FCC CFR47 PART 22H, 24E AND 27

CERTIFICATION TEST REPORT

FOR

PORTABLE COMPUTING DEVICE WITH WWAN, 802.11B/G/A/N AND BLUETOOTH RADIOS

MODEL NUMBER: 1573

FCC ID: C3K1573

REPORT NUMBER: 13U15414-12, Revision B

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Prepared for
MICROSOFT CORPORATION
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	01/15/2014	Initial Issue	T. Chan
A	01/31/2014	Make correction on page numbers	M. Mekuria
B	02/18/2014	Correction on page numbers 412	C. Pang

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: MICROSOFT CORPORATION
1 MICROSOFT WAY
REDMOND, WA 98052, USA

EUT DESCRIPTION: PORTABLE COMPUTING DEVICE WITH WWAN, 802.11B/G/A/N AND BLUETOOTH RADIOS

MODEL: 1573

SERIAL NUMBER: 027093733852

DATE TESTED: OCTOBER 22 - DECEMBER 30, 2013

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC CFR47 PART 22H, 24E and 27	Pass

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. 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 any government.

Approved & Released For
UL Verification Services Inc. By:

Thu Chan
WiSE Operations Manager
UL Verification Services Inc.

Tested By:

Mona Hua
WiSE Lab Technician
UL Verification Services Inc.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with TIA-603-C, FCC CFR 47 Part 2, Part 22, Part 24 and Part 27.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, 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
☐ Chamber A	☒ Chamber D
☐ Chamber B	☒ Chamber E
☐ Chamber C	☐ Chamber F

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://www.ul.com.

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

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	3.52 dB
Radiated Disturbance, 30 to 1000 MHz	4.94 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is portable computing device with GSM, WCDMA, LTE, 802.11b/g/a/n and Bluetooth radios. Its model is 1573.

5.2. MAXIMUM OUTPUT POWER

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

LTE BAND 2

Part 24 LTE Band 2						
Bandwidth (MHz)	Frequency Range	Modulation	Conducted(Average)		EIRP(Average)	
			dBm	mW	dBm	mW
1.4	1850.7 - 1909.3	QPSK	23.24	210.9	25.95	393.6
		16QAM	22.51	178.2	25.20	331.1
3	1851.5 - 1908.5	QPSK	23.28	212.8	25.70	371.5
		16QAM	22.32	170.6	24.90	309.0
5	1852.5 - 1907.5	QPSK	23.32	214.8	26.00	398.1
		16QAM	22.76	188.8	25.10	323.6
10	1855.0 - 1905.0	QPSK	23.40	218.8	26.40	436.5
		16QAM	22.46	176.2	25.50	354.8
15	1857.5 - 1902.5	QPSK	23.48	222.8	26.40	436.5
		16QAM	22.72	187.1	25.10	323.6
20	1860.0 - 1900.0	QPSK	23.13	205.6	25.30	338.8
		16QAM	22.62	182.8	24.40	275.4

LTE BAND 4

Part 27 LTE Band 4						
Bandwidth (MHz)	Frequency Range	Modulation	Conducted(Average)		EIRP(Average)	
			dBm	mW	dBm	mW
1.4	1710.7-1754.3	QPSK	23.13	205.6	24.45	278.6
		16QAM	22.37	172.6	23.55	226.5
3	1711.5-1753.5	QPSK	23.18	208.0	24.15	260.0
		16QAM	22.57	180.7	23.25	211.3
5	1712.5-1752.5	QPSK	23.39	218.3	23.85	242.7
		16QAM	23.02	200.4	22.95	197.2
10	1715.0-1750.0	QPSK	23.16	207.0	23.85	242.7
		16QAM	22.31	170.2	22.85	192.8
15	1717.5-1747.5	QPSK	22.88	194.1	24.05	254.1
		16QAM	22.66	184.5	23.05	201.8
20	1720.0-1745.0	QPSK	22.68	185.4	24.15	260.0
		16QAM	22.62	182.8	23.25	211.3

LTE BAND 5

Part 22 LTE Band 5						
Bandwidth (MHz)	Frequency Range	Modulation	Conducted(Average)		ERP(Average)	
			dBm	mW	dBm	mW
1.4	824.7-848.3	QPSK	23.39	218.3	24.66	292.4
		16QAM	22.48	177.0	23.66	232.3
3	825.5-847.5	QPSK	23.12	205.1	24.86	306.2
		16QAM	22.06	160.7	23.86	243.2
5	826.5-846.5	QPSK	23.06	202.3	24.56	285.8
		16QAM	22.69	185.8	23.66	232.3
10	829.0-844.0	QPSK	23.20	208.9	24.86	306.2
		16QAM	22.41	174.2	23.86	243.2

LTE BAND 17

Part 27 LTE Band 17						
Bandwidth (MHz)	Frequency Range	Modulation	Conducted(Average)		ERP(Average)	
			dBm	mW	dBm	mW
5	706-713.5	QPSK	24.00	251.2	22.20	166.0
		16QAM	23.53	225.4	21.20	131.8
10	709.0-711.0	QPSK	23.52	224.9	21.19	131.5
		16QAM	22.61	182.4	20.19	104.5

5.3. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was Version Windows RT 8.1.

The EUT is linked CMW500 Test Set.

5.4. MAXIMUM ANTENNA GAIN

Please see table below:

LTE BANDS	Antenna Gain (dBi)
LTE Band 2, 1850.7-1909.3MHz	2.9
LTE Band 4, 1710.7 – 1754.3MHz	2.7
LTE Band 5, 824.7 – 848.3Hz	1.6
LTE Band 17, 706.5 – 713.5MHz	0.5

5.5. WORST-CASE CONFIGURATION AND MODE

The worst-case scenario for all measurements is based on the investigation results.

The device has LTE Bands of 2, 4, 5, and 17.

The RB Size was selected to measure for peak or average ERP and EIRP, which was based on the conducted power verification baseline data.
For the fundamental investigation of radiated emissions, the EUT is investigated for vertical and horizontal antenna orientations and X Y and Z orientation with and without keyboard and the worst case was determined to be at X orientation for cell bands without keyboard and Y orientation for pcs bands with keyboard.

5.6. DESCRIPTION OF TEST SETUP

RADIATED TESTS SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC/DC Adapter	Microsoft Japan	1512	0D130100H2D37	E132068

I/O CABLES (RF Conducted Test)

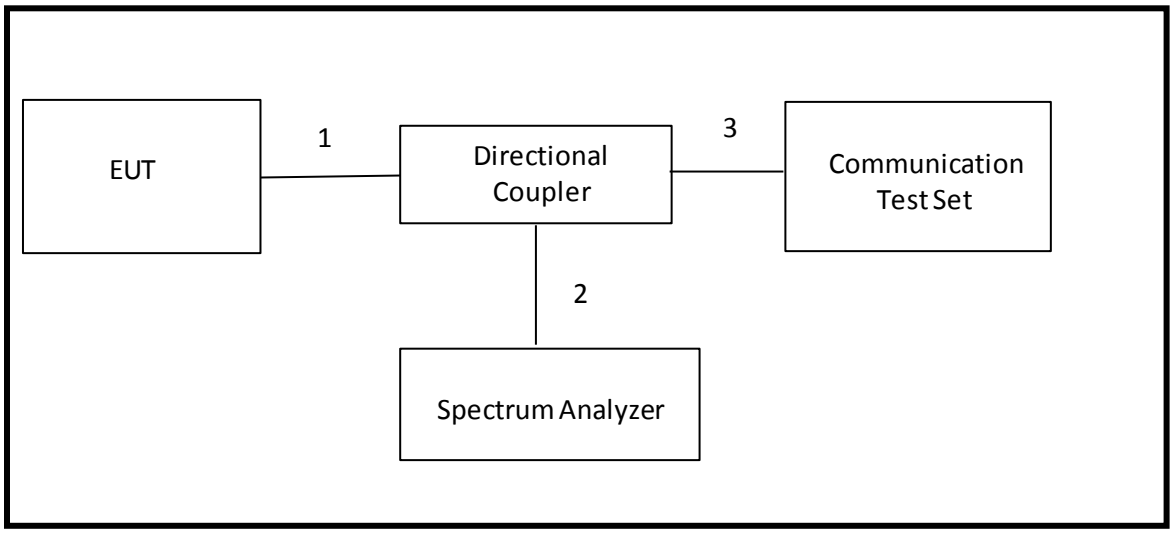
I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	RF Out	1	Directional Coupler	Un-shielded	0.1m	NA
2	RF In/Out	1	Spectrum Analyzer	Un-shielded	None	NA
3	RF In/Out	1	Communications Test Set	Un-shielded	1.2m	NA

I/O CABLES (RF Radiated Test)

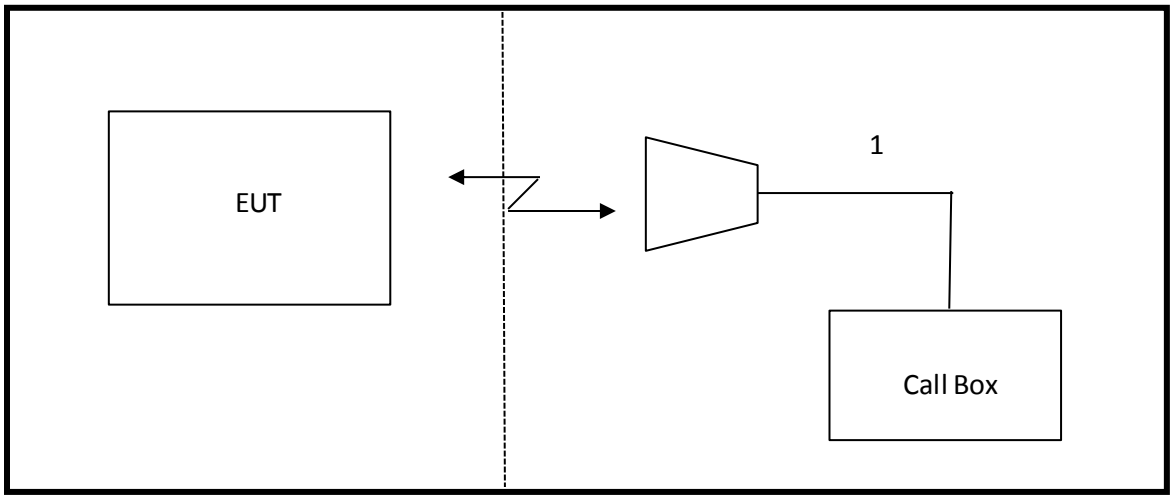
I/O CABLE LIST						
Cable No.	**Port**	**# of Identic Ports**	**Connector Type**	**Cable Type**	**Cable Length**	**Remarks**
1	RF In/Out	1	Antenna	Un-shielded	5m	NA

TEST SETUP

CONDUCTED SETUP DIAGRAM FOR TESTS



RADIATED SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Asset**	**Cal Due**
Communication Test Set	R & S	CMW500	F00014	02/21/14
Temperature / Humidity Chamber	Thermotron	SE 600-10-10	C00930	01/09/14
Vector signal generator, 6 GHz	Agilent / HP	E4438C	F00037	07/06/14
Horn Antenna	ETS Lindgren	3117	F00131	02/19/14
PreAmp 1-18GHz	Agilent/HP	8449B	C01063	03/18/14
Highpass Filter, 2.7 GHz	Micro-Tronics	HPM13194	N02686	CNR
Highpass Filter, 1.5 GHz	Micro-Tronics	HPM13193	N02688	CNR
Antenna, Tuned Dipole 400~1000 MHz	ETS Lindgren	3121C DB4	C00994	07/12/14
Spectrum Analyzer, 44GHz	Agilent	N9030A	F00129	02/21/14
Directional Coupler	Krytar	1817	N02656	CNR
Bilog, 30-1GHz	Sunol Science	A0222813-1	C01011	03/07/14
Peak Power Meter	Boonton	4541	C01189	06/20/14
Peak Power Sensor	Boonton	57006	C01202	05/29/14
PreAmp 30-1000MHz	Sonama	310	981661	11/06/14

7. RF POWER OUTPUT VERIFICATION

LTE Measurement Procedure:

All LTE bands conducted power peak and average are 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 3

Modulation	Channel bandwidth / Transmission bandwidth (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

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

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

Network Signalling value	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks (N_{RB})	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	NA
NS_03	6.6.2.2.1	2, 4,10, 23, 25, 35, 36	3	>5	≤ 1
			5	>6	≤ 1
			10	>6	≤ 1
			15	>8	≤ 1
			20	>10	≤ 1
NS_04	6.6.2.2.2	41	5	>6	≤ 1
			10, 15, 20	See Table 6.2.4-4	
NS_05	6.6.3.3.1	1	10,15,20	≥ 50	≤ 1
NS_06	6.6.2.2.3	12, 13, 14, 17	1.4, 3, 5, 10	Table 5.6-1	n/a
NS_07	6.6.2.2.3 6.6.3.3.2	13	10	Table 6.2.4-2	Table 6.2.4-2
NS_08	6.6.3.3.3	19	10, 15	> 44	≤ 3
NS_09	6.6.3.3.4	21	10, 15	> 40	≤ 1
				> 55	≤ 2
NS_10		20	15, 20	Table 6.2.4-3	Table 6.2.4-3
NS_11	6.6.2.2.1	23[1]	1.4, 3, 5, 10	Table 6.2.4-5	Table 6.2.4-5
..					
NS_32	-	-	-	-	-
Note 1: Applies to the lower block of Band 23, i.e. a carrier placed in the 2000-2010 MHz region.					

7.1. LTE BAND 2

Output Power for LTE Band 2 (1.4MHz)

Bandwidth	UL Channel	Frequency	Modulation	RB Size	RB Offset	Peak Power (dBm)	Average (dBm)
1.4	18607	1850.7	QPSK	1	0	27.19	23.06
				1	2	26.62	23.01
				1	5	27.31	23.06
				3	0	27.67	23.02
				3	1	27.60	23.01
				3	2	27.74	22.99
				6	0	28.10	22.13
			16QAM	1	0	27.45	22.45
				1	2	27.53	22.45
				1	5	27.64	**22.51**
				3	0	27.65	22.38
				3	1	27.71	22.37
				3	2	27.74	22.35
				6	0	**27.76**	21.14
1.4	18900	1880.0	QPSK	1	0	26.95	22.50
				1	2	26.89	22.46
				1	5	27.02	22.46
				3	0	27.52	22.44
				3	1	27.43	22.42
				3	2	27.52	22.41
				6	0	**28.50**	21.60
			16QAM	1	0	26.78	21.43
				1	2	26.77	21.41
				1	5	26.84	21.41
				3	0	27.74	21.73
				3	1	27.67	21.74
				3	2	27.70	21.75
				6	0	27.31	20.96
1.4	19193	1909.3	QPSK	1	0	26.71	**23.24**
				1	2	26.56	23.19
				1	5	26.49	23.21
				3	0	26.17	23.14
				3	1	26.92	23.13
				3	2	26.99	23.14
				6	0	27.53	22.32
			16QAM	1	0	26.58	22.15
				1	2	26.43	22.13
				1	5	26.45	22.16
				3	0	27.18	**22.51**
				3	1	26.98	22.49
				3	2	26.90	22.48
				6	0	26.78	21.55

Output Power for LTE Band 2 (3MHz)

Bandwidth	UL Channel	Frequency	Modulation	RB Size	RB Offset	Peak Power (dBm)	Average (dBm)
3	18615	1851.5	QPSK	1	0	27.16	23.17
				1	7	27.16	23.10
				1	14	27.45	23.22
				8	0	27.86	22.26
				8	4	27.91	22.27
				8	7	28.06	22.31
				15	0	**28.19**	22.28
			16QAM	1	0	27.69	22.29
				1	7	27.74	22.22
				1	14	28.03	**22.32**
				8	0	27.24	21.41
				8	4	27.11	21.43
				8	7	27.99	21.46
				15	0	27.83	21.45
3	18900	1880.0	QPSK	1	0	26.91	22.61
				1	7	26.78	22.42
				1	14	26.78	22.47
				8	0	27.40	21.61
				8	4	27.44	21.56
				8	7	27.65	21.56
				15	0	27.66	21.57
			16QAM	1	0	27.85	22.04
				1	7	27.80	21.90
				1	14	27.97	21.96
				8	0	27.06	20.85
				8	4	27.12	20.81
				8	7	27.33	20.82
				15	0	27.68	20.77
3	19185	1908.5	QPSK	1	0	27.75	**23.28**
				1	7	26.48	23.16
				1	14	26.47	23.19
				8	0	27.29	22.29
				8	4	27.17	22.28
				8	7	27.41	22.28
				15	0	**27.93**	22.30
			16QAM	1	0	26.74	22.16
				1	7	26.27	22.05
				1	14	26.29	22.09
				8	0	26.78	21.45
				8	4	26.50	21.42
				8	7	26.78	21.43
				15	0	27.26	21.41

Output Power for LTE Band 2 (5MHz)

Bandwidth	UL Channel	Frequency	Modulation	RB Size	RB Offset	Peak Power (dBm)	Average (dBm)
5	18625	1852.5	QPSK	1	0	27.18	23.14
				1	12	27.26	23.11
				1	24	27.65	**23.32**
				12	0	28.03	22.27
				12	6	27.96	22.27
				12	11	28.36	22.32
				25	0	**28.39**	22.31
			16QAM	1	0	26.97	22.10
				1	12	27.17	22.08
				1	24	27.58	22.26
				12	0	27.35	21.42
				12	6	27.14	21.43
				12	11	27.26	21.47
				25	0	**28.20**	21.56
5	18900	1880.0	QPSK	1	0	26.91	22.59
				1	12	26.68	22.41
				1	24	26.99	22.65
				12	0	27.64	21.62
				12	6	27.57	21.56
				12	11	27.70	21.54
				25	0	27.61	21.61
			16QAM	1	0	27.28	21.83
				1	12	27.01	21.69
				1	24	27.36	21.91
				12	0	27.12	20.95
				12	6	26.95	20.88
				12	11	26.73	20.86
				25	0	27.76	20.92
5	19175	1907.5	QPSK	1	0	27.12	23.30
				1	12	26.85	23.23
				1	24	26.77	23.26
				12	0	27.54	22.38
				12	6	27.20	22.37
				12	11	27.10	22.23
				25	0	27.76	22.24
			16QAM	1	0	26.85	**22.76**
				1	12	26.51	22.72
				1	24	26.44	**22.76**
				12	0	26.71	21.44
				12	6	26.30	21.44
				12	11	26.35	21.45
				25	0	27.49	21.38

Output Power for LTE Band 2 (10MHz)

Bandwidth	UL Channel	Frequency	Modulation	RB Size	RB Offset	Peak Power (dBm)	Average (dBm)
10	18650	1855.0	QPSK	1	0	27.17	23.18
				1	24	27.54	23.21
				1	49	27.77	23.32
				25	0	28.04	22.40
				25	12	27.99	22.40
				25	24	28.35	22.46
				50	0	**28.57**	22.42
			16QAM	1	0	27.69	22.34
				1	24	28.09	22.35
				1	49	28.11	**22.46**
				25	0	27.80	21.57
				25	12	27.93	21.59
				25	24	28.17	21.65
				50	0	**28.22**	21.56
10	18900	1880.0	QPSK	1	0	27.08	22.71
				1	24	26.85	22.43
				1	49	27.15	22.65
				25	0	27.28	21.73
				25	12	27.31	21.62
				25	24	27.26	21.62
				50	0	27.96	21.65
			16QAM	1	0	28.05	22.15
				1	24	27.81	21.93
				1	49	28.21	22.16
				25	0	27.52	20.97
				25	12	27.25	20.86
				25	24	27.49	20.89
				50	0	27.69	20.89
10	19150	1905.0	QPSK	1	0	27.49	**23.40**
				1	24	26.87	23.14
				1	49	26.63	23.13
				25	0	27.73	22.39
				25	12	27.36	22.30
				25	24	27.32	22.29
				50	0	28.07	22.35
			16QAM	1	0	27.29	22.30
				1	24	26.83	22.04
				1	49	26.40	22.02
				25	0	27.87	21.67
				25	12	27.00	21.58
				25	24	26.97	21.56
				50	0	27.76	21.56

Output Power for LTE Band 2 (15MHz)

Bandwidth	UL Channel	Frequency	Modulation	RB Size	RB Offset	Peak Power (dBm)	Average (dBm)
15	18675	1857.5	QPSK	1	0	26.96	23.15
				1	37	27.20	23.09
				1	74	27.72	23.23
				36	0	27.94	22.38
				36	16	27.95	22.36
				36	35	28.14	22.37
				75	0	**29.05**	22.35
			16-QAM	1	0	27.93	**22.72**
				1	37	28.30	22.65
				1	74	28.31	22.67
				36	0	27.50	21.45
				36	16	27.58	21.42
				36	35	27.72	21.45
				75	0	**28.33**	21.43
15	18900	1880.0	QPSK	1	0	27.30	23.03
				1	37	26.83	22.54
				1	74	27.33	22.92
				36	0	27.76	21.94
				36	16	27.44	21.70
				36	35	27.62	21.80
				75	0	28.79	21.87
			16-QAM	1	0	27.44	22.13
				1	37	26.06	21.74
				1	74	27.86	22.09
				36	0	27.58	21.11
				36	16	27.18	20.95
				36	35	27.43	20.96
				75	0	28.11	21.05
15	19125	1902.5	QPSK	1	0	27.74	**23.48**
				1	37	27.20	23.24
				1	74	26.53	23.19
				36	0	28.20	22.77
				36	16	27.57	22.49
				36	35	27.50	22.40
				75	0	28.64	22.51
			16-QAM	1	0	27.59	22.60
				1	37	27.44	22.38
				1	74	26.90	22.35
				36	0	27.72	21.79
				36	16	27.36	21.67
				36	35	27.23	21.60
				75	0	28.10	21.65

Output Power for LTE Band 2 (20MHz)

Bandwidth	UL Channel	Frequency	Modulation	RB Size	RB Offset	Peak Power (dBm)	Average (dBm)
20	18700	1860	QPSK	1	0	27.00	22.86
				1	49	27.53	22.83
				1	99	27.43	22.67
				50	0	27.28	21.99
				50	24	27.68	21.84
				50	49	27.77	21.80
				100	0	28.11	21.91
			16-QAM	1	0	26.56	22.47
				1	49	26.93	22.45
				1	99	26.93	22.34
				50	0	27.35	21.02
				50	24	27.34	21.00
				50	49	27.46	20.97
				100	0	27.76	20.94
20	18900	1880.0	QPSK	1	0	27.49	22.99
				1	49	27.04	22.39
				1	99	27.68	22.93
				50	0	27.69	21.88
				50	24	27.66	21.68
				50	49	27.74	21.75
				100	0	28.07	21.85
			16-QAM	1	0	26.83	22.36
				1	49	26.32	21.76
				1	99	26.89	22.24
				50	0	27.27	20.99
				50	24	27.19	20.78
				50	49	27.32	20.80
				100	0	28.06	20.95
20	19100	1900	QPSK	1	0	27.09	**23.13**
				1	49	27.70	23.11
				1	99	26.90	23.06
				50	0	27.97	22.36
				50	24	27.83	22.30
				50	49	27.50	22.23
				100	0	**28.44**	22.31
			16-QAM	1	0	27.76	**22.62**
				1	49	27.40	22.57
				1	99	26.97	22.53
				50	0	27.58	21.55
				50	24	27.29	21.48
				50	49	27.11	21.44
				100	0	**28.11**	21.55

7.2. LTE BAND 4

Output Power for LTE Band 4 (1.4MHz)

Bandwidth	UL Channel	Frequency	Modulation	RB Size	RB Offset	Peak Power (dBm)	Average (dBm)
1.4	19957	1710.7	QPSK	1	0	27.01	22.24
				1	2	26.91	22.30
				1	5	26.98	22.46
				3	0	27.58	22.22
				3	1	27.48	22.25
				3	2	27.36	22.24
				6	0	**28.38**	21.62
			16QAM	1	0	27.20	21.62
				1	2	27.16	21.70
				1	5	27.11	21.83
				3	0	**27.75**	21.61
				3	1	27.63	21.64
				3	2	27.60	21.62
				6	0	27.25	20.78
1.4	20175	1732.5	QPSK	1	0	24.60	21.47
				1	2	24.61	21.40
				1	5	24.78	21.35
				3	0	24.88	21.48
				3	1	24.73	21.44
				3	2	24.79	21.39
				6	0	25.86	21.39
			16QAM	1	0	24.82	21.56
				1	2	24.90	21.51
				1	5	25.10	21.48
				3	0	25.35	21.45
				3	1	25.07	21.40
				3	2	25.15	21.38
				6	0	26.17	21.07
1.4	20393	1754.3	QPSK	1	0	26.16	23.10
				1	2	26.01	23.09
				1	5	25.92	**23.13**
				3	0	26.75	23.11
				3	1	26.36	23.08
				3	2	26.32	23.11
				6	0	27.41	22.36
			16QAM	1	0	26.32	22.17
				1	2	26.10	22.14
				1	5	26.10	22.20
				3	0	26.71	22.34
				3	1	26.41	22.32
				3	2	26.38	**22.37**
				6	0	27.01	21.56

Output Power for LTE Band 4 (3MHz)

Bandwidth	UL Channel	Frequency	Modulation	RB Size	RB Offset	Peak Power (dBm)	Average (dBm)
3	19965	1711.5	QPSK	1	0	27.55	21.66
				1	7	27.13	21.78
				1	14	26.43	22.96
				8	0	27.62	21.76
				8	4	27.45	21.89
				8	7	27.58	22.05
				15	0	27.83	21.92
			16QAM	1	0	27.56	21.65
				1	7	26.64	22.52
				1	14	26.76	22.18
				8	0	27.60	20.87
				8	4	27.35	21.01
				8	7	27.32	21.17
				15	0	27.63	20.97
3	20175	1732.5	QPSK	1	0	24.38	21.74
				1	7	24.41	21.42
				1	14	24.69	21.31
				8	0	25.46	21.50
				8	4	25.24	21.38
				8	7	25.71	21.30
				15	0	26.12	21.58
			16QAM	1	0	24.71	21.43
				1	7	24.88	21.17
				1	14	25.31	21.07
				8	0	25.62	21.32
				8	4	25.61	21.24
				8	7	25.86	21.18
				15	0	26.30	21.30
3	20385	1753.5	QPSK	1	0	26.89	23.09
				1	7	26.34	23.09
				1	14	25.96	**23.18**
				8	0	27.00	22.18
				8	4	26.66	22.26
				8	7	26.72	22.34
				15	0	27.55	22.25
			16QAM	1	0	26.99	22.45
				1	7	26.44	22.46
				1	14	26.12	**22.57**
				8	0	27.38	21.25
				8	4	26.92	21.36
				8	7	27.10	21.43
				15	0	27.36	21.30

Output Power for LTE Band 4 (5MHz)

Bandwidth	UL Channel	Frequency	Mode	RB Size	RB Offset	Peak Power (dBm)	Average (dBm)
5	19975	1712.5	QPSK	1	0	27.10	22.54
				1	12	26.50	22.88
				1	24	25.97	**23.39**
				12	0	27.17	22.06
				12	6	26.87	22.29
				12	11	26.86	22.61
				25	0	27.93	22.42
			16QAM	1	0	27.38	21.89
				1	12	26.61	22.27
				1	24	26.02	22.73
				12	0	27.26	21.13
				12	6	27.12	21.30
				12	11	26.85	21.70
				25	0	28.02	21.52
5	20175	1732.5	QPSK	1	0	24.35	21.74
				1	12	24.57	21.39
				1	24	25.02	21.16
				12	0	25.42	21.70
				12	6	25.14	21.57
				12	11	25.63	21.42
				25	0	26.21	21.47
			16QAM	1	0	24.52	21.47
				1	12	24.81	21.27
				1	24	25.42	21.06
				12	0	25.22	21.43
				12	6	25.03	21.21
				12	11	25.40	21.21
				25	0	26.45	21.32
5	20375	1752.5	QPSK	1	0	27.60	22.89
				1	12	26.87	23.15
				1	24	26.12	23.34
				12	0	27.82	22.01
				12	6	27.42	22.17
				12	11	27.27	22.27
				25	0	28.10	22.19
			16QAM	1	0	27.48	22.69
				1	12	26.90	22.78
				1	24	26.20	**23.02**
				12	0	27.39	21.06
				12	6	27.06	21.24
				12	11	27.10	21.33
				25	0	27.95	21.20

Output Power for LTE Band 4 (10MHz)

Bandwidth	UL Channel	Frequency	Mode	RB Size	RB Offset	Peak Power (dBm)	Average (dBm)
10	20000	1715.0	QPSK	1	0	27.03	22.41
				1	24	25.63	**23.16**
				1	49	24.63	23.06
				25	0	27.13	22.04
				25	12	26.10	22.57
				25	24	25.84	22.83
				50	0	27.41	22.56
			16QAM	1	0	27.57	21.41
				1	24	25.93	22.24
				1	49	24.74	**22.31**
				25	0	27.23	21.10
				25	12	26.33	21.64
				25	24	25.86	22.07
				50	0	27.29	21.67
10	20175	1732.5	QPSK	1	0	24.07	21.96
				1	24	24.51	21.45
				1	49	25.31	20.85
				25	0	25.10	21.85
				25	12	25.21	21.56
				25	24	26.06	21.27
				50	0	26.40	21.54
			16QAM	1	0	24.33	21.61
				1	24	24.96	21.23
				1	49	26.11	20.72
				25	0	25.24	21.57
				25	12	25.32	21.38
				25	24	26.03	21.01
				50	0	26.75	21.27
10	20350	1750.0	QPSK	1	0	27.02	22.18
				1	24	27.08	22.53
				1	49	26.07	22.93
				25	0	28.11	21.70
				25	12	27.92	21.85
				25	24	27.80	22.12
				50	0	28.43	22.03
			16QAM	1	0	27.56	21.66
				1	24	27.41	21.93
				1	49	26.24	22.31
				25	0	28.10	20.83
				25	12	28.07	20.98
				25	24	27.81	21.26
				50	0	28.12	21.30

Output Power for LTE Band 4 (15MHz)

Bandwidth	UL Channel	Frequency	Mode	RB Size	RB Offset	Peak Power (dBm)	Average (dBm)
15	20025	1717.5	QPSK	1	0	26.64	22.12
				1	37	24.81	22.87
				1	74	24.07	22.51
				36	0	26.70	22.19
				36	16	25.68	22.61
				36	35	25.23	22.49
				75	0	27.19	22.53
			16-QAM	1	0	27.10	21.66
				1	37	25.04	22.27
				1	74	24.21	22.02
				36	0	26.80	21.43
				36	16	25.78	22.01
				36	35	25.14	21.84
				75	0	26.87	21.77
15	20175	1732.5	QPSK	1	0	24.00	22.13
				1	37	24.48	21.53
				1	74	25.64	20.62
				36	0	25.13	21.87
				36	16	25.22	21.58
				36	35	26.22	21.11
				75	0	26.78	21.58
			16-QAM	1	0	24.23	21.72
				1	37	25.01	21.21
				1	74	26.79	20.61
				36	0	25.29	21.66
				36	16	25.23	21.32
				36	35	26.23	20.98
				75	0	26.95	21.45
15	20325	1747.5	QPSK	1	0	26.73	21.88
				1	37	27.04	22.09
				1	74	26.11	**22.88**
				36	0	27.53	21.53
				36	16	27.75	21.55
				36	35	27.90	22.08
				75	0	28.55	22.13
			16-QAM	1	0	27.89	21.87
				1	37	28.51	22.22
				1	74	26.42	**22.66**
				36	0	27.91	20.67
				36	16	27.97	20.81
				36	35	28.12	21.26
				75	0	28.25	21.30

Output Power for LTE Band 4 (20MHz)

Bandwidth	UL Channel	Frequency	Mode	RB Size	RB Offset	Peak Power (dBm)	Average (dBm)
20	20050	1720.0	QPSK	1	0	26.88	21.77
				1	49	24.33	22.51
				1	99	24.21	21.98
				50	0	26.68	22.41
				50	24	25.44	22.51
				50	49	24.85	22.17
				100	0	26.73	22.29
			16-QAM	1	0	26.71	22.19
				1	49	24.37	22.51
				1	99	24.41	22.00
				50	0	26.54	21.84
				50	24	25.67	22.07
				50	49	24.73	21.81
				100	0	26.91	21.79
20	20175	1732.5	QPSK	1	0	24.10	22.24
				1	49	24.70	21.63
				1	99	26.27	20.72
				50	0	25.05	21.99
				50	24	25.26	21.56
				50	49	26.41	21.03
				100	0	26.54	21.43
			16-QAM	1	0	24.15	22.21
				1	49	24.78	21.69
				1	99	26.02	21.14
				50	0	25.22	21.87
				50	24	25.31	21.43
				50	49	26.66	20.89
				100	0	26.69	21.55
20	20300	1745.0	QPSK	1	0	26.20	21.90
				1	49	27.51	21.56
				1	99	26.29	**22.68**
				50	0	27.61	21.54
				50	24	27.96	21.43
				50	49	28.24	22.00
				100	0	28.06	21.82
			16-QAM	1	0	26.37	21.94
				1	49	27.88	21.88
				1	99	26.36	**22.62**
				50	0	27.62	20.91
				50	24	28.13	20.72
				50	49	28.09	21.13
				100	0	28.10	20.93

7.3. LTE BAND 5

Output Power for LTE Band 5 (1.4MHz)

Bandwidth	UL Channel	Frequency	Mode	RB Size	RB Offset	Peak Power (dBm)	Average (dBm)
1.4	20407	824.7	QPSK	1	0	29.03	**23.39**
				1	2	28.91	23.23
				1	5	28.76	23.13
				3	0	29.64	23.23
				3	1	29.54	23.19
				3	2	29.53	23.14
				6	0	30.13	22.20
			16QAM	1	0	28.84	22.42
				1	2	28.81	22.33
				1	5	28.85	22.39
				3	0	29.84	**22.48**
				3	1	29.81	22.41
				3	2	29.72	22.36
				6	0	28.82	21.63
1.4	20525	836.5	QPSK	1	0	27.20	23.16
				1	2	27.15	23.05
				1	5	27.21	23.05
				3	0	27.66	23.03
				3	1	27.54	22.99
				3	2	27.53	22.96
				6	0	28.54	22.08
			16QAM	1	0	27.12	22.22
				1	2	27.10	22.13
				1	5	27.17	22.12
				3	0	27.58	22.13
				3	1	27.51	22.08
				3	2	27.49	22.05
				6	0	27.14	21.31
1.4	20643	848.3	QPSK	1	0	27.65	23.27
				1	2	27.57	23.26
				1	5	27.46	23.29
				3	0	28.41	23.23
				3	1	28.25	23.22
				3	2	28.25	23.22
				6	0	28.71	22.29
			16QAM	1	0	27.70	22.30
				1	2	27.58	22.28
				1	5	27.51	22.30
				3	0	28.35	22.45
				3	1	28.14	22.42
				3	2	28.19	22.46
				6	0	27.64	21.66

Output Power for LTE Band 5 (3MHz)

Bandwidth	UL Channel	Frequency	Mode	RB Size	RB Offset	Peak Power (dBm)	Average (dBm)
3	20415	825.5	QPSK	1	0	28.52	23.02
				1	7	28.05	22.61
				1	14	27.95	22.53
				8	0	28.47	21.74
				8	4	28.34	21.61
				8	7	28.50	21.57
				15	0	28.36	21.77
			16QAM	1	0	29.37	21.98
				1	7	29.06	21.59
				1	14	29.27	21.66
				8	0	28.57	21.09
				8	4	28.61	20.98
				8	7	28.65	20.96
				15	0	28.07	20.90
3	20525	836.5	QPSK	1	0	23.15	**23.12**
				1	7	27.03	22.98
				1	14	27.57	21.93
				8	0	27.54	22.21
				8	4	27.46	22.14
				8	7	27.64	22.12
				15	0	27.71	22.09
			16QAM	1	0	27.22	**22.06**
				1	7	27.25	21.90
				1	14	27.59	21.94
				8	0	27.03	21.26
				8	4	26.72	21.21
				8	7	27.07	21.18
				15	0	27.26	21.23
3	20635	847.5	QPSK	1	0	27.63	22.85
				1	7	27.29	22.81
				1	14	27.12	22.95
				8	0	28.24	21.81
				8	4	28.01	21.86
				8	7	27.82	21.89
				15	0	27.74	21.85
			16QAM	1	0	27.77	21.90
				1	7	27.27	21.84
				1	14	27.11	21.96
				8	0	27.42	21.05
				8	4	27.25	21.06
				8	7	27.29	21.09
				15	0	27.93	21.00

Output Power for LTE Band 5 (5MHz)

Bandwidth	UL Channel	Frequency	Mode	RB Size	RB Offset	Peak Power (dBm)	Average (dBm)
5	20425	826.5	QPSK	1	0	28.34	**23.06**
				1	12	27.97	22.60
				1	24	27.62	22.48
				12	0	27.89	21.78
				12	6	27.57	21.61
				12	11	28.83	21.51
				25	0	28.41	21.58
			16QAM	1	0	28.68	22.08
				1	12	28.11	21.63
				1	24	28.06	21.67
				12	0	28.63	21.03
				12	6	28.35	20.86
				12	11	27.68	20.81
				25	0	28.82	20.92
5	20525	836.5	QPSK	1	0	27.05	23.04
				1	12	27.03	22.97
				1	24	27.54	23.01
				12	0	27.47	22.22
				12	6	27.06	22.17
				12	11	27.76	22.16
				25	0	27.90	22.10
			16QAM	1	0	27.08	22.08
				1	12	27.06	22.13
				1	24	27.62	22.20
				12	0	26.75	21.24
				12	6	26.62	21.13
				12	11	26.74	21.11
				25	0	27.83	21.28
5	20625	846.5	QPSK	1	0	28.44	22.83
				1	12	27.92	22.72
				1	24	27.38	22.92
				12	0	28.99	21.78
				12	6	28.47	21.78
				12	11	28.21	21.84
				25	0	28.34	21.80
			16QAM	1	0	28.16	22.65
				1	12	27.57	22.53
				1	24	27.18	**22.69**
				12	0	27.92	21.04
				12	6	27.37	21.03
				12	11	27.27	21.13
				25	0	28.28	20.97

Output Power for LTE Band 5 (10MHz)

Bandwidth	UL Channel	Frequency	Mode	RB Size	RB Offset	Peak Power (dBm)	Average (dBm)
10	20450	829.0	QPSK	1	0	28.65	23.10
				1	24	28.10	22.77
				1	49	27.22	23.15
				25	0	**28.82**	22.03
				25	12	28.14	21.75
				25	24	28.27	21.82
				50	0	28.61	21.98
			16QAM	1	0	**29.68**	**22.41**
				1	24	28.89	21.77
				1	49	27.59	22.10
				25	0	29.12	21.15
				25	12	28.71	21.03
				25	24	28.24	21.07
				50	0	29.23	21.08
10	20525	836.5	QPSK	1	0	27.46	22.96
				1	24	27.05	22.95
				1	49	28.06	22.68
				25	0	27.46	22.19
				25	12	27.46	22.10
				25	24	28.10	22.08
				50	0	28.51	22.03
			16QAM	1	0	27.96	22.08
				1	24	27.31	22.12
				1	49	28.75	21.86
				25	0	27.12	21.26
				25	12	26.87	21.12
				25	24	27.58	21.12
				50	0	28.24	21.14
10	20600	844.0	QPSK	1	0	27.94	**23.20**
				1	24	27.76	22.66
				1	49	27.17	22.82
				25	0	28.77	21.93
				25	12	28.65	21.69
				25	24	28.52	21.74
				50	0	28.46	21.81
			16QAM	1	0	28.07	22.24
				1	24	27.98	21.73
				1	49	27.21	21.88
				25	0	28.54	21.25
				25	12	28.34	21.03
				25	24	28.06	21.06
				50	0	28.01	21.04

7.4. LTE BAND 17

Output Power for LTE Band 17 (5MHz)

Bandwidth	UL Channel	Frequency	Mode	RB Size	RB Offset	Peak Power (dBm)	Average (dBm)
5	23755	706.5	QPSK	1	0	27.29	23.42
				1	12	27.31	23.20
				1	24	27.53	23.02
				12	0	27.42	22.57
				12	6	27.34	22.21
				12	11	27.68	21.94
				25	0	28.02	22.35
			16QAM	1	0	27.01	22.38
				1	12	27.21	22.29
				1	24	27.57	22.18
				12	0	26.58	21.52
				12	6	26.46	21.33
				12	11	26.77	21.10
				25	0	27.83	21.38
5	23790	710.0	QPSK	1	0	27.29	22.78
				1	12	27.44	22.70
				1	24	27.22	22.57
				12	0	27.85	22.10
				12	6	27.92	21.98
				12	11	27.23	21.77
				25	0	27.98	21.87
			16QAM	1	0	27.30	21.92
				1	12	27.68	21.90
				1	24	27.44	21.75
				12	0	26.98	21.09
				12	6	26.81	21.01
				12	11	27.25	20.83
				25	0	27.63	20.93
5	23825	713.5	QPSK	1	0	27.83	22.56
				1	12	27.51	22.61
				1	24	27.50	**24.00**
				12	0	28.05	21.63
				12	6	27.80	21.70
				12	11	27.94	21.97
				25	0	28.06	21.88
			16QAM	1	0	27.30	22.32
				1	12	27.07	22.33
				1	24	27.04	**23.53**
				12	0	26.94	20.80
				12	6	26.77	20.84
				12	11	26.81	21.11
				25	0	27.55	20.96

Output Power for LTE Band 17 (10MHz)

Bandwidth	UL Channel	Frequency	Mode	RB Size	RB Offset	Peak Power (dBm)	Average (dBm)
10	23780	709.0	QPSK	1	0	27.34	**23.52**
				1	24	27.77	23.01
				1	49	27.22	22.48
				25	0	27.66	22.20
				25	12	27.64	21.88
				25	24	27.52	21.67
				50	0	28.07	21.94
			16QAM	1	0	27.37	22.38
				1	24	28.05	21.94
				1	49	27.64	21.50
				25	0	27.25	21.41
				25	12	27.26	21.10
				25	24	27.57	20.84
				50	0	28.26	21.24
10	23790	710.0	QPSK	1	0	27.47	23.41
				1	24	27.61	22.63
				1	49	27.23	22.87
				25	0	27.63	22.13
				25	12	27.56	21.81
				25	24	27.52	21.64
				50	0	28.10	21.85
			16QAM	1	0	27.53	22.44
				1	24	28.17	21.82
				1	49	27.50	21.76
				25	0	27.49	21.16
				25	12	27.37	20.85
				25	24	27.54	20.72
				50	0	27.82	20.92
10	23800	711.0	QPSK	1	0	27.43	23.27
				1	24	27.17	22.34
				1	49	27.29	23.48
				25	0	27.95	22.05
				25	12	27.99	21.77
				25	24	27.82	21.70
				50	0	28.03	21.92
			16QAM	1	0	27.32	22.51
				1	24	27.47	21.63
				1	49	27.16	**22.61**
				25	0	27.52	21.07
				25	12	27.34	20.90
				25	24	27.31	20.85
				50	0	27.51	20.93

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 low, middle and high channel in each band. The -26dB bandwidth was also measured and recorded.

MODES TESTED

- LTE Band 2
- LTE Band 4
- LTE Band 5
- LTE Band 17

RESULTS

Band	Mode	RB SIZE / RB OFFSET	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 2	1.4 MHz BAND QPSK	6/0	1850.7	1.0862	1.2980
		6/0	1880.0	1.0929	1.2980
		6/0	1909.3	1.0841	1.2990
	1.4 MHz BAND 16QAM	6/0	1850.7	1.065	1.3730
		6/0	1880.0	1.0934	1.2570
		6/0	1909.3	1.0977	1.3940
	3 MHz BAND QPSK	15/0	1851.5	2.6712	2.9170
		15/0	1880.0	2.6827	2.8590
		15/0	1908.5	2.6999	2.9680
	3 MHz BAND 16QAM	15/0	1851.5	2.6753	2.9160
		15/0	1880.0	2.6759	2.9330
		15/0	1908.5	2.6828	3.0050
	5 MHz BAND QPSK	25/0	1852.5	4.4968	4.6760
		25/0	1880.0	4.4821	4.7380
		25/0	1907.5	4.4534	4.6830
	5 MHz BAND 16QAM	25/0	1852.5	4.506	4.7410
		25/0	1880.0	4.4867	4.8940
		25/0	1907.5	4.4819	4.8040
	10 MHz BAND QPSK	50/0	1855	8.9848	9.3660
		50/0	1880.0	8.9557	9.3330
		50/0	1905.0	8.9628	9.3550
	10 MHz BAND 16QAM	50/0	1855	8.9213	9.4700
		50/0	1880.0	8.9666	9.4740
		50/0	1905.0	8.9648	9.4740
	15 MHz BAND QPSK	75/0	1857.5	13.503	13.9400
		75/0	1880.0	13.394	13.9700
		75/0	1902.5	13.413	14.3900
	15 MHz BAND 16QAM	75/0	1857.5	13.444	14.2100
		75/0	1880.0	13.434	13.9900
		75/0	1902.5	13.415	14.4100
	20 MHz BAND QPSK	100/0	1860	17.814	18.7900
		100/0	1880.0	17.841	18.6000
		100/0	1900.0	17.964	19.2700
	20 MHz BAND 16QAM	100/0	1860	17.861	18.8200
		100/0	1880.0	17.941	18.7100
		100/0	1900.0	17.986	18.8500

Band	Mode	RB SIZE/ RB OFFSET	f (MHz)	99% BW (MHz)	(-) 26dB BW (MHz)
LTE BAND 4	1.4 MHz BAND QPSK	6/0	1710.7	1.0859	1.2660
		6/0	1732.5	1.0887	1.3640
		6/0	1754.3	1.0909	1.3430
	1.4 MHz BAND 16QAM	6/0	1710.7	1.0713	1.2450
		6/0	1732.5	1.0809	1.4550
		6/0	1754.3	1.0854	1.2880
	3.0 MHz BAND QPSK	15/0	1711.5	2.6893	2.9710
		15/0	1732.5	2.7107	2.9660
		15/0	1753.5	2.6880	2.8810
	3.0 MHz BAND 16QAM	15/0	1711.5	2.6678	2.9340
		15/0	1732.5	2.6897	3.7070
		15/0	1753.5	2.6937	2.8800
	5.0 MHz BAND QPSK	25/0	1712.5	4.4478	4.9400
		25/0	1732.5	4.5000	4.7820
		25/0	1752.5	4.4887	4.6940
	5.0 MHz BAND 16QAM	25/0	1712.5	4.4624	4.7890
		25/0	1732.5	4.5037	5.7060
		25/0	1752.5	4.4948	4.7780
	10 MHz BAND QPSK	50/0	1715.0	8.9664	11.4200
		50/0	1732.5	8.9768	9.5220
		50/0	1750.0	8.9366	9.4970
	10 MHz BAND 16QAM	50/0	1715.0	8.8919	9.9300
		50/0	1732.5	8.9616	12.7900
		50/0	1750.0	8.9164	9.3700
	15 MHz BAND QPSK	75/0	1717.5	13.5260	22.8900
		75/0	1732.5	13.4120	18.9400
		75/0	1747.5	13.4430	14.4100
	15 MHz BAND 16QAM	75/0	1717.5	13.5690	21.7600
		75/0	1732.5	13.4270	21.3200
		75/0	1747.5	13.4250	13.9100
	20 MHz BAND QPSK	100/0	1720.0	17.9380	28.4900
		100/0	1732.5	17.9830	18.6900
		100/0	1745.0	17.8700	19.3200
	20 MHz BAND 16QAM	100/0	1720.0	18.0590	28.6700
		100/0	1732.5	17.9930	26.4800
		100/0	1745.0	17.9180	19.2900

Band	Mode	RB SIZE/ RB OFFSET	f (MHz)	99% BW (MHz)	(-) 26dB BW (MHz)
LTE BAND 5	1.4 MHz BAND QPSK	6/0	824.7	1.0871	1.2180
		6/0	836.5	1.0747	1.3020
		6/0	848.3	1.0986	1.2200
	1.4 MHz BAND 16 QAM	6/0	824.7	1.0747	1.2600
		6/0	836.5	1.0811	1.2420
		6/0	848.3	1.0835	1.3010
	3 MHz BAND QPSK	15/0	825.5	2.7054	2.8700
		15/0	836.5	2.6887	2.9290
		15/0	847.5	2.7008	2.9290
	3 MHz BAND 16 QAM	15/0	825.5	2.6800	2.7760
		15/0	836.5	2.7058	2.8220
		15/0	847.5	2.6532	2.9300
	5 MHz BAND QPSK	25/0	821.5	4.3975	4.7550
		25/0	836.5	4.3952	4.6560
		25/0	846.5	4.4759	4.7380
	5 MHz BAND 16 QAM	25/0	821.5	4.4926	4.7510
		25/0	836.5	4.4686	4.8430
		25/0	846.5	4.4533	4.7680
	10 MHz BAND QPSK	50/0	829.0	8.9332	9.4700
		50/0	836.5	8.8931	9.5280
		50/0	844.0	8.9559	9.5130
	10 MHz BAND 16 QAM	50/0	829.0	8.9859	9.4760
		50/0	836.5	8.9365	9.4970
		50/0	844.0	9.0085	9.5020

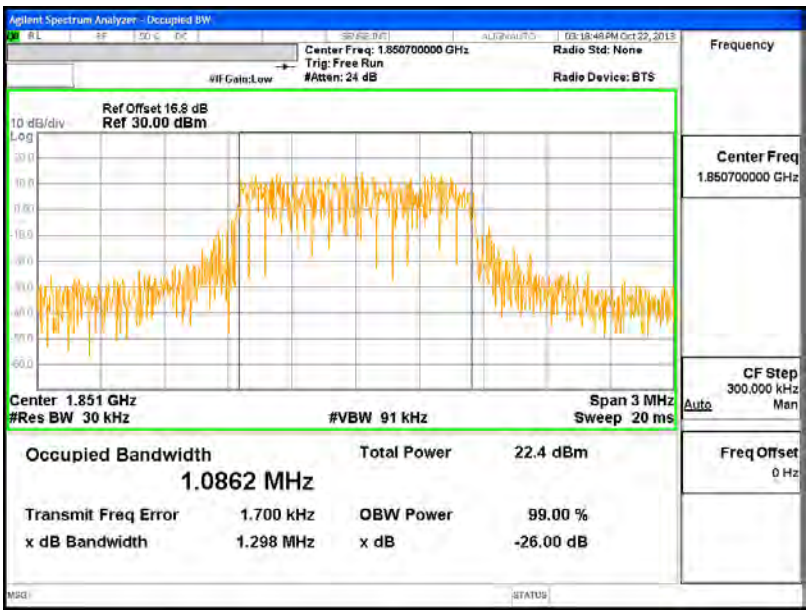
Band	Mode	RB SIZE/ RB OFFSET	f (MHz)	99% BW (MHz)	(-) 26dB BW (MHz)
LTE BAND 17	5 MHz BAND QPSK	25/0	706.5	4.4836	4.7390
		25/0	710.0	4.4763	4.7970
		25/0	713.5	4.4887	4.9570
	5 MHz BAND 16 QAM	25/0	706.5	4.4980	4.7990
		25/0	710.0	4.4986	4.7310
		25/0	713.5	4.4854	4.6920
	10 MHz BAND QPSK	50/0	709.0	8.9250	9.4220
		50/0	710.0	8.9949	9.3470
		50/0	711.0	8.9695	9.3570
	10 MHz BAND 16 QAM	50/0	709.0	8.9632	9.5670
		50/0	710.0	8.9424	9.4360
		50/0	711.0	8.9608	9.3890

8.1.1. LTE BAND 2

Band 2 (1.4 MHz Bandwidth)

LTE QPSK

LOW CH, RB6_0



MID CH, RB6_0

HI CH, RB6_0

Band 2 (1.4 MHz Bandwidth)

LTE 16QAM

LOW CH, RB6_0

MID CH, RB6_0

HI CH, RB6_0

Band 2 (3MHz Bandwidth)

LTE QPSK

LOW CH, RB15_0

MID CH, RB15_0

HI CH, RB15_0

Band 2 (3MHz Bandwidth)

LTE 16QAM

LOW CH, RB15_0

MID CH, RB15_0

HI CH, RB15_0

Band 2 (5MHz Bandwidth)

LTE QPSK

LOW CH, RB25_0

MID CH, RB25_0

HI CH, RB25_0

Band 2 (5MHz Bandwidth)

LTE 16QAM

LOW CH, RB25_0

MID CH, RB25_0

HI CH, RB25_0

Band 2 (10MHz Bandwidth)

LTE QPSK

LOW CH, RB50_0

MID CH, RB50_0

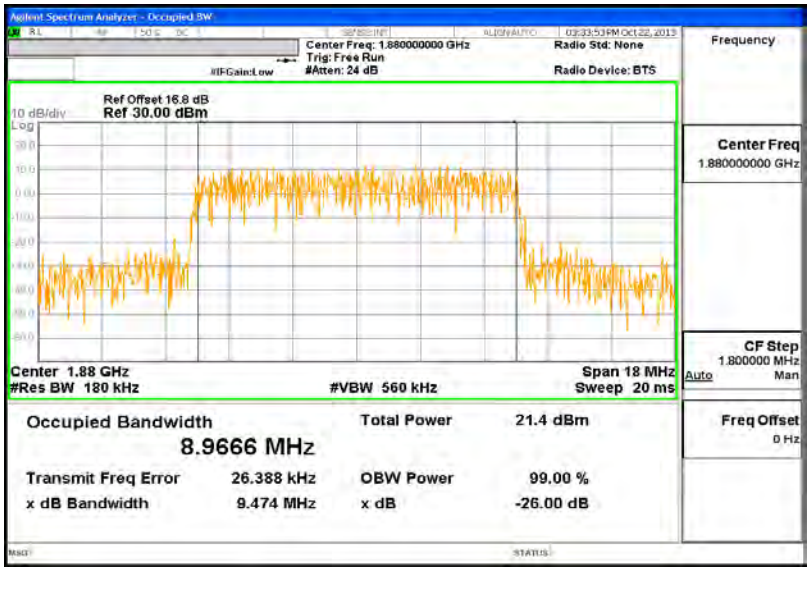
HI CH, RB50_0

Band 2 (10MHz Bandwidth)

LTE 16QAM

LOW CH, RB50_0

MID CH, RB50_0



HI CH, RB50_0

Band 2 (15MHz Bandwidth)

LTE QPSK

LOW CH, RB75_0

MID CH, RB75_0

HI CH, RB75_0

Band 2 (15MHz Bandwidth)

LTE 16QAM

LOW CH, RB75_0

MID CH, RB75_0

HI CH, RB75_0

Band 2 (20MHz Bandwidth)

LTE QPSK

LOW CH, RB100_0

MID CH, RB100_0

HI CH, RB100_0

Band 2 (20MHz Bandwidth)

LTE 16QAM

LOW CH, RB100_0

MID CH, RB100_0

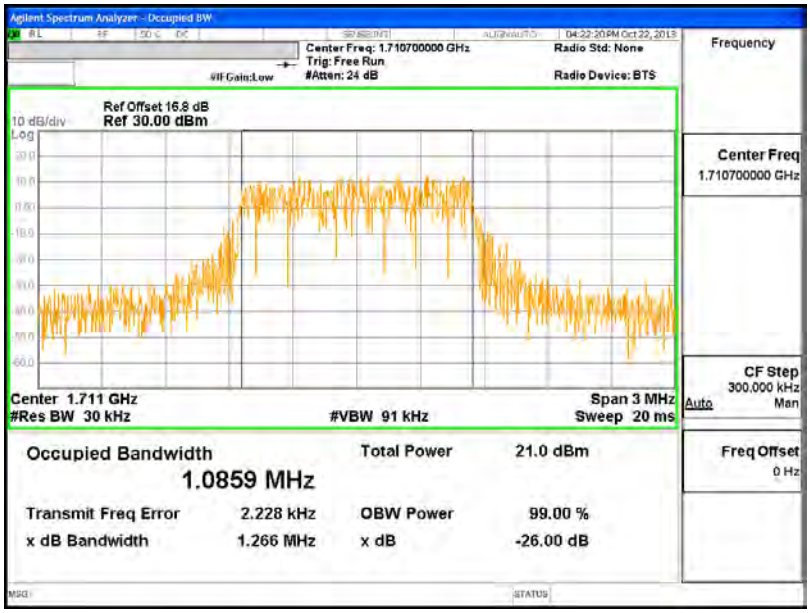
HI CH, RB100_0

8.1.2. LTE BAND 4

Band 4 (1.4 MHz Bandwidth)

LTE QPSK

LOW CH, RB6_0



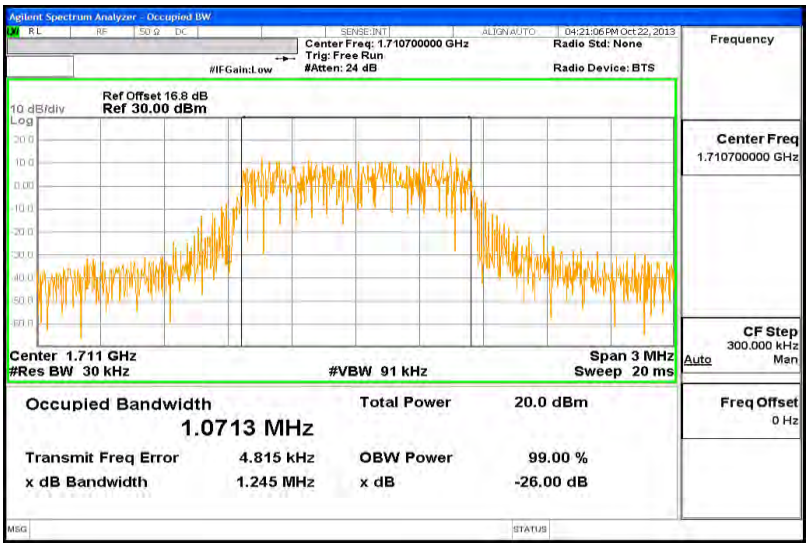
MID CH, RB6_0

HI CH, RB6_0

Band 4 (1.4 MHz Bandwidth)

LTE 16QAM

LOW CH, RB6_0



MID CH, RB6_0

HI CH, RB6_0

Band 4 (3MHz Bandwidth)

LTE QPSK

LOW CH, RB15_0

MID CH, RB15_0

HI CH, RB15_0

Band 4 (3MHz Bandwidth)

LTE 16QAM

LOW CH, RB15_0

MID CH, RB15_0

HI CH, RB15_0

Band 4 (5MHz Bandwidth)

LTE QPSK

LOW CH, RB25_0

MID CH, RB25_0

HI CH, RB25_0

Band 4 (5MHz Bandwidth)

LTE 16QAM

LOW CH, RB25_0

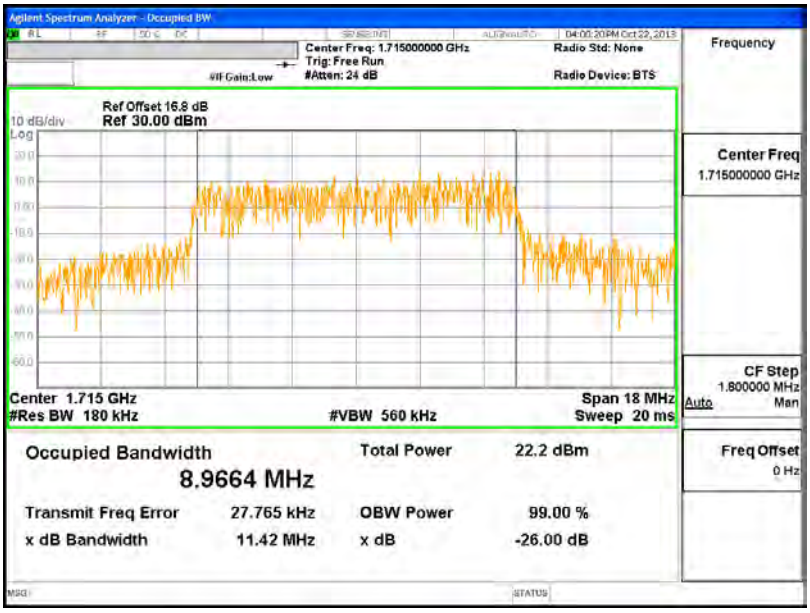
MID CH, RB25_0

HI CH, RB25_0

Band 4 (10MHz Bandwidth)

LTE QPSK

LOW CH, RB50_0



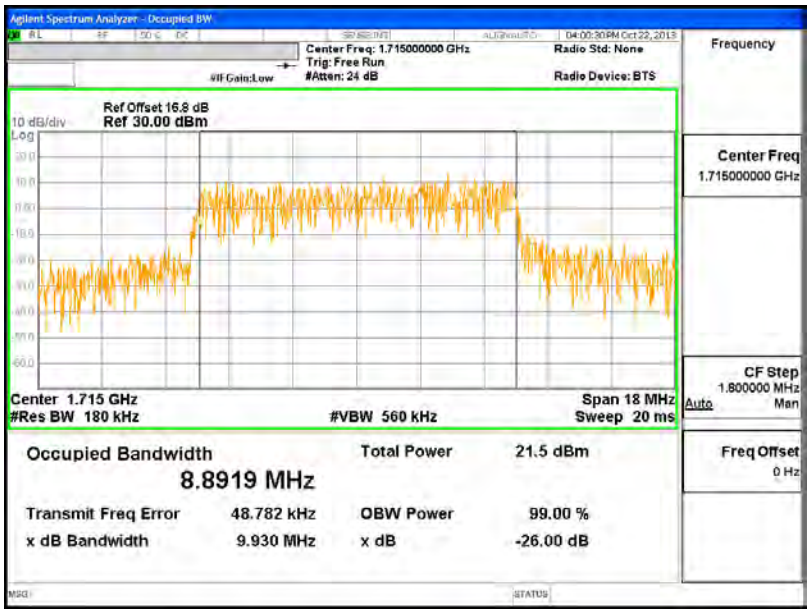
MID CH, RB50_0

HI CH, RB50_0

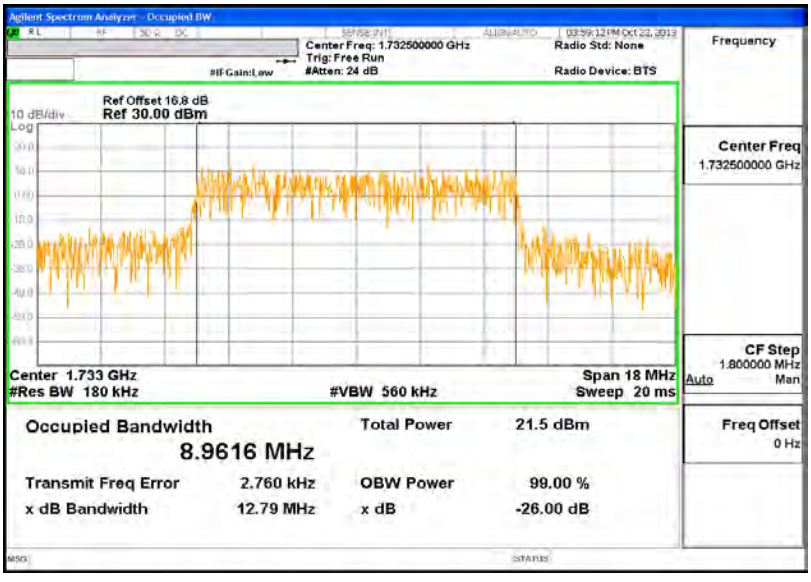
Band 4 (10MHz Bandwidth)

LTE 16QAM

LOW CH, RB50_0



MID CH, RB50_0



HI CH, RB50_0

Band 4 (15MHz Bandwidth)

LTE QPSK

LOW CH, RB75_0

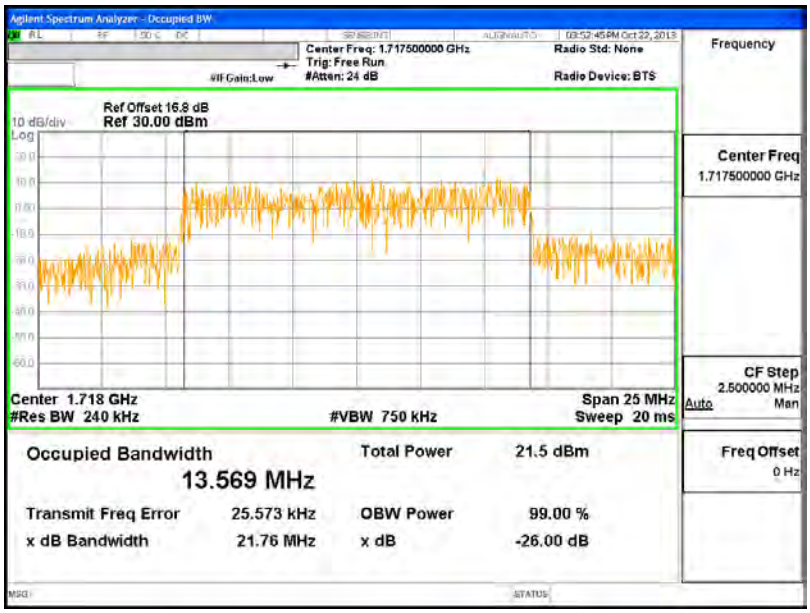
MID CH, RB75_0

HI CH, RB75_0

Band 4 (15MHz Bandwidth)

LTE 16QAM

LOW CH, RB75_0



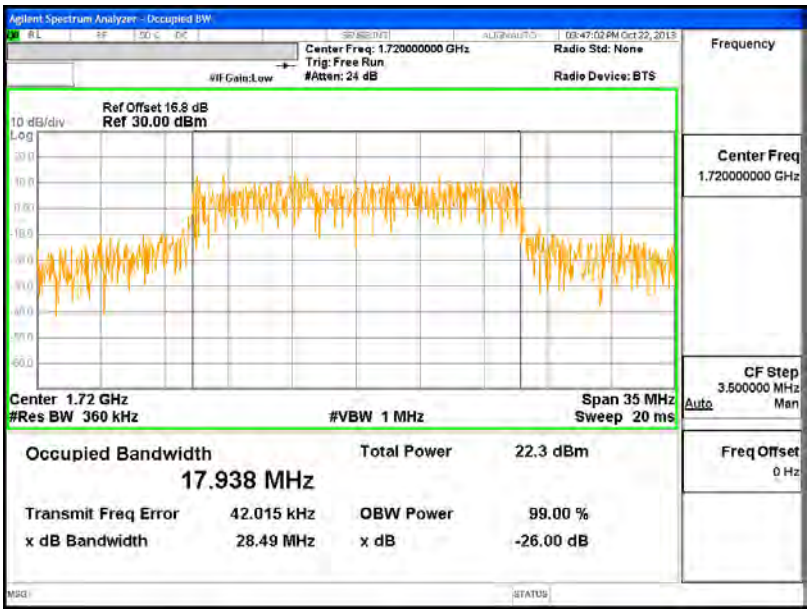
MID CH, RB75_0

HI CH, RB75_0

Band 4 (20MHz Bandwidth)

LTE QPSK

LOW CH, RB100_0



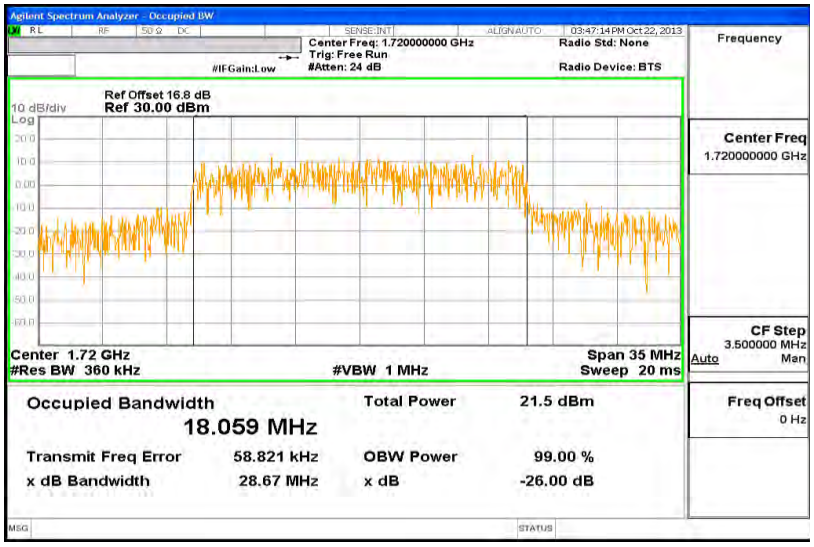
MID CH, RB100_0

HI CH, RB100_0

Band 4 (20MHz Bandwidth)

LTE 16QAM

LOW CH, RB100_0



MID CH, RB100_0

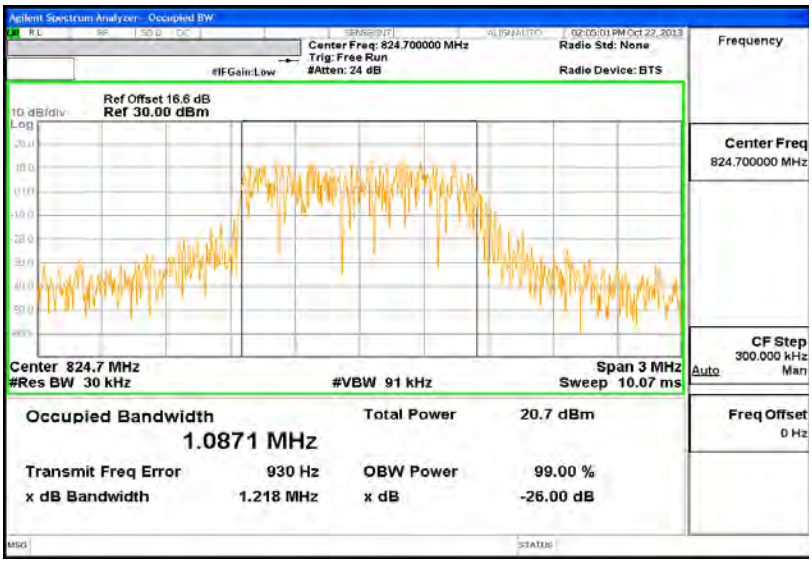
HI CH, RB100_0

8.1.3. LTE BAND 5

Band 5 (1.4 MHz Bandwidth)

LTE QPSK

LOW CH, RB6_0



MID CH, RB6_0

HI CH, RB6_0

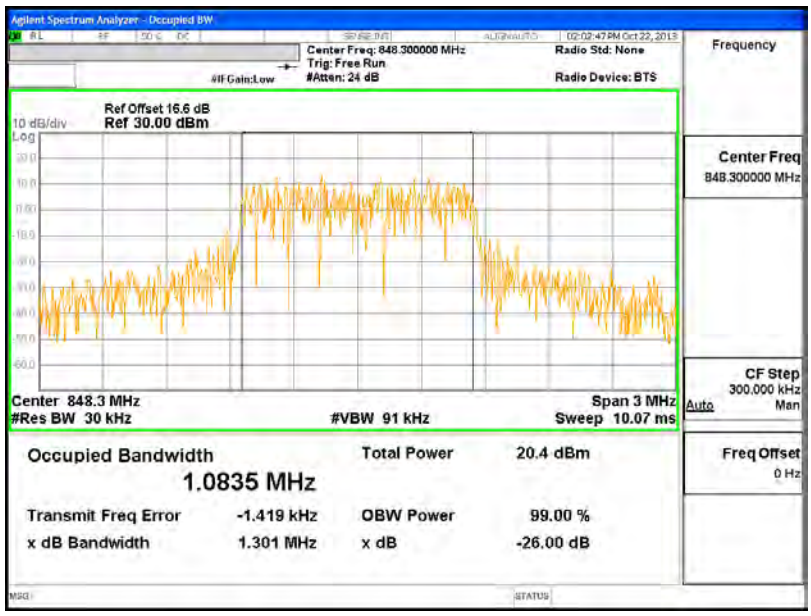
Band 5 (1.4 MHz Bandwidth)

LTE 16QAM

LOW CH, RB6_0

MID CH, RB6_0

HI CH, RB6_0



Band 4 (3MHz BANDWIDTH)

LTE QPSK

LOW CH, RB15_0

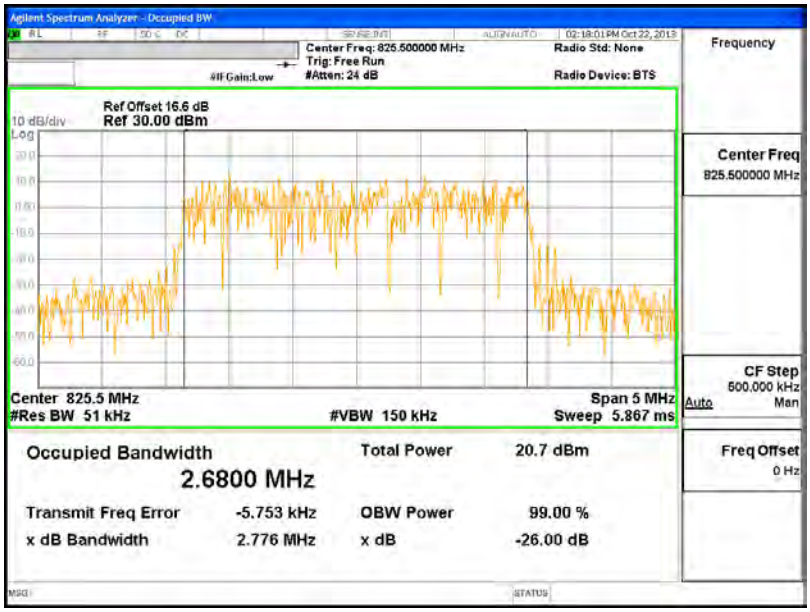
MID CH, RB15_0

HI CH, RB15_0

Band 5 (3MHz BANDWIDTH)

LTE 16QAM

LOW CH, RB15_0



MID CH, RB15_0

HI CH, RB15_0

Band 5 (5MHz BANDWIDTH)

LTE QPSK

LOW CH, RB25_0

MID CH, RB25_0

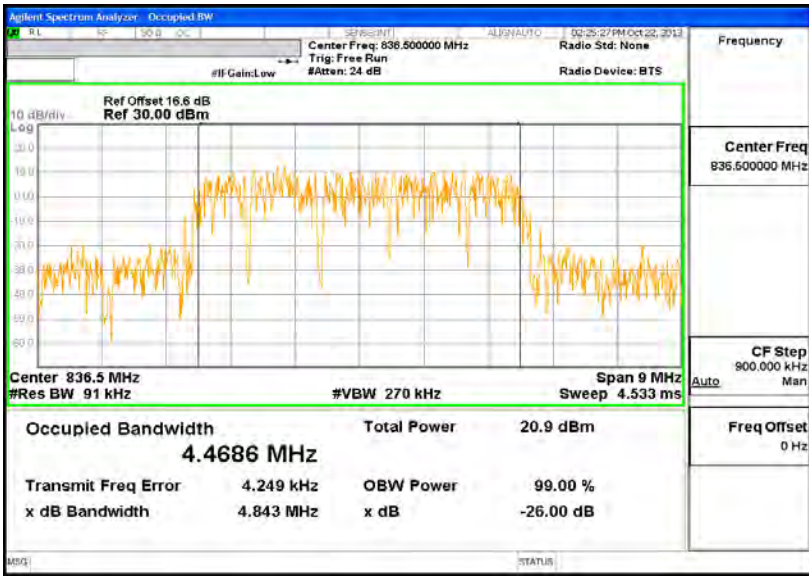
HI CH, RB25_0

Band 5 (5MHz BANDWIDTH)

LTE 16QAM

LOW CH, RB25_0

MID CH, RB25_0



HI CH, RB25_0

Band 5 (10MHz BANDWIDTH)

LTE QPSK

LOW CH, RB50_0

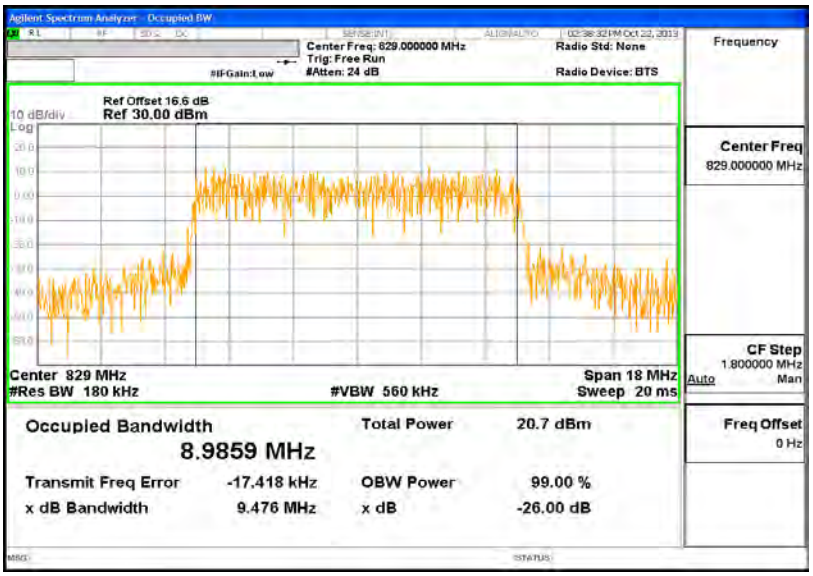
MID CH, RB50_0

HI CH, RB50_0

Band 5 (10MHz BANDWIDTH)

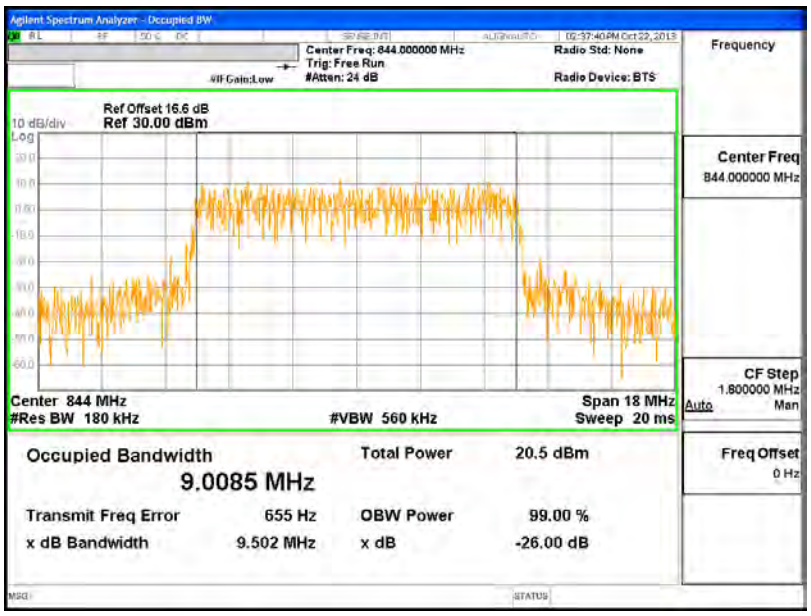
LTE 16QAM

LOW CH, RB50_0



MID CH, RB50_0

HI CH, RB50_0



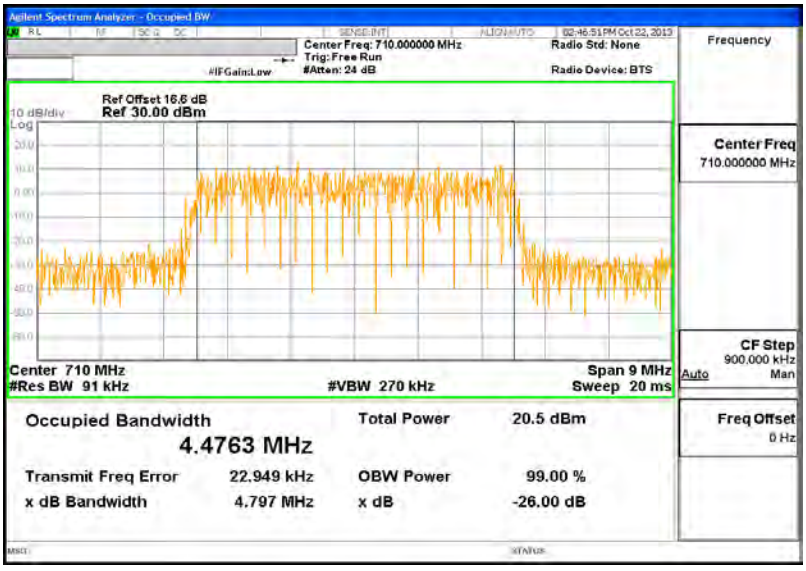
8.1.4. LTE BAND 17

Band 17 (5MHz BANDWIDTH)

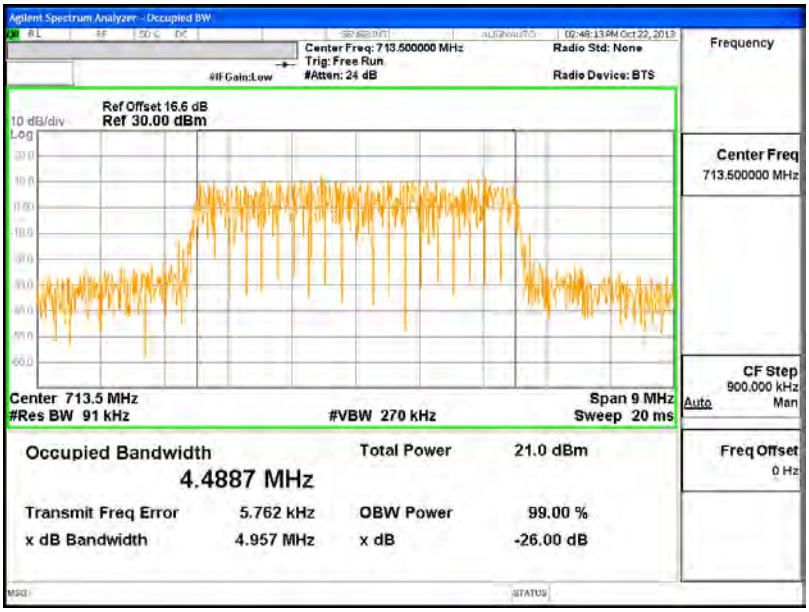
LTE QPSK

LOW CH, RB25_0

MID CH, RB25_0



HI CH, RB25_0



Band 17 (5MHz BANDWIDTH)

LTE 16QAM

LOW CH, RB25_0

MID CH, RB25_0

HI CH, RB25_0

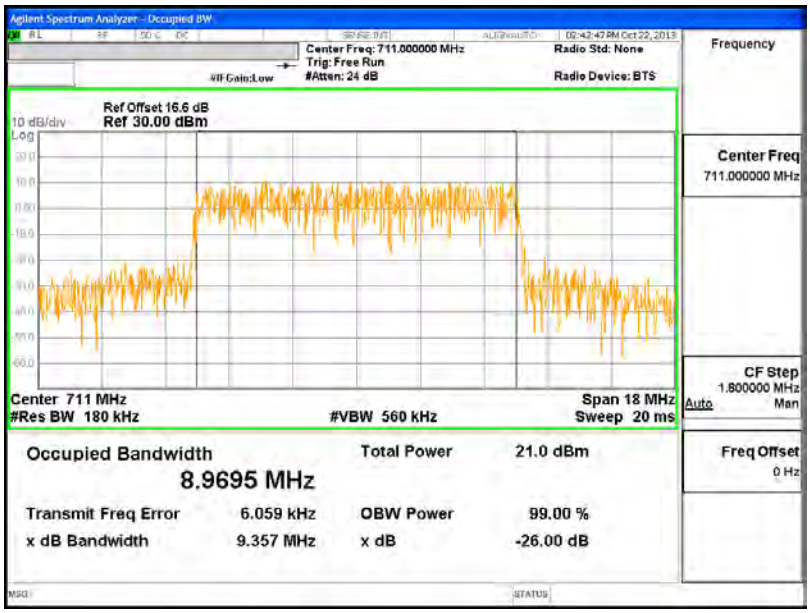
Band 17 (10MHz BANDWIDTH)

LTE QPSK

LOW CH, RB50_0

MID CH, RB50_0

HI CH, RB50_0



Band 17 (10MHz BANDWIDTH)

LTE 16QAM

LOW CH, RB50_0

MID CH, RB50_0

HI CH, RB50_0

8.2. BANDEDGE AND EMISSION MASK

RULE PART(S)

FCC: §2.1051, §22.901, §22.917, §24.238 and §27.53.

LIMITS

FCC: §22.359, §24.238, §27.53
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: §27.53
(c) 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;
(1) On any frequency outside the 746-758 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;
(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)(1) and (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)(3) and (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.

(m)(4) For mobile digital stations, the attenuation factor shall be not less than 43 + 10 log (P) dB at the channel edge and 55 + 10 log (P) dB at 5.5 megahertz from the channel edges. (Channel edges are defined under §27.5 (i) Frequency assignment for the BRS/EBS band)
(m)(6) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed

TEST PROCEDURE

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

For each bandedge measurement:
Set the spectrum analyzer span to include the block edge frequency (704, 716, 824, 849, 1710 and1755, 1850 and 1910MHz)
Set a marker to point the corresponding bandedge frequency in each test case.
Set display line at -13 dBm
Set resolution bandwidth to at least 1% of emission bandwidth.

MODES TESTED

- Band 2
- Band 4
- Band 5
- Band 17

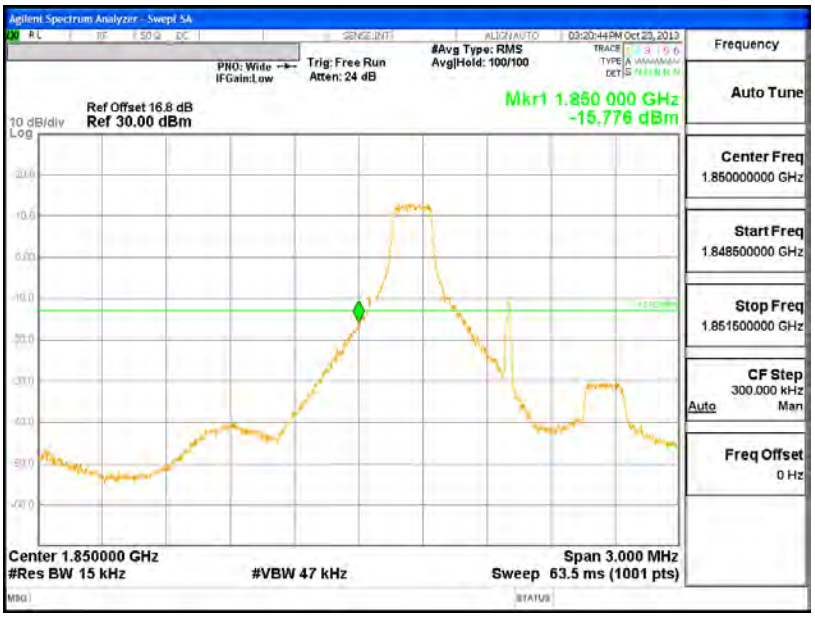
RESULTS

8.2.1. LTE BAND 2

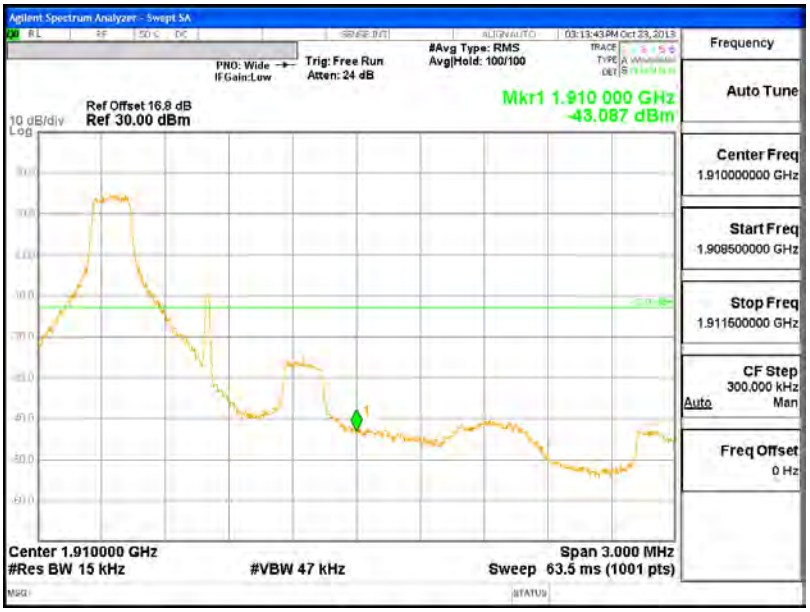
Band 2 (1.4 MHz BANDWIDTH)

LTE QPSK

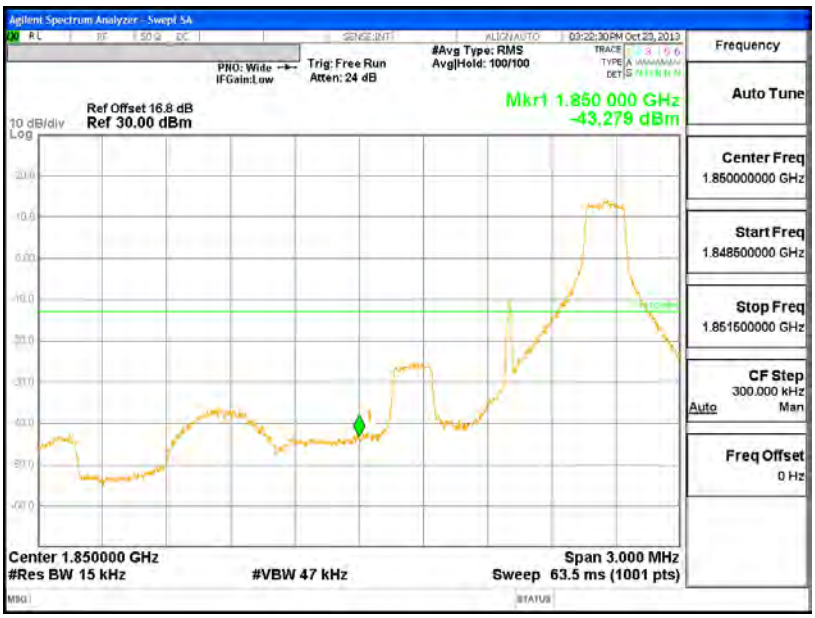
LOW CH, RB1_0



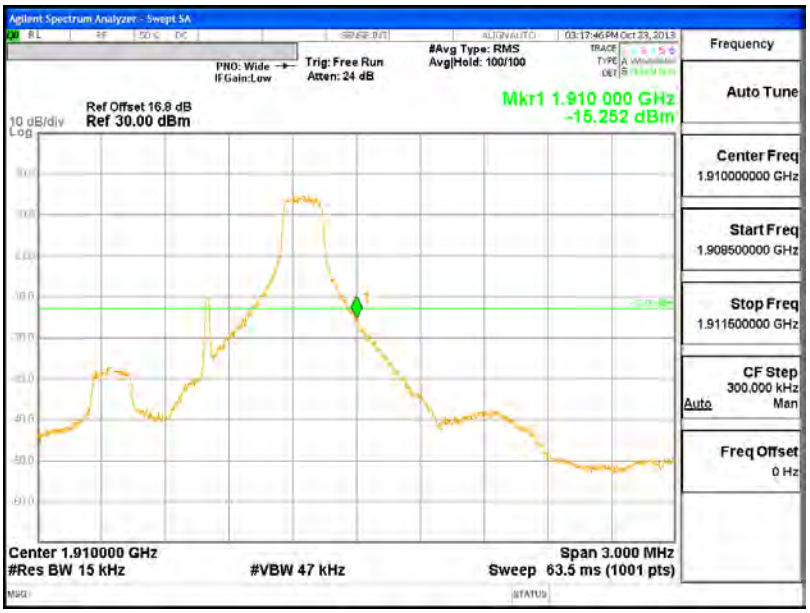
HIGH CH, RB1-0



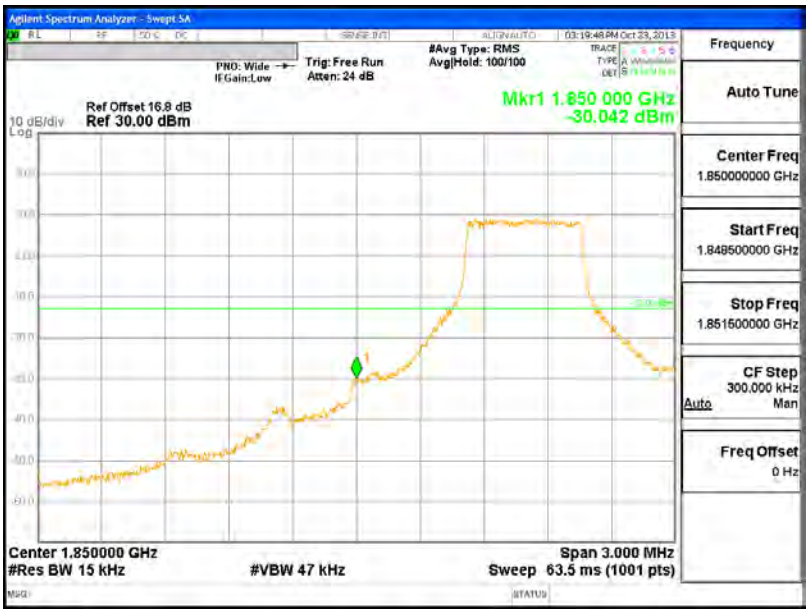
LOW CH, RB1-5



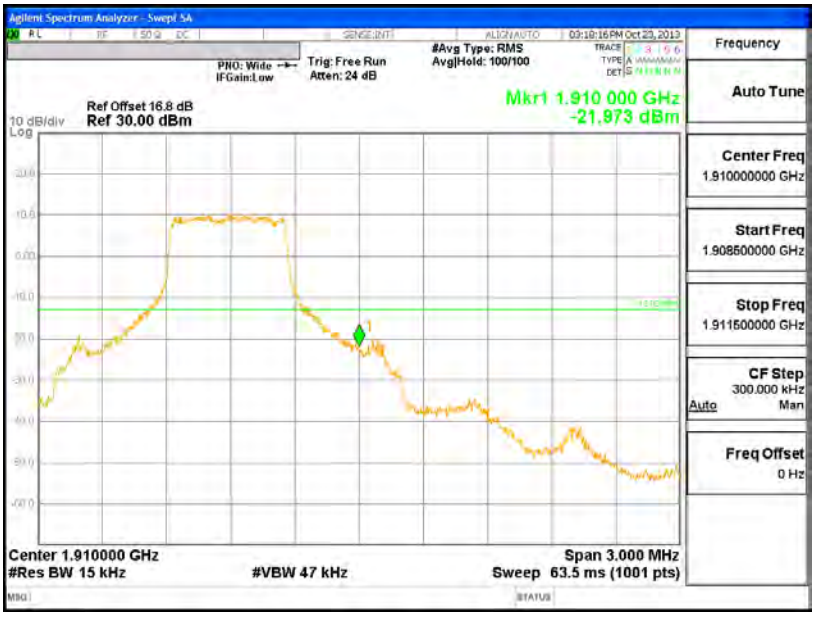
HIGH CH, RB1-5



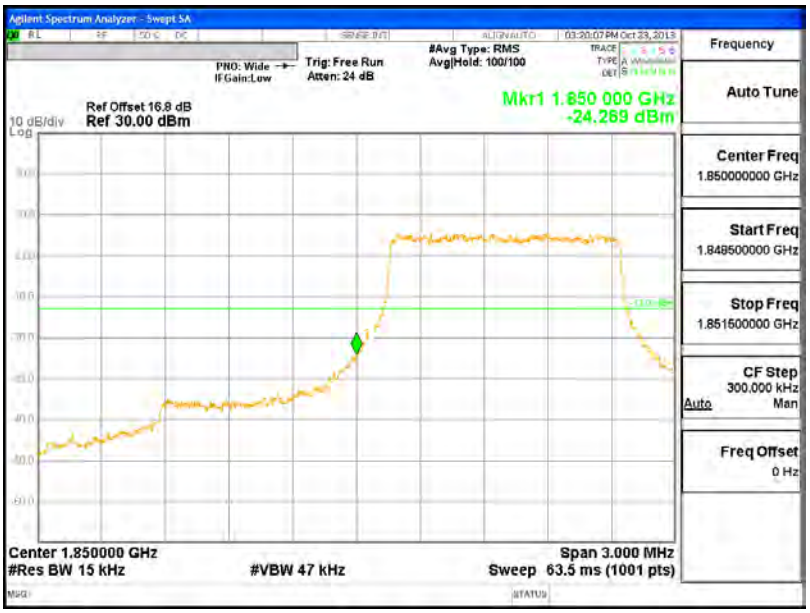
LOW CH, RB3-2



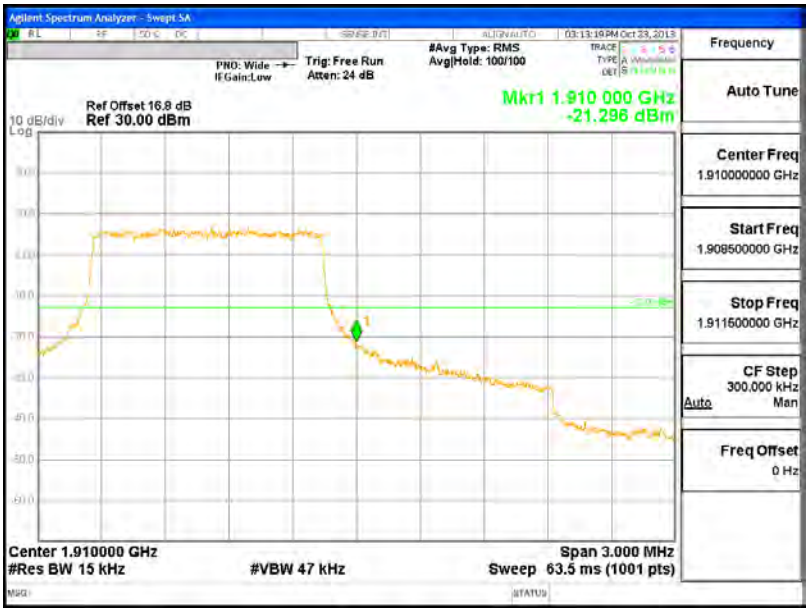
HIGH CH, RB3-2



LOW CH, RB6-0



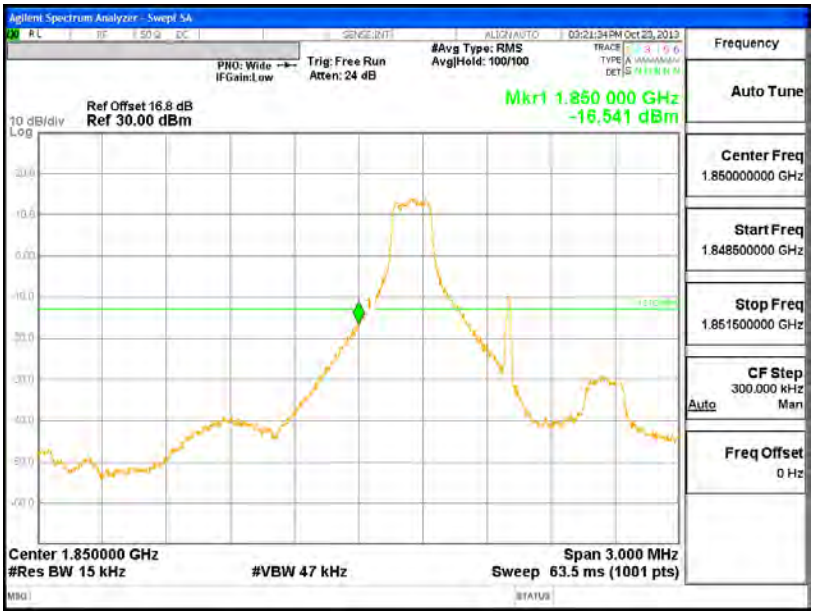
HIGH CH, RB6-0



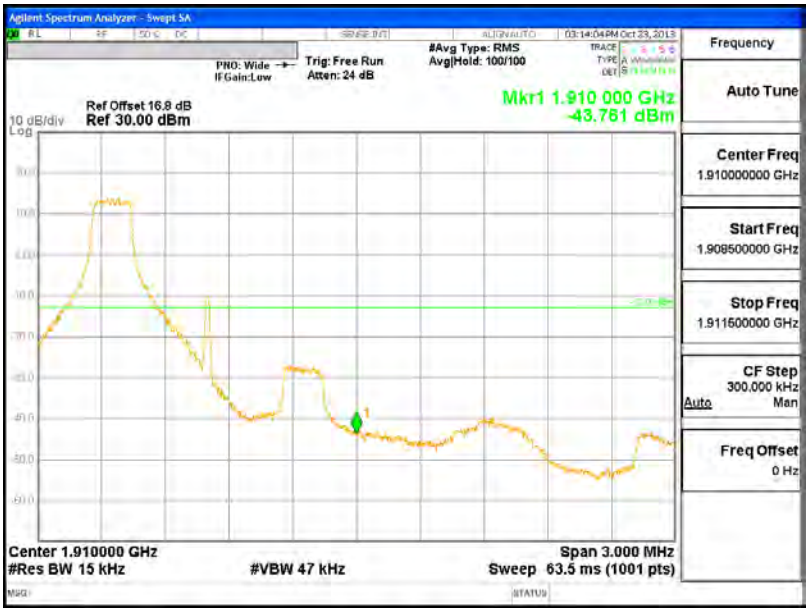
Band 2 (1.4 MHz BANDWIDTH)

LTE 16QAM

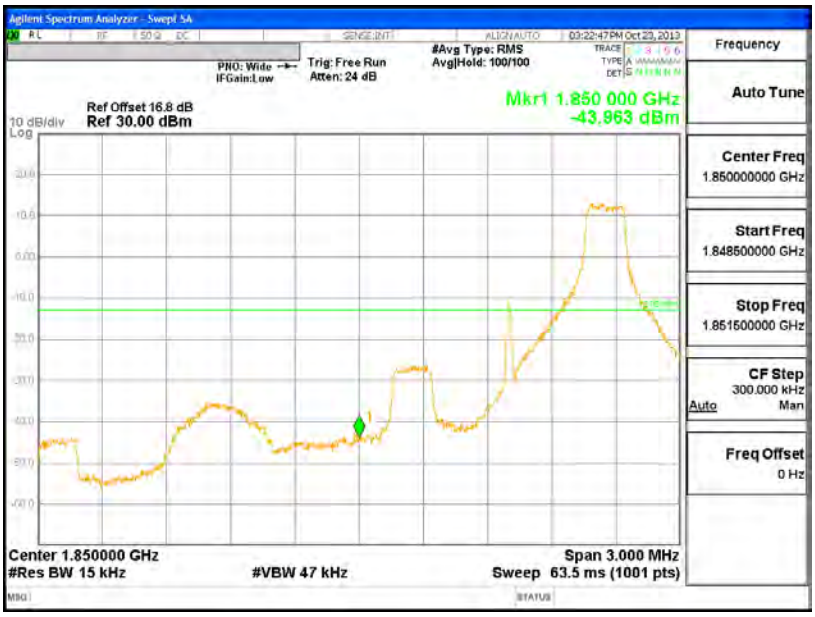
LOW CH, RB1_0



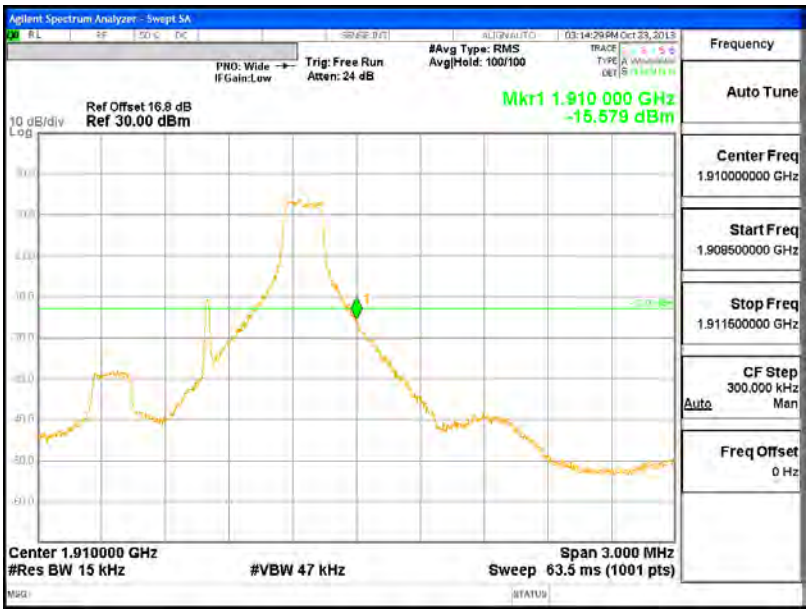
HIGH CH, RB1-0



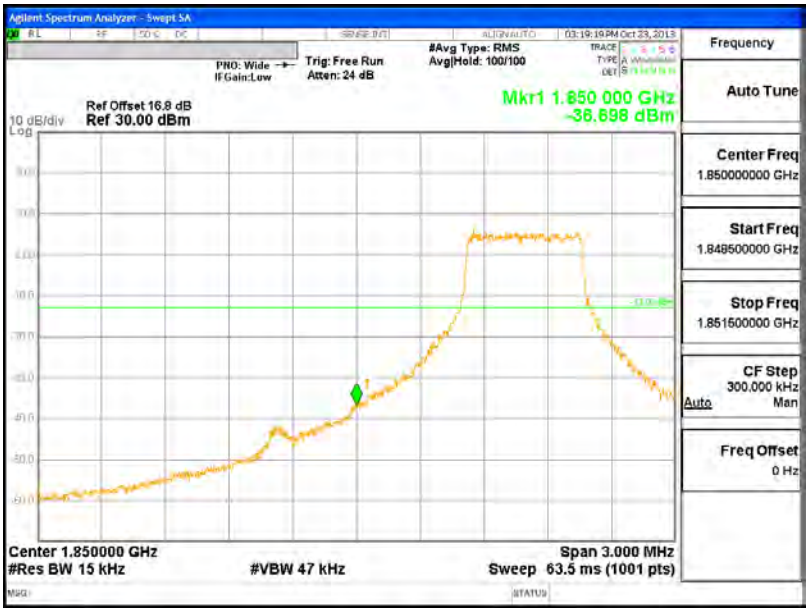
LOW CH, RB1-5



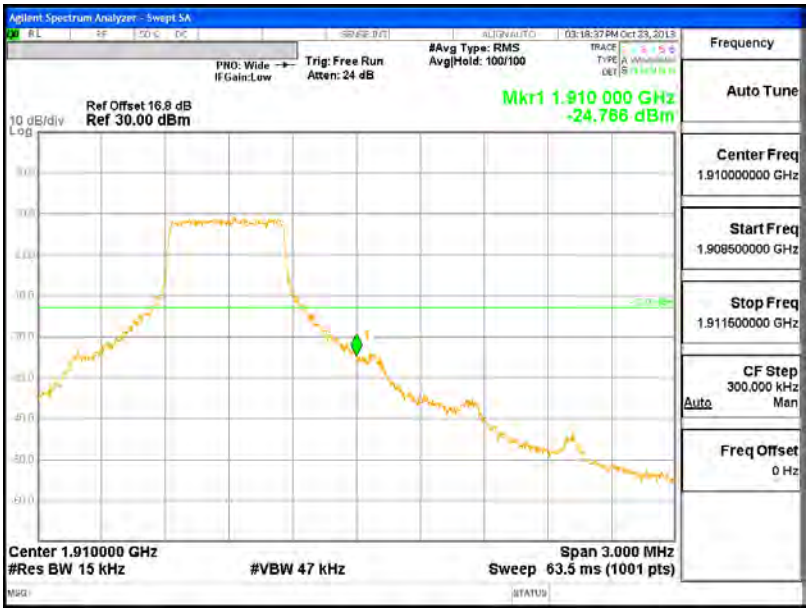
HIGH CH, RB1-5



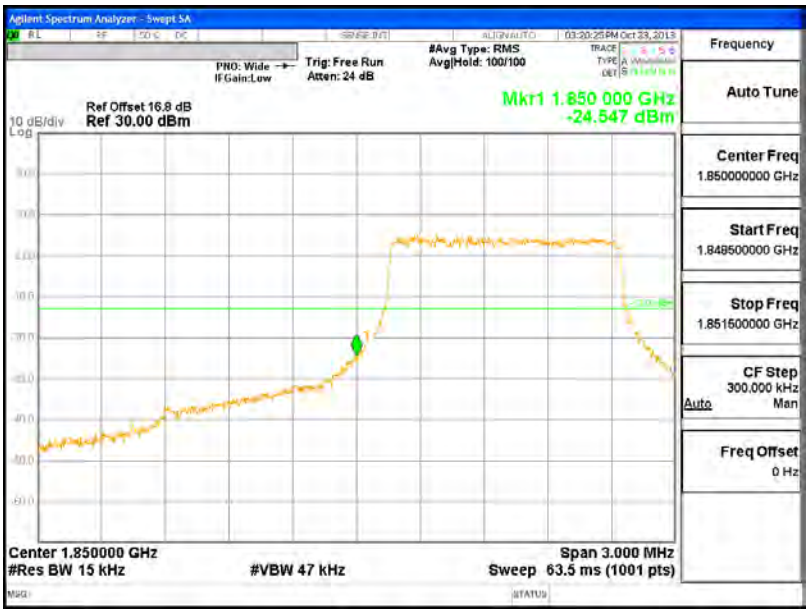
LOW CH, RB3-2



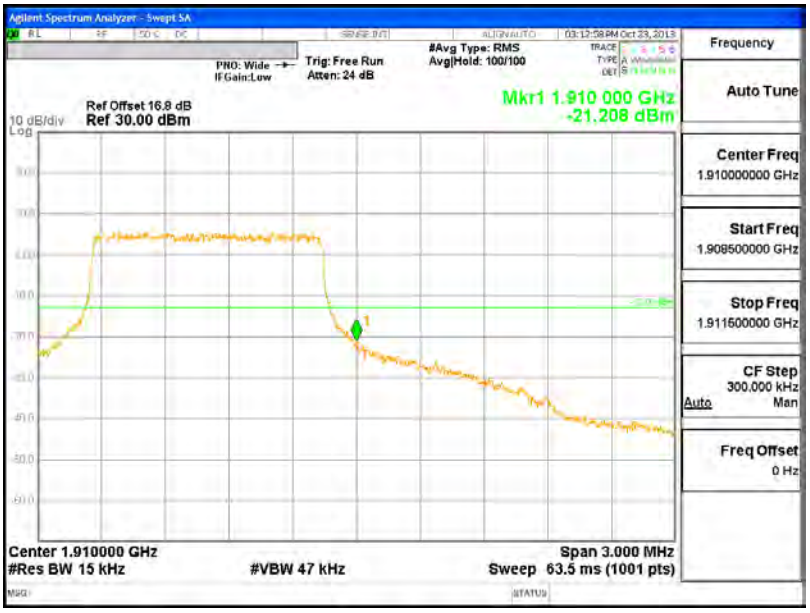
HIGH CH, RB3-2



LOW CH, RB6-0

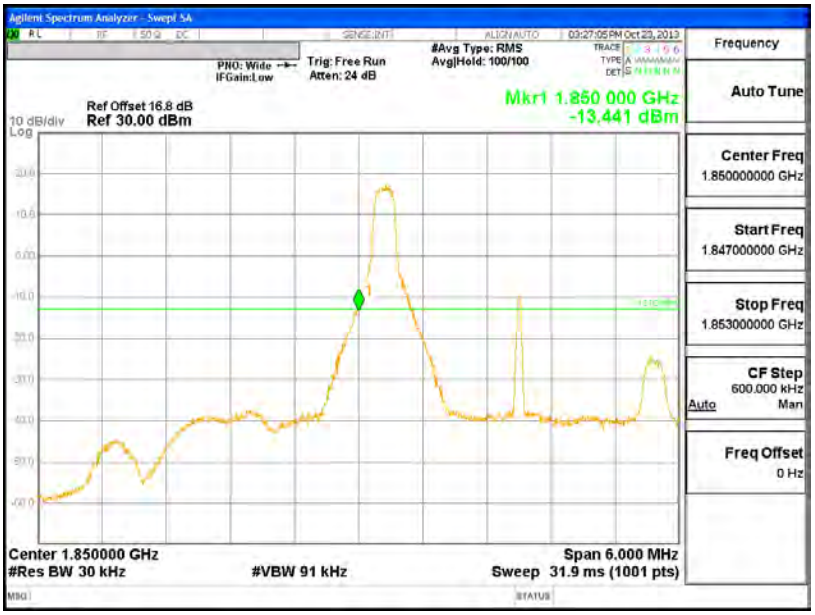


HIGH CH, RB6-0



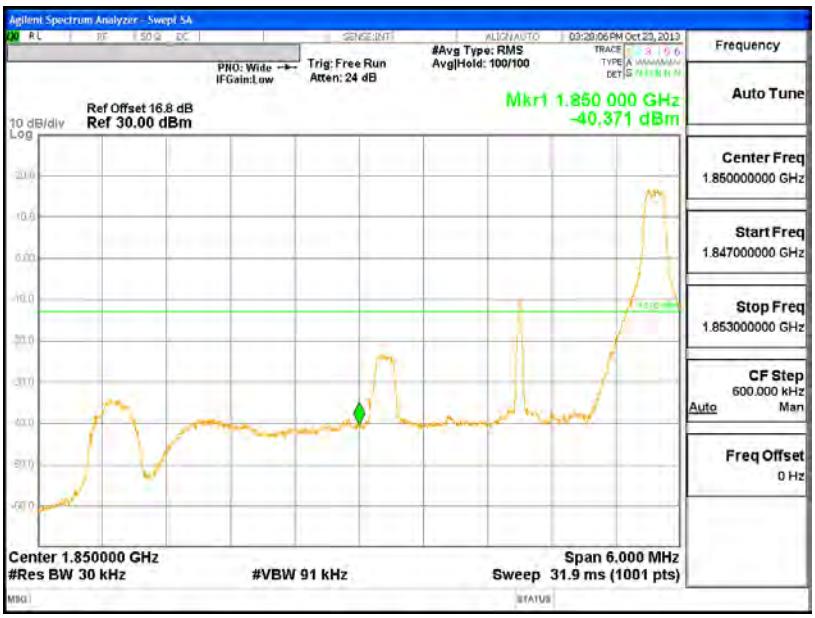
Band 2 (3MHz BANDWIDTH)
LTE QPSK10MHz

LOW CH, RB1_0

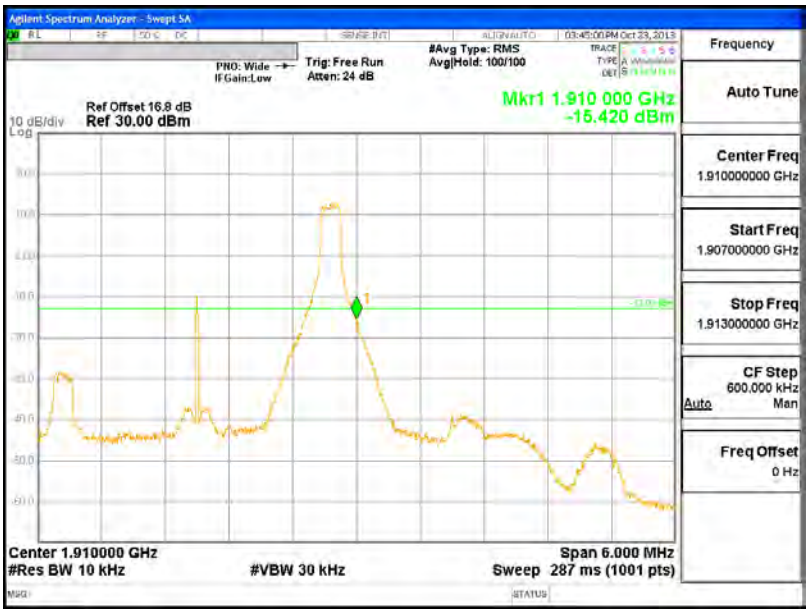


HIGH CH, RB1-0

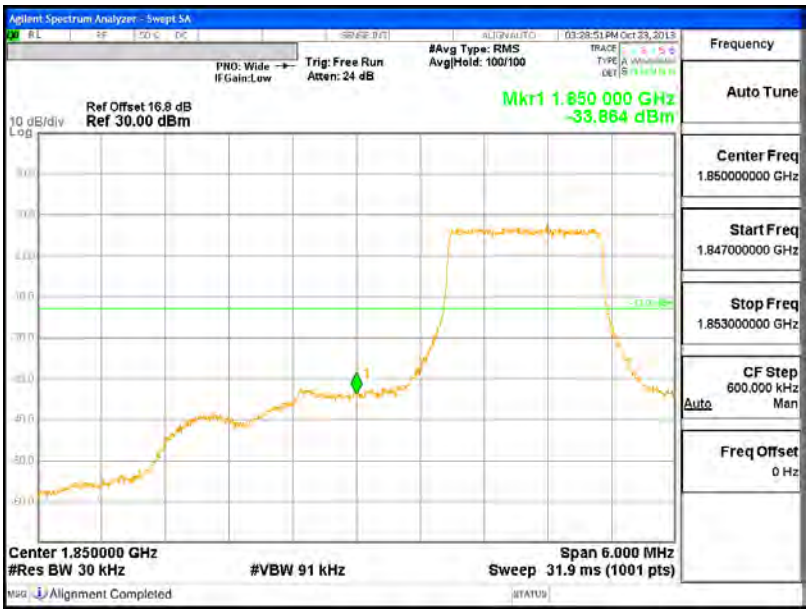
LOW CH, RB1-14



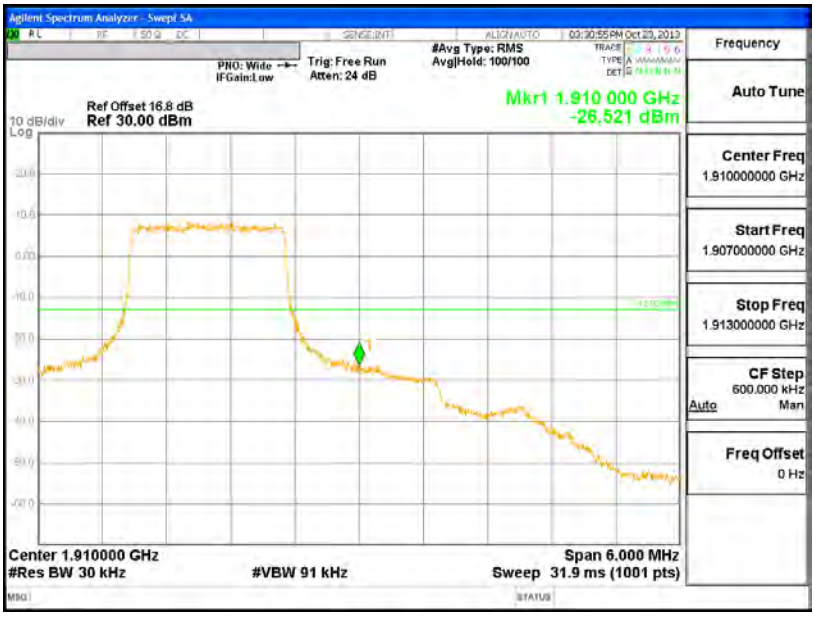
HIGH CH, RB1-14



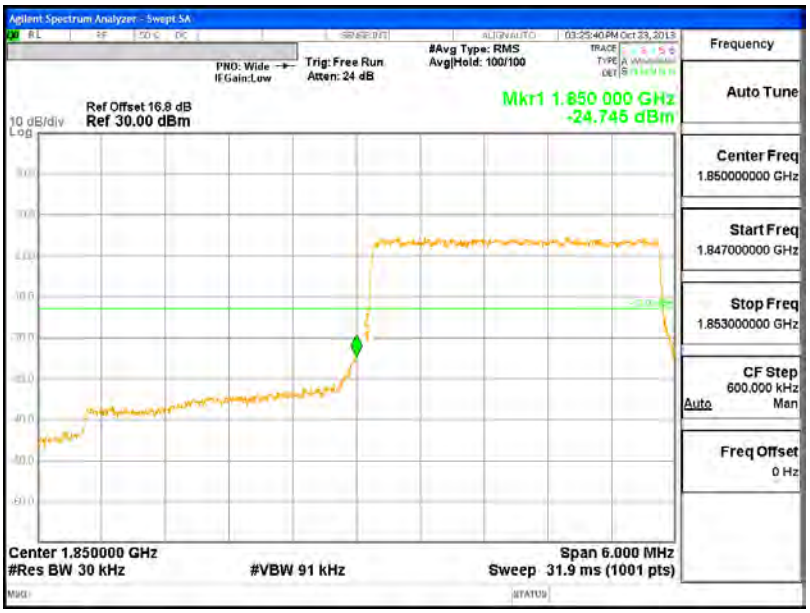
LOW CH, RB8-4



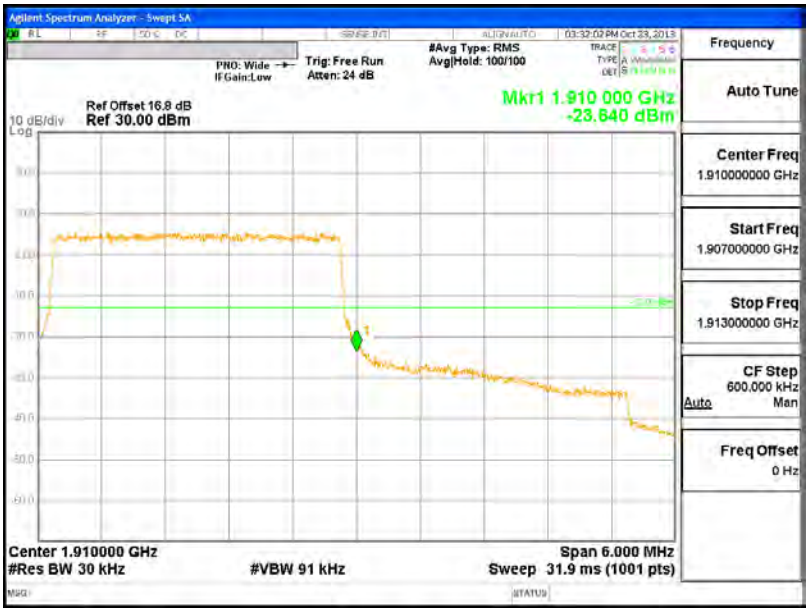
HIGH CH, RB8-4



LOW CH, RB15-0



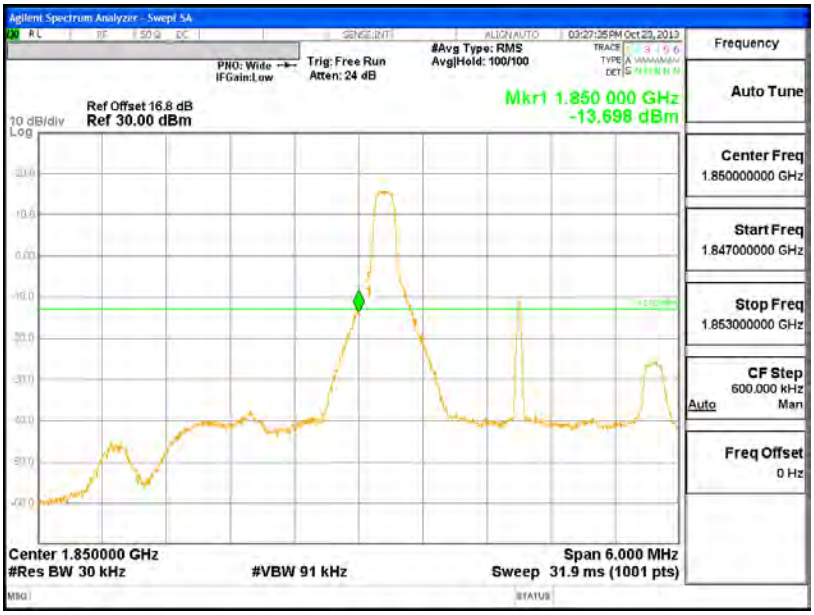
HIGH CH, RB15-0



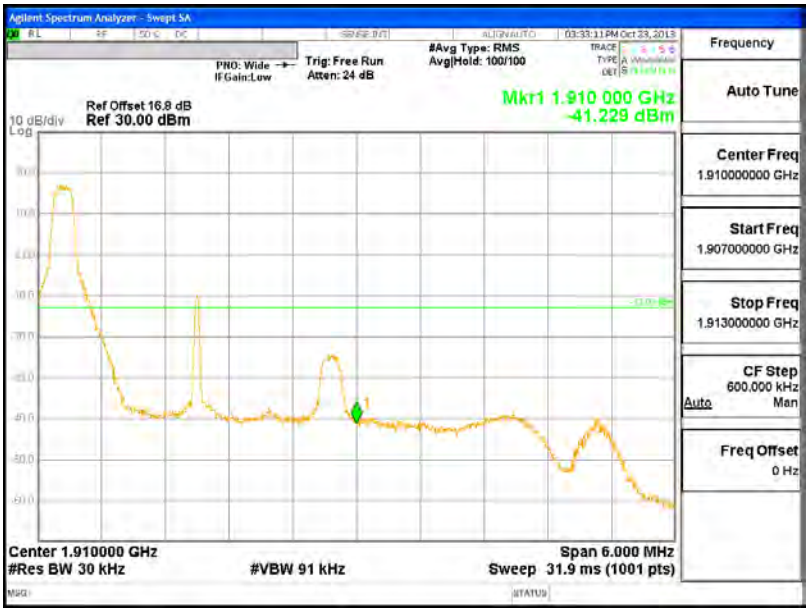
Band 2 (3MHz BANDWIDTH)

LTE 16QAM

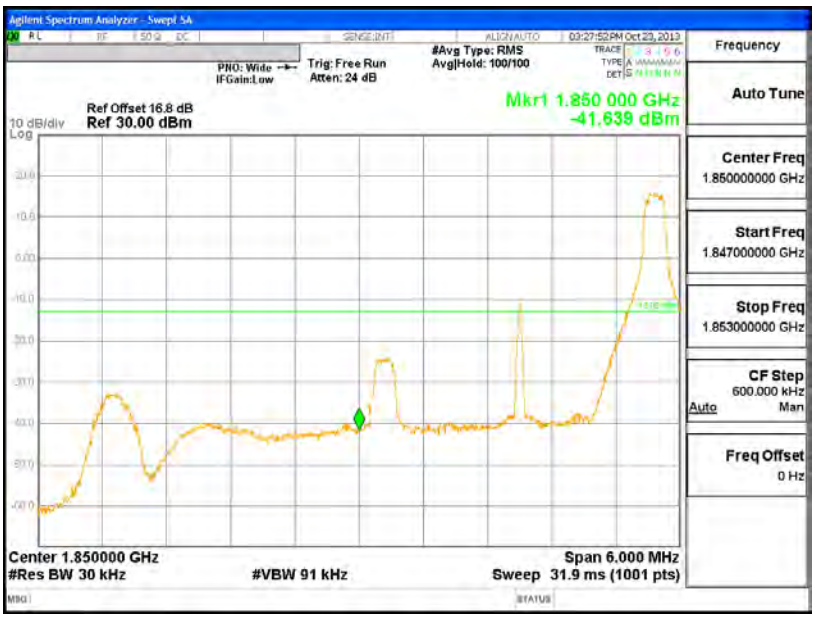
LOW CH, RB1_0



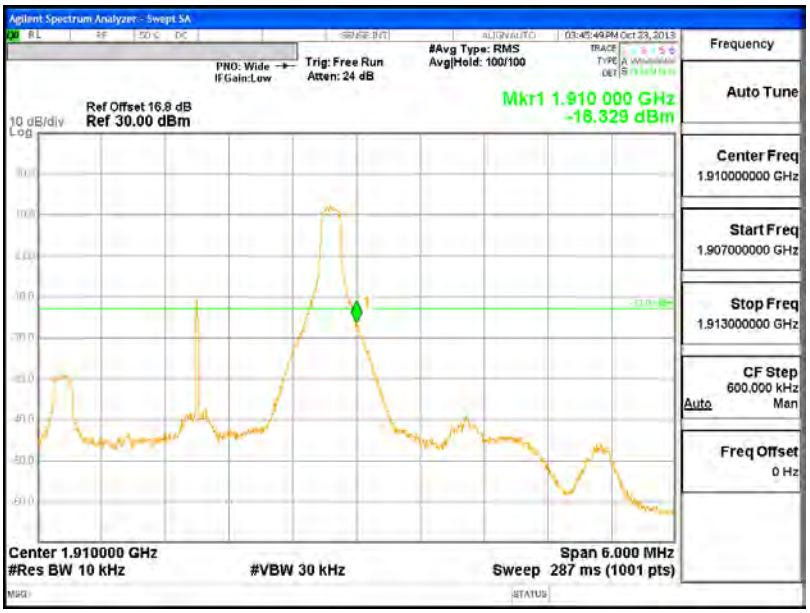
HIGH CH, RB1-0



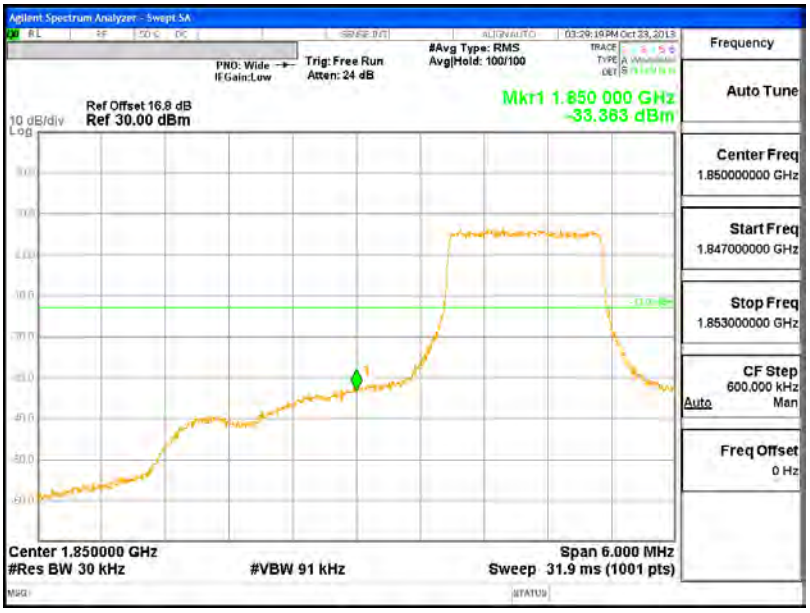
LOW CH, RB1-14



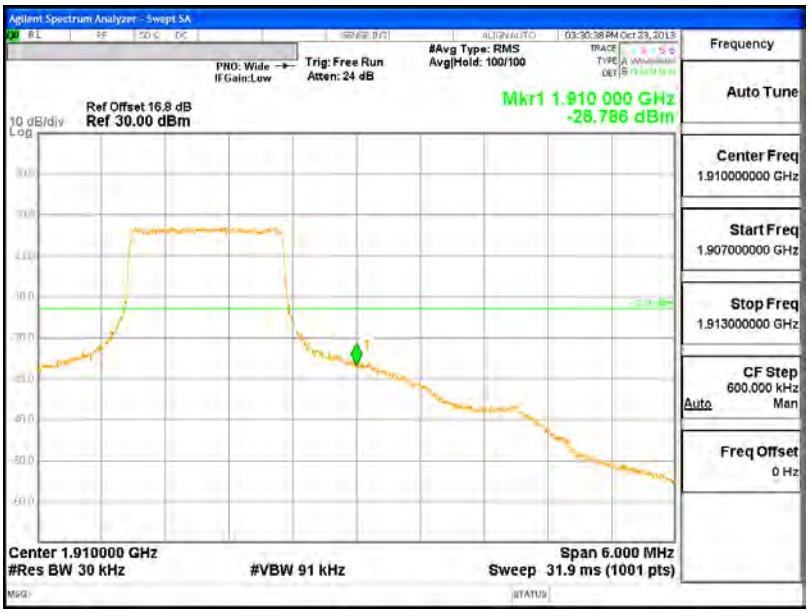
HIGH CH, RB1-14



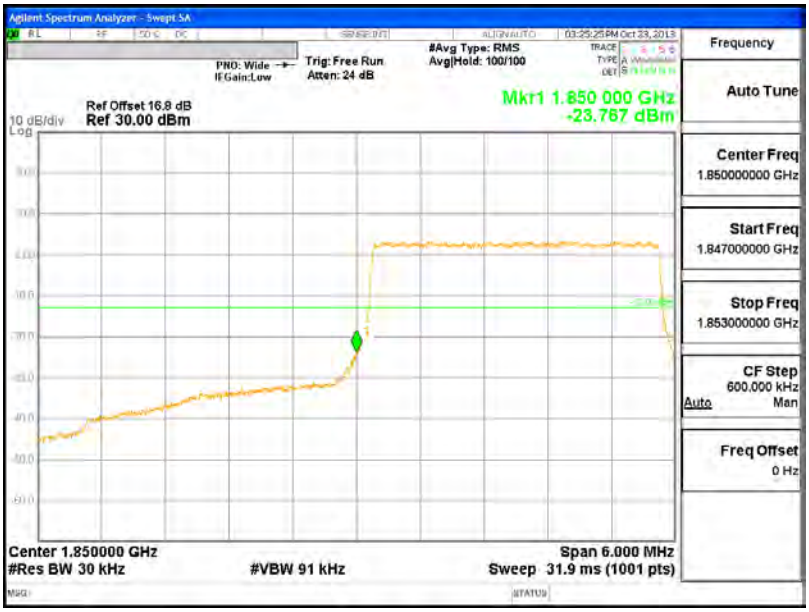
LOW CH, RB8-4



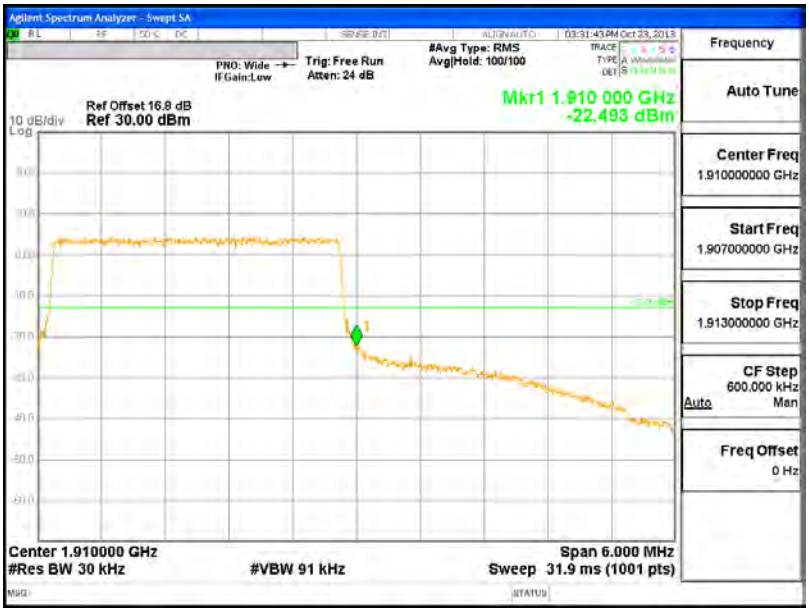
HIGH CH, RB8-4



LOW CH, RB15-0



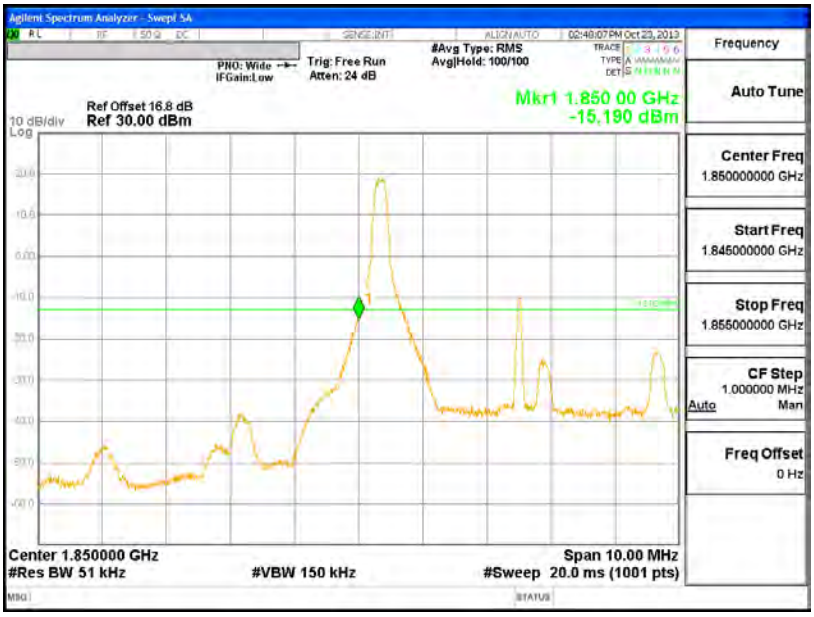
HIGH CH, RB15-0



Band 2 (5MHz BANDWIDTH)

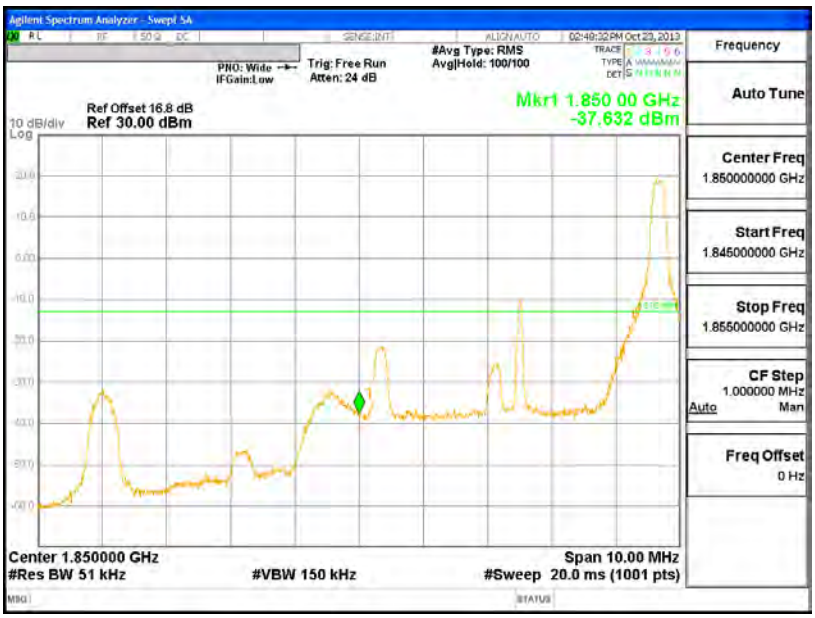
LTE QPSK

LOW CH, RB1_0

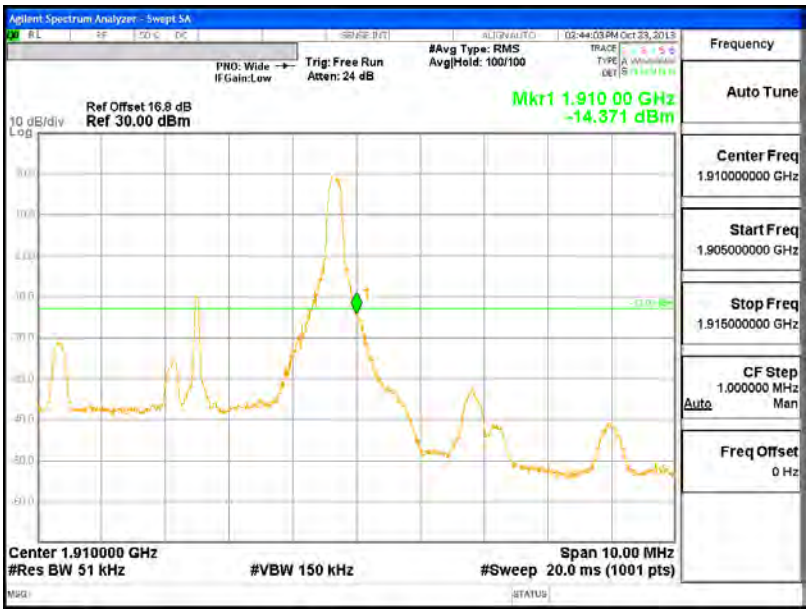


HIGH CH, RB1-0

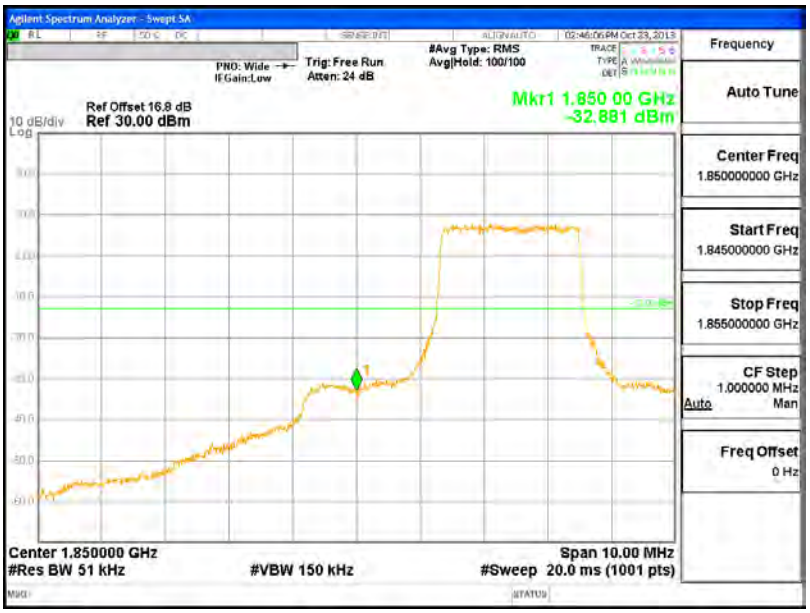
LOW CH, RB1-24



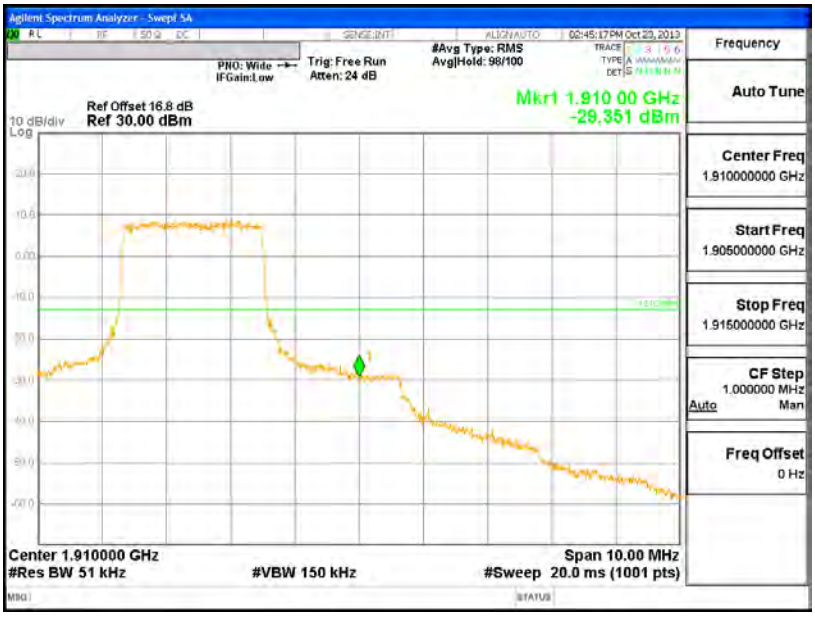
HIGH CH, RB1-24



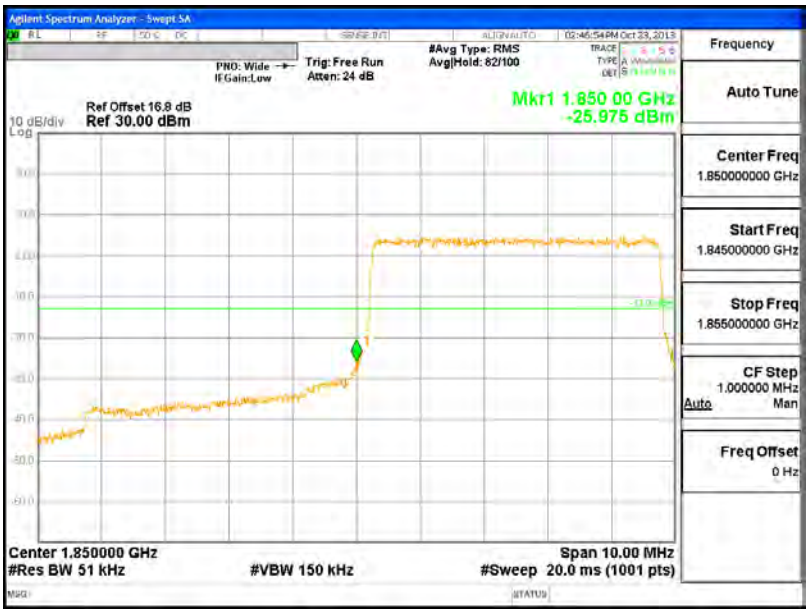
LOW CH, RB12-6



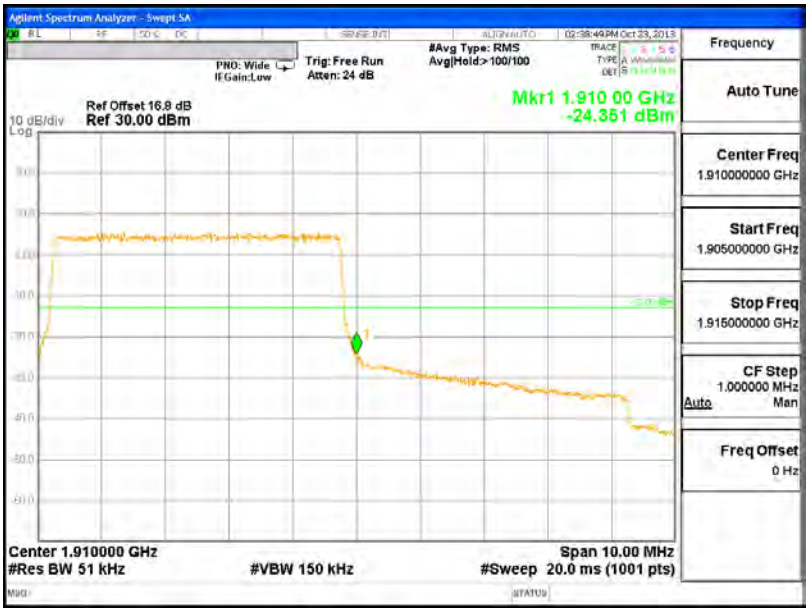
HIGH CH, RB12-6



LOW CH, RB25-0



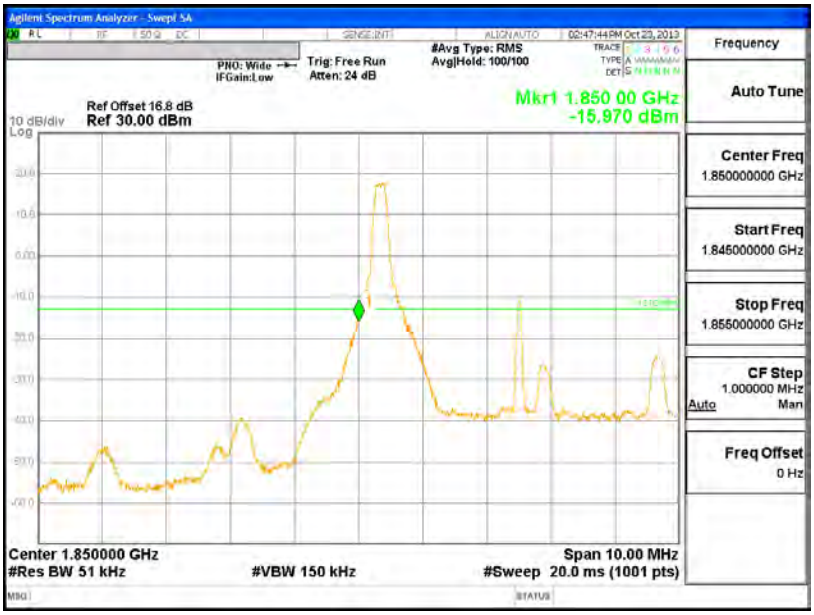
HIGH CH, RB25-0



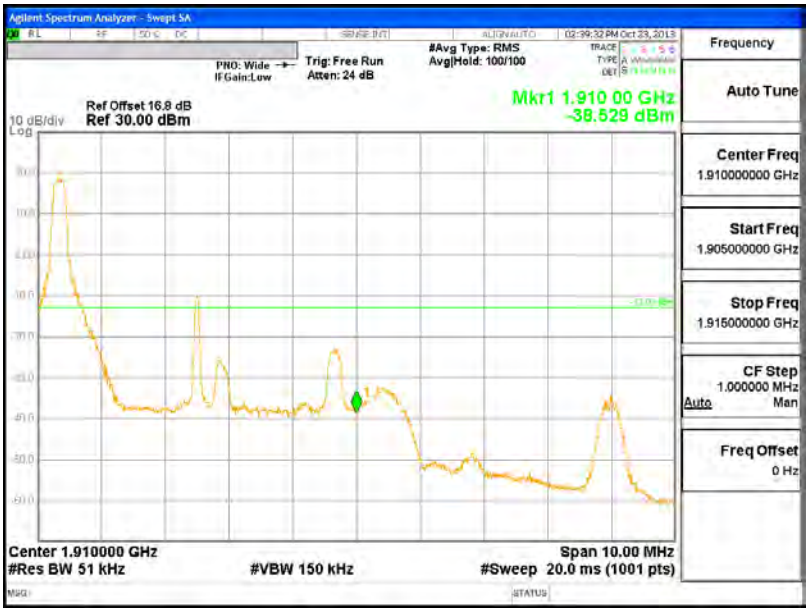
Band 2 (5MHz BANDWIDTH)

LTE 16QAM

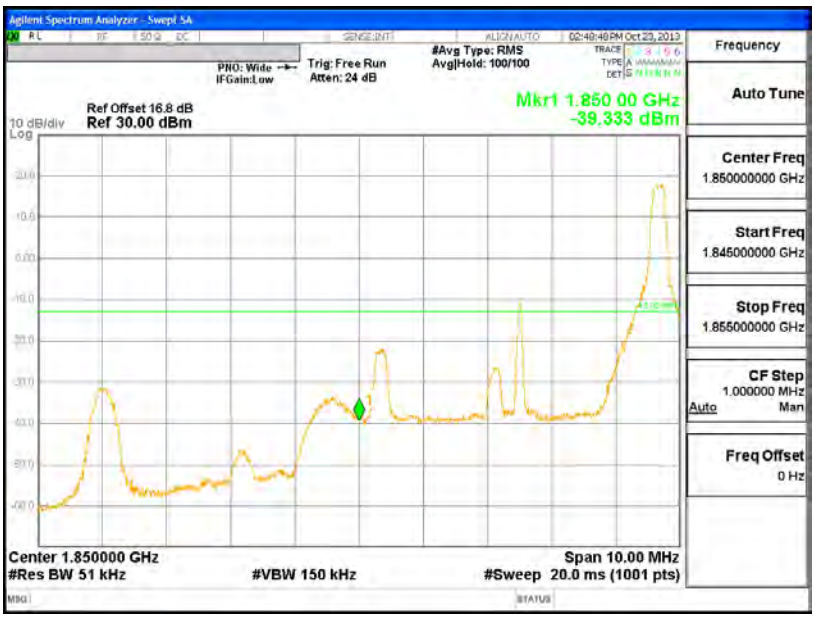
LOW CH, RB1_0



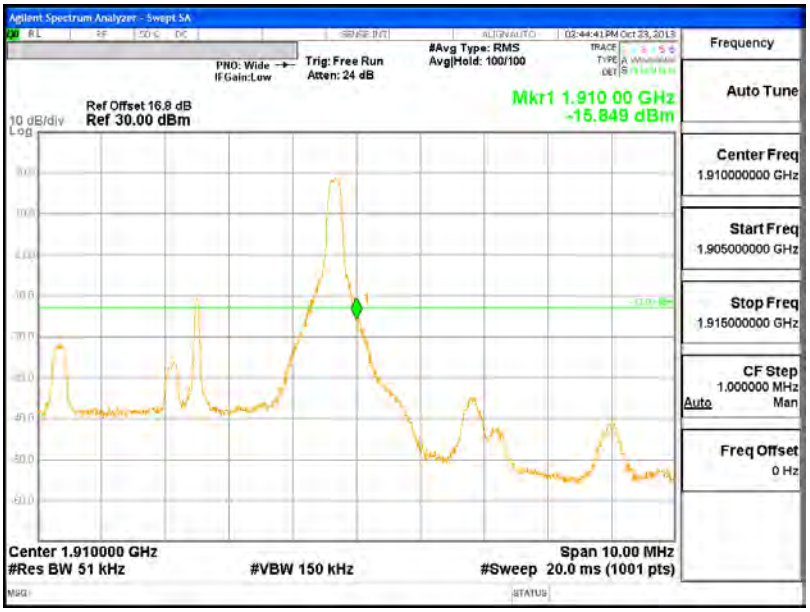
HIGH CH, RB1-0



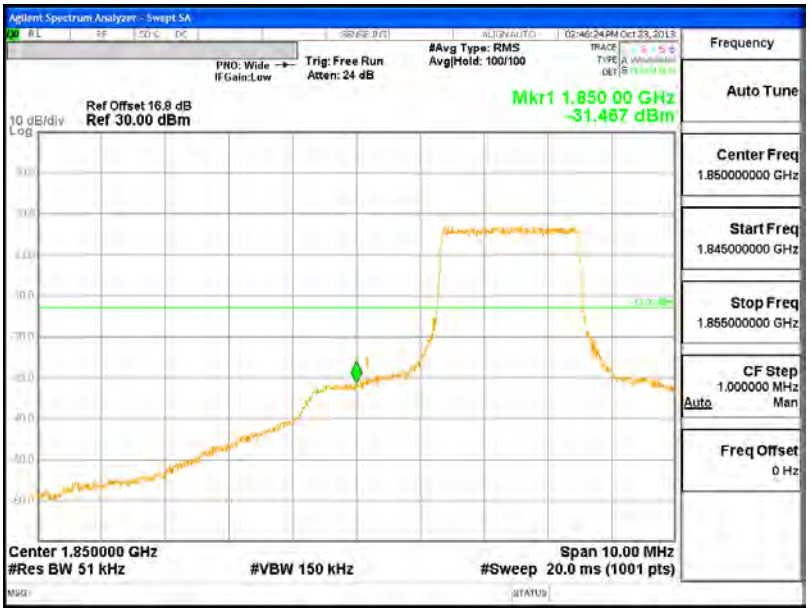
LOW CH, RB1-24



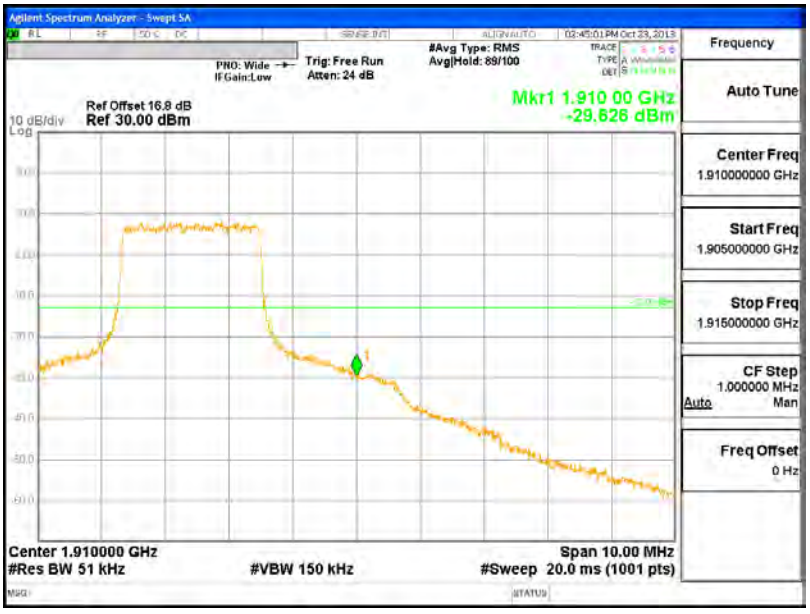
HIGH CH, RB1-24



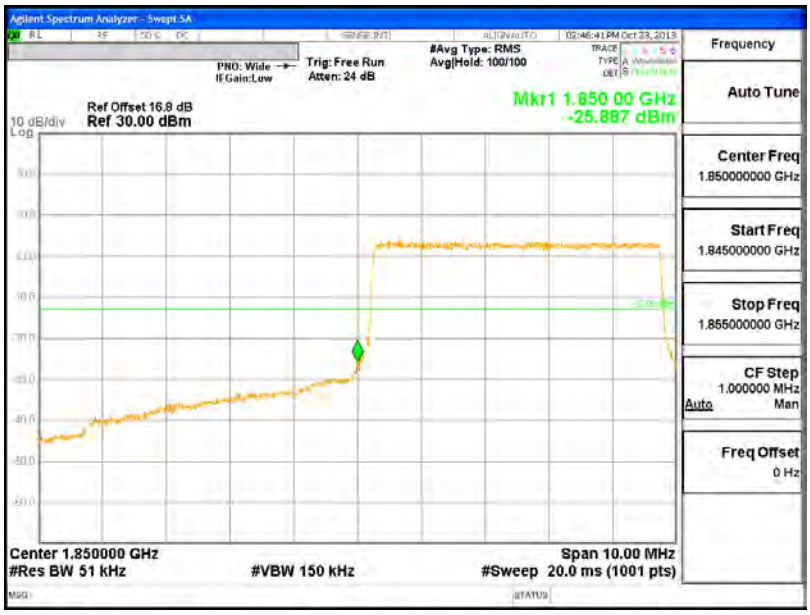
LOW CH, RB12-6



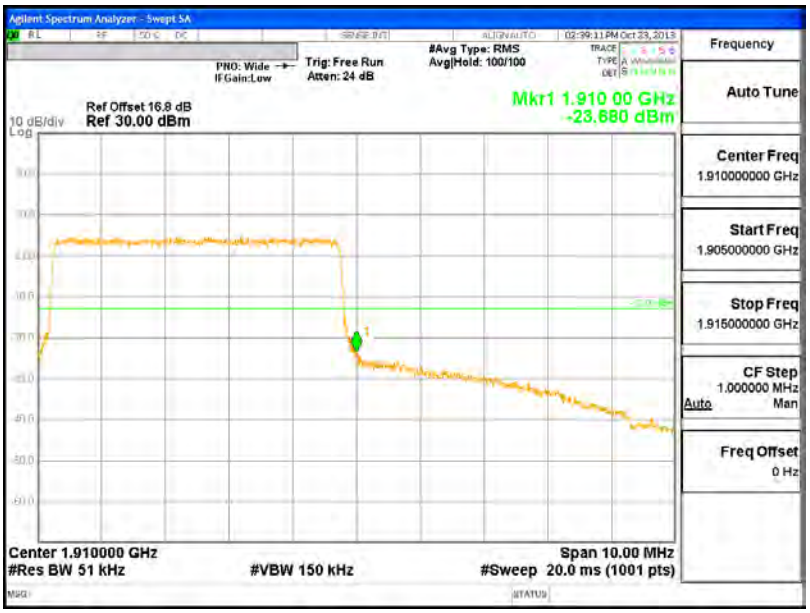
HIGH CH, RB12-6



LOW CH, RB25-0



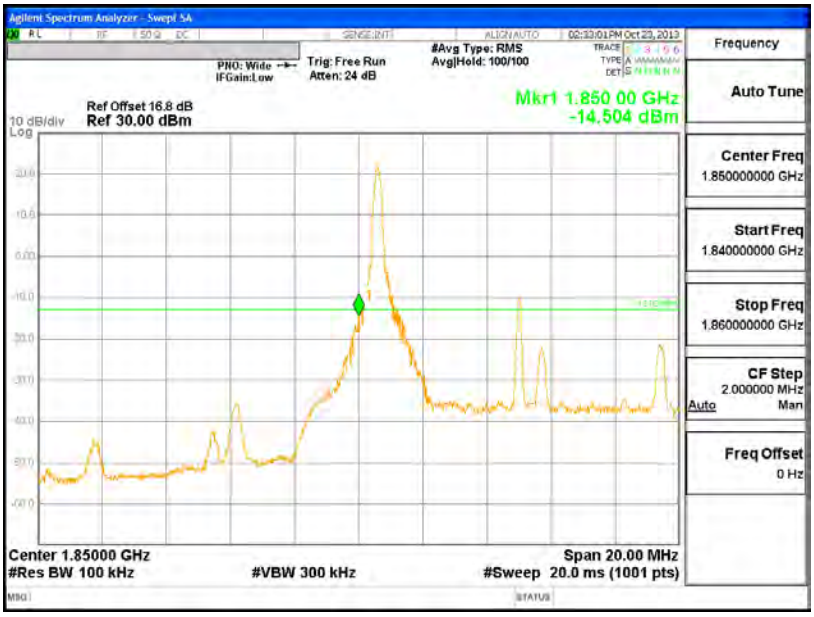
HIGH CH, RB25-0



Band 2 (10MHz BANDWIDTH)

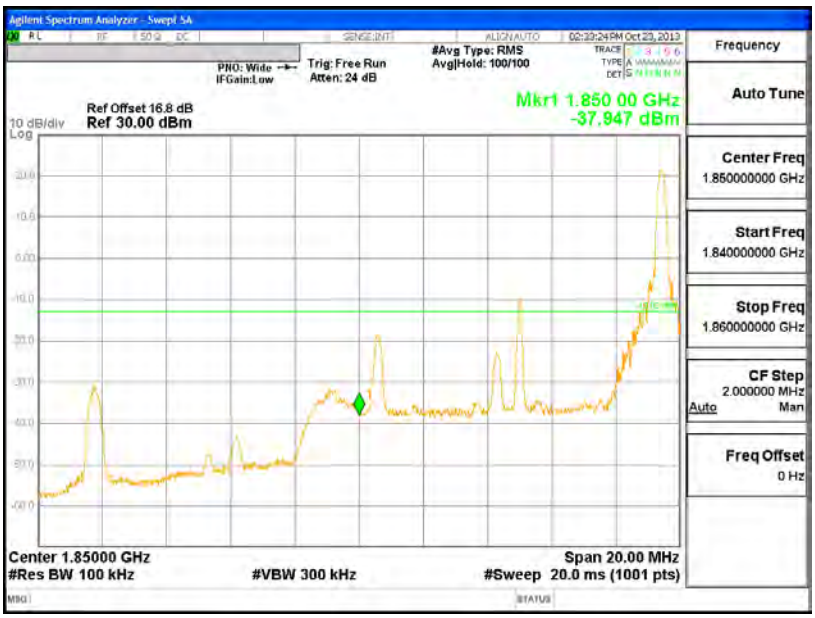
LTE QPSK

LOW CH, RB1_0

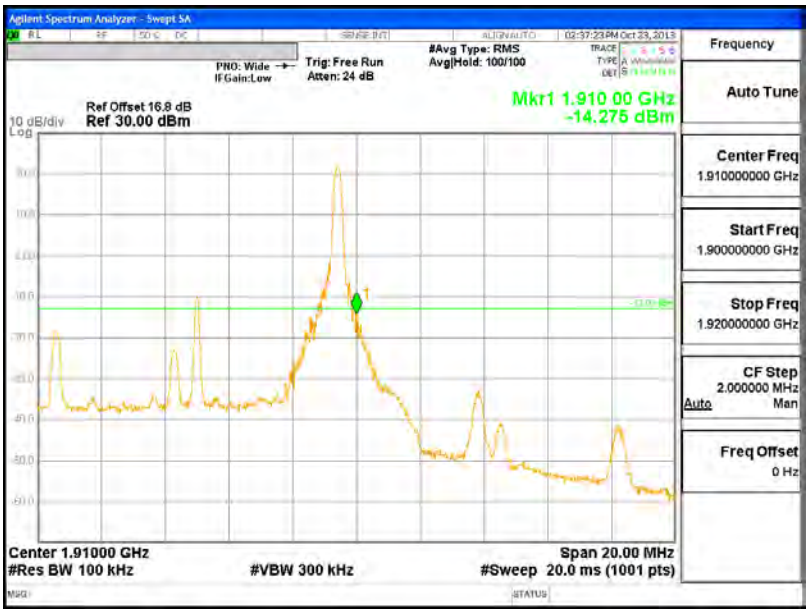


HIGH CH, RB1-0

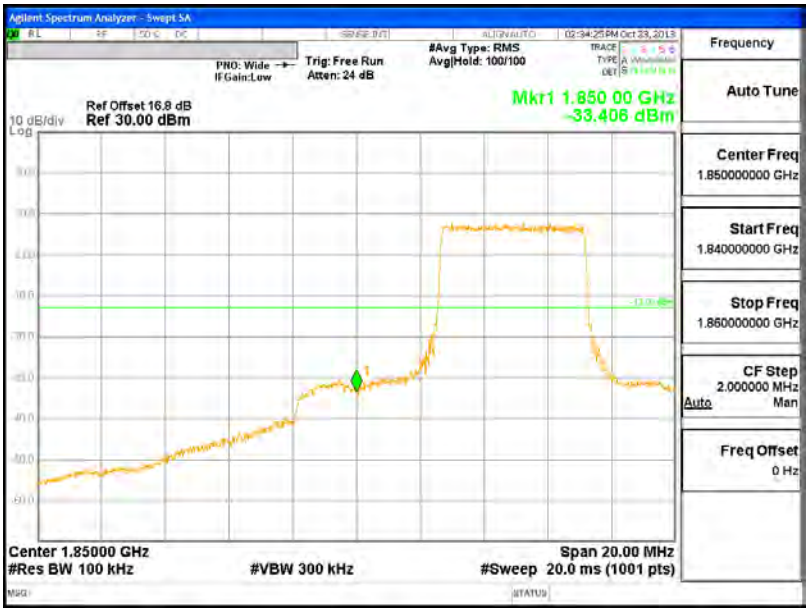
LOW CH, RB1-49



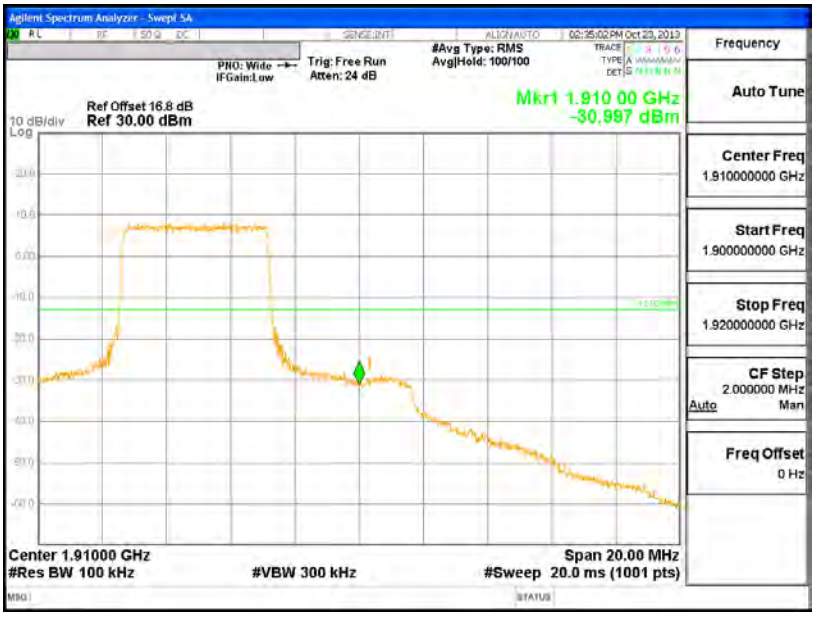
HIGH CH, RB1-49



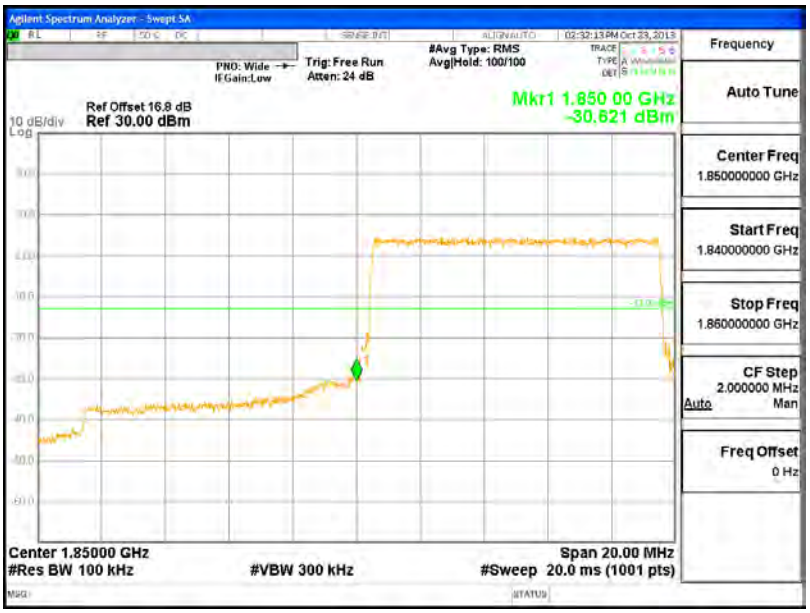
LOW CH, RB25-12



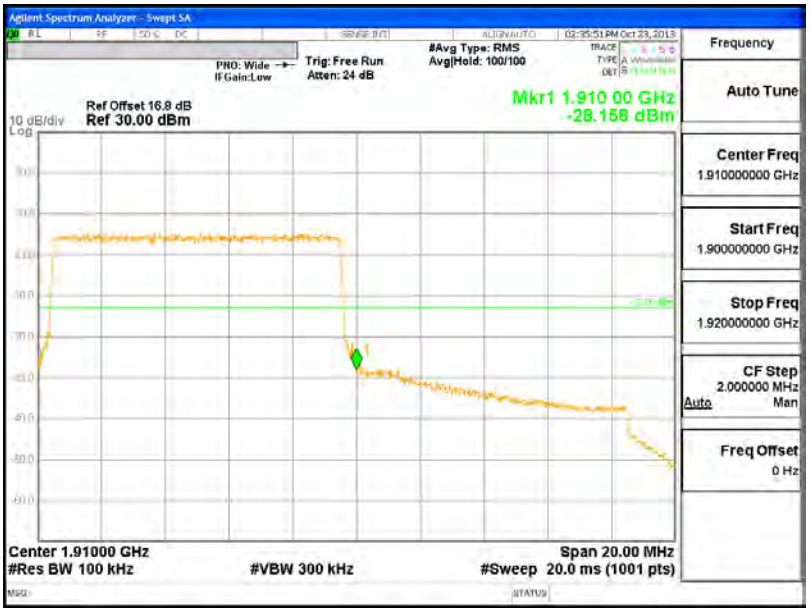
HIGH CH, RB25-12



LOW CH, RB50-0



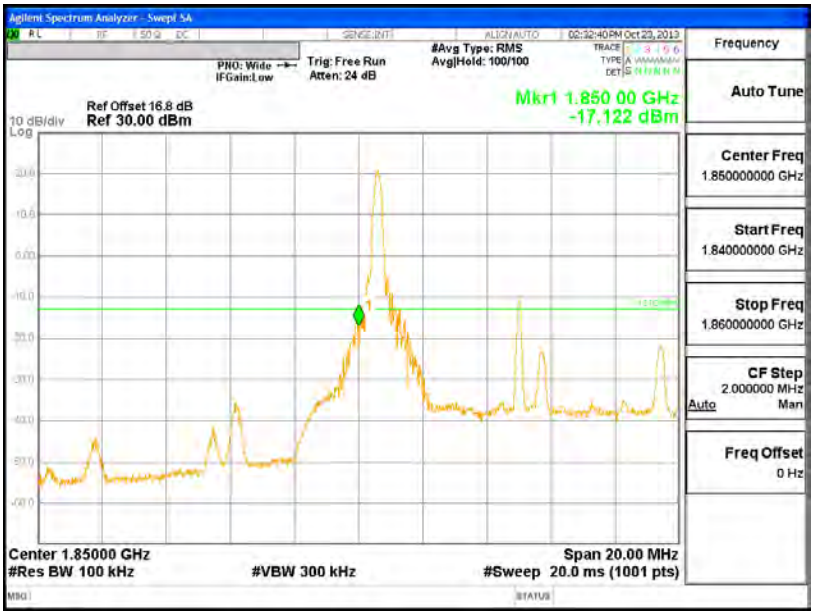
HIGH CH, RB50-0



Band 2 (10 MHz BANDWIDTH)

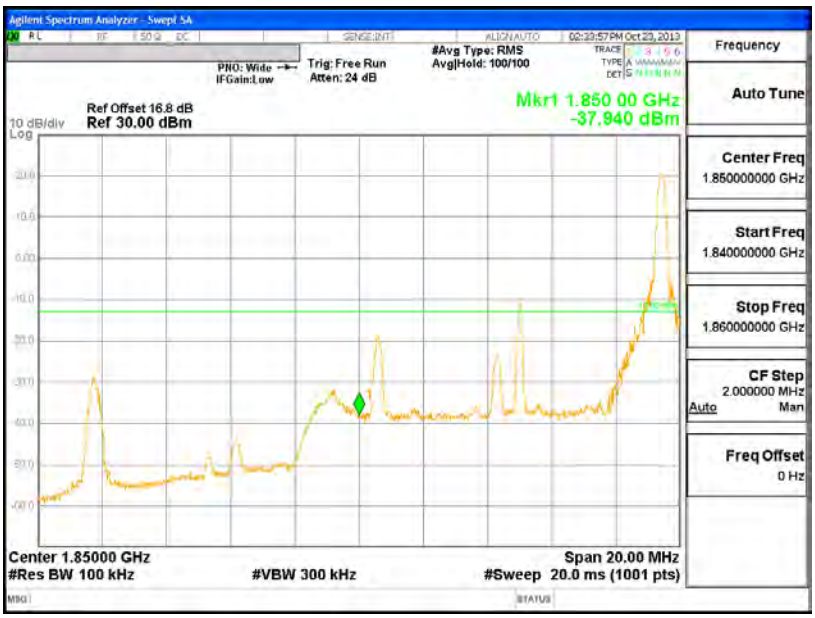
LTE 16QAM

LOW CH, RB1_0

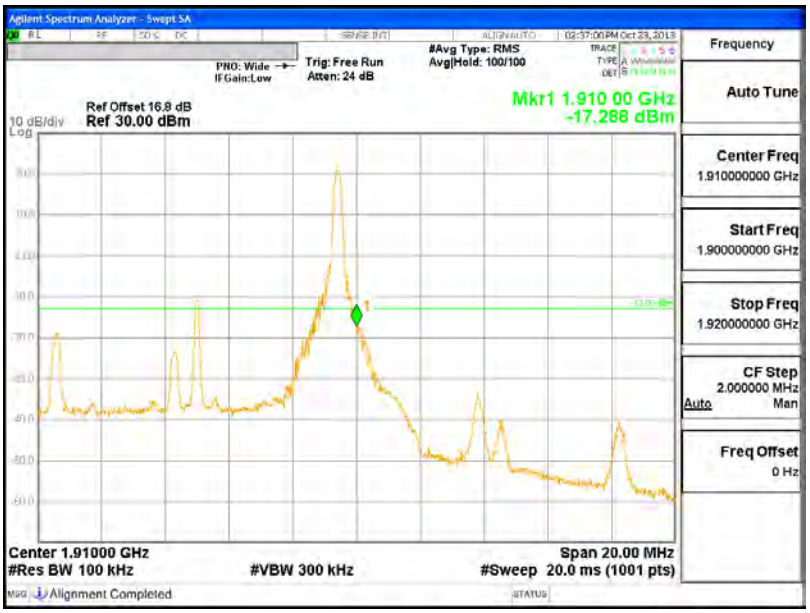


HIGH CH, RB1-0

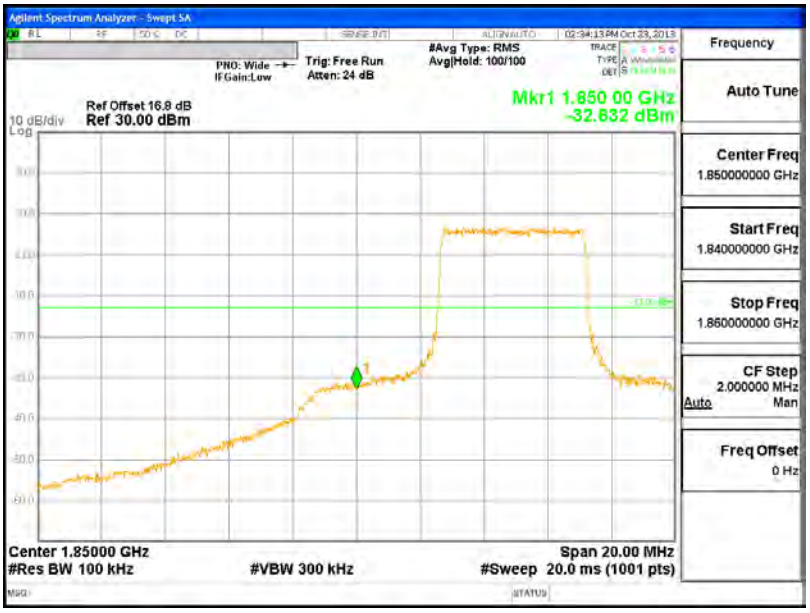
LOW CH, RB1-49



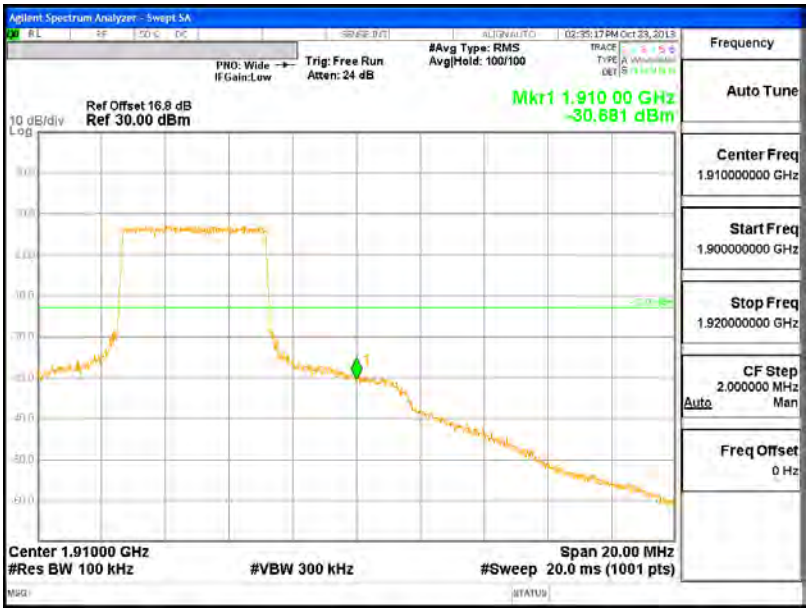
HIGH CH, RB1-49



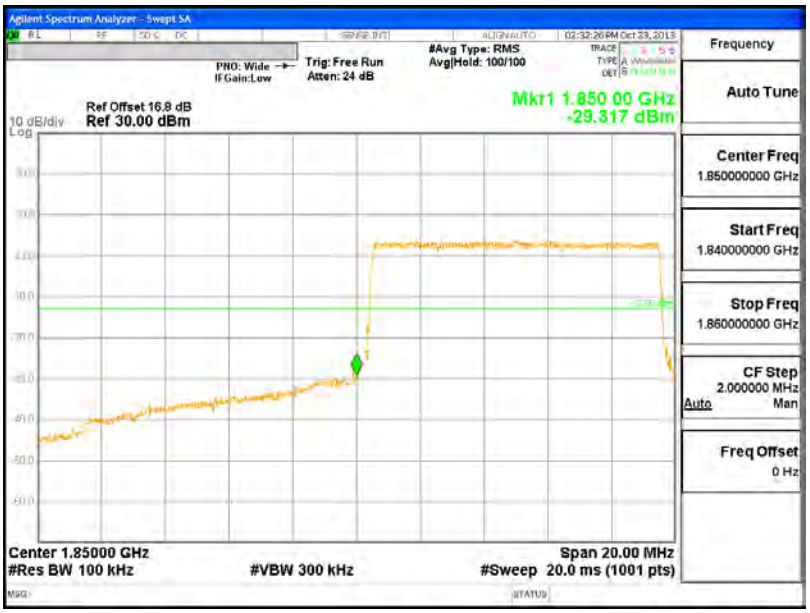
LOW CH, RB25-12



HIGH CH, RB25-12



LOW CH, RB50-0



HIGH CH, RB50-0