REPORT No.: SZ22020094W04

TEST REPORT

APPLICANT	:	Fell Technology AS
PRODUCT NAME	:	Waterguard Hub
MODEL NAME	:	W3701
BRAND NAME	:	Fell Technology AS
FCC ID	:	2AFOZW3701
STANDARD(S)	:	47 CFR Part 2 47 CFR Part 24, Subpart E 47 CFR Part 27, Subpart F&H&L
RECEIPT DATE	:	2022-02-21
TEST DATE	:	2022-04-02 to 2022-05-26
ISSUE DATE	:	2022-08-11

Edited by: Tang Jinde (Rapporteur)

Approved by: Shen Junsheng (Supervisor)

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DIRECTORY

Change History		
Version	Date	Reason for change
1.0	2022-08-11	First edition

1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	Fell Technology AS
Applicant Address:	Bragernes Torg 2 3017 Drammen Norway
Manufacturer:	Fell Technology AS
Manufacturer Address:	Bragernes Torg 2 3017 Drammen Norway

1.2. Equipment Under Test (EUT) Description

Product Name:	Waterguard Hub	
Sample No.:	2#	
Hardware Version:	1.0.0	
Software Version:	1.0.0	
Modulation Type:	QPSK, 16QAM	
LTE Category:	M1	
Carrier Aggregation:	Not Support	
Operation Band:	LTE Band 2 / 4 / 12 / 13	
Frequency Range:	LTE Band 2	Tx: 1850MHz–1910MHz
		Rx: 1930MHz–1990MHz
	LTE Band 4	Tx: 1710MHz–1755MHz
		Rx: 2110MHz–2155MHz
	LTE Band 12	Tx: 699MHz – 716MHz
		Rx: 729MHz– 746MHz
	LTE Band 13	Tx: 777MHz–787MHz
		Rx: 746MHz–756MHz
Channel Bandwidth:	LTE Band 2	1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz
	LTE Band 4	1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz
	LTE Band 12	1.4MHz, 3 MHz, 5 MHz, 10MHz
	LTE Band 13	5 MHz, 10MHz
Antenna Type:	Fixed Internal Antenna	

Antenna Gain:	LTE Band 2	3.00dBi
	LTE Band 4	3.00dBi
	LTE Band 12	-0.50dBi
	LTE Band 13	-0.50dBi
Accessory Information:	AC Adapter	
	Brand Name:	N/A
	Model No.:	SK03T-2400100V
	Serial No.:	N/A
	Rated Output:	5V⎓700mA
	Rated Input:	100-240V~50/60Hz, 0.6A
	Manufacturer:	Shenzhen SIMSUKIAN Electronic Technology Co.,Ltd.

Note 1: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

1.3. Maximum E.R.P./E.I.R.P. and Emission Designator

LTE Band 2	Maximum E.R.P./E.I.R.P. (W)		Emission Designator (99%OBW)	
BW(MHz)	QPSK	16QAM	QPSK	16QAM
20	0.258	0.263	1M14G7D	1M12W7D
15	0.258	0.262	1M13G7D	0M97W7D
10	0.265	0.255	1M13G7D	1M00W7D
5	0.265	0.256	1M13G7D	0M97W7D
3	0.243	0.195	1M11G7D	0M96W7D
1.4	0.244	0.191	1M11G7D	0M95W7D
LTE Band 4	**Maximum E.R.P./E.I.R.P. (W)**		**Emission Designator (99%OBW)**	
BW(MHz)	QPSK	16QAM	QPSK	16QAM
20	0.282	0.284	1M14G7D	0M97W7D
15	0.281	0.278	1M13G7D	0M97W7D
10	0.282	0.281	1M13G7D	0M99W7D
5	0.284	0.272	1M13G7D	0M97W7D
3	0.276	0.216	1M11G7D	0M96W7D
1.4	0.212	0.211	1M10G7D	0M95W7D
LTE Band 12	**Maximum E.R.P./E.I.R.P. (W)**		**Emission Designator (99%OBW)**	
BW(MHz)	QPSK	16QAM	QPSK	16QAM
10	0.105	0.108	1M12G7D	0M97W7D
5	0.104	0.106	1M18G7D	0M96W7D
3	0.104	0.078	1M11G7D	0M95W7D
1.4	0.103	0.077	1M11G7D	1M10W7D
LTE Band 13	**Maximum E.R.P./E.I.R.P. (W)**		**Emission Designator (99%OBW)**	
BW(MHz)	QPSK	16QAM	BW(MHz)	QPSK
10	0.084	0.085	1M12G7D	0M94W7D
5	0.090	0.092	1M12G7D	0M96W7D

1.4. Test Standards and Results

The objective of the report is to perform testing according to Part 2, Part 22, Part 24, Part 27 for the EUT FCC ID Certification:

No.	Identity	Document Title
1	47 CFR Part 2	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
2	47 CFR Part 24	Personal Communications Services
3	47 CFR Part 27	Miscellaneous Wireless Communications Services

Test detailed items/section required by FCC rules and results are as below:

Section	Description	Test Date	Test Engineer	Result	Method Determination /Remark
2.1046 24.232(c) 27.50(b)(10) 27.50(d)(4) 27.50(c)(10)	Transmitter Conducted Output Power and E.R.P./E.I.R.P.	Apr.02 to 22, 2022	Li Huaijie	PASS	No deviation
2.1049	Occupied Bandwidth	Apr.02 to 27, 2022	Li Huaijie	PASS	No deviation
2.1055 24.235 27.54	Frequency Stability	Apr. 28, 2022	Li Huaijie	PASS	No deviation
24.232(d), 27.50(d)(5)	Peak to Average Radio	Apr.25 to 28, 2022	Li Huaijie	PASS	No deviation
2.1051 24.238(a) 27.53(c)(2) 27.53(g) 27.53(h)	Conducted Spurious Emissions	Apr.25 to 28, 2022	Li Huaijie	PASS	No deviation
2.1051 24.238(a) 27.53(c)(2) 27.53(g) 27.53(h)	Band Edge	Apr.25 to 28, 2022	Li Huaijie	PASS	No deviation

2.1051 24.238(a) 27.53(c)(2) 27.53(g) 27.53(h)	Radiated Spurious Emissions	May.26, 2022	Su Zhan	PASS	No deviation

Note 1: The tests were performed according to the method of measurements prescribed in KDB971168 D01 v03 and ANSI/TIA-603-E-2016.

Note 2: The path loss during the RF test is calibrated to correct the results by the offset setting in the test equipments. The ref offset 24.5dB contains two parts that cable loss 14.5dB and Attenuator 10dB.

Note 3: Additions to, deviation, or exclusions from the method shall be judged in the “method determination" column of add, deviate or exclude from the specific method shall be explained in the "Remark" of the above table.

Note 4: When the test result is a critical value, we will use the measurement uncertainty give the judgment result based on the 95% confidence intervals.

1.5. Environmental Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15-35
Relative Humidity (%):	30-60
Atmospheric Pressure (kPa):	86-106

2. 47 CFR Part 2, Part 24E, Part 27F&H&L Requirements

2.1. Transmitter Conducted Output Power and E.R.P./E.I.R.P.

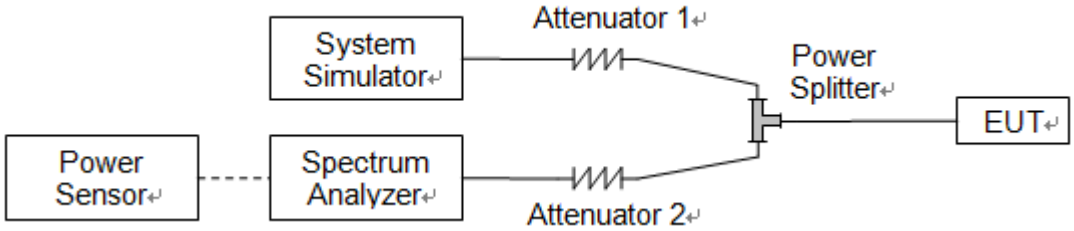
2.1.1. Requirement

According to FCC section 2.1046(a), for transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in FCC section 2.1033(c)(8).

According to FCC section 24.232 (c) for LTE Band 2, Mobile and portable stations are limited to 2 watts E.I.R.P. and the equipment must employ a means for limiting power to the minimum necessary for successful communications.
According to FCC section 27.50 (d)(4) for LTE Band 4, Fixed, mobile and portable (hand-held) stations in the 1710-1755MHz band are limited to 1wat E.I.R.P.
According to FCC section 27.50 (c)(10) for LTE Band 12, Portable stations (hand-held devices) operating in the 704-716MHz band are limited to 3watts E.R.P.

According to FCC section 27.50 (b)(10) for LTE Band 13, Portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts E.R.P.

2.1.2. Test Description



The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power. A call is established between the EUT and the SS.

2.1.3. Test Procedure

KDB 971168 D01v03 Section 5.2 and ANSI/TIA-603-E-2016.

E.I.R.P. (dBm) = Conducted Output Power (dBm) + Antenna Gain (dBi)
E.R.P. (dBm) = E.I.R.P. (dBm) - 2.15

2.1.4. Result

Conducted Output Power:

LTE Band 2						
BW [MHz]	Modulation	RB Size	RB Offset	Average Power Low Ch. / Freq.	Average Power Middle Ch. / Freq.	Average Power High Ch. / Freq.
Channel				18700	18900	19100
Frequency (MHz)				1860	1880	1900
20	QPSK	1	0	20.92	20.87	21.12
20	QPSK	1	5	20.68	20.64	20.79
20	QPSK	3	0	21.03	21.00	20.90
20	QPSK	3	3	20.90	20.87	20.87
20	QPSK	6	0	20.87	20.90	20.81
20	16QAM	1	0	20.99	21.03	21.20
20	16QAM	1	5	20.87	20.77	21.00
20	16QAM	3	0	20.97	20.95	20.90
20	16QAM	3	3	20.69	20.80	20.65
20	16QAM	5	0	20.76	20.86	20.96

LTE Band 2						
BW [MHz]	Modulation	RB Size	RB Offset	Average Power Low Ch. / Freq.	Average Power Middle Ch. / Freq.	Average Power High Ch. / Freq.
Channel				18675	18900	19125
Frequency (MHz)				1857.5	1880	1902.5
15	QPSK	1	0	21.01	21.06	21.03
15	QPSK	1	5	20.46	20.74	20.88
15	QPSK	3	0	20.96	21.06	21.11
15	QPSK	3	3	20.79	20.92	20.88
15	QPSK	6	0	20.83	20.90	20.84
15	16QAM	1	0	20.86	21.19	21.02
15	16QAM	1	5	20.81	21.07	20.65
15	16QAM	3	0	20.90	21.03	20.85
15	16QAM	3	3	20.77	20.72	20.77
15	16QAM	5	0	20.81	21.05	20.94

LTE Band 2						
BW [MHz]	Modulation	RB Size	RB Offset	Average Power Low Ch. / Freq.	Average Power Middle Ch. / Freq.	Average Power High Ch. / Freq.
Channel				18650	18900	19150
Frequency (MHz)				1855	1880	1905
10	QPSK	1	0	20.85	20.92	21.04
10	QPSK	1	5	20.72	20.87	20.98
10	QPSK	3	0	21.04	21.24	21.01
10	QPSK	3	3	20.92	20.99	20.97
10	QPSK	6	0	19.93	20.02	19.86
10	16QAM	1	0	20.90	21.09	20.89
10	16QAM	1	5	20.68	20.87	20.86
10	16QAM	3	0	20.86	21.04	20.70
10	16QAM	3	3	20.72	20.91	20.66
10	16QAM	5	0	20.90	20.99	20.97

LTE Band 2						
BW [MHz]	Modulation	RB Size	RB Offset	Average Power Low Ch. / Freq.	Average Power Middle Ch. / Freq.	Average Power High Ch. / Freq.
Channel				18625	18900	19175
Frequency (MHz)				1852.5	1880	1907.5
5	QPSK	1	0	20.80	20.84	20.97
5	QPSK	1	5	20.64	20.73	21.01
5	QPSK	3	0	21.09	21.12	21.24
5	QPSK	3	3	20.94	20.98	21.00
5	QPSK	6	0	19.94	19.97	19.87
5	16QAM	1	0	21.02	21.05	21.07
5	16QAM	1	5	20.92	20.93	20.97
5	16QAM	3	0	21.01	21.05	20.85
5	16QAM	3	3	20.74	20.88	20.58
5	16QAM	5	0	19.87	19.96	19.96

LTE Band 2						
BW [MHz]	Modulation	RB Size	RB Offset	Average Power Low Ch. / Freq.	Average Power Middle Ch. / Freq.	Average Power High Ch. / Freq.
Channel				18615	18900	19185
Frequency (MHz)				1851.5	1880	1908.5
3	QPSK	1	0	20.77	20.85	20.86
3	QPSK	1	5	20.64	20.73	20.74
3	QPSK	3	0	19.91	20.00	19.90
3	QPSK	3	3	19.70	19.79	19.74
3	QPSK	6	0	18.78	18.88	18.73
3	16QAM	1	0	19.75	19.80	19.91
3	16QAM	1	5	19.64	19.64	19.77
3	16QAM	3	0	18.68	18.86	18.85
3	16QAM	3	3	18.46	18.64	18.59
3	16QAM	5	0	18.59	18.78	18.53

LTE Band 2						
BW [MHz]	Modulation	RB Size	RB Offset	Average Power Low Ch. / Freq.	Average Power Middle Ch. / Freq.	Average Power High Ch. / Freq.
Channel				18607	18900	19193
Frequency (MHz)				1850.7	1880	1909.3
1.4	QPSK	1	0	19.33	18.64	20.88
1.4	QPSK	1	5	19.84	20.67	20.78
1.4	QPSK	3	0	19.74	19.84	19.92
1.4	QPSK	3	3	19.54	19.73	19.75
1.4	QPSK	6	0	19.74	18.83	18.74
1.4	16QAM	1	0	19.53	19.80	19.74
1.4	16QAM	1	5	19.73	19.66	19.58
1.4	16QAM	3	0	19.80	18.91	18.75
1.4	16QAM	3	3	19.62	18.66	18.61
1.4	16QAM	5	0	19.71	18.47	18.64

LTE Band 4						
BW [MHz]	Modulation	RB Size	RB Offset	Average Power Low Ch. / Freq.	Average Power Middle Ch. / Freq.	Average Power High Ch. / Freq.
Channel				20050	20175	20300
Frequency (MHz)				1720	1732.5	1745
20	QPSK	1	0	21.24	21.38	21.50
20	QPSK	1	5	21.02	21.17	21.36
20	QPSK	3	0	21.15	21.42	21.48
20	QPSK	3	3	20.92	21.26	21.26
20	QPSK	6	0	20.96	21.23	21.31
20	16QAM	1	0	21.20	21.30	21.54
20	16QAM	1	5	20.91	21.06	21.38
20	16QAM	3	0	20.96	21.23	21.38
20	16QAM	3	3	20.79	21.08	21.20
20	16QAM	5	0	21.02	21.17	21.38

LTE Band 4						
BW [MHz]	Modulation	RB Size	RB Offset	Average Power Low Ch. / Freq.	Average Power Middle Ch. / Freq.	Average Power High Ch. / Freq.
Channel				20025	20175	20325
Frequency (MHz)				1717.5	1732.5	1747.5
15	QPSK	1	0	21.24	21.38	21.50
15	QPSK	1	5	21.02	21.17	21.36
15	QPSK	3	0	21.15	21.42	21.48
15	QPSK	3	3	20.92	21.26	21.26
15	QPSK	6	0	20.96	21.23	21.31
15	16QAM	1	0	21.20	21.30	21.54
15	16QAM	1	5	20.91	21.06	21.38
15	16QAM	3	0	20.96	21.23	21.38
15	16QAM	3	3	20.79	21.08	21.20
15	16QAM	5	0	21.02	21.17	21.38

LTE Band 4						
BW [MHz]	Modulation	RB Size	RB Offset	Average Power Low Ch. / Freq.	Average Power Middle Ch. / Freq.	Average Power High Ch. / Freq.
Channel				20025	20175	20325
Frequency (MHz)				1717.5	1732.5	1747.5
10	QPSK	1	0	21.24	21.38	21.50
10	QPSK	1	5	21.02	21.17	21.36
10	QPSK	3	0	21.15	21.42	21.48
10	QPSK	3	3	20.92	21.26	21.26
10	QPSK	6	0	20.96	21.23	21.31
10	16QAM	1	0	21.20	21.30	21.54
10	16QAM	1	5	20.91	21.06	21.38
10	16QAM	3	0	20.96	21.23	21.38
10	16QAM	3	3	20.79	21.08	21.20
10	16QAM	5	0	21.02	21.17	21.38

LTE Band 4						
BW [MHz]	Modulation	RB Size	RB Offset	Average Power Low Ch. / Freq.	Average Power Middle Ch. / Freq.	Average Power High Ch. / Freq.
Channel				19975	20175	20375
Frequency (MHz)				1712.5	1732.5	1752.5
5	QPSK	1	0	21.24	21.38	21.50
5	QPSK	1	5	21.02	21.17	21.36
5	QPSK	3	0	21.15	21.42	21.48
5	QPSK	3	3	20.92	21.26	21.26
5	QPSK	6	0	20.96	21.23	21.31
5	16QAM	1	0	21.20	21.30	21.54
5	16QAM	1	5	20.91	21.06	21.38
5	16QAM	3	0	20.96	21.23	21.38
5	16QAM	3	3	20.79	21.08	21.20
5	16QAM	5	0	21.02	21.17	21.38

LTE Band 4						
BW [MHz]	Modulation	RB Size	RB Offset	Average Power Low Ch. / Freq.	Average Power Middle Ch. / Freq.	Average Power High Ch. / Freq.
Channel				19965	20175	20385
Frequency (MHz)				1711.5	1732.5	1753.5
3	QPSK	1	0	21.24	21.38	21.50
3	QPSK	1	5	21.02	21.17	21.36
3	QPSK	3	0	21.15	21.42	21.48
3	QPSK	3	3	20.92	21.26	21.26
3	QPSK	6	0	20.96	21.23	21.31
3	16QAM	1	0	21.20	21.30	21.54
3	16QAM	1	5	20.91	21.06	21.38
3	16QAM	3	0	20.96	21.23	21.38
3	16QAM	3	3	20.79	21.08	21.20
3	16QAM	5	0	21.02	21.17	21.38

LTE Band 4						
BW [MHz]	Modulation	RB Size	RB Offset	Average Power Low Ch. / Freq.	Average Power Middle Ch. / Freq.	Average Power High Ch. / Freq.
Channel				19957	20175	20393
Frequency (MHz)				1710.7	1732.5	1754.3
1.4	QPSK	1	0	20.05	20.10	20.08
1.4	QPSK	1	5	19.93	20.23	20.08
1.4	QPSK	3	0	19.50	20.26	20.18
1.4	QPSK	3	3	19.70	20.03	20.08
1.4	QPSK	6	0	19.71	19.82	20.07
1.4	16QAM	1	0	19.69	20.22	20.06
1.4	16QAM	1	5	19.71	19.98	19.87
1.4	16QAM	3	0	19.50	19.83	19.99
1.4	16QAM	3	3	19.50	19.83	20.01
1.4	16QAM	5	0	19.71	19.82	20.25

LTE Band 12						
BW [MHz]	Modulation	RB Size	RB Offset	Average Power Low Ch. / Freq.	Average Power Middle Ch. / Freq.	Average Power High Ch. / Freq.
Channel				23060	23095	23130
Frequency (MHz)				704	707.5	711
10	QPSK	1	0	20.70	20.43	20.52
10	QPSK	1	5	20.34	20.35	20.34
10	QPSK	3	0	20.58	20.61	20.63
10	QPSK	3	3	20.38	20.55	20.46
10	QPSK	6	0	19.44	19.48	19.45
10	16QAM	1	0	20.80	20.65	20.84
10	16QAM	1	5	20.44	20.59	20.45
10	16QAM	3	0	20.63	20.61	20.50
10	16QAM	3	3	20.30	20.44	20.40
10	16QAM	5	0	20.61	20.63	20.74

LTE Band 12						
BW [MHz]	Modulation	RB Size	RB Offset	Average Power Low Ch. / Freq.	Average Power Middle Ch. / Freq.	Average Power High Ch. / Freq.
Channel				23035	23095	23155
Frequency (MHz)				701.5	707.5	713.5
5	QPSK	1	0	20.47	20.58	20.56
5	QPSK	1	5	20.29	20.38	20.35
5	QPSK	3	0	20.57	20.59	20.65
5	QPSK	3	3	20.42	20.52	20.46
5	QPSK	6	0	19.48	19.52	19.47
5	16QAM	1	0	20.64	20.69	20.77
5	16QAM	1	5	20.46	20.62	20.59
5	16QAM	3	0	20.50	20.75	20.43
5	16QAM	3	3	20.27	20.44	20.20
5	16QAM	5	0	19.66	19.56	19.46

LTE Band 12						
BW [MHz]	Modulation	RB Size	RB Offset	Average Power Low Ch. / Freq.	Average Power Middle Ch. / Freq.	Average Power High Ch. / Freq.
Channel				23025	23095	23165
Frequency (MHz)				700.5	707.5	714.5
3	QPSK	1	0	20.29	20.67	20.22
3	QPSK	1	5	20.01	20.36	19.87
3	QPSK	3	0	19.45	19.60	19.36
3	QPSK	3	3	19.33	19.47	19.26
3	QPSK	6	0	18.31	18.42	18.23
3	16QAM	1	0	19.59	19.45	19.40
3	16QAM	1	5	19.39	19.37	19.22
3	16QAM	3	0	18.78	18.57	18.55
3	16QAM	3	3	18.54	18.30	18.17
3	16QAM	5	0	18.52	18.37	18.20

LTE Band 12						
BW [MHz]	Modulation	RB Size	RB Offset	Average Power Low Ch. / Freq.	Average Power Middle Ch. / Freq.	Average Power High Ch. / Freq.
Channel				23017	23095	23173
Frequency (MHz)				699.7	707.5	715.3
1.4	QPSK	1	0	20.21	20.63	20.28
1.4	QPSK	1	5	19.13	20.55	19.99
1.4	QPSK	3	0	19.15	19.67	19.35
1.4	QPSK	3	3	19.03	19.43	19.23
1.4	QPSK	6	0	19.20	18.39	18.12
1.4	16QAM	1	0	19.12	19.38	19.19
1.4	16QAM	1	5	19.12	19.12	18.99
1.4	16QAM	3	0	19.12	18.60	18.23
1.4	16QAM	3	3	19.32	18.49	17.86
1.4	16QAM	5	0	19.12	18.48	18.21

LTE Band 13						
BW [MHz]	Modulation	RB Size	RB Offset	Average Power Low Ch. / Freq.	Average Power Middle Ch. / Freq.	Average Power High Ch. / Freq.
Channel				/	23230	/
Frequency (MHz)				/	782	/
10	QPSK	1	0	/	19.51	/
10	QPSK	1	5	/	19.58	/
10	QPSK	3	0	/	19.73	/
10	QPSK	3	3	/	19.55	/
10	QPSK	6	0	/	18.50	/
10	16QAM	1	0	/	19.59	/
10	16QAM	1	5	/	19.57	/
10	16QAM	3	0	/	19.80	/
10	16QAM	3	3	/	19.55	/
10	16QAM	5	0	/	19.67	/

LTE Band 13						
BW [MHz]	Modulation	RB Size	RB Offset	Average Power Low Ch. / Freq.	Average Power Middle Ch. / Freq.	Average Power High Ch. / Freq.
Channel				23205	23230	23255
Frequency (MHz)				779.5	782	784.5
5	QPSK	1	0	19.68	19.77	20.00
5	QPSK	1	5	19.56	19.73	19.96
5	QPSK	3	0	19.73	19.86	20.05
5	QPSK	3	3	19.55	19.67	19.88
5	QPSK	6	0	18.50	18.63	18.94
5	16QAM	1	0	19.71	19.69	20.13
5	16QAM	1	5	19.68	19.73	19.94
5	16QAM	3	0	19.76	19.88	20.06
5	16QAM	3	3	19.47	19.77	19.88
5	16QAM	5	0	18.57	18.81	19.07

Effective Radiated Power and Effective Isotropic Radiated Power

LTE Band 2				Measured E.I.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				18700		18900		19100	
Frequency (MHz)				1860		1880		1900	
				dBm	W	dBm	W	dBm	W
20	QPSK	1	0	23.92	0.247	23.87	0.244	24.12	0.258
20	QPSK	1	5	23.68	0.233	23.64	0.231	23.79	0.239
20	QPSK	3	0	24.03	0.253	24.00	0.251	23.90	0.245
20	QPSK	3	3	23.90	0.245	23.87	0.244	23.87	0.244
20	QPSK	6	0	23.87	0.244	23.90	0.245	23.81	0.240
20	16QAM	1	0	23.99	0.251	24.03	0.253	24.20	0.263
20	16QAM	1	5	23.87	0.244	23.77	0.238	24.00	0.251
20	16QAM	3	0	23.97	0.249	23.95	0.248	23.90	0.245
20	16QAM	3	3	23.69	0.234	23.80	0.240	23.65	0.232
20	16QAM	5	0	23.76	0.238	23.86	0.243	23.96	0.249

LTE Band 2				Measured E.I.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				18675		18900		19125	
Frequency (MHz)				1857.5		1880		1902.5	
				dBm	W	dBm	W	dBm	W
15	QPSK	1	0	24.01	0.252	24.06	0.255	24.03	0.253
15	QPSK	1	5	23.46	0.222	23.74	0.237	23.88	0.244
15	QPSK	3	0	23.96	0.249	24.06	0.255	24.11	0.258
15	QPSK	3	3	23.79	0.239	23.92	0.247	23.88	0.244
15	QPSK	6	0	23.83	0.242	23.90	0.245	23.84	0.242
15	16QAM	1	0	23.86	0.243	24.19	0.262	24.02	0.252
15	16QAM	1	5	23.81	0.240	24.07	0.255	23.65	0.232
15	16QAM	3	0	23.90	0.245	24.03	0.253	23.85	0.243
15	16QAM	3	3	23.77	0.238	23.72	0.236	23.77	0.238
15	16QAM	5	0	23.81	0.240	24.05	0.254	23.94	0.248

LTE Band 2				Measured E.I.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				18650		18900		19150	
Frequency (MHz)				1855		1880		1905	
				dBm	W	dBm	W	dBm	W
10	QPSK	1	0	23.85	0.243	23.92	0.247	24.04	0.254
10	QPSK	1	5	23.72	0.236	23.87	0.244	23.98	0.250
10	QPSK	3	0	24.04	0.254	24.24	0.265	24.01	0.252
10	QPSK	3	3	23.92	0.247	23.99	0.251	23.97	0.249
10	QPSK	6	0	22.93	0.196	23.02	0.200	22.86	0.193
10	16QAM	1	0	23.90	0.245	24.09	0.256	23.89	0.245
10	16QAM	1	5	23.68	0.233	23.87	0.244	23.86	0.243
10	16QAM	3	0	23.86	0.243	24.04	0.254	23.70	0.234
10	16QAM	3	3	23.72	0.236	23.91	0.246	23.66	0.232
10	16QAM	5	0	23.90	0.245	23.99	0.251	23.97	0.249

LTE Band 2				Measured E.I.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				18625		18900		19175	
Frequency (MHz)				1852.5		1880		1907.5	
				dBm	W	dBm	W	dBm	W
5	QPSK	1	0	23.80	0.240	23.84	0.242	23.97	0.249
5	QPSK	1	5	23.64	0.231	23.73	0.236	24.01	0.252
5	QPSK	3	0	24.09	0.256	24.12	0.258	24.24	0.265
5	QPSK	3	3	23.94	0.248	23.98	0.250	24.00	0.251
5	QPSK	6	0	22.94	0.197	22.97	0.198	22.87	0.194
5	16QAM	1	0	24.02	0.252	24.05	0.254	24.07	0.255
5	16QAM	1	5	23.92	0.247	23.93	0.247	23.97	0.249
5	16QAM	3	0	24.01	0.252	24.05	0.254	23.85	0.243
5	16QAM	3	3	23.74	0.237	23.88	0.244	23.58	0.228
5	16QAM	5	0	22.87	0.194	22.96	0.198	22.96	0.198

LTE Band 2				Measured E.I.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				18615		18900		19185	
Frequency (MHz)				1851.5		1880		1908.5	
				dBm	W	dBm	W	dBm	W
3	QPSK	1	0	23.77	0.238	23.85	0.243	23.86	0.243
3	QPSK	1	5	23.64	0.231	23.73	0.236	23.74	0.237
3	QPSK	3	0	22.91	0.195	23.00	0.200	22.90	0.195
3	QPSK	3	3	22.70	0.186	22.79	0.190	22.74	0.188
3	QPSK	6	0	21.78	0.151	21.88	0.154	21.73	0.149
3	16QAM	1	0	22.75	0.188	22.80	0.191	22.91	0.195
3	16QAM	1	5	22.64	0.184	22.64	0.184	22.77	0.189
3	16QAM	3	0	21.68	0.147	21.86	0.153	21.85	0.153
3	16QAM	3	3	21.46	0.140	21.64	0.146	21.59	0.144
3	16QAM	5	0	21.59	0.144	21.78	0.151	21.53	0.142

LTE Band 2				Measured E.I.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				18607		18900		19193	
Frequency (MHz)				1850.7		1880		1909.3	
				dBm	W	dBm	W	dBm	W
1.4	QPSK	1	0	22.33	0.171	21.64	0.146	23.88	0.244
1.4	QPSK	1	5	22.84	0.192	23.67	0.233	23.78	0.239
1.4	QPSK	3	0	22.74	0.188	22.84	0.192	22.92	0.196
1.4	QPSK	3	3	22.54	0.179	22.73	0.187	22.75	0.188
1.4	QPSK	6	0	22.74	0.188	21.83	0.152	21.74	0.149
1.4	16QAM	1	0	22.53	0.179	22.80	0.191	22.74	0.188
1.4	16QAM	1	5	22.73	0.187	22.66	0.185	22.58	0.181
1.4	16QAM	3	0	22.80	0.191	21.91	0.155	21.75	0.150
1.4	16QAM	3	3	22.62	0.183	21.66	0.147	21.61	0.145
1.4	16QAM	5	0	22.71	0.187	21.47	0.140	21.64	0.146

LTE Band 4				Measured E.I.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				20050		20175		20300	
Frequency (MHz)				1720		1732.5		1745	
				dBm	W	dBm	W	dBm	W
20	QPSK	1	0	24.24	0.265	24.38	0.274	24.50	0.282
20	QPSK	1	5	24.02	0.252	24.17	0.261	24.36	0.273
20	QPSK	3	0	24.15	0.260	24.42	0.277	24.48	0.281
20	QPSK	3	3	23.92	0.247	24.26	0.267	24.26	0.267
20	QPSK	6	0	23.96	0.249	24.23	0.265	24.31	0.270
20	16QAM	1	0	24.20	0.263	24.30	0.269	24.54	0.284
20	16QAM	1	5	23.91	0.246	24.06	0.255	24.38	0.274
20	16QAM	3	0	23.96	0.249	24.23	0.265	24.38	0.274
20	16QAM	3	3	23.79	0.239	24.08	0.256	24.20	0.263
20	16QAM	5	0	24.02	0.252	24.17	0.261	24.38	0.274

LTE Band 4				Measured E.I.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				20025		20175		20325	
Frequency (MHz)				1717.5		1732.5		1747.5	
				dBm	W	dBm	W	dBm	W
15	QPSK	1	0	24.25	0.266	24.45	0.279	24.49	0.281
15	QPSK	1	5	24.02	0.252	24.22	0.264	24.34	0.272
15	QPSK	3	0	24.14	0.259	24.48	0.281	24.49	0.281
15	QPSK	3	3	24.02	0.252	24.25	0.266	24.32	0.270
15	QPSK	6	0	23.97	0.249	24.19	0.262	24.30	0.269
15	16QAM	1	0	24.20	0.263	24.19	0.262	24.44	0.278
15	16QAM	1	5	24.07	0.255	24.15	0.260	24.33	0.271
15	16QAM	3	0	24.00	0.251	24.28	0.268	24.29	0.269
15	16QAM	3	3	23.81	0.240	24.08	0.256	24.12	0.258
15	16QAM	5	0	24.02	0.252	24.21	0.264	24.33	0.271

LTE Band 4				Measured E.I.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				20000		20175		20350	
Frequency (MHz)				1715		1732.5		1750	
				dBm	W	dBm	W	dBm	W
10	QPSK	1	0	24.07	0.255	24.46	0.279	24.45	0.279
10	QPSK	1	5	23.93	0.247	24.27	0.267	24.31	0.270
10	QPSK	3	0	24.14	0.259	24.50	0.282	24.44	0.278
10	QPSK	3	3	24.01	0.252	24.30	0.269	24.21	0.264
10	QPSK	6	0	23.08	0.203	23.31	0.214	23.28	0.213
10	16QAM	1	0	24.21	0.264	24.33	0.271	24.26	0.267
10	16QAM	1	5	24.06	0.255	24.09	0.256	24.16	0.261
10	16QAM	3	0	24.09	0.256	24.30	0.269	24.30	0.269
10	16QAM	3	3	23.73	0.236	24.18	0.262	24.09	0.256
10	16QAM	5	0	24.03	0.253	24.34	0.272	24.30	0.269

LTE Band 4				Measured E.I.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				19975		20175		20375	
Frequency (MHz)				1712.5		1732.5		1752.5	
				dBm	W	dBm	W	dBm	W
5	QPSK	1	0	24.19	0.262	24.40	0.275	24.53	0.284
5	QPSK	1	5	23.97	0.249	24.07	0.255	24.39	0.275
5	QPSK	3	0	24.20	0.263	24.43	0.277	24.43	0.277
5	QPSK	3	3	23.97	0.249	24.30	0.269	24.20	0.263
5	QPSK	6	0	23.06	0.202	23.39	0.218	23.28	0.213
5	16QAM	1	0	24.15	0.260	24.33	0.271	24.48	0.281
5	16QAM	1	5	24.06	0.255	24.22	0.264	24.24	0.265
5	16QAM	3	0	24.08	0.256	24.32	0.270	24.27	0.267
5	16QAM	3	3	23.83	0.242	24.14	0.259	24.05	0.254
5	16QAM	5	0	23.19	0.208	23.33	0.215	23.34	0.216

LTE Band 4				Measured E.I.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				19965		20175		20385	
Frequency (MHz)				1711.5		1732.5		1753.5	
				dBm	W	dBm	W	dBm	W
3	QPSK	1	0	21.77	0.150	24.41	0.276	24.29	0.269
3	QPSK	1	5	23.76	0.238	24.21	0.264	24.16	0.261
3	QPSK	3	0	22.89	0.195	23.29	0.213	23.33	0.215
3	QPSK	3	3	22.78	0.190	23.10	0.204	23.15	0.207
3	QPSK	6	0	21.85	0.153	22.20	0.166	22.29	0.169
3	16QAM	1	0	22.76	0.189	23.13	0.206	23.34	0.216
3	16QAM	1	5	22.63	0.183	23.03	0.201	23.19	0.208
3	16QAM	3	0	21.53	0.142	22.31	0.170	22.43	0.175
3	16QAM	3	3	21.54	0.143	21.92	0.156	22.29	0.169
3	16QAM	5	0	21.77	0.150	22.16	0.164	22.17	0.165

LTE Band 4				Measured E.I.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				19957		20175		20393	
Frequency (MHz)				1710.7		1732.5		1754.3	
				dBm	W	dBm	W	dBm	W
1.4	QPSK	1	0	23.05	0.202	23.10	0.204	23.08	0.203
1.4	QPSK	1	5	22.93	0.196	23.23	0.210	23.08	0.203
1.4	QPSK	3	0	22.50	0.178	23.26	0.212	23.18	0.208
1.4	QPSK	3	3	22.70	0.186	23.03	0.201	23.08	0.203
1.4	QPSK	6	0	22.71	0.187	22.82	0.191	23.07	0.203
1.4	16QAM	1	0	22.69	0.186	23.22	0.210	23.06	0.202
1.4	16QAM	1	5	22.71	0.187	22.98	0.199	22.87	0.194
1.4	16QAM	3	0	22.50	0.178	22.83	0.192	22.99	0.199
1.4	16QAM	3	3	22.50	0.178	22.83	0.192	23.01	0.200
1.4	16QAM	5	0	22.71	0.187	22.82	0.191	23.25	0.211

LTE Band 12				Measured E.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				23060		23095		23130	
Frequency (MHz)				704		707.5		711	
				dBm	W	dBm	W	dBm	W
10	QPSK	1	0	20.20	0.105	19.93	0.098	20.02	0.100
10	QPSK	1	5	19.84	0.096	19.85	0.097	19.84	0.096
10	QPSK	3	0	20.08	0.102	20.11	0.103	20.13	0.103
10	QPSK	3	3	19.88	0.097	20.05	0.101	19.96	0.099
10	QPSK	6	0	18.94	0.078	18.98	0.079	18.95	0.079
10	16QAM	1	0	20.30	0.107	20.15	0.104	20.34	0.108
10	16QAM	1	5	19.94	0.099	20.09	0.102	19.95	0.099
10	16QAM	3	0	20.13	0.103	20.11	0.103	20.00	0.100
10	16QAM	3	3	19.80	0.095	19.94	0.099	19.90	0.098
10	16QAM	5	0	20.11	0.103	20.13	0.103	20.24	0.106

LTE Band 12				Measured E.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				23035		23095		23155	
Frequency (MHz)				701.5		707.5		713.5	
				dBm	W	dBm	W	dBm	W
5	QPSK	1	0	19.97	0.099	20.08	0.102	20.06	0.101
5	QPSK	1	5	19.79	0.095	19.88	0.097	19.85	0.097
5	QPSK	3	0	20.07	0.102	20.09	0.102	20.15	0.104
5	QPSK	3	3	19.92	0.098	20.02	0.100	19.96	0.099
5	QPSK	6	0	18.98	0.079	19.02	0.080	18.97	0.079
5	16QAM	1	0	20.14	0.103	20.19	0.104	20.27	0.106
5	16QAM	1	5	19.96	0.099	20.12	0.103	20.09	0.102
5	16QAM	3	0	20.00	0.100	20.25	0.106	19.93	0.098
5	16QAM	3	3	19.77	0.095	19.94	0.099	19.70	0.093
5	16QAM	5	0	19.16	0.082	19.06	0.081	18.96	0.079

LTE Band 12				Measured E.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				23025		23095		23165	
Frequency (MHz)				700.5		707.5		714.5	
				dBm	W	dBm	W	dBm	W
3	QPSK	1	0	19.79	0.095	20.17	0.104	19.72	0.094
3	QPSK	1	5	19.51	0.089	19.86	0.097	19.37	0.086
3	QPSK	3	0	18.95	0.079	19.10	0.081	18.86	0.077
3	QPSK	3	3	18.83	0.076	18.97	0.079	18.76	0.075
3	QPSK	6	0	17.81	0.060	17.92	0.062	17.73	0.059
3	16QAM	1	0	19.09	0.081	18.95	0.079	18.90	0.078
3	16QAM	1	5	18.89	0.077	18.87	0.077	18.72	0.074
3	16QAM	3	0	18.28	0.067	18.07	0.064	18.05	0.064
3	16QAM	3	3	18.04	0.064	17.80	0.060	17.67	0.058
3	16QAM	5	0	18.02	0.063	17.87	0.061	17.70	0.059

LTE Band 12				Measured E.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				23017		23095		23173	
Frequency (MHz)				699.7		707.5		715.3	
				dBm	W	dBm	W	dBm	W
1.4	QPSK	1	0	19.71	0.094	20.13	0.103	19.78	0.095
1.4	QPSK	1	5	18.63	0.073	20.05	0.101	19.49	0.089
1.4	QPSK	3	0	18.65	0.073	19.17	0.083	18.85	0.077
1.4	QPSK	3	3	18.53	0.071	18.93	0.078	18.73	0.075
1.4	QPSK	6	0	18.70	0.074	17.89	0.062	17.62	0.058
1.4	16QAM	1	0	18.62	0.073	18.88	0.077	18.69	0.074
1.4	16QAM	1	5	18.62	0.073	18.62	0.073	18.49	0.071
1.4	16QAM	3	0	18.62	0.073	18.10	0.065	17.73	0.059
1.4	16QAM	3	3	18.82	0.076	17.99	0.063	17.36	0.054
1.4	16QAM	5	0	18.62	0.073	17.98	0.063	17.71	0.059

LTE Band 13				Measured E.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				/		23230		/	
Frequency (MHz)				/		782		/	
				dBm	W	dBm	W	dBm	W
10	QPSK	1	0	/	/	19.01	0.080	/	/
10	QPSK	1	5	/	/	19.08	0.081	/	/
10	QPSK	3	0	/	/	19.23	0.084	/	/
10	QPSK	3	3	/	/	19.05	0.080	/	/
10	QPSK	6	0	/	/	18.00	0.063	/	/
10	16QAM	1	0	/	/	19.09	0.081	/	/
10	16QAM	1	5	/	/	19.07	0.081	/	/
10	16QAM	3	0	/	/	19.30	0.085	/	/
10	16QAM	3	3	/	/	19.05	0.080	/	/
10	16QAM	5	0	/	/	19.17	0.083	/	/

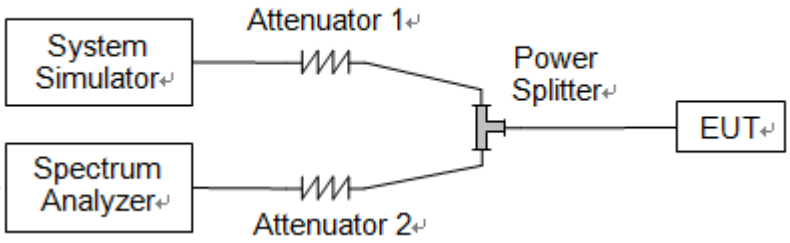
LTE Band 13				Measured E.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				23205		23230		23255	
Frequency (MHz)				779.5		782		784.5	
				dBm	W	dBm	W	dBm	W
5	QPSK	1	0	19.18	0.083	19.27	0.085	19.50	0.089
5	QPSK	1	5	19.06	0.081	19.23	0.084	19.46	0.088
5	QPSK	3	0	19.23	0.084	19.36	0.086	19.55	0.090
5	QPSK	3	3	19.05	0.080	19.17	0.083	19.38	0.087
5	QPSK	6	0	18.00	0.063	18.13	0.065	18.44	0.070
5	16QAM	1	0	19.21	0.083	19.19	0.083	19.63	0.092
5	16QAM	1	5	19.18	0.083	19.23	0.084	19.44	0.088
5	16QAM	3	0	19.26	0.084	19.38	0.087	19.56	0.090
5	16QAM	3	3	18.97	0.079	19.27	0.085	19.38	0.087
5	16QAM	5	0	18.07	0.064	18.31	0.068	18.57	0.072

2.2. Occupied Bandwidth

2.2.1. Requirement

According to FCC section 2.1049, the occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission. Occupied bandwidth is also known as the 99% emission bandwidth.

2.2.2. Test Description



The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power. A call is established between the EUT and the SS.

2.2.3. Test Procedure

KDB 971168 D01v03 Section 4.1 and ANSI/TIA-603-E-2016.

2.2.4. Test Result

LTE Band 2				
BW(MHz)	Channel Level	Modulation	99% BW(MHz)	26dB BW(MHz)
1.4	Low	QPSK	1.11	1.37
	Low	16QAM	0.94	1.16
	Mid	QPSK	1.11	1.36
	Mid	16QAM	0.95	1.19
	High	QPSK	1.10	1.34
	High	16QAM	0.95	1.30
3	Low	QPSK	1.11	1.31
	Low	16QAM	0.96	1.16
	Mid	QPSK	1.10	1.35
	Mid	16QAM	0.96	1.31
	High	QPSK	1.11	1.37
	High	16QAM	0.95	1.15
5	Low	QPSK	1.13	1.33
	Low	16QAM	0.97	1.24
	Mid	QPSK	1.13	1.34
	Mid	16QAM	0.97	1.20
	High	QPSK	1.10	1.33
	High	16QAM	0.96	1.17
10	Low	QPSK	1.13	1.33
	Low	16QAM	0.99	1.26
	Mid	QPSK	1.12	1.42
	Mid	16QAM	0.95	1.20
	High	QPSK	1.12	1.32
	High	16QAM	1.00	1.34
15	Low	QPSK	1.11	1.40
	Low	16QAM	0.97	1.20
	Mid	QPSK	1.12	1.44
	Mid	16QAM	0.95	1.17
	High	QPSK	1.13	1.36
	High	16QAM	0.96	1.25
20	Low	QPSK	1.14	1.45
	Low	16QAM	0.98	1.26
	Mid	QPSK	1.12	1.32
	Mid	16QAM	1.12	1.32
	High	QPSK	1.12	1.32
	High	16QAM	0.96	1.19

LTE Band 4				
BW(MHz)	Channel Level	Modulation	99% BW(MHz)	26dB BW(MHz)
1.4	Low	QPSK	1.10	1.33
	Low	16QAM	0.94	1.16
	Mid	QPSK	1.10	1.36
	Mid	16QAM	0.95	1.17
	High	QPSK	1.10	1.32
	High	16QAM	0.94	1.30
3	Low	QPSK	1.11	1.31
	Low	16QAM	0.96	1.44
	Mid	QPSK	1.11	1.32
	Mid	16QAM	0.94	1.26
	High	QPSK	1.10	1.31
	High	16QAM	0.94	1.16
5	Low	QPSK	1.11	1.33
	Low	16QAM	0.97	1.23
	Mid	QPSK	1.13	1.34
	Mid	16QAM	0.97	1.20
	High	QPSK	1.10	1.36
	High	16QAM	0.95	1.16
10	Low	QPSK	1.12	1.50
	Low	16QAM	0.96	1.19
	Mid	QPSK	1.13	1.39
	Mid	16QAM	0.98	1.43
	High	QPSK	1.12	1.40
	High	16QAM	0.99	1.23
15	Low	QPSK	1.13	1.35
	Low	16QAM	0.96	1.26
	Mid	QPSK	1.13	1.35
	Mid	16QAM	0.97	1.19
	High	QPSK	1.12	1.43
	High	16QAM	0.96	1.23
20	Low	QPSK	1.14	1.44
	Low	16QAM	0.97	1.30
	Mid	QPSK	1.13	1.35
	Mid	16QAM	0.97	1.26
	High	QPSK	1.13	1.47
	High	16QAM	0.96	1.20

LTE Band 12				
BW(MHz)	Channel Level	Modulation	99% BW(MHz)	26dB BW(MHz)
1.4	Low	QPSK	1.11	1.33
	Low	16QAM	0.94	1.16
	Mid	QPSK	1.11	1.36
	Mid	16QAM	0.94	1.15
	High	QPSK	1.11	1.35
	High	16QAM	1.10	1.29
3	Low	QPSK	1.11	1.33
	Low	16QAM	0.95	1.13
	Mid	QPSK	1.11	1.34
	Mid	16QAM	0.95	1.23
	High	QPSK	1.11	1.33
	High	16QAM	0.95	1.18
5	Low	QPSK	1.18	1.34
	Low	16QAM	0.95	1.19
	Mid	QPSK	1.12	1.33
	Mid	16QAM	0.96	1.19
	High	QPSK	1.11	1.31
	High	16QAM	0.95	1.15
10	Low	QPSK	1.11	1.34
	Low	16QAM	0.97	1.23
	Mid	QPSK	1.12	1.42
	Mid	16QAM	0.95	1.20
	High	QPSK	1.12	1.33
	High	16QAM	0.97	1.21

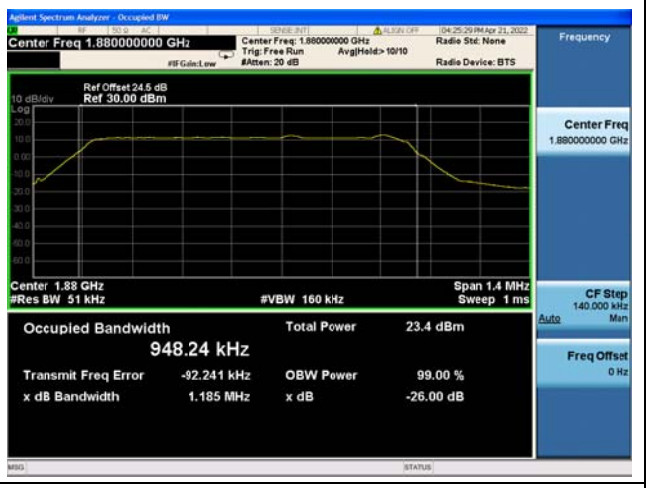
LTE Band 13				
BW(MHz)	Channel Level	Modulation	99% BW(MHz)	26dB BW(MHz)
5	Low	QPSK	1.12	1.33
	Low	16QAM	0.95	1.17
	Mid	QPSK	1.12	1.33
	Mid	16QAM	0.96	1.18
	High	QPSK	1.11	1.40
	High	16QAM	0.94	1.16
10	Low	QPSK	/	/
	Low	16QAM	/	/
	Mid	QPSK	1.12	1.34
	Mid	16QAM	0.94	1.25
	High	QPSK	/	/
	High	16QAM	/	/

Band 2 / 1.4MHz / Low CH / QPSK

Band 2 / 1.4MHz / Low CH / 16QAM

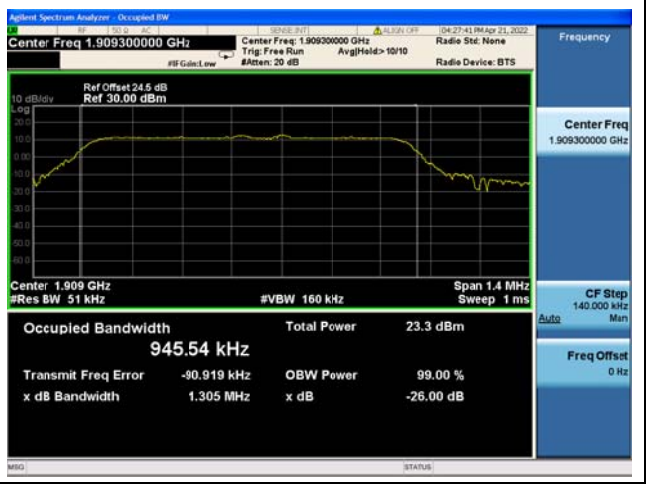
Band 2 / 1.4MHz / Mid CH / QPSK

Band 2 / 1.4MHz / Mid CH / 16QAM



Band 2 / 1.4MHz / High CH / QPSK

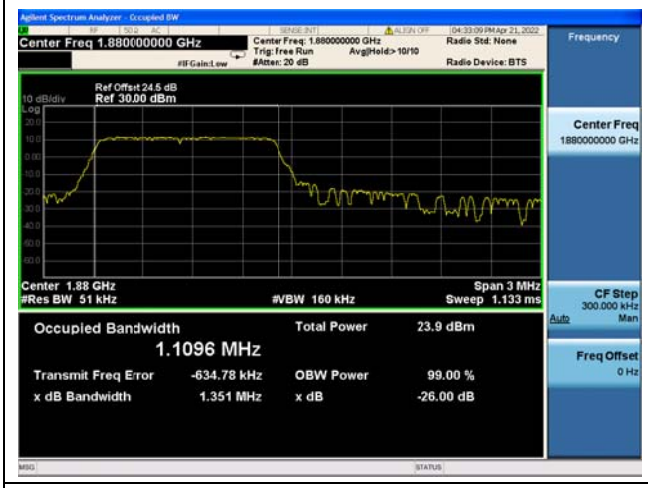
Band 2 / 1.4MHz / High CH / 16QAM



Band 2 / 3MHz / Low CH / QPSK

Band 2 / 3MHz / Low CH / 16QAM

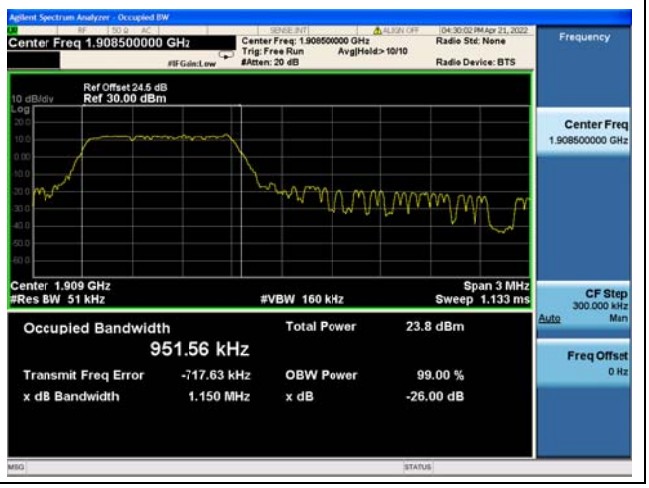
Band 2 / 3MHz / Mid CH / QPSK



Band 2 / 3MHz / Mid CH / 16QAM

Band 2 / 3MHz / High CH / QPSK

Band 2 / 3MHz / High CH / 16QAM



Band 2 / 5MHz / Low CH / QPSK

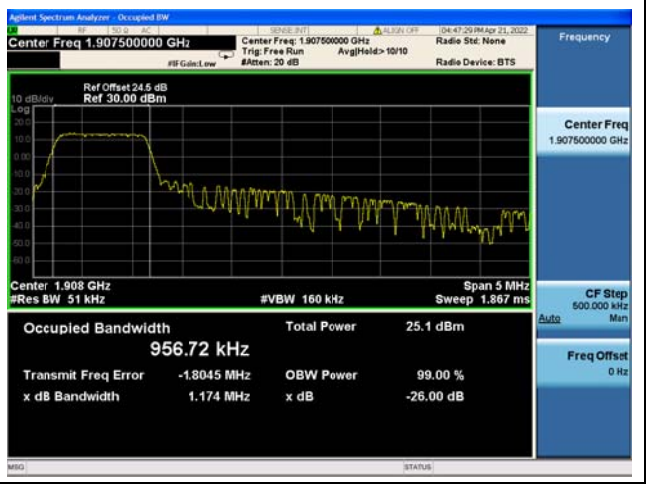
Band 2 / 5MHz / Low CH / 16QAM

Band 2 / 5MHz / Mid CH / QPSK

Band 2 / 5MHz / Mid CH / 16QAM

Band 2 / 5MHz / High CH / QPSK

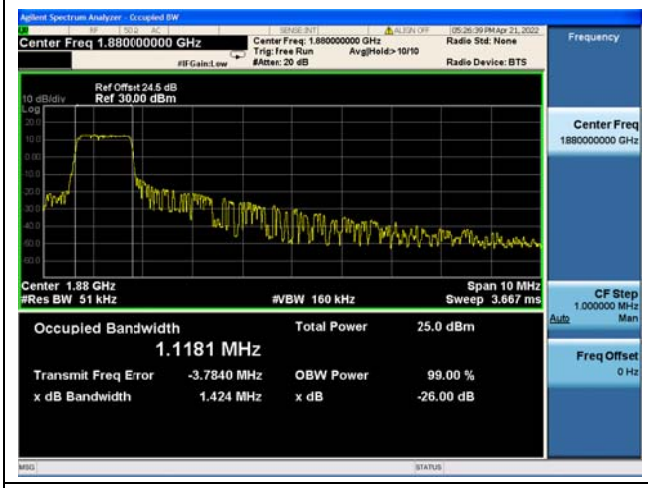
Band 2 / 5MHz / High CH / 16QAM



Band 2 / 10MHz / Low CH / QPSK

Band 2 / 10MHz / Low CH / 16QAM

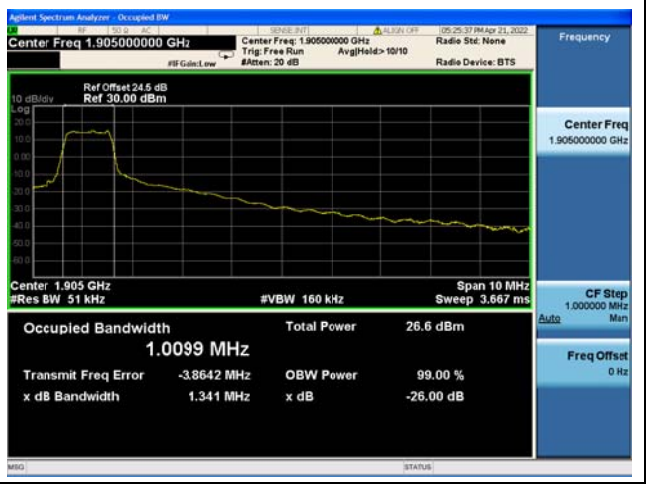
Band 2 / 10MHz / Mid CH / QPSK



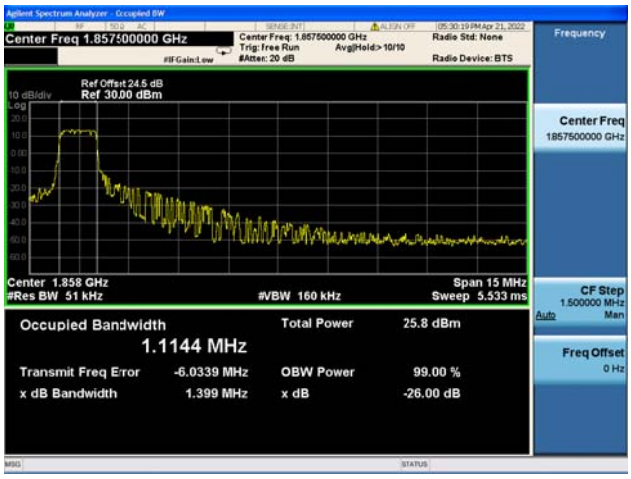
Band 2 / 10MHz / Mid CH / 16QAM

Band 2 / 10MHz / High CH / QPSK

Band 2 / 10MHz / High CH / 16QAM

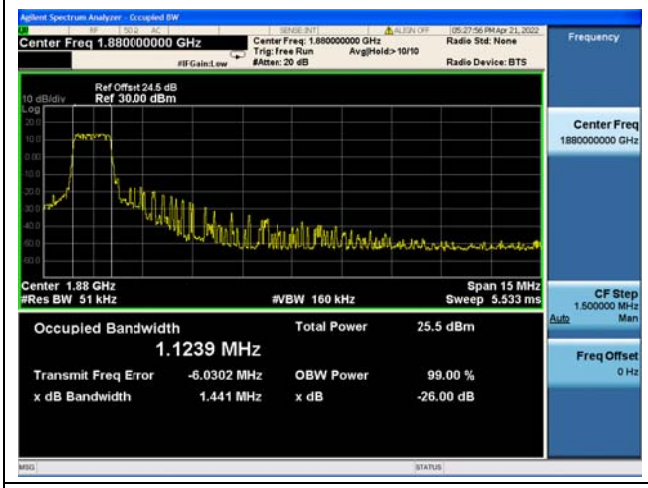


Band 2 / 15MHz / Low CH / QPSK

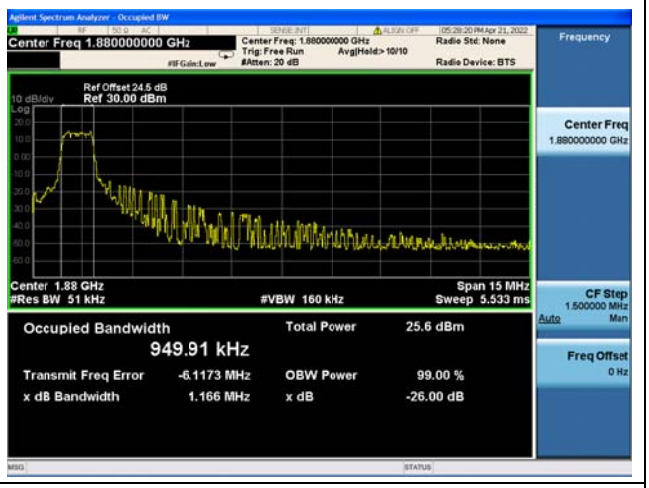


Band 2 / 15MHz / Low CH / 16QAM

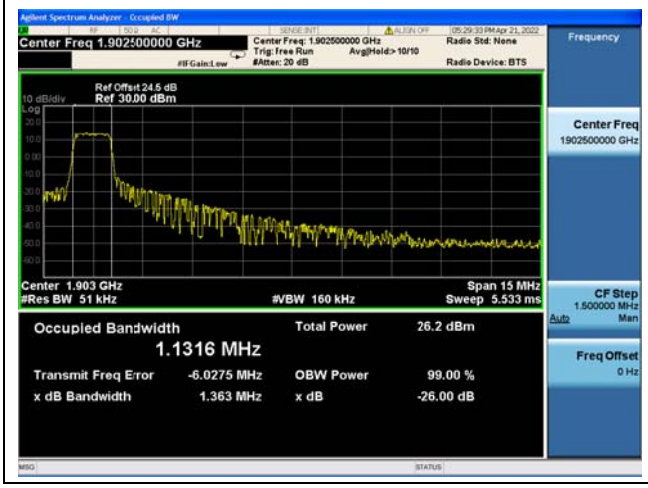
Band 2 / 15MHz / Mid CH / QPSK



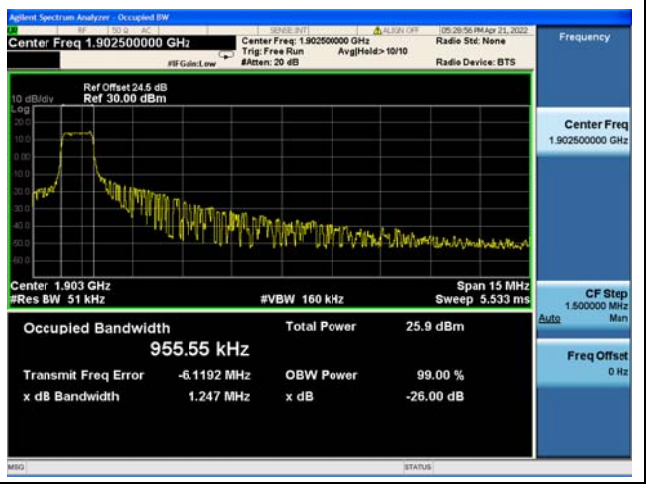
Band 2 / 15MHz / Mid CH / 16QAM



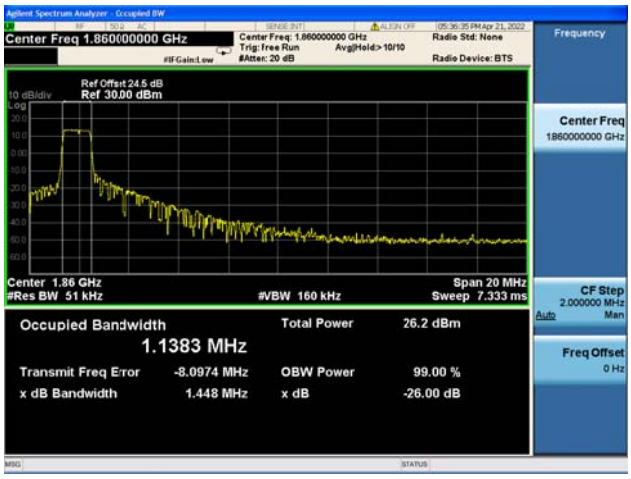
Band 2 / 15MHz / High CH / QPSK



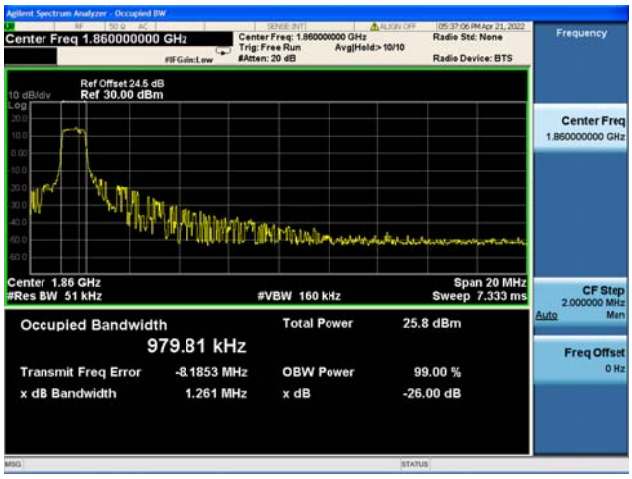
Band 2 / 15MHz / High CH / 16QAM



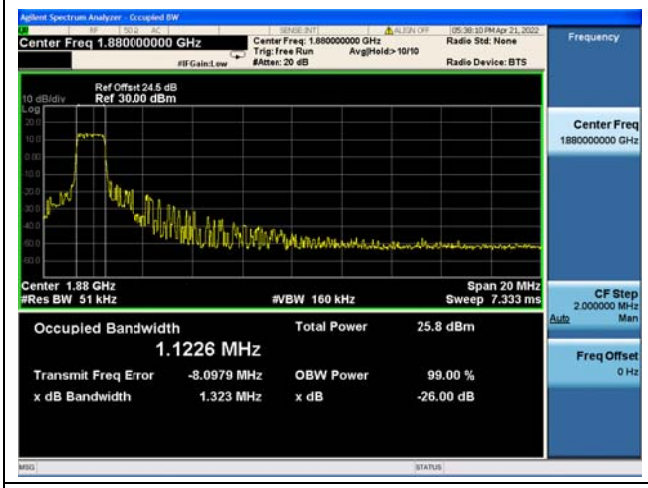
Band 2 / 20MHz / Low CH / QPSK



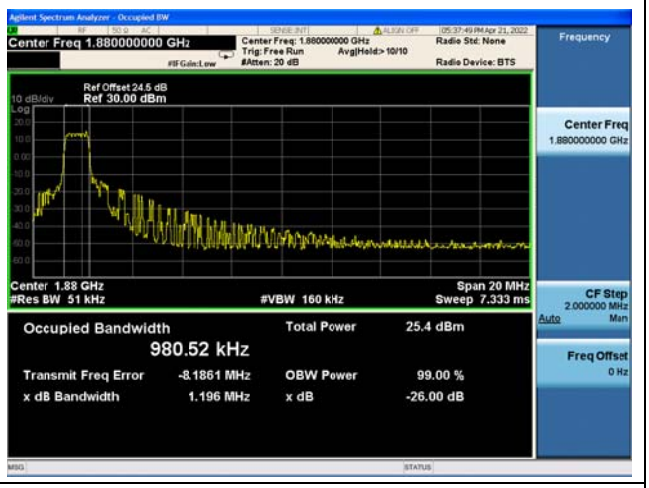
Band 2 / 20MHz / Low CH / 16QAM



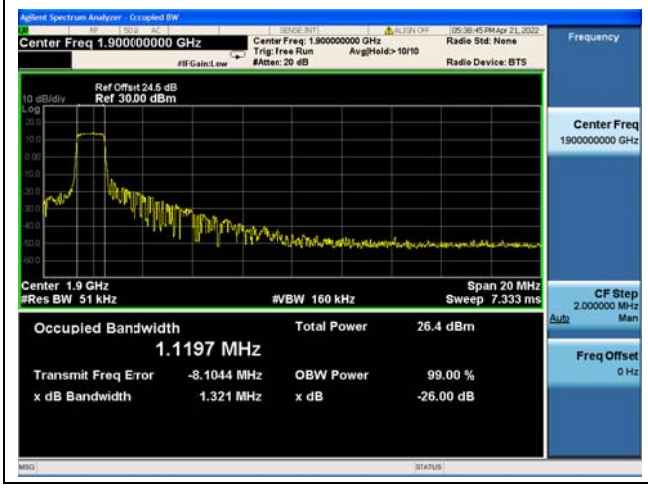
Band 2 / 20MHz / Mid CH / QPSK



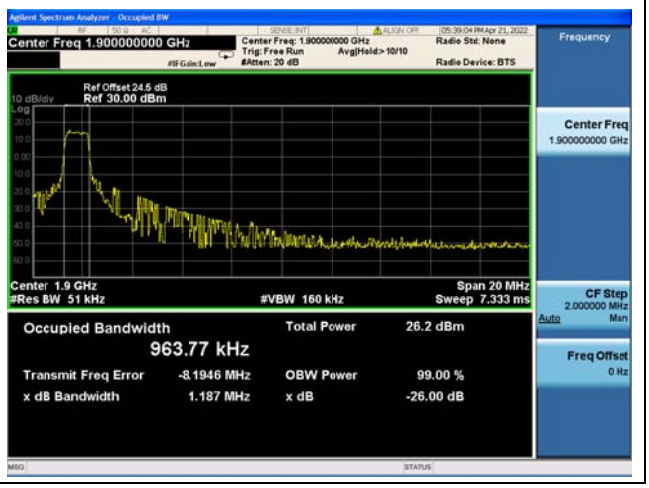
Band 2 / 20MHz / Mid CH / 16QAM



Band 2 / 20MHz / High CH / QPSK



Band 2 / 20MHz / High CH / 16QAM

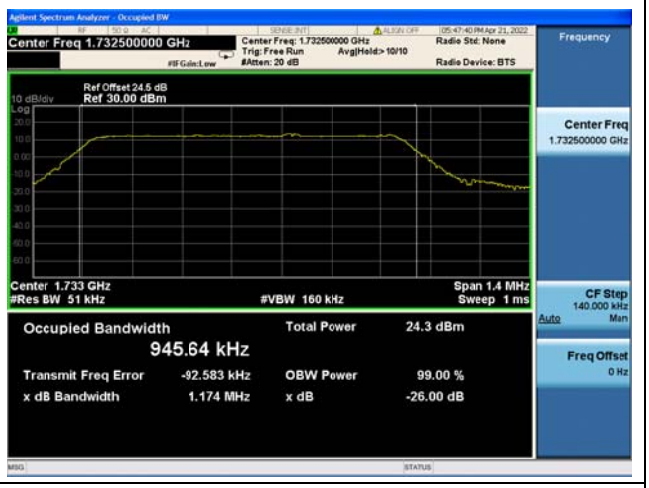


Band 4 / 1.4MHz / Low CH / QPSK

Band 4 / 1.4MHz / Low CH / 16QAM

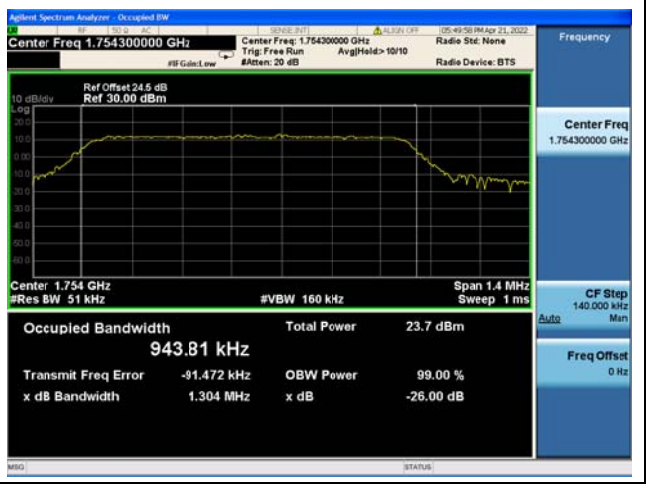
Band 4 / 1.4MHz / Mid CH / QPSK

Band 4 / 1.4MHz / Mid CH / 16QAM

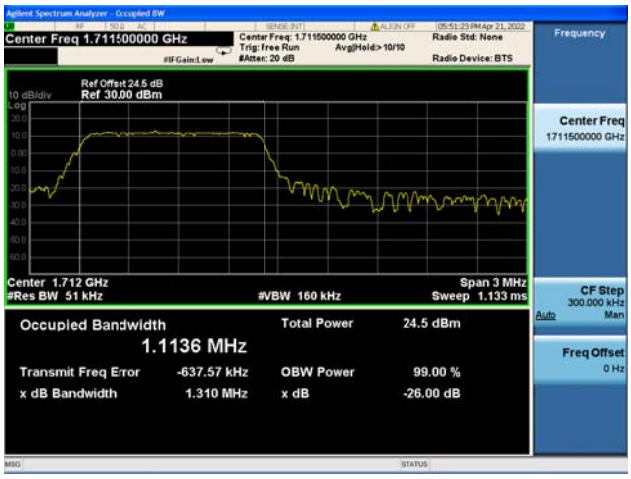


Band 4 / 1.4MHz / High CH / QPSK

Band 4 / 1.4MHz / High CH / 16QAM

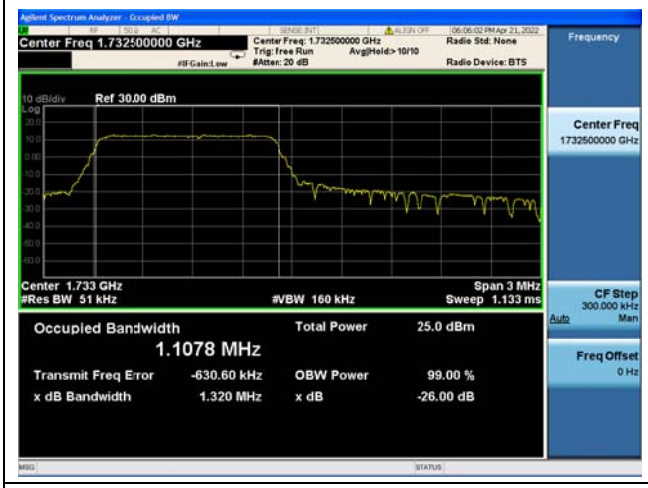


Band 4 / 3MHz / Low CH / QPSK

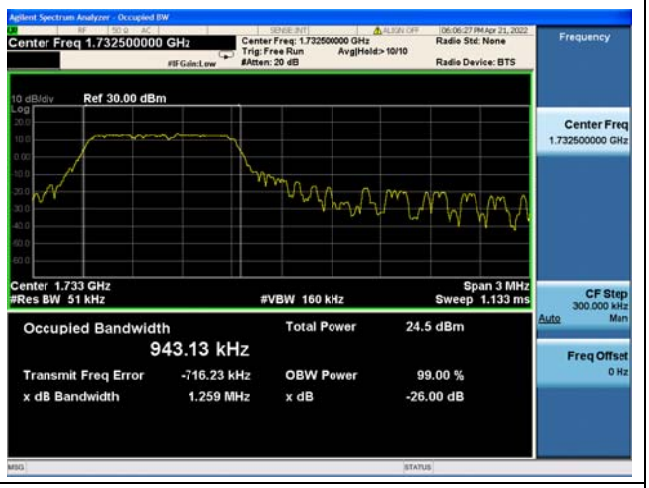


Band 4 / 3MHz / Low CH / 16QAM

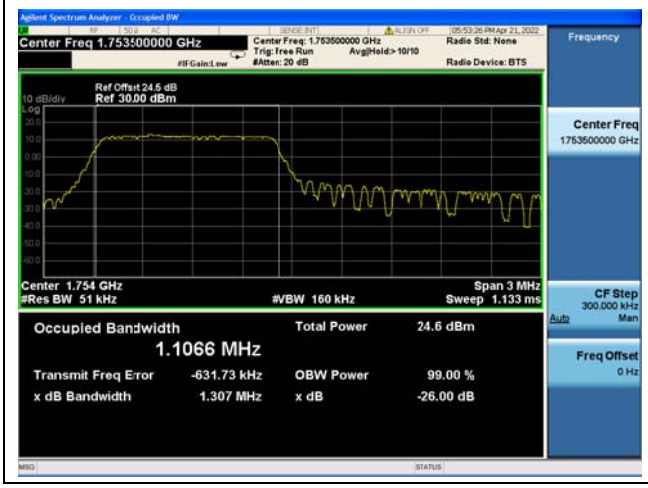
Band 4 / 3MHz / Mid CH / QPSK



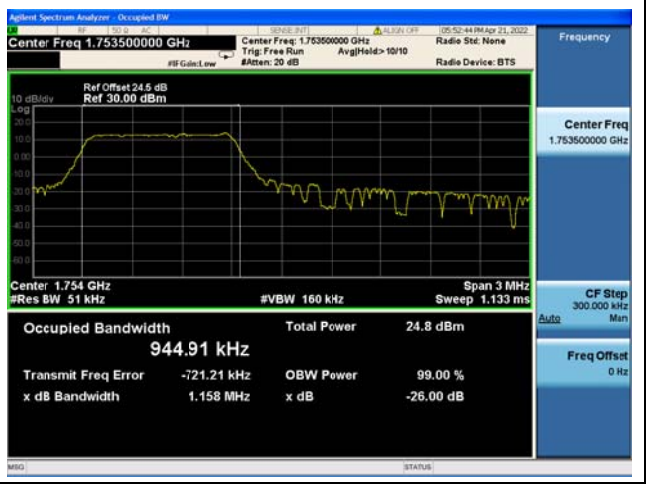
Band 4 / 3MHz / Mid CH / 16QAM



Band 4 / 3MHz / High CH / QPSK



Band 4 / 3MHz / High CH / 16QAM

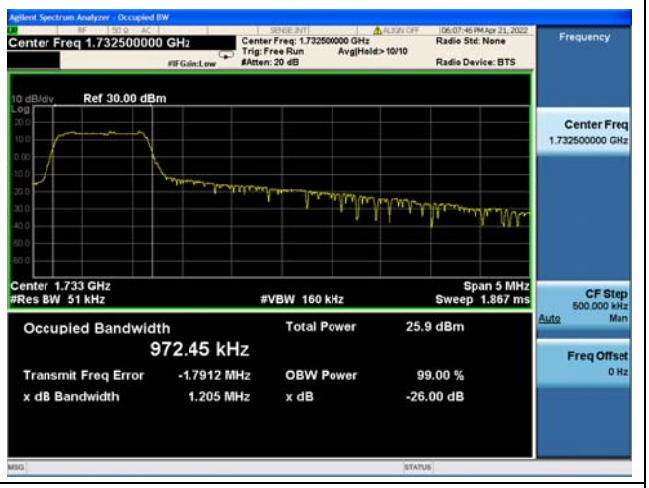


Band 4 / 5MHz / Low CH / QPSK

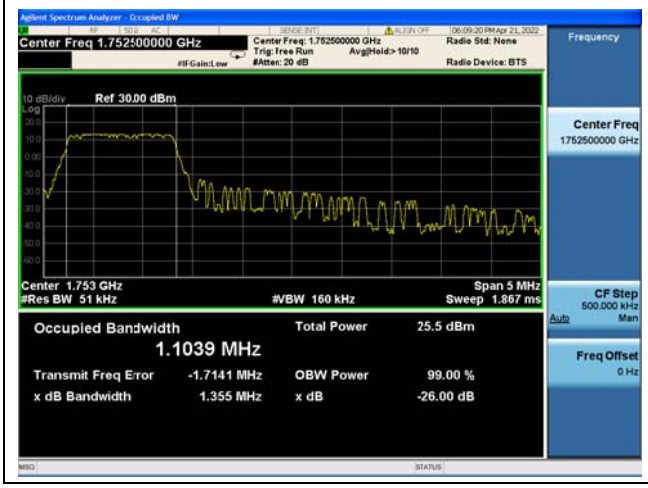
Band 4 / 5MHz / Low CH / 16QAM

Band 4 / 5MHz / Mid CH / QPSK

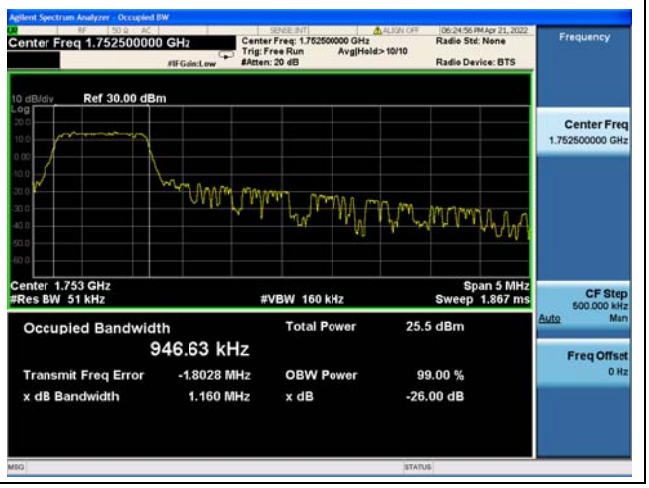
Band 4 / 5MHz / Mid CH / 16QAM



Band 4 / 5MHz / High CH / QPSK



Band 4 / 5MHz / High CH / 16QAM

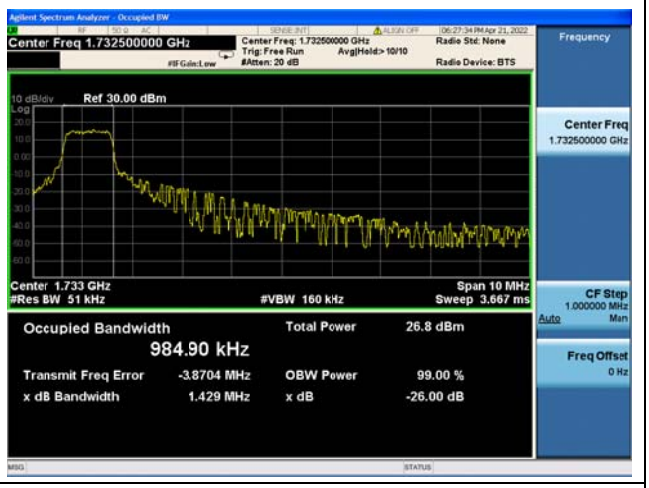


Band 4 / 10MHz / Low CH / QPSK

Band 4 / 10MHz / Low CH / 16QAM

Band 4 / 10MHz / Mid CH / QPSK

Band 4 / 10MHz / Mid CH / 16QAM

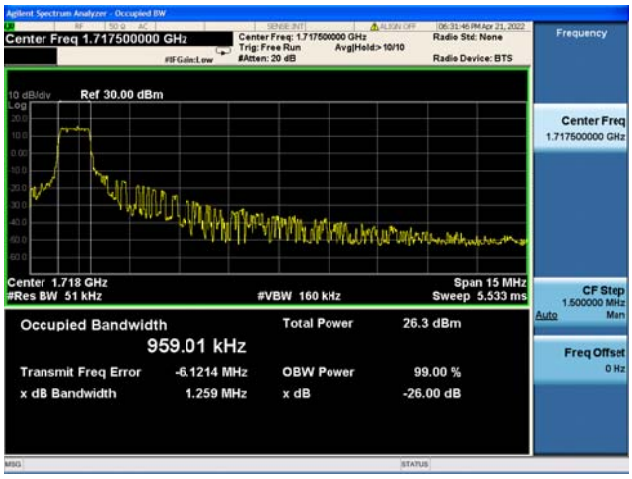


Band 4 / 10MHz / High CH / QPSK

Band 4 / 10MHz / High CH / 16QAM

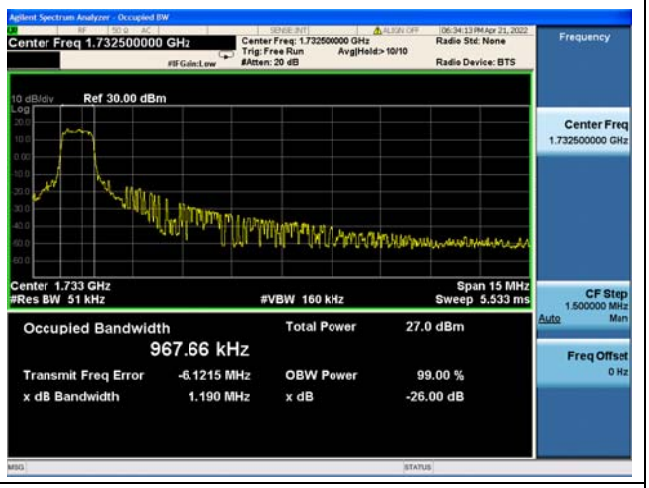
Band 4 / 15MHz / Low CH / QPSK

Band 4 / 15MHz / Low CH / 16QAM

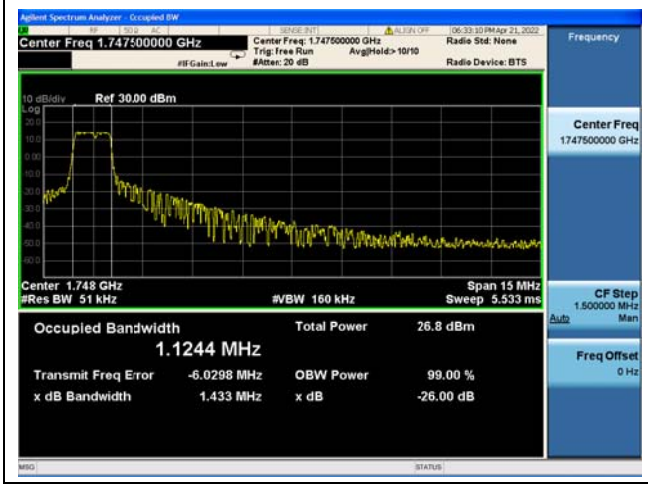


Band 4 / 15MHz / Mid CH / QPSK

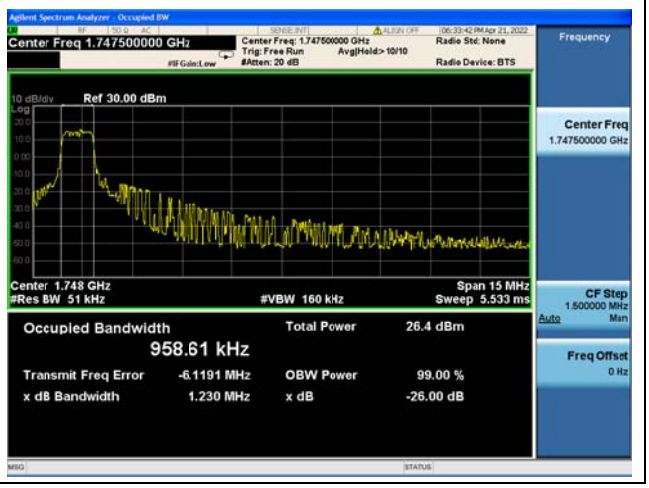
Band 4 / 15MHz / Mid CH / 16QAM



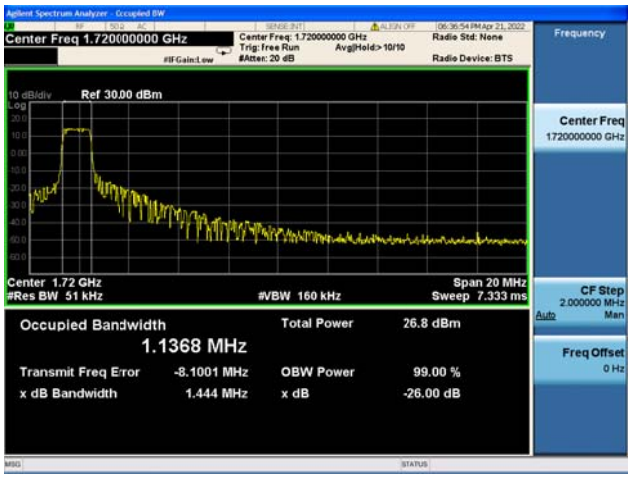
Band 4 / 15MHz / High CH / QPSK



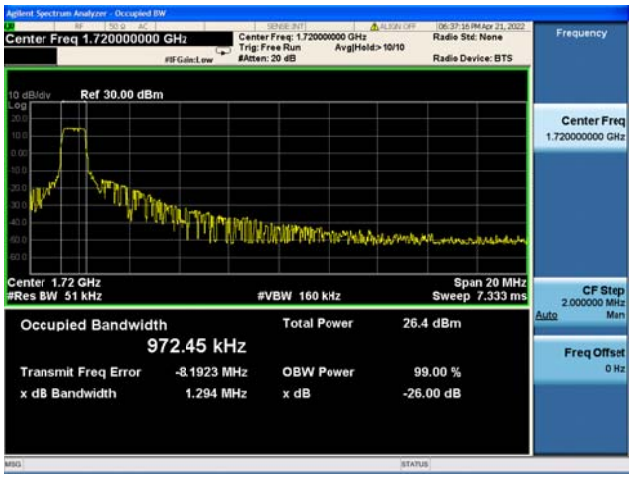
Band 4 / 15MHz / High CH / 16QAM



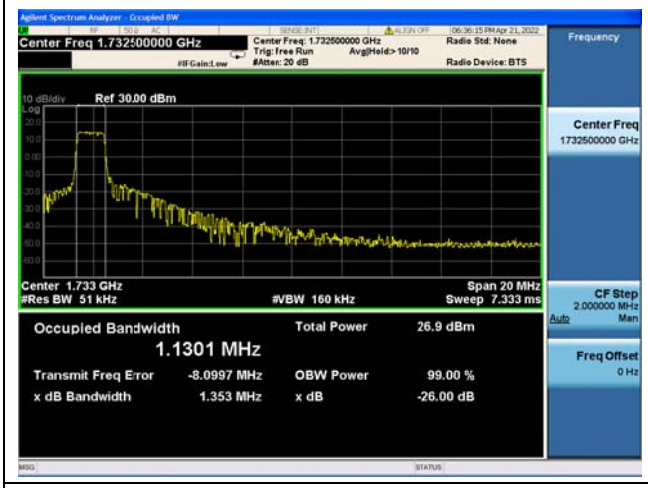
Band 4 / 20MHz / Low CH / QPSK



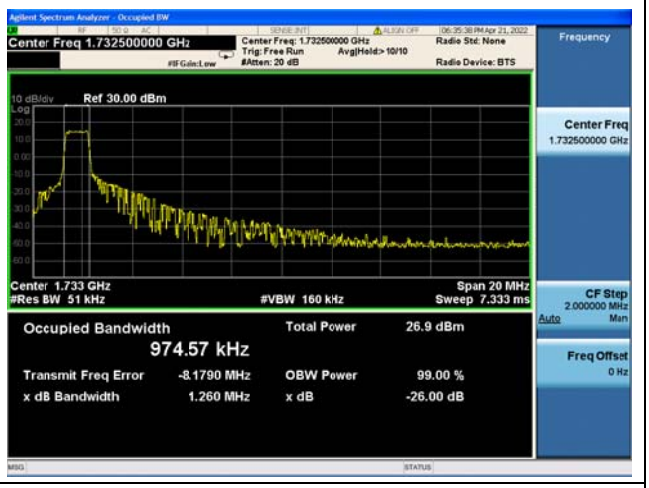
Band 4 / 20MHz / Low CH / 16QAM



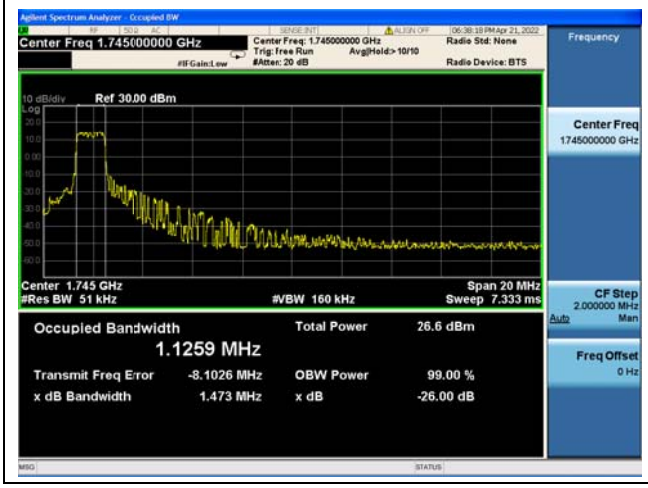
Band 4 / 20MHz / Mid CH / QPSK



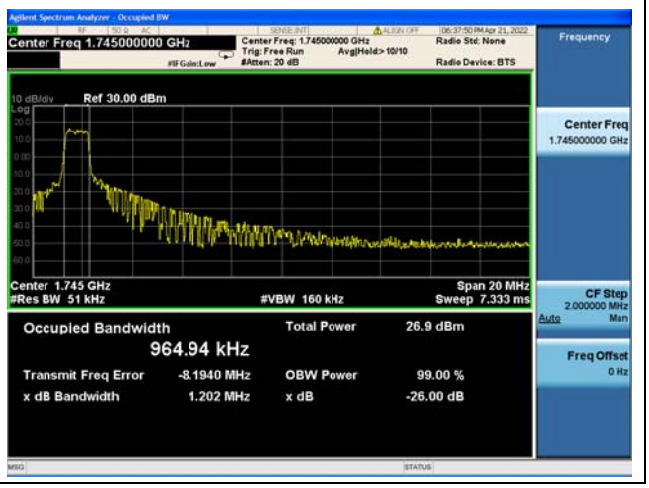
Band 4 / 20MHz / Mid CH / 16QAM



Band 4 / 20MHz / High CH / QPSK



Band 4 / 20MHz / High CH / 16QAM

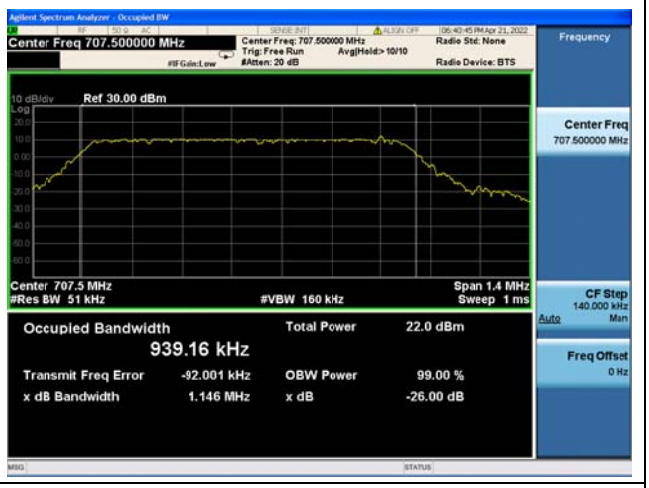


Band 12 / 1.4MHz / Low CH / QPSK

Band 12 / 1.4MHz / Low CH / 16QAM

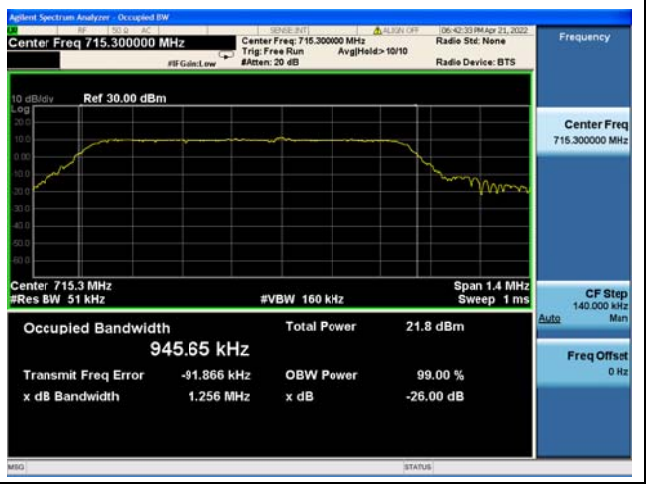
Band 12 / 1.4MHz / Mid CH / QPSK

Band 12 / 1.4MHz / Mid CH / 16QAM



Band 12 / 1.4MHz / High CH / QPSK

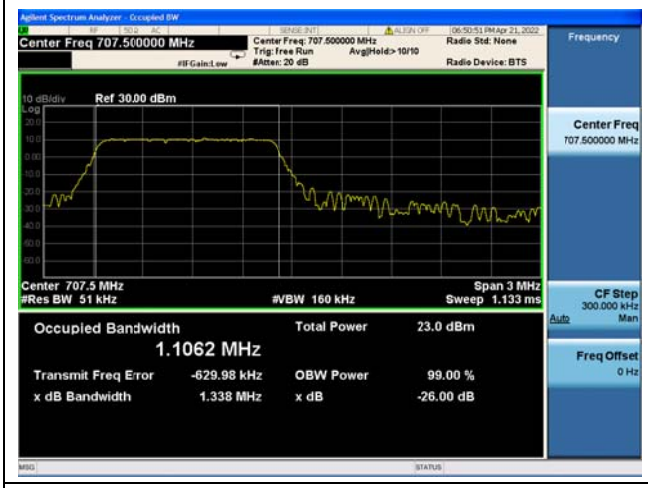
Band 12 / 1.4MHz / High CH / 16QAM



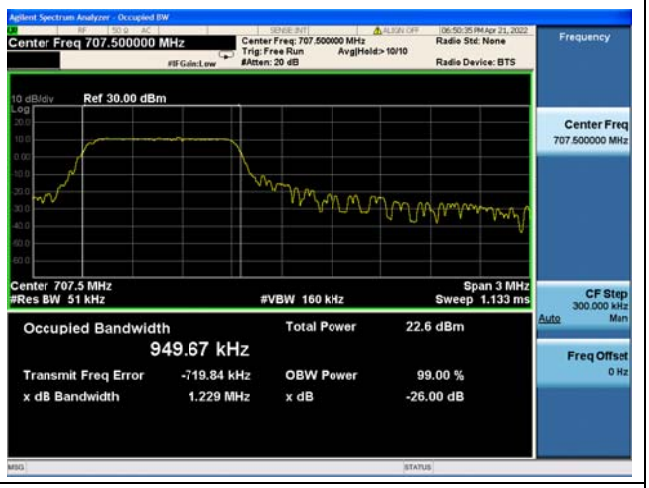
Band 12 / 3MHz / Low CH / QPSK

Band 12 / 3MHz / Low CH / 16QAM

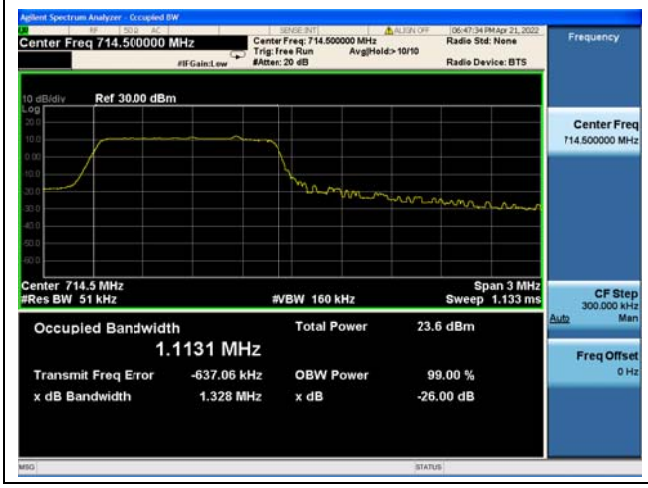
Band 12 / 3MHz / Mid CH / QPSK



Band 12 / 3MHz / Mid CH / 16QAM



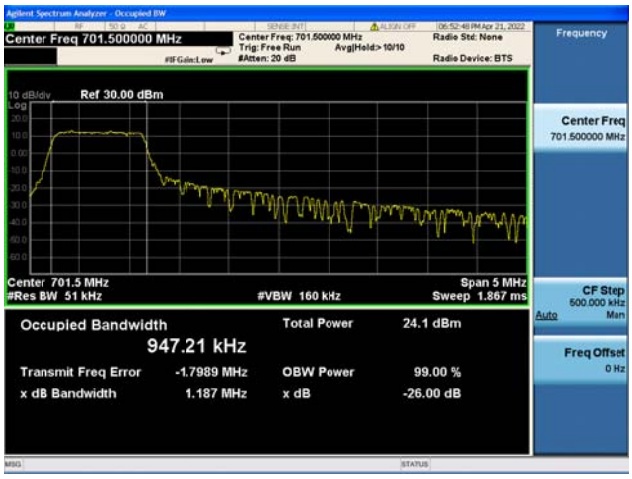
Band 12 / 3MHz / High CH / QPSK



Band 12 / 3MHz / High CH / 16QAM

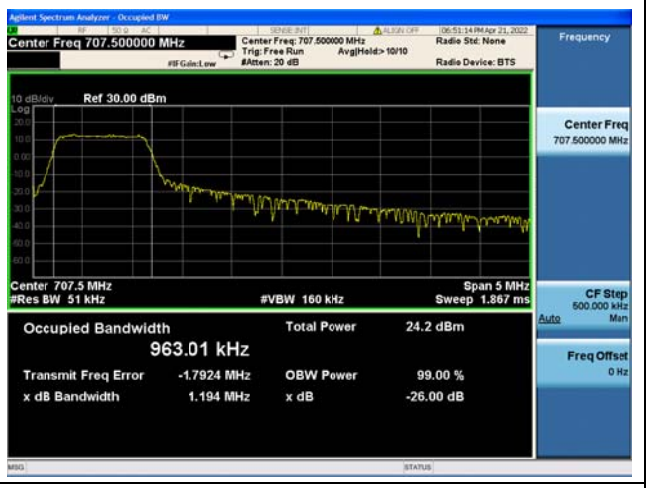
Band 12 / 5MHz / Low CH / QPSK

Band 12 / 5MHz / Low CH / 16QAM



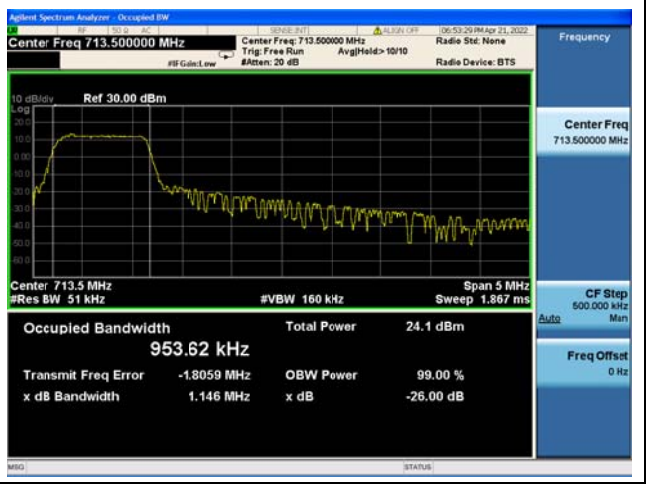
Band 12 / 5MHz / Mid CH / QPSK

Band 12 / 5MHz / Mid CH / 16QAM



Band 12 / 5MHz / High CH / QPSK

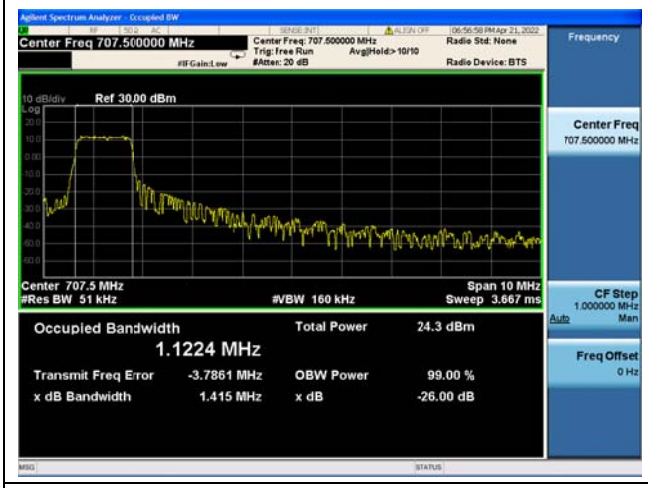
Band 12 / 5MHz / High CH / 16QAM



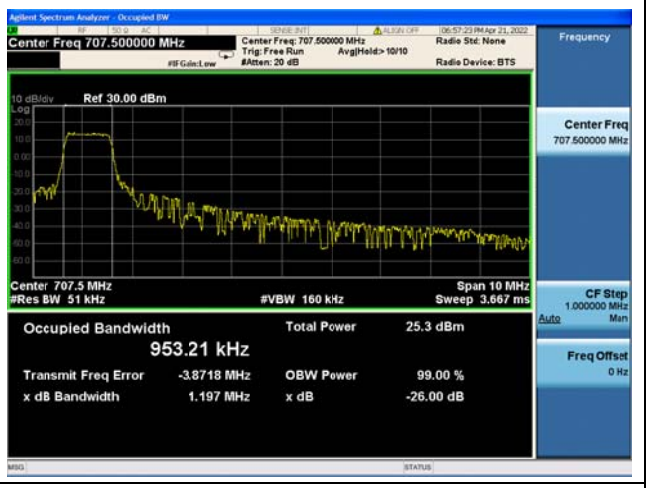
Band 12 / 10MHz / Low CH / QPSK

Band 12 / 10MHz / Low CH / 16QAM

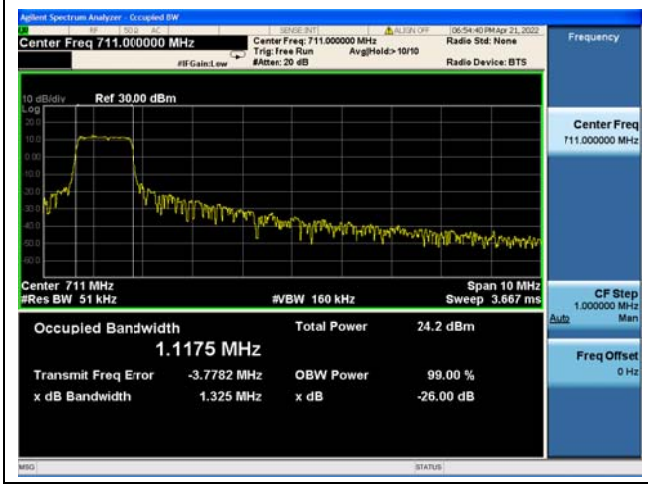
Band 12 / 10MHz / Mid CH / QPSK



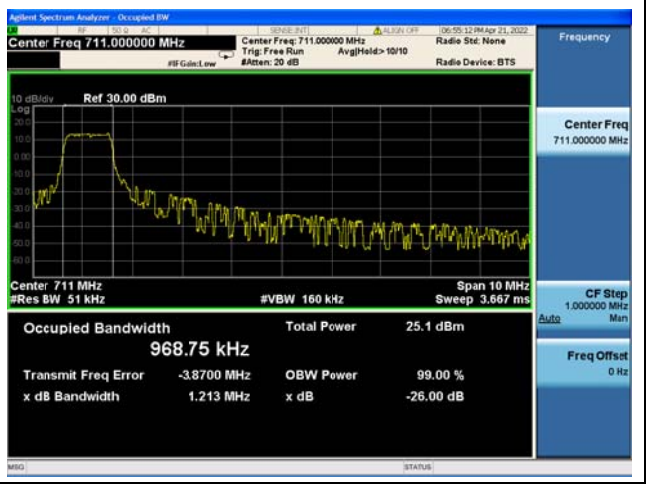
Band 12 / 10MHz / Mid CH / 16QAM



Band 12 / 10MHz / High CH / QPSK



Band 12 / 10MHz / High CH / 16QAM

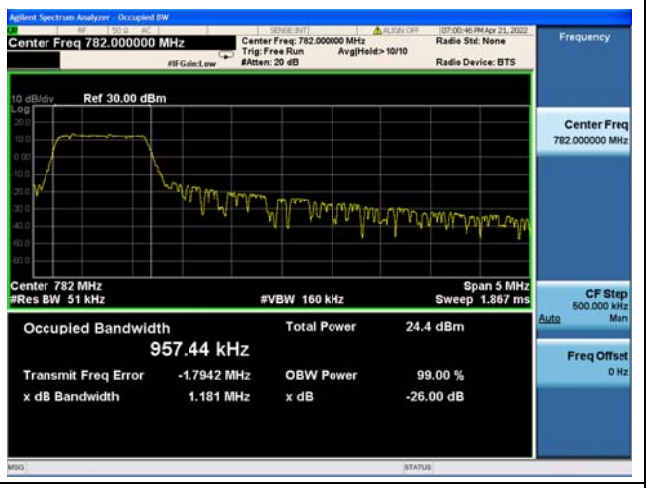


Band 13 / 5MHz / Low CH / QPSK

Band 13 / 5MHz / Low CH / 16QAM

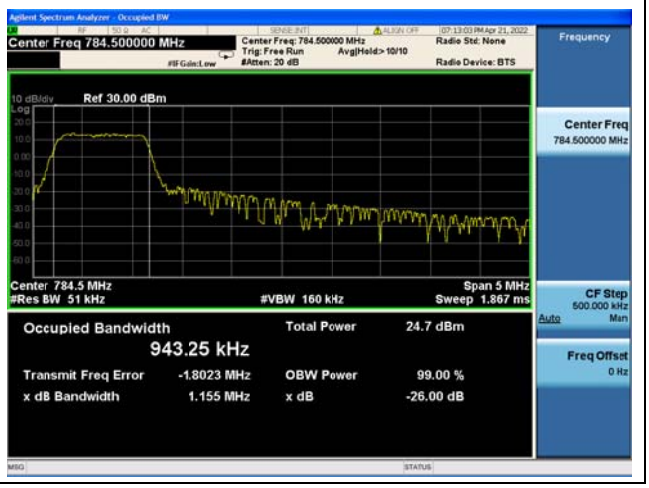
Band 13 / 5MHz / Mid CH / QPSK

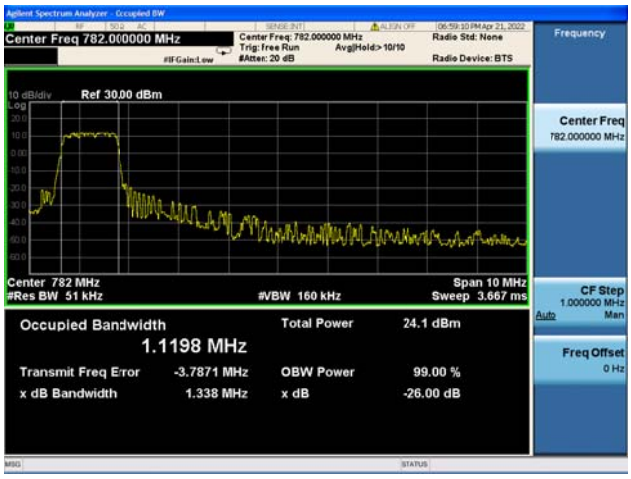
Band 13 / 5MHz / Mid CH / 16QAM



Band 13 / 5MHz / High CH / QPSK

Band 13 / 5MHz / High CH / 16QAM



Band 13 / 10MHz / Mid CH / QPSK	Band 13 / 10MHz / Mid CH / 16QAM
	

2.3. Frequency Stability

2.3.1. Requirement

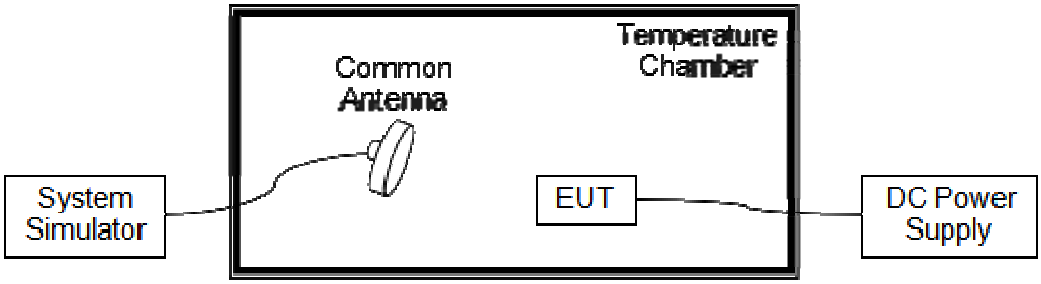
According to FCC section 2.1055, 24.235, 27.54, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. According to FCC section 2.1055, the test conditions are:

(a) The temperature is varied from -30°C to +50°C at intervals of not more than 10°C.

(b) For hand carried battery powered equipment, the primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacture. The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

Note: The operating temperature of EUT is from -10°C to 60°C, which are specified by the applicant.

2.3.2. Test Description



The EUT which is powered by the DC Power Supply directly , is located in the Temperature Chamber. The EUT is commanded by the System Simulator (SS) to operate at the maximum output power. A call is established between the EUT and the SS via a Common Antenna.

2.3.3. Test Procedure

KDB 971168 D01v03 Section 9.0 and ANSI/TIA-603-E-2016.

2.3.4. Test Result

The nominal, highest and lowest extreme voltages are separately24.00V, 27.60V and 20.40V, which are specified by the applicant; the normal temperature here used is 20°C.

LTE Band 2, QPSK, Channel 18900, Frequency 1880.0MHz Limit =Within Authorized Band					
Voltage (%)	**Power (VDC)**	**Temp (°C)**	**Fre. Dev. (Hz)**	**Deviation (ppm)**	**Result**
100	24.00	+20(Ref)	-50	-0.027	PASS
100		-10	32	0.017	
100		0	-48	-0.026	
100		+10	31	0.016	
100		+20	15	0.008	
100		+30	26	0.014	
100		+40	35	0.019	
115	27.60	+20	44	0.023	
85	20.40	+20	28	0.015	

LTE Band 4, QPSK, Channel 20175, Frequency 1732.5MHz Limit =Within Authorized Band					
Voltage (%)	**Power (VDC)**	**Temp (°C)**	**Fre. Dev. (Hz)**	**Deviation (ppm)**	**Result**
100	24.00	+20(Ref)	-22	-0.013	PASS
100		-10	43	0.025	
100		0	38	0.022	
100		+10	-38	-0.022	
100		+20	21	0.012	
100		+30	-58	-0.033	
100		+40	41	0.024	
115	27.60	+20	45	0.026	
85	20.40	+20	37	0.021	

LTE Band 12, QPSK, Channel 23095, Frequency 707.5MHz Limit =Within Authorized Band					
Voltage (%)	**Power (VDC)**	**Temp (°C)**	**Fre. Dev. (Hz)**	**Deviation (ppm)**	**Result**
100	24.00	+20(Ref)	30	0.042	PASS
100		-10	51	0.072	
100		0	-50	-0.071	
100		+10	32	0.045	
100		+20	-44	-0.062	
100		+30	-14	-0.020	
100		+40	-20	-0.028	
115	27.60	+20	46	0.065	
85	20.40	+20	-15	-0.021	

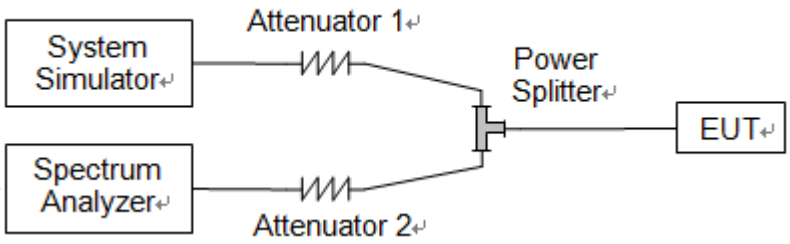
LTE Band 13, QPSK, Channel 23230, Frequency 782.0MHz Limit =Within Authorized Band					
Voltage (%)	**Power (VDC)**	**Temp (°C)**	**Fre. Dev. (Hz)**	**Deviation (ppm)**	**Result**
100	24.00	+20(Ref)	-23	-0.029	PASS
100		-10	-28	-0.036	
100		0	-35	-0.045	
100		+10	44	0.056	
100		+20	44	0.056	
100		+30	22	0.028	
100		+40	-30	-0.038	
115	27.60	+20	-37	-0.047	
85	20.40	+20	-34	-0.043	

2.4. Peak to Average Radio

2.4.1. Requirement

According to FCC section 24.232(d) and 27.50(d), the peak to average ratio (PAR) of the transmission may not exceed 13dB.

2.4.2. Test Description



The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power. A call is established between the EUT and the SS.

2.4.3. Test Procedure

KDB 971168 D01v03 Section 5.7 and ANSI/TIA-603-E-2016.

2.4.4. Test Result

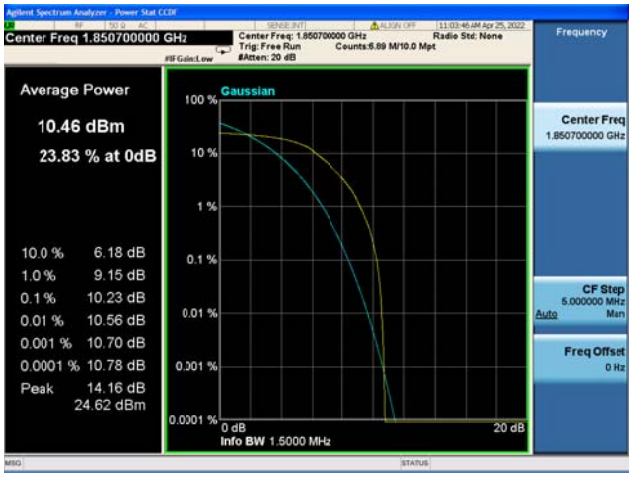
Record the maximum PAPR level associated with a probability of 0.1%.

LTE Band 2					
BW(MHz)	**Channel Level**	**Modulation**	**PAR Radio(dB)**	**Limit(dB)**	**Verdict**
1.4	Low	QPSK	10.15	<=13	PASS
	Low	16QAM	10.23	<=13	PASS
	Mid	QPSK	10.40	<=13	PASS
	Mid	16QAM	10.25	<=13	PASS
	High	QPSK	9.35	<=13	PASS
	High	16QAM	10.27	<=13	PASS
3	Low	QPSK	9.59	<=13	PASS
	Low	16QAM	10.01	<=13	PASS
	Mid	QPSK	9.99	<=13	PASS
	Mid	16QAM	10.01	<=13	PASS
	High	QPSK	9.35	<=13	PASS
	High	16QAM	10.05	<=13	PASS
5	Low	QPSK	9.36	<=13	PASS
	Low	16QAM	9.73	<=13	PASS
	Mid	QPSK	9.23	<=13	PASS
	Mid	16QAM	9.79	<=13	PASS
	High	QPSK	9.40	<=13	PASS
	High	16QAM	10.21	<=13	PASS
10	Low	QPSK	9.29	<=13	PASS
	Low	16QAM	9.69	<=13	PASS
	Mid	QPSK	9.24	<=13	PASS
	Mid	16QAM	9.30	<=13	PASS
	High	QPSK	9.19	<=13	PASS
	High	16QAM	10.41	<=13	PASS
15	Low	QPSK	9.19	<=13	PASS
	Low	16QAM	9.27	<=13	PASS
	Mid	QPSK	9.05	<=13	PASS
	Mid	16QAM	9.10	<=13	PASS
	High	QPSK	9.50	<=13	PASS
	High	16QAM	10.10	<=13	PASS
20	Low	QPSK	8.94	<=13	PASS
	Low	16QAM	9.70	<=13	PASS
	Mid	QPSK	9.38	<=13	PASS
	Mid	16QAM	9.76	<=13	PASS
	High	QPSK	9.25	<=13	PASS
	High	16QAM	9.90	<=13	PASS

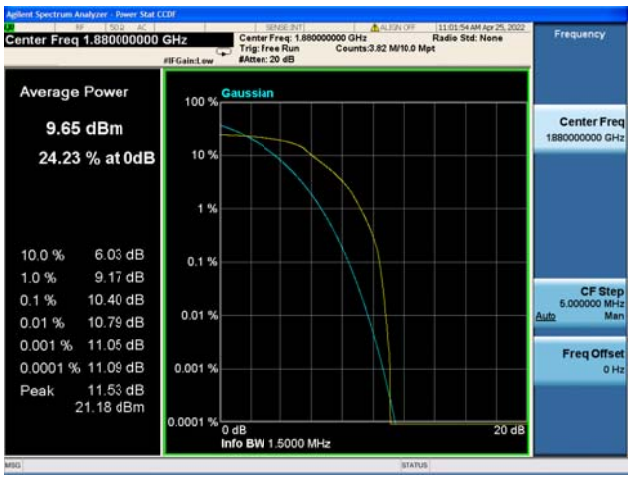
LTE Band 4					
BW(MHz)	**Channel Level**	**Modulation**	**PAR Radio(dB)**	**Limit(dB)**	**Verdict**
1.4	Low	QPSK	9.67	<=13	PASS
	Low	16QAM	9.93	<=13	PASS
	Mid	QPSK	9.45	<=13	PASS
	Mid	16QAM	10.51	<=13	PASS
	High	QPSK	9.20	<=13	PASS
	High	16QAM	10.08	<=13	PASS
3	Low	QPSK	9.59	<=13	PASS
	Low	16QAM	10.10	<=13	PASS
	Mid	QPSK	9.60	<=13	PASS
	Mid	16QAM	9.90	<=13	PASS
	High	QPSK	9.64	<=13	PASS
	High	16QAM	10.02	<=13	PASS
5	Low	QPSK	9.13	<=13	PASS
	Low	16QAM	9.67	<=13	PASS
	Mid	QPSK	9.00	<=13	PASS
	Mid	16QAM	9.49	<=13	PASS
	High	QPSK	8.53	<=13	PASS
	High	16QAM	9.31	<=13	PASS
10	Low	QPSK	9.14	<=13	PASS
	Low	16QAM	9.65	<=13	PASS
	Mid	QPSK	8.57	<=13	PASS
	Mid	16QAM	8.78	<=13	PASS
	High	QPSK	8.90	<=13	PASS
	High	16QAM	9.17	<=13	PASS
15	Low	QPSK	9.04	<=13	PASS
	Low	16QAM	9.63	<=13	PASS
	Mid	QPSK	8.76	<=13	PASS
	Mid	16QAM	8.92	<=13	PASS
	High	QPSK	8.89	<=13	PASS
	High	16QAM	9.49	<=13	PASS
20	Low	QPSK	9.37	<=13	PASS
	Low	16QAM	9.75	<=13	PASS
	Mid	QPSK	8.87	<=13	PASS
	Mid	16QAM	9.21	<=13	PASS
	High	QPSK	8.90	<=13	PASS
	High	16QAM	9.25	<=13	PASS

Band 2 / 1.4MHz / Low CH / QPSK

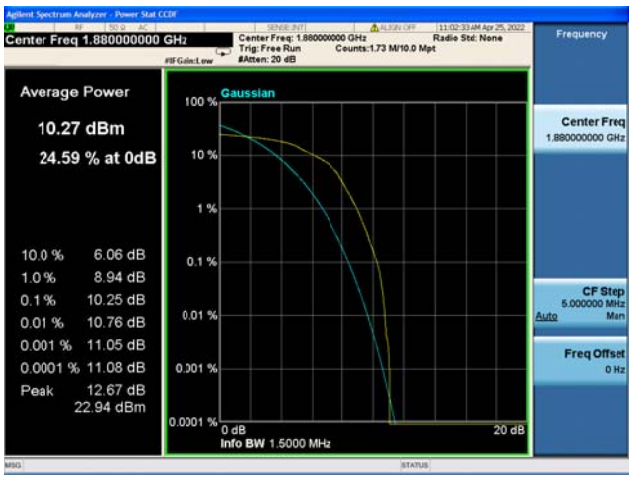
Band 2 / 1.4MHz / Low CH / 16QAM



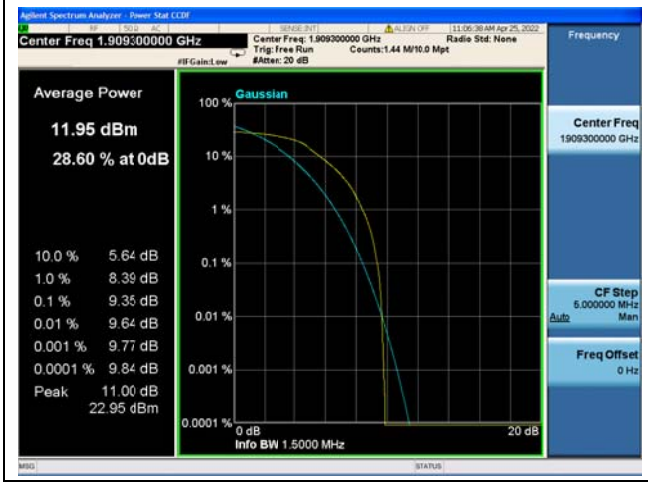
Band 2 / 1.4MHz / Mid CH / QPSK



Band 2 / 1.4MHz / Mid CH / 16QAM



Band 2 / 1.4MHz / High CH / QPSK



Band 2 / 1.4MHz / High CH / 16QAM