



TEST REPORT

Report Number: 14040863-E10V2

Applicant : APPLE, INC
1 APPLE PARK WAY
CUPERTINO, CA 95014, U.S.A.

Model : A2650

Brand : APPLE

FCC ID : BCG-E8140A

EUT Description : SMARTPHONE

Test Standard(s) : FCC CFR 47 Part 2, Part 22, Part 27, and Part 96

Date Of Issue:
JULY 11, 2022

Prepared by:
UL LLC
47173 Benicia Street
Fremont, CA 94538, U.S.A.
TEL: (510) 319-4000
FAX: (510) 661-0888



Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
V1	6/28/2022	Initial Review	Mengistu Mekuria
V2	7/11/2022	Revise TCB Questions section 6	Tewodros Woldemichael

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS	6
2. SUMMARY OF TEST RESULTS	7
3. TEST METHODOLOGY	8
4. FACILITIES AND ACCREDITATION	8
5. DECISION RULES AND MEASUREMENT UNCERTAINTY	9
5.1. METROLOGICAL TRACEABILITY	9
5.2. DECISION RULES	9
5.3. MEASUREMENT UNCERTAINTY	9
5.4. SAMPLE CALCULATION.....	9
6. EQUIPMENT UNDER TEST	10
6.1. DESCRIPTION OF EUT.....	10
6.2. MAXIMUM OUTPUT POWER.....	10
6.3. SOFTWARE AND FIRMWARE.....	14
6.4. MAXIMUM ANTENNA GAIN	14
6.5. WORST-CASE CONFIGURATION AND MODE	15
6.6. DESCRIPTION OF TEST SETUP.....	16
7. TEST AND MEASUREMENT EQUIPMENT	18
8. RF OUTPUT POWER VERIFICATION	19
8.1.1. LTE BAND 5.....	20
8.1.2. LTE BAND 7.....	21
8.1.3. LTE BAND 41.....	22
8.1.4. LTE BAND 48.....	24
9. CONDUCTED TEST RESULTS.....	26
9.1. OCCUPIED BANDWIDTH.....	26
9.1.1. LTE BAND 5.....	29
9.1.2. LTE BAND 7.....	30
9.1.3. LTE BAND 41.....	31
9.1.4. LTE BAND 48.....	33
9.2. EMISSION MASK AND ADJACENT CHANNEL POWER	35
9.2.1. LTE BAND 5 EMISSION MASK.....	36
9.2.2. LTE BAND 7 EMISSION MASK.....	38

9.2.3. LTE BAND 41 EMISSION MASK.....41

9.2.4. LTE BAND 48 EMISSION MASK AND ADJACENT CHANNEL POWER.....44

9.3. OUT OF BAND EMISSIONS.....49

9.3.1. LTE BAND 5.....50

9.3.2. LTE BAND 7.....51

9.3.3. LTE BAND 41.....52

9.3.4. LTE BAND 48.....53

9.4. FREQUENCY STABILITY.....55

9.4.1. LTE BAND 5.....56

9.4.2. LTE BAND 7.....57

9.4.3. LTE BAND 41.....58

9.4.4. LTE BAND 48.....59

9.5. PEAK-TO-AVERAGE POWER RATIO.....60

9.5.1. LTE BAND 5.....60

9.5.2. LTE BAND 7.....60

9.5.3. LTE BAND 41.....61

9.5.4. LTE BAND 48.....61

10. RADIATED TEST RESULTS62

10.1. FIELD STRENGTH OF SPURIOUS RADIATION, ANT 1.....67

10.1.1. LTE BAND 5.....68

10.1.2. LTE BAND 7.....69

10.1.3. LTE BAND 41.....70

10.2. FIELD STRENGTH OF SPURIOUS RADIATION, ANT2.....71

10.2.1. LTE BAND 5.....72

10.2.2. LTE BAND 7.....73

10.2.3. LTE BAND 41.....74

10.3. FIELD STRENGTH OF SPURIOUS RADIATION, ANT3.....75

10.3.1. LTE BAND 7.....76

10.3.2. LTE BAND 41.....77

10.4. FIELD STRENGTH OF SPURIOUS RADIATION, ANT4.....78

10.4.1. LTE BAND 7.....79

10.4.2. LTE BAND 41.....80

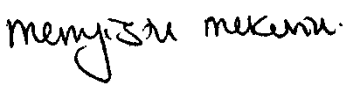

10.4.3. LTE BAND 48.....81

10.5. FIELD STRENGTH OF SPURIOUS RADIATION, ANT7.....82

10.5.1. LTE BAND 48.....83

10.6. FIELD STRENGTH OF SPURIOUS RADIATION, ANT8.....	84
LTE BAND 48	85
10.7. FIELD STRENGTH OF SPURIOUS RADIATION, ANT9.....	86
10.7.1. LTE BAND 48	87
11. SETUP PHOTOS.....	88

1. ATTESTATION OF TEST RESULTS

Applicant Name and Address	APPLE, INC 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A.	
Model	A2650	
Brand	APPLE	
FCC ID	BCG-E8140A	
EUT Description	SMARTPHONE	
Serial Number	MX6MQD93RY, KQ7YDHNY3 (CONDUCTED) AND R9VD6JPQTY, JJJ377FDJ2 (RADIATED)	
Sample Receipt Date	FEBRUARY 02, 2022	
Date Tested	FEBRUARY 04, 2022 to JUNE 16, 2022	
Applicable Standards	FCC CFR 47 Part 2, Part 22, Part 27, and Part 96	
Test Results	COMPLIES	
<p>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.</p> <p>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.</p> <p>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. This report must not be used by the client to claim product certification, approval, or endorsement by A2LA, NIST, any agency of the Federal Government, or any agency of the U.S. government.</p>		
Approved & Released By:	Prepared By:	
		
Mengistu Mekuria Staff Engineer UL LLC	Binod Sitaula Laboratory 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	Band	Requirement Clause Number (FCC)	Result	Remarks
RF Conducted Output Power		2.1046	Complies	
Effective Radiated Power	5	22.913 (a)(5)	Complies	
Equivalent Isotropic Radiated power	7, 41 48	27.50 (h) (2) 96.41 (b)	Complies	
Occupied Bandwidth	5, 7, 41, 48	2.1049	Complies	
Band Edge and Emission Mask	5, 7, 41, 48	2.1051, 22.917 (a), 27.53 (m)(4) &(m)(6), 96.41(e)	Complies	
Out of Band Emissions	5, 7, 41, 48	2.1051, 22.917 (a), 27.53 (m)(4) &(m)(6), 96.41(e)	Complies	
Frequency Stability	5, 7, 41, 48	2.1055, 22.355, 27.54	Complies	
Peak-to-Average Ratio	5, 7, 41, 48	27.50 (d) (5), 96.41 (g)	Complies	
Field Strength of Spurious Radiation	5, 7, 41, 48	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
<input checked="" type="checkbox"/>	Building 1: 47173 Benicia Street, Fremont, CA 94538, USA	US0104	2324A	550739
<input checked="" type="checkbox"/>	Building 2: 47266 Benicia Street, Fremont, CA 94538, USA	US0104	22541	550739
<input type="checkbox"/>	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

MAINS CONDUCTED EMISSIONS

Where relevant, the following sample calculation is provided:

Final Voltage (dBuV) = Measured Voltage (dBuV) + Cable Loss (dB) + Limiter Factor (dB) + LISN Insertion Loss.
36.5 dBuV + 0 dB + 10.1 dB + 0 dB = 46.6 dBuV

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

$ERP/EIRP = P_{Meas} + GT - LC$

where: ERP/EIRP = effective or equivalent radiated power, respectively (expressed in the same units as P_{Meas} , typically dBW or dBm);

P_{Meas} = 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:

OUTPUT POWER FOR LTE BAND 5

Part 22H								
ERP Limit (W)		7.00						
Antenna Gain (dBi)_(Ant1)		-5.00						
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	25.46	18.31	0.068	7292	7M29G7W
	16QAM			25.70	18.55	0.072	7308	7M31D7W
5+3	QPSK	826.5	847.5	25.20	18.05	0.064	7386	7M39G7W
	16QAM			25.70	18.55	0.072	7374	7M37D7W
5+10	QPSK	826.5	844.0	25.70	18.55	0.072	13619	13M6G7W
	16QAM			25.60	18.45	0.070	13631	13M6D7W
10+5	QPSK	829.0	846.5	25.70	18.55	0.072	13769	13M8G7W
	16QAM			25.51	18.36	0.069	13742	13M7D7W
10+10	QPSK	829.0	844.0	25.70	18.55	0.072	18495	18M5G7W
	16QAM			25.45	18.30	0.068	18502	18M5D7W

OUTPUT POWER FOR LTE BAND 7

Part 27								
EIRP Limit (W)		2.00						
Antenna Gain (dBi)_(Ant3)		2.10						
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	27.10	0.513	27712	27M7G7W
	16QAM			24.48	26.58	0.455	27753	27M8D7W
20+10	QPSK	2510.0	2564.5	25.00	27.10	0.513	27910	27M9G7W
	16QAM			24.52	26.62	0.459	27904	27M9D7W
15+15	QPSK	2507.5	2562.5	24.89	26.99	0.500	28418	28M4G7W
	16QAM			25.00	27.10	0.513	28416	28M4D7W
15+20	QPSK	2507.8	2560.0	25.00	27.10	0.513	32587	32M6G7W
	16QAM			23.89	25.99	0.397	32609	32M6D7W
20+15	QPSK	2510.0	2562.2	25.00	27.10	0.513	32448	32M4G7W
	16QAM			24.34	26.44	0.441	32436	32M4D7W
20+20	QPSK	2510.0	2560.0	25.00	27.10	0.513	37430	37M4G7W
	16QAM			23.89	25.99	0.397	37459	37M5D7W

OUTPUT POWER FOR LTE BAND 41

Part 27								
EIRP Limit (W)		2.00						
Antenna Gain (dBi) (Ant3)		1.80						
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	29.80	0.955	22182	22M2G7W
	16QAM			26.50	28.30	0.676	23028	23M0D7W
20+5	QPSK	2506.0	2686.7	28.00	29.80	0.955	22781	22M8G7W
	16QAM			26.50	28.30	0.676	22705	22M7D7W
10+20	QPSK	2501.5	2680.0	28.00	29.80	0.955	27848	27M8G7W
	16QAM			26.47	28.27	0.671	27740	27M7D7W
20+10	QPSK	2506.0	2684.5	28.00	29.80	0.955	27550	27M6G7W
	16QAM			26.49	28.29	0.675	27536	27M5D7W
15+15	QPSK	2503.5	2682.5	28.00	29.80	0.955	28388	28M4G7W
	16QAM			27.04	28.84	0.766	28404	28M4D7W
15+20	QPSK	2503.8	2680.0	28.00	29.80	0.955	32695	32M7G7W
	16QAM			26.91	28.71	0.743	32724	32M7D7W
20+15	QPSK	2506.0	2682.2	28.00	29.80	0.955	32287	32M3G7W
	16QAM			27.85	29.65	0.923	32333	32M3D7W
20+20	QPSK	2506.0	2680.0	28.00	29.80	0.955	37282	37M3G7W
	16QAM			26.83	28.63	0.729	37268	37M3D7W

OUTPUT POWER FOR LTE BAND 48

LOW CHANNEL

Part 96								
EIRP Limit (W)/ 10MHz		0.20						
Antenna Gain (dBi) (Ant9)		-2.10						
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	20.49	18.39	0.069	22897	22M9G7W
	16QAM			20.49	18.39	0.069	22836	22M8D7W
20+5	QPSK	3560.0	3696.7	20.46	18.36	0.069	22816	22M8G7W
	16QAM			20.46	18.36	0.069	22660	22M7D7W
10+20	QPSK	3555.5	3690.0	19.96	17.86	0.061	27729	27M7G7W
	16QAM			19.90	17.80	0.060	27643	27M6D7W
20+10	QPSK	3560.0	3694.5	19.96	17.86	0.061	27493	27M5G7W
	16QAM			19.98	17.88	0.061	27549	27M5D7W
15+20	QPSK	3557.8	3690.0	19.91	17.81	0.060	32475	32M5G7W
	16QAM			19.91	17.81	0.060	32292	32M3D7W
20+15	QPSK	3560.0	3692.2	19.98	17.88	0.061	32437	32M4G7W
	16QAM			19.95	17.85	0.061	32348	32M3D7W
20+20	QPSK	3560.0	3690.0	21.41	19.31	0.085	37104	37M1G7W
	16QAM			21.41	19.31	0.085	32437	32M4D7W

MIDDLE CHANNEL

Part 96								
EIRP Limit (W)/ 10MHz		0.20						
Antenna Gain (dBi) (Ant9)		-1.80						
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	24.00	22.20	0.166	22897	22M9G7W
	16QAM			23.98	22.18	0.165	22836	22M8D7W
20+5	QPSK	3560.0	3696.7	23.91	22.11	0.163	22816	22M8G7W
	16QAM			23.96	22.16	0.164	22660	22M7D7W
10+20	QPSK	3555.5	3690.0	24.30	22.50	0.178	27729	27M7G7W
	16QAM			24.24	22.44	0.175	27643	27M6D7W
20+10	QPSK	3560.0	3694.5	24.30	22.50	0.178	27493	27M5G7W
	16QAM			24.21	22.41	0.174	27549	27M5D7W
15+20	QPSK	3557.8	3690.0	24.29	22.49	0.177	32475	32M5G7W
	16QAM			24.30	22.50	0.178	32292	32M3D7W
20+15	QPSK	3560.0	3692.2	24.29	22.49	0.177	32437	32M4G7W
	16QAM			24.30	22.50	0.178	32348	32M3D7W
20+20	QPSK	3560.0	3690.0	24.29	22.49	0.177	37104	37M1G7W
	16QAM			24.30	22.50	0.178	32437	32M4D7W

HIGH CHANNEL

Part 96								
EIRP Limit (W)/ 10MHz		0.20						
Antenna Gain (dBi) (Ant9)		-3.10						
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	20.40	17.30	0.054	22897	22M9G7W
	16QAM			20.49	17.39	0.055	22836	22M8D7W
20+5	QPSK	3560.0	3696.7	20.47	17.37	0.055	22816	22M8G7W
	16QAM			20.21	17.11	0.051	22660	22M7D7W
10+20	QPSK	3555.5	3690.0	19.93	16.83	0.048	27729	27M7G7W
	16QAM			19.99	16.89	0.049	27643	27M6D7W
20+10	QPSK	3560.0	3694.5	20.00	16.90	0.049	27493	27M5G7W
	16QAM			19.97	16.87	0.049	27549	27M5D7W
15+20	QPSK	3557.8	3690.0	19.97	16.87	0.049	32475	32M5G7W
	16QAM			19.97	16.87	0.049	32292	32M3D7W
20+15	QPSK	3560.0	3692.2	19.94	16.84	0.048	32437	32M4G7W
	16QAM			19.96	16.86	0.049	32348	32M3D7W
20+20	QPSK	3560.0	3690.0	21.46	18.36	0.069	37104	37M1G7W
	16QAM			21.45	18.35	0.068	32437	32M4D7W

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(s) 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, 5G NR n5	824 – 849	-5.0	-5.2					
LTE Band 7, 5G NR n7	2500 – 2570	-2.4	-0.4	2.1	-2.9			
LTE Band 41, 5G NR n41	2496 – 2690	-2.3	-0.8	1.8	-1.8			
LTE Band 48, 5G NR n48 (Low)	3550 – 3600				-5.1	-3.0	-4.9	-2.1
LTE Band 48, 5G NR n48 (Mid)	3600 – 3650				-4.9	-2.9	-3.2	-1.8
LTE Band 48, 5G NR n48 (High)	3650 – 3700				-6.2	-3.2	-3.1	-3.1

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 exhibit 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	Z	Z	N/A	N/A	N/A	N/A	N/A
2300 – 2700 MHz	X	X	Y	Y	N/A	N/A	N/A
3300 – 3980 MHz	N/A	N/A	N/A	Y	Y	X	X

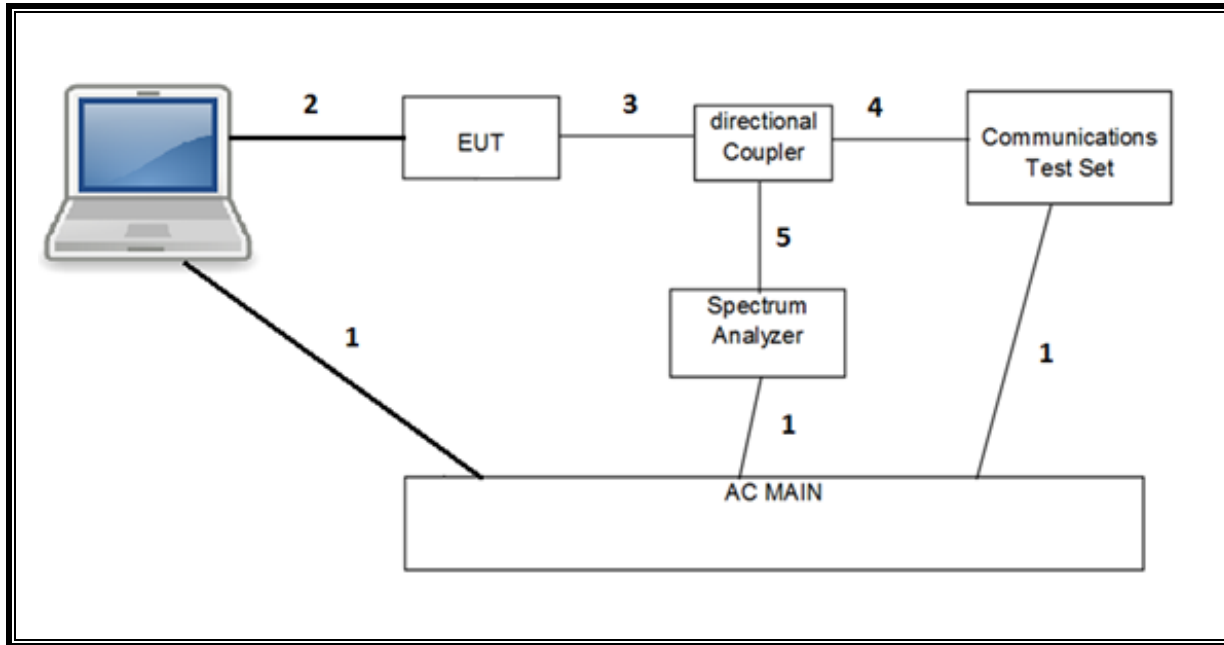
Radiated spurious emissions were investigated from 9kHz to 30MHz, 30MHz-1GHz and above 1GHz. There were no emissions found with less than 20dB of margin from 9kHz to 1GHz.

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.

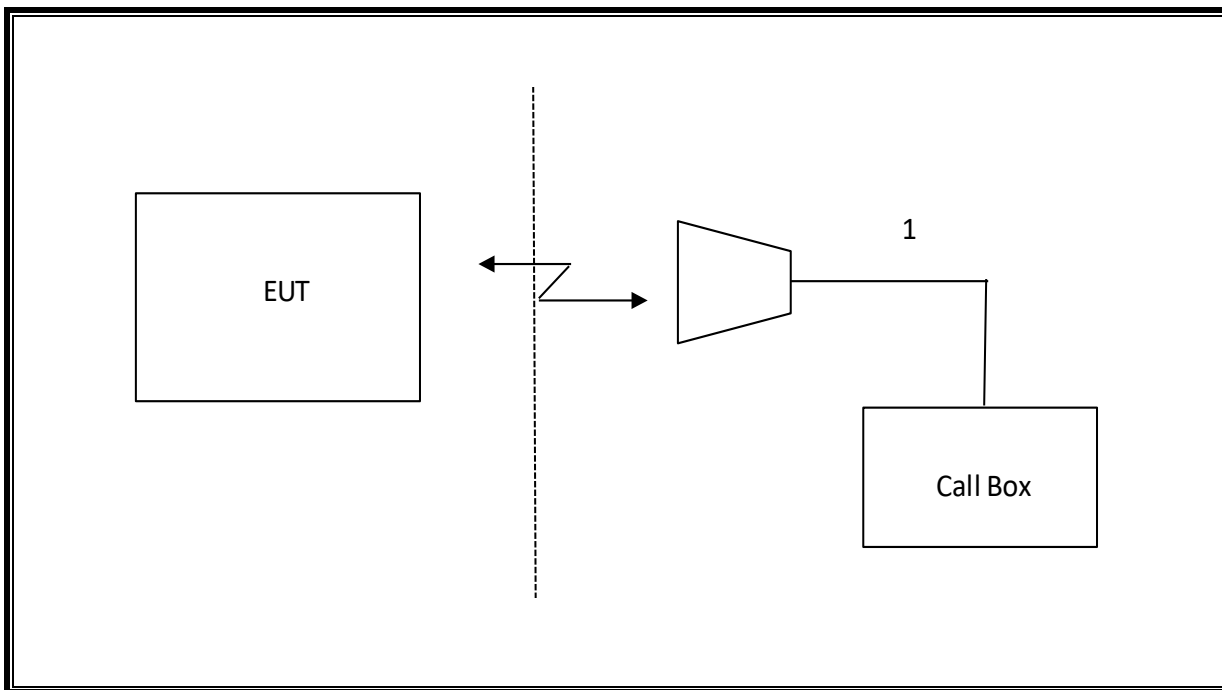
6.6. DESCRIPTION OF TEST SETUP

SUPPORT TEST EQUIPMENT						
Description	Manufacturer	Model	Serial Number	FCC ID/ DoC		
Laptop	Apple	MacBook Pro	HRP082673	BCGA1708		
AC/DC adapter	Apple	A1718	C4H64450HH3GN8RA6	--		
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	80402	6/14/2022
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences Corp.	JB3	85151	3/21/2023
*RF Amplifier, 1-18GHz	T1165	AFS42-00101800-25-S-42	T1165	6/12/2022
*Amplifier, 1 to 18GHz	Miteq	AFS42-00101800-25-S-42	T1165	6/12/2022
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight	N9030A	85212	1/30/2023
Wideband Communication Test Set, Call Box	Rohde & Schwarz	CMW500	85827	connection purpose only
Antenna, Horn 1-18GHz	ETS Lindgren	3117	80403	5/26/2023
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight	N9030A	125178	1/24/2023
Wideband Communication Test Set, Call Box	R&S GmbH & Co. KG	CMW500	80105	connection purpose only
Antenna, Broadband Hybrid, 30MHz to 3GHz	Sunol Sciences Corp.	JB3	203089	1/31/2023
Amplifier, 9KHz to 1GHz, 32dB	SONOMA INSTRUMENT	310	170649	7/07/2022
Directional Coupler	KRYTAR	152613	T1536	9/23/2022
Directional Coupler	KRYTAR	152613	T1537	9/23/2022
Power Meter, P-series single channel	Keysight	N1911A	82174	1/24/2023
Power Sensor, P - series, 50MHz to 18GHz, Wideband	Keysight	N1921A	90388	1/24/2023
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	2/1/2023
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight	N9030A	85201	2/1/2023
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight	N9030A	85214	2/2/2023
Spectrum Analyzer, PXA, 3Hz to 50GHz w/Ext. Mixer	Keysight	N9030A	80400	2/1/2023
Wideband Communication Test Set, Call Box	R&S GmbH & Co. KG	CMW500	85806	2/22/2023
Wideband Communication Test Set, Call Box	R&S GmbH & Co. KG	CMW500	85943	2/20/2023
Wireless Test Platform, UXM 5G	Keysight	E7515B	207269	1/24/2023
Environmental Chamber	Cincinnati Sub Zero	ZPHS-8-3.5-SCT/WC	82472	6/15/2022
UL AUTOMATION SOFTWARE				
CLT Software	UL	UL RF	Ver 3.7.6, Match 1, 2022	
Power Measurement Software	UL	UL RF	Ver 3.4.9, April 29, 2022	
Radiated test software	UL	UL RF	Ver 9.5 June 15, 2022	

NOTES:

- * Testing is completed before equipment expiration date.
- ** 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:

8.1.1. LTE BAND 5

Test Engineer ID:	25780	Test Date:	2/4/2022
--------------------------	-------	-------------------	----------

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				ANT 2			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
3MHz / 5MHz	825.5	829.4	1	14	1	0	25.24	25.70	24.76	23.52	24.24	24.43	23.50	22.26
			15	0	25	0	25.46	25.54	24.49	23.51	24.47	24.12	23.12	22.07
	834.0	837.9	1	14	1	0	25.20	25.67	24.76	23.67	24.22	24.70	23.77	22.50
			15	0	25	0	25.46	25.56	24.65	23.62	24.47	24.54	23.65	22.63
	842.5	846.5	1	14	1	0	25.21	25.42	24.60	23.29	24.27	23.92	22.78	21.80
			15	0	25	0	25.37	25.45	24.43	23.45	24.46	23.78	22.75	21.76

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				ANT 2			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
5MHz / 3MHz	826.5	830.4	1	24	1	0	25.07	25.70	24.57	23.55	24.26	24.70	23.61	22.37
			25	0	15	0	25.20	25.28	24.31	23.28	24.35	24.15	23.13	22.11
	835.0	838.9	1	24	1	0	25.03	25.70	24.58	23.58	24.13	24.63	23.47	22.42
			25	0	15	0	25.20	25.24	24.30	23.33	24.31	24.37	23.39	22.37
	843.6	847.5	1	24	1	0	25.00	24.97	23.86	22.75	24.17	23.65	22.59	21.58
			25	0	15	0	25.12	24.96	23.94	22.97	24.33	23.54	22.54	21.54

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				ANT 2			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
5MHz / 10MHz	826.5	833.7	1	24	1	0	25.67	25.60	24.38	21.21	24.70	24.30	23.02	19.79
			25	0	50	0	24.15	23.20	23.18	21.14	22.81	21.84	23.26	19.91
	831.6	838.8	1	24	1	0	25.70	25.59	24.35	21.16	24.67	24.25	23.05	19.91
			25	0	50	0	24.14	23.18	24.12	21.13	22.80	21.83	21.81	19.88
	836.8	844.0	1	24	1	0	25.68	25.56	24.31	21.20	24.68	24.07	23.02	19.74
			25	0	50	0	24.11	23.14	23.18	21.10	22.76	21.80	21.78	19.82

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				ANT 2			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
10MHz / 5MHz	829.0	836.2	1	49	1	0	25.70	25.51	24.34	21.20	24.69	24.05	23.11	19.86
			50	0	25	0	24.02	23.06	23.05	21.01	22.73	21.76	21.75	19.82
	834.3	841.5	1	49	1	0	25.60	25.41	24.31	21.18	24.70	24.23	22.92	19.96
			50	0	25	0	23.99	23.05	23.01	21.00	22.74	21.75	21.74	19.78
	839.3	846.5	1	49	1	0	25.59	25.35	24.34	21.11	24.66	24.25	23.01	20.01
			50	0	25	0	23.97	23.00	22.98	20.96	22.72	21.73	21.74	19.77

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				ANT 2			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
10MHz / 10MHz	829.0	838.9	1	49	1	0	25.64	25.45	24.32	21.23	24.70	24.06	23.05	19.91
			50	0	50	0	15.62	16.12	15.88	15.95	14.37	14.65	14.66	14.44
	831.5	841.4	1	49	1	0	24.09	23.10	23.10	21.07	22.76	21.78	21.77	19.86
			50	0	50	0	25.60	25.45	24.31	21.10	24.62	24.09	22.99	19.74
	834.1	844.0	1	49	1	49	15.56	16.06	15.98	15.77	14.36	14.72	14.65	14.41
			50	0	50	0	24.11	23.11	22.67	24.91	22.77	21.79	21.11	19.83
834.1	844.0	1	49	1	0	25.70	25.45	24.23	21.17	24.67	24.13	22.95	19.85	
		50	0	50	0	15.62	16.06	15.89	15.88	14.37	14.76	14.57	14.52	

8.1.2. LTE BAND 7

Test Engineer ID:	25780	Test Date:	2/4/2022
--------------------------	-------	-------------------	----------

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	25.44	23.50	21.31	23.70	23.01	21.57	18.92	25.00	24.45	22.85	20.30	23.10	22.69	21.07	18.55
			50	0	100	0	23.55	23.15	22.60	21.10	21.84	20.84	20.54	18.80	23.08	22.09	22.03	20.03	21.26	20.30	20.03	18.26
	2525.6	2540.0	1	49	1	0	25.53	25.46	23.50	21.12	23.60	22.80	21.60	18.81	24.82	24.39	23.25	20.13	23.04	22.05	21.07	18.41
			50	0	100	0	24.08	23.08	23.07	21.04	21.53	20.57	20.57	18.54	23.08	22.07	22.08	20.06	21.08	20.06	20.06	18.28
	2545.6	2560.0	1	49	1	0	25.57	25.47	23.56	21.21	23.56	22.75	21.52	18.53	24.87	24.48	22.82	20.20	23.20	22.74	21.08	18.46
			50	0	100	0	24.11	23.13	23.09	21.10	21.58	20.70	20.57	18.53	23.08	22.06	22.07	20.06	21.35	20.40	20.37	18.34

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	25.53	25.42	23.53	21.07	23.55	22.77	21.58	18.88	24.8294	24.52	23.07	20.23	23.06	22.66	21.08	18.43
			100	0	50	0	23.54	23.05	22.53	21.01	21.88	20.87	20.59	18.87	23.10	22.06	22.03	20.05	21.26	20.24	20.09	18.24
	2530.1	2544.5	1	99	1	0	25.58	25.37	23.56	21.05	23.70	22.55	21.55	18.76	24.87	24.43	22.89	20.10	23.20	22.67	21.07	18.39
			100	0	50	0	23.98	22.97	22.95	20.95	21.80	20.81	20.52	18.79	23.01	21.88	21.82	20.00	21.24	20.24	20.23	18.22
	2550.1	2564.5	1	99	1	0	25.70	25.65	23.58	21.12	23.55	22.82	21.55	18.57	25.00	24.41	22.82	20.07	23.03	22.69	21.03	18.38
			100	0	50	0	23.56	23.02	22.99	20.97	21.79	20.81	20.52	18.81	23.02	21.85	22.01	20.00	22.23	20.30	20.31	18.29

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	25.70	25.49	23.51	21.35	23.70	23.27	21.53	19.01	24.82	24.97	24.51	22.96	23.20	22.88	21.05	18.63
			75	0	75	0	23.50	23.24	22.50	21.17	21.87	20.87	20.77	18.80	22.83	23.16	22.18	22.13	21.01	20.49	20.22	18.46
	2527.5	2542.5	1	74	1	0	25.52	25.42	23.57	21.27	23.54	23.14	21.54	18.90	24.89	25.00	22.84	20.65	23.05	22.8	21.07	18.59
			75	0	75	0	24.16	23.16	23.14	21.12	21.51	20.58	20.54	18.56	22.88	22.45	22.26	20.40	21.01	20.49	20.44	18.49
	2547.5	2562.5	1	74	1	0	25.70	25.67	23.54	21.30	23.54	22.99	21.54	18.53	24.81	24.79	23.07	20.61	23.07	22.90	21.08	18.64
			75	0	75	0	23.57	23.20	23.15	21.15	21.51	20.59	20.55	18.53	22.86	22.42	22.44	20.40	21.07	20.58	20.57	18.53

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	25.42	23.52	21.24	23.60	23.29	21.57	19.04	25.00	23.80	22.89	20.27	23.04	22.52	21.01	18.28
			75	0	100	0	23.60	23.11	22.58	21.06	21.89	20.92	20.84	18.87	23.11	22.09	21.80	20.06	21.05	20.72	20.03	18.67
	2525.3	2542.4	1	74	1	0	25.56	25.31	23.52	21.12	23.51	23.19	21.53	18.97	24.86	23.80	22.84	20.15	23.01	22.22	21.04	18.02
			75	0	100	0	23.60	23.05	23.04	21.01	21.86	20.83	20.73	18.80	23.12	22.01	21.82	20.06	21.03	20.03	20.00	18.06
	2542.9	2560.0	1	74	1	0	25.51	25.48	23.52	21.07	23.70	23.16	21.55	18.94	24.87	23.89	22.80	20.17	23.20	22.49	21.07	18.33
			75	0	100	0	24.05	23.05	23.02	20.99	21.82	20.83	20.80	18.77	23.08	22.12	21.82	20.09	21.03	20.08	20.04	18.09

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

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	25.54	25.70	23.57	21.78	23.53	22.98	22.49	20.26	24.86	24.32	22.87	19.81	23.02	23.20	21.03	18.66
			100	0	75	0	23.77	23.32	22.59	21.09	22.00	22.56	21.65	20.29	22.87	23.74	21.82	19.81	21.88	21.31	20.07	18.66
	2527.6	2544.7	1	99	1	0	25.54	25.53	23.54	21.51	23.70	23.10	22.47	20.36	25.00	24.34	22.81	20.99	23.04	23.17	21.05	19.05
			100	0	75	0	24.37	24.09	22.58	21.64	22.47	23.15	22.10	20.83	23.23	23.94	21.87	20.46	22.21	21.75	20.08	19.12
	2545.1	2562.2	1	99	1	0	25.50	25.58	23.51	20.84	23.54	23.00	22.52	19.82	24.90	24.29	22.88	20.80	23.07	22.90	21.01	18.32
			100	0	75	0	25.08	23.91	22.51	21.53	22.23	22.90	21.94	20.58	23.44	23.83	21.81	20.84	22.14	21.67	20.04	19.16

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	25.47	23.52	21.21	23.57	23.30	21.52	19.02	25.00	23.89	22.88	23.93	23.20	22.65	21.01	18.43
			100	0	100	0	23.91	23.00	22.50	20.95	21.90	20.90	20.89	18.86	22.81	21.87	22.53	21.54	21.27	20.09	20.05	18.25
	2525.1	2544.9	1	99	1	0	25.54	25.29	23.53	20.78	23.53	23.25	21.55	18.95	24.82	23.84	24.39	23.82	23.02	22.69	21.06	18.38
			100	0	100	0	23.99	22.96	22.60	20.94	21.77	20.82	20.83	18.81	22.81	21.86	22.51	21.50	22.13	20.26	20.26	18.25
	2540.2	2560.0	1	99	1	0	25.50	24.77	23.87	20.59	23.70	23.30	21.52	18.96	24.88	23.88	23.48	23.88	23.02	22.64	21.03	18.35
			100	0	100	0	23.53	22.54	22.56	20.51	21.85	20.84	20.81	18.80	22.87	21.86	22.52	21.50	22.45	20.05	20.23	18.25

8.1.3. LTE BAND 41

Test Engineer ID:	25780	Test Date:	3/11/2022
-------------------	-------	------------	-----------

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			
							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	23.39	23.38	23.38	23.32	23.63	23.60	23.67	23.67	21.83	21.86	21.87	21.81	21.92	21.97	22.00	21.94
			25	0	100	0	23.37	23.35	23.32	23.33	23.62	23.62	23.60	23.69	21.84	21.89	21.84	21.81	21.92	21.97	21.97	22.00
	2583.8	2595.5	1	24	1	0	28.52	27.13	26.70	23.65	28.70	27.18	26.61	23.66	28.00	26.50	26.00	22.97	27.70	26.20	25.62	22.70
			25	0	100	0	26.63	25.69	25.69	23.69	26.62	25.67	25.66	23.66	25.90	24.95	24.91	22.93	25.70	24.70	24.70	22.70
	2668.3	2680.0	1	24	1	0	28.38	26.89	26.31	23.36	28.62	27.20	26.70	23.63	27.62	26.02	25.53	22.44	26.91	25.36	24.83	21.87
			25	0	100	0	26.38	25.30	25.35	23.31	26.61	25.60	25.66	23.67	25.67	24.65	24.60	22.64	24.86	23.79	23.86	21.91

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			
							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	27.34	26.85	21.42	22.87	27.60	27.15	26.79	23.65	25.82	25.38	24.53	21.85	25.94	25.45	25.17	21.97
			100	0	25	0	23.30	23.39	23.40	23.40	23.62	23.66	23.64	23.68	21.90	21.89	21.80	21.85	21.98	21.95	21.90	21.99
	2590.5	2602.2	1	99	1	0	28.70	27.16	26.60	23.64	28.70	27.10	26.63	23.66	28.00	26.50	26.00	23.00	27.70	26.20	25.68	22.72
			100	0	25	0	26.63	25.64	25.69	23.63	26.68	25.62	25.63	23.61	26.00	25.00	25.00	23.00	25.70	24.70	24.70	22.70
	2675.0	2686.7	1	99	1	0	28.22	26.84	26.34	23.34	27.30	27.13	26.63	23.68	27.63	26.02	25.64	22.66	26.92	25.42	24.92	21.94
			100	0	25	0	26.38	25.32	25.40	23.37	26.64	25.63	25.62	23.64	25.53	24.65	24.64	22.62	24.97	23.93	23.94	21.98

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			
							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	23.32	23.35	23.39	23.33	23.61	23.61	23.69	23.62	21.89	21.82	21.90	21.87	21.96	22.00	21.93	21.98
			50	0	100	0	23.37	23.35	23.37	23.32	23.65	23.60	23.67	23.67	21.85	21.83	21.90	21.83	21.91	21.91	21.92	21.97
	2583.6	2598.0	1	49	1	0	28.52	27.16	26.7	23.64	28.70	27.20	26.64	23.66	28.00	26.47	26.00	23.00	27.70	26.20	25.55	22.70
			50	0	100	0	26.61	25.60	25.6136	23.64	26.64	25.67	25.65	23.61	25.97	24.92	24.96	22.90	25.70	24.70	24.70	22.70
	2665.6	2680.0	1	49	1	0	28.38	26.89	26.31	23.39	28.62	27.19	26.63	23.68	27.66	26.02	25.53	22.44	26.91	25.36	24.83	21.87
			50	0	100	0	26.37	25.37	25.32	23.33	26.64	25.64	25.62	23.65	25.67	24.65	24.60	22.64	24.86	23.97	23.86	21.91

OUTPUT POWER FOR LTE BAND 41 (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			
							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	27.30	26.78	26.57	23.38	27.64	27.15	26.95	23.66	25.84	25.40	24.73	21.84	25.92	25.45	25.13	21.95
			100	0	50	0	23.31	23.39	23.26	23.31	23.63	23.66	23.63	23.66	21.90	21.86	21.89	21.90	21.92	21.91	22.00	22.00
	2588.1	2602.5	1	99	1	0	28.68	27.17	26.70	23.62	28.70	27.18	26.65	23.66	28.00	26.49	26.00	22.92	27.70	26.20	25.85	22.70
			100	0	50	0	26.65	25.63	25.62	23.64	26.64	25.65	25.67	23.66	25.91	24.94	25.00	22.99	25.70	24.70	24.70	22.70
	2670.1	2684.5	1	99	1	0	28.22	26.85	26.34	23.30	28.30	27.11	26.65	23.69	27.57	26.01	25.66	22.58	26.89	25.11	24.85	21.78
			100	0	50	0	26.36	25.31	25.34	23.38	26.68	25.66	25.64	23.64	25.66	24.60	24.65	22.61	24.75	23.94	23.88	21.91

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			
							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	28.28	26.70	26.29	23.28	28.55	27.99	27.29	23.40	26.78	25.26	24.70	21.77	26.84	25.37	24.88	21.84
			75	0	75	0	25.81	24.86	23.23	23.26	24.36	24.34	24.36	22.70	21.76	21.80	21.74	21.70	21.82	21.89	21.86	21.81
	2585.5	2600.5	1	74	1	0	28.59	28.70	26.75	23.03	28.70	28.70	28.02	23.49	28.00	27.04	26.20	23.40	27.70	26.06	25.55	22.53
			75	0	75	0	28.14	27.14	27.03	23.14	28.17	27.17	27.18	23.47	26.47	25.49	25.49	23.46	25.86	24.87	24.88	22.85
	2667.5	2682.5	1	74	1	0	28.28	27.70	26.25	23.00	28.51	28.00	27.33	22.71	27.51	26.04	25.59	22.50	26.83	25.37	24.90	21.80
			75	0	75	0	27.18	26.15	26.04	23.12	27.45	26.45	26.47	22.76	25.50	24.51	24.59	22.55	24.89	23.85	23.82	21.89

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			
							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	28.26	26.74	26.28	23.30	28.54	27.99	27.29	23.40	26.73	25.26	24.70	21.76	26.87961	25.30	24.82	21.88
			75	0	100	0	25.79	24.80	23.22	23.29	24.49	24.48	24.48	23.55	21.79	21.71	21.75	21.78	21.89	21.89	21.88	21.83
	2583.3	2600.4	1	74	1	0	28.57	28.70	26.51	23.41	28.70	28.27	27.59	23.65	28.00	26.91	25.84	23.18	27.70	26.33	25.56	22.83
			75	0	100	0	28.09	27.14	27.09	23.41	27.70	28.27	26.73	23.75	26.58	25.60	25.60	23.55	25.83	24.84	24.84	22.83
	2662.9	2680.0	1	74	1	0	28.26	27.70	26.23	22.33	28.51	27.50	26.80	22.92	27.59	26.06	25.51	22.57	26.84	25.33	24.80	21.88
			75	0	100	0	27.14	26.15	26.12	22.44	26.92	25.94	25.95	22.96	25.52	24.52	24.58	22.57	24.82	23.85	23.82	21.87

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	28.23	27.70	26.25	22.37	28.59	27.45	27.73	22.81	26.79	26.20	24.72	23.70	26.83	26.30	26.03	21.30
			100	0	75	0	23.28	23.21	24.11	23.76	23.80	23.81	23.82	23.24	21.78	21.79	21.79	22.01	21.87	21.88	21.88	21.69
	2585.6	2602.7	1	99	1	0	28.57	28.70	26.80	23.58	28.52	28.01	27.58	22.61	27.88	27.85	25.81	23.46	27.60	27.29	27.11	22.61
			100	0	75	0	28.43	27.40	27.26	23.87	27.35	27.35	28.70	23.38	28.00	27.78	26.81	23.68	27.69	27.70	27.70	23.20
	2665.1	2682.2	1	99	1	0	28.26	27.70	26.24	22.82	28.54	27.08	26.57	22.34	27.52	26.97	25.56	23.25	26.81	25.94	25.42	20.33
			100	0	75	0	27.36	26.37	26.35	22.85	27.78	28.00	27.24	22.79	26.98	26.42	25.50	23.02	26.27	26.30	26.09	20.75

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	28.21	26.79	26.22	23.23	28.57	27.38	27.38	23.35	26.71	25.28	24.72	21.75	26.90	25.30	24.90	21.87
			1	0	1	99	15.28	15.22	15.29	15.90	15.90	16.01	16.01	16.08	13.70	13.78	13.71	13.77	13.85	13.84	13.87	13.82
	100	0	100	0	23.29	23.29	24.24	23.23	23.90	23.90	23.49	21.73	21.76	21.79	21.75	21.87	21.80	21.86	21.81			
	1	99	1	0	28.70	28.68	26.79	23.05	28.70	27.67	26.97	23.56	28.00	26.83	25.81	23.20	27.70	26.29	25.75	22.96		
	1	0	1	99	21.87	21.87	26.76	21.69	20.72	20.87	20.66	20.96	19.31	19.35	19.36	19.32	19.45	19.61	19.35	19.67		
	100	0	100	0	28.24	27.29	27.19	23.23	27.22	26.24	26.23	23.20	26.78	25.79	25.78	23.75	25.97	24.98	24.99	22.99		
2583.1	2602.9	1	99	1	0	28.29	27.70	26.24	23.11	28.56	27.34	26.79	23.08	27.59	26.08	25.57	22.60	26.89	25.34	24.85	21.86	
		1	0	1	99	20.92	20.90	20.90	21.09	20.47	20.75	20.31	20.71	19.02	19.07	19.07	19.06	18.38	18.32	18.33	18.33	
2660.2	2680.0	1	99	1	0	27.33	26.33	26.31	23.32	26.96	25.96	25.98	23.00	25.55	24.53	24.56	22.51	24.85	23.81	23.89	21.86	
		100	0	100	0	27.33	26.33	26.31	23.32	26.96	25.96	25.98	23.00	25.55	24.53	24.56	22.51	24.85	23.81	23.89	21.86	

8.1.4. LTE BAND 48

Test Engineer ID:	25780	Test Date:	4/3/2022
-------------------	-------	------------	----------

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

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB	PCC RB Offset	SCC1 RB	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	20.43	20.42	20.42	20.48	20.46	20.43	20.50	20.50	20.49	20.49	20.48	20.40	19.91	19.93	19.98	19.98
			25	0	100	0	13.95	13.95	13.90	13.96	13.95	13.92	13.96	13.98	13.94	13.96	13.93	13.92	13.50	13.41	13.44	13.43
	1	24	1	0	24.00	23.93	23.98	20.92	24.00	23.91	23.92	20.93	24.00	23.98	23.99	20.97	23.50	23.47	23.49	20.42		
	3615.8	3627.5	25	0	100	0	21.97	21.93	21.92	20.99	21.97	21.99	21.91	21.00	21.95	21.98	21.94	20.92	21.41	21.49	21.42	20.46
	3678.3	3690.0	1	24	1	0	20.44	20.42	20.47	20.46	20.47	20.40	20.45	20.46	20.40	20.49	20.48	20.45	19.99	19.95	19.90	19.92
			25	0	100	0	13.99	13.92	13.94	13.97	13.93	13.94	13.99	14.00	13.94	13.95	13.93	13.93	13.44	13.47	13.41	13.48

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	20.44	20.50	20.44	20.41	20.50	20.41	20.42	20.42	20.46	20.46	20.41	20.45	19.92	19.92	19.94	19.92
			100	0	25	0	13.98	13.92	13.94	13.95	13.97	13.98	13.91	13.98	13.96	13.91	14.00	13.93	13.50	13.46	13.40	13.49
	1	99	1	0	24.00	23.94	23.95	20.93	23.95	23.94	23.98	20.98	23.91	23.96	24.00	20.95	23.50	23.40	23.43	20.45		
	3622.5	3634.2	100	0	25	0	21.95	21.97	21.92	20.94	21.91	21.95	21.96	20.93	21.91	21.95	21.95	20.97	21.47	21.43	21.45	20.42
	3685.0	3696.7	1	99	1	0	20.49	20.45	20.41	20.42	20.43	20.50	20.48	20.41	20.47	20.41	20.42	20.45	19.91	19.97	19.94	20.00
			100	0	25	0	13.97	13.99	13.94	13.99	13.94	13.97	13.97	13.98	14.00	13.98	13.91	13.98	13.44	13.43	13.49	13.44

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	19.94	19.96	19.93	19.98	19.94	19.93	19.91	20.00	19.96	19.90	19.99	19.97	19.49	19.41	19.40	19.45
			50	0	100	0	14.99	14.98	15.00	14.97	14.95	14.98	14.93	14.93	14.92	14.97	14.90	14.91	14.46	14.43	14.44	14.49
	1	49	1	0	24.50	24.49	23.95	20.94	24.46	24.48	23.95	20.96	24.30	24.24	23.72	20.71	23.95	23.95	23.43	20.42		
	3615.6	3630.0	50	0	100	0	21.41	21.46	21.48	21.00	21.45	21.40	21.41	20.92	21.42	21.45	21.48	20.92	20.99	20.99	20.98	20.47
	3675.6	3690.0	1	49	1	0	19.91	19.98	19.98	19.97	19.96	19.91	19.99	19.92	19.93	19.99	19.90	19.96	19.45	19.43	19.41	19.46
			50	0	100	0	14.98	14.96	14.96	14.94	14.98	14.94	14.94	14.91	14.93	14.98	14.94	14.97	14.42	14.42	14.49	14.41

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	19.99	19.98	19.91	19.93	19.91	19.97	19.90	19.92	19.96	19.98	19.92	19.93	19.49	19.45	19.41	19.46
			100	0	50	0	14.94	14.98	14.99	14.98	14.93	14.95	15.00	14.92	14.97	14.96	14.97	14.96	14.47	14.40	14.41	14.49
	1	99	1	0	24.45	24.50	23.93	20.91	24.50	24.47	23.96	20.95	24.30	24.21	23.75	20.77	23.94	23.97	23.49	20.46		
	3620.1	3634.5	100	0	50	0	21.43	21.41	21.40	20.98	21.45	21.49	21.45	20.92	21.45	21.47	20.92	21.00	20.93	20.90	20.43	
	3680.1	3694.5	1	99	1	0	19.90	19.92	19.99	19.95	19.93	19.90	19.91	19.97	20.00	19.97	19.90	19.96	19.49	19.50	19.45	19.47
			100	0	50	0	14.91	14.95	14.99	15.00	14.96	14.92	14.91	14.92	14.97	14.93	14.98	14.94	14.41	14.47	14.44	14.41

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	20.00	19.91	19.92	19.97	19.95	19.90	19.92	19.95	19.91	19.91	19.96	20.00	19.48	19.50	19.42	19.49
			75	0	100	0	14.93	14.97	14.93	14.93	15.00	14.90	14.92	14.92	14.90	15.00	14.98	14.97	14.46	14.46	14.48	14.46
	1	74	1	0	24.92	24.92	23.96	20.99	24.96	24.98	23.93	20.98	24.29	24.30	23.28	20.28	24.42	24.45	23.47	20.42		
	3615.3	3632.4	75	0	100	0	21.46	21.44	21.47	20.98	21.47	21.47	21.49	20.96	21.42	21.50	21.42	20.99	20.95	20.93	20.93	20.45
	3672.9	3690.0	1	74	1	0	19.92	20.00	19.96	19.98	19.91	19.94	19.97	19.94	19.97	19.97	19.98	19.96	19.48	19.47	19.40	19.41
			75	0	100	0	14.99	14.95	14.91	14.93	14.95	14.98	14.96	14.97	14.91	14.96	14.98	14.92	14.45	14.41	14.45	14.41

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	19.99	19.92	19.93	19.92	19.98	19.91	19.96	20.00	19.98	19.95	19.95	19.92	19.48	19.46	19.43	19.44
			100	0	75	0	14.98	14.97	14.95	14.91	14.95	14.91	14.94	14.93	14.94	14.97	14.92	14.47	14.47	14.45	14.49	
	1	99	1	0	25.00	24.94	23.99	20.92	24.90	24.99	23.94	20.93	24.29	24.30	23.26	20.30	24.42	24.44	23.41	20.40		
	3617.6	3634.7	100	0	75	0	21.42	21.44	21.42	20.90	21.42	21.42	21.43	20.91	21.43	21.40	21.42	20.97	21.00	20.95	20.92	20.49
	3675.1	3692.2	1	99	1	0	19.95	19.98	19.95	19.96	19.95	19.96	19.90	19.97	19.94	19.96	19.95	19.98	19.50	19.49	19.49	19.48
			100	0	75	0	14.90	14.98	14.97	14.91	14.99	14.97	14.93	14.96	15.00	14.97	14.95	14.96	14.42	14.40	14.46	14.49

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	21.45	21.46	21.47	20.97	21.49	21.41	21.43	20.91	21.41	21.41	21.41	20.96	20.91	21.00	20.91	20.43
			1	0	1	99	7.94	7.97	7.92	7.92	8.00	7.94	8.00	8.00	7.97	7.92	7.93	7.95	7.49	7.43	7.43	7.50
			100	0	100	0	14.91	14.99	14.96	14.98	14.92	14.93	14.98	14.90	14.98	14.95	14.96	14.91	14.49	14.43	14.48	14.48
			1	99	1	0	25.00	24.99	23.98	20.99	25.00	24.97	23.96	20.95	24.29	24.30	23.25	20.24	24.48	24.44	23.50	20.47
	3615.1	3634.9	1	0	1	99	14.44	14.43	14.50	14.43	14.46	14.41	14.47	14.44	14.50	14.41	14.43	14.45	13.92	13.99	13.91	13.95
			100	0	100	0	21.40	21.44	21.47	20.97	21.44	21.47	21.41	20.92	21.46	21.47	21.48	20.97	20.95	20.95	20.90	20.47
			1	99	1	0	21.45	21.42	21.43	20.99	21.44	21.48	21.42	20.90	21.46	21.45	21.48	20.92	20.90	20.95	20.90	20.40
			1	0	1	99	7.94	7.94	7.95	7.92	7.99	8.00	7.98	7.90	7.98	7.91	7.96	7.98	7.41	7.47	7.43	7.44
	3670.2	3690.0	1	0	1	99	15.00	14.97	15.00	14.98	14.98	14.95	14.98	14.94	14.96	14.94	14.95	14.90	14.50	14.43	14.42	14.46
			100	0	100	0	15.00	14.97	15.00	14.98	14.98	14.95	14.98	14.94	14.96	14.94	14.95	14.90	14.50	14.43	14.42	14.46

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	7.2922	7.789
	3MHz + 5MHz BAND 16QAM			7.3075	7.810
	5MHz + 3MHz BAND QPSK	25/0 + 15/0		7.3858	7.848
	5MHz + 3MHz BAND 16QAM			7.3742	7.847
	5MHz + 10MHz BAND QPSK	25/0 + 50/0		13.619	14.29
	5MHz + 10MHz BAND 16QAM			13.631	14.27
	10MHz + 5MHz BAND QPSK	50/0 + 25/0		13.769	14.29
	10MHz + 5MHz BAND 16QAM			13.742	14.34
	10MHz + 10MHz BAND QPSK	50/0 + 50/0		18.495	19.33
	10MHz + 10MHz BAND 16QAM			18.502	19.34

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	27.712	29.84
	10MHz + 20MHz BAND 16QAM			27.753	29.82
	20MHz + 10MHz BAND QPSK	100/0 + 50/0		27.910	30.06
	20MHz + 10MHz BAND 16QAM			27.904	30.07
	15MHz + 15MHz BAND QPSK	75/0 + 75/0		28.481	30.57
	15MHz + 15MHz BAND 16QAM			28.416	30.59
	15MHz + 20MHz BAND QPSK	75/0 + 100/0		32.587	34.86
	15MHz + 20MHz BAND 16QAM			32.609	34.83
	20MHz + 15MHz BAND QPSK	100/0 + 75/0		32.448	34.85
	20MHz + 15MHz BAND 16QAM			32.436	34.87
	20MHz + 20MHz BAND QPSK	100/0 + 100/0		37.430	39.82
	20MHz + 20MHz BAND 16QAM			37.459	39.86

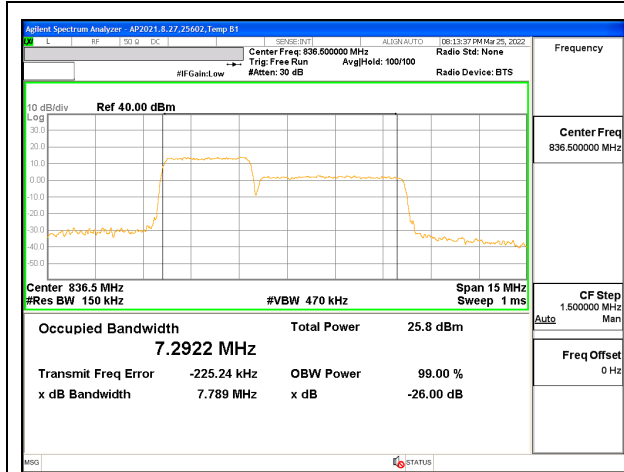
LTE BAND 41

Band	Mode	RB Allocation/RB Offset	f (MHz)	99% BW (MHz)	- 26dB BW (MHz)
LTE BAND 41 (FCC)	5MHz + 20MHz BAND QPSK	25/0 + 100/0	2593	22.182	23.64
	5MHz + 20MHz BAND 16QAM			23.028	24.73
	20MHz + 5MHz BAND QPSK	100/0 + 25/0		22.781	23.64
	20MHz + 5MHz BAND 16QAM			22.705	23.65
	10MHz + 20MHz BAND QPSK	50/0 + 100/0		27.848	29.74
	10MHz + 20MHz BAND 16QAM			27.740	29.80
	20MHz + 10MHz BAND QPSK	100/0 + 50/0		27.550	28.58
	20MHz + 10MHz BAND 16QAM			27.536	28.71
	15MHz + 15MHz BAND QPSK	75/0 + 75/0		28.388	30.45
	15MHz + 15MHz BAND 16QAM			28.404	30.46
	15MHz + 20MHz BAND QPSK	75/0 + 100/0		32.695	34.88
	15MHz + 20MHz BAND 16QAM			32.724	34.72
	20MHz + 15MHz BAND QPSK	100/0 + 75/0		32.287	33.74
	20MHz + 15MHz BAND 16QAM			32.333	33.48
	20MHz + 20MHz BAND QPSK	100/0 + 100/0		37.282	38.62
	20MHz + 20MHz BAND 16QAM			37.268	38.60

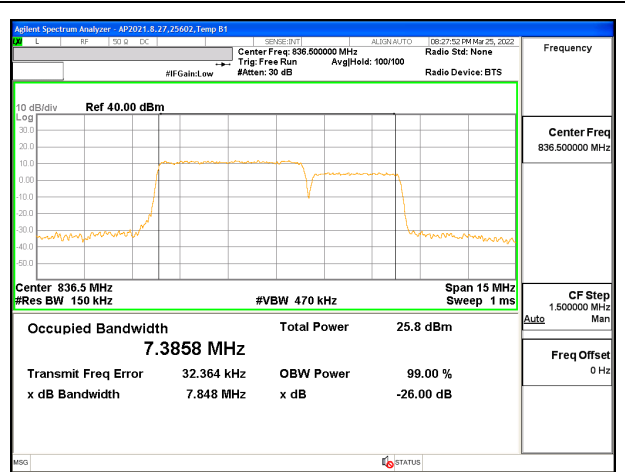
LTE BAND 48

Band	Mode	RB Allocation/RB Offset	f (MHz)	99% BW (MHz)	- 26dB BW (MHz)
3	5MHz + 20MHz BAND QPSK	25/0 + 100/0	3625	22.897	24.62
	5MHz + 20MHz BAND 16QAM			22.836	24.67
	20MHz + 5MHz BAND QPSK	100/0 + 25/0		22.816	23.68
	20MHz + 5MHz BAND 16QAM			22.660	23.58
	10MHz + 20MHz BAND QPSK	50/0 + 100/0		27.729	29.74
	10MHz + 20MHz BAND 16QAM			27.643	29.72
	20MHz + 10MHz BAND QPSK	100/0 + 50/0		27.493	28.74
	20MHz + 10MHz BAND 16QAM			27.549	28.79
	15MHz + 20MHz BAND QPSK	75/0 + 100/0		32.475	34.78
	15MHz + 20MHz BAND 16QAM			32.292	34.67
	20MHz + 15MHz BAND QPSK	100/0 + 75/0		32.437	33.78
	20MHz + 15MHz BAND 16QAM			32.348	33.77
	20MHz + 20MHz BAND QPSK	100/0 + 100/0		37.104	38.62
	20MHz + 20MHz BAND 16QAM			32.437	33.78

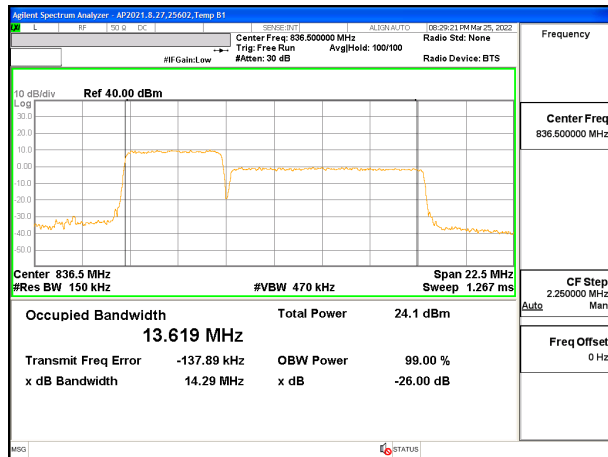
9.1.1. LTE BAND 5



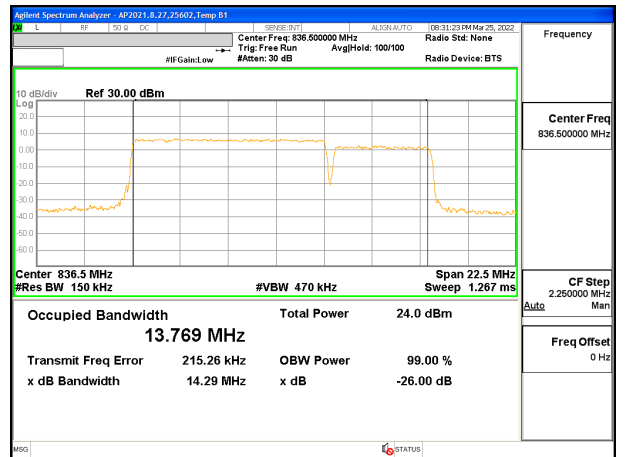
LTE B5 3MHz + 5MHz QPSK RB15-0 + RB25-0



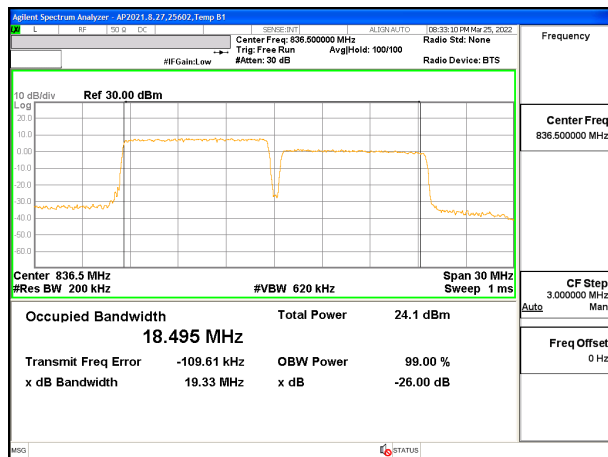
LTE B5 5MHz + 3MHz QPSK RB25-0 + RB15-0



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

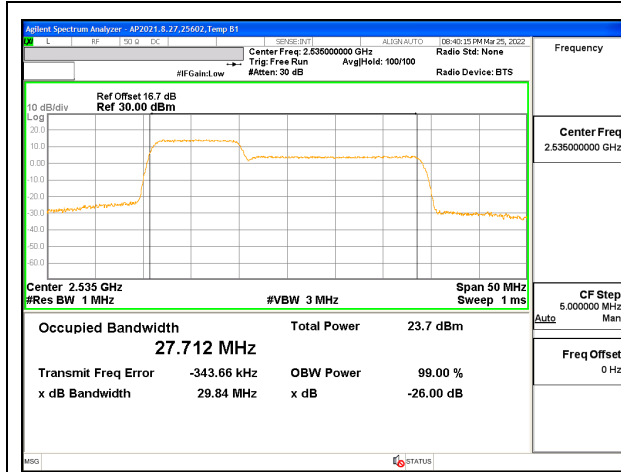


LTE B5 10MHz + 5MHz QPSK RB50-0 + RB25-0

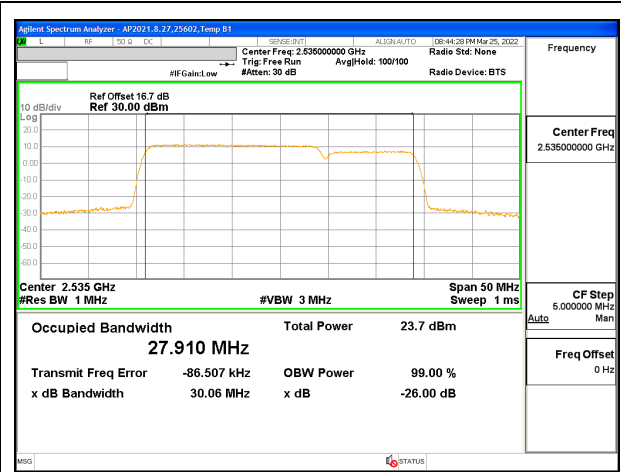


LTE B5 10MHz + 10MHz QPSK RB50-0 + RB50-0

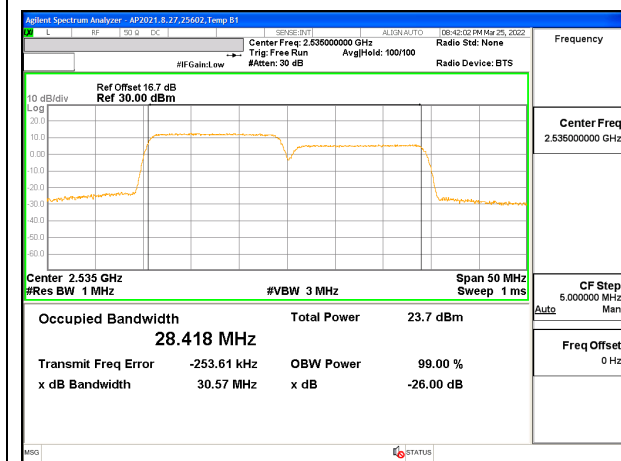
9.1.2. LTE BAND 7



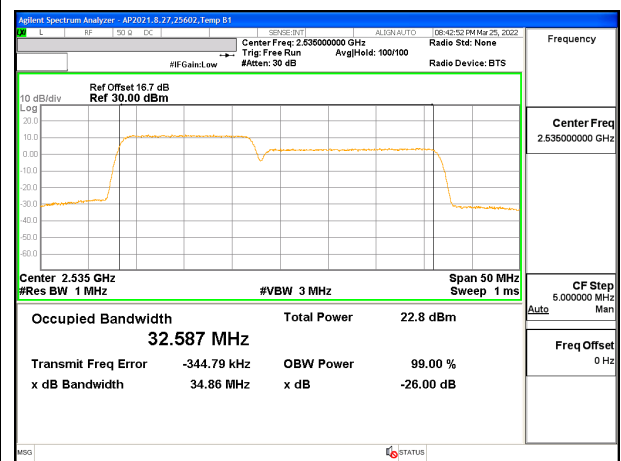
LTE B7 10MHz + 20MHz QPSK RB50-0 + RB100-0



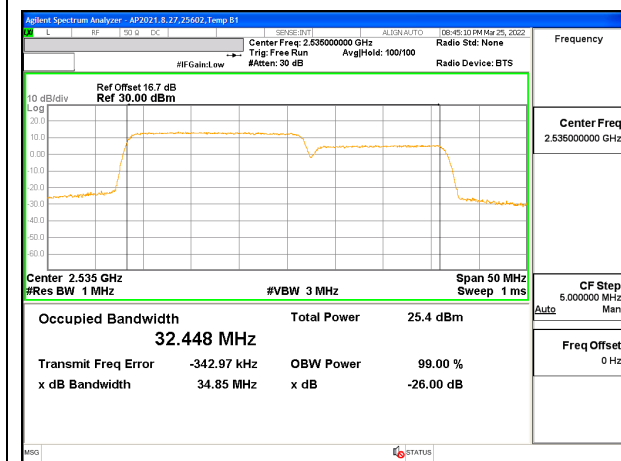
LTE B7 20MHz + 10MHz QPSK RB100-0 + RB50-0



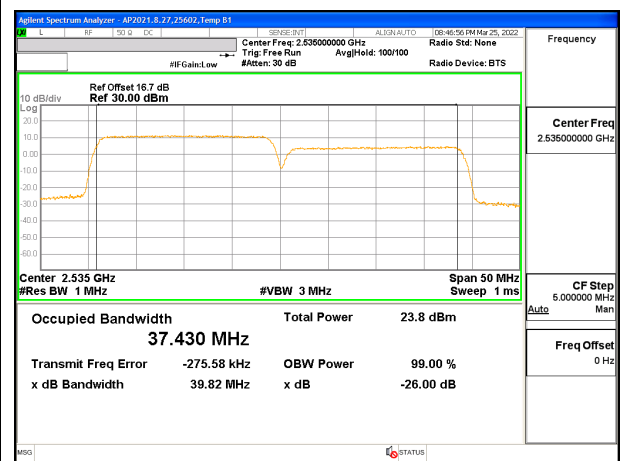
LTE B7 15MHz + 15MHz QPSK RB75-0 + RB75-0



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

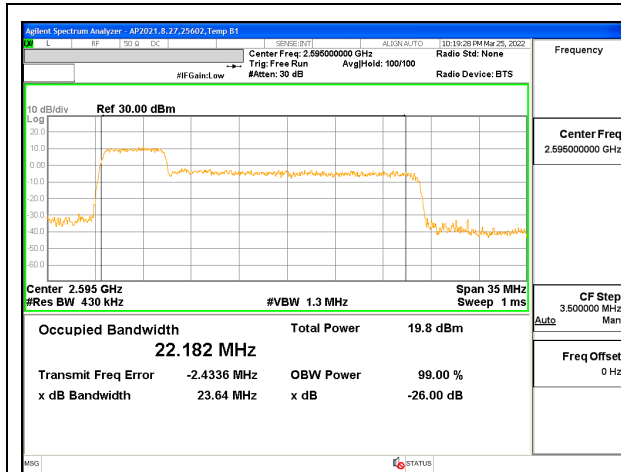


LTE B7 20MHz + 15MHz QPSK RB100-0 + RB75-0

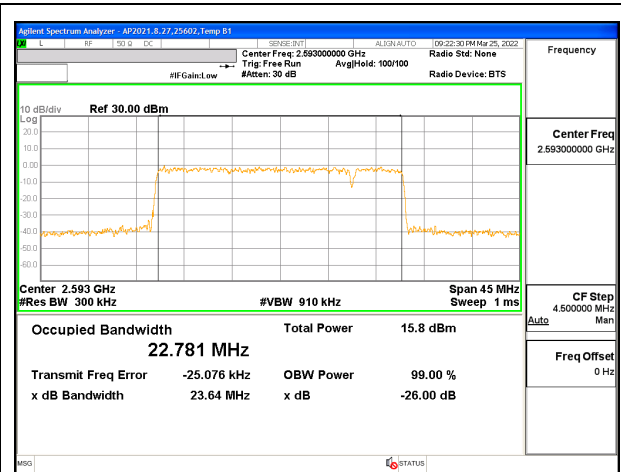


LTE B7 20MHz + 20MHz QPSK RB100-0 + RB100-0

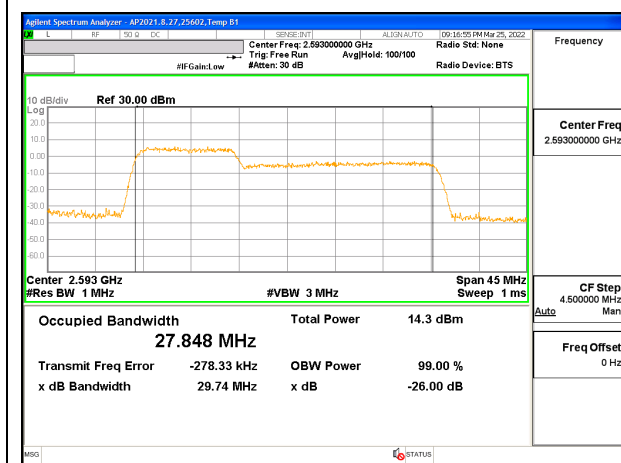
9.1.3. LTE BAND 41



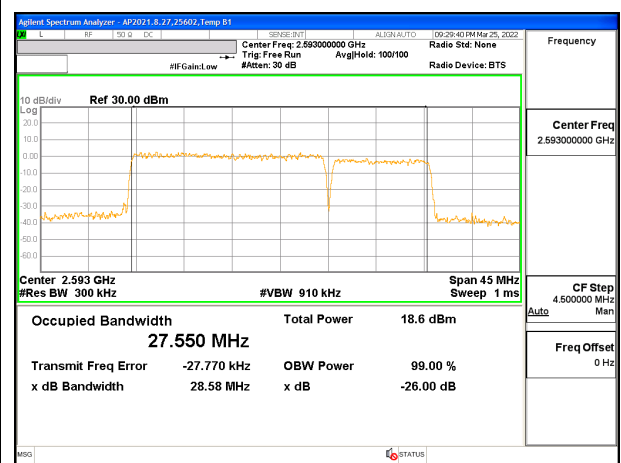
LTE B41 5MHz + 20MHz QPSK RB25-0 + RB100-0



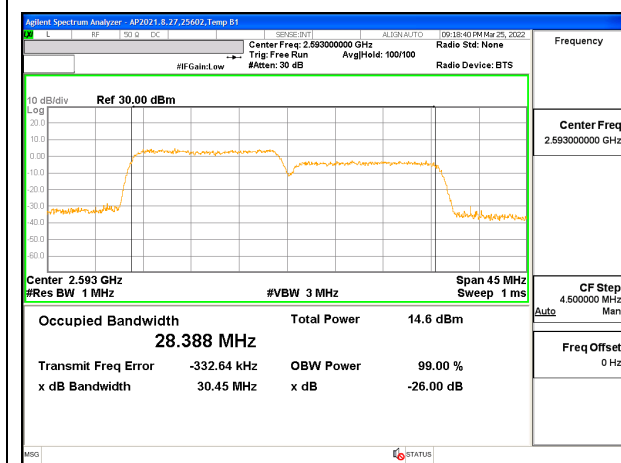
LTE B41 20MHz + 5MHz QPSK RB100-0 + RB25-0



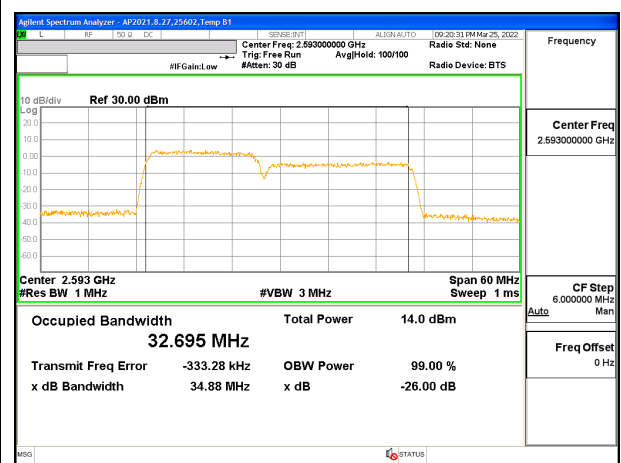
LTE B41 10MHz + 20MHz QPSK RB50-0 + RB100-0



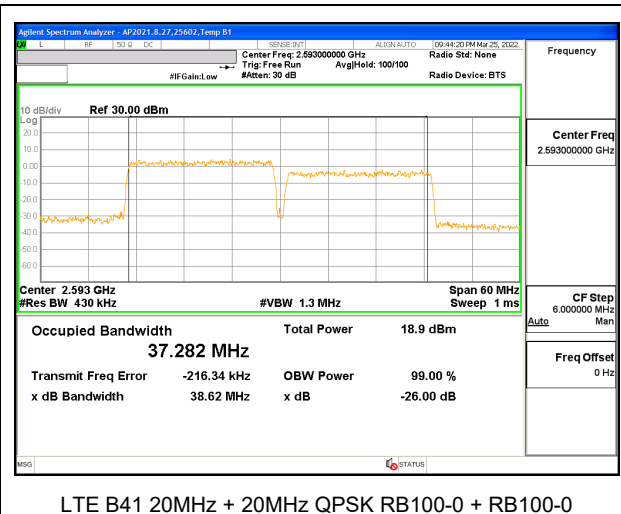
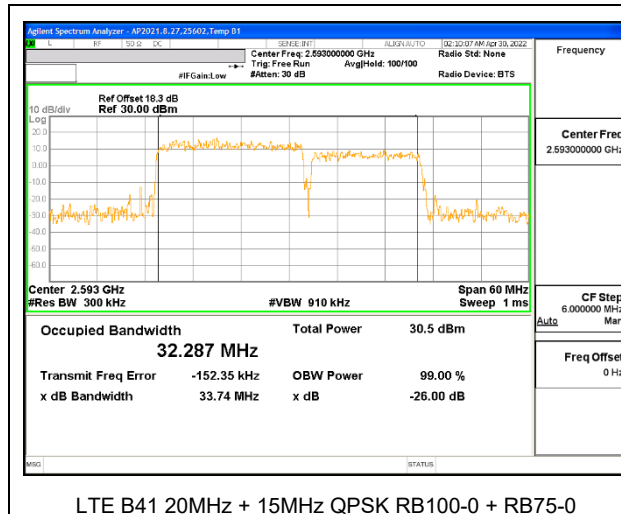
LTE B41 20MHz + 10MHz QPSK RB100-0 + RB50-0



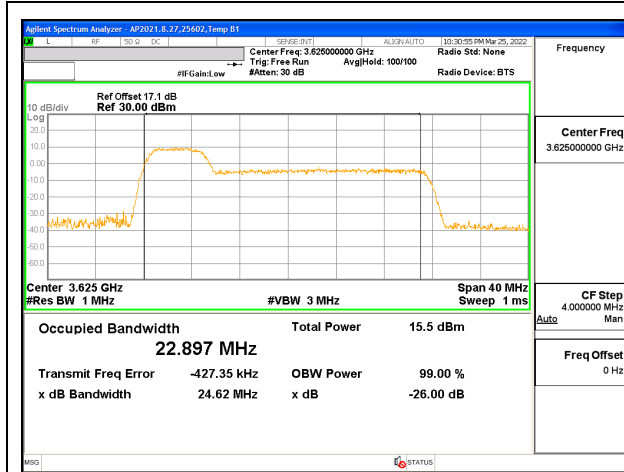
LTE B41 15MHz + 15MHz QPSK RB75-0 + RB75-0



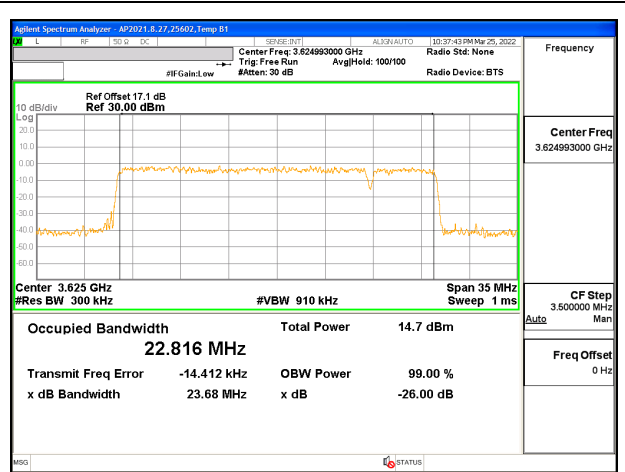
LTE B41 15MHz + 20MHz QPSK RB75-0 + RB100-0



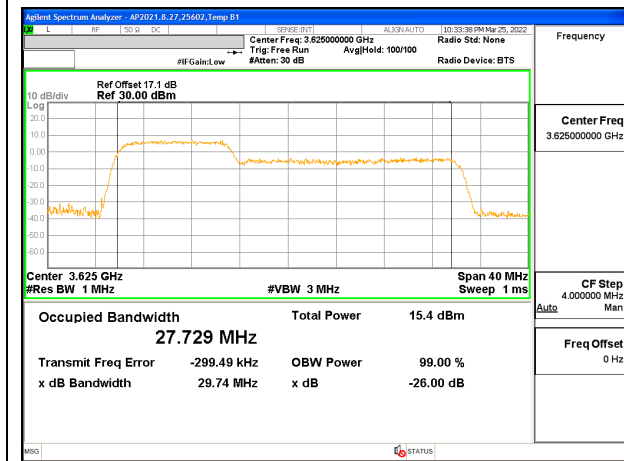
9.1.4. LTE BAND 48



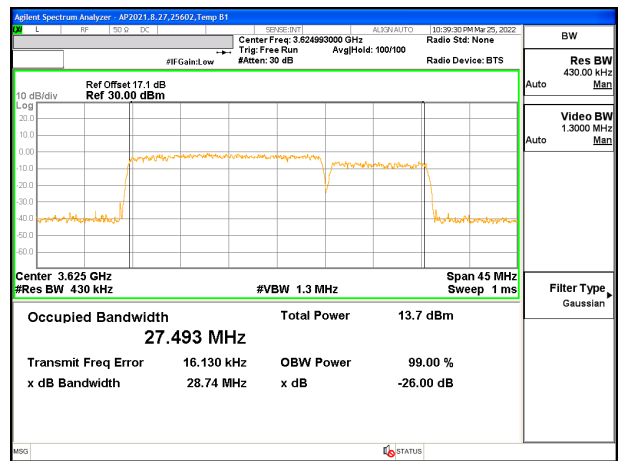
LTE B48 5MHz + 20MHz QPSK RB25-0 + RB100-0



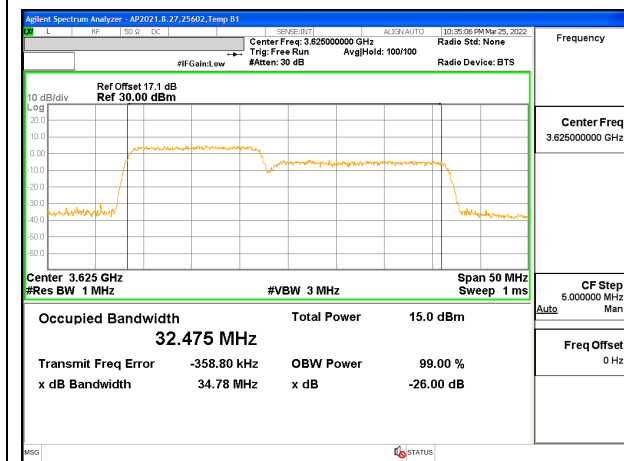
LTE B48 20MHz + 5MHz QPSK RB100-0 + RB25-0



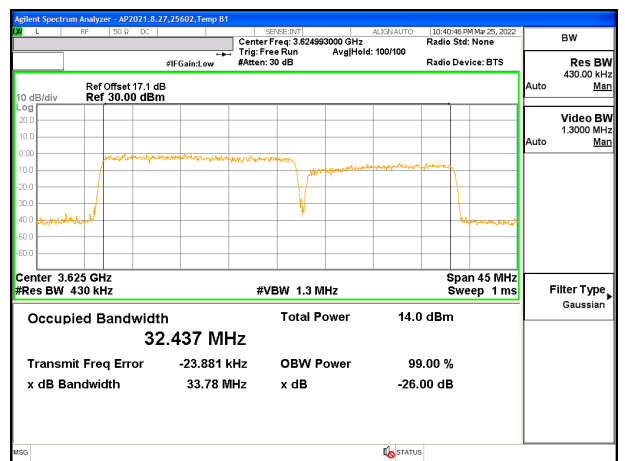
LTE B48 10MHz + 20MHz QPSK RB50-0 + RB100-0



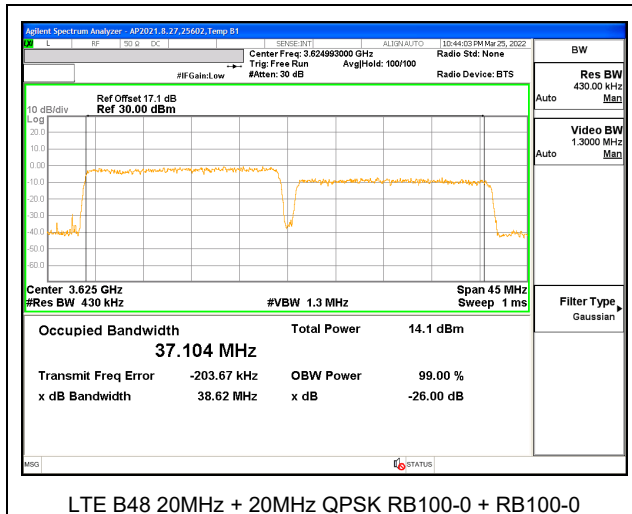
LTE B48 20MHz + 10MHz QPSK RB100-0 + RB50-0



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



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



9.2. 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.

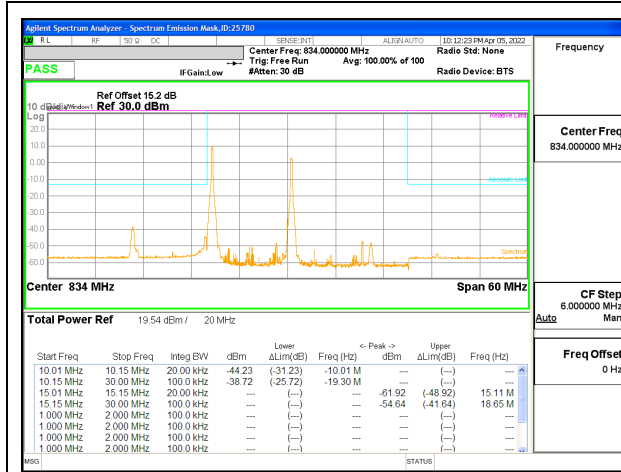
RESULTS

9.2.1. LTE BAND 5 EMISSION MASK

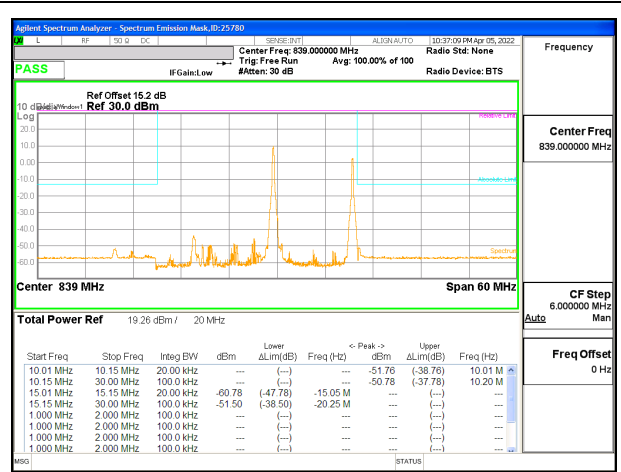
LIMITS

FCC: §22.917

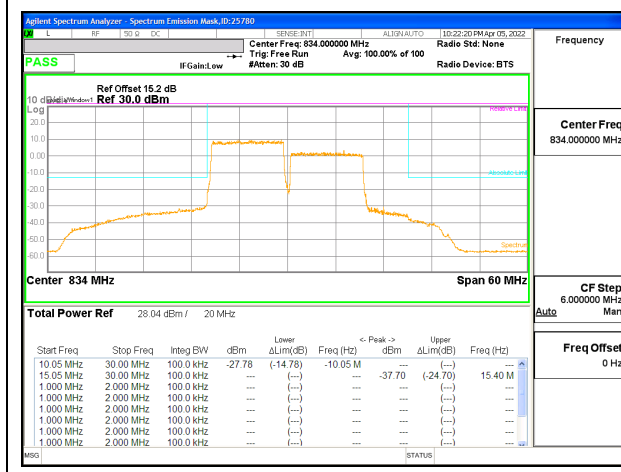
The power of any emission outside the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.



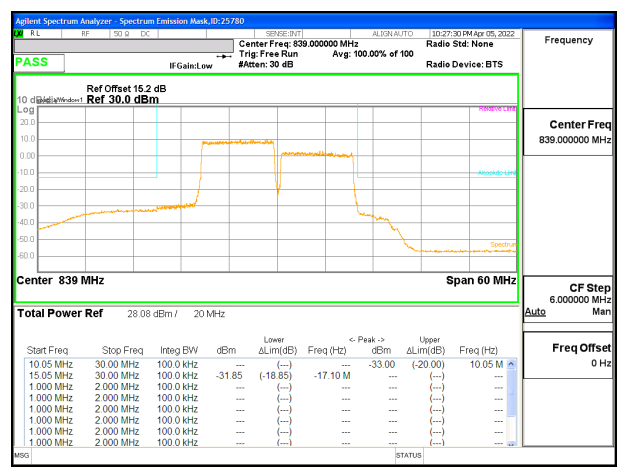
LTE B5 10MHz + 10MHz QPSK Low Ch RB1-0 + RB1-0



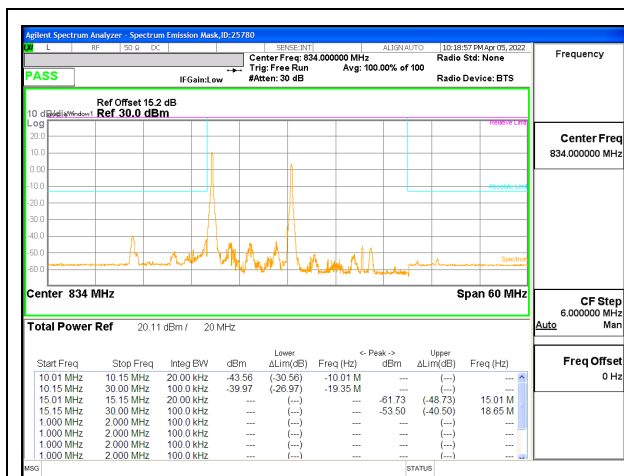
LTE B5 10MHz + 10MHz QPSK High Ch RB1-49 + RB1-49



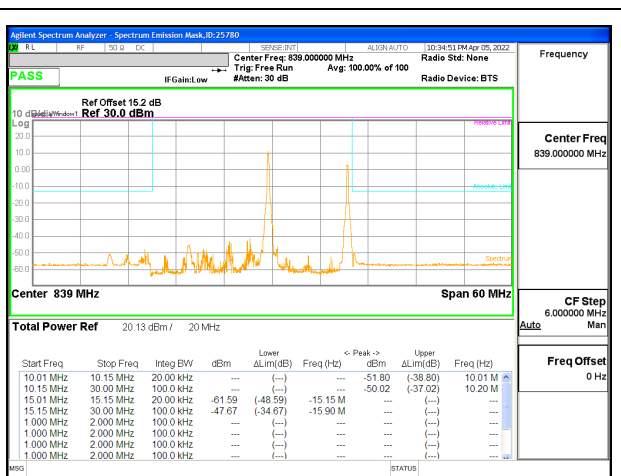
LTE B5 10MHz + 10MHz QPSK Low Ch RB50-0 + RB50-0



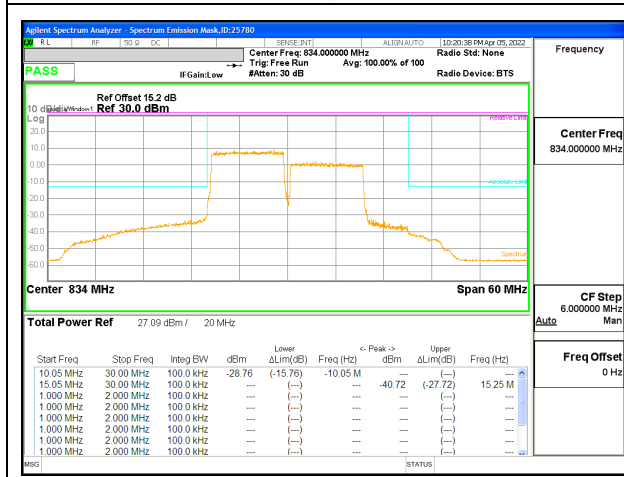
LTE B5 10MHz + 10MHz QPSK High Ch RB50-0 + RB50-0



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

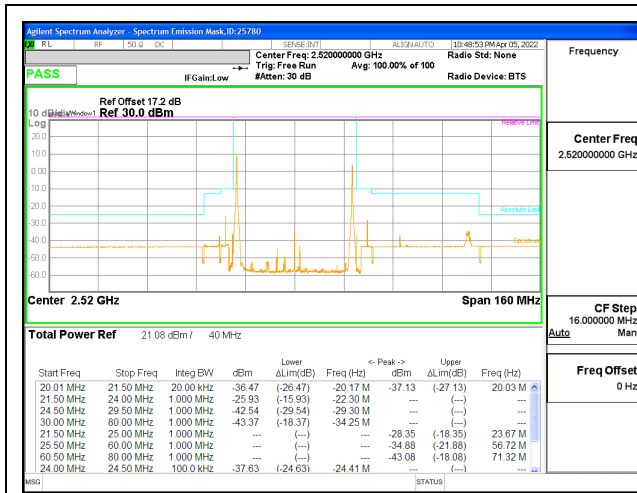


LTE B5 10MHz + 10MHz 16QAM High Ch RB50-0 + RB50-0

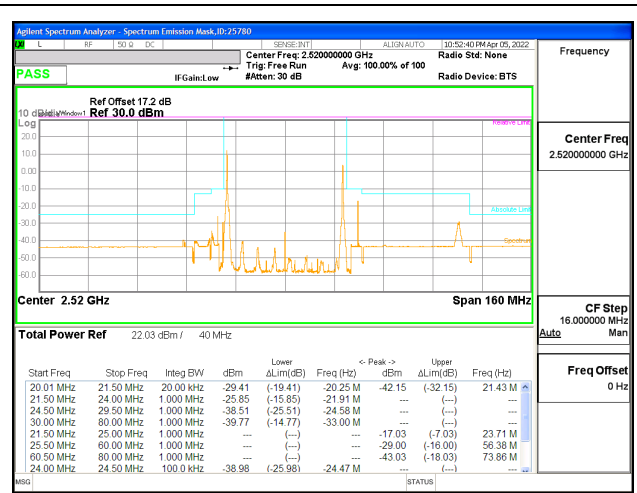
9.2.2. LTE BAND 7 EMISSION MASK

LIMITS

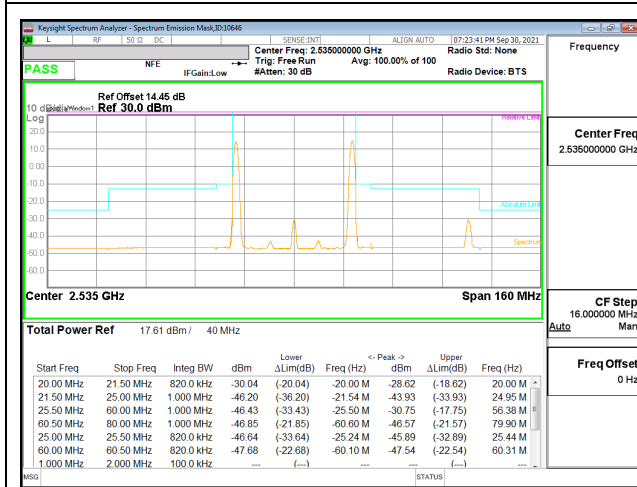
FCC: §27.53(m)(4) For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 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.



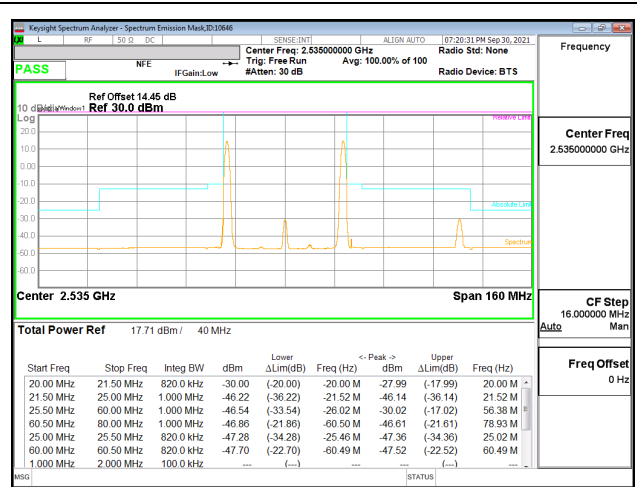
LTE B7 20MHz + 20MHz QPSK Low Ch RB1-0 + RB1-99



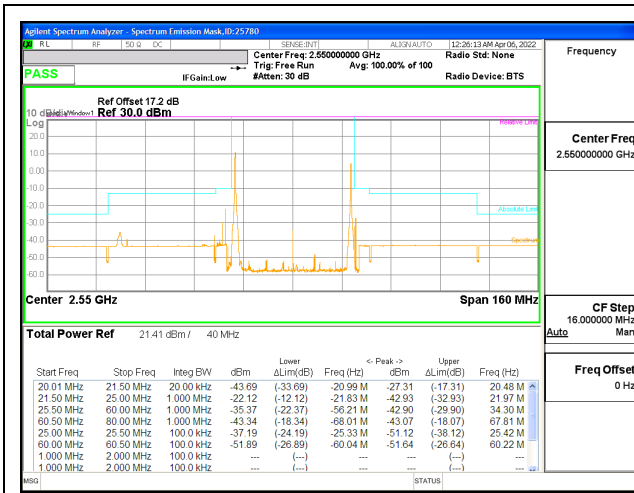
LTE B7 20MHz + 20MHz 16QAM Low Ch RB1-0 + RB1-99



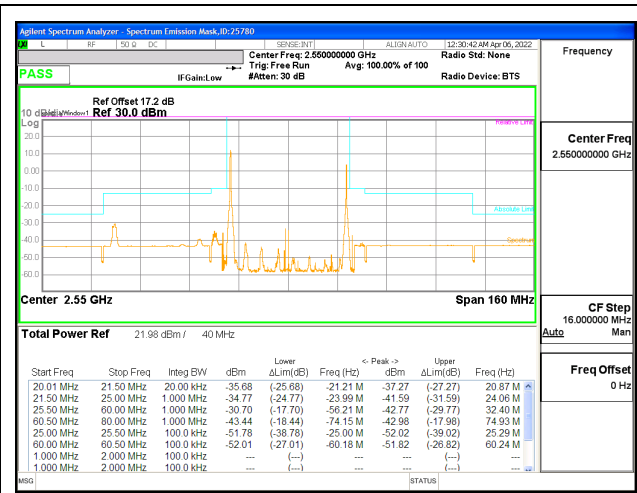
LTE B7 20MHz + 20MHz QPSK Mid Ch RB1-0 + RB1-99



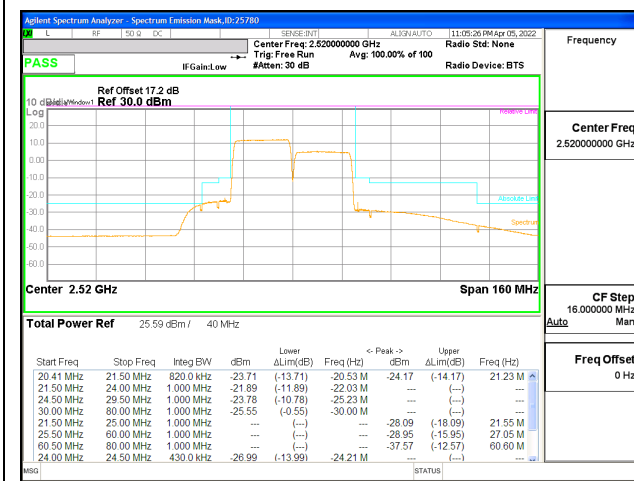
LTE B7 20MHz + 20MHz 16QAM Mid Ch RB1-0 + RB1-99



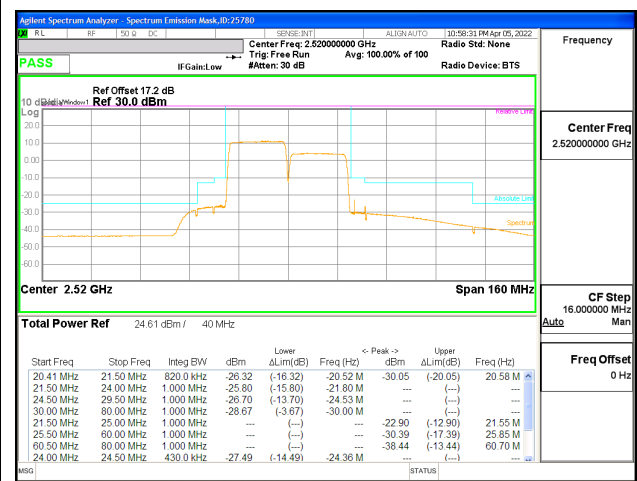
LTE B7 20MHz + 20MHz QPSK High Ch RB1-0 + RB1-99



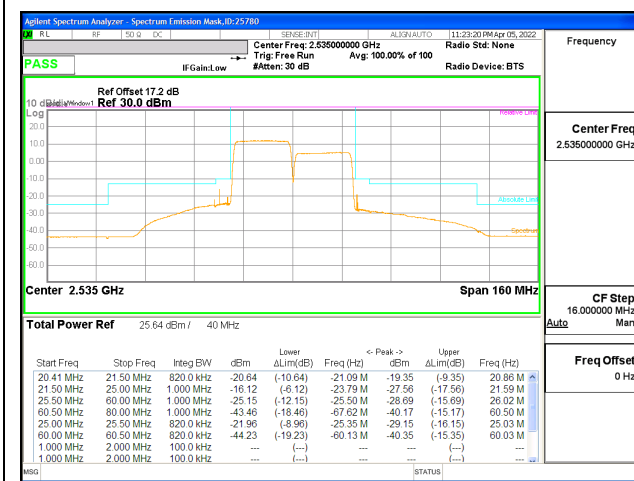
LTE B7 20MHz + 20MHz 16QAM High Ch RB1-0 + RB1-99



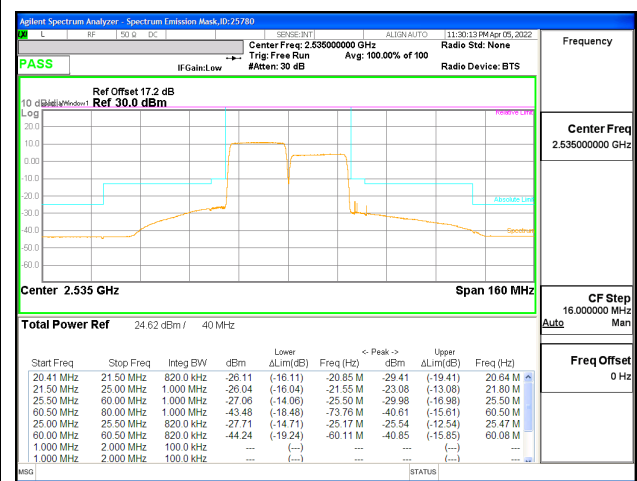
LTE B7 20MHz + 20MHz QPSK Low Ch RB100-0 + RB100-0



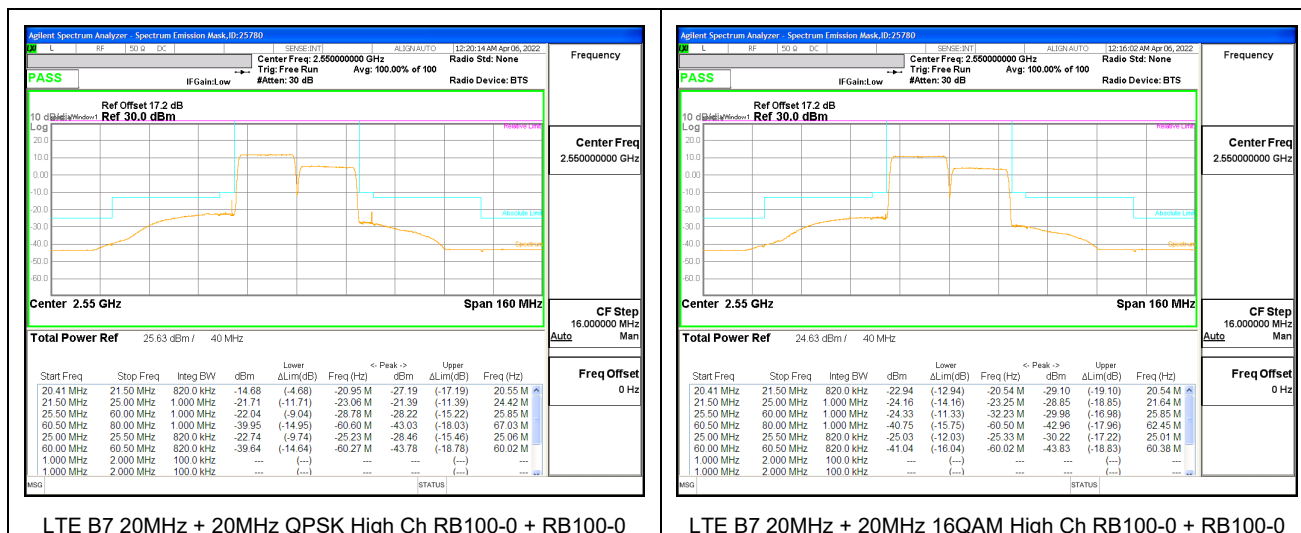
LTE B7 20MHz + 20MHz 16QAM Low Ch RB100-0 + RB100-0



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



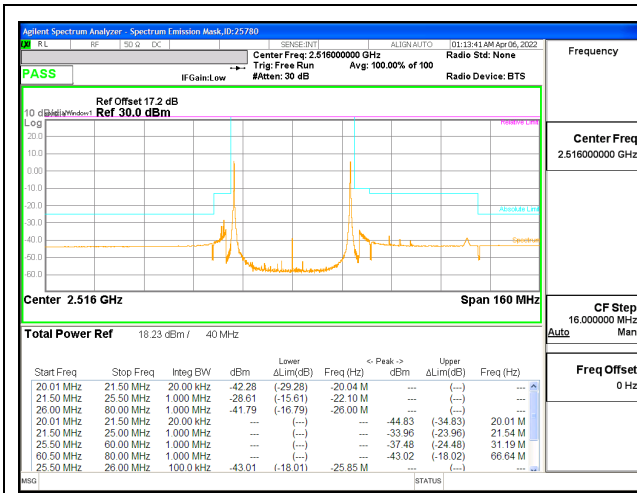
LTE B7 20MHz + 20MHz 16QAM Mid Ch RB100-0 + RB100-0



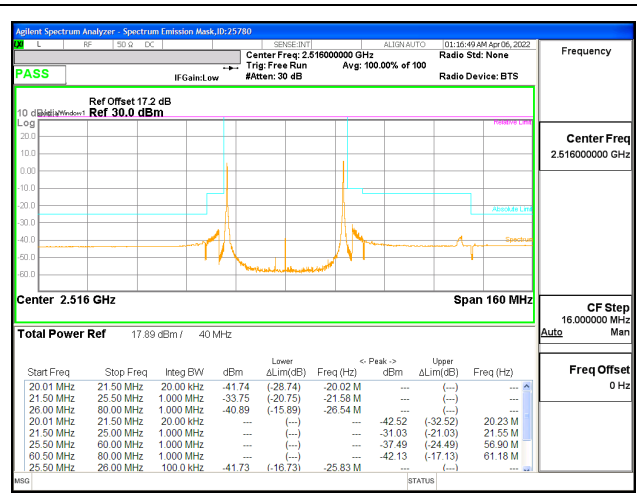
9.2.3. LTE BAND 41 EMISSION MASK

LIMITS

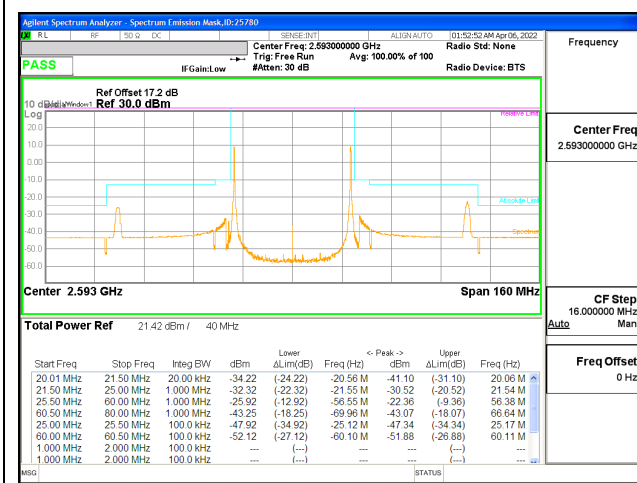
FCC: §27.53(m)(4) For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log (P)$ 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 than $43 + 10 \log (P)$ 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.



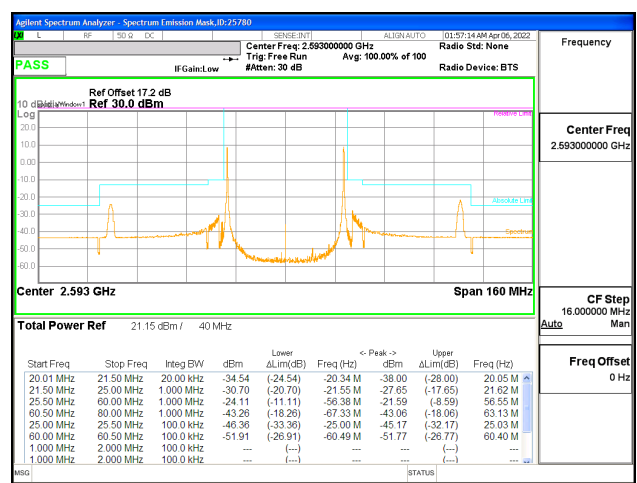
LTE B41 20MHz + 20MHz QPSK Low Ch RB1-0 + RB1-99



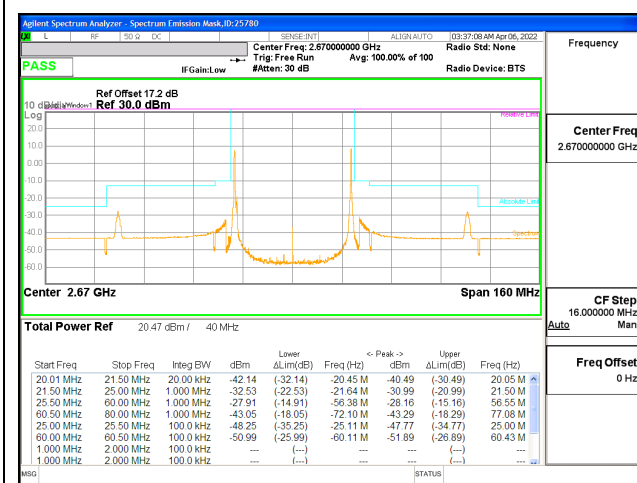
LTE B41 20MHz + 20MHz 16QAM Low Ch RB1-0 + RB1-99



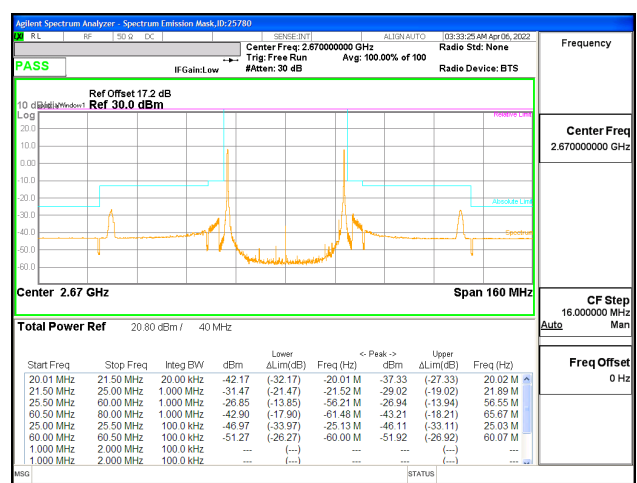
LTE B41 20MHz + 20MHz QPSK Mid Ch RB1-0 + RB1-99



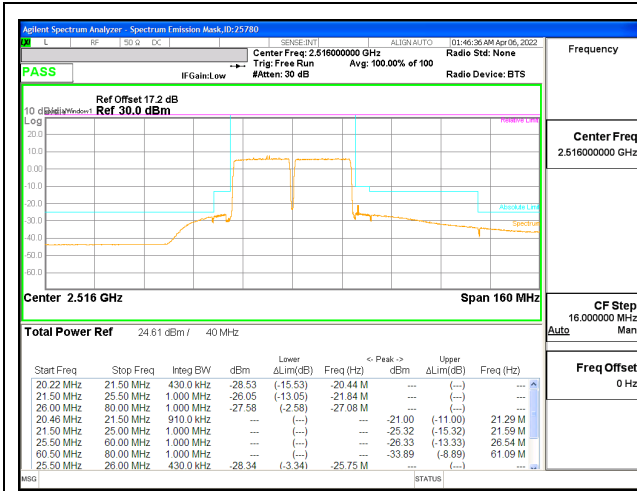
LTE B41 20MHz + 20MHz 16QAM Mid Ch RB1-0 + RB1-99



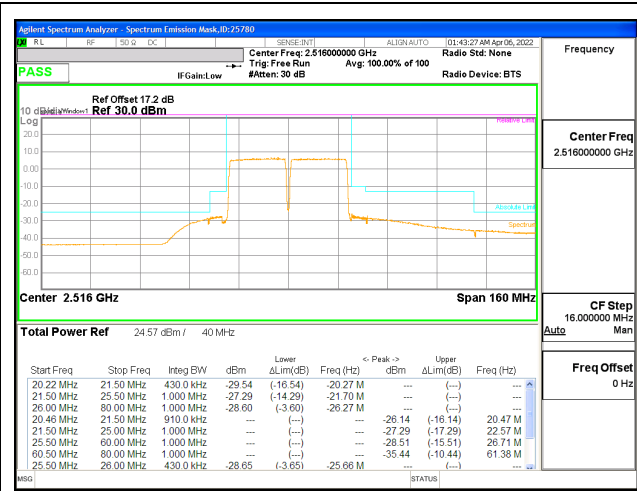
LTE B41 20MHz + 20MHz QPSK High Ch RB1-0 + RB1-99



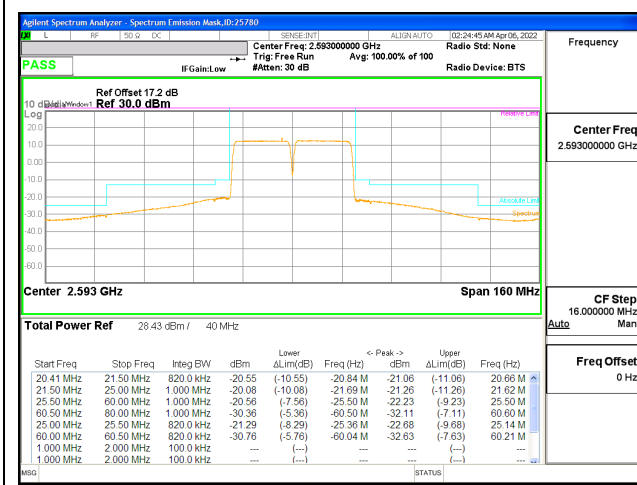
LTE B41 20MHz + 20MHz 16QAM High Ch RB1-0 + RB1-99



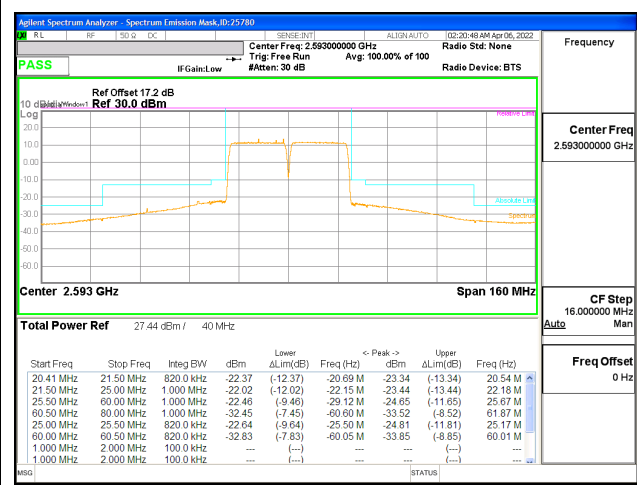
LTE B41 20MHz + 20MHz QPSK Low Ch RB100-0 + RB100-0



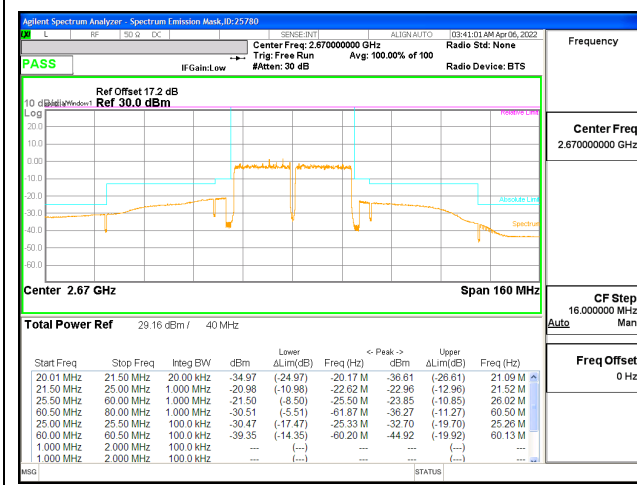
LTE B41 20MHz + 20MHz 16QAM Low Ch RB100-0 + RB100-0



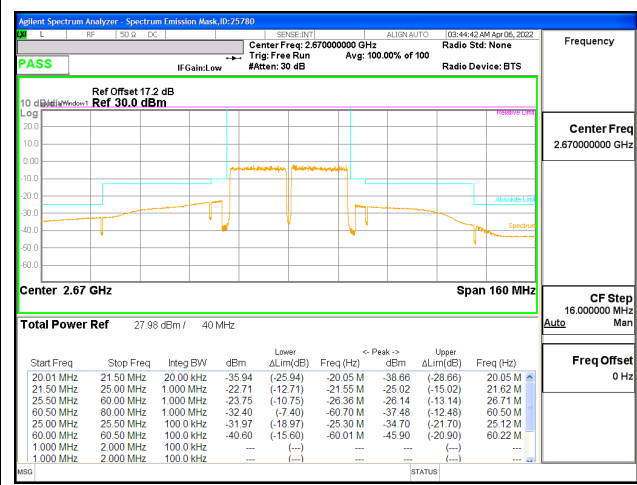
LTE B41 20MHz + 20MHz QPSK Mid Ch RB100-0 + RB100-0



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

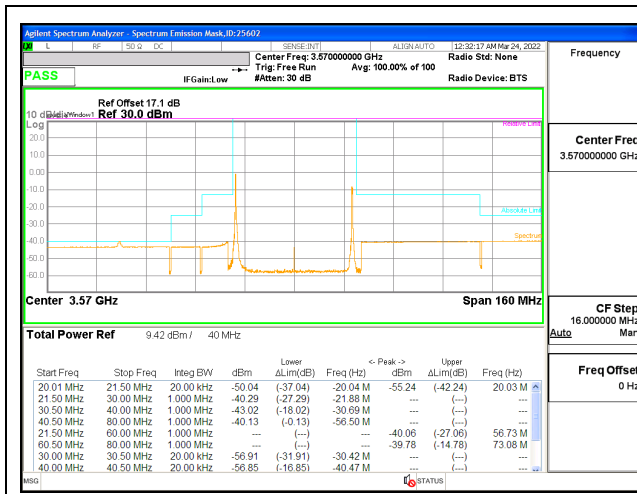
(e) 3.5 GHz Emissions and Interference Limits—

(1) General protection levels

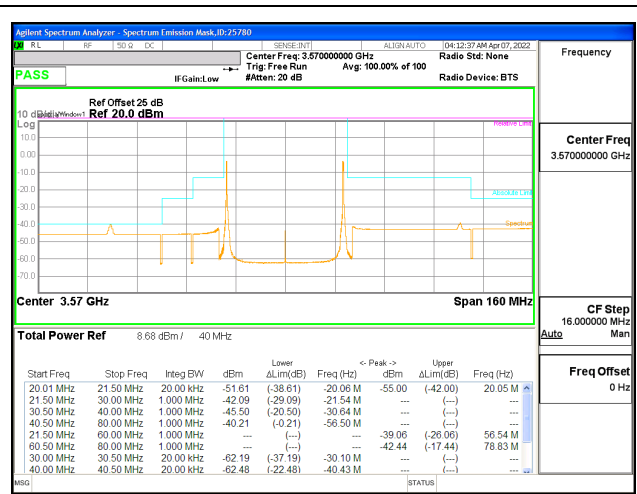
(ii) Except as otherwise specified in paragraph (e)(2) of this section, for channel and frequency assignments made by a CBSD to End User Devices, the conducted power of any End User Device emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed -13 dBm/MHz 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 -40 dBm/MHz.
licensees.

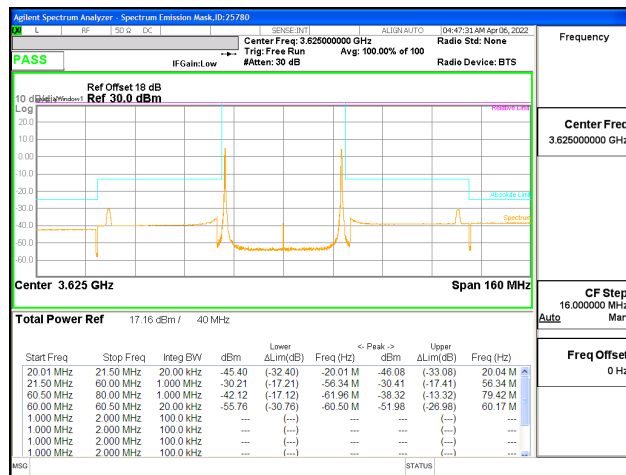
LTE BAND 48 EMISSION MASK



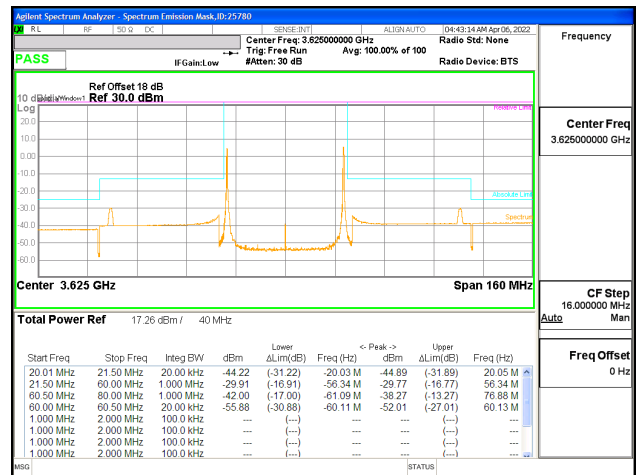
LTE B48 20MHz + 20MHz QPSK Low Ch RB1-0 + RB1-99



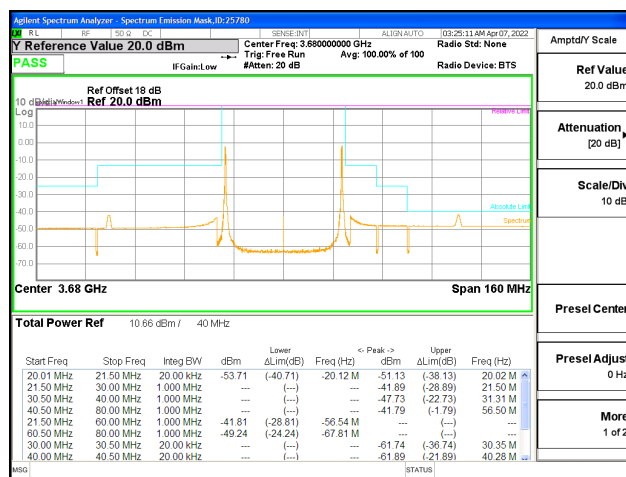
LTE B48 20MHz + 20MHz 16QAM Low Ch RB1-0 + RB1-99



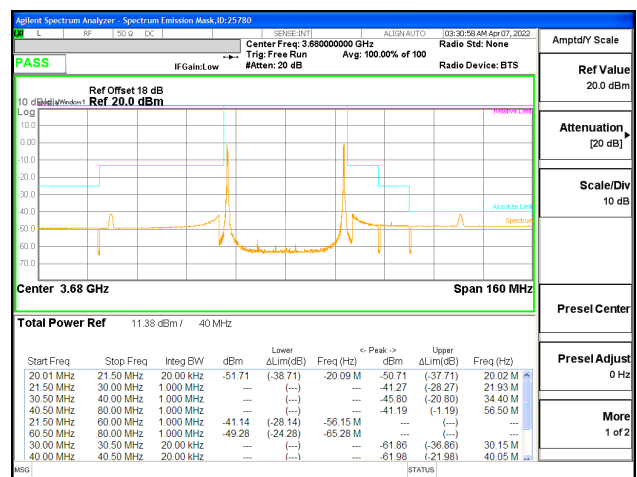
LTE B48 20MHz + 20MHz QPSK Mid Ch RB1-0 + RB1-99



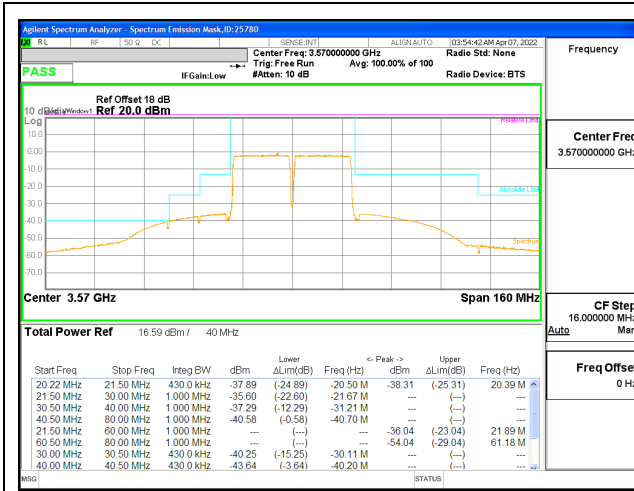
LTE B48 20MHz + 20MHz 16QAM Mid Ch RB1-0 + RB1-99



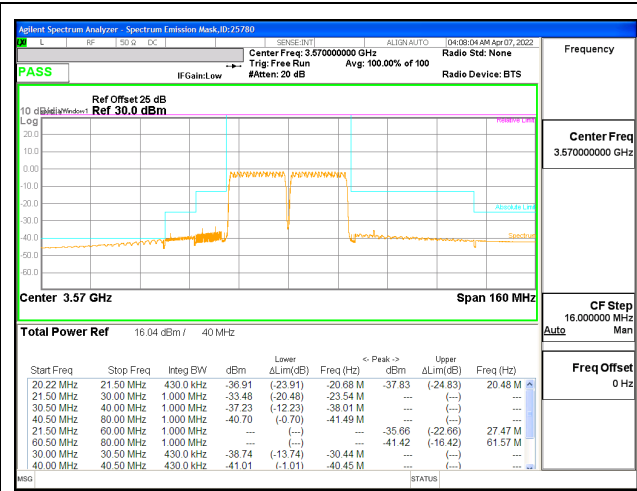
LTE B48 20MHz + 20MHz QPSK High Ch RB1-0 + RB1-99



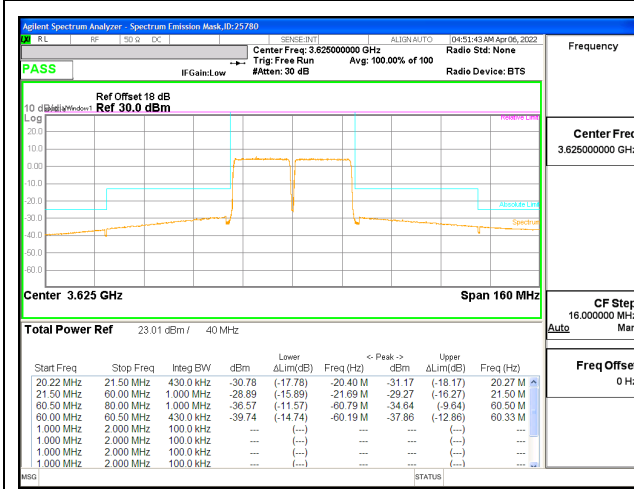
LTE B48 20MHz + 20MHz 16QAM High Ch RB1-0 + RB1-99



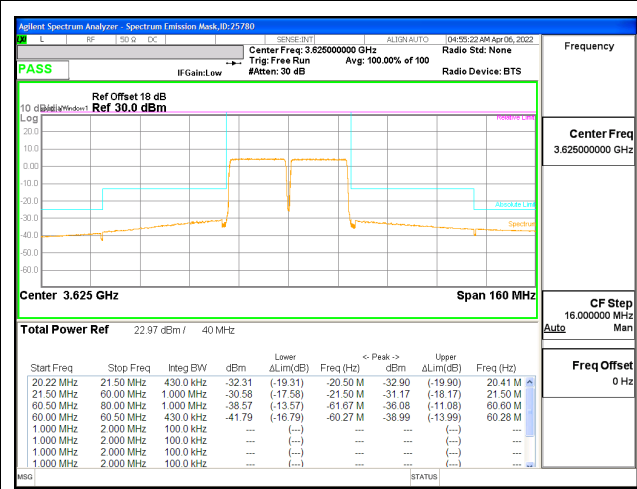
LTE B48 20MHz + 20MHz QPSK Low Ch RB100-0 + RB100-0



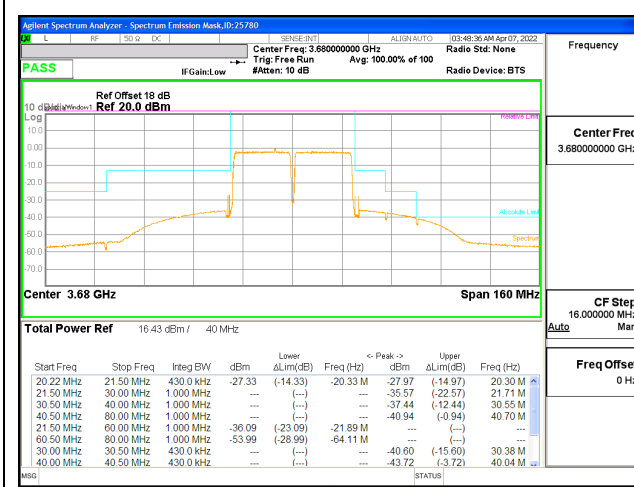
LTE B48 20MHz + 20MHz 16QAM Low Ch RB100-0 + RB100-0



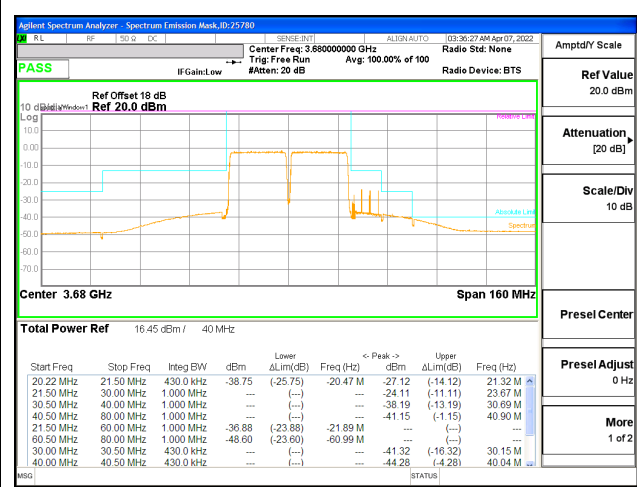
LTE B48 20MHz + 20MHz QPSK Mid Ch RB100-0 + RB100-0



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

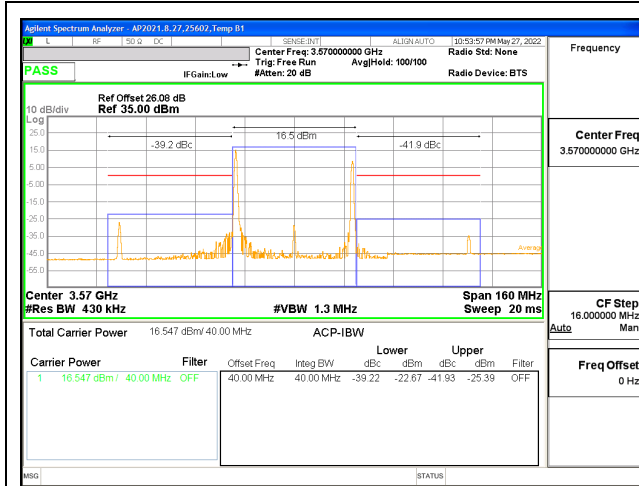


LTE B48 20MHz + 20MHz QPSK High Ch RB100-0 + RB100-0

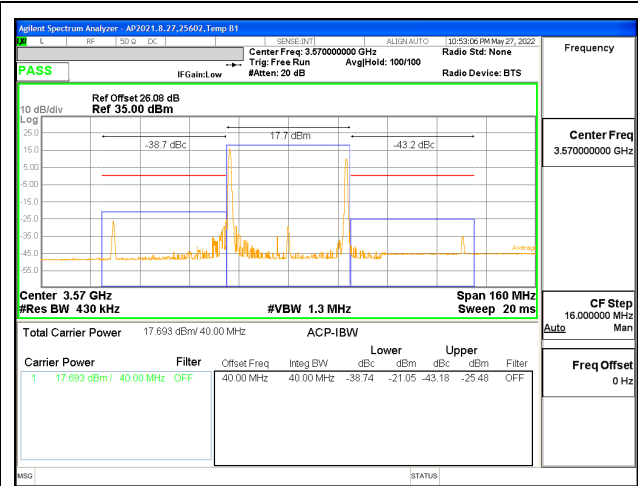


LTE B48 20MHz + 20MHz 16QAM High Ch RB100-0 + RB100-0

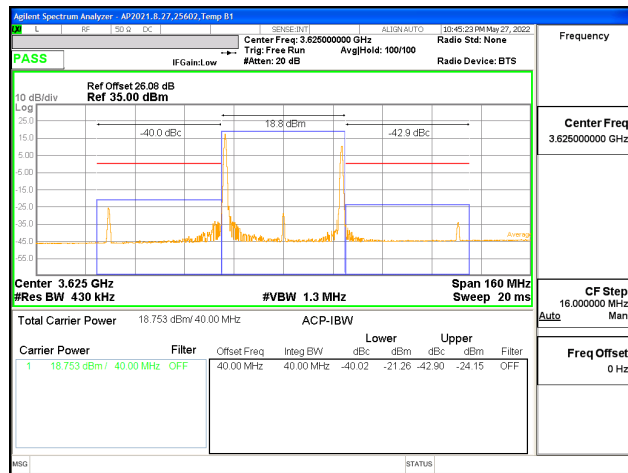
LTE BAND 48 ADJACENT CHANNEL POWER



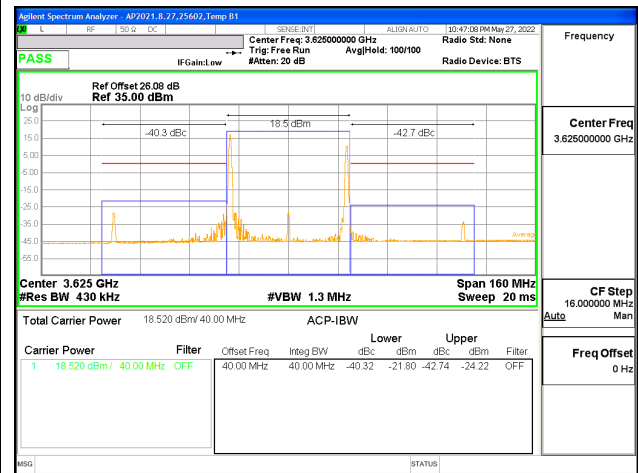
LTE B48 20MHz + 20MHz QPSK Low Ch RB1-0 + RB1-99



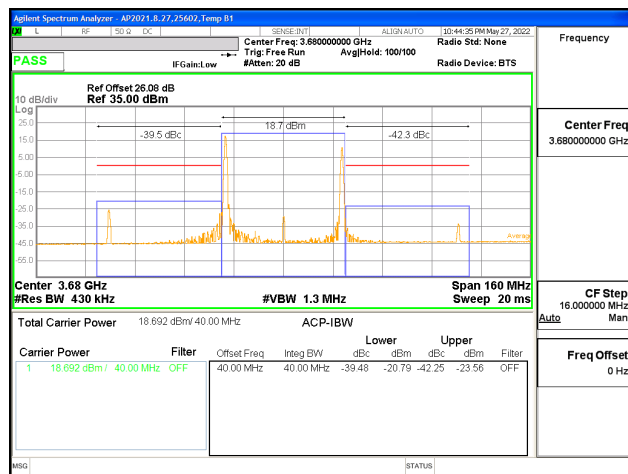
LTE B48 20MHz + 20MHz 16QAM Low Ch RB1-0 + RB1-99



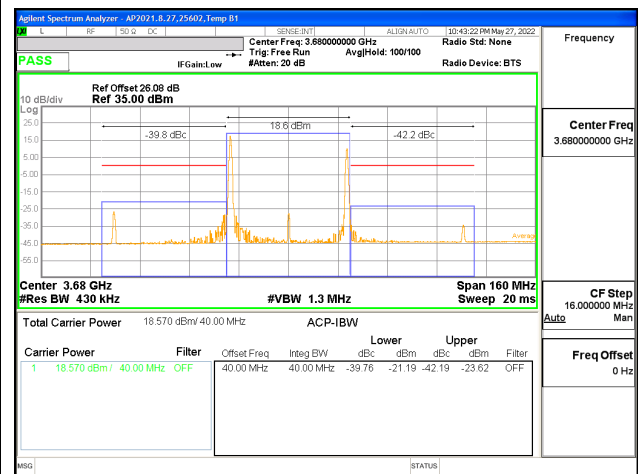
LTE B48 20MHz + 20MHz QPSK Mid Ch RB1-0 + RB1-99



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



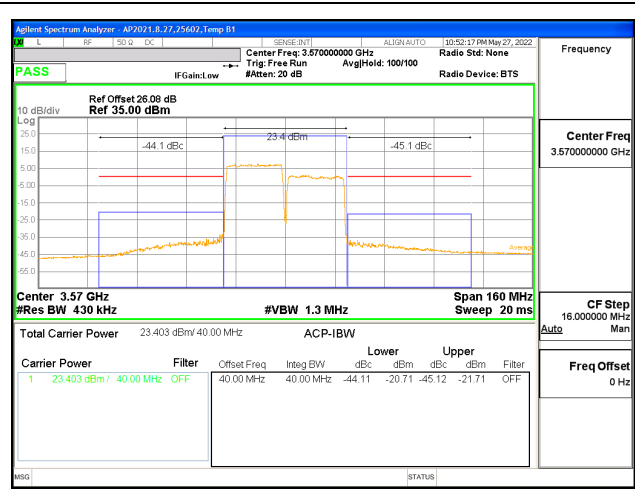
LTE B48 20MHz + 20MHz QPSK High Ch RB1-0 + RB1-99



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



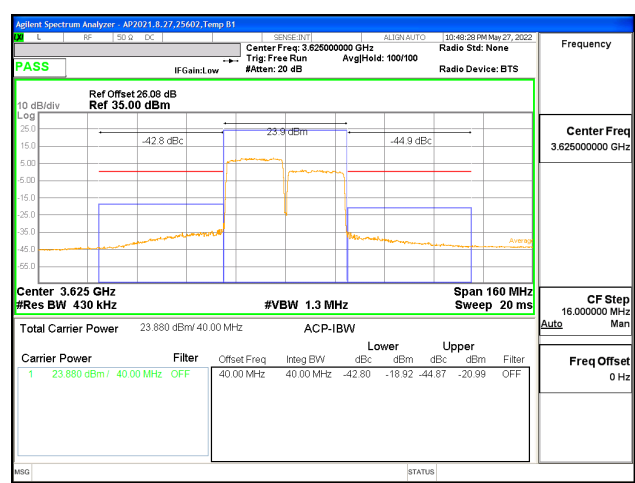
LTE B48 20MHz + 20MHz QPSK Low Ch RB100-0 + RB100-0



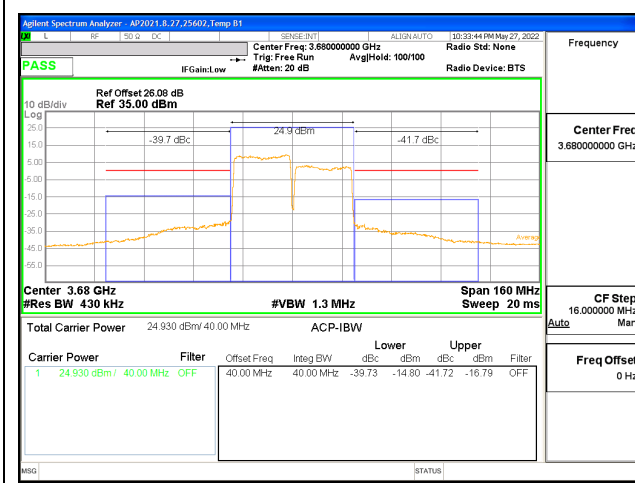
LTE B48 20MHz + 20MHz 16QAM Low Ch RB100-0 + RB100-0



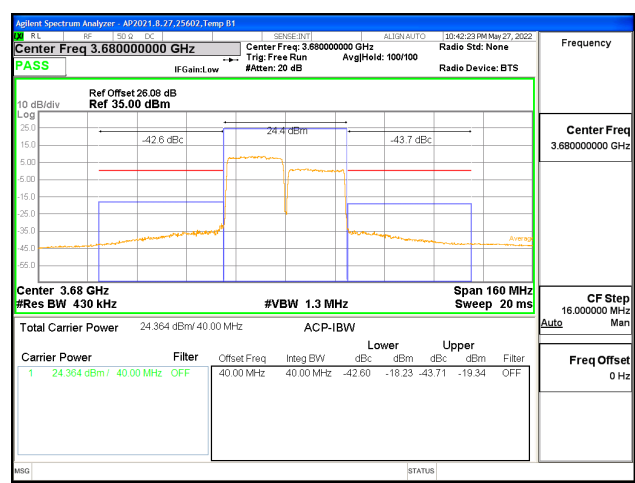
LTE B48 20MHz + 20MHz QPSK Mid Ch RB100-0 + RB100-0



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)

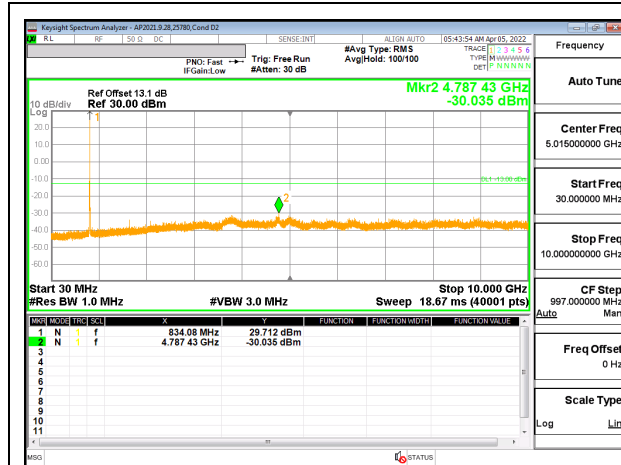
RESULTS

9.3.1. LTE BAND 5

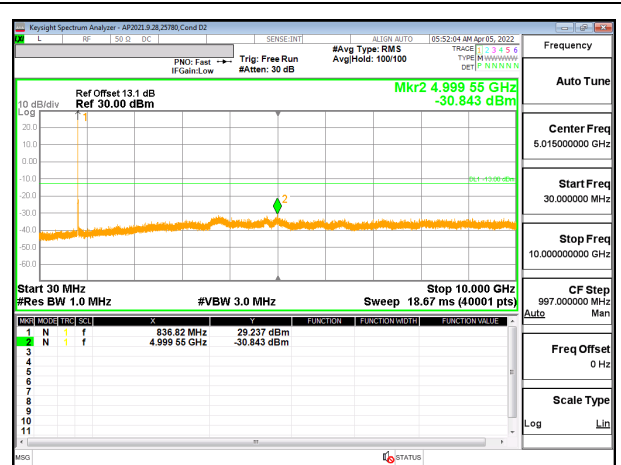
LIMITS

FCC: §22.917

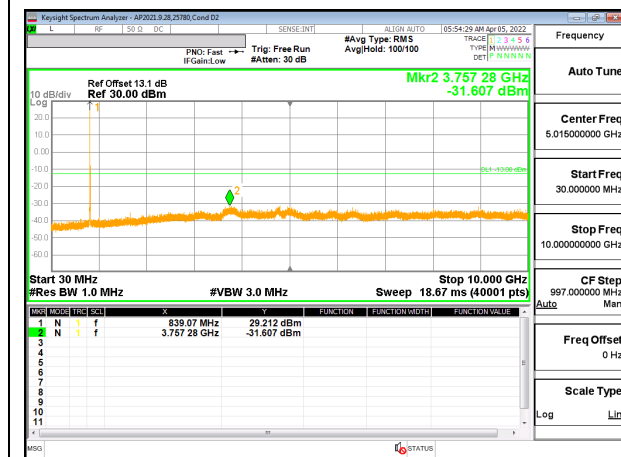
The minimum permissible attenuation level of any spurious emissions is $43 + 10 \log(P)$ dB where transmitting power (P) in Watts.



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



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



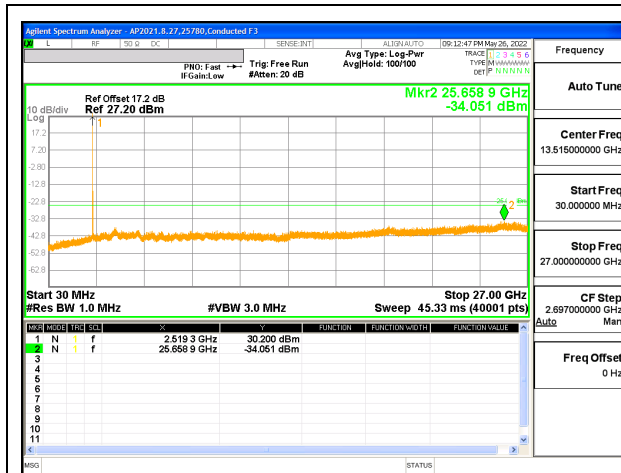
LTE B5 10MHz + 10MHz QPSK High Ch RB1-49 + RB1-0

9.3.2. LTE BAND 7

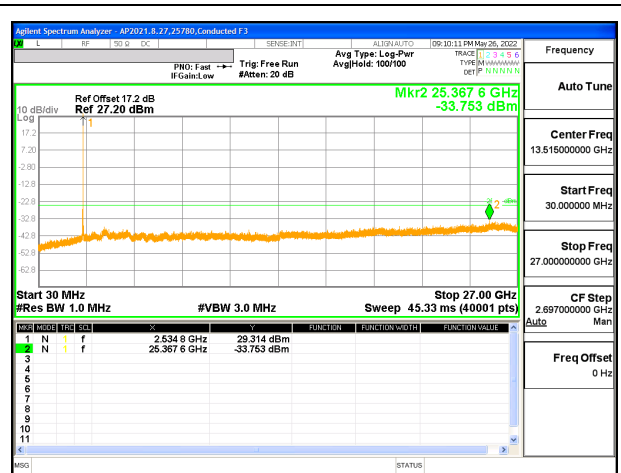
LIMITS

FCC: §27.53 (m)

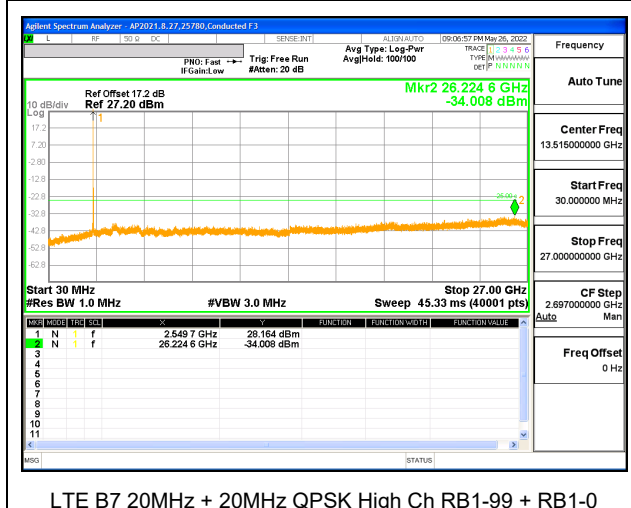
The minimum permissible attenuation level of any spurious emissions is $55 + 10 \log (P)$ dB where transmitting power (P) in Watts.



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



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



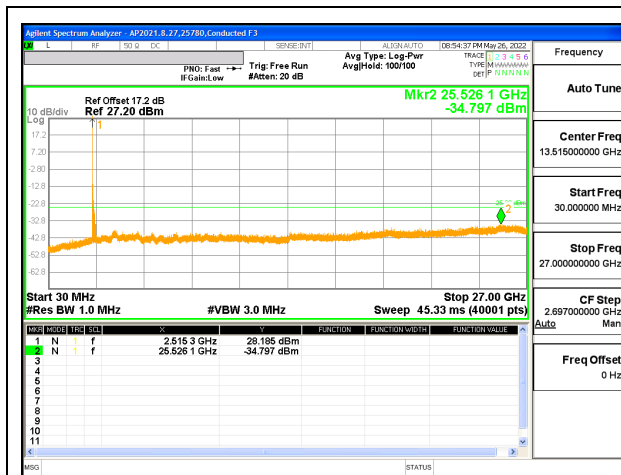
LTE B7 20MHz + 20MHz QPSK High Ch RB1-99 + RB1-0

9.3.3. LTE BAND 41

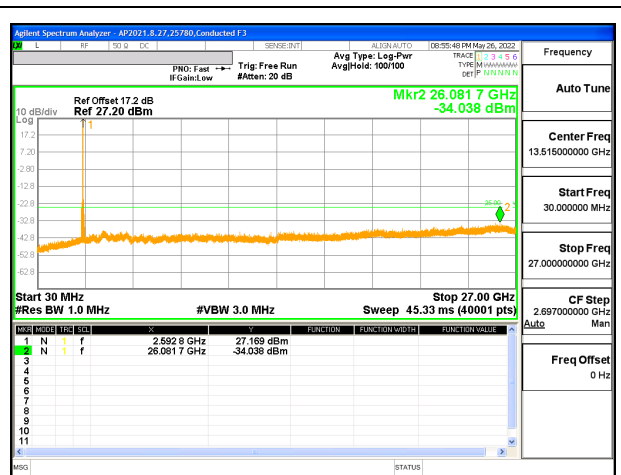
LIMITS

FCC: §27.53 (m)

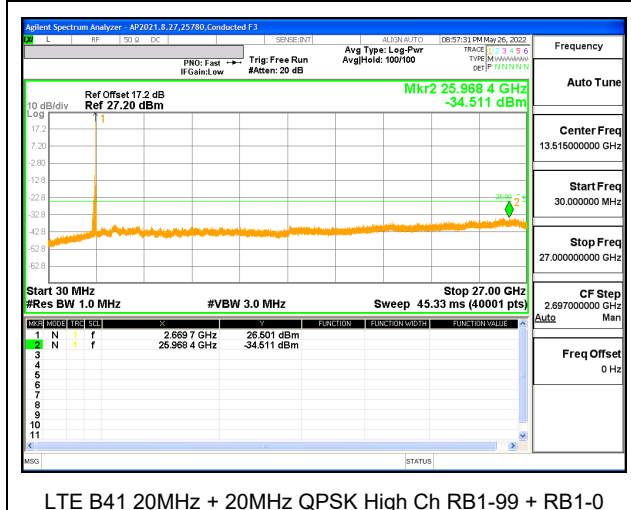
The minimum permissible attenuation level of any spurious emissions is $55 + 10 \log(P)$ dB where transmitting power (P) in Watts.



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

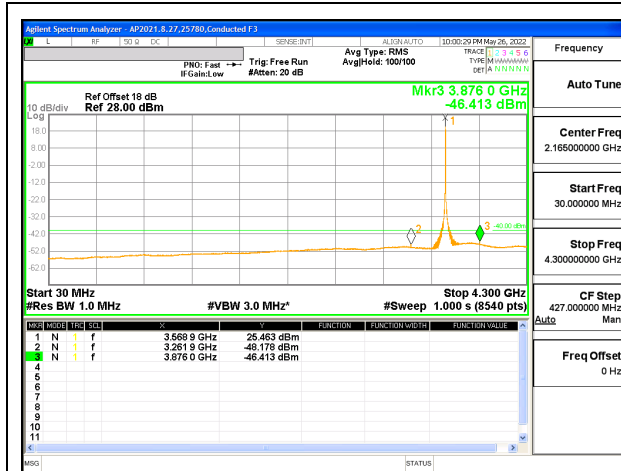
9.3.4. LTE BAND 48

LIMITS

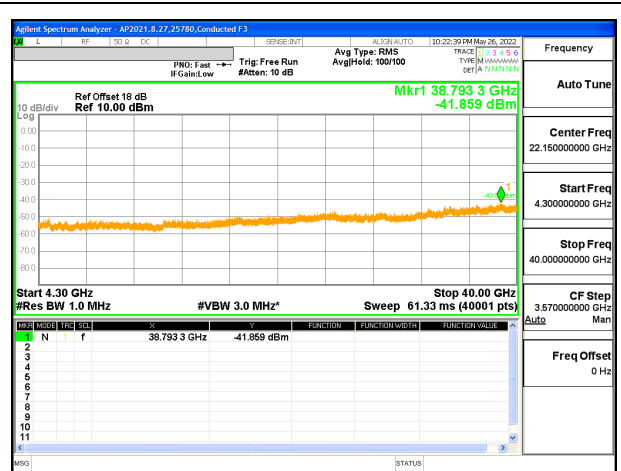
FCC: §96.41

(e) 3.5 GHz Emissions and Interference Limits—

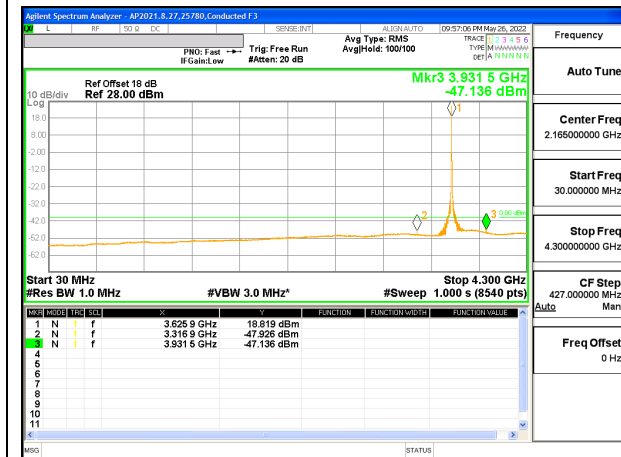
(2) Additional protection levels. Notwithstanding paragraph (e)(1) of this section, for CBSDs and End User Devices, the conducted power of emissions below 3540 MHz or above 3710 MHz shall not exceed -25 dBm/MHz, and the conducted power of emissions below 3530 MHz or above 3720 MHz shall not exceed -40dBm/MHz.



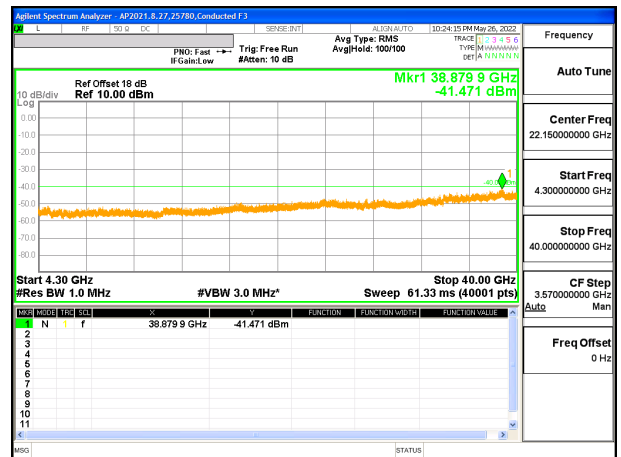
LTE B48 20MHz + 20MHz QPSK Low Ch RB1-99 + RB1-0
 (30MHz to 4.5GHz)



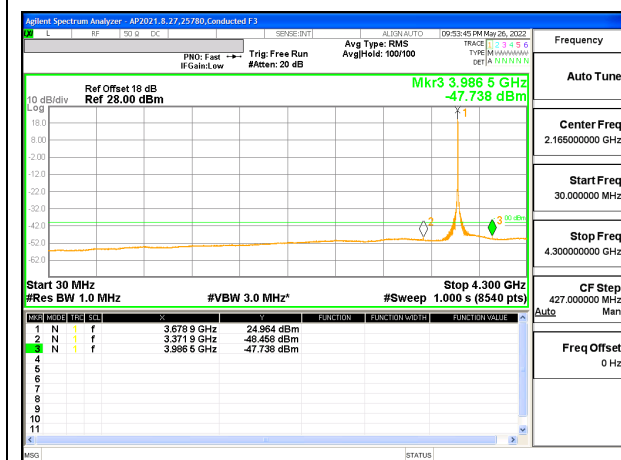
LTE B48 20MHz + 20MHz QPSK Low Ch RB1-99 + RB1-0
 (4.5GHz to 40GHz)



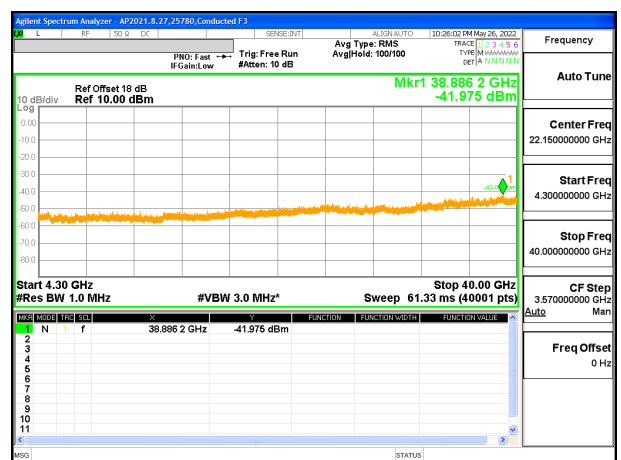
LTE B48 20MHz + 20MHz QPSK Middle Ch RB1-99 + RB1-0
 (30MHz to 4.5GHz)



LTE B48 20MHz + 20MHz QPSK Middle Ch RB1-99 + RB1-0
 (4.5GHz to 40GHz)



LTE B48 20MHz + 20MHz QPSK High Ch RB1-99 + RB1-0
 (30MHz to 4.5GHz)



LTE B48 20MHz + 20MHz QPSK High Ch RB1-99 + RB1-0
 (4.5GHz to 40GHz)

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 placed inside a temperature chamber. The temperature is set to 20°C 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 +50°C 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:	25602	Test Date:	5/9/2022
--------------------------	-------	-------------------	----------

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)	Normal	824.5805	848.4487					
Extreme (50°C)		824.5805	848.4487	13.4	0.016	Yes		
Extreme (40°C)		824.5805	848.4487	21.6	0.026	Yes		
Extreme (30°C)		824.5805	848.4487	23.5	0.028	Yes		
Extreme (10°C)		824.5805	848.4487	23.3	0.028	Yes		
Extreme (0°C)		824.5805	848.4487	14.9	0.018	Yes		
Extreme (-10°C)		824.5805	848.4487	1.3	0.002	Yes		
Extreme (-20°C)		824.5805	848.4487	-12.4	-0.015	Yes		
Extreme (-30°C)		824.5805	848.4487	-24.2	-0.029	Yes		
20°C	15%	824.5805	848.4487	13.5	0.016	Yes		
	-15%	824.5805	848.4487	20.4	0.024	Yes		
	End Point Voltage	824.5805	848.4487	-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:	25602	Test Date:	5/9/2022
--------------------------	-------	-------------------	----------

QPSK (20MHz + 20MHz BANDWIDTH)

Band	7	Frequency Range		Frequency Error Reading (Hz)	Limit	
Condition		2500	2570		Frequency Stability (ppm)	Within Authorized Frequency Block (Hz)
Temperature	Voltage	Freq Reading @ Low End (MHz)	Freq Reading @ High End (MHz)			
Normal (20°C)	Normal	2501.1507	2568.8940			
Extreme (50°C)		2501.1507	2568.8940	33.2	0.013	Yes
Extreme (40°C)		2501.1507	2568.8940	41.1	0.016	Yes
Extreme (30°C)		2501.1507	2568.8940	43.4	0.017	Yes
Extreme (10°C)		2501.1508	2568.8941	50.2	0.020	Yes
Extreme (0°C)		2501.1507	2568.8940	47.7	0.019	Yes
Extreme (-10°C)		2501.1507	2568.8940	32.8	0.013	Yes
Extreme (-20°C)		2501.1507	2568.8940	8.8	0.003	Yes
Extreme (-30°C)		2501.1507	2568.8940	-14.2	-0.006	Yes
20°C	15%	2501.1507	2568.8940	15.8	0.006	Yes
	-15%	2501.1507	2568.8940	-10.3	-0.004	Yes
	End Point Voltage	2501.1507	2568.8940	-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:	25602	Test Date:	5/9/2022
--------------------------	-------	-------------------	----------

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	2496.9367	2689.3308					
Extreme (50°C)		2496.9367	2689.3308	-44.6	-0.017	Yes		
Extreme (40°C)		2496.9367	2689.3308	-42.4	-0.016	Yes		
Extreme (30°C)		2496.9367	2689.3308	-29.9	-0.012	Yes		
Extreme (10°C)		2496.9367	2689.3308	-22.8	-0.009	Yes		
Extreme (0°C)		2496.9367	2689.3308	-7.7	-0.003	Yes		
Extreme (-10°C)		2496.9367	2689.3308	-15.6	-0.006	Yes		
Extreme (-20°C)		2496.9367	2689.3308	-22.2	-0.009	Yes		
Extreme (-30°C)		2496.9366	2689.3307	-63.4	-0.024	Yes		
20°C	15%	2496.9367	2689.3308	-42.2	42.2	Yes		
	-15%	2496.9367	2689.3308	-15.5	15.5	Yes		
	End Point Voltage	2496.9366	2689.3307	-66.1	-66.1	Yes		

9.4.4. LTE BAND 48

Test Engineer ID:	25602	Test Date:	5/8/2022
--------------------------	-------	-------------------	----------

QPSK (20MHz + 20MHz BANDWIDTH)

Band	48	Frequency Range		Frequency Error Reading (Hz)	Limit	
Condition		3550	3700		Frequency Stability (ppm)	Within Authorized Frequency Block (Hz)
Temperature	Voltage	Freq Reading @ Low End (MHz)	Freq Reading @ High End (MHz)			
Normal (20°C)	Normal	3551.1349	3699.3159			
Extreme (50°C)		3551.1349	3699.3159	45.8	0.013	Yes
Extreme (40°C)		3551.1349	3699.3159	45.3	0.012	Yes
Extreme (30°C)		3551.1349	3699.3159	38.5	0.011	Yes
Extreme (10°C)		3551.1349	3699.3159	45.7	0.013	Yes
Extreme (0°C)		3551.1349	3699.3159	25.8	0.007	Yes
Extreme (-10°C)		3551.1349	3699.3159	2.5	0.001	Yes
Extreme (-20°C)		3551.1349	3699.3159	-41.4	-0.011	Yes
Extreme (-30°C)		3551.1348	3699.3158	-59.2	-0.016	Yes
20°C	15%	3551.1349	3699.3159	48.4	42.2	Yes
	-15%	3551.1349	3699.3159	29.7	15.5	Yes
	End Point Voltage	3551.1348	3699.3158	-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; 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:	25780	Test Date:	4/2/2022
--------------------------	-------	-------------------	----------

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	32.24	26.46	5.78
				16QAM	32.88	26.19	6.69
	5 MHz / 3MHz	835.0	838.9	QPSK	32.19	26.40	5.79
				16QAM	32.95	26.20	6.75
	5MHz / 10MHz	831.6	838.8	QPSK	30.47	24.61	5.86
				16QAM	30.45	23.59	6.86
	10MHz / 5MHz	834.3	841.5	QPSK	30.69	24.57	6.12
				16QAM	30.69	23.58	7.11
	10MHz / 10MHz	831.5	841.4	QPSK	30.84	24.60	6.24
				16QAM	30.72	23.62	7.10
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:	25780	Test Date:	4/2/2022
--------------------------	-------	-------------------	----------

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	30.82	24.73	6.09	
				16QAM	30.65	23.72	6.93	
	20MHz / 10MHz	2530.1	2544.5	QPSK	30.63	23.72	6.91	
				16QAM	31.16	23.72	7.44	
	15 MHz / 15MHz	2527.5	2542.5	QPSK	30.78	24.69	6.09	
				16QAM	31.16	23.72	7.44	
	15MHz / 20MHz	2525.3	2542.4	QPSK	30.83	24.69	6.14	
				16QAM	30.76	23.71	7.05	
	20MHz / 15MHz	2527.6	2544.7	QPSK	32.06	25.94	6.12	
				16QAM	32.29	25.15	7.14	
	20MHz / 20MHz	2525.1	2544.9	QPSK	30.88	24.71	6.17	
				16QAM	30.87	23.71	7.16	
	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:	25780	Test Date:	4/2/2022
--------------------------	-------	-------------------	----------

Band	Bandwidth (MHz)	PCC f (MHz)	SCC1 f (MHz)	Modulation	Conducted Power (dBm)		Peak-to-Average Power Ratio (dB)
					Peak	Average	
Band 41 (FCC)	5MHz / 20MHz	2583.8	2595.5	QPSK	33.23	20.53	5.71
				16QAM	33.18	19.55	6.64
	20MHz / 5MHz	2590.5	2602.2	QPSK	33.24	20.52	5.73
				16QAM	33.24	19.52	6.73
	10MHz / 20MHz	2583.6	2598.0	QPSK	33.29	20.52	5.78
				16QAM	33.14	19.54	6.61
	20MHz / 10MHz	2588.1	2602.5	QPSK	33.28	20.51	5.78
				16QAM	33.24	19.52	6.73
	15MHz / 15MHz	2585.5	2600.5	QPSK	33.28	20.52	5.77
				16QAM	33.26	19.53	6.74
	15MHz / 20MHz	2583.3	2600.4	QPSK	33.29	20.52	5.78
				16QAM	33.25	19.49	6.77
	20MHz / 15MHz	2585.6	2602.7	QPSK	33.41	21.52	4.90
				16QAM	33.39	20.52	5.88
	20MHz / 20MHz	2583.1	2602.9	QPSK	33.26	21.42	4.85
				16QAM	33.31	20.44	5.88
Duty Cycle Correction Factor (dB) =			6.99				
Peak-to-Average Power Ratio= Peak Reading - Average Reading - Duty Cycle Correction Factor							

9.5.4. LTE BAND 48

Test Engineer ID:	25780	Test Date:	4/2/2022
--------------------------	-------	-------------------	----------

Band	Bandwidth (MHz)	PCC f (MHz)	SCC1 f (MHz)	Modulation	Conducted Power (dBm)		Peak-to-Average Power Ratio (dB)	
					Peak	Average		
Band 41 (FCC)	5MHz / 20MHz	3615.8	3627.5	QPSK	28.34	15.76	5.59	
				16QAM	29.30	15.79	6.52	
	20MHz / 5MHz	3622.5	3634.2	QPSK	30.33	18.71	4.63	
				16QAM	30.34	17.70	5.65	
	10MHz / 20MHz	3615.6	3630.0	QPSK	27.77	15.28	5.50	
				16QAM	28.75	15.29	6.47	
	20MHz / 10MHz	3620.1	3634.5	QPSK	30.31	18.72	4.60	
				16QAM	30.37	17.72	5.66	
	15MHz / 20MHz	3615.3	3632.4	QPSK	27.87	15.26	5.62	
				16QAM	28.78	15.28	6.51	
	20MHz / 15MHz	3617.6	3634.7	QPSK	30.40	18.73	4.68	
				16QAM	30.36	17.73	5.64	
	20MHz / 20MHz	3615.1	3634.9	QPSK	30.38	18.74	4.65	
				16QAM	30.64	17.77	5.88	
	Duty Cycle Correction Factor (dB) =			6.99				
	Peak-to-Average Power Ratio= Peak Reading - Average Reading - Duty Cycle Correction Factor							

10. RADIATED TEST RESULTS

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.

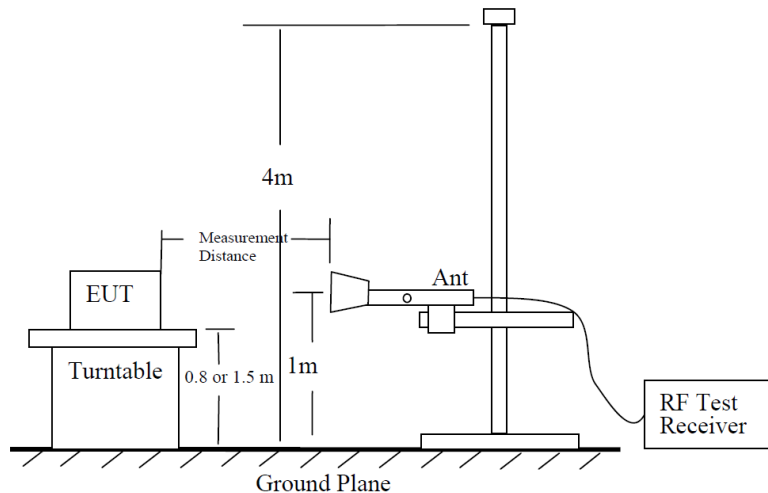


Figure 6—Test site-up for radiated ERP and/or EIRP measurements

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

- a) $E \text{ (dB}\mu\text{V/m)} = \text{Measured amplitude level (dB}\mu\text{V)} + \text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)}$.
- b) $E \text{ (dB}\mu\text{V/m)} = \text{Measured amplitude level (dBm)} + 107 + \text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)}$.
- c) $E \text{ (dB}\mu\text{V/m)} = \text{EIRP (dBm)} - 20\log(D) + 104.8$; where D is the measurement distance (in the far field region) in m.
- d) $\text{EIRP (dBm)} = E \text{ (dB}\mu\text{V/m)} + 20\log(D) - 104.8$; where D is the measurement distance (in the far field region) in m.

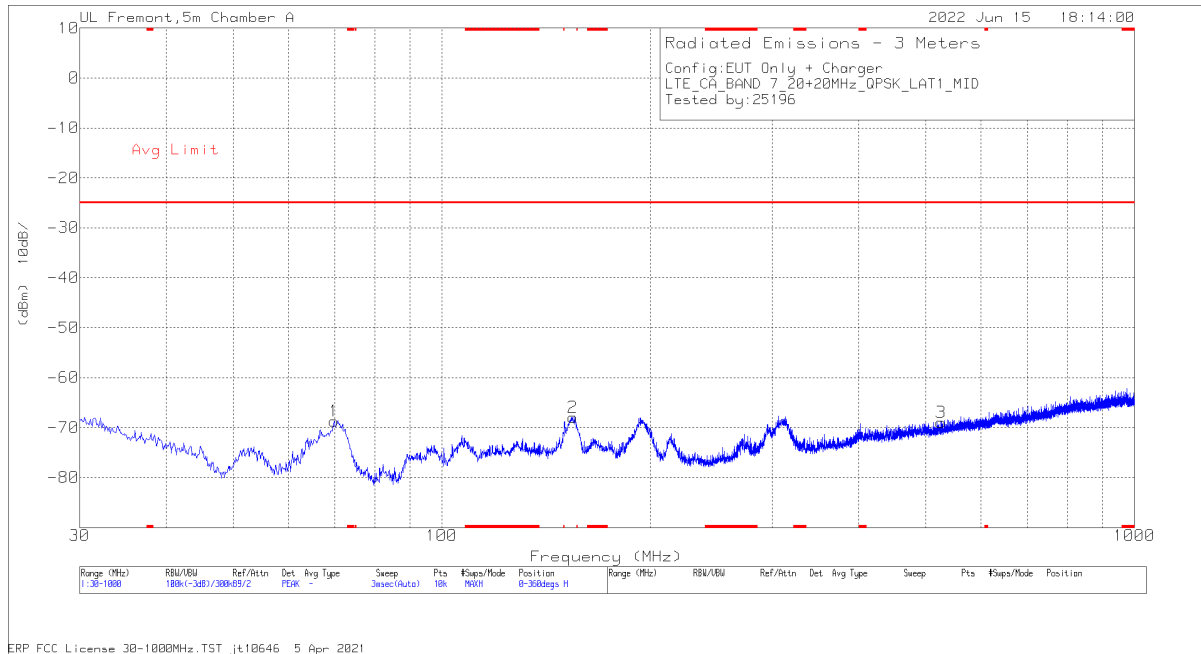
So, from d)

The measuring distance is usually at 3m, then $20 \cdot \log(3) = 9.5424$

Then, $\text{EIRP (dBm)} = E \text{ (dB}\mu\text{V/m)} + 9.5424 - 104.8 = E \text{ (dB}\mu\text{V/m)} - 95.2576$

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

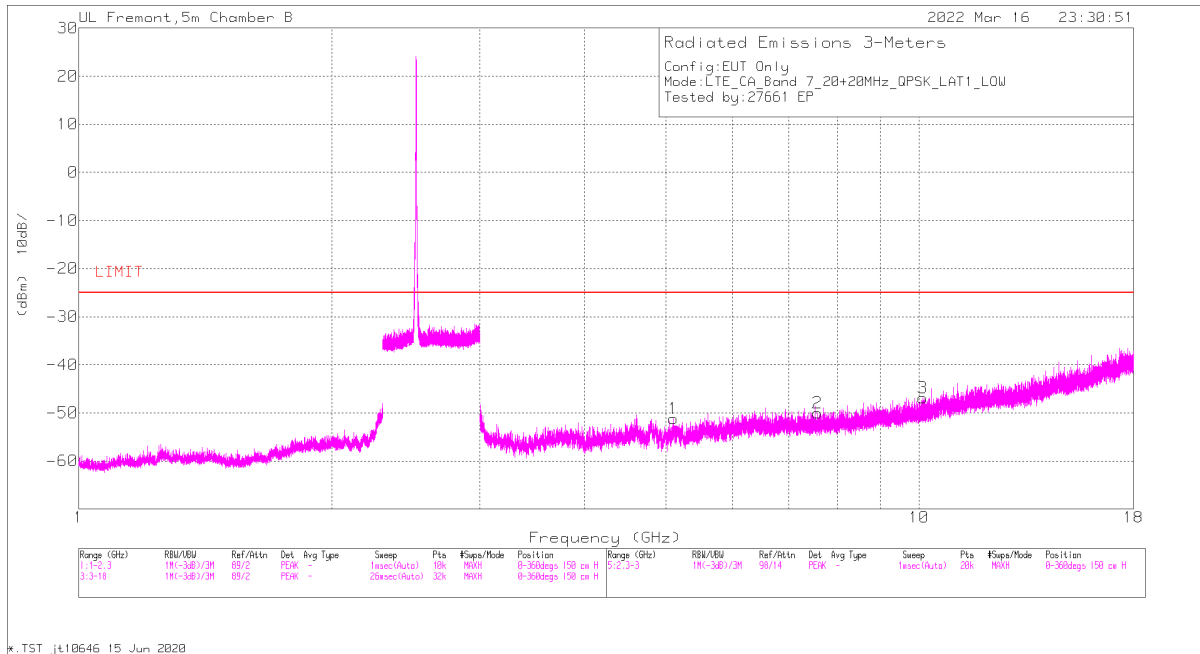


Vertical Polarity

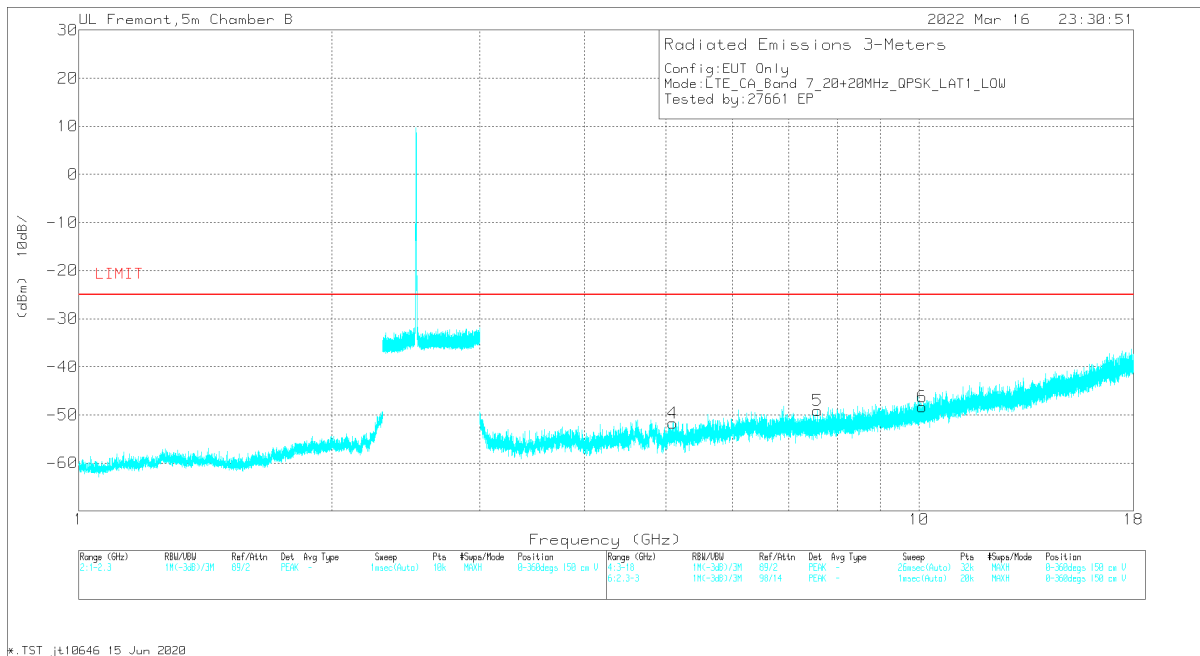
Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	85151 ACF (dB)_3m	Amp/Cbl (dB/m)	EIRP CF	Corrected Reading (dBm)	Avg Limit	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	69.867	38.76	Pk	14.4	-26.7	-95.2	-68.74	-25	-43.74	0-360	298	H
4	71.322	38.91	Pk	14.4	-26.7	-95.2	-68.59	-25	-43.59	0-360	199	V
5	152.996	31.1	Pk	18.9	-25.7	-95.2	-70.9	-25	-45.9	0-360	199	V
2	154.451	34.18	Pk	18.8	-25.7	-95.2	-67.92	-25	-42.92	0-360	199	H
6	496.958	28.47	Pk	23.9	-25.1	-95.2	-67.93	-25	-42.93	0-360	199	V
3	525.767	26.99	Pk	24.3	-25.1	-95.2	-69.01	-25	-44.01	0-360	98	H

Example Plot Above 1GHz



Horizontal Polarity



Vertical Polarity

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T962 (dB/m)	Amp/Cbl/Fitr/Pad (dB)	EIRP CF	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
5.092031	39.06	Pk	34.2	-30.5	.8	-95.2	-51.64	-25	-26.64	V
5.098125	39.39	Pk	34.2	-30.4	.8	-95.2	-51.21	-25	-26.21	H
7.570781	36.92	Pk	35.8	-27	.4	-95.2	-49.08	-25	-24.08	V
7.575938	35.97	Pk	35.8	-27	.4	-95.2	-50.03	-25	-25.03	H
10.093594	33.84	Pk	37.2	-24.8	.6	-95.2	-48.36	-25	-23.36	V
10.10625	35.31	Pk	37.2	-24.9	.7	-95.2	-46.89	-25	-21.89	H

10.1. FIELD STRENGTH OF SPURIOUS RADIATION, ANT 1

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 #:	14040683
Date:	04/17/2022
Test Engineer:	27661
Configuration:	EUT only
Mode	LTE Band 5 QPSK 10MHz + 10MHz
Chamber #:	Chamber B

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										
1.6664	43.98	Pk	28.3	-34.9	.7	-95.2	-57.12	-13	-44.12	H
1.6669	43.10	Pk	28.3	-34.9	.7	-95.2	-58.00	-13	-45.00	V
2.5003	46.12	Pk	32.7	-34.8	.5	-95.2	-50.68	-13	-37.68	H
2.5032	44.89	Pk	32.7	-34.8	.5	-95.2	-51.91	-13	-38.91	V
3.3135	42.27	Pk	32.6	-33.8	.5	-95.2	-53.63	-13	-40.63	H
3.3144	41.94	Pk	32.6	-33.8	.5	-95.2	-53.96	-13	-40.96	V
Mid Channel, 831.6MHz + 841.5MHz										
1.6649	42.89	Pk	28.3	-34.9	.7	-95.2	-58.21	-13	-45.21	V
1.6688	42.95	Pk	28.3	-34.9	.7	-95.2	-58.15	-13	-45.15	H
2.4960	43.35	Pk	32.8	-34.8	.5	-95.2	-53.35	-13	-40.35	V
2.5014	43.02	Pk	32.7	-34.8	.5	-95.2	-53.78	-13	-40.78	H
3.2998	41.38	Pk	32.6	-33.8	.5	-95.2	-54.52	-13	-41.52	V
3.3218	41.39	Pk	32.6	-33.8	.5	-95.2	-54.51	-13	-41.51	H
High Channel, 834.1MHz + 844MHz										
1.6767	42.51	Pk	28.5	-34.9	.7	-95.2	-58.39	-13	-45.39	V
1.6772	43.56	Pk	28.5	-34.9	.7	-95.2	-57.34	-13	-44.34	H
2.5019	42.17	Pk	32.7	-34.8	.5	-95.2	-54.63	-13	-41.63	H
2.5044	42.01	Pk	32.7	-34.8	.5	-95.2	-54.79	-13	-41.79	V
3.3242	41.31	Pk	32.6	-33.8	.5	-95.2	-54.59	-13	-41.59	V
3.3306	41.33	Pk	32.6	-33.7	.5	-95.2	-54.47	-13	-41.47	H

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 #:	14040683
Date:	04/17/2022
Test Engineer:	27661
Configuration:	EUT only
Mode	LTE Band 7 QPSK 20MHz + 20MHz
Chamber #:	Chamber B

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 + 2529.8MHz										
5.0920	39.06	Pk	34.2	-30.5	.8	-95.2	-51.64	-25	-26.64	V
5.0981	39.39	Pk	34.2	-30.4	.8	-95.2	-51.21	-25	-26.21	H
7.5708	36.92	Pk	35.8	-27	.4	-95.2	-49.08	-25	-24.08	V
7.5759	35.97	Pk	35.8	-27	.4	-95.2	-50.03	-25	-25.03	H
10.0936	33.84	Pk	37.2	-24.8	.6	-95.2	-48.36	-25	-23.36	V
10.1063	35.31	Pk	37.2	-24.9	.7	-95.2	-46.89	-25	-21.89	H
Mid Channel, 2525.1MHz + 2544.9MHz										
5.0648	38.55	Pk	34.1	-30.6	.6	-95.2	-52.55	-25	-27.55	V
5.0897	38.33	Pk	34.2	-30.5	.8	-95.2	-52.37	-25	-27.37	H
7.6214	36.08	Pk	35.8	-26.9	.4	-95.2	-49.82	-25	-24.82	V
7.6420	36.91	Pk	35.9	-26.9	.4	-95.2	-48.89	-25	-23.89	H
10.1508	34.34	Pk	37.2	-24.8	.6	-95.2	-47.86	-25	-22.86	V
10.1644	35.6	Pk	37.2	-24.9	.5	-95.2	-46.8	-25	-21.80	H
High Channel, 2540.2MHz + 2560MHz										
5.0883	38.19	Pk	34.2	-30.5	.8	-95.2	-52.51	-25	-27.51	V
5.0906	38.98	Pk	34.2	-30.5	.8	-95.2	-51.72	-25	-26.72	H
7.6819	35.86	Pk	35.8	-26.7	.5	-95.2	-49.74	-25	-24.74	V
7.6870	35.44	Pk	35.8	-26.7	.5	-95.2	-50.16	-25	-25.16	H
10.2530	34.88	Pk	37.3	-25.0	.7	-95.2	-47.32	-25	-22.32	V
10.2708	34.13	Pk	37.3	-24.9	.7	-95.2	-47.97	-25	-22.97	H

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 #:	14040683
Date:	04/17/2022
Test Engineer:	27661
Configuration:	EUT only
Mode	Band 41 QPSK 20MHz + 20MHz
Chamber #:	Chamber B

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										
5.0283	38.75	Pk	34.1	-30.7	.7	-95.2	-52.35	-25	-27.35	H
5.0288	38.37	Pk	34.1	-30.7	.7	-95.2	-52.73	-25	-27.73	V
7.5080	35.66	Pk	35.7	-26.9	.3	-95.2	-50.44	-25	-25.44	H
7.5122	36.33	Pk	35.7	-27.0	.3	-95.2	-49.87	-25	-24.87	V
10.0411	33.80	Pk	37.1	-24.9	.7	-95.2	-48.50	-25	-23.50	V
10.0416	34.64	Pk	37.1	-24.9	.7	-95.2	-47.66	-25	-22.66	H
Mid Channel, 2583.1MHz + 2602.9MHz										
5.1609	39.01	Pk	34.2	-30.5	.8	-95.2	-51.69	-25	-26.69	V
5.1703	39.46	Pk	34.2	-30.6	.7	-95.2	-51.44	-25	-26.44	H
7.6716	35.74	Pk	35.9	-26.8	.4	-95.2	-49.96	-25	-24.96	V
7.7142	37.27	Pk	35.8	-26.9	.4	-95.2	-48.63	-25	-23.63	H
10.3392	34.11	Pk	37.5	-24.8	.7	-95.2	-47.69	-25	-22.69	V
10.3528	34.72	Pk	37.6	-24.8	.7	-95.2	-46.98	-25	-21.98	H
High Channel, 2660.2MHz + 2680MHz										
5.3077	37.27	Pk	34.4	-30.3	.7	-95.2	-53.13	-25	-28.13	H
5.3198	37.31	Pk	34.4	-30.4	.8	-95.2	-53.09	-25	-28.09	V
7.9889	35.42	Pk	35.8	-26.6	.3	-95.2	-50.28	-25	-25.28	V
8.0039	35.17	Pk	35.9	-26.5	.3	-95.2	-50.33	-25	-25.33	H
10.6144	34.44	Pk	37.9	-24.3	.7	-95.2	-46.46	-25	-21.46	V
10.6266	35.89	Pk	37.9	-24.4	.6	-95.2	-45.21	-25	-20.21	H

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 #:	14040683
Date:	04/18/2022
Test Engineer:	30606
Configuration:	EUT only
Mode	LTE Band 5 QPSK 10MHz + 10MHz
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										
1.6459	38.92	Pk	28.5	-29.4	.7	-95.2	-56.48	-13	-43.48	V
1.6488	40.01	Pk	28.5	-29.4	.7	-95.2	-55.39	-13	-42.39	H
2.4740	40.41	Pk	32.2	-28.1	.5	-95.2	-50.19	-13	-37.19	H
2.4740	40.35	Pk	32.2	-28.1	.5	-95.2	-50.25	-13	-37.25	V
3.3081	37.46	Pk	32.5	-26.5	.7	-95.2	-51.04	-13	-38.04	H
3.3135	37.32	Pk	32.5	-26.6	.6	-95.2	-51.38	-13	-38.38	V
Mid Channel, 831.6MHz + 841.5MHz										
1.6698	39.53	Pk	28.5	-29.3	.7	-95.2	-55.77	-13	-42.77	V
1.6713	39.48	Pk	28.5	-29.3	.7	-95.2	-55.82	-13	-42.82	H
2.5083	38.41	Pk	32.4	-28.1	.7	-95.2	-51.79	-13	-38.79	H
2.5127	37.82	Pk	32.4	-28.1	.7	-95.2	-52.38	-13	-39.38	V
3.3218	37.61	Pk	32.6	-26.6	.6	-95.2	-50.99	-13	-37.99	V
3.3232	37.77	Pk	32.6	-26.6	.6	-95.2	-50.83	-13	-37.83	H
High Channel, 834.1MHz + 844MHz										
1.6693	39.89	Pk	28.5	-29.4	.7	-95.2	-55.51	-13	-42.51	H
1.6703	39.6	Pk	28.5	-29.3	.7	-95.2	-55.7	-13	-42.70	V
2.4887	41.29	Pk	32.2	-28.0	.5	-95.2	-49.21	-13	-36.21	H
2.4892	41.25	Pk	32.2	-28.0	.6	-95.2	-49.15	-13	-36.15	V
3.3125	36.70	Pk	32.5	-26.6	.6	-95.2	-52.00	-13	-39.00	V
3.3262	36.78	Pk	32.6	-26.6	.6	-95.2	-51.82	-13	-38.82	H

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 #:	14040683
Date:	04/18/2022
Test Engineer:	30606
Configuration:	EUT only
Mode	LTE Band 7 QPSK 20MHz + 20MHz
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 + 2529.8MHz										
5.0147	34.57	Pk	34.3	-24.3	.8	-95.2	-49.83	-25	-24.83	V
5.0222	35.93	Pk	34.2	-24.2	.7	-95.2	-48.57	-25	-23.57	H
7.5366	32.6	Pk	35.6	-20.3	.3	-95.2	-47.00	-25	-22.00	H
7.5539	33.06	Pk	35.6	-20.2	.3	-95.2	-46.44	-25	-21.44	V
10.0327	32.25	Pk	37.1	-17.7	.7	-95.2	-42.85	-25	-17.85	H
10.0434	31.54	Pk	37.1	-17.8	.7	-95.2	-43.66	-25	-18.66	V
Mid Channel, 2525.1MHz + 2544.9MHz										
5.0433	35.27	Pk	34.4	-24.1	.6	-95.2	-49.03	-25	-24.03	V
5.0513	36.80	Pk	34.4	-24	.6	-95.2	-47.4	-25	-22.40	H
7.5839	33.03	Pk	35.6	-19.9	.5	-95.2	-45.97	-25	-20.97	V
7.5967	32.89	Pk	35.7	-20.0	.4	-95.2	-46.21	-25	-21.21	H
10.1194	31.51	Pk	37.2	-17.8	.7	-95.2	-43.59	-25	-18.59	H
10.1288	32.45	Pk	37.2	-17.7	.7	-95.2	-42.55	-25	-17.55	V
High Channel, 2540.2MHz + 2560MHz										
5.0695	35.19	Pk	34.4	-23.7	.7	-95.2	-48.61	-25	-23.61	V
5.0803	36.26	Pk	34.4	-23.7	.7	-95.2	-47.54	-25	-22.54	H
7.6341	33.23	Pk	35.7	-19.6	.4	-95.2	-45.47	-25	-20.47	H
7.6392	32.72	Pk	35.7	-19.6	.4	-95.2	-45.98	-25	-20.98	V
10.1625	31.92	Pk	37.3	-17.6	.5	-95.2	-43.08	-25	-18.08	H
10.1677	32.62	Pk	37.3	-17.6	.5	-95.2	-42.38	-25	-17.38	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 #:	14040683
Date:	04/23/2022
Test Engineer:	30606
Configuration:	EUT only
Mode	Band 41 QPSK 20MHz + 20MHz
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										
5.0278	35.74	Pk	34.3	-24.2	.7	-95.2	-48.66	-25	-23.66	V
5.0348	35.37	Pk	34.4	-24.2	.7	-95.2	-48.93	-25	-23.93	H
7.5150	33.38	Pk	35.6	-20.1	.3	-95.2	-46.02	-25	-21.02	V
7.5164	32.48	Pk	35.6	-20.1	.3	-95.2	-46.92	-25	-21.92	H
10.0134	31.95	Pk	37.2	-17.6	.6	-95.2	-43.05	-25	-18.05	H
10.0195	31.74	Pk	37.2	-17.6	.6	-95.2	-43.26	-25	-18.26	V
Mid Channel, 2583.1MHz + 2602.9MHz										
5.1877	35.62	Pk	34.4	-23.6	.8	-95.2	-47.98	-25	-22.98	H
5.1919	35.03	Pk	34.4	-23.5	.8	-95.2	-48.47	-25	-23.47	V
7.7203	32.83	Pk	35.8	-19.7	.3	-95.2	-45.97	-25	-20.97	V
7.7489	33.23	Pk	35.7	-19.6	.3	-95.2	-45.57	-25	-20.57	H
10.3420	33.22	Pk	37.5	-17.1	.7	-95.2	-40.88	-25	-15.88	H
10.3542	31.39	Pk	37.5	-16.9	.8	-95.2	-42.41	-25	-17.41	V
High Channel, 2660.2MHz + 2680MHz										
5.3208	35.41	Pk	34.5	-24.2	.8	-95.2	-48.69	-25	-23.69	H
5.3245	35.38	Pk	34.5	-24.2	.8	-95.2	-48.72	-25	-23.72	V
7.9898	33.14	Pk	35.7	-19.6	.3	-95.2	-45.66	-25	-20.66	H
7.9973	32.03	Pk	35.7	-19.6	.3	-95.2	-46.77	-25	-21.77	V
10.6463	32.74	Pk	37.9	-16.8	.5	-95.2	-40.86	-25	-15.86	V
10.6692	31.94	Pk	37.9	-17.0	.5	-95.2	-41.86	-25	-16.86	H

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 #:	14040683
Date:	04/24/2022
Test Engineer:	27661
Configuration:	EUT only
Mode	LTE Band 7 QPSK 20MHz + 20MHz
Chamber #:	Chamber B

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 + 2529.8MHz										
5.0400	38.6	Pk	34	-30.7	.6	-95.2	-52.70	-25	-27.70	V
5.0508	39.53	Pk	34.1	-30.7	.6	-95.2	-51.67	-25	-26.67	H
7.5614	36.08	Pk	35.8	-27.0	.4	-95.2	-49.92	-25	-24.92	V
7.5736	35.93	Pk	35.8	-27.0	.4	-95.2	-50.07	-25	-25.07	H
10.0102	34.37	Pk	37.1	-24.9	.6	-95.2	-48.03	-25	-23.03	H
10.0172	35.59	Pk	37.1	-24.8	.6	-95.2	-46.71	-25	-21.71	V
Mid Channel, 2525.1MHz + 2544.9MHz										
5.0358	39.29	Pk	34.0	-30.6	.7	-95.2	-51.81	-25	-26.81	V
5.0461	39.83	Pk	34.1	-30.7	.6	-95.2	-51.37	-25	-26.37	H
7.7236	36.93	Pk	35.8	-26.9	.3	-95.2	-49.07	-25	-24.07	V
7.7386	37.94	Pk	35.9	-26.8	.3	-95.2	-47.86	-25	-22.86	H
10.0463	34.37	Pk	37.1	-24.9	.7	-95.2	-47.93	-25	-22.93	V
10.0870	35.97	Pk	37.2	-24.8	.6	-95.2	-46.23	-25	-21.23	H
High Channel, 2540.2MHz + 2560MHz										
5.0888	38.28	Pk	34.2	-30.5	.8	-95.2	-52.42	-25	-27.42	V
5.0920	38.74	Pk	34.2	-30.5	.8	-95.2	-51.96	-25	-26.96	H
7.6167	35.24	Pk	35.8	-26.9	.4	-95.2	-50.66	-25	-25.66	V
7.6313	35.88	Pk	35.8	-26.9	.4	-95.2	-50.02	-25	-25.02	H
10.1372	35.44	Pk	37.2	-24.8	.7	-95.2	-46.66	-25	-21.66	V
10.1456	35.09	Pk	37.3	-24.8	.6	-95.2	-47.01	-25	-22.01	H

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 #:	14040683
Date:	04/21/2022
Test Engineer:	27661
Configuration:	EUT only
Mode	Band 41 QPSK 20MHz + 20MHz
Chamber #:	Chamber B

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										
5.0067	37.80	Pk	34.1	-30.8	.8	-95.2	-53.3	-25	-28.30	V
5.0184	38.77	Pk	34.0	-30.8	.8	-95.2	-52.43	-25	-27.43	H
7.5141	36.10	Pk	35.7	-27.0	.3	-95.2	-50.1	-25	-25.10	V
7.5263	36.01	Pk	35.8	-27.0	.3	-95.2	-50.09	-25	-25.09	H
10.0673	34.02	Pk	37.2	-25.0	.7	-95.2	-48.28	-25	-23.28	V
10.0692	34.70	Pk	37.2	-25.0	.7	-95.2	-47.6	-25	-22.60	H
Mid Channel, 2583.1MHz + 2602.9MHz										
5.1722	39.74	Pk	34.2	-30.6	.7	-95.2	-51.16	-25	-26.16	H
5.1773	39.31	Pk	34.2	-30.6	.7	-95.2	-51.59	-25	-26.59	V
7.7306	35.83	Pk	35.8	-26.8	.3	-95.2	-50.07	-25	-25.07	V
7.7330	36.2	Pk	35.8	-26.8	.3	-95.2	-49.70	-25	-24.70	H
10.3059	33.87	Pk	37.4	-25.1	.6	-95.2	-48.43	-25	-23.43	V
10.3172	34.78	Pk	37.4	-25.0	.6	-95.2	-47.42	-25	-22.42	H
High Channel, 2660.2MHz + 2680MHz										
5.3030	39.16	Pk	34.3	-30.3	.6	-95.2	-51.44	-25	-26.44	V
5.3161	37.76	Pk	34.4	-30.4	.8	-95.2	-52.64	-25	-27.64	H
7.9973	36.26	Pk	35.9	-26.5	.3	-95.2	-49.24	-25	-24.24	V
8.0128	35.68	Pk	35.8	-26.5	.3	-95.2	-49.92	-25	-24.92	H
10.6134	33.90	Pk	37.9	-24.3	.7	-95.2	-47.00	-25	-22.00	V
10.6359	35.00	Pk	37.9	-24.3	.5	-95.2	-46.10	-25	-21.10	H

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 #:	14040683
Date:	04/21/2022
Test Engineer:	30606
Configuration:	EUT only
Mode	LTE Band 7 QPSK 20MHz + 20MHz
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 + 2529.8MHz										
5.0208	35.86	Pk	34.2	-24.2	.7	-95.2	-48.64	-25	-23.64	V
5.0273	36.17	Pk	34.3	-24.2	.7	-95.2	-48.23	-25	-23.23	H
7.5291	32.77	Pk	35.6	-20.2	.3	-95.2	-46.73	-25	-21.73	H
7.5323	33.50	Pk	35.6	-20.2	.3	-95.2	-46.00	-25	-21.00	V
10.0233	31.31	Pk	37.2	-17.6	.6	-95.2	-43.69	-25	-18.69	V
10.0322	31.86	Pk	37.1	-17.7	.7	-95.2	-43.24	-25	-18.24	H
Mid Channel, 2525.1MHz + 2544.9MHz										
5.0794	36.27	Pk	34.4	-23.7	.7	-95.2	-47.53	-25	-22.53	H
5.0831	35.06	Pk	34.4	-23.7	.8	-95.2	-48.64	-25	-23.64	V
7.5745	33.08	Pk	35.6	-19.8	.4	-95.2	-45.92	-25	-20.92	V
7.5919	33.84	Pk	35.7	-20.0	.5	-95.2	-45.16	-25	-20.16	H
10.1213	31.62	Pk	37.2	-17.8	.7	-95.2	-43.48	-25	-18.48	H
10.1325	31.86	Pk	37.3	-17.7	.7	-95.2	-43.04	-25	-18.04	V
High Channel, 2540.2MHz + 2560MHz										
5.0658	35.10	Pk	34.4	-23.8	.6	-95.2	-48.9	-25	-23.90	V
5.0712	36.21	Pk	34.4	-23.7	.7	-95.2	-47.59	-25	-22.59	H
7.6139	33.12	Pk	35.7	-19.9	.4	-95.2	-45.88	-25	-20.88	V
7.6223	33.42	Pk	35.7	-19.8	.4	-95.2	-45.48	-25	-20.48	H
10.1808	32.31	Pk	37.3	-17.5	.6	-95.2	-42.49	-25	-17.49	H
10.1808	32.34	Pk	37.3	-17.5	.6	-95.2	-42.46	-25	-17.46	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 #:	14040683
Date:	04/22/2022
Test Engineer:	30606
Configuration:	EUT only
Mode	Band 41 QPSK 20MHz + 20MHz
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										
5.0170	36.04	Pk	34.2	-24.2	.8	-95.2	-48.36	-25	-23.36	V
5.0344	36.76	Pk	34.4	-24.2	.7	-95.2	-47.54	-25	-22.54	H
7.5089	32.28	Pk	35.6	-20.1	.3	-95.2	-47.12	-25	-22.12	V
7.5159	33.14	Pk	35.6	-20.1	.3	-95.2	-46.26	-25	-21.26	H
10.0228	30.64	Pk	37.2	-17.6	.6	-95.2	-44.36	-25	-19.36	V
10.0238	32.3	Pk	37.2	-17.6	.6	-95.2	-42.7	-25	-17.70	H
Mid Channel, 2583.1MHz + 2602.9MHz										
5.1272	35.8	Pk	34.4	-23.9	.8	-95.2	-48.10	-25	-23.10	V
5.1450	36.29	Pk	34.3	-24	.8	-95.2	-47.81	-25	-22.81	H
7.7222	33.77	Pk	35.7	-19.7	.3	-95.2	-45.13	-25	-20.13	V
7.7475	33.30	Pk	35.7	-19.6	.3	-95.2	-45.50	-25	-20.50	H
10.3434	31.97	Pk	37.5	-17.1	.7	-95.2	-42.13	-25	-17.13	V
10.3505	32.90	Pk	37.4	-17.0	.7	-95.2	-41.20	-25	-16.20	H
High Channel, 2660.2MHz + 2680MHz										
5.3123	34.61	Pk	34.5	-24.2	.7	-95.2	-49.59	-25	-24.59	V
5.3227	35.22	Pk	34.5	-24.2	.8	-95.2	-48.88	-25	-23.88	H
7.9884	32.43	Pk	35.7	-19.5	.3	-95.2	-46.27	-25	-21.27	V
7.9955	33.76	Pk	35.7	-19.6	.3	-95.2	-45.04	-25	-20.04	H
10.5211	34.34	Pk	37.7	-17.4	.5	-95.2	-40.06	-25	-15.06	H
10.5248	31.39	Pk	37.7	-17.4	.5	-95.2	-43.01	-25	-18.01	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 #:	14040683
Date:	05/25/2022
Test Engineer:	27661
Configuration:	EUT only
Mode	Band 48 QPSK 20MHz + 20MHz
Chamber #:	Chamber B

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										
7.1157	32.39	RMS	35.6	-26.8	.5	-95.2	-53.51	-40	-13.51	V
7.1373	32.95	RMS	35.6	-27.0	.6	-95.2	-53.05	-40	-13.05	H
10.6266	32.56	RMS	37.9	-24.4	.6	-95.2	-48.54	-40	-8.54	V
10.6592	31.94	RMS	37.9	-24.0	.6	-95.2	-48.76	-40	-8.76	H
14.2384	30.43	RMS	38.9	-20.2	.8	-95.2	-45.27	-40	-5.27	H
14.2437	30.45	RMS	38.9	-20.2	.8	-95.2	-45.25	-40	-5.25	V
Mid Channel, 3615.1MHz + 3634.9MHz										
7.2003	32.31	RMS	35.6	-27.1	.6	-95.2	-53.79	-40	-13.79	V
7.2219	33.12	RMS	35.6	-26.8	.5	-95.2	-52.78	-40	-12.78	H
10.7804	31.36	RMS	38.0	-23.7	.6	-95.2	-48.94	-40	-8.94	V
10.8509	30.77	RMS	37.9	-23.6	.5	-95.2	-49.63	-40	-9.63	H
14.4129	30.17	RMS	39.3	-19.4	.8	-95.2	-44.33	-40	-4.33	V
14.4613	29.76	RMS	39.4	-19.2	.7	-95.2	-44.54	-40	-4.54	H
High Channel, 3670.2MHz + 3690MHz										
7.3439	32.63	RMS	35.7	-26.7	.6	-95.2	-52.97	-40	-12.97	H
7.3545	33.73	RMS	35.7	-26.7	.7	-95.2	-51.77	-40	-11.77	V
10.9685	31.05	RMS	37.9	-23.5	.6	-95.2	-49.15	-40	-9.15	V
10.9993	30.95	RMS	37.9	-23.5	.7	-95.2	-49.15	-40	-9.15	H
14.6711	29.78	RMS	39.8	-19.4	.9	-95.2	-44.12	-40	-4.12	H
14.6777	30.14	RMS	39.8	-19.6	.9	-95.2	-43.96	-40	-3.96	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 #:	14040683
Date:	05/25/2022
Test Engineer:	27661
Configuration:	EUT only
Mode	Band 48 QPSK 20MHz + 20MHz
Chamber #:	Chamber B

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										
7.273866	33.27	RMS	35.7	-26.7	.5	-95.2	-52.43	-40	-12.43	H
7.279594	32.83	RMS	35.6	-26.6	.5	-95.2	-52.87	-40	-12.87	V
10.927088	31.22	RMS	37.9	-23.8	.7	-95.2	-49.18	-40	-9.18	H
10.92885	32.77	RMS	37.9	-23.8	.7	-95.2	-47.63	-40	-7.63	V
14.549906	29.91	RMS	39.7	-20.2	.8	-95.2	-44.99	-40	-4.99	H
14.581191	30.16	RMS	39.7	-19.7	.9	-95.2	-44.14	-40	-4.14	V
Mid Channel, 3615.1MHz + 3634.9MHz										
7.289728	32.84	RMS	35.6	-26.4	.6	-95.2	-52.56	-40	-12.56	V
7.302066	33.64	RMS	35.7	-26.4	.6	-95.2	-51.66	-40	-11.66	H
10.903734	31.28	RMS	37.9	-23.7	.6	-95.2	-49.12	-40	-9.12	H
10.930613	31.07	RMS	37.9	-23.8	.7	-95.2	-49.33	-40	-9.33	V
14.518181	30.46	RMS	39.6	-19.8	.8	-95.2	-44.14	-40	-4.14	H
14.551228	29.33	RMS	39.7	-20.3	.8	-95.2	-45.67	-40	-5.67	V
High Channel, 3670.2MHz + 3690MHz										
7.266375	33.06	RMS	35.6	-26.8	.6	-95.2	-52.74	-40	-12.74	V
7.272544	33.69	RMS	35.6	-26.7	.5	-95.2	-52.11	-40	-12.11	H
10.898888	31.24	RMS	37.9	-23.8	.6	-95.2	-49.26	-40	-9.26	V
10.902853	32.31	RMS	37.9	-23.7	.6	-95.2	-48.09	-40	-8.09	H
14.405381	29.87	RMS	39.3	-19.3	.8	-95.2	-44.53	-40	-4.53	V
14.522147	30.38	RMS	39.6	-19.8	.8	-95.2	-44.22	-40	-4.22	H

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

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.

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

Project #:	14040683
Date:	05/25/2022
Test Engineer:	27661
Configuration:	EUT only
Mode	Band 48 QPSK 20MHz + 20MHz
Chamber #:	Chamber B

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										
7.076025	33.58	RMS	35.6	-26.9	.6	-95.2	-52.32	-40	-12.32	V
7.103344	33.91	RMS	35.6	-26.8	.5	-95.2	-51.99	-40	-11.99	H
10.612481	32.28	RMS	37.9	-24.3	.6	-95.2	-48.72	-40	-8.72	V
10.655663	32.44	RMS	37.9	-24	.6	-95.2	-48.26	-40	-8.26	H
14.215913	30.08	RMS	38.8	-19.8	.8	-95.2	-45.32	-40	-5.32	V
14.231334	30.66	RMS	38.9	-20.1	.8	-95.2	-44.94	-40	-4.94	H
Mid Channel, 3615.1MHz + 3634.9MHz										
7.218347	34.2	RMS	35.6	-26.8	.5	-95.2	-51.7	-40	-11.7	H
7.220109	32.21	RMS	35.6	-26.8	.5	-95.2	-53.69	-40	-13.69	V
10.831913	32	RMS	37.9	-23.8	.6	-95.2	-48.5	-40	-8.5	H
10.844691	30.96	RMS	38	-23.7	.5	-95.2	-49.44	-40	-9.44	V
14.540213	29.69	RMS	39.7	-20	.8	-95.2	-45.01	-40	-5.01	V
14.564006	30.6	RMS	39.7	-20.1	.8	-95.2	-44.2	-40	-4.2	H
High Channel, 3670.2MHz + 3690MHz										
7.393275	32.99	RMS	35.7	-26.8	.6	-95.2	-52.71	-40	-12.71	H
7.398122	33.38	RMS	35.7	-26.8	.6	-95.2	-52.32	-40	-12.32	V
11.066766	31.16	RMS	37.9	-23.5	.6	-95.2	-49.04	-40	-9.04	H
11.068088	31.26	RMS	37.9	-23.5	.6	-95.2	-48.94	-40	-8.94	V
14.760084	29.59	RMS	39.7	-20.1	.8	-95.2	-45.21	-40	-5.21	H
14.773744	29.82	RMS	39.7	-20.1	.8	-95.2	-44.98	-40	-4.98	V

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 #:	14040683
Date:	05/25/2022
Test Engineer:	27661
Configuration:	EUT only
Mode	Band 48 QPSK 20MHz + 20MHz
Chamber #:	Chamber B

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										
7.111716	32.8	RMS	35.6	-26.8	.5	-95.2	-53.1	-40	-13.1	H
7.119206	32.95	RMS	35.6	-26.9	.5	-95.2	-53.05	-40	-13.05	V
10.661391	32.07	RMS	37.9	-24	.6	-95.2	-48.63	-40	-8.63	V
10.661391	32.07	RMS	37.9	-24	.6	-95.2	-48.63	-40	-8.63	V
10.697081	32.12	RMS	38	-24.3	.5	-95.2	-48.88	-40	-8.88	H
14.232656	30.4	RMS	38.9	-20.2	.8	-95.2	-45.3	-40	-5.3	H
Mid Channel, 3615.1MHz + 3634.9MHz										
7.2276	32.86	RMS	35.6	-26.8	.5	-95.2	-53.04	-40	-13.04	H
7.236413	33.64	RMS	35.6	-26.8	.5	-95.2	-52.26	-40	-12.26	V
10.844691	31.84	RMS	38	-23.7	.5	-95.2	-48.56	-40	-8.56	V
10.857909	31.42	RMS	38	-23.7	.4	-95.2	-49.08	-40	-9.08	H
14.446359	30.23	RMS	39.4	-19.4	.8	-95.2	-44.17	-40	-4.17	H
14.461781	30.64	RMS	39.4	-19.2	.7	-95.2	-43.66	-40	-3.66	V
High Channel, 3670.2MHz + 3690MHz										
7.335553	33.41	RMS	35.7	-26.8	.5	-95.2	-52.39	-40	-12.39	H
7.340841	33.2	RMS	35.7	-26.8	.6	-95.2	-52.5	-40	-12.5	V
11.030194	31.3	RMS	37.9	-23.3	.6	-95.2	-48.7	-40	-8.7	V
11.038566	31.61	RMS	37.9	-23.2	.6	-95.2	-48.29	-40	-8.29	H
14.667113	29.17	RMS	39.8	-19.2	.9	-95.2	-44.53	-40	-4.53	H
14.690906	29.77	RMS	39.8	-19.8	.9	-95.2	-44.53	-40	-4.53	V

11. SETUP PHOTOS

Please refer to 14040863-EP1V1 for setup photos.

END OF REPORT