

Product Name: LTE Cat-M1 Tracker	Report No: FCC022022-05738RF12(d)
Product Model: ATD521	Security Classification: Open
Version: V1.0	Total Page: 51

Testing Report



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FCC Radio Test Report

FCC ID: 2AH4HATD521

This report concerns: Original Grant

Project No. : 2022-05738
Equipment : LTE Cat-M1 Tracker
Brand Name : Mobilogix
Test Model : ATD521
Series Model : NA
Applicant : Mobilogix, Inc.
Address : 5500 Trabuco Rd Suite 150 Irvine, CA, USA
Manufacturer : Mobilogix, Inc.
Address : 5500 Trabuco Rd Suite 150 Irvine, CA, USA
Factory : Suga Electronics (Dongguan) Co., Ltd.
Address : No.8 Fulong Road, Qingxi Town, Dongguan City
Date of Receipt : Aug. 05, 2022
Date of Test : Aug. 09, 2022 ~ Aug. 25, 2022
Issued Date : Nov. 04, 2022
Report Version : V1.0
Test Sample : Engineering Sample No.: 20221103019315
Standard(s) : 47 CFR FCC Part 90 Subpart S
47 CFR FCC Part 2
ANSI C63.26-2015
ANSI/TIA/EIA-603-E-2016
FCC KDB 971168 D01 Power Meas License Digital Systems v03r01

- The test result referred exclusively to the presented test model /sample.
- Without written approval of TIRT Inc. the test report shall not reproduced except in full.

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REPORT ISSUED HISTORY

Report No.	Version	Description	Issued Date	Note
FCC022022-05738RF12(d)	V1.0	Original Report.	2022.11.04	Valid

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

Company:	Beijing TIRT Technology Service Co.,Ltd Shenzhen
Address:	101, 3 # Factory Building, Gongjin Electronics Shatin Community, Kengzi Street, Pingshan District, Shenzhen, China
CNAS Registration Number:	CNAS L14158
A2LA Registration Number:	6049.01
FCC Accredited Lab. Designation Number:	CN1309
FCC Test Firm Registration Number:	825524
Telephone:	+86-0755-27087573

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:

Uncertainty	
Parameter	Uncertainty
Occupied Channel Bandwidth	±142.12 KHz
RF power conducted	±0.74 dB
RF power radiated	±3.25dB
Spurious emissions, conducted	±1.78dB
Spurious emissions, radiated (30MHz~1GHz)	±4.6dB
Spurious emissions, radiated (1GHz ~ 18GHz)	±4.9dB
Conduction Emissions(150kHz~30MHz)	±3.1 dB
Humidity	±4.6%
Temperature	±0.7°C
Time	±1.25%

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	23°C	41%	DC 3.7V	Stone Tang
Occupied Bandwidth	23°C	41%	DC 3.7V	Stone Tang
Conducted Spurious Emissions	23°C	41%	DC 3.7V	Stone Tang
Radiated Spurious Emissions (9 kHz to 30 MHz)	25°C	55%	AC 120V/60Hz	Stone Tang
Radiated Spurious Emissions (30 MHz to 1000 MHz)	24°C	50%	AC 120V/60Hz	Stone Tang
Radiated Spurious Emissions (Above 1000 MHz)	24°C	51%	AC 120V/60Hz	Stone Tang
Mask Measurements	23°C	41%	DC 3.7V	Stone Tang
Peak To Average Ratio	23°C	41%	DC 3.7V	Stone Tang
Frequency Stability	Normal & Extreme	41%	Normal & Extreme	Stone Tang

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	LTE Cat-M1 Tracker			
Brand Name	Mobilogix			
Test Model	ATD521			
Series Model	NA			
Model Difference(s)	There are 3 types of this product: 1. Type L: MCU model: EFR32BG12P232F512GM68-CR. 2. Type S: MCU model: EFR32BG12P232F1024GM68-CR. Compared to the Type L, only the memory is different. 3. Type D: The same as Type L, but the labels are different, the customer are different. The difference does not affect RF characteristics, and type L is the main test model.			
Power Source	1# DC Voltage supplied from AC adapter. Model: ADS-10LA-06 05010EPCU 2# Supplied from battery.			
Power Rating	1# I/P: 100-240V ~ 50/60Hz MAX 0.3A O/P: 5V \equiv 2.0A 2# DC 3.7V / 3000mAh			
LTE Category	M1			
IMEI No.	Radiated	864351051515882		
	Conducted	864351051515635		
Modulation Type	LTE	UL: QPSK,16QAM DL: QPSK,16QAM		
Max. ERP	LTE	Channel Bandwidth (MHz)	QPSK (dBm)	16QAM (dBm)
		1.4	20.30	19.44
	Band 26	3	20.53	19.13
		5	20.51	19.88
		10	20.38	19.90

Note:

- 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	P/N	Antenna Type	Connector	Gain (dBi)	Note
ethertronics	1004795	Internal	N/A	1.6	LTE Band 26

Note: The antenna gain is provided by the manufacturer.

2.2 DESCRIPTION OF TEST MODES

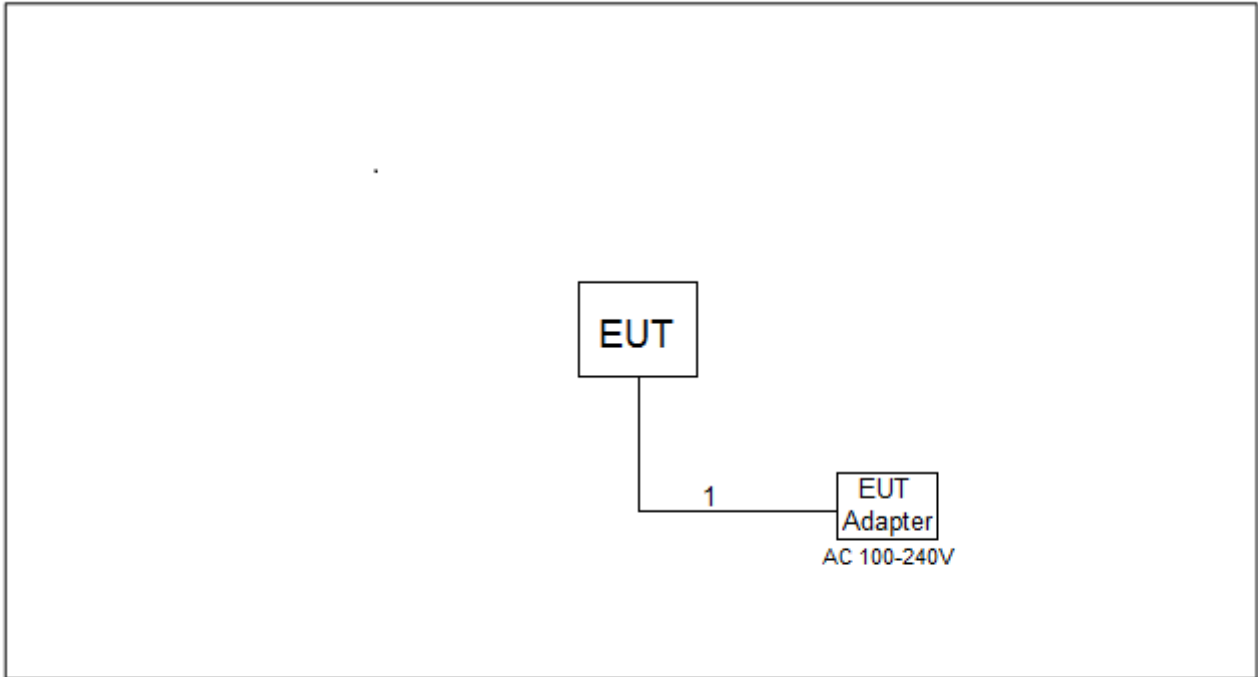
Following mode(s) is (were) found to be the worst case(s) and selected for the final test.

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	1RB/5RB/6RB
	26705 to 26775	26705, 26740, 26775	3MHz	QPSK, 16QAM	1RB/5RB/6RB
	26715 to 26765	26715, 26740, 26765	5MHz	QPSK, 16QAM	1RB/5RB/6RB
	26740	26740	10MHz	QPSK, 16QAM	1RB/5RB/6RB
Occupied Bandwidth	26697 to 26783	26697, 26740, 26783	1.4MHz	QPSK, 16QAM	5RB/6RB
	26705 to 26775	26705, 26740, 26775	3MHz	QPSK, 16QAM	5RB/6RB
	26715 to 26765	26715, 26740, 26765	5MHz	QPSK, 16QAM	5RB/6RB
	26740	26740	10MHz	QPSK, 16QAM	5RB/6RB
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/6RB
	26715 to 26765	26715, 26765	5MHz	QPSK	1RB/6RB
	26740	26740	10MHz	QPSK	1RB/6RB
Peak To Average Ratio	26697 to 26783	26697, 26740, 26783	1.4MHz	QPSK, 16QAM	1RB
	26705 to 26775	26705, 26740, 26775	3MHz	QPSK, 16QAM	1RB
	26715 to 26765	26715, 26740, 26765	5MHz	QPSK, 16QAM	1RB
	26740	26740	10MHz	QPSK, 16QAM	1RB
Frequency Stability	26715 to 26765	26740	10MHz	QPSK	6RB

Note:

1. QPSK modulation mode supports the highest RB size up to 6RB and 16QAM modulation mode supports the highest RB size up to 5RB.

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



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	Brand	Model No.	Series No.
-	-	-	-	-

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

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:

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

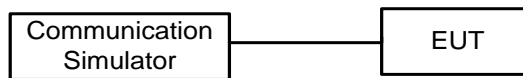
$ERP = EIPR - 2.15\text{dBi}$.

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.

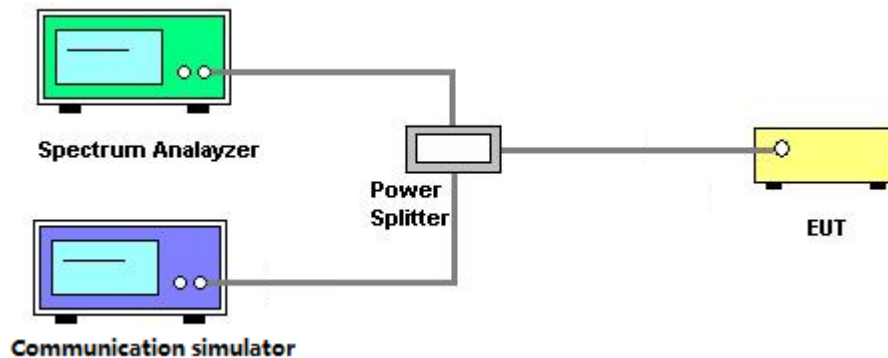
3.2 OCCUPIED BANDWIDTH MEASUREMENT

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

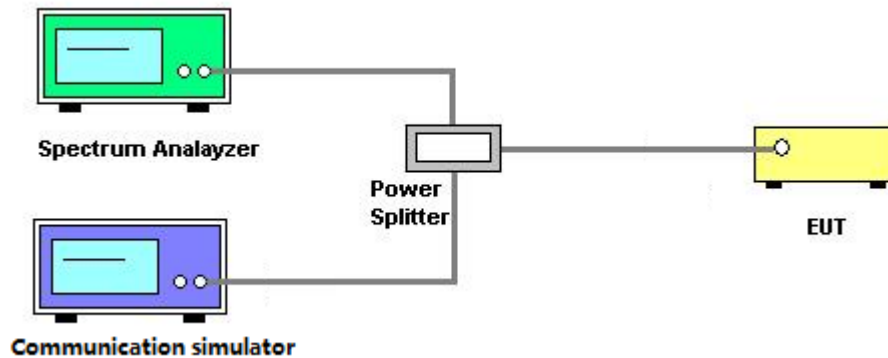
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. The emission limit equal to -13dBm.

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.

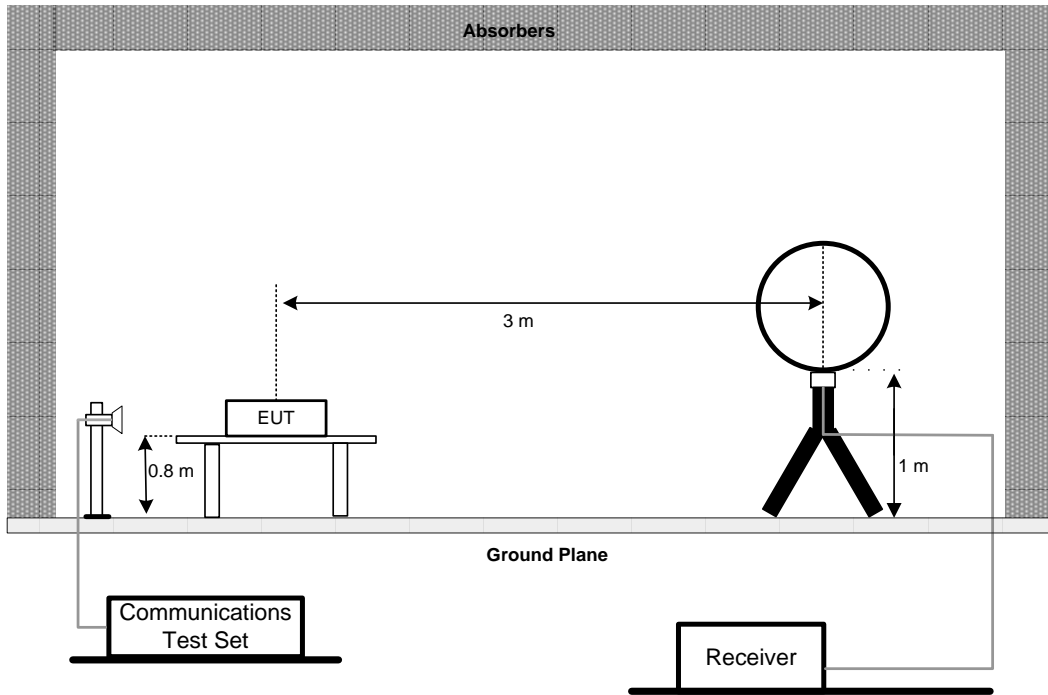
3.4.2 TEST PROCEDURES

The testing follows FCC KDB 971168 v03r01 Section 5.8.

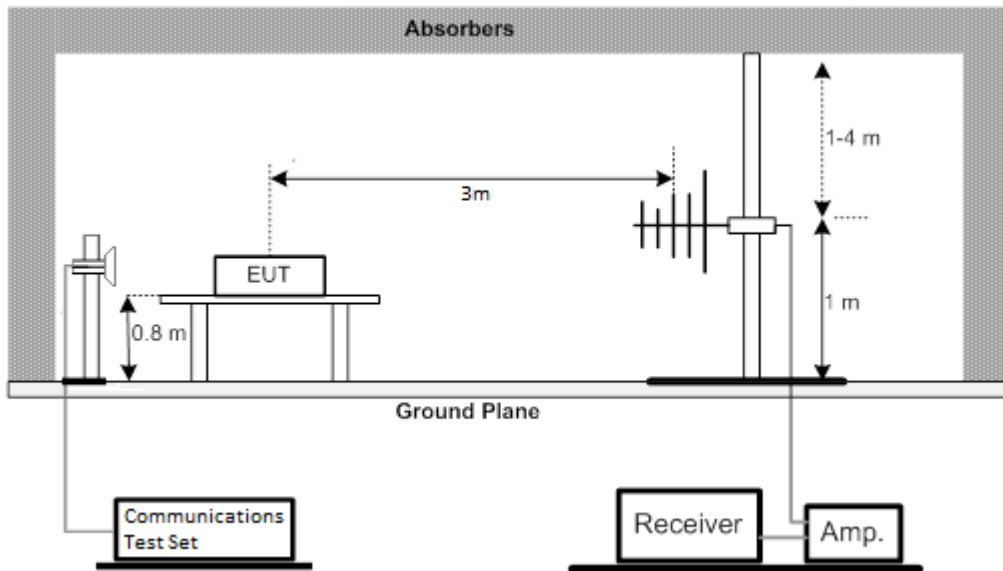
1. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. 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.

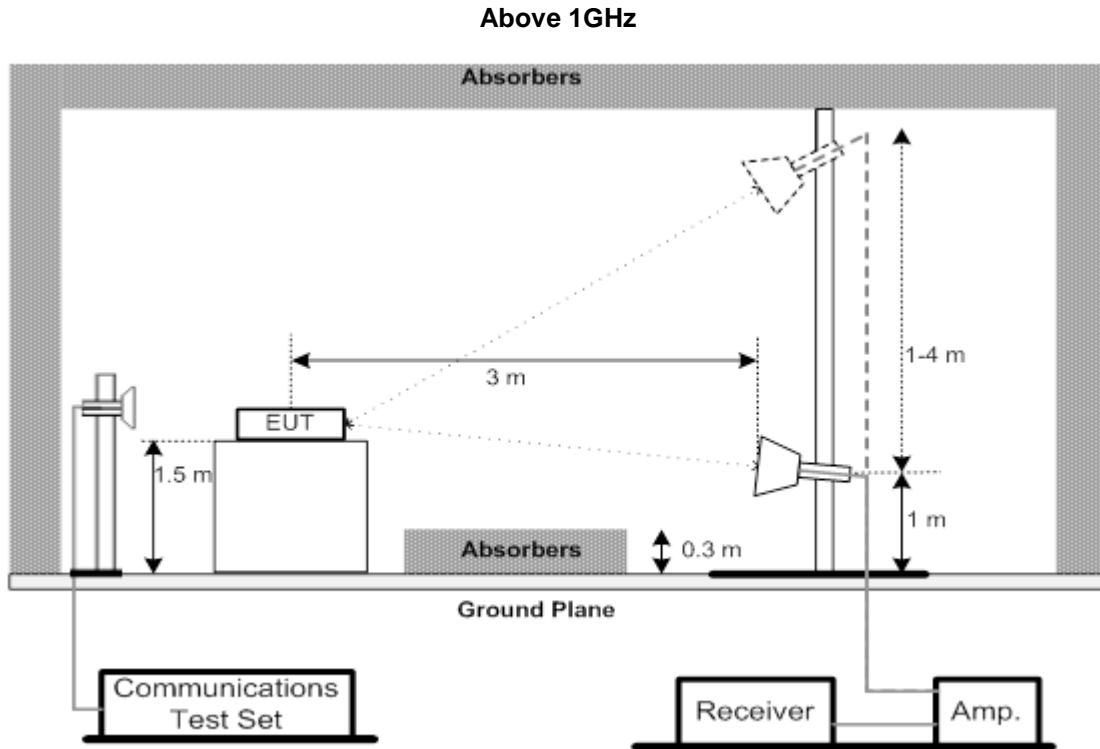
3.4.3 TEST SETUP LAYOUT

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

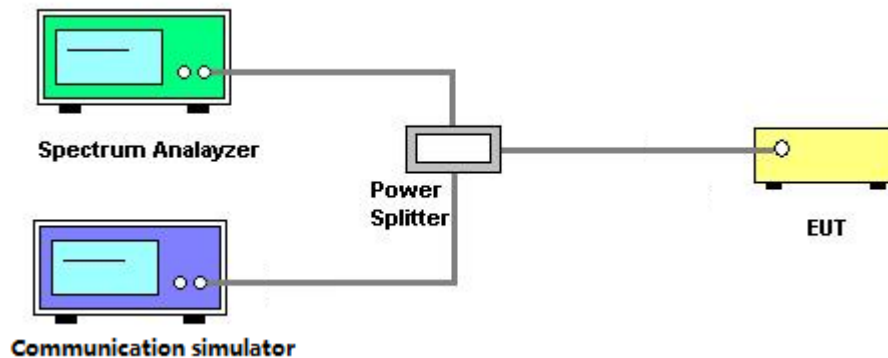
According to FCC part 90.691 shall be tested the emission mask. For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $116 \log_{10}(f/6.1)$ decibels or $50 +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

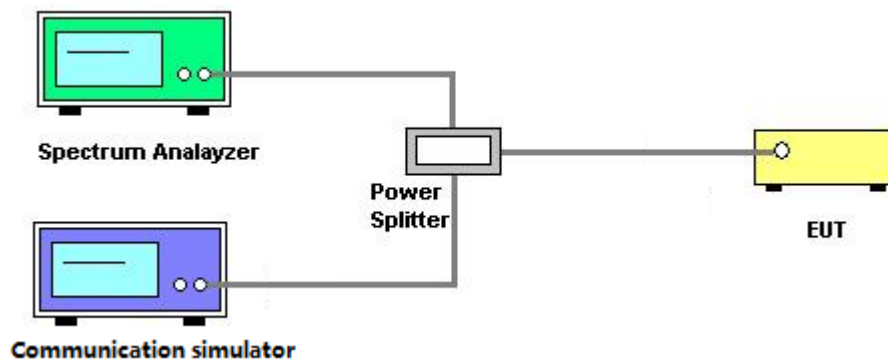
In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB.

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

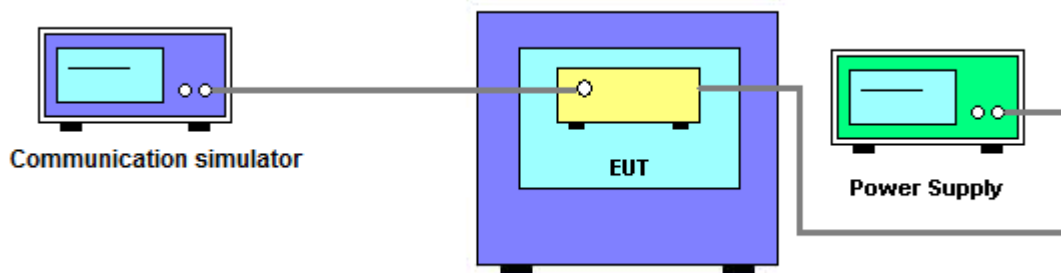
± 1.5 ppm is for base and fixed station. ± 2.5 ppm is for mobile station.

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

Main Test Equipment					
No.	Equipment Name	Manufacturer	Model	Calibrated date	Calibrated until
1	DC Power Supply	Keysight	E3642A	2021/11/10	2022/11/09
2	Wideband Radio Communication Tester	R & S	CMW 500	2021/11/03	2022/11/02
3	MXA Signal Analyzer	Keysight	N9020B	2021/11/10	2022/11/09
4	Programmable Temperature & Humidity Chamber	ETMOA	NTH1100-30A	2021/11/10	2022/11/09
5	Temperature&Humidity Recorder	Anymetre	JR900	2021/11/10	2022/11/09
6	Integral Antenna	SCHWARZBECK	VULB9163	2021/11/10	2022/11/09
7	Loop Antenna	SCHWARZBECK	FMZB1519B	2021/11/10	2022/11/09
8	Horn Antenna	SCHWARZBECK	BBHA 9170	2021/11/10	2022/11/09
9	Double Ridged Broadband Horn Antenna	SCHWARZBECK	BBHA 9120D	2021/11/10	2022/11/09
10	Spectrum Analyzer	R & S	FSV30	2021/11/10	2022/11/09
11	EMI Receiver	R & S	ESR	2021/11/10	2022/11/09
12	Broadband amplifier	SCHWARZBECK	BBV9718	2021/11/10	2022/11/09
13	Broadband amplifier	SCHWARZBECK	BBV9721	2021/11/10	2022/11/09
14	Anechoic Chamber	ZHONGSHUO	FSAC318	2021/07/17	2024/07/16
15	RF Cable	Top Precision	BLU18A-Sm-2m	2021/11/10	2022/11/09
16	RF Cable	Top Precision	BLU18A-Sm-2m	2021/11/10	2022/11/09
17	RF Cable	ZDECL	ZT40-2.92J-6M	2021/11/10	2022/11/09
18	Band Reject Filter Group	Tonscend	JS0806-F	NA	NA

Software Information			
Test Item	Software Name	Manufacturer	Version
RSE	EZ-EMC	EZ-EMC	TW-03A2
Conducted RF	JS1120 RF Test System	Shenzhen JS tonscend co., Ltd	2.6.9.0826

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.

APPENDIX A - OUTPUT POWER

Output Power (dBm)

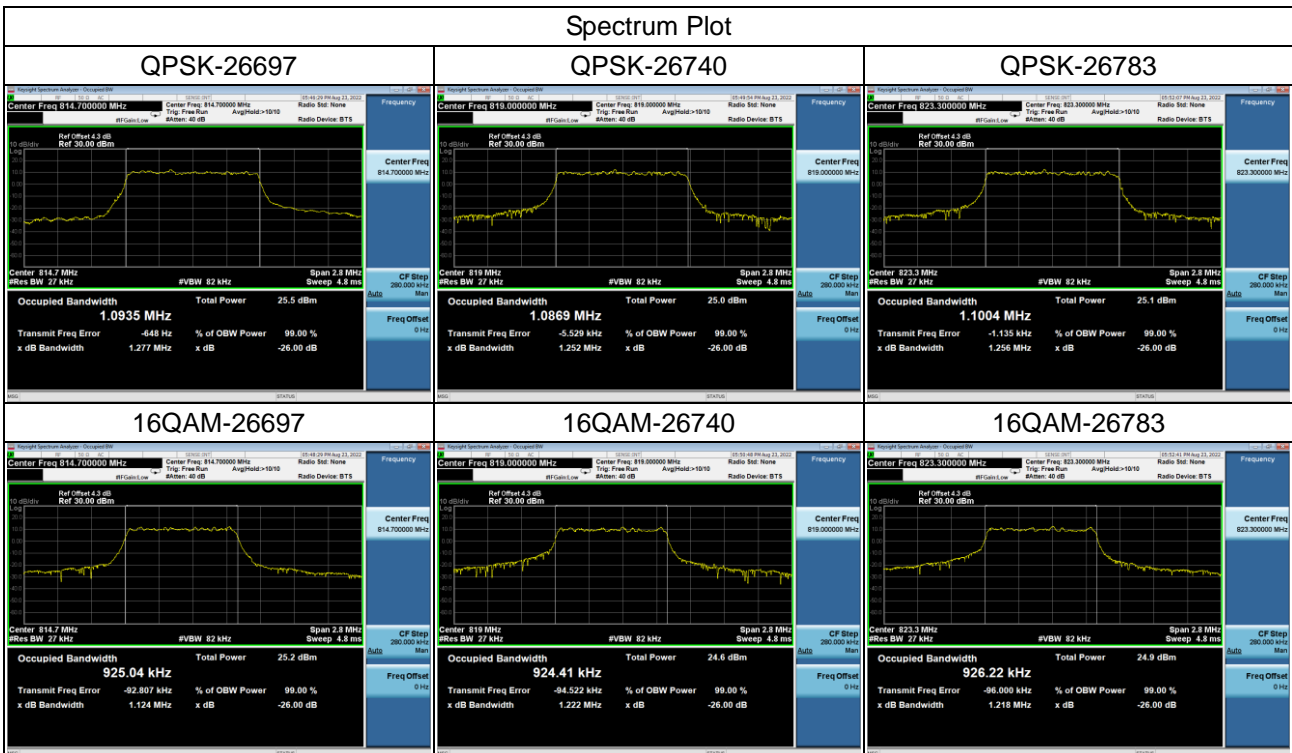
LTE Band / BW	Channel / Frequency (MHz)	RB Size	RB Offset	Index	Conducted Power (dBm)	RB Size	RB Offset	Index	Conducted Power (dBm)
					QPSK				16QAM
26 / 1.4MHz	26697 / 814.7	1	0	0	20.85	1	0	0	19.40
		6	0	0	18.30	5	0	0	18.32
	26740 / 819	1	0	0	20.37	1	0	0	19.99
		6	0	0	18.53	5	0	0	18.35
	26783 / 823.3	1	5	0	20.62	1	5	0	19.48
		6	0	0	18.60	5	0	0	18.33
26 / 3MHz	26705 / 815.5	1	0	0	20.68	1	0	0	19.53
		6	0	0	18.44	5	0	0	18.23
	26740 / 819	1	0	0	21.08	1	0	0	19.68
		6	0	0	18.73	5	0	0	18.63
	26775 / 822.5	1	5	1	20.85	1	5	1	19.53
		6	0	1	18.71	5	0	1	18.50
26 / 5MHz	26715 / 816.5	1	0	3	20.27	1	0	3	19.85
		6	0	0	19.48	5	0	0	19.51
	26740 / 819	1	0	0	21.06	1	0	0	20.43
		6	0	0	19.50	5	0	0	19.59
	26765 / 821.5	1	5	0	20.87	1	5	0	20.39
		6	0	3	19.16	5	0	3	19.12
26 / 10MHz	26740 / 819	1	0	0	20.93	1	0	0	20.45
		4	0	0	20.41	5	0	0	20.09

ERP (dBm)

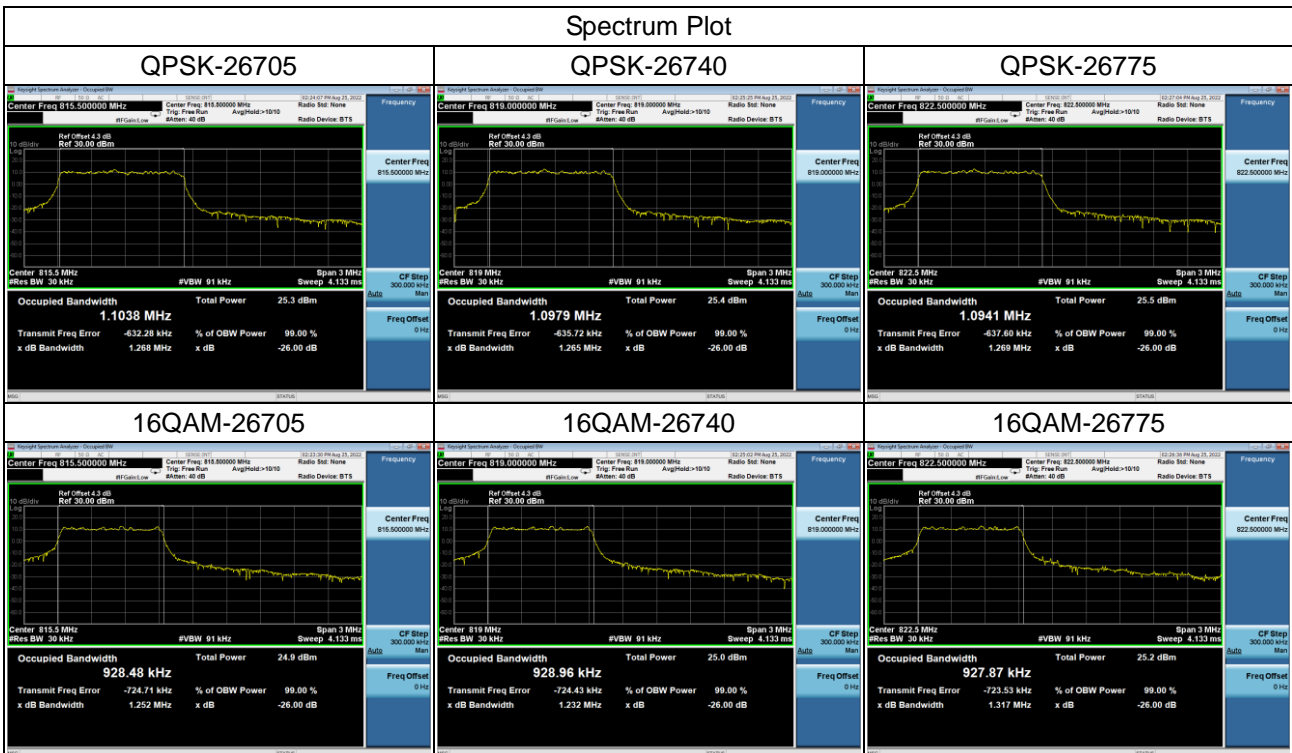
LTE Band / BW	Channel / Frequency (MHz)	RB Size	RB Offset	Index	ERP (dBm)	RB Size	RB Offset	Index	ERP (dBm)
					QPSK				16QAM
26 / 1.4MHz	26697 / 814.7	1	0	0	20.30	1	0	0	18.85
		6	0	0	17.75	5	0	0	17.77
	26740 / 819	1	0	0	19.82	1	0	0	19.44
		6	0	0	17.98	5	0	0	17.80
	26783 / 823.3	1	5	0	20.07	1	5	0	18.93
		6	0	0	18.05	5	0	0	17.78
26 / 3MHz	26705 / 815.5	1	0	0	20.13	1	0	0	18.98
		6	0	0	17.89	5	0	0	17.68
	26740 / 819	1	0	0	20.53	1	0	0	19.13
		6	0	0	18.18	5	0	0	18.08
	26775 / 822.5	1	5	1	20.30	1	5	1	18.98
		6	0	1	18.16	5	0	1	17.95
26 / 5MHz	26715 / 816.5	1	0	3	19.72	1	0	3	19.30
		6	0	0	18.93	5	0	0	18.96
	26740 / 819	1	0	0	20.51	1	0	0	19.88
		6	0	0	18.95	5	0	0	19.04
	26765 / 821.5	1	5	0	20.32	1	5	0	19.84
		6	0	3	18.61	5	0	3	18.57
26 / 10MHz	26740 / 819	1	0	0	20.38	1	0	0	19.90
		4	0	0	19.86	5	0	0	19.54

APPENDIX B - OCCUPIED BANDWIDTH

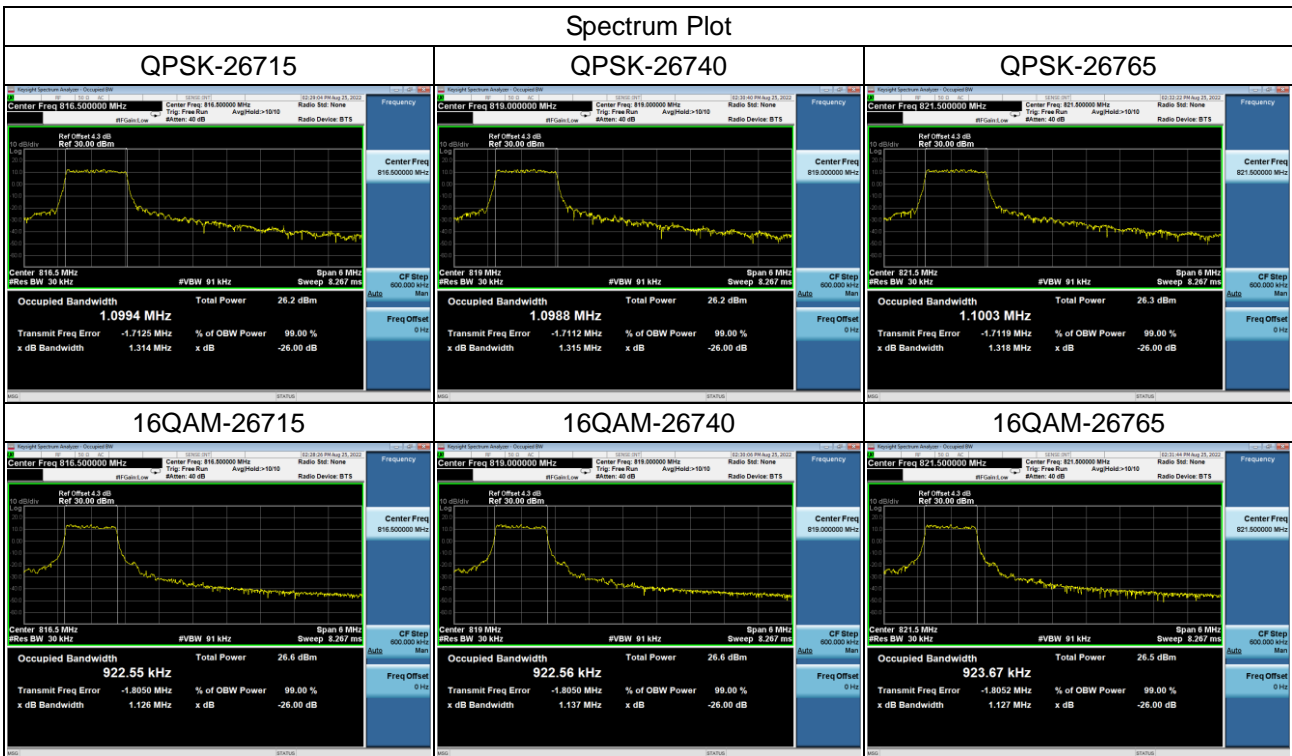
LTE Band 26_1.4MHz					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		26dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
26697	814.7	1.0935	0.9250	1.277	1.124
26740	819	1.0869	0.9244	1.252	1.222
26783	823.3	1.1004	0.9262	1.256	1.218



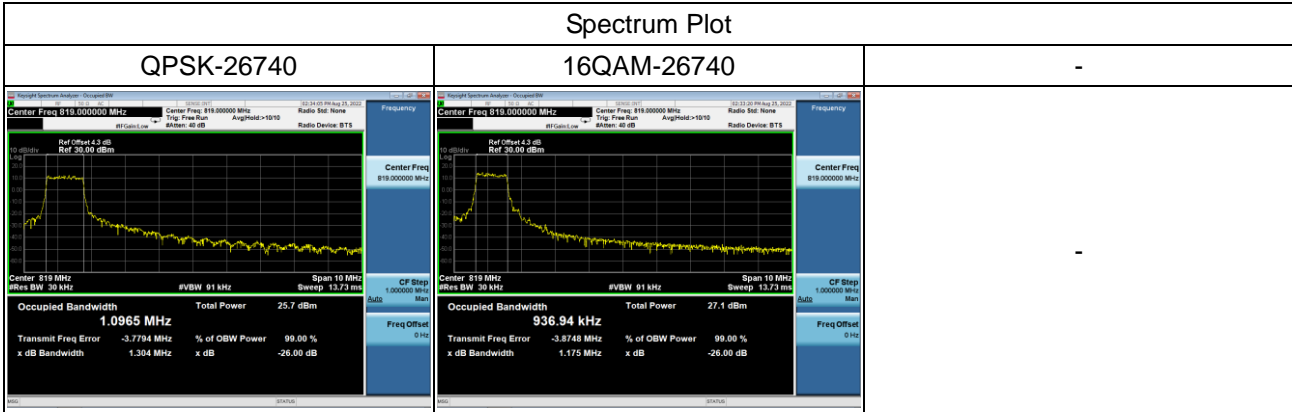
LTE Band 26_3MHz					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		26dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
26705	815.5	1.1038	0.9285	1.268	1.252
26740	819	1.0979	0.9290	1.265	1.232
26775	822.5	1.0941	0.9279	1.269	1.317



LTE Band 26_5MHz					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		26dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
26715	816.5	1.0994	0.9226	1.314	1.126
26740	819	1.0988	0.9226	1.315	1.137
26765	821.5	1.1003	0.9237	1.318	1.127

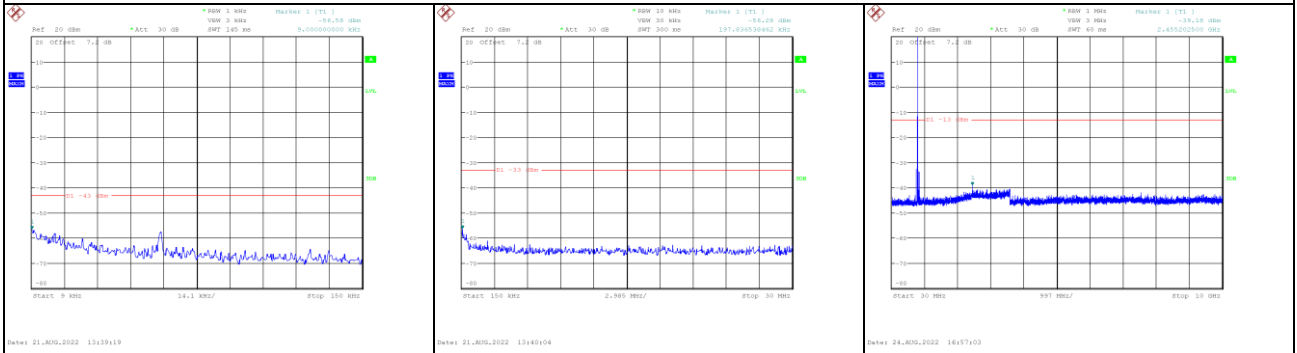


LTE Band 26_10MHz					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		26dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
26740	819	1.0965	0.9369	1.304	1.175

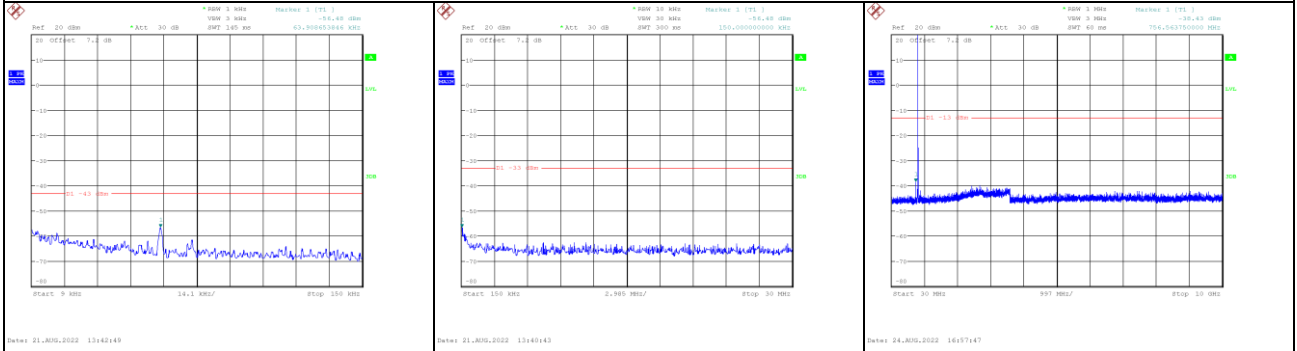


APPENDIX C - CONDUCTED SPURIOUS EMISSIONS

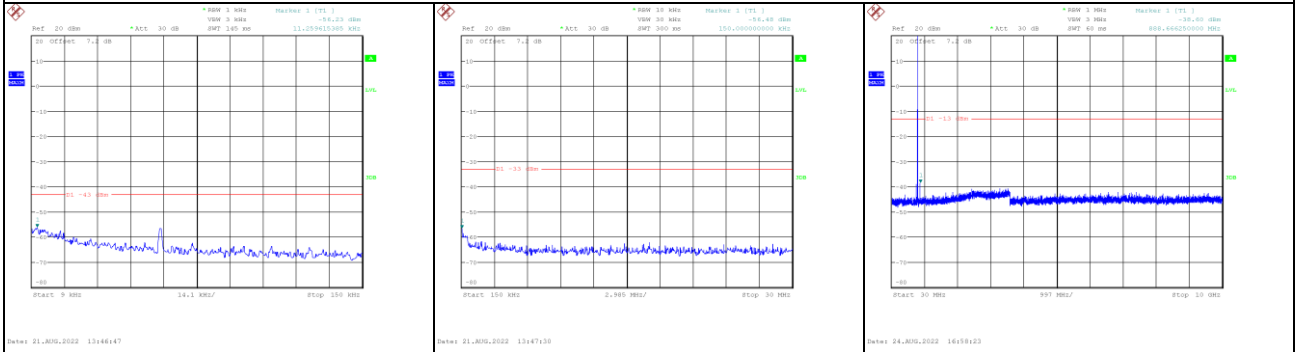
LTE Band 26_1.4MHz_CH26740 Spectrum Plot



LTE Band 26_5MHz_CH26740 Spectrum Plot



LTE Band 26_10MHz_CH26740 Spectrum Plot



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

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

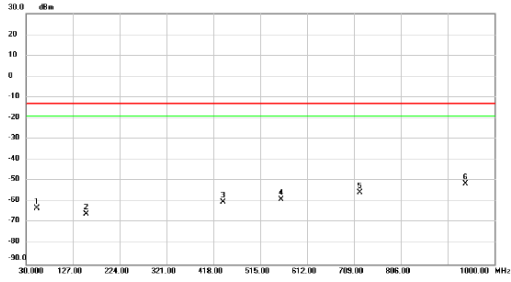
There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

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

Test Mode : LTE Band 26_TX CH26740_1.4MHz

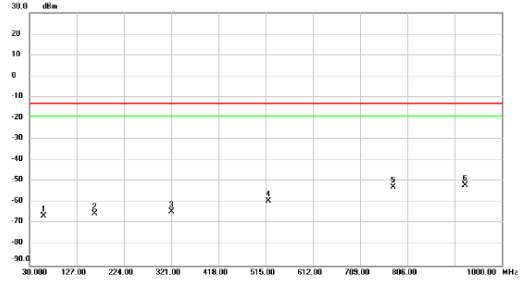
Test Mode : LTE Band 26_TX CH26740_1.4MHz

Vertical



No. Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measurement dBm	Limit dBm	Margin dB	Detector	Comment
1	62.310	-60.31	-2.90	-63.21	-13.00	-50.21	peak	
2	154.160	-56.30	-9.57	-65.87	-13.00	-52.87	peak	
3	438.370	-58.17	-1.90	-60.07	-13.00	-47.07	peak	
4	558.650	-58.19	-0.62	-58.81	-13.00	-45.81	peak	
5	721.610	-57.23	1.57	-55.66	-13.00	-42.66	peak	
6 *	938.375	-55.46	4.07	-51.39	-13.00	-38.39	peak	

Horizontal

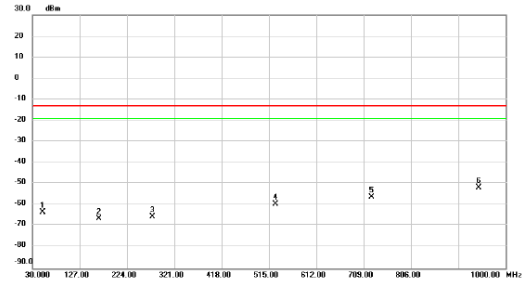


No. Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measurement dBm	Limit dBm	Margin dB	Detector	Comment
1	59.100	-66.12	-0.34	-66.46	-13.00	-53.46	peak	
2	164.345	-54.31	-10.94	-65.25	-13.00	-52.25	peak	
3	321.970	-60.33	-3.97	-64.30	-13.00	-51.30	peak	
4	520.335	-57.76	-1.35	-59.11	-13.00	-46.11	peak	
5	777.385	-55.00	2.33	-52.67	-13.00	-39.67	peak	
6 *	924.625	-55.36	3.75	-51.61	-13.00	-38.61	peak	

Test Mode : LTE Band 26_TX CH26740_5MHz

Test Mode : LTE Band 26_TX CH26740_5MHz

Vertical



No. Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measurement dBm	Limit dBm	Margin dB	Detector	Comment
1	51.825	-60.58	-2.87	-63.45	-13.00	-50.45	peak	
2	166.770	-57.69	-8.72	-66.41	-13.00	-53.41	peak	
3	276.380	-60.06	-5.55	-65.61	-13.00	-52.61	peak	
4	528.095	-58.50	-1.15	-59.65	-13.00	-46.65	peak	
5	725.005	-57.89	1.64	-56.25	-13.00	-43.25	peak	
6 *	945.195	-55.85	4.07	-51.78	-13.00	-38.78	peak	

Horizontal

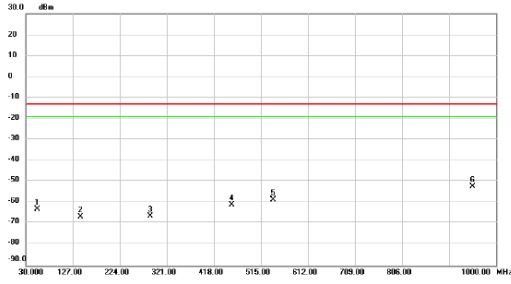


No. Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measurement dBm	Limit dBm	Margin dB	Detector	Comment
1	60.070	-66.67	-0.54	-67.21	-13.00	-54.21	peak	
2	162.405	-55.01	-10.95	-65.96	-13.00	-52.96	peak	
3	385.990	-59.52	-3.26	-62.78	-13.00	-49.78	peak	
4	543.615	-57.24	-1.17	-58.41	-13.00	-45.41	peak	
5	748.285	-58.05	2.19	-55.86	-13.00	-42.86	peak	
6 *	866.140	-56.07	3.45	-52.62	-13.00	-39.62	peak	

Test Mode : LTE Band 26_TX CH26740_10MHz

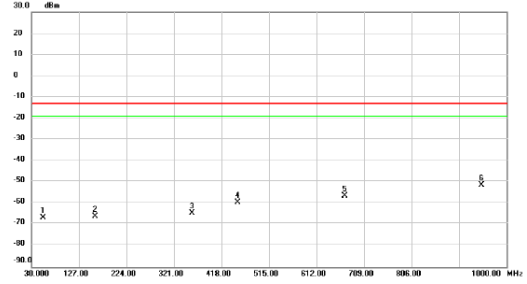
Test Mode : LTE Band 26_TX CH26740_10MHz

Vertical



No. Mk.	Freq. MHz	Reading Level dBm	Correc Factor dB	Measure-ment dBm	Limit dBm	Margin dB	Detector	Comment
1	53.280	-60.09	-2.94	-63.03	-13.00	-50.03	peak	
2	143.490	-57.02	-0.69	-66.71	-13.00	-53.71	peak	
3	286.080	-61.34	-4.97	-66.31	-13.00	-53.31	peak	
4	456.345	-58.66	-2.27	-60.93	-13.00	-47.93	peak	
5	540.220	-57.71	-0.99	-58.70	-13.00	-45.70	peak	
6 *	951.015	-56.33	4.08	-52.25	-13.00	-39.25	peak	

Horizontal



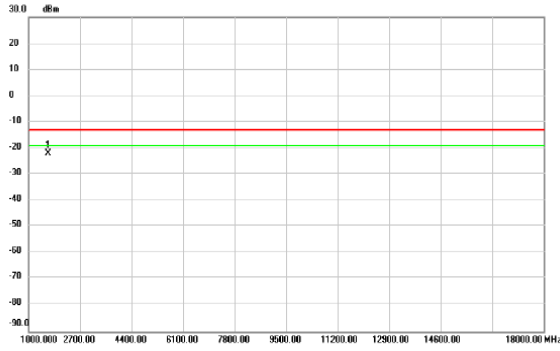
No. Mk.	Freq. MHz	Reading Level dBm	Correc Factor dB	Measure-ment dBm	Limit dBm	Margin dB	Detector	Comment
1	53.765	-67.26	0.45	-66.81	-13.00	-53.81	peak	
2	159.495	-55.23	-10.99	-66.22	-13.00	-53.22	peak	
3	358.345	-61.14	-3.66	-64.80	-13.00	-51.80	peak	
4	450.495	-56.90	-2.52	-59.42	-13.00	-46.42	peak	
5	669.715	-57.81	1.14	-56.67	-13.00	-43.67	peak	
6 *	949.075	-55.20	3.81	-51.39	-13.00	-38.39	peak	

APPENDIX F - RADIATED SPURIOUS EMISSIONS (ABOVE 1000MHZ)

Test Mode : LTE Band 26_TX CH26740_1.4MHz

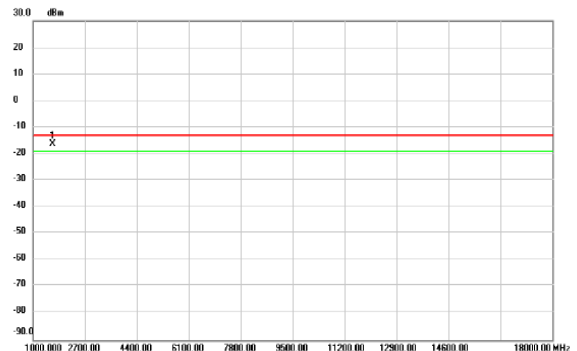
Test Mode : LTE Band 26_TX CH26740_1.4MHz

Vertical



No. Mk	Freq	Reading Level	Correct Factor	Measurement	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1 *	1637.500	-8.33	-13.76	-22.09	-13.00	-9.09	peak	

Horizontal

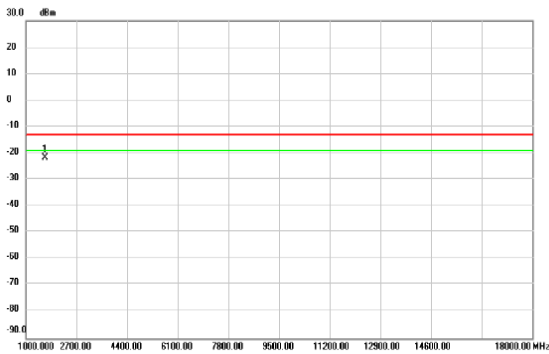


No. Mk	Freq	Reading Level	Correct Factor	Measurement	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1 *	1637.500	-1.99	-14.31	-16.30	-13.00	-3.30	peak	

Test Mode : LTE Band 26_TX CH26740_5M

Test Mode : LTE Band 26_TX CH26740_5M

Vertical



No. Mk	Freq	Reading Level	Correct Factor	Measurement	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1 *	1637.500	-8.09	-13.76	-21.95	-13.00	-8.85	peak	

Horizontal

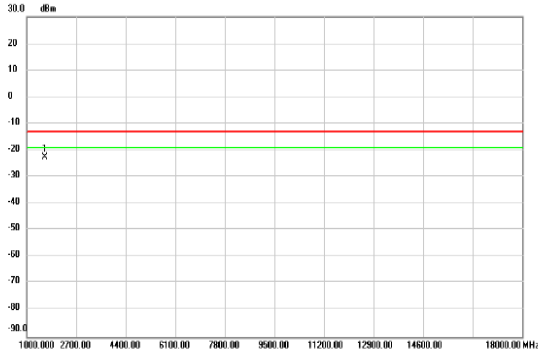


No. Mk	Freq	Reading Level	Correct Factor	Measurement	Limit	Margin		
	MHz	dBm	dB	dBm	dBm	dB	Detector	Comment
1 *	1637.500	-2.36	-14.31	-16.67	-13.00	-3.67	peak	

Test Mode : LTE Band 26_TX CH26740_10MHz

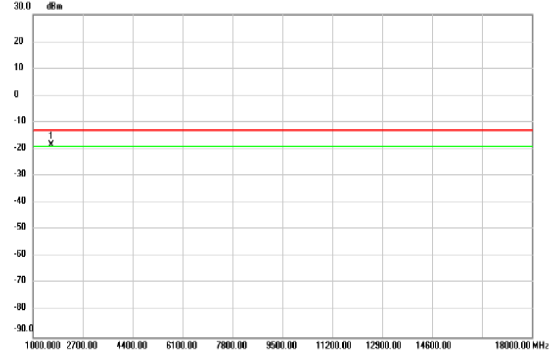
Test Mode : LTE Band 26_TX CH26740_10MHz

Vertical



No. Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measurement dBm	Limit dBm	Margin dB	Detector	Comment
1 *	1629.000	-8.78	-13.77	-22.55	-13.00	-9.55	peak	

Horizontal

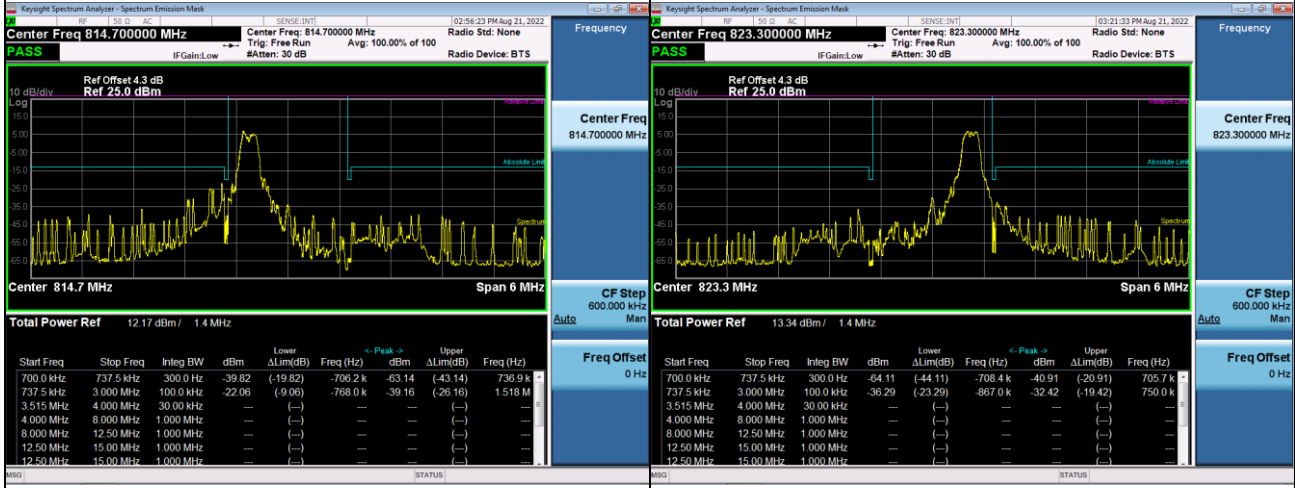


No. Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measurement dBm	Limit dBm	Margin dB	Detector	Comment
1 *	1629.000	-3.97	-14.33	-18.30	-13.00	-5.30	peak	

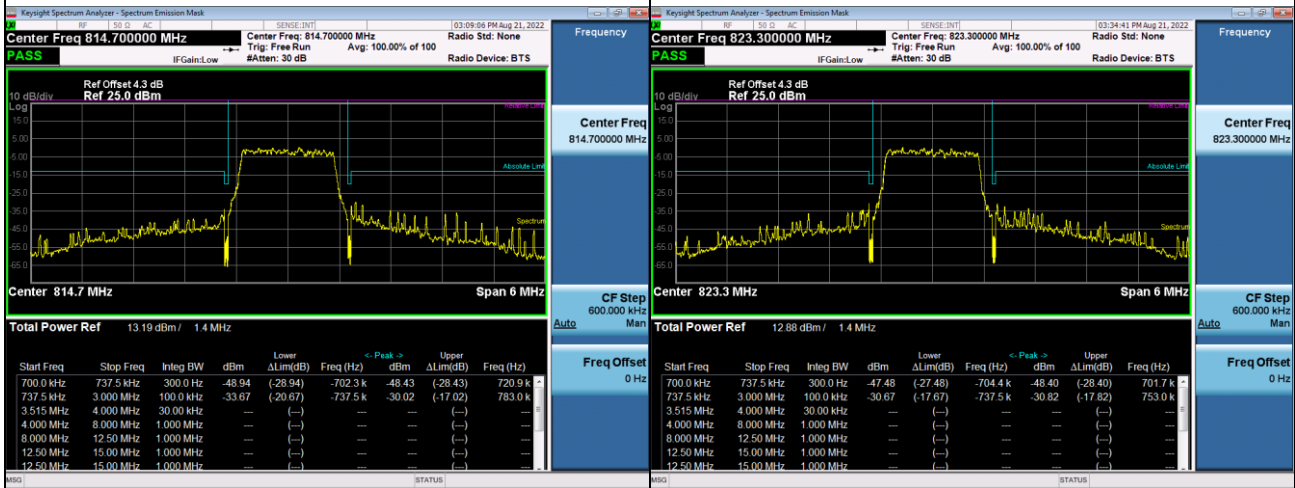
APPENDIX G - MASK

LTE Band 26_1.4MHz

1RB#0		1RB#5	
Channel	26697	Channel	26783

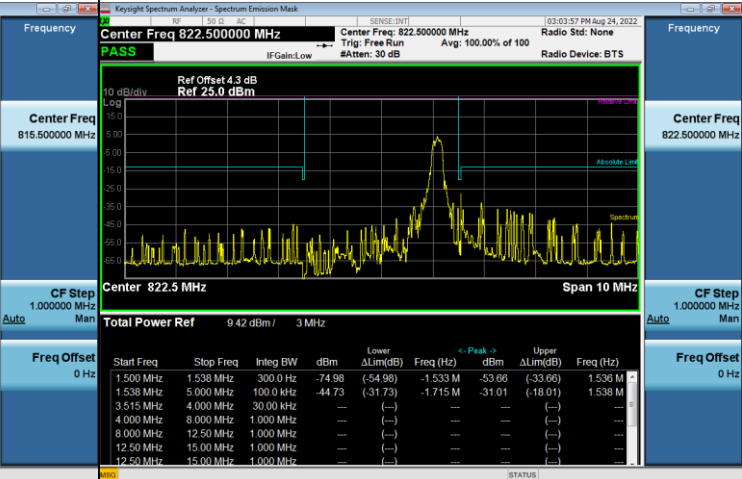
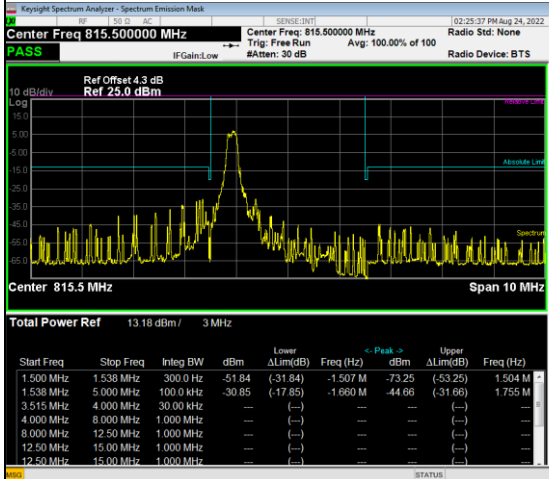


6RB#0			
Channel	26697	Channel	26783



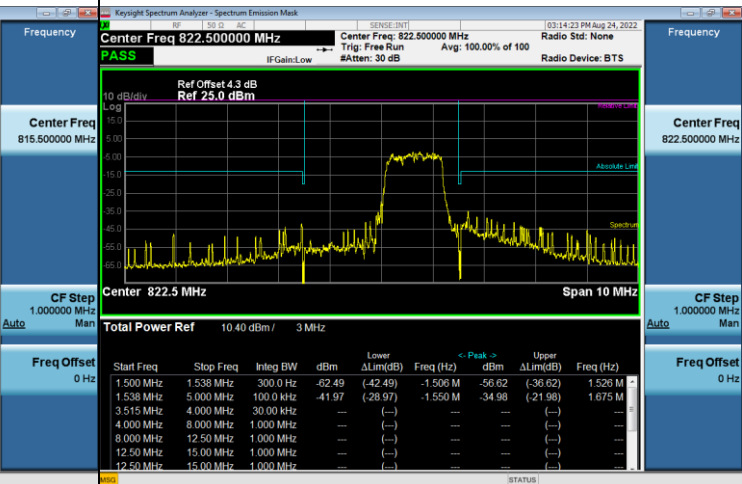
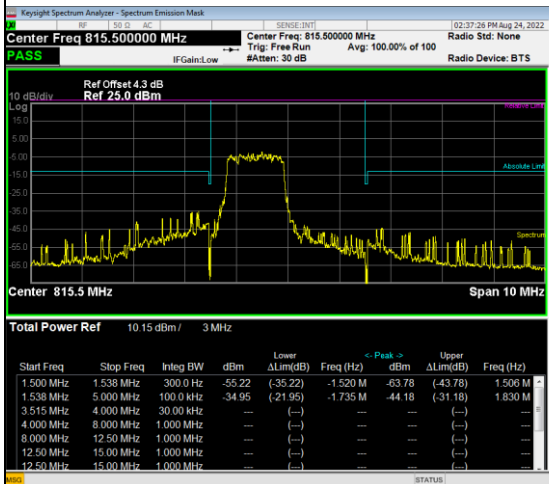
LTE Band 26_3MHz

1RB#0		1RB#5	
Channel	26705	Channel	26775



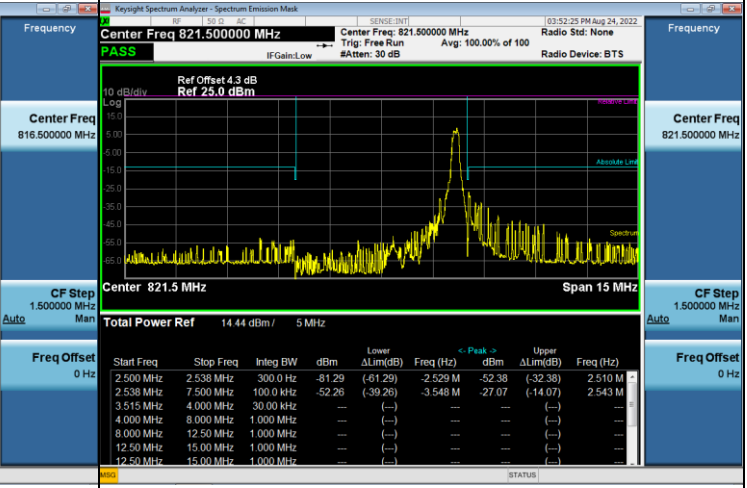
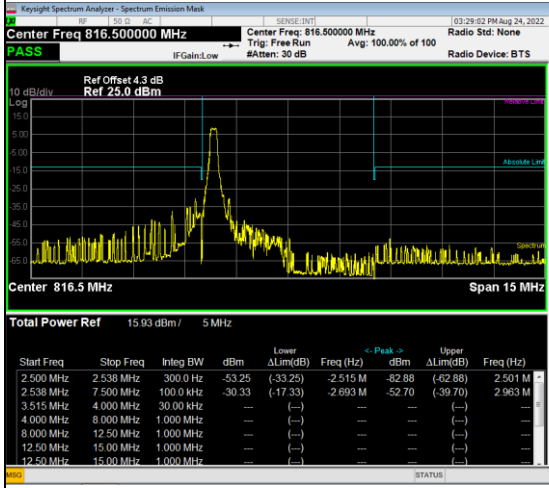
6RB#0

Channel	26705	Channel	26775
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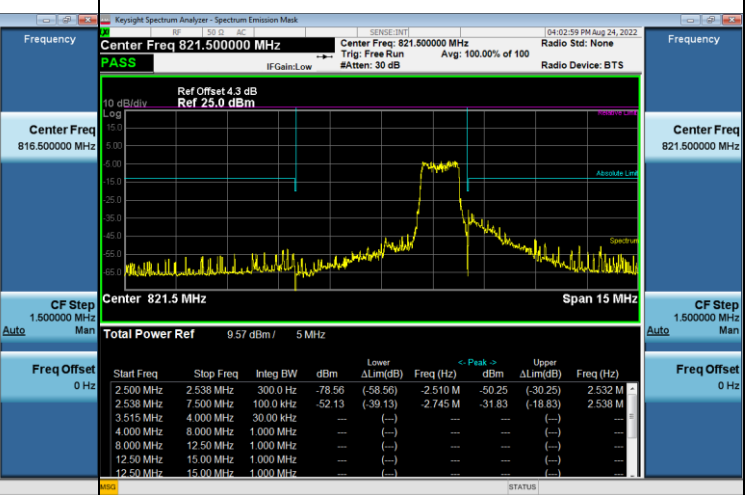
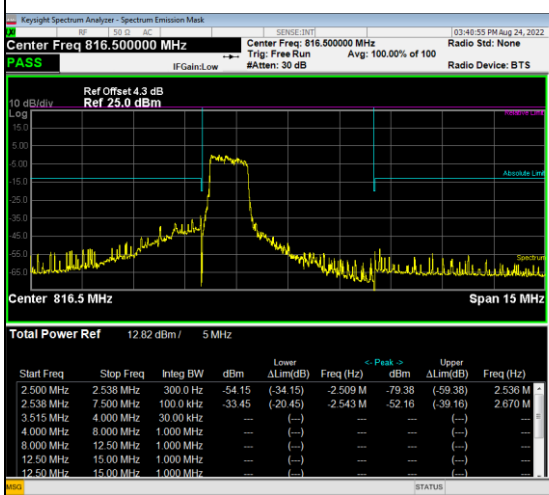
LTE Band 26_5MHz

1RB#0		1RB#5	
Channel	26715	Channel	26765



6RB#0

Channel		26715	Channel		26765
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LTE Band 26_10MHz

1RB#0

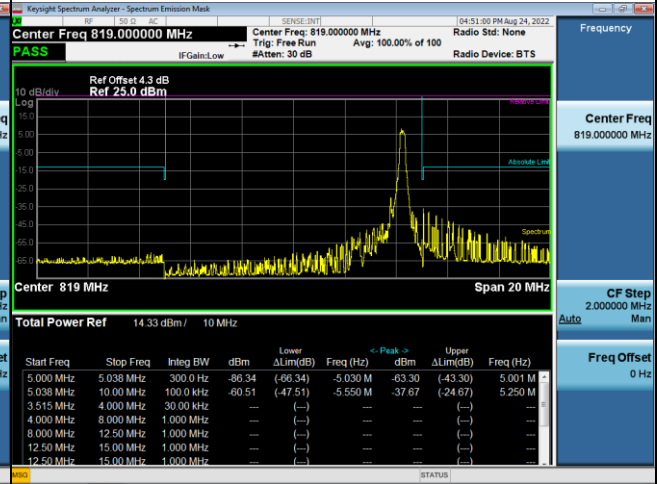
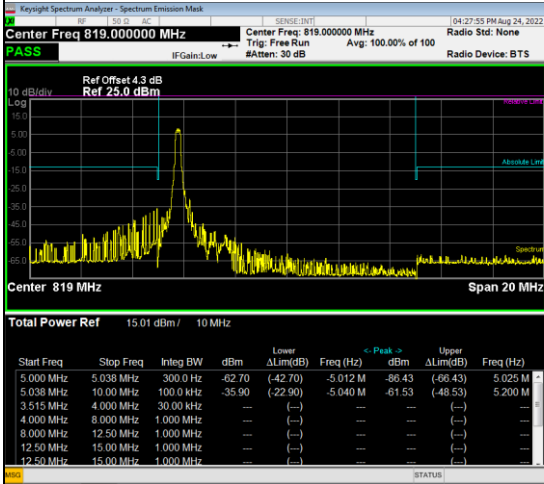
1RB#5

Channel

26740

Channel

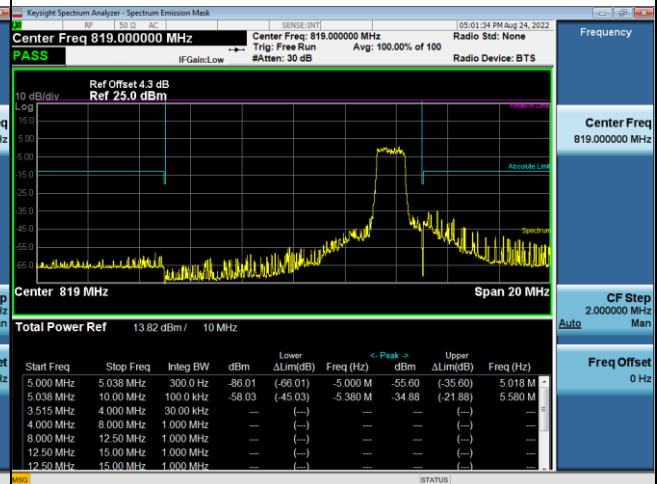
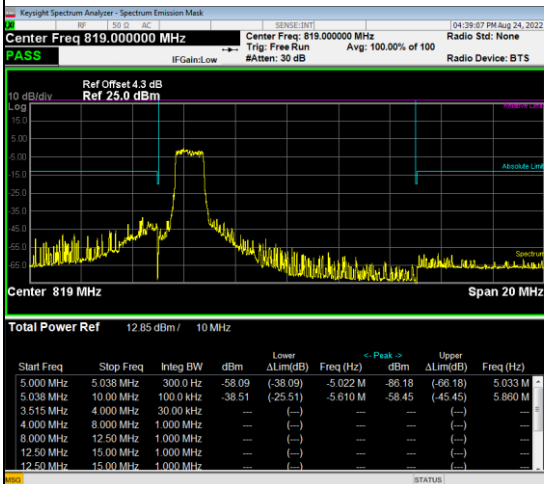
26740



6RB#0

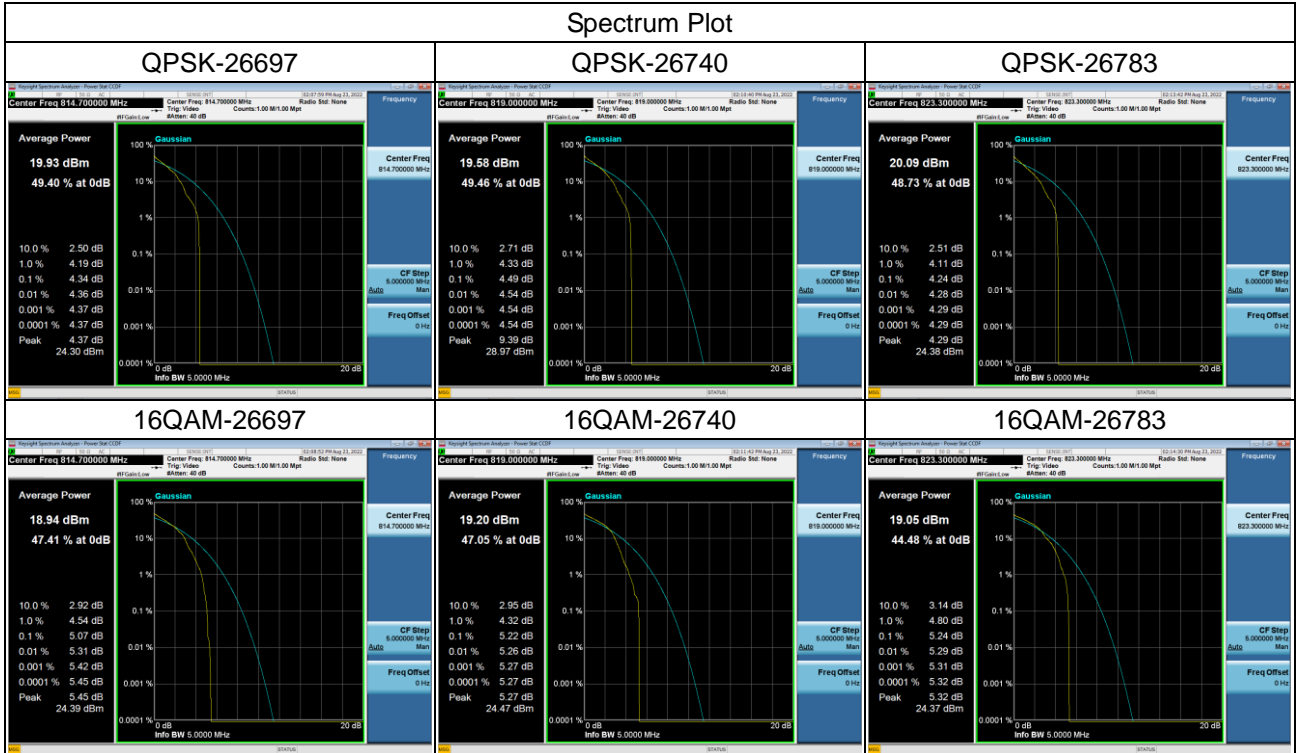
Channel

26740

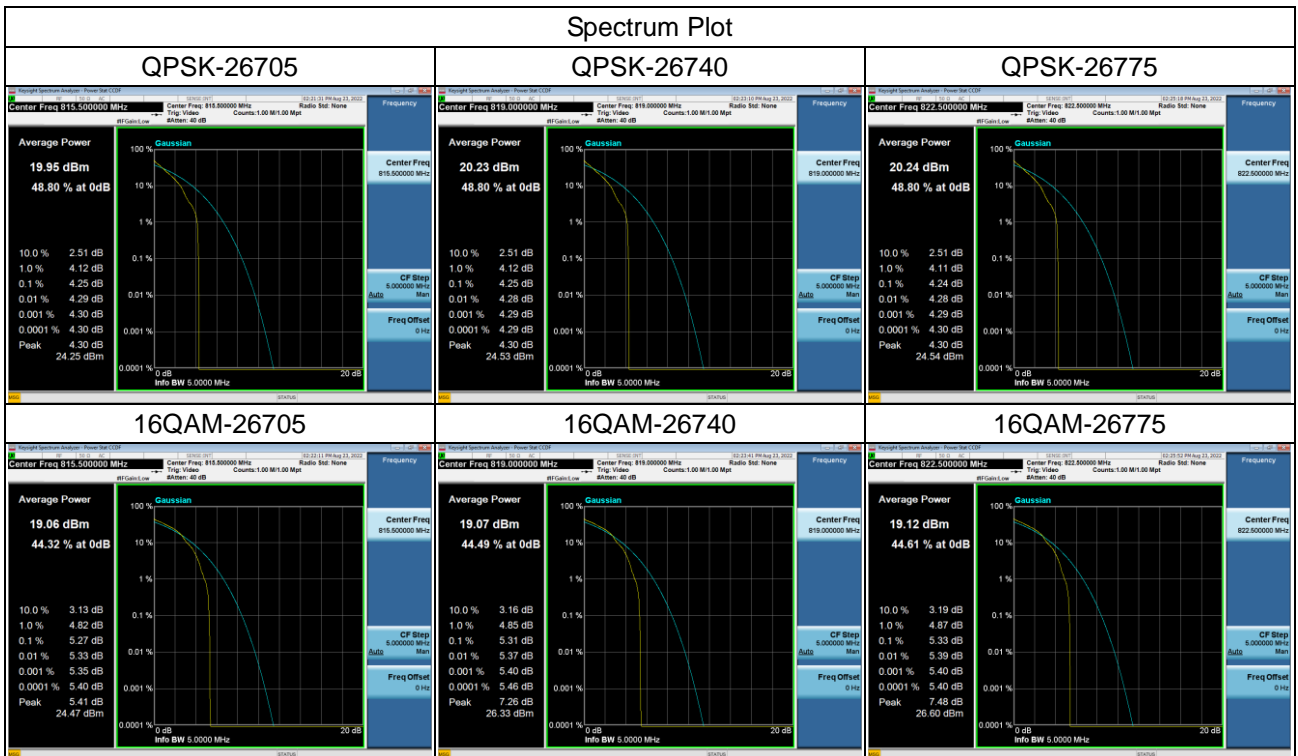


APPENDIX H - PEAK TO AVERAGE RATIO

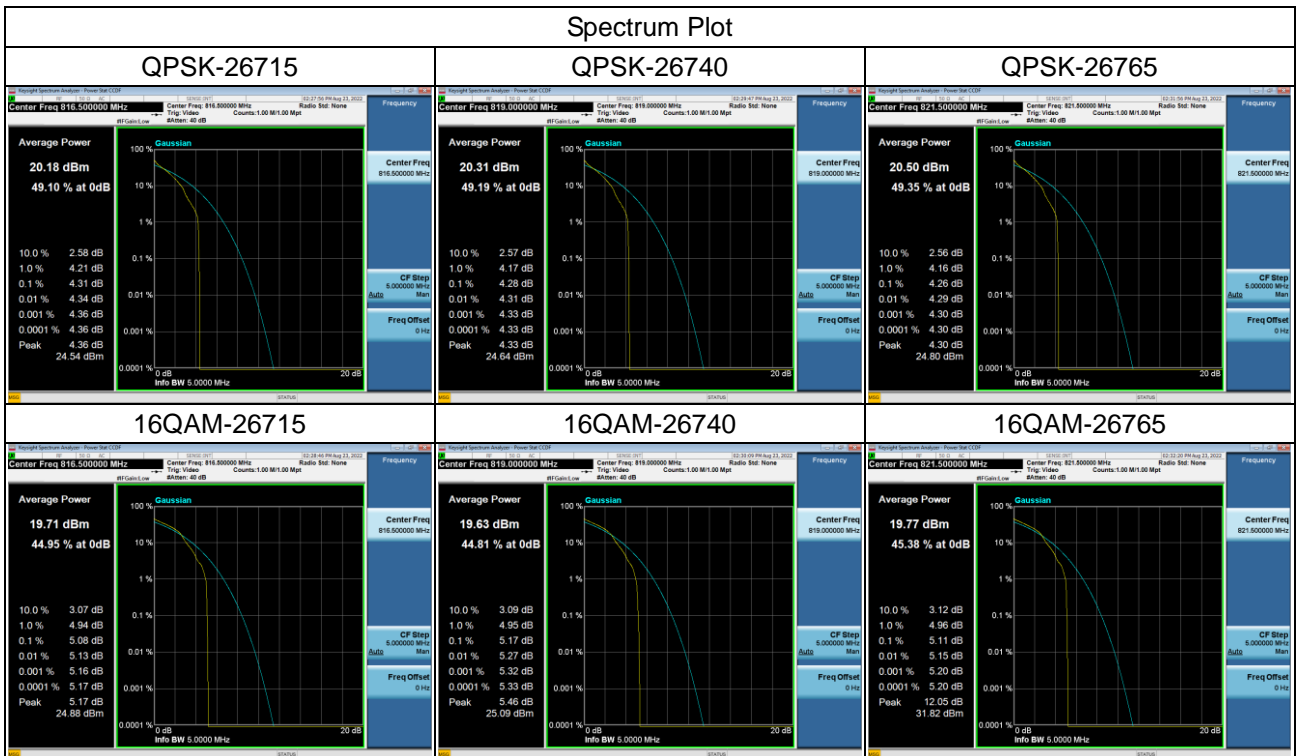
LTE Band 26_1.4MHz					
Channel	Frequency (MHz)	Peak To Average Ratio (dB)		Max. Limit (dB)	Result
		QPSK	16QAM		
26697	814.7	4.34	5.07	13	Pass
26740	819	4.49	5.22	13	Pass
26783	823.3	4.24	5.24	13	Pass



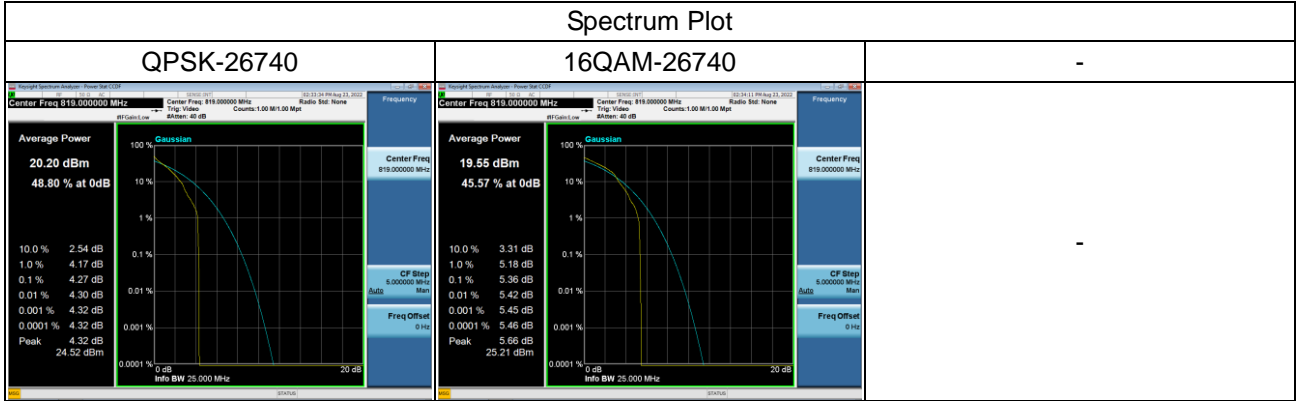
LTE Band 26_3MHz					
Channel	Frequency (MHz)	Peak To Average Ratio (dB)		Max. Limit (dB)	Result
		QPSK	16QAM		
26705	815.5	4.25	5.27	13	Pass
26740	819	4.25	5.31	13	Pass
26775	822.5	4.24	5.33	13	Pass



LTE Band 26_5MHz					
Channel	Frequency (MHz)	Peak To Average Ratio (dB)		Max. Limit (dB)	Result
		QPSK	16QAM		
26715	816.5	4.31	5.08	13	Pass
26740	819	4.28	5.17	13	Pass
26765	821.5	4.26	5.11	13	Pass



LTE Band 26_10MHz					
Channel	Frequency (MHz)	Peak To Average Ratio (dB)		Max. Limit (dB)	Result
		QPSK	16QAM		
26740	819	4.27	5.36	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	-7.03	-0.0086	±2.5ppm
40	-6.42	-0.0078	
30	-5.54	-0.0068	
20	-6.28	-0.0077	
10	-7.87	-0.0096	
0	-5.78	-0.0071	
-10	-6.05	-0.0074	
-20	-7.31	-0.0089	
-30	-6.17	-0.0075	
Minimun Voltage	-8.58	-0.0105	
Maximun Voltage	-7.71	-0.0094	
Normal Voltage	-6.41	-0.0078	

Note: Nominal voltage= 3.7V, Maximum voltage= 3.8V, Minimum voltage= 3.0V.

End of Test Report