



# TEST REPORT

**Report Number :** 13571607-E10V4

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

**Model :** A2482

**Brand :** APPLE

**FCC ID :** BCG-E3997A

**EUT Description :** SMARTPHONE

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

**Date Of Issue:**  
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Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
V1	7/15/2021	Initial Review	Mengistu Mekuria
V2	7/20/2021	Addressed TCB feedback	Mengistu Mekuria
V3	8/04/2021	Updated 6.5 to clarify that conducted tests were selected based on worst case conducted power.	John Thompson
V4	8/11/2021	Updated FCC ID – TCB Feedback	Tony Li

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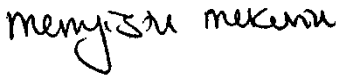
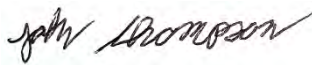
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# 1. ATTESTATION OF TEST RESULTS

Applicant Name and Address	APPLE, INC. 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A.	
Model	A2482	
Brand	APPLE	
FCC ID	BCG-E3997A	
EUT Description	SMARTPHONE	
Serial Number	CQF9R4NQNJ (Conducted), XWGGFJ25JV (Radiated)	
Sample Receipt Date	FEBRUARY 19, 2021	
Date Tested	FEBRUARY 19, 2021 to JUNE 10, 2021	
Applicable Standards	FCC CFR 47 Part 2, Part 22, Part 27 and Part 96	
Test Results	COMPLIES	
<p>UL Verification Services Inc. 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 Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. 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 NVLAP, NIST, any agency of the Federal Government, or any agency of the U.S. government.</p>		
Approved & Released By:	Prepared By:	
		
Mengistu Mekuria Lead Test Engineer UL Verification Services Inc.	John Thompson Laboratory Engineer UL Verification Services Inc.	

## 2. SUMMARY OF TEST RESULTS

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

Requirement Description	Requirement Clause Number (FCC)	Result	Remarks
RF Conducted Output Power	2.1046	Complies	
Effective Radiated Power	22.913 (a)(5)	Complies	
Equivalent Isotropic Radiated power	27.50 (h) (2) 27.50 (d) (4) 96.41 (b)	Complies	
Occupied Bandwidth	2.1049	Complies	
Band Edge and Emission Mask	2.1051, 22.917 (a), 27.53(h) 27.53 (m)(4) &(m)(6), 96.41(e)	Complies	
Out of Band Emissions	2.1051, 22.917 (a), 27.53(h) 27.53 (m)(4) &(m)(6), 96.41(e)	Complies	
Frequency Stability	2.1055, 22.355, 27.54	Complies	
Peak-to-Average Ratio	27.50 (d) (5), 96.41 (g)	Complies	
Field Strength of Spurious Radiation	2.1053, 22.917 (a), 27.53(h) 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 Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0, 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, California, USA	US0104	2324A	208313
<input checked="" type="checkbox"/>	Building 2: 47266 Benicia Street, Fremont, California, USA	US0104	22541	208313
<input type="checkbox"/>	Building 4: 47658 Kato Rd, Fremont, California, USA	US0104	2324B	208313



## 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 <sub>Lab</sub>
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, CDMA, IEEE 802.11a/b/g/n/ac/ax, Bluetooth, Ultra-Wideband, GPS, NFC and WPT. All models 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 (Ant 1)								
ERP Limit (W)		7.00						
Antenna Gain (dBi)		-4.50						
Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	ERP Average (dBm)	ERP Average (W)	99% BW (kHz)	Emission Designator
3+5	QPSK	825.5	846.5	25.70	19.05	0.080	7363	7M36G7W
	16QAM			25.67	19.02	0.080	7446	7M45G7W
5+3	QPSK	826.5	847.5	25.45	18.80	0.076	7449	7M45G7W
	16QAM			25.70	19.05	0.080	7425	7M43G7W
5+10	QPSK	826.5	844.0	25.70	19.05	0.080	13733	13M7G7W
	16QAM			24.94	18.29	0.068	13721	13M7D7W
10+5	QPSK	829.0	846.5	25.70	19.05	0.080	13700	13M7G7W
	16QAM			24.83	18.18	0.066	13741	13M7D7W
10+10	QPSK	829.0	844.0	25.70	19.05	0.080	18679	18M7G7W
	16QAM			24.38	17.73	0.059	18690	18M7D7W

**OUTPUT POWER FOR LTE BAND 7**

Part 27 (Ant 3)								
EIRP Limit (W)		2.00						
Antenna Gain (dBi)		1.90						
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	25.20	27.10	0.513	27718	27M7G7W
	16QAM			24.26	26.16	0.413	27647	27M6D7W
20+10	QPSK	2510.0	2564.5	25.20	27.10	0.513	27682	27M7G7W
	16QAM			24.32	26.22	0.419	27672	27M7D7W
15+15	QPSK	2507.5	2562.5	25.20	27.10	0.513	28084	28M1G7W
	16QAM			23.93	25.83	0.383	28128	28M1D7W
15+20	QPSK	2507.8	2560.0	25.20	27.10	0.513	32479	32M5G7W
	16QAM			24.58	26.48	0.444	32546	32M5D7W
20+15	QPSK	2510.0	2562.2	25.20	27.10	0.513	32581	32M6G7W
	16QAM			24.45	26.35	0.431	32594	32M6D7W
20+20	QPSK	2510.0	2560.0	25.20	27.10	0.513	37434	37M4G7W
	16QAM			24.07	25.97	0.395	37488	37M5D7W

**OUTPUT POWER FOR LTE BAND 41**

Part 27 (Ant 3)								
EIRP Limit (W)		2.00						
Antenna Gain (dBi)		1.90						
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	26.50	28.40	0.692	22831	22M8G7W
	16QAM			25.51	27.41	0.551	22840	22M8D7W
20+5	QPSK	2506.0	2686.7	26.50	28.40	0.692	22834	22M8G7W
	16QAM			25.32	27.22	0.527	22723	22M7D7W
10+20	QPSK	2501.5	2680.0	26.50	28.40	0.692	27657	27M7G7W
	16QAM			24.71	26.61	0.458	27659	27M7D7W
20+10	QPSK	2506.0	2684.5	26.50	28.40	0.692	27729	27M7G7W
	16QAM			25.35	27.25	0.531	27699	27M7D7W
15+15	QPSK	2503.5	2682.5	26.50	28.40	0.692	28270	28M3G7W
	16QAM			24.85	26.75	0.473	28218	28M2D7W
15+20	QPSK	2503.8	2680.0	26.50	28.40	0.692	32545	32M5G7W
	16QAM			24.93	26.83	0.482	32507	32M5D7W
20+15	QPSK	2506.0	2682.2	26.50	28.40	0.692	32472	32M5G7W
	16QAM			25.21	27.11	0.514	32574	32M6D7W
20+20	QPSK	2506.0	2680.0	26.50	28.40	0.692	37399	37M4G7W
	16QAM			25.13	27.03	0.505	37439	37M4D7W

**OUTPUT POWER FOR LTE BAND 48**

Part 96 (Ant 7)								
EIRP Limit (W)/ 10MHz		0.20						
Antenna Gain (dBi)		-1.00						
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	23.30	22.30	0.170	22703	22M7G7W
	16QAM			23.28	22.28	0.169	22671	22M7D7W
20+5	QPSK	3560.0	3696.7	23.46	22.46	0.176	22924	22M9G7W
	16QAM			23.49	22.49	0.177	22800	22M8D7W
10+20	QPSK	3555.5	3690.0	23.44	22.44	0.175	27622	27M6G7W
	16QAM			23.33	22.33	0.171	27624	27M6D7W
20+10	QPSK	3560.0	3694.5	23.40	22.40	0.174	27634	27M6G7W
	16QAM			23.41	22.41	0.174	27709	27M7D7W
15+20	QPSK	3557.8	3690.0	23.47	22.47	0.177	32484	32M5G7W
	16QAM			23.34	22.34	0.171	32503	32M5D7W
20+15	QPSK	3560.0	3692.2	23.45	22.45	0.176	32460	32M5G7W
	16QAM			23.34	22.34	0.171	32514	32M5D7W
20+20	QPSK	3560.0	3690.0	23.33	22.33	0.171	37322	37M3G7W
	16QAM			23.46	22.46	0.176	37341	37M3D7W

**OUTPUT POWER FOR LTE BAND 66B**

Part 27 (Ant 3)								
EIRP Limit (W)		1.00						
Antenna Gain (dBi)		-1.90						
Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)	99% BW (kHz)	Emission Designator
5+5	QPSK	1712.5	1777.5	25.20	23.30	0.214	9221	9M22G7W
	16QAM			24.12	22.22	0.167	9229	9M23D7W
5+10	QPSK	1712.8	1775.0	25.20	23.30	0.214	13867	13M9G7W
	16QAM			24.38	22.48	0.177	13871	13M9D7W
10+5	QPSK	1715.0	1777.2	25.20	23.30	0.214	13848	13M8G7W
	16QAM			24.20	22.30	0.170	13872	13M9D7W
5+15	QPSK	1713.0	1772.5	25.20	23.30	0.214	18181	18M2G7W
	16QAM			24.14	22.24	0.167	18176	18M2D7W
15+5	QPSK	1717.5	1777.0	25.20	23.30	0.214	18178	18M2G7W
	16QAM			24.08	22.18	0.165	18146	18M1D7W
10+10	QPSK	1715.0	1775.0	25.20	23.30	0.214	18712	18M7G7W
	16QAM			24.35	22.45	0.176	18769	18M8D7W

**OUTPUT POWER FOR LTE BAND 66C**

Part 27 (Ant 3)								
EIRP Limit (W)		1.00						
Antenna Gain (dBi)		-1.90						
Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)	99% BW (kHz)	Emission Designator
10+15	QPSK	1715.3	1772.5	25.20	23.30	0.214	22829	22M8G7W
	16QAM			24.11	22.21	0.166	22774	22M8D7W
15+10	QPSK	1717.5	1774.7	25.20	23.30	0.214	22895	22M9G7W
	16QAM			24.16	22.26	0.168	22931	22M9D7W
10+20	QPSK	1715.5	1770.0	25.20	23.30	0.214	27439	27M4G7W
	16QAM			24.16	22.26	0.168	27409	27M4D7W
20+10	QPSK	1720.0	1774.5	25.20	23.30	0.214	27563	27M6G7W
	16QAM			24.11	22.21	0.166	27604	27M6D7W
15+15	QPSK	1717.5	1772.5	25.20	23.30	0.214	28001	28M0G7W
	16QAM			24.26	22.36	0.172	28038	28M0D7W
15+20	QPSK	1717.8	1770.0	25.20	23.30	0.214	32301	32M3G7W
	16QAM			24.19	22.29	0.169	32319	32M3D7W
20+15	QPSK	1720.0	1772.2	25.20	23.30	0.214	32338	32M3G7W
	16QAM			24.27	22.37	0.173	32395	32M4D7W
20+5	QPSK	1720.0	1776.7	25.20	23.30	0.214	22740	22M7G7W
	16QAM			24.35	22.45	0.176	22722	22M7D7W
5+20	QPSK	1713.3	1770.0	25.20	23.30	0.214	22530	22M5G7W
	16QAM			24.32	22.42	0.175	22495	22M5D7W
20+20	QPSK	1720.0	1770.0	25.20	23.30	0.214	37480	37M5G7W
	16QAM			24.27	22.37	0.173	37185	37M2D7W

### 6.3. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was version: 0.21.02-1.

### 6.4. MAXIMUM ANTENNA GAIN

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

LTE Bands	ANT 1 Antenna Gain (dBi)	ANT 2 Antenna Gain (dBi)	ANT 3 Antenna Gain (dBi)	ANT 4 Antenna Gain (dBi)	ANT 7 Antenna Gain (dBi)	ANT 8 Antenna Gain (dBi)	ANT 9 Antenna Gain (dBi)
LTE Band 5, 824 – 849 MHz	-4.5	-5.7					
LTE Band 7, 2500 – 2570 MHz	-1.6	0.4	1.9	-3.8			
LTE Band 41, 2496 – 2690 MHz	-1.6	0.4	1.9	-3.8			
LTE Band 48, 3550 – 3700 MHz				-3.3	-1.0	-8.6	-4.4
LTE Band 66B, 66C, 1710 – 1780 MHz	-3.7	-4.0	-1.9	-3.4			

## 6.5. WORST-CASE CONFIGURATION AND MODE

The EUT supports LTE dual carrier Bands of: Band 5, Band 7, Band 41, Band 48 and Band 66.

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, 38, 41, and 66	Ant 1
LTE BAND 48	Ant 9

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	Y	X	N/A	N/A	N/A	N/A	N/A
1710 – 1915 MHz	X	Y	X	X	N/A	N/A	N/A
2300 – 2700 MHz	X	Y	X	X	N/A	N/A	N/A
3300 – 3980 MHz	N/A	N/A	N/A	Y	X	Z	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.

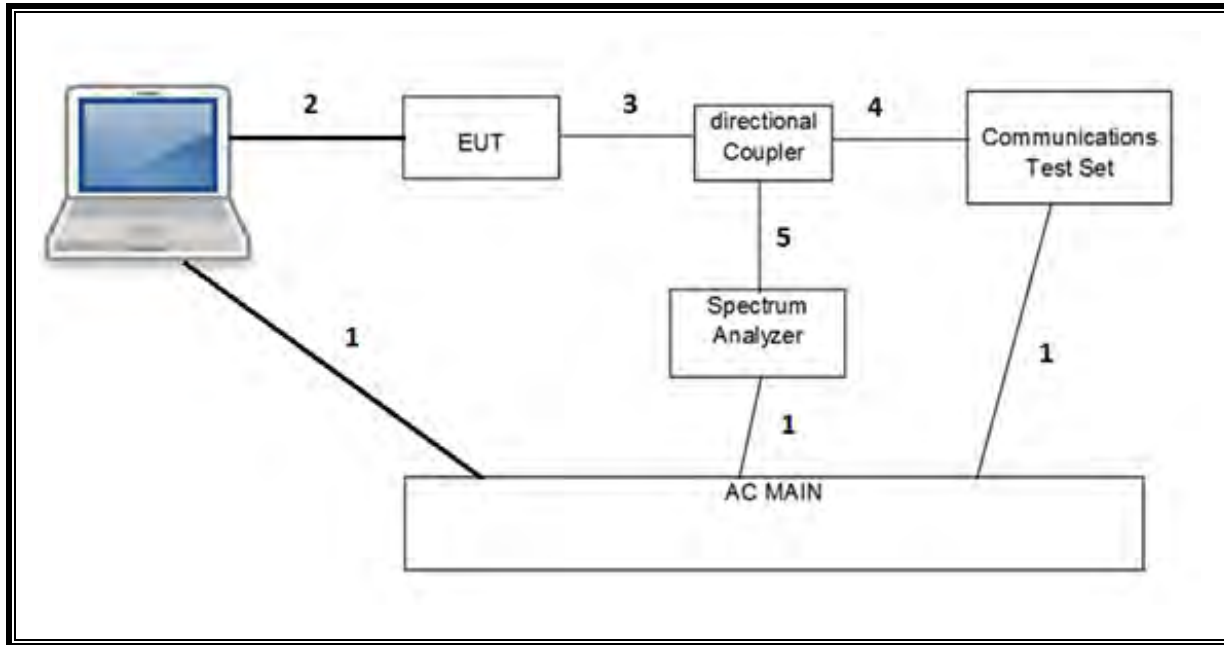
For interband transmission of multiple channels in Ant 1 and Ant 2 in Cellular bands, tests were conducted for various configurations having the highest power, least separation in frequencies and widest operation bandwidths. No noticeable new emission was found.

## 6.6. DESCRIPTION OF TEST SETUP

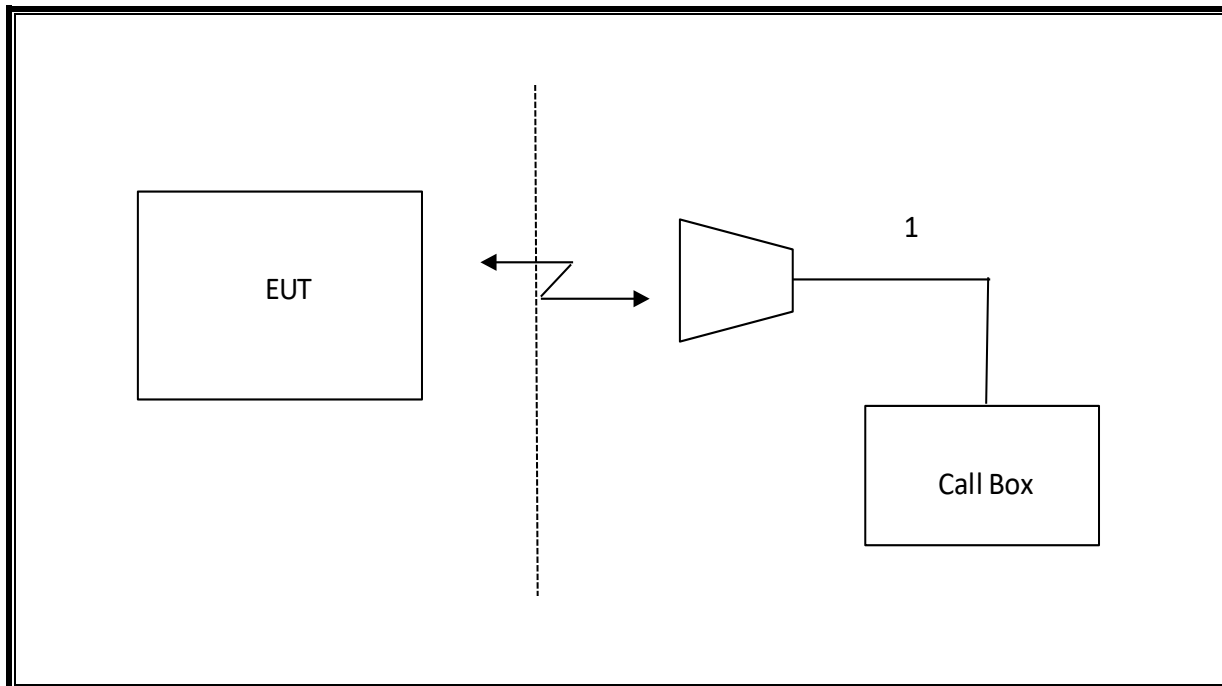
SUPPORT TEST EQUIPMENT						
Description		Manufacturer	Model	Serial Number	FCC ID/ DoC	
Laptop		Apple	MacBook Pro	C02VD7SAH22	BCGA1708	
AC/DC adapter		Apple	A1718	C4H714302LCGN8RA5		
I/O CABLES (RF CONDUCTED TEST)						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
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	T345	05/26/2022
Antenna, Horn 1-18GHz	ETS Lindgren	3117	T136	07/07/2022
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences	JB3	T900	02/24/2022
Amplifier, 1 to 18GHz	Miteq	AFS42-00101800-25-S-42	T1165	06/12/2022
Spectrum Analyzer, PXA 3Hz to 44GHz	Keysight	N9030A	T907	07/22/2022
Amplifier, 10KHz to 1GHz, 32dB	Sonoma	310N	T285	07/22/2021
Spectrum Analyzer, PSA, 3Hz to 44GHz	Keysight	N9030A	T123	01/19/2022
Spectrum Analyzer, PSA, 3Hz to 44GHz	Keysight	N9030A	T908	01/28/2022
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight	N9030A	T200	01/19/2022
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight	N9030A	T905	01/21/2022
Spectrum Analyzer, PXA 3Hz to 44GHz	Keysight	N9030A	T340	01/28/2022
Spectrum Analyzer, PXA 3Hz to 44GHz	Keysight	N9030A	T199	01/20/2022
Spectrum Analyzer, PXA 3Hz to 50GHz	Keysight	N9030B	207995	05/27/2022
Spectrum Analyzer, PXA, 3Hz to 50GHz w/Ext. Mixer	Keysight	N9030A	T342	01/25/2022
Spectrum Analyzer, PSA 3Hz to 44GHz	Keysight	E4446A	T123	01/22/2022
Wideband Communication Test Set, Call Box	R&S GmbH & Co. KG	CMW500	AE0038201512	connection purpose only
Directional Coupler	KRYTAR	152610	T1161	09/16/2021
Directional Coupler	KRYTAR	152610	T1536	09/16/2021
Directional Coupler	KRYTAR	152610	T1537	09/16/2021
Power Meter, P-series single channel	Keysight	N1912A	T1245	01/21/2022
Power Meter, P-series single channel	Keysight	N1912A	T1269	01/25/2022
Power Meter, P-series single channel	Keysight	N1912A	T1272	01/21/2022
Power Sensor, P - series, 50MHz to 18GHz, Wideband	Keysight	N1921A	T1224	01/28/2022
Filter, HPF 3.0GHz	Micro-Tronics	HPM17543	T487	04/27/2022
Filter, HPF 1.2GHz	Micro-Tronics	WHKX1.2/15G-6ST	T1737	6/23/2021
Filter, BRF 1850 – 1910 MHz	Micro-Tronics	BRM50714-02	T1796	06/10/2022
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight	N9030A	T1210	01/22/2022
Wideband Communication Test Set, Call Box	R&S GmbH & Co. KG	CMW500	T1526	02/26/2022
Wideband Communication Test Set, Call Box	R&S GmbH & Co. KG	CMW500	T260	02/20/2022
Wideband Communication Test Set, Call Box	R&S GmbH & Co. KG	CMW500	T958	02/22/2022
Wideband Communication Test Set, Call Box	R&S GmbH & Co. KG	CMW500	T964	02/17/2022
Wideband Communication Test Set, Call Box	R&S GmbH & Co. KG	CMW500	T979	02/22/2022
Chamber, Environmental	Cincinnati Sub Zero	ZPHS-8-3.5-SCT/WC	T754	06/21/2021
Chamber, Environmental	Cincinnati Sub Zero	ZPHS-8-3.5-SCT/WC	T1154	06/21/2021
Amplifier, 26.5GHz to 40GHz	Miteq	NSP 4000 SP2	T88	04/22/2022
Amplifier, 1 to 26.5GHz, 23.5dB Gain minimum	Keysight	8449B	T404	04/19/2022
Antenna, Horn 18 to 26.5GHz	ARA	MWH-1826/B	T447	04/22/2022
Antenna, Horn 26.5GHz to 40GHz	ARA	MWH-2640	T1864	04/19/2022
Spectrum Analyzer	Keysight	8564E	T106	01/27/2022
Antenna, Active Loop 9KHz to 30MHz	EMCO	6502	T1616	12/02/2021
UL AUTOMATION SOFTWARE				
CLT Software	UL	UL RF	Ver 3.4, June 08 2021	
Power Measurement Software	UL	UL RF	Ver 3.1.4, May 20, 2021	

Radiated test software	UL	UL RF	Ver 9.5 July 7, 2020
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**NOTES:**

1. \* Testing is completed before equipment expiration date.

## 8. RF OUTPUT POWER VERIFICATION

### RULE PART(S)

FCC: §2.1046, §22.913, §27.50

### RESULT

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

### 8.1. LTE BAND 5

Test Engineer ID:	10646	Test Date:	3/19/2021
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#### 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	25.51	<b>25.67</b>	<b>24.90</b>	23.96	24.28	24.41	<b>24.33</b>	<b>23.30</b>
			15	0	25	0	25.69	<b>25.67</b>	24.68	<b>24.12</b>	<b>24.42</b>	24.42	24.17	23.24
	834.0	837.9	1	14	1	0	25.53	25.21	23.77	23.23	24.24	24.14	22.80	21.92
			15	0	25	0	25.69	25.24	23.86	23.31	24.39	24.02	23.10	22.25
	842.5	846.5	1	14	1	0	25.57	25.65	23.88	23.39	24.23	<b>24.70</b>	23.62	22.76
			15	0	25	0	<b>25.70</b>	25.61	24.22	23.64	24.35	24.40	23.70	22.78

#### 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	25.35	<b>25.70</b>	<b>24.90</b>	23.89	24.15	24.51	<b>24.25</b>	23.09
			25	0	15	0	<b>25.45</b>	25.42	24.73	<b>23.94</b>	<b>24.22</b>	24.21	23.93	<b>23.13</b>
	835.0	838.9	1	24	1	0	25.27	25.30	24.10	23.13	23.99	24.07	22.85	21.90
			25	0	15	0	25.41	24.97	23.98	22.97	24.17	23.72	22.71	21.73
	843.6	847.5	1	24	1	0	25.41	25.65	24.48	23.57	24.08	<b>24.70</b>	23.66	22.76
			25	0	15	0	25.41	25.20	24.16	23.22	24.13	24.21	23.37	22.39

#### 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	<b>25.70</b>	24.59	<b>24.11</b>	20.43	24.66	<b>24.14</b>	<b>23.47</b>	<b>20.20</b>
			25	0	50	0	23.71	22.68	22.84	20.79	22.98	21.94	22.09	19.91
	831.6	838.8	1	24	1	0	25.56	24.55	23.85	<b>20.88</b>	<b>24.70</b>	23.76	22.80	19.77
			25	0	50	0	23.63	22.70	22.72	20.70	22.91	22.03	21.98	20.06
	836.8	844.0	1	24	1	0	25.62	<b>24.94</b>	23.63	20.21	24.70	23.54	23.15	19.46
			25	0	50	0	23.69	22.66	22.67	20.71	22.99	21.94	21.94	19.76

#### 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	25.69	24.78	<b>23.95</b>	20.65	24.54	23.45	<b>22.89</b>	19.73
			50	0	25	0	23.83	22.92	22.82	<b>21.03</b>	22.83	21.86	21.77	19.72
	834.3	841.5	1	49	1	0	<b>25.70</b>	<b>24.83</b>	23.44	20.30	24.58	23.85	22.69	19.47
			50	0	25	0	23.88	22.86	22.87	20.89	22.77	21.69	21.84	19.78
	839.3	846.5	1	49	1	0	25.68	24.73	23.79	20.89	<b>24.70</b>	<b>23.98</b>	22.61	<b>19.90</b>
			50	0	25	0	23.80	22.89	22.92	20.86	22.77	21.73	21.77	19.82

**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	<b>25.70</b>	24.22	<b>23.78</b>	20.32	24.29	<b>23.74</b>	<b>22.57</b>	19.75
			1	0	1	49	15.22	15.28	15.33	15.03	14.22	14.31	13.79	14.69
			50	0	50	0	23.73	22.78	22.82	20.78	22.65	21.53	21.54	19.62
	831.5	841.4	1	49	1	0	25.61	<b>24.38</b>	23.73	20.54	<b>24.70</b>	23.69	22.50	19.23
			1	0	1	49	15.32	15.20	15.67	15.07	13.87	13.78	13.32	13.81
			50	0	50	0	23.78	22.72	22.69	20.81	22.67	21.62	21.54	19.67
	834.1	844.0	1	49	1	0	25.64	24.38	23.44	<b>20.88</b>	24.55	23.37	22.52	<b>19.87</b>
			1	0	1	49	15.51	15.10	15.30	14.84	14.16	13.88	14.36	13.95
			50	0	50	0	23.82	22.83	22.68	20.86	22.56	21.58	21.60	19.62







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

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)															
							ANT 1				ANT 2				ANT 3				ANT 4			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
20MHz / 15MHz	2506.0	2523.1	1	99	1	0	27.50	26.12	25.68	22.53	25.00	23.61	23.12	20.04	26.50	25.21	23.37	21.66	24.28	22.95	22.40	19.31
			100	0	75	0	22.63	22.64	22.70	22.75	20.20	20.22	20.20	20.30	21.79	21.81	21.85	21.88	19.42	19.39	19.47	19.48
	2585.6	2602.7	1	99	1	0	27.21	25.85	25.43	22.58	24.88	23.58	23.07	20.33	26.29	24.80	24.33	21.48	25.00	23.62	23.03	20.22
			100	0	75	0	25.42	24.47	24.47	22.45	23.12	22.14	22.12	20.24	24.41	23.47	23.45	21.46	23.04	22.09	22.12	20.14
	2665.1	2682.2	1	99	1	0	26.78	25.33	25.41	22.16	24.74	23.18	23.21	19.99	25.94	24.54	24.14	21.34	24.68	23.24	22.55	20.03
			100	0	75	0	25.11	24.17	24.16	22.15	22.92	21.94	21.97	20.00	24.28	23.29	23.30	21.26	22.95	21.95	22.00	19.98

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

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)															
							ANT 1				ANT 2				ANT 3				ANT 4			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
20MHz / 20MHz	2506.0	2525.8	1	99	1	0	27.50	25.98	25.59	22.52	25.00	23.51	22.82	19.93	26.50	25.13	23.43	21.68	24.28	22.90	22.43	19.25
			1	0	1	99	14.54	14.54	14.69	14.53	12.03	12.00	12.20	12.02	13.57	13.50	13.72	13.56	11.25	11.28	11.41	11.22
			100	0	100	0	22.59	22.60	22.60	22.71	20.22	20.27	20.23	20.25	21.77	21.78	21.78	21.84	19.43	19.43	19.44	19.45
			1	99	1	0	27.17	25.78	25.35	22.44	24.83	23.53	23.00	20.24	26.02	24.76	24.28	21.45	25.00	23.42	23.00	20.23
			1	0	1	99	18.97	19.08	18.91	18.19	16.73	16.85	16.75	15.93	17.53	17.63	17.62	16.24	15.80	16.00	15.95	14.60
			100	0	100	0	25.43	24.43	24.42	22.41	23.12	22.13	22.12	20.19	24.44	23.45	23.46	21.47	23.13	22.14	22.16	20.19
	2660.2	2680.0	1	99	1	0	26.83	25.21	25.30	21.98	24.61	23.08	23.07	19.90	25.90	24.47	23.56	21.19	24.61	23.17	22.51	19.93
			1	0	1	99	18.15	18.14	18.67	16.85	15.99	15.97	16.48	14.72	15.68	15.78	16.31	14.51	13.88	13.93	14.43	12.70
			100	0	100	0	25.09	24.14	24.12	22.12	22.89	21.94	21.95	19.94	24.27	23.26	23.25	21.28	22.94	21.96	21.94	19.98



**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	21.14	21.22	21.25	20.57	18.42	18.55	18.58	17.85	20.58	20.70	20.76	20.03	18.05	18.12	18.19	17.51
			1	0	1	99	7.68	7.69	7.87	7.57	5.17	5.16	5.07	5.32	7.14	7.15	7.30	7.07	4.70	4.65	4.79	4.54
			100	0	100	0	14.75	14.85	14.87	14.88	11.96	11.97	12.01	12.06	14.24	14.29	14.29	14.35	11.74	11.72	11.75	11.71
			1	99	1	0	23.33	23.46	23.45	20.90	21.98	22.00	20.93	18.18	24.19	24.20	23.15	20.34	21.48	21.50	20.55	17.87
			1	0	1	99	12.18	14.40	14.31	14.53	7.55	7.54	8.02	10.17	13.60	13.72	13.78	13.98	10.57	10.69	10.61	11.04
			100	0	100	0	21.31	21.29	21.34	20.82	18.53	18.59	18.61	18.13	20.72	20.78	20.81	20.27	18.14	18.20	18.20	17.76
	3615.1	3634.9	1	99	1	0	21.09	21.01	21.62	20.88	18.34	18.31	18.83	18.17	20.54	20.57	21.15	20.38	18.13	18.05	18.61	17.95
			1	0	1	99	7.74	7.72	8.16	7.90	5.02	5.06	5.16	4.99	7.16	7.14	7.59	7.36	4.61	4.59	4.99	4.85
			100	0	100	0	14.76	14.78	14.78	14.79	11.98	11.96	11.95	12.05	14.23	14.29	14.30	14.29	11.65	11.68	11.68	11.74
			1	99	1	0	21.09	21.01	21.62	20.88	18.34	18.31	18.83	18.17	20.54	20.57	21.15	20.38	18.13	18.05	18.61	17.95
			1	0	1	99	7.74	7.72	8.16	7.90	5.02	5.06	5.16	4.99	7.16	7.14	7.59	7.36	4.61	4.59	4.99	4.85
			100	0	100	0	14.76	14.78	14.78	14.79	11.98	11.96	11.95	12.05	14.23	14.29	14.30	14.29	11.65	11.68	11.68	11.74





**OUTPUT POWER FOR LTE BAND 66C (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	1720.0	1737.1	1	99	1	0	25.70	24.61	23.85	20.71	23.46	22.60	21.62	18.59	25.10	24.06	23.10	20.28	23.51	22.87	21.76	18.50
			100	0	75	0	23.73	22.80	22.74	20.81	21.73	20.74	20.75	18.74	23.38	22.33	22.33	20.38	21.77	20.83	20.83	18.86
	1747.6	1764.7	1	99	1	0	25.52	24.58	23.18	20.56	23.64	22.66	21.56	18.50	25.20	24.16	23.15	20.15	23.70	22.67	21.58	18.89
			100	0	75	0	23.71	22.72	22.74	20.75	21.68	20.72	20.75	18.73	23.30	22.34	22.36	20.37	21.80	20.80	20.80	18.82
	1755.1	1772.2	1	99	1	0	25.51	24.49	22.05	20.79	23.51	22.55	21.72	18.50	25.06	24.27	23.35	20.35	23.60	22.58	21.83	18.65
			100	0	75	0	23.75	22.75	22.76	20.80	21.73	20.71	20.75	18.75	23.35	22.36	22.34	20.35	21.83	20.81	20.83	18.85

**OUTPUT POWER FOR LTE BAND 66C (20.0MHz + 5.0MHz)**

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)															
							ANT 1				ANT 2				ANT 3				ANT 4			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
20MHz / 5MHz	1720.0	1731.7	1	99	1	0	25.61	24.93	23.50	20.69	23.70	22.52	21.81	18.59	25.08	24.26	23.51	20.25	23.70	22.80	21.68	18.63
			100	0	25	0	23.75	22.73	22.77	20.77	21.68	20.67	20.68	18.73	23.30	22.30	22.33	20.34	21.65	20.67	20.67	18.75
	1752.5	1764.2	1	99	1	0	25.63	24.68	23.40	20.93	23.50	22.67	21.48	18.91	25.20	24.21	23.03	20.44	23.58	22.48	21.73	18.65
			100	0	25	0	23.72	22.70	22.76	20.73	21.65	20.64	20.70	18.68	23.25	22.28	22.25	20.28	21.65	20.65	20.67	18.77
	1765.0	1776.7	1	99	1	0	25.62	24.83	23.38	20.81	23.50	22.61	21.69	18.81	25.05	24.35	23.42	20.42	23.43	22.45	21.64	18.72
			100	0	25	0	23.75	22.75	22.38	20.79	21.72	20.71	20.72	18.76	23.30	22.32	22.38	20.35	21.70	20.71	20.73	18.75

**OUTPUT POWER FOR LTE BAND 66C (5.0MHz + 20.0MHz)**

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)															
							ANT 1				ANT 2				ANT 3				ANT 4			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
5MHz / 20MHz	1713.3	1725.0	1	24	1	0	25.70	24.70	22.96	20.81	23.58	22.64	21.59	18.70	25.08	24.21	23.33	20.30	23.60	22.48	21.27	18.74
			25	0	100	0	23.84	22.75	22.69	20.79	21.73	20.66	20.69	18.70	23.29	22.23	22.24	20.26	21.69	20.64	20.70	18.67
	1745.8	1757.5	1	24	1	0	25.60	24.71	23.81	20.50	23.59	22.84	21.83	18.84	25.08	24.30	23.23	20.03	23.70	22.74	21.63	18.52
			25	0	100	0	23.77	22.76	22.78	20.77	21.64	20.67	20.67	18.67	23.18	22.26	22.21	20.24	21.72	20.66	20.71	18.72
	1758.3	1770.0	1	24	1	0	25.58	24.80	23.30	20.70	23.57	22.70	21.63	18.64	25.20	24.32	23.12	20.28	23.59	22.70	21.78	18.75
			25	0	100	0	23.73	22.72	22.72	20.76	21.66	20.68	20.64	18.71	23.21	22.24	22.25	20.26	21.66	20.67	20.64	18.74

**OUTPUT POWER FOR LTE BAND 66C (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	1720.0	1739.8	1	99	1	0	25.56	24.88	23.68	20.69	23.40	22.57	21.71	18.61	25.20	24.27	23.18	20.16	23.68	22.61	21.72	18.60
			1	0	1	99	15.21	15.27	15.37	14.00	13.58	13.50	13.82	12.34	15.00	14.98	15.16	13.76	13.48	13.27	13.35	12.12
	100	0	100	0	23.81	22.79	22.85	20.85	21.75	20.74	20.77	18.79	23.37	22.32	22.35	20.40	21.85	20.83	20.83	18.92		
	1745.1	1764.9	1	99	1	0	25.43	24.84	23.30	20.62	23.54	22.58	21.45	18.68	25.02	24.19	23.09	20.00	23.70	22.74	21.42	18.63
			1	0	1	99	14.81	15.03	15.04	13.73	13.31	13.37	13.60	12.34	15.02	15.26	15.30	14.05	13.28	13.32	13.40	12.17
	1750.2	1770.0	1	99	1	0	23.81	22.78	22.80	20.85	21.76	20.74	20.75	18.79	23.34	22.31	22.36	20.36	21.81	20.83	20.83	18.89
1			0	1	99	15.25	15.25	15.69	13.85	13.56	13.72	13.77	12.39	15.13	15.26	15.42	13.94	13.44	13.45	13.61	12.27	
100	0	100	0	23.79	22.78	22.75	20.78	21.74	20.75	20.76	18.80	23.32	22.42	22.34	20.40	21.85	20.86	20.85	18.90			

## 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	7.363	7.89
	3MHz + 5MHz BAND 16QAM			7.446	7.87
	5MHz + 3MHz BAND QPSK	25/0 + 15/0		7.449	7.89
	5MHz + 3MHz BAND 16QAM			7.425	7.93
	5MHz + 10MHz BAND QPSK	25/0 + 50/0		13.733	14.38
	5MHz + 10MHz BAND 16QAM			13.721	14.35
	10MHz + 5MHz BAND QPSK	50/0 + 25/0		13.700	14.45
	10MHz + 5MHz BAND 16QAM			13.741	14.53
	10MHz + 10MHz BAND QPSK	50/0 + 50/0		18.679	19.75
	10MHz + 10MHz BAND 16QAM			18.690	19.69

**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	27.718	29.26
	10MHz + 20MHz BAND 16QAM			27.647	29.01
	20MHz + 10MHz BAND QPSK	100/0 + 50/0		27.682	29.30
	20MHz + 10MHz BAND 16QAM			27.672	29.04
	15MHz + 15MHz BAND QPSK	75/0 + 75/0		28.084	29.46
	15MHz + 15MHz BAND 16QAM			28.128	29.64
	15MHz + 20MHz BAND QPSK	75/0 + 100/0		32.479	34.17
	15MHz + 20MHz BAND 16QAM			32.546	34.10
	20MHz + 15MHz BAND QPSK	100/0 + 75/0		32.581	34.26
	20MHz + 15MHz BAND 16QAM			32.594	34.18
	20MHz + 20MHz BAND QPSK	100/0 + 100/0		37.434	39.57
	20MHz + 20MHz BAND 16QAM			37.488	39.55



**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	22.831	23.74
	5MHz + 20MHz BAND 16QAM			22.840	23.75
	20MHz + 5MHz BAND QPSK	100/0 + 25/0		22.834	23.73
	20MHz + 5MHz BAND 16QAM			22.723	23.81
	10MHz + 20MHz BAND QPSK	50/0 + 100/0		27.657	28.85
	10MHz + 20MHz BAND 16QAM			27.659	28.83
	20MHz + 10MHz BAND QPSK	100/0 + 50/0		27.729	28.88
	20MHz + 10MHz BAND 16QAM			27.699	28.92
	15MHz + 15MHz BAND QPSK	75/0 + 75/0		28.270	29.70
	15MHz + 15MHz BAND 16QAM			28.218	29.58
	15MHz + 20MHz BAND QPSK	75/0 + 100/0		32.545	33.94
	15MHz + 20MHz BAND 16QAM			32.507	34.31
	20MHz + 15MHz BAND QPSK	100/0 + 75/0		32.472	34.06
	20MHz + 15MHz BAND 16QAM			32.574	34.00
	20MHz + 20MHz BAND QPSK	100/0 + 100/0		37.399	39.28
	20MHz + 20MHz BAND 16QAM			37.439	39.11

**LTE BAND 48**

Band	Mode	RB Allocation/RB Offset	f (MHz)	99% BW (MHz)	- 26dB BW (MHz)
LTE BAND 48 (FCC)	5MHz + 20MHz BAND QPSK	25/0 + 100/0	3625	22.703	23.61
	5MHz + 20MHz BAND 16QAM			22.671	23.53
	20MHz + 5MHz BAND QPSK	100/0 + 25/0		22.924	23.90
	20MHz + 5MHz BAND 16QAM			22.800	23.67
	10MHz + 20MHz BAND QPSK	50/0 + 100/0		27.622	28.64
	10MHz + 20MHz BAND 16QAM			27.624	28.69
	20MHz + 10MHz BAND QPSK	100/0 + 50/0		27.634	28.70
	20MHz + 10MHz BAND 16QAM			27.709	28.63
	15MHz + 20MHz BAND QPSK	75/0 + 100/0		32.484	33.71
	15MHz + 20MHz BAND 16QAM			32.503	33.63
	20MHz + 15MHz BAND QPSK	100/0 + 75/0		32.460	33.78
	20MHz + 15MHz BAND 16QAM			32.514	33.56
	20MHz + 20MHz BAND QPSK	100/0 + 100/0		37.322	38.81
	20MHz + 20MHz BAND 16QAM			37.341	38.85

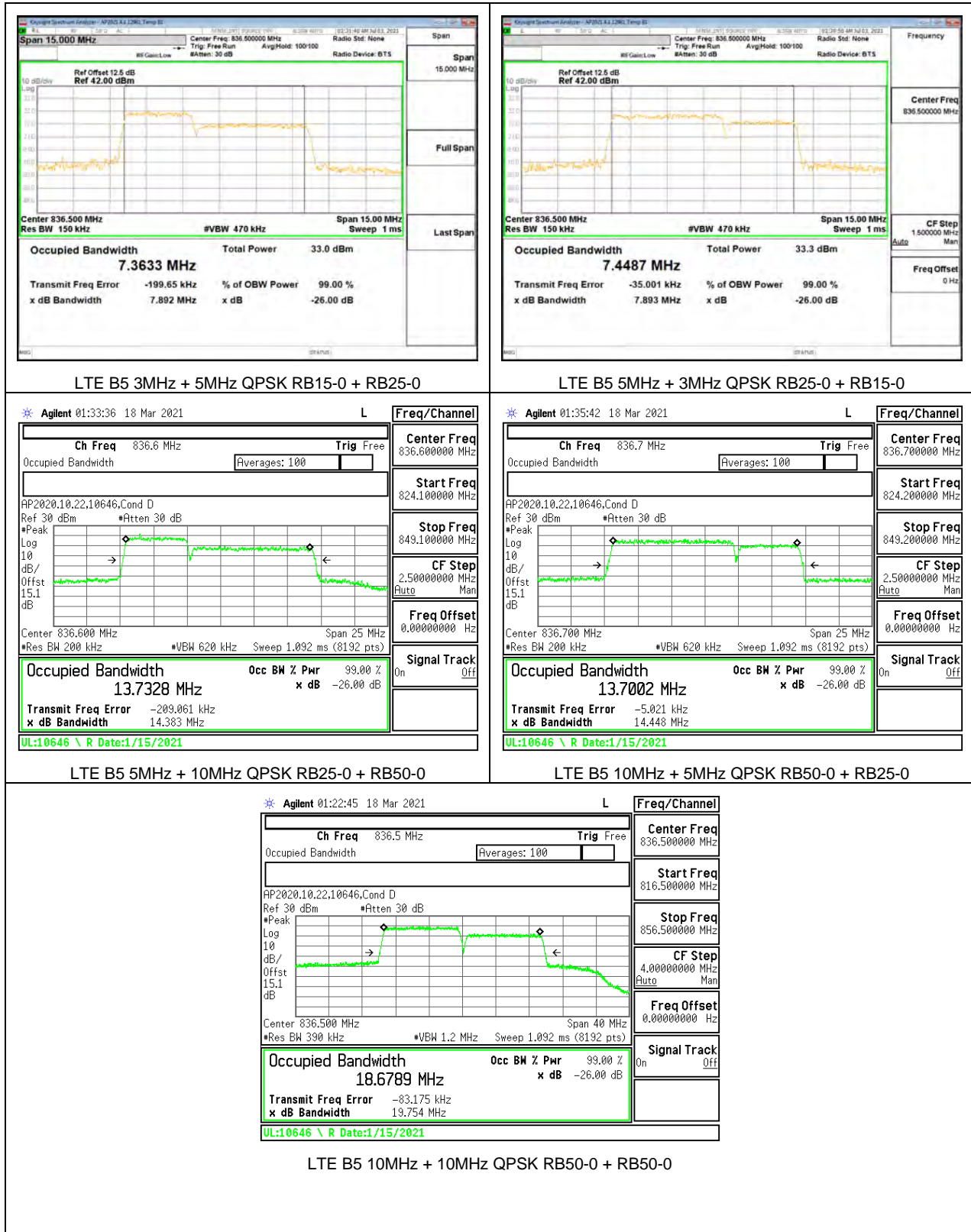
**LTE BAND 66B**

Band	Mode	RB Allocation/RB Offset	f (MHz)	99% BW (MHz)	- 26dB BW (MHz)
LTE BAND 66B	5MHz + 5MHz BAND QPSK	25/0 + 25/0	1745.0	9.221	9.67
	5MHz + 5MHz BAND 16QAM			9.229	9.74
	5MHz + 10MHz BAND QPSK	25/0 + 50/0		13.867	14.45
	5MHz + 10MHz BAND 16QAM			13.871	14.50
	10MHz + 5MHz BAND QPSK	50/0 + 25/0		13.848	14.37
	10MHz + 5MHz BAND 16QAM			13.872	14.51
	5MHz + 15MHz BAND QPSK	25/0 + 75/0		18.181	18.90
	5MHz + 15MHz BAND 16QAM			18.176	18.84
	15MHz + 5MHz BAND QPSK	75/0 + 25/0		18.178	18.82
	15MHz + 5MHz BAND 16QAM			18.146	18.92
	10MHz + 10MHz BAND QPSK	50/0 + 50/0		18.712	19.58
	10MHz + 10MHz BAND 16QAM			18.769	19.59

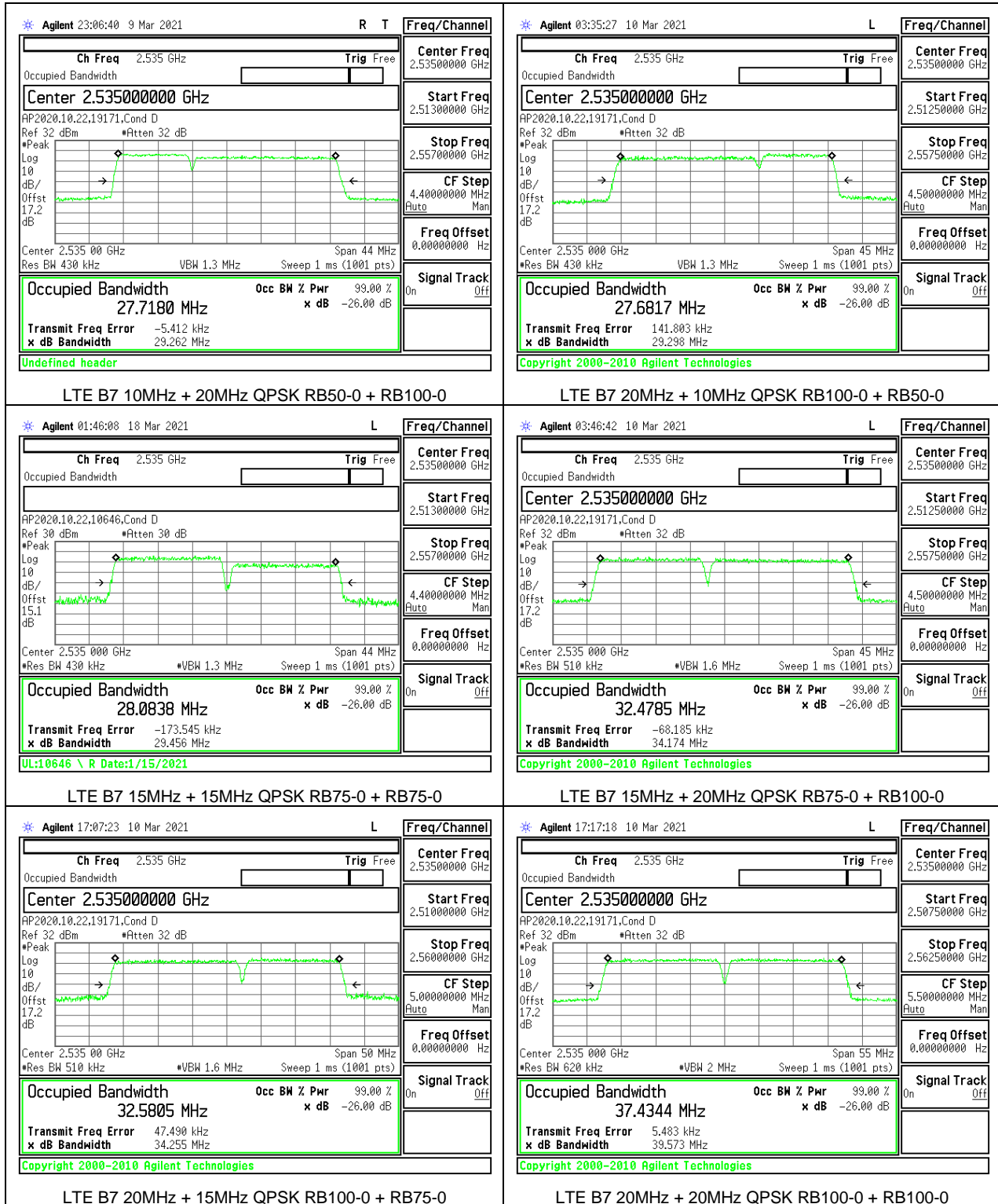
**LTE BAND 66C**

Band	Mode	RB Allocation/RB Offset	f (MHz)	99% BW (MHz)	- 26dB BW (MHz)
LTE Band 66C	10MHz + 15MHz BAND QPSK	50/0 + 75/10	1745.0	22.829	23.91
	10MHz + 15MHz BAND 16QAM			22.774	23.84
	15MHz + 10MHz BAND QPSK	75/0 + 50/0		22.895	23.95
	15MHz + 10MHz BAND 16QAM			22.931	24.05
	10MHz + 20MHz BAND QPSK	50/0 + 100/0		27.439	28.72
	10MHz + 20MHz BAND 16QAM			27.409	28.61
	20MHz + 10MHz BAND QPSK	100/0 + 50/0		27.563	28.78
	20MHz + 10MHz BAND 16QAM			27.604	28.85
	15MHz + 15MHz BAND QPSK	75/0 + 75/0		28.001	29.34
	15MHz + 15MHz BAND 16QAM			28.038	29.35
	15MHz + 20MHz BAND QPSK	75/0 + 100/0		32.301	33.78
	15MHz + 20MHz BAND 16QAM			32.319	33.82
	20MHz + 15MHz BAND QPSK	100/0 + 75/0		32.338	33.84
	20MHz + 15MHz BAND 16QAM			32.395	33.94
	20MHz + 5MHz BAND QPSK	100/0 + 25/0		22.740	23.68
	20MHz + 5MHz BAND 16QAM			22.722	23.74
	5MHz + 20MHz BAND QPSK	25/0 + 100/0		22.530	23.44
	5MHz + 20MHz BAND 16QAM			22.495	23.50
	20MHz + 20MHz BAND QPSK	100/0 + 100/0		37.480	39.10
	20MHz + 20MHz BAND 16QAM			37.185	38.81

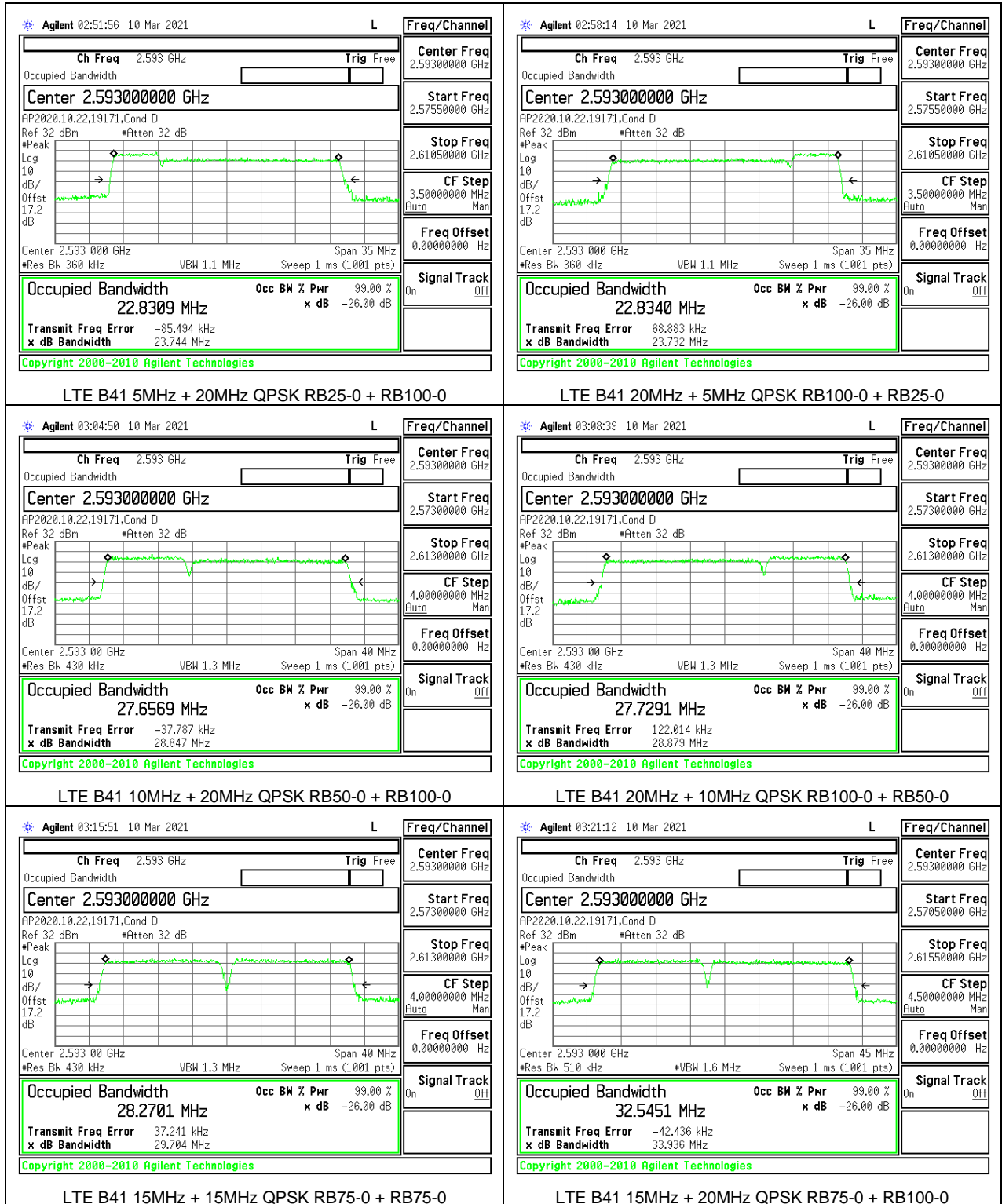
9.1.1. LTE BAND 5

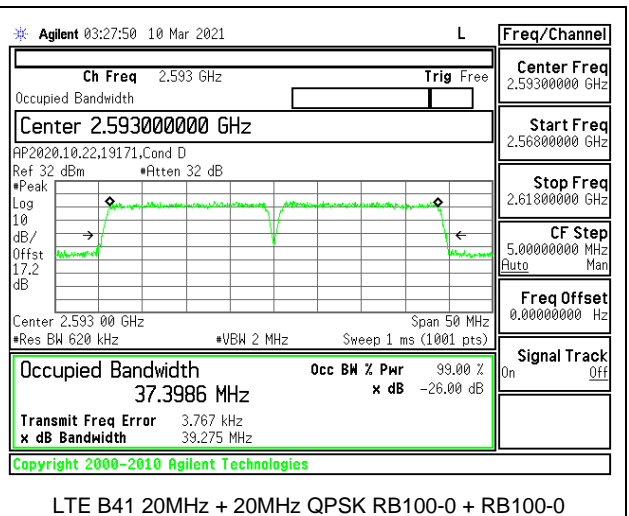
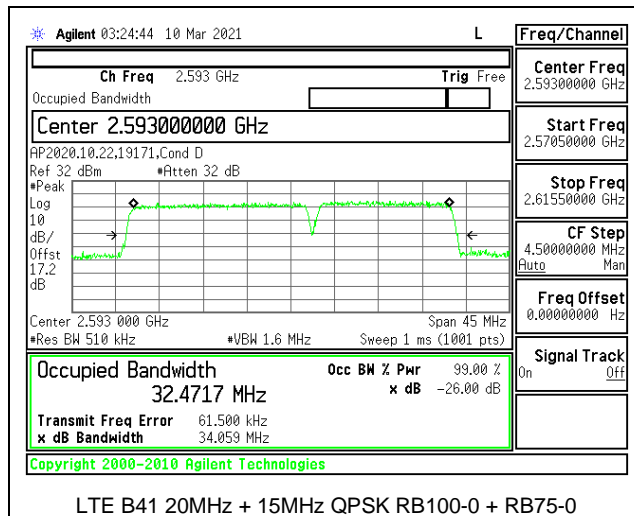


9.1.2. LTE BAND 7

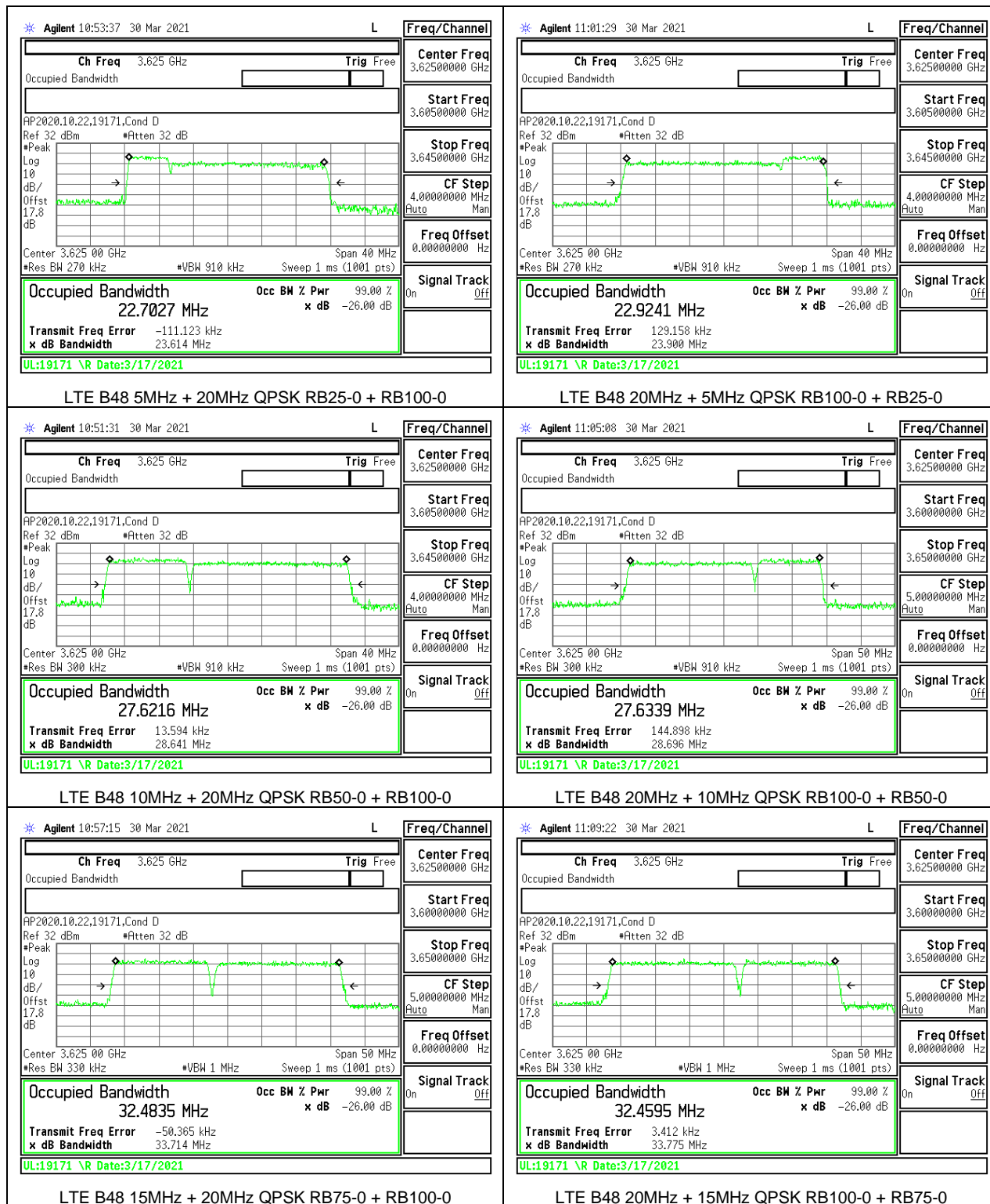


9.1.3. LTE BAND 41

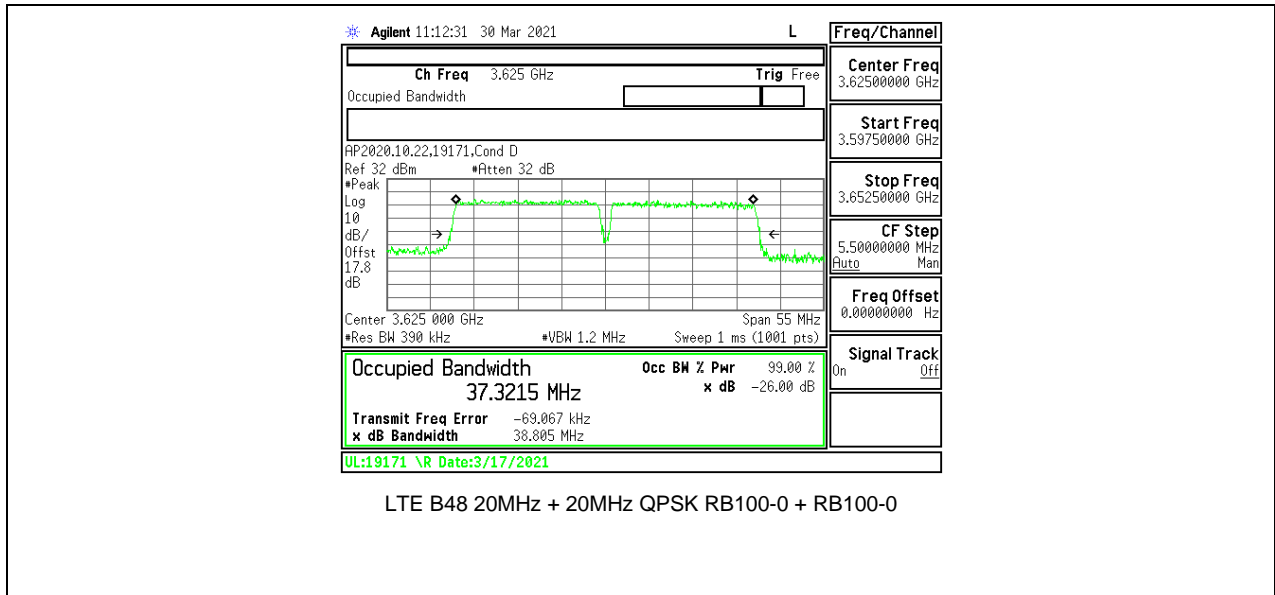




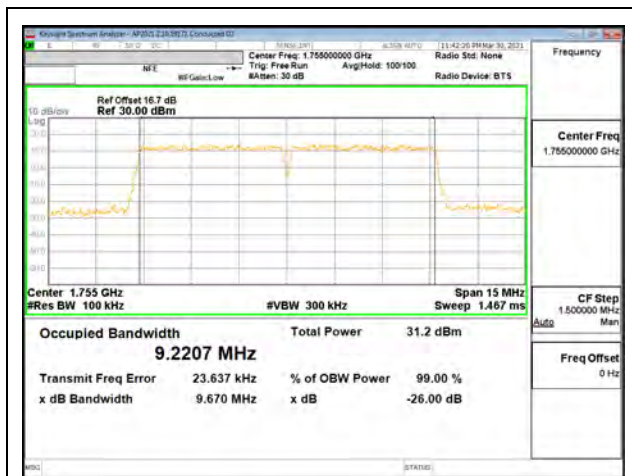
9.1.4. LTE BAND 48







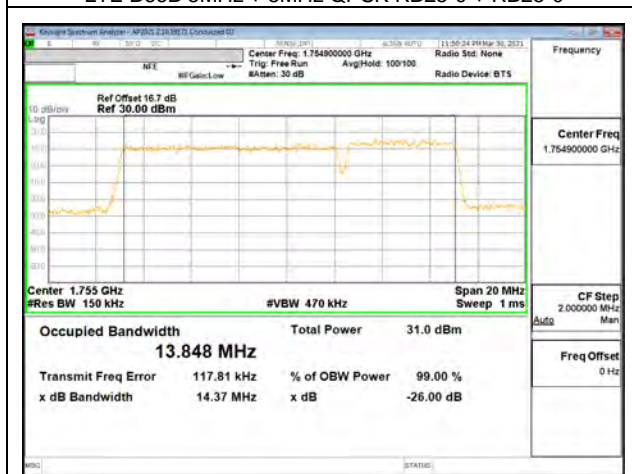
9.1.5. LTE BAND 66B



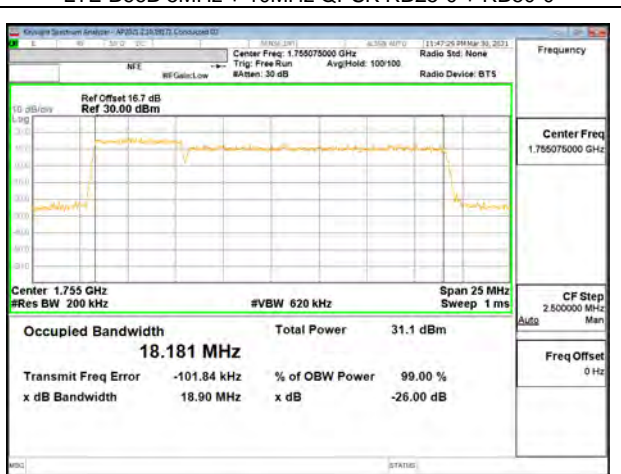
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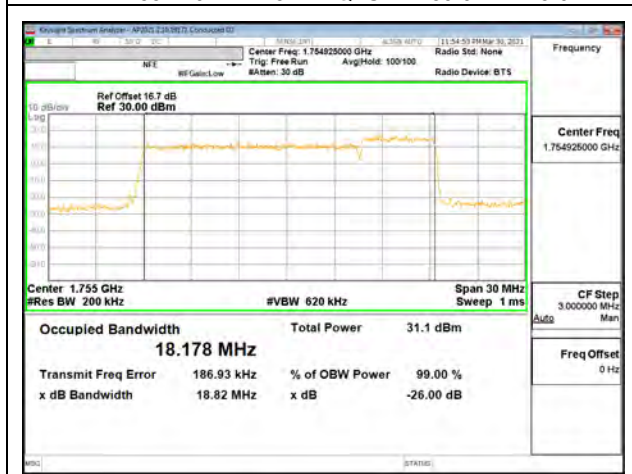
LTE B66B 5MHz + 10MHz QPSK RB25-0 + RB50-0



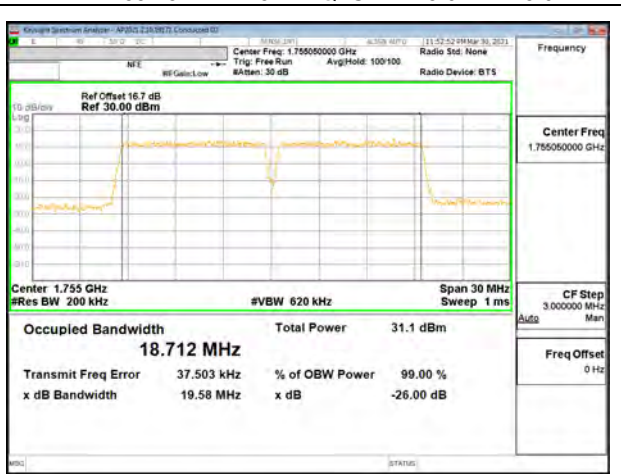
LTE B66B 10MHz + 5MHz QPSK RB50-0 + RB25-0



LTE B66B 5MHz + 15MHz QPSK RB25-0 + RB75-0



LTE B66B 15MHz + 5MHz QPSK RB75-0 + RB25-0

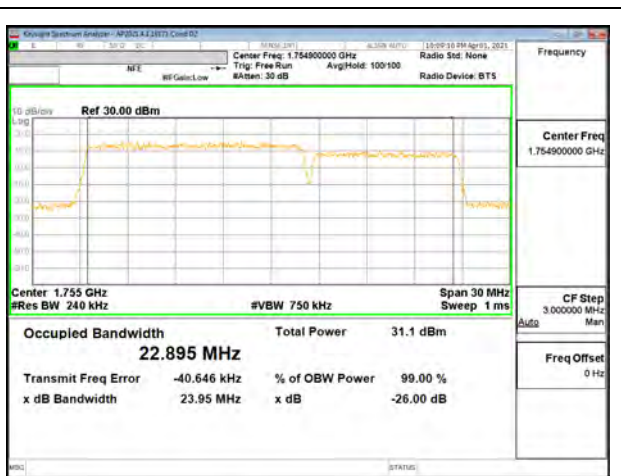


LTE B66B 10MHz + 10MHz QPSK RB50-0 + RB50-0

9.1.6. LTE BAND 66C



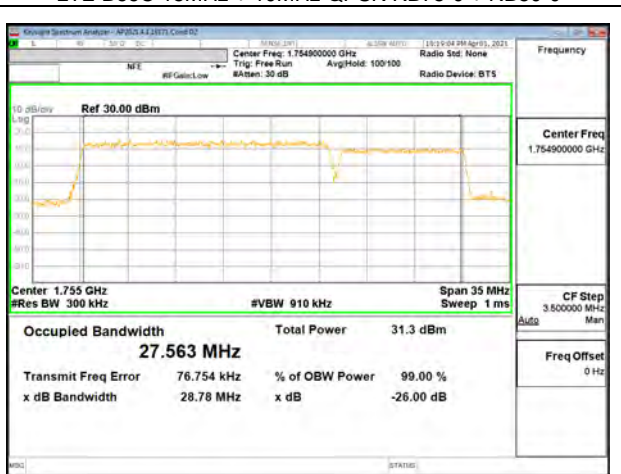
LTE B66C 10MHz + 15MHz QPSK RB50-0 + RB75-0



LTE B66C 15MHz + 10MHz QPSK RB75-0 + RB50-0



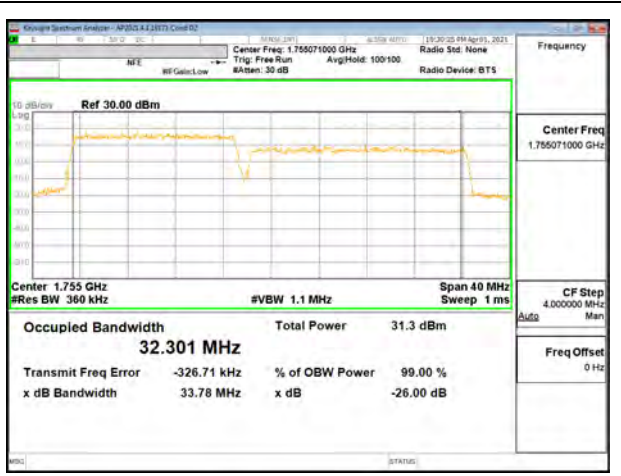
LTE B66C 10MHz + 20MHz QPSK RB50-0 + RB100-0



LTE B66C 20MHz + 10MHz QPSK RB100-0 + RB50-0



LTE B66C 15MHz + 15MHz QPSK RB75-0 + RB75-0

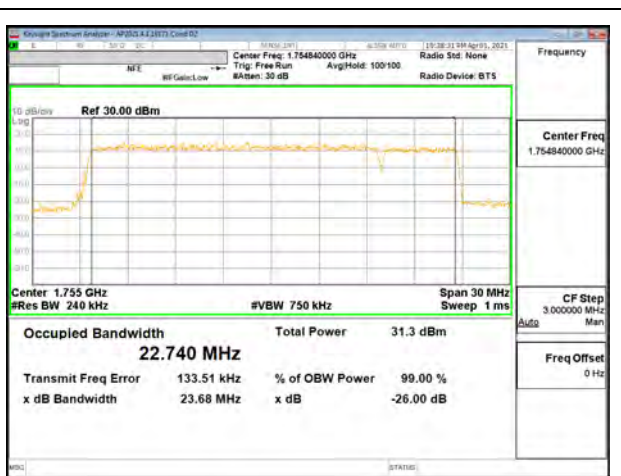


LTE B66C 15MHz + 20MHz QPSK RB75-0 + RB100-0

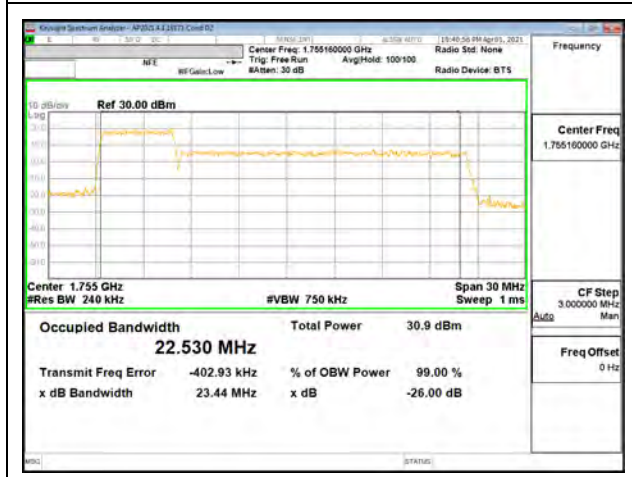




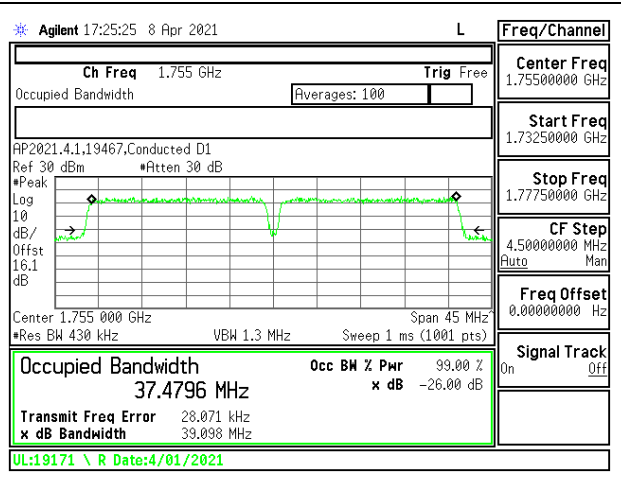
LTE B66C 20MHz + 15MHz QPSK RB100-0 + RB75-0



LTE B66C 20MHz + 5MHz QPSK RB100-0 + RB25-0



LTE B66C 5MHz + 20MHz QPSK RB25-0 + RB100-0



LTE B66C 20MHz + 20MHz QPSK RB100-0 + RB100-0

## 9.2. EMISSION MASK AND ADJACENT CHANNEL POWER

For Spectrum Emission Mask plots, the Keysight PXA N9030A is configured to sweep with a moving integration window, the width of which can be adjusted to different sizes across the sweep. The window width is configured to be greater than or equal to the required reference bandwidth. The center frequencies of the integration window for the different integration windows was set such that the upper and lower edges of the windows are aligned with the transition points in the reference bandwidths. This is achieved by setting the start / stop frequencies of the window with an offset equal to the reference bandwidth / 2 from the transition point.

### TEST PROCEDURE

The transmitter output was connected to a 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 Emission Mask measurement:

1. Set the spectrum analyzer span to include the block edge frequency.
2. Set the Spectrum Emission Mask to cover all frequencies at their respective limits
3. Set the Spectrum Emission Mask to use the required Measurement Bandwidth
4. Set resolution bandwidth to at least 1% of emission bandwidth.

### TEST PROCEDURE FOR FCC PART 27

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

### TEST PROCEDURE FOR FCC PART 96

(3) Measurement procedure.

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

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

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

**RESULTS**

**9.2.1. LTE BAND 5 EMISSION MASK**

**LIMITS**

FCC: §22.917

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



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



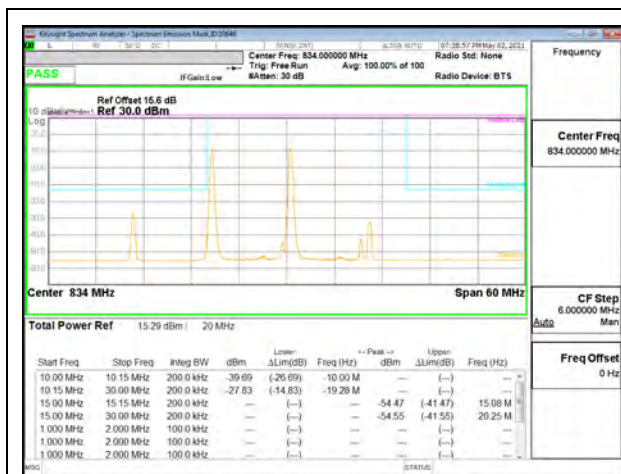
LTE B5 10MHz + 10MHz QPSK High Ch RB1-49 + RB1-49



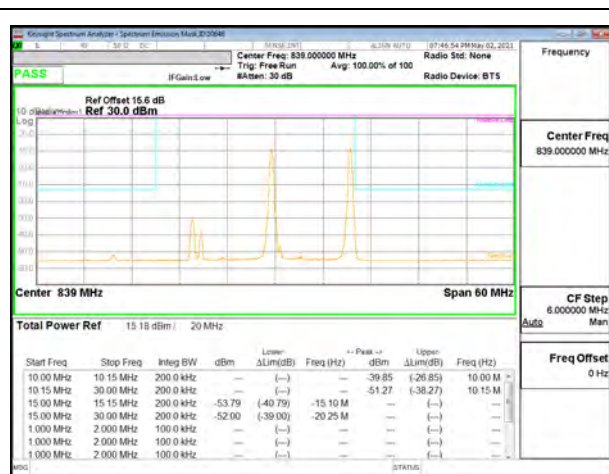
LTE B5 10MHz + 10MHz QPSK Low Ch RB50-0 + RB50-0



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



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



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



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



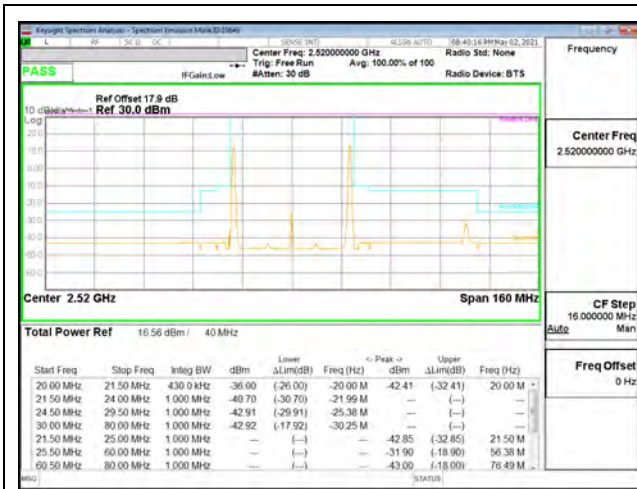
LTE B5 10MHz + 10MHz 16QAM High Ch RB50-0 + RB50-0

## 9.2.2. LTE BAND 7 EMISSION MASK

### LIMITS

FCC: §27.53(m)(4) For mobile digital stations, the attenuation factor shall be not less than  $40 + 10 \log (P)$  dB on all frequencies between the channel edge and 5 megahertz from the channel edge,  $43 + 10 \log (P)$  dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and  $55 + 10 \log (P)$  dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less 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.





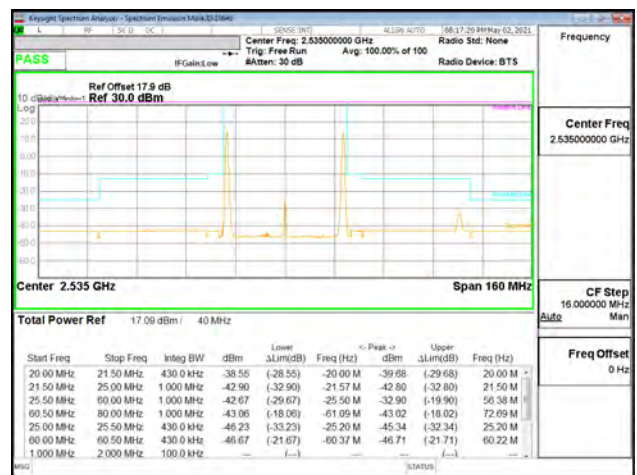
LTE B7 20MHz + 20MHz QPSK Low Ch RB1-0 + RB1-99



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



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



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



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



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



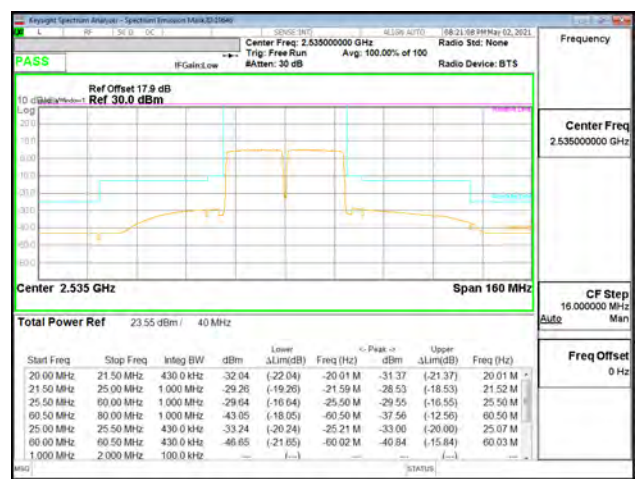
LTE B7 20MHz + 20MHz QPSK Low Ch RB100-0 + RB100-0



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



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



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



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



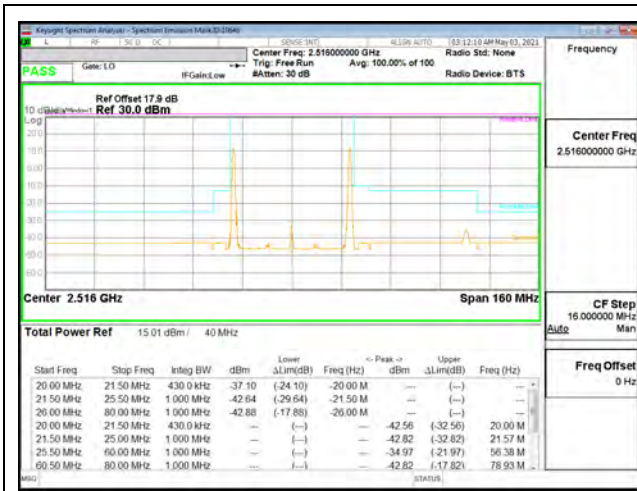
LTE B7 20MHz + 20MHz 16QAM High Ch RB100-0 + RB100-0

### 9.2.3. LTE BAND 41 EMISSION MASK

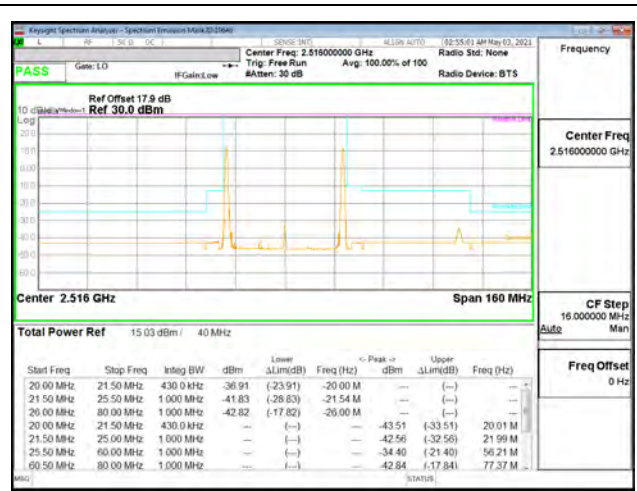
#### LIMITS

FCC: §27.53(m)(4) For mobile digital stations, the attenuation factor shall be not less than  $40 + 10 \log (P)$  dB on all frequencies between the channel edge and 5 megahertz from the channel edge,  $43 + 10 \log (P)$  dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and  $55 + 10 \log (P)$  dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less 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.

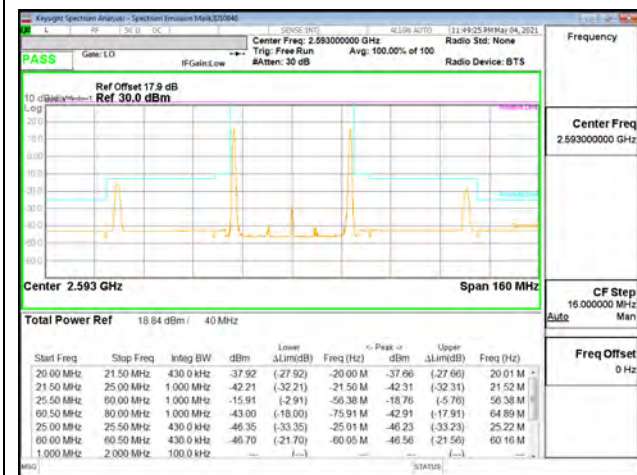




LTE B41 20MHz + 20MHz QPSK Low Ch RB1-0 + RB1-99



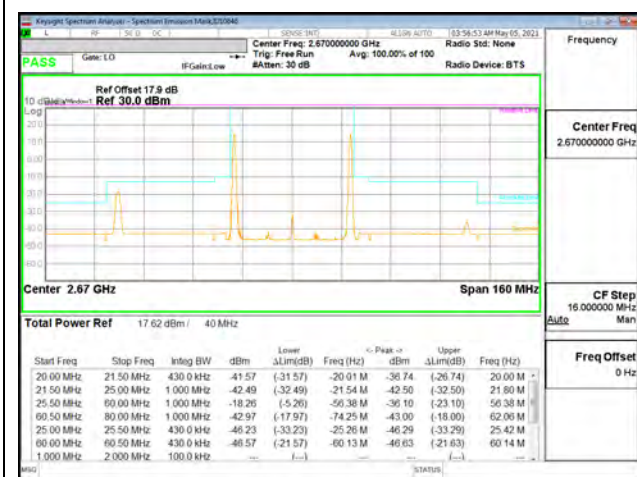
LTE B41 20MHz + 20MHz 16QAM Low Ch RB1-0 + RB1-99



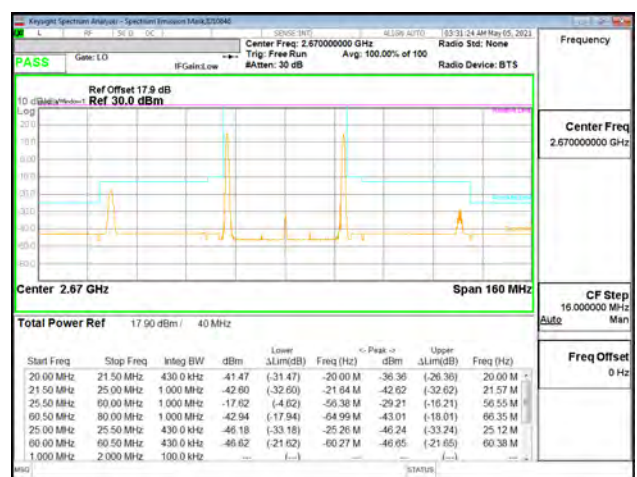
LTE B41 20MHz + 20MHz QPSK Mid Ch RB1-0 + RB1-99



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



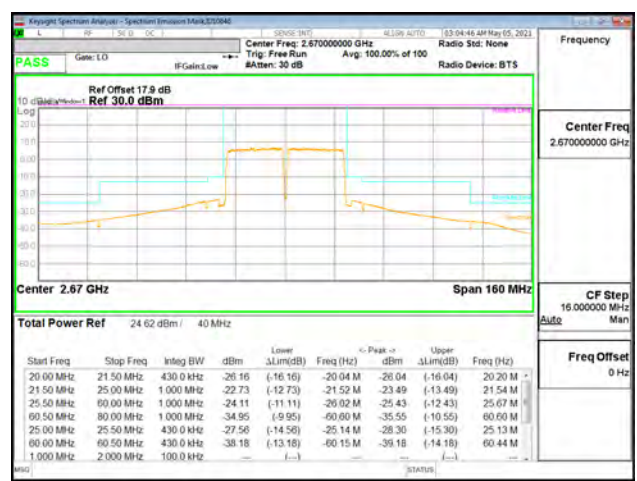
LTE B41 20MHz + 20MHz QPSK Mid Ch RB100-0 + RB100-0



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.

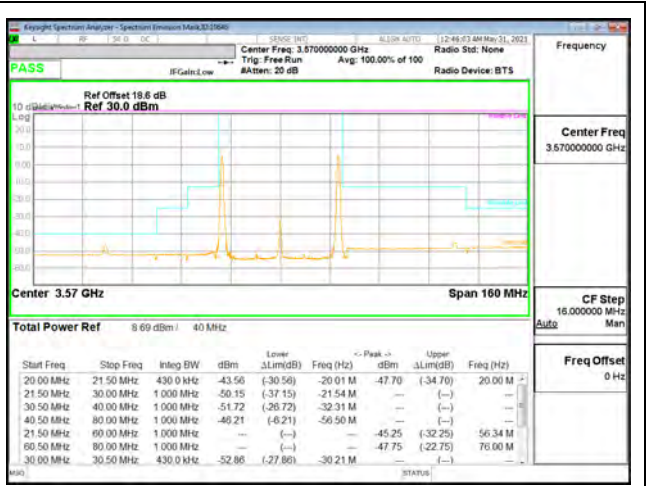
(2) Additional protection levels. Notwithstanding paragraph (e)(1) of this section, for CBSDs and End User Devices, the conducted power of emissions below 3540 MHz or above 3710 MHz shall not exceed  $-25$  dBm/MHz, and the conducted power of emissions below 3530 MHz or above 3720 MHz shall not exceed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



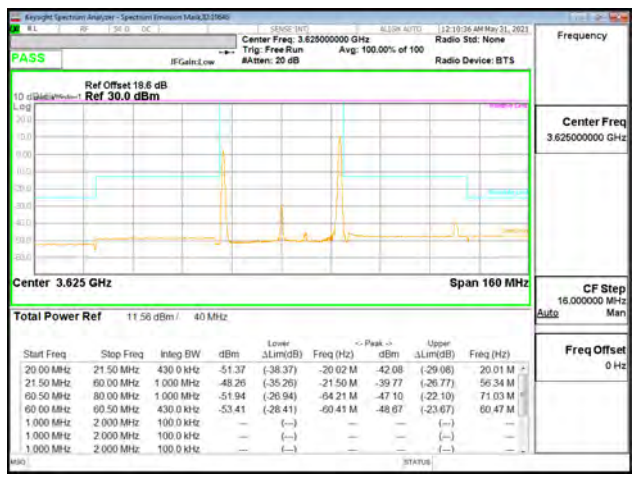
**LTE BAND 48 EMISSION MASK**



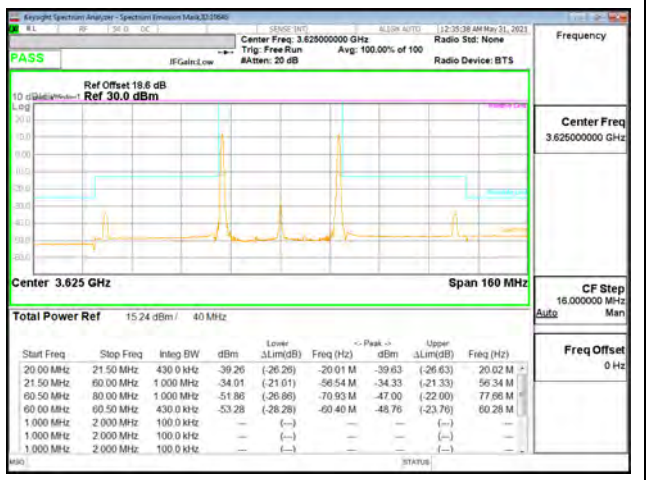
LTE B48 20MHz + 20MHz QPSK Low Ch RB1-0 + RB1-99



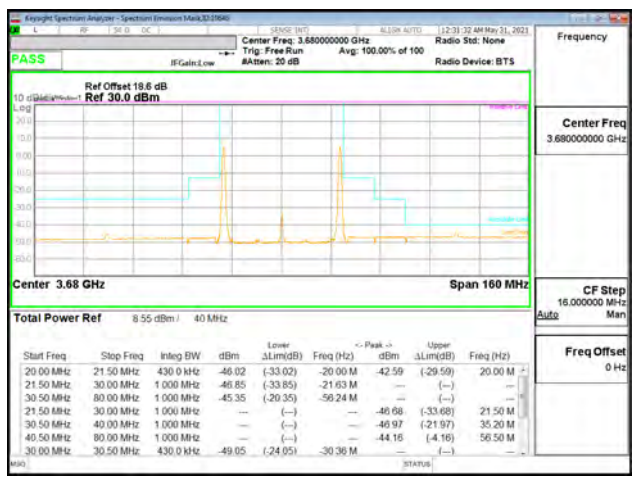
LTE B48 20MHz + 20MHz 16QAM Low Ch RB1-0 + RB1-99



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



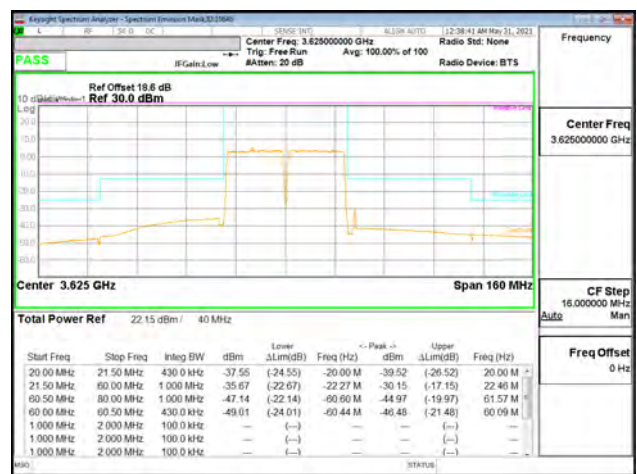
LTE B48 20MHz + 20MHz QPSK Low Ch RB100-0 + RB100-0



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



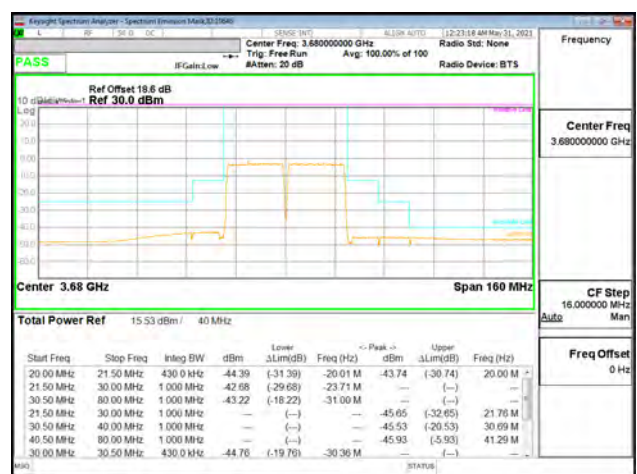
LTE B48 20MHz + 20MHz QPSK Mid Ch RB100-0 + RB100-0



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



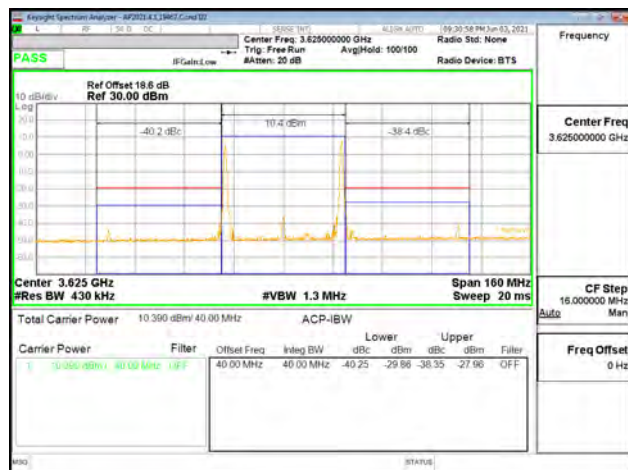
**LTE BAND 48 ADJACENT CHANNEL POWER**



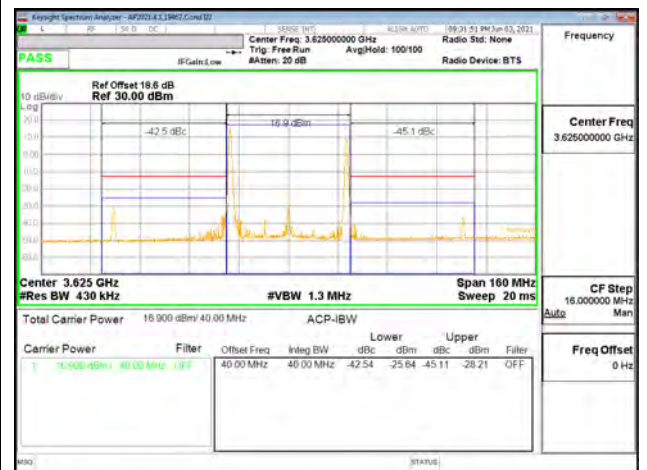
LTE B48 20MHz + 20MHz QPSK Low Ch RB1-0 + RB1-99



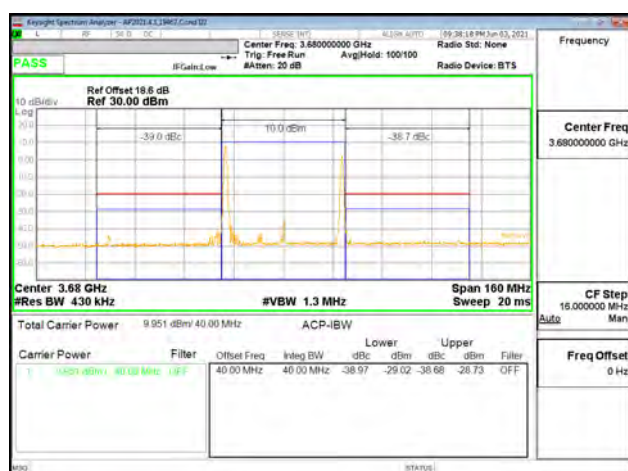
LTE B48 20MHz + 20MHz 16QAM Low Ch RB1-0 + RB1-99



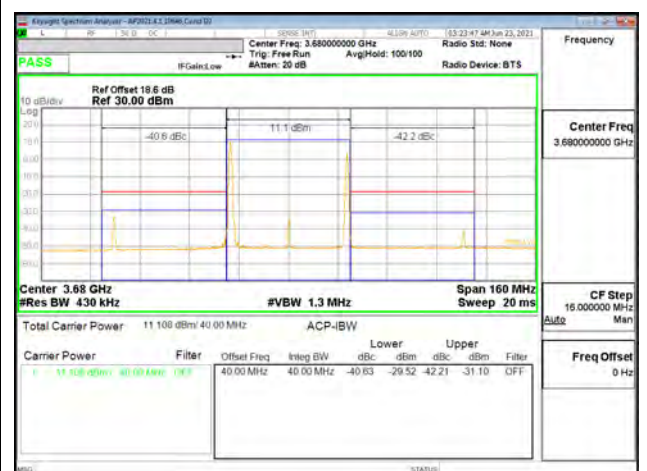
LTE B48 20MHz + 20MHz QPSK Mid Ch RB1-0 + RB1-99



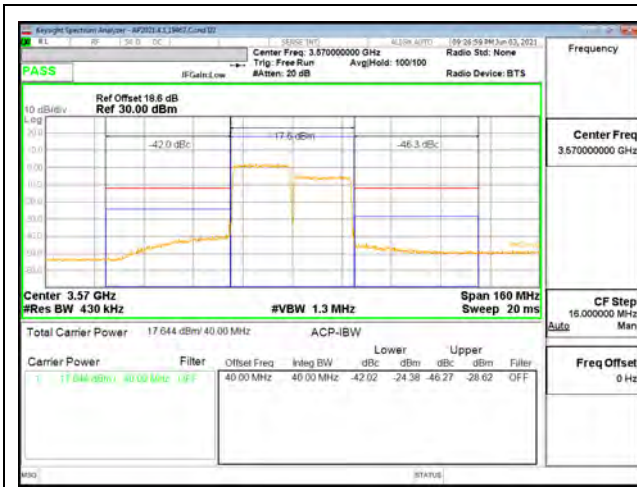
LTE B48 20MHz + 20MHz 16QAM Mid Ch RB1-0 + RB1-99



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



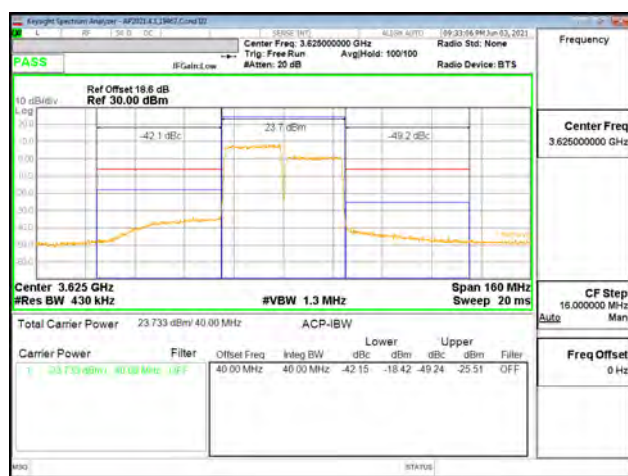
LTE B48 20MHz + 20MHz 16QAM High Ch RB1-0 + RB1-99



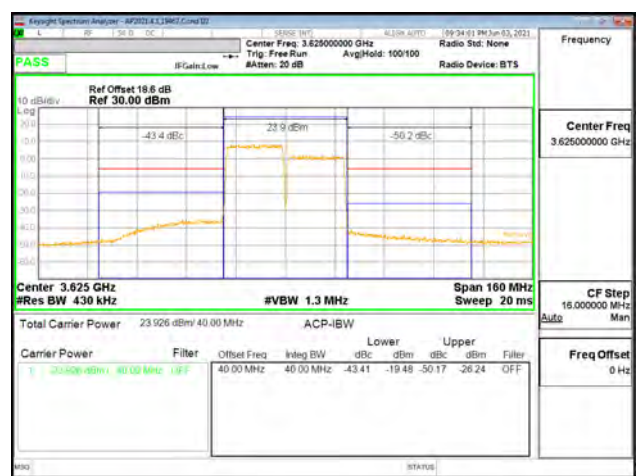
LTE B48 20MHz + 20MHz QPSK Low Ch RB100-0 + RB100-0



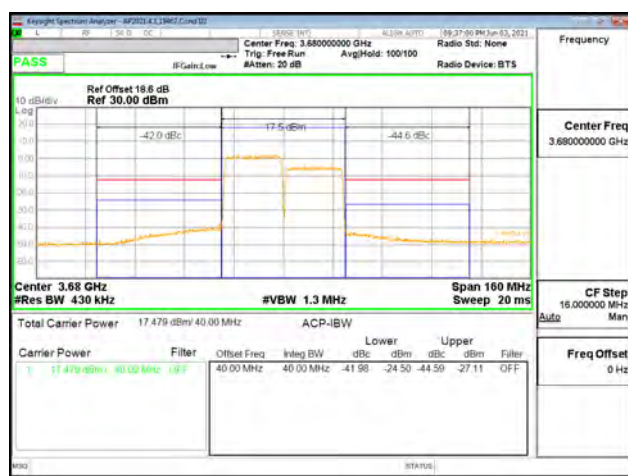
LTE B48 20MHz + 20MHz 16QAM Low Ch RB100-0 + RB100-0



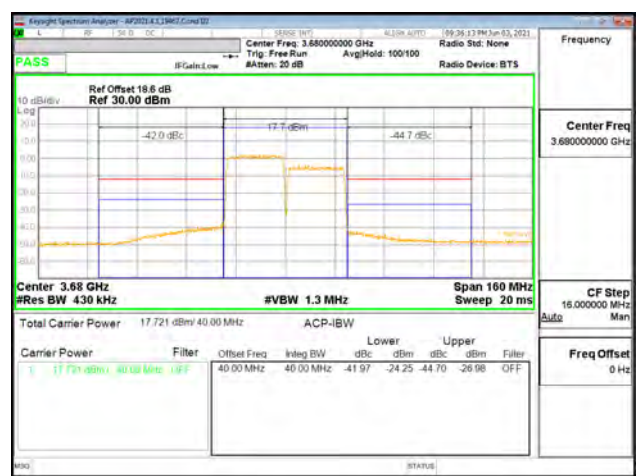
LTE B48 20MHz + 20MHz QPSK Mid Ch RB100-0 + RB100-0



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

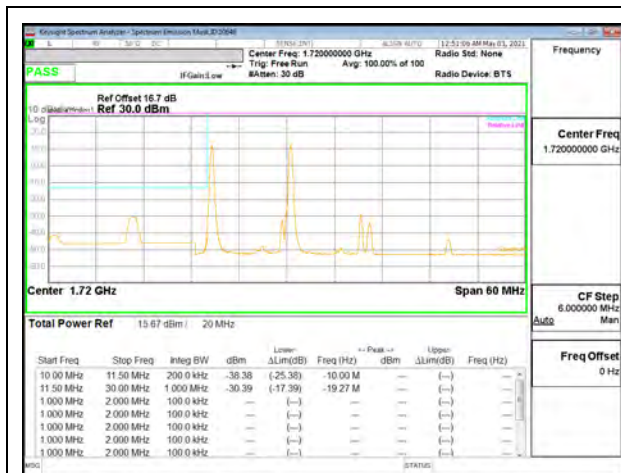


### 9.2.5. LTE BAND 66B EMISSION MASK

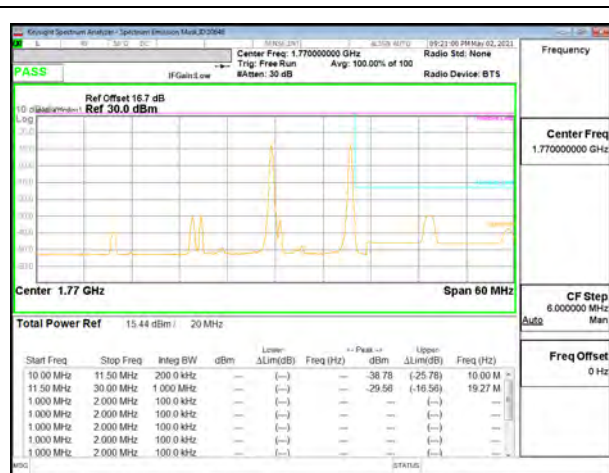
#### LIMITS

FCC: §27.53(h)

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 B66B 10MHz + 10MHz QPSK Low Ch RB1-0 + RB1-0



LTE B66B 10MHz + 10MHz QPSK High Ch RB1-49 + RB1-49



LTE B66B 10MHz + 10MHz QPSK Low Ch RB50-0 + RB50-0



LTE B66B 10MHz + 10MHz QPSK High Ch RB50-0 + RB50-0



LTE B66B 10MHz + 10MHz 16QAM Low Ch RB1-0 + RB1-0



LTE B66B 10MHz + 10MHz 16QAM High Ch RB1-49 + RB1-49



LTE B66B 10MHz + 10MHz 16QAM Low Ch RB50-0 + RB50-0



LTE B66B 10MHz + 10MHz 16QAM High Ch RB50-0 + RB50-0

### 9.2.6. LTE BAND 66C EMISSION MASK

#### LIMITS

FCC: §27.53(h)

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 B66C 20MHz + 20MHz QPSK Low Ch RB1-0 + RB1-0



LTE B66C 20MHz + 20MHz QPSK High Ch RB1-99 + RB1-99



LTE B66C 20MHz + 20MHz QPSK Low Ch RB100-0 + RB100-0



LTE B66C 20MHz + 20MHz QPSK High Ch RB100-0 + RB100-0





LTE B66C 20MHz + 20MHz 16QAM Low Ch RB1-0 + RB1-0



LTE B66C 20MHz + 20MHz 16QAM High Ch RB1-99 + RB1-99



LTE B66C 20MHz + 20MHz 16QAM Low Ch RB100-0 + RB100-0



LTE B66C 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)

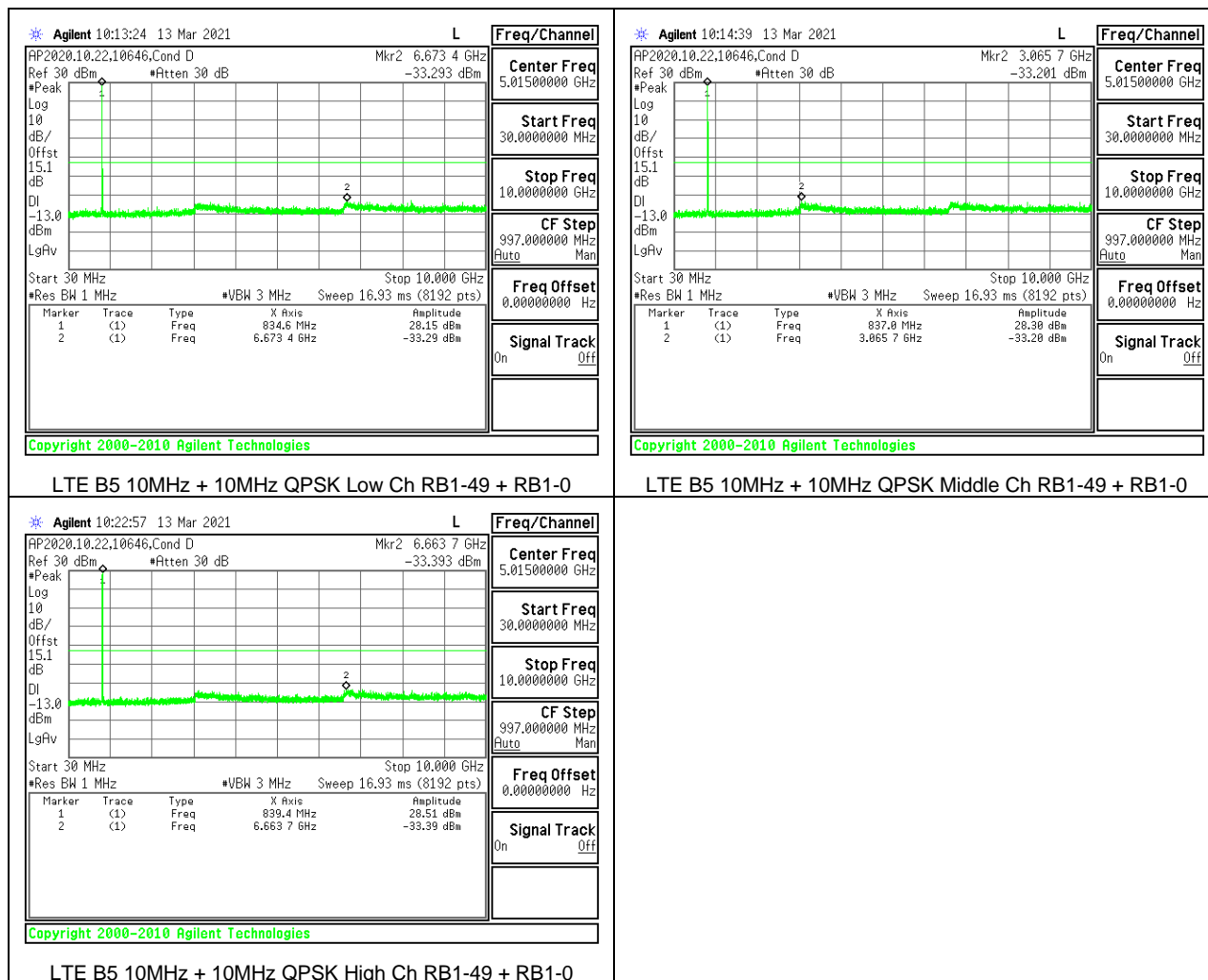
#### **RESULTS**

### 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.



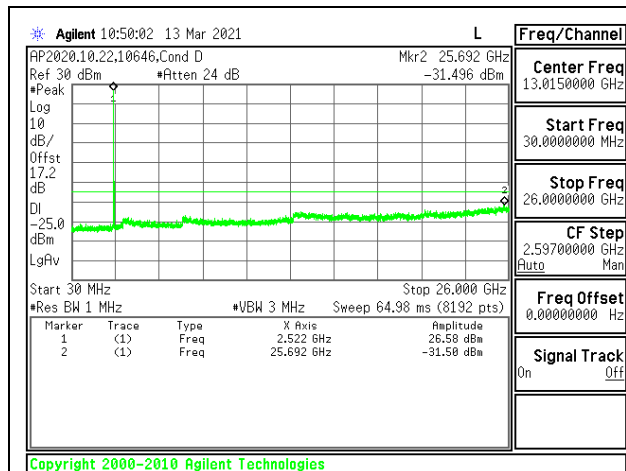


### 9.3.2. LTE BAND 7

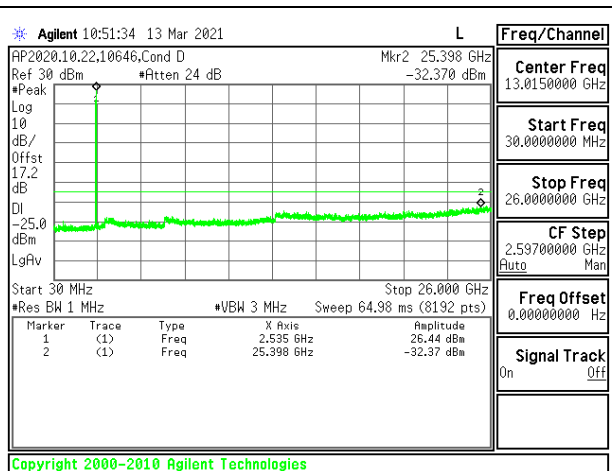
#### LIMITS

FCC: §27.53 (m)

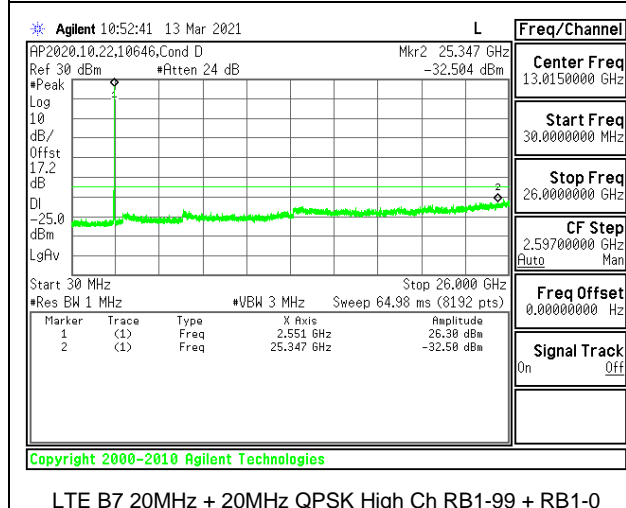
The minimum permissible attenuation level of any spurious emissions is  $55 + 10 \log (P)$  dB where transmitting power (P) in Watts.



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

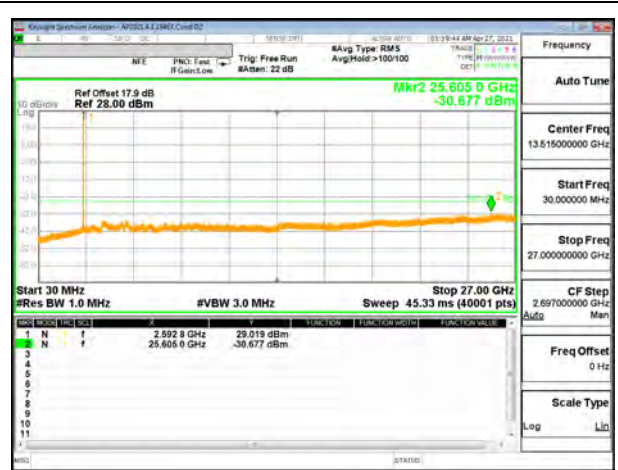
#### LIMITS

FCC: §27.53 (m)

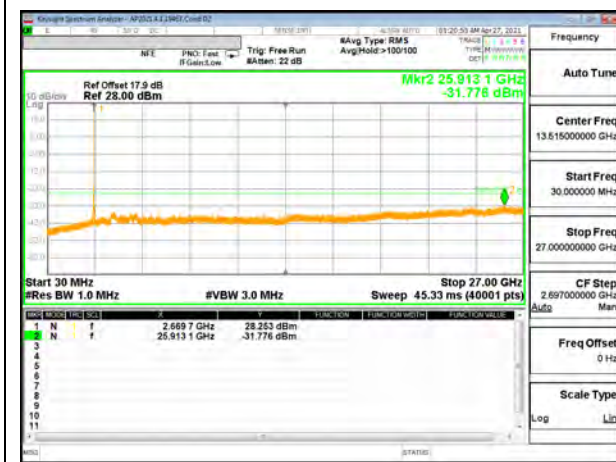
The minimum permissible attenuation level of any spurious emissions is  $55 + 10 \log (P)$  dB where transmitting power (P) in Watts.



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

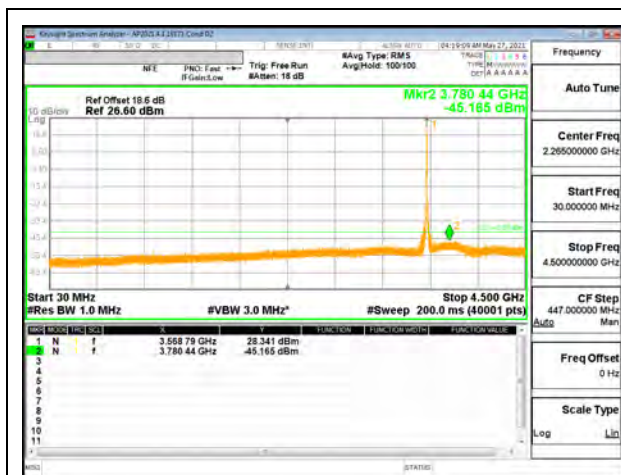
### 9.3.4. LTE BAND 48

#### LIMITS

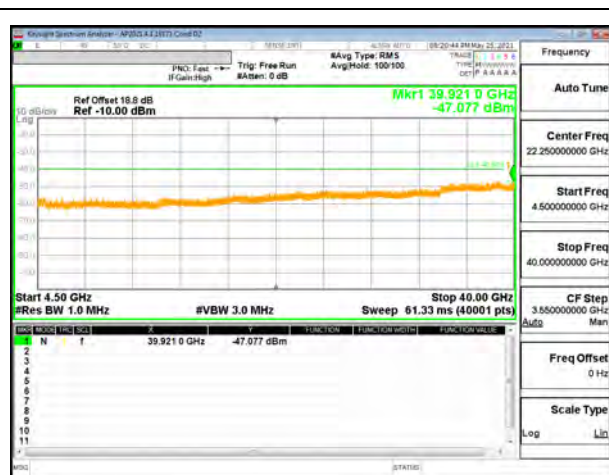
FCC: §96.41

(e) 3.5 GHz Emissions and Interference Limits—

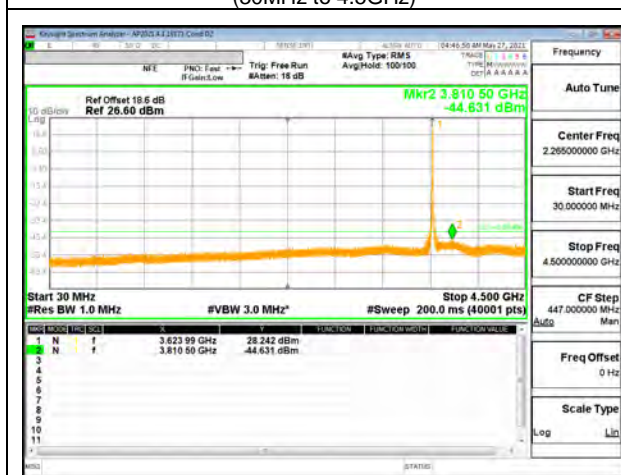
(2) Additional protection levels. Notwithstanding paragraph (e)(1) of this section, for CBSDs and End User Devices, the conducted power of emissions below 3540 MHz or above 3710 MHz shall not exceed  $-25$  dBm/MHz, and the conducted power of emissions below 3530 MHz or above 3720 MHz shall not exceed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



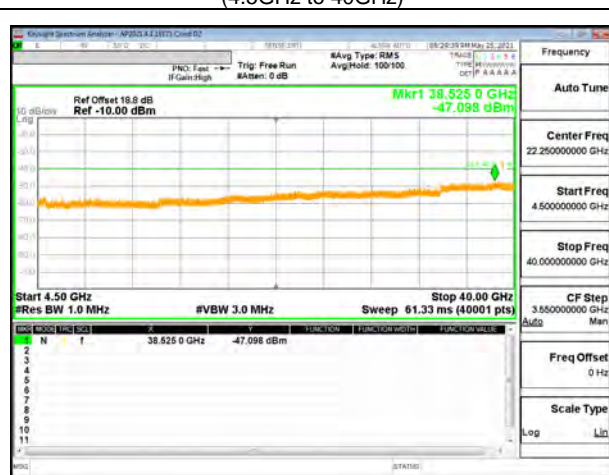
LTE B48 20MHz + 20MHz QPSK Low Ch RB1-99 + RB1-0  
 (30MHz to 4.5GHz)



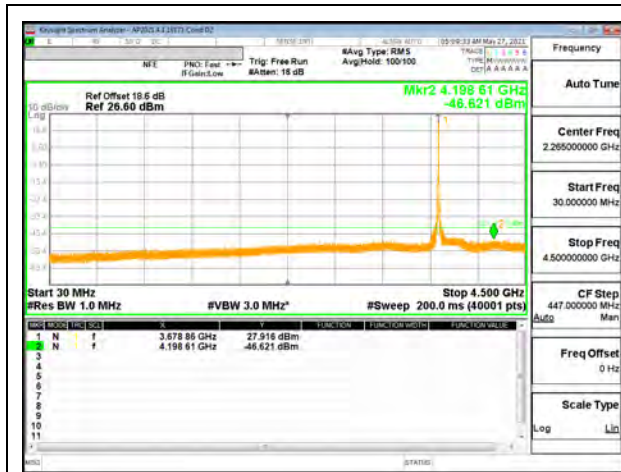
LTE B48 20MHz + 20MHz QPSK Low Ch RB1-99 + RB1-0  
 (4.5GHz to 40GHz)



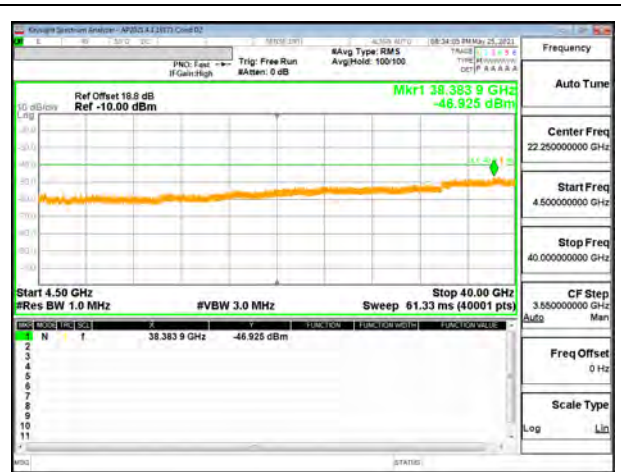
LTE B48 20MHz + 20MHz QPSK Middle Ch RB1-99 + RB1-0  
 (30MHz to 4.5GHz)



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)

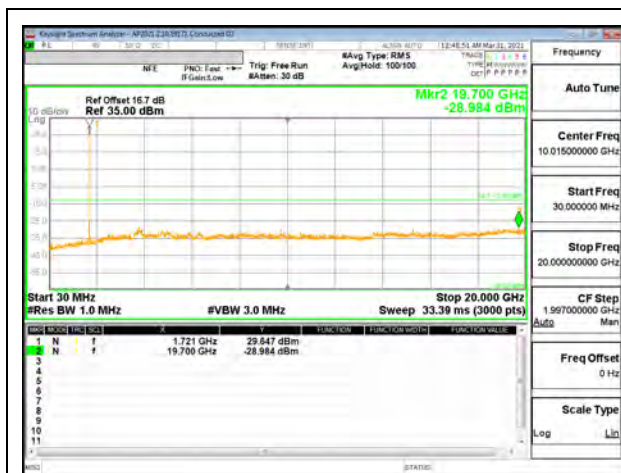


### 9.3.5. LTE BAND 66B

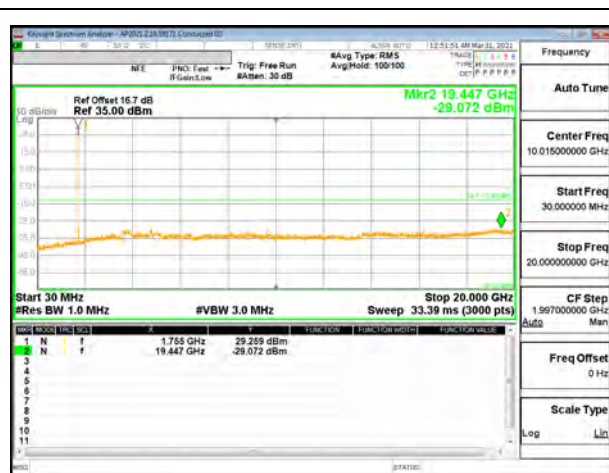
#### LIMITS

FCC: §27.53 (h)

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



LTE B66B 10MHz + 10MHz QPSK Low Ch RB1-49 + RB1-0



LTE B66B 10MHz + 10MHz QPSK Middle Ch RB1-49 + RB1-0



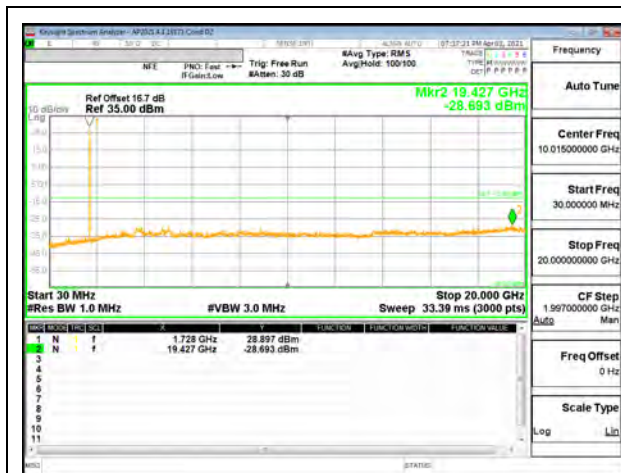
LTE B66B 10MHz + 10MHz QPSK High Ch RB1-49 + RB1-0

### 9.3.6. LTE BAND 66C

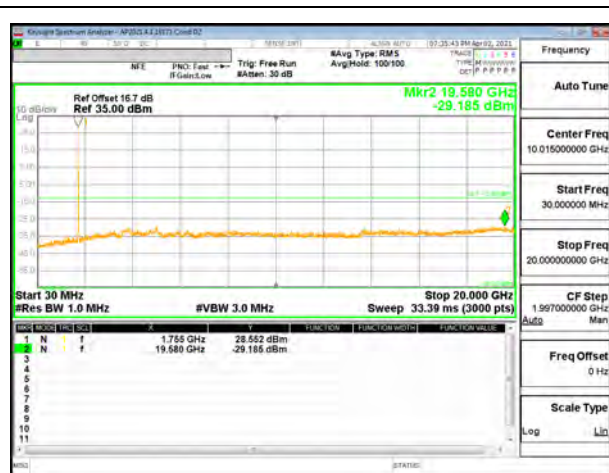
#### LIMITS

FCC: §27.53 (h)

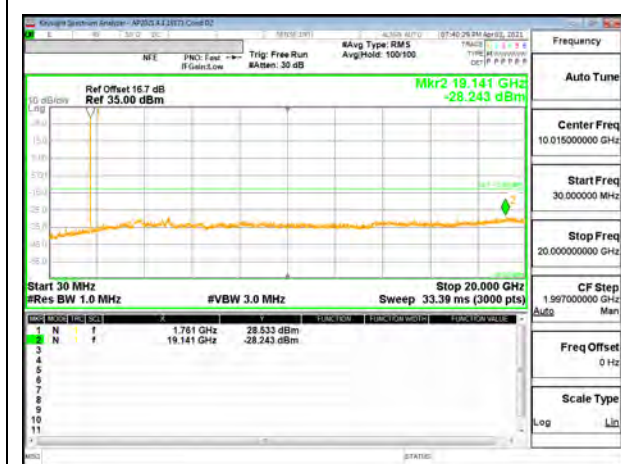
The minimum permissible attenuation level of any spurious emissions is  $43 + 10 \log(P)$  dB where transmitting power (P) in Watts.



LTE B66C 20MHz + 20MHz QPSK Low Ch RB1-99 + RB1-0



LTE B66C 20MHz + 20MHz QPSK Middle Ch RB1-99 + RB1-0



LTE B66C 20MHz + 20MHz QPSK High Ch RB1-99 + RB1-0

## 9.4. FREQUENCY STABILITY

### TEST PROCEDURE

Use CMW 500 with Frequency Error measurement capability.

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

Low voltage, 3.23VDC, Normal, 3.80VDC and High voltage, 4.37VDC.  
End Voltage, 3.00VDC.

### **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.

<b>Test Engineer ID:</b>	10646	<b>Test Date:</b>	5/8/2021
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**QPSK (10MHz + 10MHz BANDWIDTH)**

Limit		824	849	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	824.5529	848.4168		
Extreme (50C)		824.5529	848.4168	35.4	0.042
Extreme (40C)		824.5529	848.4168	39.1	0.047
Extreme (30C)		824.5529	848.4168	45.4	0.054
Extreme (10C)		824.5529	848.4168	32.7	0.039
Extreme (0C)		824.5529	848.4168	16.9	0.020
Extreme (-10C)		824.5529	848.4167	-17.9	-0.021
Extreme (-20C)		824.5529	848.4167	-27.2	-0.033
Extreme (-30C)		824.5529	848.4167	-25.1	-0.030
20C	15%	824.5529	848.4167	-12.9	-0.015
	-15%	824.5529	848.4168	16.8	0.020
	End Point	824.5529	848.4168	27.1	0.032



**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.

<b>Test Engineer ID:</b>	10646	<b>Test Date:</b>	5/8/2021
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**QPSK (20MHz + 20MHz BANDWIDTH)**

Limit		2500	2570	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	2501.1337	2568.8540		
Extreme (50C)		2501.1337	2568.8540	62.0	0.024
Extreme (40C)		2501.1337	2568.8541	77.8	0.031
Extreme (30C)		2501.1338	2568.8541	98.3	0.039
Extreme (10C)		2501.1338	2568.8541	78.7	0.031
Extreme (0C)		2501.1337	2568.8540	25.2	0.010
Extreme (-10C)		2501.1336	2568.8539	-25.4	-0.010
Extreme (-20C)		2501.1336	2568.8539	-52.8	-0.021
Extreme (-30C)		2501.1336	2568.8539	-56.8	-0.022
20C	15%	2501.1336	2568.8539	-41.9	-0.017
	-15%	2501.1337	2568.8540	52.5	0.021
	End Point	2501.1337	2568.8540	70.2	0.028

**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.

<b>Test Engineer ID:</b>	10646	<b>Test Date:</b>	5/8/2021
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**QPSK (20MHz + 20MHz BANDWIDTH)**

Limit		2496	2690	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	2496.6851	2689.2845		
Extreme (50C)		2496.6852	2689.2846	73.5	0.028
Extreme (40C)		2496.6852	2689.2846	81.8	0.032
Extreme (30C)		2496.6852	2689.2846	82.7	0.032
Extreme (10C)		2496.6852	2689.2845	52.1	0.020
Extreme (0C)		2496.6851	2689.2845	-21.6	-0.008
Extreme (-10C)		2496.6851	2689.2845	-39.5	-0.015
Extreme (-20C)		2496.6851	2689.2844	-54.8	-0.021
Extreme (-30C)		2496.6851	2689.2845	-43.2	-0.017
20C	15%	2496.6851	2689.2844	-52.3	-0.020
	-15%	2496.6851	2689.2845	40.4	0.016
	End Point	2496.6852	2689.2846	58.8	0.023

**9.4.4. LTE BAND 48**

<b>Test Engineer ID:</b>	10646	<b>Test Date:</b>	5/8/2021
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**QPSK (20MHz + 20MHz BANDWIDTH)**

Limit		3550	3700	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	3550.9879	3698.9329		
Extreme (50C)		3550.9879	3698.9329	53.0	0.015
Extreme (40C)		3550.9879	3698.9330	74.8	0.021
Extreme (30C)		3550.9879	3698.9330	68.1	0.019
Extreme (10C)		3550.9878	3698.9329	-18.5	-0.005
Extreme (0C)		3550.9878	3698.9329	-29.8	-0.008
Extreme (-10C)		3550.9878	3698.9328	-65.8	-0.018
Extreme (-20C)		3550.9878	3698.9328	-70.0	-0.019
Extreme (-30C)		3550.9878	3698.9328	-66.9	-0.018
20C	15%	3550.9879	3698.9329	52.6	0.015
	-15%	3550.9879	3698.9329	54.7	0.015
	End Point	3550.9879	3698.9330	60.1	0.017

**9.4.5. LTE BAND 66B**

**LIMITS**

FCC: §27.54

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

<b>Test Engineer ID:</b>	10646	<b>Test Date:</b>	5/8/2021
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**QPSK (10MHz + 10MHz BANDWIDTH)**

Limit		1710	1780	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	1710.5528	1779.4128		
Extreme (50C)		1710.5529	1779.4128	29.6	0.017
Extreme (40C)		1710.5529	1779.4128	38.5	0.022
Extreme (30C)		1710.5529	1779.4128	46.8	0.027
Extreme (10C)		1710.5529	1779.4128	33.3	0.019
Extreme (0C)		1710.5529	1779.4128	12.4	0.007
Extreme (-10C)		1710.5528	1779.4128	-16.8	-0.010
Extreme (-20C)		1710.5528	1779.4128	-28.0	-0.016
Extreme (-30C)		1710.5528	1779.4128	-28.0	-0.016
20C	15%	1710.5528	1779.4128	-18.8	-0.011
	-15%	1710.5529	1779.4128	16.1	0.009
	End Point	1710.5529	1779.4128	33.6	0.019

**9.4.6. LTE BAND 66C**

**LIMITS**

FCC: §27.54

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

<b>Test Engineer ID:</b>	10646	<b>Test Date:</b>	5/8/2021
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**QPSK (20MHz + 20MHz BANDWIDTH)**

Limit		1710	1780	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	1711.1116	1778.8930		
Extreme (50C)		1711.1117	1778.8931	38.7	0.022
Extreme (40C)		1711.1117	1778.8931	60.1	0.034
Extreme (30C)		1711.1117	1778.8931	79.6	0.046
Extreme (10C)		1711.1117	1778.8931	51.5	0.030
Extreme (0C)		1711.1116	1778.8931	12.4	0.007
Extreme (-10C)		1711.1116	1778.8930	-28.3	-0.016
Extreme (-20C)		1711.1116	1778.8930	-44.9	-0.026
Extreme (-30C)		1711.1116	1778.8930	-49.4	-0.028
20C	15%	1711.1116	1778.8930	-25.5	-0.015
	-15%	1711.1116	1778.8931	25.6	0.015
	End Point	1711.1117	1778.8931	61.1	0.035

## 9.5. PEAK-TO-AVERAGE POWER RATIO

### LIMIT

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

### RESULT

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

**9.5.1. LTE BAND 5**

<b>Test Engineer ID:</b>	19171	<b>Test Date:</b>	3/26/2021
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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	30.30	24.10	6.20
				16QAM	30.40	23.45	6.95
	5 MHz / 3MHz	835.0	838.9	QPSK	30.21	24.03	6.18
				16QAM	30.26	23.37	6.89
	5MHz / 10MHz	831.8	839.0	QPSK	30.18	24.02	6.16
				16QAM	30.23	23.05	7.18
	10MHz / 5MHz	834.3	841.5	QPSK	30.18	23.92	6.26
				16QAM	30.23	22.98	7.25
	10MHz / 10MHz	831.6	841.5	QPSK	30.57	23.92	6.65
				16QAM	30.57	22.96	7.61
Duty Cycle Correction Factor (dB) =			0.00				

**9.5.2. LTE BAND 7**

<b>Test Engineer ID:</b>	19171	<b>Test Date:</b>	3/26/2021
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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	32.74	26.10	6.64	
				16QAM	33.18	25.25	7.93	
	20MHz / 10MHz	2530.1	2544.5	QPSK	32.63	26.13	6.50	
				16QAM	33.10	25.26	7.84	
	15 MHz / 15MHz	2527.5	2542.5	QPSK	32.80	26.11	6.69	
				16QAM	33.03	25.22	7.81	
	15MHz / 20MHz	2525.3	2542.4	QPSK	32.66	26.08	6.58	
				16QAM	33.06	25.24	7.82	
	20MHz / 15MHz	2527.6	2544.7	QPSK	32.42	26.11	6.31	
				16QAM	33.00	25.23	7.77	
	20MHz / 20MHz	2525.1	2544.9	QPSK	32.69	26.10	6.59	
				16QAM	32.92	25.24	7.68	
	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**

<b>Test Engineer ID:</b>	10646	<b>Test Date:</b>	4/8/2021
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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	34.06	18.73	8.34
				16QAM	33.34	17.73	8.62
	20MHz / 5MHz	2590.5	2602.2	QPSK	33.71	18.74	7.98
				16QAM	33.80	17.74	9.07
	10MHz / 20MHz	2583.6	2598.0	QPSK	34.10	18.74	8.37
				16QAM	31.55	17.79	6.77
	20MHz / 10MHz	2588.1	2602.5	QPSK	34.19	18.76	8.44
				16QAM	31.48	17.77	6.72
	15MHz / 15MHz	2585.5	2600.5	QPSK	31.52	18.75	5.78
				16QAM	31.48	17.76	6.73
	15MHz / 20MHz	2583.3	2600.4	QPSK	33.73	18.68	8.06
				16QAM	33.63	17.72	8.92
	20MHz / 15MHz	2585.6	2602.7	QPSK	34.03	18.76	8.28
				16QAM	31.55	17.77	6.79
	20MHz / 20MHz	2583.1	2602.9	QPSK	33.83	18.65	8.19
				16QAM	33.82	16.11	10.72
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**

<b>Test Engineer ID:</b>	19171	<b>Test Date:</b>	3/26/2021
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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	31.43	18.16	6.28	
				16QAM	31.96	18.16	6.81	
	20MHz / 5MHz	3622.5	3634.2	QPSK	31.57	18.18	6.40	
				16QAM	31.98	18.19	6.80	
	10MHz / 20MHz	3615.6	3630.0	QPSK	31.21	17.67	6.55	
				16QAM	31.57	17.74	6.84	
	20MHz / 10MHz	3620.1	3634.5	QPSK	31.41	17.69	6.73	
				16QAM	31.63	17.75	6.89	
	15MHz / 20MHz	3615.3	3632.4	QPSK	31.43	17.64	6.80	
				16QAM	31.64	17.71	6.94	
	20MHz / 15MHz	3617.6	3634.7	QPSK	31.25	17.69	6.57	
				16QAM	31.47	17.71	6.77	
	20MHz / 20MHz	3615.1	3634.9	QPSK	31.57	17.68	6.90	
				16QAM	31.52	17.72	6.81	
	Duty Cycle Correction Factor (dB) =			6.99				
	Peak-to-Average Power Ratio= Peak Reading - Average Reading - Duty Cycle Correction Factor							



**9.5.5. LTE BAND 66B**

<b>Test Engineer ID:</b>	19171	<b>Test Date:</b>	4/2/2021
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Band	Bandwidth (MHz)	PCC f (MHz)	SCC1 f (MHz)	Modulation	Conducted Power (dBm)		Peak-to-Average Power Ratio (dB)
					Peak	Average	
Band 66B	5MHz / 5MHz	1752.6	1757.4	QPSK	30.86	23.96	6.90
				16QAM	30.83	23.05	7.78
	5MHz / 10MHz	1750.3	1757.5	QPSK	31.10	24.02	7.08
				16QAM	31.06	23.06	8.00
	10 MHz / 5MHz	1752.5	1759.7	QPSK	31.14	24.00	7.14
				16QAM	31.07	23.06	8.01
	5MHz / 15MHz	1748.1	1757.4	QPSK	31.27	24.07	7.20
				16QAM	31.28	23.11	8.17
	15MHz / 5MHz	1752.6	1761.9	QPSK	31.11	24.00	7.11
				16QAM	31.44	23.03	8.41
	10MHz / 10MHz	1750.1	1760.0	QPSK	31.23	24.02	7.21
				16QAM	31.31	23.01	8.30

Duty Cycle Correction Factor (dB) = 0.00

Peak-to-Average Power Ratio= Peak Reading - Average Reading - Duty Cycle Correction Factor

**9.5.6. LTE BAND 66C**

<b>Test Engineer ID:</b>	19171	<b>Test Date:</b>	4/2/2021
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Band	Bandwidth (MHz)	PCC f (MHz)	SCC1 f (MHz)	Modulation	Conducted Power (dBm)		Peak-to-Average Power Ratio (dB)
					Peak	Average	
Band 66C	10MHz / 15MHz	1749.9	1759.9	QPSK	31.45	24.01	7.44
				16QAM	31.42	23.11	8.31
	15MHz / 10MHz	1750.1	1762.1	QPSK	31.81	24.02	7.79
				16QAM	31.60	23.05	8.55
	10MHz / 20MHz	1745.6	1760.0	QPSK	31.64	24.08	7.56
				16QAM	31.64	23.08	8.56
	20MHz / 10MHz	1750.1	1764.5	QPSK	31.57	24.01	7.56
				16QAM	31.62	23.06	8.56
	15MHz / 15MHz	1747.5	1762.5	QPSK	31.81	24.02	7.79
				16QAM	31.60	23.05	8.55
	15MHz / 20MHz	1745.3	1762.4	QPSK	31.77	24.02	7.75
				16QAM	31.80	23.13	8.67
	20MHz / 15MHz	1747.6	1764.7	QPSK	31.67	24.00	7.67
				16QAM	31.87	23.05	8.82
	20MHz / 5MHz	1752.5	1764.2	QPSK	31.41	24.01	7.40
				16QAM	31.47	23.04	8.43
	5MHz / 20MHz	1745.8	1757.5	QPSK	31.52	24.04	7.48
				16QAM	31.59	23.12	8.47
	20MHz / 20MHz	1745.1	1764.9	QPSK	31.74	24.04	7.70
				16QAM	31.79	23.07	8.72
Duty Cycle Correction Factor (dB) =			0.00				
Peak-to-Average Power Ratio= Peak Reading - Average Reading - Duty Cycle Correction Factor							

## 10. RADIATED TEST RESULTS

### Radiated measurement using the Field Strength Method

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

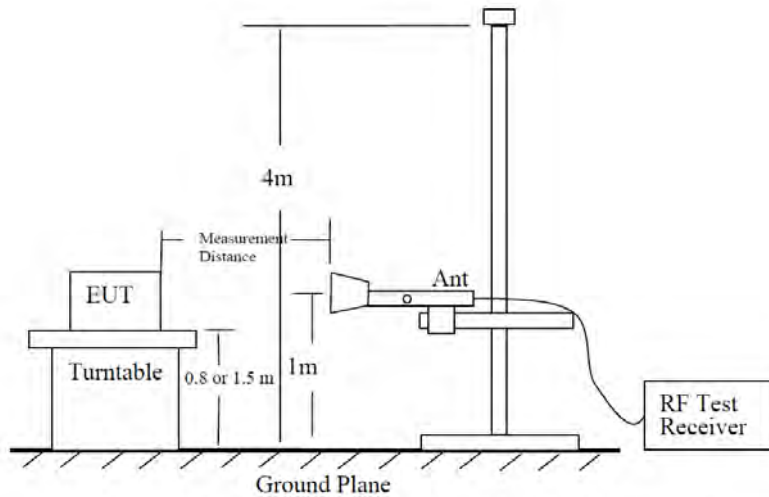


Figure 6—Test site-up for radiated ERP and/or EIRP measurements

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

- a)  $E \text{ (dB}\mu\text{V/m)} = \text{Measured amplitude level (dB}\mu\text{V)} + \text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)}$ .
- 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.

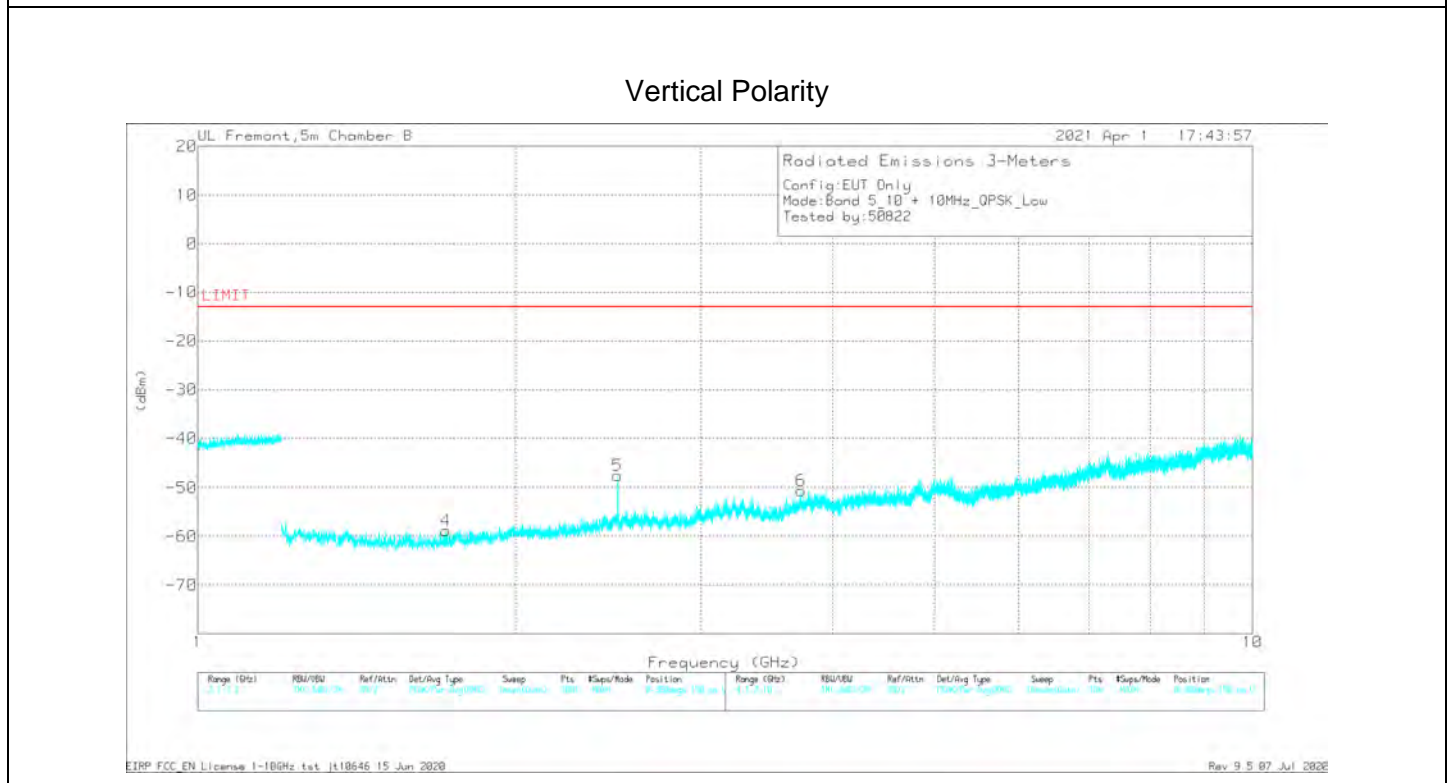
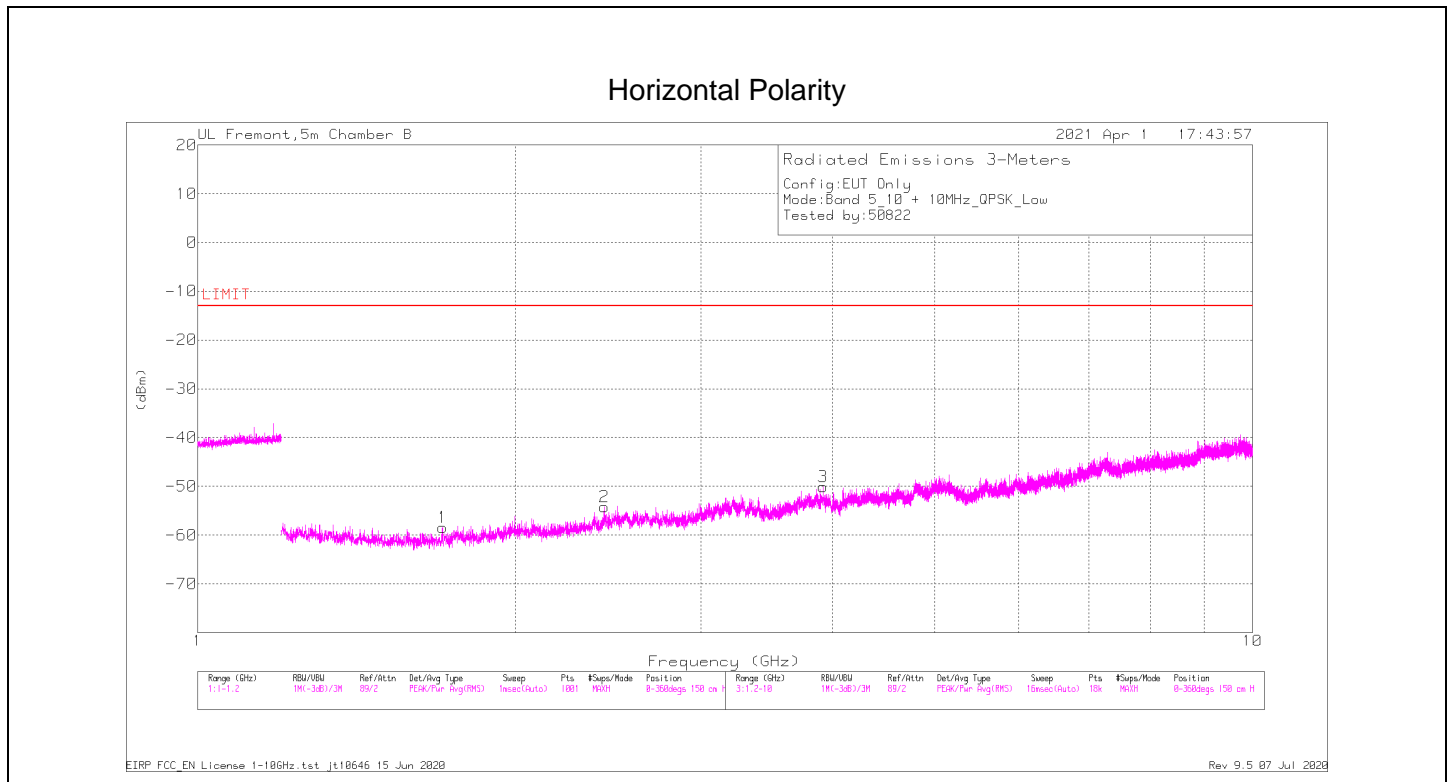
So, from d)

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

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 that: we do confidence check to our chambers every day to see if any degradation from expected/normal reading reference data. Also we do ambient check to all our chambers every month.

### 10.1. Example Plot



**Radiated Emissions**

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
1.80762	39.4	Pk	25.9	-27.6	.6	-95.2	-56.9	-13	-43.9	H
1.83982	38.7	Pk	26	-27.4	.5	-95.2	-57.4	-13	-44.4	V
2.508	38.07	Pk	29.1	-26.5	.7	-95.2	-53.83	-13	-40.83	H
2.50925	44.49	Pk	29.1	-26.6	.7	-95.2	-47.51	-13	-34.51	V
3.78626	39.48	Pk	30.8	-25.1	.6	-95.2	-49.42	-13	-36.42	H
3.80043	39.04	Pk	30.9	-25.2	.8	-95.2	-49.66	-13	-36.66	V

Pk - Peak detector

EIRP FCC\_EN License 1-10GHz.tst jt10646 15 Jun 2020

## 10.2. FIELD STRENGTH OF SPURIOUS RADIATION, ANT1

### TEST PROCEDURE

KDB 971168 D01/D02 v02r01

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

### RESULTS

Maximum + maximum bandwidth combinations of QPSK mode was tested, QPSK results are reported as worst case.

### 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 #:	13571607
Date:	04/01/2021
Test Engineer:	50822
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
<b>Low Channel, 829MHz + 838.9MHz</b>										
1.70387	39.51	Pk	25.2	-27.6	.6	-95.2	-57.49	-13	-44.49	H
1.71457	39	Pk	25.2	-27.6	.6	-95.2	-58	-13	-45	V
2.42766	38.69	Pk	28.8	-26.8	.5	-95.2	-54.01	-13	-41.01	H
2.50182	46.52	Pk	29	-26.6	.6	-95.2	-45.68	-13	-32.68	V
3.72801	39.05	Pk	30.5	-25.2	.5	-95.2	-50.35	-13	-37.35	V
3.91935	38.14	Pk	31.5	-25	.6	-95.2	-49.96	-13	-36.96	H
<b>Mid Channel, 831.6MHz + 841.5MHz</b>										
1.80762	39.4	Pk	25.9	-27.6	.6	-95.2	-56.9	-13	-43.9	H
1.83982	38.7	Pk	26	-27.4	.5	-95.2	-57.4	-13	-44.4	V
2.508	38.07	Pk	29.1	-26.5	.7	-95.2	-53.83	-13	-40.83	H
2.50925	44.49	Pk	29.1	-26.6	.7	-95.2	-47.51	-13	-34.51	V
3.78626	39.48	Pk	30.8	-25.1	.6	-95.2	-49.42	-13	-36.42	H
3.80043	39.04	Pk	30.9	-25.2	.8	-95.2	-49.66	-13	-36.66	V
<b>High Channel, 834.1MHz + 844MHz</b>										
1.71614	39.58	Pk	25.2	-27.6	.6	-95.2	-57.42	-13	-44.42	H
1.74801	39.06	Pk	25.6	-27.6	.7	-95.2	-57.44	-13	-44.44	V
2.51689	43.94	Pk	29.2	-26.5	.8	-95.2	-47.76	-13	-34.76	V
2.52066	37.45	Pk	29.2	-26.6	.8	-95.2	-54.35	-13	-41.35	H
3.86325	37.94	Pk	31.3	-25.1	.6	-95.2	-50.46	-13	-37.46	H
3.86527	38.69	Pk	31.2	-25.1	.7	-95.2	-49.71	-13	-36.71	V

**10.2.2. LTE BAND 7**

**LIMIT**

FCC: §27.53 (m)

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

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

Project #:	13571607
Date:	04/01/2021
Test Engineer:	50822
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										
5.44031	36.47	Pk	32.7	-24.1	.6	-95.2	-49.53	-25	-24.53	H
5.47969	34.59	Pk	32.9	-23.8	.5	-95.2	-51.01	-25	-26.01	V
7.21828	34.98	Pk	37.2	-20.9	.3	-95.2	-43.62	-25	-18.62	V
7.26422	34.25	Pk	37.1	-20.9	.5	-95.2	-44.25	-25	-19.25	H
9.95016	33.04	Pk	38.3	-17.6	.6	-95.2	-40.86	-25	-15.86	V
9.95344	33.8	Pk	38.4	-17.6	.6	-95.2	-40	-25	-15	H
Mid Channel, 2525.1MHz + 2544.9MHz										
5.01984	35.81	Pk	33.7	-23.5	.8	-95.2	-48.39	-25	-23.39	H
5.04938	36.41	Pk	33.8	-23.4	.6	-95.2	-47.79	-25	-22.79	V
7.23609	35.31	Pk	37.2	-21.3	.3	-95.2	-43.69	-25	-18.69	V
7.26516	34.79	Pk	37.1	-20.8	.5	-95.2	-43.61	-25	-18.61	H
10.19297	34.65	Pk	38.7	-17.3	.7	-95.2	-38.45	-25	-13.45	H
10.49859	34.34	Pk	39.5	-17	.6	-95.2	-37.76	-25	-12.76	V
High Channel, 2540.2MHz + 2560MHz										
5.05453	36.03	Pk	33.8	-23.5	.6	-95.2	-48.27	-25	-23.27	V
5.09766	36.17	Pk	33.9	-23.8	.8	-95.2	-48.13	-25	-23.13	H
7.25813	34.74	Pk	37.2	-21.1	.5	-95.2	-43.86	-25	-18.86	V
7.28578	33.8	Pk	37.1	-20.3	.4	-95.2	-44.2	-25	-19.2	H
10.34531	33.08	Pk	39.1	-17.5	.7	-95.2	-39.82	-25	-14.82	V
10.40063	33.82	Pk	39.3	-17.3	.8	-95.2	-38.58	-25	-13.58	H



### 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 #:	13571607
Date:	04/01/2021
Test Engineer:	50822
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										
5.02969	37.24	Pk	33.7	-23.5	.7	-95.2	-47.06	-25	-22.06	H
5.11406	35.36	Pk	33.9	-23.7	.8	-95.2	-48.84	-25	-23.84	V
7.29234	35.71	Pk	37.1	-20.6	.4	-95.2	-42.59	-25	-17.59	V
7.80422	34.86	Pk	37.2	-21	.4	-95.2	-43.74	-25	-18.74	H
10.36266	33.61	Pk	39.2	-17.1	.8	-95.2	-38.69	-25	-13.69	V
10.43766	33.36	Pk	39.4	-16.9	.8	-95.2	-38.54	-25	-13.54	H
Mid Channel, 2583.1MHz + 2602.9MHz										
5.19007	37.31	Pk	33.7	-23.6	.8	-95.2	-46.99	-25	-21.99	H
5.19792	37.21	Pk	33.7	-23.6	.9	-95.2	-46.99	-25	-21.99	V
7.80609	35.44	Pk	37.2	-21	.4	-95.2	-43.16	-25	-18.16	H
7.80647	35.6	Pk	37.2	-21	.4	-95.2	-43	-25	-18	V
9.69703	34.12	Pk	38.7	-17.7	.8	-95.2	-39.28	-25	-14.28	V
10.24162	33.94	Pk	38.8	-16.9	.8	-95.2	-38.56	-25	-13.56	H
High Channel, 2660.2MHz + 2680MHz										
4.83047	38.13	Pk	33.1	-24.5	.6	-95.2	-47.87	-25	-22.87	V
5.54531	36.3	Pk	33.2	-23.5	.6	-95.2	-48.6	-25	-23.6	H
8.09906	35.05	Pk	37.2	-20.1	.3	-95.2	-42.75	-25	-17.75	V
8.93438	35.12	Pk	38.2	-19.1	.4	-95.2	-40.58	-25	-15.58	H
11.05313	32.86	Pk	39.4	-17	.6	-95.2	-39.34	-25	-14.34	V
11.08781	34.24	Pk	39.3	-17.4	.8	-95.2	-38.26	-25	-13.26	H

**10.2.4. LTE BAND 66B**

**LIMIT**

FCC: §27.53 (h)

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 66B (10.0MHZ + 10.0MHZ BANDWIDTH)**

Project #:	13571607
Date:	04/06/2021
Test Engineer:	50822
Configuration:	EUT only
Mode	Band 66B QPSK 10MHz + 10MHz
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBm)	Det	AF T962 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1715MHz + 1724.9MHz									
3.64313	36	Pk	30.1	-24.4	-95.2	-53.5	-13	-40.5	V
3.65344	36.8	Pk	30.1	-24.5	-95.2	-52.8	-13	-39.8	H
5.30391	34.24	Pk	33.3	-23.2	-95.2	-50.86	-13	-37.86	V
5.32781	35.08	Pk	33.2	-22.8	-95.2	-49.72	-13	-36.72	H
7.17656	33.52	Pk	37.1	-20.4	-95.2	-44.98	-13	-31.98	V
7.22344	34.09	Pk	37.1	-19.8	-95.2	-43.81	-13	-30.81	H
Mid Channel, 1750.1MHz + 1760MHz									
3.36891	35.15	Pk	30.9	-24.6	-95.2	-53.75	-13	-40.75	V
3.38063	35.86	Pk	30.9	-24.9	-95.2	-53.34	-13	-40.34	H
5.08922	35.86	Pk	33.8	-21.7	-95.2	-47.24	-13	-34.24	V
5.12531	35.16	Pk	33.8	-22.2	-95.2	-48.44	-13	-35.44	H
6.90703	34.59	Pk	36.1	-20.8	-95.2	-45.31	-13	-32.31	H
7.12641	34.69	Pk	36.8	-20.5	-95.2	-44.21	-13	-31.21	V
High Channel, 1765.1MHz + 1775MHz									
3.66891	37.06	Pk	30.2	-24.7	-95.2	-52.64	-13	-39.64	H
3.71016	36.81	Pk	30.4	-24.7	-95.2	-52.69	-13	-39.69	V
5.09766	35.46	Pk	33.9	-21.7	-95.2	-47.54	-13	-34.54	H
5.09906	34.42	Pk	33.9	-21.7	-95.2	-48.58	-13	-35.58	V
7.19813	33.52	Pk	37.1	-19.8	-95.2	-44.38	-13	-31.38	V
7.21688	33.71	Pk	37.2	-19.6	-95.2	-43.89	-13	-30.89	H

## 10.2.5. LTE BAND 66C

### LIMIT

FCC: §27.53 (h)

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 66C (20.0MHZ + 20.0MHZ BANDWIDTH)

Project #:	13571607
Date:	04/06/2021
Test Engineer:	50822
Configuration:	EUT only
Mode	Band 66B QPSK 20MHz + 20MHz
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBm)	Det	AF T962 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1720MHz + 1739.8MHz									
3.825	38.53	Pk	31	-24.7	-95.2	-50.37	-13	-37.37	V
3.855	36.93	Pk	31.1	-24.2	-95.2	-51.37	-13	-38.37	H
5.71359	36.59	Pk	33	-21.6	-95.2	-47.21	-13	-34.21	H
5.98172	35.41	Pk	34.4	-22	-95.2	-47.39	-13	-34.39	V
8.08875	34.64	Pk	37.2	-19.2	-95.2	-42.56	-13	-29.56	H
8.15719	34.02	Pk	37.3	-19.7	-95.2	-43.58	-13	-30.58	V
Mid Channel, 1745.1MHz + 1764.9MHz									
3.72047	36.61	Pk	30.4	-24.9	-95.2	-53.09	-13	-40.09	V
3.75984	36.89	Pk	30.6	-24.9	-95.2	-52.61	-13	-39.61	H
6.00656	34.09	Pk	34.5	-22	-95.2	-48.61	-13	-35.61	H
6.03844	35.22	Pk	34.6	-22.5	-95.2	-47.88	-13	-34.88	V
8.12109	34.02	Pk	37.2	-19.7	-95.2	-43.68	-13	-30.68	V
8.17078	35.48	Pk	37.3	-20.1	-95.2	-42.52	-13	-29.52	H
High Channel, 1750.2MHz + 1770MHz									
3.675	37.35	Pk	30.2	-24.8	-95.2	-52.45	-13	-39.45	V
3.71672	37.12	Pk	30.4	-24.9	-95.2	-52.58	-13	-39.58	H
5.76234	35.29	Pk	33.1	-22.2	-95.2	-49.01	-13	-36.01	V
5.90719	35.23	Pk	34.1	-22.5	-95.2	-48.37	-13	-35.37	H
7.77422	34.75	Pk	37.2	-19.4	-95.2	-42.65	-13	-29.65	V
7.78172	35.33	Pk	37.2	-19.2	-95.2	-41.87	-13	-28.87	H

### **10.3. 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**

### 10.3.1. 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 #:	13571607
Date:	05/01/2021
Test Engineer:	50822
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
<b>Low Channel, 829MHz + 838.9MHz</b>										
1.66682	41.06	Pk	25	-27.9	.7	-95.2	-56.34	-13	-43.34	H
1.68734	38.49	Pk	25	-27.7	.7	-95.2	-58.71	-13	-45.71	V
2.50001	46.58	Pk	29	-26.5	.6	-95.2	-45.52	-13	-32.52	H
2.50019	44.79	Pk	29	-26.6	.6	-95.2	-47.41	-13	-34.41	V
3.2102	37.21	Pk	31.3	-25.7	.5	-95.2	-51.89	-13	-38.89	H
3.21825	37.74	Pk	31.3	-25.5	.5	-95.2	-51.16	-13	-38.16	V
<b>Mid Channel, 831.6MHz + 841.5MHz</b>										
1.60165	38.57	Pk	24.8	-27.9	.7	-95.2	-59.03	-13	-46.03	H
1.6722	40.35	Pk	25	-27.8	.7	-95.2	-56.95	-13	-43.95	V
2.50762	38.49	Pk	29.1	-26.5	.7	-95.2	-53.41	-13	-40.41	H
2.50778	39.17	Pk	29.1	-26.5	.7	-95.2	-52.73	-13	-39.73	V
3.22223	37.57	Pk	31.3	-25.5	.4	-95.2	-51.43	-13	-38.43	H
3.28609	37.74	Pk	31.3	-25.3	.8	-95.2	-50.66	-13	-37.66	V
<b>High Channel, 834.1MHz + 844MHz</b>										
1.67665	41.47	Pk	25	-27.8	.7	-95.2	-55.83	-13	-42.83	H
1.67737	40.26	Pk	25	-27.8	.7	-95.2	-57.04	-13	-44.04	V
2.51567	40.47	Pk	29.2	-26.5	.8	-95.2	-51.23	-13	-38.23	V
2.51576	38.79	Pk	29.2	-26.5	.8	-95.2	-52.91	-13	-39.91	H
3.24234	36.96	Pk	31.3	-25.7	.4	-95.2	-52.24	-13	-39.24	H
3.28756	37.57	Pk	31.2	-25.3	.8	-95.2	-50.93	-13	-37.93	V

### 10.3.2. 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 #:	13571607
Date:	04/01/2021
Test Engineer:	50822
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
<b>Low Channel, 2510MHz + 2529.8MHz</b>										
5.09438	36.19	Pk	33.9	-23.8	.8	-95.2	-48.11	-25	-23.11	H
5.16	34.96	Pk	33.8	-23.8	.8	-95.2	-49.44	-25	-24.44	V
8.04281	34.71	Pk	37.1	-20.4	.4	-95.2	-43.39	-25	-18.39	V
8.08641	35.04	Pk	37.2	-20.1	.3	-95.2	-42.76	-25	-17.76	H
10.49531	32.95	Pk	39.5	-16.9	.6	-95.2	-39.05	-25	-14.05	V
10.58391	33.27	Pk	39.5	-17.3	.9	-95.2	-38.83	-25	-13.83	H
<b>Mid Channel, 2525.1MHz + 2544.9MHz</b>										
5.19984	33.91	Pk	33.7	-23.6	.9	-95.2	-50.29	-25	-25.29	V
5.20828	34.99	Pk	33.6	-23.8	1	-95.2	-49.41	-25	-24.41	H
8.02125	34.67	Pk	37.1	-20.2	.3	-95.2	-43.33	-25	-18.33	H
8.04234	34.68	Pk	37.1	-20.4	.4	-95.2	-43.42	-25	-18.42	V
10.64438	32.36	Pk	39.4	-17.3	.5	-95.2	-40.24	-25	-15.24	H
10.66078	33.31	Pk	39.4	-17.4	.5	-95.2	-39.39	-25	-14.39	V
<b>High Channel, 2540.2MHz + 2560MHz</b>										
4.99641	35.08	Pk	33.6	-23	.8	-95.2	-48.72	-25	-23.72	V
5.15391	34.78	Pk	33.8	-23.9	.8	-95.2	-49.72	-25	-24.72	H
8.33391	33.4	Pk	37.5	-20.2	.3	-95.2	-44.2	-25	-19.2	V
8.53031	34.68	Pk	37.5	-19.9	.3	-95.2	-42.62	-25	-17.62	H
10.76438	34.37	Pk	39.2	-17.2	.9	-95.2	-37.93	-25	-12.93	V
11.10984	33.24	Pk	39.2	-17.1	.9	-95.2	-38.96	-25	-13.96	H

**10.3.3. 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 #:	13571607
Date:	04/02/2021
Test Engineer:	50822
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
<b>Low Channel, 2506MHz + 2525.8MHz</b>										
4.78969	37.16	Pk	33	-24.5	.8	-95.2	-48.74	-25	-23.74	V
5.12063	34.75	Pk	33.9	-23.6	.8	-95.2	-49.35	-25	-24.35	H
7.57875	34.32	Pk	36.9	-21.4	.5	-95.2	-44.88	-25	-19.88	V
7.72547	34.08	Pk	37.1	-21	.3	-95.2	-44.72	-25	-19.72	H
9.99891	33.24	Pk	38.3	-17.3	.5	-95.2	-40.46	-25	-15.46	H
10.24547	32.78	Pk	38.8	-16.9	.8	-95.2	-39.72	-25	-14.72	V
<b>Mid Channel, 2583.1MHz + 2602.9MHz</b>										
4.78969	37.16	Pk	33	-24.5	.8	-95.2	-48.74	-25	-23.74	V
5.12063	34.75	Pk	33.9	-23.6	.8	-95.2	-49.35	-25	-24.35	H
7.57875	34.32	Pk	36.9	-21.4	.5	-95.2	-44.88	-25	-19.88	V
7.72547	34.08	Pk	37.1	-21	.3	-95.2	-44.72	-25	-19.72	H
9.99891	33.24	Pk	38.3	-17.3	.5	-95.2	-40.46	-25	-15.46	H
10.24547	32.78	Pk	38.8	-16.9	.8	-95.2	-39.72	-25	-14.72	V
<b>High Channel, 2660.2MHz + 2680MHz</b>										
5.10797	36.52	Pk	33.9	-23.6	.8	-95.2	-47.58	-25	-22.58	V
5.18484	34.74	Pk	33.6	-23.6	.8	-95.2	-49.66	-25	-24.66	H
8.00813	34.11	Pk	37.1	-20.4	.3	-95.2	-44.09	-25	-19.09	V
8.08734	34.61	Pk	37.2	-20.1	.3	-95.2	-43.19	-25	-18.19	H
10.59656	33.36	Pk	39.5	-17.4	.9	-95.2	-38.84	-25	-13.84	V
10.72969	34.4	Pk	39.3	-17.3	.7	-95.2	-38.1	-25	-13.10	H



**10.3.4. LTE BAND 66B**

**LIMIT**

FCC: §27.53 (h)

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 66B (10.0MHZ + 10.0MHZ BANDWIDTH)**

Project #:	13571607
Date:	04/07/2021
Test Engineer:	50822
Configuration:	EUT only
Mode	Band 66B QPSK 10MHz + 10MHz
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBm)	Det	AF T962 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1715MHz + 1724.9MHz									
3.86297	36.68	Pk	31.3	-24.2	-95.2	-51.42	-13	-38.42	H
3.88313	37.85	Pk	31.3	-24.3	-95.2	-50.35	-13	-37.35	V
5.09953	35.23	Pk	33.9	-21.7	-95.2	-47.77	-13	-34.77	H
5.14781	37.79	Pk	33.8	-22.4	-95.2	-46.01	-13	-33.01	V
6.89156	35.83	Pk	36.2	-21.1	-95.2	-44.27	-13	-31.27	V
7.23328	34.65	Pk	37.2	-20.3	-95.2	-43.65	-13	-30.65	H
Mid Channel, 1750.1MHz + 1760MHz									
3.5625	36.78	Pk	30.1	-25	-95.2	-53.32	-13	-40.32	H
3.6	36.74	Pk	30.1	-24.7	-95.2	-53.06	-13	-40.06	V
4.81641	36.81	Pk	33	-22.7	-95.2	-48.09	-13	-35.09	V
4.83047	37.22	Pk	33.1	-23.1	-95.2	-47.98	-13	-34.98	H
6.84891	34.7	Pk	36.1	-21	-95.2	-45.4	-13	-32.4	H
6.91828	34.55	Pk	36.3	-20.7	-95.2	-45.05	-13	-32.05	V
High Channel, 1765.1MHz + 1775MHz									
3.91266	36.36	Pk	31.5	-24	-95.2	-51.34	-13	-38.34	V
3.9225	36.68	Pk	31.5	-23.9	-95.2	-50.92	-13	-37.92	H
5.3925	35.88	Pk	32.9	-22.6	-95.2	-49.02	-13	-36.02	H
5.55609	37.14	Pk	33.2	-23.3	-95.2	-48.16	-13	-35.16	V
7.63922	35.58	Pk	36.9	-21.3	-95.2	-44.02	-13	-31.02	V
7.78313	34.86	Pk	37.2	-19.2	-95.2	-42.34	-13	-29.34	H

### 10.3.5. LTE BAND 66C

#### LIMIT

FCC: §27.53 (h)

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 66C (20.0MHZ + 20.0MHZ BANDWIDTH)

Project #:	13571607
Date:	04/07/2021
Test Engineer:	50822
Configuration:	EUT only
Mode	Band 66B QPSK 20MHz + 20MHz
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBm)	Det	AF T962 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1720MHz + 1739.8MHz									
3.78047	38.09	Pk	30.8	-25	-95.2	-51.31	-13	-38.31	H
3.80766	37.01	Pk	30.9	-24.6	-95.2	-51.89	-13	-38.89	V
5.08266	34.89	Pk	33.8	-21.8	-95.2	-48.31	-13	-35.31	H
5.09484	34.02	Pk	33.9	-21.7	-95.2	-48.98	-13	-35.98	V
7.21594	32.95	Pk	37.2	-19.6	-95.2	-44.65	-13	-31.65	V
7.22156	34.14	Pk	37.1	-19.7	-95.2	-43.66	-13	-30.66	H
Mid Channel, 1745.1MHz + 1764.9MHz									
3.77531	38.17	Pk	30.7	-25	-95.2	-51.33	-13	-38.33	V
3.81797	36.99	Pk	30.9	-24.6	-95.2	-51.91	-13	-38.91	H
5.59594	36.11	Pk	33.3	-22.9	-95.2	-48.69	-13	-35.69	H
5.65031	35.55	Pk	33.1	-21.9	-95.2	-48.45	-13	-35.45	V
7.76203	35.37	Pk	37.1	-19.6	-95.2	-42.33	-13	-29.33	H
7.79391	34.13	Pk	37.2	-19.1	-95.2	-42.97	-13	-29.97	V
High Channel, 1750.2MHz + 1770MHz									
3.79172	38.04	Pk	30.8	-24.8	-95.2	-51.16	-13	-38.16	H
3.80672	36.72	Pk	30.9	-24.6	-95.2	-52.18	-13	-39.18	V
5.04375	34.95	Pk	33.7	-22	-95.2	-48.55	-13	-35.55	H
5.10047	35.56	Pk	33.9	-21.8	-95.2	-47.54	-13	-34.54	V
7.22578	33.81	Pk	37.1	-19.8	-95.2	-44.09	-13	-31.09	V
7.26094	34.95	Pk	37.1	-20.5	-95.2	-43.65	-13	-30.65	H

## 10.4. 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

**10.4.1. 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 #:	13571607
Date:	04/06/2021
Test Engineer:	50822
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										
5.06625	36.25	Pk	33.8	-23.5	.6	-95.2	-48.05	-25	-23.05	H
5.10281	35.19	Pk	34	-23.8	.8	-95.2	-49.01	-25	-24.01	V
7.63406	33.71	Pk	36.9	-21.1	.4	-95.2	-45.29	-25	-20.29	H
7.67344	34.15	Pk	37	-20.9	.4	-95.2	-44.55	-25	-19.55	V
11.01	32.81	Pk	39.4	-17	.6	-95.2	-39.39	-25	-14.39	V
11.05031	33.95	Pk	39.4	-17.1	.6	-95.2	-38.35	-25	-13.35	H
Mid Channel, 2525.1MHz + 2544.9MHz										
5.58047	35.41	Pk	33.2	-23.5	.4	-95.2	-49.69	-25	-24.69	H
5.61328	35.86	Pk	33.2	-23.3	.7	-95.2	-48.74	-25	-23.74	V
7.27781	34.75	Pk	37.1	-20.4	.4	-95.2	-43.35	-25	-18.35	V
7.67391	35.8	Pk	37	-21	.4	-95.2	-43	-25	-18	H
10.5	32.95	Pk	39.5	-17	.6	-95.2	-39.15	-25	-14.15	V
10.58156	33.87	Pk	39.5	-17.2	.9	-95.2	-38.13	-25	-13.13	H
High Channel, 2540.2MHz + 2560MHz										
5.51297	34.46	Pk	33.2	-23.4	.9	-95.2	-50.04	-25	-25.04	V
5.51484	35.38	Pk	33.2	-23.5	.9	-95.2	-49.22	-25	-24.22	H
8.11875	34.7	Pk	37.2	-20.5	.3	-95.2	-43.5	-25	-18.5	H
8.25234	35.75	Pk	37.4	-20.6	.3	-95.2	-42.35	-25	-17.35	V
11.00391	33.64	Pk	39.4	-16.9	.6	-95.2	-38.46	-25	-13.46	H
11.12719	33.86	Pk	39.2	-17.1	.8	-95.2	-38.44	-25	-13.44	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 #:	13571607
Date:	04/06/2021
Test Engineer:	50822
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										
5.53313	36.34	Pk	33.2	-23.5	.9	-95.2	-48.26	-25	-23.26	H
5.53969	34.99	Pk	33.2	-23.5	.8	-95.2	-49.71	-25	-24.71	V
8.69813	33.66	Pk	37.5	-19.5	.4	-95.2	-43.14	-25	-18.14	V
8.73328	33.72	Pk	37.5	-19.5	.3	-95.2	-43.18	-25	-18.18	H
11.33625	34.23	Pk	39.2	-17.5	.5	-95.2	-38.77	-25	-13.77	H
11.43984	32.21	Pk	39.3	-17.1	.7	-95.2	-40.09	-25	-15.09	V
Mid Channel, 2583.1MHz + 2602.9MHz										
5.17641	36.61	Pk	33.7	-23.6	.7	-95.2	-47.79	-25	-22.79	H
5.17641	34.9	Pk	33.7	-23.6	.7	-95.2	-49.5	-25	-24.5	V
7.35938	33.89	Pk	37	-21.2	.5	-95.2	-45.01	-25	-20.01	V
7.36078	34.43	Pk	37	-21.3	.5	-95.2	-44.57	-25	-19.57	H
10.70719	34.25	Pk	39.3	-17.4	.5	-95.2	-38.55	-25	-13.55	H
10.7475	32.8	Pk	39.3	-17	.8	-95.2	-39.3	-25	-14.3	V
High Channel, 2660.2MHz + 2680MHz										
5.07516	36.09	Pk	33.8	-23.6	.7	-95.2	-48.21	-25	-23.21	H
5.12203	36.19	Pk	33.9	-23.6	.8	-95.2	-47.91	-25	-22.91	V
7.70578	34.84	Pk	37	-20.9	.5	-95.2	-43.76	-25	-18.76	H
7.90594	34.56	Pk	37.3	-20	.4	-95.2	-42.94	-25	-17.94	V
10.69031	33.29	Pk	39.4	-17.1	.5	-95.2	-39.11	-25	-14.11	H
11.00016	32.99	Pk	39.4	-16.8	.6	-95.2	-39.01	-25	-14.01	V

### 10.4.3. LTE BAND 66B

#### LIMIT

FCC: §27.53 (h)

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 66B (10.0MHZ + 10.0MHZ BANDWIDTH)

Project #:	13571607
Date:	04/07/2021
Test Engineer:	50822
Configuration:	EUT only
Mode	Band 66B QPSK 10MHz + 10MHz
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBm)	Det	AF T962 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1715MHz + 1724.9MHz									
3.90797	36.17	Pk	31.4	-24	-95.2	-51.63	-13	-38.63	V
3.93	36.81	Pk	31.5	-23.8	-95.2	-50.69	-13	-37.69	H
5.19656	36.77	Pk	33.7	-23.6	-95.2	-48.33	-13	-35.33	V
6.01688	36.17	Pk	34.5	-22.2	-95.2	-46.73	-13	-33.73	H
7.19766	34.7	Pk	37.1	-19.9	-95.2	-43.3	-13	-30.3	H
7.22438	33.93	Pk	37.1	-19.8	-95.2	-43.97	-13	-30.97	V
Mid Channel, 1750.1MHz + 1760MHz									
3.86156	37.06	Pk	31.3	-24.2	-95.2	-51.04	-13	-38.04	H
3.97313	36.47	Pk	31.6	-24.3	-95.2	-51.43	-13	-38.43	V
5.00391	36.46	Pk	33.7	-23.1	-95.2	-48.14	-13	-35.14	V
5.08734	36.19	Pk	33.8	-21.7	-95.2	-46.91	-13	-33.91	H
7.21078	35.23	Pk	37.1	-19.6	-95.2	-42.47	-13	-29.47	V
7.22203	34.44	Pk	37.1	-19.7	-95.2	-43.36	-13	-30.36	H
High Channel, 1765.1MHz + 1775MHz									
4.13484	35.82	Pk	31.8	-23.6	-95.2	-51.18	-13	-38.18	V
4.13531	37.31	Pk	31.9	-23.6	-95.2	-49.59	-13	-36.59	H
5.67844	34.6	Pk	33.1	-21.3	-95.2	-48.8	-13	-35.8	V
5.6925	35.88	Pk	33	-21.4	-95.2	-47.72	-13	-34.72	H
7.21594	34.91	Pk	37.2	-19.6	-95.2	-42.69	-13	-29.69	V
7.2975	34.81	Pk	37	-21	-95.2	-44.39	-13	-31.39	H

### 10.4.4. LTE BAND 66C

#### LIMIT

FCC: §27.53 (h)

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 66C (20.0MHZ + 20.0MHZ BANDWIDTH)

Project #:	13571607
Date:	04/07/2021
Test Engineer:	50822
Configuration:	EUT only
Mode	Band 66B QPSK 10MHz + 10MHz
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBm)	Det	AF T962 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1720MHz + 1739.8MHz									
3.91594	35.44	Pk	31.5	-23.9	-95.2	-52.16	-13	-39.16	V
3.92203	36.52	Pk	31.5	-23.9	-95.2	-51.08	-13	-38.08	H
5.58891	36.32	Pk	33.2	-23.1	-95.2	-48.78	-13	-35.78	H
5.68641	34.06	Pk	33.1	-21.4	-95.2	-49.44	-13	-36.44	V
7.18594	34.59	Pk	36.9	-20.3	-95.2	-44.01	-13	-31.01	H
7.215	33.19	Pk	37.2	-19.6	-95.2	-44.41	-13	-31.41	V
Mid Channel, 1745.1MHz + 1764.9MHz									
3.91219	36.47	Pk	31.4	-24	-95.2	-51.33	-13	-38.33	H
3.93656	35.55	Pk	31.6	-23.9	-95.2	-51.95	-13	-38.95	V
5.58844	36.71	Pk	33.2	-23.1	-95.2	-48.39	-13	-35.39	H
5.65781	35.98	Pk	33.1	-21.8	-95.2	-47.92	-13	-34.92	V
6.94547	35.93	Pk	36.3	-21.2	-95.2	-44.17	-13	-31.17	V
7.75172	34.36	Pk	37.1	-19.6	-95.2	-43.34	-13	-30.34	H
High Channel, 1750.2MHz + 1770MHz									
3.91547	36.29	Pk	31.5	-23.9	-95.2	-51.31	-13	-38.31	V
3.97547	36.9	Pk	31.5	-24.3	-95.2	-51.1	-13	-38.1	H
5.05969	35.63	Pk	33.8	-22	-95.2	-47.77	-13	-34.77	V
5.10516	35.28	Pk	34	-21.8	-95.2	-47.72	-13	-34.72	H
7.14656	34.02	Pk	36.8	-19.8	-95.2	-44.18	-13	-31.18	V
7.17609	34.67	Pk	37.1	-20.3	-95.2	-43.73	-13	-30.73	H



## 10.5. 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

### 10.5.1. 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 #:	13571607
Date:	04/08/2021
Test Engineer:	50822
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										
5.11125	36.25	Pk	33.9	-23.7	.8	-95.2	-47.95	-25	-22.95	H
5.17734	36.17	Pk	33.7	-23.6	.7	-95.2	-48.23	-25	-23.23	V
7.20563	35.34	Pk	37	-21	.4	-95.2	-43.46	-25	-18.46	V
7.33078	34.59	Pk	37	-21	.3	-95.2	-44.31	-25	-19.31	H
10.27266	33.06	Pk	38.9	-17.4	.7	-95.2	-39.94	-25	-14.94	V
10.35703	32.9	Pk	39.2	-17.3	.8	-95.2	-39.6	-25	-14.6	H
Mid Channel, 2525.1MHz + 2544.9MHz										
5.11781	35.61	Pk	33.9	-23.6	.8	-95.2	-48.49	-25	-23.49	V
5.16703	35.54	Pk	33.7	-23.8	.7	-95.2	-49.06	-25	-24.06	H
7.82625	33.74	Pk	37.3	-20.5	.4	-95.2	-44.26	-25	-19.26	V
7.90406	35.21	Pk	37.3	-20	.4	-95.2	-42.29	-25	-17.29	H
10.58063	34.4	Pk	39.5	-17.2	.9	-95.2	-37.6	-25	-12.6	H
10.64484	33.7	Pk	39.4	-17.3	.5	-95.2	-38.9	-25	-13.9	V
High Channel, 2540.2MHz + 2560MHz										
5.06063	35.81	Pk	33.8	-23.4	.6	-95.2	-48.39	-25	-23.39	H
5.0625	35.22	Pk	33.9	-23.4	.6	-95.2	-48.88	-25	-23.88	V
7.90781	35.33	Pk	37.2	-20	.4	-95.2	-42.27	-25	-17.27	H
7.91016	34.23	Pk	37.2	-20.1	.3	-95.2	-43.57	-25	-18.57	V
10.65047	34.22	Pk	39.4	-17.4	.5	-95.2	-38.48	-25	-13.48	V
11.02406	34	Pk	39.4	-17.3	.5	-95.2	-38.6	-25	-13.6	H

**10.5.2. 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 #:	13571607
Date:	04/08/2021
Test Engineer:	50822
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										
5.025	35.84	Pk	33.7	-23.4	.7	-95.2	-48.36	-25	-23.36	H
5.06203	34.92	Pk	33.9	-23.4	.6	-95.2	-49.18	-25	-24.18	V
7.81031	35.09	Pk	37.3	-20.9	.4	-95.2	-43.31	-25	-18.31	V
7.82766	34.74	Pk	37.3	-20.4	.3	-95.2	-43.26	-25	-18.26	H
11.29875	33.34	Pk	39.2	-17.3	.7	-95.2	-39.26	-25	-14.26	V
11.3625	34.3	Pk	39.2	-17.2	.7	-95.2	-38.2	-25	-13.2	H
Mid Channel, 2583.1MHz + 2602.9MHz										
5.08359	35.75	Pk	33.8	-23.8	.8	-95.2	-48.65	-25	-23.65	V
5.10047	35.67	Pk	33.9	-23.8	.8	-95.2	-48.63	-25	-23.63	H
8.13797	35.07	Pk	37.3	-20.4	.3	-95.2	-42.93	-25	-17.93	H
8.14313	34.26	Pk	37.3	-20.3	.3	-95.2	-43.64	-25	-18.64	V
10.37578	33.11	Pk	39.3	-17	.8	-95.2	-38.99	-25	-13.99	V
10.41563	33.58	Pk	39.3	-17.1	.8	-95.2	-38.62	-25	-13.62	H
High Channel, 2660.2MHz + 2680MHz										
5.09438	36.78	Pk	33.9	-23.8	.8	-95.2	-47.52	-25	-22.52	V
5.20594	35.08	Pk	33.6	-23.7	.9	-95.2	-49.32	-25	-24.32	H
7.25438	35.05	Pk	37.2	-21.3	.5	-95.2	-43.75	-25	-18.75	V
7.26703	35.02	Pk	37.2	-20.7	.5	-95.2	-43.18	-25	-18.18	H
10.29516	33.2	Pk	39	-17.3	.6	-95.2	-39.7	-25	-14.7	V
10.52109	34.37	Pk	39.5	-17.4	.5	-95.2	-38.23	-25	-13.23	H

### 10.5.3. 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 #:	13571607
Date:	04/12/2021
Test Engineer:	50822
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										
7.28441	29.12	RMS	37.1	-20.3	.5	-95.2	-48.78	-40	-8.78	V
7.35542	28.99	RMS	36.9	-21.1	.7	-95.2	-49.71	-40	-9.71	H
10.24292	26.58	RMS	38.8	-16.9	.6	-95.2	-46.12	-40	-6.12	V
10.38516	26.58	RMS	39.2	-17.1	.5	-95.2	-46.02	-40	-6.02	H
13.60464	27.74	RMS	40.2	-18.7	.6	-95.2	-45.36	-40	-5.36	V
13.85851	26.74	RMS	40.6	-18.3	.7	-95.2	-45.46	-40	-5.46	H
Mid Channel, 3615.1MHz + 3634.9MHz										
7.27607	28.8	RMS	37.1	-20.4	.5	-95.2	-49.2	-40	-9.2	V
7.36552	28.09	RMS	36.9	-21.3	.7	-95.2	-50.81	-40	-10.81	H
10.50453	22.35	RMS	39.5	-17	.6	-95.2	-49.75	-40	-9.75	H
10.61248	21.64	RMS	39.5	-17.1	.6	-95.2	-50.56	-40	-10.56	V
14.36837	22.32	RMS	41.4	-18.7	.8	-95.2	-49.38	-40	-9.38	V
14.42918	23.05	RMS	41.4	-18.8	.8	-95.2	-48.75	-40	-8.75	H
High Channel, 3670.2MHz + 3690MHz										
7.27941	28.03	RMS	37.1	-20.4	.5	-95.2	-49.97	-40	-9.97	H
7.31352	28.38	RMS	37.1	-21.2	.5	-95.2	-50.42	-40	-10.42	V
10.57344	26.84	RMS	39.5	-17.1	.6	-95.2	-45.36	-40	-5.36	H
10.61361	26.01	RMS	39.5	-17.1	.6	-95.2	-46.19	-40	-6.19	V
14.09715	27.86	RMS	40.9	-18.6	.7	-95.2	-44.34	-40	-4.34	V
14.13228	27.8	RMS	41	-19	.8	-95.2	-44.6	-40	-4.6	H

### 10.5.4. LTE BAND 66B

#### LIMIT

FCC: §27.53 (h)

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 66B (10.0MHZ + 10.0MHZ BANDWIDTH)

Project #:	13571607
Date:	04/08/2021
Test Engineer:	50822
Configuration:	EUT only
Mode	Band 66B QPSK 10MHz + 10MHz
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBm)	Det	AF T962 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1715MHz + 1724.9MHz									
3.75891	38	Pk	30.6	-24.8	-95.2	-51.4	-13	-38.4	H
3.96844	37.09	Pk	31.6	-24.3	-95.2	-50.81	-13	-37.81	V
5.07469	35.46	Pk	33.8	-21.9	-95.2	-47.84	-13	-34.84	H
5.1	34.95	Pk	33.9	-21.8	-95.2	-48.15	-13	-35.15	V
7.73344	34.36	Pk	37.1	-19.5	-95.2	-43.24	-13	-30.24	V
8.02125	35.71	Pk	37.1	-19.7	-95.2	-42.09	-13	-29.09	H
Mid Channel, 1750.1MHz + 1760MHz									
3.95203	36.22	Pk	31.6	-24.3	-95.2	-51.68	-13	-38.68	V
3.96703	37.22	Pk	31.6	-24.3	-95.2	-50.68	-13	-37.68	H
5.0475	37.33	Pk	33.8	-22	-95.2	-46.07	-13	-33.07	H
5.06203	35.53	Pk	33.9	-22	-95.2	-47.77	-13	-34.77	V
7.31344	35.78	Pk	37.1	-21.4	-95.2	-43.72	-13	-30.72	H
7.80891	34.17	Pk	37.3	-19.3	-95.2	-43.03	-13	-30.03	V
High Channel, 1765.1MHz + 1775MHz									
3.93656	35.18	Pk	31.6	-23.9	-95.2	-52.32	-13	-39.32	V
3.97313	37.01	Pk	31.6	-24.3	-95.2	-50.89	-13	-37.89	H
5.51813	36.12	Pk	33.2	-23.6	-95.2	-49.48	-13	-36.48	V
5.62922	35.87	Pk	33.2	-22.4	-95.2	-48.53	-13	-35.53	H
7.80047	33.39	Pk	37.2	-19.1	-95.2	-43.71	-13	-30.71	V
7.81219	35.63	Pk	37.3	-19.4	-95.2	-41.67	-13	-28.67	H

### 10.5.5. LTE BAND 66C

#### LIMIT

FCC: §27.53 (h)

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 66C (20.0MHZ + 20.0MHZ BANDWIDTH)

Project #:	13571607
Date:	04/08/2021
Test Engineer:	50822
Configuration:	EUT only
Mode	Band 66B QPSK 10MHz + 10MHz
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBm)	Det	AF T962 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1720MHz + 1739.8MHz									
3.915	36.49	Pk	31.5	-24	-95.2	-51.21	-13	-38.21	H
3.93563	37	Pk	31.6	-23.9	-95.2	-50.5	-13	-37.5	V
5.08781	35.39	Pk	33.8	-21.7	-95.2	-47.71	-13	-34.71	H
5.13797	36.5	Pk	33.9	-22.4	-95.2	-47.2	-13	-34.2	V
7.38422	35.08	Pk	37	-20.7	-95.2	-43.82	-13	-30.82	H
7.75078	35.59	Pk	37.1	-19.6	-95.2	-42.11	-13	-29.11	V
Mid Channel, 1745.1MHz + 1764.9MHz									
3.80906	37.17	Pk	30.9	-24.6	-95.2	-51.73	-13	-38.73	V
3.85266	36.74	Pk	31.1	-24.3	-95.2	-51.66	-13	-38.66	H
5.11078	35.37	Pk	33.9	-22	-95.2	-47.93	-13	-34.93	V
5.13844	36.15	Pk	33.9	-22.4	-95.2	-47.55	-13	-34.55	H
6.96563	36.71	Pk	36.4	-21.4	-95.2	-43.49	-13	-30.49	H
7.14609	34.09	Pk	36.8	-19.8	-95.2	-44.11	-13	-31.11	V
High Channel, 1750.2MHz + 1770MHz									
4.19203	36.2	Pk	31.9	-22.9	-95.2	-50	-13	-37	H
4.78594	37.33	Pk	33	-22.6	-95.2	-47.47	-13	-34.47	V
5.68406	35.7	Pk	33.1	-21.3	-95.2	-47.7	-13	-34.7	H
6.84844	35.61	Pk	36.1	-21.1	-95.2	-44.59	-13	-31.59	V
8.29828	35.05	Pk	37.5	-20	-95.2	-42.65	-13	-29.65	H
8.48391	35.38	Pk	37.5	-19.4	-95.2	-41.72	-13	-28.72	V

## **10.6. 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**



**10.6.1. LTE BAND 48**

**LIMIT**

FCC: §96.41

(e) 3.5 GHz Emissions and Interference Limits—

(2) Additional protection levels. Notwithstanding paragraph (d)(1) of this section, the conducted power of any emissions below 3530 MHz or above 3720 MHz shall not exceed -40dBm/MHz.

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

Project #:	13571607
Date:	04/01/2021
Test Engineer:	50822
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										
7.23228	29.59	RMS	37.2	-21.2	.5	-95.2	-49.11	-40	-9.11	H
7.28128	28.64	RMS	37.1	-20.3	.5	-95.2	-49.26	-40	-9.26	V
10.69592	27.63	RMS	39.4	-17.2	.5	-95.2	-44.87	-40	-4.87	H
10.69593	27.37	RMS	39.4	-17.2	.5	-95.2	-45.13	-40	-5.13	V
13.47235	27.22	RMS	40	-18.2	.8	-95.2	-45.38	-40	-5.38	V
13.53273	27.22	RMS	40	-18.4	.7	-95.2	-45.68	-40	-5.68	H
Mid Channel, 3615.1MHz + 3634.9MHz										
7.22391	29.21	RMS	37.1	-20.9	.5	-95.2	-49.29	-40	-9.29	V
7.23469	29.28	RMS	37.2	-21.3	.5	-95.2	-49.52	-40	-9.52	H
10.24831	27.5	RMS	38.9	-16.9	.6	-95.2	-45.1	-40	-5.1	V
10.29372	27.35	RMS	38.9	-17.3	.6	-95.2	-45.65	-40	-5.65	H
13.28697	27.24	RMS	40	-18.1	.9	-95.2	-45.16	-40	-5.16	H
13.34413	26.66	RMS	39.8	-18.5	.6	-95.2	-46.64	-40	-6.64	V
High Channel, 3670.2MHz + 3690MHz										
7.22202	28.78	RMS	37.1	-20.9	.5	-95.2	-49.72	-40	-9.72	H
7.28789	31.81	RMS	37.2	-20.4	.5	-95.2	-46.09	-40	-6.09	V
11.24779	28.42	RMS	39.1	-17.3	.9	-95.2	-44.08	-40	-4.08	V
11.28502	26.35	RMS	39.2	-17.5	.7	-95.2	-46.45	-40	-6.45	H
14.32961	27.89	RMS	41.3	-19	.8	-95.2	-44.21	-40	-4.21	H
14.39607	27.97	RMS	41.4	-19	.8	-95.2	-44.03	-40	-4.03	V

## **10.7. FIELD STRENGTH OF SPURIOUS RADIATION, ANT8**

### **TEST PROCEDURE**

KDB 971168 D01/D02 v02r01

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

### **RESULTS**

**10.7.1. 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 #:	13571607
Date:	04/12/2021
Test Engineer:	50822
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										
7.03151	29.22	RMS	36.5	-21.3	.6	-95.2	-50.18	-40	-10.18	H
7.04067	29.37	RMS	36.6	-21.3	.8	-95.2	-49.73	-40	-9.73	V
9.64124	27.28	RMS	38.7	-17.7	.7	-95.2	-46.22	-40	-6.22	H
9.80185	27.99	RMS	38.6	-17.7	.8	-95.2	-45.51	-40	-5.51	V
12.85885	27.07	RMS	40.2	-18.2	.9	-95.2	-45.23	-40	-5.23	V
13.10905	27.08	RMS	40.3	-18.3	.7	-95.2	-45.42	-40	-5.42	H
Mid Channel, 3615.1MHz + 3634.9MHz										
7.0457	29.66	RMS	36.6	-21.4	.8	-95.2	-49.54	-40	-9.54	H
7.29599	29.24	RMS	37.1	-20.7	.6	-95.2	-48.96	-40	-8.96	V
9.88175	26.92	RMS	38.5	-17.7	.7	-95.2	-46.78	-40	-6.78	V
10.05268	25.76	RMS	38.4	-17.4	.6	-95.2	-47.84	-40	-7.84	H
13.5319	27.69	RMS	40	-18.4	.7	-95.2	-45.21	-40	-5.21	V
13.53226	27.53	RMS	40	-18.4	.7	-95.2	-45.37	-40	-5.37	H
High Channel, 3670.2MHz + 3690MHz										
7.23202	29.19	RMS	37.2	-21.2	.5	-95.2	-49.51	-40	-9.51	H
7.29162	28.92	RMS	37.1	-20.6	.6	-95.2	-49.18	-40	-9.18	V
10.57131	26.41	RMS	39.5	-17.1	.6	-95.2	-45.79	-40	-5.79	V
10.6828	26.89	RMS	39.4	-17.1	.6	-95.2	-45.41	-40	-5.41	H
13.83456	27.26	RMS	40.6	-18.6	.8	-95.2	-45.14	-40	-5.14	V
13.90045	27.74	RMS	40.6	-18.8	.7	-95.2	-44.96	-40	-4.96	H

## **10.8. 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**

**10.8.1. 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 #:	13571607
Date:	04/12/2021
Test Engineer:	50822
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										
7.04743	29.24	RMS	36.6	-21.4	.9	-95.2	-49.86	-40	-9.86	V
7.05235	29.26	RMS	36.5	-21.4	.9	-95.2	-49.94	-40	-9.94	H
10.74831	26.99	RMS	39.3	-17	.6	-95.2	-45.31	-40	-5.31	V
10.95817	26.16	RMS	39.4	-17.2	.6	-95.2	-46.24	-40	-6.24	H
14.30915	27.58	RMS	41.3	-18.8	.7	-95.2	-44.42	-40	-4.42	V
14.36014	26.97	RMS	41.5	-18.6	.9	-95.2	-44.43	-40	-4.43	H
Mid Channel, 3615.1MHz + 3634.9MHz										
7.28848	29.25	RMS	37.2	-20.5	.5	-95.2	-48.75	-40	-8.75	V
7.29485	28.49	RMS	37.1	-20.7	.6	-95.2	-49.71	-40	-9.71	H
10.86924	26.78	RMS	39.3	-17	.4	-95.2	-45.72	-40	-5.72	V
11.05484	26.93	RMS	39.4	-17	.6	-95.2	-45.27	-40	-5.27	H
14.30869	27.88	RMS	41.3	-18.8	.7	-95.2	-44.12	-40	-4.12	V
14.43679	27.33	RMS	41.5	-18.9	.8	-95.2	-44.47	-40	-4.47	H
High Channel, 3670.2MHz + 3690MHz										
7.23807	28.63	RMS	37.2	-21.3	.5	-95.2	-50.17	-40	-10.17	H
7.30398	28.88	RMS	37.1	-21	.6	-95.2	-49.62	-40	-9.62	V
10.44996	26.09	RMS	39.4	-17	.6	-95.2	-46.11	-40	-6.11	H
10.57289	27.01	RMS	39.5	-17.1	.6	-95.2	-45.19	-40	-5.19	V
13.83743	27.75	RMS	40.6	-18.6	.8	-95.2	-44.65	-40	-4.65	V
13.88005	27.24	RMS	40.6	-18.7	.7	-95.2	-45.36	-40	-5.36	H

## 11. SETUP PHOTO

Please refer to 13571607-EP1V1 for setup photos

**END OF REPORT**