FCC TEST REPORT

Product Name:	Mobile Phone
Trade Mark:	BLU
Model No.:	C5L MAX
Add. Model No.:	N/A
Report Number:	220126014RFM-2
Test Standards:	FCC 47 CFR Part 22 FCC 47 CFR Part 24 FCC 47 CFR Part 27
FCC ID:	YHLBLUC5LMX173
Test Result:	PASS
Date of Issue:	March 25, 2022

Prepared for:

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

Prepared by:

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Prepared by:	Calvin Chen Senior Project Engineer	Reviewed by:	Eric Yu Project Supervisor
Approved by:	Kevin Liang Assistant Manager	Date:	March 25, 2022

Version

Version No.	Date	Description
V1.0	March 25, 2022	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:	Mobile Phone		
Model No.:	C5L MAX		
Add. Model No.:	N/A		
Trade Mark:	BLU		
DUT Stage:	Production Unit		
EUT Supports Function: (Provided by the customer)	GSM Bands:	GSM850/1900	
	UTRA Bands:	Band II/ Band IV/ Band V	
	E-UTRA Bands:	FDD Band 2/ Band 4/ Band 5/ Band 7/Band 12/Band 17/ Band 66/	
	2.4 GHz ISM Band:	IEEE 802.11b/g/n	
		Bluetooth 5.0	
	RNSS Bands:	1559 MHz to 1610 MHz	GPS/ GLONASS/ BDS
	BSR:	VHF Band II	FM
Software Version:	BLU_C0173WW_V11.0.03.02_GENERIC 22-02-2022 10:36 (Provided by the customer)		
Hardware Version:	A507_MB_V6.0 (Provided by the customer)		
Sample Received Date:	January 26, 2022		
Sample Tested Date:	February 15, 2022 to March 3, 2022		

1.2.2 Description of Accessories

Adapter	
Model No.:	US-FC-0750
Input:	100-240 V~50/60 Hz 0.2 A
Output:	5.0 V ⎓ 750 mA
DC Cable:	0.9 Meter, Unshielded without ferrite

Battery	
Model No.:	C775444200L
Battery Type:	Lithium-ion Rechargeable Battery
Rated Voltage:	3.8 Vdc
Limited Charge Voltage:	4.35 Vdc
Rated Capacity:	2000 mAh

Cable	
Description:	USB Micro-B Plug Cable
Cable Type:	Unshielded without ferrite
Length:	1 Meter

1.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD

Support Networks:	LTE	
Type of Modulation:	LTE Band 2/4/5/7/12/17/66	QPSK, 16QAM
Antenna Type:	PIFA Antenna	
Antenna Gain: (Provided by the customer)	LTE Band 2:	-1.7 dBi
	LTE Band 4:	-1.7 dBi
	LTE Band 5:	-1.5 dBi
	LTE Band 7:	-1.6 dBi
	LTE Band 12:	-1.9 dBi
	LTE Band 17:	-2.0 dBi
	LTE Band 66:	-1.7 dBi
IEMI:	Radiation: 362523432421801, 362523432421819	
	Conducted: 362523432421447, 362523432421454	
Normal Test Voltage:	3.8 Vdc	
Extreme Test Voltage:	3.6 to 4.35Vdc	
Extreme Test Temperature:	-20 °C to +50 °C	

Summary of Results:

Bands	BW	Modulation	Frequency Range	Max RF Output Power (dBm)		EIRP	99% BW	Emission Designator
	(MHz)		(MHz)	Conducted (Average)	ERP/EIRP (Average)	(W)	(MHz)	
2	1.4	QPSK	1850.7-1909.3	23.72	22.02	0.15922	1.1028	1M11G7D
		16QAM		23.31	21.61	0.14488	1.1064	1M11W7D
	3	QPSK	1851.5-1908.5	23.61	21.91	0.15524	2.7169	2M72G7D
		16QAM		23.32	21.62	0.14521	2.7144	2M71W7D
	5	QPSK	1852.5-1907.5	23.73	22.03	0.15959	4.5237	4M52G7D
		16QAM		23.25	21.55	0.14289	4.5425	4M54W7D
	10	QPSK	1855.0-1905.0	23.76	22.06	0.16069	9.0090	9M01G7D
		16QAM		23.20	21.50	0.14125	9.0060	9M01W7D
	15	QPSK	1857.5-1902.5	23.76	22.06	0.16069	13.5020	13M5G7D
		16QAM		23.30	21.60	0.14454	13.5610	13M6W7D
	20	QPSK	1860.0-1900.0	23.78	22.08	0.16144	18.0570	18M1G7D
		16QAM		23.34	21.64	0.14588	18.0950	18M1W7D

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	23.93	22.23	0.16711	1.1040	1M10G7D
		16QAM		23.61	21.91	0.15524	1.1077	1M11W7D
	3	QPSK	1711.5-1753.5	23.88	22.18	0.16520	2.7174	2M72G7D
		16QAM		23.61	21.91	0.15524	2.7156	2M72W7D
	5	QPSK	1712.5-1752.5	23.93	22.23	0.16711	4.5218	4M52G7D
		16QAM		23.64	21.94	0.15631	4.5506	4M55W7D
	10	QPSK	1715-1750	23.89	22.19	0.16558	9.0190	9M02G7D
		16QAM		23.63	21.93	0.15596	9.0058	9M01W7D
	15	QPSK	1717.5-1747.5	23.88	22.18	0.16520	13.5360	13M5G7D
		16QAM		23.58	21.88	0.15417	13.5380	13M5W7D
	20	QPSK	1720-1745	23.99	22.29	0.16943	18.0660	18M1G7D
		16QAM		23.68	21.98	0.15776	18.0890	18M1W7D
5	1.4	QPSK	824.7-848.3	23.85	20.20	0.10471	1.1060	1M11G7D
		16QAM		23.11	19.26	0.08433	1.1077	1M11W7D
	3	QPSK	825.5-847.5	23.79	20.14	0.10328	2.7163	2M72G7D
		16QAM		23.28	19.63	0.09183	2.7192	2M72W7D
	5	QPSK	826.5-846.5	23.85	20.20	0.10471	4.5249	4M52G7D
		16QAM		23.14	20.99	0.12560	4.5438	4M54W7D
	10	QPSK	829-844	23.95	20.30	0.10715	9.0138	9M01G7D
		16QAM		23.31	19.66	0.09247	9.0312	9M03W7D
7	5	QPSK	2502.5-2567.5	23.97	22.37	0.17258	4.5320	4M53G7D
		16QAM		23.13	21.53	0.14223	4.5526	4M55W7D
	10	QPSK	2505-2565	23.97	22.37	0.17258	9.0298	9M03G7D
		16QAM		23.1	21.5	0.14125	9.0188	9M02W7D
	15	QPSK	2507.5-2562.5	24.01	22.41	0.17418	13.5070	13M5G7D
		16QAM		23.14	21.54	0.14256	13.5090	13M5W7D
	20	QPSK	2510-2560	24.03	22.43	0.17498	18.0780	18M1G7D
		16QAM		23.17	21.57	0.14355	18.0520	18M1W7D
12	1.4	QPSK	699.7-715.3	23.84	19.79	0.24210	1.1046	1M10G7D
		16QAM		22.85	19.10	0.19275	1.1070	1M11W7D
	3	QPSK	700.5-714.5	23.83	19.78	0.24155	2.7135	2M72G7D
		16QAM		22.84	18.79	0.19231	2.7220	2M72W7D
	5	QPSK	701.5-713.5	23.90	19.85	0.24547	4.5363	4M54G7D
		16QAM		22.87	18.82	0.19364	4.5465	4M55W7D
	10	QPSK	704-711	23.93	19.88	0.24717	9.0612	9M06G7D
		16QAM		22.89	18.84	0.19454	9.0369	9M04W7D

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)			
17	5	QPSK	706.5-713.5	23.90	19.75	0.09441	4.5254	4M53G7D
		16QAM		22.95	18.80	0.07586	4.5400	4M54W7D
	10	QPSK	709-711	23.93	19.78	0.09506	8.9821	8M98G7D
		16QAM		23.02	18.87	0.07709	8.9941	8M99W7D
66	1.4	QPSK	1710.7-1779.3	23.93	22.23	0.16711	1.1057	1M11G7W
		16QAM		22.85	21.15	0.13032	1.1085	1M11D7W
	3	QPSK	1711.5-1778.5	23.86	22.16	0.16444	2.7186	2M72G7W
		16QAM		22.86	21.16	0.13062	2.7132	2M71D7W
	5	QPSK	1712.5-1777.5	23.78	22.08	0.16144	4.5312	4M53G7W
		16QAM		22.86	21.16	0.13062	4.5329	4M53D7W
	10	QPSK	1715-1775	23.91	22.21	0.16634	9.0121	9M01G7W
		16QAM		22.89	21.19	0.13152	9.0164	9M01D7W
	15	QPSK	1717.5-1772.5	23.91	22.21	0.16634	13.5280	13M5G7W
		16QAM		22.89	21.19	0.13152	13.5450	13M5D7W
	20	QPSK	1720-1770	23.94	22.24	0.16749	18.1000	18M1G7W
		16QAM		22.93	21.23	0.13274	18.0880	18M1D7W

1.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested with associated equipment below.

1) 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: Unit D/E of 9/F and 16/F, Block A, Building 6, Baoneng science and technology park, Longhua district, Shenzhen, China, 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 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 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	±3.2 dB
2	Conducted emission 150kHz-30MHz	±2.7 dB
3	Radiated spurious emissions 30MHz-1GHz	± 4.9 dB
4	Radiated spurious emissions 1GHz-18GHz	± 4.8 dB
5	Radiated spurious emissions 18GHz-40GHz	± 5.1 dB
6	Occupied Bandwidth	± 1.86 %
7	DC Supply Voltages	± 0.68 %
8	Temperature	± 0.62 °C
9	Humidity	± 3.9 %
10	Conducted spurious emissions	± 2.7 dB
11	DC Supply Voltages	± 0.68 %
12	AC Supply Voltages	± 1.2 %
13	Radio Frequency	± 6.5 x 10^{-8}
14	RF Power, Conducted	± 0.9 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 & Band 66)			
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 &	ANSI C63.26-2015 &	PASS

	FCC 47 CFR Part 22.355	KDB 971168 D01v03r01	

FCC 47 CFR Part 27 Test Cases (LTE Band 7)			
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

FCC 47 CFR Part 27 Test Cases (LTE Band 12 & Band 17)			
Test Item	**Test Requirement**	**Test Method**	**Result**
Effective Radiated Power (ERP)	FCC 47 CFR Part 2.1046(a) & FCC 47 CFR Part 27.50(c)(10)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Conducted Output Power	FCC 47 CFR Part 2.1046(a) & FCC 47 CFR Part 27.50(c)(10)	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(g)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Band Edge at antenna terminals	FCC 47 CFR Part 27.53(g)	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(g)	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(g)	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	Jan. 22, 2021	Jan. 21, 2024
☒	Receiver	R&S	ESIB26	100114	Nov. 05, 2021	Nov. 04, 2022
☐	Loop Antenna	ETS-LINDGREN	6502	00202525	Nov. 11, 2021	Nov. 10, 2023
☒	Broadband Antenna	ETS-LINDGREN	3142E	00201566	Nov. 11, 2021	Nov. 10, 2023
☒	6dB Attenuator	Talent	RA6A5-N-18	18103001	Nov. 11, 2021	Nov. 10, 2023
☒	Preamplifier	HP	8447F	2805A02960	Nov. 05, 2022	Nov. 04, 2022
☐	Broadband Antenna (Pre-amplifier)	ETS-LINDGREN	3142E-PA	00201891	Apr. 30, 2021	Apr. 29, 2023
☐	6dB Attenuator	Talent	RA6A5-N-18	18103002	Nov. 05, 2021	Nov. 04, 2022
☐	Horn Antenna	ETS-LINDGREN	3117	00164202	Nov. 11, 2021	Nov. 10, 2023
☒	Horn Antenna (Pre-amplifier)	ETS-LINDGREN	3117-PA	00201541	Apr. 30, 2021	Apr. 29, 2023
☐	Horn Antenna	ETS-LINDGREN	3116C	00200180	Jun. 19, 2020	Jun. 18, 2022
☒	Horn Antenna (Pre-amplifier)	ETS-LINDGREN	3116C-PA	00202652	Nov. 14, 2020	Nov. 13, 2022
☒	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)**
☒	Receiver	R&S	ESR7	1316.3003K07 -101181-K3	Nov. 05, 2021	Nov. 4, 2022
☒	EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY51440197	Apr. 22, 2021	Apr. 21, 2022
☒	Wideband Radio Communication Tester	R&S	CMW500	120932	Apr. 22, 2021	Apr. 21, 2022
☐	Wideband Radio Communication Tester	R&S	CMW500	119583	Apr. 22, 2021	Apr. 21, 2022
☐	Universal Radio Communication Tester	R&S	CMU200	114713	Nov. 05, 2021	Nov. 4, 2022
☒	DC Source	KIKUSUI	PWR400L	LK003024	N/A	N/A
☒	Temp & Humidity chamber	Votisch	VT4002	58566133290 020	Apr. 21, 2021	Apr. 20, 2022

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	3.8	20 to 75
TL/VL	-20	3.6	20 to 75
TH/VL	+50	3.6	20 to 75
TL/VH	-20	4.35	20 to 75
TH/VH	+50	4.35	20 to 75

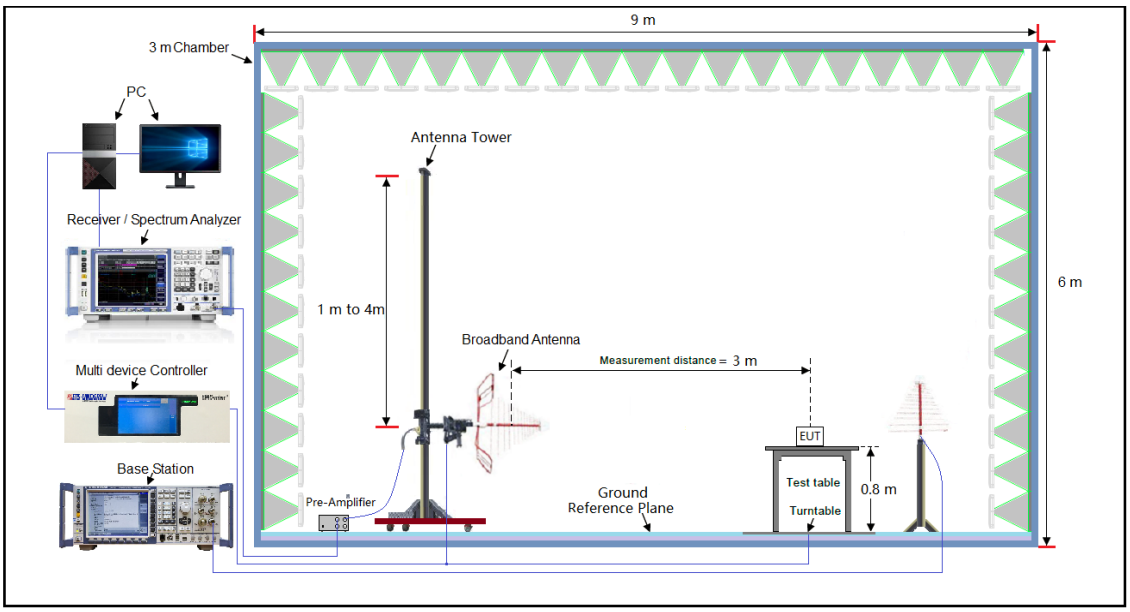
Remark:

1) The EUT just work in such extreme temperature of -20 °C to +50 °C and the extreme voltage of 3.6 V to 4.35 V, so here the EUT is tested in the temperature of -20 °C to +50 °C and the voltage of 3.6 V to 4.35 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.

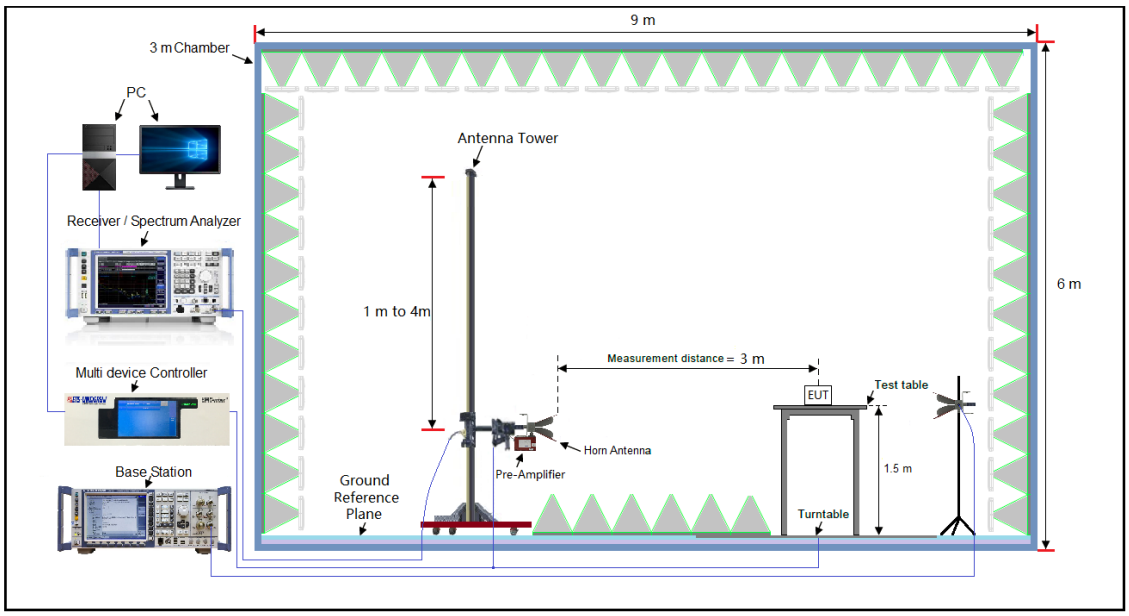
4.2 TEST SETUP

4.2.1 For Radiated Emissions test setup

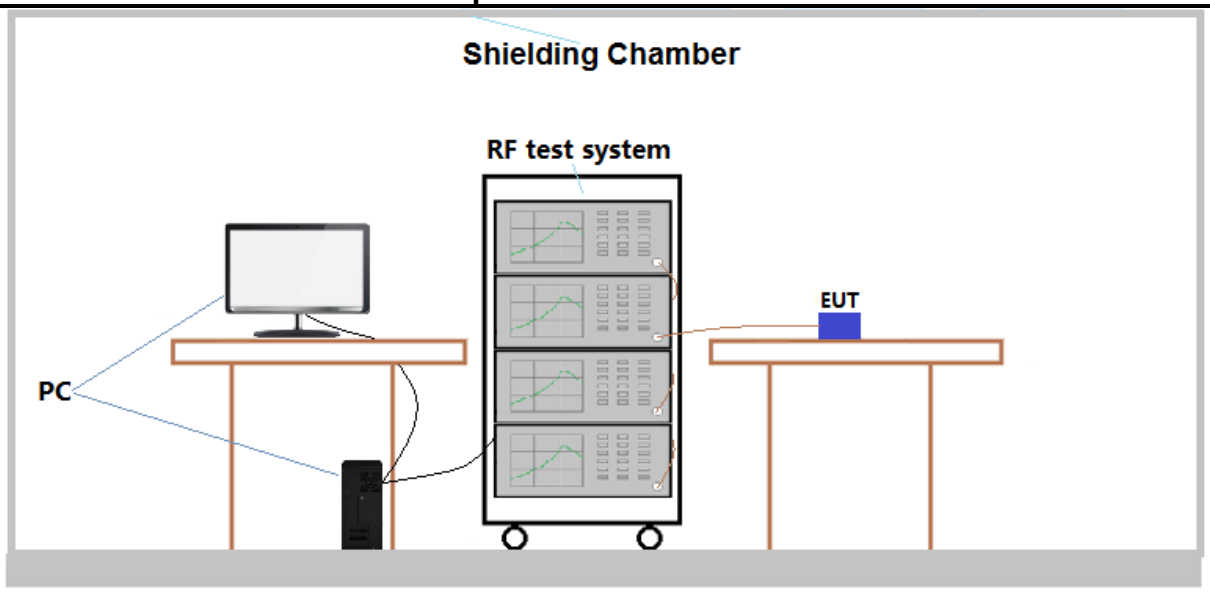
Radiated Emissions 30MHz to 1GHz Test setup



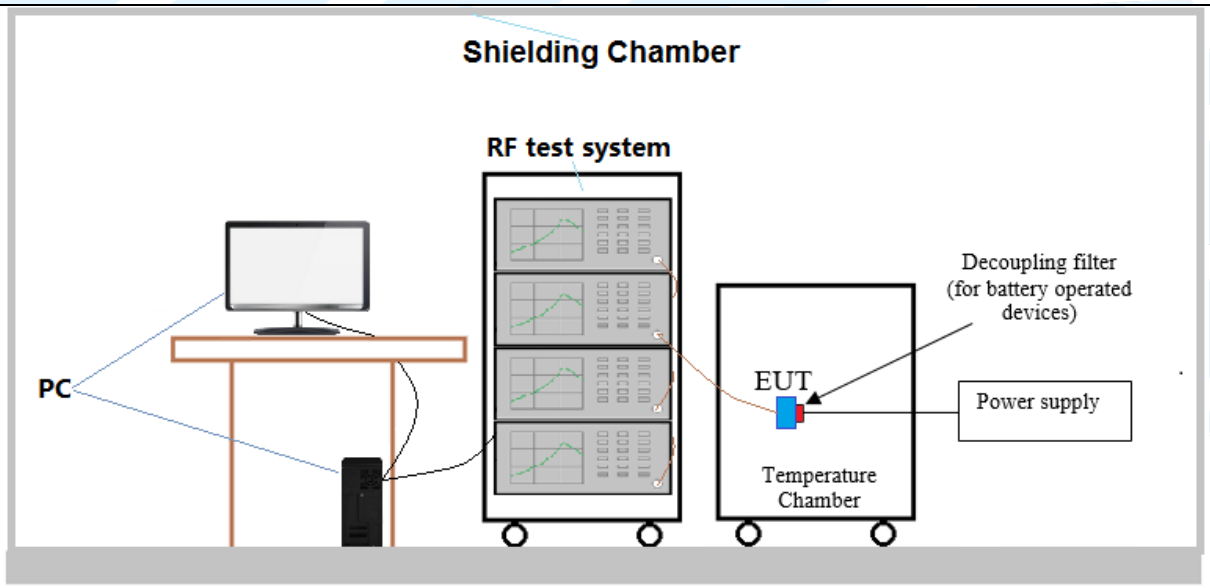
Radiated Emissions Above 1GHz Test setup



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
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
LTE Band 12 TX: 699-716MHz	Low Range	1.4	23017	699.7
		3	23025	700.5
		5	23035	701.5
		10	23060	704
	Middle Range	1.4/3/5/10	23095	707.5
	High Range	1.4	23173	715.3
		3	23165	714.5
		5	23155	713.5
		10	23130	711
LTE Band 17 TX: 704-716MHz	Low Range	5	23755	706.5
		10	23780	709
	Middle Range	5/10	23790	710
	High Range	5	23825	713.5
		10	23800	711
LTE Band 66 TX: 1710-1780MHz	Low Range	1.4	131979	1710.7
		3	131987	1711.5
		5	131997	1712.5
		10	132022	1715
		15	132047	1717.5
		20	132072	1720
	Middle Range	1.4/3/5/10/ 15/20	132322	1745
	High Range	1.4	132665	1779.3
		3	132657	1778.5
		5	132647	1777.5
		10	132622	1775
		15	132597	1772.5
		20	132572	1770

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 3.8V 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 12	1TX	Chain 0	Y axis
LTE Band 17	1TX	Chain 0	Y axis
LTE Band 66	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	23.72	23.56	23.51	1	0	23.58	23.46	23.43
	1	2	23.59	23.66	23.63	1	7	23.53	23.59	23.58
	1	5	23.65	23.60	23.62	1	14	23.49	23.61	23.49
	3	0	23.55	23.48	23.50	8	0	22.45	22.47	22.60
	3	1	23.55	23.42	23.52	8	3	22.51	22.57	22.46
	3	3	23.41	23.55	23.37	8	7	22.29	22.65	22.51
	6	0	22.50	22.53	22.62	15	0	22.49	22.39	22.57
16QAM	1	0	23.31	22.55	22.64	1	0	23.32	22.55	22.48
	1	2	23.31	22.55	22.59	1	7	23.23	22.61	22.57
	1	5	23.24	22.80	22.50	1	14	23.15	22.82	22.61
	3	0	22.59	22.57	22.64	8	0	21.48	21.68	21.63
	3	1	22.65	22.61	22.70	8	3	21.61	21.68	21.67
	3	3	22.57	22.66	22.66	8	7	21.63	21.68	21.66
	6	0	21.69	21.76	21.55	15	0	21.82	21.59	21.65
Channel Bandwidth: 5 MHz						Channel Bandwidth: 10 MHz				
QPSK	1	0	23.73	23.48	23.50	1	0	23.67	23.50	23.55
	1	12	23.64	23.49	23.63	1	24	23.69	23.52	23.59
	1	24	23.60	23.60	23.58	1	49	23.56	23.76	23.56
	12	0	22.38	22.43	22.61	25	0	22.53	22.40	22.53
	12	6	22.58	22.50	22.42	25	12	22.52	22.50	22.45
	12	13	22.46	22.59	22.40	25	25	22.35	22.56	22.45
	25	0	22.59	22.43	22.56	50	0	22.54	22.52	22.62
16QAM	1	0	23.25	22.48	22.49	1	0	23.20	22.57	22.66
	1	12	23.13	22.65	22.65	1	24	23.14	22.50	22.68
	1	24	23.17	22.66	22.64	1	49	23.15	22.65	22.61
	12	0	21.58	21.72	21.54	25	0	21.46	21.73	21.70
	12	6	21.53	21.66	21.79	25	12	21.62	21.70	21.63
	12	13	21.66	21.57	21.66	25	25	21.59	21.70	21.55
	25	0	21.79	21.64	21.67	50	0	21.65	21.66	21.67
Channel Bandwidth: 15 MHz						Channel Bandwidth: 20 MHz				
QPSK	1	0	23.66	23.55	23.50	1	0	23.74	23.61	23.62
	1	37	23.51	23.63	23.58	1	50	23.71	23.67	23.69
	1	74	23.67	23.76	23.55	1	99	23.68	23.78	23.68
	37	0	22.50	22.55	22.50	50	0	22.58	22.59	22.66
	37	19	22.50	22.52	22.52	50	25	22.61	22.59	22.57
	37	39	22.34	22.64	22.42	50	50	22.49	22.71	22.54
	75	0	22.46	22.51	22.51	100	0	22.65	22.55	22.63
16QAM	1	0	23.18	22.56	22.61	1	0	23.33	22.67	22.66
	1	37	23.30	22.57	22.68	1	50	23.32	22.68	22.72
	1	74	23.29	22.70	22.56	1	99	23.34	22.83	22.68
	37	0	21.54	21.70	21.68	50	0	21.64	21.77	21.74
	37	19	21.49	21.68	21.67	50	25	21.68	21.74	21.80
	37	39	21.65	21.74	21.64	50	50	21.68	21.77	21.70
	75	0	21.64	21.58	21.65	100	0	21.84	21.77	21.72

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	23.86	23.63	23.84	1	0	23.72	23.53	23.76
	1	2	23.62	23.71	23.93	1	7	23.56	23.64	23.88
	1	5	23.85	23.59	23.90	1	14	23.69	23.60	23.77
	3	0	23.52	23.56	23.68	8	0	22.42	22.55	22.78
	3	1	23.59	23.59	23.74	8	3	22.55	22.74	22.68
	3	3	23.60	23.62	23.51	8	7	22.48	22.72	22.65
	6	0	22.41	22.79	22.86	15	0	22.40	22.65	22.81
16QAM	1	0	22.90	22.79	23.61	1	0	22.91	22.79	23.45
	1	2	22.73	22.70	22.43	1	7	22.65	22.76	22.41
	1	5	22.84	22.87	23.50	1	14	22.75	22.89	23.61
	3	0	22.75	22.70	22.81	8	0	21.64	21.81	21.80
	3	1	22.74	22.70	22.77	8	3	21.70	21.77	21.74
	3	3	22.78	22.80	22.94	8	7	21.84	21.82	21.94
	6	0	21.66	21.82	21.77	15	0	21.79	21.65	21.87
	Channel Bandwidth: 5 MHz					Channel Bandwidth: 10 MHz				
QPSK	1	0	23.87	23.55	23.83	1	0	23.81	23.57	23.88
	1	12	23.67	23.54	23.93	1	24	23.72	23.57	23.89
	1	24	23.80	23.59	23.86	1	49	23.76	23.75	23.84
	12	0	22.35	22.51	22.79	25	0	22.50	22.48	22.71
	12	6	22.62	22.67	22.64	25	12	22.56	22.67	22.67
	12	13	22.65	22.66	22.54	25	25	22.54	22.63	22.59
	25	0	22.50	22.69	22.80	50	0	22.45	22.78	22.86
16QAM	1	0	22.84	22.72	23.46	1	0	22.79	22.81	23.63
	1	12	22.55	22.80	22.49	1	24	22.56	22.65	22.52
	1	24	22.77	22.73	23.64	1	49	22.75	22.72	23.61
	12	0	21.74	21.85	21.71	25	0	21.62	21.86	21.87
	12	6	21.62	21.75	21.86	25	12	21.71	21.79	21.70
	12	13	21.87	21.71	21.94	25	25	21.80	21.84	21.83
	25	0	21.76	21.70	21.89	50	0	21.62	21.72	21.89
	Channel Bandwidth: 15 MHz					Channel Bandwidth: 20 MHz				
QPSK	1	0	23.80	23.62	23.83	1	0	23.88	23.68	23.95
	1	37	23.54	23.68	23.88	1	50	23.74	23.72	23.99
	1	74	23.87	23.75	23.83	1	99	23.88	23.77	23.96
	37	0	22.47	22.63	22.68	50	0	22.55	22.67	22.84
	37	19	22.54	22.69	22.74	50	25	22.65	22.76	22.79
	37	39	22.53	22.71	22.56	50	50	22.68	22.78	22.68
	75	0	22.37	22.77	22.75	100	0	22.56	22.81	22.87
16QAM	1	0	22.77	22.80	23.58	1	0	22.92	22.91	23.63
	1	37	22.72	22.72	22.52	1	50	22.74	22.83	22.56
	1	74	22.89	22.77	23.56	1	99	22.94	22.90	23.68
	37	0	21.70	21.83	21.85	50	0	21.80	21.90	21.91
	37	19	21.58	21.77	21.74	50	25	21.77	21.83	21.87
	37	39	21.86	21.88	21.92	50	50	21.89	21.91	21.98
	75	0	21.61	21.64	21.87	100	0	21.81	21.83	21.94

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	23.57	23.72	23.58	1	0	23.64	23.74	23.67
	1	2	23.84	23.77	23.85	1	7	23.71	23.79	23.75
	1	5	23.58	23.77	23.63	1	14	23.67	23.71	23.61
	3	0	23.63	23.72	23.60	8	0	22.71	22.58	22.58
	3	1	23.64	23.68	23.44	8	3	22.61	22.57	22.54
	3	3	23.67	23.57	23.71	8	7	22.59	22.58	22.55
	6	0	22.72	22.67	22.64	15	0	22.67	22.68	22.58
16QAM	1	0	22.92	22.83	22.13	1	0	22.76	22.71	22.09
	1	2	22.76	23.11	22.68	1	7	22.86	23.28	22.86
	1	5	22.89	22.81	22.77	1	14	22.92	22.82	22.80
	3	0	22.86	22.67	22.74	8	0	21.74	21.64	21.83
	3	1	22.59	22.80	22.75	8	3	21.52	21.79	21.70
	3	3	22.86	22.66	22.69	8	7	21.83	21.71	21.71
	6	0	21.71	21.71	21.68	15	0	21.78	21.74	21.80
Channel Bandwidth: 5 MHz						Channel Bandwidth: 10 MHz				
QPSK	1	0	23.54	23.62	23.75	1	0	23.72	23.77	23.75
	1	12	23.78	23.85	23.85	1	24	23.86	23.94	23.95
	1	24	23.65	23.76	23.69	1	49	23.69	23.81	23.74
	12	0	22.77	22.67	22.51	25	0	22.80	22.72	22.68
	12	6	22.54	22.71	22.48	25	12	22.70	22.75	22.64
	12	13	22.65	22.66	22.57	25	25	22.71	22.74	22.71
	25	0	22.57	22.69	22.69	50	0	22.77	22.81	22.71
16QAM	1	0	22.86	22.77	22.06	1	0	22.93	22.91	22.25
	1	12	22.87	23.14	22.85	1	24	22.92	23.31	22.87
	1	24	22.90	22.85	22.88	1	49	22.93	22.91	22.95
	12	0	21.82	21.65	21.80	25	0	21.92	21.73	21.89
	12	6	21.62	21.73	21.81	25	12	21.67	21.92	21.90
	12	13	21.89	21.61	21.76	25	25	21.93	21.72	21.84
	25	0	21.61	21.75	21.81	50	0	21.80	21.82	21.84

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	23.83	23.82	23.91	1	0	23.85	23.72	23.97
	1	12	23.81	23.73	23.83	1	24	23.92	23.72	23.87
	1	24	23.97	23.76	23.81	1	49	23.96	23.83	23.94
	12	0	22.73	22.84	22.87	25	0	22.81	22.86	22.81
	12	6	22.79	22.90	22.94	25	12	22.80	22.81	22.87
	12	13	22.80	22.77	22.87	25	25	22.79	22.76	22.91
	25	0	22.82	22.88	22.76	50	0	22.86	22.74	22.89
16QAM	1	0	22.77	22.87	22.89	1	0	22.81	22.77	22.94
	1	12	23.02	22.75	23.09	1	24	22.91	22.75	22.97
	1	24	23.13	22.85	22.89	1	49	23.10	22.86	22.73
	12	0	21.93	22.01	21.91	25	0	21.91	21.92	22.01
	12	6	21.96	22.01	22.16	25	12	22.06	21.97	22.00
	12	13	22.01	21.90	22.11	25	25	22.00	21.98	22.11
	25	0	21.93	22.06	22.06	50	0	21.87	22.19	22.00
	Channel Bandwidth: 15 MHz					Channel Bandwidth: 20 MHz				
QPSK	1	0	23.79	23.76	23.95	1	0	23.98	23.88	23.98
	1	37	23.81	23.83	23.94	1	50	23.99	23.84	24.03
	1	74	24.01	23.70	23.91	1	99	24.01	23.84	24.00
	37	0	22.80	22.78	22.93	50	0	22.91	22.86	22.95
	37	19	22.92	22.84	22.87	50	25	22.93	22.90	22.99
	37	39	22.94	22.78	22.94	50	50	22.97	22.95	22.94
	75	0	22.76	22.76	22.73	100	0	22.87	22.94	22.91
16QAM	1	0	22.92	22.81	22.93	1	0	22.93	22.91	23.04
	1	37	23.01	22.91	23.14	1	50	23.05	22.92	23.15
	1	74	23.06	22.90	22.78	1	99	23.17	22.96	22.91
	37	0	21.90	22.01	22.06	50	0	22.06	22.05	22.10
	37	19	22.10	21.97	22.11	50	25	22.10	22.03	22.19
	37	39	22.03	21.92	21.93	50	50	22.06	22.08	22.12
	75	0	21.86	22.06	22.03	100	0	21.94	22.21	22.11

4.5.5 LTE Band 12

LTE Band 12 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	23.70	23.78	23.40	1	0	23.62	23.83	23.54
	1	2	23.78	23.84	23.77	1	7	23.70	23.83	23.72
	1	5	23.57	23.77	23.62	1	14	23.73	23.71	23.48
	3	0	23.52	23.57	23.58	8	0	22.64	22.59	22.49
	3	1	23.66	23.72	23.56	8	3	22.65	22.56	22.64
	3	3	23.61	23.62	23.50	8	7	22.54	22.62	22.49
	6	0	22.57	22.60	22.45	15	0	22.64	22.65	22.55
16QAM	1	0	22.73	22.61	22.68	1	0	22.80	22.74	22.70
	1	2	22.75	22.80	22.83	1	7	22.75	22.84	22.82
	1	5	22.77	22.63	22.65	1	14	22.74	22.57	22.75
	3	0	22.50	22.82	22.69	8	0	21.53	21.89	21.61
	3	1	22.79	22.76	22.40	8	3	21.70	21.90	21.33
	3	3	22.68	22.85	22.43	8	7	21.68	21.87	21.57
	6	0	21.74	21.71	21.59	15	0	21.75	21.58	21.60
Channel Bandwidth: 5 MHz						Channel Bandwidth: 10 MHz				
QPSK	1	0	23.63	23.65	23.38	1	0	23.71	23.84	23.58
	1	12	23.69	23.90	23.86	1	24	23.88	23.93	23.90
	1	24	23.76	23.64	23.46	1	49	23.77	23.79	23.63
	12	0	22.70	22.66	22.45	25	0	22.71	22.67	22.62
	12	6	22.64	22.65	22.56	25	12	22.72	22.73	22.65
	12	13	22.51	22.64	22.62	25	25	22.67	22.64	22.66
	25	0	22.65	22.59	22.51	50	0	22.74	22.70	22.59
16QAM	1	0	22.70	22.71	22.56	1	0	22.83	22.79	22.71
	1	12	22.76	22.87	22.71	1	24	22.88	22.89	22.87
	1	24	22.68	22.62	22.57	1	49	22.82	22.72	22.77
	12	0	21.59	21.91	21.76	25	0	21.66	21.98	21.78
	12	6	21.68	21.87	21.50	25	12	21.81	21.92	21.51
	12	13	21.75	21.80	21.42	25	25	21.86	21.88	21.59
	25	0	21.72	21.63	21.55	50	0	21.77	21.72	21.71

4.5.6 LTE Band 17

LTE Band 17 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	23.63	23.55	23.55	1	0	23.79	23.58	23.71
	1	12	23.90	23.57	23.73	1	24	23.93	23.73	23.81
	1	24	23.71	23.42	23.57	1	49	23.87	23.58	23.68
	12	0	22.49	22.43	22.58	25	0	22.69	22.57	22.60
	12	6	22.48	22.44	22.38	25	12	22.54	22.50	22.52
	12	13	22.69	22.46	22.42	25	25	22.71	22.62	22.59
	25	0	22.58	22.49	22.57	50	0	22.75	22.56	22.60
16QAM	1	0	22.70	22.59	22.01	1	0	22.74	22.76	22.15
	1	12	22.95	22.83	22.68	1	24	23.02	22.87	22.78
	1	24	22.49	22.58	22.46	1	49	22.68	22.76	22.66
	12	0	21.60	21.74	21.64	25	0	21.72	21.84	21.66
	12	6	21.57	21.68	21.67	25	12	21.62	21.70	21.71
	12	13	21.54	21.68	21.40	25	25	21.61	21.73	21.53
	25	0	21.77	21.49	21.59	50	0	21.83	21.64	21.60

4.5.7 LTE Band 66

LTE Band 66 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	23.66	23.85	23.74	1	0	23.52	23.75	23.66
	1	2	23.52	23.93	23.78	1	7	23.46	23.86	23.73
	1	5	23.65	23.75	23.77	1	14	23.49	23.76	23.64
	3	0	23.63	23.70	23.48	8	0	22.53	22.69	22.58
	3	1	23.58	23.74	23.63	8	3	22.54	22.89	22.57
	3	3	23.62	23.55	23.48	8	7	22.50	22.65	22.62
	6	0	22.50	22.82	22.63	15	0	22.49	22.68	22.58
16QAM	1	0	22.85	22.52	22.78	1	0	22.86	22.52	22.62
	1	2	22.72	22.62	22.80	1	7	22.64	22.68	22.78
	1	5	22.64	22.43	22.60	1	14	22.55	22.45	22.71
	3	0	22.63	22.77	22.81	8	0	21.52	21.88	21.80
	3	1	22.75	22.79	22.75	8	3	21.71	21.86	21.72
	3	3	22.73	22.80	22.74	8	7	21.79	21.82	21.74
	6	0	21.60	21.84	21.75	15	0	21.73	21.67	21.85
Channel Bandwidth: 5 MHz						Channel Bandwidth: 10 MHz				
QPSK	1	0	23.67	23.77	23.73	1	0	23.61	23.79	23.78
	1	12	23.57	23.76	23.78	1	24	23.62	23.79	23.74
	1	24	23.60	23.75	23.73	1	49	23.56	23.91	23.71
	12	0	22.46	22.65	22.59	25	0	22.61	22.62	22.51
	12	6	22.61	22.82	22.53	25	12	22.55	22.82	22.56
	12	13	22.67	22.59	22.51	25	25	22.56	22.56	22.56
	25	0	22.59	22.72	22.57	50	0	22.54	22.81	22.63
16QAM	1	0	22.79	22.45	22.63	1	0	22.74	22.54	22.80
	1	12	22.54	22.72	22.86	1	24	22.55	22.57	22.89
	1	24	22.57	22.29	22.74	1	49	22.55	22.28	22.71
	12	0	21.62	21.92	21.71	25	0	21.50	21.93	21.87
	12	6	21.63	21.84	21.84	25	12	21.72	21.88	21.68
	12	13	21.82	21.71	21.74	25	25	21.75	21.84	21.63
	25	0	21.70	21.72	21.87	50	0	21.56	21.74	21.87
Channel Bandwidth: 15 MHz						Channel Bandwidth: 20 MHz				
QPSK	1	0	23.60	23.84	23.73	1	0	23.68	23.90	23.85
	1	37	23.44	23.90	23.73	1	50	23.64	23.94	23.84
	1	74	23.67	23.91	23.70	1	99	23.68	23.93	23.83
	37	0	22.58	22.77	22.48	50	0	22.66	22.81	22.64
	37	19	22.53	22.84	22.63	50	25	22.64	22.91	22.68
	37	39	22.55	22.64	22.53	50	50	22.70	22.71	22.65
	75	0	22.46	22.80	22.52	100	0	22.65	22.84	22.64
16QAM	1	0	22.72	22.53	22.75	1	0	22.87	22.64	22.80
	1	37	22.71	22.64	22.89	1	50	22.73	22.75	22.93
	1	74	22.69	22.33	22.66	1	99	22.74	22.46	22.78
	37	0	21.58	21.90	21.85	50	0	21.68	21.97	21.91
	37	19	21.59	21.86	21.72	50	25	21.78	21.92	21.85
	37	39	21.81	21.88	21.72	50	50	21.84	21.91	21.78
	75	0	21.55	21.66	21.85	100	0	21.75	21.85	21.92

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
6	ANSI C63.26-2015	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services
7	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 & LTE Band 66: 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)
LTE Band 12 & Band 17: FCC 47 CFR Part 27.50(c)(10)

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

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.

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	22.02	21.61	/	33.01	Pass
Middle	21.96	21.10	/	33.01	Pass
Highest	21.93	20.94	/	33.01	Pass
Channel Bandwidth: 3MHz					
Lowest	21.88	21.62	/	33.01	Pass
Middle	21.91	21.12	/	33.01	Pass
Highest	21.88	20.91	/	33.01	Pass
Channel Bandwidth: 5MHz					
Lowest	22.03	21.55	/	33.01	Pass
Middle	21.90	20.96	/	33.01	Pass
Highest	21.93	20.95	/	33.01	Pass
Channel Bandwidth: 10MHz					
Lowest	21.99	21.50	/	33.01	Pass
Middle	22.06	20.95	/	33.01	Pass
Highest	21.89	20.98	/	33.01	Pass
Channel Bandwidth: 15MHz					
Lowest	21.97	21.60	/	33.01	Pass
Middle	22.06	21.00	/	33.01	Pass
Highest	21.88	20.98	/	33.01	Pass
Channel Bandwidth: 20MHz					
Lowest	22.04	21.64	/	33.01	Pass
Middle	22.08	21.13	/	33.01	Pass
Highest	21.99	21.02	/	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	22.16	21.20	/	30.00	Pass
Middle	22.01	21.17	/	30.00	Pass
Highest	22.23	21.91	/	30.00	Pass
Channel Bandwidth: 3MHz					
Lowest	22.02	21.21	/	30.00	Pass
Middle	21.94	21.19	/	30.00	Pass
Highest	22.18	21.91	/	30.00	Pass
Channel Bandwidth: 5MHz					
Lowest	22.17	21.14	/	30.00	Pass
Middle	21.89	21.10	/	30.00	Pass
Highest	22.23	21.94	/	30.00	Pass
Channel Bandwidth: 10MHz					
Lowest	22.11	21.09	/	30.00	Pass
Middle	22.05	21.11	/	30.00	Pass
Highest	22.19	21.93	/	30.00	Pass
Channel Bandwidth: 15MHz					
Lowest	22.17	21.19	/	30.00	Pass
Middle	22.05	21.10	/	30.00	Pass
Highest	22.18	21.88	/	30.00	Pass
Channel Bandwidth: 20MHz					
Lowest	22.18	21.24	/	30.00	Pass
Middle	22.07	21.21	/	30.00	Pass
Highest	22.29	21.98	/	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	20.19	19.27	/	38.45	Pass
Middle	20.12	19.46	/	38.45	Pass
Highest	20.20	19.12	/	38.45	Pass
Channel Bandwidth: 3MHz					
Lowest	20.06	19.27	/	38.45	Pass
Middle	20.14	19.63	/	38.45	Pass
Highest	20.10	19.21	/	38.45	Pass
Channel Bandwidth: 5MHz					
Lowest	20.13	19.25	/	38.45	Pass
Middle	20.20	19.49	/	38.45	Pass
Highest	20.20	19.23	/	38.45	Pass
Channel Bandwidth: 10MHz					
Lowest	20.21	19.28	/	38.45	Pass
Middle	20.29	19.66	/	38.45	Pass
Highest	20.30	19.30	/	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	22.37	21.53	/	33.01	Pass
Middle	22.22	21.27	/	33.01	Pass
Highest	22.31	21.49	/	33.01	Pass
Channel Bandwidth: 10MHz					
Lowest	22.36	21.5	/	33.01	Pass
Middle	22.23	21.26	/	33.01	Pass
Highest	22.37	21.37	/	33.01	Pass
Channel Bandwidth: 15MHz					
Lowest	22.41	21.46	/	33.01	Pass
Middle	21.31	21.31	/	33.01	Pass
Highest	21.54	21.54	/	33.01	Pass
Channel Bandwidth: 20MHz					
Lowest	22.41	21.57	/	33.01	Pass
Middle	22.28	21.36	/	33.01	Pass
Highest	22.43	21.55	/	33.01	Pass

5.2.5 LTE Band 12

LTE Band 12 Maximum ERP (dBm)					
Channel	QPSK; RB:1	16QAM; RB:1	64QAM; RB:1	Limit (dBm)	Result
Channel Bandwidth: 1.4MHz					
Lowest	19.73	18.72	/	34.77	Pass
Middle	19.79	18.75	/	34.77	Pass
Highest	19.72	18.78	/	34.77	Pass
Channel Bandwidth: 3MHz					
Lowest	19.68	18.75	/	34.77	Pass
Middle	19.78	18.79	/	34.77	Pass
Highest	19.67	18.77	/	34.77	Pass
Channel Bandwidth: 5MHz					
Lowest	19.71	18.71	/	34.77	Pass
Middle	19.85	18.82	/	34.77	Pass
Highest	19.81	18.66	/	34.77	Pass
Channel Bandwidth: 10MHz					
Lowest	19.83	18.83	/	34.77	Pass
Middle	19.88	18.84	/	34.77	Pass
Highest	19.85	18.82	/	34.77	Pass

5.2.6 LTE Band 17

LTE Band 17 Maximum ERP (dBm)					
Channel	QPSK; RB:1	16QAM; RB:1	64QAM; RB:1	Limit (dBm)	Result
Channel Bandwidth: 5MHz					
Lowest	19.75	18.80	/	34.77	Pass
Middle	19.42	18.68	/	34.77	Pass
Highest	19.58	18.53	/	34.77	Pass
Channel Bandwidth: 10MHz					
Lowest	19.78	18.87	/	34.77	Pass
Middle	19.58	18.72	/	34.77	Pass
Highest	19.66	18.63	/	34.77	Pass

5.2.7 LTE Band 66

LTE Band 66 Maximum EIRP (dBm)					
Channel	QPSK; RB:1	16QAM; RB:1	64QAM; RB:1	Limit (dBm)	Result
Channel Bandwidth: 1.4MHz					
Lowest	21.96	21.15	/	30.00	Pass
Middle	22.23	20.92	/	30.00	Pass
Highest	22.08	21.10	/	30.00	Pass
Channel Bandwidth: 3MHz					
Lowest	21.82	21.16	/	30.00	Pass
Middle	22.16	20.98	/	30.00	Pass
Highest	22.03	21.08	/	30.00	Pass
Channel Bandwidth: 5MHz					
Lowest	21.97	21.09	/	30.00	Pass
Middle	22.07	21.02	/	30.00	Pass
Highest	22.08	21.16	/	30.00	Pass
Channel Bandwidth: 10MHz					
Lowest	21.92	21.04	/	30.00	Pass
Middle	22.21	20.87	/	30.00	Pass
Highest	22.08	21.19	/	30.00	Pass
Channel Bandwidth: 15MHz					
Lowest	21.97	21.02	/	30.00	Pass
Middle	22.21	20.94	/	30.00	Pass
Highest	22.03	21.19	/	30.00	Pass
Channel Bandwidth: 20MHz					
Lowest	21.98	21.17	/	30.00	Pass
Middle	22.24	21.05	/	30.00	Pass
Highest	22.15	21.23	/	30.00	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 & LTE Band 66:** 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) **LTE Band 12 & Band 17:** FCC 47 CFR Part 27.50(c)(10)
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(c)(10):
Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

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.

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 & LTE Band 66:** 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) **LTE Band 12 & Band 17:** 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.

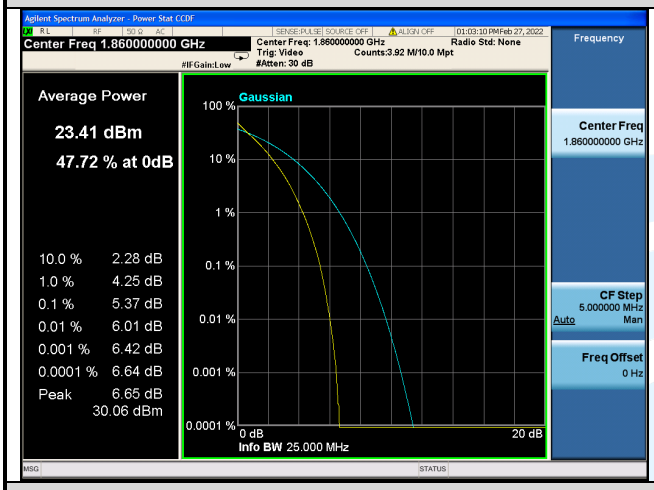
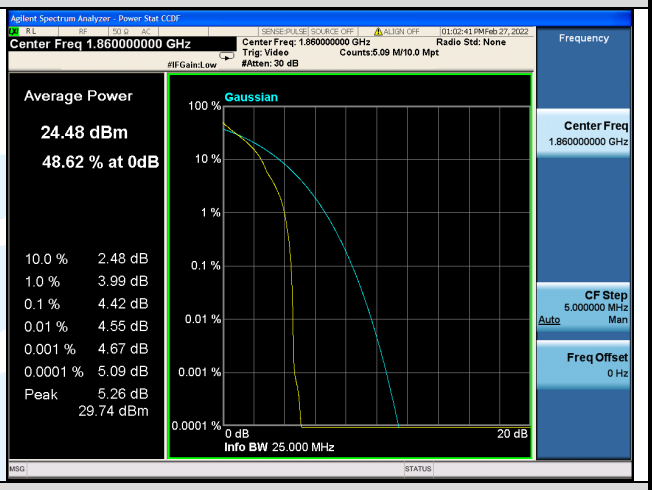
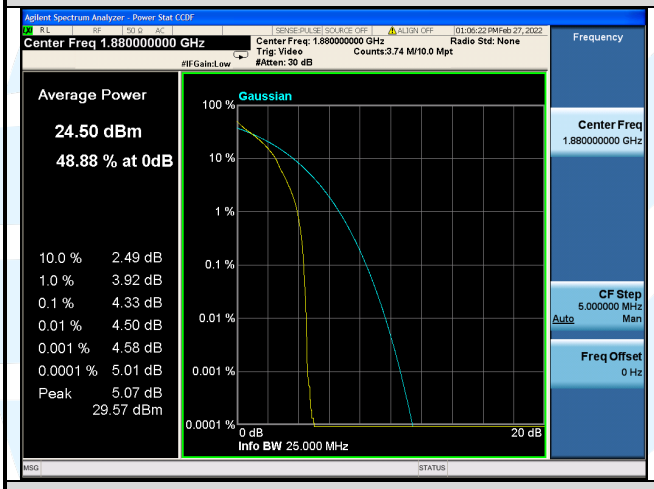
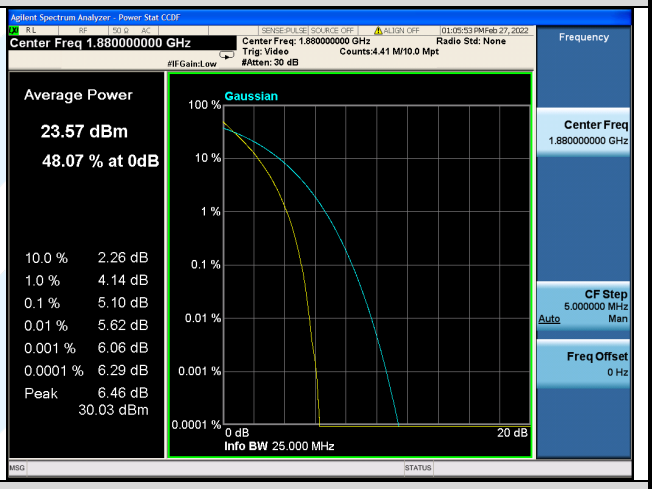
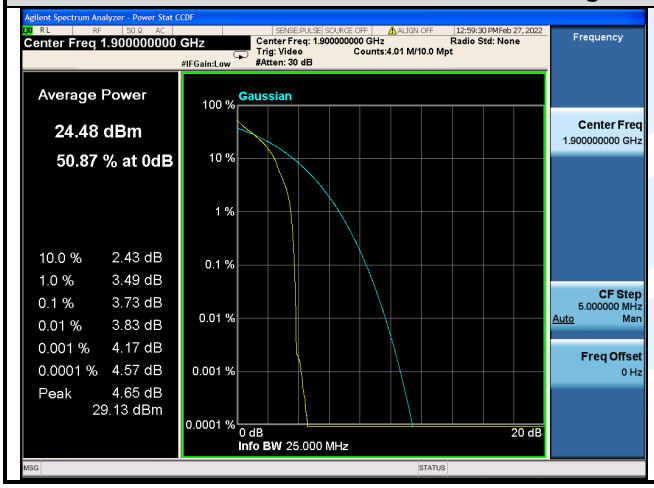
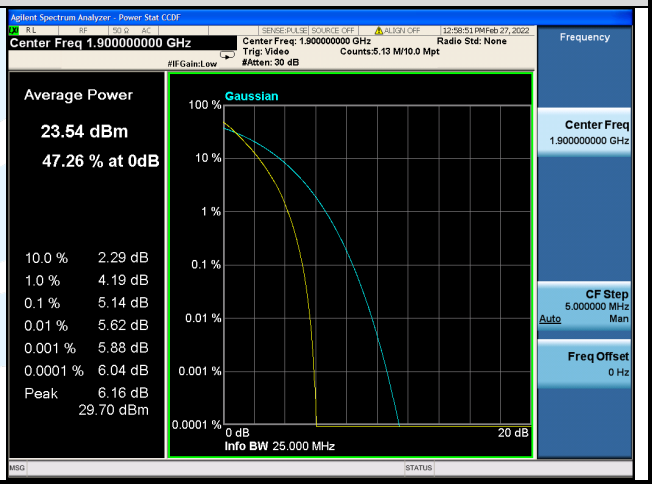
a) Set resolution/measurement bandwidth ≥ signal's occupied bandwidth
b) Set the number of counts to a value that stabilizes the measured CCDF curve
c) Record the maximum PAPR level associated with a probability of 0.1 %

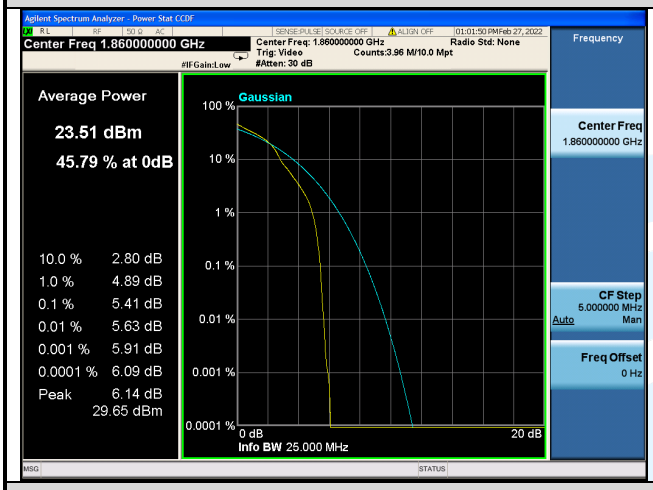
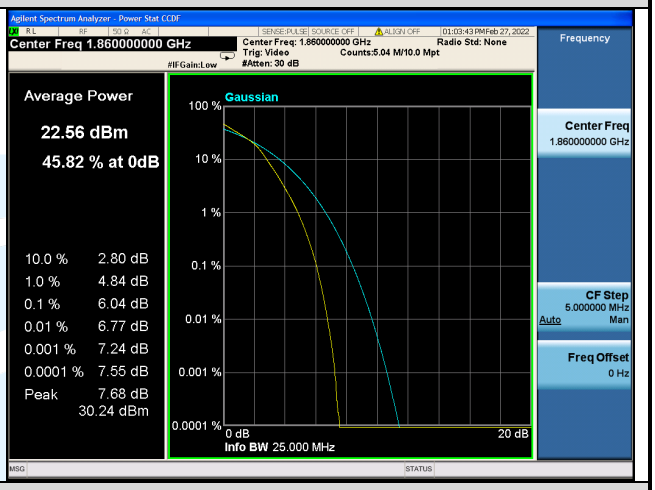
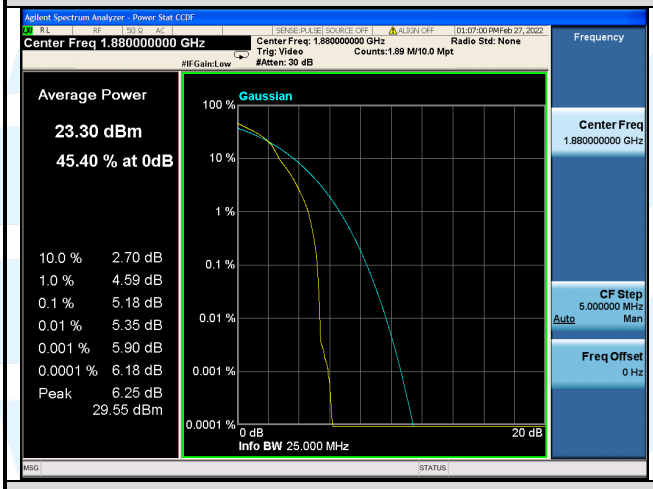
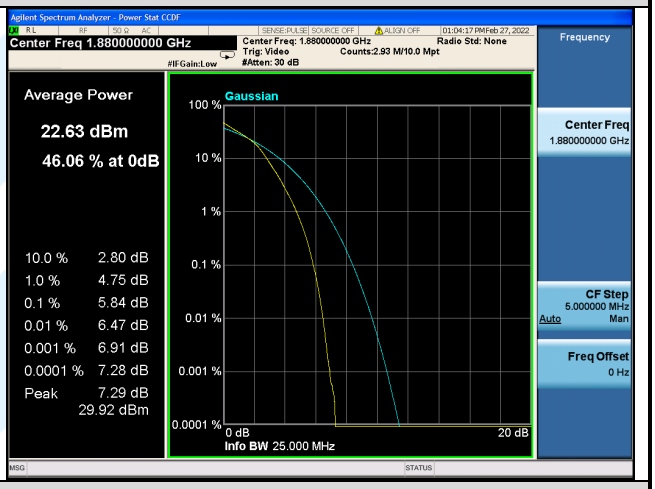
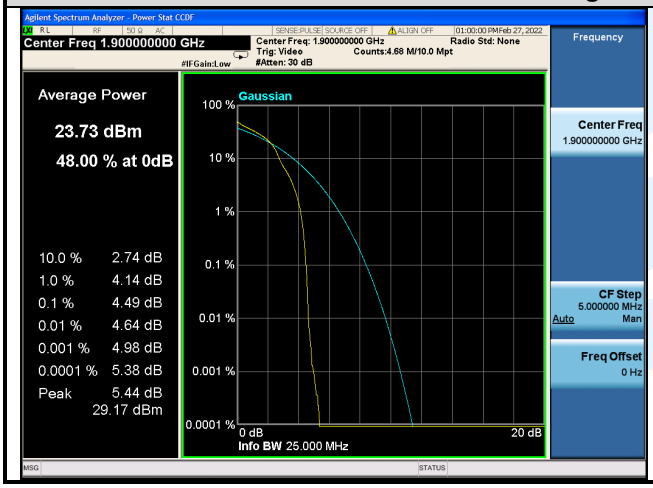
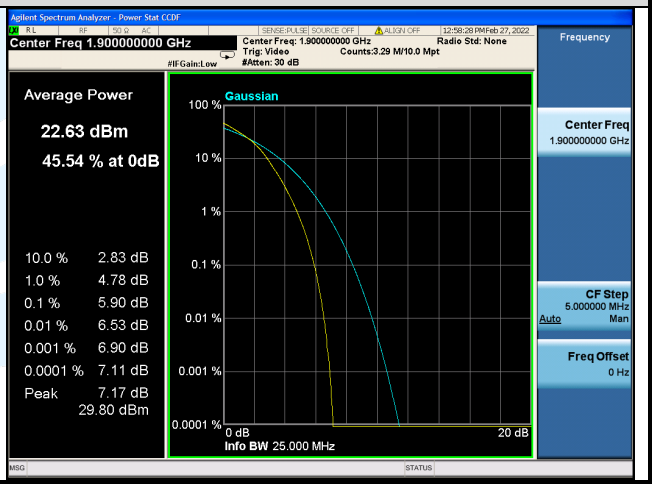
Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

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

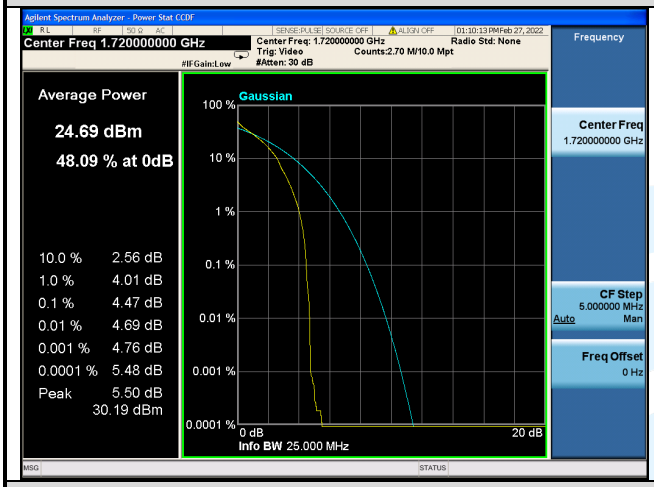
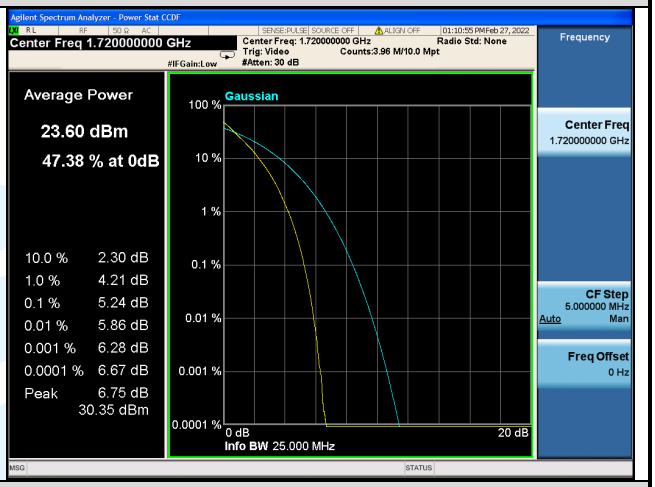
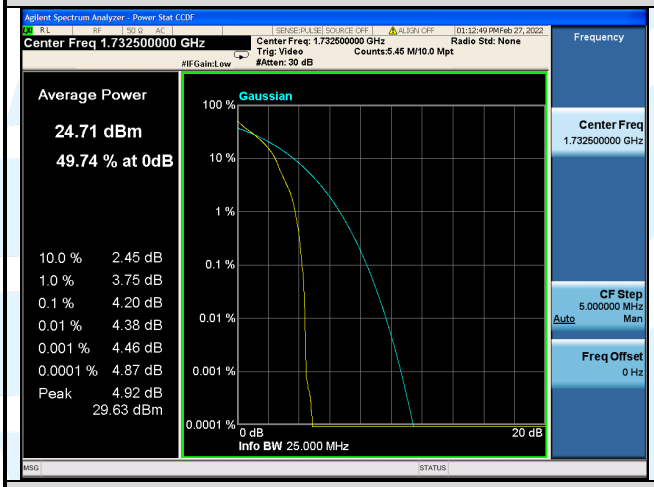
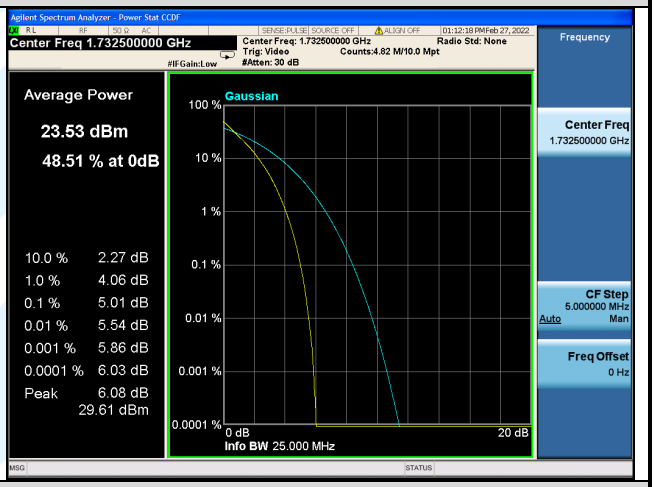
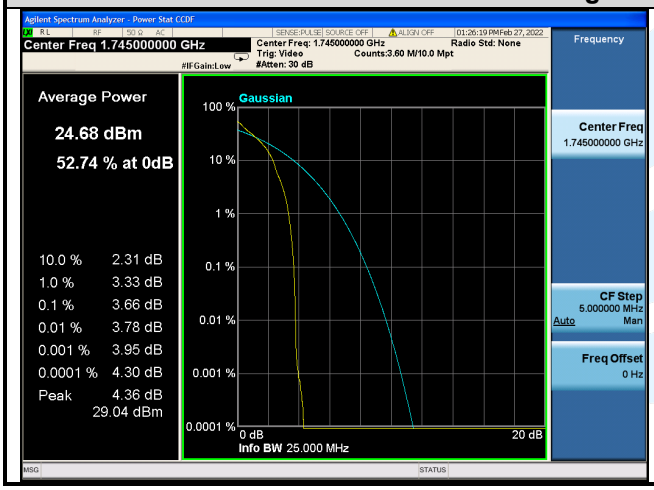
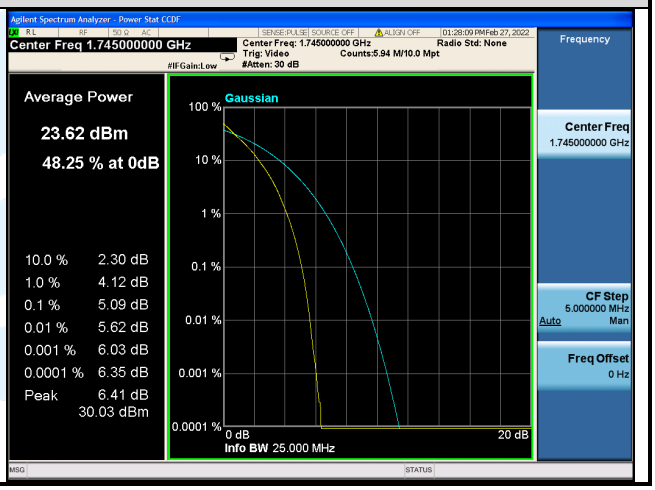
LTE Band 2 Peak-to-average ratio (dB)						
Channel	**RB Configuration**	**Channel Bandwidth: 20 MHz**			**Limit (dB)**	**Result**
		QPSK	**16QAM**	**64QAM**		
Lowest	1 RB	5.37	5.41	/	13	Pass
	Full RB	4.42	6.04	/	13	Pass
Middle	1 RB	4.33	5.18	/	13	Pass
	Full RB	5.10	5.84	/	13	Pass
Highest	1 RB	3.73	4.49	/	13	Pass
	Full RB	5.14	5.90	/	13	Pass

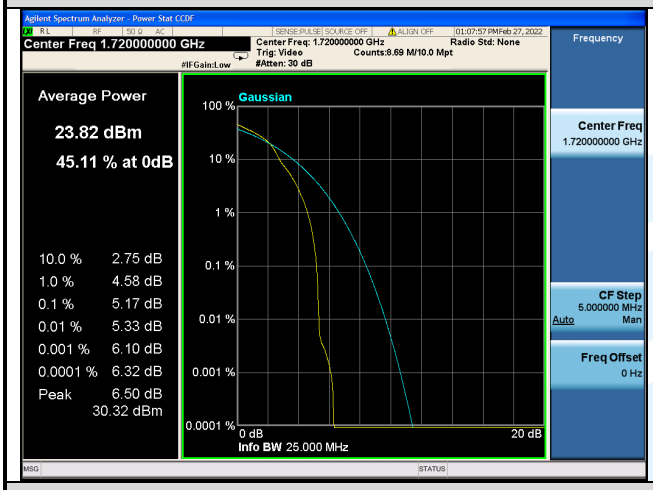
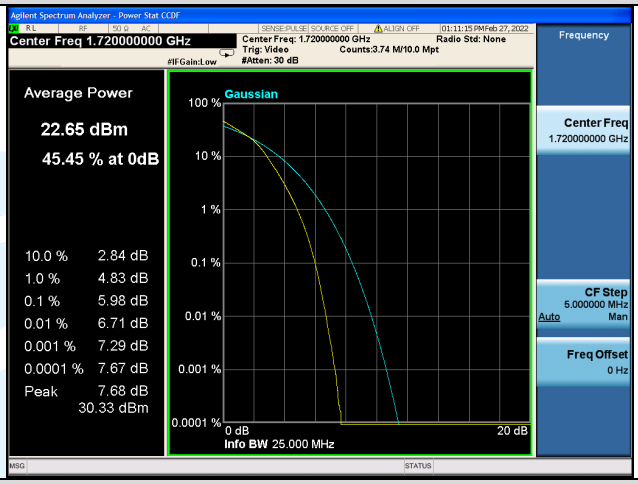
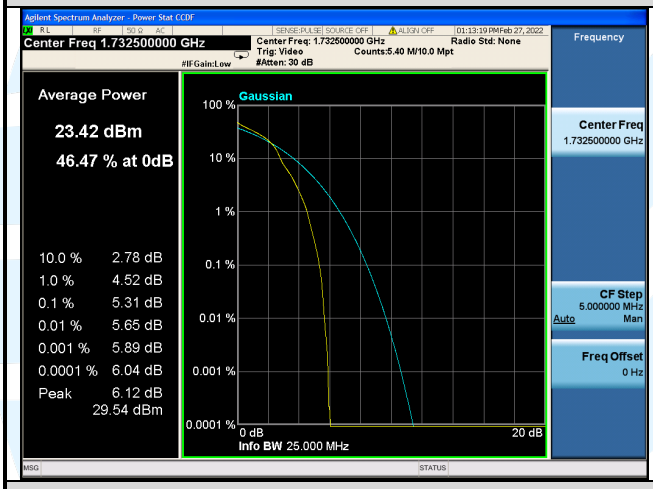
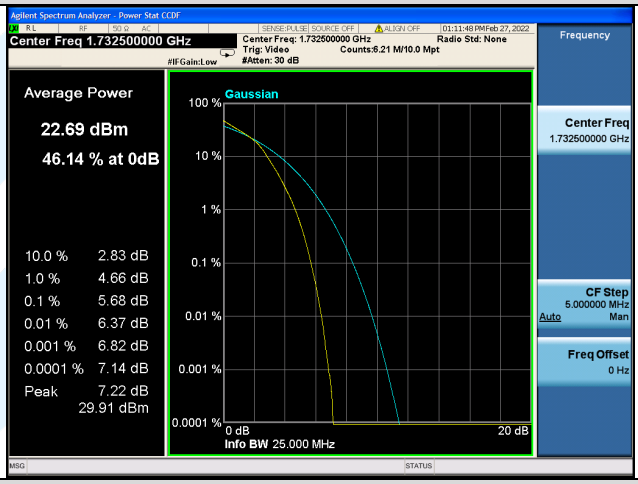
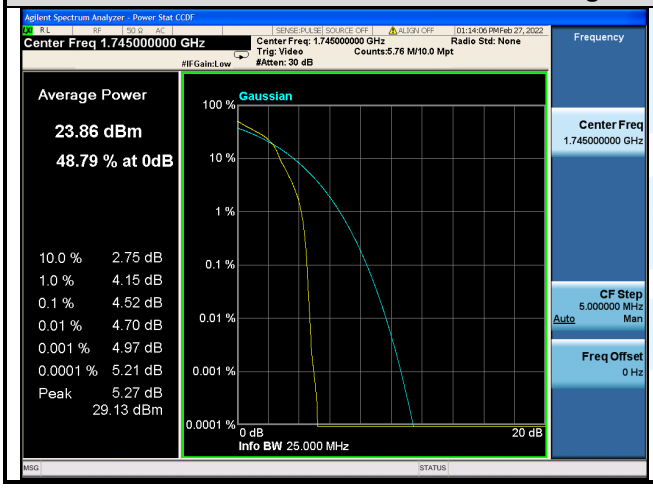
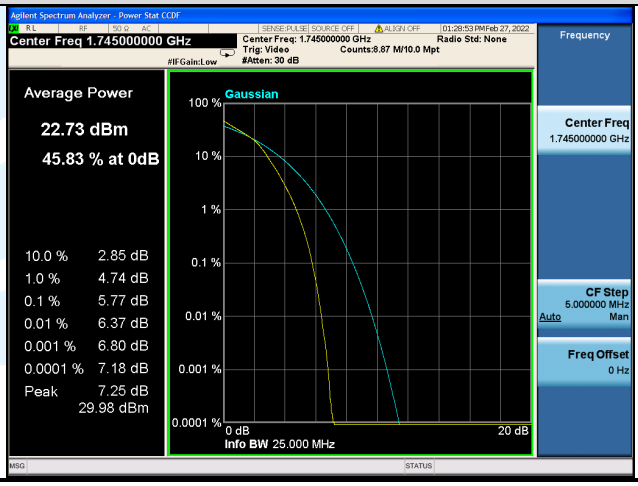
LTE Band 2 / 20 MHz / QPSK	
1 RB	Full RB
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

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

5.4.2 LTE Band 4

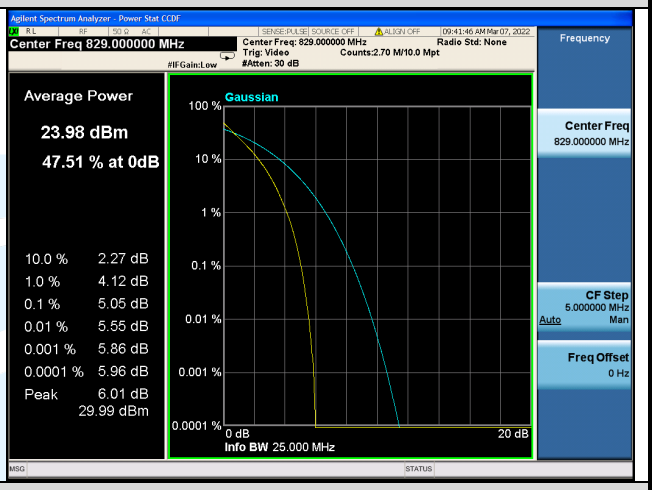
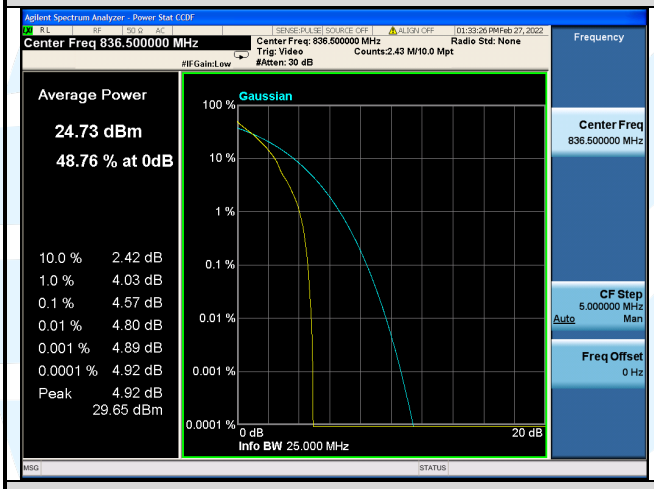
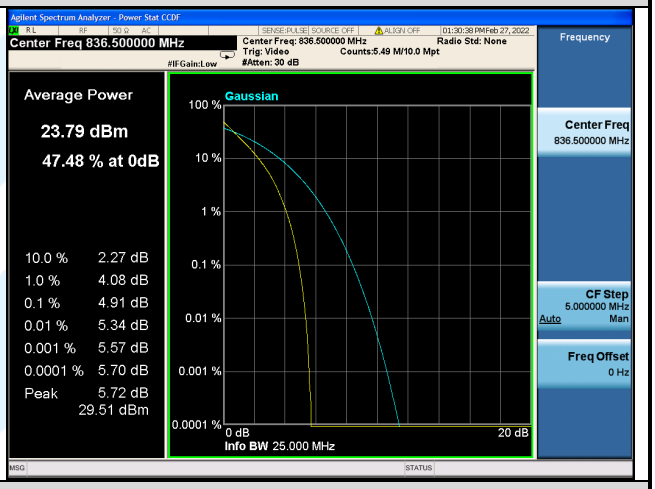
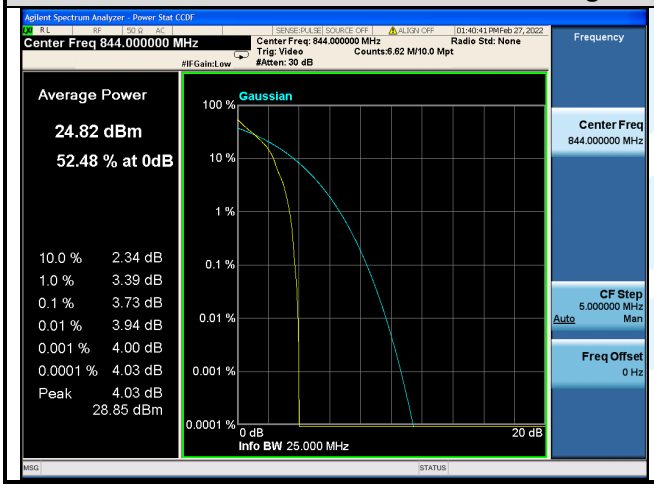
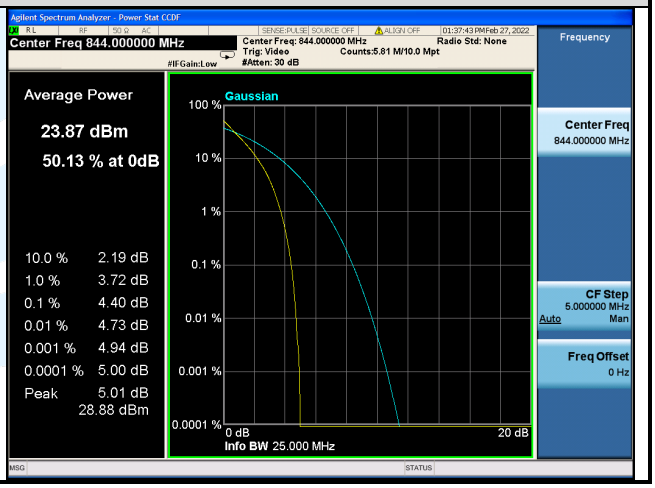
LTE Band 4 Peak-to-average ratio (dB)						
Channel	RB Configuration	Channel Bandwidth: 20 MHz			Limit (dB)	Result
		QPSK	16QAM	64QAM		
Lowest	1 RB	4.47	5.17	/	13	Pass
	Full RB	5.24	5.98	/	13	Pass
Middle	1 RB	4.20	5.31	/	13	Pass
	Full RB	5.01	5.68	/	13	Pass
Highest	1 RB	3.66	4.52	/	13	Pass
	Full RB	5.09	5.77	/	13	Pass

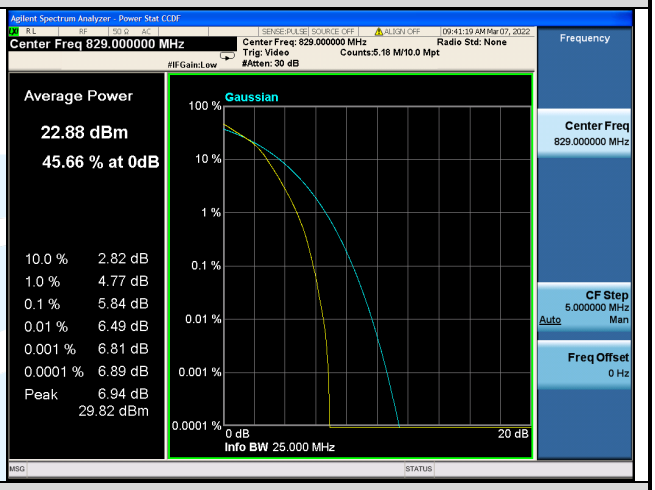
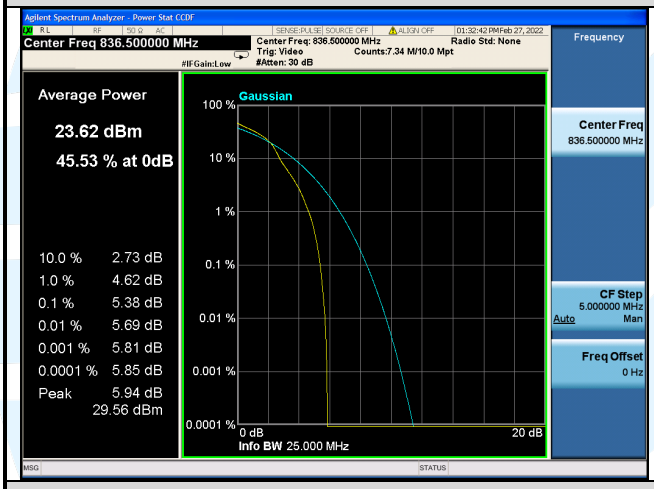
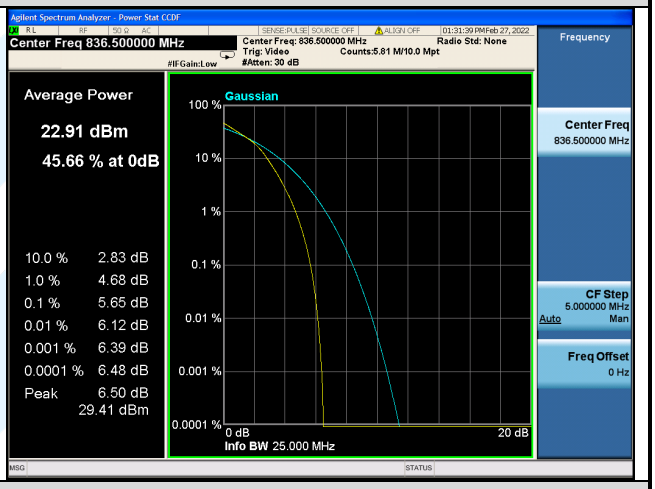
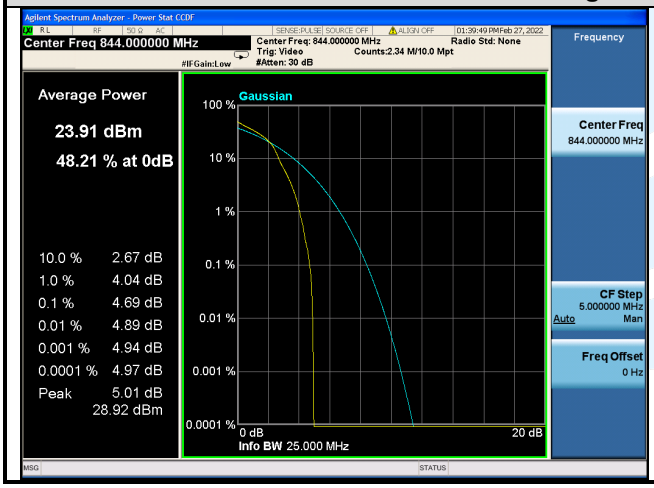
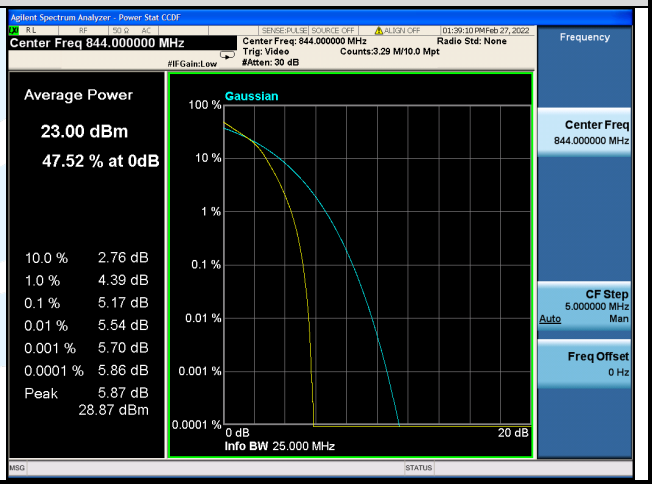
LTE Band 4 / 20MHz / QPSK	
1 RB	Full RB
Lowest Channel	
	
Middle Channel	
	
Highest Channel	
	

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

5.4.3 LTE Band 5

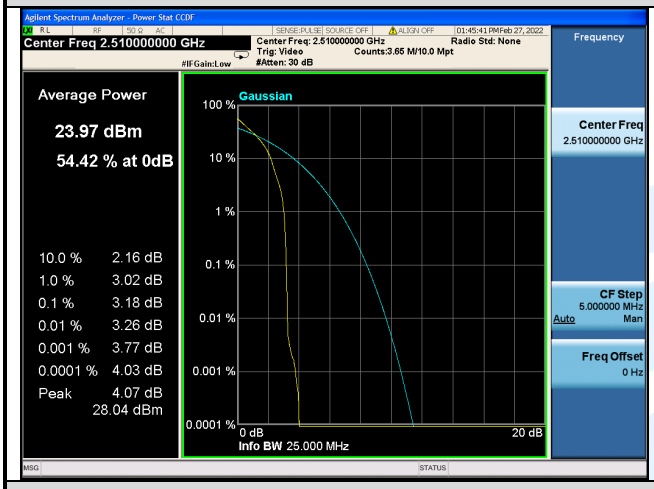
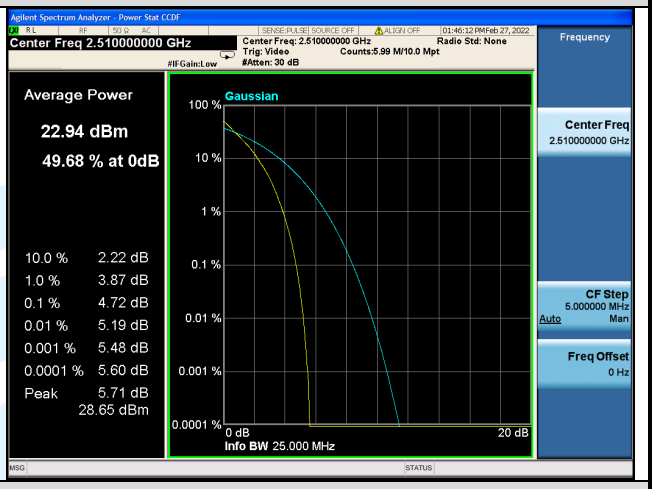
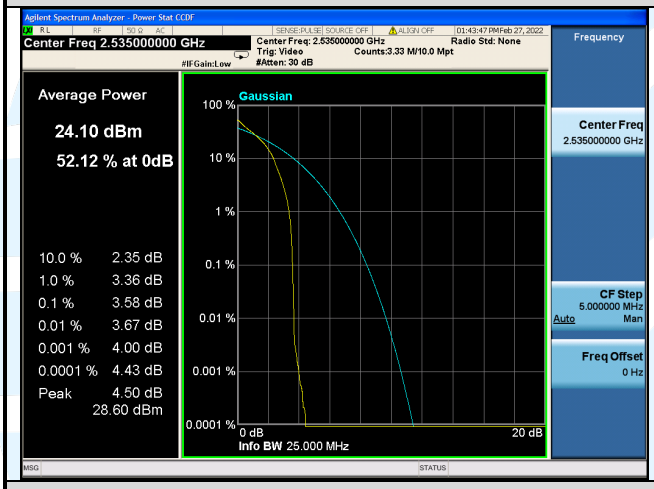
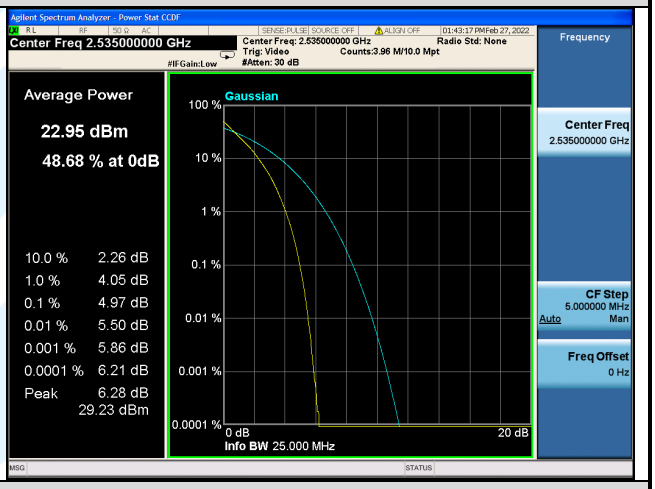
LTE Band 5 Peak-to-average ratio (dB)						
Channel	RB Configuration	Channel Bandwidth: 10 MHz			Limit (dB)	Result
		QPSK	16QAM	64QAM		
Lowest	1 RB	3.72	4.72	/	13	Pass
	Full RB	5.05	5.84	/	13	Pass
Middle	1 RB	4.57	5.38	/	13	Pass
	Full RB	4.91	5.65	/	13	Pass
Highest	1 RB	3.73	4.69	/	13	Pass
	Full RB	4.40	5.17	/	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	3.18	4.31	/	13	Pass
	Full RB	4.72	5.44	/	13	Pass
Middle	1 RB	3.58	4.74	/	13	Pass
	Full RB	4.97	5.67	/	13	Pass
Highest	1 RB	3.40	4.29	/	13	Pass
	Full RB	4.90	5.52	/	13	Pass

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