



TEST REPORT

APPLICANT : Xwireless LLC

PRODUCT NAME : Tablet

MODEL NAME : CMG101

BRAND NAME : Vortex

FCC ID : 2ADLJ-CMG101

STANDARD(S) : 47 CFR Part 2
47 CFR Part 90, Subpart S

RECEIPT DATE : 2023-08-08

TEST DATE : 2023-08-15 to 2023-09-04

ISSUE DATE : 2023-09-05



Edited by:

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Peng Mi (Rapporteur)

Approved by:

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MORLAB

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Change History		
Version	Date	Reason for change
1.0	2023-09-05	First edition



1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	Xwireless LLC
Applicant Address:	11565 Old Georgetown Rd, Rockville, MD 20852
Manufacturer:	Xwireless LLC
Manufacturer Address:	11565 Old Georgetown Rd, Rockville, MD 20852

1.2. Equipment Under Test (EUT) Description

Product Name:	Tablet	
Sample No.:	15#	
Hardware Version:	V1.0	
Software Version:	VORTEX_CMG101_13.0_05	
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:	PIFA Antenna	
Antenna Gain:	LTE Band 26	0.52dBi
Accessory Information:	Battery	
	Brand Name:	N/A
	Model No.:	3088128
	Serial No.:	N/A
	Capacity:	5000mAh
	Rated Voltage:	3.8V
	Charge Limit:	4.35V
	Manufacturer:	SHENZHEN UTILITY ENERGY CO., LTD.



Accessory Information:	AC Adapter	
	Brand Name:	N/A
	Model No.:	TN-050200U3
	Serial No.:	N/A
	Rated Output:	5V=2A
	Rated Input:	100-240V~50/60Hz, 0.35A
	Manufacturer:	Guangdong Beicom Electronics Co., Ltd.

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

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

LTE Band 26	Maximum E.R.P./E.I.R.P. (W)		Emission Designator (99%OBW)	
BW(MHz)	QPSK	16QAM	QPSK	16QAM
10	0.135	0.118	9M02G7D	8M99W7D
5	0.136	0.119	4M50G7D	4M51W7D
3	0.135	0.117	2M69G7D	2M70W7D
1.4	0.135	0.118	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	Aug. 16, 2023	Chen Hao Li Huajie	PASS	No deviation
90.209	Occupied Bandwidth	Aug. 16, 2023	Li Huajie	PASS	No deviation
2.1055, 90.213	Frequency Stability	Aug. 16, 2023	Li Huajie	PASS	No deviation
2.1051, 90.691	Conducted Spurious Emissions	Aug. 16, 2023	Li Huajie	PASS	No deviation
2.1051, 90.691	Band Edge	Aug. 16, 2023	Li Huajie	PASS	No deviation
2.1053, 90.691	Radiated Spurious Emissions	Sep. 04, 2022	Su Zhan	PASS	No deviation

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

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

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

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



1.5. Environmental Conditions

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

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

2.47 CFR Part 2, Part 90S Requirements

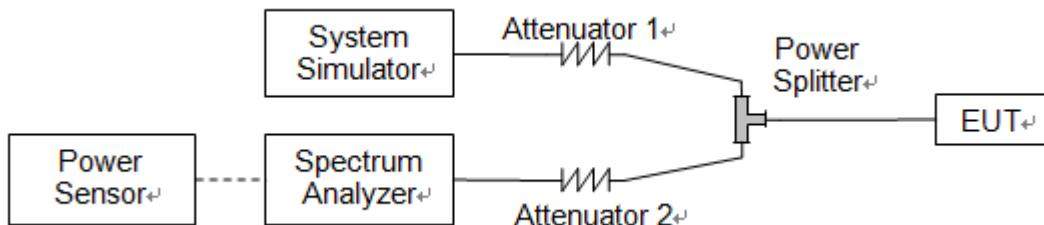
2.1. Transmitter Conducted Output Power and E.R.P./E.I.R.P.

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 90.635(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.

$$\text{EIRP (dBm)} = \text{Conducted Output Power (dBm)} + \text{Antenna Gain (dBi)}$$

$$\text{ERP (dBm)} = \text{EIPR (dBm)} - 2.15$$



2.1.4. Result

Conducted Output Power

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	/	22.93	/
10	QPSK	1	25	/	22.87	/
10	QPSK	1	49	/	22.82	/
10	QPSK	25	0	/	22.23	/
10	QPSK	25	12	/	22.17	/
10	QPSK	25	25	/	22.06	/
10	QPSK	50	0	/	22.06	/
10	16QAM	1	0	/	22.34	/
10	16QAM	1	25	/	22.23	/
10	16QAM	1	49	/	22.08	/
10	16QAM	25	0	/	21.19	/
10	16QAM	25	12	/	21.10	/
10	16QAM	25	25	/	21.05	/
10	16QAM	50	0	/	20.91	/



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	22.95	22.86	22.87
5	QPSK	1	12	22.87	22.75	22.79
5	QPSK	1	24	22.80	22.68	22.69
5	QPSK	12	0	22.27	22.25	22.20
5	QPSK	12	7	22.19	22.09	22.11
5	QPSK	12	13	22.11	21.99	22.00
5	QPSK	25	0	22.03	21.92	21.91
5	16QAM	1	0	22.38	22.26	22.37
5	16QAM	1	12	22.21	22.13	22.17
5	16QAM	1	24	22.10	22.06	22.08
5	16QAM	12	0	21.23	21.12	21.15
5	16QAM	12	7	21.10	21.04	20.98
5	16QAM	12	13	21.06	21.01	21.04
5	16QAM	25	0	20.91	20.84	20.79



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	22.93	22.83	22.81
3	QPSK	1	8	22.92	22.85	22.91
3	QPSK	1	14	22.81	22.78	22.69
3	QPSK	8	0	22.24	22.17	22.17
3	QPSK	8	4	22.21	22.11	22.19
3	QPSK	8	7	22.06	21.99	21.94
3	QPSK	15	0	22.08	22.03	22.06
3	16QAM	1	0	22.33	22.26	22.31
3	16QAM	1	8	22.28	22.26	22.25
3	16QAM	1	14	22.13	22.05	22.03
3	16QAM	8	0	21.18	21.14	21.08
3	16QAM	8	4	21.09	20.97	21.01
3	16QAM	8	7	21.01	20.94	20.92
3	16QAM	15	0	20.90	20.89	20.83



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	22.92	22.89	22.89
1.4	QPSK	1	3	22.87	22.86	22.86
1.4	QPSK	1	5	22.84	22.76	22.81
1.4	QPSK	3	0	22.29	22.19	22.21
1.4	QPSK	3	1	22.18	22.17	22.15
1.4	QPSK	3	3	22.13	22.01	22.10
1.4	QPSK	6	0	22.03	21.97	21.91
1.4	16QAM	1	0	22.36	22.28	22.29
1.4	16QAM	1	3	22.22	22.20	22.20
1.4	16QAM	1	5	22.15	22.07	22.13
1.4	16QAM	3	0	21.23	21.17	21.17
1.4	16QAM	3	1	21.10	21.00	21.04
1.4	16QAM	3	3	20.99	20.88	20.87
1.4	16QAM	6	0	20.90	20.78	20.83

**Effective Radiated Power and Effective Isotropic Radiated Power**

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	/	21.30	0.135	/
10	QPSK	1	25	/	21.24	0.133	/
10	QPSK	1	49	/	21.19	0.132	/
10	QPSK	25	0	/	20.60	0.115	/
10	QPSK	25	12	/	20.54	0.113	/
10	QPSK	25	25	/	20.43	0.110	/
10	QPSK	50	0	/	20.43	0.110	/
10	16QAM	1	0	/	20.71	0.118	/
10	16QAM	1	25	/	20.60	0.115	/
10	16QAM	1	49	/	20.45	0.111	/
10	16QAM	25	0	/	19.56	0.090	/
10	16QAM	25	12	/	19.47	0.089	/
10	16QAM	25	25	/	19.42	0.087	/
10	16QAM	50	0	/	19.28	0.085	/



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	21.32	0.136	21.23	0.133	21.24	0.133
5	QPSK	1	12	21.24	0.133	21.12	0.129	21.16	0.131
5	QPSK	1	24	21.17	0.131	21.05	0.127	21.06	0.128
5	QPSK	12	0	20.64	0.116	20.62	0.115	20.57	0.114
5	QPSK	12	7	20.56	0.114	20.46	0.111	20.48	0.112
5	QPSK	12	13	20.48	0.112	20.36	0.109	20.37	0.109
5	QPSK	25	0	20.40	0.110	20.29	0.107	20.28	0.107
5	16QAM	1	0	20.75	0.119	20.63	0.116	20.74	0.119
5	16QAM	1	12	20.58	0.114	20.50	0.112	20.54	0.113
5	16QAM	1	24	20.47	0.111	20.43	0.110	20.45	0.111
5	16QAM	12	0	19.60	0.091	19.49	0.089	19.52	0.090
5	16QAM	12	7	19.47	0.089	19.41	0.087	19.35	0.086
5	16QAM	12	13	19.43	0.088	19.38	0.087	19.41	0.087
5	16QAM	25	0	19.28	0.085	19.21	0.083	19.16	0.082



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
3	QPSK	1	0	21.32	0.136	21.23	0.133	21.24
3	QPSK	1	8	21.24	0.133	21.12	0.129	21.16
3	QPSK	1	14	21.17	0.131	21.05	0.127	21.06
3	QPSK	8	0	20.64	0.116	20.62	0.115	20.57
3	QPSK	8	4	20.56	0.114	20.46	0.111	20.48
3	QPSK	8	7	20.48	0.112	20.36	0.109	20.37
3	QPSK	15	0	20.40	0.110	20.29	0.107	20.28
3	16QAM	1	0	20.75	0.119	20.63	0.116	20.74
3	16QAM	1	8	20.58	0.114	20.50	0.112	20.54
3	16QAM	1	14	20.47	0.111	20.43	0.110	20.45
3	16QAM	8	0	19.60	0.091	19.49	0.089	19.52
3	16QAM	8	4	19.47	0.089	19.41	0.087	19.35
3	16QAM	8	7	19.43	0.088	19.38	0.087	19.41
3	16QAM	15	0	19.28	0.085	19.21	0.083	19.16



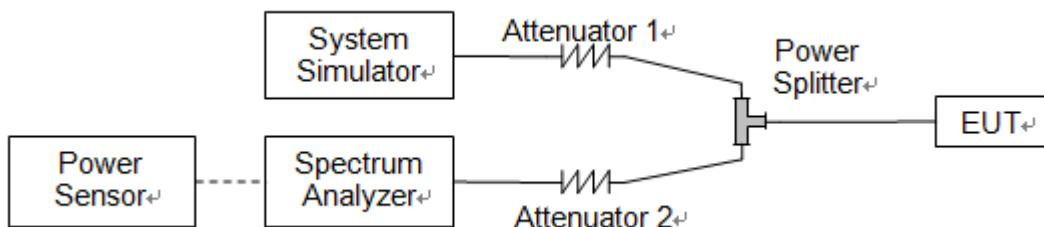
LTE Band 26				Measured E.R.P.				
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.	Middle Ch. / Freq.	High Ch. / Freq.		
Channel				26697	26740	26783		
Frequency (MHz)				814.7	819.0	823.3		
				dBm	W	dBm	W	dBm
1.4	QPSK	1	0	21.29	0.135	21.26	0.134	21.26
1.4	QPSK	1	3	21.24	0.133	21.23	0.133	21.23
1.4	QPSK	1	5	21.21	0.132	21.13	0.130	21.18
1.4	QPSK	3	0	20.66	0.116	20.56	0.114	20.58
1.4	QPSK	3	1	20.55	0.114	20.54	0.113	20.52
1.4	QPSK	3	3	20.50	0.112	20.38	0.109	20.47
1.4	QPSK	6	0	20.40	0.110	20.34	0.108	20.28
1.4	16QAM	1	0	20.73	0.118	20.65	0.116	20.66
1.4	16QAM	1	3	20.59	0.115	20.57	0.114	20.57
1.4	16QAM	1	5	20.52	0.113	20.44	0.111	20.50
1.4	16QAM	3	0	19.60	0.091	19.54	0.090	19.54
1.4	16QAM	3	1	19.47	0.089	19.37	0.086	19.41
1.4	16QAM	3	3	19.36	0.086	19.25	0.084	19.24
1.4	16QAM	6	0	19.27	0.085	19.15	0.082	19.20
								0.083

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.

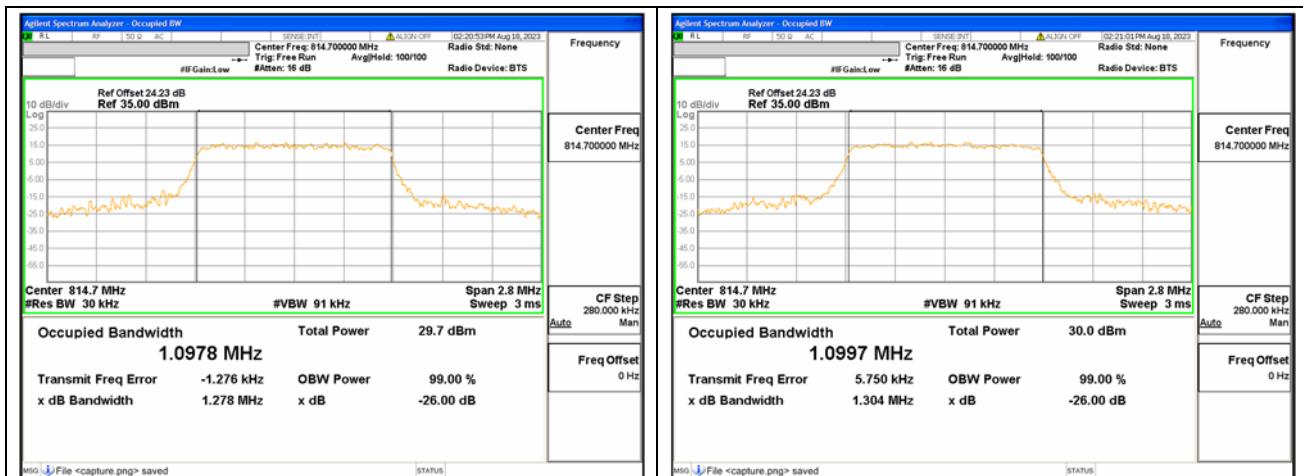


2.2.4. Test Result

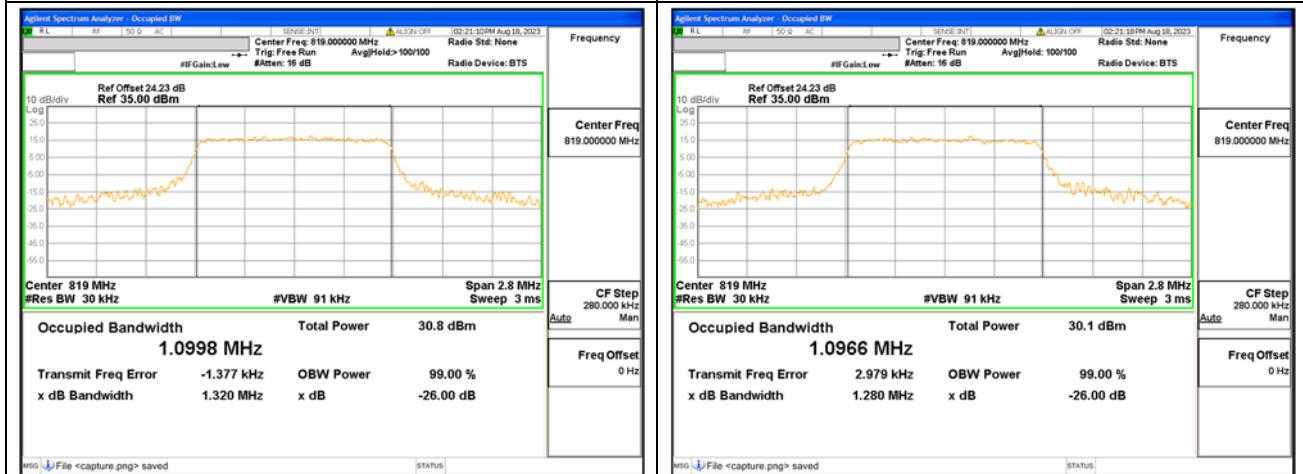
LTE Band 26				
BW(MHz)	Channel Level	Modulation	99% BW(MHz)	26dB BW(MHz)
1.4	Low	QPSK	1.10	1.28
	Low	16QAM	1.10	1.30
	Mid	QPSK	1.10	1.32
	Mid	16QAM	1.10	1.28
	High	QPSK	1.10	1.29
	High	16QAM	1.10	1.28
3	Low	QPSK	2.69	2.89
	Low	16QAM	2.69	3.07
	Mid	QPSK	2.69	2.98
	Mid	16QAM	2.69	2.93
	High	QPSK	2.69	2.92
	High	16QAM	2.70	3.14
5	Low	QPSK	4.50	4.95
	Low	16QAM	4.50	5.30
	Mid	QPSK	4.50	4.93
	Mid	16QAM	4.50	5.53
	High	QPSK	4.50	4.93
	High	16QAM	4.51	4.88
10	Low	QPSK	8.99	10.01
	Low	16QAM	8.99	9.94
	Mid	QPSK	9.00	9.55
	Mid	16QAM	8.98	10.18
	High	QPSK	9.02	10.05
	High	16QAM	8.97	10.45



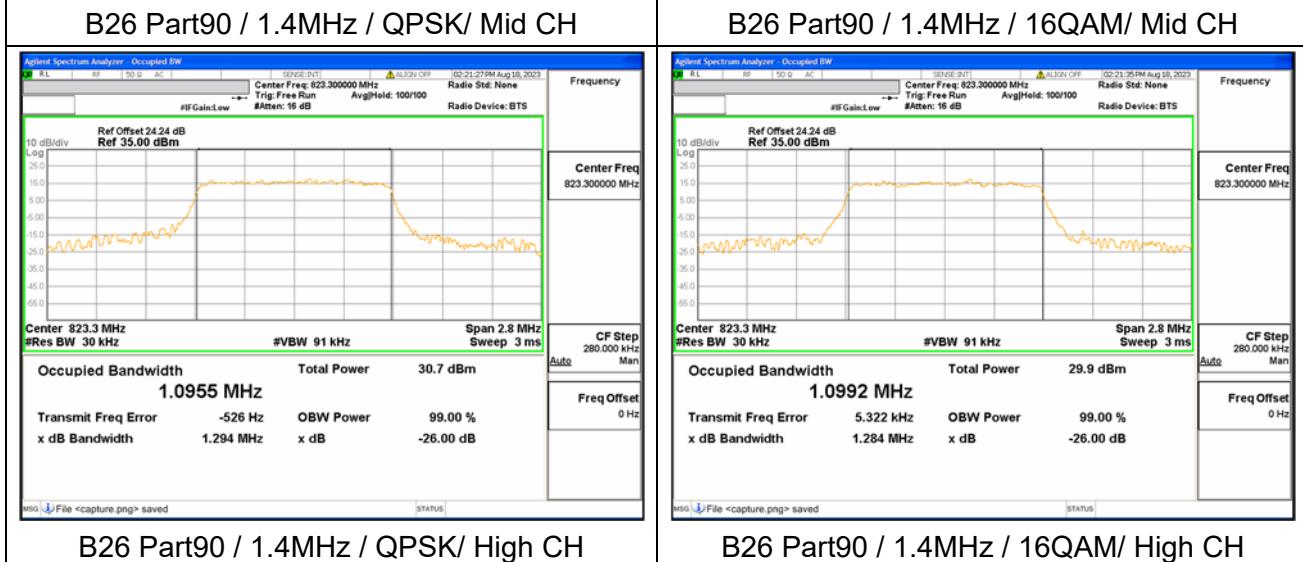
REPORT No. : SZ23080057W07



B26 Part90 / 1.4MHz / QPSK/ Low CH



B26 Part90 / 1.4MHz / 16QAM/ Low CH



B26 Part90 / 1.4MHz / QPSK/ Mid CH

B26 Part90 / 1.4MHz / 16QAM/ Mid CH

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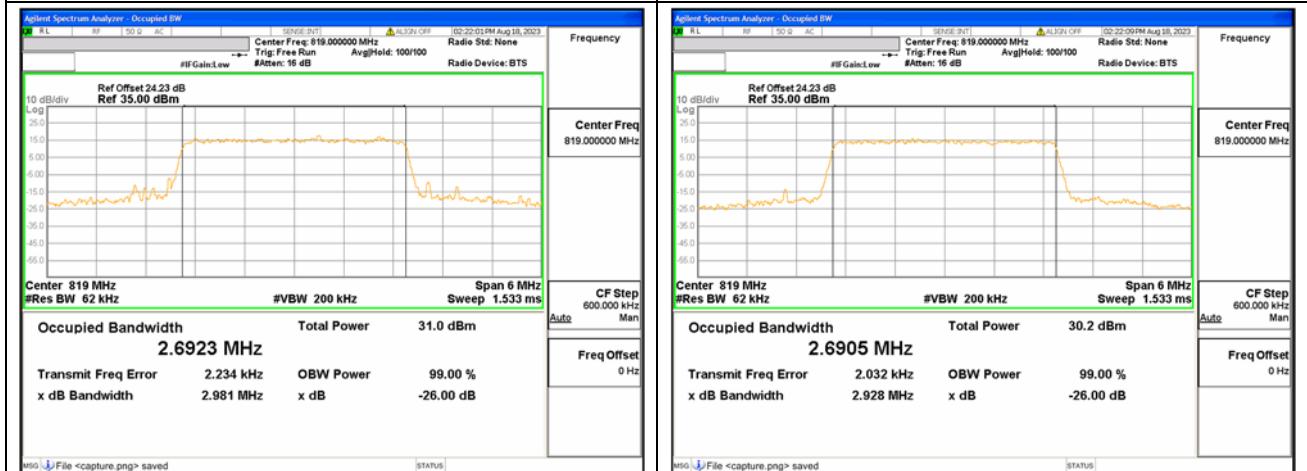
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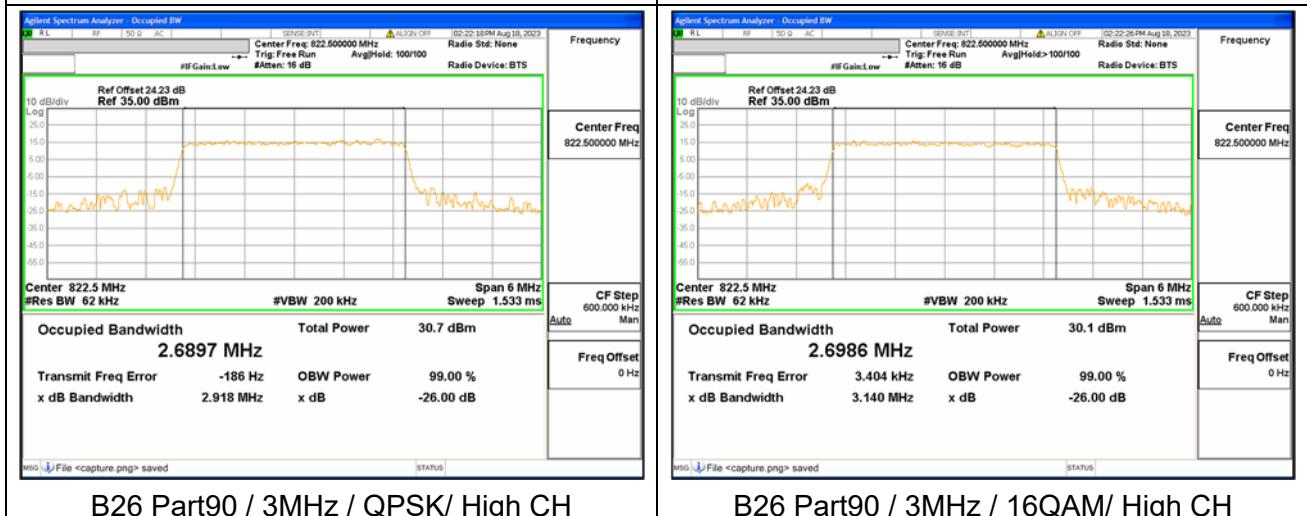
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B26 Part90 / 3MHz / QPSK/ Low CH



B26 Part90 / 3MHz / QPSK/ Mid CH

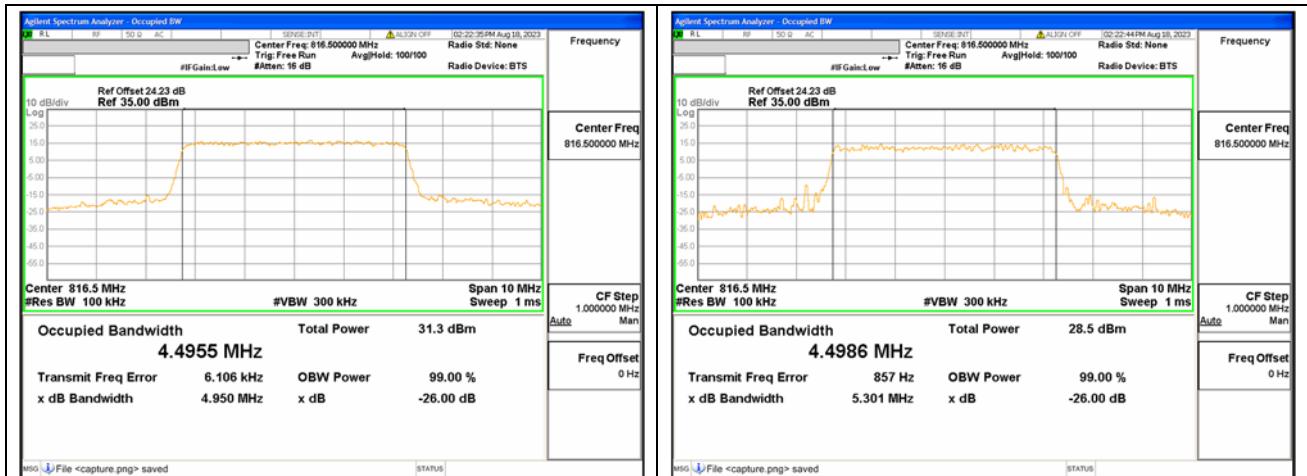


B26 Part90 / 3MHz / QPSK/ High CH

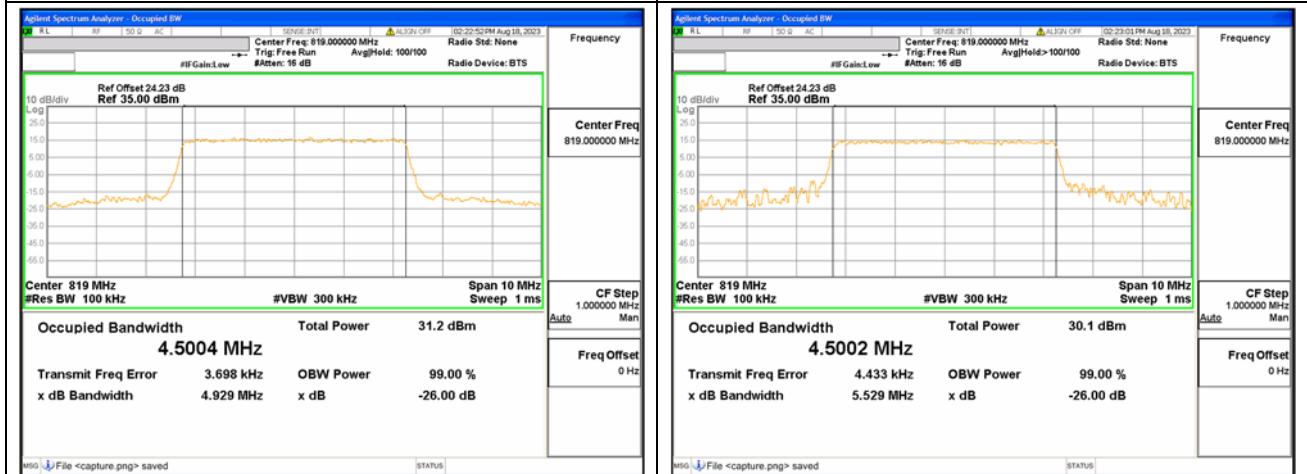
B26 Part90 / 3MHz / 16QAM/ High CH



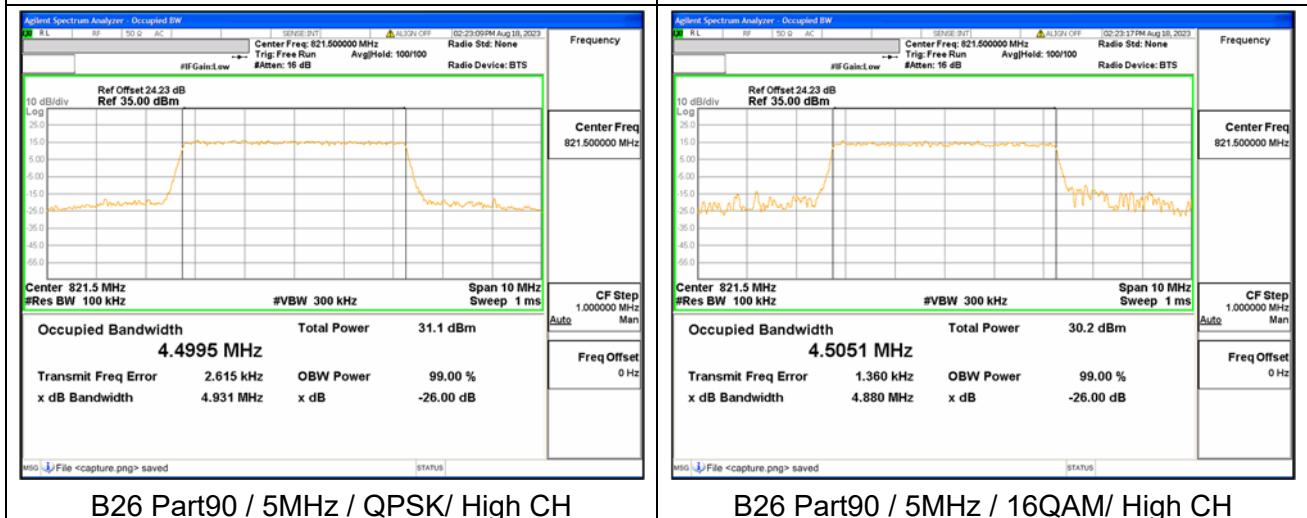
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B26 Part90 / 5MHz / QPSK/ Low CH

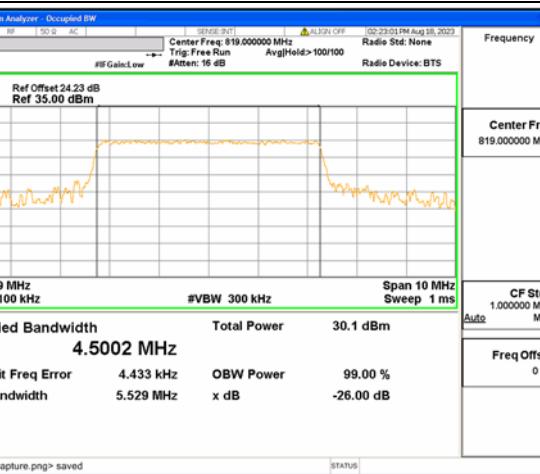


B26 Part90 / 5MHz / QPSK/ Mid CH

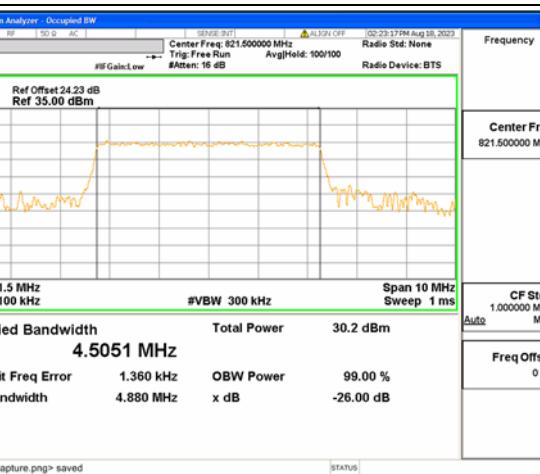


B26 Part90 / 5MHz / QPSK/ High CH

B26 Part90 / 5MHz / 16QAM/ Low CH



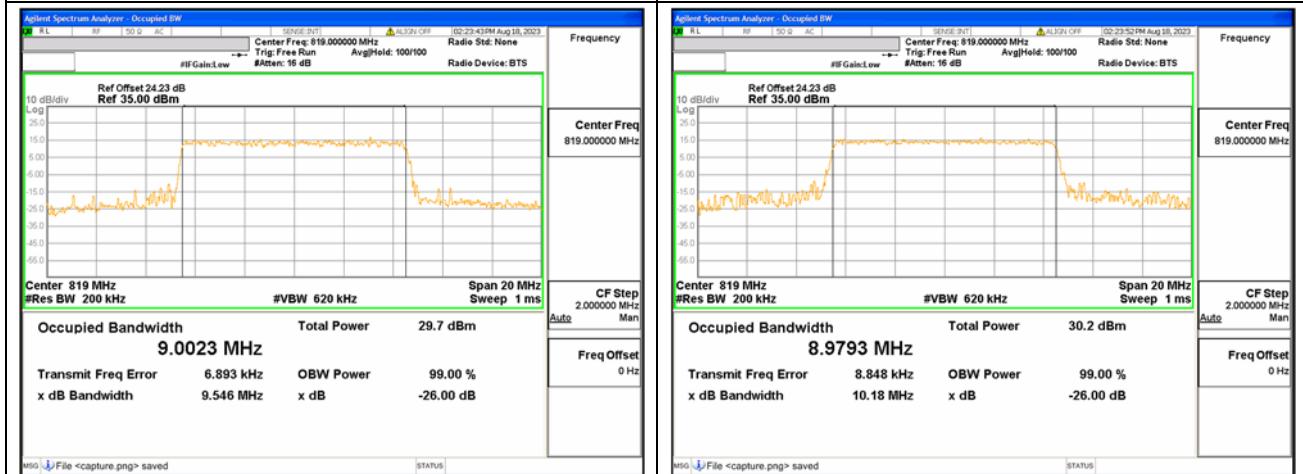
B26 Part90 / 5MHz / 16QAM/ Mid CH



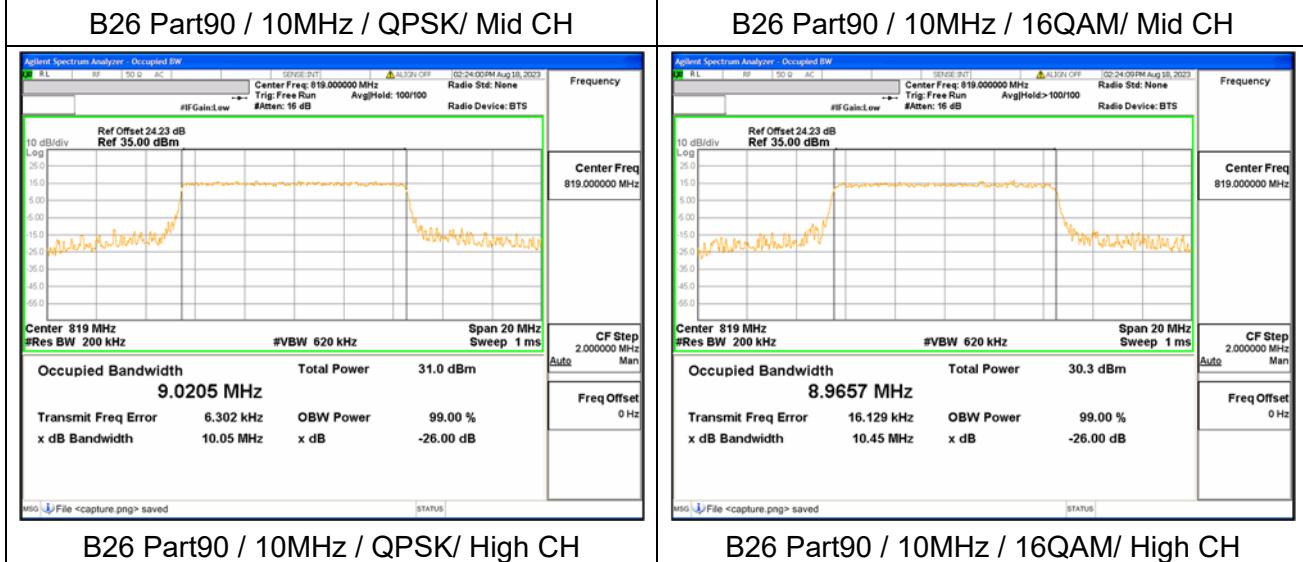
B26 Part90 / 5MHz / 16QAM/ High CH



B26 Part90 / 10MHz / QPSK/ Low CH



B26 Part90 / 10MHz / 16QAM/ Low CH



B26 Part90 / 10MHz / QPSK/ Mid CH

B26 Part90 / 10MHz / 16QAM/ Mid CH

2.3. Frequency Stability

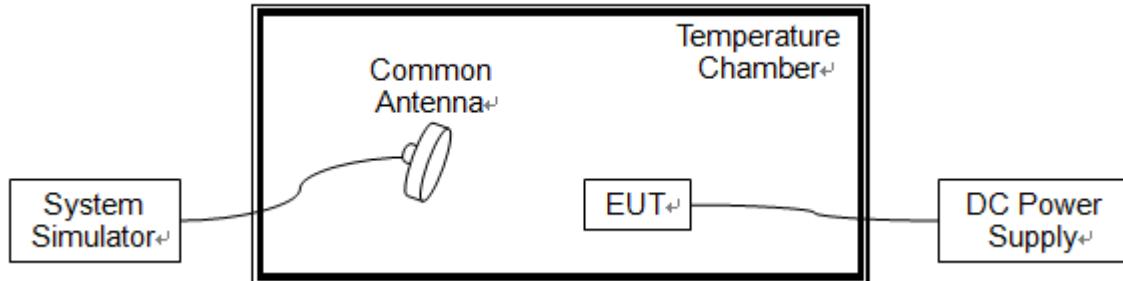
2.3.1. Requirement

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 -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 manufacturer. The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

Note: The operating temperature of EUT is from 0°C to 45°C, which are specified by the applicant.

2.3.2. Test Description



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

2.3.3. Test procedure

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



2.3.4. Test Result

The nominal, highest and lowest extreme voltages are separately 3.80V, 4.35V and 3.50V, which are specified by the applicant; the normal temperature here used is 20°C.

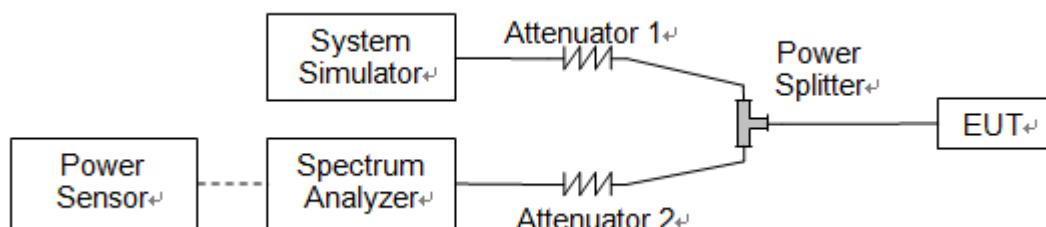
LTE Band 26, QPSK, Channel 26740, Frequency 819MHz					
Limit =±2.5ppm					
Voltage (%)	Power (VDC)	Temp (°C)	Fre. Dev. (Hz)	Deviation (ppm)	Result
Normal	3.80	+20(Ref)	-23	-0.028	PASS
Normal		0	-22	-0.027	
Normal		+10	21	0.026	
Normal		+20	-14	-0.017	
Normal		+30	-15	-0.018	
Normal		+40	-9	-0.011	
Normal		+45	17	0.021	
High	4.35	+20	15	0.018	
BATT.ENDPOINT	3.50	+20	13	0.016	

2.4. Conducted Spurious Emissions

2.4.1. 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.

2.4.2. 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.

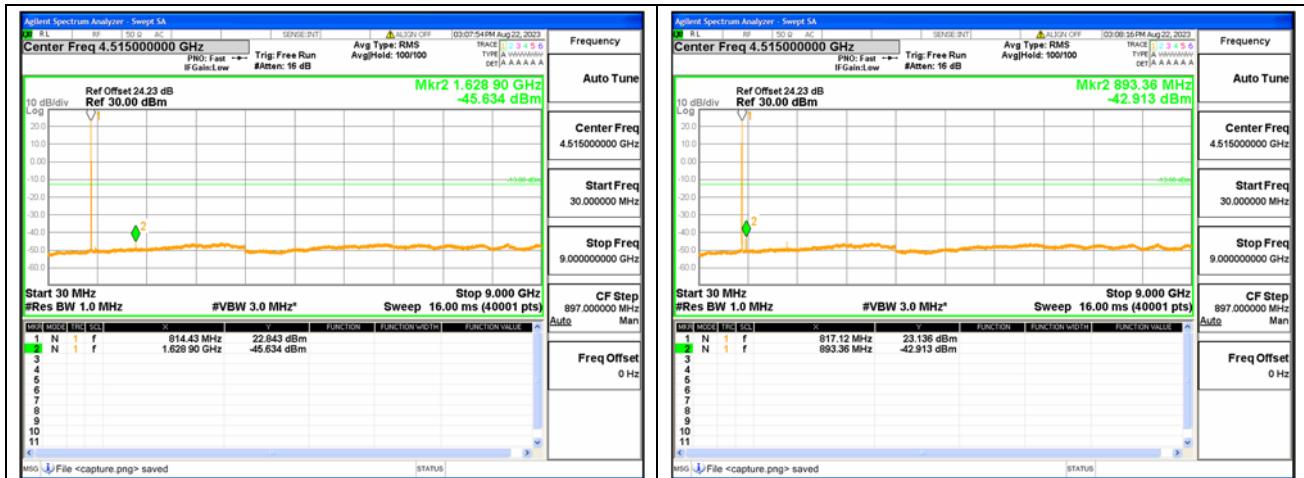
2.4.3. Test procedure

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

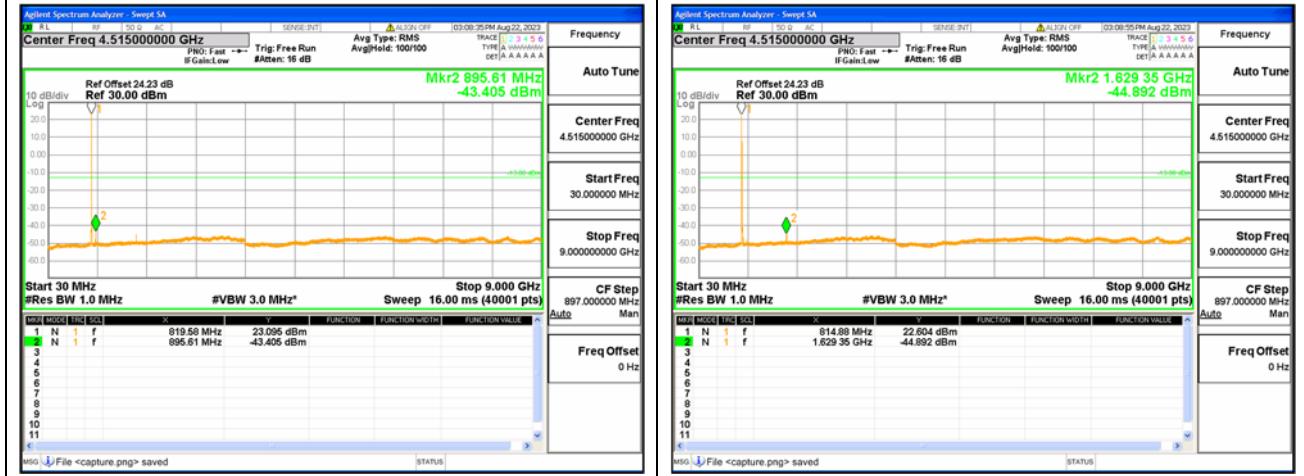


2.4.4. Test Result

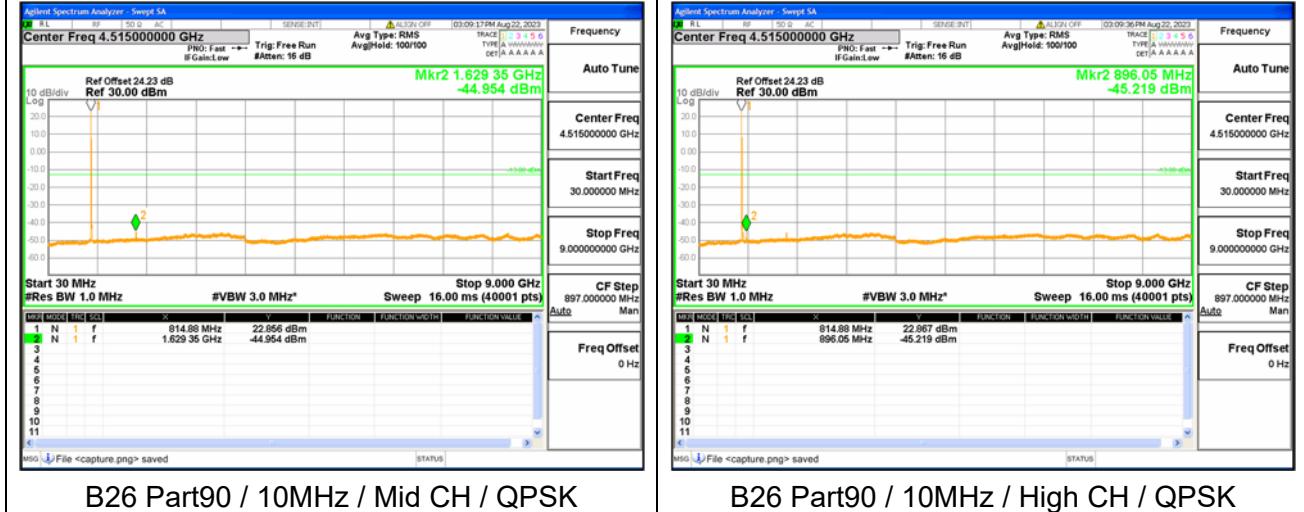




B26 Part90 / 5MHz / Low CH / QPSK



B26 Part90 / 5MHz / High CH / QPSK



B26 Part90 / 10MHz / Mid CH / QPSK

B26 Part90 / 10MHz / High CH / QPSK

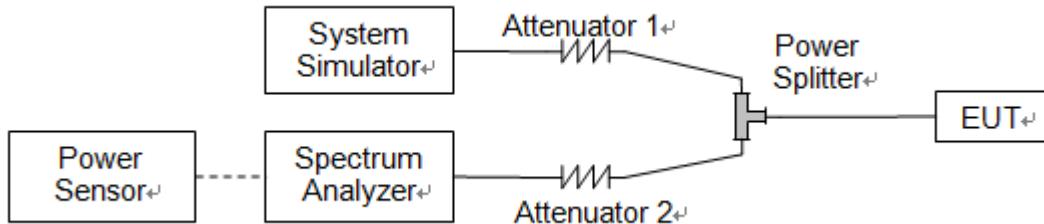
2.5. Band Edge

2.5.1. Requirement

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.

2.5.2. Test Description

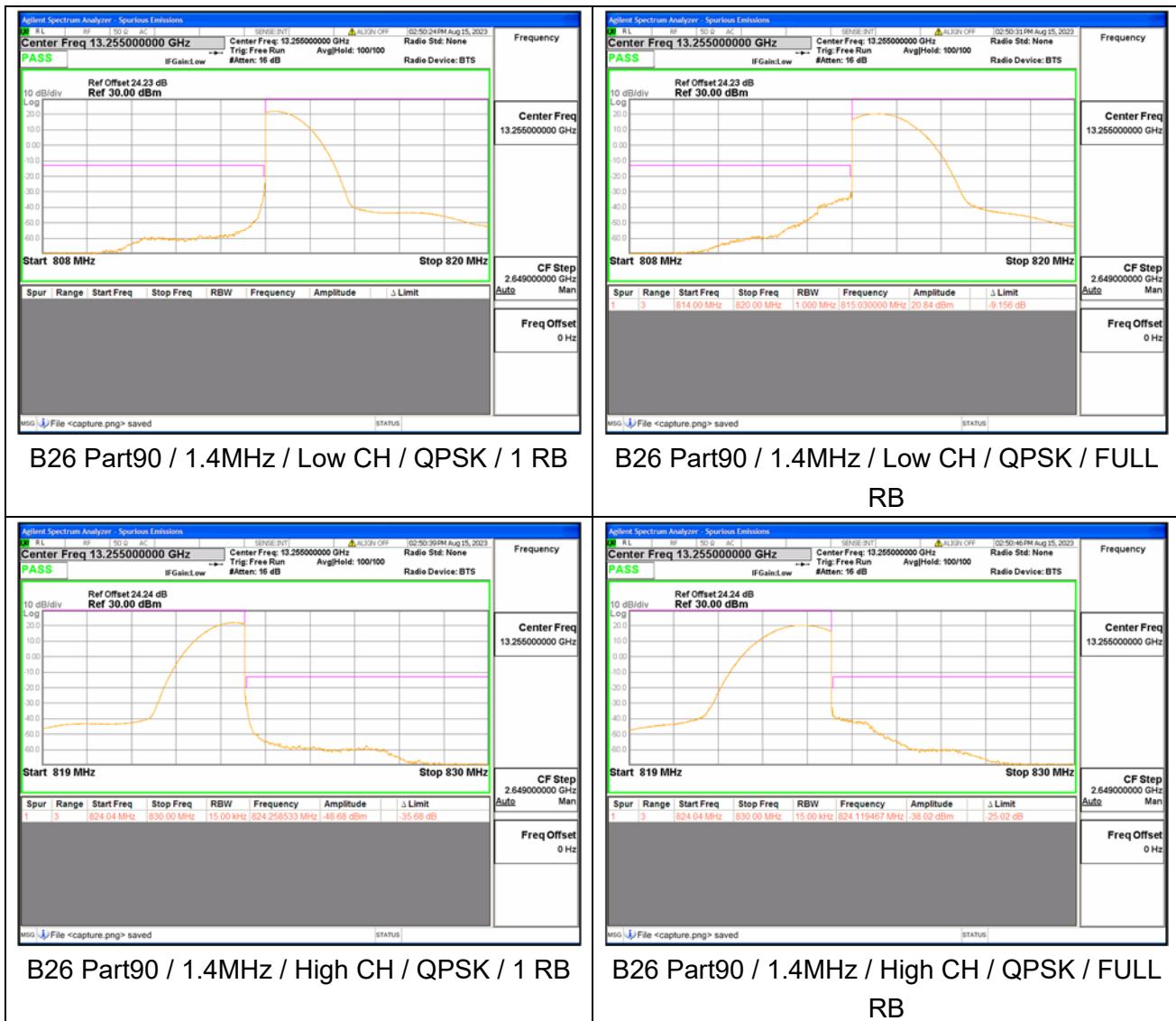


The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum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

2.5.3. Test procedure

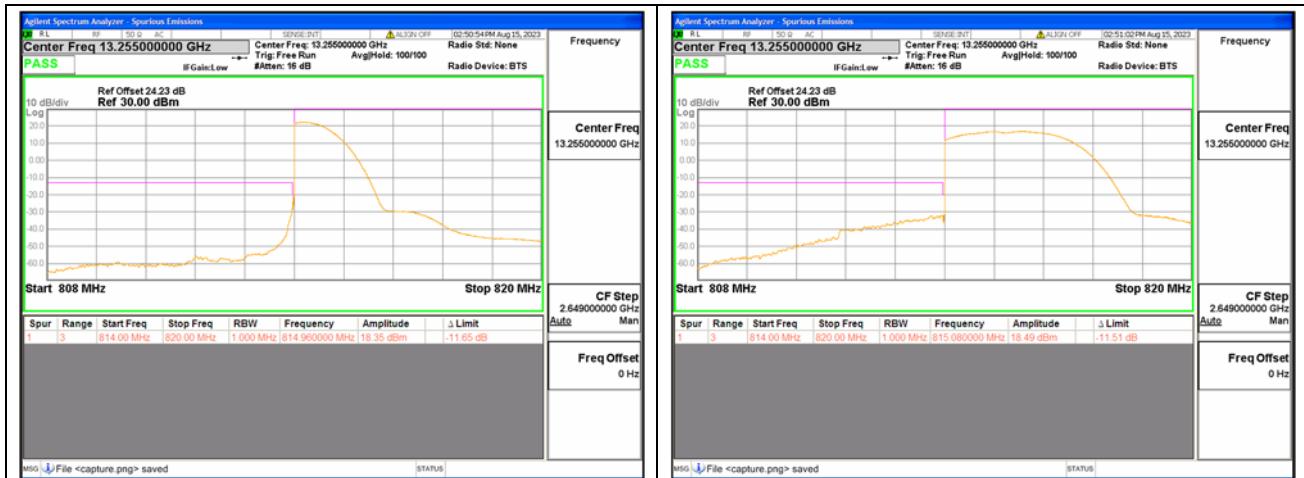
KDB 971168 D01v03 Section 6.0 and ANSI/TIA-603-E-2016.

2.5.4. Test Result

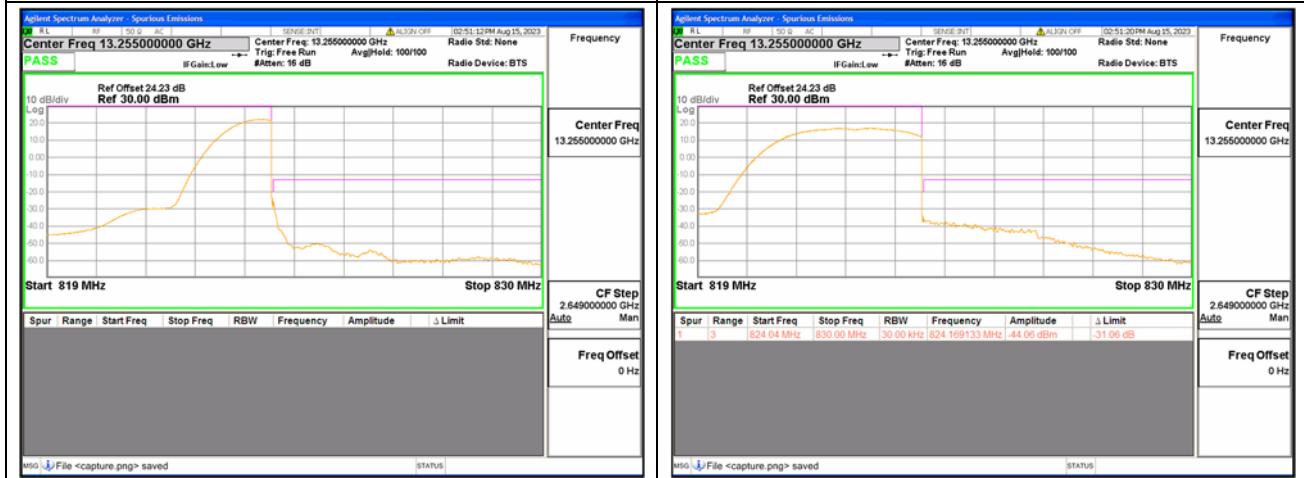




REPORT No. : SZ23080057W07

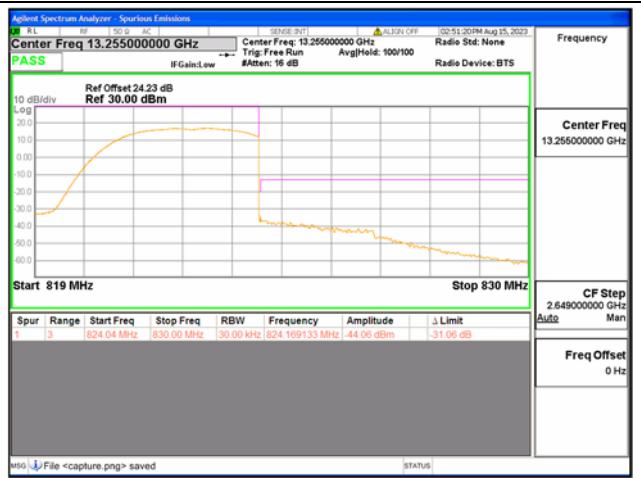


B26 Part90 / 3MHz / Low CH / QPSK / 1 RB



B26 Part90 / 3MHz / High CH / QPSK / 1 RB

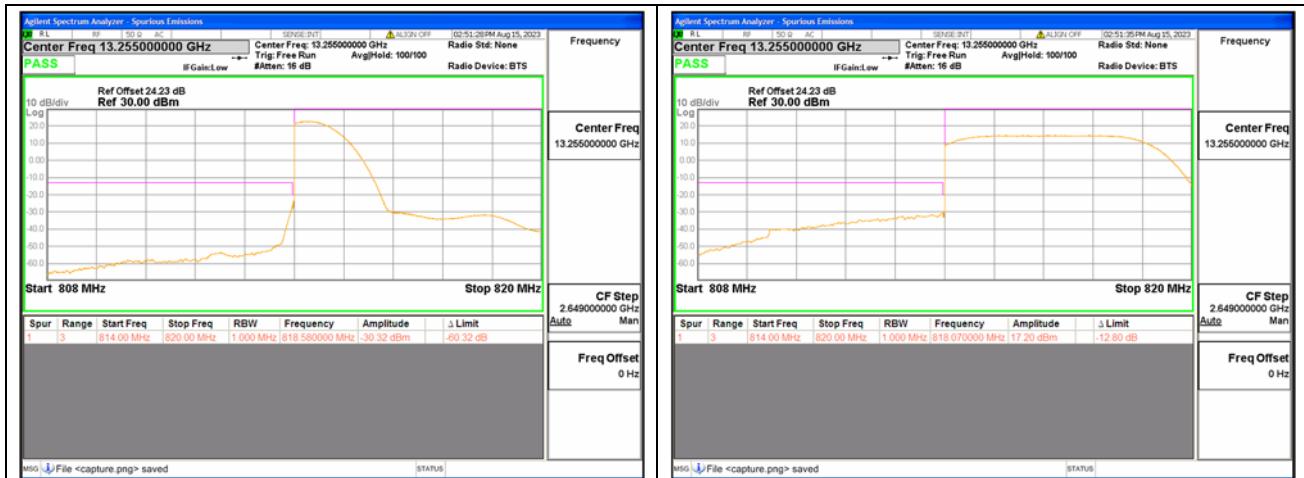
B26 Part90 / 3MHz / Low CH / QPSK / FULL RB



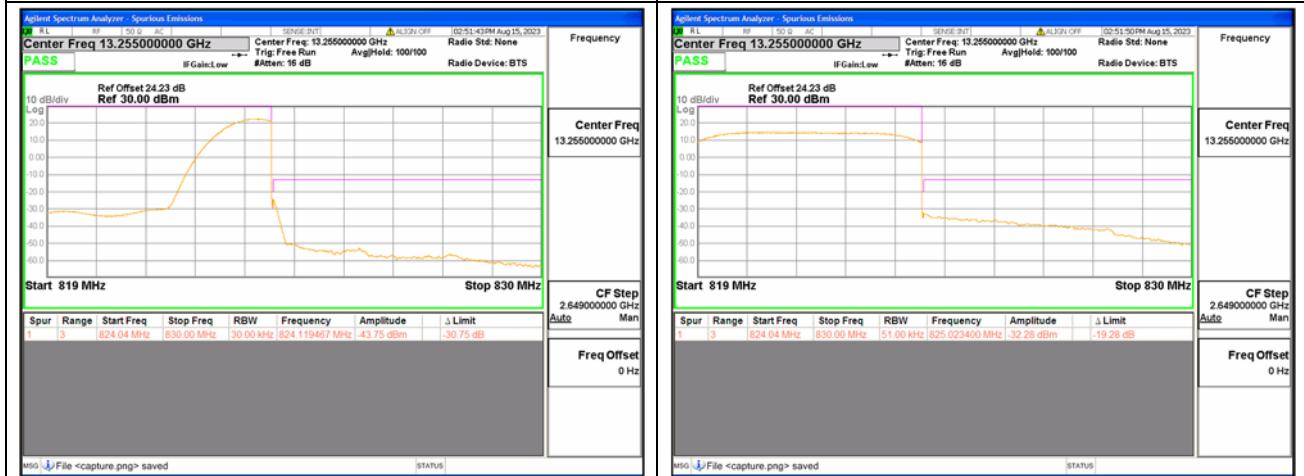
B26 Part90 / 3MHz / High CH / QPSK / FULL RB



REPORT No. : SZ23080057W07

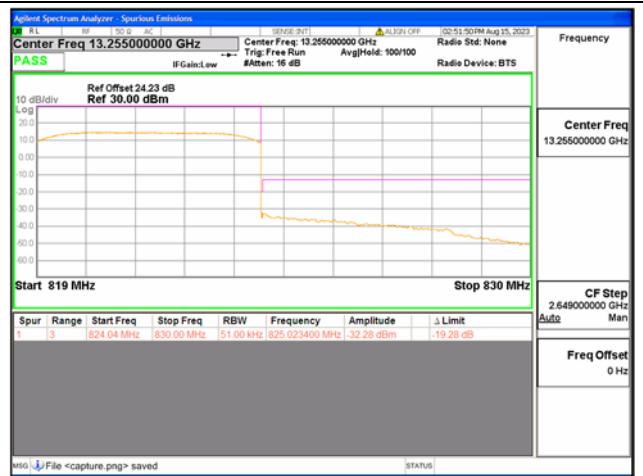


B26 Part90 / 5MHz / Low CH / QPSK / 1 RB



B26 Part90 / 5MHz / High CH / QPSK / 1 RB

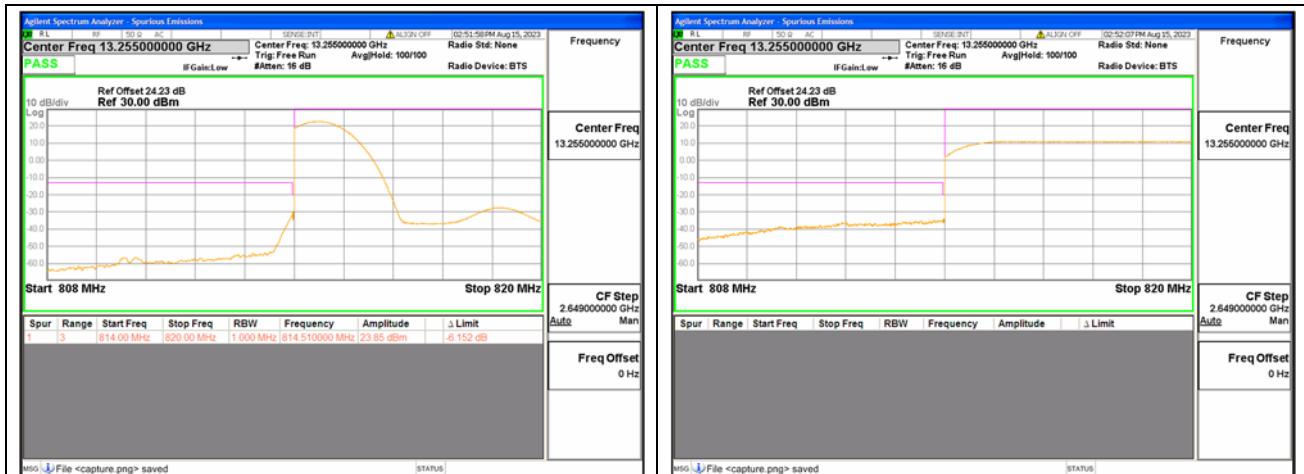
B26 Part90 / 5MHz / Low CH / QPSK / FULL RB



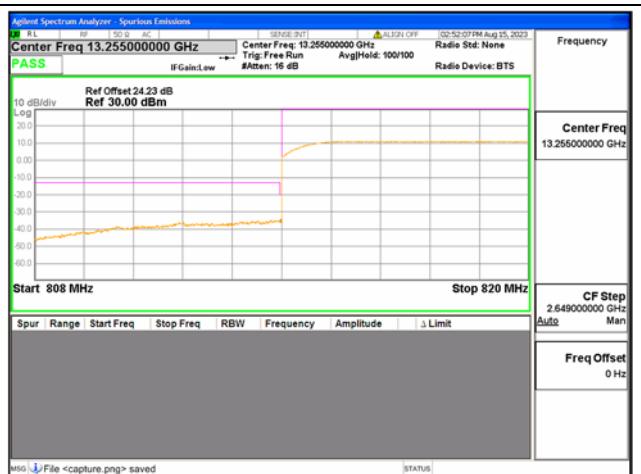
B26 Part90 / 5MHz / High CH / QPSK / FULL RB



REPORT No. : SZ23080057W07



B26 Part90 / 10MHz / Low CH / QPSK / 1 RB



B26 Part90 / 10MHz / Low CH / QPSK / FULL RB



B26 Part90 / 10MHz / High CH / QPSK / 1 RB

B26 Part90 / 10MHz / High CH / QPSK / FULL RB

MORLAB

Shenzhen Morlab Communications Technology Co., Ltd.
FL.1-3, Building A, FeiYang Science Park, No.8 LongChang Road,
Block67, BaoAn District, ShenZhen , GuangDong Province, P. R. China

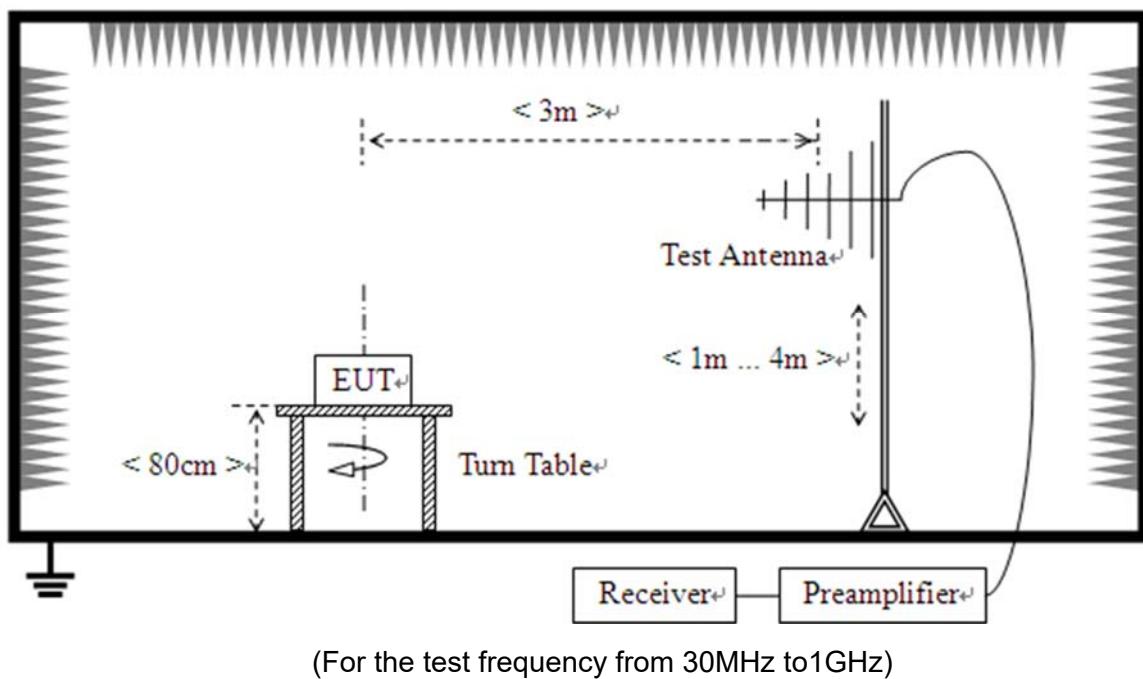
Tel: 86-755-36698555 Fax: 86-755-36698525
Http://www.morlab.cn E-mail: service@morlab.cn

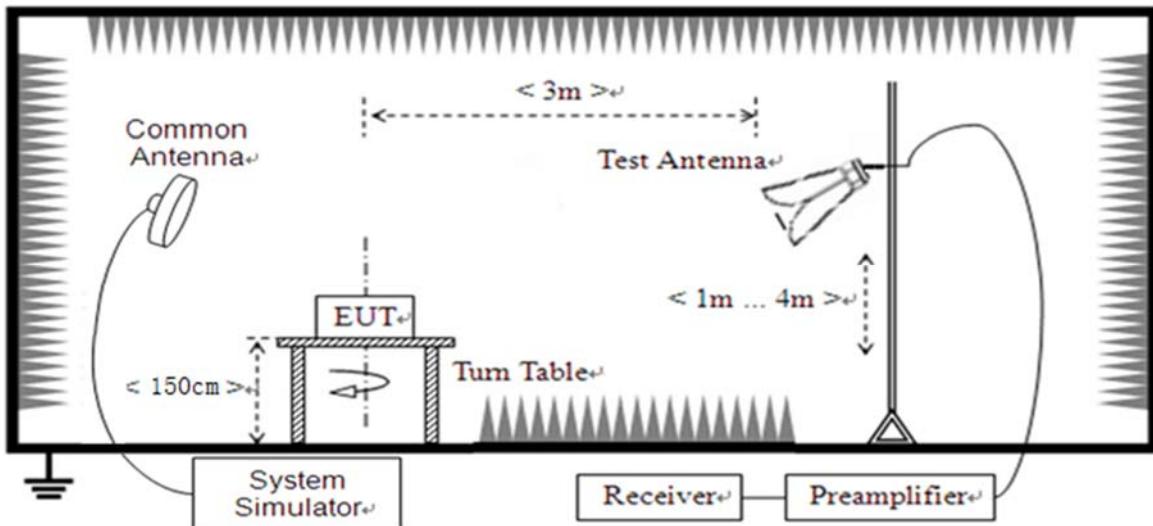
2.6. Radiated Spurious Emissions

2.6.1. 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.

2.6.2. Test Description





(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.

2.6.3. 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.



2.6.4. Test Result

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

The substitution corrections are obtained as described below:

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

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

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

P_{SUBST_TX} is signal generator level,

P_{SUBST_RX} is receiver level,

L_{SUBST_CABLES} is cable losses including TX cable,

$G_{SUBST_TX_ANT}$ is substitution antenna gain.

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

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

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

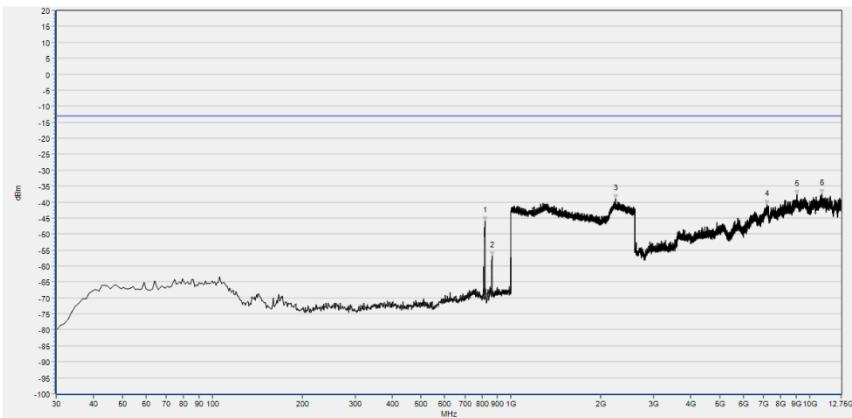
Note2: All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

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

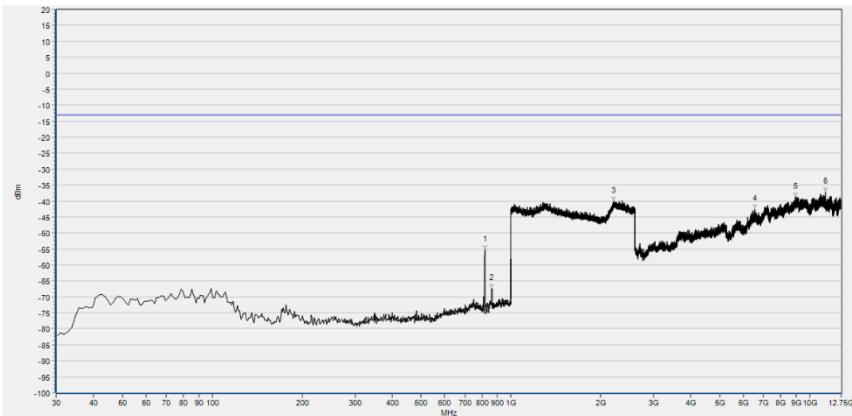
Note 4: N/A means the frequency is the basic frequency or the base station frequency, they are no need to verdict.

Note 5: The amplitude of emissions(18GHz to 10th harmonics) which are attenuated more than 20 dB below the limit are not be reported.

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

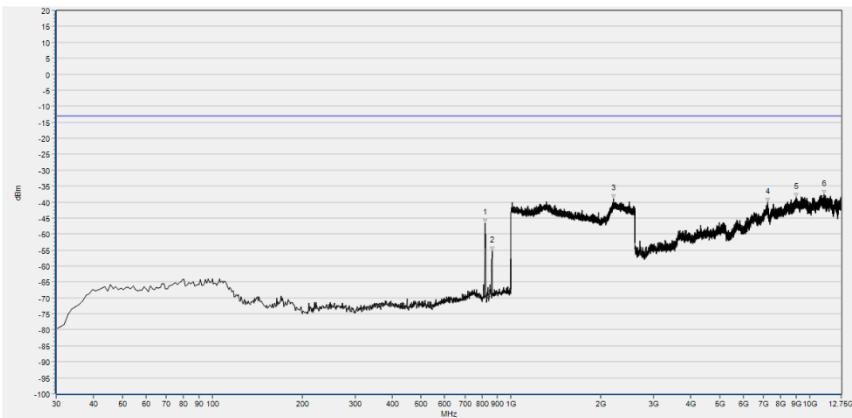


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	817.640	-45.96	-13.00	Horizontal	N/A
2	863.230	-56.96	-13.00	Horizontal	N/A
3	2243.377	-39.02	-13.00	Horizontal	PASS
4	7190.480	-40.67	-13.00	Horizontal	PASS
5	9075.032	-37.74	-13.00	Horizontal	PASS
6	10970.658	-37.32	-13.00	Horizontal	PASS

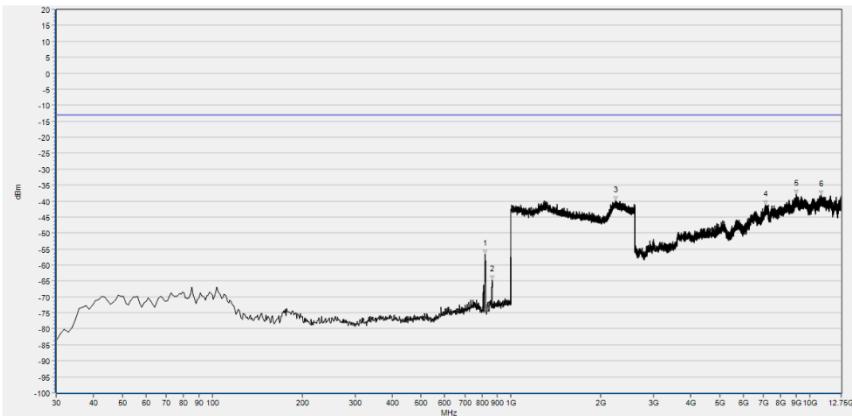


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	816.670	-55.35	-13.00	Vertical	N/A
2	861.290	-67.27	-13.00	Vertical	N/A
3	2210.084	-40.21	-13.00	Vertical	PASS
4	6540.762	-42.67	-13.00	Vertical	PASS
5	8971.668	-38.72	-13.00	Vertical	PASS
6	11301.055	-37.31	-13.00	Vertical	PASS

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

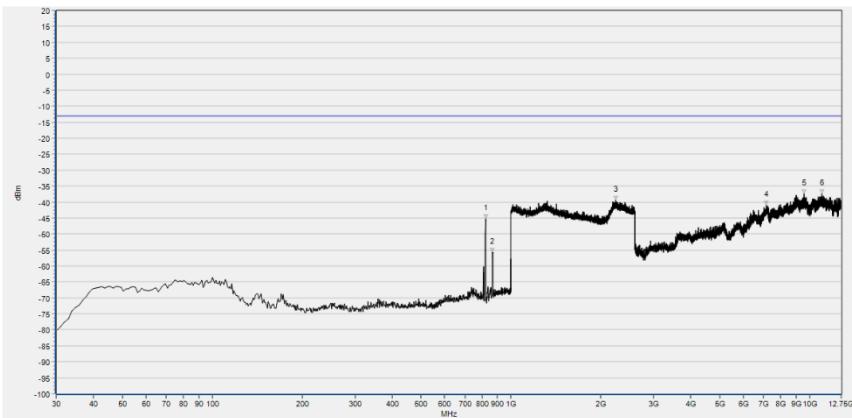


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	817.640	-46.63	-13.00	Horizontal	N/A
2	866.140	-55.41	-13.00	Horizontal	N/A
3	2209.444	-38.93	-13.00	Horizontal	PASS
4	7240.316	-40.21	-13.00	Horizontal	PASS
5	9001.200	-38.61	-13.00	Horizontal	PASS
6	11188.462	-37.69	-13.00	Horizontal	PASS

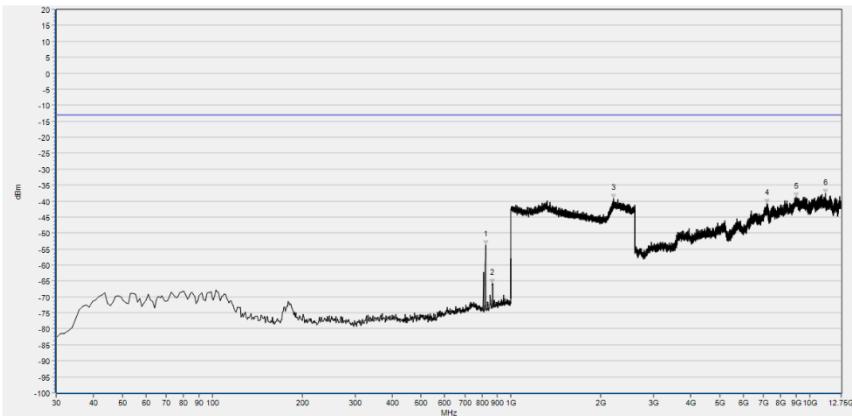


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	816.670	-56.54	-13.00	Vertical	N/A
2	866.140	-64.72	-13.00	Vertical	N/A
3	2237.615	-39.88	-13.00	Vertical	PASS
4	7116.648	-41.16	-13.00	Vertical	PASS
5	8999.354	-37.95	-13.00	Vertical	PASS
6	10931.897	-38.13	-13.00	Vertical	PASS

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



No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	822.490	-45.26	-13.00	Horizontal	N/A
2	867.110	-55.69	-13.00	Horizontal	N/A
3	2236.975	-39.43	-13.00	Horizontal	PASS
4	7159.102	-40.97	-13.00	Horizontal	PASS
5	9573.395	-37.32	-13.00	Horizontal	PASS
6	10989.116	-37.40	-13.00	Horizontal	PASS



No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	822.490	-53.85	-13.00	Vertical	N/A
2	864.200	-65.83	-13.00	Vertical	N/A
3	2204.322	-39.32	-13.00	Vertical	PASS
4	7190.480	-40.75	-13.00	Vertical	PASS
5	9019.658	-38.74	-13.00	Vertical	PASS
6	11319.513	-37.56	-13.00	Vertical	PASS



Annex A Test Uncertainty

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

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

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



Annex B Testing Laboratory Information

1. Identification of the Responsible Testing Laboratory

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

2. Identification of the Responsible Testing Location

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

3. Facilities and Accreditations

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



4. Test Equipments Utilized

4.1 Conducted Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Due Date
EXA Signal Analyzer	MY51511149	N9020A	Agilent	2023.06.21	2024.06.20
Communication Test Station	6200995016	MT8820C	Anritsu	2022.10.11	2023.10.10
Temperature Chamber	S022177101 00089002	KMT-36LF 1A0	KOMEG	2022.11.18	2023.11.17

4.2 List of Software Used

Description	Manufacturer	Software Version
Morlab FCC LTE Test System	MORLAB	V6.45
MORLAB EMCR	MORLAB	V1.2



4.3 Radiated Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Due Date
System Simulator	152038	CMW500	R&S	2022.10.11	2023.10.10
Receiver	MY54130016	N9038A	Agilent	2023.06.21	2024.06.20
Test Antenna - Bi-Log	9163-519	VULB 9163	Schwarzbeck	2022.05.25	2025.05.24
Test Antenna - Horn	9120D-963	BBHA 9120D	Schwarzbeck	2022.05.23	2025.05.24
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	S020180L320 3	Tonscend	2023.06.27	2024.06.26
18-26.5GHz pre-Amplifier	46732	S10M100L380 2	Tonscend	2023.06.27	2024.06.26
26-40GHz pre-Amplifier	56774	S40M400L400 2	Tonscend	2023.06.27	2024.06.26
Notch Filter	N/A	WRCGV -LTE 26	Wainwright	N/A	N/A
Anechoic Chamber	N/A	9m*6m*6m	CRT	2022.05.10	2025.05.09

— END OF REPORT —