FCC Test Report
(Part 96 – LTE Band 48)

Report No.:	RFBEIH-WTW-P21110117
FCC ID:	P27-SCO4255PA10
Test Model:	SCO4255P-BC-A10
Received Date:	Nov. 16, 2021
Test Date:	Nov. 17 ~ Dec. 01, 2021 & Jan. 30 ~ Feb. 08, 2022
Issued Date:	Feb. 09, 2022
Applicant:	Sercomm Corp.
Address:	8F, No. 3-1, YuanQu St., NanKang, Taipei 115, Taiwan, R.O.C.
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
Test Location:	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, Taiwan
FCC Registration / Designation Number:	788550 / TW0003

Testing Laboratory
2021

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Release Control Record

Issue No.	Description	Date Issued
RFBEIH-WTW-P21110117	Original release	Feb. 09, 2022

1 Certificate of Conformity

Product:	Englewood HGO
Brand:	Sercomm
Test Model:	SCO4255P-BC-A10
Sample Status:	Engineering sample
Applicant:	Sercomm Corp.
Test Date:	Nov. 17 ~ Dec. 01, 2021 & Jan. 30 ~ Feb. 08, 2022
Standards:	47 CFR FCC Part 96

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

Prepared by : Pettie Chen , **Date:** Feb. 09, 2022

Pettie Chen / Senior Specialist

Approved by : Jeremy Lin , **Date:** Feb. 09, 2022

Jeremy Lin / Project Engineer

2 Summary of Test Results

47 CFR FCC Part 96			
FCC Clause	Test Item	Result	Remarks
2.1046 96.41(b)	Maximum Peak Output Power	Pass	Meet the requirement of limit.
2.1046 96.41(b)	Maximum Power Spectral Density	Pass	Meet the requirement of limit.
96.41(g)	Peak to Average Ration	Pass	Meet the requirement of limit.
2.1049	Emission Bandwidth	Pass	Meet the requirement of limit.
2.1055	Frequency Stability	Pass	Meet the requirement of limit.
2.1051 96.41(e)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 96.41(e)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -0.35dB at 7340.00MHz.

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	2.91 dB
	200MHz ~1000MHz	2.92 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	1.76 dB
	18GHz ~ 40GHz	1.77 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Englewood HGO			
Brand	Sercomm			
Test Model	SCO4255P-BC-A10			
Sample Status	Engineering sample			
Power Supply Rating	12Vdc (Adapter) 56Vdc (PoE)			
Modulation Type	QPSK, 16QAM, 64QAM			
Operating Frequency	SC (10MHz)	TX: 3555 ~ 3695 MHz		
		RX: 3555 ~ 3695 MHz		
	SC (20MHz)	TX: 3560 ~ 3690 MHz		
		RX: 3560 ~ 3690 MHz		
	DC (10MHz + 10MHz)	TX: 3555 ~ 3695 MHz		
		RX: 3555 ~ 3695 MHz		
	DC (20MHz + 20MHz)	TX: 3560 ~ 3690 MHz		
		RX: 3560 ~ 3690 MHz		
Max. EIRP Power		QPSK	16QAM	64QAM
	Per 10M			
	SC (10MHz)	29580.125mW (44.71dBm/10MHz)	26424.088mW (44.22dBm/10MHz)	25882.129mW (44.13dBm/10MHz)
	SC (20MHz)	18879.913mW (42.76dBm/10MHz)	18663.797mW (42.71dBm/10MHz)	17906.059mW (42.53dBm/10MHz)
	DC (10MHz + 10MHz)	14554.591mW (41.63dBm/10MHz)	13243.415mW (41.22dBm/10MHz)	12647.363mW (41.02dBm/10MHz)
	DC (20MHz + 20MHz)	8394.600mW (39.24dBm/10MHz)	8165.824mW (39.12dBm/10MHz)	7655.966mW (38.84dBm/10MHz)
	Full Power			
	SC (10MHz)	29580.125mW (44.71dBm/channel bandwidth)	26424.088mW (44.22dBm/channel bandwidth)	25882.129mW (44.13dBm/channel bandwidth)
	SC (20MHz)	34119.291mW (45.33dBm/channel bandwidth)	33573.761mW (45.26dBm/channel bandwidth)	32885.163mW (45.17dBm/channel bandwidth)
	DC (10MHz + 10MHz)	14554.591mW (41.63dBm/channel bandwidth)	13243.415mW (41.22dBm/channel bandwidth)	12647.363mW (41.02dBm/channel bandwidth)
	DC (20MHz + 20MHz)	15205.475mW (41.82dBm/channel bandwidth)	14859.356mW (41.72dBm/channel bandwidth)	14321.879mW (41.56dBm/channel bandwidth)
Emission Designator		QPSK	16QAM	64QAM
	SC (10MHz)	8M93G7D	8M92D7W	8M93D7W
	SC (20MHz)	17M9G7D	17M8D7W	17M9D7W
	DC (10MHz + 10MHz)	8M94G7D	8M94D7W	8M93D7W
	DC (20MHz + 20MHz)	17M8G7D	17M8D7W	17M9D7W
Antenna Type	Refer to Note as below			
Antenna Connector	Refer to Note as below			
Accessory Device	Adapter			
Cable Supplied	NA			

Note:

1. The EUT provides 4 completed transmitters and 4 receivers. The antennas provided to the EUT, please refer to the following table:

TX Antenna	Antenna Type	Antenna Connector	Antenna Gain (dBi)	Frequency Range
0	Patch array	IPEX	9.8	3550MHz - 3700 MHz
1				
2				
3				

2. The EUT uses following Adapter and PoE. (The PoE is for support unit only.)

Adapter	
Brand	MOSO POWER SUPPLY TECHNOLOGY CO.,LTD
Model	MS-T2500R120-030N0-N
Part Number	SB007-N0
AC Input	100Vac-240Vac
DC Output	12Vdc/2.5A
DC Cable	1.5m non-shielded cable

PoE (support unit only)	
Brand	ChenZhou Frecom Electronics Co., Ltd.
Model	PGOB24D01-560054
AC Input	100-240V, 0.7A, 50/60Hz
DC Output	56V, 0.536A
DC Cable	1.5m non-shielded cable

3. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.
4. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

3.2 Test Mode Applicability and Tested Channel Detail

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports. The worst case was found when positioned as the table below. Following channel(s) was (were) selected for the final test as listed below:

Band	Radiated Emission
LTE Band 48	Z-plane

Test results are presented in the report as below.

Test Mode	Test Condition
A	Power from Adapter
B	Power from PoE

LTE Band 48
SC Mode:

Test Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation
A	Maximum Output Power	55290 to 56690	55290 (3555.0MHz), 55990 (3625.0MHz), 56690 (3695.0MHz)	10MHz	QPSK / 16QAM / 64QAM
		55340 to 56640	55340 (3560.0MHz), 55990 (3625.0MHz), 56640 (3690.0MHz)	20MHz	QPSK / 16QAM / 64QAM
A	Modulation characteristics	55340 to 56640	55990 (3625.0MHz)	20MHz	QPSK / 16QAM / 64QAM
A	Frequency Stability	55290 to 56690	55290 (3555.0MHz), 56690 (3695.0MHz)	10MHz	QPSK
		55340 to 56640	55340 (3560.0MHz), 56640 (3690.0MHz)	20MHz	QPSK
A	Occupied Bandwidth	55290 to 56690	55290 (3555.0MHz), 55990 (3625.0MHz), 56690 (3695.0MHz)	10MHz	QPSK / 16QAM / 64QAM
		55340 to 56640	55340 (3560.0MHz), 55990 (3625.0MHz), 56640 (3690.0MHz)	20MHz	QPSK / 16QAM / 64QAM
A	Peak to Average Ratio	55290 to 56690	55290 (3555.0MHz), 55990 (3625.0MHz), 56690 (3695.0MHz)	10MHz	QPSK / 16QAM / 64QAM
		55340 to 56640	55340 (3560.0MHz), 55990 (3625.0MHz), 56640 (3690.0MHz)	20MHz	QPSK / 16QAM / 64QAM
A	Conducted Emission	55290 to 56690	55290 (3555.0MHz), 55990 (3625.0MHz), 56690 (3695.0MHz)	10MHz	QPSK
		55340 to 56640	55340 (3560.0MHz), 55990 (3625.0MHz), 56640 (3690.0MHz)	20MHz	QPSK

Test Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation
A, B	Radiated Emission Below 1GHz	55340 to 56640	56640 (3690.0MHz)	20MHz	QPSK
A	Radiated Emission Above 1GHz	55290 to 56690	55290 (3555.0MHz), 55990 (3625.0MHz), 56690 (3695.0MHz)	10MHz	QPSK
		55340 to 56640	55340 (3560.0MHz), 55990 (3625.0MHz), 56640 (3690.0MHz)	20MHz	QPSK

DC Mode:

Test Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation
A	Maximum Output Power	55290 to 56690	55290 (3555.0MHz)+ 55390 (3565.0MHz), 55940 (3620.0MHz)+ 56040 (3630.0MHz), 56590 (3685.0MHz)+ 56690 (3695.0MHz)	10MHz+10MHz	QPSK / 16QAM / 64QAM
		55340 to 56640	55340 (3560.0MHz)+ 55540 (3580.0MHz), 55890 (3615.0MHz)+ 56090 (3635.0MHz), 56440 (3670.0MHz)+ 56640 (3690.0MHz)	20MHz+20MHz	QPSK / 16QAM / 64QAM
A	Frequency Stability	55290 to 56690	55290 (3555.0MHz)+ 55390 (3565.0MHz), 56590 (3685.0MHz)+ 56690 (3695.0MHz)	10MHz	QPSK
		55340 to 56640	55340 (3560.0MHz)+ 55540 (3580.0MHz), 56440 (3670.0MHz)+ 56640 (3690.0MHz)	20MHz	QPSK
A	Occupied Bandwidth	55290 to 56690	55290 (3555.0MHz)+ 55390 (3565.0MHz), 55940 (3620.0MHz)+ 56040 (3630.0MHz), 56590 (3685.0MHz)+ 56690 (3695.0MHz)	10MHz	QPSK / 16QAM / 64QAM
		55340 to 56640	55340 (3560.0MHz)+ 55540 (3580.0MHz), 55890 (3615.0MHz)+ 56090 (3635.0MHz), 56440 (3670.0MHz)+ 56640 (3690.0MHz)	20MHz	QPSK / 16QAM / 64QAM

Test Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation
A	Peak to Average Ratio	55290 to 56690	55290 (3555.0MHz)+ 55390 (3565.0MHz), 55940 (3620.0MHz)+ 56040 (3630.0MHz), 56590 (3685.0MHz)+ 56690 (3695.0MHz)	10MHz	QPSK / 16QAM / 64QAM
		55340 to 56640	55340 (3560.0MHz)+ 55540 (3580.0MHz), 55890 (3615.0MHz)+ 56090 (3635.0MHz), 56440 (3670.0MHz)+ 56640 (3690.0MHz)	20MHz	QPSK / 16QAM / 64QAM
A, B	Radiated Emission Below 1GHz	55340 to 56640	56440 (3670.0MHz)+ 56640 (3690.0MHz)	20MHz	QPSK
A	Radiated Emission Above 1GHz	55340 to 56640	55340 (3560.0MHz)+ 55540 (3580.0MHz), 55890 (3615.0MHz)+ 56090 (3635.0MHz), 56440 (3670.0MHz)+ 56640 (3690.0MHz)	20MHz	QPSK

Note:

1. For radiated emission below 1GHz, select the worst radiated emission channel (above 1GHz) for final testing.
2. The output power for QPSK, 16QAM and 64QAM, measured value of QPSK is higher than 16QAM and 64QAM mode. Therefore, only Modulation characteristics, occupied bandwidth and Peak to average ratio items had been tested under QPSK, 16QAM and 64QAM modes, the other test items were performed under QPSK mode only.

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
Maximum Output Power	25deg. C, 60%RH	120Vac, 60Hz	James Yang
Modulation Characteristics	25deg. C, 60%RH	120Vac, 60Hz	James Yang
Frequency Stability	25deg. C, 60%RH	120Vac, 60Hz	James Yang
Occupied Bandwidth	25deg. C, 60%RH	120Vac, 60Hz	James Yang
Peak To Average Ratio	25deg. C, 60%RH	120Vac, 60Hz	James Yang
Conducted Emission	25deg. C, 60%RH	120Vac, 60Hz	James Yang
Radiated Emission	25deg. C, 70%RH	120Vac, 60Hz	Hans Wu Rex Wang

3.3 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.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Radio Communication Analyzer	Anritsu	MT8821C	6261806803	NA	-
B.	Notebook	DELL	E5410	1HC2XM1	FCC DoC Approved	-
C.	PoE	ChenZhou Frecom Electronics Co., Ltd.	PGOB24D01-560054	NA	NA	Provided by client

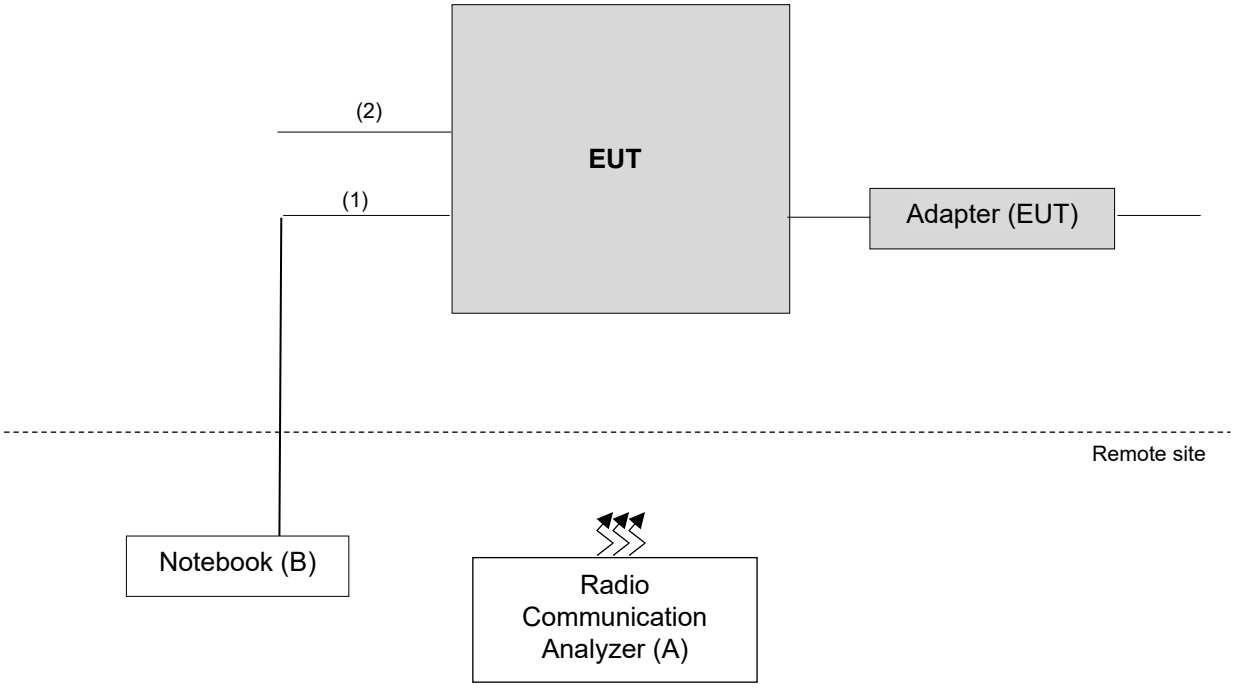
Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item A, B acted as communication partners to transfer data.

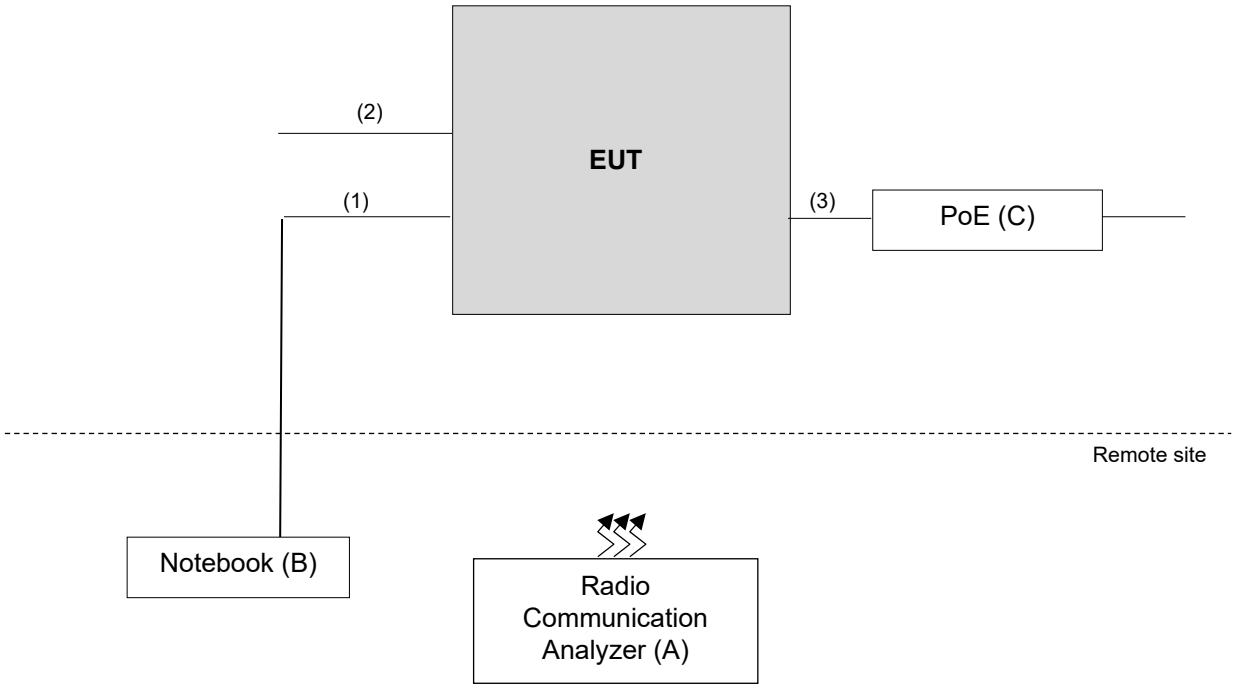
ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ45 Cable	1	10	N	0	-
2.	RJ45 Cable	1	1.5	N	0	-
3.	RJ45 Cable	1	1.5	N	0	-

3.3.1 Configuration of System under Test

Test Mode A



Test Mode B



3.4 General Description of Applied Standards and References

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

Test standard:

FCC 47 CFR Part 2

FCC 47 CFR Part 96

ANSI/TIA/EIA-603-E-2016

All test items have been performed and recorded as per the above standards.

References Test Guidance:

KDB 971168 D01 Power Meas License Digital Systems v03r01

KDB 940660 D01 Part 96 CBRS Eqpt v03

All test items have been performed as a reference to the above KDB test guidance.

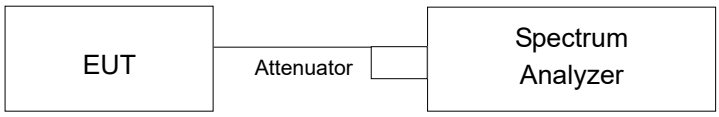
4 Test Types and Results

4.1 Maximum Output Power Measurement

4.1.1 Limits of Maximum Output Power Measurement

Device		Maximum EIRP (dBm/10 MHz)
☐	End User Device	23
☐	Category A CBSD	30
☒	Category B CBSD	47

4.1.2 Test Setup



4.1.3 Test Instruments

Test Date: Nov. 17 ~ Dec. 01, 2021

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer KEYSIGHT	N9030B	MY57140953	Jul. 06, 2021	Jul. 05, 2022
Radio Communication Analyzer Anritsu	MT8821C	6272278310	Jun. 23, 2021	Jun. 22, 2022
RF cable	JB200	Cable-OVEN-02	NA	NA
DC-6GHz 20dB 50W Fixed attenuator Woken	MDC9331N-20	0724	Jun. 24, 2020	Jun. 23, 2022
Temperature & Humidity Chamber TERCHY	HRM-120RF	931022	Dec. 24, 2020	Dec. 23, 2021
AC Power Supply Extech	CFW-105	E000603	NA	NA
Digital Multimeter Fluke	87-III	70360742	Jun. 24, 2021	Jun. 23, 2022

Note: The calibration interval of the above test instruments is 12/24 months and the calibrations are traceable to NML/ROC and NIST/USA.

Test Date: Jan. 30 ~ Feb. 08, 2022

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer KEYSIGHT	N9030B	MY57140953	Jul. 06, 2021	Jul. 05, 2022
Radio Communication Analyzer Anritsu	MT8821C	6272278310	Jun. 23, 2021	Jun. 22, 2022
RF cable	JB200	Cable-OVEN-02	NA	NA
DC-6GHz 20dB 50W Fixed attenuator Woken	MDC9331N-20	0724	Jun. 24, 2020	Jun. 23, 2022
Temperature & Humidity Chamber TERCHY	HRM-120RF	931022	Jan. 03, 2022	Jan. 02, 2023
AC Power Supply Extech	CFW-105	E000603	NA	NA
Digital Multimeter Fluke	87-III	70360742	Jun. 24, 2021	Jun. 23, 2022

Note: The calibration interval of the above test instruments is 12/24 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.1.4 Test Procedures

Conducted output power measurement

a. Connect the DUT transmitter output to the spectrum analyzer via coaxial cable while ensuring proper impedance matching.
b. Set span to at least 1.5 times the OBW.
c. Set RBW = 1-5% of the OBW, not to exceed 1 MHz.
d. Set VBW ≥ 3 × RBW.
e. Set number of points in sweep ≥ 2 × span / RBW.
f. Sweep time = auto-couple.
g. Detector = RMS (power averaging).
h. If the EUT can be configured to transmit continuously (i.e., burst duty cycle ≥ 98%), then set the trigger to free run.
i. If the EUT cannot be configured to transmit continuously (i.e., burst duty cycle < 98 %), then use a sweep trigger with the level set to enable triggering only on full power bursts and configure the EUT to transmit at full power for the entire duration of each sweep. Ensure that the sweep time is less than or equal to the transmission burst duration.
j. Trace average at least 100 traces in power averaging (i.e., RMS) mode.
k. Compute the power by integrating the spectrum across the OBW of the signal using the instrument's band or channel power measurement function, with the band/channel limits set equal to the OBW band edges. If the instrument does not have a band or channel power function, then sum the spectrum levels (in linear power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.
l. For per 10MHz method, channel power integrating bandwidth 10MHz is used for bandwidth 5M, 10M, 15M and 20M. For full power method, channel power integrating bandwidth 10MHz is used for bandwidth 5M, 10M, integrating bandwidth 15MHz is used for bandwidth 15M, integrating bandwidth 20MHz is used for bandwidth 20M.

Maximum EIRP

The relevant equation for determining the maximum ERP or EIRP from the measured RF output power is given in Equation as follows:

ERP or EIRP = $P_{Meas} + G_T$
where

ERP or EIRP effective radiated power or equivalent isotropically radiated power, respectively (expressed in the same units as P_{Meas}, e.g., dBm or dBW)
P_{Meas} measured transmitter output power or PSD, in dBm or dBW
G_T gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP)

4.1.5 Deviation from Test Standard

No deviation.

4.1.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.1.7 Test Results

SC Mode:

Conducted Output Power & Per 10 MHz EIRP Power

Channel	Freq. (MHz)	Band / BW: 48 / 10M					
		QPSK					
		Conducted Output Power (dBm/10MHz)					EIRP (dBm/10MHz)
		Chain 0	Chain 1	Chain 2	Chain 3	Total	
Low	3555	22.24	23.31	22.56	22.73	28.75	44.57
Middle	3625	22.36	23.43	22.68	22.92	28.89	44.71
High	3695	22.32	23.28	22.64	22.71	28.77	44.59
Channel	Freq. (MHz)	16QAM					
		Conducted Output Power (dBm/10MHz)					EIRP (dBm/10MHz)
		Chain 0	Chain 1	Chain 2	Chain 3	Total	
Low	3555	21.67	22.69	22.23	22.33	28.27	44.09
Middle	3625	21.85	22.80	22.37	22.46	28.40	44.22
High	3695	21.83	22.64	22.28	22.31	28.30	44.12
Channel	Freq. (MHz)	64QAM					
		Conducted Output Power (dBm/10MHz)					EIRP (dBm/10MHz)
		Chain 0	Chain 1	Chain 2	Chain 3	Total	
Low	3555	21.57	22.65	22.13	22.21	28.18	44.00
Middle	3625	21.71	22.76	22.33	22.31	28.31	44.13
High	3695	21.77	22.58	22.21	22.18	28.22	44.04

Note:

1. Directional gain = 9.8dBi+10log(4) = 15.82dBi
2. EIRP (dBm / 10MHz) = Total Conducted Output Power (dBm / 10MHz) + Directional Gain

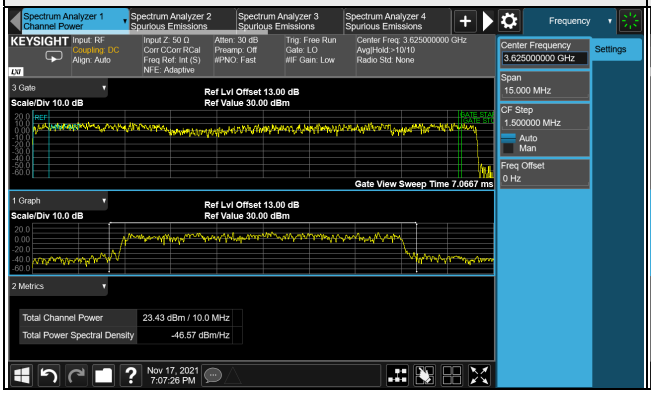
Channel	Freq. (MHz)	Band / BW: 48 / 20M					
		QPSK					
		Conducted Output Power (dBm/10MHz)					EIRP (dBm/10MHz)
		Chain 0	Chain 1	Chain 2	Chain 3	Total	
Low	3560	20.07	21.25	20.80	20.87	26.79	42.61
Middle	3625	20.33	21.39	20.88	21.01	26.94	42.76
High	3690	20.09	20.88	20.42	20.79	26.58	42.40
Channel	Freq. (MHz)	16QAM					
		Conducted Output Power (dBm/10MHz)					EIRP (dBm/10MHz)
		Chain 0	Chain 1	Chain 2	Chain 3	Total	
Low	3560	19.73	20.96	20.58	20.61	26.51	42.33
Middle	3625	20.08	21.21	20.76	21.32	26.89	42.71
High	3690	19.67	20.63	20.26	21.22	26.50	42.32
Channel	Freq. (MHz)	64QAM					
		Conducted Output Power (dBm/10MHz)					EIRP (dBm/10MHz)
		Chain 0	Chain 1	Chain 2	Chain 3	Total	
Low	3560	19.46	20.47	20.44	20.57	26.28	42.10
Middle	3625	19.76	20.97	20.67	21.21	26.71	42.53
High	3690	19.42	20.45	20.18	21.13	26.36	42.18

Note:

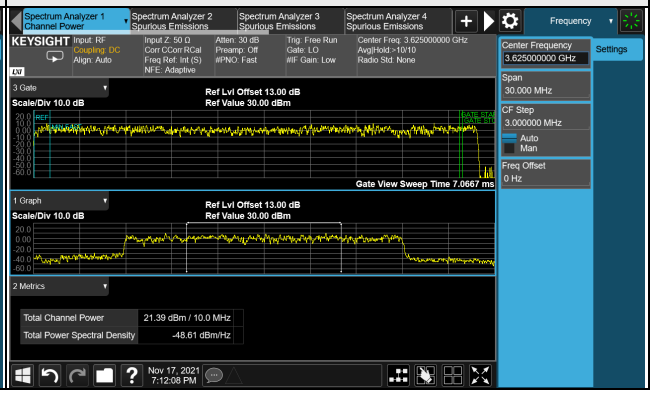
1. Directional gain = 9.8dBi+10log(4) = 15.82dBi
2. EIRP (dBm / 10MHz) = Total Conducted Output Power (dBm / 10MHz) + Directional Gain

Spectrum Plot of Worst Value

10MHz / QPSK / Chain 1



20MHz / QPSK / Chain 1



SC Mode:

For FULL EIRP Power

Channel	Freq. (MHz)	Band / BW: 48 / 10M					
		QPSK					
		Conducted Output Power (dBm/channel bandwidth)					EIRP (dBm/channel bandwidth)
		Chain 0	Chain 1	Chain 2	Chain 3	Total	
Low	3555	22.24	23.33	22.56	22.73	28.75	44.57
Middle	3625	22.36	23.43	22.68	22.92	28.89	44.71
High	3695	22.32	23.28	22.64	22.71	28.77	44.59
Channel	Freq. (MHz)	16QAM					
		Conducted Output Power (dBm/channel bandwidth)					EIRP (dBm/channel bandwidth)
		Chain 0	Chain 1	Chain 2	Chain 3	Total	
Low	3555	21.67	22.69	22.23	22.33	28.27	44.09
Middle	3625	21.85	22.80	22.37	22.46	28.40	44.22
High	3695	21.83	22.64	22.28	22.31	28.30	44.12
Channel	Freq. (MHz)	64QAM					
		Conducted Output Power (dBm/channel bandwidth)					EIRP (dBm/channel bandwidth)
		Chain 0	Chain 1	Chain 2	Chain 3	Total	
Low	3555	21.57	22.65	22.13	22.21	28.18	44.00
Middle	3625	21.71	22.76	22.33	22.31	28.31	44.13
High	3695	21.77	22.58	22.21	22.18	28.22	44.04

Note:

1. Directional gain = 9.8dBi+10log(4) = 15.82dBi
2. EIRP (dBm / Channel Bandwidth) = Total Conducted Output Power (dBm / Channel Bandwidth) + Directional Gain

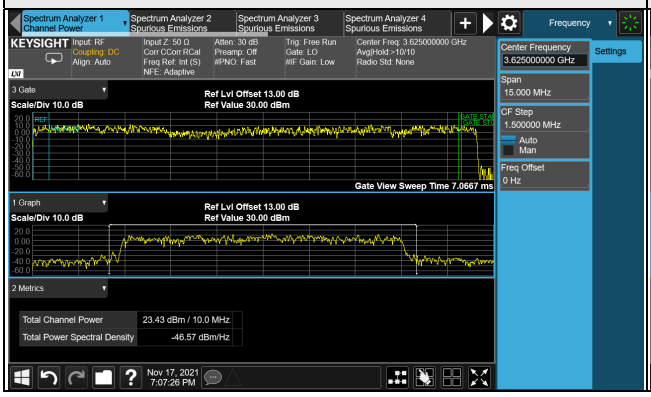
Channel	Freq. (MHz)	Band / BW: 48 / 20M					
		QPSK					
		Conducted Output Power (dBm/channel bandwidth)					EIRP (dBm/channel bandwidth)
		Chain 0	Chain 1	Chain 2	Chain 3	Total	
Low	3560	22.61	23.63	23.23	23.37	29.25	45.07
Middle	3625	22.96	23.77	23.52	23.67	29.51	45.33
High	3690	22.39	23.27	23.14	23.21	29.04	44.86
Channel	Freq. (MHz)	16QAM					
		Conducted Output Power (dBm/channel bandwidth)					EIRP (dBm/channel bandwidth)
		Chain 0	Chain 1	Chain 2	Chain 3	Total	
Low	3560	22.44	23.52	23.12	23.17	29.10	44.92
Middle	3625	22.83	23.71	23.47	23.63	29.44	45.26
High	3690	22.29	23.17	22.86	23.12	28.89	44.71
Channel	Freq. (MHz)	64QAM					
		Conducted Output Power (dBm/channel bandwidth)					EIRP (dBm/channel bandwidth)
		Chain 0	Chain 1	Chain 2	Chain 3	Total	
Low	3560	22.40	23.47	23.01	22.99	29.00	44.82
Middle	3625	22.74	23.69	23.29	23.54	29.35	45.17
High	3690	22.17	23.03	22.68	22.89	28.73	44.55

Note:

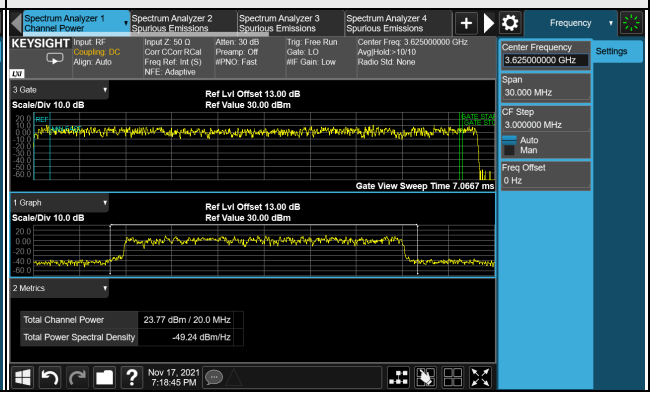
1. Directional gain = 9.8dBi+10log(4) = 15.82dBi
2. EIRP (dBm / Channel Bandwidth) = Total Conducted Output Power (dBm / Channel Bandwidth) + Directional Gain

Spectrum Plot of Worst Value

10MHz / QPSK / Chain 1



20MHz / QPSK / Chain 1



DC Mode:

Conducted Output Power & EIRP Power (dBm/10MHz)

Channel	Freq. (MHz)	Band / BW: 48 / 10MHz+10MHz							
		QPSK							
		Conducted Output Power (dBm/10MHz)							EIRP (dBm/10MHz)
		PCC			SCC			PCC + SCC Total	
		Chain 0	Chain 1	Total	Chain 2	Chain 3	Total		
Low	3555 + 3565	22.24	23.43	25.89	22.45	22.67	25.57	28.74	44.56
Middle	3620 + 3630	22.67	23.95	26.37	23.06	23.39	26.24	29.31	45.13
High	3685 + 3695	22.59	23.72	26.20	22.93	23.26	26.11	29.17	44.99
Channel	Freq. (MHz)	16QAM							
		Conducted Output Power (dBm/10MHz)							EIRP (dBm/10MHz)
		PCC			SCC			PCC + SCC Total	
		Chain 0	Chain 1	Total	Chain 2	Chain 3	Total		
Low	3555 + 3565	21.67	22.80	25.28	22.41	22.61	25.52	28.41	44.23
Middle	3620 + 3630	21.99	23.16	25.62	22.97	23.27	26.13	28.90	44.72
High	3685 + 3695	21.77	23.01	25.44	22.84	23.17	26.02	28.75	44.57
Channel	Freq. (MHz)	64QAM							
		Conducted Output Power (dBm/10MHz)							EIRP (dBm/10MHz)
		PCC			SCC			PCC + SCC Total	
		Chain 0	Chain 1	Total	Chain 2	Chain 3	Total		
Low	3555 + 3565	21.57	22.69	25.18	22.32	22.58	25.46	28.33	44.15
Middle	3620 + 3630	21.93	22.87	25.44	22.86	22.98	25.93	28.70	44.52
High	3685 + 3695	21.62	22.78	25.25	22.64	22.85	25.76	28.52	44.34

Note:

1. Directional gain = 9.8dBi+10log(4) = 15.82dBi
2. EIRP (dBm / 10MHz) = Total Conducted Output Power (dBm / 10MHz) + Directional Gain

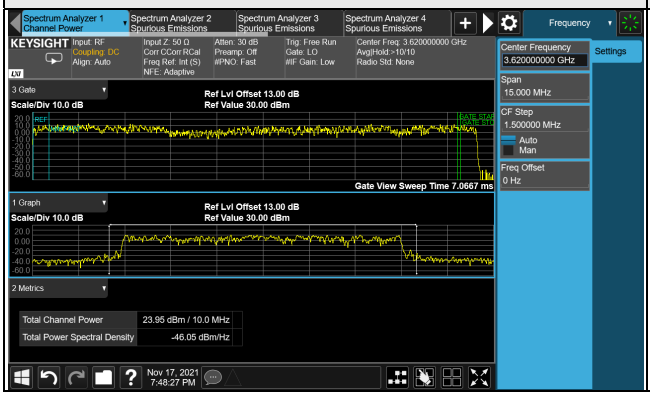
Channel	Freq. (MHz)	Band / BW: 48 / 20MHz+20MHz							
		QPSK							
		Conducted Output Power (dBm/10MHz)							EIRP (dBm/10MHz)
		PCC			SCC			PCC + SCC Total	
		Chain 0	Chain 1	Total	Chain 2	Chain 3	Total		
Low	3560 + 3580	20.07	21.25	23.71	20.61	20.88	23.76	26.74	42.56
Middle	3615 + 3635	20.23	21.33	23.83	20.92	21.04	23.99	26.92	42.74
High	3670 + 3690	19.77	20.96	23.42	20.22	20.65	23.45	26.44	42.26
Channel	Freq. (MHz)	16QAM							
		Conducted Output Power (dBm/10MHz)							EIRP (dBm/10MHz)
		PCC			SCC			PCC + SCC Total	
		Chain 0	Chain 1	Total	Chain 2	Chain 3	Total		
Low	3560 + 3580	19.73	20.96	23.40	20.56	20.84	23.71	26.57	42.39
Middle	3615 + 3635	19.99	21.21	23.65	20.88	20.95	23.93	26.80	42.62
High	3670 + 3690	19.53	20.80	23.22	20.22	20.54	23.39	26.32	42.14
Channel	Freq. (MHz)	64QAM							
		Conducted Output Power (dBm/10MHz)							EIRP (dBm/10MHz)
		PCC			SCC			PCC + SCC Total	
		Chain 0	Chain 1	Total	Chain 2	Chain 3	Total		
Low	3560 + 3580	19.46	20.47	23.00	20.23	20.36	23.31	26.17	41.99
Middle	3615 + 3635	19.64	20.88	23.31	20.67	20.71	23.70	26.52	42.34
High	3670 + 3690	19.11	20.64	22.95	19.91	20.18	23.06	26.02	41.84

Note:

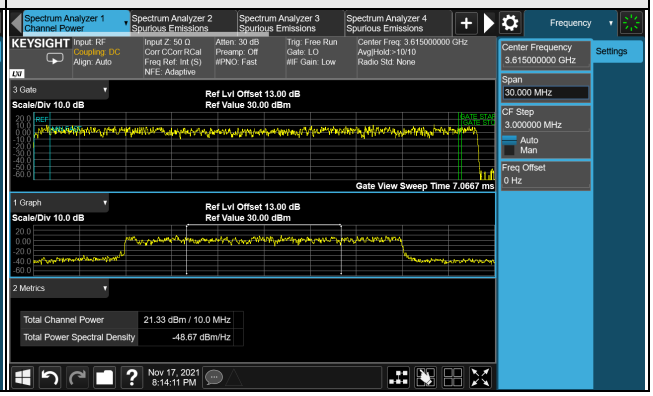
1. Directional gain = 9.8dBi+10log(4) = 15.82dBi
2. EIRP (dBm / 10MHz) = Total Conducted Output Power (dBm / 10MHz) + Directional Gain

Spectrum Plot of Worst Value

10MHz+10MHz / QPSK / PCC / Chain 1



20MHz+20MHz / QPSK / PCC / Chain 1



DC Mode:

For FULL EIRP Power

Channel	Freq. (MHz)	Band / BW: 48 / 10MHz+10MHz							
		QPSK							
		Conducted Output Power (dBm/channel bandwidth)							EIRP (dBm/channel bandwidth)
		PCC			SCC			PCC + SCC Total	
		Chain 0	Chain 1	Total	Chain 2	Chain 3	Total		
Low	3555 + 3565	22.24	23.43	25.89	22.45	22.67	25.57	28.74	44.56
Middle	3620 + 3630	22.67	23.95	26.37	23.06	23.39	26.24	29.31	45.13
High	3685 + 3695	22.59	23.72	26.20	22.93	23.26	26.11	29.17	44.99
Channel	Freq. (MHz)	16QAM							
		Conducted Output Power (dBm/channel bandwidth)							EIRP (dBm/channel bandwidth)
		PCC			SCC			PCC + SCC Total	
		Chain 0	Chain 1	Total	Chain 2	Chain 3	Total		
Low	3555 + 3565	21.67	22.80	25.28	22.41	22.61	25.52	28.41	44.23
Middle	3620 + 3630	21.99	23.16	25.62	22.97	23.27	26.13	28.90	44.72
High	3685 + 3695	21.77	23.01	25.44	22.84	23.17	26.02	28.75	44.57
Channel	Freq. (MHz)	64QAM							
		Conducted Output Power (dBm/channel bandwidth)							EIRP (dBm/channel bandwidth)
		PCC			SCC			PCC + SCC Total	
		Chain 0	Chain 1	Total	Chain 2	Chain 3	Total		
Low	3555 + 3565	21.57	22.69	25.18	22.32	22.58	25.46	28.33	44.15
Middle	3620 + 3630	21.93	22.87	25.44	22.86	22.98	25.93	28.70	44.52
High	3685 + 3695	21.62	22.78	25.25	22.64	22.85	25.76	28.52	44.34

Note:

1. Directional gain = 9.8dBi+10log(4) = 15.82dBi
2. EIRP (dBm / Channel Bandwidth) = Total Conducted Output Power (dBm / Channel Bandwidth) + Directional Gain

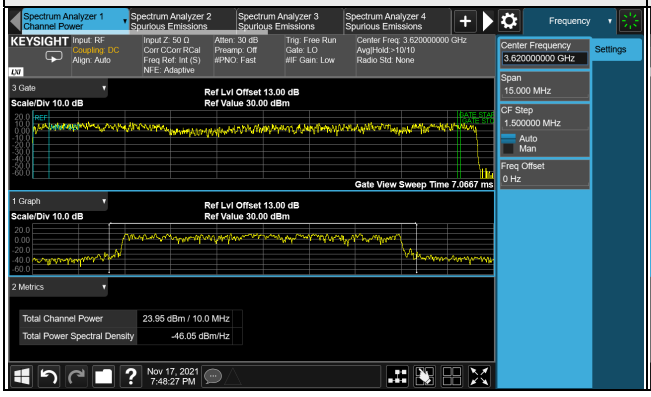
Channel	Freq. (MHz)	Band / BW: 48 / 20MHz+20MHz							
		QPSK							
		Conducted Output Power (dBm/channel bandwidth)							EIRP (dBm/channel bandwidth)
		PCC			SCC			PCC + SCC Total	
		Chain 0	Chain 1	Total	Chain 2	Chain 3	Total		
Low	3560 + 3580	22.61	23.63	26.16	23.25	23.35	26.31	29.25	45.07
Middle	3615 + 3635	22.92	23.86	26.43	23.42	23.67	26.56	29.50	45.32
High	3670 + 3690	22.19	23.27	25.77	22.86	22.94	25.91	28.85	44.67
Channel	Freq. (MHz)	16QAM							
		Conducted Output Power (dBm/channel bandwidth)							EIRP (dBm/channel bandwidth)
		PCC			SCC			PCC + SCC Total	
		Chain 0	Chain 1	Total	Chain 2	Chain 3	Total		
Low	3560 + 3580	22.44	23.52	26.02	23.16	23.33	26.26	29.15	44.97
Middle	3615 + 3635	22.78	23.69	26.27	23.38	23.60	26.50	29.40	45.22
High	3670 + 3690	22.13	23.22	25.72	22.76	22.82	25.80	28.77	44.59
Channel	Freq. (MHz)	64QAM							
		Conducted Output Power (dBm/channel bandwidth)							EIRP (dBm/channel bandwidth)
		PCC			SCC			PCC + SCC Total	
		Chain 0	Chain 1	Total	Chain 2	Chain 3	Total		
Low	3560 + 3580	22.40	23.47	25.98	22.86	23.03	25.96	28.98	44.80
Middle	3615 + 3635	22.69	23.61	26.18	23.10	23.41	26.27	29.24	45.06
High	3670 + 3690	22.02	23.11	25.61	22.43	22.73	25.59	28.61	44.43

Note:

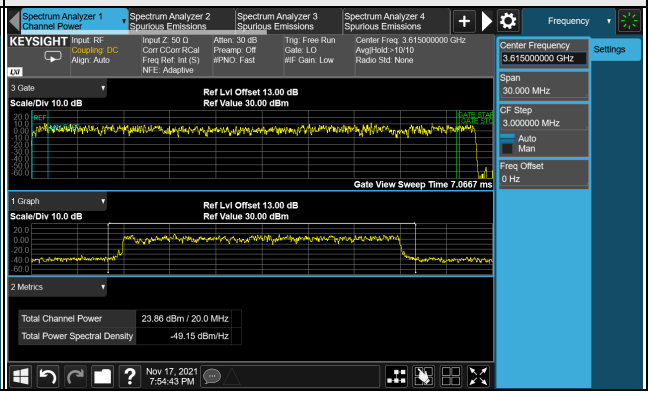
1. Directional gain = 9.8dBi+10log(4) = 15.82dBi
2. EIRP (dBm / Channel Bandwidth) = Total Conducted Output Power (dBm / Channel Bandwidth) + Directional Gain

Spectrum Plot of Worst Value

10MHz+10MHz / QPSK / PCC / Chain 1



20MHz+20MHz / QPSK / PCC / Chain 1

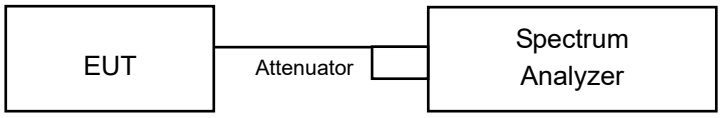


4.2 Maximum Power Spectral Density Measurement

4.2.1 Limits of Maximum Power Spectral Density Measurement

Device		Maximum PSD (dBm/MHz)
☐	End User Device	n/a
☐	Category A CBSD	20
☒	Category B CBSD	37

4.2.2 Test Setup



4.2.3 Test Instruments

Refer to section 4.1.3 to get information of above instrument.

4.2.4 Test Procedure

1. Connect the transmitter to the spectrum analyzer via coaxial cable while ensuring proper impedance matching.
2. Set instrument center frequency to OBW center frequency.
3. Set span to 2 × to 3 × the OBW.
4. Set the RBW to the specified reference bandwidth (often 1 MHz).
5. Set VBW ≥ 3 × RBW.
6. Detector = RMS (power averaging).
7. Ensure that the number of measurement points in the sweep ≥ 2 × span/RBW.
8. Sweep time = auto couple.
9. Employ trace averaging (RMS) mode over a minimum of 100 traces.
10. Use the peak marker function to determine the maximum amplitude level within the reference bandwidth (PSD).

4.2.5 Deviation from Test Standard

No deviation.

4.2.6 EUT Operating Condition

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.2.7 Test Results

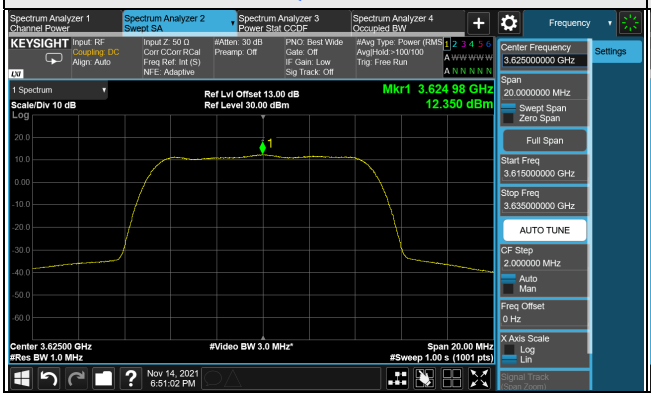
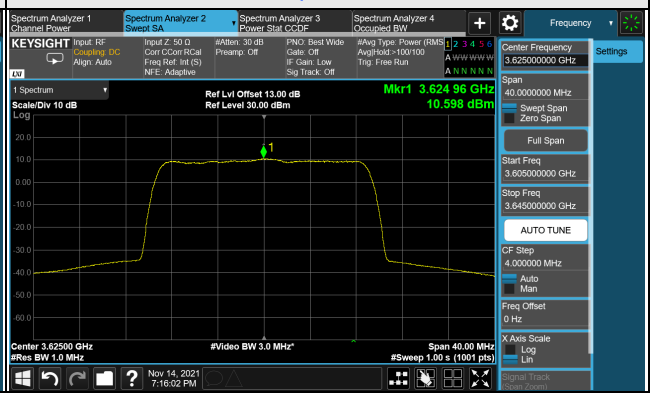
SC Mode:

Channel	Freq. (MHz)	10MHz QPSK							
		Conducted Power Density (dBm/MHz)					EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)	Pass/Fail
		Chain 0	Chain 1	Chain 2	Chain 3	Total			
Low	3555	11.98	12.19	11.83	12.00	18.02	33.84	37.00	Pass
Middle	3625	12.12	12.32	11.91	12.35	18.20	34.02	37.00	Pass
High	3695	12.07	12.11	11.78	12.05	18.03	33.85	37.00	Pass
Channel	Freq. (MHz)	16QAM							
		Conducted Power Density (dBm/MHz)					EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)	Pass/Fail
		Chain 0	Chain 1	Chain 2	Chain 3	Total			
Low	3555	11.41	11.57	11.53	11.43	17.51	33.33	37.00	Pass
Middle	3625	11.63	11.82	11.69	11.77	17.75	33.57	37.00	Pass
High	3695	11.51	11.53	11.56	11.61	17.57	33.39	37.00	Pass
Channel	Freq. (MHz)	64QAM							
		Conducted Power Density (dBm/MHz)					EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)	Pass/Fail
		Chain 0	Chain 1	Chain 2	Chain 3	Total			
Low	3555	11.15	11.49	11.21	11.23	17.29	33.11	37.00	Pass
Middle	3625	11.27	11.73	11.62	11.51	17.56	33.38	37.00	Pass
High	3695	11.13	11.36	11.31	11.42	17.33	33.15	37.00	Pass

Channel	Freq. (MHz)	20MHz QPSK							
		Conducted Power Density (dBm/MHz)					EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)	Pass/Fail
		Chain 0	Chain 1	Chain 2	Chain 3	Total			
Low	3560	9.81	10.48	10.13	10.01	16.13	31.95	37.00	Pass
Middle	3625	10.25	10.60	10.23	10.11	16.32	32.14	37.00	Pass
High	3690	9.51	10.33	9.98	9.91	15.96	31.78	37.00	Pass
Channel	Freq. (MHz)	16QAM							
		Conducted Power Density (dBm/MHz)					EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)	Pass/Fail
		Chain 0	Chain 1	Chain 2	Chain 3	Total			
Low	3560	9.64	10.46	10.00	9.94	16.04	31.86	37.00	Pass
Middle	3625	9.86	10.52	9.89	10.06	16.11	31.93	37.00	Pass
High	3690	9.44	10.28	9.73	9.83	15.85	31.67	37.00	Pass
Channel	Freq. (MHz)	64QAM							
		Conducted Power Density (dBm/MHz)					EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)	Pass/Fail
		Chain 0	Chain 1	Chain 2	Chain 3	Total			
Low	3560	9.41	10.37	9.77	9.82	15.88	31.70	37.00	Pass
Middle	3625	9.73	10.51	9.82	10.03	16.05	31.87	37.00	Pass
High	3690	9.27	10.19	9.62	9.76	15.74	31.56	37.00	Pass

Note:

1. Directional gain = 9.8dBi + 10log(4) = 15.82dBi
2. EIRP PSD (dBm/MHz) = Total Conducted Power Density (dBm/MHz) + Directional Gain

Spectrum Plot of Worst Value	
10MHz / QPSK / Chain 3	20MHz / QPSK / Chain 1
	

DC Mode:

Channel	Freq. (MHz)	10MHz+10MHz									
		QPSK									
		Conducted Power Density (dBm/MHz)							EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)	Pass/Fail
		PCC			SCC			PCC + SCC Total			
		Chain 0	Chain 1	Total	Chain 2	Chain 3	Total				
Low	3555 + 3565	12.66	13.02	15.85	12.33	12.35	15.35	18.62	34.44	37.00	Pass
Middle	3620 + 3630	12.85	13.20	16.04	12.96	13.30	16.14	19.10	34.92	37.00	Pass
High	3685 + 3695	12.67	13.08	15.89	12.87	12.88	15.89	18.90	34.72	37.00	Pass
Channel	Freq. (MHz)	16QAM									
		Conducted Power Density (dBm/MHz)							EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)	Pass/Fail
		PCC			SCC			PCC + SCC Total			
		Chain 0	Chain 1	Total	Chain 2	Chain 3	Total				
Low	3555 + 3565	12.03	12.76	15.42	12.21	12.31	15.27	18.36	34.18	37.00	Pass
Middle	3620 + 3630	12.16	12.88	15.55	12.83	12.98	15.92	18.74	34.56	37.00	Pass
High	3685 + 3695	12.09	12.84	15.49	12.81	12.81	15.82	18.67	34.49	37.00	Pass
Channel	Freq. (MHz)	64QAM									
		Conducted Power Density (dBm/MHz)							EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)	Pass/Fail
		PCC			SCC			PCC + SCC Total			
		Chain 0	Chain 1	Total	Chain 2	Chain 3	Total				
Low	3555 + 3565	12.01	12.43	15.24	12.13	12.29	15.22	18.24	34.06	37.00	Pass
Middle	3620 + 3630	11.98	12.62	15.32	12.71	12.73	15.73	18.54	34.36	37.00	Pass
High	3685 + 3695	11.97	12.60	15.31	12.54	12.65	15.61	18.47	34.29	37.00	Pass

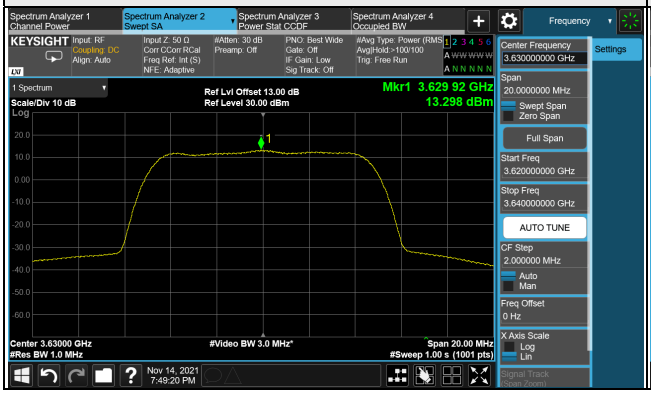
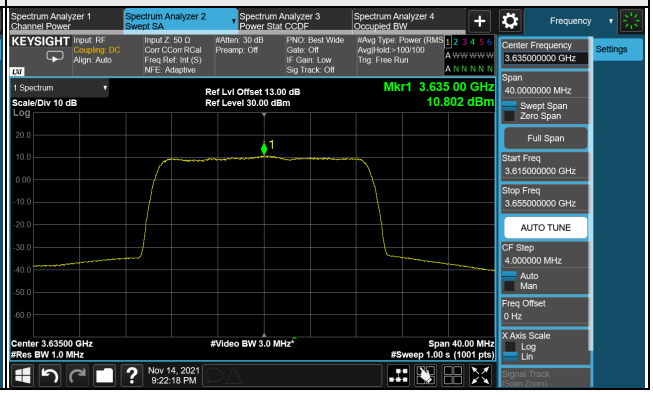
Note:

1. Directional gain = 9.8dBi + 10log(4) = 15.82dBi
2. EIRP PSD (dBm/MHz) = Total Conducted Power Density (dBm/MHz) + Directional Gain

Channel	Freq. (MHz)	20MHz+20MHz									
		QPSK									
		Conducted Power Density (dBm/MHz)							EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)	Pass/Fail
		PCC			SCC			PCC + SCC Total			
		Chain 0	Chain 1	Total	Chain 2	Chain 3	Total				
Low	3560 + 3580	9.88	10.45	13.18	10.05	10.42	13.25	16.23	32.05	37.00	Pass
Middle	3615 + 3635	10.35	10.62	13.50	10.48	10.80	13.65	16.59	32.41	37.00	Pass
High	3670 + 3690	9.76	10.13	12.96	9.86	10.26	13.07	16.03	31.85	37.00	Pass
Channel	Freq. (MHz)	16QAM									
		Conducted Power Density (dBm/MHz)							EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)	Pass/Fail
		PCC			SCC			PCC + SCC Total			
		Chain 0	Chain 1	Total	Chain 2	Chain 3	Total				
Low	3560 + 3580	9.62	10.36	13.02	9.96	10.28	13.13	16.09	31.91	37.00	Pass
Middle	3615 + 3635	10.16	10.58	13.39	10.23	10.43	13.34	16.37	32.19	37.00	Pass
High	3670 + 3690	9.27	10.01	12.67	9.77	10.08	12.94	15.81	31.63	37.00	Pass
Channel	Freq. (MHz)	64QAM									
		Conducted Power Density (dBm/MHz)							EIRP PSD (dBm/MHz)	EIRP PSD Limit (dBm/MHz)	Pass/Fail
		PCC			SCC			PCC + SCC Total			
		Chain 0	Chain 1	Total	Chain 2	Chain 3	Total				
Low	3560 + 3580	9.43	10.30	12.90	9.87	10.13	13.01	15.97	31.79	37.00	Pass
Middle	3615 + 3635	9.88	10.51	13.22	10.03	10.27	13.16	16.20	32.02	37.00	Pass
High	3670 + 3690	9.21	9.79	12.52	9.63	9.71	12.68	15.61	31.43	37.00	Pass

Note:

1. Directional gain = 9.8dBi + 10log(4) = 15.82dBi
2. EIRP PSD (dBm/MHz) = Total Conducted Power Density (dBm/MHz) + Directional Gain

Spectrum Plot of Worst Value	
10MHz+10MHz / QPSK / SCC / Chain 3	20MHz+20MHz / QPSK / SCC / Chain 3
	

4.3 Modulation Characteristics Measurement

4.3.1 Limits of Modulation Characteristics

N/A

4.3.2 Test Setup

4.3.3 Test Instruments

Refer to section 4.4.3 to get information of above instrument.

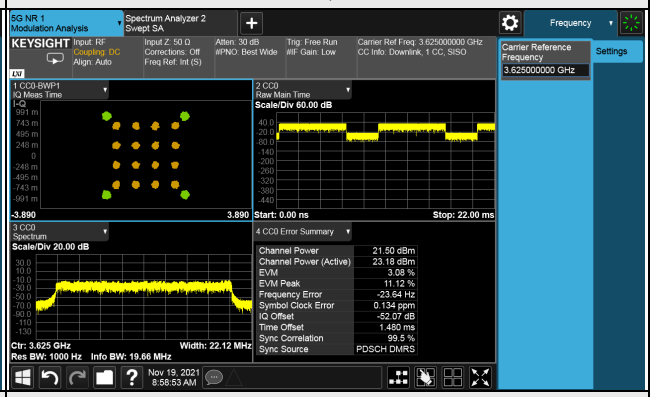
4.3.4 Deviation fromTest Standard

No deviation.

4.3.5 EUT Operating Conditions

Connect the EUT to Communication Simulator via the antenna connector, the frequency band is set as EUT supported Modulation and Channels, the EUT output is matched with 50 ohm load, the waveform quality and constellation of the EUT was tested.

4.3.6 Test Results

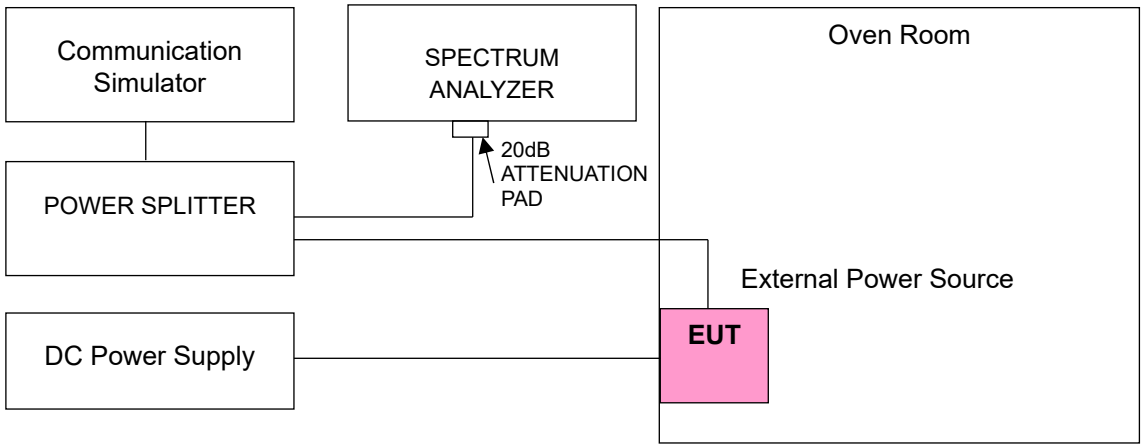
Spectrum Plot of Measurement Value	
Channel: 55990 / Frequency (MHz): 3625.0MHz	
QPSK	16QAM
	
64QAM	
	

4.4 Frequency Stability Measurement

4.4.1 Limits of Frequency Stabiliity Measurement

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency band.

4.4.2 Test Setup



4.4.3 Test Instruments

Test Date: Nov. 18, 2021

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Radio Communication Analyzer Anritsu	MT8820C	6201010284	Dec. 28, 2020	Dec. 27, 2021
Temperature & Humidity Chamber TERCHY	HRM-120RF	931022	Dec. 24, 2020	Dec. 23, 2021
Three-phase coupling / decoupling network TESEQ	CDN 3063	4006	Mar. 10, 2021	Mar. 09, 2022
DC Power Supply Topward	6306A	727263	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.4.4 Test Procedure

a. 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.

b. 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.

c. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ±0.5 ℃ 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.

Note: The frequency error was recorded frequency error from the communication simulator.

4.4.5 Test Results

SC Mode: Chain 0

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 48, Channel Bandwidth: 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
13.2	3555.000001	0.000	3695.000003	0.001
12	3555.000004	0.001	3695.000001	0.000
10.8	3555.000001	0.000	3695.000002	0.001

Note: The applicant defined the normal working voltage is from 10.8Vac to 13.2Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 48, Channel Bandwidth: 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	3555.000003	0.001	3695.000003	0.001
-30	3555.000001	0.000	3695.000002	0.001
-20	3555.000002	0.000	3695.000003	0.001
-10	3555.000001	0.000	3695.000003	0.001
0	3555.000004	0.001	3695.000001	0.000
10	3555.000002	0.000	3695.000003	0.001
20	3554.999997	-0.001	3694.999997	-0.001
30	3554.999998	-0.001	3694.999997	-0.001
40	3554.999997	-0.001	3694.999997	-0.001
50	3554.999997	-0.001	3694.999996	-0.001
55	3554.999998	-0.001	3694.999997	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 48, Channel Bandwidth: 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
13.2	3560.000003	0.001	3690.000001	0.000
12	3560.000001	0.000	3690.000003	0.001
10.8	3560.000002	0.000	3690.000003	0.001

Note: The applicant defined the normal working voltage is from 10.8Vac to 13.2Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 48, Channel Bandwidth: 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	3560.000004	0.001	3690.000001	0.000
-30	3560.000002	0.001	3690.000002	0.001
-20	3560.000002	0.001	3690.000002	0.001
-10	3560.000004	0.001	3690.000003	0.001
0	3560.000003	0.001	3690.000002	0.000
10	3560.000003	0.001	3690.000001	0.000
20	3559.999998	-0.001	3689.999998	-0.001
30	3559.999998	-0.001	3689.999998	-0.001
40	3559.999999	0.000	3689.999998	-0.001
50	3559.999998	0.000	3689.999998	-0.001
55	3559.999998	-0.001	3689.999998	-0.001

SC Mode: Chain 1

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 48, Channel Bandwidth: 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
13.2	3555.000001	0.000	3695.000002	0.001
12	3555.000002	0.000	3695.000003	0.001
10.8	3555.000003	0.001	3695.000002	0.001

Note: The applicant defined the normal working voltage is from 10.8Vac to 13.2Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 48, Channel Bandwidth: 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	3555.000002	0.001	3695.000001	0.000
-30	3555.000003	0.001	3695.000002	0.001
-20	3555.000003	0.001	3695.000002	0.001
-10	3555.000002	0.001	3695.000003	0.001
0	3555.000003	0.001	3695.000003	0.001
10	3555.000002	0.000	3695.000004	0.001
20	3554.999997	-0.001	3694.999998	-0.001
30	3554.999997	-0.001	3694.999997	-0.001
40	3554.999997	-0.001	3694.999996	-0.001
50	3554.999999	0.000	3694.999997	-0.001
55	3554.999999	0.000	3694.999999	0.000

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 48, Channel Bandwidth: 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
13.2	3560.000002	0.000	3690.000004	0.001
12	3560.000002	0.001	3690.000002	0.001
10.8	3560.000003	0.001	3690.000002	0.000

Note: The applicant defined the normal working voltage is from 10.8Vac to 13.2Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 48, Channel Bandwidth: 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	3560.000003	0.001	3690.000001	0.000
-30	3560.000003	0.001	3690.000003	0.001
-20	3560.000003	0.001	3690.000003	0.001
-10	3560.000001	0.000	3690.000001	0.000
0	3560.000002	0.001	3690.000002	0.001
10	3560.000003	0.001	3690.000003	0.001
20	3559.999999	0.000	3689.999997	-0.001
30	3559.999999	0.000	3689.999998	0.000
40	3559.999998	-0.001	3689.999998	-0.001
50	3559.999997	-0.001	3689.999997	-0.001
55	3559.999996	-0.001	3689.999997	-0.001

SC Mode: Chain 2

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 48, Channel Bandwidth: 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
13.2	3555.000001	0.000	3695.000003	0.001
12	3555.000004	0.001	3695.000003	0.001
10.8	3555.000002	0.001	3695.000003	0.001

Note: The applicant defined the normal working voltage is from 10.8Vac to 13.2Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 48, Channel Bandwidth: 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	3555.000004	0.001	3695.000004	0.001
-30	3555.000003	0.001	3695.000001	0.000
-20	3555.000003	0.001	3695.000001	0.000
-10	3555.000001	0.000	3695.000002	0.001
0	3555.000002	0.001	3695.000002	0.000
10	3555.000001	0.000	3695.000003	0.001
20	3554.999996	-0.001	3694.999997	-0.001
30	3554.999996	-0.001	3694.999997	-0.001
40	3554.999998	0.000	3694.999999	0.000
50	3554.999997	-0.001	3694.999997	-0.001
55	3554.999999	0.000	3694.999998	0.000

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 48, Channel Bandwidth: 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
13.2	3560.000002	0.001	3690.000002	0.001
12	3560.000003	0.001	3690.000003	0.001
10.8	3560.000004	0.001	3690.000003	0.001

Note: The applicant defined the normal working voltage is from 10.8Vac to 13.2Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 48, Channel Bandwidth: 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	3560.000004	0.001	3690.000001	0.000
-30	3560.000002	0.000	3690.000001	0.000
-20	3560.000002	0.000	3690.000001	0.000
-10	3560.000003	0.001	3690.000002	0.001
0	3560.000004	0.001	3690.000003	0.001
10	3560.000003	0.001	3690.000004	0.001
20	3559.999999	0.000	3689.999997	-0.001
30	3559.999999	0.000	3689.999996	-0.001
40	3559.999998	-0.001	3689.999997	-0.001
50	3559.999998	0.000	3689.999999	0.000
55	3559.999997	-0.001	3689.999998	-0.001

SC Mode: Chain 3

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 48, Channel Bandwidth: 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
13.2	3555.000001	0.000	3695.000001	0.000
12	3555.000004	0.001	3695.000003	0.001
10.8	3555.000003	0.001	3695.000004	0.001

Note: The applicant defined the normal working voltage is from 10.8Vac to 13.2Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 48, Channel Bandwidth: 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	3555.000001	0.000	3695.000001	0.000
-30	3555.000002	0.001	3695.000004	0.001
-20	3555.000002	0.001	3695.000004	0.001
-10	3555.000004	0.001	3695.000001	0.000
0	3555.000002	0.001	3695.000002	0.001
10	3555.000003	0.001	3695.000002	0.000
20	3554.999998	0.000	3694.999996	-0.001
30	3554.999999	0.000	3694.999998	-0.001
40	3554.999997	-0.001	3694.999997	-0.001
50	3554.999999	0.000	3694.999998	0.000
55	3554.999999	0.000	3694.999996	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 48, Channel Bandwidth: 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
13.2	3560.000001	0.000	3690.000001	0.000
12	3560.000003	0.001	3690.000003	0.001
10.8	3560.000003	0.001	3690.000003	0.001

Note: The applicant defined the normal working voltage is from 10.8Vac to 13.2Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 48, Channel Bandwidth: 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	3560.000003	0.001	3690.000002	0.001
-30	3560.000002	0.001	3690.000004	0.001
-20	3560.000002	0.001	3690.000004	0.001
-10	3560.000002	0.001	3690.000003	0.001
0	3560.000002	0.000	3690.000002	0.001
10	3560.000003	0.001	3690.000001	0.000
20	3559.999998	-0.001	3689.999996	-0.001
30	3559.999997	-0.001	3689.999998	-0.001
40	3559.999998	-0.001	3689.999997	-0.001
50	3559.999997	-0.001	3689.999998	0.000
55	3559.999996	-0.001	3689.999998	-0.001

DC Mode: Chain 0

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 48, Channel Bandwidth: 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
13.2	3555.000002	0.000	3685.000003	0.001
12	3555.000003	0.001	3685.000003	0.001
10.8	3555.000001	0.000	3685.000002	0.000

Note: The applicant defined the normal working voltage is from 10.8Vac to 13.2Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 48, Channel Bandwidth: 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	3555.000001	0.000	3685.000002	0.001
-30	3555.000003	0.001	3685.000004	0.001
-20	3555.000003	0.001	3685.000004	0.001
-10	3555.000001	0.000	3685.000004	0.001
0	3555.000003	0.001	3685.000002	0.001
10	3555.000002	0.001	3685.000002	0.000
20	3554.999998	-0.001	3684.999997	-0.001
30	3554.999998	0.000	3684.999999	0.000
40	3554.999996	-0.001	3684.999998	-0.001
50	3554.999996	-0.001	3684.999996	-0.001
55	3554.999998	-0.001	3684.999996	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 48, Channel Bandwidth: 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
13.2	3560.000002	0.001	3670.000001	0.000
12	3560.000002	0.000	3670.000001	0.000
10.8	3560.000001	0.000	3670.000002	0.000

Note: The applicant defined the normal working voltage is from 10.8Vac to 13.2Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 48, Channel Bandwidth: 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	3560.000003	0.001	3670.000004	0.001
-30	3560.000004	0.001	3670.000004	0.001
-20	3560.000004	0.001	3670.000004	0.001
-10	3560.000002	0.001	3670.000001	0.000
0	3560.000003	0.001	3670.000001	0.000
10	3560.000001	0.000	3670.000002	0.000
20	3559.999998	-0.001	3669.999996	-0.001
30	3559.999997	-0.001	3669.999996	-0.001
40	3559.999997	-0.001	3669.999997	-0.001
50	3559.999996	-0.001	3669.999996	-0.001
55	3559.999997	-0.001	3669.999997	-0.001

DC Mode: Chain 1

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 48, Channel Bandwidth: 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
13.2	3555.000003	0.001	3685.000002	0.001
12	3555.000003	0.001	3685.000003	0.001
10.8	3555.000002	0.001	3685.000002	0.000

Note: The applicant defined the normal working voltage is from 10.8Vac to 13.2Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 48, Channel Bandwidth: 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	3555.000001	0.000	3685.000001	0.000
-30	3555.000002	0.000	3685.000003	0.001
-20	3555.000002	0.000	3685.000003	0.001
-10	3555.000004	0.001	3685.000003	0.001
0	3555.000004	0.001	3685.000002	0.001
10	3555.000003	0.001	3685.000002	0.000
20	3554.999996	-0.001	3684.999996	-0.001
30	3554.999998	0.000	3684.999997	-0.001
40	3554.999997	-0.001	3684.999998	-0.001
50	3554.999996	-0.001	3684.999998	-0.001
55	3554.999999	0.000	3684.999997	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 48, Channel Bandwidth: 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
13.2	3560.000002	0.001	3670.000003	0.001
12	3560.000002	0.001	3670.000002	0.001
10.8	3560.000001	0.000	3670.000002	0.001

Note: The applicant defined the normal working voltage is from 10.8Vac to 13.2Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 48, Channel Bandwidth: 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	3560.000004	0.001	3670.000003	0.001
-30	3560.000002	0.000	3670.000002	0.000
-20	3560.000002	0.000	3670.000002	0.000
-10	3560.000001	0.000	3670.000001	0.000
0	3560.000002	0.001	3670.000002	0.000
10	3560.000001	0.000	3670.000004	0.001
20	3559.999998	-0.001	3669.999997	-0.001
30	3559.999999	0.000	3669.999999	0.000
40	3559.999997	-0.001	3669.999997	-0.001
50	3559.999998	-0.001	3669.999996	-0.001
55	3559.999999	0.000	3669.999998	-0.001

DC Mode: Chain 2

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 48, Channel Bandwidth: 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
13.2	3565.000001	0.000	3695.000003	0.001
12	3565.000001	0.000	3695.000004	0.001
10.8	3565.000003	0.001	3695.000001	0.000

Note: The applicant defined the normal working voltage is from 10.8Vac to 13.2Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 48, Channel Bandwidth: 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	3565.000004	0.001	3695.000002	0.001
-30	3565.000002	0.001	3695.000003	0.001
-20	3565.000002	0.001	3695.000003	0.001
-10	3565.000001	0.000	3695.000002	0.001
0	3565.000004	0.001	3695.000004	0.001
10	3565.000004	0.001	3695.000002	0.000
20	3564.999996	-0.001	3694.999997	-0.001
30	3564.999997	-0.001	3694.999996	-0.001
40	3564.999999	0.000	3694.999996	-0.001
50	3564.999998	-0.001	3694.999997	-0.001
55	3564.999996	-0.001	3694.999999	0.000

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 48, Channel Bandwidth: 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
13.2	3580.000001	0.000	3690.000003	0.001
12	3580.000001	0.000	3690.000001	0.000
10.8	3580.000001	0.000	3690.000002	0.001

Note: The applicant defined the normal working voltage is from 10.8Vac to 13.2Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 48, Channel Bandwidth: 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	3580.000001	0.000	3690.000003	0.001
-30	3580.000003	0.001	3690.000002	0.001
-20	3580.000003	0.001	3690.000002	0.001
-10	3580.000003	0.001	3690.000004	0.001
0	3580.000003	0.001	3690.000003	0.001
10	3580.000001	0.000	3690.000002	0.000
20	3579.999999	0.000	3689.999998	-0.001
30	3579.999997	-0.001	3689.999998	-0.001
40	3579.999997	-0.001	3689.999997	-0.001
50	3579.999997	-0.001	3689.999997	-0.001
55	3579.999997	-0.001	3689.999997	-0.001

DC Mode: Chain 3

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 48, Channel Bandwidth: 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
13.2	3565.000003	0.001	3695.000002	0.001
12	3565.000001	0.000	3695.000004	0.001
10.8	3565.000004	0.001	3695.000003	0.001

Note: The applicant defined the normal working voltage is from 10.8Vac to 13.2Vdc.

Frequency Error vs. Temperature

Temp. (℃)	LTE Band 48, Channel Bandwidth: 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	3565.000004	0.001	3695.000002	0.001
-30	3565.000001	0.000	3695.000004	0.001
-20	3565.000001	0.000	3695.000004	0.001
-10	3565.000003	0.001	3695.000001	0.000
0	3565.000002	0.001	3695.000001	0.000
10	3565.000002	0.000	3695.000002	0.001
20	3564.999999	0.000	3694.999998	-0.001
30	3564.999998	-0.001	3694.999997	-0.001
40	3564.999996	-0.001	3694.999999	0.000
50	3564.999998	-0.001	3694.999999	0.000
55	3564.999998	-0.001	3694.999996	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 48, Channel Bandwidth: 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
13.2	3580.000002	0.000	3690.000002	0.001
12	3580.000004	0.001	3690.000003	0.001
10.8	3580.000001	0.000	3690.000003	0.001

Note: The applicant defined the normal working voltage is from 10.8Vac to 13.2Vdc.

Frequency Error vs. Temperature

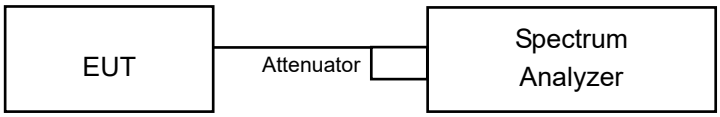
Temp. (℃)	LTE Band 48, Channel Bandwidth: 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	3580.000003	0.001	3690.000003	0.001
-30	3580.000002	0.000	3690.000002	0.000
-20	3580.000002	0.000	3690.000002	0.000
-10	3580.000004	0.001	3690.000002	0.001
0	3580.000002	0.001	3690.000004	0.001
10	3580.000003	0.001	3690.000003	0.001
20	3579.999997	-0.001	3689.999997	-0.001
30	3579.999999	0.000	3689.999997	-0.001
40	3579.999998	-0.001	3689.999998	-0.001
50	3579.999999	0.000	3689.999996	-0.001
55	3579.999997	-0.001	3689.999998	-0.001

4.5 Emission Bandwidth Measurement

4.5.1 Limits of Emission Bandwidth Measurement

Reference only

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.3 to get information of above instrument.

4.5.4 Test Procedure

Occupied Bandwdith & 26dBc Bandwidth

1. The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be wide enough to see sufficient roll off of the signal to make the measurement.
2. The nominal RBW shall be in the range of 1% to 5% of the anticipated OBW, and the VBW shall be set ≥ 3 × RBW.
3. Set the reference level of the instrument as required to prevent the signal amplitude from exceeding the maximum spectrum analyzer input mixer level for linear operation.
   NOTE—Step 1), step 2), and step 3) may require iteration to adjust within the specified tolerances.
4. The dynamic range of the spectrum analyzer at the selected RBW shall be more than 10 dB below the target “−X dB” requirement, i.e., if the requirement calls for measuring the −26 dB OBW, the spectrum analyzer noise floor at the selected RBW shall be at least 36 dB below the reference level.
5. Set spectrum analyzer detection mode to peak, and the trace mode to max hold.
6. Determine the reference value by either of the following:
   a) Set the EUT to transmit a modulated signal. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value).
   b) Set the EUT to transmit an unmodulated carrier. Set the spectrum analyzer marker to the level of the carrier.
7. Determine the “−X dB amplitude” as equal to (Reference Value − X). Alternatively, this calculation can be performed on the spectrum analyzer using the delta-marker measurement function.

4.5.5 Deviation fromTest Standard

No deviation.

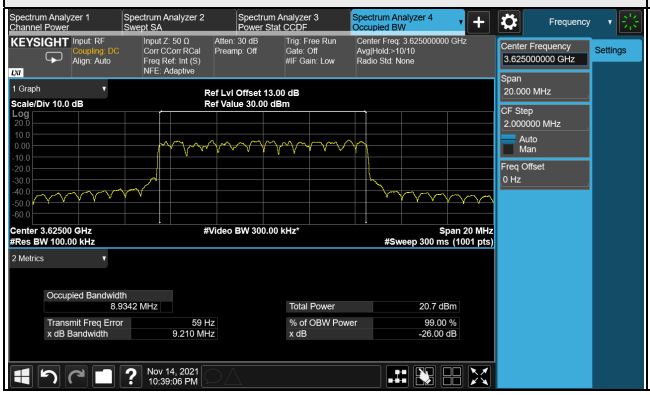
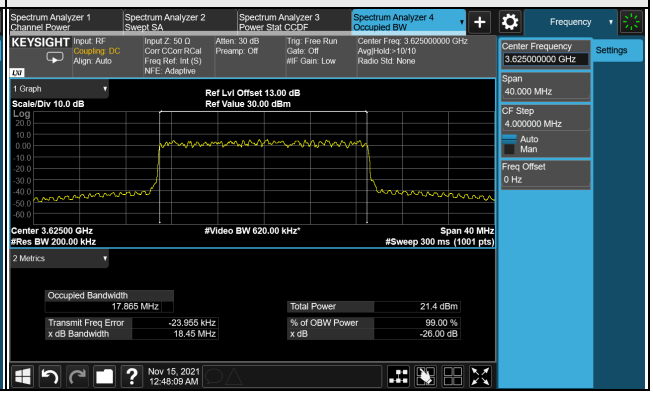
4.5.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.5.7 Test Result

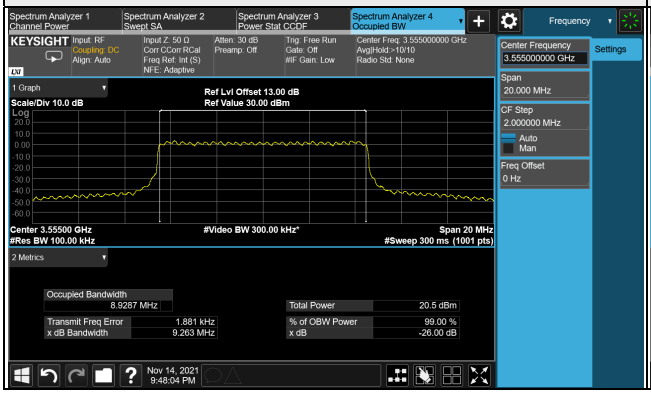
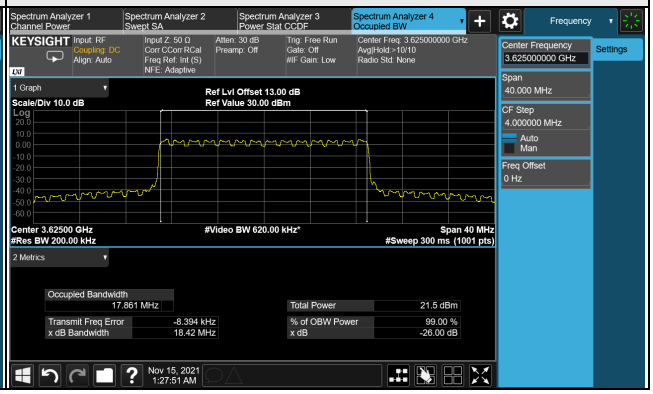
Occupied Bandwidth
SC Mode: Chain 0

LTE Band 48, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
55290	3555.0	8.87	8.92	8.91
55990	3625.0	8.93	8.91	8.88
56690	3695.0	8.91	8.90	8.90
LTE Band 48, Channel Bandwidth 20MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
55340	3560.0	17.80	17.77	17.85
55990	3625.0	17.87	17.77	17.76
56640	3690.0	17.78	17.75	17.84

Spectrum Plot of Worst Value	
10MHz / QPSK	20MHz / QPSK
	

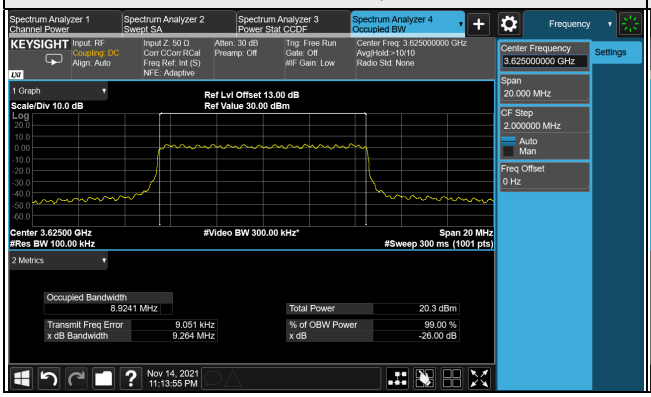
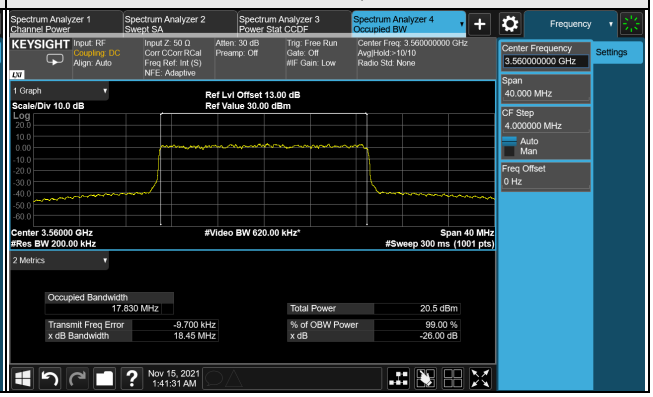
SC Mode: Chain 1

LTE Band 48, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
55290	3555.0	8.88	8.88	8.93
55990	3625.0	8.91	8.89	8.88
56690	3695.0	8.90	8.89	8.89
LTE Band 48, Channel Bandwidth 20MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
55340	3560.0	17.80	17.77	17.83
55990	3625.0	17.80	17.80	17.86
56640	3690.0	17.76	17.75	17.81

Spectrum Plot of Worst Value	
10MHz / 64QAM	20MHz / 16QAM
	

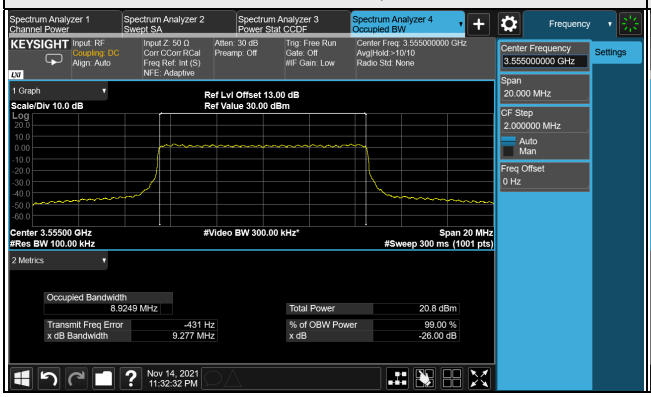
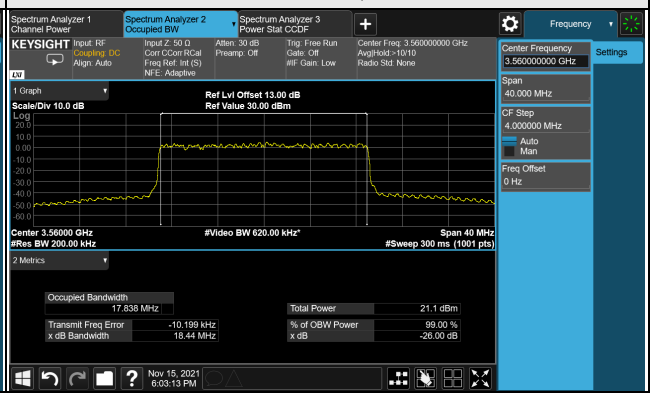
SC Mode: Chain 2

LTE Band 48, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
55290	3555.0	8.88	8.91	8.90
55990	3625.0	8.91	8.90	8.92
56690	3695.0	8.88	8.89	8.88
LTE Band 48, Channel Bandwidth 20MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
55340	3560.0	17.83	17.78	17.75
55990	3625.0	17.72	17.64	17.82
56640	3690.0	17.65	17.77	17.73

Spectrum Plot of Worst Value	
10MHz / 64QAM	20MHz / QPSK
	

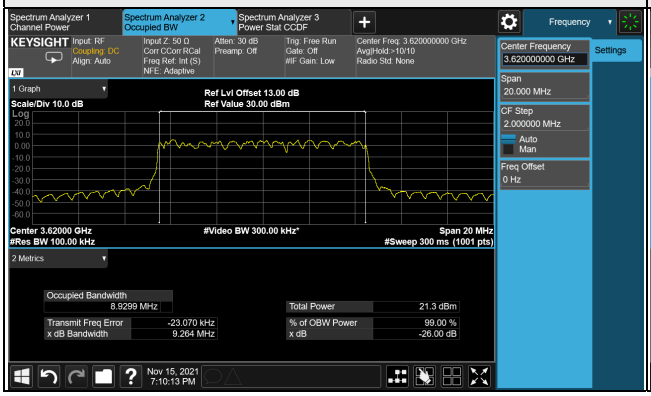
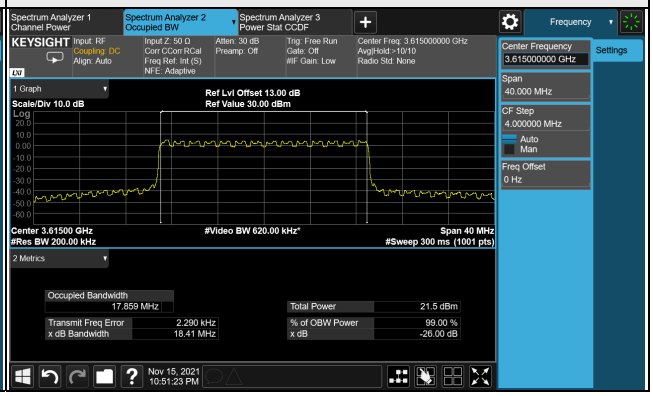
SC Mode: Chain 3

LTE Band 48, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
55290	3555.0	8.91	8.91	8.92
55990	3625.0	8.86	8.91	8.92
56690	3695.0	8.89	8.88	8.91
LTE Band 48, Channel Bandwidth 20MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
55340	3560.0	17.84	17.74	17.78
55990	3625.0	17.68	17.77	17.80
56640	3690.0	17.77	17.76	17.77

Spectrum Plot of Worst Value	
10MHz / 64QAM	20MHz / QPSK
	

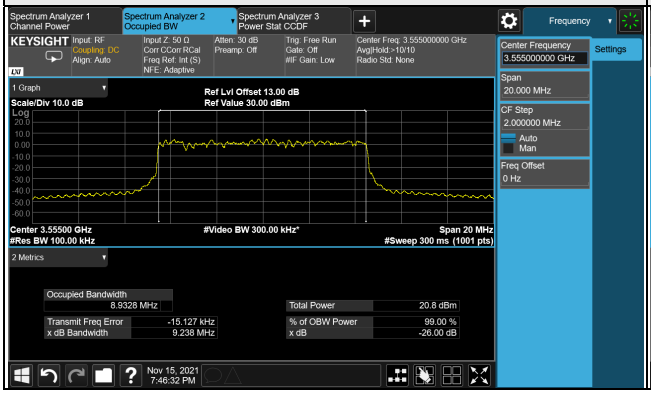
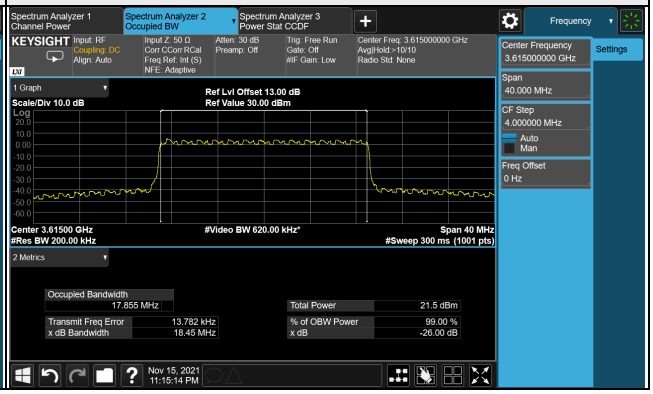
DC Mode: Chain 0

LTE Band 48, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
55290	3555	8.88	8.84	8.87
55940	3620	8.93	8.87	8.86
56590	3685	8.90	8.87	8.89
LTE Band 48, Channel Bandwidth 20MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
55340	3560	17.83	17.74	17.85
55890	3615	17.62	17.79	17.86
56440	3670	17.80	17.77	17.84

Spectrum Plot of Worst Value	
10MHz / QPSK	20MHz / 64QAM
	

DC Mode: Chain 1

LTE Band 48, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
55290	3555	8.93	8.92	8.92
55940	3620	8.88	8.89	8.89
56590	3685	8.89	8.88	8.90
LTE Band 48, Channel Bandwidth 20MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
55340	3560	17.73	17.82	17.82
55890	3615	17.83	17.78	17.86
56440	3670	17.78	17.78	17.82

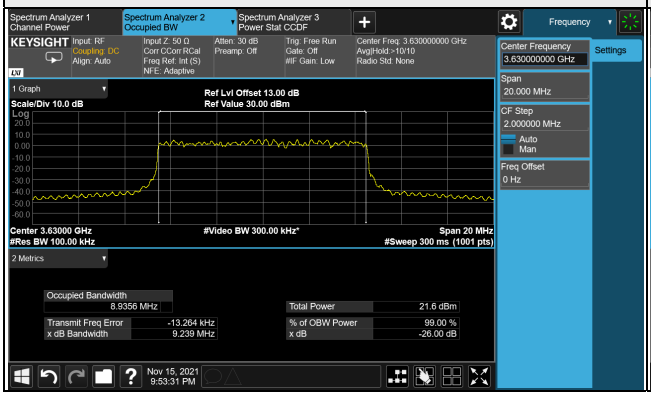
Spectrum Plot of Worst Value	
10MHz / QPSK	20MHz / 64QAM
	

DC Mode: Chain 2

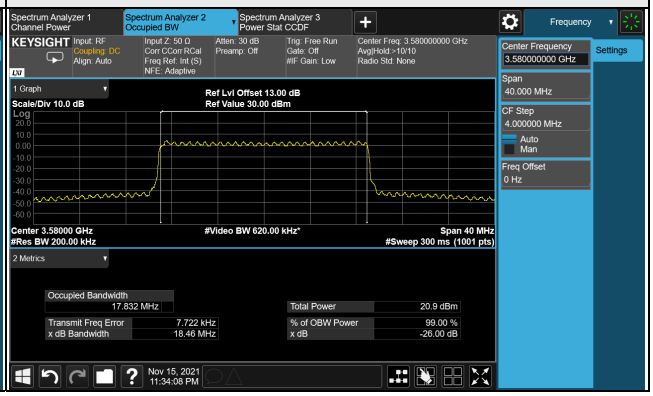
LTE Band 48, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
55390	3565	8.91	8.91	8.90
56040	3630	8.89	8.94	8.91
56690	3695	8.91	8.89	8.91
LTE Band 48, Channel Bandwidth 20MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
55540	3580	17.77	17.76	17.83
56090	3635	17.61	17.75	17.71
56640	3690	17.78	17.77	17.80

Spectrum Plot of Worst Value

10MHz / 16QAM

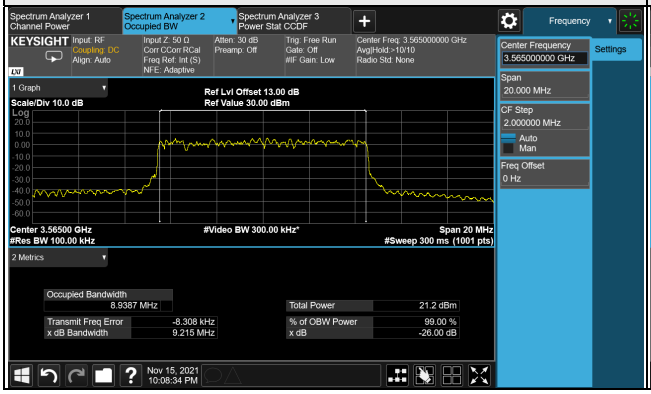
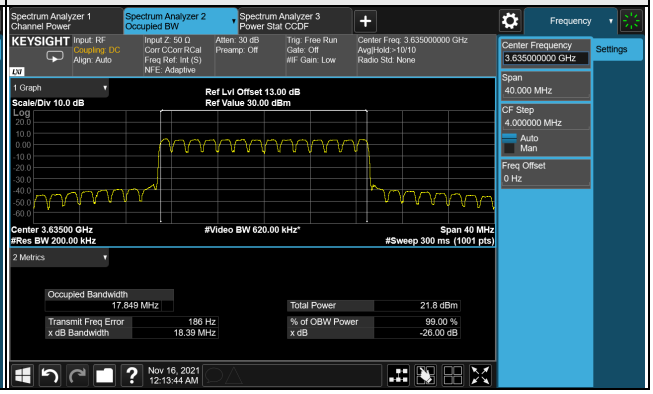


20MHz / 64QAM



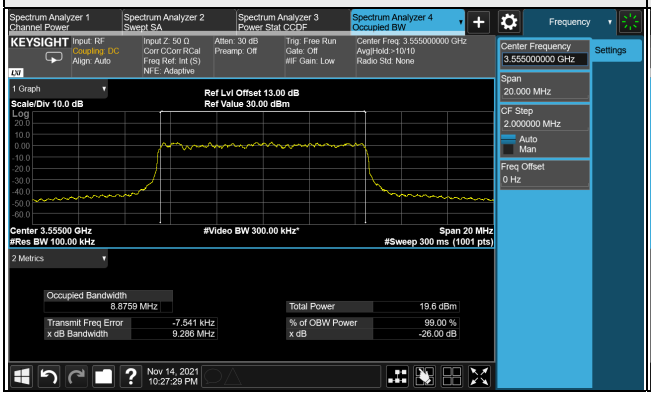
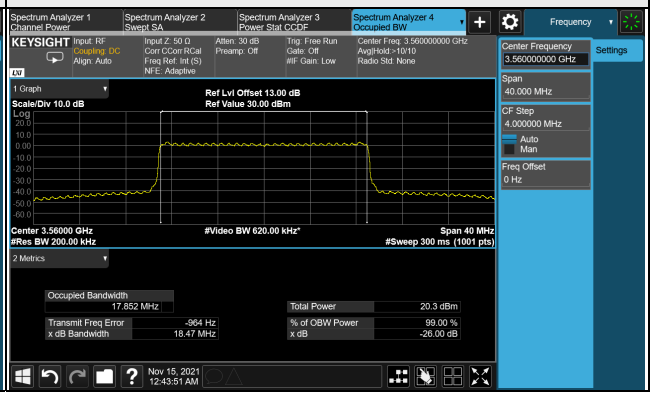
DC Mode: Chain 3

LTE Band 48, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
55390	3565	8.94	8.90	8.93
56040	3630	8.90	8.91	8.85
56690	3695	8.88	8.87	8.88
LTE Band 48, Channel Bandwidth 20MHz				
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM
55540	3580	17.83	17.73	17.83
56090	3635	17.68	17.77	17.85
56640	3690	17.68	17.75	17.72

Spectrum Plot of Worst Value	
10MHz / QPSK	20MHz / 64QAM
	

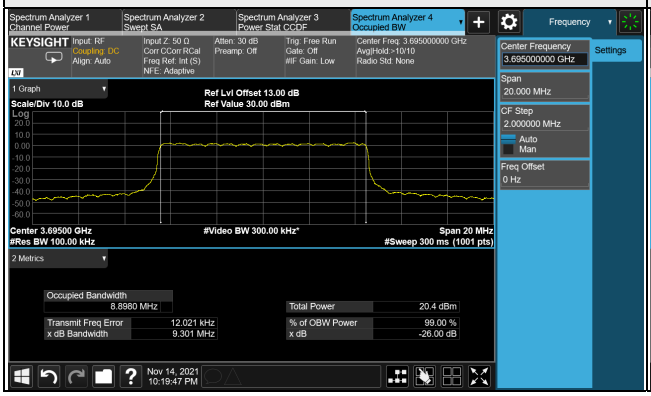
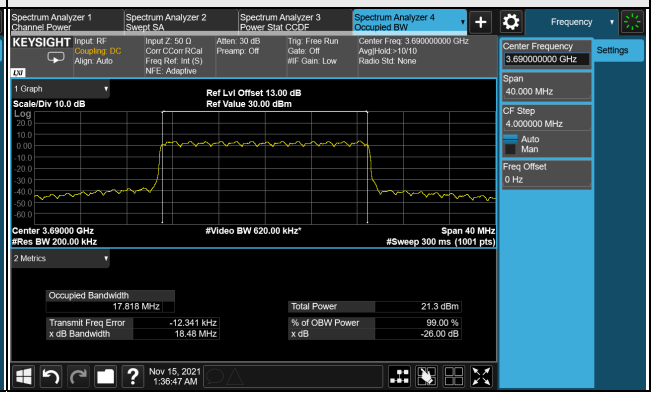
26dB Bandwidth
SC Mode: Chain 0

LTE Band 48, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
55290	3555.0	9.29	9.24	9.27
55990	3625.0	9.21	9.25	9.26
56690	3695.0	9.26	9.22	9.28
LTE Band 48, Channel Bandwidth 20MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
55340	3560.0	18.43	18.45	18.47
55990	3625.0	18.45	18.46	18.47
56640	3690.0	18.47	18.46	18.46

Spectrum Plot of Worst Value	
10MHz / QPSK	20MHz / 64QAM
	

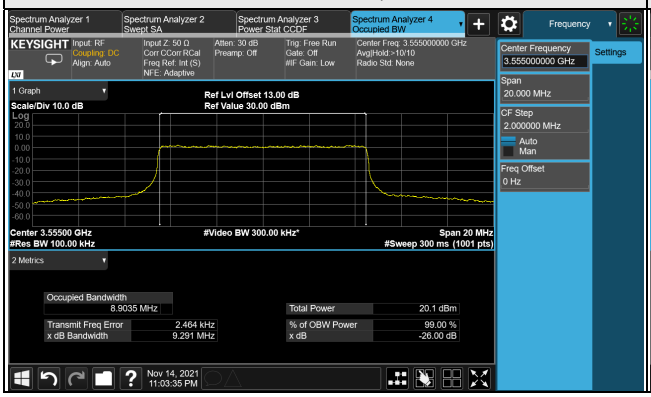
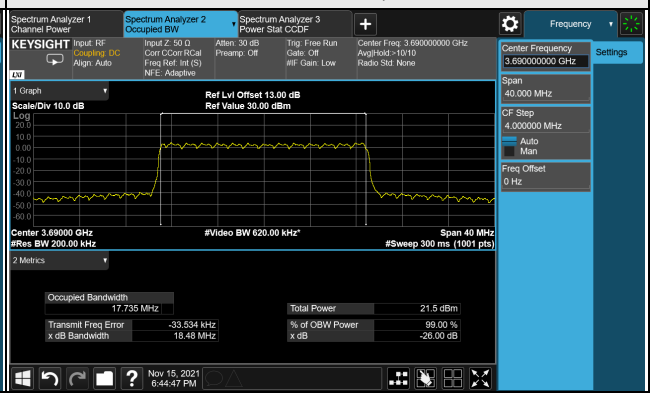
SC Mode: Chain 1

LTE Band 48, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
55290	3555.0	9.27	9.27	9.26
55990	3625.0	9.25	9.24	9.28
56690	3695.0	9.27	9.27	9.30
LTE Band 48, Channel Bandwidth 20MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
55340	3560.0	18.45	18.45	18.46
55990	3625.0	18.42	18.39	18.42
56640	3690.0	18.43	18.45	18.48

Spectrum Plot of Worst Value	
10MHz / 64QAM	20MHz / 64QAM
	

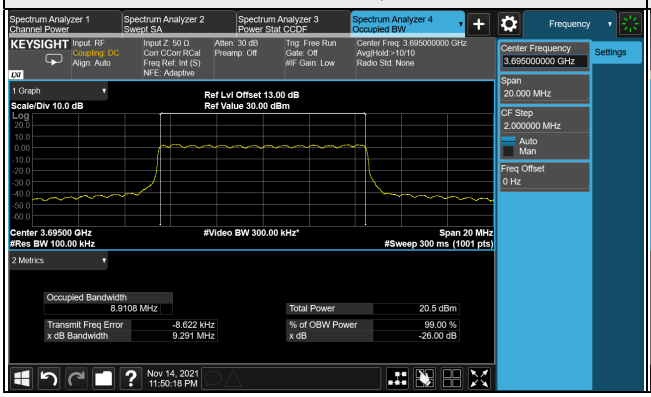
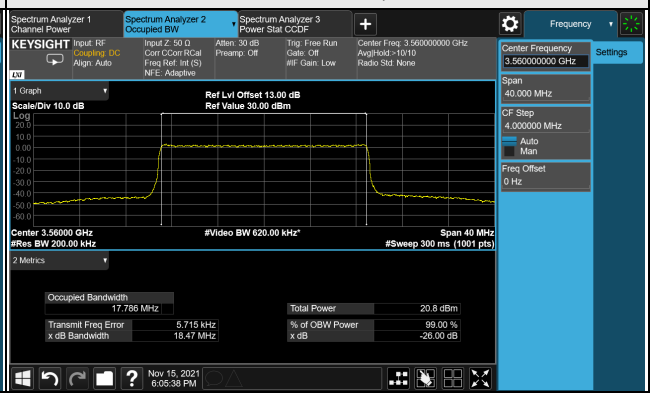
SC Mode: Chain 2

LTE Band 48, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
55290	3555.0	9.29	9.26	9.29
55990	3625.0	9.27	9.27	9.26
56690	3695.0	9.26	9.26	9.26
LTE Band 48, Channel Bandwidth 20MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
55340	3560.0	18.45	18.46	18.47
55990	3625.0	18.47	18.48	18.46
56640	3690.0	18.47	18.45	18.48

Spectrum Plot of Worst Value	
10MHz / 64QAM	20MHz / 64QAM
	

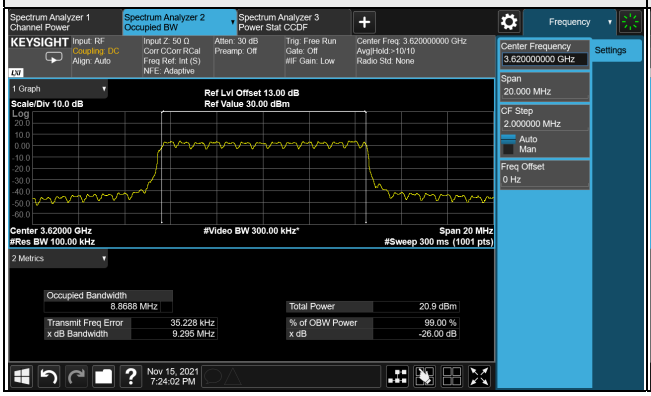
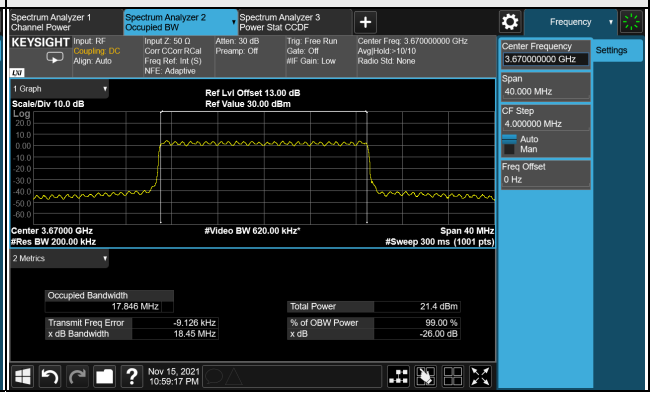
SC Mode: Chain 3

LTE Band 48, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
55290	3555.0	9.24	9.26	9.27
55990	3625.0	9.22	9.24	9.24
56690	3695.0	9.26	9.27	9.29
LTE Band 48, Channel Bandwidth 20MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
55340	3560.0	18.44	18.46	18.47
55990	3625.0	18.44	18.38	18.45
56640	3690.0	18.45	18.41	18.46

Spectrum Plot of Worst Value	
10MHz / 64QAM	20MHz / 64QAM
	

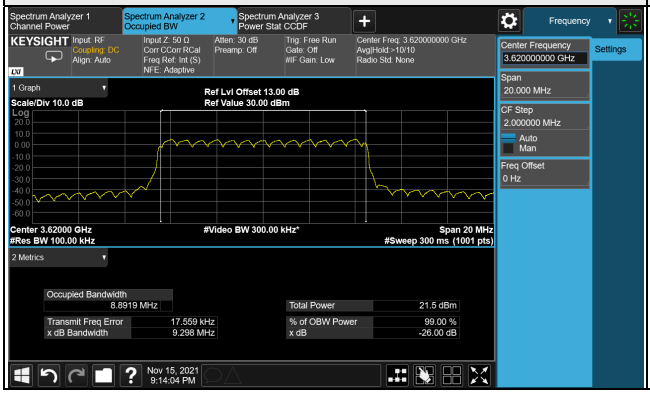
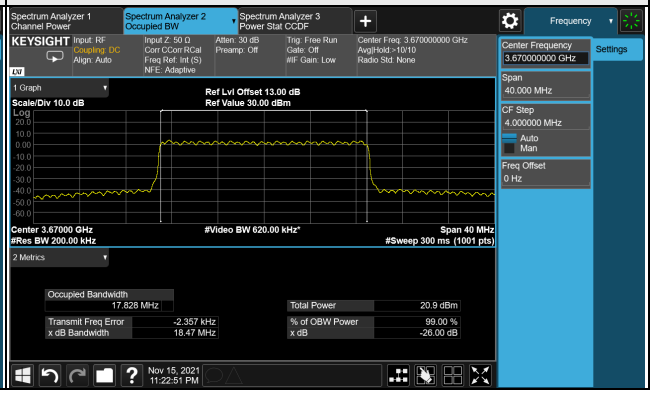
DC Mode: Chain 0

LTE Band 48, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
55290	3555	9.28	9.25	9.28
55940	3620	9.26	9.25	9.30
56590	3685	9.27	9.27	9.26
LTE Band 48, Channel Bandwidth 20MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
55340	3560	18.43	18.45	18.45
55890	3615	18.42	18.40	18.41
56440	3670	18.44	18.43	18.45

Spectrum Plot of Worst Value	
10MHz / 64QAM	20MHz / 64QAM
	

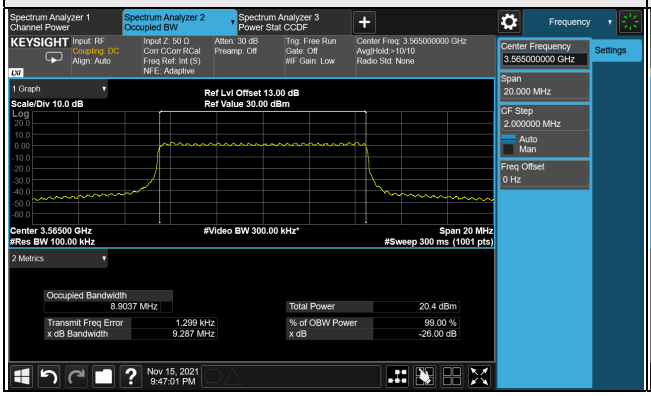
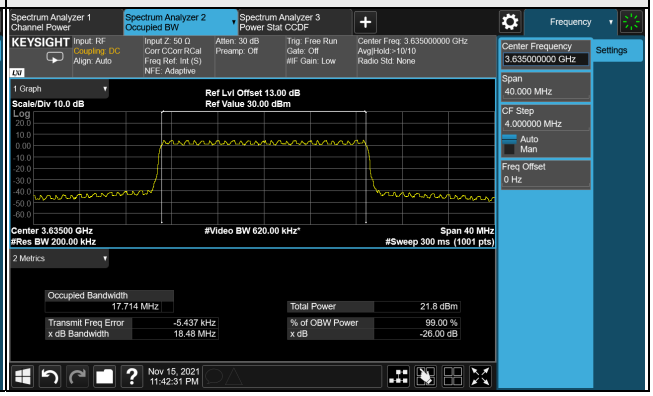
DC Mode: Chain 1

LTE Band 48, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
55290	3555	9.23	9.25	9.25
55940	3620	9.24	9.24	9.30
56590	3685	9.23	9.25	9.26
LTE Band 48, Channel Bandwidth 20MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
55340	3560	18.42	18.43	18.46
55890	3615	18.45	18.46	18.45
56440	3670	18.44	18.45	18.47

Spectrum Plot of Worst Value	
10MHz / 64QAM	20MHz / 64QAM
	

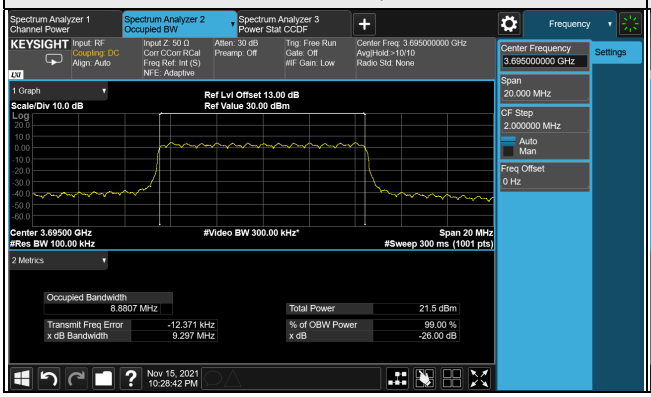
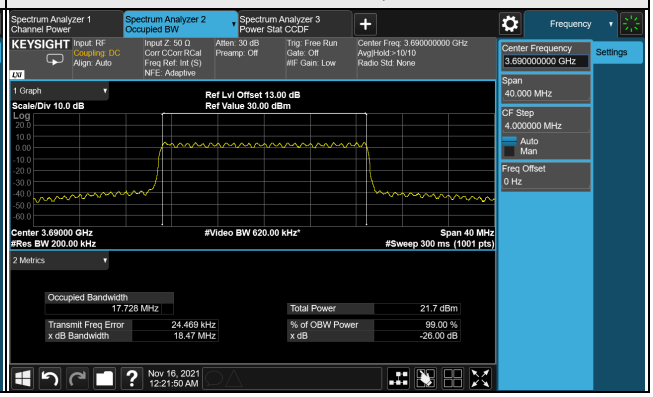
DC Mode: Chain 2

LTE Band 48, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
55390	3565	9.25	9.25	9.29
56040	3630	9.25	9.23	9.29
56690	3695	9.23	9.28	9.25
LTE Band 48, Channel Bandwidth 20MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
55540	3580	18.45	18.45	18.46
56090	3635	18.45	18.42	18.48
56640	3690	18.45	18.46	18.43

Spectrum Plot of Worst Value	
10MHz / 64QAM	20MHz / 64QAM
	

DC Mode: Chain 3

LTE Band 48, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
55390	3565	9.21	9.26	9.26
56040	3630	9.22	9.21	9.26
56690	3695	9.23	9.28	9.30
LTE Band 48, Channel Bandwidth 20MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
55540	3580	18.45	18.44	18.47
56090	3635	18.42	18.47	18.39
56640	3690	18.46	18.45	18.47

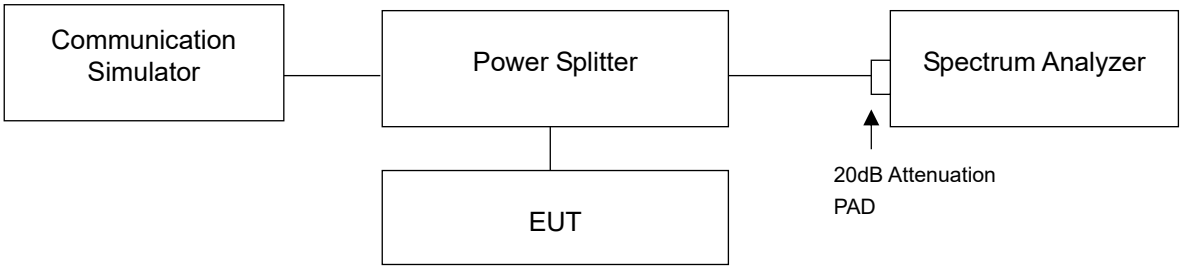
Spectrum Plot of Worst Value	
10MHz / 64QAM	20MHz / 64QAM
	

4.6 Peak to Average Ratio Measurement

4.6.1 Limits of Peak to Average Ratio Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.4.3 to get information of above instrument.

4.6.4 Test Procedures

a. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
b. Set the number of counts to a value that stabilizes the measured CCDF curve;
c. Record the maximum PAPR level associated with a probability of 0.1%.

4.6.5 Deviation from Test Standard

No deviation.

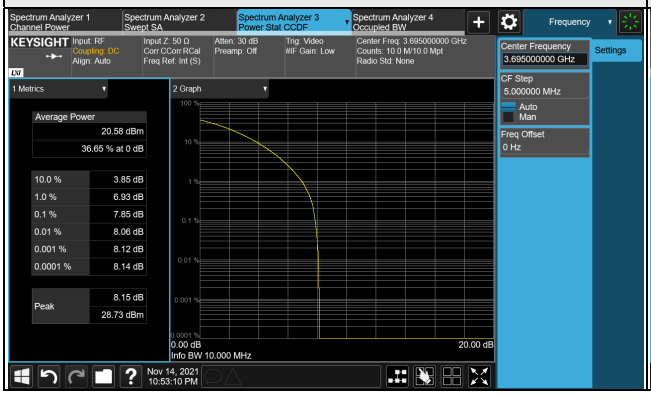
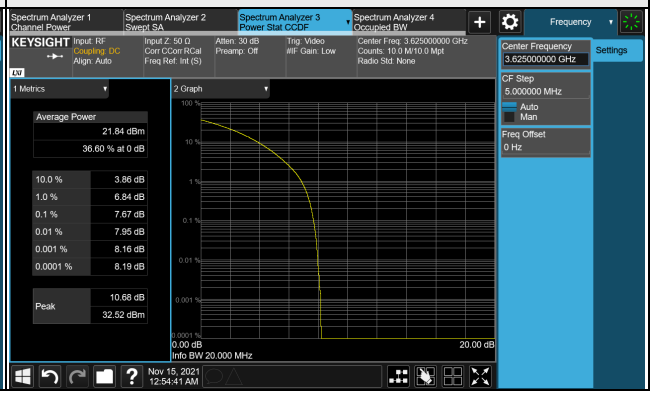
4.6.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.6.7 Test Results

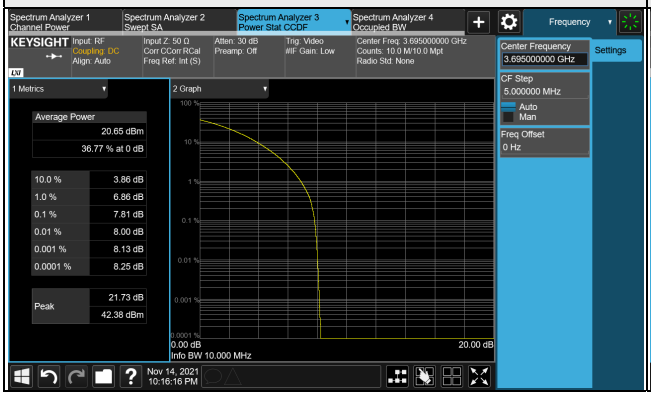
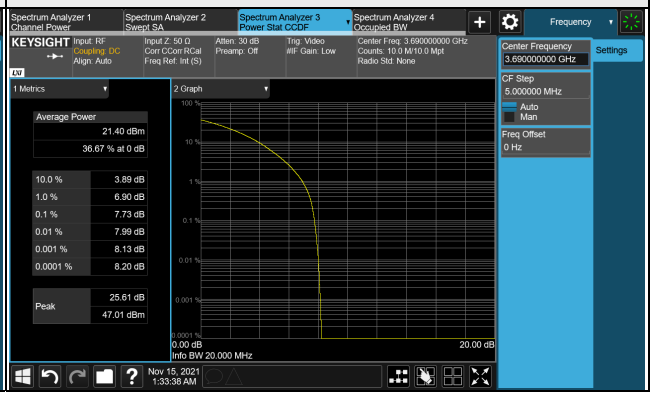
SC Mode: Chain 0

LTE Band 48, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	Peak To Average Ratio (dB)		
		QPSK	16QAM	64QAM
55290	3555.0	7.60	7.68	7.69
55990	3625.0	7.80	7.68	7.85
56690	3695.0	7.74	7.63	7.85
LTE Band 48, Channel Bandwidth 20MHz				
Channel	Frequency (MHz)	Peak To Average Ratio (dB)		
		QPSK	16QAM	64QAM
55340	3560.0	7.59	7.52	7.50
55990	3625.0	7.50	7.58	7.67
56640	3690.0	7.63	7.71	7.60

Spectrum Plot of Worst Value	
10MHz / 64QAM	20MHz / 64QAM
	

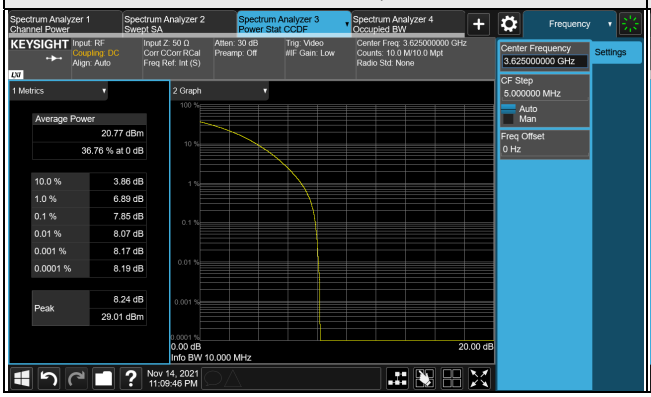
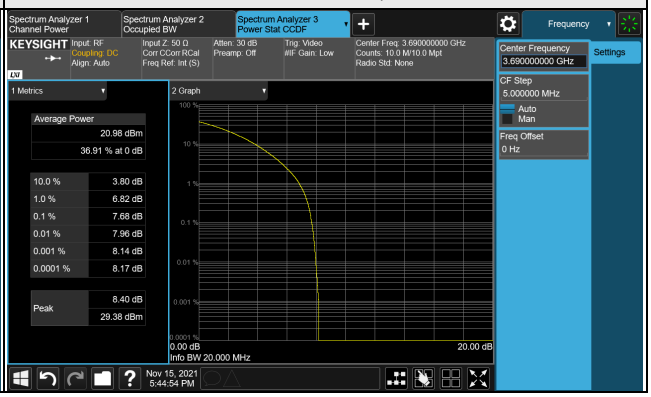
SC Mode: Chain 1

LTE Band 48, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	Peak To Average Ratio (dB)		
		QPSK	16QAM	64QAM
55290	3555.0	7.61	7.75	7.67
55990	3625.0	7.59	7.61	7.69
56690	3695.0	7.74	7.81	7.73
LTE Band 48, Channel Bandwidth 20MHz				
Channel	Frequency (MHz)	Peak To Average Ratio (dB)		
		QPSK	16QAM	64QAM
55340	3560.0	7.44	7.54	7.49
55990	3625.0	7.56	7.66	7.62
56640	3690.0	7.52	7.73	7.52

Spectrum Plot of Worst Value	
10MHz / 16QAM	20MHz / 16QAM
	

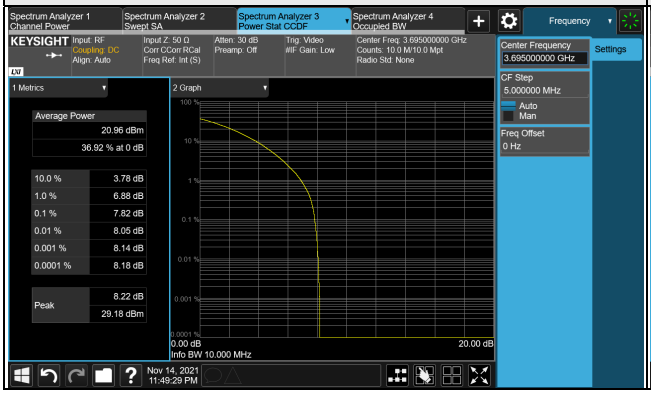
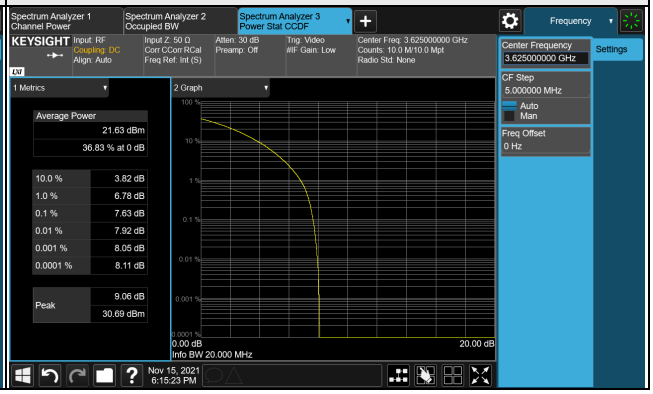
SC Mode: Chain 2

LTE Band 48, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	Peak To Average Ratio (dB)		
		QPSK	16QAM	64QAM
55290	3555.0	7.66	7.66	7.65
55990	3625.0	7.67	7.85	7.62
56690	3695.0	7.68	7.68	7.78
LTE Band 48, Channel Bandwidth 20MHz				
Channel	Frequency (MHz)	Peak To Average Ratio (dB)		
		QPSK	16QAM	64QAM
55340	3560.0	7.28	7.37	7.48
55990	3625.0	7.55	7.44	7.57
56640	3690.0	7.57	7.68	7.55

Spectrum Plot of Worst Value	
10MHz / 16QAM	20MHz / 16QAM
	

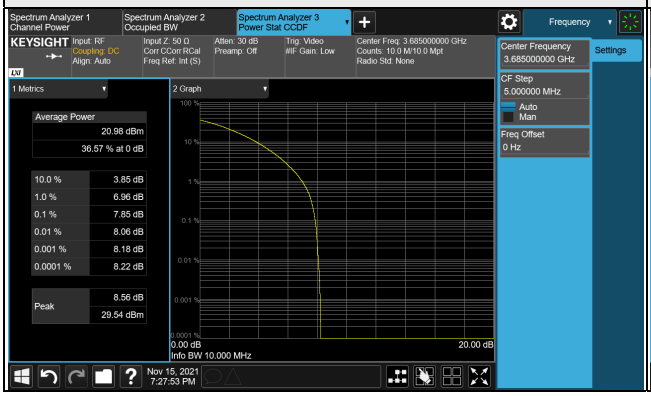
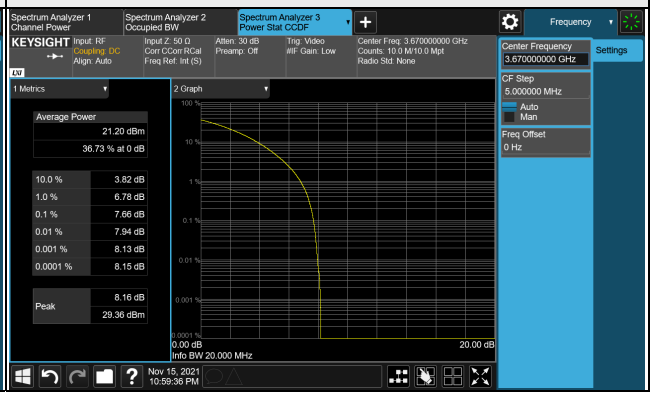
SC Mode: Chain 3

LTE Band 48, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	Peak To Average Ratio (dB)		
		QPSK	16QAM	64QAM
55290	3555.0	7.65	7.63	7.62
55990	3625.0	7.64	7.75	7.77
56690	3695.0	7.66	7.66	7.82
LTE Band 48, Channel Bandwidth 20MHz				
Channel	Frequency (MHz)	Peak To Average Ratio (dB)		
		QPSK	16QAM	64QAM
55340	3560.0	7.44	7.43	7.50
55990	3625.0	7.55	7.51	7.63
56640	3690.0	7.61	7.56	7.56

Spectrum Plot of Worst Value	
10MHz / 64QAM	20MHz / 64QAM
	

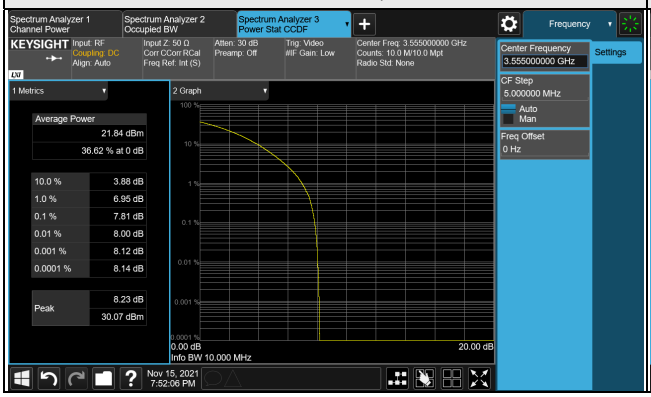
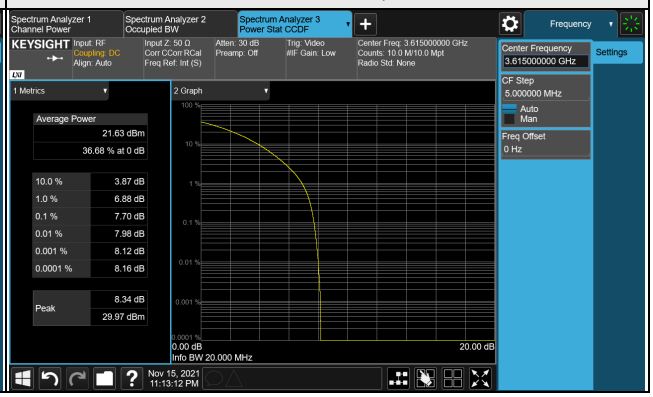
DC Mode: Chain 0

LTE Band 48, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	Peak To Average Ratio (dB)		
		QPSK	16QAM	64QAM
55290	3555	7.58	7.60	7.80
55940	3620	7.76	7.63	7.70
56590	3685	7.85	7.55	7.75
LTE Band 48, Channel Bandwidth 20MHz				
Channel	Frequency (MHz)	Peak To Average Ratio (dB)		
		QPSK	16QAM	64QAM
55340	3560	7.51	7.52	7.52
55890	3615	7.60	7.52	7.58
56440	3670	7.55	7.57	7.66

Spectrum Plot of Worst Value	
10MHz / QPSK	20MHz / 64QAM
	

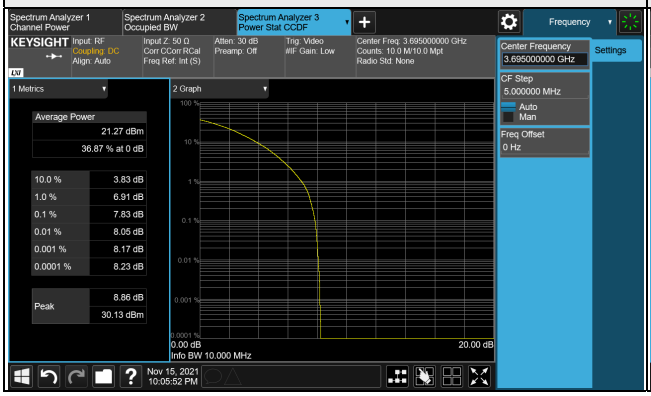
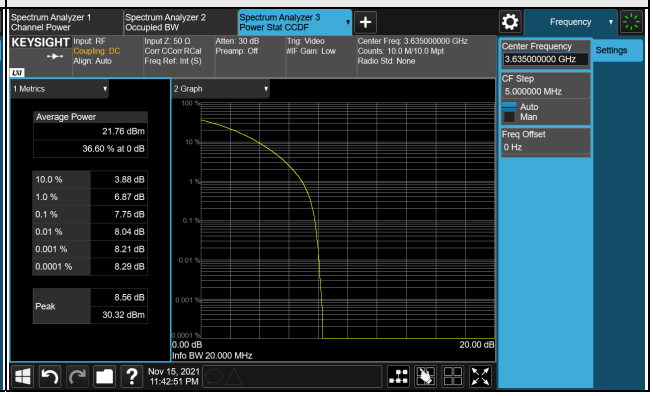
DC Mode: Chain 1

LTE Band 48, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	Peak To Average Ratio (dB)		
		QPSK	16QAM	64QAM
55290	3555	7.72	7.77	7.81
55940	3620	7.57	7.60	7.76
56590	3685	7.68	7.57	7.77
LTE Band 48, Channel Bandwidth 20MHz				
Channel	Frequency (MHz)	Peak To Average Ratio (dB)		
		QPSK	16QAM	64QAM
55340	3560	7.48	7.45	7.40
55890	3615	7.65	7.70	7.51
56440	3670	7.48	7.56	7.57

Spectrum Plot of Worst Value	
10MHz / 64QAM	20MHz / 16QAM
	

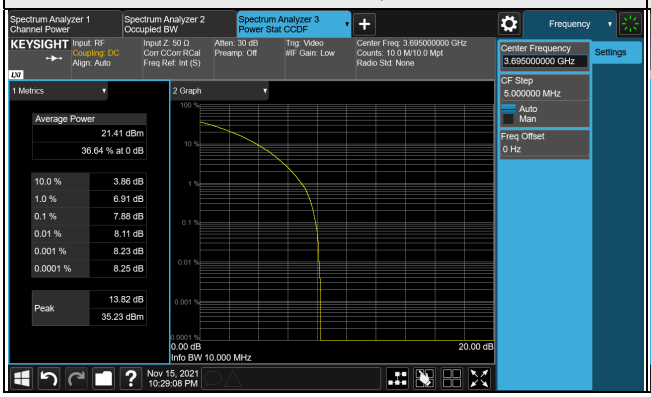
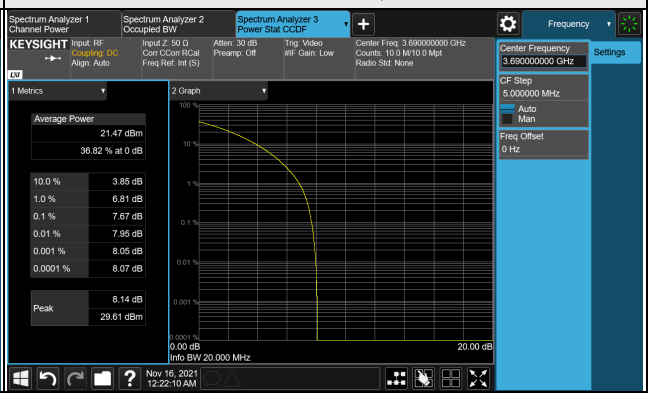
DC Mode: Chain 2

LTE Band 48, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	Peak To Average Ratio (dB)		
		QPSK	16QAM	64QAM
55390	3565	7.66	7.63	7.67
56040	3630	7.83	7.68	7.79
56690	3695	7.76	7.73	7.83
LTE Band 48, Channel Bandwidth 20MHz				
Channel	Frequency (MHz)	Peak To Average Ratio (dB)		
		QPSK	16QAM	64QAM
55540	3580	7.40	7.45	7.54
56090	3635	7.64	7.54	7.75
56640	3690	7.49	7.62	7.56

Spectrum Plot of Worst Value	
10MHz / 64QAM	20MHz / 64QAM
	

DC Mode: Chain 3

LTE Band 48, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	Peak To Average Ratio (dB)		
		QPSK	16QAM	64QAM
55390	3565	7.63	7.59	7.75
56040	3630	7.68	7.68	7.87
56690	3695	7.69	7.70	7.88
LTE Band 48, Channel Bandwidth 20MHz				
Channel	Frequency (MHz)	Peak To Average Ratio (dB)		
		QPSK	16QAM	64QAM
55540	3580	7.45	7.45	7.52
56090	3635	7.65	7.62	7.59
56640	3690	7.55	7.55	7.67

Spectrum Plot of Worst Value	
10MHz / 64QAM	20MHz / 64QAM
	

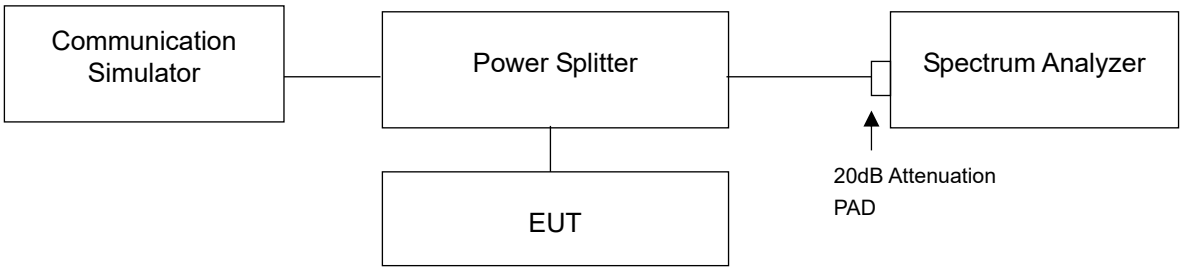
4.7 Conducted Spurious Emissions

4.7.1 Limits of Conducted Spurious Emissions Measurement

Power of any emissions outside the Fundamental	Limit
Within 0-10MHz above the Assigned Channel	-13 dBm/MHz
Within 0-10MHz below the Assigned Channel	
Greater than 10MHz above the Assigned Channel	-25 dBm/MHz
Greater than 10MHz below the Assigned Channel	
Power of any emission below 3530MHz	-40 dBm/MHz
Power of any emission above 3720MHz	

Note:
This device can be impelement MIMO function, so the limit of spurious emissions needs to be reduced by 10log($Numbers_{Ant}$) according to FCC KDB 662911 D01 guidance.

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.4.3 to get information of above instrument.

4.7.4 Test Procedure

a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
b. Measuring frequency range are from 9 kHz to 40GHz. 20dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.
c. Measuring frequency band edge, 20dB attenuation pad is connected with spectrum. 1% of the fundamental emission bandwidth is used for conducted emission measurement.

4.7.5 Deviation fromTest Standard

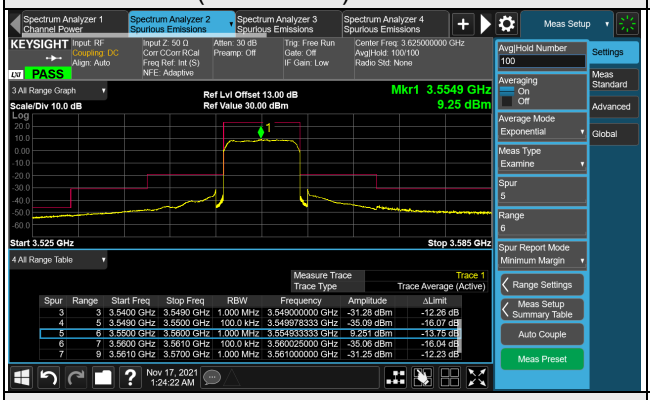
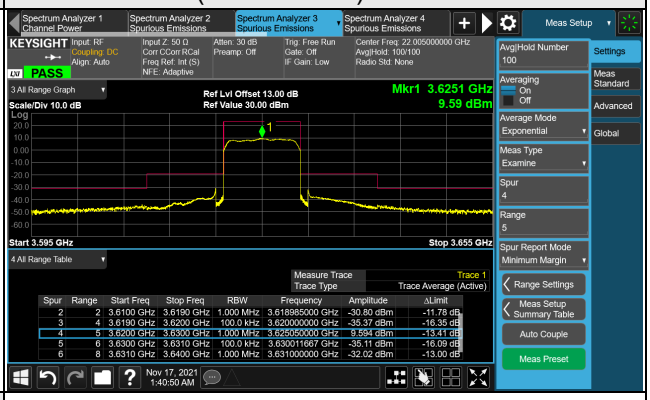
No deviation.

4.7.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.7.7 Test Results

SC Mode: Chain 0

LTE Band 48, Channel Bandwidth 10MHz	
Channel 55290 (3555.0MHz)	Channel 55990 (3625.00MHz)
	
Channel 56690 (3695.0MHz)