



TEST REPORT

Report Number : 13911916-E10V3

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

Model : A2595

Brand : APPLE

FCC ID : BCG-E4082A

EUT Description : SMARTPHONE

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

Date Of Issue:
FEBRUARY 11, 2022

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Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
V1	1/24/2022	Initial Review	Mengistu Mekuria
V2	2/02/2022	Corrected LTE Band 41 Output Power	John Thompson
V3	2/11/2022	Removed ULCA B66 Data	Mengistu Mekuria

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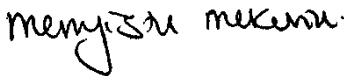

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1. ATTESTATION OF TEST RESULTS

Applicant Name and Address	APPLE, INC. 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A.	
Model	A2595	
Brand	APPLE	
FCC ID	BCG-E4082A	
EUT Description	SMARTPHONE	
Serial Number	FG114670W7R0J57NU (Conducted) AND G2HG2D1Q9D (Radiated)	
Sample Receipt Date	September 29, 2021	
Date Tested	September 29, 2021 to January 20, 2022	
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 Staff Engineer UL Verification Services Inc.	John Thompson Test 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	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	550739
<input checked="" type="checkbox"/>	Building 2: 47266 Benicia Street, Fremont, California, USA	US0104	22541	550739
<input type="checkbox"/>	Building 4: 47658 Kato Rd, Fremont, California, USA	US0104	2324B	550739

5. DECISION RULES AND MEASUREMENT UNCERTAINTY

5.1. METROLOGICAL TRACEABILITY

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

5.2. DECISION RULES

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

5.3. MEASUREMENT UNCERTAINTY

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

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

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

5.4. SAMPLE CALCULATION

RADIATED EMISSIONS

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

MAINS CONDUCTED EMISSIONS

Where relevant, the following sample calculation is provided:

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

6. EQUIPMENT UNDER TEST

6.1. DESCRIPTION OF EUT

The Apple iPhone is a smartphone with multimedia functions (music, application support, and video), cellular GSM, GPRS, EGPRS, UMTS, LTE, 5G FR1, IEEE 802.11a/b/g/n/ac/ax, Bluetooth, GPS and NFC. All models support at least one UICC based SIM. The second SIM is an UICC based e-SIM (electronic SIM) in some models. China model has 1 p-SIM only. The device supports a built-in inductive charging 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

$$\text{ERP/EIRP} = \text{PMeas} + \text{GT} - \text{LC}$$

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

PMeas = measured transmitter output power or PSD, in dBm or dBW;

GT = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);

LC = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

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

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

OUTPUT POWER FOR LTE BAND 5

Part 22H (Ant 1)								
ERP Limit (W)		7.00						
Antenna Gain (dBi)		-1.60						
Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	ERP Average (dBm)	ERP Average (W)	99% BW (kHz)	Emission Designator
3+5	QPSK	825.5	846.5	25.70	21.95	0.157	7455	7M46G7W
	16QAM			25.64	21.89	0.155	7465	7M47G7W
5+3	QPSK	826.5	847.5	25.70	21.95	0.157	7457	7M46G7W
	16QAM			25.63	21.88	0.154	7456	7M46G7W
5+10	QPSK	826.5	844.0	25.70	21.95	0.157	13846	13M8G7W
	16QAM			24.71	20.96	0.125	13847	13M8D7W
10+5	QPSK	829.0	846.5	25.70	21.95	0.157	13844	13M8G7W
	16QAM			24.72	20.97	0.125	13826	13M8D7W
10+10	QPSK	829.0	844.0	25.70	21.95	0.157	18741	18M7G7W
	16QAM			25.13	21.38	0.138	18736	18M7D7W

OUTPUT POWER FOR LTE BAND 7

Part 27 (Ant 2)								
EIRP Limit (W)		2.00						
Antenna Gain (dBi)		2.80						
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	21.70	24.50	0.282	28165	28M2G7W
	16QAM			21.05	23.85	0.243	28063	28M1D7W
20+10	QPSK	2510.0	2564.5	21.70	24.50	0.282	28132	28M1G7W
	16QAM			21.13	23.93	0.247	28108	28M1D7W
15+15	QPSK	2507.5	2562.5	21.70	24.50	0.282	28644	28M6G7W
	16QAM			21.00	23.80	0.240	28565	28M6D7W
15+20	QPSK	2507.8	2560.0	21.70	24.50	0.282	32900	32M9G7W
	16QAM			21.42	24.22	0.264	32848	32M8D7W
20+15	QPSK	2510.0	2562.2	21.70	24.50	0.282	32913	32M9G7W
	16QAM			20.96	23.76	0.238	32855	32M9D7W
20+20	QPSK	2510.0	2560.0	21.70	24.50	0.282	37745	37M7G7W
	16QAM			21.10	23.90	0.245	37753	37M8D7W

OUTPUT POWER FOR LTE BAND 41

Part 27 (Ant 2)								
EIRP Limit (W)		2.00						
Antenna Gain (dBi)		2.80						
Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)	99% BW (kHz)	Emission Designator
5+20	QPSK	2499.3	2680.0	24.20	27.00	0.501	22868	22M9G7W
	16QAM			22.78	25.58	0.361	22818	22M8D7W
20+5	QPSK	2506.0	2686.7	24.20	27.00	0.501	22756	22M8G7W
	16QAM			22.17	24.97	0.314	22835	22M8D7W
10+20	QPSK	2501.5	2680.0	24.20	27.00	0.501	27642	27M6G7W
	16QAM			22.63	25.43	0.349	27675	27M7D7W
20+10	QPSK	2506.0	2684.5	24.20	27.00	0.501	27625	27M6G7W
	16QAM			22.86	25.66	0.368	27699	27M7D7W
15+15	QPSK	2503.5	2682.5	24.20	27.00	0.501	28277	28M3G7W
	16QAM			22.80	25.60	0.363	28169	28M2D7W
15+20	QPSK	2503.8	2680.0	24.20	27.00	0.501	32548	32M5G7W
	16QAM			22.66	25.46	0.352	32646	32M6D7W
20+15	QPSK	2506.0	2682.2	24.20	27.00	0.501	32602	32M6G7W
	16QAM			22.85	25.65	0.367	32620	32M6D7W
20+20	QPSK	2506.0	2680.0	24.20	27.00	0.501	37576	37M6G7W
	16QAM			22.87	25.67	0.369	37487	37M5D7W

OUTPUT POWER FOR LTE BAND 48

Part 96 (Ant 1)								
EIRP Limit (W)/ 10MHz		0.20						
Antenna Gain (dBi)		-0.20						
Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)	99% BW (kHz)	Emission Designator
5+20	QPSK	3553.3	3690.0	22.70	22.50	0.178	22850	22M9G7W
	16QAM			22.62	22.42	0.175	22638	22M6D7W
20+5	QPSK	3560.0	3696.7	22.56	22.36	0.172	22681	22M7G7W
	16QAM			22.70	22.50	0.178	22604	22M6D7W
10+20	QPSK	3555.5	3690.0	22.70	22.50	0.178	27713	27M7G7W
	16QAM			22.62	22.42	0.175	27680	27M7D7W
20+10	QPSK	3560.0	3694.5	22.70	22.50	0.178	27780	27M8G7W
	16QAM			22.65	22.45	0.176	27723	27M7D7W
15+20	QPSK	3557.8	3690.0	22.70	22.50	0.178	32350	32M4G7W
	16QAM			22.68	22.48	0.177	32325	32M3D7W
20+15	QPSK	3560.0	3692.2	22.70	22.50	0.178	32512	32M5G7W
	16QAM			22.68	22.48	0.177	32484	32M5D7W
20+20	QPSK	3560.0	3690.0	22.70	22.50	0.178	37314	37M3G7W
	16QAM			22.51	22.31	0.170	37189	37M2D7W

OUTPUT POWER FOR LTE BAND 66C

Part 27 (Ant 1)								
EIRP Limit (W)		1.00						
Antenna Gain (dBi)		0.80						
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	25.70	26.50	0.447	23166	23M2G7W
	16QAM			24.92	25.72	0.373	23085	23M1D7W
15+10	QPSK	1717.5	1774.7	25.70	26.50	0.447	23079	23M1G7W
	16QAM			25.12	25.92	0.391	23092	23M1D7W
10+20	QPSK	1715.5	1770.0	25.70	26.50	0.447	27680	27M7G7W
	16QAM			25.14	25.94	0.393	27687	27M7D7W
20+10	QPSK	1720.0	1774.5	25.70	26.50	0.447	27670	27M7G7W
	16QAM			25.08	25.88	0.387	27755	27M8D7W
15+15	QPSK	1717.5	1772.5	25.70	26.50	0.447	28306	28M3G7W
	16QAM			25.09	25.89	0.388	28235	28M2D7W
15+20	QPSK	1717.8	1770.0	25.70	26.50	0.447	32627	32M6G7W
	16QAM			25.14	25.94	0.393	32595	32M6D7W
20+15	QPSK	1720.0	1772.2	25.70	26.50	0.447	32677	32M7G7W
	16QAM			24.92	25.72	0.373	32743	32M7D7W
20+5	QPSK	1720.0	1776.7	25.70	26.50	0.447	22791	22M8G7W
	16QAM			25.15	25.95	0.394	22817	22M8D7W
5+20	QPSK	1713.3	1770.0	25.70	26.50	0.447	22869	22M9G7W
	16QAM			24.94	25.74	0.375	22829	22M8D7W
20+20	QPSK	1720.0	1770.0	25.70	26.50	0.447	37516	37M5G7W
	16QAM			25.18	25.98	0.396	37606	37M6D7W

6.3. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was version: 0.13.02.

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 4 Antenna Gain (dBi)
LTE Band 5, 824 – 849 MHz	-1.6	-4.0	
LTE Band 7, 2500 – 2570 MHz	-2.3	2.8	
LTE Band 41, 2496 – 2690 MHz	-2.3	2.8	
LTE Band 48, 3550 – 3700 MHz	-0.2		-2.1
LTE Band 66C, 1710 – 1780 MHz	0.8	-0.1	

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, 48 and 66	Ant 1

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, and ANT 4 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	ANT4
663 – 849 MHz	X	X	N/A
1710 – 1915 MHz	X	X	N/A
2300 – 2700 MHz	Y	Y	N/A
3300 – 3980 MHz	Z	N/A	Y

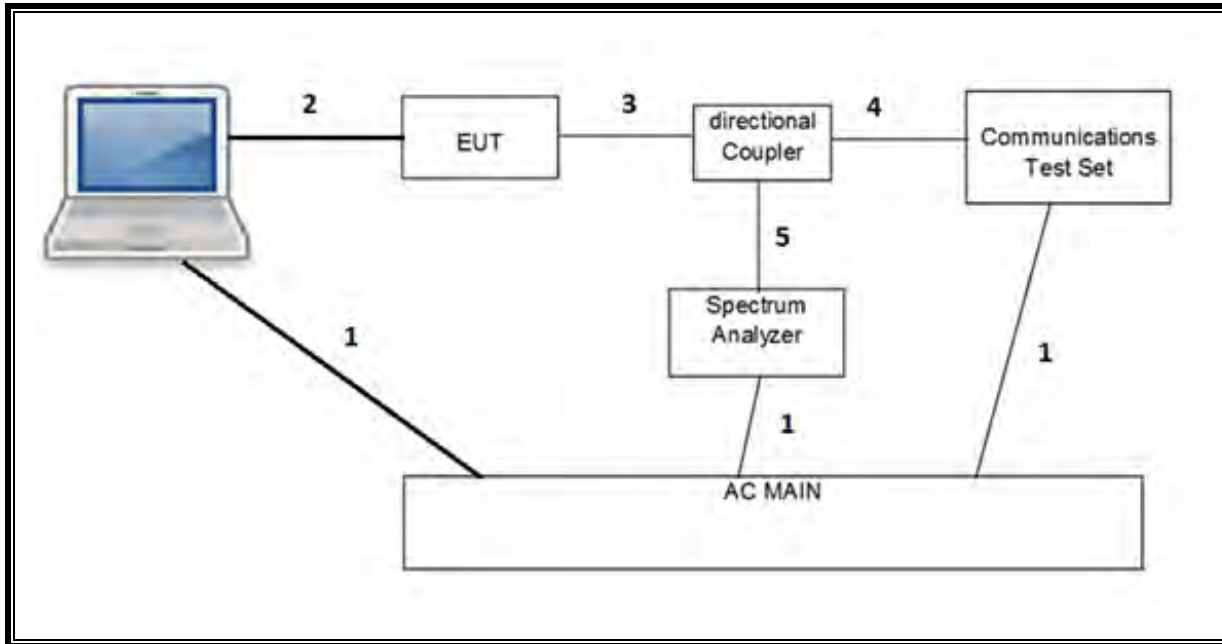
Radiated spurious emissions were investigated from 9kHz to 30MHz, 30MHz-1GHz and above 1GHz. There were no emissions found with less than 20dB of margin from 9kHz to 1GHz.

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

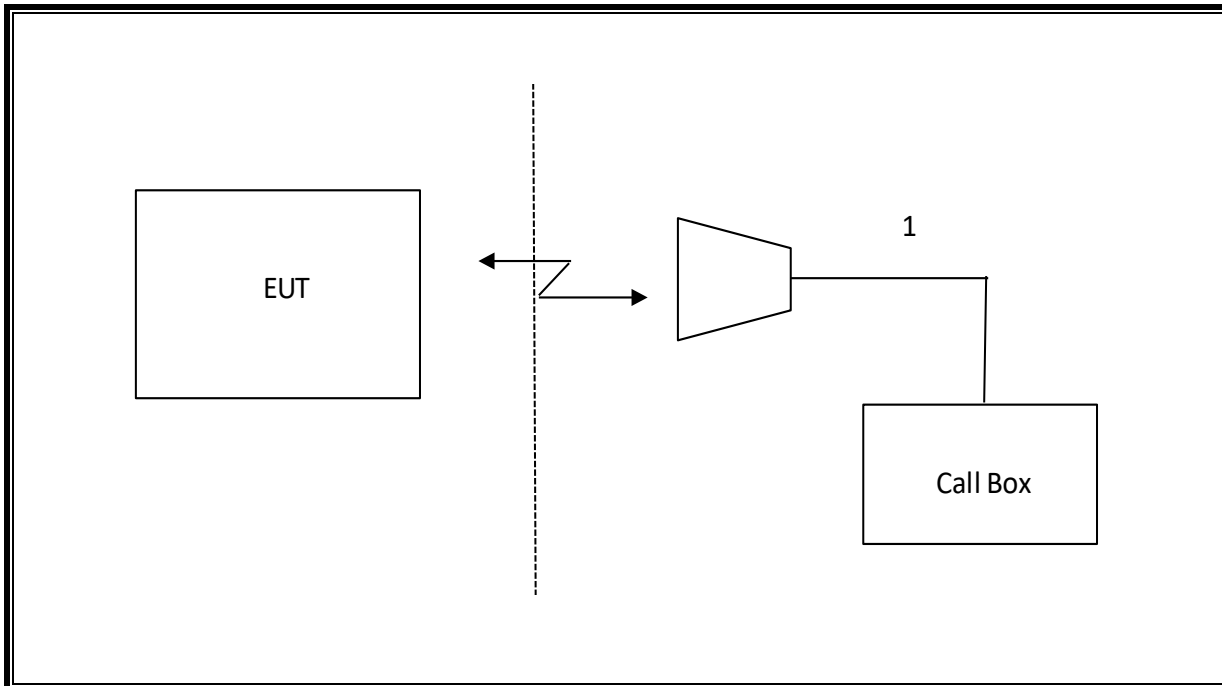
6.6. DESCRIPTION OF TEST SETUP

SUPPORT TEST EQUIPMENT						
Description	Manufacturer	Model	Serial Number	FCC ID/ DoC		
Laptop	Apple	MacBook Pro	QDS-BRCM1069	A1398		
AC/DC adapter	Apple	B123	N/A	PA-1450-BA1		
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
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	09/23/2022
Directional Coupler	KRYTAR	152610	T1536	09/23/2022
Directional Coupler	KRYTAR	152610	T1537	09/23/2022
Power Meter, P-series single channel	Keysight	N1912A	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	152043	152043	07/29/2022
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	06/16/2022
Chamber, Environmental	Cincinnati Sub Zero	ZPHS-8-3.5-SCT/WC	T1154	06/15/2022
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	05/24/2022
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	

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:	39004	Test Date:	9/29/2021
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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	25.45	25.34	24.67	23.31	23.47	22.26	21.31	20.54
			15	0	25	0	25.65	25.64	24.70	23.78	23.57	22.58	21.62	20.49
	834.0	837.9	1	14	1	0	25.42	24.84	23.50	22.70	23.79	22.75	21.81	20.74
			15	0	25	0	25.50	24.71	23.68	22.90	23.83	22.82	21.89	20.91
	842.5	846.5	1	14	1	0	25.53	25.14	23.61	22.72	22.97	22.04	21.08	20.15
			15	0	25	0	25.70	25.28	24.28	23.33	23.03	22.12	21.12	20.09

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	25.70	25.34	24.91	23.55	23.15	22.05	21.11	20.33
			25	0	15	0	25.60	25.63	24.70	23.69	23.49	22.52	21.53	20.45
	835.0	838.9	1	24	1	0	25.42	25.02	23.73	22.73	23.80	22.87	21.89	20.71
			25	0	15	0	25.47	24.63	23.60	22.67	23.87	22.84	21.84	21.01
	843.6	847.5	1	24	1	0	25.57	25.37	24.07	23.06	22.48	21.54	20.53	19.53
			25	0	15	0	25.64	25.22	24.15	23.26	22.76	21.75	20.74	19.65

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	24.84	23.66	22.78	22.63	24.50	23.57	20.82	19.60
			25	0	50	0	25.70	24.71	23.75	22.75	22.59	21.60	21.29	19.61
	831.6	838.8	1	24	1	0	24.57	23.66	22.66	21.69	24.41	23.49	21.48	19.54
			25	0	50	0	24.74	23.71	22.72	21.81	22.56	21.56	21.52	19.62
	836.8	844.0	1	24	1	0	25.36	24.31	23.42	22.45	24.45	23.54	21.62	19.44
			25	0	50	0	25.08	24.03	23.00	22.20	22.58	21.57	21.16	19.61

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	24.74	23.67	22.68	22.56	24.41	23.37	20.34	19.86
			50	0	25	0	25.70	24.72	23.71	22.68	22.56	21.56	21.41	19.63
	834.3	841.5	1	49	1	0	24.48	23.52	22.65	21.73	24.50	23.66	21.47	19.51
			50	0	25	0	24.73	23.68	22.63	21.77	22.52	21.58	21.57	19.60
	839.3	846.5	1	49	1	0	24.79	23.93	23.00	22.00	24.31	23.46	20.80	19.39
			50	0	25	0	24.71	23.83	22.79	21.83	22.51	21.54	20.86	19.51

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

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)							
							ANT 1				ANT 2			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
10MHz/ 10MHz	829.0	838.9	1	49	1	0	25.66	24.69	22.80	21.03	24.22	23.29	20.35	19.45
			1	0	1	49	15.41	15.46	15.62	15.52	13.82	13.91	14.00	13.87
			50	0	50	0	24.71	23.73	22.66	21.14	23.15	22.19	20.20	19.52
	831.5	841.4	1	49	1	0	25.70	25.04	23.16	21.19	24.50	23.31	21.00	19.49
			1	0	1	49	15.56	15.46	15.53	15.52	13.84	13.85	13.82	14.00
			50	0	50	0	24.08	23.14	23.12	21.11	22.48	21.50	21.19	19.53
	834.1	844.0	1	49	1	0	25.66	25.13	23.35	21.07	24.35	23.34	21.39	19.52
			1	0	1	49	15.53	15.42	15.71	15.51	13.87	13.91	13.92	13.88
			50	0	50	0	24.08	23.09	23.10	21.06	22.48	21.49	21.20	19.53

8.2. LTE BAND 7

Test Engineer ID:	39004	Test Date:	9/15/2021
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OUTPUT POWER FOR LTE BAND 7 (10.0MHz + 20.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)							
							ANT 1				ANT 2			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
10MHz / 20MHz	2505.5	2519.9	1	49	1	0	25.00	24.44	23.15	21.55	21.70	20.76	19.73	18.00
			50	0	100	0	23.17	22.23	22.25	20.22	19.84	18.92	18.87	16.96
	2525.6	2540.0	1	49	1	0	24.84	24.43	23.16	20.23	21.57	21.05	18.98	18.14
			50	0	100	0	23.11	22.16	22.18	20.17	19.80	18.83	18.84	16.86
	2545.6	2560.0	1	49	1	0	24.85	24.39	23.08	20.06	21.42	21.01	19.65	18.11
			50	0	100	0	23.10	22.12	22.12	20.11	19.70	18.71	18.74	16.75

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

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)							
							ANT 1				ANT 2			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
20MHz / 10MHz	2510.0	2524.4	1	99	1	0	24.98	24.50	23.80	20.32	21.70	21.13	20.11	16.91
			100	0	50	0	23.22	22.22	22.26	20.24	19.84	18.83	18.81	16.86
	2530.1	2544.5	1	99	1	0	25.00	24.52	23.69	20.22	21.47	20.89	20.37	16.84
			100	0	50	0	23.17	22.17	22.15	20.18	19.75	18.75	18.71	16.77
	2550.1	2564.5	1	99	1	0	24.99	24.44	23.83	20.28	21.58	20.97	19.62	16.78
			100	0	50	0	23.15	22.16	22.15	20.19	19.67	18.65	18.67	16.69

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

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)							
							ANT 1				ANT 2			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
15MHz / 15MHz	2507.5	2522.5	1	74	1	0	25.00	24.63	23.19	20.29	21.70	20.95	19.98	17.10
			75	0	75	0	23.26	22.30	22.34	20.30	19.83	18.85	18.93	16.86
	2527.5	2542.5	1	74	1	0	24.95	24.52	23.26	20.18	21.39	21.00	19.33	16.80
			75	0	75	0	23.21	22.27	22.27	20.25	19.75	18.76	18.78	16.78
	2547.5	2562.5	1	74	1	0	24.90	24.51	23.10	20.25	21.43	20.93	19.01	16.65
			75	0	75	0	23.19	22.22	22.25	20.22	19.65	18.65	18.73	16.66

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

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)							
							ANT 1				ANT 2			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
15MHz / 20MHz	2507.8	2524.9	1	74	1	0	25.00	24.61	23.35	20.38	21.70	21.42	19.63	17.14
			75	0	100	0	23.33	22.36	22.41	20.39	20.01	19.37	18.89	17.10
	2525.3	2542.4	1	74	1	0	24.99	24.64	23.21	20.41	20.74	20.25	19.06	16.12
			75	0	100	0	23.31	22.36	22.37	20.38	19.14	18.15	18.14	16.21
	2542.9	2560.0	1	74	1	0	25.00	24.60	23.29	20.35	21.54	21.37	19.90	16.95
			75	0	100	0	23.29	22.31	22.35	20.32	19.98	19.17	18.75	16.78

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

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)							
							ANT 1				ANT 2			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
20MHz / 15MHz	2510.0	2527.1	1	99	1	0	24.98	24.47	23.82	20.28	21.70	20.70	18.55	17.00
			100	0	75	0	23.17	22.19	22.17	20.19	20.08	18.50	18.57	16.81
	2527.6	2544.7	1	99	1	0	25.00	24.41	23.78	20.27	19.88	20.96	17.91	16.73
			100	0	75	0	23.15	22.16	22.14	20.17	19.30	18.65	18.80	16.34
	2545.1	2562.2	1	99	1	0	24.96	24.43	23.77	20.23	21.05	20.66	18.89	16.45
			100	0	75	0	23.10	22.13	22.12	20.13	19.22	18.12	18.18	16.12

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

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)							
							ANT 1				ANT 2			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
20MHz/ 20MHz	2510.0	2529.8	1	99	1	0	25.00	24.65	23.53	20.47	21.70	21.10	20.25	16.88
			1	0	1	99	15.06	15.84	14.41	13.97	10.65	11.09	10.45	9.54
			100	0	100	0	23.24	22.28	22.32	20.24	19.84	18.86	18.84	16.88
	2525.1	2544.9	1	99	1	0	25.00	24.55	23.36	20.17	21.48	20.96	19.70	16.71
			1	0	1	99	15.75	16.32	14.91	14.24	11.62	12.21	10.79	10.15
			100	0	100	0	21.87	22.24	22.23	20.25	19.53	18.78	18.75	16.83
	2540.2	2560.0	1	99	1	0	24.98	24.50	23.27	20.09	21.30	20.95	19.84	16.86
			1	0	1	99	15.59	16.19	14.81	14.16	11.21	11.90	10.71	10.27
			100	0	100	0	22.28	22.21	22.21	20.20	19.62	18.62	18.65	16.69

8.3. LTE BAND 41

Test Engineer ID:	39004	Test Date:	9/29/2021
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OUTPUT POWER FOR LTE BAND 41 (5.0MHz + 20.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)							
							ANT 1				ANT 2			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
5MHz / 20MHz	2499.3	2511.0	1	24	1	0	22.91	22.93	23.35	23.07	18.73	18.63	19.28	18.82
			25	0	100	0	23.10	23.06	23.04	23.03	18.87	18.92	18.88	18.78
	2583.8	2595.5	1	24	1	0	27.83	26.41	26.01	23.02	24.20	22.78	22.32	19.44
			25	0	100	0	25.96	25.07	24.98	23.00	22.35	21.35	21.33	19.38
	2668.3	2680.0	1	24	1	0	27.84	26.31	25.41	22.99	23.89	22.70	20.46	19.38
			25	0	100	0	25.97	24.95	24.98	23.01	22.29	21.26	21.01	19.35

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

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)							
							ANT 1				ANT 2			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
20MHz / 5MHz	2506.0	2517.7	1	99	1	0	26.76	26.15	24.47	22.74	22.30	21.59	19.57	18.20
			100	0	25	0	22.92	22.88	22.88	22.85	18.36	18.33	18.30	18.33
	2590.5	2602.2	1	99	1	0	28.00	26.37	25.52	22.96	24.20	22.17	20.69	18.87
			100	0	25	0	25.85	24.82	24.87	22.84	21.67	20.64	20.67	18.73
	2675.0	2686.7	1	99	1	0	27.63	25.98	26.04	22.82	23.39	21.99	21.47	18.73
			100	0	25	0	25.75	24.75	24.75	22.75	21.63	20.62	20.64	18.64

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

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)							
							ANT 1				ANT 2			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
10MHz / 20MHz	2501.5	2515.9	1	49	1	0	22.90	22.75	22.97	22.80	18.82	18.70	19.04	18.88
			50	0	100	0	23.08	23.00	23.03	23.00	18.95	18.91	18.99	18.93
	2583.6	2598.0	1	49	1	0	27.77	26.36	26.24	23.09	24.13	22.63	22.05	19.54
			50	0	100	0	25.97	25.06	25.05	23.06	22.39	21.41	21.45	19.45
	2665.6	2680.0	1	49	1	0	27.78	26.23	25.36	22.90	24.20	22.40	20.56	19.27
			50	0	100	0	25.95	24.97	24.98	23.01	22.31	21.33	20.85	19.43

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

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)							
							ANT 1				ANT 2			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
20MHz / 10MHz	2506.0	2520.4	1	99	1	0	26.88	26.38	24.71	22.96	22.79	22.33	20.27	18.91
			100	0	50	0	23.09	23.09	23.07	23.06	19.04	18.99	18.99	19.01
	2588.1	2602.5	1	99	1	0	27.94	26.58	25.95	23.19	24.20	22.86	21.43	19.54
			100	0	50	0	26.04	25.06	25.07	23.04	22.39	21.40	21.41	19.43
	2670.1	2684.5	1	99	1	0	27.79	26.40	26.26	23.04	24.10	22.61	21.88	19.43
			100	0	50	0	25.96	25.03	25.05	23.00	22.33	21.33	21.19	19.34

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

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)							
							ANT 1				ANT 2			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
15MHz / 15MHz	2503.5	2518.5	1	74	1	0	27.82	26.28	24.91	22.82	23.87	22.26	20.28	18.90
			75	0	75	0	23.09	23.09	23.08	23.06	19.04	19.04	19.04	19.03
	2585.5	2600.5	1	74	1	0	27.90	26.43	25.88	23.19	24.20	22.80	21.74	19.58
			75	0	75	0	25.99	25.00	25.10	23.04	22.39	21.45	21.46	19.46
	2667.5	2682.5	1	74	1	0	27.81	26.20	25.68	22.95	24.20	22.49	20.99	19.39
			75	0	75	0	25.96	25.05	25.04	23.04	22.33	21.41	21.10	19.52

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

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)							
							ANT 1				ANT 2			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
15MHz / 20MHz	2503.8	2520.9	1	74	1	0	27.84	26.27	24.91	22.78	23.63	22.13	19.98	18.71
			75	0	100	0	23.13	23.02	23.13	23.08	18.91	18.91	18.94	18.93
	2583.3	2600.4	1	74	1	0	27.87	26.30	25.85	23.19	24.20	22.66	21.60	19.46
			75	0	100	0	26.01	25.07	25.10	23.02	22.25	21.28	21.37	19.31
	2662.9	2680.0	1	74	1	0	27.78	26.17	25.29	22.86	24.04	22.30	20.39	19.15
			75	0	100	0	26.00	24.98	25.02	23.01	22.21	21.20	20.58	19.29

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			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
20MHz / 15MHz	2506.0	2523.1	1	99	1	0	27.77	26.34	24.64	22.91	23.70	22.40	20.15	19.02
			100	0	75	0	23.15	23.08	23.11	23.16	19.10	19.09	19.09	19.10
	2585.6	2602.7	1	99	1	0	27.89	26.55	25.96	23.16	24.20	22.85	21.62	19.63
			100	0	75	0	26.00	25.04	25.09	23.10	22.40	21.43	21.39	19.47
	2665.1	2682.2	1	99	1	0	27.78	26.26	26.27	23.09	24.15	22.57	21.45	19.54
			100	0	75	0	25.98	25.02	25.03	22.99	22.41	21.39	20.92	19.41

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			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
20MHz/ 20MHz	2506.0	2525.8	1	99	1	0	27.74	26.30	24.58	22.89	23.72	22.35	20.20	18.91
			1	0	1	99	15.11	15.05	15.21	14.96	10.87	10.83	11.00	10.81
			100	0	100	0	23.11	23.08	23.11	23.10	19.10	19.08	19.07	19.08
	2583.1	2602.9	1	99	1	0	27.85	26.52	25.92	23.13	24.20	22.87	21.66	19.62
			1	0	1	99	17.67	17.89	17.75	17.50	12.83	12.99	12.95	12.58
			100	0	100	0	26.07	25.06	25.09	23.10	22.49	21.52	21.36	19.52
	2660.2	2680.0	1	99	1	0	27.67	26.24	25.82	23.01	24.17	22.51	21.12	19.39
			1	0	1	99	16.60	16.65	17.13	16.36	11.87	11.91	12.41	11.70
			100	0	100	0	26.00	25.02	25.07	22.98	22.39	21.49	20.62	19.40

8.4. LTE BAND 48

Test Engineer ID:	44353	Test Date:	12/8/2021
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OUTPUT POWER FOR LTE BAND 48 (5.0MHz + 20.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)							
							Ant 1				Ant 4			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
5MHz / 20MHz	3553.3	3565.0	1	24	1	0	19.73	19.66	20.20	19.93	16.80	16.75	17.30	16.95
			25	0	100	0	13.64	13.66	13.39	13.38	10.77	10.79	10.79	10.69
	3615.8	3627.5	1	24	1	0	22.70	22.62	22.56	20.61	20.34	20.32	20.80	17.59
			25	0	100	0	21.68	21.74	21.67	20.70	18.62	18.63	18.61	17.65
	3678.3	3690.0	1	24	1	0	19.95	19.99	19.73	20.20	17.08	17.17	17.29	17.30
			25	0	100	0	13.78	13.80	13.68	13.68	10.85	10.86	10.85	10.84

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

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)							
							Ant 1				Ant 4			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
20MHz / 5MHz	3560.0	3571.7	1	99	1	0	19.90	20.05	20.01	20.20	17.05	17.14	17.30	17.11
			100	0	25	0	13.19	13.19	13.02	12.95	10.51	10.49	10.55	10.47
	3622.5	3634.2	1	99	1	0	22.56	22.70	22.51	19.73	20.75	20.75	20.80	18.03
			100	0	25	0	20.63	20.67	20.70	19.68	18.78	18.77	18.85	17.80
	3685.0	3696.7	1	99	1	0	20.06	19.97	20.20	20.08	16.77	16.82	17.30	17.01
			100	0	25	0	13.20	13.21	13.09	13.13	9.95	9.99	9.99	9.94

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

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)							
							Ant 1				Ant 4			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
10MHz / 20MHz	3555.5	3569.9	1	49	1	0	19.24	19.18	19.48	19.70	16.68	16.62	16.80	16.62
			50	0	100	0	14.73	14.52	14.51	14.54	12.08	12.12	12.11	11.82
	3615.6	3630.0	1	49	1	0	22.70	22.62	22.31	19.61	21.22	21.30	21.04	18.14
			50	0	100	0	20.14	20.17	20.21	19.74	18.45	18.53	18.55	18.01
	3675.6	3690.0	1	49	1	0	19.56	19.53	19.69	19.54	16.64	16.53	16.54	16.80
			50	0	100	0	14.82	14.70	14.75	14.72	11.95	11.96	11.95	11.88

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

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)							
							Ant 1				Ant 4			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
20MHz / 10MHz	3560.0	3574.4	1	99	1	0	19.50	19.42	19.65	19.49	16.59	16.69	16.80	16.62
			100	0	50	0	14.90	14.63	14.62	14.61	12.04	12.06	12.06	11.77
	3620.1	3634.5	1	99	1	0	22.70	22.65	22.26	19.49	21.21	21.30	20.78	18.03
			100	0	50	0	19.76	19.81	19.88	19.34	18.23	18.32	18.36	17.81
	3680.1	3694.5	1	99	1	0	19.15	19.12	19.70	19.45	16.26	16.26	16.80	16.49
			100	0	50	0	14.43	14.30	14.31	14.32	11.54	11.54	11.55	11.40

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

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)							
							ANT 1				ANT 4			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
15MHz / 20MHz	3557.8	3574.9	1	74	1	0	19.36	19.38	19.59	19.44	16.63	16.60	16.80	16.64
			75	0	100	0	14.83	14.61	14.65	14.60	12.04	12.09	12.10	11.77
	3615.3	3632.4	1	74	1	0	22.70	22.68	22.02	19.28	21.80	21.66	20.67	18.04
			75	0	100	0	19.52	19.58	19.59	19.08	18.30	18.38	18.37	17.85
	3672.9	3690.0	1	74	1	0	19.52	19.44	19.42	19.67	16.71	16.57	16.53	16.80
			75	0	100	0	14.84	14.71	14.71	14.77	11.92	11.98	11.98	11.84

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

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)							
							ANT 1				ANT 4			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
20MHz / 15MHz	3560.0	3577.1	1	99	1	0	19.39	19.47	19.60	19.46	16.73	16.74	16.74	16.80
			100	0	75	0	14.86	14.61	14.65	14.62	12.18	12.25	12.25	11.96
	3617.6	3634.7	1	99	1	0	22.70	22.68	21.81	19.05	21.68	21.80	20.78	17.98
			100	0	75	0	19.33	19.36	19.44	18.93	18.32	18.38	18.39	17.88
	3675.1	3692.2	1	99	1	0	19.18	19.11	19.70	19.39	16.33	16.23	16.80	16.58
			100	0	75	0	14.47	14.36	14.38	14.31	11.55	11.59	11.59	11.50

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 1				Ant 4			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
20MHz/ 20MHz	3560.0	3579.8	1	99	1	0	20.90	20.94	21.07	20.44	18.07	18.05	18.30	17.64
			1	0	1	99	7.75	7.75	7.94	7.68	4.89	4.85	5.06	4.90
			100	0	100	0	14.82	14.57	14.64	14.59	12.00	11.98	12.02	11.82
	3615.1	3634.9	1	99	1	0	22.70	22.51	22.19	19.38	21.74	21.80	20.83	18.11
			1	0	1	99	12.93	12.83	12.78	12.92	11.56	11.70	11.58	11.79
			100	0	100	0	19.73	19.77	19.82	19.27	18.39	18.42	18.48	18.00
3670.2	3690.0	1	99	1	0	20.69	20.59	21.20	20.40	17.75	17.74	18.30	17.53	
		1	0	1	99	7.42	7.37	7.82	7.47	4.48	4.42	4.85	4.51	
			100	0	100	0	14.49	14.37	14.41	14.35	11.55	11.63	11.56	11.52

8.5. LTE BAND 66C

Test Engineer ID:	39004	Test Date:	9/20/2021
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OUTPUT POWER FOR LTE BAND 66C (10.0MHz + 15.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB	PCC RB Offset	SCC1 RB	SCC1 RB Offset	Conducted Average (dBm)							
							ANT 1				ANT 2			
							Size	Offset	Size	Offset	QPSK	16QAM	64QAM	256QAM
10MHz / 15MHz	1715.3	1727.3	1	49	1	0	25.70	24.92	22.85	21.01	22.70	21.81	19.21	17.97
			50	0	75	0	24.10	23.12	23.13	21.15	20.92	19.94	19.97	18.00
	1747.9	1759.9	1	49	1	0	25.49	24.78	23.21	21.11	22.59	21.87	19.90	17.72
			50	0	75	0	23.96	22.98	23.00	21.04	20.84	19.89	19.81	17.85
	1760.5	1772.5	1	49	1	0	25.53	24.89	23.99	20.81	22.70	21.86	20.28	17.82
			50	0	75	0	24.02	23.02	23.03	20.98	20.97	19.95	19.94	17.90

OUTPUT POWER FOR LTE BAND 66C (15.0MHz + 10.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB	PCC RB Offset	SCC1 RB	SCC1 RB Offset	Conducted Average (dBm)							
							ANT 1				ANT 2			
							Size	Offset	Size	Offset	QPSK	16QAM	64QAM	256QAM
15MHz / 10MHz	1717.5	1729.5	1	74	1	0	25.70	25.12	22.99	21.25	22.59	21.85	19.12	17.80
			75	0	50	0	24.26	23.23	23.28	21.29	20.82	19.84	19.87	17.88
	1750.1	1762.1	1	74	1	0	25.59	25.12	23.41	20.93	22.55	21.71	19.66	17.67
			75	0	50	0	24.15	23.13	23.14	21.12	20.76	19.78	19.79	17.78
	1762.7	1774.7	1	74	1	0	25.65	24.86	24.21	21.02	22.70	21.70	20.24	17.78
			75	0	50	0	24.17	23.18	23.19	21.15	20.86	19.86	19.85	17.81

OUTPUT POWER FOR LTE BAND 66C (10.0MHz + 20.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB	PCC RB Offset	SCC1 RB	SCC1 RB Offset	Conducted Average (dBm)							
							ANT 1				ANT 2			
							Size	Offset	Size	Offset	QPSK	16QAM	64QAM	256QAM
10MHz / 20MHz	1715.5	1729.9	1	49	1	0	25.70	25.05	22.54	21.41	21.97	21.05	18.38	17.94
			50	0	100	0	24.21	23.25	23.22	21.26	20.89	19.89	19.87	17.91
	1745.6	1760.0	1	49	1	0	25.67	25.14	23.42	21.18	22.59	21.53	19.77	17.63
			50	0	100	0	24.10	23.08	23.10	21.12	20.81	19.79	19.78	17.74
	1755.6	1770.0	1	49	1	0	25.60	25.00	23.68	20.89	22.70	21.76	19.87	17.62
			50	0	100	0	24.11	23.11	23.10	21.10	20.85	19.84	19.84	17.79

OUTPUT POWER FOR LTE BAND 66C (20.0MHz + 10.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB	PCC RB Offset	SCC1 RB	SCC1 RB Offset	Conducted Average (dBm)							
							ANT 1				ANT 2			
							Size	Offset	Size	Offset	QPSK	16QAM	64QAM	256QAM
20MHz / 10MHz	1720.0	1734.4	1	99	1	0	25.70	25.08	22.41	21.10	22.19	21.40	21.40	18.10
			100	0	50	0	24.06	23.07	23.09	21.06	20.87	19.91	19.91	17.91
	1750.1	1764.5	1	99	1	0	25.37	24.80	23.24	20.67	22.57	21.66	21.66	17.70
			100	0	50	0	23.91	22.91	22.93	20.90	20.81	19.85	19.85	17.83
	1760.1	1774.5	1	99	1	0	25.44	24.98	23.88	21.02	22.70	21.83	21.83	17.71
			100	0	50	0	23.95	22.96	22.93	20.90	20.88	19.87	19.87	17.86

OUTPUT POWER FOR LTE BAND 66C (15.0MHz + 15.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB	PCC RB Offset	SCC1 RB	SCC1 RB Offset	Conducted Average (dBm)							
							ANT 1				ANT 2			
							Size	Offset	Size	Offset	QPSK	16QAM	64QAM	256QAM
15MHz / 15MHz	1717.5	1732.5	1	74	1	0	25.63	25.09	22.43	21.07	22.34	21.42	18.67	17.80
			75	0	75	0	24.31	23.30	23.27	21.28	20.95	19.94	19.95	17.98
	1747.5	1762.5	1	74	1	0	25.60	25.01	23.04	21.05	22.57	21.57	19.49	17.83
			75	0	75	0	24.11	23.15	23.14	21.11	20.87	19.90	19.89	17.88
	1757.5	1772.5	1	74	1	0	25.70	25.02	23.85	21.04	22.70	21.80	19.95	17.83
			75	0	75	0	24.14	23.15	23.14	21.13	20.93	19.95	19.96	17.90

OUTPUT POWER FOR LTE BAND 66C (15.0MHz + 20.0MHz)

Bandwidth	PCC Frequency (MHz)	SCC1 Frequency (MHz)	PCC RB Size	PCC RB Offset	SCC1 RB Size	SCC1 RB Offset	Conducted Average (dBm)							
							ANT 1				ANT 2			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
15MHz / 20MHz	1717.8	1734.9	1	74	1	0	25.70	25.07	22.67	21.07	21.82	20.92	18.41	17.74
			75	0	100	0	24.28	23.30	23.30	21.31	20.87	19.88	19.80	17.86
	1745.3	1762.4	1	74	1	0	25.60	25.14	23.43	21.15	22.70	21.85	19.34	17.66
			75	0	100	0	24.19	23.18	23.18	21.17	20.82	19.83	19.76	17.81
	1752.9	1770.0	1	74	1	0	25.64	24.83	23.81	20.94	22.65	21.69	19.70	17.64
			75	0	100	0	24.21	23.22	23.20	21.17	20.84	19.86	19.86	17.82

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			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
20MHz / 15MHz	1720.0	1737.1	1	99	1	0	25.70	24.89	22.61	21.21	21.98	21.16	18.46	17.92
			100	0	75	0	24.20	23.27	23.27	21.24	20.90	19.95	19.94	17.93
	1747.6	1764.7	1	99	1	0	25.61	24.85	23.33	21.10	22.67	21.69	19.51	17.72
			100	0	75	0	24.15	23.15	23.12	21.11	20.85	19.89	19.79	17.84
	1755.1	1772.2	1	99	1	0	25.65	24.92	23.55	20.87	22.70	21.73	19.63	17.75
			100	0	75	0	24.12	23.13	23.14	21.09	20.86	19.88	19.87	17.84

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			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
20MHz / 5MHz	1720.0	1731.7	1	99	1	0	25.70	25.15	22.68	21.05	22.25	21.80	19.62	17.84
			100	0	25	0	24.18	23.16	23.17	21.15	20.87	19.76	19.80	17.75
	1752.5	1764.2	1	99	1	0	25.51	24.94	23.43	21.21	22.70	21.71	20.06	17.56
			100	0	25	0	24.01	23.03	23.09	21.00	20.78	19.87	19.89	17.81
	1765.0	1776.7	1	99	1	0	25.59	25.07	23.97	20.91	22.64	20.94	18.43	17.76
			100	0	25	0	24.06	23.10	23.08	21.02	20.86	19.90	19.82	17.89

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			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
5MHz / 20MHz	1713.3	1725.0	1	24	1	0	25.70	24.94	22.12	21.07	21.81	20.94	18.40	17.76
			25	0	100	0	24.09	23.05	23.08	21.08	20.79	19.77	19.78	17.80
	1745.8	1757.5	1	24	1	0	25.47	24.83	23.06	20.90	22.49	21.67	19.48	17.56
			25	0	100	0	23.94	22.97	22.93	20.95	20.63	19.64	19.55	17.64
	1758.3	1770.0	1	24	1	0	25.52	24.85	23.20	20.78	22.70	21.67	19.55	17.57
			25	0	100	0	23.94	22.95	22.93	20.91	20.72	19.74	19.72	17.68

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			
							QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
20MHz/ 20MHz	1720.0	1739.8	1	99	1	0	25.70	25.18	23.17	21.39	22.16	21.28	18.76	17.89
			1	0	1	99	16.08	16.11	16.20	14.71	11.38	11.41	11.62	10.10
			100	0	100	0	24.20	23.21	23.22	21.28	20.94	19.94	19.90	17.96
	1745.1	1764.9	1	99	1	0	25.58	24.88	23.45	21.06	22.70	21.92	19.64	17.87
			1	0	1	99	15.91	16.08	16.03	14.76	11.23	11.46	11.33	10.11
			100	0	100	0	24.11	23.12	23.09	21.16	20.90	19.89	19.91	17.89
	1750.2	1770.0	1	99	1	0	25.53	24.93	23.71	20.82	22.65	21.72	19.87	17.71
			1	0	1	99	15.92	16.06	16.11	14.58	11.23	11.30	11.40	10.14
			100	0	100	0	24.14	23.12	23.14	21.14	20.90	19.91	19.94	17.89

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	7.455	7.84
	3MHz + 5MHz BAND 16QAM			7.465	7.86
	5MHz + 3MHz BAND QPSK	25/0 + 15/0		7.457	7.83
	5MHz + 3MHz BAND 16QAM			7.456	7.83
	5MHz + 10MHz BAND QPSK	25/0 + 50/0		13.846	14.54
	5MHz + 10MHz BAND 16QAM			13.847	14.47
	10MHz + 5MHz BAND QPSK	50/0 + 25/0		13.844	14.36
	10MHz + 5MHz BAND 16QAM			13.826	14.39
	10MHz + 10MHz BAND QPSK	50/0 + 50/0		18.741	19.55
	10MHz + 10MHz BAND 16QAM			18.736	19.58

LTE BAND 7

Band	Mode	RB Allocation/RB Offset	f (MHz)	99% BW (MHz)	- 26dB BW (MHz)
LTE BAND 7	10MHz + 20MHz BAND QPSK	50/0 + 100/0	2535	28.165	30.20
	10MHz + 20MHz BAND 16QAM			28.063	30.26
	20MHz + 10MHz BAND QPSK	100/0 + 50/0		28.132	30.28
	20MHz + 10MHz BAND 16QAM			28.108	30.09
	15MHz + 15MHz BAND QPSK	75/0 + 75/0		28.644	30.96
	15MHz + 15MHz BAND 16QAM			28.565	30.76
	15MHz + 20MHz BAND QPSK	75/0 + 100/0		32.900	35.17
	15MHz + 20MHz BAND 16QAM			32.848	35.17
	20MHz + 15MHz BAND QPSK	100/0 + 75/0		32.913	35.22
	20MHz + 15MHz BAND 16QAM			32.855	35.24
	20MHz + 20MHz BAND QPSK	100/0 + 100/0		37.745	40.16
	20MHz + 20MHz BAND 16QAM			37.753	40.26

LTE BAND 41

Band	Mode	RB Allocation/RB Offset	f (MHz)	99% BW (MHz)	- 26dB BW (MHz)
LTE BAND 41	5MHz + 20MHz BAND QPSK	25/0 + 100/0	2593	22.868	23.71
	5MHz + 20MHz BAND 16QAM			22.818	24.06
	20MHz + 5MHz BAND QPSK	100/0 + 25/0		22.756	23.57
	20MHz + 5MHz BAND 16QAM			22.835	23.56
	10MHz + 20MHz BAND QPSK	50/0 + 100/0		27.642	28.50
	10MHz + 20MHz BAND 16QAM			27.675	28.58
	20MHz + 10MHz BAND QPSK	100/0 + 50/0		27.625	28.69
	20MHz + 10MHz BAND 16QAM			27.699	28.54
	15MHz + 15MHz BAND QPSK	75/0 + 75/0		28.277	29.31
	15MHz + 15MHz BAND 16QAM			28.169	29.11
	15MHz + 20MHz BAND QPSK	75/0 + 100/0		32.548	34.53
	15MHz + 20MHz BAND 16QAM			32.646	34.43
	20MHz + 15MHz BAND QPSK	100/0 + 75/0		32.602	34.10
	20MHz + 15MHz BAND 16QAM			32.620	33.86
	20MHz + 20MHz BAND QPSK	100/0 + 100/0		37.576	38.76
	20MHz + 20MHz BAND 16QAM			37.487	38.96

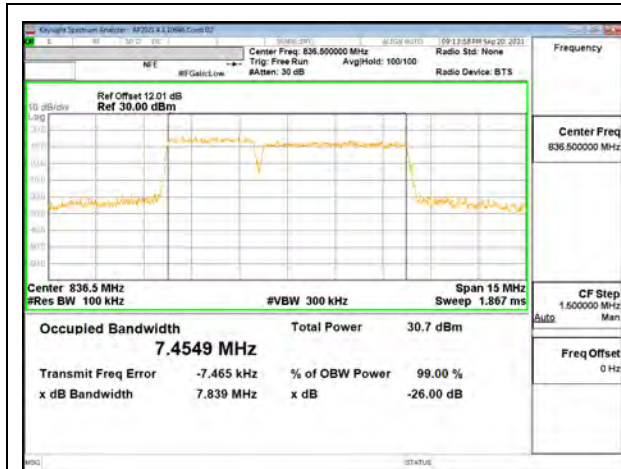
LTE BAND 48

Band	Mode	RB Allocation/RB Offset	f (MHz)	99% BW (MHz)	- 26dB BW (MHz)
LTE BAND 48	5MHz + 20MHz BAND QPSK	25/0 + 100/0	3625	22.850	24.72
	5MHz + 20MHz BAND 16QAM			22.638	24.20
	20MHz + 5MHz BAND QPSK	100/0 + 25/0		22.681	23.50
	20MHz + 5MHz BAND 16QAM			22.604	23.56
	10MHz + 20MHz BAND QPSK	50/0 + 100/0		27.713	29.52
	10MHz + 20MHz BAND 16QAM			27.680	29.60
	20MHz + 10MHz BAND QPSK	100/0 + 50/0		27.780	29.87
	20MHz + 10MHz BAND 16QAM			27.723	30.03
	15MHz + 20MHz BAND QPSK	75/0 + 100/0		32.350	34.73
	15MHz + 20MHz BAND 16QAM			32.325	34.37
	20MHz + 15MHz BAND QPSK	100/0 + 75/0		32.512	34.64
	20MHz + 15MHz BAND 16QAM			32.484	34.76
	20MHz + 20MHz BAND QPSK	100/0 + 100/0		37.314	39.92
	20MHz + 20MHz BAND 16QAM			37.189	39.66

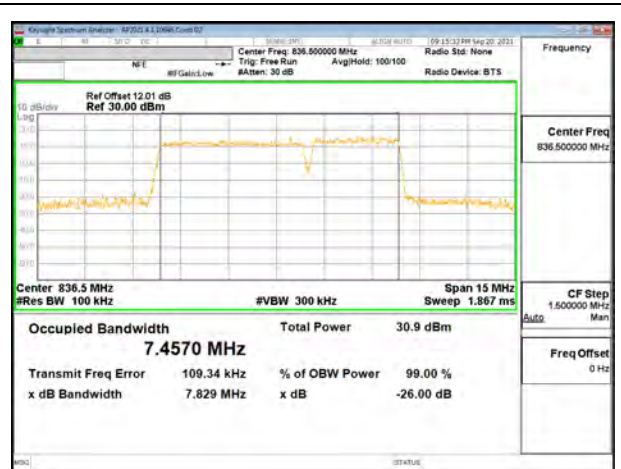
LTE BAND 66C

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	23.166	24.04
	10MHz + 15MHz BAND 16QAM			23.085	23.95
	15MHz + 10MHz BAND QPSK	75/0 + 50/0		23.079	24.22
	15MHz + 10MHz BAND 16QAM			23.092	24.03
	10MHz + 20MHz BAND QPSK	50/0 + 100/0		27.680	28.69
	10MHz + 20MHz BAND 16QAM			27.687	28.99
	20MHz + 10MHz BAND QPSK	100/0 + 50/0		27.670	28.80
	20MHz + 10MHz BAND 16QAM			27.755	28.68
	15MHz + 15MHz BAND QPSK	75/0 + 75/0		28.306	29.39
	15MHz + 15MHz BAND 16QAM			28.235	29.61
	15MHz + 20MHz BAND QPSK	75/0 + 100/0		32.627	34.17
	15MHz + 20MHz BAND 16QAM			32.595	34.03
	20MHz + 15MHz BAND QPSK	100/0 + 75/0		32.677	33.99
	20MHz + 15MHz BAND 16QAM			32.743	34.05
	20MHz + 5MHz BAND QPSK	100/0 + 25/0		22.791	23.60
	20MHz + 5MHz BAND 16QAM			22.817	23.57
	5MHz + 20MHz BAND QPSK	25/0 + 100/0		22.869	23.79
	5MHz + 20MHz BAND 16QAM			22.829	23.60
	20MHz + 20MHz BAND QPSK	100/0 + 100/0		37.516	39.03
	20MHz + 20MHz BAND 16QAM			37.606	38.86

9.1.1. LTE BAND 5



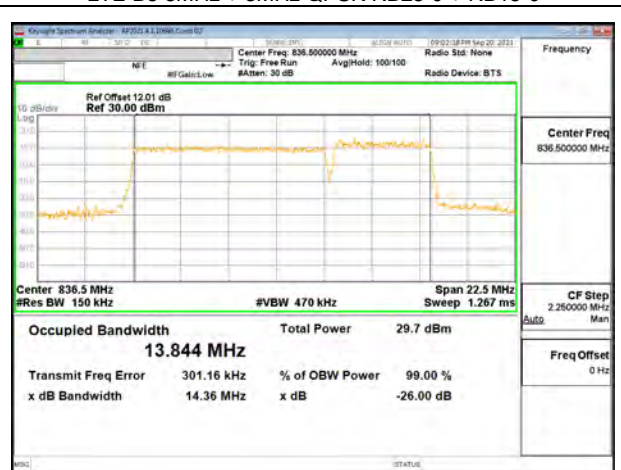
LTE B5 3MHz + 5MHz QPSK RB15-0 + RB25-0



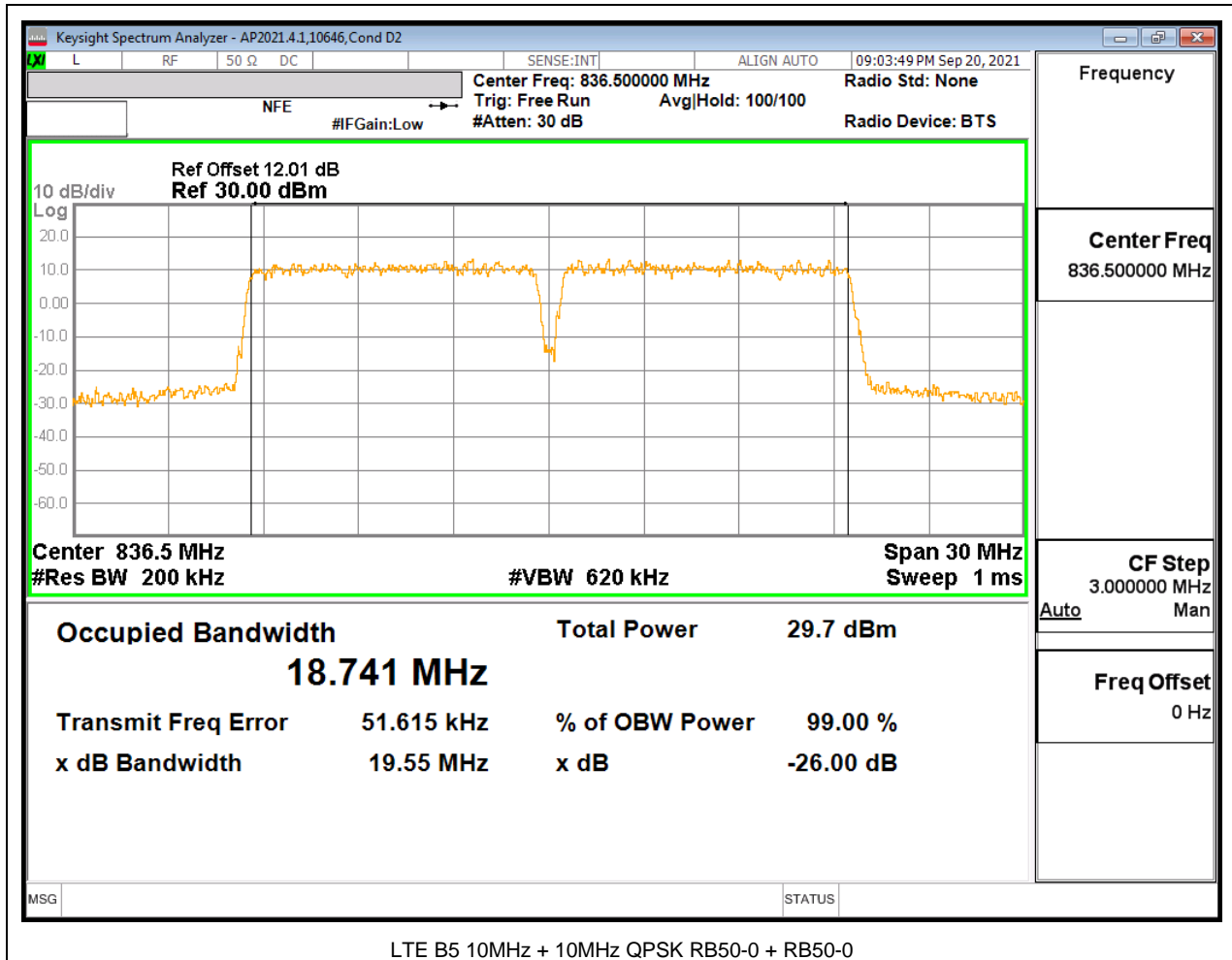
LTE B5 5MHz + 3MHz QPSK RB25-0 + RB15-0



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



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



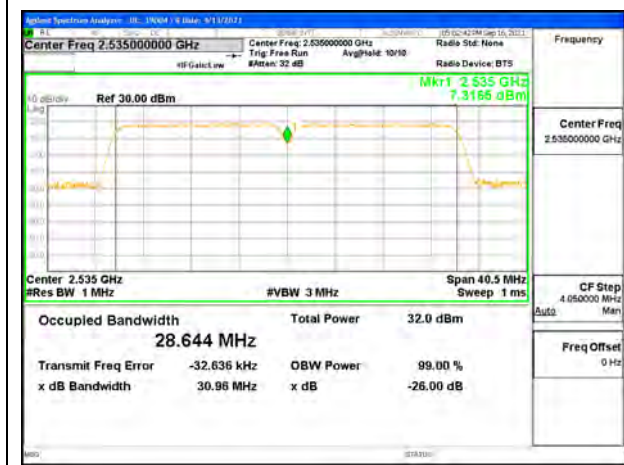
9.1.2. LTE BAND 7



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



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



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



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



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

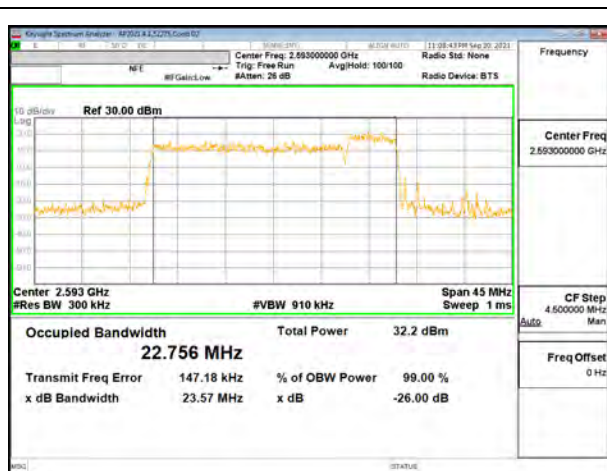


LTE B7 20MHz + 20MHz QPSK RB100-0 + RB100-0

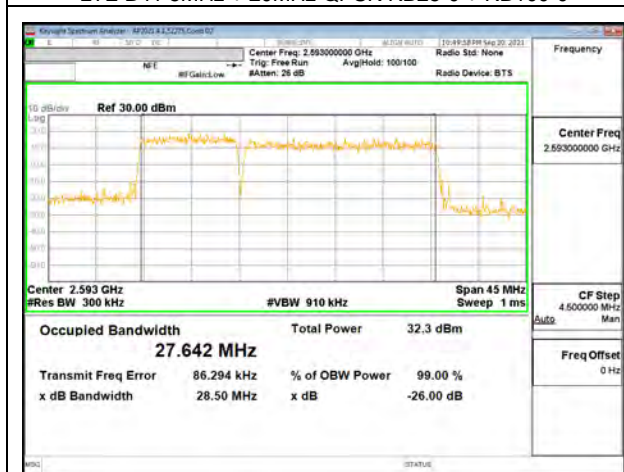
9.1.3. LTE BAND 41



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



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



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



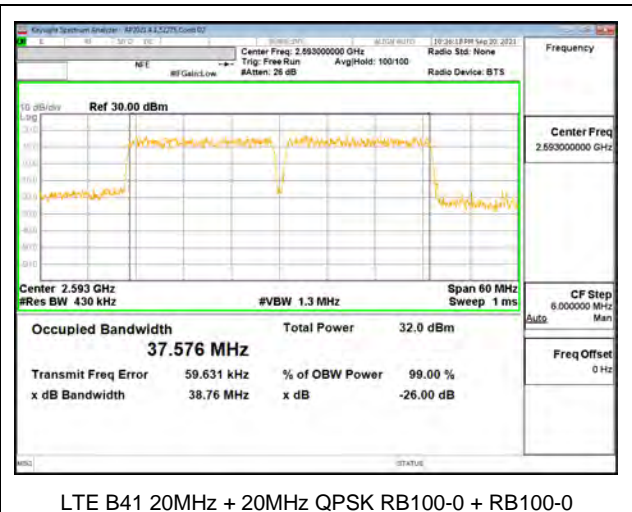
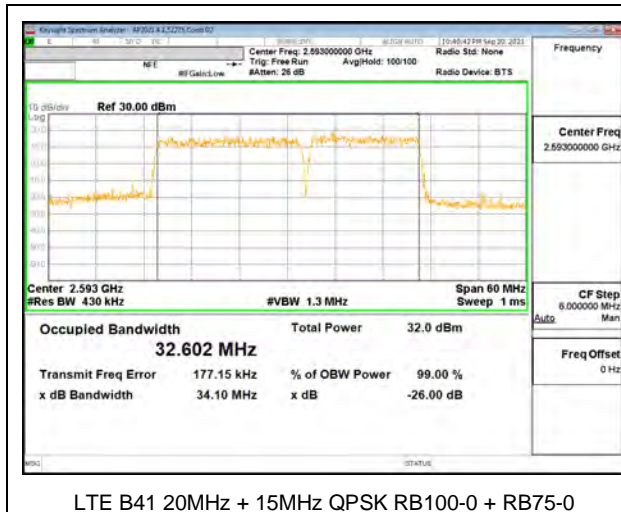
LTE B41 20MHz + 10MHz QPSK RB100-0 + RB50-0



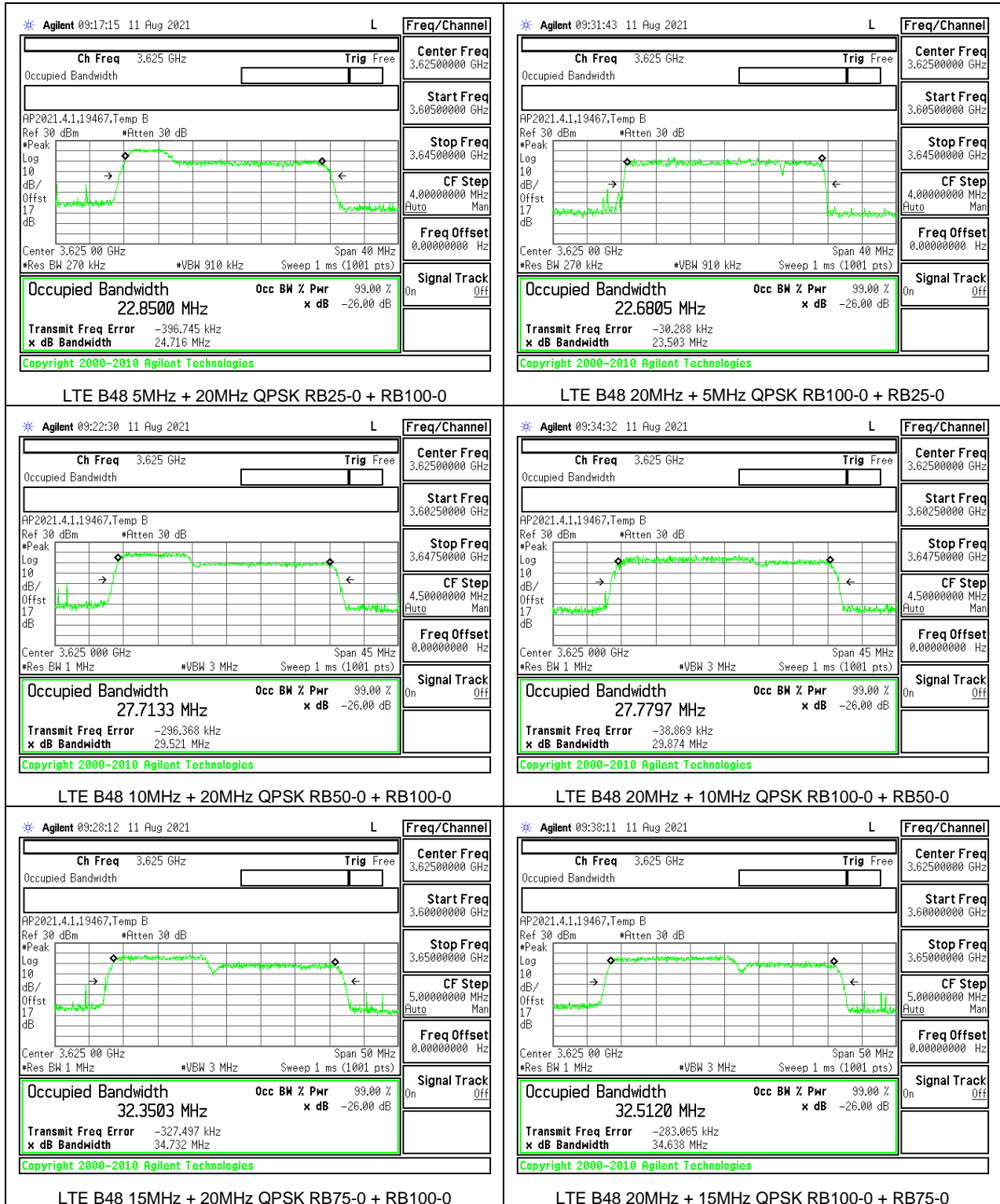
LTE B41 15MHz + 15MHz QPSK RB75-0 + RB75-0

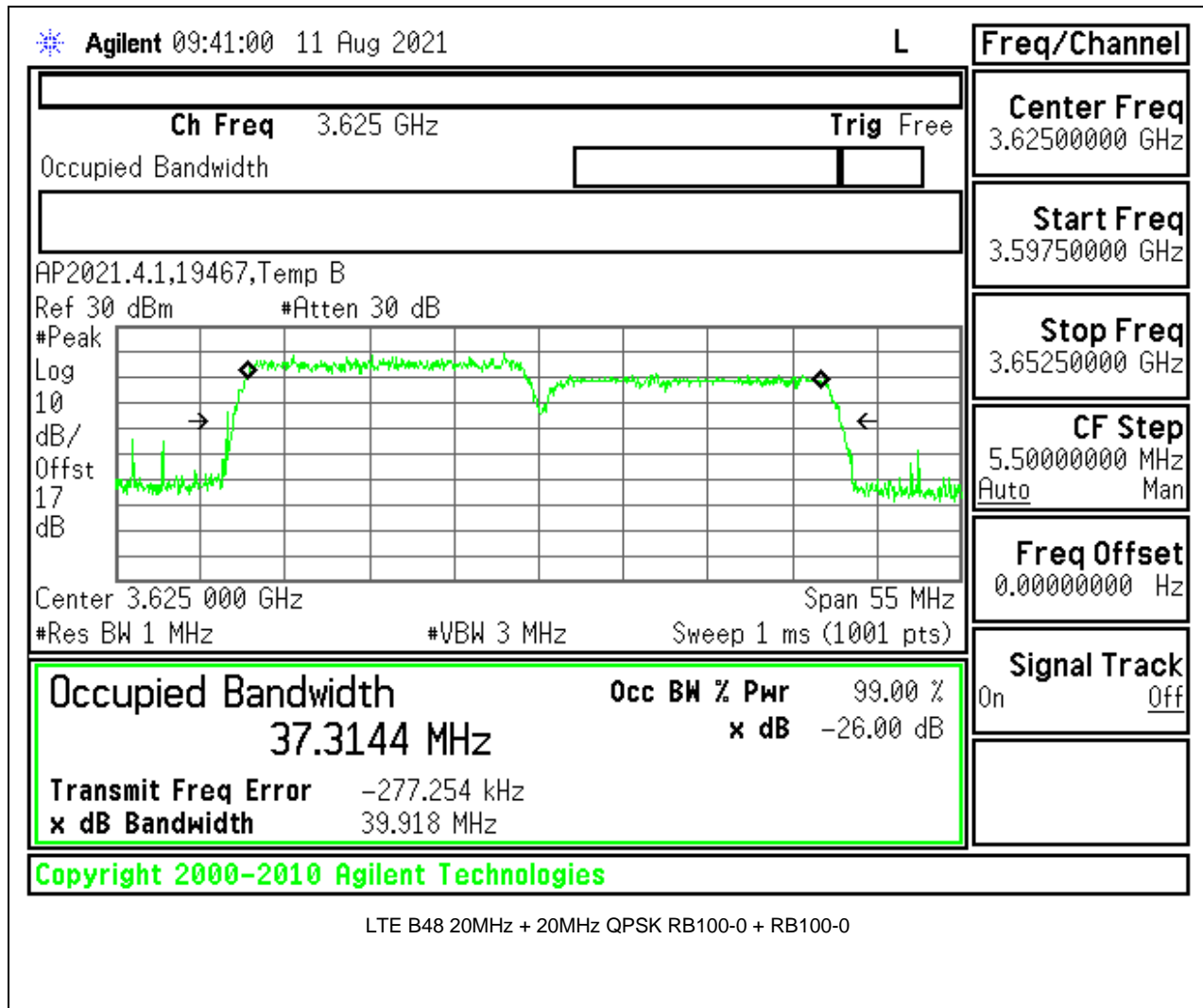


LTE B41 15MHz + 20MHz QPSK RB75-0 + RB100-0



9.1.4. LTE BAND 48





9.1.5. 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

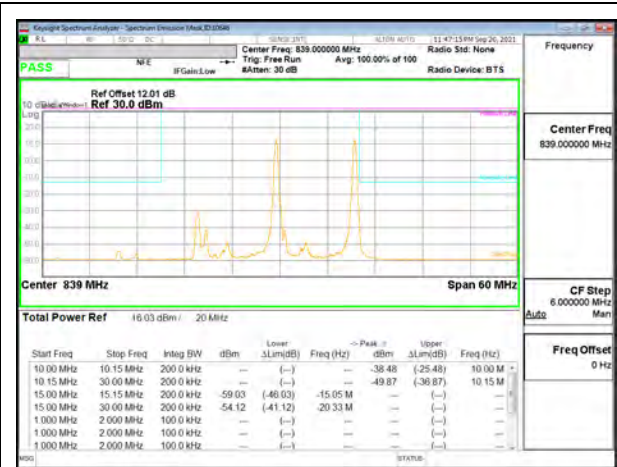
LIMITS

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



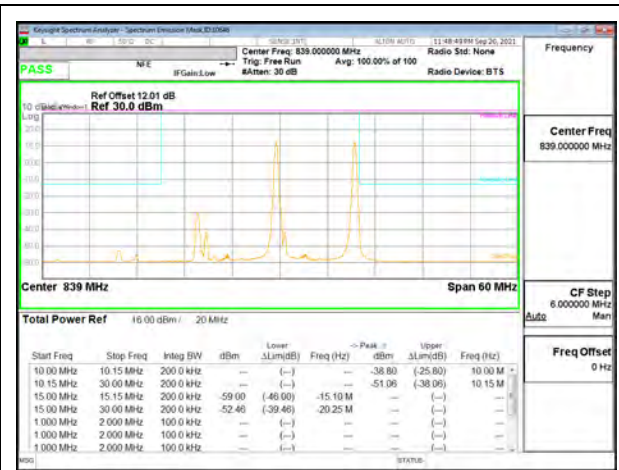
LTE B5 10MHz + 10MHz QPSK Low Ch RB50-0 + RB50-0



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

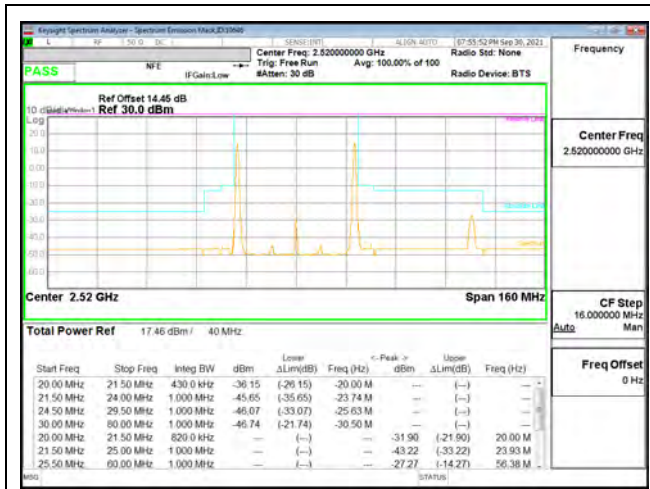


LTE B5 10MHz + 10MHz 16QAM High Ch RB50-0 + RB50-0

9.2.2. LTE BAND 7 EMISSION MASK

LIMITS

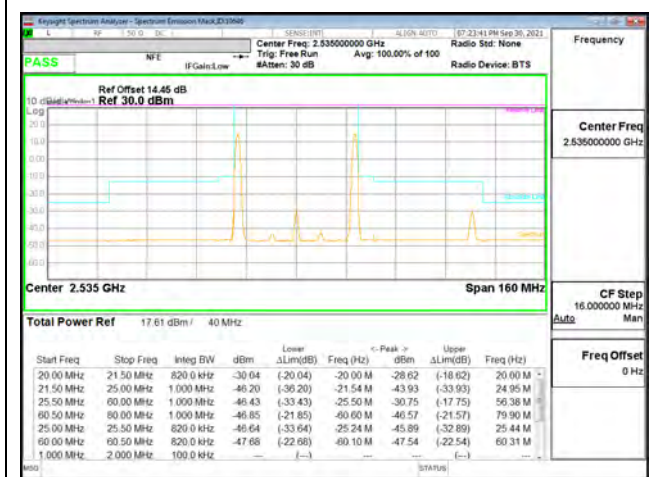
FCC: §27.53(m)(4) For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and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



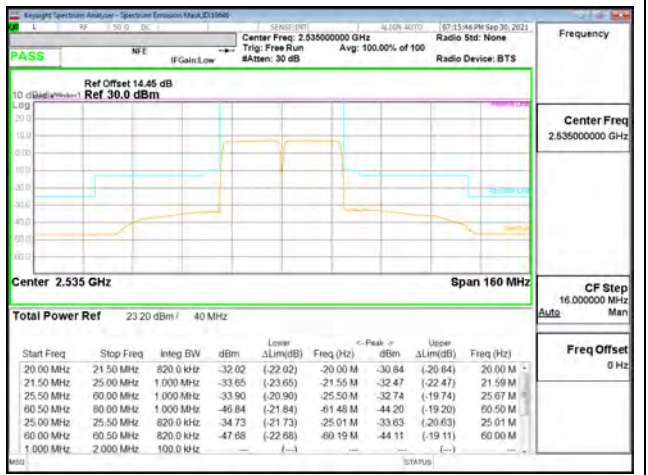
LTE B7 20MHz + 20MHz QPSK Low Ch RB100-0 + RB100-0



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



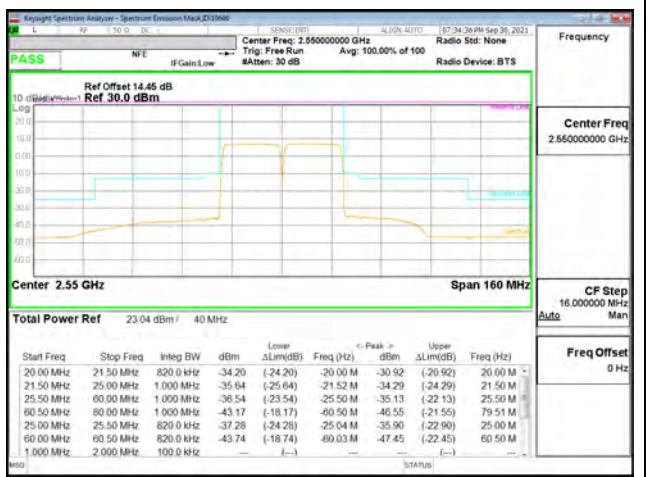
LTE B7 20MHz + 20MHz QPSK Mid Ch RB100-0 + RB100-0



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



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

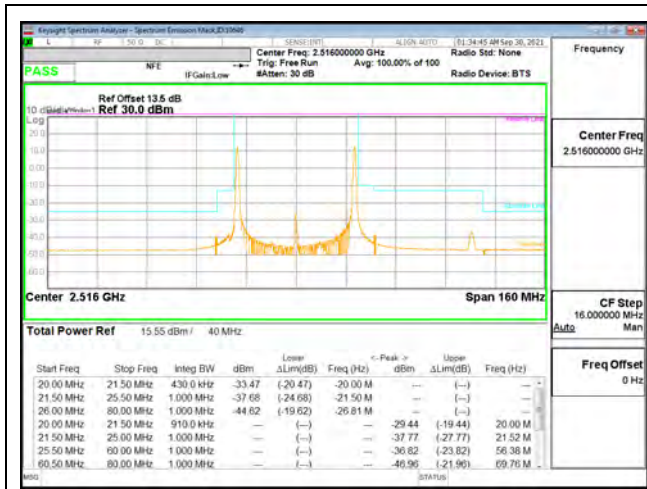


LTE B7 20MHz + 20MHz 16QAM High Ch RB100-0 + RB100-0

9.2.3. LTE BAND 41 EMISSION MASK

LIMITS

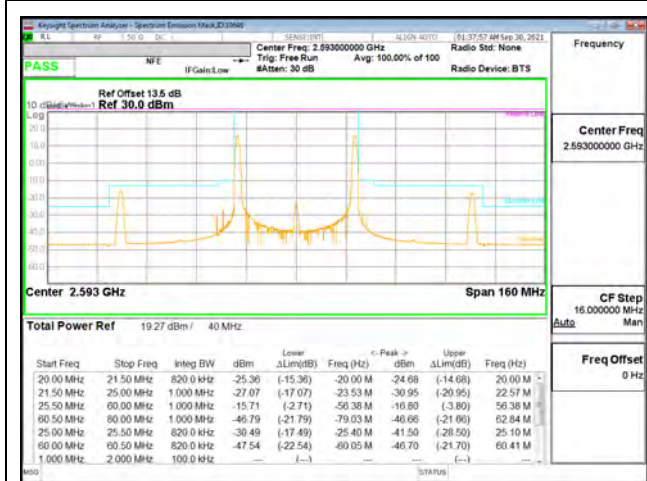
FCC: §27.53(m)(4) For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and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



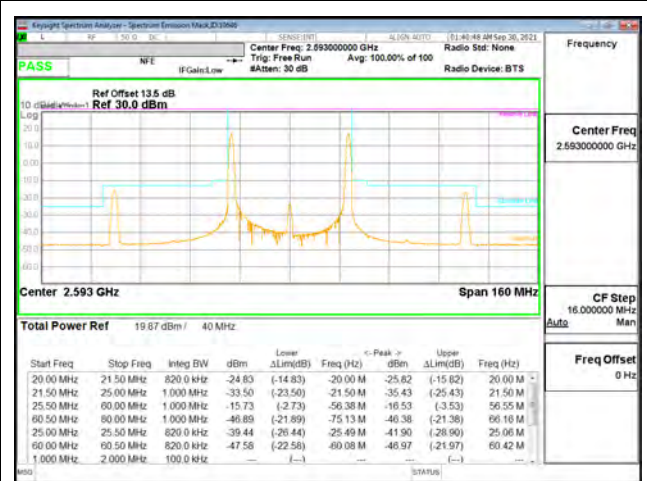
LTE B41 20MHz + 20MHz QPSK Low Ch RB1-0 + RB1-99



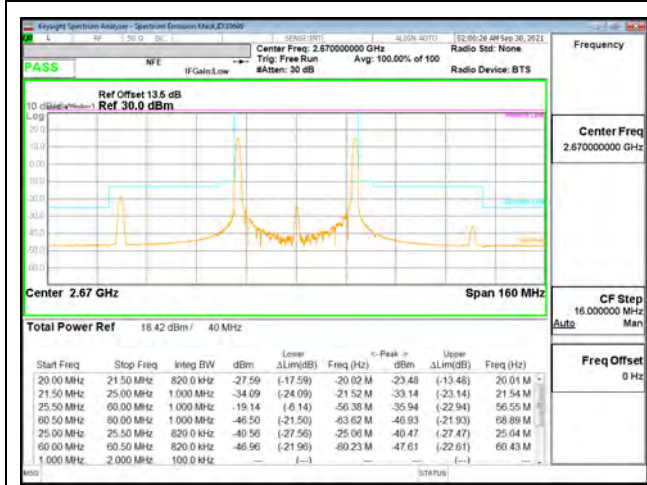
LTE B41 20MHz + 20MHz 16QAM Low Ch RB1-0 + RB1-99



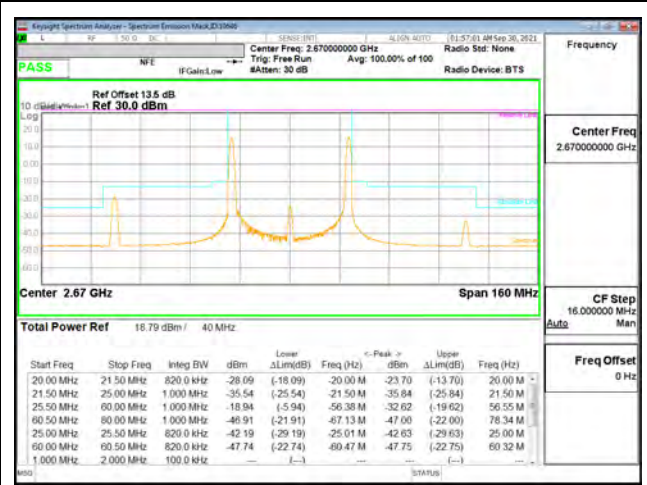
LTE B41 20MHz + 20MHz QPSK Mid Ch RB1-0 + RB1-99



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

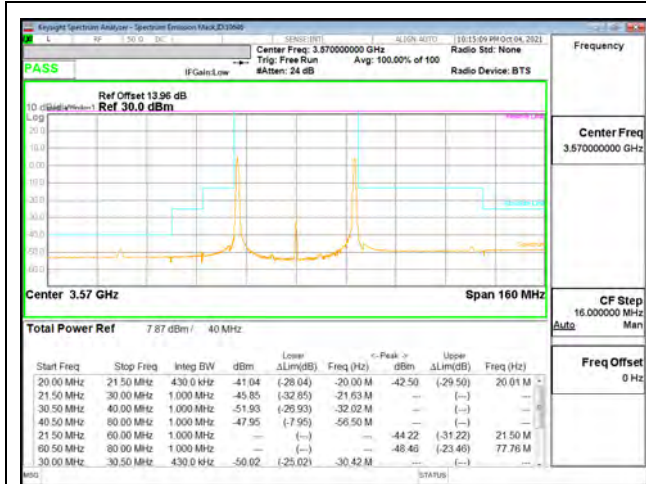
(e) 3.5 GHz Emissions and Interference Limits—

(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.

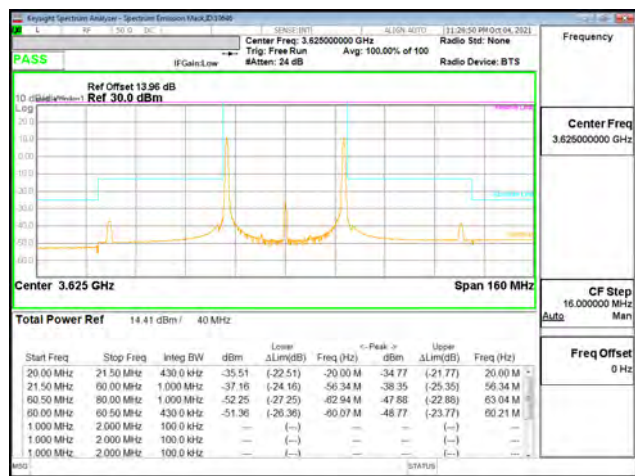
LTE BAND 48 EMISSION MASK



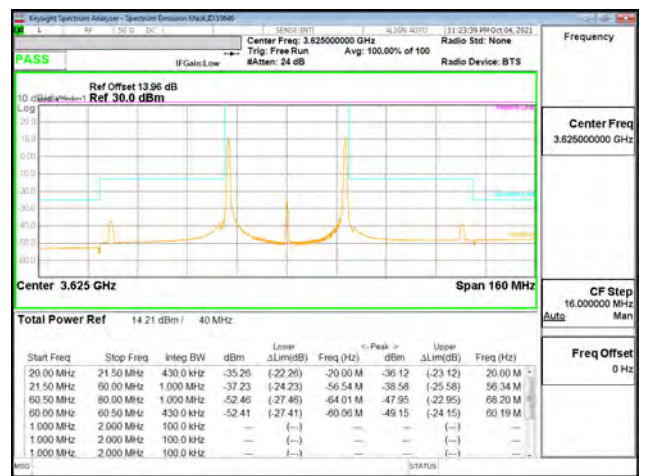
LTE B48 20MHz + 20MHz QPSK Low Ch RB1-0 + RB1-99



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



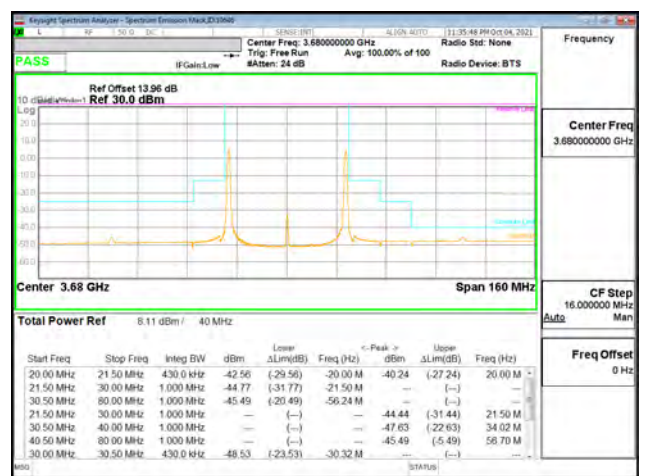
LTE B48 20MHz + 20MHz QPSK Mid Ch RB1-0 + RB1-99



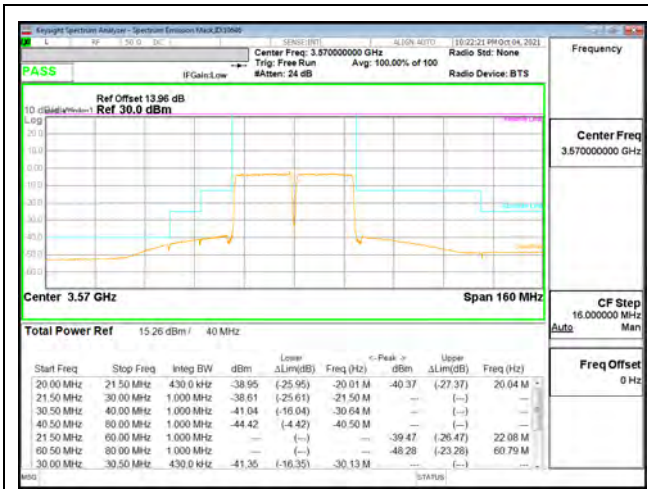
LTE B48 20MHz + 20MHz 16QAM Mid Ch RB1-0 + RB1-99



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



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



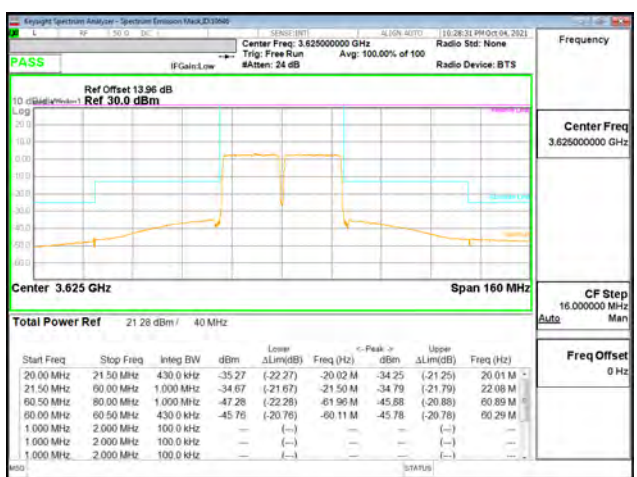
LTE B48 20MHz + 20MHz QPSK Low Ch RB100-0 + RB100-0



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

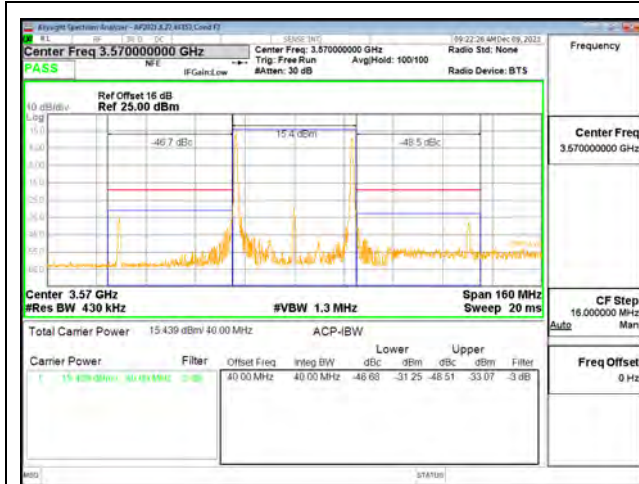


LTE B48 20MHz + 20MHz QPSK High Ch RB100-0 + RB100-0

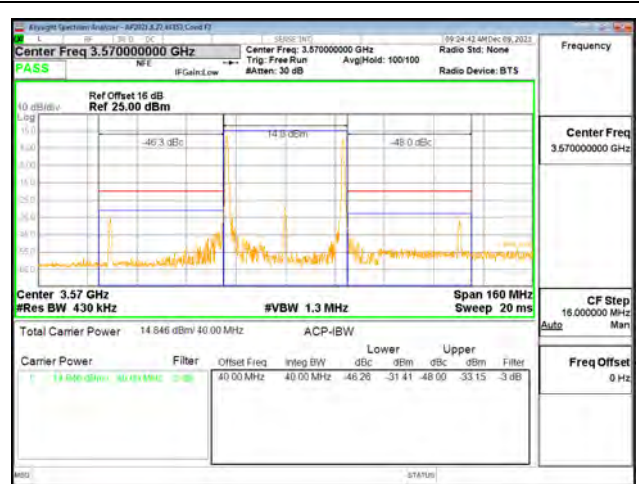


LTE B48 20MHz + 20MHz 16QAM High Ch RB100-0 + RB100-0

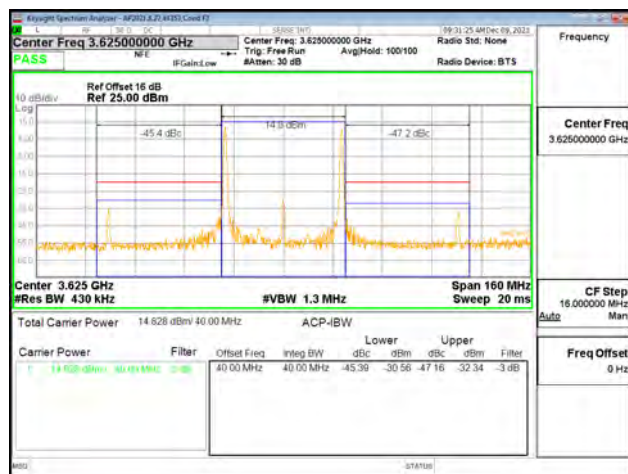
LTE BAND 48 ADJACENT CHANNEL POWER



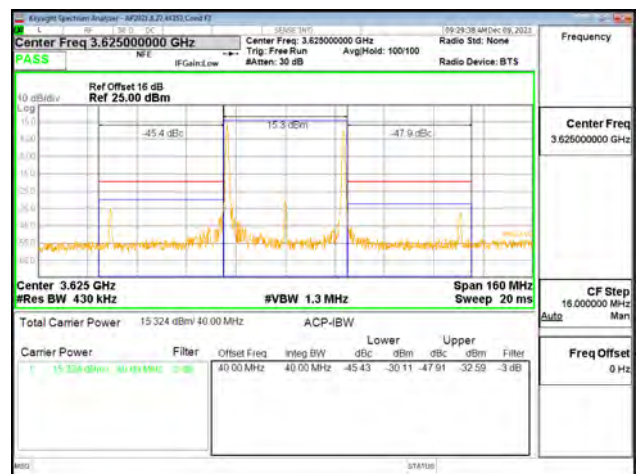
LTE B48 20MHz + 20MHz QPSK Low Ch RB1-0 + RB1-99



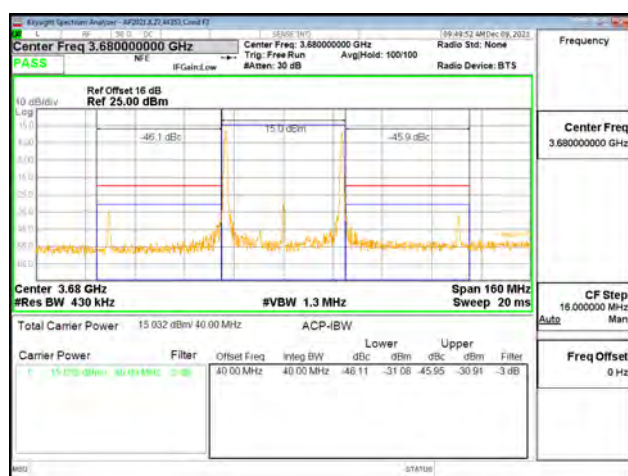
LTE B48 20MHz + 20MHz 16QAM Low Ch RB1-0 + RB1-99



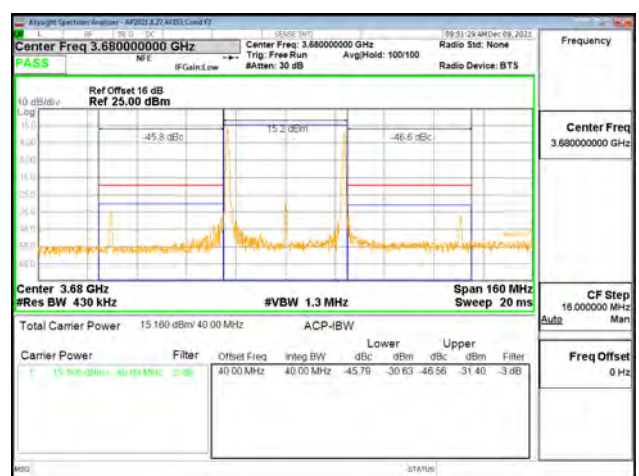
LTE B48 20MHz + 20MHz QPSK Mid Ch RB1-0 + RB1-99



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



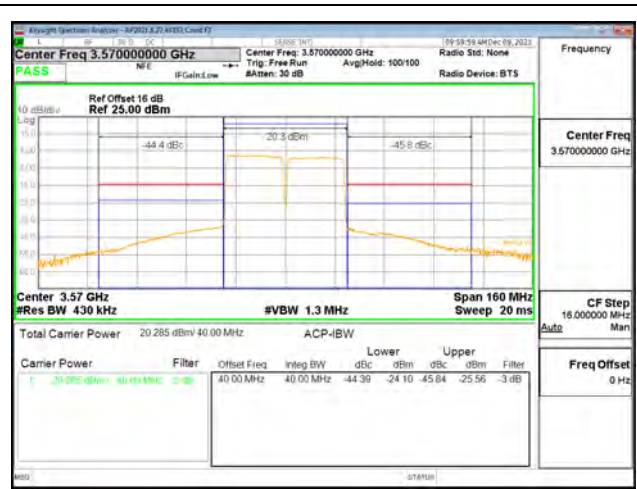
LTE B48 20MHz + 20MHz QPSK High Ch RB1-0 + RB1-99



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



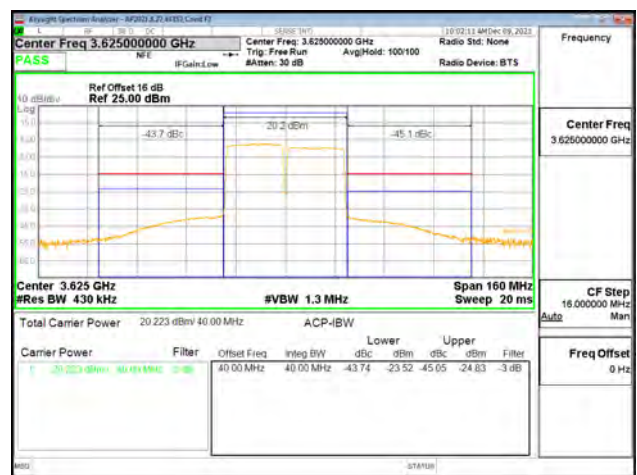
LTE B48 20MHz + 20MHz QPSK Low Ch RB100-0 + RB100-0



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 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



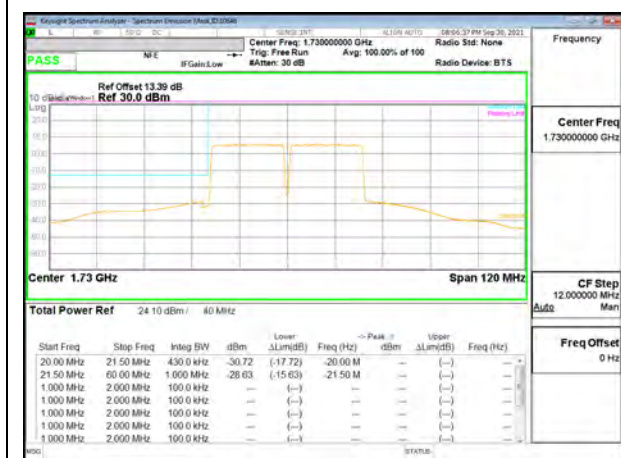
LTE B66C 20MHz + 20MHz QPSK High Ch RB100-0 + RB100-0



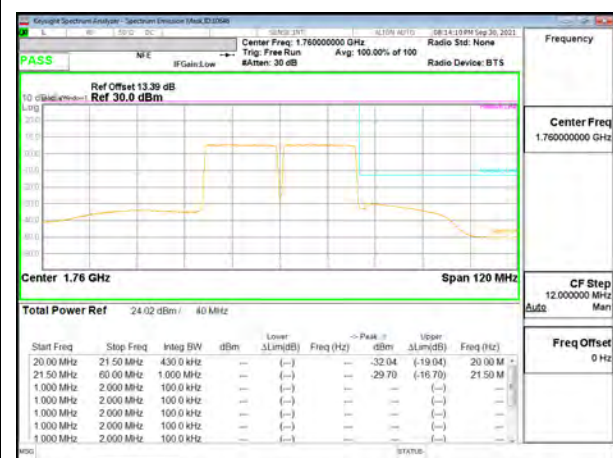
LTE B66C 20MHz + 20MHz 16QAM Low Ch RB1-0 + RB1-0



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)

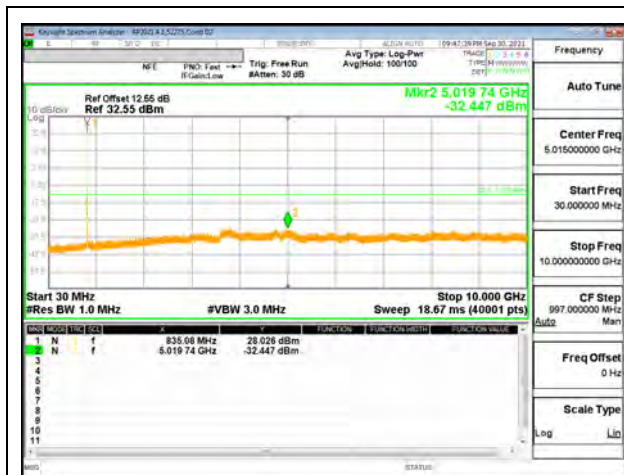
RESULTS

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.



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



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



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

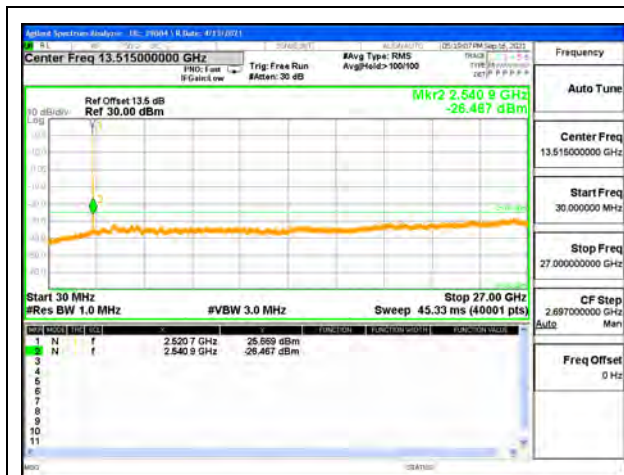
Intentionally Blank

9.3.2. LTE BAND 7

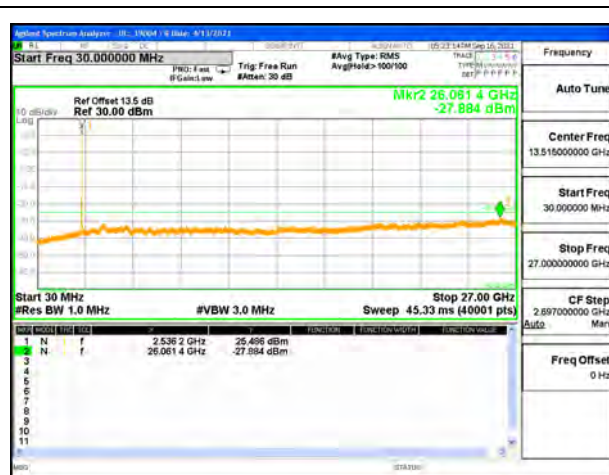
LIMITS

FCC: §27.53 (m)

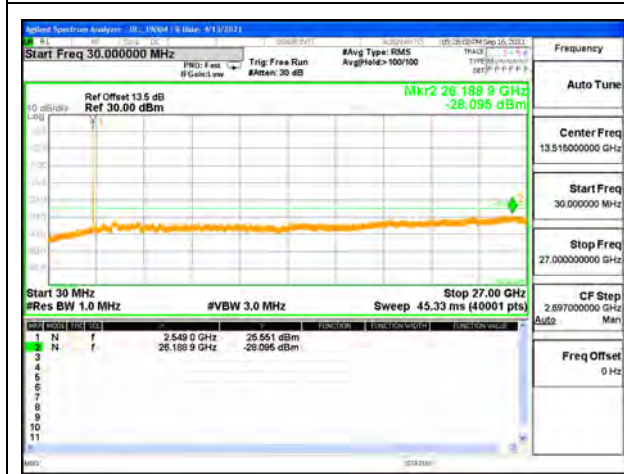
The minimum permissible attenuation level of any spurious emissions is $55 + 10 \log(P)$ dB where transmitting power (P) in Watts.



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

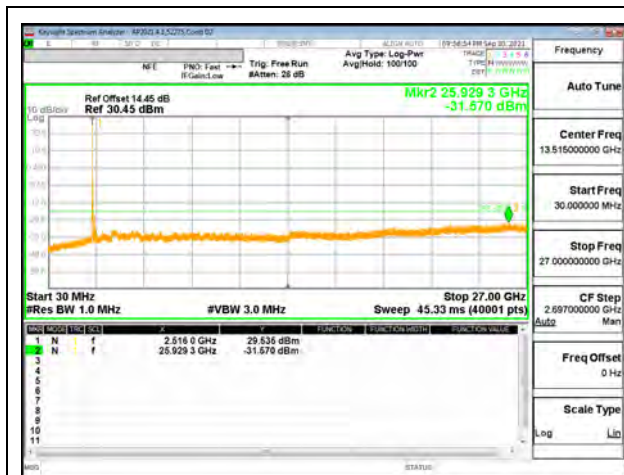
Intentionally Blank

9.3.3. LTE BAND 41

LIMITS

FCC: §27.53 (m)

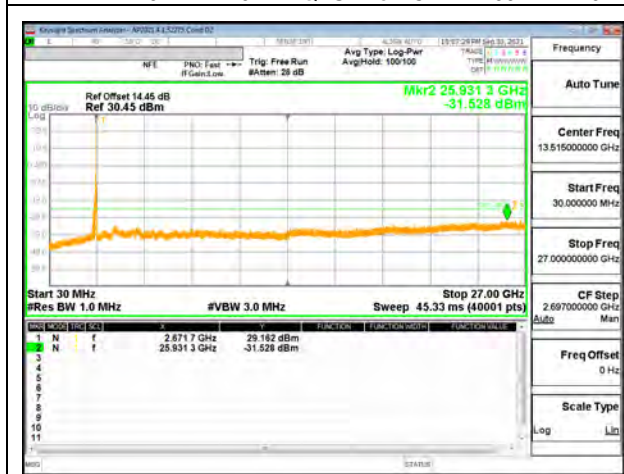
The minimum permissible attenuation level of any spurious emissions is $55 + 10 \log (P)$ dB where transmitting power (P) in Watts.



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

Intentionally Blank

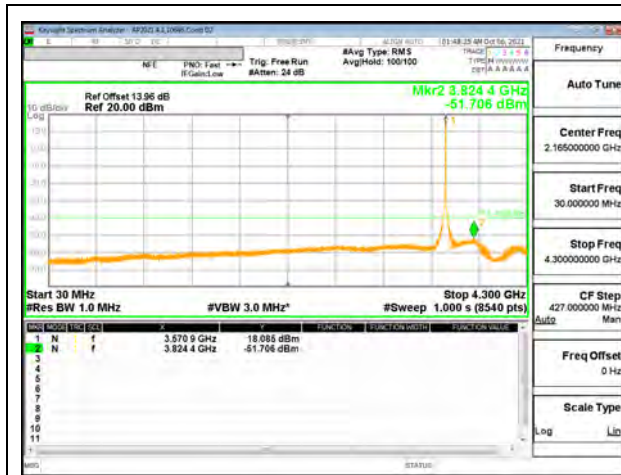
9.3.4. LTE BAND 48

LIMITS

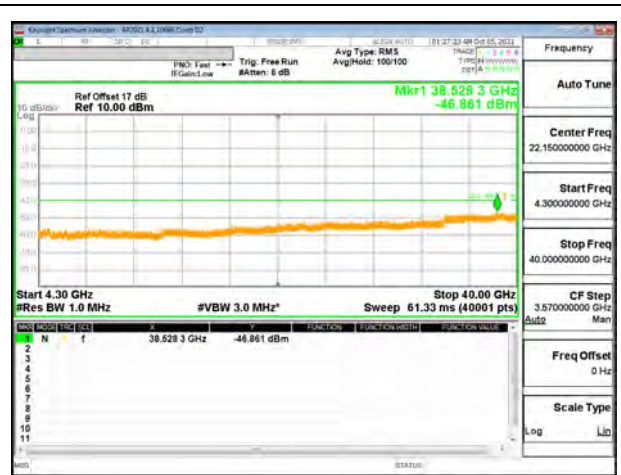
FCC: §96.41

(e) 3.5 GHz Emissions and Interference Limits—

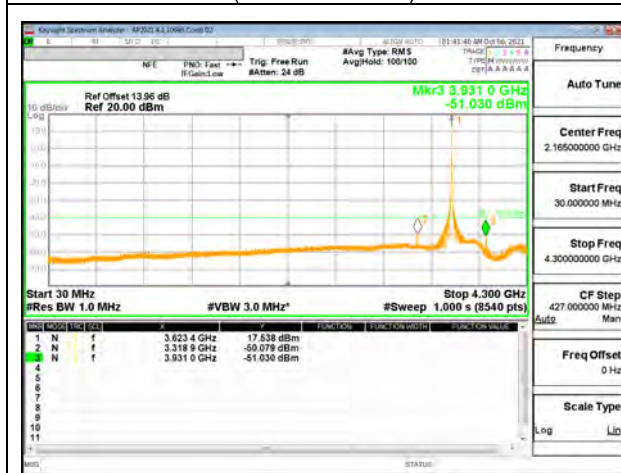
(2) Additional protection levels. Notwithstanding paragraph (e)(1) of this section, for CBSDs and End User Devices, the conducted power of emissions below 3540 MHz or above 3710 MHz shall not exceed -25 dBm/MHz, and the conducted power of emissions below 3530 MHz or above 3720 MHz shall not exceed -40dBm/MHz.



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



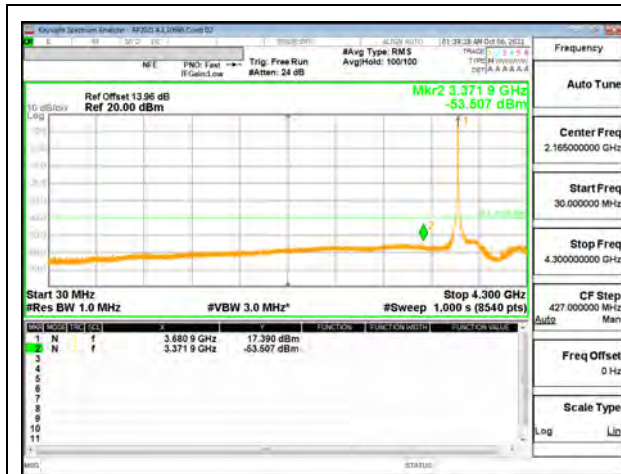
LTE B48 20MHz + 20MHz QPSK Low Ch RB1-99 + RB1-0
 (4.5GHz to 40GHz)



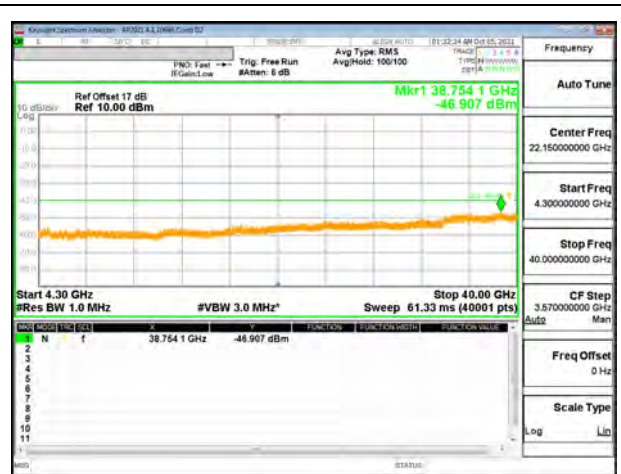
LTE B48 20MHz + 20MHz QPSK Middle Ch RB1-99 + RB1-0
 (30MHz to 4.5GHz)



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



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



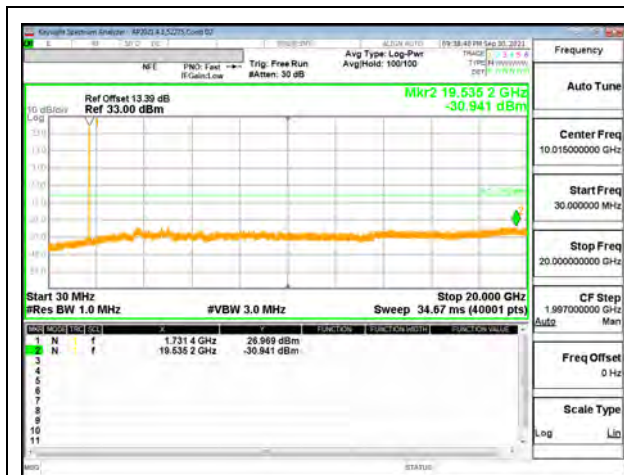
LTE B48 20MHz + 20MHz QPSK High Ch RB1-99 + RB1-0
 (4.5GHz to 40GHz)

9.3.5. LTE BAND 66C

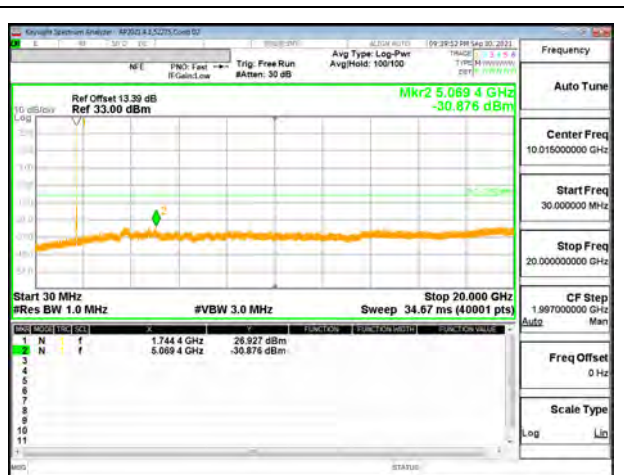
LIMITS

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

Intentionally Blank

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.

Test Engineer ID:	25780	Test Date:	11/2/2021
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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	824.5690	848.4430		
Extreme (50C)		824.5690	848.4430	12.0	0.014
Extreme (40C)		824.5690	848.4430	13.7	0.016
Extreme (30C)		824.5690	848.4430	-11.7	-0.014
Extreme (10C)		824.5690	848.4430	-19.3	-0.023
Extreme (0C)		824.5690	848.4430	-28.1	-0.034
Extreme (-10C)		824.5690	848.4430	-29.2	-0.035
Extreme (-20C)		824.5690	848.4430	-29.0	-0.035
Extreme (-30C)		824.5690	848.4430	-23.1	-0.028
20C	15%	824.5690	848.4430	-4.2	-0.005
	-15%	824.5690	848.4430	6.2	0.007
	End Point	824.5690	848.4430	7.3	0.009

9.4.2. LTE BAND 7

LIMITS

FCC: §27.54

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

Test Engineer ID:	25780	Test Date:	11/2/2021
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QPSK (20MHz + 20MHz BANDWIDTH)

Limit		2500	2570	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	2501.1871	2568.8565		
Extreme (50C)		2501.1871	2568.8565	23.7	0.009
Extreme (40C)		2501.1871	2568.8565	32.8	0.013
Extreme (30C)		2501.1871	2568.8565	24.0	0.009
Extreme (10C)		2501.1871	2568.8565	-39.2	-0.015
Extreme (0C)		2501.1870	2568.8564	-54.1	-0.021
Extreme (-10C)		2501.1870	2568.8564	-62.6	-0.025
Extreme (-20C)		2501.1870	2568.8564	-61.0	-0.024
Extreme (-30C)		2501.1870	2568.8564	-59.7	-0.024
20C	15%	2501.1871	2568.8565	9.3	0.004
	-15%	2501.1871	2568.8565	12.2	0.005
	End Point	2501.1871	2568.8565	13.1	0.005

9.4.3. LTE BAND 41

LIMITS

FCC: §27.54

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

Test Engineer ID:	25780	Test Date:	11/2/2021
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QPSK (20MHz + 20MHz BANDWIDTH)

Limit		2496	2690	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (20C)	Normal	2496.9627	2689.5367		
Extreme (50C)		2496.9627	2689.5367	25.6	0.010
Extreme (40C)		2496.9627	2689.5367	31.4	0.012
Extreme (30C)		2496.9627	2689.5367	22.9	0.009
Extreme (10C)		2496.9627	2689.5367	-39.5	-0.015
Extreme (0C)		2496.9626	2689.5366	-55.6	-0.021
Extreme (-10C)		2496.9626	2689.5366	-65.8	-0.025
Extreme (-20C)		2496.9626	2689.5366	-60.2	-0.023
Extreme (-30C)		2496.9627	2689.5367	-36.4	-0.014
20C	15%	2496.9627	2689.5367	12.4	0.005
	-15%	2496.9627	2689.5367	12.4	0.005
	End Point	2496.9627	2689.5367	11.2	0.004

9.4.4. LTE BAND 48

Test Engineer ID:	25602	Test Date:	11/2/2021
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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	3550.3765	3699.6895		
Extreme (50C)		3550.3765	3699.6895	21.2	0.006
Extreme (40C)		3550.3765	3699.6895	30.8	0.008
Extreme (30C)		3550.3765	3699.6895	21.1	0.006
Extreme (10C)		3550.3765	3699.6895	-41.5	-0.011
Extreme (0C)		3550.3764	3699.6894	-58.0	-0.016
Extreme (-10C)		3550.3764	3699.6894	-68.0	-0.019
Extreme (-20C)		3550.3764	3699.6894	-61.2	-0.017
Extreme (-30C)		3550.3765	3699.6895	-41.4	-0.011
20C	15%	3550.3765	3699.6895	-8.0	-0.002
	-15%	3550.3765	3699.6895	-8.1	-0.002
	End Point	3550.3765	3699.6895	-7.3	-0.002

9.4.5. 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.

Test Engineer ID:	25602	Test Date:	11/2/2021
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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	1710.5065	1778.8815		
Extreme (50C)		1710.5065	1778.8815	16.5	0.009
Extreme (40C)		1710.5065	1778.8815	15.9	0.009
Extreme (30C)		1710.5065	1778.8815	11.7	0.007
Extreme (10C)		1710.5065	1778.8815	-20.7	-0.012
Extreme (0C)		1710.5065	1778.8815	-29.5	-0.017
Extreme (-10C)		1710.5065	1778.8815	-34.5	-0.020
Extreme (-20C)		1710.5065	1778.8815	-31.7	-0.018
Extreme (-30C)		1710.5065	1778.8815	-40.7	-0.023
20C	15%	1710.5065	1778.8815	8.7	0.005
	-15%	1710.5065	1778.8815	8.9	0.005
	End Point	1710.5065	1778.8815	8.7	0.005

9.5. PEAK-TO-AVERAGE POWER RATIO Band 41 IC data is missing

LIMIT

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

RESULT

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

9.5.1. LTE BAND 5

Test Engineer ID:	50822	Test Date:	9/28/2021
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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	31.70	26.05	5.65	
				16QAM	31.85	25.29	6.56	
	5 MHz / 3MHz	835.0	838.9	QPSK	31.87	26.07	5.80	
				16QAM	31.95	25.17	6.78	
	5MHz / 10MHz	831.8	839.0	QPSK	32.35	24.78	7.56	
				16QAM	32.32	23.85	8.47	
	10MHz / 5MHz	834.3	841.5	QPSK	32.41	25.32	7.09	
				16QAM	32.54	24.34	8.20	
	10MHz / 10MHz	831.6	841.5	QPSK	32.51	25.3	7.21	
				16QAM	32.39	23.82	8.57	
	Duty Cycle Correction Factor (dB) =			0.00				

9.5.2. LTE BAND 7

Test Engineer ID:	39004	Test Date:	11/9/2021
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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	30.96	24.45	6.51	
				16QAM	30.94	23.47	7.46	
	20MHz / 10MHz	2530.1	2544.5	QPSK	31.30	24.45	6.84	
				16QAM	31.27	23.45	7.82	
	15 MHz / 15MHz	2527.5	2542.5	QPSK	31.19	24.41	6.78	
				16QAM	31.17	23.47	7.70	
	15MHz / 20MHz	2525.3	2542.4	QPSK	31.11	24.42	6.69	
				16QAM	31.03	23.46	7.58	
	20MHz / 15MHz	2527.6	2544.7	QPSK	31.25	24.44	6.80	
				16QAM	31.21	23.47	7.74	
	20MHz / 20MHz	2525.1	2544.9	QPSK	31.17	24.43	6.74	
				16QAM	31.10	23.47	7.63	
	Duty Cycle Correction Factor (dB) =			0.00				
	Peak-to-Average Power Ratio= Peak Reading - Average Reading - Duty Cycle Correction Factor							

9.5.3. LTE BAND 41

Test Engineer ID:	25602	Test Date:	9/28/2021
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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	34.30	19.72	7.59
				16QAM	33.96	18.81	8.16
	20MHz / 5MHz	2590.5	2602.2	QPSK	34.58	19.76	7.83
				16QAM	34.37	18.81	8.57
	10MHz / 20MHz	2583.6	2598.0	QPSK	34.96	19.77	8.20
				16QAM	34.66	18.77	8.90
	20MHz / 10MHz	2588.1	2602.5	QPSK	34.60	19.78	7.83
				16QAM	34.39	18.82	8.58
	15MHz / 15MHz	2585.5	2600.5	QPSK	34.90	19.75	8.16
				16QAM	34.25	18.79	8.47
	15MHz / 20MHz	2583.3	2600.4	QPSK	34.72	19.74	7.99
				16QAM	34.79	18.77	9.03
	20MHz / 15MHz	2585.6	2602.7	QPSK	34.64	19.80	7.85
				16QAM	34.76	18.82	8.95
	20MHz / 20MHz	2583.1	2602.9	QPSK	34.57	19.75	7.83
				16QAM	34.55	18.78	8.78
Duty Cycle Correction Factor (dB) =			6.99				
Peak-to-Average Power Ratio= Peak Reading - Average Reading - Duty Cycle Correction Factor							

9.5.4. LTE BAND 48

Test Engineer ID:	50822	Test Date:	9/30/2021
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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 48	5MHz / 20MHz	3615.8	3627.5	QPSK	30.00	16.12	6.89	
				16QAM	30.47	16.12	7.36	
	20MHz / 5MHz	3622.5	3634.2	QPSK	30.80	16.14	7.67	
				16QAM	30.65	16.17	7.49	
	10MHz / 20MHz	3615.6	3630.0	QPSK	29.73	15.62	7.12	
				16QAM	30.41	15.65	7.77	
	20MHz / 10MHz	3620.1	3634.5	QPSK	29.78	15.65	7.14	
				16QAM	30.22	15.63	7.60	
	15MHz / 20MHz	3615.3	3632.4	QPSK	29.70	15.57	7.14	
				16QAM	30.49	15.6	7.90	
	20MHz / 15MHz	3617.6	3634.7	QPSK	29.78	15.65	7.14	
				16QAM	30.22	15.63	7.60	
	20MHz / 20MHz	3615.1	3634.9	QPSK	29.96	15.56	7.41	
				16QAM	30.57	15.59	7.99	
	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 66C

Test Engineer ID:	39004	Test Date:	9/29/2021
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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	32.35	24.43	7.92
				16QAM	32.29	23.46	8.83
	15MHz / 10MHz	1750.1	1762.1	QPSK	32.39	24.41	7.97
				16QAM	32.42	23.45	8.97
	10MHz / 20MHz	1745.6	1760.0	QPSK	32.47	24.43	8.04
				16QAM	32.51	23.43	9.07
	20MHz / 10MHz	1750.1	1764.5	QPSK	32.53	24.42	8.12
				16QAM	32.51	23.42	9.09
	15MHz / 15MHz	1747.5	1762.5	QPSK	32.47	24.42	8.05
				16QAM	32.54	23.44	9.11
	15MHz / 20MHz	1745.3	1762.4	QPSK	32.59	24.4	8.19
				16QAM	32.54	23.43	9.11
	20MHz / 15MHz	1747.6	1764.7	QPSK	32.59	24.41	8.18
				16QAM	32.65	23.45	9.20
	20MHz / 5MHz	1752.5	1764.2	QPSK	32.57	24.40	8.16
				16QAM	32.48	23.43	9.05
	5MHz / 20MHz	1745.8	1757.5	QPSK	32.35	24.42	7.93
				16QAM	32.37	23.45	8.92
20MHz / 20MHz	1745.1	1764.9	QPSK	32.31	24.42	7.90	
			16QAM	32.42	23.44	8.99	
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.

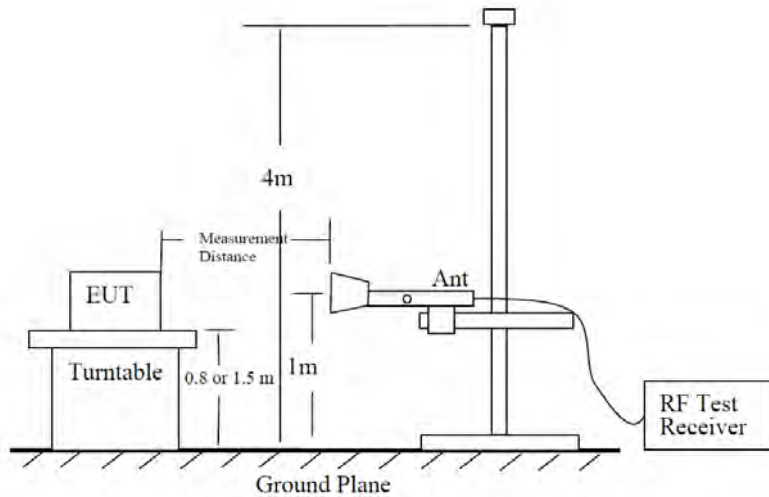


Figure 6—Test site-up for radiated ERP and/or EIRP measurements

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.

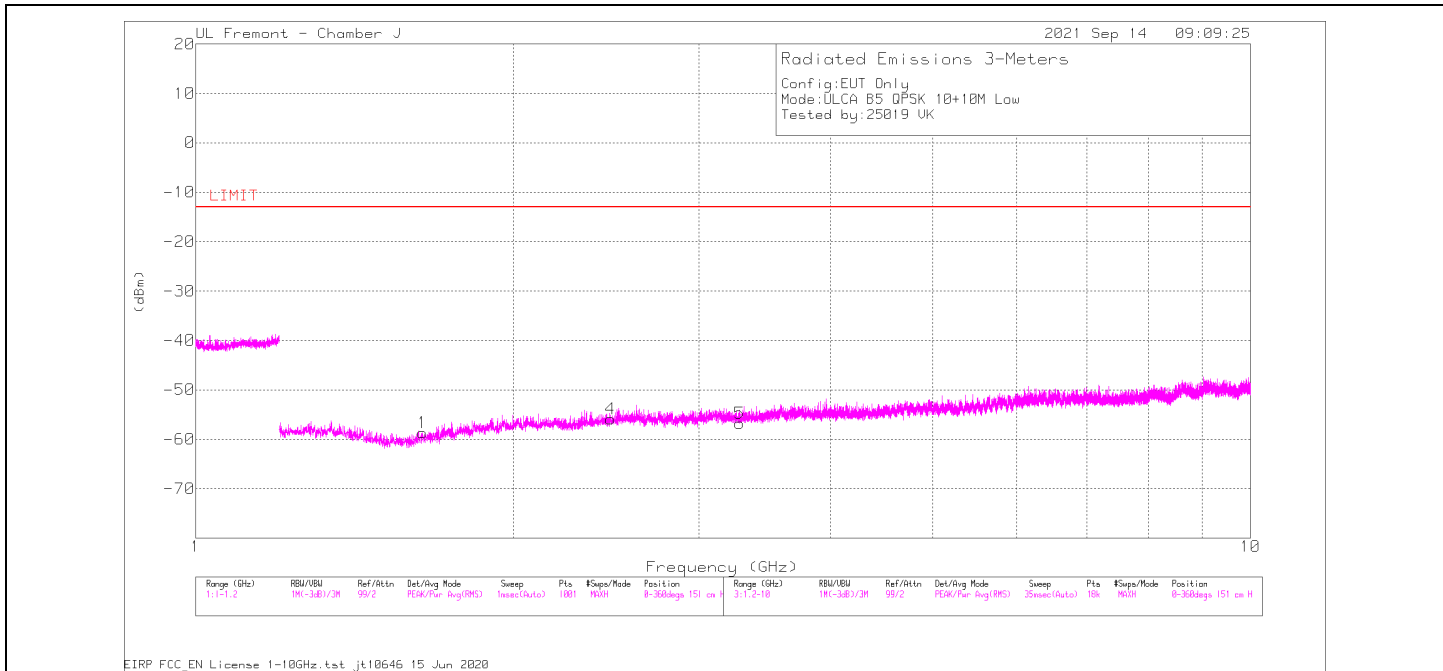
So, from d)

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

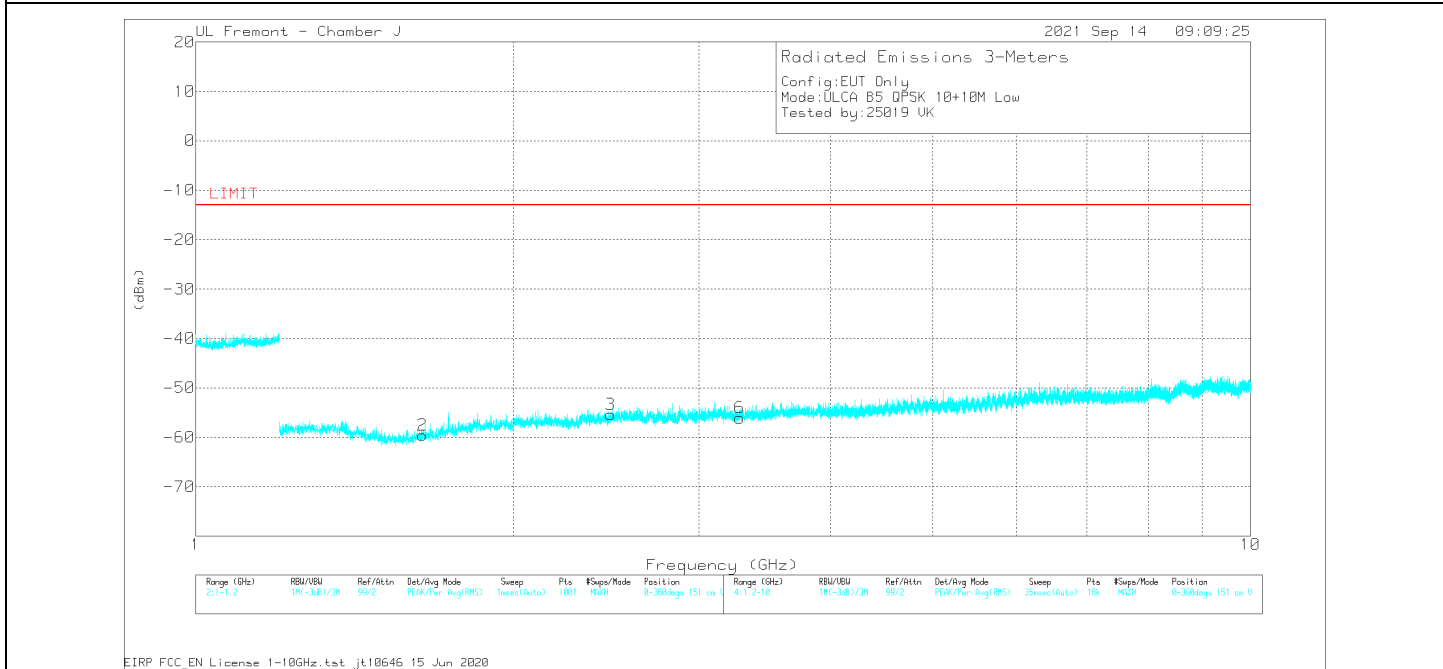
Then, $\text{EIRP (dBm)} = E \text{ (dB}\mu\text{V/m)} + 9.5424 - 104.8 = E \text{ (dB}\mu\text{V/m)} - 95.2576$

Note 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



Horizontal Polarity



Vertical Polarity

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0100034 (dB/m)	Amp/Cbl (dB)	172654 HPF (dB)	EIRP CF	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
1.6383	45.4	Pk	28.7	-37.2	.7	-95.2	-57.60	-13	-44.60	H
2.47359	45.58	Pk	32.3	-37.1	.5	-95.2	-53.92	-13	-40.92	H
3.27851	44.9	Pk	32.9	-36.5	.5	-95.2	-53.40	-13	-40.40	H
1.63912	45.73	Pk	28.8	-37.2	.7	-95.2	-57.17	-13	-44.17	V
2.47473	45.57	Pk	32.3	-37.1	.5	-95.2	-53.93	-13	-40.93	V
3.27669	45.04	Pk	32.9	-36.4	.5	-95.2	-53.16	-13	-40.16	V

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 #:	13911916
Date:	09/14/2021
Test Engineer:	25019
Configuration:	EUT only
Mode	LTE Band 5 QPSK 10MHz + 10MHz
Chamber #:	Chamber J

Frequency (GHz)	Meter Reading (dBm)	Det	AF T962 (dB/m)	Amp/Cbl (dB)	HPF 1.2GHz T1737 1-18GHz	EIRP CF	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 829MHz + 838.9MHz										
1.6383	45.4	Pk	28.7	-37.2	.7	-95.2	-57.60	-13	-44.60	H
2.47359	45.58	Pk	32.3	-37.1	.5	-95.2	-53.92	-13	-40.92	H
3.27851	44.9	Pk	32.9	-36.5	.5	-95.2	-53.40	-13	-40.40	H
1.63912	45.73	Pk	28.8	-37.2	.7	-95.2	-57.17	-13	-44.17	V
2.47473	45.57	Pk	32.3	-37.1	.5	-95.2	-53.93	-13	-40.93	V
3.27669	45.04	Pk	32.9	-36.4	.5	-95.2	-53.16	-13	-40.16	V
Mid Channel, 831.6MHz + 841.5MHz										
1.64025	45.3	Pk	28.8	-37.2	.7	-95.2	-57.60	-13	-44.60	H
2.46282	46.61	Pk	32.2	-37.1	.5	-95.2	-52.99	-13	-39.99	H
3.28431	45.12	Pk	32.8	-36.5	.5	-95.2	-53.28	-13	-40.28	H
1.64284	45.47	Pk	28.8	-37.2	.7	-95.2	-57.43	-13	-44.43	V
2.46388	46.28	Pk	32.2	-37.1	.5	-95.2	-53.32	-13	-40.32	V
3.28255	44.95	Pk	32.9	-36.5	.5	-95.2	-53.35	-13	-40.35	V
High Channel, 834.1MHz + 844MHz										
1.66681	46.28	Pk	28.7	-37.2	.7	-95.2	-56.72	-13	-43.72	H
2.5008	46.63	Pk	32.5	-37.1	.5	-95.2	-52.67	-13	-39.67	H
3.3362	45.03	Pk	33	-36.4	.5	-95.2	-53.07	-13	-40.07	H
1.66666	46.58	Pk	28.7	-37.2	.7	-95.2	-56.42	-13	-43.42	V
2.50196	46.19	Pk	32.6	-37.1	.5	-95.2	-53.01	-13	-40.01	V
3.33555	45.11	Pk	33	-36.4	.5	-95.2	-52.99	-13	-39.99	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 #:	13911916
Date:	09/21/2021
Test Engineer:	25019
Configuration:	EUT only
Mode	LTE Band 7 QPSK 20MHz + 20MHz
Chamber #:	Chamber S

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										
5.03991	41.62	Pk	34	-33.6	.8	-95.2	-52.38	-25	-27.38	H
7.56178	39.82	Pk	35.7	-30.8	.4	-95.2	-50.08	-25	-25.08	H
10.07888	39.01	Pk	36.9	-28.8	.7	-95.2	-47.39	-25	-22.39	H
5.03976	41.09	Pk	34	-33.6	.9	-95.2	-52.81	-25	-27.81	V
7.55935	39.26	Pk	35.7	-30.8	.4	-95.2	-50.64	-25	-25.64	V
10.07801	37.94	Pk	36.9	-28.8	.7	-95.2	-48.46	-25	-23.46	V
Mid Channel, 2525.1MHz + 2544.9MHz										
5.07103	43.21	Pk	34	-33.7	.6	-95.2	-51.09	-25	-26.09	H
7.60406	40.15	Pk	35.8	-30.5	.5	-95.2	-49.25	-25	-24.25	H
10.14054	38.04	Pk	36.9	-28.8	.7	-95.2	-48.36	-25	-23.36	H
5.07	42.9	Pk	34	-33.7	.6	-95.2	-51.4	-25	-26.4	V
7.60389	39.74	Pk	35.7	-30.5	.5	-95.2	-49.76	-25	-24.76	V
10.13887	38.85	Pk	36.9	-28.8	.7	-95.2	-47.55	-25	-22.55	V
High Channel, 2540.2MHz + 2560.0MHz										
5.10158	51.52	Pk	34.5	-41.8	.8	-95.2	-50.18	-25	-25.18	H
5.1023	51.33	Pk	34.5	-41.8	.8	-95.2	-50.37	-25	-25.37	V
7.65143	48.13	Pk	36.1	-38.9	.3	-95.2	-49.57	-25	-24.57	H
7.65153	48.37	Pk	36.1	-38.9	.3	-95.2	-49.33	-25	-24.33	V
10.19984	47.54	Pk	37.4	-36.8	.8	-95.2	-46.26	-25	-21.26	H
10.20181	47.26	Pk	37.4	-36.8	.8	-95.2	-46.54	-25	-21.54	V

10.2.3. LTE BAND 41

LIMIT

FCC: §27.53 (m)

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

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

Project #:	13911916
Date:	09/16/2021
Test Engineer:	25019
Configuration:	EUT only
Mode	Band 41 QPSK 20MHz + 20MHz
Chamber #:	Chamber J

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										
1.73512	45.5	Pk	29.5	-37.2	.7	-95.2	-56.70	-25	-31.70	H
1.73502	45.59	Pk	29.5	-37.2	.7	-95.2	-56.61	-25	-31.61	V
5.03122	42.23	Pk	33.9	-33.6	.7	-95.2	-51.97	-25	-26.97	H
7.55018	39.69	Pk	35.7	-30.8	.3	-95.2	-50.31	-25	-25.31	H
5.03159	41.94	Pk	33.9	-33.6	.7	-95.2	-52.26	-25	-27.26	V
7.54851	39.55	Pk	35.7	-30.8	.3	-95.2	-50.45	-25	-25.45	V
Mid Channel, 2583.1MHz + 2602.9MHz										
5.18495	42.12	Pk	34.2	-33.3	.8	-95.2	-51.38	-25	-26.38	H
7.77796	39.88	Pk	35.8	-30.6	.4	-95.2	-49.72	-25	-24.72	H
10.37067	38.87	Pk	37.1	-28.8	.8	-95.2	-47.23	-25	-22.23	H
5.18518	42.09	Pk	34.2	-33.3	.8	-95.2	-51.41	-25	-26.41	V
7.77971	40.09	Pk	35.8	-30.6	.4	-95.2	-49.51	-25	-24.51	V
10.37319	38.29	Pk	37.1	-28.9	.8	-95.2	-47.91	-25	-22.91	V
High Channel, 2660.2MHz + 2680.0MHz										
5.3393	42.62	Pk	34.4	-33.6	.7	-95.2	-51.08	-25	-26.08	H
8.00933	40.51	Pk	35.7	-30.4	.4	-95.2	-48.99	-25	-23.99	H
10.68015	38.47	Pk	37.4	-28.4	.4	-95.2	-47.33	-25	-22.33	H
5.34032	43.23	Pk	34.4	-33.6	.7	-95.2	-50.47	-25	-25.47	V
8.01249	40.07	Pk	35.7	-30.4	.4	-95.2	-49.43	-25	-24.43	V
10.68061	38.86	Pk	37.4	-28.4	.4	-95.2	-46.94	-25	-21.94	V

10.2.4. 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 #:	13911916
Date:	9/13/2021
Test Engineer:	25019
Configuration:	EUT only
Mode	Band 48 QPSK 20MHz + 20MHz
Chamber #:	Chamber J

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										
7.10044	39.83	RMS	35.8	-30.8	.5	-95.2	-49.87	-40	-9.87	H
10.65146	38	RMS	38	-28.3	.7	-95.2	-46.80	-40	-6.80	H
14.20105	35.07	RMS	39.1	-25.8	1	-95.2	-45.83	-40	-5.83	H
7.10069	40.01	RMS	35.8	-30.8	.5	-95.2	-49.69	-40	-9.69	V
10.6494	38.47	RMS	38	-28.3	.7	-95.2	-46.33	-40	-6.33	V
14.19935	35.59	RMS	39.1	-25.8	1	-95.2	-45.31	-40	-5.31	V
Mid Channel, 3615.1MHz + 3634.9MHz										
7.24773	40.03	RMS	35.8	-30.6	.6	-95.2	-49.37	-40	-9.37	H
10.87141	37.46	RMS	38	-28.3	.7	-95.2	-47.34	-40	-7.34	H
14.49548	36.08	RMS	39.5	-25.1	1.3	-95.2	-43.42	-40	-3.42	H
7.24732	39.67	RMS	35.8	-30.6	.6	-95.2	-49.73	-40	-9.73	V
10.87132	37.55	RMS	38	-28.3	.7	-95.2	-47.25	-40	-7.25	V
14.49803	35.32	RMS	39.5	-25	1.3	-95.2	-44.08	-40	-4.08	V
High Channel, 3670.2MHz + 3690.0MHz										
3.98698	44.57	RMS	33.5	-34.8	3.3	-95.2	-48.63	-40	-8.63	H
11.04047	37.95	RMS	38.1	-28	.7	-95.2	-46.45	-40	-6.45	H
7.36126	39.11	RMS	35.8	-30.8	.7	-95.2	-50.39	-40	-10.39	H
11.0404	37.66	RMS	38.1	-28	.7	-95.2	-46.74	-40	-6.74	V
3.98622	46.4	RMS	33.5	-34.8	3.4	-95.2	-46.70	-40	-6.70	V
7.35941	40.19	RMS	35.8	-30.8	.7	-95.2	-49.31	-40	-9.31	V

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 #:	13911916
Date:	09/21/2021
Test Engineer:	25019
Configuration:	EUT only
Mode	Band 66B QPSK 20MHz + 20MHz
Chamber #:	Chamber S

Frequency (GHz)	Meter Reading (dBUV)	Det	AF T962 (dB/m)	Amp/Cbl (dB)	HPF 2.7GHz T772 1-18GHz	EIRP CF	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1720MHz + 1739.8MHz										
3.46009	43.3	Pk	33.1	-36.2	.6	-95.2	-54.40	-13	-41.40	H
5.18836	42.14	Pk	34.4	-33.3	.5	-95.2	-51.46	-13	-38.46	H
6.91981	40.41	Pk	35.9	-31	.5	-95.2	-49.39	-13	-36.39	H
3.46077	43.09	Pk	33.1	-36.2	.6	-95.2	-54.61	-13	-41.61	V
5.18831	42.3	Pk	34.4	-33.3	.5	-95.2	-51.30	-13	-38.30	V
6.92051	41	Pk	35.9	-30.9	.5	-95.2	-48.70	-13	-35.70	V
Mid Channel, 1745.1MHz + 1764.9MHz										
3.51119	45.19	Pk	32.8	-36	.8	-95.2	-52.41	-13	-39.41	H
5.26391	42.13	Pk	34.4	-33.5	.7	-95.2	-51.47	-13	-38.47	H
7.02227	39.59	Pk	35.5	-30.8	.4	-95.2	-50.51	-13	-37.51	H
3.50866	44.38	Pk	32.7	-36	.8	-95.2	-53.32	-13	-40.32	V
5.26629	42.1	Pk	34.4	-33.6	.7	-95.2	-51.60	-13	-38.60	V
7.02057	39.63	Pk	35.5	-30.8	.4	-95.2	-50.47	-13	-37.47	V
High Channel, 1750.2MHz + 1770.0MHz										
3.51896	44.61	Pk	32.8	-36	.8	-95.2	-52.99	-13	-39.99	H
5.27965	42.42	Pk	34.4	-33.6	.5	-95.2	-51.48	-13	-38.48	H
7.03846	39.92	Pk	35.5	-30.6	.5	-95.2	-49.88	-13	-36.88	H
3.51848	44.6	Pk	32.8	-36	.8	-95.2	-53.00	-13	-40.00	V
5.27936	43.38	Pk	34.4	-33.6	.5	-95.2	-50.52	-13	-37.52	V
7.0405	39.24	Pk	35.5	-30.6	.5	-95.2	-50.56	-13	-37.56	V

10.3. FIELD STRENGTH OF SPURIOUS RADIATION, ANT2

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 #:	13911916
Date:	10/14/2021
Test Engineer:	39006
Configuration:	EUT only
Mode	LTE Band 5 QPSK 10MHz + 10MHz
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBm)	Det	AF T962 (dB/m)	Amp/Cbl (dB)	HPF 1.2GHz T1737 1-18GHz	EIRP CF	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 829MHz + 838.9MHz										
1.64831	42.25	Pk	28.4	-34.9	.8	-95.2	-58.65	-13	-45.65	V
1.6488	42.03	Pk	28.4	-34.9	.8	-95.2	-58.87	-13	-45.87	H
2.44373	42.03	Pk	32.3	-34.7	.5	-95.2	-55.07	-13	-42.07	V
2.44422	41.34	Pk	32.3	-34.7	.5	-95.2	-55.76	-13	-42.76	H
3.32324	40.65	Pk	32.6	-33.8	.6	-95.2	-55.15	-13	-42.15	V
3.32716	40.83	Pk	32.6	-33.7	.6	-95.2	-54.87	-13	-41.87	H
Mid Channel, 831.6MHz + 841.5MHz										
1.6444	42.46	Pk	28.4	-34.9	.7	-95.2	-58.54	-13	-45.54	V
1.65369	42.93	Pk	28.4	-34.9	.8	-95.2	-57.97	-13	-44.97	H
2.49751	40.41	Pk	32.8	-34.8	.6	-95.2	-56.19	-13	-43.19	V
2.50729	41.84	Pk	32.7	-34.7	.7	-95.2	-54.66	-13	-41.66	H
3.35551	41.12	Pk	32.5	-33.7	.6	-95.2	-54.68	-13	-41.68	H
3.36627	41.99	Pk	32.5	-33.7	.6	-95.2	-53.81	-13	-40.81	V
High Channel, 834.1MHz + 844MHz										
1.68547	41.4	Pk	28.7	-34.9	.7	-95.2	-59.30	-13	-46.30	V
1.69573	41.22	Pk	28.8	-34.9	.7	-95.2	-59.38	-13	-46.38	H
2.5244	40.6	Pk	32.7	-34.7	.8	-95.2	-55.80	-13	-42.80	H
2.52733	41.58	Pk	32.7	-34.7	.8	-95.2	-54.82	-13	-41.82	V
3.37164	40.74	Pk	32.6	-33.7	.6	-95.2	-54.96	-13	-41.96	H
3.37409	40.52	Pk	32.6	-33.6	.6	-95.2	-55.08	-13	-42.08	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 #:	13911916
Date:	10/14/2021
Test Engineer:	39006
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										
5.07844	37.68	Pk	34.1	-30.5	.7	-95.2	-53.22	-25	-28.22	V
5.10328	40.5	Pk	34.1	-30.5	.8	-95.2	-50.30	-25	-25.30	H
7.49953	35.76	Pk	35.8	-26.8	.4	-95.2	-50.04	-25	-25.04	V
7.52578	35.82	Pk	35.8	-27	.3	-95.2	-50.28	-25	-25.28	H
10.02609	34.1	Pk	37.2	-24.8	.7	-95.2	-48.00	-25	-23.00	V
10.04344	34.97	Pk	37.1	-24.9	.7	-95.2	-47.33	-25	-22.33	H
Mid Channel, 2525.1MHz + 2544.9MHz										
5.05922	38.99	Pk	34.1	-30.7	.6	-95.2	-52.21	-25	-27.21	V
5.07234	38.07	Pk	34.1	-30.6	.7	-95.2	-52.93	-25	-27.93	H
7.46531	35.06	Pk	35.8	-26.8	.4	-95.2	-50.74	-25	-25.74	V
7.50234	35.14	Pk	35.8	-26.9	.4	-95.2	-50.76	-25	-25.76	H
10.16531	34.5	Pk	37.2	-24.9	.5	-95.2	-47.90	-25	-22.90	V
10.17469	33.91	Pk	37.3	-25	.6	-95.2	-48.39	-25	-23.39	H
High Channel, 2540.2MHz + 2560.0MHz										
5.12531	38.08	Pk	34.2	-30.7	.8	-95.2	-52.82	-25	-27.82	H
5.15813	38.37	Pk	34.3	-30.5	.8	-95.2	-52.23	-25	-27.23	V
7.62469	34.88	Pk	35.8	-26.9	.4	-95.2	-51.02	-25	-26.02	V
7.68328	34.55	Pk	35.8	-26.7	.5	-95.2	-51.05	-25	-26.05	H
10.30219	34.46	Pk	37.4	-25	.6	-95.2	-47.74	-25	-22.74	V
10.33922	33.71	Pk	37.5	-24.8	.7	-95.2	-48.09	-25	-23.09	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 #:	13911916
Date:	10/14/2021
Test Engineer:	39006
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										
4.9875	38.57	Pk	34	-30.8	.7	-95.2	-52.73	-25	-27.73	V
4.995	37.98	Pk	34	-30.8	.7	-95.2	-53.32	-25	-28.32	H
7.45547	36.44	Pk	35.8	-26.8	.4	-95.2	-49.36	-25	-24.36	H
7.46438	34.71	Pk	35.8	-26.8	.4	-95.2	-51.09	-25	-26.09	V
10.08938	34.24	Pk	37.1	-24.8	.6	-95.2	-48.06	-25	-23.06	V
10.13484	34.7	Pk	37.2	-24.9	.7	-95.2	-47.50	-25	-22.50	H
Mid Channel, 2583.1MHz + 2602.9MHz										
5.15953	39.09	Pk	34.2	-30.5	.8	-95.2	-51.61	-25	-26.61	V
5.16844	39.39	Pk	34.2	-30.6	.7	-95.2	-51.51	-25	-26.51	H
7.74469	35.63	Pk	35.9	-26.8	.3	-95.2	-50.17	-25	-25.17	H
7.75172	35.53	Pk	35.9	-26.9	.3	-95.2	-50.37	-25	-25.37	V
10.37813	34.83	Pk	37.6	-24.8	.8	-95.2	-46.77	-25	-21.77	H
10.38516	33.95	Pk	37.6	-24.7	.8	-95.2	-47.55	-25	-22.55	V
High Channel, 2660.2MHz + 2680.0MHz										
5.36438	37.35	Pk	34.5	-30.2	.5	-95.2	-53.05	-25	-28.05	V
5.37375	37.59	Pk	34.5	-30.1	.6	-95.2	-52.61	-25	-27.61	H
8.03813	35.54	Pk	35.9	-26.4	.4	-95.2	-49.76	-25	-24.76	V
8.06484	35.44	Pk	35.9	-26.2	.4	-95.2	-49.66	-25	-24.66	H
10.57688	34.26	Pk	37.9	-24.4	.9	-95.2	-46.54	-25	-21.54	H
10.57922	35.63	Pk	37.9	-24.3	.9	-95.2	-45.07	-25	-20.07	V

10.3.4. 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 #:	13911916
Date:	10/14/2021
Test Engineer:	30606
Configuration:	EUT only
Mode	Band 66B QPSK 10MHz + 10MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T962 (dB/m)	Amp/Cbl (dB)	HPF 2.7GHz T772 1-18GHz	EIRP CF	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1720MHz + 1739.8MHz										
3.4408	36.65	Pk	32.7	-26.2	.7	-95.2	-51.35	-13	-38.35	V
3.44359	37.14	Pk	32.7	-26.2	.7	-95.2	-50.86	-13	-37.86	H
5.14956	35.51	Pk	34.4	-24	.5	-95.2	-48.79	-13	-35.79	V
5.17568	35.85	Pk	34.4	-23.9	.5	-95.2	-48.35	-13	-35.35	H
6.87458	33.19	Pk	35.5	-20.5	.6	-95.2	-46.41	-13	-33.41	V
6.87875	33.69	Pk	35.5	-20.6	.6	-95.2	-46.01	-13	-33.01	H
Mid Channel, 1745.1MHz + 1764.9MHz										
3.48988	37.57	Pk	32.6	-26.1	.7	-95.2	-50.43	-13	-37.43	V
3.51085	36.96	Pk	32.8	-26	.8	-95.2	-50.64	-13	-37.64	H
5.2292	35.17	Pk	34.5	-24	.6	-95.2	-48.93	-13	-35.93	H
5.23285	35.56	Pk	34.5	-24.1	.6	-95.2	-48.64	-13	-35.64	V
6.98675	33.6	Pk	35.5	-20.8	.5	-95.2	-46.40	-13	-33.40	H
7.00773	33.71	Pk	35.5	-21	.5	-95.2	-46.49	-13	-33.49	V
High Channel, 1750.2MHz + 1770.0MHz										
3.4973	36.77	Pk	32.7	-26.1	.7	-95.2	-51.13	-13	-38.13	V
3.51799	36.2	Pk	32.9	-26	.8	-95.2	-51.30	-13	-38.30	H
5.23197	35.93	Pk	34.5	-24.1	.6	-95.2	-48.27	-13	-35.27	H
5.23857	35.21	Pk	34.4	-24	.6	-95.2	-48.99	-13	-35.99	V
6.98415	34.52	Pk	35.5	-20.8	.5	-95.2	-45.48	-13	-32.48	V
6.98979	34.22	Pk	35.5	-20.8	.5	-95.2	-45.78	-13	-32.78	H

10.4. FIELD STRENGTH OF SPURIOUS RADIATION, ANT4

TEST PROCEDURE

KDB 971168 D01/D02 v02r01

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

RESULTS

10.4.1. LTE BAND 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 #:	13911916
Date:	12/9/2021
Test Engineer:	30606
Configuration:	EUT only
Mode	Band 48 QPSK 20MHz + 20MHz
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBm)	Det	AF T962 (dB/m)	Amp/Cbl (dB)	T1792 3400-3800MHz BRF	EIRP CF	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 3560MHz + 3579.8MHz										
5.334574	28.8	RMS	34.5	-24.3	.5	-95.2	-55.7	-40	-15.7	V
5.854387	29.11	RMS	35.1	-23.2	.7	-95.2	-53.49	-40	-13.49	H
6.807709	27.07	RMS	35.5	-21	.4	-95.2	-53.23	-40	-13.23	V
7.503309	27.02	RMS	35.6	-20.2	.6	-95.2	-52.18	-40	-12.18	H
9.016326	27.5	RMS	36.2	-18.7	.8	-95.2	-49.40	-40	-9.40	V
9.666832	27.13	RMS	36.8	-18.3	.6	-95.2	-48.97	-40	-8.97	H
Mid Channel, 3615.1MHz + 3634.9MHz										
5.522496	23.39	RMS	34.8	-23.3	.7	-95.2	-59.61	-40	-19.61	V
5.668928	23.89	RMS	34.8	-23	.4	-95.2	-59.11	-40	-19.11	H
7.232173	22.26	RMS	35.5	-20.5	.5	-95.2	-57.44	-40	-17.44	V
7.673718	22.14	RMS	35.7	-19.6	.8	-95.2	-56.16	-40	-16.16	H
9.037754	21.7	RMS	36.2	-18.6	.8	-95.2	-55.10	-40	-15.10	V
10.019375	20.97	RMS	37.2	-17.6	.6	-95.2	-54.03	-40	-14.03	H
High Channel, 3670.2MHz + 3690.0MHz										
5.426839	23.13	RMS	34.7	-23.8	.4	-95.2	-60.77	-40	-20.77	H
6.847306	21.93	RMS	35.5	-20.8	.5	-95.2	-58.07	-40	-18.07	H
8.605393	21.5	RMS	35.9	-18.8	.7	-95.2	-55.90	-40	-15.90	H
5.62366	23.98	RMS	34.8	-23.2	.5	-95.2	-59.12	-40	-19.12	V
7.144072	22.45	RMS	35.6	-20.5	.5	-95.2	-57.15	-40	-17.15	V
8.633378	21.68	RMS	35.9	-18.6	.9	-95.2	-55.32	-40	-15.32	V

11. SETUP PHOTO

Please refer to 13911916-EP1V1 for setup photos

END OF REPORT