TEST REPORT

APPLICANT	:	LogicMark, Inc.
PRODUCT NAME	:	Connected Personal Emergency Response System (PERS) device.
MODEL NAME	:	60911, 60711
BRAND NAME	:	LogicMark
FCC ID	:	TYD-FA60911
STANDARD(S)	:	47 CFR Part 2 47 CFR Part 24, Subpart E 47 CFR Part 27, Subpart H&L
RECEIPT DATE	:	2023-02-02
TEST DATE	:	2023-02-14 to 2023-05-16
ISSUE DATE	:	2023-08-07

Edited by: Zeng Xiaoying (Rapporteur)

Approved by: Shen Junsheng (Supervisor)

NOTE: This document is issued by Shenzhen Morlab Communications Technology Co., Ltd., the test report shall not be reproduced except in full without prior written permission of the company. The test results apply only to the particular sample(s) tested and to the specific tests carried out which is available on request for validation and information confirmed at our website.

MORLAB
Shenzhen Morlab Communications Technology Co., Ltd.
FL.1-3, Building A, FeiYang Science Park, No.8 LongChang Road,
Block67, BaoAn District, ShenZhen , GuangDong Province, P. R. China
Tel: 86-755-36698555 Fax: 86-755-36698525
Http://www.morlab.cn E-mail: service@morlab.cn

DIRECTORY

1. Technical Information ····· 3
1.1. Applicant and Manufacturer Information ····· 3
1.2. Equipment Under Test (EUT) Description ····· 3
1.3. Maximum E.R.P./E.I.R.P. and Emission Designator ····· 5
1.4. Test Standards and Results ····· 6
1.5. Environmental Conditions ····· 7
2. 47 CFR Part 2, Part 24E, Part 27 H&L Requirements ····· 8
2.1. Transmitter Conducted Output Power and E.R.P./E.I.R.P. ····· 8
2.2. Occupied Bandwidth ····· 41
2.3. Frequency Stability ····· 53
2.4. Peak to Average Radio ····· 56
2.5. Conducted Spurious Emissions ····· 65
2.6. Band Edge ····· 74
2.7. Radiated Spurious Emissions ····· 92
Annex A Test Uncertainty ····· 113
Annex B Testing Laboratory Information ····· 114

Change History		
Version	Date	Reason for change
1.0	2023-08-07	First edition

1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant	LogicMark, Inc.
Applicant Address	2801 Diode Lane, Louisville, KY 40299 United States
Manufacturer	Skymax Electronics Company Limited
Manufacturer Address	Rm. 9, 12/F, Grandtech Centre, 8 On Ping Street, Shatin, N.T., Hong kong

1.2. Equipment Under Test (EUT) Description

Product Name:	Connected Personal Emergency Response System (PERS) device.	
Sample No.:	1#	
Hardware Version:	V1.0	
Software Version:	V1.0	
Modulation Type:	16QAM	
Carrier Aggregation:	Not Support	
Operation Band:	Band 2 / 4 / 12	
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
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
Antenna Type:	PIFA Antenna	
Antenna Gain:	LTE Band 2	2.11dBi
	LTE Band 4	2.09dBi
	LTE Band 12	1.53dBi

Accessory Information:	Battery 1	
	Brand Name:	Wifi PERS_SD752540PE
	Model No.:	XDRDG218001
	Serial No.:	N/A
	Capacity:	1070mAh
	Rated Voltage:	3.85V
	Charge Limit:	4.4V
	Manufacturer:	ZHUHAI SUNDA TECHNOLOGY CO.,LTD
	Battery 2	
	Brand Name:	Great Power
	Model No.:	GSP752540HV
	Serial No.:	N/A
	Capacity:	1000mAh
	Rated Voltage:	3.85V
	Charge Limit:	4.4V
	Manufacturer:	ZHUHAI GREAT POWER ENERGY CO., LTD.
	Adaptor	
	Brand Name:	N/A
	Model No.:	AS0601A-0501000USU
	Serial No.:	N/A
	Rated Output:	5V⎓1A
	Rated Input:	100-240V~50/60Hz, 0.2A
	Manufacturer:	SHENZHEN FUSHIGANG TECHNOLOGY CO., LTD.

Note 1: According to the certificate holder, they declared that the models 60911 and 60711, only the models are different, they have the same hardware and software. In addition to the differences described above, the others are the same. No other changes, all RF parameters remain the same as before. The main measuring model is 60911, only the results for 60911 were recorded in this report.

Note 2: 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)	16QAM	16QAM
20	0.259	17M9W7D
15	0.256	13M5W7D
10	0.256	8M96W7D
5	0.256	4M51W7D
3	0.255	2M71W7D
1.4	0.255	1M10W7D
LTE Band 4	**Maximum E.R.P./E.I.R.P. (W)**	**Emission Designator (99%OBW)**
BW(MHz)	16QAM	16QAM
20	0.252	17M9W7D
15	0.247	13M4W7D
10	0.251	8M95W7D
5	0.251	4M51W7D
3	0.247	2M71W7D
1.4	0.249	1M10W7D
LTE Band 12	**Maximum E.R.P./E.I.R.P. (W)**	**Emission Designator (99%OBW)**
BW(MHz)	16QAM	16QAM
10	0.136	8M95W7D
5	0.136	4M51W7D
3	0.135	2M71W7D
1.4	0.135	1M10W7D

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(c)(10) 27.50(d)(4)	Transmitter Conducted Output Power and E.R.P./E.I.R.P.	May 16, 2023	Zheng Jianhua Li Huaijie	PASS	No deviation
2.1049	Occupied Bandwidth	Feb. 14, 2023	Li Huaijie	PASS	No deviation
2.1055 24.235 27.54	Frequency Stability	Feb. 14, 2023	Li Huaijie	PASS	No deviation
24.232(d), 27.50(d)(5)	Peak to Average Radio	Feb. 14, 2023	Li Huaijie	PASS	No deviation
2.1051 24.238(a) 27.53(g) 27.53(h)	Conducted Spurious Emissions	Feb. 14, 2023	Li Huaijie	PASS	No deviation
2.1051 24.238(a) 27.53(g) 27.53(h)	Band Edge	Feb. 14, 2023	Li Huaijie	PASS	No deviation
2.1053 24.238(a) 27.53(g) 27.53(h)	Radiated Spurious Emissions	Feb. 19, 2023	Gao Jianrou	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 27 H&L Requirements

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

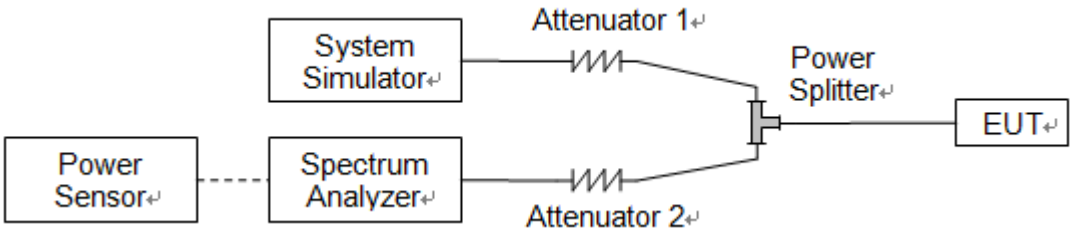
2.1.1. Requirement

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.

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	16QAM	1	0	21.93	22.02	21.95
20	16QAM	1	49	21.90	22.00	21.94
20	16QAM	1	99	21.91	21.98	21.96
20	16QAM	50	0	21.07	21.15	21.05
20	16QAM	50	24	21.06	21.13	21.12
20	16QAM	50	50	21.03	21.11	21.04
20	16QAM	100	0	21.03	21.08	21.01

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	16QAM	1	0	21.85	21.93	21.86
15	16QAM	1	37	21.82	21.97	21.90
15	16QAM	1	74	21.88	21.93	21.88
15	16QAM	36	0	21.06	21.08	21.02
15	16QAM	36	20	20.98	21.04	21.11
15	16QAM	36	39	20.94	21.09	20.99
15	16QAM	75	0	20.96	21.01	20.92

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	16QAM	1	0	21.87	21.93	21.88
10	16QAM	1	25	21.82	21.98	21.87
10	16QAM	1	49	21.88	21.93	21.95
10	16QAM	25	0	21.05	21.13	21.01
10	16QAM	25	12	21.01	21.09	21.05
10	16QAM	25	25	20.93	21.04	21.03
10	16QAM	50	0	20.98	21.03	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				18625	18900	19175
Frequency (MHz)				1852.5	1880	1907.5
5	16QAM	1	0	21.90	21.96	21.85
5	16QAM	1	12	21.80	21.97	21.87
5	16QAM	1	24	21.87	21.90	21.94
5	16QAM	12	0	21.05	21.06	20.97
5	16QAM	12	7	21.01	21.12	21.02
5	16QAM	12	13	21.00	21.01	21.00
5	16QAM	25	0	20.95	21.00	20.93

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	16QAM	1	0	21.92	21.93	21.85
3	16QAM	1	8	21.80	21.96	21.89
3	16QAM	1	14	21.83	21.89	21.94
3	16QAM	8	0	21.05	21.13	21.01
3	16QAM	8	4	21.04	21.09	21.03
3	16QAM	8	7	21.01	21.02	21.00
3	16QAM	15	0	20.95	21.00	20.99

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	16QAM	1	0	21.92	21.93	21.90
1.4	16QAM	1	3	21.83	21.90	21.85
1.4	16QAM	1	5	21.86	21.94	21.92
1.4	16QAM	3	0	21.85	21.89	21.82
1.4	16QAM	3	1	21.87	21.95	21.91
1.4	16QAM	3	3	21.81	21.89	21.83
1.4	16QAM	6	0	20.95	21.04	20.96

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	16QAM	1	0	21.86	21.92	21.89
20	16QAM	1	49	21.83	21.90	21.87
20	16QAM	1	99	21.81	21.88	21.84
20	16QAM	50	0	21.32	21.38	21.31
20	16QAM	50	24	21.28	21.35	21.25
20	16QAM	50	50	21.24	21.31	21.26
20	16QAM	100	0	21.26	21.33	21.28

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	16QAM	1	0	21.83	21.84	21.84
15	16QAM	1	37	21.74	21.80	21.81
15	16QAM	1	74	21.73	21.83	21.76
15	16QAM	36	0	21.25	21.31	21.25
15	16QAM	36	20	21.24	21.31	21.20
15	16QAM	36	39	21.21	21.28	21.17
15	16QAM	75	0	21.25	21.25	21.21

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				20000	20175	20350
Frequency (MHz)				1715	1732.5	1750
10	16QAM	1	0	21.80	21.90	21.86
10	16QAM	1	25	21.82	21.85	21.77
10	16QAM	1	49	21.76	21.86	21.81
10	16QAM	25	0	21.31	21.36	21.23
10	16QAM	25	12	21.20	21.29	21.20
10	16QAM	25	25	21.17	21.26	21.21
10	16QAM	50	0	21.19	21.29	21.19

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	16QAM	1	0	21.80	21.91	21.83
5	16QAM	1	12	21.76	21.83	21.83
5	16QAM	1	24	21.72	21.79	21.83
5	16QAM	12	0	21.23	21.34	21.28
5	16QAM	12	7	21.26	21.31	21.18
5	16QAM	12	13	21.18	21.22	21.16
5	16QAM	25	0	21.25	21.28	21.19

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	16QAM	1	0	21.79	21.83	21.84
3	16QAM	1	8	21.79	21.81	21.82
3	16QAM	1	14	21.73	21.84	21.79
3	16QAM	8	0	21.22	21.29	21.24
3	16QAM	8	4	21.27	21.25	21.21
3	16QAM	8	7	21.16	21.28	21.23
3	16QAM	15	0	21.16	21.31	21.26

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	16QAM	1	0	21.80	21.87	21.83
1.4	16QAM	1	3	21.76	21.80	21.83
1.4	16QAM	1	5	21.74	21.84	21.82
1.4	16QAM	3	0	21.77	21.82	21.72
1.4	16QAM	3	1	21.70	21.84	21.74
1.4	16QAM	3	3	21.68	21.72	21.75
1.4	16QAM	6	0	21.22	21.23	21.20

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				23060	23095	23130
Frequency (MHz)				704	707.5	711
10	16QAM	1	0	21.92	21.97	21.95
10	16QAM	1	25	21.88	21.95	21.85
10	16QAM	1	49	21.85	21.92	21.83
10	16QAM	25	0	21.31	21.36	21.30
10	16QAM	25	12	21.26	21.33	21.24
10	16QAM	25	25	21.31	21.34	21.24
10	16QAM	50	0	21.32	21.33	21.30

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	16QAM	1	0	21.86	21.92	21.89
5	16QAM	1	12	21.81	21.94	21.81
5	16QAM	1	24	21.83	21.83	21.73
5	16QAM	12	0	21.30	21.29	21.21
5	16QAM	12	7	21.19	21.30	21.15
5	16QAM	12	13	21.24	21.24	21.20
5	16QAM	25	0	21.30	21.26	21.22

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	16QAM	1	0	21.87	21.91	21.85
3	16QAM	1	8	21.79	21.85	21.77
3	16QAM	1	14	21.76	21.88	21.79
3	16QAM	8	0	21.22	21.35	21.24
3	16QAM	8	4	21.25	21.32	21.15
3	16QAM	8	7	21.30	21.32	21.21
3	16QAM	15	0	21.27	21.26	21.24

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	16QAM	1	0	21.90	21.90	21.86
1.4	16QAM	1	3	21.82	21.91	21.78
1.4	16QAM	1	5	21.75	21.90	21.74
1.4	16QAM	3	0	21.75	21.78	21.78
1.4	16QAM	3	1	21.68	21.77	21.66
1.4	16QAM	3	3	21.77	21.76	21.73
1.4	16QAM	6	0	21.29	21.25	21.23

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	16QAM	1	0	24.04	0.254	24.13	0.259	24.06	0.255
20	16QAM	1	49	24.01	0.252	24.11	0.258	24.05	0.254
20	16QAM	1	99	24.02	0.252	24.09	0.256	24.07	0.255
20	16QAM	50	0	23.18	0.208	23.26	0.212	23.16	0.207
20	16QAM	50	24	23.17	0.207	23.24	0.211	23.23	0.210
20	16QAM	50	50	23.14	0.206	23.22	0.210	23.15	0.207
20	16QAM	100	0	23.14	0.206	23.19	0.208	23.12	0.205

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	16QAM	1	0	23.96	0.249	24.04	0.254	23.97	0.249
15	16QAM	1	37	23.93	0.247	24.08	0.256	24.01	0.252
15	16QAM	1	74	23.99	0.251	24.04	0.254	23.99	0.251
15	16QAM	36	0	23.17	0.207	23.19	0.208	23.13	0.206
15	16QAM	36	20	23.09	0.204	23.15	0.207	23.22	0.210
15	16QAM	36	39	23.05	0.202	23.20	0.209	23.10	0.204
15	16QAM	75	0	23.07	0.203	23.12	0.205	23.03	0.201

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	16QAM	1	0	23.98	0.250	24.04	0.254	23.99	0.251
10	16QAM	1	25	23.93	0.247	24.09	0.256	23.98	0.250
10	16QAM	1	49	23.99	0.251	24.04	0.254	24.06	0.255
10	16QAM	25	0	23.16	0.207	23.24	0.211	23.12	0.205
10	16QAM	25	12	23.12	0.205	23.20	0.209	23.16	0.207
10	16QAM	25	25	23.04	0.201	23.15	0.207	23.14	0.206
10	16QAM	50	0	23.09	0.204	23.14	0.206	23.07	0.203

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	16QAM	1	0	24.01	0.252	24.07	0.255	23.96	0.249
5	16QAM	1	12	23.91	0.246	24.08	0.256	23.98	0.250
5	16QAM	1	24	23.98	0.250	24.01	0.252	24.05	0.254
5	16QAM	12	0	23.16	0.207	23.17	0.207	23.08	0.203
5	16QAM	12	7	23.12	0.205	23.23	0.210	23.13	0.206
5	16QAM	12	13	23.11	0.205	23.12	0.205	23.11	0.205
5	16QAM	25	0	23.06	0.202	23.11	0.205	23.04	0.201

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	16QAM	1	0	24.03	0.253	24.04	0.254	23.96	0.249
3	16QAM	1	8	23.91	0.246	24.07	0.255	24.00	0.251
3	16QAM	1	14	23.94	0.248	24.00	0.251	24.05	0.254
3	16QAM	8	0	23.16	0.207	23.24	0.211	23.12	0.205
3	16QAM	8	4	23.15	0.207	23.20	0.209	23.14	0.206
3	16QAM	8	7	23.12	0.205	23.13	0.206	23.11	0.205
3	16QAM	15	0	23.06	0.202	23.11	0.205	23.10	0.204

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	16QAM	1	0	24.03	0.253	24.04	0.254	24.01	0.252
1.4	16QAM	1	3	23.94	0.248	24.01	0.252	23.96	0.249
1.4	16QAM	1	5	23.97	0.249	24.05	0.254	24.03	0.253
1.4	16QAM	3	0	23.96	0.249	24.00	0.251	23.93	0.247
1.4	16QAM	3	1	23.98	0.250	24.06	0.255	24.02	0.252
1.4	16QAM	3	3	23.92	0.247	24.00	0.251	23.94	0.248
1.4	16QAM	6	0	23.06	0.202	23.15	0.207	23.07	0.203

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	16QAM	1	0	23.95	0.248	24.01	0.252	23.98	0.250
20	16QAM	1	49	23.92	0.247	23.99	0.251	23.96	0.249
20	16QAM	1	99	23.90	0.245	23.97	0.249	23.93	0.247
20	16QAM	50	0	23.41	0.219	23.47	0.222	23.40	0.219
20	16QAM	50	24	23.37	0.217	23.44	0.221	23.34	0.216
20	16QAM	50	50	23.33	0.215	23.40	0.219	23.35	0.216
20	16QAM	100	0	23.35	0.216	23.42	0.220	23.37	0.217

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	16QAM	1	0	23.92	0.247	23.93	0.247	23.93	0.247
15	16QAM	1	37	23.83	0.242	23.89	0.245	23.90	0.245
15	16QAM	1	74	23.82	0.241	23.92	0.247	23.85	0.243
15	16QAM	36	0	23.34	0.216	23.40	0.219	23.34	0.216
15	16QAM	36	20	23.33	0.215	23.40	0.219	23.29	0.213
15	16QAM	36	39	23.30	0.214	23.37	0.217	23.26	0.212
15	16QAM	75	0	23.34	0.216	23.34	0.216	23.30	0.214

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	16QAM	1	0	23.89	0.245	23.99	0.251	23.95	0.248
10	16QAM	1	25	23.91	0.246	23.94	0.248	23.86	0.243
10	16QAM	1	49	23.85	0.243	23.95	0.248	23.90	0.245
10	16QAM	25	0	23.40	0.219	23.45	0.221	23.32	0.215
10	16QAM	25	12	23.29	0.213	23.38	0.218	23.29	0.213
10	16QAM	25	25	23.26	0.212	23.35	0.216	23.30	0.214
10	16QAM	50	0	23.28	0.213	23.38	0.218	23.28	0.213

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	16QAM	1	0	23.89	0.245	24.00	0.251	23.92	0.247
5	16QAM	1	12	23.85	0.243	23.92	0.247	23.92	0.247
5	16QAM	1	24	23.81	0.240	23.88	0.244	23.92	0.247
5	16QAM	12	0	23.32	0.215	23.43	0.220	23.37	0.217
5	16QAM	12	7	23.35	0.216	23.40	0.219	23.27	0.212
5	16QAM	12	13	23.27	0.212	23.31	0.214	23.25	0.211
5	16QAM	25	0	23.34	0.216	23.37	0.217	23.28	0.213

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	16QAM	1	0	23.88	0.244	23.92	0.247	23.93	0.247
3	16QAM	1	8	23.88	0.244	23.90	0.245	23.91	0.246
3	16QAM	1	14	23.82	0.241	23.93	0.247	23.88	0.244
3	16QAM	8	0	23.31	0.214	23.38	0.218	23.33	0.215
3	16QAM	8	4	23.36	0.217	23.34	0.216	23.30	0.214
3	16QAM	8	7	23.25	0.211	23.37	0.217	23.32	0.215
3	16QAM	15	0	23.25	0.211	23.40	0.219	23.35	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				19957		20175		20393	
Frequency (MHz)				1710.7		1732.5		1754.3	
				dBm	W	dBm	W	dBm	W
1.4	16QAM	1	0	23.89	0.245	23.96	0.249	23.92	0.247
1.4	16QAM	1	3	23.85	0.243	23.89	0.245	23.92	0.247
1.4	16QAM	1	5	23.83	0.242	23.93	0.247	23.91	0.246
1.4	16QAM	3	0	23.86	0.243	23.91	0.246	23.81	0.240
1.4	16QAM	3	1	23.79	0.239	23.93	0.247	23.83	0.242
1.4	16QAM	3	3	23.77	0.238	23.81	0.240	23.84	0.242
1.4	16QAM	6	0	23.31	0.214	23.32	0.215	23.29	0.213

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	16QAM	1	0	21.30	0.135	21.35	0.136	21.33	0.136
10	16QAM	1	25	21.26	0.134	21.33	0.136	21.23	0.133
10	16QAM	1	49	21.23	0.133	21.30	0.135	21.21	0.132
10	16QAM	25	0	20.69	0.117	20.74	0.119	20.68	0.117
10	16QAM	25	12	20.64	0.116	20.71	0.118	20.62	0.115
10	16QAM	25	25	20.69	0.117	20.72	0.118	20.62	0.115
10	16QAM	50	0	20.70	0.117	20.71	0.118	20.68	0.117

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	16QAM	1	0	21.24	0.133	21.30	0.135	21.27	0.134
5	16QAM	1	12	21.19	0.132	21.32	0.136	21.19	0.132
5	16QAM	1	24	21.21	0.132	21.21	0.132	21.11	0.129
5	16QAM	12	0	20.68	0.117	20.67	0.117	20.59	0.115
5	16QAM	12	7	20.57	0.114	20.68	0.117	20.53	0.113
5	16QAM	12	13	20.62	0.115	20.62	0.115	20.58	0.114
5	16QAM	25	0	20.68	0.117	20.64	0.116	20.60	0.115

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	16QAM	1	0	21.25	0.133	21.29	0.135	21.23	0.133
3	16QAM	1	8	21.17	0.131	21.23	0.133	21.15	0.130
3	16QAM	1	14	21.14	0.130	21.26	0.134	21.17	0.131
3	16QAM	8	0	20.60	0.115	20.73	0.118	20.62	0.115
3	16QAM	8	4	20.63	0.116	20.70	0.117	20.53	0.113
3	16QAM	8	7	20.68	0.117	20.70	0.117	20.59	0.115
3	16QAM	15	0	20.65	0.116	20.64	0.116	20.62	0.115

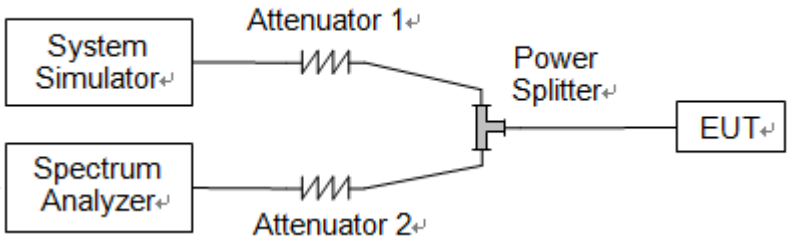
LTE Band 12				Measured E.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				23017		23095		23173	
Frequency (MHz)				699.7		707.5		715.3	
				dBm	W	dBm	W	dBm	W
1.4	16QAM	1	0	21.28	0.134	21.28	0.134	21.24	0.133
1.4	16QAM	1	3	21.20	0.132	21.29	0.135	21.16	0.131
1.4	16QAM	1	5	21.13	0.130	21.28	0.134	21.12	0.129
1.4	16QAM	3	0	21.13	0.130	21.16	0.131	21.16	0.131
1.4	16QAM	3	1	21.06	0.128	21.15	0.130	21.04	0.127
1.4	16QAM	3	3	21.15	0.130	21.14	0.130	21.11	0.129
1.4	16QAM	6	0	20.67	0.117	20.63	0.116	20.61	0.115

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

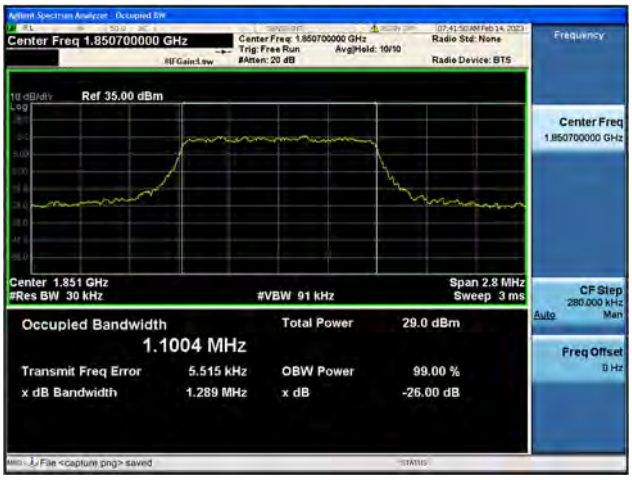
KDB 971168 D01v03 Section 4.1 and ANSI/TIA-603-E-2016.

2.2.4. Test Result

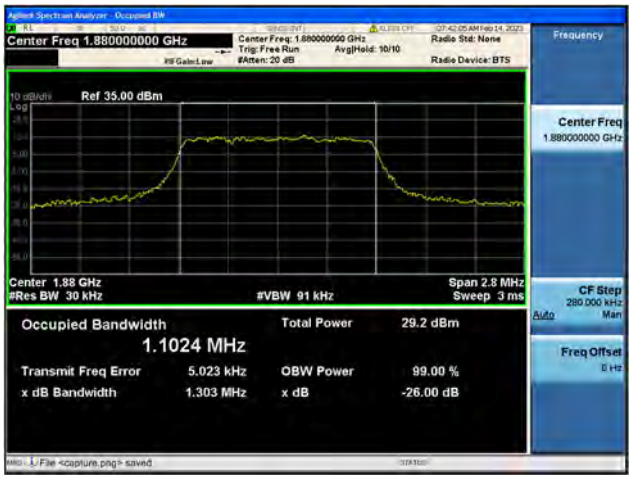
LTE Band 2				
BW(MHz)	Channel Level	Modulation	99% BW(MHz)	26dB BW(MHz)
1.4	Low	16QAM	1.10	1.29
	Mid	16QAM	1.10	1.30
	High	16QAM	1.10	1.35
3	Low	16QAM	2.70	3.00
	Mid	16QAM	2.71	3.00
	High	16QAM	2.71	2.99
5	Low	16QAM	4.51	4.97
	Mid	16QAM	4.51	5.01
	High	16QAM	4.51	5.00
10	Low	16QAM	8.95	9.86
	Mid	16QAM	8.94	9.75
	High	16QAM	8.96	9.82
15	Low	16QAM	13.43	14.62
	Mid	16QAM	13.43	14.63
	High	16QAM	13.48	14.61
20	Low	16QAM	17.91	19.43
	Mid	16QAM	17.88	19.36
	High	16QAM	17.98	19.54

LTE Band 4				
BW(MHz)	Channel Level	Modulation	99% BW(MHz)	26dB BW(MHz)
1.4	Low	16QAM	1.10	1.29
	Mid	16QAM	1.10	1.27
	High	16QAM	1.10	1.28
3	Low	16QAM	2.70	2.99
	Mid	16QAM	2.71	2.99
	High	16QAM	2.70	3.00
5	Low	16QAM	4.51	5.00
	Mid	16QAM	4.51	5.02
	High	16QAM	4.51	5.07
10	Low	16QAM	8.95	9.73
	Mid	16QAM	8.94	9.75
	High	16QAM	8.95	9.83
15	Low	16QAM	13.42	14.65
	Mid	16QAM	13.44	14.64
	High	16QAM	13.42	14.59
20	Low	16QAM	17.94	19.47
	Mid	16QAM	17.92	19.42
	High	16QAM	17.89	19.42

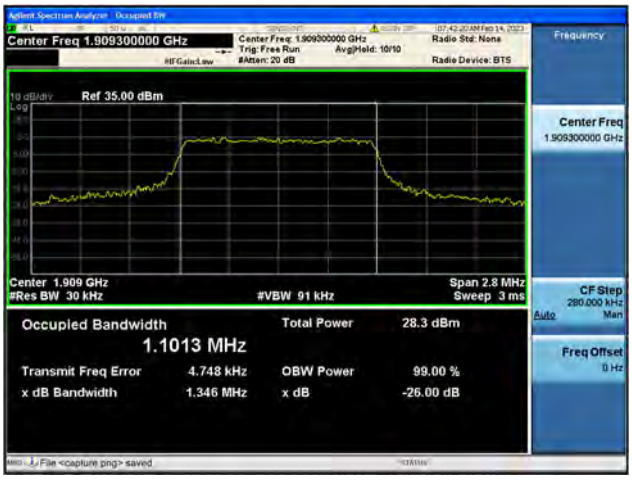
LTE Band 12				
BW(MHz)	Channel Level	Modulation	99% BW(MHz)	26dB BW(MHz)
1.4	Low	16QAM	1.10	1.28
	Mid	16QAM	1.10	1.29
	High	16QAM	1.10	1.29
3	Low	16QAM	2.71	3.00
	Mid	16QAM	2.71	2.99
	High	16QAM	2.70	3.00
5	Low	16QAM	4.51	4.97
	Mid	16QAM	4.51	5.03
	High	16QAM	4.50	4.96
10	Low	16QAM	8.93	9.78
	Mid	16QAM	8.95	9.77
	High	16QAM	8.95	9.80



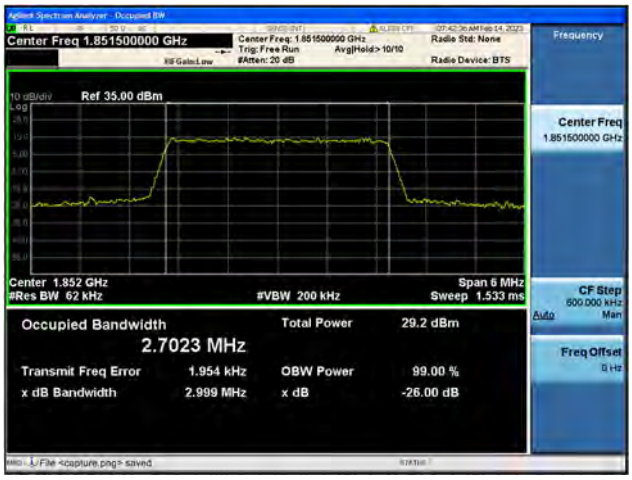
Band2 / 1.4MHz / 16QAM/ Low CH



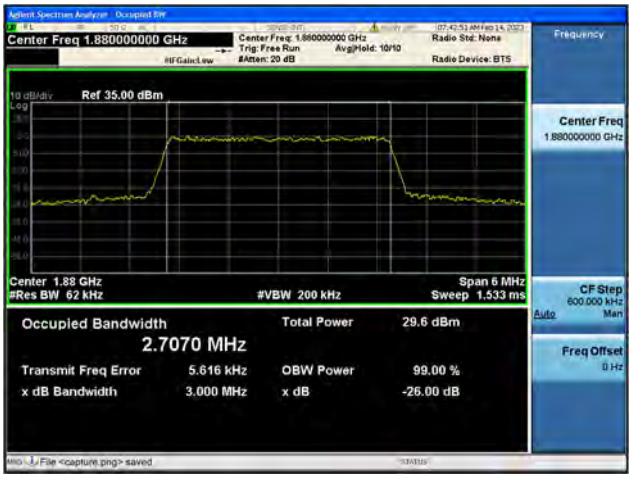
Band2 / 1.4MHz / 16QAM/ Mid CH



Band2 / 1.4MHz / 16QAM/ High CH

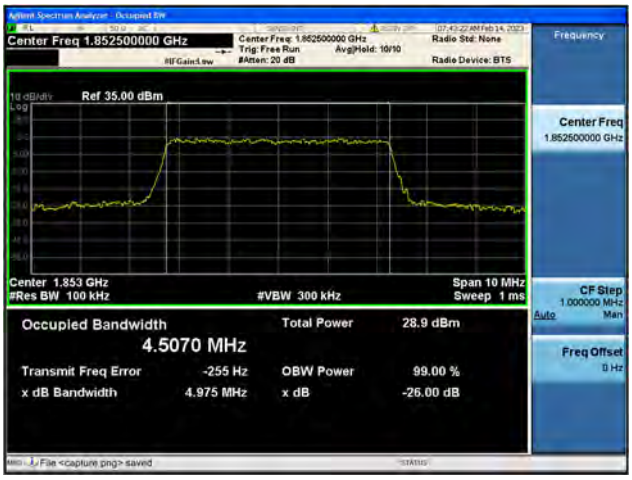


Band2 / 3MHz / 16QAM/ Low CH

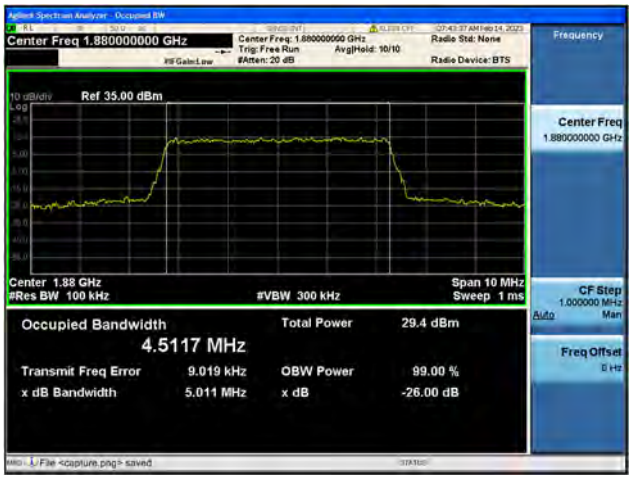


Band2 / 3MHz / 16QAM/ Mid CH

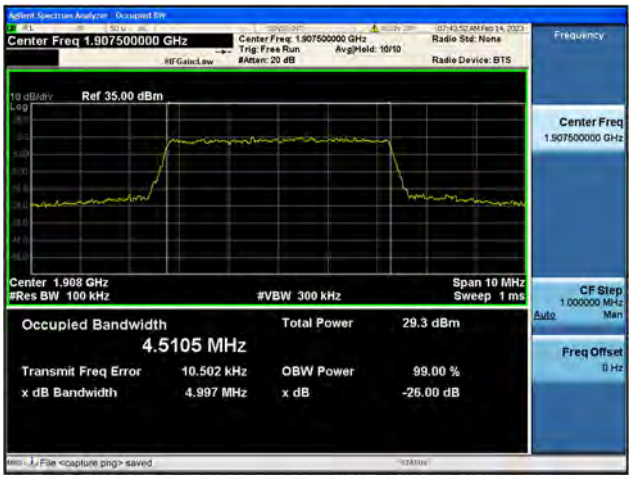
Band2 / 3MHz / 16QAM/ High CH



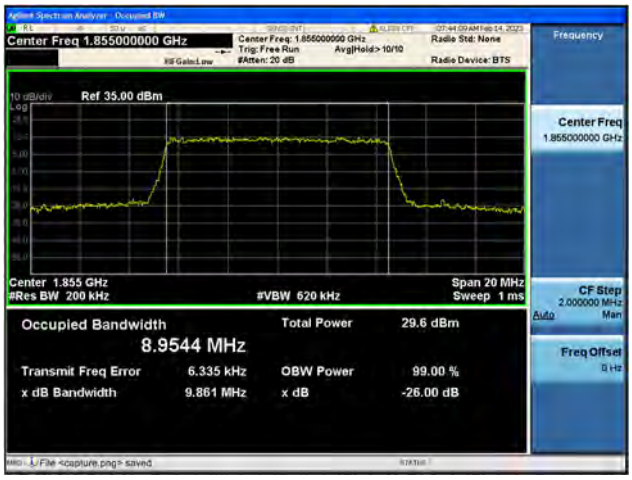
Band2 / 5MHz / 16QAM/ Low CH



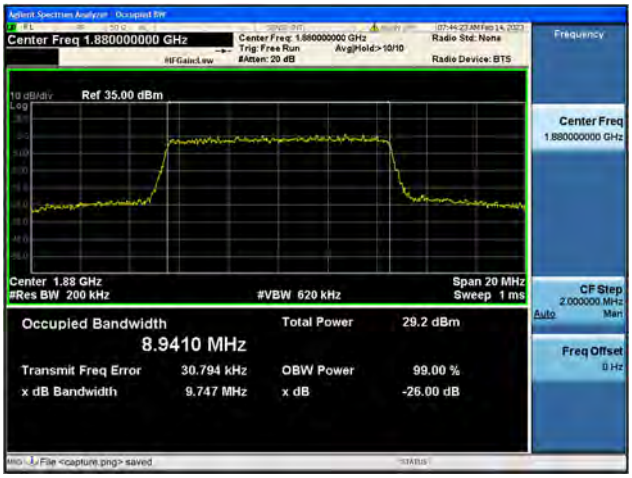
Band2 / 5MHz / 16QAM/ Mid CH



Band2 / 5MHz / 16QAM/ High CH

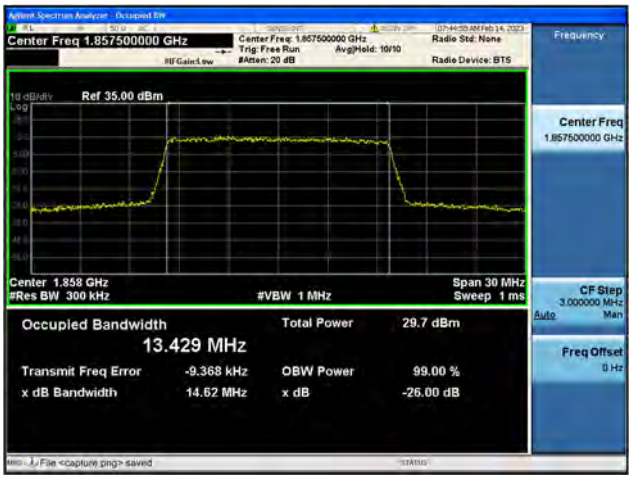


Band2 / 10MHz / 16QAM/ Low CH

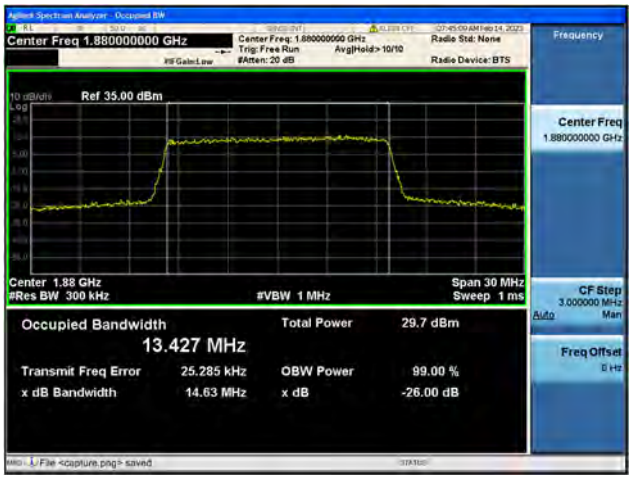


Band2 / 10MHz / 16QAM/ Mid CH

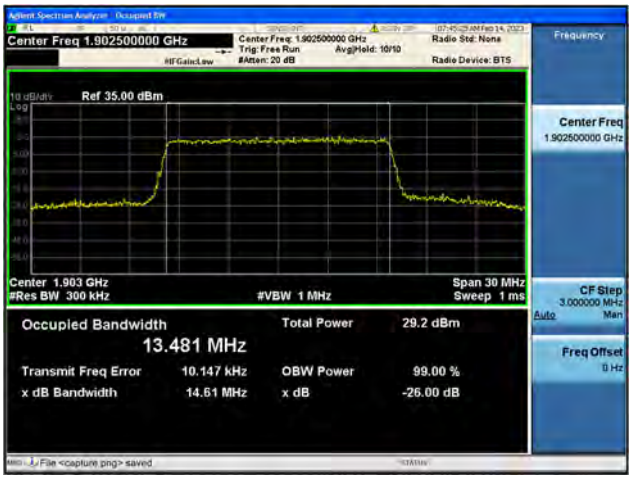
Band2 / 10MHz / 16QAM/ High CH



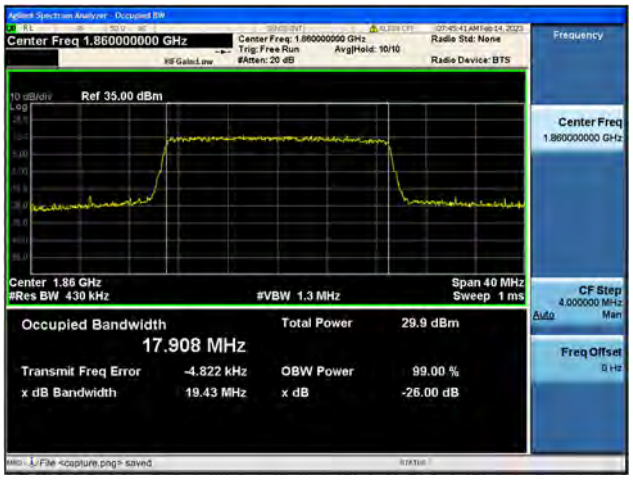
Band2 / 15MHz / 16QAM/ Low CH



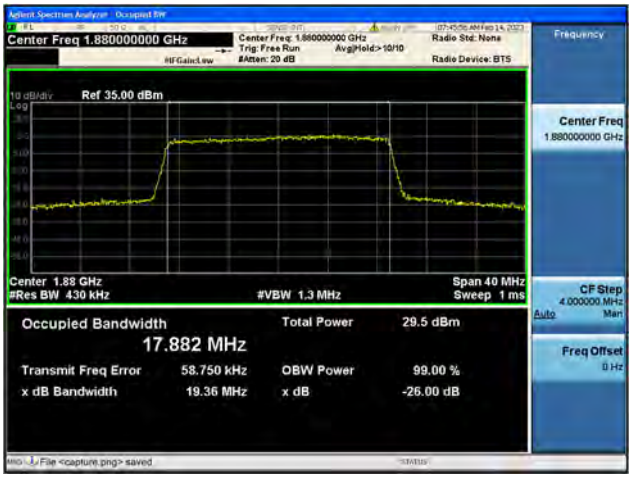
Band2 / 15MHz / 16QAM/ Mid CH



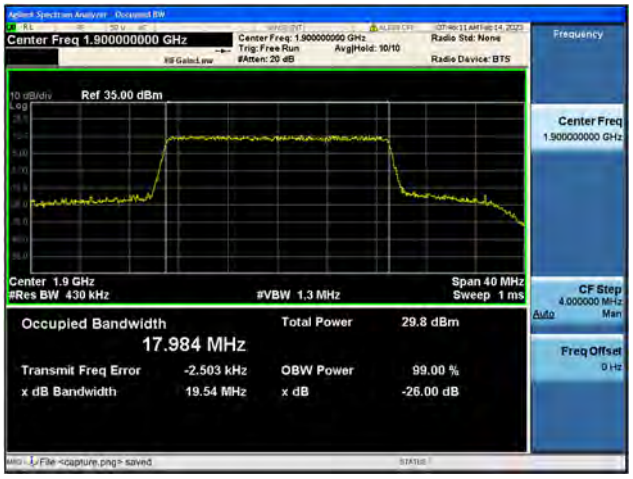
Band2 / 15MHz / 16QAM/ High CH



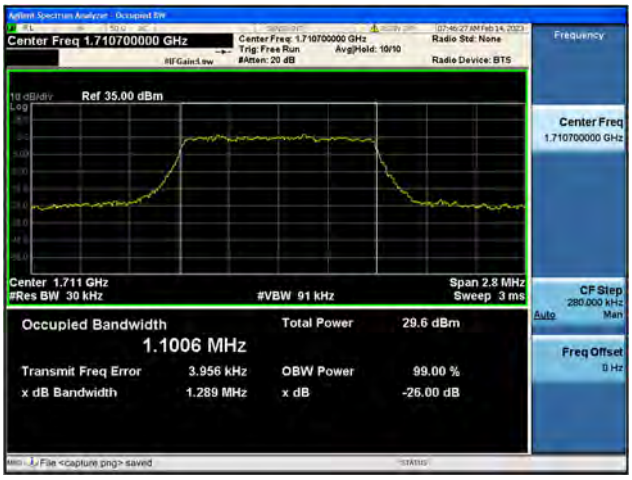
Band2 / 20MHz / 16QAM/ Low CH



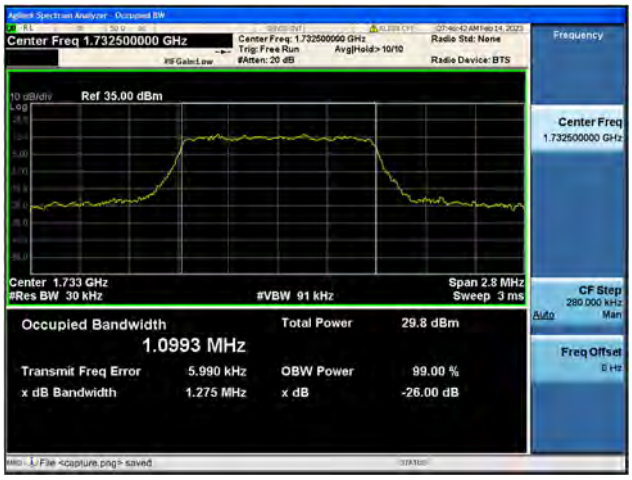
Band2 / 20MHz / 16QAM/ Mid CH



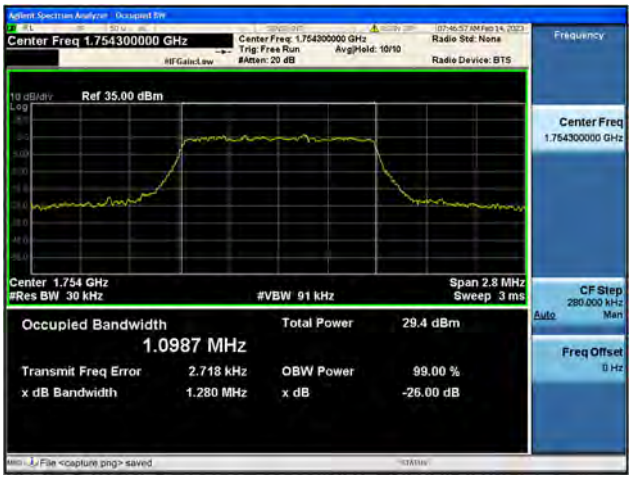
Band2 / 20MHz / 16QAM/ High CH



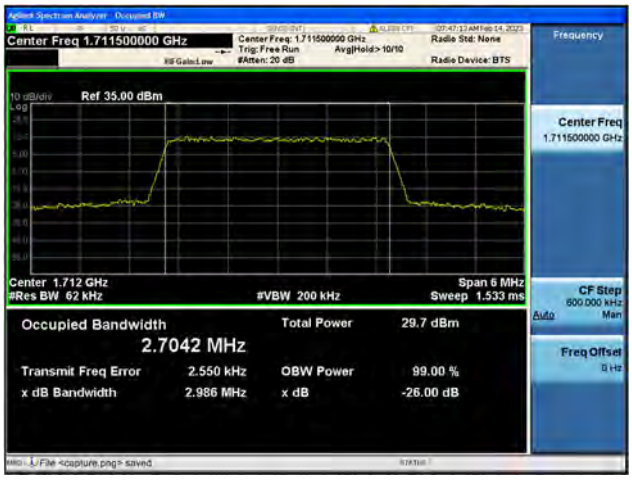
Band4 / 1.4MHz / 16QAM/ Low CH



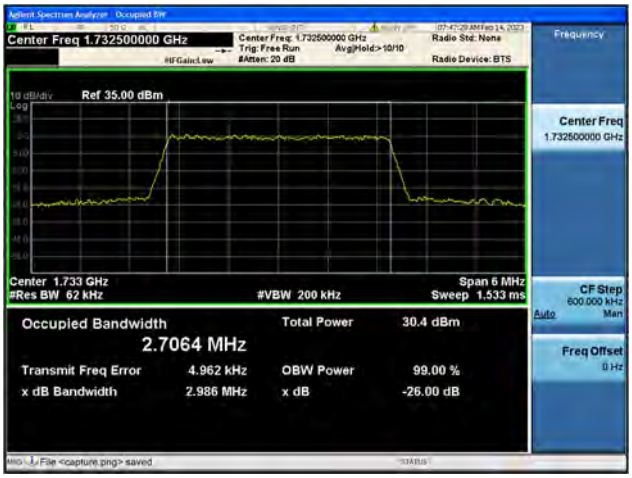
Band4 / 1.4MHz / 16QAM/ Mid CH



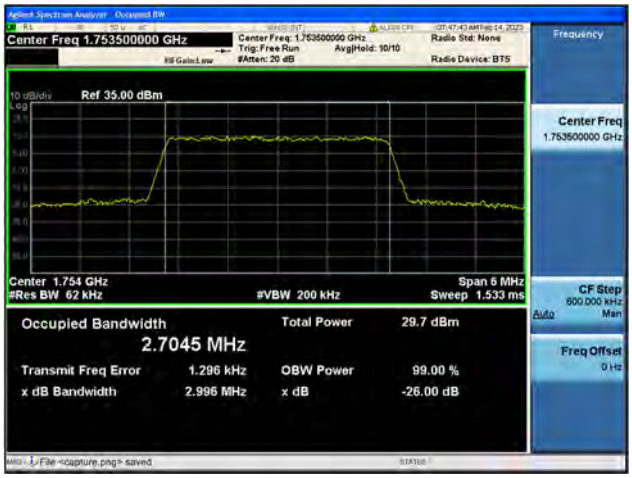
Band4 / 1.4MHz / 16QAM/ High CH



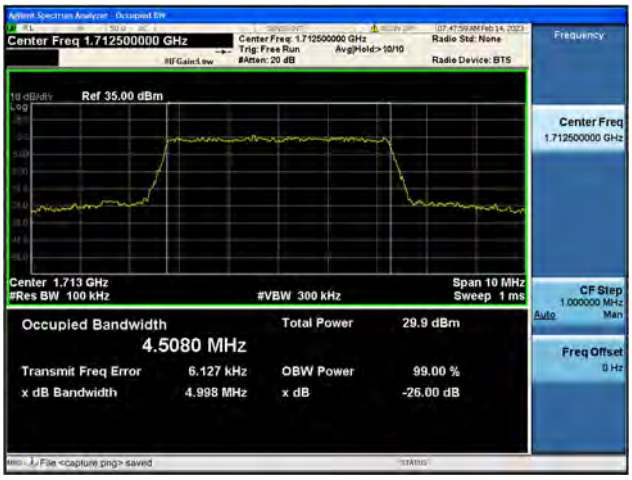
Band4 / 3MHz / 16QAM/ Low CH



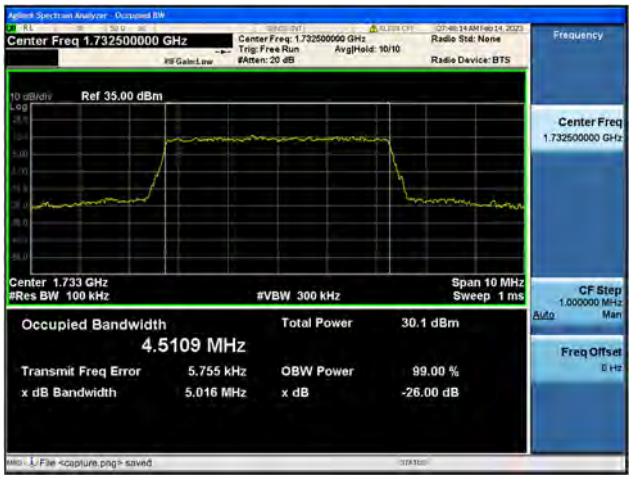
Band4 / 3MHz / 16QAM/ Mid CH



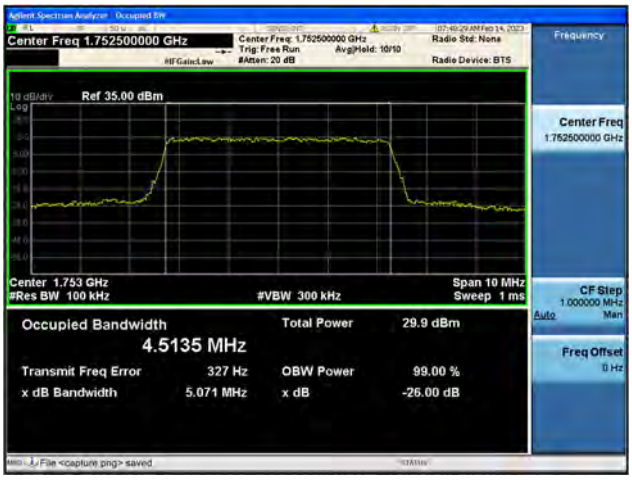
Band4 / 3MHz / 16QAM/ High CH



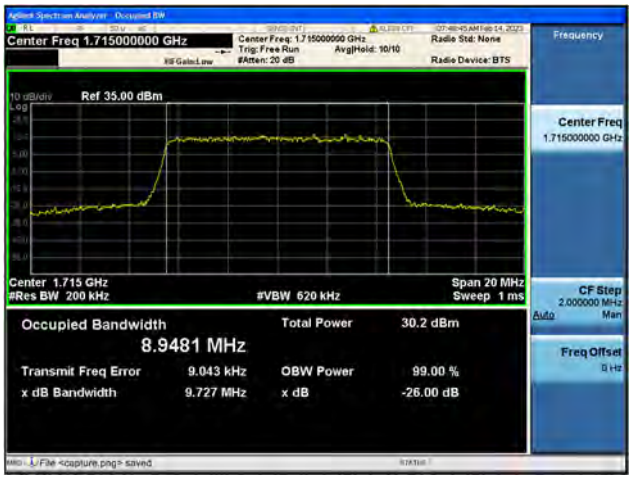
Band4 / 5MHz / 16QAM/ Low CH



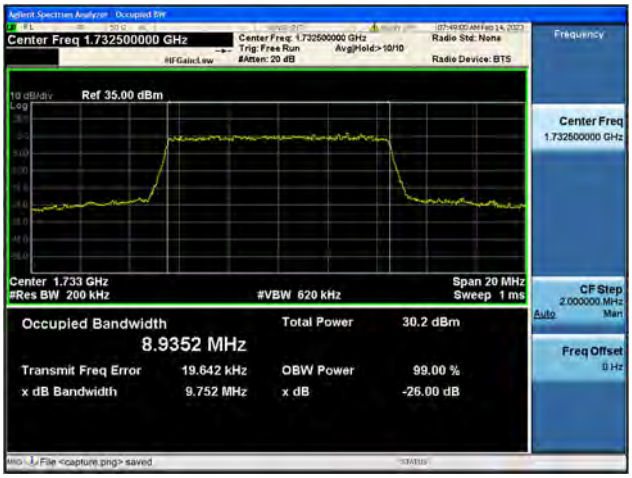
Band4 / 5MHz / 16QAM/ Mid CH



Band4 / 5MHz / 16QAM/ High CH

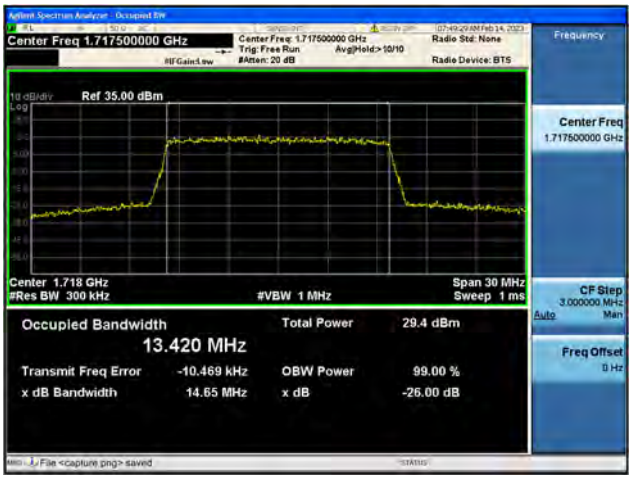


Band4 / 10MHz / 16QAM/ Low CH

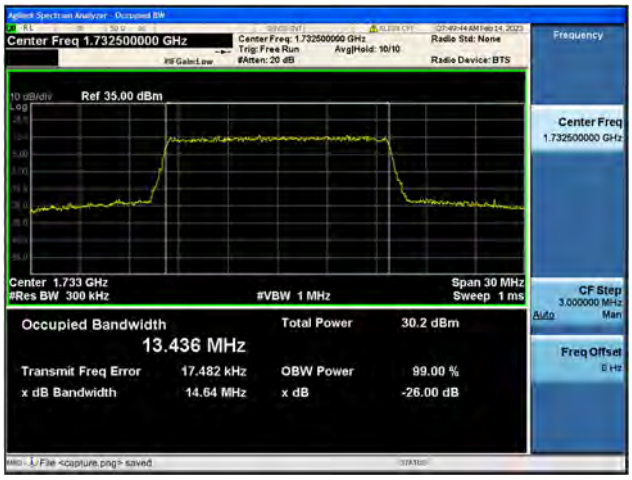


Band4 / 10MHz / 16QAM/ Mid CH

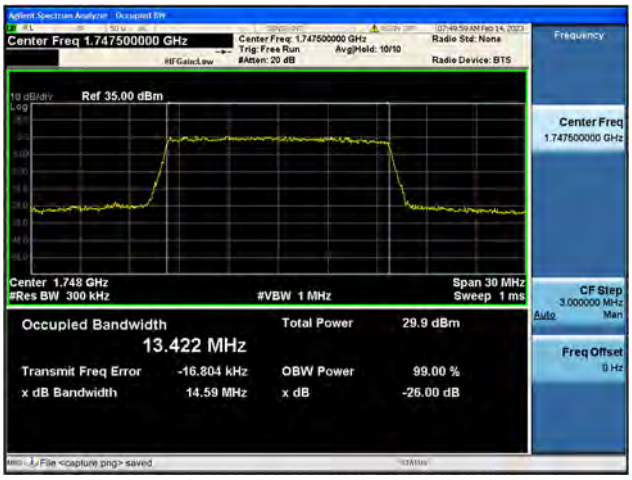
Band4 / 10MHz / 16QAM/ High CH



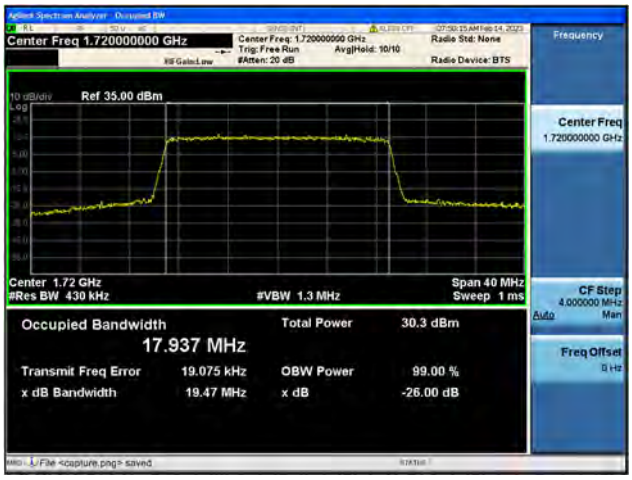
Band4 / 15MHz / 16QAM/ Low CH



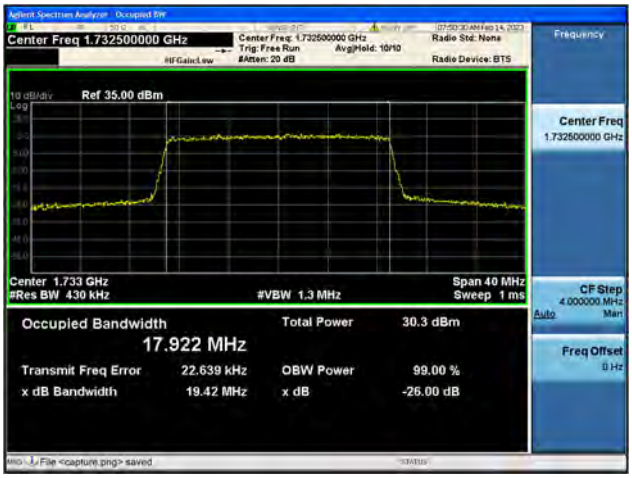
Band4 / 15MHz / 16QAM/ Mid CH



Band4 / 15MHz / 16QAM/ High CH

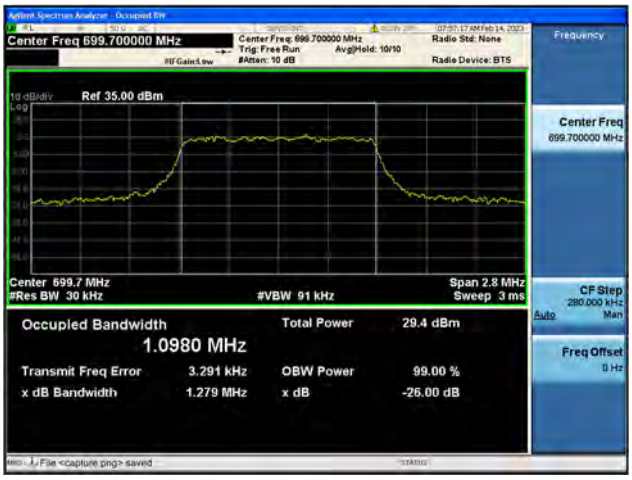


Band4 / 20MHz / 16QAM/ Low CH

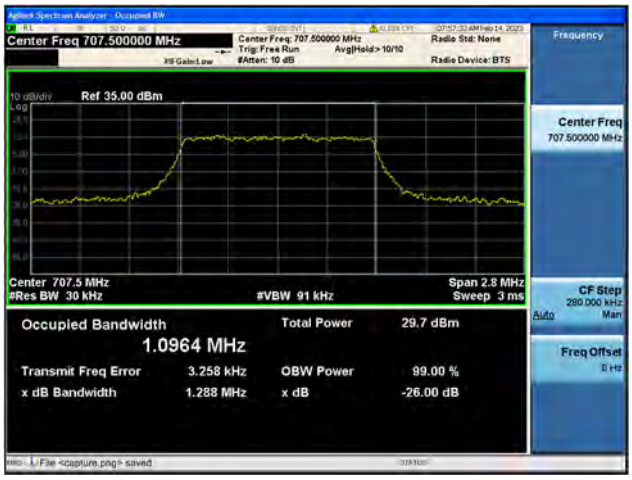


Band4 / 20MHz / 16QAM/ Mid CH

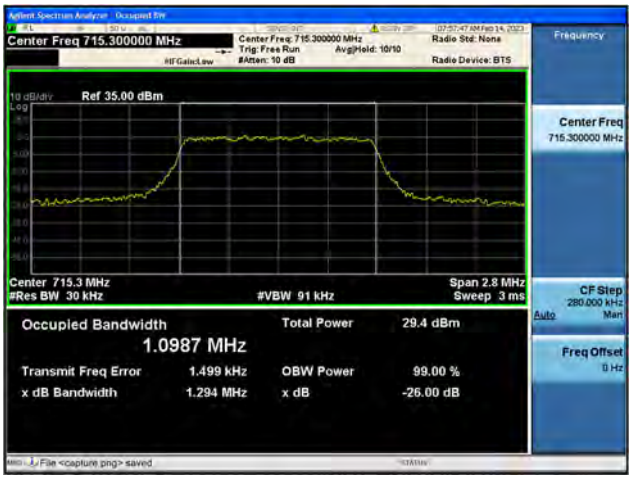
Band4 / 20MHz / 16QAM/ High CH



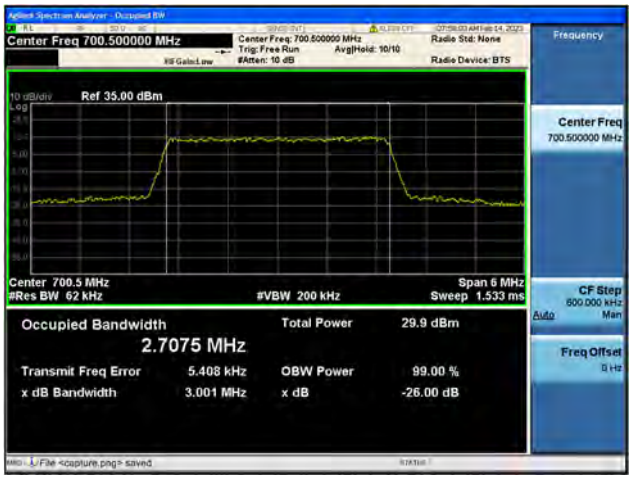
Band12 / 1.4MHz / 16QAM/ Low CH



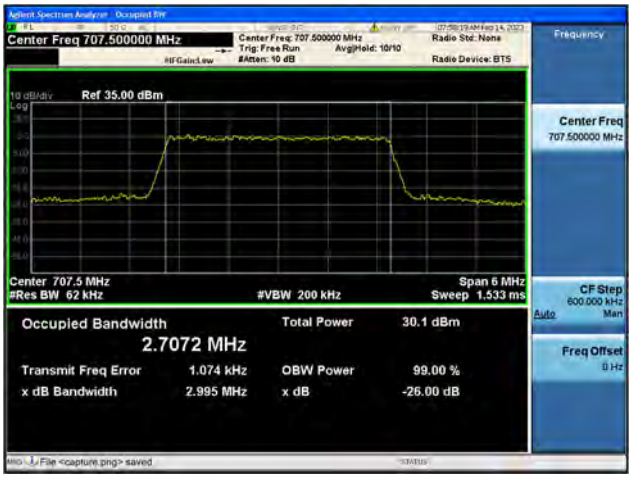
Band12 / 1.4MHz / 16QAM/ Mid CH



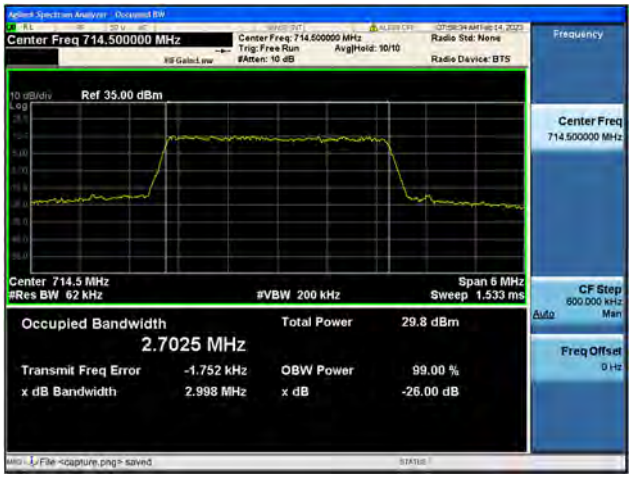
Band12 / 1.4MHz / 16QAM/ High CH



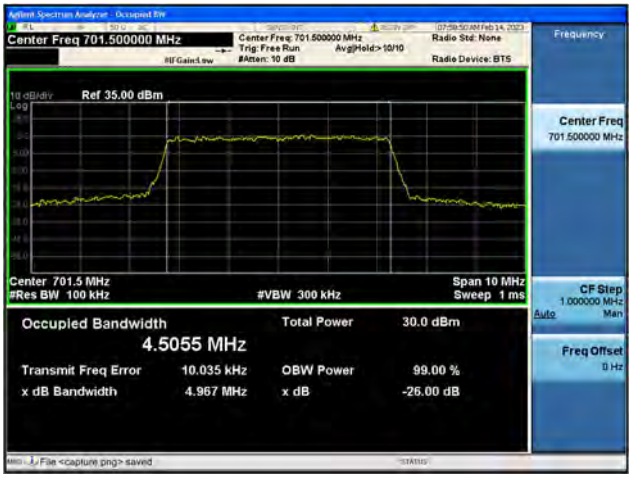
Band12 / 3MHz / 16QAM/ Low CH



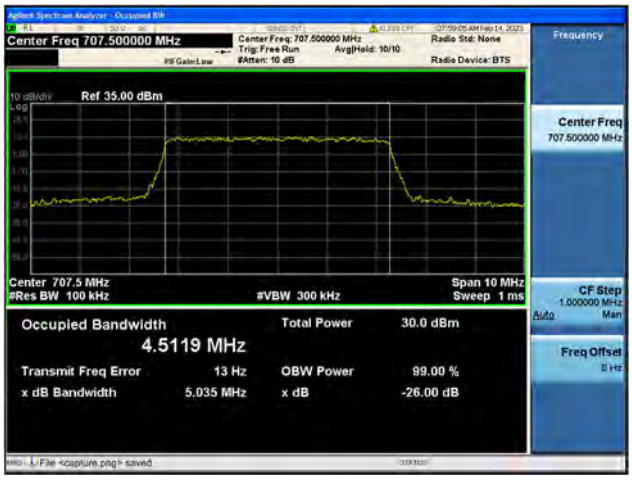
Band12 / 3MHz / 16QAM/ Mid CH



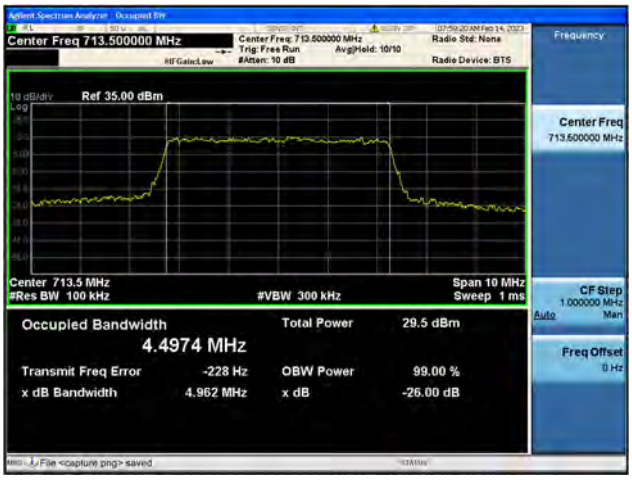
Band12 / 3MHz / 16QAM/ High CH



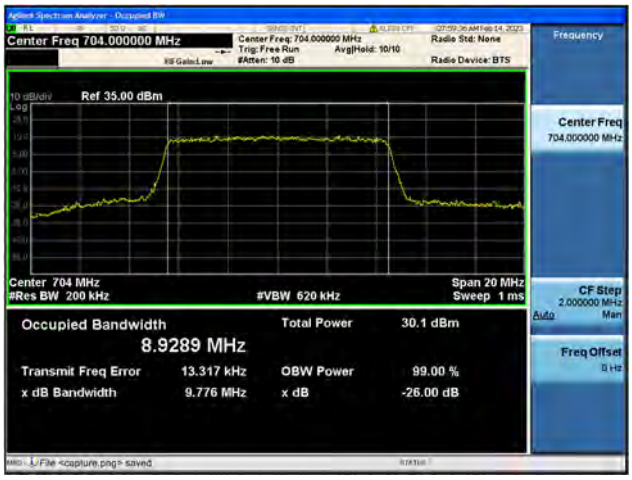
Band12 / 5MHz / 16QAM/ Low CH



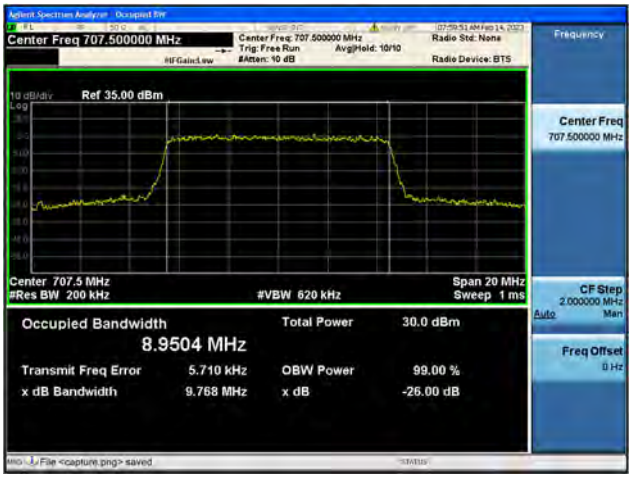
Band12 / 5MHz / 16QAM/ Mid CH



Band12 / 5MHz / 16QAM/ High CH



Band12 / 10MHz / 16QAM/ Low CH



Band12 / 10MHz / 16QAM/ Mid CH

Band12 / 10MHz / 16QAM/ High CH

2.3. Frequency Stability

2.3.1. Requirement

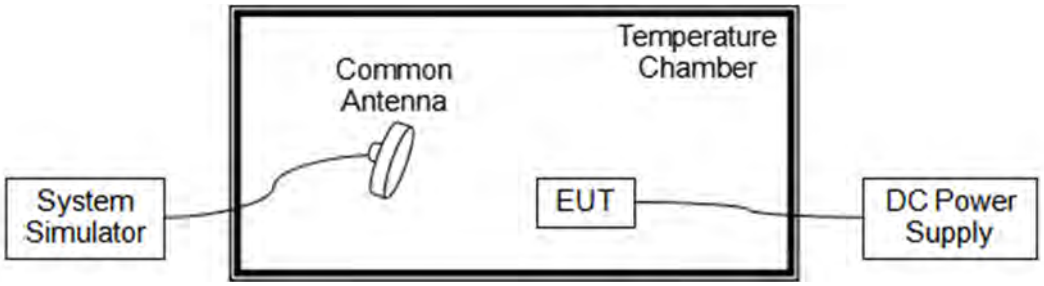
According to FCC section 2.1055, 24.235, 27.54, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. According to FCC section 2.1055, the test conditions are:

(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 0°C to 45°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 separately 3.85V, 4.40V and 3.00V, which are specified by the applicant; the normal temperature here used is 20°C.

LTE Band 2, 16QAM, Channel 18900, Frequency 1880.0MHz Limit =Within Authorized Band					
Voltage (%)	**Power (VDC)**	**Temp(°C)**	**Fre. Dev. (Hz)**	**Deviation (ppm)**	**Result**
Normal	3.85	+20(Ref)	20	0.011	PASS
Normal		0	46	0.024	
Normal		+10	14	0.007	
Normal		+20	13	0.007	
Normal		+30	-16	-0.009	
Normal		+40	47	0.025	
Normal		+45	50	0.027	
High	4.40	+20	29	0.015	
BATT.ENDPOINT	3.00	+20	26	0.014	

LTE Band 4, 16QAM, Channel 20175, Frequency 1732.5MHz Limit =Within Authorized Band					
Voltage (%)	**Power (VDC)**	**Temp(°C)**	**Fre. Dev. (Hz)**	**Deviation (ppm)**	**Result**
Normal	3.85	+20(Ref)	21	0.012	PASS
Normal		0	29	0.017	
Normal		+10	24	0.014	
Normal		+20	-22	-0.013	
Normal		+30	-23	-0.013	
Normal		+40	39	0.023	
Normal		+45	38	0.022	
High	4.40	+20	19	0.011	
BATT.ENDPOINT	3.00	+20	21	0.012	

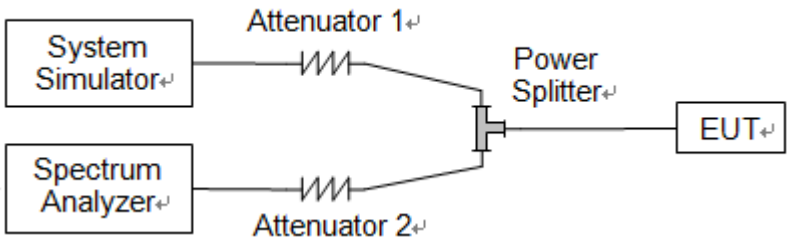
LTE Band 12, 16QAM, Channel 23095, Frequency 707.5MHz Limit =Within Authorized Band					
Voltage (%)	**Power (VDC)**	**Temp(°C)**	**Fre. Dev. (Hz)**	**Deviation (ppm)**	**Result**
Normal	3.85	+20(Ref)	42	0.059	PASS
Normal		0	46	0.065	
Normal		+10	24	0.034	
Normal		+20	42	0.059	
Normal		+30	-20	-0.028	
Normal		+40	-21	-0.030	
Normal		+45	-14	-0.020	
High	4.40	+20	17	0.024	
BATT.ENDPOINT	3.00	+20	21	0.030	

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	16QAM	5.54	<=13	PASS
	Mid	16QAM	5.75	<=13	PASS
	High	16QAM	4.60	<=13	PASS
3	Low	16QAM	5.67	<=13	PASS
	Mid	16QAM	5.94	<=13	PASS
	High	16QAM	5.07	<=13	PASS
5	Low	16QAM	5.71	<=13	PASS
	Mid	16QAM	5.87	<=13	PASS
	High	16QAM	5.53	<=13	PASS
10	Low	16QAM	5.80	<=13	PASS
	Mid	16QAM	5.95	<=13	PASS
	High	16QAM	5.88	<=13	PASS
15	Low	16QAM	5.77	<=13	PASS
	Mid	16QAM	5.86	<=13	PASS
	High	16QAM	5.86	<=13	PASS
20	Low	16QAM	5.92	<=13	PASS
	Mid	16QAM	5.80	<=13	PASS
	High	16QAM	6.02	<=13	PASS

LTE Band 4					
BW(MHz)	**Channel Level**	**Modulation**	**PAR Radio(dB)**	**Limit(dB)**	**Verdict**
1.4	Low	16QAM	5.94	<=13	PASS
	Mid	16QAM	6.17	<=13	PASS
	High	16QAM	6.03	<=13	PASS
3	Low	16QAM	6.05	<=13	PASS
	Mid	16QAM	6.38	<=13	PASS
	High	16QAM	6.08	<=13	PASS
5	Low	16QAM	6.10	<=13	PASS
	Mid	16QAM	6.22	<=13	PASS
	High	16QAM	5.99	<=13	PASS
10	Low	16QAM	5.99	<=13	PASS
	Mid	16QAM	6.15	<=13	PASS
	High	16QAM	5.83	<=13	PASS
15	Low	16QAM	5.99	<=13	PASS
	Mid	16QAM	6.13	<=13	PASS
	High	16QAM	5.74	<=13	PASS
20	Low	16QAM	6.04	<=13	PASS
	Mid	16QAM	6.12	<=13	PASS
	High	16QAM	5.90	<=13	PASS

Band2 / 1.4MHz / Low CH / 16QAM

Band2 / 1.4MHz / Mid CH / 16QAM

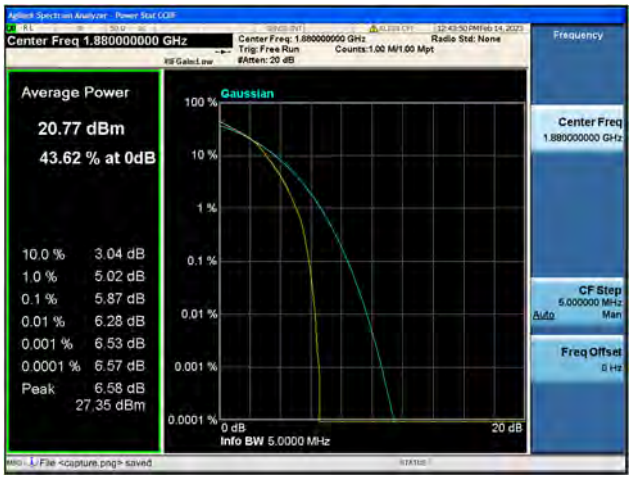
Band2 / 1.4MHz / High CH / 16QAM

Band2 / 3MHz / Low CH / 16QAM

Band2 / 3MHz / Mid CH / 16QAM

Band2 / 3MHz / High CH / 16QAM

Band2 / 5MHz / Low CH / 16QAM



Band2 / 5MHz / Mid CH / 16QAM

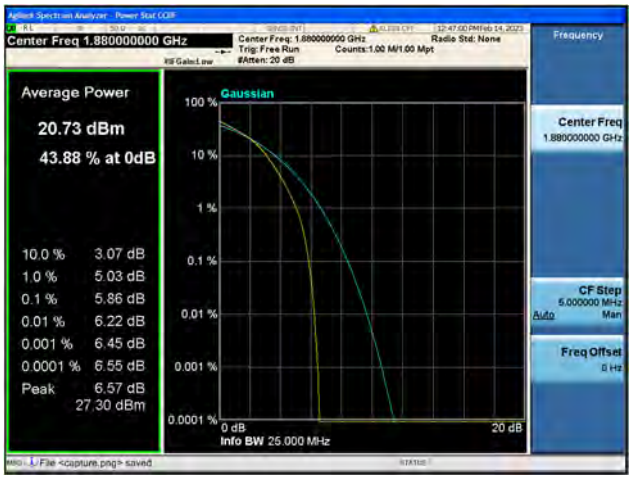
Band2 / 5MHz / High CH / 16QAM

Band2 / 10MHz / Low CH / 16QAM

Band2 / 10MHz / Mid CH / 16QAM

Band2 / 10MHz / High CH / 16QAM

Band2 / 15MHz / Low CH / 16QAM



Band2 / 15MHz / Mid CH / 16QAM

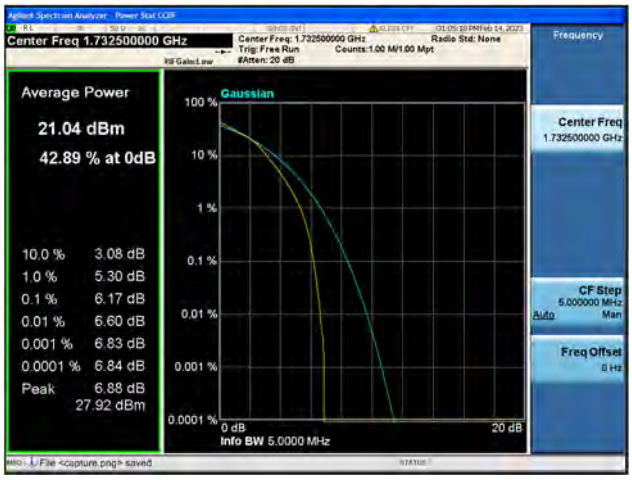
Band2 / 15MHz / High CH / 16QAM

Band2 / 20MHz / Low CH / 16QAM

Band2 / 20MHz / Mid CH / 16QAM

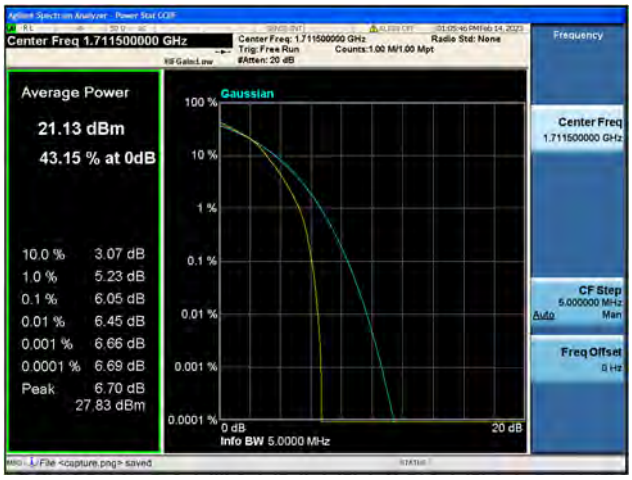
Band2 / 20MHz / High CH / 16QAM

Band4 / 1.4MHz / Low CH / 16QAM



Band4 / 1.4MHz / Mid CH / 16QAM

Band4 / 1.4MHz / High CH / 16QAM

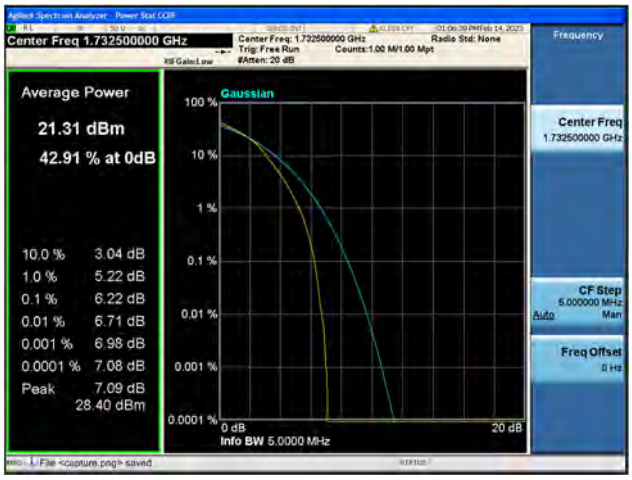


Band4 / 3MHz / Low CH / 16QAM

Band4 / 3MHz / Mid CH / 16QAM

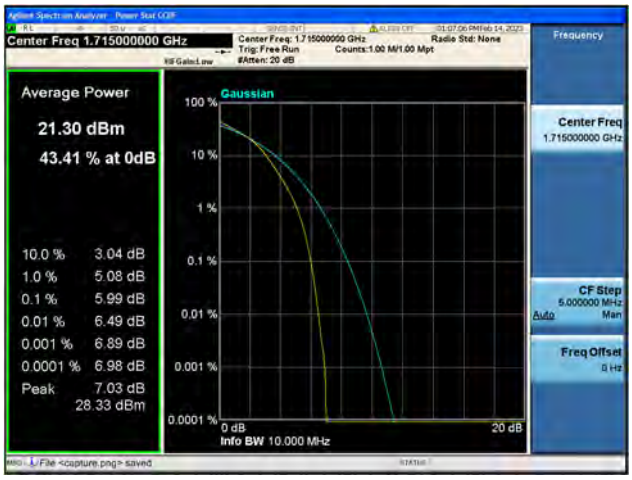
Band4 / 3MHz / High CH / 16QAM

Band4 / 5MHz / Low CH / 16QAM



Band4 / 5MHz / Mid CH / 16QAM

Band4 / 5MHz / High CH / 16QAM

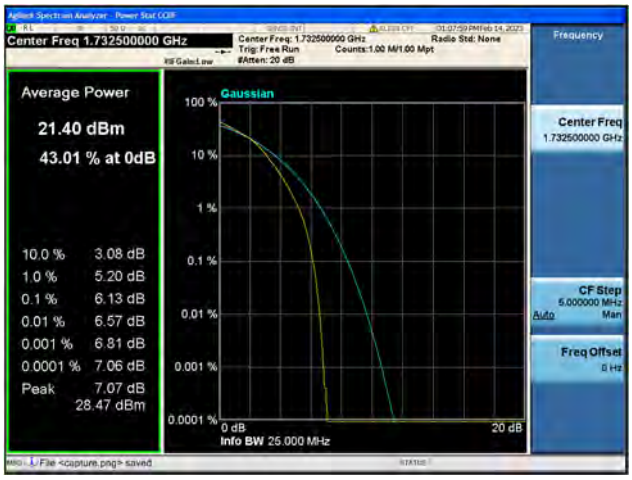


Band4 / 10MHz / Low CH / 16QAM

Band4 / 10MHz / Mid CH / 16QAM

Band4 / 10MHz / High CH / 16QAM

Band4 / 15MHz / Low CH / 16QAM



Band4 / 15MHz / Mid CH / 16QAM

Band4 / 15MHz / High CH / 16QAM

Band4 / 20MHz / Low CH / 16QAM

Band4 / 20MHz / Mid CH / 16QAM

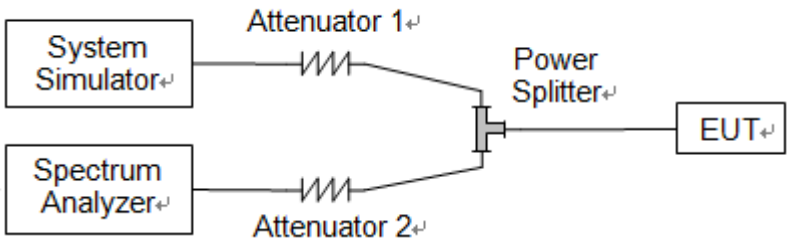
Band4 / 20MHz / High CH / 16QAM

2.5. Conducted Spurious Emissions

2.5.1. Requirement

According to FCC section 2.1051, the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43+10*log(P)dB. This calculated to be -13dBm.

2.5.2. Test Description

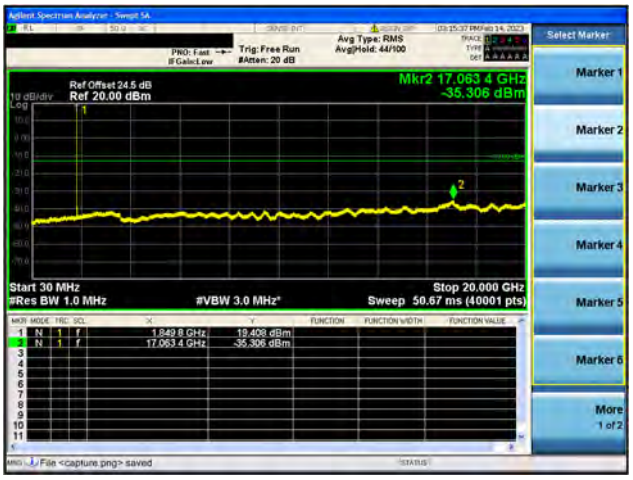


The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum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

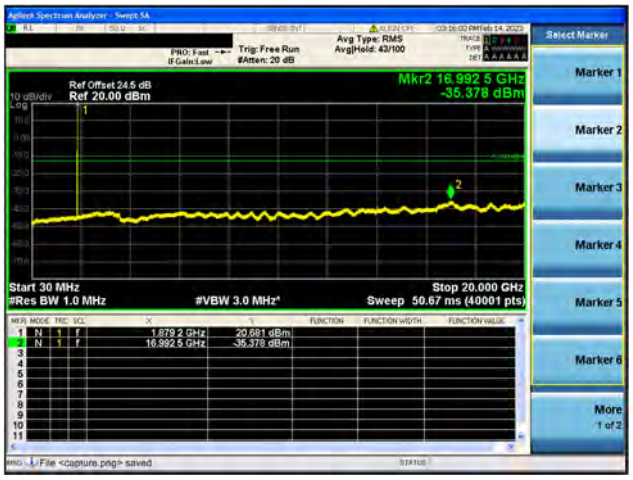
2.5.3. Test Procedure

KDB 971168 D01v03 Section 6.0 and ANSI/TIA-603-E-2016.

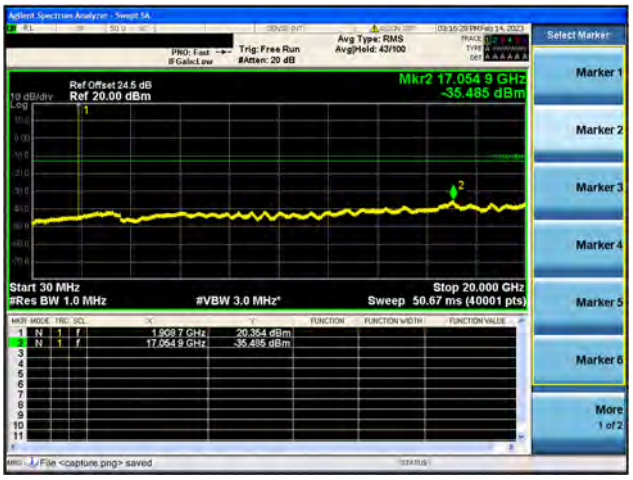
2.5.4. Test Result



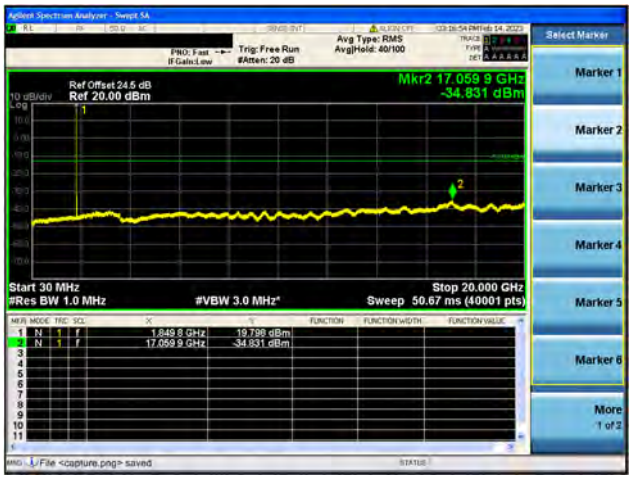
Band2 / 1.4MHz / Low CH / 16QAM



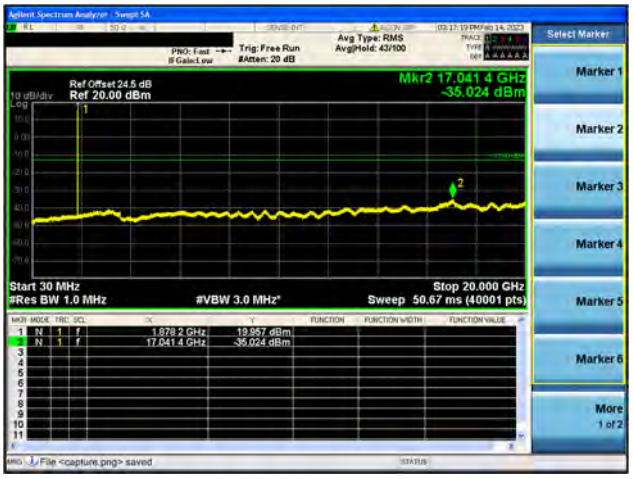
Band2 / 1.4MHz / Mid CH / 16QAM



Band2 / 1.4MHz / High CH / 16QAM

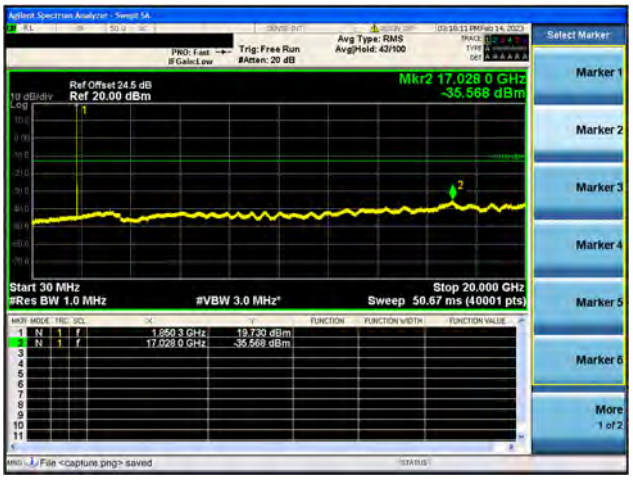


Band2 / 3MHz / Low CH / 16QAM

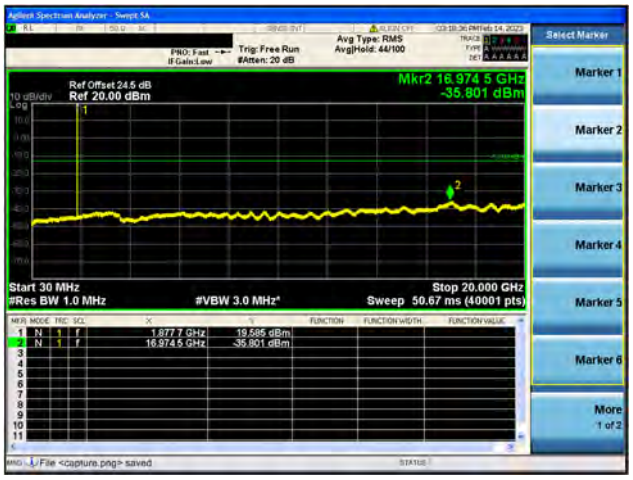


Band2 / 3MHz / Mid CH / 16QAM

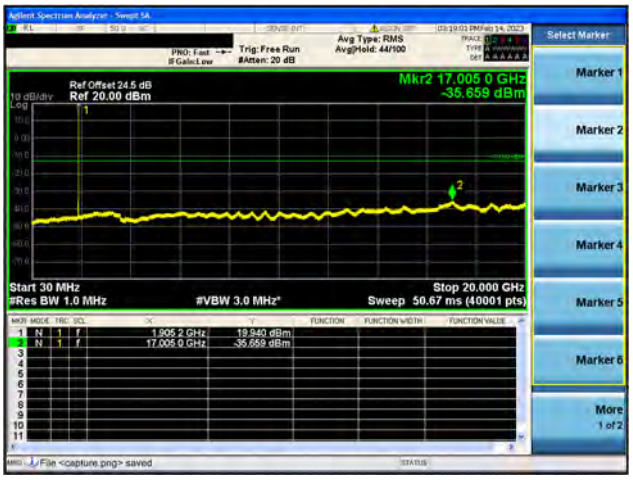
Band2 / 3MHz / High CH / 16QAM



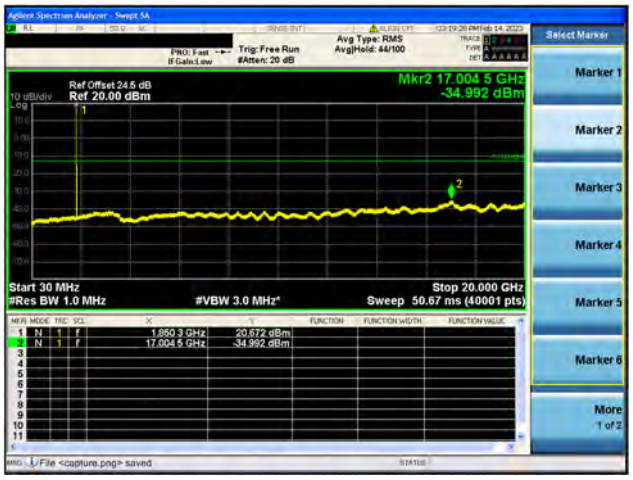
Band2 / 5MHz / Low CH / 16QAM



Band2 / 5MHz / Mid CH / 16QAM



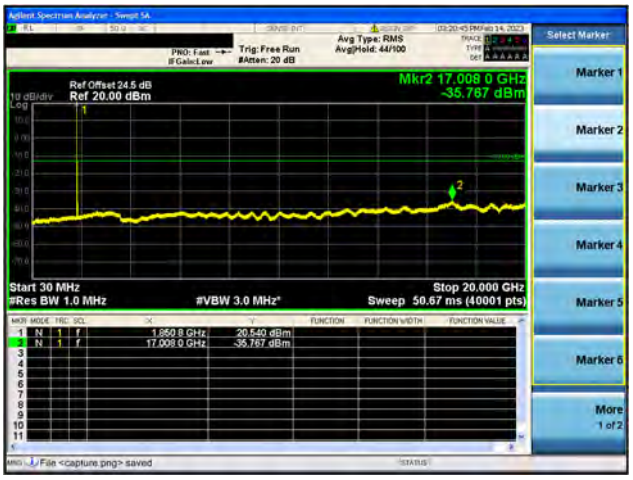
Band2 / 5MHz / High CH / 16QAM



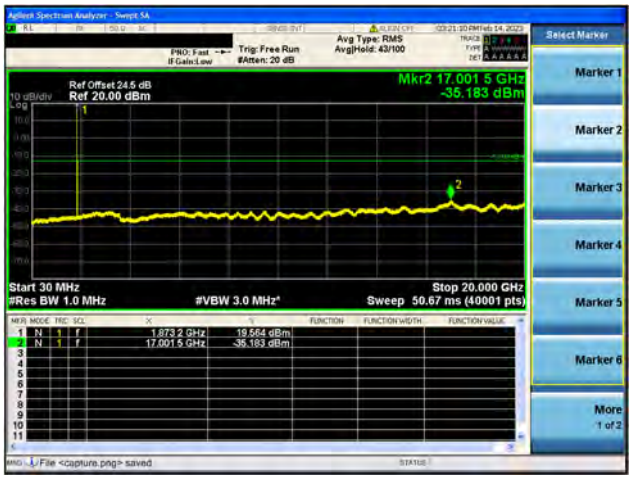
Band2 / 10MHz / Low CH / 16QAM

Band2 / 10MHz / Mid CH / 16QAM

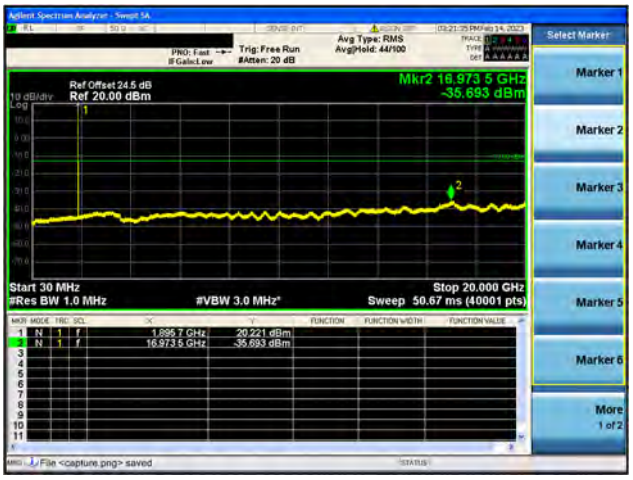
Band2 / 10MHz / High CH / 16QAM



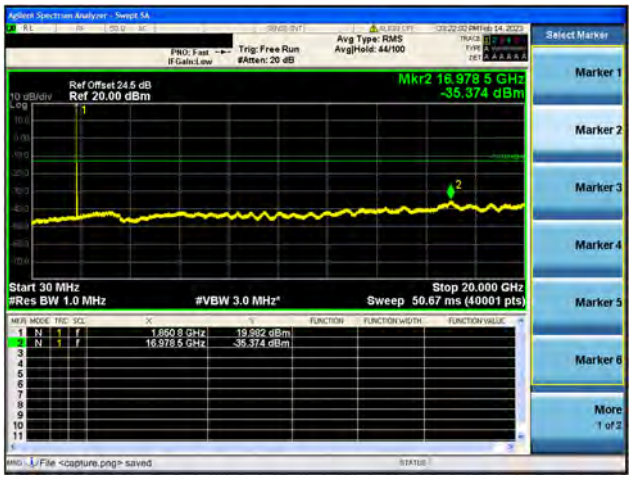
Band2 / 15MHz / Low CH / 16QAM



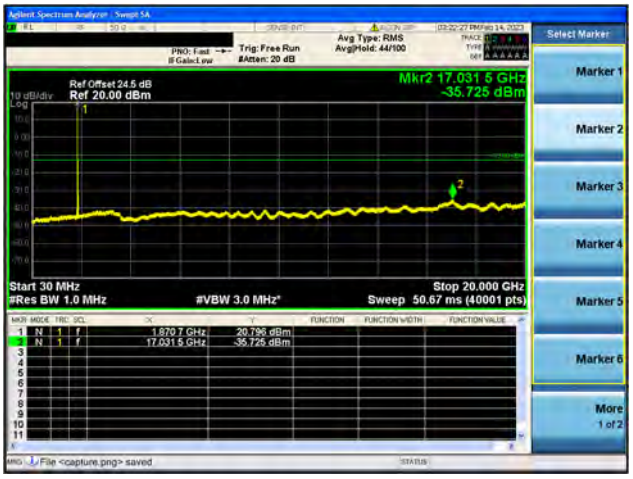
Band2 / 15MHz / Mid CH / 16QAM



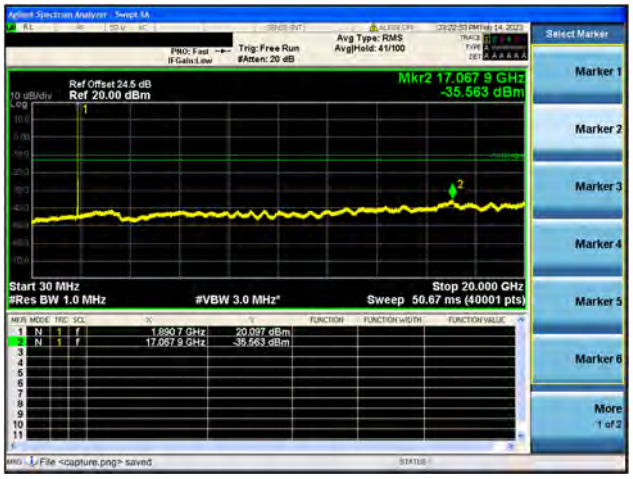
Band2 / 15MHz / High CH / 16QAM



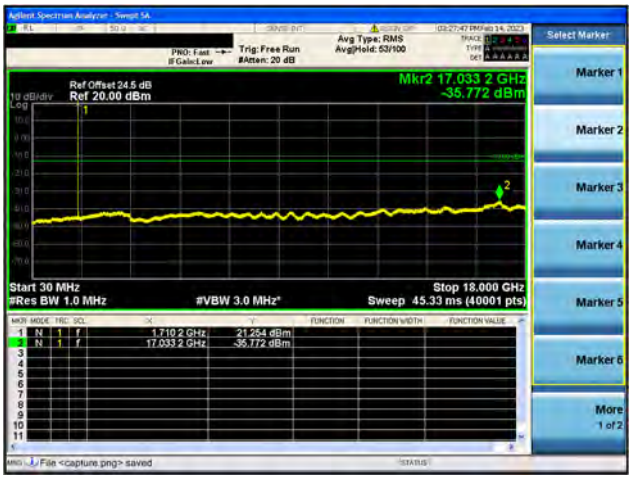
Band2 / 20MHz / Low CH / 16QAM



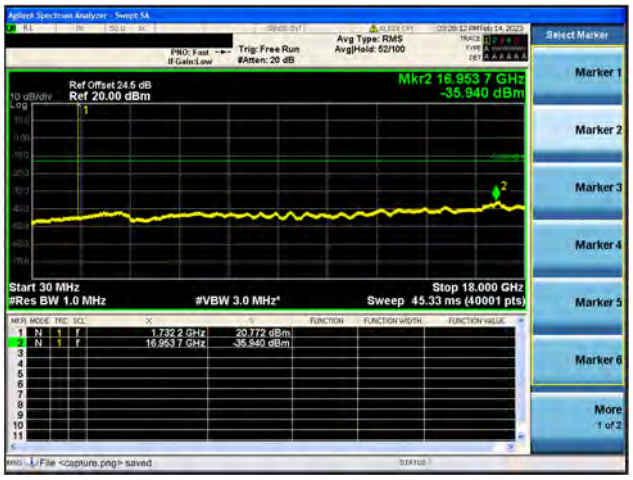
Band2 / 20MHz / Mid CH / 16QAM



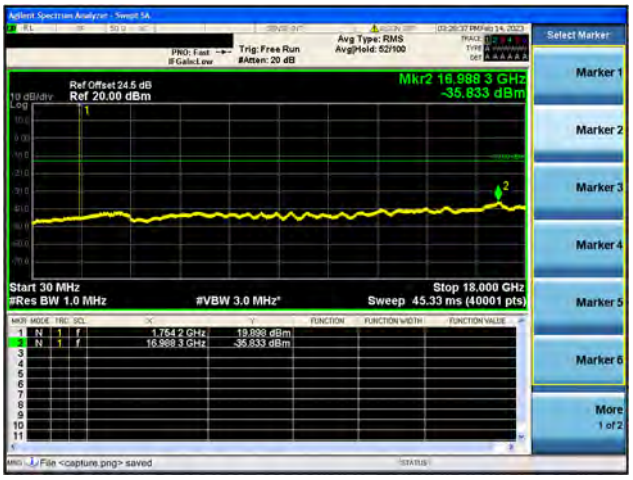
Band2 / 20MHz / High CH / 16QAM



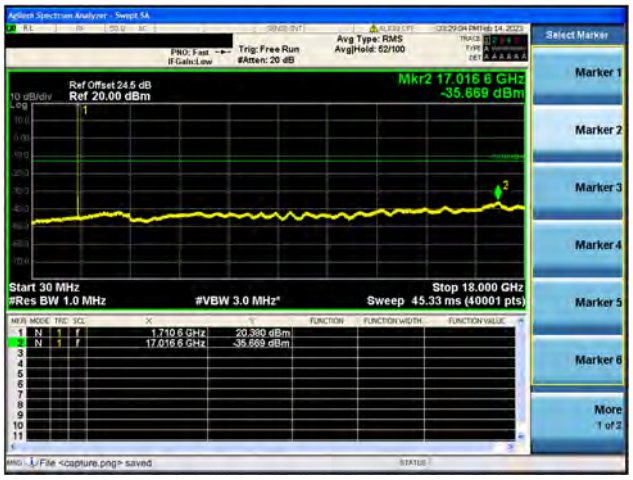
Band4 / 1.4MHz / Low CH / 16QAM



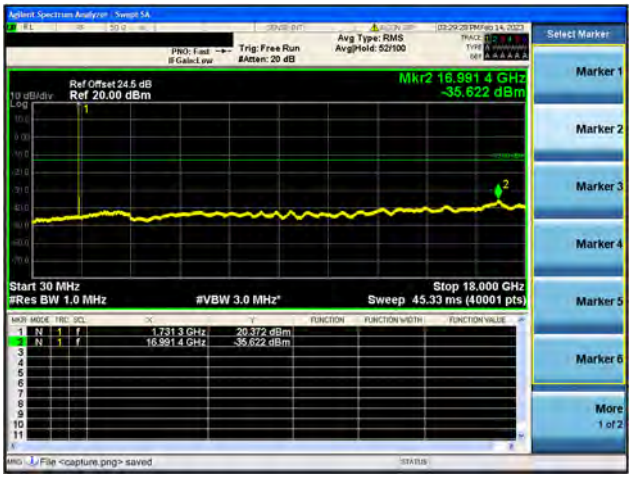
Band4 / 1.4MHz / Mid CH / 16QAM



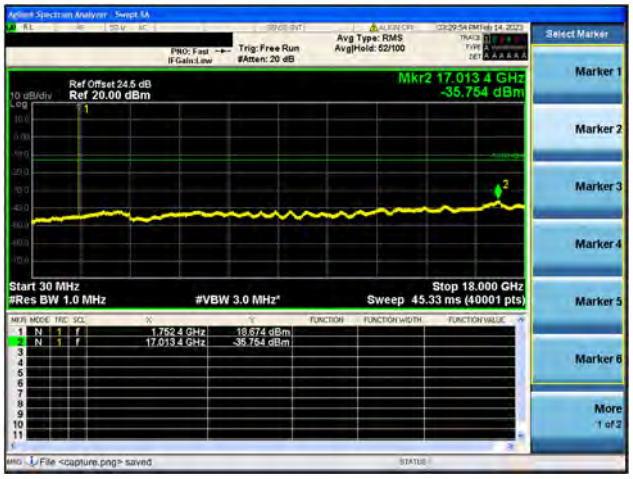
Band4 / 1.4MHz / High CH / 16QAM



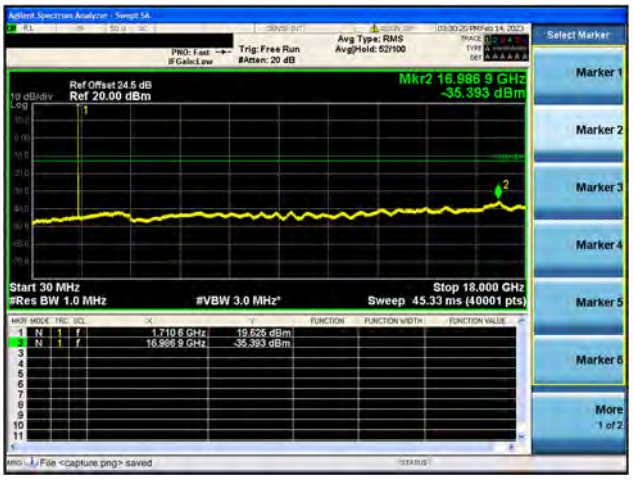
Band4 / 3MHz / Low CH / 16QAM



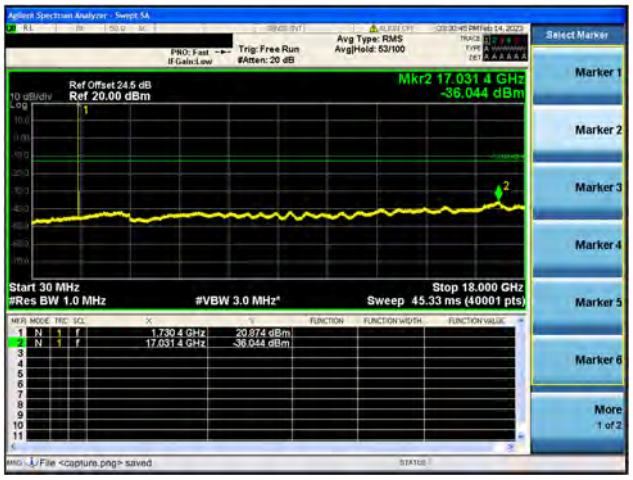
Band4 / 3MHz / Mid CH / 16QAM



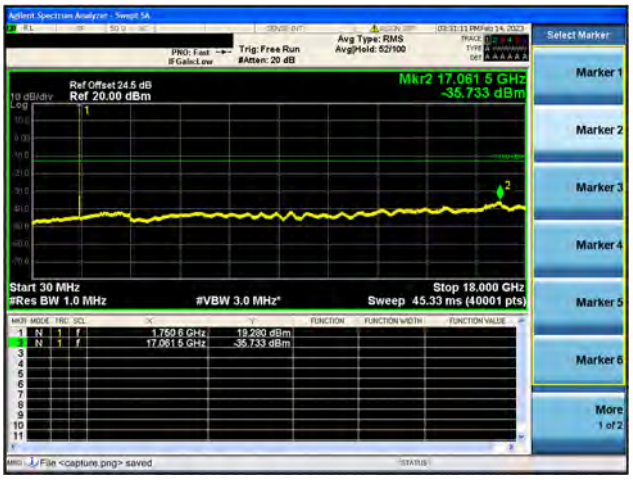
Band4 / 3MHz / High CH / 16QAM



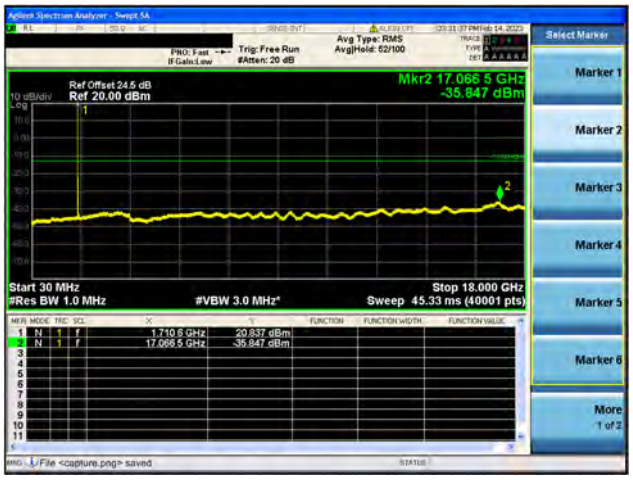
Band4 / 5MHz / Low CH / 16QAM



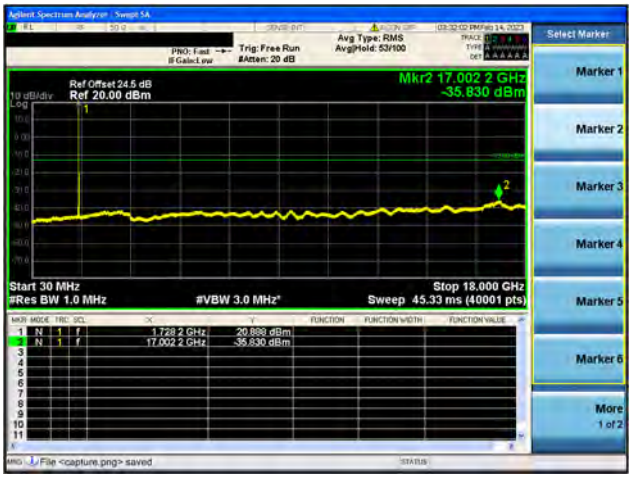
Band4 / 5MHz / Mid CH / 16QAM



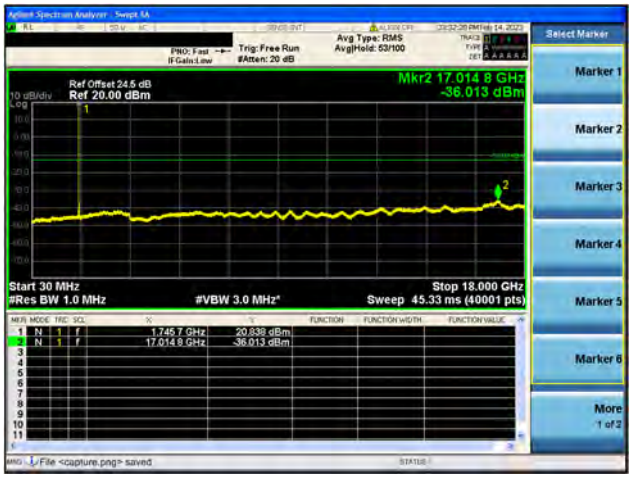
Band4 / 5MHz / High CH / 16QAM



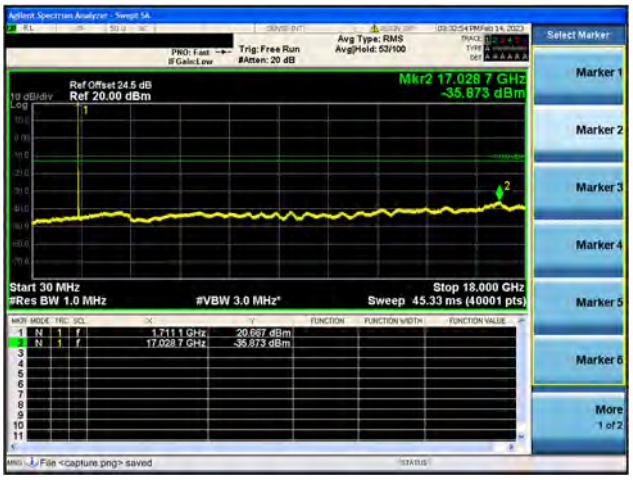
Band4 / 10MHz / Low CH / 16QAM



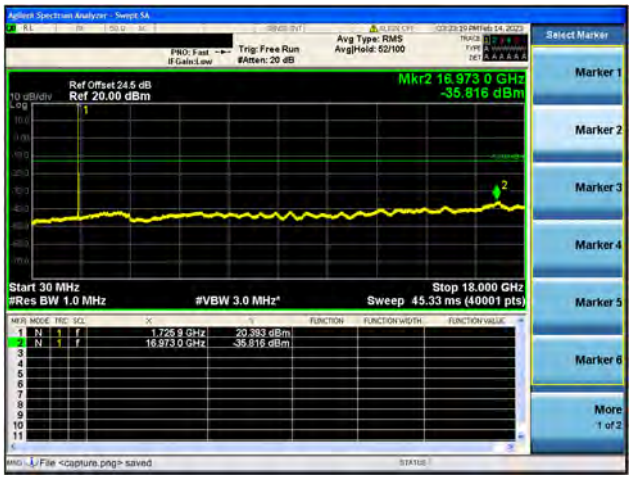
Band4 / 10MHz / Mid CH / 16QAM



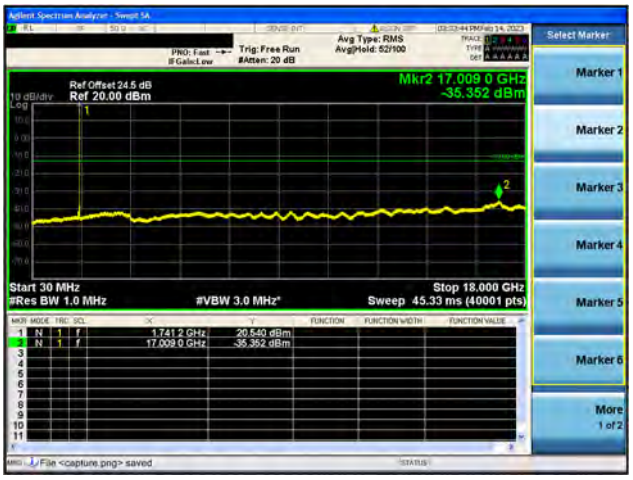
Band4 / 10MHz / High CH / 16QAM



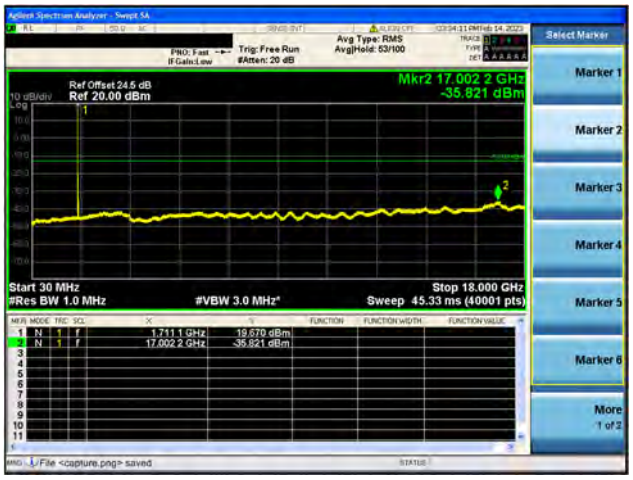
Band4 / 15MHz / Low CH / 16QAM



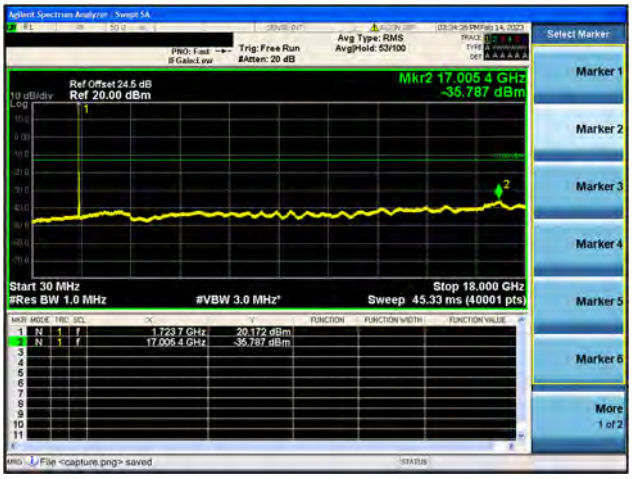
Band4 / 15MHz / Mid CH / 16QAM



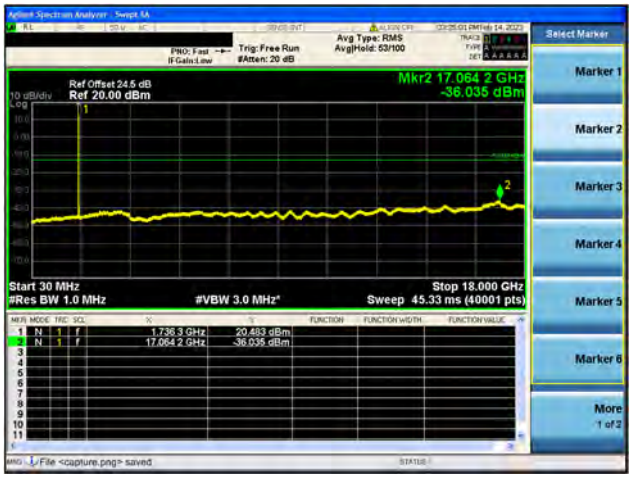
Band4 / 15MHz / High CH / 16QAM



Band4 / 20MHz / Low CH / 16QAM



Band4 / 20MHz / Mid CH / 16QAM



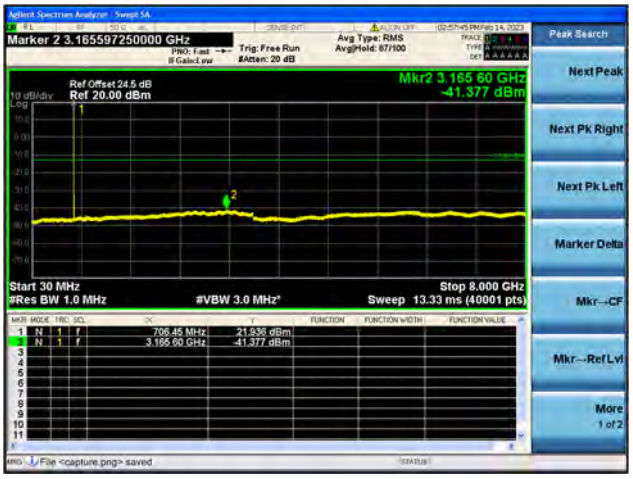
Band4 / 20MHz / High CH / 16QAM

Band12 / 1.4MHz / Low CH / 16QAM

Band12 / 1.4MHz / Mid CH / 16QAM

Band12 / 1.4MHz / High CH / 16QAM

Band12 / 3MHz / Low CH / 16QAM



Band12 / 3MHz / Mid CH / 16QAM

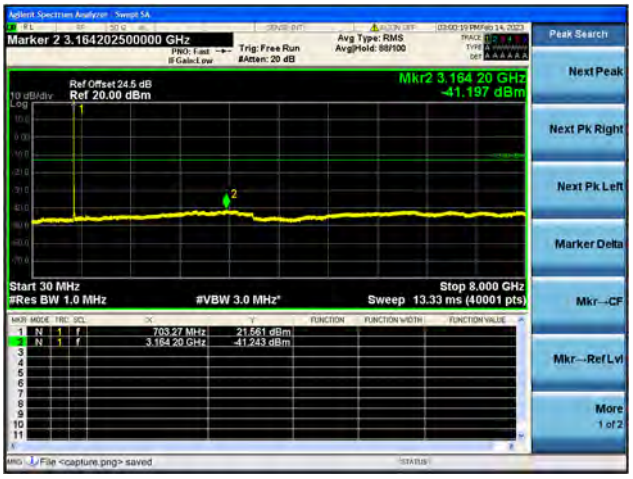
Band12 / 3MHz / High CH / 16QAM

Band12 / 5MHz / Low CH / 16QAM

Band12 / 5MHz / Mid CH / 16QAM

Band12 / 5MHz / High CH / 16QAM

Band12 / 10MHz / Low CH / 16QAM



Band12 / 10MHz / Mid CH / 16QAM

Band12 / 10MHz / High CH / 16QAM

2.6. Band Edge

2.6.1. Requirement

Band 2

According to FCC section 24.238(a), for operations in the 1850–1910MHz bands, the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB in a 1MHz bandwidth. However, in the 1 MHz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

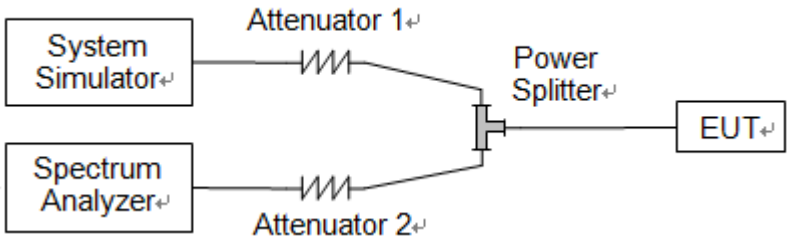
Band 4

According to FCC section 27.53(h), for operations in the 1710–1755MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 + 10 log10(P) dB a 1MHz bandwidth. However, in the 1 MHz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

Band 12

For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

2.6.2. 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.

2.6.3. Test Procedure

KDB 971168 D01v03 Section 6.0 and ANSI/TIA-603-E-2016.

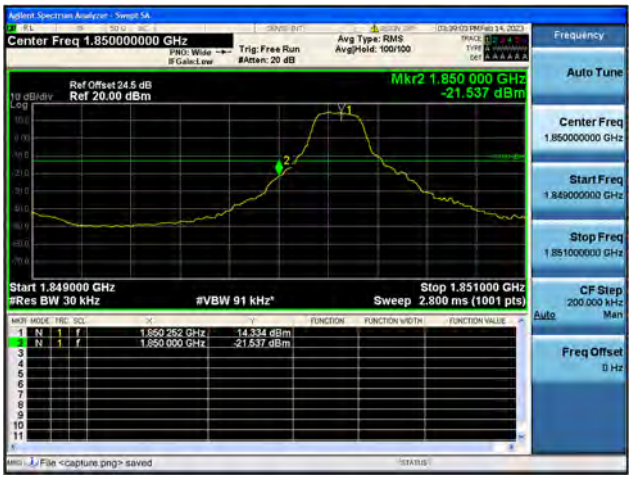
2.6.4. Test Result

Band2 / 1.4MHz / Low CH / 16QAM / 1 RB

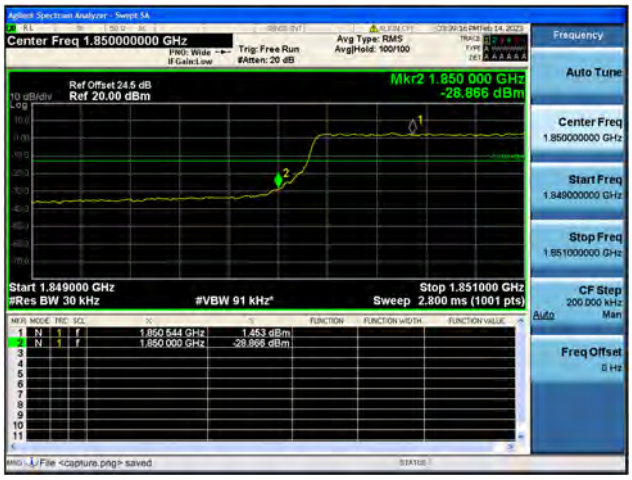
Band2 / 1.4MHz / Low CH / 16QAM / FULL RB

Band2 / 1.4MHz / High CH / 16QAM / 1 RB

Band2 / 1.4MHz / High CH / 16QAM / FULL RB

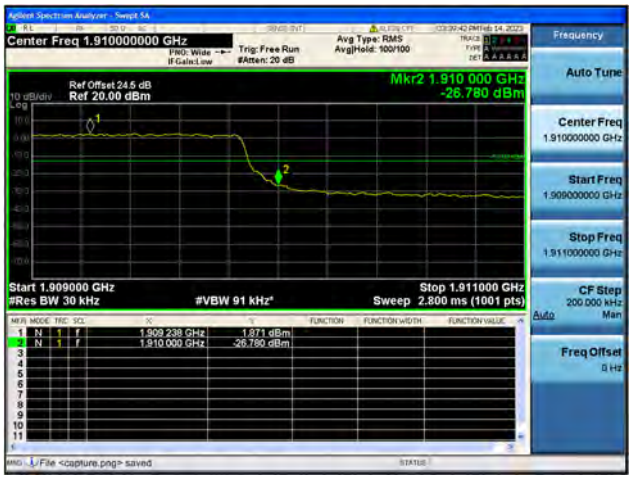


Band2 / 3MHz / Low CH / 16QAM / 1 RB



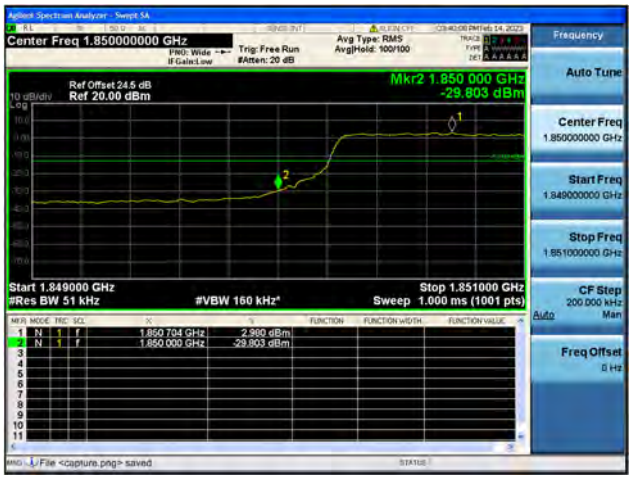
Band2 / 3MHz / Low CH / 16QAM / FULL RB

Band2 / 3MHz / High CH / 16QAM / 1 RB



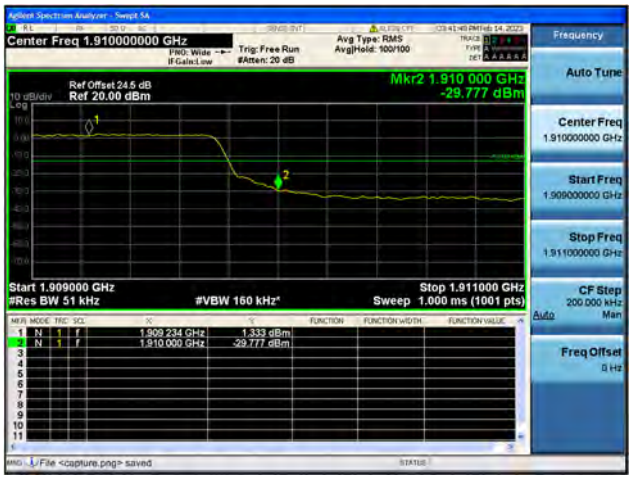
Band2 / 3MHz / High CH / 16QAM / FULL RB

Band2 / 5MHz / Low CH / 16QAM / 1 RB



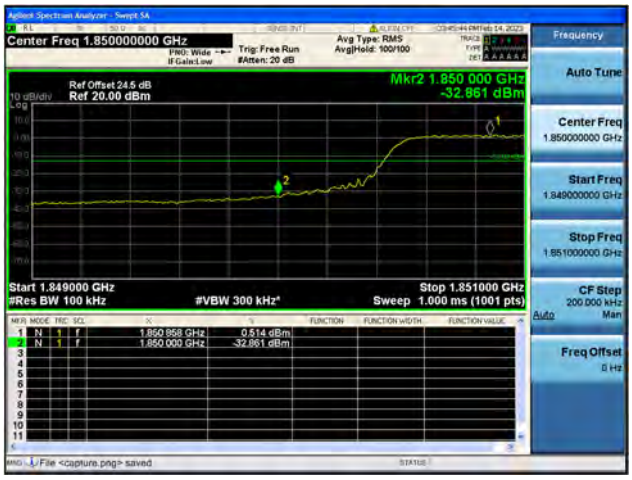
Band2 / 5MHz / Low CH / 16QAM / FULL RB

Band2 / 5MHz / High CH / 16QAM / 1 RB



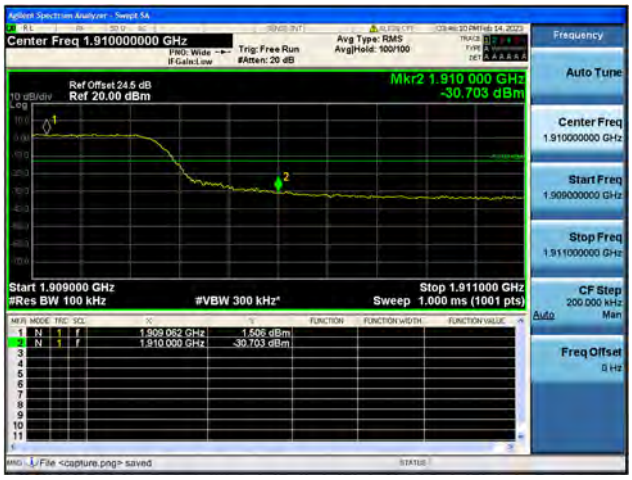
Band2 / 5MHz / High CH / 16QAM / FULL RB

Band2 / 10MHz / Low CH / 16QAM / 1 RB



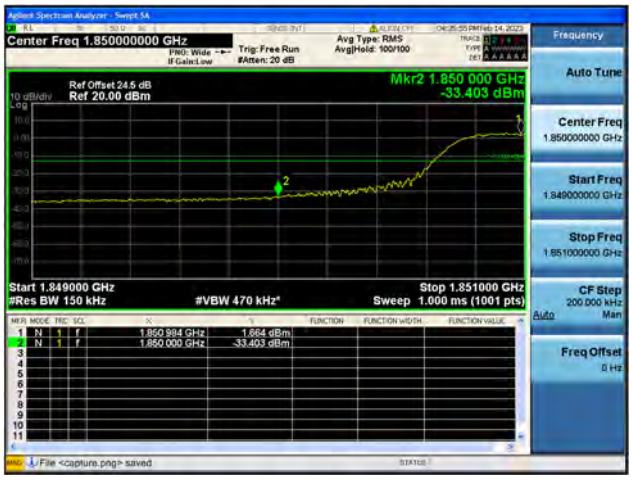
Band2 / 10MHz / Low CH / 16QAM / FULL RB

Band2 / 10MHz / High CH / 16QAM / 1 RB



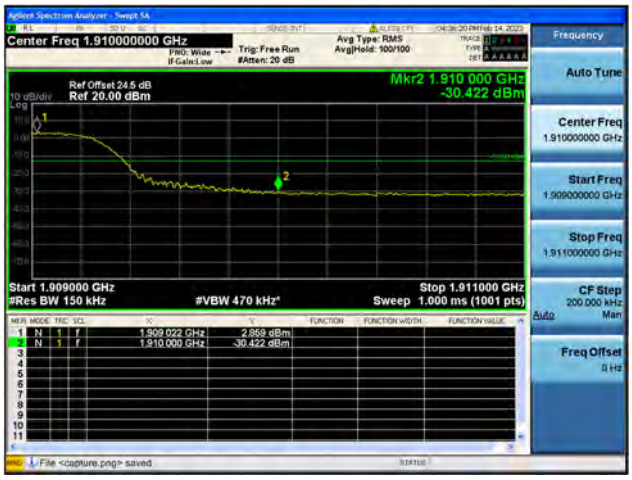
Band2 / 10MHz / High CH / 16QAM / FULL RB

Band2 / 15MHz / Low CH / 16QAM / 1 RB



Band2 / 15MHz / Low CH / 16QAM / FULL RB

Band2 / 15MHz / High CH / 16QAM / 1 RB

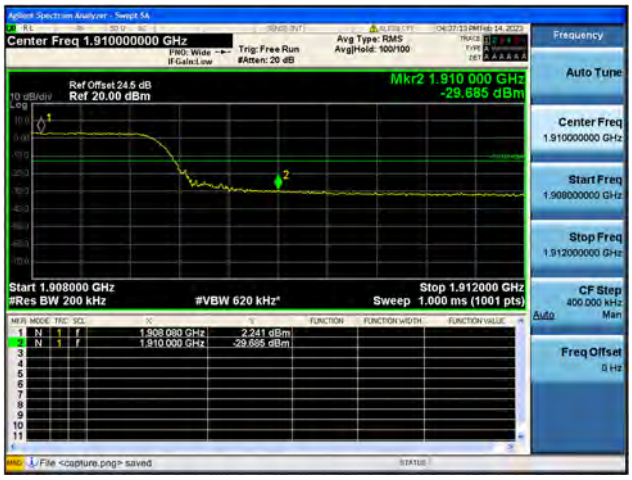


Band2 / 15MHz / High CH / 16QAM / FULL RB

Band2 / 20MHz / Low CH / 16QAM / 1 RB

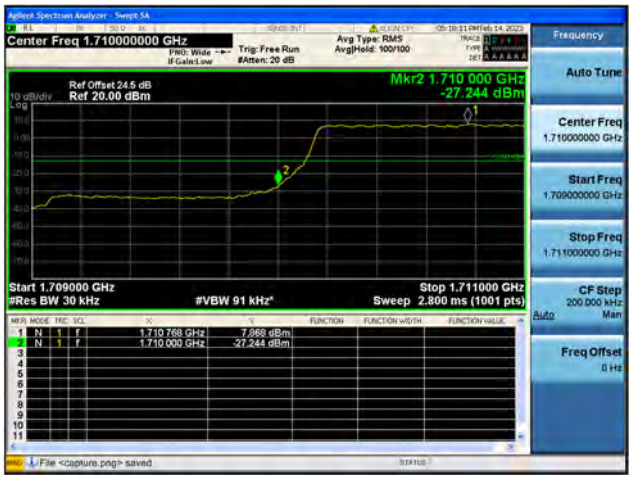
Band2 / 20MHz / Low CH / 16QAM / FULL RB

Band2 / 20MHz / High CH / 16QAM / 1 RB



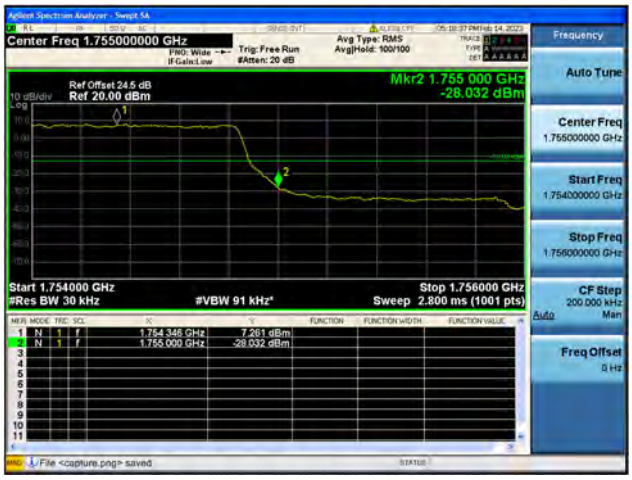
Band2 / 20MHz / High CH / 16QAM / FULL RB

Band4 / 1.4MHz / Low CH / 16QAM / 1 RB

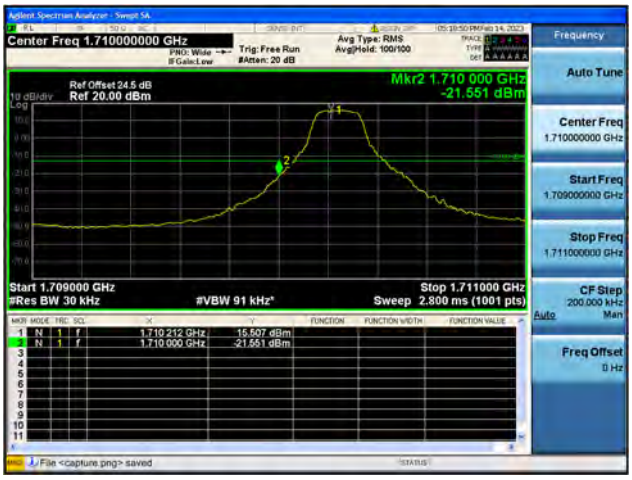


Band4 / 1.4MHz / Low CH / 16QAM / FULL RB

Band4 / 1.4MHz / High CH / 16QAM / 1 RB

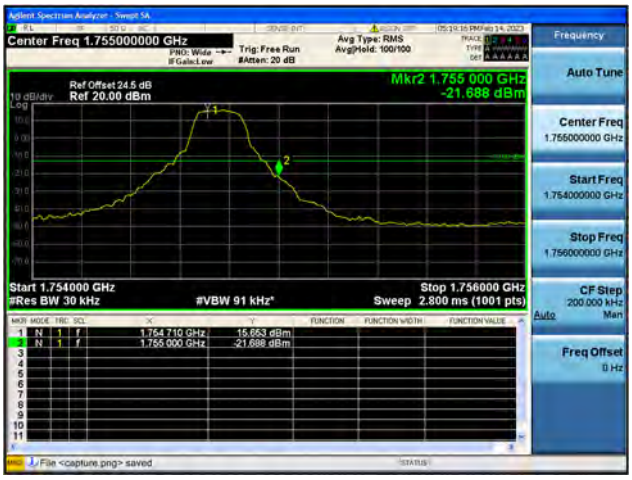


Band4 / 1.4MHz / High CH / 16QAM / FULL RB

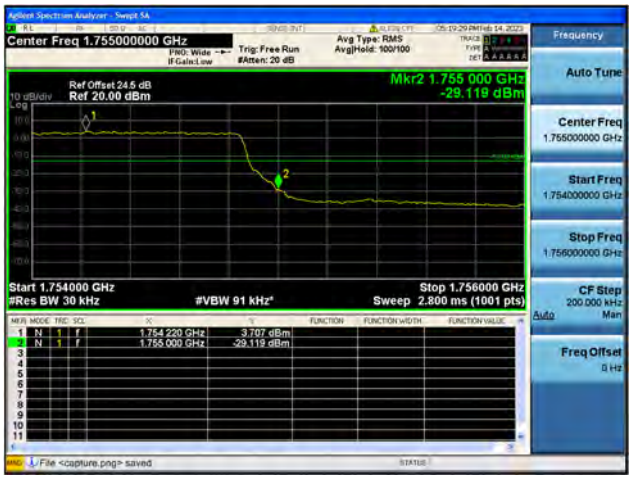


Band4 / 3MHz / Low CH / 16QAM / 1 RB

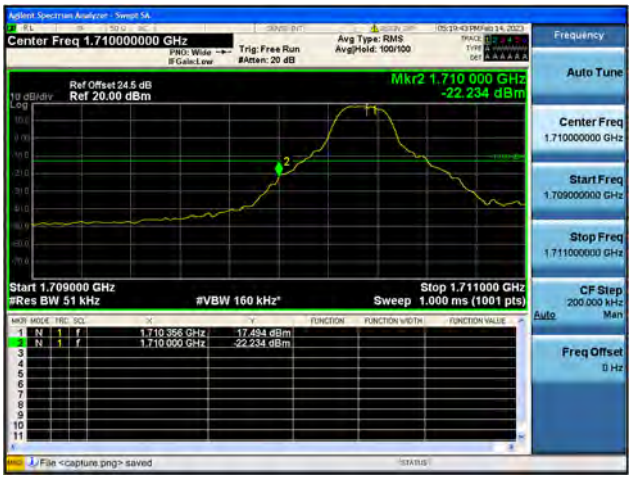
Band4 / 3MHz / Low CH / 16QAM / FULL RB



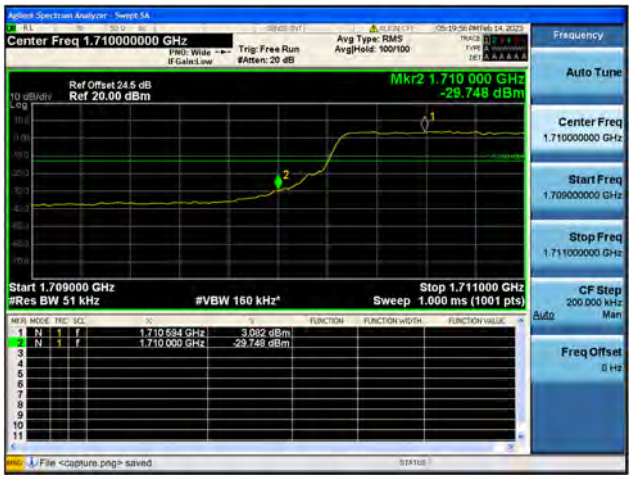
Band4 / 3MHz / High CH / 16QAM / 1 RB



Band4 / 3MHz / High CH / 16QAM / FULL RB

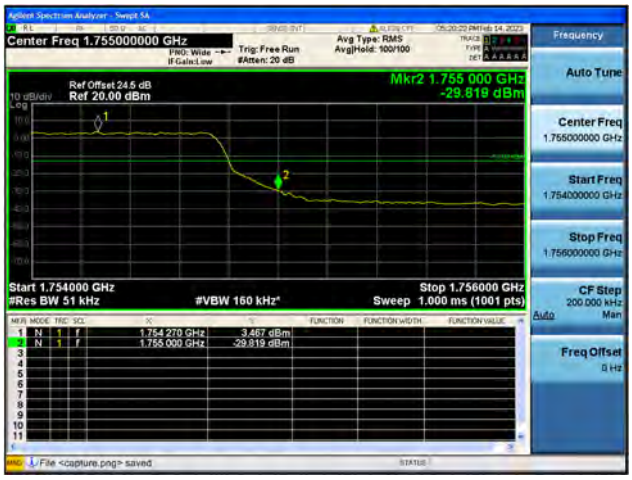


Band4 / 5MHz / Low CH / 16QAM / 1 RB



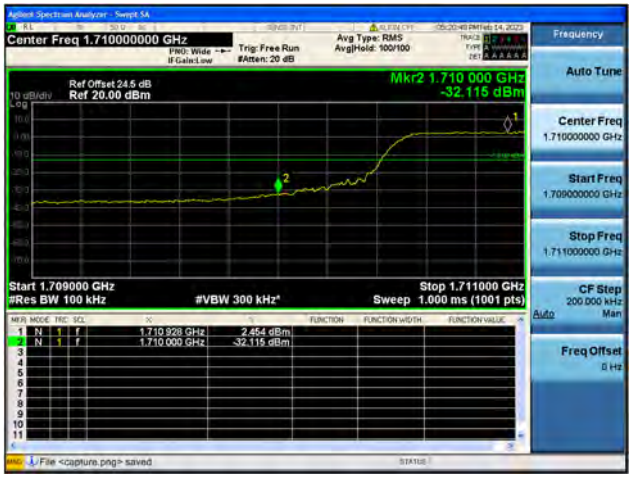
Band4 / 5MHz / Low CH / 16QAM / FULL RB

Band4 / 5MHz / High CH / 16QAM / 1 RB



Band4 / 5MHz / High CH / 16QAM / FULL RB

Band4 / 10MHz / Low CH / 16QAM / 1 RB



Band4 / 10MHz / Low CH / 16QAM / FULL RB

Band4 / 10MHz / High CH / 16QAM / 1 RB

Band4 / 10MHz / High CH / 16QAM / FULL RB

Band4 / 15MHz / Low CH / 16QAM / 1 RB

Band4 / 15MHz / Low CH / 16QAM / FULL RB

Band4 / 15MHz / High CH / 16QAM / 1 RB

Band4 / 15MHz / High CH / 16QAM / FULL RB

Band4 / 20MHz / Low CH / 16QAM / 1 RB

Band4 / 20MHz / Low CH / 16QAM / FULL RB

Band4 / 20MHz / High CH / 16QAM / 1 RB

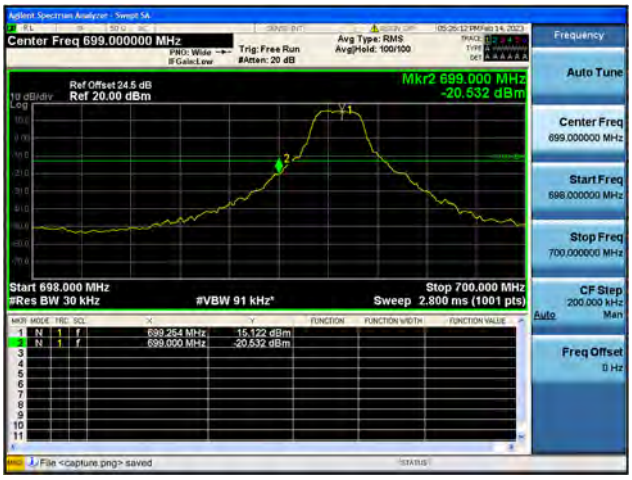
Band4 / 20MHz / High CH / 16QAM / FULL RB

Band12 / 1.4MHz / Low CH / 16QAM / 1 RB

Band12 / 1.4MHz / Low CH / 16QAM / FULL RB

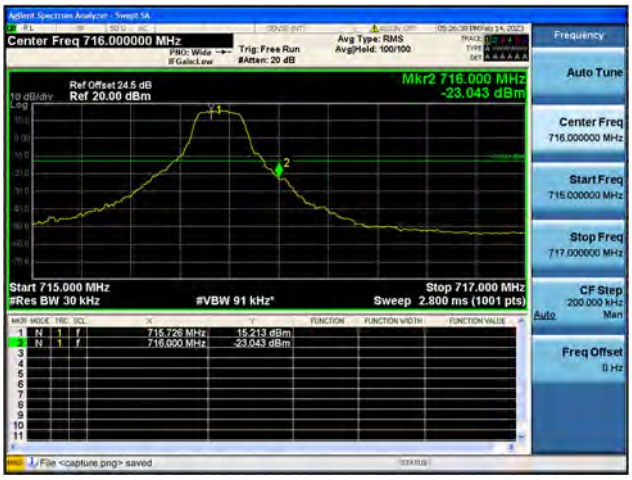
Band12 / 1.4MHz / High CH / 16QAM / 1 RB

Band12 / 1.4MHz / High CH / 16QAM / FULL RB

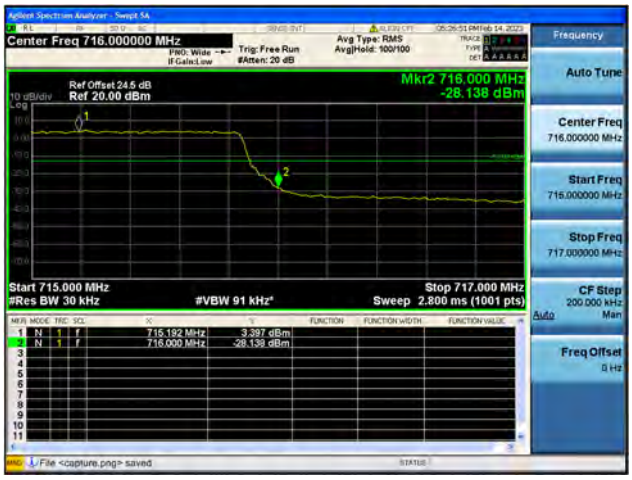


Band12 / 3MHz / Low CH / 16QAM / 1 RB

Band12 / 3MHz / Low CH / 16QAM / FULL RB

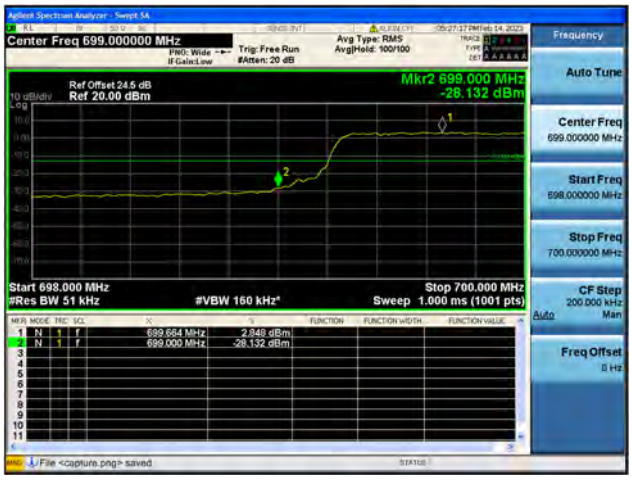


Band12 / 3MHz / High CH / 16QAM / 1 RB



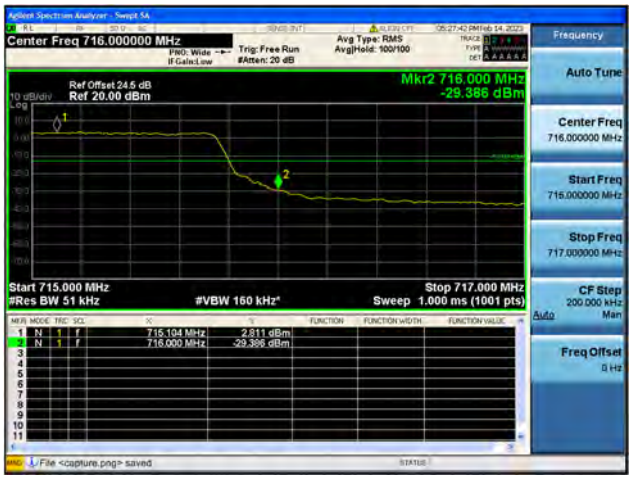
Band12 / 3MHz / High CH / 16QAM / FULL RB

Band12 / 5MHz / Low CH / 16QAM / 1 RB



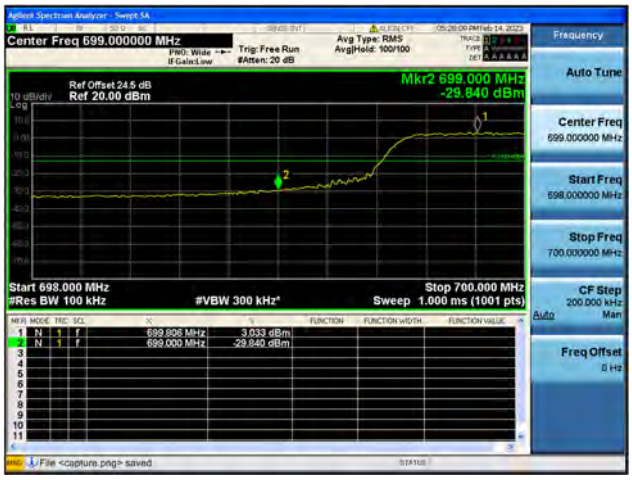
Band12 / 5MHz / Low CH / 16QAM / FULL RB

Band12 / 5MHz / High CH / 16QAM / 1 RB



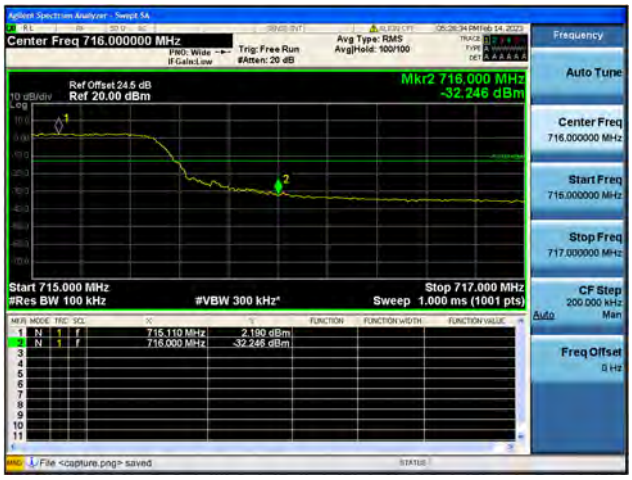
Band12 / 5MHz / High CH / 16QAM / FULL RB

Band12 / 10MHz / Low CH / 16QAM / 1 RB



Band12 / 10MHz / Low CH / 16QAM / FULL RB

Band12 / 10MHz / High CH / 16QAM / 1 RB



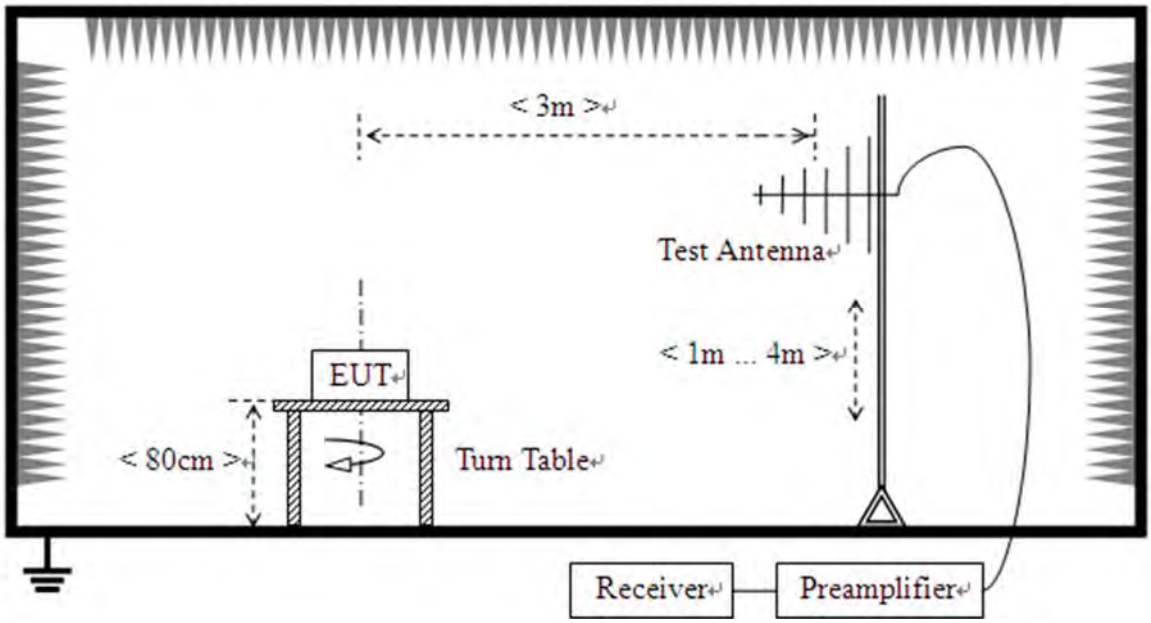
Band12 / 10MHz / High CH / 16QAM / FULL RB

2.7. Radiated Spurious Emissions

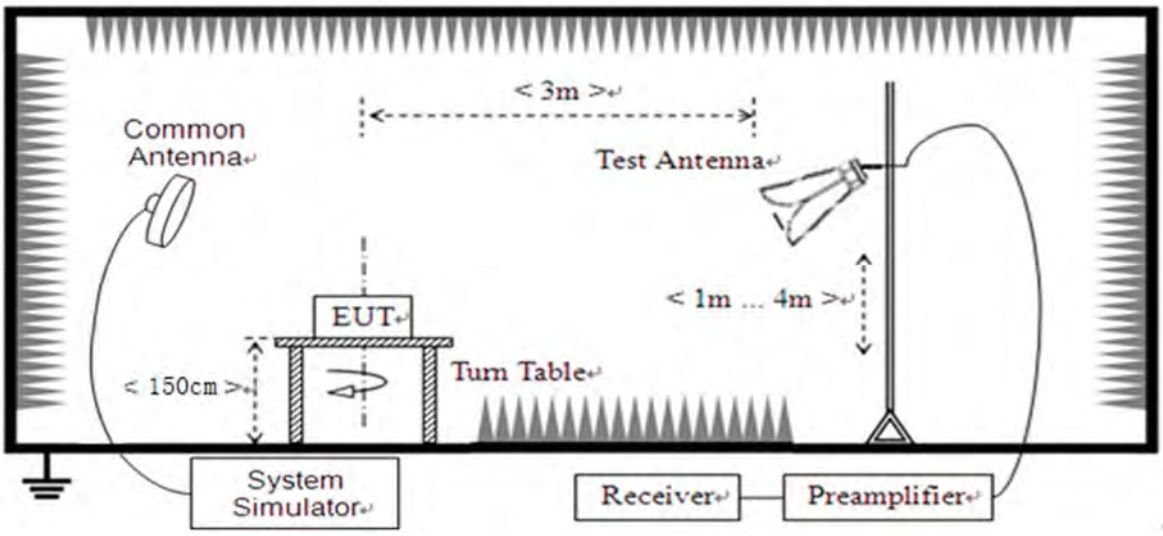
2.7.1. Requirement

According to FCC section 2.1051, the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43+10*log(P)dB. This calculated to be -13dBm.

2.7.2. Test Description



(For the test frequency from 30MHz to1GHz)



(For the test frequency above 1GHz)

The EUT is located in a 3m Full-Anechoic Chamber, the cable loss, air loss and so on of the site as factors are pre-calibrated using the "Substitution" method, and calculated to correct the reading.
A call is established between the EUT and the SS via a Common Antenna. The EUT is commanded by the SS to operate at the maximum and minimum output power, and only the test result of the maximum output power was recorded.
In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) and Horn Test Antenna (above 1GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground and the Turn Table is actuated to turn from 0° to 360°to determine the maximum value of the radiated power. The emission levels at both horizontal and vertical polarizations should be tested. The Filters consists of Notch Filters and High Pass Filter.

Note: When doing measurements above 1GHz, the EUT has been within the 3dB cone width of the horn antenna during horizontal antenna.

2.7.3. Test Procedure

KDB 971168 D01v03 Section 5.8 and ANSI/TIA-603-E-2016.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements.

For measurements above 1GHz the resolution bandwidth is set to 1MHz, the video band width is set to 3MHz for peak measurements.

2.7.4. Test Result

The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. The lowest, middle and highest channels are tested to verify the out of band emissions.

The substitution corrections are obtained as described below:

$A_{SUBST} = P_{SUBST_TX} - P_{SUBST_RX} - L_{SUBST_CABLES} + G_{SUBST_TX_ANT}$

$A_{TOT} = L_{CABLES} + A_{SUBST}$

Where A_{SUBST} is the final substitution correction including receive antenna gain.

P_{SUBST_TX} is signal generator level,

P_{SUBST_RX} is receiver level,

L_{SUBST_CABLES} is cable losses including TX cable,

$G_{SUBST_TX_ANT}$ is substitution antenna gain.

A_{TOT} is total correction factor including cable loss and substitution correction

During the test, the data of A_{TOT} was added in the test spectrum analyze, so spectrum analyze reading is the final values which contain the data of A_{TOT}.

Note1: The power of the EUT transmitting frequency should be ignored.

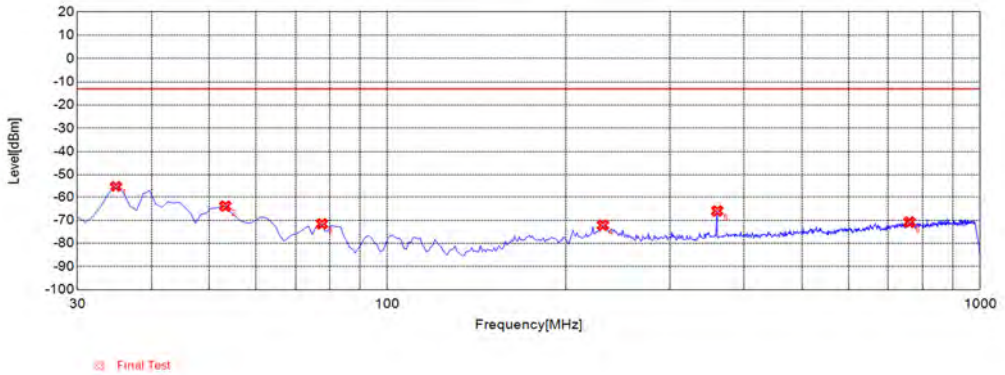
Note2: All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

Note3: All bandwidth and modulation were considered and evaluated respectively by performing full test for each band, only the worst cases (Max Bandwidth and 16QAM mode) were recorded in this test report.

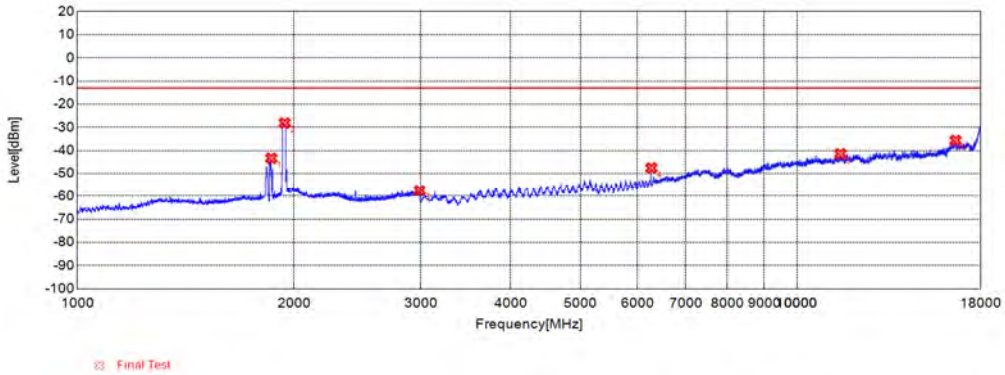
Note4: N/A means the frequency is the basic frequency or the base station frequency, they are no need to verdict.

Note5: The amplitude of emissions(18GHz to 10th harmonics) which are attenuated more than 20 dB below the limit are not be reported.

LTE Band 2, 20MHz BW, Low Channel, 16QAM

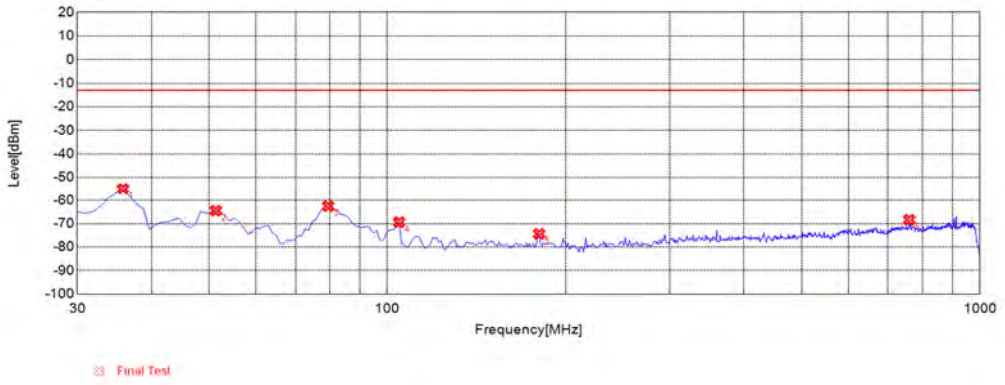


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	34.8550	-55.22	-13.00	Horizontal	PASS
2	53.3030	-63.96	-13.00	Horizontal	PASS
3	77.5780	-71.57	-13.00	Horizontal	PASS
4	230.9910	-72.17	-13.00	Horizontal	PASS
5	360.1300	-66	-13.00	Horizontal	PASS
6	760.1700	-70.82	-13.00	Horizontal	PASS

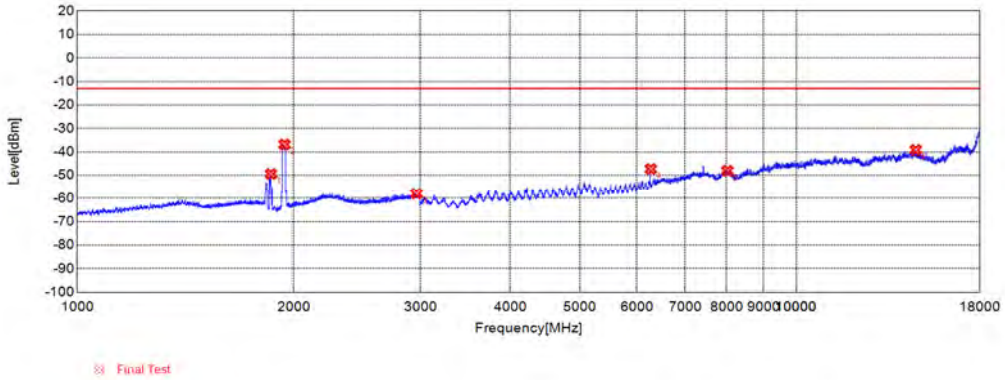


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	1859.6200	-43.37	-13.00	Horizontal	N/A
2	1941.6470	-28.15	-13.00	Horizontal	N/A
3	2989.3300	-57.58	-13.00	Horizontal	PASS
4	6275.5460	-47.59	-13.00	Horizontal	PASS
5	11488.9150	-41.43	-13.00	Horizontal	PASS
6	16609.7680	-35.65	-13.00	Horizontal	PASS

LTE Band 2, 20MHz BW, Low Channel, 16QAM

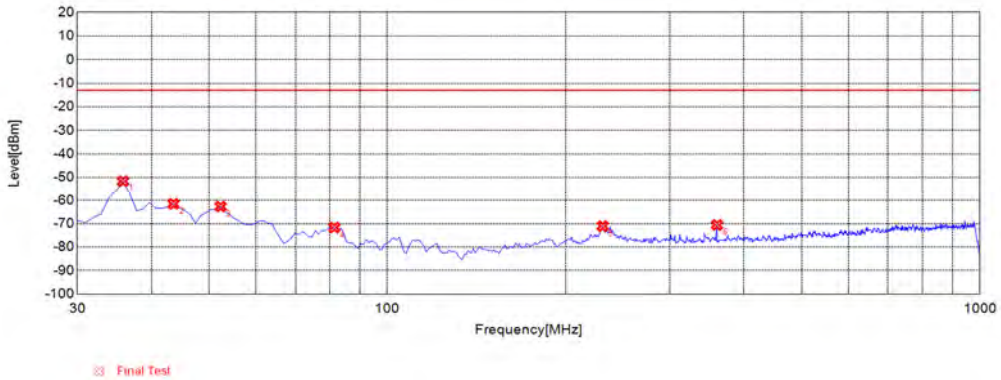


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	35.8260	-54.96	-13.00	Vertical	PASS
2	51.3610	-64.49	-13.00	Vertical	PASS
3	79.5200	-62.55	-13.00	Vertical	PASS
4	104.7650	-69.4	-13.00	Vertical	PASS
5	180.5010	-74.37	-13.00	Vertical	PASS
6	760.1700	-68.36	-13.00	Vertical	PASS

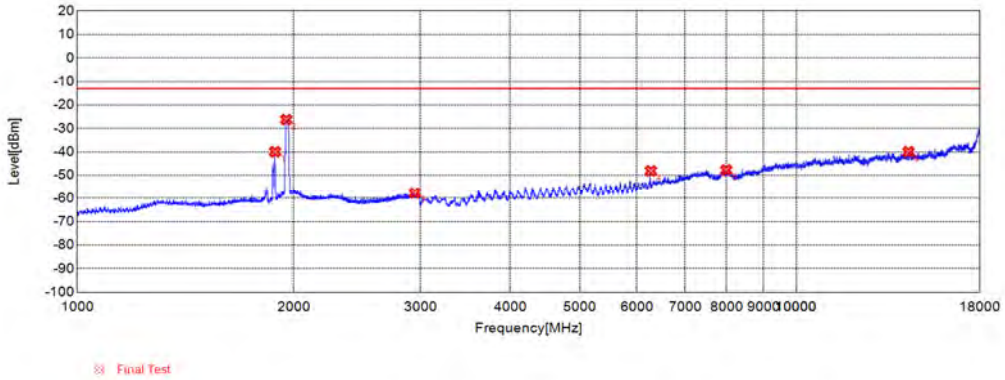


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	1858.9530	-49.4	-13.00	Vertical	N/A
2	1941.6470	-36.83	-13.00	Vertical	N/A
3	2963.3210	-58.01	-13.00	Vertical	PASS
4	6275.5460	-47.29	-13.00	Vertical	PASS
5	8018.3360	-48.04	-13.00	Vertical	PASS
6	14664.4440	-39.16	-13.00	Vertical	PASS

LTE Band 2, 20MHz BW, Mid Channel, 16QAM

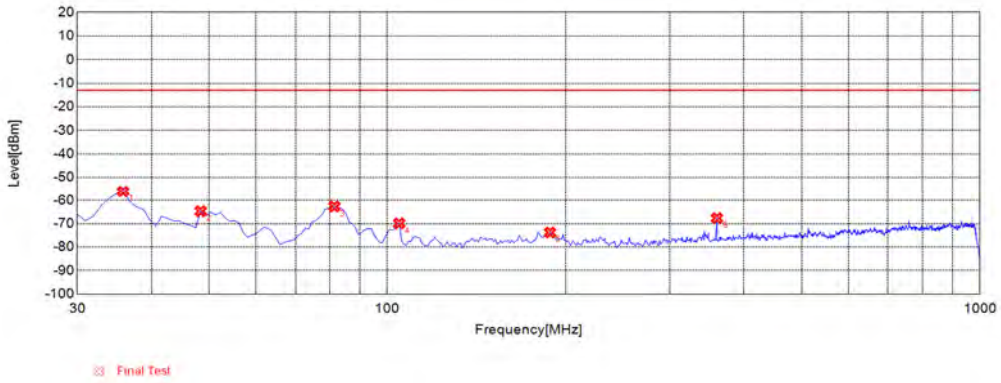


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	35.8260	-51.55	-13.00	Horizontal	PASS
2	43.5940	-61.56	-13.00	Horizontal	PASS
3	52.3320	-62.72	-13.00	Horizontal	PASS
4	81.4610	-71.68	-13.00	Horizontal	PASS
5	230.9910	-71.1	-13.00	Horizontal	PASS
6	360.1300	-70.58	-13.00	Horizontal	PASS

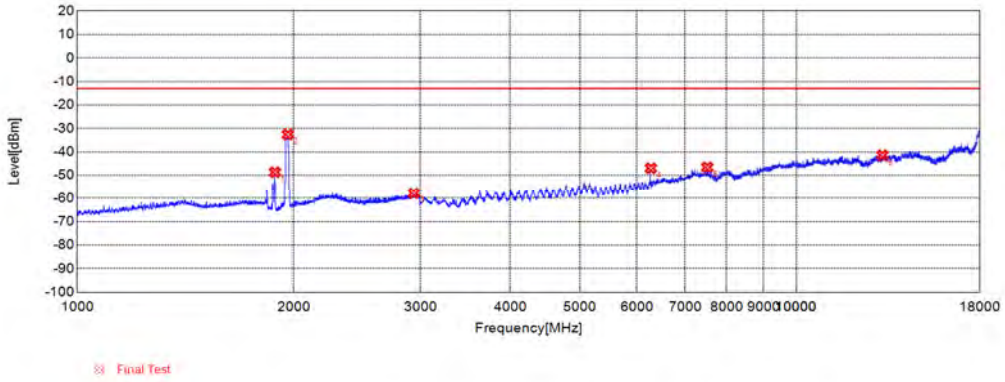


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	1883.6280	-39.94	-13.00	Horizontal	N/A
2	1952.3170	-26.22	-13.00	Horizontal	N/A
3	2945.9820	-57.73	-13.00	Horizontal	PASS
4	6275.5460	-48.1	-13.00	Horizontal	PASS
5	7990.8320	-47.73	-13.00	Horizontal	PASS
6	14326.8880	-39.96	-13.00	Horizontal	PASS

LTE Band 2, 20MHz BW, Mid Channel, 16QAM

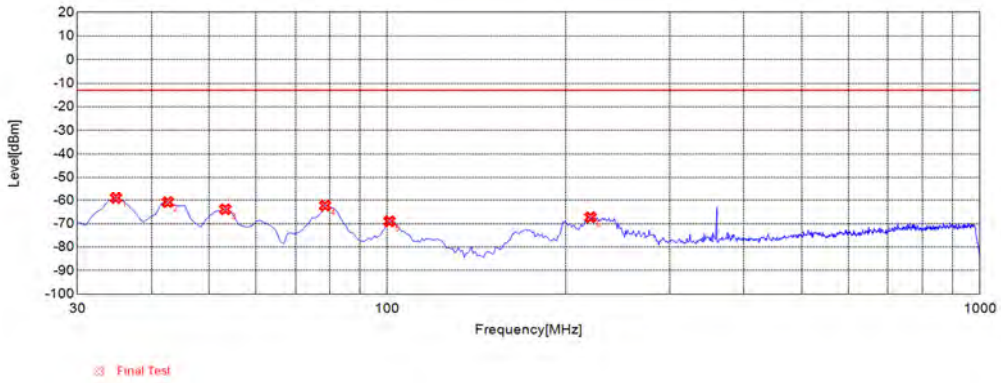


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	35.8260	-56.12	-13.00	Vertical	PASS
2	48.4480	-64.71	-13.00	Vertical	PASS
3	81.4610	-62.69	-13.00	Vertical	PASS
4	104.7650	-69.89	-13.00	Vertical	PASS
5	188.2680	-73.77	-13.00	Vertical	PASS
6	360.1300	-67.67	-13.00	Vertical	PASS

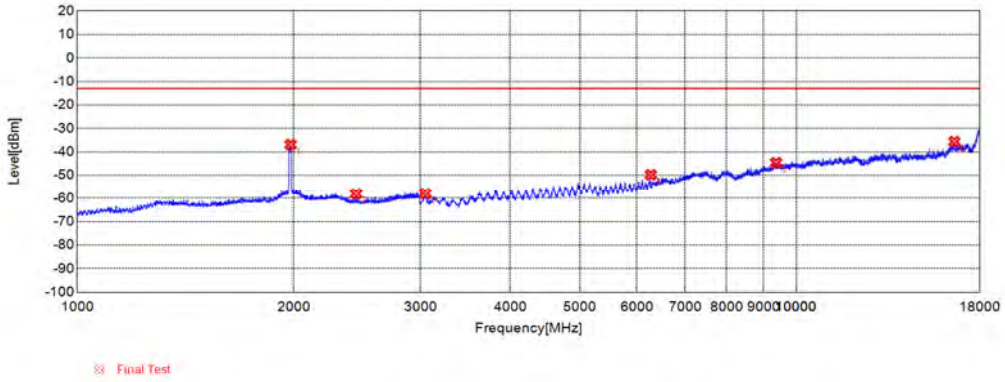


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	1882.9610	-48.67	-13.00	Vertical	N/A
2	1962.3210	-32.6	-13.00	Vertical	N/A
3	2937.9790	-57.84	-13.00	Vertical	PASS
4	6275.5460	-46.97	-13.00	Vertical	PASS
5	7520.7530	-46.55	-13.00	Vertical	PASS
6	13174.1960	-41.43	-13.00	Vertical	PASS

LTE Band 2, 20MHz BW, High Channel, 16QAM

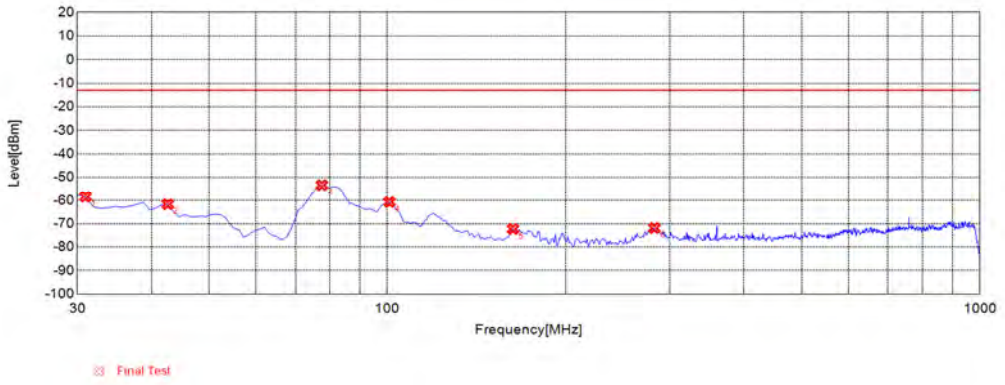


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	34.8550	-59.07	-13.00	Horizontal	PASS
2	42.6230	-60.87	-13.00	Horizontal	PASS
3	53.3030	-63.9	-13.00	Horizontal	PASS
4	78.5490	-62.35	-13.00	Horizontal	PASS
5	100.8810	-69.02	-13.00	Horizontal	PASS
6	220.3100	-67.3	-13.00	Horizontal	PASS

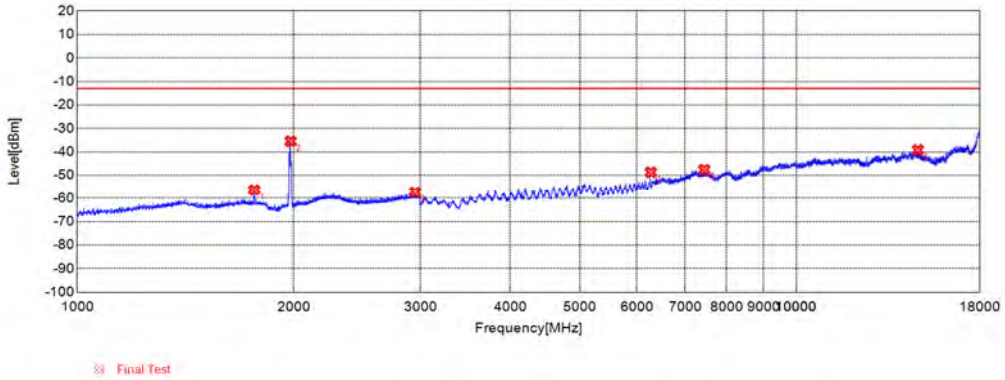


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	1979.6600	-36.9	-13.00	Horizontal	N/A
2	2441.8140	-58.14	-13.00	Horizontal	PASS
3	3047.5080	-57.99	-13.00	Horizontal	PASS
4	6275.5460	-49.78	-13.00	Horizontal	PASS
5	9373.5620	-44.6	-13.00	Horizontal	PASS
6	16592.2650	-35.64	-13.00	Horizontal	PASS

LTE Band 2, 20MHz BW, High Channel, 16QAM

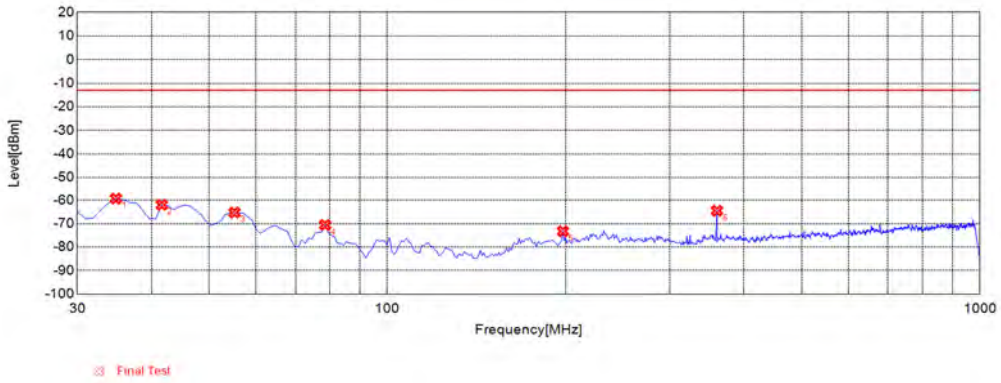


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	30.9710	-58.51	-13.00	Vertical	PASS
2	42.6230	-61.69	-13.00	Vertical	PASS
3	77.5780	-53.29	-13.00	Vertical	PASS
4	100.8810	-60.73	-13.00	Vertical	PASS
5	163.0230	-72.29	-13.00	Vertical	PASS
6	282.4520	-71.88	-13.00	Vertical	PASS

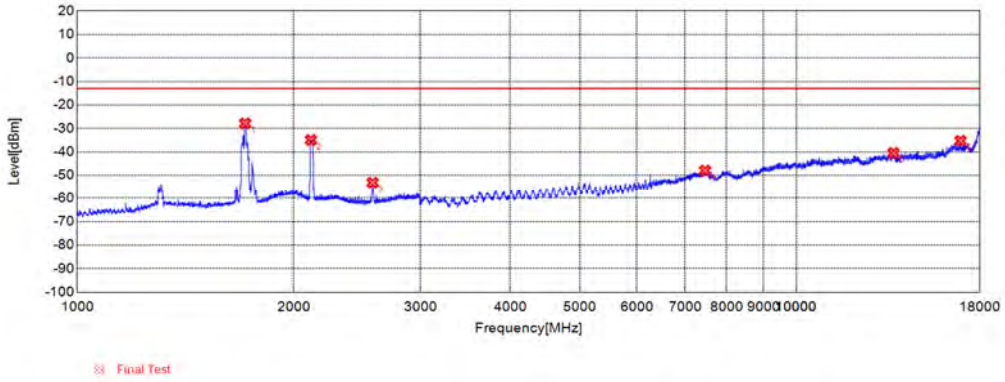


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	1762.2540	-56.39	-13.00	Vertical	N/A
2	1979.6600	-35.44	-13.00	Vertical	PASS
3	2949.3160	-57.36	-13.00	Vertical	PASS
4	6275.5460	-48.7	-13.00	Vertical	PASS
5	7448.2410	-47.57	-13.00	Vertical	PASS
6	14764.4610	-39.15	-13.00	Vertical	PASS

LTE Band 4, 20MHz BW, Low Channel, 16QAM

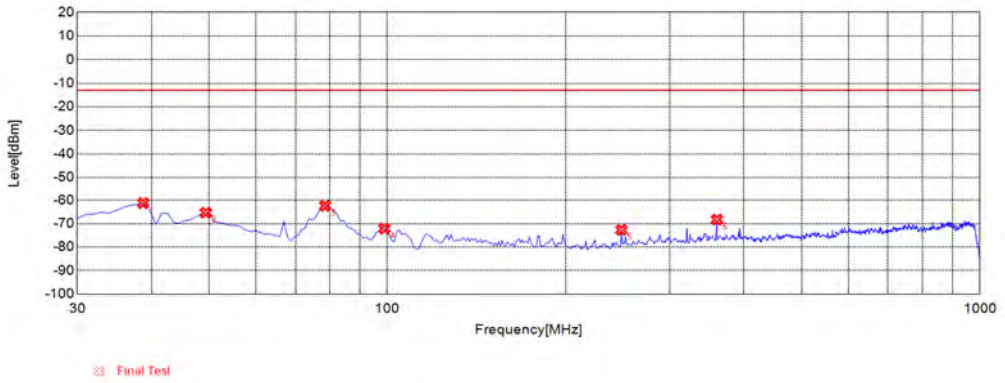


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	34.8550	-59.36	-13.00	Horizontal	PASS
2	41.6520	-62.01	-13.00	Horizontal	PASS
3	55.2450	-65.3	-13.00	Horizontal	PASS
4	78.5490	-70.55	-13.00	Horizontal	PASS
5	197.9780	-73.23	-13.00	Horizontal	PASS
6	360.1300	-64.54	-13.00	Horizontal	PASS

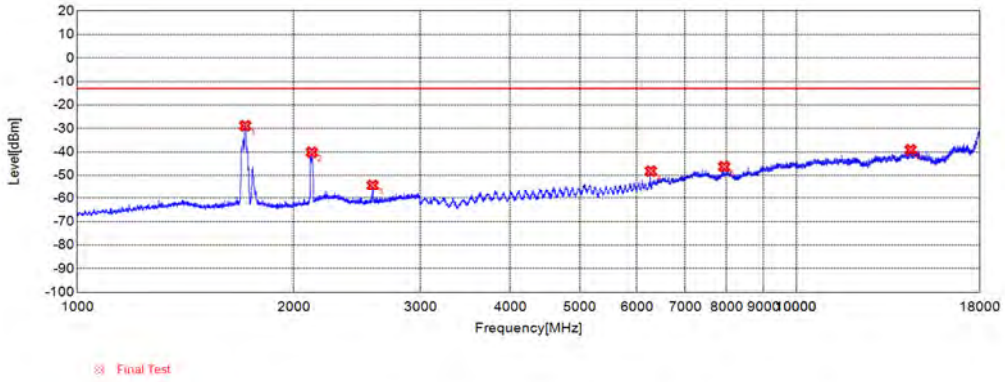


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	1711.5710	-27.89	-13.00	Horizontal	PASS
2	2113.0380	-34.91	-13.00	Horizontal	PASS
3	2575.1920	-53.11	-13.00	Horizontal	PASS
4	7468.2450	-47.94	-13.00	Horizontal	PASS
5	13654.2760	-40.39	-13.00	Horizontal	PASS
6	16924.8210	-35.27	-13.00	Horizontal	PASS

LTE Band 4, 20MHz BW, Low Channel, 16QAM

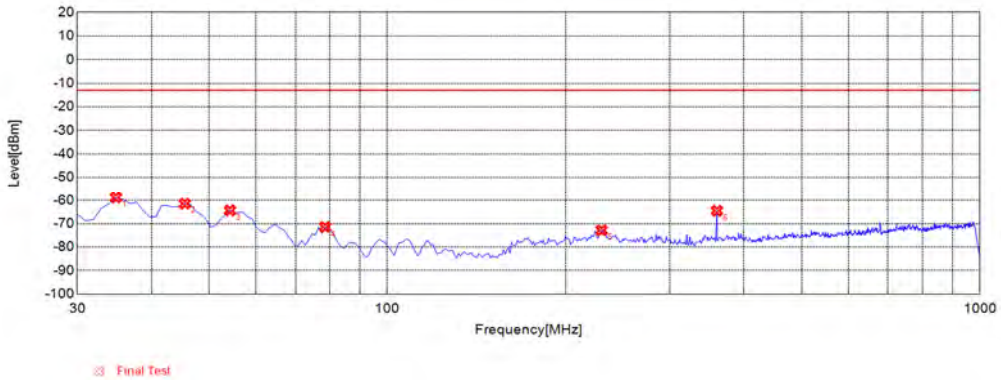


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	38.7390	-61.27	-13.00	Vertical	PASS
2	49.4190	-65.34	-13.00	Vertical	PASS
3	78.5490	-62.44	-13.00	Vertical	PASS
4	98.9390	-72.1	-13.00	Vertical	PASS
5	248.4680	-72.67	-13.00	Vertical	PASS
6	360.1300	-68.29	-13.00	Vertical	PASS

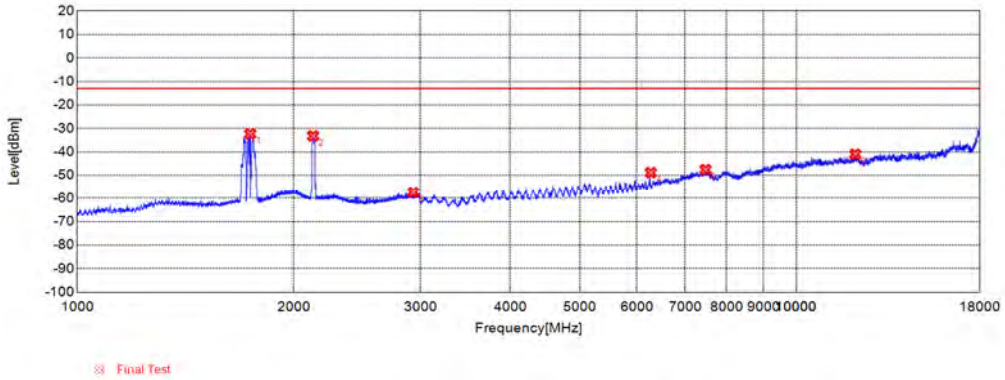


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	1711.5710	-28.86	-13.00	Vertical	PASS
2	2119.0400	-40.13	-13.00	Vertical	PASS
3	2575.1920	-54.25	-13.00	Vertical	PASS
4	6275.5460	-48.17	-13.00	Vertical	PASS
5	7938.3230	-46.28	-13.00	Vertical	PASS
6	14424.4040	-39.11	-13.00	Vertical	PASS

LTE Band 4, 20MHz BW, Mid Channel, 16QAM

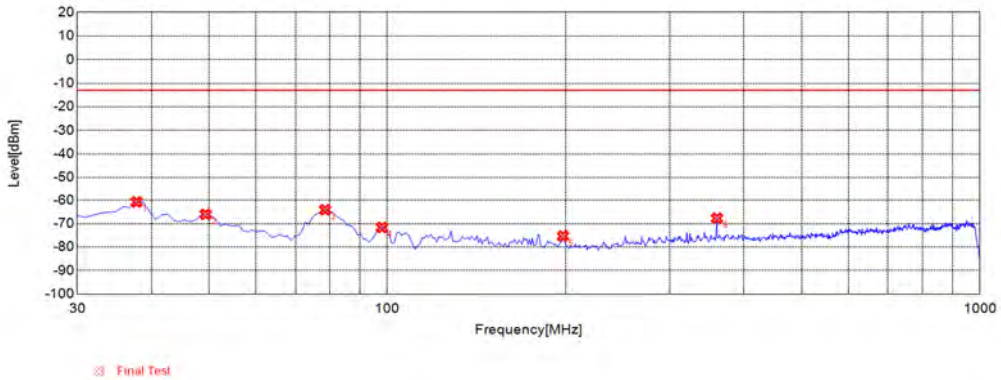


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	34.8550	-58.86	-13.00	Horizontal	PASS
2	45.5360	-61.48	-13.00	Horizontal	PASS
3	54.2740	-64.36	-13.00	Horizontal	PASS
4	78.5490	-71.41	-13.00	Horizontal	PASS
5	230.0200	-72.84	-13.00	Horizontal	PASS
6	360.1300	-64.55	-13.00	Horizontal	PASS

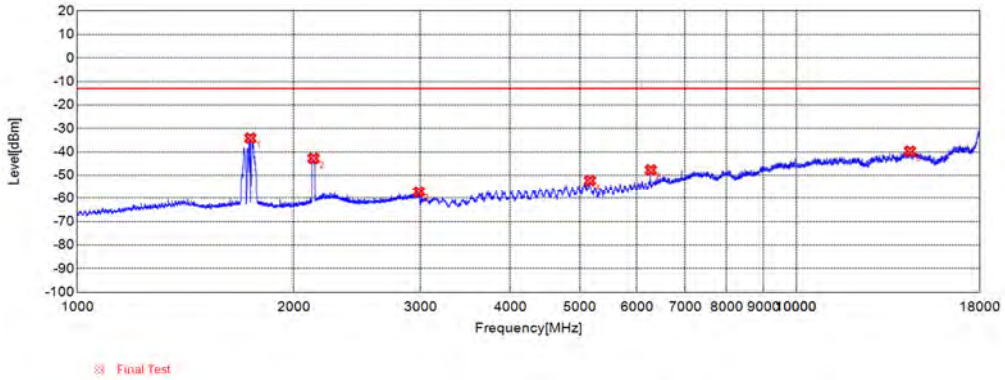


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	1739.5800	-32.34	-13.00	Horizontal	PASS
2	2127.7090	-33.18	-13.00	Horizontal	PASS
3	2932.6440	-57.46	-13.00	Horizontal	PASS
4	6275.5460	-48.86	-13.00	Horizontal	PASS
5	7478.2460	-47.55	-13.00	Horizontal	PASS
6	12076.5130	-41.01	-13.00	Horizontal	PASS

LTE Band 4, 20MHz BW, Mid Channel, 16QAM

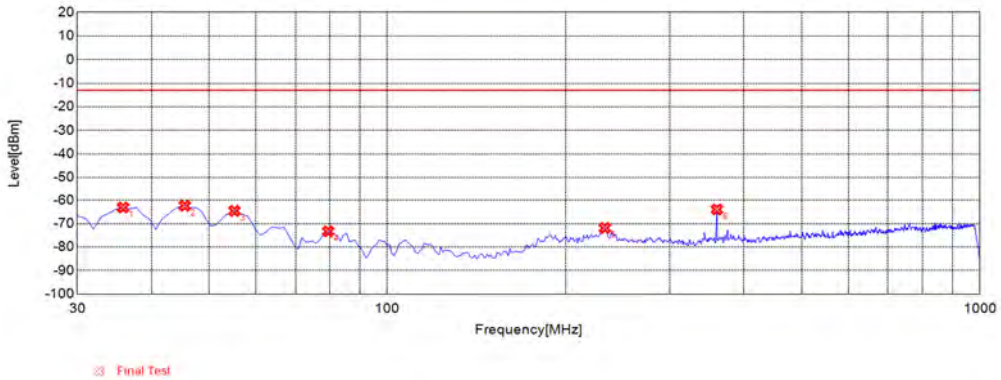


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	37.7680	-60.78	-13.00	Vertical	PASS
2	49.4190	-66.07	-13.00	Vertical	PASS
3	78.5490	-64.13	-13.00	Vertical	PASS
4	97.9680	-71.6	-13.00	Vertical	PASS
5	197.9780	-75.29	-13.00	Vertical	PASS
6	360.1300	-67.72	-13.00	Vertical	PASS

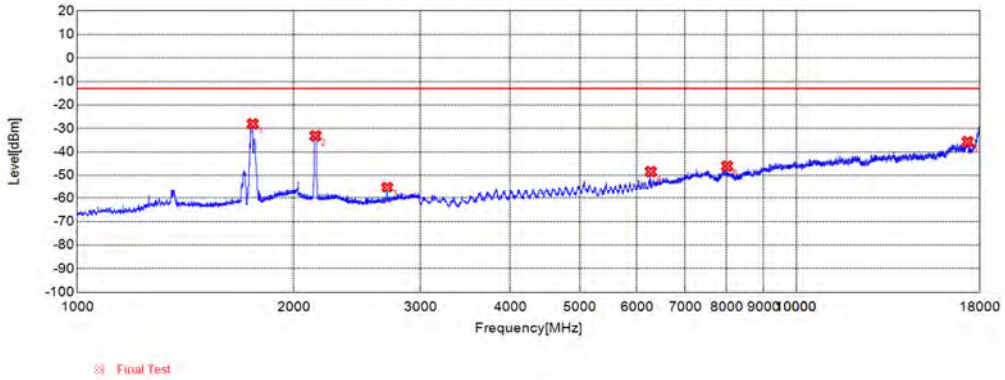


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	1740.2470	-34.12	-13.00	Vertical	PASS
2	2131.0440	-42.75	-13.00	Vertical	PASS
3	2986.6620	-57.24	-13.00	Vertical	PASS
4	5165.3610	-52.25	-13.00	Vertical	PASS
5	6275.5460	-47.71	-13.00	Vertical	PASS
6	14394.3990	-39.73	-13.00	Vertical	PASS

LTE Band 4, 20MHz BW, High Channel, 16QAM

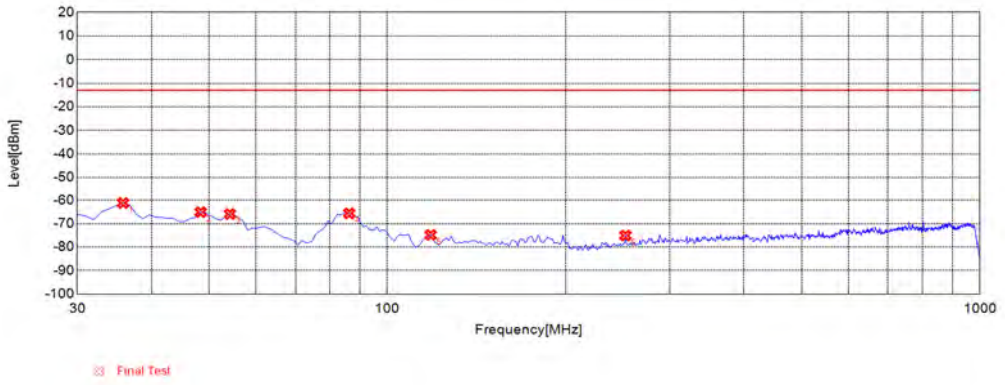


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	35.8260	-63.14	-13.00	Horizontal	PASS
2	45.5360	-62.42	-13.00	Horizontal	PASS
3	55.2450	-64.6	-13.00	Horizontal	PASS
4	79.5200	-73.32	-13.00	Horizontal	PASS
5	232.9330	-71.87	-13.00	Horizontal	PASS
6	360.1300	-63.96	-13.00	Horizontal	PASS

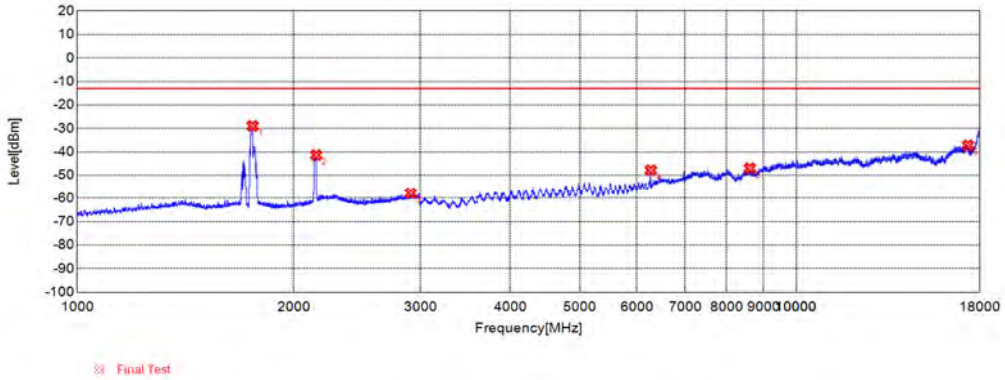


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	1753.5850	-28.07	-13.00	Horizontal	PASS
2	2143.7150	-33.14	-13.00	Horizontal	PASS
3	2697.2320	-55.21	-13.00	Horizontal	PASS
4	6275.5460	-48.41	-13.00	Horizontal	PASS
5	8010.8350	-46.08	-13.00	Horizontal	PASS
6	17304.8840	-35.67	-13.00	Horizontal	PASS

LTE Band 4, 20MHz BW, High Channel, 16QAM

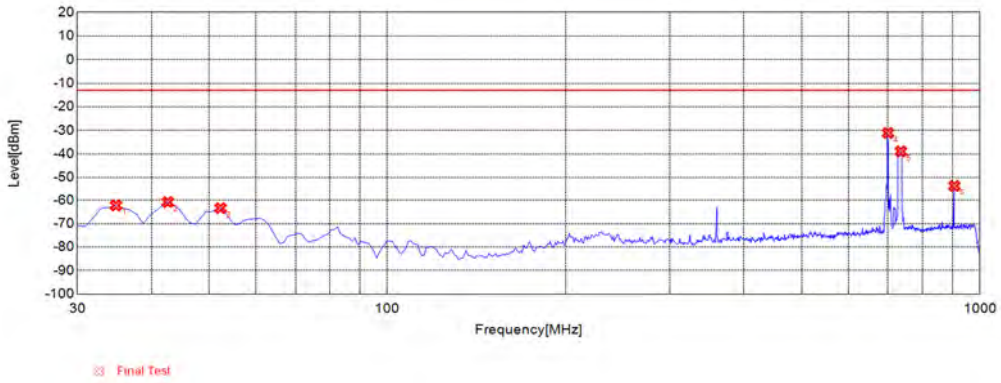


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	35.8260	-61.21	-13.00	Vertical	PASS
2	48.4480	-65.1	-13.00	Vertical	PASS
3	54.2740	-65.93	-13.00	Vertical	PASS
4	86.3160	-65.65	-13.00	Vertical	PASS
5	118.3580	-74.82	-13.00	Vertical	PASS
6	252.3520	-75.05	-13.00	Vertical	PASS

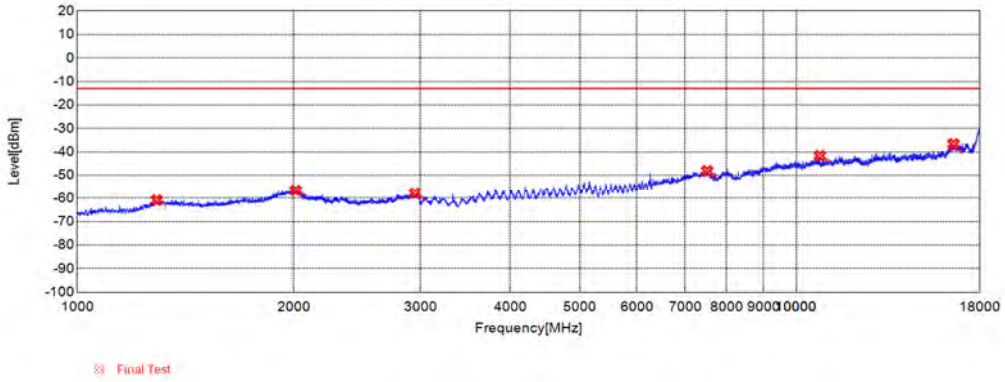


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	1752.9180	-28.95	-13.00	Vertical	PASS
2	2149.0500	-41.33	-13.00	Vertical	PASS
3	2908.6360	-57.83	-13.00	Vertical	PASS
4	6275.5460	-47.8	-13.00	Vertical	PASS
5	8618.4360	-46.97	-13.00	Vertical	PASS
6	17329.8880	-37.19	-13.00	Vertical	PASS

LTE Band 12, 10MHz BW, Low Channel, 16QAM

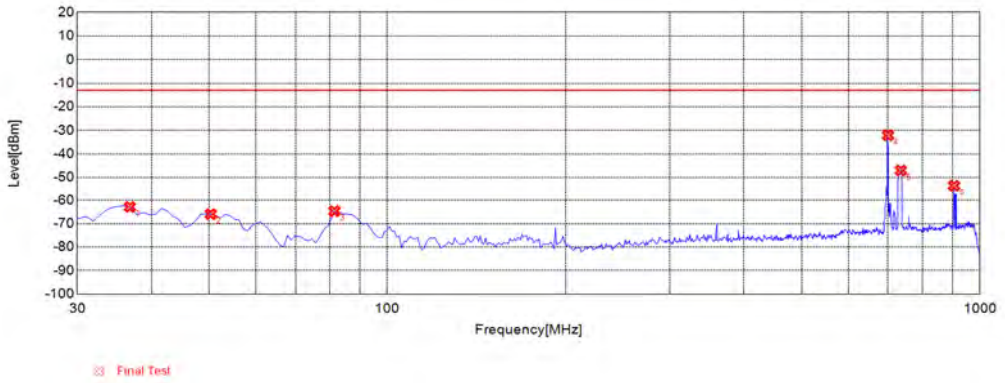


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	34.8550	-62.3	-13.00	Horizontal	PASS
2	42.6230	-60.83	-13.00	Horizontal	PASS
3	52.3320	-63.4	-13.00	Horizontal	PASS
4	699.9700	-31.11	-13.00	Horizontal	PASS
5	735.8960	-38.89	-13.00	Horizontal	PASS
6	905.8160	-53.55	-13.00	Horizontal	PASS

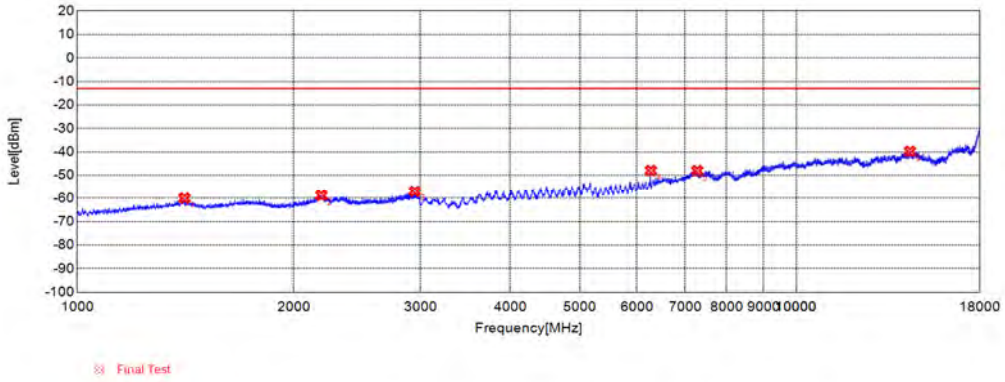


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	1290.0970	-60.9	-13.00	Horizontal	PASS
2	2012.3370	-56.56	-13.00	Horizontal	PASS
3	2947.3160	-57.81	-13.00	Horizontal	PASS
4	7518.2530	-48.09	-13.00	Horizontal	PASS
5	10783.7970	-41.6	-13.00	Horizontal	PASS
6	16549.7580	-36.62	-13.00	Horizontal	PASS

LTE Band 12, 10MHz BW, Low Channel, 16QAM

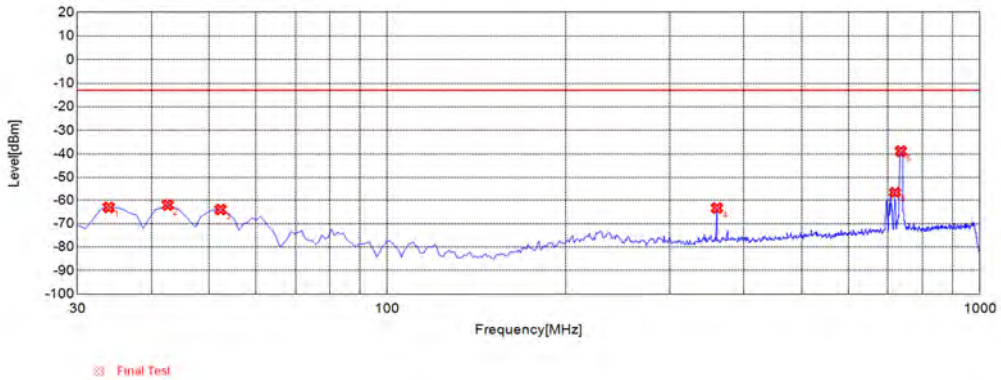


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	36.7970	-62.89	-13.00	Vertical	PASS
2	50.3900	-65.95	-13.00	Vertical	PASS
3	81.4610	-64.7	-13.00	Vertical	PASS
4	699.9700	-32.07	-13.00	Vertical	PASS
5	735.8960	-46.97	-13.00	Vertical	PASS
6	904.8450	-53.46	-13.00	Vertical	PASS

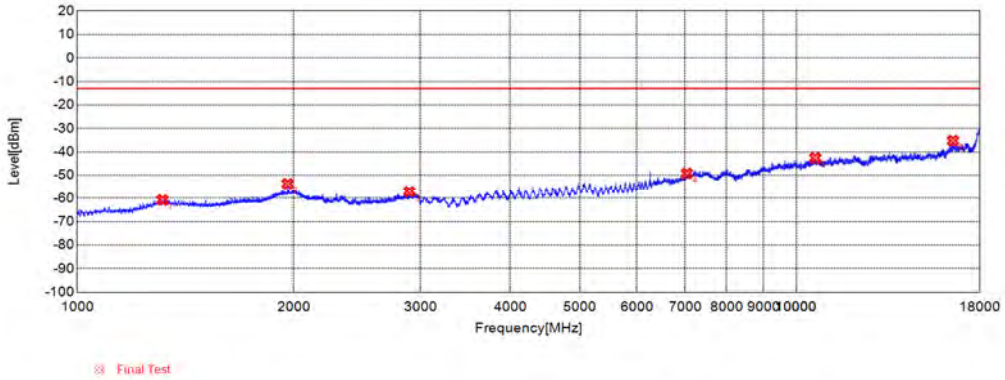


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	1409.4700	-60.04	-13.00	Vertical	PASS
2	2185.7290	-58.84	-13.00	Vertical	PASS
3	2945.9820	-56.97	-13.00	Vertical	PASS
4	6275.5460	-47.94	-13.00	Vertical	PASS
5	7280.7130	-48.01	-13.00	Vertical	PASS
6	14394.3990	-39.78	-13.00	Vertical	PASS

LTE Band 12, 10MHz BW, Mid Channel, 16QAM

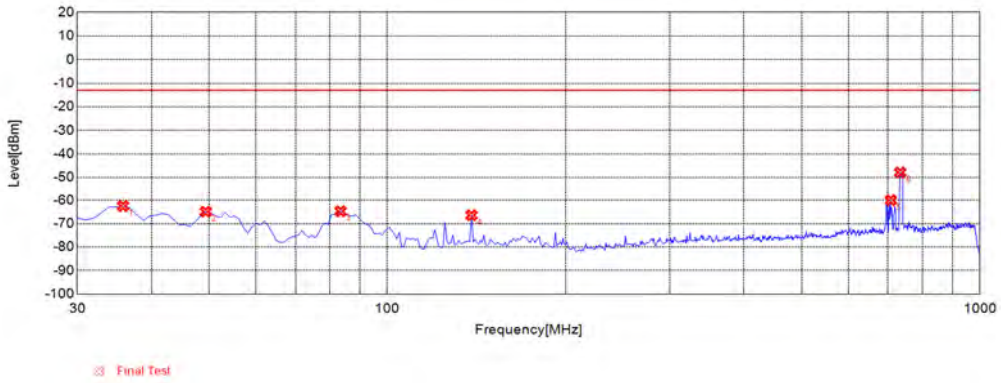


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	33.8840	-63.08	-13.00	Horizontal	PASS
2	42.6230	-62.09	-13.00	Horizontal	PASS
3	52.3320	-63.99	-13.00	Horizontal	PASS
4	360.1300	-63.36	-13.00	Horizontal	PASS
5	719.3890	-56.49	-13.00	Horizontal	N/A
6	735.8960	-38.82	-13.00	Horizontal	N/A

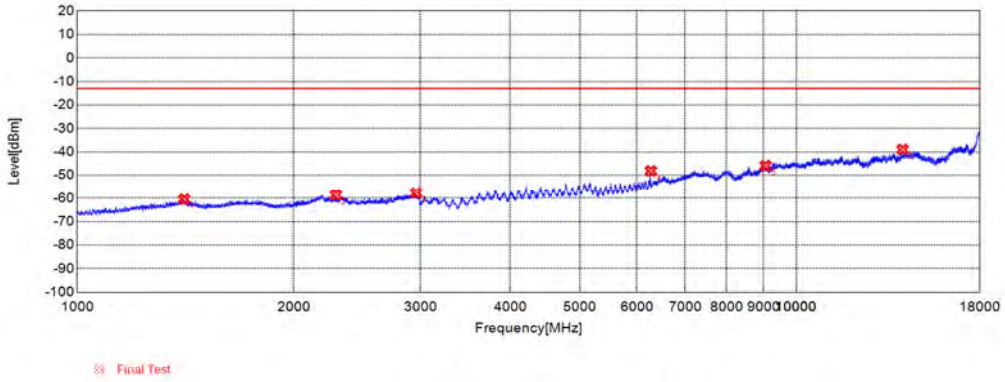


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	1313.4380	-60.81	-13.00	Horizontal	PASS
2	1960.9870	-53.62	-13.00	Horizontal	PASS
3	2895.9650	-57.1	-13.00	Horizontal	PASS
4	7045.6740	-49.18	-13.00	Horizontal	PASS
5	10628.7710	-42.59	-13.00	Horizontal	PASS
6	16519.7530	-35.2	-13.00	Horizontal	PASS

LTE Band 12, 10MHz BW, Mid Channel, 16QAM

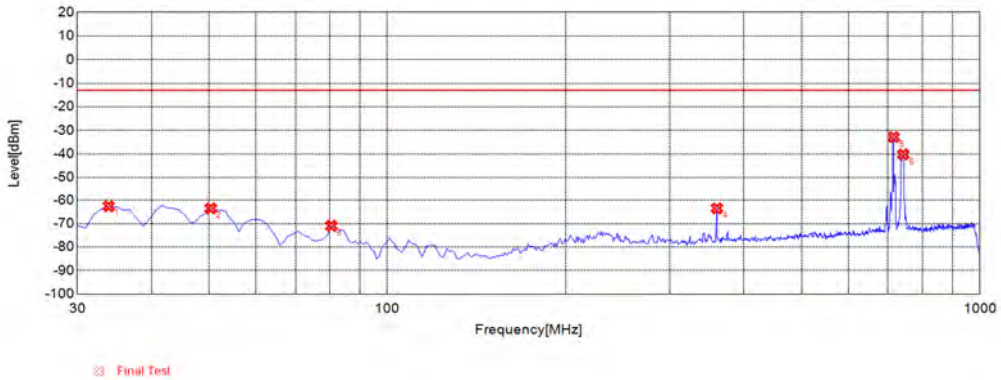


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	35.8260	-62.52	-13.00	Vertical	PASS
2	49.4190	-64.91	-13.00	Vertical	PASS
3	83.4030	-64.72	-13.00	Vertical	PASS
4	138.7490	-66.44	-13.00	Vertical	PASS
5	707.7380	-60.01	-13.00	Vertical	PASS
6	733.9540	-47.84	-13.00	Vertical	PASS

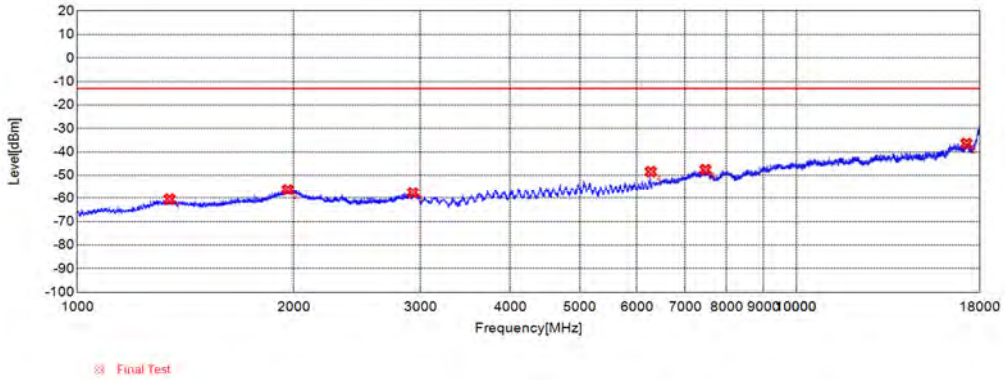


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	1408.1360	-60.5	-13.00	Vertical	PASS
2	2289.0960	-58.65	-13.00	Vertical	PASS
3	2959.3200	-57.74	-13.00	Vertical	PASS
4	6275.5460	-48.12	-13.00	Vertical	PASS
5	9063.5110	-45.88	-13.00	Vertical	PASS
6	14059.3430	-38.98	-13.00	Vertical	PASS

LTE Band 12, 10MHz BW, High Channel, 16QAM

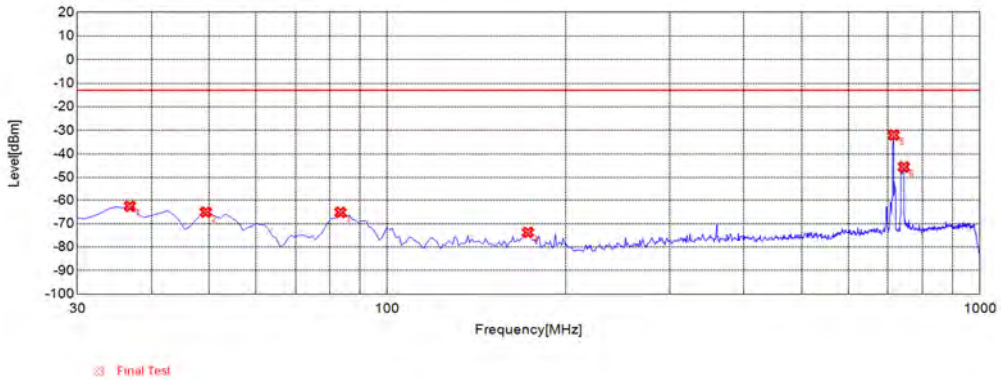


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	33.8840	-62.59	-13.00	Horizontal	PASS
2	50.3900	-63.53	-13.00	Horizontal	PASS
3	80.4900	-70.92	-13.00	Horizontal	PASS
4	360.1300	-63.53	-13.00	Horizontal	PASS
5	715.5060	-32.84	-13.00	Horizontal	PASS
6	742.6930	-40.2	-13.00	Horizontal	PASS

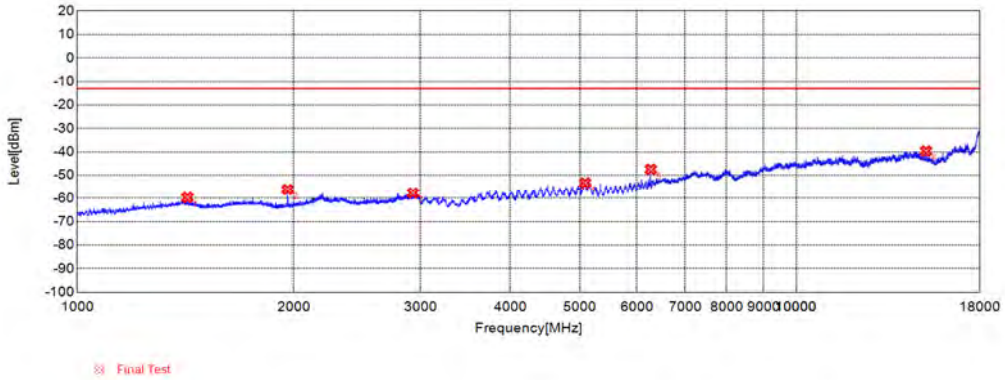


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	1343.4480	-60.47	-13.00	Horizontal	PASS
2	1961.6540	-56.24	-13.00	Horizontal	PASS
3	2928.6430	-57.57	-13.00	Horizontal	PASS
4	6275.5460	-48.44	-13.00	Horizontal	PASS
5	7475.7460	-47.56	-13.00	Horizontal	PASS
6	17249.8750	-36.39	-13.00	Horizontal	PASS

LTE Band 12, 10MHz BW, High Channel, 16QAM



No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	36.7970	-62.59	-13.00	Vertical	PASS
2	49.4190	-65.1	-13.00	Vertical	PASS
3	83.4030	-65.22	-13.00	Vertical	PASS
4	172.7330	-73.72	-13.00	Vertical	PASS
5	715.5060	-31.97	-13.00	Vertical	PASS
6	744.6350	-45.52	-13.00	Vertical	PASS



No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	1422.8080	-59.75	-13.00	Vertical	PASS
2	1960.9870	-56.23	-13.00	Vertical	PASS
3	2929.3100	-57.75	-13.00	Vertical	PASS
4	5085.3480	-53.31	-13.00	Vertical	PASS
5	6275.5460	-47.47	-13.00	Vertical	PASS
6	15154.5260	-39.66	-13.00	Vertical	PASS

Annex A Test Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for test performed on the EUT as specified in CISPR 16-1-2:

Test Items	Uncertainty
Output Power	±2.22 dB
Bandwidth	±5%
Conducted Spurious Emission	±2.77 dB
Band Edge	±2.77 dB
Equivalent Isotropic Radiated Power	±2.22 dB
Radiated Spurious Emissions	±6 dB

This uncertainty represent an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Annex B Testing Laboratory Information

1. Identification of the Responsible Testing Laboratory

Laboratory Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Laboratory Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China
Telephone:	+86 755 36698555
Facsimile:	+86 755 36698525

2. Identification of the Responsible Testing Location

Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China

3. Facilities and Accreditations

All measurement facilities used to collect the measurement data are located at FL.3, Building A, FeiYang Science Park, Block 67, BaoAn District, Shenzhen, 518101 P. R. China. The test site is constructed in conformance with the requirements of ANSI C63.10-2013and CISPR Publication 22; the FCC designation number is CN1192, the test firm registration number is 226174.

4. Test Equipments Utilized

4.1 Conducted Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Due Date
EXA Signal Analyzer	MY51511149	N9020A	Agilent	2022.07.04	2023.07.03
Communication Test Station	6200995016	MT8820C	Anritsu	2022.10.11	2023.10.10
Temperature Chamber	S022177101 00089002	KMT-36LF 1A0	KOMEG	2022.11.18	2023.11.17

4.2 List of Software Used

Description	Manufacturer	Software Version
Morlab FCC LTE Test System	MORLAB	V4.4
MORLAB EMCR V1.2	MORLAB	V1.0

4.3 Radiated Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Due Date
System Simulator	152038	CMW500	R&S	2022.10.11	2023.10.10
Receiver	MY54130016	N9038A	Agilent	2022.07.07	2023.07.06
Test Antenna - Bi-Log	9163-519	VULB 9163	Schwarzbeck	2022.05.25	2025.05.24
Test Antenna - Horn	9120D-963	BBHA 9120D	Schwarzbeck	2022.05.23	2025.05.24
RF Coaxial Cable (DC-18GHz)	MRE001	PE330	Pasternack	2022.07.08	2023.07.07
RF Coaxial Cable (DC-18GHz)	MRE002	CLU18	Pasternack	2022.07.08	2023.07.07
RF Coaxial Cable (DC-18GHz)	MRE003	CLU18	Pasternack	2022.07.08	2023.07.07
RF Coaxial Cable (DC-40GHz)	22290045	QA360-40-KK-0.5	Qualwave	2022.07.08	2023.07.07
RF Coaxial Cable (DC-40GHz)	22290046	QA360-40-KK F-2	Qualwave	2022.07.08	2023.07.07
Preamplifier (10MHz-6GHz)	46732	S10M100L380 2	LUCIX CORP.	2022.07.08	2023.07.07
Preamplifier (2GHz-18GHz)	61171/61172	S020180L320 3	LUCIX CORP.	2022.07.08	2023.07.07
Preamplifier (18GHz-40GHz)	DS77209	DCLNA0118-4 0C-S	Decentest	2022.07.23	2023.07.22
Notch Filter	N/A	WRCGV -LTE B2	Wainwright	2022.07.08	2023.07.07
Notch Filter	N/A	WRCGV -LTE B4	Wainwright	2022.07.08	2023.07.07
Notch Filter	N/A	WRCGV -LTE B12	Wainwright	2022.07.08	2023.07.07
Anechoic Chamber	N/A	9m*6m*6m	CRT	2022.05.10	2025.05.09

END OF REPORT