



FCC 47 CFR PART 02
FCC 47 CFR PART 22
FCC 47 CFR PART 24
FCC 47 CFR PART 27
FCC 47 CFR PART 90

CERTIFICATION TEST REPORT

For

Children watch

MODEL NUMBER: CP303C

FCC ID: R38YL303C

REPORT NUMBER: 4789488320-5

ISSUE DATE: August 17, 2020

Prepared for

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Revision History

Rev.	Issue Date	Revisions	Revised By
--	7/14/2020	Initial Issue	
V1	08/14/2020	Report revised based in reviewer's comments	Jacky Jiang
V2	08/17/2020	Report revised based in reviewer's comments	Jacky Jiang

Summary of Test Results			
Standard(s) Section	Description	Requirements	Result
§22.913(a)	Effective (Isotropic) Radiated Power of Transmitter	$ERP \leq 7 \text{ W}$	PASS
§24.232(c) §27.50(h)	Effective (Isotropic) Radiated Power of Transmitter	$EIRP \leq 2 \text{ W}$	PASS
§27.50(d)	Effective (Isotropic) Radiated Power of Transmitter	$EIRP \leq 1 \text{ W}$	PASS
§27.50(b) §27.50(c)	Effective (Isotropic) Radiated Power of Transmitter	$ERP \leq 3 \text{ W}$	PASS
§90.635(b)	Effective (Isotropic) Radiated Power of Transmitter	$ERP \leq 100 \text{ W}$	PASS
§24.232(d) §27.50(a) §27.50(c) §27.50(d)	Peak to Average Radio	$\leq 13\text{dB}$	PASS
§2.1049	Occupied Bandwidth	OBW: No limit EBW: No limit	PASS
§2.1051, §22.917(a) §24.238(a) §27.53(g) §27.53(h) §27.53(m) §90.691	Band Edge Compliance	$\leq 43+10\log_{10}(P[W])/1\%*EBW$, in 1 MHz bands immediately outside and adjacent to the frequency block.	PASS
§2.1051 §22.901 §22.917(a) §24.238(a) §27.53(g) §27.53(h) §27.53(m) §90.691	Spurious Emission at Antenna Terminal	$\leq 43+10\log_{10}(P[W])/100 \text{ kHz}$, from 9 kHz to 10th harmonics but outside authorized operating frequency ranges.	PASS
§2.1053, §22.917, §24.238(a), §27.53(h) §27.53(m) §90.691	Radiated Spurious Emissions	$\leq 43+10\log_{10}(P[W])$	PASS
§2.1055 §22.355 §24.235 §27.54 §90.213	Frequency Stability	$\leq \pm 2.5\text{ppm}$ (Part 22, 90) Emission must remain in band (Part 24,27)	PASS

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1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name: Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd
Address: Building B, Boton Science Park, Chaguang Road, Xili Town, Nanshan District, Shenzhen

Manufacturer Information

Company Name: Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd
Address: Building B, Boton Science Park, Chaguang Road, Xili Town, Nanshan District, Shenzhen

EUT Description

Product Name: Children watch
Brand Name: Coolpad
Model Name: CP303C
FCC ID: R38YL303C
Date Tested: May 8, 2020~ August 14, 2020

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC 47 CFR PART 22	PASS
FCC 47 CFR PART 24	PASS
FCC 47 CFR PART 27	PASS
FCC 47 CFR PART 90	PASS

Prepared By:



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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.26-2015 & KDB971168, FCC CFR 47 Part 2, Part 22, Part 24, Part 27, Part 90.

3. FACILITIES AND ACCREDITATIO

Accreditation Certificate	A2LA (Certificate No.: 4102.01) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with A2LA. FCC (FCC Designation No.: CN1187) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. Has been recognized to perform compliance testing on equipment subject to the Commission's Declaration of Conformity (DoC) and Certification rules ISED (Company No.: 21320) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been registered and fully described in a report filed with ISED. The Company Number is 21320. VCCI (Registration No.: G-20019, R-20004, C-20012 and T-20011) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with VCCI, the Membership No. is 3793. <u>Facility Name:</u> Chamber D, the VCCI registration No. is G-20019 and R-20004 Shielding Room B , the VCCI registration No. is C-20012 and T-20011
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Note 1: All tests measurement facilities use to collect the measurement data are located at Building 10, Innovation Technology Park, Song Shan Lake Hi tech Development Zone, Dongguan, 523808, China

Note 2: The test anechoic chamber in UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch had been calibrated and compared to the open field sites and the test anechoic chamber is shown to be equivalent to or worst case from the open field site.

4. CALIBRATION AND UNCERTAINTY

4.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations and is traceable to recognized national standards.

4.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Test Item	Uncertainty
Uncertainty for Conduction emission test	3.32dB (150KHz-30MHz)
	3.72dB (9KHz-150KHz)
Uncertainty for Radiation Emission test (include Fundamental emission) (30MHz-1GHz)	4.70 dB (Antenna Polarize: V)
	4.84 dB (Antenna Polarize: H)
Uncertainty for Radiation Emission test (1GHz to 26GHz) (include Fundamental emission)	4.10dB(1-6GHz)
	4.40dB (6GHz-18Gz)
	3.54dB (18GHz-26Gz)
Bandwidth	1.1%
Stop Transmitting Time Test	0.6%
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

5. EQUIPMENT UNDER TEST

5.1 DESCRIPTION OF EUT

Equipment	Children watch
Model Name	CP303C
Power Input	DC 3.85V, 890mAh
Hardware Version	P1
Software Version	/

5.2 TECHNICAL INFORMATION

E-UTRA Band	Characteristics				
	E-UTRA operating bands		Bandwidth		
	Transmit	Receive			
2	1850 MHz to 1910 MHz	1930 MHz to 1990 MHz	☒ 1.4M ☒ 10M	☒ 3M ☒ 15M	☒ 5M ☒ 20M
4	1710 MHz to 1755 MHz	2110 MHz to 2155 MHz	☒ 1.4M ☒ 10M	☒ 3M ☒ 15M	☒ 5M ☒ 20M
5	824 MHz to 849 MHz	869 MHz to 894 MHz	☒ 1.4M ☒ 10M	☒ 3M	☒ 5M
12	699 MHz -716 MHz	729 MHz -746 MHz	☒ 1.4M ☒ 10M	☒ 3M	☒ 5M
13	777 MHz -787 MHz	746 MHz -756 MHz	☒ 5M	☒ 10M	
25	1850 MHz -1915 MHz	1930 MHz -1995 MHz	☒ 1.4M ☒ 10M	☒ 3M ☒ 15M	☒ 5M ☒ 20M
26 (Part 22)	814 MHz -849 MHz	859 MHz -894 MHz	☒ 1.4M ☒ 10M	☒ 3M ☒ 15M	☒ 5M
26 (Part 90S)	814 MHz -824 MHz	859 MHz -869 MHz	☒ 1.4M ☒ 10M	☒ 3M	☒ 5M
41	2496 MHz -2690 MHz	2496 MHz -2690 MHz	☒ 5M ☒ 20M	☒ 10M	☒ 15M
66	1710 MHz -1780 MHz	2110 MHz -2200 MHz	☒ 1.4M ☒ 10M	☒ 3M ☒ 15M	☒ 5M ☒ 20M
71	663 MHz -698 MHz	617 MHz -652 MHz	☒ 5M ☒ 20M	☒ 10M	☒ 5M

5.3 MAXIMUM OUTPUT POWER

The transmitter has a maximum radiated ERP / EIRP output powers as follows:

LTE Band2

Part 24						
EIRP Limit(W)		2.00				
Antenna Gain (dBi)		-1.38				
Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)
1.4	QPSK	1850.7	1910.3	22.13	20.75	0.119
	16QAM			21.36	19.98	0.100
3	QPSK	1851.5	1908.5	22.50	21.12	0.129
	16QAM			21.64	20.26	0.106
5	QPSK	1852.5	1907.5	22.51	21.13	0.130
	16QAM			21.43	20.05	0.101
10	QPSK	1855.0	1905.0	22.47	21.09	0.129
	16QAM			21.66	20.28	0.107
15	QPSK	1857.5	1902.5	22.38	21.00	0.126
	16QAM			21.60	20.22	0.105
20	QPSK	1860.0	1900.0	22.15	20.77	0.119
	16QAM			21.19	19.81	0.096

LTE Band4

Part 27						
EIRP Limit(W)		1.00				
Antenna Gain (dBi)		-1.23				
Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)
1.4	QPSK	1710.7	1754.3	21.99	20.76	0.119
	16QAM			21.04	19.81	0.096
3	QPSK	1711.5	1753.5	22.12	20.89	0.123
	16QAM			21.24	20.01	0.100
5	QPSK	1712.5	1752.5	22.12	20.89	0.123
	16QAM			21.22	19.99	0.100
10	QPSK	1715.0	1750.0	22.10	20.87	0.122
	16QAM			21.20	19.97	0.099
15	QPSK	1717.5	1747.5	22.09	20.86	0.122

	16QAM			21.70	20.47	0.111
20	QPSK	1720.0	1745.0	22.28	21.05	0.127
	16QAM			21.05	19.82	0.096

LTE Band5

Part 22						
ERP Limit(W)		7.00				
Antenna Gain (dBi)		-3.70				
Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	ERP Average (dBm)	ERP Average (W)
1.4	QPSK	824.7	848.3	22.85	19.15	0.082
	16QAM			22.05	18.35	0.068
3	QPSK	825.5	847.5	22.86	19.16	0.082
	16QAM			21.98	18.28	0.067
5	QPSK	826.5	846.5	22.79	19.09	0.081
	16QAM			21.72	18.02	0.063
10	QPSK	829.0	844.0	22.88	19.18	0.083
	16QAM			22.17	18.47	0.070

LTE Band12

Part 27						
ERP Limit(W)		3.00				
Antenna Gain (dBi)		-6.43				
Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	ERP Average (dBm)	ERP Average (W)
1.4	QPSK	699.7	715.3	22.78	16.35	0.043
	16QAM			21.82	15.39	0.035
3	QPSK	700.5	714.5	22.88	16.45	0.044
	16QAM			21.87	15.44	0.035
5	QPSK	701.5	713.5	22.74	16.31	0.043
	16QAM			21.60	15.17	0.033
10	QPSK	704.0	711.0	22.75	16.32	0.043
	16QAM			21.88	15.45	0.035

LTE Band13

Part 27						
ERP Limit(W)		3.00				
Antenna Gain (dBi)		-6.76				
Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	ERP Average (dBm)	ERP Average (W)
5	QPSK	779.5	784.5	22.75	15.99	0.040
	16QAM			21.23	14.47	0.028
10	QPSK	782	782	22.30	15.54	0.036
	16QAM			21.31	14.55	0.029

LTE Band25

Part 24						
EIRP Limit(W)		2.00				
Antenna Gain (dBi)		-1.38				
Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)
1.4	QPSK	1850.7	1914.3	22.93	21.55	0.143
	16QAM			22.03	20.65	0.116
3	QPSK	1851.5	1913.5	22.89	21.51	0.142
	16QAM			22.21	20.83	0.121
5	QPSK	1852.5	1912.5	22.28	20.90	0.123
	16QAM			21.25	19.87	0.097
10	QPSK	1855.0	1910.0	22.47	21.09	0.129
	16QAM			21.67	20.29	0.107
15	QPSK	1857.5	1907.5	22.49	21.11	0.129
	16QAM			21.87	20.49	0.112
20	QPSK	1860.0	1905.0	22.33	20.95	0.124
	16QAM			21.15	19.77	0.095

LTE Band26

Part 90						
ERP Limit(W)		100.00				
Antenna Gain (dBi)		-5.87				
Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	ERP Average (dBm)	ERP Average (W)
1.4	QPSK	814.7	823.3	22.46	16.59	0.046
	16QAM			21.60	15.73	0.037
3	QPSK	815.5	822.5	22.76	16.89	0.049
	16QAM			21.39	15.52	0.036
5	QPSK	816.5	821.5	22.63	16.76	0.047
	16QAM			21.66	15.79	0.038
10	QPSK	819.0	/	22.45	16.58	0.046
	16QAM			21.52	15.65	0.037

LTE Band41

Part 27						
EIRP Limit(W)		2.00				
Antenna Gain (dBi)		-1.03				
Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)
5	QPSK	2498.5	2687.5	22.23	21.20	0.132
	16QAM			21.24	20.21	0.105
10	QPSK	2501.0	2685.0	22.09	21.06	0.128
	16QAM			21.86	20.83	0.121
15	QPSK	2503.5	2682.5	22.51	21.48	0.141
	16QAM			21.85	20.82	0.121
20	QPSK	2506.0	2680.0	22.49	21.46	0.140
	16QAM			20.73	19.70	0.093

LTE Band66

Part 27						
EIRP Limit(W)		1.00				
Antenna Gain (dBi)		-1.23				
Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)
1.4	QPSK	1710.7	1779.3	22.88	21.65	0.146
	16QAM			21.71	20.48	0.112
3	QPSK	1711.5	1778.5	22.08	20.85	0.122
	16QAM			21.18	19.95	0.099
5	QPSK	1712.5	1777.5	22.16	20.93	0.124
	16QAM			21.87	20.64	0.116
10	QPSK	1715.0	1775.0	22.83	21.60	0.145
	16QAM			21.87	20.64	0.116
15	QPSK	1717.5	1772.5	22.79	21.56	0.143
	16QAM			22.43	21.20	0.132
20	QPSK	1720.0	1770.0	23.09	21.86	0.153
	16QAM			21.86	20.63	0.116

LTE Band71

Part 27						
EIRP Limit(W)		3.00				
Antenna Gain (dBi)		-7.17				
Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)
5	QPSK	665.5	695.5	22.98	15.81	0.038
	16QAM			21.51	14.34	0.027
10	QPSK	668.0	693.0	22.79	15.62	0.036
	16QAM			21.94	14.77	0.030
15	QPSK	670.5	690.5	22.96	15.79	0.038
	16QAM			22.46	15.29	0.034
20	QPSK	673.0	688.0	22.99	15.82	0.038
	16QAM			21.79	14.62	0.029

5.4 WORST-CASE CONFIGURATION AND MODE

The EUT supports LTE Bands of:

Band 2, Band 4, Band 5, Band 12, Band 13, Band 25, Band 26, Band 41, Band 66 and Band 71.

FCC rule Part 22.905 of LTE Band 26 (824-849MHz) is covered by LTE Band 5 of same rule since they have the same output power and supported bandwidths.

During all testing, EUT is in link mode with base station emulator at maximum power level. The worst-case scenario for all measurements is based on the average conducted output power measurement investigation results. Output power measurements were measured on QPSK, 16QAM. All testing was performed using QPSK and 16QAM modulations to represent the worst case.

The radiated spurious emissions measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT was investigated in three orthogonal orientations X, Y and Z. It was determined that Y orientation was the worst-case orientation connected with charger and earphone.

Radiated spurious emissions were investigated below 30MHz, 30MHz-1GHz and above 1GHz. There were no emissions found on below 30MHz. the emissions between 30MHz-1GHz were tested the highest transmitting power channel and the worse configuration.

Worst Case

Test Items	Test configuration			
Description	Modulation	Channel	Bandwidth (MHz)	RB Configuration
Occupied Bandwidth	QPSK, 16QAM	L, M, H	1.4,3,5,10,15,20	Full RB
Band Edge Compliance	QPSK, 16QAM	L, M, H	1.4,3,5,10,15,20	1.RB size=1, RB Location= Low & High 2.RB size =Full RB
Spurious Emission at Antenna Terminal	QPSK, 16QAM	L, M, H	1.4,3,5,10,15,20	RB size=1, RB Location= Low
Radiated Spurious Emissions	QPSK	L, M, H	The Minimum and Maximum BW	RB size=1, RB Location= Low

5.5 TEST ENVIRONMENT

Environment Parameter	Selected Values During Tests	
Relative Humidity	52%	
Atmospheric Pressure:	1025Pa	
Temperature	TN	25.0 °C
Voltage:	VL	3.23V
	VN	3.80V
	VH	4.35V
	End Voltage	3.00V

Note: VL= Lower Extreme Test Voltage
VN= Nominal Voltage
VH= Upper Extreme Test Voltage
TN= Normal Temperature

5.6 TEST CHANNEL LIST

Mode	TX	Low	Middle	High
LTE Band 2	TX (1.4 MHz)	18607	18900	19193
		1850.7	1880.0	1909.3
	TX (3 MHz)	18615	18900	19185
		1851.5	1880.0	1908.5
	TX (5 MHz)	18625	18900	19175
		1852.5	1880.0	1907.5
	TX (10 MHz)	18650	18900	19150
		1855	1880.0	1905
	TX (15 MHz)	18675	18900	19125
		1857.5	1880.0	1902.5
	TX (20 MHz)	18700	18900	19100
		1860.0	1880.0	1900.0

Mode	TX/RX	Low	Middle	High
LTE Band 4	TX (1.4 MHz)	19957	20175	20393
		1710.7	1732.5	1754.3
	TX (3 MHz)	19965	20175	20385
		1711.5	1732.5	1753.5
	TX (5 MHz)	19975	20175	20375
		1712.5	1732.5	1752.5
	TX (10 MHz)	20000	20175	20350
		1715	1732.5	1750
	TX (15 MHz)	20025	20175	20325
		1717.5	1732.5	1747.5
	TX (20 MHz)	20050	20175	20300
		1720.0	1732.5	1745.0

Mode	TX/RX	Low	Middle	High
LTE Band 5	TX (1.4 MHz)	20407	20525	20643
		824.7	836.5	848.3
	TX (3 MHz)	20415	20525	20635
		825.5	836.5	847.5
	TX (5 MHz)	20425	20525	20625
		826.5	836.5	846.5
	TX (10 MHz)	20450	20525	20600
		829.0	836.5	844.0

Mode	TX/RX	Low	Middle	High
LTE Band 12	TX (1.4 MHz)	23017	23095	23173
		699.7	707.5	715.3
	TX (3 MHz)	23025	23095	23165
		700.5	707.5	714.5
	TX (5 MHz)	23035	23095	23155
		701.5	707.5	713.5
	TX (10 MHz)	23060	23095	23130
		704.0	707.5	711.0

Mode	TX/RX	Low	Middle	High
LTE Band 13	TX (5 MHz)	23205	23230	23255
		779.5	782.0	784.5
	TX (10 MHz)	23230	23230	23230
		782.0	782.0	782.0

Mode	TX/RX	Low	Middle	High
LTE Band 25	TX (1.4 MHz)	26047	26365	26683
		1850.7	1882.5	1914.3
	TX (3 MHz)	26055	26365	26675
		1851.5	1882.5	1913.5
	TX (5 MHz)	26065	26365	26665
		1852.5	1882.5	1912.5
	TX (10 MHz)	26090	26365	26640
		1855.0	1882.5	1910.0
	TX (15 MHz)	26115	26365	26615
		1857.5	1882.5	1907.5
	TX (20 MHz)	26140	26365	26590
		1860.0	1882.5	1905.0

Mode	TX/RX	Low	Middle	High
LTE Band 26	TX(1.4 MHz)	26697	26740	26783
		814.7	819.0	823.3
	TX(3 MHz)	26705	26740	26775
		815.5	819.0	822.5
	TX(5 MHz)	26715	26740	26765
		816.5	819.0	821.5
	TX(10 MHz)	26740		
		819 .0		

Mode	TX/RX	Low	Middle	High
LTE Band 41	TX (5 MHz)	39675	40620	41564
		2498.5	2593.0	2687.5
	TX (10 MHz)	39700	40620	41539
		2501.0	2593.0	2685.0
	TX (15 MHz)	39725	40620	41514
		2503.5	2593.0	2682.5
	TX (20 MHz)	39750	40620	41489
		2506.0	2593.0	2680.0

Mode	TX/RX	Low	Middle	High
LTE Band 66	TX (1.4 MHz)	131979	132322	132665
		1710.7	1745.0	1779.3
	TX (3 MHz)	131987	132322	132657
		1711.5	1745.0	1778.5
	TX (5 MHz)	131997	132322	132647
		1712.5	1745.0	1777.5
	TX (10 MHz)	132022	132322	132622
		1715.0	1745.0	1775.0
	TX (15 MHz)	132047	132322	132597
		1717.5	1745.0	1772.5
	TX (20 MHz)	132072	132322	132572
		1720.0	1745.0	1770.0

Mode	TX/RX	Low	Middle	High
LTE Band 71	TX (5 MHz)	133147	133297	133447
		665.5	680.5	695.5
	TX (10 MHz)	133172	133297	133422
		668.0	680.5	693.0
	TX (15 MHz)	133197	133297	133397
		670.5	680.5	690.5
	TX (20 MHz)	133222	133297	133372
		673.0	680.5	688.0

Note: FCC rule Part 22.905 of LTE Band 26 (824-849MHz) is covered by LTE Band 5 of same rule since they have the same output power and supported bandwidths. Therefore, for Band 26, only the Part 90S data was recorded in this report.

5.7 DESCRIPTION OF AVAILABLE ANTENNAS

Band	Antenna Type	Max Antenna Gain (dBi)
LTE Band 2	PIFA	-1.38
LTE Band 4	PIFA	-1.23
LTE Band 5	PIFA	-3.70
LTE Band 12	PIFA	-6.43
LTE Band 13	PIFA	-6.76
LTE Band 25	PIFA	-1.38
LTE Band 26	PIFA	-5.87
LTE Band 41	PIFA	-1.03
LTE Band 66	PIFA	-1.23
LTE Band 71	PIFA	-7.17

5.8 DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Item	Equipment	Brand Name	Model Name	FCC ID
1	N/A	N/A	N/A	N/A

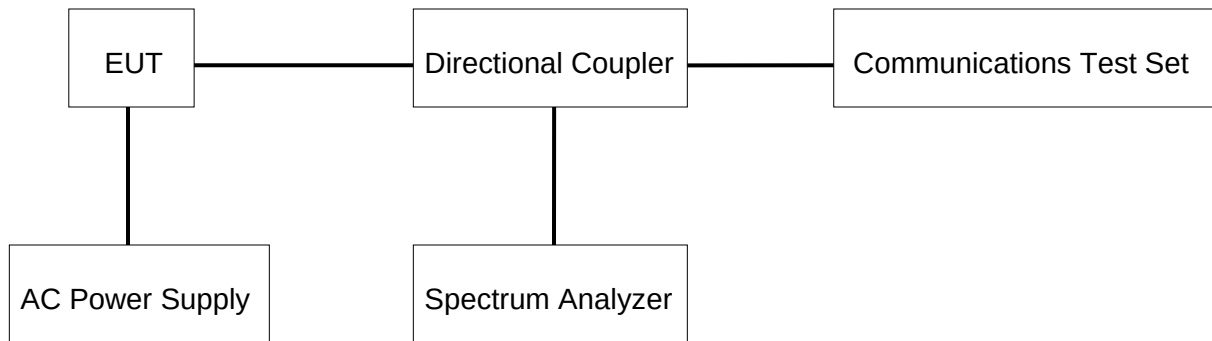
I/O CABLES

Cable No	Port	Connector Type	Cable Type	Cable Length(m)	Remarks
1	N/A	N/A	N/A	N/A	N/A

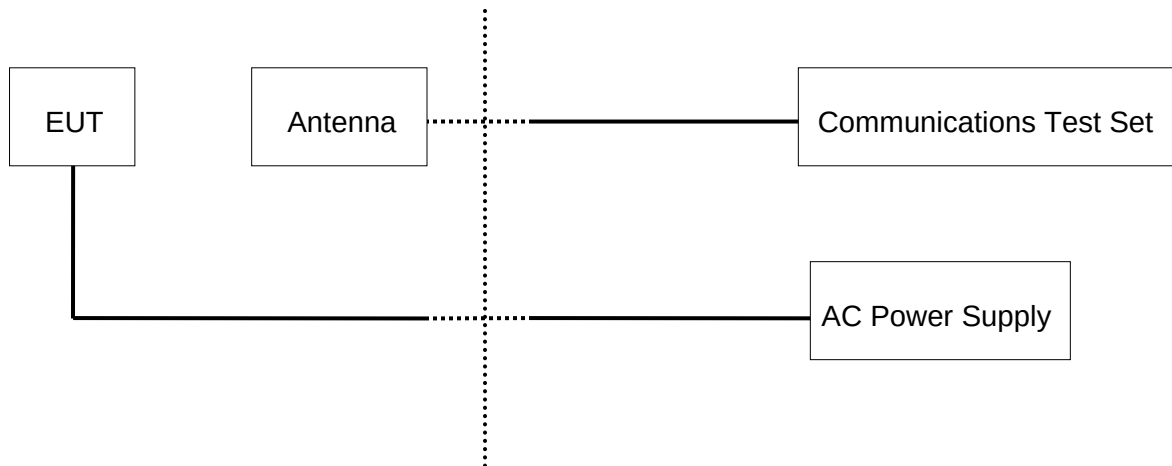
ACCESSORY

Item	Accessory	Brand Name	Model Name	Description
1	Travel Changer	Coolpad	RD0501000-USBA18MG	5V/1A

CONDUCTED TEST SETUP



RADIATED TEST SETUP



5.9 MEASURING INSTRUMENT AND SOFTWARE USED

Conducted Emissions						
Instrument						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
☒	Spectrum Analyzer	Keysight	N9030A	MY5541051 2	Dec.06,20 19	Dec.06,2020
☒	Power Meter	Keysight	N1911A	MY5541602 4	Dec.06,20 19	Dec.06,2020
☒	Wideband Radio Communication Tester	R&S	CMW500	155523	Dec.06,20 19	Dec.05,2020
Software						
Used	Description		Manufacturer	Name		Version
☒	Antenna port test software		UL	CLT		Ver 2.4
Radiated Emissions						
Instrument						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
☒	MXE EMI Receiver	KESIGHT	N9038A	MY5640003 6	Dec.06,20 19	Dec.06,2020
☒	Hybrid Log Periodic Antenna	TDK	HLP-3003C	130960	Sep.17, 2018	Sep.17, 2021
☒	Preamplifier	HP	8447D	2944A09099	Dec.05,20 19	Dec.05,2020
☒	EMI Measurement Receiver	R&S	ESR26	101377	Dec.05,20 19	Dec.05,2020
☒	Horn Antenna	TDK	HRN-0118	130939	Sep.17, 2018	Sep.17, 2021
☒	High Gain Horn Antenna	Schwarzbeck	BBHA-9170	691	Aug.11, 2018	Aug.11, 2021
☒	Preamplifier	TDK	PA-02-0118	TRS-305- 00066	Dec.05,20 19	Dec.05,2020
☒	Preamplifier	TDK	PA-02-2	TRS-307- 00003	Dec.05,20 19	Dec.05,2020
☒	Loop antenna	Schwarzbeck	1519B	00008	Jan.07, 2019	Jan.07, 2022
☒	High Pass Filter	Wi	WHKX10- 2700-3000- 18000-40SS	23	Dec.05,20 19	Dec.05,2020
Software						
Used	Description		Manufacturer	Name		Version
☒	Test Software for Radiated disturbance		Farad	EZ-EMC		Ver. UL-3A1

6. TEST RESULTS

6.1 OUTPUT POWER VERIFICATION

ERP/EIRP RULE PART(S)

FCC: §2.1046, §22.913, §24.232, §27.50, §90.635.

LIMITS

22.913(a) The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

24.232(c) Mobile/portable stations are limited to 2 watts e.i.r.p. peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.

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

27.50(d) 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 watts EIRP.

27.50(h) Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

90.635(b) The maximum output power of the transmitter for mobile stations is 100 watts (20 dBw).

ERP/EIRP TEST PROCEDURE

ANSI C63.26:2015/ KDB 971168 D01 Section 5.6.

$ERP/ EIRP = P_{Meas} + GT - LC$

where:

ERP or EIRP = effective or equivalent isotropically radiated power, respectively (expressed in the same units as P_{Meas} , typically dBW or dBm);

P_{Meas} = measured transmitter output power or PSD, in dBm or dBW;

GT = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);

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

RESULTS

See the following pages.

LTE Band 2

Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				18607	18900	19193
Band 2 1.4MHz	QPSK	1	0	22.05	22.02	21.77
		1	3	21.91	22.13	21.85
		1	5	21.78	22.09	21.68
		3	0	21.71	22.01	21.92
		3	2	21.76	22.05	21.94
		3	3	21.77	22.05	21.91
		6	0	20.84	20.96	20.76
	16QAM	1	0	20.97	21.23	20.78
		1	3	21.12	21.36	20.80
		1	5	21.00	21.33	20.64
		3	0	21.27	21.23	20.70
		3	2	21.24	20.83	20.79
		3	3	21.24	20.83	20.67
		6	0	20.11	20.29	19.78
Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				18615	18900	19185
Band 2 3MHz	QPSK	1	0	22.16	22.24	22.21
		1	7	22.13	22.50	22.09
		1	14	22.06	22.18	21.97
		8	0	21.20	21.10	21.01
		8	4	21.21	21.10	20.93
		8	7	21.04	21.07	20.92
		15	0	21.09	21.10	20.91
	16QAM	1	0	21.29	21.21	21.64
		1	7	21.27	21.48	21.30
		1	14	21.16	21.31	20.55
		8	0	20.25	20.41	20.15
		8	4	20.16	20.26	20.06
		8	7	20.12	20.44	19.99
		15	0	20.08	20.42	20.07
Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				18625	18900	19175
Band 2 5MHz	QPSK	1	0	22.12	22.45	21.85
		1	13	22.24	22.51	22.10
		1	24	21.96	22.45	21.70
		12	0	21.21	21.27	21.14
		12	6	21.14	21.30	21.11
		12	13	21.17	21.27	20.99

	16QAM	25	0	21.27	21.19	21.07
		1	0	21.22	20.64	21.06
		1	13	21.22	20.71	20.78
		1	24	20.78	20.84	20.71
		12	0	20.15	20.32	20.17
		12	6	20.30	20.43	20.17
		12	13	20.29	20.38	20.11
		25	0	20.16	20.40	20.15
Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				18650	18900	19150
Band 2 10MHz	QPSK	1	0	22.38	22.38	22.24
		1	25	22.31	22.47	22.42
		1	49	22.28	22.38	22.13
		25	0	21.30	21.23	21.25
		25	13	21.21	21.15	21.17
		25	25	21.12	21.11	21.02
		50	0	21.07	21.14	21.04
	16QAM	1	0	21.43	21.40	21.05
		1	25	21.41	21.61	21.66
		1	49	21.10	21.51	21.27
		25	0	20.41	20.27	20.32
		25	13	20.20	20.26	20.26
		25	25	20.17	20.28	20.04
		50	0	20.15	20.23	20.13
Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				18675	18900	19125
Band 2 15MHz	QPSK	1	0	21.55	22.08	21.89
		1	38	21.79	22.28	22.38
		1	74	21.80	21.92	21.68
		36	0	20.59	20.82	20.87
		36	18	20.65	20.92	20.82
		36	39	20.60	20.81	20.81
		75	0	20.64	20.76	20.78
	16QAM	1	0	21.44	20.62	21.25
		1	38	21.60	21.10	21.36
		1	74	21.20	21.01	20.28
		36	0	19.65	19.87	20.13
		36	18	19.68	20.08	19.94
		36	39	19.54	19.97	19.90
		75	0	20.22	20.29	20.30
Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				18700	18900	19100
Band 2	QPSK	1	0	21.81	21.72	21.99

20MHz		1	50	21.87	22.12	22.15
		1	99	21.64	21.41	21.66
		50	0	20.87	20.96	21.07
		50	25	20.83	21.02	21.03
		50	50	20.86	20.96	20.89
		100	0	20.79	21.00	21.08
	16QAM	1	0	20.78	20.47	20.92
		1	50	20.98	21.18	21.19
		1	99	20.40	20.48	20.67
		50	0	19.81	20.05	20.07
		50	25	19.83	20.20	20.22
		50	50	19.87	20.03	19.95
		100	0	19.88	20.01	19.92

LTE Band 4

Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				19957	20175	20393
Band 4 1.4MHz	QPSK	1	0	21.40	21.58	21.76
		1	3	21.22	21.73	21.99
		1	5	21.22	21.69	21.78
		3	0	21.46	21.71	21.91
		3	2	21.35	21.73	21.92
		3	3	21.38	21.72	21.91
		6	0	20.37	20.77	20.71
	16QAM	1	0	20.31	20.83	21.04
		1	3	20.35	20.95	20.28
		1	5	20.48	20.83	20.31
		3	0	20.72	20.74	20.17
		3	2	20.69	20.77	20.81
		3	3	20.66	20.67	20.94
		6	0	19.58	20.05	19.76
Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				19965	20175	20385
Band 4 3MHz	QPSK	1	0	21.84	22.03	21.79
		1	7	21.90	22.10	21.91
		1	14	21.73	22.12	21.88
		8	0	20.64	20.80	20.71
		8	4	20.78	20.83	20.81
		8	7	20.69	20.83	20.78
		15	0	20.74	20.80	20.76
	16QAM	1	0	20.76	20.98	21.11
		1	7	20.83	21.15	21.24
		1	14	20.71	20.96	20.27
		8	0	19.76	19.80	19.70

		8	4	19.73	20.19	19.78
		8	7	19.55	20.16	19.87
		15	0	19.68	20.03	19.82
Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				19975	20175	20375
Band 4 5MHz	QPSK	1	0	21.72	22.06	21.62
		1	13	21.84	22.12	21.94
		1	24	21.58	21.92	21.71
		12	0	20.74	20.8	20.78
		12	6	20.79	20.89	20.66
		12	13	20.88	20.83	20.77
		25	0	20.78	20.78	20.76
	16QAM	1	0	20.81	20.79	20.19
		1	13	20.94	21.22	20.18
		1	24	20.09	20.82	20.23
		12	0	19.80	19.85	19.76
		12	6	19.70	19.82	19.84
		12	13	19.93	19.74	19.98
		25	0	19.81	19.79	19.83
Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				20000	20175	20350
Band 4 10MHz	QPSK	1	0	21.75	21.85	21.81
		1	25	21.86	22.10	21.93
		1	49	21.84	21.68	22.03
		25	0	20.68	20.70	20.77
		25	13	20.62	20.80	20.81
		25	25	20.65	20.73	20.75
		50	0	20.65	20.70	20.74
	16QAM	1	0	20.55	20.76	20.76
		1	25	20.41	21.20	20.87
		1	49	20.29	20.84	20.68
		25	0	19.79	19.78	20.04
		25	13	19.77	20.05	19.93
		25	25	19.83	19.91	19.87
		50	0	19.54	19.77	19.67
Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				20025	20175	20325
Band 4 15MHz	QPSK	1	0	21.70	21.95	22.09
		1	38	21.76	21.90	21.85
		1	74	21.82	21.74	21.89
		36	0	20.63	20.65	20.81
		36	18	20.66	20.78	20.79
		36	39	20.53	20.67	20.71
		75	0	20.54	20.67	20.67
	16QAM	1	0	21.25	21.07	21.70
		1	38	20.81	21.03	20.90

		1	74	20.86	20.96	21.02
		36	0	19.62	19.73	19.54
		36	18	19.73	19.92	19.67
		36	39	19.56	19.80	19.50
		75	0	19.51	19.72	19.65
Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				20050	20175	20300
Band 4 20MHz	QPSK	1	0	21.39	21.78	22.28
		1	50	21.64	22.05	21.71
		1	99	21.75	21.65	21.59
		50	0	20.81	21.09	21.03
		50	25	20.85	21.11	20.84
		50	50	20.88	20.99	20.78
		100	0	20.91	20.94	20.95
	16QAM	1	0	20.77	20.66	20.62
		1	50	20.99	21.05	20.99
		1	99	20.97	20.66	20.93
		50	0	19.86	20.03	19.98
		50	25	19.87	20.30	19.75
		50	50	19.81	20.08	19.69
		100	0	19.97	19.99	19.81

LTE Band 5

Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				20407	20525	20643
Band 5 1.4MHz	QPSK	1	0	22.85	22.34	22.39
		1	3	22.85	22.69	22.36
		1	5	22.69	22.39	22.51
		3	0	22.73	22.52	22.57
		3	2	22.82	22.65	22.74
		3	3	22.75	22.54	22.43
		6	0	21.63	21.53	21.41
	16QAM	1	0	21.57	21.32	21.60
		1	3	21.56	21.36	21.37
		1	5	21.90	21.32	21.43
		3	0	21.85	21.32	21.94
		3	2	21.31	21.54	22.05
		3	3	21.35	21.55	22.00
		6	0	20.43	20.74	20.49
Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				20415	20525	20635
Band 5 3MHz	QPSK	1	0	22.61	22.86	22.67
		1	7	22.67	22.74	22.78
		1	14	22.61	22.76	22.46
		8	0	21.57	21.40	21.44

		8	4	21.57	21.49	21.51
		8	7	21.57	21.49	21.44
		15	0	21.50	21.46	21.45
	16QAM	1	0	21.60	21.78	21.09
		1	7	21.67	21.98	21.31
		1	14	21.70	21.88	20.84
		8	0	20.84	20.91	20.57
		8	4	20.81	20.99	20.62
		8	7	20.54	20.99	20.48
		15	0	20.55	20.70	20.54
Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				20425	20525	20625
Band 5 5MHz	QPSK	1	0	22.51	22.27	22.05
		1	13	22.74	22.79	22.55
		1	24	22.51	22.67	22.33
		12	0	21.41	21.38	21.58
		12	6	21.50	21.45	21.45
		12	13	21.51	21.46	21.37
		25	0	21.42	21.42	21.44
	16QAM	1	0	21.15	20.76	21.52
		1	13	21.36	21.03	20.98
		1	24	21.29	20.84	20.89
		12	0	20.39	20.42	20.71
		12	6	20.46	20.58	20.47
		12	13	20.43	20.57	20.40
		25	0	20.50	20.67	20.49
Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				20450	20525	20600
Band 5 10MHz	QPSK	1	0	22.53	22.65	22.47
		1	25	22.58	22.88	22.86
		1	49	22.42	22.70	22.45
		25	0	21.55	21.43	21.56
		25	13	21.59	21.52	21.58
		25	25	21.49	21.51	21.47
		50	0	21.58	21.46	21.58
	16QAM	1	0	21.64	21.51	21.34
		1	25	21.72	21.94	21.52
		1	49	21.28	22.17	20.88
		25	0	20.69	20.52	20.80
		25	13	20.68	20.58	20.57
		25	25	20.54	20.56	20.45
		50	0	20.59	20.40	20.73

LTE Band 12

Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				23017	23095	23173
Band 12 1.4MHz	QPSK	1	0	22.63	22.61	22.39
		1	3	22.78	22.62	22.48
		1	5	22.59	22.60	22.29
		3	0	22.52	22.55	22.49
		3	2	22.50	22.58	22.45
		3	3	22.54	22.57	22.66
	16QAM	6	0	21.51	21.55	21.32
		1	0	21.43	21.54	21.59
		1	3	21.45	21.47	21.53
		1	5	21.44	21.51	20.94
		3	0	21.48	21.37	21.40
		3	2	21.47	21.40	21.53
		3	3	21.82	21.49	21.47
		6	0	20.56	20.73	20.27
Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				23025	23095	23165
Band 12 3MHz	QPSK	1	0	22.77	22.68	22.53
		1	7	22.88	22.77	22.47
		1	14	22.60	22.71	22.43
		8	0	21.60	21.57	21.33
		8	4	21.61	21.58	21.35
		8	7	21.52	21.58	21.31
		15	0	21.44	21.58	21.30
	16QAM	1	0	21.61	21.68	21.40
		1	7	21.66	21.82	21.87
		1	14	21.50	21.33	20.95
		8	0	20.55	20.88	20.47
		8	4	20.51	20.94	20.30
		8	7	20.51	20.72	20.31
		15	0	20.59	20.80	20.35
Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				23035	23095	23155
Band 12 5MHz	QPSK	1	0	22.50	22.53	21.95
		1	13	22.53	22.74	22.49
		1	24	22.42	22.53	22.07
		12	0	21.68	21.56	21.53
		12	6	21.64	21.56	21.45
		12	13	21.52	21.54	21.23
		25	0	21.44	21.56	21.45
	16QAM	1	0	21.26	20.92	21.21
		1	13	21.06	21.04	20.98
		1	24	21.14	20.96	20.82

		12	0	20.62	20.55	20.45
		12	6	20.60	20.68	20.49
		12	13	20.49	20.66	20.46
		25	0	20.42	20.61	20.58
Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				23060	23095	23130
Band 12 10MHz	QPSK	1	0	22.43	22.37	22.56
		1	25	22.61	22.69	22.75
		1	49	22.28	22.50	22.49
		25	0	21.49	21.51	21.59
		25	13	21.49	21.55	21.64
		25	25	21.45	21.44	21.34
		50	0	21.43	21.40	21.40
	16QAM	1	0	21.41	21.16	21.88
		1	25	21.60	21.53	21.09
		1	49	21.39	20.97	21.60
		25	0	20.56	20.53	20.69
		25	13	20.67	20.58	20.70
		25	25	20.65	20.60	20.42
		50	0	20.47	20.32	20.46

LTE Band 13

Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				23205	23230	23255
Band 13 5MHz	QPSK	1	0	22.26	22.02	22.14
		1	13	22.36	22.46	22.75
		1	24	22.45	22.08	22.15
		12	0	21.27	21.30	21.32
		12	6	21.37	21.43	21.29
		12	13	21.29	21.44	21.29
		25	0	21.37	21.39	21.26
	16QAM	1	0	20.68	20.93	21.13
		1	13	20.87	21.23	20.95
		1	24	21.01	20.94	20.98
		12	0	20.32	20.19	20.29
		12	6	20.51	20.20	20.22
		12	13	20.34	20.21	20.11
		25	0	20.37	20.39	20.25
Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				23230	23230	23230
Band 13 10MHz	QPSK	1	0	21.98	21.90	21.77
		1	25	22.30	22.15	22.00
		1	49	22.03	21.93	22.06
		25	0	21.25	21.21	21.15
		25	13	21.24	21.23	21.17

		25	25	21.17	21.18	21.14
		50	0	21.18	21.10	21.14
	16QAM	1	0	20.85	21.07	20.91
		1	25	21.21	21.31	21.31
		1	49	20.95	20.82	21.00
		25	0	20.37	20.25	20.21
		25	13	20.35	20.30	20.33
		25	25	20.28	20.22	20.29
		50	0	20.25	20.19	20.15

LTE Band 25

Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				26047	26365	26683
Band 25 1.4MHz	QPSK	1	0	22.42	22.56	22.55
		1	3	22.53	22.93	22.66
		1	5	22.48	22.80	22.20
		3	0	22.53	22.62	22.53
		3	2	22.67	22.76	22.45
		3	3	22.60	22.67	22.32
		6	0	21.49	21.79	21.55
	16QAM	1	0	21.75	21.65	21.60
		1	3	21.72	21.86	21.63
		1	5	21.16	21.72	21.28
		3	0	20.81	21.81	21.60
		3	2	20.86	21.97	21.58
		3	3	20.88	22.03	21.50
		6	0	20.17	21.14	20.73
Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				26055	26365	26675
Band 25 3MHz	QPSK	1	0	22.56	22.75	22.55
		1	7	22.59	22.89	22.71
		1	14	22.59	22.88	21.95
		8	0	21.55	21.70	21.55
		8	4	21.55	21.76	21.62
		8	7	21.47	21.85	21.61
		15	0	21.53	21.74	21.76
	16QAM	1	0	21.48	21.94	21.38
		1	7	21.44	22.21	21.74
		1	14	21.37	22.14	21.35
		8	0	20.22	21.10	20.82
		8	4	20.22	20.77	20.67
		8	7	20.34	20.49	20.69
		15	0	20.32	20.69	20.78
Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				26065	26365	26665

Band 25 5MHz	QPSK	1	0	21.65	21.94	22.08
		1	13	22.07	22.07	22.13
		1	24	21.70	21.94	22.28
		12	0	20.83	21.02	20.92
		12	6	20.88	21.00	20.98
		12	13	20.91	20.97	21.10
		25	0	20.89	20.92	20.93
	16QAM	1	0	20.39	21.25	20.38
		1	13	20.46	21.09	20.40
		1	24	20.34	20.71	20.78
		12	0	19.91	20.06	19.87
		12	6	19.83	20.03	20.21
		12	13	19.87	20.12	20.28
		25	0	19.82	20.17	19.95
Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
Band 25 10MHz	QPSK	1	0	22.10	22.22	22.04
		1	25	21.70	22.47	22.20
		1	49	22.00	22.17	21.93
		25	0	20.97	21.14	21.01
		25	13	20.96	21.18	20.98
		25	25	20.76	21.04	21.03
		50	0	20.83	21.02	21.07
	16QAM	1	0	20.91	21.23	20.76
		1	25	20.92	21.67	20.60
		1	49	20.88	21.15	21.10
		25	0	19.97	20.18	20.10
		25	13	20.08	20.23	20.17
		25	25	19.96	20.09	20.21
		50	0	20.02	20.15	20.10
Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
Band 25 15MHz	QPSK	1	0	21.76	22.44	22.07
		1	38	22.09	22.49	22.36
		1	74	21.89	22.24	21.73
		36	0	20.97	21.25	20.98
		36	18	20.94	21.21	20.99
		36	39	21.03	21.04	21.04
		75	0	20.98	21.09	21.00
	16QAM	1	0	21.50	21.28	20.81
		1	38	21.87	21.60	21.37
		1	74	21.05	21.11	20.68
		36	0	20.00	20.27	20.25
		36	18	19.93	20.25	20.06
		36	39	19.91	20.08	20.24
		75	0	20.09	20.13	19.87
Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		

				Channel	Channel	Channel
				26140	26365	26590
Band 25 20MHz	QPSK	1	0	21.97	21.76	22.33
		1	50	22.27	22.17	22.16
		1	99	21.74	21.75	21.46
		50	0	21.03	21.20	21.12
		50	25	21.10	21.22	21.01
		50	50	21.14	21.01	20.95
		100	0	21.07	21.11	21.10
	16QAM	1	0	20.94	20.91	21.15
		1	50	21.06	21.07	21.01
		1	99	20.40	20.50	20.72
		50	0	19.97	20.28	20.15
		50	25	20.02	20.34	20.13
		50	50	20.10	20.09	20.25
		100	0	20.12	20.21	20.17

LTE Band 26

Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				26697	26740	26783
Band 26 1.4MHz	QPSK	1	0	21.92	22.11	22.06
		1	3	21.90	22.12	22.24
		1	5	22.20	22.30	22.15
		3	0	21.98	22.23	22.31
		3	2	22.03	22.37	22.35
		3	3	22.03	22.24	22.46
		6	0	20.98	21.17	21.52
	16QAM	1	0	21.02	21.21	20.93
		1	3	21.11	21.16	21.41
		1	5	21.07	21.20	20.88
		3	0	21.11	21.03	20.80
		3	2	21.25	21.08	21.27
		3	3	20.94	21.11	21.60
		6	0	20.23	20.05	20.22
Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				26705	26740	26775
Band 26 3MHz	QPSK	1	0	22.05	22.23	22.36
		1	7	22.15	22.27	22.76
		1	14	22.16	22.45	22.33
		8	0	21.13	21.35	21.40
		8	4	21.16	21.34	21.41
		8	7	21.21	21.38	21.33
		15	0	21.17	21.34	21.35
	16QAM	1	0	21.06	21.17	21.12
		1	7	21.31	21.39	21.32
		1	14	21.15	21.39	21.27
		8	0	20.13	20.27	20.54

		8	4	20.17	20.42	20.58
		8	7	20.14	20.47	20.52
		15	0	19.94	20.34	20.57
Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				26715	26740	26765
Band 26 5MHz	QPSK	1	0	21.91	22.21	22.14
		1	13	22.17	22.46	22.63
		1	24	22.19	22.44	22.32
		12	0	21.15	21.27	21.40
		12	6	21.29	21.31	21.36
		12	13	21.24	21.39	21.33
		25	0	21.29	21.30	21.27
	16QAM	1	0	20.84	20.68	21.35
		1	13	21.13	21.23	21.11
		1	24	21.00	20.78	20.86
		12	0	20.29	20.33	20.24
		12	6	20.39	20.32	20.29
		12	13	20.14	20.46	20.19
		25	0	20.43	20.32	20.43
Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				NA	26740	NA
Band 26 10MHz	QPSK	1	0	/	22.11	/
		1	25	/	22.45	/
		1	49	/	22.30	/
		25	0	/	21.14	/
		25	13	/	21.37	/
		25	25	/	21.37	/
		50	0	/	21.20	/
	16QAM	1	0	/	21.11	/
		1	25	/	21.52	/
		1	49	/	21.04	/
		25	0	/	20.22	/
		25	13	/	20.41	/
		25	25	/	20.36	/
		50	0	/	20.34	/

LTE Band 41

Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				39675	40620	41564
Band 41 5MHz	QPSK	1	0	21.26	21.10	21.99
		1	13	21.51	21.55	22.23
		1	24	21.34	21.33	21.93
		12	0	20.39	20.31	20.82
		12	6	20.48	20.31	20.84
		12	13	20.42	20.31	20.81

	16QAM	25	0	20.41	20.26	20.81
		1	0	20.23	19.73	21.03
		1	13	20.57	20.33	21.24
		1	24	19.66	19.75	21.00
		12	0	19.23	19.13	19.92
		12	6	19.35	19.05	20.03
		12	13	19.32	19.03	19.94
		25	0	19.61	19.12	19.80
Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				39700	40620	41539
Band 41 10MHz	QPSK	1	0	21.55	21.40	21.66
		1	25	21.69	21.44	22.09
		1	49	21.73	21.32	21.68
		25	0	20.54	20.47	20.93
		25	13	20.66	20.34	20.94
		25	25	20.72	20.33	20.93
		50	0	20.64	20.32	20.91
	16QAM	1	0	21.67	20.89	20.36
		1	25	21.67	20.85	20.27
		1	49	21.86	20.56	20.18
		25	0	19.57	19.55	20.08
		25	13	19.60	19.41	20.13
		25	25	19.59	19.36	19.94
		50	0	19.65	19.33	19.92
Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				39725	40620	41514
Band 41 15MHz	QPSK	1	0	21.39	21.42	22.00
		1	38	21.84	21.28	22.51
		1	74	21.42	21.31	22.11
		36	0	20.46	20.48	21.01
		36	18	20.68	20.35	20.94
		36	39	20.63	20.41	20.93
		75	0	20.46	20.47	20.97
	16QAM	1	0	20.62	20.03	21.45
		1	38	21.16	19.91	21.85
		1	74	20.83	19.86	21.61
		36	0	19.51	19.54	19.95
		36	18	19.61	19.44	19.95
		36	39	19.52	19.32	19.75
		75	0	19.50	19.34	19.95
Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				39750	40620	41489
Band 41 20MHz	QPSK	1	0	21.71	21.65	21.78
		1	50	22.17	21.46	22.49
		1	99	21.79	21.45	21.86
		50	0	20.60	20.55	21.06

		50	25	20.65	20.47	21.07
		50	50	20.53	20.42	20.85
		100	0	20.56	20.57	20.97
	16QAM	1	0	20.46	20.38	20.20
		1	50	20.73	20.16	20.39
		1	99	20.45	20.33	20.42
		50	0	19.50	19.72	19.97
		50	25	19.68	19.42	19.90
		50	50	19.69	19.54	20.00
		100	0	19.58	19.47	19.83

LTE Band 66

Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				131979	132322	132665
Band 66 1.4MHz	QPSK	1	0	22.33	22.53	22.54
		1	3	22.40	22.62	22.86
		1	5	22.46	22.24	22.58
		3	0	22.36	22.76	22.84
		3	2	22.40	22.58	22.88
		3	3	22.42	22.58	22.78
	16QAM	6	0	21.34	21.43	21.73
		1	0	21.39	21.32	21.15
		1	3	21.44	21.37	20.94
		1	5	21.34	21.23	21.22
		3	0	21.26	21.17	21.67
		3	2	21.46	21.13	21.71
		3	3	21.57	21.31	21.64
		6	0	20.42	20.52	20.74
Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				131987	132322	132657
Band 66 3MHz	QPSK	1	0	21.89	21.84	21.86
		1	7	22.04	22.08	22.03
		1	14	21.93	21.90	21.88
		8	0	21.02	20.97	21.16
		8	4	20.98	21.02	21.09
		8	7	20.99	20.94	20.98
		15	0	20.84	20.98	21.01
	16QAM	1	0	21.02	20.61	20.96
		1	7	21.03	20.75	21.07
		1	14	20.96	21.18	20.94
		8	0	19.99	20.01	20.01
		8	4	19.93	20.10	20.06
		8	7	20.00	20.05	19.97
		15	0	19.93	20.04	19.79
Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel

				131997	132322	132647
Band 66 5MHz	QPSK	1	0	21.87	21.85	21.87
		1	13	22.16	21.93	21.97
		1	24	21.86	21.78	21.99
		12	0	20.97	20.97	21.07
		12	6	21.08	21.05	21.11
		12	13	20.90	21.06	20.99
		25	0	20.94	21.02	21.08
	16QAM	1	0	20.42	20.74	20.75
		1	13	20.53	20.76	20.84
		1	24	20.30	20.62	20.48
		12	0	19.94	19.99	20.03
		12	6	20.15	20.07	20.17
		12	13	20.07	20.00	20.26
		25	0	20.05	20.08	20.05
Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				132022	132322	132622
Band 66 10MHz	QPSK	1	0	22.32	22.57	22.44
		1	25	22.47	22.83	22.63
		1	49	22.40	22.42	22.72
		25	0	21.18	21.56	21.64
		25	13	21.23	21.43	21.65
		25	25	21.06	21.28	21.49
		50	0	21.06	21.40	21.67
	16QAM	1	0	21.17	21.87	21.62
		1	25	21.87	21.07	21.63
		1	49	21.20	21.56	21.36
		25	0	20.32	20.58	20.72
		25	13	20.30	20.40	20.69
		25	25	20.18	20.49	20.60
		50	0	20.21	20.42	20.55
Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				132047	132322	132597
Band 66 15MHz	QPSK	1	0	22.67	22.61	22.58
		1	38	22.73	22.79	22.66
		1	74	22.71	22.63	22.70
		36	0	21.30	21.56	21.87
		36	18	21.24	21.44	21.83
		36	39	21.18	21.44	21.65
		75	0	21.32	21.47	21.59
	16QAM	1	0	21.47	21.94	22.23
		1	38	21.99	22.01	22.43
		1	74	21.39	22.05	22.31
		36	0	20.29	20.62	20.83
		36	18	20.35	20.50	20.81
		36	39	20.35	20.56	20.58
		75	0	20.28	20.63	20.68

Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				132072	132322	132572
Band 66 20MHz	QPSK	1	0	22.16	22.47	22.76
		1	50	22.47	22.48	23.09
		1	99	22.26	22.55	22.70
		50	0	21.31	21.66	21.73
		50	25	21.33	21.53	21.87
		50	50	21.41	21.56	21.71
		100	0	21.49	21.67	21.68
	16QAM	1	0	21.29	21.08	21.66
		1	50	21.34	21.35	21.86
		1	99	20.77	21.26	21.54
		50	0	20.37	20.75	20.74
		50	25	20.42	20.62	20.75
		50	50	20.41	20.56	20.58
		100	0	20.42	20.67	20.72

LTE Band 71

Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				133147	133297	133447
Band 71 5MHz	QPSK	1	0	22.75	22.22	22.39
		1	13	22.98	22.45	22.52
		1	24	22.58	22.42	22.32
		12	0	21.50	21.63	21.64
		12	6	21.70	21.74	21.58
		12	13	21.63	21.73	21.49
		25	0	21.54	21.65	21.48
	16QAM	1	0	21.10	21.05	21.40
		1	13	21.51	21.29	21.36
		1	24	21.18	21.07	21.49
		12	0	20.49	20.67	20.41
		12	6	20.58	20.74	20.65
		12	13	20.64	20.74	20.57
		25	0	20.70	20.85	20.55
Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				133172	133297	133422
Band 71 10MHz	QPSK	1	0	22.58	22.71	22.35
		1	25	22.60	22.65	22.73
		1	49	22.52	22.79	22.37
		25	0	21.62	21.69	21.52
		25	13	21.73	21.73	21.68
		25	25	21.54	21.62	21.37
		50	0	21.53	21.64	21.48
	16QAM	1	0	21.51	21.65	20.99
		1	25	21.94	21.65	21.32

		1	49	21.47	21.64	21.35
		25	0	20.65	20.73	20.70
		25	13	20.78	20.78	20.84
		25	25	20.59	20.67	20.58
		50	0	20.55	20.67	20.55
Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				133197	133297	133397
Band 71 15MHz	QPSK	1	0	22.40	22.48	22.89
		1	38	22.36	22.94	22.96
		1	74	22.50	22.49	22.66
		36	0	21.56	21.62	21.70
		36	18	21.64	21.74	21.73
		36	39	21.57	21.70	21.58
		75	0	21.45	21.60	21.57
	16QAM	1	0	21.75	22.00	21.82
		1	38	21.57	22.46	21.88
		1	74	21.31	22.24	21.51
		36	0	20.65	20.73	20.74
		36	18	20.66	20.77	20.67
		36	39	20.63	20.73	20.56
		75	0	20.52	20.67	20.64
Bandwidth	Modulation	RB size	RB offset	Average Power (dBm)		
				Channel	Channel	Channel
				133222	133297	133372
Band 71 20MHz	QPSK	1	0	22.12	22.49	22.37
		1	50	22.34	22.99	22.76
		1	99	22.32	22.52	22.34
		50	0	21.57	21.65	21.71
		50	25	21.59	21.74	21.66
		50	50	21.53	21.61	21.56
		100	0	21.53	21.53	21.55
	16QAM	1	0	21.52	21.30	21.24
		1	50	21.74	21.79	21.69
		1	99	21.11	21.41	21.12
		50	0	20.41	20.67	20.67
		50	25	20.71	20.70	20.61
		50	50	20.78	20.58	20.51
		100	0	20.74	20.60	20.56

6.2 PEAK TO AVERAGE RADIO

LIMITS

In addition, when the transmitter power is measured in terms of average value, the peak-to-average ratio of the power shall not exceed 13 dB.

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v03r01.

The transmitter output was connected to a CMW500 Test Set and configured to operate at maximum power. The PAR was measured on the Spectrum Analyzer.

RESULTS

See the following pages.

LTE Band	Bandwidth (MHz)	F (MHz)	RB Configuration	Modulation	Measured (dB)	Limit (dB)	Verdict
2	1.4	1850.7	1RB 0#	QPSK	2.92	13	PASS
				16QAM	3.97	13	PASS
	3	1851.5		QPSK	2.85	13	PASS
				16QAM	3.76	13	PASS
	5	1852.5		QPSK	2.93	13	PASS
				16QAM	3.76	13	PASS
	10	1855.0		QPSK	2.94	13	PASS
				16QAM	3.73	13	PASS
	15	1857.5		QPSK	3.08	13	PASS
				16QAM	3.97	13	PASS
20	1860.0	QPSK	3.14	13	PASS		
		16QAM	3.98	13	PASS		

LTE Band	Bandwidth (MHz)	F (MHz)	RB Configuration	Modulation	Measured (dB)	Limit (dB)	Verdict
4	1.4	1710.7	1RB 0#	QPSK	3.18	13	PASS
				16QAM	4.03	13	PASS
	3	1711.5		QPSK	3.12	13	PASS
				16QAM	3.97	13	PASS
	5	1712.5		QPSK	3.30	13	PASS
				16QAM	4.10	13	PASS
	10	1715.0		QPSK	3.16	13	PASS
				16QAM	4.06	13	PASS
	15	1717.5		QPSK	3.14	13	PASS
				16QAM	4.33	13	PASS
	20	1720.0		QPSK	3.13	13	PASS
				16QAM	3.86	13	PASS

LTE Band	Bandwidth (MHz)	F (MHz)	RB Configuration	Modulation	Measured (dB)	Limit (dB)	Verdict
12	1.4	699.7	1RB 0#	QPSK	3.20	13	PASS
				16QAM	4.25	13	PASS
	3	700.5		QPSK	3.18	13	PASS
				16QAM	4.36	13	PASS
	5	701.5		QPSK	3.20	13	PASS
				16QAM	4.35	13	PASS
	10	704.0		QPSK	3.42	13	PASS
				16QAM	4.28	13	PASS

LTE Band	Bandwidth (MHz)	F (MHz)	RB Configuration	Modulation	Measured (dB)	Limit (dB)	Verdict
13	5	826.5	1RB 0#	QPSK	4.01	13	PASS
				16QAM	5.01	13	PASS
	10	829.0		QPSK	4.12	13	PASS
				16QAM	5.05	13	PASS

LTE Band	Bandwidth (MHz)	F (MHz)	RB Configuration	Modulation	Measured (dB)	Limit (dB)	Verdict
25	1.4	1850.7	1RB 0#	QPSK	3.81	13	PASS
				16QAM	4.70	13	PASS
	3	1851.5		QPSK	3.82	13	PASS
				16QAM	4.71	13	PASS
	5	1852.5		QPSK	3.94	13	PASS
				16QAM	4.64	13	PASS
	10	1855.0		QPSK	3.77	13	PASS
				16QAM	4.71	13	PASS
	15	1857.5		QPSK	4.12	13	PASS
				16QAM	4.83	13	PASS
	20	1860.0		QPSK	4.39	13	PASS
				16QAM	5.33	13	PASS

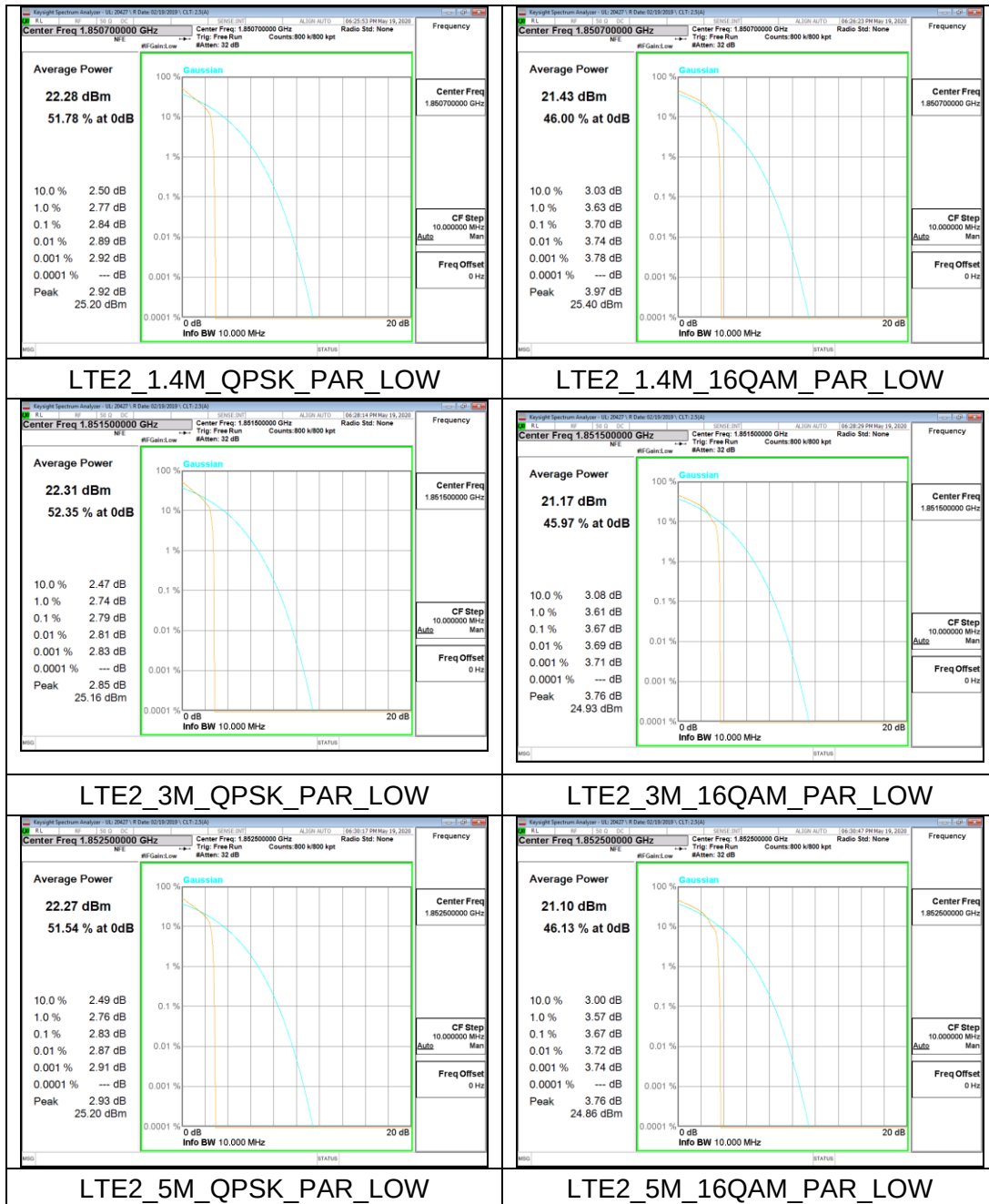
LTE Band	Bandwidth (MHz)	F (MHz)	RB Configuration	Modulation	Measured (dB)	Limit (dB)	Verdict
26	1.4	814.7	1RB 0#	QPSK	3.32	13	PASS
				16QAM	4.26	13	PASS
	3	815.5		QPSK	3.63	13	PASS
				16QAM	4.46	13	PASS
	5	816.5		QPSK	3.88	13	PASS
				16QAM	4.84	13	PASS
	10	819.0		QPSK	4.18	13	PASS
				16QAM	4.95	13	PASS

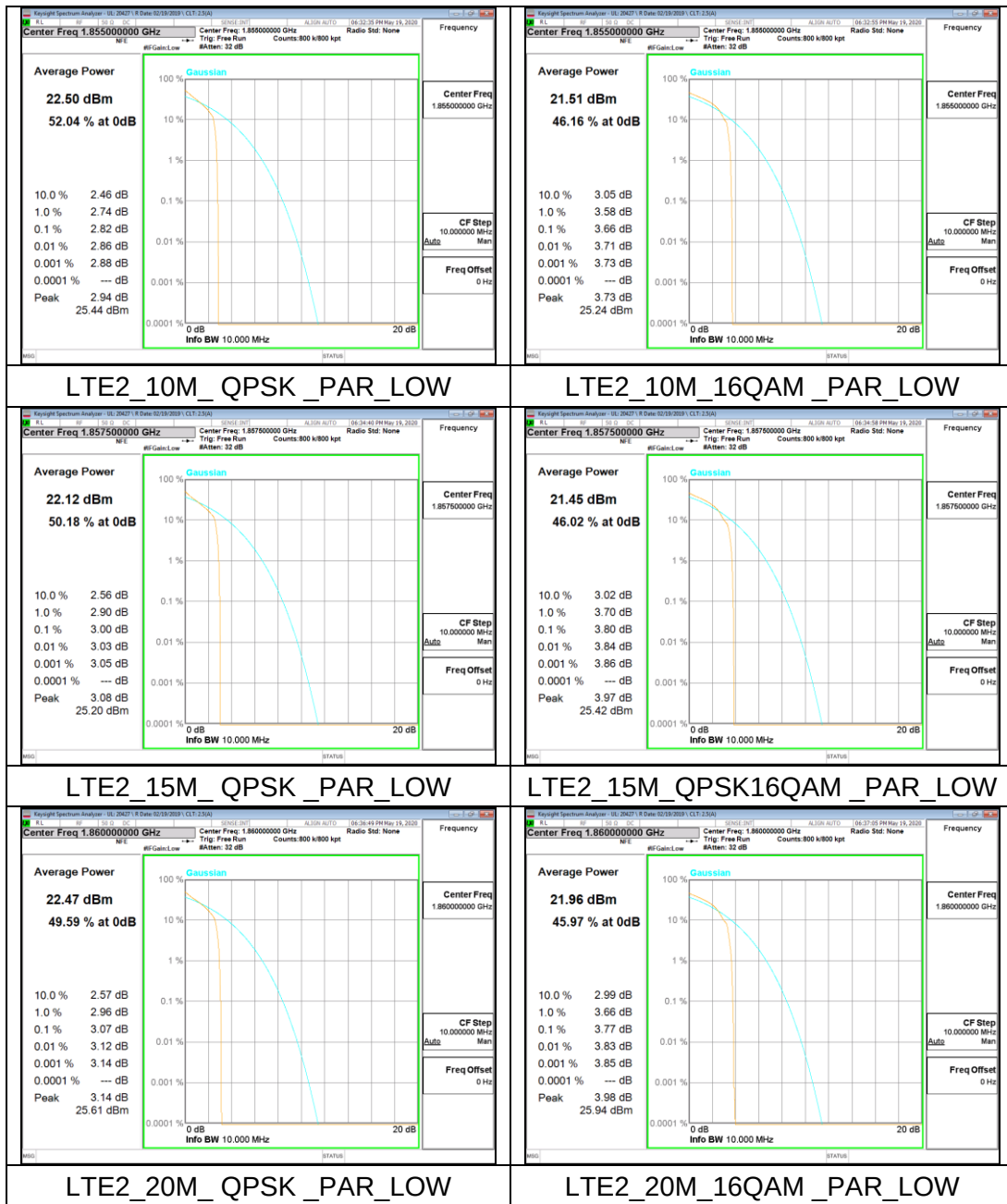
LTE Band	Bandwidth (MHz)	F (MHz)	RB Configuration	Modulation	Measured (dB)	Limit (dB)	Verdict
41	5	2498.5	1RB 0#	QPSK	3.07	13	PASS
				16QAM	4.41	13	PASS
	10	2501.0		QPSK	3.14	13	PASS
				16QAM	4.67	13	PASS
	15	2503.5		QPSK	3.09	13	PASS
				16QAM	4.67	13	PASS
	20	2506.0		QPSK	3.02	13	PASS
				16QAM	4.05	13	PASS

LTE Band	Bandwidth (MHz)	F (MHz)	RB Configuration	Modulation	Measured (dB)	Limit (dB)	Verdict
66	1.4	1710.7	1RB 0#	QPSK	5.31	13	PASS
				16QAM	5.30	13	PASS
	3	1711.5		QPSK	4.40	13	PASS
				16QAM	5.17	13	PASS
	5	1712.5		QPSK	4.12	13	PASS
				16QAM	5.39	13	PASS
	10	1715.0		QPSK	4.17	13	PASS
				16QAM	5.11	13	PASS
	15	1717.5		QPSK	4.23	13	PASS
				16QAM	5.33	13	PASS
	20	1720.0		QPSK	4.26	13	PASS
				16QAM	5.15	13	PASS

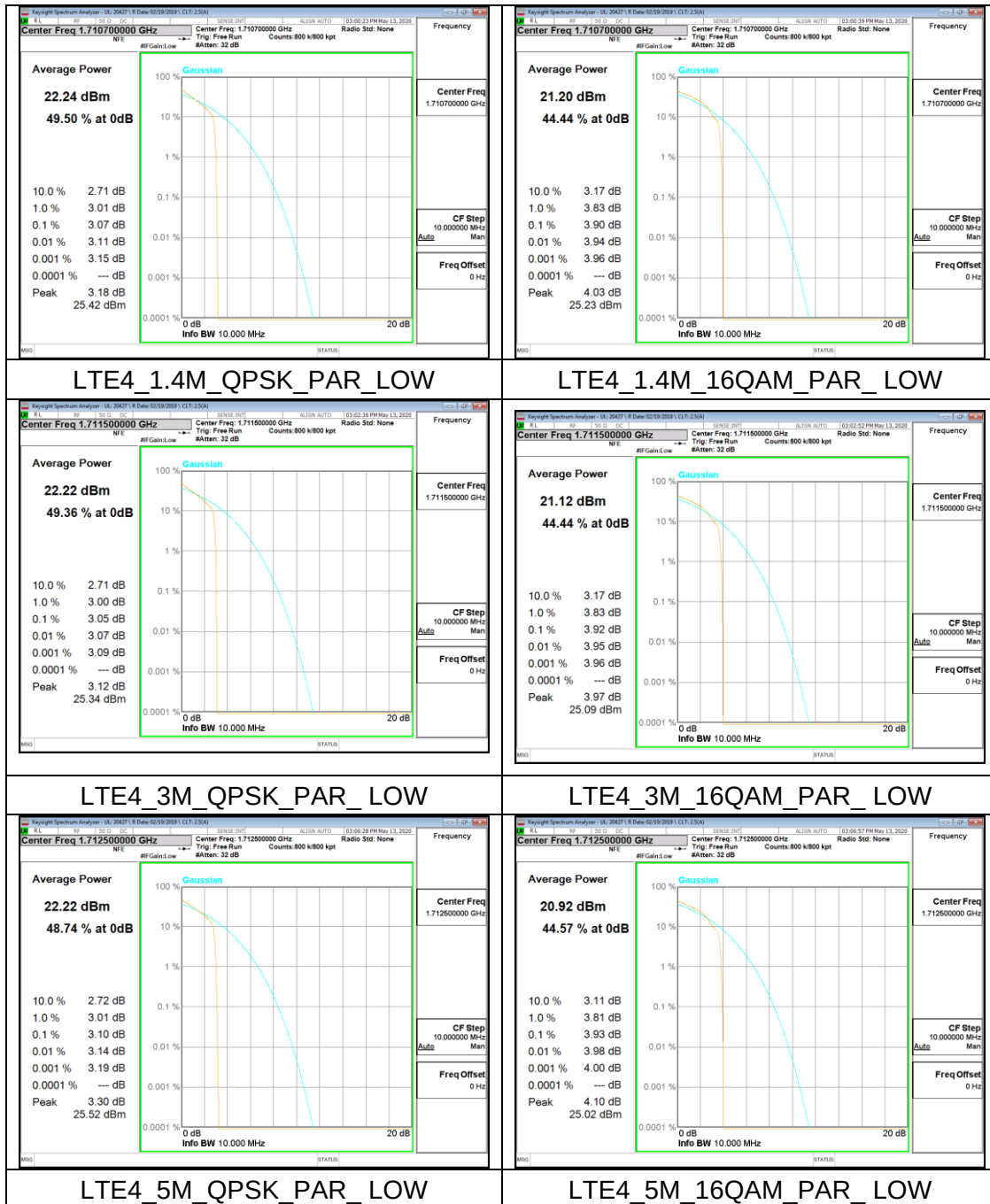
LTE Band	Bandwidth (MHz)	F (MHz)	RB Configuration	Modulation	Measured (dB)	Limit (dB)	Verdict
71	5	666.5	1RB 0#	QPSK	4.78	13	PASS
				16QAM	5.28	13	PASS
	10	668.0		QPSK	6.22	13	PASS
				16QAM	7.07	13	PASS
	15	670.5		QPSK	4.41	13	PASS
				16QAM	5.24	13	PASS
	20	673.0		QPSK	4.49	13	PASS
				16QAM	5.51	13	PASS

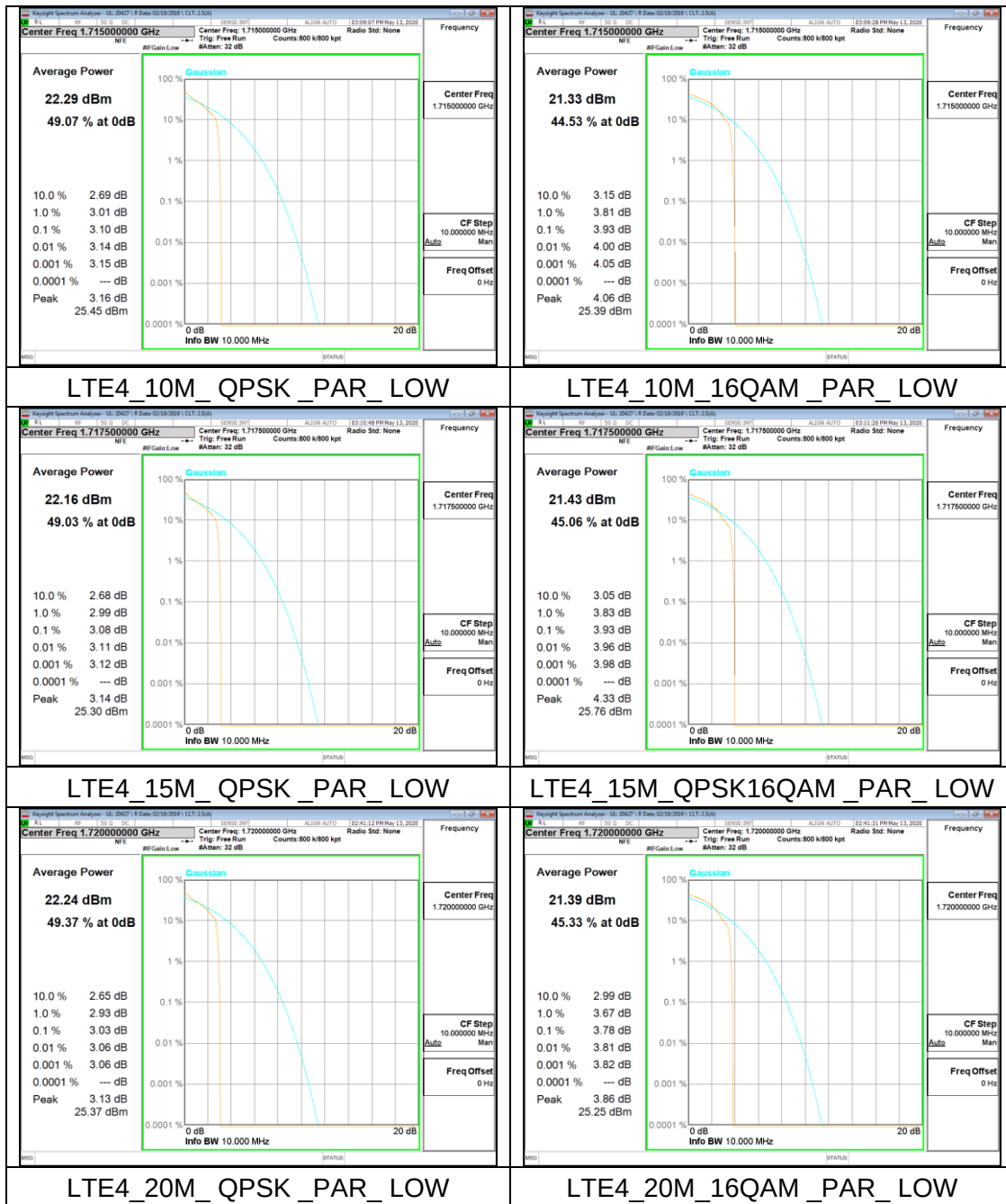
LTE Band 2



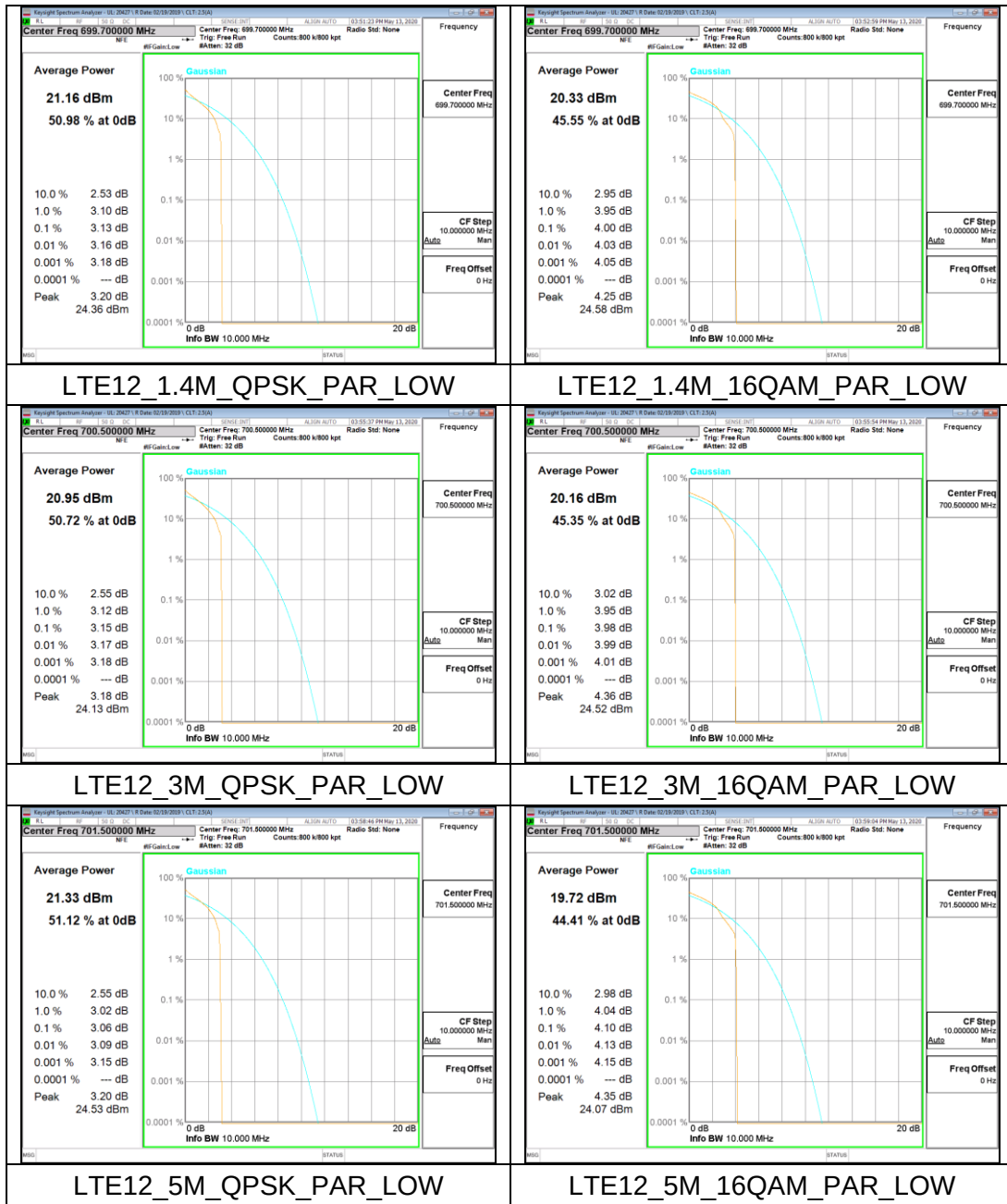


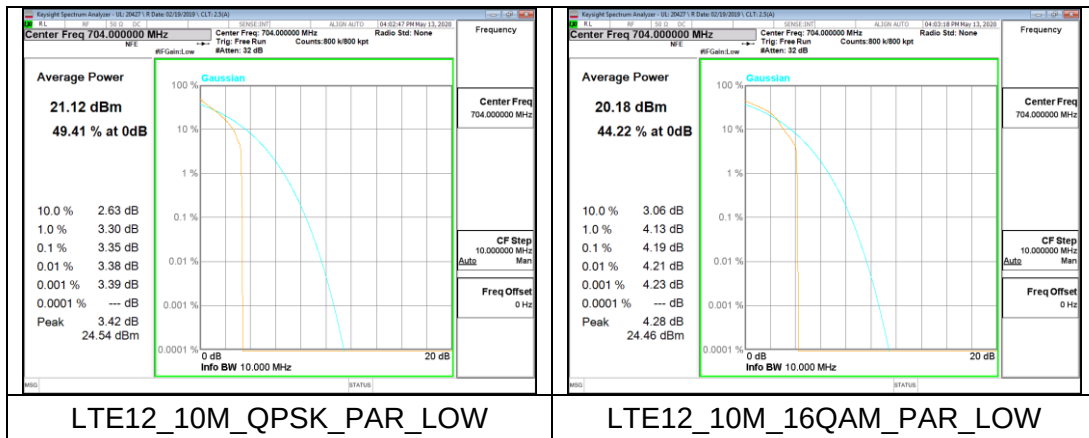
LTE Band 4



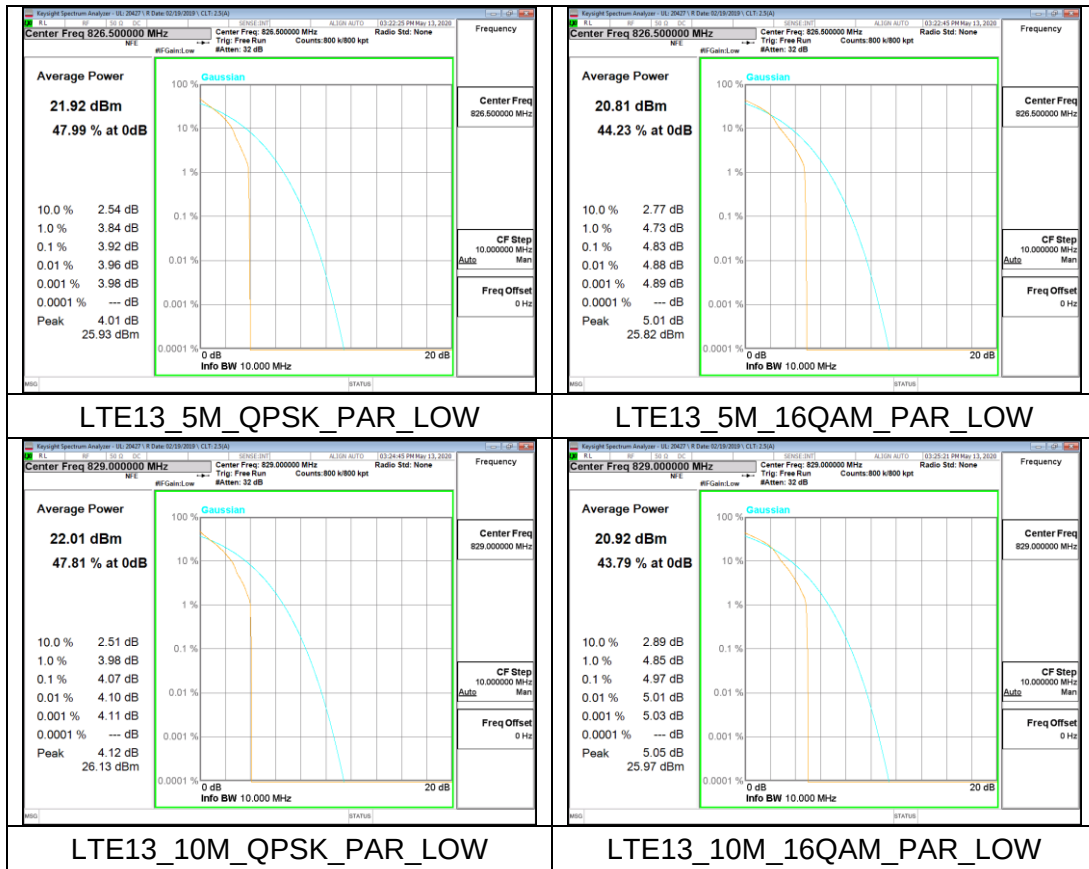


LTE Band 12





LTE Band 13



LTE Band 25

