



CERTIFICATION TEST REPORT

Report Number. : 12726917-E2V3

Applicant : Samsung Electronics Co., Ltd.
129 Samsung-Ro, Yeongtong-Gu,
Suwon-Si, Gyeonggi-Do, 16677, Korea

MODEL : SM-A705W

FCC ID : A3LSMA705W

EUT Description : GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac, ANT+ and NFC

Test Standard(s) : FCC CFR47 PART 22 SUBPART H
FCC CFR47 PART 24 SUBPART E
FCC CFR47 PART 27 SUBPART F, H, L, and M
FCC CFR47 PART 90 SUBPART S
FCC CFR47 PART 15 SUBPART B

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1. ATTESTATION OF TEST RESULTS

Applicant Name and Address	SAMSUNG ELECTRONICS CO., LTD. 129 SAMSUNG-RO, YEONGTONG-GU, SUWON-SI, GYEONGGI-DO, 16677, KOREA
MODEL:	SM-A705W
FCC ID	A3LSMA705W
EUT Description	GSM/WCDMA/LTE PHONE WITH BT, DTS/UNII a/b/g/n/ac, ANT+ AND NFC
Serial Number	R38M20ETWBY (CONDUCTED), R38M20ESQ7B (RADIATED)
Date Tested	APRIL 01, 2019 to MAY 08, 2019
Applicable Standards	FCC CFR 47 PART 22H, 24E, 27F,H,L,M and 90S
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 For UL Verification Services Inc. By: 	Reviewed By: 
Dan Corona Operations Leader Consumer Technology Division UL Verification Services Inc.	Steven Tran Project Engineer Consumer Technology Division UL Verification Services Inc.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.26:2015, ANSI C63.4:2014, TIA-603-E, FCC CFR 47 Part 2, Part 22, Part 24, Part 27, Part 90, FCC KDB 971168 D01 v3r1.

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. Line conducted emissions are measured only at the 47173 address. 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
<input type="checkbox"/> Chamber A (ISED:2324B-1)	<input type="checkbox"/> Chamber D (ISED:22541-1)	<input checked="" type="checkbox"/> Chamber I (ISED:2324A-5)
<input type="checkbox"/> Chamber B (ISED:2324B-2)	<input type="checkbox"/> Chamber E (ISED:22541-2)	<input checked="" type="checkbox"/> Chamber J (ISED:2324A-6)
<input type="checkbox"/> Chamber C (ISED:2324B-3)	<input type="checkbox"/> Chamber F (ISED:22541-3)	<input checked="" type="checkbox"/> Chamber K (ISED:2324A-1)
	<input type="checkbox"/> Chamber G (ISED:22541-4)	<input type="checkbox"/> Chamber L (ISED:2324A-3)
	<input type="checkbox"/> 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

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:

$$\text{Field Strength (dBuV/m)} = \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} - \text{Preamp Gain (dB)}$$
$$36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} = 28.9 \text{ dBuV/m}$$

MAINS CONDUCTED EMISSIONS

Where relevant, the following sample calculation is provided:

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

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Worst Case Conducted Disturbance, 9KHz to 0.15 MHz	3.84 dB
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.65 dB
Worst Case Radiated Disturbance, 9KHz to 30 MHz	3.15 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	5.36 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.32 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.45 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.24 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac, ANT+ and NFC.

5.2. MAXIMUM OUTPUT POWER

ERP/EIRP LIMIT

FCC: §2.1046, §22.913, §24.232, §27.50, §90.635

EIRP/ERP TEST PROCEDURE

ANSI C63.26:2015 Sub-Clause 5.2.7/ TIA-603-E Clause 2.2.17
KDB 971168 D01 Section 5.8
KDB 412172 D01

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

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

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

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

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

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

The transmitter has a maximum average radiated ERP / EIRP output powers as follows:

GSM MODES

Part 22 850MHz					
Frequency range (MHz)	Modulation	Radiated ERP		99% BW (kHz)	Emission Designator
		Average (dBm)	Average (W)		
824.2-848.8	GPRS	30.37	1.0889	245.73	246KGXW
	EGPRS	24.80	0.3020	248.42	248KG7W
Part 24 1900MHz					
Frequency range (MHz)	Modulation	Radiated EIRP		99% BW (kHz)	Emission Designator
		Average (dBm)	Average (W)		
1850.2-1909.8	GPRS	29.13	0.8185	243.88	244KGXW
	EGPRS	26.57	0.4539	239.34	239KG7W

WCDMA MODES

Part 22 Band 5					
Frequency range (MHz)	Modulation	Radiated ERP		99% BW (kHz)	Emission Designator
		Average (dBm)	Average (W)		
826.4-846.6	REL 99	21.05	0.1274	4140	4M14F9W
	HSDPA	19.89	0.0975	4150	4M15F9W
Part 24 Band 2					
Frequency range (MHz)	Modulation	Radiated EIRP		99% BW (kHz)	Emission Designator
		Average (dBm)	Average (W)		
1852.4-1907.6	REL 99	23.63	0.2307	4130	4M13F9W
	HSDPA	21.56	0.1432	4130	4M13F9W
Part 27 Band 4					
Frequency range (MHz)	Modulation	Radiated EIRP		99% BW (kHz)	Emission Designator
		Average (dBm)	Average (W)		
1712.4-1752.6	REL 99	22.32	0.1706	4130	4M13F9W
	HSDPA	22.37	0.1726	4120	4M12F9W

LTE BAND 2

Part 24							
Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Radiated EIRP		99% BW (kHz)	Emission Designator
				Average (dBm)	Average (W)		
1.4	QPSK	1850.7	1909.3	23.32	0.2148	1100	1M10G7W
	16QAM			22.44	0.1754	1080	1M08D7W
3.0	QPSK	1851.5	1908.5	23.56	0.2270	2690	2M69G7W
	16QAM			22.61	0.1824	2690	2M69D7W
5.0	QPSK	1852.5	1907.5	23.79	0.2393	4490	4M49G7W
	16QAM			22.94	0.1968	4490	4M49D7W
10.0	QPSK	1855.0	1905.0	23.56	0.2270	8970	8M97G7W
	16QAM			22.68	0.1854	8970	8M97D7W
15.0	QPSK	1857.5	1902.5	24.04	0.2535	13360	13M4G7W
	16QAM			22.91	0.1954	13380	13M4D7W
20.0	QPSK	1860.0	1900.0	23.61	0.2296	17800	17M8G7W
	16QAM			22.76	0.1888	17800	17M8D7W

LTE BAND 4

Part 27							
Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Radiated EIRP		99% BW (kHz)	Emission Designator
				Average (dBm)	Average (W)		
1.4	QPSK	1710.7	1754.3	22.55	0.1799	1090	1M09G7W
	16QAM			21.79	0.1510	1080	1M08D7W
3.0	QPSK	1711.5	1753.5	22.55	0.1799	2690	2M69G7W
	16QAM			21.62	0.1452	2690	2M69D7W
5.0	QPSK	1712.5	1752.5	22.58	0.1811	4500	4M50G7W
	16QAM			21.68	0.1472	4500	4M50D7W
10.0	QPSK	1715.0	1750.0	22.68	0.1853	8940	8M94G7W
	16QAM			21.71	0.1483	8940	8M94D7W
15.0	QPSK	1717.5	1747.5	22.60	0.1820	13370	13M4G7W
	16QAM			21.71	0.1483	13400	13M4D7W
20.0	QPSK	1720.0	1745.0	22.53	0.1791	17820	17M8G7W
	16QAM			21.69	0.1476	17860	17M9D7W

LTE BAND 5

Part 22H							
Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Radiated ERP		99% BW (kHz)	Emission Designator
				Average (dBm)	Average (W)		
1.4	QPSK	824.7	848.3	20.45	0.1109	1090	1M09G7W
	16QAM			19.59	0.0910	1080	1M08D7W
3.0	QPSK	825.5	847.5	20.98	0.1253	2690	2M69G7W
	16QAM			20.17	0.1040	2680	2M68D7W
5.0	QPSK	826.5	846.5	20.86	0.1219	4500	4M50G7W
	16QAM			20.15	0.1035	4500	4M50D7W
10.0	QPSK	829.0	844.0	21.02	0.1265	8940	8M94G7W
	16QAM			20.22	0.1052	8930	8M93D7W

LTE BAND 7

Part 27							
Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Radiated EIRP		99% BW (kHz)	Emission Designator
				Average (dBm)	Average (W)		
5.0	QPSK	2502.5	2567.5	20.52	0.1127	4500	4M50G7W
	16QAM			19.72	0.0938	4500	4M50D7W
10.0	QPSK	2505.0	2565.0	20.52	0.1127	8960	8M96G7W
	16QAM			19.66	0.0925	8950	8M95D7W
15.0	QPSK	2507.5	2562.5	21.13	0.1297	13420	13M4G7W
	16QAM			20.28	0.1067	13420	13M4D7W
20.0	QPSK	2510.0	2560.0	20.92	0.1236	17830	17M8G7W
	16QAM			20.14	0.1033	17840	17M8D7W

LTE BAND 12

Part 27							
Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Radiated ERP		99% BW (kHz)	Emission Designator
				Average (dBm)	Average (W)		
1.4	QPSK	699.7	715.3	20.53	0.1130	1090	1M09G7W
	16QAM			19.59	0.0910	1080	1M08D7W
3.0	QPSK	700.5	714.5	20.83	0.1211	2680	2M68G7W
	16QAM			19.97	0.0993	2680	2M68D7W
5.0	QPSK	701.5	713.5	20.72	0.1180	4520	4M52G7W
	16QAM			19.91	0.0979	4490	4M49D7W
10.0	QPSK	704.0	711.0	20.58	0.1143	8950	8M95G7W
	16QAM			19.72	0.0938	8960	8M96D7W

LTE BAND 13

Part 27							
Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Radiated ERP		99% BW (kHz)	Emission Designator
				Average (dBm)	Average (W)		
5.0	QPSK	779.5	784.5	19.86	0.0968	4510	4M51G7W
	16QAM			19.02	0.0798	4520	4M52D7W
10.0	QPSK	782.0	782.0	20.14	0.1033	8960	8M96G7W
	16QAM			19.25	0.0841	8940	8M94D7W

LTE BAND 26 (FCC Part 90S)

Part 90S							
Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Radiated ERP		99% BW (kHz)	Emission Designator
				Average (dBm)	Average (W)		
1.4	QPSK	814.7	823.3	19.28	0.0847	1080	1M08G7W
	16QAM			18.37	0.0687	1080	1M08D7W
3.0	QPSK	815.5	822.5	19.54	0.0899	2690	2M69G7W
	16QAM			18.74	0.0748	2690	2M69D7W
5.0	QPSK	816.5	821.5	19.73	0.0940	4500	4M50G7W
	16QAM			19.07	0.0807	4500	4M50D7W
10.0	QPSK	819.0	819.0	19.44	0.0879	8940	8M94G7W
	16QAM			18.51	0.0710	8940	8M94D7W
15.0	QPSK	821.5	821.5	19.82	0.0959	13390	13M4G7W
	16QAM			18.89	0.0774	13390	13M4D7W

LTE BAND 26 (FCC Part 22)

Part 22							
Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Radiated ERP		99% BW (kHz)	Emission Designator
				Average (dBm)	Average (W)		
1.4	QPSK	824.7	848.3	19.30	0.0851	1080	1M08G7W
	16QAM			18.45	0.0700	1080	1M08D7W
3.0	QPSK	825.5	847.5	19.67	0.0927	2690	2M69G7W
	16QAM			18.88	0.0773	2680	2M68D7W
5.0	QPSK	826.5	846.5	20.09	0.1021	4510	4M51G7W
	16QAM			19.43	0.0877	4510	4M51D7W
10.0	QPSK	829.0	844.0	19.96	0.0991	8950	8M95G7W
	16QAM			19.19	0.0830	8950	8M95D7W
15.0	QPSK	831.5	841.5	20.04	0.1009	13360	13M4G7W
	16QAM			19.25	0.0841	13370	13M4D7W

LTE BAND 41 (FCC)

Part 27							
Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Radiated EIRP		99% BW (kHz)	Emission Designator
				Average (dBm)	Average (W)		
5.0	QPSK	2498.5	2687.5	18.20	0.0661	4510	4M51G7W
	16QAM			17.41	0.0551	4490	4M49D7W
10.0	QPSK	2501.0	2685.0	18.38	0.0689	8940	8M94G7W
	16QAM			17.51	0.0564	8930	8M93D7W
15.0	QPSK	2503.5	2682.5	18.64	0.0731	13420	13M4G7W
	16QAM			17.73	0.0593	13380	13M4D7W
20.0	QPSK	2506.0	2680.0	19.16	0.0824	17750	17M8G7W
	16QAM			18.27	0.0671	17810	17M8D7W

LTE BAND 66

Part 27							
Bandwidth (MHz)	Modulation	Low Frequency (MHz)	Upper Frequency (MHz)	Radiated ERP		99% BW (kHz)	Emission Designator
				Average (dBm)	Average (W)		
1.4	QPSK	1710.7	1779.3	21.82	0.1521	1080	1M08G7W
	16QAM			20.98	0.1253	1090	1M09D7W
3.0	QPSK	1711.5	1778.5	21.96	0.1570	2690	2M69G7W
	16QAM			21.11	0.1291	2680	2M68D7W
5.0	QPSK	1712.5	1777.5	22.20	0.1660	4510	4M51G7W
	16QAM			21.36	0.1368	4500	4M50D7W
10.0	QPSK	1715.0	1775.0	21.98	0.1578	8960	8M96G7W
	16QAM			21.10	0.1288	8980	8M98D7W
15.0	QPSK	1717.5	1772.5	22.26	0.1683	13390	13M4G7W
	16QAM			21.39	0.1377	13430	13M4D7W
20.0	QPSK	1720.0	1770.0	21.60	0.1445	17810	17M8G7W
	16QAM			20.83	0.1211	17860	17M9D7W

5.3. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was A705FN.001.

5.4. MAXIMUM ANTENNA GAIN

Please see table below:

LTE Bands	Antenna Gain (dBi)
GSM850, 824-849MHz	-7.39
GSM1900, 1850-1910MHz	-5.89
WCDMA Band 2, 1850-1910 MHz	-5.89
WCDMA Band 4, 1710-1755 MHz	-6.87
WCDMA Band 5, 824-849 MHz	-7.39
LTE BAND 2, 1850 - 1910 MHz	-5.89
LTE BAND 4, 1710 - 1755 MHz	-6.87
LTE BAND 5, 824-849 MHz	-7.39
LTE BAND 7, 2500 - 2570 MHz	-6.27
LTE BAND 12, 699 - 716 MHz	-7.88
LTE BAND 13, 777 - 787 MHz	-9.91
LTE BAND 17, 704-716 MHz	-7.88
LTE BAND 26 (FCC PART 22), 824 - 849 MHz	-7.39
LTE BAND 26 (FCC PART 90S), 814 - 824 MHz	-7.39
LTE BAND 41 (FCC), 2496 - 2690 MHz	-6.35
LTE BAND 66, 1710 - 1780 MHz	-6.25

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 26, Band 41 and Band 66.

The worst-case scenario for all measurements is based on the average conducted output power measurement investigation results. Output power measurements were measured on QPSK, 16QAM, and 64QAM modulations. All testing was performed using QPSK, and 16QAM modulations to represent the worst case.

The fundamental of the EUT was investigated in three orthogonal orientations X, Y, & Z, and it was determined that X-Axis for 1700 and 1900MHz, X-Axis for 700 and 800MHz, and Y-Axis for 2500MHz with AC/DC Adapter and headset was worst-case orientation.

All radios that can be transmitted simultaneously have been evaluated for radiated for all possible combinations of transmission and found to be in compliance.

LTE Band 17 (704 - 716 MHz, 5/10 MHz bandwidth) is covered by LTE Band 12 because it is a subset of LTE band 12 and they have same output power and channel bandwidth.

LTE Band 38 (2570 - 2620 MHz, 5/10/15/20 MHz bandwidth) is covered by LTE Band 41 because it is a subset of LTE band 41 and they have same output power and channel bandwidth.

For check the Part15B receiver mode (Appendix A):

For LTE B12 / LTE B13 / LTE B26, the spurious emissions was investigated in three orthogonal orientations X, Y and Z it was determined that X orientation was worst-case orientation.

In addition, LTE Band 17 (Frequency range: 734-746 MHz) is covered by LTE Band 12 (Frequency range: 729-746 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	Samsung	EP-TA50EWE	DW3J719AS/A-E	N/A
USB Data Cable	Samsung	N/A	N/A	N/A
Earphone	Samsung	N/A	N/A	N/A

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	RF Out	1	Spectrum Analyzer	Shielded	None	NA
2	Antenna Port	1	EUT	Shielded	0.1m	NA
3	RF In/Out	1	Communication Test Set	Shielded	1m	NA

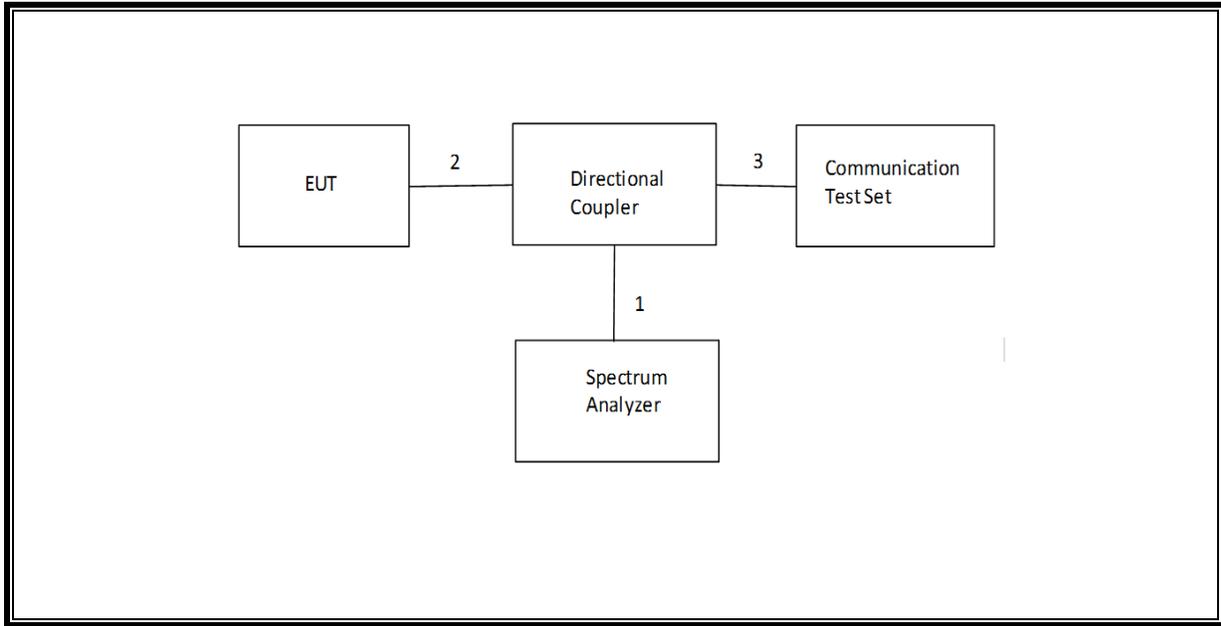
I/O CABLES (RF Radiated Test)

I/O Cable List						
Cable No	Port	# of identic	Connector Type	Cable Type	Cable Length	Remarks
1	USB	1	AC Adapter	Un-shielded	1.2m	No
2	Earphone	1	USB	Un-shielded	1m	No
3	RF In/out	1	Communication Test Set	Un-shielded	2m	No

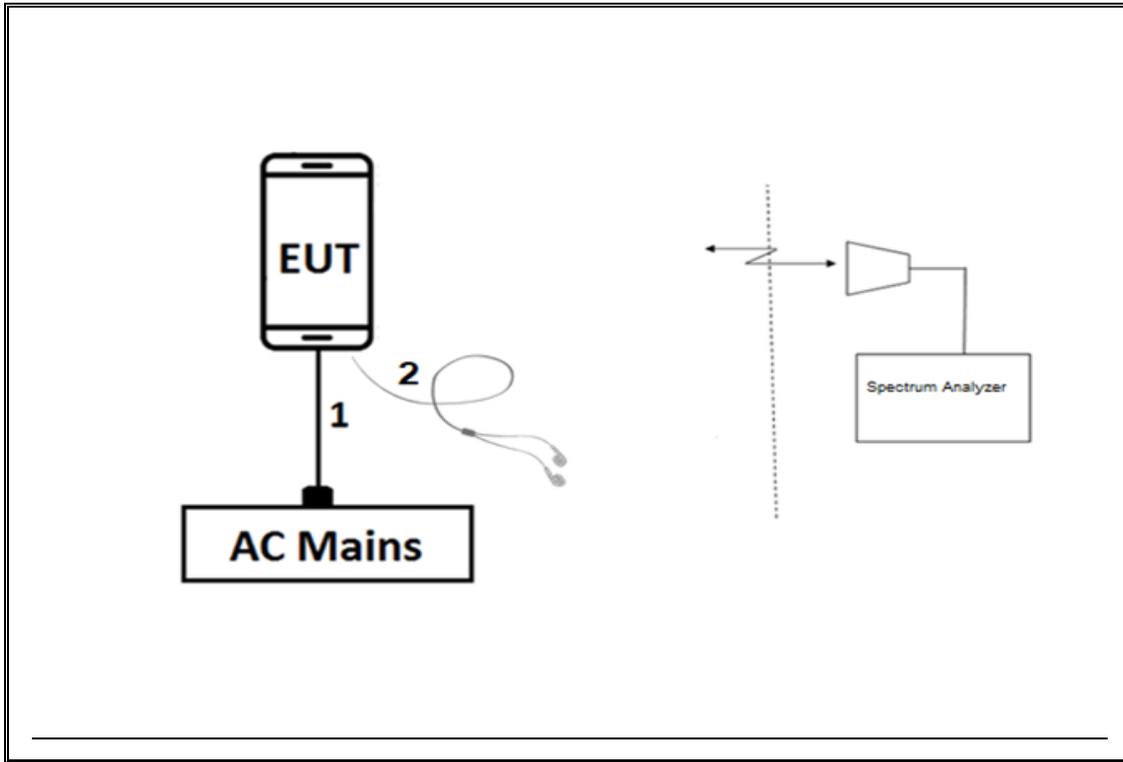
TEST SETUP

The EUT is continuously communicated to the call box during the tests

CONDUCTED TEST SETUP DIAGRAM



RADIATED TEST SETUP DIAGRAM



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	ID Num	Cal Due	Last Cal
Highpass Filter, 2.7 GHz	Micro-Circuits	H2G518G6	T772	07/05/19	07/05/18
Highpass Filter, 1.5 GHz	Micro-Tronics	HPM50114	T1852	07/31/19	07/31/18
Highpass Filter, 4GHz	Micro-Tronics	HPM13351	T1240	08/31/19	08/31/18
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T344	04/30/19	04/30/18
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T863	06/21/19	06/21/18
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	PRE0189055	04/20/20	04/20/19
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T862	05/24/19	05/24/18
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	AT0067	04/26/19	04/26/18
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T345	04/25/19	04/25/18
Ant., Horn 18 - 26.5 GHz	ARA	MWH-1826/B	T477	06/16/2019	06/16/2018
Hybrid Antenna	SunAR rf motion	JB3	PRE0184052	10/24/19	10/24/18
Hybrid Antenna	SunAR rf motion	JB3	PRE0184971	11/13/19	11/13/18
Hybrid Antenna	SunAR rf motion	JB3	PRE0181575	08/01/19	08/01/18
Hybrid Antenna	SunAR rf motion	JB3	PRE0181574	08/01/19	08/01/18
RF Amplifier	MITEQ	AFS42-00101800-25-S-42	171460	08/01/19	08/01/18
RF Amplifier	AMPLICAL	AMP1G18-35	T1571	07/30/19	07/30/18
RF Amplifier	AMPLICAL	AMP1G18-35	T1569	06/03/19	06/03/18
RF Amplifier	MITEQ	AFS42-00101800-25-S-42	T1165	02/20/20	02/20/19
RF Amplifier 9KHz – 1GHz	SONOMA INSTR	310	PRE0180175	07/09/19	07/09/18
RF Amplifier 9KHz – 1GHz	SONOMA INSTR	310	PRE0180174	05/31/19	05/31/18
RF Amplifier 9KHz – 1GHz	SONOMA INSTR	310	175953	12/13/19	12/13/18
Amplifier 100kHz – 1GHz	Agilent	8447D	T15	10/20/19	10/20/18
Directional Coupler	KRYTAR	T922	PRE0078321	06/18/19	06/18/18
Wideband Communication Test Set, Call Box	R&S	CMW500	T375	02/18/20	02/18/19
Wideband Communication Test Set, Call Box	R&S	CMW500	T1871	02/18/20	02/18/19
Wideband Communication Test Set, Call Box	R&S	CMW500	T949	02/21/20	02/21/19
Chamber, Environmental	Thermotron	SE-600-10-10	T80	05/01/19	11/01/18
Spectrum Analyzer	Agilent (Keysight) Technologies	E4440A	T200	01/28/20	01/28/19
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	PRE0179375	05/08/19	05/08/18
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	PRE0179372	05/04/19	05/04/18
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	PRE0179377	02/15/20	02/15/19
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	PRE0179376	02/14/20	02/14/19
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T1454	01/25/20	01/25/19
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T917	01/24/20	01/24/19
DC power supply, 8 V @ 3 A or 15 V @ 2 A	Agilent / HP	E3610A	None	CNR	CNR
DC power supply 15V	Sprensen	XT15-4	T463	CNR	CNR
Power Meter	Keysight	N1911A	T1265	01/29/20	01/29/19
Power Sensor	Keysight	N1921A	T1227	02/05/20	02/05/19

UL AUTOMATION SOFTWARE			
CLT Software	UL	UL RF	Ver 7.6, November 11, 2017
Power Measurement Software	UL	UL RF	Ver 2.2, June 2017

NOTES:

1. Equipment listed above that calibrated during the testing period was set for test after the calibration.
2. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.

7. RF OUTPUT POWER VERIFICATION

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

7.1. GSM

Using CMW500 Communication Test Set

Function: Menu select > GSM Mobile Station > GSM 850/900/1800/1900

Press **Connection control** to choose the different menus

Press **RESET** > choose all to reset all settings

Connection	Press Signal Off to turn off the signal and change settings Network Support > GSM+GPRS or GSM+EGPRS Main Service > Packet Data Service selection > Test Mode A – Auto Slot Config. off
MS Signal	Press Slot Config bottom on the right twice to select and change the number of time slots and power setting > Slot configuration > Uplink/Gamma > 33 dBm for GPRS 850/900 > 27 dBm for EGPRS 850/900 > 30 dBm for GPRS1800/1900 > 26 dBm for EGPRS1800/1900
BS Signal	Enter the same channel number for TCH channel (test channel) and BCCH channel Frequency Offset > + 0 Hz Mode > BCCH and TCH BCCH Level > -85 dBm (May need to adjust if link is not stable) BCCH Channel > choose desire test channel [Enter the same channel number for TCH channel (test channel) and BCCH channel] Channel Type > Off P0> 4 dB Slot Config > Unchanged (if already set under MS Signal) TCH > choose desired test channel Hopping > Off Main Timeslot > 3 (Default)
Network	Coding Scheme > CS 4 (GPRS) and MCS5 (EGPRS) Bit Stream > 2E9-1PSR Bit Pattern
AF/RF	Enter appropriate offsets for Ext. Att. Output and Ext. Att. Input
Connection	Press Signal On to turn on the signal and change settings

RESULT

7.1.1. GSM850

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GPRS (GMSK) - Coding Scheme: CS1

Band	Ch No.	Freq. (MHz)	Power			
			1 slot	2 slots	3 slots	4 slots
850.0	128	824.2	33.3	29.9	28.1	26.7
	190	836.6	33.2	29.9	28.1	26.6
	251	848.8	32.7	29.8	27.4	26.5

EGPRS (8PSK) - Coding Scheme: MCS5

Band	Ch No.	Freq. (MHz)	Power			
			1 slot	2 slots	3 slots	4 slots
850.0	128	824.2	26.7	24.0	22.1	20.9
	190	836.6	26.9	24.3	22.1	21.0
	251	848.8	26.2	23.8	22.0	20.1

7.1.2. GSM1900

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GPRS (GMSK) - Coding Scheme: CS1

Band	Ch No.	Freq. (MHz)	Power			
			1 slot	2 slots	3 slots	4 slots
1900.0	512	1850.2	30.1	28.4	26.2	25.5
	661	1880.0	30.0	28.4	26.2	25.5
	810	1909.8	29.8	28.5	26.4	25.5

EGPRS (8PSK) - Coding Scheme: MCS5

Band	Ch No.	Freq. (MHz)	Power			
			1 slot	2 slots	3 slots	4 slots
1900.0	512	1850.2	25.0	22.8	22.0	20.2
	661	1880.0	24.9	22.9	21.7	19.8
	810	1909.8	25.6	23.1	22.5	21.0

7.2. WCDMA

TEST PROCEDURE

The transmitter output was connected to the input terminal of Directional Coupler via calibrated coaxial cable. The output coupling terminal of the Directional Coupler was directly connected to a spectrum analyzer while the output through terminal connected to the communication test set via calibrated coaxial cable.

The output power was measured with the spectrum analyzer at the low, middle and high channel in each band.

- Set the spectrum analyzer span wide enough or greater than the modulated signal BW.
- Set a spectrum analyzer at peak detection mode with VBW \geq RBW \geq 26dB BW, typically 5MHz.
- Set a marker to point the corresponding peak value.

REL 99

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 specification. The DUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7).

Mode	Subtest	Rel99
WCDMA General Settings	Loopback Mode	Test Mode 2
	Rel99 RMC	12.2kbps RMC
	Power Control Algorithm	Algorithm2
	β_c/β_d	8/15

HSDPA REL 5

The following 4 Sub-tests were completed according to Release 5 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

Mode	HSDPA	HSDPA	HSDPA	HSDPA	
Subtest	1	2	3	4	
W-CDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set 1			
	Power Control Algorithm	Algorithm 2			
	Bc	2/15	12/15	15/15	15/15
	Bd	15/15	15/15	8/15	4/15
	Bd (SF)	64			
	β_c/β_d	2/15	12/15	15/8	15/4
	Bhs	4/15	24/15	30/15	30/15
MPR (dB)	0	0	0.5	0.5	
HSDPA Specific Settings	D _{ACK}	8			
	D _{NAK}	8			
	DCQI	8			
	Ack-Nack repetition factor	3			
	CQI Feedback (Table 5.2B.4)	4ms			
	CQI Repetition Factor (Table 5.2B.4)	2			
A _{hs} = β_{hs}/β_c	30/15				

HSPA (HSDPA & HSUPA)

The following 5 Sub-tests were completed according to Release 9 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

	Mode	HSPA				
	Subtest	1	2	3	4	5
WCDMA General Settings	Loopback Mode	Test Mode 1				
	Rel99 RMC	12.2 kbps RMC				
	HSDPA FRC	H-Set 1				
	HSUPA Test	HSPA				
	Power Control Algorithm	Algorithm 2				Algorithm 1
	β_c	11/15	6/15	15/15	2/15	15/15
	β_d	15/15	15/15	9/15	15/15	0
	β_{ec}	209/225	12/15	30/15	2/15	5/15
	β_c/β_d	11/15	6/15	15/9	2/15	-
	β_{hs}	22/15	12/15	30/15	4/15	5/15
	β_{ed}	1309/225	94/75	47/15	56/75	47/15
CM (dB)	1	3	2	3	1	
MPR (dB)	0	2	1	2	0	
HSDPA Specific Settings	DACK	8				0
	DNAK	8				0
	DCQI	8				0
	Ack-Nack repetition factor	3				
	CQI Feedback (Table 5.2B.4)	4ms				
	CQI Repetition Factor (Table 5.2B.4)	2				
	A _{hs} = β_{hs}/β_c	30/15				
HSUPA Specific Settings	E-DPDCCH	6	8	8	5	0
	DHARQ	0	0	0	0	0
	AG Index	20	12	15	17	12
	ETFCl (from 34.121 Table C.11.1.3)	75	67	92	71	67
	Associated Max UL Data Rate kbps	242.1	174.9	482.8	205.8	308.9
	Reference E-TFCIs	5	5	2	5	1
	Reference E-TFCI	11	11	11	11	67
	Reference E-TFCI PO	4	4	4	4	18
	Reference E-TFCI	67	67	92	67	67
	Reference E-TFCI PO	18	18	18	18	18
	Reference E-TFCI	71	71	71	71	71
	Reference E-TFCI PO	23	23	23	23	23
	Reference E-TFCI	75	75	75	75	75
	Reference E-TFCI PO	26	26	26	26	26
Reference E-TFCI	81	81	81	81	81	
Reference E-TFCI PO	27	27	27	27	27	
Maximum Channelization Codes	2xSF2				SF4	

DUAL CARRIER HSDPA (DC-HSDPA (REL 8, CAT 24))

The following tests were completed according to procedures in section 7.3.13 of 3GPP TS34.108 v9.5.0. A summary of these settings are illustrated below:

Downlink Physical Channels are set as per 3GPP TS34.121-1 v9.0.0 E.5.0

Table E.5.0: Levels for HSDPA connection setup

Parameter During Connection setup	Unit	Value
P-CPICH_Ec/Ior	dB	-10
P-CCPCH and SCH_Ec/Ior	dB	-12
PICH_Ec/Ior	dB	-15
HS-PDSCH	dB	off
HS-SCCH_1	dB	off
DPCH_Ec/Ior	dB	-5
OCNS_Ec/Ior	dB	-3.1

Call is set up as per 3GPP TS34.108 v9.5.0 sub clause 7.3.13

The configurations of the fixed reference channels for HSDPA RF tests are described in 3GPP TS 34.121, annex C for FDD and 3GPP TS 34.122.

Table C.8.1.12: Fixed Reference Channel H-Set 12

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	Processes	6
Information Bit Payload (N_{INF})	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK
Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table. Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.		

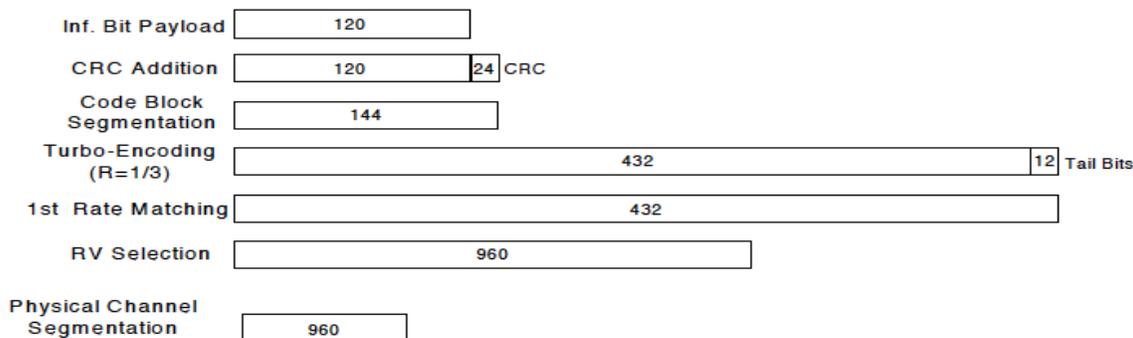


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

The following 4 Sub-tests for HSDPA were completed according to Release 8 procedures in section 5.2 of 3GPP TS34.121. A summary of subtest settings are illustrated below:

Mode	HSDPA	HSDPA	HSDPA	HSDPA	
Subtest	1	2	3	4	
WCDMA General Settings	Loopback Mode				Test Mode 1
	Rel99 RMC				12.2kbps RMC
	HSDPA FRC				H-Set 1
	Power Control Algorithm				Algorithm2
	β_c	2/15	11/15	15/15	15/15
	β_d	15/15	15/15	8/15	4/15
	β_d (SF)	64			
	β_c/β_d	2/15	12/15	15/8	15/4
β_{hs}	4/15	24/15	30/15	30/15	
MPR (dB)	0	0	0.5	0.5	
HSDPA Specific Settings	DACK				8
	DNAK				8
	DCQI				8
	Ack-Nack Repetition factor				3
	CQI Feedback				4ms
	CQI Repetition Factor				2
	Ahs = β_{hs}/β_c				30/15

HSPA+

The following 1 Sub-test was completed according to Release 9 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

Table C.11.1.4: β values for transmitter characteristics tests with HS-DPCCH and E-DCH with 16QAM

Sub-test	β_c (Note3)	β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (2xSF2) (Note 4)	β_{ed} (2xSF4) (Note 4)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 4)	E-TFCI (Note 5)	E-TFCI (boost)
1	1	0	30/15	30/15	β_{ed1} : 30/15 β_{ed2} : 30/15	β_{ed3} : 24/15 β_{ed4} : 24/15	3.5	2.5	14	105	105
Note 1: $\Delta_{ACK}, \Delta_{NACK}$ and $\Delta_{CQI} = 30/15$ with $\beta_{hs} = 30/15 * \beta_c$. Note 2: CM = 3.5 and the MPR is based on the relative CM difference, MPR = MAX(CM-1,0). Note 3: DPDCH is not configured, therefore the β_c is set to 1 and $\beta_d = 0$ by default. Note 4: β_{ed} can not be set directly; it is set by Absolute Grant Value. Note 5: All the sub-tests require the UE to transmit 2SF2+2SF4 16QAM EDCH and they apply for UE using E-DPDCH category 7. E-DCH TTI is set to 2ms TTI and E-DCH table index = 2. To support these E-DCH configurations DPDCH is not allocated. The UE is signalled to use the extrapolation algorithm.											

RESULT

7.2.1. WCDMA BAND5

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Band	Mode		UL Ch No.	Freq. (MHz)	MPR (dB)	Average	
						(dBm)	
W-CDMA Band 5 (850MHz)	Rel 99	RMC, 12.2 kbps	4132	826.4	N/A	24.1	
			4183	836.6	N/A	23.8	
			4233	846.6	N/A	23.7	
	HSDPA	Subtest 1	4132	826.4	0	23.4	
			4183	836.6	0	23.3	
			4233	846.6	0	23.1	
		Subtest 2	4132	826.4	0.0	23.4	
			4183	836.6	0.0	23.3	
			4233	846.6	0.0	23.1	
		Subtest 3	4132	826.4	0.5	22.9	
			4183	836.6	0.5	22.8	
			4233	846.6	0.5	22.6	
		Subtest 4	4132	826.4	0.5	22.9	
			4183	836.6	0.5	22.8	
			4233	846.6	0.5	22.6	
		HSUPA	Subtest 1	4132	826.4	0.0	23.0
				4183	836.6	0.0	22.7
				4233	846.6	0.0	22.7
	Subtest 2		4132	826.4	2.0	21.2	
			4183	836.6	2.0	20.9	
			4233	846.6	2.0	20.7	
	Subtest 3		4132	826.4	1.0	22.2	
			4183	836.6	1.0	21.9	
			4233	846.6	1.0	21.8	
	Subtest 4		4132	826.4	2.0	21.1	
			4183	836.6	2.0	20.8	
			4233	846.6	2.0	20.6	
	Subtest 5		4132	826.4	0.0	23.0	
			4183	836.6	0.0	22.8	
			4233	846.6	0.0	22.6	
	DC-HSDPA	Subtest 1	4132	826.4	0.0	23.4	
			4183	836.6	0.0	23.3	
			4233	846.6	0.0	23.1	
		Subtest 2	4132	826.4	0.0	23.4	
			4183	836.6	0.0	23.3	
			4233	846.6	0.0	23.1	
		Subtest 3	4132	826.4	0.5	22.9	
			4183	836.6	0.5	22.8	
			4233	846.6	0.5	22.6	
		Subtest 4	4132	826.4	0.5	22.9	
			4183	836.6	0.5	22.8	
			4233	846.6	0.5	22.6	

7.2.2. WCDMA BAND2

ID:	52280	Date:	4/1/19
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Band	Mode		UL Ch No.	Freq. (MHz)	MPR (dB)	Average	
						(dBm)	
W-CDMA Band 2 (1900MHz)	Rel 99	RMC, 12.2 kbps	9262	1852.4	N/A	23.3	
			9400	1880.0	N/A	24.3	
			9538	1907.6	N/A	24.3	
	HSDPA	Subtest 1	9262	1852.4	0	21.8	
			9400	1880.0	0	22.0	
			9538	1907.6	0	22.0	
		Subtest 2	9262	1852.4	0	21.8	
			9400	1880.0	0	22.0	
			9538	1907.6	0	22.1	
		Subtest 3	9262	1852.4	0.5	21.4	
			9400	1880.0	0.5	21.5	
			9538	1907.6	0.5	21.5	
		Subtest 4	9262	1852.4	0.5	21.4	
			9400	1880.0	0.5	21.5	
			9538	1907.6	0.5	21.5	
		HSUPA	Subtest 1	9262	1852.4	0	22.1
				9400	1880.0	0	22.1
				9538	1907.6	0	22.1
	Subtest 2		9262	1852.4	2	20.2	
			9400	1880.0	2	20.1	
			9538	1907.6	2	20.1	
	Subtest 3		9262	1852.4	1	21.2	
			9400	1880.0	1	21.1	
			9538	1907.6	1	21.1	
	Subtest 4		9262	1852.4	2	20.2	
			9400	1880.0	2	20.1	
			9538	1907.6	2	20.0	
	Subtest 5		9262	1852.4	0	22.2	
			9400	1880.0	0	22.1	
			9538	1907.6	0	22.1	
	DC-HSDPA	Subtest 1	9262	1852.4	0	21.9	
			9400	1880.0	0	22.0	
			9538	1907.6	0	22.0	
		Subtest 2	9262	1852.4	0	21.8	
			9400	1880.0	0	22.0	
			9538	1907.6	0	22.0	
		Subtest 3	9262	1852.4	0.5	21.4	
			9400	1880.0	0.5	21.6	
			9538	1907.6	0.5	21.5	
		Subtest 4	9262	1852.4	0.5	21.3	
			9400	1880.0	0.5	21.5	
			9538	1907.6	0.5	21.5	

7.2.3. WCDMA BAND4

ID:	52300	Date:	4/10/19
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Band	Mode		UL Ch No.	Freq. (MHz)	MPR (dB)	Average	
						(dBm)	
W-CDMA Band 4 (1900MHz)	Rel 99	RMC, 12.2 kbps	1312	1712.4	N/A	23.0	
			1413	1732.6	N/A	24.0	
			1513	1752.6	N/A	23.9	
	HSDPA	Subtest 1	1312	1712.4	0	22.5	
			1413	1732.6	0	23.6	
			1513	1752.6	0	23.9	
		Subtest 2	1312	1712.4	0	22.5	
			1413	1732.6	0	23.7	
			1513	1752.6	0	24.0	
		Subtest 3	1312	1712.4	0.5	22.0	
			1413	1732.6	0.5	23.1	
			1513	1752.6	0.5	23.6	
		Subtest 4	1312	1712.4	0.5	22.1	
			1413	1732.6	0.5	23.2	
			1513	1752.6	0.5	23.5	
		HSUPA	Subtest 1	1312	1712.4	0	22.5
				1413	1732.6	0	23.1
				1513	1752.6	0	23.7
	Subtest 2		1312	1712.4	2	20.5	
			1413	1732.6	2	21.7	
			1513	1752.6	2	22.1	
	Subtest 3		1312	1712.4	1	21.5	
			1413	1732.6	1	22.9	
			1513	1752.6	1	23.2	
	Subtest 4		1312	1712.4	2	20.5	
			1413	1732.6	2	21.7	
			1513	1752.6	2	22.2	
	Subtest 5		1312	1712.4	0	22.5	
			1413	1732.6	0	22.9	
			1513	1752.6	0	23.2	
	DC-HSDPA	Subtest 1	1312	1712.4	0	22.5	
			1413	1732.6	0	23.6	
			1513	1752.6	0	23.9	
		Subtest 2	1312	1712.4	0	22.5	
			1413	1732.6	0	23.7	
			1513	1752.6	0	24.0	
		Subtest 3	1312	1712.4	0.5	22.0	
			1413	1732.6	0.5	23.1	
			1513	1752.6	0.5	23.6	
		Subtest 4	1312	1712.4	0.5	22.0	
			1413	1732.6	0.5	23.2	
			1513	1752.6	0.5	23.5	

7.3. LTE

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
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	13	10	Table 6.2.4-2	Table 6.2.4-2
	6.6.3.3.2				
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 2
- LTE 4
- LTE 5
- LTE 7
- LTE 12
- LTE 13
- LTE 17
- LTE 26 (FCC PART 90S)
- LTE 26 (FCC PART 22)
- LTE 41 (FCC)
- LTE 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:

7.3.1. LTE 2

ID:	38866	Date:	4/2/19
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OUTPUT POWER FOR LTE BAND 2 (1.4 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				18607 1850.7 MHz	18900 1880.0 MHz	19193 1909.3 MHz
1.4	QPSK	1	0	23.8	24.1	23.6
		1	2	23.9	24.1	23.7
		1	5	23.8	24.0	23.6
		3	0	23.6	23.6	23.4
		3	1	23.7	23.8	23.5
		3	2	23.6	23.7	23.5
		6	0	22.9	23.0	22.8
	16QAM	1	0	22.6	22.7	22.8
		1	2	22.7	22.8	22.8
		1	5	22.6	22.8	22.8
		3	0	22.7	22.6	22.5
		3	1	22.8	22.7	22.6
		3	2	22.8	22.7	22.6
		6	0	21.9	22.0	21.6
	64QAM	1	0	22.3	22.4	22.0
		1	2	22.3	22.5	22.0
		1	5	22.3	22.4	21.9
		3	0	22.0	22.3	21.9
		3	1	22.1	22.4	22.0
		3	2	22.0	22.4	22.0
		6	0	21.2	21.2	21.3

OUTPUT POWER FOR LTE BAND 2 (3.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				18615 1851.5 MHz	18900 1880.0 MHz	19185 1908.5 MHz
3.0	QPSK	1	0	23.9	24.0	23.7
		1	7	24.0	24.1	23.8
		1	14	23.9	24.0	23.7
		8	0	22.9	23.0	22.7
		8	4	22.9	23.1	22.7
		8	7	22.9	23.0	22.8
		15	0	22.8	22.9	22.7
	16QAM	1	0	22.6	23.1	22.6
		1	7	22.7	23.2	22.6
		1	14	22.6	23.1	22.5
		8	0	21.9	22.0	21.7
		8	4	22.0	22.0	21.8
		8	7	22.0	22.0	21.7
		15	0	21.8	21.9	21.6
	64QAM	1	0	22.1	22.3	22.2
		1	7	22.3	22.4	22.3
		1	14	22.2	22.2	22.2
		8	0	21.1	21.2	21.1
		8	4	21.2	21.2	21.1
		8	7	21.2	21.2	21.1
		15	0	21.1	21.3	21.0

OUTPUT POWER FOR LTE BAND 2 (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				18625	18900	19175
				1852.5 MHz	1880.0 MHz	1907.5 MHz
5.0	QPSK	1	0	23.9	24.1	23.7
		1	12	23.9	24.1	23.7
		1	24	23.9	24.1	23.7
		12	0	22.8	22.9	22.8
		12	6	22.8	23.0	22.8
		12	11	22.8	22.9	22.7
		25	0	22.3	22.4	22.2
	16QAM	1	0	22.8	23.0	23.1
		1	12	22.8	23.0	23.1
		1	24	22.8	22.9	23.0
		12	0	21.9	22.0	21.9
		12	6	21.9	22.0	21.9
		12	11	21.9	22.0	21.8
		25	0	21.8	21.9	21.8
	64QAM	1	0	22.3	22.1	22.3
		1	12	22.3	22.0	22.2
		1	24	22.3	22.0	22.1
		12	0	21.2	21.3	21.0
		12	6	21.2	21.3	21.0
		12	11	21.2	21.3	21.0
25	0	21.1	21.2	21.0		

OUTPUT POWER FOR LTE BAND 2 (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				18650	18900	19150
				1855.0 MHz	1880.0 MHz	1905.0 MHz
10.0	QPSK	1	0	23.9	24.2	23.8
		1	24	23.9	24.1	23.7
		1	49	23.9	24.2	23.7
		25	0	22.3	22.4	22.2
		25	12	22.3	22.4	22.2
		25	24	22.4	22.4	22.2
		50	0	22.3	22.4	22.2
	16QAM	1	0	22.8	22.9	23.0
		1	24	22.7	22.7	22.9
		1	49	22.8	22.8	22.8
		25	0	22.4	22.4	22.3
		25	12	22.4	22.4	22.3
		25	24	22.5	22.4	22.2
		50	0	22.4	22.4	22.2
	64QAM	1	0	22.2	22.4	22.3
		1	24	22.2	22.3	22.3
		1	49	22.3	22.3	22.2
		25	0	21.1	21.3	21.2
		25	12	21.2	21.3	21.1
		25	24	21.3	21.3	21.1
		50	0	21.3	21.2	21.1

OUTPUT POWER FOR LTE BAND 2 (15.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				18675	18900	19125
				1857.5 MHz	1880.0 MHz	1902.5 MHz
15.0	QPSK	1	0	23.9	23.9	23.8
		1	37	23.9	23.9	23.7
		1	74	23.8	23.9	23.7
		36	0	22.8	22.9	22.7
		36	16	22.9	23.0	22.8
		36	35	22.9	23.0	22.7
		75	0	22.9	23.0	22.7
	16QAM	1	0	23.0	22.8	23.0
		1	37	23.0	22.7	23.0
		1	74	23.0	22.6	22.8
		36	0	21.8	22.0	21.9
		36	16	22.0	22.0	21.9
		36	35	21.9	22.0	21.8
		75	0	22.0	22.0	21.8
	64QAM	1	0	22.6	22.5	22.1
		1	37	22.5	22.4	22.1
		1	74	22.6	22.3	21.9
		36	0	21.1	21.3	21.2
		36	16	21.2	21.3	21.2
		36	35	21.2	21.3	21.2
		75	0	21.2	21.3	21.1

OUTPUT POWER FOR LTE BAND 2 (20.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				18700	18900	19100
				1860.0 MHz	1880.0 MHz	1900.0 MHz
20.0	QPSK	1	0	23.9	23.9	23.9
		1	49	23.9	24.0	23.7
		1	99	23.8	24.0	23.6
		50	0	22.9	22.9	22.8
		50	24	22.9	22.9	22.9
		50	49	22.8	22.9	22.8
		100	0	22.8	22.9	22.8
	16QAM	1	0	23.1	23.3	23.0
		1	49	23.1	23.3	23.0
		1	99	23.0	23.3	22.8
		50	0	21.9	22.0	21.9
		50	24	21.9	22.0	21.8
		50	49	21.8	21.9	21.7
		100	0	21.9	22.0	21.8
	64QAM	1	0	22.2	22.5	22.6
		1	49	22.3	22.4	22.5
		1	99	22.2	22.4	22.4
		50	0	21.2	21.3	21.2
		50	24	21.2	21.3	21.1
		50	49	21.2	21.3	21.1
		100	0	21.2	21.3	21.1

7.3.2. LTE 4

ID:	38206	Date:	5/7/19
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OUTPUT POWER FOR LTE BAND 4 (1.4 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				19957 1710.7 MHz	20175 1732.5 MHz	20393 1754.3 MHz
1.4	QPSK	1	0	23.9	23.9	24.1
		1	2	24.0	24.0	24.1
		1	5	23.9	23.9	24.0
		3	0	23.9	23.8	24.0
		3	1	24.0	23.9	24.1
		3	2	24.0	23.9	24.1
	16QAM	6	0	23.0	22.9	23.1
		1	0	23.0	23.0	23.5
		1	2	23.0	23.1	23.5
		1	5	23.0	23.0	23.4
		3	0	23.1	23.0	23.3
		3	1	23.2	23.1	23.3
	64QAM	3	2	23.2	23.0	23.3
		6	0	22.2	22.1	22.0
		1	0	22.3	22.2	22.6
		1	2	22.4	22.3	22.7
		1	5	22.3	22.2	22.6
		3	0	22.3	22.0	22.5
		3	1	22.3	22.1	22.6
		3	2	22.3	22.1	22.6
		6	0	21.5	21.2	21.2

OUTPUT POWER FOR LTE BAND 4 (3.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				19965 1711.5 MHz	20175 1732.5 MHz	20385 1753.5 MHz
3.0	QPSK	1	0	24.0	24.0	24.2
		1	7	24.1	24.1	24.2
		1	14	24.0	24.0	24.1
		8	0	23.0	23.0	23.1
		8	4	23.1	23.0	23.2
		8	7	23.1	23.0	23.2
	16QAM	15	0	23.0	23.0	23.1
		1	0	23.1	22.9	23.5
		1	7	23.1	23.0	23.6
		1	14	23.1	22.9	23.5
		8	0	22.1	22.2	22.2
		8	4	22.2	22.2	22.3
	64QAM	8	7	22.2	22.2	22.3
		15	0	22.0	22.1	22.2
		1	0	22.4	22.5	22.4
		1	7	22.5	22.6	22.5
		1	14	22.4	22.4	22.4
		8	0	21.2	21.2	21.4
		8	4	21.2	21.3	21.4
		8	7	21.2	21.2	21.4
		15	0	21.3	21.2	21.4

OUTPUT POWER FOR LTE BAND 4 (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				19975	20175	20375
				1712.5 MHz	1732.5 MHz	1752.5 MHz
5.0	QPSK	1	0	24.2	24.0	24.3
		1	12	24.1	24.0	24.1
		1	24	24.2	24.0	24.2
		12	0	23.1	23.0	23.2
		12	6	23.1	23.0	23.2
		12	11	23.1	23.0	23.2
	16QAM	25	0	23.1	23.0	23.2
		1	0	23.3	23.6	23.3
		1	12	23.2	23.5	23.2
		1	24	23.3	23.6	23.3
		12	0	22.2	22.2	22.3
		12	6	22.2	22.2	22.3
	64QAM	12	11	22.2	22.2	22.3
		25	0	22.2	22.1	22.2
		1	0	22.5	22.1	22.6
		1	12	22.4	22.1	22.6
		1	24	22.5	22.1	22.6
		12	0	21.3	21.2	21.3
		12	6	21.3	21.2	21.3
		12	11	21.3	21.2	21.3
25	0	21.3	21.2	21.3		

OUTPUT POWER FOR LTE BAND 4 (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				20000	20175	20350
				1715.0 MHz	1732.5 MHz	1750.0 MHz
10.0	QPSK	1	0	24.1	24.1	24.1
		1	24	24.0	24.0	24.1
		1	49	24.0	24.0	24.1
		25	0	23.1	23.1	23.1
		25	12	23.0	23.0	23.1
		25	24	23.0	23.0	23.1
		50	0	23.0	23.0	23.1
	16QAM	1	0	23.0	23.5	23.2
		1	24	23.0	23.4	23.1
		1	49	22.9	23.4	23.1
		25	0	23.2	23.1	23.3
		25	12	23.1	23.2	23.2
		25	24	23.1	23.1	23.3
		50	0	23.1	23.1	23.2
	64QAM	1	0	22.6	22.3	22.4
		1	24	22.5	22.3	22.4
		1	49	22.4	22.3	22.4
		25	0	21.3	21.2	21.3
		25	12	21.3	21.2	21.3
		25	24	21.3	21.2	21.3
		50	0	21.3	21.2	21.3

OUTPUT POWER FOR LTE BAND 4 (15.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				20025	20175	20325
				1717.5 MHz	1732.5 MHz	1747.5 MHz
15.0	QPSK	1	0	24.1	24.2	24.3
		1	37	24.1	24.0	24.1
		1	74	24.2	24.1	24.2
		36	0	23.2	23.1	23.2
		36	16	23.2	23.0	23.2
		36	35	23.1	23.1	23.1
		75	0	23.1	23.1	23.1
	16QAM	1	0	23.4	23.1	23.6
		1	37	23.4	23.0	23.5
		1	74	23.5	23.1	23.6
		36	0	22.2	22.2	22.3
		36	16	22.2	22.1	22.3
		36	35	22.2	22.1	22.2
		75	0	22.2	22.2	22.2
	64QAM	1	0	22.9	22.6	22.5
		1	37	22.8	22.5	22.3
		1	74	22.9	22.5	22.4
		36	0	21.3	21.3	21.4
		36	16	21.3	21.2	21.4
		36	35	21.3	21.2	21.3
		75	0	21.3	21.3	21.3

OUTPUT POWER FOR LTE BAND 4 (20.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				20050	20175	20300
				1720.0 MHz	1732.5 MHz	1745.0 MHz
20.0	QPSK	1	0	24.1	24.3	24.2
		1	49	24.1	24.0	24.1
		1	99	24.0	24.1	24.2
		50	0	23.2	23.1	23.2
		50	24	23.2	23.1	23.2
		50	49	23.0	23.0	23.1
		100	0	23.1	23.0	23.2
	16QAM	1	0	23.4	23.8	23.6
		1	49	23.5	23.5	23.5
		1	99	23.4	23.6	23.6
		50	0	22.2	22.2	22.2
		50	24	22.2	22.2	22.3
		50	49	22.1	22.1	22.2
		100	0	22.2	22.2	22.3
	64QAM	1	0	22.5	22.7	22.9
		1	49	22.5	22.5	22.8
		1	99	22.4	22.5	22.9
		50	0	21.4	21.3	21.3
		50	24	21.4	21.3	21.3
		50	49	21.2	21.2	21.3
		100	0	21.3	21.3	21.3

7.3.3. LTE 5

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OUTPUT POWER FOR LTE BAND 5 (1.4 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				20407 824.7 MHz	20525 836.5 MHz	20643 848.3 MHz
1.4	QPSK	1	0	23.9	23.6	23.3
		1	2	23.9	23.7	23.3
		1	5	23.8	23.6	23.3
		3	0	23.7	23.6	23.2
		3	1	23.8	23.6	23.3
		3	2	23.8	23.6	23.2
		6	0	22.8	22.7	22.3
	16QAM	1	0	22.9	23.0	22.2
		1	2	22.9	23.0	22.3
		1	5	22.9	22.9	22.2
		3	0	22.8	22.8	22.4
		3	1	22.9	22.8	22.5
		3	2	22.9	22.8	22.4
		6	0	22.0	21.6	21.5
	64QAM	1	0	22.2	22.0	22.0
		1	2	22.3	22.1	22.1
		1	5	22.1	22.0	21.9
		3	0	22.1	21.8	21.9
		3	1	22.2	21.9	22.0
		3	2	22.2	21.9	21.9
		6	0	21.4	21.0	20.7

OUTPUT POWER FOR LTE BAND 5 (3.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				20415 825.5 MHz	20525 836.5 MHz	20635 847.5 MHz
3.0	QPSK	1	0	23.9	23.7	23.4
		1	7	23.9	23.8	23.5
		1	14	23.8	23.7	23.4
		8	0	22.9	22.7	22.3
		8	4	22.9	22.8	22.4
		8	7	22.9	22.8	22.4
		15	0	22.9	22.7	22.3
	16QAM	1	0	22.9	22.6	22.7
		1	7	22.9	22.6	22.8
		1	14	22.8	22.5	22.6
		8	0	22.0	21.9	21.4
		8	4	22.0	21.9	21.5
		8	7	22.0	21.9	21.5
		15	0	21.9	21.8	21.4
	64QAM	1	0	22.4	22.2	21.8
		1	7	22.4	22.3	21.9
		1	14	22.3	22.2	21.8
		8	0	21.2	21.1	20.8
		8	4	21.2	21.1	20.8
		8	7	21.2	21.1	20.8
		15	0	21.3	21.0	20.8

OUTPUT POWER FOR LTE BAND 5 (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				20425	20525	20625
				826.5 MHz	836.5 MHz	846.5 MHz
5.0	QPSK	1	0	23.9	23.8	23.5
		1	12	23.9	23.8	23.3
		1	24	23.9	23.7	23.4
		12	0	22.9	22.7	22.5
		12	6	22.9	22.7	22.4
		12	11	22.9	22.7	22.4
	25	0	22.9	22.7	22.5	
	16QAM	1	0	23.0	22.9	23.0
		1	12	22.9	22.8	22.8
		1	24	22.9	22.7	22.8
		12	0	22.0	21.9	21.7
		12	6	22.0	21.8	21.5
		12	11	22.0	21.8	21.5
	25	0	21.9	21.8	21.6	
	64QAM	1	0	22.4	21.9	22.2
		1	12	22.3	21.8	22.0
		1	24	22.3	21.8	21.9
		12	0	21.3	21.1	20.9
12		6	21.3	21.1	20.8	
12		11	21.2	21.1	20.7	
25	0	21.2	21.0	20.9		

OUTPUT POWER FOR LTE BAND 5 (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				20450	20525	20600
				829.0 MHz	836.5 MHz	844.0 MHz
10.0	QPSK	1	0	23.9	23.7	23.5
		1	24	23.8	23.7	23.4
		1	49	23.7	23.6	23.4
		25	0	22.9	22.8	22.5
		25	12	22.9	22.8	22.5
		25	24	22.8	22.7	22.4
		50	0	22.9	22.7	22.5
	16QAM	1	0	22.9	22.6	22.8
		1	24	22.8	22.5	22.8
		1	49	22.7	22.4	22.6
		25	0	21.6	21.3	21.1
		25	12	21.5	21.3	21.1
		25	24	21.5	21.3	21.1
		50	0	21.4	21.3	21.0
	64QAM	1	0	22.3	22.3	21.9
		1	24	22.2	22.2	21.9
		1	49	22.1	22.1	21.8
		25	0	21.8	21.6	21.5
		25	12	21.8	21.6	21.4
		25	24	21.7	21.5	21.4
		50	0	21.7	21.6	21.4

7.3.4. LTE 7

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OUTPUT POWER FOR LTE BAND 7 (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				20775 2502.5 MHz	21100 2535.0 MHz	21425 2567.5 MHz
5.0	QPSK	1	0	24.5	24.5	24.3
		1	12	24.4	24.4	24.3
		1	24	24.4	24.4	24.3
		12	0	23.4	23.4	23.3
		12	6	23.4	23.4	23.3
		12	11	23.4	23.5	23.3
		25	0	23.4	23.4	23.3
	16QAM	1	0	23.5	23.8	23.4
		1	12	23.5	23.8	23.4
		1	24	23.5	23.9	23.4
		12	0	22.4	22.5	22.4
		12	6	22.5	22.6	22.5
		12	11	22.5	22.5	22.4
		25	0	22.4	22.4	22.3
	64QAM	1	0	22.3	22.7	22.6
		1	12	22.3	22.7	22.6
		1	24	22.4	22.7	22.6
		12	0	21.5	21.4	21.5
		12	6	21.5	21.5	21.5
		12	11	21.5	21.4	21.5
		25	0	21.4	21.4	21.5

OUTPUT POWER FOR LTE BAND 7 (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				20800 2505.0 MHz	21100 2535.0 MHz	21400 2565.0 MHz
10.0	QPSK	1	0	24.3	24.4	24.2
		1	24	24.3	24.4	24.2
		1	49	24.3	24.4	24.2
		25	0	22.9	22.9	22.8
		25	12	22.9	22.9	22.8
		25	24	22.9	22.9	22.8
		50	0	22.9	22.9	22.8
	16QAM	1	0	23.7	23.3	23.2
		1	24	23.7	23.3	23.2
		1	49	23.7	23.3	23.1
		25	0	22.9	22.9	22.8
		25	12	23.0	22.9	22.9
		25	24	23.0	22.9	22.8
		50	0	22.9	22.8	22.8
	64QAM	1	0	22.6	22.7	22.5
		1	24	22.6	22.7	22.5
		1	49	22.7	22.7	22.5
		25	0	21.5	21.4	21.5
		25	12	21.5	21.5	21.5
		25	24	21.5	21.4	21.5
		50	0	21.4	21.4	21.5

OUTPUT POWER FOR LTE BAND 7 (15.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				20825	21100	21375
				2507.5 MHz	2535.0 MHz	2562.5 MHz
15.0	QPSK	1	0	24.3	24.4	24.2
		1	37	24.3	24.5	24.2
		1	74	24.3	24.4	24.2
		36	0	23.3	23.4	23.3
		36	16	23.4	23.5	23.3
		36	35	23.3	23.4	23.3
		75	0	23.4	23.4	23.3
	16QAM	1	0	23.6	23.6	23.3
		1	37	23.8	23.7	23.2
		1	74	23.7	23.7	23.1
		36	0	22.4	22.4	22.4
		36	16	22.5	22.5	22.4
		36	35	22.5	22.4	22.4
		75	0	22.5	22.4	22.4
	64QAM	1	0	23.0	22.7	22.5
		1	37	23.0	22.7	22.5
		1	74	23.0	22.7	22.5
		36	0	21.5	21.6	21.5
		36	16	21.6	21.6	21.5
		36	35	21.6	21.6	21.5
		75	0	21.5	21.5	21.5

OUTPUT POWER FOR LTE BAND 7 (20.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				20850	21100	21350
				2510.0 MHz	2535.0 MHz	2560.0 MHz
20.0	QPSK	1	0	24.2	24.4	24.2
		1	49	24.3	24.4	24.2
		1	99	24.2	24.3	24.2
		50	0	23.3	23.4	23.3
		50	24	23.4	23.4	23.3
		50	49	23.3	23.4	23.3
		100	0	23.3	23.4	23.3
	16QAM	1	0	23.7	23.6	23.8
		1	49	23.9	23.7	23.8
		1	99	23.7	23.7	23.7
		50	0	22.4	22.3	22.4
		50	24	22.5	22.4	22.4
		50	49	22.4	22.4	22.4
		100	0	22.3	22.3	22.4
	64QAM	1	0	22.6	22.7	23.0
		1	49	22.8	22.7	23.0
		1	99	22.6	22.7	22.9
		50	0	21.6	21.5	21.5
		50	24	21.6	21.5	21.5
		50	49	21.5	21.5	21.5
		100	0	21.5	21.5	21.5

7.3.5. LTE 12

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OUTPUT POWER FOR LTE BAND 12 (1.4 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				23017 699.7 MHz	23095 707.5 MHz	23173 715.3 MHz
1.4	QPSK	1	0	24.0	23.9	23.6
		1	2	24.1	24.0	23.7
		1	5	24.0	23.9	23.6
		3	0	24.0	23.8	23.6
		3	1	24.1	23.9	23.7
		3	2	24.0	23.8	23.7
	16QAM	6	0	23.1	22.9	22.7
		1	0	23.0	22.9	22.9
		1	2	23.1	23.0	23.0
		1	5	23.0	23.0	23.0
		3	0	23.2	22.9	22.8
		3	1	23.3	23.0	22.9
	64QAM	3	2	23.2	23.0	22.9
		6	0	22.3	22.1	21.6
		1	0	22.5	22.3	22.4
		1	2	22.6	22.4	22.4
		1	5	22.4	22.3	22.3
		3	0	22.5	22.1	22.3
		3	1	22.5	22.2	22.4
		3	2	22.5	22.2	22.4
		6	0	21.6	21.3	21.0

OUTPUT POWER FOR LTE BAND 12 (3.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				23025 700.5 MHz	23095 707.5 MHz	23165 714.5 MHz
3.0	QPSK	1	0	24.1	24.0	23.7
		1	7	24.1	24.0	23.8
		1	14	24.0	23.9	23.7
		8	0	23.1	23.0	22.7
		8	4	23.2	23.0	22.7
		8	7	23.1	23.0	22.7
	16QAM	15	0	23.1	22.9	22.7
		1	0	23.1	22.9	23.1
		1	7	23.1	22.9	23.1
		1	14	23.0	22.8	23.0
		8	0	22.2	22.1	21.8
		8	4	22.2	22.1	21.8
	64QAM	8	7	22.2	22.1	21.9
		15	0	22.1	22.0	21.8
		1	0	22.6	22.6	22.2
		1	7	22.6	22.6	22.3
		1	14	22.5	22.5	22.2
		8	0	21.4	21.3	21.2
		8	4	21.4	21.4	21.2
		8	7	21.4	21.3	21.2
		15	0	21.5	21.3	21.2

OUTPUT POWER FOR LTE BAND 12 (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				23035	23095	23155
				701.5 MHz	707.5 MHz	713.5 MHz
5.0	QPSK	1	0	24.1	24.0	23.9
		1	12	24.0	24.0	23.8
		1	24	24.0	24.0	23.8
		12	0	23.1	23.0	22.9
		12	6	23.1	23.0	22.8
		12	11	23.1	22.9	22.8
	25	0	23.1	22.9	22.9	
	16QAM	1	0	23.6	23.1	23.0
		1	12	23.5	23.0	22.8
		1	24	23.6	23.0	22.8
		12	0	22.3	22.1	22.0
		12	6	22.3	22.1	21.9
		12	11	22.3	22.1	21.9
	25	0	22.2	22.0	21.9	
	64QAM	1	0	22.6	22.2	22.5
		1	12	22.6	22.1	22.4
		1	24	22.6	22.1	22.4
		12	0	21.5	21.4	21.2
12		6	21.5	21.4	21.1	
12		11	21.5	21.3	21.1	
25	0	21.5	21.3	21.2		

OUTPUT POWER FOR LTE BAND 12 (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				23060	23095	23130
				704.0 MHz	707.5 MHz	711.0 MHz
10.0	QPSK	1	0	24.1	24.0	24.0
		1	24	23.9	23.9	23.9
		1	49	23.9	23.9	23.8
		25	0	23.1	23.0	23.0
		25	12	23.1	23.0	23.0
		25	24	23.0	23.0	22.9
		50	0	23.1	23.0	22.9
	16QAM	1	0	23.1	22.9	23.3
		1	24	23.0	22.8	23.2
		1	49	22.9	22.8	23.1
		25	0	22.2	22.1	22.1
		25	12	22.2	22.1	22.1
		25	24	22.2	22.0	22.0
		50	0	22.2	22.1	22.0
	64QAM	1	0	22.5	22.6	22.3
		1	24	22.4	22.5	22.3
		1	49	22.3	22.4	22.2
		25	0	21.5	21.4	21.3
		25	12	21.5	21.4	21.3
		25	24	21.4	21.3	21.3
		50	0	21.4	21.3	21.3

7.3.6. LTE 13

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OUTPUT POWER FOR LTE BAND 13 (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				23205	23230	23255
				779.5 MHz	782.0 MHz	784.5 MHz
5.0	QPSK	1	0	23.4	23.3	23.2
		1	12	23.3	23.2	23.2
		1	24	23.4	23.2	23.2
		12	0	22.2	22.3	22.2
		12	6	22.3	22.3	22.2
		12	11	22.3	22.2	22.2
		25	0	22.3	22.2	22.2
	16QAM	1	0	22.3	22.7	22.3
		1	12	22.2	22.6	22.2
		1	24	22.4	22.6	22.2
		12	0	21.2	21.4	21.3
		12	6	21.4	21.4	21.3
		12	11	21.4	21.4	21.2
		25	0	21.3	21.3	21.1
	64QAM	1	0	21.3	21.4	21.3
		1	12	21.4	21.3	21.3
		1	24	21.3	21.4	21.3
		12	0	20.5	20.6	20.6
		12	6	20.6	20.6	20.6
		12	11	20.5	20.6	20.5
		25	0	20.5	20.5	20.5

OUTPUT POWER FOR LTE BAND 13 (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				N/A	23230	N/A
				N/A	782.0 MHz	N/A
10.0	QPSK	1	0	23.3		
		1	24	23.2		
		1	49	23.2		
		25	0	22.2		
		25	12	22.3		
		25	24	22.2		
		50	0	22.2		
	16QAM	1	0	22.4		
		1	24	22.5		
		1	49	22.4		
		25	0	21.3		
		25	12	21.3		
		25	24	21.2		
		50	0	21.3		
	64QAM	1	0	21.5		
		1	24	21.5		
		1	49	21.4		
		25	0	20.7		
		25	12	20.7		
		25	24	20.6		
		50	0	20.6		

7.3.7. LTE 17

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OUTPUT POWER FOR LTE BAND 17 (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				23755 706.5 MHz	23790 710.0 MHz	23825 713.5 MHz
5.0	QPSK	1	0	23.9	24.0	23.8
		1	12	24.0	24.0	23.7
		1	24	24.0	23.8	23.7
		12	0	22.9	22.9	22.9
		12	6	23.0	22.9	22.8
		12	11	22.9	22.9	22.8
	16QAM	25	0	22.9	22.9	22.9
		1	0	23.0	23.1	23.3
		1	12	23.0	23.0	23.2
		1	24	23.0	22.9	23.2
		12	0	22.0	22.0	22.0
		12	6	22.1	22.0	22.0
	64QAM	12	11	22.0	22.0	22.0
		25	0	21.9	22.0	22.0
		1	0	22.5	22.3	22.5
		1	12	22.5	22.2	22.5
		1	24	22.4	22.2	22.5
		12	0	21.5	21.4	21.2
		12	6	21.5	21.4	21.2
		12	11	21.5	21.3	21.1
25	0	21.5	21.3	21.2		

OUTPUT POWER FOR LTE BAND 17 (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				23780 709.0 MHz	23790 710.0 MHz	23800 711.0 MHz
10.0	QPSK	1	0	23.8	23.7	23.9
		1	24	23.8	23.8	23.8
		1	49	23.7	23.7	23.7
		25	0	23.2	23.2	23.1
		25	12	23.2	23.1	23.2
		25	24	23.1	23.1	23.1
	16QAM	50	0	23.2	23.1	23.1
		1	0	22.8	22.7	23.2
		1	24	22.8	22.7	23.1
		1	49	22.6	22.5	23.0
		25	0	22.5	22.4	22.4
		25	12	22.5	22.4	22.4
	64QAM	25	24	22.4	22.4	22.4
		50	0	22.4	22.3	22.4
		1	0	22.5	22.5	22.4
		1	24	22.5	22.5	22.4
		1	49	22.3	22.4	22.2
		25	0	21.5	21.5	21.3
		25	12	21.5	21.5	21.4
		25	24	21.5	21.3	21.4
50	0	21.5	21.3	21.4		

7.3.8. LTE 26 (FCC PART 90S)

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OUTPUT POWER FOR LTE BAND 26 (FCC PART 90S) (1.4 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power			
				Conducted Average (dBm)			
				26697 814.7 MHz	26740 819.0 MHz	26783 823.3 MHz	
1.4	QPSK	1	0	22.9	22.8	22.8	
		1	2	22.9	22.8	22.8	
		1	5	22.9	22.9	22.8	
		3	0	22.7	22.7	22.7	
		3	1	22.8	22.7	22.7	
		3	2	22.8	22.7	22.6	
	16QAM	6	0	21.9	21.9	21.9	
		1	0	21.8	21.8	21.7	
		1	2	21.9	21.9	21.8	
		1	5	21.9	21.9	21.8	
		3	0	22.0	22.0	21.9	
		3	1	22.0	22.0	21.9	
	64QAM	3	2	22.0	21.9	21.9	
		6	0	21.0	21.0	21.0	
		1	0	21.2	21.2	21.2	
		1	2	21.3	21.2	21.2	
		1	5	21.2	21.2	21.2	
		3	0	21.2	21.2	21.2	
			3	1	21.2	21.2	21.2
			3	2	21.2	21.3	21.3
			6	0	19.9	20.0	19.9

OUTPUT POWER FOR LTE BAND 26 (FCC PART 90S) (3.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power			
				Conducted Average (dBm)			
				26705 815.5 MHz	26740 819.0 MHz	26775 822.5 MHz	
3.0	QPSK	1	0	23.0	23.0	23.0	
		1	7	23.0	23.0	23.0	
		1	14	22.9	22.9	23.0	
		8	0	22.0	22.0	22.0	
		8	4	22.0	22.0	22.0	
		8	7	21.9	21.9	21.8	
	16QAM	15	0	21.9	21.8	21.8	
		1	0	22.3	22.3	22.3	
		1	7	22.4	22.1	22.2	
		1	14	22.3	22.2	22.3	
		8	0	21.0	21.1	21.1	
		8	4	21.0	21.0	21.1	
	64QAM	8	7	21.0	21.0	21.1	
		15	0	21.0	21.0	21.0	
		1	0	21.1	21.1	21.1	
		1	7	21.2	21.1	21.1	
		1	14	21.1	21.1	21.1	
		8	0	19.9	20.0	20.0	
			8	4	19.9	19.9	19.9
			8	7	19.9	20.0	19.9
			15	0	20.0	20.0	19.9

OUTPUT POWER FOR LTE BAND 26 (FCC PART 90S) (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				26715	26740	26765
				816.5 MHz	819.0 MHz	821.5 MHz
5.0	QPSK	1	0	23.0	22.9	23.0
		1	12	22.9	22.8	22.9
		1	24	22.9	22.8	22.8
		12	0	21.9	21.9	22.0
		12	6	21.9	22.0	22.0
		12	11	21.9	21.9	21.9
		25	0	21.9	22.0	22.0
	16QAM	1	0	22.0	22.1	22.1
		1	12	22.0	22.1	22.1
		1	24	22.0	22.1	22.1
		12	0	21.0	21.0	21.0
		12	6	21.0	21.1	21.1
		12	11	21.0	21.0	21.1
		25	0	20.9	21.1	21.1
	64QAM	1	0	21.3	21.1	21.1
		1	12	21.3	21.0	21.0
		1	24	21.2	21.1	21.1
		12	0	20.0	20.2	20.2
		12	6	20.0	20.2	20.2
		12	11	20.0	20.2	20.2
		25	0	20.0	20.1	20.2

OUTPUT POWER FOR LTE BAND 26 (FCC PART 90S) (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				N/A	26740	N/A
				N/A	819.0 MHz	N/A
10.0	QPSK	1	0	23.0		
		1	24	22.8		
		1	49	22.8		
		25	0	21.9		
		25	12	22.0		
		25	24	21.9		
		50	0	22.0		
	16QAM	1	0	22.2		
		1	24	22.2		
		1	49	22.2		
		25	0	21.0		
		25	12	21.1		
		25	24	21.0		
		50	0	21.1		
	64QAM	1	0	21.1		
		1	24	21.0		
		1	49	21.1		
		25	0	20.1		
		25	12	20.2		
		25	24	20.2		
		50	0	20.1		

OUTPUT POWER FOR LTE BAND 26 (FCC PART 90S) (15.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				26765	N/A	N/A
15.0	QPSK	1	0	23.0		
		1	37	22.9		
		1	74	22.9		
		36	0	21.9		
		36	16	21.9		
		36	35	21.8		
		75	0	21.9		
	16QAM	1	0	22.2		
		1	37	22.3		
		1	74	22.3		
		36	0	21.0		
		36	16	21.0		
		36	35	20.9		
		75	0	20.9		
	64QAM	1	0	21.5		
		1	37	21.5		
		1	74	21.4		
		36	0	20.0		
		36	16	20.0		
		36	35	19.9		
		75	0	20.0		

7.3.9. LTE 26 (FCC PART 22)

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OUTPUT POWER FOR LTE BAND 26 (FCC PART 22) (1.4 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				26797 824.7 MHz	26915 836.5 MHz	27033 848.3 MHz
1.4	QPSK	1	0	22.9	22.9	22.4
		1	2	22.9	22.9	22.5
		1	5	22.9	22.9	22.4
		3	0	22.7	22.8	22.4
		3	1	22.7	22.8	22.5
		3	2	22.6	22.8	22.4
	16QAM	6	0	21.9	21.8	21.4
		1	0	21.8	21.9	21.8
		1	2	21.8	22.0	21.8
		1	5	21.8	22.0	21.8
		3	0	22.0	21.9	21.6
		3	1	22.0	21.9	21.7
	64QAM	3	2	21.9	21.9	21.6
		6	0	21.0	21.0	20.4
		1	0	21.1	21.0	20.6
		1	2	21.2	21.1	20.7
		1	5	21.2	21.0	20.7
		3	0	21.2	21.0	20.4
		3	1	21.1	21.1	20.5
		3	2	21.1	21.0	20.5
		6	0	19.9	20.2	19.6

OUTPUT POWER FOR LTE BAND 26 (FCC PART 22) (3.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				26805 825.5 MHz	26915 836.5 MHz	27025 847.5 MHz
3.0	QPSK	1	0	22.9	22.9	22.5
		1	7	22.9	22.9	22.6
		1	14	22.9	22.8	22.5
		8	0	22.0	21.8	21.5
		8	4	21.9	21.9	21.5
		8	7	21.8	21.9	21.5
	16QAM	15	0	21.8	21.9	21.5
		1	0	22.2	22.0	21.4
		1	7	22.2	22.0	21.5
		1	14	22.2	21.9	21.3
		8	0	21.1	21.0	20.6
		8	4	21.1	21.0	20.6
	64QAM	8	7	21.1	21.0	20.7
		15	0	21.0	20.9	20.6
		1	0	21.2	21.1	20.9
		1	7	21.1	21.2	21.0
		1	14	21.1	21.1	20.9
		8	0	20.0	20.0	19.7
		8	4	20.0	20.1	19.7
		8	7	19.9	20.1	19.7
		15	0	20.0	20.0	19.6

OUTPUT POWER FOR LTE BAND 26 (FCC PART 22) (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				26815	26915	27015
				826.5 MHz	836.5 MHz	846.5 MHz
5.0	QPSK	1	0	22.9	23.0	22.5
		1	12	22.9	22.9	22.5
		1	24	22.9	22.9	22.4
		12	0	21.9	21.9	21.5
		12	6	21.9	21.9	21.5
		12	11	21.9	21.9	21.5
		25	0	21.9	21.9	21.5
	16QAM	1	0	22.0	22.1	22.0
		1	12	22.0	22.1	22.0
		1	24	22.0	22.0	22.0
		12	0	21.0	21.0	20.7
		12	6	21.1	21.1	20.7
		12	11	21.1	21.0	20.7
		25	0	21.1	21.0	20.6
	64QAM	1	0	21.1	21.0	20.5
		1	12	21.1	20.9	20.8
		1	24	21.1	20.9	20.8
		12	0	20.2	20.1	19.7
		12	6	20.2	20.1	19.7
		12	11	20.2	20.0	19.7
25	0	20.2	20.0	19.6		

OUTPUT POWER FOR LTE BAND 26 (FCC PART 22) (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				26840	26915	26990
				829.0 MHz	836.5 MHz	844.0 MHz
10.0	QPSK	1	0	22.8	22.8	22.6
		1	24	22.8	22.8	22.5
		1	49	22.7	22.6	22.4
		25	0	21.9	21.9	21.6
		25	12	21.9	21.9	21.6
		25	24	21.8	21.8	21.6
		50	0	21.9	21.9	21.6
	16QAM	1	0	21.9	21.9	21.5
		1	24	21.9	21.9	21.5
		1	49	21.7	21.7	21.3
		25	0	21.1	21.1	20.7
		25	12	21.1	21.1	20.7
		25	24	21.0	21.0	20.6
		50	0	21.0	21.0	20.7
	64QAM	1	0	20.9	21.2	20.8
		1	24	20.9	21.3	20.8
		1	49	20.6	21.1	20.6
		25	0	19.8	20.1	19.8
		25	12	19.8	20.1	19.8
		25	24	19.7	20.0	19.7
		50	0	19.8	20.0	19.7

OUTPUT POWER FOR LTE BAND 26 (FCC PART 22) (15.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				26865	26915	26965
				831.5 MHz	836.5 MHz	841.5 MHz
15.0	QPSK	1	0	22.9	22.9	22.8
		1	37	22.9	22.9	22.6
		1	74	22.6	22.6	22.5
		36	0	21.9	21.9	21.7
		36	16	21.9	21.9	21.7
		36	35	21.8	21.8	21.6
		75	0	21.9	21.9	21.7
	16QAM	1	0	21.9	21.9	22.2
		1	37	21.8	21.8	22.0
		1	74	21.7	21.6	21.9
		36	0	21.0	21.0	20.9
		36	16	21.0	21.0	20.9
		36	35	20.9	20.9	20.7
		75	0	20.9	20.9	20.8
	64QAM	1	0	21.3	21.3	21.0
		1	37	21.3	21.3	20.8
		1	74	21.0	21.0	20.7
		36	0	20.0	20.0	19.9
		36	16	19.9	20.0	19.9
		36	35	19.9	19.9	19.7
		75	0	20.0	20.0	19.8

7.3.10. LTE 41 (FCC)

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OUTPUT POWER FOR LTE BAND 41 (FCC) (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				39675	40620	41565
				2498.5 MHz	2593.0 MHz	2687.5 MHz
5.0	QPSK	1	0	23.8	23.8	23.6
		1	12	23.8	23.8	23.6
		1	24	23.8	23.8	23.6
		12	0	22.8	22.9	22.7
		12	6	22.8	22.9	22.7
		12	11	22.8	22.8	22.7
	16QAM	25	0	22.8	22.9	22.7
		1	0	22.7	22.8	22.7
		1	12	22.8	22.9	22.7
		1	24	22.8	22.8	22.6
		12	0	21.9	22.0	21.8
		12	6	21.9	21.9	21.9
	64QAM	12	11	21.9	21.9	21.8
		25	0	21.8	22.0	21.8
		1	0	21.6	21.6	21.5
		1	12	21.6	21.6	21.5
		1	24	21.6	21.6	21.6
		12	0	20.8	20.9	20.8
		12	6	20.8	20.9	20.8
		12	11	20.8	20.9	20.8
		25	0	20.8	20.9	20.8

OUTPUT POWER FOR LTE BAND 41 (FCC) (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				39700	40620	41540
				2501.0 MHz	2593.0 MHz	2685.0 MHz
10.0	QPSK	1	0	23.8	23.9	23.9
		1	24	23.8	23.9	23.9
		1	49	23.7	23.8	23.9
		25	0	22.4	22.4	22.4
		25	12	22.3	22.4	22.4
		25	24	22.3	22.4	22.3
	16QAM	50	0	22.3	22.4	22.3
		1	0	22.9	23.0	22.9
		1	24	22.9	22.9	22.9
		1	49	22.9	22.9	22.9
		25	0	21.9	22.0	22.0
		25	12	21.9	22.0	22.0
	64QAM	25	24	21.8	22.0	22.0
		50	0	21.9	22.0	22.0
		1	0	21.9	22.0	21.9
		1	24	22.0	22.0	21.9
		1	49	21.9	22.0	21.9
		25	0	20.8	20.9	20.9
		25	12	20.8	20.9	21.0
		25	24	20.8	20.8	20.8
		50	0	20.8	20.9	20.9

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

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				39725	40620	41515
				2503.5 MHz	2593.0 MHz	2682.5 MHz
15.0	QPSK	1	0	23.7	23.9	23.7
		1	37	23.5	23.8	23.7
		1	74	23.5	23.8	23.6
		36	0	22.6	22.9	22.7
		36	16	22.5	22.9	22.7
		36	35	22.6	22.8	22.8
		75	0	22.5	22.8	22.8
	16QAM	1	0	22.8	22.9	22.8
		1	37	22.8	22.8	22.6
		1	74	22.7	22.8	22.5
		36	0	21.7	21.9	21.8
		36	16	21.6	21.9	21.8
		36	35	21.7	21.9	21.9
		75	0	21.6	21.9	21.8
	64QAM	1	0	21.6	22.0	21.6
		1	37	21.5	22.0	21.6
		1	74	21.4	22.0	21.6
		36	0	20.5	21.0	20.8
		36	16	20.6	21.0	20.8
		36	35	20.5	20.9	20.7
		75	0	20.5	20.9	20.7

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

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				39750	40620	41490
				2506.0 MHz	2593.0 MHz	2680.0 MHz
20.0	QPSK	1	0	23.7	23.9	23.8
		1	49	23.5	23.9	23.6
		1	99	23.6	23.8	23.6
		50	0	22.6	23.0	22.8
		50	24	22.6	22.9	22.8
		50	49	22.7	22.9	22.7
		100	0	22.7	22.9	22.7
	16QAM	1	0	22.8	22.9	22.9
		1	49	22.7	22.8	22.6
		1	99	22.8	22.8	22.6
		50	0	21.6	22.0	21.9
		50	24	21.7	22.0	21.8
		50	49	21.8	21.9	21.8
		100	0	21.7	22.0	21.9
	64QAM	1	0	22.0	22.0	21.8
		1	49	21.9	21.9	21.7
		1	99	22.0	21.9	21.5
		50	0	20.5	21.0	20.9
		50	24	20.5	20.9	20.8
		50	49	20.6	20.9	20.9
		100	0	20.6	21.0	20.9

7.3.11. LTE 66

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OUTPUT POWER FOR LTE BAND 66 (1.4 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power			
				Conducted Average (dBm)			
				131979	132322	132665	
				1710.7 MHz	1745.0 MHz	1779.3 MHz	
1.4	QPSK	1	0	23.9	23.9	24.0	
		1	2	24.0	24.0	24.1	
		1	5	23.9	23.9	24.0	
		3	0	23.8	23.9	23.8	
		3	1	23.9	24.0	23.9	
		3	2	23.9	24.0	24.0	
	16QAM	6	0	23.0	22.9	23.2	
		1	0	23.0	23.3	22.9	
		1	2	23.0	23.3	23.0	
		1	5	23.0	23.3	22.9	
		3	0	23.0	23.0	23.0	
		3	1	23.0	23.0	23.0	
	64QAM	3	2	23.0	23.0	23.0	
		6	0	22.1	21.9	22.2	
		1	0	22.1	22.1	22.4	
		1	2	22.2	22.2	22.5	
		1	5	22.1	22.1	22.4	
		3	0	21.9	22.1	22.4	
			3	1	22.0	22.2	22.4
			3	2	22.0	22.2	22.4
			6	0	21.1	21.4	21.1

OUTPUT POWER FOR LTE BAND 66 (3.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power			
				Conducted Average (dBm)			
				131987	132322	132657	
				1711.5 MHz	1745.0 MHz	1778.5 MHz	
3.0	QPSK	1	0	23.9	24.0	24.2	
		1	7	24.0	24.1	24.2	
		1	14	23.9	24.0	24.2	
		8	0	23.0	23.0	23.2	
		8	4	23.0	23.0	23.2	
		8	7	23.0	23.0	23.2	
	16QAM	15	0	23.0	23.0	23.1	
		1	0	23.0	22.9	23.4	
		1	7	23.0	23.0	23.4	
		1	14	23.0	22.8	23.4	
		8	0	22.1	22.2	22.2	
		8	4	22.1	22.2	22.2	
	64QAM	8	7	22.1	22.2	22.2	
		15	0	22.0	22.1	22.2	
		1	0	22.2	22.4	22.3	
		1	7	22.2	22.5	22.3	
		1	14	22.2	22.4	22.2	
		8	0	21.2	21.2	21.1	
			8	4	21.2	21.2	21.1
			8	7	21.2	21.2	21.1
			15	0	21.2	21.1	21.2

OUTPUT POWER FOR LTE BAND 66 (5.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				131997	132322	132647
				1712.5 MHz	1745.0 MHz	1777.5 MHz
5.0	QPSK	1	0	24.0	24.2	24.2
		1	12	24.0	24.1	24.1
		1	24	24.0	24.1	24.2
		12	0	23.0	23.0	23.1
		12	6	23.0	23.1	23.2
		12	11	23.0	23.0	23.1
		25	0	23.0	23.1	23.1
	16QAM	1	0	23.1	23.2	23.6
		1	12	23.0	23.1	23.5
		1	24	23.1	23.1	23.5
		12	0	22.1	22.2	22.3
		12	6	22.1	22.2	22.3
		12	11	22.1	22.1	22.3
		25	0	22.0	22.1	22.2
	64QAM	1	0	22.4	22.0	22.4
		1	12	22.4	22.0	22.4
		1	24	22.4	22.0	22.4
		12	0	21.1	21.2	21.3
		12	6	21.1	21.2	21.3
		12	11	21.1	21.2	21.3
		25	0	21.1	21.1	21.2

OUTPUT POWER FOR LTE BAND 66 (10.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				132022	132322	132622
				1715.0 MHz	1745.0 MHz	1775.0 MHz
10.0	QPSK	1	0	24.0	24.1	24.1
		1	24	23.9	24.0	24.1
		1	49	23.9	24.0	24.2
		25	0	23.0	23.0	23.1
		25	12	23.0	23.0	23.0
		25	24	23.1	23.0	23.1
		50	0	23.1	23.1	23.0
	16QAM	1	0	23.0	23.0	23.4
		1	24	23.0	22.8	23.4
		1	49	23.0	22.8	23.3
		25	0	22.2	22.1	22.1
		25	12	22.2	22.1	22.1
		25	24	22.2	22.1	22.2
		50	0	22.1	22.1	22.1
	64QAM	1	0	22.3	22.3	22.5
		1	24	22.2	22.2	22.4
		1	49	22.2	22.2	22.4
		25	0	21.3	21.3	21.3
		25	12	21.2	21.2	21.2
		25	24	21.2	21.2	21.3
		50	0	21.2	21.3	21.2

OUTPUT POWER FOR LTE BAND 66 (15.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				132047	132322	132597
				1717.5 MHz	1745.0 MHz	1772.5 MHz
15.0	QPSK	1	0	24.1	24.2	24.3
		1	37	24.0	24.0	24.1
		1	74	24.1	24.1	24.2
		36	0	23.1	23.1	23.2
		36	16	23.1	23.1	23.1
		36	35	23.0	23.0	23.1
		75	0	23.0	23.1	23.1
	16QAM	1	0	23.4	23.0	23.6
		1	37	23.3	22.9	23.4
		1	74	23.4	23.0	23.3
		36	0	22.1	22.2	22.3
		36	16	22.1	22.2	22.2
		36	35	22.1	22.1	22.2
		75	0	22.1	22.1	22.2
	64QAM	1	0	22.3	22.6	22.7
		1	37	22.2	22.4	22.7
		1	74	22.2	22.5	22.7
		36	0	21.3	21.3	21.2
		36	16	21.3	21.2	21.2
		36	35	21.2	21.2	21.1
		75	0	21.2	21.2	21.2

OUTPUT POWER FOR LTE BAND 66 (20.0 MHz)

Bandwidth (MHz)	Modulation	RB Allocation	RB Offset	Power		
				Conducted Average (dBm)		
				132072	132322	132572
				1720.0 MHz	1745.0 MHz	1770.0 MHz
20.0	QPSK	1	0	24.0	24.1	24.2
		1	49	24.0	24.0	24.0
		1	99	24.0	24.0	24.1
		50	0	23.1	23.1	23.1
		50	24	23.1	23.1	23.1
		50	49	23.0	23.0	23.0
		100	0	23.0	23.1	23.0
	16QAM	1	0	23.3	23.7	23.6
		1	49	23.3	23.5	23.4
		1	99	23.4	23.6	23.3
		50	0	22.2	22.2	22.2
		50	24	22.1	22.1	22.2
		50	49	22.1	22.1	22.1
		100	0	22.1	22.2	22.1
	64QAM	1	0	22.8	22.5	22.4
		1	49	22.7	22.4	22.3
		1	99	22.7	22.4	22.3
		50	0	21.2	21.3	21.2
		50	24	21.2	21.3	21.3
		50	49	21.2	21.2	21.2
		100	0	21.2	21.2	21.2

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

- GSM 850
- GSM 1900
- WCDMA Band 5
- WCDMA Band 2
- WCDMA Band 4
- LTE Band 2
- LTE Band 4
- LTE Band 5
- LTE Band 7
- LTE Band 12
- LTE Band 13
- LTE Band 26 (FCC PART 90S)
- LTE Band 26 (FCC PART 22)
- LTE Band 41 (FCC)
- 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.

GSM

Band	Modulation	Channel	f(MHz)	99% BW (KHz)	-26dB BW (KHz)
GSM850	GPRS	190	836.6	245.73	316.28
	EGPRS			248.42	309.71
GSM1900	GPRS	661	1880.0	243.88	315.26
	EGPRS			239.34	313.25

WCDMA

Band	Modulation	Channel	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
BAND5	REL 99	4408	836.6	4.14	4.71
	HSDPA			4.15	4.72
BAND2	REL 99	9800	1880.0	4.13	4.74
	HSDPA			4.13	4.69
BAND4	REL 99	1638	1732.6	4.13	4.67
	HSDPA			4.12	4.68

LTE2

Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 2	1.4 MHz, QPSK	6/0	1880.0	1.10	1.25
	1.4 MHz, 16QAM			1.08	1.23
	3 MHz, QPSK	15/0		2.69	3.00
	3 MHz, 16QAM			2.69	2.98
	5 MHz, QPSK	25/0		4.49	4.90
	5 MHz, 16QAM			4.49	4.92
	10 MHz, QPSK	50/0		8.97	9.69
	10 MHz, 16QAM			8.97	9.61
	15 MHz, QPSK	75/0		13.36	14.37
	15 MHz, 16QAM			13.38	14.53
	20 MHz, QPSK	100/0		17.80	19.00
	20 MHz, 16QAM			17.80	19.14

LTE4

Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 4	1.4 MHz, QPSK	6/0	1732.5	1.09	1.23
	1.4 MHz, 16QAM			1.08	1.22
	3 MHz, QPSK	15/0		2.69	2.99
	3 MHz, 16QAM			2.69	2.96
	5 MHz, QPSK	25/0		4.50	4.93
	5 MHz, 16QAM			4.50	4.94
	10 MHz, QPSK	50/0		8.94	9.78
	10 MHz, 16QAM			8.94	9.65
	15 MHz, QPSK	75/0		13.37	14.53
	15 MHz, 16QAM			13.40	14.65
	20 MHz, QPSK	100/0		17.82	19.23
	20 MHz, 16QAM			17.86	19.19

LTE5

Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 5	1.4 MHz, QPSK	6/0	836.5	1.09	1.24
	1.4 MHz, 16QAM			1.08	1.23
	3 MHz, QPSK	15/0		2.69	2.97
	3 MHz, 16QAM			2.68	2.98
	5 MHz, QPSK	25/0		4.50	4.94
	5 MHz, 16QAM			4.50	4.93
	10 MHz, QPSK	50/0		8.94	9.39
	10 MHz, 16QAM			8.93	9.58

LTE7

Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 7	5 MHz, QPSK	25/0	2535.0	4.50	4.92
	5 MHz, 16QAM			4.50	4.95
	10 MHz, QPSK	50/0		8.96	9.82
	10 MHz, 16QAM			8.95	9.81
	15 MHz, QPSK	75/0		13.42	14.50
	15 MHz, 16QAM			13.42	14.59
	20 MHz, QPSK	100/0		17.83	19.19
	20 MHz, 16QAM			17.84	19.26

LTE12

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	1.09	1.23
	1.4 MHz, 16QAM			1.08	1.23
	3 MHz, QPSK	15/0		2.68	2.96
	3 MHz, 16QAM			2.68	2.98
	5 MHz, QPSK	25/0		4.52	4.90
	5 MHz, 16QAM			4.49	4.97
	10 MHz, QPSK	50/0		8.95	9.74
	10 MHz, 16QAM			8.96	9.67

LTE13

Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 13	5 MHz, QPSK	25/0	782.0	4.51	4.95
	5 MHz, 16QAM			4.52	4.90
	10 MHz, QPSK	50/0		8.96	9.70
	10 MHz, 16QAM			8.94	9.65

LTE26 (FCC 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	819 821.5(15MHz)	1.08	1.23
	1.4 MHz, 16QAM			1.08	1.23
	3 MHz, QPSK	15/0		2.69	2.98
	3 MHz, 16QAM			2.69	2.98
	5 MHz, QPSK	25/0		4.50	4.97
	5 MHz, 16QAM			4.50	4.98
	10 MHz, QPSK	50/0		8.94	9.62
	10 MHz, 16QAM			8.94	9.68
	15 MHz, QPSK	75/0		13.39	14.37
	15 MHz, 16QAM			13.39	14.47

LTE26 (FCC PART 22)

Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 26	1.4 MHz, QPSK	6/0	831.5 836.5(15MHz)	1.08	1.23
	1.4 MHz, 16QAM			1.08	1.23
	3 MHz, QPSK	15/0		2.69	2.98
	3 MHz, 16QAM			2.68	2.97
	5 MHz, QPSK	25/0		4.51	4.94
	5 MHz, 16QAM			4.51	4.92
	10 MHz, QPSK	50/0		8.95	9.69
	10 MHz, 16QAM			8.95	9.62
	15 MHz, QPSK	50/0		13.36	14.57
	15 MHz, 16QAM			13.37	14.38

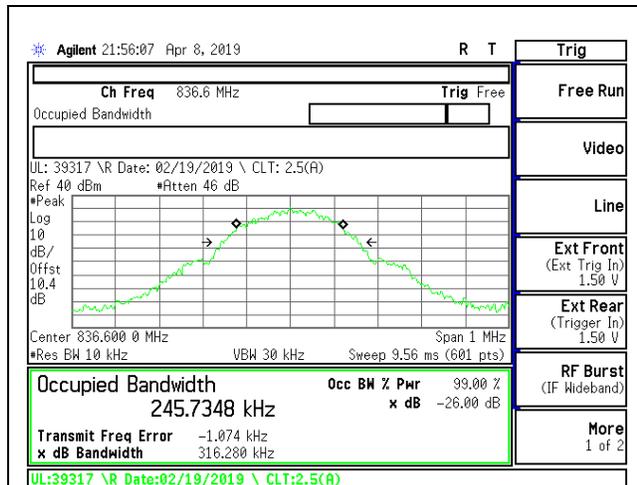
LTE41 (FCC)

Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 41	5 MHz, QPSK	25/0	2593.0	4.51	4.90
	5 MHz, 16QAM			4.49	4.86
	10 MHz, QPSK	50/0		8.94	9.65
	10 MHz, 16QAM			8.93	9.69
	15 MHz, QPSK	75/0		13.42	14.39
	15 MHz, 16QAM			13.38	14.50
	20 MHz, QPSK	100/0		17.75	19.04
	20 MHz, 16QAM			17.81	19.17

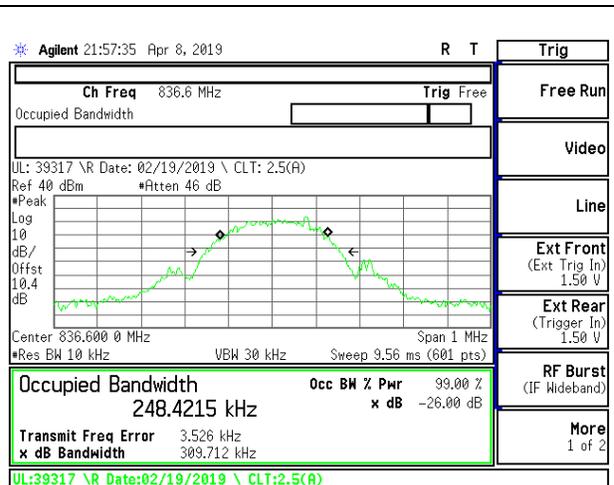
LTE66

Band	Mode	RB Allocation/RB Offset	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 66	1.4 MHz, QPSK	6/0	1745.0	1.08	1.21
	1.4 MHz, 16QAM			1.09	1.23
	3 MHz, QPSK	15/0		2.69	2.96
	3 MHz, 16QAM			2.68	3.00
	5 MHz, QPSK	25/0		4.51	4.95
	5 MHz, 16QAM			4.50	4.89
	10 MHz, QPSK	50/0		8.96	9.72
	10 MHz, 16QAM			8.98	9.72
	15 MHz, QPSK	75/0		13.39	14.43
	15 MHz, 16QAM			13.43	14.37
	20 MHz, QPSK	100/0		17.81	19.28
	20 MHz, 16QAM			17.86	19.06

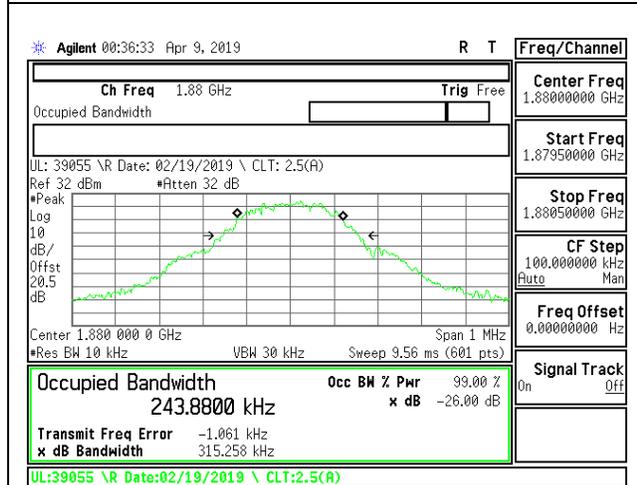
8.1.1. GSM



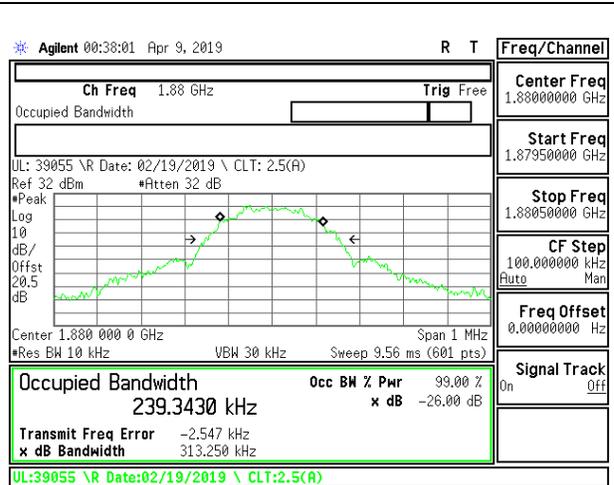
GSM 850MHz GPRS MID Channel



GSM 850MHz EGPRS MID Channel

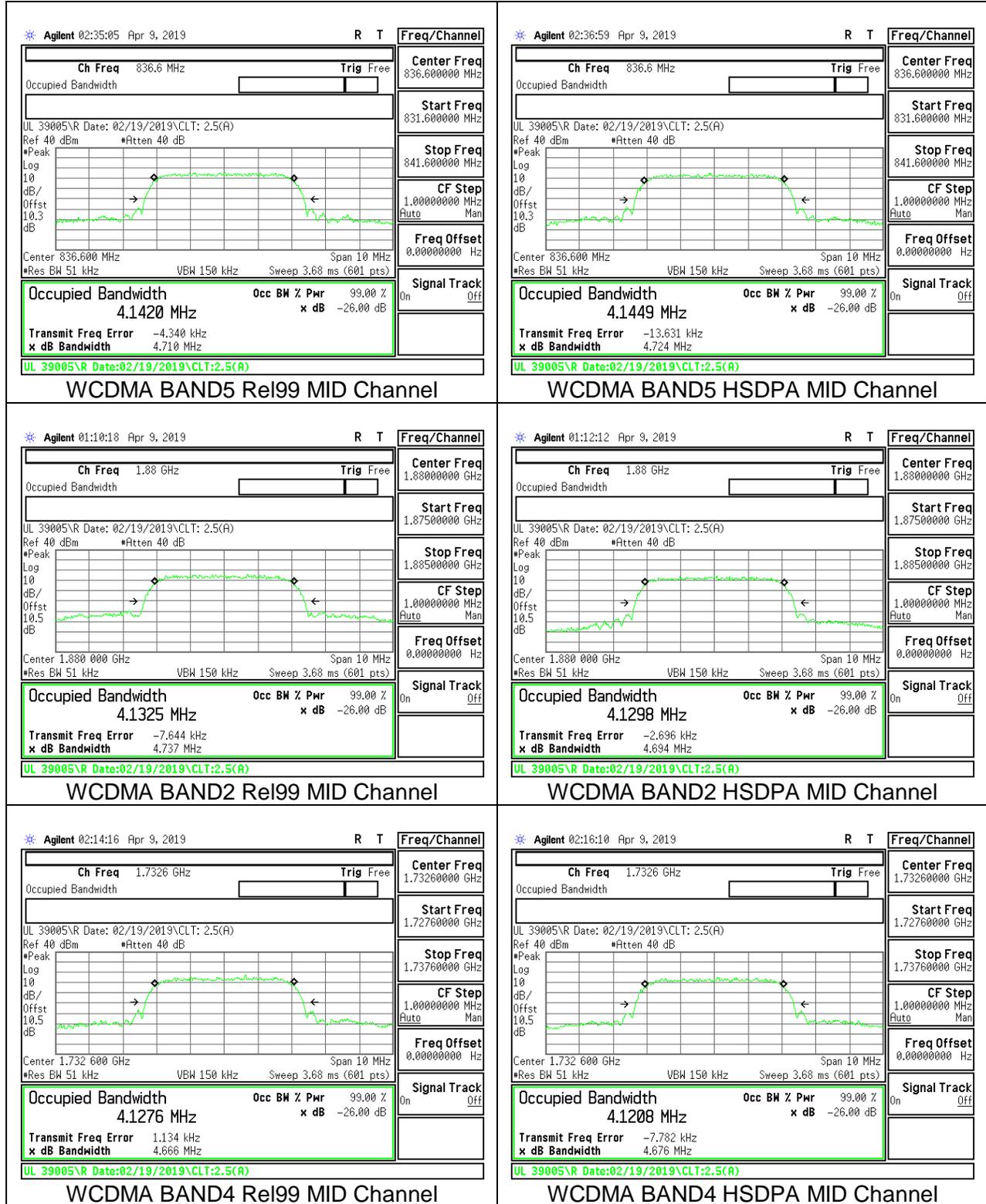


GSM 1900MHz GPRS MID Channel

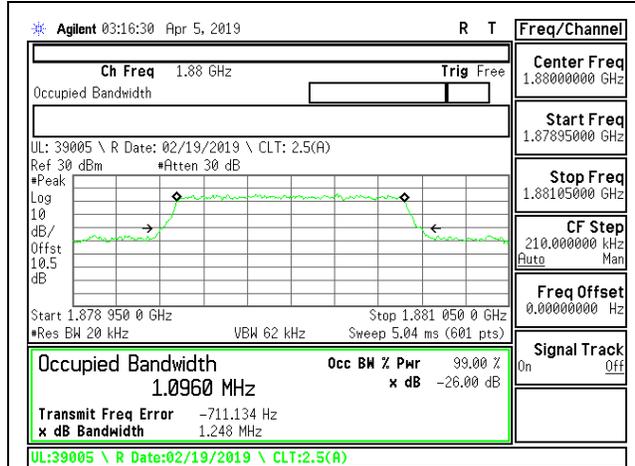


GSM 1900MHz EGPRS MID Channel

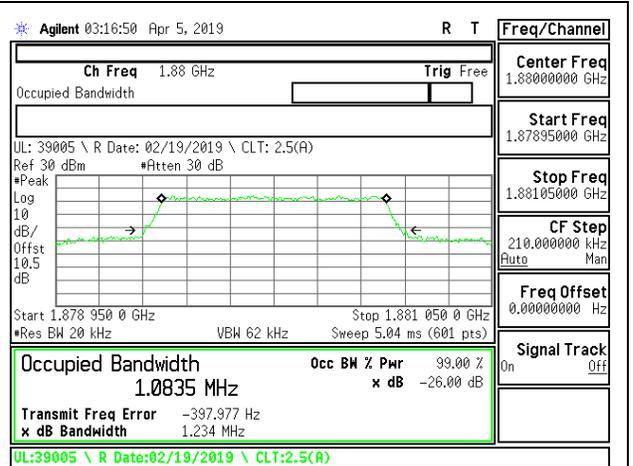
8.1.2. WCDMA



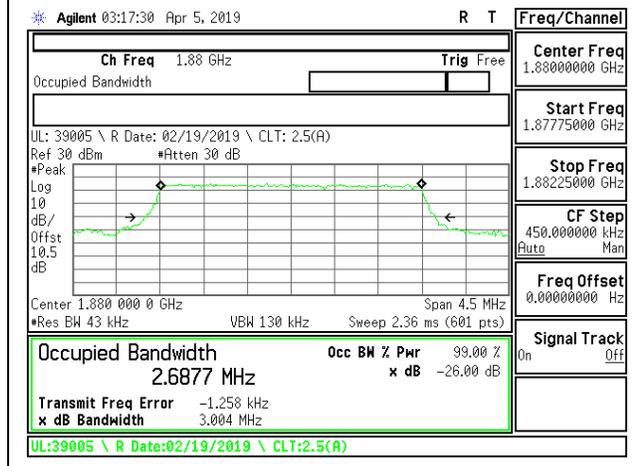
8.1.3. LTE BAND 2



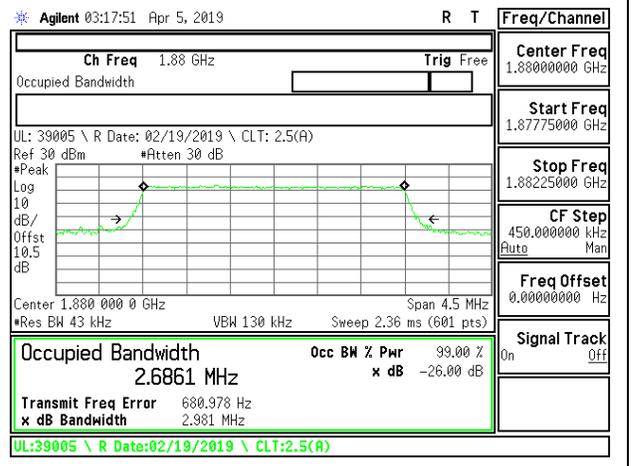
LTE B2 1.4MHz QPSK Mid Channel RB6-0



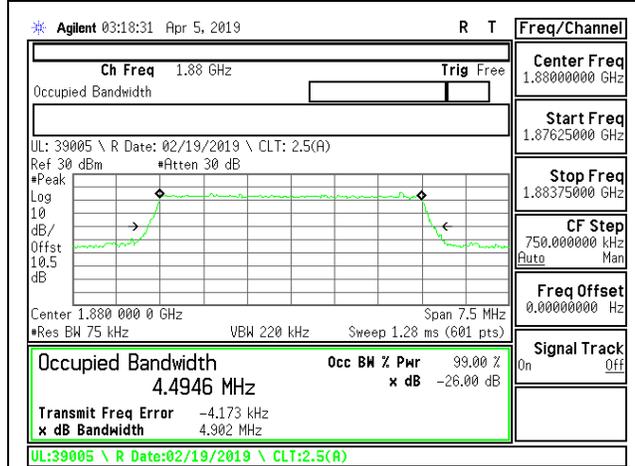
LTE B2 1.4MHz 16QAM Mid Channel RB6-0



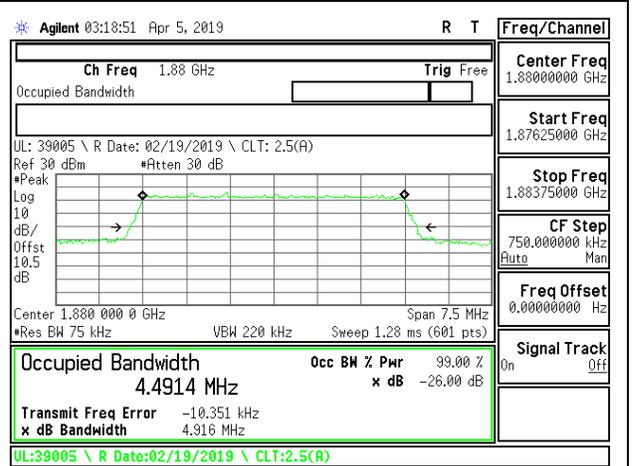
LTE B2 3MHz QPSK Mid Channel RB15-0



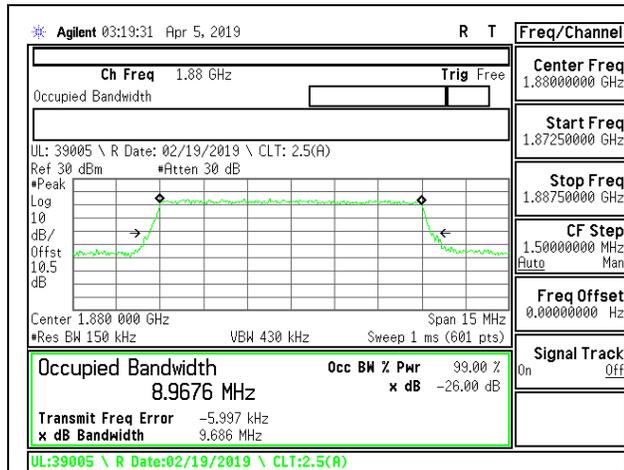
LTE B2 3MHz 16QAM Mid Channel RB15-0



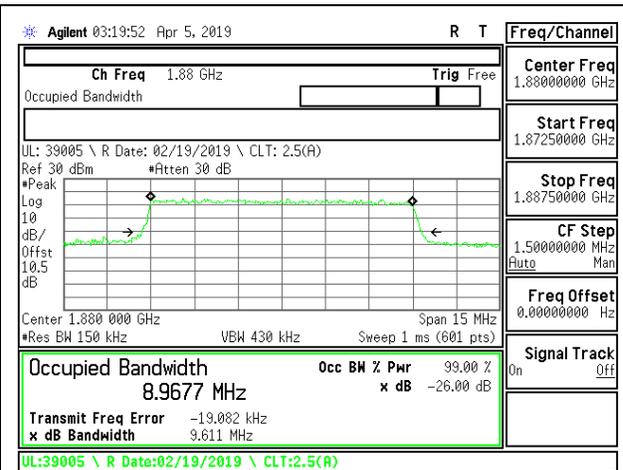
LTE B2 5MHz QPSK Mid Channel RB25-0



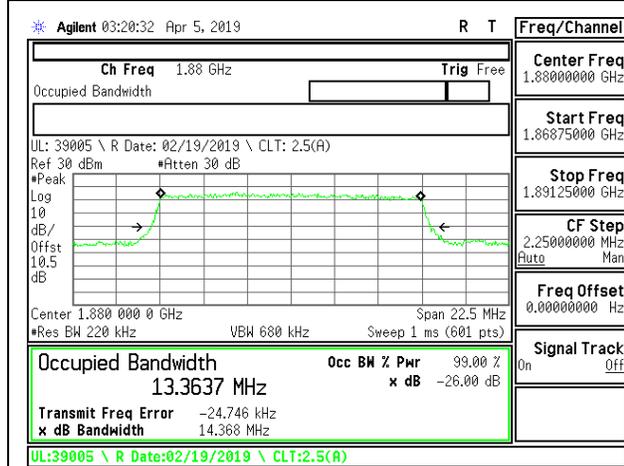
LTE B2 5MHz 16QAM Mid Channel RB25-0



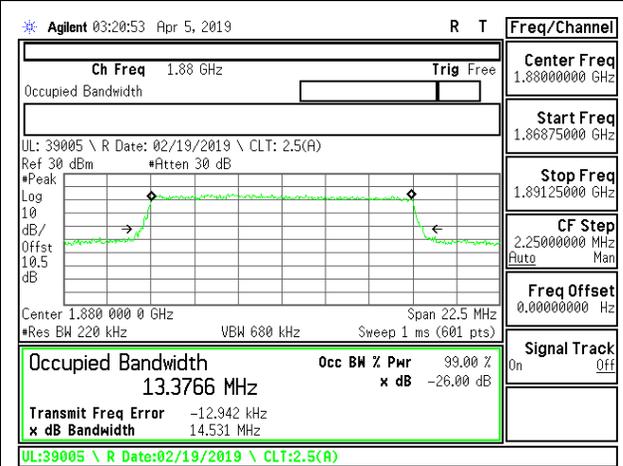
LTE B2 10MHz QPSK Mid Channel RB50-0



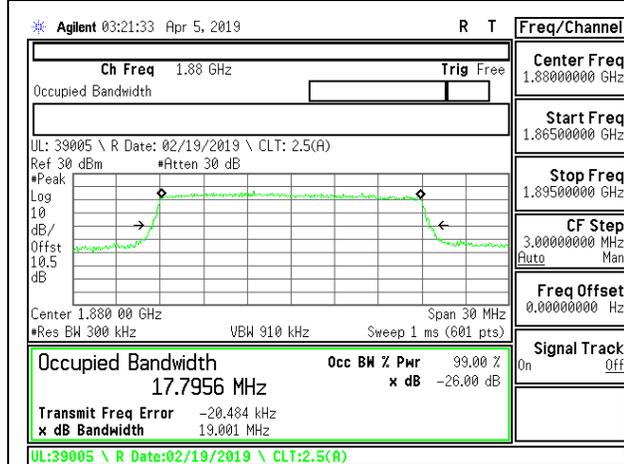
LTE B2 10MHz 16QAM Mid Channel RB50-0



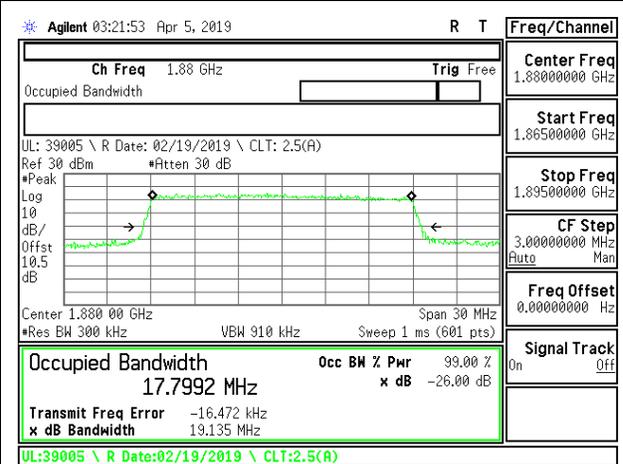
LTE B2 15MHz QPSK Mid Channel RB75-0



LTE B2 15MHz 16QAM Mid Channel RB75-0

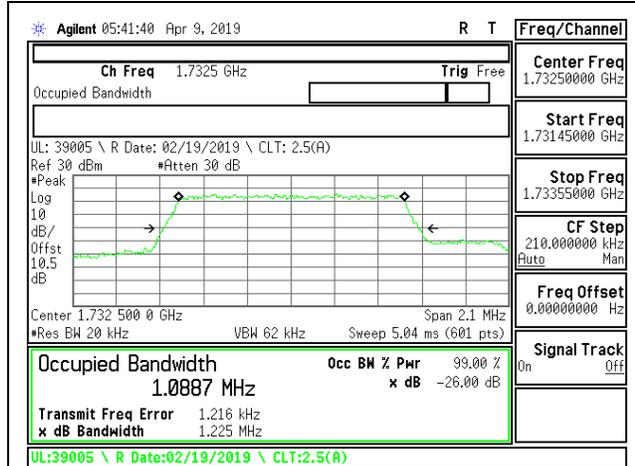


LTE B2 20MHz QPSK Mid Channel RB100-0

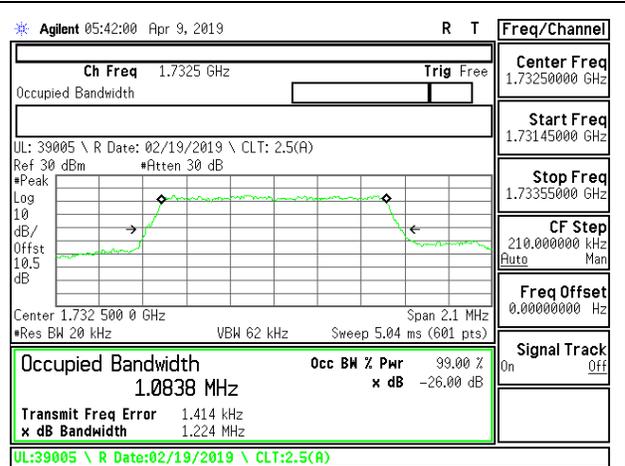


LTE B2 20MHz 16QAM Mid Channel RB100-0

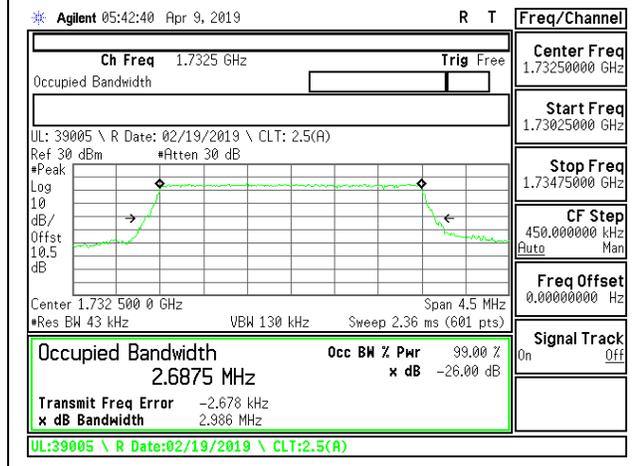
8.1.4. LTE BAND 4



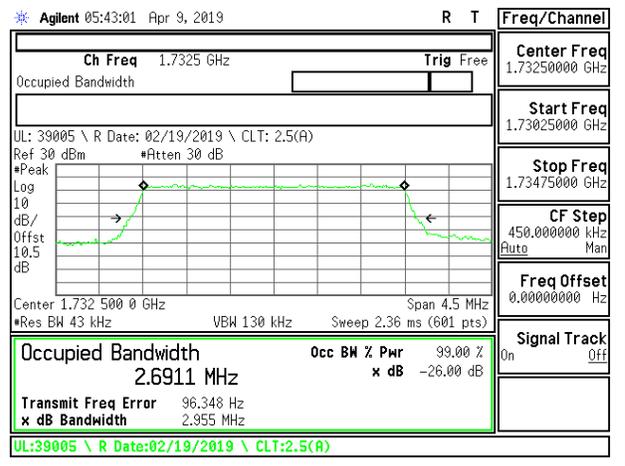
LTE B4 1.4MHz QPSK Mid Channel RB6-0



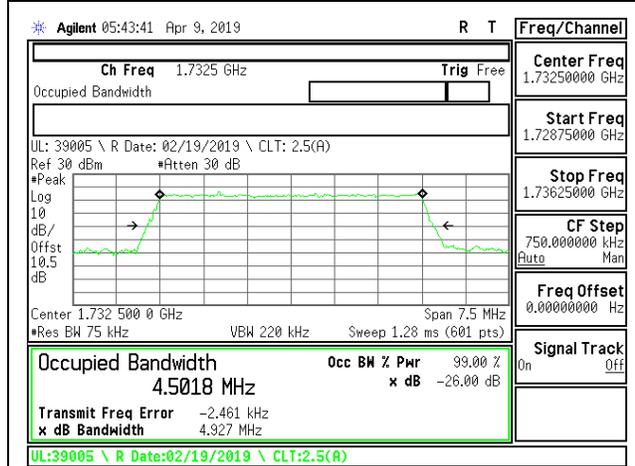
LTE B4 1.4MHz 16QAM Mid Channel RB6-0



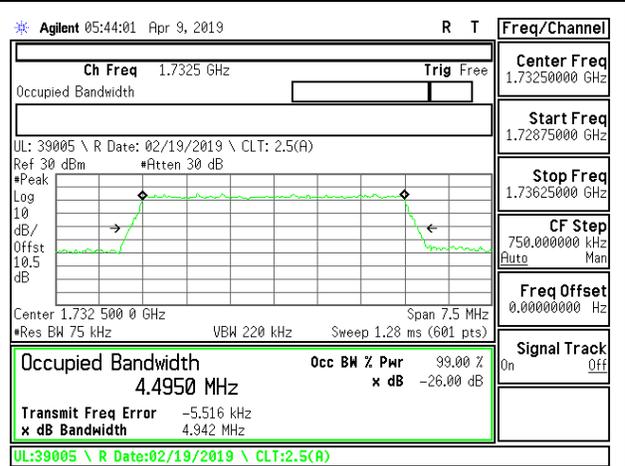
LTE B4 3MHz QPSK Mid Channel RB15-0



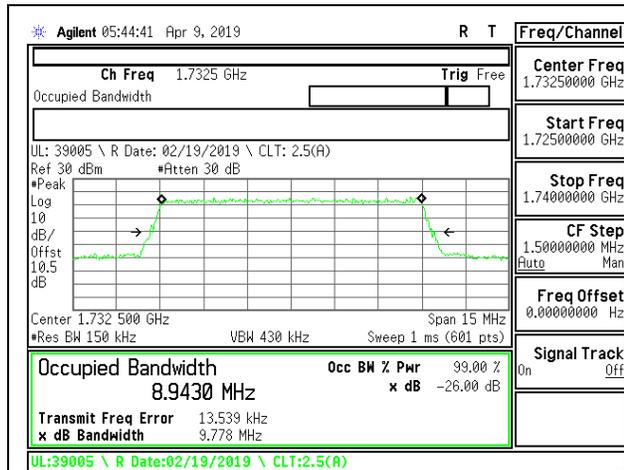
LTE B4 3MHz 16QAM Mid Channel RB15-0



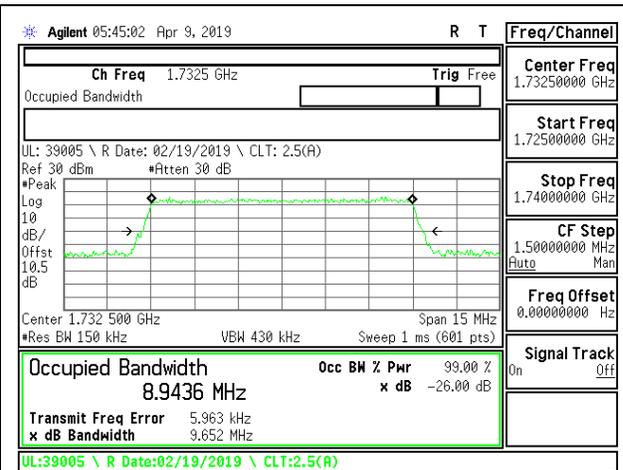
LTE B4 5MHz QPSK Mid Channel RB25-0



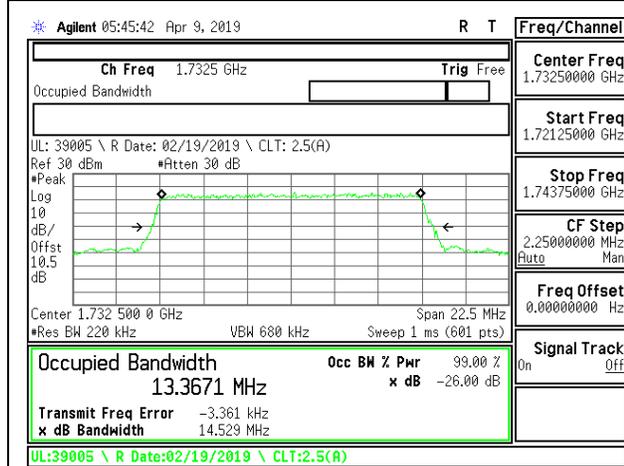
LTE B4 5MHz 16QAM Mid Channel RB25-0



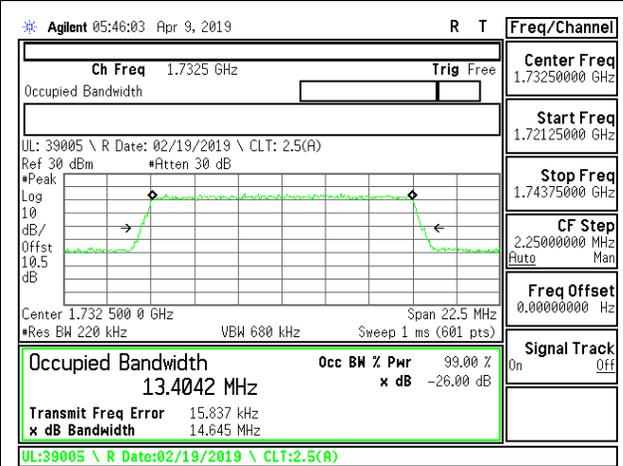
LTE B4 10MHz QPSK Mid Channel RB50-0



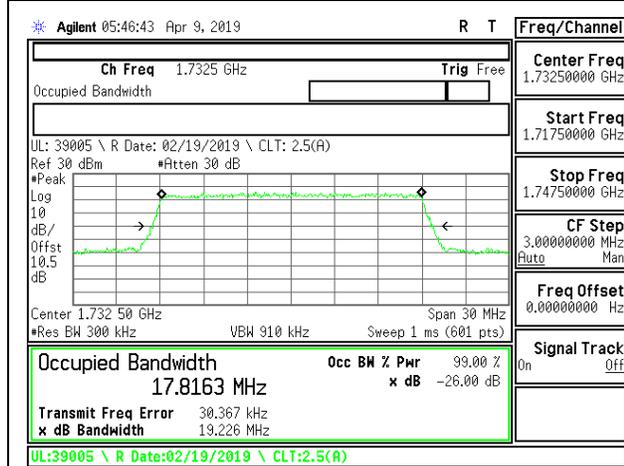
LTE B4 10MHz 16QAM Mid Channel RB50-0



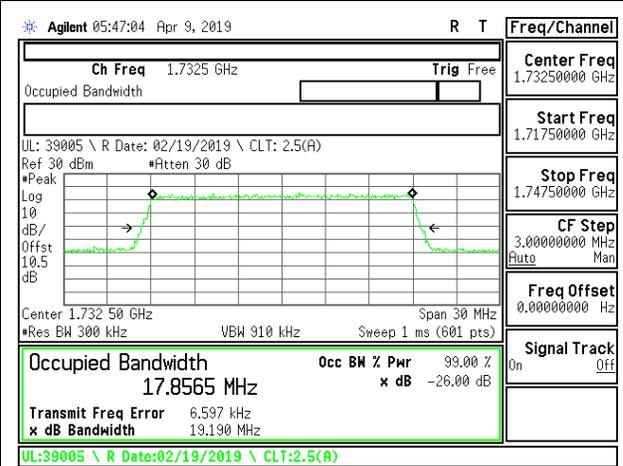
LTE B4 15MHz QPSK Mid Channel RB75-0



LTE B4 15MHz 16QAM Mid Channel RB75-0

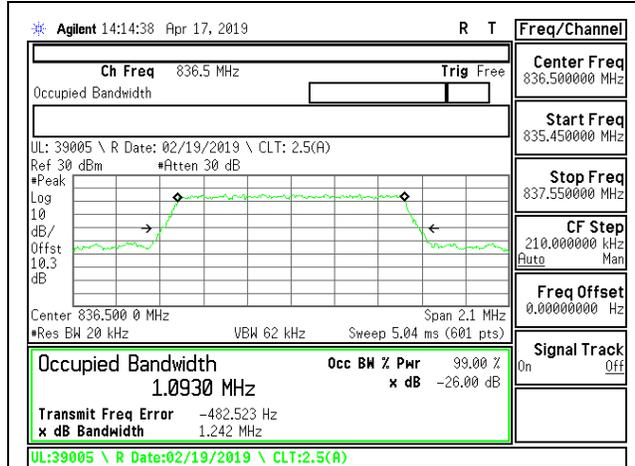


LTE B4 20MHz QPSK Mid Channel RB100-0

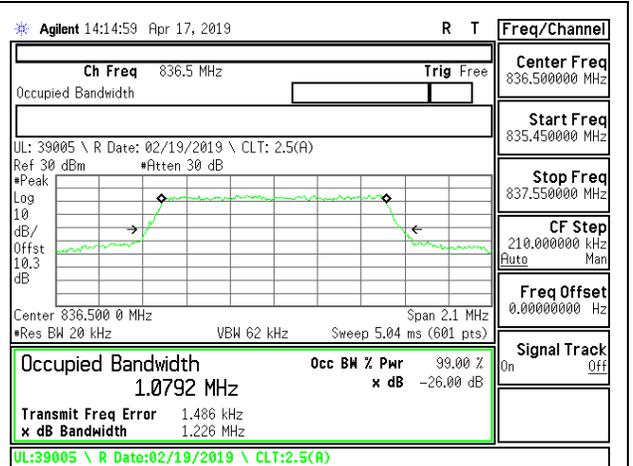


LTE B4 20MHz 16QAM Mid Channel RB100-0

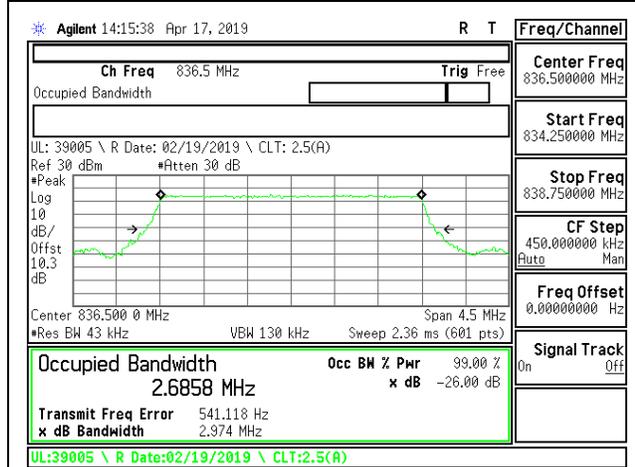
8.1.5. LTE BAND 5



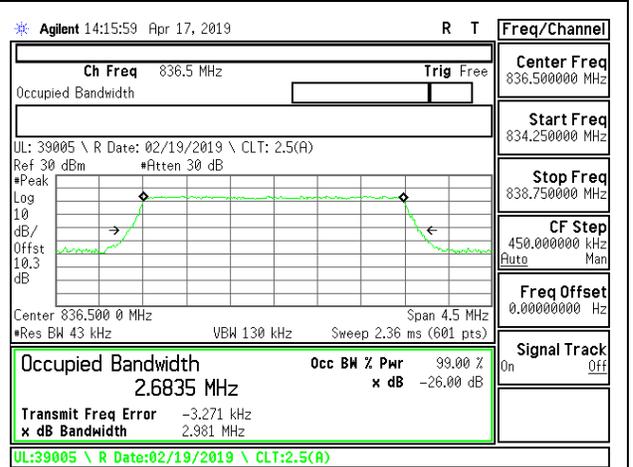
LTE B5 1.4MHz QPSK Mid Channel RB6-0



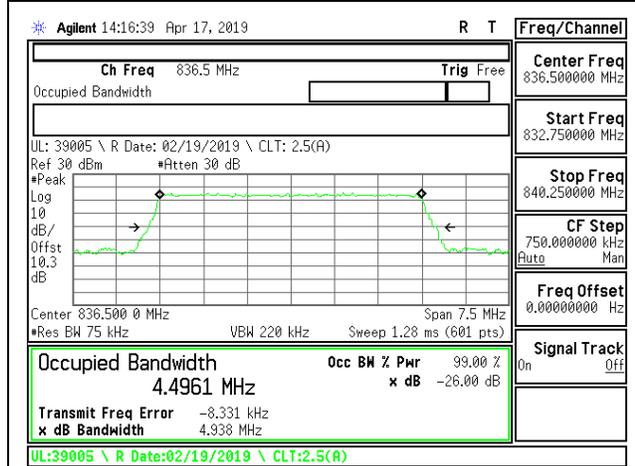
LTE B5 1.4MHz 16QAM Mid Channel RB6-0



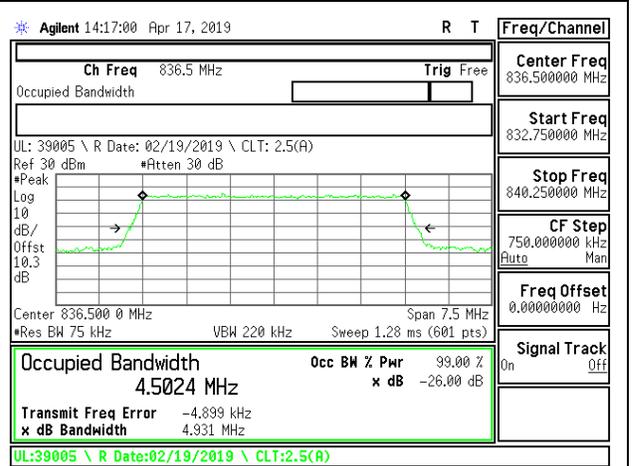
LTE B5 3MHz QPSK Mid Channel RB15-0



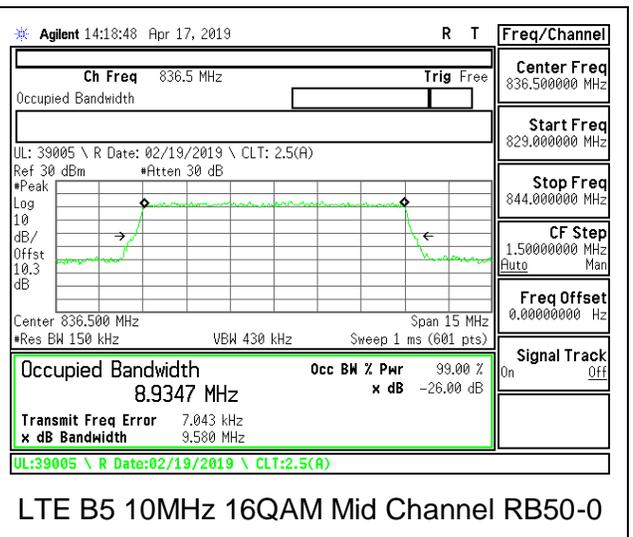
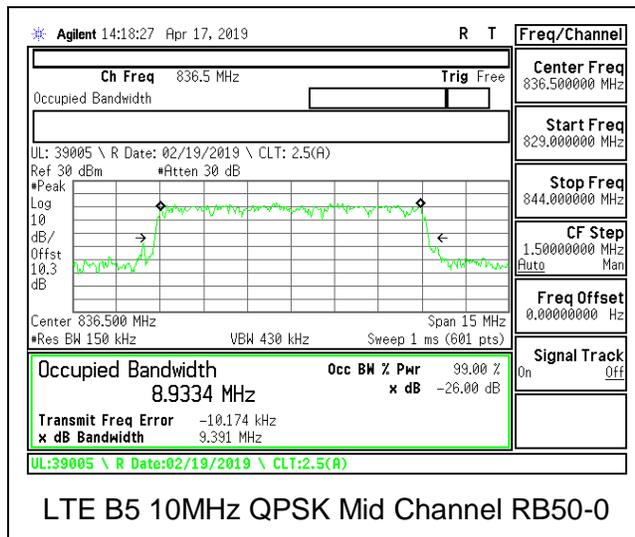
LTE B5 3MHz 16QAM Mid Channel RB15-0



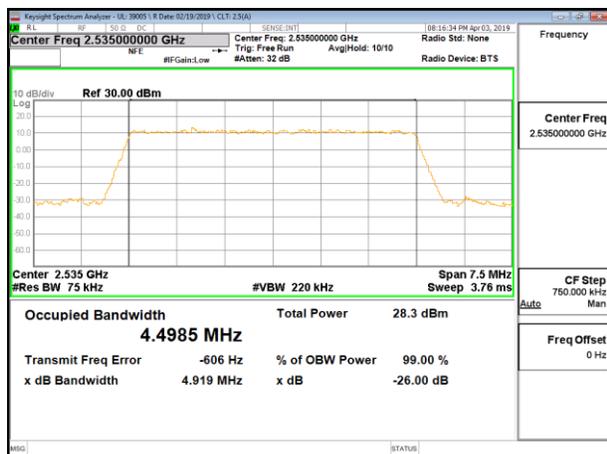
LTE B5 5MHz QPSK Mid Channel RB25-0



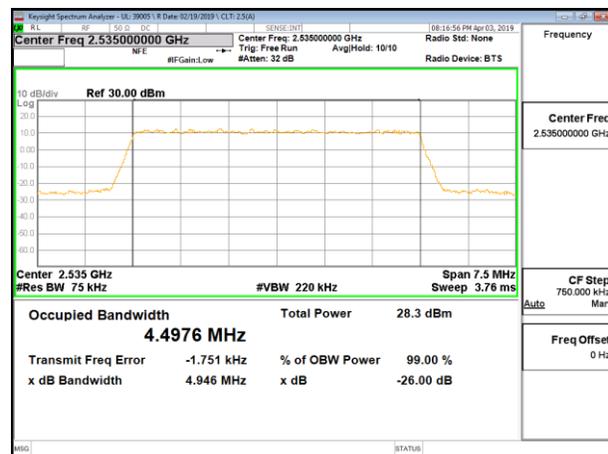
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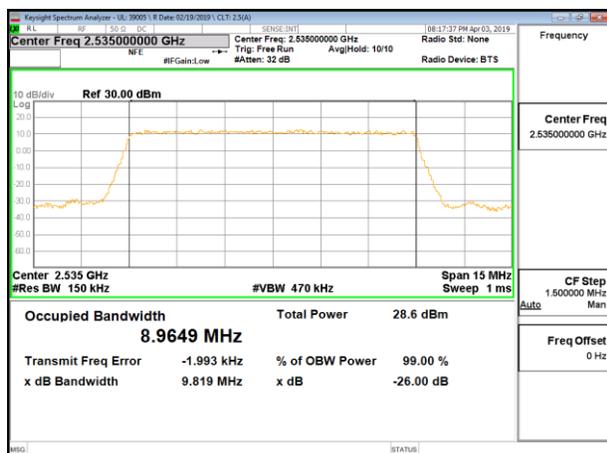
8.1.6. LTE BAND 7



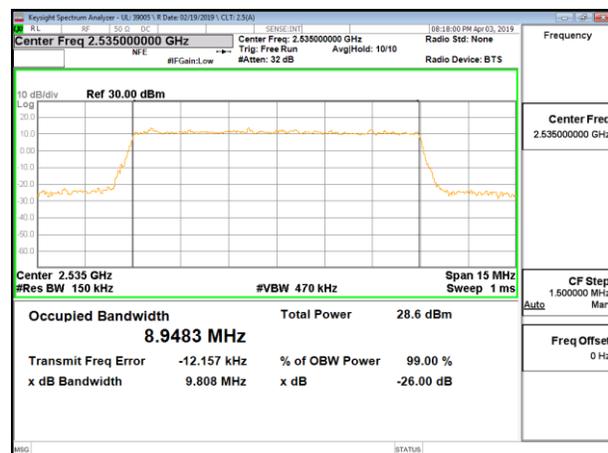
LTE B7 5MHz QPSK Mid Channel RB25-0



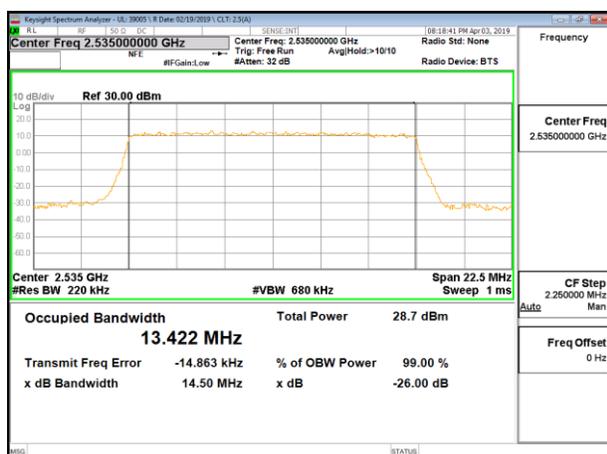
LTE B7 5MHz 16QAM Mid Channel RB25-0



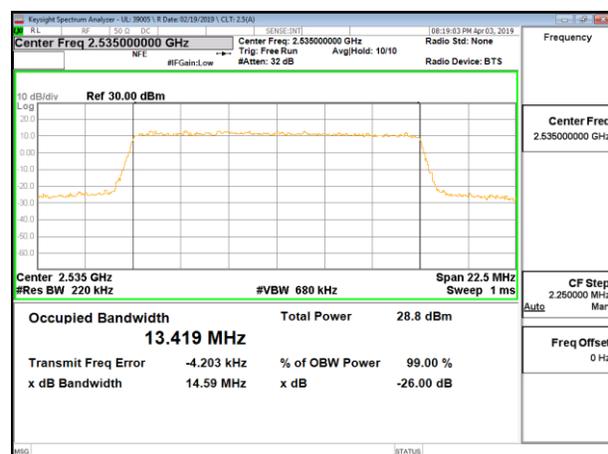
LTE B7 10MHz QPSK Mid Channel RB50-0



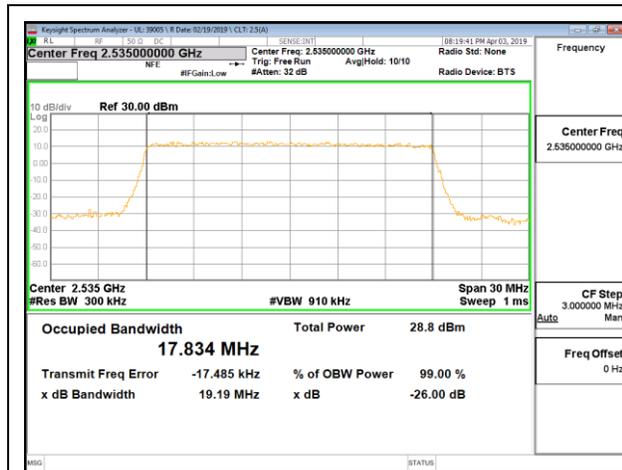
LTE B7 10MHz 16QAM Mid Channel RB50-0



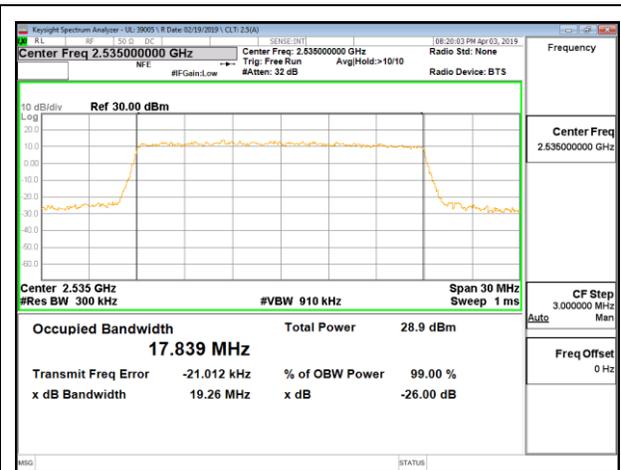
LTE B7 15MHz QPSK Mid Channel RB75-0



LTE B7 15MHz 16QAM Mid Channel RB75-0

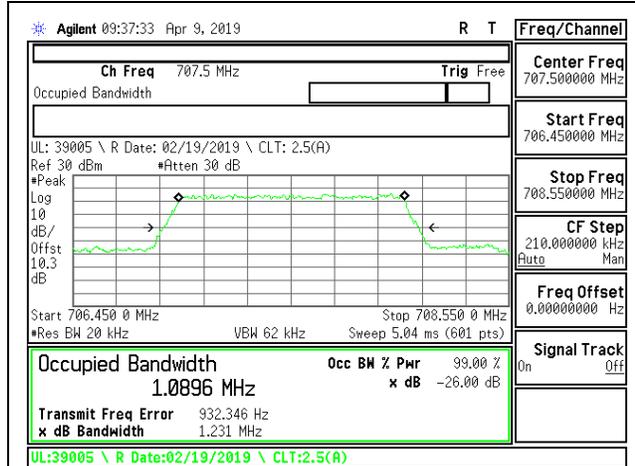


LTE B7 20MHz QPSK Mid Channel RB100-0

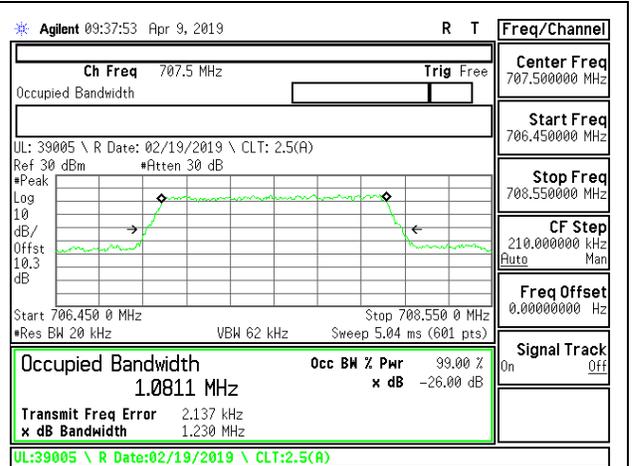


LTE B7 20MHz 16QAM Mid Channel RB100-0

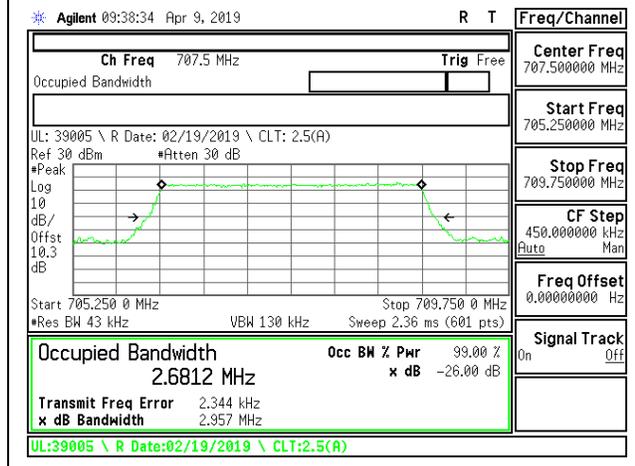
8.1.7. LTE BAND 12



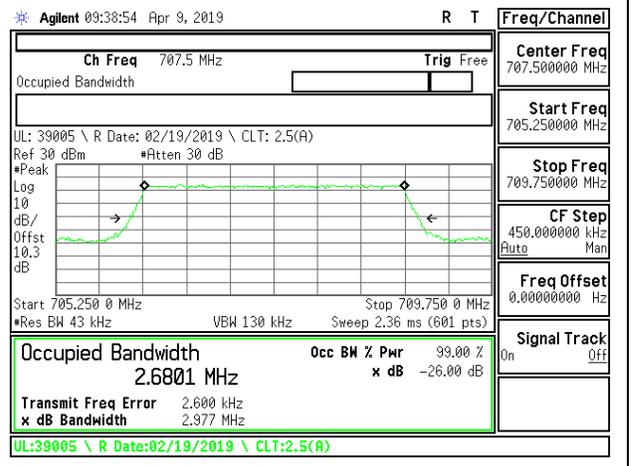
LTE B12 1.4MHz QPSK Mid Channel RB6-0



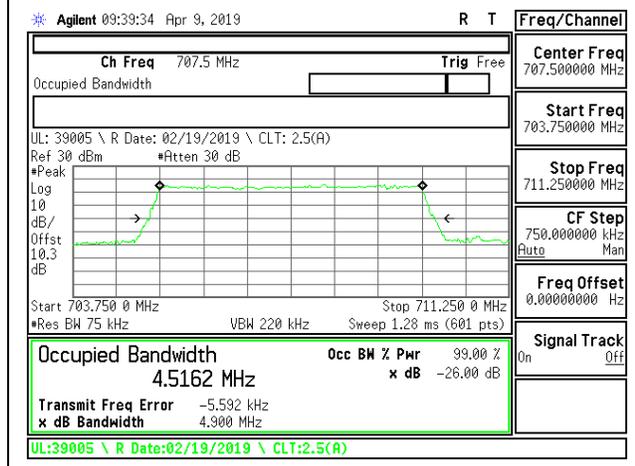
LTE B12 1.4MHz 16QAM Mid Channel RB6-0



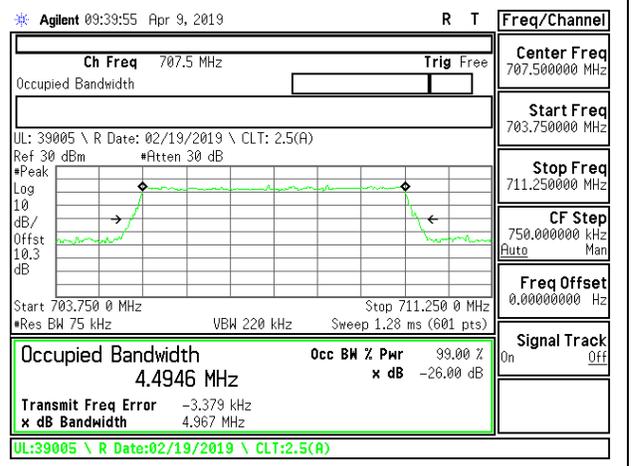
LTE B12 3MHz QPSK Mid Channel RB15-0



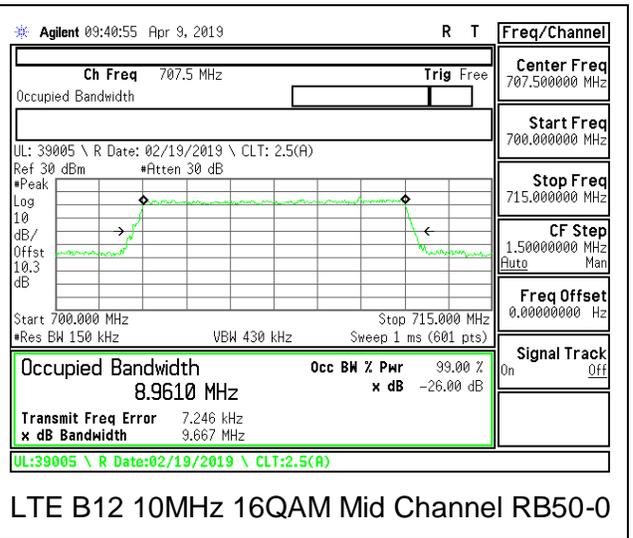
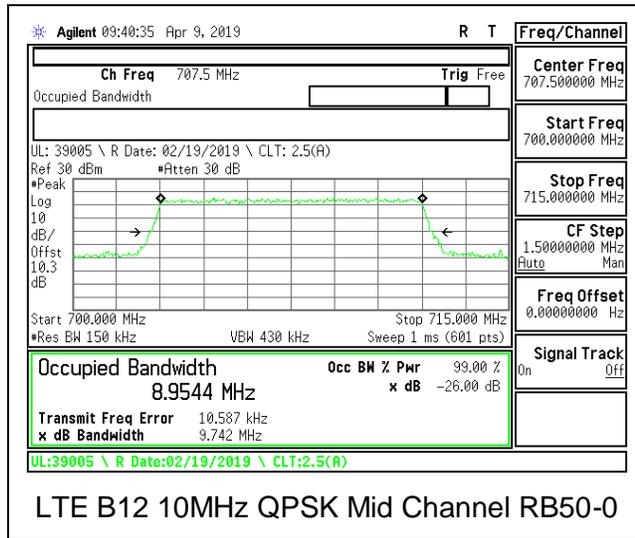
LTE B12 3MHz 16QAM Mid Channel RB15-0



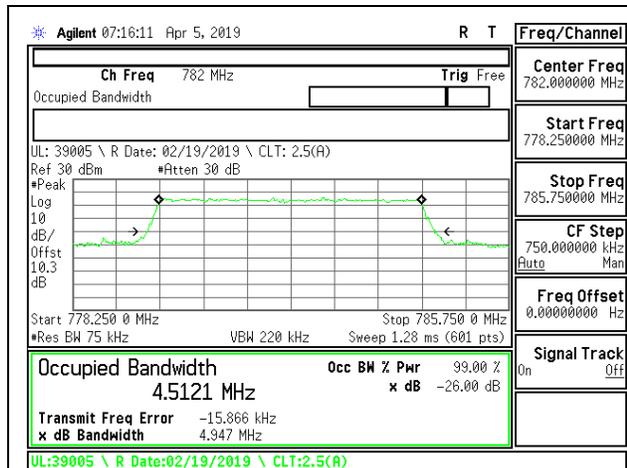
LTE B12 5MHz QPSK Mid Channel RB25-0



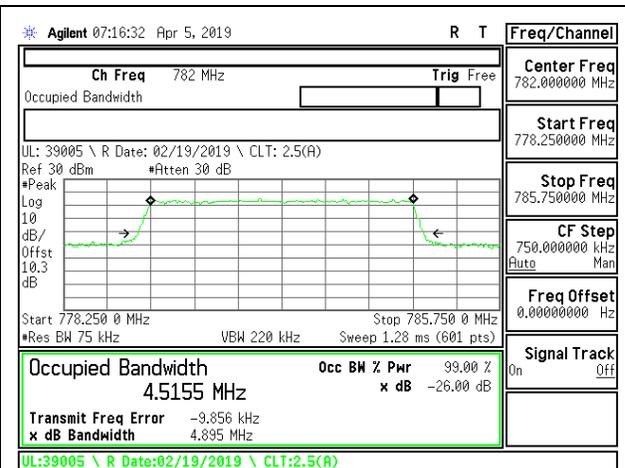
LTE B12 5MHz 16QAM Mid Channel RB25-0



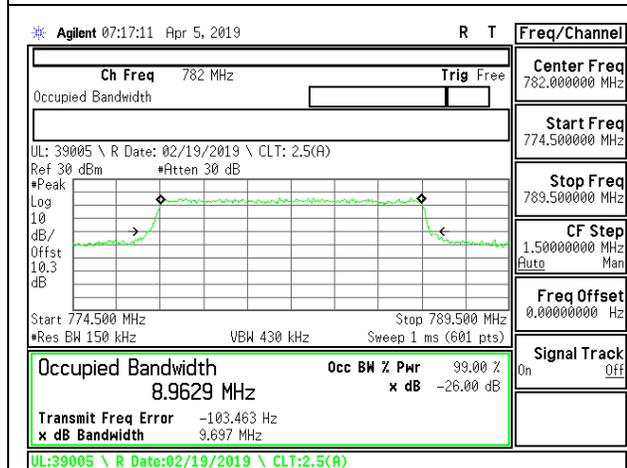
8.1.8. LTE BAND 13



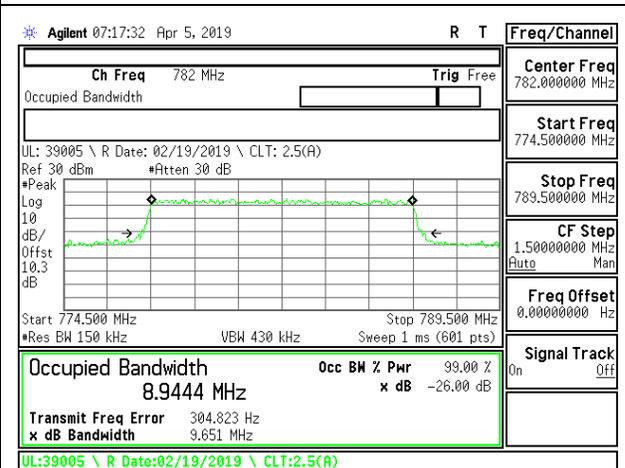
LTE B13 5MHz QPSK Mid Channel RB25-0



LTE B13 5MHz 16QAM Mid Channel RB25-0

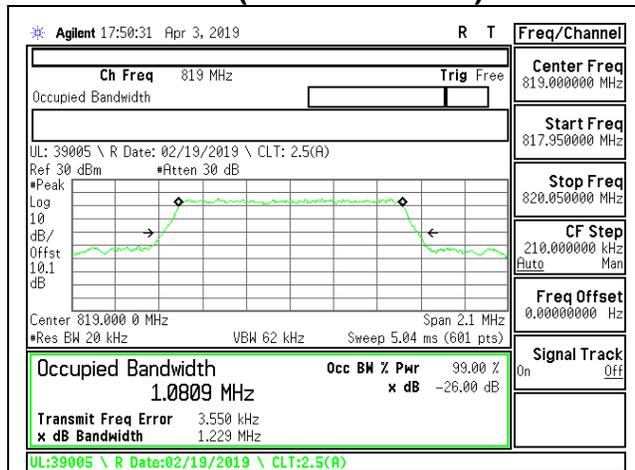


LTE B13 10MHz QPSK Mid Channel RB50-0

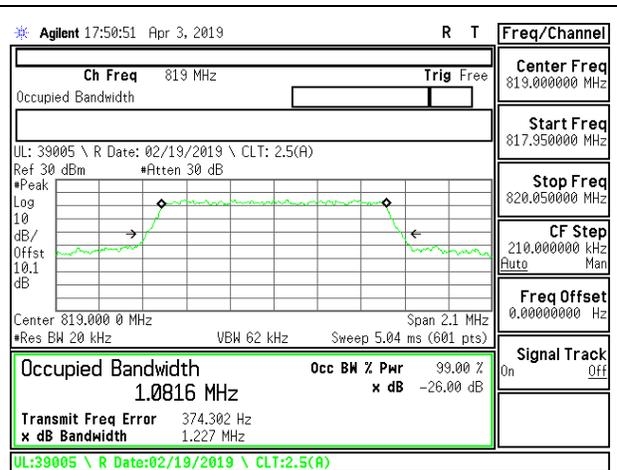


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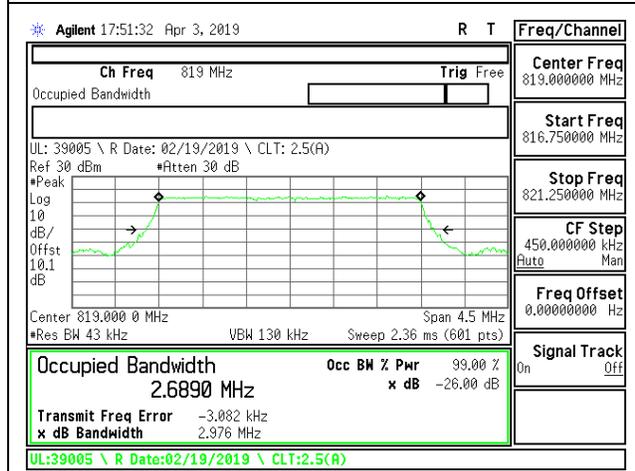
8.1.9. LTE BAND 26 (FCC PART 90S)



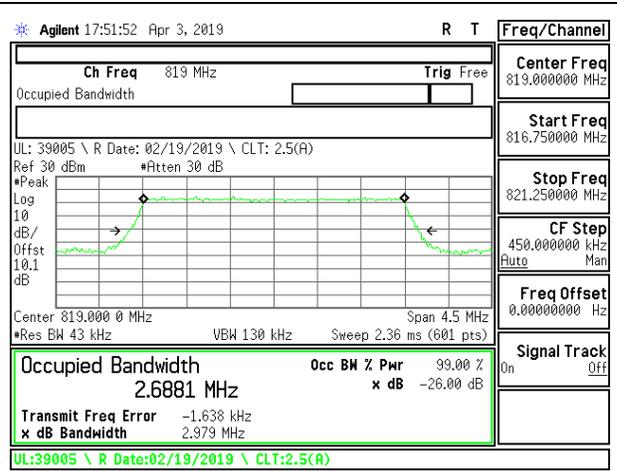
LTE B26 1.4MHz QPSK Mid Channel RB6-0



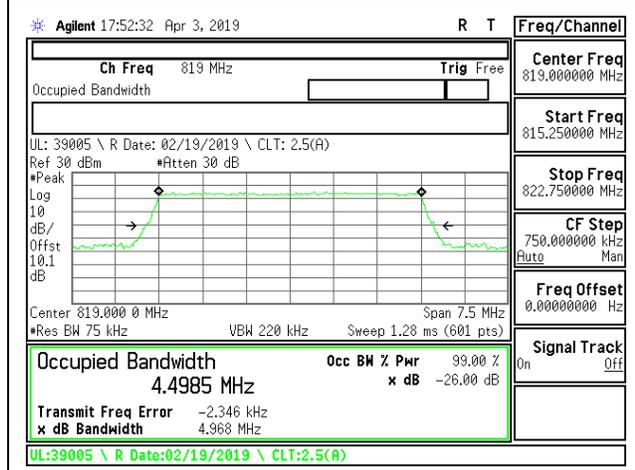
LTE B26 1.4MHz 16QAM Mid Channel RB6-0



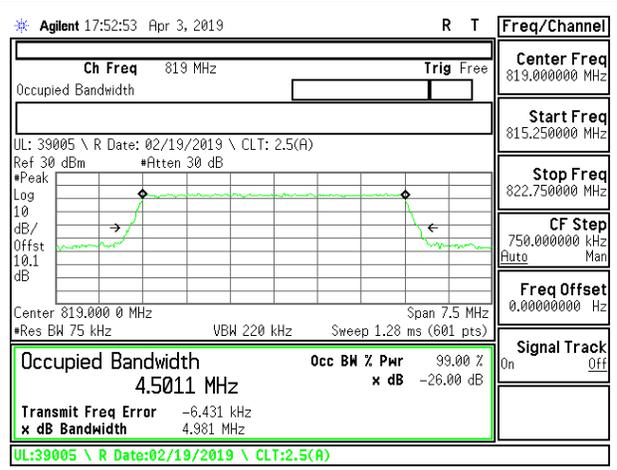
LTE B26 3MHz QPSK Mid Channel RB15-0



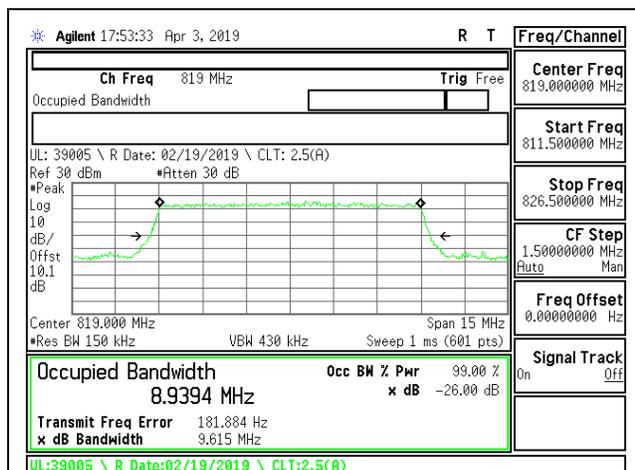
LTE B26 3MHz 16QAM Mid Channel RB15-0



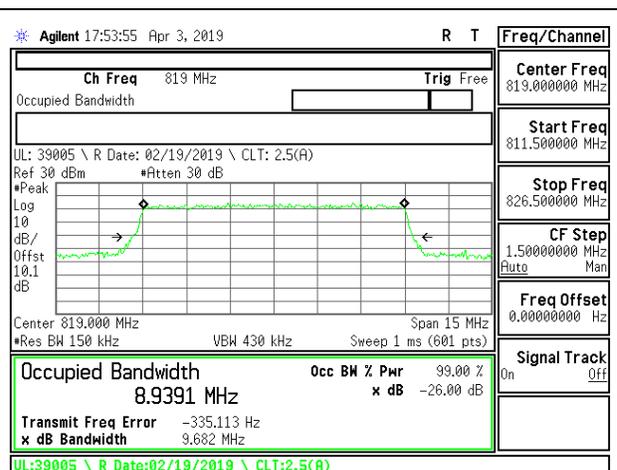
LTE B26 5MHz QPSK Mid Channel RB25-0



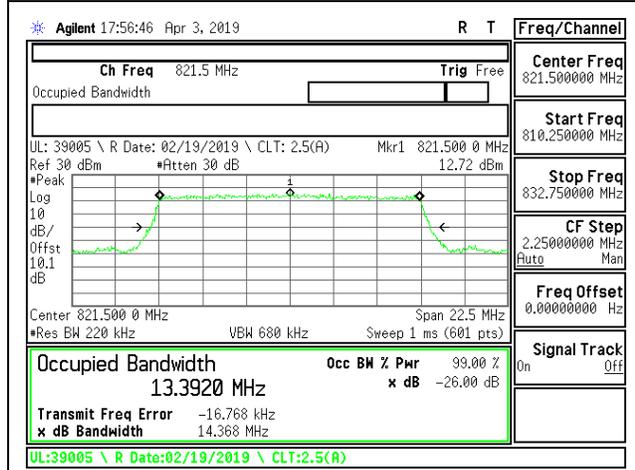
LTE B26 5MHz 16QAM Mid Channel RB25-0



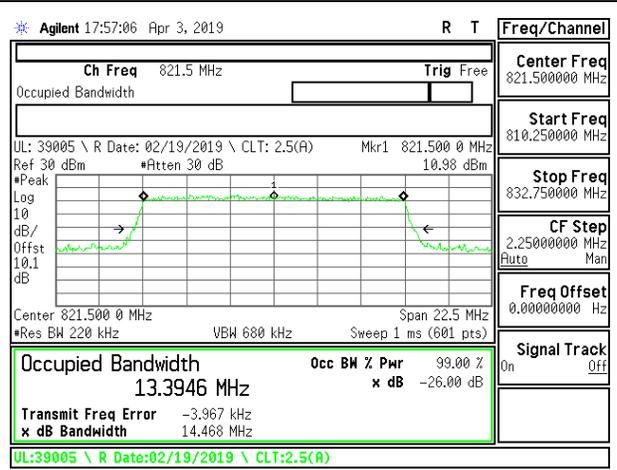
LTE B26 10MHz QPSK Mid Channel RB50-0



LTE B26 10MHz 16QAM Mid Channel RB50-0

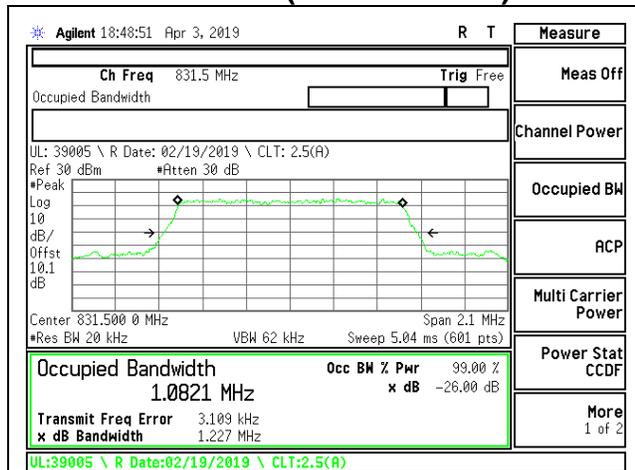


LTE B26 15MHz QPSK Mid Channel RB50-0

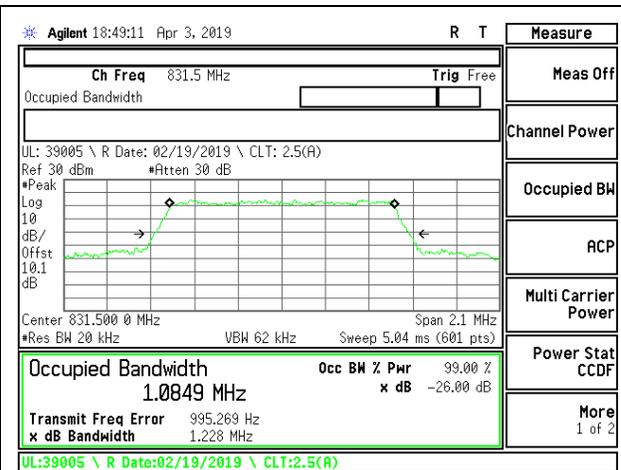


LTE B26 15MHz 16QAM Mid Channel RB50-0

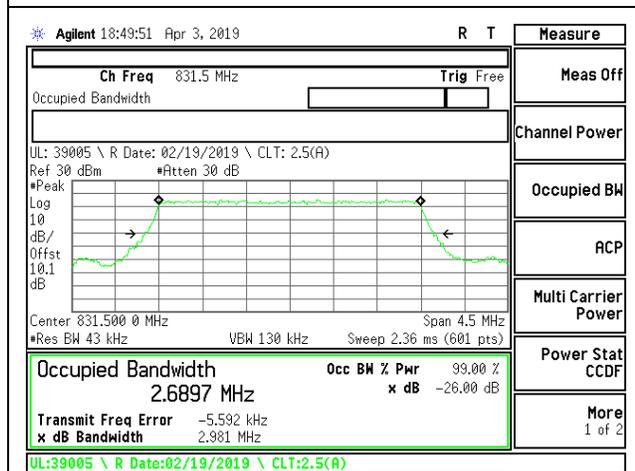
8.1.10. LTE BAND 26 (FCC PART 22)



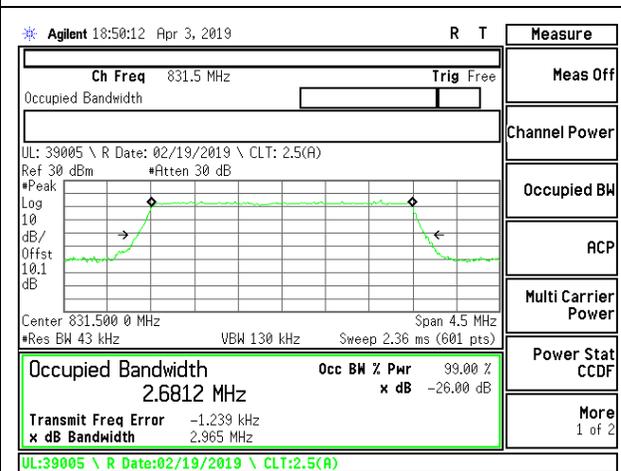
LTE B26 1.4MHz QPSK Mid Channel RB6-0



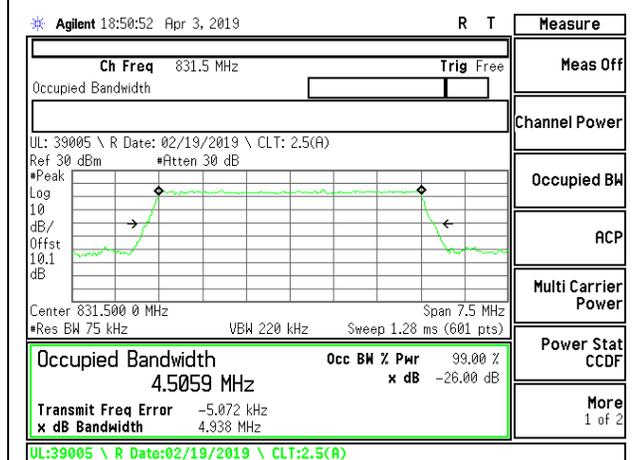
LTE B26 1.4MHz 16QAM Mid Channel RB6-0



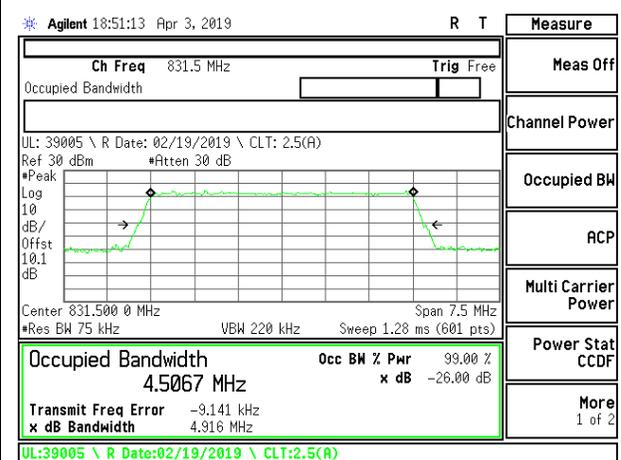
LTE B26 3MHz QPSK Mid Channel RB15-0



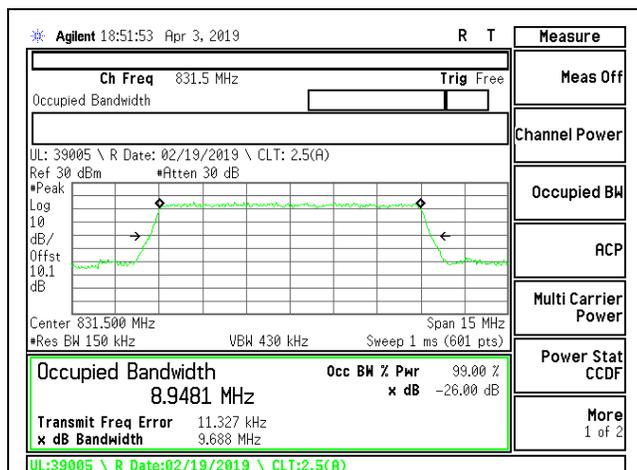
LTE B26 3MHz 16QAM Mid Channel RB15-0



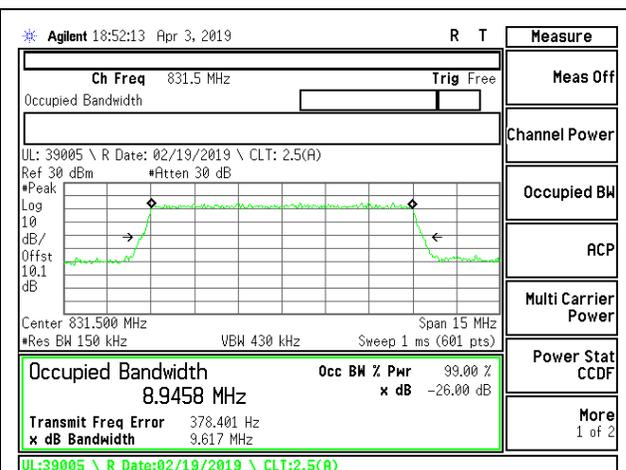
LTE B26 5MHz QPSK Mid Channel RB25-0



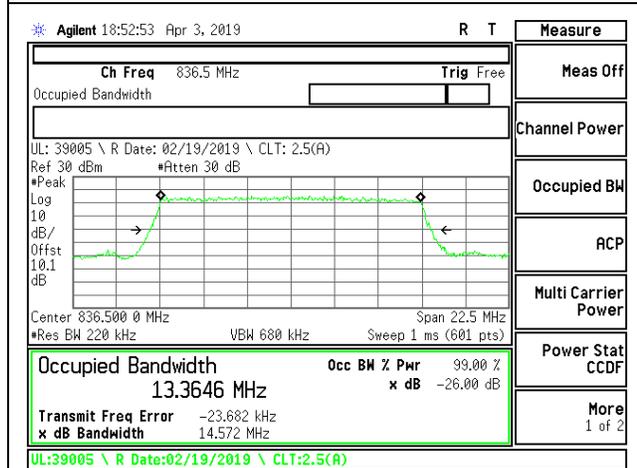
LTE B26 5MHz 16QAM Mid Channel RB25-0



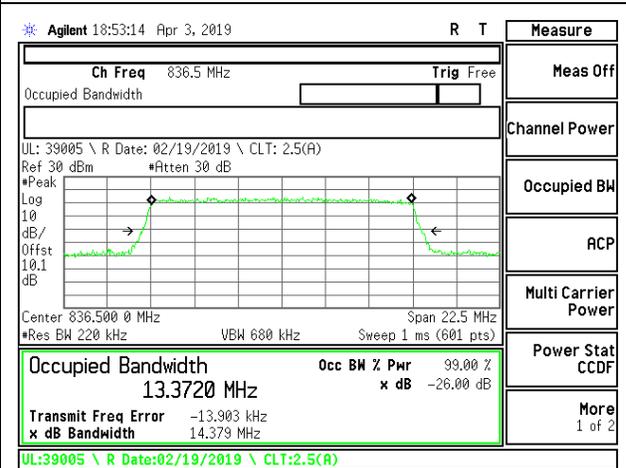
LTE B26 10MHz QPSK Mid Channel RB50-0



LTE B26 10MHz 16QAM Mid Channel RB50-0

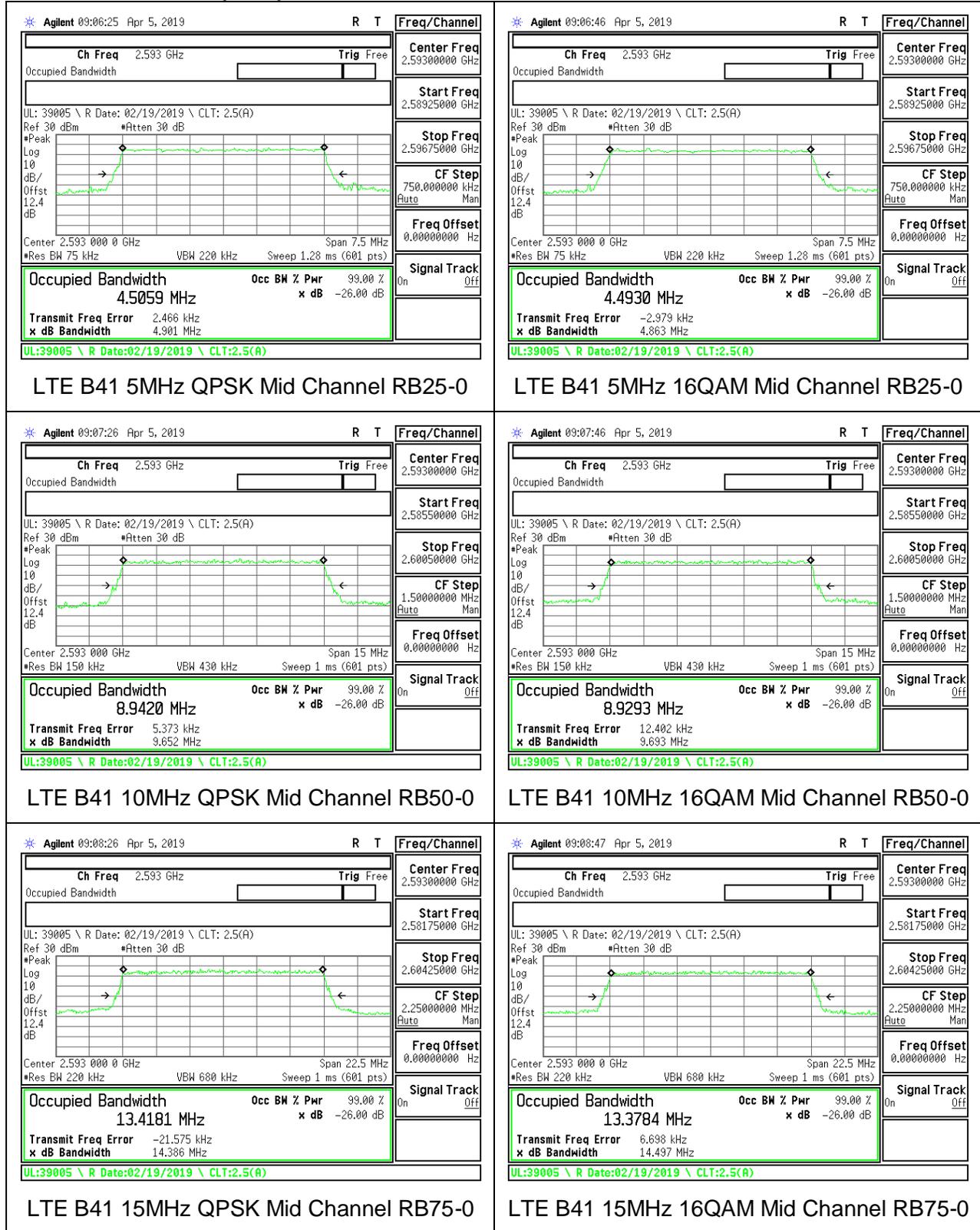


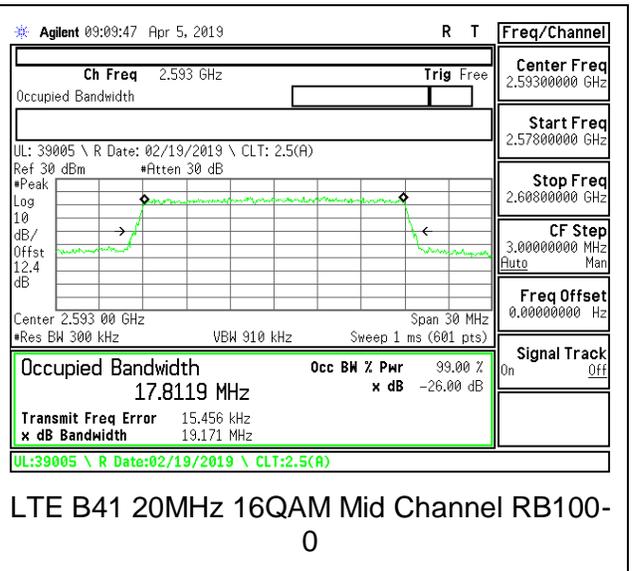
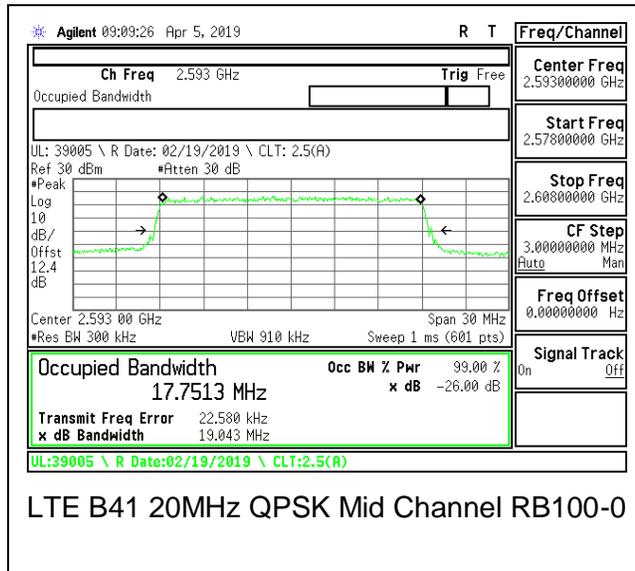
LTE B26 15MHz QPSK Mid Channel RB75-0



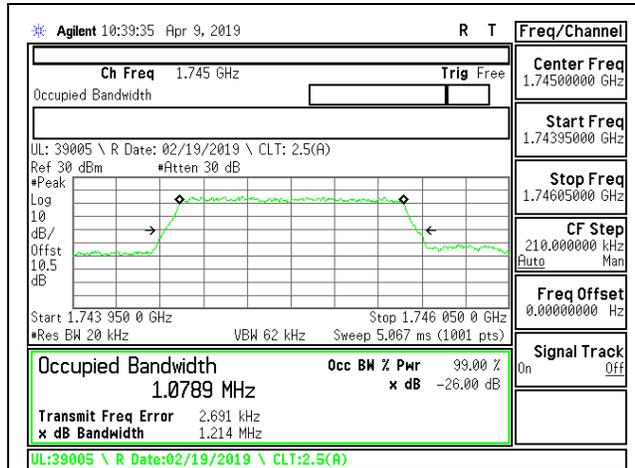
LTE B26 15MHz 16QAM Mid Channel RB75-0

8.1.11. LTE BAND 41 (FCC)

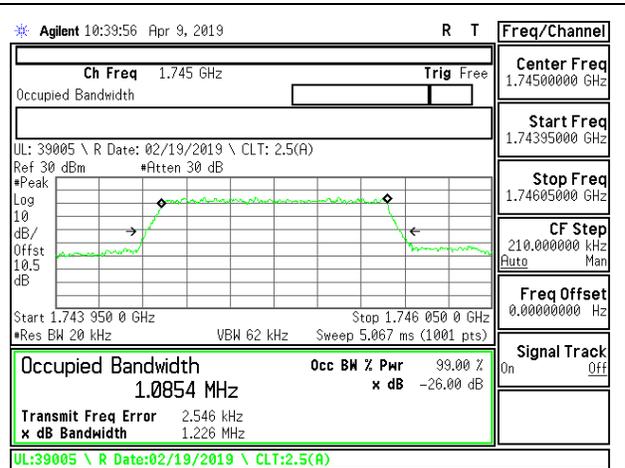




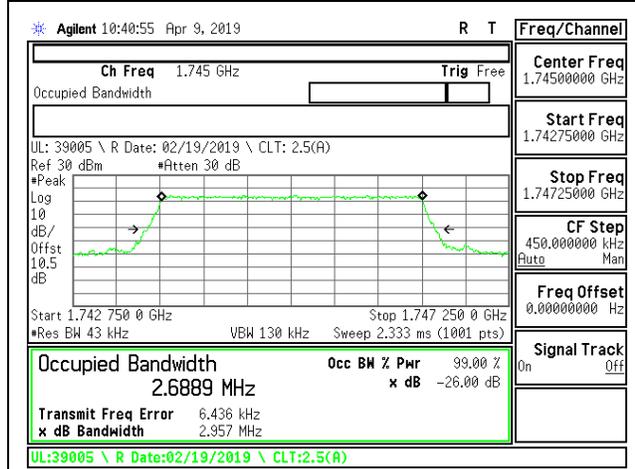
8.1.12. LTE BAND 66



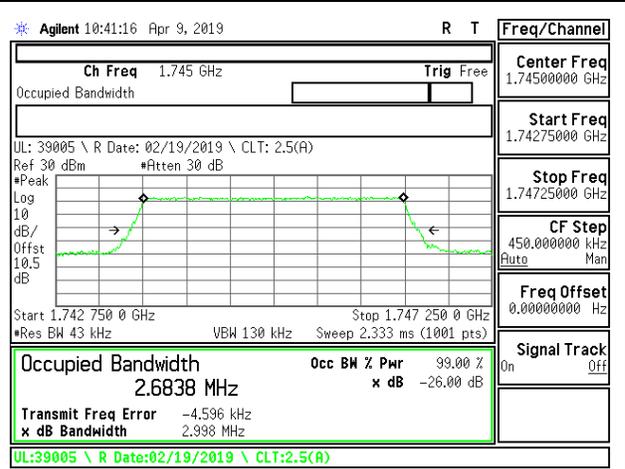
LTE B66 1.4MHz QPSK Mid Channel RB6-0



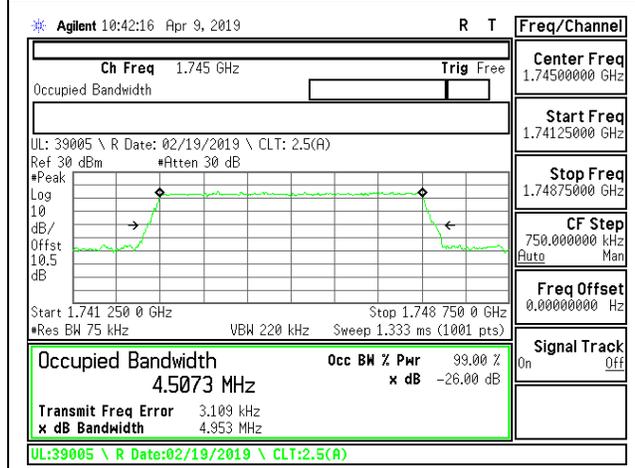
LTE B66 1.4MHz 16QAM Mid Channel RB6-0



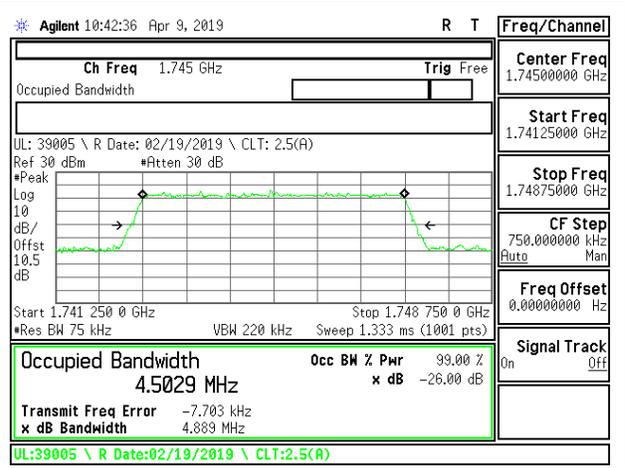
LTE B66 3MHz QPSK Mid Channel RB15-0



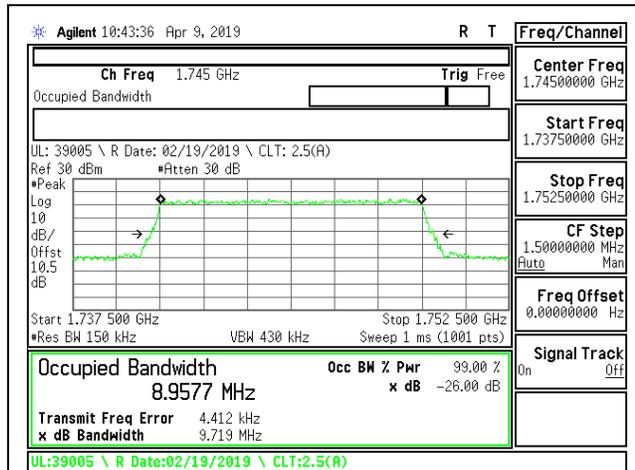
LTE B66 3MHz 16QAM Mid Channel RB15-0



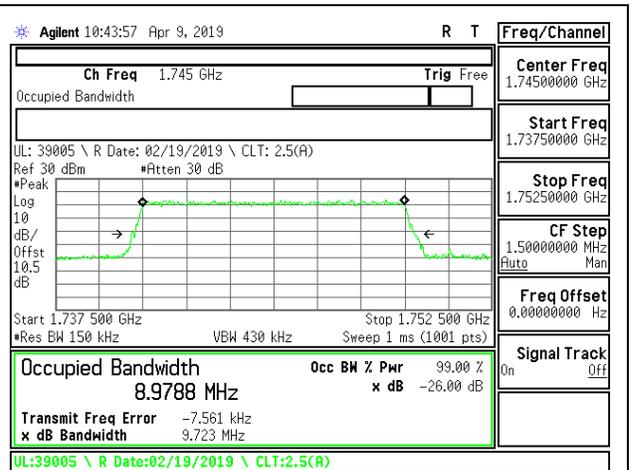
LTE B66 5MHz QPSK Mid Channel RB25-0



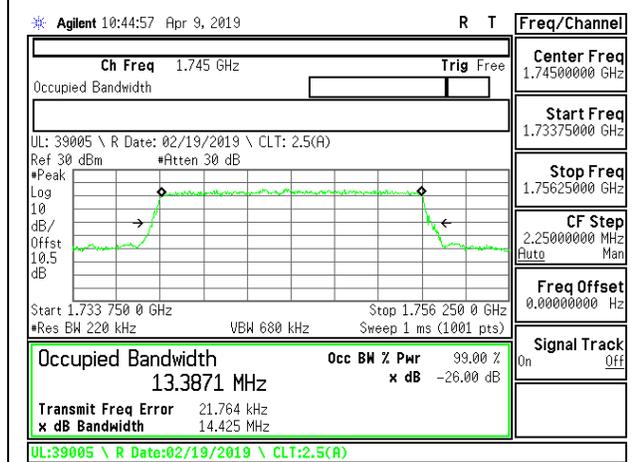
LTE B66 5MHz 16QAM Mid Channel RB25-0



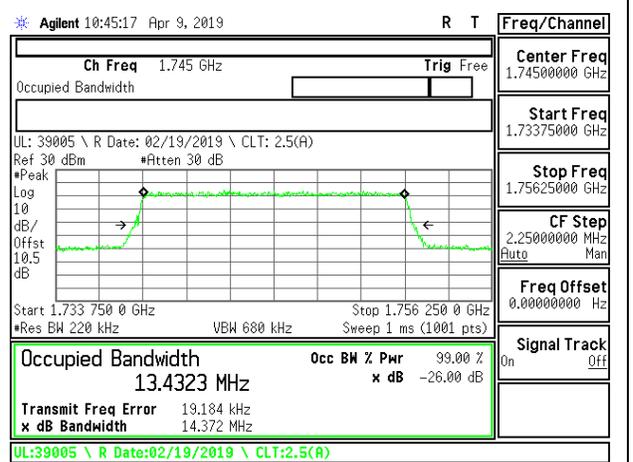
LTE B66 10MHz QPSK Mid Channel RB50-0



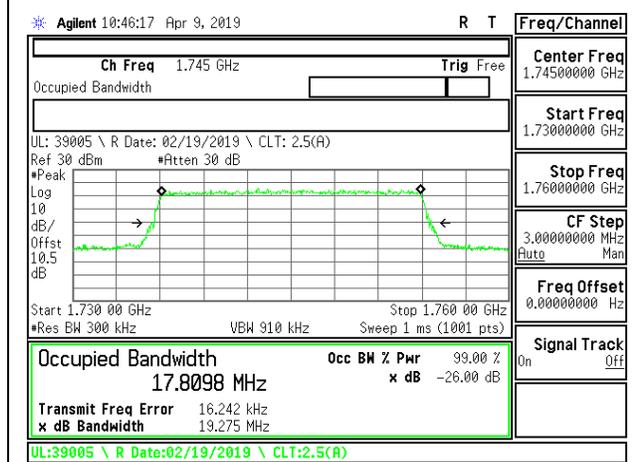
LTE B66 10MHz 16QAM Mid Channel RB50-0



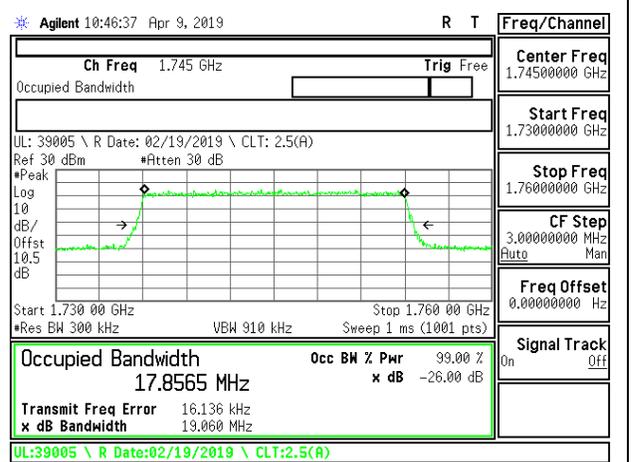
LTE B66 15MHz QPSK Mid Channel RB75-0



LTE B66 15MHz 16QAM Mid Channel RB75-0



LTE B66 20MHz QPSK Mid Channel RB100-0



LTE B66 20MHz 16QAM Mid Channel RB100-0

8.2. BAND EDGE AND EMISSION MASK

RULE PART(S)

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

LIMITS

FCC: §22.917, §24.238, §27.53 (h), §90.691

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 $116 \text{ Log}_{10}(f/6.1)$ decibels or $50 + 10 \text{ Log}_{10}(P)$ 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 $43 + 10 \text{ Log}_{10}(P)$ 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 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;

(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 = -40 dBm/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.

TEST PROCEDURE

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

For each band edge measurement:

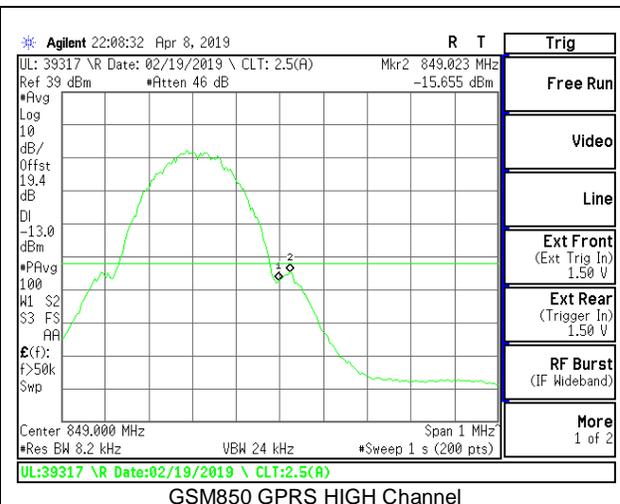
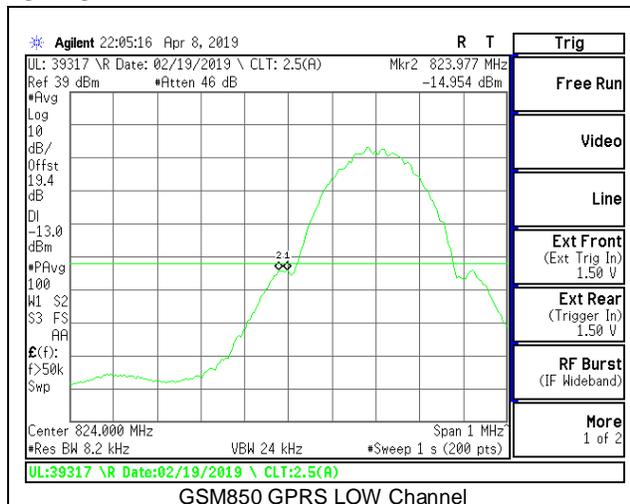
- Set the spectrum analyzer span to include the block edge frequency.
- Set a marker to point the corresponding band edge frequency in each test case.
- Set display line at -13 dBm
- Set resolution bandwidth to at least 1% of emission bandwidth.

MODES TESTED

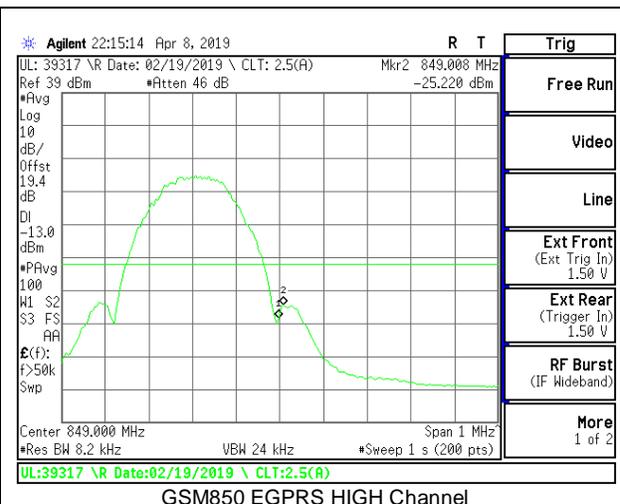
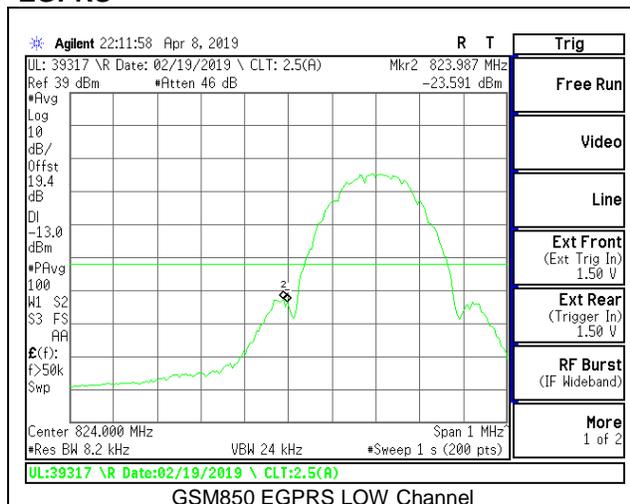
- GSM 850
- GSM 1900
- WCDMA Band 5
- WCDMA Band 2
- WCDMA Band 4
- LTE Band 2
- LTE Band 4
- LTE Band 5
- LTE Band 7
- LTE Band 12
- LTE Band 13
- LTE Band 26 (FCC PART 90S)
- LTE Band 26 (FCC PART 22)
- LTE Band 41 (FCC)
- LTE Band 66

RESULTS

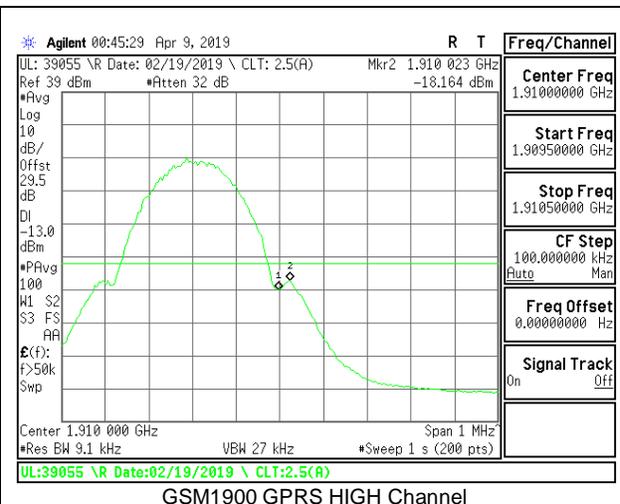
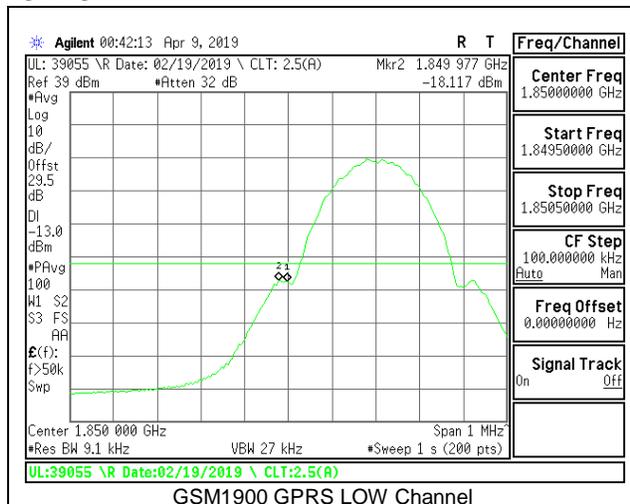
**8.2.1. GSM850
 GPRS**



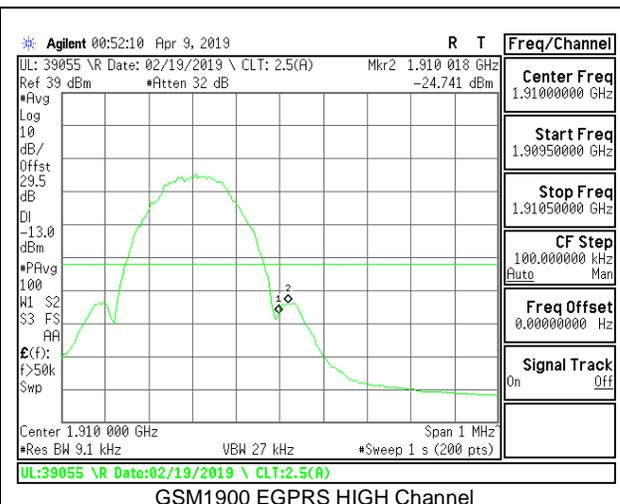
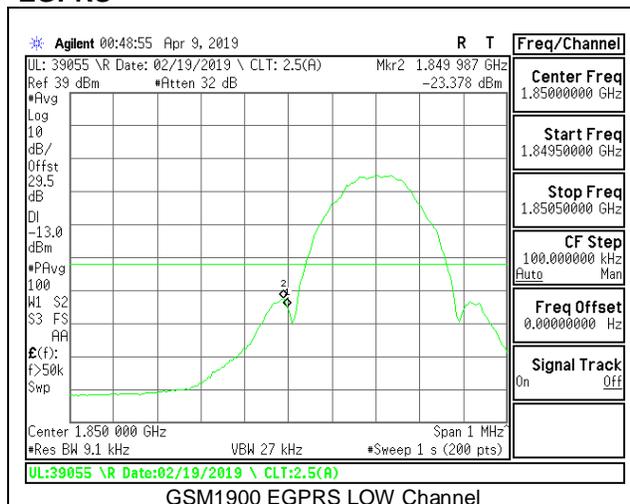
EGPRS



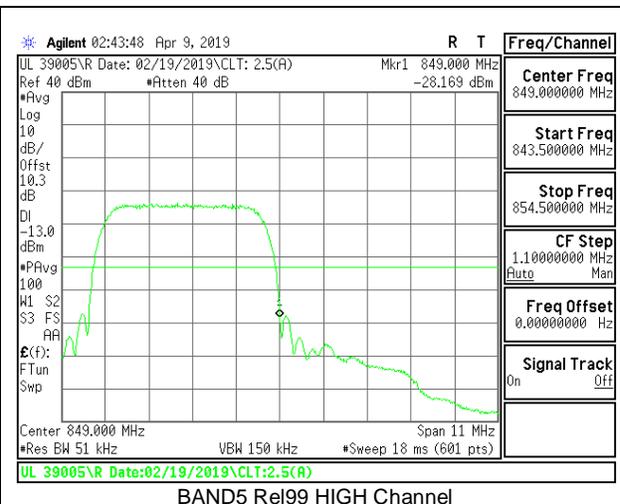
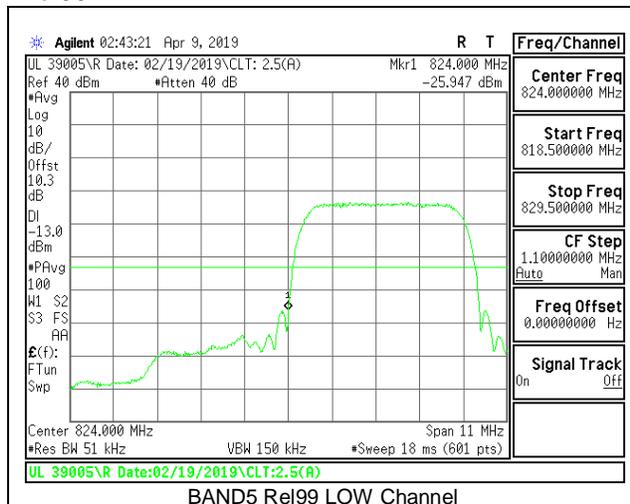
**8.2.2. GSM1900
 GPRS**



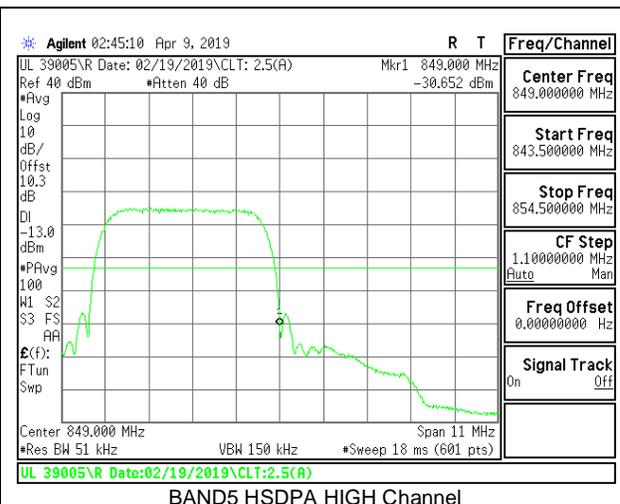
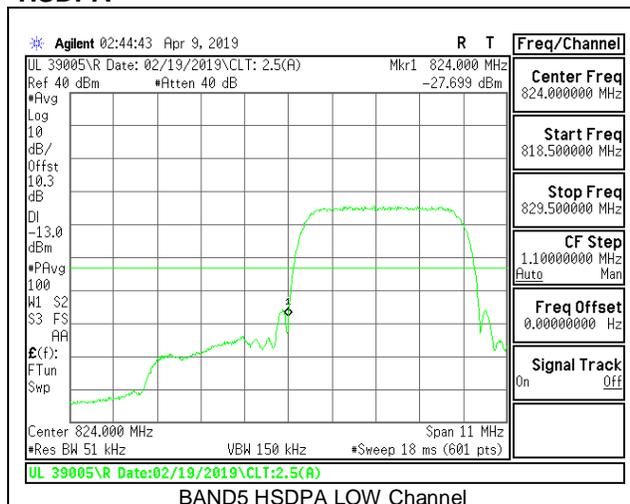
EGPRS



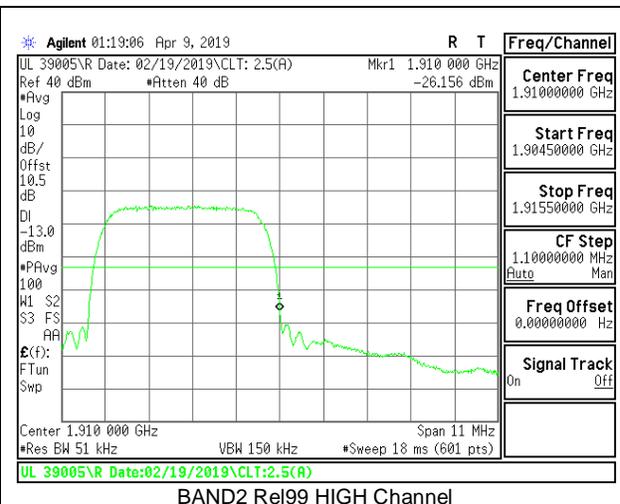
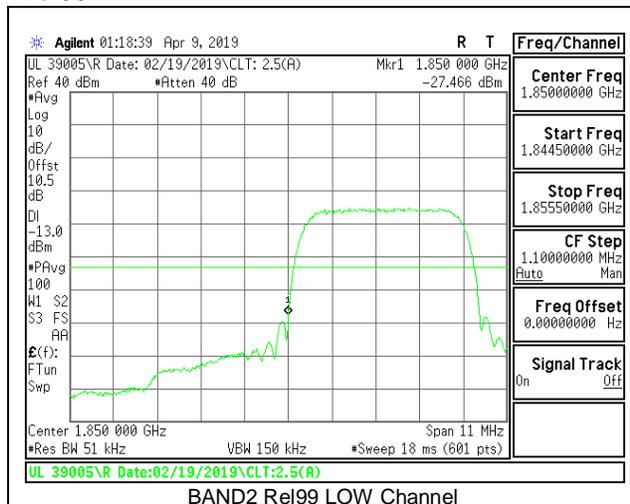
8.2.3. WCDMA BAND5
Rel99



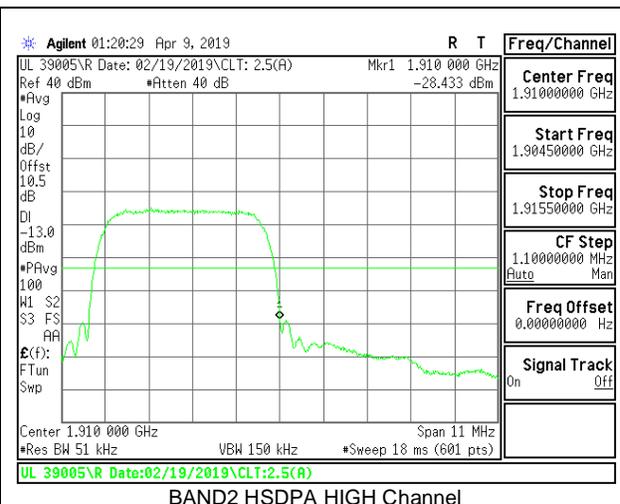
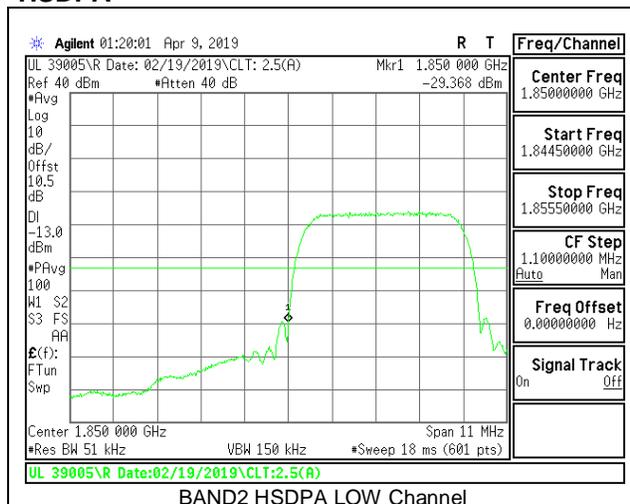
HSDPA



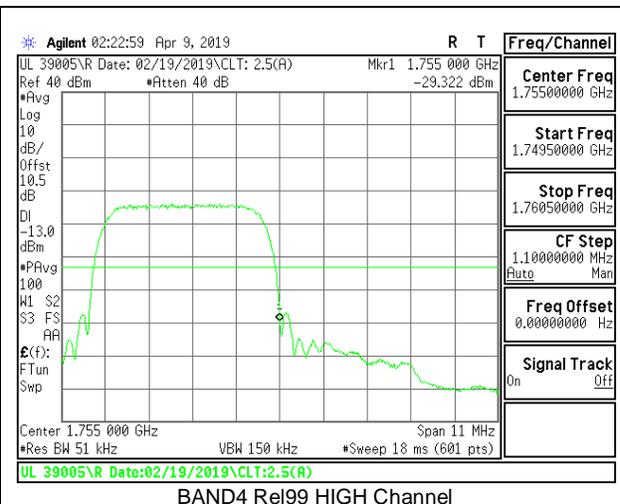
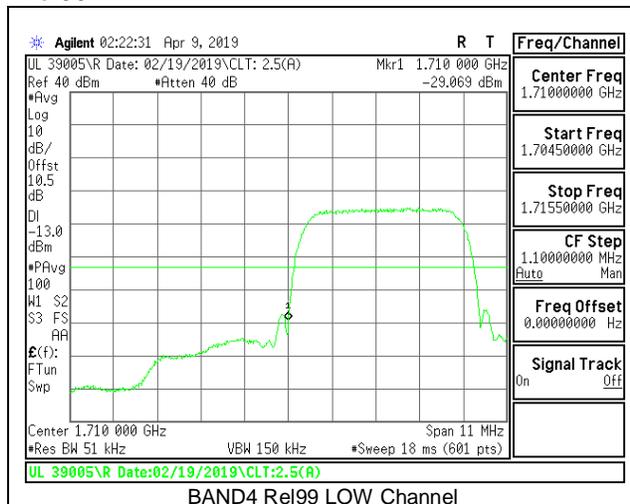
8.2.4. WCDMA BAND2
Rel99



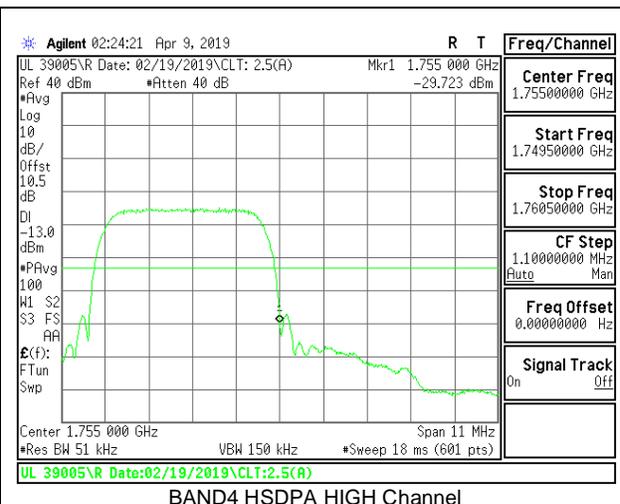
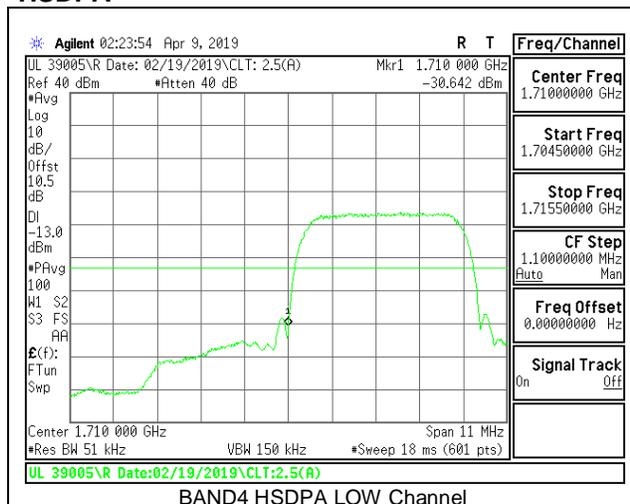
HSDPA



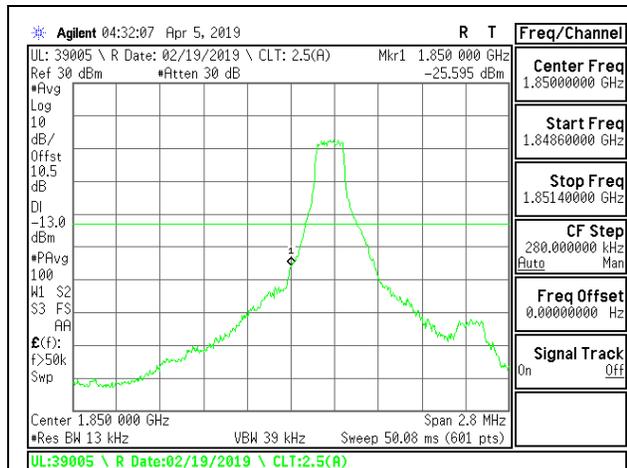
8.2.5. WCDMA BAND4
Rel99



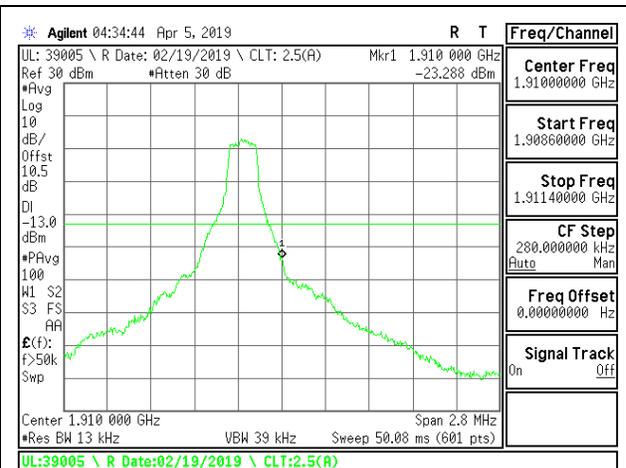
HSDPA



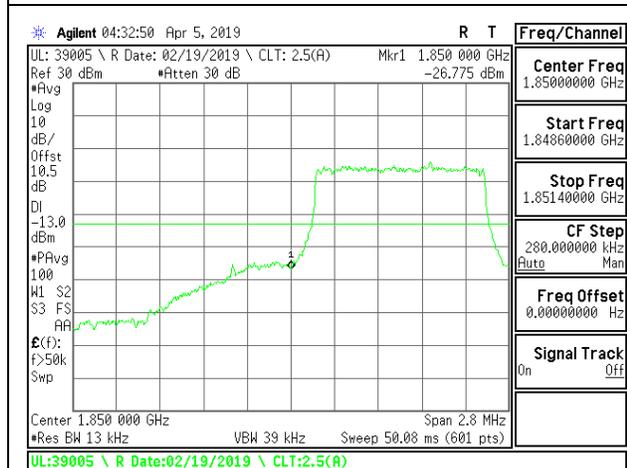
8.2.6. LTE BAND 2 BANDEDGE



LTE B2 1.4MHz QPSK Low Channel RB1-0



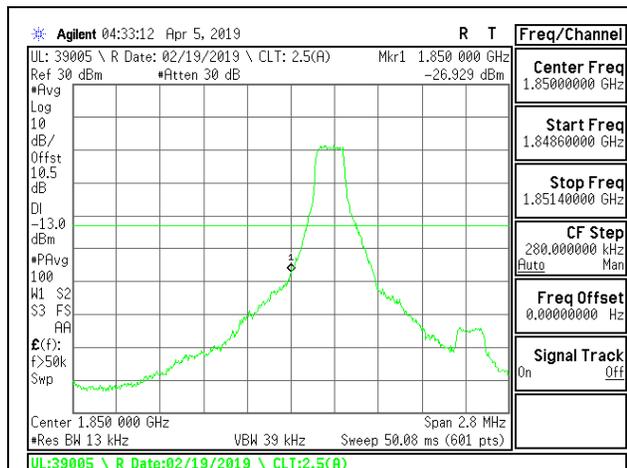
LTE B2 1.4MHz QPSK High Channel RB1-5



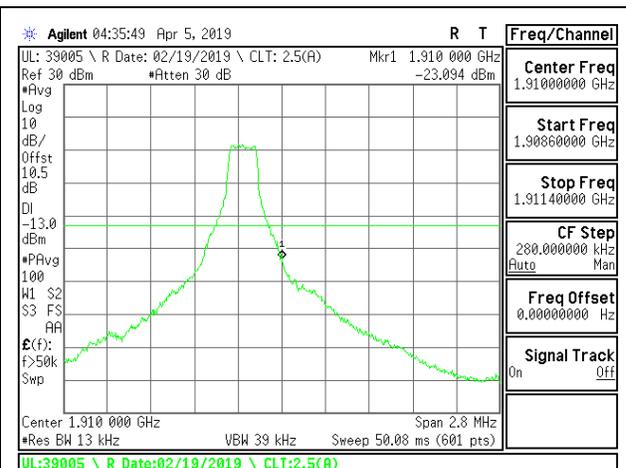
LTE B2 1.4MHz QPSK Low Channel RB6-0



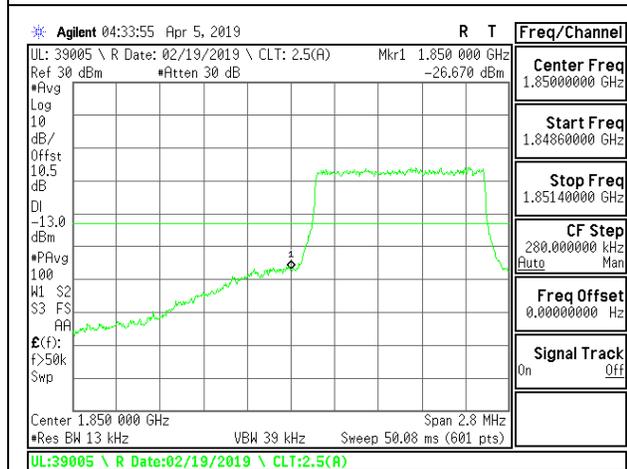
LTE B2 1.4MHz QPSK High Channel RB6-0



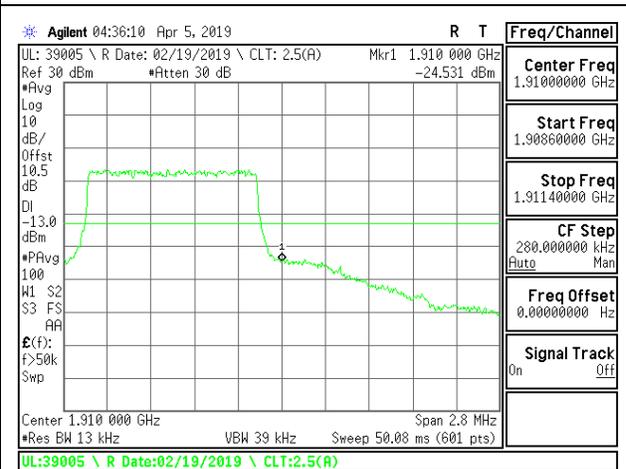
LTE B2 1.4MHz 16QAM Low Channel RB1-0



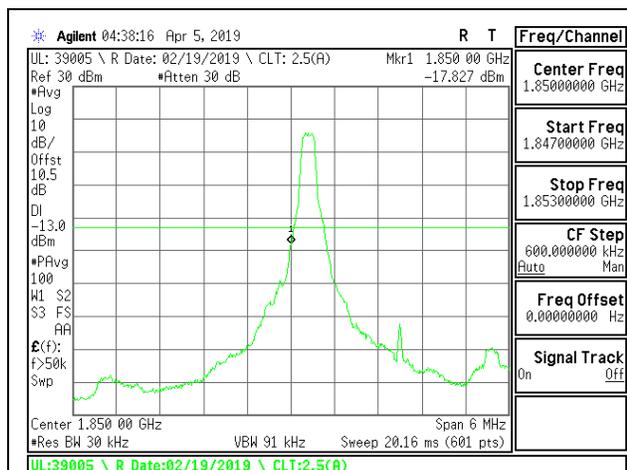
LTE B2 1.4MHz 16QAM High Channel RB1-5



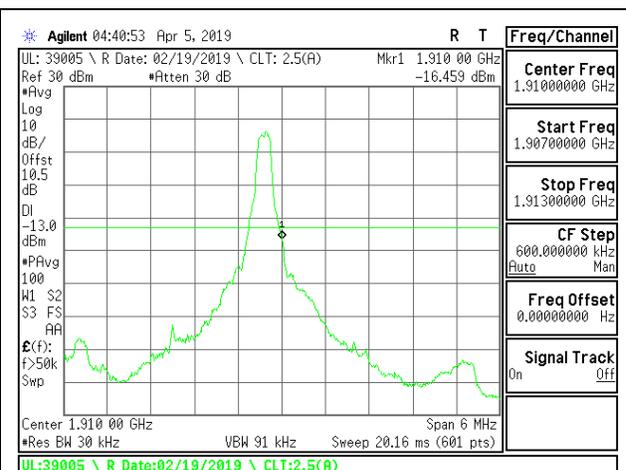
LTE B2 1.4MHz 16QAM Low Channel RB6-0



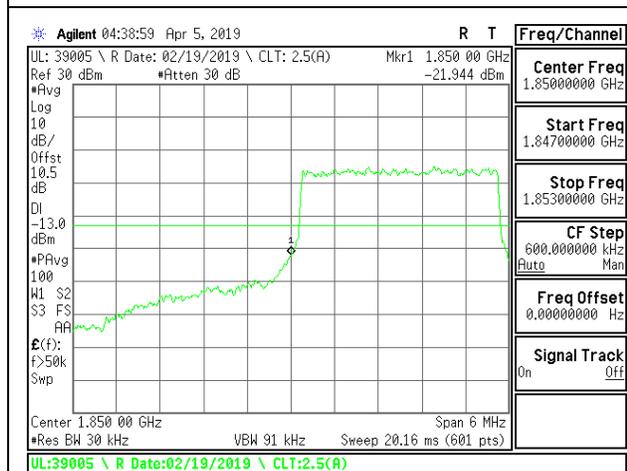
LTE B2 1.4MHz 16QAM High Channel RB6-0



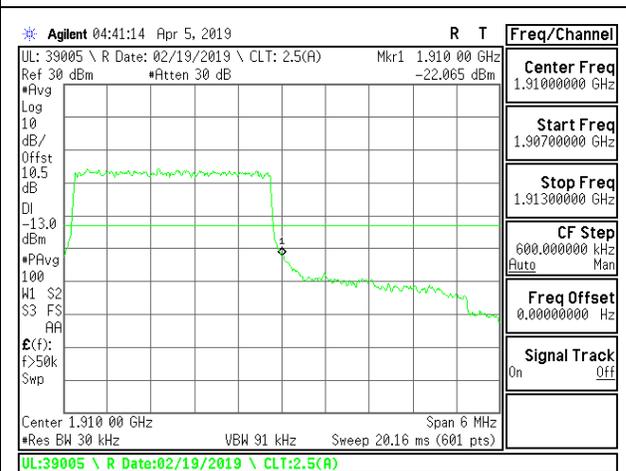
LTE B2 3MHz QPSK Low Channel RB1-0



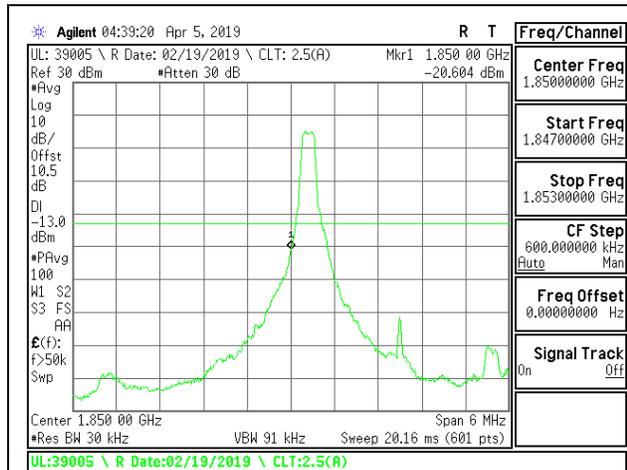
LTE B2 3MHz QPSK High Channel RB1-14



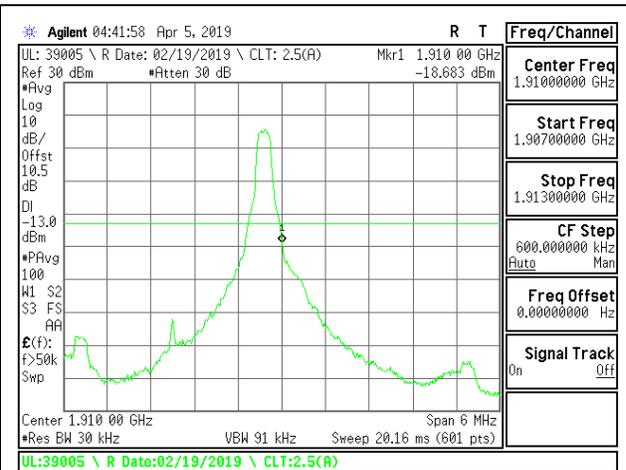
LTE B2 3MHz QPSK Low Channel RB15-0



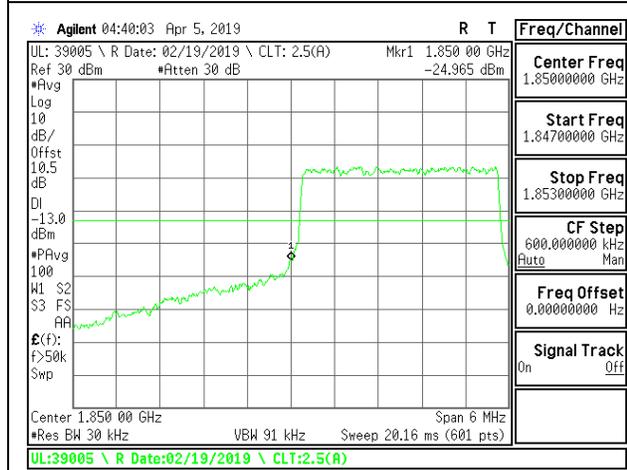
LTE B2 3MHz QPSK High Channel RB15-0



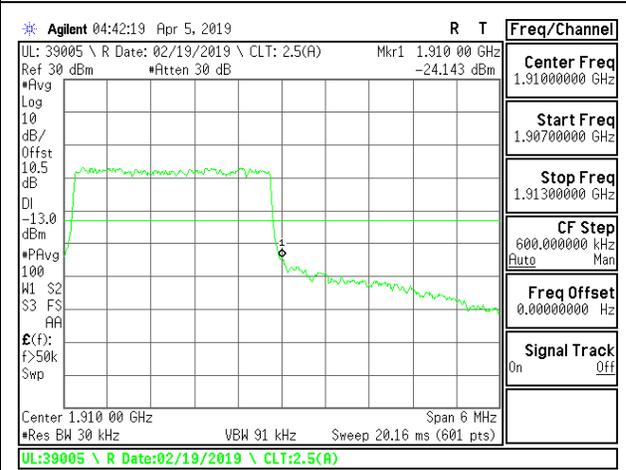
LTE B2 3MHz 16QAM Low Channel RB1-0



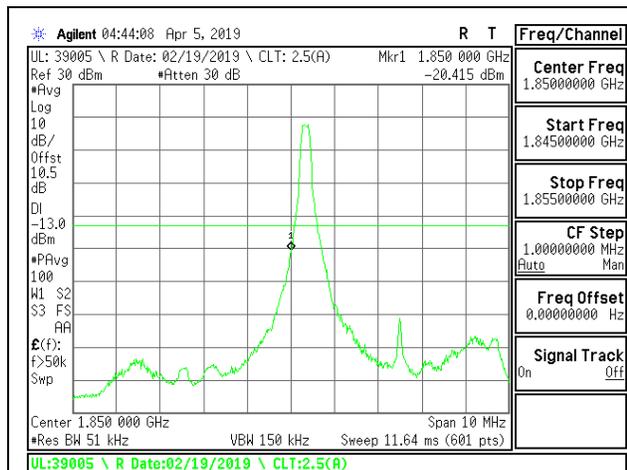
LTE B2 3MHz 16QAM High Channel RB1-14



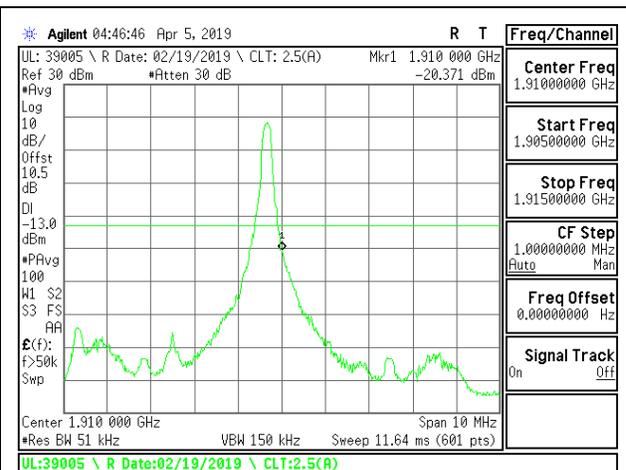
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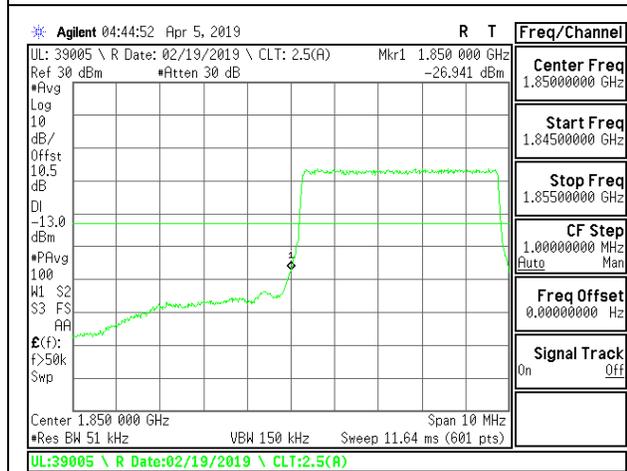
LTE B2 3MHz 16QAM High Channel RB15-0



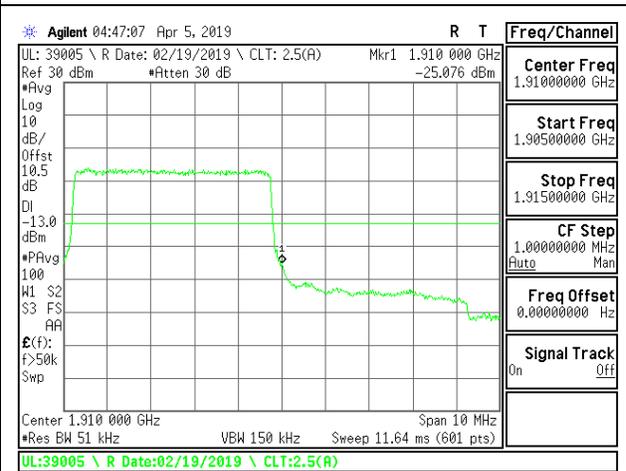
LTE B2 5MHz QPSK Low Channel RB1-0



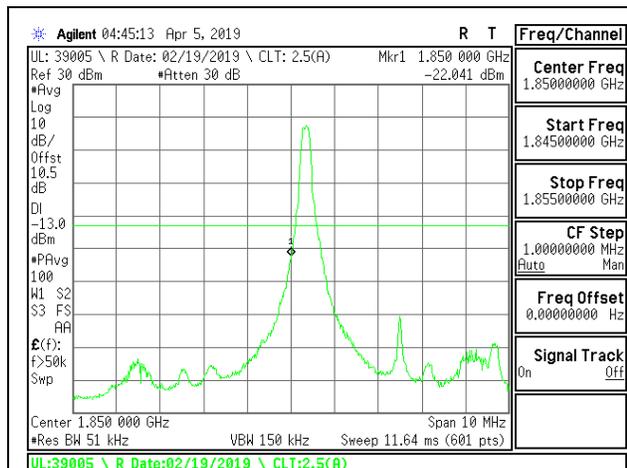
LTE B2 5MHz QPSK High Channel RB1-24



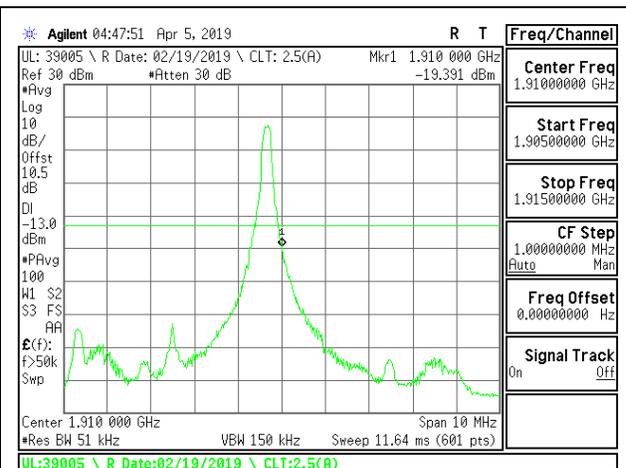
LTE B2 5MHz QPSK Low Channel RB25-0



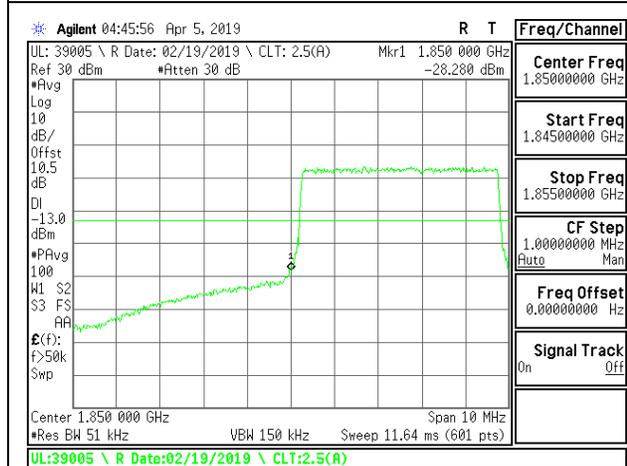
LTE B2 5MHz QPSK High Channel RB25-0



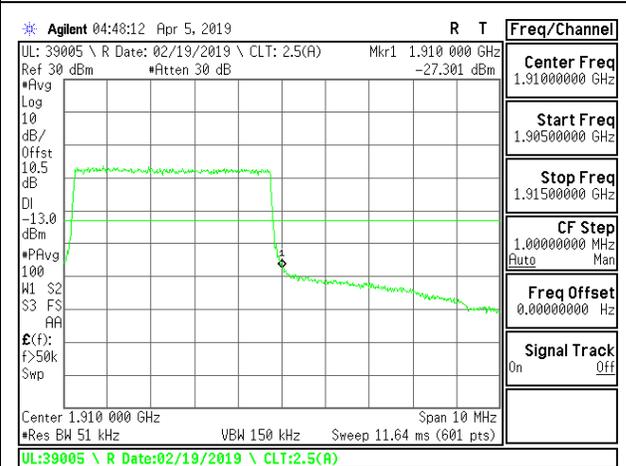
LTE B2 5MHz 16QAM Low Channel RB1-0



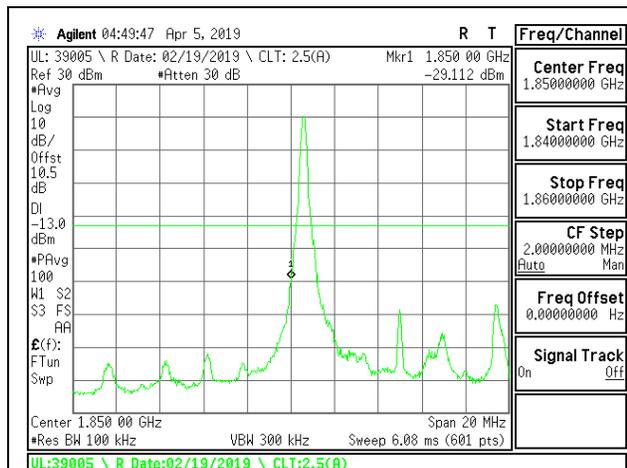
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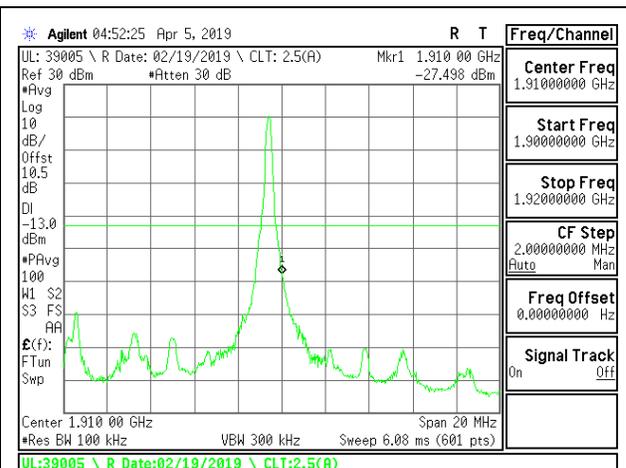
LTE B2 5MHz 16QAM Low Channel RB25-0



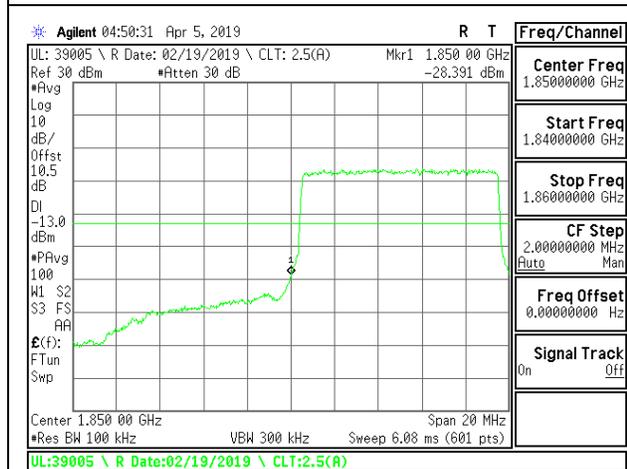
LTE B2 5MHz 16QAM High Channel RB25-0



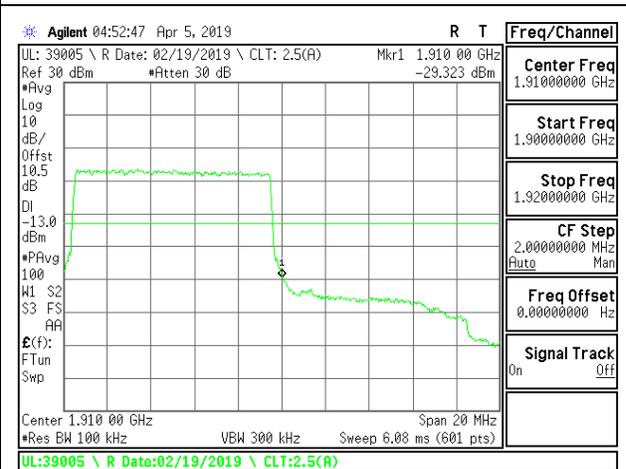
LTE B2 10MHz QPSK Low Channel RB1-0



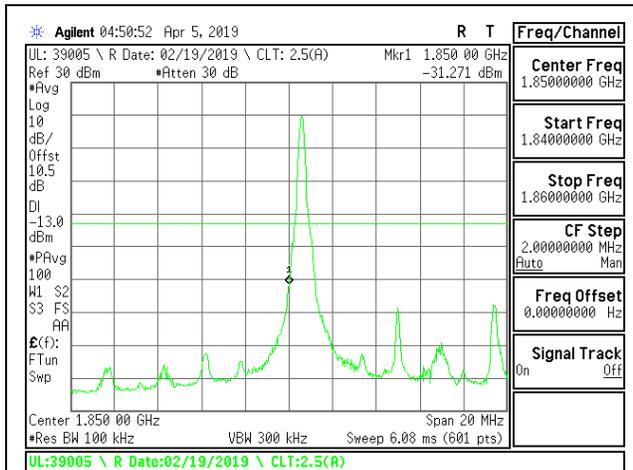
LTE B2 10MHz QPSK High Channel RB1-49



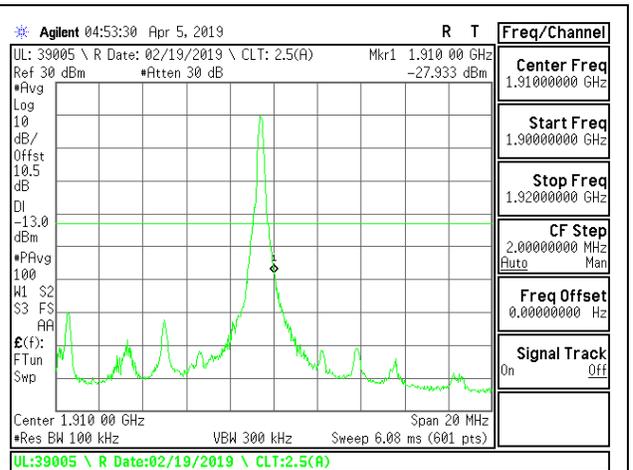
LTE B2 10MHz QPSK Low Channel RB50-0



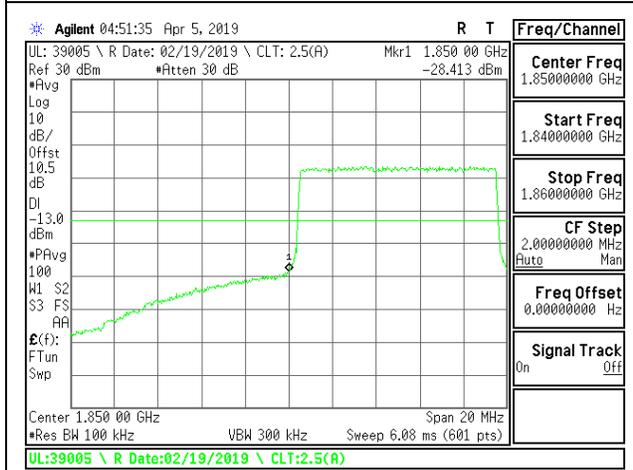
LTE B2 10MHz QPSK High Channel RB50-0



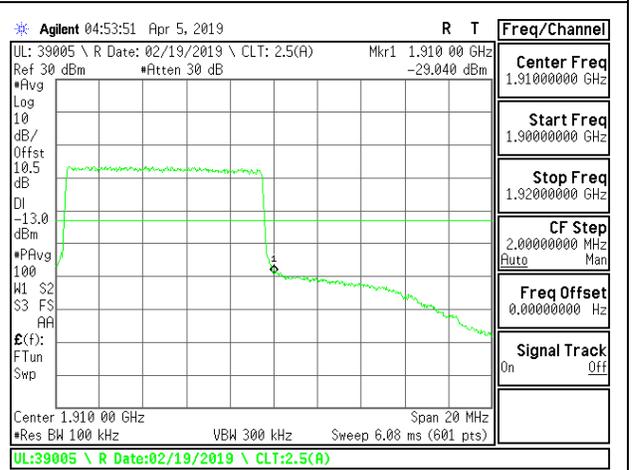
LTE B2 10MHz 16QAM Low Channel RB1-0



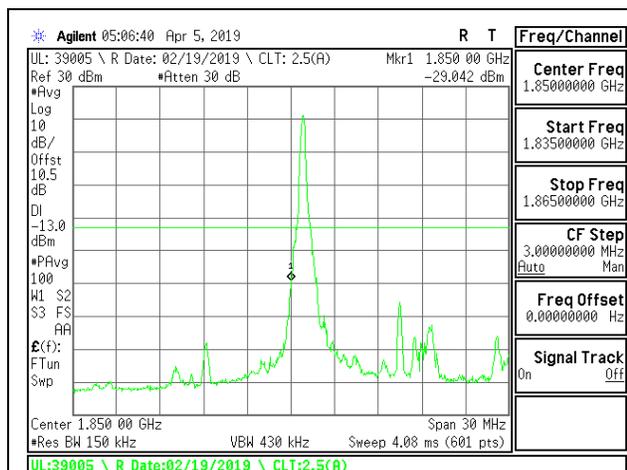
LTE B2 10MHz 16QAM High Channel RB1-0



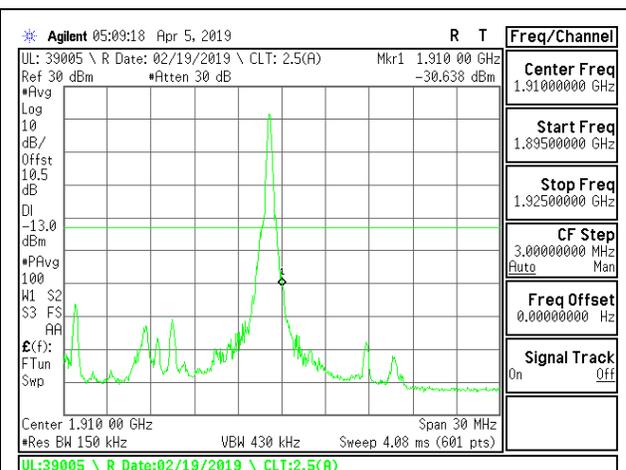
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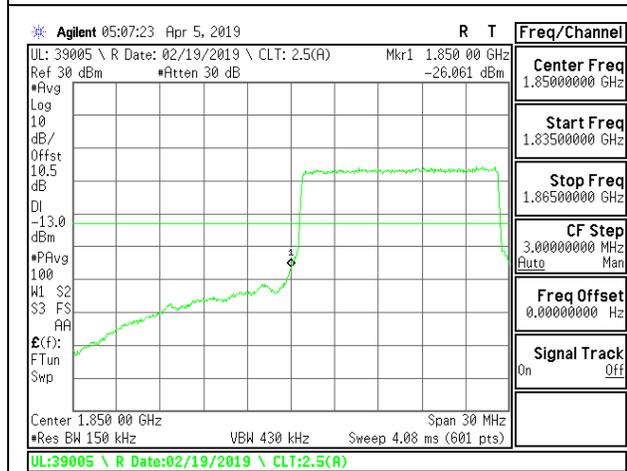
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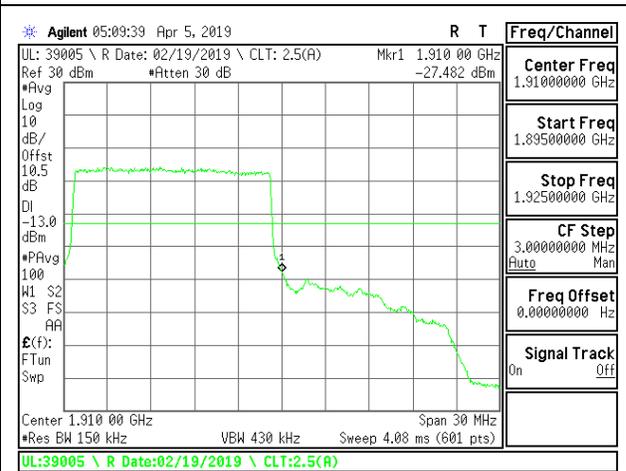
LTE B2 15MHz QPSK Low Channel RB1-0



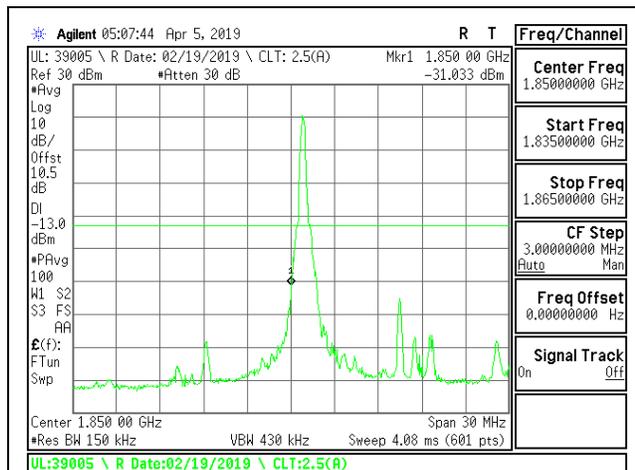
LTE B2 15MHz QPSK High Channel RB1-74



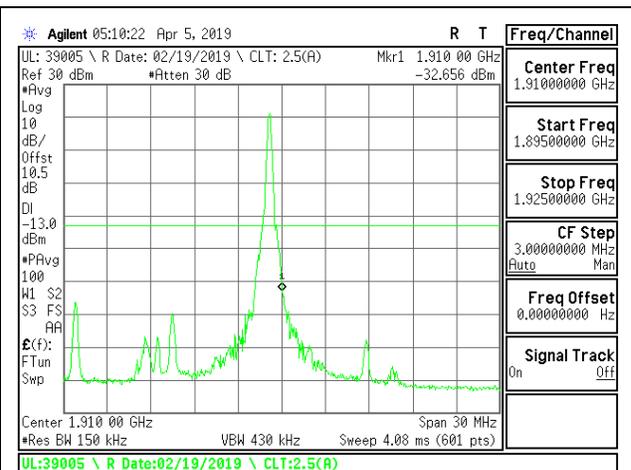
LTE B2 15MHz QPSK Low Channel RB75-0



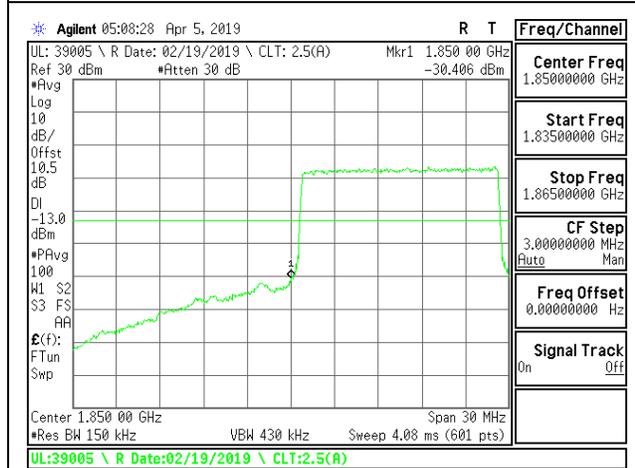
LTE B2 15MHz QPSK High Channel RB75-0



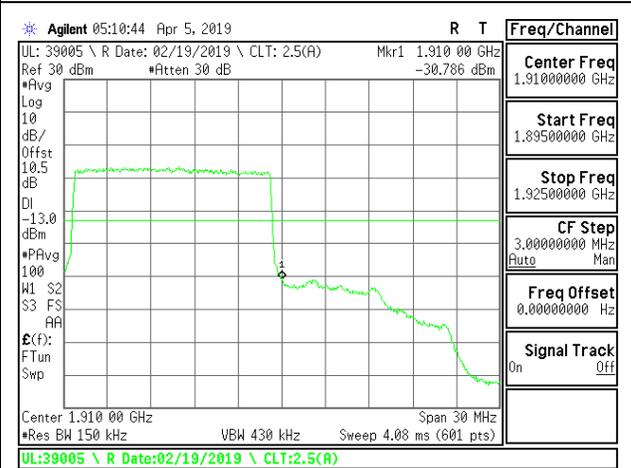
LTE B2 15MHz 16QAM Low Channel RB1-0



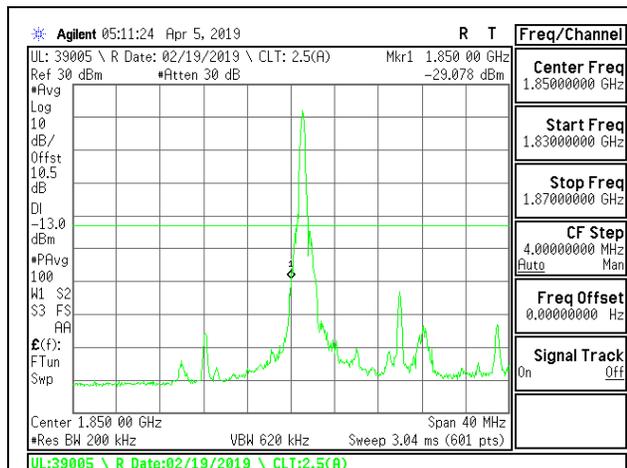
LTE B2 15MHz 16QAM High Channel RB1-74



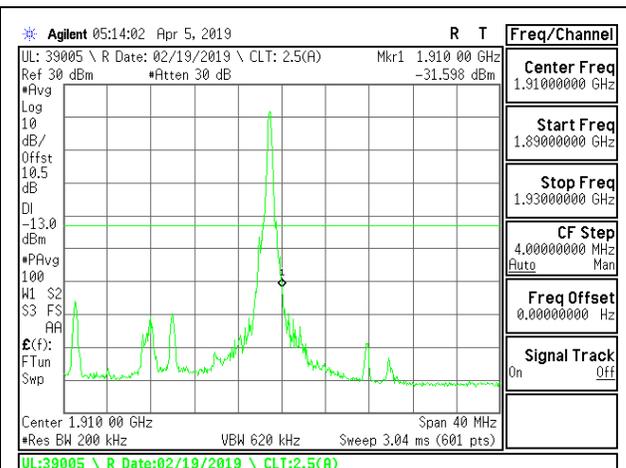
LTE B2 15MHz 16QAM Low Channel RB75-0



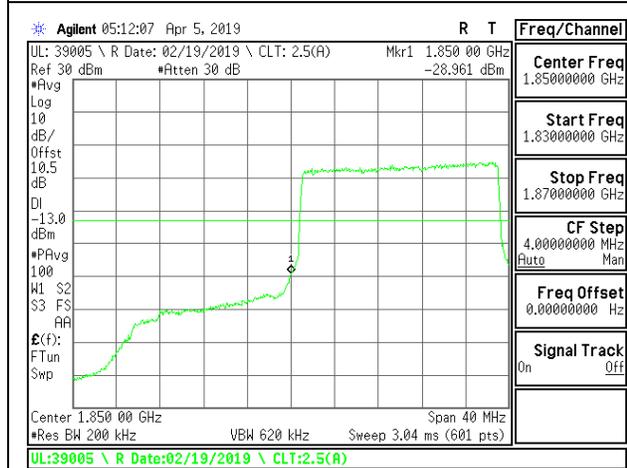
LTE B2 15MHz 16QAM High Channel RB75-0



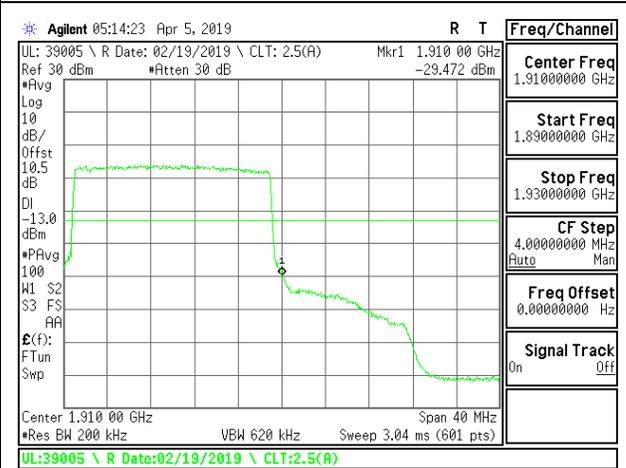
LTE B2 20MHz QPSK Low Channel RB1-0



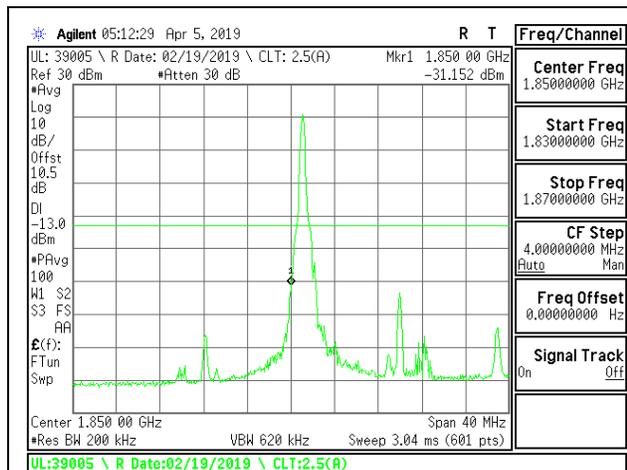
LTE B2 20MHz QPSK High Channel RB1-99



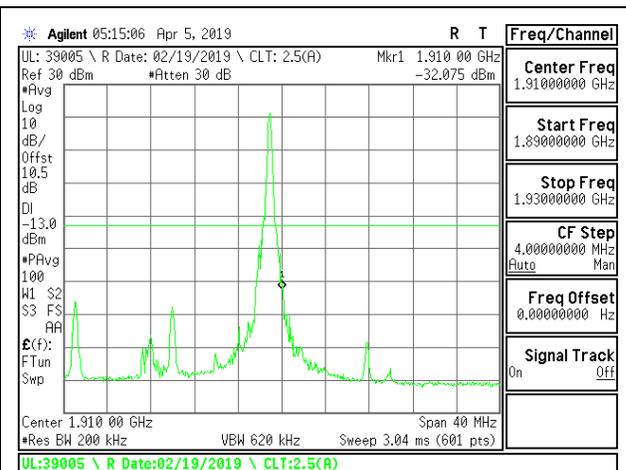
LTE B2 20MHz QPSK Low Channel RB100-0



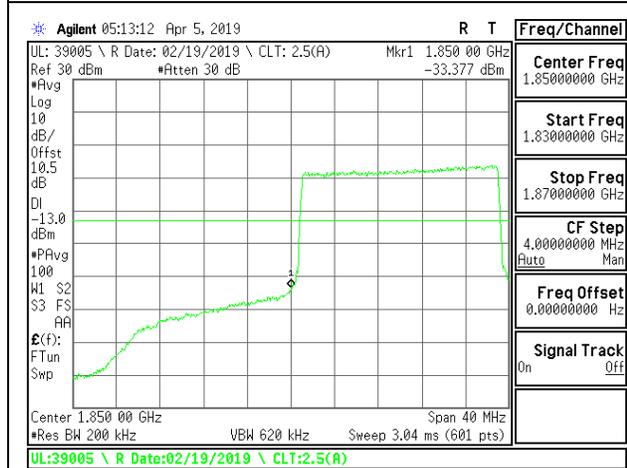
LTE B2 20MHz QPSK High Channel RB100-0



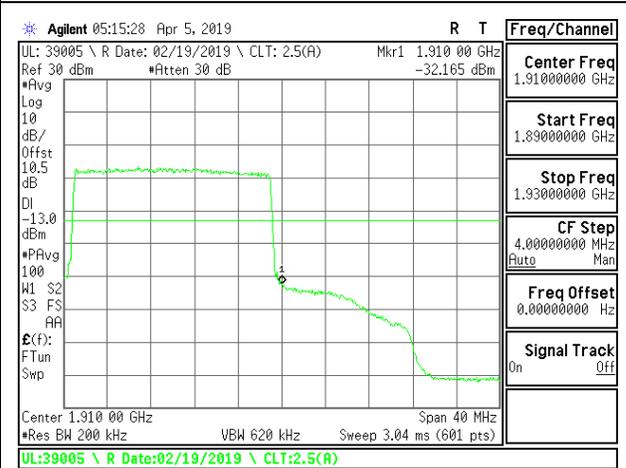
LTE B2 20MHz 16QAM Low Channel RB1-0



LTE B2 20MHz 16QAM High Channel RB1-99

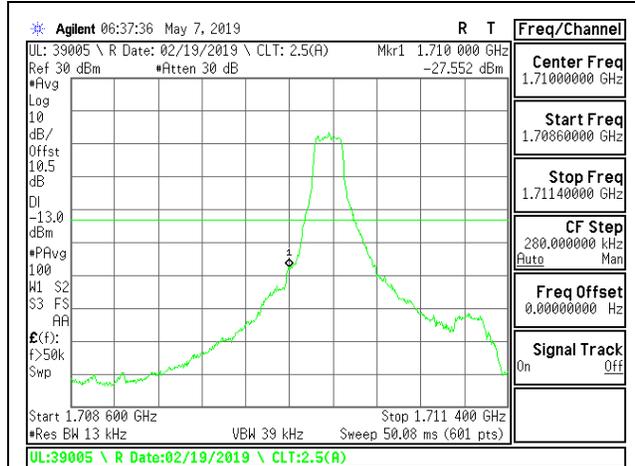


LTE B2 20MHz 16QAM Low Channel RB100-0

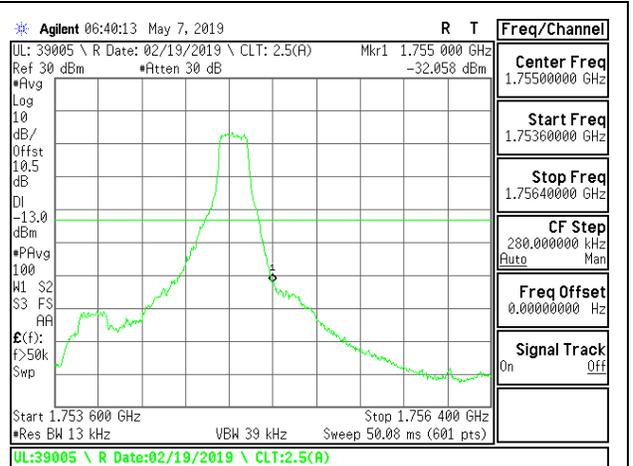


LTE B2 20MHz 16QAM High Channel RB100-0

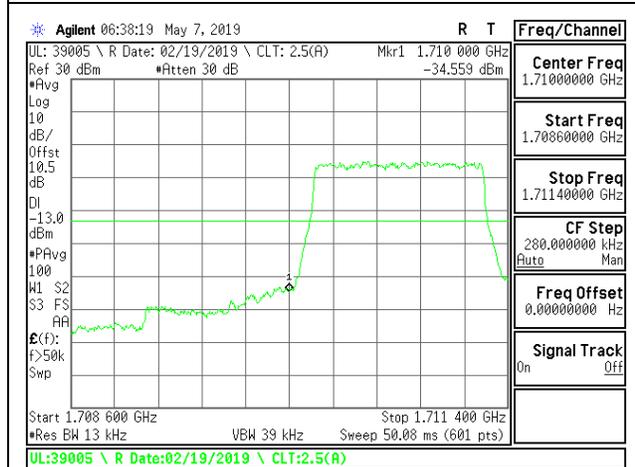
8.2.7. LTE BAND 4 BANDEDGE



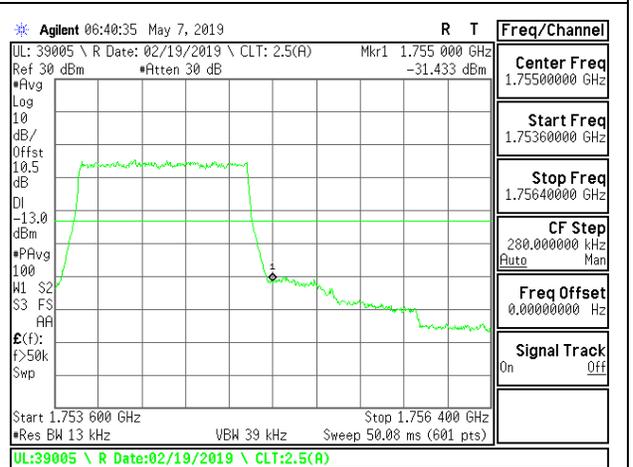
LTE B4 1.4MHz QPSK Low Channel RB1-0



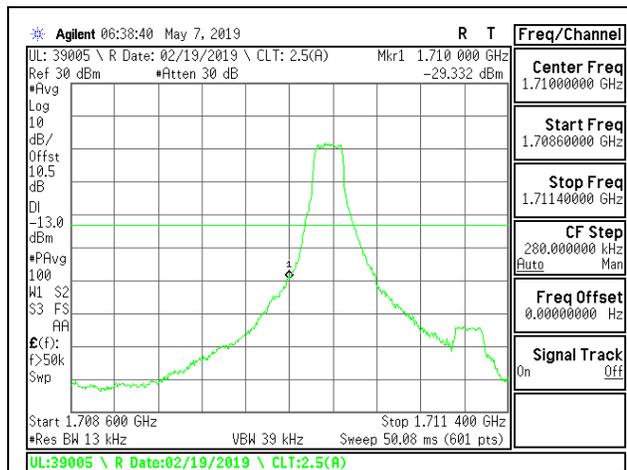
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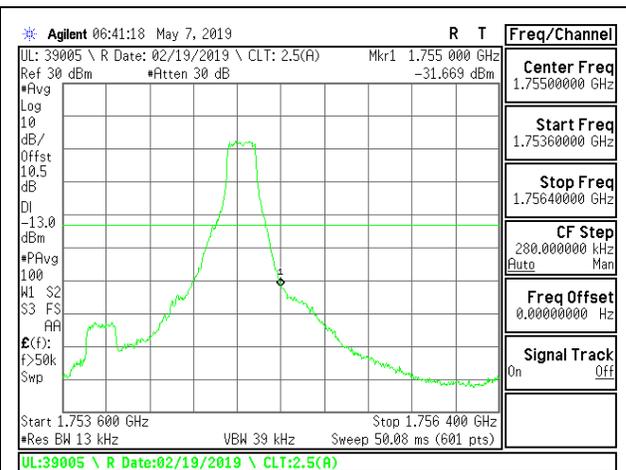
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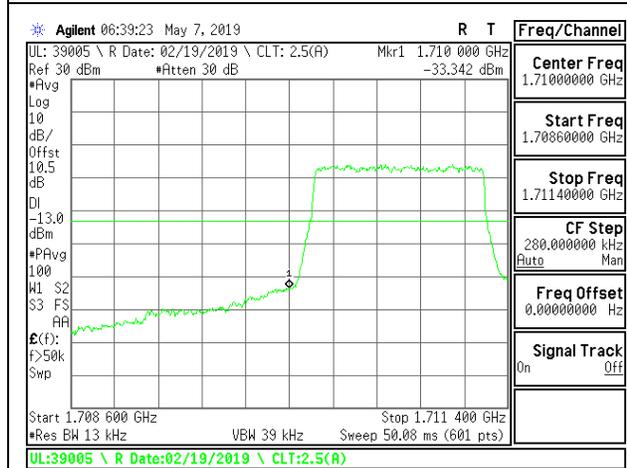
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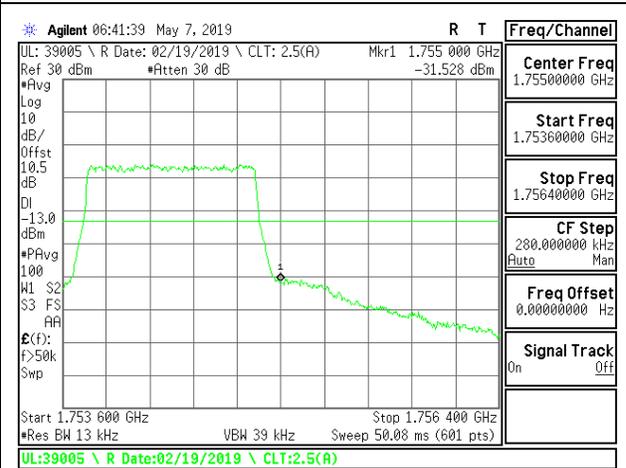
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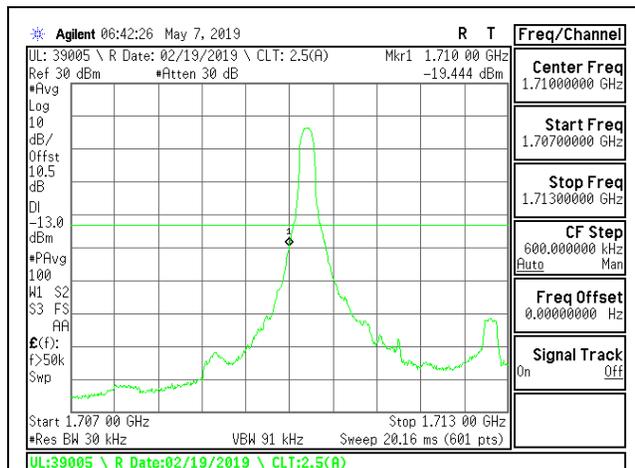
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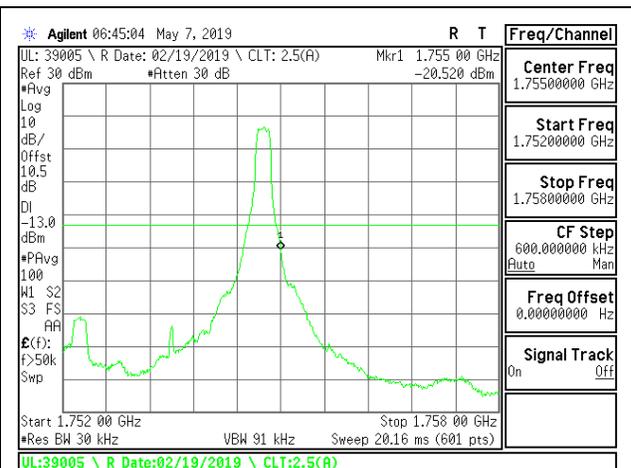
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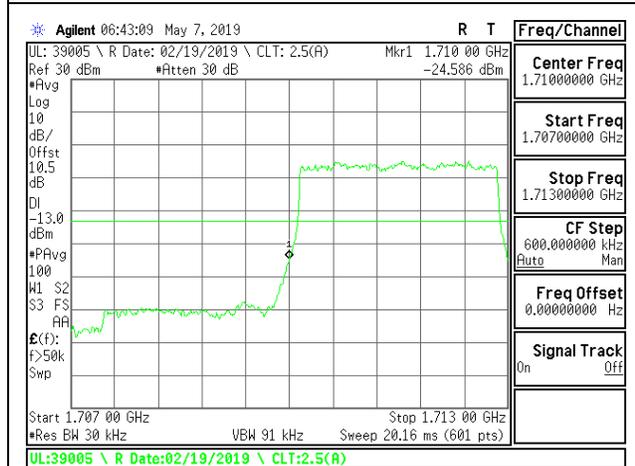
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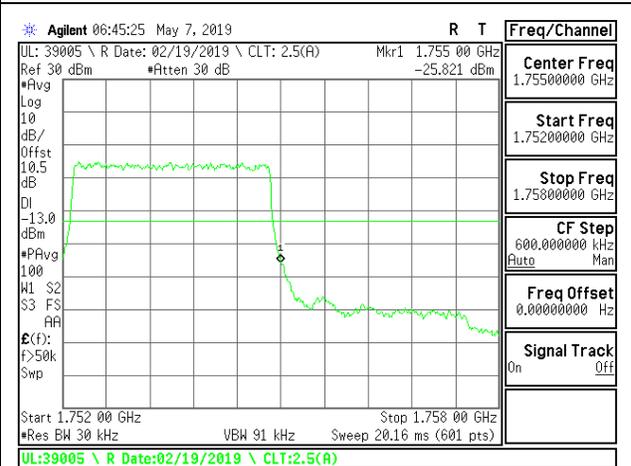
LTE B4 3MHz QPSK Low Channel RB1-0



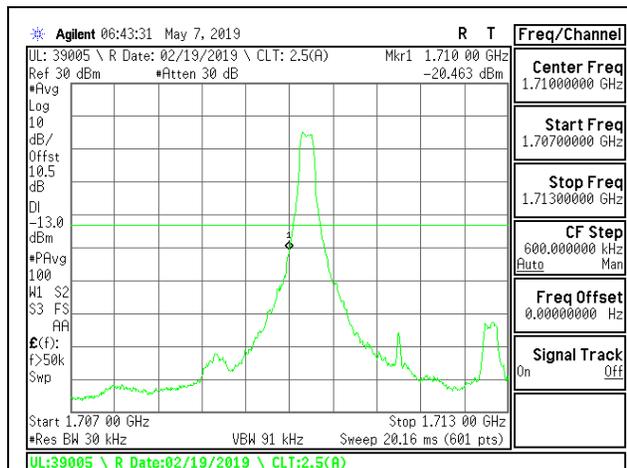
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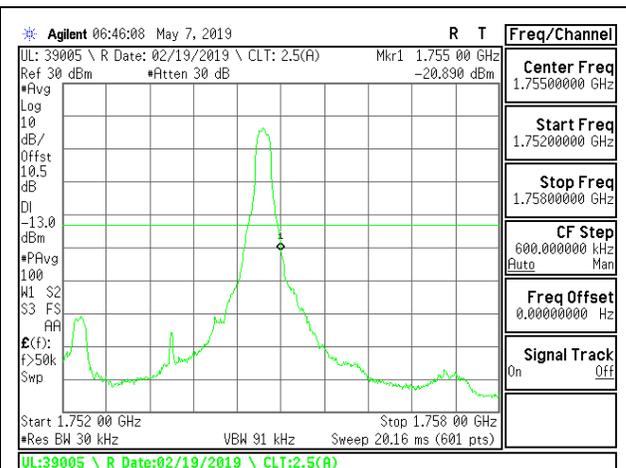
LTE B4 3MHz QPSK Low Channel RB15-0



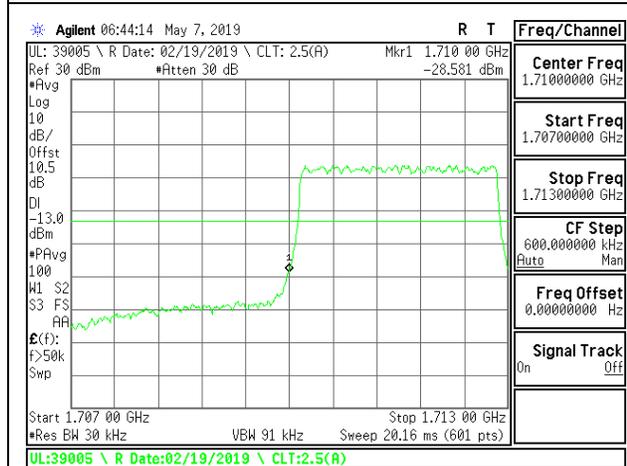
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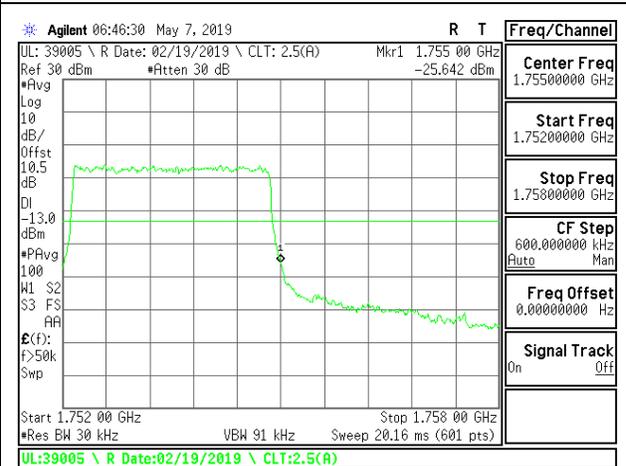
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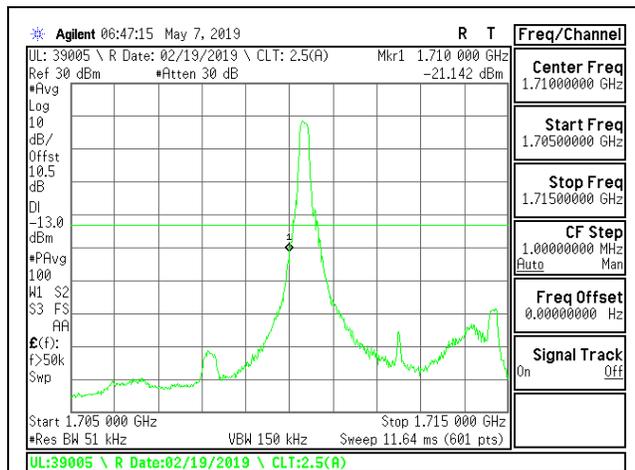
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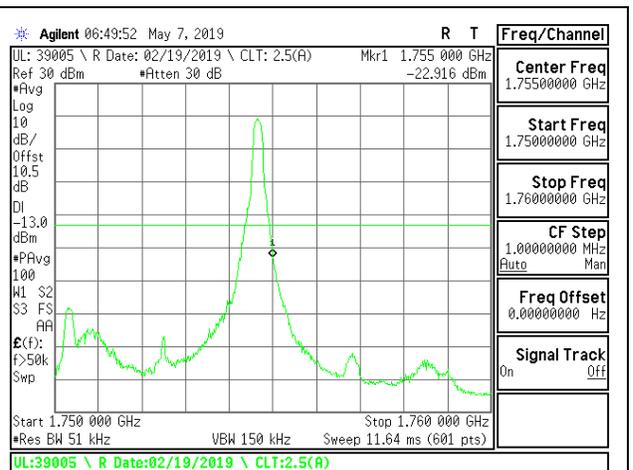
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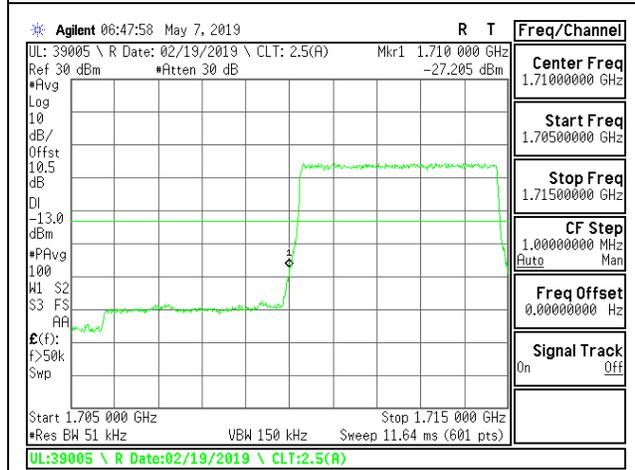
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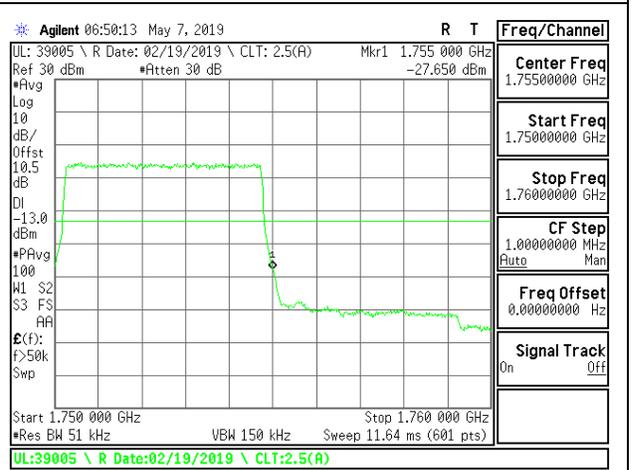
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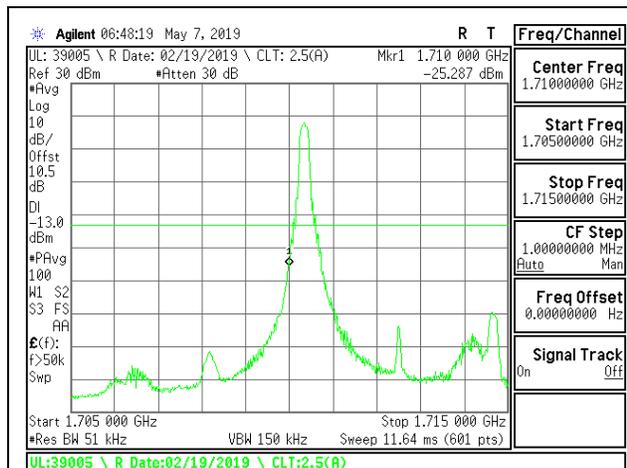
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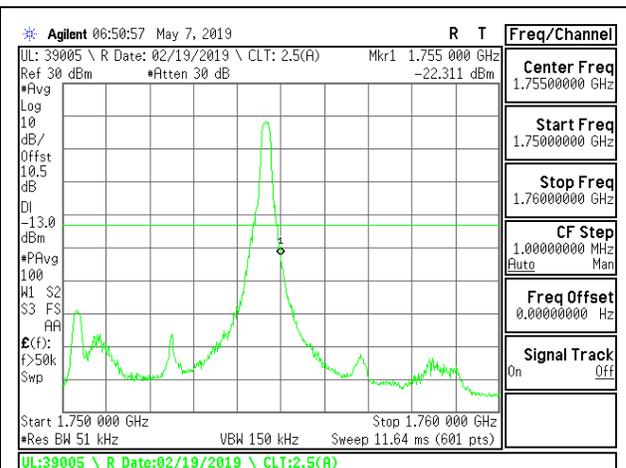
LTE B4 5MHz QPSK Low Channel RB25-0



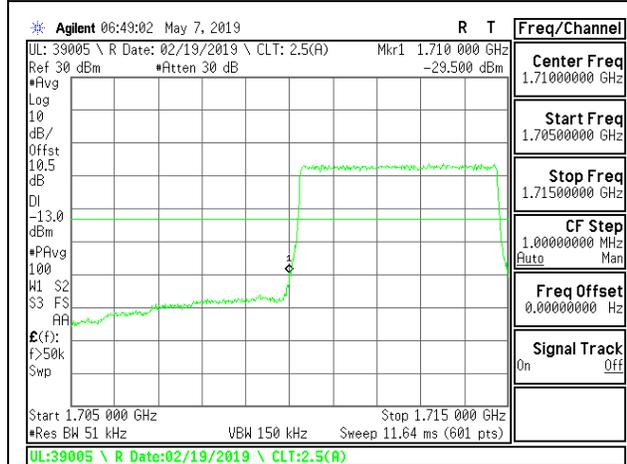
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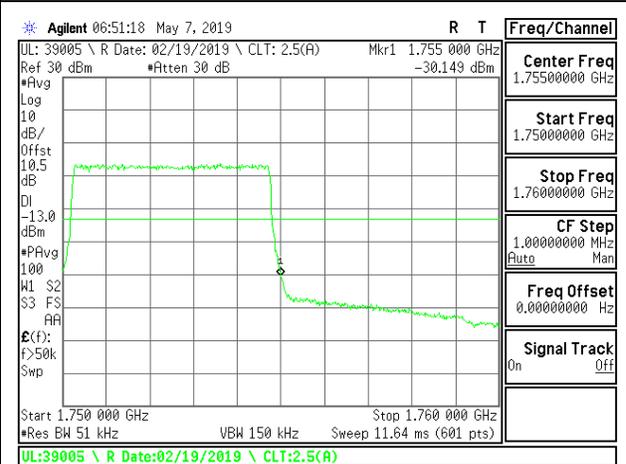
LTE B4 5MHz 16QAM Low Channel RB1-0



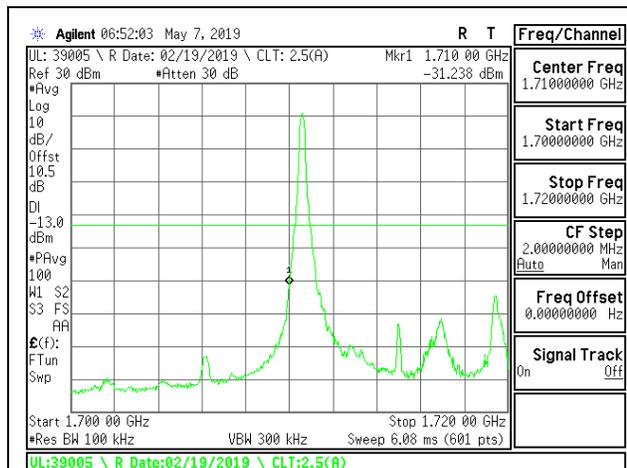
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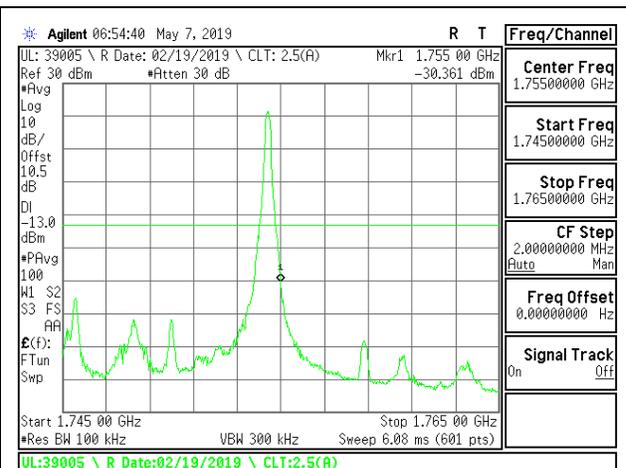
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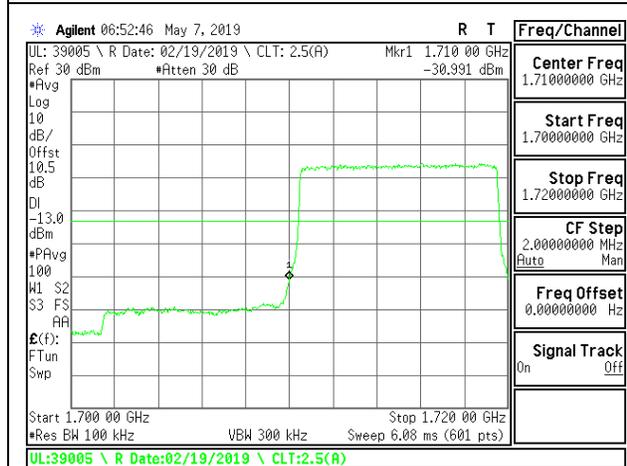
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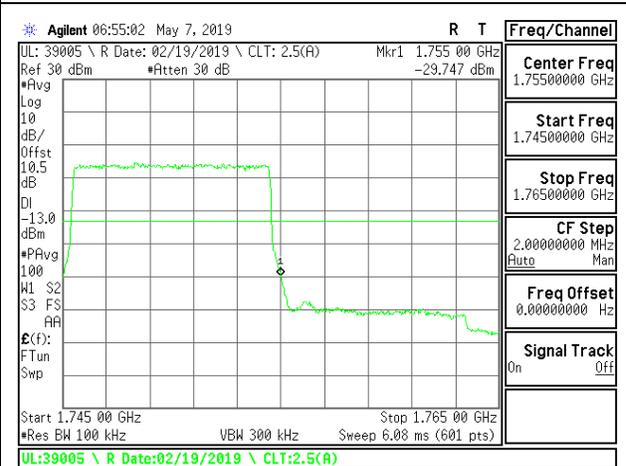
LTE B4 10MHz QPSK Low Channel RB1-0



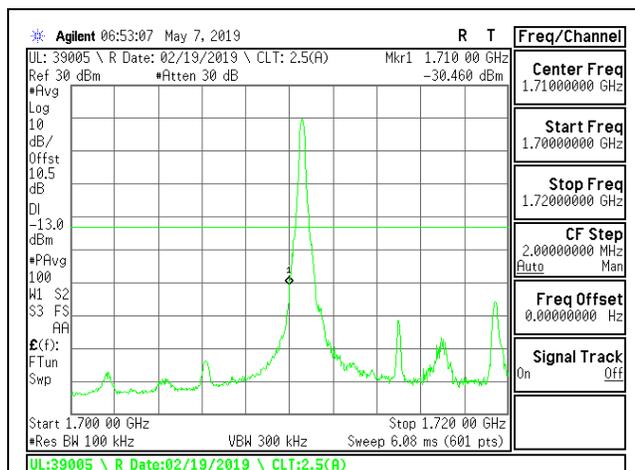
LTE B4 10MHz QPSK High Channel RB1-49



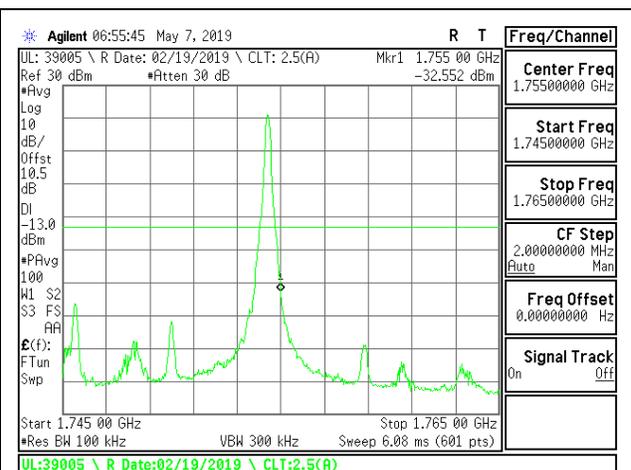
LTE B4 10MHz QPSK Low Channel RB50-0



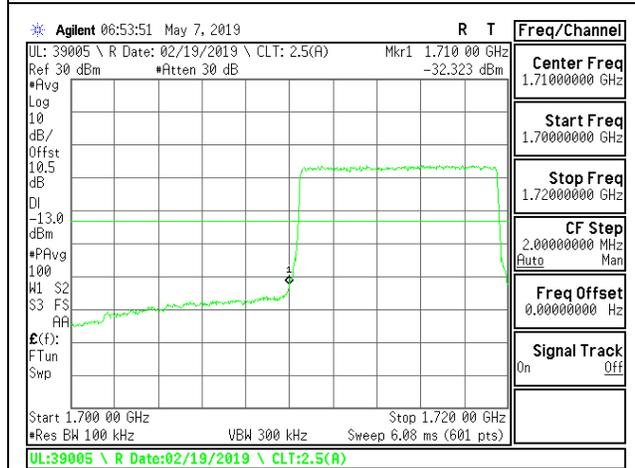
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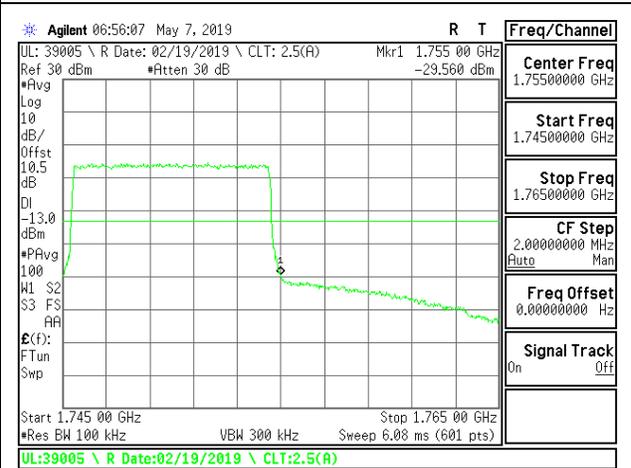
LTE B4 10MHz 16QAM Low Channel RB1-0



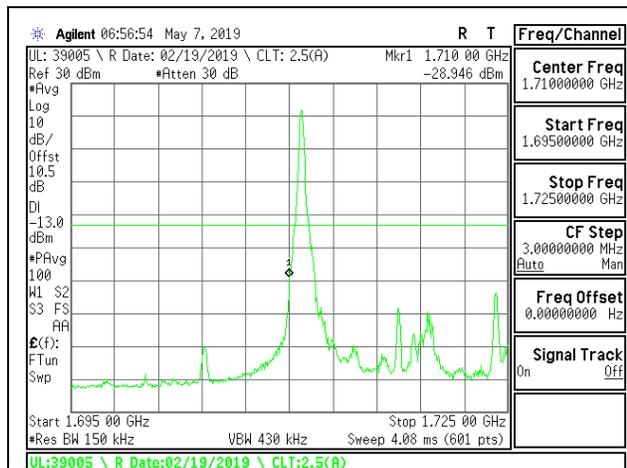
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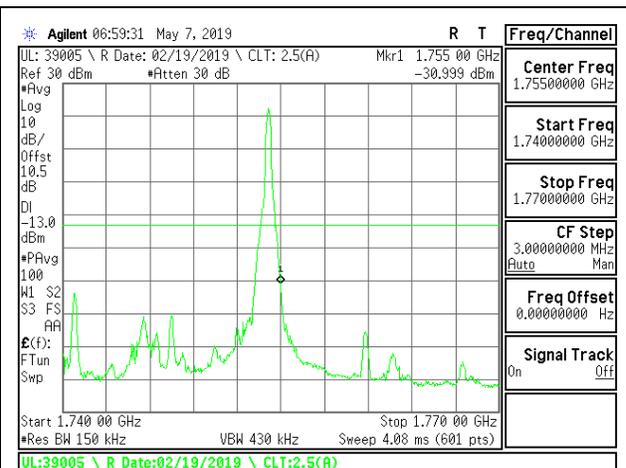
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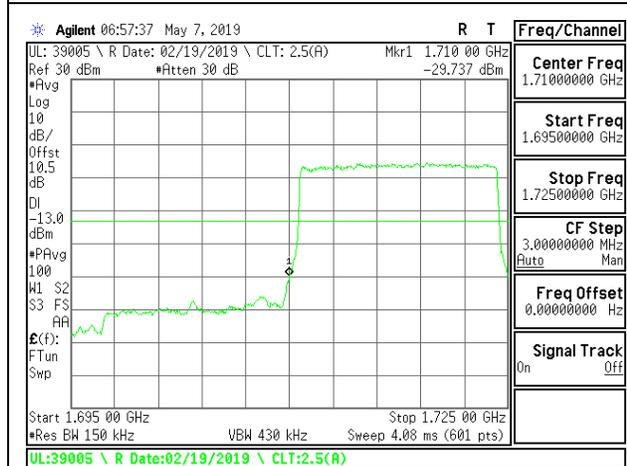
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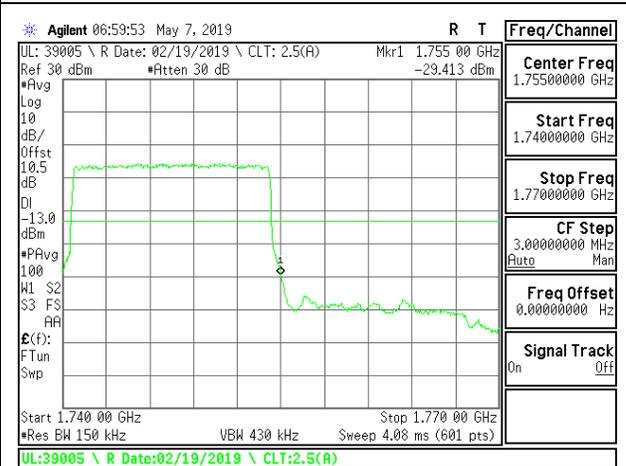
LTE B4 15MHz QPSK Low Channel RB1-0



LTE B4 15MHz QPSK High Channel RB1-74



LTE B4 15MHz QPSK Low Channel RB75-0



LTE B4 15MHz QPSK High Channel RB75-0