TEST REPORT

APPLICANT	:	Sonim Technologies, Inc.
PRODUCT NAME	:	GSM, WCDMA, LTE Cell Phone
MODEL NAME	:	XP3900
BRAND NAME	:	Sonim
FCC ID	:	WYPP14303
STANDARD(S)	:	47 CFR Part 2 47 CFR Part 90, Subpart S&R
RECEIPT DATE	:	2021-04-23
TEST DATE	:	2021-05-06 to 2021-05-24
ISSUE DATE	:	2021-06-03

Edited by: Zeng Xiaoying (Rapporteur)

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MORLAB

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DIRECTORY

Change History		
Version	Date	Reason for change
1.0	2021-06-03	First edition

1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	Sonim Technologies, Inc.
Applicant Address:	6836 Bee Cave Road, Building 1, Suite 279, Austin, Texas 78746, USA
Manufacturer:	Sonim Technologies, Inc.
Manufacturer Address:	6836 Bee Cave Road, Building 1, Suite 279, Austin, Texas 78746, USA

1.2. Equipment Under Test (EUT) Description

Product Name:	GSM, WCDMA, LTE Cell Phone	
Serial No.:	N/A	
IMEI:	Conducted	001080002706704
	Radiated	001080002707256
Hardware Version:	P14303: 0200 P14403: 0201(Non-camera)	
Software Version:	3P.2.0-01-11.0.0-19.20.16	
Modulation Type:	QPSK, 16QAM, 64QAM	
Carrier Aggregation:	Only support downlink CA_2A-2A, CA_2A-4A, CA_2A-5A, CA_2A-12A, CA_2A-13A, CA_2A-14A, CA_2A-66A, CA_2A-71A, CA_2C, CA_4A-4A, CA_4A-5A, CA_4A-12A, CA_4A-13A, CA_4A-71A, CA_5A-5A, CA_5A-41A, CA_5A-66A, CA_5B, CA_12A-66A, CA_13A-66A, CA_14A-66A, CA_25A-25A, CA_25A-26A, CA_26A-41A, CA_41A-41A, CA_41C, CA_66A-66A, CA_66A-71A, CA_66B, CA_66C	
Operation Band:	Band 14 / 26	
Frequency Range:	LTE Band 14	Tx: 788MHz–798MHz
		Rx: 758MHz–768MHz
	LTE Band 26	Tx: 814MHz–824MHz
		Rx: 859MHz–869MHz
Channel Bandwidth	LTE Band 14	5MHz, 10MHz
	LTE Band 26	1.4MHz, 3MHz, 5MHz, 10MHz

Antenna Type:	Fixed Internal Antenna	
Antenna Gain:	LTE Band 14	-1.57dBi
	LTE Band 26	-1.52dBi
Accessory Information:	Battery	
	Brand Name:	Sonim
	Model No.:	BAT-02300-01S
	Serial No.:	(N/A, marked #1 by test site)
	Capacity:	2300mAh
	Rated Voltage:	3.85V
	Charge Limit:	4.2V
	Manufacturer:	Tianjin Lishen Battery Joint-Stock Co., Ltd.
	AC Adapter	
	Brand Name:	Sonim
	Model No.:	UC13US
	Serial No.:	(N/A, marked #1 by test site)
	Rated Output:	5V⎓2A
	Rated Input:	100-240V~50/60Hz, 0.35A
	Manufacturer:	Jiangsu Chenyang Electron Co., Ltd.

Note 1: According to the certificate holder, they declare that the model XP3900 (FCC ID: WYPP14303) has two types, namely "P14303" and "P14403", the difference is as follows. The main measuring model is XP3900 (Type: P14303), only the results for XP3900 (Type: P14303) were recorded in this report.

Model name	Type name	Variant
XP3900	P14303	With camera
	P14403	Without camera

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 14	Maximum E.R.P./E.I.R.P. (W)			Emission Designator (99%OBW)		
BW(MHz)	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
10	0.076	0.063	0.062	8M96G7D	8M93W7D	8M94W7D
5	0.074	0.068	0.062	4M51G7D	4M51W7D	4M50W7D
LTE Band 26	**Maximum E.R.P./E.I.R.P. (W)**			**Emission Designator (99%OBW)**		
BW(MHz)	QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
10	0.070	0.062	0.051	8M99G7D	9M00W7D	9M00W7D
5	0.070	0.062	0.051	4M51G7D	4M51W7D	4M51W7D
3	0.070	0.062	0.050	2M70G7D	2M70W7D	2M70W7D
1.4	0.071	0.065	0.051	1M10G7D	1M10W7D	1M10W7D

1.4. Test Standards and Results

The objective of the report is to perform testing according to Part 2 and Part 90 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 90	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, 90.635(b) 90.542(a)(7)	Transmitter Conducted Output Power and E.R.P./E.I.R.P.	May 20&24, 2021	Yu Zhizheng Gao Jianrou	PASS	No deviation
2.1049, 90.209	Occupied Bandwidth	May 06, 2021	Ling Keye	PASS	No deviation
2.1055	Frequency Stability	May 18, 2021	Ling Keye	PASS	No deviation
2.1051, 90.691(a) 90.543(e)(f)	Conducted Spurious Emissions	May 08&11, 2021	Ling Keye	PASS	No deviation
2.1051, 90.691(a) 90.543(e)(f)	Band Edge	May 10, 2021	Ling Keye	PASS	No deviation
2.1051, 90.691(a) 90.543(e)(f)	Radiated Spurious Emissions	May 10&19, 2021	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% risk level.

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 90S&R Requirements

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

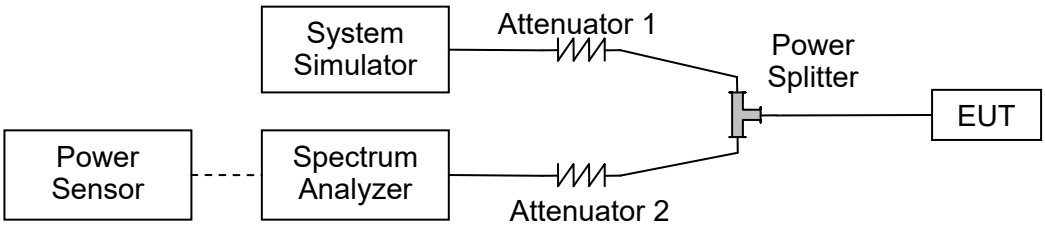
2.1.1. Requirement

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 90.542(a)(7) for LTE Band 14, portable stations (hand-held devices) transmitting in the 758-768 MHz band and the 788-798 MHz band are limited to 3 watts ERP.

According to FCC section 90.635(b) for LTE Band 26, the maximum output power of the transmitter for mobile stations is 100 watts.

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.

EIRP (dBm) = Conducted Output Power (dBm) + Antenna Gain (dBi)
ERP (dBm) = EIPR (dBm) - 2.15

2.1.4. Result

Conducted Output Power

LTE Band 14						
BW [MHz]	Modulation	RB Size	RB Offset	Average Power Low Ch. / Freq.	Average Power Middle Ch. / Freq.	Average Power High Ch. / Freq.
Channel				/	23330	/
Frequency (MHz)				/	793	/
10	QPSK	1	0	/	22.45	/
10	QPSK	1	25	/	22.37	/
10	QPSK	1	49	/	22.24	/
10	QPSK	25	0	/	21.67	/
10	QPSK	25	12	/	21.55	/
10	QPSK	25	25	/	21.52	/
10	QPSK	50	0	/	21.57	/
10	16QAM	1	0	/	21.52	/
10	16QAM	1	25	/	21.55	/
10	16QAM	1	49	/	21.63	/
10	16QAM	25	0	/	21.31	/
10	16QAM	25	12	/	21.52	/
10	16QAM	25	25	/	21.52	/
10	16QAM	50	0	/	21.35	/
10	64QAM	1	0	/	21.53	/
10	64QAM	1	25	/	21.49	/
10	64QAM	1	49	/	21.45	/
10	64QAM	25	0	/	21.49	/
10	64QAM	25	12	/	21.45	/
10	64QAM	25	25	/	21.19	/
10	64QAM	50	0	/	21.40	/

LTE Band 14						
BW [MHz]	Modulation	RB Size	RB Offset	Average Power Low Ch. / Freq.	Average Power Middle Ch. / Freq.	Average Power High Ch. / Freq.
Channel				23305	23330	23355
Frequency (MHz)				790.5	793	795.5
5	QPSK	1	0	22.25	22.35	22.24
5	QPSK	1	12	22.26	22.22	22.32
5	QPSK	1	24	22.27	22.21	22.23
5	QPSK	12	0	21.38	21.35	21.39
5	QPSK	12	7	21.49	21.53	21.54
5	QPSK	12	13	21.46	21.48	21.45
5	QPSK	25	0	21.47	21.36	21.40
5	16QAM	1	0	21.38	21.31	21.51
5	16QAM	1	12	21.43	21.35	21.41
5	16QAM	1	24	21.41	21.32	21.40
5	16QAM	12	0	21.34	21.39	21.37
5	16QAM	12	7	21.49	21.39	21.51
5	16QAM	12	13	21.45	21.44	21.44
5	16QAM	25	0	21.46	21.40	21.44
5	64QAM	1	0	21.33	21.44	21.27
5	64QAM	1	12	21.32	21.43	21.28
5	64QAM	1	24	21.33	21.33	21.33
5	64QAM	12	0	21.43	21.20	21.21
5	64QAM	12	7	21.30	21.23	21.37
5	64QAM	12	13	21.28	21.30	21.23
5	64QAM	25	0	21.24	21.28	21.29

LTE Band 26						
BW [MHz]	Modulation	RB Size	RB Offset	Average Power Low Ch. / Freq.	Average Power Middle Ch. / Freq.	Average Power High Ch. / Freq.
Channel				/	26740	/
Frequency (MHz)				/	819.0	/
10	QPSK	1	0	/	22.12	/
10	QPSK	1	25	/	22.15	/
10	QPSK	1	49	/	22.01	/
10	QPSK	25	0	/	21.54	/
10	QPSK	25	12	/	21.50	/
10	QPSK	25	25	/	21.49	/
10	QPSK	50	0	/	21.50	/
10	16QAM	1	0	/	21.22	/
10	16QAM	1	25	/	21.31	/
10	16QAM	1	49	/	21.25	/
10	16QAM	25	0	/	21.26	/
10	16QAM	25	12	/	21.27	/
10	16QAM	25	25	/	21.44	/
10	16QAM	50	0	/	21.61	/
10	64QAM	1	0	/	20.59	/
10	64QAM	1	25	/	20.69	/
10	64QAM	1	49	/	20.41	/
10	64QAM	25	0	/	20.76	/
10	64QAM	25	12	/	20.52	/
10	64QAM	25	25	/	20.42	/
10	64QAM	50	0	/	20.72	/

LTE Band 26						
BW [MHz]	Modulation	RB Size	RB Offset	Average Power Low Ch. / Freq.	Average Power Middle Ch. / Freq.	Average Power High Ch. / Freq.
Channel				26715	26740	26765
Frequency (MHz)				816.5	819.0	821.5
5	QPSK	1	0	22.11	22.05	22.07
5	QPSK	1	12	22.06	22.09	22.07
5	QPSK	1	24	22.02	21.96	22.02
5	QPSK	12	0	21.48	21.46	21.49
5	QPSK	12	7	21.58	21.59	21.57
5	QPSK	12	13	21.47	21.38	21.45
5	QPSK	25	0	21.51	21.46	21.45
5	16QAM	1	0	21.22	21.16	21.25
5	16QAM	1	12	21.26	21.19	21.28
5	16QAM	1	24	21.31	21.31	21.33
5	16QAM	12	0	21.59	21.57	21.51
5	16QAM	12	7	21.44	21.40	21.41
5	16QAM	12	13	21.56	21.48	21.47
5	16QAM	25	0	21.11	21.12	21.11
5	64QAM	1	0	20.60	20.60	20.58
5	64QAM	1	12	20.49	20.39	20.48
5	64QAM	1	24	20.43	20.43	20.34
5	64QAM	12	0	20.70	20.74	20.69
5	64QAM	12	7	20.29	20.22	20.29
5	64QAM	12	13	20.69	20.71	20.66
5	64QAM	25	0	20.69	20.60	20.67

LTE Band 26						
BW [MHz]	Modulation	RB Size	RB Offset	Average Power Low Ch. / Freq.	Average Power Middle Ch. / Freq.	Average Power High Ch. / Freq.
Channel				26705	26740	26775
Frequency (MHz)				815.5	819.0	822.5
3	QPSK	1	0	22.15	22.07	22.12
3	QPSK	1	8	22.06	22.09	22.00
3	QPSK	1	14	22.11	22.05	22.09
3	QPSK	8	0	21.38	21.34	21.42
3	QPSK	8	4	21.55	21.55	21.52
3	QPSK	8	7	21.55	21.51	21.59
3	QPSK	15	0	21.40	21.35	21.33
3	16QAM	1	0	21.51	21.48	21.55
3	16QAM	1	8	21.50	21.54	21.53
3	16QAM	1	14	21.48	21.48	21.41
3	16QAM	8	0	21.57	21.52	21.53
3	16QAM	8	4	21.51	21.55	21.55
3	16QAM	8	7	21.27	21.17	21.31
3	16QAM	15	0	21.34	21.24	21.33
3	64QAM	1	0	20.29	20.27	20.23
3	64QAM	1	8	20.59	20.60	20.52
3	64QAM	1	14	20.53	20.53	20.44
3	64QAM	8	0	20.42	20.43	20.45
3	64QAM	8	4	20.42	20.42	20.40
3	64QAM	8	7	20.69	20.61	20.63
3	64QAM	15	0	20.69	20.67	20.62

LTE Band 26						
BW [MHz]	Modulation	RB Size	RB Offset	Average Power Low Ch. / Freq.	Average Power Middle Ch. / Freq.	Average Power High Ch. / Freq.
Channel				26697	26740	26783
Frequency (MHz)				814.7	819.0	823.3
1.4	QPSK	1	0	22.02	21.97	21.93
1.4	QPSK	1	3	22.01	21.94	22.01
1.4	QPSK	1	5	22.01	21.94	21.99
1.4	QPSK	3	0	22.15	22.08	22.16
1.4	QPSK	3	1	22.06	22.08	21.96
1.4	QPSK	3	3	22.06	22.03	22.06
1.4	QPSK	6	0	21.16	21.17	21.20
1.4	16QAM	1	0	21.21	21.15	21.11
1.4	16QAM	1	3	21.28	21.24	21.26
1.4	16QAM	1	5	21.37	21.31	21.40
1.4	16QAM	3	0	21.38	21.33	21.32
1.4	16QAM	3	1	21.38	21.30	21.35
1.4	16QAM	3	3	21.38	21.36	21.40
1.4	16QAM	6	0	21.74	21.77	21.67
1.4	64QAM	1	0	20.63	20.63	20.63
1.4	64QAM	1	3	20.69	20.63	20.60
1.4	64QAM	1	5	20.59	20.52	20.59
1.4	64QAM	3	0	20.68	20.72	20.66
1.4	64QAM	3	1	20.73	20.64	20.67
1.4	64QAM	3	3	20.65	20.62	20.64
1.4	64QAM	6	0	20.72	20.63	20.69

Effective Radiated Power and Effective Isotropic Radiated Power:

LTE Band 14				Measured E.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				/		23330		/	
Frequency (MHz)				/		793		/	
				/	/	dBm	W	/	/
10	QPSK	1	0	/	/	18.78	0.076	/	/
10	QPSK	1	25	/	/	18.70	0.074	/	/
10	QPSK	1	49	/	/	18.75	0.075	/	/
10	QPSK	25	0	/	/	17.87	0.061	/	/
10	QPSK	25	12	/	/	17.68	0.059	/	/
10	QPSK	25	25	/	/	17.62	0.058	/	/
10	QPSK	50	0	/	/	17.65	0.058	/	/
10	16QAM	1	0	/	/	17.77	0.060	/	/
10	16QAM	1	25	/	/	17.69	0.059	/	/
10	16QAM	1	49	/	/	17.99	0.063	/	/
10	16QAM	25	0	/	/	17.80	0.060	/	/
10	16QAM	25	12	/	/	17.75	0.060	/	/
10	16QAM	25	25	/	/	17.88	0.061	/	/
10	16QAM	50	0	/	/	17.65	0.058	/	/
10	64QAM	1	0	/	/	17.95	0.062	/	/
10	64QAM	1	25	/	/	17.77	0.060	/	/
10	64QAM	1	49	/	/	17.74	0.059	/	/
10	64QAM	25	0	/	/	17.67	0.058	/	/
10	64QAM	25	12	/	/	17.60	0.058	/	/
10	64QAM	25	25	/	/	17.66	0.058	/	/
10	64QAM	50	0	/	/	17.73	0.059	/	/

LTE Band 14				Measured E.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				23205		23230		23255	
Frequency (MHz)				779.5		782		784.5	
				dBm	W	dBm	W	dBm	W
5	QPSK	1	0	18.67	0.074	18.70	0.074	18.68	0.074
5	QPSK	1	12	18.67	0.074	18.69	0.074	18.65	0.073
5	QPSK	1	24	18.66	0.073	18.64	0.073	18.57	0.072
5	QPSK	12	0	17.58	0.057	17.66	0.058	17.75	0.060
5	QPSK	12	7	17.65	0.058	17.64	0.058	17.73	0.059
5	QPSK	12	13	17.57	0.057	17.73	0.059	17.71	0.059
5	QPSK	25	0	17.64	0.058	17.61	0.058	17.71	0.059
5	16QAM	1	0	17.71	0.059	18.07	0.064	17.86	0.061
5	16QAM	1	12	17.77	0.060	17.92	0.062	17.80	0.060
5	16QAM	1	24	17.87	0.061	17.69	0.059	17.70	0.059
5	16QAM	12	0	18.30	0.068	18.27	0.067	18.20	0.066
5	16QAM	12	7	18.31	0.068	18.20	0.066	18.32	0.068
5	16QAM	12	13	18.28	0.067	18.27	0.067	18.31	0.068
5	16QAM	25	0	17.65	0.058	17.69	0.059	17.71	0.059
5	64QAM	1	0	17.91	0.062	17.89	0.062	17.81	0.060
5	64QAM	1	12	17.87	0.061	17.77	0.060	17.90	0.062
5	64QAM	1	24	17.88	0.061	17.87	0.061	17.87	0.061
5	64QAM	12	0	17.70	0.059	17.76	0.060	17.83	0.061
5	64QAM	12	7	17.87	0.061	17.66	0.058	17.76	0.060
5	64QAM	12	13	17.66	0.058	17.77	0.060	17.67	0.058
5	64QAM	25	0	17.57	0.057	17.68	0.059	17.68	0.059

LTE Band 26				Measured E.R.P.			
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.	Middle Ch. / Freq.		High Ch. / Freq.
Channel				/	26740		/
Frequency (MHz)				/	819		/
				/	dBm	W	/
10	QPSK	1	0	/	18.45	0.070	/
10	QPSK	1	25	/	18.48	0.070	/
10	QPSK	1	49	/	18.34	0.068	/
10	QPSK	25	0	/	17.87	0.061	/
10	QPSK	25	12	/	17.83	0.061	/
10	QPSK	25	25	/	17.82	0.061	/
10	QPSK	50	0	/	17.83	0.061	/
10	16QAM	1	0	/	17.55	0.057	/
10	16QAM	1	25	/	17.64	0.058	/
10	16QAM	1	49	/	17.58	0.057	/
10	16QAM	25	0	/	17.59	0.057	/
10	16QAM	25	12	/	17.6	0.058	/
10	16QAM	25	25	/	17.77	0.060	/
10	16QAM	50	0	/	17.94	0.062	/
10	64QAM	1	0	/	16.92	0.049	/
10	64QAM	1	25	/	17.02	0.050	/
10	64QAM	1	49	/	16.74	0.047	/
10	64QAM	25	0	/	17.09	0.051	/
10	64QAM	25	12	/	16.85	0.048	/
10	64QAM	25	25	/	16.75	0.047	/
10	64QAM	50	0	/	17.05	0.051	/

LTE Band 26				Measured E.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				26715		26740		26765	
Frequency (MHz)				816.5		819.0		821.5	
				dBm	W	dBm	W	dBm	W
5	QPSK	1	0	18.44	0.070	18.38	0.069	18.40	0.069
5	QPSK	1	12	18.39	0.069	18.42	0.070	18.40	0.069
5	QPSK	1	24	18.35	0.068	18.29	0.067	18.35	0.068
5	QPSK	12	0	17.81	0.060	17.79	0.060	17.82	0.061
5	QPSK	12	7	17.91	0.062	17.92	0.062	17.90	0.062
5	QPSK	12	13	17.80	0.060	17.71	0.059	17.78	0.060
5	QPSK	25	0	17.84	0.061	17.79	0.060	17.78	0.060
5	16QAM	1	0	17.55	0.057	17.49	0.056	17.58	0.057
5	16QAM	1	12	17.59	0.057	17.52	0.056	17.61	0.058
5	16QAM	1	24	17.64	0.058	17.64	0.058	17.66	0.058
5	16QAM	12	0	17.92	0.062	17.90	0.062	17.84	0.061
5	16QAM	12	7	17.77	0.060	17.73	0.059	17.74	0.059
5	16QAM	12	13	17.89	0.062	17.81	0.060	17.80	0.060
5	16QAM	25	0	17.44	0.055	17.45	0.056	17.44	0.055
5	64QAM	1	0	16.93	0.049	16.93	0.049	16.91	0.049
5	64QAM	1	12	16.82	0.048	16.72	0.047	16.81	0.048
5	64QAM	1	24	16.76	0.047	16.76	0.047	16.67	0.046
5	64QAM	12	0	17.03	0.050	17.07	0.051	17.02	0.050
5	64QAM	12	7	16.62	0.046	16.55	0.045	16.62	0.046
5	64QAM	12	13	17.02	0.050	17.04	0.051	16.99	0.050
5	64QAM	25	0	17.02	0.050	16.93	0.049	17.00	0.050

LTE Band 26				Measured E.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				26705		26740		26775	
Frequency (MHz)				815.5		819.0		822.5	
				dBm	W	dBm	W	dBm	W
3	QPSK	1	0	18.48	0.070	18.40	0.069	18.45	0.070
3	QPSK	1	8	18.39	0.069	18.42	0.070	18.33	0.068
3	QPSK	1	14	18.44	0.070	18.38	0.069	18.42	0.070
3	QPSK	8	0	17.71	0.059	17.67	0.058	17.75	0.060
3	QPSK	8	4	17.88	0.061	17.88	0.061	17.85	0.061
3	QPSK	8	7	17.88	0.061	17.84	0.061	17.92	0.062
3	QPSK	15	0	17.73	0.059	17.68	0.059	17.66	0.058
3	16QAM	1	0	17.84	0.061	17.81	0.060	17.88	0.061
3	16QAM	1	8	17.83	0.061	17.87	0.061	17.86	0.061
3	16QAM	1	14	17.81	0.060	17.81	0.060	17.74	0.059
3	16QAM	8	0	17.90	0.062	17.85	0.061	17.86	0.061
3	16QAM	8	4	17.84	0.061	17.88	0.061	17.88	0.061
3	16QAM	8	7	17.60	0.058	17.50	0.056	17.64	0.058
3	16QAM	15	0	17.67	0.058	17.57	0.057	17.66	0.058
3	64QAM	1	0	16.62	0.046	16.60	0.046	16.56	0.045
3	64QAM	1	8	16.92	0.049	16.93	0.049	16.85	0.048
3	64QAM	1	14	16.86	0.049	16.86	0.049	16.77	0.048
3	64QAM	8	0	16.75	0.047	16.76	0.047	16.78	0.048
3	64QAM	8	4	16.75	0.047	16.75	0.047	16.73	0.047
3	64QAM	8	7	17.02	0.050	16.94	0.049	16.96	0.050
3	64QAM	15	0	17.02	0.050	17.00	0.050	16.95	0.050

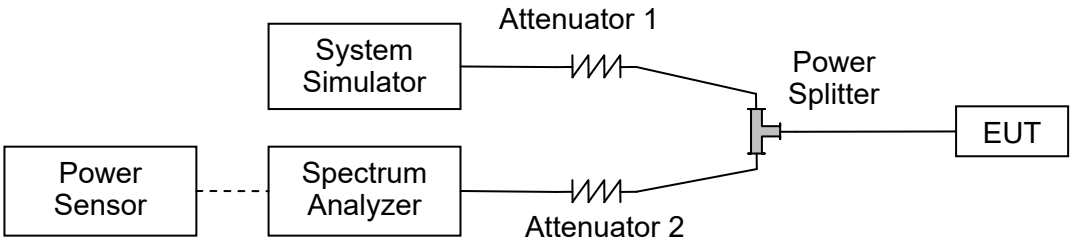
LTE Band 26				Measured E.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				26697		26740		26783	
Frequency (MHz)				814.7		819.0		823.3	
				dBm	W	dBm	W	dBm	W
1.4	QPSK	1	0	18.35	0.068	18.30	0.068	18.26	0.067
1.4	QPSK	1	3	18.34	0.068	18.27	0.067	18.34	0.068
1.4	QPSK	1	5	18.34	0.068	18.27	0.067	18.32	0.068
1.4	QPSK	3	0	18.48	0.070	18.41	0.069	18.49	0.071
1.4	QPSK	3	1	18.39	0.069	18.41	0.069	18.29	0.067
1.4	QPSK	3	3	18.39	0.069	18.36	0.069	18.39	0.069
1.4	QPSK	6	0	17.49	0.056	17.50	0.056	17.53	0.057
1.4	16QAM	1	0	17.54	0.057	17.48	0.056	17.44	0.055
1.4	16QAM	1	3	17.61	0.058	17.57	0.057	17.59	0.057
1.4	16QAM	1	5	17.70	0.059	17.64	0.058	17.73	0.059
1.4	16QAM	3	0	17.71	0.059	17.66	0.058	17.65	0.058
1.4	16QAM	3	1	17.71	0.059	17.63	0.058	17.68	0.059
1.4	16QAM	3	3	17.71	0.059	17.69	0.059	17.73	0.059
1.4	16QAM	6	0	18.07	0.064	18.10	0.065	18.00	0.063
1.4	64QAM	1	0	16.96	0.050	16.96	0.050	16.96	0.050
1.4	64QAM	1	3	17.02	0.050	16.96	0.050	16.93	0.049
1.4	64QAM	1	5	16.92	0.049	16.85	0.048	16.92	0.049
1.4	64QAM	3	0	17.01	0.050	17.05	0.051	16.99	0.050
1.4	64QAM	3	1	17.06	0.051	16.97	0.050	17.00	0.050
1.4	64QAM	3	3	16.98	0.050	16.95	0.050	16.97	0.050
1.4	64QAM	6	0	17.05	0.051	16.96	0.050	17.02	0.050

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

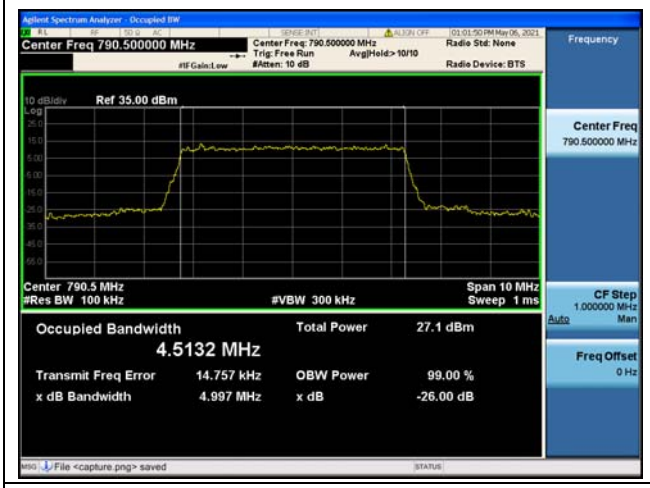
KDB 971168 D01v03 Section 4.1 and ANSI/TIA-603-E-2016.

2.2.4. Test Result

LTE Band 14				
BW(MHz)	Channel Level	Modulation	99% BW(MHz)	26dB BW(MHz)
5	Low	QPSK	4.51	5.00
	Low	16QAM	4.51	5.02
	Low	64QAM	4.50	4.96
	Mid	QPSK	4.49	5.00
	Mid	16QAM	4.49	4.97
	Mid	64QAM	4.50	4.98
	High	QPSK	4.49	4.99
	High	16QAM	4.50	4.98
	High	64QAM	4.50	4.96
10	Mid	QPSK	8.96	9.85
	Mid	16QAM	8.93	9.72
	Mid	64QAM	8.94	9.86

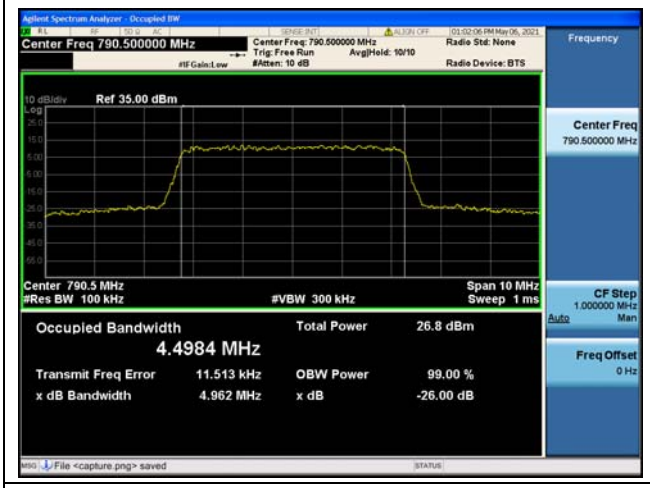
LTE Band 26				
BW(MHz)	Channel Level	Modulation	99% BW(MHz)	26dB BW(MHz)
1.4	Low	QPSK	1.10	1.31
	Low	16QAM	1.10	1.28
	Low	64QAM	1.10	1.30
	Mid	QPSK	1.10	1.30
	Mid	16QAM	1.10	1.28
	Mid	64QAM	1.10	1.29
	High	QPSK	1.10	1.29
	High	16QAM	1.10	1.29
	High	64QAM	1.10	1.30
3	Low	QPSK	2.70	2.98
	Low	16QAM	2.70	2.98
	Low	64QAM	2.70	2.99
	Mid	QPSK	2.70	2.98
	Mid	16QAM	2.70	3.01
	Mid	64QAM	2.70	2.97
	High	QPSK	2.70	2.98
	High	16QAM	2.70	2.99
	High	64QAM	2.70	2.99
5	Low	QPSK	4.51	5.00
	Low	16QAM	4.50	5.02
	Low	64QAM	4.51	5.02
	Mid	QPSK	4.50	5.02
	Mid	16QAM	4.51	5.04
	Mid	64QAM	4.51	5.01
	High	QPSK	4.50	5.06
	High	16QAM	4.51	5.04
	High	64QAM	4.50	5.02
10	Mid	QPSK	8.99	9.85
	Mid	16QAM	9.00	9.89
	Mid	64QAM	9.00	9.83

Band14 / 5MHz / Low CH / QPSK



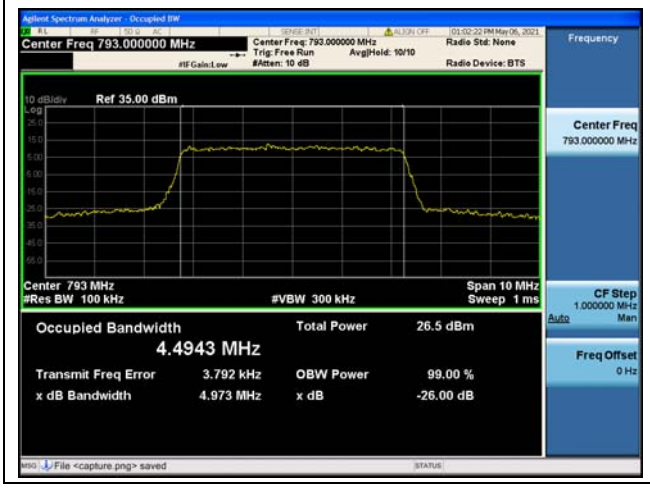
Band14 / 5MHz / Low CH / 16QAM

Band14 / 5MHz / Low CH / 64QAM



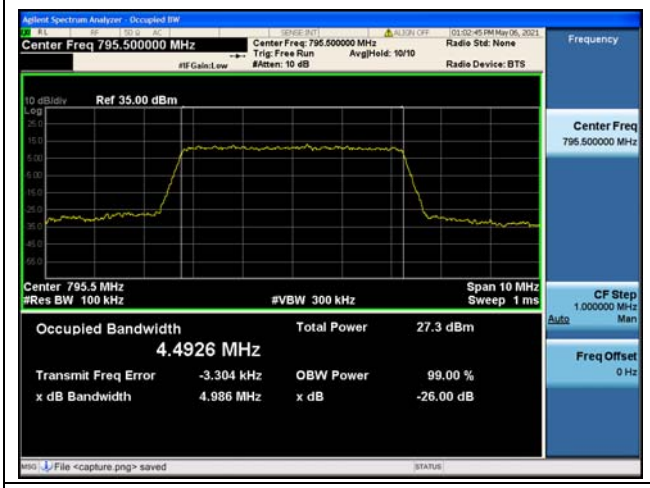
Band14 / 5MHz / Mid CH / QPSK

Band14 / 5MHz / Mid CH / 16QAM

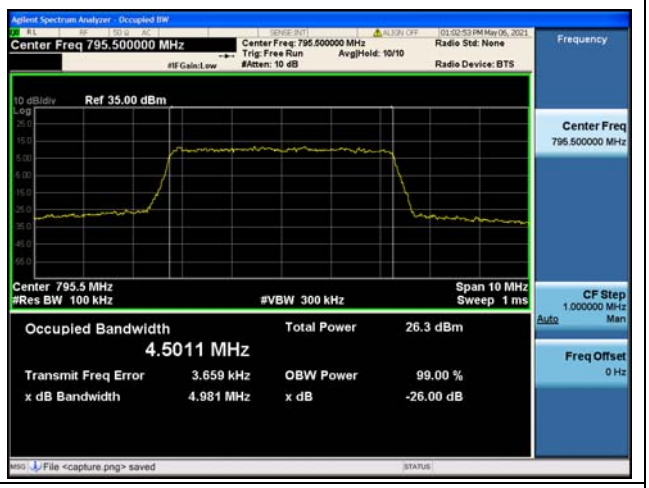


Band14 / 5MHz / Mid CH / 64QAM

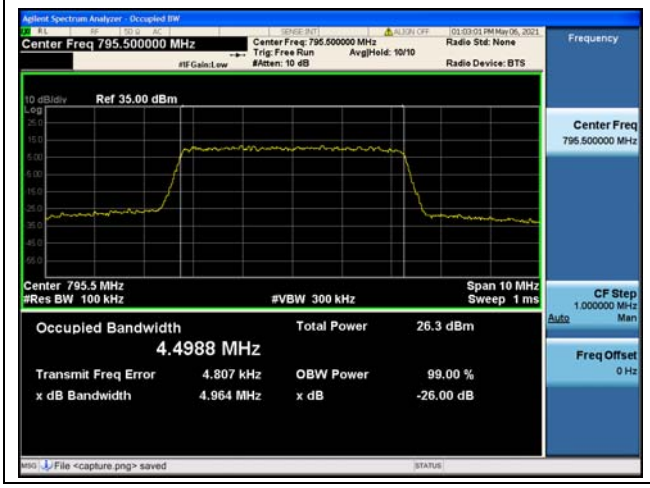
Band14 / 5MHz / High CH / QPSK



Band14 / 5MHz / High CH / 16QAM

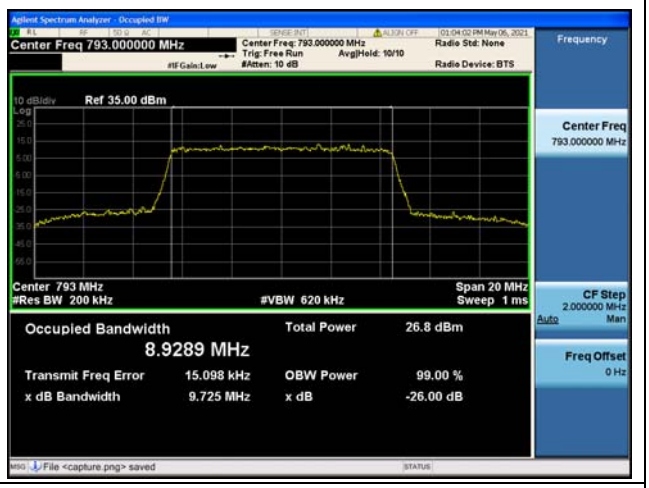


Band14 / 5MHz / High CH / 64QAM

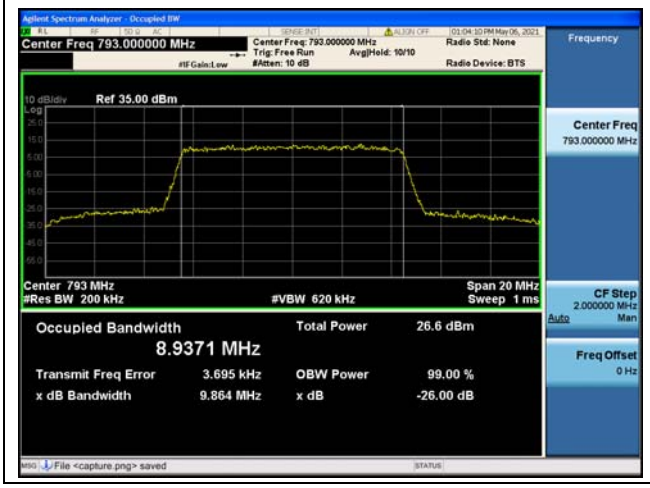


Band14 / 10MHz / Mid CH / QPSK

Band14 / 10MHz / Mid CH / 16QAM



Band14 / 10MHz / Mid CH / 64QAM



Band26 / 1.4MHz / Low CH / QPSK

Band26 / 1.4MHz / Low CH / 16QAM

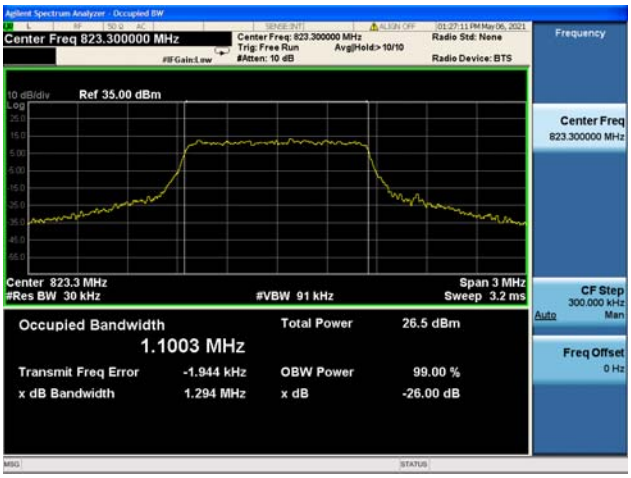
Band26 / 1.4MHz / Low CH / 64QAM

Band26 / 1.4MHz / Mid CH / QPSK

Band26 / 1.4MHz / Mid CH / 16QAM

Band26 / 1.4MHz / Mid CH / 64QAM

Band26 / 1.4MHz / High CH / QPSK

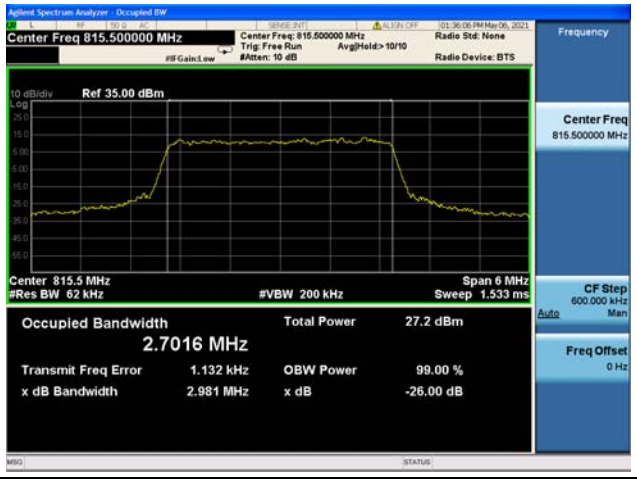


Band26 / 1.4MHz / High CH / 16QAM

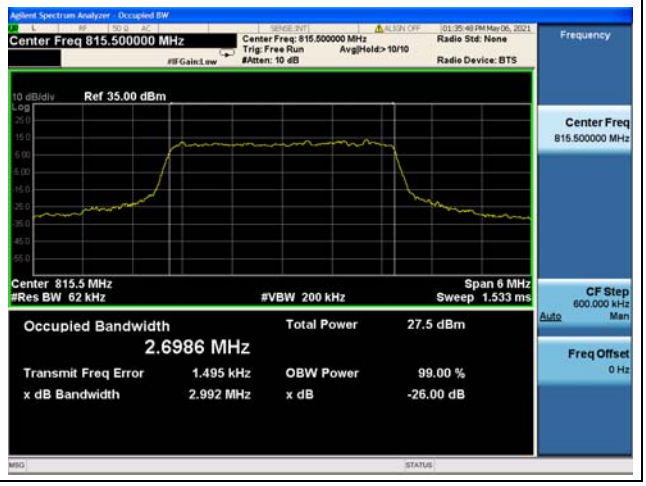
Band26 / 1.4MHz / High CH / 64QAM

Band26 / 3MHz / Low CH / QPSK

Band26 / 3MHz / Low CH / 16QAM

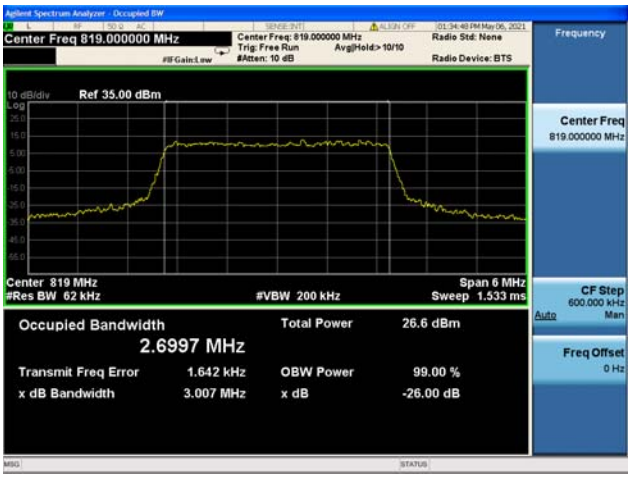


Band26 / 3MHz / Low CH / 64QAM



Band26 / 3MHz / Mid CH / QPSK

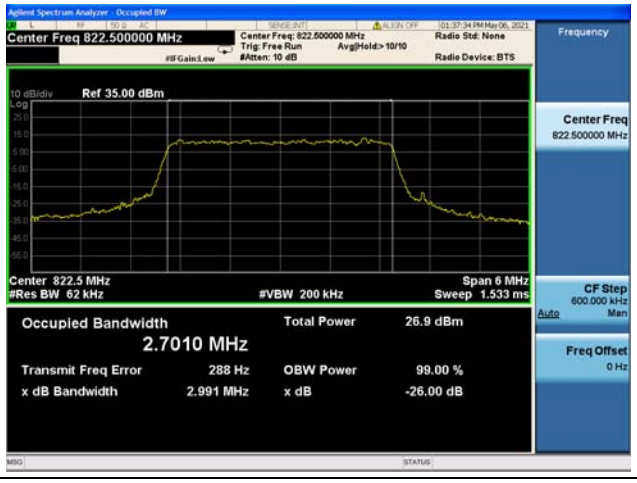
Band26 / 3MHz / Mid CH / 16QAM



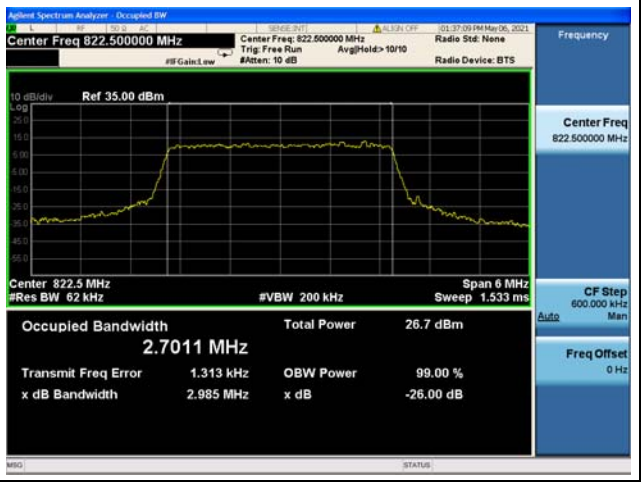
Band26 / 3MHz / Mid CH / 64QAM

Band26 / 3MHz / High CH / QPSK

Band26 / 3MHz / High CH / 16QAM



Band26 / 3MHz / High CH / 64QAM



Band26 / 5MHz / Low CH / QPSK

Band26 / 5MHz / Low CH / 16QAM

Band26 / 5MHz / Low CH / 64QAM

Band26 / 5MHz / Mid CH / QPSK

Band26 / 5MHz / Mid CH / 16QAM

Band26 / 5MHz / Mid CH / 64QAM

Band26 / 5MHz / High CH / QPSK

Band26 / 5MHz / High CH / 16QAM

Band26 / 5MHz / High CH / 64QAM

Band26 / 10MHz / Mid CH / QPSK

Band26 / 10MHz / Mid CH / 16QAM

Band26 / 10MHz / Mid CH / 64QAM

2.3. Frequency Stability

2.3.1. Requirement

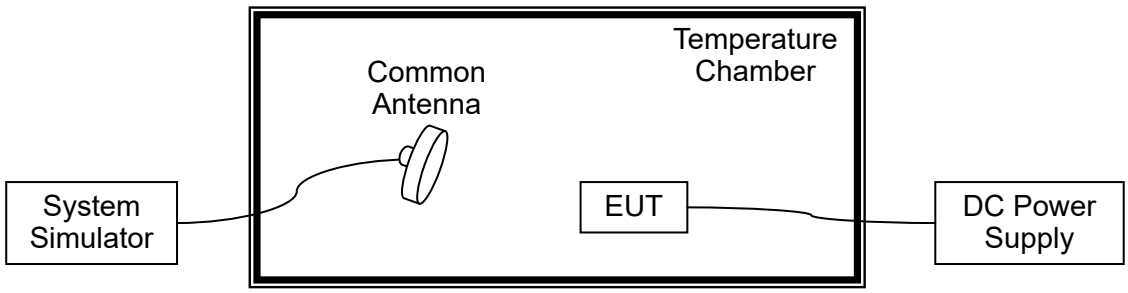
According to FCC section 2.1055, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. According to FCC section 2.1055, the test conditions are:

(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 -20°C to 55°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, 4.20V and 3.60V, which are specified by the applicant; the normal temperature here used is 20°C.

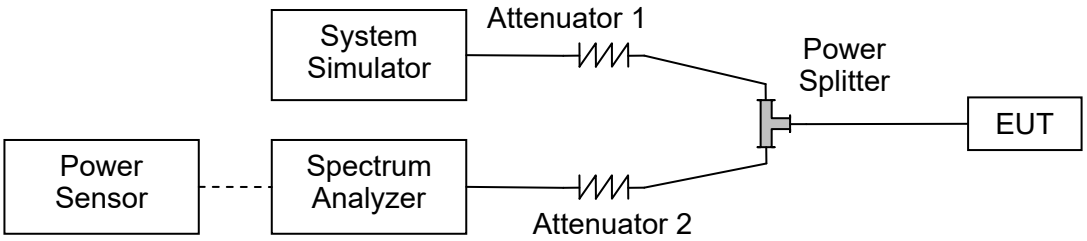
LTE Band 14, QPSK, Channel 23330, Frequency 793.0MHz Limit =±2.5ppm					
Voltage (%)	**Power (VDC)**	**Temp(°C)**	**Fre. Dev.(Hz)**	**Deviation (ppm)**	**Result**
100	3.85	+20(Ref)	-33	-0.042	PASS
100		-10	53	0.067	
100		0	-81	-0.102	
100		+10	-58	-0.073	
100		+20	-82	-0.103	
100		+30	97	0.122	
100		+40	-39	-0.049	
100		+50	-81	-0.102	
100		+55	31	0.039	
115	4.20	+20	90	0.113	
85	3.60	+20	21	0.026	

LTE Band 26, QPSK, Channel 26740, Frequency 819MHz Limit =±2.5ppm					
Voltage (%)	**Power (VDC)**	**Temp(°C)**	**Fre. Dev.(Hz)**	**Deviation (ppm)**	**Result**
100	3.85	+20(Ref)	26	0.032	PASS
100		-10	-52	-0.063	
100		0	29	0.035	
100		+10	-15	-0.018	
100		+20	15	0.018	
100		+30	-75	-0.092	
100		+40	34	0.042	
100		+50	76	0.093	
100		+55	-54	-0.066	
115	4.20	+20	74	0.090	
85	3.60	+20	33	0.040	

2.4. Peak to Average Radio

2.4.1. Requirement

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

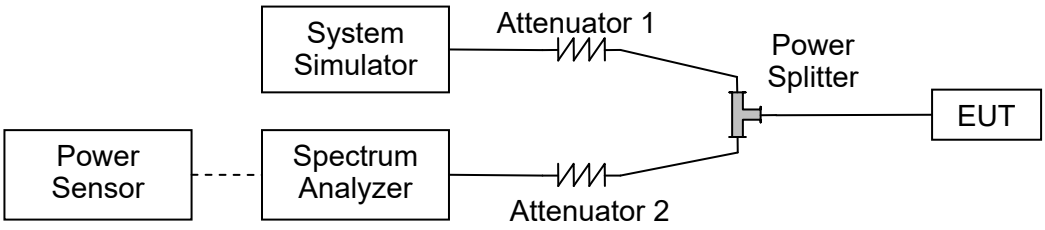
Note: This test case does not apply this kind of EUT for part 90.

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

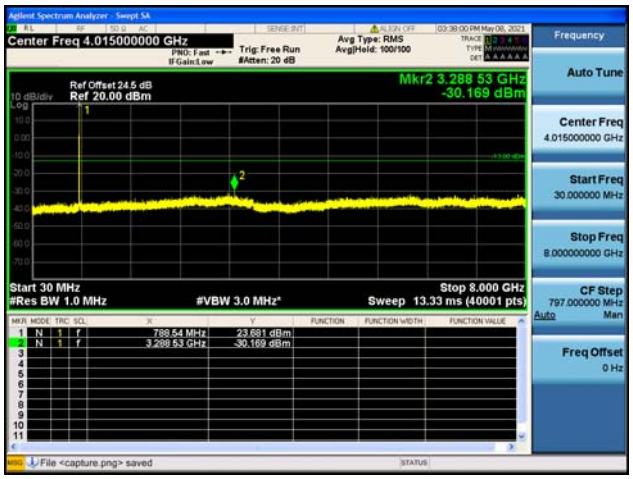
KDB 971168 D01v03 Section 6.0 and ANSI/TIA-603-E-2016.

2.5.4. Test Result

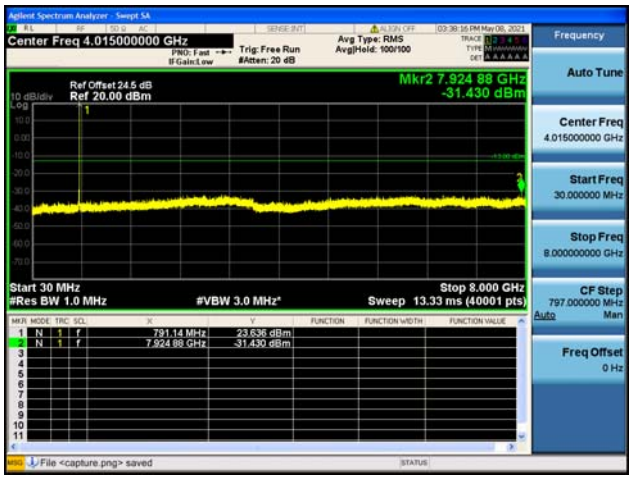
Band14 / 5MHz / Low CH / QPSK

Band14 / 5MHz / Low CH / 16QAM

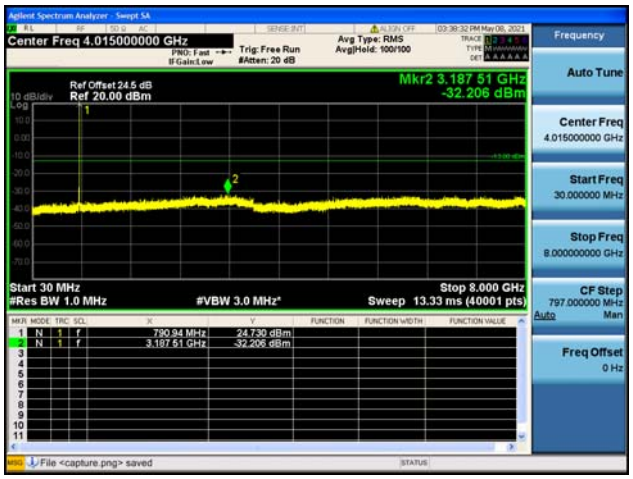
Band14 / 5MHz / Low CH / 64QAM



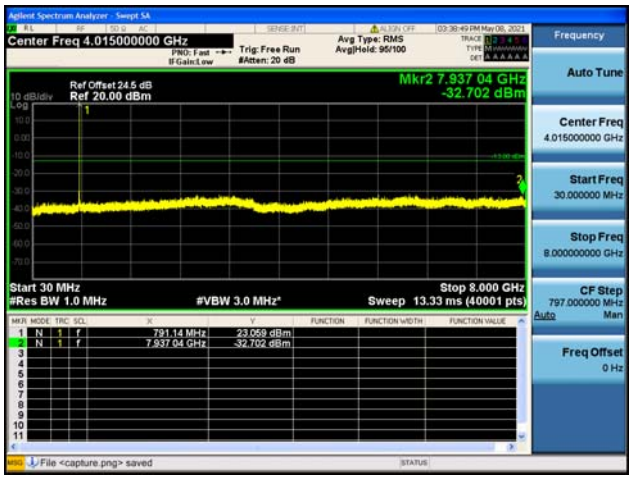
Band14 / 5MHz / Mid CH / QPSK



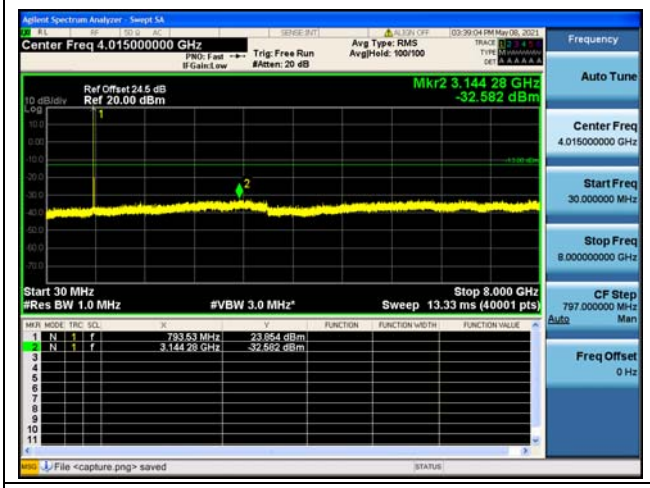
Band14 / 5MHz / Mid CH / 16QAM



Band14 / 5MHz / Mid CH / 64QAM



Band14 / 5MHz / High CH / QPSK

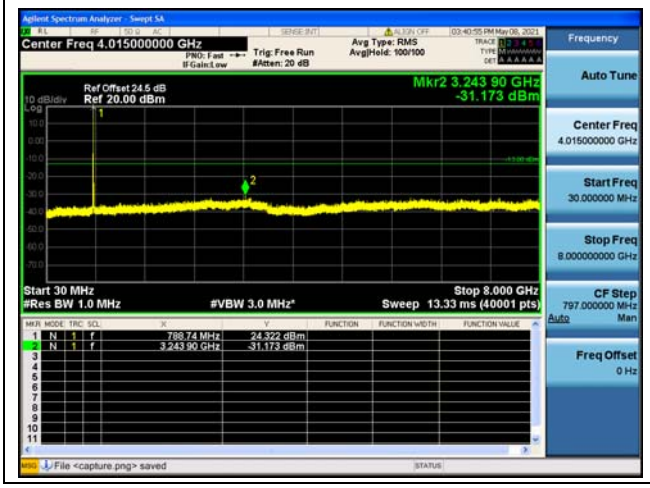


Band14 / 5MHz / High CH / 16QAM

Band14 / 5MHz / High CH / 64QAM

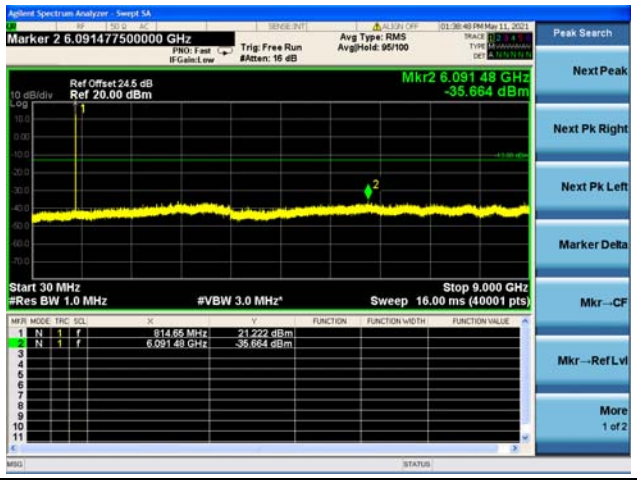
Band14 / 10MHz / Mid CH / QPSK

Band14 / 10MHz / Mid CH / 16QAM



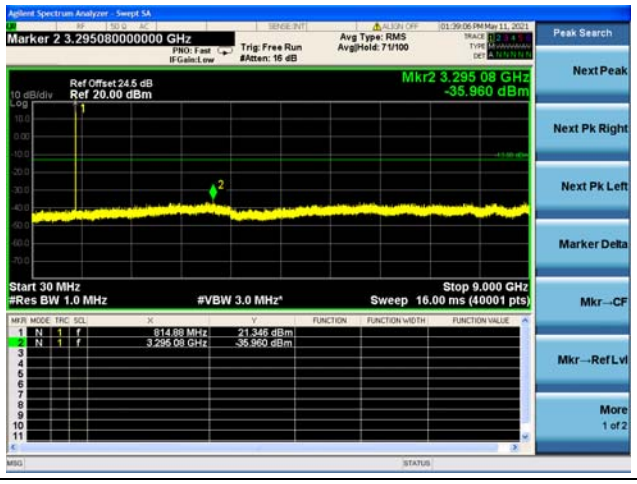
Band14 / 10MHz / Mid CH / 64QAM

Band26 / 1.4MHz / Low CH / QPSK



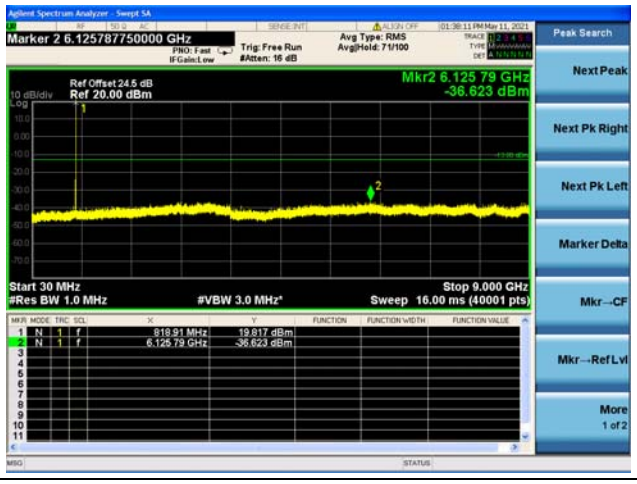
Band26 / 1.4MHz / Low CH / 16QAM

Band26 / 1.4MHz / Low CH / 64QAM



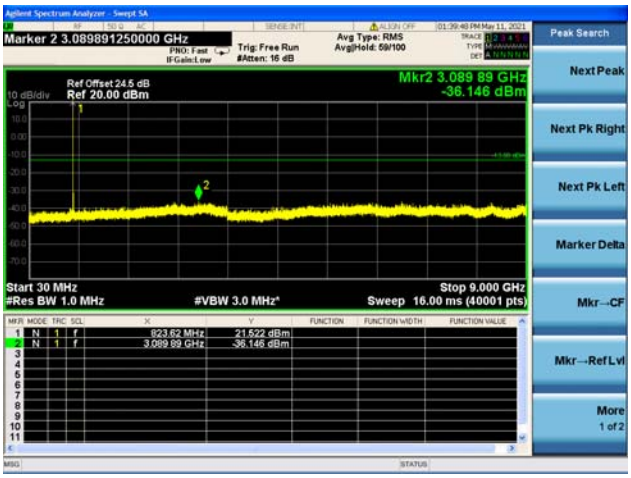
Band26 / 1.4MHz / Mid CH / QPSK

Band26 / 1.4MHz / Mid CH / 16QAM

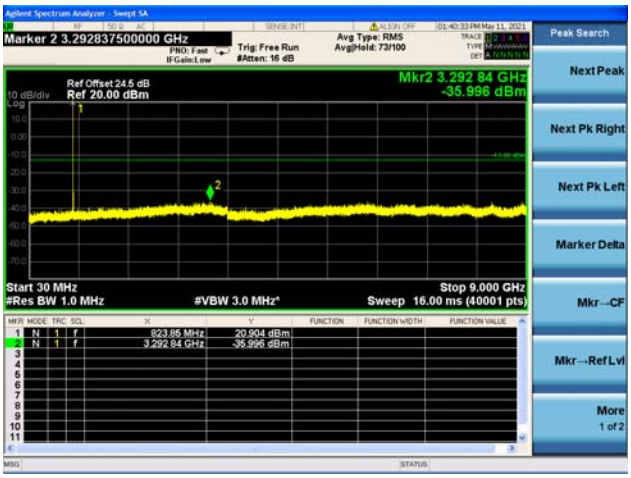


Band26 / 1.4MHz / Mid CH / 64QAM

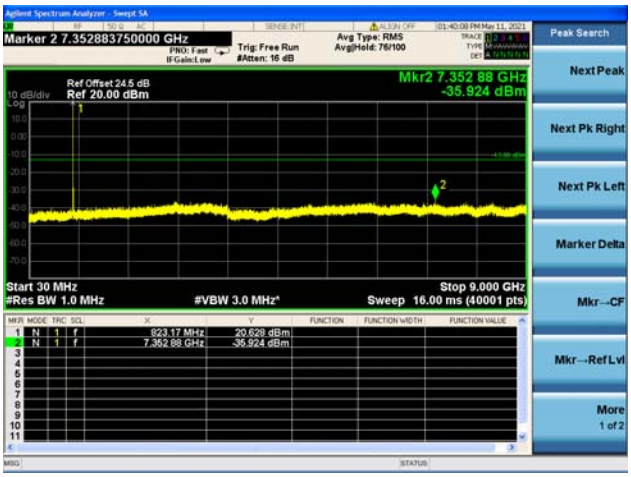
Band26 / 1.4MHz / High CH / QPSK



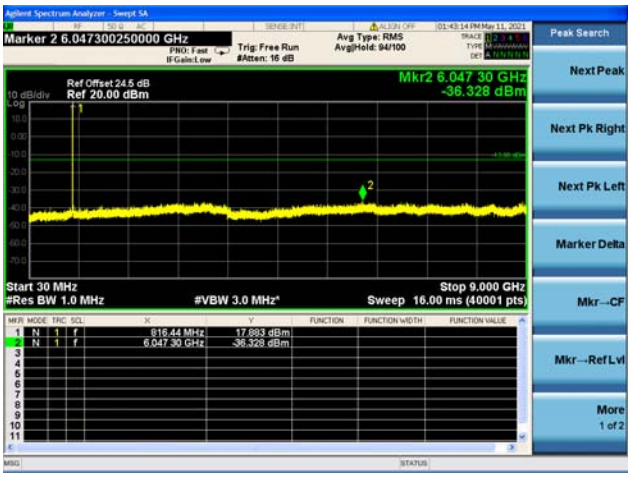
Band26 / 1.4MHz / High CH / 16QAM



Band26 / 1.4MHz / High CH / 64QAM

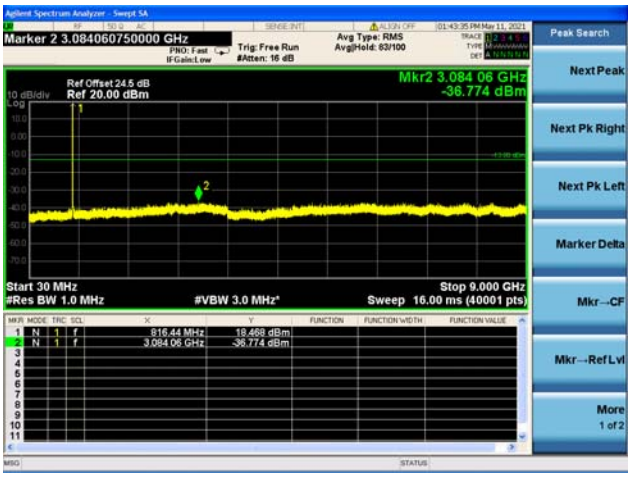


Band26 / 3MHz / Low CH / QPSK

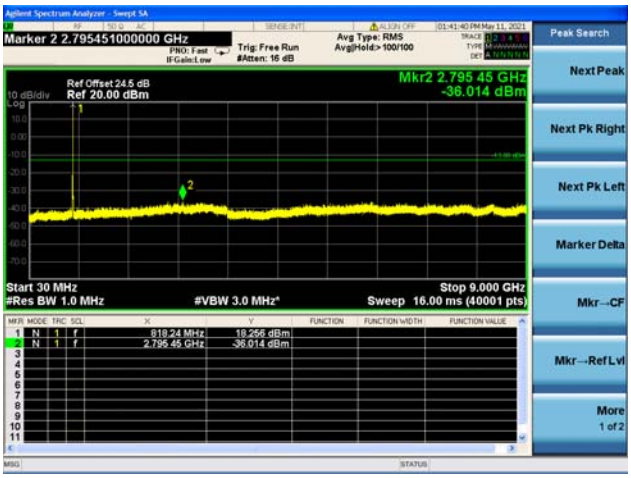


Band26 / 3MHz / Low CH / 16QAM

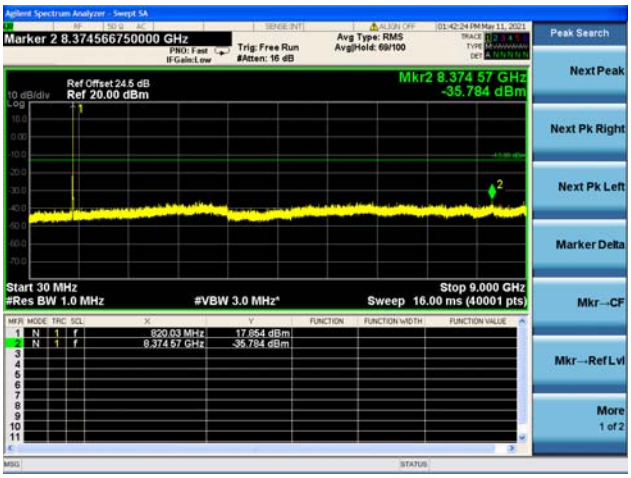
Band26 / 3MHz / Low CH / 64QAM



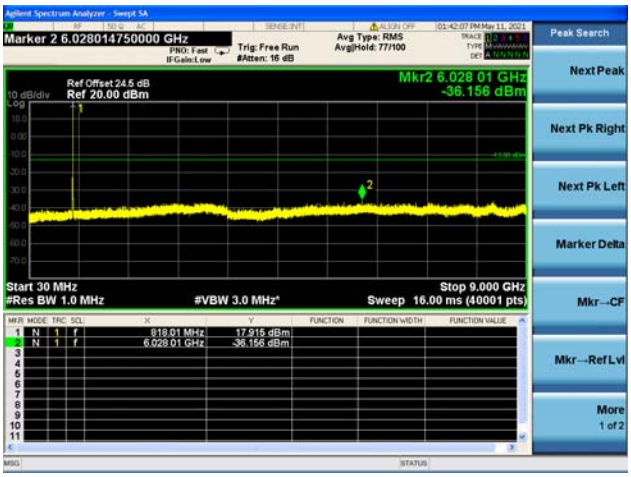
Band26 / 3MHz / Mid CH / QPSK



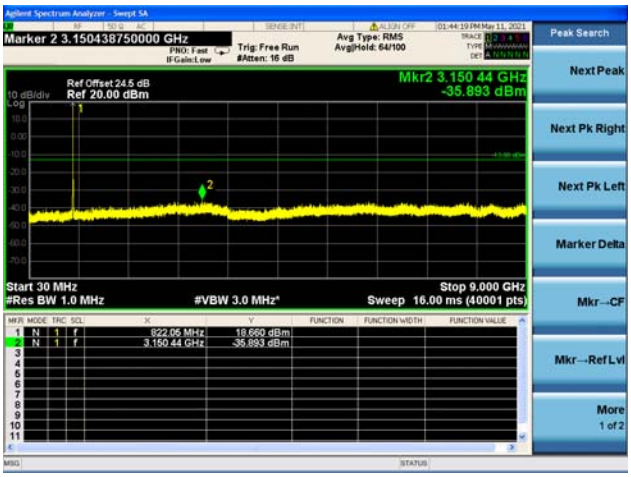
Band26 / 3MHz / Mid CH / 16QAM



Band26 / 3MHz / Mid CH / 64QAM



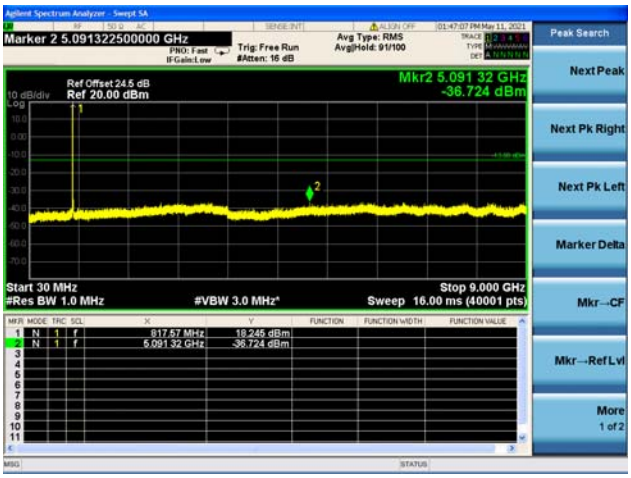
Band26 / 3MHz / High CH / QPSK



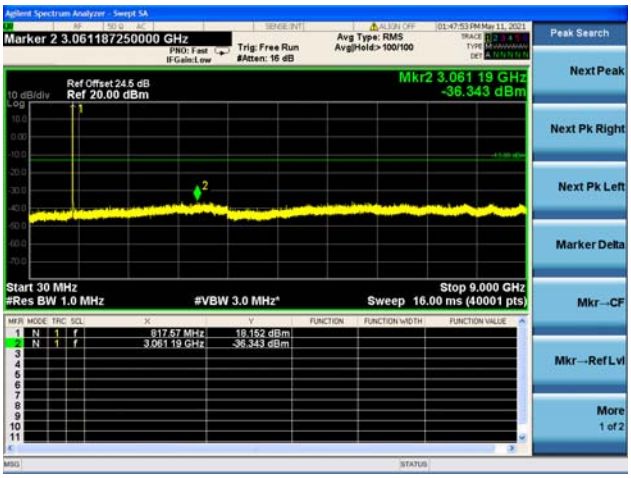
Band26 / 3MHz / High CH / 16QAM

Band26 / 3MHz / High CH / 64QAM

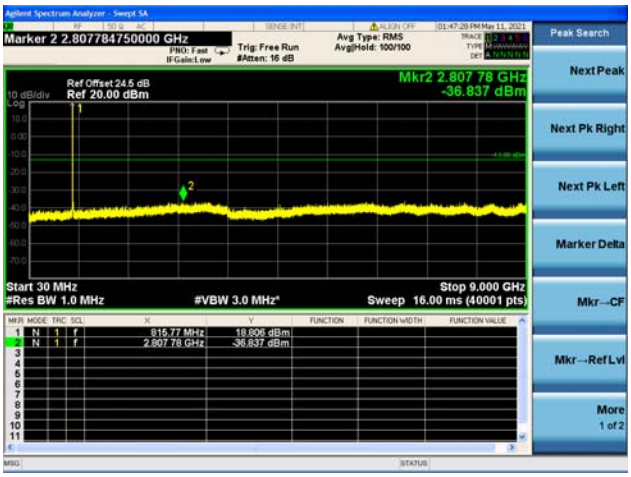
Band26 / 5MHz / Low CH / QPSK



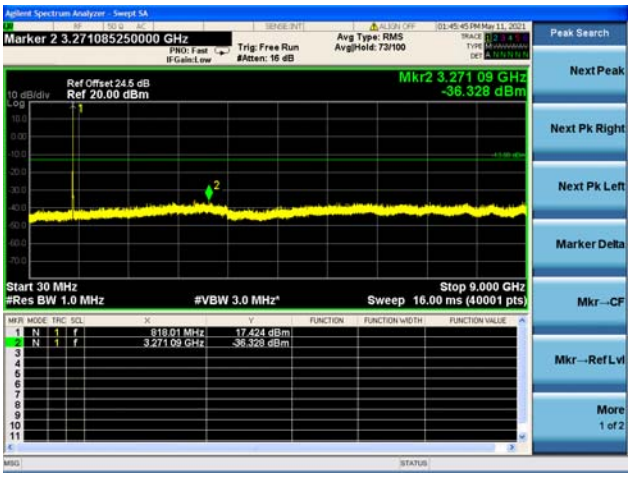
Band26 / 5MHz / Low CH / 16QAM



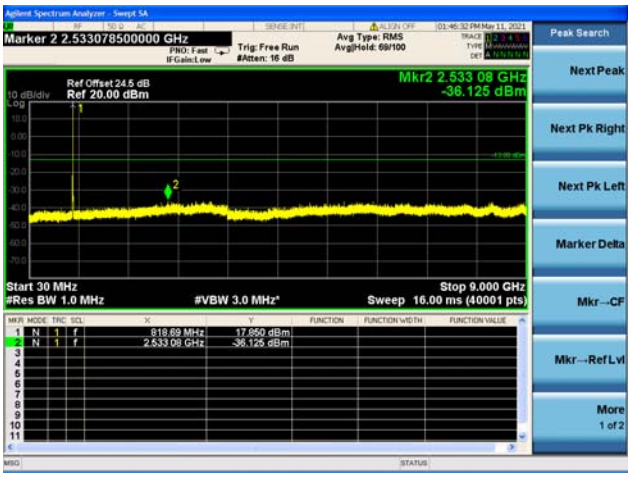
Band26 / 5MHz / Low CH / 64QAM



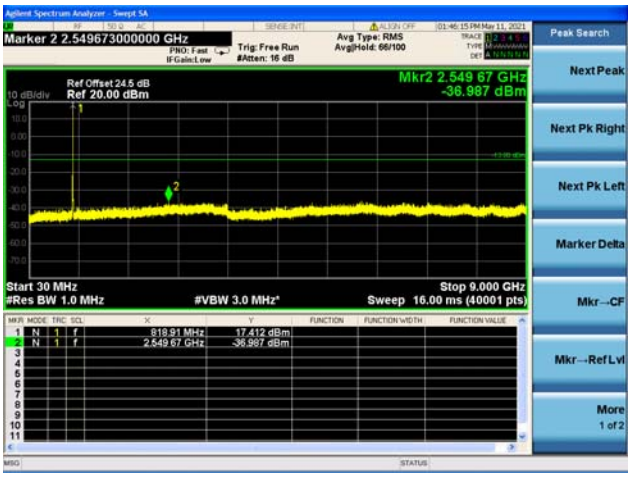
Band26 / 5MHz / Mid CH / QPSK



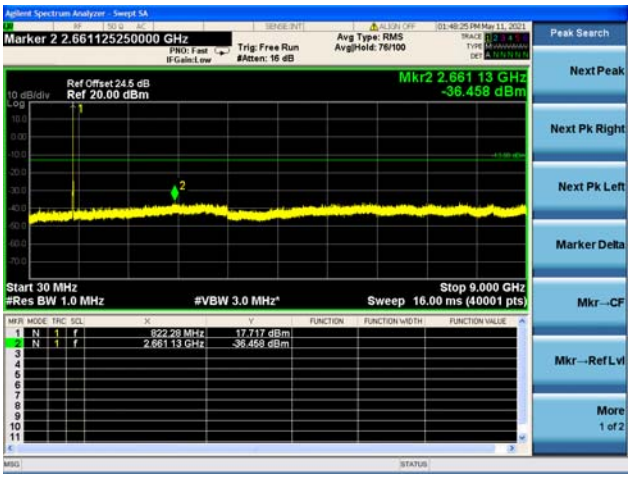
Band26 / 5MHz / Mid CH / 16QAM



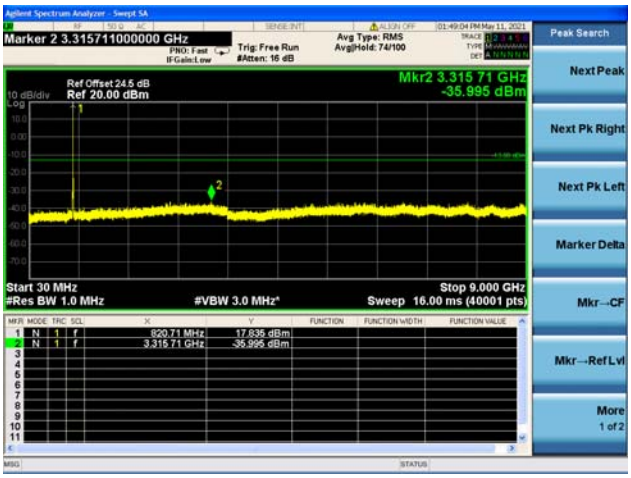
Band26 / 5MHz / Mid CH / 64QAM



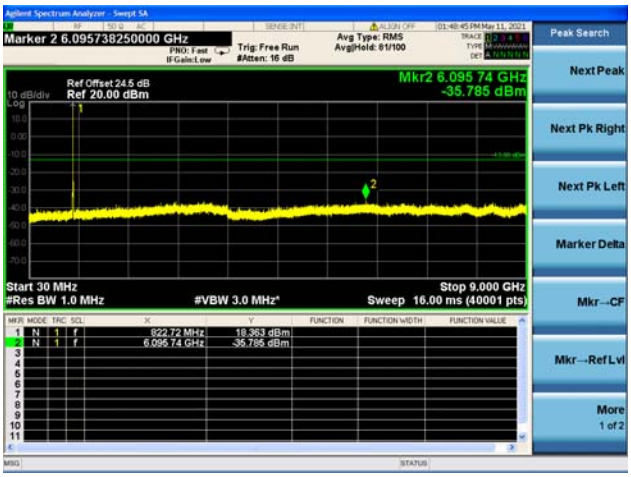
Band26 / 5MHz / High CH / QPSK



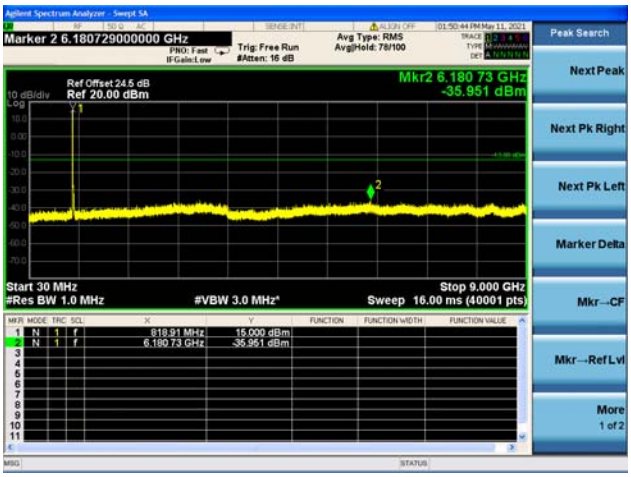
Band26 / 5MHz / High CH / 16QAM



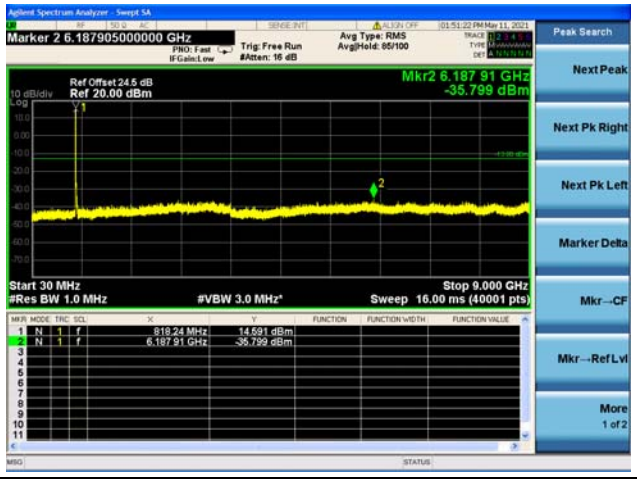
Band26 / 5MHz / High CH / 64QAM



Band26 / 10MHz / Mid CH / QPSK



Band26 / 10MHz / Mid CH / 16QAM



Band26 / 10MHz / Mid CH / 64QAM

2.6. Band Edge

2.6.1. Requirement

Band 14

According to FCC section 90.543(e), for operations in the 758-768 MHz and the 788-798 MHz bands, the power of any emission outside the 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, in accordance with the following:

(1) On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations.

(2) On any frequency between 775-788 MHz, above 805 MHz, and below 758 MHz, by at least 43 + 10 log (P) dB.

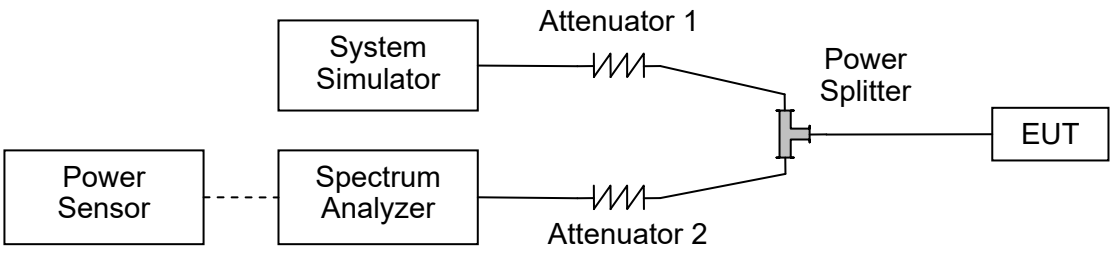
(3) Compliance with the provisions of paragraphs (e)(1) and (2) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

(4) Compliance with the provisions of paragraph (e)(3) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of 30 kHz may be employed.

Band26

According to FCC section 90.961(a), 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.

2.6.2. Test Description



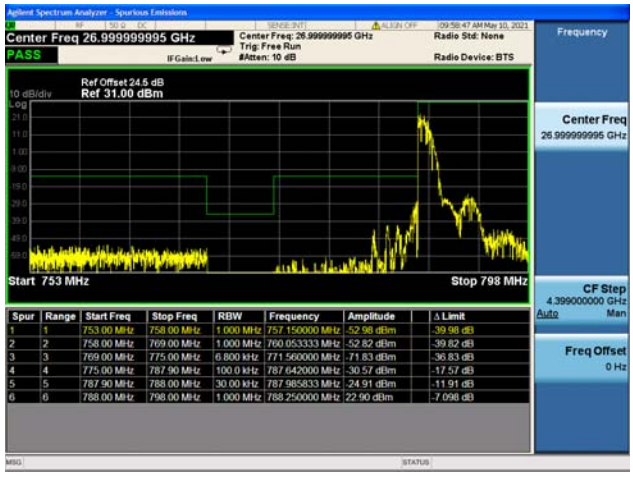
The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum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

2.6.3. Test procedure

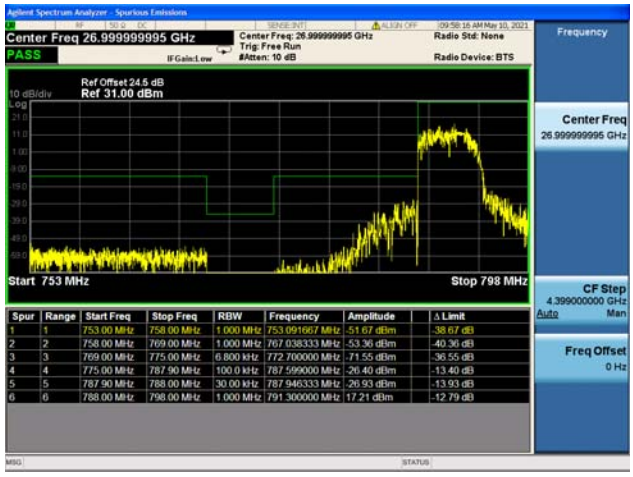
KDB 971168 D01v03 Section 6.0 and ANSI/TIA-603-E-2016.

2.6.4. Test Result

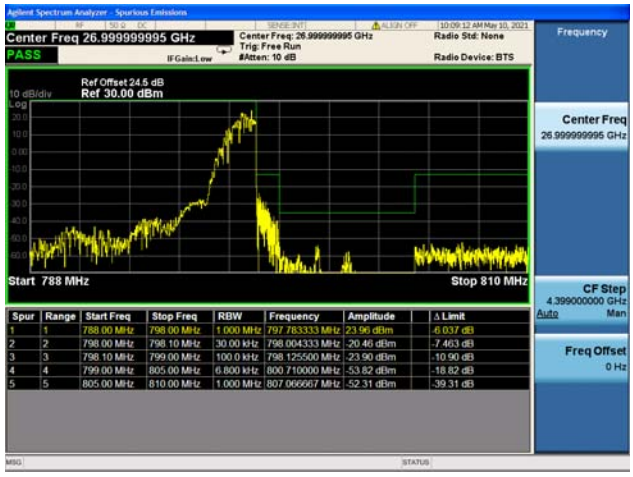
Band14 / 5MHz / Low CH / QPSK / 1 RB



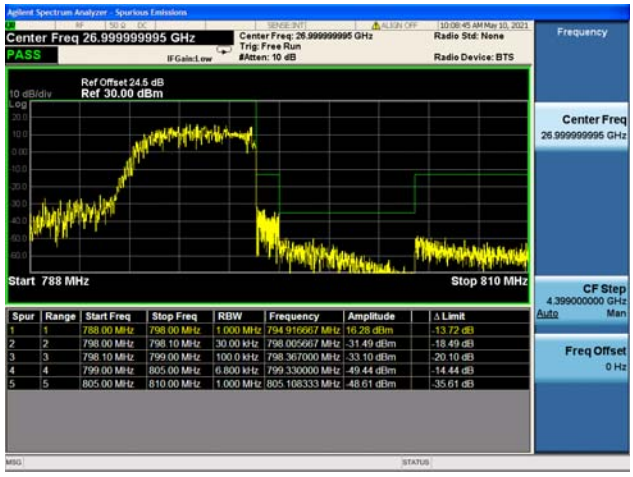
Band14 / 5MHz / Low CH / QPSK / FULL RB



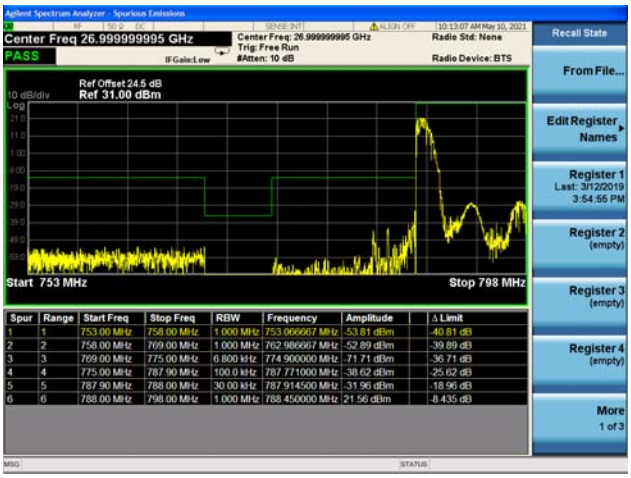
Band14 / 5MHz / High CH / QPSK / 1 RB



Band14 / 5MHz / High CH / QPSK / FULL RB

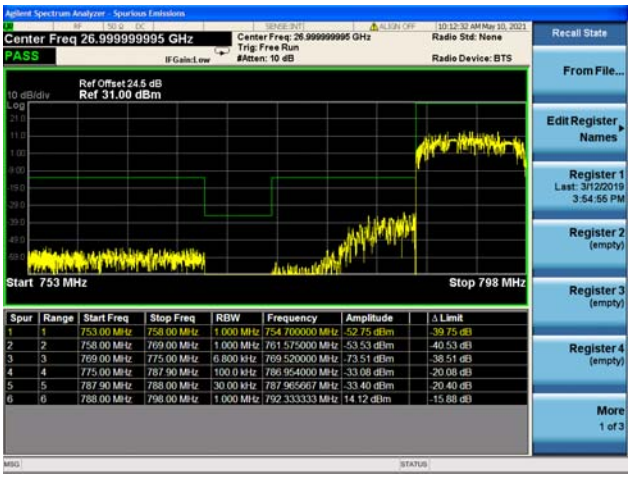


Band14 / 10MHz / Low CH / QPSK / 1 RB



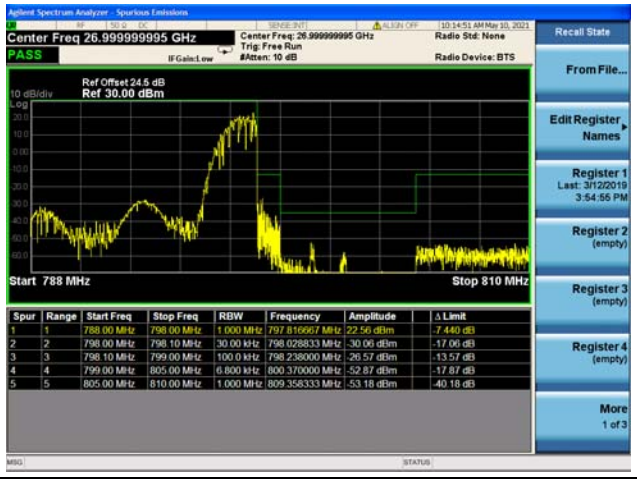
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	753.00 MHz	758.00 MHz	1.000 MHz	753.066667 MHz	-53.81 dBm	-40.81 dB
2	2	758.00 MHz	769.00 MHz	1.000 MHz	762.986667 MHz	-52.89 dBm	-39.89 dB
3	3	769.00 MHz	775.00 MHz	6.800 kHz	774.900000 MHz	-71.71 dBm	-36.71 dB
4	4	775.00 MHz	787.90 MHz	100.0 kHz	787.771000 MHz	-38.62 dBm	-25.62 dB
5	5	787.90 MHz	788.00 MHz	30.00 kHz	787.914500 MHz	-31.96 dBm	-18.96 dB
6	6	788.00 MHz	798.00 MHz	1.000 MHz	788.450000 MHz	21.56 dBm	-8.435 dB

Band14 / 10MHz / Low CH / QPSK / FULL RB



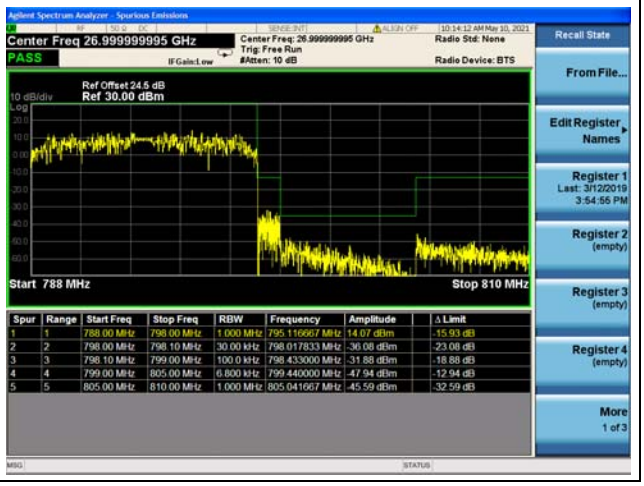
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	753.00 MHz	758.00 MHz	1.000 MHz	754.700000 MHz	-52.75 dBm	-39.75 dB
2	2	758.00 MHz	769.00 MHz	1.000 MHz	761.575000 MHz	-53.53 dBm	-40.53 dB
3	3	769.00 MHz	775.00 MHz	6.800 kHz	769.520000 MHz	-73.51 dBm	-38.51 dB
4	4	775.00 MHz	787.90 MHz	100.0 kHz	786.954000 MHz	-33.08 dBm	-20.08 dB
5	5	787.90 MHz	788.00 MHz	30.00 kHz	787.965667 MHz	-33.40 dBm	-20.40 dB
6	6	788.00 MHz	798.00 MHz	1.000 MHz	792.333333 MHz	14.12 dBm	-15.88 dB

Band14 / 10MHz / High CH / QPSK / 1 RB



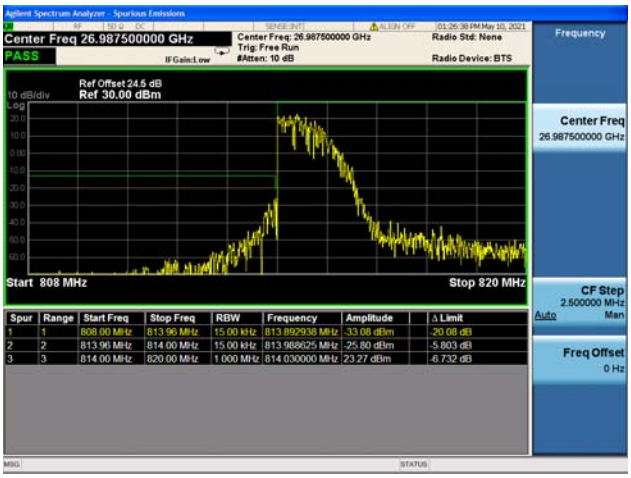
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	788.00 MHz	798.00 MHz	1.000 MHz	797.816667 MHz	22.56 dBm	-7.440 dB
2	2	798.00 MHz	798.10 MHz	30.00 kHz	798.028833 MHz	-30.06 dBm	-17.06 dB
3	3	798.10 MHz	799.00 MHz	100.0 kHz	798.238000 MHz	-26.57 dBm	-13.57 dB
4	4	799.00 MHz	805.00 MHz	6.800 kHz	800.370000 MHz	-52.87 dBm	-17.87 dB
5	5	805.00 MHz	810.00 MHz	1.000 MHz	809.358333 MHz	-53.18 dBm	-40.18 dB

Band14 / 10MHz / High CH / QPSK / FULL RB

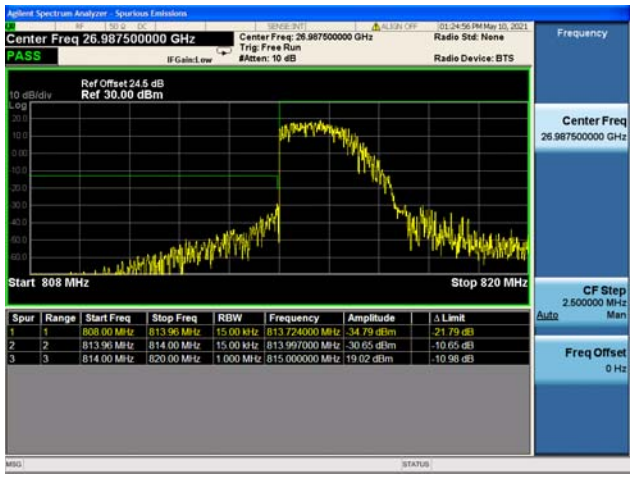


Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	788.00 MHz	798.00 MHz	1.000 MHz	795.116667 MHz	14.07 dBm	-15.93 dB
2	2	798.00 MHz	798.10 MHz	30.00 kHz	798.017833 MHz	-36.08 dBm	-23.08 dB
3	3	798.10 MHz	799.00 MHz	100.0 kHz	798.433000 MHz	-31.88 dBm	-18.88 dB
4	4	799.00 MHz	805.00 MHz	6.800 kHz	799.440000 MHz	-47.94 dBm	-12.94 dB
5	5	805.00 MHz	810.00 MHz	1.000 MHz	805.041667 MHz	-45.59 dBm	-32.59 dB

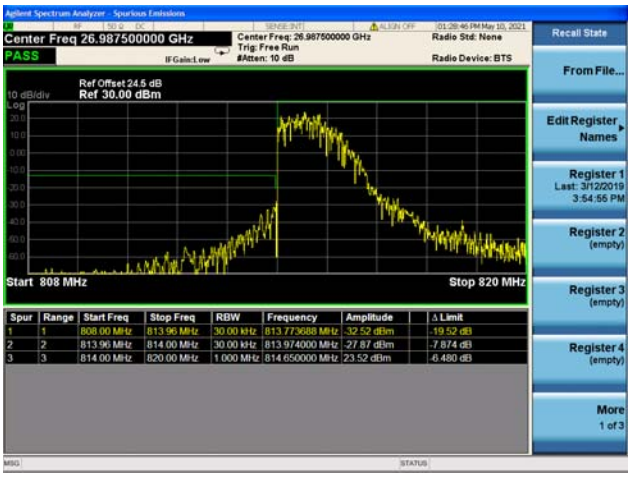
Band26 / 1.4MHz / Low CH / QPSK / 1 RB



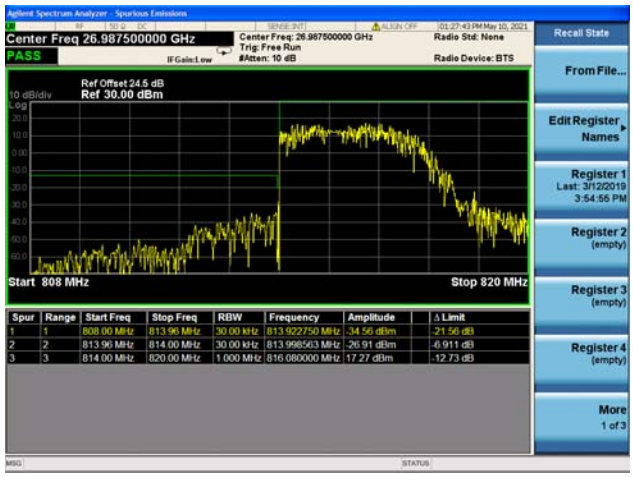
Band26 / 1.4MHz / Low CH / QPSK / FULL RB



Band26 / 3MHz / Low CH / QPSK / 1 RB

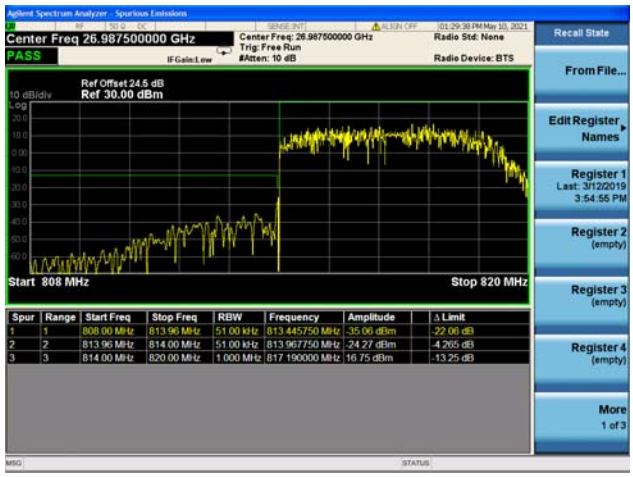


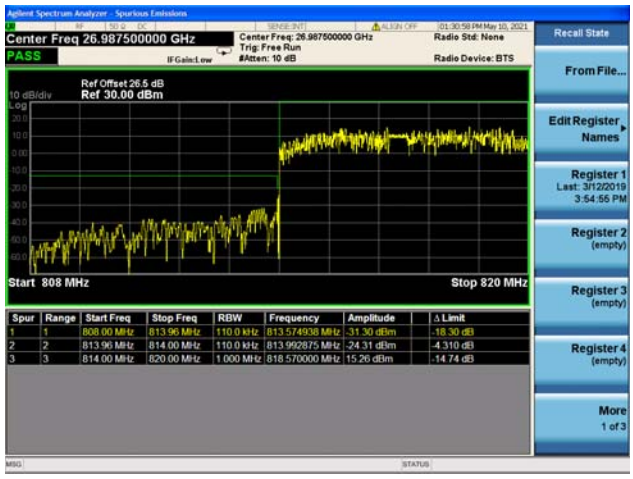
Band26 / 3MHz / Low CH / QPSK / FULL RB



Band26 / 5MHz / Low CH / QPSK / 1 RB

Band26 / 5MHz / Low CH / QPSK / FULL RB



Band26 / 10MHz / Low CH / QPSK / 1 RB	Band26 / 10MHz / Low CH / QPSK / FULL RB
	

2.7. Radiated Spurious Emissions

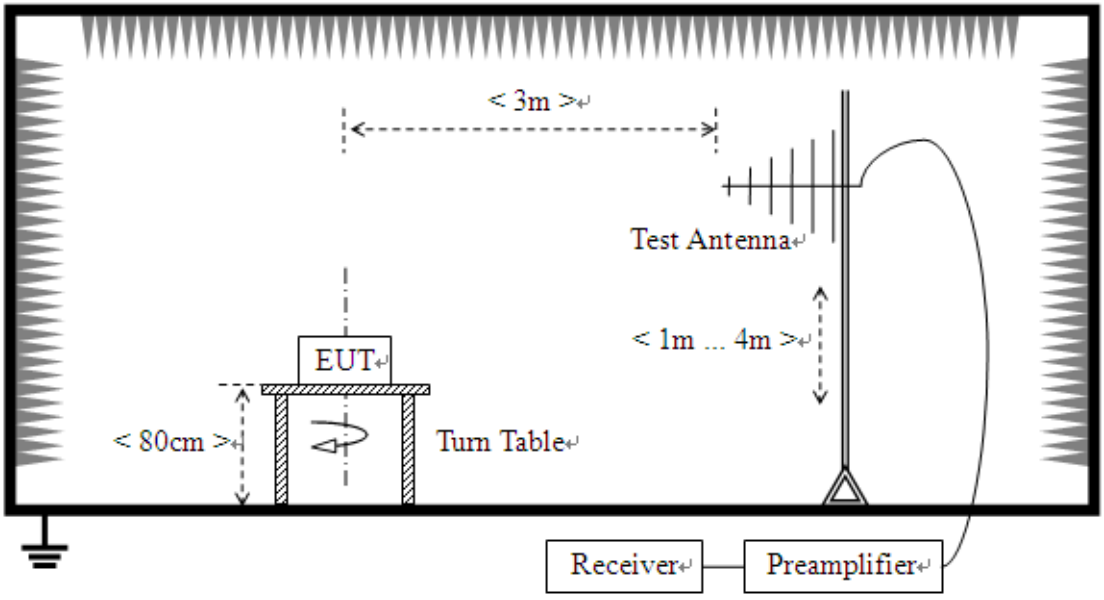
2.7.1. Requirement

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.

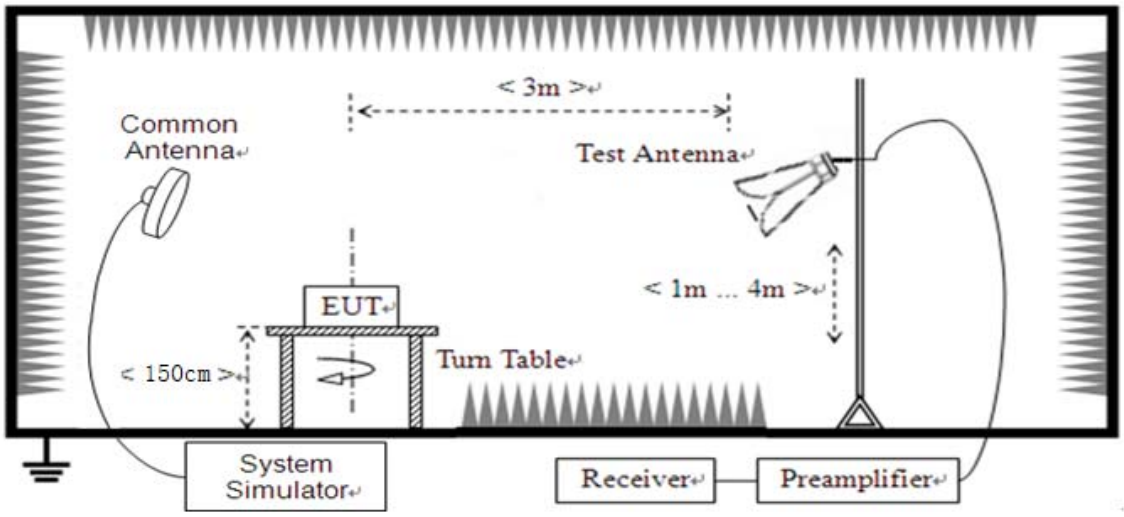
Additional requirement for Band 14

According to FCC section 90.543(f), for operations in the 758-775 MHz and 788-805 MHz bands, all emissions including harmonics in the band 1559-1610 MHz shall be limited to −70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and −80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. This calculated to be -40dBm.

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}.

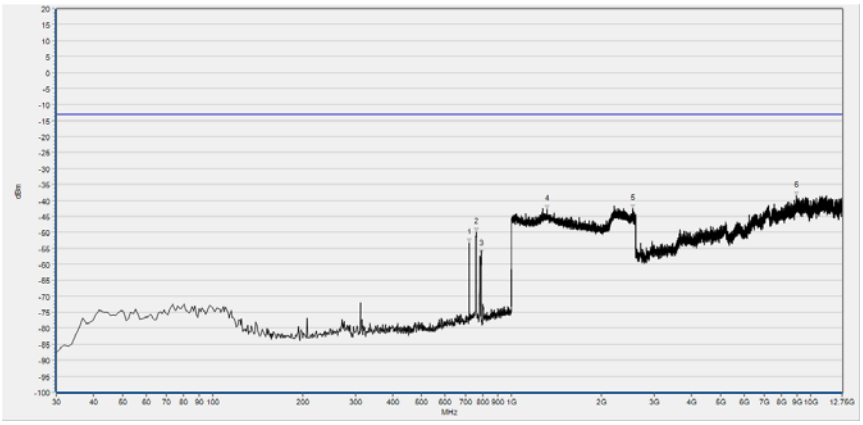
Note 1: The power of the EUT transmitting frequency should be ignored.

Note 2: 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.

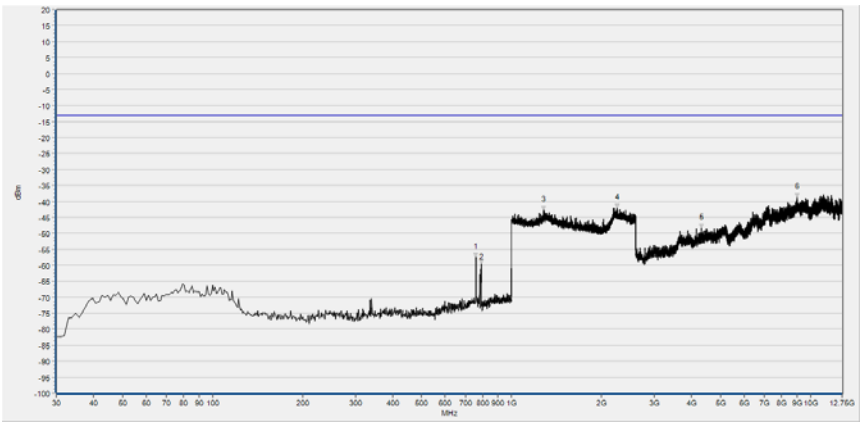
Note 3: All bandwidth and modulation were considered and evaluated respectively by performing full test for each band, only the worst cases (Max Bandwidth and QPSK mode) were recorded in this test report.

Note 4: N/A means the frequency is the basic frequency or the base station frequency, they are no need to verdict.

LTE Band 14, 5MHz BW, Low Channel, QPSK

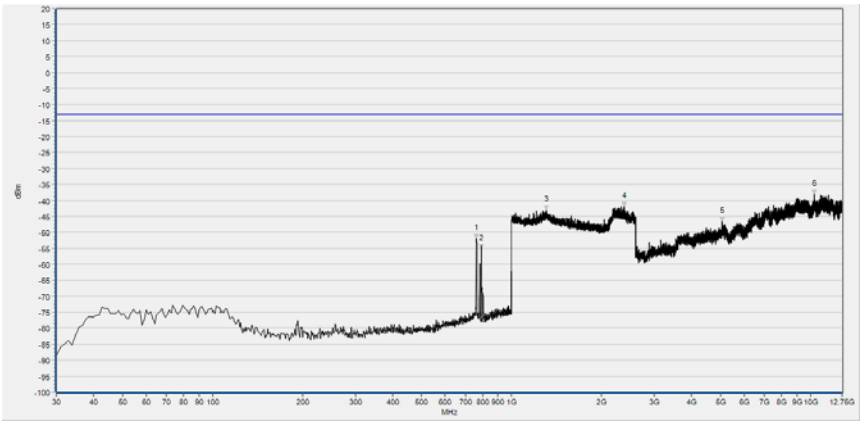


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	721.610	-53.27	-13.00	Horizontal	PASS
2	761.380	-49.86	-13.00	Horizontal	N/A
3	791.450	-56.88	-13.00	Horizontal	N/A
4	1315.646	-42.82	-13.00	Horizontal	PASS
5	2541.096	-42.49	-13.00	Horizontal	PASS
6	8977.205	-38.62	-13.00	Horizontal	PASS

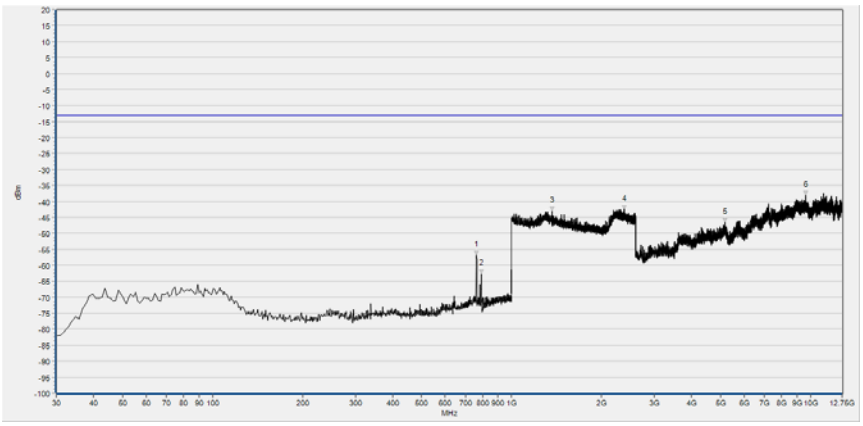


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	759.440	-57.53	-13.00	Vertical	N/A
2	791.450	-59.66	-13.00	Vertical	N/A
3	1280.432	-42.85	-13.00	Vertical	PASS
4	2248.499	-42.22	-13.00	Vertical	PASS
5	4311.047	-48.48	-13.00	Vertical	PASS
6	9004.892	-38.80	-13.00	Vertical	PASS

LTE Band 14, 5MHz BW, Mid Channel, QPSK

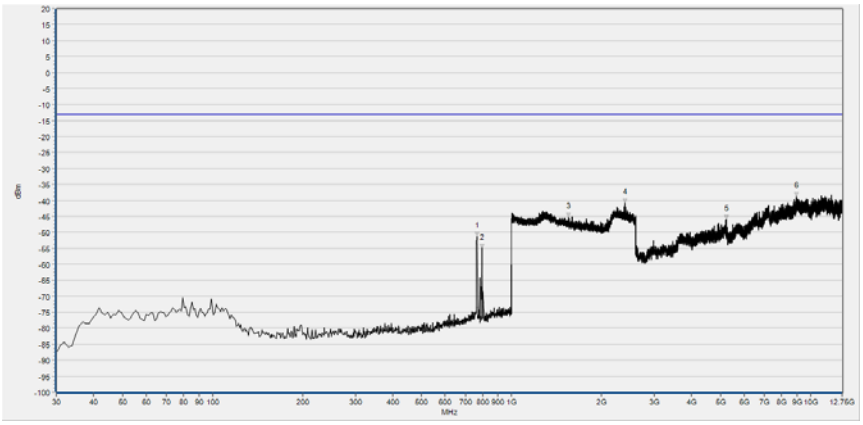


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	762.350	-51.93	-13.00	Horizontal	N/A
2	792.420	-55.15	-13.00	Horizontal	N/A
3	1306.683	-43.02	-13.00	Horizontal	PASS
4	2377.831	-41.84	-13.00	Horizontal	PASS
5	5051.209	-46.65	-13.00	Horizontal	PASS
6	10295.099	-38.15	-13.00	Horizontal	PASS

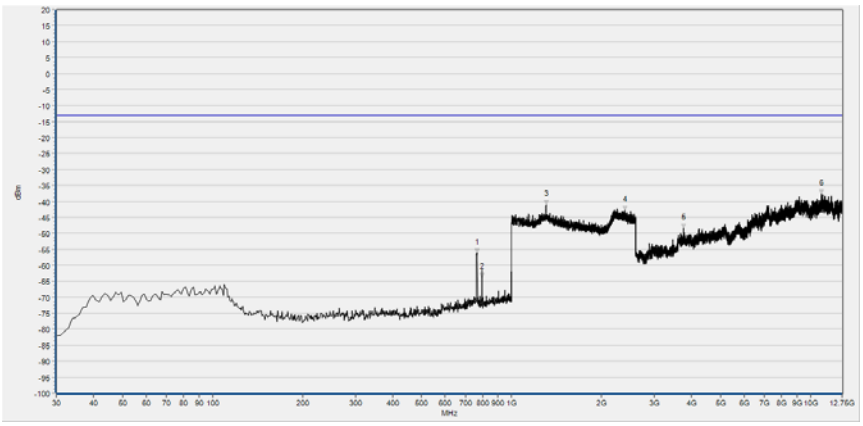


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	761.380	-56.95	-13.00	Vertical	N/A
2	791.450	-62.77	-13.00	Vertical	N/A
3	1366.226	-43.00	-13.00	Vertical	PASS
4	2380.392	-42.54	-13.00	Vertical	PASS
5	5182.260	-46.50	-13.00	Vertical	PASS
6	9647.227	-38.14	-13.00	Vertical	PASS

LTE Band 14, 5MHz BW, High Channel, QPSK

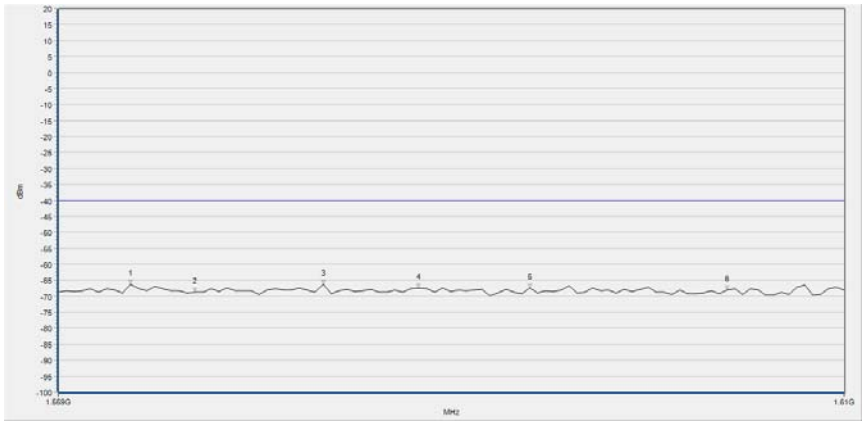


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	766.230	-51.36	-13.00	Horizontal	N/A
2	796.300	-55.10	-13.00	Horizontal	N/A
3	1548.699	-45.34	-13.00	Horizontal	PASS
4	2388.715	-40.88	-13.00	Horizontal	PASS
5	5235.788	-45.89	-13.00	Horizontal	PASS
6	8975.359	-38.70	-13.00	Horizontal	PASS

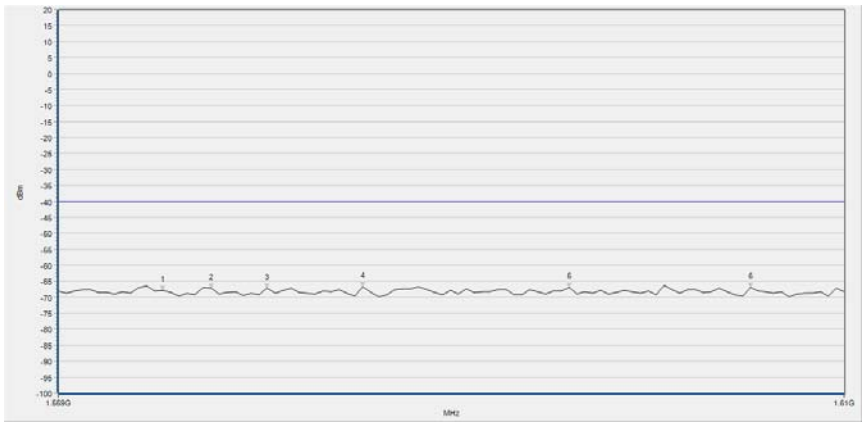


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	765.260	-56.19	-13.00	Vertical	N/A
2	796.300	-63.87	-13.00	Vertical	N/A
3	1303.481	-41.02	-13.00	Vertical	PASS
4	2394.478	-42.71	-13.00	Vertical	PASS
5	3759.156	-48.27	-13.00	Vertical	PASS
6	10856.219	-37.73	-13.00	Vertical	PASS

LTE Band 14,1559MHz-1610MHz, 5MHz BW, Mid Channel, QPSK

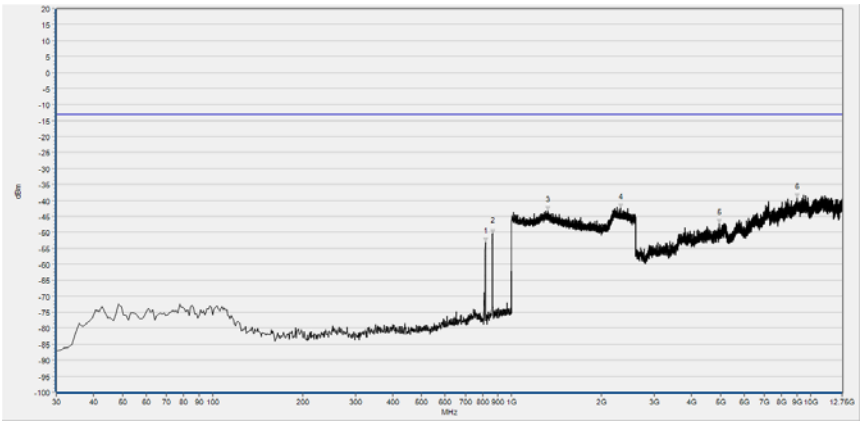


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	1563.636	-66.23	-40.00	Horizontal	PASS
2	1567.758	-68.63	-40.00	Horizontal	PASS
3	1576.000	-66.35	-40.00	Horizontal	PASS
4	1582.182	-67.36	-40.00	Horizontal	PASS
5	1589.394	-67.38	-40.00	Horizontal	PASS
6	1602.273	-68.13	-40.00	Horizontal	PASS

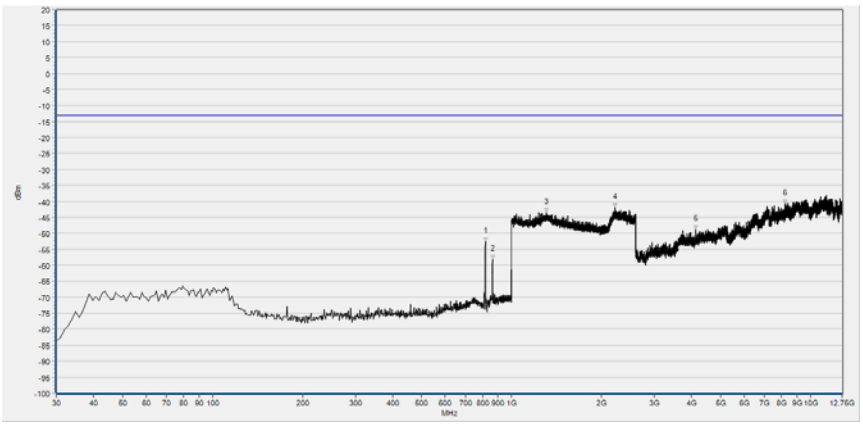


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	1565.697	-67.75	-40.00	Vertical	PASS
2	1568.788	-67.16	-40.00	Vertical	PASS
3	1572.394	-67.26	-40.00	Vertical	PASS
4	1578.576	-66.60	-40.00	Vertical	PASS
5	1591.970	-67.00	-40.00	Vertical	PASS
6	1603.818	-66.89	-40.00	Vertical	PASS

LTE Band 26, 5MHz BW, Low Channel, QPSK

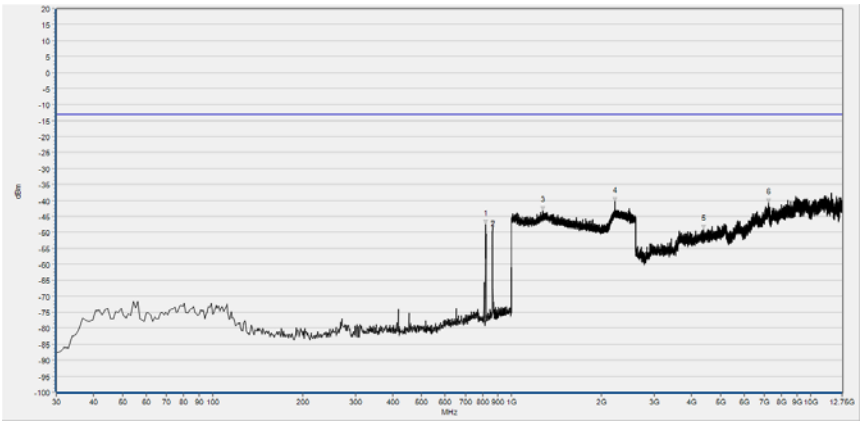


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	816.670	-52.99	-13.00	Horizontal	N/A
2	863.230	-50.36	-13.00	Horizontal	N/A
3	1322.049	-43.33	-13.00	Horizontal	PASS
4	2310.604	-42.30	-13.00	Horizontal	PASS
5	4947.845	-47.28	-13.00	Horizontal	PASS
6	9004.892	-39.30	-13.00	Horizontal	PASS

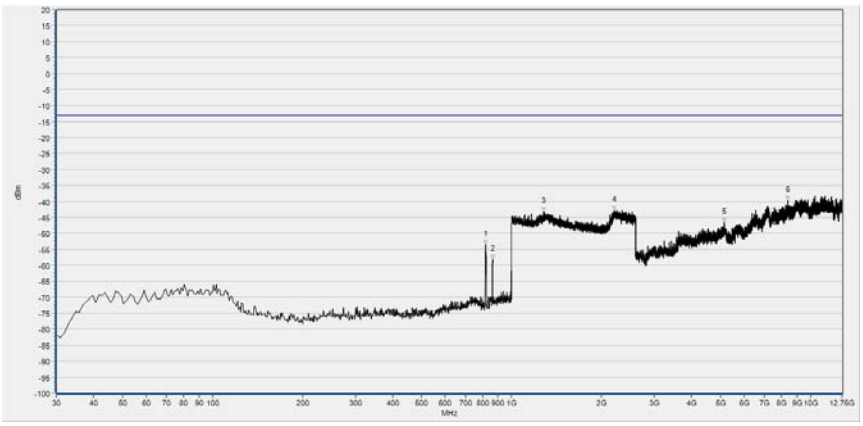


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	817.640	-52.74	-13.00	Vertical	N/A
2	863.230	-58.26	-13.00	Vertical	N/A
3	1305.402	-43.51	-13.00	Vertical	PASS
4	2219.688	-41.99	-13.00	Vertical	PASS
5	4124.623	-48.94	-13.00	Vertical	PASS
6	8205.665	-40.85	-13.00	Vertical	PASS

LTE Band 26, 5MHz BW, Mid Channel, QPSK

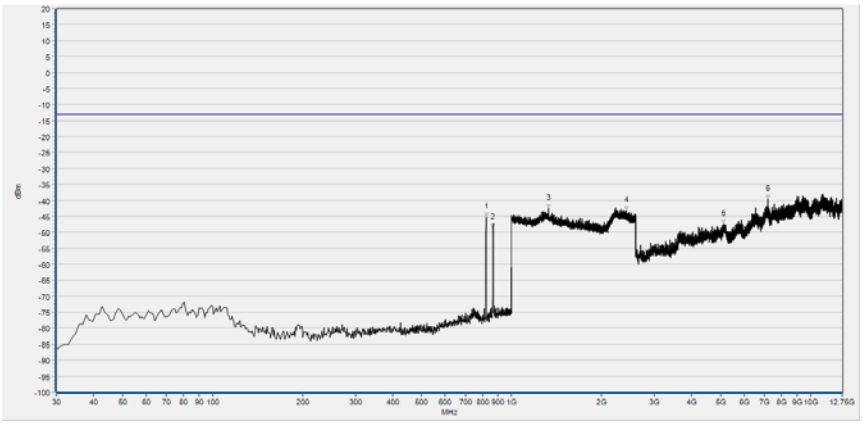


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	817.640	-47.49	-13.00	Horizontal	N/A
2	864.200	-47.74	-13.00	Horizontal	N/A
3	1270.188	-43.22	-13.00	Horizontal	PASS
4	2214.566	-40.23	-13.00	Horizontal	PASS
5	4394.108	-48.99	-13.00	Horizontal	PASS
6	7245.854	-40.80	-13.00	Horizontal	PASS

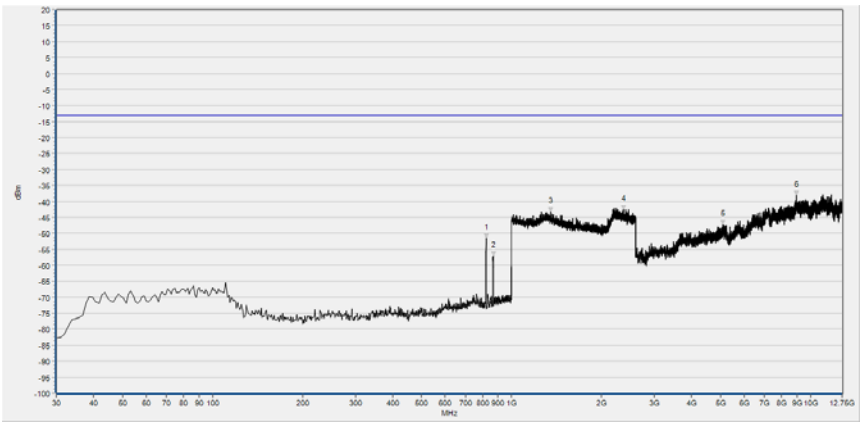


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	816.670	-53.49	-13.00	Vertical	N/A
2	863.230	-58.12	-13.00	Vertical	N/A
3	1277.231	-43.31	-13.00	Vertical	PASS
4	2204.962	-42.88	-13.00	Vertical	PASS
5	5149.036	-46.64	-13.00	Vertical	PASS
6	8405.010	-39.68	-13.00	Vertical	PASS

LTE Band 26, 5MHz BW, High Channel, QPSK



No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	821.520	-45.35	-13.00	Horizontal	N/A
2	865.170	-48.57	-13.00	Horizontal	N/A
3	1325.890	-42.51	-13.00	Horizontal	PASS
4	2421.369	-43.24	-13.00	Horizontal	PASS
5	5117.658	-47.59	-13.00	Horizontal	PASS
6	7179.405	-39.76	-13.00	Horizontal	PASS



No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	822.490	-51.58	-13.00	Vertical	N/A
2	868.080	-57.01	-13.00	Vertical	N/A
3	1350.860	-43.32	-13.00	Vertical	PASS
4	2373.349	-42.66	-13.00	Vertical	PASS
5	5078.896	-47.25	-13.00	Vertical	PASS
6	8962.439	-38.15	-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:	Morlab Laboratory of 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:	Morlab Laboratory of 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
Power Splitter	NW521	1506A	Weinschel	N/A	N/A
Attenuator 1	(N/A.)	10dB	Resnet	N/A	N/A
Attenuator 2	(N/A.)	3dB	Resnet	N/A	N/A
EXA Signal Analzyer	MY51511149	N9020A	Agilent	2020.07.27	2021.07.26
USB Power Sensor	MY54210011	U2021XA	Agilent	2020.10.23	2021.10.22
System Simulator	6200995016	MT8820C	Anritsu	2020.10.28	2021.10.27
System Simulator	6261830572	MT8821C	Anritsu	2021.02.25	2022.02.24
RF Cable (30MHz-26GHz)	CB01	RF01	Morlab	N/A	N/A
Coaxial Cable	CB02	RF02	Morlab	N/A	N/A
SMA Connector	CN01	RF03	HUBER-SUHNER	N/A	N/A
Temperature Chamber	20171112102	HZ-2019	Dongguan Lixian Instrument Technology Co., Ltd	2020.10.26	2021.10.25
Computer	T430i	Think Pad	Lenovo	N/A	N/A
Software Version: Morlab FCC Test System V2.8					

4.2 Radiated Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Due Date
System Simulator	152038	CMW500	R&S	2020.11.19	2021.11.18
System Simulator	6200995016	MT8820C	Anritsu	2020.10.28	2021.10.27
Receiver	MY54130016	N9038A	Agilent	2020.07.21	2021.07.20
Test Antenna - Bi-Log	9163-519	VULB 9163	Schwarzbeck	2019.05.24	2022.05.23
Test Antenna - Horn	9170C-531	BBHA9170	Schwarzbeck	2019.07.26	2022.07.25
Test Antenna - Horn	01774	BBHA 9120D	Schwarzbeck	2019.07.26	2022.07.25
Coaxial cable (N male) (9KHz-30MHz)	CB04	EMC04	Morlab	N/A	N/A
Coaxial cable (N male) (30MHz-26GHz)	CB02	EMC02	Morlab	N/A	N/A
Coaxial cable (N male) (30MHz-26GHz)	CB03	EMC03	Morlab	N/A	N/A
Coaxial cable (N male) (30MHz-40GHz)	CB05	EMC05	Morlab	N/A	N/A
1-18GHz pre-Amplifier	61171/61172	S020180L3203	Tonscend	2020.07.21	2021.07.20
18-26.5GHz pre-Amplifier	46732	S10M100L3802	Tonscend	2020.07.21	2021.07.20
26-40GHz pre-Amplifier	56774	S40M400L4002	Tonscend	2020.07.21	2021.07.20
Notch Filter	N/A	WRCGV -LTE 14	Wainwright	2020.07.21	2021.07.20
Notch Filter	N/A	WRCGV -LTE 26	Wainwright	2020.07.21	2021.07.20
Anechoic Chamber	N/A	9m*6m*6m	CRT	2019.07.13	2022.07.12

END OF REPORT