

# FCC TEST REPORT

**Product Name:** Mobile Phone  
**Trade Mark:** BLU  
**Model No.:** G90  
**Report Number:** 200102002RFM-2  
**Test Standards:** FCC 47 CFR Part 22  
 FCC 47 CFR Part 24  
 FCC 47 CFR Part 27  
 FCC 47 CFR Part 90  
**FCC ID:** YHLBLUG90  
**Test Result:** PASS  
**Date of Issue:** February 25, 2020

Prepared for:

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

Prepared by:

**Shenzhen UnionTrust Quality and Technology Co., Ltd.**  
**16/F, Block A, Building 6, Baoneng Science and Technology Park,**  
**Qingxiang Road No.1, Longhua New District, Shenzhen, China**  
**TEL: +86-755-2823 0888**  
**FAX: +86-755-2823 0886**

Prepared by: \_\_\_\_\_

*Henry Lu*

Henry Lu  
Team Leader

Reviewed by: \_\_\_\_\_

*Kevin Liang*

Kevin Liang  
Assistant Manager

Approved by: \_\_\_\_\_



Billy Li  
Technical Director

Date: \_\_\_\_\_

February 25, 2020

**Shenzhen UnionTrust Quality and Technology Co., Ltd.**

**Version**

Version No.	Date	Description
V1.0	February 25, 2020	Original

**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

Tel: +86-755-28230888

Fax: +86-755-28230886

E-mail: [info@uttlab.com](mailto:info@uttlab.com)<http://www.uttlab.com>UTTR-RF-FCC4G-V1.0

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## 1. GENERAL INFORMATION

### 1.1 CLIENT INFORMATION

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

### 1.2 EUT INFORMATION

#### 1.2.1 General Description of EUT

<b>Product Name:</b>	Mobile Phone	
<b>Model No.:</b>	G90	
<b>Trade Mark:</b>	BLU	
<b>DUT Stage:</b>	Identical Prototype	
<b>EUT Supports Function:</b>	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 13/ Band 17
	2.4 GHz ISM Band:	IEEE 802.11b/g/n Bluetooth V4.2
<b>Sample Received Date:</b>	January 2, 2020	
<b>Sample Tested Date:</b>	January 2, 2020 to February 12, 2020	

#### 1.2.2 Description of Accessories

<b>Adapter</b>	
<b>Model No.:</b>	US-WT-2000
<b>Input:</b>	100-240 V~50/60 Hz 0.3 A
<b>Output:</b>	5.0 V = 2.0 A
<b>DC Cable:</b>	1.20 Meter, Shielded without ferrite
<b>Manufacturer:</b>	Shenzhen Tianyin Electronics Co.,Ltd
<b>Address of Manufacturer:</b>	2-6 FL, Bldg 9, SanZhuli Industrial Park, Shuitian Community Shiyan Subdistrict, Bao'an District

<b>Battery</b>	
<b>Model No.:</b>	C876642400P
<b>Battery Type:</b>	Lithium-ion Rechargeable Battery
<b>Rated Voltage:</b>	3.85 Vdc
<b>Limited Charge Voltage:</b>	4.4 Vdc
<b>Rated Capacity:</b>	3930 mAh
<b>Manufacturer:</b>	BRICH ELECTRONIC.
<b>Address of Manufacturer:</b>	No.18, haibin road, No.6 Industrial Zone,Wusha chang'an Town,dongguan city, guangdong Province, China

<b>Cable</b>	
<b>Description:</b>	USB Type-C Plug Cable
<b>Cable Type:</b>	Shielded without ferrite
<b>Length:</b>	1.20 Meter

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E-mail: info@uttlab.com

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Earphone	
<b>Cable Type:</b>	Unshielded
<b>Length:</b>	1.50 Meter

### 1.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD

<b>Support Networks:</b>	LTE	
<b>Type of Modulation:</b>	LTE Band 2/4/5/7/12/13/17:	QPSK, 16QAM
<b>Antenna Type:</b>	PIFA Antenna	
<b>Antenna Gain:</b>	LTE Band 2:	0.8 dBi
	LTE Band 4:	0.8 dBi
	LTE Band 5:	-0.8 dBi
	LTE Band 7:	0.8 dBi
	LTE Band 12:	-2.8 dBi
	LTE Band 13:	-2.8 dBi
	LTE Band 17:	-2.8 dBi
<b>IEMI:</b>	Radiation: 863653035423971, 863653035423989	
	Conducted: 863653037353093, 863653037353101	
<b>Normal Test Voltage:</b>	3.85 Vdc	
<b>Extreme Test Voltage:</b>	3.5 to 4.4Vdc	
<b>Extreme Test Temperature:</b>	-30 °C to +50 °C	

Summary of Results:									
Bands	BW	Modulation	Frequency Range	Max RF Output Power (dBm)		EIRP (W)	99% BW (MHz)	Emission Designator	
	(MHz)		(MHz)	Conducted (Average)	ERP/EIRP (Average)				
2	1.4	QPSK	1850.7-1909.3	23.58	24.38	0.27416	1.1069	1M11G7W	
		16QAM		22.70	23.50	0.22387	1.1045	1M10D7W	
	3	QPSK	1851.5-1908.5	23.51	24.31	0.26977	2.6985	2M70G7W	
		16QAM		22.66	23.46	0.22182	2.6903	2M69D7W	
	5	QPSK	1852.5-1907.5	23.49	24.29	0.26853	4.5178	4M52G7W	
		16QAM		22.74	23.54	0.22594	4.5245	4M52D7W	
	10	QPSK	1855.0-1905.0	23.52	24.32	0.27040	8.9962	9M00G7W	
		16QAM		22.77	23.57	0.22751	8.9965	9M00D7W	
	15	QPSK	1857.5-1902.5	23.55	24.35	0.27227	13.516	13M5G7W	
		16QAM		22.77	23.57	0.22751	13.489	13M5D7W	
	20	QPSK	1860.0-1900.0	23.59	24.39	0.27479	17.991	18M0G7W	
		16QAM		22.81	23.61	0.22961	18.040	18M0D7W	
	4	1.4	QPSK	1710.7-1754.3	23.23	24.03	0.25293	1.1067	1M11G7W
			16QAM		22.44	23.24	0.21086	1.1001	1M10D7W
3		QPSK	1711.5-1753.5	23.17	23.97	0.24946	2.6947	2M69G7W	
		16QAM		23.40	23.20	0.20893	2.6913	2M69D7W	
5		QPSK	1712.5-1752.5	23.22	24.02	0.25235	4.5060	4M51G7W	
		16QAM		22.48	23.28	0.21281	4.5144	4M51D7W	
10		QPSK	1715-1750	23.18	23.98	0.25003	9.0009	9M00G7W	
		16QAM		22.51	23.31	0.21429	8.9952	9M00D7W	
15		QPSK	1717.5-1747.5	23.20	24.00	0.25119	13.477	13M5G7W	
		16QAM		22.51	23.31	0.21429	13.488	13M5D7W	
20		QPSK	1720-1745	23.28	24.08	0.25586	18.003	18M0G7W	
		16QAM		22.55	23.35	0.21627	18.019	18M0D7W	
5		1.4	QPSK	824.7-848.3	23.71	20.76	0.11912	1.1046	1M10G7W
			16QAM		22.75	19.80	0.09550	1.1030	1M10D7W
	3	QPSK	825.5-847.5	23.58	20.63	0.11561	2.6956	2M70G7W	
		16QAM		22.84	19.89	0.09750	2.6834	2M68D7W	
	5	QPSK	826.5-846.5	23.65	20.70	0.11749	4.5205	4M52G7W	
		16QAM		22.85	19.90	0.09772	4.5241	4M52D7W	
	10	QPSK	829-844	23.73	20.78	0.11967	9.0016	9M00G7W	
		16QAM		22.90	19.95	0.09886	8.9963	9M00D7W	

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Summary of Results:									
Bands	BW	Modulation	Frequency Range	Max RF Output Power (dBm)		EIRP (W)	99% BW (MHz)	Emission Designator	
	(MHz)		(MHz)	Conducted (Average)	ERP/EIRP (Average)				
7	5	QPSK	2502.5-2567.5	23.78	24.58	0.28708	4.5233	4M52G7W	
		16QAM		22.99	23.79	0.23933	4.5262	4M53D7W	
	10	QPSK	2505-2565	23.77	24.57	0.28642	9.0079	9M01G7W	
		16QAM		22.87	23.67	0.23281	8.9931	8M99D7W	
	15	QPSK	2507.5-2562.5	23.88	24.68	0.29376	13.495	13M5G7W	
		16QAM		22.88	23.84	0.24210	13.193	13M2D7W	
	20	QPSK	2510-2560	23.89	24.69	0.29444	17.998	18M0G7W	
		16QAM		22.89	23.67	0.23281	18.041	18M0D7W	
	12	1.4	QPSK	699.7-715.3	23.38	18.43	0.06966	1.1079	1M11G7W
			16QAM		22.49	17.54	0.05675	1.1012	1M10D7W
3		QPSK	700.5-714.5	23.29	18.34	0.06823	2.6977	2M70G7W	
		16QAM		22.48	17.53	0.05662	2.6892	2M69D7W	
5		QPSK	701.5-713.5	23.37	18.42	0.06950	4.5408	4M54G7W	
		16QAM		22.37	17.42	0.05521	4.5420	4M54D7W	
10		QPSK	704-711	23.41	18.46	0.07015	9.0458	9M05G7W	
		16QAM		22.53	17.58	0.05728	9.0385	9M04D7W	
13		5	QPSK	779.5-784.5	23.66	18.71	0.07430	4.5346	4M53G7W
			16QAM		22.56	17.61	0.05768	4.5542	4M55D7W
	10	QPSK	782-782	23.77	18.82	0.07621	9.0024	9M00G7W	
		16QAM		22.62	17.67	0.05848	8.9945	8M99D7W	
17	5	QPSK	706.5-713.5	23.34	18.39	0.06902	4.5347	4M53G7W	
		16QAM		22.42	17.47	0.05585	4.5434	4M54D7W	
	10	QPSK	709-711	23.45	18.50	0.07079	9.0606	9M06G7W	
		16QAM		22.52	17.57	0.05715	9.0325	9M03D7W	



## 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: 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 &	ANSI C63.26-2015 &	PASS

### Shenzhen UnionTrust Quality and Technology Co., Ltd.

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	FCC 47 CFR Part 22.355	KDB 971168 D01v03r01
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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&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

FCC 47 CFR Part 27 Test Cases (LTE Band 13)			
Test Item	Test Requirement	Test Method	Result
Effective Radiated Power (ERP)	FCC 47 CFR Part 2.1046(a) & FCC 47 CFR Part 27.50(b)(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(b)(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)	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
Band Edge at antenna terminals	FCC 47 CFR Part 27.53	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	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	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS

**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

Tel: +86-755-28230888

Fax: +86-755-28230886

E-mail: info@uttlab.com

<http://www.uttlab.com>

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Frequency stability	FCC 47 CFR Part 2.1055 & FCC 47 CFR Part 27.54	ANSI C63.26-2015 & KDB 971168 D01v03r01	PASS
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### 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)
<input checked="" type="checkbox"/>	3M Chamber & Accessory Equipment	ETS-LINDGREN	3M	N/A	Dec. 03, 2018	Dec. 03, 2021
<input checked="" type="checkbox"/>	Receiver	R&S	ESIB26	100114	Nov. 24, 2019	Nov. 23, 2020
<input type="checkbox"/>	Loop Antenna	ETS-LINDGREN	6502	00202525	Nov. 16, 2019	Nov. 15, 2020
<input checked="" type="checkbox"/>	Broadband Antenna	ETS-LINDGREN	3142E	00201566	Nov. 16, 2019	Nov. 15, 2020
<input checked="" type="checkbox"/>	6dB Attenuator	Talent	RA6A5-N-18	18103001	Nov. 16, 2019	Nov. 15, 2020
<input checked="" type="checkbox"/>	Preamplifier	HP	8447F	2805A02960	Nov. 24, 2019	Nov. 23, 2020
<input type="checkbox"/>	Broadband Antenna (Pre-amplifier)	ETS-LINDGREN	3142E-PA	00201891	May 18, 2019	May 18, 2020
<input type="checkbox"/>	6dB Attenuator	Talent	RA6A5-N-18	18103002	Nov. 24, 2019	Nov. 23, 2020
<input type="checkbox"/>	Horn Antenna	ETS-LINDGREN	3117	00164202	Nov. 16, 2019	Nov. 15, 2020
<input checked="" type="checkbox"/>	Horn Antenna (Pre-amplifier)	ETS-LINDGREN	3117-PA	00201874	May 18, 2019	May 18, 2020
<input type="checkbox"/>	Horn Antenna	ETS-LINDGREN	3116C	00200180	Jun. 23, 2019	Jun. 23, 2020
<input checked="" type="checkbox"/>	Horn Antenna (Pre-amplifier)	ETS-LINDGREN	3116C-PA	00202652	Nov. 16, 2019	Nov. 15, 2020
<input checked="" type="checkbox"/>	Multi device Controller	ETS-LINDGREN	7006-001	00160105	N/A	N/A
<input checked="" type="checkbox"/>	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)
<input checked="" type="checkbox"/>	Receiver	R&S	ESR7	1316.3003K07-101181-K3	Nov. 24, 2019	Nov. 23, 2020
<input checked="" type="checkbox"/>	EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY51440197	Nov. 24, 2019	Nov. 23, 2020
<input checked="" type="checkbox"/>	Wideband Radio Communication Tester	R&S	CMW500	120932	Jul. 19, 2019	Jul. 19, 2020
<input type="checkbox"/>	Wideband Radio Communication Tester	R&S	CMW500	119583	Jul. 31, 2019	Jul. 31, 2020
<input checked="" type="checkbox"/>	DC Source	KIKUSUI	PWR400L	LK003024	Sep. 09, 2019	Sep. 08, 2020
<input type="checkbox"/>	Temp & Humidity chamber	Espec	GL(U)04K A(W)	16921H201P3	Jul. 19, 2019	Jul. 19, 2020
<input checked="" type="checkbox"/>	Temp & Humidity chamber	Votisch	VT4002	58566133290020	Jun. 05, 2018	Jun. 05, 2020

**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

Tel: +86-755-28230888

Fax: +86-755-28230886

E-mail: info@uttlab.com

<http://www.uttlab.com>

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#### 4. TEST CONFIGURATION

##### 4.1 ENVIRONMENTAL CONDITIONS FOR TESTING

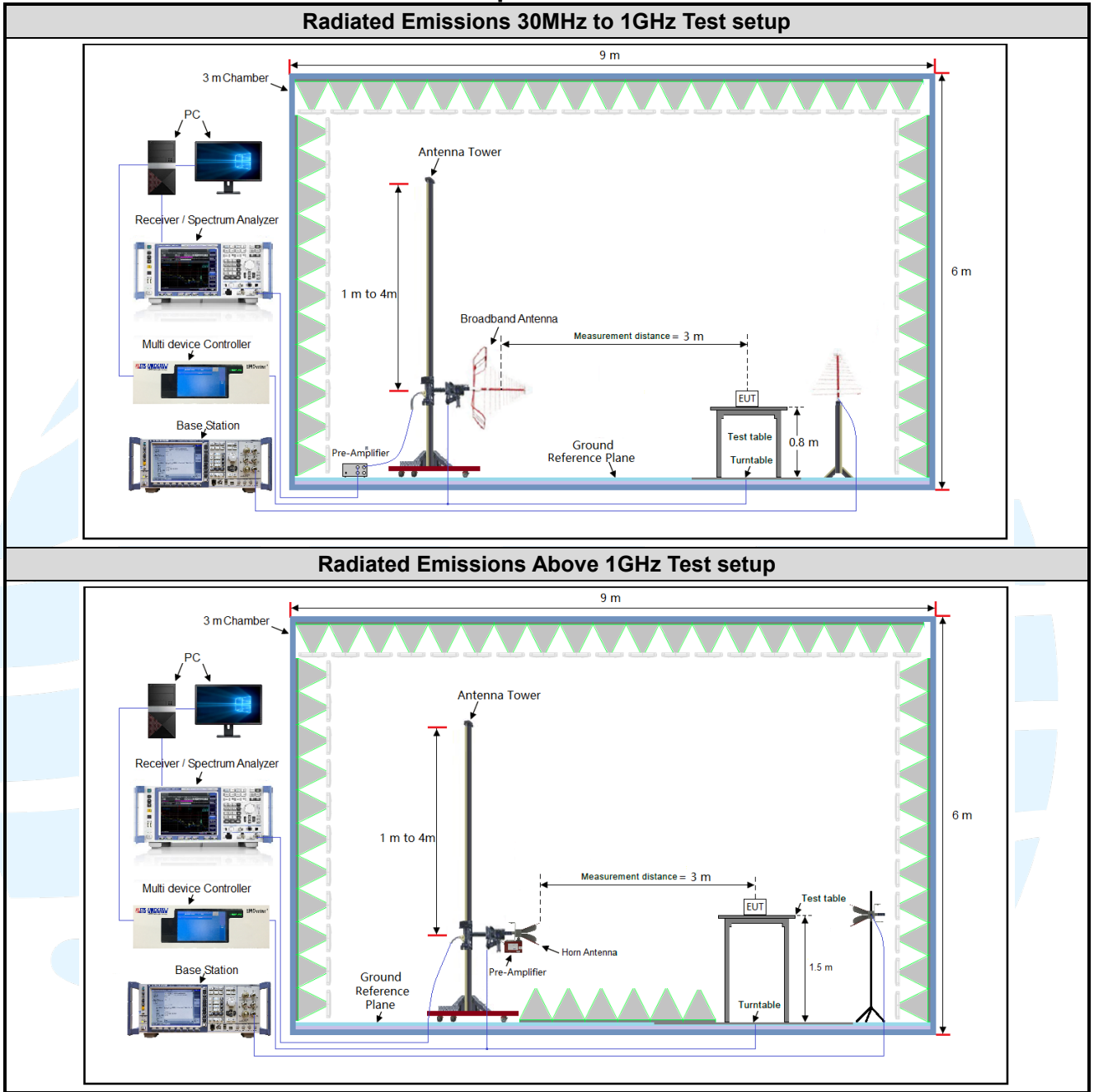
Test Environment	Selected Values During Tests		
Test Condition	Ambient		
	Temperature (°C)	Voltage (V)	Relative Humidity (%)
TN/VN	+15 to +35	3.85	20 to 75
TL/VL	-30	3.5	20 to 75
TH/VL	+50	3.5	20 to 75
TL/VH	-30	4.4	20 to 75
TH/VH	+50	4.4	20 to 75

**Remark:**

- 1) The EUT just work in such extreme temperature of -30 °C to +50 °C and the extreme voltage of 3.5 V to 4.4 V, so here the EUT is tested in the temperature of -30 °C to +50 °C and the voltage of 3.5 V to 4.4 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.

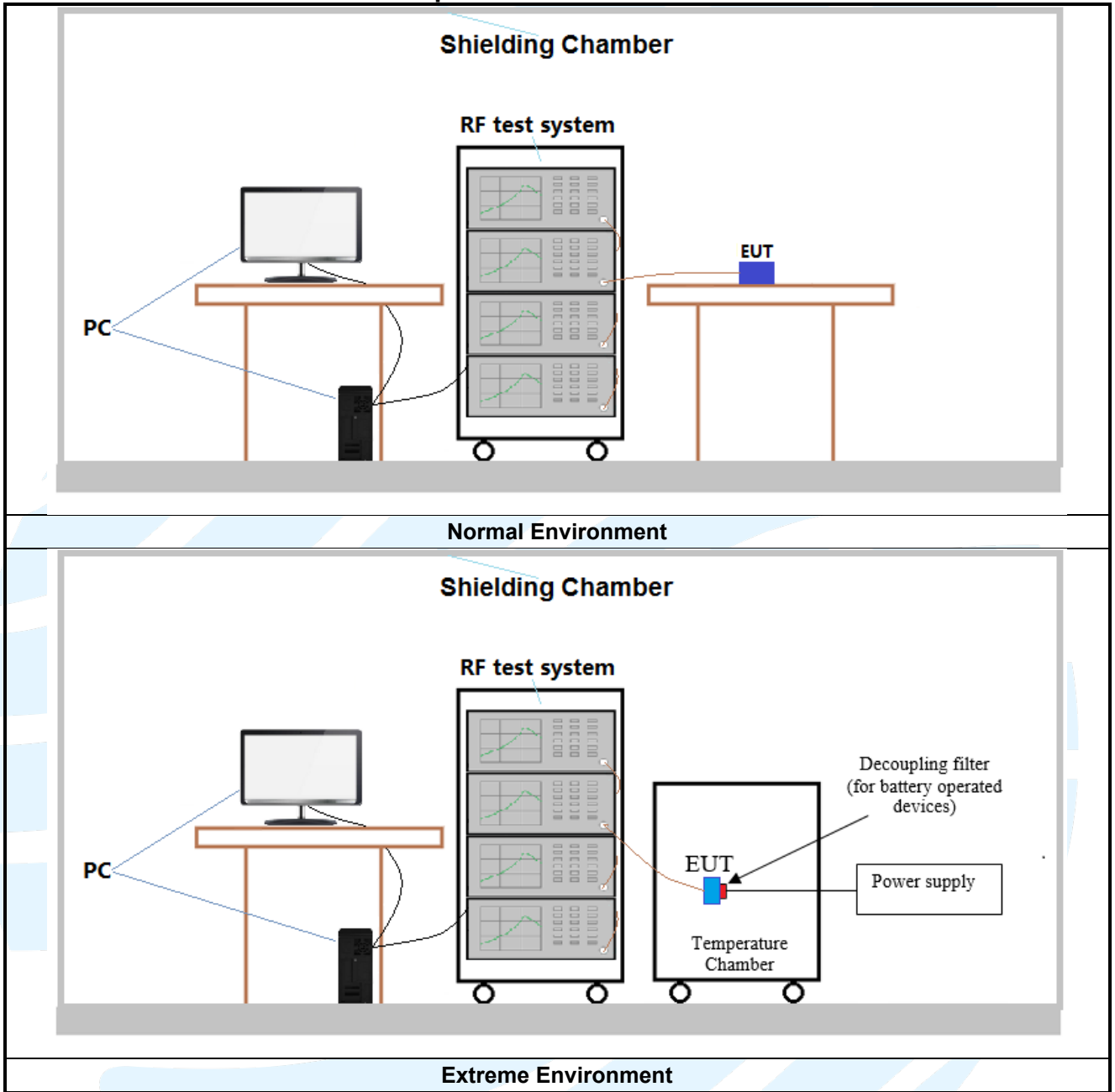
4.2 TEST SETUP

4.2.1 For Radiated Emissions test setup





4.2.2 For Conducted RF test setup



### 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
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
	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
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

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E-mail: info@uttlab.com

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		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 13 TX: 777-787MHz	Low Range	5	23205	779.5
		10	23230	782
	Middle Range	5/10	23230	782
	High Range	5	23255	784.5
		10	23230	782
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

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<http://www.uttlab.com>

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### 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 3.85V 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 13	1TX	Chain 0	Y axis
LTE Band 17	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	23.15	23.25	23.02	1	0	23.01	23.15	22.94	
	1	2	23.42	23.58	23.49	1	7	23.36	23.51	23.44	
	1	5	23.28	22.97	23.07	1	14	23.12	22.98	22.94	
	3	0	23.26	23.20	23.11	8	0	22.16	22.19	22.21	
	3	1	23.24	23.16	23.24	8	3	22.20	22.31	22.18	
	3	3	23.19	23.16	23.01	8	7	22.07	22.26	22.15	
16QAM	6	0	22.16	22.31	22.20	15	0	22.15	22.17	22.15	
	1	0	22.25	22.17	22.44	1	0	22.26	22.17	22.28	
	1	2	22.70	22.56	22.68	1	7	22.62	22.62	22.66	
	1	5	22.25	22.28	22.35	1	14	22.16	22.30	22.46	
	3	0	22.17	22.15	22.17	8	0	21.06	21.26	21.16	
	3	1	22.22	22.19	22.15	8	3	21.18	21.26	21.12	
Channel Bandwidth: 5 MHz	3	3	22.13	22.20	22.12	8	7	21.19	21.22	21.12	
	6	0	21.08	21.30	21.07	15	0	21.21	21.13	21.17	
	1	0	23.16	23.17	23.01	1	0	23.10	23.19	23.06	
	1	12	23.47	23.41	23.49	1	24	23.52	23.44	23.45	
	1	24	23.23	22.97	23.03	1	49	23.19	23.13	23.01	
	12	0	22.09	22.15	22.22	25	0	22.24	22.12	22.14	
QPSK	12	6	22.27	22.24	22.14	25	12	22.21	22.24	22.17	
	12	13	22.24	22.20	22.04	25	25	22.13	22.17	22.09	
	25	0	22.25	22.21	22.14	50	0	22.20	22.30	22.20	
	1	0	22.19	22.10	22.29	1	0	22.14	22.19	22.46	
	1	12	22.52	22.66	22.74	1	24	22.53	22.51	22.77	
	1	24	22.18	22.14	22.49	1	49	22.16	22.13	22.46	
16QAM	12	0	21.16	21.30	21.07	25	0	21.04	21.31	21.23	
	12	6	21.10	21.24	21.24	25	12	21.19	21.28	21.08	
	12	13	21.22	21.11	21.12	25	25	21.15	21.24	21.01	
	25	0	21.18	21.18	21.19	50	0	21.04	21.20	21.19	
	Channel Bandwidth: 15 MHz					Channel Bandwidth: 20 MHz					
	QPSK	1	0	23.09	23.24	23.01	1	0	23.17	23.30	23.13
1		37	23.34	23.55	23.44	1	50	23.54	<b>23.59</b>	23.55	
1		74	23.30	23.13	23.00	1	99	23.31	23.15	23.13	
37		0	22.21	22.27	22.11	50	0	22.29	22.31	22.27	
37		19	22.19	22.26	22.24	50	25	22.30	22.33	22.29	
37		39	22.12	22.25	22.06	50	50	22.27	22.32	22.18	
16QAM	75	0	22.12	22.29	22.09	100	0	22.31	22.33	22.21	
	1	0	22.12	22.18	22.41	1	0	22.27	22.29	22.46	
	1	37	22.69	22.58	22.77	1	50	22.71	22.69	22.81	
	1	74	22.30	22.18	22.41	1	99	22.35	22.31	22.53	
	37	0	21.12	21.28	21.21	50	0	21.22	21.35	21.27	
	37	19	21.06	21.26	21.12	50	25	21.25	21.32	21.25	
Channel Bandwidth: 20 MHz	37	39	21.21	21.28	21.10	50	50	21.24	21.31	21.16	
	75	0	21.03	21.12	21.17	100	0	21.23	21.31	21.24	

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	22.73	22.78	22.88	1	0	22.59	22.68	22.80	
	1	2	23.00	23.23	23.22	1	7	22.94	23.16	23.17	
	1	5	22.86	22.75	22.94	1	14	22.70	22.76	22.81	
	3	0	22.94	22.84	23.01	8	0	21.84	21.83	22.11	
	3	1	22.95	22.87	23.05	8	3	21.91	22.02	21.99	
	3	3	22.96	22.84	22.95	8	7	21.84	21.94	22.09	
16QAM	6	0	21.87	21.99	22.14	15	0	21.86	21.85	22.09	
	1	0	22.09	21.93	22.24	1	0	22.10	21.93	22.08	
	1	2	22.44	22.31	22.42	1	7	22.36	22.37	22.40	
	1	5	21.99	22.13	22.18	1	14	21.90	22.15	22.29	
	3	0	21.96	21.76	22.05	8	0	20.85	20.87	21.04	
	3	1	22.08	21.88	22.03	8	3	21.04	20.95	21.00	
QPSK	3	3	21.97	21.83	22.08	8	7	21.03	20.85	21.08	
	6	0	20.91	20.96	20.99	15	0	21.04	20.79	21.09	
	Channel Bandwidth: 5 MHz						Channel Bandwidth: 10 MHz				
	QPSK	1	0	22.74	22.70	22.87	1	0	22.68	22.72	22.92
		1	12	23.05	23.06	23.22	1	24	23.10	23.09	23.18
		1	24	22.81	22.75	22.90	1	49	22.77	22.91	22.88
12		0	21.77	21.79	22.12	25	0	21.92	21.76	22.04	
12		6	21.98	21.95	21.95	25	12	21.92	21.95	21.98	
12		13	22.01	21.88	21.98	25	25	21.90	21.85	22.03	
16QAM	25	0	21.96	21.89	22.08	50	0	21.91	21.98	22.14	
	1	0	22.03	21.86	22.09	1	0	21.98	21.95	22.26	
	1	12	22.26	22.41	22.48	1	24	22.27	22.26	22.51	
	1	24	21.92	21.99	22.32	1	49	21.90	21.98	22.29	
	12	0	20.95	20.91	20.95	25	0	20.83	20.92	21.11	
	12	6	20.96	20.93	21.12	25	12	21.05	20.97	20.96	
QPSK	12	13	21.06	20.74	21.08	25	25	20.99	20.87	20.97	
	25	0	21.01	20.84	21.11	50	0	20.87	20.86	21.11	
	Channel Bandwidth: 15 MHz						Channel Bandwidth: 20 MHz				
	QPSK	1	0	22.67	22.77	22.87	1	0	22.75	22.83	22.99
		1	37	22.92	23.20	23.17	1	50	23.12	23.24	23.28
		1	74	22.88	22.91	22.87	1	99	22.89	22.93	23.00
37		0	21.89	21.91	22.01	50	0	21.97	21.95	22.17	
37		19	21.90	21.97	22.05	50	25	22.01	22.04	22.10	
37		39	21.89	21.93	22.00	50	50	22.04	22.00	22.12	
16QAM	75	0	21.83	21.97	22.03	100	0	22.02	22.01	22.15	
	1	0	21.96	21.94	22.21	1	0	22.11	22.05	22.26	
	1	37	22.43	22.33	22.51	1	50	22.45	22.44	22.55	
	1	74	22.04	22.03	22.24	1	99	22.09	22.16	22.36	
	37	0	20.91	20.89	21.09	50	0	21.01	20.96	21.15	
	37	19	20.92	20.95	21.00	50	25	21.11	21.01	21.13	
QPSK	37	39	21.05	20.91	21.06	50	50	21.08	20.94	21.12	
	75	0	20.86	20.78	21.09	100	0	21.06	20.97	21.16	

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	23.47	23.54	23.44	1	0	23.54	23.56	23.53	
	1	2	23.71	23.54	23.62	1	7	23.58	23.56	23.52	
	1	5	23.47	23.61	23.57	1	14	23.56	23.55	23.55	
	3	0	23.44	23.59	23.57	8	0	22.52	22.45	22.55	
	3	1	23.50	23.54	23.41	8	3	22.47	22.43	22.51	
	3	3	23.53	23.42	23.55	8	7	22.45	22.43	22.39	
16QAM	6	0	22.54	22.46	22.51	15	0	22.49	22.47	22.45	
	1	0	22.71	22.47	22.65	1	0	22.55	22.35	22.61	
	1	2	22.74	22.45	22.66	1	7	22.84	22.62	22.84	
	1	5	22.75	22.45	22.60	1	14	22.78	22.46	22.63	
	3	0	22.56	22.52	22.53	8	0	21.44	21.49	21.62	
	3	1	22.53	22.49	22.46	8	3	21.46	21.48	21.41	
Channel Bandwidth: 5 MHz	3	3	22.51	22.53	22.41	8	7	21.48	21.58	21.43	
	6	0	21.50	21.45	21.43	15	0	21.57	21.48	21.55	
	QPSK	1	0	23.44	23.44	23.61	1	0	23.62	23.59	23.61
		1	12	23.65	23.62	23.62	1	24	<b>23.73</b>	23.71	23.72
		1	24	23.54	23.60	23.63	1	49	23.58	23.65	23.68
		12	0	22.58	22.54	22.48	25	0	22.61	22.59	22.65
12		6	22.40	22.57	22.45	25	12	22.56	22.61	22.61	
12		13	22.51	22.51	22.41	25	25	22.57	22.59	22.55	
16QAM	25	0	22.39	22.48	22.56	50	0	22.59	22.60	22.58	
	1	0	22.65	22.41	22.58	1	0	22.72	22.55	22.77	
	1	12	22.85	22.48	22.83	1	24	22.90	22.65	22.85	
	1	24	22.76	22.49	22.71	1	49	22.79	22.55	22.78	
	12	0	21.52	21.50	21.59	25	0	21.62	21.58	21.68	
	12	6	21.56	21.42	21.52	25	12	21.61	21.61	21.61	
Channel Bandwidth: 10 MHz	12	13	21.54	21.48	21.48	25	25	21.58	21.59	21.56	
	25	0	21.40	21.49	21.56	50	0	21.59	21.56	21.59	



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	23.21	23.57	23.26	1	0	23.23	23.47	23.32
	1	12	23.55	23.78	23.63	1	24	23.66	23.77	23.67
	1	24	23.41	23.30	23.42	1	49	23.40	23.37	23.55
	12	0	22.24	22.40	22.52	25	0	22.32	22.42	22.46
	12	6	22.25	22.63	22.40	25	12	22.26	22.54	22.33
	12	13	22.29	22.43	22.41	25	25	22.28	22.42	22.45
	25	0	22.40	22.54	22.34	50	0	22.44	22.40	22.47
16QAM	1	0	22.37	22.50	22.58	1	0	22.41	22.40	22.63
	1	12	22.82	22.72	22.99	1	24	22.71	22.72	22.87
	1	24	22.50	22.45	22.72	1	49	22.47	22.46	22.56
	12	0	21.49	21.41	21.34	25	0	21.47	21.32	21.44
	12	6	21.45	21.59	21.57	25	12	21.55	21.55	21.41
	12	13	21.51	21.42	21.51	25	25	21.50	21.50	21.51
	25	0	21.60	21.39	21.49	50	0	21.54	21.52	21.43
Channel Bandwidth: 15 MHz						Channel Bandwidth: 20 MHz				
QPSK	1	0	23.17	23.51	23.30	1	0	23.36	23.63	23.33
	1	37	23.55	23.88	23.74	1	50	23.73	<b>23.89</b>	23.83
	1	74	23.45	23.24	23.52	1	99	23.45	23.38	23.61
	37	0	22.31	22.34	22.58	50	0	22.42	22.42	22.60
	37	19	22.38	22.57	22.33	50	25	22.39	22.63	22.45
	37	39	22.43	22.44	22.48	50	50	22.46	22.61	22.48
	75	0	22.34	22.42	22.31	100	0	22.45	22.60	22.49
16QAM	1	0	22.52	22.44	22.62	1	0	22.53	22.54	22.73
	1	37	22.81	22.88	23.04	1	50	22.85	22.89	23.05
	1	74	22.43	22.50	22.61	1	99	22.54	22.56	22.74
	37	0	21.46	21.41	21.49	50	0	21.62	21.45	21.53
	37	19	21.59	21.55	21.52	50	25	21.59	21.61	21.60
	37	39	21.53	21.44	21.33	50	50	21.56	21.60	21.52
	75	0	21.53	21.39	21.46	100	0	21.61	21.54	21.54

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	23.16	23.19	23.03	1	0	23.08	23.24	23.17
	1	2	23.19	23.30	23.28	1	7	23.11	23.29	23.23
	1	5	23.04	23.33	23.38	1	14	23.20	23.27	23.24
	3	0	23.06	23.17	23.10	8	0	22.18	22.19	22.01
	3	1	23.16	23.24	23.14	8	3	22.15	22.08	22.22
	3	3	23.13	23.26	23.04	8	7	22.06	22.26	22.03
	6	0	22.04	22.16	22.05	15	0	22.11	22.21	22.15
16QAM	1	0	22.06	21.97	22.40	1	0	22.13	22.10	22.42
	1	2	22.12	22.15	22.49	1	7	22.12	22.19	22.48
	1	5	22.13	22.07	22.33	1	14	22.10	22.01	22.43
	3	0	22.16	22.15	22.10	8	0	21.19	21.22	21.02
	3	1	22.29	22.17	22.13	8	3	21.20	21.31	21.06
	3	3	22.11	22.24	22.05	8	7	21.11	21.26	21.19
	6	0	21.23	21.21	21.08	15	0	21.24	21.08	21.09
Channel Bandwidth: 5 MHz						Channel Bandwidth: 10 MHz				
QPSK	1	0	23.09	23.06	23.01	1	0	23.17	23.25	23.21
	1	12	23.10	23.36	23.37	1	24	23.29	23.39	23.41
	1	24	23.23	23.20	23.22	1	49	23.24	23.35	23.39
	12	0	22.24	22.26	21.97	25	0	22.25	22.27	22.14
	12	6	22.14	22.17	22.14	25	12	22.22	22.25	22.23
	12	13	22.03	22.28	22.16	25	25	22.19	22.28	22.20
	25	0	22.12	22.15	22.11	50	0	22.21	22.26	22.19
16QAM	1	0	22.03	22.07	22.28	1	0	22.16	22.15	22.43
	1	12	22.13	22.22	22.37	1	24	22.25	22.24	22.53
	1	24	22.04	22.06	22.25	1	49	22.18	22.16	22.45
	12	0	21.25	21.24	21.17	25	0	21.32	21.31	21.19
	12	6	21.18	21.28	21.23	25	12	21.31	21.33	21.24
	12	13	21.18	21.19	21.04	25	25	21.29	21.27	21.21
	25	0	21.21	21.13	21.04	50	0	21.26	21.22	21.20

#### 4.5.6 LTE Band 13

LTE Band 13 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	23.66	23.59	1	0	/	23.77	/
	1	12	23.47	23.51	23.48	1	24	/	23.71	/
	1	24	23.48	23.57	23.43	1	49	/	23.68	/
	12	0	22.21	22.35	22.30	25	0	/	22.50	/
	12	6	22.36	22.44	22.35	25	12	/	22.47	/
	12	13	22.29	22.39	22.36	25	25	/	22.43	/
16QAM	25	0	22.31	22.35	22.19	50	0	/	22.41	/
	1	0	22.47	22.55	22.40	1	0	/	22.61	/
	1	12	22.44	22.56	22.49	1	24	/	22.62	/
	1	24	22.30	22.48	22.36	1	49	/	22.58	/
	12	0	21.29	21.39	21.23	25	0	/	21.48	/
	12	6	21.15	21.31	21.15	25	12	/	21.42	/
16QAM	12	13	21.22	21.28	21.28	25	25	/	21.35	/
	25	0	21.06	21.19	21.07	50	0	/	21.33	/

#### 4.5.7 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	23.03	23.20	23.14	1	0	23.19	23.23	23.30
	1	12	23.32	23.25	23.34	1	24	23.35	23.41	23.42
	1	24	23.09	23.21	23.34	1	49	23.25	23.37	23.45
	12	0	22.05	22.04	22.15	25	0	22.25	22.18	22.17
	12	6	22.18	22.19	22.07	25	12	22.24	22.25	22.21
	12	13	22.15	22.02	22.04	25	25	22.17	22.18	22.21
	25	0	22.06	22.14	22.17	50	0	22.23	22.21	22.20
16QAM	1	0	22.20	22.03	22.34	1	0	22.24	22.20	22.48
	1	12	22.19	22.20	22.42	1	24	22.26	22.24	22.52
	1	24	22.08	22.05	22.28	1	49	22.27	22.23	22.48
	12	0	21.20	21.09	21.18	25	0	21.32	21.19	21.20
	12	6	21.26	21.21	21.20	25	12	21.31	21.23	21.24
	12	13	21.19	21.16	21.09	25	25	21.26	21.21	21.22
	25	0	21.18	21.03	21.17	50	0	21.24	21.18	21.18

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	-	-	☒	☒	☒	☒	☒	☒	☐	☒	☐	☐	☒	☒	☒
	12	☒	☒	☒	☒	-	-	☒	☒	☐	☒	☐	☐	☒	☒	☒
	13	-	-	☒	☒	-	-	☒	☒	☐	☒	☐	☐	☒	☒	☒
	17	-	-	☒	☒	-	-	☒	☒	☐	☒	☐	☐	☒	☒	☒
Conducted output power	2	☒	☒	☒	☒	☒	☒	☒	☒	☐	☒	☒	☒	☒	☒	☒
	4	☒	☒	☒	☒	☒	☒	☒	☒	☐	☒	☒	☒	☒	☒	☒
	5	☒	☒	☒	☒	--	--	☒	☒	☐	☒	☒	☒	☒	☒	☒
	7	-	-	☒	☒	☒	☒	☒	☒	☐	☒	☒	☒	☒	☒	☒
	12	☒	☒	☒	☒	-	-	☒	☒	☐	☒	☒	☒	☒	☒	☒
	13	-	-	☒	☒	-	-	☒	☒	☐	☒	☒	☒	☒	☒	☒
	17	-	-	☒	☒	-	-	☒	☒	☐	☒	☒	☒	☒	☒	☒
99%&26dB Bandwidth	2	☒	☒	☒	☒	☒	☒	☒	☒	☐	☐	☐	☒	☒	☒	☒
	4	☒	☒	☒	☒	☒	☒	☒	☒	☐	☐	☐	☒	☒	☒	☒
	5	☒	☒	☒	☒	--	--	☒	☒	☐	☐	☐	☒	☒	☒	☒
	7	-	-	☒	☒	☒	☒	☒	☒	☐	☐	☐	☒	☒	☒	☒
	12	☒	☒	☒	☒	-	-	☒	☒	☐	☐	☐	☒	☒	☒	☒
	13	-	-	☒	☒	-	-	☒	☒	☐	☐	☐	☒	☒	☒	☒
	17	-	-	☒	☒	-	-	☒	☒	☐	☐	☐	☒	☒	☒	☒

Item	Band	Bandwidth(MHz)						Modulation			RB			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	64QAM	1	Half	Full	L	M	H
peak-to-average ratio	2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	--	--	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	7	-	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	12	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	13	-	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	17	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Band Edge at antenna terminals	2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	--	--	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	7	-	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	12	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	-	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	13	-	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	-	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	17	-	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	-	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Spurious emissions at antenna terminals	2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	--	--	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	7	-	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	12	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	-	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	13	-	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	-	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	17	-	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	-	-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Item	Band	Bandwidth(MHz)						Modulation			RB			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	64QAM	1	Half	Full	L	M	H
Field strength of spurious radiation	2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	--	--	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	7	-	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	12	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-	-	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	13	-	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-	-	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
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Frequency stability	2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	--	--	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	7	-	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	12	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-	-	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	13	-	-	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-	-	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	17	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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	FCC 47 CFR Part 90	Private Land Mobile Radio 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:** 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)  
**LTE Band 13:** FCC 47 CFR Part 27.50(b)(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.

**FCC 47 CFR Part 27.50(b)(10):**

Portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP.

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.

**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

Tel: +86-755-28230888

Fax: +86-755-28230886

E-mail: info@uttlab.com

<http://www.uttlab.com>

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**Test Procedure:**

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

where:

ERP or EIRP = effective radiated power or equivalent isotropically radiated power, respectively (expressed in the same units as P<sub>Meas</sub>, typically dBW or dBm);

P<sub>Meas</sub> = measured transmitter output power or PSD, in dBm or dBW;

G<sub>T</sub> = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);

1) L<sub>C</sub> = 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
<b>Channel Bandwidth: 1.4MHz</b>					
Lowest	24.22	23.50	/	33.01	Pass
Middle	24.38	23.36	/	33.01	Pass
Highest	24.29	23.48	/	33.01	Pass
<b>Channel Bandwidth: 3MHz</b>					
Lowest	24.16	23.42	/	33.01	Pass
Middle	24.31	23.42	/	33.01	Pass
Highest	24.24	23.46	/	33.01	Pass
<b>Channel Bandwidth: 5MHz</b>					
Lowest	24.27	23.32	/	33.01	Pass
Middle	24.21	23.46	/	33.01	Pass
Highest	24.29	23.54	/	33.01	Pass
<b>Channel Bandwidth: 10MHz</b>					
Lowest	24.32	23.33	/	33.01	Pass
Middle	24.24	23.31	/	33.01	Pass
Highest	24.25	23.57	/	33.01	Pass
<b>Channel Bandwidth: 15MHz</b>					
Lowest	24.14	23.49	/	33.01	Pass
Middle	24.35	23.38	/	33.01	Pass
Highest	24.24	23.57	/	33.01	Pass
<b>Channel Bandwidth: 20MHz</b>					
Lowest	24.34	23.51	/	33.01	Pass
Middle	24.39	23.49	/	33.01	Pass
Highest	24.35	23.61	/	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
<b>Channel Bandwidth: 1.4MHz</b>					
Lowest	23.80	23.24	/	30.00	Pass
Middle	24.03	23.11	/	30.00	Pass
Highest	24.02	23.22	/	30.00	Pass
<b>Channel Bandwidth: 3MHz</b>					
Lowest	23.74	23.16	/	30.00	Pass
Middle	23.96	23.17	/	30.00	Pass
Highest	23.97	23.20	/	30.00	Pass
<b>Channel Bandwidth: 5MHz</b>					
Lowest	23.85	23.06	/	30.00	Pass
Middle	23.86	23.21	/	30.00	Pass
Highest	24.02	23.28	/	30.00	Pass
<b>Channel Bandwidth: 10MHz</b>					
Lowest	23.90	23.07	/	30.00	Pass
Middle	23.89	23.06	/	30.00	Pass
Highest	23.98	23.31	/	30.00	Pass
<b>Channel Bandwidth: 15MHz</b>					
Lowest	23.72	23.23	/	30.00	Pass
Middle	24.00	23.13	/	30.00	Pass
Highest	23.97	23.31	/	30.00	Pass
<b>Channel Bandwidth: 20MHz</b>					
Lowest	23.92	23.25	/	30.00	Pass
Middle	24.04	23.24	/	30.00	Pass
Highest	24.08	23.35	/	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
<b>Channel Bandwidth: 1.4MHz</b>					
Lowest	20.76	19.80	/	38.45	Pass
Middle	20.59	19.50	/	38.45	Pass
Highest	20.67	19.65	/	38.45	Pass
<b>Channel Bandwidth: 3MHz</b>					
Lowest	20.63	19.89	/	38.45	Pass
Middle	20.61	19.67	/	38.45	Pass
Highest	20.57	19.89	/	38.45	Pass
<b>Channel Bandwidth: 5MHz</b>					
Lowest	20.70	19.90	/	38.45	Pass
Middle	20.67	19.53	/	38.45	Pass
Highest	20.67	19.88	/	38.45	Pass
<b>Channel Bandwidth: 10MHz</b>					
Lowest	20.78	19.95	/	38.45	Pass
Middle	20.76	19.70	/	38.45	Pass
Highest	20.77	19.90	/	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
<b>Channel Bandwidth: 5MHz</b>					
Lowest	24.35	23.62	/	33.01	Pass
Middle	24.58	23.52	/	33.01	Pass
Highest	24.43	23.79	/	33.01	Pass
<b>Channel Bandwidth: 10MHz</b>					
Lowest	24.46	23.51	/	33.01	Pass
Middle	24.57	23.52	/	33.01	Pass
Highest	24.47	23.67	/	33.01	Pass
<b>Channel Bandwidth: 15MHz</b>					
Lowest	24.35	23.61	/	33.01	Pass
Middle	24.68	23.68	/	33.01	Pass
Highest	24.54	23.84	/	33.01	Pass
<b>Channel Bandwidth: 20MHz</b>					
Lowest	24.53	23.65	/	33.01	Pass
Middle	24.69	23.69	/	33.01	Pass
Highest	24.63	23.85	/	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
<b>Channel Bandwidth: 1.4MHz</b>					
Lowest	18.09	17.17	/	34.77	Pass
Middle	18.38	17.20	/	34.77	Pass
Highest	18.43	17.54	/	34.77	Pass
<b>Channel Bandwidth: 3MHz</b>					
Lowest	18.16	17.17	/	34.77	Pass
Middle	18.34	17.24	/	34.77	Pass
Highest	18.28	17.53	/	34.77	Pass
<b>Channel Bandwidth: 5MHz</b>					
Lowest	18.15	17.18	/	34.77	Pass
Middle	18.41	17.27	/	34.77	Pass
Highest	18.42	17.42	/	34.77	Pass
<b>Channel Bandwidth: 10MHz</b>					
Lowest	18.34	17.30	/	34.77	Pass
Middle	18.44	17.29	/	34.77	Pass
Highest	18.46	17.58	/	34.77	Pass

### 5.2.6 LTE Band 13

LTE Band 13 Maximum ERP (dBm)					
Channel	QPSK; RB:1	16QAM; RB:1	64QAM; RB:1	Limit (dBm)	Result
<b>Channel Bandwidth: 5MHz</b>					
Lowest	18.68	17.49	/	34.77	Pass
Middle	18.71	17.61	/	34.77	Pass
Highest	18.64	17.54	/	34.77	Pass
<b>Channel Bandwidth: 10MHz</b>					
Lowest	/	/	/	34.77	Pass
Middle	18.82	17.67	/	34.77	Pass
Highest	/	/	/	34.77	Pass

### 5.2.7 LTE Band 17

LTE Band 17 Maximum ERP (dBm)					
Channel	QPSK; RB:1	16QAM; RB:1	64QAM; RB:1	Limit (dBm)	Result
<b>Channel Bandwidth: 5MHz</b>					
Lowest	18.37	17.24	/	34.77	Pass
Middle	18.30	17.25	/	34.77	Pass
Highest	18.39	17.47	/	34.77	Pass
<b>Channel Bandwidth: 10MHz</b>					
Lowest	18.30	17.31	/	34.77	Pass
Middle	18.42	17.29	/	34.77	Pass
Highest	18.50	17.57	/	34.77	Pass

#### 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

Tel: +86-755-28230888

Fax: +86-755-28230886

E-mail: info@uttlab.com

<http://www.uttlab.com>

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### 5.3 CONDUCTED OUTPUT POWER

FCC 47 CFR Part 2.1046(a)

**LTE Band 2 & LTE Band 25:** FCC 47 CFR Part 24.232(c)

**LTE Band 4 & LTE Band 66:** FCC 47 CFR Part 27.50(d)(4)

**Test Requirement:**

**LTE Band 5 & LTE Band 26:** FCC 47 CFR Part 22.913(a)

**LTE Band 7 & Band 38 & Band 41:** FCC 47 CFR Part 27.50(h)(2)

**LTE Band 12 & Band 17:** FCC 47 CFR Part 27.50(c)(10)

**LTE Band 13:** FCC 47 CFR Part 27.50(b)(10)

**Test Method:**

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**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.

**FCC 47 CFR Part 27.50(b)(10):**

Portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP.

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 & LTE Band 25: FCC 47 CFR Part 24.232(d)  
 LTE Band 4 & LTE Band 66: FCC 47 CFR Part 27.50(d)(5)  
 LTE Band 5 & LTE Band 26: FCC 47 CFR Part 22.913(a)  
 LTE Band 7 & Band 38 & Band 41: FCC 47 CFR Part 27.50(d)(5)  
 LTE Band 12 & Band 17: FCC 47 CFR Part 27.50(d)(5)  
 LTE Band 13: 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.

- Set resolution/measurement bandwidth  $\geq$  signal's occupied bandwidth
- Set the number of counts to a value that stabilizes the measured CCDF curve
- 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

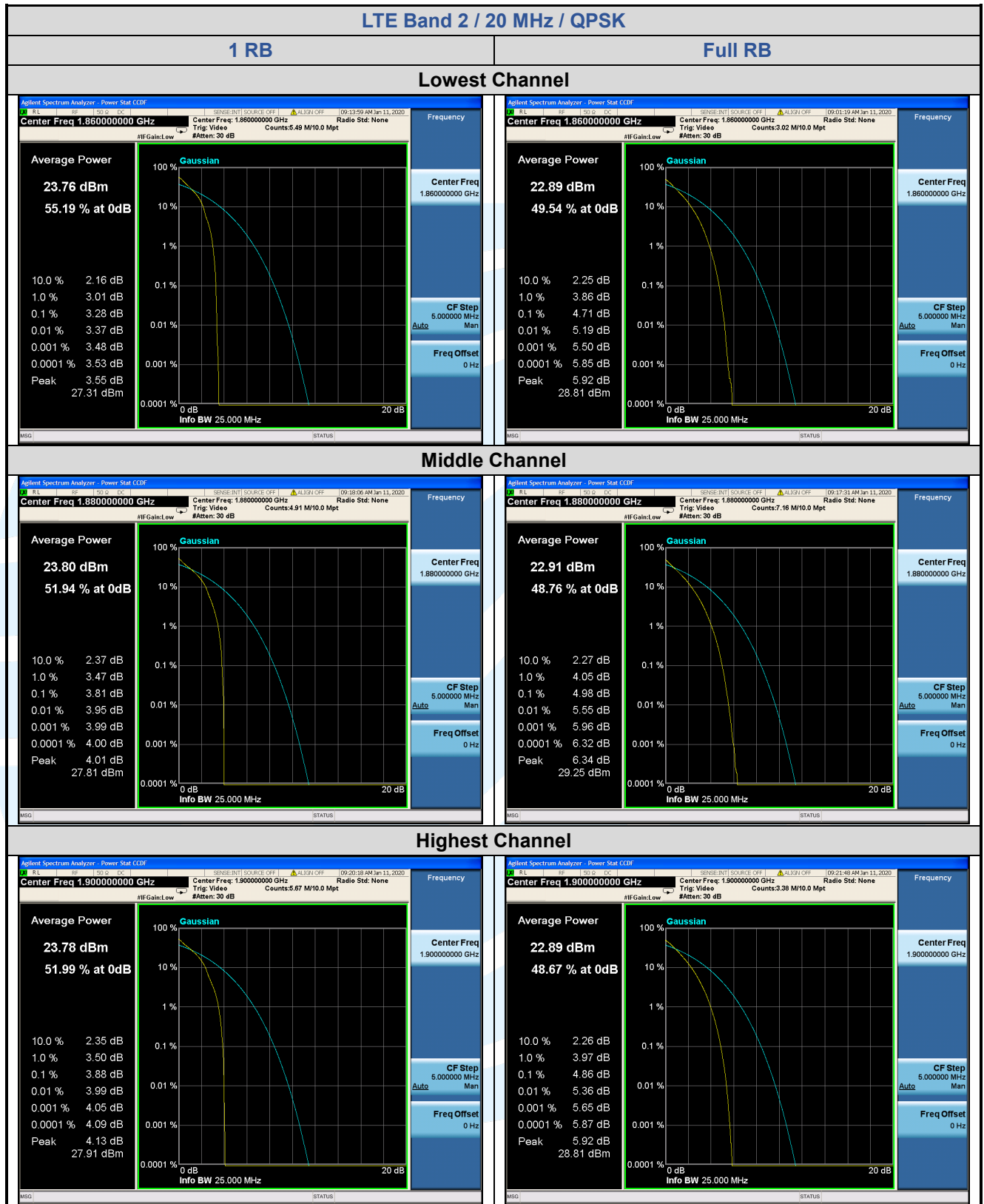
**Test Mode:** Link mode

**Test Results:** Pass

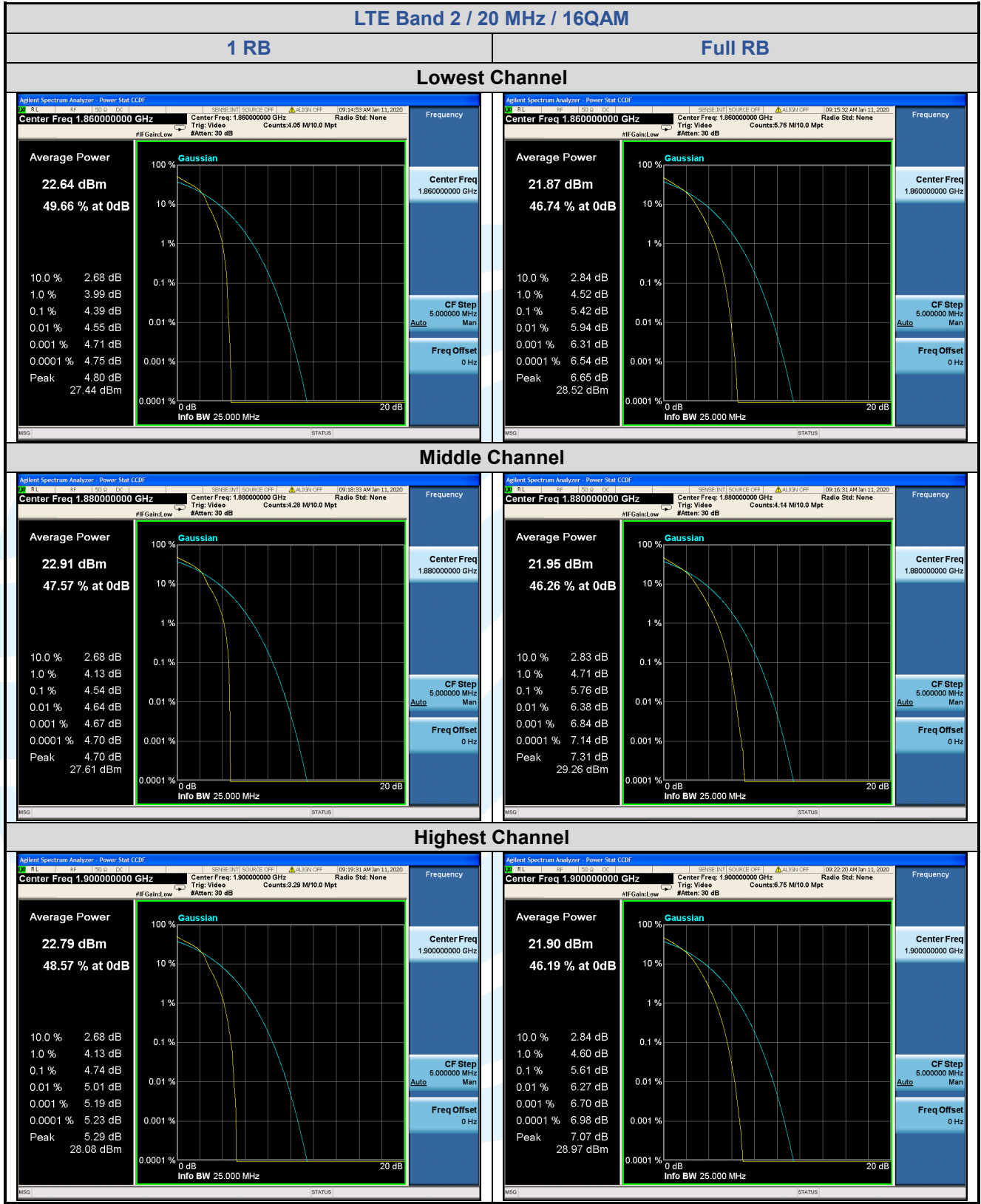
**Test Data:** See table below

#### 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	3.28	4.39	/	13	Pass
	Full RB	4.71	5.42	/	13	Pass
Middle	1 RB	3.81	4.54	/	13	Pass
	Full RB	4.98	5.76	/	13	Pass
Highest	1 RB	3.88	4.74	/	13	Pass
	Full RB	4.86	5.61	/	13	Pass







**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

Tel: +86-755-28230888

Fax: +86-755-28230886

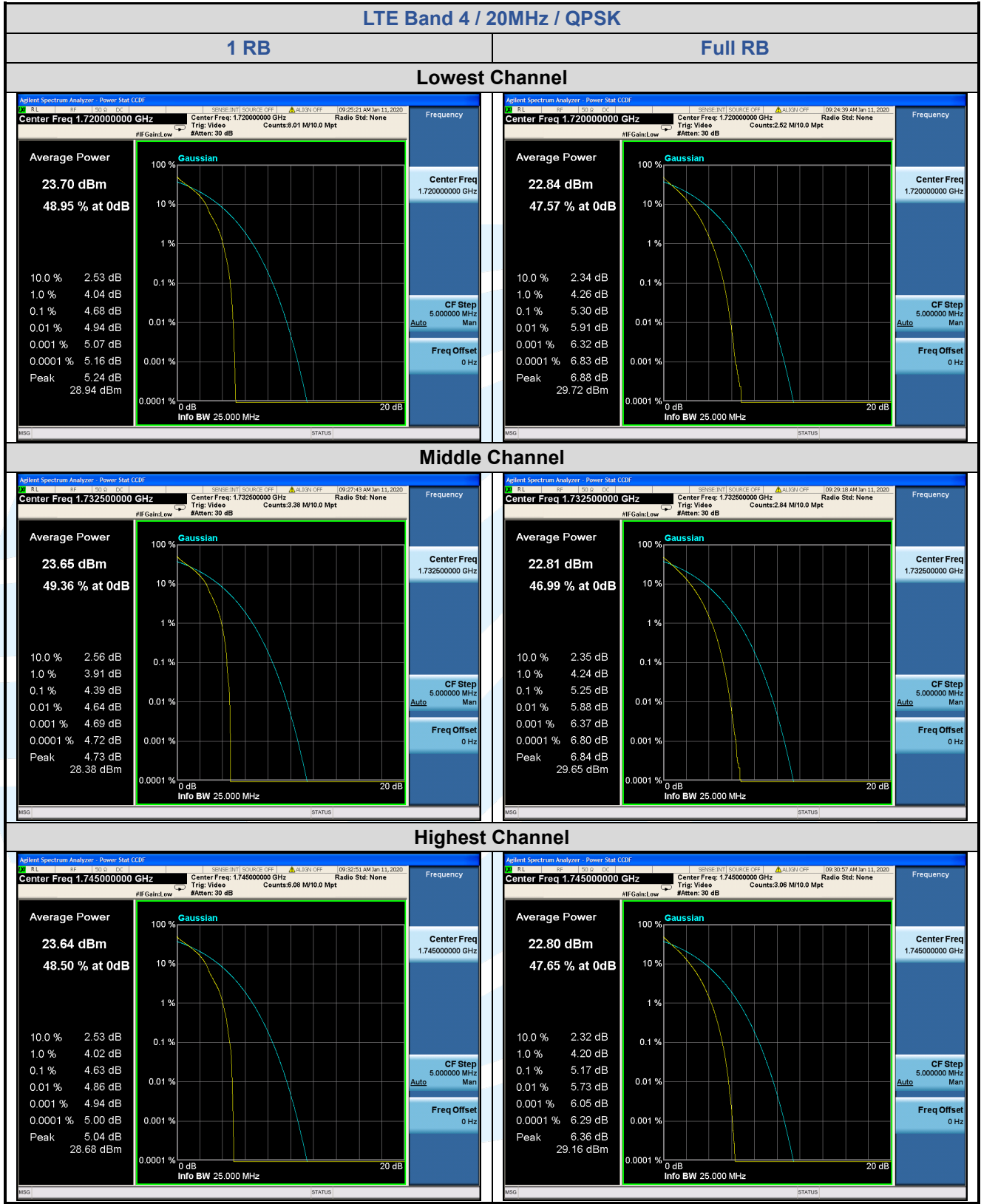
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5.4.2 LTE Band 4

LTE Band 4 Peak-to-average ratio (dB)						
Channel	RB Configuration	Channel Bandwidth: 20 MHz			Limit (dB)	Result
		QPSK	16QAM	64QAM		
Lowest	1 RB	4.68	5.72	/	13	Pass
	Full RB	5.30	6.03	/	13	Pass
Middle	1 RB	4.39	5.16	/	13	Pass
	Full RB	5.25	6.02	/	13	Pass
Highest	1 RB	4.63	5.33	/	13	Pass
	Full RB	5.17	5.96	/	13	Pass



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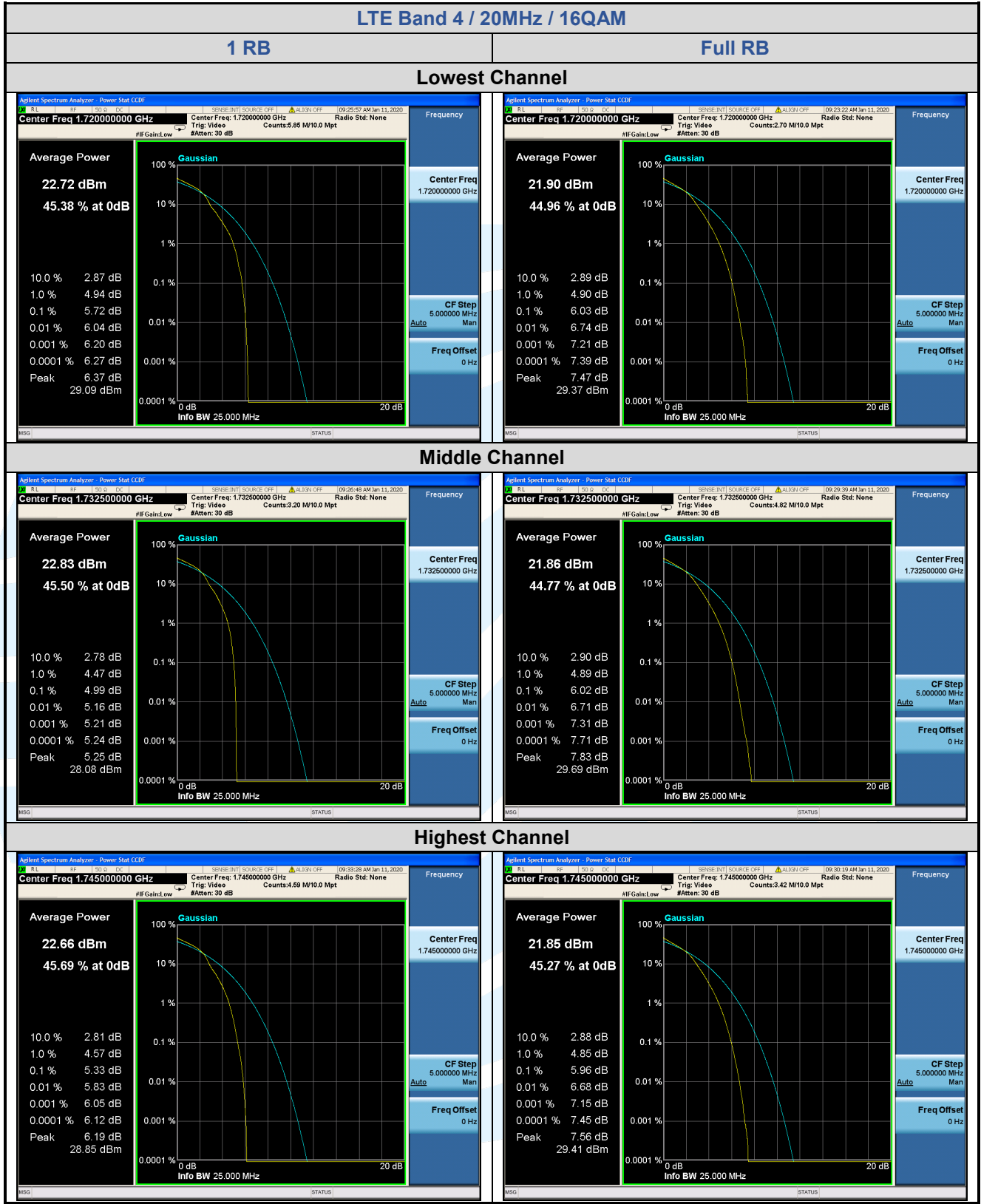
Tel: +86-755-28230888

Fax: +86-755-28230886

E-mail: info@uttlab.com

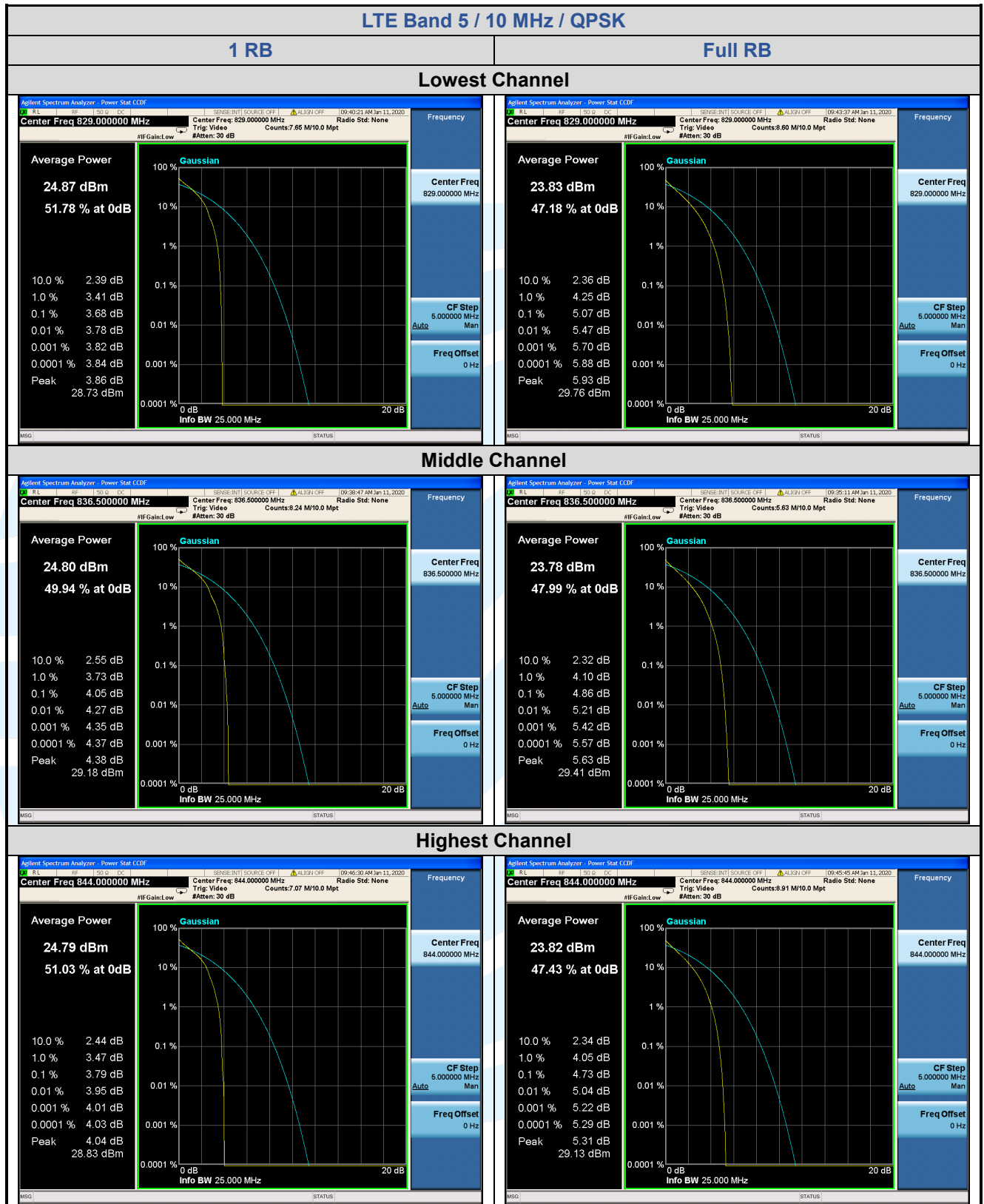
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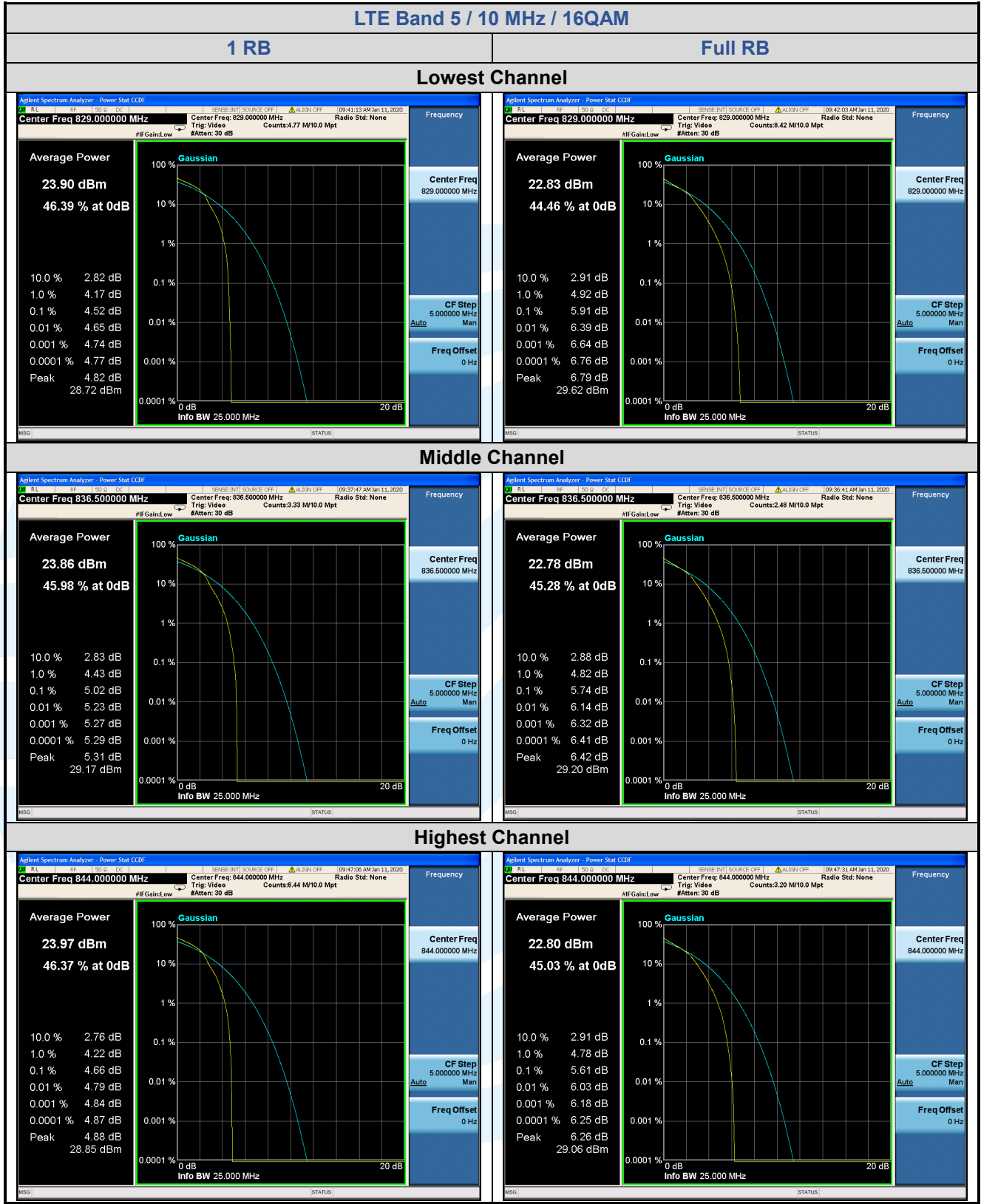
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**5.4.3 LTE Band 5**

LTE Band 5 Peak-to-average ratio (dB)						
Channel	RB Configuration	Channel Bandwidth: 10 MHz			Limit (dB)	Result
		QPSK	16QAM	64QAM		
Lowest	1 RB	3.68	4.52	/	13	Pass
	Full RB	5.07	5.91	/	13	Pass
Middle	1 RB	4.05	5.02	/	13	Pass
	Full RB	4.86	5.74	/	13	Pass
Highest	1 RB	3.79	4.66	/	13	Pass
	Full RB	4.73	5.61	/	13	Pass





**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

Tel: +86-755-28230888

Fax: +86-755-28230886

E-mail: info@uttlab.com

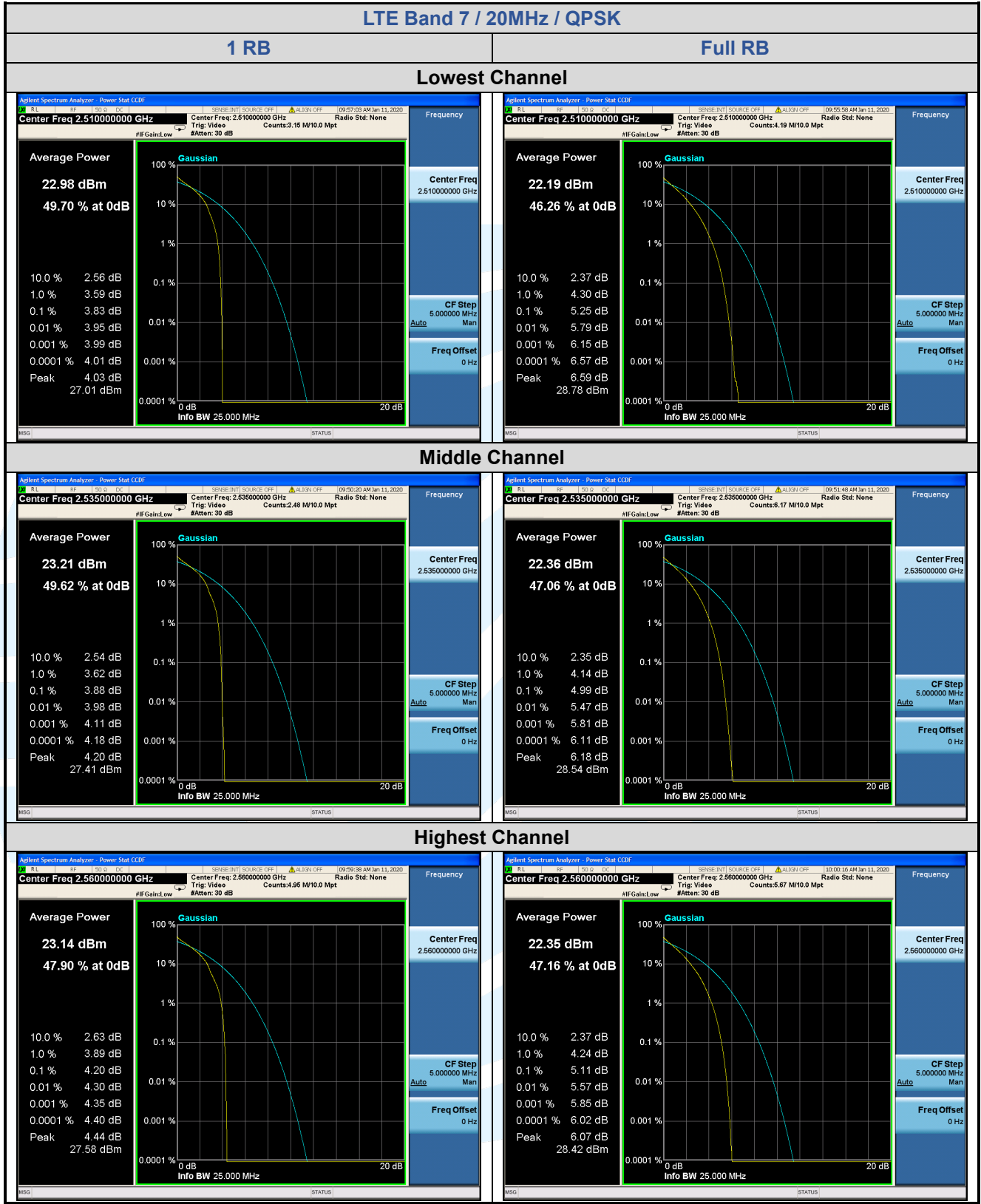
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5.4.4 LTE Band 7

LTE Band 7 Peak-to-average ratio (dB)						
Channel	RB Configuration	Channel Bandwidth: 20 MHz			Limit (dB)	Result
		QPSK	16QAM	64QAM		
Lowest	1 RB	3.83	4.57	/	13	Pass
	Full RB	5.25	6.09	/	13	Pass
Middle	1 RB	3.88	4.93	/	13	Pass
	Full RB	4.99	5.77	/	13	Pass
Highest	1 RB	4.20	5.06	/	13	Pass
	Full RB	5.11	5.91	/	13	Pass



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Address: 16/F, Block A, Building 6, Baoneng Science and Technology Park, Qingxiang Road No.1, Longhua New District, Shenzhen, China

Tel: +86-755-28230888

Fax: +86-755-28230886

E-mail: info@uttlab.com

<http://www.uttlab.com>

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