CERTIFICATION TEST REPORT

Report Number. : 12696945-E7V3

Applicant	:	APPLE, INC. 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A.
Model	:	A2221
FCC ID	:	BCG-E3304A
EUT Description	:	SMARTPHONE
Test Standard(s)	:	FCC CFR47 PART 22H, 24E, 27, 90S, AND 96

Date Of Issue:
AUGUST 15, 2019

Prepared by:
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NVLAP Lab code: 200065-0

Rev.	Issue Date	Revisions	Revised By
V1	7/19/2019	Initial Review	Mengistu Mekuria
V2	8/1/2019	Address TCB Questions	Mengistu Mekuria
V3	8/15/2019	Address TCB Questions	John Thompson

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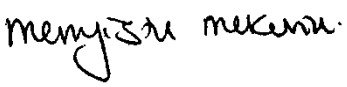
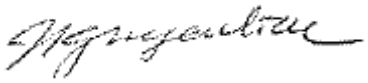
1. ATTESTATION OF TEST RESULTS

Applicant Name and Address	APPLE, INC. 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A.
Model	A2221
FCC ID	BCG-E3304A
EUT Description	SMARTPHONE
Serial Number	C7CYQ00AMTCF (Conducted), C7CYG03EMCHT (Radiated)
Date Tested	FEBRUARY 18, 2019 to AUGUST 13, 2019
Applicable Standards	PART 22H, 24E, 27, 90S, AND 96
Test Results	COMPLIES

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

Approved & Released By:	Prepared By:
	
Mengistu Mekuria Senior Test Engineer UL Verification Services Inc.	Lieu Nguyen Laboratory Engineer UL Verification Services Inc.

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.26:2015, FCC CFR 47 Part 2, Part 22, Part 24, Part 27, Part 90S, and 96, FCC KDB 971168 D01 v03r01/ D02 v02r01, KDB 412172 D01 v01r01.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, and 47658 Kato Road, Fremont, California, USA. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

47173 Benicia Street	47266 Benicia Street	47658 Kato Rd.
☐ Chamber A (ISED:2324B-1)	☐ Chamber D (ISED:22541-1)	☐ Chamber I (ISED: 2324A-5)
☒ Chamber B (ISED:2324B-2)	☐ Chamber E (ISED:22541-2)	☐ Chamber J (ISED: 2324A-6)
☐ Chamber C (ISED:2324B-3)	☐ Chamber F (ISED:22541-3)	☐ Chamber K (ISED: 2324A-1)
	☐ Chamber G (ISED:22541-4)	☐ Chamber L (ISED: 2324A-3)
	☐ Chamber H (ISED:22541-5)	

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. Chambers above are covered under Industry Canada company address and respective code.
UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0.

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4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. 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

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Conducted Disturbance, 9KHz to 0.15 MHz	3.84 dB
Conducted Disturbance, 0.15 to 30 MHz	3.65 dB
Radiated Disturbance, 9KHz to 30 MHz	2.52 dB
Radiated Disturbance, 30 to 1000 MHz	4.88 dB
Radiated Disturbance,1000 to 18000 MHz	4.24 dB
Radiated Disturbance,18000 to 26000 MHz	4.37 dB
Radiated Disturbance,26000 to 40000 MHz	5.17 dB
Occupied Channel Bandwidth	±0.39 %
Temperature	±0.9 °C
Supply voltages	±0.45 %
Time	±0.02 %

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

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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

EUT is a smartphone with multimedia functions (music, application support, and video), cellular GSM, GPRS, EGPRS, UMTS, LTE, TD-SCDMA, CDMA, IEEE 802.11a/b/g/n/ac/ax, Bluetooth, Ultra-Wide band, GPS and NFC. All models support at least one UICC based SIM. The second SIM, if present, is either UICC based pSIM (physical SIM) or e-SIM (electronic SIM). The device has a built-in inductive charging receiver. The rechargeable battery is also not user accessible.

5.2. MAXIMUM OUTPUT POWER

ERP/EIRP LIMIT
FCC: §2.1046, §22.913, §24.232, §27.50, §90.635, §90.541, and §96.41

EIRP/ERP TEST PROCEDURE
ANSI C63.26:2015
KDB 971168 D01 Section 5.6

ERP/EIRP = PMeas + GT − LC
where: ERP/EIRP = effective or equivalent radiated power, respectively (expressed in the same units as PMeas, typically dBW or dBm);
PMeas = measured transmitter output power or PSD, in dBm or dBW;
GT = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);
LC = signal attenuation in the connecting cable between the transmitter and antenna, in dB.2

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:

LTE BAND 2

Part 24	
EIRP Limit (W)	2.00
Antenna Gain (dBi)	-2.00

Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)	99% BW (kHz)	Emission Designator
1.4	QPSK	1850.7	1909.3	25.7	23.70	0.234	1093.4	1M09G7W
	16QAM			24.8	22.82	0.191	1090	1M09D7W
	64QAM			23.3	21.29	0.134	1092.2	1M09D7W
3.0	QPSK	1851.5	1908.5	25.7	23.70	0.234	2705.2	2M71G7W
	16QAM			24.8	22.85	0.193	2706.8	2M71D7W
	64QAM			23.3	21.31	0.135	2707.2	2M71D7W
5.0	QPSK	1852.5	1907.5	25.7	23.70	0.234	4499.4	4M50G7W
	16QAM			24.9	22.90	0.195	4497.5	4M50D7W
	64QAM			23.6	21.57	0.143	4495.9	4M50D7W
10.0	QPSK	1855.0	1905.0	25.7	23.70	0.234	9008.4	9M01G7W
	16QAM			25.0	23.00	0.199	9007.5	9M01D7W
	64QAM			23.5	21.54	0.142	9027.2	9M03D7W
15.0	QPSK	1857.5	1902.5	25.7	23.66	0.233	13487	13M5G7W
	16QAM			24.9	22.93	0.196	13491	13M5D7W
	64QAM			23.6	21.56	0.143	13518	13M5D7W
20.0	QPSK	1860.0	1900.0	25.7	23.70	0.234	17970	18M0G7W
	16QAM			25.0	23.02	0.201	17955	18M0D7W
	64QAM			23.6	21.65	0.146	17969	18M0D7W

LTE BAND 5

Part 22H	
ERP Limit (W)	7.00
Antenna Gain (dBi)	-3.20

Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	ERP Average (dBm)	ERP Average (W)	99% BW (kHz)	Emission Designator
1.4	QPSK	824.7	848.3	25.7	20.35	0.108	1089.4	1M09G7W
	16QAM			24.8	19.44	0.088	1094.2	1M09D7W
	64QAM			23.6	18.21	0.066	1091	1M09D7W
3.0	QPSK	825.5	847.5	25.7	20.35	0.108	2701.4	2M70G7W
	16QAM			24.7	19.36	0.086	2711.3	2M71D7W
	64QAM			23.5	18.15	0.065	2704.2	2M70D7W
5.0	QPSK	826.5	846.5	25.7	20.35	0.108	4499.1	4M50G7W
	16QAM			25.0	19.62	0.092	4487.8	4M49D7W
	64QAM			23.8	18.44	0.070	4499	4M50D7W
10.0	QPSK	829.0	844.0	25.7	20.35	0.108	9007.9	9M01G7W
	16QAM			25.0	19.69	0.093	9025.7	9M03D7W
	64QAM			23.8	18.47	0.070	9006.4	9M01D7W

LTE BAND 7

Part 27	
EIRP Limit (W)	2.00
Antenna Gain (dBi)	-2.10

Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)	99% BW (kHz)	Emission Designator
5.0	QPSK	2502.5	2567.5	25.7	23.60	0.229	4501.6	4M50G7W
	16QAM			25.2	23.14	0.206	4508.6	4M51D7W
	64QAM			23.6	21.53	0.142	4494.6	4M49D7W
10.0	QPSK	2505.0	2565.0	25.7	23.60	0.229	9017.9	9M02G7W
	16QAM			25.1	23.02	0.200	9005.1	9M01D7W
	64QAM			23.7	21.64	0.146	9021.4	9M02D7W
15.0	QPSK	2507.5	2562.5	25.7	23.60	0.229	13481	13M5G7W
	16QAM			25.0	22.95	0.197	13461	13M5D7W
	64QAM			23.8	21.69	0.148	13468	13M5D7W
20.0	QPSK	2510.0	2560.0	25.7	23.60	0.229	17949	17M9G7W
	16QAM			25.0	22.93	0.196	17982	18M0D7W
	64QAM			24.1	21.96	0.157	17943	17M9D7W

LTE BAND 12

Part 27	
ERP Limit (W)	3.00
Antenna Gain (dBi)	-3.40

Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	ERP Average (dBm)	ERP Average (W)	99% BW (kHz)	Emission Designator
1.4	QPSK	699.7	715.3	25.7	20.15	0.104	1090.7	1M09G7W
	16QAM			24.9	19.37	0.087	1095.5	1M10D7W
	64QAM			23.6	18.06	0.064	1092	1M09D7W
3.0	QPSK	700.5	714.5	25.7	20.15	0.104	2705.5	2M71G7W
	16QAM			24.8	19.27	0.085	2652.3	2M65D7W
	64QAM			23.3	17.76	0.060	2702.7	2M70D7W
5.0	QPSK	701.5	713.5	25.7	20.14	0.103	4498.2	4M50G7W
	16QAM			25.1	19.51	0.089	4496.2	4M50D7W
	64QAM			23.6	18.07	0.064	4498.2	4M50D7W
10.0	QPSK	704.0	711.0	25.7	20.14	0.103	9024.5	9M02G7W
	16QAM			25.0	19.47	0.089	9013.9	9M01D7W
	64QAM			23.6	18.04	0.064	9020	9M02D7W

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LTE BAND 13

Part 27	
ERP Limit (W)	3.00
Antenna Gain (dBi)	-3.80

Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	ERP Average (dBm)	ERP Average (W)	99% BW (kHz)	Emission Designator
5.0	QPSK	779.5	784.5	25.7	19.75	0.094	4496.5	4M50G7W
	16QAM			24.9	18.90	0.078	4498.6	4M50D7W
	64QAM			23.7	17.71	0.059	4513.4	4M51D7W
10.0	QPSK	782.0	782.0	25.7	19.75	0.094	8993.8	8M99G7W
	16QAM			25.0	19.07	0.081	8988.1	8M99D7W
	64QAM			23.6	17.63	0.058	8993	8M99D7W

LTE BAND 17

Part 27	
ERP Limit (W)	3.00
Antenna Gain (dBi)	-3.40

Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	ERP Average (dBm)	ERP Average (W)	99% BW (kHz)	Emission Designator
5.0	QPSK	706.5	713.5	25.7	20.15	0.104	4495	4M50G7W
	16QAM			25.0	19.40	0.087	4505.2	4M51D7W
	64QAM			23.5	17.95	0.062	4499.3	4M50D7W
10.0	QPSK	709.0	711.0	25.7	20.15	0.104	9013.1	9M01G7W
	16QAM			25.1	19.53	0.090	9029.6	9M03D7W
	64QAM			23.5	17.94	0.062	9014.9	9M01D7W

LTE BAND 25

Part 24	
EIRP Limit (W)	2.00
Antenna Gain (dBi)	-2.00

Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)	99% BW (kHz)	Emission Designator
1.4	QPSK	1850.7	1914.3	25.7	23.70	0.234	1095.9	1M10G7W
	16QAM			24.6	22.63	0.183	1091.2	1M09D7W
	64QAM			23.4	21.38	0.137	1093.3	1M09D7W
3.0	QPSK	1851.5	1913.5	25.7	23.70	0.234	2702.7	2M70G7W
	16QAM			24.6	22.56	0.180	2704.4	2M70D7W
	64QAM			23.1	21.12	0.129	2707.8	2M71D7W
5.0	QPSK	1852.5	1912.5	25.7	23.70	0.234	4498.7	4M50G7W
	16QAM			24.8	22.82	0.191	4495.8	4M50D7W
	64QAM			23.4	21.44	0.139	4504	4M50D7W
10.0	QPSK	1855.0	1910.0	25.7	23.70	0.234	9025.6	9M03G7W
	16QAM			24.9	22.90	0.195	9022.3	9M02D7W
	64QAM			23.5	21.51	0.142	9005.5	9M01D7W
15.0	QPSK	1857.5	1907.5	25.7	23.69	0.234	13489	13M5G7W
	16QAM			25.0	23.01	0.200	13493	13M5D7W
	64QAM			23.5	21.50	0.141	13492	13M5D7W
20.0	QPSK	1860.0	1905.0	25.7	23.70	0.234	17958	18M0G7W
	16QAM			25.0	22.98	0.198	17982	18M0D7W
	64QAM			23.6	21.62	0.145	17973	18M0D7W

LTE BAND 26 (FCC Part 90S)

Part 90S	
ERP Limit (W)	100.00
Antenna Gain (dBi)	-3.20

Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	ERP Average (dBm)	ERP Average (W)	99% BW (kHz)	Emission Designator
1.4	QPSK	814.7	823.3	25.7	20.35	0.108	1094.5	1M09G7W
	16QAM			24.8	19.46	0.088	1092.1	1M09D7W
	64QAM			23.7	18.36	0.069	1093.4	1M09D7W
3.0	QPSK	815.5	822.5	25.7	20.35	0.108	2701.1	2M70G7W
	16QAM			24.9	19.55	0.090	2700.3	2M70D7W
	64QAM			23.7	18.34	0.068	2703.6	2M70D7W
5.0	QPSK	816.5	821.5	25.7	20.31	0.107	4500.7	4M50G7W
	16QAM			25.1	19.74	0.094	4497.4	4M50D7W
	64QAM			24.0	18.68	0.074	4502.7	4M50D7W
10.0	QPSK	819.0	819.0	25.7	20.35	0.108	9009.8	9M01G7W
	16QAM			25.0	19.64	0.092	9002.9	9M00D7W
	64QAM			23.9	18.51	0.071	9029.8	9M03D7W

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LTE BAND 30

Part 27	
EIRP Limit (W)	0.25
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
5.0	QPSK	2307.5	2312.5	25.7	22.90	0.195	4495.7	4M50G7W
	16QAM			25.1	22.30	0.170	4504	4M50D7W
	64QAM			23.6	20.81	0.121	4499	4M50D7W
10.0	QPSK	2310.0	2310.0	25.7	22.86	0.193	9010.3	9M01G7W
	16QAM			25.0	22.21	0.166	9004.9	9M00D7W
	64QAM			23.5	20.73	0.118	9007.3	9M01D7W

LTE BAND 41

Part 27	
EIRP Limit (W)	2.00
Antenna Gain (dBi)	-2.10

Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)	99% BW (kHz)	Emission Designator
5.0	QPSK	2498.5	2687.5	28.7	26.60	0.457	4496.6	4M50G7W
	16QAM			28.0	25.91	0.390	4470.2	4M47D7W
	64QAM			26.9	24.78	0.301	4498.8	4M50D7W
10.0	QPSK	2501.0	2685.0	28.5	26.40	0.437	8965.7	8M97G7W
	16QAM			27.9	25.80	0.380	9003.7	9M00D7W
	64QAM			26.9	24.80	0.302	8965.3	8M97D7W
15.0	QPSK	2503.5	2682.5	28.7	26.60	0.457	13476	13M5G7W
	16QAM			28.0	25.86	0.385	13399	13M4D7W
	64QAM			26.9	24.80	0.302	13494	13M5D7W
20.0	QPSK	2506.0	2680.0	28.7	26.60	0.457	17959	18M0G7W
	16QAM			28.2	26.06	0.404	17862	17M9D7W
	64QAM			27.0	24.90	0.309	17736	17M7D7W

LTE BAND 48

Part 96	
EIRP Limit (W)	2.00
Antenna Gain (dBi)	-2.70

Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)	99% BW (kHz)	Emission Designator
5.0	QPSK	3552.5	3697.5	25.7	23.00	0.200	4476.1	4M48G7W
	16QAM			24.9	22.21	0.166	4479.8	4M48D7W
	64QAM			23.9	21.24	0.133	4465.8	4M47D7W
10.0	QPSK	3555.0	3695.0	25.7	22.99	0.199	8959.3	8M96G7W
	16QAM			25.1	22.40	0.174	8977.9	8M98D7W
	64QAM			24.1	21.37	0.137	8968.3	8M97D7W
15.0	QPSK	3557.5	3692.5	25.7	23.00	0.199	13413	13M4G7W
	16QAM			25.1	22.40	0.174	13457	13M5D7W
	64QAM			24.0	21.32	0.135	13439	13M4D7W
20.0	QPSK	3560.0	3690.0	25.7	23.00	0.200	17966	18M0G7W
	16QAM			25.1	22.37	0.173	17903	17M9D7W
	64QAM			24.0	21.33	0.136	17910	17M9D7W

LTE BAND 66

Part 27	
EIRP Limit (W)	1.00
Antenna Gain (dBi)	-2.20

Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)	99% BW (kHz)	Emission Designator
1.4	QPSK	1710.7	1779.3	25.7	23.46	0.222	1090.2	1M09G7W
	16QAM			25.0	22.82	0.191	1088.8	1M09D7W
	64QAM			23.5	21.26	0.134	1094.1	1M09D7W
3.0	QPSK	1711.5	1778.5	25.7	23.50	0.224	2702.4	2M70G7W
	16QAM			24.9	22.68	0.185	2704	2M70D7W
	64QAM			23.5	21.27	0.134	2701.4	2M70D7W
5.0	QPSK	1712.5	1777.5	25.7	23.50	0.224	4501.1	4M50G7W
	16QAM			25.0	22.83	0.192	4493.1	4M49D7W
	64QAM			23.6	21.43	0.139	4494.5	4M49D7W
10.0	QPSK	1715.0	1775.0	25.7	23.50	0.224	9020.1	9M02G7W
	16QAM			25.1	22.88	0.194	9022.5	9M02D7W
	64QAM			23.7	21.50	0.141	8988.6	8M99D7W
15.0	QPSK	1717.5	1772.5	25.7	23.50	0.224	13458	13M5G7W
	16QAM			25.0	22.81	0.191	13458	13M5D7W
	64QAM			23.7	21.50	0.141	13487	13M5D7W
20.0	QPSK	1720.0	1770.0	25.7	23.50	0.224	17939	17M9G7W
	16QAM			25.1	22.92	0.196	17955	18M0D7W
	64QAM			23.8	21.62	0.145	17931	17M9D7W

5.3. SOFTWARE AND FIRMWARE

The EUT Firmware installed during testing was version: 19-01.1919.01_27-0.22.00-27.

5.4. MAXIMUM ANTENNA GAIN

Please see table below:

LTE Bands	ANT 1 Antenna Gain (dBi)	ANT 2 Antenna Gain (dBi)	ANT 3 Antenna Gain (dBi)	ANT 4 Antenna Gain (dBi)
LTE Band 2, 1850 – 1910 MHz	-2.0	-1.1	-	-
LTE Band 4, 1710 – 1755 MHz	-2.2	-1.9	-	-
LTE Band 5, 824 – 849 MHz	-3.2	-5.4	-	-
LTE Band 7, 2500 – 2570 MHz	-2.1	-4.6	-	-
LTE Band 12, 699 – 716 MHz	-3.4	-4.4	-	-
LTE Band 13, 777 – 787 MHz	-3.8	-5.2	-	-
LTE Band 17, 704 – 716 MHz	-3.4	-4.4	-	-
LTE Band 25, 1850 – 1915 MHz	-2.0	-1.1	-	-
LTE Band 26, 814 – 824 MHz (FCC Part 90S)	-3.2	-5.4	-	-
LTE Band 30, 2305 – 2315 MHz	-2.8	-5.0	-	-
LTE Band 41, 2496 – 2690 MHz (FCC)	-2.1	-3.7	-	-
LTE Band 48, 3550 – 3700 MHz	-	-	-2.7	-5.3
LTE Band 66, 1710 – 1780 MHz	-2.2	-1.9	-	-

Note:
Conducted Port 1 can support Ant 1 and Ant 3 while Port 2 supports Ant 2 and Ant 4. These ports have a switching system between the two antennas of different frequency ranges.

5.5. WORST-CASE CONFIGURATION AND MODE

The EUT supports LTE Bands of:
Band 2, Band 4, Band 5, Band 7, Band 12, Band 13, Band 17, Band 25, Band 26, Band 30, Band 41, Band 48, and Band 66.

LTE Band 4 (1710-1755MHz, 5/10/15/20MHz bandwidth) is covered by LTE Band 66 because it is a subset of LTE band 66 and they have same output power.

FCC rule Part 22.905 of LTE Band 26 (824-849MHz) is covered by LTE Band 5 of same rule since they have the same output power and supported bandwidths.

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. Tests were performed on the conducted test at Ant 1 antenna as worst case since it has higher output powers.

The EUT was investigated in three orthogonal orientations X/Y/Z on both Ant 1 and Ant 2 antennas. For Ant 1 antenna, it was determined that Y(Landscape) orientation was worst-case orientation for cell bands; X (Flatbed) orientation was worst-case orientation for pcs and 48 bands, and Z (Portrait) orientation was worst-case orientation for 7, 30, 38 and 41 bands without AC/DC adapter. For Ant 2 antenna, it was determined that X (Flatbed) orientation was worst-case orientation for Cell and PCS bands and Y(Landscape) orientation was worst-case orientation for 7, 30, 38, 41, and 48 bands without AC/DC adapter.

Radiated spurious emissions were investigated below 30MHz, 30MHz-1GHz and above 1GHz. There were no emissions found on below 30MHz and 30MHz-1GHz.

For simultaneous transmission of multiple channels in the 2.4GHz/5GH WLAN, UWB, and 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.

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5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List			
Description	Manufacturer	Model	Serial Number
Laptop AC/DC adapter	Apple	85W MagSafe 2	C0651730MMMG6P4AL
Laptop	Apple	Macbook Pro	C02PM012G3QD
Laptop	Apple	Macbook Pro	C02P52HGG085

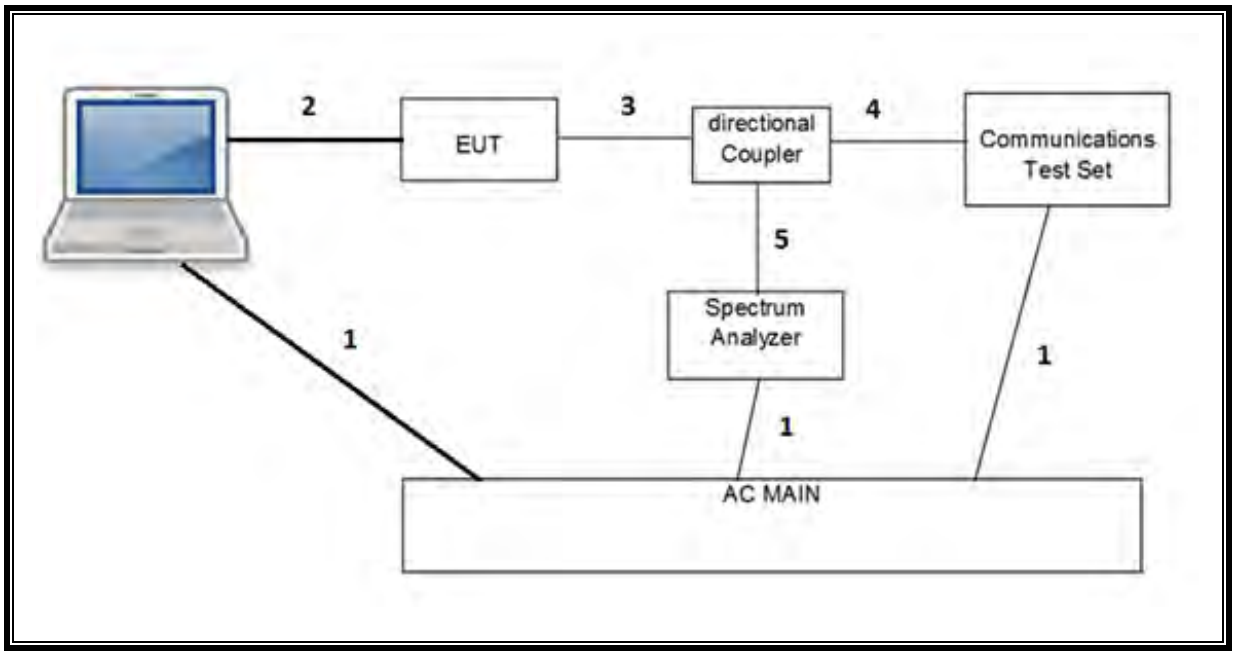
I/O CABLES (RF Conducted Test)

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	3	US 115V	Un-shielded	2.0m	N/A
2	USB	1	DC	Un-shielded	1.0m	N/A
3	RF In/Out	1	EUT	Un-shielded	0.6m	N/A
4	RF In/Out	1	Communication Test Set	Un-shielded	1.2m	N/A
5	RF In/Out	1	Barrel	N/A	N/A	N/A

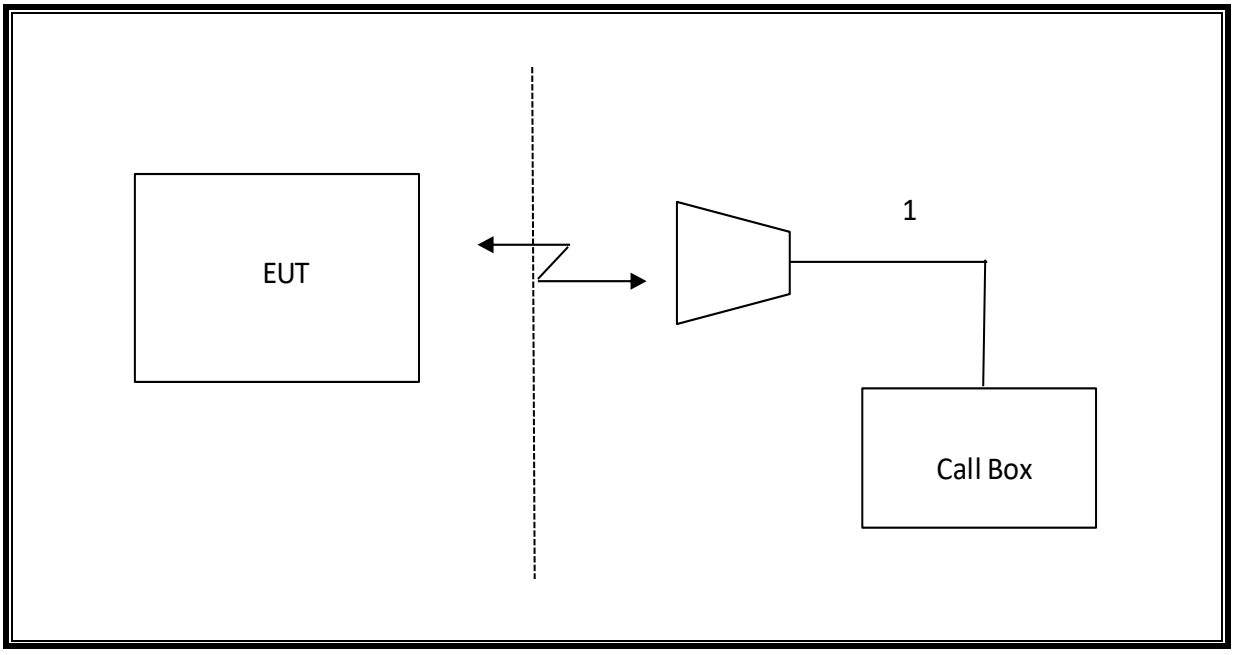
I/O CABLES (RF Radiated Test)

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	RF In/Out	1	Antenna	Un-shielded	5.0m	N/A

CONDUCTED SETUP



RADIATED SETUP



6. 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**
Amplifier, 10KHz to 1GHz, 32dB	Sonoma	310N	T15	08/15/2019
Amplifier, 18-26GHz	Agilent	8449B	T404	3/23/2020
Amplifier, 26-40GHz	Miteq	TTA2640	T1804	3/23/2020
Spectrum Analyzer, PXA 3Hz to 44GHZ	Agilent	N9030A	T905	1/24/2020
Spectrum Analyzer, PXA 3Hz to 44GHz	Keysight	N9030A	T340	01/22/2020
Spectrum Analyzer, PXA 3Hz to 44GHz	Keysight	N9030A	T1454	01/23/2020
Spectrum Analyzer, PXA 3Hz to 44GHz	Keysight	N9030A	T908	01/23/2020
Spectrum Analyzer, PXA 3Hz to 44GHz	Keysight	N9030A	T339	01/29/2020
Amplifier, 1 to 18GHz	MITEQ	AFS42-00101800-25-S-42	T931	05/11/2020
Amplifier, 10KHz to 1GHz, 32dB	Sonoma	310N	PRE0180176	11/01/2019
Spectrum Analyzer, PSA, 3Hz to 44GHz	Keysight	E4446A	T177	04/12/2019
Spectrum Analyzer, PSA, 3Hz to 44GHz	Keysight	E4446A	T123	01/28/2020
Spectrum Analyzer, PSA, 3Hz to 44GHz	Keysight	E4440A	T198	01/30/2020
Spectrum Analyzer, PSA, 3Hz to 44GHz	Keysight	E4440A	T99	1/28/2020
Directional Coupler	KRYTAR	152610	T1536	04/27/2019
Directional Coupler	KRYTAR	152610	T1537	04/27/2019
Wireless Communications Test Set, 8960 Series 10	Agilent	E5515C	T211	05/10/2020
Filter, HPF 3.0GHz	Micro-Tronics	HPM17543	T487	12/04/2019
Filter, HPF 1.2GHz	Micro-Tronics	WHKX1.2/15G-6ST	T1182	05/19/2019
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight	N9030A	T459	07/25/2019
Wideband Communication Test Set, Call Box	R&S GmbH & Co. KG	CMW500	T959	02/16/2020
Wideband Communication Test Set, Call Box	R&S GmbH & Co. KG	CMW500	T1871	02/18/2020
Wideband Communication Test Set, Call Box	R&S GmbH & Co. KG	CMW500	T921	02/18/2020
Wideband Communication Test Set, Call Box	R&S GmbH & Co. KG	CMW500	T376	02/21/2020
Wideband Communication Test Set, Call Box	R&S GmbH & Co. KG	CMW500	T958	02/20/2020
Chamber, Environmental	Cincinnati Sub Zero	ZPHS-8-3.5-SCT/WC	T754	08/15/2019
Power Meter, P-series single channel	Keysight	N1911A	T1268	01/31/2020
Power Sensor	Keysight	N1921A	T1228	07/10/2019
Power Sensor	Keysight	N1921A	T413	2/22/2020
Antenna, Horn 1-18GHz	ETS Lindgren	T3117	T346	05/14/2020
Antenna, Horn 1-18GHz	ETS Lindgren	3117	T344	05/07/2020
Antenna, Horn 18-26GHz	ARA	MWH-1826/B	T447	6/16/2019
Antenna, Horn 26-40GHz	ARA	MWH-2640/B	T446	8/9/2019
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences	JB3	PRE0181574	08/01/2019
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences	JB3	PRE0077974	05/13/2020
Antenna, Active Loop 9KHz to 30MHz	EMCO	6502	T1616	10/18/2019
UL AUTOMATION SOFTWARE				
CLT Software	UL	UL RF	Ver 9.5, April 26, 2016	
Power Measurement Software	UL	UL RF	Ver 2.2, June 2017	

NOTES:

1. For equipment listed above that had a calibration due during the testing period, its use was paused to allow for calibration.

7. RF OUTPUT POWER VERIFICATION

CONDUCTED OUTPUT POWER MEASUREMENT PROCEDURE

All LTE bands conducted average power is obtained from the CMW500 telecommunication test set.
The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS36.101 specification.
UE Power Class: 3 (23 +/- 2dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101.

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3

Modulation	Channel bandwidth / Transmission bandwidth (N_{RB})						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2
64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2
64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3

The allowed A-MPR values specified below in Table 6.2.4.-1 of 3GPP TS36.101 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signaling Value of "NS_01".3

Table 6.2.4-1: Additional Maximum Power Reduction (A-MPR)

Network Signalling value	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks (N_{RB})	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	NA
NS_03	6.6.2.2.1	2, 4,10, 23, 25, 35, 36	3	>5	≤ 1
			5	>6	≤ 1
			10	>6	≤ 1
			15	>8	≤ 1
			20	>10	≤ 1
NS_04	6.6.2.2.2	41	5	>6	≤ 1
			10, 15, 20	See Table 6.2.4-4	
NS_05	6.6.3.3.1	1	10,15,20	≥ 50	≤ 1
NS_06	6.6.2.2.3	12, 13, 14, 17	1.4, 3, 5, 10	Table 5.6-1	n/a
NS_07	6.6.2.2.3 6.6.3.3.2	13	10	Table 6.2.4-2	Table 6.2.4-2
NS_08	6.6.3.3.3	19	10, 15	> 44	≤ 3
NS_09	6.6.3.3.4	21	10, 15	> 40	≤ 1
				> 55	≤ 2
NS_10		20	15, 20	Table 6.2.4-3	Table 6.2.4-3
NS_11	6.6.2.2.1	23[1]	1.4, 3, 5, 10	Table 6.2.4-5	Table 6.2.4-5
..					
NS_32	-	-	-	-	-

Note 1: Applies to the lower block of Band 23, i.e. a carrier placed in the 2000-2010 MHz region.

MODES TESTED

- LTE Band 2
- LTE Band 5
- LTE Band 7
- LTE Band 12
- LTE Band 13
- LTE Band 17
- LTE Band 25
- LTE Band 26
- LTE Band 30
- LTE Band 41
- LTE Band 48
- LTE Band 66

RESULTS

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:

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7.1. LTE BAND 2

ID:	39004	Date:	7/8/19

OUTPUT POWER FOR LTE BAND 2 (1.4 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1			Ant 2		
				Conducted Average (dBm)			Conducted Average (dBm)		
				18607	18900	19193	18607	18900	19193
				1850.7 MHz	1880.0 MHz	1909.3 MHz	1850.7 MHz	1880.0 MHz	1909.3 MHz
1.4	QPSK	1	0	25.1	25.2	25.5	**18.5**	18.0	18.2
		1	2	25.1	25.2	**25.7**	18.4	18.0	18.1
		1	5	25.1	25.3	25.5	18.4	17.9	18.2
		3	0	25.0	25.1	25.5	18.4	17.8	18.1
		3	1	25.0	25.1	25.4	18.2	17.9	18.1
		3	2	25.0	25.1	25.4	18.3	17.8	18.1
		6	0	24.0	24.1	24.3	17.2	16.7	17.1
	16QAM	1	0	24.4	24.3	**24.8**	17.6	17.2	17.3
		1	2	24.4	24.3	24.8	17.5	17.2	17.4
		1	5	24.3	24.4	24.7	**17.6**	17.1	17.4
		3	0	24.1	24.1	24.5	17.3	16.9	17.1
		3	1	24.1	24.0	24.5	17.3	16.9	17.1
		3	2	24.1	24.1	24.5	17.3	16.8	17.1
		6	0	23.0	23.0	23.5	16.1	15.8	16.0
	64QAM	1	0	**23.3**	23.0	23.2	16.5	16.0	**16.6**
		1	2	23.2	22.8	23.3	16.5	16.1	16.5
		1	5	23.2	22.9	23.2	16.4	15.9	16.5
		3	0	23.0	22.6	23.1	16.3	15.9	16.2
		3	1	23.0	22.6	23.1	16.2	15.9	16.2
		3	2	23.0	22.7	23.1	16.2	15.8	16.2
		6	0	21.8	21.6	22.0	15.3	14.8	15.0

OUTPUT POWER FOR LTE BAND 2 (3.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1			Ant 2		
				Conducted Average (dBm)			Conducted Average (dBm)		
				18615	18900	19185	18615	18900	19185
				1851.5 MHz	1880.0 MHz	1908.5 MHz	1851.5 MHz	1880.0 MHz	1908.5 MHz
3.0	QPSK	1	0	25.2	25.2	25.5	**18.5**	17.9	18.2
		1	7	25.2	25.3	**25.7**	**18.5**	18.0	18.2
		1	14	25.1	25.3	25.4	18.4	17.9	18.2
		8	0	24.1	24.0	24.5	17.3	16.9	17.1
		8	4	24.1	24.0	24.4	17.3	16.9	17.1
		8	7	24.1	24.1	24.4	17.3	16.8	17.1
		15	0	24.1	24.2	24.5	17.3	16.9	17.1
	16QAM	1	0	24.4	24.3	**24.8**	**17.7**	17.1	17.4
		1	7	24.5	24.5	24.8	17.7	17.1	17.4
		1	14	24.4	24.5	24.7	17.5	17.1	17.4
		8	0	23.0	23.0	23.4	16.3	15.8	16.0
		8	4	23.0	23.0	23.3	16.3	15.8	16.0
		8	7	23.0	23.0	23.3	16.3	15.8	16.0
		15	0	23.0	23.1	23.3	16.3	15.7	16.1
	64QAM	1	0	23.1	22.8	**23.3**	16.3	16.0	16.3
		1	7	23.2	22.9	**23.3**	16.4	15.9	16.4
		1	14	23.1	23.0	23.2	**16.4**	15.9	16.3
		8	0	21.8	21.6	22.0	15.2	14.7	15.0
		8	4	21.8	21.6	22.0	15.2	14.7	15.0
		8	7	21.8	21.6	22.0	15.2	14.7	15.0
		15	0	21.8	21.6	22.0	15.2	14.7	15.1

OUTPUT POWER FOR LTE BAND 2 (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1			Ant 2		
				Conducted Average (dBm)			Conducted Average (dBm)		
				18625	18900	19175	18625	18900	19175
				1852.5 MHz	1880.0 MHz	1907.5 MHz	1852.5 MHz	1880.0 MHz	1907.5 MHz
5.0	QPSK	1	0	25.2	25.2	25.6	**18.5**	17.9	18.3
		1	12	25.2	25.3	**25.7**	18.4	17.9	18.2
		1	24	25.3	25.4	25.6	18.3	18.0	18.2
		12	0	24.2	24.2	24.6	17.3	17.0	17.2
		12	6	24.1	24.2	24.6	17.4	17.0	17.1
		12	11	24.2	24.3	24.5	17.3	16.9	17.1
		25	0	24.2	24.3	24.6	17.3	17.0	17.2
	16QAM	1	0	24.6	24.5	24.9	17.6	17.3	17.6
		1	12	24.5	24.6	**24.9**	**17.7**	17.2	17.5
		1	24	24.8	24.8	24.8	17.6	17.3	17.5
		12	0	23.1	23.2	23.5	16.4	16.0	16.2
		12	6	23.2	23.2	23.6	16.5	16.0	16.2
		12	11	23.2	23.2	23.5	16.4	16.0	16.2
		25	0	23.1	23.2	23.5	16.4	15.9	16.2
	64QAM	1	0	23.3	23.1	23.5	16.5	16.2	**16.7**
		1	12	23.1	23.2	23.5	16.6	16.2	16.5
		1	24	23.4	23.3	**23.6**	16.5	16.2	16.6
		12	0	22.0	21.9	22.2	15.4	14.9	15.2
		12	6	22.0	21.8	22.2	15.4	14.9	15.2
		12	11	22.1	21.9	22.2	15.4	14.9	15.2
		25	0	22.0	21.9	22.1	15.4	15.0	15.2

OUTPUT POWER FOR LTE BAND 2 (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1			Ant 2		
				Conducted Average (dBm)			Conducted Average (dBm)		
				18650	18900	19150	18650	18900	19150
				1855.0 MHz	1880.0 MHz	1905.0 MHz	1855.0 MHz	1880.0 MHz	1905.0 MHz
10.0	QPSK	1	0	25.3	25.2	25.4	**18.5**	18.0	18.4
		1	24	25.4	25.3	**25.7**	18.4	18.1	18.3
		1	49	25.6	25.5	25.6	18.3	18.0	18.3
		25	0	24.4	24.3	24.6	17.5	17.1	17.4
		25	12	24.4	24.3	24.7	17.4	17.1	17.3
		25	24	24.5	24.5	24.7	17.4	17.1	17.3
		50	0	24.5	24.4	24.8	17.4	17.1	17.4
	16QAM	1	0	24.7	24.5	24.8	17.7	17.3	17.6
		1	24	24.8	24.5	**25.0**	17.6	17.3	**17.7**
		1	49	25.0	24.7	25.0	17.6	17.4	17.5
		25	0	23.4	23.3	23.6	16.6	16.2	16.5
		25	12	23.4	23.3	23.7	16.5	16.2	16.4
		25	24	23.5	23.5	23.7	16.4	16.1	16.4
		50	0	23.4	23.4	23.7	16.5	16.1	16.4
	64QAM	1	0	23.4	23.1	23.2	16.6	16.2	16.5
		1	24	23.4	23.1	23.4	16.6	16.2	16.5
		1	49	**23.5**	23.2	23.5	16.5	16.4	**16.6**
		25	0	22.3	22.1	22.2	15.6	15.2	15.5
		25	12	22.4	22.1	22.3	15.5	15.2	15.4
		25	24	22.4	22.1	22.4	15.5	15.2	15.4
		50	0	22.3	22.1	22.3	15.5	15.1	15.4

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OUTPUT POWER FOR LTE BAND 2 (15.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1			Ant 2		
				Conducted Average (dBm)			Conducted Average (dBm)		
				18675	18900	19125	18675	18900	19125
				1857.5 MHz	1880.0 MHz	1902.5 MHz	1857.5 MHz	1880.0 MHz	1902.5 MHz
15.0	QPSK	1	0	25.3	25.2	25.5	**18.5**	18.0	18.3
		1	37	25.5	25.4	25.6	18.3	17.9	18.4
		1	74	25.4	25.4	**25.7**	18.2	18.0	18.2
		36	0	24.4	24.4	24.5	17.5	17.1	17.3
		36	16	24.5	24.4	24.6	17.4	17.1	17.4
		36	35	24.5	24.5	24.7	17.3	17.1	17.3
		75	0	24.5	24.5	24.6	17.3	17.0	17.4
	16QAM	1	0	24.5	24.5	24.8	17.5	17.3	17.5
		1	37	24.7	24.6	24.9	17.5	17.2	**17.6**
		1	74	24.8	24.8	**24.9**	17.5	17.4	17.5
		36	0	23.5	23.4	23.5	16.4	16.2	16.3
		36	16	23.6	23.3	23.6	16.4	16.2	16.4
		36	35	23.6	23.5	23.7	16.4	16.1	16.4
		75	0	23.5	23.4	23.6	16.3	16.1	16.4
	64QAM	1	0	23.4	23.2	23.1	**16.7**	16.2	16.3
		1	37	**23.6**	23.2	23.3	16.6	16.2	16.5
		1	74	23.5	23.4	23.5	16.6	16.3	16.5
		36	0	22.3	22.1	22.2	15.5	15.1	15.4
		36	16	22.4	22.2	22.3	15.5	15.2	15.5
		36	35	22.3	22.2	22.4	15.4	15.1	15.4
		75	0	22.4	22.1	22.3	15.4	15.1	15.4

OUTPUT POWER FOR LTE BAND 2 (20.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1			Ant 2		
				Conducted Average (dBm)			Conducted Average (dBm)		
				18700	18900	19100	18700	18900	19100
				1860.0 MHz	1880.0 MHz	1900.0 MHz	1860.0 MHz	1880.0 MHz	1900.0 MHz
20.0	QPSK	1	0	25.3	25.4	25.5	**18.5**	18.0	18.1
		1	49	25.6	25.3	25.4	18.2	18.0	18.2
		1	99	25.4	25.5	**25.7**	18.1	18.0	18.2
		50	0	24.5	24.3	24.5	17.4	17.1	17.3
		50	24	24.5	24.4	24.6	17.3	17.1	17.4
		50	49	24.4	24.5	24.7	17.2	17.1	17.4
		100	0	24.5	24.5	24.6	17.3	17.1	17.4
	16QAM	1	0	24.7	24.8	24.8	**17.7**	17.3	17.5
		1	49	24.8	24.6	24.8	17.6	17.4	17.6
		1	99	24.8	25.0	**25.0**	17.4	17.5	17.6
		50	0	23.5	23.4	23.5	16.5	16.1	16.3
		50	24	23.6	23.5	23.5	16.4	16.1	16.4
		50	49	23.5	23.5	23.7	16.3	16.1	16.3
		100	0	23.5	23.5	23.6	16.3	16.1	16.4
	64QAM	1	0	23.3	23.4	23.6	16.5	16.2	16.5
		1	49	23.3	23.3	23.4	16.5	16.3	16.6
		1	99	23.3	23.5	**23.6**	16.2	16.4	**16.6**
		50	0	22.4	22.1	22.2	15.5	15.1	15.3
		50	24	22.4	22.1	22.2	15.4	15.1	15.4
		50	49	22.3	22.1	22.4	15.3	15.1	15.4
		100	0	22.3	22.1	22.2	15.3	15.1	15.4

7.2. LTE BAND 5

ID:	39004	Date:	7/8/19

OUTPUT POWER FOR LTE BAND 5 (1.4 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1 Conducted Average (dBm)			Ant 2 Conducted Average (dBm)		
				20407	20525	20643	20407	20525	20643
				824.7 MHz	836.5 MHz	848.3 MHz	824.7 MHz	836.5 MHz	848.3 MHz
1.4	QPSK	1	0	25.2	25.4	25.2	24.2	24.1	24.0
		1	2	25.1	25.4	25.1	24.2	24.1	24.0
		1	5	25.2	**25.7**	25.1	**24.5**	24.1	24.1
		3	0	25.1	25.3	24.9	24.1	24.0	23.8
		3	1	25.0	25.3	24.9	24.2	24.0	23.8
		3	2	25.0	25.3	24.9	24.1	24.0	23.8
		6	0	23.9	24.3	23.8	23.1	22.9	22.8
	16QAM	1	0	24.4	**24.8**	24.4	23.4	23.4	23.3
		1	2	24.3	24.8	24.4	23.5	23.4	23.2
		1	5	24.3	24.8	24.4	**23.6**	23.3	23.3
		3	0	24.1	24.4	24.1	23.2	23.1	23.0
		3	1	24.1	24.4	24.1	23.2	23.1	23.0
		3	2	24.1	24.4	24.1	23.2	23.1	22.9
		6	0	23.0	23.2	22.9	22.1	21.9	21.9
	64QAM	1	0	23.4	**23.6**	23.4	22.2	22.3	22.2
		1	2	23.3	23.4	23.4	22.2	**22.3**	22.2
		1	5	23.3	23.5	23.3	22.2	22.3	22.2
		3	0	23.0	23.2	23.1	21.9	22.0	21.9
		3	1	23.0	23.2	23.1	21.9	22.0	21.9
		3	2	23.0	23.1	23.1	21.9	22.0	21.9
		6	0	21.8	22.1	22.0	20.9	20.9	20.7

OUTPUT POWER FOR LTE BAND 5 (3.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1 Conducted Average (dBm)			Ant 2 Conducted Average (dBm)		
				20415	20525	20635	20415	20525	20635
				825.5 MHz	836.5 MHz	847.5 MHz	825.5 MHz	836.5 MHz	847.5 MHz
3.0	QPSK	1	0	25.2	25.4	25.1	24.2	24.1	24.0
		1	7	25.2	**25.7**	25.1	**24.5**	24.1	24.1
		1	14	25.3	25.4	25.0	24.3	24.0	24.0
		8	0	24.0	24.3	23.9	23.1	22.9	22.8
		8	4	24.0	24.2	23.9	23.1	22.9	22.8
		8	7	24.0	24.2	23.9	23.2	22.9	22.8
		15	0	24.1	24.3	24.0	23.2	23.0	22.9
	16QAM	1	0	24.5	24.7	24.5	23.5	23.5	23.3
		1	7	24.4	**24.7**	24.5	23.6	23.4	23.3
		1	14	24.6	24.6	24.3	**23.7**	23.4	23.3
		8	0	23.0	23.3	22.9	22.1	22.0	21.8
		8	4	23.0	23.3	22.9	22.2	21.9	21.9
		8	7	23.0	23.2	22.9	22.2	21.9	21.8
		15	0	23.0	23.2	22.9	22.2	21.9	21.9
	64QAM	1	0	23.1	**23.5**	23.4	22.3	22.3	22.0
		1	7	23.3	**23.5**	23.3	22.4	**22.4**	22.0
		1	14	23.3	23.3	23.2	**22.4**	22.2	22.0
		8	0	21.8	22.1	21.9	20.9	21.0	20.6
		8	4	21.9	22.1	20.6	20.9	20.9	20.6
		8	7	21.9	22.1	22.0	21.0	20.9	20.6
		15	0	21.9	22.1	22.0	21.0	20.9	20.7

OUTPUT POWER FOR LTE BAND 5 (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1			Ant 2		
				Conducted Average (dBm)			Conducted Average (dBm)		
				20425	20525	20625	20425	20525	20625
				826.5 MHz	836.5 MHz	846.5 MHz	826.5 MHz	836.5 MHz	846.5 MHz
5.0	QPSK	1	0	25.2	**25.7**	25.3	24.4	24.2	24.0
		1	12	25.3	25.5	25.2	**24.5**	24.2	24.0
		1	24	25.4	25.4	25.1	24.4	24.1	24.1
		12	0	24.1	24.4	24.1	23.4	23.1	22.9
		12	6	24.1	24.4	24.1	23.4	23.1	22.9
		12	11	24.2	24.4	24.1	23.4	23.1	22.9
		25	0	24.2	24.4	24.1	23.4	23.1	22.9
	16QAM	1	0	24.7	24.9	24.7	23.8	23.6	23.5
		1	12	24.7	24.8	24.5	**23.9**	23.5	23.5
		1	24	**25.0**	24.8	24.4	23.8	23.4	23.5
		12	0	23.2	23.4	23.1	22.4	22.1	22.0
		12	6	23.1	23.4	23.0	22.5	22.1	21.9
		12	11	23.2	23.4	23.0	22.4	22.1	21.9
		25	0	23.2	23.4	23.0	22.4	22.1	21.9
	64QAM	1	0	23.2	**23.8**	23.8	22.3	22.5	**22.5**
		1	12	23.3	23.7	23.7	22.4	22.4	22.3
		1	24	23.6	23.6	23.6	**22.5**	**22.5**	22.3
		12	0	22.0	22.3	22.2	21.1	21.1	20.9
		12	6	22.0	22.3	22.1	21.1	21.0	20.8
		12	11	22.1	22.2	22.2	21.2	21.0	20.8
		25	0	22.0	22.3	22.1	21.1	21.1	20.8

OUTPUT POWER FOR LTE BAND 5 (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1			Ant 2		
				Conducted Average (dBm)			Conducted Average (dBm)		
				20450	20525	20600	20450	20525	20600
				829.0 MHz	836.5 MHz	844.0 MHz	829.0 MHz	836.5 MHz	844.0 MHz
10.0	QPSK	1	0	25.2	25.6	25.4	24.5	24.4	24.2
		1	24	25.5	25.5	25.3	**24.5**	24.2	24.1
		1	49	**25.7**	25.3	25.2	24.3	24.2	24.2
		25	0	24.4	24.6	24.2	23.5	23.2	23.2
		25	12	24.5	24.5	24.2	23.5	23.3	23.0
		25	24	24.5	24.4	24.1	23.4	23.2	23.1
		50	0	24.4	24.5	24.3	23.4	23.3	23.0
	16QAM	1	0	24.6	24.9	24.7	23.8	**23.8**	23.5
		1	24	**25.0**	24.8	24.7	23.8	23.6	23.4
		1	49	25.0	24.6	24.5	23.6	23.6	23.5
		25	0	23.4	23.6	23.3	22.6	22.3	22.2
		25	12	23.5	23.6	23.3	22.5	22.3	22.1
		25	24	23.6	23.5	23.2	22.5	22.3	22.1
		50	0	23.5	23.6	23.3	22.5	22.4	22.0
	64QAM	1	0	23.2	23.7	23.6	22.4	22.5	22.5
		1	24	23.8	23.6	23.8	22.5	22.5	22.4
		1	49	**23.8**	23.5	23.6	**22.6**	22.4	22.3
		25	0	22.3	22.6	22.4	21.3	21.3	21.2
		25	12	22.4	22.5	22.5	21.3	21.3	21.2
		25	24	22.6	22.4	22.3	21.3	21.3	21.0
		50	0	22.4	22.5	22.5	21.3	21.3	21.2

7.3. LTE BAND 7

ID:	39004	Date:	7/8/19

OUTPUT POWER FOR LTE BAND 7 (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1			Ant 2		
				Conducted Average (dBm)			Conducted Average (dBm)		
				20775	21100	21425	20775	21100	21425
				2502.5	2535	2567.5	2502.5	2535	2567.5
5.0	QPSK	1	0	25.4	**25.7**	25.1	19.60	19.42	19.36
		1	12	25.4	25.5	25.2	**19.75**	19.34	19.24
		1	24	25.3	25.5	25.2	19.61	19.34	19.35
		12	0	24.4	24.5	24.1	18.54	18.32	18.28
		12	6	24.4	24.4	24.1	18.51	18.30	18.22
		12	11	24.3	24.4	24.1	18.51	18.27	18.23
		25	0	24.4	24.5	24.1	18.59	18.27	18.25
	16QAM	1	0	24.7	**25.2**	24.6	18.92	**19.03**	18.70
		1	12	24.7	25.1	24.6	18.96	18.83	18.69
		1	24	24.7	25.0	24.7	18.99	18.74	18.82
		12	0	23.4	23.6	23.1	17.63	17.36	17.30
		12	6	23.4	23.5	23.0	17.64	17.37	17.21
		12	11	23.3	23.5	23.1	17.64	17.31	17.21
		25	0	23.3	23.5	23.1	17.62	17.31	17.26
	64QAM	1	0	23.3	**23.6**	23.1	17.81	**17.92**	17.55
		1	12	23.2	23.5	23.0	17.89	17.80	17.50
		1	24	23.2	23.5	23.2	17.88	17.70	17.54
		12	0	22.0	22.1	21.7	16.40	16.35	16.21
		12	6	21.9	22.1	21.7	16.45	16.29	16.21
		12	11	21.8	22.1	21.8	16.43	16.27	16.20
		25	0	21.9	22.1	21.7	16.53	16.29	16.17

OUTPUT POWER FOR LTE BAND 7 (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1			Ant 2		
				Conducted Average (dBm)			Conducted Average (dBm)		
				20800	21100	21400	20800	21100	21400
				2505	2535	2565	2505	2535	2565
10.0	QPSK	1	0	25.3	**25.7**	25.2	**19.75**	19.39	19.43
		1	24	25.2	25.4	25.1	19.70	19.37	19.44
		1	49	25.1	25.3	25.1	19.65	19.38	19.39
		25	0	24.4	24.5	24.2	18.74	18.39	18.40
		25	12	24.3	24.4	24.1	18.67	18.42	18.39
		25	24	24.2	24.4	24.2	18.57	18.42	18.33
		50	0	24.3	24.5	24.2	18.61	18.44	18.40
	16QAM	1	0	24.9	**25.1**	24.8	**19.10**	18.86	18.87
		1	24	24.8	25.0	24.5	19.02	18.83	18.76
		1	49	24.6	24.8	24.5	18.94	18.79	18.81
		25	0	23.5	23.7	23.3	17.84	17.51	17.47
		25	12	23.4	23.7	23.2	17.78	17.47	17.47
		25	24	23.4	23.6	23.2	17.70	17.43	17.42
		50	0	23.4	23.6	23.2	17.74	17.44	17.50
	64QAM	1	0	23.5	**23.7**	23.4	17.98	17.75	17.74
		1	24	23.2	23.5	23.1	**18.02**	17.66	17.62
		1	49	23.3	23.5	23.3	17.77	17.62	17.68
		25	0	22.2	22.5	22.0	16.79	16.53	16.48
		25	12	22.1	22.4	21.9	16.73	16.49	16.44
		25	24	22.1	22.3	22.0	16.61	16.48	16.39
		50	0	22.1	22.3	22.0	16.66	16.50	16.46

OUTPUT POWER FOR LTE BAND 7 (15.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1			Ant 2		
				Conducted Average (dBm)			Conducted Average (dBm)		
				20825	21100	21375	20825	21100	21375
				2507.5	2535	2562.5	2507.5	2535	2562.5
15.0	QPSK	1	0	25.3	**25.7**	25.4	**19.75**	19.39	19.38
		1	37	25.1	25.4	25.0	19.56	19.35	19.43
		1	74	25.2	25.1	25.0	19.57	19.28	19.40
		36	0	24.4	24.5	24.3	18.74	18.40	18.38
		36	16	24.4	24.4	24.1	18.61	18.44	18.48
		36	35	24.2	24.2	24.0	18.64	18.39	18.47
		75	0	24.4	24.3	24.1	18.61	18.38	18.46
	16QAM	1	0	24.9	**25.0**	24.8	**19.12**	18.97	18.86
		1	37	24.6	24.8	24.7	18.92	18.76	18.79
		1	74	24.7	24.6	24.5	18.92	18.66	18.78
		36	0	23.5	23.5	23.3	17.80	17.45	17.43
		36	16	23.4	23.4	23.2	17.66	17.43	17.52
		36	35	23.3	23.3	23.1	17.73	17.43	17.48
		75	0	23.4	23.4	23.1	17.67	17.44	17.45
	64QAM	1	0	23.6	23.8	**23.8**	**18.07**	17.88	17.71
		1	37	23.4	23.6	23.3	17.88	17.72	17.66
		1	74	23.6	23.4	23.5	17.83	17.59	17.61
		36	0	22.2	22.5	22.3	16.80	16.54	16.41
		36	16	22.1	22.4	22.1	16.66	16.52	16.47
		36	35	22.1	22.3	22.1	16.67	16.46	16.48
		75	0	22.1	22.4	22.1	16.62	16.44	16.40

OUTPUT POWER FOR LTE BAND 7 (20.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Conducted Average (dBm)			Conducted Average (dBm)		
				20850	21100	21350	20850	21100	21350
				2510	2535	2560	2510	2535	2560
20.0	QPSK	1	0	25.4	**25.7**	25.3	**19.75**	19.49	19.34
		1	49	25.0	25.3	25.3	19.58	19.40	19.39
		1	99	25.4	25.1	25.0	19.62	19.36	19.42
		50	0	24.2	24.4	24.2	18.64	18.38	18.32
		50	24	24.1	24.3	24.1	18.63	18.34	18.37
		50	49	24.2	24.2	24.0	18.57	18.37	18.50
		100	0	24.2	24.4	24.1	18.59	18.41	18.37
	16QAM	1	0	24.9	**25.0**	24.9	**19.06**	18.93	18.94
		1	49	24.7	24.9	24.8	18.95	18.79	18.92
		1	99	25.0	24.7	24.6	19.03	18.74	18.96
		50	0	23.3	23.5	23.3	17.70	17.48	17.40
		50	24	23.1	23.4	23.3	17.62	17.45	17.49
		50	49	23.3	23.2	23.1	17.62	17.38	17.56
		100	0	23.1	23.3	23.2	17.62	17.39	17.45
	64QAM	1	0	23.5	**24.1**	23.8	**18.07**	17.70	17.81
		1	49	23.3	23.7	23.7	17.86	17.56	17.82
		1	99	23.7	23.7	23.6	**18.07**	17.54	17.74
		50	0	22.2	22.5	22.5	16.60	16.49	16.34
		50	24	22.1	22.4	22.3	16.61	16.46	16.42
		50	49	22.3	22.3	22.1	16.59	16.41	16.47
		100	0	22.1	22.3	22.3	16.57	16.40	16.38

7.4. LTE BAND 12

ID:	39004	Date:	7/8/19

OUTPUT POWER FOR LTE BAND 12 (1.4 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1			Ant 2		
				Conducted Average (dBm)			Conducted Average (dBm)		
				23017	23095	23173	23017	23095	23173
				699.7 MHz	707.5 MHz	715.3 MHz	699.7 MHz	707.5 MHz	715.3 MHz
1.4	QPSK	1	0	25.6	25.4	25.6	23.9	24.1	**24.5**
		1	2	25.5	25.4	25.6	23.8	24.1	24.3
		1	5	25.6	25.5	**25.7**	23.9	24.2	24.3
		3	0	25.4	25.2	25.4	23.8	23.9	24.1
		3	1	25.4	25.2	25.4	23.8	23.9	24.1
		3	2	25.4	25.2	25.4	23.8	23.9	24.1
		6	0	24.3	24.3	24.3	22.7	22.9	23.0
	16QAM	1	0	24.8	24.8	24.8	23.1	23.4	**23.6**
		1	2	24.7	24.8	24.8	23.1	23.4	23.5
		1	5	24.7	24.8	**24.9**	23.2	23.5	23.5
		3	0	24.5	24.4	24.5	22.9	23.0	23.2
		3	1	24.4	24.4	24.5	22.9	23.1	23.2
		3	2	24.5	24.4	24.5	22.8	23.1	23.2
		6	0	23.3	23.1	23.5	21.7	21.9	22.2
	64QAM	1	0	**23.6**	23.3	23.3	**22.3**	22.0	22.1
		1	2	**23.6**	23.3	23.2	22.3	22.0	22.1
		1	5	23.5	23.4	23.3	22.3	22.2	22.1
		3	0	23.3	22.9	23.1	22.0	21.7	21.9
		3	1	23.2	22.9	23.1	22.0	21.7	21.9
		3	2	23.2	22.9	23.1	22.0	21.7	21.9
		6	0	22.0	22.0	22.0	20.7	20.7	20.8

OUTPUT POWER FOR LTE BAND 12 (3.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1			Ant 2		
				Conducted Average (dBm)			Conducted Average (dBm)		
				23025	23095	23165	23025	23095	23165
				700.5 MHz	707.5 MHz	714.5 MHz	700.5 MHz	707.5 MHz	714.5 MHz
3.0	QPSK	1	0	25.5	25.4	25.5	24.0	24.0	**24.5**
		1	7	25.4	25.5	**25.7**	24.1	24.1	24.4
		1	14	25.3	25.4	25.5	24.0	24.1	24.2
		8	0	24.3	24.3	24.3	22.9	22.8	23.2
		8	4	24.3	24.2	24.3	22.9	22.8	23.1
		8	7	24.3	24.2	24.4	22.9	22.9	23.1
		15	0	24.3	24.3	24.5	22.9	22.9	23.2
	16QAM	1	0	**24.8**	24.6	24.8	23.3	23.3	23.6
		1	7	24.8	24.8	24.8	23.4	23.4	**23.6**
		1	14	24.6	24.6	24.8	23.1	23.4	23.4
		8	0	23.3	23.3	23.2	21.9	21.8	22.1
		8	4	23.3	23.2	23.2	21.9	21.8	22.1
		8	7	23.2	23.2	23.3	21.9	21.9	22.1
		15	0	23.2	23.2	23.3	21.9	21.9	22.2
	64QAM	1	0	**23.3**	**23.3**	23.1	22.2	22.0	22.1
		1	7	23.3	23.3	23.3	22.2	**22.3**	22.2
		1	14	23.2	23.3	23.3	22.0	22.0	22.1
		8	0	22.0	21.9	21.8	20.8	20.5	20.8
		8	4	21.9	21.9	21.9	20.7	20.6	20.7
		8	7	21.9	21.9	21.9	20.7	20.7	20.7
		15	0	21.9	21.9	21.8	20.8	20.6	20.8

OUTPUT POWER FOR LTE BAND 12 (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1			Ant 2		
				Conducted Average (dBm)			Conducted Average (dBm)		
				23035	23095	23155	23035	23095	23155
				701.5 MHz	707.5 MHz	713.5 MHz	701.5 MHz	707.5 MHz	713.5 MHz
5.0	QPSK	1	0	25.6	25.5	25.5	24.1	24.2	24.3
		1	12	25.4	25.5	25.6	24.0	24.1	**24.5**
		1	24	25.4	25.4	**25.7**	24.1	24.2	24.3
		12	0	24.5	24.4	24.4	23.0	23.0	23.3
		12	6	24.3	24.3	24.5	22.9	23.0	23.3
		12	11	24.3	24.3	24.5	22.9	23.0	23.3
		25	0	24.3	24.4	24.5	22.9	23.0	23.3
	16QAM	1	0	**25.1**	24.9	24.8	23.4	23.4	23.8
		1	12	24.8	24.9	24.8	23.3	23.5	**23.8**
		1	24	24.9	24.9	24.9	23.4	23.5	23.7
		12	0	23.5	23.3	23.4	22.0	22.0	22.3
		12	6	23.3	23.3	23.4	21.9	22.0	22.3
		12	11	23.3	23.3	23.4	21.9	22.1	22.3
		25	0	23.3	23.3	23.4	21.9	22.0	22.3
	64QAM	1	0	**23.6**	23.3	23.6	**22.4**	22.1	22.3
		1	12	23.4	23.4	23.4	22.2	22.2	22.3
		1	24	23.4	23.5	23.5	22.3	22.3	22.4
		12	0	22.1	22.0	22.0	20.9	20.8	20.9
		12	6	22.1	22.0	22.0	20.8	20.8	21.0
		12	11	22.1	22.0	22.0	20.8	20.9	21.0
		25	0	22.1	22.0	22.0	20.8	20.8	21.0

OUTPUT POWER FOR LTE BAND 12 (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1			Ant 2		
				Conducted Average (dBm)			Conducted Average (dBm)		
				23060	23095	23130	23060	23095	23130
				704.0 MHz	707.5 MHz	711.0 MHz	704.0 MHz	707.5 MHz	711.0 MHz
10.0	QPSK	1	0	25.6	25.5	25.6	24.2	24.1	24.2
		1	24	25.4	25.6	25.5	24.1	24.2	24.3
		1	49	25.6	25.6	**25.7**	24.3	24.5	**24.5**
		25	0	24.4	24.6	24.5	23.0	23.1	23.2
		25	12	24.4	24.5	24.4	23.0	23.2	23.3
		25	24	24.6	24.5	24.5	23.1	23.2	23.5
		50	0	24.5	24.5	24.5	23.0	23.2	23.4
	16QAM	1	0	**25.0**	24.8	25.0	23.4	23.5	23.5
		1	24	24.8	24.9	24.8	23.3	23.6	23.7
		1	49	25.0	24.8	25.0	23.5	**23.9**	23.8
		25	0	23.4	23.6	23.5	22.1	22.2	22.3
		25	12	23.4	23.5	23.5	22.1	22.2	22.3
		25	24	23.6	23.5	23.5	22.2	22.3	22.5
		50	0	23.5	23.5	23.5	22.0	21.4	22.4
	64QAM	1	0	23.5	23.4	23.5	22.2	22.2	22.1
		1	24	23.3	23.5	**23.6**	22.2	22.3	22.3
		1	49	23.5	23.5	23.5	22.3	**22.4**	22.4
		25	0	22.3	22.2	22.2	21.0	20.9	21.1
		25	12	22.3	22.2	22.1	21.0	20.9	21.1
		25	24	22.3	22.2	22.2	20.9	21.1	21.2
		50	0	22.2	22.2	22.1	20.9	21.0	21.1

7.5. LTE BAND 13

ID:	39004	Date:	7/8/19

OUTPUT POWER FOR LTE BAND 13 (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1 Conducted Average (dBm)			Ant 2 Conducted Average (dBm)		
				23205	23230	23255	23205	23230	23255
				779.5 MHz	782.0 MHz	784.5 MHz	779.5 MHz	782.0 MHz	784.5 MHz
5.0	QPSK	1	0	25.7	25.4	25.2	24.3	24.5	24.2
		1	12	25.3	25.3	25.3	24.3	24.3	24.3
		1	24	25.4	25.4	25.3	24.3	24.3	24.3
		12	0	24.4	24.2	24.2	23.1	23.2	23.1
		12	6	24.3	24.3	24.2	23.2	23.1	23.2
		12	11	24.3	24.1	24.2	23.3	23.1	23.3
		25	0	24.3	24.2	24.3	23.2	23.2	23.3
	16QAM	1	0	24.9	24.8	24.6	23.7	23.7	23.5
		1	12	24.6	24.7	24.7	23.7	23.6	23.5
		1	24	24.6	24.8	24.7	23.7	23.7	23.6
		12	0	23.4	23.2	23.2	22.0	22.2	22.1
		12	6	23.2	23.2	23.2	22.1	22.1	22.2
		12	11	23.2	23.2	23.2	22.2	22.2	22.2
		25	0	23.2	23.2	23.2	22.2	22.2	22.2
	64QAM	1	0	23.4	23.7	23.3	22.3	22.4	22.2
		1	12	23.5	23.5	23.3	22.2	22.3	22.2
		1	24	23.5	23.5	23.3	22.2	22.4	22.2
		12	0	22.0	22.0	22.0	20.8	20.9	20.8
		12	6	22.0	22.1	22.0	20.7	20.9	20.9
		12	11	21.9	22.0	22.0	20.9	20.8	20.9
		25	0	22.1	22.0	22.0	20.9	20.8	20.9

OUTPUT POWER FOR LTE BAND 13 (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1 Conducted Average (dBm)			Ant 2 Conducted Average (dBm)		
				N/A	23230	N/A	N/A	23230	N/A
				N/A	782.0 MHz	N/A	N/A	782.0 MHz	N/A
10.0	QPSK	1	0		25.7			24.4	
		1	24		25.4			24.4	
		1	49		25.5			24.5	
		25	0		24.4			23.4	
		25	12		24.5			23.4	
		25	24		24.4			23.5	
		50	0		24.5			23.4	
	16QAM	1	0		25.0			23.7	
		1	24		24.7			23.6	
		1	49		24.7			23.8	
		25	0		23.4			22.3	
		25	12		23.4			22.4	
		25	24		23.4			22.5	
		50	0		23.4			22.4	
	64QAM	1	0		23.4			22.4	
		1	24		23.6			22.3	
		1	49		23.5			22.4	
		25	0		22.3			21.0	
		25	12		22.2			21.1	
		25	24		22.2			21.1	
		50	0		22.2			21.0	

7.6. LTE BAND 17

ID:	39004	Date:	7/8/19

OUTPUT POWER FOR LTE BAND 17 (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1 Conducted Average (dBm)			Ant 2 Conducted Average (dBm)		
				23755	23790	23825	23755	23790	23825
				706.5 MHz	710.0 MHz	713.5 MHz	706.5 MHz	710.0 MHz	713.5 MHz
5.0	QPSK	1	0	25.4	25.5	25.4	24.0	24.1	24.2
		1	12	25.5	25.4	25.6	24.1	24.1	24.5
		1	24	25.4	25.4	25.7	24.1	24.4	24.3
		12	0	24.3	24.3	24.3	22.9	23.0	23.2
		12	6	24.4	24.3	24.4	22.9	23.0	23.2
		12	11	24.3	24.3	24.4	23.0	23.0	23.2
		25	0	24.4	24.4	24.5	23.0	23.0	23.3
	16QAM	1	0	24.6	24.9	24.8	23.3	23.4	23.7
		1	12	24.8	24.9	25.0	23.3	23.5	23.7
		1	24	24.8	24.9	24.9	23.3	23.7	23.7
		12	0	23.3	23.3	23.3	21.9	22.0	22.2
		12	6	23.3	23.3	23.4	21.9	21.9	22.2
		12	11	23.3	23.3	23.4	22.0	22.0	22.2
		25	0	23.3	23.3	23.4	21.9	22.0	22.2
	64QAM	1	0	23.2	23.4	23.5	22.2	22.4	22.3
		1	12	23.4	23.3	23.3	22.2	22.4	22.4
		1	24	23.4	23.4	23.4	22.4	22.5	22.5
		12	0	22.0	22.0	22.0	20.9	20.9	21.0
		12	6	22.0	21.9	21.9	20.8	20.9	21.1
		12	11	22.0	21.9	21.9	20.8	20.9	21.0
		25	0	22.0	22.0	21.9	20.8	20.9	21.1

OUTPUT POWER FOR LTE BAND 17 (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1 Conducted Average (dBm)			Ant 2 Conducted Average (dBm)		
				23780	23790	23800	23780	23790	23800
				709.0 MHz	710.0 MHz	711.0 MHz	709.0 MHz	710.0 MHz	711.0 MHz
10.0	QPSK	1	0	25.5	25.6	25.5	24.1	24.1	24.1
		1	24	25.6	25.5	25.5	24.2	24.2	24.2
		1	49	25.7	25.7	25.7	24.5	24.5	24.4
		25	0	24.5	24.5	24.5	23.1	23.1	23.1
		25	12	24.5	24.4	24.4	23.1	23.1	23.2
		25	24	24.5	24.5	24.5	23.3	23.4	23.4
		50	0	24.4	24.5	24.5	23.2	23.3	23.3
	16QAM	1	0	24.8	24.8	24.9	23.4	23.4	23.4
		1	24	25.0	24.7	24.8	23.6	23.4	23.5
		1	49	25.1	24.9	25.0	23.8	23.7	23.7
		25	0	23.6	23.5	23.5	22.1	22.1	22.2
		25	12	23.5	23.4	23.5	22.2	22.2	22.3
		25	24	23.5	23.5	23.5	22.3	22.4	22.4
		50	0	23.5	23.5	23.5	22.2	22.3	22.3
	64QAM	1	0	23.3	23.4	23.4	22.2	22.3	22.3
		1	24	23.4	23.3	23.5	22.3	22.4	22.5
		1	49	23.4	23.4	23.5	22.5	22.5	22.5
		25	0	22.2	22.1	22.2	21.0	21.1	21.2
		25	12	22.2	22.1	22.2	21.2	21.2	21.2
		25	24	22.2	22.2	22.2	21.2	21.3	21.3
		50	0	22.2	22.1	22.1	21.2	21.2	21.2

7.7. LTE BAND 25

ID:	39004	Date:	7/8/19

OUTPUT POWER FOR LTE BAND 25 (1.4 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1			Ant 2		
				Conducted Average (dBm)			Conducted Average (dBm)		
				26047	26365	26683	26047	26365	26683
				1850.7 MHz	1882.5 MHz	1914.3 MHz	1850.7 MHz	1882.5 MHz	1914.3 MHz
1.4	QPSK	1	0	25.1	25.3	25.2	18.5	18.0	18.2
		1	2	25.0	25.3	25.0	18.3	17.9	18.1
		1	5	25.1	25.7	25.0	18.3	17.9	18.1
		3	0	25.0	25.2	24.9	18.3	17.8	18.0
		3	1	25.0	25.2	24.9	18.3	17.8	18.0
		3	2	25.0	25.2	24.9	18.2	17.8	18.0
		6	0	24.0	24.2	23.9	17.2	16.8	16.9
	16QAM	1	0	24.4	24.6	24.3	17.6	17.2	17.3
		1	2	24.3	24.6	24.2	17.5	17.2	17.3
		1	5	24.4	24.6	24.2	17.5	17.2	17.2
		3	0	24.0	24.2	24.0	17.3	16.9	16.9
		3	1	24.1	24.3	24.0	17.3	16.9	16.9
		3	2	24.1	24.3	24.0	17.2	16.9	17.0
		6	0	22.9	23.1	22.9	16.2	15.8	15.9
	64QAM	1	0	23.2	23.0	23.0	16.6	16.0	16.2
		1	2	23.3	23.0	23.0	16.7	16.1	16.2
		1	5	23.4	22.9	23.0	16.5	16.0	16.3
		3	0	23.0	22.8	22.9	16.4	15.8	16.0
		3	1	23.1	22.7	22.9	16.3	15.8	16.0
		3	2	23.1	22.8	22.9	16.3	15.8	16.0
		6	0	21.9	21.8	21.8	15.1	14.9	14.9

OUTPUT POWER FOR LTE BAND 25 (3.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1			Ant 2		
				Conducted Average (dBm)			Conducted Average (dBm)		
				26055	26365	26675	26055	26365	26675
				1851.5 MHz	1882.5 MHz	1913.5 MHz	1851.5 MHz	1882.5 MHz	1913.5 MHz
3.0	QPSK	1	0	25.2	25.2	25.2	18.5	17.9	18.1
		1	7	25.2	25.7	25.1	18.3	18.0	18.1
		1	14	25.1	25.2	25.0	18.4	17.9	18.0
		8	0	24.0	24.1	23.9	17.3	16.8	16.9
		8	4	24.0	24.2	23.9	17.3	16.8	16.9
		8	7	24.0	24.2	23.9	17.3	16.8	16.9
		15	0	24.1	24.2	24.0	17.3	16.8	17.0
	16QAM	1	0	24.4	24.5	24.3	17.6	17.1	17.3
		1	7	24.5	24.6	24.2	17.5	17.2	17.3
		1	14	24.3	24.5	24.3	17.6	17.2	17.2
		8	0	23.1	23.1	22.9	16.2	15.8	15.9
		8	4	23.0	23.1	22.9	16.2	15.8	15.9
		8	7	23.0	23.1	22.9	16.2	15.8	15.9
		15	0	23.0	23.0	22.9	16.2	15.8	15.9
	64QAM	1	0	23.1	23.0	23.1	16.5	16.0	16.1
		1	7	23.1	23.0	23.1	16.5	16.1	16.2
		1	14	23.0	23.0	23.1	16.5	16.1	16.2
		8	0	21.9	21.7	21.8	15.2	14.8	14.9
		8	4	21.8	21.7	21.8	15.2	14.8	14.9
		8	7	21.8	21.7	21.8	15.2	14.8	14.9
		15	0	21.9	21.7	21.8	15.2	14.8	14.9

OUTPUT POWER FOR LTE BAND 25 (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1			Ant 2		
				Conducted Average (dBm)			Conducted Average (dBm)		
				26065	26365	26665	26065	26365	26665
				1852.5 MHz	1882.5 MHz	1912.5 MHz	1852.5 MHz	1882.5 MHz	1912.5 MHz
5.0	QPSK	1	0	25.1	25.3	25.7	18.5	18.0	18.2
		1	12	25.1	25.3	25.2	18.4	18.0	18.1
		1	24	25.3	25.4	25.1	18.3	18.1	18.2
		12	0	24.1	24.3	24.2	17.4	17.0	17.1
		12	6	24.1	24.3	24.1	17.4	17.0	17.1
		12	11	24.2	24.4	24.1	17.3	17.0	17.1
		25	0	24.2	24.3	24.1	17.4	17.0	17.1
	16QAM	1	0	24.5	24.7	24.7	17.8	17.2	17.4
		1	12	24.4	24.8	24.4	17.8	17.3	17.4
		1	24	24.7	24.8	24.4	17.7	17.4	17.4
		12	0	23.1	23.3	23.2	16.4	16.0	16.1
		12	6	23.1	23.3	23.1	16.4	16.0	16.1
		12	11	23.2	23.3	23.1	16.3	16.0	16.1
		25	0	23.1	23.2	23.1	16.3	15.9	16.1
	64QAM	1	0	23.3	23.1	23.4	16.6	16.2	16.6
		1	12	23.2	23.1	23.4	16.6	16.2	16.4
		1	24	23.3	23.2	23.3	16.7	16.3	16.5
		12	0	22.0	21.9	22.1	15.5	14.9	15.2
		12	6	22.0	21.9	22.0	15.5	14.9	15.2
		12	11	22.1	21.8	21.9	15.4	14.9	15.1
		25	0	22.0	21.9	22.0	15.4	14.9	15.1

OUTPUT POWER FOR LTE BAND 25 (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1			Ant 2		
				Conducted Average (dBm)			Conducted Average (dBm)		
				26090	26365	26640	26090	26365	26640
				1855.0 MHz	1882.5 MHz	1910.0 MHz	1855.0 MHz	1882.5 MHz	1910.0 MHz
10.0	QPSK	1	0	25.3	25.3	25.7	18.5	18.1	18.3
		1	24	25.4	25.4	25.5	18.4	18.0	18.2
		1	49	25.5	25.5	25.1	18.4	18.1	18.2
		25	0	24.3	24.5	24.5	17.5	17.1	17.3
		25	12	24.4	24.5	24.4	17.4	17.1	17.2
		25	24	24.5	24.5	24.3	17.3	17.1	17.2
		50	0	24.4	24.5	24.4	17.4	17.1	17.3
	16QAM	1	0	24.6	24.5	24.8	17.7	17.4	17.6
		1	24	24.7	24.7	24.8	17.6	17.3	17.5
		1	49	24.9	24.8	24.5	17.7	17.4	17.5
		25	0	23.3	23.4	23.6	16.6	16.2	16.4
		25	12	23.4	23.4	23.5	16.5	16.2	16.3
		25	24	23.5	23.5	23.3	16.5	16.2	16.3
		50	0	23.4	23.4	23.5	16.5	16.2	16.3
	64QAM	1	0	23.3	23.2	23.4	16.5	16.2	16.6
		1	24	23.3	23.2	23.4	16.5	16.3	16.5
		1	49	23.5	23.3	23.4	16.6	16.4	16.4
		25	0	22.2	22.1	22.3	15.6	15.1	15.4
		25	12	22.3	22.1	22.3	15.5	15.1	15.4
		25	24	22.3	22.2	22.3	15.4	15.2	15.3
		50	0	22.3	22.1	22.3	15.5	15.1	15.4

OUTPUT POWER FOR LTE BAND 25 (15.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1			Ant 2		
				Conducted Average (dBm)			Conducted Average (dBm)		
				26115	26365	26615	26115	26365	26615
				1857.5 MHz	1882.5 MHz	1907.5 MHz	1857.5 MHz	1882.5 MHz	1907.5 MHz
15.0	QPSK	1	0	25.3	25.2	25.4	18.5	18.0	18.3
		1	37	25.5	25.4	25.7	18.4	18.0	18.3
		1	74	25.4	25.4	25.1	18.3	18.1	18.1
		36	0	24.4	24.4	24.6	17.4	17.2	17.3
		36	16	24.5	24.5	24.6	17.4	17.1	17.3
		36	35	24.5	24.5	24.5	17.3	17.1	17.3
		75	0	24.5	24.5	24.6	17.3	17.1	17.3
	16QAM	1	0	24.7	24.4	24.7	17.6	17.2	17.6
		1	37	24.9	24.6	25.0	17.7	17.2	17.6
		1	74	24.7	24.6	24.5	17.8	17.4	17.4
		36	0	23.4	23.3	23.7	16.5	16.2	16.4
		36	16	23.5	23.5	23.7	16.4	16.2	16.4
		36	35	23.5	23.5	23.5	16.4	16.2	16.3
		75	0	23.5	23.5	23.6	16.4	16.2	16.3
	64QAM	1	0	23.4	23.2	23.2	16.7	16.2	16.5
		1	37	23.5	23.2	23.4	16.6	16.2	16.4
		1	74	23.5	23.4	23.3	16.6	16.4	16.3
		36	0	22.3	22.1	22.4	15.5	15.2	15.4
		36	16	22.4	22.2	22.4	15.5	15.1	15.4
		36	35	22.3	22.2	22.3	15.5	15.2	15.3
		75	0	22.3	22.2	22.3	15.4	15.1	15.3

OUTPUT POWER FOR LTE BAND 25 (20.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1			Ant 2		
				Conducted Average (dBm)			Conducted Average (dBm)		
				26140	26365	26590	26140	26365	26590
				1860.0 MHz	1882.5 MHz	1905.0 MHz	1860.0 MHz	1882.5 MHz	1905.0 MHz
20.0	QPSK	1	0	25.3	25.3	25.4	18.5	18.0	18.3
		1	49	25.5	25.4	25.7	18.3	18.0	18.3
		1	99	25.4	25.5	25.2	18.1	18.2	18.2
		50	0	24.4	24.4	24.5	17.5	17.1	17.3
		50	24	24.5	24.5	24.6	17.3	17.1	17.3
		50	49	24.4	24.5	24.5	17.3	17.1	17.3
		100	0	24.5	24.5	24.7	17.3	17.1	17.3
	16QAM	1	0	24.7	24.5	24.8	17.7	17.3	17.6
		1	49	24.8	24.7	25.0	17.6	17.3	17.7
		1	99	24.7	24.8	24.6	17.4	17.5	17.5
		50	0	23.4	23.3	23.5	16.5	16.1	16.4
		50	24	23.5	23.4	23.7	16.4	16.2	16.4
		50	49	23.4	23.5	23.6	16.3	16.2	16.4
		100	0	23.4	23.5	23.7	16.3	16.2	16.4
	64QAM	1	0	23.3	23.3	23.3	16.5	16.4	16.5
		1	49	23.3	23.4	23.6	16.4	16.4	16.6
		1	99	23.3	23.4	23.5	16.2	16.5	16.6
		50	0	22.3	22.1	22.2	15.5	15.2	15.4
		50	24	22.3	22.1	22.3	15.4	15.1	15.4
		50	49	22.3	22.1	22.4	15.3	15.2	15.4
		100	0	22.3	22.1	22.4	15.4	15.1	15.4

7.8. LTE BAND 26 (Part 90S)

ID:	39004	Date:	7/8/19

OUTPUT POWER FOR LTE BAND 26 (1.4 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1 Conducted Average (dBm)			Ant 2 Conducted Average (dBm)		
				26697	26740	26783	26697	26740	26783
				814.7 MHz	819.0 MHz	823.3 MHz	814.7 MHz	819.0 MHz	823.3 MHz
1.4	QPSK	1	0	25.5	25.5	25.4	24.1	24.3	24.5
		1	2	25.7	25.5	25.4	24.0	24.2	24.4
		1	5	25.5	25.5	25.5	24.1	24.2	24.4
		3	0	25.4	25.4	25.2	23.9	24.1	24.2
		3	1	25.4	25.4	25.2	23.9	24.1	24.2
		3	2	25.4	25.3	25.2	23.9	24.1	24.2
		6	0	24.3	24.3	24.1	22.9	23.1	23.1
	16QAM	1	0	24.7	24.8	24.7	23.3	23.5	23.7
		1	2	24.7	24.7	24.6	23.2	23.5	23.7
		1	5	24.7	24.8	24.8	23.3	23.6	23.7
		3	0	24.5	24.4	24.3	23.0	23.2	23.4
		3	1	24.5	24.4	24.3	22.9	23.2	23.3
		3	2	24.5	24.4	24.3	23.0	23.2	23.4
		6	0	23.3	23.2	23.2	21.9	22.1	22.2
	64QAM	1	0	23.7	23.6	23.6	22.4	22.2	22.3
		1	2	23.7	23.5	23.6	22.3	22.2	22.4
		1	5	23.7	23.6	23.6	22.4	22.1	22.3
		3	0	23.5	23.3	23.3	22.1	21.9	22.2
		3	1	23.5	23.3	23.3	22.0	21.9	22.2
		3	2	23.5	23.3	23.3	22.0	21.9	22.2
		6	0	22.4	22.3	22.0	20.9	20.9	21.1

OUTPUT POWER FOR LTE BAND 26 (3.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1 Conducted Average (dBm)			Ant 2 Conducted Average (dBm)		
				26705	26740	26775	26705	26740	26775
				815.5 MHz	819.0 MHz	822.5 MHz	815.5 MHz	819.0 MHz	822.5 MHz
3.0	QPSK	1	0	25.6	25.5	25.3	24.1	24.2	24.3
		1	7	25.6	25.5	25.4	24.1	24.3	24.5
		1	14	25.7	25.4	25.4	24.1	24.3	24.3
		8	0	24.4	24.3	24.2	22.9	23.1	23.2
		8	4	24.3	24.3	24.2	22.9	23.0	23.2
		8	7	24.4	24.3	24.2	22.9	23.1	23.2
		15	0	24.4	24.4	24.2	23.0	23.2	23.2
	16QAM	1	0	24.9	24.8	24.5	23.4	23.5	23.6
		1	7	24.8	24.7	24.7	23.4	23.6	23.6
		1	14	24.7	24.6	24.7	23.3	23.6	23.6
		8	0	23.4	23.3	23.1	21.9	22.1	22.1
		8	4	23.3	23.3	23.2	21.9	22.0	22.1
		8	7	23.3	23.2	23.2	21.9	22.1	22.1
		15	0	23.3	23.3	23.2	21.9	22.1	22.1
	64QAM	1	0	23.7	23.6	23.5	22.2	22.2	22.3
		1	7	23.7	23.5	23.6	22.1	22.3	22.4
		1	14	23.6	23.6	23.5	22.1	22.2	22.3
		8	0	22.3	22.2	22.1	20.8	20.9	20.9
		8	4	22.2	22.2	22.1	20.8	20.9	21.0
		8	7	22.3	22.2	22.1	20.8	20.8	21.0
		15	0	22.3	22.2	22.1	20.8	20.8	21.0

OUTPUT POWER FOR LTE BAND 26 (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1			Ant 2		
				Conducted Average (dBm)			Conducted Average (dBm)		
				26715	26740	26765	26715	26740	26765
				816.5 MHz	819.0 MHz	821.5 MHz	816.5 MHz	819.0 MHz	821.5 MHz
5.0	QPSK	1	0	25.7	25.7	25.5	24.1	24.2	24.3
		1	12	25.6	25.5	25.4	24.2	24.3	24.5
		1	24	25.6	25.5	25.5	24.2	24.4	24.4
		12	0	24.5	24.5	24.4	23.1	23.1	23.3
		12	6	24.5	24.5	24.3	23.1	23.1	23.3
		12	11	24.5	24.5	24.4	23.1	23.2	23.3
		25	0	24.5	24.5	24.3	23.1	23.2	23.3
	16QAM	1	0	25.1	25.0	24.9	23.6	23.5	23.7
		1	12	25.0	24.8	24.8	23.6	23.5	23.7
		1	24	25.0	24.8	24.9	23.6	23.6	23.8
		12	0	23.4	23.5	23.4	22.0	22.1	22.3
		12	6	23.4	23.4	23.3	22.1	22.1	22.2
		12	11	23.5	23.4	23.4	22.1	22.2	22.3
		25	0	23.5	23.4	23.3	22.1	22.2	22.2
	64QAM	1	0	24.0	23.9	23.7	22.5	22.4	22.4
		1	12	24.0	23.7	23.6	22.4	22.3	22.5
		1	24	23.9	23.7	23.6	22.4	22.5	22.6
		12	0	22.5	22.5	22.3	21.0	21.1	21.0
		12	6	22.5	22.4	22.3	21.1	21.0	21.1
		12	11	22.5	22.4	22.3	21.1	21.0	21.1
		25	0	22.5	22.4	22.3	21.0	21.0	21.1

OUTPUT POWER FOR LTE BAND 26 (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1			Ant 2		
				Conducted Average (dBm)			Conducted Average (dBm)		
				N/A	26740	N/A	N/A	26740	N/A
				N/A	819.0 MHz	N/A	N/A	819.0 MHz	N/A
10.0	QPSK	1	0		25.7			24.2	
		1	24		25.6			24.3	
		1	49		25.5			24.5	
		25	0		24.6			23.3	
		25	12		24.6			23.3	
		25	24		24.5			23.4	
		50	0		24.6			23.4	
	16QAM	1	0		25.0			23.6	
		1	24		24.9			23.6	
		1	49		24.8			23.8	
		25	0		23.7			22.3	
		25	12		23.7			22.4	
		25	24		23.6			22.5	
		50	0		23.6			22.4	
	64QAM	1	0		23.9			22.4	
		1	24		23.6			22.3	
		1	49		23.6			22.6	
		25	0		22.6			21.2	
		25	12		22.6			21.2	
		25	24		22.5			21.3	
		50	0		22.6			21.2	

7.9. LTE BAND 30

ID:	39004	Date:	7/8/19

OUTPUT POWER FOR LTE BAND 30 (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1			Ant 2		
				Conducted Average (dBm)			Conducted Average (dBm)		
				27685	27710	27735	27685	27710	27735
				2307.5 MHz	2310.0 MHz	2312.5 MHz	2307.5 MHz	2310.0 MHz	2312.5 MHz
5.0	QPSK	1	0	25.3	25.4	25.7	20.3	20.4	20.2
		1	12	25.3	25.7	25.7	20.3	20.3	20.3
		1	24	25.5	25.7	25.6	20.3	20.5	20.4
		12	0	24.2	24.5	24.6	19.3	19.3	19.2
		12	6	24.3	24.5	24.6	19.2	19.3	19.2
		12	11	24.4	24.6	24.6	19.3	19.2	19.2
		25	0	24.3	24.5	24.6	19.2	19.2	19.3
	16QAM	1	0	24.6	24.9	25.0	19.7	19.6	19.7
		1	12	24.7	25.0	25.0	19.7	19.6	19.7
		1	24	24.8	25.1	25.0	19.7	19.7	19.8
		12	0	23.2	23.5	23.5	18.3	18.3	18.3
		12	6	23.3	23.5	23.6	18.3	18.3	18.3
		12	11	23.4	23.6	23.6	18.3	18.3	18.2
		25	0	23.3	23.5	23.6	18.3	18.2	18.3
	64QAM	1	0	23.1	23.3	23.6	18.4	18.6	18.4
		1	12	23.2	23.4	23.6	18.5	18.5	18.4
		1	24	23.4	23.6	23.6	18.5	18.5	18.2
		12	0	21.9	22.1	22.3	17.1	17.1	17.1
		12	6	22.0	22.1	22.2	17.2	17.1	17.1
		12	11	22.1	22.2	22.2	17.1	17.1	17.1
		25	0	22.0	22.1	22.2	17.2	17.1	17.1

OUTPUT POWER FOR LTE BAND 30 (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1			Ant 2		
				Conducted Average (dBm)			Conducted Average (dBm)		
				N/A	27710	N/A	N/A	27710	N/A
				N/A	2310.0 MHz	N/A	N/A	2310.0 MHz	N/A
10.0	QPSK	1	0		25.5			20.5	
		1	24		25.6			20.4	
		1	49		25.7			20.5	
		25	0		24.5			19.4	
		25	12		24.6			19.4	
		25	24		24.7			19.4	
		50	0		24.7			19.4	
	16QAM	1	0		24.8			19.8	
		1	24		25.0			19.8	
		1	49		25.0			19.8	
		25	0		23.6			18.5	
		25	12		23.6			18.5	
		25	24		23.7			18.5	
		50	0		23.7			18.4	
	64QAM	1	0		23.3			18.5	
		1	24		23.5			18.5	
		1	49		23.5			18.4	
		25	0		22.2			17.5	
		25	12		22.3			17.4	
		25	24		22.3			17.4	
		50	0		22.3			17.3	

7.10. LTE BAND 41

ID:	39004	Date:	7/8/19

OUTPUT POWER FOR LTE BAND 41 (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1			Ant 2		
				Conducted Average (dBm)			Conducted Average (dBm)		
				39675	40620	41565	39675	40620	41565
				2498.5 MHz	2593.0 MHz	2687.5 MHz	2498.5 MHz	2593.0 MHz	2687.5 MHz
5.0	QPSK	1	0	25.7	28.4	28.3	19.8	21.3	21.4
		1	12	27.6	28.5	28.3	21.4	21.3	21.4
		1	24	27.7	28.7	28.4	21.4	21.4	21.3
		12	0	24.5	27.3	27.3	18.6	20.2	20.3
		12	6	24.5	27.3	27.3	18.8	20.3	20.3
		12	11	26.5	27.3	27.3	20.3	20.3	20.3
		25	0	24.5	27.4	27.3	18.5	20.3	20.3
	16QAM	1	0	25.3	27.9	27.6	19.3	20.8	20.9
		1	12	27.1	28.0	27.7	20.7	20.8	20.8
		1	24	27.1	28.0	27.7	20.8	20.9	20.8
		12	0	23.5	26.4	26.3	19.3	19.4	19.3
		12	6	23.5	26.3	26.3	16.3	19.4	19.3
		12	11	25.5	26.4	26.3	18.3	19.4	19.3
		25	0	23.5	26.3	26.3	16.3	19.3	19.3
	64QAM	1	0	24.1	26.8	26.6	18.4	20.0	20.0
		1	12	25.9	26.8	26.6	19.7	20.0	19.9
		1	24	25.9	26.9	26.7	19.9	19.9	20.0
		12	0	22.4	25.3	25.4	16.5	18.5	18.5
		12	6	22.4	25.3	25.3	16.5	18.5	18.5
		12	11	24.5	25.3	25.3	18.5	18.5	18.5
		25	0	22.4	25.4	25.2	16.4	18.5	18.5

OUTPUT POWER FOR LTE BAND 41 (10.0MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1			Ant 2		
				Conducted Average (dBm)			Conducted Average (dBm)		
				39700	40620	41540	39700	40620	41540
				2501.0 MHz	2593.0 MHz	2685.0 MHz	2501.0 MHz	2593.0 MHz	2685.0 MHz
10.0	QPSK	1	0	24.5	28.4	28.4	18.5	21.4	21.4
		1	24	27.5	28.5	28.4	21.3	21.4	21.4
		1	49	27.7	28.5	28.5	21.3	21.5	21.4
		25	0	24.4	27.4	27.4	18.5	20.4	20.5
		25	12	26.5	27.5	27.4	20.4	20.4	20.5
		25	24	25.5	27.5	27.5	19.4	20.5	20.5
		50	0	24.5	27.5	27.4	18.5	20.4	20.5
	16QAM	1	0	23.9	27.8	27.8	17.8	21.0	20.8
		1	24	26.9	27.9	27.8	20.8	21.0	20.8
		1	49	26.9	27.9	27.8	20.8	20.9	20.8
		25	0	23.5	26.5	26.5	17.6	19.5	19.5
		25	12	25.5	26.6	26.5	19.5	19.5	19.5
		25	24	24.5	26.6	26.6	18.5	19.5	19.5
		50	0	23.5	26.6	26.4	17.4	19.5	19.5
	64QAM	1	0	22.8	26.9	26.7	16.9	20.3	20.1
		1	24	25.8	26.9	26.8	20.0	20.2	20.0
		1	49	25.9	26.9	26.8	19.9	20.2	20.0
		25	0	22.5	25.5	25.5	17.7	18.7	18.8
		25	12	24.5	25.6	25.5	19.0	18.7	18.8
		25	24	23.6	25.6	25.5	18.6	18.7	18.8
		50	0	22.5	25.6	25.5	17.6	18.7	18.8

OUTPUT POWER FOR LTE BAND 41 (15.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1			Ant 2		
				Conducted Average (dBm)			Conducted Average (dBm)		
				39725	40620	41515	39725	40620	41515
				2503.5 MHz	2593.0 MHz	2682.5 MHz	2503.5 MHz	2593.0 MHz	2682.5 MHz
15.0	QPSK	1	0	24.7	28.4	28.4	18.5	21.1	21.4
		1	37	27.6	28.5	28.4	21.3	21.2	21.3
		1	74	27.7	28.7	28.4	21.4	21.3	21.2
		36	0	23.6	27.4	27.4	17.4	20.1	20.3
		36	16	26.6	27.5	27.4	20.4	20.2	20.3
		36	35	25.6	27.6	27.4	19.3	20.2	20.3
		75	0	23.6	27.5	27.4	17.3	20.1	20.3
	16QAM	1	0	23.9	27.8	27.8	17.8	20.4	20.7
		1	37	26.8	27.9	27.8	20.7	20.4	20.6
		1	74	26.9	28.0	27.8	20.9	20.5	20.6
		36	0	22.6	26.5	26.4	16.5	19.3	19.4
		36	16	25.7	26.6	26.4	19.4	19.3	19.4
		36	35	24.7	26.6	26.4	18.4	19.3	19.4
		75	0	22.6	26.5	26.4	16.3	19.3	19.3
	64QAM	1	0	23.0	26.9	26.7	17.0	19.9	19.9
		1	37	26.0	26.9	26.7	19.9	19.9	19.8
		1	74	26.2	26.9	26.8	20.1	20.0	19.8
		36	0	21.6	25.5	25.4	15.6	18.5	18.6
		36	16	24.7	25.5	25.4	18.6	18.5	18.6
		36	35	23.7	25.5	25.4	17.6	18.5	18.6
		75	0	21.6	25.6	25.5	15.5	18.4	18.5

OUTPUT POWER FOR LTE BAND 41 (20.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1			Ant 2		
				Conducted Average (dBm)			Conducted Average (dBm)		
				39750	40620	41490	39750	40620	41490
				2506.0 MHz	2593.0 MHz	2680.0 MHz	2506.0 MHz	2593.0 MHz	2680.0 MHz
20.0	QPSK	1	0	24.5	28.5	28.3	18.5	21.1	21.3
		1	49	27.5	28.6	28.4	21.3	21.2	21.2
		1	99	27.7	28.7	28.5	21.5	21.3	21.2
		50	0	23.5	27.4	27.3	17.4	20.1	20.3
		50	24	26.5	27.5	27.3	20.3	20.1	20.2
		50	49	25.5	27.5	27.4	19.3	20.2	20.2
		100	0	23.5	27.5	27.3	17.3	20.1	20.2
	16QAM	1	0	23.9	28.0	27.7	17.8	20.6	20.8
		1	49	27.0	28.0	27.7	20.8	20.6	20.7
		1	99	27.1	28.2	27.9	21.0	20.7	20.7
		50	0	22.5	26.5	26.4	16.5	19.2	19.4
		50	24	25.6	26.6	26.4	19.4	19.2	19.3
		50	49	24.6	26.6	26.5	18.5	19.2	19.3
		100	0	22.6	26.5	26.4	16.3	19.1	19.3
	64QAM	1	0	22.8	26.9	26.6	16.9	19.8	20.0
		1	49	25.9	27.0	26.6	19.9	19.8	19.8
		1	99	26.1	27.0	26.8	20.1	19.9	19.8
		50	0	21.5	25.5	25.4	15.6	18.3	18.6
		50	24	24.6	25.6	25.4	18.5	18.4	18.5
		50	49	23.6	25.6	25.4	17.6	18.4	18.5
		100	0	21.5	25.5	25.3	15.5	18.4	18.5

7.11. LTE BAND 48

ID:	39004	Date:	7/23/19

OUTPUT POWER FOR LTE BAND 48 (5 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 3			Ant 4		
				Conducted Average (dBm)			Conducted Average (dBm)		
				55265	55990	56715	55265	55990	56715
				3552.5 MHz	3625.0 MHz	3697.5 MHz	3552.5 MHz	3625.0 MHz	3697.5 MHz
5.0	QPSK	1	0	21.0	25.4	20.9	18.5	22.5	18.5
		1	12	20.6	24.9	20.4	17.9	21.9	18.0
		1	24	21.0	25.7	20.9	18.4	22.2	18.4
		12	0	20.1	24.5	20.1	17.4	21.3	17.6
		12	6	20.0	24.4	20.0	17.3	21.3	17.5
		12	11	20.1	24.4	20.0	17.4	21.3	17.5
		25	0	20.0	24.3	19.9	17.3	21.3	17.4
	16QAM	1	0	19.9	24.9	20.0	17.8	21.7	17.6
		1	12	19.7	24.4	19.8	17.2	21.3	17.2
		1	24	19.8	24.9	20.2	17.7	21.6	17.5
		12	0	19.3	23.3	19.4	16.4	20.2	16.4
		12	6	19.2	23.2	19.3	16.3	20.2	16.3
		12	11	19.3	23.2	19.4	16.3	20.2	16.3
		25	0	19.2	23.2	19.3	16.2	20.1	16.3
	64QAM	1	0	19.3	23.8	19.3	16.6	20.8	16.8
		1	12	19.2	23.3	19.3	15.9	20.3	16.2
		1	24	19.7	23.9	19.6	16.4	20.8	16.6
		12	0	17.9	22.1	18.0	15.5	18.9	15.1
		12	6	17.9	22.1	18.0	15.1	19.1	15.3
		12	11	17.9	22.1	18.1	15.2	19.1	15.2
		25	0	17.9	22.1	18.1	15.1	19.2	15.4

OUTPUT POWER FOR LTE BAND 48 (10 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 3			Ant 4		
				Conducted Average (dBm)			Conducted Average (dBm)		
				55290	55990	56690	55290	55990	56690
				3555 MHz	3625.0 MHz	3695 MHz	3555 MHz	3625.0 MHz	3695 MHz
10.0	QPSK	1	0	21.0	25.6	21.0	18.5	22.5	18.5
		1	24	20.7	25.3	20.7	18.2	22.2	18.4
		1	49	20.9	25.7	20.9	18.5	22.3	18.5
		25	0	20.3	24.5	20.4	17.4	21.4	17.7
		25	12	20.2	24.4	20.3	17.4	21.4	17.6
		25	24	20.3	24.5	20.4	17.5	21.4	17.6
		50	0	20.1	24.3	20.2	17.2	21.3	17.4
	16QAM	1	0	20.8	25.1	20.9	17.8	21.9	17.7
		1	24	20.5	24.9	20.6	17.5	21.6	17.5
		1	49	20.7	25.1	20.9	17.7	21.7	17.7
		25	0	19.2	23.4	19.2	16.3	20.4	16.6
		25	12	19.1	23.3	19.2	16.2	20.3	16.5
		25	24	19.2	23.4	19.3	16.3	20.3	16.6
		50	0	19.1	23.2	19.2	16.2	20.3	16.4
	64QAM	1	0	19.6	23.9	19.8	16.7	20.7	16.7
		1	24	19.4	23.8	19.5	16.4	20.4	16.6
		1	49	19.6	24.1	19.7	16.7	20.6	16.7
		25	0	18.2	22.3	18.3	15.4	19.4	15.5
		25	12	18.2	22.3	18.2	15.3	19.3	15.5
		25	24	18.2	22.3	18.2	15.4	19.3	15.5
		50	0	18.0	22.2	18.1	15.2	19.2	15.4

OUTPUT POWER FOR LTE BAND 48 (15 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 3			Ant 4		
				Conducted Average (dBm)			Conducted Average (dBm)		
				55315	55990	56665	55315	55990	56665
				3557.5 MHz	3625.0 MHz	3692.5 MHz	3557.5 MHz	3625.0 MHz	3692.5 MHz
15.0	QPSK	1	0	20.9	25.5	21.0	18.4	22.5	18.5
		1	37	20.6	25.2	20.6	18.1	22.0	18.2
		1	74	20.8	25.7	21.0	18.5	22.3	18.5
		36	0	20.3	24.5	20.4	17.5	21.4	17.7
		36	16	20.3	24.5	20.4	17.6	21.4	17.7
		36	35	20.3	24.5	20.4	17.6	21.3	17.7
		75	0	20.1	24.2	20.2	17.3	21.1	17.5
	16QAM	1	0	20.7	25.0	20.8	17.9	21.6	17.8
		1	37	20.4	24.7	20.5	17.5	21.2	17.5
		1	74	20.5	25.1	20.8	18.0	21.4	17.8
		36	0	19.3	23.4	19.3	16.5	20.4	16.6
		36	16	19.3	23.4	19.3	16.5	20.4	16.6
		36	35	19.2	23.4	19.3	16.5	20.4	16.6
		75	0	19.1	23.2	19.1	16.2	20.2	16.4
	64QAM	1	0	19.7	23.9	19.7	16.9	20.7	16.9
		1	37	19.4	23.7	19.3	16.6	20.3	16.6
		1	74	19.7	24.0	19.7	16.9	20.6	16.8
		36	0	18.2	22.4	18.3	15.5	19.4	15.7
		36	16	18.2	22.4	18.3	15.4	19.4	15.7
		36	35	18.1	22.4	18.3	15.4	19.4	15.7
		75	0	18.0	22.2	18.1	15.2	19.1	15.5

OUTPUT POWER FOR LTE BAND 48 (20 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 3			Ant 4		
				Conducted Average (dBm)			Conducted Average (dBm)		
				55340	55990	56640	55340	55990	56640
				3560 MHz	3625.0 MHz	3690 MHz	3560 MHz	3625.0 MHz	3690 MHz
20.0	QPSK	1	0	20.9	25.6	20.9	18.4	22.5	18.5
		1	49	20.6	25.4	20.7	18.2	22.3	18.3
		1	99	20.8	25.7	20.9	18.4	22.4	18.5
		50	0	20.4	24.5	20.4	17.4	21.5	17.7
		50	24	20.0	24.2	20.1	17.1	21.2	17.4
		50	49	20.2	24.5	20.4	17.4	21.4	17.7
		100	0	20.1	24.3	20.2	17.2	21.2	17.4
	16QAM	1	0	20.0	25.0	20.1	17.8	21.7	17.8
		1	49	19.7	24.8	19.8	17.6	21.5	17.6
		1	99	19.8	25.1	20.0	17.8	21.7	17.8
		50	0	18.9	23.5	18.9	16.5	20.4	16.6
		50	24	18.6	23.2	18.6	16.2	20.2	16.3
		50	49	18.8	23.5	18.9	16.5	20.4	16.6
		100	0	18.7	23.3	18.7	16.3	20.2	16.3
	64QAM	1	0	18.8	24.0	18.8	16.9	20.9	16.8
		1	49	18.4	23.8	18.5	16.6	20.7	16.6
		1	99	18.6	24.0	18.7	16.9	20.8	16.8
		50	0	17.8	22.6	17.7	15.4	19.5	15.6
		50	24	17.4	22.2	17.4	15.2	19.2	15.4
		50	49	17.6	22.5	17.7	15.4	19.4	15.7
		100	0	17.4	22.3	17.5	15.3	19.2	15.4

UL VERIFICATION SERVICES INC.
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7.12. LTE BAND 66

ID:	39004	Date:	7/8/19

OUTPUT POWER FOR LTE BAND 66 (1.4 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1 Conducted Average (dBm)			Ant 2 Conducted Average (dBm)		
				131979	132322	132665	131979	132322	132665
				1710.7	1745	1779.3	1710.7	1745	1779.3
1.4	QPSK	1	0	25.3	25.6	25.0	21.5	21.2	21.1
		1	2	25.3	25.6	25.0	21.2	21.2	21.0
		1	5	25.4	25.7	25.0	21.2	21.3	21.1
		3	0	25.3	25.5	24.9	21.1	21.1	20.9
		3	1	25.3	25.5	25.0	21.1	21.1	20.9
		3	2	25.3	25.5	25.0	21.1	21.1	20.9
		6	0	24.3	24.5	24.0	20.0	20.1	19.9
	16QAM	1	0	24.6	25.0	24.4	20.5	20.5	20.3
		1	2	24.6	25.0	24.3	20.5	20.4	20.3
		1	5	24.7	25.0	24.4	20.6	20.5	20.3
		3	0	24.4	24.7	24.2	20.2	20.2	20.0
		3	1	24.4	24.7	24.1	20.2	20.2	20.0
		3	2	24.4	24.6	24.1	20.3	20.2	20.0
		6	0	23.3	23.5	23.0	19.2	19.0	18.8
	64QAM	1	0	23.4	23.4	23.1	19.6	19.4	19.2
		1	2	23.3	23.4	23.1	19.6	19.4	19.2
		1	5	23.5	23.4	23.1	19.6	19.5	19.2
		3	0	23.1	23.0	22.9	19.2	19.1	19.0
		3	1	23.1	23.0	22.9	19.2	19.1	19.0
		3	2	23.1	23.2	22.9	19.3	19.0	19.0
		6	0	21.9	22.1	21.8	18.1	18.1	17.9

OUTPUT POWER FOR LTE BAND 66 (3.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1 Conducted Average (dBm)			Ant 2 Conducted Average (dBm)		
				131987	132322	132657	131987	132322	132657
				1711.5	1745	1778.5	1711.5	1745	1778.5
3.0	QPSK	1	0	25.4	25.4	25.2	21.3	21.2	21.1
		1	7	25.4	25.7	25.2	21.5	21.3	21.1
		1	14	25.4	25.5	25.2	21.3	21.2	21.0
		8	0	24.3	24.4	24.1	20.2	20.1	19.9
		8	4	24.3	24.4	24.1	20.2	20.1	19.9
		8	7	24.3	24.4	24.1	20.2	20.1	19.9
		15	0	24.3	24.4	24.1	20.2	20.1	19.9
	16QAM	1	0	24.7	24.8	24.5	20.6	20.5	20.4
		1	7	24.7	24.9	24.5	20.6	20.5	20.4
		1	14	24.7	24.8	24.5	20.6	20.4	20.3
		8	0	23.3	23.3	23.1	19.2	19.1	18.9
		8	4	23.3	23.3	23.1	19.1	19.1	18.9
		8	7	21.3	23.3	23.1	19.1	19.1	18.9
		15	0	23.3	23.3	22.6	19.1	19.1	18.9
	64QAM	1	0	23.4	23.3	23.1	19.3	19.3	19.1
		1	7	23.2	23.4	23.1	19.5	19.4	19.2
		1	14	23.3	23.5	23.0	19.4	19.3	19.2
		8	0	21.9	22.0	21.7	18.1	18.1	17.9
		8	4	21.9	22.0	21.7	18.1	18.1	17.9
		8	7	21.9	22.1	21.7	18.1	18.1	17.9
		15	0	21.9	22.0	21.7	18.1	18.0	17.8

OUTPUT POWER FOR LTE BAND 66 (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1			Ant 2		
				Conducted Average (dBm)			Conducted Average (dBm)		
				131997	132322	132647	131997	132322	132647
				1712.5 MHz	1745.0 MHz	1777.5 MHz	1712.5 MHz	1745.0 MHz	1777.5 MHz
5.0	QPSK	1	0	25.5	25.4	25.3	21.5	21.3	21.2
		1	12	25.5	25.5	25.3	21.4	21.3	21.0
		1	24	25.7	25.6	25.3	21.4	21.3	21.1
		12	0	24.5	24.5	24.3	20.3	20.2	20.1
		12	6	24.5	24.5	24.2	20.3	20.2	20.0
		12	11	24.5	24.5	24.2	20.3	20.2	20.0
		25	0	24.5	24.5	24.3	20.3	20.2	20.1
	16QAM	1	0	24.9	24.9	24.8	20.7	20.7	20.6
		1	12	24.9	25.0	24.7	20.6	20.7	20.4
		1	24	25.0	25.0	24.7	20.7	20.7	20.5
		12	0	23.5	23.6	23.4	19.3	19.2	19.1
		12	6	23.5	23.6	22.4	19.3	19.2	19.0
		12	11	23.5	23.6	23.3	19.3	19.2	19.1
		25	0	23.3	23.5	23.1	19.2	19.2	19.1
	64QAM	1	0	23.4	23.5	23.3	19.6	19.5	19.5
		1	12	23.4	23.6	23.2	19.6	19.5	19.5
		1	24	23.4	23.6	23.2	19.6	19.5	19.5
		12	0	22.0	22.1	22.0	18.3	18.2	18.1
		12	6	22.0	22.1	21.9	18.3	18.2	18.1
		12	11	21.9	22.2	21.9	18.3	18.2	18.1
		25	0	22.1	22.2	21.9	18.3	18.2	18.0

OUTPUT POWER FOR LTE BAND 66 (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1			Ant 2		
				Conducted Average (dBm)			Conducted Average (dBm)		
				132022	132322	132622	132022	132322	132622
				1715.0 MHz	1745.0 MHz	1775.0 MHz	1715.0 MHz	1745.0 MHz	1775.0 MHz
10.0	QPSK	1	0	25.5	25.6	25.5	21.5	21.3	21.3
		1	24	25.5	25.6	25.5	21.4	21.3	21.3
		1	49	25.6	25.7	25.4	21.5	21.3	21.2
		25	0	24.6	24.7	24.5	20.4	20.4	20.3
		25	12	24.5	24.8	24.5	20.4	20.4	20.3
		25	24	24.6	24.7	24.4	20.4	20.4	20.2
		50	0	24.5	24.7	24.5	20.4	20.4	20.3
	16QAM	1	0	24.8	25.0	24.9	20.7	20.8	20.8
		1	24	24.8	25.0	24.8	20.7	20.7	20.6
		1	49	24.9	25.1	24.7	20.8	20.6	20.6
		25	0	23.6	23.8	23.6	19.5	19.4	19.4
		25	12	23.6	23.8	23.5	19.5	19.4	19.3
		25	24	23.6	23.8	23.5	19.4	19.4	19.2
		50	0	23.6	23.8	23.5	19.4	19.3	19.3
	64QAM	1	0	23.4	23.5	23.5	19.6	19.6	19.6
		1	24	23.3	23.5	23.4	19.6	19.6	19.5
		1	49	23.5	23.7	23.3	19.6	19.6	19.4
		25	0	22.3	22.4	22.2	18.5	18.5	18.3
		25	12	22.3	22.4	22.2	18.5	18.4	18.3
		25	24	22.3	22.6	22.2	18.5	18.5	18.2
		50	0	22.3	22.5	22.2	18.5	18.4	18.3

OUTPUT POWER FOR LTE BAND 66 (15.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1			Ant 2		
				Conducted Average (dBm)			Conducted Average (dBm)		
				132047	132322	132597	132047	132322	132597
				1717.5 MHz	1745.0 MHz	1772.5 MHz	1717.5 MHz	1745.0 MHz	1772.5 MHz
15.0	QPSK	1	0	25.6	25.6	25.5	21.5	21.3	21.2
		1	37	25.4	25.6	25.4	21.4	21.3	21.3
		1	74	25.4	25.7	25.1	21.4	21.1	21.1
		36	0	24.4	24.6	24.3	20.4	20.3	20.3
		36	16	24.5	24.6	24.4	20.4	20.3	20.3
		36	35	24.5	24.6	24.3	20.4	20.3	20.2
		75	0	24.5	24.6	24.4	20.4	20.3	20.2
	16QAM	1	0	24.8	24.9	24.7	20.7	20.6	20.7
		1	37	24.7	25.0	24.7	20.7	20.6	20.7
		1	74	24.8	24.9	24.4	20.7	20.5	20.5
		36	0	23.5	23.6	23.4	19.4	19.4	19.3
		36	16	23.5	23.7	23.4	19.5	19.4	19.3
		36	35	23.5	23.7	23.3	19.5	19.4	19.3
		75	0	23.5	23.7	23.3	19.4	19.3	19.3
	64QAM	1	0	23.6	23.6	23.6	19.6	19.5	19.5
		1	37	23.6	23.6	23.4	19.7	19.5	19.5
		1	74	23.5	23.7	23.3	19.7	19.4	19.3
		36	0	22.3	22.4	22.4	18.4	18.3	18.3
		36	16	22.4	22.4	22.3	18.4	18.4	18.3
		36	35	22.4	22.5	22.3	18.5	18.4	18.3
		75	0	22.4	22.4	22.3	18.4	18.3	18.3

OUTPUT POWER FOR LTE BAND 66 (20.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Ant 1			Ant 2		
				Conducted Average (dBm)			Conducted Average (dBm)		
				132072	132322	132572	132072	132322	132572
				1720.0 MHz	1745.0 MHz	1770.0 MHz	1720.0 MHz	1745.0 MHz	1770.0 MHz
20.0	QPSK	1	0	25.5	25.4	25.5	21.5	21.4	21.2
		1	49	25.6	25.6	25.4	21.4	21.3	21.1
		1	99	25.5	25.7	25.2	21.3	21.2	21.1
		50	0	24.5	24.6	24.5	20.4	20.3	20.2
		50	24	24.6	24.6	24.4	20.4	20.3	20.2
		50	49	24.5	24.7	24.4	20.4	20.3	20.2
		100	0	24.5	24.6	24.4	20.4	20.3	20.2
	16QAM	1	0	24.8	25.0	24.9	20.8	20.8	20.5
		1	49	24.9	25.0	24.7	20.8	20.7	20.5
		1	99	24.8	25.1	24.5	20.6	20.6	20.4
		50	0	23.5	23.6	23.5	19.4	19.3	19.2
		50	24	23.6	23.7	23.4	19.5	19.3	19.3
		50	49	23.5	23.7	23.3	19.5	19.3	19.2
		100	0	23.5	23.7	23.3	19.4	19.3	19.2
	64QAM	1	0	23.3	23.6	23.8	19.4	19.7	19.6
		1	49	23.4	23.6	23.8	19.5	19.6	19.8
		1	99	23.6	23.7	23.5	19.4	19.5	19.6
		50	0	22.3	22.3	22.3	18.4	18.3	18.3
		50	24	22.3	22.4	22.3	18.5	18.3	18.3
		50	49	22.2	22.5	22.3	18.5	18.3	18.3
		100	0	22.2	22.4	22.3	18.4	18.3	18.2

8. CONDUCTED TEST RESULTS

8.1. 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.

MODES TESTED

- LTE Band 2
- LTE Band 5
- LTE Band 7
- LTE Band 12
- LTE Band 13
- LTE Band 17
- LTE Band 25
- LTE Band 26
- LTE Band 30
- LTE Band 41
- LTE Band 48
- LTE Band 66

RESULTS

There is no limit required and power is the same for low, middle and high channel; therefore, only middle channel was tested.

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LTE BAND 2

Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 2	1.4MHz, QPSK	6/0	1880.0	1.0934	1.248
	1.4MHz,16QAM			1.0900	1.247
	1.4MHz 64QAM			1.0922	1.245
	3MHz, QPSK	15/0		2.7052	2.993
	3MHz, 16QAM			2.7068	2.981
	3MHz 64QAM			2.7072	2.993
	5MHz, QPSK	25/0		4.4994	4.916
	5MHz, 16QAM			4.4975	4.936
	5MHz 64QAM			4.4959	4.945
	10MHz, QPSK	50/0		9.0084	10.40
	10MHz, 16QAM			9.0075	10.45
	10MHz 64QAM			9.0272	10.47
	15MHz, QPSK	75/0		13.487	15.56
	15MHz, 16QAM			13.491	15.43
	15MHz 64QAM			13.518	15.75
	20MHz, QPSK	100/0		17.970	20.06
	20MHz, 16QAM			17.955	20.02
	20MHz 64QAM			17.969	19.92

LTE BAND 5

Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 5	1.4MHz, QPSK	6/0	836.5	1.0894	1.242
	1.4MHz,16QAM			1.0942	1.245
	1.4MHz 64QAM			1.0910	1.242
	3MHz, QPSK	15/0		2.7014	2.994
	3MHz, 16QAM			2.7113	2.984
	3MHz 64QAM			2.7042	2.985
	5MHz, QPSK	25/0		4.4992	4.944
	5MHz, 16QAM			4.4878	4.934
	5MHz 64QAM			4.4990	4.956
	10MHz, QPSK	50/0		9.0079	10.48
	10MHz, 16QAM			9.0257	10.40
	10MHz 64QAM			9.0064	10.41

LTE BAND 7

Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 7	5MHz, QPSK	25/0	2535.0	4.5016	4.917
	5MHz, 16QAM			4.5086	4.920
	5MHz 64QAM			4.4946	4.931
	10MHz, QPSK	50/0		9.0179	10.44
	10MHz, 16QAM			9.0051	10.43
	10MHz 64QAM			9.0214	10.37
	15MHz, QPSK	75/0		13.481	15.77
	15MHz, 16QAM			13.461	15.89
	15MHz 64QAM			13.468	15.47
	20MHz, QPSK	100/0		17.949	19.84
	20MHz, 16QAM			17.982	19.68
	20MHz 64QAM			17.943	19.86

LTE BAND 12

Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 12	1.4 MHz, QPSK	6/0	707.5	1.0907	1.245
	1.4 MHz,16QAM			1.0955	1.242
	1.4 MHz 64QAM			1.0920	1.238
	3 MHz, QPSK	15/0		2.7055	2.987
	3 MHz, 16QAM			2.6523	2.887
	3 MHz 64QAM			2.7027	2.990
	5 MHz, QPSK	25/0		4.4982	4.930
	5 MHz, 16QAM			4.4962	4.951
	5 MHz 64QAM			4.4982	4.931
	10 MHz, QPSK	50/0		9.0245	10.45
	10 MHz, 16QAM			9.0139	10.50
	10 MHz 64QAM			9.0200	10.42

LTE BAND 13

Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 13	5 MHz, QPSK	25/0	782.0	4.4965	4.918
	5 MHz, 16QAM			4.4986	4.914
	5 MHz 64QAM			4.5134	4.939
	10 MHz, QPSK	50/0		8.9938	10.37
	10 MHz, 16QAM			8.9881	10.45
	10 MHz 64QAM			8.9930	10.30

LTE BAND 17

Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 17	5 MHz, QPSK	25/0	710.0	4.4950	4.931
	5 MHz, 16QAM			4.5052	4.923
	5 MHz 64QAM			4.4993	4.919
	10 MHz, QPSK	50/0		9.0131	10.43
	10 MHz, 16QAM			9.0296	10.48
	10 MHz 64QAM			9.0149	10.36

LTE BAND 25

Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 25	1.4MHz, QPSK	6/0	1882.5	1.0959	1.244
	1.4MHz,16QAM			1.0912	1.246
	1.4MHz 64QAM			1.0933	1.246
	3MHz, QPSK	15/0		2.7027	2.984
	3MHz, 16QAM			2.7044	2.987
	3MHz 64QAM			2.7078	2.995
	5MHz, QPSK	25/0		4.4987	4.919
	5MHz, 16QAM			4.4958	4.914
	5MHz 64QAM			4.5040	4.938
	10MHz, QPSK	50/0		9.0256	10.42
	10MHz, 16QAM			9.0223	10.46
	10MHz 64QAM			9.0055	10.39
	15MHz, QPSK	75/0		13.489	15.48
	15MHz, 16QAM			13.493	15.52
	15MHz 64QAM			13.492	15.39
	20MHz, QPSK	100/0		17.958	20.21
	20MHz, 16QAM			17.982	19.82
	20MHz 64QAM			17.973	20.02

LTE BAND 26(PART 90S)

Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 26	1.4 MHz, QPSK	6/0	819.0	1.0945	1.248
	1.4 MHz,16QAM			1.0921	1.247
	1.4 MHz 64QAM			1.0934	1.246
	3 MHz, QPSK	15/0		2.7011	2.982
	3 MHz, 16QAM			2.7003	2.989
	3 MHz 64QAM			2.7036	2.995
	5 MHz, QPSK	25/0		4.5007	4.916
	5 MHz, 16QAM			4.4974	4.927
	5 MHz 64QAM			4.5027	4.945
	10 MHz, QPSK	50/0		9.0098	10.32
	10 MHz, 16QAM			9.0029	10.45
	10 MHz 64QAM			9.0298	10.40

LTE BAND 30

Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 30	5MHz, QPSK	25/0	2310.0	4.4957	4.939
	5MHz, 16QAM			4.5040	4.905
	5MHz 64QAM			4.4990	4.938
	10MHz, QPSK	50/0		9.0103	10.45
	10MHz, 16QAM			9.0049	10.52
	10MHz 64QAM			9.0073	10.42

LTE BAND 41

Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 41	5MHz, QPSK	25/0	2593.0	4.4966	5.168
	5MHz, 16QAM			4.4915	4.856
	5MHz 64QAM			4.4988	5.345
	10MHz, QPSK	50/0		8.9657	9.353
	10MHz, 16QAM			8.9973	9.788
	10MHz 64QAM			8.9653	9.432
	15MHz, QPSK	75/0		13.460	14.69
	15MHz, 16QAM			13.366	14.25
	15MHz 64QAM			13.456	15.78
	20MHz, QPSK	100/0		18.001	19.32
	20MHz, 16QAM			17.862	18.53
	20MHz 64QAM			17.736	18.48

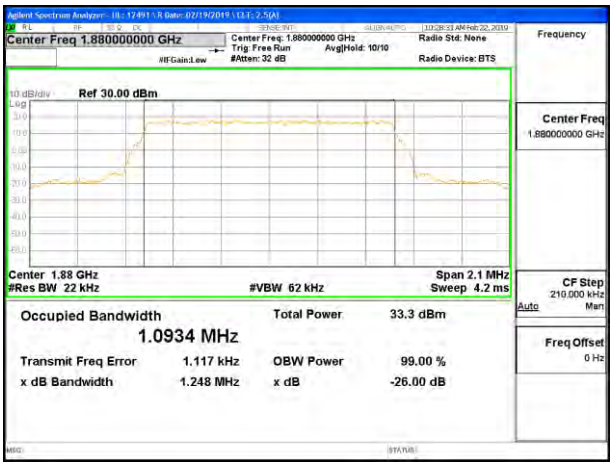
LTE BAND 48

Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 48	5MHz, QPSK	25/0	3625.0	4.4761	4.875
	5MHz, 16QAM			4.4798	4.818
	5MHz 64QAM			4.4658	4.948
	10MHz, QPSK	50/0		8.9593	10.16
	10MHz, 16QAM			8.9779	10.14
	10MHz 64QAM			8.9683	10.16
	15MHz, QPSK	75/0		13.413	14.67
	15MHz, 16QAM			13.457	15.21
	15MHz 64QAM			13.439	15.40
	20MHz, QPSK	100/0		17.966	19.16
	20MHz, 16QAM			17.903	19.66
	20MHz 64QAM			17.910	19.41

LTE BAND 66

Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 66	1.4MHz, QPSK	6/0	1745.0	1.0902	1.244
	1.4MHz,16QAM			1.0888	1.244
	1.4MHz 64QAM			1.0941	1.244
	3MHz, QPSK	15/0		2.7024	2.990
	3MHz, 16QAM			2.7040	2.983
	3MHz 64QAM			2.7014	2.989
	5MHz, QPSK	25/0		4.5011	4.916
	5MHz, 16QAM			4.4931	4.942
	5MHz 64QAM			4.4945	4.903
	10MHz, QPSK	50/0		9.0201	10.39
	10MHz, 16QAM			9.0225	10.49
	10MHz 64QAM			8.9886	10.41
	15MHz, QPSK	75/0		13.458	15.38
	15MHz, 16QAM			13.458	15.27
	15MHz 64QAM			13.487	15.44
	20MHz, QPSK	100/0		17.939	20.12
	20MHz, 16QAM			17.955	19.92
	20MHz 64QAM			17.931	19.90

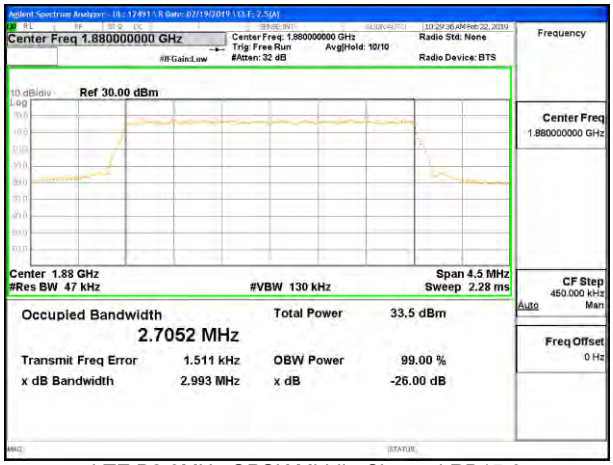
8.1.1. LTE BAND 2



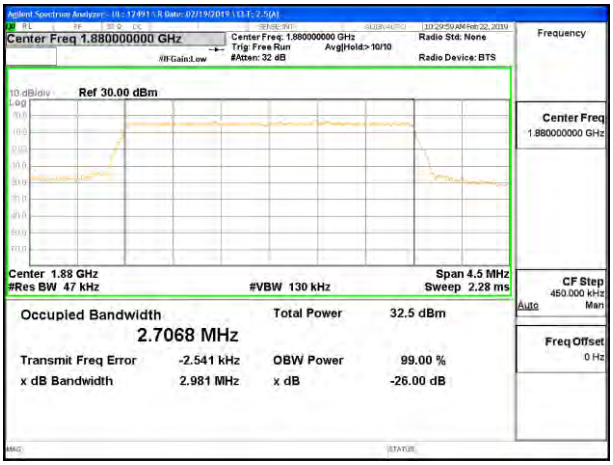
LTE B2 1.4MHz QPSK Middle Channel RB6-0

LTE B2 1.4MHz 16QAM Middle Channel RB6-0

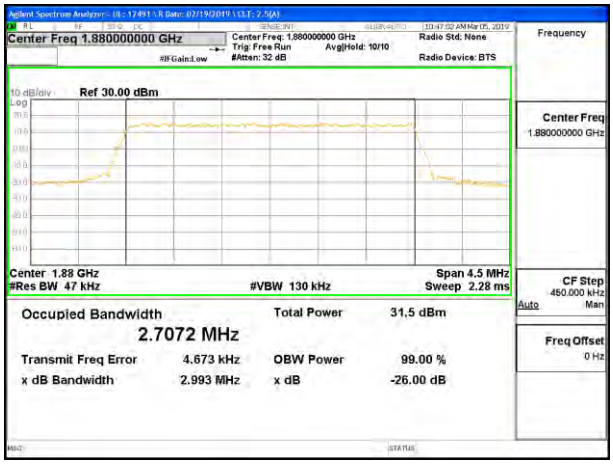
LTE B2 1.4MHz 64QAM Middle Channel RB6-0



LTE B2 3MHz QPSK Middle Channel RB15-0



LTE B2 3MHz 16QAM Middle Channel RB15-0



LTE B2 3MHz 64QAM Middle Channel RB15-0

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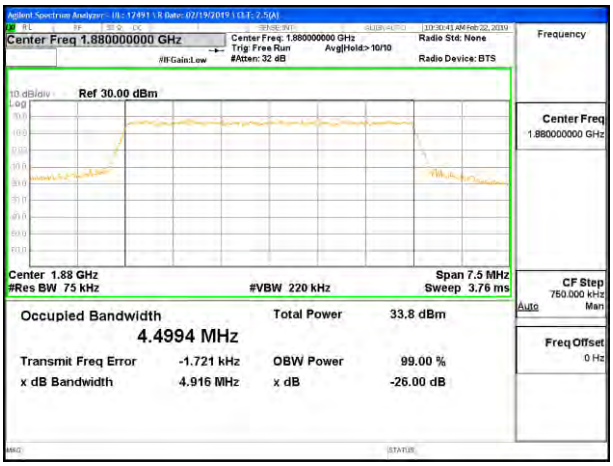
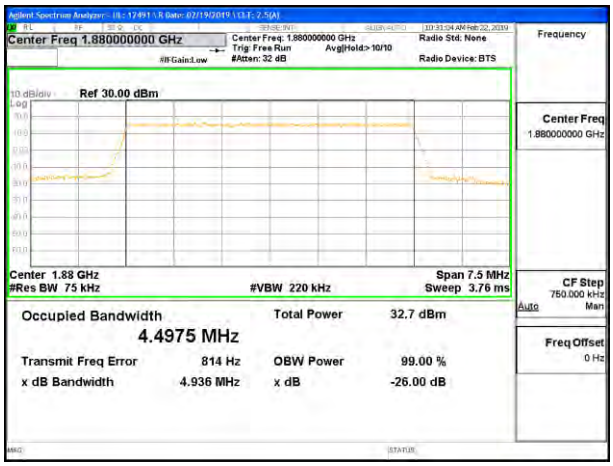
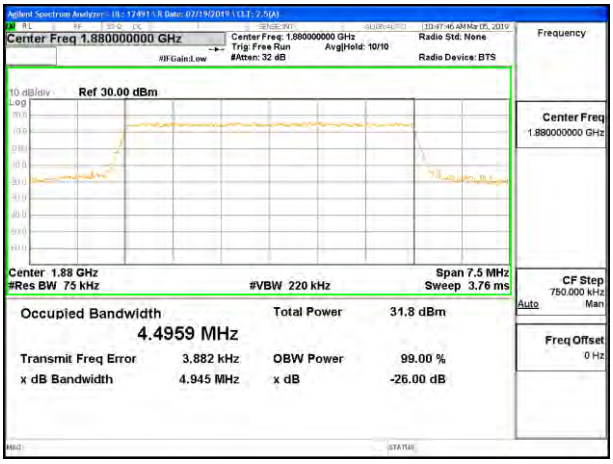


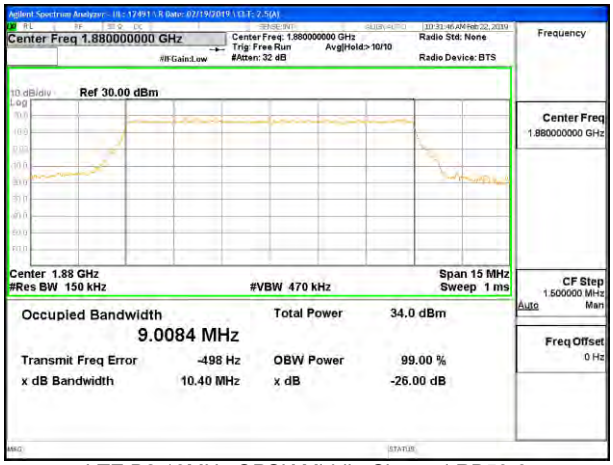
LTE B2 5MHz QPSK Middle Channel RB25-0



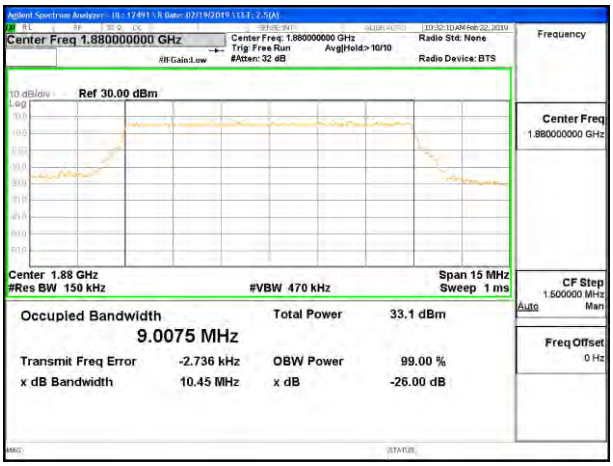
LTE B2 5MHz 16QAM Middle Channel RB25-0



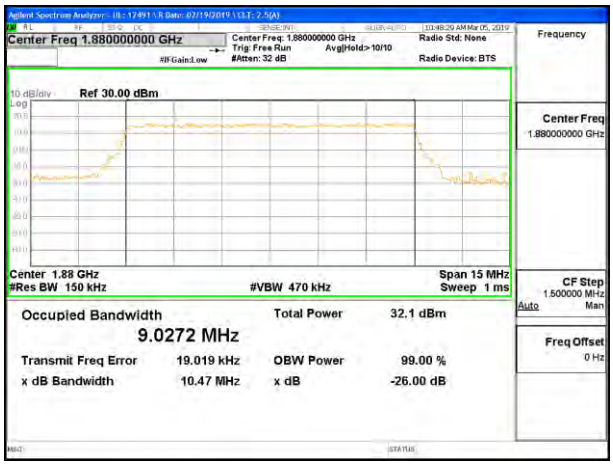
LTE B2 5MHz 64QAM Middle Channel RB25-0



LTE B2 10MHz QPSK Middle Channel RB50-0



LTE B2 10MHz 16QAM Middle Channel RB50-0



LTE B2 10MHz 64QAM Middle Channel RB50-0

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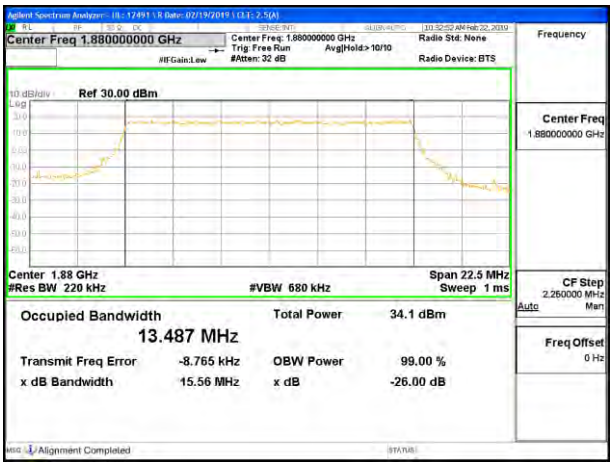
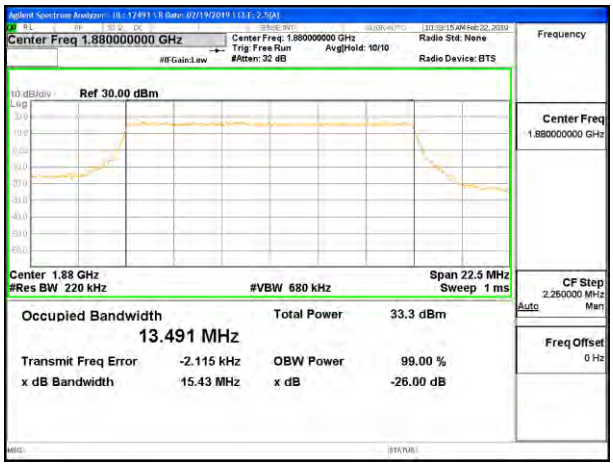
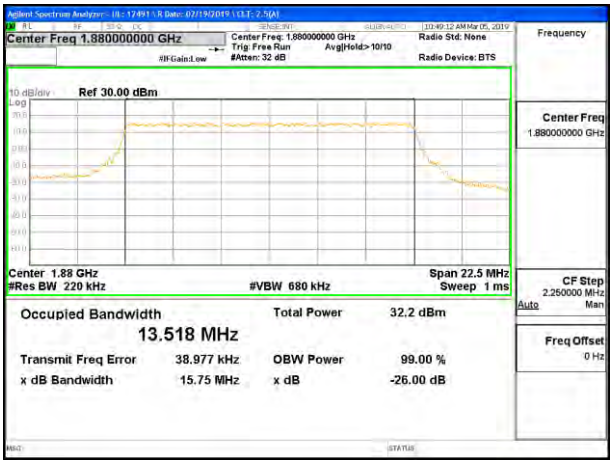


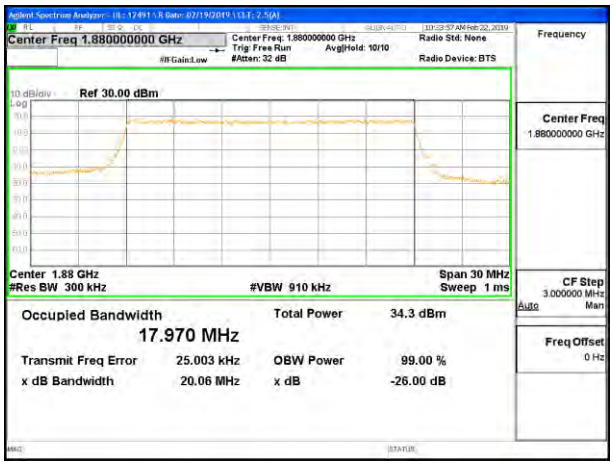
LTE B2 15MHz QPSK Middle Channel RB75-0



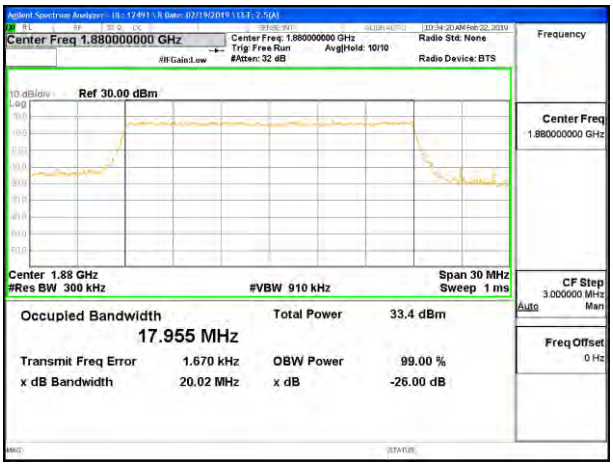
LTE B2 15MHz 16QAM Middle Channel RB75-0



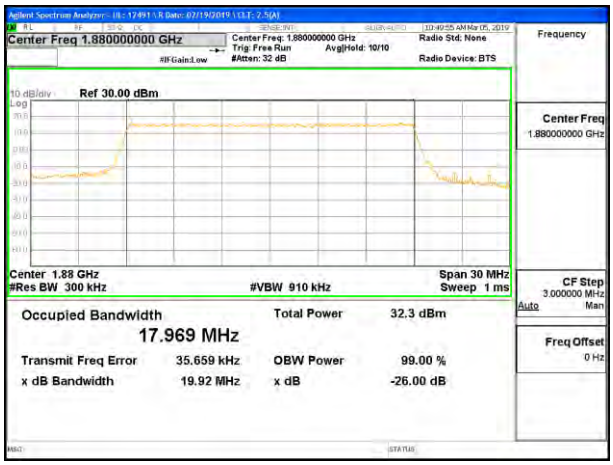
LTE B2 15MHz 64QAM Middle Channel RB75-0



LTE B2 20MHz QPSK Middle Channel RB100-0



LTE B2 20MHz 16QAM Middle Channel RB100-0



LTE B2 20MHz 64QAM Middle Channel RB100-0

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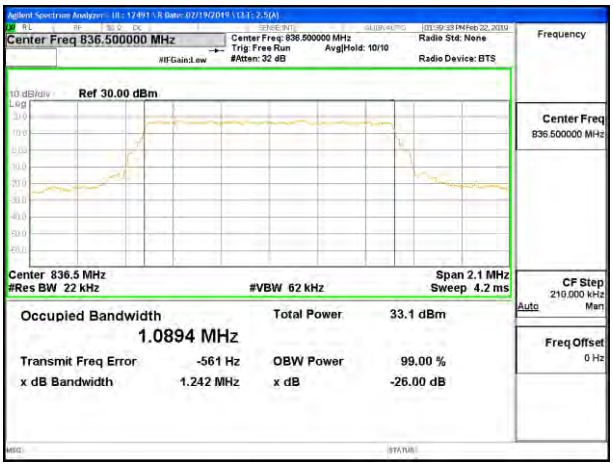
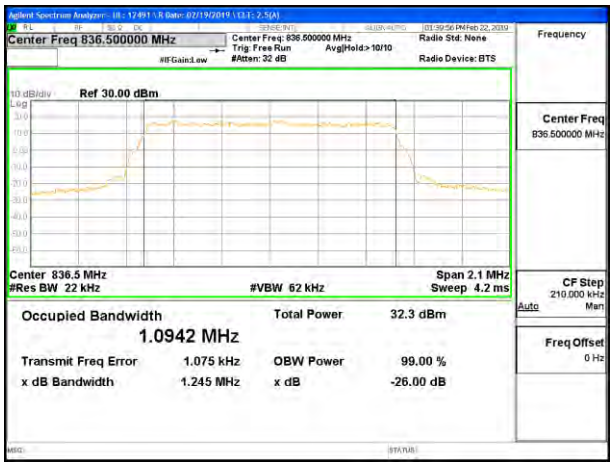
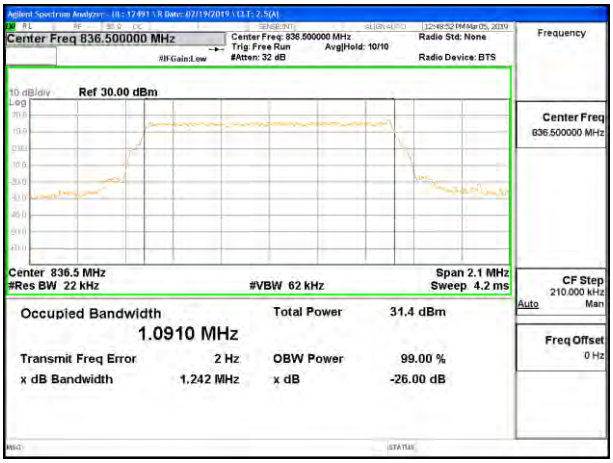
8.1.2. LTE BAND 5



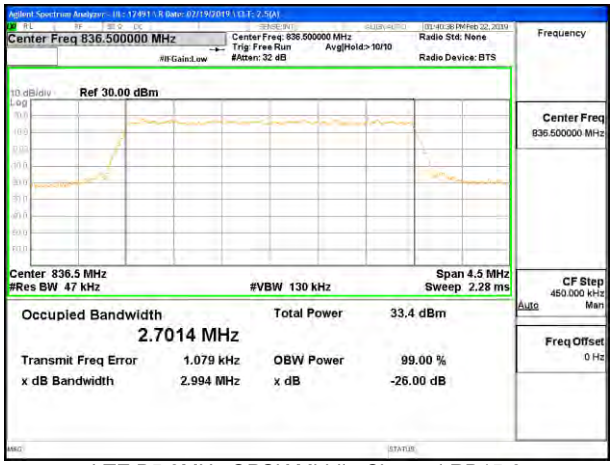
LTE B5 1.4MHz QPSK Middle Channel RB6-0



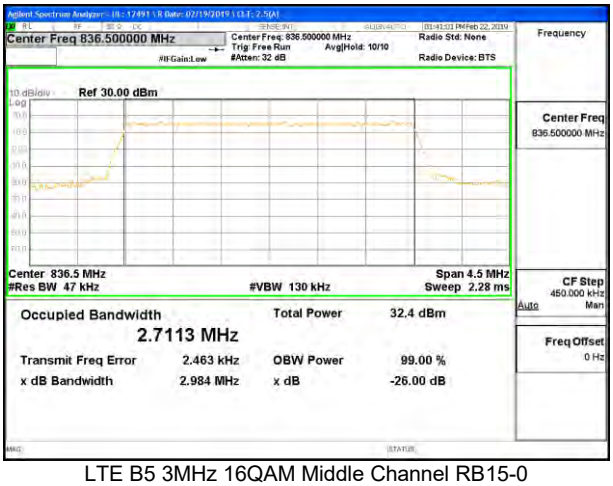
LTE B5 1.4MHz 16QAM Middle Channel RB6-0



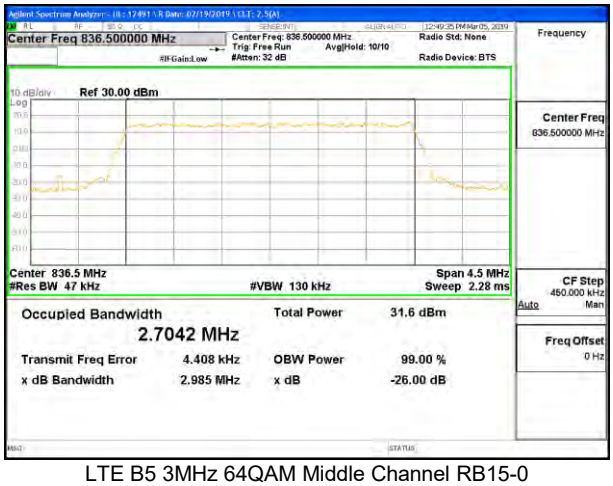
LTE B5 1.4MHz 64QAM Middle Channel RB6-0



LTE B5 3MHz QPSK Middle Channel RB15-0



LTE B5 3MHz 16QAM Middle Channel RB15-0



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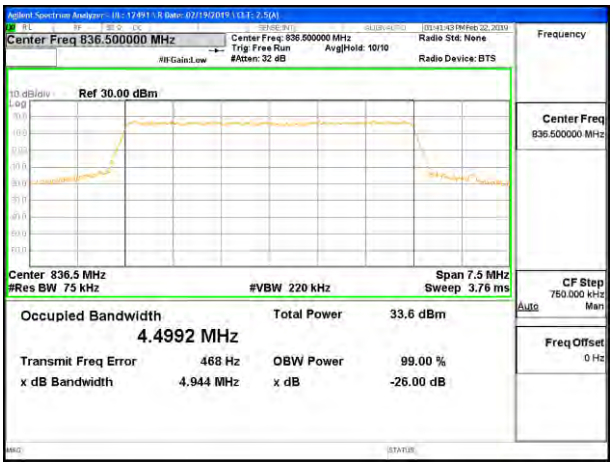
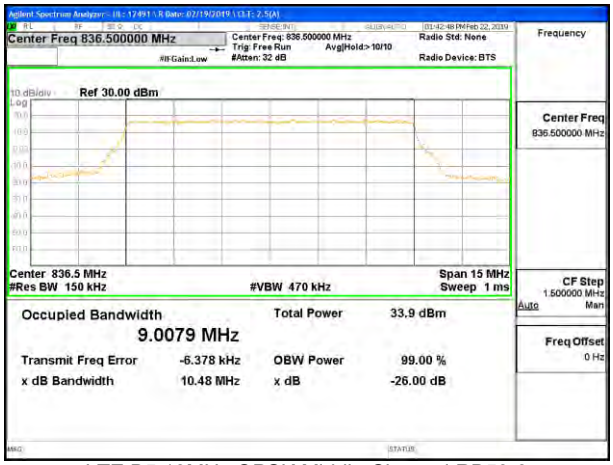


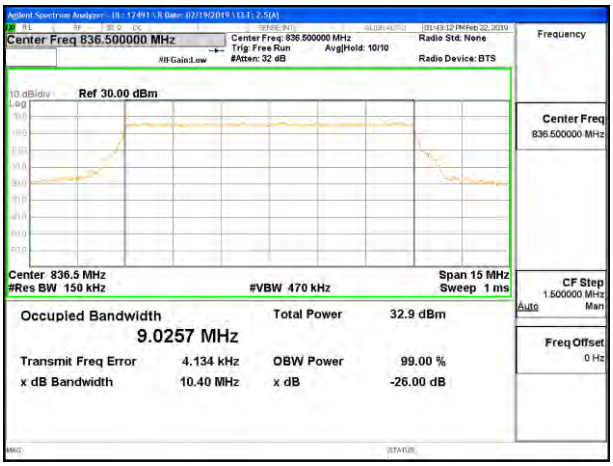
LTE B5 5MHz QPSK Middle Channel RB25-0

LTE B5 5MHz 16QAM Middle Channel RB25-0

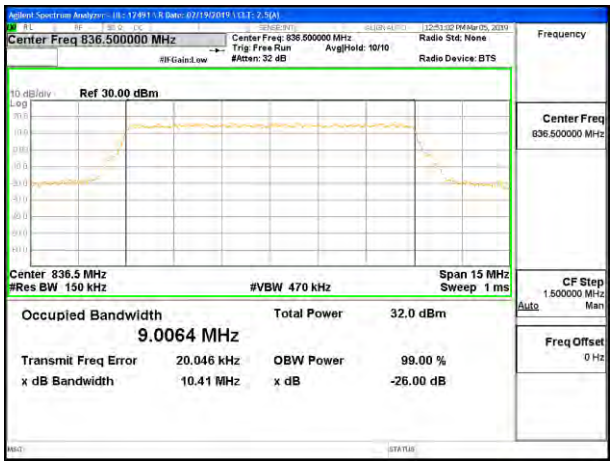
LTE B5 5MHz 64QAM Middle Channel RB25-0



LTE B5 10MHz QPSK Middle Channel RB50-0



LTE B5 10MHz 16QAM Middle Channel RB50-0



LTE B5 10MHz 64QAM Middle Channel RB50-0

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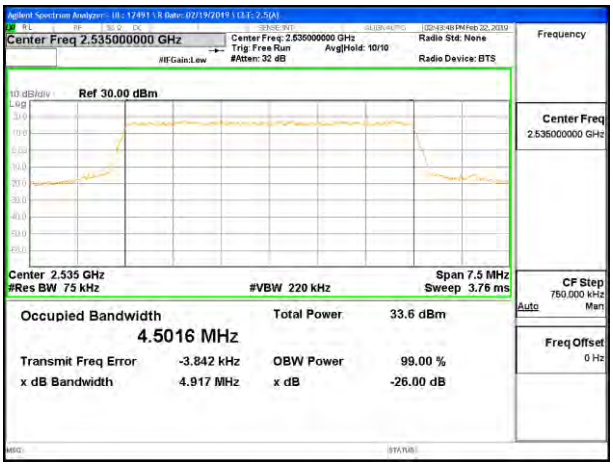
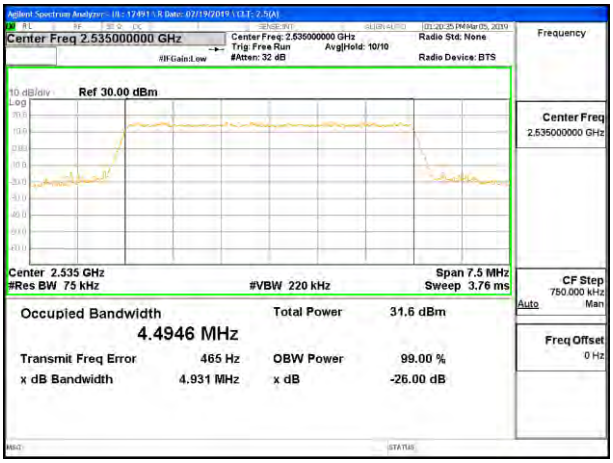
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

8.1.3. LTE BAND 7

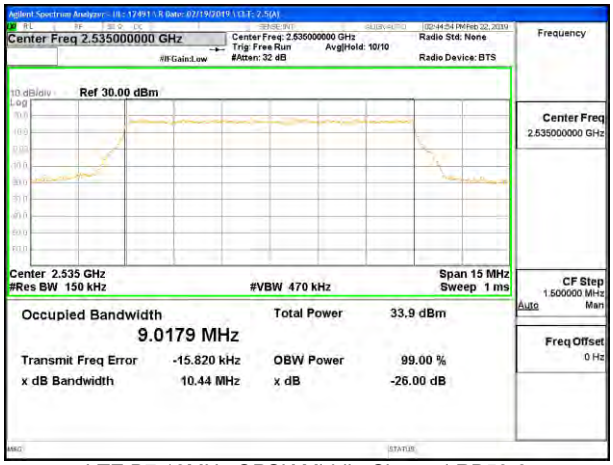


LTE B7 5MHz QPSK Middle Channel RB25-0

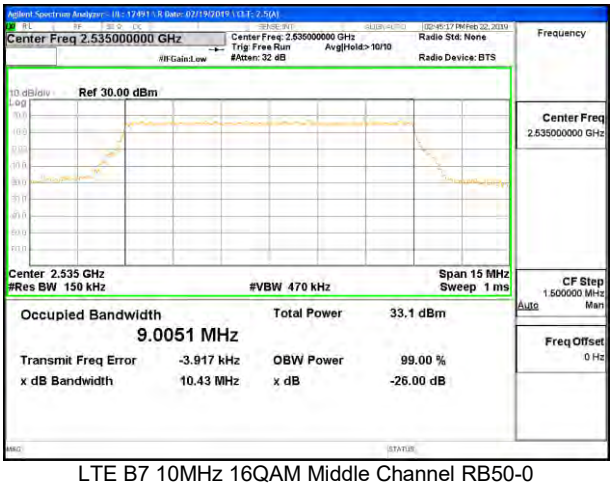
LTE B7 5MHz 16QAM Middle Channel RB25-0



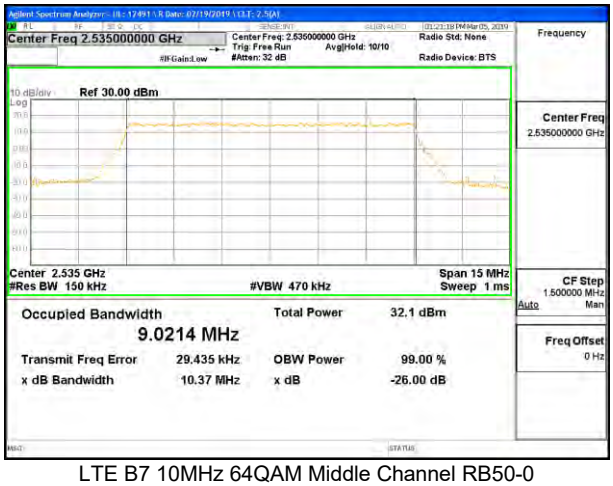
LTE B7 5MHz 64QAM Middle Channel RB25-0



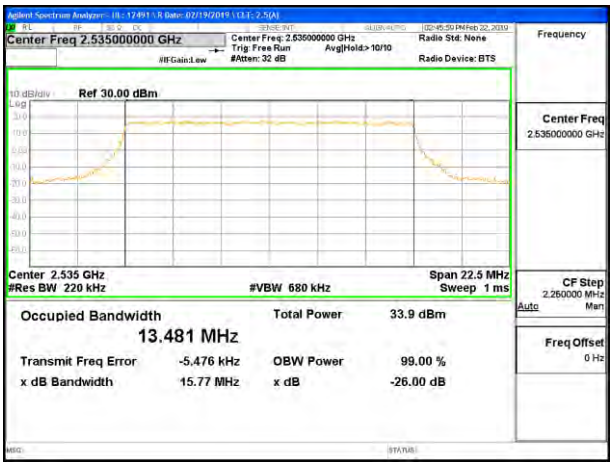
LTE B7 10MHz QPSK Middle Channel RB50-0



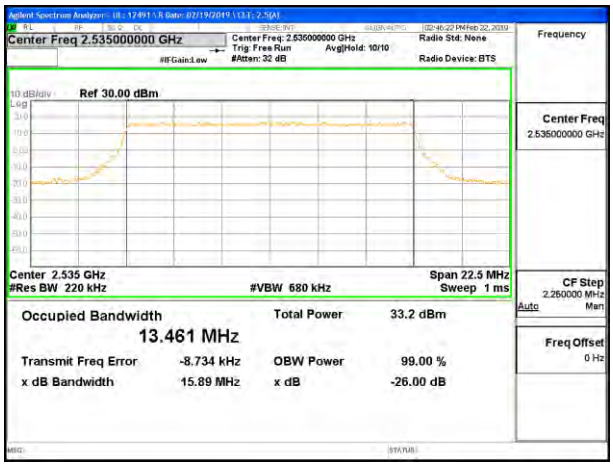
LTE B7 10MHz 16QAM Middle Channel RB50-0



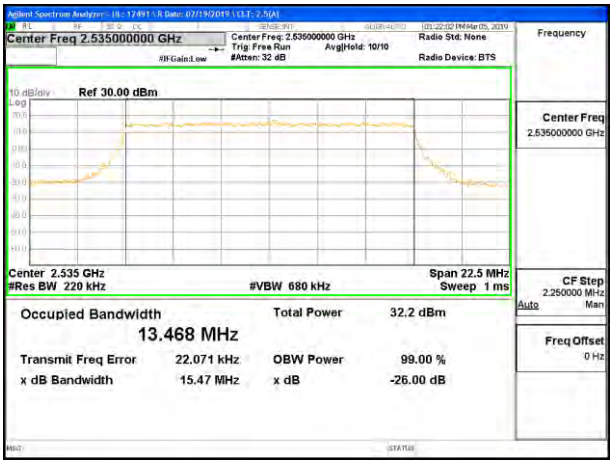
LTE B7 10MHz 64QAM Middle Channel RB50-0



LTE B7 15MHz QPSK Middle Channel RB75-0

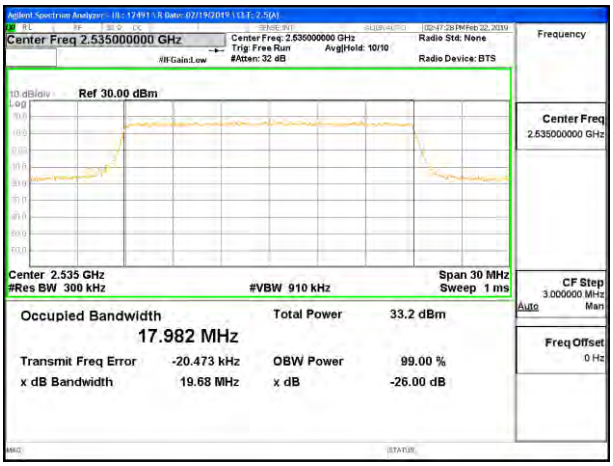


LTE B7 15MHz 16QAM Middle Channel RB75-0

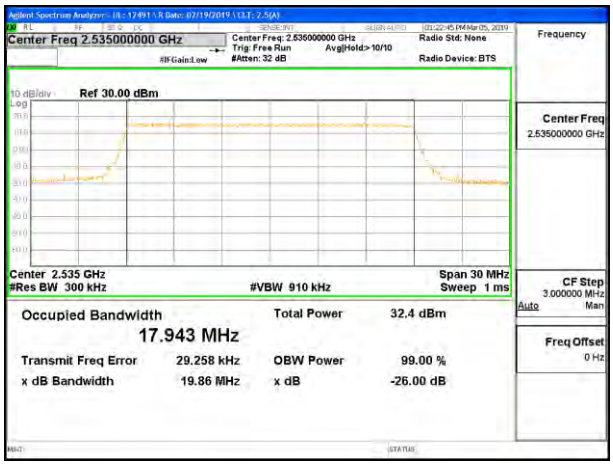


LTE B7 15MHz 64QAM Middle Channel RB75-0

LTE B7 20MHz QPSK Middle Channel RB100-0



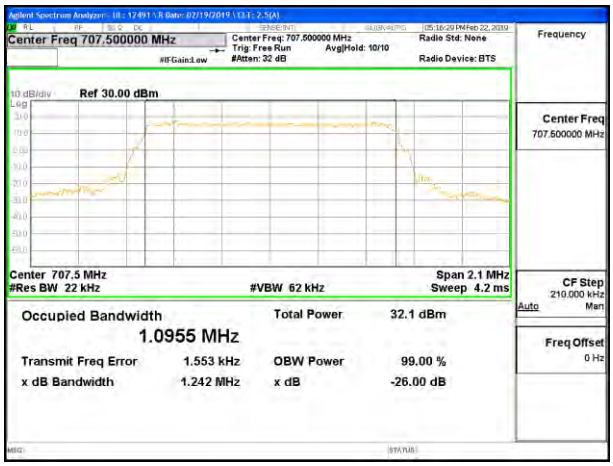
LTE B7 20MHz 16QAM Middle Channel RB100-0



LTE B7 20MHz 64QAM Middle Channel RB100-0

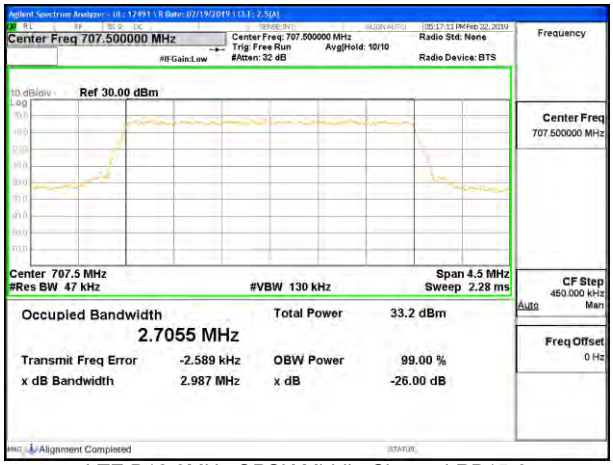
8.1.4. LTE BAND 12

LTE B12 1.4MHz QPSK Middle Channel RB6-0

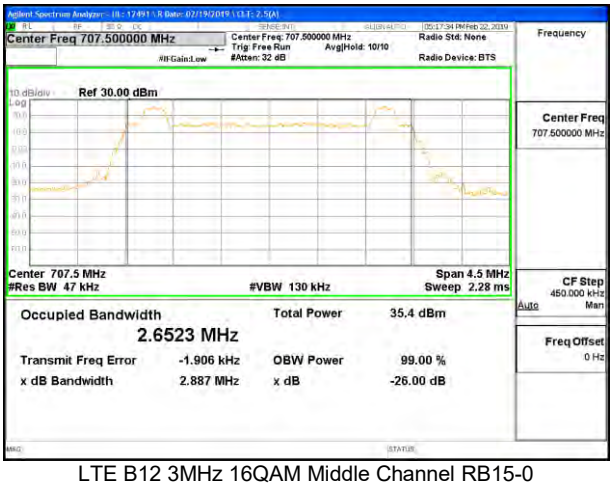


LTE B12 1.4MHz 16QAM Middle Channel RB6-0

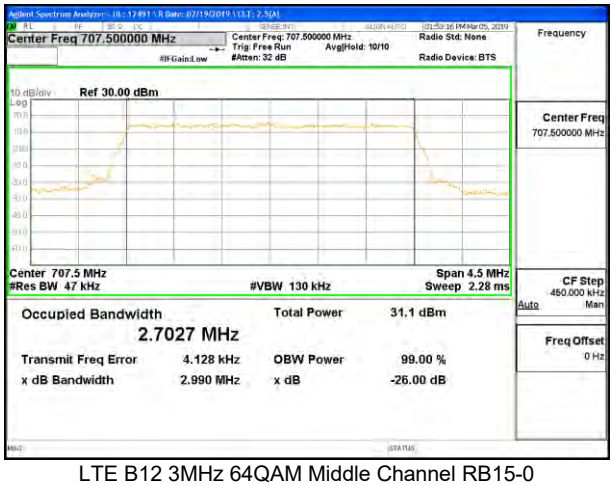
LTE B12 1.4MHz 64QAM Middle Channel RB6-0



LTE B12 3MHz QPSK Middle Channel RB15-0



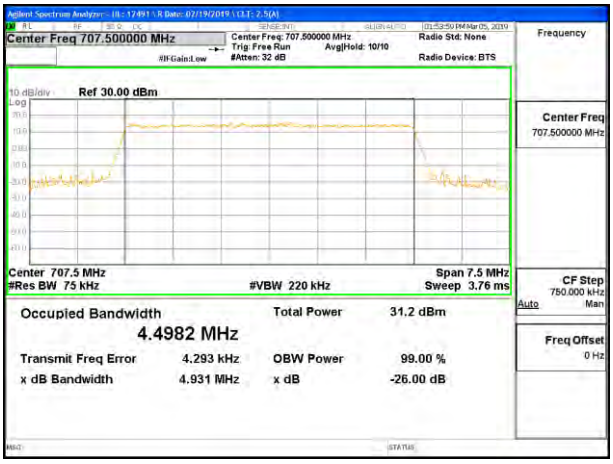
LTE B12 3MHz 16QAM Middle Channel RB15-0



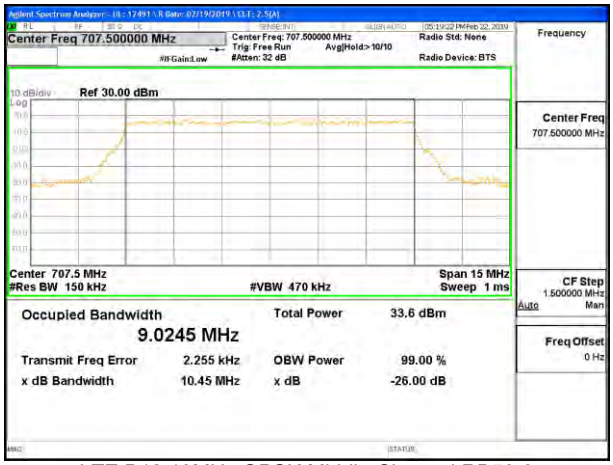
LTE B12 3MHz 64QAM Middle Channel RB15-0

LTE B12 5MHz QPSK Middle Channel RB25-0

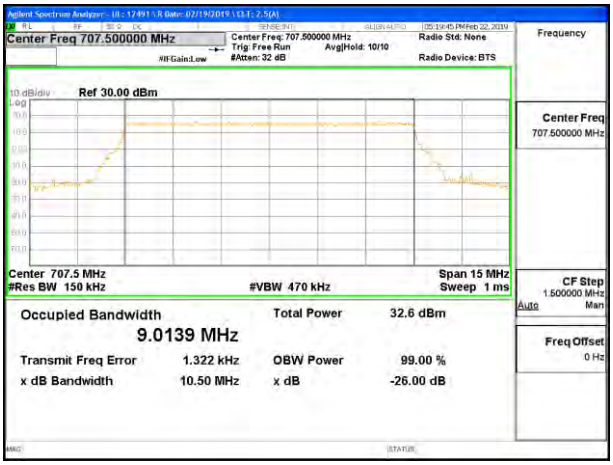
LTE B12 5MHz 16QAM Middle Channel RB25-0



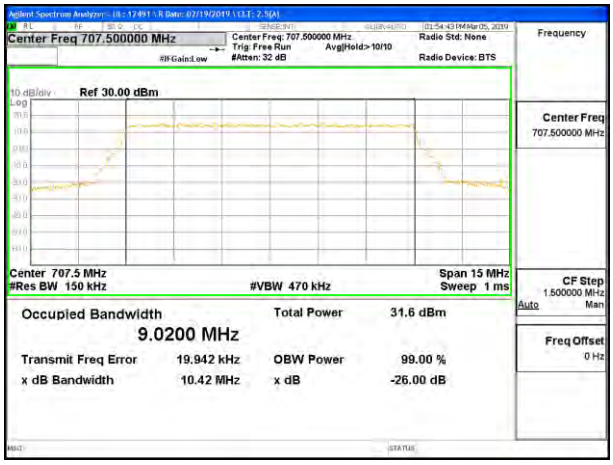
LTE B12 5MHz 64QAM Middle Channel RB25-0



LTE B12 10MHz QPSK Middle Channel RB50-0

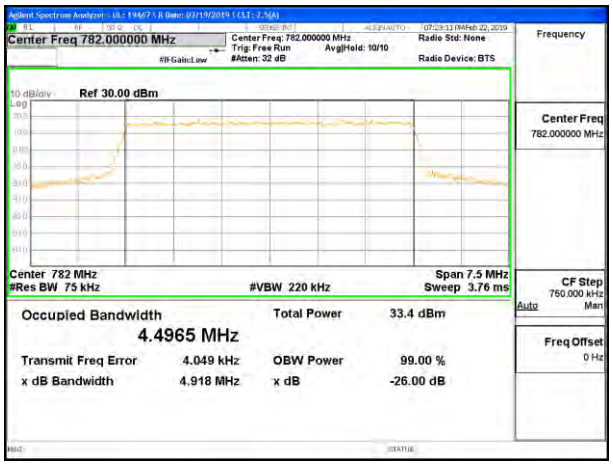


LTE B12 10MHz 16QAM Middle Channel RB50-0

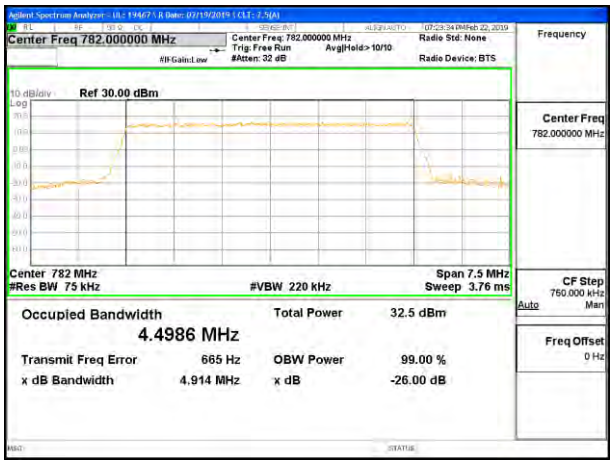


LTE B12 10MHz 64QAM Middle Channel RB50-0

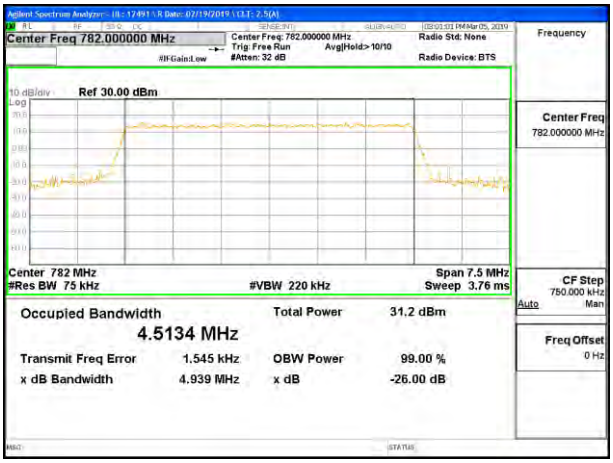
8.1.5. LTE BAND 13



LTE B13 5MHz QPSK Middle Channel RB25-0

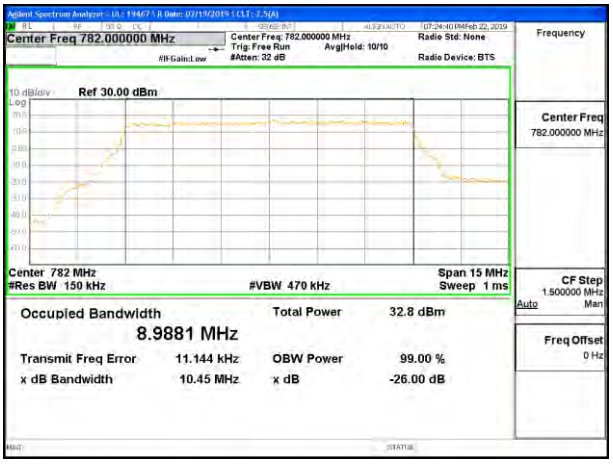


LTE B13 5MHz 16QAM Middle Channel RB25-0



LTE B13 5MHz 64QAM Middle Channel RB25-0

LTE B13 10MHz QPSK Middle Channel RB50-0



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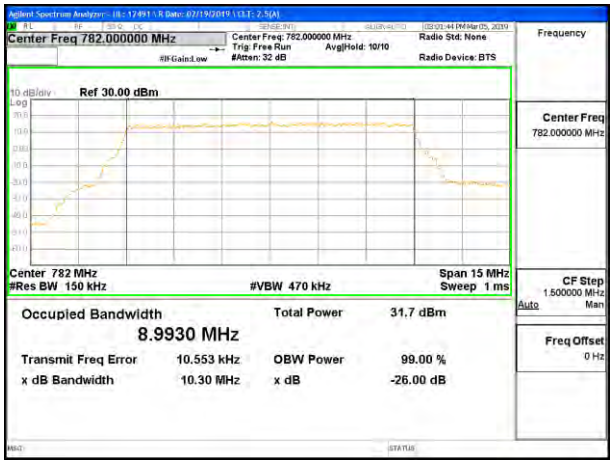
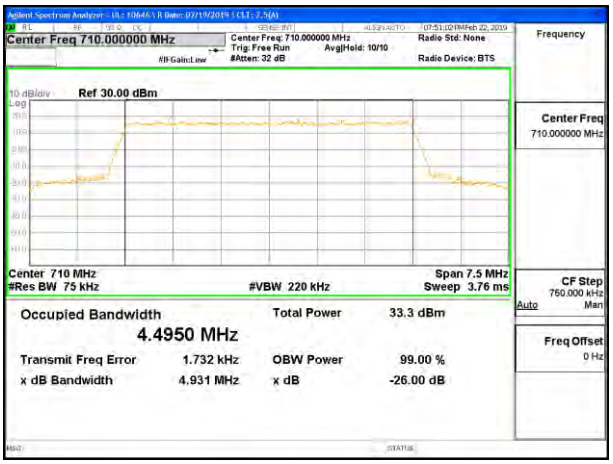
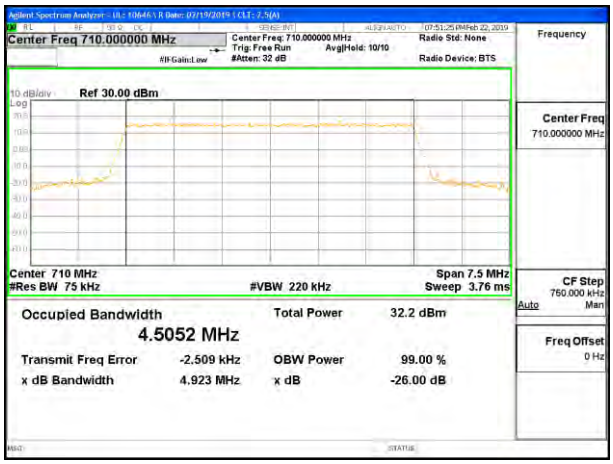


LTE B13 10MHz 64QAM Middle Channel RB50-0

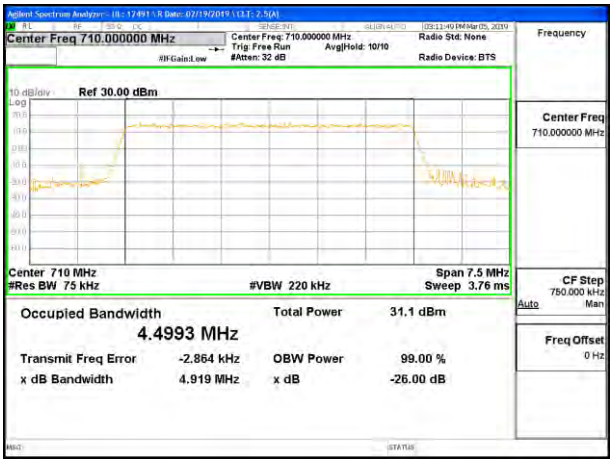
8.1.6. LTE BAND 17



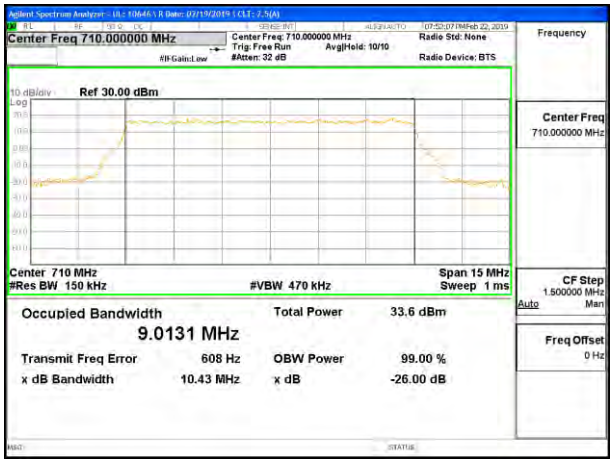
LTE B17 5MHz QPSK Middle Channel RB25-0



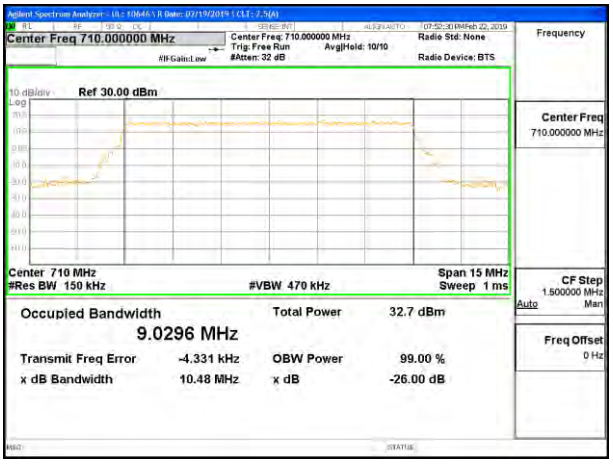
LTE B17 5MHz 16QAM Middle Channel RB25-0



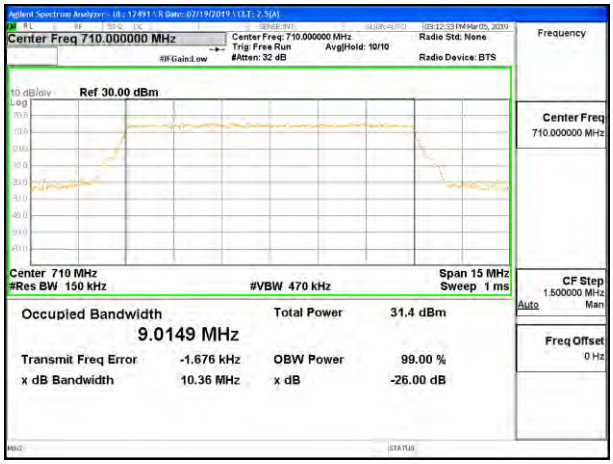
LTE B17 5MHz 64QAM Middle Channel RB25-0



LTE B17 10MHz QPSK Middle Channel RB50-0

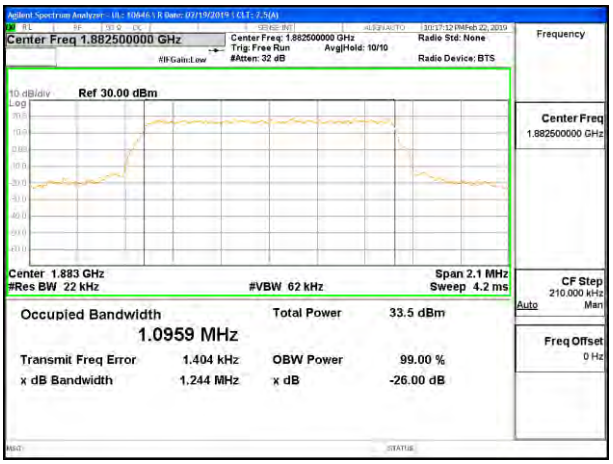


LTE B17 10MHz 16QAM Middle Channel RB50-0

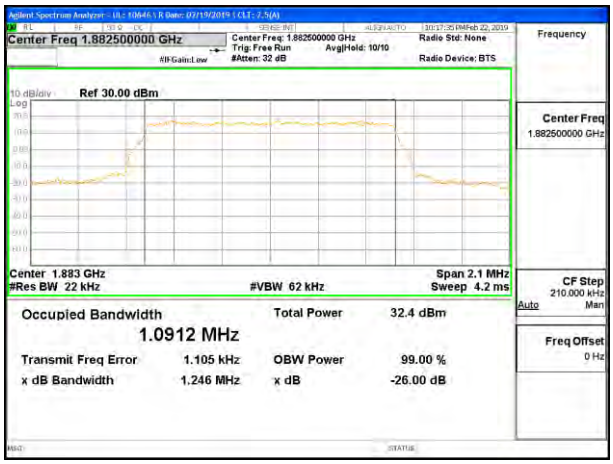


LTE B17 10MHz 64QAM Middle Channel RB50-0

8.1.7. LTE BAND 25

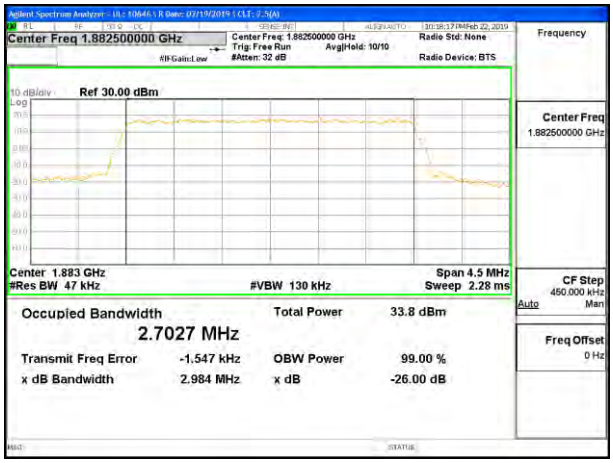


LTE B25 1.4MHz QPSK Middle Channel RB6-0

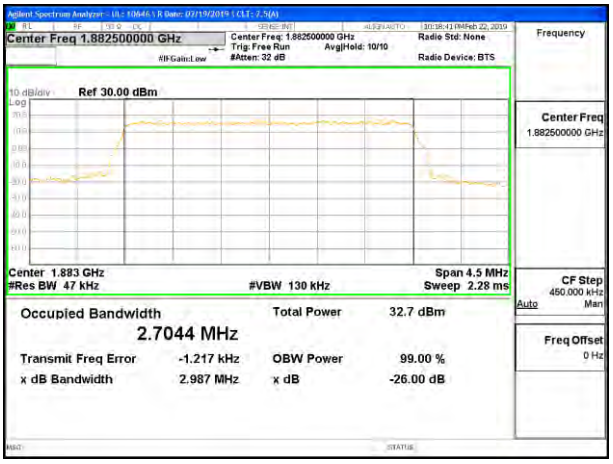


LTE B25 1.4MHz 16QAM Middle Channel RB6-0

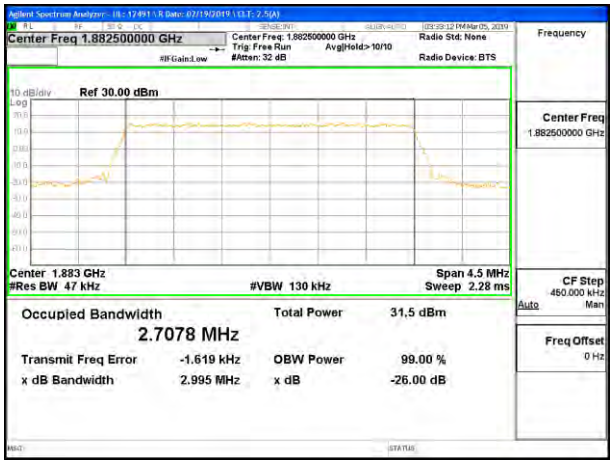
LTE B25 1.4MHz 64QAM Middle Channel RB6-0



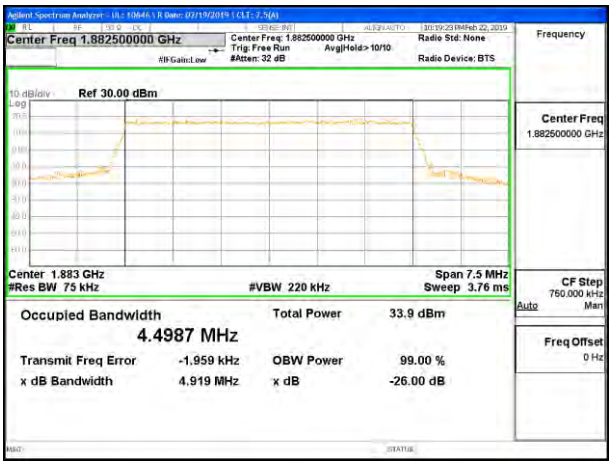
LTE B25 3MHz QPSK Middle Channel RB15-0



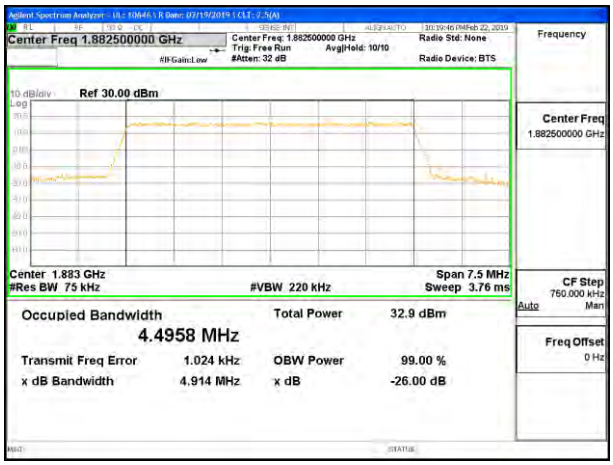
LTE B25 3MHz 16QAM Middle Channel RB15-0



LTE B25 3MHz 64QAM Middle Channel RB15-0

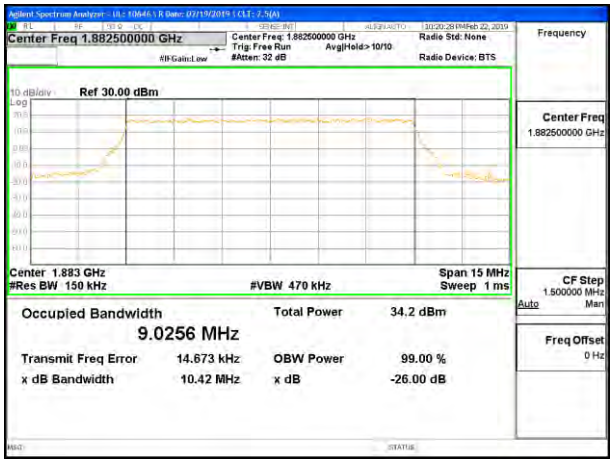


LTE B25 5MHz QPSK Middle Channel RB25-0

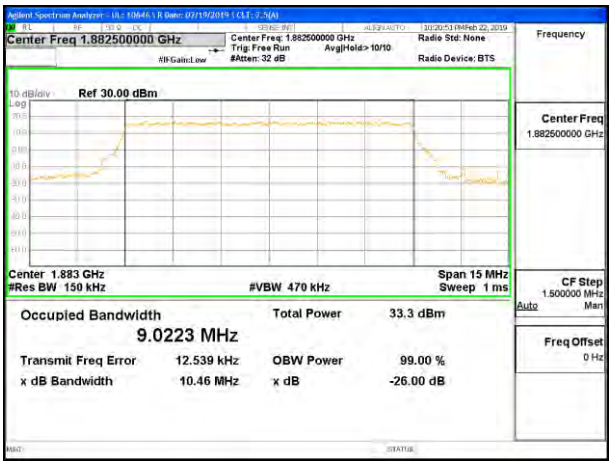


LTE B25 5MHz 16QAM Middle Channel RB25-0

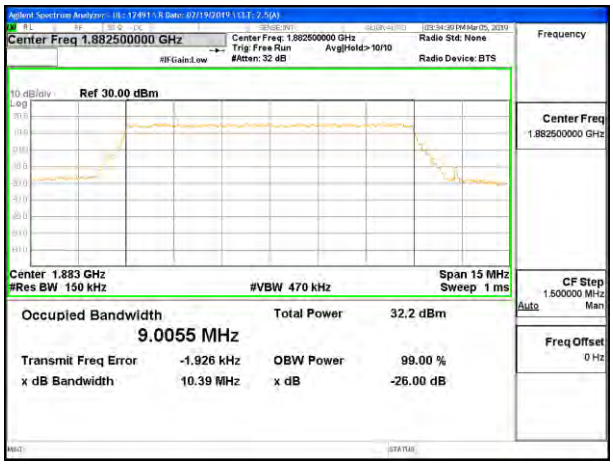
LTE B25 5MHz 64QAM Middle Channel RB25-0



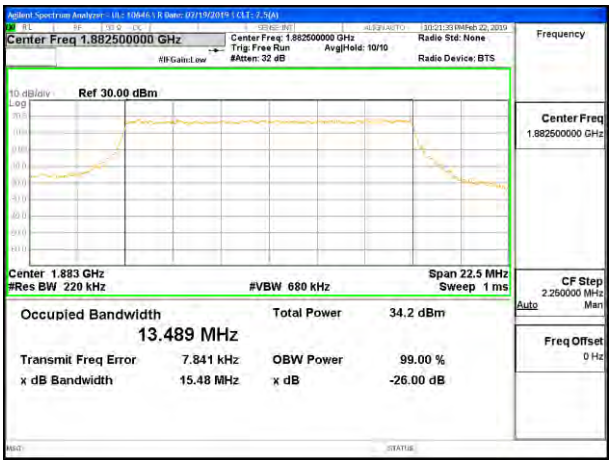
LTE B25 10MHz QPSK Middle Channel RB50-0



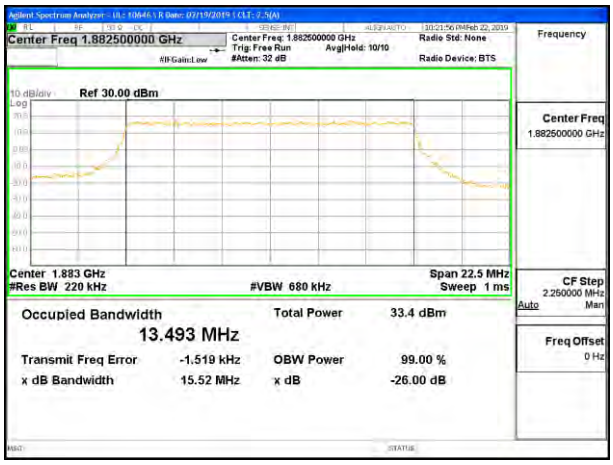
LTE B25 10MHz 16QAM Middle Channel RB50-0



LTE B25 10MHz 64QAM Middle Channel RB50-0

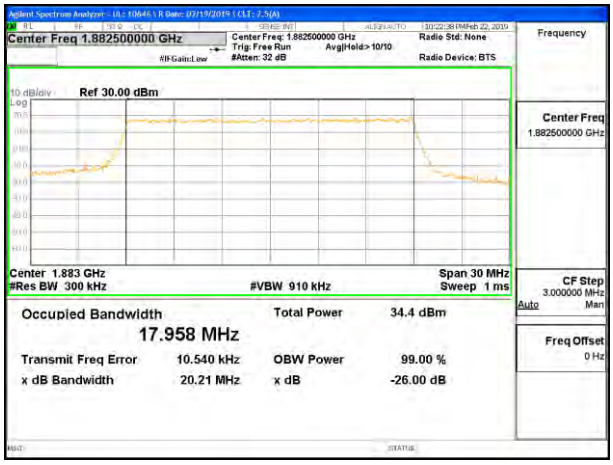


LTE B25 15MHz QPSK Middle Channel RB75-0

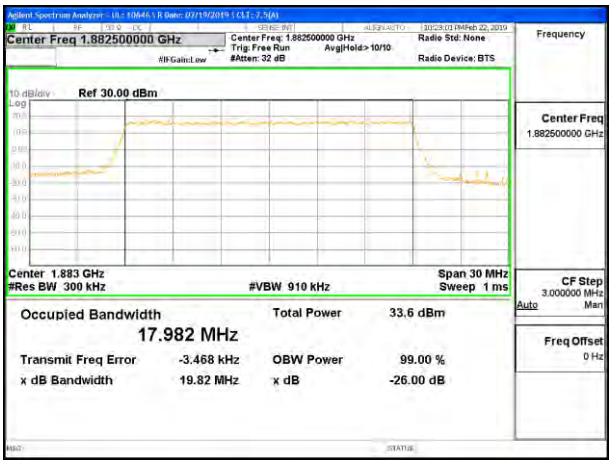


LTE B25 15MHz 16QAM Middle Channel RB75-0

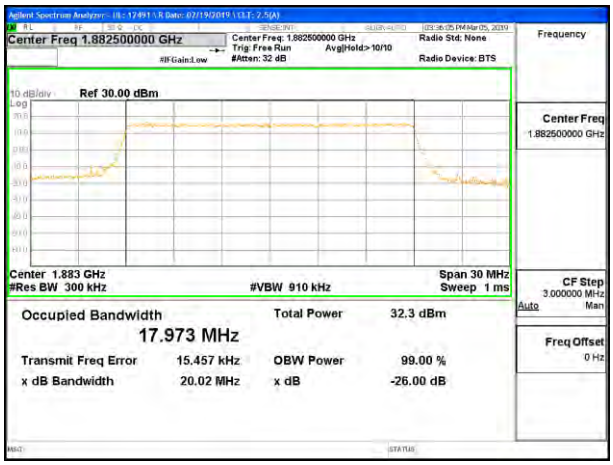
LTE B25 15MHz 64QAM Middle Channel RB75-0



LTE B25 20MHz QPSK Middle Channel RB100-0

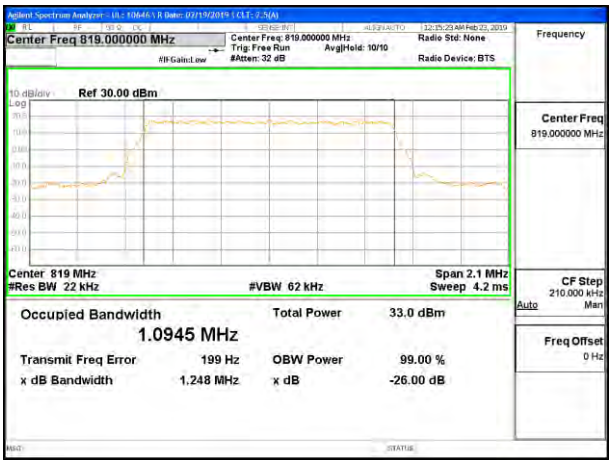


LTE B25 20MHz 16QAM Middle Channel RB100-0



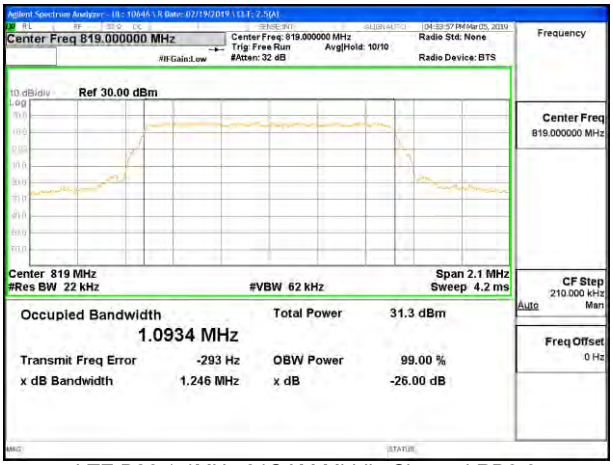
LTE B25 20MHz 64QAM Middle Channel RB100-0

8.1.8. LTE BAND 26 (PART 90S)

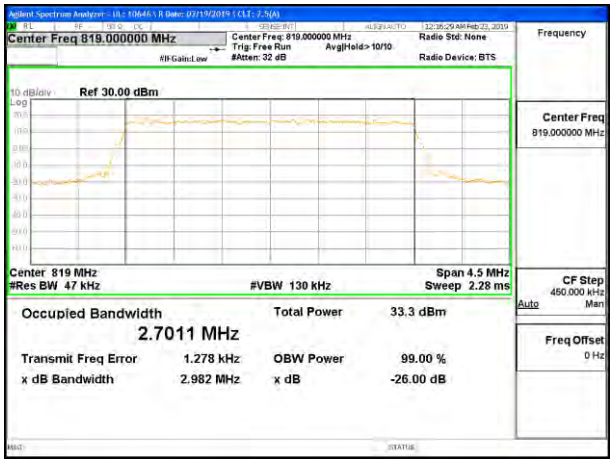


LTE B26 1.4MHz QPSK Middle Channel RB6-0

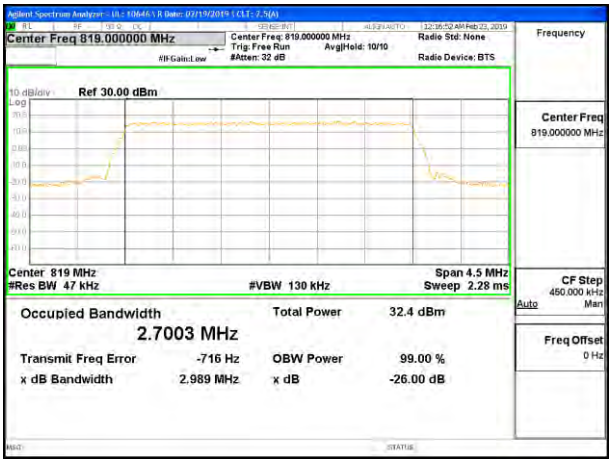
LTE B26 1.4MHz 16QAM Middle Channel RB6-0



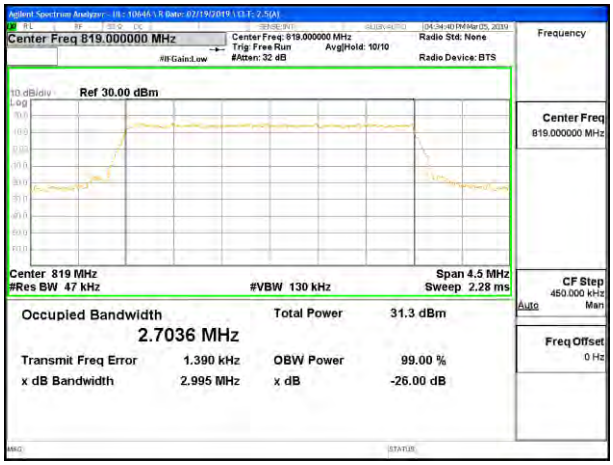
LTE B26 1.4MHz 64QAM Middle Channel RB6-0



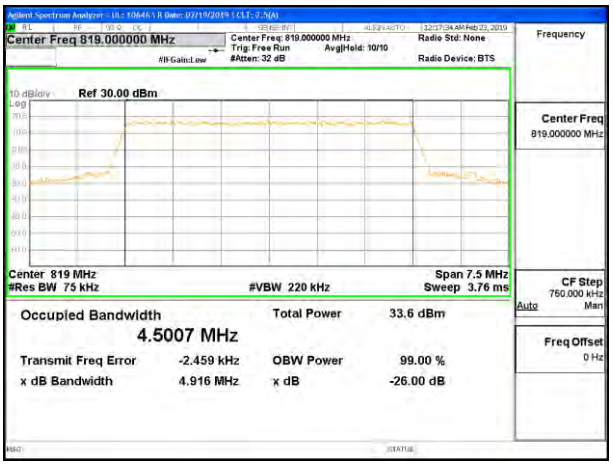
LTE B26 3MHz QPSK Middle Channel RB15-0



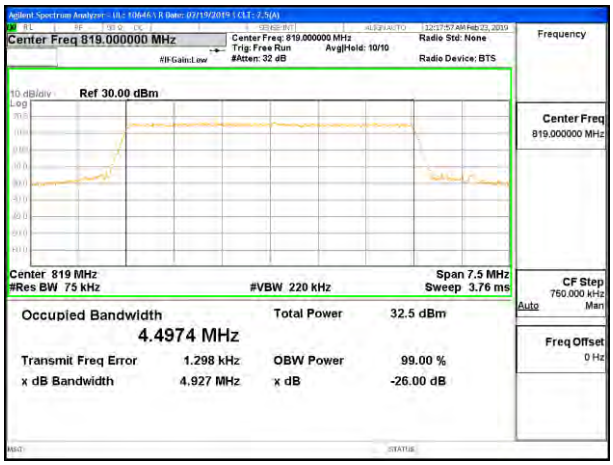
LTE B26 3MHz 16QAM Middle Channel RB15-0



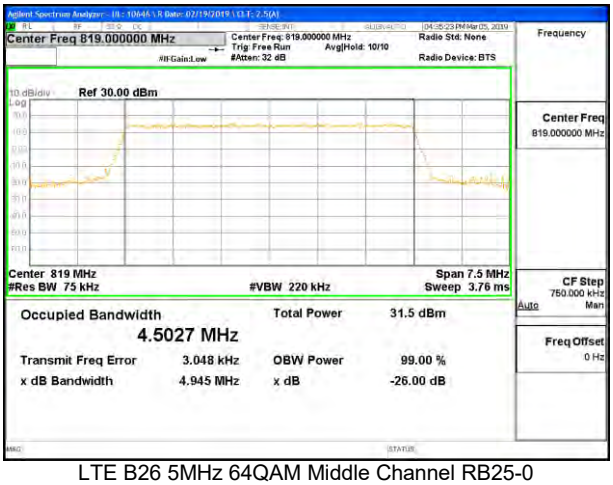
LTE B26 3MHz 64QAM Middle Channel RB15-0



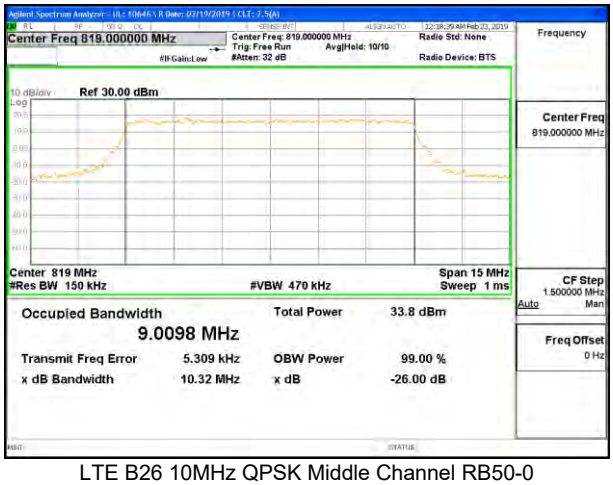
LTE B26 5MHz QPSK Middle Channel RB25-0



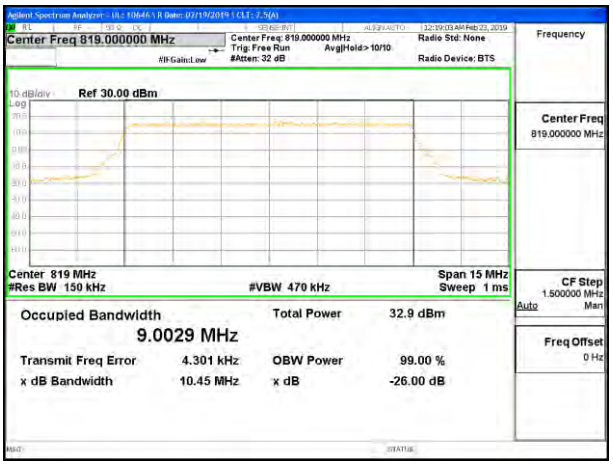
LTE B26 5MHz 16QAM Middle Channel RB25-0



LTE B26 5MHz 64QAM Middle Channel RB25-0



LTE B26 10MHz QPSK Middle Channel RB50-0

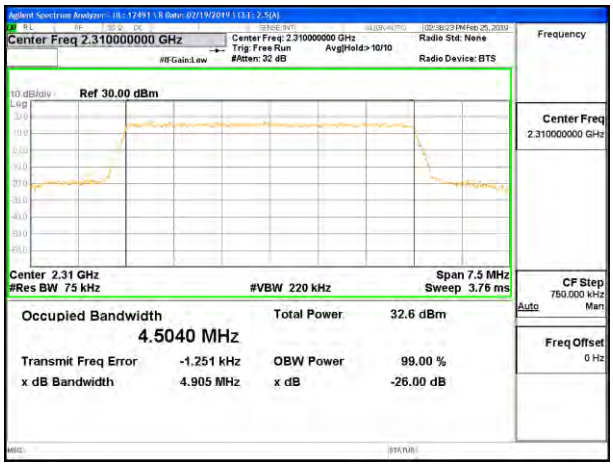


LTE B26 10MHz 16QAM Middle Channel RB50-0

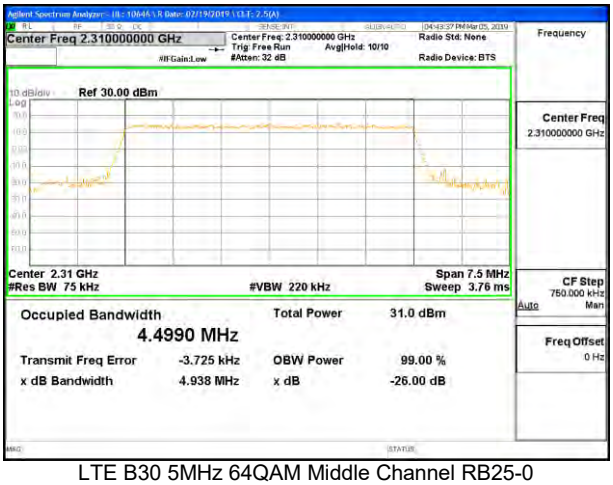
LTE B26 10MHz 64QAM Middle Channel RB50-0

8.1.9. LTE BAND 30

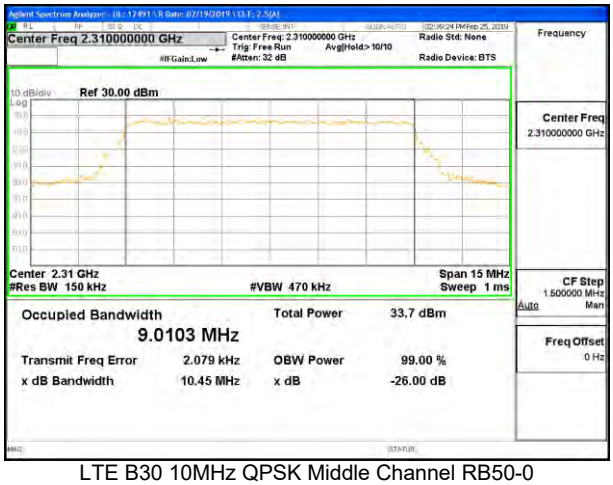
LTE B30 5MHz QPSK Middle Channel RB25-0



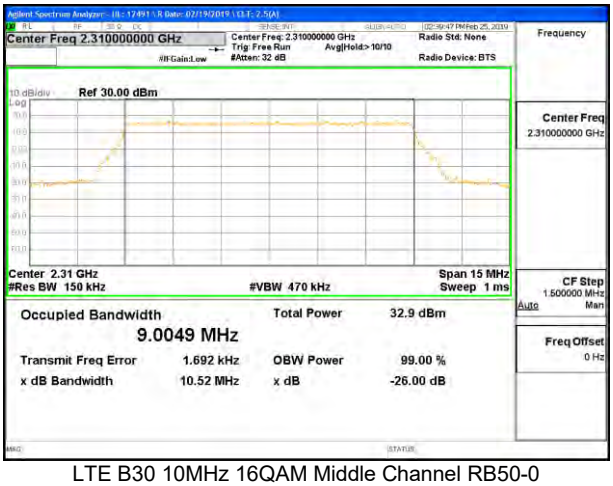
LTE B30 5MHz 16QAM Middle Channel RB25-0



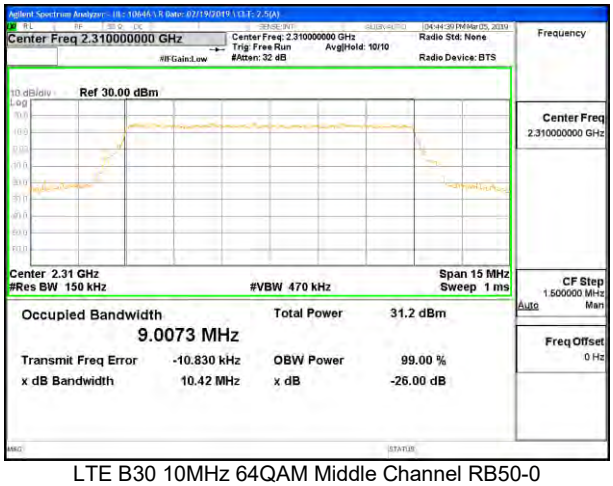
LTE B30 5MHz 64QAM Middle Channel RB25-0



LTE B30 10MHz QPSK Middle Channel RB50-0



LTE B30 10MHz 16QAM Middle Channel RB50-0



LTE B30 10MHz 64QAM Middle Channel RB50-0

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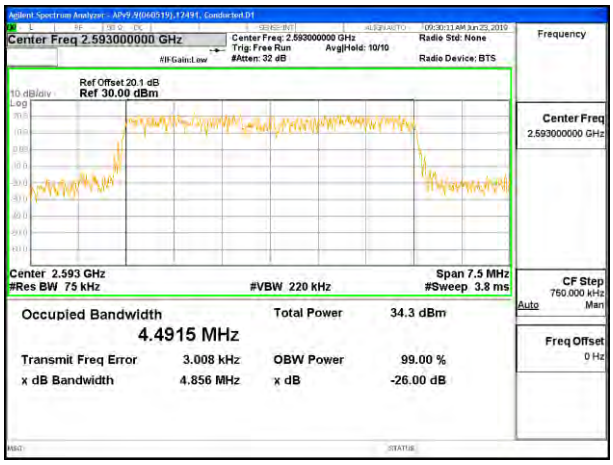
8.1.10. LTE BAND 41

LTE B41 5MHz QPSK Middle Channel RB25-0



LTE B41 5MHz 16QAM Middle Channel RB25-0

LTE B41 5MHz 64QAM Middle Channel RB25-0

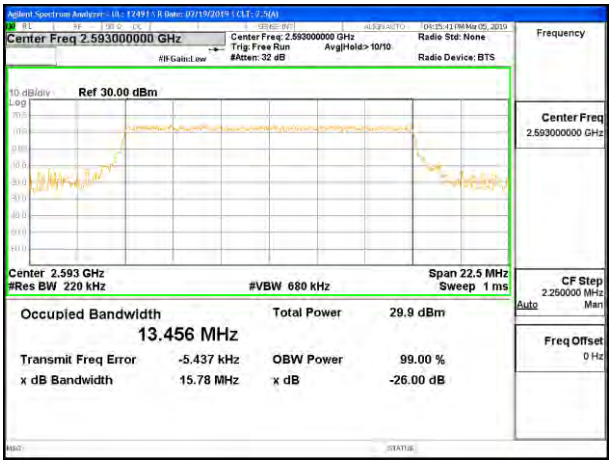
LTE B41 10MHz QPSK Middle Channel RB50-0

LTE B41 10MHz 16QAM Middle Channel RB50-0

LTE B41 10MHz 64QAM Middle Channel RB50-0

LTE B41 15MHz QPSK Middle Channel RB75-0

LTE B41 15MHz 16QAM Middle Channel RB75-0



LTE B41 15MHz 64QAM Middle Channel RB75-0

LTE B41 20MHz QPSK Middle Channel RB100-0

LTE B41 20MHz 16QAM Middle Channel RB100-0

LTE B41 20MHz 64QAM Middle Channel RB100-0

8.1.11. LTE BAND 48

LTE B48 5MHz QPSK Middle Channel RB25-0

LTE B48 5MHz 16QAM Middle Channel RB25-0

LTE B48 5MHz 64QAM Middle Channel RB25-0

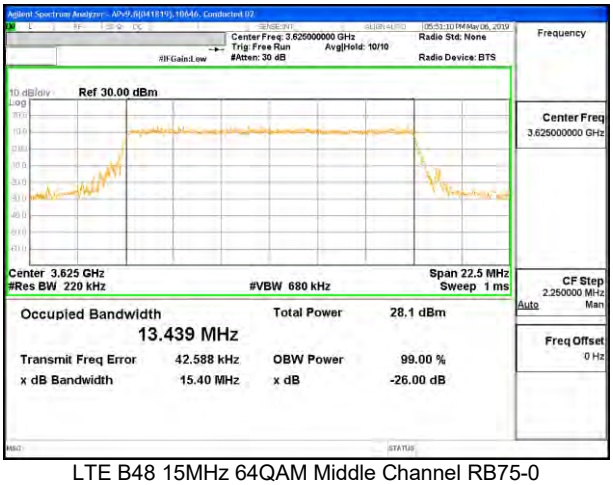
LTE B48 10MHz QPSK Middle Channel RB50-0

LTE B48 10MHz 16QAM Middle Channel RB50-0

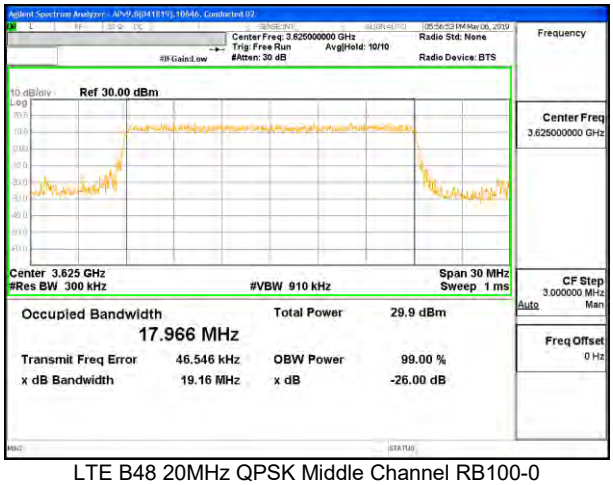
LTE B48 10MHz 64QAM Middle Channel RB50-0

LTE B48 15MHz QPSK Middle Channel RB75-0

LTE B48 15MHz 16QAM Middle Channel RB75-0

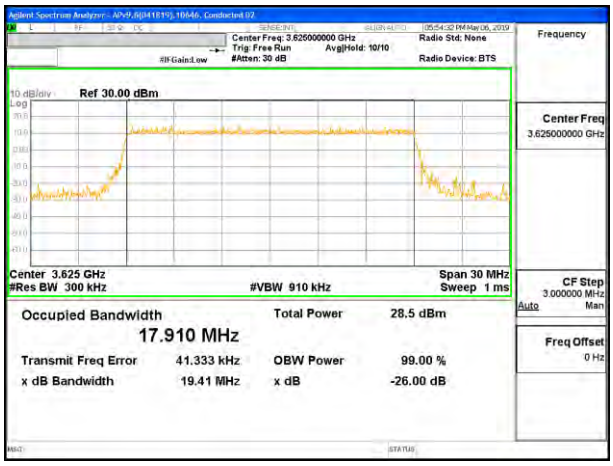


LTE B48 15MHz 64QAM Middle Channel RB75-0



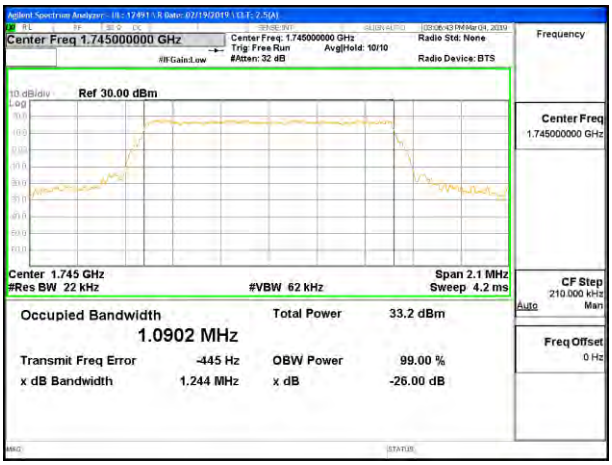
LTE B48 20MHz QPSK Middle Channel RB100-0

LTE B48 20MHz 16QAM Middle Channel RB100-0



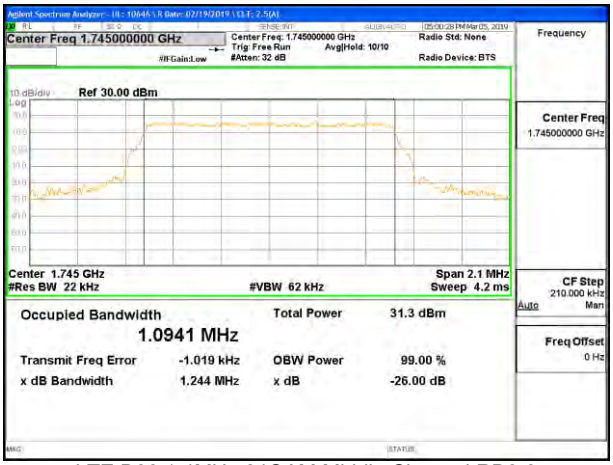
LTE B48 20MHz 64QAM Middle Channel RB100-0

8.1.12. LTE BAND 66

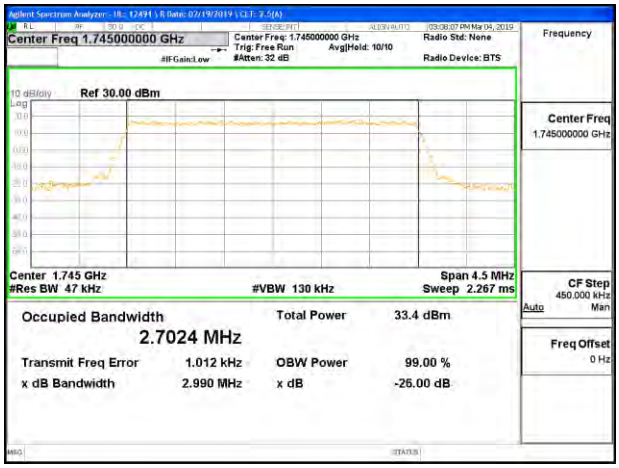


LTE B66 1.4MHz QPSK Middle Channel RB6-0

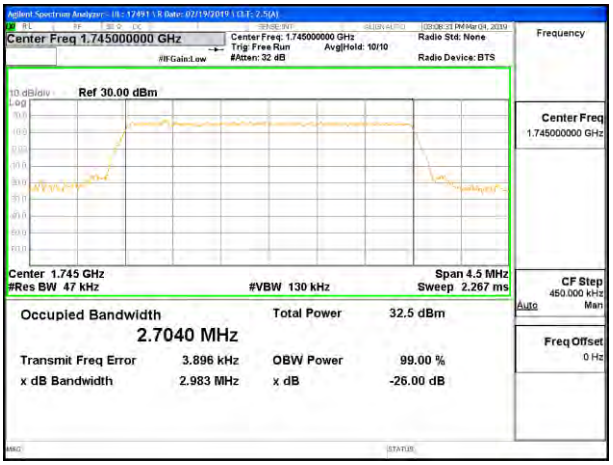
LTE B66 1.4MHz 16QAM Middle Channel RB6-0



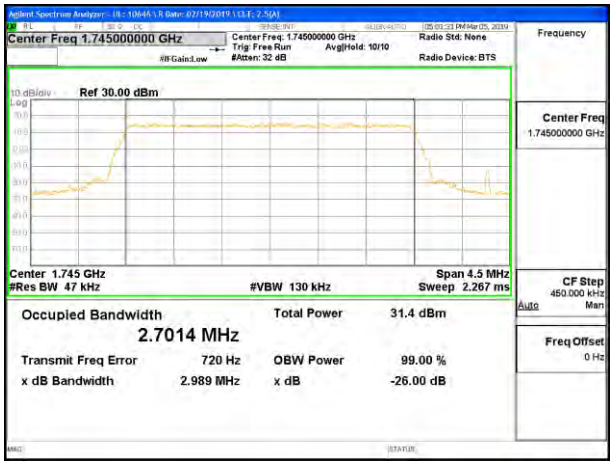
LTE B66 1.4MHz 64QAM Middle Channel RB6-0



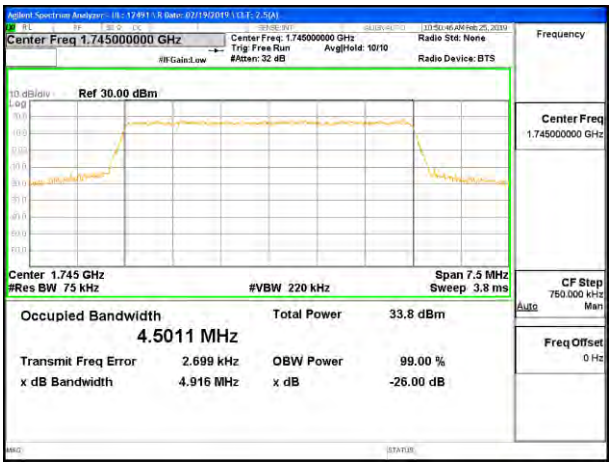
LTE B66 3MHz QPSK Middle Channel RB15-0



LTE B66 3MHz 16QAM Middle Channel RB15-0

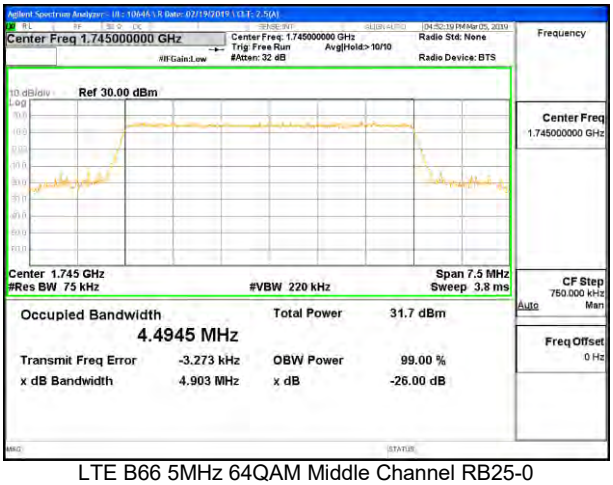


LTE B66 3MHz 64QAM Middle Channel RB15-0

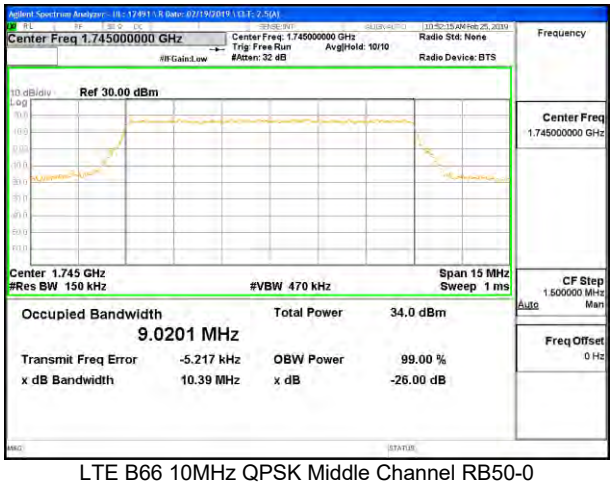


LTE B66 5MHz QPSK Middle Channel RB25-0

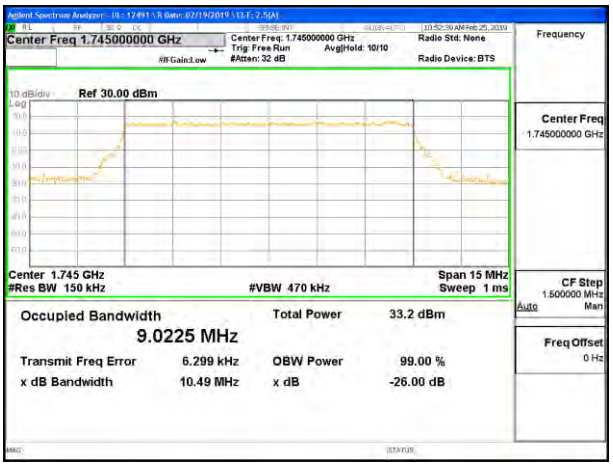
LTE B66 5MHz 16QAM Middle Channel RB25-0



LTE B66 5MHz 64QAM Middle Channel RB25-0

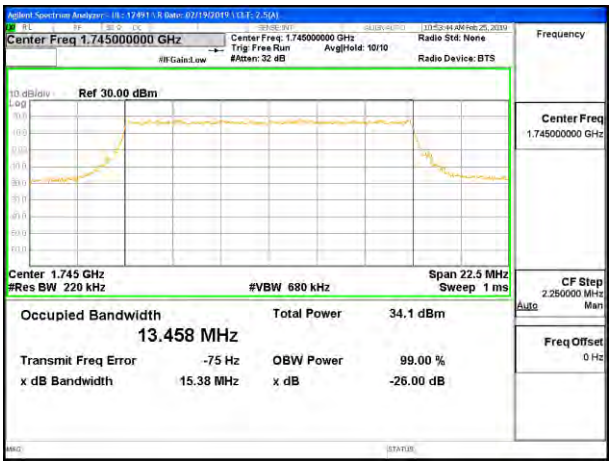


LTE B66 10MHz QPSK Middle Channel RB50-0

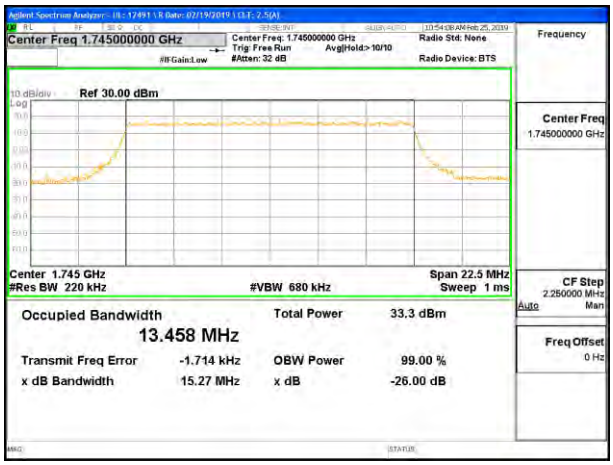


LTE B66 10MHz 16QAM Middle Channel RB50-0

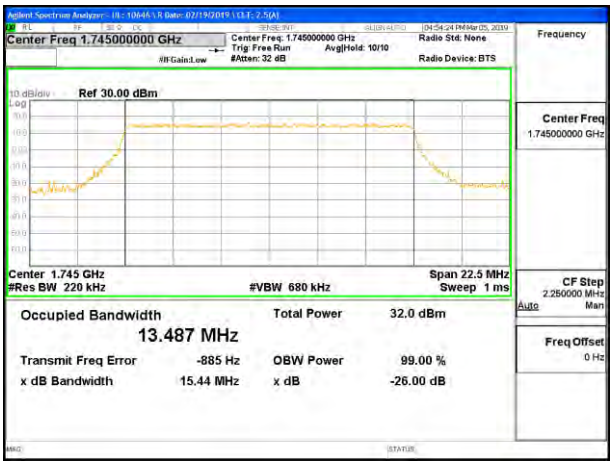
LTE B66 10MHz 64QAM Middle Channel RB50-0



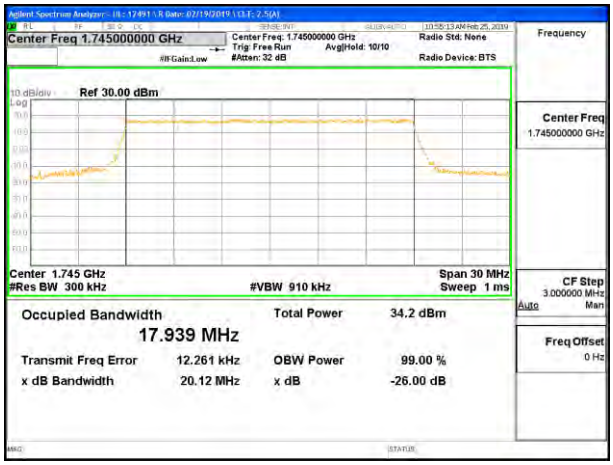
LTE B66 15MHz QPSK Middle Channel RB75-0



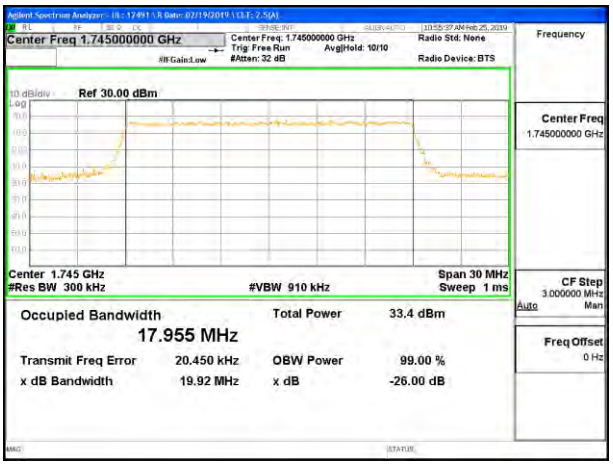
LTE B66 15MHz 16QAM Middle Channel RB75-0



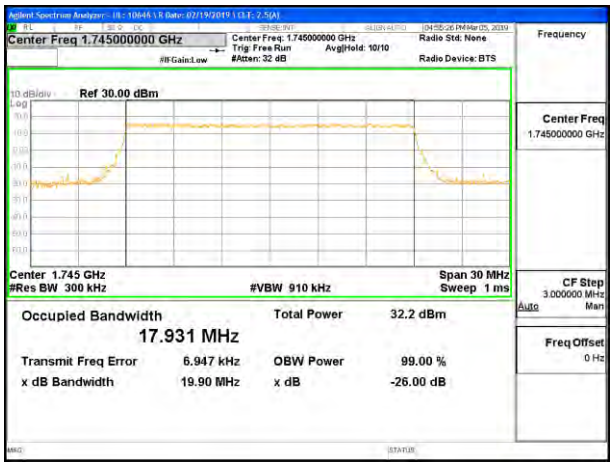
LTE B66 15MHz 64QAM Middle Channel RB75-0



LTE B66 20MHz QPSK Middle Channel RB100-0



LTE B66 20MHz 16QAM Middle Channel RB100-0



LTE B66 20MHz 64QAM Middle Channel RB100-0

8.2. BAND EDGE AND EMISSION MASK

RULE PART(S)

FCC: §2.1051, §22.917, §24.238, §27.53, §90.691, and §96.41

LIMITS

FCC: §22.917, §24.238, §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.

FCC: §90.691 Emission mask requirements for EA-based systems.
(a) Out-of-band emission requirement shall apply only to the “outer” channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116 Log10(f/6.1) decibels or 50 + 10 Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 43 + 10Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

FCC: §27.53 (Band 30)
(a) For operations in the 2305-2320 MHz band and the 2345-2360 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power P (with averaging performed only during periods of transmission) within the licensed band(s) of operation, in watts, by the following amounts:

(4) For mobile and portable stations operating in the 2305-2315 MHz and 2350-2360 MHz bands:

(i) By a factor of not less than: 43 + 10 log (P) dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than 55 + 10 log (P) dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz, not less than 61 + 10 log (P) dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz, and not less than 67 + 10 log (P) dB on all frequencies between 2328 and 2337 MHz;

(ii) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2300 and 2305 MHz, 55 + 10 log (P) dB on all frequencies between 2296 and 2300 MHz, 61 + 10 log (P) dB on all frequencies between 2292 and 2296 MHz, 67 + 10 log (P) dB on all frequencies between 2288 and 2292 MHz, and 70 + 10 log (P) dB below 2288 MHz;

(iii) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2360 and 2365 MHz, and not less than 70 + 10 log (P) dB above 2365 MHz.

FCC: §27.53 (Band 13)
(c)For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;

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(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations;

(5) Compliance with the provisions of paragraphs (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

(6) Compliance with the provisions of paragraphs (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

(f) Emissions in the band 1559-1610 MHz shall be limited to −70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals. (-70 dBW/MHz = -40dBm/MHz).

FCC: §27.53 (Band 12, 17)
(g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

FCC: §27.53 (Band 7, 41)
(m)(4) For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.
FCC: §96.41
(e) 3.5 GHz Emissions and Interference Limits—(1) General protection levels. Except as otherwise specified in paragraph (e)(2) of this section, for channel and frequency assignments made by the SAS to CBSDs, the conducted power of any emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed −13 dBm/MHz within 0-10 megahertz above the upper SAS-assigned channel edge and within 0-10 megahertz below the lower SAS-assigned channel edge. At all frequencies greater than 10 megahertz above the upper SAS assigned channel edge and less than 10 MHz below the lower SAS assigned channel edge, the conducted power of any emission shall not exceed −25 dBm/MHz. The upper and lower SAS assigned channel edges are the upper and lower limits of any channel assigned to a CBSD by an SAS, or in the case of multiple contiguous channels, the upper and lower limits of the combined contiguous channels.

(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.

TEST PROCEDURE

The transmitter output was connected to a CMW500Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.

For each band edge measurement:

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

TEST PROCEDURE (FCC LTE BAND 7, 41)

(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 (FCC LTE BAND 30)

(5) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the channel blocks at 2305, 2310, 2315, 2320, 2345, 2350, 2355, and 2360 MHz, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter 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 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.

TEST PROCEDURE (FCC LTE BAND 48)

(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 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.

Notes:

Band 12

1.4MHz BW: For emissions within 100kHz of the band edge the value measured in 13kHz, after correction of 10log(13/30), 3.6dB, to account for reference bandwidth of 30kHz and measurement bandwidth of 13 kHz, are below -13dBm. For emissions more than 100kHz from the band edge the value measured in 13kHz, after correction of 10log(13/100), 8.9dB, to account for reference bandwidth of 100kHz and measurement bandwidth of 30 kHz, are below -13dBm.

3MHz BW: For emissions more than 100kHz from the band edge the value measured in 30kHz, after correction of 10log(30/100), 5.2dB, to account for reference bandwidth of 100kHz and measurement bandwidth of 30 kHz, are below -13dBm.

5MHz BW: For emissions more than 100kHz from the band edge the value measured in 51kHz, after correction of 10log(51/100), 2.9dB, to account for reference bandwidth of 100kHz and measurement bandwidth of 51 kHz, are below -13dBm.

Band 17
For emissions more than 100kHz from the band edge the value measured in 51kHz, after correction of 10log(51/100), 2.9dB, to account for reference bandwidth of 100kHz and measurement bandwidth of 51 kHz, are below -13dBm.

Band 48
The worst case ACLR is determined through the following calculations:

The Channel Power is noted as $P_{fundamental}$.
The Bandwidth of the adjacent channel is noted as BW_{adj}. It is restricted to multiples of 10MHz, and it is the least bandwidth needed to be equal or greater than the signal bandwidth.

The highest measured power in a reference bandwidth in the Adjacent Channel is noted as $P_{reference}$.
The reference
The bandwidth of the reference bandwidth used is noted as $BW_{reference}$.

The Adjacent Channel Power, P_{adj}, is then extrapolated with the equation: $P_{adj} = P_{refference} + 10Log(BW_{adj}/BW_{reference})$.
The ACLR is then: $ACLR = P_{adj} - P_{fundamental}$.

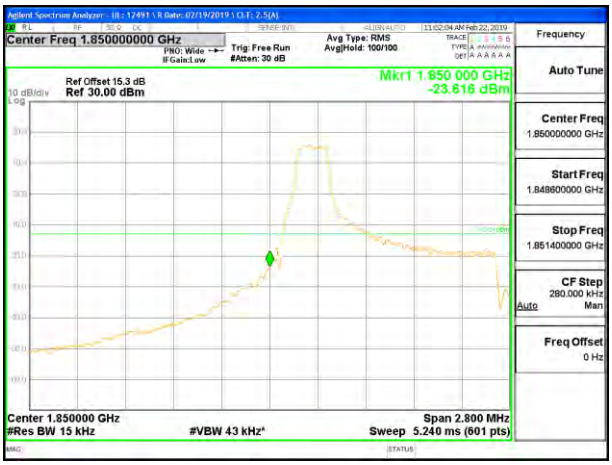
This calculation was run for every plot, and the one with the highest (worst case) ACLR is displayed for each bandwidth at the end of section 8.2.12 of this report.

MODES TESTED

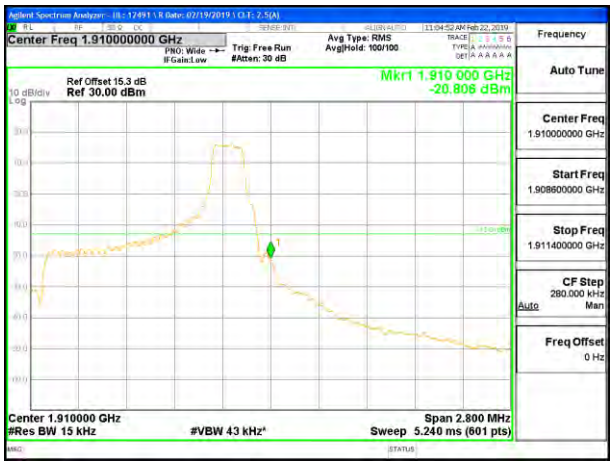
- LTE Band 2
- LTE Band 5
- LTE Band 7
- LTE Band 12
- LTE Band 13
- LTE Band 17
- LTE Band 25
- LTE Band 26
- LTE Band 30
- LTE Band 41
- LTE Band 48
- LTE Band 66

RESULTS

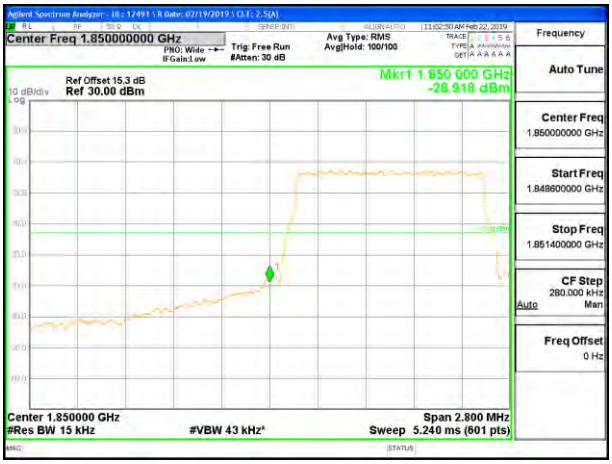
8.2.1. LTE BAND 2 BANDEDGE



LTE B2 1.4MHz QPSK Low Channel RB1-0



LTE B2 1.4MHz QPSK High Channel RB1-5



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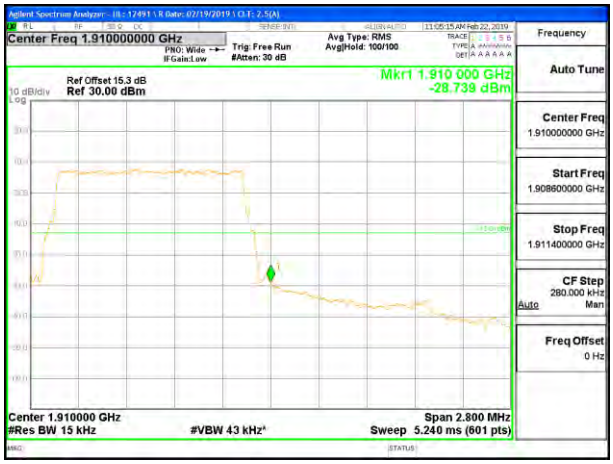

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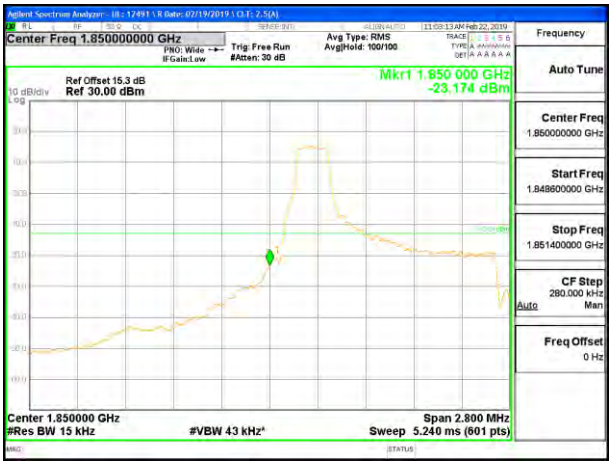

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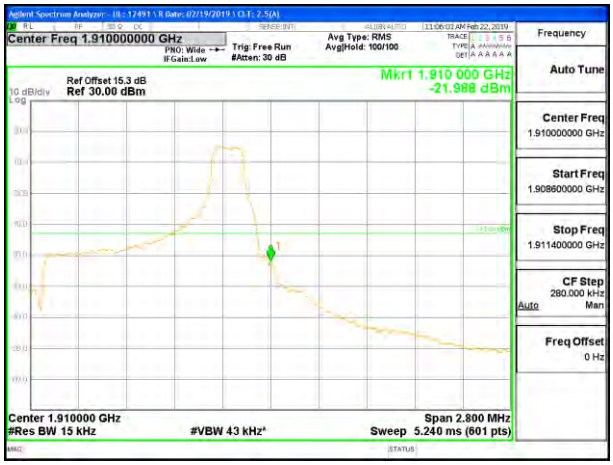

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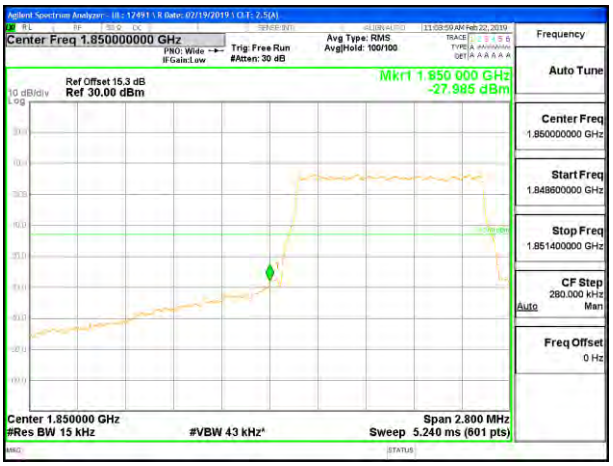

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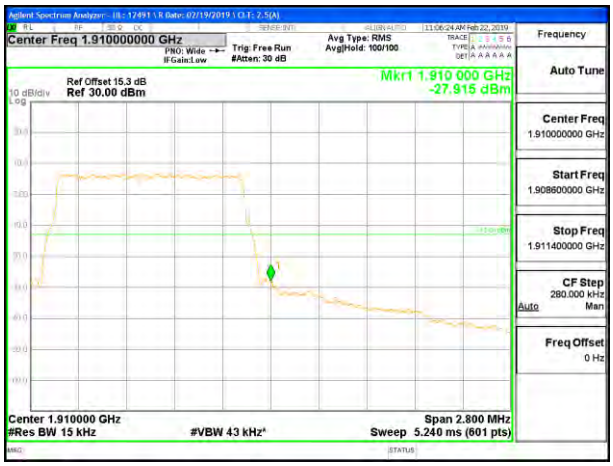

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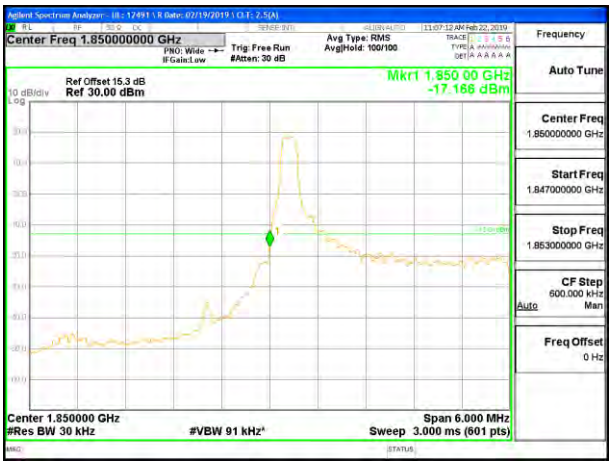
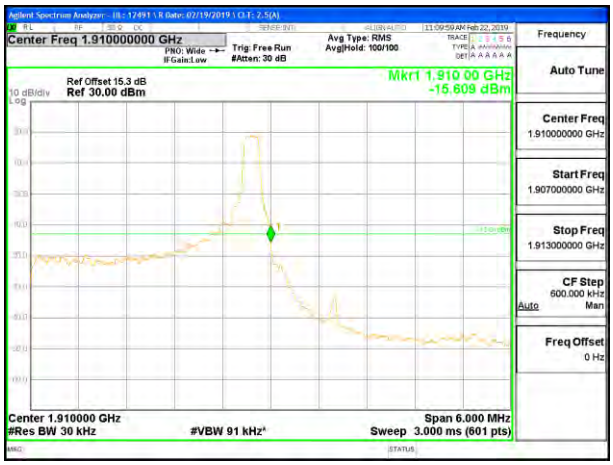
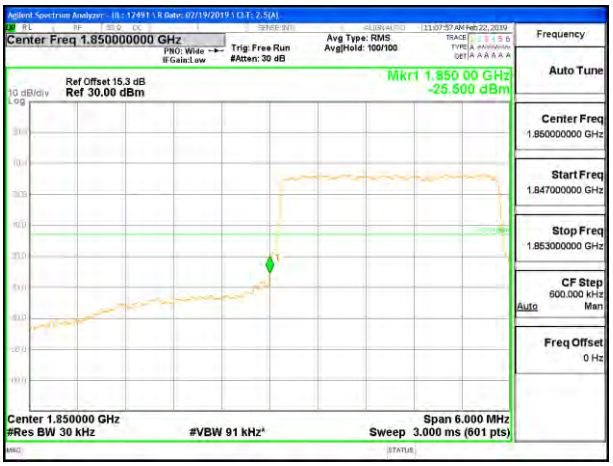


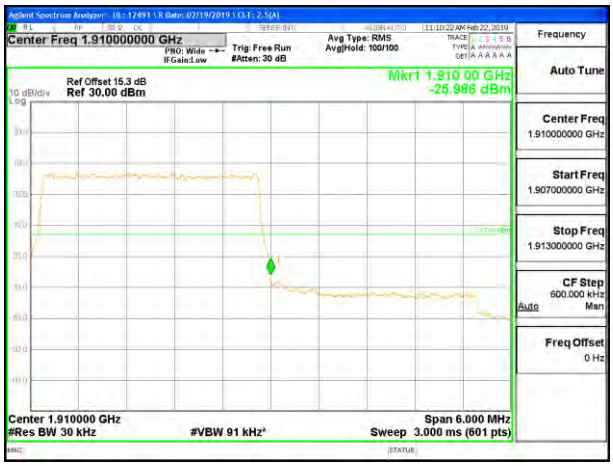
LTE B2 3MHz QPSK Low Channel RB1-0



LTE B2 3MHz QPSK High Channel RB1-14



LTE B2 3MHz QPSK Low Channel RB15-0



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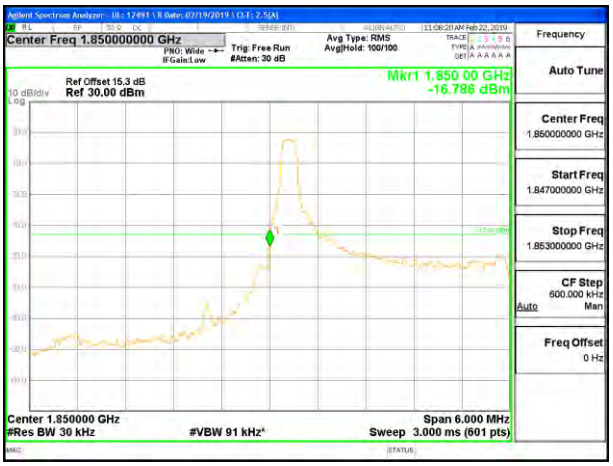

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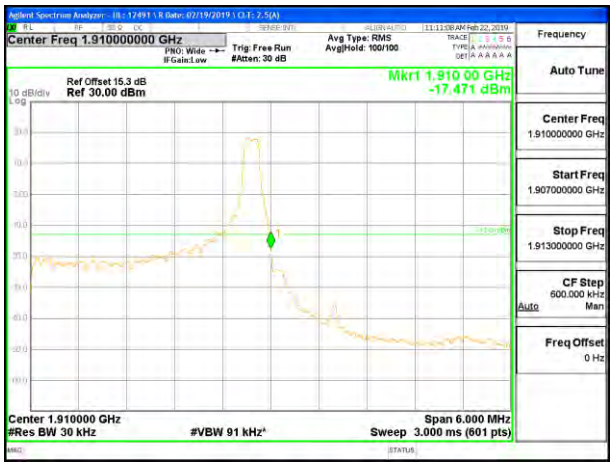

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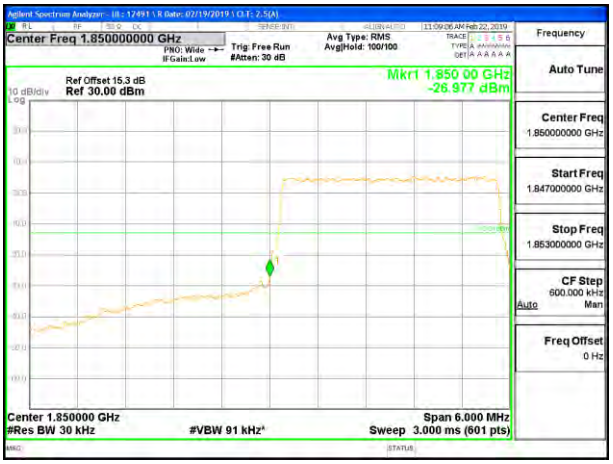

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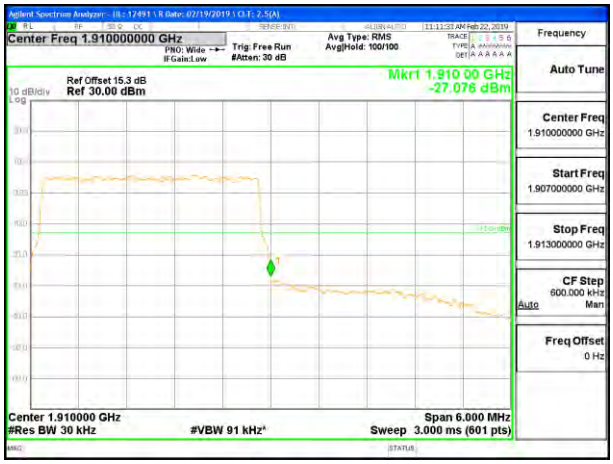
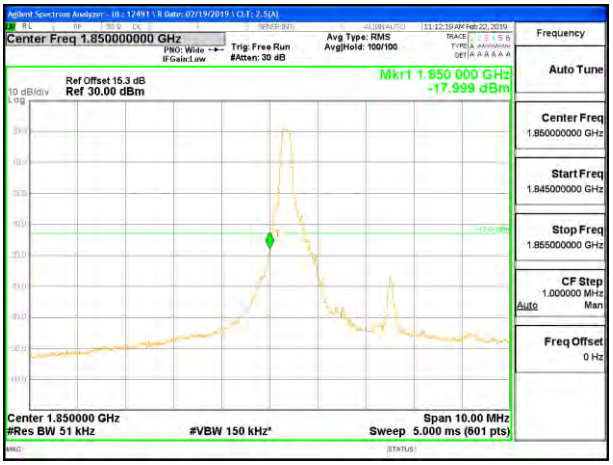
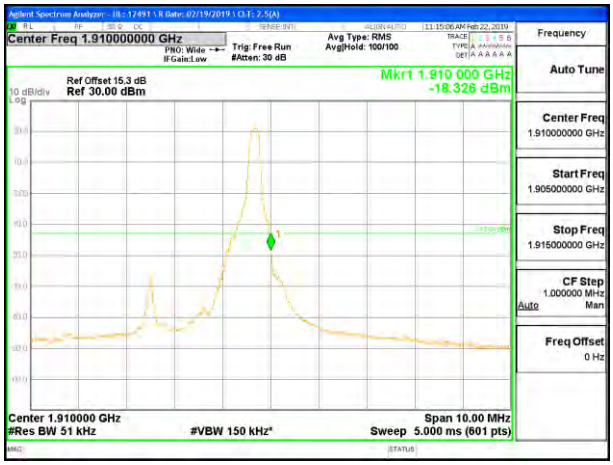


LTE B2 3MHz 16QAM High Channel RB15-0



LTE B2 5MHz QPSK Low Channel RB1-0



LTE B2 5MHz QPSK High Channel RB1-24

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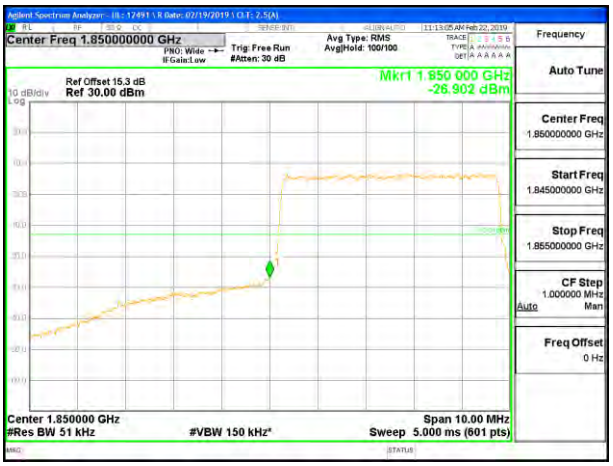
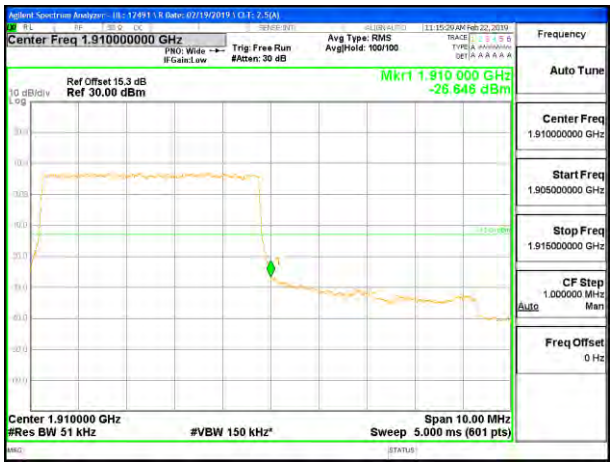
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888



LTE B2 5MHz QPSK Low Channel RB25-0



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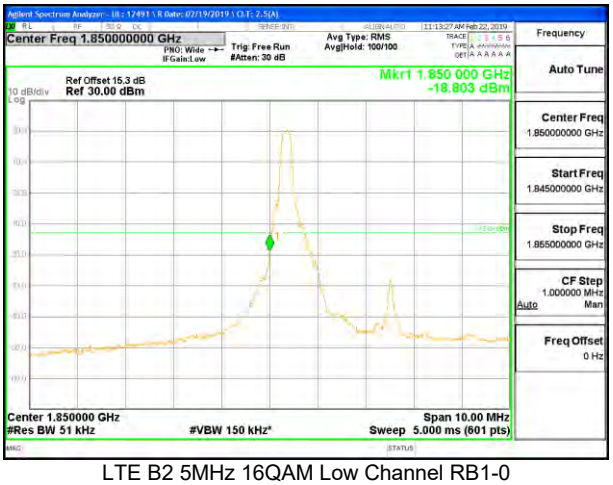
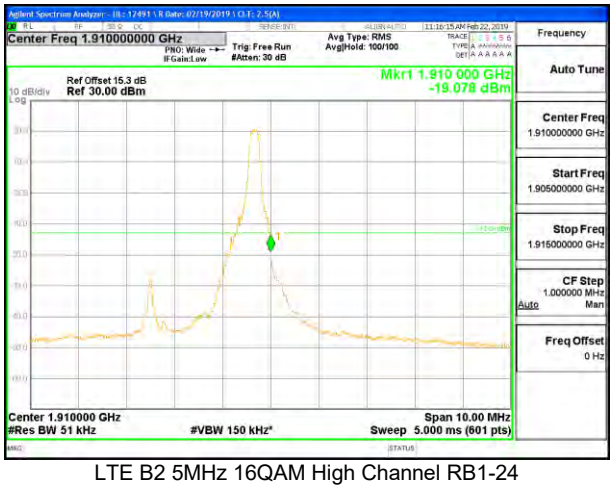
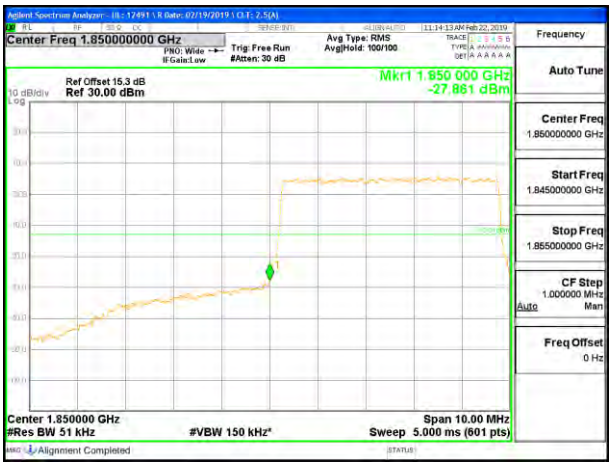


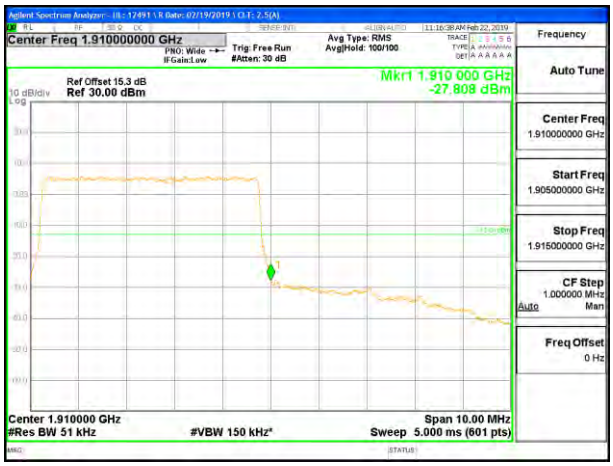
LTE B2 5MHz 16QAM Low Channel RB1-0



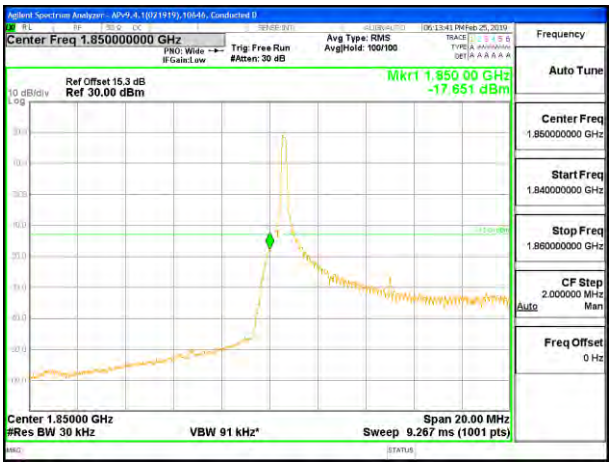
LTE B2 5MHz 16QAM High Channel RB1-24



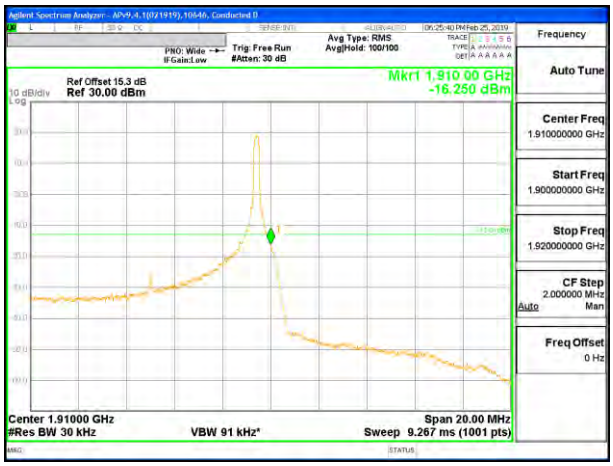
LTE B2 5MHz 16QAM Low Channel RB25-0



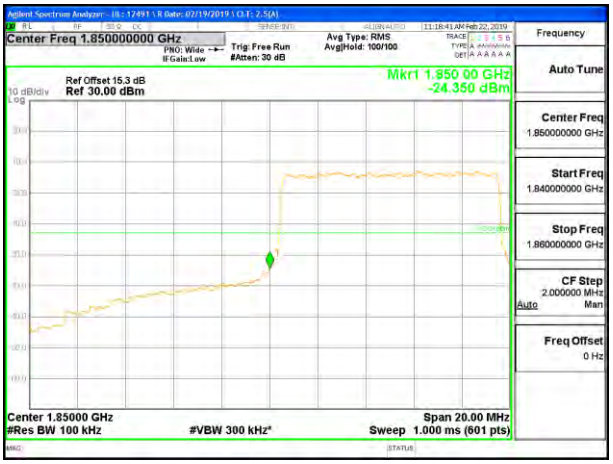
LTE B2 5MHz 16QAM High Channel RB25-0



LTE B2 10MHz QPSK Low Channel RB1-0



LTE B2 10MHz QPSK High Channel RB1-49



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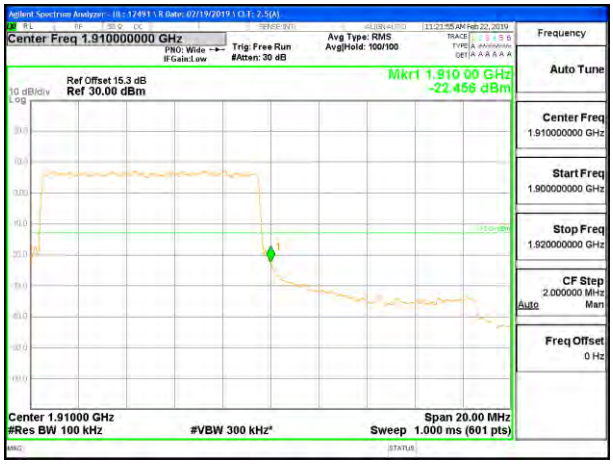

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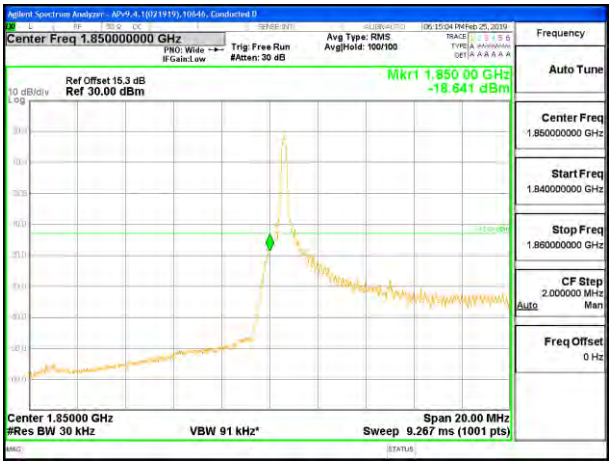

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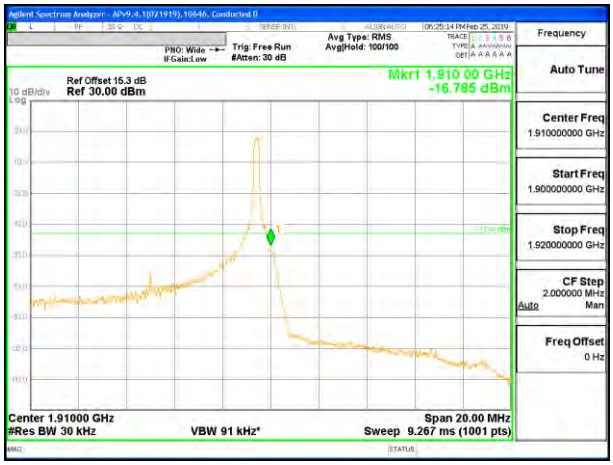
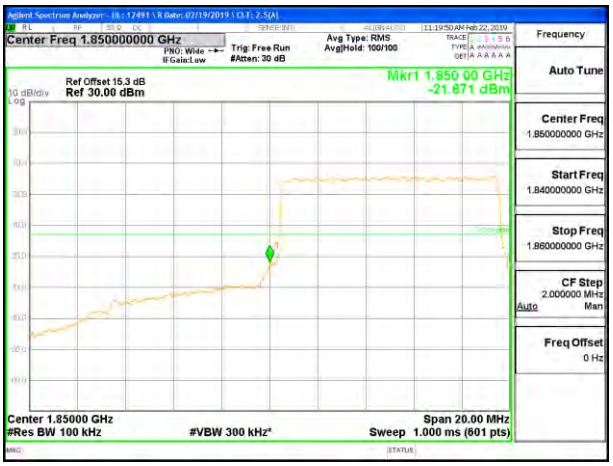
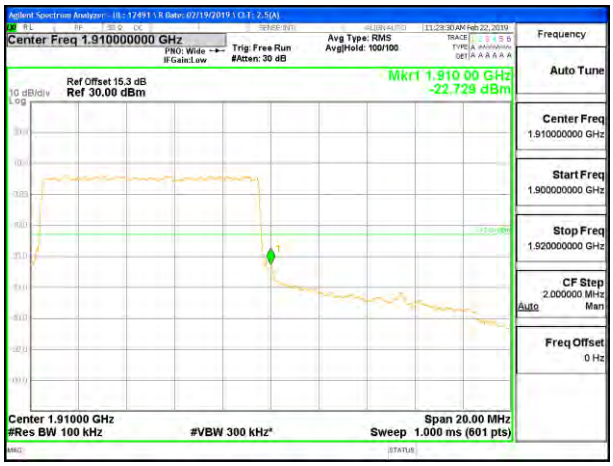


LTE B2 10MHz 16QAM High Channel RB1-49



LTE B2 10MHz 16QAM Low Channel RB50-0



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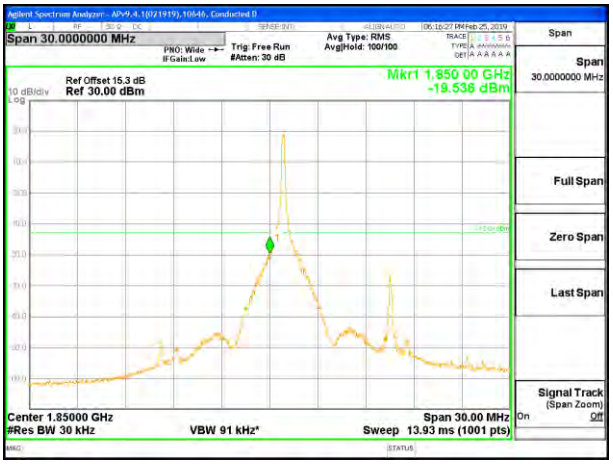
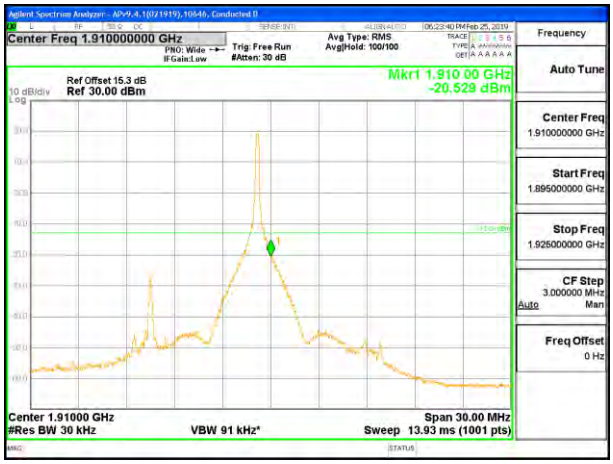
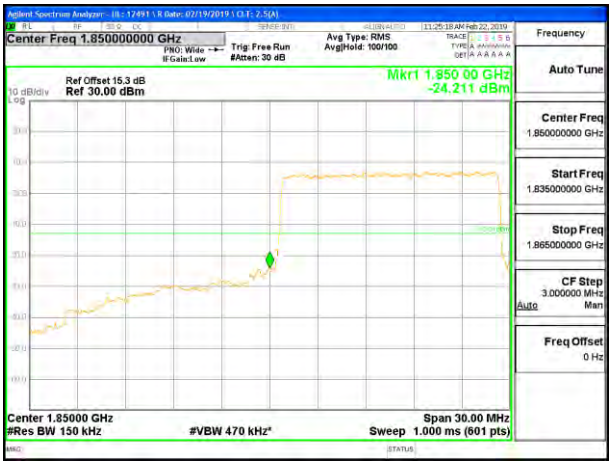


LTE B2 15MHz QPSK Low Channel RB1-0



LTE B2 15MHz QPSK High Channel RB1-74



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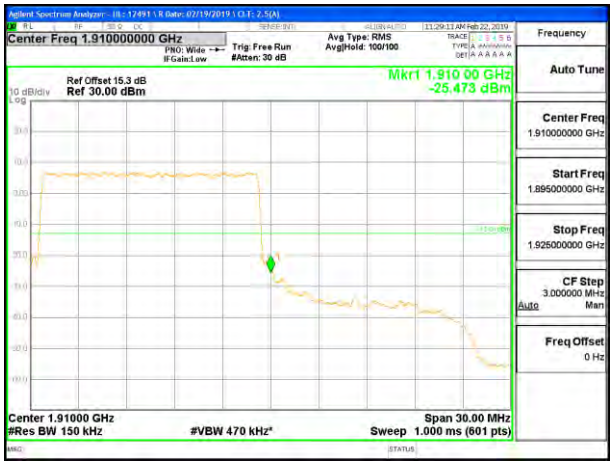
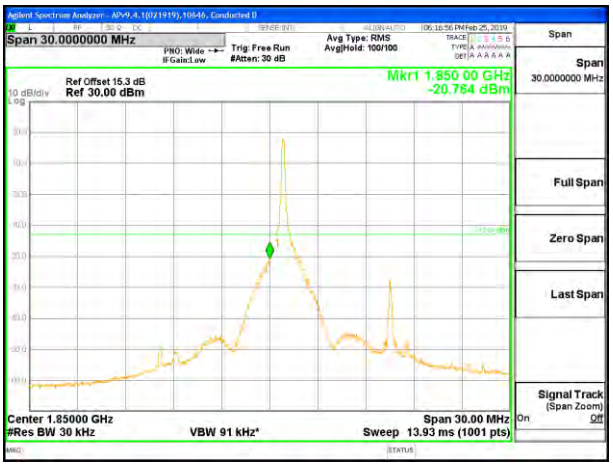
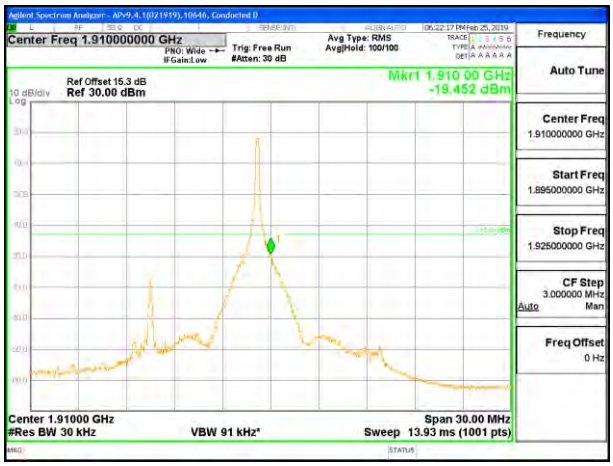


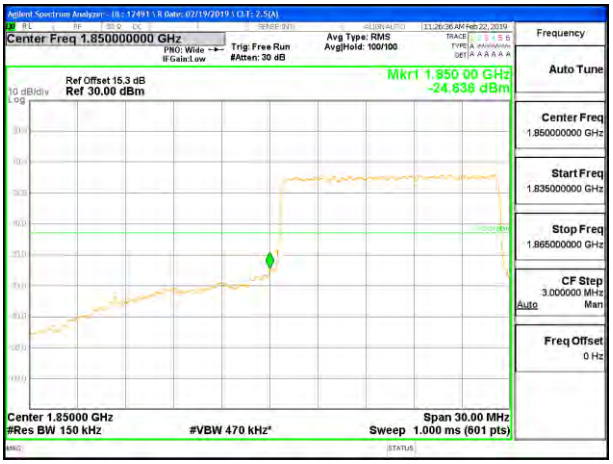
LTE B2 15MHz QPSK High Channel RB75-0



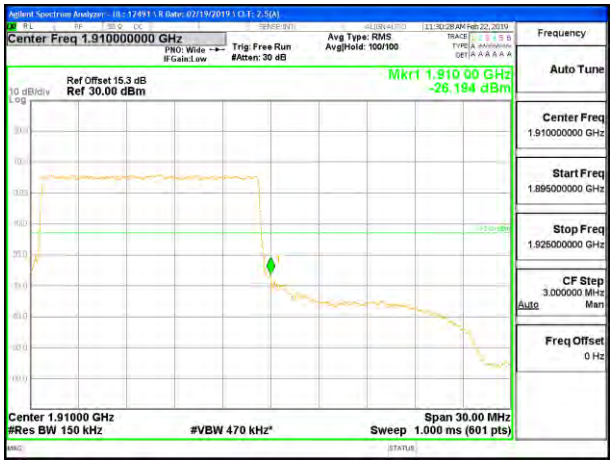
LTE B2 15MHz 16QAM Low Channel RB1-0



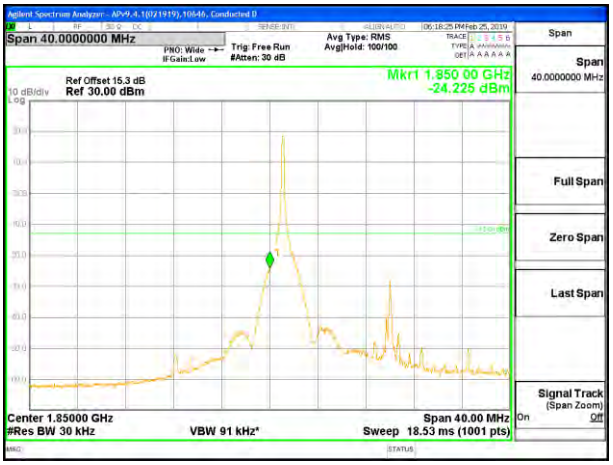
LTE B2 15MHz 16QAM High Channel RB1-74



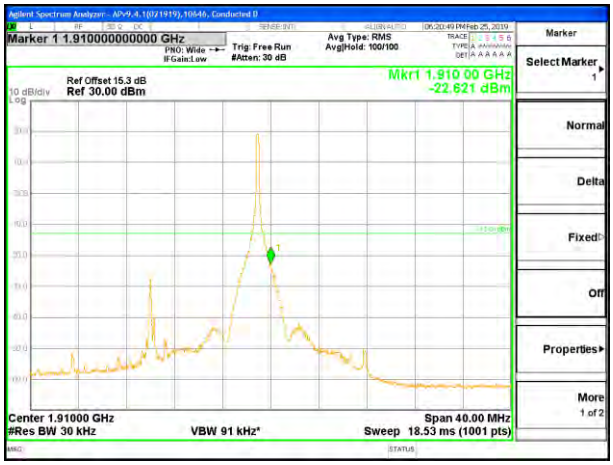
LTE B2 15MHz 16QAM Low Channel RB75-0



LTE B2 15MHz 16QAM High Channel RB75-0



LTE B2 20MHz QPSK Low Channel RB1-0



LTE B2 20MHz QPSK High Channel RB1-99

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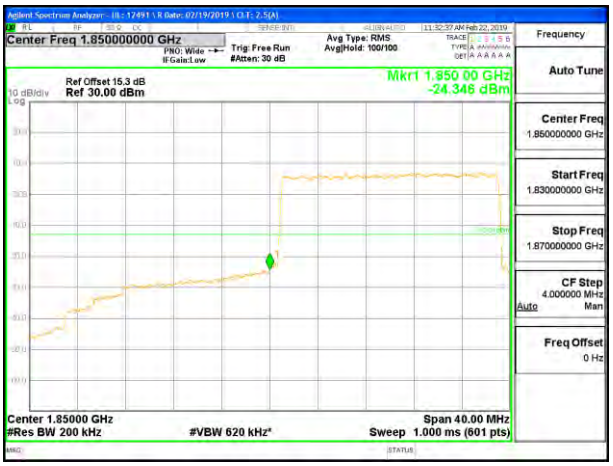
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888



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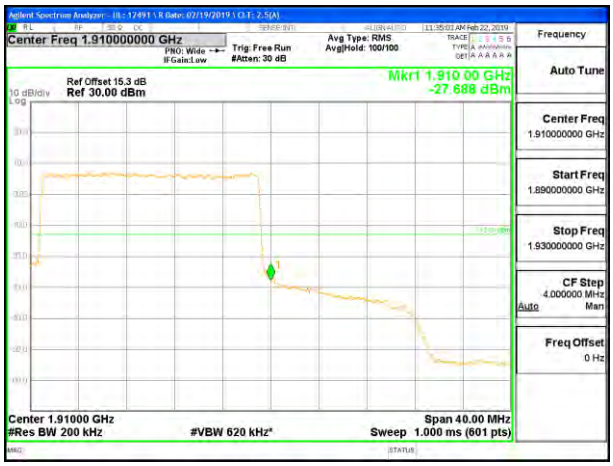
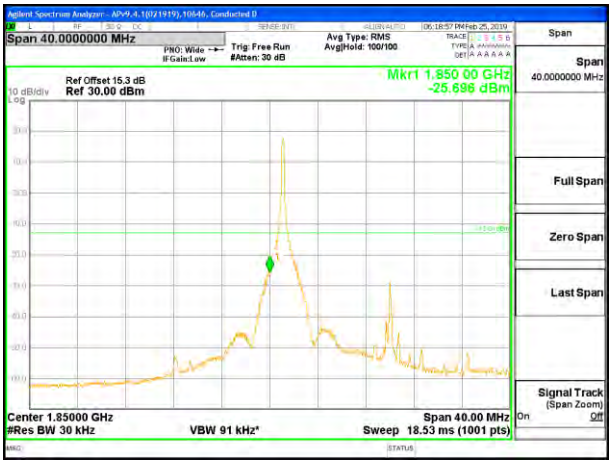
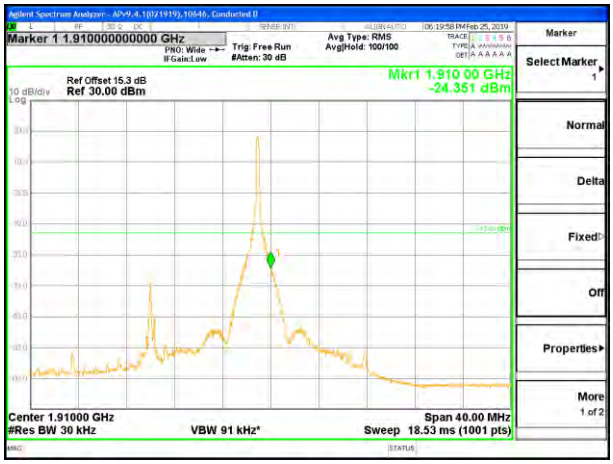


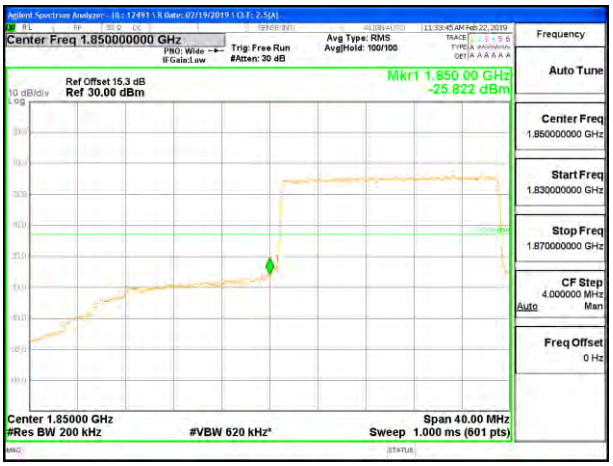
LTE B2 20MHz QPSK High Channel RB100-0



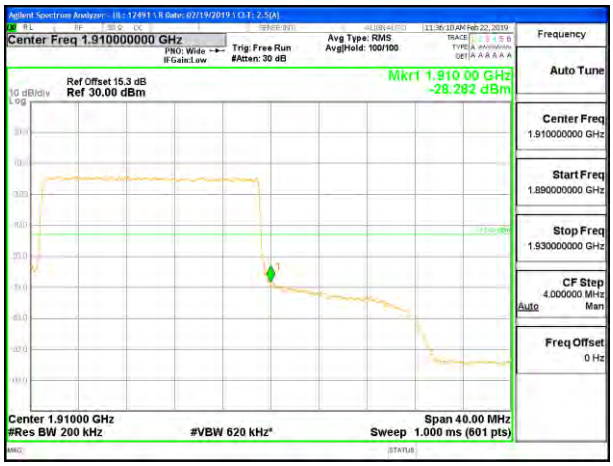
LTE B2 20MHz 16QAM Low Channel RB1-0



LTE B2 20MHz 16QAM High Channel RB1-99

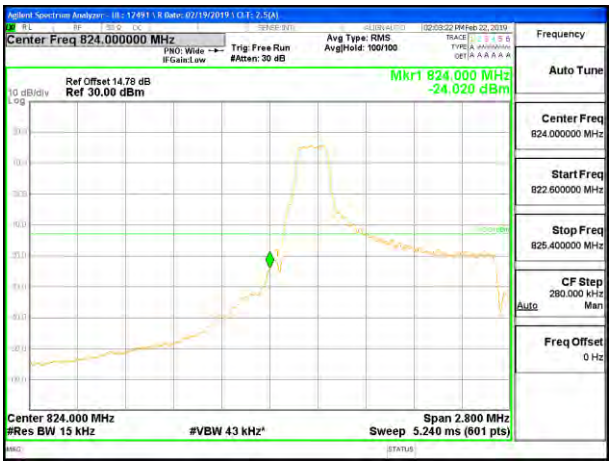


LTE B2 20MHz 16QAM Low Channel RB100-0

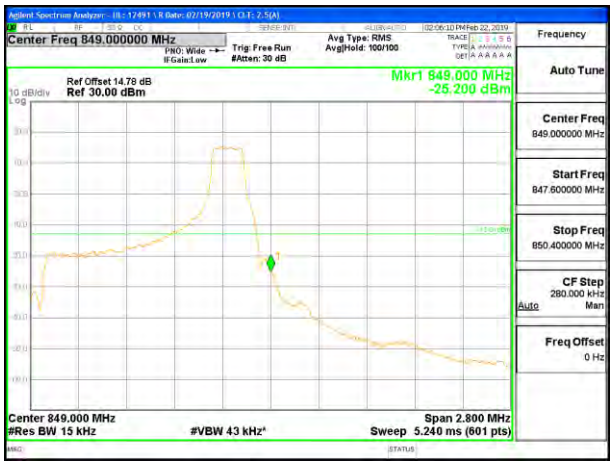


LTE B2 20MHz 16QAM High Channel RB100-0

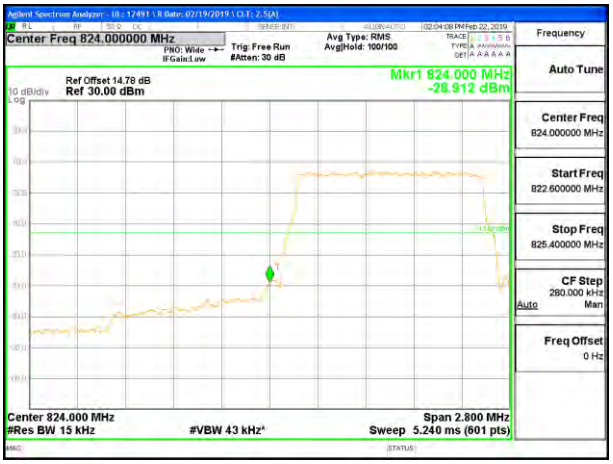
8.2.2. LTE BAND 5 BANDEDGE



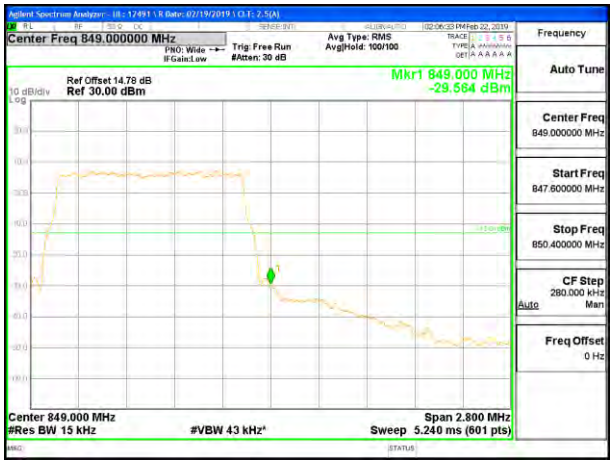
LTE B5 1.4MHz QPSK Low Channel RB1-0



LTE B5 1.4MHz QPSK High Channel RB1-5



LTE B5 1.4MHz QPSK Low Channel RB6-0



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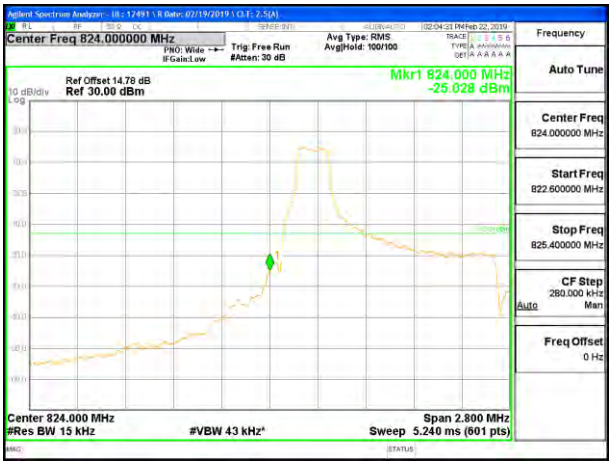
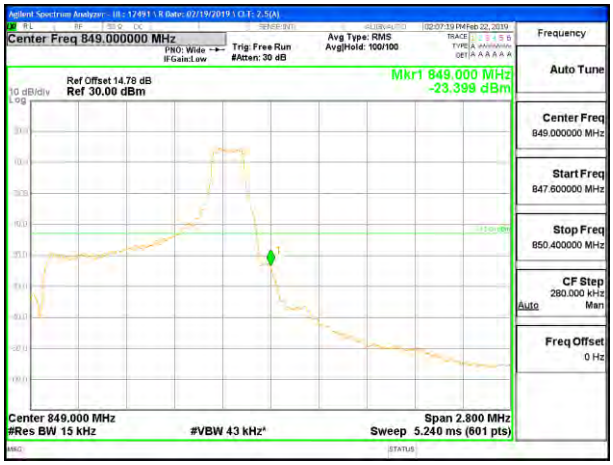
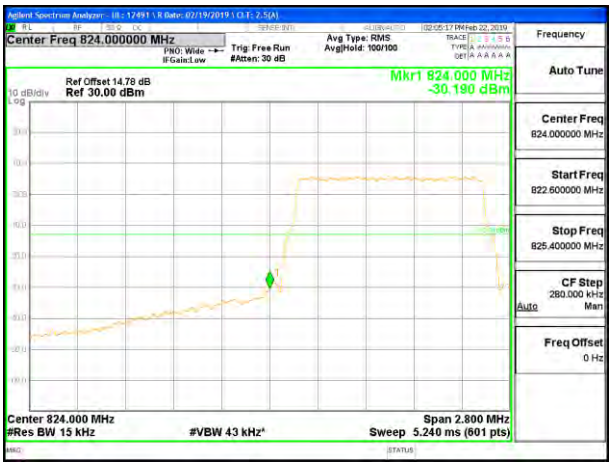


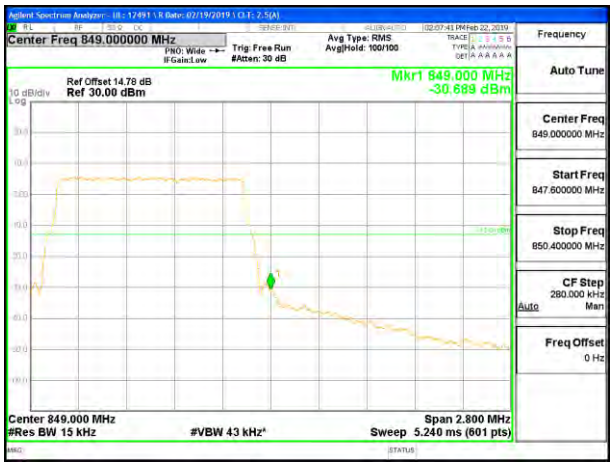
LTE B5 1.4MHz 16QAM Low Channel RB1-0



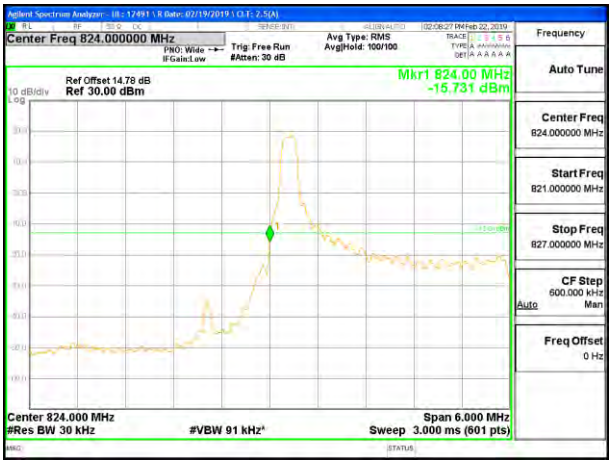
LTE B5 1.4MHz 16QAM High Channel RB1-5



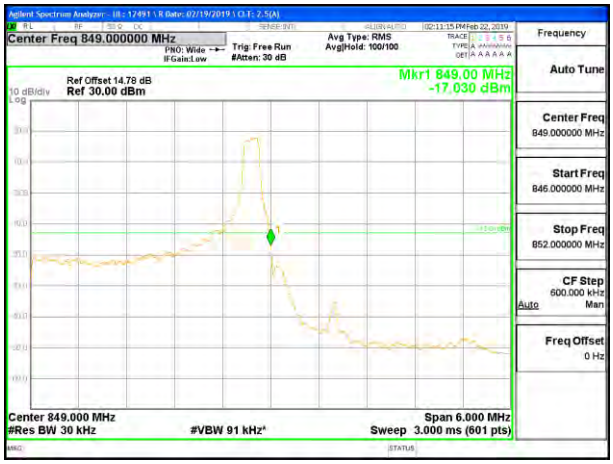
LTE B5 1.4MHz 16QAM Low Channel RB6-0



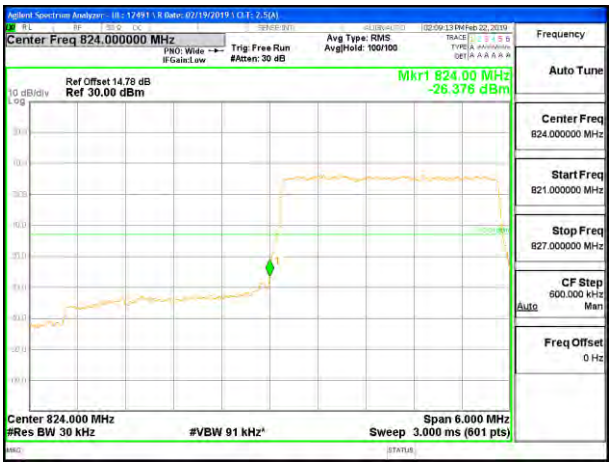
LTE B5 1.4MHz 16QAM High Channel RB6-0



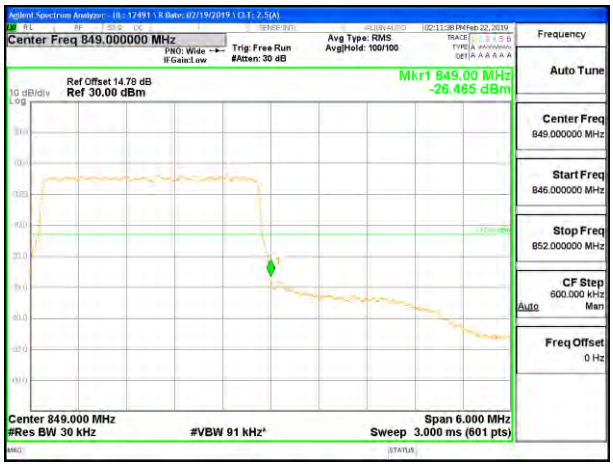
LTE B5 3MHz QPSK Low Channel RB1-0



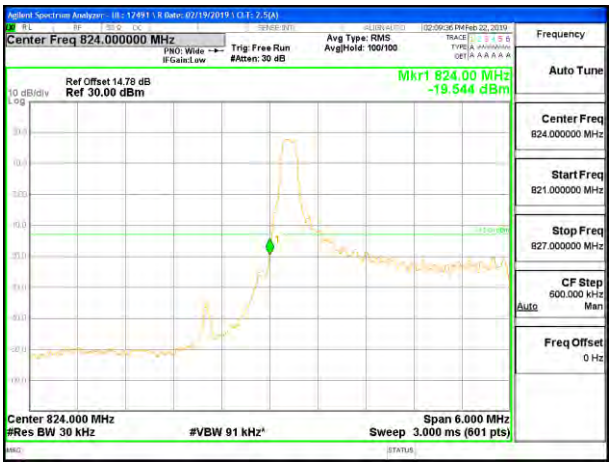
LTE B5 3MHz QPSK High Channel RB1-14



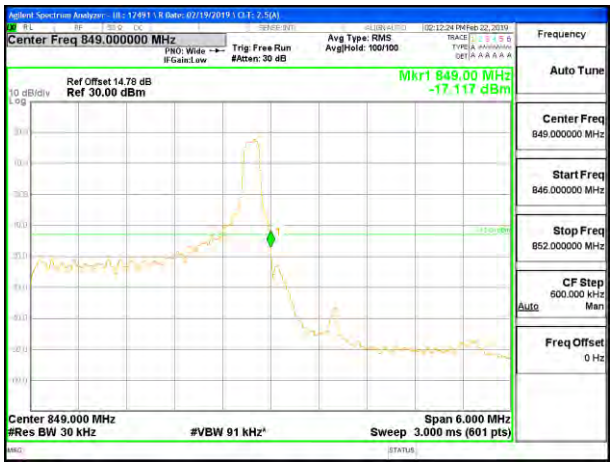
LTE B5 3MHz QPSK Low Channel RB15-0



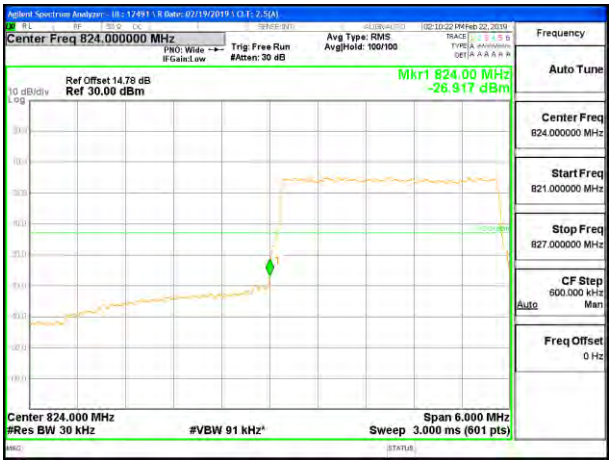
LTE B5 3MHz QPSK High Channel RB15-0



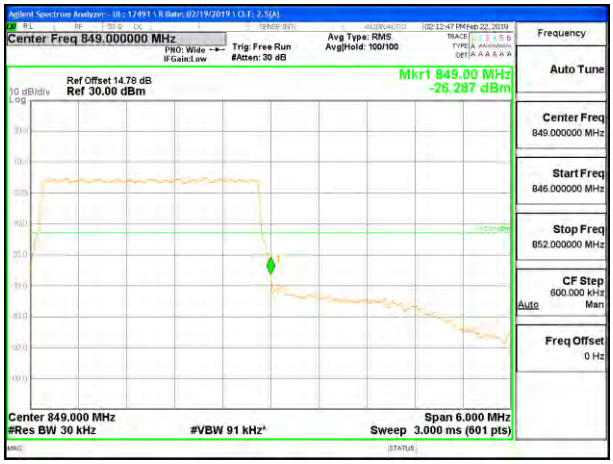
LTE B5 3MHz 16QAM Low Channel RB1-0



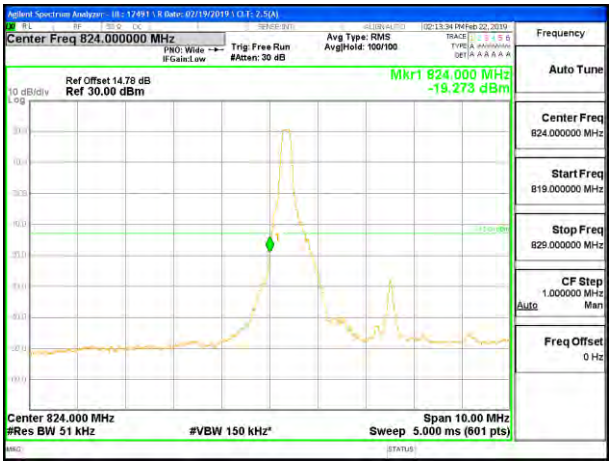
LTE B5 3MHz 16QAM High Channel RB1-14



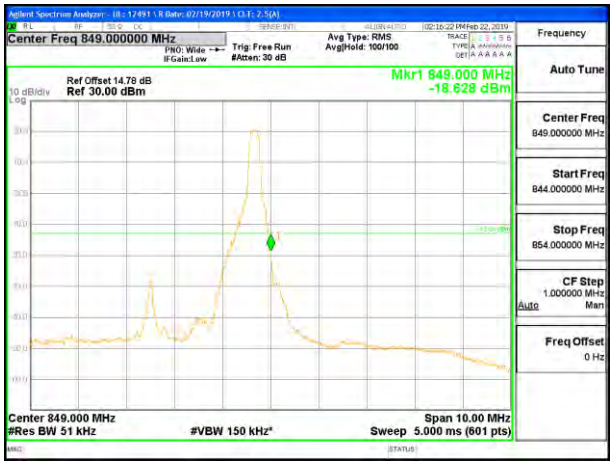
LTE B5 3MHz 16QAM Low Channel RB15-0



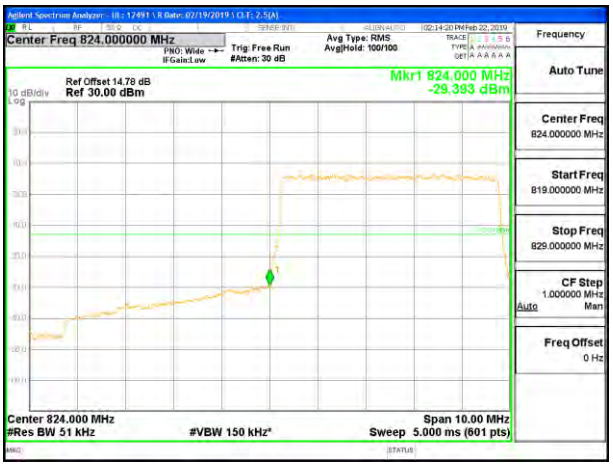
LTE B5 3MHz 16QAM High Channel RB15-0



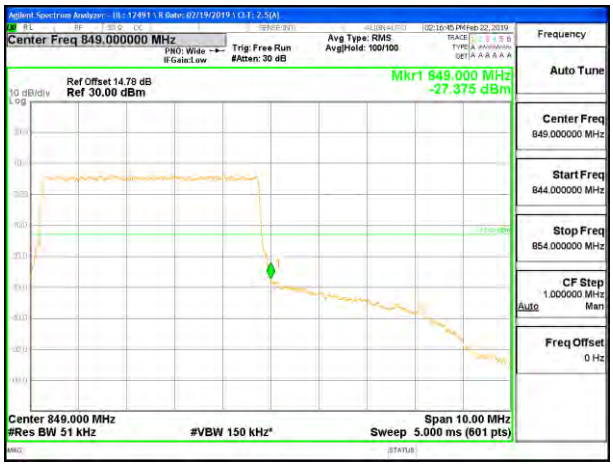
LTE B5 5MHz QPSK Low Channel RB1-0



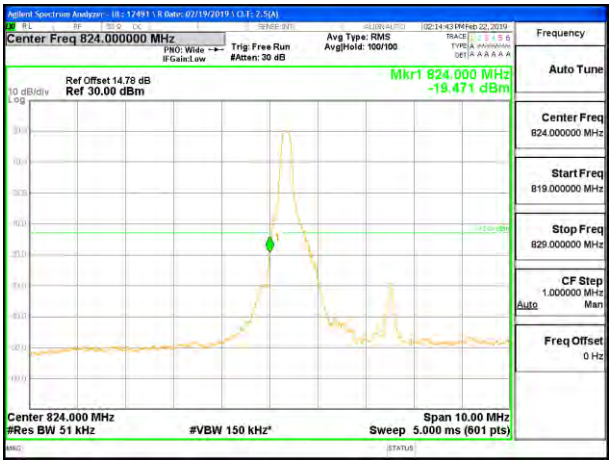
LTE B5 5MHz QPSK High Channel RB1-24



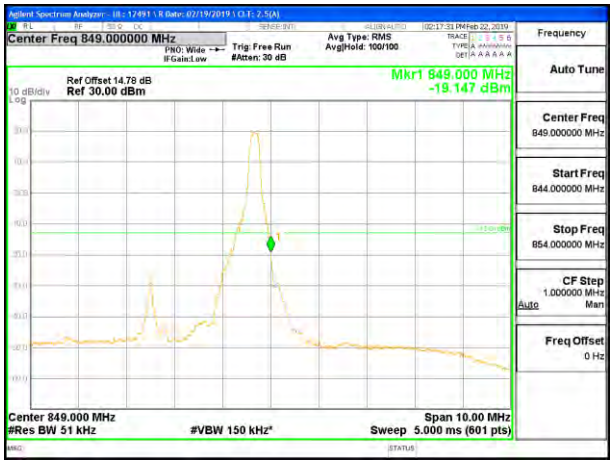
LTE B5 5MHz QPSK Low Channel RB25-0



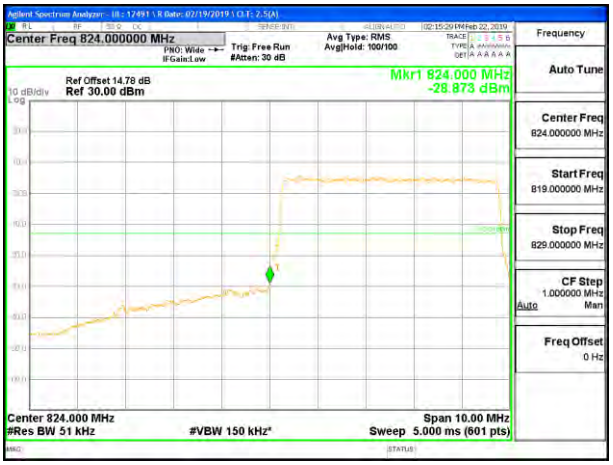
LTE B5 5MHz QPSK High Channel RB25-0



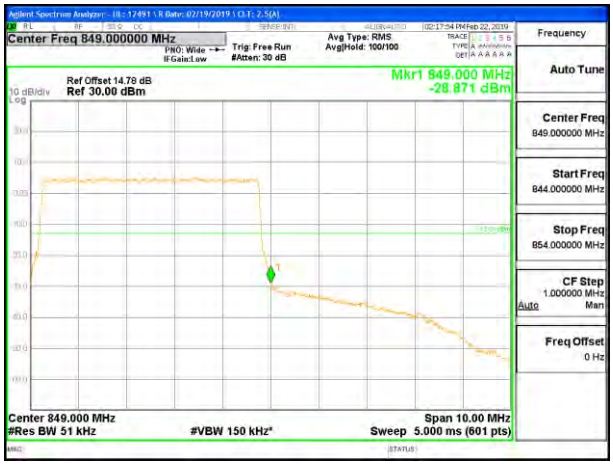
LTE B5 5MHz 16QAM Low Channel RB1-0



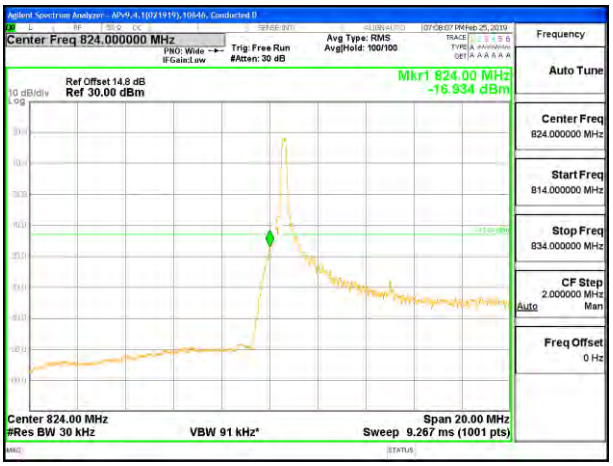
LTE B5 5MHz 16QAM High Channel RB1-24



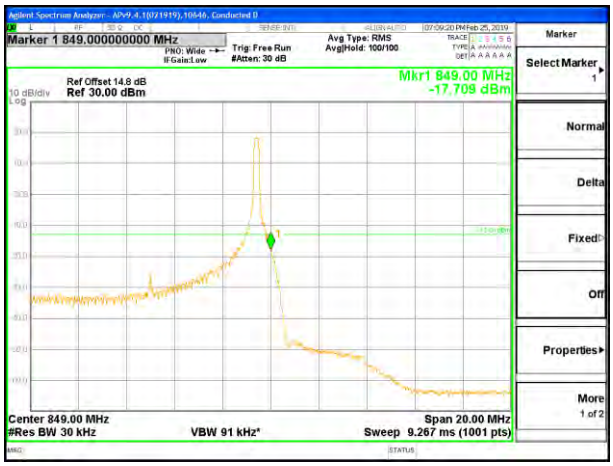
LTE B5 5MHz 16QAM Low Channel RB25-0



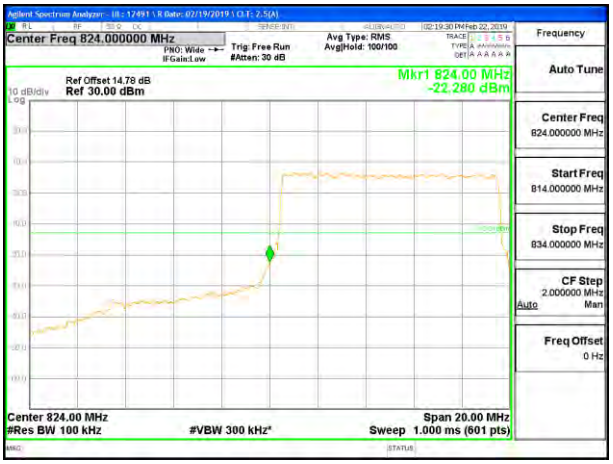
LTE B5 5MHz 16QAM High Channel RB25-0



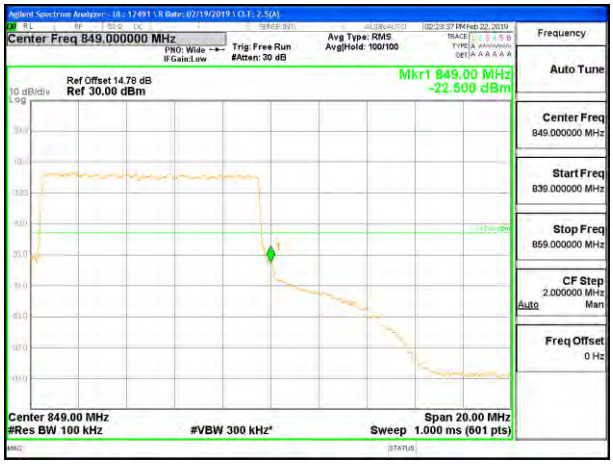
LTE B5 10MHz QPSK Low Channel RB1-0



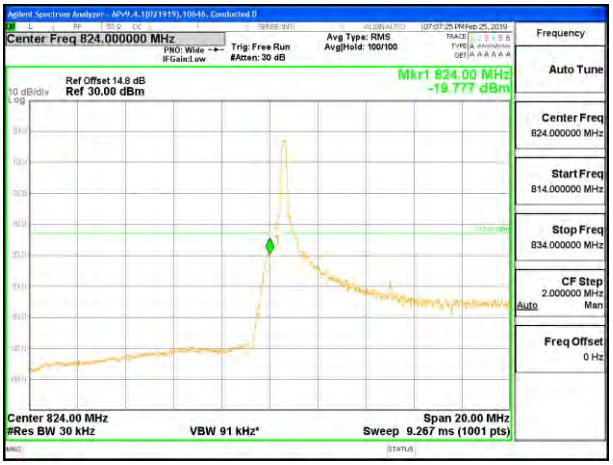
LTE B5 10MHz QPSK High Channel RB1-49



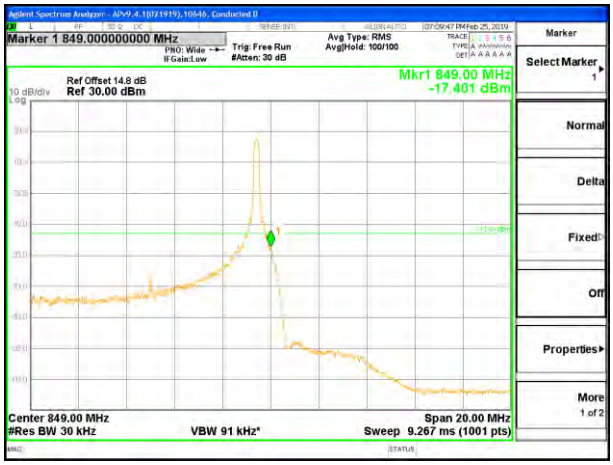
LTE B5 10MHz QPSK Low Channel RB50-0



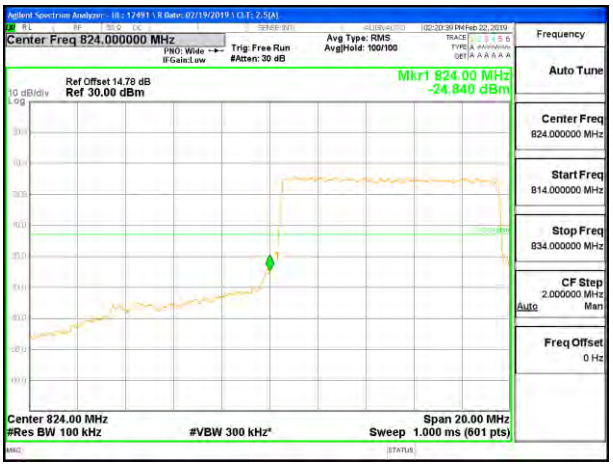
LTE B5 10MHz QPSK High Channel RB50-0



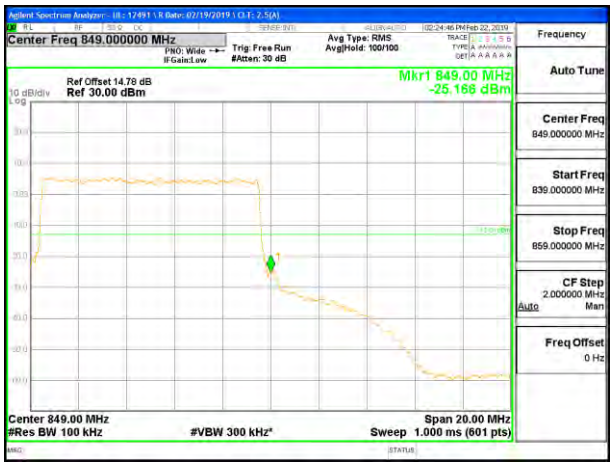
LTE B5 10MHz 16QAM Low Channel RB1-0



LTE B5 10MHz 16QAM High Channel RB1-49

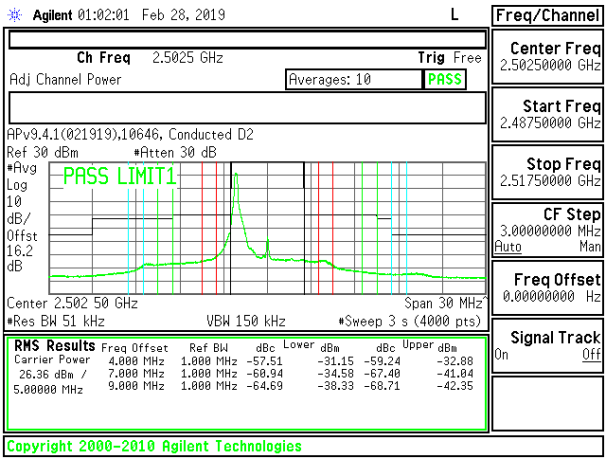


LTE B5 10MHz 16QAM Low Channel RB50-0

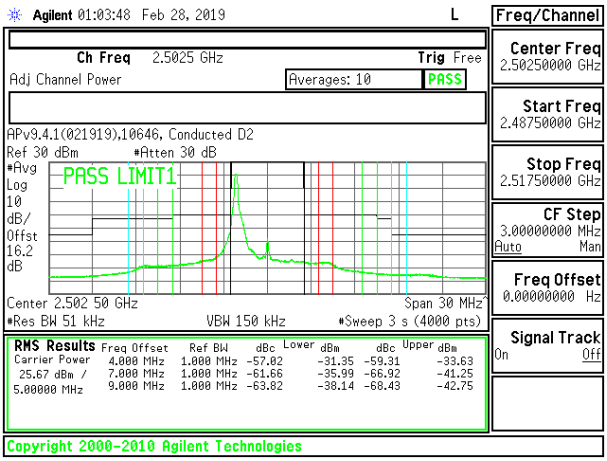


LTE B5 10MHz 16QAM High Channel RB50-0

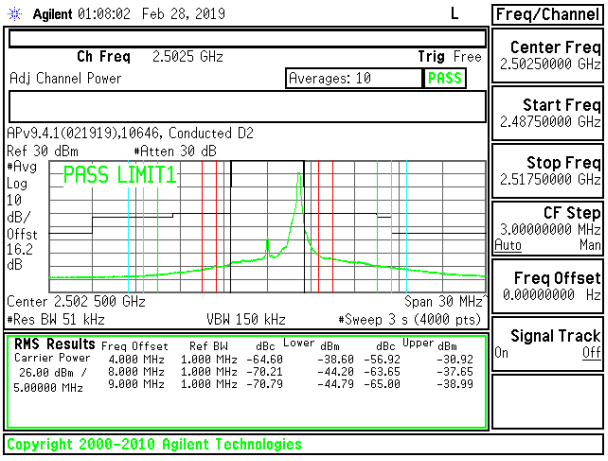
8.2.3. LTE BAND 7 ADJACENT CHANNEL POWER



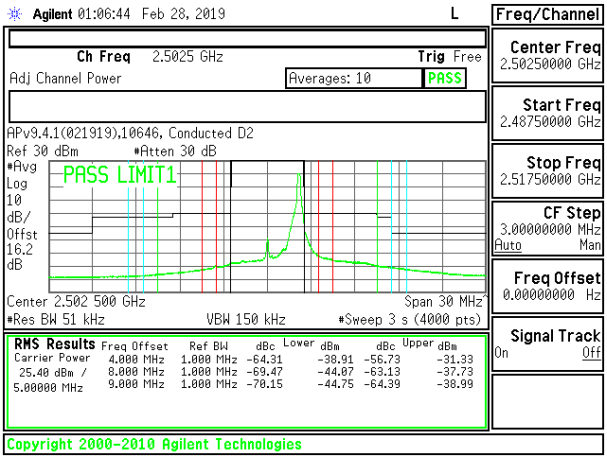
LTE B7 5MHz QPSK Low Channel RB1-0



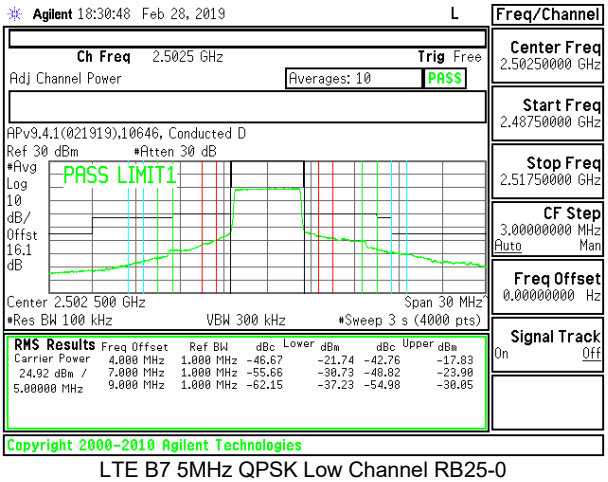
LTE B7 5MHz 16QAM Low Channel RB1-0



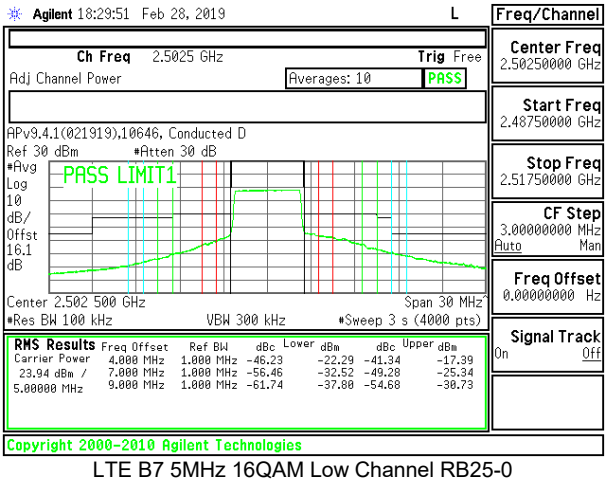
LTE B7 5MHz QPSK Low Channel RB1-24



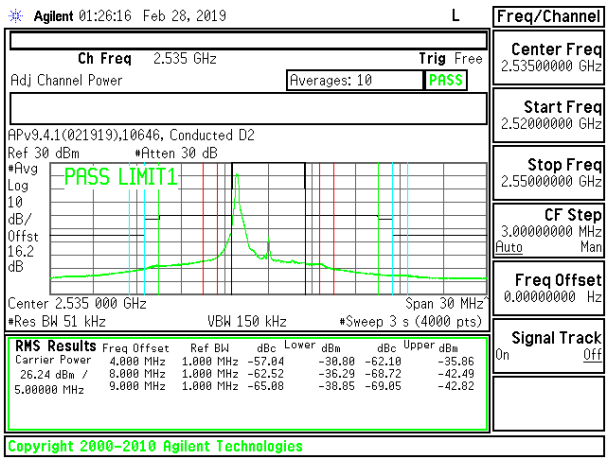
LTE B7 5MHz 16QAM Low Channel RB1-24



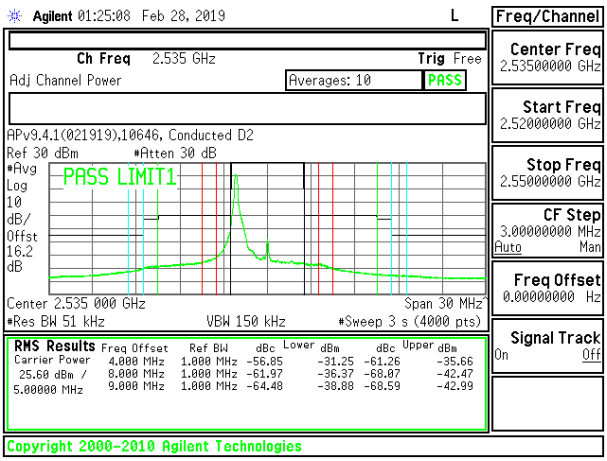
LTE B7 5MHz QPSK Low Channel RB25-0



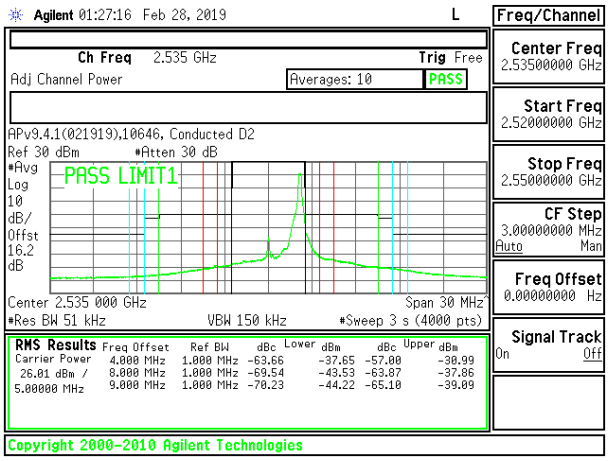
LTE B7 5MHz 16QAM Low Channel RB25-0



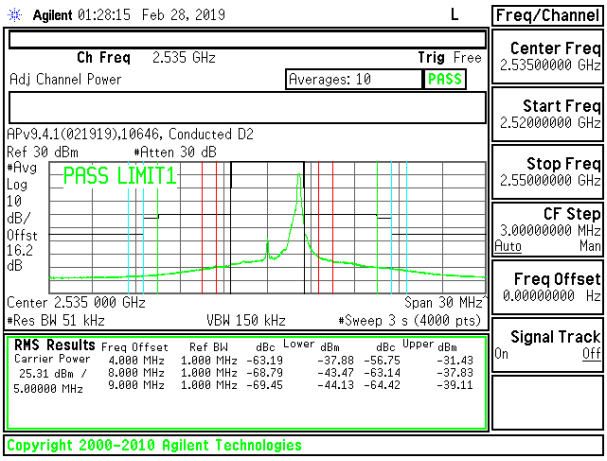
LTE B7 5MHz QPSK Middle Channel RB1-0



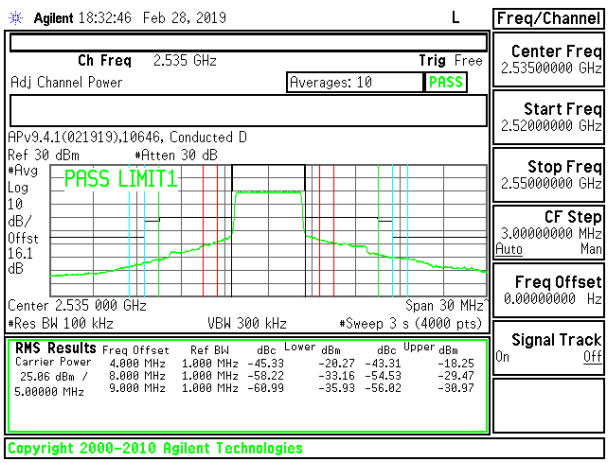
LTE B7 5MHz 16QAM Middle Channel RB1-0



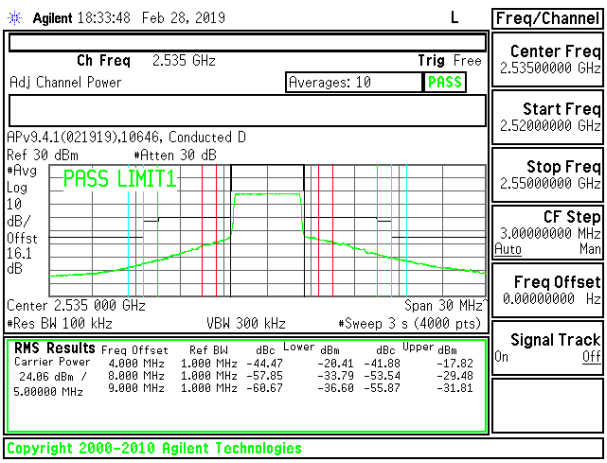
LTE B7 5MHz QPSK Middle Channel RB1-24



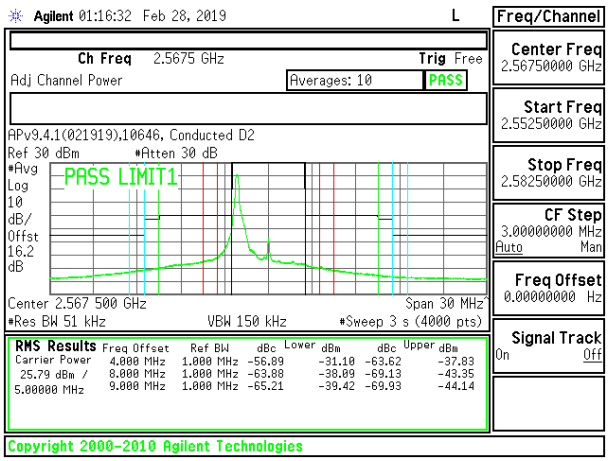
LTE B7 5MHz 16QAM Middle Channel RB1-24



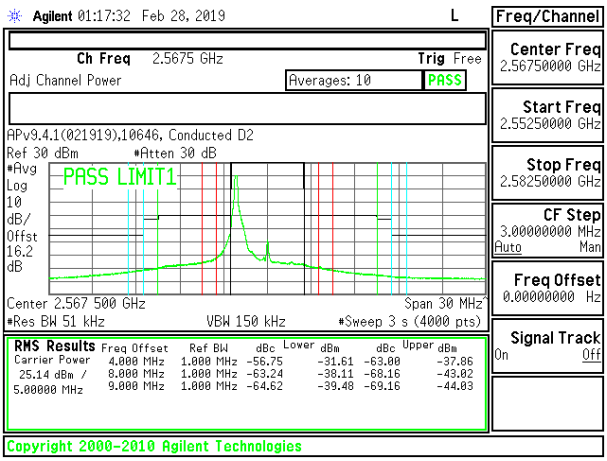
LTE B7 5MHz QPSK Middle Channel RB25-0



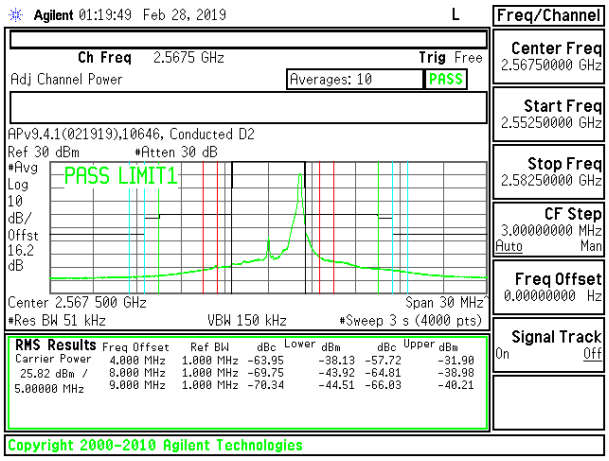
LTE B7 5MHz 16QAM Middle Channel RB25-0



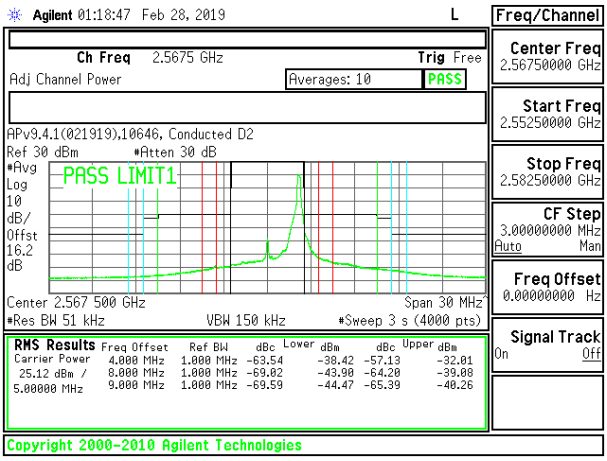
LTE B7 5MHz QPSK High Channel RB1-0



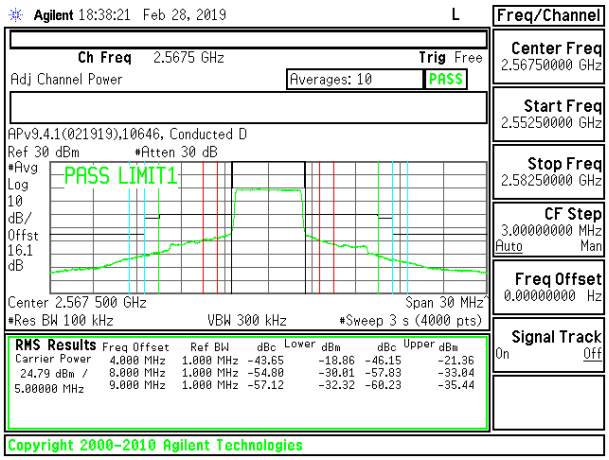
LTE B7 5MHz 16QAM High Channel RB1-0



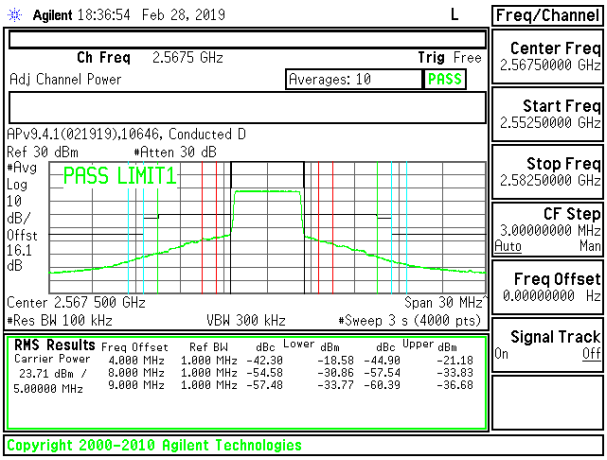
LTE B7 5MHz QPSK High Channel RB1-24



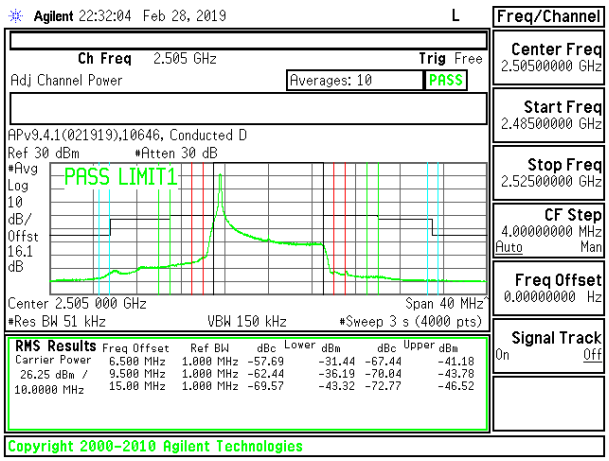
LTE B7 5MHz 16QAM High Channel RB1-24



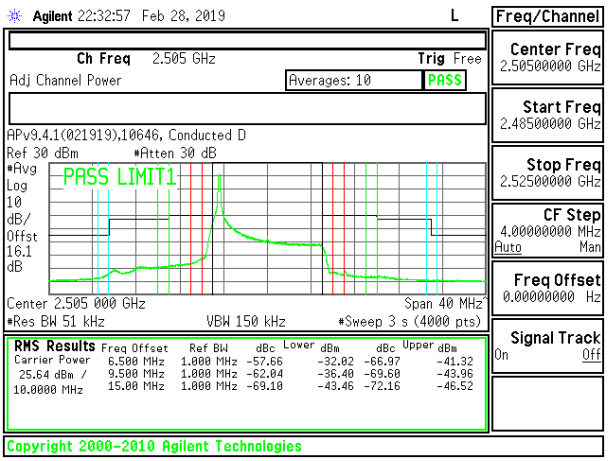
LTE B7 5MHz QPSK High Channel RB25-0



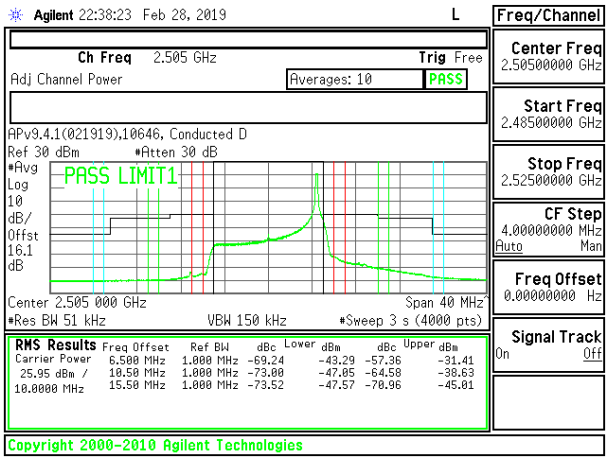
LTE B7 5MHz 16QAM High Channel RB25-0



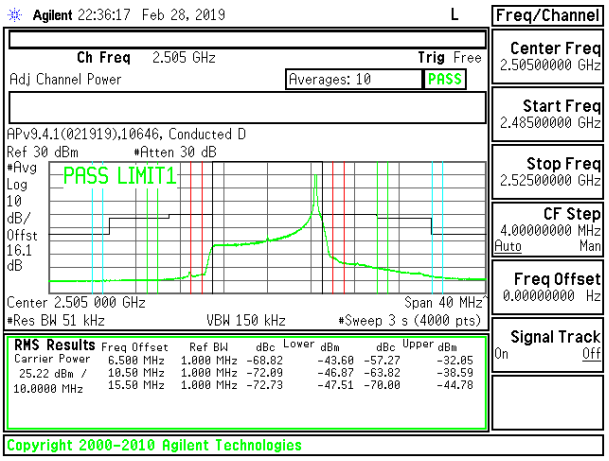
LTE B7 10MHz QPSK Low Channel RB1-0



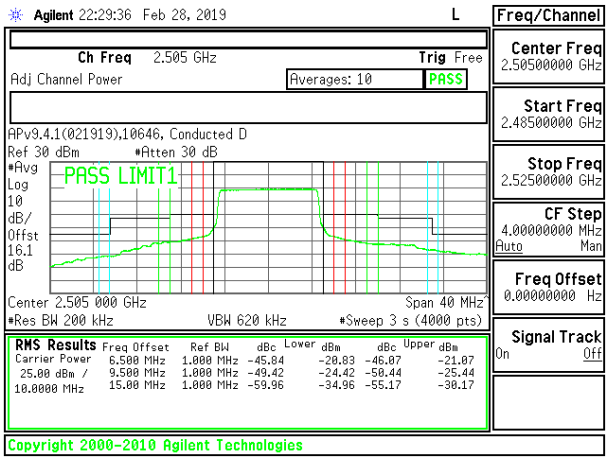
LTE B7 10MHz 16QAM Low Channel RB1-0



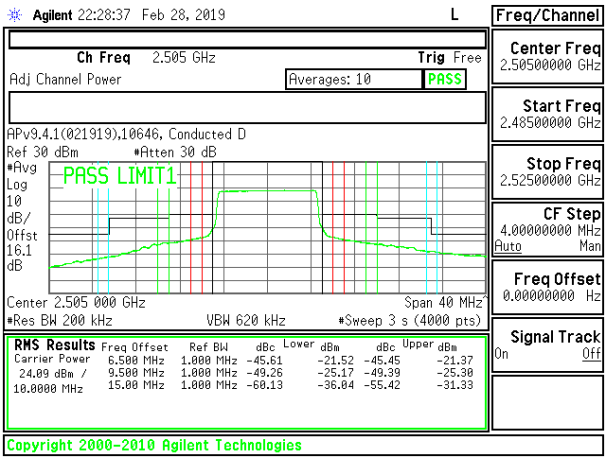
LTE B7 10MHz QPSK Low Channel RB1-49



LTE B7 10MHz 16QAM Low Channel RB1-49



LTE B7 10MHz QPSK Low Channel RB50-0



LTE B7 10MHz 16QAM Low Channel RB50-0