

FCC Radio Test Report

FCC ID: M82-DLTV6210LTE

Report No. : BTL-FCCP-2-1608T164C
Equipment : Computer
Model Name : DLT-V6210LTE, DLTV6210XXXXXXXXXXXXXXX (where X may be any alphanumeric character, blank or "-".)
Brand Name : ADVANTECH
Applicant : Advantech Co., Ltd.
Address : No.1, Alley 20, Lane 26, Rueiguang Road, Neihu District, Taipei 11491, Taiwan, R.O.C.
Manufacturer : Advantech Co., Ltd.
Address : No.1, Alley 20, Lane 26, Rueiguang Road, Neihu District, Taipei 11491, Taiwan, R.O.C.

Radio Function : WCDMA Band IV+ LTE Band 4, 12

FCC Rule Part(s) : 47 CFR FCC Part 27, Subpart L
Measurement : ANSI/TIA/EIA-603-E-2016
Procedure(s) : KDB 971168 D01 Power Meas License Digital Systems v03r01

Date of Receipt : 2019/10/18
Date of Test : 2019/10/18 ~ 2020/8/26
Issued Date : 2020/9/4

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

Prepared by


 Peter Chen, Engineer

Approved by


 Scott Hsu, Manager



BTL Inc.

No.18, Ln. 171, Sec. 2, Jiuzong Rd., Neihu Dist., Taipei City 114, Taiwan

Tel: +886-2-2657-3299

Fax: +886-2-2657-3331

Web: www.newbtl.com

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).

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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 are not use in determining the Pass/Fail results.

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REPORT ISSUED HISTORY

Report Version	Description	Issued Date
R00	Original Issue.	2020/2/27
R01	Revised report to address TCB's comments.	2020/7/9
R02	Revised report to address TCB's comments.	2020/8/28
R03	Revised report to address TCB's comments.	2020/9/4

1 SUMMARY OF TEST RESULTS

Test procedures according to the technical standards.

FCC Clause No	Description	Test Result	Judgement	Remark
15.207	AC Power Line Conducted Emissions	N/A	N/A	NOTE (3)
2.1046 24.232(c)	RF Power Output	APPENDIX A	Pass	-----
2.1049	Occupied Bandwidth	APPENDIX B	Pass	-----
2.1051 27.53(h) 27.53(g) 27.53(c)(2)(4)	Conducted Spurious Emissions	APPENDIX C	Pass	-----
2.1053 27.53(h)	Radiated Spurious Emissions	APPENDIX D	Pass	-----
2.1051 27.53(h) 27.53(g) 27.53(c)(2)(4)	Band Edge Measurements	APPENDIX E	Pass	-----
-	Peak To Average Ratio	APPENDIX F	Pass	Record Only
2.1055 27.54	Frequency Stability	APPENDIX G	Pass	-----

NOTE:

- (1) "N/A" denotes test is not applicable in this Test Report.
- (2) The report format version is TP.1.1.1.
- (3) This is a DC input device.

1.1 TEST FACILITY

The test facilities used to collect the test data in this report:

No. 68-1, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan

The test sites and facilities are covered under FCC RN: 674415 and DN: TW0659.

☐ C05 ☐ CB08 ☐ CB11 ☒ CB15 ☐ CB16
☒ SR06

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k = 2$, providing a level of confidence of approximately **95 %**.

The measurement instrumentation uncertainty considerations contained in CISPR 16-4-2. The BTL measurement uncertainty is less than the CISPR 16-4-2 U_{CISPR} requirement.

A. Radiated Spurious Emissions test :

Test Site	Measurement Frequency Range	U,(dB)
CB15	0.03 GHz ~ 0.2 GHz	4.17
	0.2 GHz ~ 1 GHz	4.72
	1 GHz ~ 6 GHz	5.21
	6 GHz ~ 18 GHz	5.51
	18 GHz ~ 26 GHz	3.69
	26 GHz ~ 40 GHz	4.23

B. Conducted test:

Test Item	U,(dB)
Output power	1.06

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	Environment Condition	Test Voltage	Tested by
RF Power Output	24.1 °C, 46 %	DC 60V	Jay Kao
Occupied Bandwidth	24.8 °C, 46 %	DC 60V	Jay Kao
Conducted Spurious Emissions	24.8 °C, 46 %	DC 60V	Jay Kao
Radiated Spurious Emissions	22 °C, 67 %	Refer to data	Hunter Chiang
Band Edge	24.8 °C, 46 %	DC 60V	Jay Kao
Peak to Average Ratio	24.8 °C, 46 %	DC 60V	Jay Kao
Frequency Stability	Normal and Extreme		Jay Kao

2 GENERAL INFORMATION

2.1 DESCRIPTION OF EUT

Equipment	Computer			
Model Name	DLT-V6210LTE, DLT-V6210XXXXXXXXXXXXXXX (where X may be any alphanumeric character, blank or "-".)			
Brand Name	ADVANTECH			
Model Difference	Different model distribute to different area.			
Power Source	Supplied from DC power.			
Power Rating	9-60V --- 3.6A			
Products Covered	1 * WWAN Card: Quectel / EC25-A			
Test Model	DLT-V6210LTE			
Sample Status	Engineering Sample			
Operation Frequency	Mode	Band	UL Frequency (MHz)	DL Frequency (MHz)
	WCDMA	IV	1712.4 ~1752.6	2112.4 ~ 2152.6
	LTE	4	1710 ~1755	2110 ~ 2155
	LTE	12	699 ~716	725 ~746
EUT Modification(s)	N/A			

NOTE:

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

(2) Channel List:

WCDMA Band IV				
Test Frequency ID	UARFCN	Frequency of Uplink (MHz)	UARFCN	Frequency of Downlink (MHz)
Low Range	1312	1712.4	1537	2112.4
Mid Range	1413	1732.6	1638	2132.5
High Range	1513	1752.6	1738	2152.6

LTE Band 4					
Test Frequency ID	Bandwidth (MHz)	N _{UL}	Frequency of Uplink (MHz)	N _{DL}	Frequency of Downlink (MHz)
Low Range	1.4	19957	1710.7	1957	2110.7
	3	19965	1711.5	1965	2111.5
	5	19975	1712.5	1975	2112.5
	10	20000	1715	2000	2115
	15	20025	1717.5	2025	2117.5
	20	20050	1720	2050	2120
Mid Range	1.4/3/5/10/15/20	20175	1732.5	2175	2132.5
High Range	1.4	20393	1754.3	2393	2154.3
	3	20385	1753.5	2385	2153.5
	5	20375	1752.5	2375	2152.5
	10	20350	1750	2350	2150
	15	20325	1747.5	2325	2147.5
	20	20300	1745	2300	2145

LTE Band 12					
Test Frequency ID	Bandwidth (MHz)	N _{UL}	Frequency of Uplink (MHz)	N _{DL}	Frequency of Downlink (MHz)
Low Range	1.4	23017	699.7	5017	729.7
	3	23025	700.5	5025	730.5
	5	23035	701.5	5035	731.5
	10	23060	704	5060	734
Mid Range	1.4/3/5/10	23095	707.5	5095	737.5
High Range	1.4	23173	715.3	5173	745.3
	3	23165	714.5	5165	744.5
	5	23155	713.5	5155	743.5
	10	23130	711	5130	741

(3) Table for Filed Antenna:

Group 1(External):

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Note
1	taoglas	TLS.01.305111	Dipole	SMA(M)	2.50	WCDMA Band IV
					2.50	LTE Band 4
					2.42	LTE Band 12
2	taoglas	TLS.01.305111	Dipole	SMA(M)	2.50	WCDMA Band IV
					2.50	LTE Band 4
					2.42	LTE Band 12

Group 2(Integrated):

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Note
1	taoglas	MA540.A.ABICG.001	Dipole	IPEX MHF	3.5	WCDMA Band IV
					3.5	LTE Band 4
					-2.67	LTE Band 12
2	taoglas	MA540.A.ABICG.001	Dipole	IPEX MHF	2.2	WCDMA Band IV
					2.2	LTE Band 4
					-2.64	LTE Band 12

Note:

For WCDMA Band IV, LTE Band 4: Group 2 is found to be the worst case and used for final test.

For LTE Band 12: Group 1 is found to be the worst case and used for final test.

2.2 TEST MODES

WCDMA BAND 4			
Test Item	Available Channel	Tested Channel	Mode
EIRP	1312 to 1513	1312, 1413, 1513	WCDMA,HSDPA, HSUPA
Frequency Stability	1312 to 1513	1413	WCDMA
Occupied Bandwidth	1312 to 1513	1312, 1413, 1513	WCDMA,HSDPA, HSUPA
Band Edge	1312 to 1513	1312, 1513	WCDMA,HSDPA, HSUPA
Peak to Average Ratio	1312 to 1513	1312, 1413, 1513	WCDMA,HSDPA, HSUPA
Conducuted Spurious Emission	1312 to 1513	1413	WCDMA,HSDPA, HSUPA
Radiated Spurious Emission	1312 to 1513	1312	WCDMA,HSDPA, HSUPA

LTE BAND 4 MODE					
Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
Output Power	19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK, 16QAM	1RB/3RB/6RB
	19965 to 20385	19965, 20175, 20385	3MHz	QPSK, 16QAM	1RB/8RB/15RB
	19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM	1RB/12RB/25RB
	20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM	1RB/25RB/50RB
	20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM	1RB/36RB/75RB
	20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM	1RB/50RB/100RB
EIRP	20050 to 20300	20050, 20175, 20300	20MHz	QPSK	1RB/50RB/100RB
Occupied Bandwidth	19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK, 16QAM	6RB
	19965 to 20385	19965, 20175, 20385	3MHz	QPSK, 16QAM	15RB
	19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM	25RB
	20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM	50RB
	20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM	75 RB
	20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM	100RB
Conducted Spurious Emissions	19957 to 20393	20175	1.4MHz	QPSK	1RB
	19965 to 20385	20175	3MHz	QPSK	1RB
	19975 to 20375	20175	5MHz	QPSK	1RB
	20000 to 20350	20175	10MHz	QPSK	1RB
	20025 to 20325	20175	15MHz	QPSK	1RB
	20050 to 20300	20175	20MHz	QPSK	1RB
Radiated Spurious Emissions	20050 to 20300	20175	20MHz	QPSK	1RB
Band Edge	19957 to 20393	19957, 20393	1.4MHz	QPSK	1RB/6RB
	19965 to 20385	19965, 20385	3MHz	QPSK	1RB/15RB
	19975 to 20375	19975, 20375	5MHz	QPSK	1RB/25RB
	20000 to 20350	20000, 20350	10MHz	QPSK	1RB/50RB
	20025 to 20325	20025, 20325	15MHz	QPSK	1RB/75RB
	20050 to 20300	20050, 20300	20MHz	QPSK	1RB/100RB
Peak To Average Ratio	19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK, 16QAM	1RB
	19965 to 20385	19965, 20175, 20385	3MHz	QPSK, 16QAM	1RB
	19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM	1RB
	20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM	1RB
	20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM	1RB
	20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM	1RB
Frequency Stability	19957 to 20393	20175	1.4MHz	QPSK	1RB
	19965 to 20385	20175	3MHz	QPSK	1RB
	19975 to 20375	20175	5MHz	QPSK	1RB
	20000 to 20350	20175	10MHz	QPSK	1RB
	20025 to 20325	20175	15MHz	QPSK	1RB
	20050 to 20300	20175	20MHz	QPSK	1RB

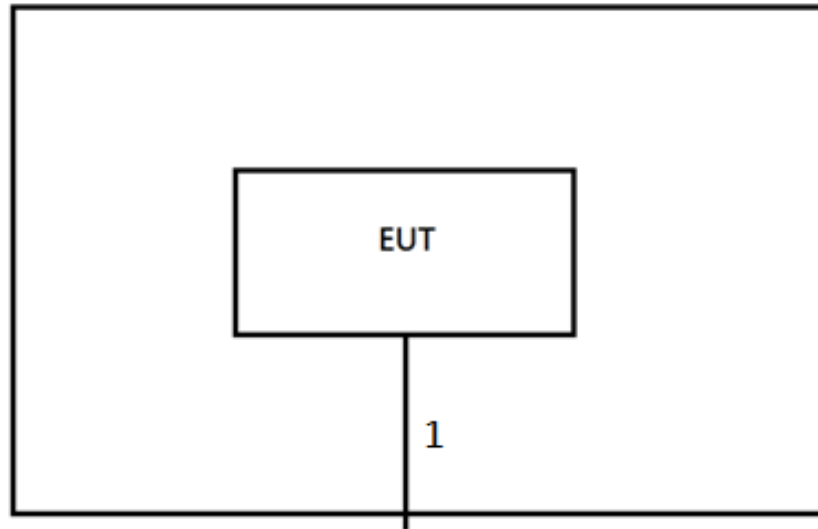
LTE BAND 12 MODE					
Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
Output Power	23017 to 23173	23017, 23095, 23173	1.4MHz	QPSK, 16QAM	1RB/3RB/6RB
	23025 to 23165	23025, 23095, 23165	3MHz	QPSK, 16QAM	1RB/8RB/15RB
	23035 to 23155	23035, 23095, 23155	5MHz	QPSK, 16QAM	1RB/12RB/25RB
	23060 to 23130	23060, 23095, 23130	10MHz	QPSK, 16QAM	1RB/25RB/50RB
ERP	23060 to 23130	23060, 23095, 23130	10MHz	QPSK	1RB/25RB/50RB
Occupied Bandwidth	23017 to 23173	23017, 23095, 23173	1.4MHz	QPSK, 16QAM	6RB
	23025 to 23165	23025, 23095, 23165	3MHz	QPSK, 16QAM	15RB
	23035 to 23155	23035, 23095, 23155	5MHz	QPSK, 16QAM	25RB
	23060 to 23130	23060, 23095, 23130	10MHz	QPSK, 16QAM	50RB
Conducted Spurious Emissions	23017 to 23173	23095	1.4MHz	QPSK	1RB
	23025 to 23165	23095	3MHz	QPSK	1RB
	23035 to 23155	23095	5MHz	QPSK	1RB
	23060 to 23130	23095	10MHz	QPSK	1RB
Radiated Spurious Emissions	23060 to 23130	23095	10MHz	QPSK	1RB
Band Edge	23017 to 23173	23017, 23173	1.4MHz	QPSK, 16QAM	1RB/6RB
	23025 to 23165	23025, 23165	3MHz	QPSK, 16QAM	1RB/15RB
	23035 to 23155	23035, 23155	5MHz	QPSK, 16QAM	1RB/25RB
	23060 to 23130	23060, 23130	10MHz	QPSK, 16QAM	1RB/50RB
Peak To Average Ratio	23017 to 23173	23017, 23095, 23173	1.4MHz	QPSK, 16QAM	1RB/3RB/6RB
	23025 to 23165	23025, 23095, 23165	3MHz	QPSK, 16QAM	1RB/8RB/15RB
	23035 to 23155	23035, 23095, 23155	5MHz	QPSK, 16QAM	1RB/12RB/25RB
	23060 to 23130	23060, 23095, 23130	10MHz	QPSK, 16QAM	1RB/25RB/50RB
Frequency Stability	23017 to 23173	23095	1.4MHz	QPSK	1RB
	23025 to 23165	23095	3MHz	QPSK	1RB
	23035 to 23155	23095	5MHz	QPSK	1RB
	23060 to 23130	23095	10MHz	QPSK	1RB

NOTE:

- (1) The Radiated emissions test was verified based on the worst conducted power and Bandwidth test results reported in the original report.
- (2) All X, Y and Z axes are evaluated, but only the worst case (WCDMA Band IV, LTE Band 4: Y axis, LTE Band 12: X axis) is recorded.

2.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Equipment letters and Cable numbers refer to item numbers described in the tables of clause 2.4.



2.4 SUPPORT UNITS

Item	Equipment	Brand	Model No.	Series No.	Remarks
-	-	-	-	-	-

Item	Shielded	Ferrite Core	Length	Cable Type	Remarks
1	NO	NO	3m	DC Cable	-

3 RF POWER OUTPUT TEST

3.1 LIMIT

Band	Limit
WCDMA Band IV	Fixed, mobile, and portable (hand-held) stations are limited to 1 watt EIRP.
LTE Band 4	Fixed, mobile, and portable (hand-held) stations are limited to 1 watt EIRP.
LTE Band 12	Portable stations (hand-held devices) and fixed and mobile stations are limited to 3 watts ERP.

3.2 TEST PROCEDURE

EIRP / ERP Power Measurement:

EIRP = Conducted Power + Antenna gain.
ERP power = EIPR power - 2.15 dBi.

Conducted Power Measurement:

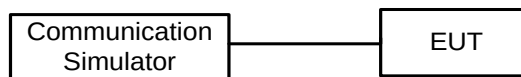
The EUT was set up for the maximum power with WCDMA and LTE link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

3.3 DEVIATION FROM TEST STANDARD

No deviation.

3.4 TEST SETUP

Conducted Power Measurement:



3.5 TEST RESULT

Please refer to the APPENDIX A.

4 OCCUPIED BANDWIDTH MEASUREMENT

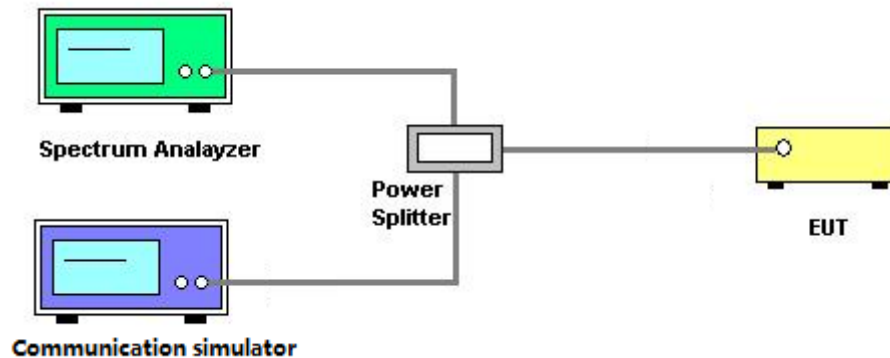
4.1 TEST PROCEDURE

- 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.
- The EUT was connected to spectrum analyzer and system simulator via a power divider.
- $RBW = (1\% \sim 5\%) * EBW$
 $VBW \geq 3 * RBW$.
- Set spectrum analyzer with Peak detector.

4.2 DEVIATION FROM TEST STANDARD

No deviation.

4.3 TEST SETUP



4.4 TEST RESULT

Please refer to the APPENDIX B.

5 CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

5.1 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. (Part 27 Subpart L & H)

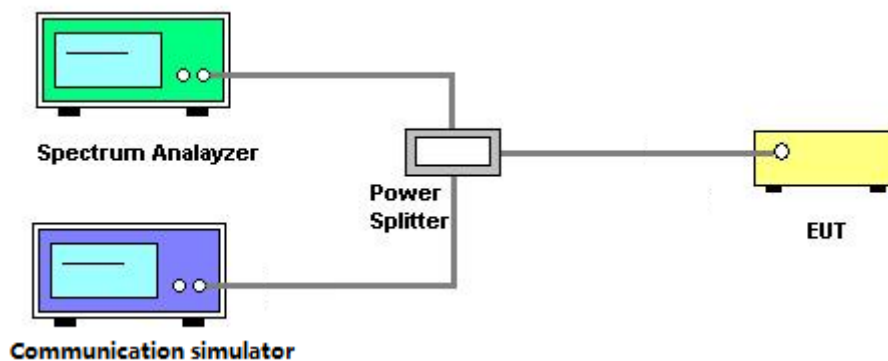
5.2 TEST PROCEDURE

- The EUT was connected to spectrum analyzer and system simulator via a power divider.
- 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.
- Set spectrum analyzer with Peak detector.
- The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

5.3 DEVIATION FROM TEST STANDARD

No deviation.

5.4 TEST SETUP



5.5 TEST RESULT

Please refer to the APPENDIX C.

6 RADIATED SPURIOUS EMISSIONS TEST

6.1 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.

NOTE:

(1) The test result calculated as following:

Measurement Value = Reading Level + Correct Factor

Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use)

Margin Level = Measurement Value - Limit Value

Calculation example:

Reading Level		Correct Factor		Measurement Value
-50.43	+	-2.11	=	-52.54

Measurement Value		Limit Value		Margin Level
-52.54	-	-13	=	-39.54

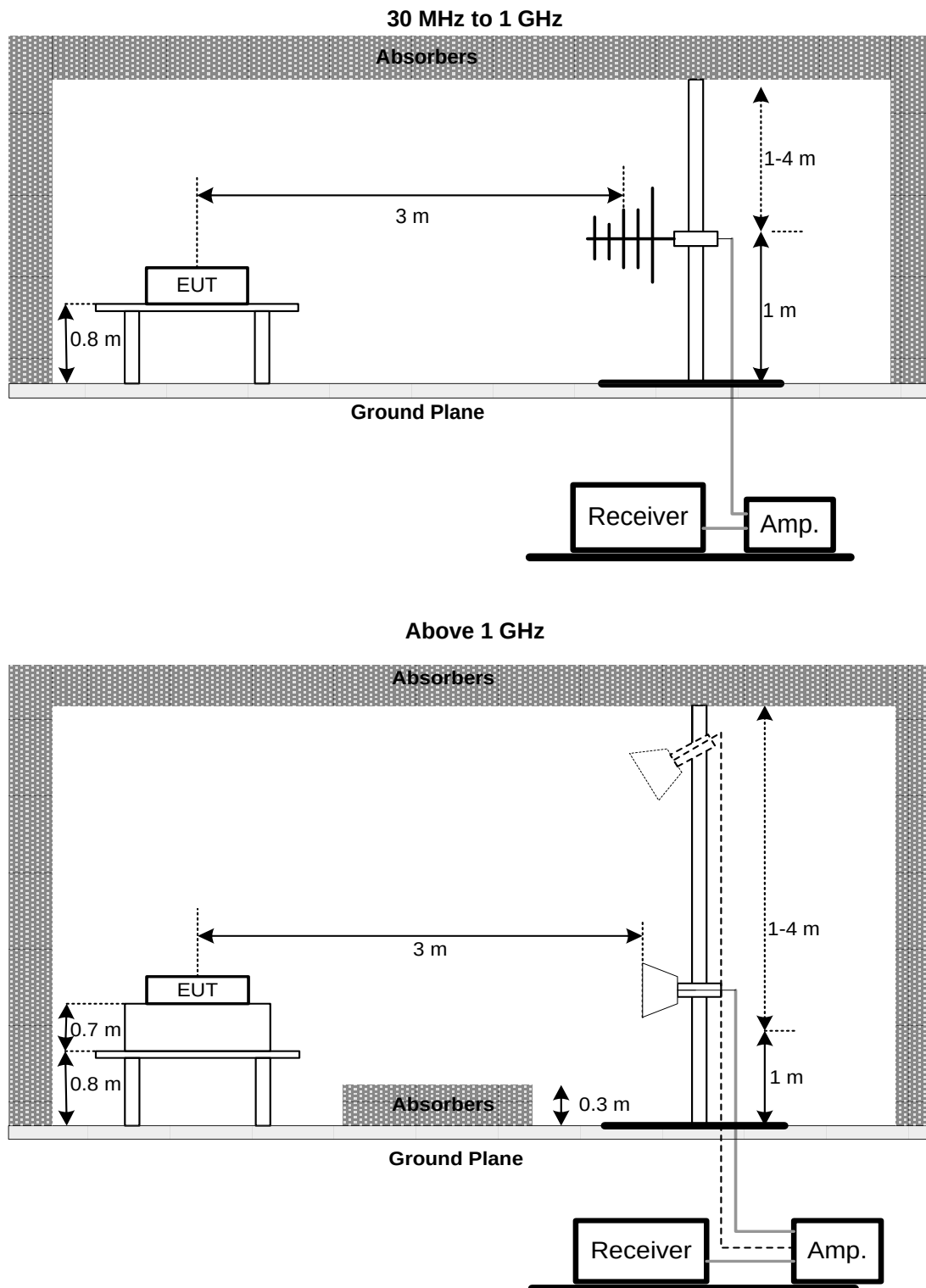
6.2 TEST PROCEDURE

- e. 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.
- f. 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
- g. EIRP = Output power level of S.G - TX cable loss + Antenna gain of substitution horn.
- h. ERP power can be calculated form EIRP power by subtracting the gain of dipole,
ERP power = EIRP power - 2.15 dBi.
- i. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz / 3 MHz.

6.3 DEVIATION FROM TEST STANDARD

No deviation.

6.4 TEST SETUP



6.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

6.6 TEST RESULT

Please refer to the APPENDIX D

7 BAND EDGE MEASUREMENT

7.1 LIMIT

The power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log (P)$ dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed. (Part 27 Subpart L & H)

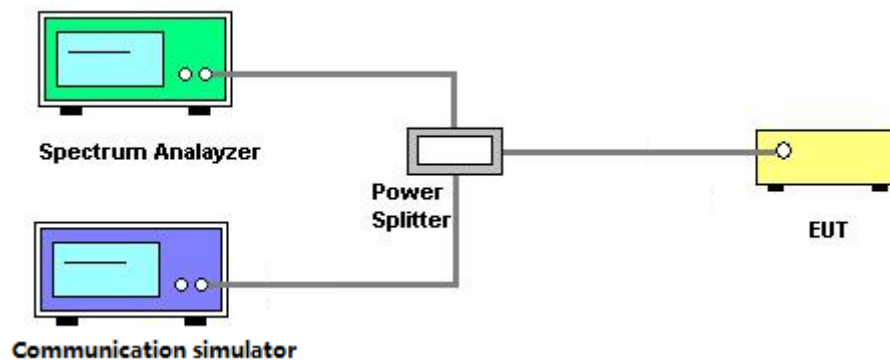
7.2 TEST PROCEDURE

- All measurements were done at low and high operational frequency range.
- Record the max trace plot into the test report.

7.3 DEVIATION FROM TEST STANDARD

No deviation.

7.4 TEST SETUP



7.5 TEST RESULT

Please refer to the APPENDIX E.

8 PEAK TO AVERAGE RATIO MEASUREMENT

8.1 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.

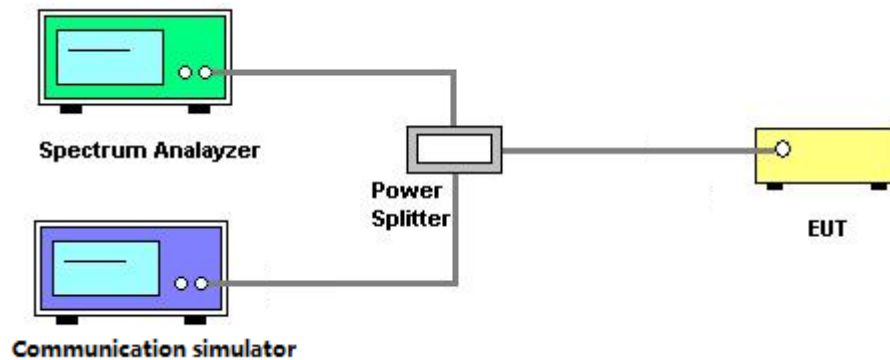
8.2 TEST PROCEDURE

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

8.3 DEVIATION FROM TEST STANDARD

No deviation.

8.4 TEST SETUP



8.5 TEST RESULT

Please refer to the APPENDIX F.

9 FREQUENCY STABILITY MEASUREMENT

9.1 LIMIT

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

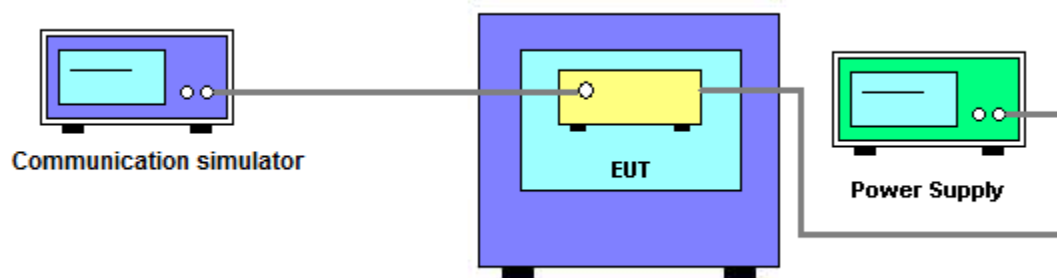
9.2 TEST PROCEDURE

- 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.
- 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.
- 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.
- The frequency error was recorded frequency error from the communication simulator.

9.3 DEVIATION FROM TEST STANDARD

No deviation.

9.4 TEST SETUP



9.5 TEST RESULT

Please refer to the APPENDIX G.

10 LIST OF MEASURING EQUIPMENTS

RF Power Output						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Radio Communication Analyzer	Anritsu	MT8820C	6201525878	2020/6/19	2021/6/18
2	8960 Series 10 Wireless Com Test Set	Agilent	E5515C	GB47390193	2020/6/4	2021/6/3

Radiated Spurious Emissions						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Preamplifier	EMCI	EMC001340	980555	2019/4/12	2020/4/11
2	Preamplifier	EMCI	EMC02325B	980217	2019/4/12	2020/4/11
3	Preamplifier	EMCI	EMC012645B	980267	2019/4/12	2020/4/11
4	Test Cable	EMCI	EMC104-SM-SM-800	150207	2019/4/12	2020/4/11
5	Test Cable	EMCI	EMC104-SM-SM-3000	151205	2019/4/12	2020/4/11
6	Test Cable	EMCI	EMC-SM-SM-7000	180408	2019/4/12	2020/4/11
7	MXE EMI Receiver	Agilent	N9038A	MY55420127	2019/3/26	2020/3/25
8	Signal Analyzer	Agilent	N9010A	MY56480554	2019/6/6	2020/6/5
9	Horn Ant	SCHWARZBECK	BBHA 9120D	9120D-1342	2019/6/10	2020/6/9
10	Trilog-Broadband Antenna	Schwarzbeck	VULB 9168	000992	2019/5/29	2020/5/28
11	5dB Attenuator	EMCI	EMCI-N-6-05	AT-N0508	2019/5/29	2020/5/28
12	Preamplifier	EMCI	EMC2654045	980030	2019/2/2	2020/2/2

Frequency Stability Measurement						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Radio Communication Analyzer	Anritsu	MT8820C	6201525878	2020/6/19	2021/6/18
2	8960 Series 10 Wireless Com Test Set	Agilent	E5515C	GB47390193	2020/6/4	2021/6/3
3	Thermal Chamber	HOLINK	H-TH-2SP-B	EK04101902	2020/7/2	2021/7/1

Others Conducted Measurement						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated Date	Calibrated Until
1	Spectrum Analyzer	Agilent	N9010A	MY54200240	2019/11/19	2020/11/18

Remark: "N/A" denotes no model name, no serial no. or no calibration specified.
All calibration period of equipment list is one year.

11 EUT TEST PHOTO

Please refer to document Appendix No.: TP-1608T164C-1 (APPENDIX-TEST PHOTOS).

12 EUT PHOTOS

Please refer to document Appendix No.: EP-1608T164C-2 (APPENDIX-EUT PHOTOS).

APPENDIX A RF POWER OUTPUT TEST

Band	WCDMA Band IV					
Tx Channel	1312	1413	1513	1312	1413	1513
Rx Channel	1537	1638	1738	1537	1638	1738
Frequency (MHz)	1712.4	1732.6	1752.6	1712.4	1732.6	1752.6
Mode	Conducted Power (dBm)			EIRP (dBm)		
RMC 12.2K	23.02	23.01	23.21	26.52	26.51	26.71
HSDPA Subtest-1	23.05	23.03	23.22	26.55	26.53	26.72
HSDPA Subtest-2	22.56	22.58	22.74	26.06	26.08	26.24
HSDPA Subtest-3	22.12	22.04	22.31	25.62	25.54	25.81
HSDPA Subtest-4	22.11	22.06	22.31	25.61	25.56	25.81
HSUPA Subtest-1	23.04	23.02	23.23	26.54	26.52	26.73
HSUPA Subtest-2	21.13	21.11	21.25	24.63	24.61	24.75
HSUPA Subtest-3	22.12	22.09	22.24	25.62	25.59	25.74
HSUPA Subtest-4	21.09	21.06	21.25	24.59	24.56	24.75
HSUPA Subtest-5	23.08	23.07	23.28	26.58	26.57	26.78
HSPA+	22.87	22.69	22.76	26.37	26.19	26.26
				Antenna Gain	3.50	dBi

Band				LTE Band 4					
Channel				19957	20175	20392	19957	20175	20392
Frequency (MHz)				1710.7	1732.5	1754.2	1710.7	1732.5	1754.2
Channel Bandwidth (MHz)	Modulation	RB Size	RB Offset	Conducted Power (dBm)			EIRP (dBm)		
1.4	QPSK	1	0	21.48	21.44	21.69	24.98	24.94	25.19
		1	2	21.64	21.59	21.74	25.14	25.09	25.24
		1	5	21.67	21.54	21.80	25.17	25.04	25.30
		3	0	21.48	21.44	21.69	24.98	24.94	25.19
		3	1	21.64	21.59	21.74	25.14	25.09	25.24
		3	2	21.67	21.54	21.80	25.17	25.04	25.30
	16QAM	6	0	20.70	20.64	20.88	24.20	24.14	24.38
		1	0	20.53	20.46	20.73	24.03	23.96	24.23
		1	2	20.74	20.66	20.76	24.24	24.16	24.26
		1	5	20.72	20.57	20.87	24.22	24.07	24.37
		3	0	20.53	20.46	20.73	24.03	23.96	24.23
		3	1	20.74	20.66	20.76	24.24	24.16	24.26
		3	2	20.72	20.57	20.87	24.22	24.07	24.37
		6	0	19.70	20.50	20.60	23.20	24.00	24.10
							Antenna Gain	3.50	dB

Band				LTE Band 4					
Channel				19965	20175	20384	19965	20175	20384
Frequency (MHz)				1711.5	1732.5	1753.4	1711.5	1732.5	1753.4
Channel Bandwidth (MHz)	Modulation	RB Size	RB Offset	Conducted Power (dBm)			EIRP (dBm)		
3	QPSK	1	0	21.53	21.49	21.74	25.03	24.99	25.24
		1	7	21.69	21.64	21.79	25.19	25.14	25.29
		1	14	21.72	21.59	21.85	25.22	25.09	25.35
		8	0	20.61	20.53	20.78	24.11	24.03	24.28
		8	4	20.73	20.69	20.81	24.23	24.19	24.31
		8	7	20.78	20.61	20.92	24.28	24.11	24.42
		15	0	20.75	20.69	20.93	24.25	24.19	24.43
	16QAM	1	0	20.58	20.51	20.78	24.08	24.01	24.28
		1	7	20.79	20.71	20.81	24.29	24.21	24.31
		1	14	20.77	20.62	20.92	24.27	24.12	24.42
		8	0	19.61	19.52	19.78	23.11	23.02	23.28
		8	4	19.72	19.69	19.81	23.22	23.19	23.31
		8	7	19.79	19.66	19.93	23.29	23.16	23.43
		15	0	19.75	19.61	19.96	23.25	23.11	23.46
							Antenna Gain	3.50	dB

Band				LTE Band 4					
Channel				19975	20175	20375	19975	20175	20375
Frequency (MHz)				1712.5	1732.5	1752.5	1712.5	1732.5	1752.5
Channel Bandwidth (MHz)	Modulation	RB Size	RB Offset	Conducted Power (dBm)			EIRP (dBm)		
5	QPSK	1	0	21.58	21.54	21.79	25.08	25.04	25.29
		1	12	21.74	21.69	21.84	25.24	25.19	25.34
		1	24	21.77	21.64	21.90	25.27	25.14	25.40
		12	0	20.66	20.58	20.83	24.16	24.08	24.33
		12	6	20.78	20.74	20.86	24.28	24.24	24.36
		12	11	20.83	20.66	20.97	24.33	24.16	24.47
		25	0	20.80	20.74	20.98	24.30	24.24	24.48
	16QAM	1	0	20.63	20.56	20.83	24.13	24.06	24.33
		1	12	20.84	20.76	20.86	24.34	24.26	24.36
		1	24	20.82	20.67	20.97	24.32	24.17	24.47
		12	0	19.66	19.57	19.83	23.16	23.07	23.33
		12	6	19.77	19.74	19.86	23.27	23.24	23.36
		12	11	19.84	19.71	19.98	23.34	23.21	23.48
		25	0	19.80	19.66	20.01	23.30	23.16	23.51
							Antenna Gain	3.50	dB

Band				LTE Band 4					
Channel				20000	20175	20350	20000	20175	20350
Frequency (MHz)				1715	1732.5	1750	1715	1732.5	1750
Channel Bandwidth (MHz)	Modulation	RB Size	RB Offset	Conducted Power (dBm)			EIRP (dBm)		
10	QPSK	1	0	21.63	21.59	21.84	25.13	25.09	25.34
		1	24	21.79	21.74	21.89	25.29	25.24	25.39
		1	49	21.82	21.69	21.95	25.32	25.19	25.45
		25	0	20.71	20.63	20.88	24.21	24.13	24.38
		25	12	20.83	20.79	20.91	24.33	24.29	24.41
		25	24	20.88	20.71	21.02	24.38	24.21	24.52
		50	0	20.85	20.79	21.03	24.35	24.29	24.53
	16QAM	1	0	20.68	20.61	20.88	24.18	24.11	24.38
		1	24	20.89	20.81	20.91	24.39	24.31	24.41
		1	49	20.87	20.72	21.02	24.37	24.22	24.52
		25	0	19.71	19.62	19.88	23.21	23.12	23.38
		25	12	19.82	19.79	19.91	23.32	23.29	23.41
		25	24	19.89	19.76	20.03	23.39	23.26	23.53
		50	0	19.85	19.71	20.06	23.35	23.21	23.56
							Antenna Gain	3.50	dB

Band				LTE Band 4					
Channel				20025	20175	20325	20025	20175	20325
Frequency (MHz)				1717.5	1732.5	1747.5	1717.5	1732.5	1747.5
Channel Bandwidth (MHz)	Modulation	RB Size	RB Offset	Conducted Power (dBm)			EIRP (dBm)		
15	QPSK	1	0	21.68	21.64	21.89	25.18	25.14	25.39
		1	37	21.84	21.79	21.94	25.34	25.29	25.44
		1	74	21.87	21.74	22.00	25.37	25.24	25.50
		36	0	20.76	20.68	20.93	24.26	24.18	24.43
		36	18	20.88	20.84	20.96	24.38	24.34	24.46
		36	35	20.93	20.76	21.07	24.43	24.26	24.57
		75	0	20.90	20.84	21.08	24.40	24.34	24.58
	16QAM	1	0	20.73	20.66	20.93	24.23	24.16	24.43
		1	37	20.94	20.86	20.96	24.44	24.36	24.46
		1	74	20.92	20.77	21.07	24.42	24.27	24.57
		36	0	19.76	19.67	19.93	23.26	23.17	23.43
		36	18	19.87	19.84	19.96	23.37	23.34	23.46
		36	35	19.94	19.81	20.08	23.44	23.31	23.58
		75	0	19.90	19.76	20.11	23.40	23.26	23.61
							Antenna Gain	3.50	dB

Band				LTE Band 4					
Channel				20050	20175	20300	20050	20175	20300
Frequency (MHz)				1720	1732.5	1745	1720	1732.5	1745
Channel Bandwidth (MHz)	Modulation	RB Size	RB Offset	Conducted Power (dBm)			EIRP (dBm)		
20	QPSK	1	0	21.73	21.69	21.94	25.23	25.19	25.44
		1	49	21.89	21.84	21.99	25.39	25.34	25.49
		1	99	21.92	21.79	22.05	25.42	25.29	25.55
		50	0	20.81	20.73	20.98	24.31	24.23	24.48
		50	24	20.93	20.89	21.01	24.43	24.39	24.51
		50	49	20.98	20.81	21.12	24.48	24.31	24.62
		100	0	20.95	20.89	21.13	24.45	24.39	24.63
	16QAM	1	0	20.78	20.71	20.98	24.28	24.21	24.48
		1	49	20.99	20.91	21.01	24.49	24.41	24.51
		1	99	20.97	20.82	21.12	24.47	24.32	24.62
		50	0	19.81	19.72	19.98	23.31	23.22	23.48
		50	24	19.92	19.89	20.01	23.42	23.39	23.51
		50	49	19.99	19.86	20.13	23.49	23.36	23.63
		100	0	19.95	19.81	20.16	23.45	23.31	23.66
							Antenna Gain	3.50	dB

Band				LTE Band 12					
Channel				23017	23095	23173	23017	23095	23173
Frequency (MHz)				699.7	707.5	715.3	699.7	707.5	715.3
Channel Bandwidth (MHz)	Modulation	RB Size	RB Offset	Conducted Power (dBm)			ERP (dBm)		
1.4	QPSK	1	0	22.92	22.89	23.04	23.19	23.16	23.31
		1	2	22.96	22.96	22.98	23.23	23.23	23.25
		1	5	22.94	22.83	23.02	23.21	23.10	23.29
		3	0	22.92	22.89	23.04	23.19	23.16	23.31
		3	1	22.96	22.96	22.98	23.23	23.23	23.25
		3	2	22.94	22.83	23.02	23.21	23.10	23.29
		6	0	21.99	21.86	22.04	22.26	22.13	22.31
	16QAM	1	0	21.98	22.01	22.06	22.25	22.28	22.33
		1	2	22.01	22.04	22.06	22.28	22.31	22.33
		1	5	21.96	20.84	22.06	22.23	21.11	22.33
		3	0	21.98	22.01	22.06	22.25	22.28	22.33
		3	1	22.01	22.04	22.06	22.28	22.31	22.33
		3	2	21.96	20.84	22.06	22.23	21.11	22.33
		6	0	21.03	20.50	20.60	21.30	20.77	20.87
							Antenna Gain	2.42	dBi

Band				LTE Band 12					
Channel				23025	23095	23165	23025	23095	23165
Frequency (MHz)				700.5	707.5	714.5	700.5	707.5	714.5
Channel Bandwidth (MHz)	Modulation	RB Size	RB Offset	Conducted Power (dBm)			ERP (dBm)		
3	QPSK	1	0	22.97	22.94	23.09	23.24	23.21	23.36
		1	7	23.01	23.01	23.03	23.28	23.28	23.30
		1	14	22.99	22.88	23.07	23.26	23.15	23.34
		8	0	21.99	22.01	22.13	22.26	22.28	22.40
		8	4	22.03	22.03	22.11	22.30	22.30	22.38
		8	7	22.08	21.89	22.11	22.35	22.16	22.38
		15	0	22.04	21.91	22.09	22.31	22.18	22.36
	16QAM	1	0	22.03	22.06	22.11	22.30	22.33	22.38
		1	7	22.06	22.09	22.11	22.33	22.36	22.38
		1	14	22.01	20.89	22.11	22.28	21.16	22.38
		8	0	21.02	21.01	21.11	21.29	21.28	21.38
		8	4	21.05	21.09	21.06	21.32	21.36	21.33
		8	7	21.01	20.92	21.12	21.28	21.19	21.39
		15	0	21.08	20.96	21.18	21.35	21.23	21.45
							Antenna Gain	2.42	dBi

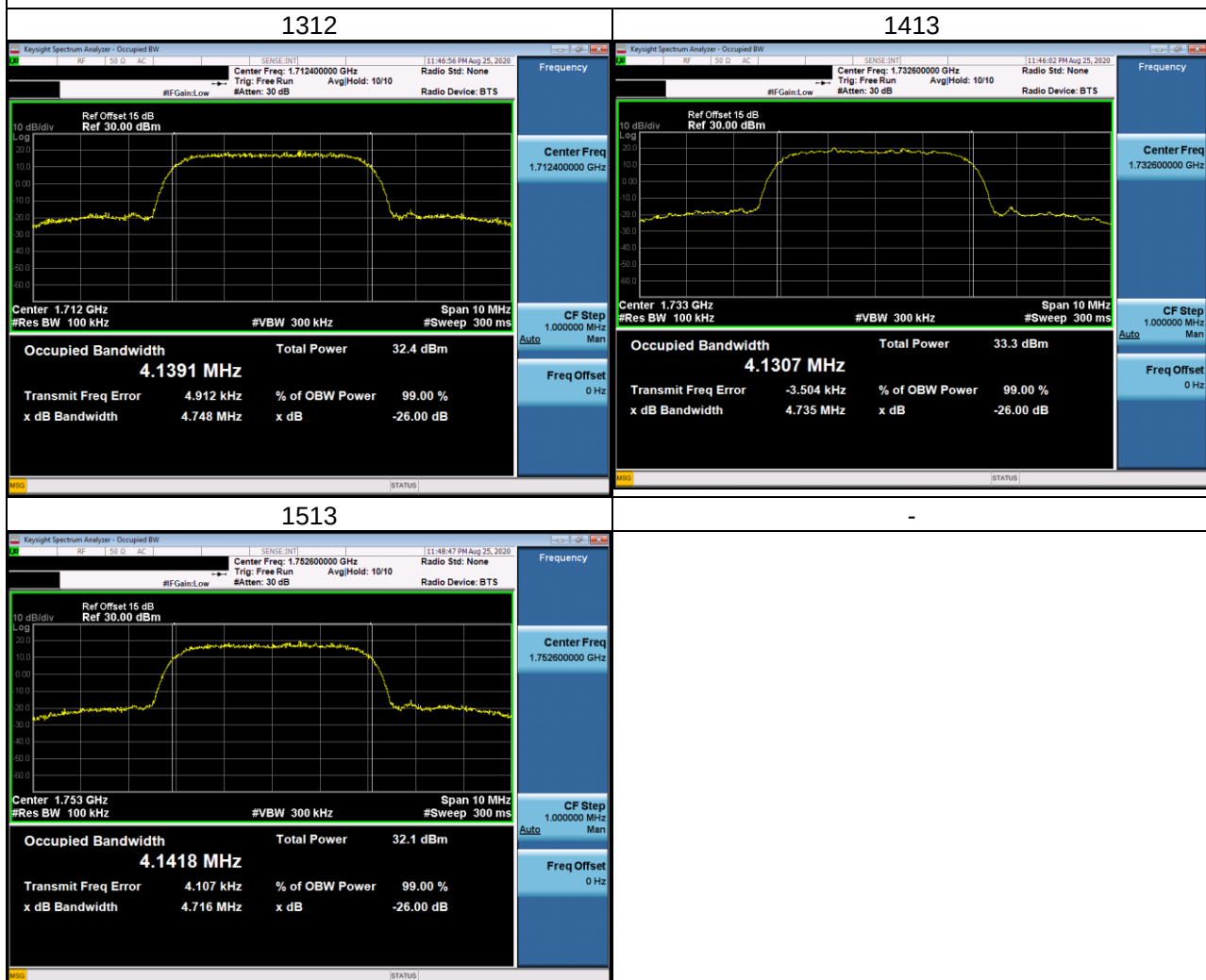
Band				LTE Band 12					
Channel				23035	23095	23155	23035	23095	23155
Frequency (MHz)				701.5	707.5	713.5	701.5	707.5	713.5
Channel Bandwidth (MHz)	Modulation	RB Size	RB Offset	Conducted Power (dBm)			ERP (dBm)		
5	QPSK	1	0	23.02	22.99	23.14	23.29	23.26	23.41
		1	12	23.06	23.06	23.08	23.33	23.33	23.35
		1	24	23.04	22.93	23.12	23.31	23.20	23.39
		12	0	22.04	22.06	22.18	22.31	22.33	22.45
		12	6	22.08	22.08	22.16	22.35	22.35	22.43
		12	11	22.13	21.94	22.16	22.40	22.21	22.43
		25	0	22.09	21.96	22.14	22.36	22.23	22.41
	16QAM	1	0	22.08	22.11	22.16	22.35	22.38	22.43
		1	12	22.11	22.14	22.16	22.38	22.41	22.43
		1	24	22.06	20.94	22.16	22.33	21.21	22.43
		12	0	21.07	21.06	21.16	21.34	21.33	21.43
		12	6	21.10	21.14	21.11	21.37	21.41	21.38
		12	11	21.06	20.97	21.17	21.33	21.24	21.44
		25	0	21.13	21.01	21.23	21.40	21.28	21.50
							Antenna Gain	2.42	dBi

Band				LTE Band 12					
Channel				23060	23095	23130	23060	23095	23130
Frequency (MHz)				704	707.5	711	704	707.5	711
Channel Bandwidth (MHz)	Modulation	RB Size	RB Offset	Conducted Power (dBm)			ERP (dBm)		
10	QPSK	1	0	23.07	23.04	23.19	23.34	23.31	23.46
		1	24	23.11	23.11	23.13	23.38	23.38	23.40
		1	49	23.09	22.98	23.17	23.36	23.25	23.44
		25	0	22.09	22.11	22.23	22.36	22.38	22.50
		25	12	22.13	22.13	22.21	22.40	22.40	22.48
		25	24	22.18	21.99	22.21	22.45	22.26	22.48
		50	0	22.14	22.01	22.19	22.41	22.28	22.46
	16QAM	1	0	22.13	22.16	22.21	22.40	22.43	22.48
		1	24	22.16	22.19	22.21	22.43	22.46	22.48
		1	49	22.11	20.99	22.21	22.38	21.26	22.48
		25	0	21.12	21.11	21.21	21.39	21.38	21.48
		25	12	21.15	21.19	21.16	21.42	21.46	21.43
		25	24	21.11	21.02	21.22	21.38	21.29	21.49
		50	0	21.18	21.06	21.28	21.45	21.33	21.55
							Antenna Gain	2.42	dBi

APPENDIX B OCCUPIED BANDWIDTH

WCDMA Band IV_WCDMA					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
1312	1712.4	4.1391	1312	1712.4	4.748
1413	1732.6	4.1307	1413	1732.6	4.735
1513	1752.6	4.1418	1513	1752.6	4.716

Spectrum Plot



LTE Band 4_1.4M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
19957	1710.7	1.1003	19957	1710.7	1.258
20175	1732.5	1.1013	20175	1732.5	1.276
20393	1754.3	1.0994	20393	1754.3	1.274
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
19957	1710.7	1.1003	19957	1710.7	1.254
20175	1732.5	1.1008	20175	1732.5	1.267
20393	1754.3	1.1012	20393	1754.3	1.268

Spectrum Plot

QPSK-19957



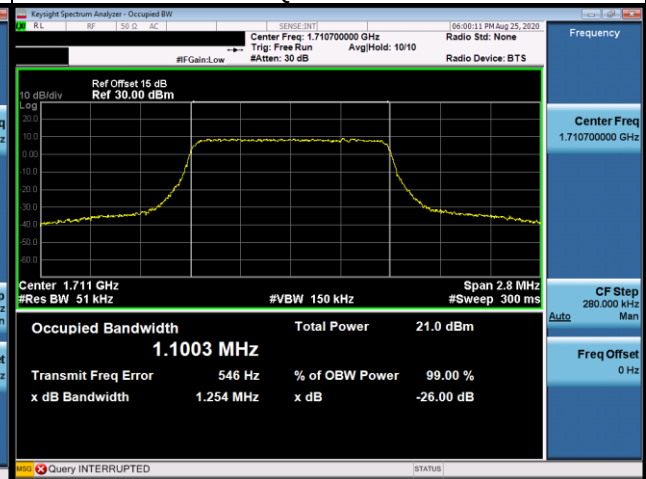
QPSK-20175



QPSK-20393



16QAM-19957



16QAM-20175



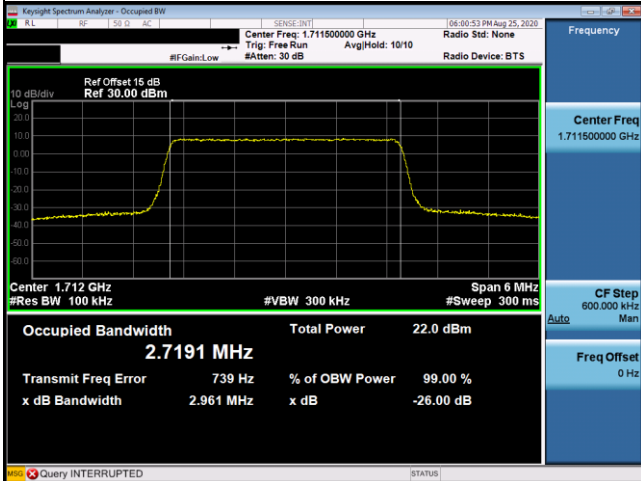
16QAM-20393



LTE Band 4_3M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
19965	1711.5	2.7191	19965	1711.5	2.961
20175	1732.5	2.7184	20175	1732.5	2.954
20385	1753.5	2.7180	20385	1753.5	2.969
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
19965	1711.5	2.7144	19965	1711.5	2.955
20175	1732.5	2.7180	20175	1732.5	2.957
20385	1753.5	2.7156	20385	1753.5	2.949

Spectrum Plot

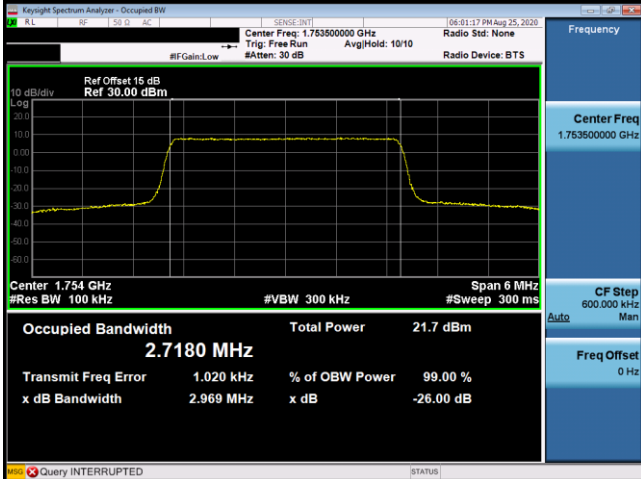
QPSK-19965



QPSK-20175



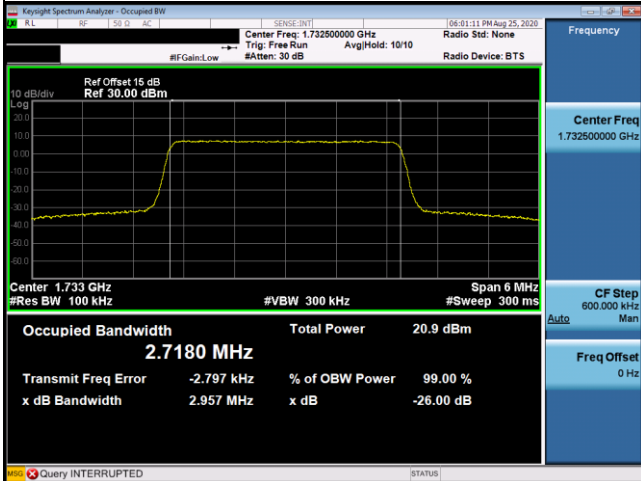
QPSK-20385



16QAM-19965



16QAM-20175



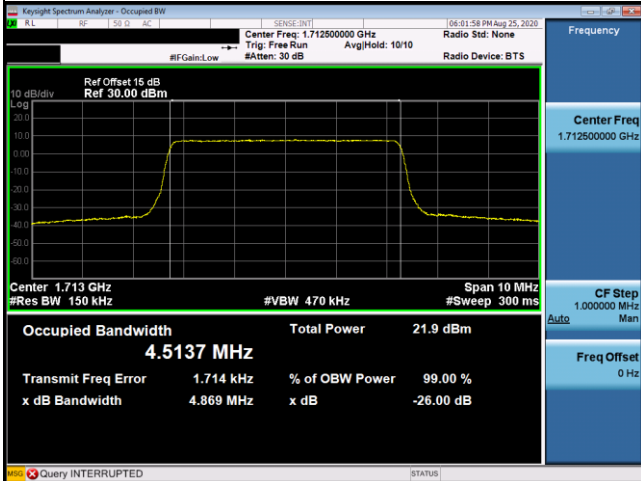
16QAM-20385



LTE Band 4_5M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
19975	1712.5	4.5137	19975	1712.5	4.869
20175	1732.5	4.5127	20175	1732.5	4.877
20375	1752.5	4.5127	20375	1752.5	4.876
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
19975	1712.5	4.5054	19975	1712.5	4.871
20175	1732.5	4.5068	20175	1732.5	4.871
20375	1752.5	4.5058	20375	1752.5	4.869

Spectrum Plot

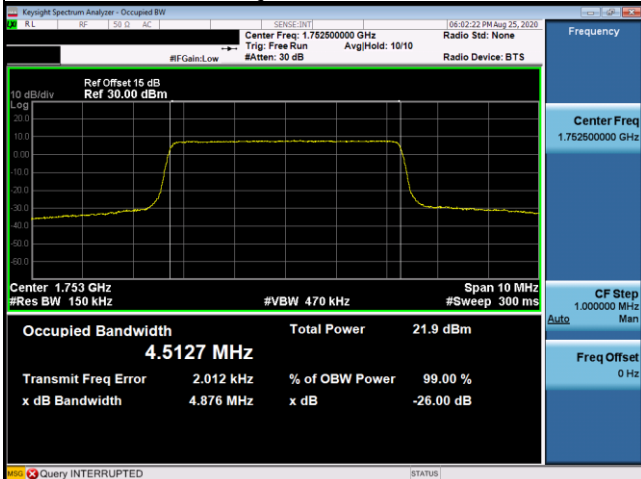
QPSK-19975



QPSK-20175



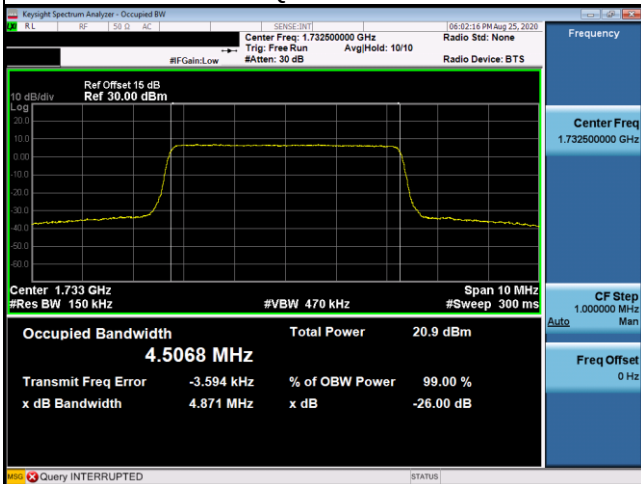
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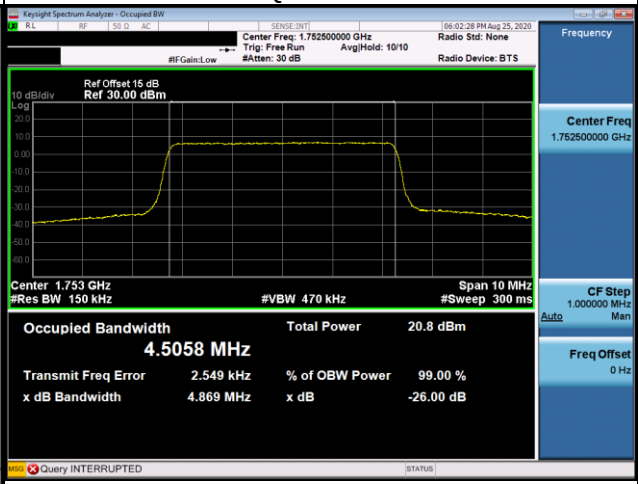
16QAM-19975



16QAM-20175



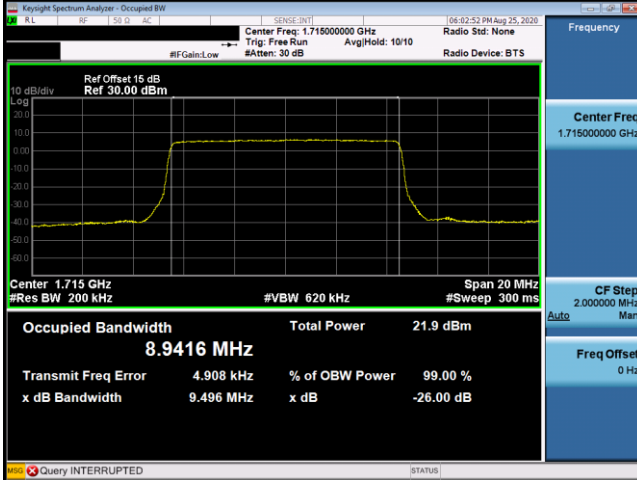
16QAM-20375



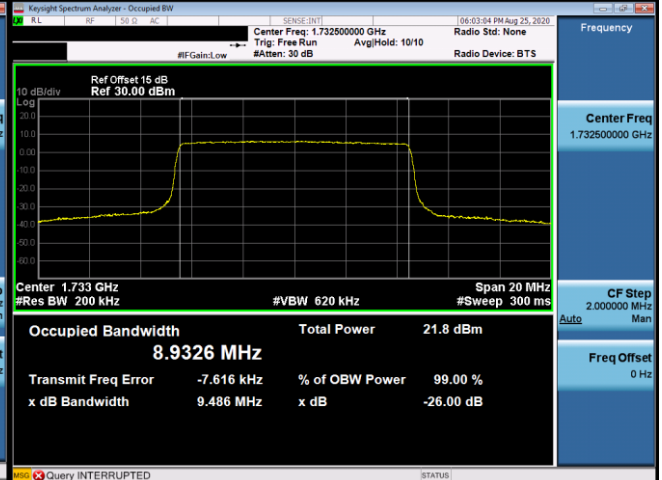
LTE Band 4_10M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20000	1715	8.9416	20000	1715	9.496
20175	1732.5	8.9326	20175	1732.5	9.486
20350	1750	8.9374	20350	1750	9.488
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20000	1715	8.9394	20000	1715	9.496
20175	1732.5	8.9320	20175	1732.5	9.482
20350	1750	8.9373	20350	1750	9.493

Spectrum Plot

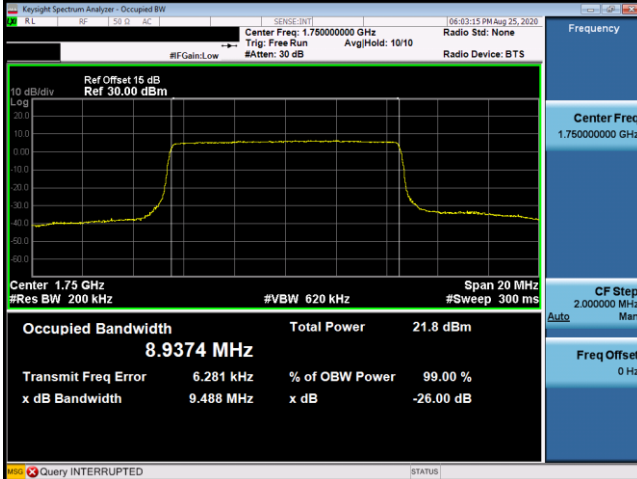
QPSK-20000



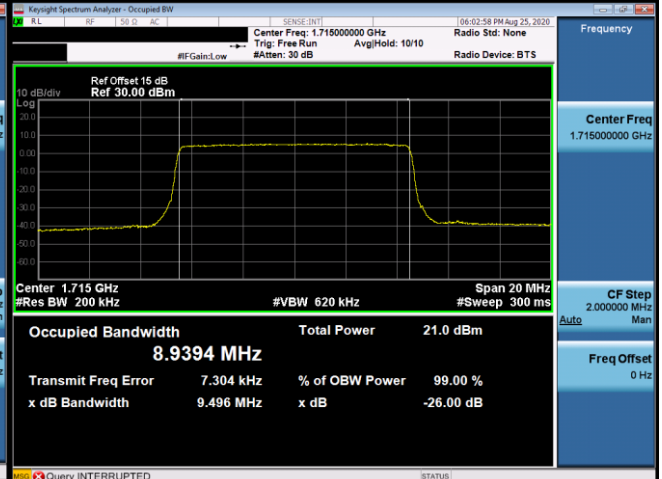
QPSK-20175



QPSK-20350



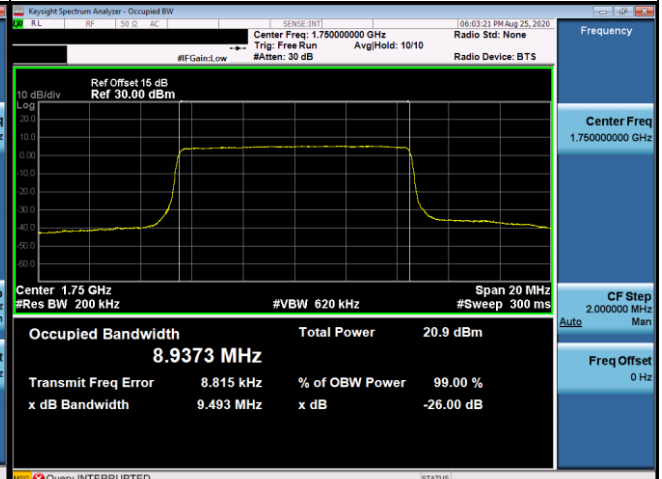
16QAM-20000



16QAM-20175



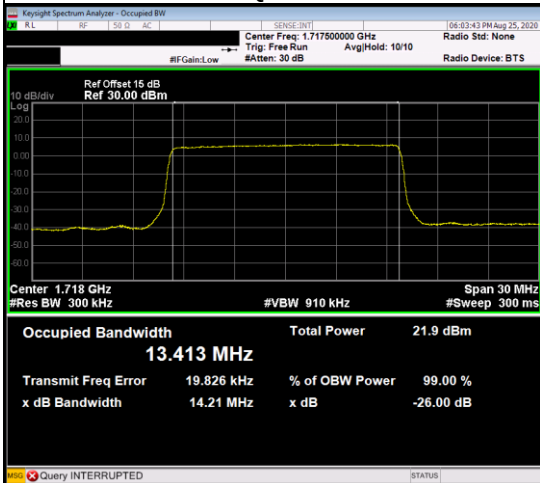
16QAM-20350



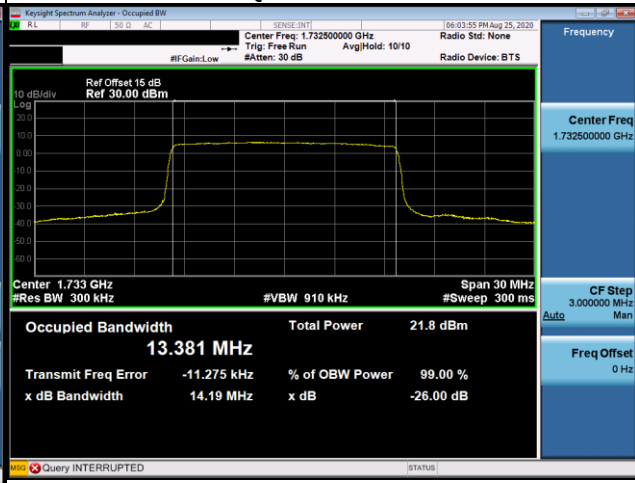
LTE Band 4_15M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20025	1717.5	13.413	20025	1717.5	14.21
20175	1732.5	13.381	20175	1732.5	14.19
20325	1747.5	13.419	20325	1747.5	14.21
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20025	1717.5	13.407	20025	1717.5	14.20
20175	1732.5	13.372	20175	1732.5	14.19
20325	1747.5	13.411	20325	1747.5	14.20

Spectrum Plot

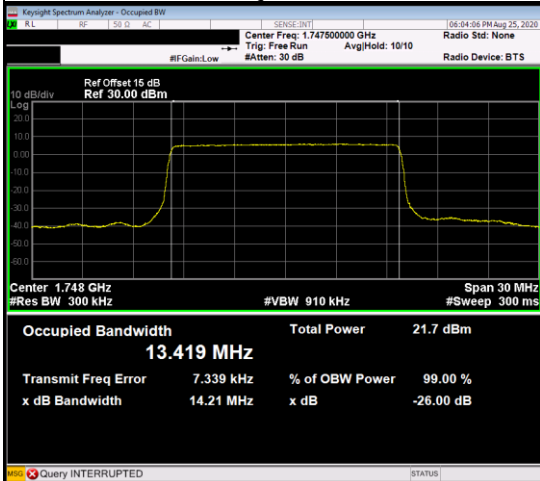
QPSK-20025



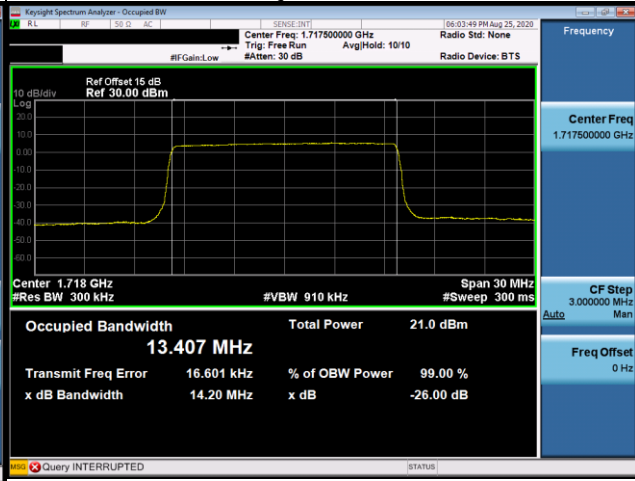
QPSK-20175



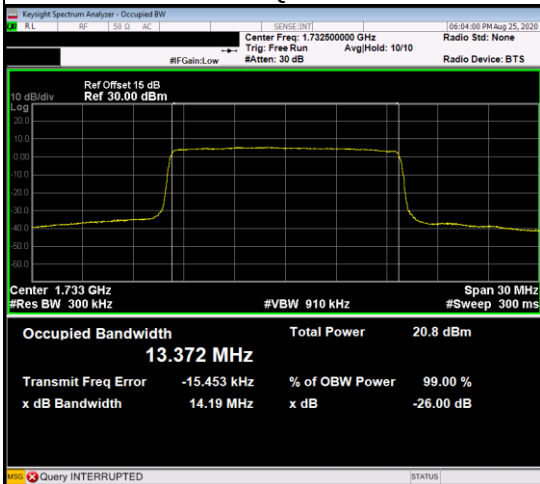
QPSK-20325



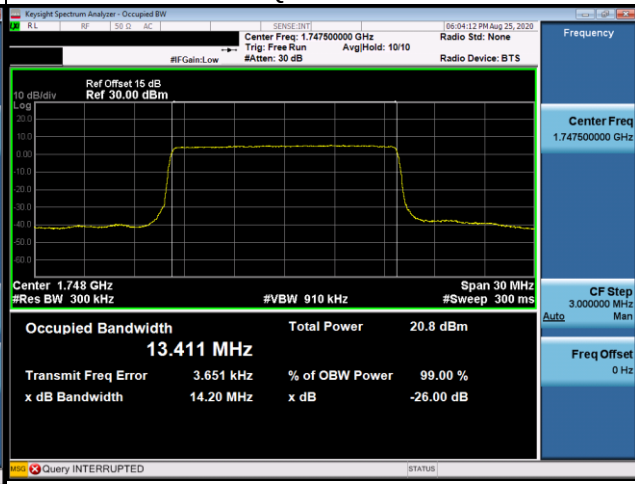
16QAM-20025



16QAM-20175



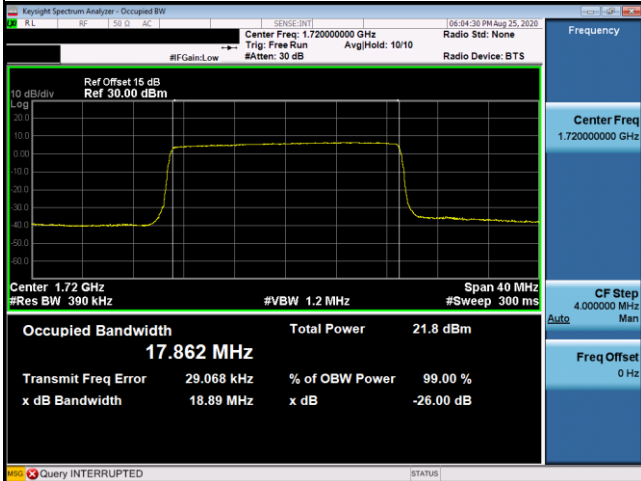
16QAM-20325



LTE Band 4_20M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20050	1720	17.862	20050	1720	18.89
20175	1732.5	17.817	20175	1732.5	18.88
20300	1745	17.902	20300	1745	18.93
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20050	1720	17.857	20050	1720	18.90
20175	1732.5	17.810	20175	1732.5	18.87
20300	1745	17.898	20300	1745	18.93

Spectrum Plot

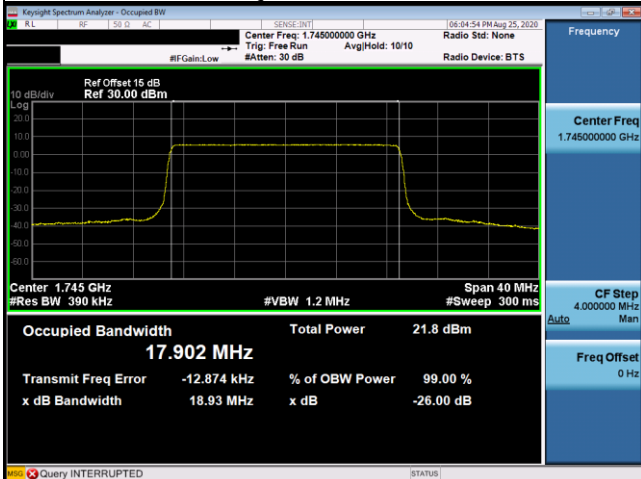
QPSK-20050



QPSK-20175



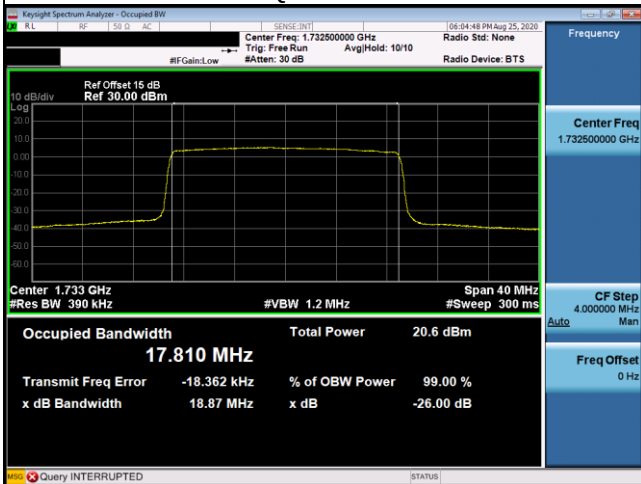
QPSK-20300



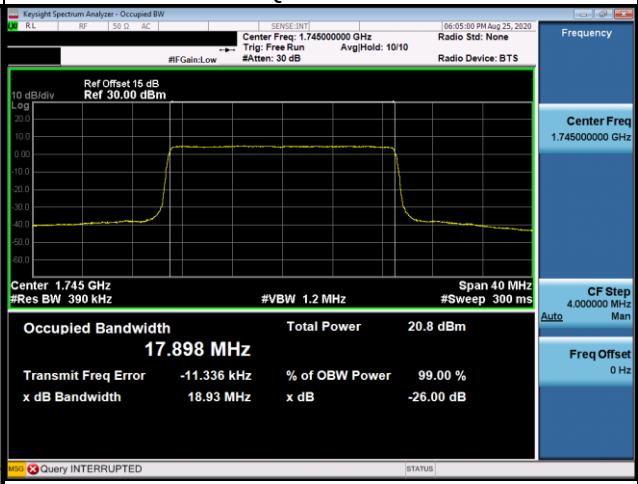
16QAM-20050



16QAM-20175



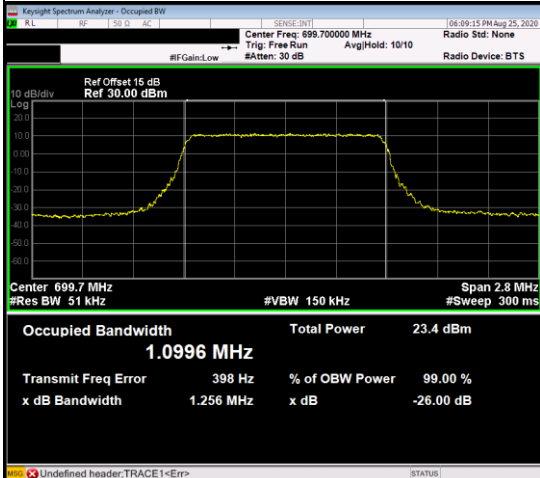
16QAM-20300



LTE Band 12_1.4M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
23017	699.7	1.0996	23017	699.7	1.256
23095	707.5	1.0990	23095	707.5	1.254
23173	715.3	1.0993	23173	715.3	1.256
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
23017	699.7	1.0990	23017	699.7	1.255
23095	707.5	1.1006	23095	707.5	1.254
23173	715.3	1.1013	23173	715.3	1.266

Spectrum Plot

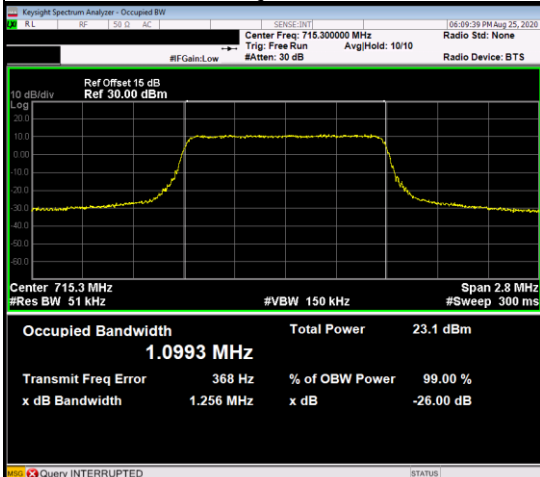
QPSK-23017



QPSK-23095



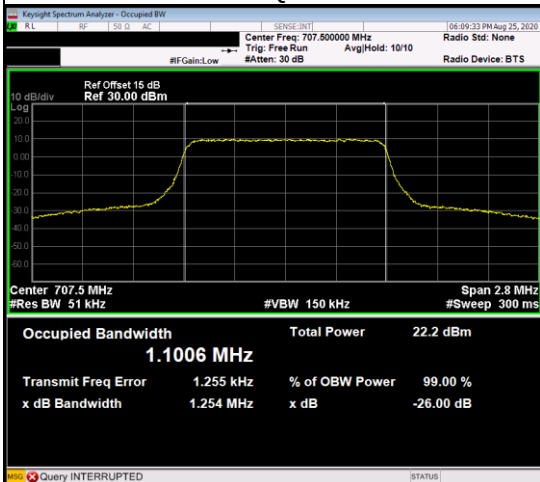
QPSK-23173



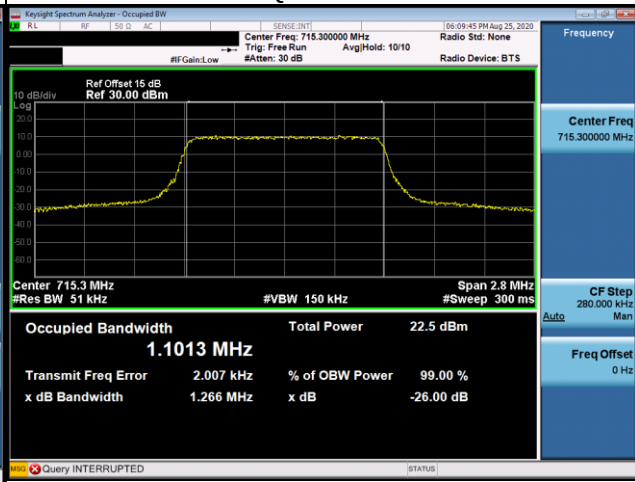
16QAM-23017



16QAM-23095



16QAM-23173



LTE Band 12_3M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
23025	700.5	2.7159	23025	700.5	2.959
23095	707.5	2.7193	23095	707.5	2.962
23165	714.5	2.7236	23165	714.5	2.964
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
23025	700.5	2.7152	23025	700.5	2.953
23095	707.5	2.7180	23095	707.5	2.957
23165	714.5	2.7193	23165	714.5	2.957