Testing Laboratory
3023

Test report No.: 2360754R-RFUSV25S-A

TEST REPORT

Product Name	Mobile Computer
Trademark	CIPHERLAB
Model and /or type reference	RK26
Applicant´s name / address	CipherLab Co., Ltd. 12F, 333, Dunhua S.Rd., Sec.2, Taipei, Taiwan
Manufacturer´s name	CIPHERLAB CO. LTD.
Test method requested, standard	FCC CFR Title 47 Part 90
Test reference	FCC CFR Title 47 Part 2 TIA/EIA 603-E 2016 KDB 971168 D01v03r01 ANSI C63.26 2015
FCC ID	Q3N-RK26
Verdict Summary	IN COMPLIANCE
Documented By (Senior Project Specialist / April Chen)	April Chen
Tested By (Engineer / Daniel Wu)	Daniel Wu
Approved By (Manager / Tim Sung)	Tim Sung
Date of Receipt	2023/06/28
Date of Issue	2023/09/08
Report Version	V1.0

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Competences and Guarantees

DEKRA is a testing laboratory competent to carry out the tests described in this report.

In order to assure the traceability to other national and international laboratories, DEKRA has a calibration and maintenance program for its measurement equipment.

DEKRA guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated in the report and it is based on the knowledge and technical facilities available at DEKRA at the time of performance of the test.

DEKRA is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

General conditions

1. The test results relate only to the samples tested.
2. The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.
3. This report must not be used to claim product endorsement by TAF or any agency of the government.
4. The test report shall not be reproduced without the written approval of DEKRA Testing and Certification Co., Ltd.
5. Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

Revision History

Report No.	Version	Description	Issued Date
2360754R-RFUSV25S-A	V1.0	Initial issue of report.	2023/09/08

1. General Information

1.1. EUT Description

Product Name	Mobile Computer
Trademark	CIPHERLAB
Model and /or type reference	RK26
IMEI No.	35453833
EUT Rated Voltage	AC 100-240V / 50-60Hz (Power by Adapter) DC 3.8V (Power by Battery)
EUT Test Voltage	AC 120V / 60Hz and DC 5V (Power by Adapter) DC 3.8V (Power by Battery)
TX Frequency	LTE Band 26 : 814MHz ~ 824MHz (Part 90)
Rx Frequency	LTE Band 26 : 859MHz ~ 869MHz (Part 90)
Bandwidth	1.4 MHz / 3 MHz / 5 MHz / 10 MHz
Type of Modulation	QPSK / 16QAM / 64QAM
Power Cable (Optional)	MFR: CIPHERLAB, M/N: RK25 SNAP ON Non-Shielded, 1.5m, with one ferrite core bonded.
Power Adapter #1 (Optional)	MFR: Sunny, M/N: SYS1561-1005 Input: AC 100-240V~ 1.0A MAX, 50-60Hz Output: +5.0V⎓2.0A
Power Adapter #2 (Optional)	MFR: CWT, M/N: 2AEA010BC3D Input: AC 100-240V~ 0.35A, 50-60Hz Output: 5.0V⎓2.0A, 10.0W

Supported Unit	
Type C Cable	MFR: SUNCA, M/N: 1Q11512211-XJ, Shielded, 1m

1.2. Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	Auden	KZLT0LS260011 (LTE Main, TX/RX)	PIFA	2.3 dBi for Band 26 (Part 90)
2	Auden	KZLT0LS260011 (LTE Aux, RX)	PIFA	-5.7 dBi for Band 26 (Part 90)

Note: The antenna gain as by the manufacturer provided.

1.3. Operational Description

The EUT provide all functions described as above. The EUT is tested with maximum rated TX power via the Base Station simulator. DEKRA has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

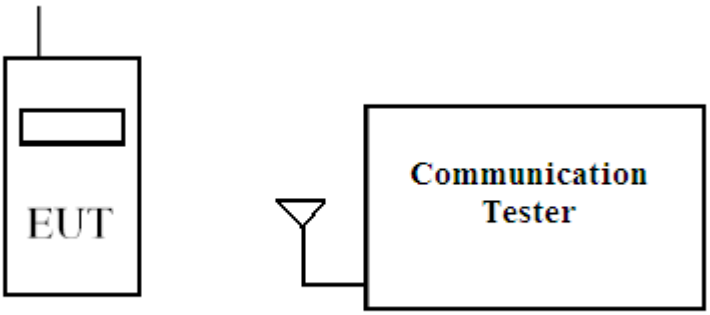
Test Mode	Mode 1: LTE Band 26 (Part 90)

Note:

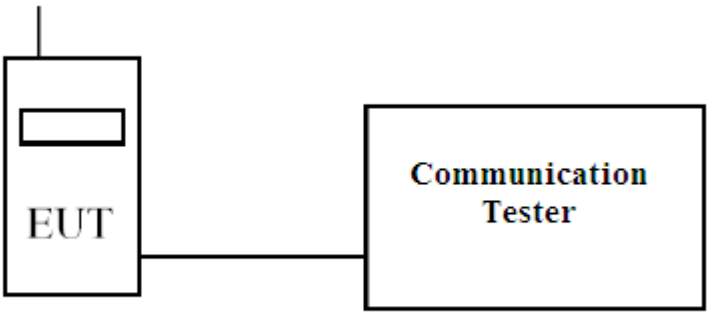
1. Regards to the frequency band operation; the lowest, middle and highest frequency of channel were selected to perform the test, and then shown on this report.
2. This device was tested under all configurations, combinations, bandwidths, RB configurations and modulations, and the worst case was found in QPSK modulation, therefore the “Conducted Band Edge” & “Spurious Emission” test items perform QPSK modulation in this report.
3. Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
4. The EUT was performed at X axis, Y axis and Z axis position for radiated spurious emission tests. The worst case was found at Z axis, so the measurement will follow this same test configuration

1.4. Configuration of tested System

(a) Configuration of Radiated measurement



(b) Configuration of Conducted measurement



1.5. EUT Setup Procedures

1	Setup the EUT and simulators as shown on 1.4.
2	Turn on the power of all equipment.
3	The EUT was set to communicate with Base Station simulator.
4	Repeat the above procedure (3).

1.6. Test Facility

Ambient conditions in the laboratory:

Performed Item	Items	Actual	Test Date
Radiated Emission	Temperature (°C)	24.5°C	2023/07/27 ~ 2023/09/01
	Humidity (%RH)	58.3 %	
Conductive	Temperature (°C)	25.0°C	
	Humidity (%RH)	65.0 %	

USA	FCC Registration Number: TW0033
Site Description	Accredited by TAF
	Accredited Number: 3023
Test Laboratory	DEKRA Testing and Certification Co., Ltd
Address	No. 5-22, Ruishukeng Linkou District, New Taipei City, 24451, Taiwan
Performed Location	No. 26, Huaya 1st Rd., Guishan Dist.,Taoyuan City 333411, Taiwan, R.O.C.
Phone Number	+886-3-275-7255
Fax Number	+886-3-327-8031

2. Technical Test

2.1. Summary of test result

Test Item	FCC Reference section	FCC Limit	Result
RF Output Power	§2.1046 §90.635(b)	<100 Watts	Pass
Occupied Bandwidth	§2.1049 §90.209(b)	Within the frequency range	Pass
Spurious Emission at Antenna Terminals	§2.1051 §90.691	<-20 dBm for less than 37.5 kHz <-13 dBm for greater than 37.5 kHz	Pass
Conducted Emission	§2.1051 §90.691	<-13 dBm	Pass
Field Strength of Spurious Radiation	§2.1053 §90.691	<-13 dBm	Pass
Frequency Stability for Temperature & Voltage	§2.1055 §90.213	<±2.5 ppm	Pass
Peak to Average Ratio	N/A	N/A	N/A

2.2. List of test Equipment

Conducted / HY-SR03

Instrument Description	Manufacturer	Model No.	Serial No.	Last Calibration	Next Calibration
Spectrum Analyzer	Agilent	N9010A	MY53470892	2022/11/07	2023/11/06
Standard Temperature & Humidity Chamber	K SON	THS-D4T-100	A0606	2022/08/23	2023/08/22
DC Power Supply	Keysight	E36234A	MY59001234	2022/10/31	2023/10/30
Radio Communication Analyzer	Anritsu	MT8820C	6201091166	2023/03/22	2024/03/21

Radiated / HY-CB03

Instrument Description	Manufacturer	Model No.	Serial No.	Last Calibration	Next Calibration
Bi-Log Antenna	SCHWARZBECK	VULB9168	9168-0678	2021/09/23	2023/09/22
Horn Antenna	Com-Power	AH-840	101100	2021/10/04	2023/10/03
Horn Antenna	RF SPIN	DRH18-E	210507A18ES	2023/05/11	2024/05/10
Pre-Amplifier	SGH	0301	20211007-10	2023/01/10	2024/01/09
Pre-Amplifier	SGH	PRAMP118	20200701	2023/01/10	2024/01/09
Pre-Amplifier	EMCI	EMC05820SE	980310	2023/01/10	2024/01/09
Pre-Amplifier	EMCI	EMC184045SE	980369	2023/01/10	2024/01/09
Coaxial Cable	EMCI	EMC102-KM-KM-600	1160314		
Coaxial Cable	EMCI	EMC102-KM-KM-7000	170242		
Spectrum Analyzer	R&S	FSV3044	101113	2023/02/04	2024/02/03
Coaxial Cable	SGH	SGH18	2021005-1	2023/01/10	2024/01/09
Coaxial Cable	SGH	SGH18	202108-4		
Coaxial Cable	SGH	HA800	GD20110223-1		
Coaxial Cable	SGH	HA800	GD20110222-3		
Radio Communication Analyzer	Anritsu	MT8820C	6201091166	2023/03/22	2024/03/21

2.3. Measurement Uncertainty

Uncertainties have been calculated according to the DEKRA internal document with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95 % confidence level based on a coverage factor (k=2).

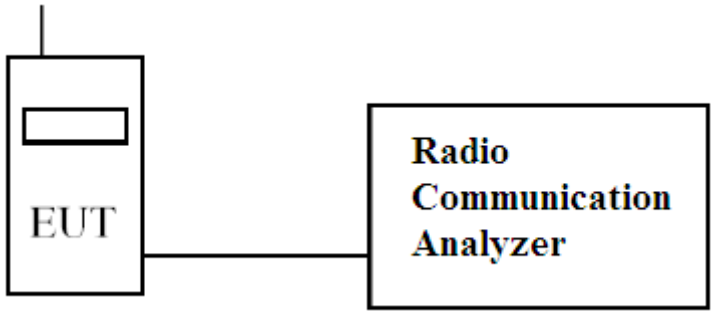
Test Item	Uncertainty
Conducted Output Power	± 1.58 dB
Occupied Bandwidth	± 1580.61 Hz
Conducted Band Edge	± 2.14 dB
Conducted Spurious Emissions	± 2.14 dB
Radiated Spurious Emissions	30MHz~1GHz: ±5.88 dB 1GHz~18GHz: ±3.11 dB 18GHz~40GHz: ±3.09 dB
Frequency Stability	± 0.42 ppm

3. Conducted Output Power Measurment

3.1. Test Specification

According to FCC Part 2.1046, 90.635

3.2. Test Setup



3.3. Limits

Band	Limit
LTE Band 26/850	ERP < 100 W

3.4. Test Procedure

The EUT is tested with maximum rated TX power via the Base Station simulator, and the output power was measured at the antenna terminals of the EUT.

3.5. Test Result of Maximum Power Output

Channel	Modulation	LTE Band 26 (Part 90)					
		RB	RB	Maximum Conducted Output Power			
		No.	Offset	1.4M	3M	5M	10M
Low	QPSK	1	#0	22.88	22.00	22.10	--
		1	#Mid	**23.01**	**23.02**	**22.64**	--
		1	#Max	22.86	22.58	21.65	--
		50%	#0	22.88	22.05	21.55	--
		50%	#Mid	22.85	22.24	21.91	--
		50%	#Max	22.84	22.05	21.36	--
		100%	--	21.84	21.98	21.54	--
	16QAM	1	#0	22.08	21.66	21.40	--
		1	#Mid	**22.13**	**22.33**	**21.78**	--
		1	#Max	22.06	21.88	20.90	--
		50%	#0	21.93	21.17	20.59	--
		50%	#Mid	21.96	21.25	20.89	--
		50%	#Max	21.80	21.07	20.29	--
		100%	--	21.06	20.96	20.48	--
	64QAM	1	#0	21.17	21.13	20.40	--
		1	#Mid	**21.18**	**21.20**	**20.73**	--
		1	#Max	21.04	20.75	19.75	--
		50%	#0	21.03	20.11	19.50	--
		50%	#Mid	21.01	20.20	19.82	--
		50%	#Max	20.98	20.01	19.31	--
		100%	--	19.95	19.89	19.37	--
Mid	QPSK	1	#0	22.18	22.42	22.01	21.90
		1	#Mid	**22.45**	**22.75**	**22.56**	**22.70**
		1	#Max	22.34	22.41	21.80	22.10
		50%	#0	22.38	21.75	21.60	21.40
		50%	#Mid	22.36	21.85	21.71	21.78
		50%	#Max	22.37	21.78	21.48	21.56
		100%	--	21.50	21.74	21.53	21.58
	16QAM	1	#0	21.43	21.69	21.28	21.17
		1	#Mid	**21.71**	**21.98**	**21.82**	**22.01**
		1	#Max	21.49	21.64	21.10	21.62
		50%	#0	21.47	20.86	20.56	20.54
		50%	#Mid	21.44	20.98	20.79	20.64
		50%	#Max	21.34	20.91	20.54	20.61
		100%	--	20.61	20.81	20.49	20.40
	64QAM	1	#0	20.41	20.70	20.20	20.18
		1	#Mid	**20.66**	**20.89**	**20.71**	**20.89**
		1	#Max	20.48	20.52	19.95	20.53
		50%	#0	20.42	19.76	19.50	19.45
		50%	#Mid	20.48	19.89	19.75	19.54
		50%	#Max	20.62	19.80	19.50	19.50
		100%	--	19.45	19.73	19.40	19.30

High	QPSK	1	#0	22.45	22.46	21.77	--
		1	#Mid	**22.59**	**22.87**	**22.65**	--
		1	#Max	22.48	22.68	22.09	--
		50%	#0	22.41	21.72	21.38	--
		50%	#Mid	22.57	21.91	21.51	--
		50%	#Max	22.48	21.83	21.60	--
		100%	--	21.37	21.81	21.36	--
	16QAM	1	#0	21.60	21.76	21.08	--
		1	#Mid	**21.83**	**22.20**	**21.84**	--
		1	#Max	21.80	22.18	21.26	--
		50%	#0	21.37	20.61	20.43	--
		50%	#Mid	21.42	20.79	20.60	--
		50%	#Max	21.40	20.71	20.58	--
		100%	--	20.40	20.54	20.33	--
	64QAM	1	#0	20.44	20.27	19.99	--
		1	#Mid	**20.84**	**20.84**	**20.72**	--
		1	#Max	20.71	20.81	20.15	--
		50%	#0	20.33	19.34	19.37	--
		50%	#Mid	20.81	19.57	19.54	--
		50%	#Max	20.64	19.59	19.54	--
		100%	--	19.21	19.53	19.25	--

3.6. Maximum Conducted Power and ERP/EIRP Power

$EIRP = P_T + G_T - L_C = ERP + 2.15\ dB$, $ERP = EIRP - 2.15\ dB$

PT = transmitter output power in dBm

GT = gain of the transmitting antenna in dBi

LC = signal attenuation in the connecting cable between the transmitter and antenna in dB

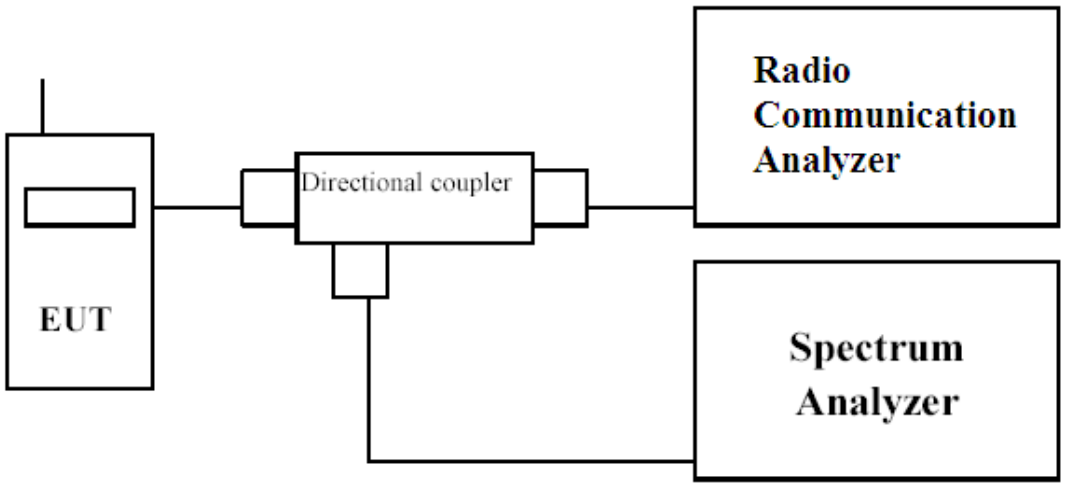
LTE Band	BW	Modulation	Conducted Peak Power (dBm)	Conducted Peak Power (W)	Antenna Gain (dBi)	Maximum ERP (W)	Maximum ERP Limit (W)
26	1.4 M	QPSK	23.01	0.200	2.3	0.207	100
		16QAM	22.13	0.163	2.3	0.169	100
		64QAM	21.18	0.131	2.3	0.136	100
	3 M	QPSK	23.02	0.200	2.3	0.207	100
		16QAM	22.33	0.171	2.3	0.177	100
		64QAM	21.20	0.132	2.3	0.136	100
	5 M	QPSK	22.65	0.184	2.3	0.191	100
		16QAM	21.84	0.153	2.3	0.158	100
		64QAM	20.73	0.118	2.3	0.122	100
	10 M	QPSK	22.70	0.186	2.3	0.193	100
		16QAM	22.01	0.159	2.3	0.164	100
		64QAM	20.89	0.123	2.3	0.127	100

4. Occupied Bandwidth

4.1. Test Secification

According to FCC Part 2.1049, 90.209

4.2. Test Setup

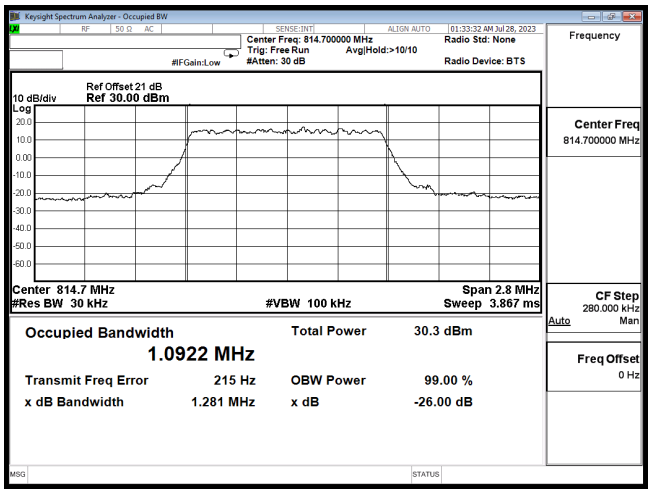


4.3. Test Procedure

The EUT is tested with maximum rated TX power via the Base Station simulator, and the occupied bandwidth was measured at the antenna terminals of the EUT. The Resolution BW of the analyzer is set to 1 %~5 % of the emission bandwidth. The EUT's occupied bandwidth is measured as the width of the signal between two points, one below the carrier center frequency and one above the carrier frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. The plots below show the resultant display from the Spectrum Analyser.

4.4. Test Result of Occupied Bandwidth

BW	Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)			26 dB Bandwidth (MHz)		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
1.4M	26697	814.7	1.0922	1.0911	1.0978	1.281	1.304	1.279
1.4M	26740	819	1.0925	1.0909	1.0979	1.279	1.294	1.298
1.4M	26783	823.3	1.0908	1.0913	1.0982	1.275	1.292	1.289
3M	26705	815.5	2.7291	2.7182	2.7178	3.059	3.036	3.040
3M	26740	819	2.7314	2.7215	2.7196	3.047	3.057	3.053
3M	26775	822.5	2.7340	2.7203	2.7234	3.061	3.053	3.051
5M	26715	816.5	4.4907	4.5049	4.4915	4.981	5.004	4.992
5M	26740	819	4.4967	4.5090	4.4956	4.965	5.009	4.983
5M	26765	821.5	4.4996	4.5193	4.4980	4.989	5.006	4.997
10M	26740	819	9.0086	9.0315	9.0114	9.964	9.949	9.981



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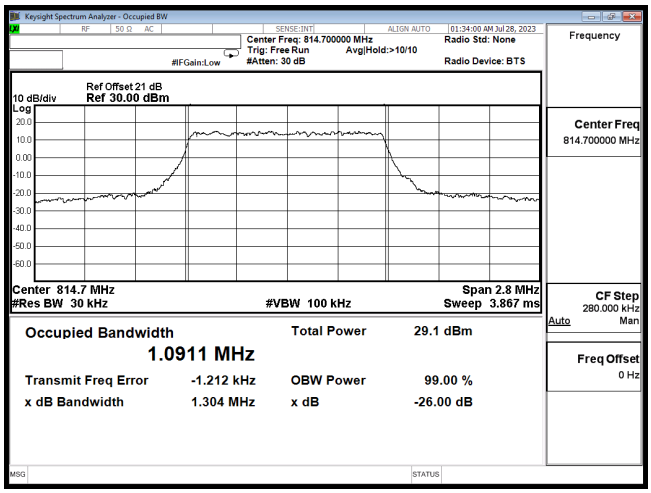

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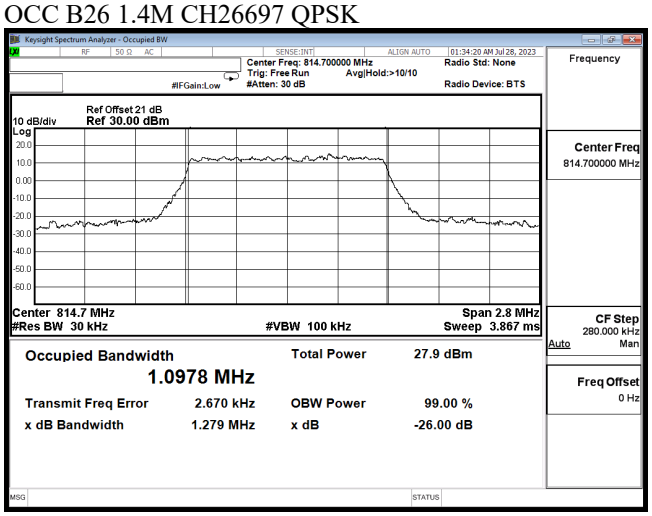

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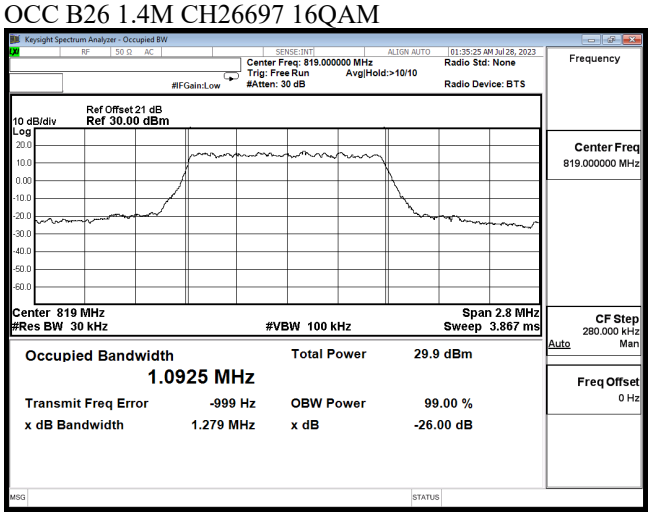

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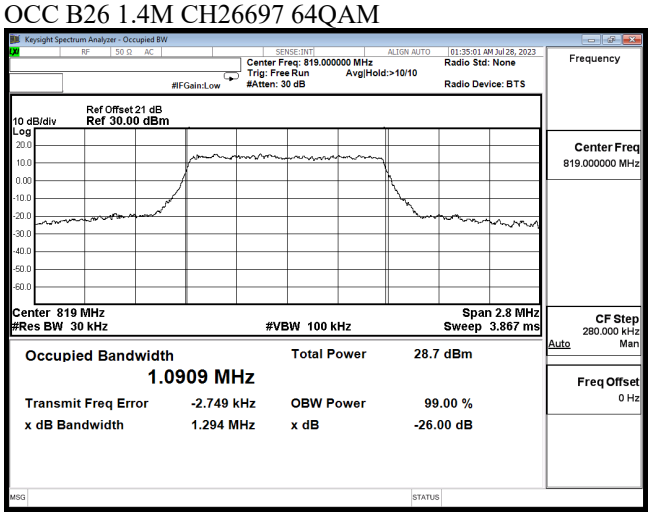

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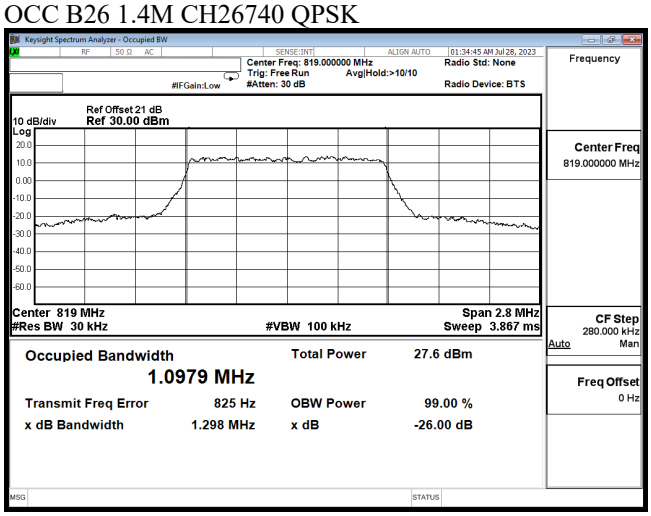

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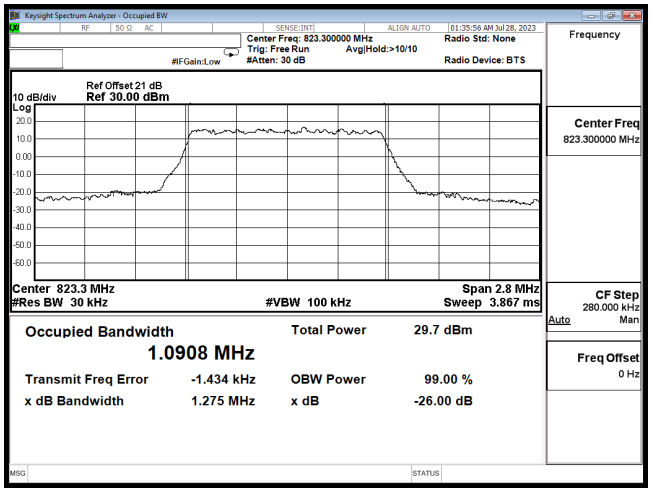

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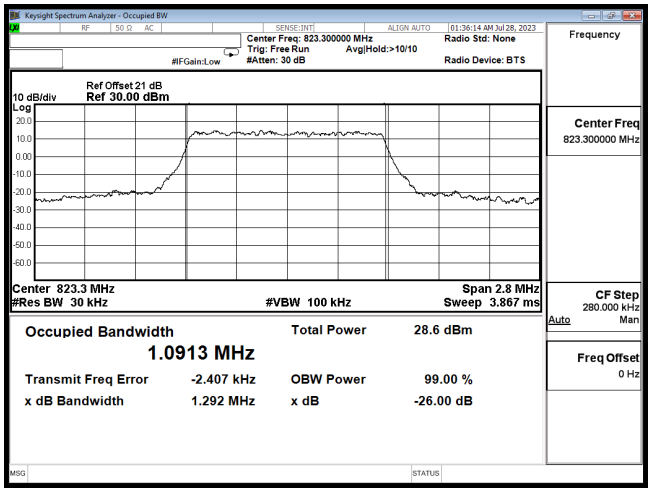

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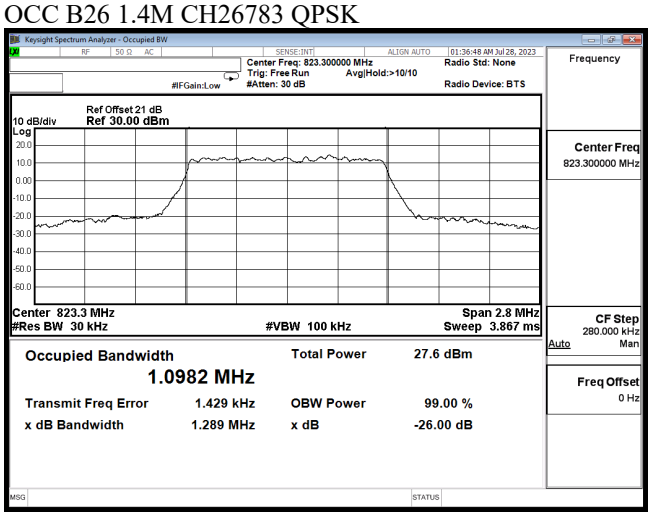

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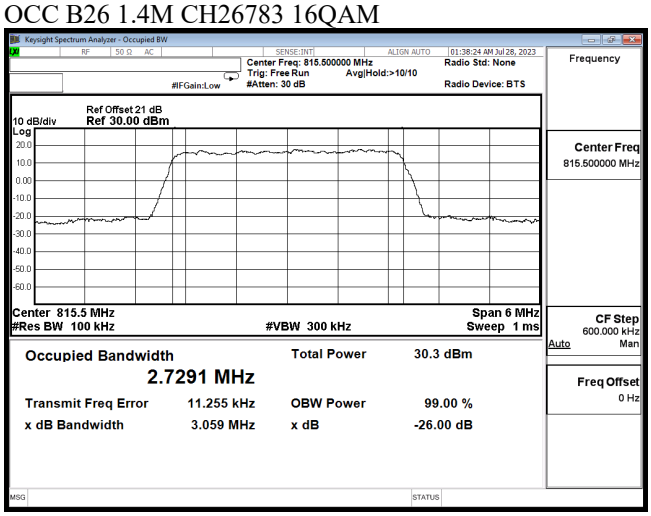

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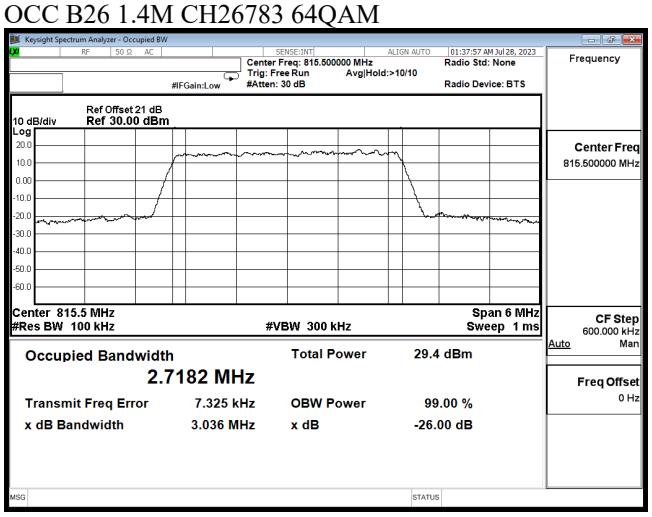

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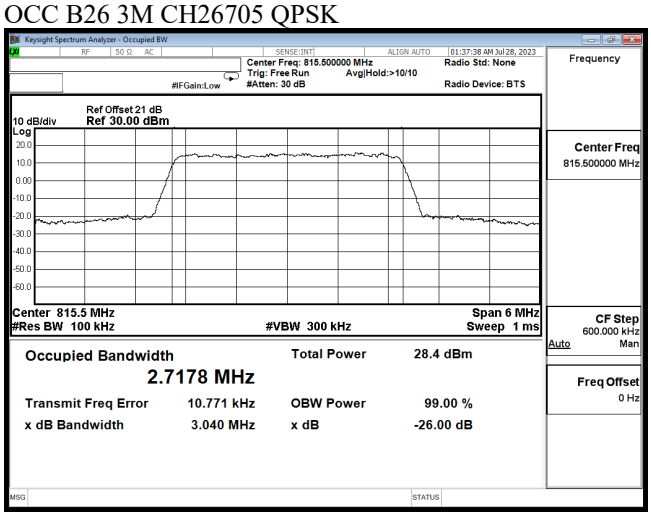

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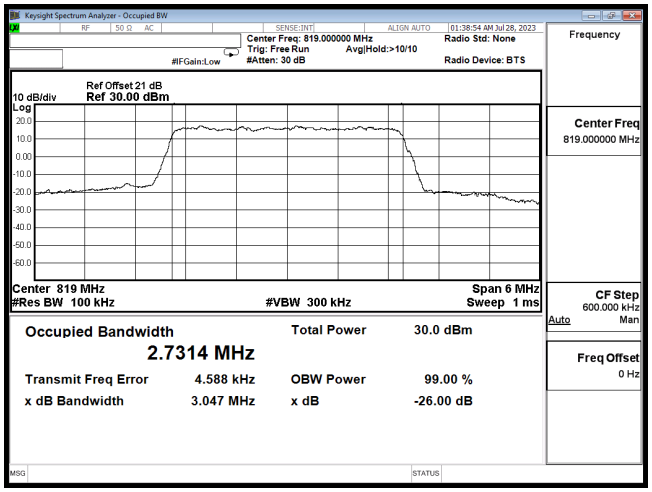

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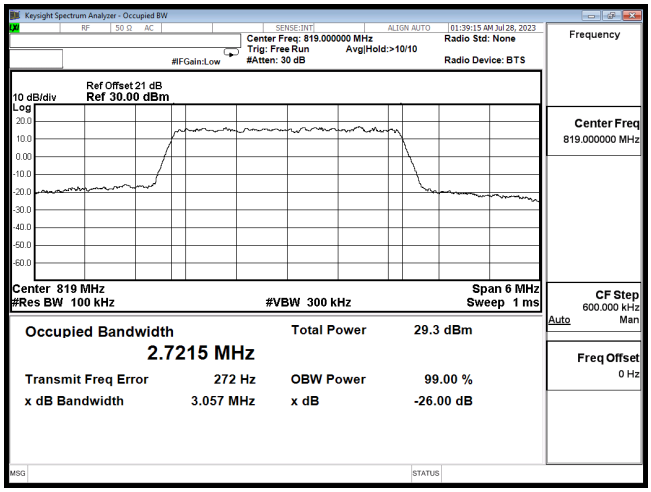
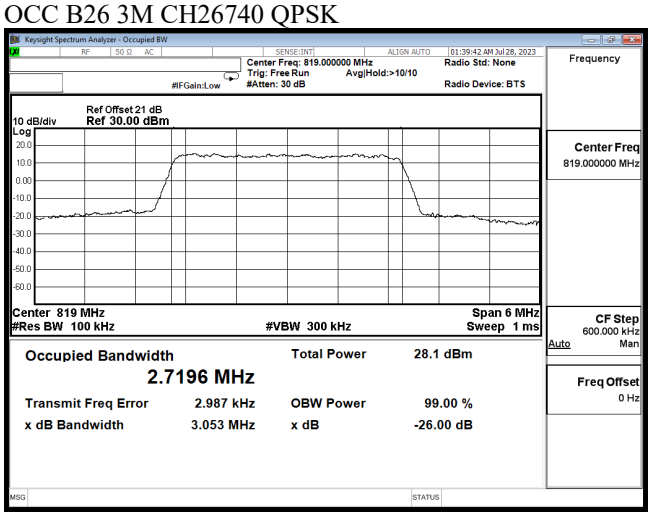
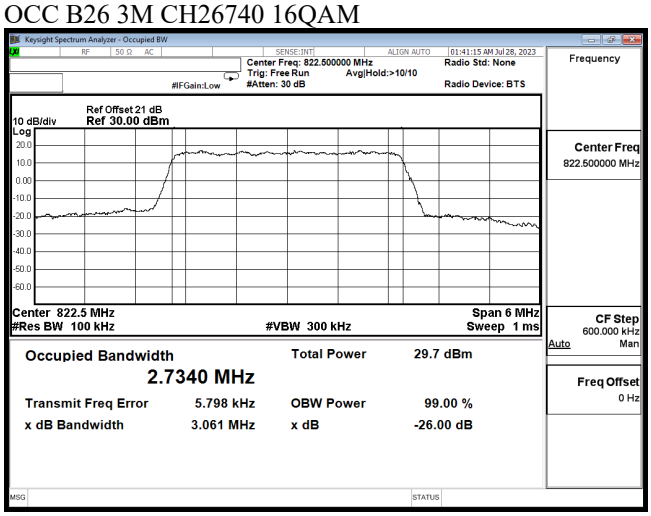


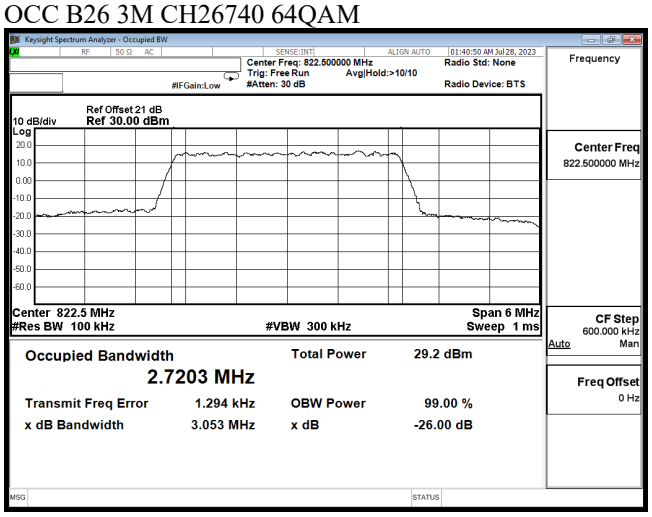
OCC B26 3M CH26740 16QAM



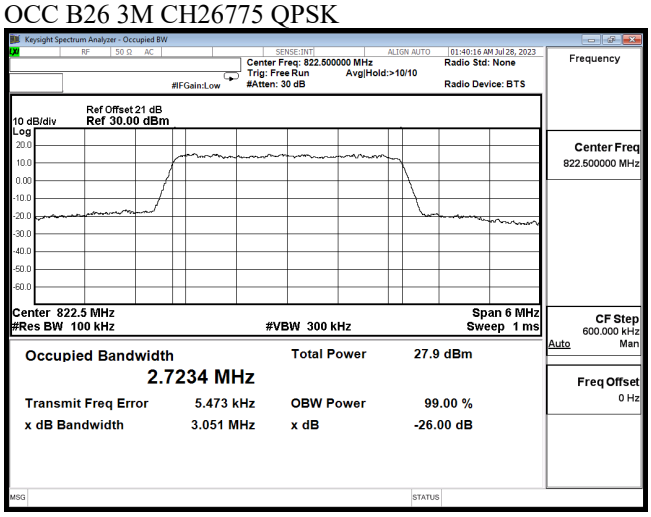
OCC B26 3M CH26740 64QAM



OCC B26 3M CH26775 QPSK



OCC B26 3M CH26775 16QAM



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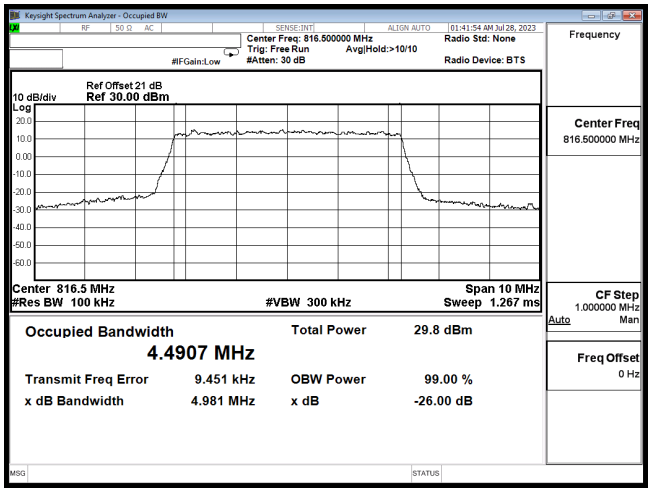
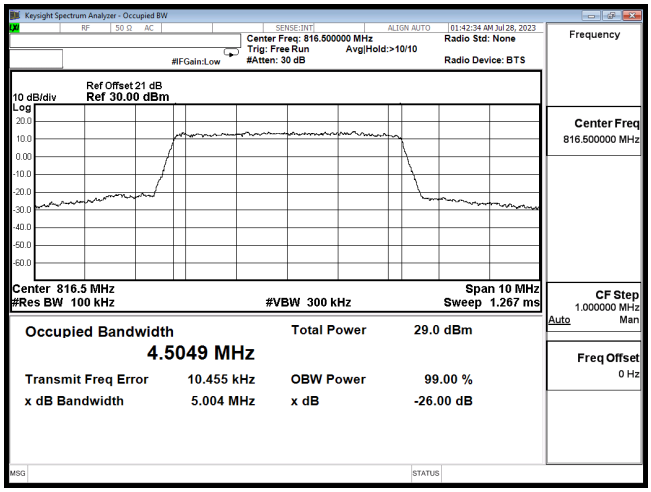


OCC B26 5M CH26715 QPSK



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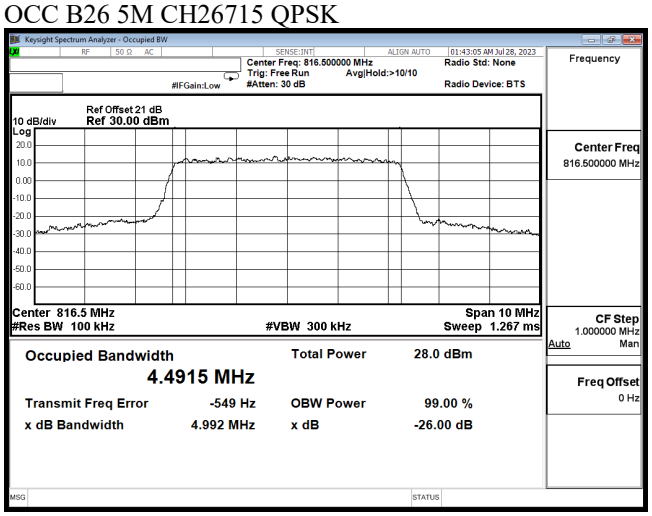

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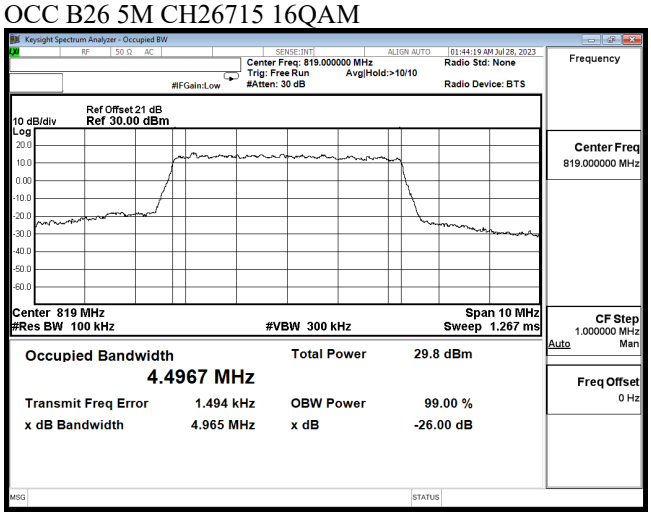

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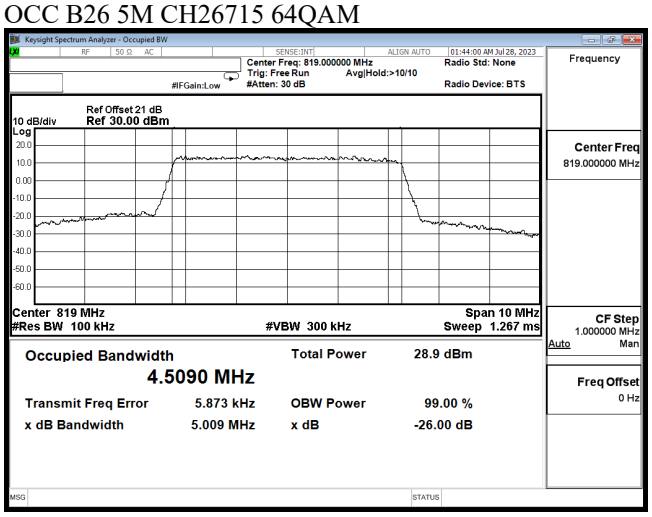

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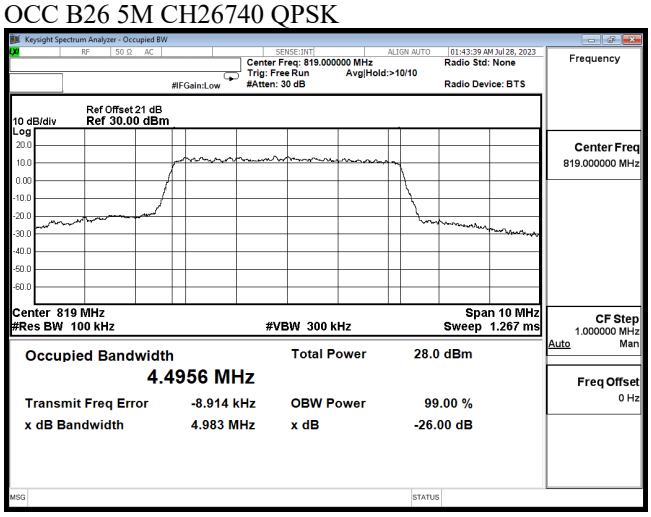

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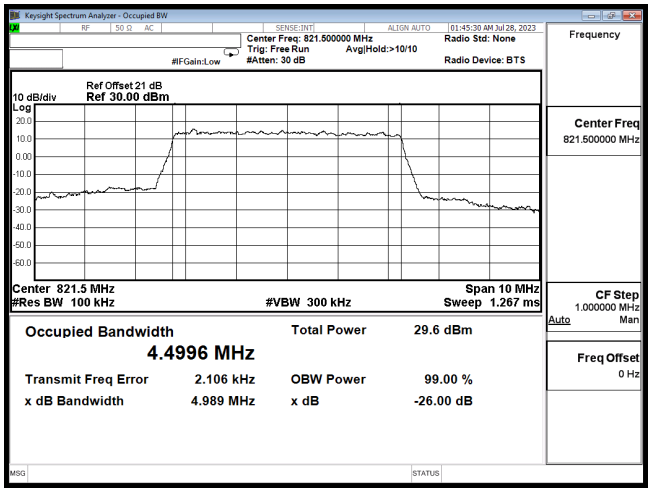

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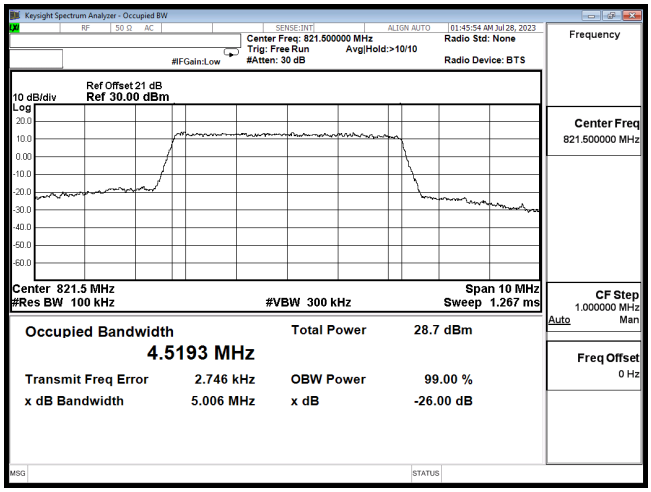

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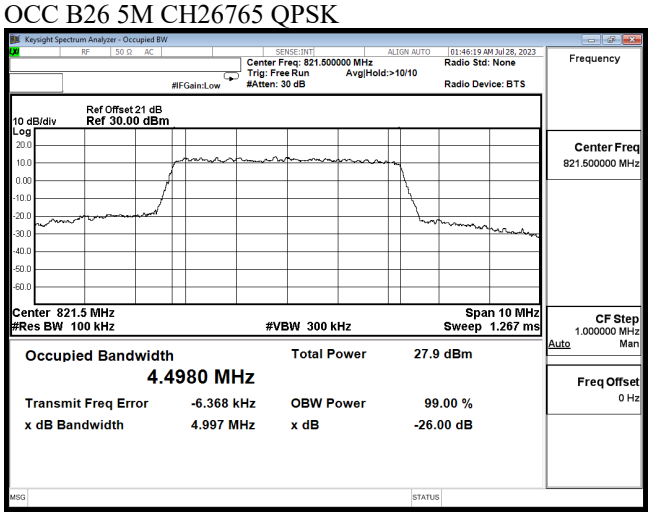

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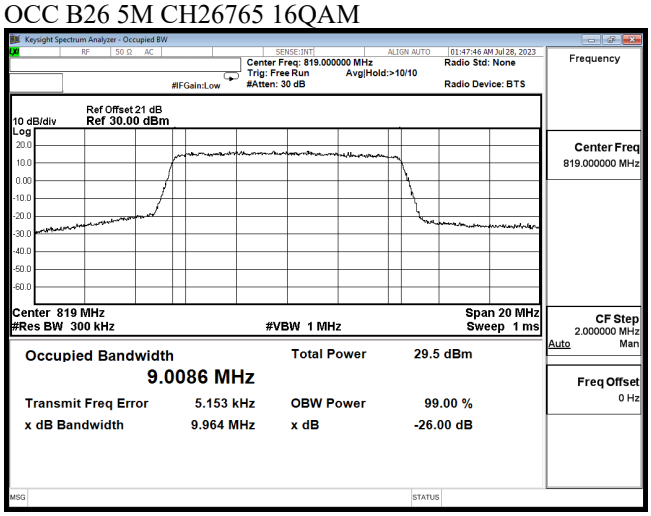

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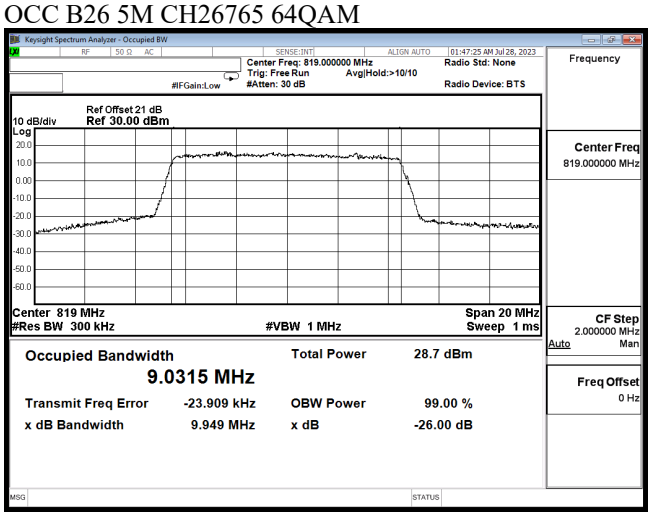

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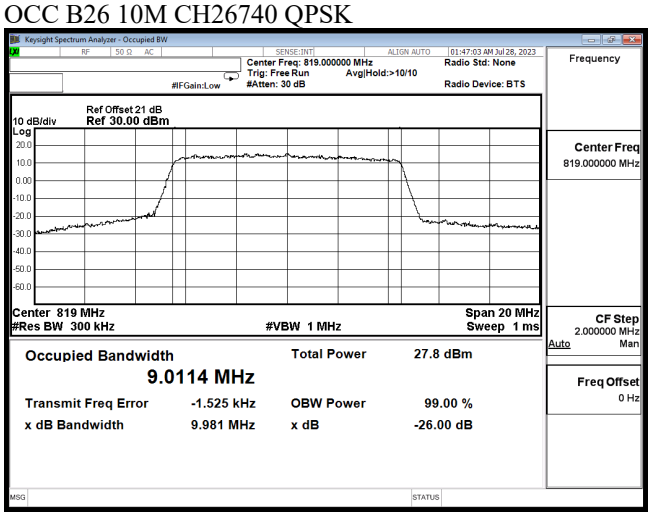


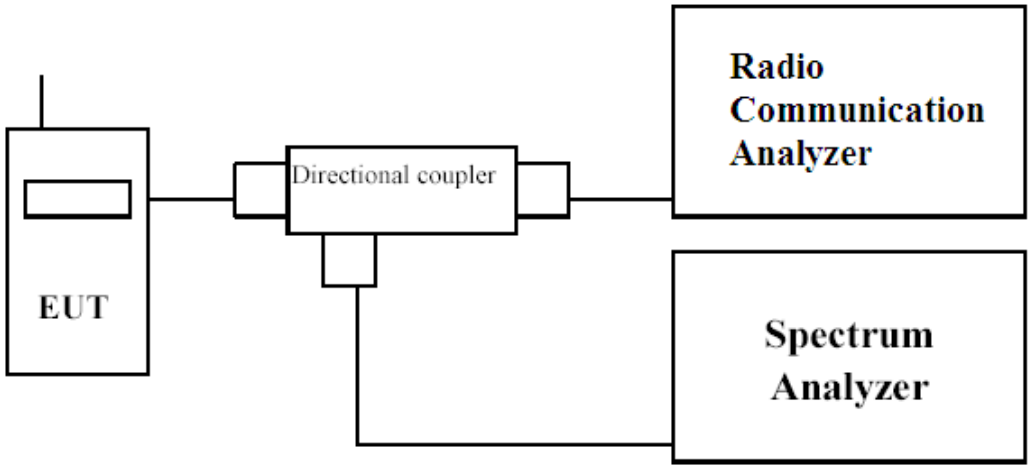
OCC B26 10M CH26740 64QAM

5. Spurious Emission At Antenna Terminals (+/-1MHz)

5.1. Test Specification

According to Part 2.1051, 90.691

5.2. Setup



5.3. Limits

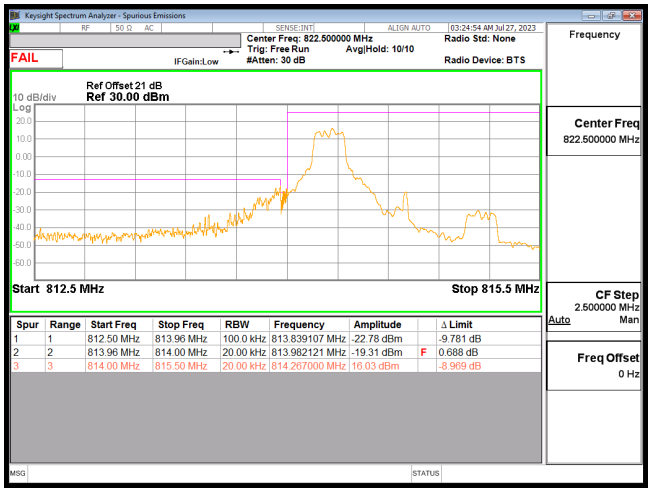
(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116 Log10(f/6.1) decibels or 50 + 10 $\log_{10}$(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 $\log_{10}$(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

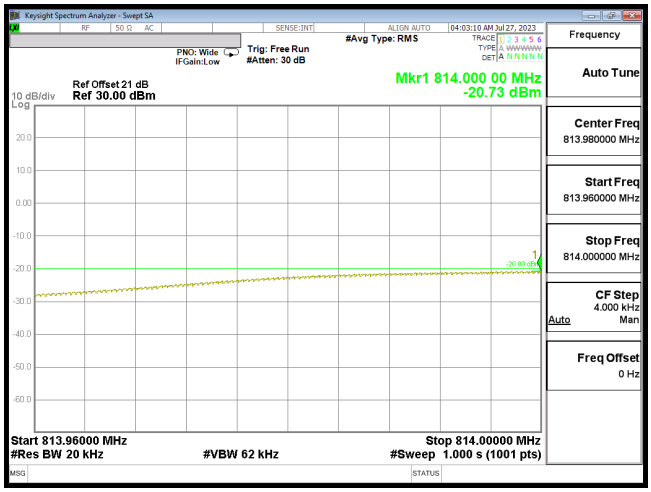
5.4. Test Procedure

In accordance with Part 90.691 at least 1 % of the emission bandwidth was used for the resolution and video bandwidths up to 1MHz away from the Block Edge. At greater than 1 MHz, the resolution and video bandwidth were increased to 1 MHz/3 MHz.The reference power and path losses of all channels used for testing in each frequency block were measured.

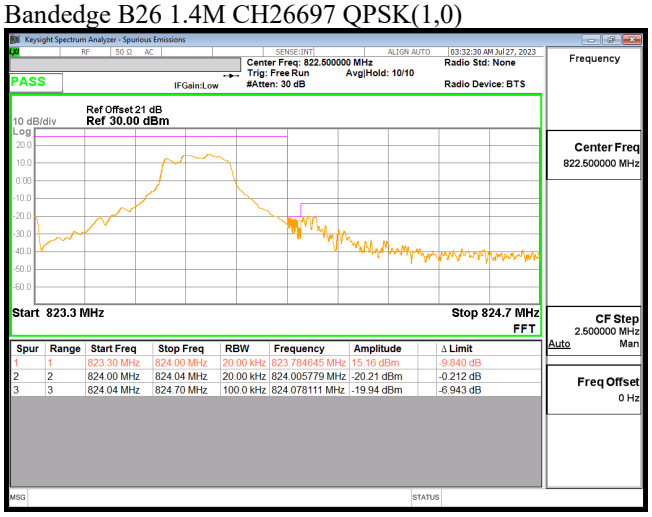
5.5. Test Result of Spurious Emission At Antenna Terminals (+/-1 MHz)



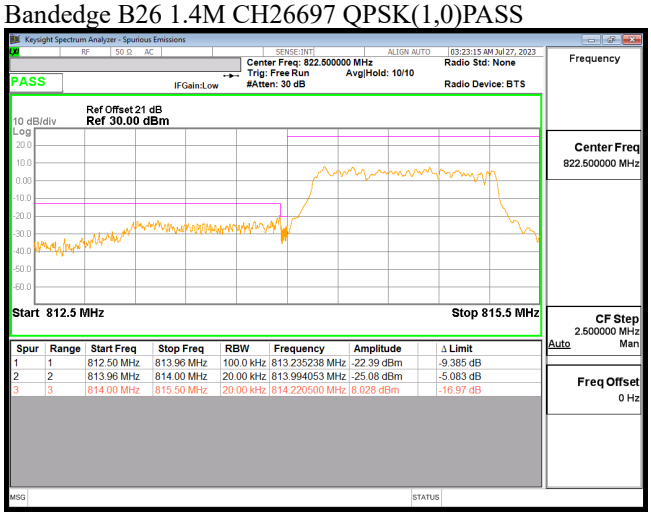
Bandedge B26 1.4M CH26697 QPSK(1,0)



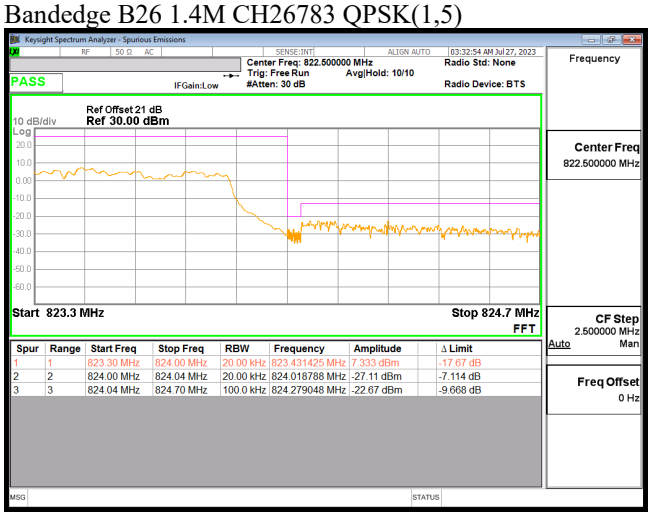
Bandedge B26 1.4M CH26697 QPSK(1,0)PASS



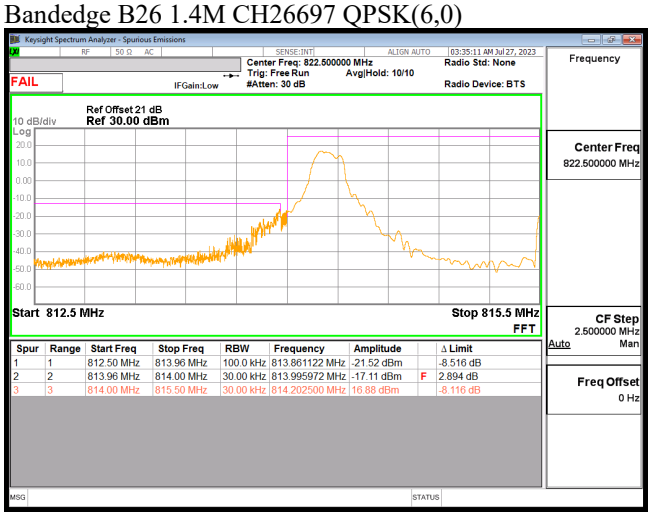
Bandedge B26 1.4M CH26783 QPSK(1,5)



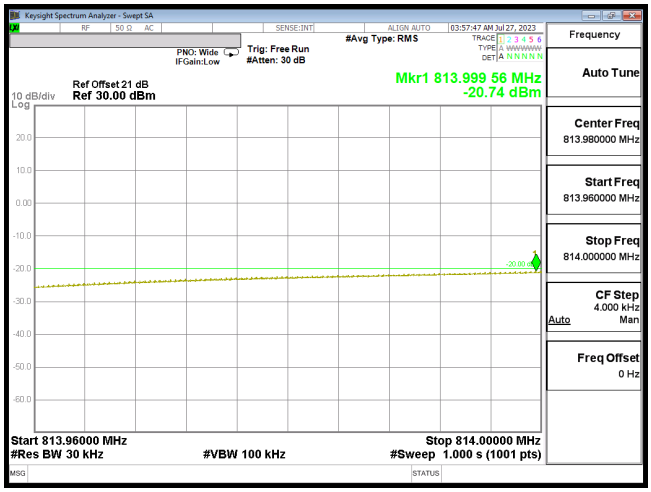
Bandedge B26 1.4M CH26697 QPSK(6,0)



Bandedge B26 1.4M CH26783 QPSK(6,0)



Bandedge B26 3M CH26705 QPSK(1,0)



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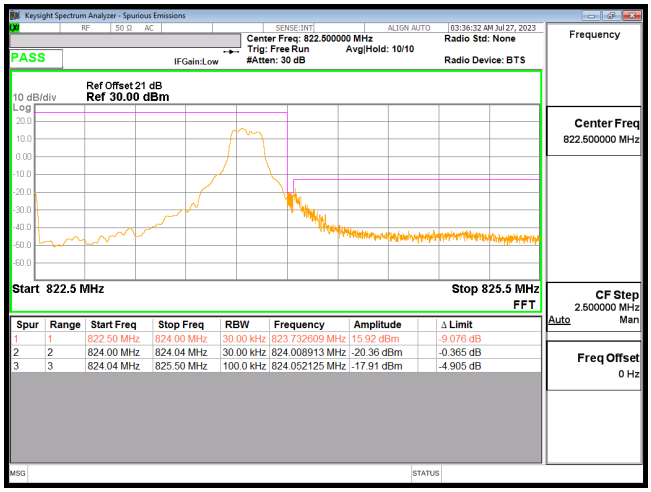
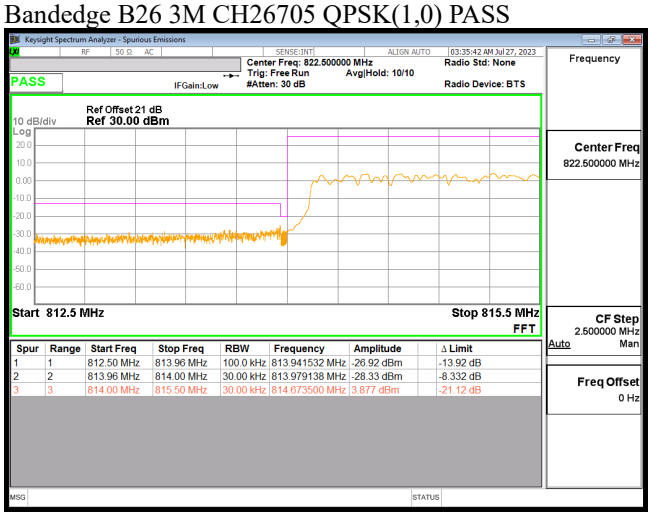
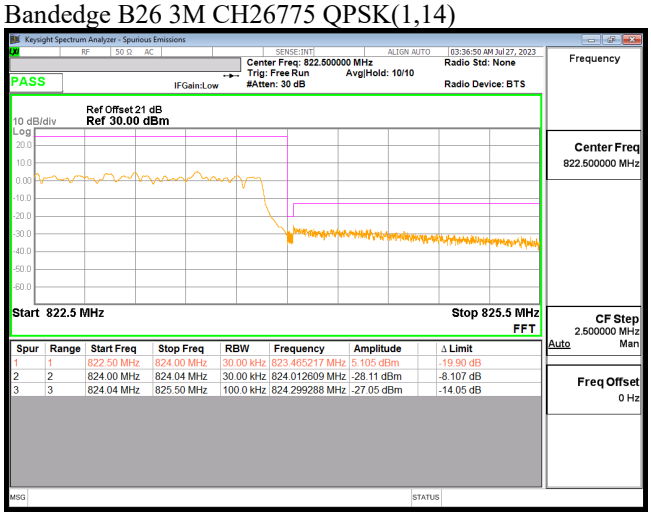


Bandedge B26 3M CH26775 QPSK(1,14)



Bandedge B26 3M CH26705 QPSK(15,0)



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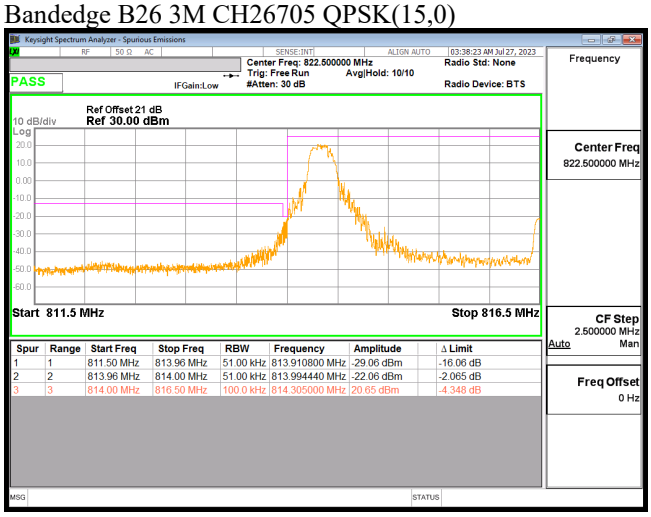

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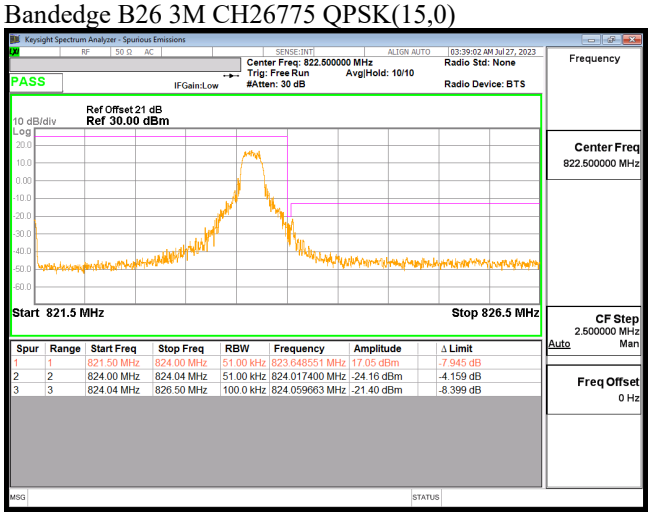

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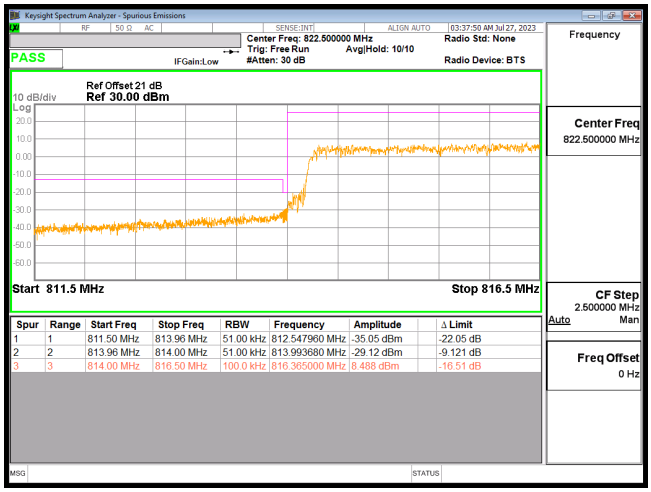
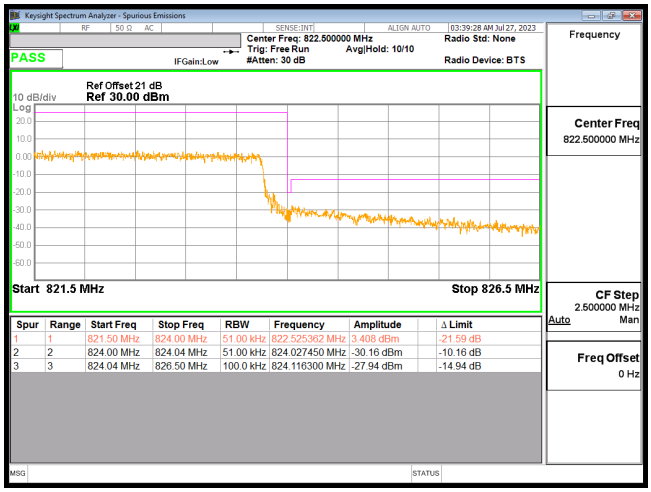
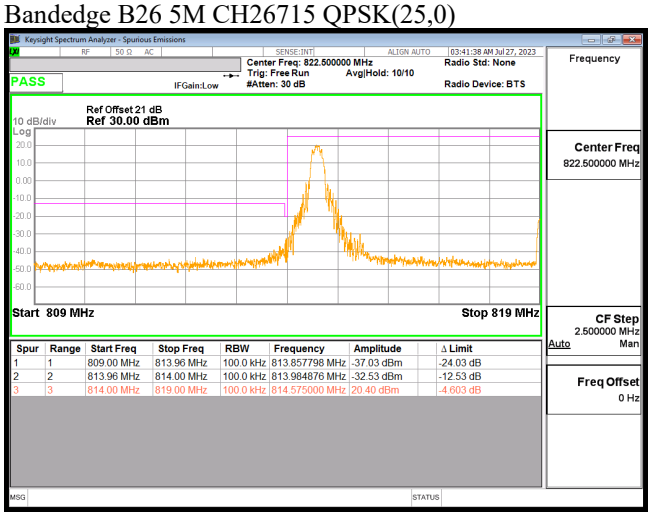


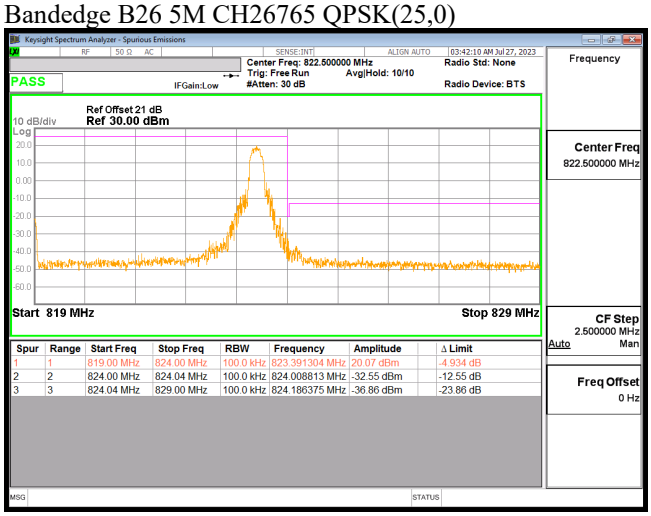
Bandedge B26 5M CH26715 QPSK(25,0)



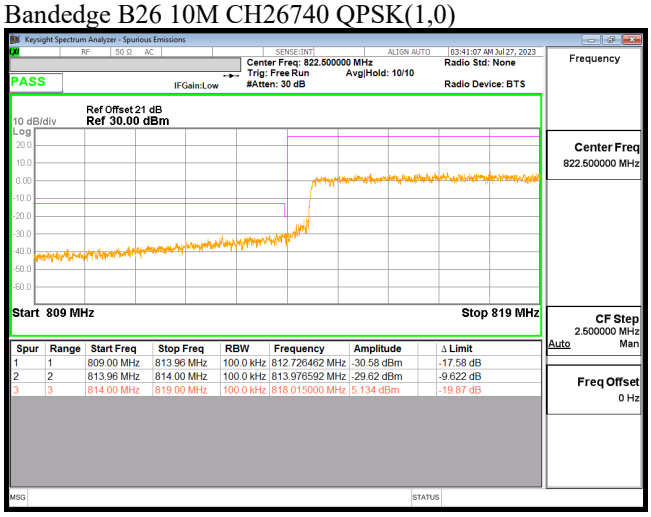
Bandedge B26 5M CH26765 QPSK(25,0)



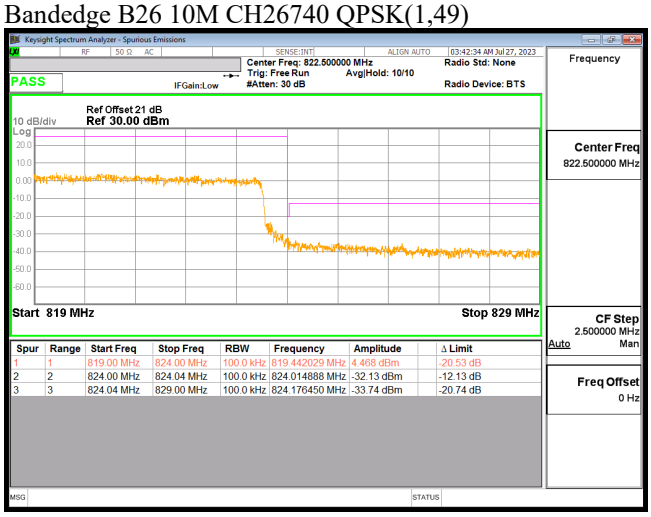
Bandedge B26 10M CH26740 QPSK(1,0)



Bandedge B26 10M CH26740 QPSK(1,49)



Bandedge B26 10M CH26740 QPSK(50,0)



Bandedge B26 10M CH26740 QPSK(50,0)

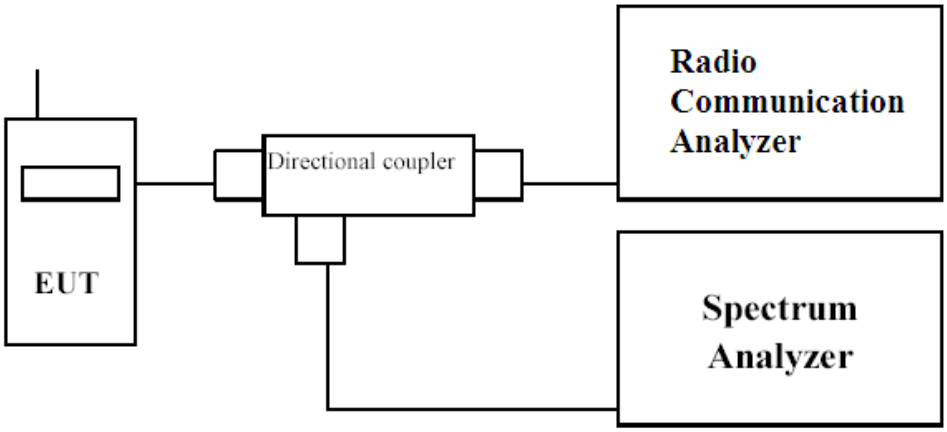
6. Spurious Emission

6.1. Test Specification

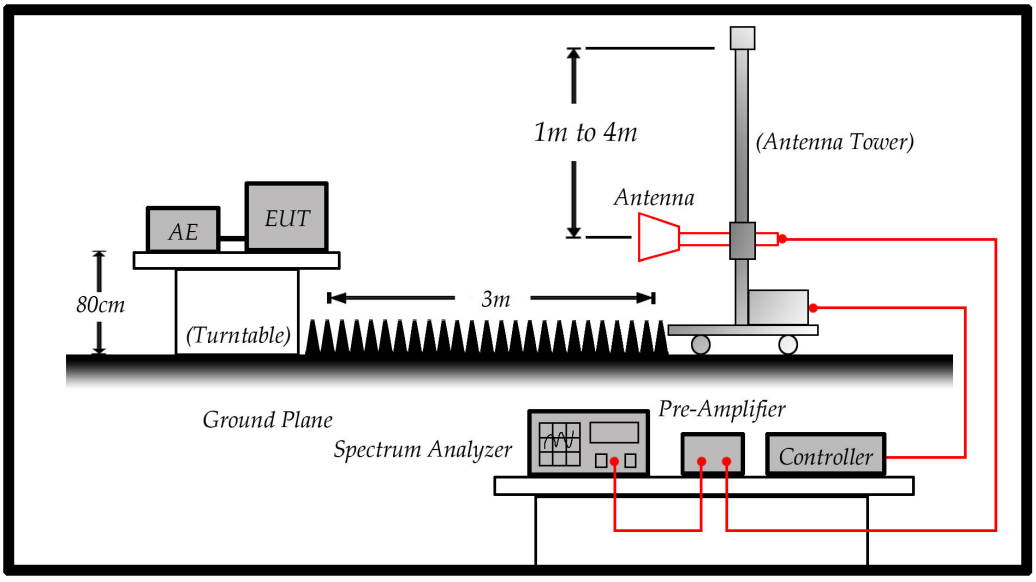
According to Part 2.1051, 90.691

6.2. Test Setup

Spurious emissions at antenna terminals



Field strength of spurious radiation



6.3. Limits

Limit	< -13 dBm

43 + 10Log(P) down on the carrier where P is the power in Watts.

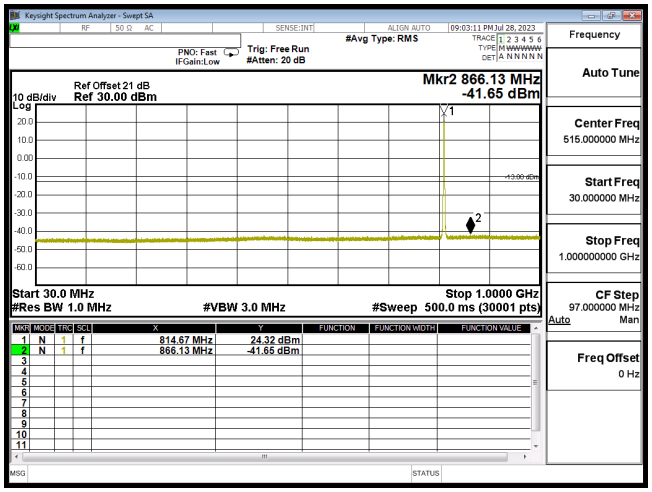
6.4. Test Procedure

In accordance with Part 2.1051, 90.691, the spurious emissions from the antenna terminal were measured. The transmitter output power was attenuated using a combination of filters and attenuators and the frequency spectrum investigated from 30 MHz to 20 GHz. The EUT was set to transmit on full power. The EUT was tested on Low, middle and High channels for both power levels. The resolution and video bandwidth was set to 1 MHz/3 MHz in accordance with Part 2.1051, 90.691. The spectrum analyzer detector was set to Max Hold. In addition, measurements were made up to the 10th harmonic of the fundamental. The device was then replaced with a substitution antenna, which input signal was adjusted until the received level matched that of the previously detected emission.

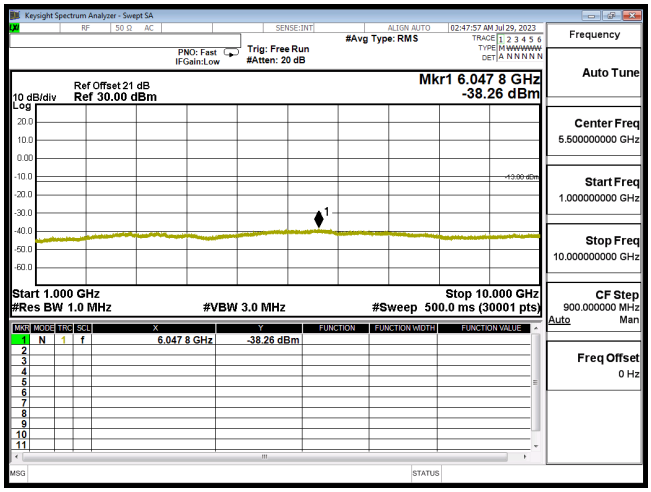
The EUT is placed on a turn table which is 1.5 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to TIA/EIA 603-D on radiated measurement.

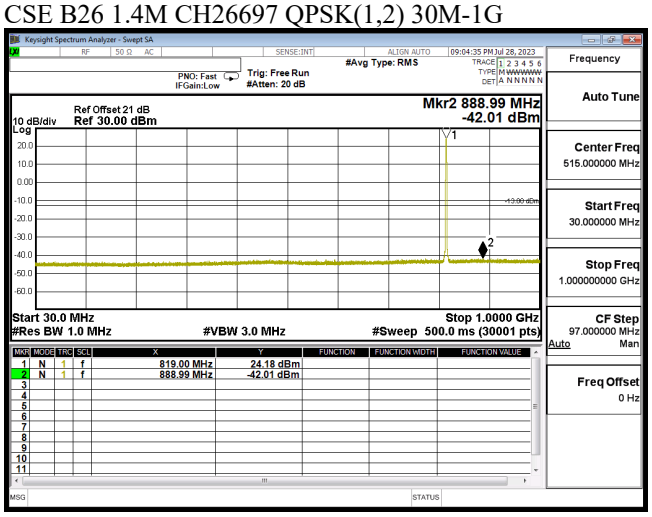
6.5. Test Result of Spurious Emission



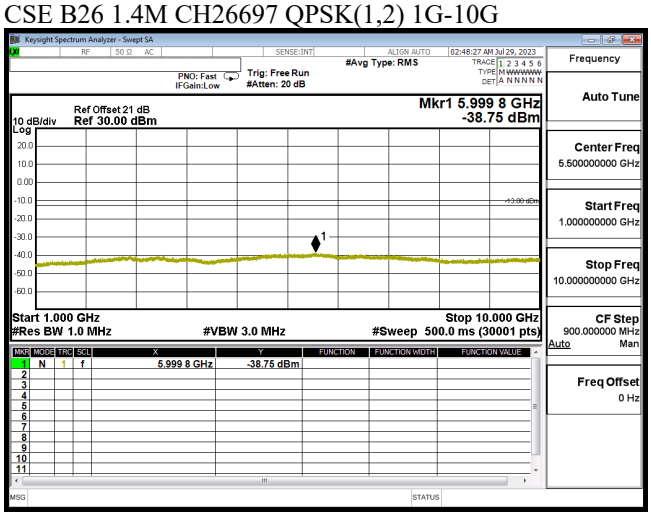
CSE B26 1.4M CH26697 QPSK(1,2) 30M-1G



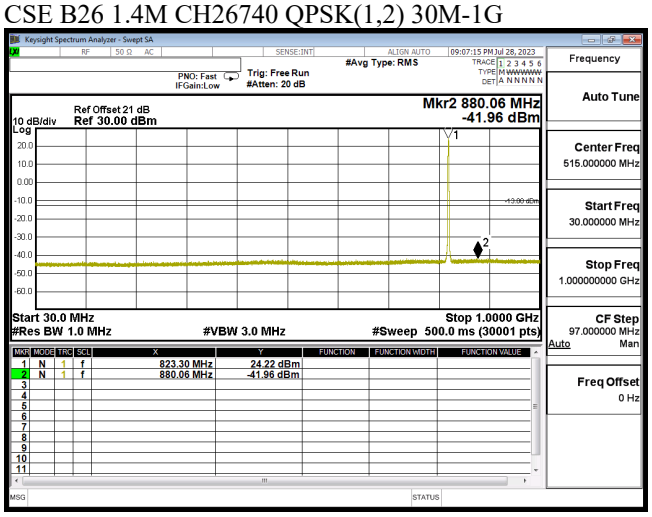
CSE B26 1.4M CH26697 QPSK(1,2) 1G-10G



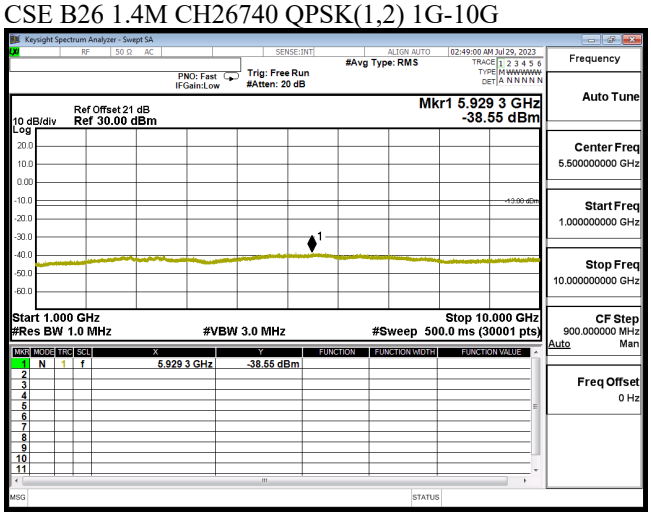
CSE B26 1.4M CH26740 QPSK(1,2) 30M-1G



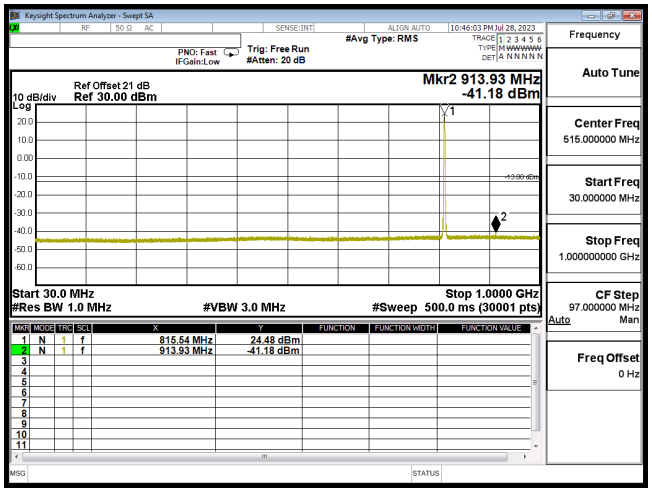
CSE B26 1.4M CH26740 QPSK(1,2) 1G-10G



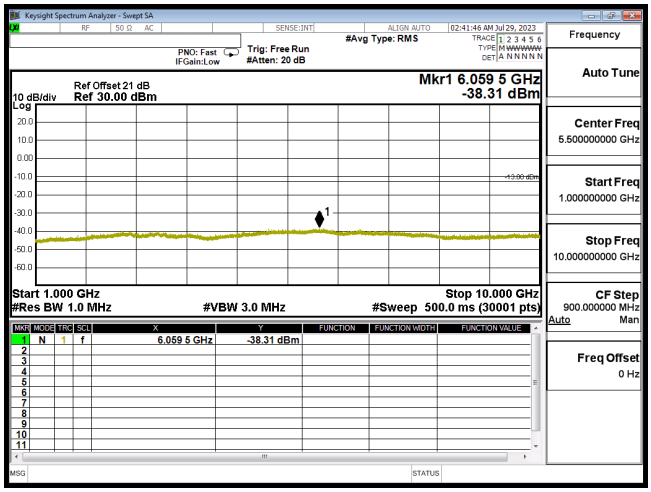
CSE B26 1.4M CH26783 QPSK(1,2) 30M-1G



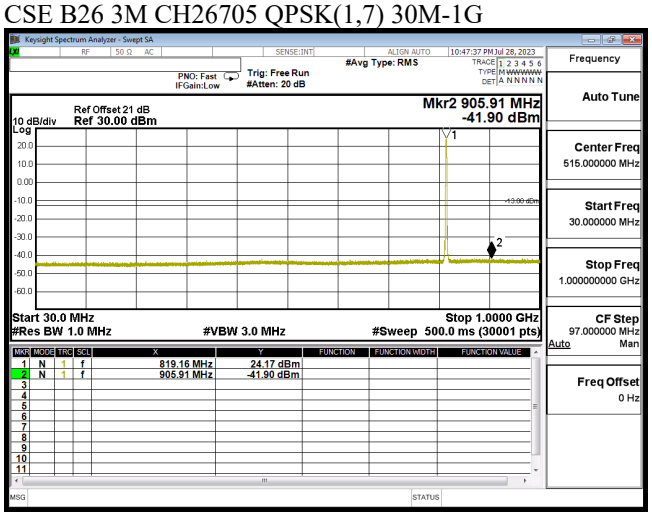
CSE B26 1.4M CH26783 QPSK(1,2) 1G-10G



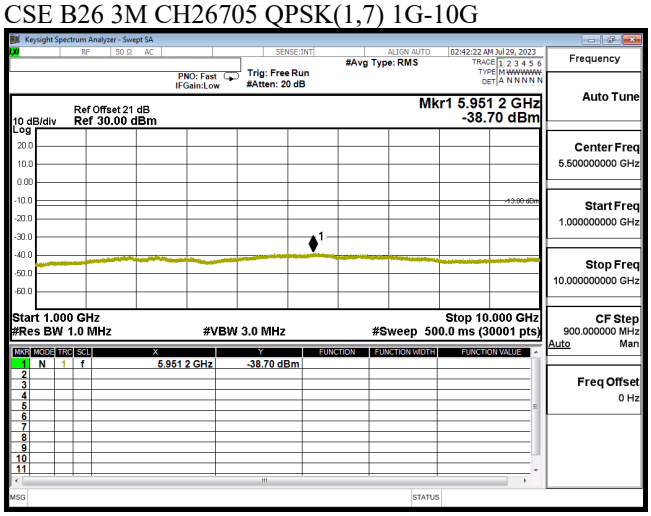
CSE B26 3M CH26705 QPSK(1,7) 30M-1G



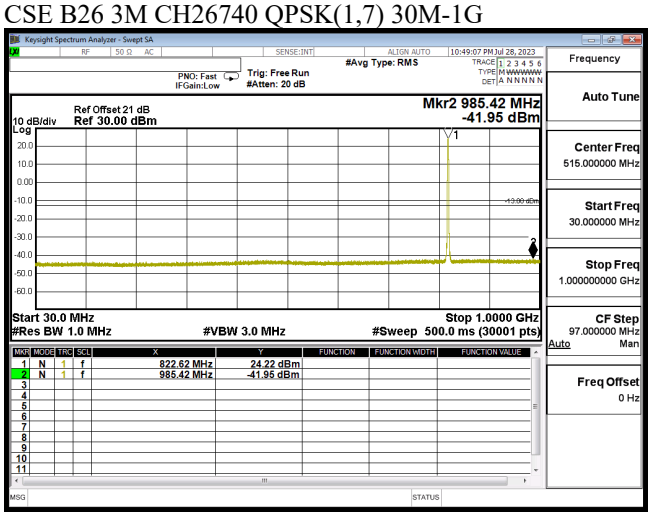
CSE B26 3M CH26705 QPSK(1,7) 1G-10G



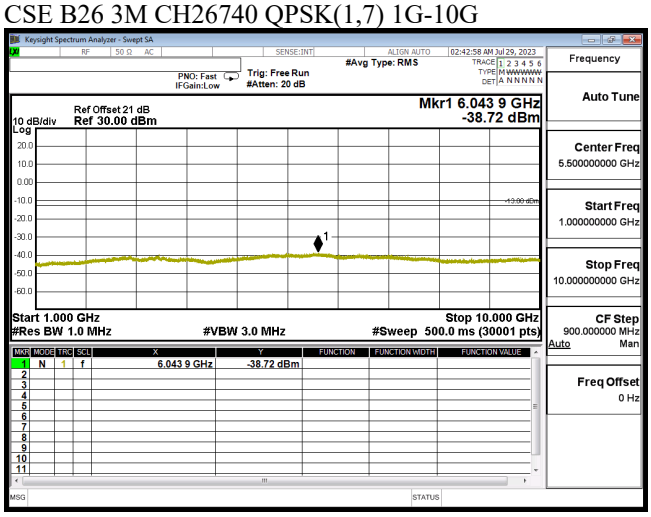
CSE B26 3M CH26740 QPSK(1,7) 30M-1G



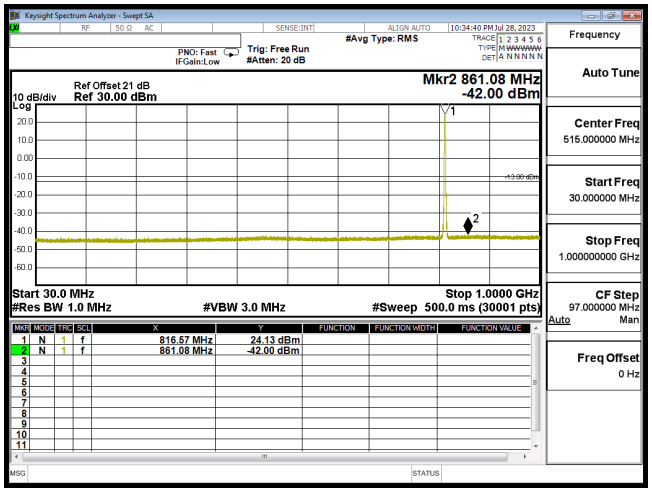
CSE B26 3M CH26740 QPSK(1,7) 1G-10G



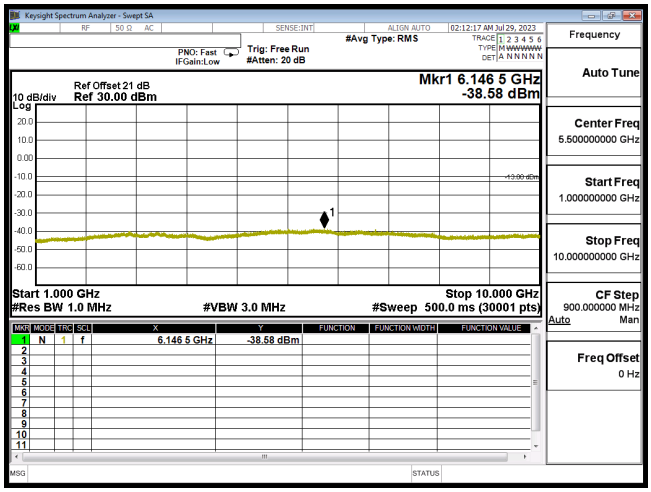
CSE B26 3M CH26775 QPSK(1,7) 30M-1G



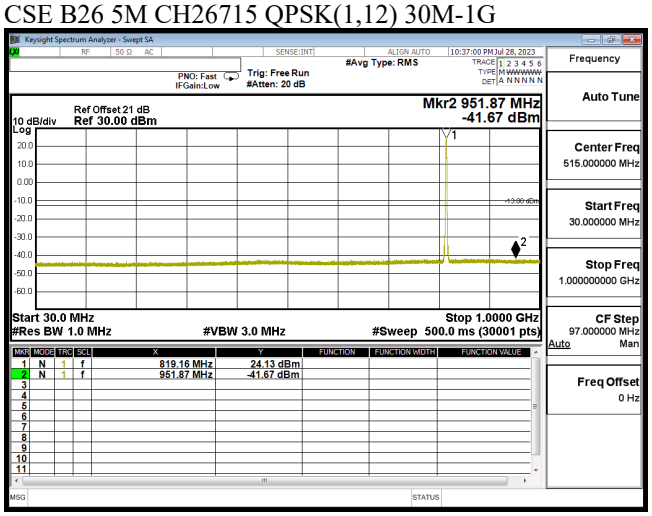
CSE B26 3M CH26775 QPSK(1,7) 1G-10G



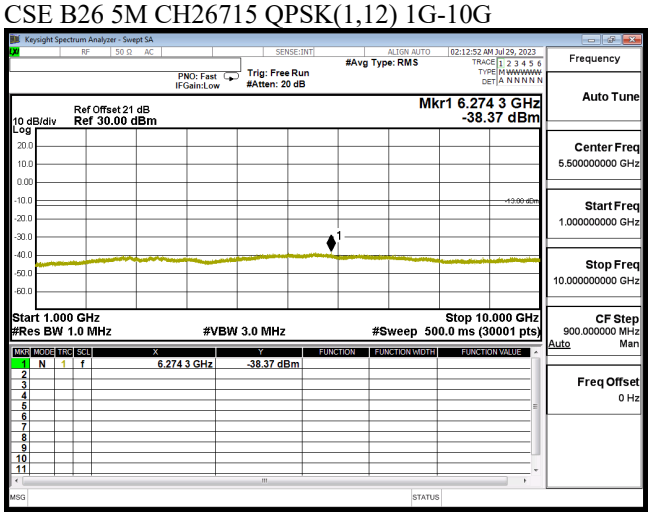
CSE B26 5M CH26715 QPSK(1,12) 30M-1G



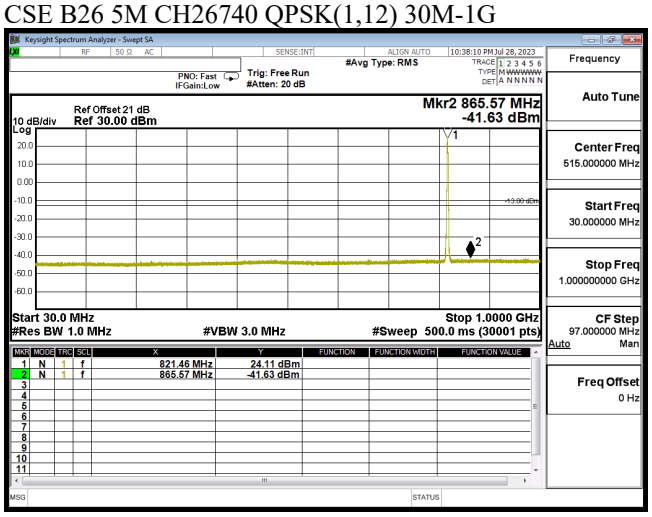
CSE B26 5M CH26715 QPSK(1,12) 1G-10G



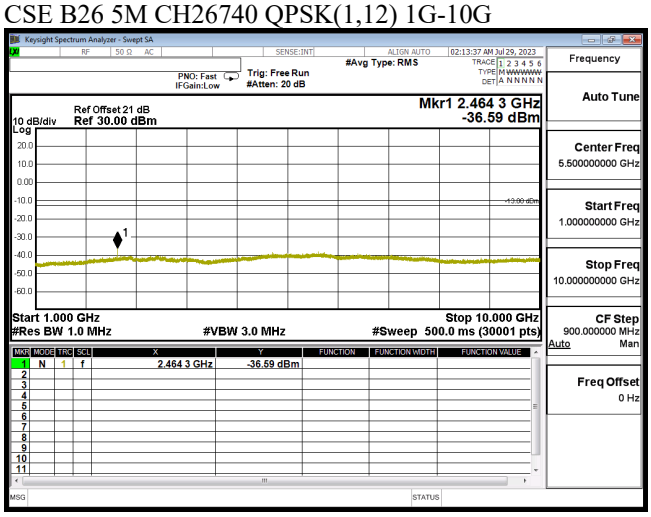
CSE B26 5M CH26740 QPSK(1,12) 30M-1G



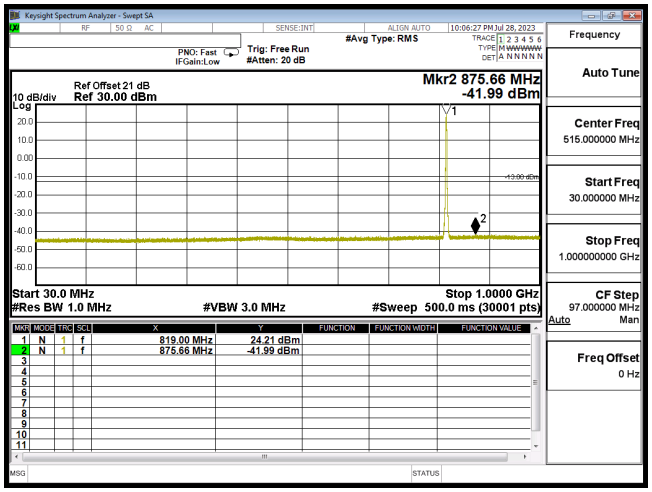
CSE B26 5M CH26740 QPSK(1,12) 1G-10G



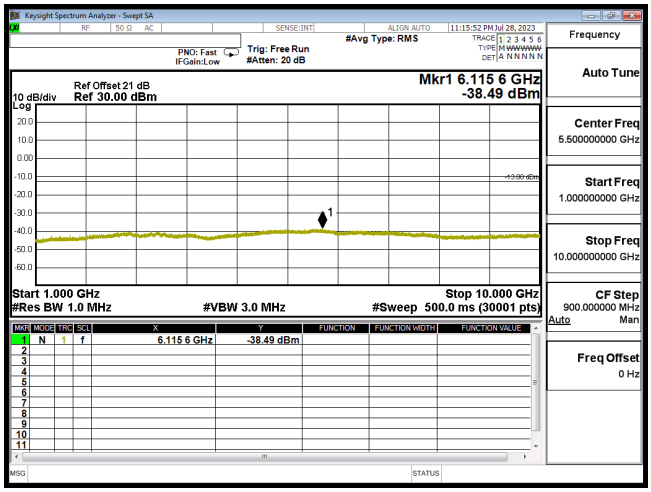
CSE B26 5M CH26765 QPSK(1,12) 30M-1G



CSE B26 5M CH26765 QPSK(1,12) 1G-10G

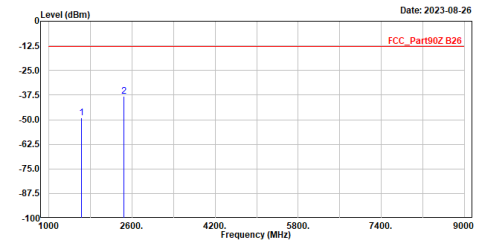


CSE B26 10M CH26740 QPSK(1,25) 30M-1G



CSE B26 10M CH26740 QPSK(1,25) 1G-10G

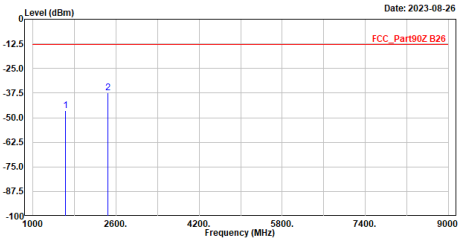
Site :HY-CB03
Condition :3m Horizontal
Mode :LTE_B26_3M_Part90_1RB7_CH26705
Test BY :Gavin Wu



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1631.000	-49.20	-13.00	-36.20	-36.05	-13.15	Peak
2	2446.500	-38.12	-13.00	-25.12	-26.49	-11.63	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) - 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

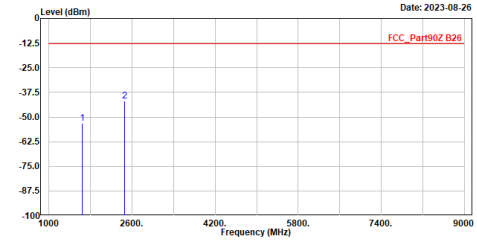
Site :HY-CB03
Condition :3m Vertical
Mode :LTE_B26_3M_Part90_1RB7_CH26705
Test BY :Gavin Wu



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1631.000	-46.37	-13.00	-33.37	-33.22	-13.15	Peak
2	2446.500	-37.37	-13.00	-24.37	-25.74	-11.63	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) - 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

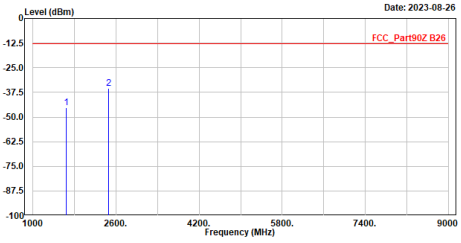
Site :HY-CB03
Condition :3m Horizontal
Mode :LTE_B26_3M_Part90_1RB7_CH26740
Test BY :Gavin Wu



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1638.000	-53.18	-13.00	-40.18	-40.01	-13.17	Peak
2	2457.000	-41.86	-13.00	-28.86	-30.22	-11.64	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) - 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

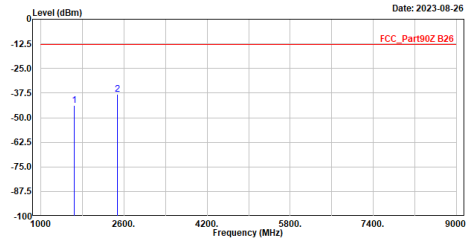
Site :HY-CB03
Condition :3m Vertical
Mode :LTE_B26_3M_Part90_1RB7_CH26740
Test BY :Gavin Wu



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1638.000	-45.10	-13.00	-32.10	-31.93	-13.17	Peak
2	2457.000	-35.45	-13.00	-22.45	-23.81	-11.64	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) - 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

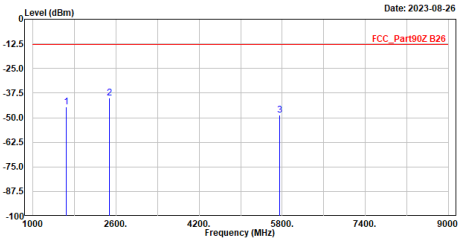
Site :HY-CB03
Condition :3m Horizontal
Mode :LTE_B26_3M_Part90_1RB7_CH26775
Test BY :Gavin Wu



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1645.000	-43.77	-13.00	-30.77	-30.59	-13.18	Peak
2	2467.500	-38.00	-13.00	-25.00	-26.34	-11.66	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) - 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

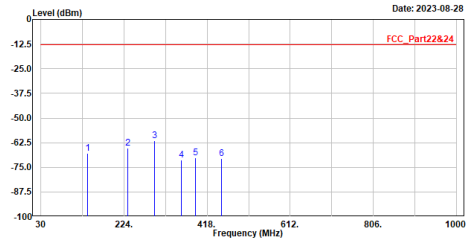
Site :HY-CB03
Condition :3m Vertical
Mode :LTE_B26_3M_Part90_1RB7_CH26775
Test BY :Gavin Wu



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1645.000	-44.40	-13.00	-31.40	-31.22	-13.18	Peak
2	2467.500	-39.96	-13.00	-26.96	-28.30	-11.66	Peak
3	5757.500	-48.71	-13.00	-35.71	-49.35	0.64	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) - 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

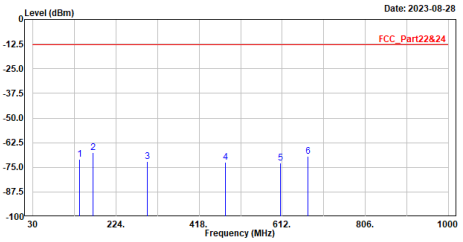
Site :HY-CB03
Condition :3m Horizontal
Mode :LTE_B26_3M_Part90_1RB7_CH26705
Test BY :Peter



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	139.610	-67.90	-13.00	-54.90	-52.86	-15.04	Peak
2	233.700	-65.36	-13.00	-52.36	-49.06	-16.30	Peak
3	295.780	-61.59	-13.00	-48.59	-47.63	-13.96	Peak
4	357.860	-71.16	-13.00	-58.16	-58.47	-12.69	Peak
5	390.840	-70.13	-13.00	-57.13	-58.70	-11.43	Peak
6	450.980	-70.63	-13.00	-57.63	-60.90	-9.73	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) - 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

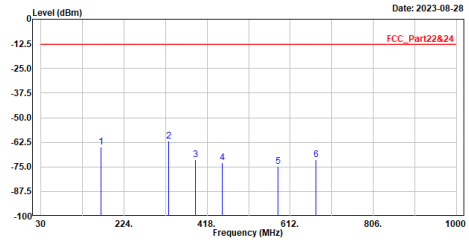
Site :HY-CB03
Condition :3m Vertical
Mode :LTE_B26_3M_Part90_1RB7_CH26705
Test BY :Peter



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	139.610	-71.10	-13.00	-58.10	-56.06	-15.04	Peak
2	170.650	-67.47	-13.00	-54.47	-53.02	-14.45	Peak
3	296.750	-71.96	-13.00	-58.96	-58.01	-13.95	Peak
4	480.080	-72.47	-13.00	-59.47	-63.35	-9.12	Peak
5	608.120	-72.71	-13.00	-59.71	-66.53	-6.18	Peak
6	672.140	-69.48	-13.00	-56.48	-64.09	-5.39	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) - 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

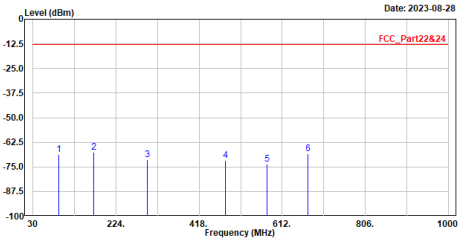
Site :HY-CB03
Condition :3m Horizontal
Mode :LTE_B26_3M_Part90_1RB7_CH26740
Test BY :Peter



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	170.650	-64.79	-13.00	-51.79	-50.34	-14.45	Peak
2	327.790	-61.98	-13.00	-48.98	-49.10	-12.88	Peak
3	390.840	-71.34	-13.00	-58.34	-59.91	-11.43	Peak
4	452.920	-72.83	-13.00	-59.83	-63.16	-9.67	Peak
5	582.900	-74.85	-13.00	-61.85	-68.07	-6.78	Peak
6	672.140	-71.27	-13.00	-58.27	-65.88	-5.39	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) - 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

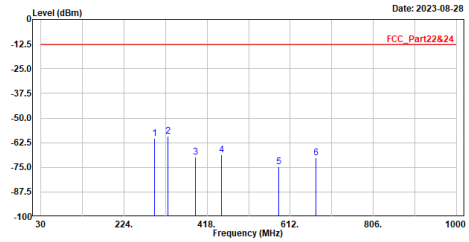
Site :HY-CB03
Condition :3m Vertical
Mode :LTE_B26_3M_Part90_1RB7_CH26740
Test BY :Peter



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	91.110	-68.72	-13.00	-55.72	-48.51	-20.21	Peak
2	171.620	-67.44	-13.00	-54.44	-53.01	-14.43	Peak
3	296.750	-71.46	-13.00	-58.46	-57.51	-13.95	Peak
4	480.080	-71.83	-13.00	-58.83	-62.71	-9.12	Peak
5	576.110	-73.53	-13.00	-60.53	-66.51	-7.02	Peak
6	672.140	-68.28	-13.00	-55.28	-62.89	-5.39	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) - 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

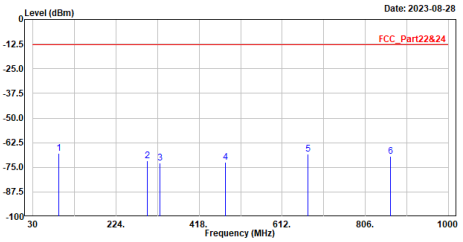
Site :HY-CB03
Condition :3m Horizontal
Mode :LTE_B26_3M_Part90_1RB7_CH26775
Test BY :Peter



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	295.780	-60.28	-13.00	-47.28	-46.32	-13.96	Peak
2	326.820	-59.31	-13.00	-46.31	-46.39	-12.92	Peak
3	390.840	-69.91	-13.00	-56.91	-58.48	-11.43	Peak
4	450.980	-68.51	-13.00	-55.51	-58.78	-9.73	Peak
5	585.810	-74.62	-13.00	-61.62	-67.91	-6.71	Peak
6	672.140	-70.32	-13.00	-57.32	-64.93	-5.39	Peak

Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) - 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

Site :HY-CB03
Condition :3m Vertical
Mode :LTE_B26_3M_Part90_1RB7_CH26775
Test BY :Peter



No.	Frequency	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	91.110	-68.05	-13.00	-55.05	-47.84	-20.21	Peak
2	296.750	-71.81	-13.00	-58.81	-57.86	-13.95	Peak
3	326.820	-72.79	-13.00	-59.79	-59.87	-12.92	Peak
4	480.080	-72.28	-13.00	-59.28	-63.16	-9.12	Peak
5	672.140	-68.34	-13.00	-55.34	-62.95	-5.39	Peak
6	864.200	-69.25	-13.00	-56.25	-66.43	-2.82	Peak

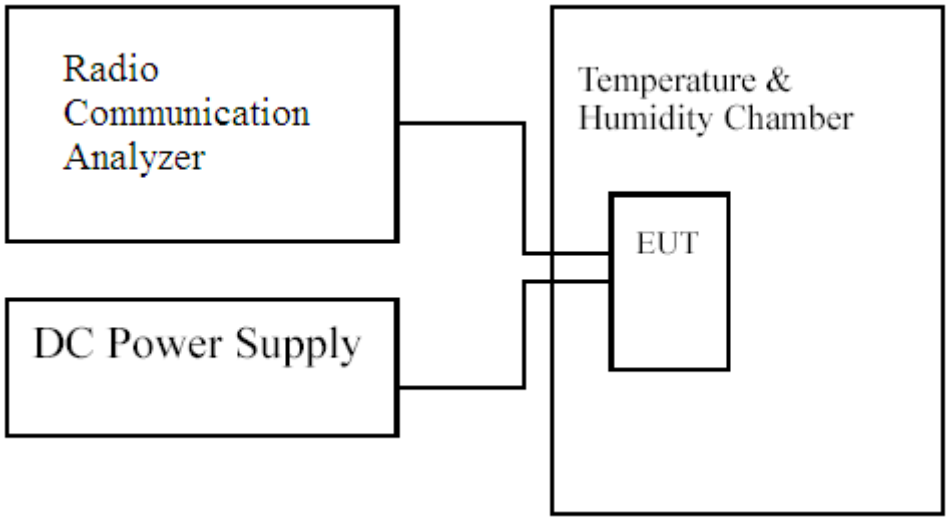
Note:
1. Level = Read Level + Factor
2. Factor = Antenna Factor + Cable Loss - Preamp Factor + Aux Factor
3. Over Limit = Level - Limit Line
4. Aux Factor = Convert E (dBuVm) to EIRP (dBm)
= 107 + 20log(3) - 104.8 = 11.8 dB
5. The other emission levels were very low against the limit.
6. The emission under 1GHz was not included since the emission levels are very low against the limit.

7. Frequency Stability Under Temperature & Voltage Variations

7.1. Test Specification

According to Part 2.1055, 90.213

7.2. Test Setup



7.3. Limits

Limit	< ± 2.5 ppm

7.4. Test Procedure

The frequency stability of transmitter is measured by:

(a) Temperature: The temperature is varied from -30 °C to 50 °C in 10 °C increment using a standard temperature & Humidity chamber.

(b) Primary Supply Voltage: The primary supply voltage is varied 85 % to 115 % of the nominal value for non-hand-carried equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating endpoint which shall be specified by the manufacturer.

The EUT was connected via the base station simulator. Universal Radio Communication Tester, was used to measure The Frequency Error. The maximum result of measurements was recorded.

7.5. Test Result of Frequency Stability Under Temperature Variations

Temperature Variations

Temperature Interval(℃)	Test Channel	Deviation (kHz)				Limit (kHz)
		1.4 M	3 M	5 M	10 M	
-30	Low	-0.0062	0.0038	0.0041	--	±2.05
-20	Low	0.0039	0.0041	0.0048	--	±2.05
-10	Low	0.0049	0.0044	0.0048	--	±2.05
0	Low	0.0053	0.0027	0.0026	--	±2.05
10	Low	0.0039	0.0041	0.0060	--	±2.05
20	Low	0.0044	0.0056	0.0065	--	±2.05
30	Low	0.0051	0.0055	0.0078	--	±2.05
40	Low	0.0062	0.0062	0.0063	--	±2.05
50	Low	-0.0047	0.0053	0.0049	--	±2.05
-30	Mid	--	--	--	-0.0033	±2.05
-20	Mid	--	--	--	-0.0021	±2.05
-10	Mid	--	--	--	-0.0045	±2.05
0	Mid	--	--	--	-0.0039	±2.05
10	Mid	--	--	--	-0.0037	±2.05
20	Mid	--	--	--	-0.0045	±2.05
30	Mid	--	--	--	-0.0058	±2.05
40	Mid	--	--	--	-0.0046	±2.05
50	Mid	--	--	--	-0.0036	±2.05
-30	High	0.0055	0.0056	0.0041	--	±2.05
-20	High	0.0052	0.0021	0.0044	--	±2.05
-10	High	0.0057	0.0047	0.0028	--	±2.05
0	High	0.0062	0.0018	0.0056	--	±2.05
10	High	0.0050	0.0050	0.0041	--	±2.05
20	High	0.0046	0.0048	0.0041	--	±2.05
30	High	0.0036	0.0042	0.0056	--	±2.05
40	High	0.0048	0.0077	0.0075	--	±2.05
50	High	-0.0050	0.0063	0.0051	--	±2.05

Voltage Variations

Temperature Interval(℃)	Test Channel	Deviation (kHz)				Limit (kHz)
		1.4 M	3 M	5 M	10 M	
4.35	Low	0.0051	0.0059	0.0060	--	±2.05
3.8	Low	0.0044	0.0056	0.0065	--	±2.05
3.6	Low	0.0058	0.0065	0.0068	--	±2.05
4.35	Mid	--	--	--	-0.0055	±2.05
3.8	Mid	--	--	--	-0.0045	±2.05
3.6	Mid	--	--	--	-0.0058	±2.05
4.35	High	0.0055	0.0055	0.0052	--	±2.05
3.8	High	0.0046	0.0048	0.0041	--	±2.05
3.6	High	0.0061	0.0048	0.0072	--	±2.05