--	☒	☐	☐	☐	☐	☒	☐	☒	☐
	7	-	-	☐	☐	☐	☒	☒	☐	☐	☐	☐	☒	☐	☒	☐

Remark:
The mark "☒" means is chosen for testing; The mark "☐" means is not chosen for testing;
The mark "-" means is not supported bandwidth

5. RADIO TECHNICAL REQUIREMENTS SPECIFICATION

5.1 REFERENCE DOCUMENTS FOR TESTING

No.	Identity	Document Title
1	FCC 47 CFR Part 2	Frequency allocations and radio treaty matters; general rules and regulations
2	FCC 47 CFR Part 22	Public Mobile Services
3	FCC 47 CFR Part 27	Miscellaneous Wireless Communications Services
4	FCC 47 CFR Part 24	Personal Communications Services
5	ANSI C63.26-2015	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services
6	KDB 971168 D01	KDB 971168 D01 Power Meas License Digital Systems v03r01

5.2 ERP OR EIRP

Test Requirement: FCC 47 CFR Part 2.1046(a)
LTE Band 2: FCC 47 CFR Part 24.232(c)
LTE Band 4: FCC 47 CFR Part 27.50(d)(4)
LTE Band 5: FCC 47 CFR Part 22.913(a)
LTE Band 7: FCC 47 CFR Part 27.50(h)(2)

Test Method: KDB 971168 D01v03r01 Section 5.6 & ANSI C63.26-2015

Limit:

FCC 47 CFR Part 22.913(a):
The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

FCC 47 CFR Part 24.232(c):
Mobile and portable stations are limited to 2 watts EIRP.

FCC 47 CFR Part 27.50(d)(4):
Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.

FCC 47 CFR Part 27.50(h)(2):
Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

Antenna height (ATT) meters (feet)	Effective radiated power (watts)[1 2 4]
Above 1,372 (4,500)	65
Above 1,220 (4,000) to 1,372 (4,500)	70
Above 1,067 (3,500) to 1,220 (4,000)	75
Above 915 (3,000) to 1,067 (3,500)	100
Above 763 (2,500) to 915 (3,000)	140
Above 610 (2,000) to 763 (2,500)	200
Above 458 (1,500) to 610 (2,000)	350
Above 305 (1,000) to 458 (1,500)	600
Up to 305 (1,000)	[3]1,000

1. Power is given in terms of effective radiated power (ERP).
2. Applicants in the Los Angeles, CA, area who demonstrate a need to serve both the downtown and fringe areas will be permitted to utilize an ERP of 1 kw at the following mountaintop sites: Santiago Park, Sierra Peak, Mount Lukens, and Mount Wilson.
3. Stations with antennas below 305 m (1,000 ft) (AAT) will be restricted to a maximum power of 1 kw (ERP).

4. Licensees in San Diego, CA, will be permitted to utilize an ERP of 500 watts at the following mountaintop sites: Palomar, Otay, Woodson and Miguel.

Test Procedure:

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

where:

ERP or EIRP = effective radiated power or equivalent isotropically radiated power, respectively (expressed in the same units as PMeas, 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);

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

Test Setup: Refer to section 4.2.1 for details.

Instruments Used: Refer to section 3 for details

Test Mode: Link mode

Test Results: Pass

Test Data: See table below

5.2.1 LTE Band 2

LTE Band 2 Maximum EIRP (dBm)					
Channel	QPSK; RB:1	16QAM; RB:1	64QAM; RB:1	Limit (dBm)	Result
Channel Bandwidth: 1.4MHz					
Lowest	25.33	24.44	/	33.01	Pass
Middle	25.62	24.59	/	33.01	Pass
Highest	25.66	24.88	/	33.01	Pass
Channel Bandwidth: 3MHz					
Lowest	24.90	24.22	/	33.01	Pass
Middle	24.90	24.19	/	33.01	Pass
Highest	25.16	24.46	/	33.01	Pass
Channel Bandwidth: 5MHz					
Lowest	24.82	24.07	/	33.01	Pass
Middle	25.15	24.03	/	33.01	Pass
Highest	25.13	24.50	/	33.01	Pass
Channel Bandwidth: 10MHz					
Lowest	24.67	24.22	/	33.01	Pass
Middle	25.19	24.14	/	33.01	Pass
Highest	25.05	24.60	/	33.01	Pass
Channel Bandwidth: 15MHz					
Lowest	24.80	24.13	/	33.01	Pass
Middle	25.18	24.20	/	33.01	Pass
Highest	25.15	24.56	/	33.01	Pass
Channel Bandwidth: 20MHz					
Lowest	24.84	24.24	/	33.01	Pass
Middle	25.21	24.23	/	33.01	Pass
Highest	25.19	24.63	/	33.01	Pass

5.2.2 LTE Band 4

LTE Band 4 Maximum EIRP (dBm)					
Channel	QPSK; RB:1	16QAM; RB:1	64QAM; RB:1	Limit (dBm)	Result
Channel Bandwidth: 1.4MHz					
Lowest	23.59	23.34	/	30.00	Pass
Middle	23.79	23.43	/	30.00	Pass
Highest	23.63	23.66	/	30.00	Pass
Channel Bandwidth: 3MHz					
Lowest	23.68	22.41	/	30.00	Pass
Middle	23.74	22.65	/	30.00	Pass
Highest	23.78	22.76	/	30.00	Pass
Channel Bandwidth: 5MHz					
Lowest	23.68	22.37	/	30.00	Pass
Middle	23.82	22.31	/	30.00	Pass
Highest	23.67	22.79	/	30.00	Pass
Channel Bandwidth: 10MHz					
Lowest	23.70	22.28	/	30.00	Pass
Middle	23.82	22.36	/	30.00	Pass
Highest	23.74	22.81	/	30.00	Pass
Channel Bandwidth: 15MHz					
Lowest	23.58	22.33	/	30.00	Pass
Middle	23.74	22.30	/	30.00	Pass
Highest	23.66	22.79	/	30.00	Pass
Channel Bandwidth: 20MHz					
Lowest	23.75	22.47	/	30.00	Pass
Middle	23.85	22.49	/	30.00	Pass
Highest	23.82	22.87	/	30.00	Pass

5.2.3 LTE Band 5

LTE Band 5 Maximum ERP (dBm)					
Channel	QPSK; RB:1	16QAM; RB:1	64QAM; RB:1	Limit (dBm)	Result
Channel Bandwidth: 1.4MHz					
Lowest	19.92	18.99	/	38.45	Pass
Middle	19.82	18.83	/	38.45	Pass
Highest	19.92	18.84	/	38.45	Pass
Channel Bandwidth: 3MHz					
Lowest	19.26	18.81	/	38.45	Pass
Middle	19.28	18.90	/	38.45	Pass
Highest	19.22	18.85	/	38.45	Pass
Channel Bandwidth: 5MHz					
Lowest	19.24	18.86	/	38.45	Pass
Middle	19.21	18.80	/	38.45	Pass
Highest	19.31	18.95	/	38.45	Pass
Channel Bandwidth: 10MHz					
Lowest	19.30	18.89	/	38.45	Pass
Middle	19.37	18.86	/	38.45	Pass
Highest	19.29	19.02	/	38.45	Pass

5.2.4 LTE Band 7

LTE Band 7 Maximum EIRP (dBm)					
Channel	QPSK; RB:1	16QAM; RB:1	64QAM; RB:1	Limit (dBm)	Result
Channel Bandwidth: 5MHz					
Lowest	24.83	24.30	/	33.01	Pass
Middle	25.01	24.29	/	33.01	Pass
Highest	25.12	24.59	/	33.01	Pass
Channel Bandwidth: 10MHz					
Lowest	25.10	24.35	/	33.01	Pass
Middle	25.26	24.34	/	33.01	Pass
Highest	25.17	24.54	/	33.01	Pass
Channel Bandwidth: 15MHz					
Lowest	24.79	24.29	/	33.01	Pass
Middle	24.95	24.45	/	33.01	Pass
Highest	25.16	24.64	/	33.01	Pass
Channel Bandwidth: 20MHz					
Lowest	25.15	24.33	/	33.01	Pass
Middle	25.27	24.46	/	33.01	Pass
Highest	25.23	24.65	/	33.01	Pass

5.3 CONDUCTED OUTPUT POWER

Test Requirement: FCC 47 CFR Part 2.1046(a)
LTE Band 2: FCC 47 CFR Part 24.232(c)
LTE Band 4: FCC 47 CFR Part 27.50(d)(4)
LTE Band 5: FCC 47 CFR Part 22.913(a)
LTE Band 7: FCC 47 CFR Part 27.50(h)(2)

Test Method: KDB 971168 D01v03r01 & ANSI C63.26-2015

Limit:

FCC 47 CFR Part 22.913(a):
The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

FCC 47 CFR Part 24.232(c):
Mobile and portable stations are limited to 2 watts EIRP.

FCC 47 CFR Part 27.50(d)(4):
Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.

FCC 47 CFR Part 27.50(h)(2):
Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

Antenna height (ATT) meters (feet)	Effective radiated power (watts)[1 2 4]
Above 1,372 (4,500)	65
Above 1,220 (4,000) to 1,372 (4,500)	70
Above 1,067 (3,500) to 1,220 (4,000)	75
Above 915 (3,000) to 1,067 (3,500)	100
Above 763 (2,500) to 915 (3,000)	140
Above 610 (2,000) to 763 (2,500)	200
Above 458 (1,500) to 610 (2,000)	350
Above 305 (1,000) to 458 (1,500)	600
Up to 305 (1,000)	[3]1,000

1. Power is given in terms of effective radiated power (ERP).
2. Applicants in the Los Angeles, CA, area who demonstrate a need to serve both the downtown and fringe areas will be permitted to utilize an ERP of 1 kw at the following mountaintop sites: Santiago Park, Sierra Peak, Mount Lukens, and Mount Wilson.
3. Stations with antennas below 305 m (1,000 ft) (AAT) will be restricted to a maximum power of 1 kw (ERP).
4. Licensees in San Diego, CA, will be permitted to utilize an ERP of 500 watts at the following mountaintop sites: Palomar, Otay, Woodson and Miguel.

Test Procedure:
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.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

Test Setup: Refer to section 4.2.2 for details.
Instruments Used: Refer to section 3 for details
Test Mode: Link mode
Test Results: Pass
Test Data: The full result refer to section 4.5 for details.

5.4 PEAK-TO-AVERAGE RATIO

Test Requirement:	**LTE Band 2:** FCC 47 CFR Part 24.232(d) **LTE Band 4:** FCC 47 CFR Part 27.50(d)(5) **LTE Band 5:** FCC 47 CFR Part 22.913(a) **LTE Band 7:** FCC 47 CFR Part 27.50(d)(5)
Test Method:	KDB 971168 D01v03r01 Section 5.7
Limit:	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

Test Procedure:

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer.

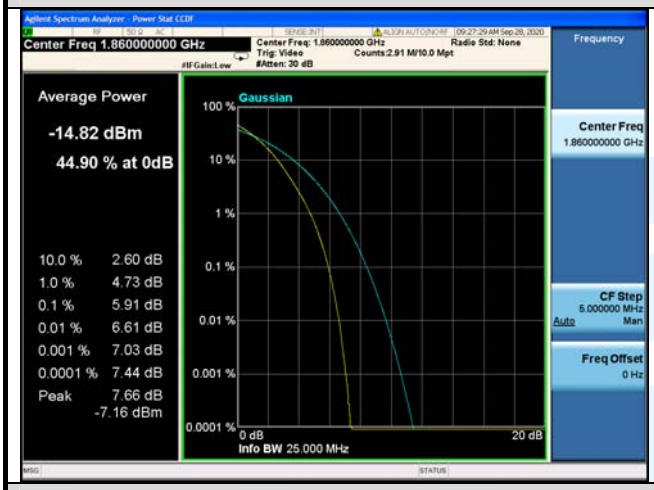
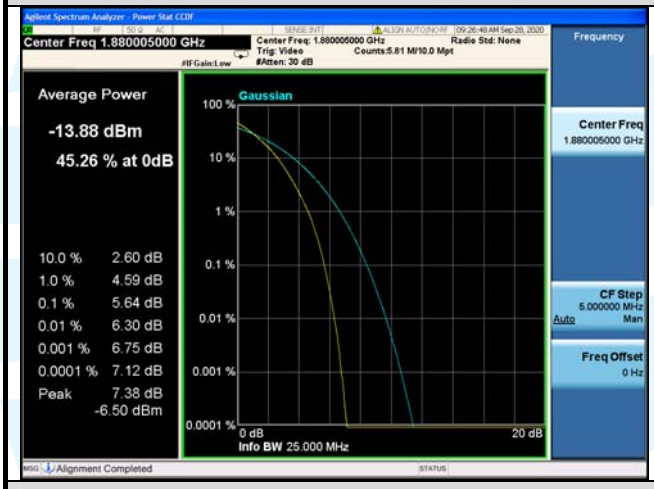
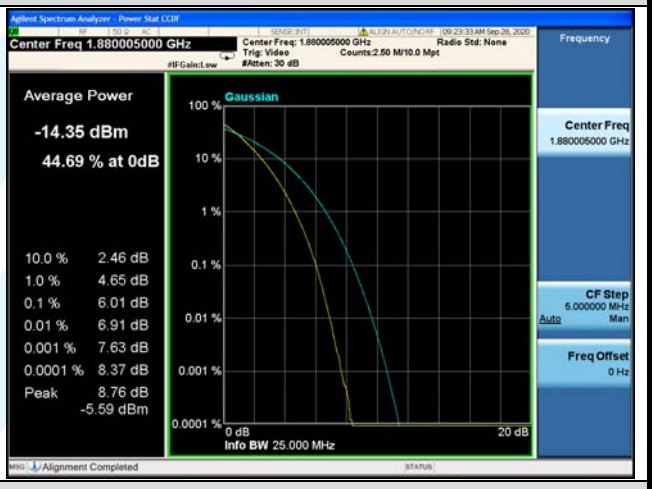
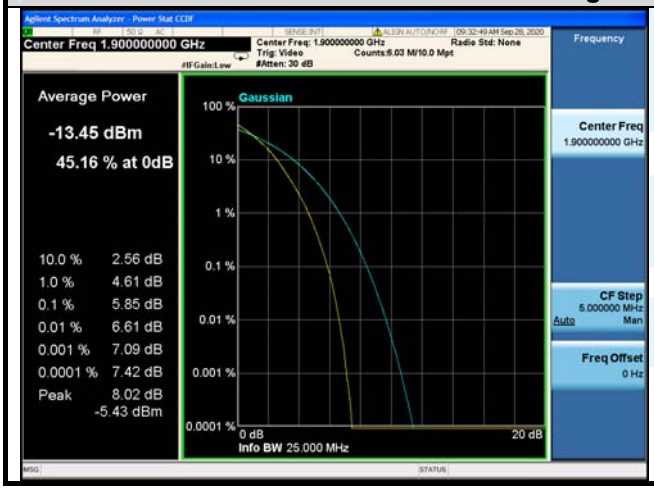
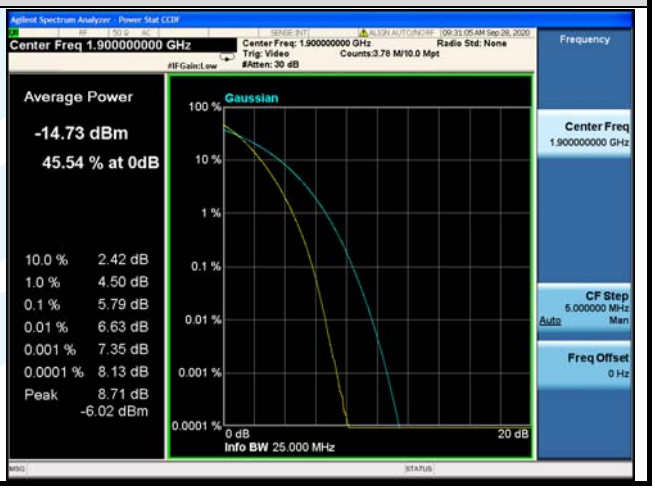
a) Set resolution/measurement bandwidth ≥ signal's occupied bandwidth
b) Set the number of counts to a value that stabilizes the measured CCDF curve
c) Record the maximum PAPR level associated with a probability of 0.1 %

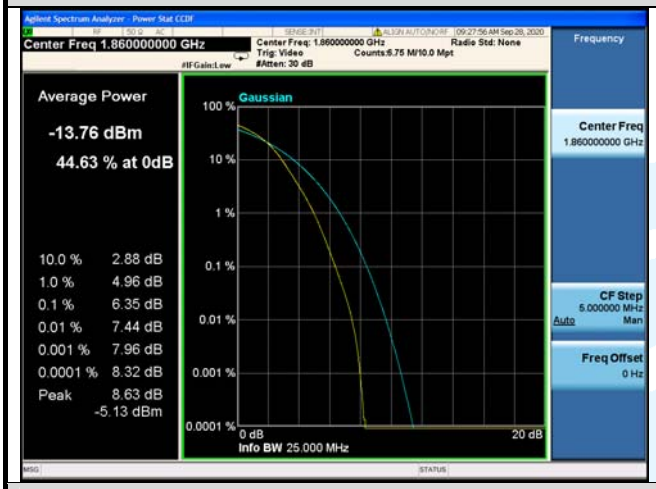
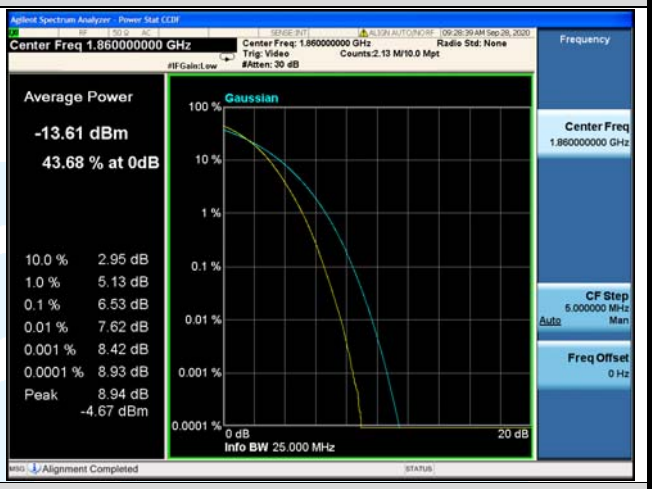
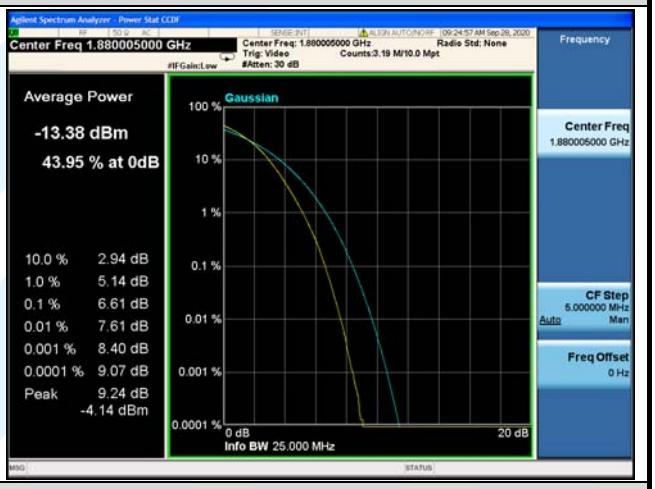
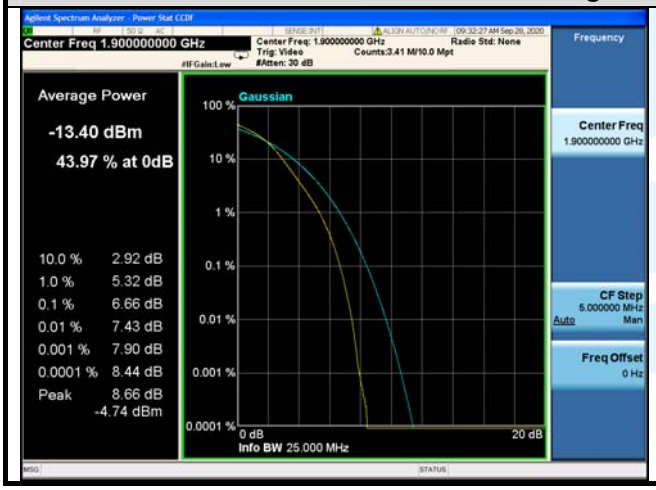
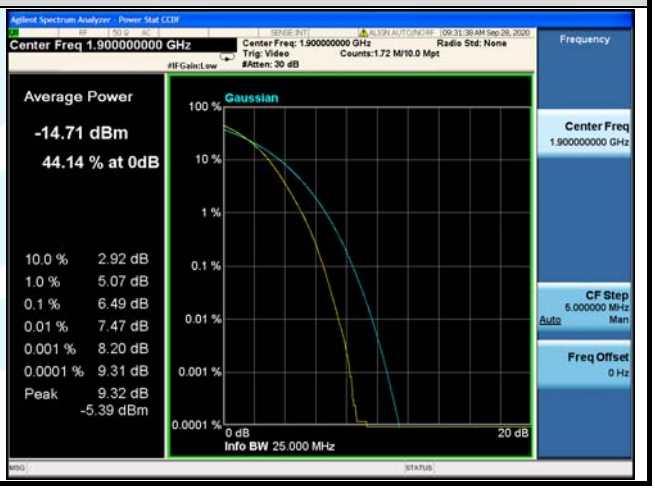
Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

Test Setup:	Refer to section 4.2.2 for details.
Instruments Used:	Refer to section 3 for details
Test Mode:	Link mode
Test Results:	Pass
Test Data:	See table below

5.4.1 LTE Band 2

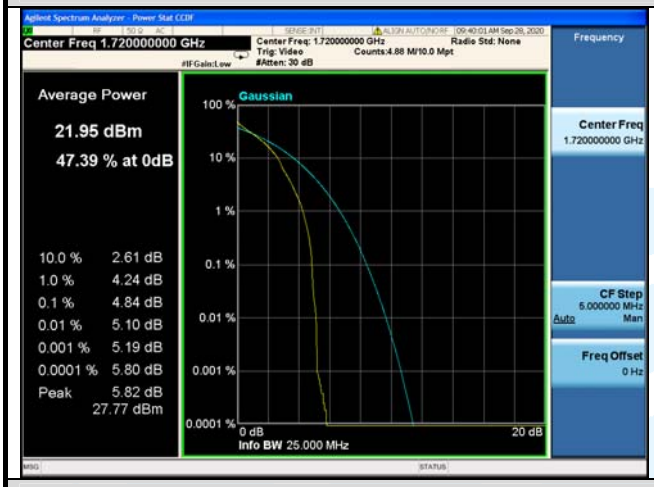
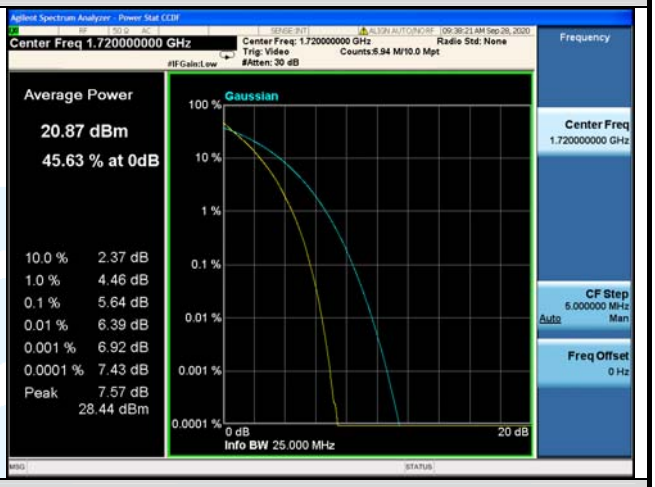
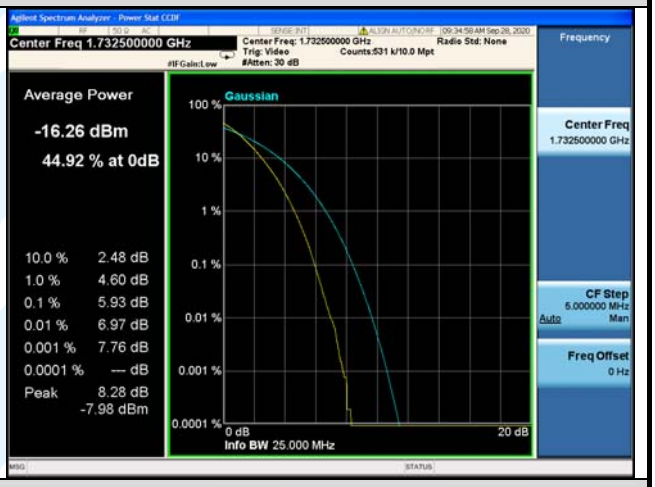
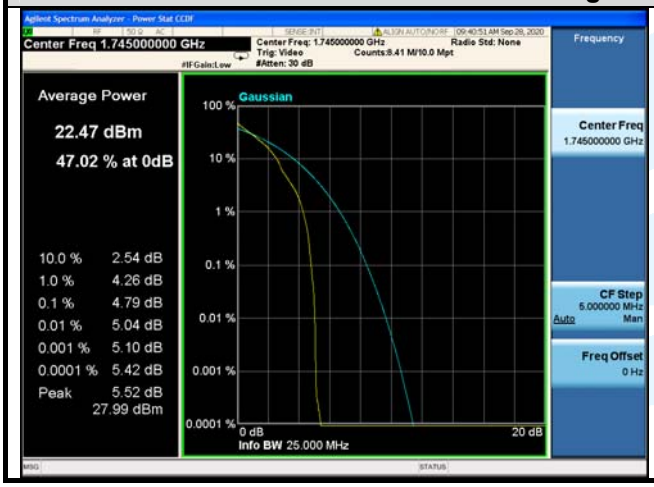
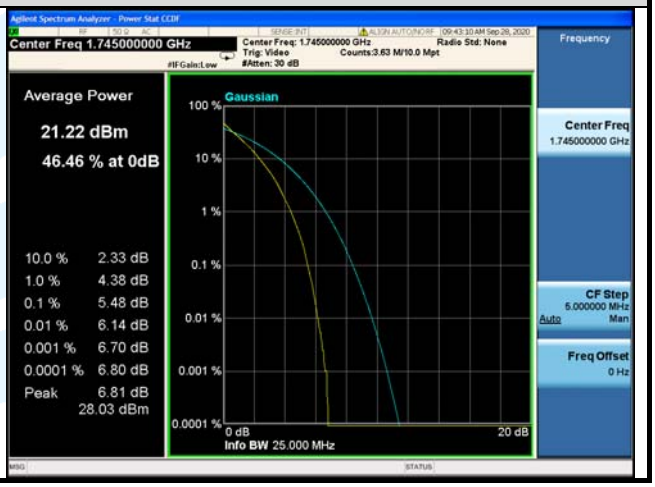
LTE Band 2 Peak-to-average ratio (dB)						
Channel	**RB Configuration**	**Channel Bandwidth: 20 MHz**			**Limit (dB)**	**Result**
		QPSK	**16QAM**	**64QAM**		
Lowest	1 RB	5.91	6.35	/	13	Pass
	Full RB	5.87	6.53	/	13	Pass
Middle	1 RB	5.64	5.96	/	13	Pass
	Full RB	6.01	6.61	/	13	Pass
Highest	1 RB	5.85	6.66	/	13	Pass
	Full RB	5.79	6.49	/	13	Pass

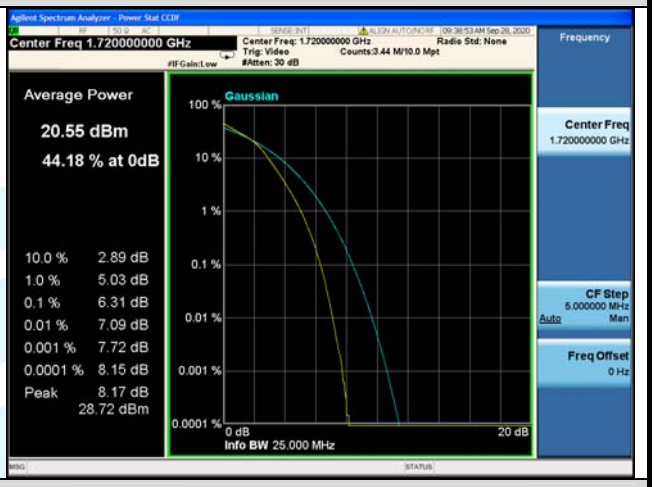
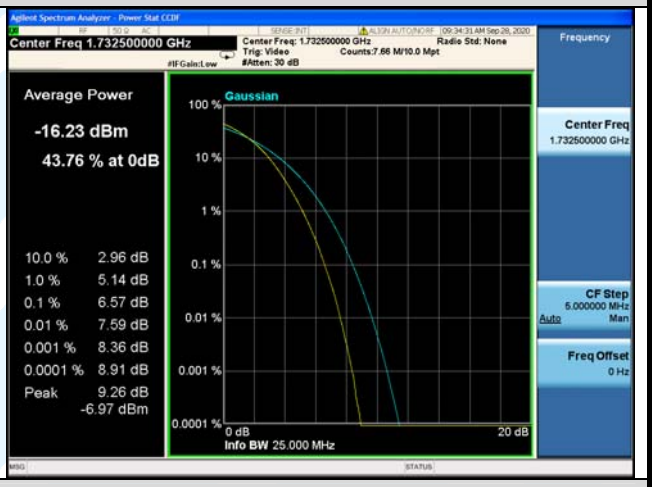
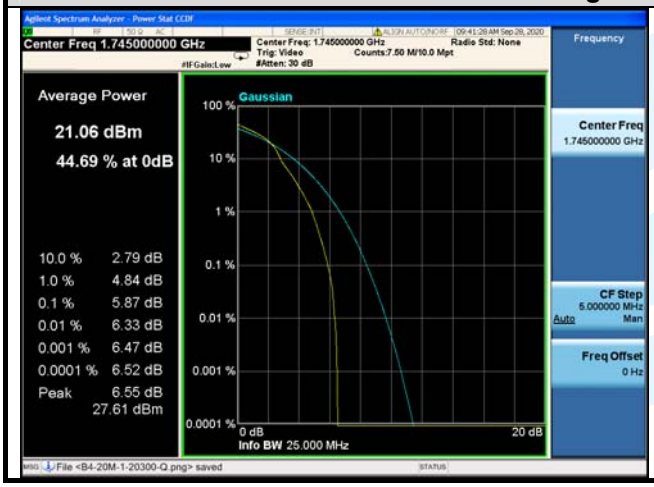
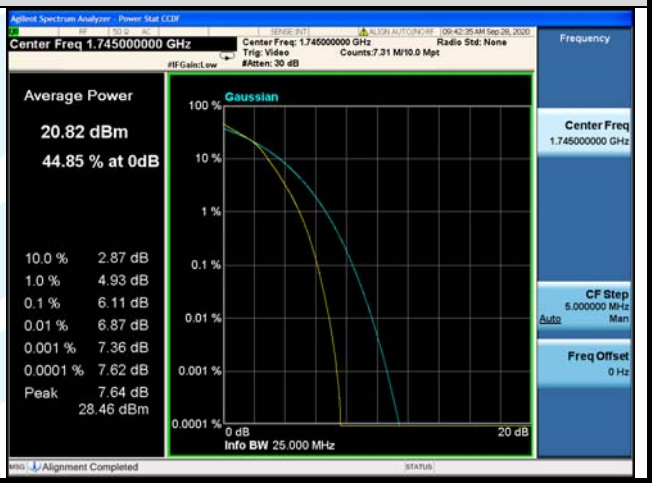
LTE Band 2 / 20 MHz / QPSK	
1 RB	Full RB
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

LTE Band 2 / 20 MHz / 16QAM	
1 RB	Full RB
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

5.4.2 LTE Band 4

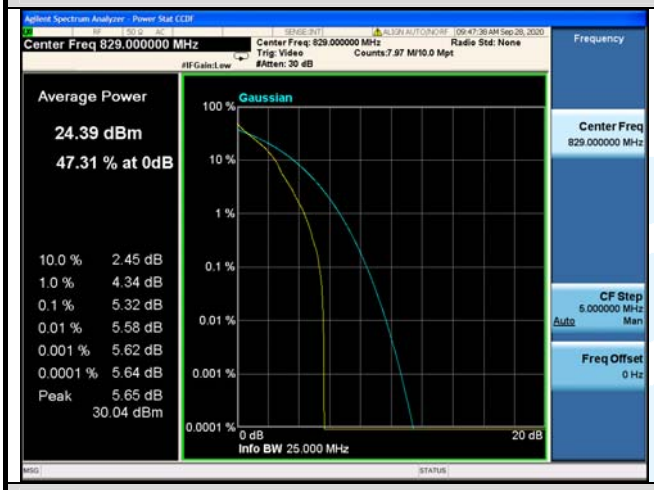
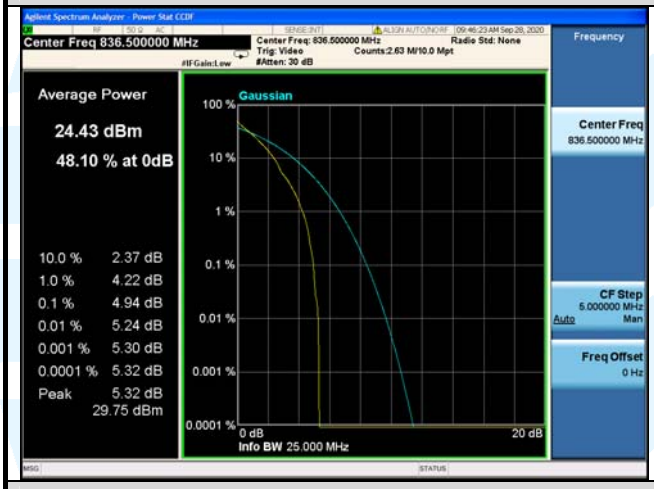
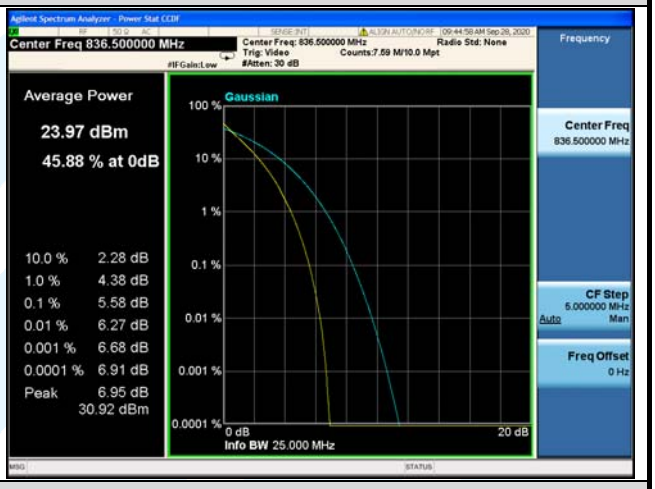
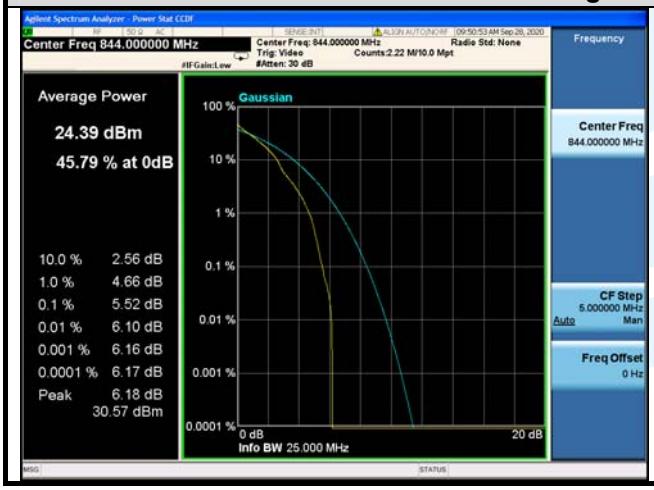
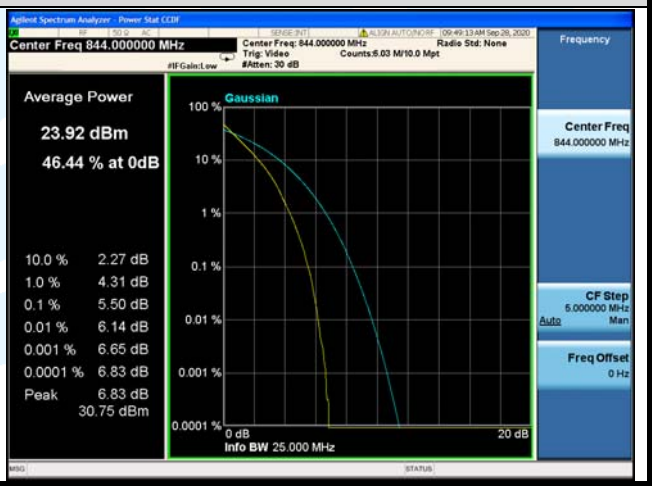
LTE Band 4 Peak-to-average ratio (dB)						
Channel	RB Configuration	Channel Bandwidth: 20 MHz			Limit (dB)	Result
		QPSK	16QAM	64QAM		
Lowest	1 RB	4.84	5.61	/	13	Pass
	Full RB	5.64	6.31	/	13	Pass
Middle	1 RB	6.15	6.96	/	13	Pass
	Full RB	5.93	6.57	/	13	Pass
Highest	1 RB	4.79	5.87	/	13	Pass
	Full RB	5.48	6.11	/	13	Pass

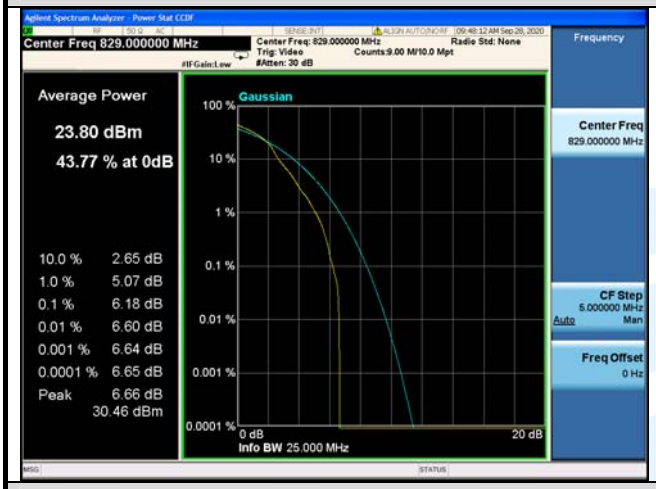
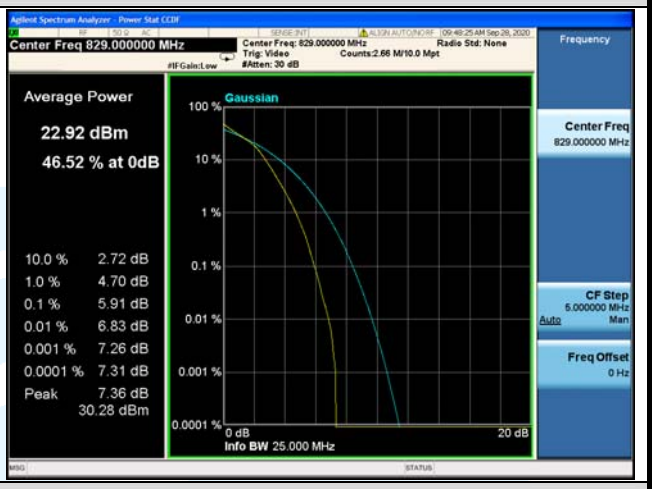
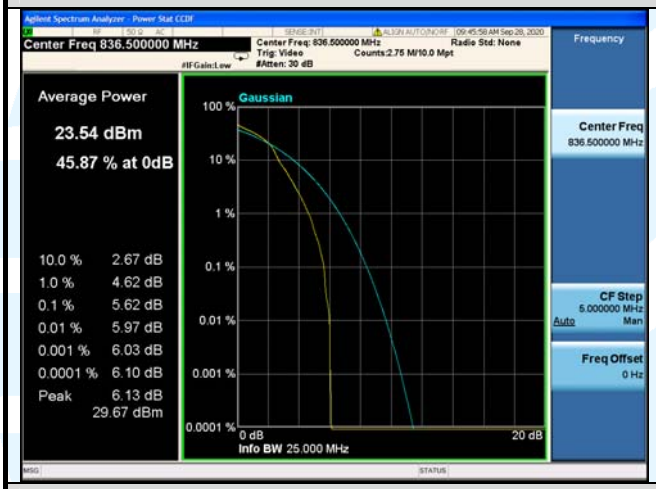
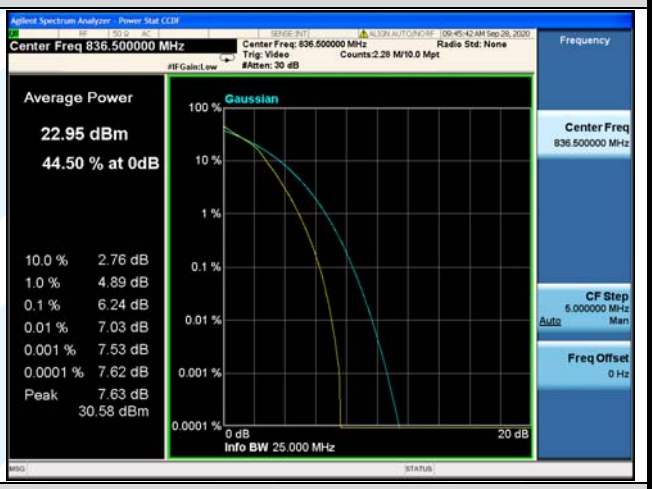
LTE Band 4 / 20MHz / QPSK	
1 RB	Full RB
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

LTE Band 4 / 20MHz / 16QAM	
1 RB	Full RB
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

5.4.3 LTE Band 5

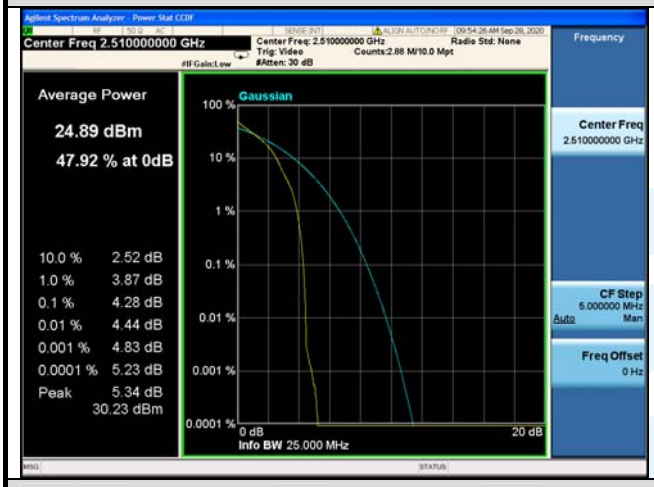
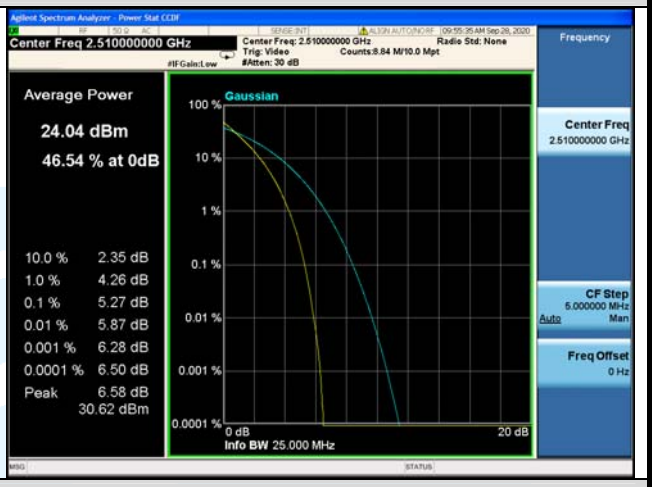
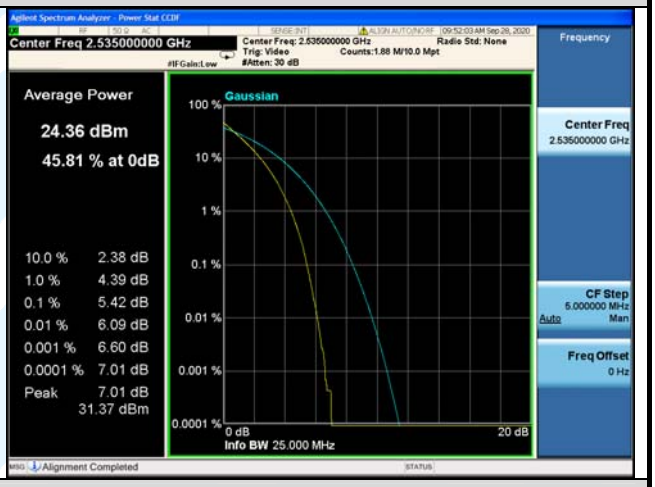
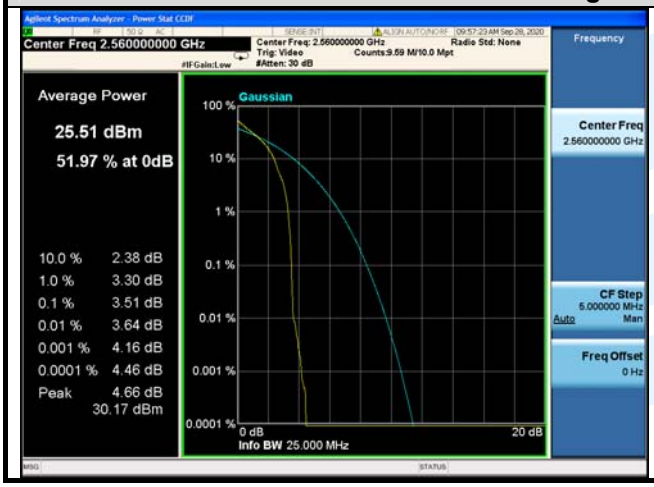
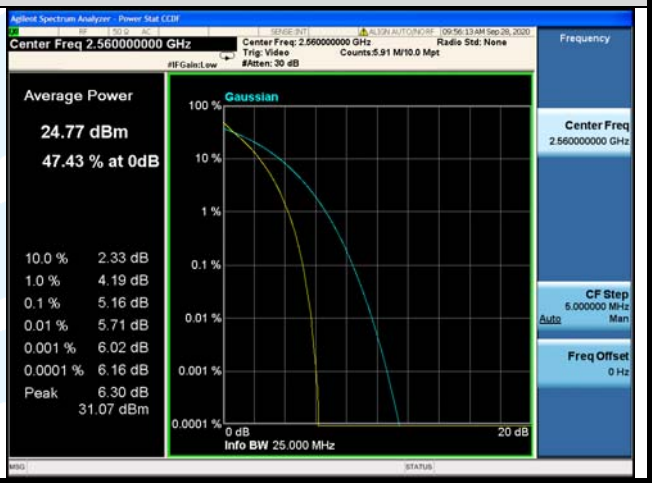
LTE Band 5 Peak-to-average ratio (dB)						
Channel	RB Configuration	Channel Bandwidth: 10 MHz			Limit (dB)	Result
		QPSK	16QAM	64QAM		
Lowest	1 RB	5.32	6.18	/	13	Pass
	Full RB	5.22	5.91	/	13	Pass
Middle	1 RB	4.94	5.62	/	13	Pass
	Full RB	5.58	6.24	/	13	Pass
Highest	1 RB	5.52	6.19	/	13	Pass
	Full RB	5.50	6.20	/	13	Pass

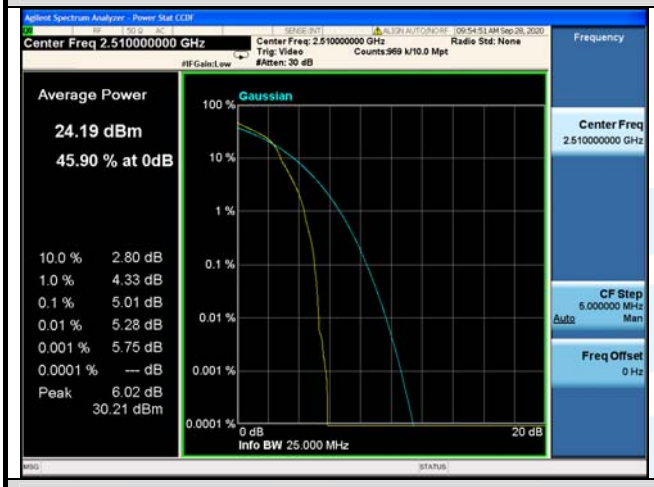
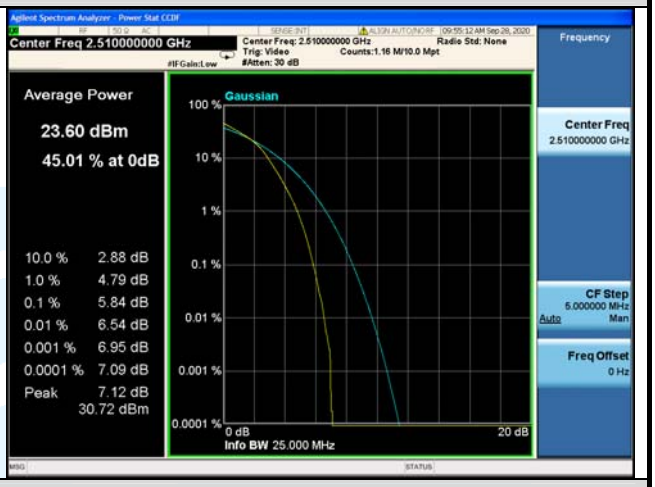
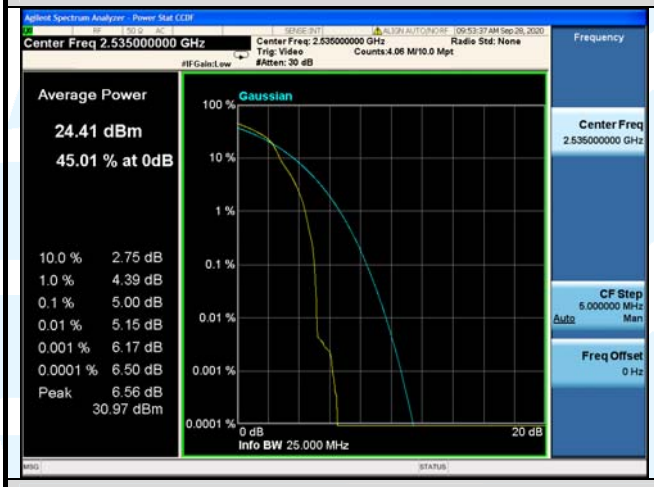
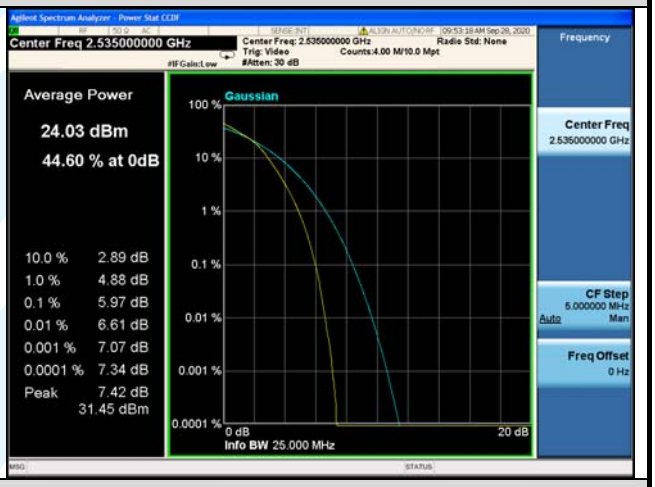
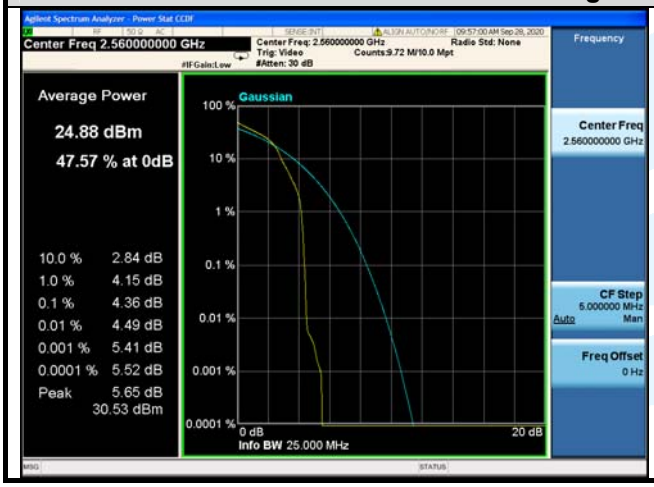
LTE Band 5 / 10 MHz / QPSK	
1 RB	Full RB
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

LTE Band 5 / 10 MHz / 16QAM	
1 RB	Full RB
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

5.4.4 LTE Band 7

LTE Band 7 Peak-to-average ratio (dB)						
Channel	RB Configuration	Channel Bandwidth: 20 MHz			Limit (dB)	Result
		QPSK	16QAM	64QAM		
Lowest	1 RB	4.28	5.01	/	13	Pass
	Full RB	5.27	5.84	/	13	Pass
Middle	1 RB	4.27	5.00	/	13	Pass
	Full RB	5.42	5.97	/	13	Pass
Highest	1 RB	3.51	4.36	/	13	Pass
	Full RB	5.16	5.55	/	13	Pass

LTE Band 7 / 20MHz / QPSK	
1 RB	Full RB
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

LTE Band 7 / 20MHz / 16QAM	
1 RB	Full RB
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

5.5 99%&26DB BANDWIDTH

Test Requirement: FCC 47 CFR Part 2.1049(h)

Test Method: ANSI C63.26-2015 & KDB 971168 D01v03r01 Section 4

Limit: No Limit, for reporting purposes only.

Test Procedure:

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at the low, middle and high channel in each band. The 99% and -26dB bandwidths was also measured and recorded.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

Test Setup: Refer to section 4.2.2 for details.

Instruments Used: Refer to section 3 for details

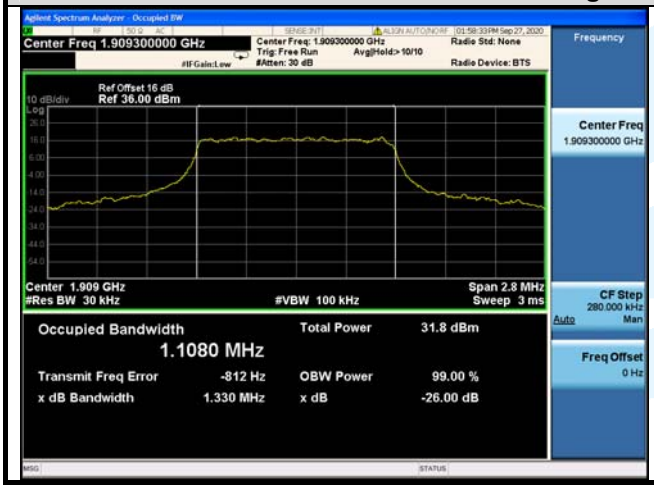
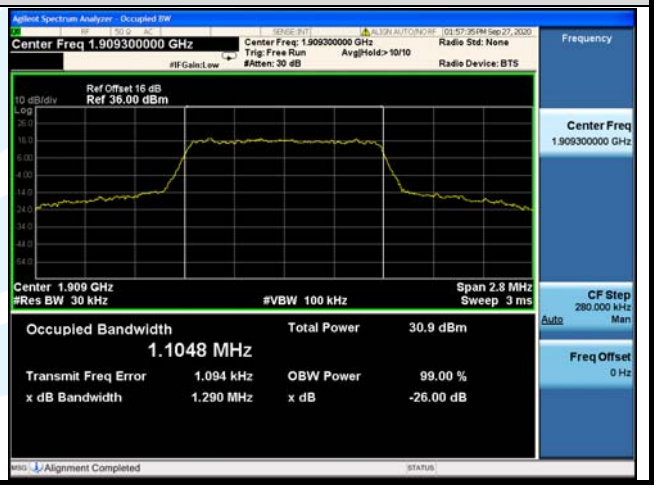
Test Mode: Link mode

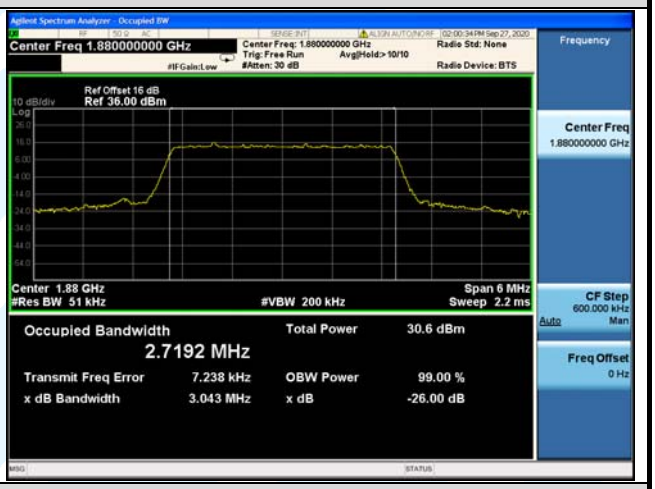
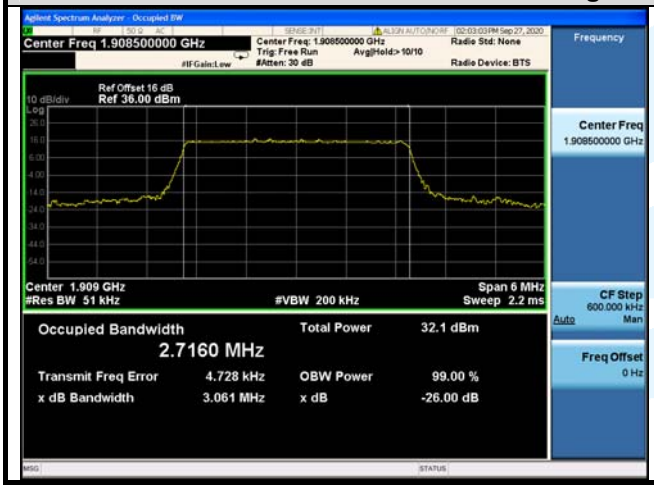
Test Results: Pass

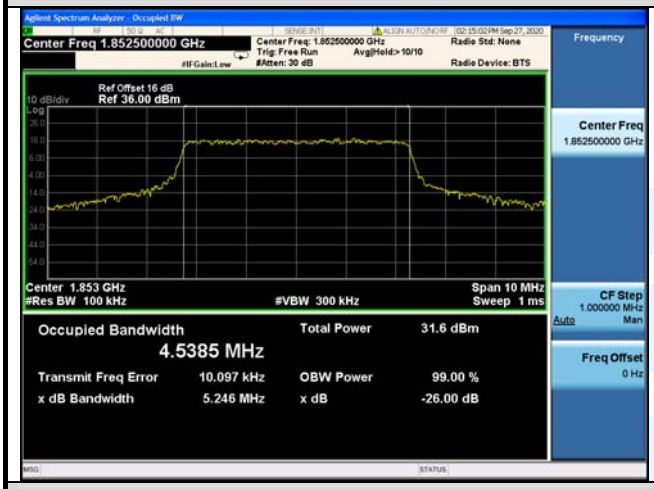
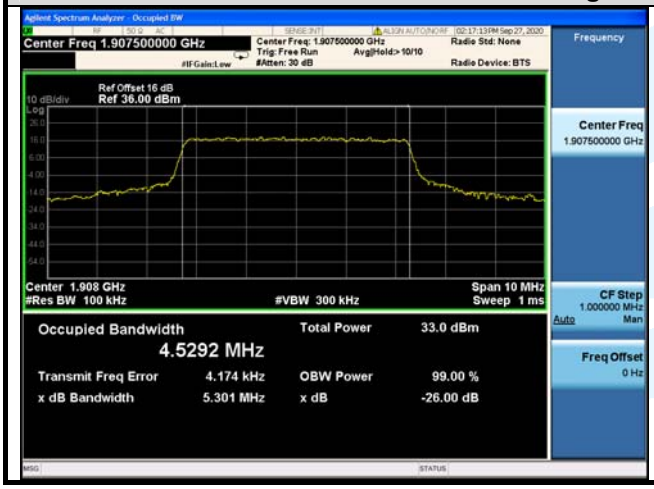
Test Data: See table below

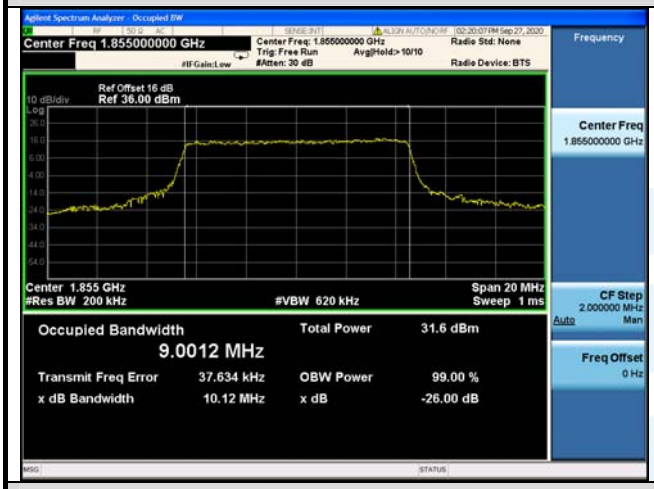
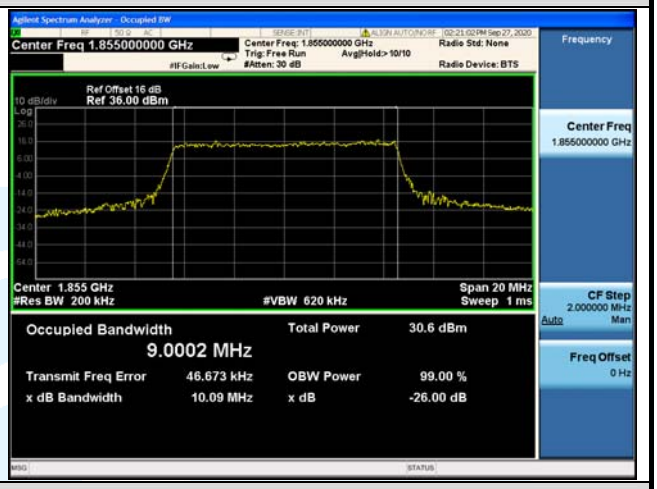
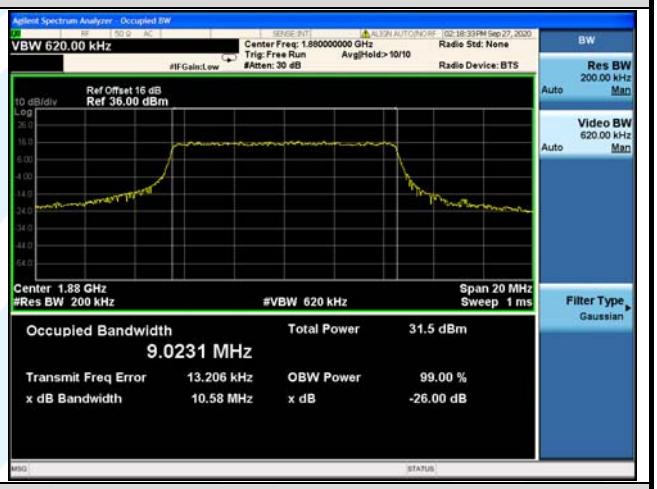
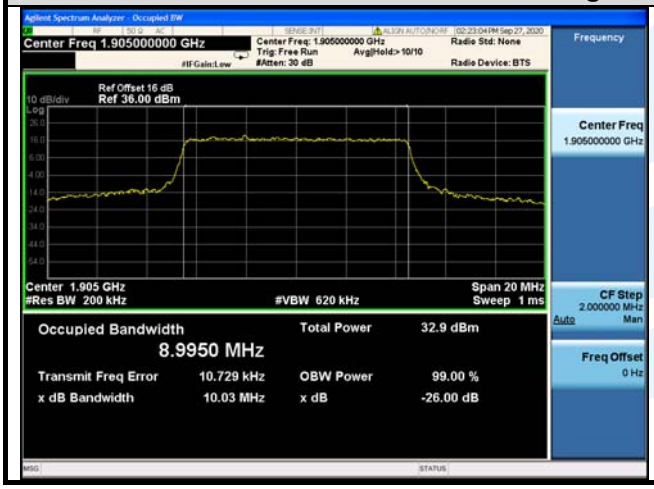
5.5.1 LTE Band 2

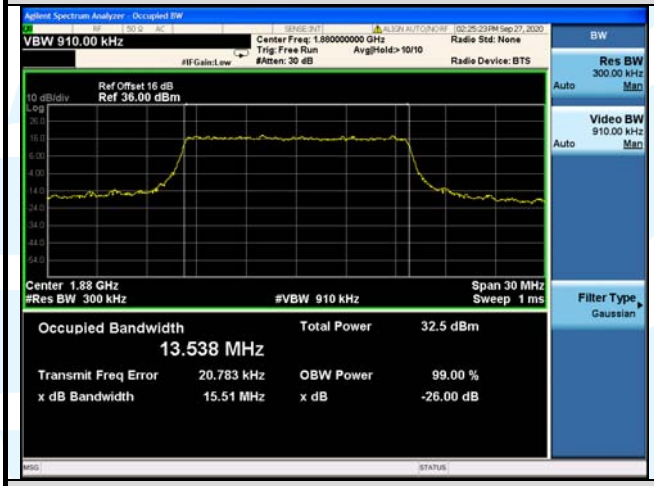
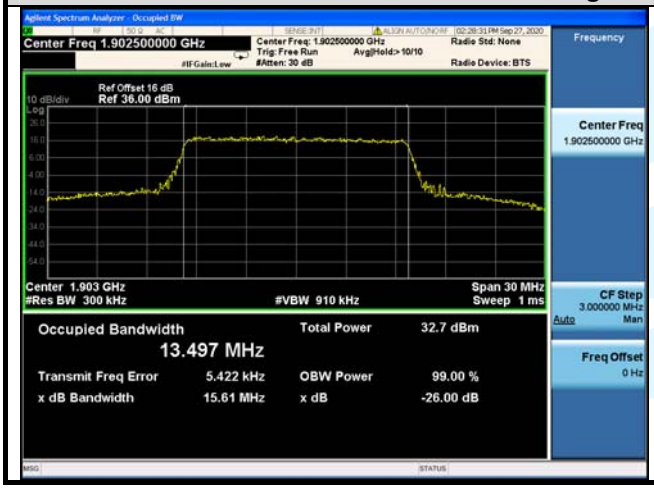
LTE Band 2								
Channel	RB Configuration		26 dB BW (MHz)			99% BW (MHz)		
	Size	Offset	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
Channel Bandwidth: 1.4 MHz								
Lowest	6	0	1.310	1.279	/	1.1011	1.1000	/
Middle	6	0	1.287	1.263	/	1.1030	1.1078	/
Highest	6	0	1.330	1.290	/	1.1080	1.1048	/
Channel Bandwidth: 3 MHz								
Lowest	15	0	3.096	3.150	/	2.7169	2.7121	/
Middle	15	0	3.063	3.043	/	2.7134	2.7192	/
Highest	15	0	3.061	3.167	/	2.7160	2.7214	/
Channel Bandwidth: 5 MHz								
Lowest	25	0	5.246	5.327	/	4.5385	4.5397	/
Middle	25	0	5.433	5.466	/	4.5314	4.5673	/
Highest	25	0	5.301	5.432	/	4.5292	4.5580	/
Channel Bandwidth: 10 MHz								
Lowest	50	0	10.12	10.09	/	9.0012	9.0002	/
Middle	50	0	10.28	10.58	/	9.0059	9.0231	/
Highest	50	0	10.03	10.13	/	8.9950	9.0026	/
Channel Bandwidth: 15 MHz								
Lowest	75	0	15.31	15.13	/	13.470	13.513	/
Middle	75	0	15.51	14.96	/	13.538	13.526	/
Highest	75	0	15.61	15.12	/	13.497	13.496	/
Channel Bandwidth: 20 MHz								
Lowest	100	0	20.20	20.16	/	17.995	18.019	/
Middle	100	0	20.22	20.01	/	18.068	18.045	/
Highest	100	0	20.25	20.23	/	18.014	17.997	/

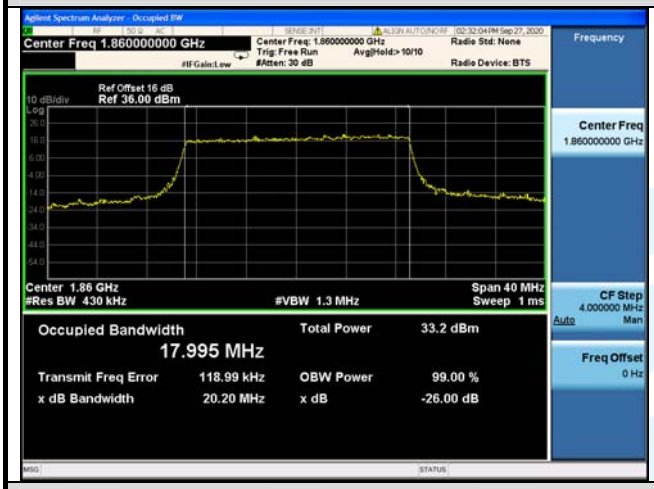
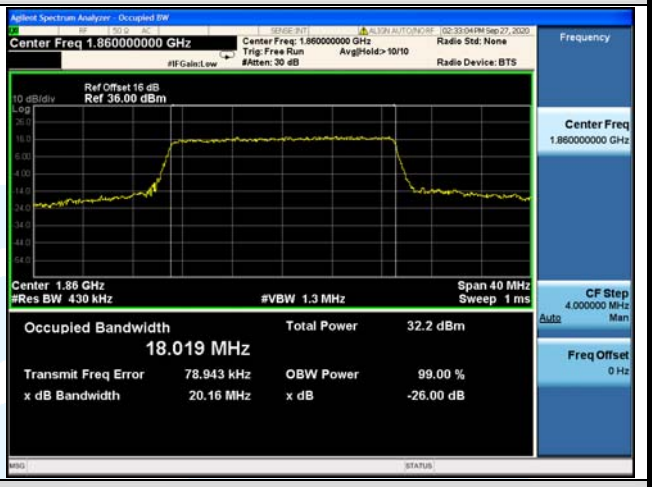
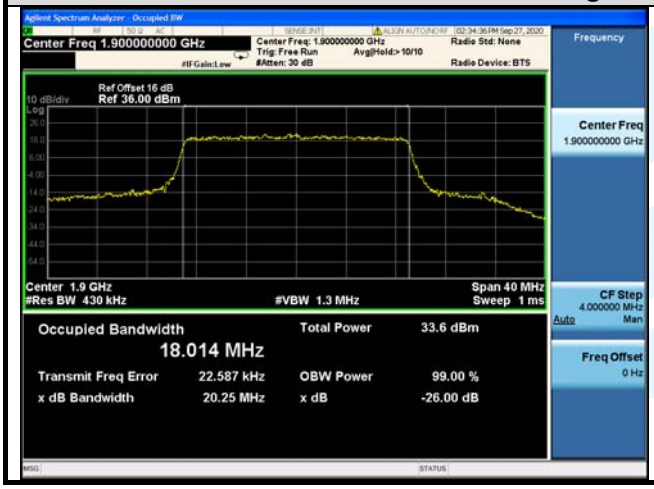
LTE Band 2_ Channel Bandwidth: 1.4 MHz	
QPSK	16QAM
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

LTE Band 2_ Channel Bandwidth: 3 MHz	
QPSK	16QAM
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

LTE Band 2_ Channel Bandwidth: 5 MHz	
QPSK	16QAM
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

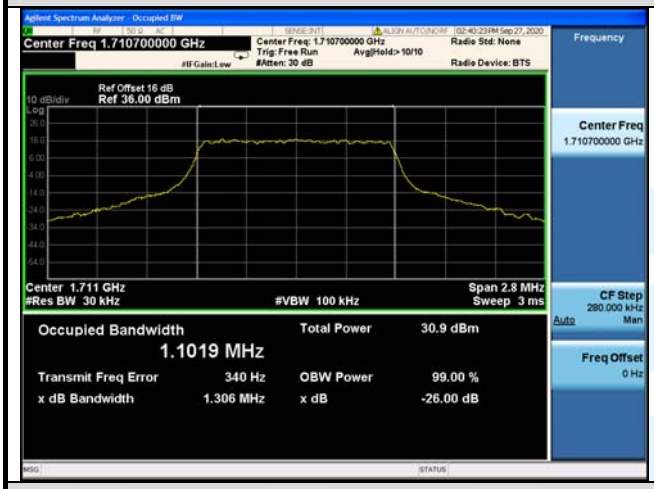
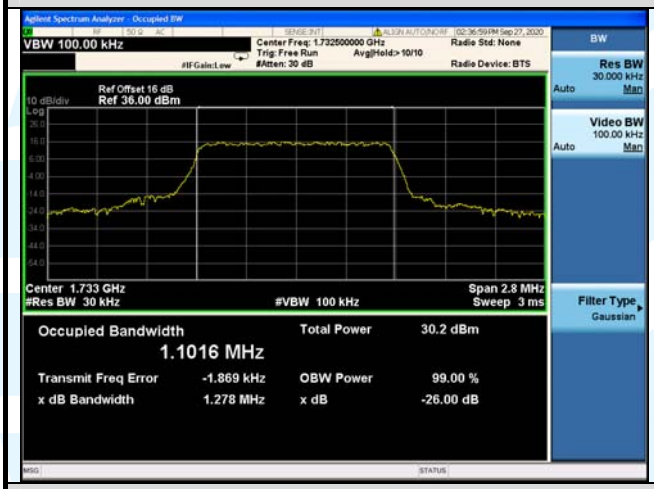
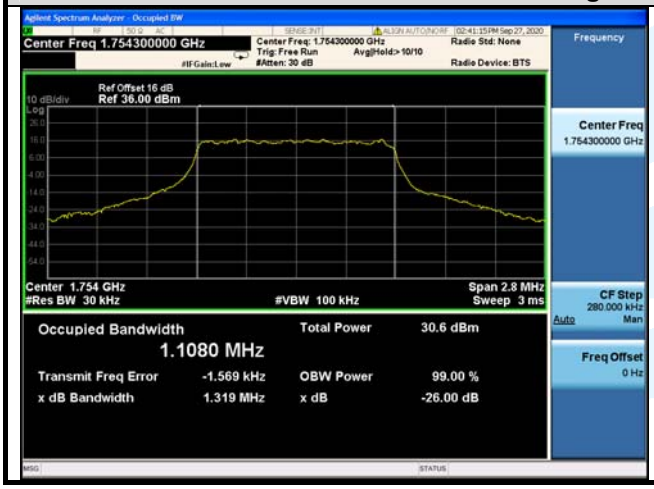
LTE Band 2_ Channel Bandwidth: 10 MHz	
QPSK	16QAM
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

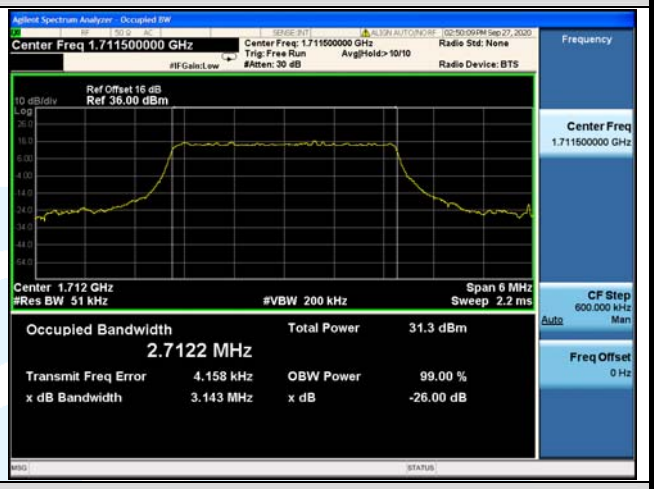
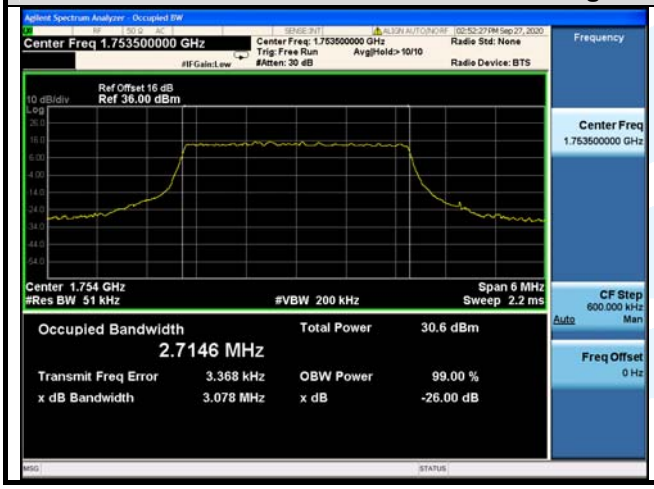
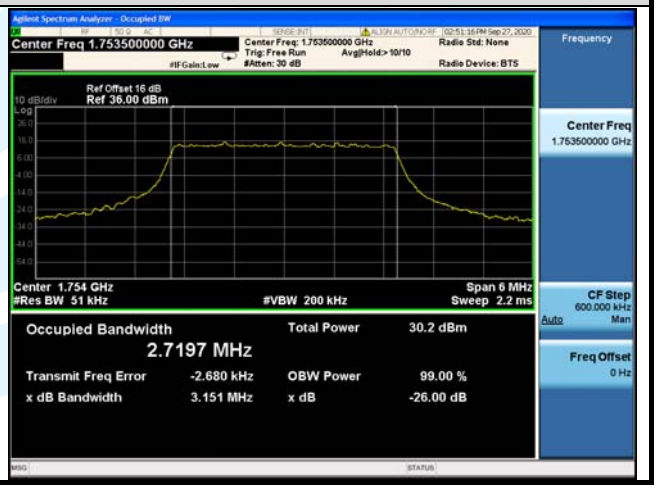
LTE Band 2_ Channel Bandwidth: 15 MHz	
QPSK	16QAM
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

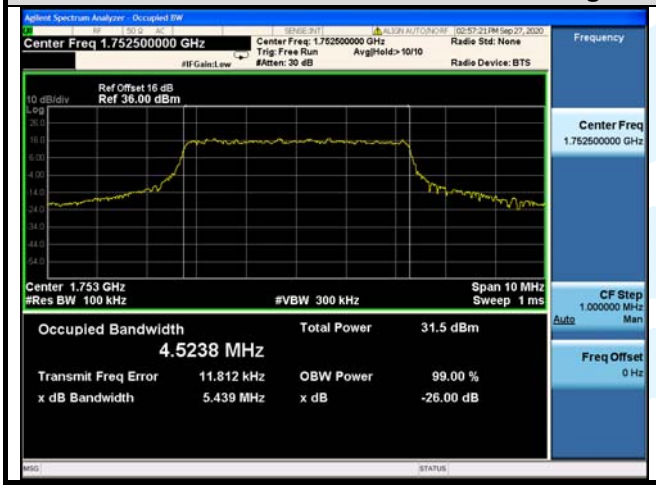
LTE Band 2_ Channel Bandwidth: 20 MHz	
QPSK	16QAM
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

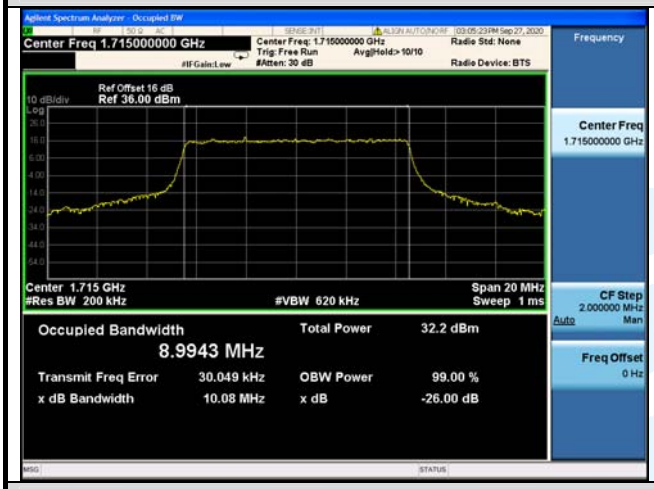
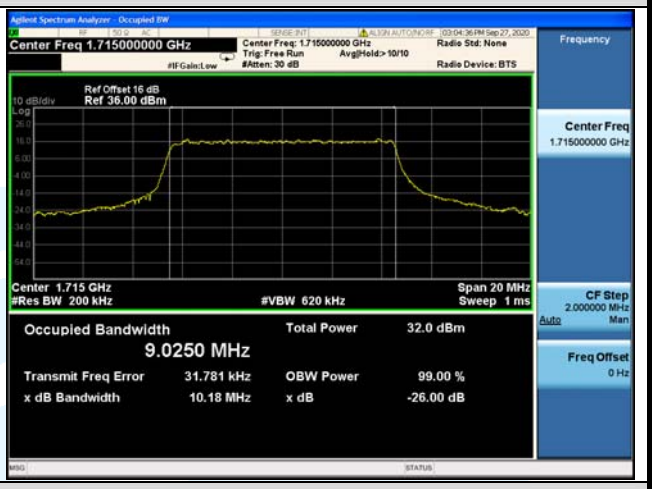
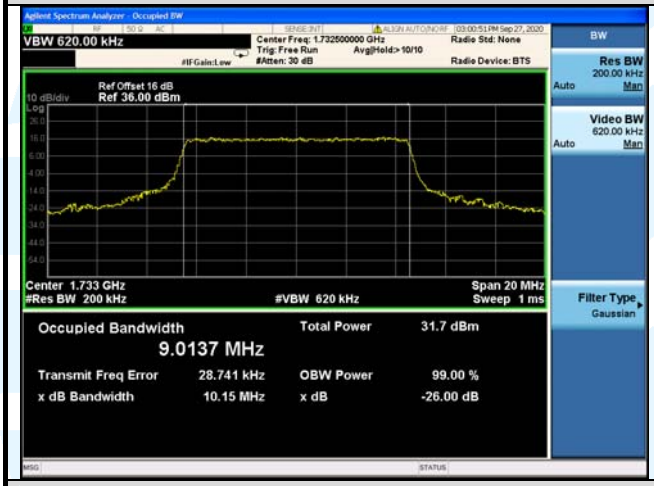
5.5.2 LTE Band 4

LTE Band 4								
Channel	RB Configuration		26 dB BW (MHz)			99% BW (MHz)		
	Size	Offset	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
Channel Bandwidth: 1.4 MHz								
Lowest	6	0	1.306	1.280		1.1019	1.0997	/
Middle	6	0	1.278	1.273		1.1016	1.1081	/
Highest	6	0	1.319	1.292		1.1080	1.1046	/
Channel Bandwidth: 3 MHz								
Lowest	15	0	3.048	3.143		2.7127	2.7122	/
Middle	15	0	3.055	3.060		2.7140	2.7239	/
Highest	15	0	3.078	3.151		2.7146	2.7197	/
Channel Bandwidth: 5 MHz								
Lowest	25	0	5.248	5.477	/	4.5281	4.5593	/
Middle	25	0	5.314	5.300	/	4.5438	4.5404	/
Highest	25	0	5.439	5.456	/	4.5238	4.5662	/
Channel Bandwidth: 10 MHz								
Lowest	50	0	10.08	10.18	/	8.9943	9.0250	/
Middle	50	0	10.15	10.22	/	9.0137	9.0098	/
Highest	50	0	10.19	10.59	/	9.0154	9.0142	/
Channel Bandwidth: 15 MHz								
Lowest	75	0	15.44	15.40	/	13.474	13.541	/
Middle	75	0	15.45	15.02	/	13.515	13.509	/
Highest	75	0	15.90	14.99	/	13.532	13.499	/
Channel Bandwidth: 20 MHz								
Lowest	100	0	20.31	20.17	/	18.039	18.039	/
Middle	100	0	20.09	20.38	/	18.022	18.086	/
Highest	100	0	20.54	20.46	/	18.073	18.048	/

LTE Band 4_ Channel Bandwidth: 1.4 MHz	
QPSK	16QAM
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

LTE Band 4_ Channel Bandwidth: 3 MHz	
QPSK	16QAM
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

LTE Band 4_ Channel Bandwidth: 5 MHz	
QPSK	16QAM
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

LTE Band 4_ Channel Bandwidth: 10 MHz	
QPSK	16QAM
Lowest Channel	
	
Middle Channel	
	
Highest Channel