REPORT No. : SZ20060021W03

TEST REPORT

APPLICANT	:	Reliance Communications LLC
PRODUCT NAME	:	Orbic Speed X
MODEL NAME	:	RC400LX
BRAND NAME	:	Orbic, Kajeet
FCC ID	:	2ABGH-RC400LX
STANDARD(S)	:	47 CFR Part 2 47 CFR Part 90, Subpart S
RECEIPT DATE	:	2020-06-28
TEST DATE	:	2020-06-29 to 2020-07-14
ISSUE DATE	:	2020-07-15

Edited by: He Dekuan (Rapporteur)

Approved by: Peng Huarui (Supervisor)

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MORLAB

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DIRECTORY

Change History		
Issue	**Date**	**Reason for change**
1.0	2020-07-15	First edition

1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	Reliance Communications LLC
Applicant Address:	91 Colin Drive, Unit 1, HOLBROOK, New York 11741, United States
Manufacturer:	Unimaxcomm
ManufacturerAddress:	Room 602, Floor 6th, Building B, Software Park T3,Hi-Tech Park South, Nanshan District, Shenzhen, P.R. China

1.2. Equipment Under Test (EUT) Description

Product Name:	Orbic Speed X	
Hardware Version:	V1.1	
Software Version:	ORB400LX_V1.0.2_BVZNAKJ	
Modulation Type:	QPSK, 16QAM	
Operation Band:	Band 26	
Frequency Range:	LTE Band 26	Tx: 814MHz – 824MHz
		Rx: 859MHz – 869MHz
Channel Bandwidth	LTE Band 26	1.4MHz, 3MHz, 5MHz, 10MHz
Antenna Type:	Fixed Internal	
Antenna Gain:	LTE Band 26	1.00 dBi
Accessory Information:	Battery	
	Brand Name:	Orbic
	Model No.:	BTE-3003
	Capacity:	3000 mAh
	Rated Voltage:	3.7 V
	Charge Limit:	4.2 V

	AC Adapter	
	Brand Name:	Orbic
	Model No.:	TPA-5950100UU
	Rated Input:	100-240V ～ 50/60Hz 0.2A
	Rated Output:	5V⎓1.0A

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

Note 2: This test report is updated from the original report (Report No.: SZ20040157W02, Model: RC400L). According to the previous similarity, only modify the product name, model, software and hardware version; Add a brand; Add 3G/4G RF front end components (added UMTS Band 4 and LTE Band 7/12/14/17/25/26/30/41/71); Disable LTE Band 13 (Remove LTE Band 13 components); Disable WiFi MIMO function and change to SISO (Remove one WiFi connector and related components), the WiFi chip and circuit are the same as before. We evaluated and tested the above changes.

1.3. Maxium ERP/EIRP and Emission Designator

LTE Band26	Maximum ERP/EIRP（W）		Emission Designator (99%OBW)	
BW(MHz)	QPSK	16QAM	QPSK	16QAM
10	0.204	0.155	8M99G7D	8M97W7D
5	0.212	0.158	4M50G7D	4M50W7D
3	0.212	0.158	2M70G7D	2M70W7D
1.4	0.206	0.153	1M10G7D	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)	Transmitter Conducted Output Power and ERP/EIRP	July 1 to 2, 2020	Chen Hao	PASS	No deviation
90.209	Occupied Bandwidth	July 14, 2020	He Dekuan	PASS	No deviation
2.1055, 90.213	Frequency Stability	July 1 to 10, 2020	He Dekuan	PASS	No deviation
2.1051,90.691	Conducted Spurious Emissions	July 14, 2020	He Dekuan	PASS	No deviation
2.1051,90.691	Band Edge	July 14, 2020	He Dekuan	PASS	No deviation
2.1051, 90.691	Radiated Spurious Emissions	July 13, 2020	Peng Xuewei	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 23.5dB contains two parts that cable loss 13.5dB and Attenuator 10dB.					

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

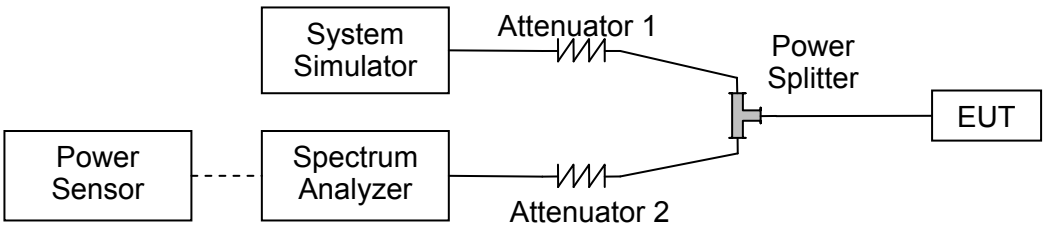
2. 47 CFR Part 2, Part 90S Requirements

2.1. Transmitter Conducted Output Power And ERP/EIRP

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).

2.1.2. Test Description



The EUTis 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 Band26						
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	/	23.97	/
10	QPSK	1	25	/	24.25	/
10	QPSK	1	49	/	24.09	/
10	QPSK	25	0	/	23.22	/
10	QPSK	25	12	/	23.29	/
10	QPSK	25	25	/	23.19	/
10	QPSK	50	0	/	23.29	/
10	16QAM	1	0	/	23.06	/
10	16QAM	1	25	/	22.70	/
10	16QAM	1	49	/	22.74	/
10	16QAM	25	0	/	22.28	/
10	16QAM	25	12	/	22.32	/
10	16QAM	25	25	/	22.28	/
10	16QAM	50	0	/	22.32	/

LTE Band26						
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	23.95	24.05	24.21
5	QPSK	1	12	24.23	24.07	24.34
5	QPSK	1	24	24.07	24.18	24.41
5	QPSK	12	0	23.20	23.28	23.38
5	QPSK	12	7	23.27	23.20	23.35
5	QPSK	12	13	23.17	23.32	23.29
5	QPSK	25	0	23.27	23.25	23.30
5	16QAM	1	0	23.04	23.01	23.00
5	16QAM	1	12	22.68	22.81	23.13
5	16QAM	1	24	22.72	22.80	23.11
5	16QAM	12	0	22.26	22.29	22.52
5	16QAM	12	7	22.30	22.22	22.47
5	16QAM	12	13	22.26	22.32	22.27
5	16QAM	25	0	22.30	22.31	22.28

LTE Band26						
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	23.96	24.06	24.22
3	QPSK	1	8	24.24	24.08	24.35
3	QPSK	1	14	24.08	24.19	24.42
3	QPSK	8	0	23.21	23.29	23.39
3	QPSK	8	4	23.28	23.21	23.36
3	QPSK	8	7	23.18	23.33	23.30
3	QPSK	15	0	23.28	23.26	23.31
3	16QAM	1	0	23.05	23.02	23.01
3	16QAM	1	8	22.69	22.82	23.14
3	16QAM	1	14	22.73	22.81	23.12
3	16QAM	8	0	22.27	22.30	22.53
3	16QAM	8	4	22.31	22.23	22.48
3	16QAM	8	7	22.27	22.33	22.28
3	16QAM	15	0	22.31	22.32	22.29

LTE Band26						
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	23.83	23.93	24.09
1.4	QPSK	1	3	24.11	23.95	24.22
1.4	QPSK	1	5	23.95	24.06	24.29
1.4	QPSK	3	0	23.08	23.16	23.26
1.4	QPSK	3	1	23.15	23.08	23.23
1.4	QPSK	3	3	23.05	23.20	23.17
1.4	QPSK	6	0	23.15	23.13	23.18
1.4	16QAM	1	0	22.92	22.89	22.88
1.4	16QAM	1	3	22.56	22.69	23.01
1.4	16QAM	1	5	22.60	22.68	22.99
1.4	16QAM	3	0	22.14	22.17	22.40
1.4	16QAM	3	1	22.18	22.10	22.35
1.4	16QAM	3	3	22.14	22.20	22.15
1.4	16QAM	6	0	22.18	22.19	22.16

Effective Radiated Power and Effective Isotropic Radiated Power:

LTE Band26				Measured ERP			
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	/	22.82	0.191	/
10	QPSK	1	25	/	23.10	0.204	/
10	QPSK	1	49	/	22.94	0.197	/
10	QPSK	25	0	/	22.07	0.161	/
10	QPSK	25	12	/	22.14	0.164	/
10	QPSK	25	25	/	22.04	0.160	/
10	QPSK	50	0	/	22.14	0.164	/
10	16QAM	1	0	/	21.91	0.155	/
10	16QAM	1	25	/	21.55	0.143	/
10	16QAM	1	49	/	21.59	0.144	/
10	16QAM	25	0	/	21.13	0.130	/
10	16QAM	25	12	/	21.17	0.131	/
10	16QAM	25	25	/	21.13	0.130	/
10	16QAM	50	0	/	21.17	0.131	/

LTE Band26				Measured ERP					
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	22.80	0.190	22.90	0.195	23.06	0.202
5	QPSK	1	12	23.08	0.203	22.92	0.196	23.19	0.208
5	QPSK	1	24	22.92	0.196	23.03	0.201	23.26	0.212
5	QPSK	12	0	22.05	0.160	22.13	0.163	22.23	0.167
5	QPSK	12	7	22.12	0.163	22.05	0.160	22.20	0.166
5	QPSK	12	13	22.02	0.159	22.17	0.165	22.14	0.163
5	QPSK	25	0	22.12	0.163	22.10	0.162	22.15	0.164
5	16QAM	1	0	21.89	0.154	21.86	0.153	21.85	0.153
5	16QAM	1	12	21.53	0.142	21.66	0.146	21.98	0.158
5	16QAM	1	24	21.57	0.143	21.65	0.146	21.96	0.157
5	16QAM	12	0	21.11	0.129	21.14	0.130	21.37	0.137
5	16QAM	12	7	21.15	0.130	21.07	0.128	21.32	0.135
5	16QAM	12	13	21.11	0.129	21.17	0.131	21.12	0.129
5	16QAM	25	0	21.15	0.130	21.16	0.130	21.13	0.130

LTE Band26				Measured EIRP					
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	22.81	0.191	22.91	0.195	23.07	0.203
3	QPSK	1	8	23.09	0.204	22.93	0.196	23.20	0.209
3	QPSK	1	14	22.93	0.196	23.04	0.201	23.27	0.212
3	QPSK	8	0	22.06	0.161	22.14	0.164	22.24	0.167
3	QPSK	8	4	22.13	0.163	22.06	0.161	22.21	0.166
3	QPSK	8	7	22.03	0.160	22.18	0.165	22.15	0.164
3	QPSK	15	0	22.13	0.163	22.11	0.163	22.16	0.164
3	16QAM	1	0	21.90	0.155	21.87	0.154	21.86	0.153
3	16QAM	1	8	21.54	0.143	21.67	0.147	21.99	0.158
3	16QAM	1	14	21.58	0.144	21.66	0.147	21.97	0.157
3	16QAM	8	0	21.12	0.129	21.15	0.130	21.38	0.137
3	16QAM	8	4	21.16	0.131	21.08	0.128	21.33	0.136
3	16QAM	8	7	21.12	0.129	21.18	0.131	21.13	0.130
3	16QAM	15	0	21.16	0.131	21.17	0.131	21.14	0.130

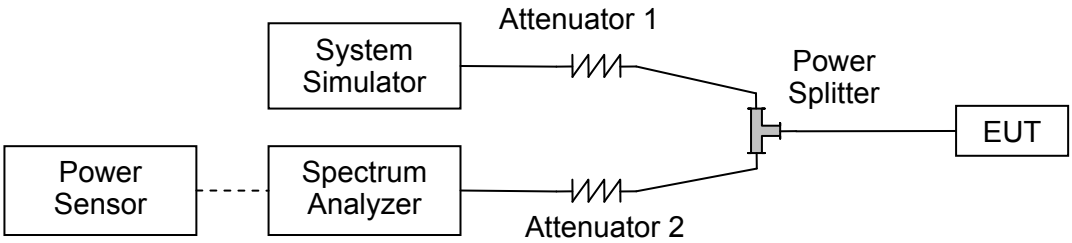
LTE Band26				Measured EIRP					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				26697		26740		26783	
Frequency (MHz)				814.7		819.0		823.3	
				dbm	W	dbm	W	dbm	W
1.4	QPSK	1	0	22.68	0.185	22.78	0.190	22.94	0.197
1.4	QPSK	1	3	22.96	0.198	22.80	0.191	23.07	0.203
1.4	QPSK	1	5	22.80	0.191	22.91	0.195	23.14	0.206
1.4	QPSK	3	0	21.93	0.156	22.01	0.159	22.11	0.163
1.4	QPSK	3	1	22.00	0.158	21.93	0.156	22.08	0.161
1.4	QPSK	3	3	21.90	0.155	22.05	0.160	22.02	0.159
1.4	QPSK	6	0	22.00	0.158	21.98	0.158	22.03	0.160
1.4	16QAM	1	0	21.77	0.150	21.74	0.149	21.73	0.149
1.4	16QAM	1	3	21.41	0.138	21.54	0.143	21.86	0.153
1.4	16QAM	1	5	21.45	0.140	21.53	0.142	21.84	0.153
1.4	16QAM	3	0	20.99	0.126	21.02	0.126	21.25	0.133
1.4	16QAM	3	1	21.03	0.127	20.95	0.124	21.20	0.132
1.4	16QAM	3	3	20.99	0.126	21.05	0.127	21.00	0.126
1.4	16QAM	6	0	21.03	0.127	21.04	0.127	21.01	0.126

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 EUTis 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.

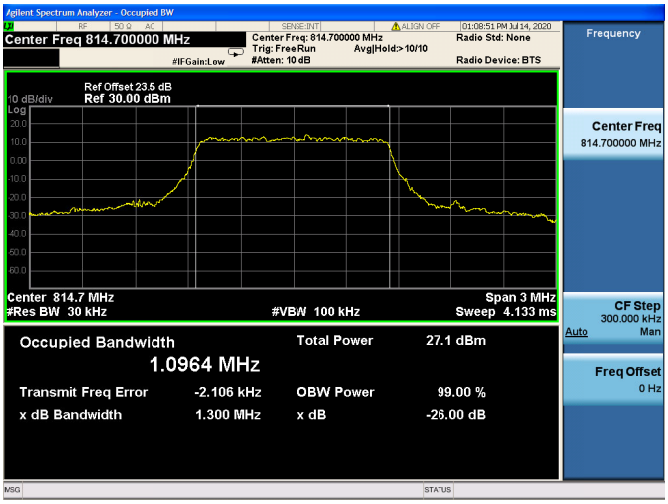
2.2.3. Test procedure

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

2.2.4. Test Result

LTE Band26				
BW(MHz)	**Channel Level**	**Modulation**	**99% BW(MHz)**	**26dB BW(MHz)**
1.4	Low	QPSK	1.10	1.30
	Low	16QAM	1.09	1.29
	Mid	QPSK	1.09	1.30
	Mid	16QAM	1.10	1.29
	High	QPSK	1.09	1.30
	High	16QAM	1.10	1.27
3	Low	QPSK	2.70	3.00
	Low	16QAM	2.70	3.00
	Mid	QPSK	2.70	2.97
	Mid	16QAM	2.70	2.96
	High	QPSK	2.70	3.00
	High	16QAM	2.69	2.96
5	Low	QPSK	4.50	5.00
	Low	16QAM	4.50	5.02
	Mid	QPSK	4.50	5.00
	Mid	16QAM	4.50	4.98
	High	QPSK	4.50	5.05
	High	16QAM	4.50	5.05
10	Mid	QPSK	8.99	9.91
	Mid	16QAM	8.97	9.91

Band 26 / 1.4MHz BW / Low CH QPSK

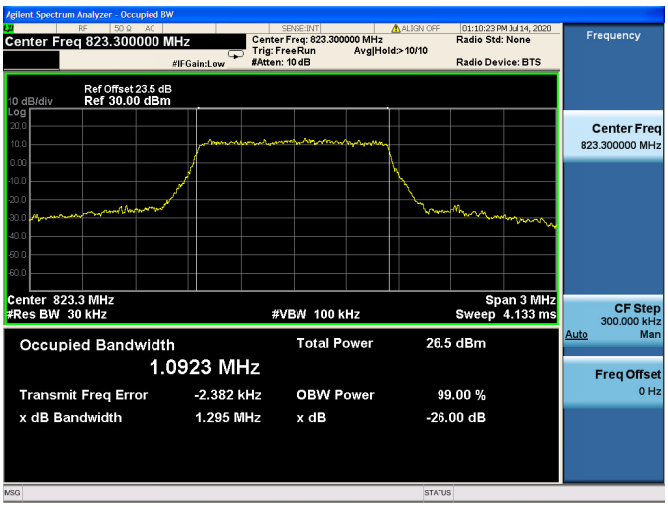


Band 26 / 1.4MHz BW / Low CH / 16QAM

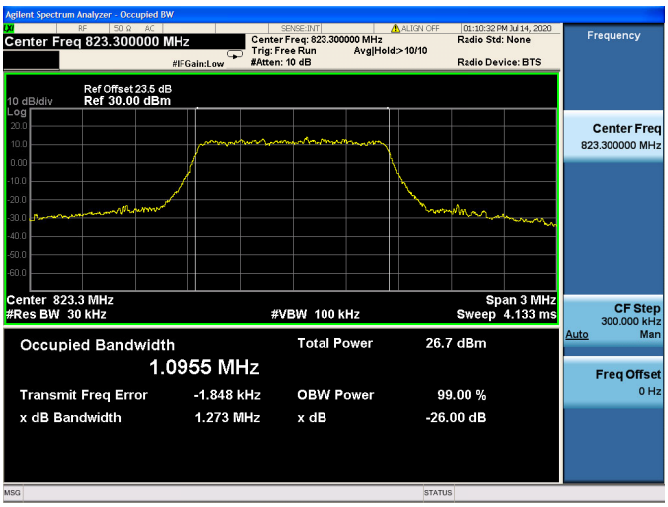
Band 26 / 1.4MHz BW / Mid CH QPSK

Band 26 / 1.4MHz BW / Mid CH / 16QAM

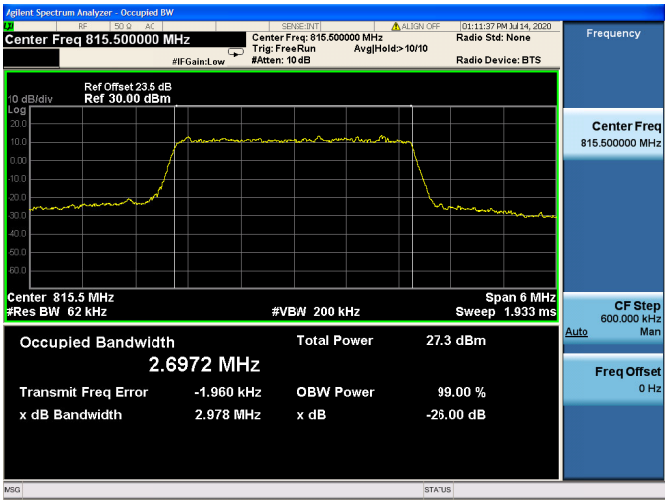
Band 26 / 1.4MHz BW / High CH QPSK



Band 26 / 1.4MHz BW / High CH / 16QAM



Band 26 / 3MHz BW / Low CH QPSK



Band 26 / 3MHz BW / Low CH / 16QAM

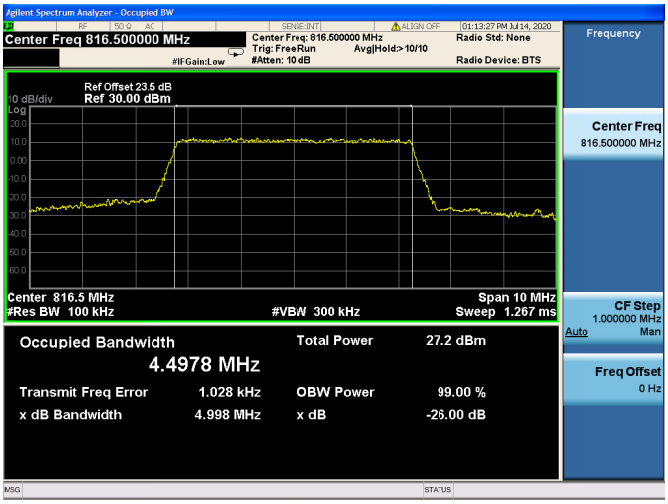
Band 26 / 3MHz BW / Mid CH QPSK

Band 26 / 3MHz BW / Mid CH / 16QAM

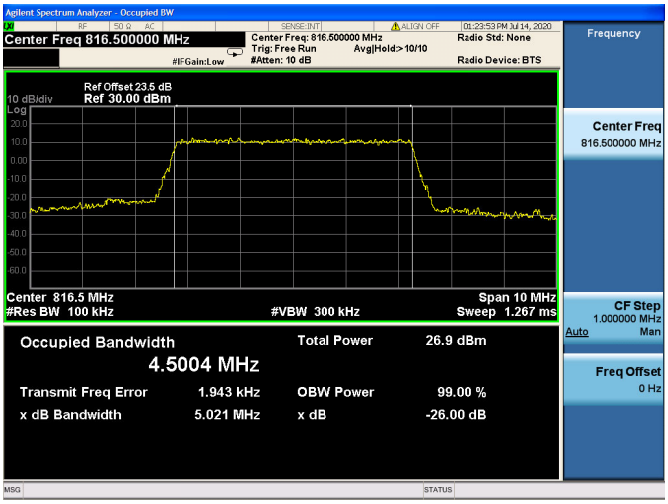
Band 26 / 3MHz BW / High CH QPSK

Band 26 / 3MHz BW / High CH / 16QAM

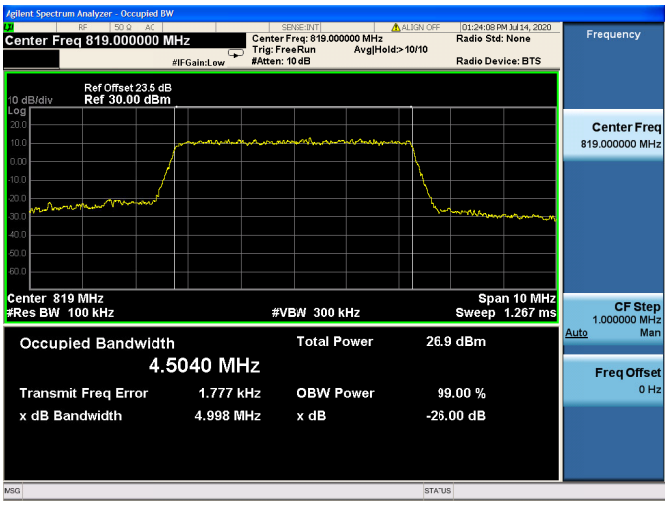
Band 26 / 5MHz BW / Low CH QPSK



Band 26 / 5MHz BW / Low CH / 16QAM

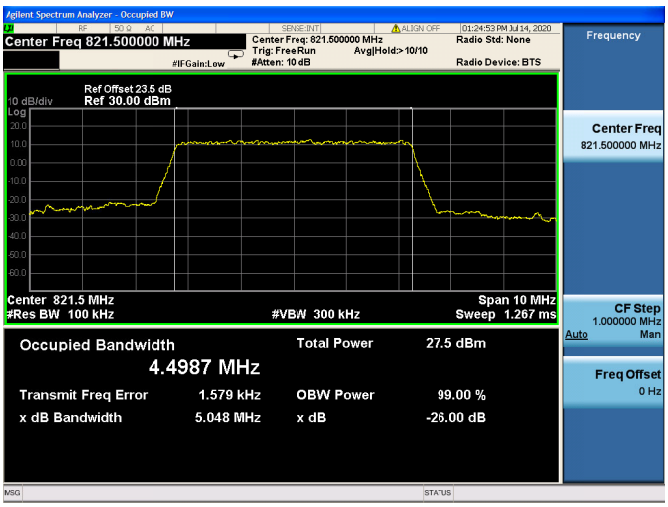


Band 26 / 5MHz BW / Mid CH QPSK

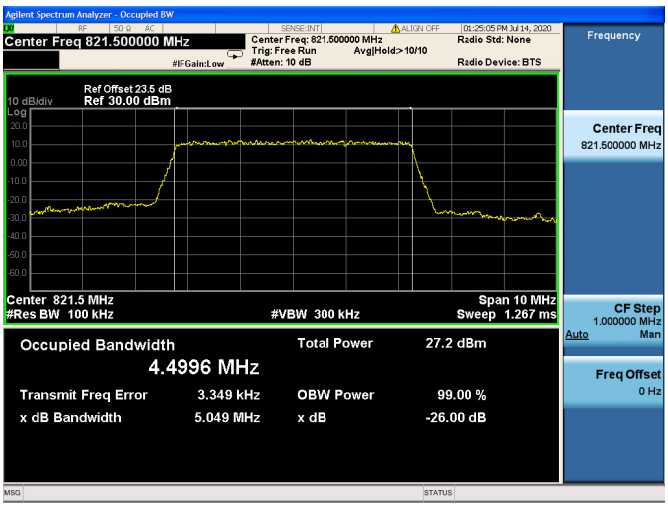


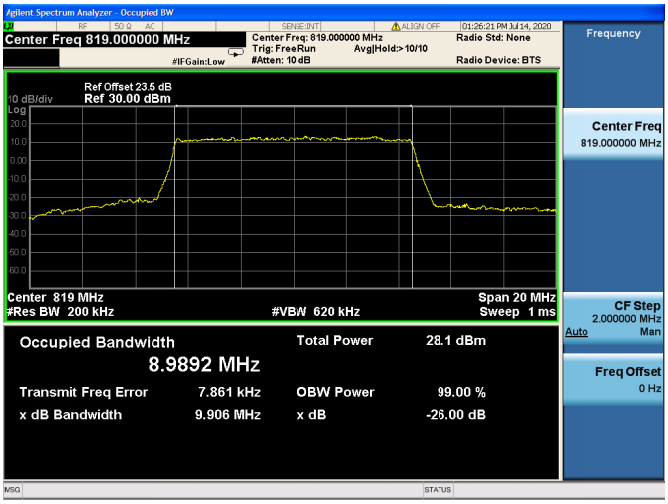
Band 26 / 5MHz BW / Mid CH / 16QAM

Band 26 / 5MHz BW / High CH QPSK



Band 26 / 5MHz BW / High CH / 16QAM



Band 26 / 10MHz BW / Mid CH QPSK	Band 26 / 10MHz BW / Mid CH / 16QAM
	

2.3. Frequency Stability

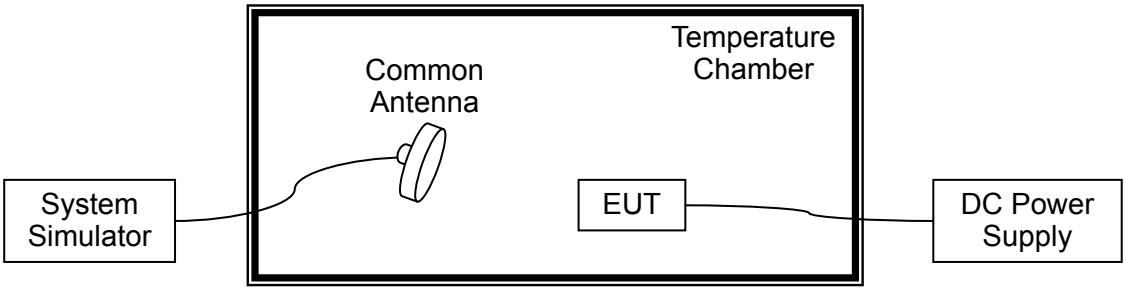
2.3.1. Requirement

According to FCC section 2.1055 & 90.213, 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 -10°C to +45°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.

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 3.7VDC, 4.0VDC and 3.5VDC, which are specified by the applicant; the normal temperature here used is 20°C.

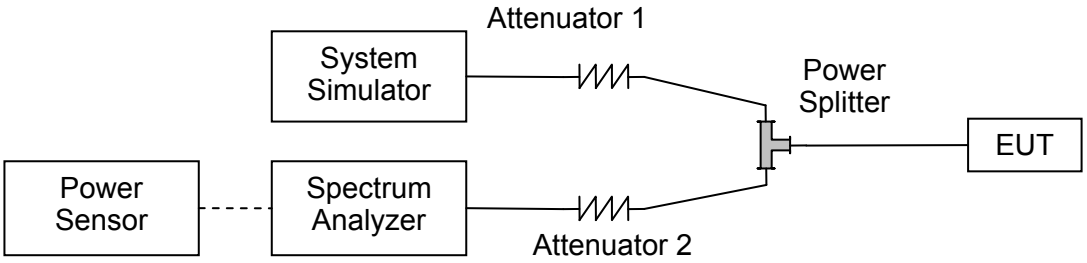
LTE Band 26, QPSK, Channel 26740, Frequency 819MHz Limit =Within Authorized Band					
Voltage(%)	**Power (VDC)**	**Temp(°C)**	**Fre. Dev.(Hz)**	**Deviation (ppm)**	**Result**
100	3.7	+20（Ref）	21	0.025	PASS
100		-10	-32	-0.038	
100		0	-15	-0.018	
100		+10	-36	-0.043	
100		+20	-37	-0.018	
100		+30	73	0.035	
100		+40	47	0.022	
100		+45	-28	-0.034	
115	4.0	+20	65	0.078	
85	3.5	+20	53	0.064	

2.4. Peak to Average Radio

2.4.1. Requirement

2.4.2. Test Description

A. Test Set:



The EUTis 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%.

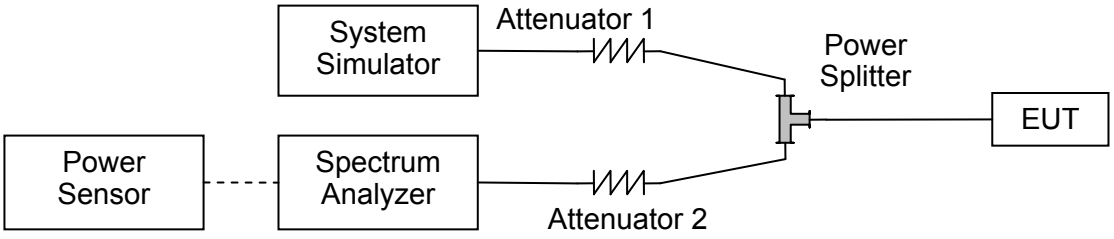
Note: PART 90 sections are none of the result

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



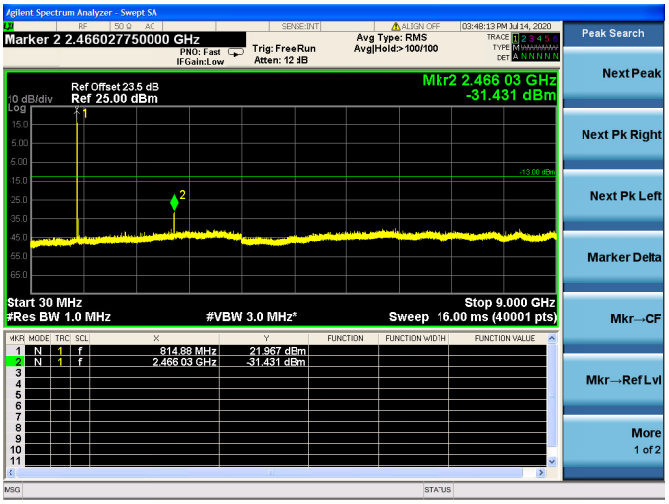
The EUTis coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum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

2.5.3. Test procedure

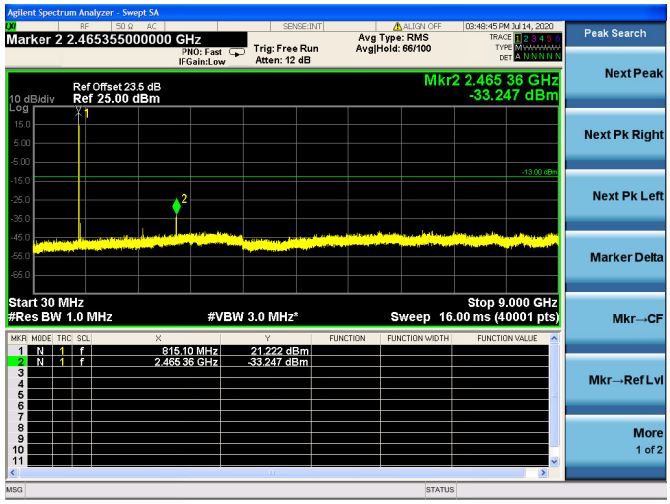
KDB 971168 D01v03 Section 6.0 and ANSI/TIA-603-E-2016.

2.5.4. Test Result

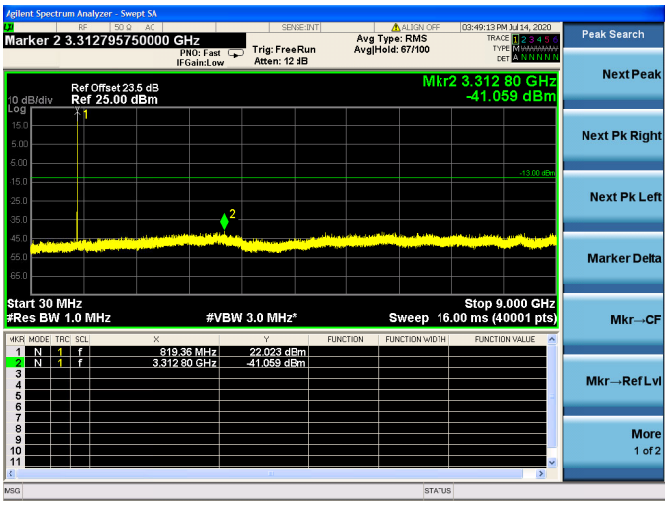
Band 26 / 1.4MHz BW / Low CH QPSK



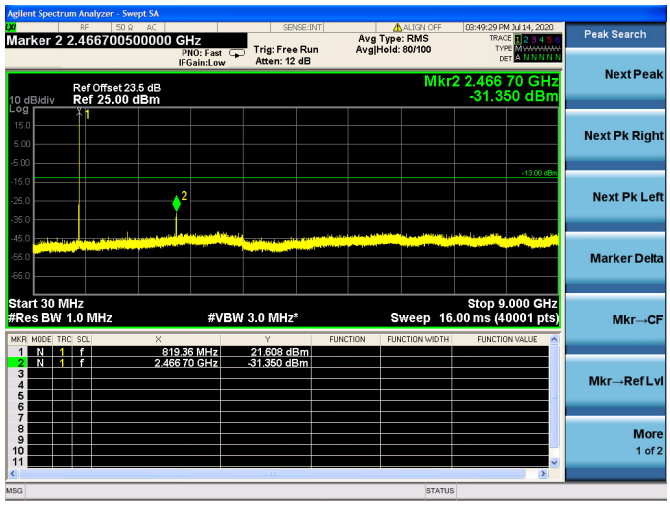
Band 26 / 1.4MHz BW / Low CH / 16QAM



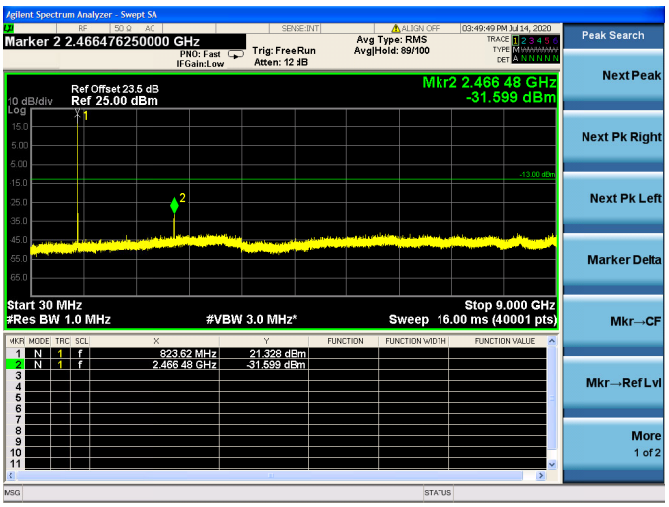
Band 26 / 1.4MHz BW / Mid CH QPSK



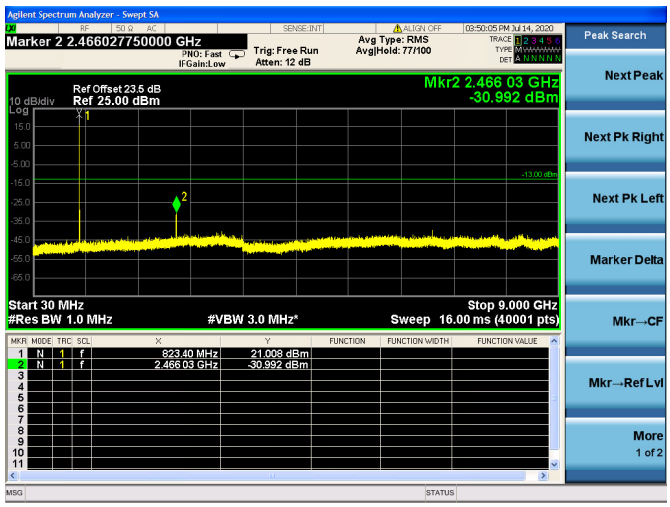
Band 26 / 1.4MHz BW / Mid CH / 16QAM



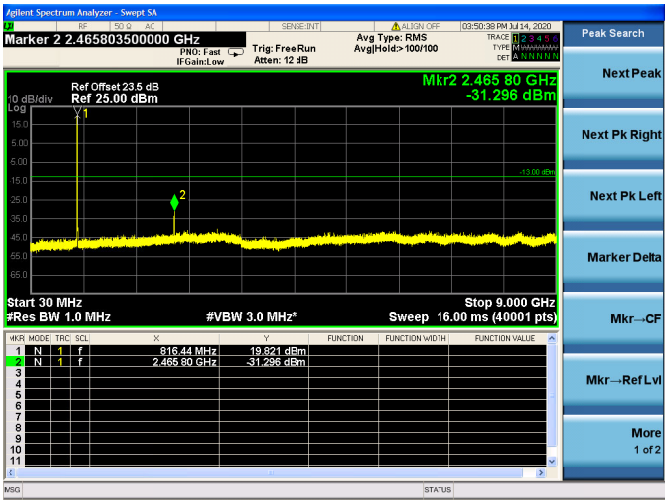
Band 26 / 1.4MHz BW / High CH QPSK



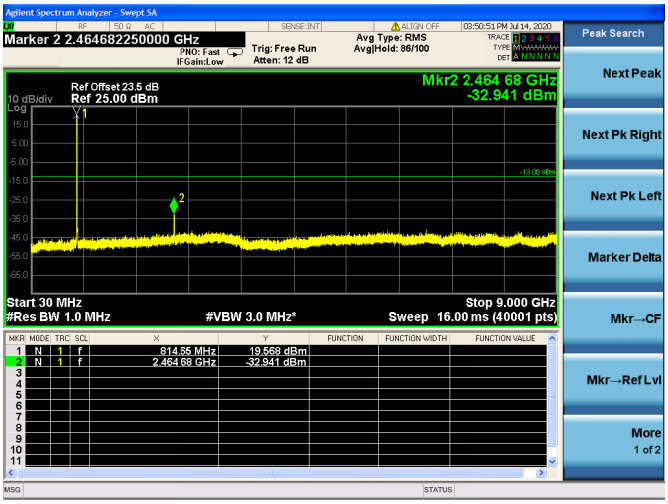
Band 26 / 1.4MHz BW / High CH / 16QAM



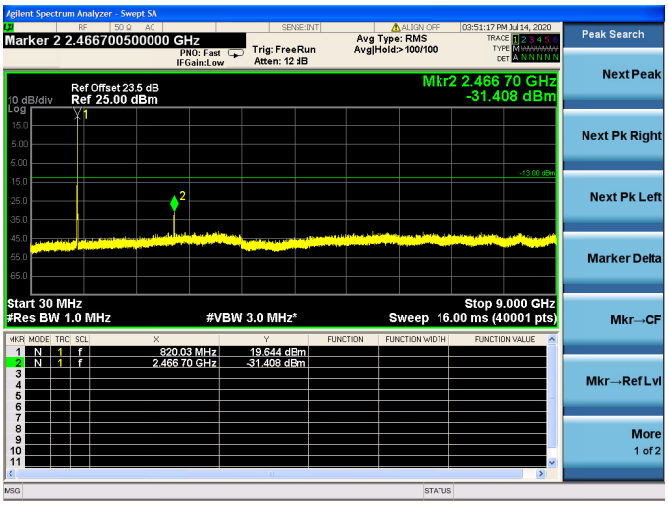
Band 26 / 3MHz BW / Low CH QPSK



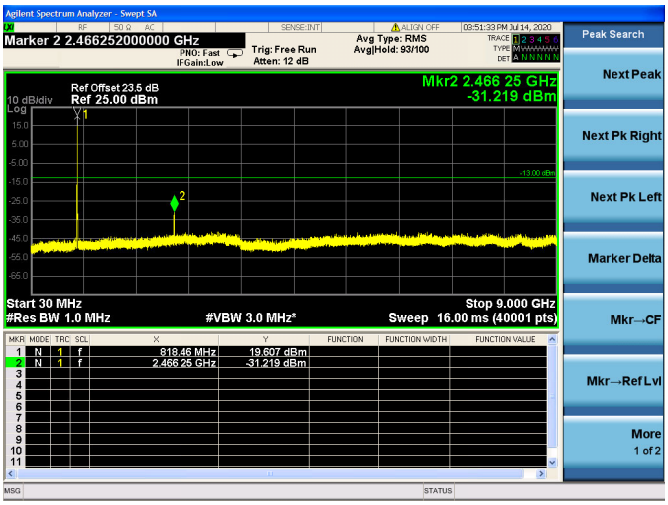
Band 26 / 3MHz BW / Low CH / 16QAM



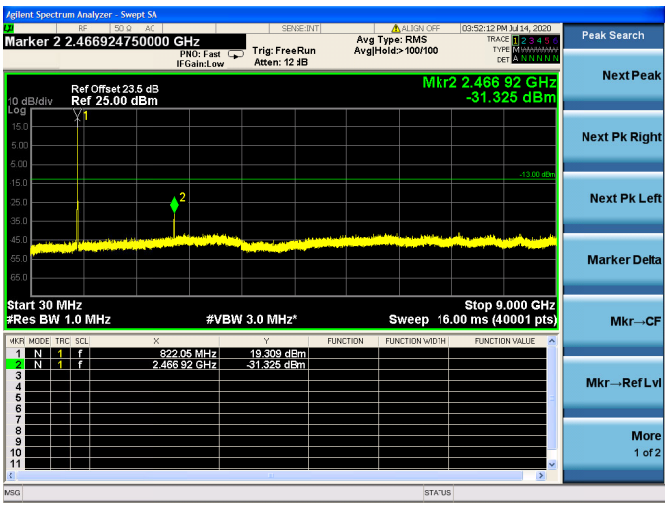
Band 26 / 3MHz BW / Mid CH QPSK



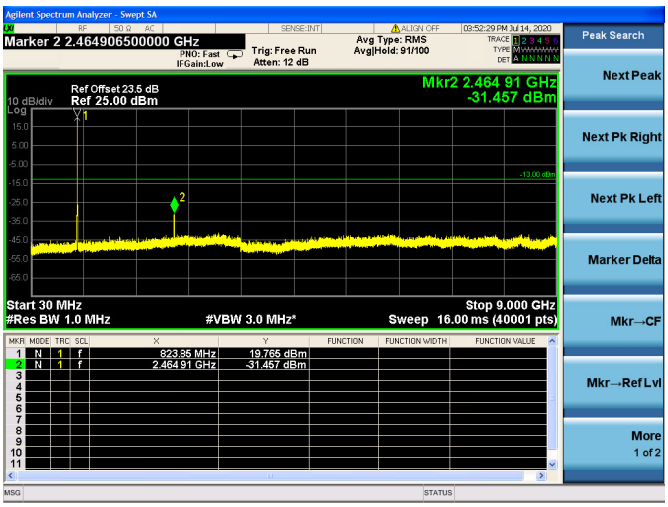
Band 26 / 3MHz BW / Mid CH / 16QAM



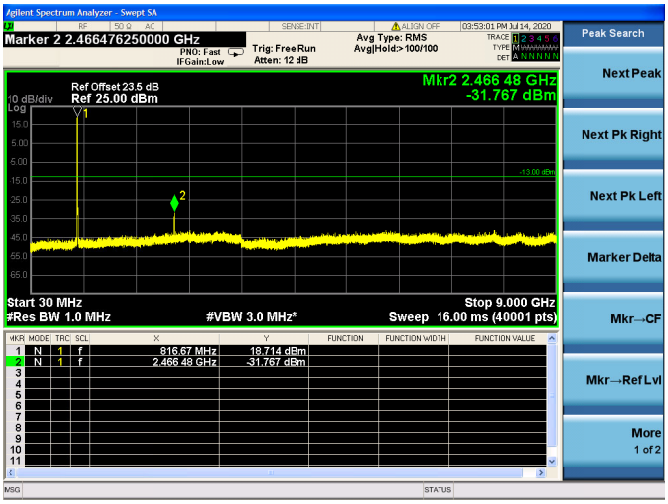
Band 26 / 3MHz BW / High CH QPSK



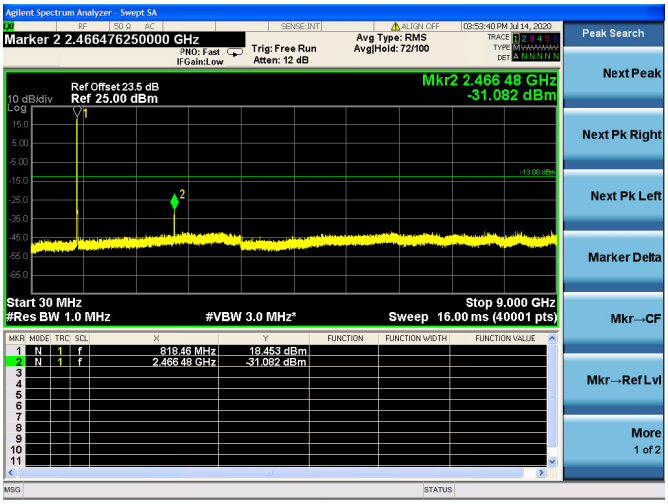
Band 26 / 3MHz BW / High CH / 16QAM



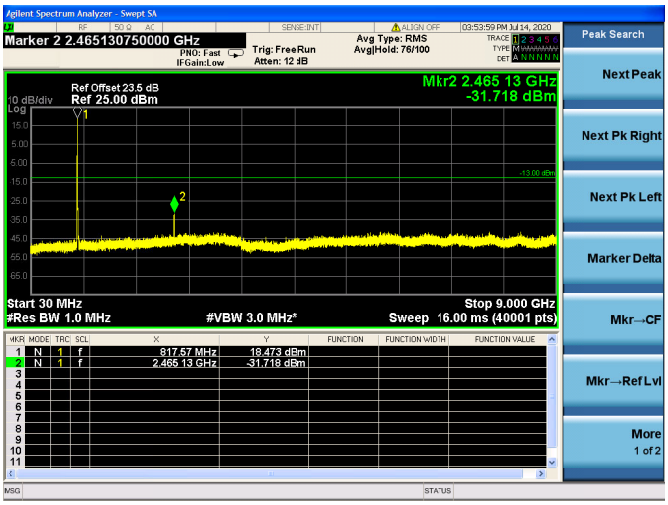
Band 26 / 5MHz BW / Low CH QPSK



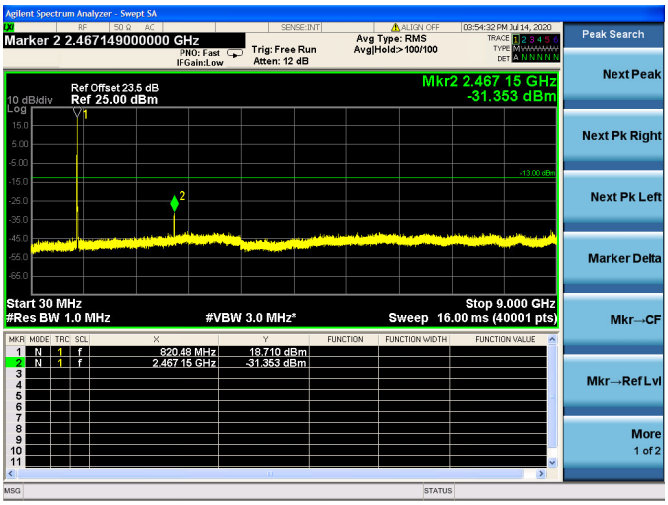
Band 26 / 5MHz BW / Low CH / 16QAM



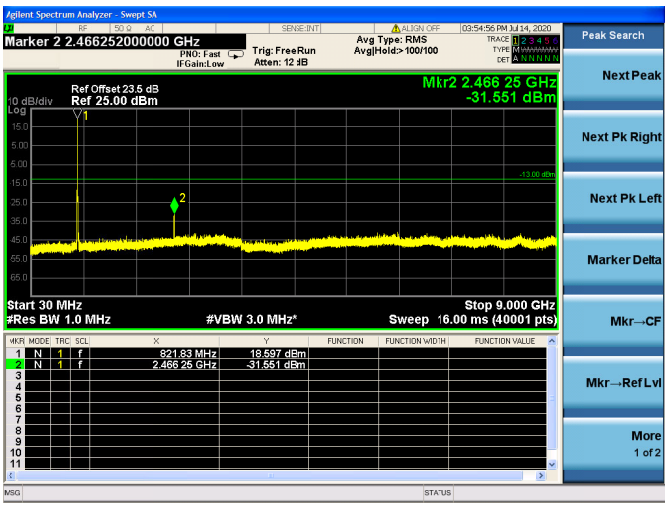
Band 26 / 5MHz BW / Mid CH QPSK



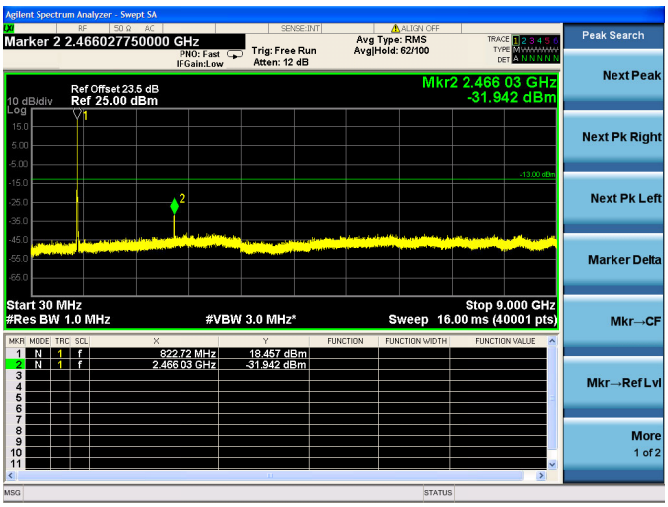
Band 26 / 5MHz BW / Mid CH / 16QAM

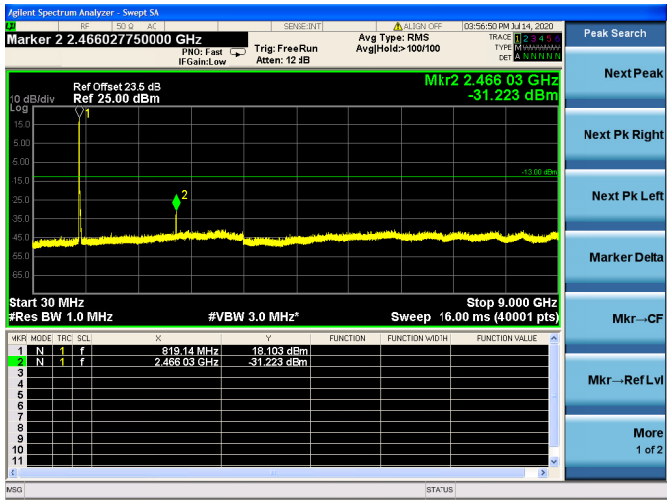
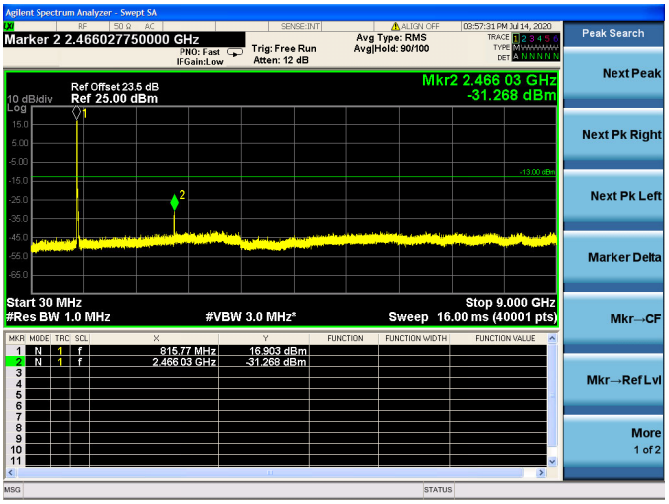


Band 26 / 5MHz BW / High CH QPSK



Band 26 / 5MHz BW / High CH / 16QAM



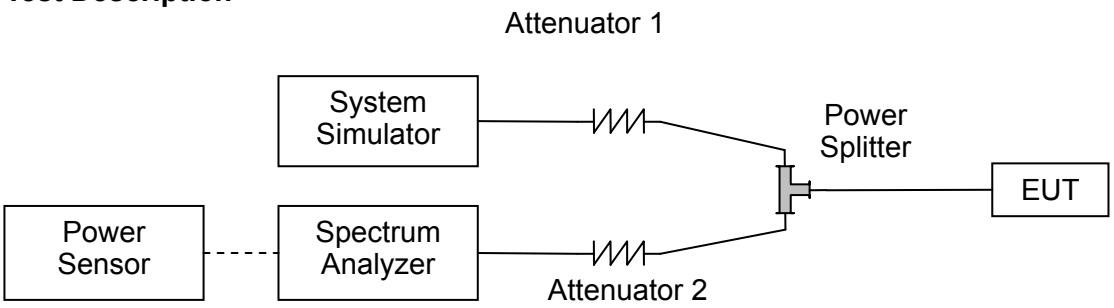
Band 26 / 10MHz BW / Mid CH QPSK	Band 26 / 10MHz BW / Mid CH / 16QAM
	

2.6. Band Edge

2.6.1. Requirement

According to FCC section 90.961, 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 EUTis 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.

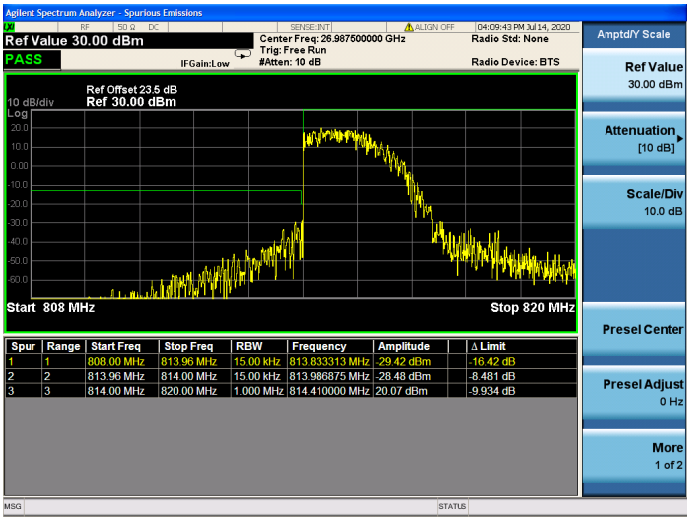
2.6.3. Test procedure

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

2.6.4. Test Result

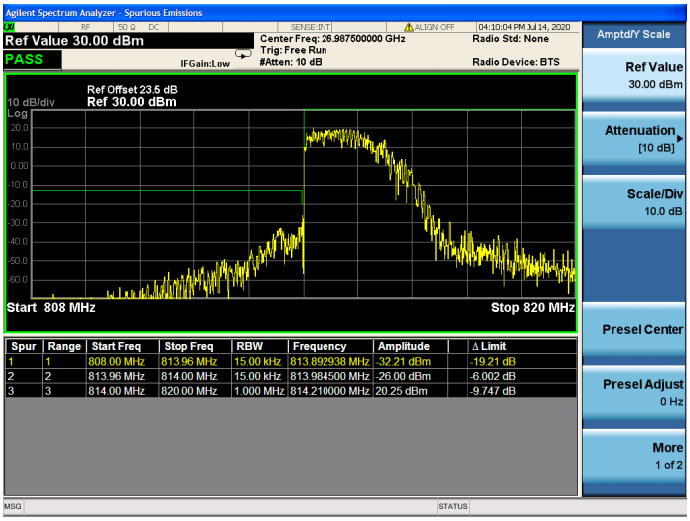
The center frequency of spectrum is the band edge frequency and span is 2MHz, Record the max trace into the test report.

Band 26 / 1.4MHz BW / QPSK / 1RB



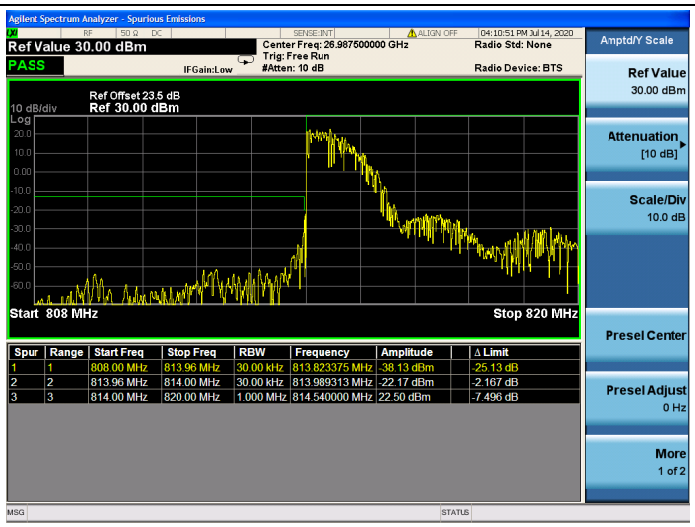
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	808.00 MHz	813.96 MHz	15.00 kHz	813.833313 MHz	-29.42 dBm	-16.42 dB
2	2	813.96 MHz	814.00 MHz	15.00 kHz	813.986875 MHz	-28.48 dBm	-8.481 dB
3	3	814.00 MHz	820.00 MHz	1.000 MHz	814.410000 MHz	20.07 dBm	-9.934 dB

Band 26 / 1.4MHz BW / QPSK / Full RB



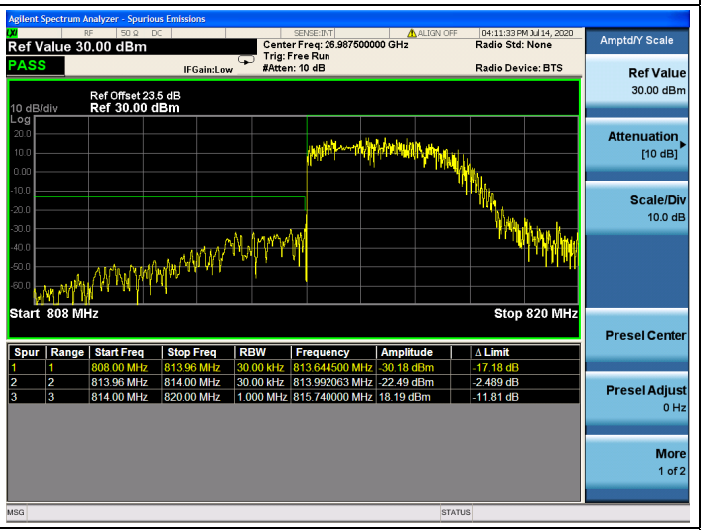
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	808.00 MHz	813.96 MHz	15.00 kHz	813.892938 MHz	-32.21 dBm	-19.21 dB
2	2	813.96 MHz	814.00 MHz	15.00 kHz	813.984500 MHz	-26.00 dBm	-6.002 dB
3	3	814.00 MHz	820.00 MHz	1.000 MHz	814.210000 MHz	20.25 dBm	-9.747 dB

Band 26 / 3MHz BW / QPSK / 1RB



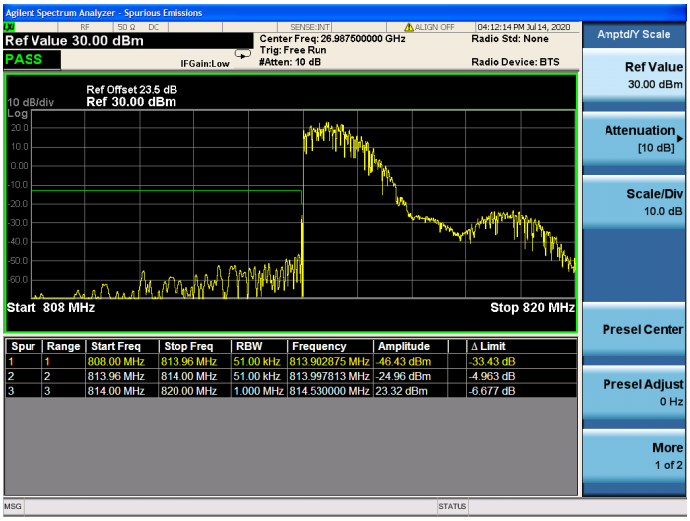
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	808.00 MHz	813.96 MHz	30.00 kHz	813.823375 MHz	-38.13 dBm	-25.13 dB
2	2	813.96 MHz	814.00 MHz	30.00 kHz	813.989313 MHz	-22.17 dBm	-2.167 dB
3	3	814.00 MHz	820.00 MHz	1.000 MHz	814.540000 MHz	22.50 dBm	-7.496 dB

Band 26 / 3MHz BW / QPSK / Full RB



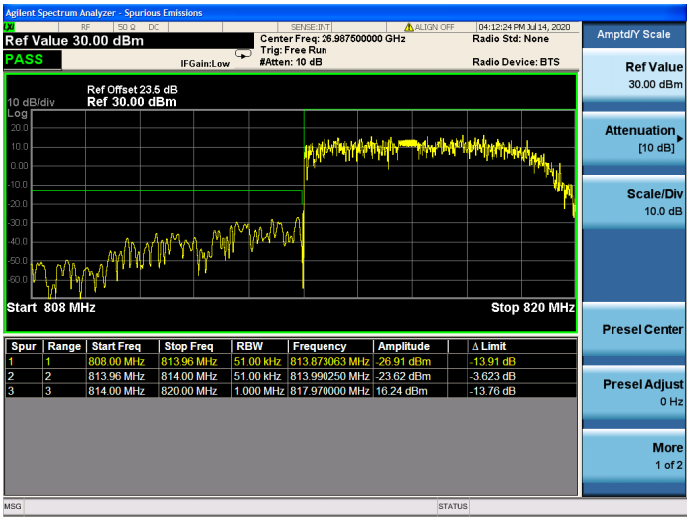
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	808.00 MHz	813.96 MHz	30.00 kHz	813.644500 MHz	-30.18 dBm	-17.18 dB
2	2	813.96 MHz	814.00 MHz	30.00 kHz	813.992063 MHz	-22.49 dBm	-2.489 dB
3	3	814.00 MHz	820.00 MHz	1.000 MHz	815.740000 MHz	18.19 dBm	-11.81 dB

Band 26 / 5MHz BW / QPSK / 1RB



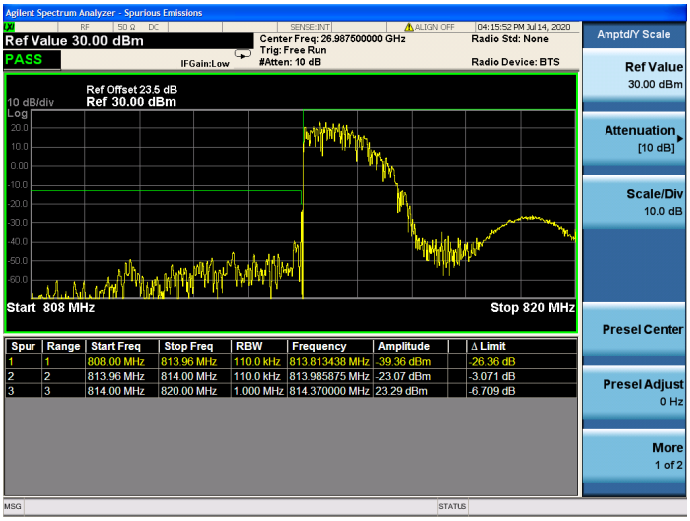
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	808.00 MHz	813.96 MHz	51.00 kHz	813.902875 MHz	-46.43 dBm	-33.43 dB
2	2	813.96 MHz	814.00 MHz	51.00 kHz	813.997813 MHz	-24.96 dBm	-4.963 dB
3	3	814.00 MHz	820.00 MHz	1.000 MHz	814.530000 MHz	23.32 dBm	-6.677 dB

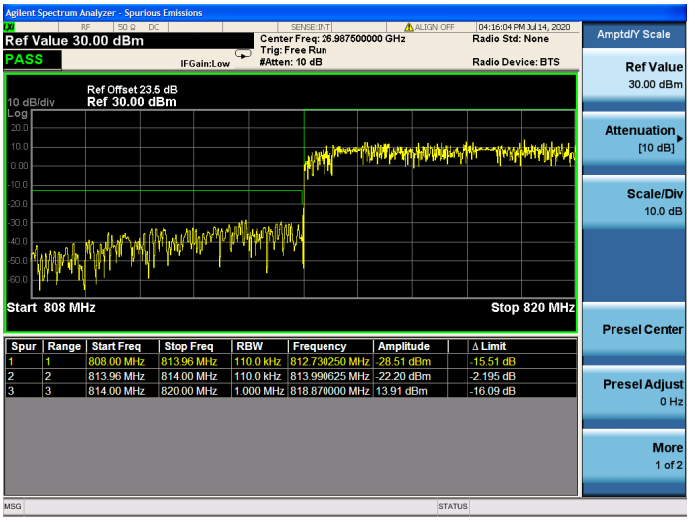
Band 26 / 5MHz BW / QPSK / Full RB



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	808.00 MHz	813.96 MHz	51.00 kHz	813.873063 MHz	-26.91 dBm	-13.91 dB
2	2	813.96 MHz	814.00 MHz	51.00 kHz	813.990250 MHz	-23.62 dBm	-3.623 dB
3	3	814.00 MHz	820.00 MHz	1.000 MHz	817.970000 MHz	16.24 dBm	-13.76 dB

Band 26 / 10MHz BW / QPSK / 1RB	Band 26 / 10MHz BW / QPSK / Full RB



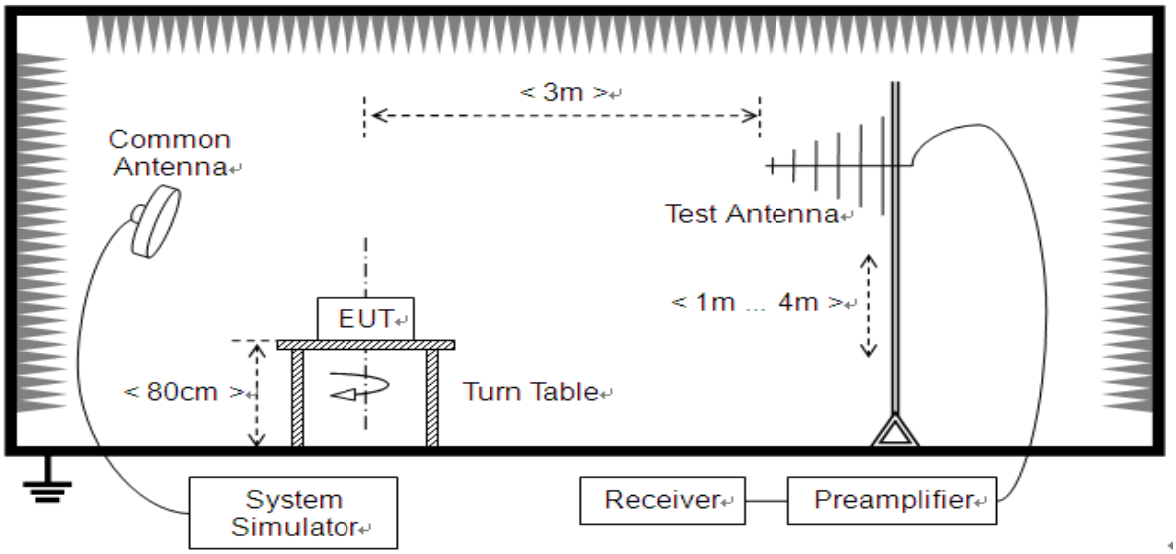


2.7. Radiated Spurious Emissions

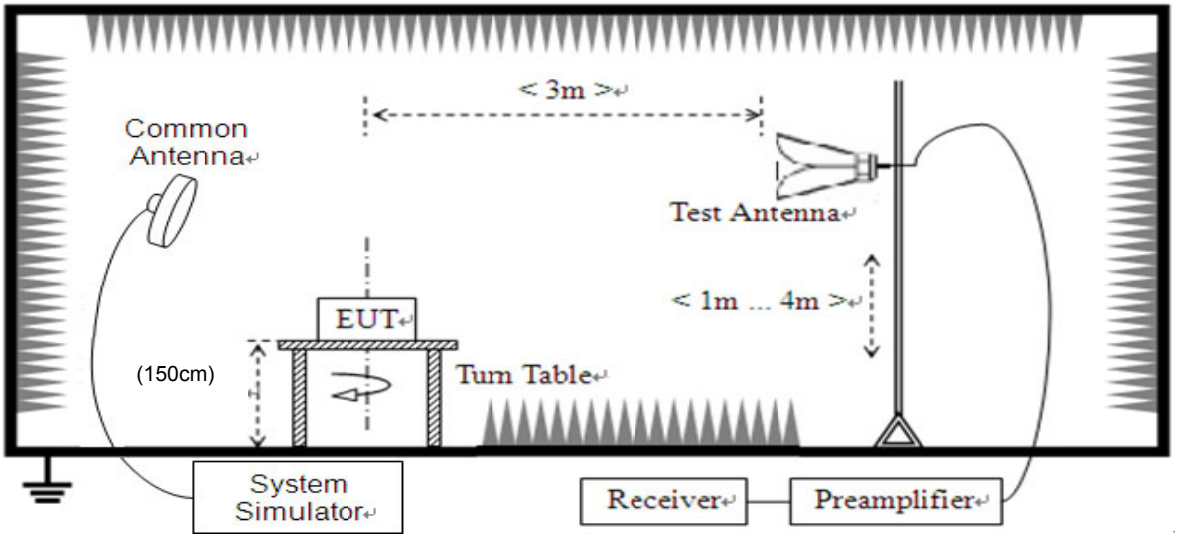
2.7.1. Requirement

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.

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.

2.7.4. Test Result

The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. Test Antenna height is varied from 1m to 4m above the ground, and the Turn Table is actuated to turn from 0° to 360°, both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. Mid channels on all channel bandwidth verified. Only the worst RB size/offset presented.

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

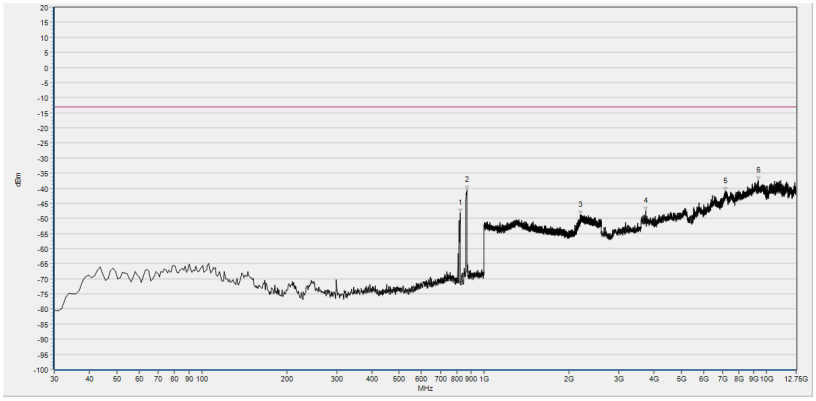
During the test, the data of A_{TOT} was added in the Test Spectrum Analyze, so Spectrum Analyze reading is the final values which contain the data of A_{TOT}.

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

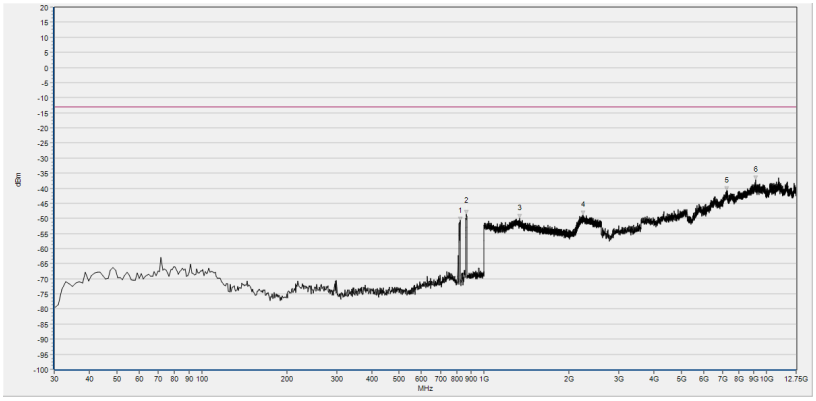
Note2: All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

Note3: All bandwidth and modulationwere 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.

LTE Band 26 10MHz BW, Mid Channel, QPSK



No.	Fre. (MHz)	Peak	Limit(PK)	Antenna	Verdict
1	822.312	-48.16	-13.00	Horizontal	NA
2	867.948	-40.47	-13.00	Horizontal	NA
3	2196.132	-48.77	-13.00	Horizontal	PASS
4	3733.795	-47.58	-13.00	Horizontal	PASS
5	7172.407	-40.95	-13.00	Horizontal	PASS
6	9382.461	-37.41	-13.00	Horizontal	PASS



No.	Freq(MHz)	Peak	limit PK	Antenna	Verdict
1	822.312	-50.74	-13.00	Vertical	NA
2	865.035	-48.64	-13.00	Vertical	NA
3	1336.646	-49.98	-13.00	Vertical	PASS
4	2240.413	-48.84	-13.00	Vertical	PASS
5	7240.097	-40.73	-13.00	Vertical	PASS
6	9145.549	-37.24	-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

Company Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Department:	Morlab 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. Morlab Laboratory
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	Cal. Due
Power Splitter	NW521	1506A	Weinschel	2020.04.15	2021.04.14
Attenuator 1	(N/A.)	10dB	Resnet	2020.04.15	2021.04.14
Attenuator 2	(N/A.)	3dB	Resnet	2020.04.15	2021.04.14
EXA Signal Analzyer	MY51511149	N9020A	Agilent	2019.07.29	2020.07.28
USB Power Sensor	MY54210011	U2021XA	Agilent	2020.04.15	2021.04.14
System Simulator	6200995016	MT8820C	Anritsu	2020.01.13	2021.01.12
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	(N/A)	HUT705P	CHONGQING HANBA EXPERIMENTAL EQUIPMENT CO.,LTD	2020.03.25	2021.03.24
Computer	T430i	Think Pad	Lenovo	N/A	N/A

4.2 Radiated Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Cal.Due
System Simulator	152038	CMW500	R&S	2020.01.13	2021.01.12
Receiver	MY54130016	N9038A	Agilent	2019.07.29	2020.07.28
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	2019.05.24	2022.05.23
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
1-18GHz pre-Amplifier	S020180L3203	N/A	Dongsheng	2019.07.29	2020.07.28
18-26.5GHz pre-Amplifier	S10M100L3802	N/A	Dongsheng	2019.07.29	2020.07.28
Notch Filter	N/A	WRCGV -LTE B2	Wainwright	2019.12.01	2020.11.30
Notch Filter	N/A	WRCGV -LTE B4	Wainwright	2019.12.01	2020.11.30
Notch Filter	N/A	WRCGV -LTE B5	Wainwright	2019.12.01	2020.11.30
Notch Filter	N/A	WRCGV -LTE B7	Wainwright	2019.12.01	2020.11.30
Notch Filter	N/A	WRCGV -LTE B12	Wainwright	2019.12.01	2020.11.30
Notch Filter	N/A	WRCGV -LTE B17	Wainwright	2019.12.01	2020.11.30
Notch Filter	N/A	WRCGV -LTE B19	Wainwright	2019.12.01	2020.11.30

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Cal.Due
Notch Filter	N/A	WRCGV -LTE B25	Wainwright	2019.12.01	2020.11.30
Notch Filter	N/A	WRCGV -LTE B26	Wainwright	2019.12.01	2020.11.30
Notch Filter	N/A	WRCGV -LTE B30	Wainwright	2019.12.01	2020.11.30
Notch Filter	N/A	WRCGV -LTE 38	Wainwright	2019.12.01	2020.11.30
Notch Filter	N/A	WRCGV -LTE B40	Wainwright	2019.12.01	2020.11.30
Notch Filter	N/A	WRCGV -LTE B41	Wainwright	2019.12.01	2020.11.30
Anechoic Chamber	N/A	9m*6m*6m	CRT	2019.07.13	2022.07.12

END OF REPORT