TEST REPORT

Report Number: 14040867-E10V4

Applicant	:	APPLE, INC 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A
Model	:	A2649
Brand	:	APPLE
FCC ID	:	BCG-E8138A
EUT Description	:	SMARTPHONE
Test Standard(s)	:	FCC CFR 47 Part 2, Part 22, Part 27 and Part 96

Date Of Issue:
AUGUST 09, 2022

Prepared by:
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ACCREDITED
CERT #0751.05

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	6/28/2022	Initial Review	Eric Ting
V2	7/19/2022	Address TCB feedback	Eric Ting
V3	8/3/2022	Address TCB feedback Section 6.2, 6.4	Eric Ting
V4	8/9/2022	Updated Section 6.2	Eric Ting

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1. ATTESTATION OF TEST RESULTS

Applicant Name and Address	APPLE, INC 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A.
Model	A2649
Brand	APPLE
FCC ID	BCG-E8138A
EUT Description	SMARTPHONE
Serial Number	C07210600PX1J1C4 (CONDUCTED), V2V9KHF5W9, GFCR6GX7F3 (RADIATED)
Sample Receipt Date	JANUARY 02, 2022
Date Tested	JANUARY 02, 2022 to JUNE 16, 2022
Applicable Standards	FCC CFR 47 Part 2, Part 22, Part 27, and Part 96
Test Results	COMPLIES

UL LLC tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

This document may not be altered or revised in any way unless done so by UL LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC will constitute fraud and shall nullify the document.

Approved & Released By:	Prepared By:
	
Dan Coronia Operations Leader UL LLC	Eric Ting Test Engineer UL LLC

2. SUMMARY OF TEST RESULTS

This report contains data provided by the customer which can impact the validity of results. UL LLC is only responsible for the validity of results after the integration of the data provided by the customer.

Requirement Description	Requirement Clause Number (FCC)	Result	Remarks
RF Conducted Output Power	2.1046	Complies	
Effective Radiated Power	22.913 (a)(5)	Complies	
Equivalent Isotropic Radiated power	27.50 (h) (2) 96.41 (b)	Complies	
Occupied Bandwidth	2.1049	Complies	
Band Edge and Emission Mask	2.1051, 22.917 (a), 27.53 (m)(4) &(m)(6), 96.41(e)	Complies	
Out of Band Emissions	2.1051, 22.917 (a), 27.53 (m)(4) &(m)(6), 96.41(e)	Complies	
Frequency Stability	2.1055, 22.355, 27.54	Complies	
Peak-to-Average Ratio	27.50 (d) (5), 96.41 (g)	Complies	
Field Strength of Spurious Radiation	2.1053, 22.917 (a), 27.53 (m)(4) &(m)(6), 96.41(e)	Complies	

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with the following:

- ANSI C63.26:2015
- FCC CFR 47 Part 2, Part 22, Part 27 and Part 96
- FCC KDB 971168 D01 v03r01: Power Meas License Digital Systems
- FCC KDB 971168 D02 v02r01: Misc Rev Approv License Devices
- FCC KDB 412172 D01 v01r01. Determining ERP and EIRP

4. FACILITIES AND ACCREDITATION

UL LLC is accredited by A2LA, certification #0751.05, for all testing performed within the scope of this report. Testing was performed at the locations noted below.

	Address	ISED CABID	ISED Company Number	FCC Registration
☒	Building 1: 47173 Benicia Street, Fremont, CA 94538, USA	US0104	2324A	550739
☒	Building 2: 47266 Benicia Street, Fremont, CA 94538, USA	US0104	22541	550739
☐	Building 4: 47658 Kato Rd, Fremont, CA 94538, USA	US0104	2324B	550739

5. DECISION RULES AND MEASUREMENT UNCERTAINTY

5.1. METROLOGICAL TRACEABILITY

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, with a maximum time between calibrations of one year or the manufacturers' recommendation, whichever is less, and where applicable is traceable to recognized national standards.

5.2. DECISION RULES

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4:2012 Clause 8.2. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

5.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	U_{Lab}
Worst Case Radiated Disturbance, 9KHz to 30 MHz	2.84 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	6.01 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.73 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.51 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.29 dB
Occupied Channel Bandwidth	±1.22 %
Temperature	±2.26%
Supply voltages	±0.57 %
Time	±3.39 %

Uncertainty figures are valid to a confidence level of 95%.

5.4. SAMPLE CALCULATION

RADIATED EMISSIONS

Where relevant, the following sample calculation is provided:
Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

6. EQUIPMENT UNDER TEST

6.1. DESCRIPTION OF EUT

The Apple iPhone is a smartphone with multimedia functions (music, application support, and video),cellular GSM, GPRS, EGPRS, UMTS, LTE, 5G FR1, IEEE 802.11a/b/g/n/ac/ax, Bluetooth, Ultra-Wideband, GPS, NFC and MSS. All models except reference model support at least one UICC based SIM. The second SIM is either an UICC based p-SIM (physical SIM) or e-SIM (electronic SIM). The device supports a built-in inductive charging transmitter and receiver. The rechargeable battery is not user accessible.

Testing was performed on the parent model and is used to support the application for the parent and variants identified in this report based on the test plan submitted and approved via KDB inquiry by the FCC and by ISED-Canada.

6.2. MAXIMUM OUTPUT POWER

ERP/EIRP TEST PROCEDURE

ANSI C63.26:2015
KDB 971168 D01 Section 5.6

ERP/EIRP = PMeas + GT − LC
where: ERP/EIRP = effective or equivalent radiated power, respectively (expressed in the same units as PMeas, typically dBW or dBm);
PMeas = measured transmitter output power or PSD, in dBm or dBW;
GT = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);
LC = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

For devices utilizing multiple antennas, KDB 662911 provides guidance for determining the effective array transmit antenna gain term to be used in the above equation.

EUT includes different power levels for head use configuration and body use configuration and the below tables contain the highest of all configurations average conducted and ERP/EIRP output powers as follows:

Note: The maximum output for L-Ch and H-Ch of LTE B48 2CA may be lower than M-Ch due to the different AMPR based on the 3GPP CA_NS10 AMPR table.

Note: The maximum output for L-Ch of LTE41 CA may be lower than M-Ch due to different AMPR based on the 3GPP CA_NS04 AMPR table.

OUTPUT POWER FOR LTE BAND 5

Part 22H	
ERP Limit (W)	7.00
Antenna Gain (dBi)	-4.60

Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	ERP Average (dBm)	ERP Average (W)	99% BW (kHz)	Emission Designator
3+5	QPSK	825.5	846.5	25.70	18.95	0.079	7438	7M44G7W
	16QAM			25.02	18.27	0.067	7400	7M40D7W
5+3	QPSK	826.5	847.5	25.70	18.95	0.079	7459	7M46G7W
	16QAM			25.00	18.25	0.067	7412	7M41D7W
5+10	QPSK	826.5	844.0	25.70	18.95	0.079	13811	13M8G7W
	16QAM			24.91	18.16	0.065	13792	13M8D7W
10+5	QPSK	829.0	846.5	25.70	18.95	0.079	13847	13M8G7W
	16QAM			24.79	18.04	0.064	13797	13M8D7W
10+10	QPSK	829.0	844.0	25.70	18.95	0.079	18735	18M7G7W
	16QAM			24.88	18.13	0.065	18724	18M7D7W

OUTPUT POWER FOR LTE BAND 7

Part 27	
EIRP Limit (W)	2.00
Antenna Gain (dBi)	0.20

Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)	99% BW (kHz)	Emission Designator
10+20	QPSK	2505.5	2560.0	25.00	25.20	0.331	28068	28M1G7W
	16QAM			24.10	24.30	0.269	28082	28M1D7W
20+10	QPSK	2510.0	2564.5	25.00	25.20	0.331	28091	28M1G7W
	16QAM			24.04	24.24	0.265	27969	28M0D7W
15+15	QPSK	2507.5	2562.5	25.00	25.20	0.331	28621	28M6G7W
	16QAM			24.06	24.26	0.267	28645	28M6D7W
15+20	QPSK	2507.8	2560.0	25.00	25.20	0.331	32918	32M9G7W
	16QAM			24.06	24.26	0.267	32736	32M7D7W
20+15	QPSK	2510.0	2562.2	25.00	25.20	0.331	32923	32M9G7W
	16QAM			24.07	24.27	0.267	32930	32M9D7W
20+20	QPSK	2510.0	2560.0	25.00	25.20	0.331	37703	37M7G7W
	16QAM			24.08	24.28	0.268	37638	37M6D7W

OUTPUT POWER FOR LTE BAND 41

Part 27	
EIRP Limit (W)	2.00
Antenna Gain (dBi)	0.60

Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)	99% BW (kHz)	Emission Designator
5+20	QPSK	2499.3	2680.0	28.00	28.60	0.724	22802	22M8G7W
	16QAM			26.59	27.19	0.524	22801	22M8D7W
20+5	QPSK	2506.0	2686.7	28.00	28.60	0.724	22830	22M8G7W
	16QAM			26.60	27.20	0.525	22815	22M8D7W
10+20	QPSK	2501.5	2680.0	28.00	28.60	0.724	27651	27M7G7W
	16QAM			26.43	27.03	0.505	27640	27M6D7W
20+10	QPSK	2506.0	2684.5	27.80	28.40	0.692	27699	27M7G7W
	16QAM			26.06	26.66	0.463	27655	27M7D7W
15+15	QPSK	2503.5	2682.5	28.00	28.60	0.724	28225	28M2G7W
	16QAM			26.56	27.16	0.520	28249	28M2D7W
15+20	QPSK	2503.8	2680.0	28.00	28.60	0.724	32576	32M6G7W
	16QAM			26.57	27.17	0.521	32540	32M5D7W
20+15	QPSK	2506.0	2682.2	28.00	28.60	0.724	32584	32M6G7W
	16QAM			26.47	27.07	0.509	32565	32M6D7W
20+20	QPSK	2506.0	2680.0	28.00	28.60	0.724	37498	37M5G7W
	16QAM			26.59	27.19	0.524	37495	37M5D7W

OUTPUT POWER FOR LTE BAND 48

LOW CHANNEL

Part 96	
EIRP Limit (W)/ 10MHz	0.20
Antenna Gain (dBi)	-1.70

Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)	99% BW (kHz)	Emission Designator
5+20	QPSK	3553.3	3690.0	20.91	19.21	0.083	22765	22M8G7W
	16QAM			20.96	19.26	0.084	22771	22M8D7W
20+5	QPSK	3560.0	3696.7	20.98	19.28	0.085	22774	22M8G7W
	16QAM			20.91	19.21	0.083	22766	22M8D7W
10+20	QPSK	3555.5	3690.0	20.49	18.79	0.076	28025	28M0G7W
	16QAM			20.46	18.76	0.075	28001	28M0D7W
20+10	QPSK	3560.0	3694.5	20.42	18.72	0.074	27986	28M0G7W
	16QAM			20.50	18.80	0.076	28034	28M0D7W
15+20	QPSK	3557.8	3690.0	20.40	18.70	0.074	32.799	32K8G7W
	16QAM			20.43	18.73	0.075	32.729	32K7D7W
20+15	QPSK	3560.0	3692.2	19.71	18.01	0.063	32829	32M8G7W
	16QAM			19.73	18.03	0.064	32861	32M9D7W
20+20	QPSK	3560.0	3690.0	21.70	20.00	0.100	37620	37M6G7W
	16QAM			21.70	20.00	0.100	37696	37M7D7W

MIDDLE CHANNEL

Part 96	
EIRP Limit (W)/ 10MHz	0.20
Antenna Gain (dBi)	-0.20

Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)	99% BW (kHz)	Emission Designator
5+20	QPSK	3553.3	3690.0	21.70	21.50	0.141	22765	22M8G7W
	16QAM			21.70	21.50	0.141	22771	22M8D7W
20+5	QPSK	3560.0	3696.7	21.70	21.50	0.141	22774	22M8G7W
	16QAM			21.70	21.50	0.141	22766	22M8D7W
10+20	QPSK	3555.5	3690.0	21.70	21.50	0.141	28025	28M0G7W
	16QAM			21.70	21.50	0.141	28001	28M0D7W
20+10	QPSK	3560.0	3694.5	21.70	21.50	0.141	27986	28M0G7W
	16QAM			21.70	21.50	0.141	28034	28M0D7W
15+20	QPSK	3557.8	3690.0	21.70	21.50	0.141	32.799	32K8G7W
	16QAM			21.70	21.50	0.141	32.729	32K7D7W
20+15	QPSK	3560.0	3692.2	21.70	21.50	0.141	32829	32M8G7W
	16QAM			21.70	21.50	0.141	32861	32M9D7W
20+20	QPSK	3560.0	3690.0	21.70	21.50	0.141	37620	37M6G7W
	16QAM			21.70	21.50	0.141	37696	37M7D7W

HIGH CHANNEL

Part 96	
EIRP Limit (W)/ 10MHz	0.20
Antenna Gain (dBi)	0.70

Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)	99% BW (kHz)	Emission Designator
5+20	QPSK	3553.3	3690.0	20.94	21.64	0.146	22765	22M8G7W
	16QAM			20.99	21.69	0.148	22771	22M8D7W
20+5	QPSK	3560.0	3696.7	20.93	21.63	0.146	22774	22M8G7W
	16QAM			20.97	21.67	0.147	22766	22M8D7W
10+20	QPSK	3555.5	3690.0	20.47	21.17	0.131	28025	28M0G7W
	16QAM			20.53	21.23	0.133	28001	28M0D7W
20+10	QPSK	3560.0	3694.5	20.49	21.19	0.132	27986	28M0G7W
	16QAM			20.45	21.15	0.130	28034	28M0D7W
15+20	QPSK	3557.8	3690.0	20.47	21.17	0.131	32.799	32K8G7W
	16QAM			20.44	21.14	0.130	32.729	32K7D7W
20+15	QPSK	3560.0	3692.2	19.78	20.48	0.112	32829	32M8G7W
	16QAM			19.77	20.47	0.111	32861	32M9D7W
20+20	QPSK	3560.0	3690.0	15.41	16.11	0.041	37620	37M6G7W
	16QAM			15.45	16.15	0.041	37696	37M7D7W

6.3. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was version: 0.15.02.

6.4. MAXIMUM ANTENNA GAIN

The antenna(s) gain and type, as provided by the manufacturer' are as follows:

LTE and 5G NR Bands	Frequency Range (MHz)	ANT 1 Antenna Gain (dBi)	ANT 2 Antenna Gain (dBi)	ANT 3 Antenna Gain (dBi)	ANT 4 Antenna Gain (dBi)	ANT 7 Antenna Gain (dBi)	ANT 8 Antenna Gain (dBi)	ANT 9 Antenna Gain (dBi)
LTE Band 5	824 – 849	-4.6	-5.8					
LTE Band 7	2500 – 2570	-1.3	-0.7	0.2	-1.5			
LTE Band 41	2496 – 2690	-1.1	1.6	0.6	-2.0			
LTE Band 48 (Low)	3550 – 3600				-3.2	-5.0	-5.0	-1.7
LTE Band 48 (Mid)	3600 – 3650				-2.8	-3.9	-4.0	-0.2
LTE Band 48 (High)	3650 – 3700				-3.5	-5.3	-4.1	0.7

Note: For Band 48 there are three antenna gains for different frequency range within assigned frequency spectrum. As a result, different antennas and conducted power combination are used to get maximum EIRP or output powers.

6.5. WORST-CASE CONFIGURATION AND MODE

The EUT supports LTE dual carrier Bands of: Band 5, Band 7, Band 41, and Band 48.

The worst-case scenario for all measurements is based on the average conducted output power measurement investigation results. Output power measurements were measured on QPSK, 16QAM and 64QAM modulations. It was found that QPSK and 16QAM results were worst case. All testing was performed using QPSK and 16QAM modulations to represent the worst case. For testing purposes emissions on sections 8 and 9 were measured while QPSK was set at or above target power for all bands. Conducted tests were performed on the worst-case antenna port because it has the highest conducted power. The worst-case antenna port is shown in the table below.

LTE Bands	Worst case Antenna Port for Conducted Power
LTE BAND 5, 7, and 41	Ant 1
LTE BAND 48	Ant 7

For Band Edge and Emission Mask: The highest BW combo and sample lower BW combinations were tested. Combination pairs of the same BW are considered generally equivalent. The RB combinations were selected such that the signal is active closest to the band limit, as this is the worst case.

For Out of Band Emissions: The highest combination and a sample lower combination was tested. The highest power RB combination was selected as worst case.

The EUT was investigated in three orthogonal orientations X/Y/Z on all ANT 1, ANT2, ANT3, ANT4, ANT7, ANT8 and ANT 9 antennas to determine the worst-case orientation. The following table exabit the worst-case orientation for different frequency bands. The full tests of the EUT have made upon the orientations that shown in the table below.

Frequency Bands	ANT1	ANT2	ANT3	ANT4	ANT7	ANT8	ANT9
663 – 849 MHz	X	X	N/A	N/A	N/A	N/A	N/A
2300 – 2700 MHz	X	Z	Y	Y	N/A	N/A	N/A
3300 – 3980 MHz	N/A	N/A	N/A	Y	Y	Z	Y

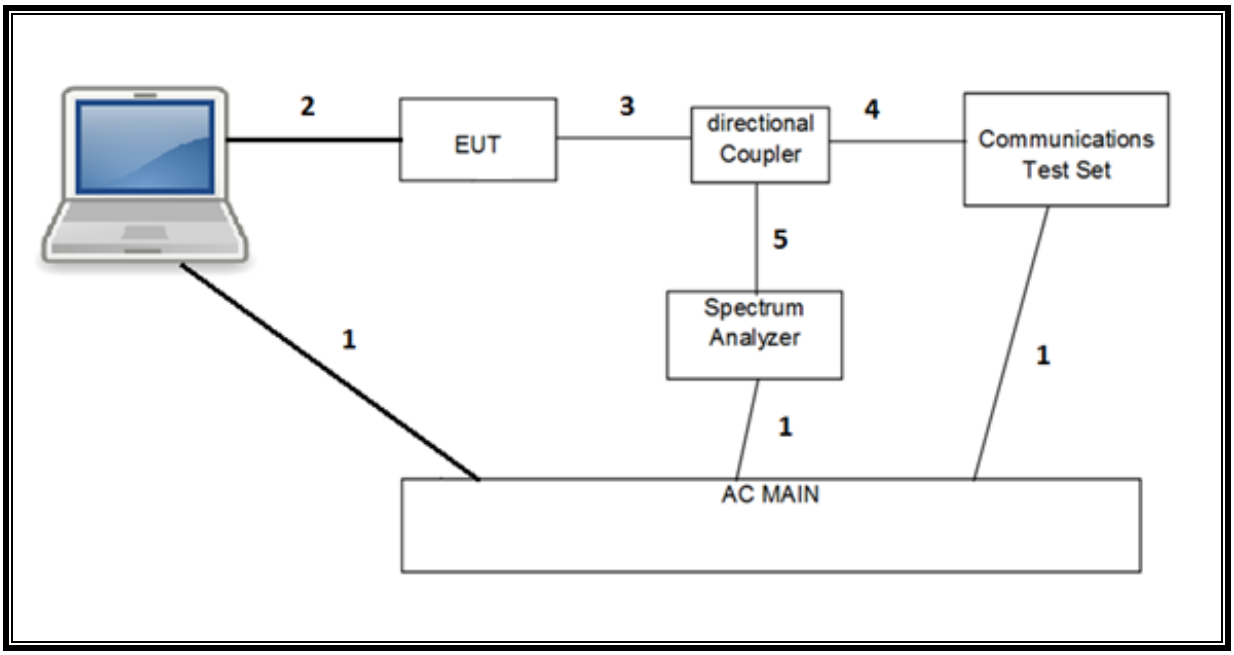
Radiated spurious emissions were investigated from 9kHz to 30MHz, 30MHz-1GHz and above 1GHz. There were no emissions found with less than 20dB of margin from 9kHz to 1GHz.

For interband transmission of multiple channels in Ant 1 and Ant 2 in Cellular bands, tests were conducted for various configurations having the highest power, least separation in frequencies and widest operation bandwidths. No noticeable new emission was found.

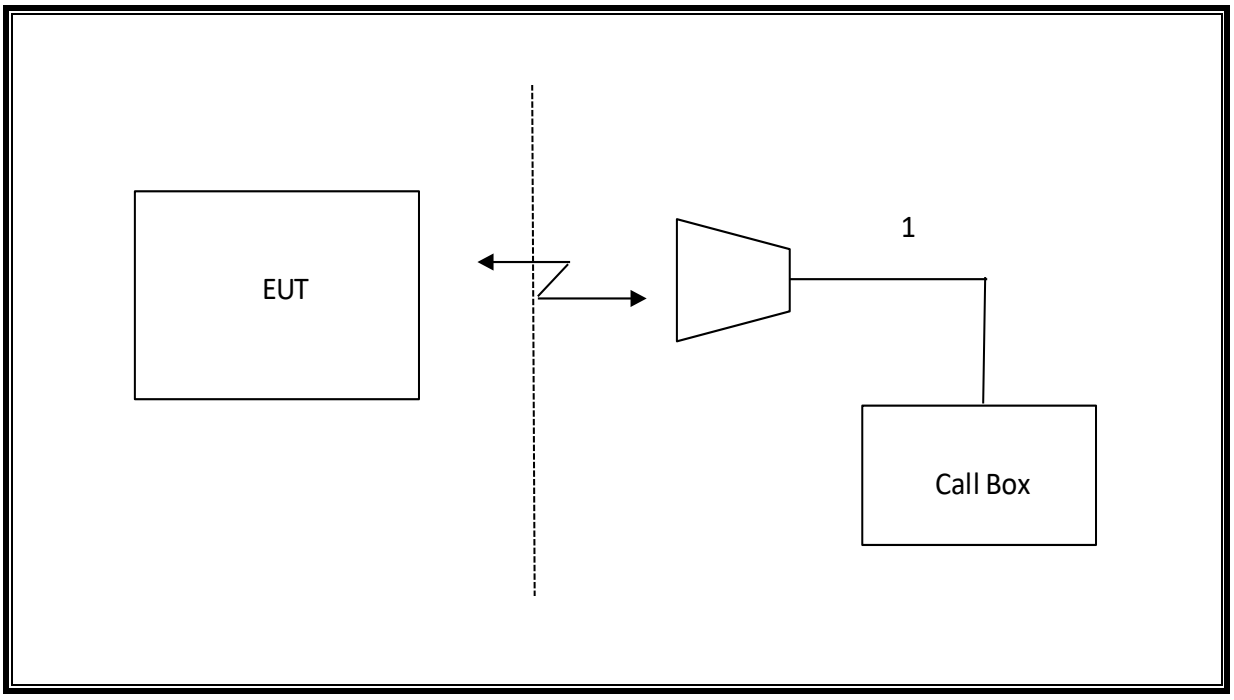
6.6. DESCRIPTION OF TEST SETUP

SUPPORT TEST EQUIPMENT						
Description		**Manufacturer**	**Model**	**Serial Number**		**FCC ID/ DoC**
Laptop		Apple	MacBook Pro	HRP082673		BCGA1708
AC/DC adapter		Apple	A1718	C4H64450HH3GN8RA6		N/A
I/O CABLES (RF CONDUCTED TEST)						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	AC	3	US 115V	Un-shielded	2.0	N/A
2	USB	1	DC	Un-shielded	1.0	N/A
3	RF In/Out	1	EUT	Un-shielded	0.6	N/A
4	RF In/Out	1	Communication Test Set	Un-shielded	1.2	N/A
5	RF In/Out	1	Barrel	N/A	N/A	N/A
I/O CABLES (RF RADIATED TEST)						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	RF In/Out	1	Antenna	Un-shielded	5.0	N/A

CONDUCTED SETUP



RADIATED SETUP



7. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Asset**	**Cal Due**
*Antenna, Horn 1-18GHz	ETS Lindgren	3117	79834	06/14/2222
*Antenna, Horn 1-18GHz	ETS Lindgren	3117	80403	06/13//2022
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences	JB3	85151	03/21/2023
*Amplifier, 1 to 18GHz	Miteq	AFS42-00101800-25-S-42	T1165	06/12/2022
Spectrum Analyzer, PXA 3Hz to 44GHz	Keysight	N9030A	85212	0/30/2023
Spectrum Analyzer, PSA, 3Hz to 44GHz	Keysight	N9030A	85213	01/19/2023
Spectrum Analyzer, PSA, 3Hz to 44GHz	Keysight	N9030A	125178	01/24/2023
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight	N9030A	85201	02/01/2023
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight	N9030A	85214	02/02/2023
Spectrum Analyzer, PXA 3Hz to 44GHz	Keysight	N9030A	80400	02/01/2023
Spectrum Analyzer, PXA 3Hz to 44GHz	Keysight	N9030A	80397	02/01/2023
Spectrum Analyzer, PXA, 3Hz to 50GHz w/Ext. Mixer	Keysight	N9030A	T342	02/01/2023
Spectrum Analyzer, PSA 3Hz to 44GHz	Keysight	E4440A	81311	02/02/2023
Directional Coupler	KRYTAR	152610	T1161	09/23/2022
Directional Coupler	KRYTAR	152610	T1536	09/23/2022
Directional Coupler	KRYTAR	152610	T1537	09/23/2022
Power Meter, P-series single channel	Keysight	N1912A	90630	01/24/2023
Power Meter, P-series single channel	Keysight	N1912A	90719	01/24/2023
Power Meter, P-series single channel	Agilent	N1911A	82174	01/24/2023
Power Sensor, P – series, 50MHz to 18GHz, Wideband	Keysight	N1921A	90389	01/25/2023
Filter, HPF 1.2GHz	Micro-Tronics	152043	152043	7/29/2022
Filter, BRF 1850 – 1910 MHz	Micro-Tronics	155055	155055	12/20/2022
Filter, BRF 2495 – 2690 MHz	Micro-Tronics	155050	155055	7/30/2022
Filter, BRF 3.4 – 3.8GHz	Micro-Tronics	208398	208398	7/30/2022
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight	N9030A	80397	02/01/2023
Wideband Communication Test Set, Call Box	R&S GmbH & Co. KG	CMW500	85827	02/21/2023
Wideband Communication Test Set, Call Box	R&S GmbH & Co. KG	CMW500	80105	02/21/2023
Wideband Communication Test Set, Call Box	R&S GmbH & Co. KG	CMW500	159994	02/23/2023
Wideband Communication Test Set, Call Box	R&S GmbH & Co. KG	CMW500	85806	02/22/2023
Wideband Communication Test Set, Call Box	R&S GmbH & Co. KG	CMW500	85943	02/20/2023
5G NR Communication Test Set, Call Box	Keysight	UXM	207269	01/24/2023
5G NR Communication Test Set, Call Box	Keysight	UXM	MY60101138	12/21/2023
*Chamber, Environmental	Cincinnati Sub Zero	ZPHS-8-3.5-SCT/WC	T754	06/16/2022
*Chamber, Environmental	Cincinnati Sub Zero	ZPHS-8-3.5-SCT/WC	T1154	06/15/2022
Amplifier, 218GHz to 26.5GHz	Amplical	AMP18G26.5-60	215705	02/26/2023
Amplifier, 26.5GHz to 40GHz	Amplical	AMP26G40-65	172346	02/01/2023
Antenna, Horn 18 to 26.5GHz	ARA	MWH-1826/B	172362	02/09/2023
Antenna, Horn 26.5GHz to 40GHz	ARA	MWH-2640/B	172365	03/08/2023
Antenna, Active Loop 9KHz to 30MHz	EMCO	6502	T35	10/05/2022
UL AUTOMATION SOFTWARE				
CLT Software	UL	UL RF	Ver 3.4, May 20, 2022	
Power Measurement Software	UL	UL RF	Ver 3.1.4, April 29, 2022	
Radiated test software	UL	UL RF	Ver 9.5, Jan 21, 2022	

NOTES:

1. * Testing is completed before equipment expiration date.
2. ** Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.

8. RF OUTPUT POWER VERIFICATION

RULE PART(S)

FCC: §2.1046, §22.913, §27.50

RESULT

EUT includes different power levels for head use configuration and body use configuration and the below tables contain the highest of all configurations average conducted output powers as follows:

8.1. LTE BAND 5

Test Engineer ID:	39004	Test Date:	2/11/2022

OUTPUT POWER FOR LTE BAND 5 (3.0MHz + 5.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm) ANT 1 QPSK	ANT 1 16QAM	ANT 1 64QAM	ANT 1 256QAM	ANT 2 QPSK	ANT 2 16QAM	ANT 2 64QAM	ANT 2 256QAM
3MHz / 5MHz	825.5	829.4	1	14	1	0	25.51	**25.02**	**24.03**	22.84	24.46	23.76	22.95	21.85
			15	0	25	0	**25.70**	24.92	23.94	**22.93**	**24.70**	**24.06**	**23.12**	**22.03**
	834.0	837.9	1	14	1	0	25.50	24.75	23.82	22.68	24.08	23.00	22.51	21.04
			15	0	25	0	25.65	24.68	23.69	22.68	24.33	23.08	22.06	20.97
	842.5	846.5	1	14	1	0	25.48	24.59	23.55	22.32	24.16	23.04	22.01	21.01
			15	0	25	0	25.63	24.65	23.63	22.59	24.41	23.15	22.09	20.96

OUTPUT POWER FOR LTE BAND 5 (5.0MHz + 3.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm) ANT 1 QPSK	ANT 1 16QAM	ANT 1 64QAM	ANT 1 256QAM	ANT 2 QPSK	ANT 2 16QAM	ANT 2 64QAM	ANT 2 256QAM
5MHz / 3MHz	826.5	830.4	1	24	1	0	25.66	**25.00**	**24.19**	**22.97**	**24.70**	**24.00**	22.80	21.67
			25	0	15	0	**25.70**	24.63	23.89	22.90	24.60	23.46	**22.94**	**21.96**
	835.0	838.9	1	24	1	0	25.58	24.71	23.84	22.63	23.73	22.88	22.60	20.57
			25	0	15	0	25.67	24.37	23.59	22.65	24.02	22.60	21.56	20.62
	843.6	847.5	1	24	1	0	25.62	24.24	23.36	22.16	24.11	22.62	21.79	20.69
			25	0	15	0	25.58	24.25	23.49	22.54	24.48	23.06	22.08	21.08

OUTPUT POWER FOR LTE BAND 5 (5.0MHz + 10.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm) ANT 1 QPSK	ANT 1 16QAM	ANT 1 64QAM	ANT 1 256QAM	ANT 2 QPSK	ANT 2 16QAM	ANT 2 64QAM	ANT 2 256QAM
5MHz / 10MHz	826.5	833.7	1	24	1	0	**25.70**	24.86	**22.81**	20.64	24.32	23.34	22.46	**21.89**
			25	0	50	0	24.10	22.49	21.72	20.61	24.04	23.31	23.00	21.25
	831.6	838.8	1	24	1	0	25.68	**24.91**	22.79	**20.66**	24.43	23.70	21.67	21.34
			25	0	50	0	24.09	22.48	21.56	20.60	22.70	**23.82**	21.22	21.72
	836.8	844.0	1	24	1	0	25.67	24.85	22.71	20.53	**24.70**	23.44	**23.11**	20.84
			25	0	50	0	24.07	23.57	22.73	20.58	23.73	23.22	21.78	20.80

OUTPUT POWER FOR LTE BAND 5 (10.0MHz + 5.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm) ANT 1 QPSK	ANT 1 16QAM	ANT 1 64QAM	ANT 1 256QAM	ANT 2 QPSK	ANT 2 16QAM	ANT 2 64QAM	ANT 2 256QAM
10MHz/ 5MHz	829.0	836.2	1	49	1	0	**25.70**	24.70	**23.79**	20.74	**24.70**	**23.88**	**22.80**	19.74
			50	0	25	0	23.80	22.77	22.74	20.74	22.80	21.70	21.85	19.76
	834.3	841.5	1	49	1	0	25.58	24.74	23.73	20.75	**24.70**	23.77	22.73	**19.78**
			50	0	25	0	23.80	22.70	22.71	20.71	22.73	21.73	21.51	19.70
	839.3	846.5	1	49	1	0	25.59	**24.79**	23.70	20.73	24.62	23.67	22.78	19.77
			50	0	25	0	23.76	22.77	22.75	**20.79**	22.79	21.76	21.71	19.72

OUTPUT POWER FOR LTE BAND 5 (10.0MHz + 10.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm) ANT 1 QPSK	ANT 1 16QAM	ANT 1 64QAM	ANT 1 256QAM	ANT 2 QPSK	ANT 2 16QAM	ANT 2 64QAM	ANT 2 256QAM
10MHz/ 10MHz	829.0	838.9	1	49	1	0	**25.70**	24.82	**23.76**	20.78	24.69	**23.73**	22.72	19.74
			1	0	1	49	15.28	15.22	15.23	15.21	14.30	14.28	14.23	14.27
			50	0	50	0	23.80	22.76	22.79	**20.80**	22.76	21.79	21.75	19.77
	831.5	841.4	1	49	1	0	25.68	24.84	23.74	20.78	**24.70**	23.73	22.70	19.78
			1	0	1	49	15.21	15.26	15.24	15.29	14.26	14.24	14.26	14.25
			50	0	50	0	23.75	22.75	22.75	20.74	22.76	21.75	21.80	19.77
	834.1	844.0	1	49	1	0	25.69	**24.88**	23.72	20.71	**24.70**	23.71	**22.76**	**19.78**
			1	0	1	49	15.25	15.24	15.29	15.21	14.24	14.23	14.25	14.20
			50	0	50	0	23.76	22.80	22.72	20.79	22.84	21.78	21.78	19.74

8.2. LTE BAND 7

Test Engineer ID:	39004	Test Date:	2/11/2022

OUTPUT POWER FOR LTE BAND 7 (10.0MHz + 20.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)													
							ANT 1				ANT 2				ANT 3				ANT 4			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
10MHz / 20MHz	2505.5	2519.9	1	49	1	0	**25.70**	**24.75**	23.70	**20.88**	23.20	22.20	21.21	18.23	25.00	24.00	23.00	20.05	**23.20**	**22.40**	21.20	18.22
			50	0	100	0	23.77	22.50	22.53	20.70	21.28	20.30	20.27	18.20	23.20	22.02	22.08	20.12	21.31	20.35	20.01	18.20
	2525.6	2540.0	1	49	1	0	**25.70**	24.70	**23.73**	20.85	23.20	22.28	21.23	18.21	**25.00**	24.00	23.00	20.12	23.01	22.28	**21.29**	18.12
			50	0	100	0	23.74	22.76	22.75	20.77	21.22	20.25	20.00	**18.27**	22.83	22.08	22.08	20.00	21.18	20.17	20.20	18.20
	2545.6	2560.0	1	49	1	0	25.54	24.71	23.70	20.72	**23.23**	**22.29**	**21.40**	18.18	24.80	**24.10**	**23.07**	**20.13**	23.16	22.22	21.02	**18.34**
			50	0	100	0	23.77	22.74	22.78	20.80	21.27	20.40	20.23	18.27	22.81	22.06	22.07	20.03	21.26	20.28	20.40	18.02

OUTPUT POWER FOR LTE BAND 7 (20.0MHz + 10.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)													
							ANT 1				ANT 2				ANT 3				ANT 4			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
20MHz / 10MHz	2510.0	2524.4	1	99	1	0	25.65	24.70	**23.75**	20.78	**23.20**	**22.38**	21.20	18.27	**25.00**	**24.04**	**23.07**	20.02	23.17	22.20	21.20	18.05
			100	0	50	0	23.75	22.73	22.74	**20.88**	21.30	20.10	20.23	18.26	23.04	22.09	22.02	20.07	21.25	20.26	20.24	18.28
	2530.1	2544.5	1	99	1	0	25.60	**24.81**	23.70	20.83	23.20	22.20	**21.27**	18.22	24.98	24.00	23.02	20.05	23.16	22.21	**21.30**	18.20
			100	0	50	0	23.78	22.76	22.73	20.70	21.20	20.21	20.12	18.22	23.09	22.11	22.09	20.05	21.13	20.14	20.22	18.25
	2550.1	2564.5	1	99	1	0	**25.70**	24.80	23.71	20.72	23.20	22.28	21.05	18.28	24.98	24.03	23.03	20.01	**23.20**	**22.24**	21.22	18.20
			100	0	50	0	23.77	22.79	22.78	20.78	21.29	20.22	20.10	**18.29**	23.09	22.10	22.03	**20.09**	21.27	20.28	20.32	**18.30**

OUTPUT POWER FOR LTE BAND 7 (15.0MHz + 15.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)													
							ANT 1				ANT 2				ANT 3				ANT 4			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
15MHz / 15MHz	2507.5	2522.5	1	74	1	0	25.64	24.77	**23.79**	**20.88**	23.20	**22.30**	21.24	18.24	**25.00**	24.01	23.02	20.08	23.20	22.26	21.06	18.01
			75	0	75	0	23.70	22.74	22.76	20.77	21.30	20.29	20.11	18.34	23.06	22.03	22.01	20.04	21.26	20.28	20.08	18.24
	2527.5	2542.5	1	74	1	0	25.54	24.72	23.78	20.86	**23.20**	22.22	**21.30**	**18.35**	24.94	**24.06**	**23.06**	20.02	**23.20**	**22.28**	**21.21**	18.23
			75	0	75	0	23.79	22.82	22.73	20.73	21.22	20.30	20.20	18.22	23.12	22.15	22.01	20.10	21.12	20.14	20.37	18.20
	2547.5	2562.5	1	74	1	0	**25.70**	**24.77**	23.74	20.70	23.20	22.00	21.28	18.21	24.96	24.01	23.01	20.01	23.12	22.27	21.00	**18.30**
			75	0	75	0	23.72	22.88	22.53	20.77	21.30	20.20	20.00	18.00	23.11	22.13	22.10	**20.10**	21.27	20.00	20.23	18.00

OUTPUT POWER FOR LTE BAND 7 (15.0MHz + 20.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)													
							ANT 1				ANT 2				ANT 3				ANT 4			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
15MHz / 20MHz	2507.8	2524.9	1	74	1	0	**25.70**	24.73	**23.78**	20.87	23.20	22.22	**21.22**	18.23	25.00	24.04	**23.11**	20.02	23.12	22.26	21.00	18.20
			75	0	100	0	23.80	22.70	22.90	**20.90**	21.28	20.30	20.12	**18.36**	23.17	22.04	22.05	20.02	21.28	20.25	20.20	18.21
	2525.3	2542.4	1	74	1	0	25.52	**24.74**	23.60	20.89	**23.20**	**22.25**	21.21	18.25	24.80	**24.06**	23.00	**20.06**	**23.20**	**22.29**	21.24	**18.30**
			75	0	100	0	23.72	22.74	22.72	20.76	21.03	20.10	20.03	18.22	23.01	22.19	22.01	20.00	21.13	20.18	20.27	18.28
	2542.9	2560.0	1	74	1	0	25.64	24.72	23.50	20.78	23.20	22.06	21.00	18.28	**25.00**	24.06	23.03	20.02	23.20	22.22	**21.25**	18.00
			75	0	100	0	23.79	22.72	22.74	20.79	21.40	20.30	20.29	18.20	22.99	22.13	22.01	20.01	21.24	20.24	20.28	18.00

OUTPUT POWER FOR LTE BAND 7 (20.0MHz + 15.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)													
							ANT 1				ANT 2				ANT 3				ANT 4			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
20MHz / 15MHz	2510.0	2527.1	1	99	1	0	**25.70**	24.76	23.58	20.72	23.20	**22.24**	21.22	**18.30**	25.00	23.82	23.05	20.02	23.19	**22.25**	**21.29**	18.08
			100	0	75	0	23.74	22.62	22.71	20.81	21.26	20.00	20.40	18.25	23.00	22.02	22.00	**20.09**	21.21	20.20	20.24	18.24
	2527.6	2544.7	1	99	1	0	25.70	24.70	**23.71**	20.76	23.20	22.13	21.10	18.27	24.81	**24.07**	23.02	20.08	23.19	22.23	21.25	18.22
			100	0	75	0	23.70	22.58	22.72	20.78	21.13	20.07	20.00	18.25	23.02	22.02	22.01	20.08	21.25	20.40	20.21	18.20
	2545.1	2562.2	1	99	1	0	25.70	**24.77**	23.67	20.75	**23.20**	22.20	**21.22**	18.30	**25.00**	23.80	**23.10**	20.05	**23.20**	22.25	21.26	**18.27**
			100	0	75	0	23.72	22.72	22.75	**20.82**	21.22	20.22	20.00	18.00	22.97	22.08	22.05	20.08	21.30	20.27	20.27	18.26

OUTPUT POWER FOR LTE BAND 7 (20.0MHz + 20.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)													
							ANT 1				ANT 2				ANT 3				ANT 4			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
20MHz/ 20MHz	2510.0	2529.8	1	99	1	0	**25.70**	24.73	23.78	**20.80**	23.20	**22.27**	**21.30**	18.22	25.00	24.03	23.04	20.05	**23.20**	22.24	21.21	18.25
			1	0	1	99	17.26	17.30	17.25	17.29	14.80	14.77	14.72	14.78	16.58	16.58	16.56	16.52	14.74	14.76	14.75	14.76
			100	0	100	0	23.74	22.66	22.71	20.75	21.25	20.28	20.01	18.24	23.15	21.98	22.03	20.05	21.28	20.28	20.30	18.20
	2525.1	2544.9	1	99	1	0	25.52	**24.78**	23.74	20.76	**23.20**	22.20	21.27	18.25	24.86	**24.08**	**23.09**	**20.08**	23.12	22.23	**21.24**	**18.30**
			1	0	1	99	17.20	17.25	17.28	17.25	14.78	14.72	14.78	14.77	16.59	16.57	16.53	16.55	14.78	14.73	14.72	14.74
			100	0	100	0	23.73	22.53	22.73	20.79	21.18	20.30	20.12	18.27	22.99	21.83	22.08	20.07	21.27	20.17	20.23	18.22
	2540.2	2560.0	1	99	1	0	25.63	24.76	**23.79**	20.79	23.12	22.24	21.21	18.27	**25.00**	24.02	23.07	20.01	**23.20**	**22.26**	21.23	18.22
			1	0	1	99	17.21	17.29	17.28	17.29	14.73	14.72	14.71	14.77	16.54	16.51	16.54	16.52	14.78	14.80	14.72	14.73
			100	0	100	0	23.77	22.53	22.72	20.78	21.29	20.29	20.05	**18.30**	23.08	21.81	22.02	20.03	21.20	20.20	20.32	18.20

8.3. LTE BAND 41

Test Engineer ID:	39004	Test Date:	2/11/2022

OUTPUT POWER FOR LTE BAND 41 (5.0MHz + 20.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)													
							ANT 1				ANT 2				ANT 3				ANT 4			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
5MHz / 20MHz	2499.3	2511.0	1	24	1	0	22.78	22.79	22.90	22.86	23.00	23.20	23.10	23.02	21.80	22.05	22.05	22.14	21.72	21.54	21.71	21.80
			25	0	100	0	22.63	22.79	22.86	22.87	23.00	23.04	23.04	22.89	21.90	22.04	22.09	22.05	21.52	21.72	21.71	21.52
	2583.8	2595.5	1	24	1	0	**28.70**	**27.05**	**26.70**	**23.76**	**28.70**	**27.27**	**26.75**	23.50	**28.00**	**26.59**	**26.03**	23.04	**27.70**	**26.28**	**25.77**	**22.76**
			25	0	100	0	26.68	25.75	25.70	23.63	26.50	25.79	25.73	**23.51**	26.20	25.03	25.02	**23.09**	25.71	24.80	24.76	22.73
	2668.3	2680.0	1	24	1	0	27.70	26.40	25.70	22.71	28.00	26.68	26.17	23.06	27.08	25.55	24.90	21.98	26.70	25.21	24.74	21.59
			25	0	100	0	25.71	24.76	24.68	22.61	26.02	25.04	25.09	23.20	25.13	24.04	23.97	21.99	24.77	23.71	23.79	21.75

OUTPUT POWER FOR LTE BAND 41 (20.0MHz + 5.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)													
							ANT 1				ANT 2				ANT 3				ANT 4			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
20MHz / 5MHz	2506.0	2517.7	1	99	1	0	26.78	26.00	26.15	22.90	27.00	26.67	**26.59**	23.09	26.00	25.52	25.40	22.03	25.76	25.00	25.28	21.86
			100	0	25	0	22.79	22.80	22.80	22.84	23.08	23.09	22.99	23.08	22.11	22.09	22.01	21.91	21.80	21.90	21.70	21.80
	2590.5	2602.2	1	99	1	0	**28.70**	**27.29**	**26.79**	23.52	**28.70**	**27.26**	26.52	**23.72**	**28.00**	**26.60**	**26.10**	**23.10**	**27.70**	**26.20**	**25.78**	22.73
			100	0	25	0	26.82	25.72	25.60	**23.59**	26.56	25.75	25.54	23.70	25.97	25.10	24.94	23.05	25.80	24.89	24.77	**22.74**
	2675.0	2686.7	1	99	1	0	27.60	26.21	25.78	22.55	28.00	26.51	26.06	23.13	27.00	25.52	25.06	22.02	26.72	25.00	24.73	21.76
			100	0	25	0	25.79	24.72	24.60	22.57	26.04	25.16	25.07	23.17	25.05	24.08	24.07	22.02	24.77	23.76	23.70	21.77

OUTPUT POWER FOR LTE BAND 41 (10.0MHz + 20.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)													
							ANT 1				ANT 2				ANT 3				ANT 4			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
10MHz / 20MHz	2501.5	2515.9	1	49	1	0	22.78	22.79	22.75	22.79	23.08	23.00	23.05	23.09	22.07	22.10	22.03	22.13	21.74	21.71	21.79	21.58
			50	0	100	0	22.75	22.77	22.70	22.80	23.03	23.14	22.94	23.10	22.04	22.08	22.07	21.85	21.75	21.78	21.50	21.54
	2583.6	2598.0	1	49	1	0	**28.65**	**27.23**	**26.80**	23.53	**28.70**	**27.10**	**26.77**	23.60	**28.00**	**26.43**	**26.09**	**23.09**	**27.70**	**26.36**	**25.71**	**22.75**
			50	0	100	0	26.68	25.74	25.75	**23.62**	26.75	25.51	25.59	**23.66**	25.81	25.07	24.90	22.86	25.78	24.80	24.75	22.62
	2665.6	2680.0	1	49	1	0	27.70	26.17	25.82	22.52	28.12	26.38	26.19	23.06	27.06	25.46	25.08	22.06	26.50	25.11	24.74	21.70
			50	0	100	0	25.78	24.59	24.71	22.57	25.84	24.95	25.07	23.03	24.87	24.15	23.81	22.00	24.80	23.50	23.78	21.75

OUTPUT POWER FOR LTE BAND 41 (20.0MHz + 10.0MHz)

Bandwidth	Frequency (MHz)	Frequency (MHz)	RB Size	RB Offset	RB Size	RB Offset	ANT 1				ANT 2				ANT 3				ANT 4			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
20MHz / 10MHz	2506.0	2520.4	1	99	1	0	27.11	26.41	26.00	22.80	27.20	**26.73**	26.40	23.28	25.91	25.30	25.90	22.27	26.15	25.19	**25.10**	21.75
			100	0	50	0	23.00	22.86	22.31	22.81	23.40	23.37	23.10	23.42	22.23	21.78	22.19	21.94	21.30	21.40	21.40	21.63
	2588.1	2602.5	1	99	1	0	**28.68**	**27.47**	**26.91**	23.59	**28.70**	26.70	**26.63**	23.80	**27.80**	**26.06**	**26.10**	**22.70**	**27.70**	**26.21**	24.99	**22.40**
			100	0	50	0	26.76	26.06	25.70	**23.62**	26.36	25.23	25.78	**23.86**	26.04	24.62	24.70	22.68	25.29	25.16	24.69	22.37
	2670.1	2684.5	1	99	1	0	27.60	26.51	25.75	22.61	28.00	26.59	25.76	23.03	27.00	25.05	24.62	21.64	26.45	25.30	24.50	21.25
			100	0	50	0	25.90	24.78	24.69	22.57	26.29	25.17	24.90	23.08	25.00	23.57	23.62	21.60	25.16	23.40	23.44	21.39

OUTPUT POWER FOR LTE BAND 41 (15.0MHz + 15.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)													
							ANT 1				ANT 2				ANT 3				ANT 4			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
15MHz / 15MHz	2503.5	2518.5	1	74	1	0	27.60	26.27	25.90	22.81	28.09	26.50	26.03	23.06	26.92	25.58	25.10	22.08	26.70	25.28	24.61	21.67
			75	0	75	0	22.80	22.89	22.83	22.79	23.10	23.10	23.01	22.88	22.17	21.92	22.05	22.00	21.70	21.74	21.70	21.59
	2585.5	2600.5	1	74	1	0	**28.64**	**27.26**	**26.72**	23.53	**28.70**	**27.12**	**26.79**	**23.80**	**28.00**	**26.56**	**26.11**	**23.08**	**27.71**	**26.20**	**25.77**	22.70
			75	0	75	0	26.79	25.79	25.72	**23.71**	26.74	25.72	25.80	23.75	26.01	24.85	24.88	22.87	25.64	24.70	24.74	**22.71**
	2667.5	2682.5	1	74	1	0	27.58	26.28	25.75	22.59	27.90	26.50	26.05	23.13	26.88	25.59	25.08	22.04	26.54	25.22	24.79	21.78
			75	0	75	0	25.72	24.78	24.76	22.67	26.18	25.05	25.14	23.07	25.08	23.84	24.01	22.08	24.70	23.90	23.79	21.73

OUTPUT POWER FOR LTE BAND 41 (15.0MHz + 20.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)													
							ANT 1				ANT 2				ANT 3				ANT 4			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
15MHz / 20MHz	2503.8	2520.9	1	74	1	0	27.50	26.34	25.70	22.65	28.07	26.39	26.17	23.06	27.02	25.53	25.05	22.05	26.70	25.27	24.70	21.75
			75	0	100	0	22.79	22.89	22.70	22.71	23.06	22.81	23.04	23.12	21.84	22.06	21.95	22.09	21.71	21.75	21.62	21.76
	2583.3	2600.4	1	74	1	0	**28.72**	**27.00**	**26.78**	**23.75**	**28.80**	**27.30**	**26.53**	23.50	**28.00**	**26.57**	**25.82**	23.02	**27.70**	**26.40**	**25.72**	**22.72**
			75	0	100	0	26.71	25.72	25.55	23.53	26.73	25.77	25.72	**23.73**	26.00	25.07	25.16	**23.16**	25.72	24.50	24.78	22.67
	2662.9	2680.0	1	74	1	0	27.54	26.29	25.72	22.74	28.08	26.55	26.06	23.07	27.09	25.59	24.81	21.94	26.75	25.30	24.80	21.90
			75	0	100	0	25.71	24.76	24.54	22.71	26.07	25.03	25.02	23.19	25.06	24.10	24.11	22.08	24.59	23.74	23.76	21.78

OUTPUT POWER FOR LTE BAND 41 (20.0MHz + 15.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)													
							ANT 1				ANT 2				ANT 3				ANT 4			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
20MHz / 15MHz	2506.0	2523.1	1	99	1	0	27.75	26.27	25.76	22.71	28.05	26.60	25.98	23.20	26.94	25.38	25.04	21.95	26.54	25.14	24.74	21.84
			100	0	75	0	22.77	22.62	22.73	22.79	23.00	22.84	23.20	23.10	22.14	22.09	21.99	22.16	21.50	21.74	21.79	21.82
	2585.6	2602.7	1	99	1	0	**28.66**	**27.22**	**26.58**	**23.77**	**28.70**	**27.09**	**26.64**	23.66	**28.00**	**26.47**	**26.08**	**23.08**	**27.70**	**26.28**	**25.54**	**22.76**
			100	0	75	0	26.76	25.78	25.62	23.76	26.70	25.54	25.65	**23.70**	26.00	24.95	25.12	23.04	25.75	24.73	24.62	22.71
	2665.1	2682.2	1	99	1	0	27.90	26.29	25.68	22.77	28.20	26.45	25.87	23.04	26.97	25.37	25.01	22.07	26.70	25.20	24.76	21.80
			100	0	75	0	25.80	24.78	24.80	22.77	26.02	25.10	25.09	23.05	25.10	24.08	24.04	22.10	24.79	23.62	23.73	21.73

OUTPUT POWER FOR LTE BAND 41 (20.0MHz + 20.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)													
							ANT 1				ANT 2				ANT 3				ANT 4			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
20MHz/ 20MHz	2506.0	2525.8	1	99	1	0	27.50	26.24	25.78	22.51	28.20	26.66	25.80	22.91	27.07	25.31	25.06	21.91	26.70	25.21	24.58	21.88
			1	0	1	99	14.80	14.79	14.78	14.76	15.11	15.07	14.91	14.95	14.14	14.10	14.04	13.95	13.77	13.50	13.70	13.50
			100	0	100	0	22.72	22.77	22.78	22.72	23.00	23.00	22.90	23.03	22.00	22.00	22.10	22.03	21.71	21.76	21.71	21.70
	2583.1	2602.9	1	99	1	0	**28.70**	**27.29**	**26.79**	23.74	**28.70**	**27.30**	**26.75**	**23.79**	**28.00**	**26.59**	**26.10**	**23.09**	**27.70**	**26.02**	**25.79**	22.74
			1	0	1	99	20.40	20.25	20.00	20.11	20.03	20.29	20.21	20.28	19.50	19.50	19.53	19.58	19.11	19.20	19.20	19.20
			100	0	100	0	26.71	25.74	25.70	**23.90**	26.78	25.76	25.74	23.78	25.80	25.07	25.01	23.01	25.78	24.80	24.90	**22.75**
	2660.2	2680.0	1	99	1	0	27.78	26.30	25.83	22.66	28.00	26.49	26.10	23.10	26.96	25.63	24.91	22.00	26.69	25.06	24.78	21.72
			1	0	1	99	19.24	19.23	19.21	19.26	19.58	19.50	19.50	19.55	18.50	18.70	18.57	18.44	18.11	18.11	18.20	18.01
			100	0	100	0	25.71	24.78	24.51	22.79	26.10	25.16	25.10	23.06	25.01	23.98	24.16	21.98	24.78	23.50	23.70	21.75

8.4. LTE BAND 48

Test Engineer ID:	39004	Test Date:	2/18/2022

OUTPUT POWER FOR LTE BAND 48 (5.0MHz + 20.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)															
							ANT 7				ANT 8				ANT 9				ANT 4			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
5MHz / 20MHz	3553.3	3565.0	1	24	1	0	20.51	20.55	20.50	20.42	20.52	20.52	20.53	20.55	20.91	20.96	20.93	20.93	19.51	19.59	19.60	19.52
			25	0	100	0	14.06	14.07	14.06	14.00	14.10	14.07	14.08	14.08	14.46	14.41	14.41	14.45	13.02	13.05	13.03	13.04
	3615.8	3627.5	1	24	1	0	**24.00**	**24.00**	**23.89**	21.05	**24.00**	**24.00**	**24.05**	**21.08**	**21.70**	**21.70**	**21.70**	**21.49**	**23.00**	**23.00**	**23.00**	**20.03**
			25	0	100	0	22.04	22.01	22.02	**21.07**	22.05	22.00	22.01	21.00	**21.70**	**21.70**	**21.70**	21.43	21.07	21.09	21.10	20.01
	3678.3	3690.0	1	24	1	0	20.54	20.55	20.52	20.56	20.57	20.56	20.60	20.54	20.94	20.99	20.96	20.98	19.52	19.53	19.50	19.59
			25	0	100	0	14.06	14.02	14.04	14.01	14.02	14.03	14.05	14.05	14.48	14.43	14.48	14.44	13.02	13.08	13.06	13.05

OUTPUT POWER FOR LTE BAND 48 (20.0MHz + 5.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)															
							ANT 7				ANT 8				ANT 9				ANT 4			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
20MHz / 5MHz	3560.0	3571.7	1	99	1	0	20.59	20.59	20.55	20.56	20.50	20.58	20.59	20.51	20.98	20.91	20.92	20.85	19.51	19.58	19.55	19.38
			100	0	25	0	14.05	14.03	14.05	14.06	14.03	14.04	14.08	14.07	14.46	14.50	14.44	14.42	13.04	13.01	13.05	13.06
	3622.5	3634.2	1	99	1	0	**24.00**	**24.00**	**24.00**	21.00	**24.00**	**24.00**	**24.00**	**21.06**	**21.70**	**21.70**	**21.70**	**21.47**	**23.00**	**23.00**	**23.00**	**20.10**
			100	0	25	0	22.08	22.05	22.05	**21.01**	22.07	22.09	22.06	21.02	**21.70**	**21.70**	**21.70**	21.40	21.05	21.08	21.03	20.04
	3685.0	3696.7	1	99	1	0	20.53	20.58	20.55	20.52	20.54	20.57	20.59	20.53	20.93	20.97	20.93	21.00	19.59	19.51	19.54	19.55
			100	0	25	0	14.09	14.02	14.01	14.08	14.03	14.04	14.05	14.08	14.47	14.49	14.48	14.49	13.04	13.09	13.16	13.09

OUTPUT POWER FOR LTE BAND 48 (10.0MHz + 20.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)															
							ANT 7				ANT 8				ANT 9				ANT 4			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
10MHz / 20MHz	3555.5	3569.9	1	49	1	0	20.01	20.10	20.05	20.03	20.07	20.05	20.08	20.71	20.49	20.46	20.34	19.75	19.03	19.05	19.02	19.06
			50	0	100	0	15.00	15.07	15.03	15.04	15.03	15.00	15.02	15.76	15.40	15.42	15.45	14.77	14.00	14.07	14.06	14.01
	3615.6	3630.0	1	49	1	0	**24.50**	**24.50**	**24.01**	**21.09**	**24.50**	**24.50**	**23.98**	21.71	**21.70**	**21.70**	**21.70**	**20.78**	**23.50**	**23.50**	**23.10**	**20.10**
			50	0	100	0	21.53	21.54	21.50	21.01	21.50	21.60	21.55	**21.75**	**21.70**	**21.70**	**21.70**	20.76	20.50	20.56	20.51	20.10
	3675.6	3690.0	1	49	1	0	20.07	20.07	20.03	20.04	20.02	20.05	20.01	20.75	20.47	20.53	20.46	19.73	19.03	19.09	18.98	19.04
			50	0	100	0	15.05	15.03	15.09	15.07	15.06	15.06	15.09	15.78	15.47	15.49	15.21	14.79	14.04	14.08	14.05	14.04

OUTPUT POWER FOR LTE BAND 48 (20.0MHz + 10.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)															
							ANT 7				ANT 8				ANT 9				ANT 4			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
20MHz / 10MHz	3560.0	3574.4	1	99	1	0	20.05	20.08	20.07	20.02	20.10	20.10	20.02	20.05	20.42	20.50	20.42	20.50	19.03	19.06	19.08	19.09
			100	0	50	0	15.06	15.09	15.06	15.07	15.0714	15.00	15.08	15.05	15.41	15.47	15.44	15.47	14.08	14.07	14.04	14.05
	3620.1	3634.5	1	99	1	0	**24.50**	**24.50**	**24.05**	21.03	**24.50**	**24.50**	**24.05**	**21.02**	**21.70**	**21.70**	**21.70**	**21.47**	**23.50**	**23.50**	**23.02**	**20.04**
			100	0	50	0	21.52	21.59	21.52	**21.05**	21.59	21.54	21.56	21.00	**21.70**	**21.70**	**21.70**	21.43	20.50	20.51	20.55	20.00
	3680.1	3694.5	1	99	1	0	20.03	20.05	20.06	20.04	20.08	20.06	20.07	20.01	20.49	20.45	20.45	20.46	19.09	19.10	19.09	19.00
			100	0	50	0	15.10	15.04	15.10	15.10	15.07	15.01	15.07	15.02	15.44	15.40	15.43	15.44	14.08	14.01	14.04	14.08

OUTPUT POWER FOR LTE BAND 48 (15.0MHz + 20.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)															
							ANT 7				ANT 8				ANT 9				ANT 4			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
15MHz / 20MHz	3557.8	3574.9	1	74	1	0	20.02	20.08	20.01	20.04	20.02	20.09	20.08	20.01	20.40	20.43	20.42	20.48	19.05	19.09	19.10	19.02
			75	0	100	0	15.09	15.01	15.10	15.02	15.09	15.00	15.08	15.08	15.41	15.44	15.40	15.43	14.00	14.02	14.03	14.06
	3615.3	3632.4	1	74	1	0	**25.00**	**25.00**	**24.05**	**21.05**	**25.00**	**25.00**	**24.03**	21.02	**21.70**	**21.70**	**21.70**	**21.42**	**24.00**	**24.00**	**23.01**	20.02
			75	0	100	0	21.51	21.58	21.52	21.04	21.51	21.50	21.55	**21.09**	**21.70**	**21.70**	**21.70**	21.24	20.60	20.60	20.56	**20.02**
	3672.9	3690.0	1	74	1	0	20.03	20.03	20.07	19.88	20.07	20.05	20.08	20.03	20.47	20.44	20.48	20.46	19.06	19.08	19.06	19.18
			75	0	100	0	15.01	15.10	15.04	15.19	15.07	15.06	15.07	15.01	15.44	15.47	15.48	15.41	14.05	14.09	14.02	14.19

OUTPUT POWER FOR LTE BAND 48 (20.0MHz + 15.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)															
							ANT 7				ANT 8				ANT 9				ANT 4			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
20MHz / 15MHz	3560.0	3577.1	1	99	1	0	20.05	20.09	20.09	20.03	20.04	20.04	20.09	20.10	19.71	19.73	19.74	19.74	19.09	19.05	19.07	19.10
			100	0	75	0	15.09	15.09	15.00	15.01	15.06	15.01	15.06	15.01	14.75	14.78	14.79	14.74	14.08	14.03	14.01	14.05
	3617.6	3634.7	1	99	1	0	**25.00**	**24.92**	**24.17**	**21.07**	**25.00**	**25.00**	**24.12**	21.05	**21.70**	**21.70**	**21.70**	20.71	**24.00**	**24.00**	**23.03**	**20.07**
			100	0	75	0	21.55	21.59	21.55	21.03	21.57	21.55	21.56	**21.08**	21.26	21.29	21.28	**20.79**	20.57	20.50	20.60	20.03
	3675.1	3692.2	1	99	1	0	20.08	20.10	20.04	19.97	20.05	20.03	20.03	20.02	19.78	19.77	19.73	19.78	19.08	19.04	19.03	19.06
			100	0	75	0	15.06	15.04	15.01	15.03	15.03	15.06	15.02	15.05	14.74	14.79	14.71	14.74	14.09	14.09	14.09	14.02

OUTPUT POWER FOR LTE BAND 48 (20.0MHz + 20.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)													
							ANT 7				ANT 8				ANT 9				ANT 4			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
20MHz/ 20MHz	3560.0	3579.8	1	99	1	0	21.54	21.51	21.55	21.07	21.54	21.60	21.60	21.02	**21.70**	**21.70**	**21.70**	21.42	20.56	20.54	20.57	20.07
			1	0	1	99	8.10	8.04	8.09	8.05	8.04	8.06	8.09	8.02	8.45	8.47	8.41	8.40	7.01	7.02	7.06	7.06
			100	0	100	0	15.09	15.10	15.06	15.00	15.02	15.03	15.06	15.01	15.40	15.40	15.42	15.45	14.02	14.09	14.04	14.08
	3615.1	3634.9	1	99	1	0	**25.00**	**25.00**	**24.02**	21.03	**25.00**	**25.00**	**23.92**	**21.09**	**21.70**	**21.70**	**21.70**	**21.48**	**24.00**	**24.00**	**23.07**	**20.10**
			1	0	1	99	14.59	14.59	14.57	14.52	14.56	14.53	14.53	14.53	14.92	14.97	14.97	14.94	13.56	13.53	13.52	13.57
			100	0	100	0	21.50	21.50	21.51	**21.10**	21.59	21.56	21.54	21.00	**21.70**	**21.70**	**21.70**	21.45	20.55	20.54	20.56	20.04
	3670.2	3690.0	1	99	1	0	21.51	21.54	21.50	21.09	21.55	21.59	21.50	21.06	**21.70**	**21.70**	**21.70**	21.46	20.58	20.53	20.60	20.05
			1	0	1	99	8.03	8.08	8.00	8.03	8.03	8.01	8.05	8.00	8.43	8.41	8.49	8.44	7.10	7.01	7.02	7.04
			100	0	100	0	15.00	15.07	15.04	15.06	15.06	15.02	15.03	15.07	15.41	15.45	15.40	15.45	14.06	14.09	14.08	14.01

9. CONDUCTED TEST RESULTS

9.1. OCCUPIED BANDWIDTH

RULE PART(S)

FCC: §2.1049

LIMITS

For reporting purposes only

TEST PROCEDURE

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at the middle channel in each band. The 99% and -26dB bandwidths was also measured and recorded.

RESULTS

There is no limit required and power is the same for low, middle and high channel; therefore, only middle channel was tested. Only QPSK plots are reported to show setting parameter complies with testing method/procedure.

LTE BAND 5

Band	Mode	RB Allocation/RB Offset	f (MHz)	99% BW (MHz)	- 26dB BW (MHz)
LTE BAND 5	3MHz + 5MHz BAND QPSK	15/0 + 25/0	836.5	7.438	7.747
	3MHz + 5MHz BAND 16QAM			7.400	7.740
	5MHz + 3MHz BAND QPSK	25/0 + 15/0		7.459	7.734
	5MHz + 3MHz BAND 16QAM			7.412	7.723
	5MHz + 10MHz BAND QPSK	25/0 + 50/0		13.811	14.31
	5MHz + 10MHz BAND 16QAM			13.792	14.27
	10MHz + 5MHz BAND QPSK	50/0 + 25/0		13.847	14.18
	10MHz + 5MHz BAND 16QAM			13.797	14.18
	10MHz + 10MHz BAND QPSK	50/0 + 50/0		18.735	19.39
	10MHz + 10MHz BAND 16QAM			18.724	19.36

LTE BAND 7

Band	Mode	RB Allocation/RB Offset	f (MHz)	99% BW (MHz)	- 26dB BW (MHz)
LTE BAND 7	10MHz + 20MHz BAND QPSK	50/0 + 100/0	2535	28.068	30.07
	10MHz + 20MHz BAND 16QAM			28.082	29.94
	20MHz + 10MHz BAND QPSK	100/0 + 50/0		28.091	29.92
	20MHz + 10MHz BAND 16QAM			27.969	30.10
	15MHz + 15MHz BAND QPSK	75/0 + 75/0		28.621	30.63
	15MHz + 15MHz BAND 16QAM			28.645	30.72
	15MHz + 20MHz BAND QPSK	75/0 + 100/0		32.918	35.01
	15MHz + 20MHz BAND 16QAM			32.736	34.96
	20MHz + 15MHz BAND QPSK	100/0 + 75/0		32.923	34.98
	20MHz + 15MHz BAND 16QAM			32.930	35.03
	20MHz + 20MHz BAND QPSK	100/0 + 100/0		37.703	39.97
	20MHz + 20MHz BAND 16QAM			37.638	39.84

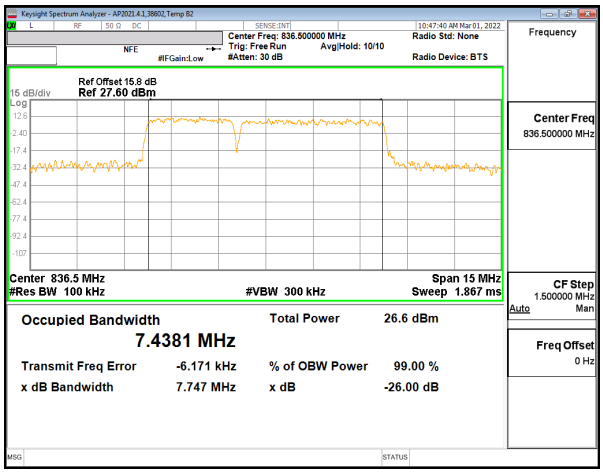
LTE BAND 41

Band	Mode	RB Allocation/RB Offset	f (MHz)	99% BW (MHz)	- 26dB BW (MHz)
LTE BAND 41	5MHz + 20MHz BAND QPSK	25/0 + 100/0	2593	22.802	23.61
	5MHz + 20MHz BAND 16QAM			22.801	23.64
	20MHz + 5MHz BAND QPSK	100/0 + 25/0		22.830	23.62
	20MHz + 5MHz BAND 16QAM			22.815	23.64
	10MHz + 20MHz BAND QPSK	50/0 + 100/0		27.651	28.62
	10MHz + 20MHz BAND 16QAM			27.640	28.59
	20MHz + 10MHz BAND QPSK	100/0 + 50/0		27.699	28.60
	20MHz + 10MHz BAND 16QAM			27.655	28.83
	15MHz + 15MHz BAND QPSK	75/0 + 75/0		28.225	29.31
	15MHz + 15MHz BAND 16QAM			28.249	29.22
	15MHz + 20MHz BAND QPSK	75/0 + 100/0		32.576	33.82
	15MHz + 20MHz BAND 16QAM			32.540	33.80
	20MHz + 15MHz BAND QPSK	100/0 + 75/0		32.584	33.91
	20MHz + 15MHz BAND 16QAM			32.565	33.86
	20MHz + 20MHz BAND QPSK	100/0 + 100/0		37.498	38.82
	20MHz + 20MHz BAND 16QAM			37.495	38.81

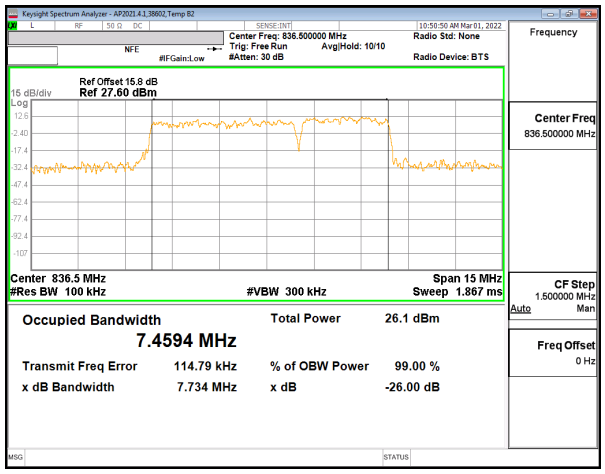
LTE BAND 48

Band	Mode	RB Allocation/RB Offset	f (MHz)	99% BW (MHz)	- 26dB BW (MHz)
LTE BAND 48	5MHz + 20MHz BAND QPSK	25/0 + 100/0	3625	22.765	23.61
	5MHz + 20MHz BAND 16QAM			22.771	23.53
	20MHz + 5MHz BAND QPSK	100/0 + 25/0		22.774	23.66
	20MHz + 5MHz BAND 16QAM			22.766	23.50
	10MHz + 20MHz BAND QPSK	50/0 + 100/0		28.025	33.58
	10MHz + 20MHz BAND 16QAM			28.001	30.78
	20MHz + 10MHz BAND QPSK	100/0 + 50/0		27.986	29.94
	20MHz + 10MHz BAND 16QAM			28.034	29.77
	15MHz + 20MHz BAND QPSK	75/0 + 100/0		32.799	36.97
	15MHz + 20MHz BAND 16QAM			32.729	38.90
	20MHz + 15MHz BAND QPSK	100/0 + 75/0		32.829	34.99
	20MHz + 15MHz BAND 16QAM			32.861	35.00
	20MHz + 20MHz BAND QPSK	100/0 + 100/0		37.620	43.06
	20MHz + 20MHz BAND 16QAM			37.696	41.38

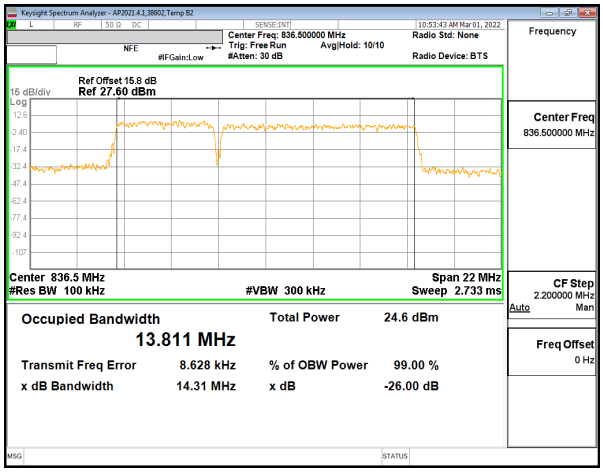
9.1.1. LTE BAND 5



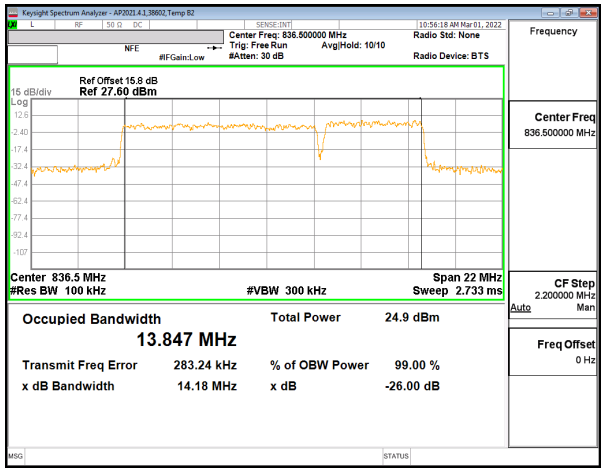
LTE B5 3MHz + 5MHz QPSK RB15-0 + RB25-0



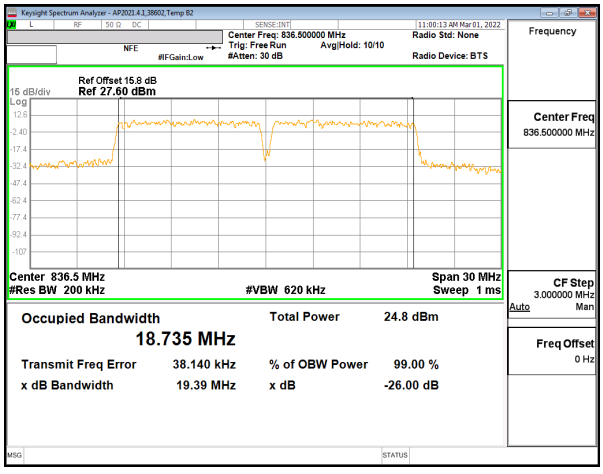
LTE B5 5MHz + 3MHz QPSK RB25-0 + RB15-0



LTE B5 5MHz + 10MHz QPSK RB25-0 + RB50-0

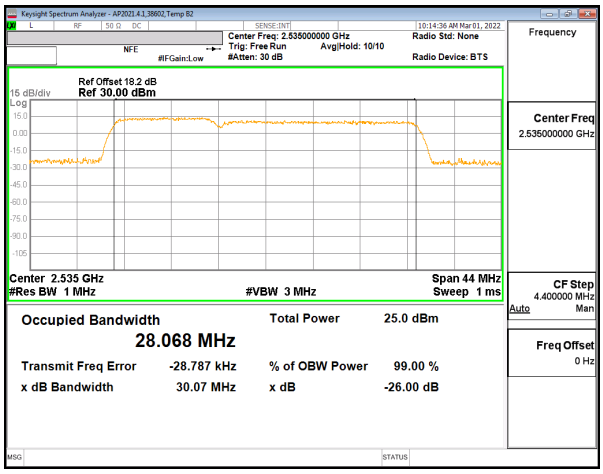


LTE B5 10MHz + 5MHz QPSK RB50-0 + RB25-0

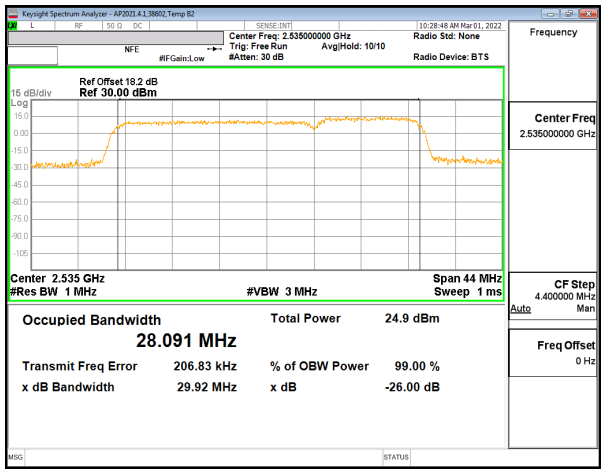


LTE B5 10MHz + 10MHz QPSK RB50-0 + RB50-0

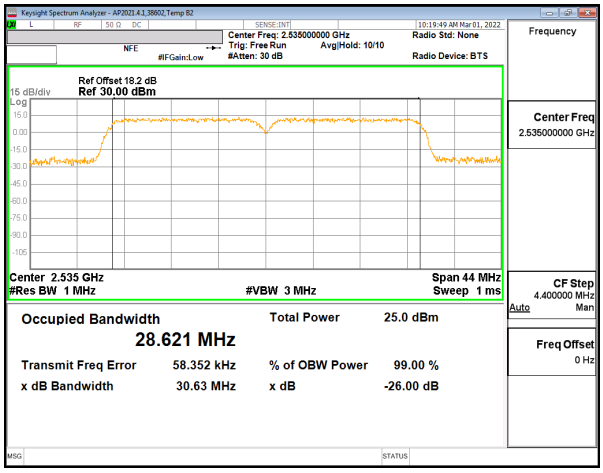
9.1.2. LTE BAND 7



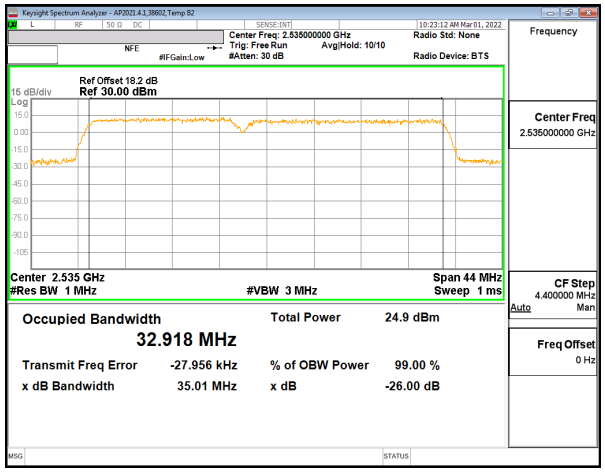
LTE B7 10MHz + 20MHz QPSK RB50-0 + RB100-0



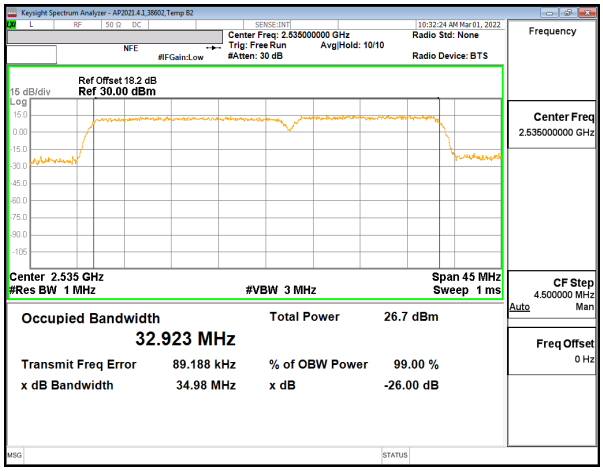
LTE B7 20MHz + 10MHz QPSK RB100-0 + RB50-0



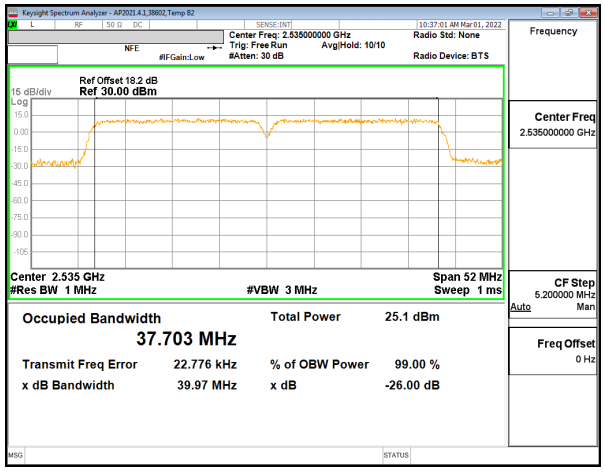
LTE B7 15MHz + 15MHz QPSK RB75-0 + RB75-0



LTE B7 15MHz + 20MHz QPSK RB75-0 + RB100-0

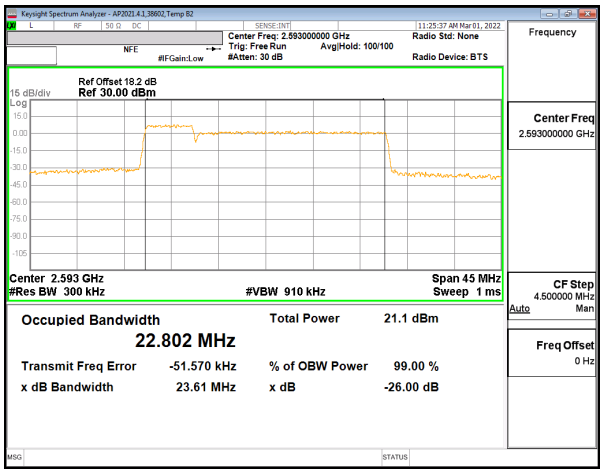


LTE B7 20MHz + 15MHz QPSK RB100-0 + RB75-0

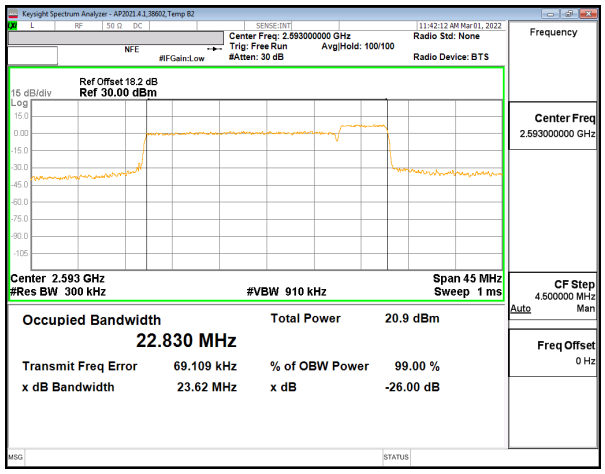


LTE B7 20MHz + 20MHz QPSK RB100-0 + RB100-0

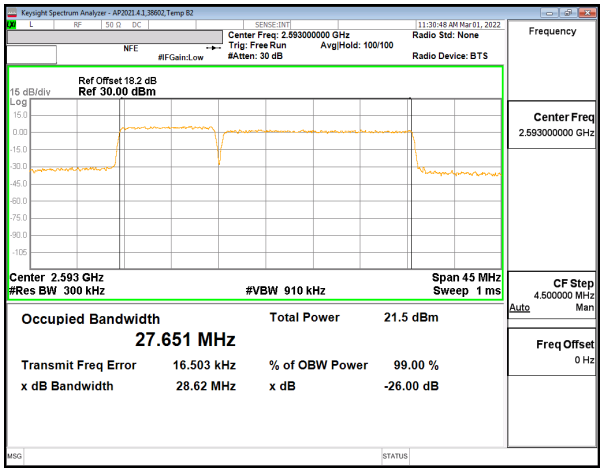
9.1.3. LTE BAND 41



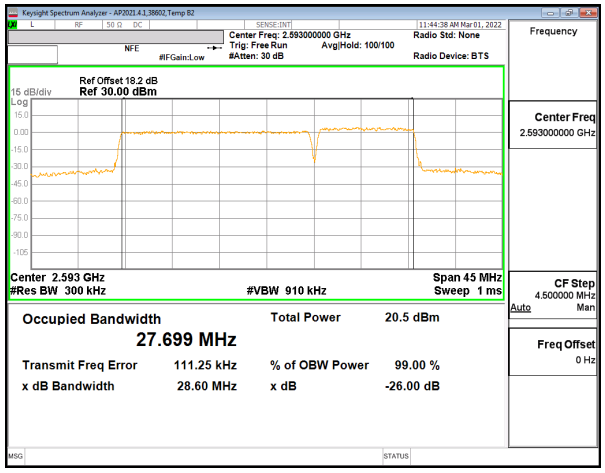
LTE B41 5MHz + 20MHz QPSK RB25-0 + RB100-0



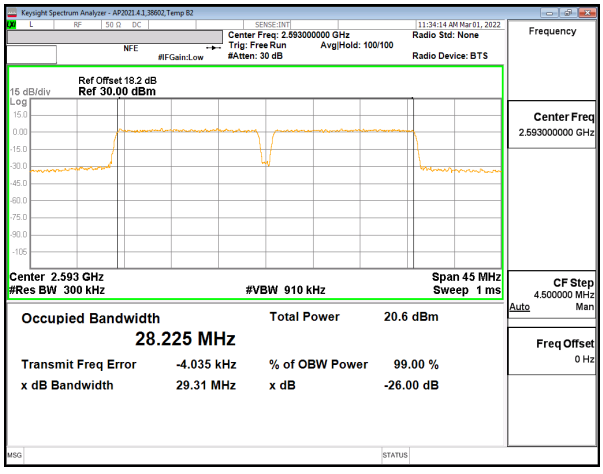
LTE B41 20MHz + 5MHz QPSK RB100-0 + RB25-0



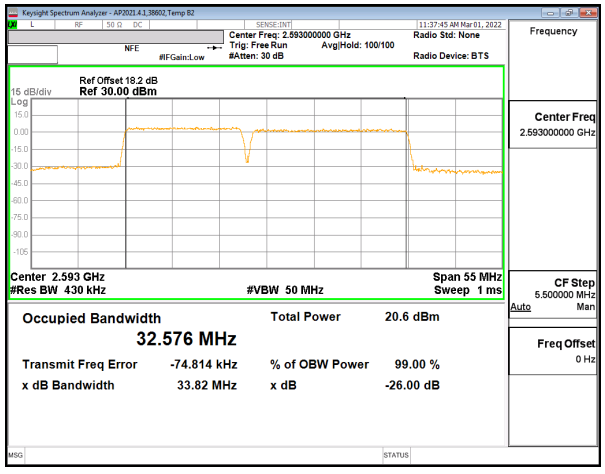
LTE B41 10MHz + 20MHz QPSK RB50-0 + RB100-0



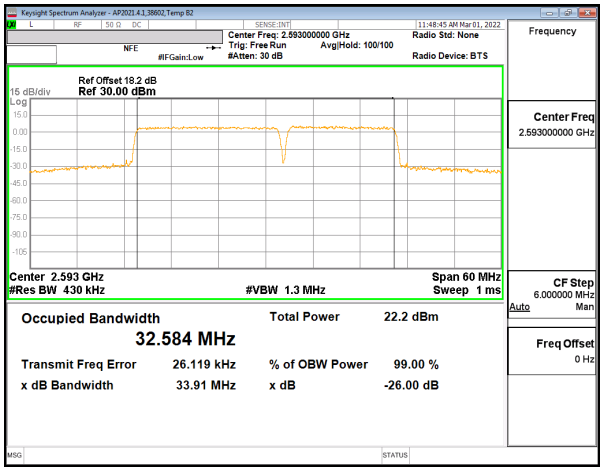
LTE B41 20MHz + 10MHz QPSK RB100-0 + RB50-0



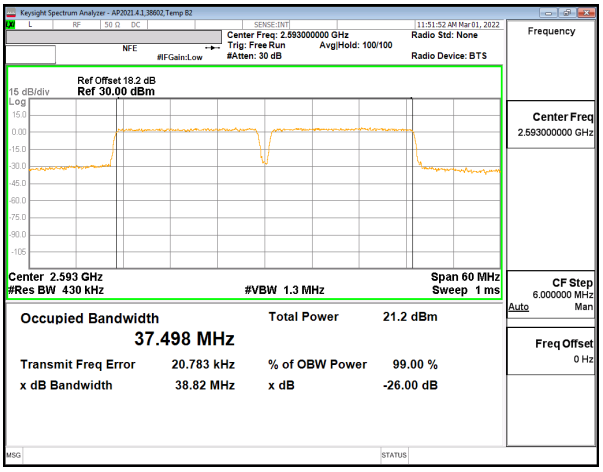
LTE B41 15MHz + 15MHz QPSK RB75-0 + RB75-0



LTE B41 15MHz + 20MHz QPSK RB75-0 + RB100-0

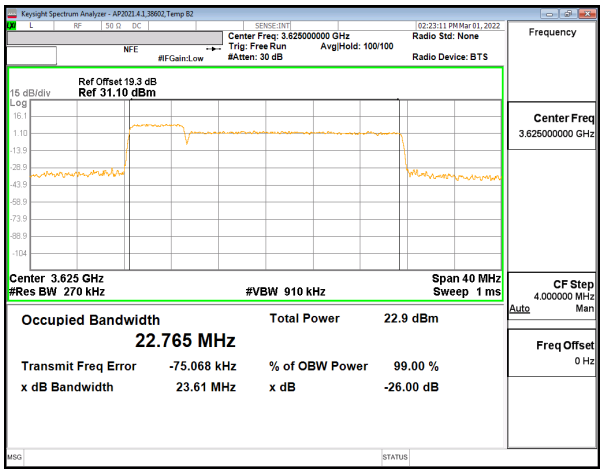


LTE B41 20MHz + 15MHz QPSK RB100-0 + RB75-0

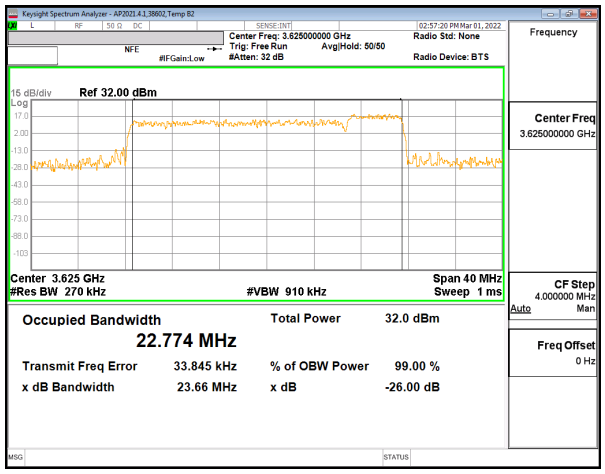


LTE B41 20MHz + 20MHz QPSK RB100-0 + RB100-0

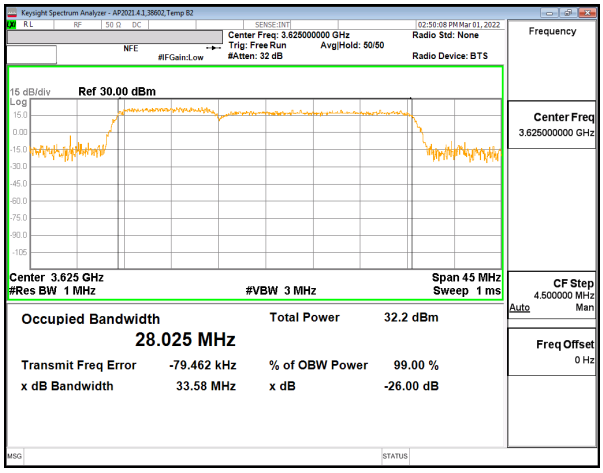
9.1.4. LTE BAND 48



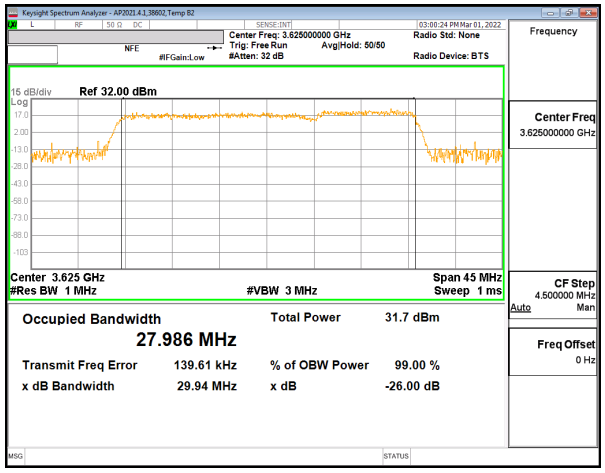
LTE B48 5MHz + 20MHz QPSK RB25-0 + RB100-0



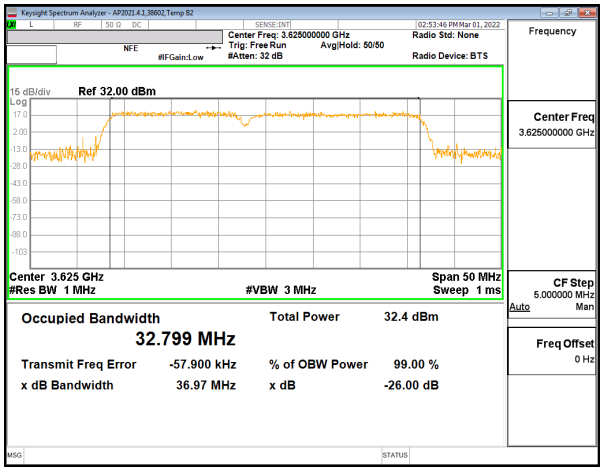
LTE B48 20MHz + 5MHz QPSK RB100-0 + RB25-0



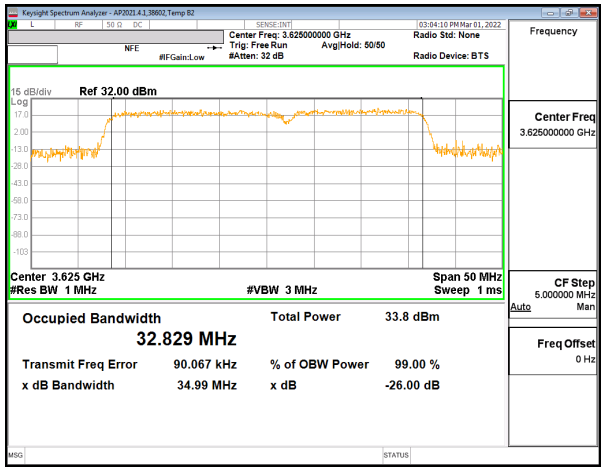
LTE B48 10MHz + 20MHz QPSK RB50-0 + RB100-0



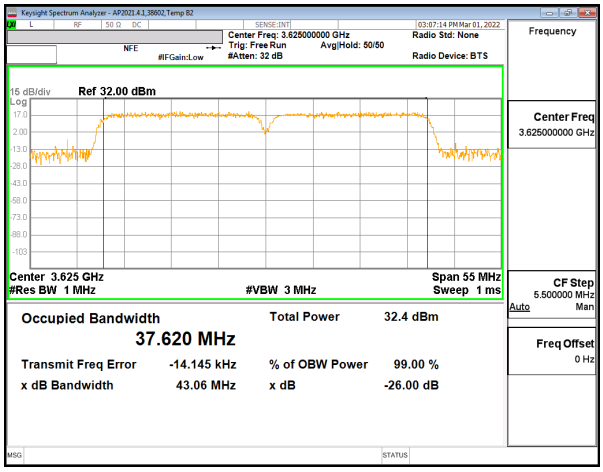
LTE B48 20MHz + 10MHz QPSK RB100-0 + RB50-0



LTE B48 15MHz + 20MHz QPSK RB75-0 + RB100-0



LTE B48 20MHz + 15MHz QPSK RB100-0 + RB75-0



LTE B48 20MHz + 20MHz QPSK RB100-0 + RB100-0

9.2. BAND EDGE AND EMISSION MASK AND ADJACENT CHANNEL POWER

TEST PROCEDURE

The transmitter output was connected to a R&S CMW500 Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.

For each band edge measurement:

- Set the spectrum analyzer span to include the block edge frequency.
- Set a marker to point the corresponding band edge frequency in each test case.
- Set display line at -13 dBm
- Set resolution bandwidth to at least 1% of emission bandwidth.

TEST PROCEDURE FOR FCC PART 27

(m)(6) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed; for mobile digital stations, in the 1 megahertz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least two percent may be employed, except when the 1 megahertz band is 2495-2496 MHz, in which case a resolution bandwidth of at least one percent may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 megahertz or 1 percent of emission bandwidth, as specified; or 1 megahertz or 2 percent for mobile digital stations, except in the band 2495-2496 MHz). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. With respect to television operations, measurements must be made of the separate visual and aural operating powers at sufficiently frequent intervals to ensure compliance with the rules.

TEST PROCEDURE FOR FCC PART 96

(3)Measurement procedure.
(i) Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's authorized frequency channel, a resolution bandwidth of no less than one percent of the fundamental emission bandwidth may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full reference bandwidth (i.e.,1 MHz or 1 percent of emission bandwidth, as specified). The fundamental emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

(ii) When measuring unwanted emissions to demonstrate compliance with the limits, the CBSD and End User Device nominal carrier frequency/channel shall be adjusted as close to the licensee's authorized frequency block edges, both upper and lower, as the design permits.

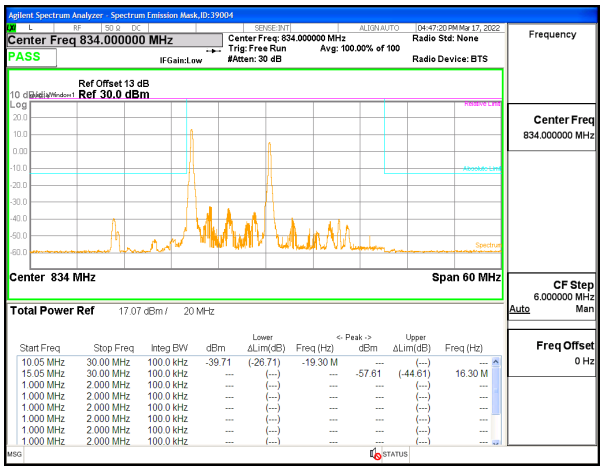
(iii) Compliance with emission limits shall be demonstrated using either average (RMS)-detected or peak-detected power measurement techniques.

RESULTS

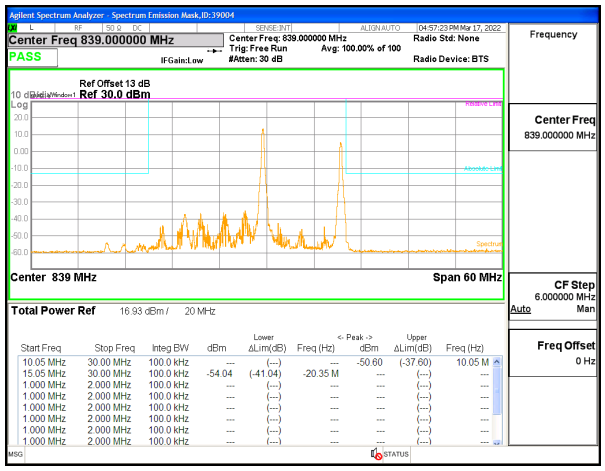
9.2.1. LTE BAND 5 EMISSION MASK

LIMITS

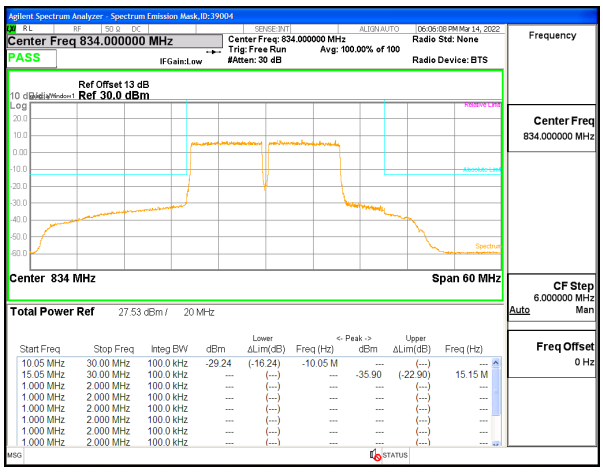
FCC: §22.917
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.



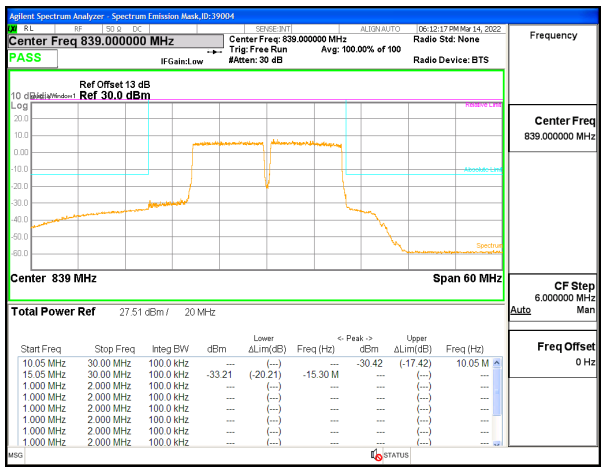
LTE B5 10MHz + 10MHz QPSK Low Ch RB1-0 + RB1-0



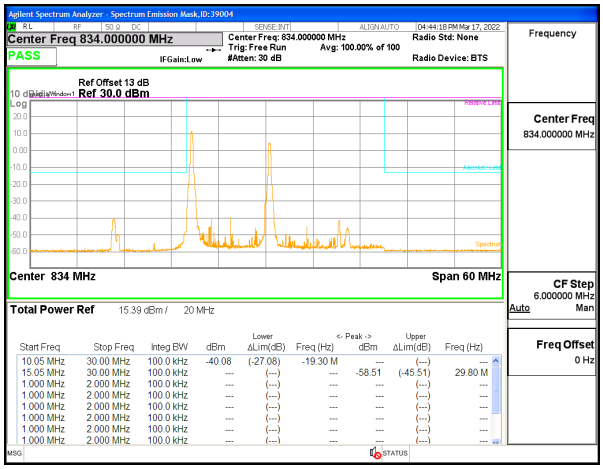
LTE B5 10MHz + 10MHz QPSK High Ch RB1-49 + RB1-49



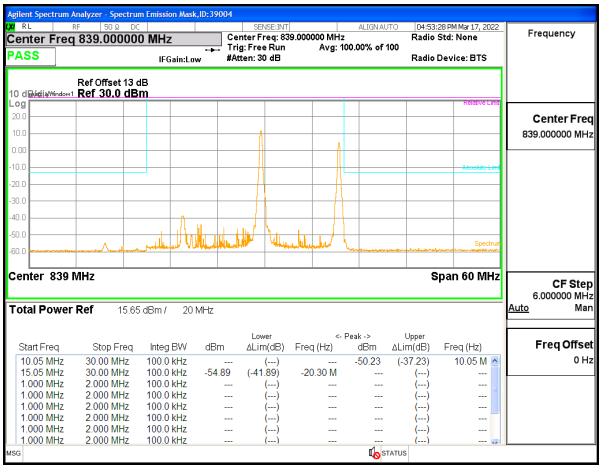
LTE B5 10MHz + 10MHz QPSK Low Ch RB50-0 + RB50-0



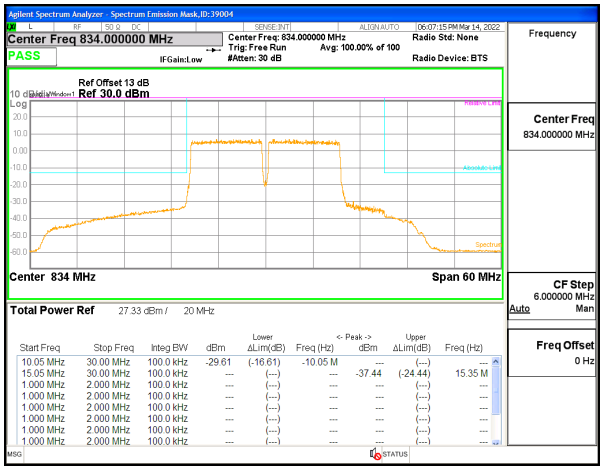
LTE B5 10MHz + 10MHz QPSK High Ch RB50-0 + RB50-0



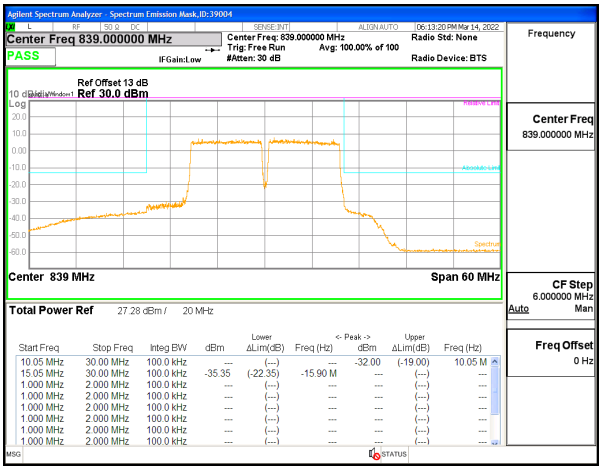
LTE B5 10MHz + 10MHz 16QAM Low Ch RB1-0 + RB1-0



LTE B5 10MHz + 10MHz 16QAM High Ch RB1-49 + RB1-49



LTE B5 10MHz + 10MHz 16QAM Low Ch RB50-0 + RB50-0

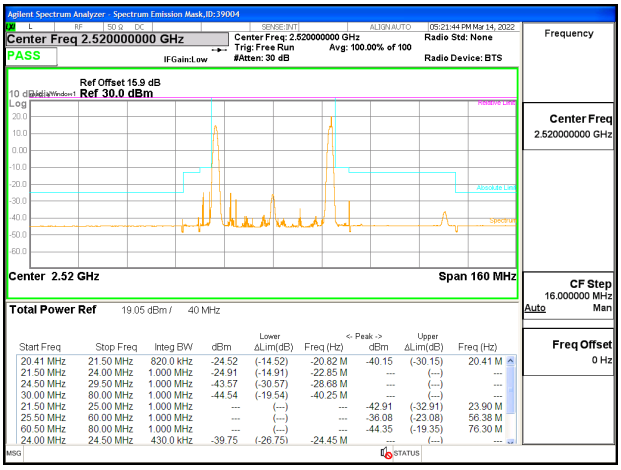


LTE B5 10MHz + 10MHz 16QAM High Ch RB50-0 + RB50-0

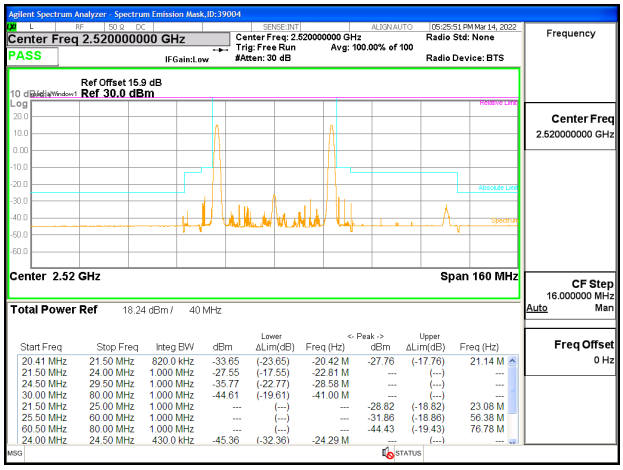
9.2.2. LTE BAND 7 EMISSION MASK

LIMITS

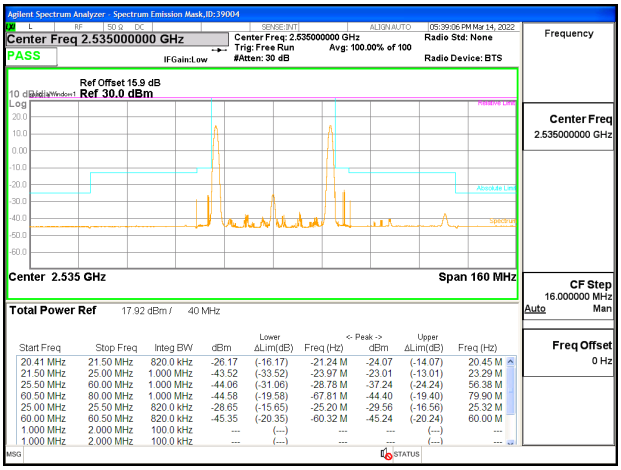
FCC: §27.53(m)(4) For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.



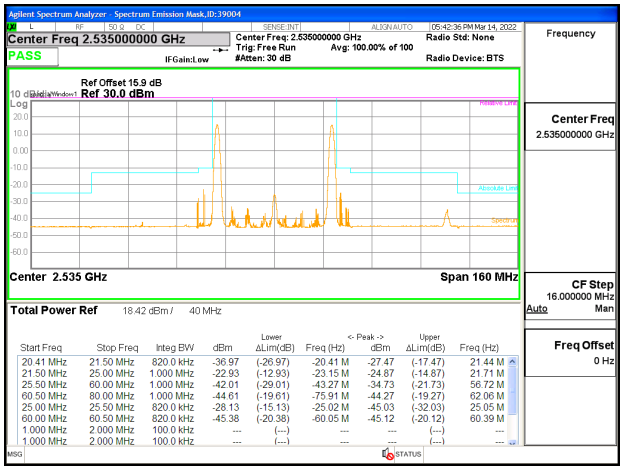
LTE B7 20MHz + 20MHz QPSK Low Ch RB1-0 + RB1-99



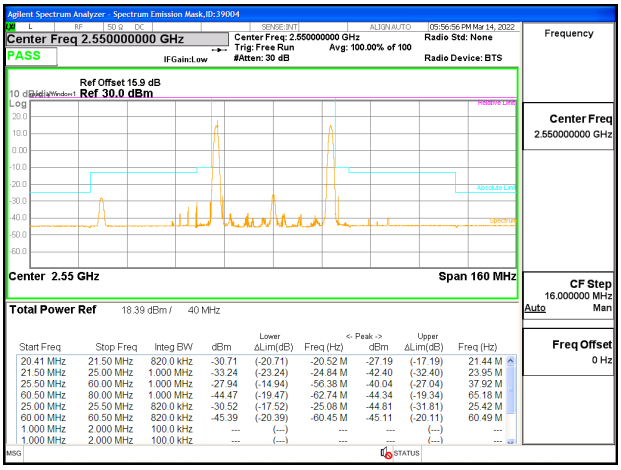
LTE B7 20MHz + 20MHz 16QAM Low Ch RB1-0 + RB1-99



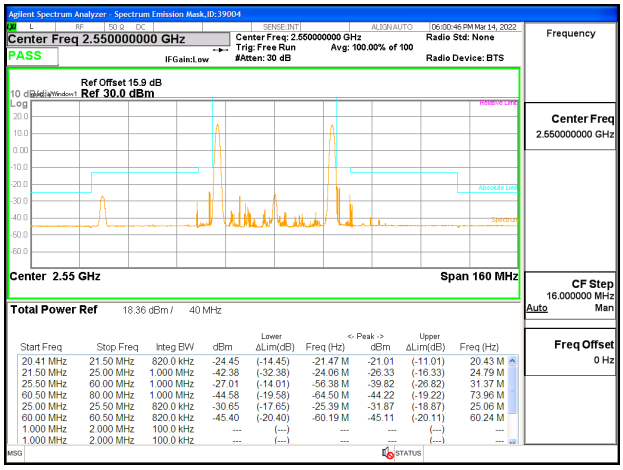
LTE B7 20MHz + 20MHz QPSK Mid Ch RB1-0 + RB1-99



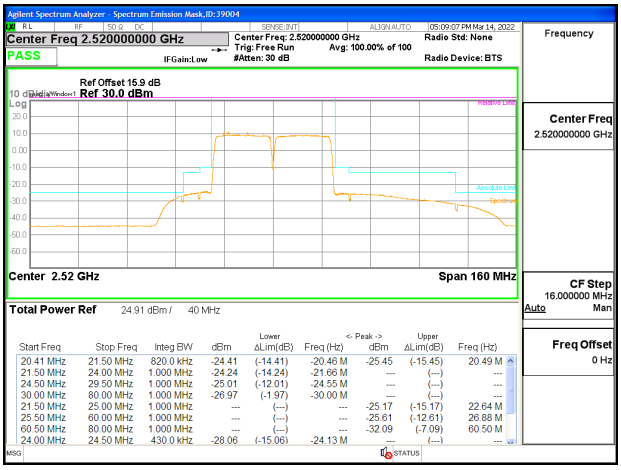
LTE B7 20MHz + 20MHz 16QAM Mid Ch RB1-0 + RB1-99



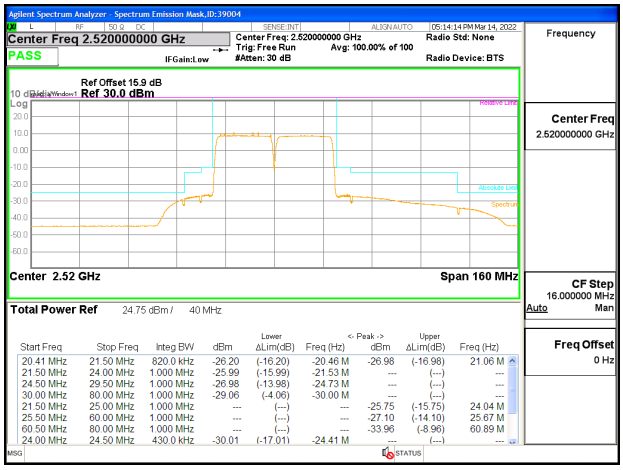
LTE B7 20MHz + 20MHz QPSK High Ch RB1-0 + RB1-99



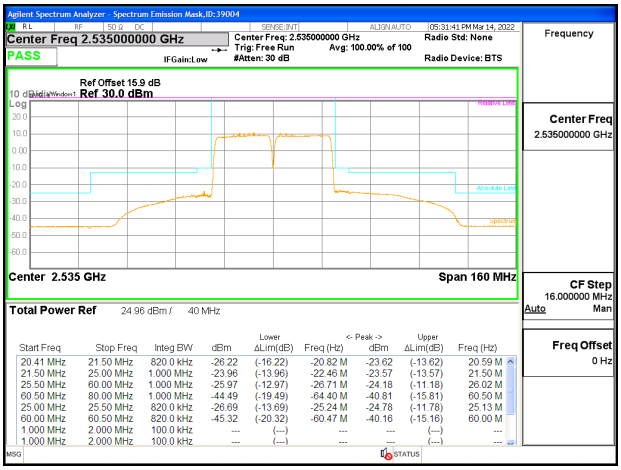
LTE B7 20MHz + 20MHz 16QAM High Ch RB1-0 + RB1-99



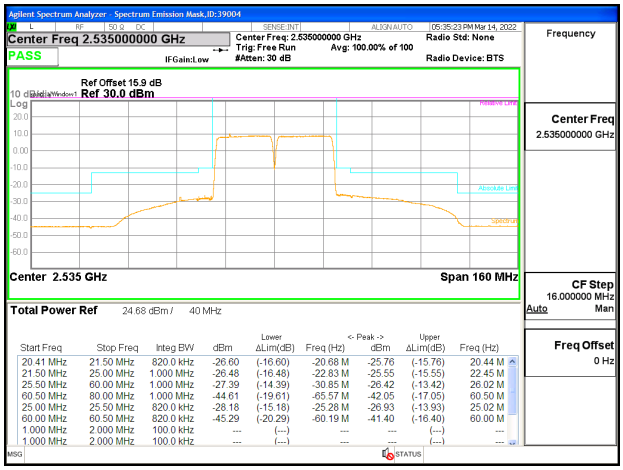
LTE B7 20MHz + 20MHz QPSK Low Ch RB100-0 + RB100-0



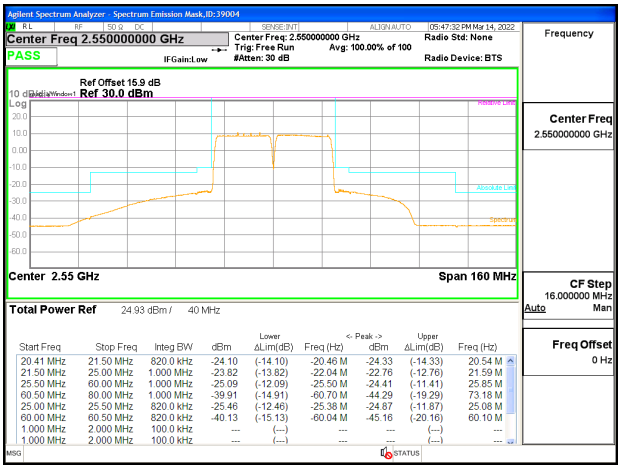
LTE B7 20MHz + 20MHz 16QAM Low Ch RB100-0 + RB100-0



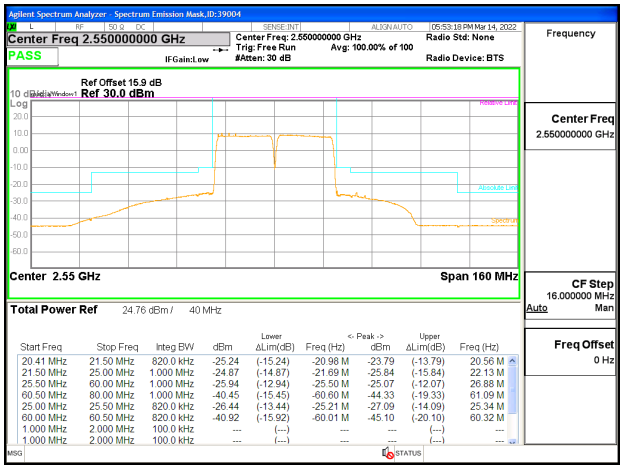
LTE B7 20MHz + 20MHz QPSK Mid Ch RB100-0 + RB100-0



LTE B7 20MHz + 20MHz 16QAM Mid Ch RB100-0 + RB100-0



LTE B7 20MHz + 20MHz QPSK High Ch RB100-0 + RB100-0

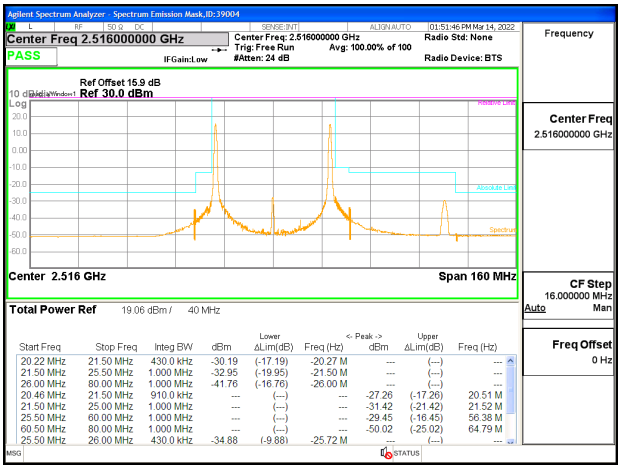


LTE B7 20MHz + 20MHz 16QAM High Ch RB100-0 + RB100-0

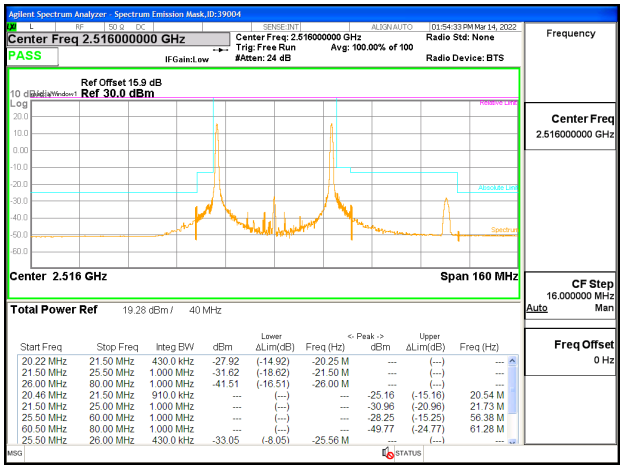
9.2.3. LTE BAND 41 EMISSION MASK

LIMITS

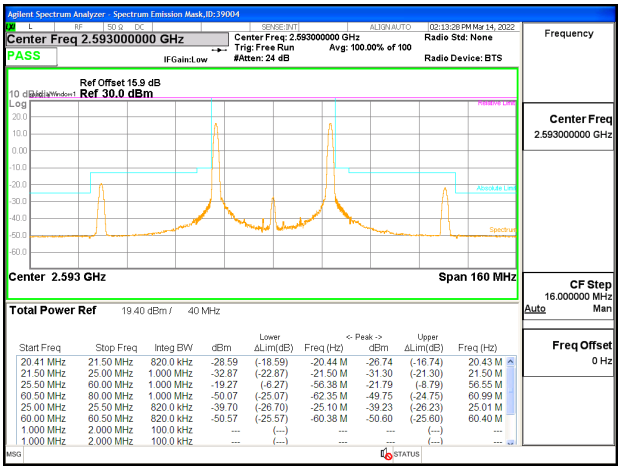
FCC: §27.53(m)(4) For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.



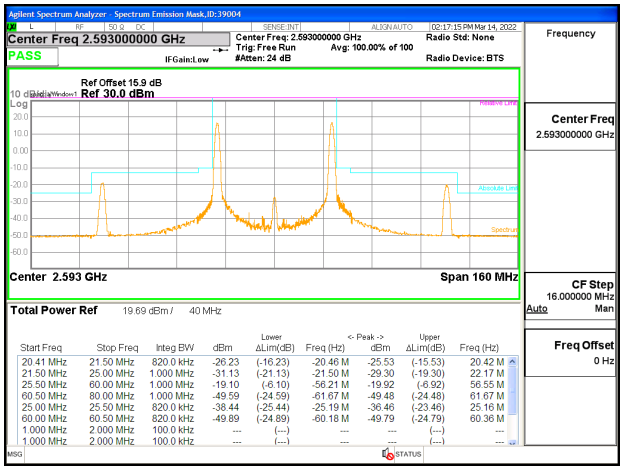
LTE B41 20MHz + 20MHz QPSK Low Ch RB1-0 + RB1-99



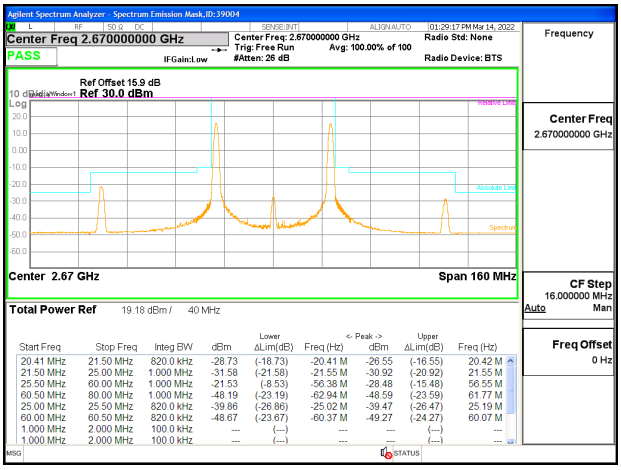
LTE B41 20MHz + 20MHz 16QAM Low Ch RB1-0 + RB1-99



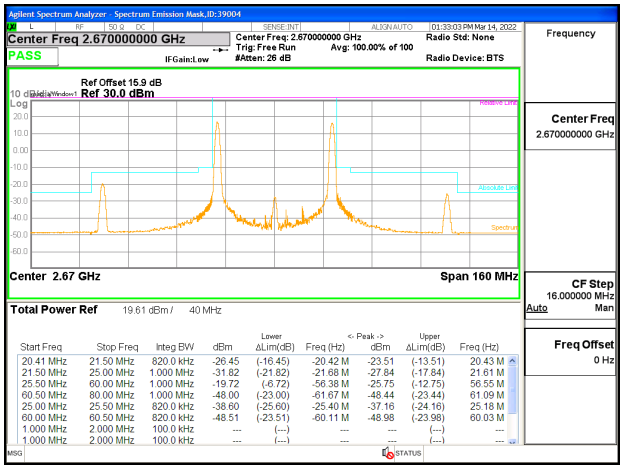
LTE B41 20MHz + 20MHz QPSK Mid Ch RB1-0 + RB1-99



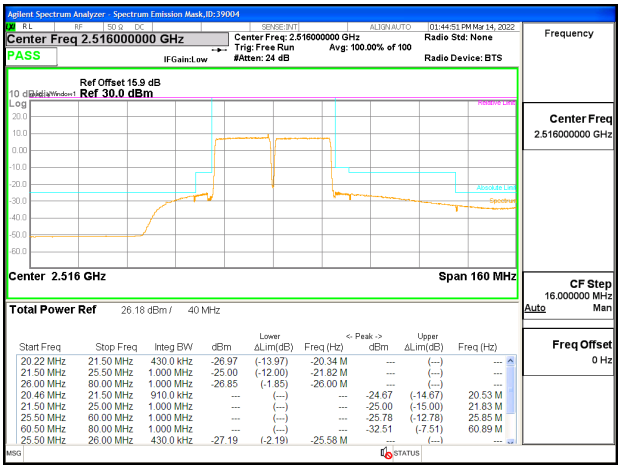
LTE B41 20MHz + 20MHz 16QAM Mid Ch RB1-0 + RB1-99



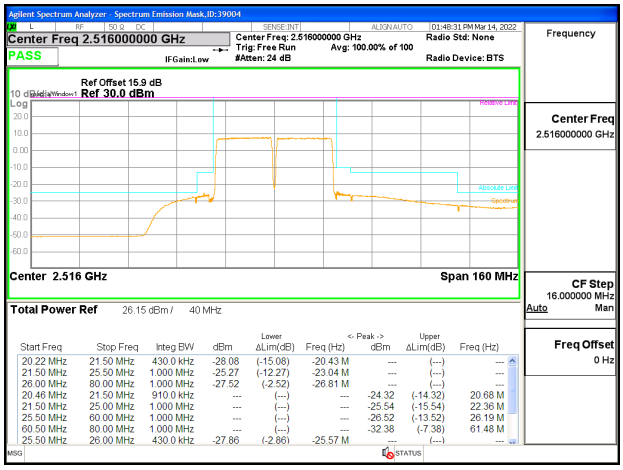
LTE B41 20MHz + 20MHz QPSK High Ch RB1-0 + RB1-99



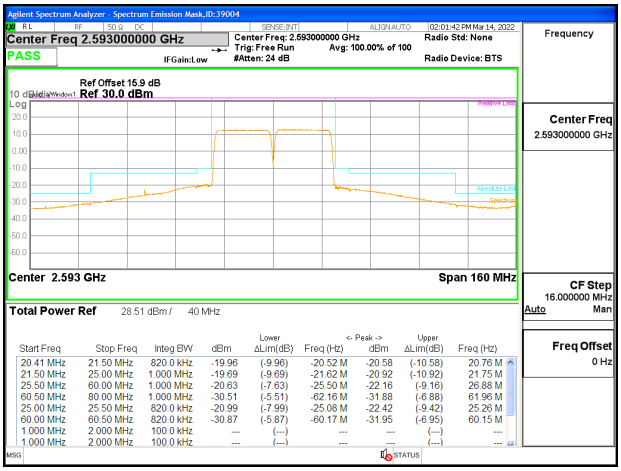
LTE B41 20MHz + 20MHz 16QAM High Ch RB1-0 + RB1-99



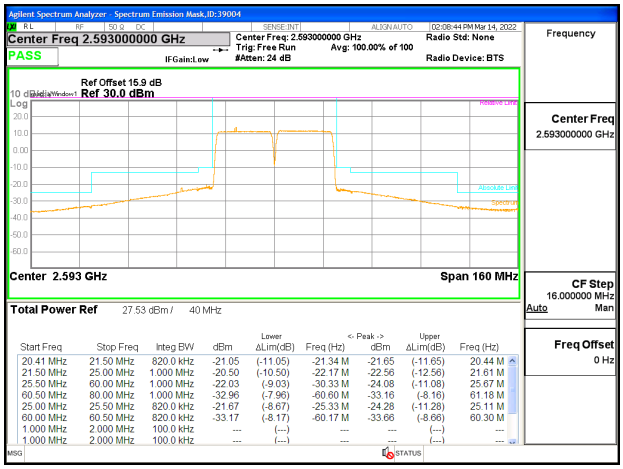
LTE B41 20MHz + 20MHz QPSK Low Ch RB100-0 + RB100-0



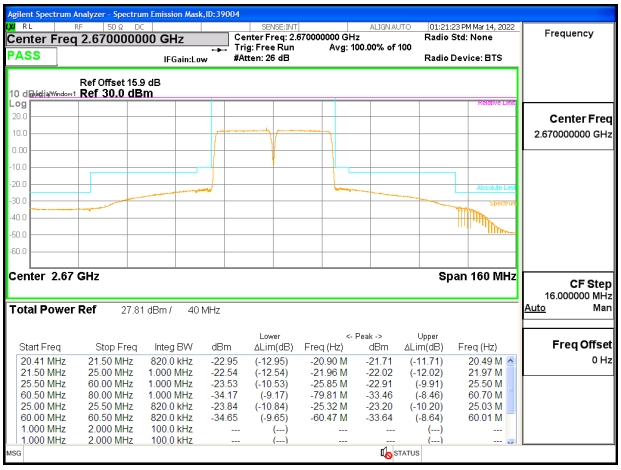
LTE B41 20MHz + 20MHz 16QAM Low Ch RB100-0 + RB100-0



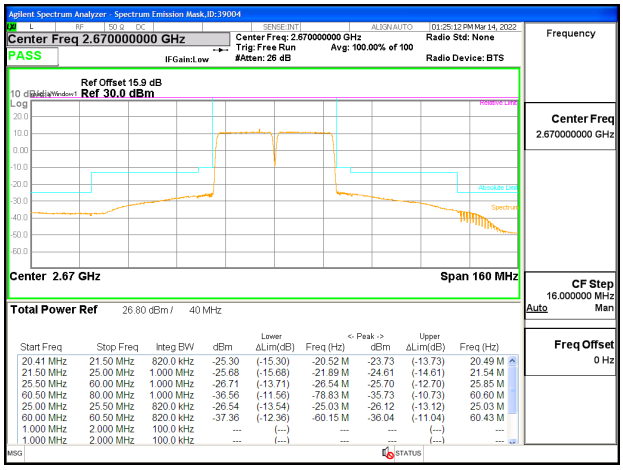
LTE B41 20MHz + 20MHz QPSK Mid Ch RB100-0 + RB100-0



LTE B41 20MHz + 20MHz 16QAM Mid Ch RB100-0 + RB100-0



LTE B41 20MHz + 20MHz QPSK High Ch RB100-0 + RB100-0



LTE B41 20MHz + 20MHz 16QAM High Ch RB100-0 + RB100-0

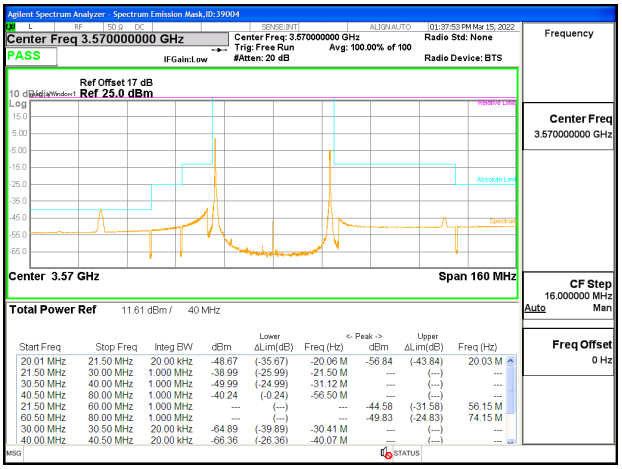
9.2.4. LTE BAND 48 EMISSION MASK AND ADJACENT CHANNEL POWER

LIMITS

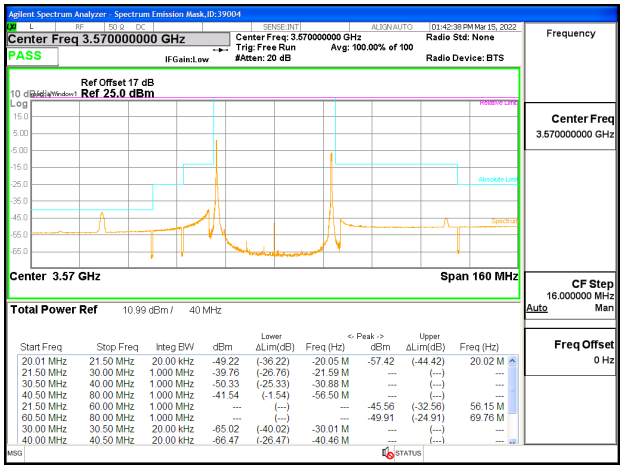
FCC: §96.41
(e) 3.5 GHz Emissions and Interference Limits—
(1) General protection levels
(ii) Except as otherwise specified in paragraph (e)(2) of this section, for channel and frequency assignments made by a CBSD to End User Devices, the conducted power of any End User Device emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed −13 dBm/MHz within 0 to B megahertz (where B is the bandwidth in megahertz of the assigned channel or multiple contiguous channels of the End User Device) above the upper CBSD-assigned channel edge and within 0 to B megahertz below the lower CBSD-assigned channel edge. At all frequencies greater than B megahertz above the upper CBSD assigned channel edge and less than B megahertz below the lower CBSD-assigned channel edge, the conducted power of any End User Device emission shall not exceed −25 dBm/MHz. Notwithstanding the emission limits in this paragraph, the Adjacent Channel Leakage Ratio for End User Devices shall be at least 30 dB.

(2) Additional protection levels. Notwithstanding paragraph (e)(1) of this section, for CBSDs and End User Devices, the conducted power of emissions below 3540 MHz or above 3710 MHz shall not exceed −25 dBm/MHz, and the conducted power of emissions below 3530 MHz or above 3720 MHz shall not exceed −40dBm/MHz.
licensees.

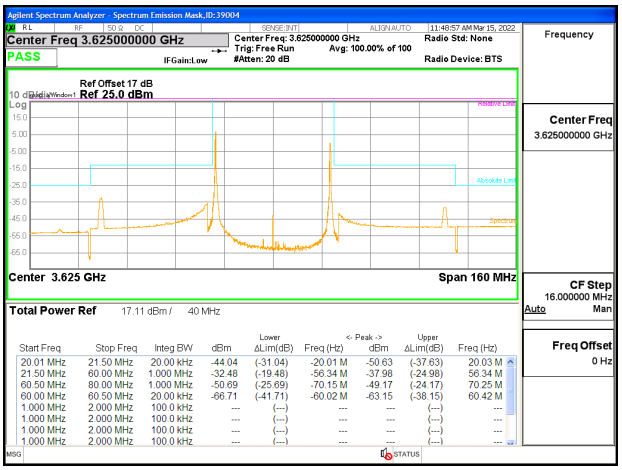
LTE BAND 48 EMISSION MASK



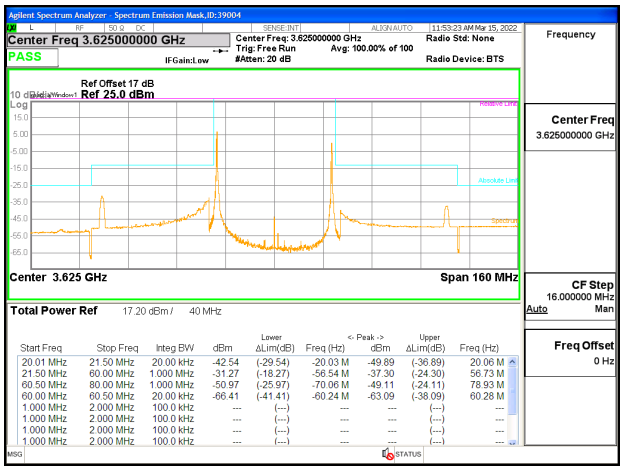
LTE B48 20MHz + 20MHz QPSK Low Ch RB1-0 + RB1-99



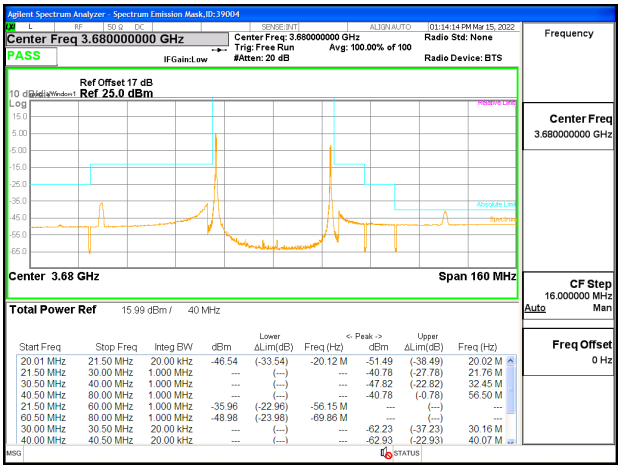
LTE B48 20MHz + 20MHz 16QAM Low Ch RB1-0 + RB1-99



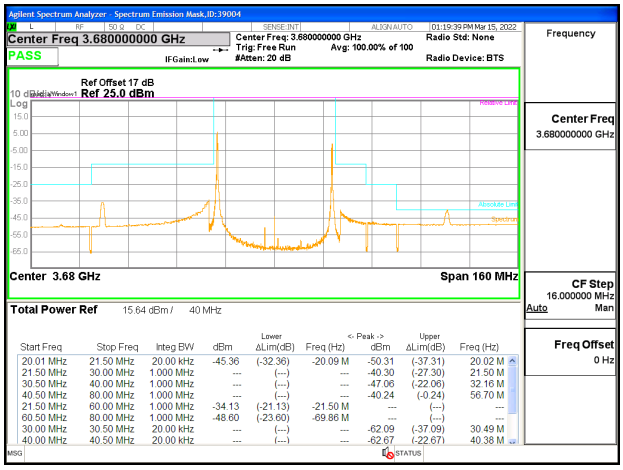
LTE B48 20MHz + 20MHz QPSK Mid Ch RB1-0 + RB1-99



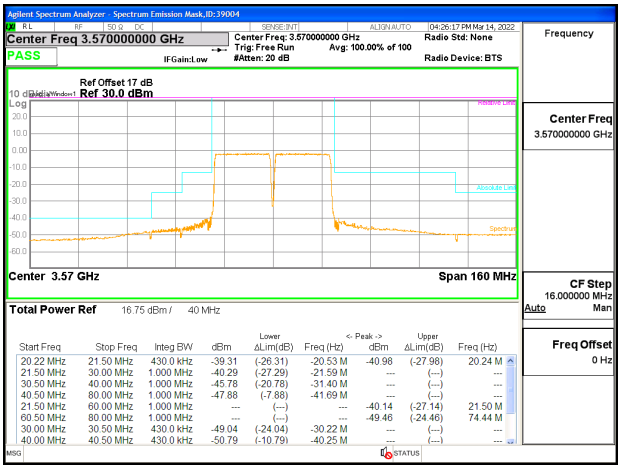
LTE B48 20MHz + 20MHz 16QAM Mid Ch RB1-0 + RB1-99



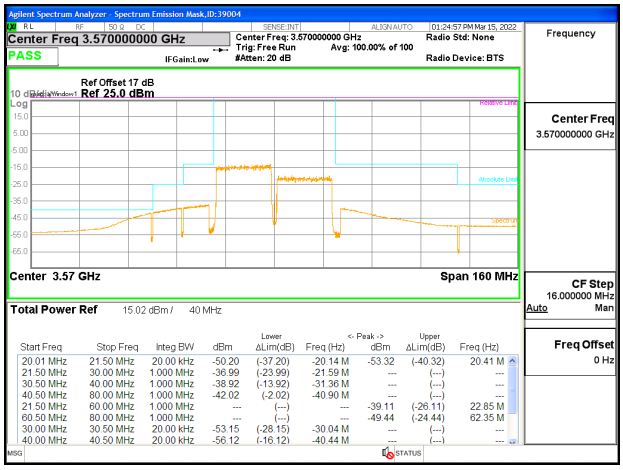
LTE B48 20MHz + 20MHz QPSK High Ch RB1-0 + RB1-99



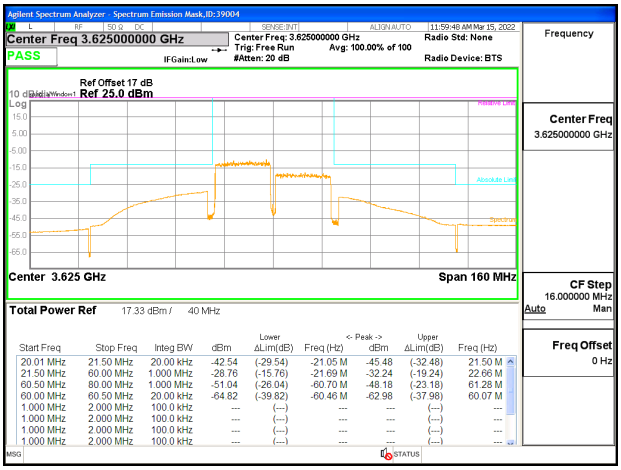
LTE B48 20MHz + 20MHz 16QAM High Ch RB1-0 + RB1-99



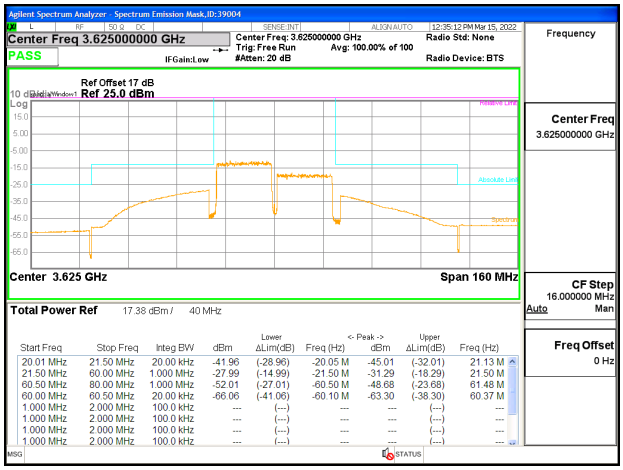
LTE B48 20MHz + 20MHz QPSK Low Ch RB100-0 + RB100-0



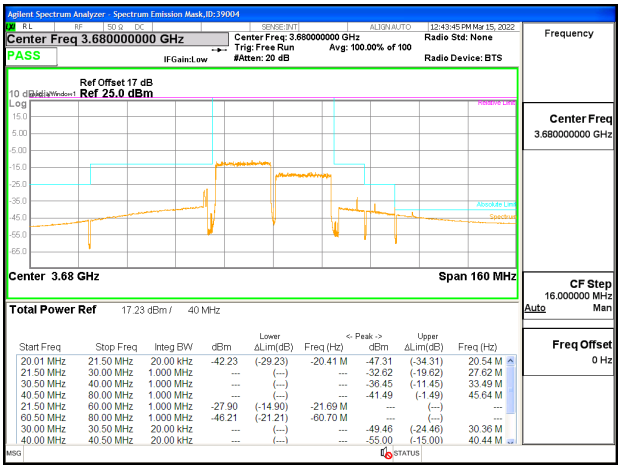
LTE B48 20MHz + 20MHz 16QAM Low Ch RB100-0 + RB100-0



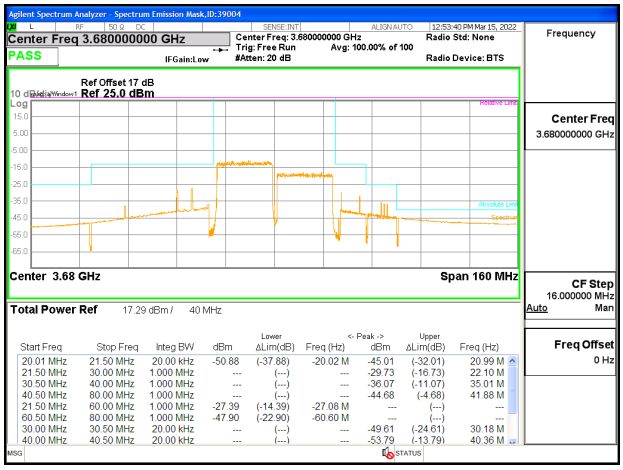
LTE B48 20MHz + 20MHz QPSK Mid Ch RB100-0 + RB100-0



LTE B48 20MHz + 20MHz 16QAM Mid Ch RB100-0 + RB100-0

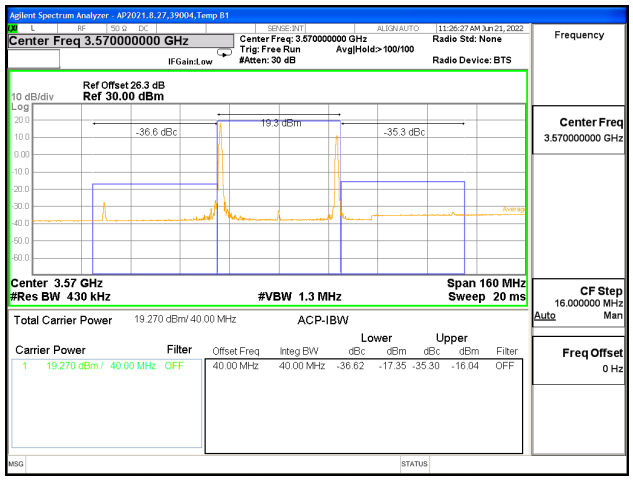


LTE B48 20MHz + 20MHz QPSK High Ch RB100-0 + RB100-0

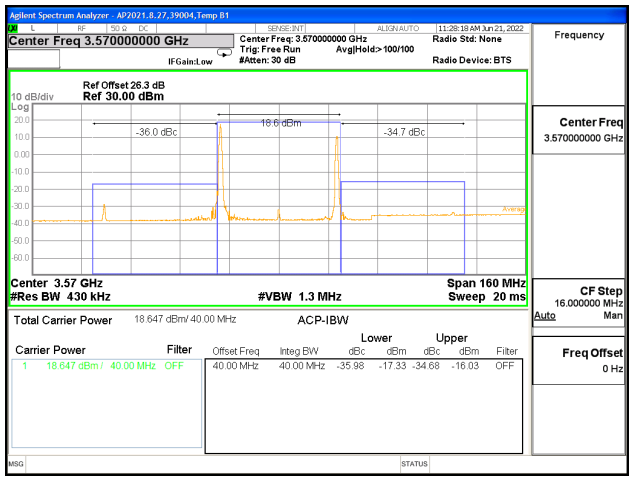


LTE B48 20MHz + 20MHz 16QAM High Ch RB100-0 + RB100-0

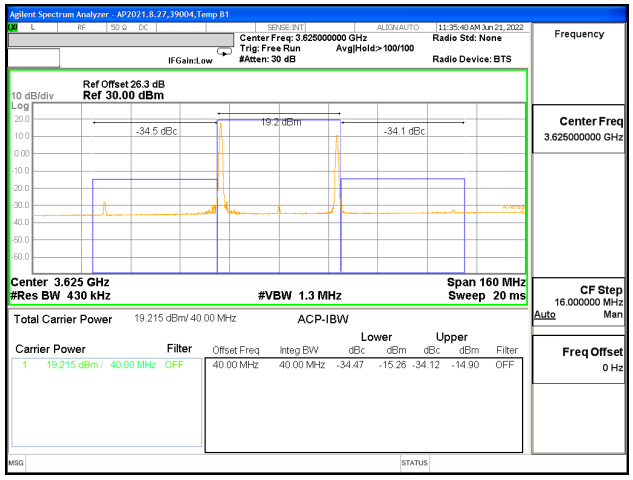
LTE BAND 48 ADJACENT CHANNEL POWER



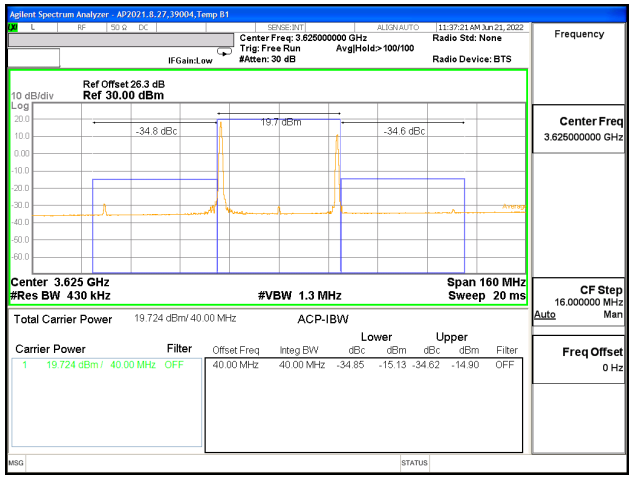
LTE B48 20MHz + 20MHz QPSK Low Ch RB1-0 + RB1-99



LTE B48 20MHz + 20MHz 16QAM Low Ch RB1-0 + RB1-99

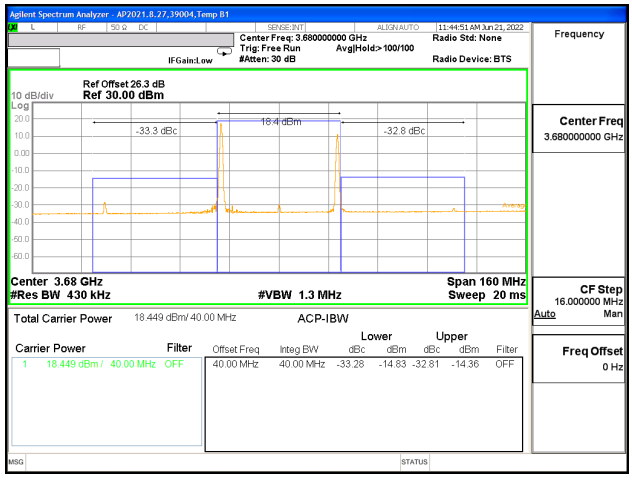


LTE B48 20MHz + 20MHz QPSK Mid Ch RB1-0 + RB1-99

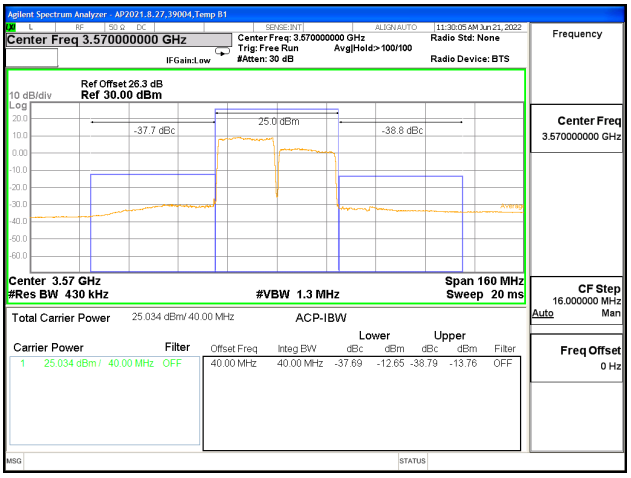


LTE B48 20MHz + 20MHz 16QAM Mid Ch RB1-0 + RB1-99

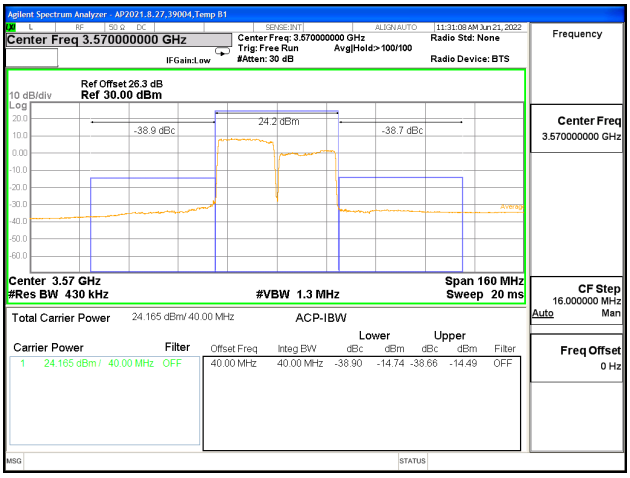
LTE B48 20MHz + 20MHz QPSK High Ch RB1-0 + RB1-99



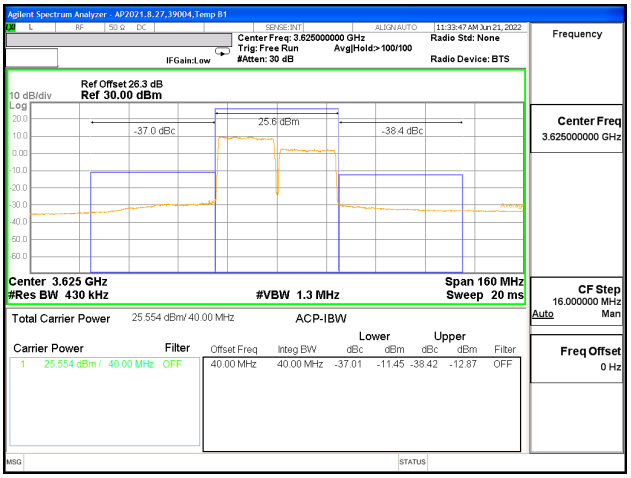
LTE B48 20MHz + 20MHz 16QAM High Ch RB1-0 + RB1-99



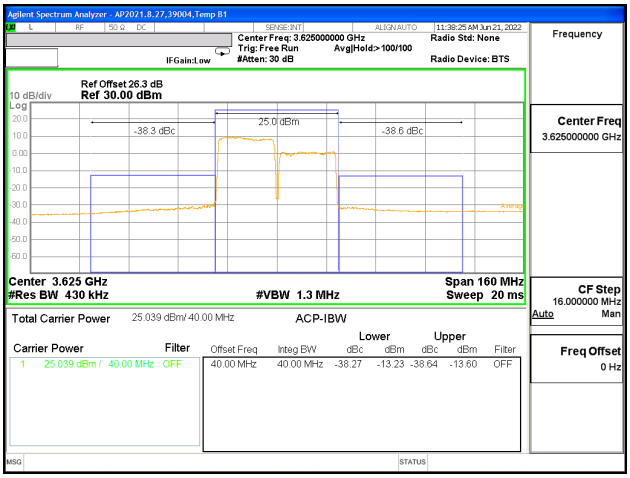
LTE B48 20MHz + 20MHz QPSK Low Ch RB100-0 + RB100-0



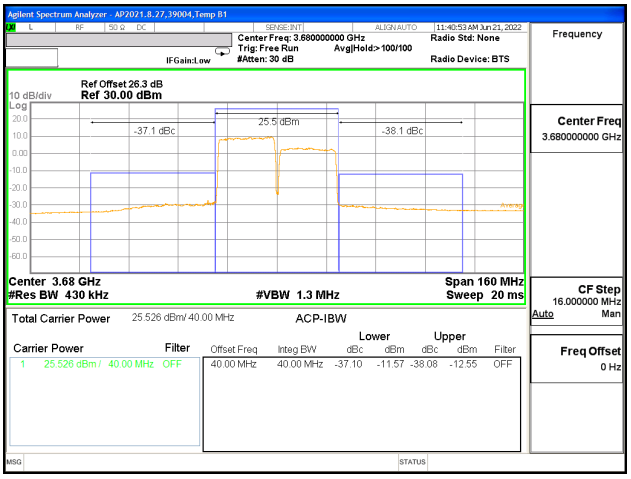
LTE B48 20MHz + 20MHz 16QAM Low Ch RB100-0 + RB100-0



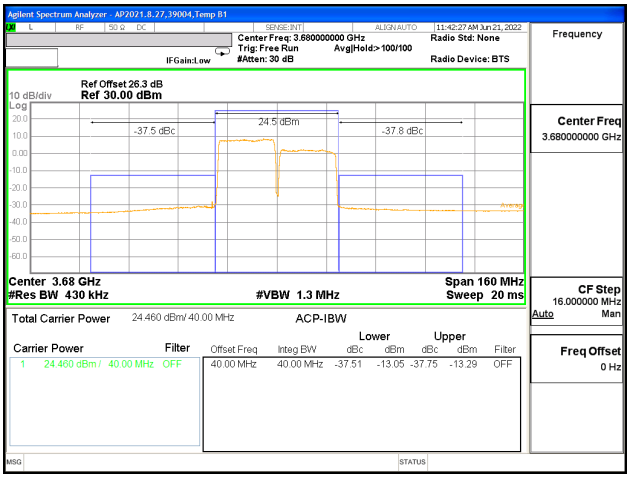
LTE B48 20MHz + 20MHz QPSK Mid Ch RB100-0 + RB100-0



LTE B48 20MHz + 20MHz 16QAM Mid Ch RB100-0 + RB100-0



LTE B48 20MHz + 20MHz QPSK High Ch RB100-0 + RB100-0



LTE B48 20MHz + 20MHz 16QAM High Ch RB100-0 + RB100-0

9.3. OUT OF BAND EMISSIONS

TEST PROCEDURE

The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic. Multiple sweeps were recorded in maximum hold mode using a peak detector to ensure that the worst-case emissions were caught.

For each out of band emissions measurement:

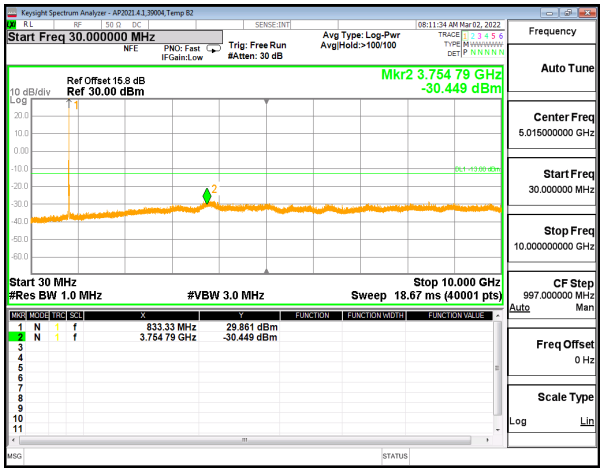
- Set display line at -13 dBm to band 5 and -25 dBm to band 7 and 41
- Set RBW & VBW to 100 kHz for the measurement below 1 GHz, and 1 MHz for the measurement above 1 GHz. (NOTE: Worst case set RBW/VBW to 1MHz/3MHz)

RESULTS

9.3.1. LTE BAND 5

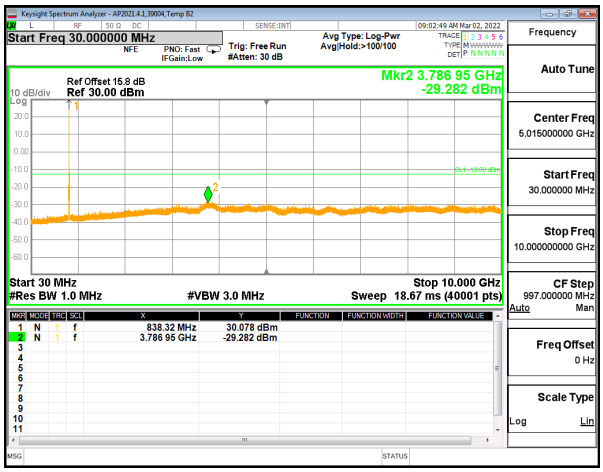
LIMITS

FCC: §22.917
The minimum permissible attenuation level of any spurious emissions is 43 + 10 log (P) dB where transmitting power (P) in Watts.



LTE B5 10MHz + 10MHz QPSK Low Ch RB1-49 + RB1-0

LTE B5 10MHz + 10MHz QPSK Middle Ch RB1-49 + RB1-0

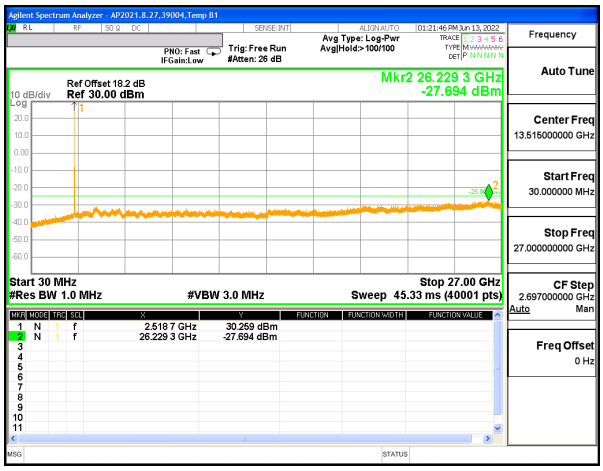


LTE B5 10MHz + 10MHz QPSK High Ch RB1-49 + RB1-0

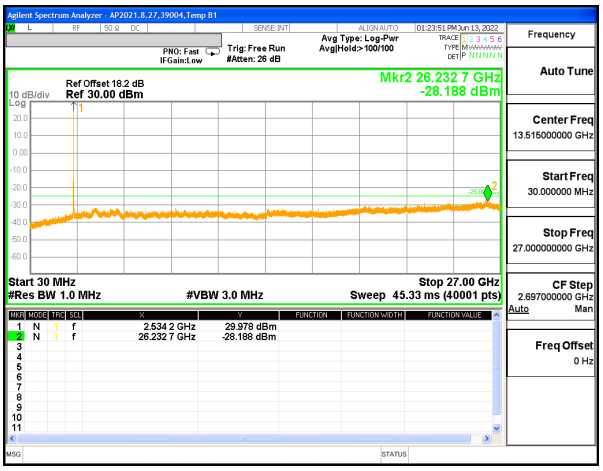
9.3.2. LTE BAND 7

LIMITS

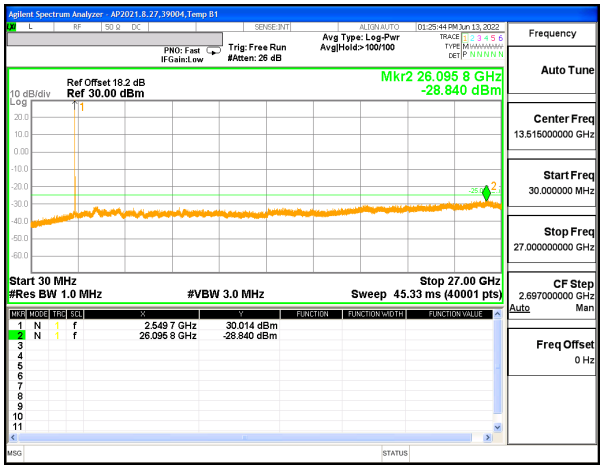
FCC: §27.53 (m)
The minimum permissible attenuation level of any spurious emissions is 55 + 10 log (P) dB where transmitting power (P) in Watts.



LTE B7 20MHz + 20MHz QPSK Low Ch RB1-99 + RB1-0



LTE B7 20MHz + 20MHz QPSK Middle Ch RB1-99 + RB1-0

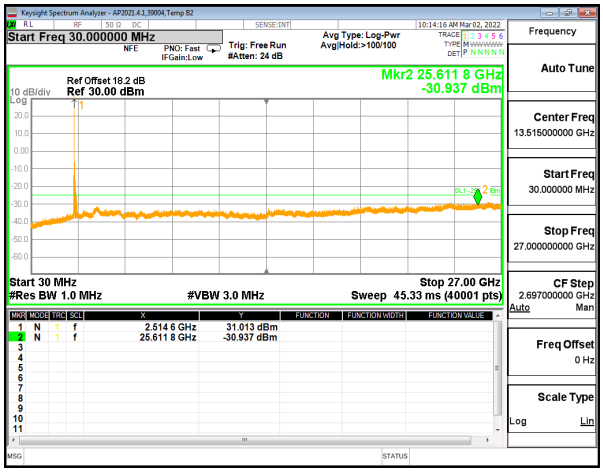


LTE B7 20MHz + 20MHz QPSK High Ch RB1-99 + RB1-0

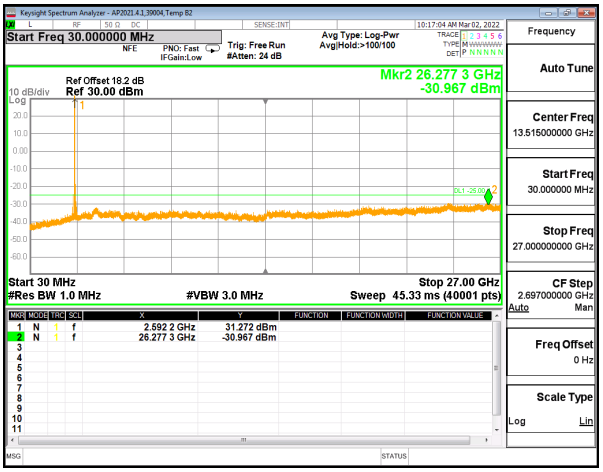
9.3.3. LTE BAND 41

LIMITS

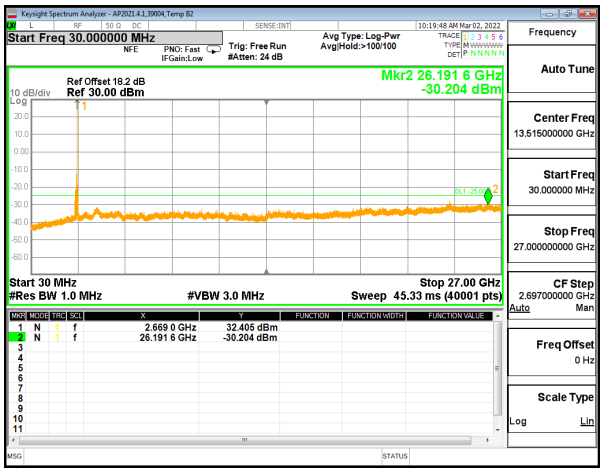
FCC: §27.53 (m)
The minimum permissible attenuation level of any spurious emissions is 55 + 10 log (P) dB where transmitting power (P) in Watts.



LTE B41 20MHz + 20MHz QPSK Low Ch RB1-99 + RB1-0



LTE B41 20MHz + 20MHz QPSK Middle Ch RB1-99 + RB1-0



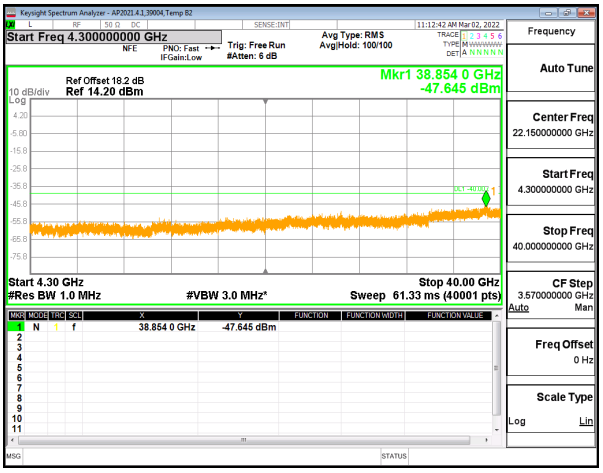
LTE B41 20MHz + 20MHz QPSK High Ch RB1-99 + RB1-0

9.3.4. LTE BAND 48

LIMITS

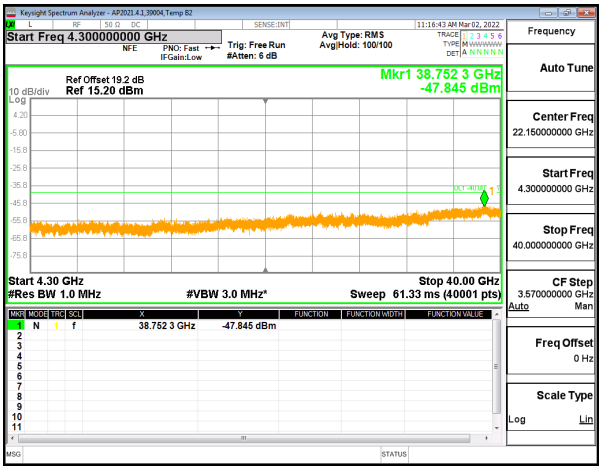
FCC: §96.41
(e) 3.5 GHz Emissions and Interference Limits—
(2) Additional protection levels. Notwithstanding paragraph (e)(1) of this section, for CBSDs and End User Devices, the conducted power of emissions below 3540 MHz or above 3710 MHz shall not exceed −25 dBm/MHz, and the conducted power of emissions below 3530 MHz or above 3720 MHz shall not exceed −40dBm/MHz.

LTE B48 20MHz + 20MHz QPSK Low Ch RB1-99 + RB1-0

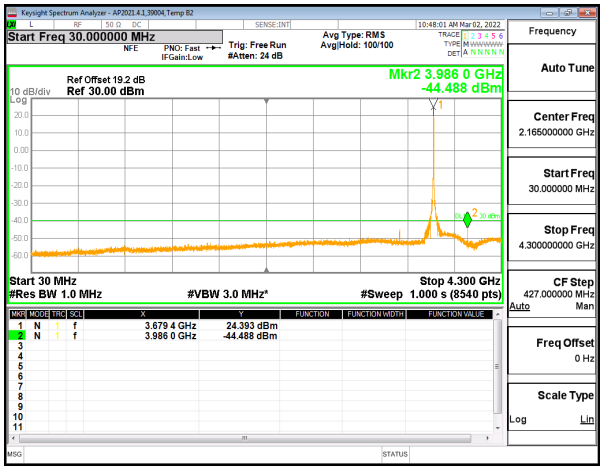


LTE B48 20MHz + 20MHz QPSK Low Ch RB1-99 + RB1-0

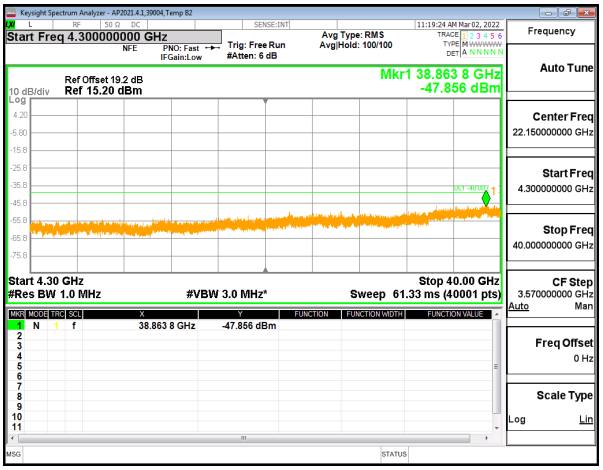
LTE B48 20MHz + 20MHz QPSK Middle Ch RB1-99 + RB1-0



LTE B48 20MHz + 20MHz QPSK Middle Ch RB1-99 + RB1-0



LTE B48 20MHz + 20MHz QPSK High Ch RB1-99 + RB1-0



LTE B48 20MHz + 20MHz QPSK High Ch RB1-99 + RB1-0

9.4. FREQUENCY STABILITY

TEST PROCEDURE

Use CMW 500 with Frequency Error measurement capability.

- Temp. = −30°C to +50°C
- Voltage = (85% - 115%)

  Low voltage, 3.23VDC, Normal, 3.8VDC and High voltage, 4.37VDC.
  End Voltage, 3.2VDC.

Frequency Stability vs Temperature:
The EUT is place inside a temperature chamber. The temperature is set to 20ºC and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize and soak, and then the measurement is repeated. This is repeated until +50ºC is reached.

Frequency Stability vs Voltage:
The peak frequency error is recorded (worst-case).

RESULTS

See the following pages.

9.4.1. LTE BAND 5

LIMITS

FCC §22.355
The carrier frequency shall not depart from the reference frequency in excess of ±2.5 ppm for mobile stations.

Test Engineer ID:	38602	Test Date:	3/17/2022

QPSK (10MHz + 10MHz BANDWIDTH)

Band	5	Frequency Range		Frequency Error Reading (Hz)	Limit	
Condition		824	849		2.5	
Temperature	Voltage	Freq Reading @ Low End (MHz)	Freq Reading @ High End (MHz)		Frequency Stability (ppm)	Within Authorized Frequency Block (Hz)
Normal (20°C)		824.5647	848.4317			
Extreme (50°C)		824.5647	848.4317	13.4	0.016	Yes
Extreme (40°C)		824.5647	848.4317	21.6	0.026	Yes
Extreme (30°C)		824.5647	848.4317	23.5	0.028	Yes
Extreme (10°C)	Normal	824.5647	848.4317	23.3	0.028	Yes
Extreme (0°C)		824.5647	848.4317	14.9	0.018	Yes
Extreme (-10°C)		824.5647	848.4317	1.3	0.002	Yes
Extreme (-20°C)		824.5647	848.4317	-12.4	-0.015	Yes
Extreme (-30°C)		824.5647	848.4317	-24.2	-0.029	Yes
20°C	15%	824.5647	848.4317	13.5	0.016	Yes
	-15%	824.5647	848.4317	20.4	0.024	Yes
	End Point Voltage	824.5647	848.4317	-34.3	-0.041	Yes

9.4.2. LTE BAND 7

LIMITS

FCC: §27.54
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test Engineer ID:	38602	Test Date:	3/17/2022

QPSK (20MHz + 20MHz BANDWIDTH)

Band	7	Frequency Range		Frequency Error Reading (Hz)	Limit	
Condition		2500	2570			
Temperature	Voltage	Freq Reading @ Low End (MHz)	Freq Reading @ High End (MHz)		Frequency Stability (ppm)	Within Authorized Frequency Block (Hz)
Normal (20°C)	Normal	2501.1209	2568.7677			
Extreme (50°C)		2501.1209	2568.7677	33.2	0.013	Yes
Extreme (40°C)		2501.1209	2568.7677	41.1	0.016	Yes
Extreme (30°C)		2501.1209	2568.7677	43.4	0.017	Yes
Extreme (10°C)		2501.1210	2568.7678	50.2	0.020	Yes
Extreme (0°C)		2501.1209	2568.7677	47.7	0.019	Yes
Extreme (-10°C)		2501.1209	2568.7677	32.8	0.013	Yes
Extreme (-20°C)		2501.1209	2568.7677	8.8	0.003	Yes
Extreme (-30°C)		2501.1209	2568.7677	-14.2	-0.006	Yes
20°C	15%	2501.1209	2568.7677	15.8	0.006	Yes
	-15%	2501.1209	2568.7677	-10.3	-0.004	Yes
	End Point Voltage	2501.1209	2568.7677	-38.7	-0.015	Yes

9.4.3. LTE BAND 41

LIMITS

FCC: §27.54
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test Engineer ID:	38602	Test Date:	3/18/2022

QPSK (20MHz + 20MHz BANDWIDTH)

Band	41	Frequency Range		Frequency Error Reading (Hz)	Limit	
Condition		2496	2690		0	
Temperature	Voltage	Freq Reading @ Low End (MHz)	Freq Reading @ High End (MHz)		Frequency Stability (ppm)	Within Authorized Frequency Block (Hz)
Normal (20°C)	Normal	2496.8748	2689.2968			
Extreme (50°C)		2496.8748	2689.2968	-44.6	-0.017	Yes
Extreme (40°C)		2496.8748	2689.2968	-42.4	-0.016	Yes
Extreme (30°C)		2496.8748	2689.2968	-29.9	-0.012	Yes
Extreme (10°C)		2496.8748	2689.2968	-22.8	-0.009	Yes
Extreme (0°C)		2496.8748	2689.2968	-7.7	-0.003	Yes
Extreme (-10°C)		2496.8748	2689.2968	-15.6	-0.006	Yes
Extreme (-20°C)		2496.8748	2689.2968	-22.2	-0.009	Yes
Extreme (-30°C)		2496.8747	2689.2967	-63.4	-0.024	Yes
20°C	15%	2496.8748	2689.2968	-42.2	42.2	Yes
	-15%	2496.8748	2689.2968	-15.5	15.5	Yes
	End Point Voltage	2496.8747	2689.2967	-66.1	-66.1	Yes

9.4.4. LTE BAND 48

LIMITS

FCC: §27.54
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test Engineer ID:	38602	Test Date:	3/18/2022

QPSK (20MHz + 20MHz BANDWIDTH)

Band	48	Frequency Range		Frequency Error Reading (Hz)	Limit	
Condition		3550	3700			
Temperature	Voltage	Freq Reading @ Low End (MHz)	Freq Reading @ High End (MHz)		Frequency Stability (ppm)	Within Authorized Frequency Block (Hz)
Normal (20°C)	Normal	3550.8859	3699.2877			
Extreme (50°C)		3550.8859	3699.2877	45.8	0.013	Yes
Extreme (40°C)		3550.8859	3699.2877	45.3	0.012	Yes
Extreme (30°C)		3550.8859	3699.2877	38.5	0.011	Yes
Extreme (10°C)		3550.8859	3699.2877	45.7	0.013	Yes
Extreme (0°C)		3550.8859	3699.2877	25.8	0.007	Yes
Extreme (-10°C)		3550.8859	3699.2877	2.5	0.001	Yes
Extreme (-20°C)		3550.8859	3699.2877	-41.4	-0.011	Yes
Extreme (-30°C)		3550.8858	3699.2876	-59.2	-0.016	Yes
20°C	15%	3550.8859	3699.2877	48.4	42.2	Yes
	-15%	3550.8859	3699.2877	29.7	15.5	Yes
	End Point Voltage	3550.8858	3699.2876	-62.2	-66.1	Yes

9.5. PEAK-TO-AVERAGE POWER RATIO

LIMIT

In addition, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time and shall use a signal corresponding to the highest PAPR during periods of continuous transmission.

RESULT

Test was performed on Antenna 1 or 7; full resource block (FRB) for each bandwidth was used to measure as the worst case. The results from all CCDF measurements are passed with 13dB peak-to-average ratio criteria.

9.5.1. LTE BAND 5

Test Engineer ID:	38602	Test Date:	3/1/2022

Band	Bandwidth (MHz)	PCC f (MHz)	SCC1 f (MHz)	Modulation	Conducted Power (dBm)		Peak-to-Average Power Ratio (dB)
					Peak	Average	
Band 5	3MHz / 5MHz	834.0	837.9	QPSK	31.08	25.35	5.73
				16QAM	31.53	24.89	6.64
	5 MHz / 3MHz	835.0	838.9	QPSK	31.06	25.35	5.71
				16QAM	31.53	24.90	6.63
	5MHz / 10MHz	831.6	838.8	QPSK	31.52	25.17	6.35
				16QAM	29.49	23.62	5.87
	10MHz / 5MHz	834.3	841.5	QPSK	31.48	25.17	6.31
				16QAM	31.44	24.16	7.28
	10MHz / 10MHz	831.5	841.4	QPSK	31.49	25.16	6.33
				16QAM	31.34	24.17	7.17
Duty Cycle Correction Factor (dB) =			0.00				
Peak-to-Average Power Ratio= Peak Reading - Average Reading - Duty Cycle Correction Factor							

9.5.2. LTE BAND 7

Test Engineer ID:	38602	Test Date:	3/1/2022

Band	Bandwidth (MHz)	PCC f (MHz)	SCC1 f (MHz)	Modulation	Conducted Power (dBm)		Peak-to-Average Power Ratio (dB)
					Peak	Average	
Band 7	10MHz / 20MHz	2525.6	2540.0	QPSK	31.07	25.15	5.92
				16QAM	31.01	24.17	6.84
	20MHz / 10MHz	2530.1	2544.5	QPSK	31.10	25.14	5.96
				16QAM	31.04	24.15	6.89
	15 MHz / 15MHz	2527.5	2542.5	QPSK	31.12	25.16	5.96
				16QAM	31.01	24.16	6.85
	15MHz / 20MHz	2525.3	2542.4	QPSK	31.15	25.17	5.98
				16QAM	31.07	24.18	6.89
	20MHz / 15MHz	2527.6	2544.7	QPSK	31.15	25.16	5.99
				16QAM	31.04	24.17	6.87
	20MHz / 20MHz	2525.1	2544.9	QPSK	31.26	25.17	6.09
				16QAM	31.24	24.14	7.10
Duty Cycle Correction Factor (dB) =			0.00				
Peak-to-Average Power Ratio= Peak Reading - Average Reading - Duty Cycle Correction Factor							

9.5.3. LTE BAND 41

Test Engineer ID:	38602	Test Date:	3/1/2022

Band	Bandwidth (MHz)	PCC f (MHz)	SCC1 f (MHz)	Modulation	Conducted Power (dBm)		Peak-to-Average Power Ratio (dB)
					Peak	Average	
Band 41	5MHz / 20MHz	2583.8	2595.5	QPSK	33.14	20.43	5.71
				16QAM	32.99	19.27	6.72
	20MHz / 5MHz	2590.5	2602.2	QPSK	33.11	20.41	5.70
				16QAM	33.16	19.39	6.77
	10MHz / 20MHz	2583.6	2598.0	QPSK	33.11	20.36	5.75
				16QAM	33.14	19.36	6.78
	20MHz / 10MHz	2588.1	2602.5	QPSK	33.13	20.36	5.77
				16QAM	33.14	19.36	6.78
	15MHz / 15MHz	2585.5	2600.5	QPSK	33.14	20.3	5.84
				16QAM	33.08	19.30	6.78
	15MHz / 20MHz	2583.3	2600.4	QPSK	33.03	20.22	5.81
				16QAM	32.97	19.23	6.74
	20MHz / 15MHz	2585.6	2602.7	QPSK	33.91	21.19	5.72
				16QAM	34.15	20.48	6.67
	20MHz / 20MHz	2583.1	2602.9	QPSK	33.10	20.19	5.91
				16QAM	33.10	19.21	6.89
Duty Cycle Correction Factor (dB) =			7.00				
Peak-to-Average Power Ratio= Peak Reading - Average Reading - Duty Cycle Correction Factor							

9.5.4. LTE BAND 48

Test Engineer ID:	38602	Test Date:	3/1/2022

Band	Bandwidth (MHz)	PCC f (MHz)	SCC1 f (MHz)	Modulation	Conducted Power (dBm)		Peak-to-Average Power Ratio (dB)
					Peak	Average	
Band 48	5MHz / 20MHz	3615.8	3627.5	QPSK	30.87	18.41	5.46
				16QAM	30.86	17.43	6.43
	20MHz / 5MHz	3622.5	3634.2	QPSK	30.92	18.36	5.56
				16QAM	30.84	17.38	6.46
	10MHz / 20MHz	3615.6	3630.0	QPSK	30.88	18.44	5.44
				16QAM	30.88	17.46	6.42
	20MHz / 10MHz	3620.1	3634.5	QPSK	30.86	18.35	5.51
				16QAM	30.55	17.07	6.48
	15MHz / 20MHz	3615.3	3632.4	QPSK	30.83	18.30	5.53
				16QAM	30.78	17.32	6.46
	20MHz / 15MHz	3617.6	3634.7	QPSK	30.85	18.30	5.55
				16QAM	30.82	17.33	6.49
	20MHz / 20MHz	3615.1	3634.9	QPSK	30.42	17.82	5.60
				16QAM	30.57	17.05	6.52
Duty Cycle Correction Factor (dB) =			7.00				
Peak-to-Average Power Ratio= Peak Reading - Average Reading - Duty Cycle Correction Factor							

10. RADIATED TEST RESULTS

Radiated measurement using the Field Strength Method

Using the test configuration shown in Figure 6 below, we measure the radiated emissions directly from the EUT and convert the measured field strength or received power to ERP or EIRP, as required, for comparison to the applicable limits. As stated in 5.5.1 of ANSI C63.26-2015, the field strength measurement method using a test site validated to the requirements of ANSI C63.4 is an alternative to the substitution measurement method.

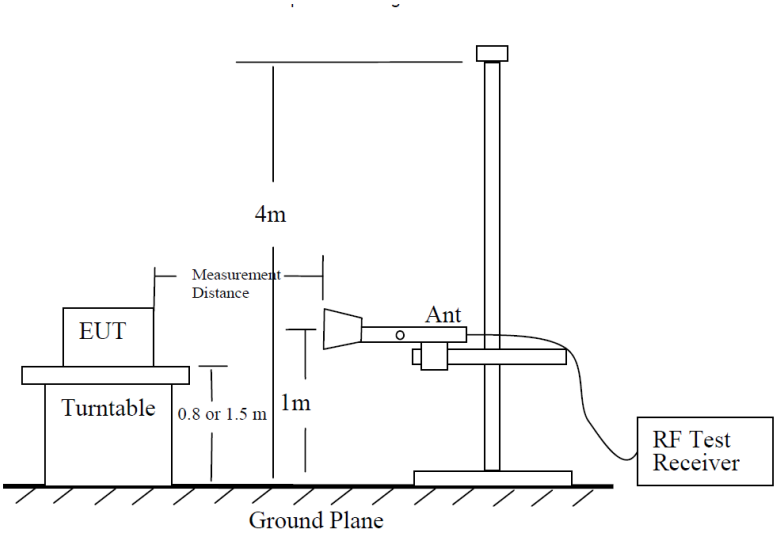


Figure 6—Test site-up for radiated ERP and/or EIRP measurements

Radiated Power Measurement Calculation According to ANSI C63.26-2015

a) E (dBµV/m) = Measured amplitude level (dBµV) + Cable Loss (dB) + Antenna Factor (dB/m).

b) E (dBµV/m) = Measured amplitude level (dBm) + 107 + Cable Loss (dB) + Antenna Factor (dB/m).

c) E (dBµV/m) = EIRP (dBm) − 20log(D) + 104.8; where D is the measurement distance (in the far field region) in m.

d) EIRP (dBm) = E (dBµV/m) + 20log(D) − 104.8; where D is the measurement distance (in the far field region) in m.

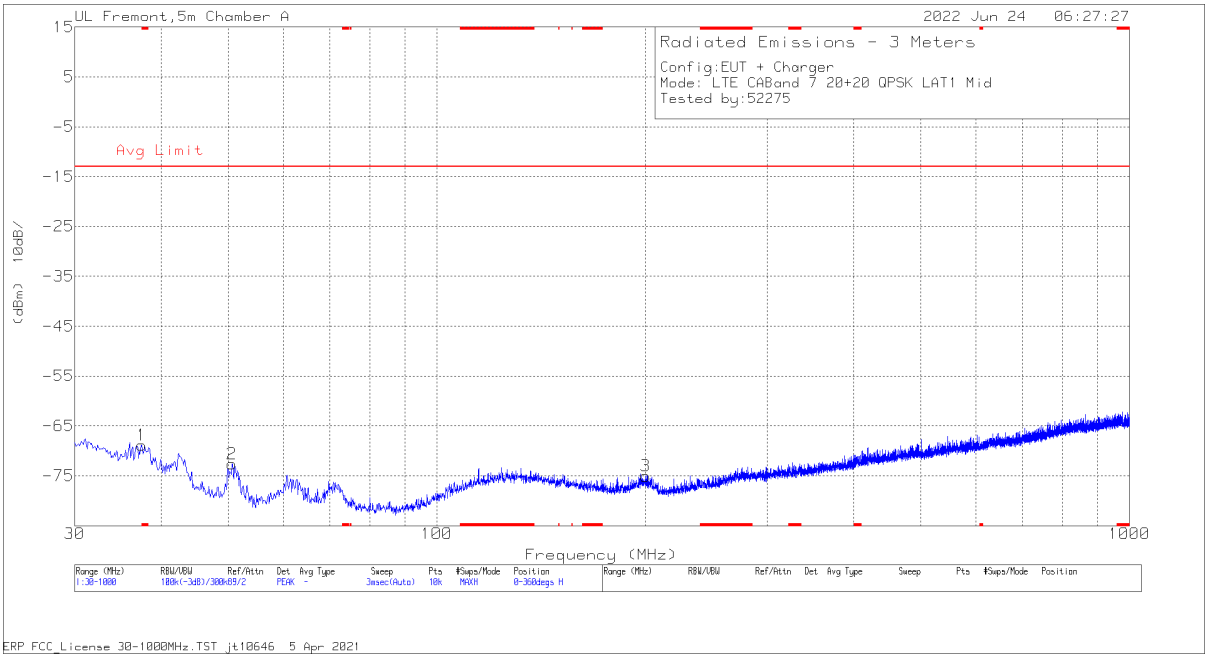
So, from d)

The measuring distance is usually at 3m, then 20*Log(3)=9.5424

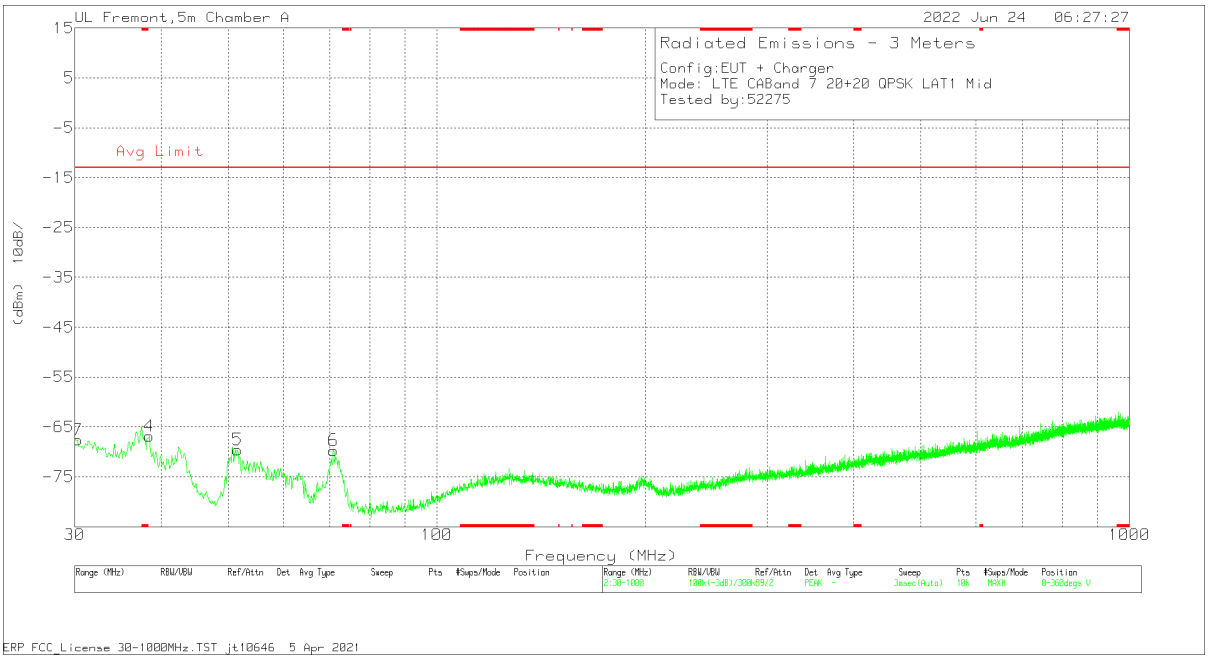
Then, EIRP (dBm) = E (dBµV/m) + 9.5424 − 104.8 = E (dBµV/m) – 95.2576

Note: Confidence check of each chamber is performed daily to see if any degradation from expected/normal reading reference data. Ambient check of each chamber is performed monthly.

Example Plot Below 1GHz



Horizontal Polarity

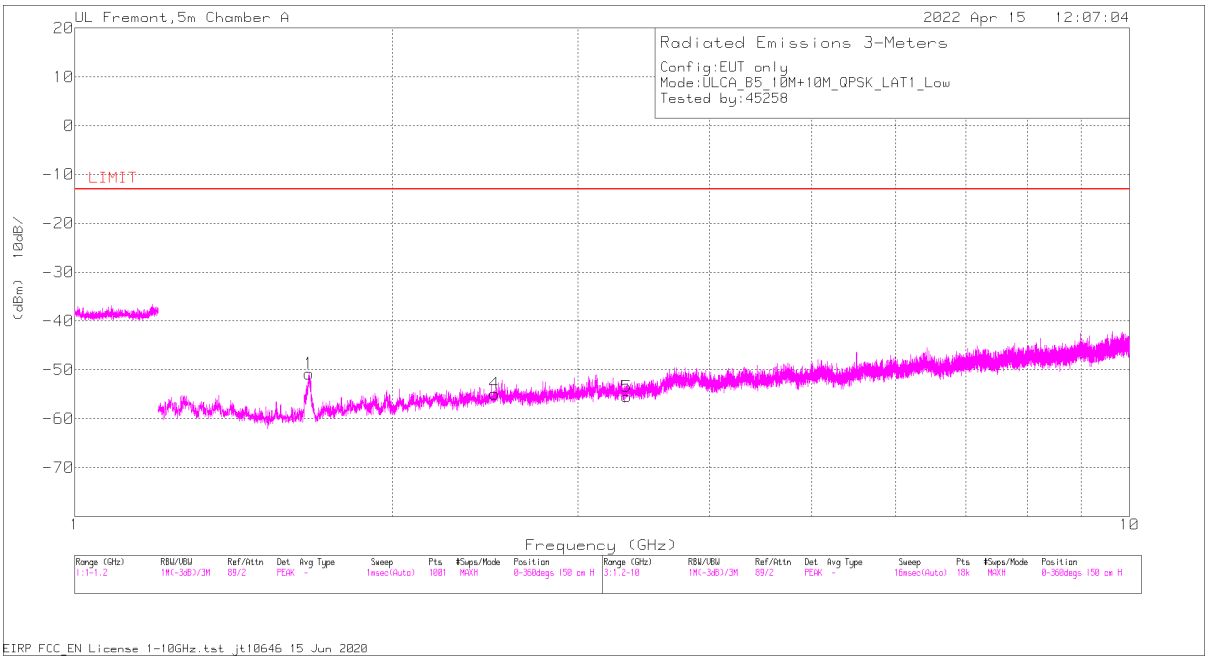


Vertical Polarity

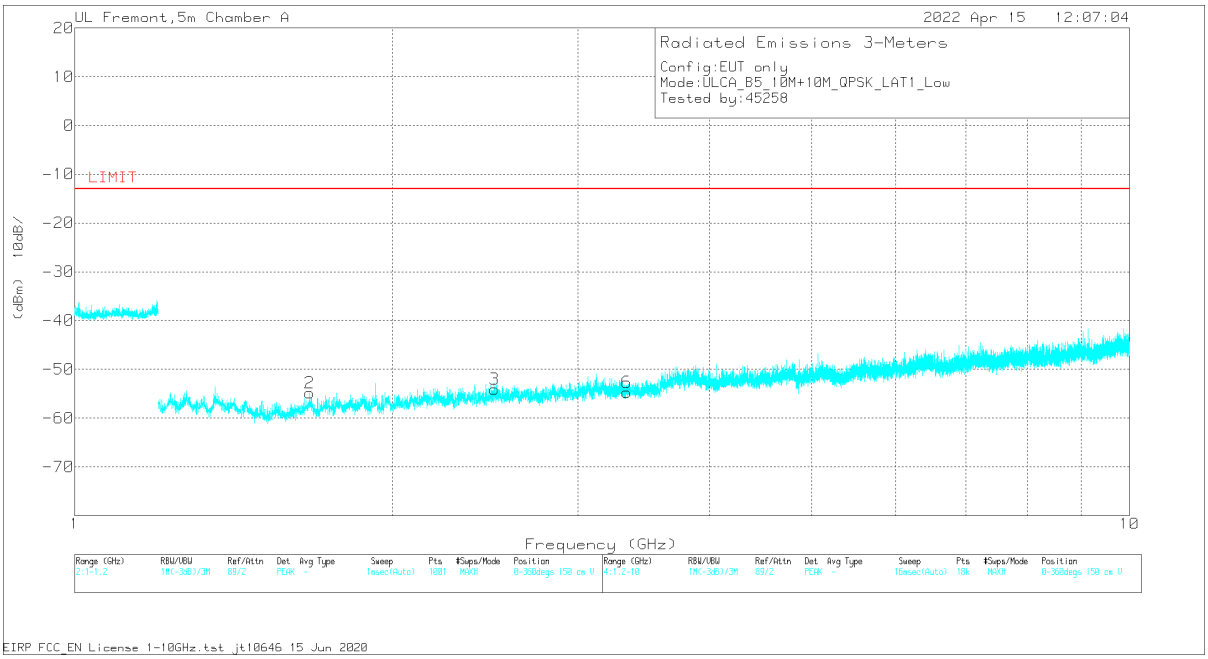
Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	85151 ACF (dB)_3m	Amp/Cbl (dB/m)	EIRP CF	Corrected Reading (dBm)	Avg Limit	Margin (dB)	Polarity
7	30.291	27.53	Pk	27.4	-27.3	-95.2	-67.57	-13	-54.57	V
1	37.469	30.76	Pk	22.8	-27.2	-95.2	-68.84	-13	-55.84	H
4	38.439	33.4	Pk	22.1	-27.1	-95.2	-66.8	-13	-53.8	V
2	50.564	34.87	Pk	14.6	-26.9	-95.2	-72.63	-13	-59.63	H
5	51.534	38.15	Pk	14.4	-26.9	-95.2	-69.55	-13	-56.55	V
6	70.934	37.82	Pk	14.4	-26.7	-95.2	-69.68	-13	-56.68	V
3	200.138	26.53	Pk	18.7	-25.1	-95.2	-75.07	-13	-62.07	H

Example Plot Above 1GHz



Horizontal Polarity



Vertical Polarity

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T962 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	EIRP CF	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
1.668845	44.61	Pk	28.5	-29.4	.7	-95.2	-50.79	-13	-37.79	H
1.669822	40.47	Pk	28.5	-29.3	.7	-95.2	-54.83	-13	-41.83	V
2.501911	35.4	Pk	32.3	-28	.6	-95.2	-54.9	-13	-41.9	H
2.501911	36.23	Pk	32.3	-28	.6	-95.2	-54.07	-13	-41.07	V
3.336934	33.22	Pk	32.6	-26.6	.5	-95.2	-55.48	-13	-42.48	H
3.336934	33.98	Pk	32.6	-26.6	.5	-95.2	-54.72	-13	-41.72	V

Pk – Peak Detector

10.1. FIELD STRENGTH OF SPURIOUS RADIATION, ANT1

TEST PROCEDURE

KDB 971168 D01/D02 v02r01

All tests above 1GHz were done with a Resolution Bandwidth of 1MHz, and a Video Bandwidth of 3MHz.

RESULTS

10.1.1. LTE BAND 5

LIMIT

FCC: §22.917(a)
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

QPSK LTE BAND 5 (10.0MHZ + 10.0MHZ BANDWIDTH)

Project #:	14040867
Date:	4/15/2022
Test Engineer:	45258
Configuration:	EUT Only
Mode	BAND 5 QPSK 10+10
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBm)	Det	AF T962 (dB/m)	Amp/Cbl (dB)	HPF 1.2GHz T1737 1-18GHz	EIRP CF	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 829MHz + 838.9MHz										
1.668845	44.61	Pk	28.5	-29.4	.7	-95.2	-50.79	-13	-37.79	H
1.669822	40.47	Pk	28.5	-29.3	.7	-95.2	-54.83	-13	-41.83	V
2.501911	35.4	Pk	32.3	-28	.6	-95.2	-54.9	-13	-41.9	H
2.501911	36.23	Pk	32.3	-28	.6	-95.2	-54.07	-13	-41.07	V
3.336934	33.22	Pk	32.6	-26.6	.5	-95.2	-55.48	-13	-42.48	H
3.336934	33.98	Pk	32.6	-26.6	.5	-95.2	-54.72	-13	-41.72	V
Mid Channel, 831.6MHz + 841.5MHz										
1.672756	35.91	Pk	28.4	-29.3	.7	-95.2	-59.49	-13	-46.49	H
1.672756	38.31	Pk	28.4	-29.3	.7	-95.2	-57.09	-13	-44.09	V
2.509245	35.81	Pk	32.4	-28.1	.7	-95.2	-54.39	-13	-41.39	H
2.509245	34.94	Pk	32.4	-28.1	.7	-95.2	-55.26	-13	-42.26	V
3.346223	36.19	Pk	32.7	-26.5	.5	-95.2	-52.31	-13	-39.31	H
3.346223	33.64	Pk	32.7	-26.5	.5	-95.2	-54.86	-13	-41.86	V
High Channel, 834.1MHz + 844MHz										
1.679111	36.46	Pk	28.4	-29.3	.7	-95.2	-58.94	-13	-45.94	H
1.679111	38.72	Pk	28.4	-29.3	.7	-95.2	-56.68	-13	-43.68	V
2.518045	34.76	Pk	32.4	-28.1	.8	-95.2	-55.34	-13	-42.34	H
2.518045	33.78	Pk	32.4	-28.1	.8	-95.2	-56.32	-13	-43.32	V
3.356	33.19	Pk	32.7	-26.6	.6	-95.2	-55.31	-13	-42.31	H
3.356	34.23	Pk	32.7	-26.6	.6	-95.2	-54.27	-13	-41.27	V

10.1.2. LTE BAND 7

LIMIT

FCC: §27.53 (m)
At least 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section.

QPSK LTE BAND 7 (20.0MHZ + 20.0MHZ BANDWIDTH)

Project #:	14040867
Date:	4/18/2022
Test Engineer:	45258
Configuration:	EUT Only
Mode	BAND 7 QPSK 20+20
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBm)	Det	AF T962 (dB/m)	Amp/Cbl (dB)	BRF 2495-2690MHz T1790 1-18GHz	EIRP CF	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 2510MHz + 2525.8MHz										
5.040938	35.22	Pk	34.4	-24.2	.6	-95.2	-49.18	-25	-24.18	H
5.040938	32.99	Pk	34.4	-24.2	.6	-95.2	-51.41	-25	-26.41	V
7.559531	30.91	Pk	35.6	-20	.3	-95.2	-48.39	-25	-23.39	H
7.559531	29.68	Pk	35.6	-20	.3	-95.2	-49.62	-25	-24.62	V
10.079531	28.06	Pk	37.1	-17.8	.6	-95.2	-47.24	-25	-22.24	H
10.079531	30.35	Pk	37.1	-17.8	.6	-95.2	-44.95	-25	-19.95	V
Mid Channel, 2525.1MHz + 2544.9MHz										
5.070469	35.41	Pk	34.4	-23.7	.7	-95.2	-48.39	-25	-23.39	H
5.070469	33.14	Pk	34.4	-23.7	.7	-95.2	-50.66	-25	-25.66	V
7.605469	31.86	Pk	35.7	-20	.4	-95.2	-47.24	-25	-22.24	H
7.605469	28.58	Pk	35.7	-20	.4	-95.2	-50.52	-25	-25.52	V
10.140469	29.09	Pk	37.3	-17.7	.6	-95.2	-45.91	-25	-20.91	H
10.140469	29.3	Pk	37.3	-17.7	.6	-95.2	-45.70	-25	-20.70	V
High Channel, 2540.2MHz + 2560.0MHz										
5.100469	32.36	Pk	34.4	-24	.8	-95.2	-51.64	-25	-26.64	H
5.100469	31.7	Pk	34.4	-24	.8	-95.2	-52.30	-25	-27.30	V
7.650469	28.21	Pk	35.7	-19.7	.3	-95.2	-50.69	-25	-25.69	H
7.650469	29.69	Pk	35.7	-19.7	.3	-95.2	-49.21	-25	-24.21	V
10.200938	28.83	Pk	37.3	-17.6	.8	-95.2	-45.87	-25	-20.87	H
10.200938	30.31	Pk	37.3	-17.6	.8	-95.2	-44.39	-25	-19.39	V

10.1.3. LTE BAND 41

LIMIT

FCC: §27.53 (m)
At least 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section.

QPSK LTE BAND 41 (20.0MHZ + 20.0MHZ BANDWIDTH)

Project #:	14040867
Date:	4/19/2022
Test Engineer:	45258
Configuration:	EUT Only
Mode	BAND 41FCC QPSK 20+20
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBm)	Det	AF T962 (dB/m)	Amp/Cbl (dB)	BRF 2495-2690MHz T1790 1-18GHz	EIRP CF	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 2506MHz + 2525.8MHz										
5.0325	31.61	Pk	34.3	-24.2	.7	-95.2	-52.79	-25	-27.79	H
5.0325	33.43	Pk	34.3	-24.2	.7	-95.2	-50.97	-25	-25.97	V
7.547813	30.32	Pk	35.6	-20.3	.3	-95.2	-49.28	-25	-24.28	H
7.547813	29.05	Pk	35.6	-20.3	.3	-95.2	-50.55	-25	-25.55	V
10.063594	27.35	Pk	37.2	-17.8	.7	-95.2	-47.75	-25	-22.75	H
10.063594	28.14	Pk	37.2	-17.8	.7	-95.2	-46.96	-25	-21.96	V
Mid Channel, 2583.1MHz + 2602.9MHz										
5.18625	32.77	Pk	34.4	-23.6	.8	-95.2	-50.83	-25	-25.83	H
5.18625	32.86	Pk	34.4	-23.6	.8	-95.2	-50.74	-25	-25.74	V
7.779375	27.72	Pk	35.7	-19.9	.3	-95.2	-51.38	-25	-26.38	H
7.779375	29.47	Pk	35.7	-19.9	.3	-95.2	-49.63	-25	-24.63	V
10.372031	27.22	Pk	37.5	-16.9	.8	-95.2	-46.58	-25	-21.58	H
10.372031	28.99	Pk	37.5	-16.9	.8	-95.2	-44.81	-25	-19.81	V
High Channel, 2660.2MHz + 2680.0MHz										
5.339531	34.73	Pk	34.5	-24.3	.6	-95.2	-49.67	-25	-24.67	H
5.339531	32.73	Pk	34.5	-24.3	.6	-95.2	-51.67	-25	-26.67	V
8.010469	30	Pk	35.7	-19.5	.3	-95.2	-48.7	-25	-23.7	H
8.010469	30.57	Pk	35.7	-19.5	.3	-95.2	-48.13	-25	-23.13	V
10.680469	29.78	Pk	38	-17.1	.5	-95.2	-44.02	-25	-19.02	H
10.680469	30.74	Pk	38	-17.1	.5	-95.2	-43.06	-25	-18.06	V

10.2. FIELD STRENGTH OF SPURIOUS RADIATION, ANT2

TEST PROCEDURE

KDB 971168 D01/D02 v02r01

All tests above 1GHz were done with a Resolution Bandwidth of 1MHz, and a Video Bandwidth of 3MHz.

RESULTS

10.2.1. LTE BAND 5

LIMIT

FCC: §22.917(a)
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

QPSK LTE BAND 5 (10.0MHZ + 10.0MHZ BANDWIDTH)

Project #:	14040867
Date:	4/15/2022
Test Engineer:	45258
Configuration:	EUT Only
Mode	BAND 5 QPSK 10+10
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBm)	Det	AF T962 (dB/m)	Amp/Cbl (dB)	HPF 1.2GHz T1737 1-18GHz	EIRP CF	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 829MHz + 838.9MHz										
1.668356	37.03	Pk	28.5	-29.4	.7	-95.2	-58.37	-13	-45.37	H
1.668356	38.2	Pk	28.5	-29.4	.7	-95.2	-57.2	-13	-44.2	V
2.5024	35.17	Pk	32.3	-28	.6	-95.2	-55.13	-13	-42.13	H
2.5024	37.04	Pk	32.3	-28	.6	-95.2	-53.26	-13	-40.26	V
3.336445	36.52	Pk	32.6	-26.6	.5	-95.2	-52.18	-13	-39.18	H
3.336445	35.22	Pk	32.6	-26.6	.5	-95.2	-53.48	-13	-40.48	V
Mid Channel, 831.6MHz + 841.5MHz										
1.678133	35.67	Pk	28.4	-29.3	.7	-95.2	-59.73	-13	-46.73	H
1.678133	38.55	Pk	28.4	-29.3	.7	-95.2	-56.85	-13	-43.85	V
2.517067	36.79	Pk	32.4	-28.1	.7	-95.2	-53.41	-13	-40.41	H
2.517067	35.31	Pk	32.4	-28.1	.7	-95.2	-54.89	-13	-41.89	V
3.356	34.82	Pk	32.7	-26.6	.6	-95.2	-53.68	-13	-40.68	H
3.356	35.64	Pk	32.7	-26.6	.6	-95.2	-52.86	-13	-39.86	V
High Channel, 834.1MHz + 844MHz										
1.678622	36.33	Pk	28.4	-29.3	.7	-95.2	-59.07	-13	-46.07	H
1.678622	38.28	Pk	28.4	-29.3	.7	-95.2	-57.12	-13	-44.12	V
2.517067	38.01	Pk	32.4	-28.1	.7	-95.2	-52.19	-13	-39.19	H
2.517067	35	Pk	32.4	-28.1	.7	-95.2	-55.2	-13	-42.2	V
3.355512	36.54	Pk	32.7	-26.6	.6	-95.2	-51.96	-13	-38.96	H
3.355512	33.99	Pk	32.7	-26.6	.6	-95.2	-54.51	-13	-41.51	V

10.2.2. LTE BAND 7

LIMIT

FCC: §27.53 (m)
At least 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section.

QPSK LTE BAND 7 (20.0MHZ + 20.0MHZ BANDWIDTH)

Project #:	14040867
Date:	4/18/2022
Test Engineer:	45258
Configuration:	EUT Only
Mode	ULCA_B7_20M+20M_QPSK
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBm)	Det	AF 80402 (dB/m)	Amp/Cbl (dB)	BRF 2495-2690MHz T1790 1-18GHz	EIRP CF	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 2510MHz + 2529.8MHz										
5.04	33.26	Pk	34.3	-24.2	0.6	-95.2	-51.24	-25	-26.24	H
5.04	31.79	Pk	34.3	-24.2	0.6	-95.2	-52.71	-25	-27.71	V
7.56	31.24	Pk	35.6	-20	0.3	-95.2	-48.06	-25	-23.06	H
7.56	30.25	Pk	35.6	-20	0.3	-95.2	-49.05	-25	-24.05	V
10.080938	30.2	Pk	37.1	-17.8	0.6	-95.2	-45.1	-25	-20.1	H
10.080938	31.54	Pk	37.1	-17.8	0.6	-95.2	-43.76	-25	-18.76	V
Mid Channel, 2525.1MHz + 2544.9MHz										
5.070469	31.37	Pk	34.4	-23.7	0.7	-95.2	-52.43	-25	-27.43	H
5.070469	32.66	Pk	34.4	-23.7	0.7	-95.2	-51.14	-25	-26.14	V
7.605938	30.22	Pk	35.7	-20	0.4	-95.2	-48.88	-25	-23.88	H
7.605938	31.92	Pk	35.7	-20	0.4	-95.2	-47.18	-25	-22.18	V
10.14	29.19	Pk	37.3	-17.7	0.7	-95.2	-45.71	-25	-20.71	H
10.14	28.18	Pk	37.3	-17.7	0.7	-95.2	-46.72	-25	-21.72	V
High Channel, 2540.2MHz + 2560MHz										
5.102813	31.38	Pk	34.4	-24	0.8	-95.2	-52.62	-25	-27.62	H
5.102813	33.52	Pk	34.4	-24	0.8	-95.2	-50.48	-25	-25.48	V
7.651875	31.72	Pk	35.7	-19.7	0.3	-95.2	-47.18	-25	-22.18	H
7.651875	28.76	Pk	35.7	-19.7	0.3	-95.2	-50.14	-25	-25.14	V
10.022344	30.52	Pk	37.2	-17.6	0.6	-95.2	-44.48	-25	-19.48	H
10.022344	29.74	Pk	37.2	-17.6	0.6	-95.2	-45.26	-25	-20.26	V

10.2.3. LTE BAND 41

LIMIT

FCC: §27.53 (m)
At least 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section.

QPSK LTE BAND 41 (20.0MHZ + 20.0MHZ BANDWIDTH)

Project #:	14040867
Date:	4/19/2022
Test Engineer:	45258
Configuration:	EUT Only
Mode	ULCA_B41 FCC_20M+20M_QPSK
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBm)	Det	AF 80402 (dB/m)	Amp/Cbl (dB)	BRF 2495-2690MHz T1790 1-18GHz	EIRP CF	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 2506MHz + 2525.8MHz										
5.032031	32.99	Pk	34.4	-24.2	0.7	-95.2	-51.31	-25	-26.31	H
5.032031	34.5	Pk	34.4	-24.2	0.7	-95.2	-49.8	-25	-24.8	V
7.547344	31.06	Pk	35.6	-20.3	0.3	-95.2	-48.54	-25	-23.54	H
7.547344	28.97	Pk	35.6	-20.3	0.3	-95.2	-50.63	-25	-25.63	V
10.064531	27.65	Pk	37.2	-17.8	0.7	-95.2	-47.45	-25	-22.45	H
10.064531	30.16	Pk	37.2	-17.8	0.7	-95.2	-44.94	-25	-19.94	V
Mid Channel, 2583.1MHz + 2602.9MHz										
5.18625	31.11	Pk	34.4	-23.6	0.8	-95.2	-52.49	-25	-27.49	H
5.18625	32.41	Pk	34.4	-23.6	0.8	-95.2	-51.19	-25	-26.19	V
7.779375	31.09	Pk	35.7	-19.9	0.3	-95.2	-48.01	-25	-23.01	H
7.779375	28.95	Pk	35.7	-19.9	0.3	-95.2	-50.15	-25	-25.15	V
10.3725	32.22	Pk	37.5	-16.9	0.8	-95.2	-41.58	-25	-16.58	H
10.3725	27.9	Pk	37.5	-16.9	0.8	-95.2	-45.9	-25	-20.9	V
High Channel, 2660.2MHz + 2680.0MHz										
5.339531	30.58	Pk	34.5	-24.3	0.6	-95.2	-53.82	-25	-28.82	H
5.339531	32.47	Pk	34.5	-24.3	0.6	-95.2	-51.93	-25	-26.93	V
8.01	30.39	Pk	35.7	-19.5	0.3	-95.2	-48.31	-25	-23.31	H
8.01	29.47	Pk	35.7	-19.5	0.3	-95.2	-49.23	-25	-24.23	V
10.679531	28.88	Pk	38	-17.1	0.5	-95.2	-44.92	-25	-19.92	H
10.679531	33.16	Pk	38	-17.1	0.5	-95.2	-40.64	-25	-15.64	V

10.3. FIELD STRENGTH OF SPURIOUS RADIATION, ANT3

TEST PROCEDURE

KDB 971168 D01/D02 v02r01

All tests above 1GHz were done with a Resolution Bandwidth of 1MHz, and a Video Bandwidth of 3MHz.

RESULTS

10.3.1. LTE BAND 7

LIMIT

FCC: §27.53 (m)
At least 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section.

QPSK LTE BAND 7 (20.0MHZ + 20.0MHZ BANDWIDTH)

Project #:	14040867
Date:	4/18/2022
Test Engineer:	45258
Configuration:	EUT Only
Mode	ULCA_B7_20M+20M_QPSK
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBm)	Det	AF 80402 (dB/m)	Amp/Cbl (dB)	BRF 2495-2690MHz T1790 1-18GHz	EIRP CF	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 2510MHz + 2529.8MHz										
5.040938	35.25	Pk	34.4	-24.2	0.6	-95.2	-49.15	-25	-24.15	H
5.040938	33.44	Pk	34.4	-24.2	0.6	-95.2	-50.96	-25	-25.96	V
7.560469	29.85	Pk	35.6	-20	0.3	-95.2	-49.45	-25	-24.45	H
7.560469	27.7	Pk	35.6	-20	0.3	-95.2	-51.6	-25	-26.6	V
10.080938	29.98	Pk	37.1	-17.8	0.6	-95.2	-45.32	-25	-20.32	H
10.080938	31.54	Pk	37.1	-17.8	0.6	-95.2	-43.76	-25	-18.76	V
Mid Channel, 2525.1MHz + 2544.9MHz										
5.070938	31.46	Pk	34.4	-23.7	0.7	-95.2	-52.34	-25	-27.34	H
5.070938	31.82	Pk	34.4	-23.7	0.7	-95.2	-51.98	-25	-26.98	V
7.605469	30.29	Pk	35.7	-20	0.4	-95.2	-48.81	-25	-23.81	H
7.605469	28.48	Pk	35.7	-20	0.4	-95.2	-50.62	-25	-25.62	V
10.14	27.4	Pk	37.3	-17.7	0.7	-95.2	-47.5	-25	-22.5	H
10.14	29.34	Pk	37.3	-17.7	0.7	-95.2	-45.56	-25	-20.56	V
High Channel, 2540.2MHz + 2560.0MHz										
5.100469	33.52	Pk	34.4	-24	0.8	-95.2	-50.48	-25	-25.48	H
5.100469	31.7	Pk	34.4	-24	0.8	-95.2	-52.3	-25	-27.3	V
7.65	29.55	Pk	35.7	-19.7	0.3	-95.2	-49.35	-25	-24.35	H
7.65	28.46	Pk	35.7	-19.7	0.3	-95.2	-50.44	-25	-25.44	V
10.201406	29.94	Pk	37.3	-17.5	0.8	-95.2	-44.66	-25	-19.66	H
10.201406	32.09	Pk	37.3	-17.5	0.8	-95.2	-42.51	-25	-17.51	V

10.3.2. LTE BAND 41

LIMIT

FCC: §27.53 (m)
At least 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section.

QPSK LTE BAND 41 (20.0MHZ + 20.0MHZ BANDWIDTH)

Project #:	14040867
Date:	4/19/2022
Test Engineer:	45258
Configuration:	EUT Only
Mode	ULCA_B41 FCC_20M+20M_QPSK
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBm)	Det	AF 80402 (dB/m)	Amp/Cbl (dB)	BRF 2495-2690MHz T1790 1-18GHz	EIRP CF	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 2506MHz + 2525.8MHz										
5.030156	35.58	Pk	34.3	-24.2	0.7	-95.2	-48.82	-25	-23.82	H
5.030156	34.26	Pk	34.3	-24.2	0.7	-95.2	-50.14	-25	-25.14	V
7.548281	31.24	Pk	35.6	-20.2	0.3	-95.2	-48.26	-25	-23.26	H
7.548281	28.58	Pk	35.6	-20.2	0.3	-95.2	-50.92	-25	-25.92	V
10.064063	29.42	Pk	37.2	-17.8	0.7	-95.2	-45.68	-25	-20.68	H
10.064063	27.95	Pk	37.2	-17.8	0.7	-95.2	-47.15	-25	-22.15	V
Mid Channel, 2583.1MHz + 2602.9MHz										
5.18625	31.84	Pk	34.4	-23.6	0.8	-95.2	-51.76	-25	-26.76	H
5.18625	31.57	Pk	34.4	-23.6	0.8	-95.2	-52.03	-25	-27.03	V
7.779844	28.97	Pk	35.7	-19.9	0.3	-95.2	-50.13	-25	-25.13	H
7.779844	30.19	Pk	35.7	-19.9	0.3	-95.2	-48.91	-25	-23.91	V
10.372031	30.53	Pk	37.5	-16.9	0.8	-95.2	-43.27	-25	-18.27	H
10.372031	29.08	Pk	37.5	-16.9	0.8	-95.2	-44.72	-25	-19.72	V
High Channel, 2660.2MHz + 2680.0MHz										
5.34	31.47	Pk	34.5	-24.3	0.6	-95.2	-52.93	-25	-27.93	H
5.34	30.63	Pk	34.5	-24.3	0.6	-95.2	-53.77	-25	-28.77	V
8.010469	29.95	Pk	35.7	-19.5	0.3	-95.2	-48.75	-25	-23.75	H
8.010469	30.42	Pk	35.7	-19.5	0.3	-95.2	-48.28	-25	-23.28	V
10.680469	28.49	Pk	38	-17.1	0.5	-95.2	-45.31	-25	-20.31	H
10.680469	29.6	Pk	38	-17.1	0.5	-95.2	-44.2	-25	-19.2	V

10.4. FIELD STRENGTH OF SPURIOUS RADIATION, ANT4

TEST PROCEDURE

KDB 971168 D01/D02 v02r01

All tests above 1GHz were done with a Resolution Bandwidth of 1MHz, and a Video Bandwidth of 3MHz.

RESULTS

10.4.1. LTE BAND 7

LIMIT

FCC: §27.53 (m)
At least 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section.

QPSK LTE BAND 7 (20.0MHZ + 20.0MHZ BANDWIDTH)

Project #:	14040867
Date:	4/28/2022
Test Engineer:	45258
Configuration:	EUT Only
Mode	ULCA_B7_20M+20M_QPSK
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBm)	Det	AF 80402 (dB/m)	Amp/Cbl (dB)	BRF 2495-2690MHz T1790 1-18GHz	EIRP CF	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 2510MHz + 2529.8MHz										
5.040469	32.88	Pk	34.3	-24.2	0.6	-95.2	-51.62	-25	-26.62	H
5.040469	32.38	Pk	34.3	-24.2	0.6	-95.2	-52.12	-25	-27.12	V
7.560469	29.8	Pk	35.6	-20	0.3	-95.2	-49.5	-25	-24.5	H
7.560469	31.61	Pk	35.6	-20	0.3	-95.2	-47.69	-25	-22.69	V
10.080469	30.07	Pk	37.1	-17.8	0.6	-95.2	-45.23	-25	-20.23	H
10.080469	28.02	Pk	37.1	-17.8	0.6	-95.2	-47.28	-25	-22.28	V
Mid Channel, 2525.1MHz + 2544.9MHz										
5.070469	33.78	Pk	34.4	-23.7	0.7	-95.2	-50.02	-25	-25.02	H
5.070469	31.66	Pk	34.4	-23.7	0.7	-95.2	-52.14	-25	-27.14	V
7.605938	30.34	Pk	35.7	-20	0.4	-95.2	-48.76	-25	-23.76	H
7.605938	29.18	Pk	35.7	-20	0.4	-95.2	-49.92	-25	-24.92	V
10.140469	29.84	Pk	37.3	-17.7	0.6	-95.2	-45.16	-25	-20.16	H
10.140469	30.46	Pk	37.3	-17.7	0.6	-95.2	-44.54	-25	-19.54	V
High Channel, 2540.2MHz + 2560.0MHz										
5.1	31.98	Pk	34.4	-24	0.8	-95.2	-52.02	-25	-27.02	H
5.1	33.76	Pk	34.4	-24	0.8	-95.2	-50.24	-25	-25.24	V
7.65	30.63	Pk	35.7	-19.7	0.3	-95.2	-48.27	-25	-23.27	H
7.65	31.01	Pk	35.7	-19.7	0.3	-95.2	-47.89	-25	-22.89	V
10.200469	29.18	Pk	37.4	-17.5	0.8	-95.2	-45.32	-25	-20.32	H
10.200469	29.4	Pk	37.4	-17.5	0.8	-95.2	-45.1	-25	-20.1	V

10.4.2. LTE BAND 41

LIMIT

FCC: §27.53 (m)
At least 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section.

QPSK LTE BAND 41 (20.0MHZ + 20.0MHZ BANDWIDTH)

Project #:	14040867
Date:	4/19/2022
Test Engineer:	45258
Configuration:	EUT Only
Mode	ULCA_B41 FCC_20M+20M_QPSK
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBm)	Det	AF 80402 (dB/m)	Amp/Cbl (dB)	BRF 2495-2690MHz T1790 1-18GHz	EIRP CF	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 2506MHz + 2525.8MHz										
5.032031	32.44	Pk	34.4	-24.2	0.7	-95.2	-51.86	-25	-26.86	H
5.032031	34.54	Pk	34.4	-24.2	0.7	-95.2	-49.76	-25	-24.76	V
7.547813	29.23	Pk	35.6	-20.3	0.3	-95.2	-50.37	-25	-25.37	H
7.547813	32.33	Pk	35.6	-20.3	0.3	-95.2	-47.27	-25	-22.27	V
10.063594	29.17	Pk	37.2	-17.8	0.7	-95.2	-45.93	-25	-20.93	H
10.063594	27.26	Pk	37.2	-17.8	0.7	-95.2	-47.84	-25	-22.84	V
Mid Channel, 2583.1MHz + 2602.9MHz										
5.18625	33.36	Pk	34.4	-23.6	0.8	-95.2	-50.24	-25	-25.24	H
5.18625	32.82	Pk	34.4	-23.6	0.8	-95.2	-50.78	-25	-25.78	V
7.778906	32.32	Pk	35.7	-19.9	0.3	-95.2	-46.78	-25	-21.78	H
7.778906	28.86	Pk	35.7	-19.9	0.3	-95.2	-50.24	-25	-25.24	V
10.372031	27.55	Pk	37.5	-16.9	0.8	-95.2	-46.25	-25	-21.25	H
10.372031	29.28	Pk	37.5	-16.9	0.8	-95.2	-44.52	-25	-19.52	V
High Channel, 2660.2MHz + 2680.0MHz										
5.34	33.47	Pk	34.5	-24.3	0.6	-95.2	-50.93	-25	-25.93	H
5.34	31.37	Pk	34.5	-24.3	0.6	-95.2	-53.03	-25	-28.03	V
8.010469	32.46	Pk	35.7	-19.5	0.3	-95.2	-46.24	-25	-21.24	H
8.010469	29.89	Pk	35.7	-19.5	0.3	-95.2	-48.81	-25	-23.81	V
10.680938	29.88	Pk	37.9	-17.1	0.5	-95.2	-44.02	-25	-19.02	H
10.680938	29.29	Pk	37.9	-17.1	0.5	-95.2	-44.61	-25	-19.61	V

10.4.3. LTE BAND 48

LIMIT

FCC: §96.41
(e) 3.5 GHz Emissions and Interference Limits—
(2) Additional protection levels. Notwithstanding paragraph (d)(1) of this section, the conducted power of any emissions below 3530 MHz or above 3720 MHz shall not exceed −40dBm/MHz.

QPSK LTE BAND 48 (20.0MHZ + 20.0MHZ BANDWIDTH)

Project #:	14040867
Date:	5/29/2022
Test Engineer:	45258
Configuration:	Eut Only
Mode	ULCA_B48_20M+20M_QPSK
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBm)	Det	AF 80402 (dB/m)	Amp/Cbl (dB)	T1792 3400-3800MHz BRF	EIRP CF	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 3560MHz + 3579.8MHz										
7.139475	26.13	RMS	35.6	-20.6	.6	-95.2	-53.47	-40	-13.47	H
7.139916	26.72	RMS	35.6	-20.6	.6	-95.2	-52.88	-40	-12.88	V
10.709859	24.97	RMS	37.9	-17.1	.5	-95.2	-48.93	-40	-8.93	H
10.709859	24.45	RMS	37.9	-17.1	.5	-95.2	-49.45	-40	-9.45	V
14.278481	24.02	RMS	39.2	-15.9	.7	-95.2	-47.18	-40	-7.18	V
14.279803	24.33	RMS	39.2	-15.9	.7	-95.2	-46.87	-40	-6.87	H
Mid Channel, 3615.1MHz + 3634.9MHz										
7.250072	26.72	RMS	35.5	-20.5	.6	-95.2	-52.88	-40	-12.88	H
7.250072	28.15	RMS	35.5	-20.5	.6	-95.2	-51.45	-40	-11.45	V
10.875094	25.53	RMS	37.8	-16.7	.5	-95.2	-48.07	-40	-8.07	H
10.875094	24.67	RMS	37.8	-16.7	.5	-95.2	-48.93	-40	-8.93	V
14.500556	24.95	RMS	39.7	-16.5	.8	-95.2	-46.25	-40	-6.25	V
14.501878	24.36	RMS	39.7	-16.5	.8	-95.2	-46.84	-40	-6.84	H
High Channel, 3670.2MHz + 3690.0MHz										
7.360228	26.54	RMS	35.6	-20.3	.7	-95.2	-52.66	-40	-12.66	H
7.360228	28.34	RMS	35.6	-20.3	.7	-95.2	-50.86	-40	-10.86	V
11.040769	23.99	RMS	37.8	-16.4	.6	-95.2	-49.21	-40	-9.21	H
11.040769	23.89	RMS	37.8	-16.4	.6	-95.2	-49.31	-40	-9.31	V
14.720428	25.08	RMS	39.9	-15.7	.9	-95.2	-45.02	-40	-5.02	H
14.720869	24.93	RMS	39.8	-15.7	.9	-95.2	-45.27	-40	-5.27	V

10.5. FIELD STRENGTH OF SPURIOUS RADIATION, ANT7

TEST PROCEDURE

KDB 971168 D01/D02 v02r01

All tests above 1GHz were done with a Resolution Bandwidth of 1MHz, and a Video Bandwidth of 3MHz.

RESULTS

10.5.1. LTE BAND 48

LIMIT

FCC: §96.41
(e) 3.5 GHz Emissions and Interference Limits—
(2) Additional protection levels. Notwithstanding paragraph (d)(1) of this section, the conducted power of any emissions below 3530 MHz or above 3720 MHz shall not exceed −40dBm/MHz.

QPSK LTE BAND 48 (20.0MHZ + 20.0MHZ BANDWIDTH)

Project #:	14040867
Date:	5/29/2022
Test Engineer:	45258
Configuration:	EUT Only
Mode	BAND 48FCC QPSK 20+20
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBm)	Det	AF T962 (dB/m)	Amp/Cbl (dB)	T1792 3400-3800MHz BRF	EIRP CF	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 3560MHz + 3579.8MHz										
7.140356	26.99	RMS	35.6	-20.6	.6	-95.2	-52.61	-40	-12.61	H
7.140356	26.74	RMS	35.6	-20.6	.6	-95.2	-52.86	-40	-12.86	V
10.7103	22.84	RMS	37.9	-17.1	.5	-95.2	-51.06	-40	-11.06	H
10.7103	23.62	RMS	37.9	-17.1	.5	-95.2	-50.28	-40	-10.28	V
14.279803	24.25	RMS	39.2	-15.9	.7	-95.2	-46.95	-40	-6.95	H
14.279803	23.87	RMS	39.2	-15.9	.7	-95.2	-47.33	-40	-7.33	V
Mid Channel, 3615.1MHz + 3634.9MHz										
7.250072	26.82	RMS	35.5	-20.5	.6	-95.2	-52.78	-40	-12.78	H
7.250072	27.44	RMS	35.5	-20.5	.6	-95.2	-52.16	-40	-12.16	V
10.875975	24.58	RMS	37.8	-16.7	.5	-95.2	-49.02	-40	-9.02	H
10.875975	25.63	RMS	37.8	-16.7	.5	-95.2	-47.97	-40	-7.97	V
14.501878	24.63	RMS	39.7	-16.5	.8	-95.2	-46.57	-40	-6.57	H
14.501878	24.81	RMS	39.7	-16.5	.8	-95.2	-46.39	-40	-6.39	V
High Channel, 3670.2MHz + 3690.0MHz										
7.360228	26.2	RMS	35.6	-20.3	.7	-95.2	-53	-40	-13	H
7.360228	27.01	RMS	35.6	-20.3	.7	-95.2	-52.19	-40	-12.19	V
11.041209	24.86	RMS	37.8	-16.4	.6	-95.2	-48.34	-40	-8.34	H
11.041209	25.73	RMS	37.8	-16.4	.6	-95.2	-47.47	-40	-7.47	V
14.719988	23.64	RMS	39.9	-15.7	.9	-95.2	-46.46	-40	-6.46	H
14.719988	24.48	RMS	39.9	-15.7	.9	-95.2	-45.62	-40	-5.62	V

10.6. FIELD STRENGTH OF SPURIOUS RADIATION, ANT8

TEST PROCEDURE

KDB 971168 D01/D02 v02r01

All tests above 1GHz were done with a Resolution Bandwidth of 1MHz, and a Video Bandwidth of 3MHz.

RESULTS

10.6.1. LTE BAND 48

LIMIT

FCC: §96.41
(e) 3.5 GHz Emissions and Interference Limits—
(2) Additional protection levels. Notwithstanding paragraph (d)(1) of this section, the conducted power of any emissions below 3530 MHz or above 3720 MHz shall not exceed −40dBm/MHz.

QPSK LTE BAND 48 (20.0MHZ + 20.0MHZ BANDWIDTH)

Project #:	14040867
Date:	5/29/2022
Test Engineer:	45258
Configuration:	EUT Only
Mode	ULCA_B48_20M+20M
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBm)	Det	AF 80402 (dB/m)	Amp/Cbl (dB)	T1792 3400-3800MHz BRF	EIRP CF	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 3560MHz + 3579.8MHz										
7.139475	24.77	RMS	35.6	-20.6	.6	-95.2	-54.83	-40	-14.83	H
7.139475	27.31	RMS	35.6	-20.6	.6	-95.2	-52.29	-40	-12.29	V
10.709859	24.83	RMS	37.9	-17.1	.5	-95.2	-49.07	-40	-9.07	H
10.709859	25.81	RMS	37.9	-17.1	.5	-95.2	-48.09	-40	-8.09	V
14.279803	24.91	RMS	39.2	-15.9	.7	-95.2	-46.29	-40	-6.29	H
14.279803	23.87	RMS	39.2	-15.9	.7	-95.2	-47.33	-40	-7.33	V
Mid Channel, 3615.1MHz + 3634.9MHz										
7.250072	25.26	RMS	35.5	-20.5	.6	-95.2	-54.34	-40	-14.34	H
7.250072	26.98	RMS	35.5	-20.5	.6	-95.2	-52.62	-40	-12.62	V
10.875094	24.33	RMS	37.8	-16.7	.5	-95.2	-49.27	-40	-9.27	H
10.875094	26.48	RMS	37.8	-16.7	.5	-95.2	-47.12	-40	-7.12	V
14.500997	23.58	RMS	39.7	-16.5	.8	-95.2	-47.62	-40	-7.62	V
14.502319	23.92	RMS	39.7	-16.5	.8	-95.2	-47.28	-40	-7.28	H
High Channel, 3670.2MHz + 3690.0MHz										
7.360228	25.26	RMS	35.6	-20.3	.7	-95.2	-53.94	-40	-13.94	H
7.360228	27.01	RMS	35.6	-20.3	.7	-95.2	-52.19	-40	-12.19	V
11.040328	26.72	RMS	37.8	-16.4	.6	-95.2	-46.48	-40	-6.48	H
11.040328	26.23	RMS	37.8	-16.4	.6	-95.2	-46.97	-40	-6.97	V
14.720428	23.51	RMS	39.9	-15.7	.9	-95.2	-46.59	-40	-6.59	H
14.721309	25.46	RMS	39.8	-15.7	.9	-95.2	-44.74	-40	-4.74	H

10.7. FIELD STRENGTH OF SPURIOUS RADIATION, ANT9

TEST PROCEDURE

KDB 971168 D01/D02 v02r01

All tests above 1GHz were done with a Resolution Bandwidth of 1MHz, and a Video Bandwidth of 3MHz.

RESULTS

10.7.1. LTE BAND 48

LIMIT

FCC: §96.41
(e) 3.5 GHz Emissions and Interference Limits—
(2) Additional protection levels. Notwithstanding paragraph (d)(1) of this section, the conducted power of any emissions below 3530 MHz or above 3720 MHz shall not exceed −40dBm/MHz.

QPSK LTE BAND 48 (20.0MHZ + 20.0MHZ BANDWIDTH)

Project #:	14040867
Date:	5/29/2022
Test Engineer:	45258
Configuration:	EUT Only
Mode	ULCA_B48_20M+20M_QPSK
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBm)	Det	AF 80402 (dB/m)	Amp/Cbl (dB)	T1792 3400-3800MHz BRF	EIRP CF	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 3560MHz + 3579.8MHz										
7.139916	27.4	RMS	35.6	-20.6	.6	-95.2	-52.2	-40	-12.2	H
7.139916	27.16	RMS	35.6	-20.6	.6	-95.2	-52.44	-40	-12.44	V
10.709859	24.34	RMS	37.9	-17.1	.5	-95.2	-49.56	-40	-9.56	H
10.7103	25.98	RMS	37.9	-17.1	.5	-95.2	-47.92	-40	-7.92	V
14.278922	23.63	RMS	39.2	-15.9	.7	-95.2	-47.57	-40	-7.57	H
14.279803	24.77	RMS	39.2	-15.9	.7	-95.2	-46.43	-40	-6.43	V
Mid Channel, 3615.1MHz + 3634.9MHz										
7.250072	26.14	RMS	35.5	-20.5	.6	-95.2	-53.46	-40	-13.46	H
7.250072	26.67	RMS	35.5	-20.5	.6	-95.2	-52.93	-40	-12.93	V
10.875094	23.18	RMS	37.8	-16.7	.5	-95.2	-50.42	-40	-10.42	H
10.875094	23.58	RMS	37.8	-16.7	.5	-95.2	-50.02	-40	-10.02	V
14.500556	25.21	RMS	39.7	-16.5	.8	-95.2	-45.99	-40	-5.99	H
14.500997	24.91	RMS	39.7	-16.5	.8	-95.2	-46.29	-40	-6.29	V
High Channel, 3670.2MHz + 3690.0MHz										
7.359788	26.95	RMS	35.6	-20.3	.7	-95.2	-52.25	-40	-12.25	H
7.359788	27.56	RMS	35.6	-20.3	.7	-95.2	-51.64	-40	-11.64	V
11.040769	25.24	RMS	37.8	-16.4	.6	-95.2	-47.96	-40	-7.96	H
11.040769	24.26	RMS	37.8	-16.4	.6	-95.2	-48.94	-40	-8.94	V
14.719988	25.46	RMS	39.9	-15.7	.9	-95.2	-44.64	-40	-4.64	H
14.719988	23.71	RMS	39.9	-15.7	.9	-95.2	-46.39	-40	-6.39	V

11. SETUP PHOTOS

Please refer to 14040867-EP1V1 for setup photos.

END OF REPORT