FCC TEST REPORT

FCC ID: 2BN8Y-GF60L

On Behalf of

Huizhou Cantrack Technology Co., ltd.

4G GPS Tracker

Model No.: GF40L, GF60L, GF70L, GF200LS, G08L, G09L, G900LS, G900LM, G500L, G06L, TK903, YG119, V20, P02L, P60L, TF220, S01, S02

Prepared for	:	Huizhou Cantrack Technology Co., ltd.
Address	:	FL5, BLDG B, Lianxing Industrial Park, JiangJun Rd, Qiuchang, HuiYang District, Huizhou, Guangdong, China, 516221

Prepared By	:	Shenzhen Alpha Product Testing Co., Ltd.
Address	:	Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103, Shenzhen, Guangdong, China

Report Number	:	A2502176-C02-R02
Date of Receipt	:	February 26, 2025
Date of Test	:	February 26, 2025 – March 14, 2025
Date of Report	:	March 15, 2025
Version Number	:	V0
Test Result	**:**	**Pass**

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TEST REPORT DECLARATION

Applicant	:	Huizhou Cantrack Technology Co., ltd.
Address	:	FL5, BLDG B, Lianxing Industrial Park, JiangJun Rd, Qiuchang, HuiYang District, Huizhou, Guangdong, China, 516221
Manufacturer	:	Huizhou Cantrack Technology Co., ltd.
Address	:	FL5, BLDG B, Lianxing Industrial Park, JiangJun Rd, Qiuchang, HuiYang District, Huizhou, Guangdong, China, 516221
EUT Description	:	4G GPS Tracker
	(A) Model No.	: GF40L, GF60L, GF70L, GF200LS, G08L, G09L, G900LS, G900LM, G500L, G06L, TK903, YG119, V20, P02L, P60L, TF220, S01, S02
	(B) Trademark	: N/A

Measurement Standard Used:

FCC CFR Title 47 Part 2
FCC CFR Title 47 Part 22 Subpart H
FCC CFR Title 47 Part 24 Subpart E
FCC CFR Title 47 Part 27

The device described above is tested by Shenzhen Alpha Product Testing Co., Ltd. to determine the maximum emission levels emanating from the device. The test results are contained in this test report and Shenzhen Alpha Product Testing Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

After the test, our opinion is that EUT compliance with the requirement of the above standards.

This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Shenzhen Alpha Product Testing Co., Ltd.

Tested by (name + signature).....:	Yannis Wen Project Engineer	Yannis Wen
Approved by (name + signature).....:	Jack Xu Project Manager	Jack Xu
Date of issue.....:	March 15, 2025	

Revision History

Revision	Issue Date	Revisions	Revised By
V0	March 15, 2025	Initial released Issue	Yannis Wen

1 Test Summary

Test Item	Section in CFR 47	Result
RF Output Power	Part 2.1046 Part 22.913(a) (5) Part 24.232 (c) Part 27.50 (d)(4) Part 27.50 (h)	Pass
Peak-To-Average Ratio	Part 2.1046 Part 22.913(d) Part 24.232 (d) Part 27.50(d)	Pass
Modulation Characteristics	Part 2.1047	N/A
99% & -26 dB Occupied Bandwidth	Part 2.1049 Part 22.917 Part 24.238 Part 27.53(a)	Pass
Spurious Emissions at Antenna Terminal	Part 2.1051 Part 22.917 (a) Part 24.238 (a) Part 27.53 (h)/(m)	Pass
Field Strength of Spurious Radiation	Part 2.1053 Part 22.917 (a) Part 24.238 (a) Part 27.53 (h)/(m)	Pass
Out of band emission, Band Edge	Part 22.917 (a) Part 24.238 (a) Part 27.53(h)/(m)	Pass
Frequency stability vs. temperature	Part 2.1055(a)(1)(b)	Pass
Frequency stability vs. voltage	Part 2.1055(d)(1)(2)	Pass

Note: 1. Pass: The EUT complies with the essential requirements in the standard.

2. The conclusion of this test report is judged by actual test data without considering measurement uncertainty.

2 General Information

2.1 General Description of EUT

Description of Device (EUT)

Description/PMN	:	Geodetic GNSS Receiver
Model No./HVIN	:	GF40L, GF60L, GF70L, GF200LS, G08L, G09L, G900LS, G900LM, G500L, G06L, TK903, YG119, V20, P02L, P60L, TF220, S01, S02
DIFF.	:	There is no difference except the name of the model. All tests are made with the GF60L model.
Test Voltage	:	DC 5V from Type-C port and DC 3.7V from battery
Support Bands	:	LTE Band 2/4/5/7/66
Equipment category	:	Cat 1(Category 1)
Channel Bandwidth	:	LTE Band 2: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 4: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 5: 1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 7: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 66: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz
TX Frequency	:	LTE Band 2: 1850 ~ 1910 MHz LTE Band 4: 1710 ~ 1755 MHz LTE Band 5: 824 ~ 849 MHz LTE Band 7: 2500 ~ 2570 MHz LTE Band 66: 1710MHz ~ 1780MHz
Modulation type	:	QPSK, 16QAM
Antenna Type	:	Internal antenna, LTE Band 2: Maximum Gain is -0.14dBi. LTE Band 4: Maximum Gain is 0.45dBi. LTE Band 5: Maximum Gain is 0.42dBi. LTE Band 7: Maximum Gain is 2.47dBi. LTE Band 66: Maximum Gain is 0.45dBi. (Antenna information is provided by applicant.)
Software version	:	V1.0
Hardware version	:	V1.0

Remark: 1. The worst-case simultaneous transmission configuration was evaluated with no non-compliance found. Results in this report are only for 4G function, and there is no other transmitter involved.
2. The product is a CAT 1 device, and Full RB for 16QAM 10/15/20M is not supported

2.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is filing to comply with Section Part 22 subpart H and Part 24 subpart E of the FCC CFR 47 Rules, Part 27 of the FCC CFR 47 Rules.

2.3 Test Facility

Shenzhen Alpha Product Testing Co., Ltd

Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103, Shenzhen, Guangdong, China

June 21, 2018 File on Federal Communication Commission
Registration Number: 293961

July 15, 2019 Certificated by IC
Registration Number: 12135A

CAB identifier: CN0085

2.4 Accessories of Device (EUT)

Accessories : N/A

Manufacturer : N/A

Model : N/A

Ratings : N/A

2.5 Tested Supporting System Details

No.	Description	Manufacturer	Model	Serial Number	Certification or SDoC
1	Notebook PC	Lenovo	ThinkPad E14	/	/

2.6 Test Conditions

Items	Required	Actual
Temperature range:	15-35℃	24℃
Humidity range:	25-75%	56%
Pressure range:	86-106kPa	98kPa

2.7 Measurement Uncertainty

Item	Uncertainty
Uncertainty for Power point Conducted Emissions Test	1.63dB
Uncertainty for Radiation Emission test in 3m chamber (below 30MHz)	3.5dB
Uncertainty for Radiation Emission test in 3m chamber (30MHz to 1GHz)	3.74dB(Polarize: V)
	3.76dB(Polarize: H)
Uncertainty for Radiation Emission test in 3m chamber (1GHz to 25GHz)	3.77dB(Polarize: V)
	3.80dB(Polarize: H)
Uncertainty for Radiation Emission test in 3m chamber (18GHz to 40GHz)	4.31 dB(Polarize: V)
	4.30 dB(Polarize: H)
Uncertainty for radio frequency	5.06×10^{-8}GHz
Uncertainty for conducted RF Power	0.40dB
Uncertainty for temperature	0.2℃
Uncertainty for humidity	1%
Uncertainty for DC and low frequency voltages	0.06%

3 Test Instruments list

Equipment	Manufacture	Model No.	Firmware version	Serial No.	Last cal.	Cal Interval
9*6*6 anechoic chamber	CHENYU	9*6*6	/	N/A	2022.05.18	3Year
Spectrum analyzer	ROHDE&SCHWARZ	FSV40-N	2.3	102137	2024.08.08	1Year
Spectrum analyzer	Agilent	N9020A	A.14.16	MY499100060	2024.08.08	1Year
Geodetic GNSS Receiver	ROHDE&SCHWARZ	ESR	2.28 SP1	1316.3003K03-102082-Wa	2024.08.08	1Year
Geodetic GNSS Receiver	R&S	ESCI	4.42 SP1	101165	2024.08.08	1Year
Bilog Antenna	Schwarzbeck	VULB 9168	/	VULB 9168#627	2023.08.28	2Year
Horn Antenna	SCHWARZBECK	BBHA 9120 D	/	2106	2023.08.19	2Year
Loop Antenna	SCHWARZBECK	FMZB 1519B	/	00128	2023.08.19	2Year
RF Cable	Resenberger	Cable 1	/	RE1	2024.08.08	1Year
RF Cable	Resenberger	Cable 2	/	RE2	2024.08.08	1Year
RF Cable	Resenberger	Cable 3	/	CE1	2024.08.08	1Year
Pre-amplifier	HP	HP8347A	/	2834A00455	2024.08.08	1Year
Pre-amplifier	Agilent	8449B	/	3008A02664	2024.08.08	1Year
L.I.S.N.#1	Schwarzbeck	NSLK8126	/	8126-466	2024.08.08	1Year
L.I.S.N.#2	ROHDE&SCHWARZ	ENV216	/	101043	2024.08.08	1Year
Horn Antenna	SCHWARZBECK	BBHA 9170	/	00946	2023.08.19	2Year
Preamplifier	SKET	LNPA_1840-50	/	SK2018101801	2024.08.08	1 Year
Power Meter	Agilent	E9300A	/	MY41496628	2024.08.08	1 Year
Power Sensor	DARE	RPR3006W	/	15100041SNO91	2024.08.08	1 Year
Electronic Thermo-Hygrometer	S.H.Qixiang	HTC-1	/	N/A	2024.08.11	1 Year
Switching Mode Power Supply	JUNKE	JK12010S	/	20140927-6	2024.08.08	1 Year
Adjustable attenuator	MWRFtest	N/A	/	N/A	N/A	N/A
10dB Attenuator	Mini-Circuits	DC-6G	/	N/A	N/A	N/A

Software Information			
Test Item	Software Name	Manufacturer	Version
RE	EZ-EMC	EZ	Alpha-3A1
CE	EZ-EMC	EZ	Alpha-3A1
RF-CE	MTS 8310	MW	V2.0.0.0

4 System test configuration

4.1 Test mode

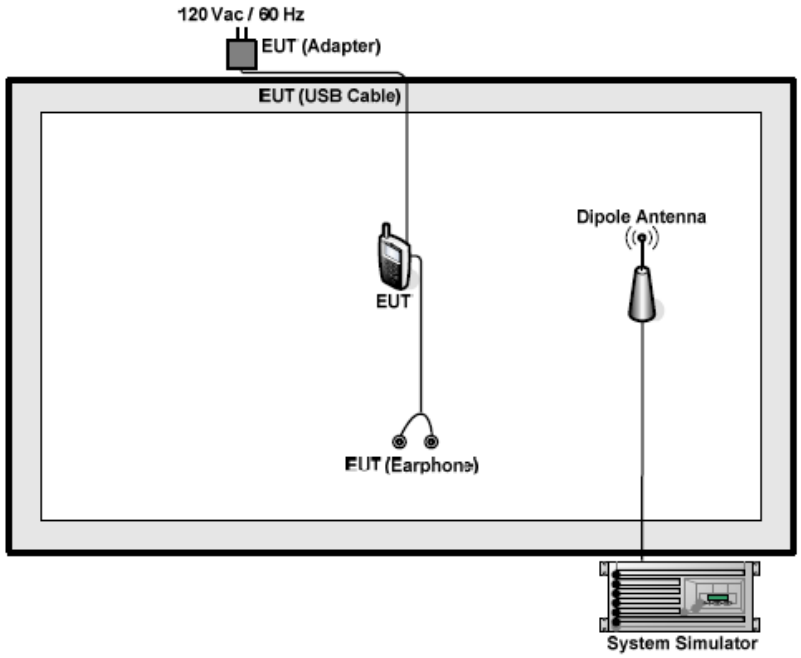
During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission.

Test modes		
Band	Radiated	Conducted
LTE Band 2	■ QPSK link, 16QAM link	■ QPSK link, 16QAM link
LTE Band 4	■ QPSK link, 16QAM link	■ QPSK link, 16QAM link
LTE Band 5	■ QPSK link, 16QAM link	■ QPSK link, 16QAM link
LTE Band 7	■ QPSK link, 16QAM link	■ QPSK link, 16QAM link
LTE Band 66	■ QPSK link, 16QAM link	■ QPSK link, 16QAM link

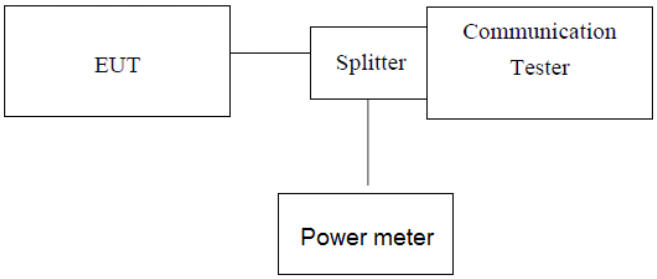
Note: Antenna port conducted and radiated test items were performed according to KDB 971168 D01 Power Meas License Digital Systems v03r1 with maximum output power.

Radiated measurements were performed with rotating EUT in different three orthogonal test planes to find the maximum emission.

4.2 Configuration of Tested System



4.3 Conducted Output Power

Test Requirement:	FCC part22.913(a) (5), FCC part24.232(b) and FCC Part 27.50 (d)(4)/(h)
Test Method:	ANSI C63.26:2015
Limit:	LTE Band 2: 2W LTE Band 4: 1W LTE Band 5: 7W LTE Band 7: 2W LTE Band 66: 1W
Test setup:	 *Note: Measurement setup for testing on Antenna connector*
Test Procedure:	1. The transmitter output port was connected to base station. 2. The RF output of EUT was connected to the power meter by RF cable and attenuator, the path loss was compensated to the results for each measurement. 3. Set EUT at maximum power through base station. 4. Select lowest, middle, and highest channels for each band and different modulation. 5. Measure the maximum burst average power.
Test Instruments:	Refer to section 3 for details
Test mode:	Refer to section 4.1 for details
Test results:	Pass

Measurement Data

LTE Band2

Bandwidth	Modulation	RB size	RB offset	Output Power (dBm) for low/mid/high channel		
				18607/1850.7	18900/1880	19193/1909.3
1.4MHz	QPSK	1	0	23.89	**24.26**	24.15
			2	23.86	24.10	24.03
			5	23.92	24.11	23.83
		3	0	24.12	24.00	23.92
			2	24.14	23.95	24.21
			3	24.10	23.85	24.25
		6	0	23.98	23.81	23.88
	QAM16	1	0	23.85	23.87	23.95
			2	24.16	23.96	24.16
			5	**24.24**	23.84	24.06
		3	0	24.17	23.88	24.15
			2	24.25	23.83	24.05
			3	23.92	23.84	23.96
		6	0	24.20	24.04	23.82

Bandwidth	Modulation	RB size	RB offset	Output Power (dBm) for low/mid/high channel		
				18615/1851.5	18900/1880	19185/1908.5
3MHz	QPSK	1	0	23.67	23.52	23.73
			7	23.77	23.50	23.78
			14	23.52	23.37	23.58
		8	0	23.49	23.73	23.58
			4	23.31	**23.79**	23.69
			7	23.77	23.45	23.37
		15	0	23.33	23.62	23.75
	QAM16	1	0	23.66	23.56	23.39
			7	23.37	23.69	23.31
			14	23.45	23.42	23.66
		8	0	23.33	23.61	23.67
			4	23.48	23.67	23.70
			7	**23.74**	23.66	23.44
		15	0	23.38	23.69	23.58

Bandwidth	Modulation	RB size	RB offset	Output Power (dBm) for low/mid/high channel		
				18625/1852.5	18900/1880	19175/1907.5
5MHz	QPSK	1	0	22.73	**23.20**	23.18
			13	22.90	22.98	22.99
			24	22.73	22.97	22.93
		12	0	22.76	22.98	22.91
			6	22.73	22.82	23.07
			13	23.17	22.92	22.87
		25	0	22.82	23.08	22.92
	QAM16	1	0	23.13	22.81	22.95
			13	23.07	22.90	22.95
			24	22.80	22.79	23.08
		12	0	22.99	**23.13**	22.91
			6	23.02	23.08	22.84
			13	23.01	22.95	22.91
		25	0	22.81	23.09	22.85

Bandwidth	Modulation	RB size	RB offset	Output Power (dBm) for low/mid/high channel		
				18650/1855	18900/1880	19150/1905
10MHz	QPSK	1	0	22.56	**22.70**	22.43
			25	22.25	22.65	22.26
			49	22.50	22.30	22.22
		25	0	22.22	22.36	22.23
			13	22.58	22.59	22.53
			25	22.47	22.22	22.46
		50	0	22.56	22.31	22.22

Bandwidth	Modulation	RB size	RB offset	Output Power (dBm) for low/mid/high channel		
				18675/1857.5	18900/1880	19125/1902.5
15MHz	QPSK	1	0	22.06	21.75	21.94
			38	21.92	21.71	21.63
			74	21.87	21.99	21.62
		36	0	21.78	22.09	22.02
			18	21.62	**22.09**	21.78
			39	21.82	21.94	21.89
		75	0	21.64	21.98	21.90

Bandwidth	Modulation	RB size	RB offset	Output Power (dBm) for low/mid/high channel		
				18700/1860	18900/1880	19100/1900
20MHz	QPSK	1	0	21.32	21.26	21.50
			50	21.17	21.42	21.54
			99	21.34	**21.55**	21.45
		50	0	21.29	21.51	21.45
			25	21.20	21.52	21.38
			50	21.46	21.31	21.26
		100	0	21.46	21.53	21.53

LTE Band4

Bandwidth	Modulation	RB size	RB offset	Output Power (dBm) for low/mid/high channel		
				19957/1710.7	20175/1732.5	20393/1754.3
1.4MHz	QPSK	1	0	23.87	24.09	23.82
			2	24.06	23.65	23.89
			5	23.65	**24.09**	23.60
		3	0	23.72	23.64	23.82
			2	23.72	23.73	23.92
			3	24.04	23.90	23.61
		6	0	23.86	23.94	23.66
	QAM16	1	0	23.83	23.66	23.80
			2	23.87	23.61	23.99
			5	23.85	23.83	**24.07**
		3	0	23.85	23.96	24.02
			2	23.82	24.02	23.77
			3	23.98	23.72	23.99
		6	0	23.89	23.63	23.78

Bandwidth	Modulation	RB size	RB offset	Output Power (dBm) for low/mid/high channel		
				19965/1711.5	20175/1732.5	20385/1753.5
3MHz	QPSK	1	0	23.18	23.35	23.25
			7	23.57	**23.59**	23.20
			14	23.50	23.41	23.26
		8	0	23.17	23.50	23.24
			4	23.45	23.37	23.41
			7	23.27	23.47	23.51
		15	0	23.18	23.14	23.16
	QAM16	1	0	23.50	23.40	23.51
			7	23.31	23.29	23.37
			14	23.38	23.27	23.11
		8	0	23.29	23.25	23.11
			4	23.16	23.30	**23.58**
			7	23.43	23.50	23.19
		15	0	23.49	23.34	23.30

Bandwidth	Modulation	RB size	RB offset	Output Power (dBm) for low/mid/high channel		
				19975/1712.5	20175/1732.5	20375/1752.5
5MHz	QPSK	1	0	22.66	22.57	22.84
			13	22.95	**22.98**	22.83
			24	22.90	22.74	22.94
		12	0	22.87	22.57	22.99
			6	22.61	22.97	22.76
			13	22.72	22.79	22.93
		25	0	22.75	22.81	22.58
	QAM16	1	0	22.88	22.63	22.84
			13	22.83	22.66	22.89
			24	22.85	22.64	22.78
		12	0	22.53	22.78	22.78
			6	22.62	**22.92**	22.54
			13	22.58	22.56	22.91
		25	0	22.64	22.53	22.50

Bandwidth	Modulation	RB size	RB offset	Output Power (dBm) for low/mid/high channel		
				20000/1715	20175/1732.5	20350/1750
10MHz	QPSK	1	0	22.43	22.34	22.44
			25	22.35	22.38	22.47
			49	22.34	22.07	22.19
		25	0	22.01	**22.49**	22.02
			13	22.33	22.26	22.48
			25	22.09	22.01	22.17
		50	0	22.24	22.23	22.39

Bandwidth	Modulation	RB size	RB offset	Output Power (dBm) for low/mid/high channel		
				20025/1717.5	20175/1732.5	20325/1747.5
15MHz	QPSK	1	0	21.57	21.83	21.62
			38	21.87	21.80	21.73
			74	21.42	21.79	21.89
		36	0	21.73	21.73	21.61
			18	21.82	21.55	21.63
			39	21.52	**21.90**	21.58
		75	0	21.42	21.47	21.79

Bandwidth	Modulation	RB size	RB offset	Output Power (dBm) for low/mid/high channel		
				20050/1720	20175/1732.5	20300/1745
20MHz	QPSK	1	0	21.06	21.36	21.11
			50	21.23	21.02	21.19
			99	21.25	**21.37**	20.90
		50	0	20.92	20.93	21.23
			25	21.17	21.27	20.93
			50	21.28	20.92	21.25
		100	0	21.29	21.31	21.25

LTE Band5

Bandwidth	Modulation	RB size	RB offset	Output Power (dBm) for low/mid/high channel		
				20417/824.7	20530/836.5	20643/848.3
1.4MHz	QPSK	1	0	23.80	**23.89**	23.62
			2	23.65	23.72	23.58
			5	23.70	23.76	23.41
		3	0	23.75	23.84	23.75
			2	23.58	23.67	23.62
			3	23.62	23.85	23.52
		6	0	23.88	23.45	23.46
	QAM16	1	0	23.45	23.67	23.63
			2	23.47	23.78	23.50
			5	23.78	23.47	23.84
		3	0	**23.85**	23.57	23.73
			2	23.81	23.78	23.67
			3	23.79	23.49	23.56
		6	0	23.49	23.79	23.45

Bandwidth	Modulation	RB size	RB offset	Output Power (dBm) for low/mid/high channel		
				20425/826.5	20530/836.5	20635/847.5
3MHz	QPSK	1	0	23.08	23.03	22.81
			7	23.03	23.22	23.21
			14	23.11	23.28	23.03
		8	0	23.00	22.91	22.81
			4	22.89	**23.30**	22.98
			7	23.12	23.27	23.14
		15	0	23.12	23.29	22.89
	QAM16	1	0	22.86	23.14	23.01
			7	23.10	22.82	23.21
			14	23.17	23.21	23.21
		8	0	22.82	23.11	23.05
			4	**23.24**	23.06	22.82
			7	23.04	23.02	22.87
		15	0	22.88	23.18	22.94

Bandwidth	Modulation	RB size	RB offset	Output Power (dBm) for low/mid/high channel		
				20435/826.5	20530/836.5	20625/846.5
5MHz	QPSK	1	0	22.60	22.57	22.55
			13	22.37	22.71	22.66
			24	22.41	22.55	22.44
		12	0	22.58	22.38	22.33
			6	22.40	**22.79**	22.73
			13	22.54	22.62	22.34
		25	0	22.73	22.75	22.41
	QAM16	1	0	22.31	22.34	22.68
			13	22.50	22.50	22.49
			24	22.32	**22.75**	22.44
		12	0	22.40	22.42	22.73
			6	22.46	22.53	22.66
			13	22.32	22.42	22.57
		25	0	22.58	22.33	22.39

Bandwidth	Modulation	RB size	RB offset	Output Power (dBm) for low/mid/high channel		
				20460/829	20530/836.5	20600/844
10MHz	QPSK	1	0	22.09	22.16	21.73
			25	22.11	21.75	21.90
			49	22.13	22.13	22.03
		25	0	21.95	21.94	22.04
			13	22.18	21.85	22.11
			25	21.71	**22.20**	21.82
		50	0	22.02	21.98	21.78

LTE Band7

Bandwidth	Modulation	RB size	RB offset	Output Power (dBm) for low/mid/high channel		
				20775/2502.5	21100/2535	21425/2567.5
5MHz	QPSK	1	0	23.23	23.30	23.26
			13	23.22	23.45	23.61
			24	23.57	23.68	23.35
		12	0	23.62	**23.70**	23.38
			6	23.60	23.68	23.44
			13	23.45	23.48	23.50
		25	0	23.46	23.26	23.48
	QAM16	1	0	23.66	23.59	23.62
			13	23.24	23.47	23.47
			24	23.36	23.47	23.65
		12	0	23.55	23.46	23.34
			6	23.59	23.24	23.66
			13	23.61	**23.67**	23.65
		25	0	23.52	23.26	23.67

Bandwidth	Modulation	RB size	RB offset	Output Power (dBm) for low/mid/high channel		
				20800/2505	21100/2535	21400/2565
10MHz	QPSK	1	0	22.80	22.84	22.85
			25	22.96	22.82	23.10
			49	22.74	22.78	22.88
		25	0	23.14	22.81	23.06
			13	22.88	23.00	23.04
			25	22.95	22.79	22.82
		50	0	22.82	**23.19**	22.99

Bandwidth	Modulation	RB size	RB offset	Output Power (dBm) for low/mid/high channel		
				20825/2507.5	21100/2535	21375/2562.5
15MHz	QPSK	1	0	22.32	22.47	22.59
			38	22.58	22.19	22.22
			74	22.20	22.16	22.13
		36	0	22.51	22.55	22.19
			18	22.39	**22.59**	22.25
			39	22.35	22.21	22.17
		75	0	22.45	22.24	22.56

Bandwidth	Modulation	RB size	RB offset	Output Power (dBm) for low/mid/high channel		
				20850/2510	21100/2535	21350/2560
20MHz	QPSK	1	0	22.01	21.72	22.09
			50	21.65	21.68	21.70
			99	21.96	22.04	21.99
		50	0	21.90	21.86	22.05
			25	21.85	21.94	21.94
			50	21.72	**22.10**	21.72
		100	0	21.64	22.03	21.68

LTE Band66

Bandwidth	Modulation	RB size	RB offset	Output Power (dBm) for low/mid/high channel		
				131979/1710.7	132322/1745	132665/1779.3
1.4MHz	QPSK	1	0	23.69	23.79	23.63
			2	23.94	**23.99**	23.93
			5	23.78	23.55	23.94
		3	0	23.91	23.90	23.66
			2	23.92	23.52	23.51
			3	23.60	23.62	23.86
		6	0	23.95	23.53	23.68
	QAM16	1	0	23.52	23.71	23.67
			2	23.83	23.77	**23.96**
			5	23.87	23.68	23.88
		3	0	23.77	23.56	23.58
			2	23.82	23.88	23.53
			3	23.81	23.90	23.79
		6	0	23.87	23.71	23.71

Bandwidth	Modulation	RB size	RB offset	Output Power (dBm) for low/mid/high channel		
				131987/1711.5	132322/1745	132657/1778.5
3MHz	QPSK	1	0	23.24	23.32	23.13
			7	23.22	23.17	23.10
			14	23.35	23.19	23.40
		8	0	23.06	23.10	23.25
			4	23.08	**23.48**	23.01
			7	23.28	23.08	23.25
		15	0	23.12	23.14	23.09
	QAM16	1	0	23.02	23.16	23.07
			7	23.43	23.40	23.03
			14	23.19	23.08	23.17
		8	0	23.43	**23.45**	23.04
			4	23.13	23.07	23.13
			7	23.42	23.39	23.27
		15	0	23.03	23.32	23.34

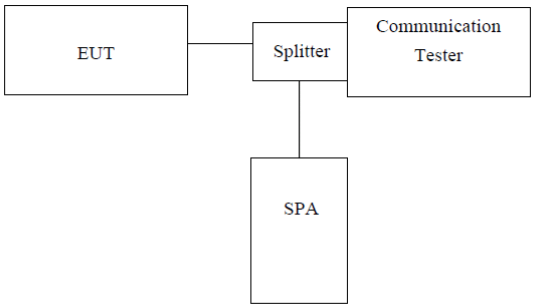
Bandwidth	Modulation	RB size	RB offset	Output Power (dBm) for low/mid/high channel		
				131997/1712.5	132322/1745	132647/1777.5
5MHz	QPSK	1	0	22.69	22.68	22.75
			13	22.83	22.50	22.62
			24	22.43	22.55	22.57
		12	0	22.62	22.43	22.48
			6	22.81	22.43	22.59
			13	22.81	22.76	22.44
		25	0	22.52	**22.88**	22.51
	QAM16	1	0	22.64	**22.86**	22.51
			13	22.84	22.62	22.49
			24	22.72	22.48	22.81
		12	0	22.84	22.72	22.80
			6	22.83	22.41	22.74
			13	22.71	22.84	22.66
		25	0	22.43	22.61	22.85

Bandwidth	Modulation	RB size	RB offset	Output Power (dBm) for low/mid/high channel		
				132022/1715	132322/1745	132622/1775
10MHz	QPSK	1	0	21.93	22.12	22.38
			25	21.98	22.38	22.02
			49	21.92	22.38	22.26
		25	0	22.23	22.24	22.01
			13	22.06	22.30	21.93
			25	22.24	22.13	22.00
		50	0	22.36	**22.40**	22.35

Bandwidth	Modulation	RB size	RB offset	Output Power (dBm) for low/mid/high channel		
				132047/1717.5	132322/1745	132597/1772.5
15MHz	QPSK	1	0	21.65	21.40	21.58
			38	21.57	21.71	21.32
			74	21.36	21.66	21.36
		36	0	21.32	**21.74**	21.55
			18	21.63	21.34	21.67
			39	21.45	21.40	21.32
		75	0	21.42	21.62	21.65

Bandwidth	Modulation	RB size	RB offset	Output Power (dBm) for low/mid/high channel		
				132072/1720	132322/1745	132572/1770
20MHz	QPSK	1	0	21.25	21.16	20.95
			50	21.28	**21.30**	21.12
			99	21.11	20.95	20.92
		50	0	21.26	21.14	21.05
			25	21.05	20.82	20.97
			50	21.08	20.91	21.21
		100	0	20.96	21.28	21.26

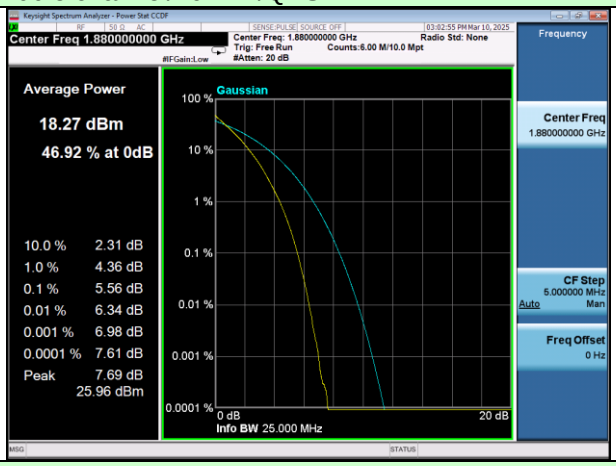
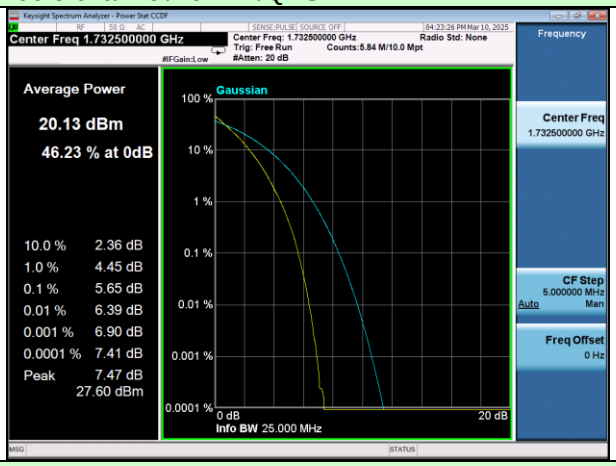
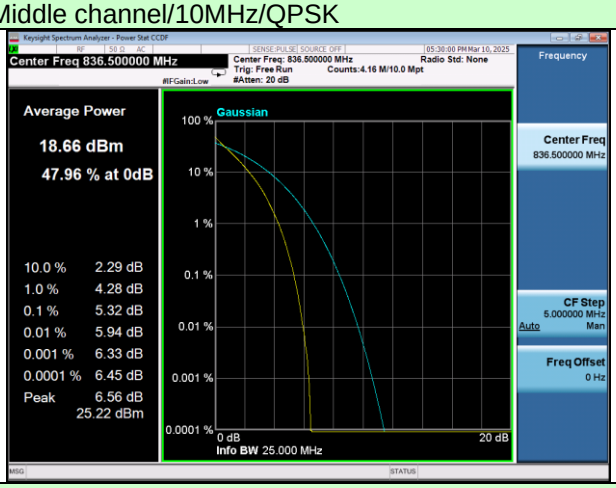
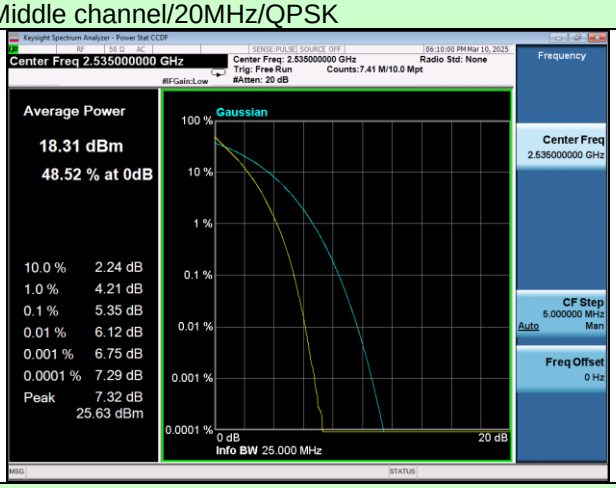
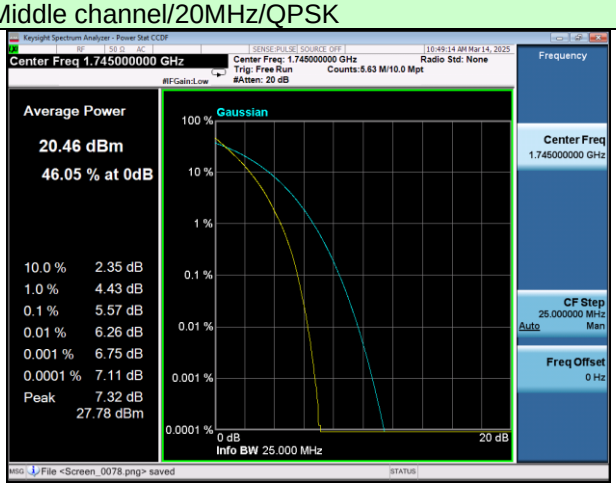
4.4 Peak-to-Average Ratio

Test Requirement:	Part 22.913(d), FCC part24.232(d) and FCC part27.50(d)(5)
Test Method:	ANSI C63.26:2015
Test Limit:	Used complementary cumulative distribution function (CCDF) of analyzer to determine that PAPR will not exceed 13 dB for more than 0.1 percent of the time
Test setup:	 *Note: Measurement setup for testing on Antenna connector*
Test Procedure:	1. The testing follows FCC KDB 971168 D01 v03r01 Section 5.7 2. The EUT was connected to spectrum and system simulator via a power divider 3. Using the CCDF measurement of spectrum analyzer; 4. Set RBW≥OBW or specified reference bandwidth; 5. Set the number of counts to a value that stabilizes the measured CCDF curve; 6. Set the measurement interval as 1ms 7. Record the maximum PAPR level associated with a probability of 0.1%.
Test Instruments:	Refer to section 3 for details
Test mode:	Refer to section 4.1 for details
Test results:	Pass

Test plots are listed as below:

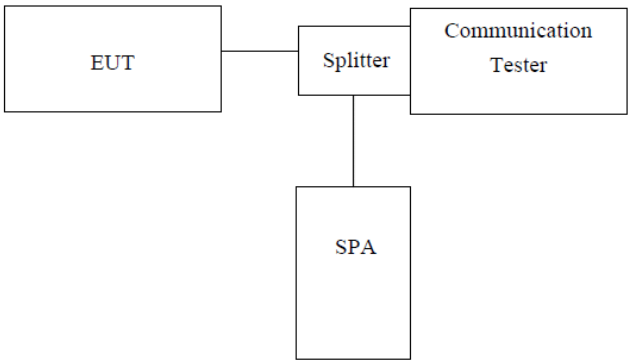
Test mode	Peak to Average Ratio (dB)	Limit (dB)	Result
LTE Band 2 Middle channel/20MHz/QPSK	5.56	13	Pass
LTE Band 4 Middle channel/20MHz/QPSK	5.65	13	Pass
LTE Band 5 Middle channel/10MHz/QPSK	5.32	13	Pass
LTE Band 7 Middle channel/20MHz/QPSK	5.35	13	Pass
LTE Band 66 Middle channel/20MHz/QPSK	5.57	13	Pass

Note: 1. All channels have been tested, and only worst data was listed in this report. (Middle channel)

Test Mode: LTE Band 2 Middle channel/20MHz/QPSK	Test Mode: LTE Band 4 Middle channel/20MHz/QPSK
	
Test Mode: LTE Band 5 Middle channel/10MHz/QPSK	Test Mode: LTE Band 7 Middle channel/20MHz/QPSK
	
Test Mode: LTE Band 66 Middle channel/20MHz/QPSK	
	

Note: All bandwidth and modulation are tested, only the worst results are reported.

4.5 Occupy Bandwidth

Test Requirement:	FCC part22.913(a), FCC part24.232(b) and FCC part27.53(a)
Test Method:	ANSI C63.26:2015
Test setup:	 *Note: Measurement setup for testing on Antenna connector*
Test Procedure:	1. The EUT's output RF connector was connected with a short cable to the spectrum analyzer, set center frequency to channel center frequency. 2. RBW was set to about 1%-5% of emission OBW, VBW≥ 3 X RBW. 3. Set spectrum analyzer detection mode to peak, and the trace mode to max hold. 4. Use the 99% OBW function, The 99% power OBW can be found on the plot, determine the "-26dB amplitude" as equal to reference value -26dB.
Test Instruments:	Refer to section 3 for details
Test mode:	Refer to section 4.1 for details
Test results:	Pass

Measurement Data

Band2						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
100%	QPSK	1.4	18900	1880	1.0967	1.316
		3	18900	1880	2.7312	3.027
		5	18900	1880	4.5158	4.985
		10	18900	1880	8.9327	9.606
		15	18900	1880	13.452	14.57
		20	18900	1880	17.861	18.91
	QAM16	1.4	18900	1880	1.0944	1.312
		3	18900	1880	2.7292	3.032
		5	18900	1880	4.5084	4.901

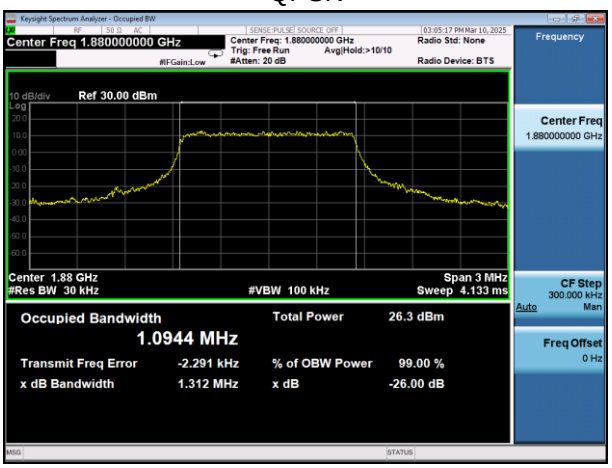
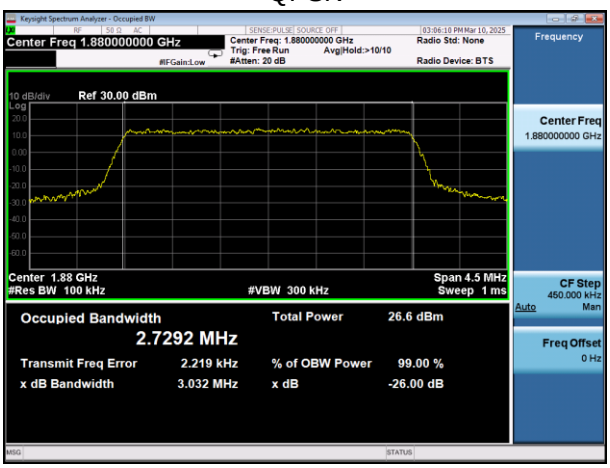
Band4						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
100%	QPSK	1.4	20175	1732.5	1.0928	1.282
		3	20175	1732.5	2.7288	3.023
		5	20175	1732.5	4.5112	4.963
		10	20175	1732.5	8.9326	9.600
		15	20175	1732.5	13.459	14.57
		20	20175	1732.5	17.860	18.94
	QAM16	1.4	20175	1732.5	1.0918	1.276
		3	20175	1732.5	2.7274	2.990
		5	20175	1732.5	4.5132	4.947

Band5						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
100%	QPSK	1.4	20530	837	1.0921	1.275
		3	20530	837	2.7294	3.017
		5	20530	837	4.5103	4.951
		10	20530	837	8.9275	9.620
	QAM16	1.4	20530	837	1.0955	1.273
		3	20530	837	2.7191	3.012
		5	20530	837	4.5250	4.964

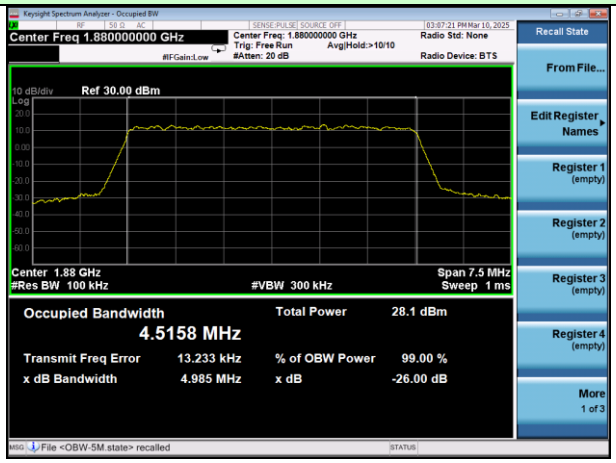
Band7						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
100%	QPSK	5	21100	2535	4.5148	4.944
		10	21100	2535	8.9325	9.642
		15	21100	2535	13.470	14.63
		20	21100	2535	17.879	18.89
	QAM16	5	21100	2535	4.5231	4.914

Band66						
RB	Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	99% Power Bandwidth(MHz)	-26dBc Bandwidth(MHz)
100%	QPSK	1.4	132322	1745	1.0931	1.287
		3	132322	1745	2.7302	3.023
		5	132322	1745	4.5230	4.973
		10	132322	1745	8.9329	9.627
		15	132322	1745	13.481	14.45
		20	132322	1745	17.886	18.92
	QAM16	1.4	132322	1745	1.0911	1.264
		3	132322	1745	2.7314	3.007
		5	132322	1745	4.5000	4.931

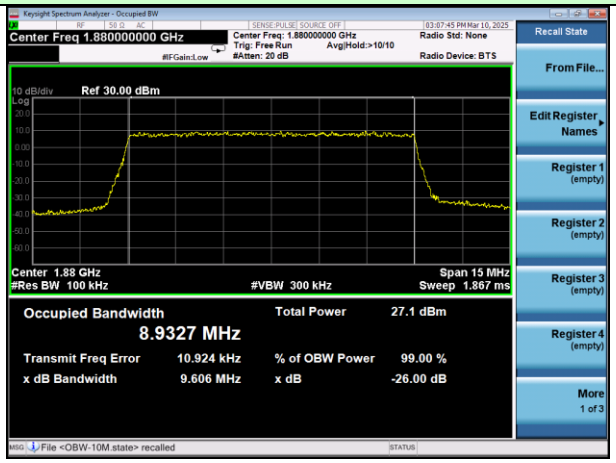
Test plot as follows:

Test Mode: LTE Band 2 Channel Bandwidth: 1.4MHz	Test Mode: LTE Band 2 Channel Bandwidth: 3MHz
	
QPSK	QPSK
	
16-QAM	16-QAM

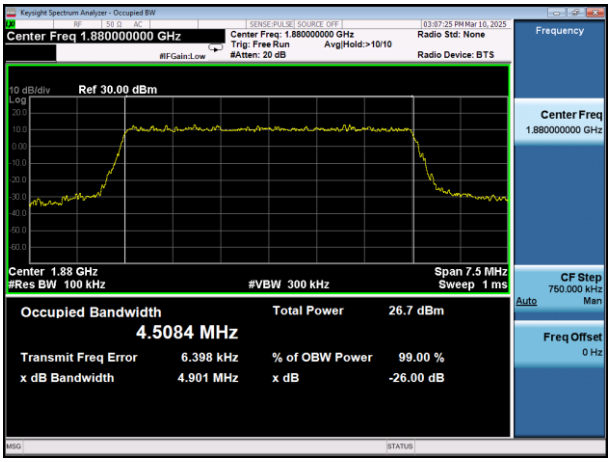
Test Mode: LTE Band 2 Channel Bandwidth: 5MHz	Test Mode: LTE Band 2 Channel Bandwidth: 10MHz



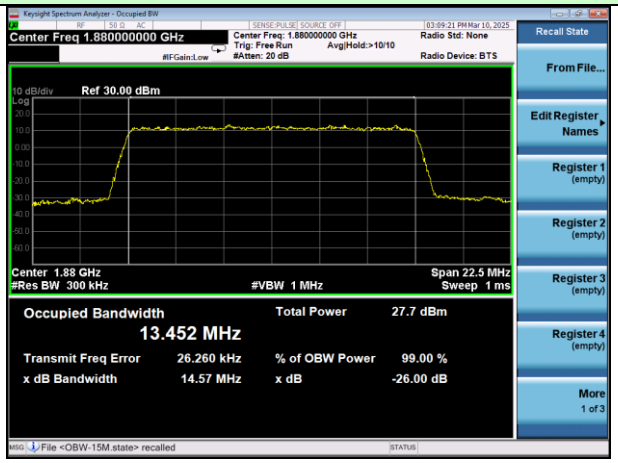
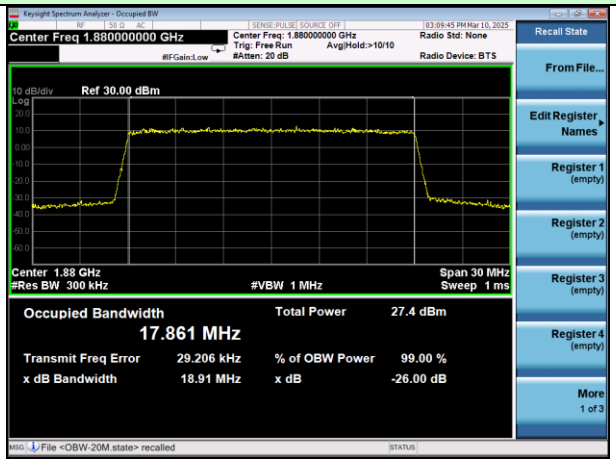
QPSK



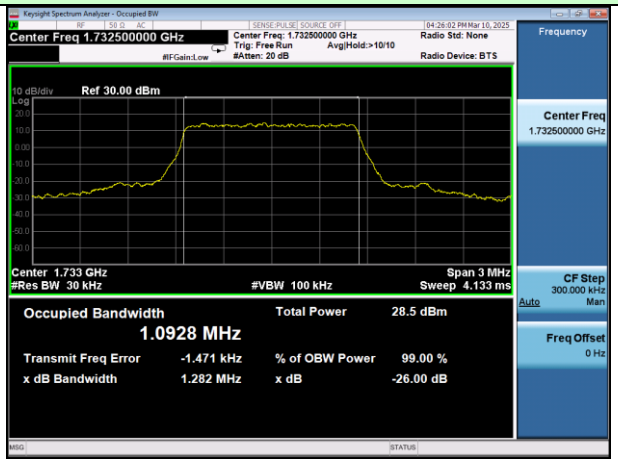
QPSK



16-QAM

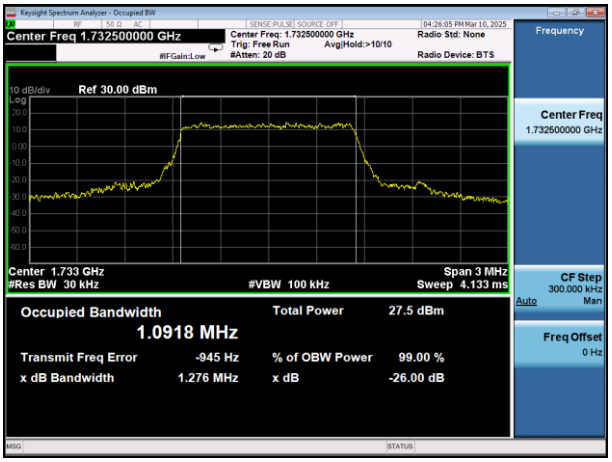
Test Mode: LTE Band 2 Channel Bandwidth: 15MHz	Test Mode: LTE Band 2 Channel Bandwidth: 20MHz
	
QPSK	QPSK

Test Mode: LTE Band 4 Channel Bandwidth: 1.4MHz	Test Mode: LTE Band 4 Channel Bandwidth: 3MHz

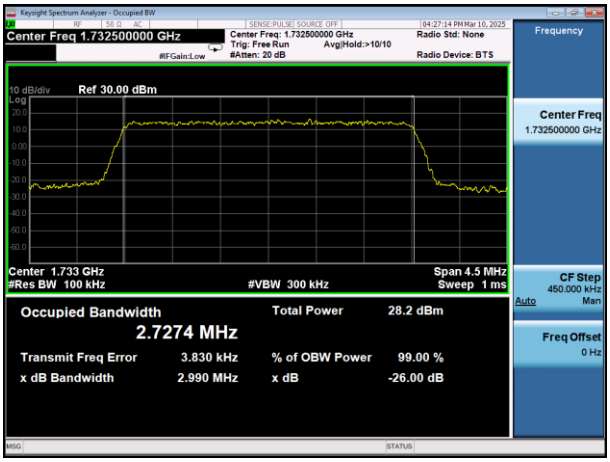


QPSK

QPSK

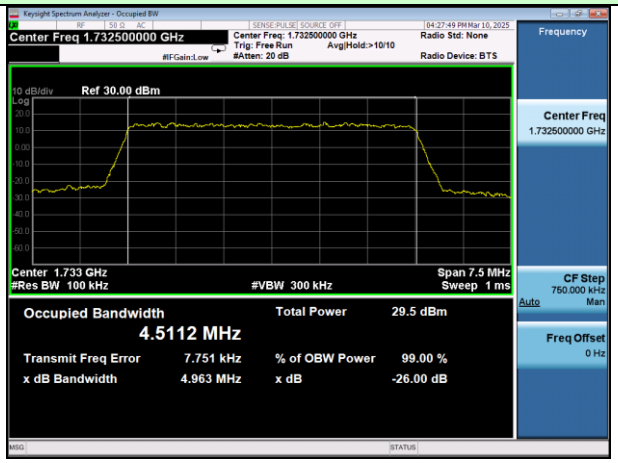


16-QAM

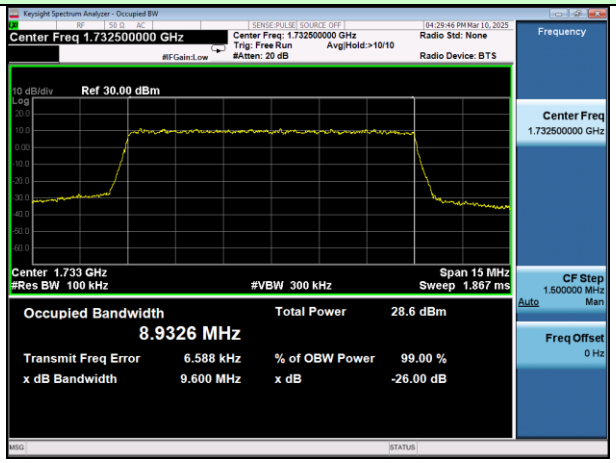


16-QAM

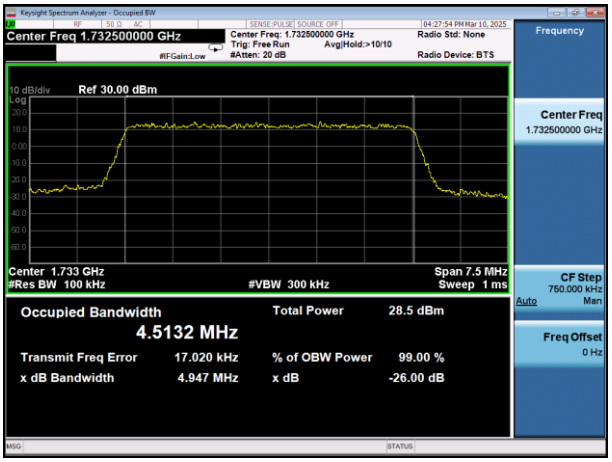
Test Mode: LTE Band 4 Channel Bandwidth: 5MHz	Test Mode: LTE Band 4 Channel Bandwidth: 10MHz



QPSK

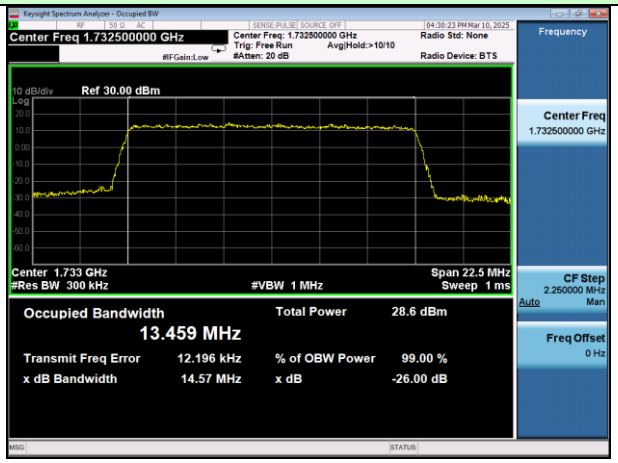


QPSK

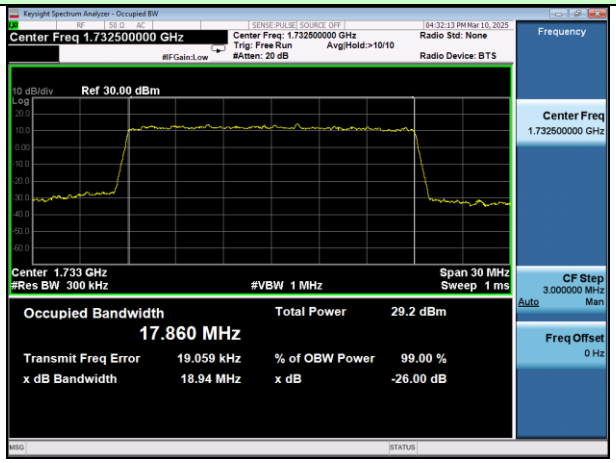


16-QAM

Test Mode: LTE Band 4 Channel Bandwidth: 15MHz	Test Mode: LTE Band 4 Channel Bandwidth: 20MHz

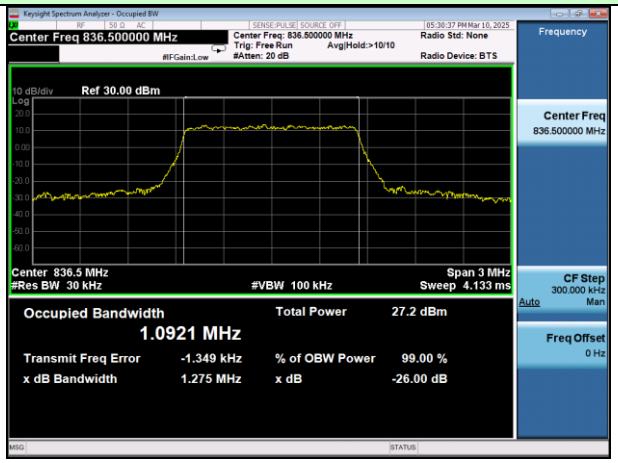


QPSK

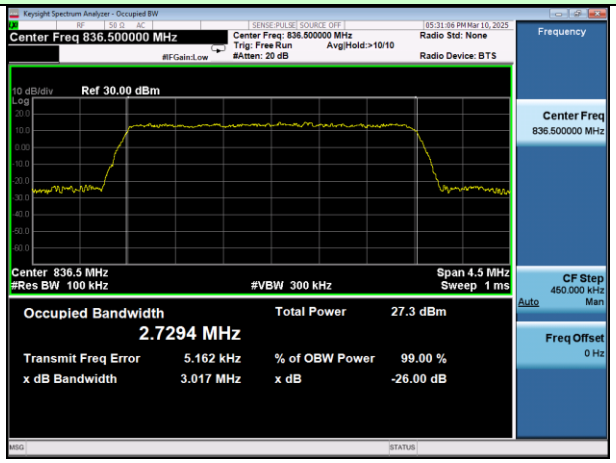


QPSK

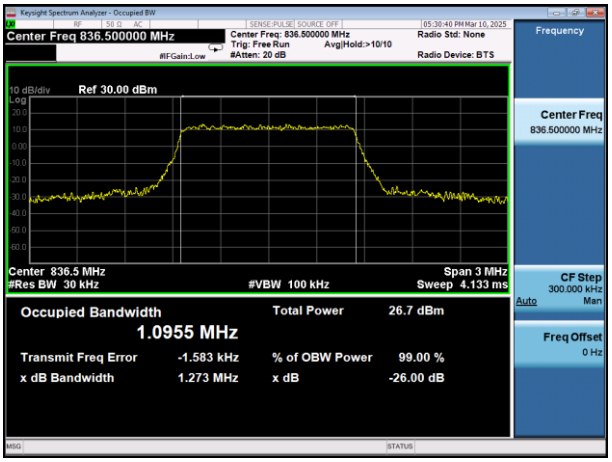
Test Mode: LTE Band 5 Channel Bandwidth: 1.4MHz	Test Mode: LTE Band 5 Channel Bandwidth: 3MHz



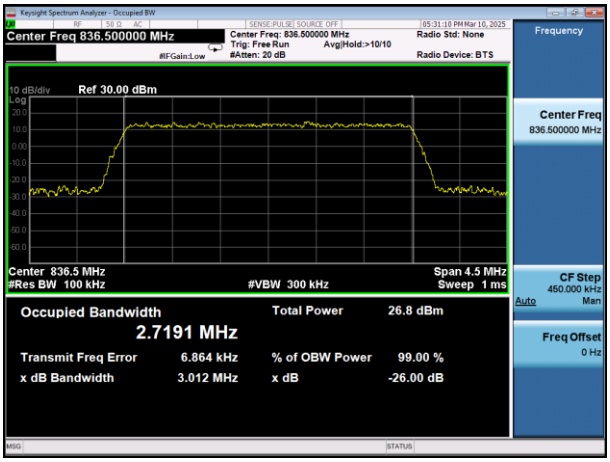
QPSK



QPSK

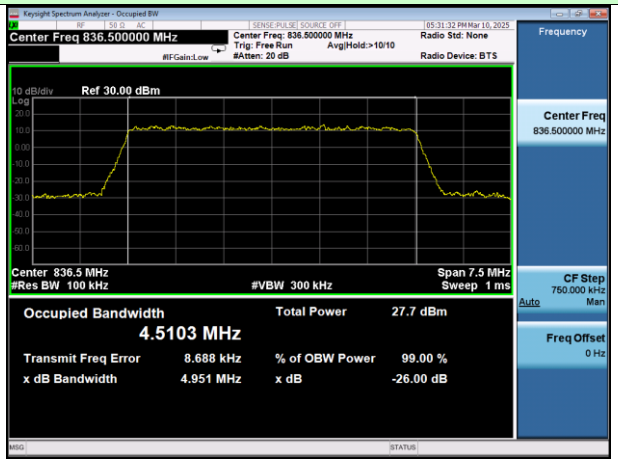


16-QAM

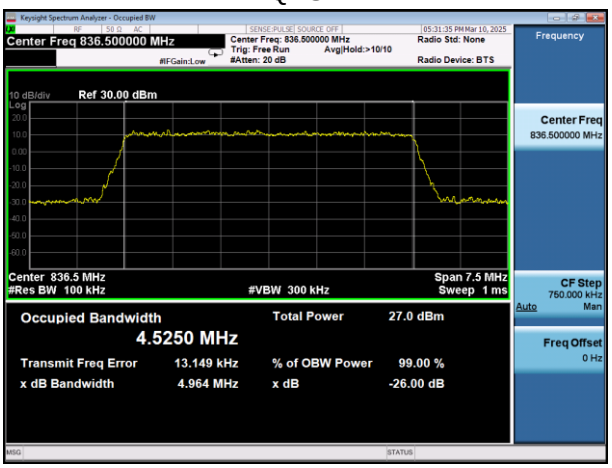


16-QAM

Test Mode: LTE Band 5
Channel Bandwidth: 5MHz

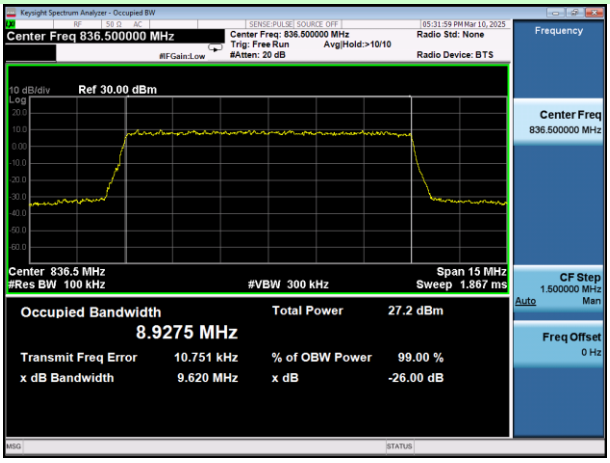


QPSK



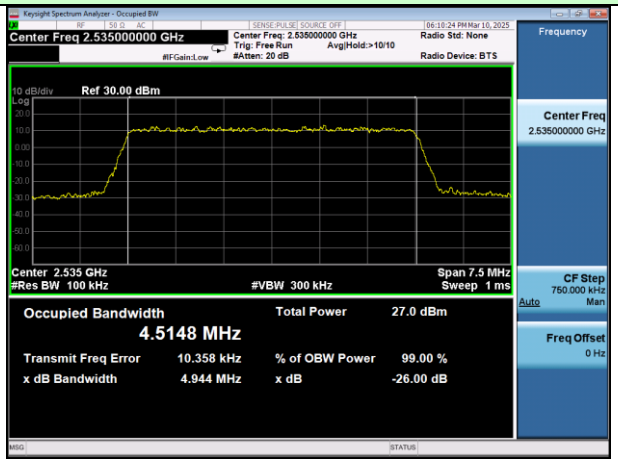
16-QAM

Test Mode: LTE Band 5
Channel Bandwidth: 10MHz

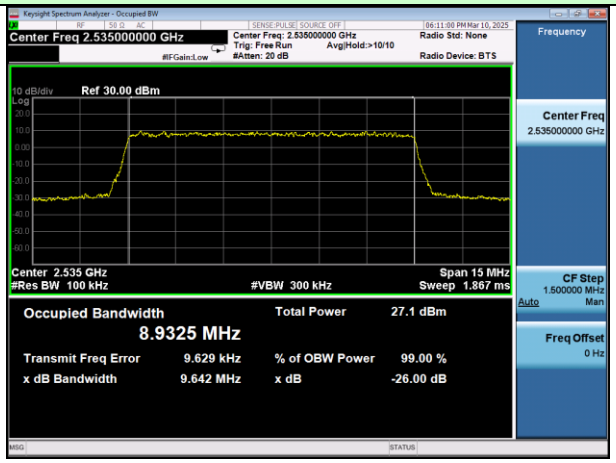


QPSK

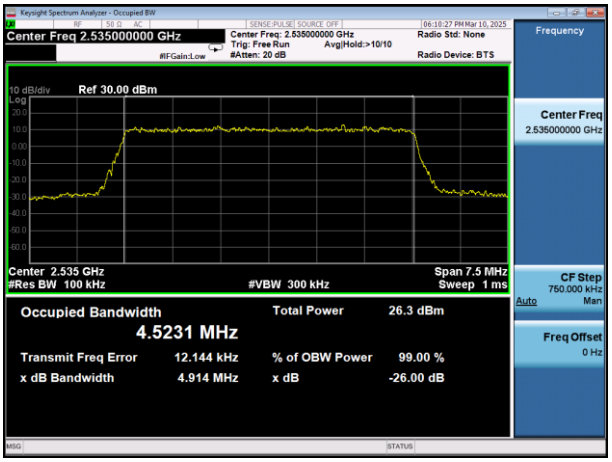
Test Mode: LTE Band 7 Channel Bandwidth: 5MHz	Test Mode: LTE Band 7 Channel Bandwidth: 10MHz



QPSK

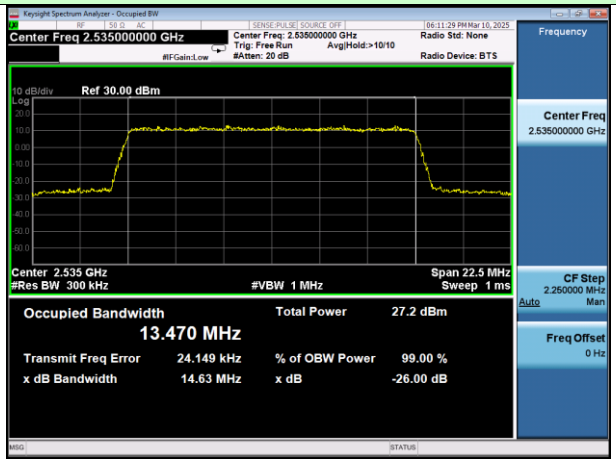


QPSK



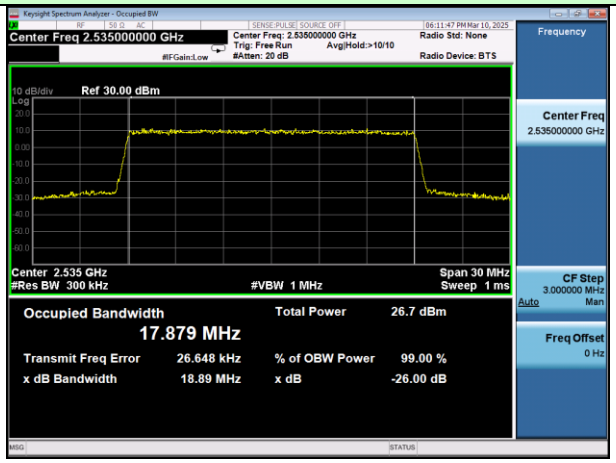
16-QAM

Test Mode: LTE Band 7
Channel Bandwidth: 15MHz



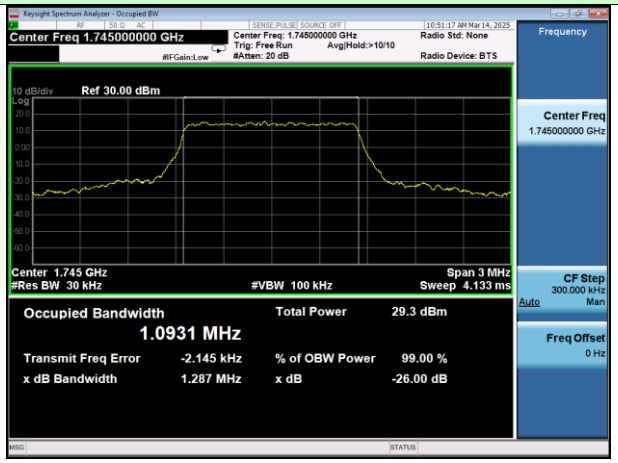
QPSK

Test Mode: LTE Band 7
Channel Bandwidth: 20MHz



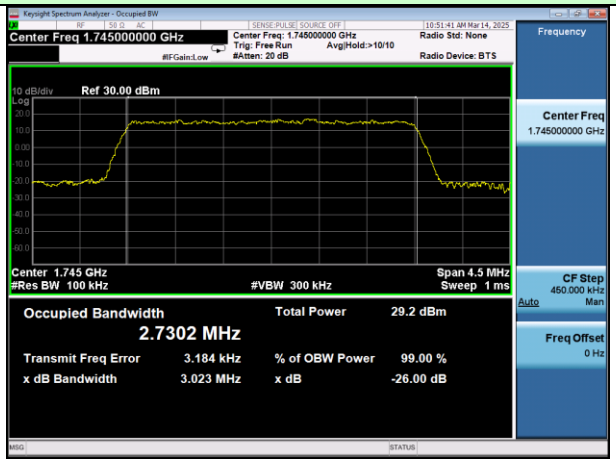
QPSK

Test Mode: LTE Band 66
Channel Bandwidth: 1.4MHz

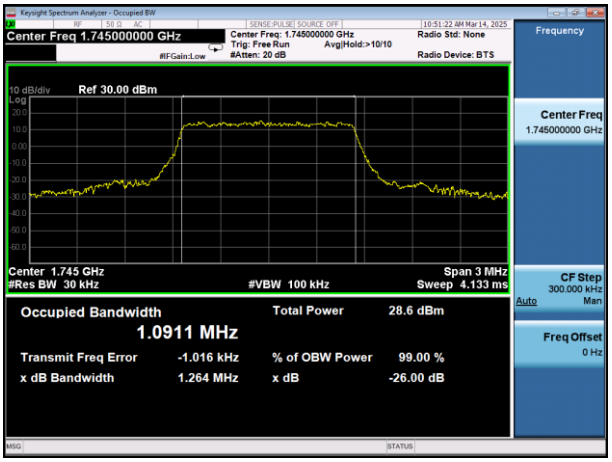


QPSK

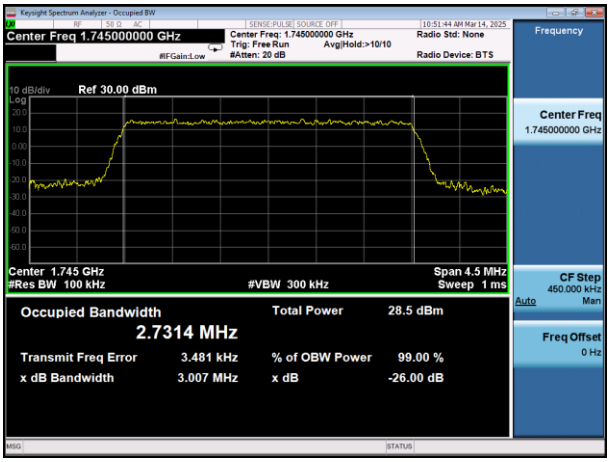
Test Mode: LTE Band 66
Channel Bandwidth: 3MHz



QPSK

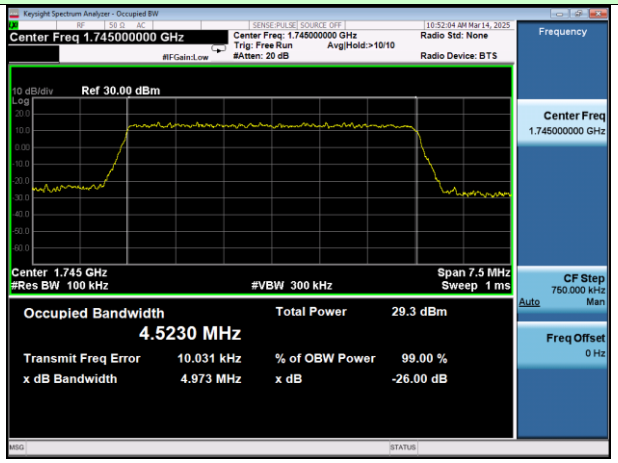


16-QAM



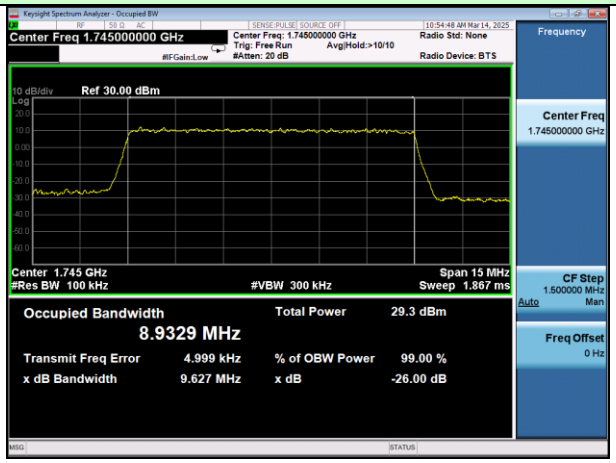
16-QAM

Test Mode: LTE Band 66
Channel Bandwidth: 5MHz



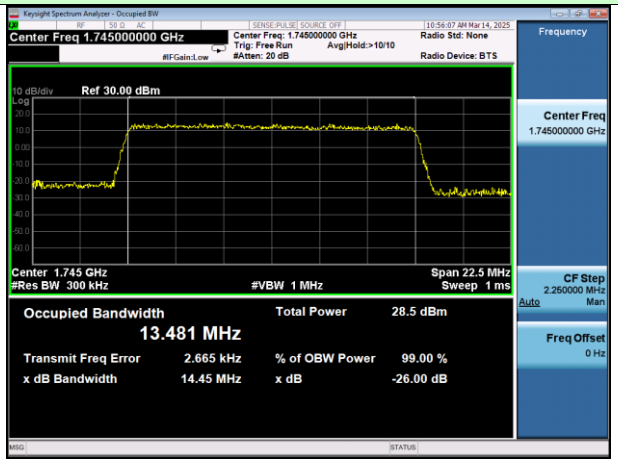
QPSK

Test Mode: LTE Band 66
Channel Bandwidth: 10MHz



QPSK

16-QAM

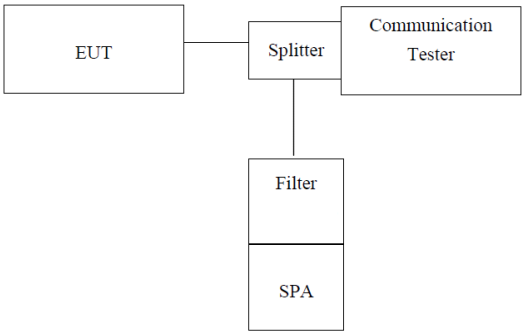
Test Mode: LTE Band 66 Channel Bandwidth: 15MHz	Test Mode: LTE Band 66 Channel Bandwidth: 20MHz
	
QPSK	QPSK

Note: All bandwidth and modulation are tested, only the worst results are reported.

4.6 MODULATION CHARACTERISTIC

According to FCC § 2.1047(d), Part 24E & Part 27 there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

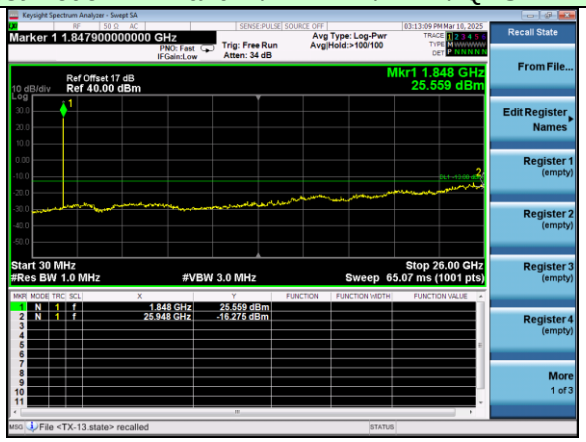
4.7 Out of band emission at antenna terminals

Test Requirement:	FCC part22.913(a), FCC part24.238(a), FCC part27.53(h) and FCC part27.53(m)
Test Method:	ANSI C63.26:2015
Limit:	-13dBm Band 7: -25dBm
Test setup:	 ***Note:*** *Measurement setup for testing on Antenna connector*
Test Procedure:	1 The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. 2 The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic. 3 For the out of band: Set the RBW=1MHz, VBW = 3MHz, Start=30MHz, Stop= 10th harmonic. 4 Band Edge Requirements: In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions.
Test Instruments:	Refer to section 3 for details
Test mode:	Refer to section 4.1 for details
Test results:	Pass

Test plot as follows:

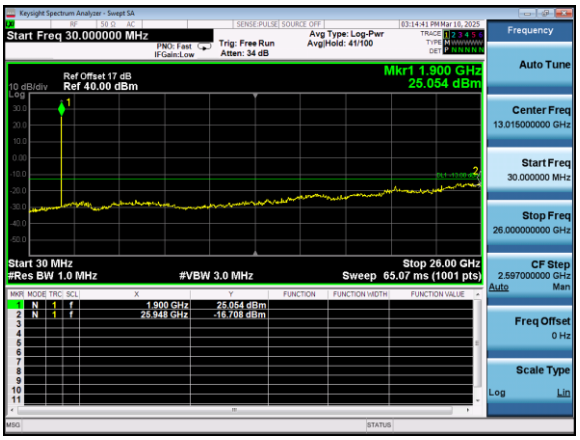
Conducted Spurious Emission:

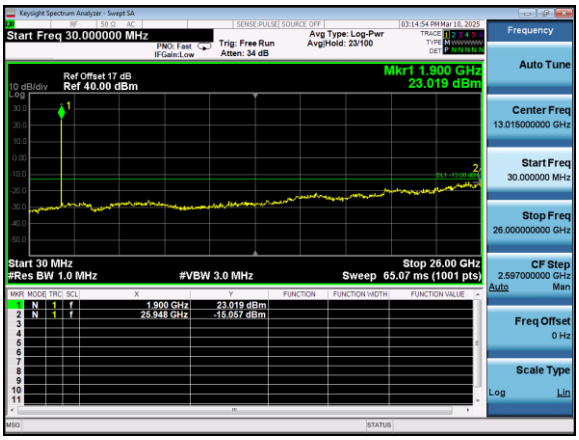
Test Mode: LTE Band 2 / 1.4MHz / 1RB / QPSK	Test Mode: LTE Band 2 / 1.4MHz / 6 RB / QPSK



Lowest channel

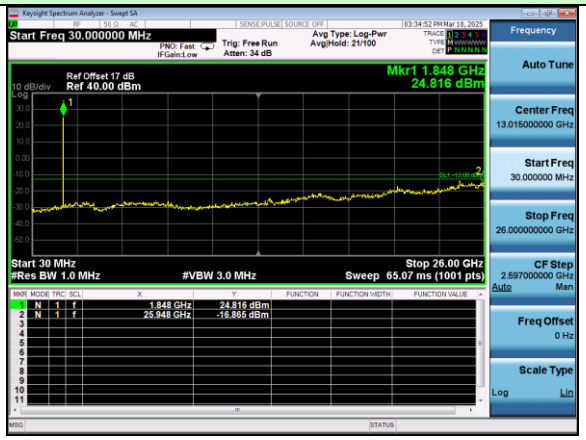
Middle channel

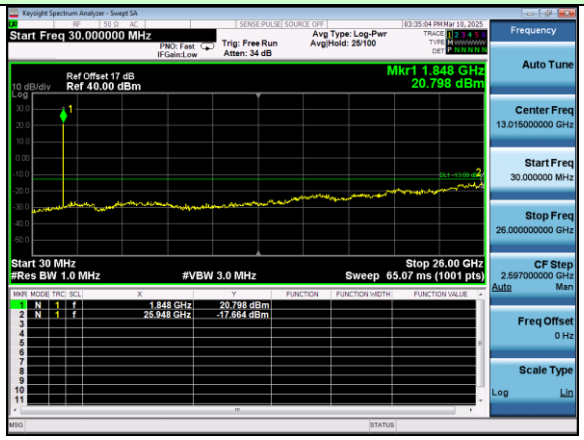




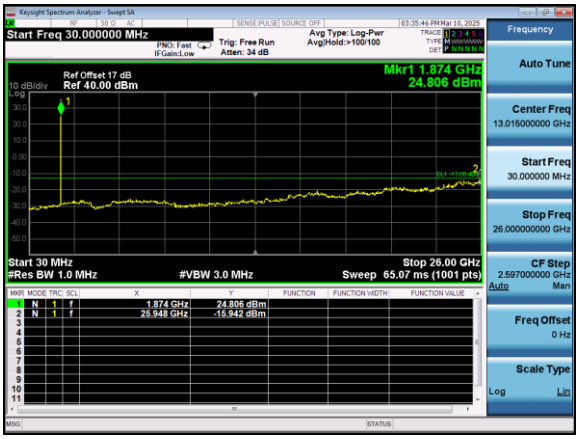
Highest channel

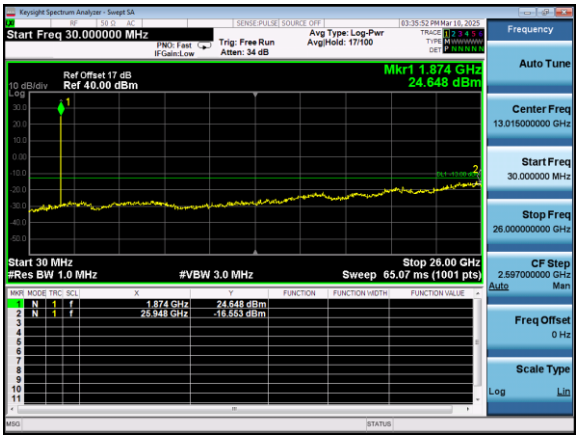
Test Mode: LTE Band 2 / 3MHz / 1RB / QPSK	Test Mode: LTE Band 2 / 3MHz / 15RB / QPSK



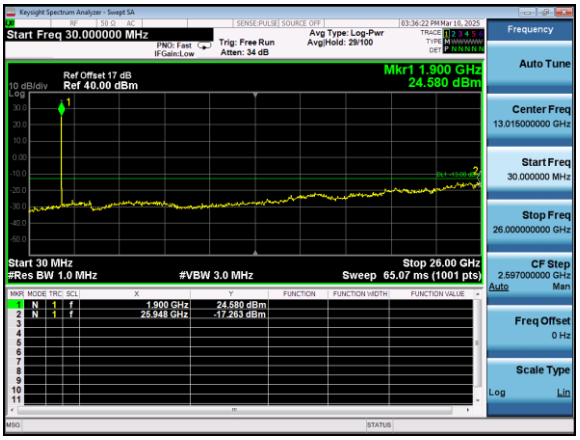


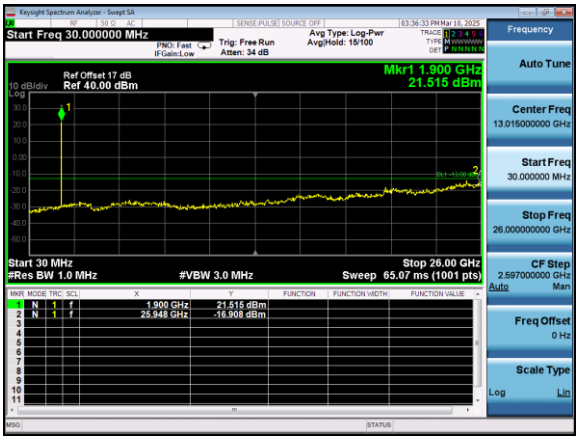
Lowest channel





Middle channel





Highest channel