

FCC Radio Test Report

FCC ID: ZMOSC138NA

This report concerns: Original Grant

Project No. : 2111C042
Equipment : LTE Module
Brand Name : Fibocom
Test Model : SC138-NA
Series Model : N/A
Applicant : Fibocom Wireless Inc.
Address : 1101, Tower A, Building 6, Shenzhen International Innovation Valley, Dashi 1st Rd, Nanshan, Shenzhen, China
Manufacturer : Fibocom Wireless Inc.
Address : 1101, Tower A, Building 6, Shenzhen International Innovation Valley, Dashi 1st Rd, Nanshan, Shenzhen, China
Factory : Huizhou HYE Technology Co., Ltd.
Address : No. 237, Sanhe group, Sanhe village, Tonghu Town, Zhongkai hi tech Zone, Huizhou
Date of Receipt : Nov. 03, 2021
Date of Test : Nov. 15, 2021 ~ Dec. 07, 2021
Issued Date : Dec. 23, 2021
Report Version : R01
Test Sample : Engineering Sample No.: DG20211115162
Standard(s) : 47 CFR FCC Part 90 Subpart S
47 CFR FCC Part 2
ANSI/TIA/EIA-603-E-2016
FCC KDB 971168 D01 Power Meas License Digital Systems v03r01

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.

Edward Li

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Approved by : Steven Lu



TESTING CERT #5123.02

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Declaration

BTL represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

BTL's reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. **BTL** shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **BTL** issued reports.

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BTL's laboratory quality assurance procedures are in compliance with the **ISO/IEC 17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

BTL is not responsible for the sampling stage, so the results only apply to the sample as received.

The information, data and test plan are provided by manufacturer which may affect the validity of results, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements of applied standards and in all the possible configurations as representative of its intended use.

Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

Please note that the measurement uncertainty is provided for informational purpose only and is not use in determining the Pass/Fail results.

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REPORT ISSUED HISTORY

Report Version	Description	Issued Date
R00	Original Issue.	Dec. 15, 2021
R01	Modified the comments of TCB.	Dec. 23, 2021

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

FCC Part 90 Subpart S & Part 2			
Standard(s) Section	Test Item	Judgment	Remark
2.1046 & 90.635 (b)	Effective Radiated Power	PASS	-----
2.1049 & 90.209	Occupied Bandwidth	PASS	-----
2.1053 & 90.669	Conducted Spurious Emissions	PASS	-----
2.1053 & 90.669	Radiated Spurious Emissions	PASS	-----
2.1053 & 90.691	Mask Measurements	PASS	-----
-	Peak To Average Ratio	PASS	Record Only
2.1055 & 90.213	Frequency Stability	PASS	-----

Note:

(1) "N/A" denotes test is not applicable in this test report.

1.1 TEST FACILITY

The test facilities used to collect the test data of radiated in this report is at the location of No. 3 Jinshagang 1st Rd. Shixia, Dalang Town, Dongguan City, Guangdong, People's Republic of China.

The test facilities used to collect the test data of conducted in this report is at the location of Room 108, Building 2, No.1, Yile Road, Songshan Lake Zone, Dongguan City, Guangdong, People's Republic of China.

BTL's Test Firm Registration Number for FCC: 357015

BTL's Designation Number for FCC: CN1240

1.2 MEASUREMENT UNCERTAINTY

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated 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))

The BTL measurement uncertainty as below table:

A. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	U,(dB)
DG-CB01	CISPR	9kHz ~ 30MHz	2.36

Test Site	Method	Measurement Frequency Range	Ant. H / V	U,(dB)
DG-CB03	CISPR	30MHz ~ 200MHz	V	4.36
		30MHz ~ 200MHz	H	3.32
		200MHz ~ 1,000MHz	V	4.08
		200MHz ~ 1,000MHz	H	3.96
		1GHz ~ 6GHz	-	3.80
		6GHz ~ 18GHz	-	4.82

B. Other Measurement:

Parameter	Uncertainty
Spectrum Bandwidth	±3.8 %
Maximum Output Power	±0.95 dB
Power Spectral Density	±0.86 dB
Frequency Stability	±0.16 dB
Temperature	±0.08 °C
Time	±0.58 %
Supply voltages	±0.3 %

Note: Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

1.3 TEST ENVIRONMENT CONDITIONS

Test Item	Temperature	Humidity	Test Voltage	Tested By
Output Power & ERP	24°C	57%	DC 3.8V	Rick Liao
Occupied Bandwidth	24°C	57%	DC 3.8V	Rick Liao
Conducted Spurious Emissions	24°C	57%	DC 3.8V	Rick Liao
Radiated Spurious Emissions	22°C	55%	DC 3.8V	Kwok Guo
Band Edge	24°C	57%	DC 3.8V	Rick Liao
Peak To Average Ratio	24°C	57%	DC 3.8V	Rick Liao
Frequency Stability	Normal & Extreme	57%	Normal & Extreme	Rick Liao

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	LTE Module				
Brand Name	Fibocom				
Test Model	SC138-NA				
Series Model	N/A				
Model Difference(s)	N/A				
Hardware Version	SC138-NA				
Software Version	SC138-NA-Q62.00.104				
Power Source	DC Voltage supplied from external power supply.				
Power Rating	DC 3.5V ~ 4.2V				
IEMI No.	866280050002329				
Modulation Type	LTE	UL: QPSK,16QAM,64QAM DL: QPSK,16QAM,64QAM			
Max. ERP	LTE	Channel Bandwidth (MHz)	QPSK (dBm)	16QAM (dBm)	64QAM (dBm)
	Band 26	1.4	20.89	20.26	19.40
		3	20.90	20.32	19.36
		5	21.02	20.48	19.30
		10	20.88	20.34	19.07

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

2. Channel List:

LTE Band 26					
Test Frequency ID	Bandwidth (MHz)	N _{UL}	Frequency of Uplink (MHz)	N _{DL}	Frequency of Downlink (MHz)
Low Range	1.4	26697	814.7	8697	859.7
	3	26705	815.5	8705	860.5
	5	26715	816.5	8715	861.5
Mid Range	1.4/3/5/10	26740	819	8740	864
High Range	1.4	26783	823.3	8783	868.3
	3	26775	822.5	8775	867.5
	5	26765	821.5	8765	866.5

3. Table for Filed Antenna:

Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Note
N/A	N/A	Dipole	SMA	0.5	LTE Band 26

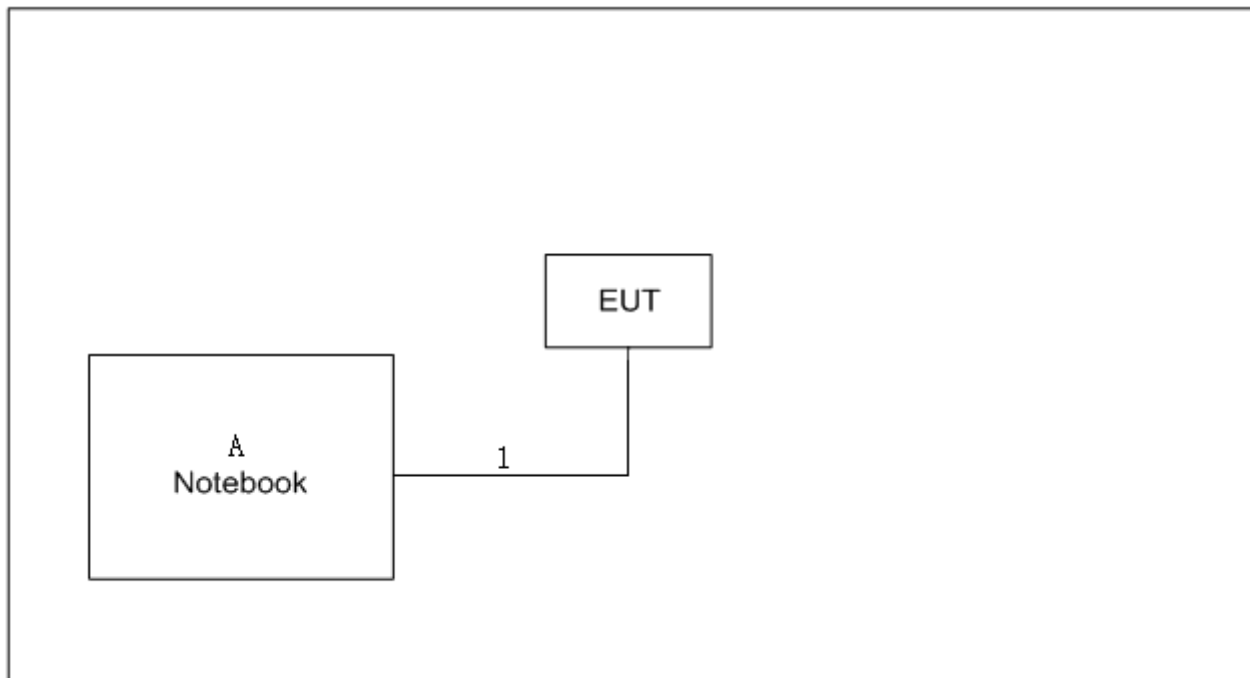
Note: The antenna gain is provided by the manufacturer.

2.2 DESCRIPTION OF TEST MODES

Following mode(s) is (were) found to be the worst case(s) and selected for the final test.

LTE BAND 26 MODE					
Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
Output Power & ERP	26697 to 26783	26697, 26740, 26783	1.4MHz	QPSK, 16QAM, 64QAM	1RB/3RB/6RB
	26705 to 26775	26705, 26740, 26775	3MHz	QPSK, 16QAM, 64QAM	1RB/8RB/15RB
	26715 to 26765	26715, 26740, 26765	5MHz	QPSK, 16QAM, 64QAM	1RB/12RB/25RB
	26740	26740	10MHz	QPSK, 16QAM, 64QAM	1RB/25RB/50RB
Occupied Bandwidth	26697 to 26783	26697, 26740, 26783	1.4MHz	QPSK, 16QAM, 64QAM	6RB
	26705 to 26775	26705, 26740, 26775	3MHz	QPSK, 16QAM, 64QAM	15RB
	26715 to 26765	26715, 26740, 26765	5MHz	QPSK, 16QAM, 64QAM	25RB
	26740	26740	10MHz	QPSK, 16QAM, 64QAM	50RB
Conducted Spurious Emissions	26697 to 26783	26740	1.4MHz	QPSK	1RB
	26705 to 26775	26740	5MHz	QPSK	1RB
	26715 to 26765	26740	10MHz	QPSK	1RB
Radiated Spurious Emissions	26697 to 26783	26740	1.4MHz	QPSK	1RB
	26705 to 26775	26740	5MHz	QPSK	1RB
	26715 to 26765	26740	10MHz	QPSK	1RB
Mask	26697 to 26783	26697, 26783	1.4MHz	QPSK	1RB
					6RB
	26705 to 26775	26705, 26775	3MHz	QPSK	1RB
					15RB
	26715 to 26765	26715, 26765	5MHz	QPSK	1RB
					25RB
Peak To Average Ratio	26697 to 26783	26697, 26740, 26783	1.4MHz	QPSK, 16QAM, 64QAM	1RB
	26705 to 26775	26705, 26740, 26775	3MHz	QPSK, 16QAM, 64QAM	1RB
	26715 to 26765	26715, 26740, 26765	5MHz	QPSK, 16QAM, 64QAM	1RB
	26740	26740	10MHz	QPSK, 16QAM, 64QAM	1RB
Frequency Stability	26715 to 26765	26740	10MHz	QPSK	1RB

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATIONOFSYSTEMTESTED



2.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.
A	Notebook	Lenovo	V310-14ISK	LR07GZNB

Item	Cable Type	Shielded Type	Ferrite Core	Length
1	USB Cable	NO	NO	0.8m

3. TEST RESULT

3.1 OUTPUT POWER MEASUREMENT

3.1.1 LIMIT

Mobile / Portable station are limited to 100 watts e.r.p.

3.1.2 TEST PROCEDURE

The testing follows FCC KDB 971168 v03r01 Section 5.0.

ERP:

$EIRP = \text{Output Power} + \text{Antenan gain}$

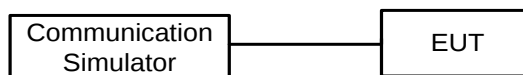
$ERP = EIPR - 2.15\text{dBi}$.

Output Power:

The EUT was set up for the maximum power with GSM, GPRS, EDGE, WCDMA, CDMA, and LTE link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

3.1.3 TESTSETUP LAYOUT

Output Power Measurement



3.1.4 TEST DEVIATION

No deviation

3.1.5 TEST RESULTS

Please refer to the APPENDIX A.

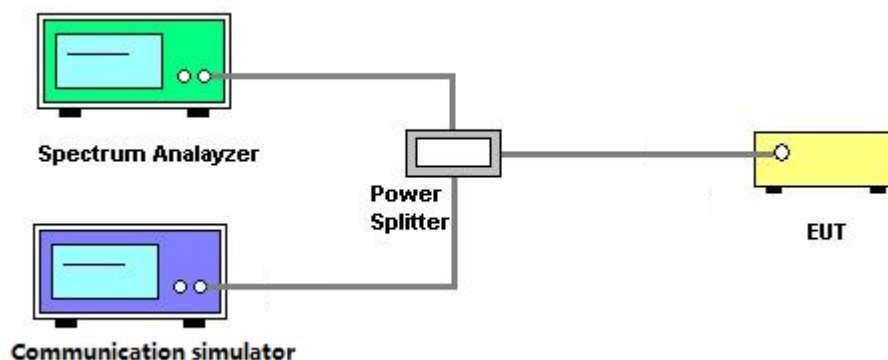
3.2 OCCUPIED BANDWIDTH MEASUREMENT

3.2.1 TEST PROCEDURE

The testing follows FCC KDB 971168 v03r01 Section 4.0.

1. The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth and 26dB bandwidth.
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. $RBW = (1\% \sim 5\%) * EBW$
 $VBW \geq 3 * RBW$
4. Set spectrum analyzer with RMS detector.

3.2.2 TEST SETUP LAYOUT



3.2.3 TEST DEVIATION

No deviation

3.2.4 TEST RESULTS

Please refer to the APPENDIX B.

3.3 CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

3.3.1 LIMIT

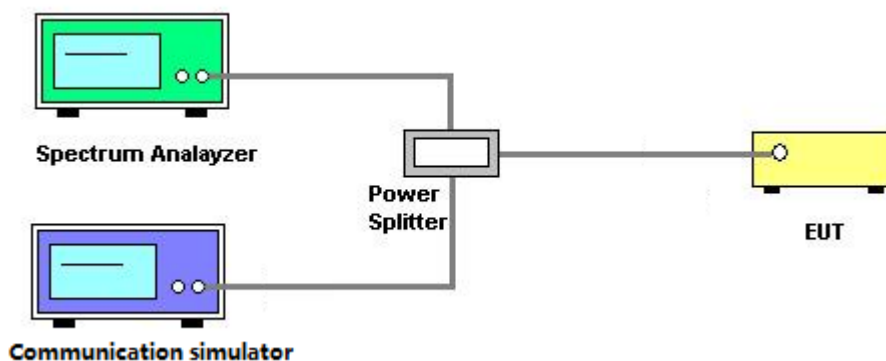
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. The emission limit equal to -13dBm.

3.3.2 TEST PROCEDURES

The testing follows FCC KDB 971168 v03r01 Section 6.0.

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The band edges of low and high channels for the highest RF powers were measured. Set RBW $\geq$ 1% EBW in the 1MHz band immediately outside and adjacent to the band edge.
3. Set spectrum analyzer with RMS detector.
4. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.3.3 TESTSETUP LAYOUT



3.3.4 TESTDEVIATION

No deviation

3.3.5 TEST RESULTS

Please refer to the APPENDIX C.

3.4 RADIATED SPURIOUS EMISSIONS MEASUREMENT

3.4.1 LIMIT

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. The emission limit equal to -13dBm.

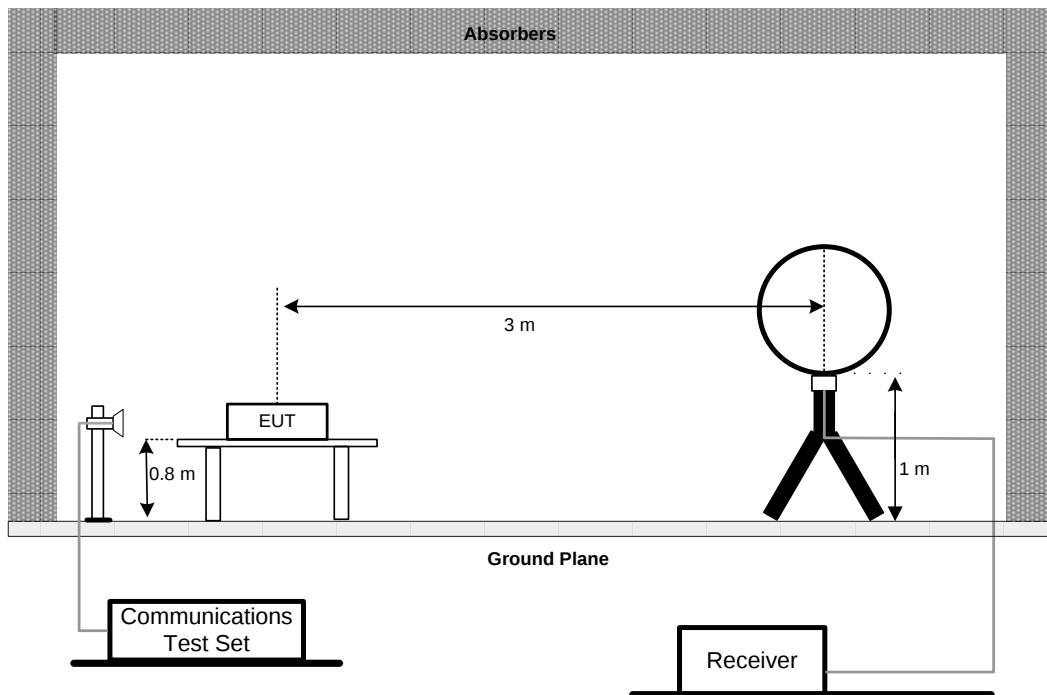
3.4.2 TEST PROCEDURES

The testing follows FCC KDB 971168 v03r01 Section 5.8.

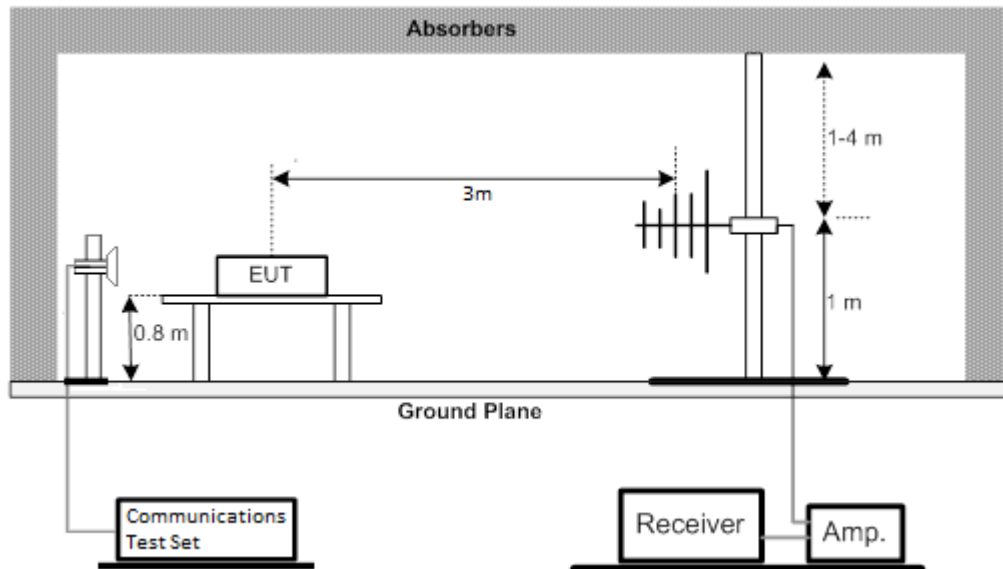
1. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
2. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value " of step a. Record the power level of S.G
3. $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}.$
4. ERP can be calculated form EIRP by subtracting the gain of dipole, $ERP = EIPR - 2.15\text{dBi}.$
5. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

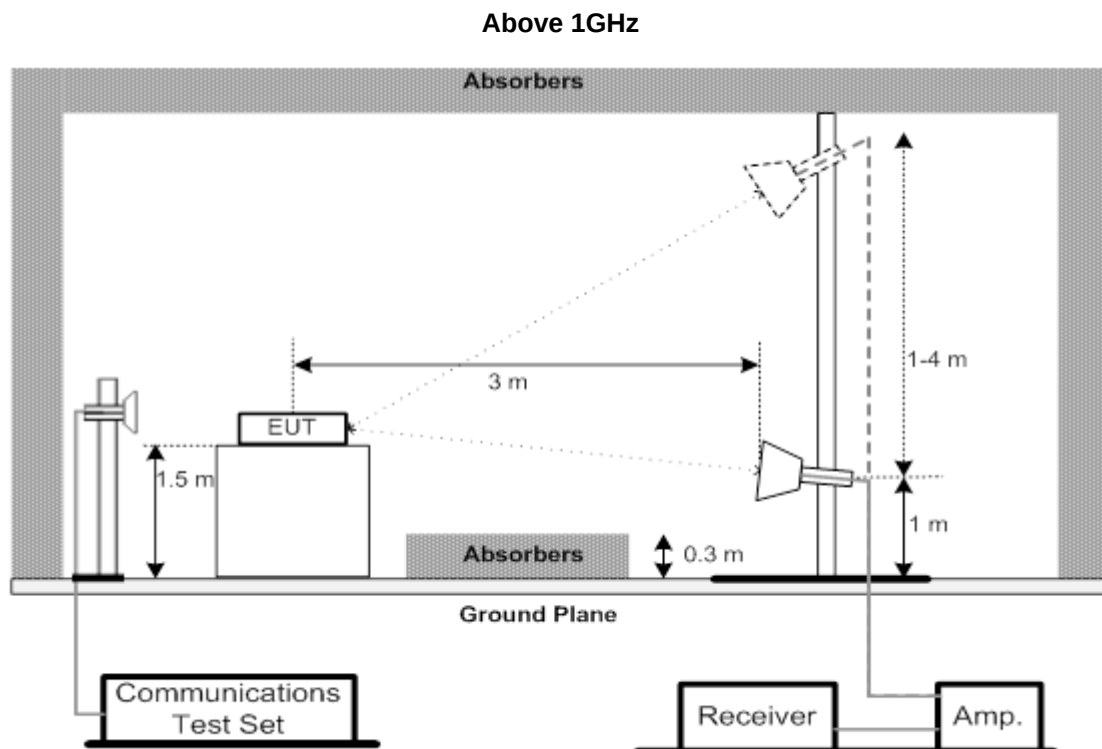
3.4.3 TEST SETUP LAYOUT

Below 30MHz



30MHz to 1000MHz





3.4.4 TESTDEVIATION

No deviation

3.4.5 TEST RESULTS (9KHZ TO 30MHZ)

Please refer to the APPENDIX D.

3.4.6 TEST RESULTS (30MHZ TO 1000MHZ)

Please refer to the APPENDIX E.

3.4.7 TEST RESULTS (ABOVE 1000MHZ)

Please refer to the APPENDIX F.

3.5 MASK MEASUREMENTS

3.5.1 LIMIT

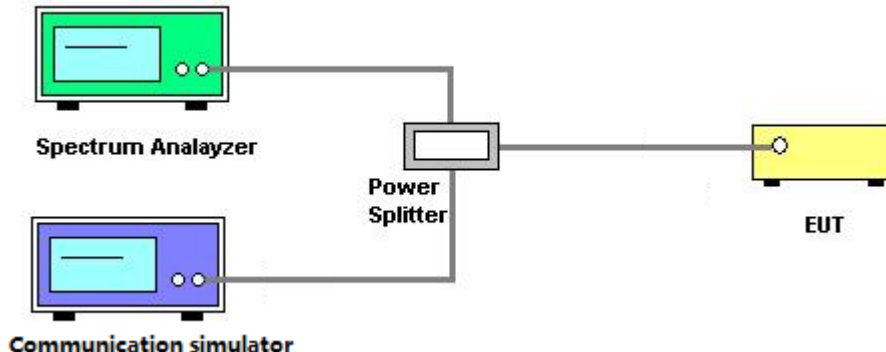
According to FCC part 90.691 shall be tested the emission mask. For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $116 \log_{10}(f/6.1)$ decibels or $50 + 10 \log_{10}(P)$ 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. 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.

3.5.2 TEST PROCEDURES

The testing follows FCC KDB 971168 v03r01 Section 6.0.

1. All measurements were done at low and high operational frequency range.
2. Set RBW=1% of 26dBc bandwidth, VBW=3 X RBW, detector=RMS, Sweep time = Auto.
For Section 90.691(a) compliance testing, use RBW = 300 Hz for offsets less than 37.5 kHz from a channel edge; RBW = 100 kHz for offsets greater than 37.5 kHz is allowed.
3. Record the max trace plot into the test report.

3.5.3 TESTSETUP LAYOUT



3.5.4 TESTDEVIATION

No deviation

3.5.5 TEST RESULTS

Please refer to the APPENDIX G.

3.6 PEAK TO AVERAGE RATIO MEASUREMENT

3.6.1 LIMIT

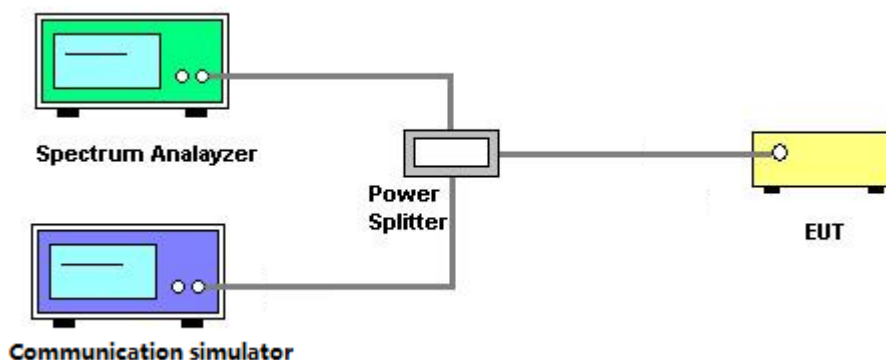
In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB.

3.6.2 TEST PROCEDURES

The testing follows FCC KDB 971168 v03r01 Section 5.7.

1. Set resolution/measurement bandwidth $\geq$ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1%.

3.6.3 TEST SETUP LAYOUT



3.6.4 TEST DEVIATION

No deviation

3.6.5 TEST RESULTS

Please refer to the APPENDIX H.

3.7 FREQUENCY STABILITY MEASUREMENT

3.7.1 LIMIT

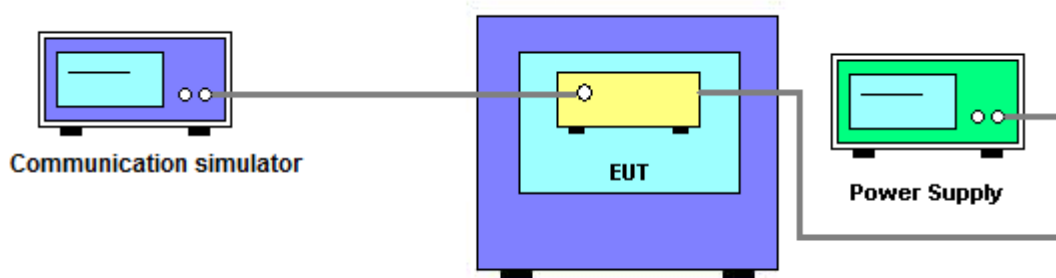
± 1.5 ppm is for base and fixed station. ± 2.5 ppm is for mobile station.

3.7.2 TEST PROCEDURES

The testing follows FCC KDB 971168 v03r01 Section 9.0.

1. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
2. EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
3. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the $\pm 0.5^{\circ}\text{C}$ during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.
4. The frequency error was recorded frequency error from the communication simulator.

3.7.3 TESTSETUP LAYOUT



3.7.4 TESTDEVIATION

No deviation

3.7.5 TEST RESULTS

Please refer to the APPENDIX I.

4. LIST OF MEASUREMENT EQUIPMENTS

Radiated Emissions - 9 kHz to 30 MHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	MXE EMI Receiver	Keysight	N9038A	MY56400091	Feb. 27, 2022
2*	Active Loop Antenna	R&S	HFH2-Z2	830749/020	Aug. 23, 2024
3	Cable	N/A	RG 213/U (9kHz~1GHz)	N/A	May 27, 2022
4	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
5	wideband radio communication tester	R&S	CMW500	152372	Feb. 27, 2022
6	Wireless Communication Test SET	Agilent	E5515C	MY48364183	Feb. 28, 2022
7	966 Chamber Room	ETS	9*6*6	N/A	Jul. 17, 2022

Radiated Emissions - 30 MHz to 1 GHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	Schwarzbeck	VULB9160	9160-3232	Mar. 15, 2022
2	Amplifier	HP	8447D	2944A08742	Feb. 28, 2022
3	Cable	emci	LMR-400	N/A	May 20, 2022
4	Controller	CT	SC100	N/A	N/A
5	Controller	MF	MF-7802	MF780208416	N/A
6	Receiver	Agilent	N9038A	MY52130039	Mar. 19, 2022
7	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
8	wideband radio communication tester	R&S	CMW500	152372	Feb. 27, 2022
9	Wireless Communication Test SET	Agilent	E5515C	MY48364183	Feb. 28, 2022
10	966 Chamber Room	RM	9*6*6	N/A	Jul. 24, 2022

Radiated Emissions - Above 1 GHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Double Ridged Horn Antenna	ARA	DRG-118A	16554	Apr. 21, 2022
2	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Jun. 30, 2022
3	Amplifier	Agilent	8449B	3008A02584	Jul. 10, 2022
4	Controller	CT	SC100	N/A	N/A
5	Controller	MF	MF-7802	MF780208416	N/A
6	Receiver	Agilent	N9038A	MY52130039	Mar. 19, 2022
7	EXA Spectrum Analyzer	Keysight	N9010A	MY56480488	Feb. 28, 2022
8	Low Noise Amplifier	CONNPHY	CLN-18G40G-4330-K	619413	Jul. 16, 2022
9	Cable	N/A	A81-SMAMSMAM-12.5M	N/A	Oct. 15, 2022
10	Cable	Talent microwave	A40-2.92M2.92M-2.5M	N/A	Nov. 29, 2021 Nov. 30, 2022
11	Filter	STI	STI15-9912	N/A	Jul. 10, 2022
12	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
13	wideband radio communication tester	R&S	CMW500	152372	Feb. 27, 2022
14	Wireless Communication Test SET	Agilent	E5515C	MY48364183	Feb. 28, 2022
15	966 Chamber Room	RM	9*6*6	N/A	Jul. 24, 2022

Conducted Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	8960 Series 10 Wireless Com Test set	Agilent	E5515E	MY52112163	Jul. 24, 2022
2	MXA Signal Analyzer	Keysight	N9020A	MY49100060	Jul. 24, 2022
3	Power Splitter	Mini-Circuits	ZFRSC-183-S+	SF103501511S	Jul. 24, 2022
4	wideband radio communication tester	R&S	CMW500	104462	Jul. 24, 2022
5	Const Temp. & Humidity Chamber	Bell	BTH-50C	20170306001	Feb. 27, 2022
6*	Multi-output DC Power Supply	GW Instek	GPC-3030DN	EK880675	Jul. 25, 2023

Remark: "N/A" denotes no model name, serial no. or calibration specified.

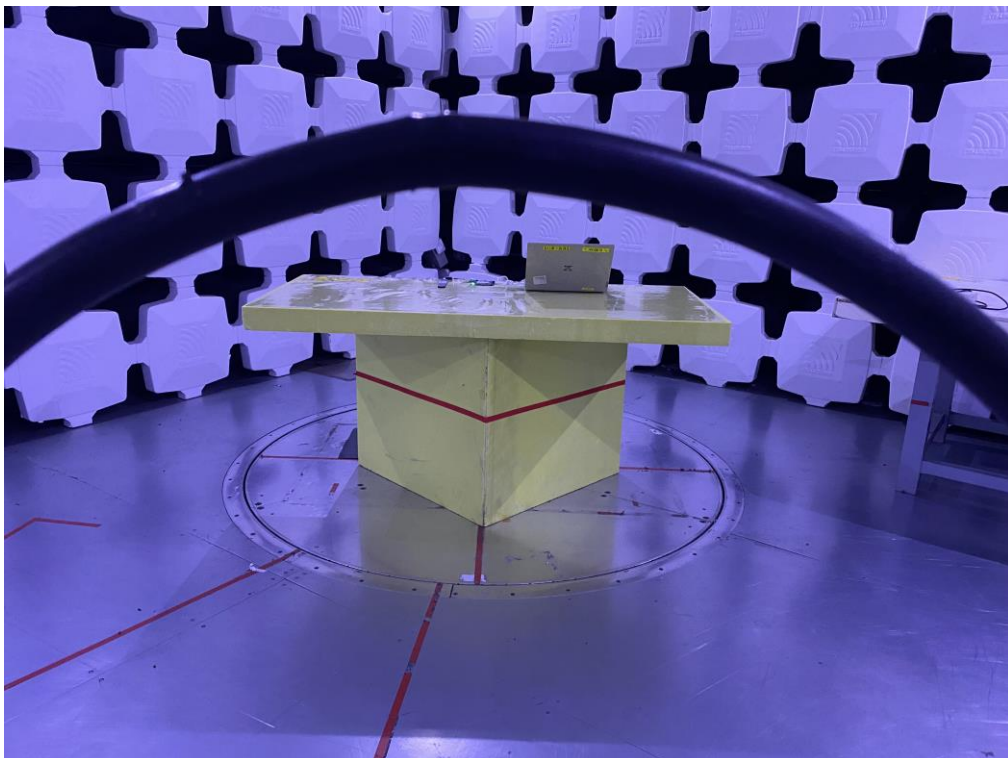
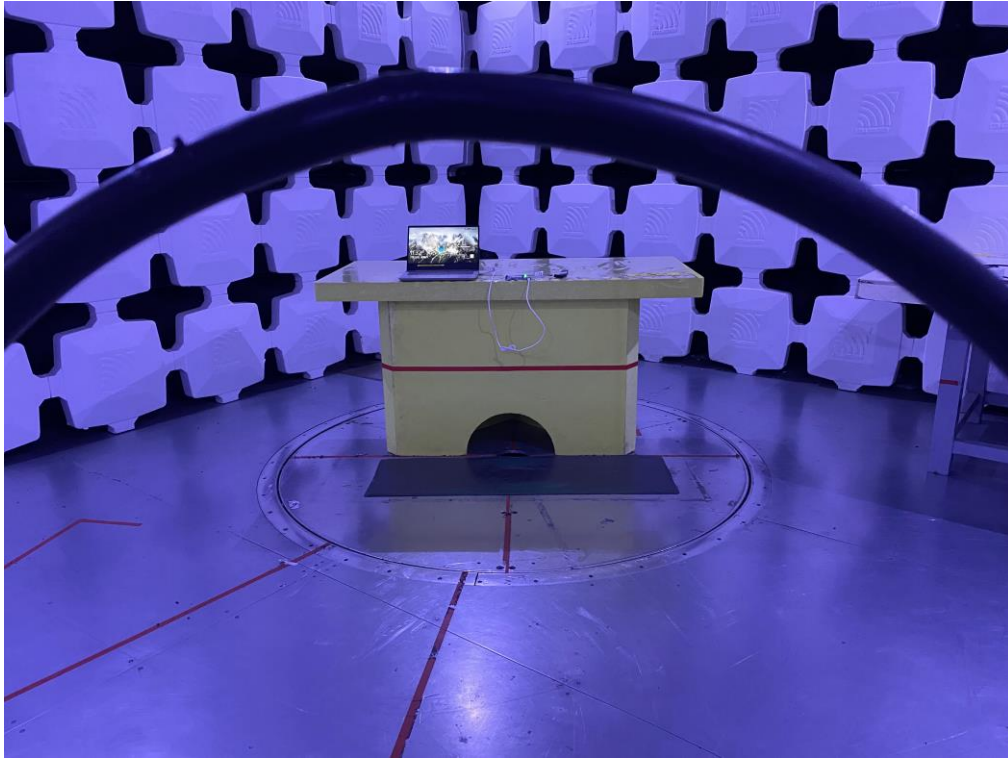
Except * item, all calibration period of equipment list is one year.

“*” calibration period of equipment list is three year.

5. EUT TEST PHOTO

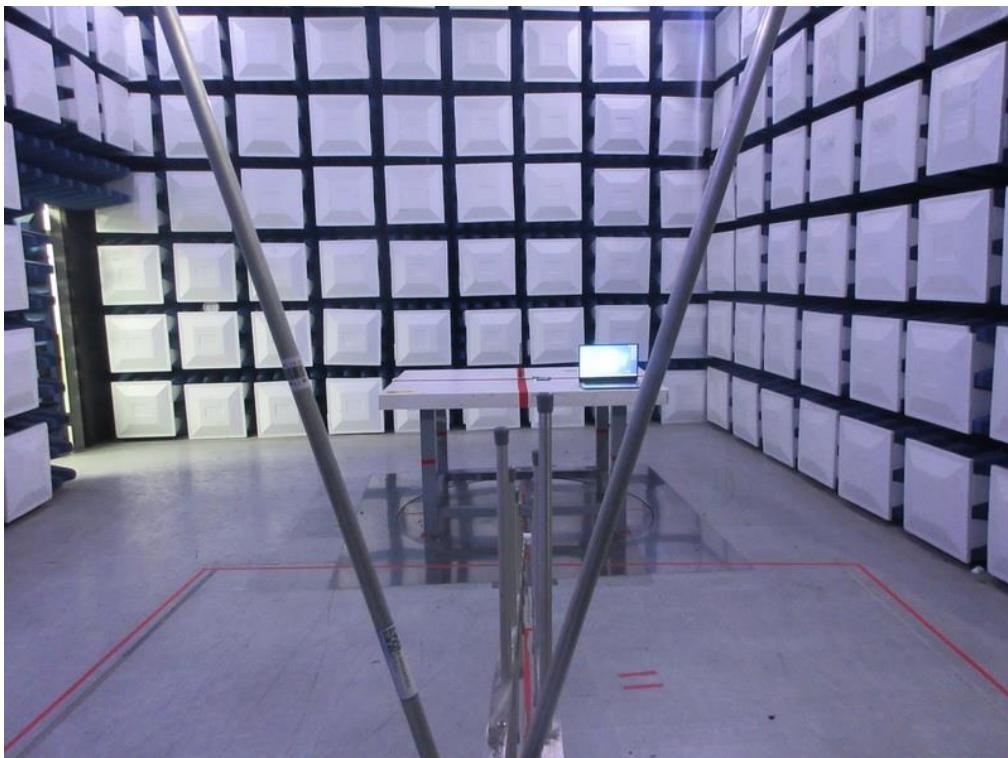
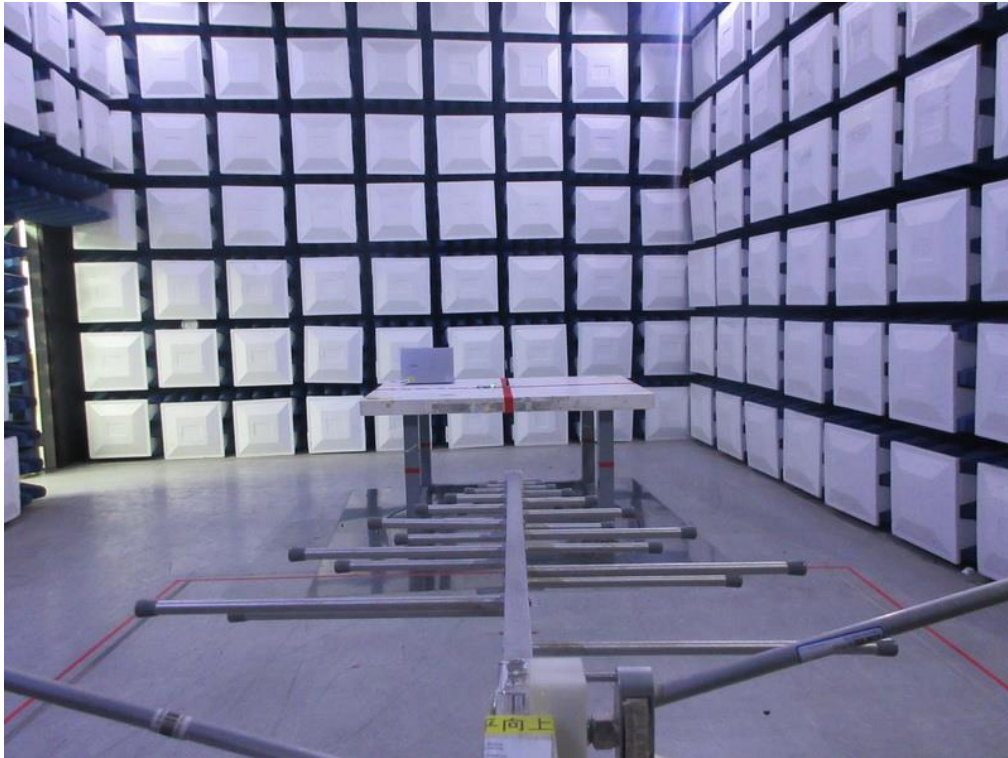
Radiated Emissions Test Photos

9 kHz to 30 MHz

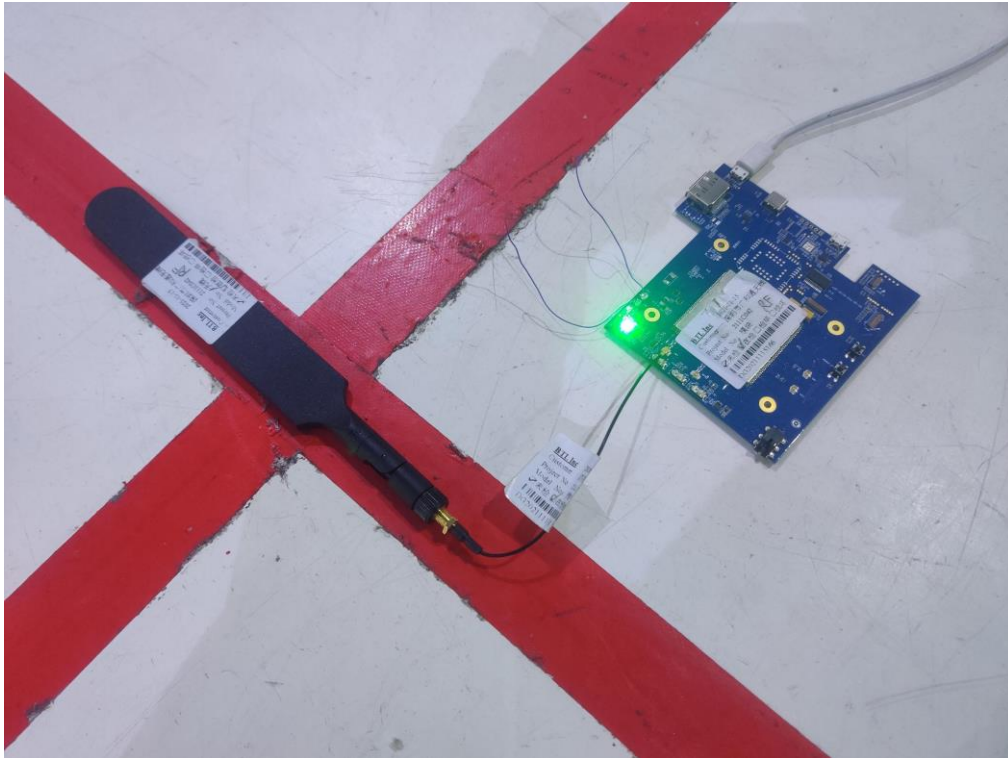


Radiated Emissions Test Photos

30 MHz to 1 GHz



Radiated Emissions Test Photos**Above 1 GHz**

Radiated Emissions Test Photos

APPENDIX A - OUTPUT POWER

Output Power (dBm)

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				26697CH	26740CH	26783CH
				814.7MHz	819MHz	823.3MHz
26 / 1.4M	QPSK	1	0	22.40	22.28	22.43
		1	2	22.43	22.36	22.52
		1	5	22.40	22.39	22.47
		3	0	22.43	22.33	22.42
		3	1	22.47	22.54	22.49
		3	2	22.44	22.50	22.44
		6	0	21.33	21.41	21.39
	16QAM	1	0	21.80	21.45	21.66
		1	2	21.91	21.53	21.73
		1	5	21.82	21.59	21.63
		3	0	21.70	21.67	21.66
		3	1	21.77	21.83	21.68
		3	2	21.67	21.76	21.62
		6	0	20.36	20.69	20.65
	64QAM	1	0	20.61	20.65	20.96
		1	2	20.67	20.70	21.05
		1	5	20.59	20.77	20.92
		3	0	20.67	20.46	20.97
		3	1	20.74	20.62	21.02
		3	2	20.68	20.56	20.90
		6	0	19.79	19.64	19.53

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				26705CH	26740CH	26775CH
				815.5MHz	819MHz	822.5MHz
26 / 3M	QPSK	1	0	22.46	22.39	22.50
		1	7	22.55	22.42	22.55
		1	14	22.42	22.49	22.50
		8	0	21.46	21.41	21.51
		8	4	21.49	21.54	21.53
		8	7	21.43	21.48	21.49
		15	0	21.44	21.53	21.52
	16QAM	1	0	21.93	21.57	21.52
		1	7	21.97	21.61	21.57
		1	14	21.92	21.66	21.46
		8	0	20.63	20.57	20.69
		8	4	20.69	20.69	20.73
		8	7	20.59	20.65	20.70
		15	0	20.60	20.58	20.68
	64QAM	1	0	20.62	20.76	20.97
		1	7	20.77	20.78	21.01
		1	14	20.65	20.82	20.95
		8	0	19.61	19.50	19.71
		8	4	19.63	19.66	19.76
		8	7	19.61	19.57	19.71
		15	0	19.66	19.70	19.65

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				26715CH	26740CH	26765CH
				816.5MHz	819MHz	821.5MHz
26 / 5M	QPSK	1	0	22.48	22.52	22.66
		1	13	22.46	22.64	22.67
		1	24	22.40	22.58	22.59
		12	0	21.49	21.49	21.55
		12	6	21.52	21.59	21.56
		12	11	21.49	21.57	21.54
		25	0	21.48	21.59	21.58
	16QAM	1	0	22.09	21.67	21.82
		1	13	22.13	21.78	21.84
		1	24	22.08	21.74	21.77
		12	0	20.72	20.63	20.75
		12	6	20.74	20.71	20.75
		12	11	20.71	20.72	20.73
		25	0	20.66	20.61	20.69
	64QAM	1	0	20.88	20.80	20.58
		1	13	20.94	20.95	20.61
		1	24	20.85	20.92	20.57
		12	0	19.58	19.65	19.72
		12	6	19.59	19.78	19.72
		12	11	19.53	19.72	19.70
		25	0	19.58	19.70	19.64

LTE Band / BW	Modulation	RB Size	RB Offset	Mid CH
				26740CH
				819MHz
26 / 10M	QPSK	1	0	22.47
		1	25	22.53
		1	49	22.51
		25	0	21.48
		25	13	21.59
		25	25	21.52
		50	0	21.57
	16QAM	1	0	21.90
		1	25	21.99
		1	49	21.98
		25	0	20.62
		25	13	20.69
		25	25	20.69
		50	0	20.68
	64QAM	1	0	20.70
		1	25	20.72
		1	49	20.72
		25	0	19.68
		25	13	19.80
		25	25	19.77
		50	0	19.75

LTE Band / BW	Modulation	RB Size	RB Offset	ERP (dBm)		
				Low CH	Mid CH	High CH
				26697CH	26740CH	26783CH
				814.7MHz	819MHz	823.3MHz
26 / 1.4M	QPSK	1	0	20.75	20.63	20.78
		1	2	20.78	20.71	20.87
		1	5	20.75	20.74	20.82
		3	0	20.78	20.68	20.77
		3	1	20.82	20.89	20.84
		3	2	20.79	20.85	20.79
		6	0	19.68	19.76	19.74
	16QAM	1	0	20.15	19.80	20.01
		1	2	20.26	19.88	20.08
		1	5	20.17	19.94	19.98
		3	0	20.05	20.02	20.01
		3	1	20.12	20.18	20.03
		3	2	20.02	20.11	19.97
		6	0	18.71	19.04	19.00
	64QAM	1	0	18.96	19.00	19.31
		1	2	19.02	19.05	19.40
		1	5	18.94	19.12	19.27
		3	0	19.02	18.81	19.32
		3	1	19.09	18.97	19.37
		3	2	19.03	18.91	19.25
		6	0	18.14	17.99	17.88

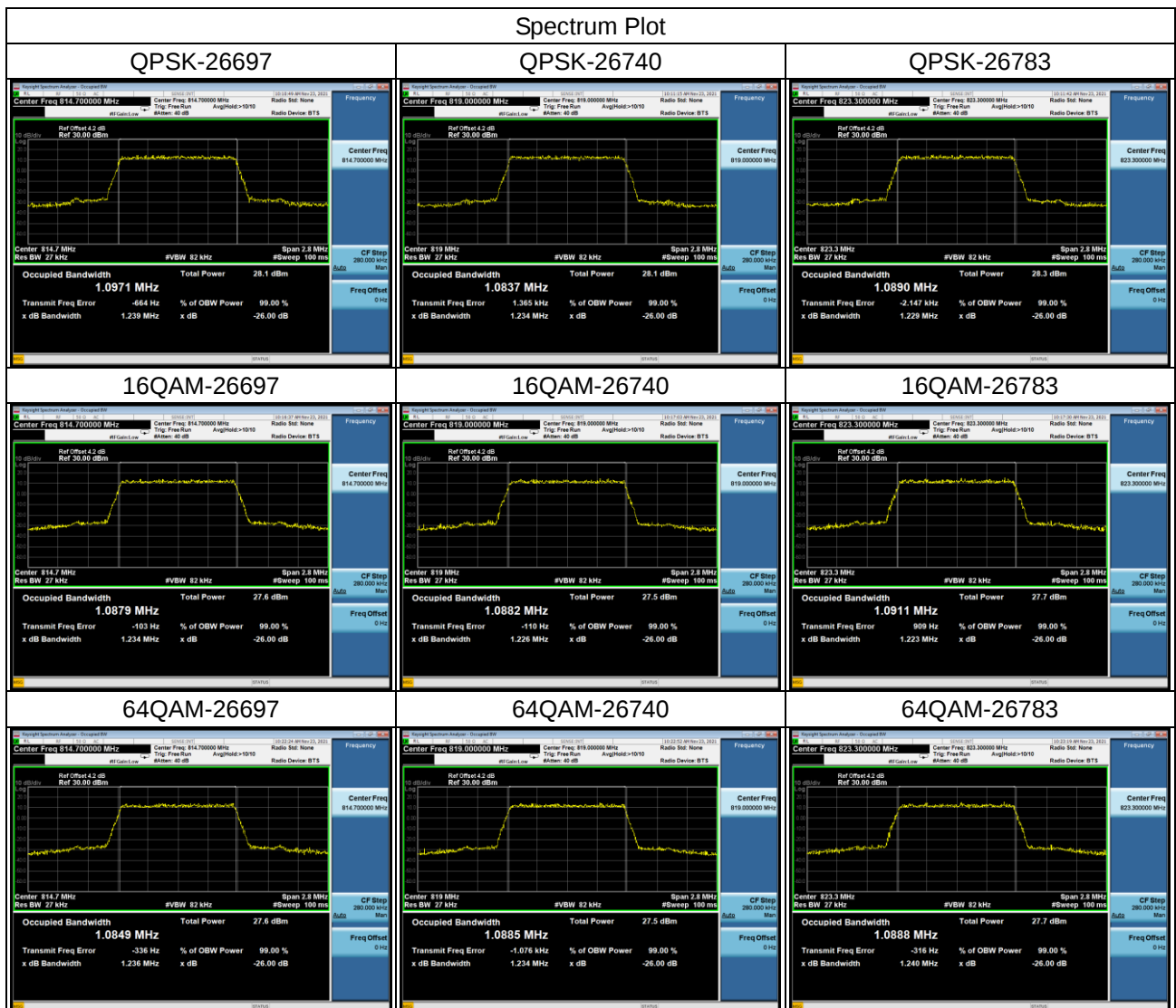
LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				26705CH	26740CH	26775CH
				815.5MHz	819MHz	822.5MHz
26 / 3M	QPSK	1	0	20.81	20.74	20.85
		1	7	20.90	20.77	20.90
		1	14	20.77	20.84	20.85
		8	0	19.81	19.76	19.86
		8	4	19.84	19.89	19.88
		8	7	19.78	19.83	19.84
		15	0	19.79	19.88	19.87
	16QAM	1	0	20.28	19.92	19.87
		1	7	20.32	19.96	19.92
		1	14	20.27	20.01	19.81
		8	0	18.98	18.92	19.04
		8	4	19.04	19.04	19.08
		8	7	18.94	19.00	19.05
		15	0	18.95	18.93	19.03
	64QAM	1	0	18.97	19.11	19.32
		1	7	19.12	19.13	19.36
		1	14	19.00	19.17	19.30
		8	0	17.96	17.85	18.06
		8	4	17.98	18.01	18.11
		8	7	17.96	17.92	18.06
		15	0	18.01	18.05	18.00

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				26715CH	26740CH	26765CH
				816.5MHz	819MHz	821.5MHz
26 / 5M	QPSK	1	0	20.83	20.87	21.01
		1	13	20.81	20.99	21.02
		1	24	20.75	20.93	20.94
		12	0	19.84	19.84	19.90
		12	6	19.87	19.94	19.91
		12	11	19.84	19.92	19.89
		25	0	19.83	19.94	19.93
	16QAM	1	0	20.44	20.02	20.17
		1	13	20.48	20.13	20.19
		1	24	20.43	20.09	20.12
		12	0	19.07	18.98	19.10
		12	6	19.09	19.06	19.10
		12	11	19.06	19.07	19.08
		25	0	19.01	18.96	19.04
	64QAM	1	0	19.23	19.15	18.93
		1	13	19.29	19.30	18.96
		1	24	19.20	19.27	18.92
		12	0	17.93	18.00	18.07
		12	6	17.94	18.13	18.07
		12	11	17.88	18.07	18.05
		25	0	17.93	18.05	17.99

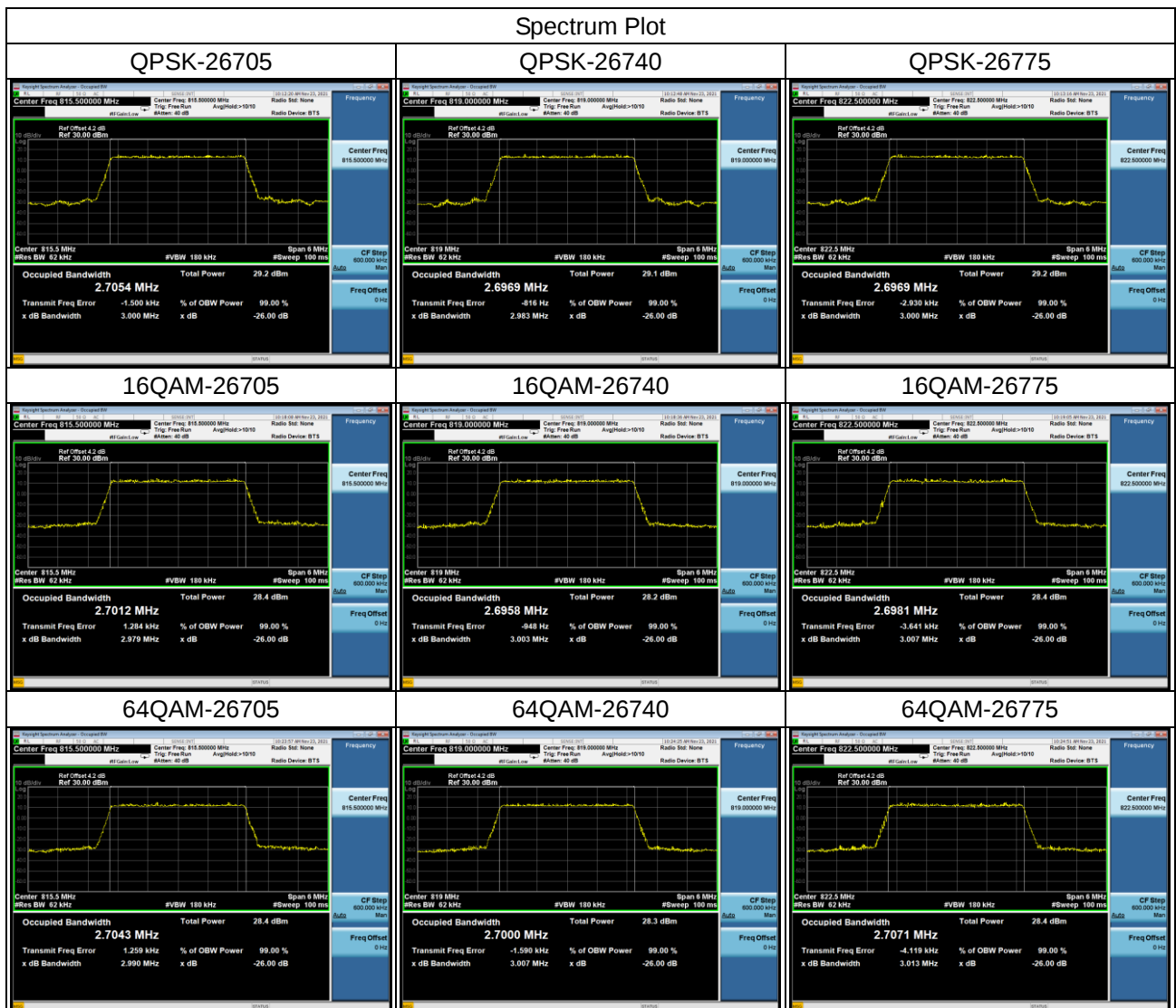
LTE Band / BW	Modulation	RB Size	RB Offset	Mid CH
				26740CH
				819MHz
26 / 10M	QPSK	1	0	20.82
		1	25	20.88
		1	49	20.86
		25	0	19.83
		25	13	19.94
		25	25	19.87
		50	0	19.92
	16QAM	1	0	20.25
		1	25	20.34
		1	49	20.33
		25	0	18.97
		25	13	19.04
		25	25	19.04
		50	0	19.03
	64QAM	1	0	19.05
		1	25	19.07
		1	49	19.07
		25	0	18.03
		25	13	18.15
		25	25	18.12
		50	0	18.10

APPENDIX B - OCCUPIED BANDWIDTH

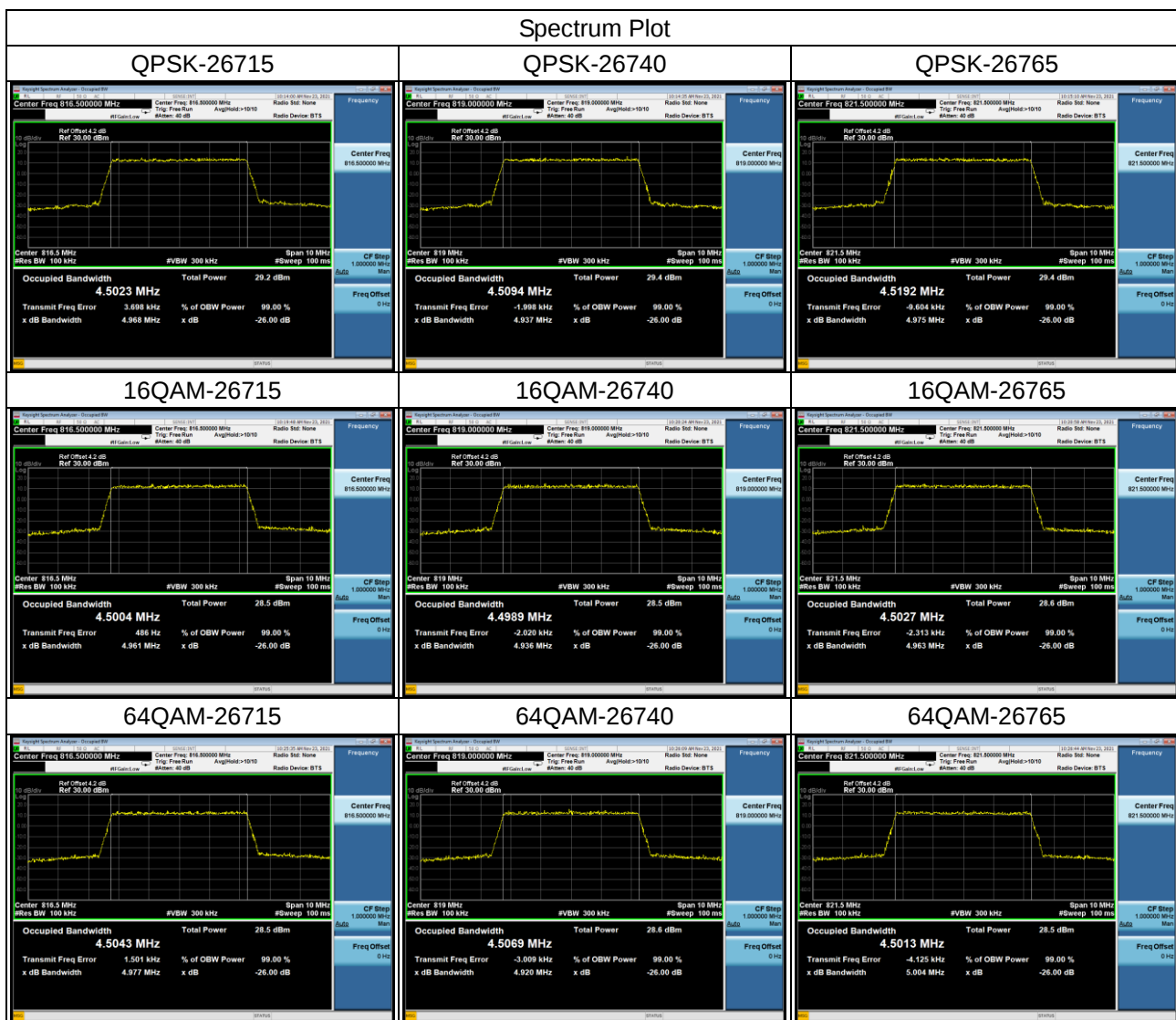
LTE Band 26_1.4MHz							
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)			26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
26697	814.7	1.0971	1.0879	1.0849	1.239	1.234	1.236
26740	819	1.0837	1.0882	1.0885	1.234	1.226	1.234
26783	823.3	1.0890	1.0911	1.0888	1.229	1.223	1.240



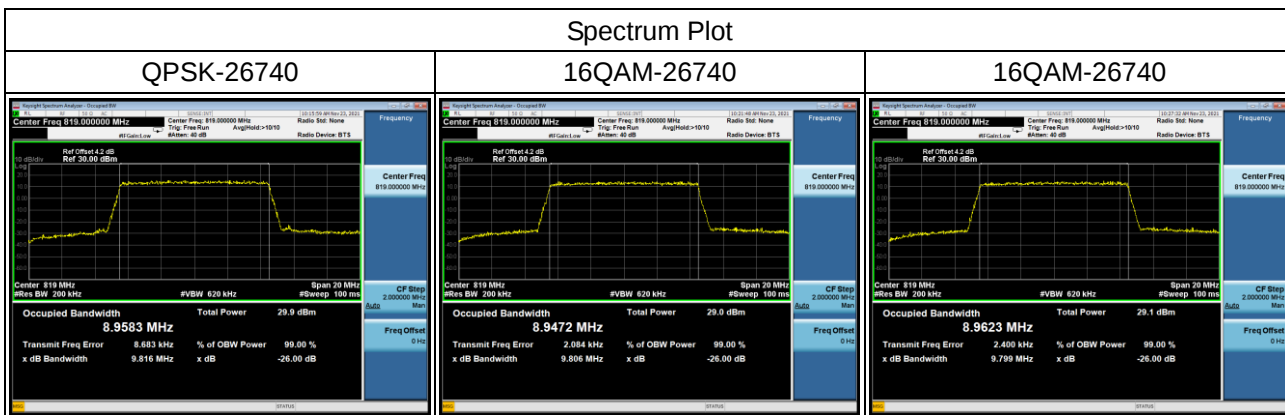
LTE Band 26_3MHz							
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)			26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
26705	815.5	2.7054	2.7012	2.7043	3.000	2.979	2.990
26740	819	2.6969	2.6958	2.7000	2.983	3.003	3.007
26775	822.5	2.6969	2.6981	2.7071	3.000	3.007	3.013



LTE Band 26_5MHz							
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)			26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
26715	816.5	4.5023	4.5004	4.5043	4.968	4.961	4.977
26740	819	4.5094	4.4989	4.5069	4.937	4.936	4.920
26765	821.5	4.5192	4.5027	4.5013	4.975	4.963	5.004

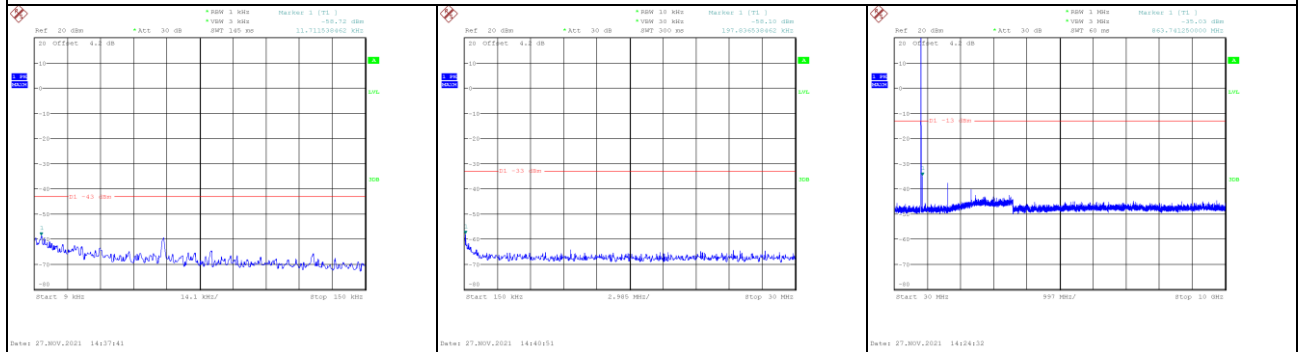


LTE Band 26_10MHz							
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)			26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
26740	819	8.9583	8.9472	8.9623	9.816	9.806	9.799

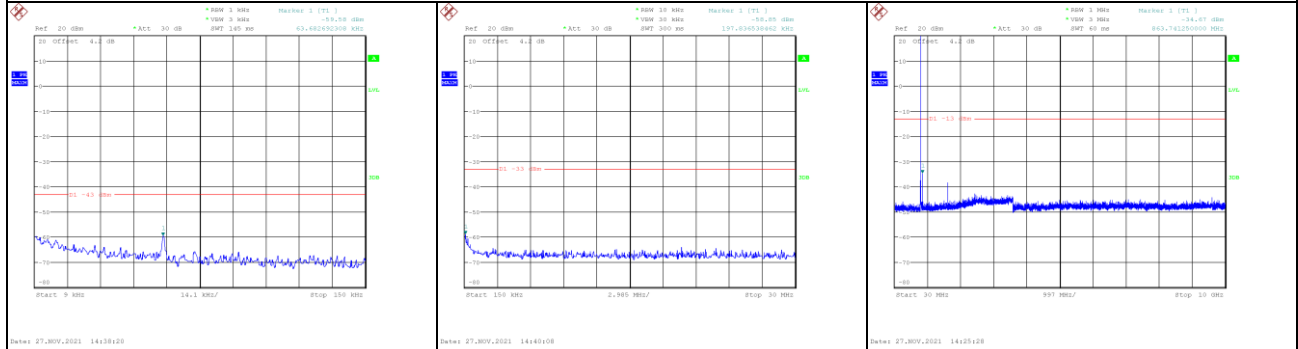


APPENDIX C - CONDUCTED SPURIOUS EMISSIONS

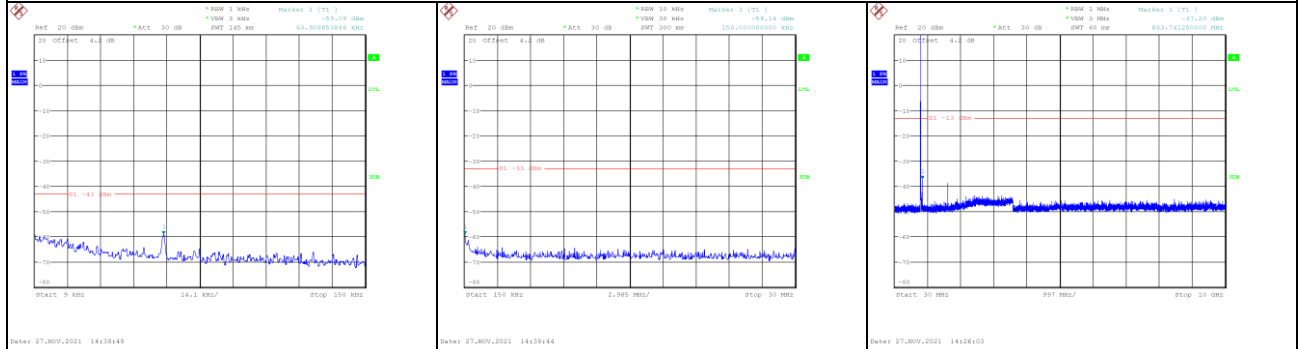
LTE Band 26_1.4MHz_CH26740 Spectrum Plot



LTE Band 26_5MHz_CH26740 Spectrum Plot



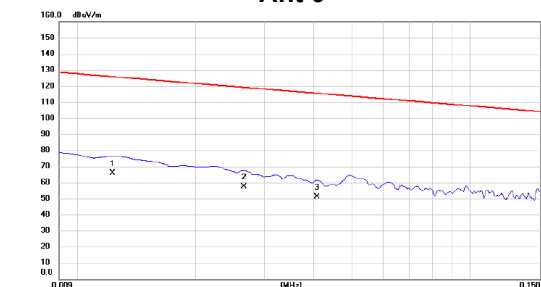
LTE Band 26_10MHz_CH26740 Spectrum Plot



APPENDIX D - RADIATED SPURIOUS EMISSIONS (9KHZ TO 30MHZ)

Test Mode : TX Mode

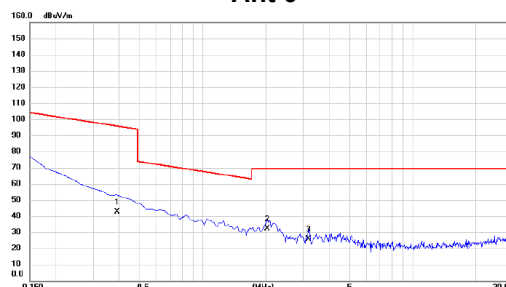
Ant 0°



No. Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Antenna Height	Table Degree	Comment
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	
1 *	0.0123	49.23	16.71	65.94	125.81	-59.87			AVG
2	0.0266	43.25	14.14	57.39	119.11	-61.72			AVG
3	0.0407	37.12	13.81	50.93	115.41	-64.48			AVG

Test Mode : TX Mode

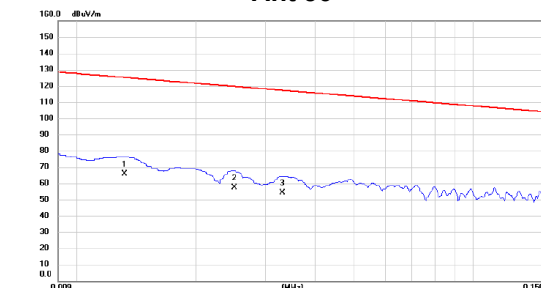
Ant 0°



No. Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Antenna Height	Table Degree	Comment
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	
1	0.3914	29.15	13.46	42.61	95.75	-53.14			AVG
2 *	2.0305	20.16	12.08	32.24	69.54	-37.30			QP
3	3.1947	14.26	11.72	25.98	69.54	-43.56			QP

Test Mode : TX Mode

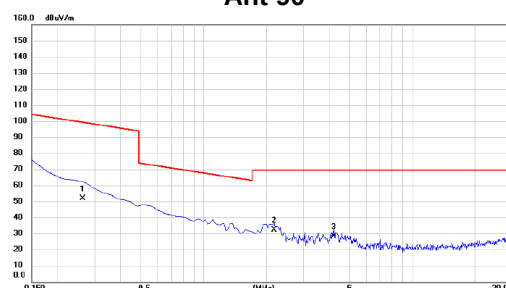
Ant 90°



No. Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Antenna Height	Table Degree	Comment
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	
1 *	0.0132	49.26	16.43	65.69	125.19	-59.50			AVG
2	0.0250	43.22	14.17	57.39	119.65	-62.26			AVG
3	0.0330	40.16	13.99	54.15	117.23	-63.08			AVG

Test Mode : TX Mode

Ant 90°

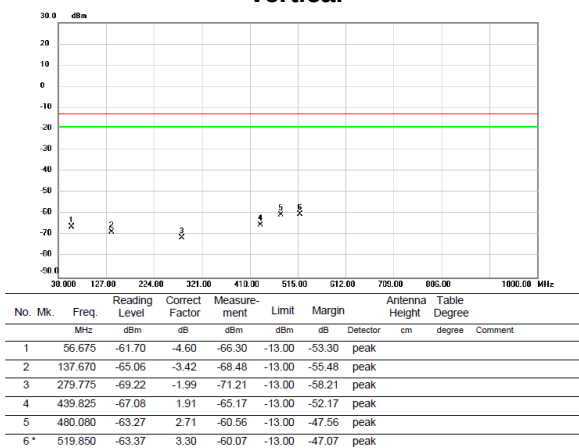


No. Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Antenna Height	Table Degree	Comment
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	
1	0.2621	38.16	13.59	51.75	99.24	-47.49			AVG
2 *	2.1798	20.14	12.02	32.16	69.54	-37.38			QP
3	4.1798	16.54	11.72	28.26	69.54	-41.28			QP

APPENDIX E - RADIATED SPURIOUS EMISSIONS (30MHZ TO 1000MHZ)

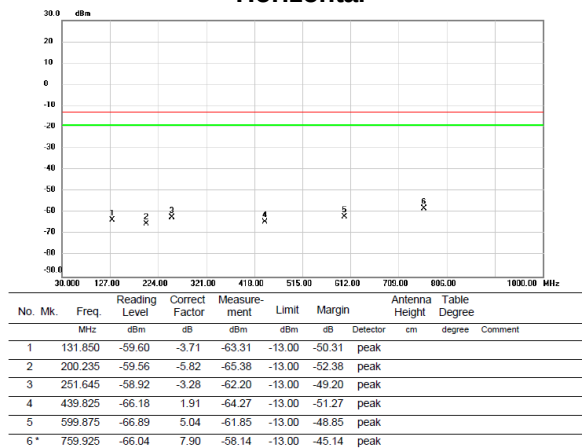
Test Mode : LTE Band 26_TX CH26740_1.4MHz

Vertical



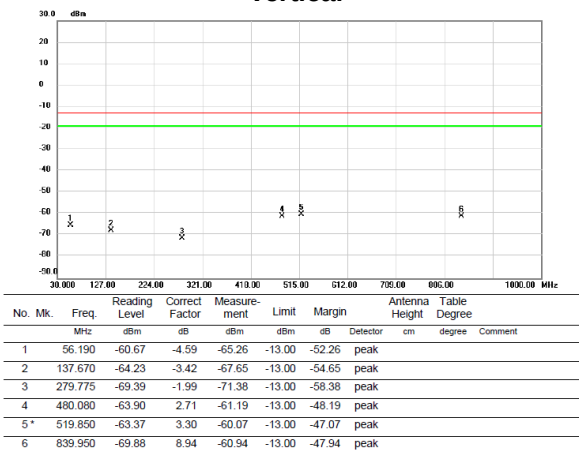
Test Mode : LTE Band 26_TX CH26740_1.4MHz

Horizontal



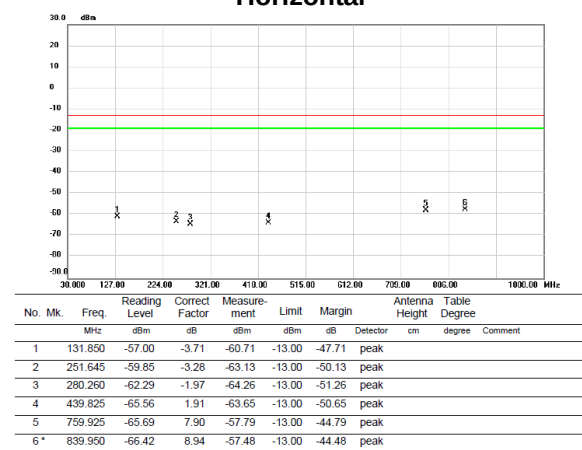
Test Mode : LTE Band 26_TX CH26740_5MHz

Vertical



Test Mode : LTE Band 26_TX CH26740_5MHz

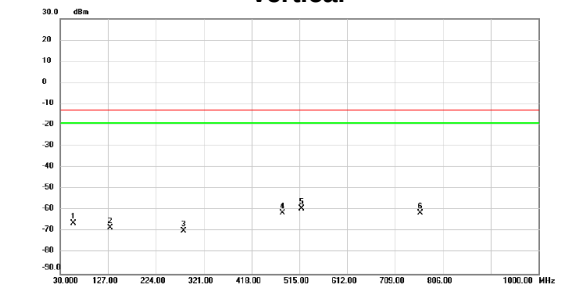
Horizontal



Test Mode : LTE Band 26_TX CH26740_10MHz

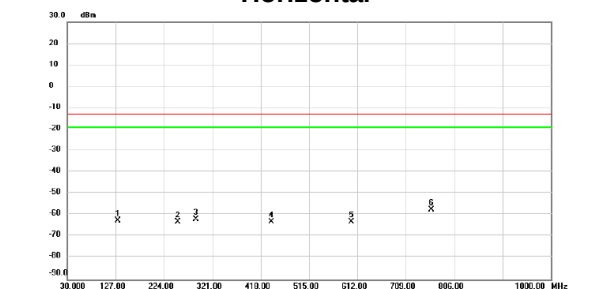
Test Mode : LTE Band 26_TX CH26740_10MHz

Vertical



No. Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Antenna Height	Table Degree	Comment
	MHz	dBm	dB	dBm	dBm	dB	cm	degree	
1	56.190	-61.67	-4.59	-66.26	-13.00	-53.26			peak
2	131.850	-64.44	-3.71	-68.15	-13.00	-55.15			peak
3	279.775	-67.81	-1.99	-69.80	-13.00	-56.80			peak
4	480.080	-64.20	2.71	-61.49	-13.00	-48.49			peak
5 *	519.850	-62.45	3.30	-59.15	-13.00	-46.15			peak
6	759.925	-69.37	7.90	-61.47	-13.00	-48.47			peak

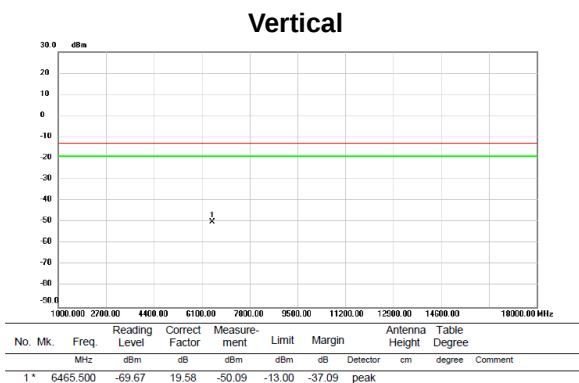
Horizontal



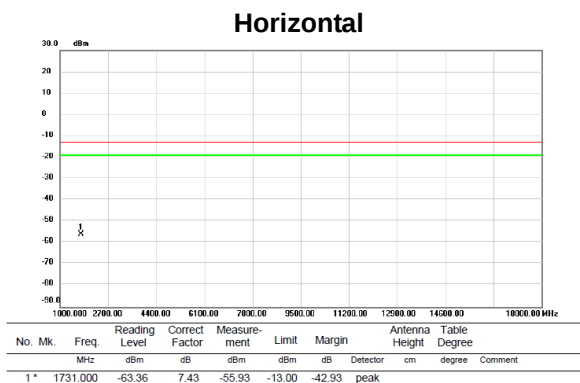
No. Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Antenna Height	Table Degree	Comment
	MHz	dBm	dB	dBm	dBm	dB	cm	degree	
1	131.850	-58.73	-3.71	-62.44	-13.00	-49.44			peak
2	251.645	-59.92	-3.28	-63.20	-13.00	-50.20			peak
3	287.535	-60.13	-1.72	-61.85	-13.00	-48.85			peak
4	439.825	-64.99	1.91	-63.08	-13.00	-50.08			peak
5	599.875	-68.08	5.04	-63.04	-13.00	-50.04			peak
6 *	759.925	-65.30	7.90	-57.40	-13.00	-44.40			peak

APPENDIX F - RADIATED SPURIOUS EMISSIONS (ABOVE 1000MHZ)

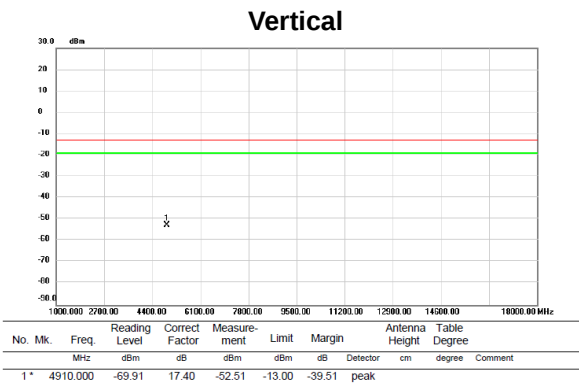
Test Mode : LTE Band 26_TX CH26740_1.4MHz



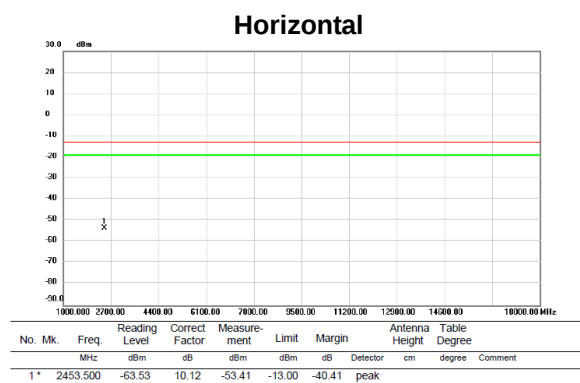
Test Mode : LTE Band 26_TX CH26740_1.4MHz



Test Mode : LTE Band 26_TX CH26740_5M



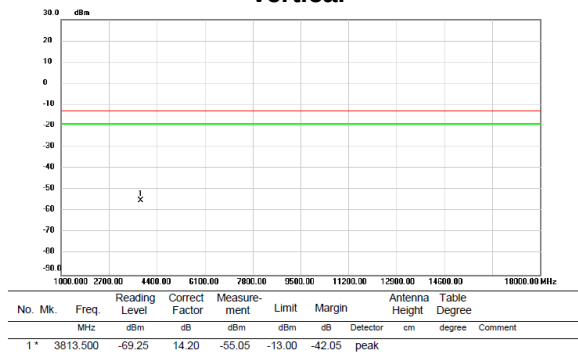
Test Mode : LTE Band 26_TX CH26740_5M



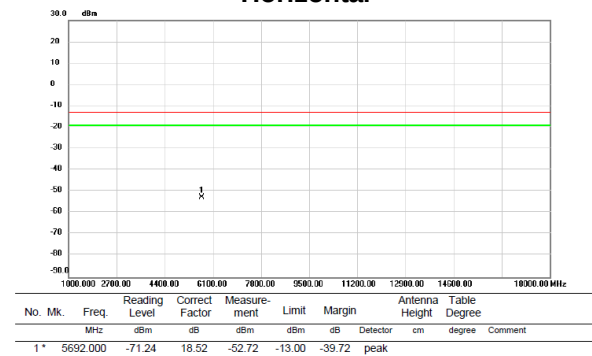
Test Mode : LTE Band 26_TX CH26740_10MHz

Test Mode : LTE Band 26_TX CH26740_10MHz

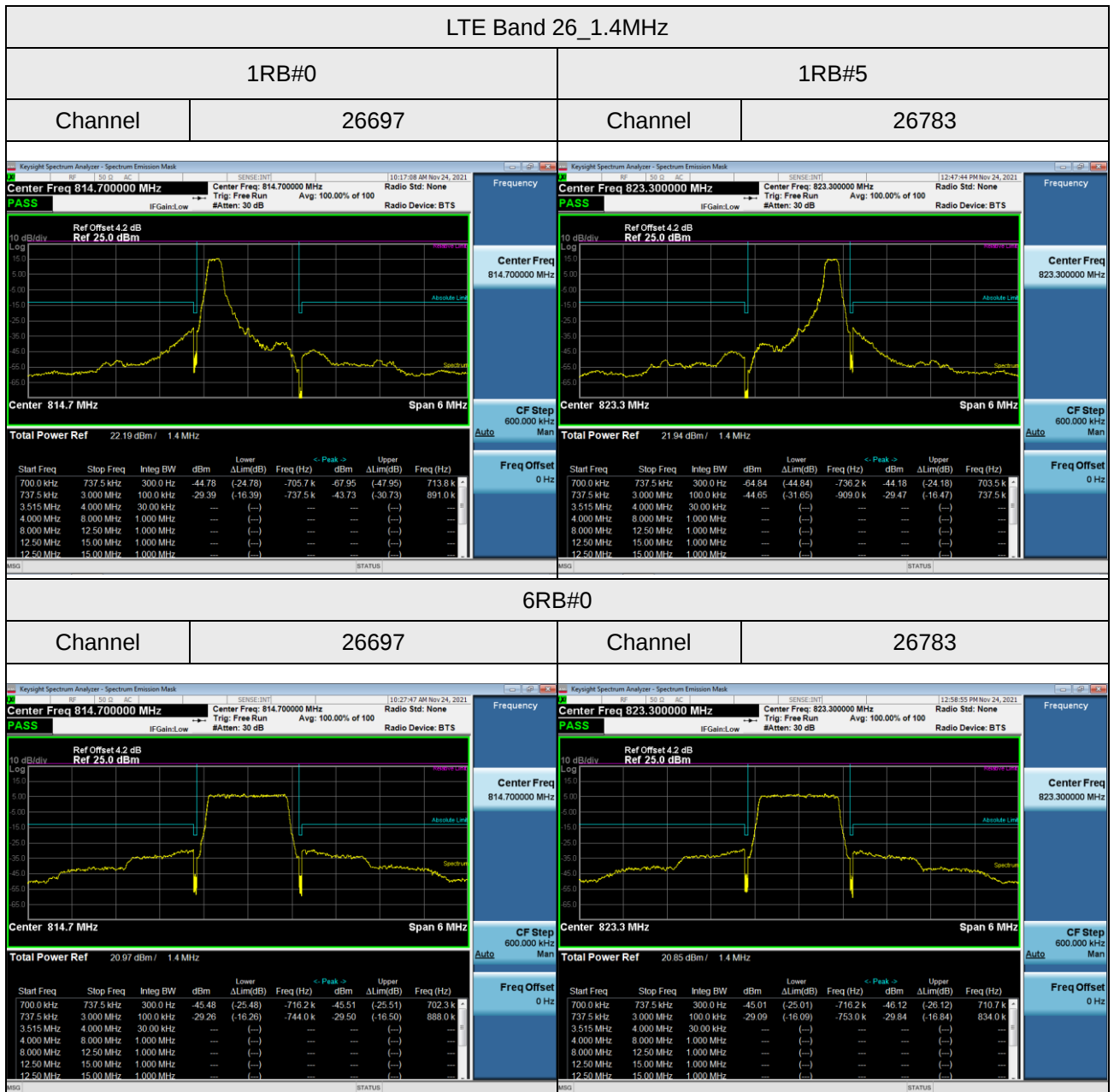
Vertical



Horizontal



APPENDIX G - MASK



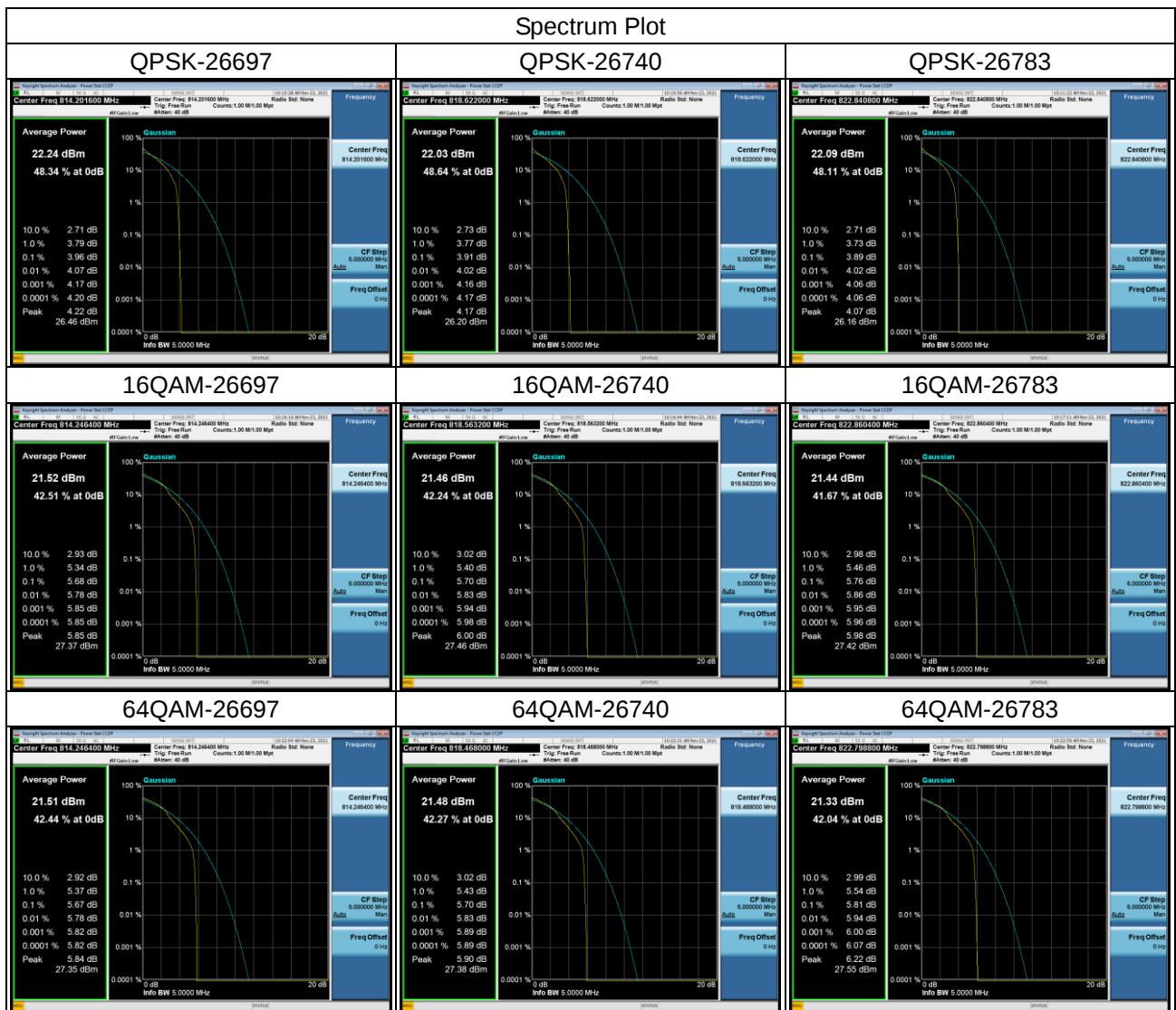




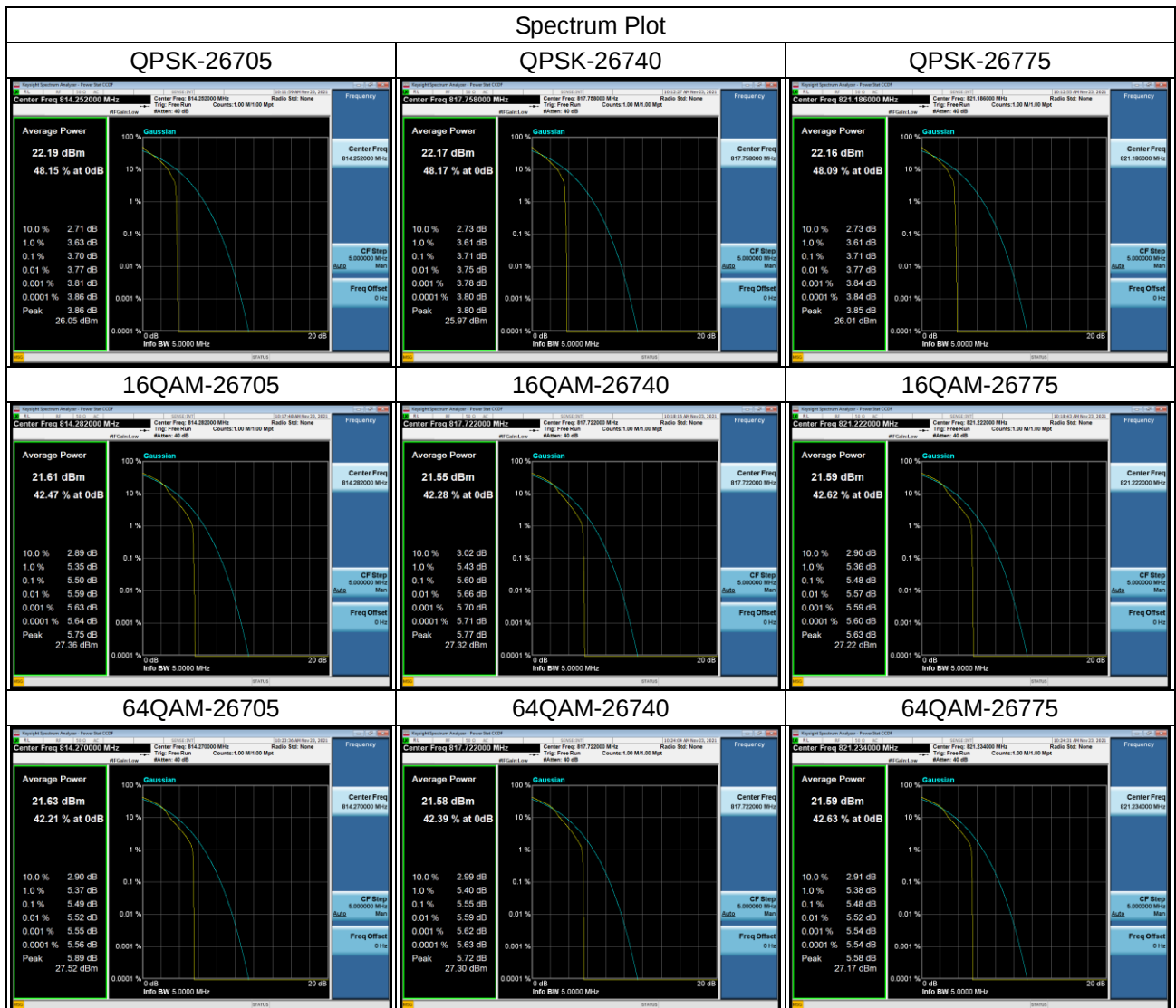


APPENDIX H - PEAK TO AVERAGE RATIO

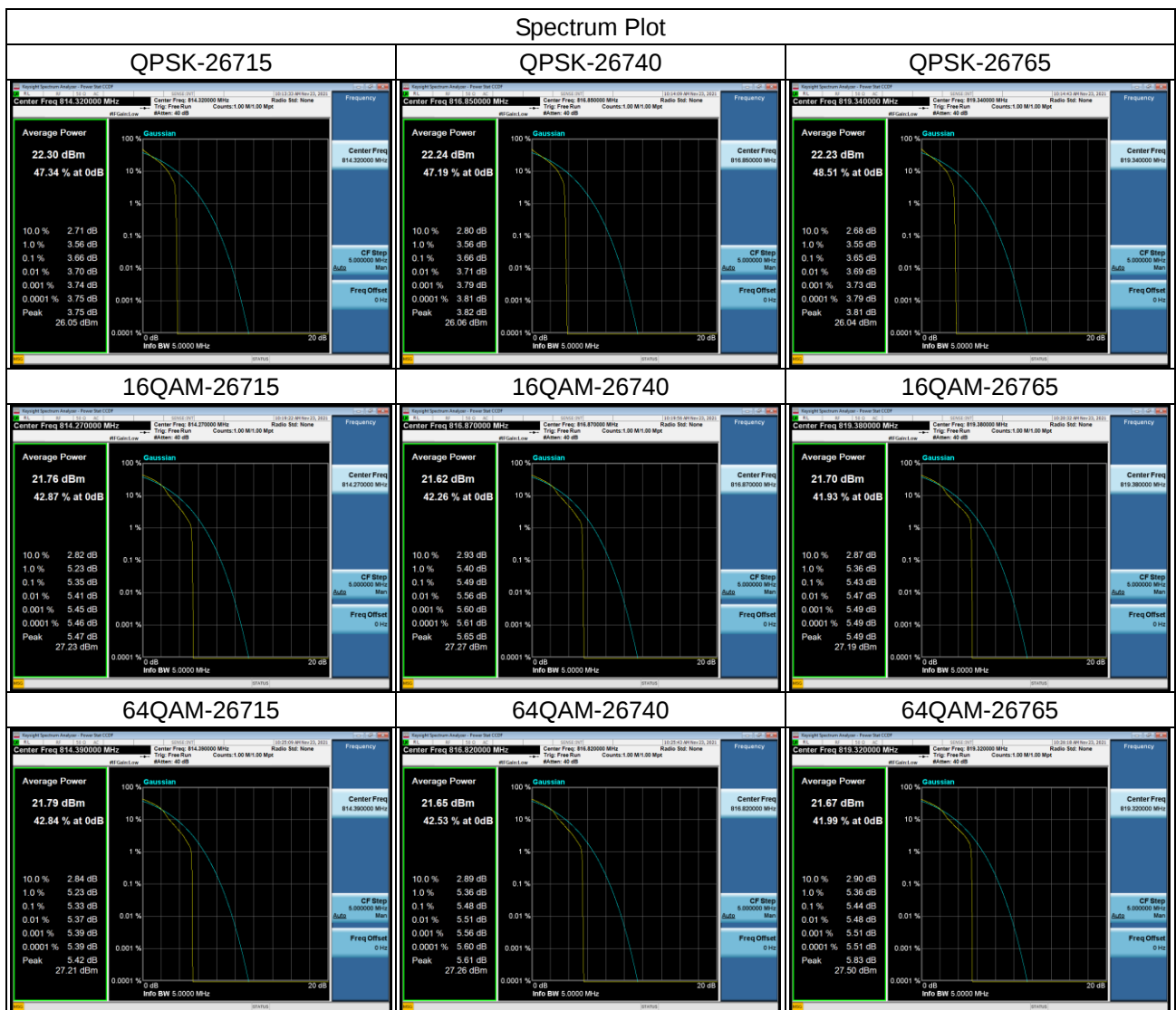
LTE Band 26_1.4MHz						
Channel	Frequency (MHz)	Peak To Average Ratio (dB)			Max. Limit (dB)	Result
		QPSK	16QAM	64QAM		
26697	814.7	3.96	5.68	5.67	13	Pass
26740	819	3.91	5.70	5.70	13	Pass
26783	823.3	3.89	5.76	5.81	13	Pass



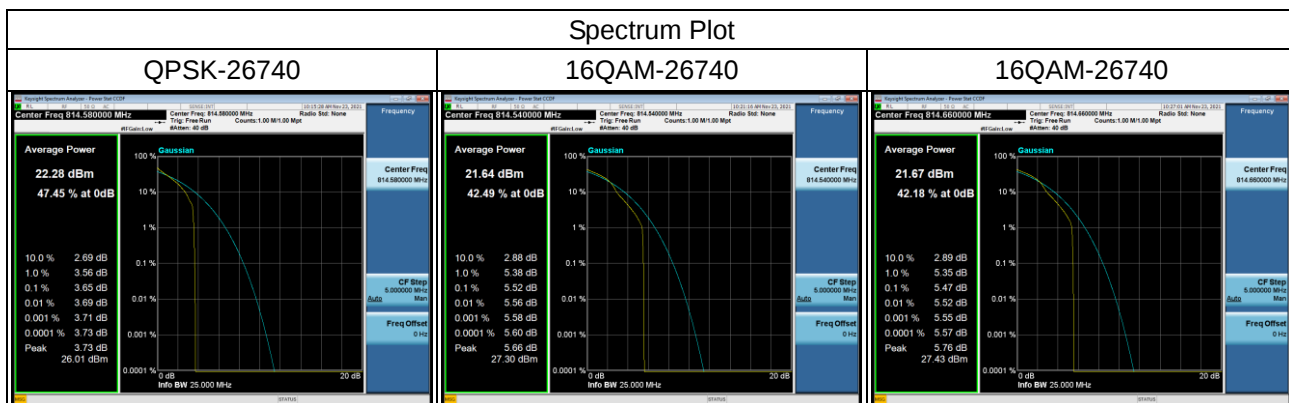
LTE Band 26_3MHz						
Channel	Frequency (MHz)	Peak To Average Ratio (dB)			Max. Limit (dB)	Result
		QPSK	16QAM	64QAM		
26705	815.5	3.70	5.50	5.49	13	Pass
26740	819	3.71	5.60	5.55	13	Pass
26775	822.5	3.71	5.48	5.48	13	Pass



LTE Band 26_5MHz						
Channel	Frequency (MHz)	Peak To Average Ratio (dB)			Max. Limit (dB)	Result
		QPSK	16QAM	64QAM		
26715	816.5	3.66	5.35	5.33	13	Pass
26740	819	3.66	5.49	5.48	13	Pass
26765	821.5	3.65	5.43	5.44	13	Pass



LTE Band 26_10MHz						
Channel	Frequency (MHz)	Peak To Average Ratio (dB)			Max. Limit (dB)	Result
		QPSK	16QAM	64QAM		
26740	819	3.65	5.52	5.47	13	Pass



APPENDIX I - FREQUENCY STABILITY

Test Mode	LTE Band 26_CH26740_10MHz
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Frequency error versus temperature and supply voltage			
Temperature (°C)	Frequency error (Hz)	ppm	Limit
50	38	0.05	±2.5ppm
40	-35	-0.04	
30	-19	-0.02	
20	-16	-0.02	
10	22	0.03	
0	-6	-0.01	
-10	4	0.00	
-20	-22	-0.03	
-30	8	0.01	
Minimun Voltage	45	0.05	
Maximun Voltage	47	0.06	
Normal Voltage	42	0.05	

Note: Nominal voltage= 3.8V, Maximum voltage= 4.2V, Minimum voltage= 3.5V.

End of Test Report