



**FCC CFR47 PART 22H AND 24E
CERTIFICATION TEST REPORT
FOR
QUAD-BAND RADIO WITH WLAN AND BT RADIO**

MODEL NUMBER: A1529

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Prepared for
**APPLE INC.
1 INFINITE LOOP
CUPERTINO, CA 95014, U.S.A.**

Prepared by
**UL VERIFICATION SERVICES INC.
47173 BENICIA STREET
FREMONT, CA 94538, U.S.A.
TEL: (510) 771-1000
FAX: (510) 661-0888**



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Revision History

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: APPLE
1 INFINITE LOOP
CUPERTINO, CA 95014, U.S.A.

EUT DESCRIPTION: QUAD-BAND RADIO WITH WLAN AND BT RADIO

MODEL: A1529

SERIAL NUMBER: C7JKV03GFLW6

DATE TESTED: APRIL 24 - JULY 12, 2013

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC CFR47 PART 22H AND 24E	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:



Tony Wang
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 and Part 24.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://www.ccsemc.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, Model A1529 is a mobile phone with multimedia functions (music, application support, and video), cellular GSM/GPRS/EGPRS/WCDMA/HSPA+/DC-HSDPA/LTE radio, IEEE 802.11a/b/g/n, Bluetooth and GPS radio. The rechargeable battery is not user accessible.

5.2. MAXIMUM OUTPUT POWER

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

LAT LTE BAND 2

Part 24 LTE Band 2 MODE (1.4 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted(Peak)		EIRP(Peak)	
		dBm	mW	dBm	mW
1850.7-1909.3	QPSK RB6-0	27.75	595.7	28.10	645.7
1850.7-1909.3	16QAM, RB6-0	27.53	566.2	27.18	522.4

Part 24 LTE Band 2 MODE (3 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted(Peak)		EIRP(Peak)	
		dBm	mW	dBm	mW
1851.5-1908.5	QPSK RB15-0	27.79	601.2	28.18	657.7
1851.5-1908.5	16QAM, RB15-0	27.63	579.4	27.18	522.4

Part 24 LTE Band 2 MODE (5 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted(Peak)		EIRP(Peak)	
		dBm	mW	dBm	mW
1852.5-1907.5	QPSK RB25-0	27.86	610.9	29.08	809.1
1852.5-1907.5	16QAM, RB25-0	27.49	561.0	28.18	657.7

Part 24 LTE Band 2 MODE (10 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted(Peak)		EIRP(Peak)	
		dBm	mW	dBm	mW
1855.0-1905.0	QPSK RB50-0	27.81	603.9	29.38	867.0
1855.0-1905.0	16QAM, RB50-0	27.96	625.2	28.48	704.7

Part 24 LTE Band 2 MODE (15.0 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted(Peak)		EIRP(Peak)	
		dBm	mW	dBm	mW
1857.5-1902.5	QPSK RB75-0	27.98	628.1	29.48	887.2
1857.5-1902.5	16QAM, RB75-0	27.80	602.6	28.48	704.7

Part 24 LTE Band 2 MODE (20.0 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted(Peak)		EIRP(Peak)	
		dBm	mW	dBm	mW
1860.0-1900.0	QPSK RB100-0	28.08	642.7	29.78	950.6
1860.0-1900.0	16QAM, RB100-0	27.68	586.1	28.78	755.1

LAT LTE BAND 5

Part 22 LTE Band 5 MODE (1.4 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted(Average)		ERP(Average)	
		dBm	mW	dBm	mW
824.7-848.3	QPSK RB6-0	24.00	251.2	21.20	131.8
824.7-848.3	16QAM, RB6-0	23.25	211.3	20.30	107.2

Part 22 LTE Band 5 MODE (3.0 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted(Average)		ERP(Average)	
		dBm	mW	dBm	mW
825.5-847.5	QPSK RB15-0	24.00	251.2	21.30	134.9
825.5-847.5	16QAM, RB15-0	23.31	214.3	20.40	109.6

Part 22 LTE Band 5 MODE (5.0 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted(Average)		ERP(Average)	
		dBm	mW	dBm	mW
826.5-846.5	QPSK RB25-0	24.00	251.2	21.40	138.0
826.5-846.5	16QAM, RB25-0	23.21	209.4	20.40	109.6

Part 22 LTE Band 5 MODE (10.0 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted(Average)		ERP(Average)	
		dBm	mW	dBm	mW
829.0-844.0	QPSK RB50-0	24.00	251.2	21.20	131.8
829.0-844.0	16QAM, RB50-0	23.25	211.3	20.30	107.2

UAT LTE BAND 2

Part 24 LTE Band 2 MODE (1.4 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted(Peak)		EIRP(Peak)	
		dBm	mW	dBm	mW
1850.7-1909.3	QPSK RB6-0	27.71	590.2	21.48	140.6
1850.7-1909.3	16QAM, RB6-0	27.26	532.1	20.48	111.7

Part 24 LTE Band 2 MODE (3 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted(Peak)		EIRP(Peak)	
		dBm	mW	dBm	mW
1851.5-1908.5	QPSK RB15-0	27.60	575.4	22.24	167.5
1851.5-1908.5	16QAM, RB15-0	27.39	548.3	21.24	133.0

Part 24 LTE Band 2 MODE (5 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted(Peak)		EIRP(Peak)	
		dBm	mW	dBm	mW
1852.5-1907.5	QPSK RB25-0	27.53	566.2	21.94	156.3
1852.5-1907.5	16QAM, RB25-0	27.49	561.0	20.94	124.2

Part 24 LTE Band 2 MODE (10 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted(Peak)		EIRP(Peak)	
		dBm	mW	dBm	mW
1855.0-1905.0	QPSK RB50-0	27.71	590.2	22.84	192.3
1855.0-1905.0	16QAM, RB50-0	27.66	583.4	21.84	152.8

Part 24 LTE Band 2 MODE (15.0 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted(Peak)		EIRP(Peak)	
		dBm	mW	dBm	mW
1857.5-1902.5	QPSK RB75-0	27.73	592.9	22.48	177.0
1857.5-1902.5	16QAM, RB75-0	27.48	559.8	21.48	140.6

Part 24 LTE Band 2 MODE (20.0 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted(Peak)		EIRP(Peak)	
		dBm	mW	dBm	mW
1860.0-1900.0	QPSK RB100-0	27.66	583.4	22.64	183.7
1860.0-1900.0	16QAM, RB100-0	27.46	557.2	21.64	145.9

UAT LTE BAND 5

Part 22 LTE Band 5 MODE (1.4 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted(Average)		ERP(Average)	
		dBm	mW	dBm	mW
824.7-848.3	QPSK RB6-0	23.70	234.4	13.80	24.0
824.7-848.3	16QAM, RB6-0	22.71	186.6	12.80	19.1

Part 22 LTE Band 5 MODE (3.0 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted(Average)		ERP(Average)	
		dBm	mW	dBm	mW
825.5-847.5	QPSK RB15-0	23.70	234.4	12.40	17.4
825.5-847.5	16QAM, RB15-0	22.78	189.7	11.40	13.8

Part 22 LTE Band 5 MODE (5.0 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted(Average)		ERP(Average)	
		dBm	mW	dBm	mW
826.5-846.5	QPSK RB25-0	23.70	234.4	12.80	19.1
826.5-846.5	16QAM, RB25-0	22.85	192.8	11.80	15.1

Part 22 LTE Band 5 MODE (10.0 MHz BANDWIDTH)					
Frequency range (MHz)	Modulation	Conducted(Average)		ERP(Average)	
		dBm	mW	dBm	mW
829.0-844.0	QPSK RB50-0	23.70	234.4	13.10	20.4
829.0-844.0	16QAM, RB50-0	22.76	188.8	12.10	16.2

5.3. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was version 11A360 baseband 7.02-16
The EUT is linked with CMW500 Test Set.

5.4. MAXIMUM ANTENNA GAIN

Please see table below:

LTE BANDS	A1529 LAT Antenna Gain (dBi)	A1529 UAT Antenna Gain (dBi)
LTE Band 2,1850-1910MHz	-0.26	-3.11
LTE Band 5, 824 – 849MHz	-1.07	-8.54

5.5. WORST-CASE CONFIGURATION AND MODE

The worst-case channel for RF radiated emissions below 1GHz tests is channel with highest RF output power.

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

The device has LTE Bands of 2 and 5

For the device, all tests were performed as below,

_Port A: Both conducted and radiated emissions measurement with all LTE bands.

_Port B: All conducted emissions measurement and only ERP/EIRP radiated emissions on all LTE bands.

For the fundamental investigation of radiated emissions, the EUT is investigated for vertical and horizontal antenna orientations and X, Y, and Z orientation and the worst case was determined to be at Z position on Cell band and X position on PCS Band.

5.6. DESCRIPTION OF TEST SETUP

RADIATED TESTS SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	Apple	A1385	D292066H2T2DHLHAC	DoC
DC Power Supply	Sorensen	XT 15-4	1319A02780	NA

I/O CABLES (RF Conducted Test)

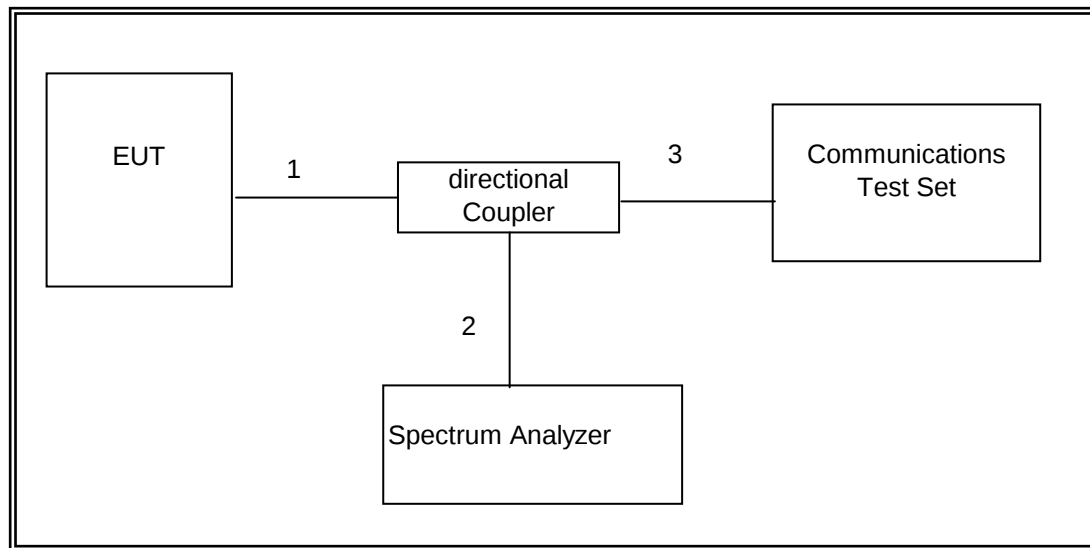
I/O Cable List						
Cable No	Port	# of identical	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	1	US 115V	Un-shielded	2m	N/A
2	DC	1	DC	Un-shielded	2m	N/A
3	RF In/Out	1	EUT	Un-shielded	1m	N/A
4	RF In/Out	1	Spectrum Analyzer	Un-shielded	1m	N/A
5	RF In/Out	1	Communication Test Set	Un-shielded	None	N/A

I/O CABLES (RF Radiated Test)

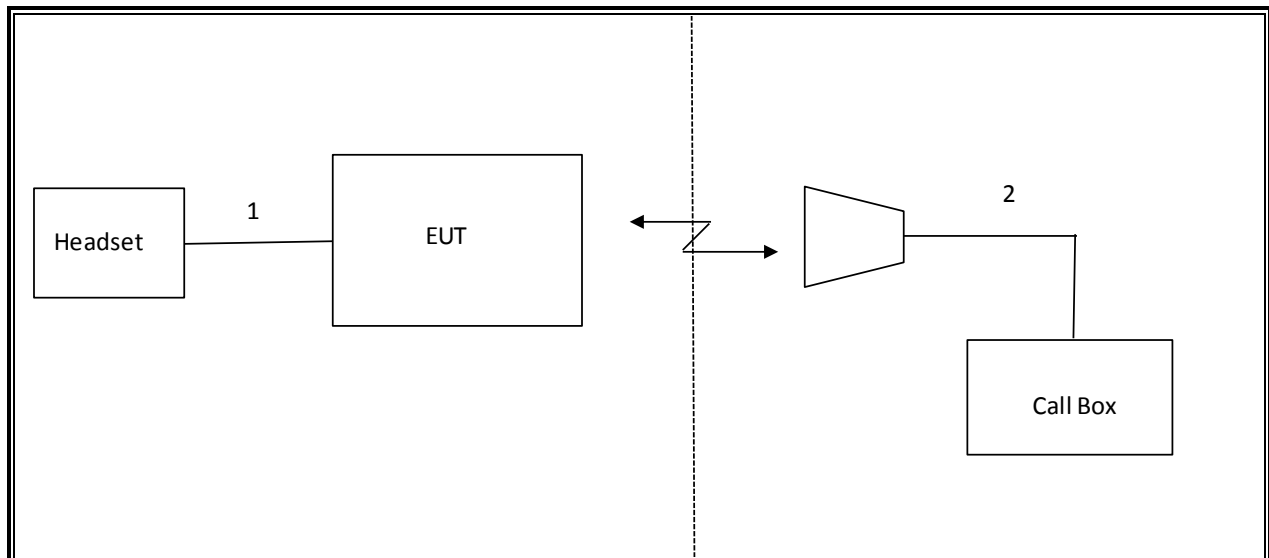
I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	Jack	1	Earphone	Un-shielded	0.5m	NA
2	RF In/Out	1	Antenna	Un-shielded	5m	NA

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
Spectrum Analyzer, 44GHz	Agilent	N9030A	F00129	02/21/14
Directional Coupler	Krytar	1817	N02656	CNR
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	07/06/13
Highpass Filter, 2.7 GHz	Micro-Tronics	HPM13194	N02686	CNR
Highpass Filter, 1.5 GHz	Micro-Tronics	HPM13193	N02688	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
Horn Antenna	ETS Lindgren	3117	F00131	02/19/14
PreAmp 1-18GHz	Agilent/HP	8449B	C01063	03/18/14
PreAmp 30-1000MHz	Sonoma	310	F00008	11/06/13

7. RF POWER OUTPUT VERIFICATION

7.1. LAT LTE BAND 2

Output power for LTE Band 2 (1.4 MHz)

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Peak Power (dBm)	Average (dBm)
1850.7	18607	QPSK	1.4	1	0	27.19	22.93
				1	2	27.21	22.85
				1	5	27.26	22.84
				3	0	27.74	22.78
				3	1	27.69	22.92
				3	2	27.75	22.93
		6		0	27.38	21.92	
		16-QAM		1	0	27.09	21.84
				1	2	27.09	21.93
				1	5	27.16	21.90
				3	0	27.66	21.78
				3	1	27.53	21.74
				3	2	27.53	21.74
				6	0	26.96	20.89
1880.0	18900			QPSK	1	0	26.47
		1			2	26.57	22.98
		1			5	26.67	23.00
		3			0	27.05	23.00
		3			1	27.02	22.90
		3			2	27.00	23.00
		6		0	27.44	22.16	
		16-QAM		1	0	26.70	22.08
				1	2	26.68	22.05
				1	5	26.71	22.03
				3	0	26.78	22.17
				3	1	26.62	22.17
				3	2	26.65	22.22
				6	0	26.73	21.14
1909.3	19193			QPSK	1	0	27.06
		1			2	27.04	22.94
		1			5	27.04	22.93
		3			0	27.44	22.86
		3			1	27.39	23.00
		3			2	27.37	22.82
		6		0	27.19	21.96	
		16-QAM		1	0	26.90	21.90
				1	2	26.86	21.82
				1	5	26.91	21.79
				3	0	27.41	21.96
				3	1	27.24	21.80
				3	2	27.25	21.73
				6	0	27.13	20.97

Output power for LTE Band 2 (3 MHz)

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Peak Power (dBm)	Average (dBm)
1851.5	18615	QPSK	3.0	1	0	27.19	22.94
				1	7	27.28	22.84
				1	14	27.44	22.88
				8	0	27.34	21.93
				8	4	27.39	21.86
				8	7	27.27	21.84
		15		0	27.79	21.88	
		16-QAM		1	0	27.07	21.85
				1	7	27.16	21.88
				1	14	27.26	21.79
				8	0	26.76	20.93
				8	4	26.86	20.92
				8	7	26.92	20.92
				15	0	27.37	20.87
1880.0	QPSK			1	0	26.72	23.00
		1		7	26.73	22.92	
		1		14	26.99	23.00	
		8		0	26.84	22.18	
		8		4	26.72	22.16	
		8		7	26.79	22.13	
	15	0		27.46	22.20		
	16-QAM	1		0	26.57	22.28	
		1		7	26.57	22.12	
		1		14	26.65	22.04	
		8		0	26.31	21.24	
		8		4	26.16	21.18	
		8		7	26.31	21.17	
		15		0	26.95	21.18	
1908.5		QPSK		1	0	26.85	23.00
	1			7	26.97	22.92	
	1			14	27.04	22.82	
	8			0	27.12	22.08	
	8			4	27.06	22.07	
	8			7	27.05	21.98	
	15	0		27.77	21.87		
	16-QAM	1		0	26.85	22.08	
		1		7	26.84	21.94	
		1		14	26.95	21.82	
		8		0	26.87	21.08	
		8		4	26.78	20.99	
		8		7	26.90	21.05	
		15		0	27.63	21.22	

Output power for LTE Band 2 (5 MHz)

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Peak Power (dBm)	Average (dBm)
1852.5	18625	QPSK	5.0	1	0	26.98	22.98
				1	12	27.08	22.92
				1	24	27.23	22.88
				12	0	27.56	21.89
				12	6	27.59	21.85
				12	11	27.66	21.82
				25	0	27.86	21.79
		16-QAM		1	0	27.10	21.88
				1	12	27.29	21.91
				1	24	27.40	21.83
				12	0	27.02	21.02
				12	6	26.97	21.01
				12	11	27.02	20.93
				25	0	27.44	20.79
1880.0	18900	QPSK		1	0	26.43	23.00
				1	12	26.47	22.94
				1	24	26.74	22.96
				12	0	26.89	22.33
				12	6	26.71	22.11
				12	11	26.85	22.13
				25	0	27.35	22.12
		16-QAM		1	0	26.55	22.27
				1	12	26.60	22.16
				1	24	26.78	22.06
				12	0	26.27	21.33
				12	6	26.11	21.24
				12	11	26.45	21.30
				25	0	26.91	21.10
1907.5	19175	QPSK	1	0	26.40	23.00	
			1	12	26.50	22.90	
			1	24	26.84	22.97	
			12	0	27.35	22.37	
			12	6	27.13	22.05	
			12	11	27.22	22.06	
			25	0	27.60	22.08	
		16-QAM	1	0	26.96	22.58	
			1	12	26.86	22.09	
			1	24	26.98	21.88	
			12	0	26.96	21.42	
			12	6	26.83	21.21	
			12	11	26.94	21.31	
			25	0	27.49	21.04	

Output power for LTE Band 2 (10 MHz)

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Peak Power (dBm)	Average (dBm)
1855.0	18650	QPSK	10.0	1	0	27.19	22.82
				1	24	27.51	22.82
				1	49	27.79	22.95
				25	0	27.47	21.76
				25	12	27.70	21.80
				25	24	27.81	21.90
		50		0	28.08	21.81	
		16-QAM		1	0	27.10	21.89
				1	24	27.31	21.76
				1	49	27.61	21.98
				25	0	27.15	20.85
				25	12	27.18	20.81
				25	24	27.42	20.89
				50	0	27.96	20.74
1880.0	18900			QPSK	1	0	26.62
		1			24	26.73	22.90
		1			49	27.23	22.95
		25			0	26.85	22.33
		25			12	26.65	22.12
		25			24	26.86	22.01
		50		0	27.64	22.12	
		16-QAM		1	0	26.43	22.22
				1	24	26.55	22.11
				1	49	26.95	21.96
				25	0	26.29	21.30
				25	12	26.16	21.12
				25	24	26.64	21.11
				50	0	27.42	21.21
1905.0	19150			QPSK	1	0	27.05
		1			24	27.58	23.00
		1			49	27.02	22.82
		25			0	27.32	22.38
		25			12	27.08	22.41
		25			24	27.11	22.12
		50		0	27.80	22.23	
		16-QAM		1	0	26.95	22.16
				1	24	26.77	22.34
				1	49	26.87	21.86
				25	0	27.10	21.41
				25	12	26.93	21.46
				25	24	26.95	21.09
				50	0	27.53	21.16

Output power for LTE Band 2 (15 MHz)

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Peak Power (dBm)	Average (dBm)
1857.5	18675	QPSK	15.0	1	0	27.26	22.89
				1	37	27.61	22.77
				1	74	27.58	23.00
				36	0	27.65	21.69
				36	16	27.84	21.84
				36	35	27.92	21.98
				75	0	27.98	21.95
		16-QAM		1	0	26.77	21.59
				1	37	27.42	21.77
				1	74	27.38	22.03
				36	0	27.48	20.77
				36	16	27.64	20.88
				36	35	27.77	20.99
				75	0	27.80	20.95
1880.0	18900	QPSK		1	0	26.77	23.00
				1	37	26.73	22.90
				1	74	27.52	22.93
				36	0	26.85	22.28
				36	16	26.69	22.09
				36	35	27.02	21.94
				75	0	27.65	22.10
		16-QAM		1	0	26.40	22.05
				1	37	26.58	22.18
				1	74	27.15	21.89
				36	0	26.61	21.28
				36	16	26.25	21.00
				36	35	27.07	21.03
				75	0	27.09	21.00
1902.5	19125	QPSK		1	0	27.62	22.90
				1	37	26.80	23.00
				1	74	26.98	22.86
				36	0	27.61	22.23
				36	16	27.25	22.35
				36	35	27.14	22.28
				75	0	27.87	22.20
		16-QAM		1	0	27.46	22.16
				1	37	26.85	22.46
				1	74	26.80	21.80
				36	0	27.34	21.18
				36	16	27.31	21.36
				36	35	27.16	21.34
				75	0	27.51	21.24

Output power for LTE Band 2 (20 MHz)

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Peak Power (dBm)	Average (dBm)
1860.0	18700	QPSK	20.0	1	0	27.25	22.84
				1	49	27.74	22.96
				1	99	27.15	23.00
				50	0	28.08	21.87
				50	24	27.77	21.92
				50	49	27.65	21.98
				100	0	27.86	21.90
		16-QAM		1	0	26.82	21.75
				1	49	27.33	21.99
				1	99	26.70	21.95
				50	0	27.63	20.78
				50	24	27.73	20.90
				50	49	27.59	20.95
				100	0	27.73	20.89
1880.0	18900	QPSK		1	0	26.76	23.00
				1	49	26.83	22.99
				1	99	27.72	22.88
				50	0	26.97	22.21
				50	24	26.89	22.13
				50	49	27.39	21.93
				100	0	27.73	22.05
		16-QAM		1	0	26.56	22.11
				1	49	26.56	22.13
				1	99	27.29	21.82
				50	0	26.44	21.14
				50	24	26.77	21.20
				50	49	27.33	20.98
				100	0	27.15	21.00
1900.0	19100	QPSK	1	0	27.81	22.94	
			1	49	27.02	23.00	
			1	99	27.00	22.89	
			50	0	28.03	22.03	
			50	24	27.59	22.22	
			50	49	27.42	22.28	
			100	0	27.94	22.14	
		16-QAM	1	0	27.52	21.86	
			1	49	26.99	22.22	
			1	99	26.86	22.00	
			50	0	27.65	21.09	
			50	24	27.15	21.18	
			50	49	27.03	21.20	
			100	0	27.68	21.13	

7.2. UAT LTE BAND 2

Output power for LTE Band 2 (1.4 MHz)

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Peak Power (dBm)	Average (dBm)
1850.7	18607	QPSK	1.4	1	0	26.47	23.37
				1	2	26.50	23.36
				1	5	26.70	22.13
				3	0	27.71	22.68
				3	1	27.61	22.71
				3	2	27.63	22.78
		6		0	27.23	21.80	
		16-QAM		1	0	26.72	21.66
				1	2	26.72	21.65
				1	5	26.78	21.69
				3	0	27.23	21.53
				3	1	27.14	21.55
				3	2	27.13	21.56
				6	0	26.91	20.72
1880.0	18900			QPSK	1	0	27.07
		1			2	26.60	23.32
		1			5	26.93	22.99
		3			0	27.29	22.94
		3			1	27.36	23.08
		3			2	27.23	22.94
		6		0	27.11	22.02	
		16-QAM		1	0	26.73	21.93
				1	2	26.71	21.94
				1	5	26.82	21.95
				3	0	27.26	21.81
				3	1	27.10	21.80
				3	2	27.13	21.85
				6	0	26.78	21.04
1909.3	19193			QPSK	1	0	26.33
		1			2	26.52	22.88
		1			5	26.49	22.92
		3			0	26.99	22.89
		3			1	26.85	22.94
		3			2	26.83	22.90
		6		0	27.44	21.92	
		16-QAM		1	0	26.55	21.93
				1	2	26.49	21.84
				1	5	26.43	21.85
				3	0	26.88	22.08
				3	1	26.73	22.10
				3	2	26.74	22.10
				6	0	27.22	21.08

Output power for LTE Band 2 (3 MHz)

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Peak Power (dBm)	Average (dBm)
1851.5	18615	QPSK	3.0	1	0	23.70	23.02
				1	7	26.64	23.31
				1	14	27.23	22.89
				8	0	27.09	21.80
				8	4	27.00	21.85
				8	7	27.06	21.88
				15	0	27.58	21.77
		16-QAM		1	0	26.74	21.76
				1	7	26.80	21.75
				1	14	26.90	21.84
				8	0	26.81	20.94
				8	4	26.80	20.91
				8	7	26.89	20.95
				15	0	27.39	20.92
1880.0	18900	QPSK		1	0	27.02	23.19
				1	7	26.60	23.32
				1	14	26.92	22.95
				8	0	27.03	22.03
				8	4	27.00	22.08
				8	7	26.99	22.01
				15	0	27.60	22.00
		16-QAM		1	0	26.71	21.98
				1	7	26.78	21.99
				1	14	26.81	21.93
				8	0	26.51	21.12
				8	4	26.48	21.11
				8	7	26.59	21.12
				15	0	27.14	21.05
1908.5	19185	QPSK		1	0	26.70	23.10
				1	7	26.89	23.16
				1	14	26.24	23.38
				8	0	26.98	21.96
				8	4	26.85	21.98
				8	7	26.85	21.99
				15	0	27.57	21.89
		16-QAM		1	0	26.60	21.95
				1	7	26.47	21.93
				1	14	26.39	21.87
				8	0	26.75	21.08
				8	4	26.63	21.02
				8	7	26.66	21.10
				15	0	27.29	21.06

Output power for LTE Band 2 (5 MHz)

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Peak Power (dBm)	Average (dBm)
1852.5	18625	QPSK	5.0	1	0	26.88	22.79
				1	12	26.81	22.29
				1	24	26.79	23.31
				12	0	27.24	21.84
				12	6	27.24	21.84
				12	11	27.25	21.90
				25	0	27.53	21.76
		16-QAM		1	0	26.78	21.58
				1	12	26.95	21.84
				1	24	27.01	22.01
				12	0	26.98	20.93
				12	6	26.93	21.00
				12	11	26.98	21.03
				25	0	27.49	20.83
1880.0	18900	QPSK		1	0	26.47	23.36
				1	12	26.75	23.08
				1	24	26.81	23.00
				12	0	27.11	21.96
				12	6	27.07	22.03
				12	11	27.15	22.03
				25	0	27.52	21.91
		16-QAM		1	0	26.77	22.08
				1	12	26.86	22.03
				1	24	26.92	21.99
				12	0	26.53	21.17
				12	6	26.45	21.16
				12	11	26.56	21.15
				25	0	27.11	20.98
1907.5	19175	QPSK		1	0	26.67	23.02
				1	12	26.63	23.06
				1	24	26.28	23.38
				12	0	27.15	21.97
				12	6	26.98	22.04
				12	11	26.97	21.95
				25	0	27.50	21.88
		16-QAM		1	0	26.76	22.11
				1	12	26.70	21.95
				1	24	26.47	22.02
				12	0	26.95	21.16
				12	6	26.75	21.11
				12	11	26.75	21.07
				25	0	27.43	20.94

Output power for LTE Band 2 (10 MHz)

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Peak Power (dBm)	Average (dBm)
1855.0	18650	QPSK	10.0	1	0	27.07	23.00
				1	24	26.87	23.37
				1	49	27.14	22.94
				25	0	27.14	21.77
				25	12	27.14	21.86
				25	24	27.15	21.87
				50	0	27.71	21.77
		16-QAM		1	0	26.73	21.69
				1	24	26.87	21.95
				1	49	26.77	21.90
				25	0	27.10	20.92
				25	12	27.04	20.99
				25	24	27.09	21.04
				50	0	27.66	20.81
1880.0	18900	QPSK		1	0	26.87	23.14
				1	24	26.70	23.40
				1	49	26.96	22.90
				25	0	26.94	21.92
				25	12	27.00	21.90
				25	24	27.12	21.88
				50	0	27.60	21.88
		16-QAM		1	0	26.51	21.93
				1	24	26.78	22.00
				1	49	26.83	21.87
				25	0	26.54	21.03
				25	12	26.50	20.99
				25	24	26.69	21.00
				50	0	27.31	20.87
1905.0	19150	QPSK		1	0	26.88	23.11
				1	24	26.63	23.36
				1	49	26.56	22.92
				25	0	27.03	21.96
				25	12	27.02	22.03
				25	24	27.01	21.90
				50	0	27.58	21.98
		16-QAM		1	0	26.67	22.09
				1	24	26.64	22.08
				1	49	26.41	22.05
				25	0	27.05	21.22
				25	12	26.91	21.12
				25	24	26.93	20.97
				50	0	27.60	21.02

Output power for LTE Band 2 (15 MHz)

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Peak Power (dBm)	Average (dBm)
1857.5	18675	QPSK	15.0	1	0	27.01	22.92
				1	37	26.91	23.12
				1	74	26.67	23.36
				36	0	27.25	21.82
				36	16	27.15	21.88
				36	35	27.09	21.86
				75	0	27.73	21.86
		16-QAM		1	0	26.74	21.72
				1	37	26.72	21.84
				1	74	26.59	21.98
				36	0	27.30	20.90
				36	16	27.15	20.98
				36	35	26.88	20.89
				75	0	27.48	20.95
1880.0	18900	QPSK		1	0	26.47	23.26
				1	37	26.91	23.31
				1	74	27.00	22.89
				36	0	26.96	21.79
				36	16	26.95	21.82
				36	35	27.17	21.83
				75	0	27.59	21.82
		16-QAM		1	0	26.45	21.89
				1	37	26.75	21.99
				1	74	26.73	21.82
				36	0	26.66	20.90
				36	16	26.61	20.95
				36	35	26.86	20.97
				75	0	27.17	20.87
1902.5	19125	QPSK		1	0	26.82	23.39
				1	37	26.53	23.17
				1	74	26.36	23.21
				36	0	27.18	22.02
				36	16	27.11	22.20
				36	35	27.09	22.01
				75	0	27.70	21.97
		16-QAM		1	0	26.77	22.03
				1	37	26.57	21.85
				1	74	26.37	22.04
				36	0	27.26	21.10
				36	16	27.03	21.09
				36	35	26.87	21.06
				75	0	27.30	20.98

Output power for LTE Band 2 (20 MHz)

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Peak Power (dBm)	Average (dBm)
1860.0	18700	QPSK	20.0	1	0	27.16	22.91
				1	49	26.96	23.11
				1	99	26.73	23.34
				50	0	27.35	21.82
				50	24	27.13	21.83
				50	49	27.13	21.98
				100	0	27.66	21.99
		16-QAM		1	0	26.60	21.36
				1	49	26.68	21.90
				1	99	26.51	22.01
				50	0	27.29	20.86
				50	24	26.63	20.81
				50	49	27.16	21.07
				100	0	27.46	21.06
1880.0	18900	QPSK		1	0	26.42	23.17
				1	49	26.84	23.39
				1	99	26.79	22.94
				50	0	27.12	21.85
				50	24	27.20	21.88
				50	49	27.36	21.82
				100	0	27.54	21.87
		16-QAM		1	0	26.48	21.99
				1	49	26.74	21.94
				1	99	26.76	21.89
				50	0	26.66	20.86
				50	24	26.66	20.92
				50	49	26.94	20.86
				100	0	27.23	20.91
1900.0	19100	QPSK	1	0	26.88	22.28	
			1	49	26.68	23.40	
			1	99	26.48	23.11	
			50	0	27.51	21.95	
			50	24	27.27	22.00	
			50	49	27.32	21.96	
			100	0	27.66	21.96	
		16-QAM	1	0	26.93	22.31	
			1	49	26.69	22.14	
			1	99	26.21	21.97	
			50	0	27.12	21.04	
			50	24	26.84	21.09	
			50	49	26.87	21.01	
			100	0	27.46	21.24	

7.3. LAT LTE BAND 5

Output power for LTE Band 5 (1.4 MHz)

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Peak Power (dBm)	Average (dBm)
824.7	20407	QPSK	1.4	1	0	27.20	23.96
				1	2	27.30	23.97
				1	5	27.28	24.00
				3	0	27.66	24.00
				3	1	27.32	23.85
				3	2	27.51	23.90
				6	0	28.39	22.86
		16-QAM		1	0	27.29	23.13
				1	2	27.22	23.15
				1	5	27.34	23.25
				3	0	27.53	23.11
				3	1	27.32	23.07
				3	2	27.41	23.02
				6	0	28.10	22.04
836.5	20525	QPSK		1	0	27.51	23.98
				1	2	27.53	23.92
				1	5	27.58	24.00
				3	0	27.91	23.86
				3	1	27.69	23.91
				3	2	27.68	24.00
				6	0	28.57	22.98
		16-QAM		1	0	27.42	23.12
				1	2	27.55	23.08
				1	5	27.52	23.06
				3	0	27.77	23.10
				3	1	27.57	23.11
				3	2	27.62	23.07
				6	0	28.32	22.02
848.3	20643	QPSK	1	0	27.20	23.96	
			1	2	27.15	23.92	
			1	5	27.00	23.75	
			3	0	27.52	23.89	
			3	1	27.25	23.81	
			3	2	27.20	23.76	
			6	0	28.27	22.73	
		16-QAM	1	0	27.23	22.81	
			1	2	27.16	23.11	
			1	5	27.06	23.13	
			3	0	27.42	23.08	
			3	1	27.14	23.10	
			3	2	27.17	23.04	
			6	0	27.73	21.82	

Output power for LTE Band 5 (3 MHz)

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Peak Power (dBm)	Average (dBm)
825.5	20415	QPSK	3.0	1	0	27.25	24.00
				1	7	27.22	23.95
				1	14	27.37	23.86
				8	0	27.70	22.80
				8	4	27.45	22.83
				8	7	27.65	22.80
				15	0	28.46	22.72
		16-QAM		1	0	27.20	23.03
				1	7	27.21	23.13
				1	14	27.32	23.05
				8	0	27.40	22.05
				8	4	27.17	22.04
				8	7	27.42	22.03
				15	0	28.42	21.73
836.5	20525	QPSK		1	0	27.68	24.00
				1	7	27.59	23.92
				1	14	27.46	24.00
				8	0	28.02	22.98
				8	4	27.71	22.91
				8	7	27.95	22.94
				15	0	28.39	22.82
		16-QAM		1	0	27.70	23.12
				1	7	27.52	23.01
				1	14	27.51	23.31
				8	0	27.91	22.03
				8	4	27.58	22.08
				8	7	27.69	22.08
				15	0	28.35	21.97
847.5	20635	QPSK		1	0	27.46	23.97
				1	7	27.20	24.00
				1	14	27.09	24.00
				8	0	27.69	22.86
				8	4	27.34	22.81
				8	7	27.58	22.81
				15	0	28.33	22.86
		16-QAM		1	0	27.41	23.11
				1	7	27.29	23.17
				1	14	27.10	23.14
				8	0	27.58	21.90
				8	4	27.29	21.90
				8	7	27.31	21.87
				15	0	28.21	21.93

Output power for LTE Band 5 (5 MHz)

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Peak (dBm)	Average (dBm)
826.5	20425	QPSK	5.0	1	0	27.23	23.93
				1	12	27.27	23.88
				1	24	27.67	24.00
				12	0	27.51	22.79
				12	6	27.32	22.72
				12	11	27.63	22.73
				25	0	28.47	22.69
		16-QAM		1	0	27.10	22.87
				1	12	27.14	22.95
				1	24	27.60	22.90
				12	0	27.52	22.02
				12	6	27.34	21.95
				12	11	27.52	21.95
				25	0	28.25	21.71
836.5	20525	QPSK		1	0	27.59	23.99
				1	12	27.52	23.94
				1	24	27.41	24.00
				12	0	27.89	22.90
				12	6	27.59	22.94
				12	11	27.70	22.93
				25	0	28.46	22.77
		16-QAM		1	0	27.56	23.01
				1	12	27.37	22.90
				1	24	27.32	22.82
				12	0	27.79	22.02
				12	6	27.52	22.05
				12	11	27.63	22.03
				25	0	28.29	21.80
846.5	20625	QPSK		1	0	27.45	24.00
				1	12	27.35	23.97
				1	24	27.06	23.89
				12	0	27.76	22.84
				12	6	27.41	22.82
				12	11	27.41	22.86
				25	0	28.28	22.74
		16-QAM		1	0	27.45	23.01
				1	12	27.40	23.13
				1	24	27.05	23.21
				12	0	27.73	22.08
				12	6	27.42	21.91
				12	11	27.52	21.81
				25	0	28.20	21.90

Output power for LTE Band 5 (10 MHz)

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Peak Power (dBm)	Average (dBm)
829.0	20450	QPSK	10.0	1	0	27.33	23.98
				1	24	27.68	24.00
				1	49	27.70	24.00
				25	0	27.75	22.67
				25	12	27.78	22.71
				25	24	28.04	22.72
		50		0	28.88	22.70	
		16-QAM		1	0	27.41	23.11
				1	24	27.79	23.13
				1	49	27.83	23.09
				25	0	27.77	21.83
				25	12	27.71	21.83
				25	24	28.01	21.85
				50	0	28.43	21.79
836.5	20525			QPSK	1	0	28.00
		1			24	27.56	23.96
		1			49	27.52	23.92
		25			0	27.93	22.84
		25			12	27.65	22.66
		25			24	27.63	22.68
		50		0	28.53	22.63	
		16-QAM		1	0	27.91	23.20
				1	24	27.61	23.07
				1	49	27.68	23.25
				25	0	28.02	22.02
				25	12	27.62	21.79
				25	24	27.67	21.87
				50	0	28.27	21.73
844.0	20600			QPSK	1	0	27.42
		1			24	27.36	24.00
		1			49	27.08	23.78
		25			0	27.81	22.55
		25			12	27.64	23.15
		25			24	27.60	22.71
		50		0	28.52	23.03	
		16-QAM		1	0	27.42	22.90
				1	24	27.22	22.66
				1	49	27.06	22.88
				25	0	27.63	21.66
				25	12	27.52	22.22
				25	24	27.56	21.81
				50	0	28.18	22.15

7.4. UAT LTE BAND 5

Output power for LTE Band 5 (1.4 MHz)

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Peak Power (dBm)	Average (dBm)
824.7	20407	QPSK	1.4	1	0	26.86	23.50
				1	2	26.89	23.70
				1	5	26.87	23.59
				3	0	27.20	23.68
				3	1	26.95	23.71
				3	2	26.95	23.64
		6		0	27.31	22.56	
		1		0	26.66	22.27	
		1		2	26.68	22.34	
		1		5	26.75	22.52	
		3		0	27.09	22.34	
		3		1	26.89	22.46	
		3		2	26.88	22.40	
		6		0	27.16	21.58	
836.5	20525	QPSK		1	0	26.70	23.70
				1	2	26.68	23.65
				1	5	26.69	23.65
				3	0	27.01	23.53
				3	1	26.75	23.49
				3	2	26.75	23.62
		6		0	27.08	22.55	
		1		0	26.53	22.52	
		1		2	26.55	22.49	
		1		5	26.57	22.52	
		3		0	26.92	22.42	
		3		1	26.69	22.39	
		3		2	26.69	22.40	
		6		0	27.08	21.57	
848.3	20643	QPSK		1	0	26.87	23.68
				1	2	26.57	23.70
				1	5	26.19	23.65
				3	0	26.93	23.70
				3	1	26.50	23.67
				3	2	26.42	23.62
		6		0	26.89	22.80	
		1		0	26.27	22.71	
		1		2	26.16	22.66	
		1		5	26.02	22.62	
		3		0	26.56	22.55	
		3		1	26.29	22.57	
		3		2	26.22	22.57	
		6		0	26.90	21.71	

Output power for LTE Band 5 (3 MHz)

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Peak Power (dBm)	Average (dBm)
825.5	20415	QPSK	3.0	1	0	26.86	23.55
				1	7	26.90	23.64
				1	14	26.71	23.57
				8	0	27.04	22.31
				8	4	27.00	22.73
				8	7	27.02	22.46
				15	0	27.81	22.80
		16-QAM		1	0	26.73	22.47
				1	7	26.75	22.56
				1	14	26.65	22.63
				8	0	26.77	21.56
				8	4	26.67	21.73
				8	7	26.69	21.47
				15	0	27.59	21.62
836.5	20525	QPSK		1	0	26.68	23.68
				1	7	26.71	23.70
				1	14	26.76	23.69
				8	0	26.95	22.65
				8	4	26.73	22.59
				8	7	26.91	22.60
				15	0	27.60	22.53
		16-QAM		1	0	26.52	22.56
				1	7	26.58	22.54
				1	14	26.62	22.43
				8	0	26.77	21.65
				8	4	26.59	21.64
				8	7	26.76	21.66
				15	0	27.36	21.58
847.5	20635	QPSK		1	0	27.07	23.64
				1	7	26.81	23.70
				1	14	26.25	23.65
				8	0	26.91	22.80
				8	4	26.55	22.84
				8	7	26.64	22.76
				15	0	27.41	22.76
		16-QAM		1	0	26.70	22.68
				1	7	26.41	22.78
				1	14	26.06	22.68
				8	0	26.81	21.78
				8	4	26.42	21.80
				8	7	26.45	21.83
				15	0	27.35	21.74

Output power for LTE Band 5 (5 MHz)

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Peak (dBm)	Average (dBm)
826.5	20425	QPSK	5.0	1	0	26.80	23.70
				1	12	26.59	23.70
				1	24	26.84	23.60
				12	0	26.96	22.56
				12	6	26.69	22.55
				12	11	26.87	22.50
				25	0	27.54	22.44
		16-QAM		1	0	26.64	22.76
				1	12	26.61	22.58
				1	24	26.78	22.60
				12	0	26.66	21.67
				12	6	26.48	21.63
				12	11	26.65	21.67
				25	0	27.32	21.47
836.5	20525	QPSK		1	0	26.92	23.61
				1	12	26.89	23.68
				1	24	27.02	23.70
				12	0	27.18	22.80
				12	6	26.90	22.79
				12	11	26.97	22.65
				25	0	27.62	22.50
		16-QAM		1	0	26.83	22.65
				1	12	26.68	22.64
				1	24	26.84	22.85
				12	0	26.82	21.59
				12	6	26.66	21.76
				12	11	26.76	21.75
				25	0	27.39	21.42
846.5	20625	QPSK	1	0	26.94	23.68	
			1	12	27.03	23.70	
			1	24	26.37	23.70	
			12	0	27.20	22.72	
			12	6	26.78	22.79	
			12	11	26.71	22.82	
			25	0	27.62	22.65	
		16-QAM	1	0	26.89	22.54	
			1	12	26.65	22.75	
			1	24	26.11	22.73	
			12	0	26.93	21.75	
			12	6	26.56	21.76	
			12	11	26.49	21.88	
			25	0	27.29	21.57	

Output power for LTE Band 5 (10 MHz)

Freq. (MHz)	UL Channel	Modulation	BW (MHz)	RB Size	RB Offset	Peak Power (dBm)	Average (dBm)
829.0	20450	QPSK	10.0	1	0	27.00	23.70
				1	24	26.70	23.69
				1	49	26.99	23.60
				25	0	26.93	22.58
				25	12	26.71	22.48
				25	24	26.87	22.26
		50		0	27.62	22.26	
		1		0	26.69	22.73	
		1		24	26.58	22.56	
		1		49	26.86	22.50	
		25		0	26.74	21.61	
		25		12	26.57	21.50	
		25		24	26.80	21.41	
		50		0	27.43	21.20	
836.5	20525	QPSK		1	0	26.95	23.62
				1	24	27.01	23.70
				1	49	26.85	23.68
				25	0	27.08	22.59
				25	12	26.84	22.68
				25	24	27.00	22.71
		50		0	27.77	22.57	
		1		0	26.77	22.45	
		1		24	26.76	22.76	
		1		49	26.64	22.68	
		25		0	26.89	21.69	
		25		12	26.74	21.72	
		25		24	26.85	21.69	
		50		0	27.54	21.43	
844.0	20600	QPSK		1	0	26.90	23.66
				1	24	26.96	23.44
				1	49	26.40	23.70
				25	0	27.13	22.32
				25	12	26.90	22.41
				25	24	26.88	22.28
		50		0	27.64	22.36	
		1		0	26.69	22.39	
		1		24	26.77	22.31	
		1		49	26.15	22.66	
		25		0	26.93	21.33	
		25		12	26.85	21.55	
		25		24	26.78	21.54	
		50		0	27.58	21.29	

8. CONDUCTED TEST RESULTS

8.1. OCCUPIED BANDWIDTH

RULE PART(S)

FCC: §2.1049

IC: RSS-132, 4.5; RSS-133, 6.5

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 5

RESULTS

Band	Mode	RB/RB SIZE	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 2	1.4 MHz BAND QPSK	3/2	1850.7	0.54545	0.7341
		6/0		1.0913	1.2170
	1.4 MHz BAND QPSK	3/2	1880.0	0.54618	0.8102
		6/0		1.0932	1.2790
	1.4 MHz BAND QPSK	3/2	1909.3	0.54645	0.7178
		6/0		1.0984	1.2030
	1.4 MHz BAND 16QAM	3/2	1850.7	0.54113	0.7503
		6/0		1.0760	1.1910
	1.4 MHz BAND 16QAM	3/2	1880.0	0.54686	0.8626
		6/0		1.0805	1.2890
	1.4 MHz BAND 16QAM	3/2	1909.3	0.54578	0.7318
		6/0		1.0851	1.2030
	3.0 MHz BAND QPSK	8/4	1851.5	1.4387	1.7260
		15/0		2.6830	2.8800
	3.0 MHz BAND QPSK	8/4	1880.0	1.4442	2.0170
		15/0		2.6967	2.9370
	3.0 MHz BAND QPSK	8/4	1908.5	1.4488	1.8760
		15/0		2.6712	2.9660
	3.0 MHz BAND 16QAM	8/4	1851.5	1.4336	1.7610
		15/0		2.6790	3.0360
	3.0 MHz BAND 16QAM	8/4	1880.0	1.4314	1.7820
		15/0		2.6649	2.9150
	3.0 MHz BAND 16QAM	8/4	1908.5	1.4331	1.9400
		15/0		2.6602	2.8460
	5.0 MHz BAND QPSK	12/6	1852.5	2.1632	2.5390
		25/0		4.4818	4.8560
	5.0 MHz BAND QPSK	12/6	1880.0	2.1648	2.5950
		25/0		4.5026	4.7590
	5.0 MHz BAND QPSK	12/6	1907.5	2.1697	2.6310
		25/0		4.4813	4.6720
	5.0 MHz BAND 16QAM	12/6	1852.5	2.1594	2.4490
		25/0		4.4855	4.8770
	5.0 MHz BAND 16QAM	12/6	1880.0	2.1582	2.5910
		25/0		4.4684	4.6600
	5.0 MHz BAND 16QAM	12/6	1907.5	2.1595	2.6290
		25/0		4.4617	5.0050
	10.0 MHz AND QPSK	25/12	1855.0	4.4956	5.2610
		50/0		8.9689	9.3730
	10.0 MHz AND QPSK	25/12	1880.0	4.4993	5.8280
		50/0		8.9278	9.5190
	10.0 MHz AND QPSK	25/12	1905.0	4.5001	5.7590
		50/0		8.9767	9.2650
	10.0 MHz AND 16QAM	25/12	1855.0	4.4793	5.2620
		50/0		8.9702	9.5940
	10.0 MHz AND 16QAM	25/12	1880.0	4.4851	5.2560
		50/0		8.8884	9.3850
	10.0 MHz AND 16QAM	25/12	1905.0	4.4814	5.0790
		50/0		8.8939	9.3560

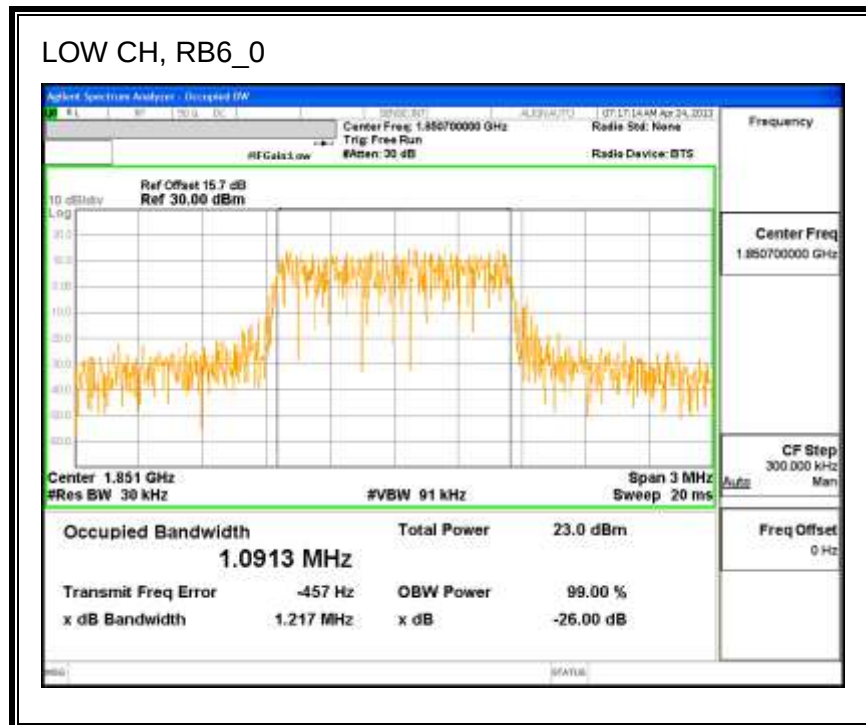
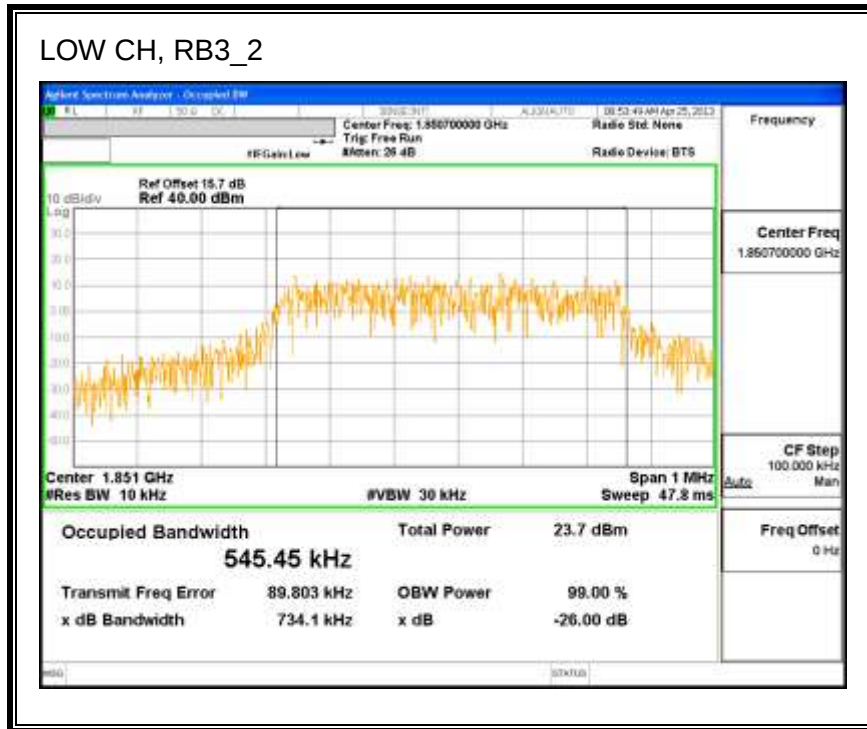
Band	Mode	RB/RB SIZE	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 2	15 MHz BAND QPSK	36/18	1857.5	6.4873	7.5140
		75/0		13.464	13.840
	15 MHz BAND QPSK	36/18	1880.0	6.4872	7.3150
		75/0		13.384	13.880
	15 MHz BAND QPSK	36/18	1902.5	6.4842	7.5130
		75/0		13.399	13.860
	15 MHz BAND 16QAM	36/18	1857.5	6.4753	7.1480
		75/0		13.464	14.020
	15 MHz BAND 16QAM	36/18	1880.0	6.4570	7.5150
		75/0		13.348	13.960
	15 MHz BAND 16QAM	36/18	1902.5	6.4621	7.4050
		75/0		13.410	13.810
	20 MHz BAND QPSK	50/19	1860.0	8.9958	9.8690
		100/0		17.938	19.290
	20 MHz BAND QPSK	50/19	1880.0	8.9512	10.020
		100/0		17.870	18.540
	20 MHz BAND QPSK	50/19	1900.0	8.9991	9.4170
		100/0		17.810	18.620
	20 MHz BAND 16QAM	50/19	1860.0	8.9738	10.030
		100/0		17.848	18.460
	20 MHz BAND 16QAM	50/19	1880.0	8.9879	9.6810
		100/0		17.849	18.510
	20 MHz BAND 16QAM	50/19	1900.0	8.9856	9.3530
		100/0		17.885	18.660

Band	Mode	RB/RB SIZE	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 5	1.4 MHz BAND QPSK	3/2	824.7	0.54652	0.7742
		6/0		1.08360	1.2030
	1.4 MHz BAND QPSK	3/2	836.5	0.54668	0.7210
		6/0		1.08020	1.2370
	1.4 MHz BAND QPSK	3/2	848.3	0.54693	0.8254
		6/0		1.09100	1.2330
	1.4 MHz BAND 16QAM	3/2	824.7	0.54562	0.7263
		6/0		1.08010	1.1620
	1.4 MHz BAND 16QAM	3/2	836.5	0.54563	0.7706
		6/0		1.08000	1.1700
	1.4 MHz BAND 16QAM	3/2	848.3	0.54547	0.8442
		6/0		1.08920	1.2030
	3.0 MHz BAND QPSK	8/4	825.5	1.44160	1.6630
		15/0		2.6787	2.8790
	3.0 MHz BAND QPSK	8/4	836.5	1.44120	1.8550
		15/0		2.67710	2.8130
	3.0 MHz BAND QPSK	8/4	847.5	1.44400	1.8340
		15/0		2.69150	2.9150
	3.0 MHz BAND 16QAM	8/4	825.5	1.43640	1.6640
		15/0		2.66280	2.8480
	3.0 MHz BAND 16QAM	8/4	836.5	1.43290	1.6870
		15/0		2.67060	2.9690
	3.0 MHz BAND 16QAM	8/4	847.5	1.43820	1.6310
		15/0		2.66950	2.7980
	5.0 MHz BAND QPSK	12/6	826.5	2.17210	2.9130
		25/0		4.49870	4.7640
	5.0 MHz BAND QPSK	12/6	836.5	2.17200	2.6310
		25/0		4.48330	4.7440
	5.0 MHz BAND QPSK	12/6	846.5	2.17400	2.7530
		25/0		4.49680	4.7400
	5.0 MHz BAND 16QAM	12/6	826.5	2.16350	2.5360
		25/0		4.47210	4.7640
	5.0 MHz BAND 16QAM	12/6	836.5	2.16430	2.5080
		25/0		4.47290	4.7550
	5.0 MHz BAND 16QAM	12/6	846.5	2.16220	2.8790
		25/0		4.47050	4.6630

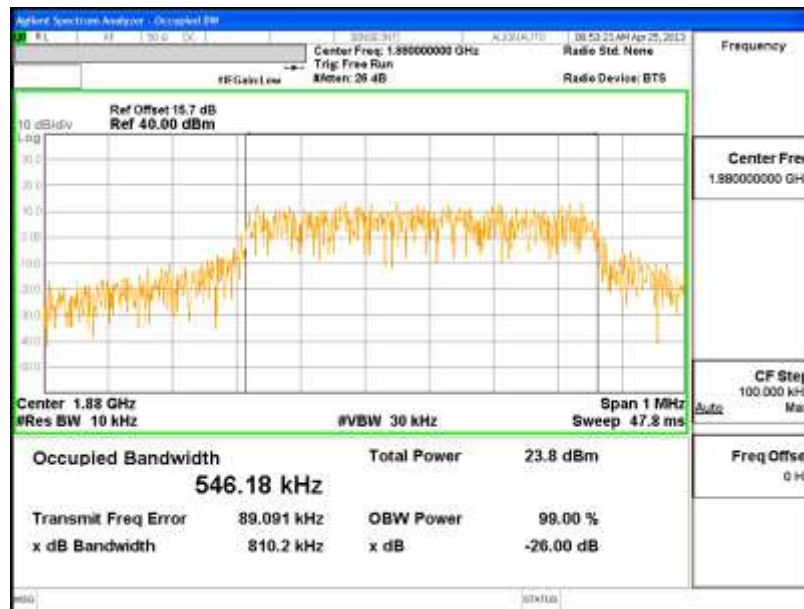
Band	Mode	RB/RB SIZE	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE BAND 5	10 MHz BAND QPSK	25/12	829.0	4.4908	5.575
		50/0		8.9492	9.310
	10 MHz BAND QPSK	25/12	836.5	4.4974	5.259
		50/0		8.9854	9.352
	10 MHz BAND QPSK	25/12	844.0	4.4947	5.081
		50/0		9.0031	9.519
	10 MHz BAND 16QAM	25/12	829.0	4.4828	5.189
		50/0		8.8542	9.529
	10 MHz BAND 16QAM	25/12	836.5	4.4876	5.078
		50/0		8.9620	9.400
	10 MHz BAND 16QAM	25/12	844	4.4814	5.006
		50/0		8.9383	9.526

8.1.1. LTE BAND 2

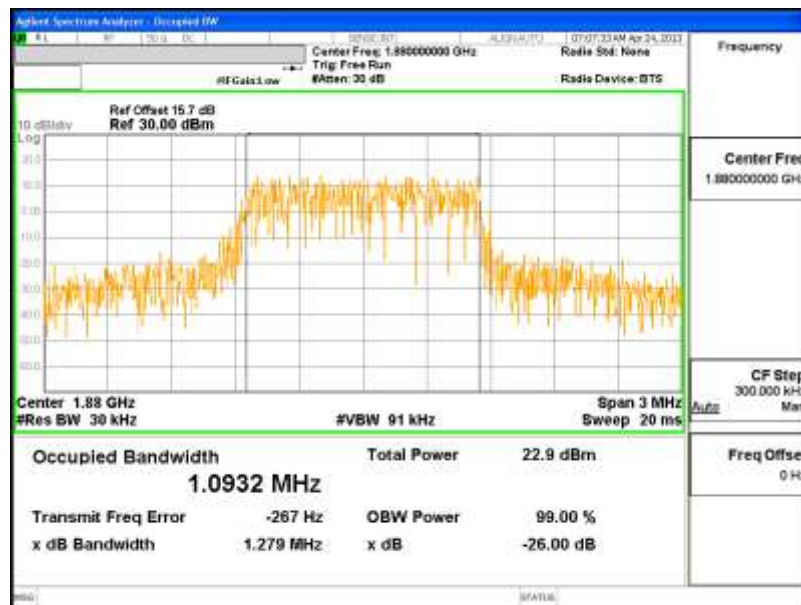
QPSK (1.4 MHz BAND WIDTH)



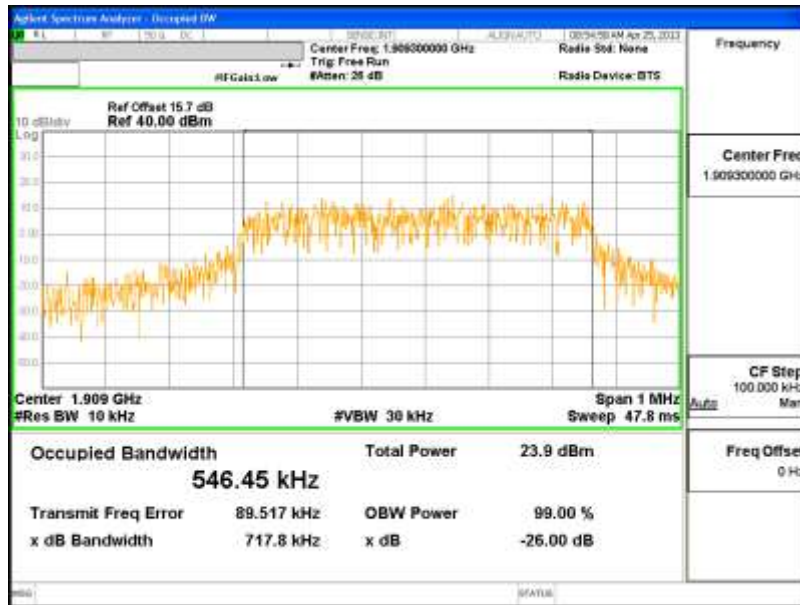
MID CH, RB3_2



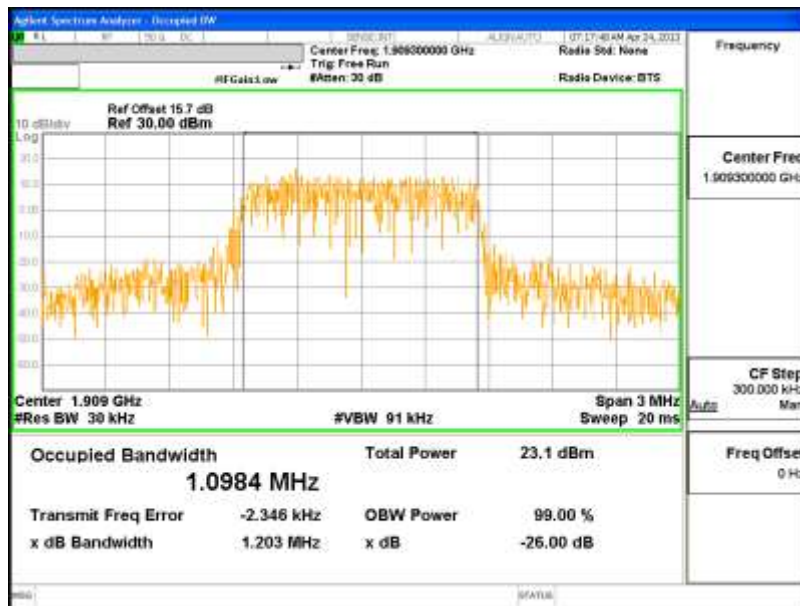
MID CH, RB6_0



HI CH, RB3_2



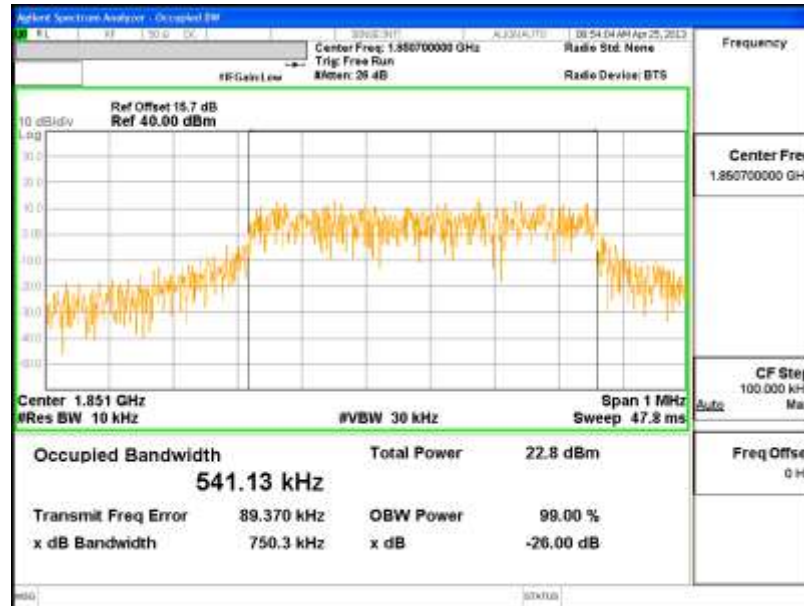
HI CH, RB6_0



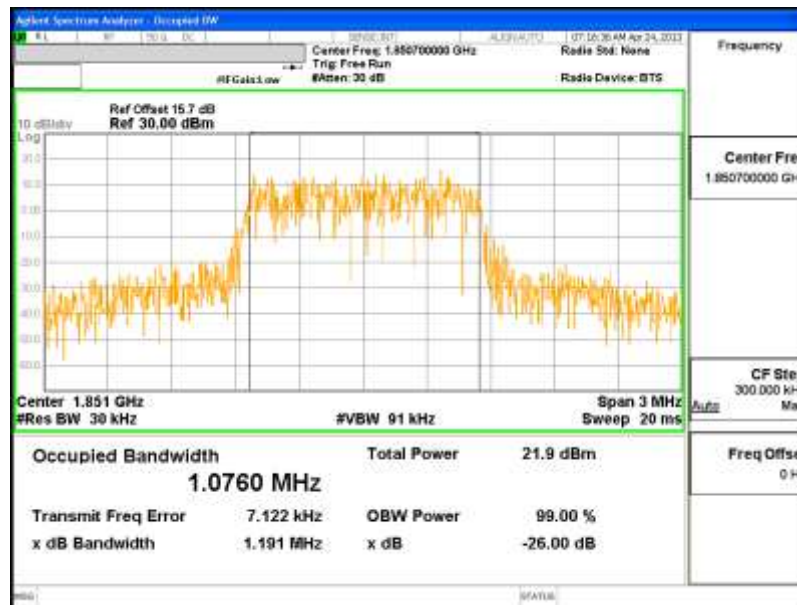
Band 2 (1.4 MHz BAND WIDTH)

LTE 16QAM

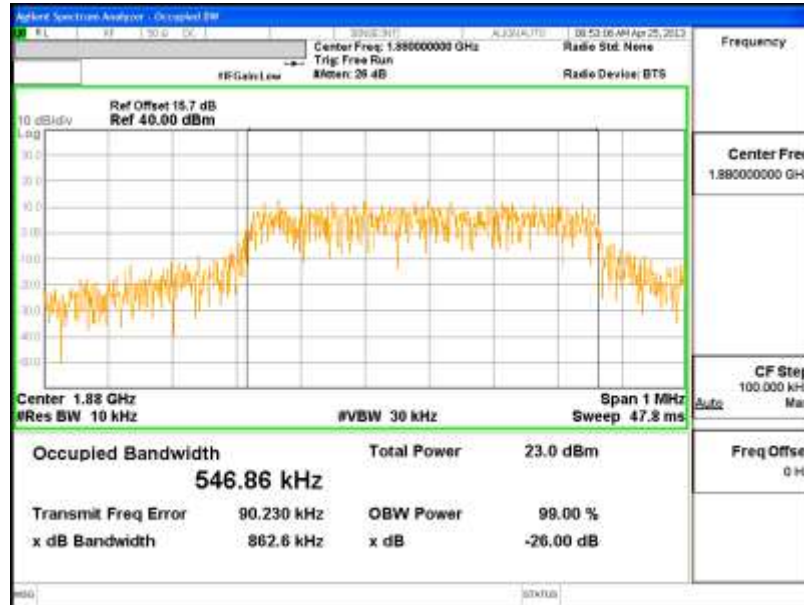
LOW CH, RB3_2



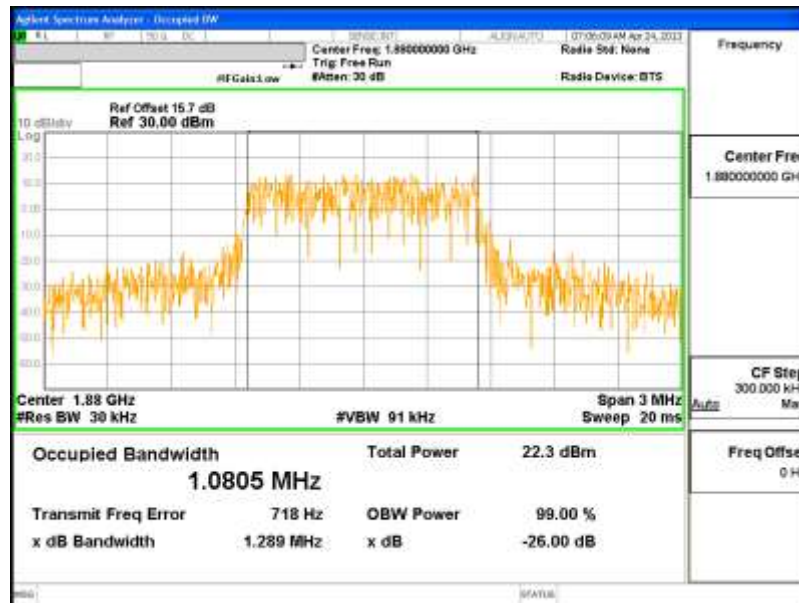
LOW CH, RB6_0



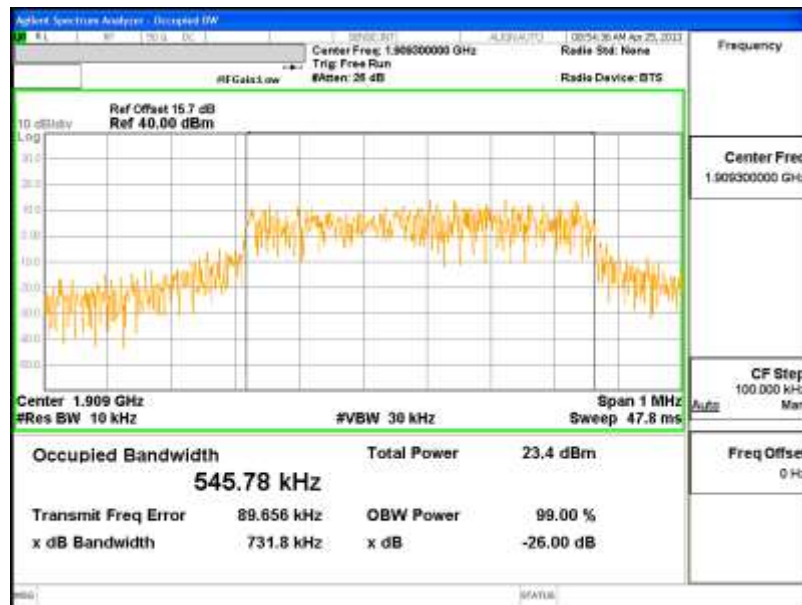
MID CH, RB3_2



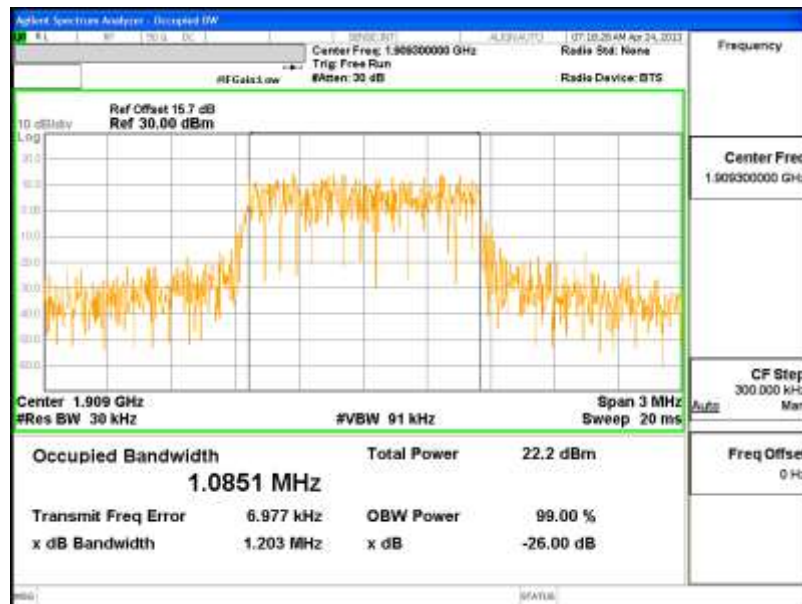
MID CH, RB6_0



HI CH, RB3_2



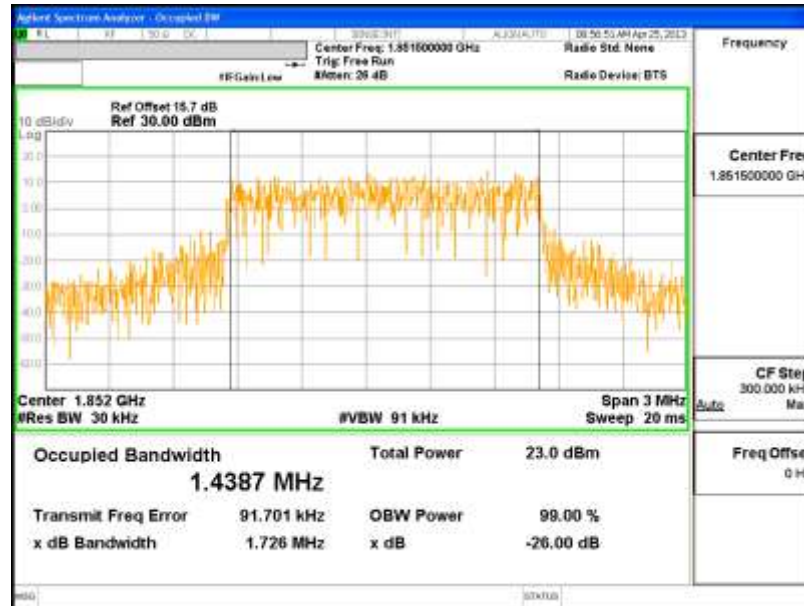
HI CH, RB6_0



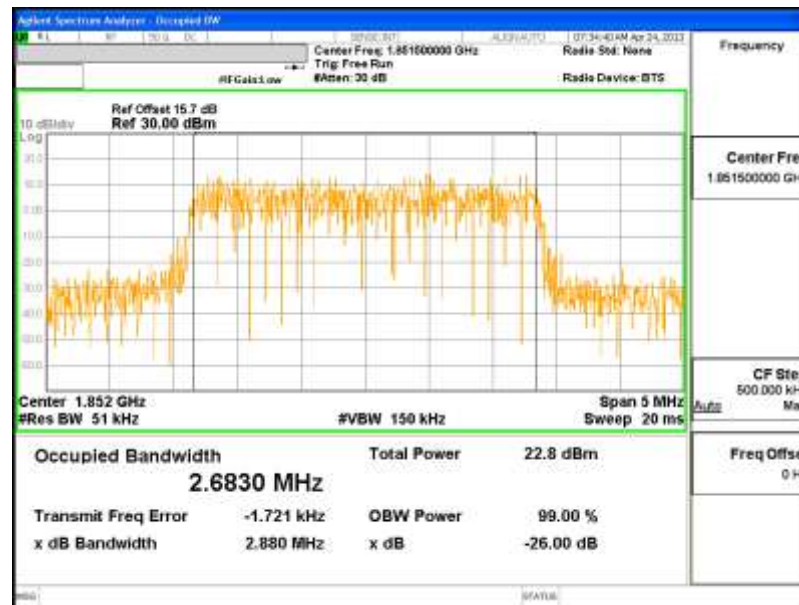
Band 2 (3.0 MHz BAND WIDTH)

LTE QPSK

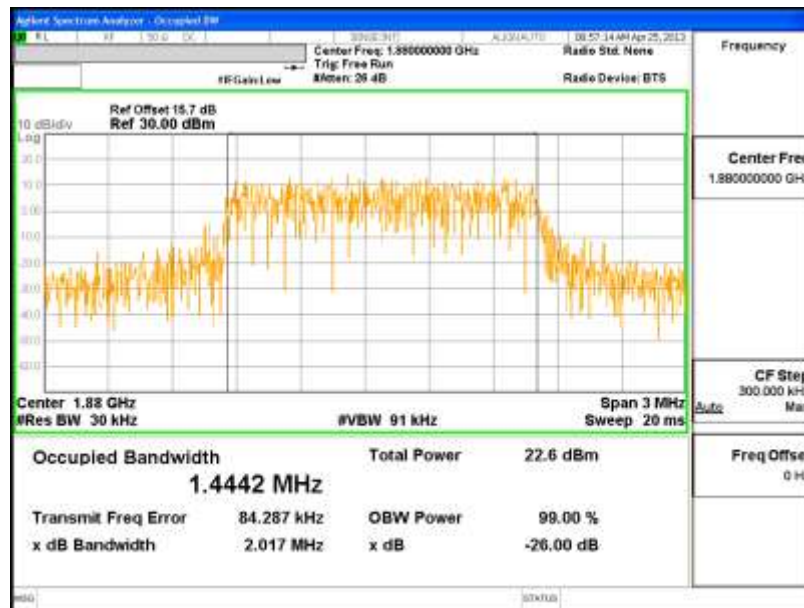
LOW CH, RB8_4



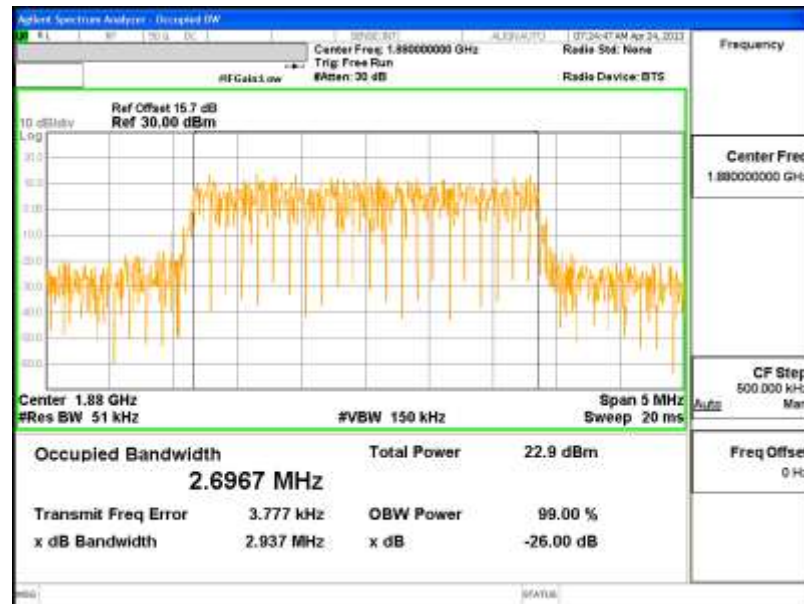
LOW CH, RB15_0



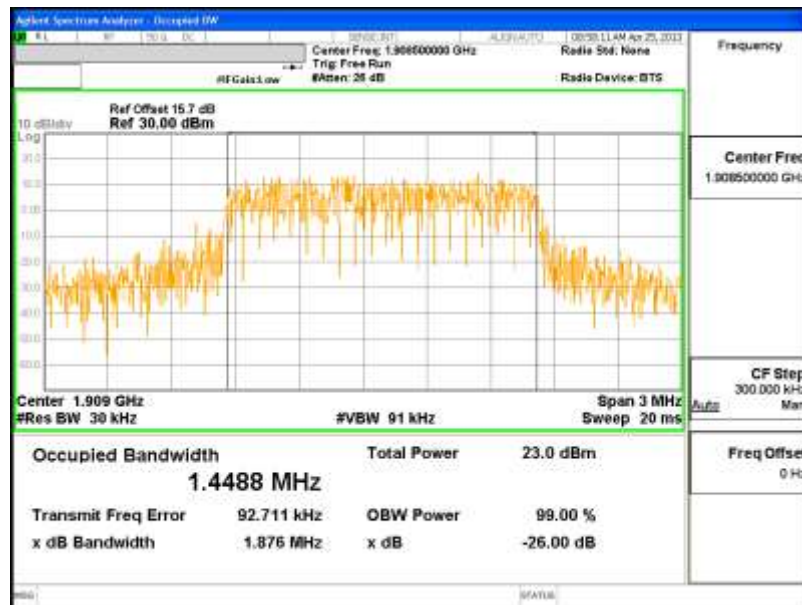
MID CH, RB8_4



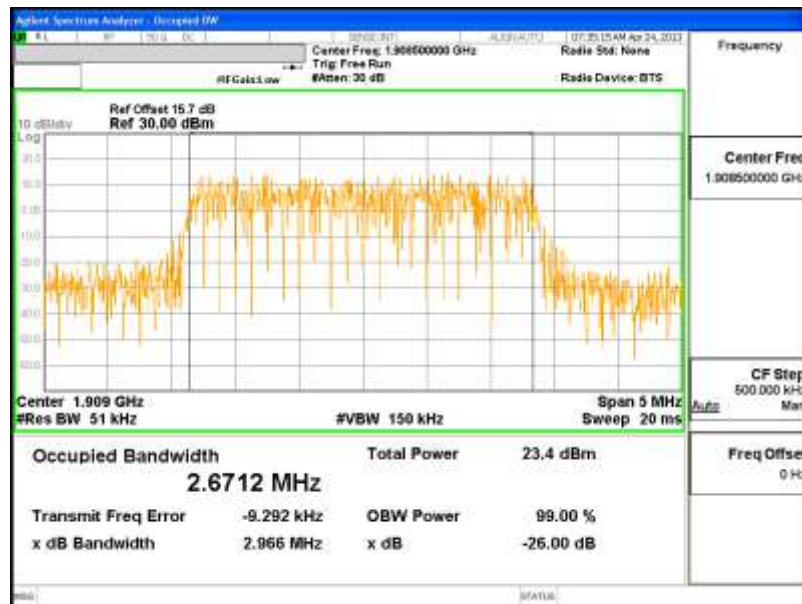
MID CH, RB15_0



HI CH, RB8_4



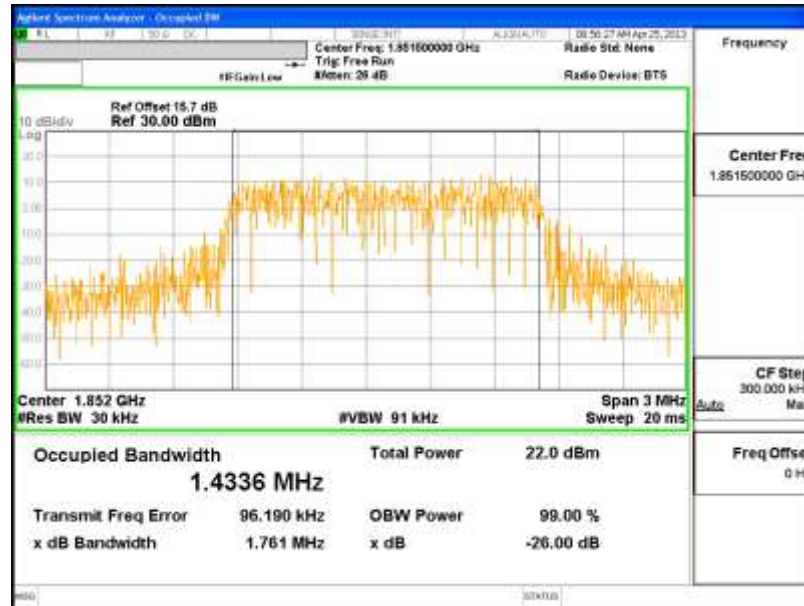
HI CH, RB15_0



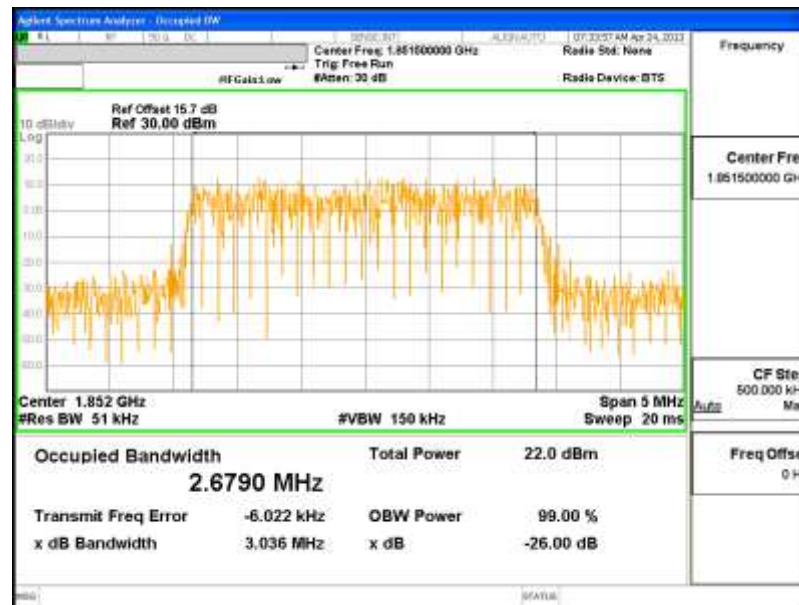
Band 2 (3.0 MHz BAND WIDTH)

LTE 16QAM

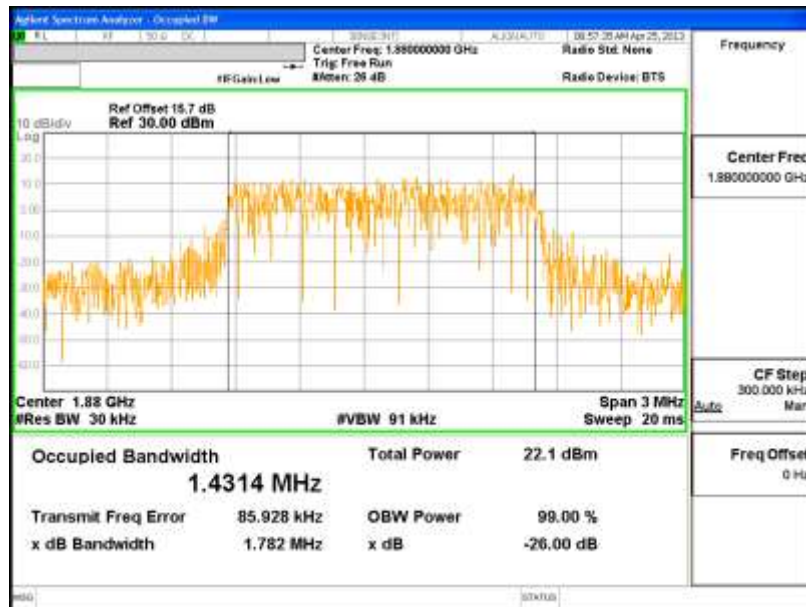
LOW CH, RB8_4



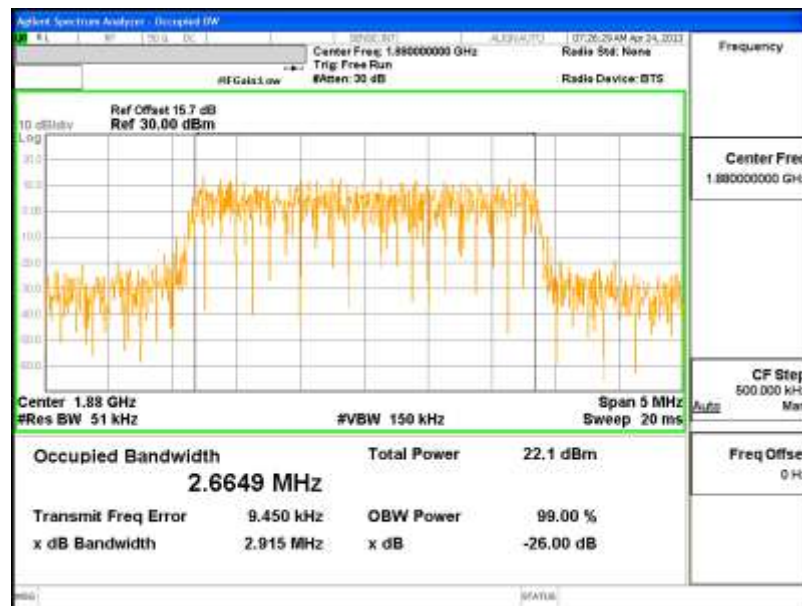
LOW CH, RB15_0



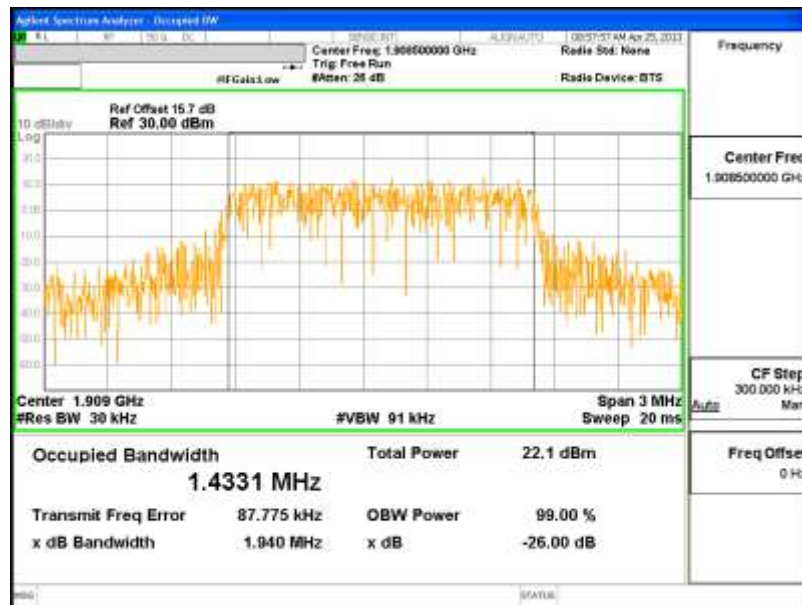
MID CH, RB8_4



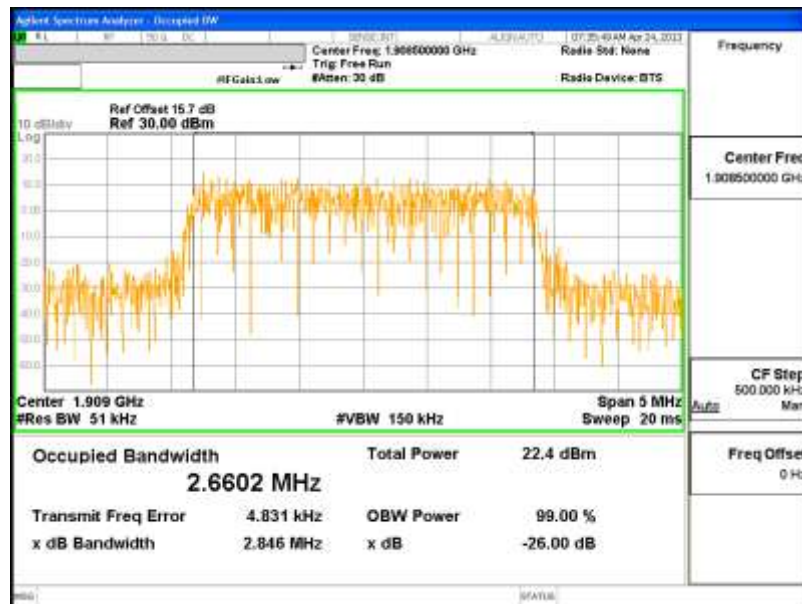
MID CH, RB15_0



HI CH, RB8_4



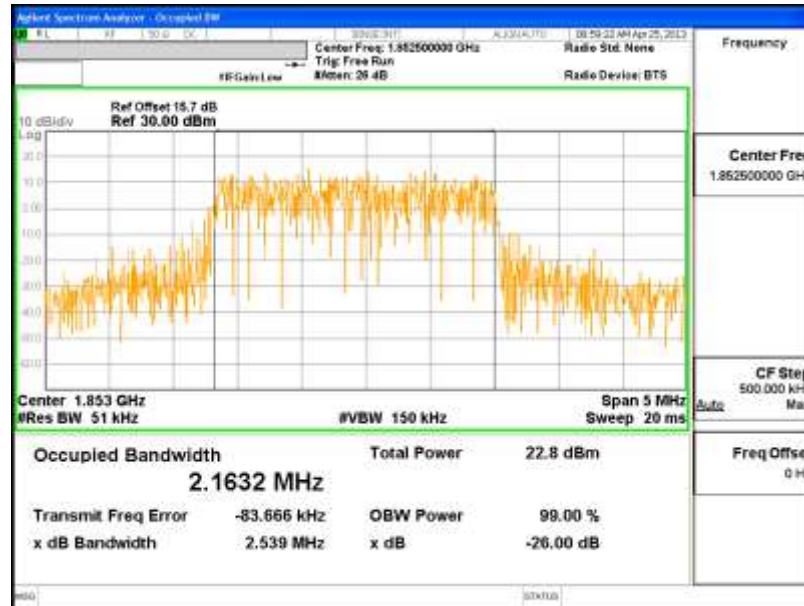
HI CH, RB15_0



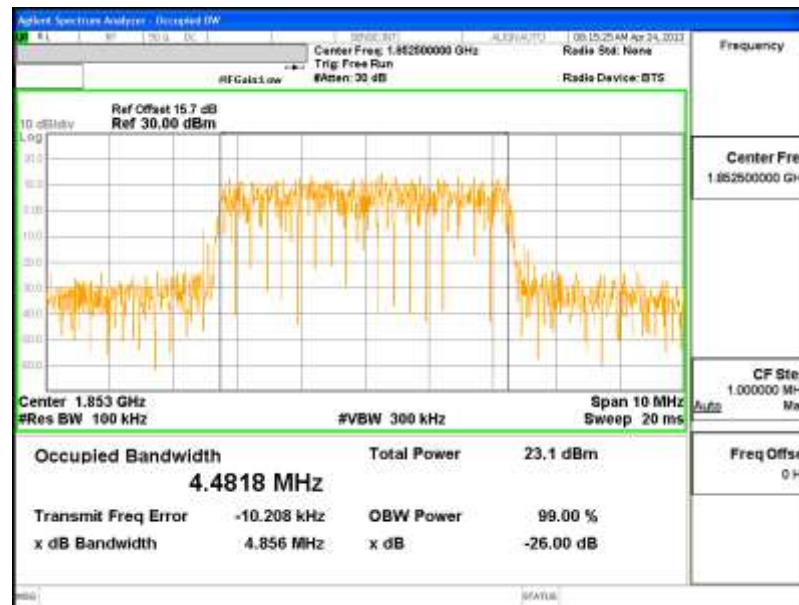
Band 2 (5.0 MHz BAND WIDTH)

LTE QPSK

LOW CH, RB12_6



LOW CH, RB25_0



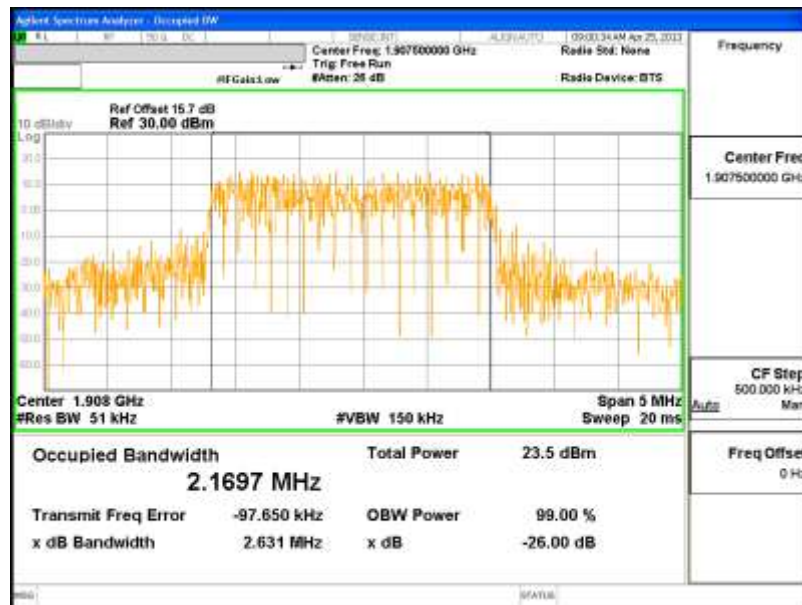
MID CH, RB12_6



MID CH, RB25_0



HI CH, RB12_6



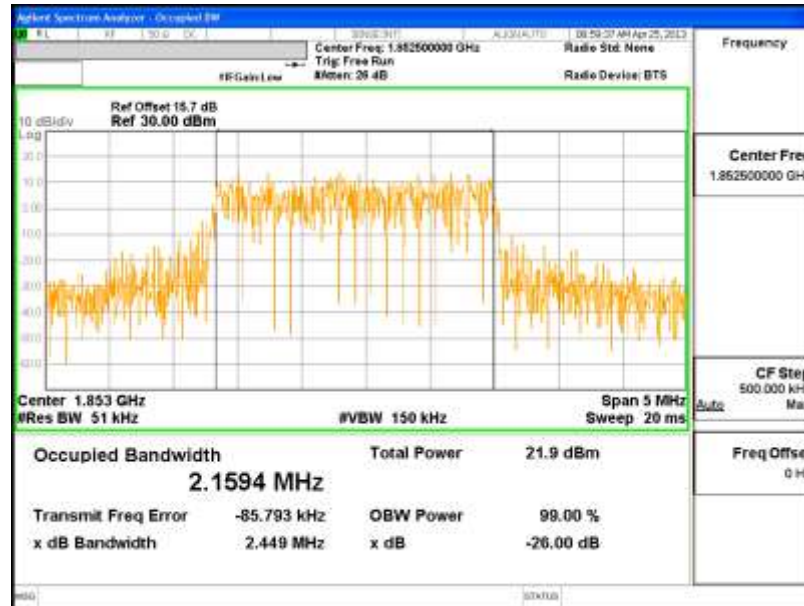
HI CH, RB25_0



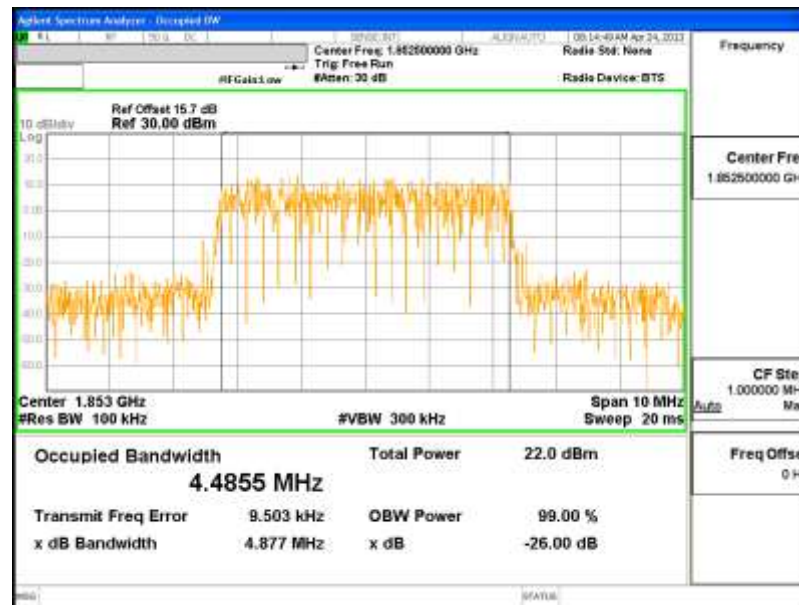
Band 2 (5 MHz BAND WIDTH)

LTE 16QAM

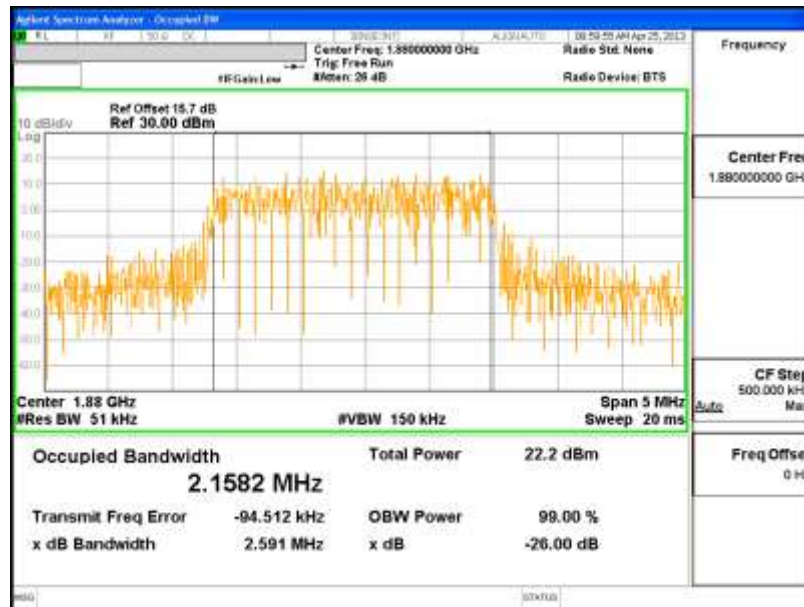
LOW CH, RB12_6



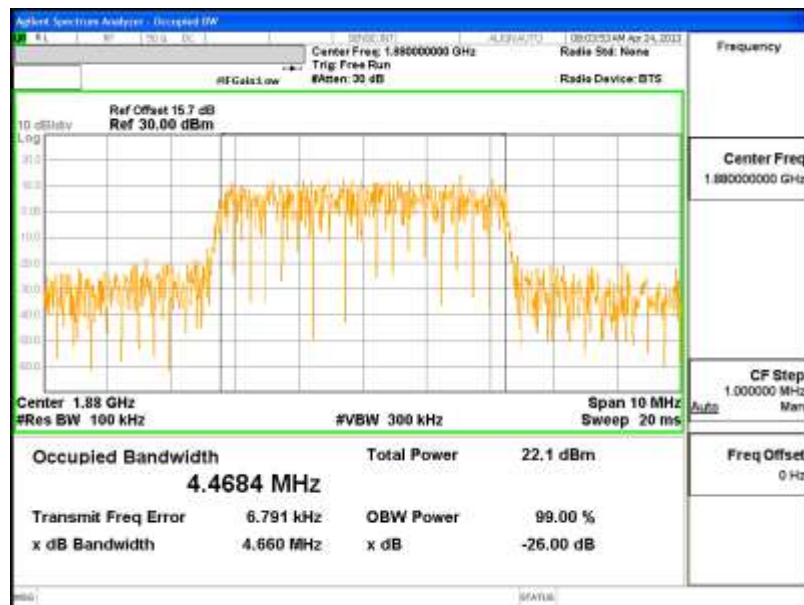
LOW CH, RB25_0



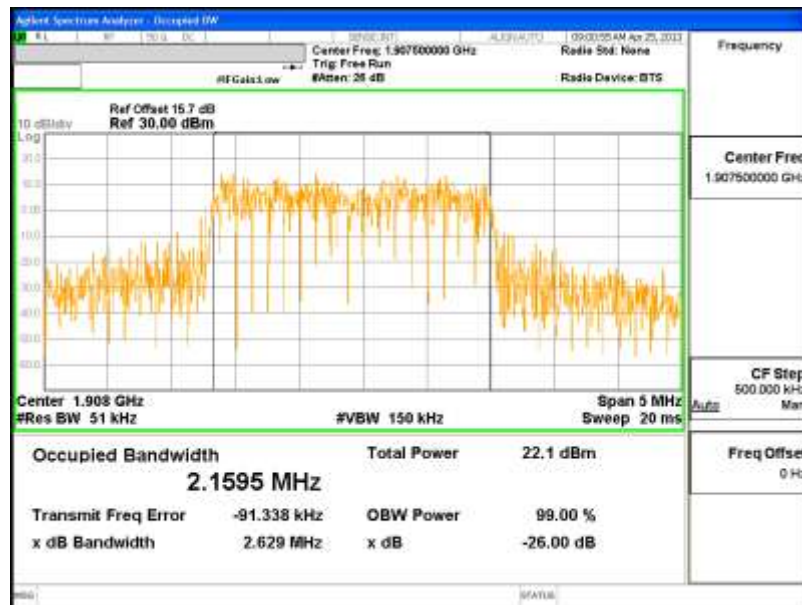
MID CH, RB12_6



MID CH, RB25_0



HI CH, RB12_6



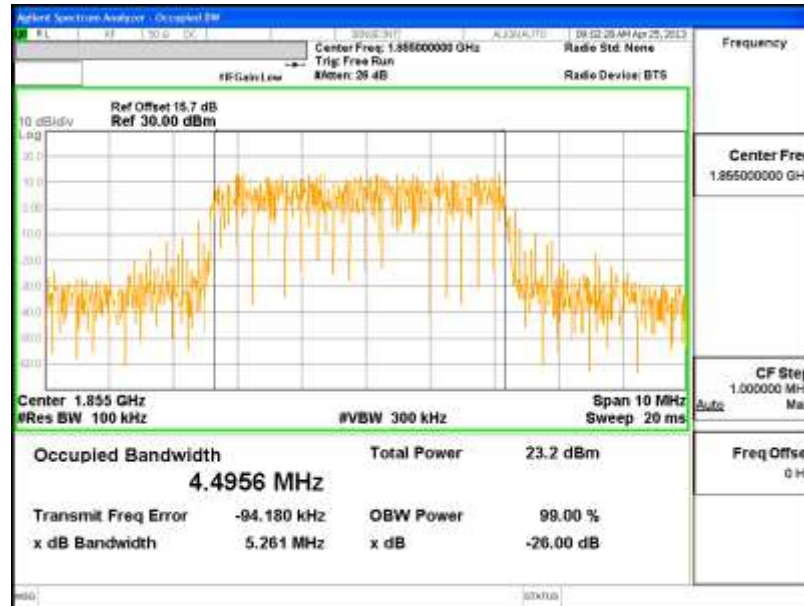
HI CH, RB25_0



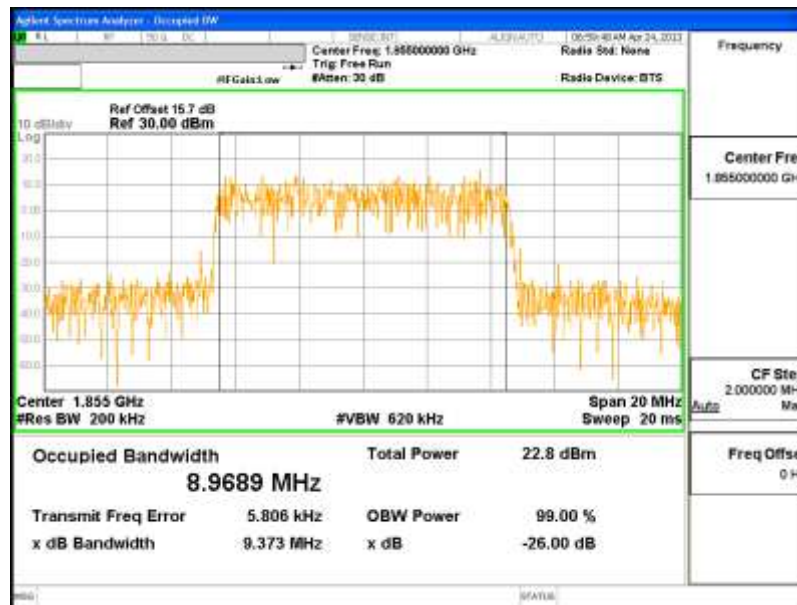
Band 2 (10.0 MHz BAND WIDTH)

LTE QPSK

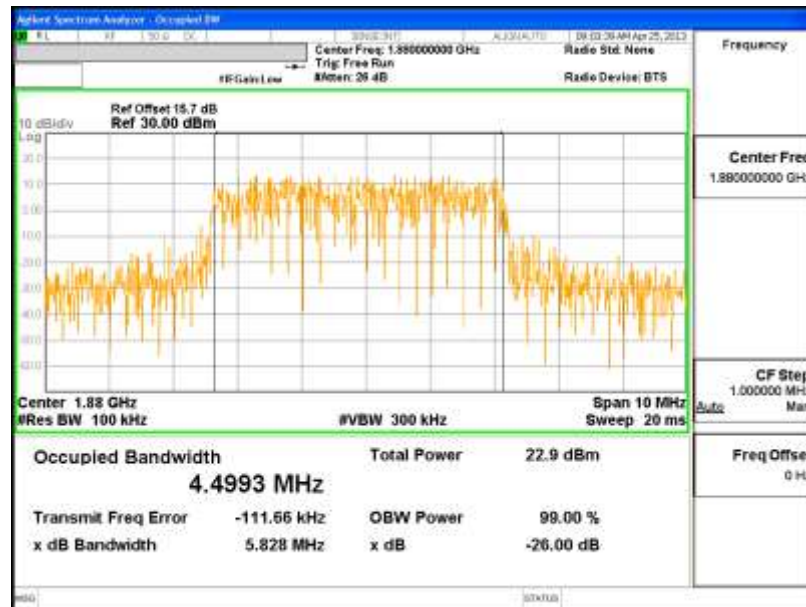
LOW CH, RB25_12



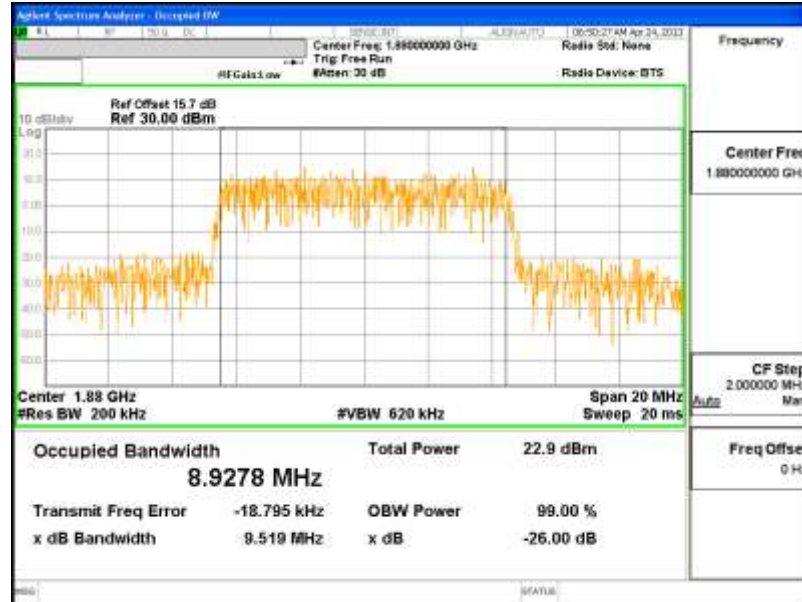
LOW CH, RB50_0



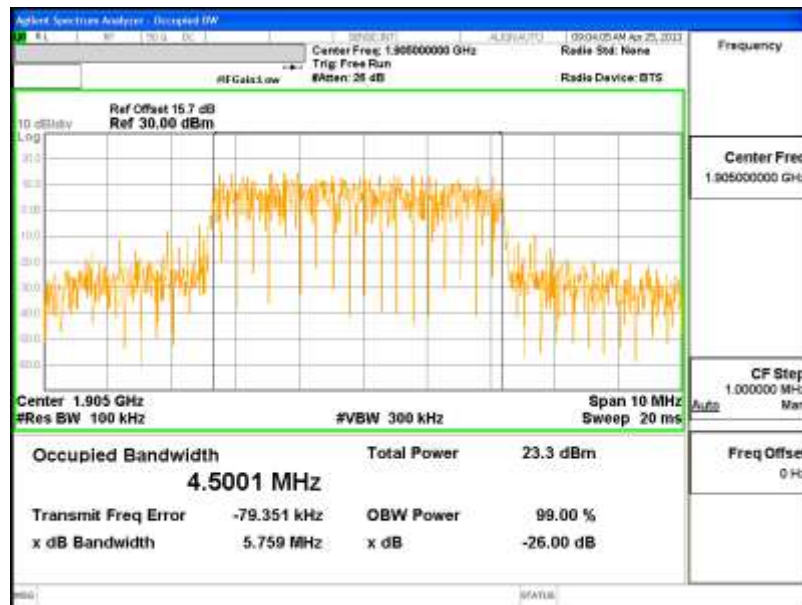
MID CH, RB25_12



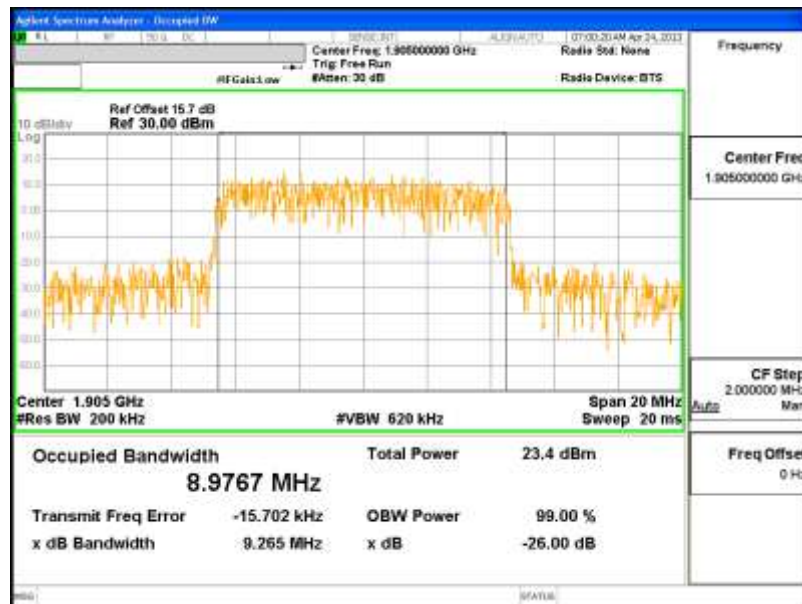
MID CH, RB50_0



HI CH, RB25_12



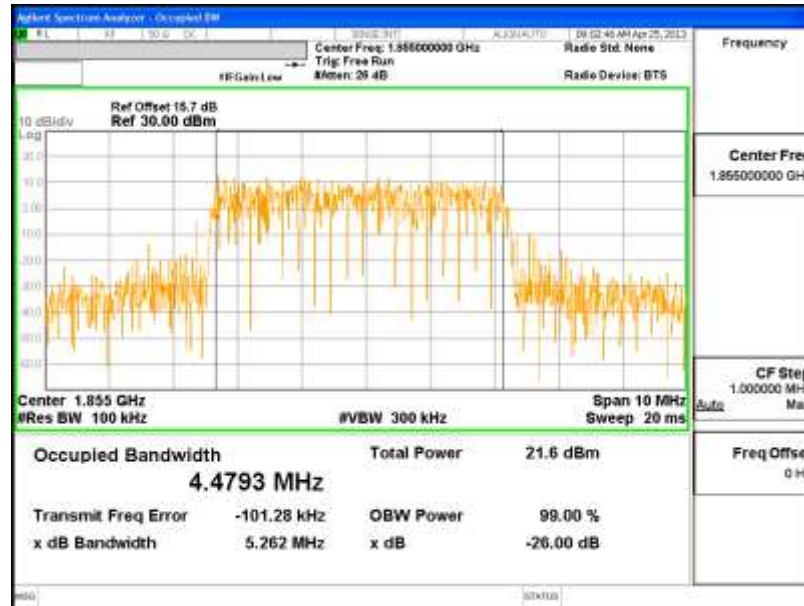
HI CH, RB50_0



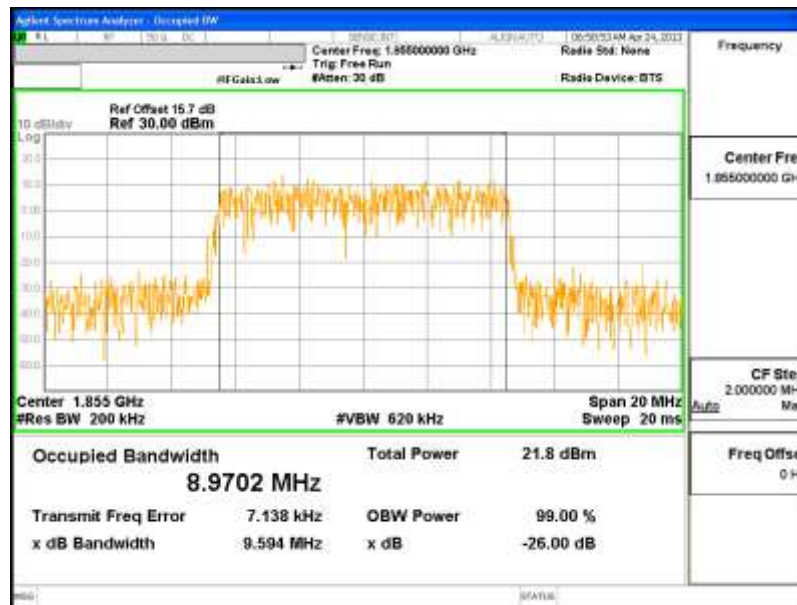
Band 2 (10 MHz BAND WIDTH)

LTE 16QAM

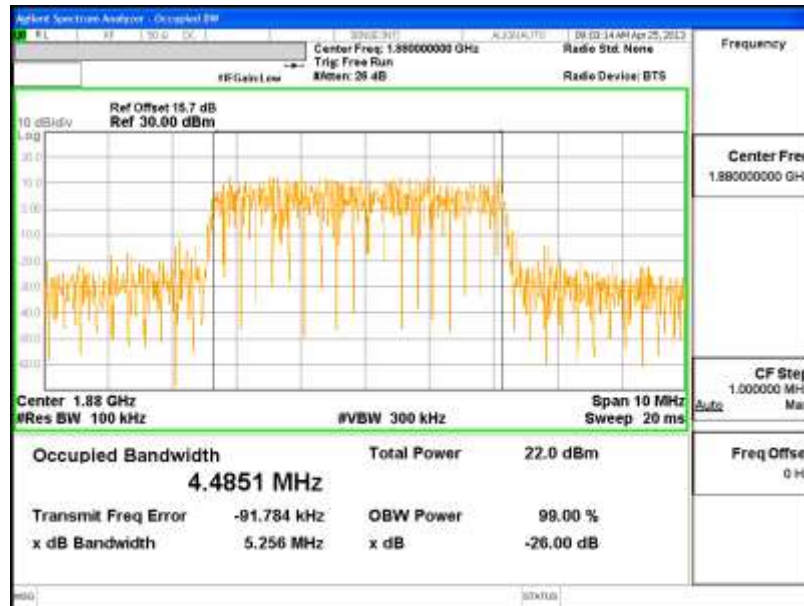
LOW CH, RB25_12



LOW CH, RB50_0



MID CH, RB25_12



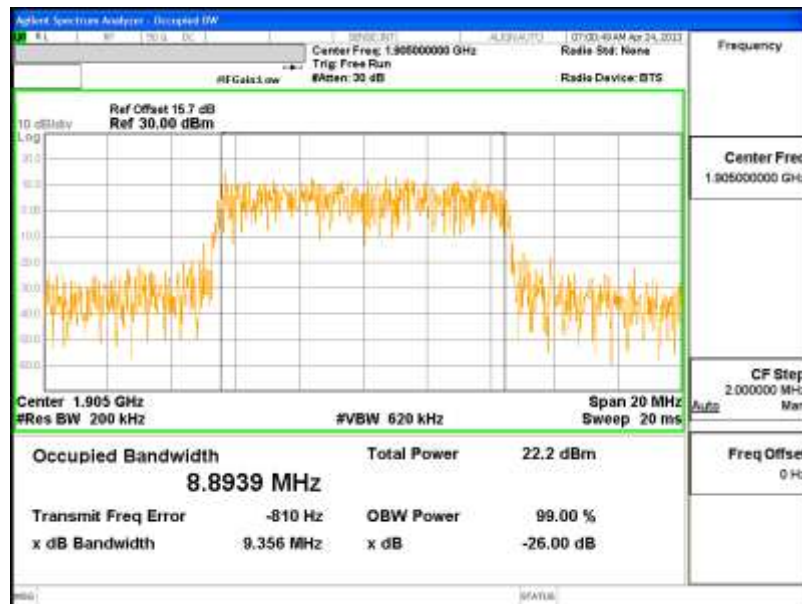
MID CH, RB50_0

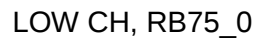
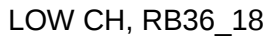


HI CH, RB25_12

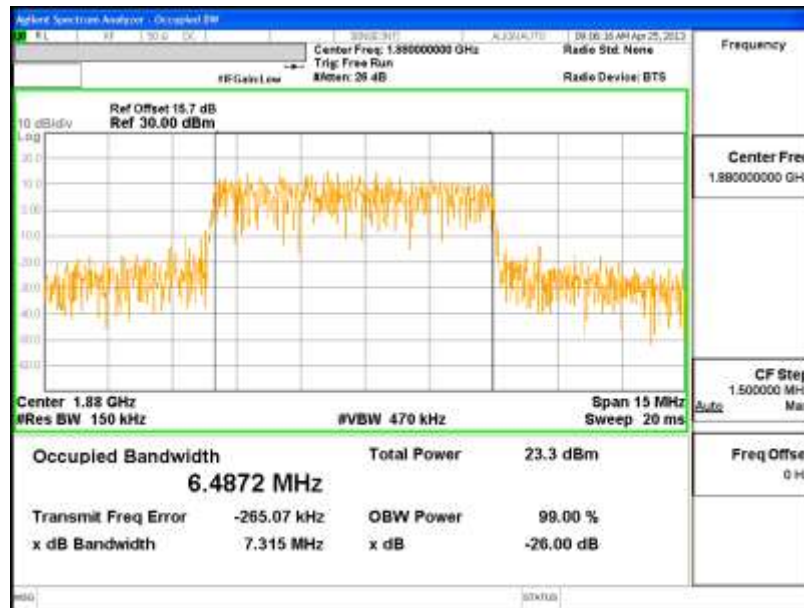


HI CH, RB50_0

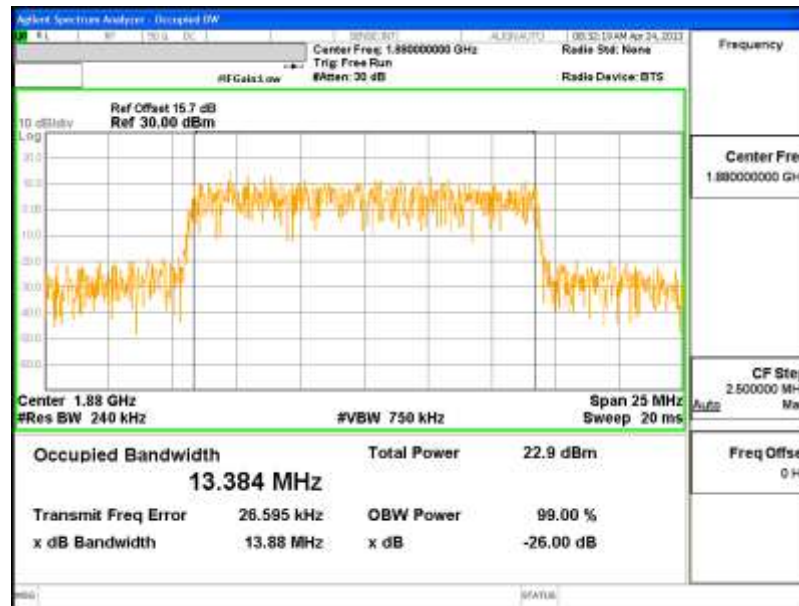




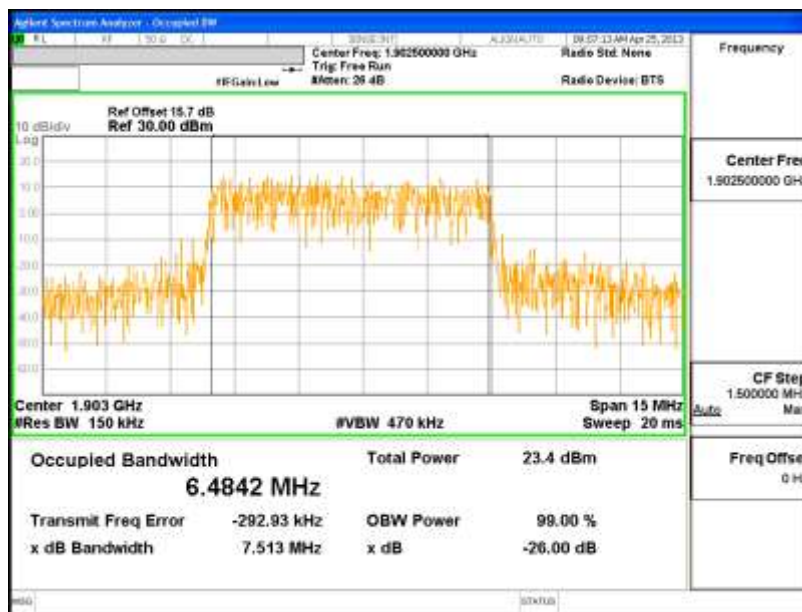
MID CH, RB36_18



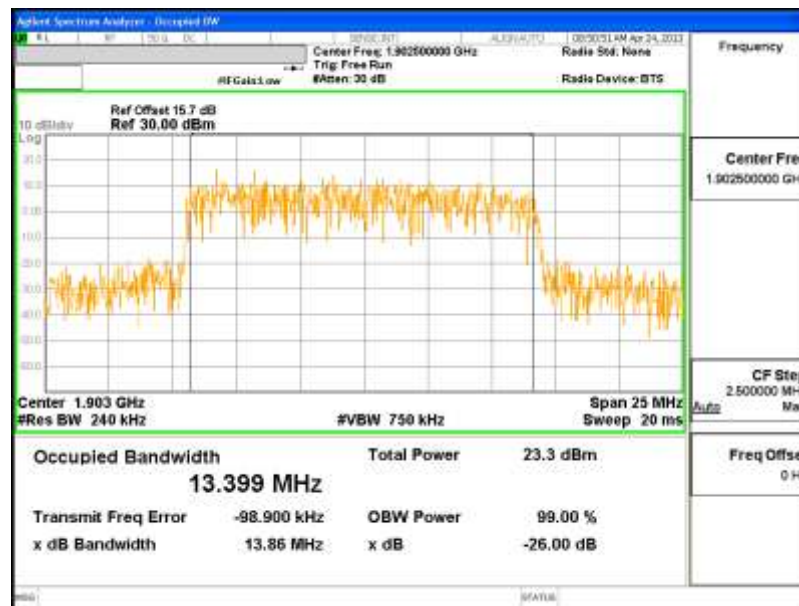
MID CH, RB75_0



HIGH CH, RB36_18

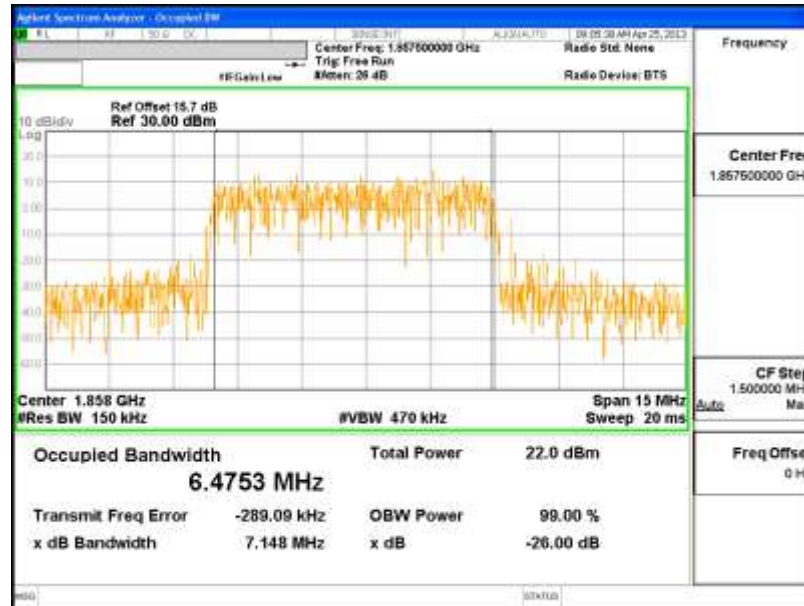


HIGH CH, RB75_0

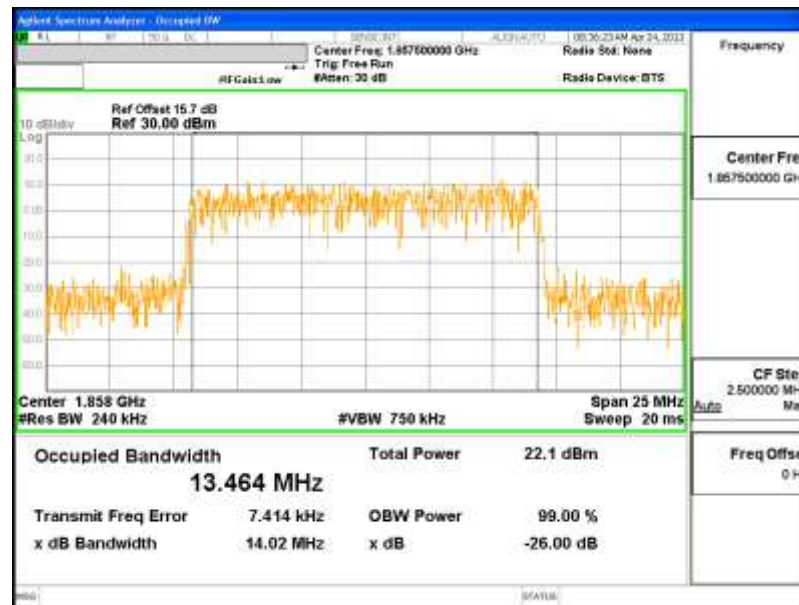


Band 2 (15.0 MHz BAND WIDTH)

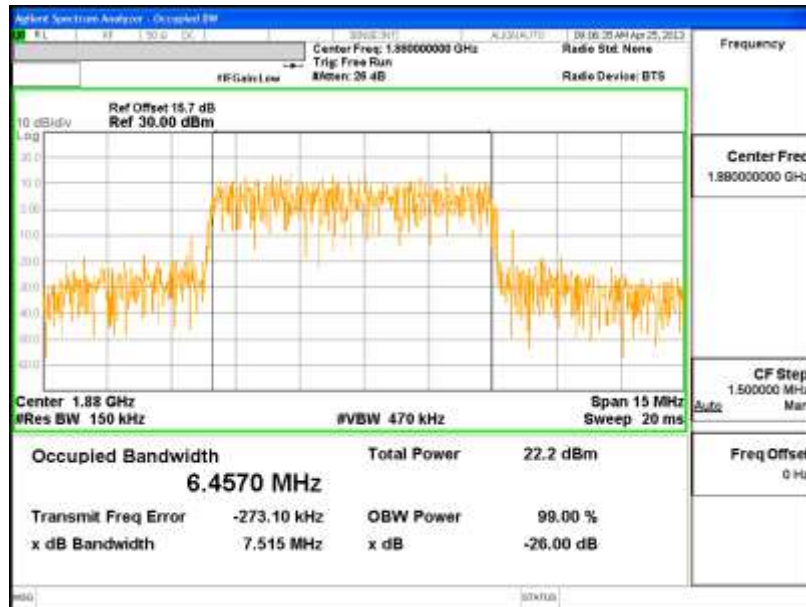
LOW CH, RB36_18



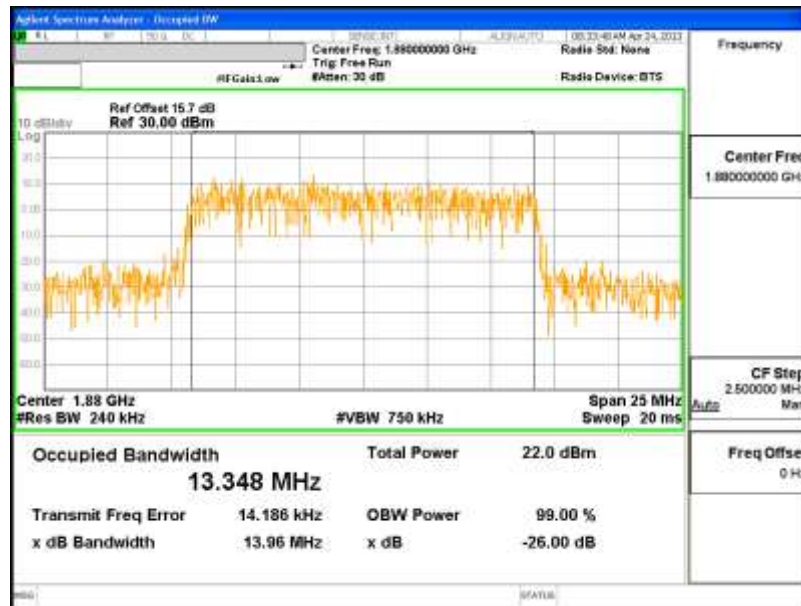
LOW CH, RB75_0



MID CH, RB36_18



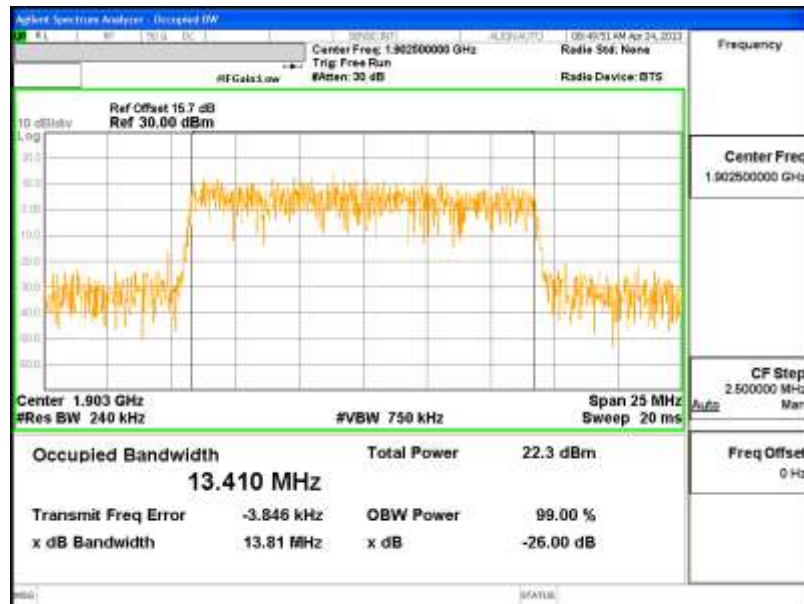
MID CH, RB75_0



HIGH CH, RB36_18



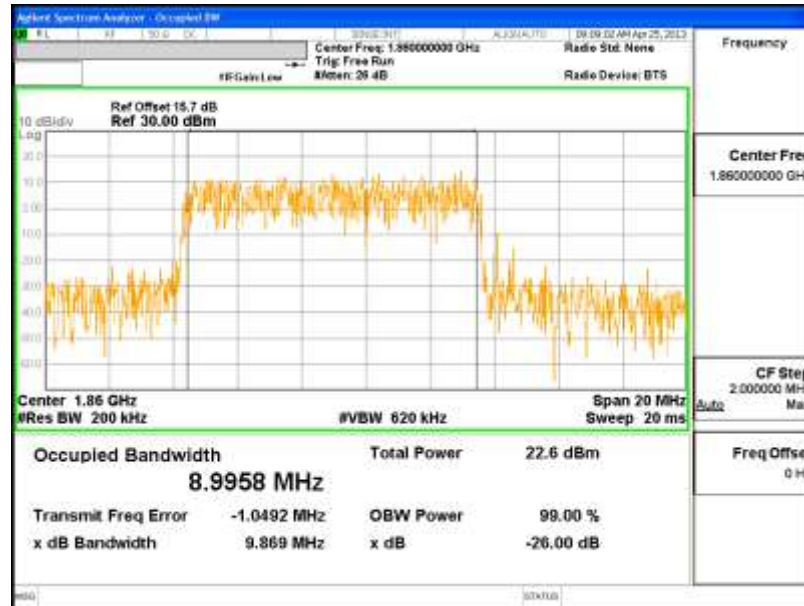
HIGH CH, RB75_0



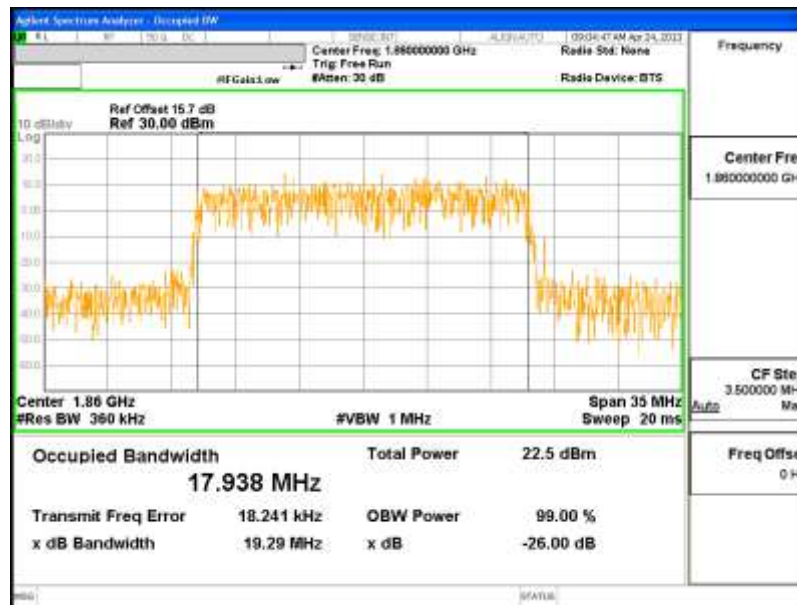
Band 2 (20.0 MHz BAND WIDTH)

LTE QPSK

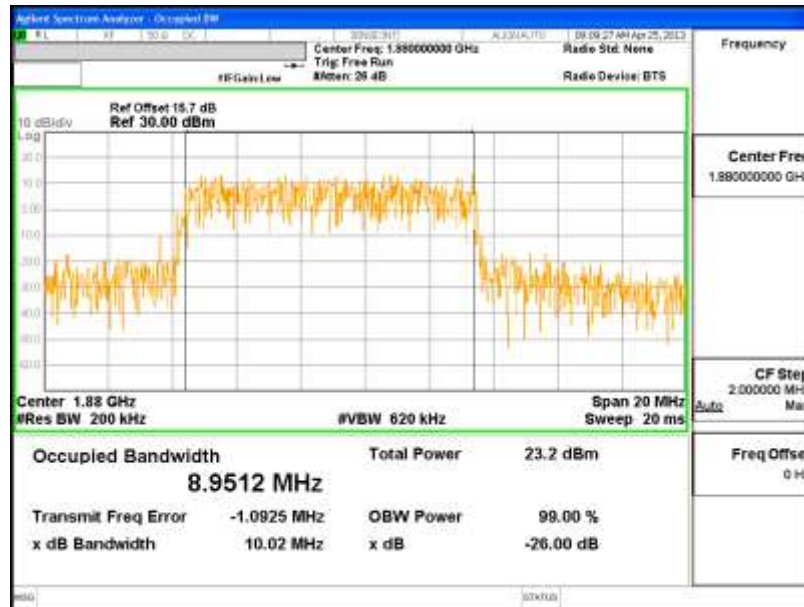
LOW CH, RB50_19



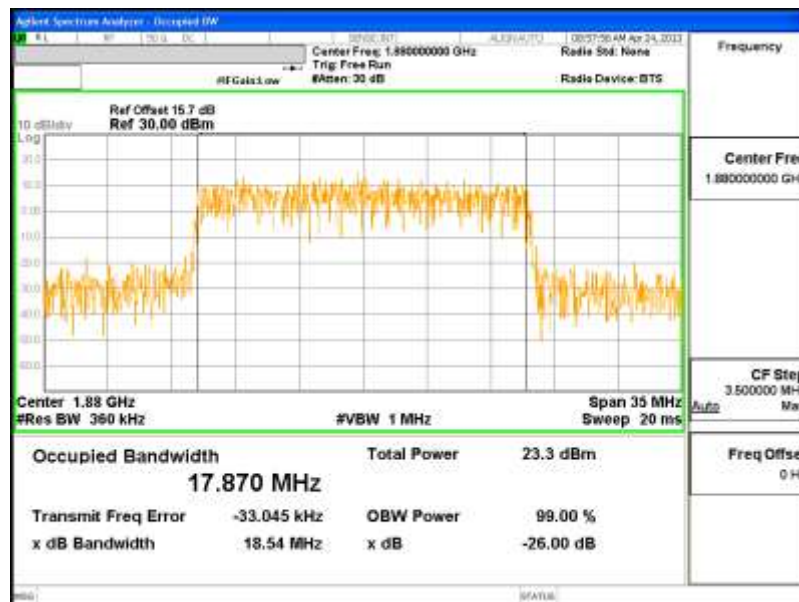
LOW CH, RB100_0



MID CH, RB50_19



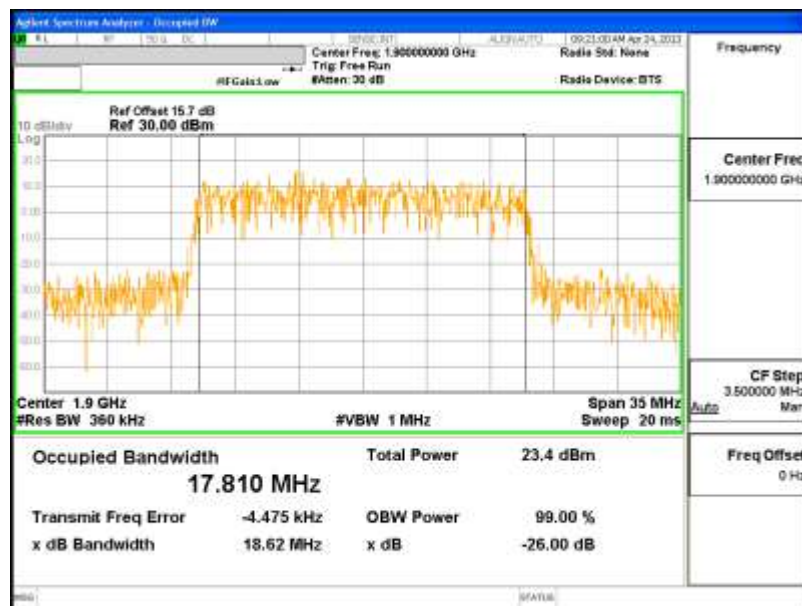
MID CH, RB100_0



HIGH CH, RB50_19



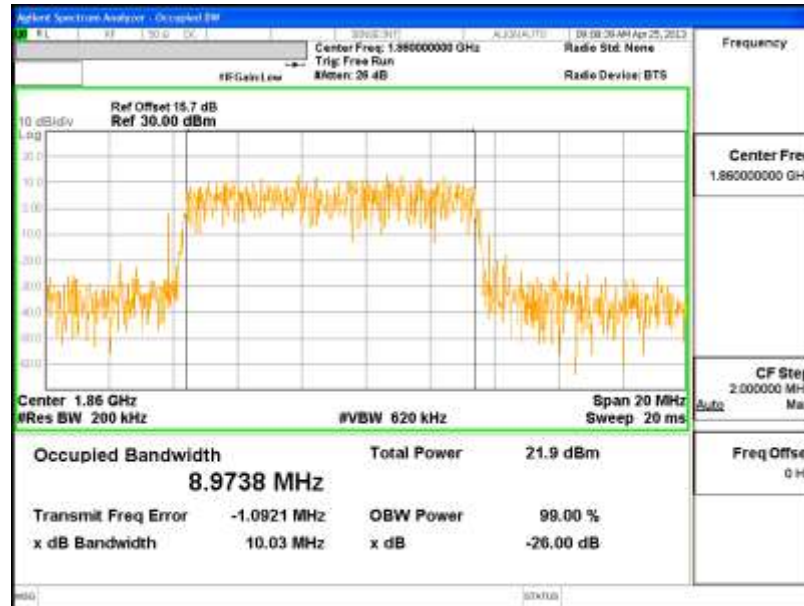
HIGH CH, RB100_0



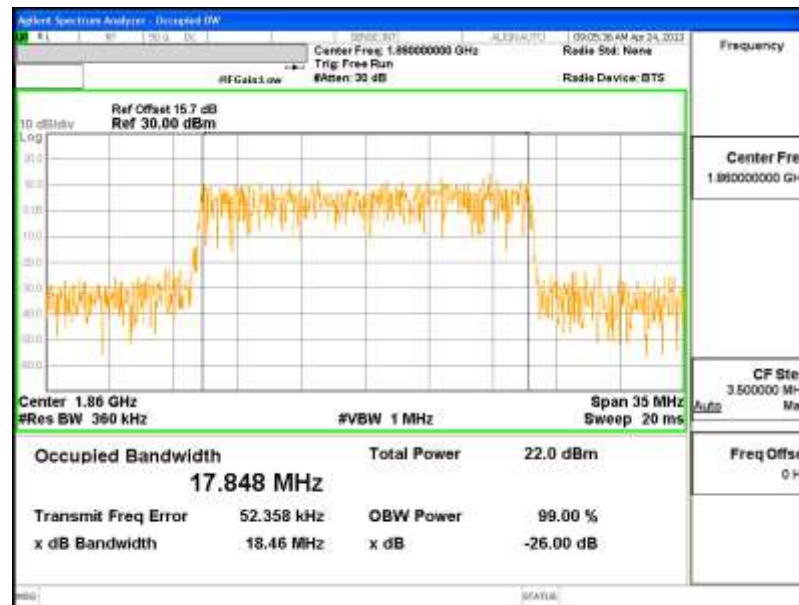
Band 2 (20.0 MHz BAND WIDTH)

LTE 16QAM

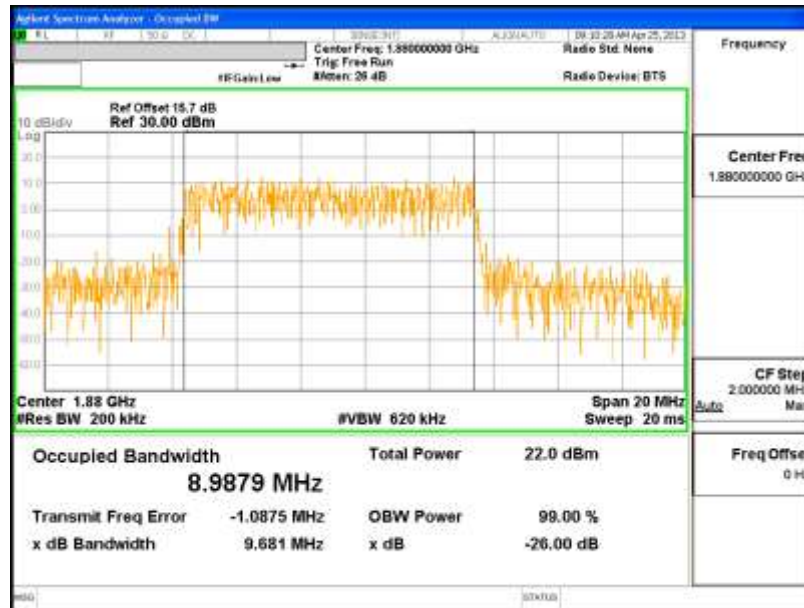
LOW CH, RB50_19



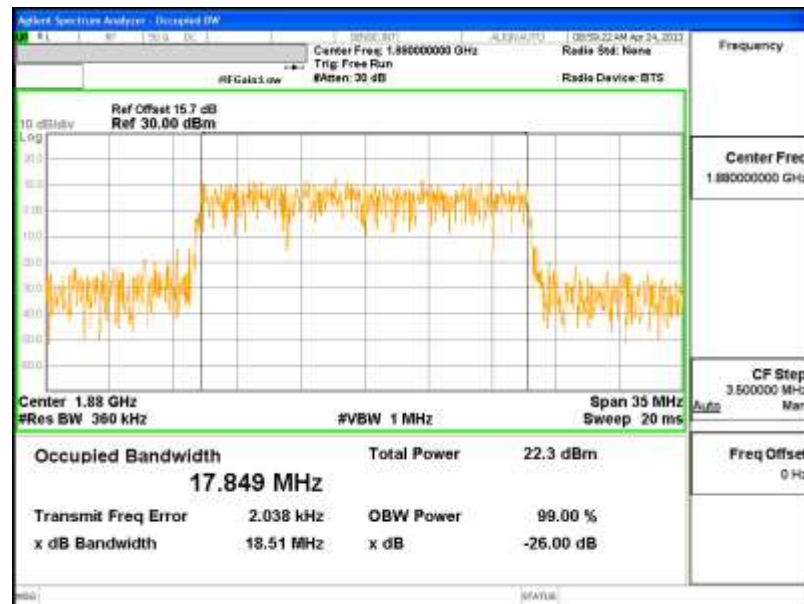
LOW CH, RB100_0



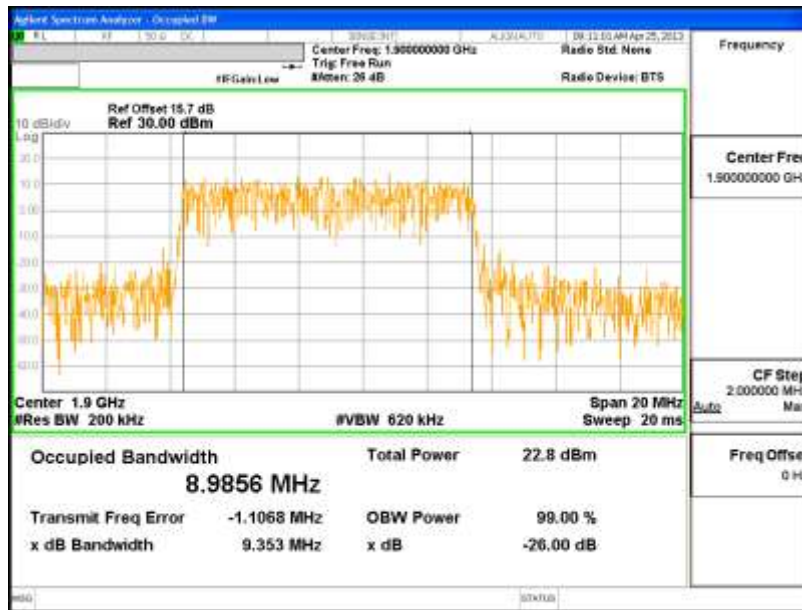
MID CH, RB50_19



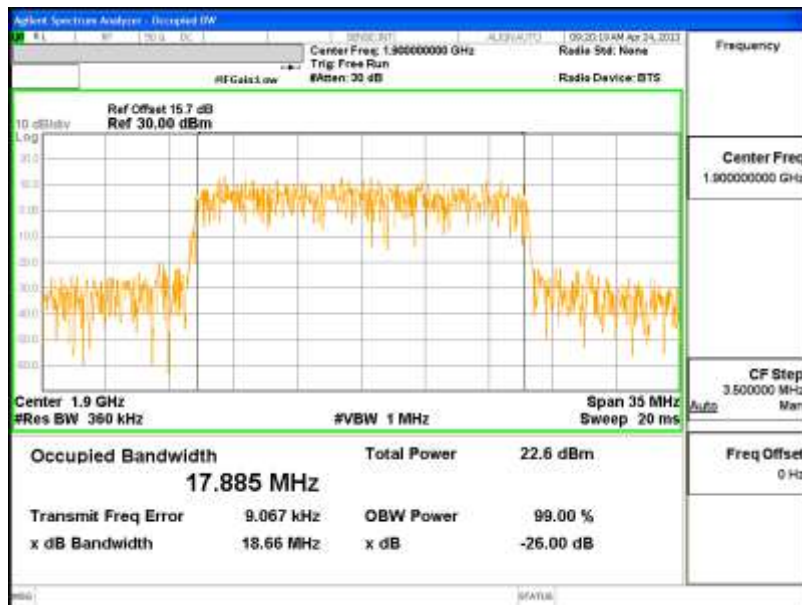
MID CH, RB100_0



HIGH CH, RB50_19

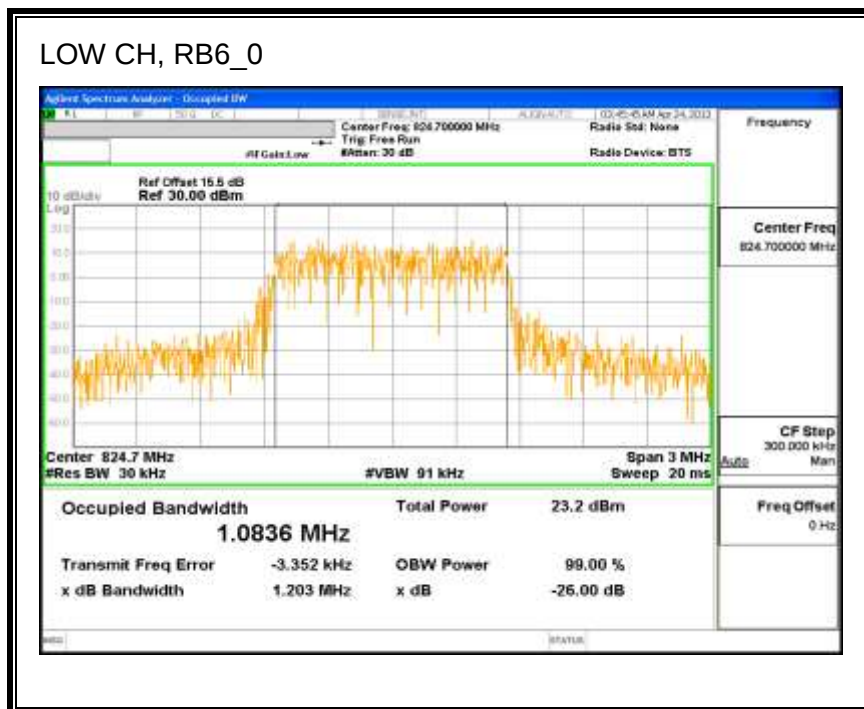
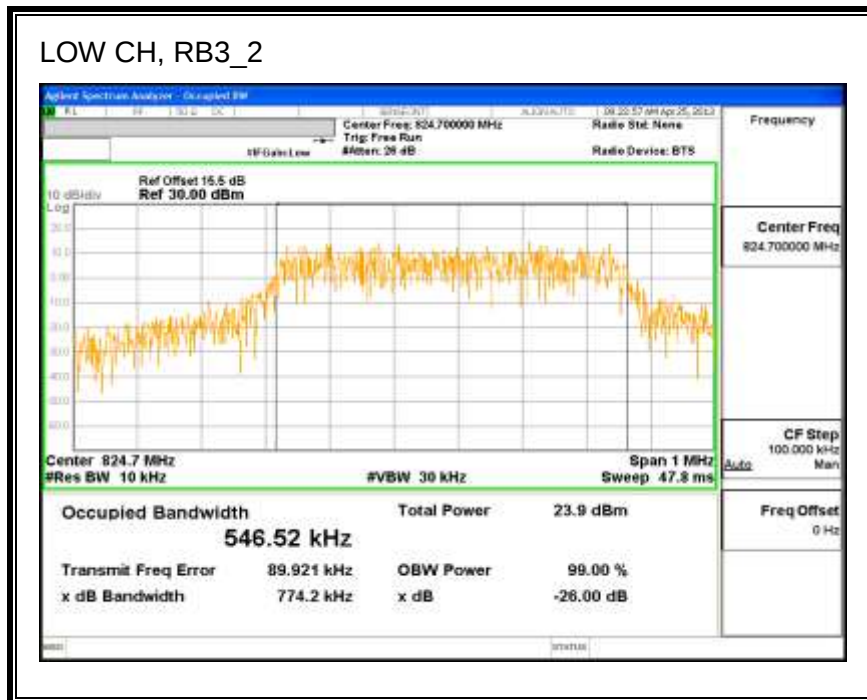


HIGH CH, RB100_0

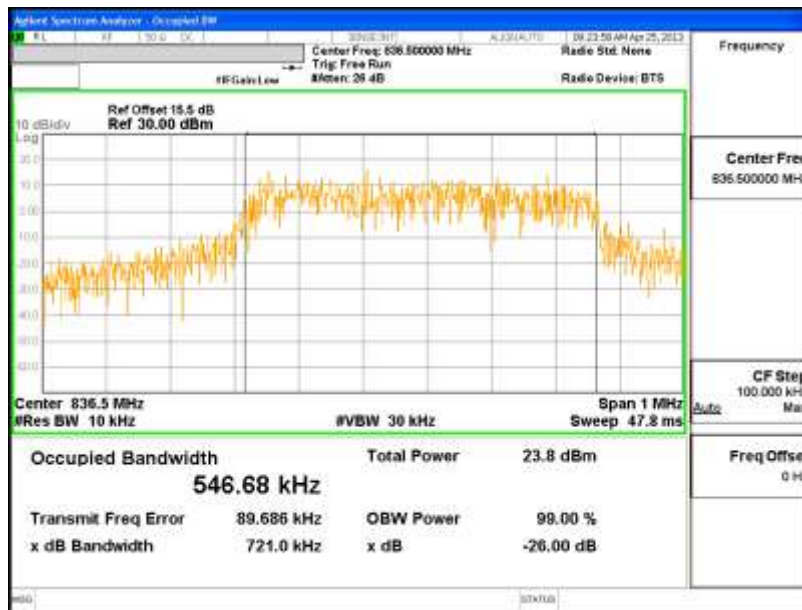


8.1.2. LTE BAND 5

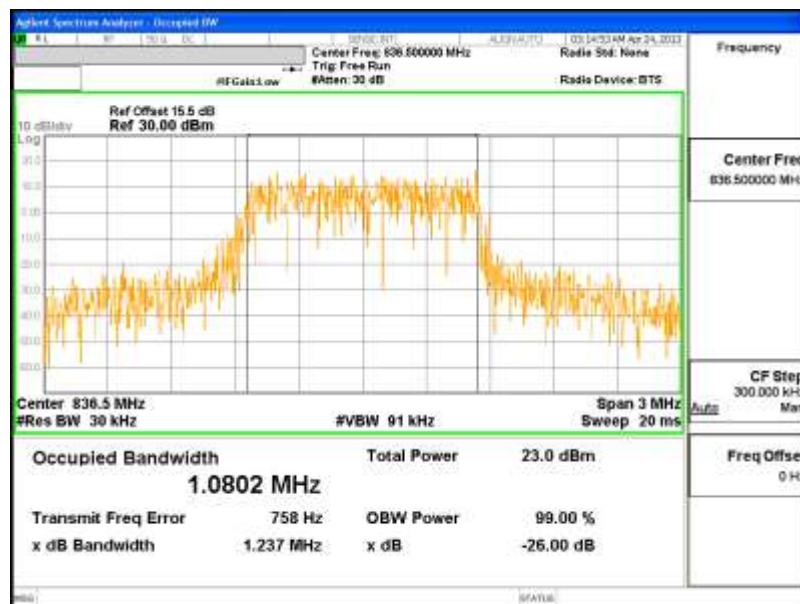
QPSK (1.4 MHz BAND WIDTH)



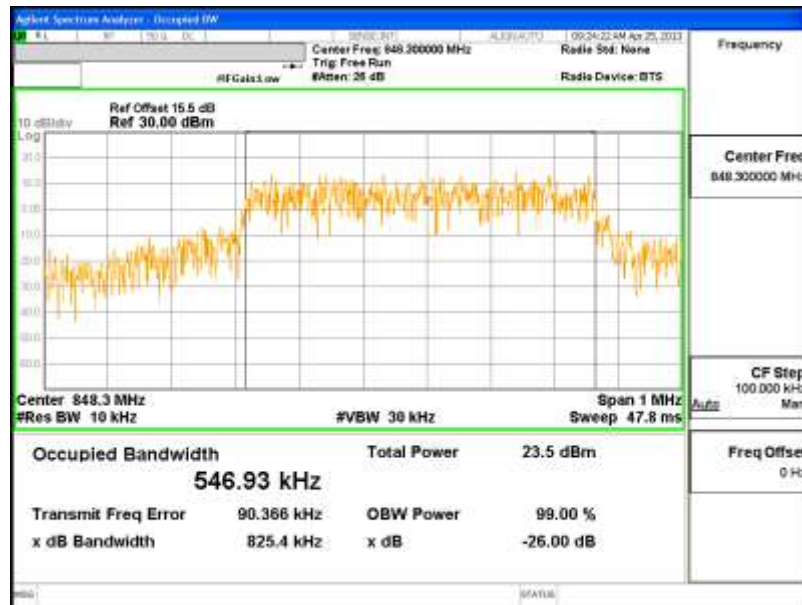
MID CH, RB3_2



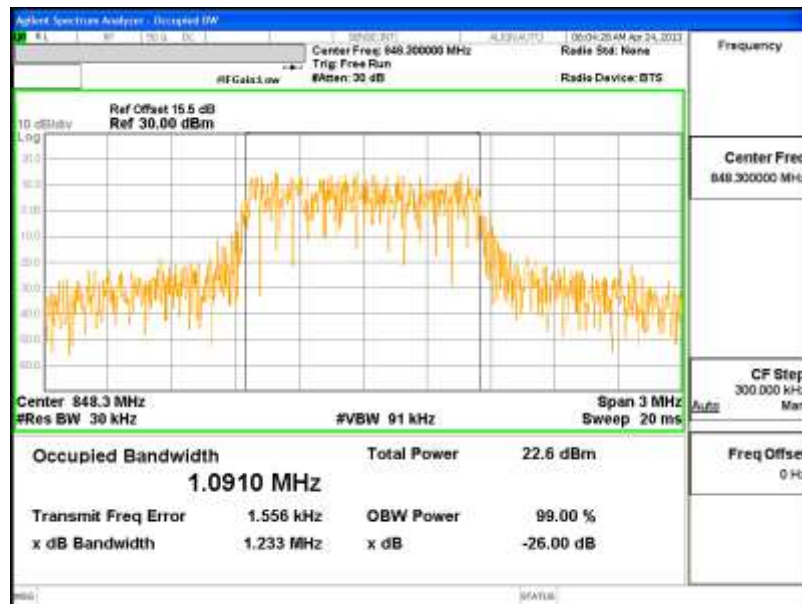
MID CH, RB6_0



HI CH, RB3_2



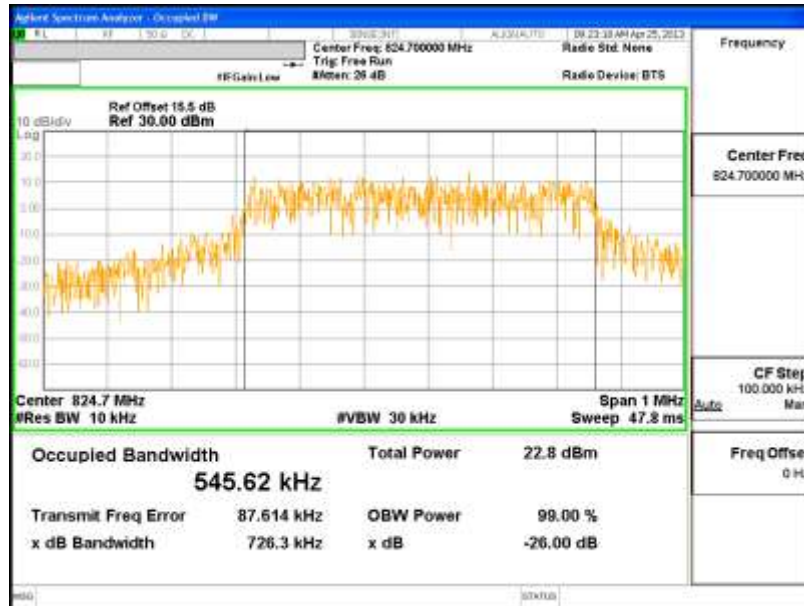
HI CH, RB6_0



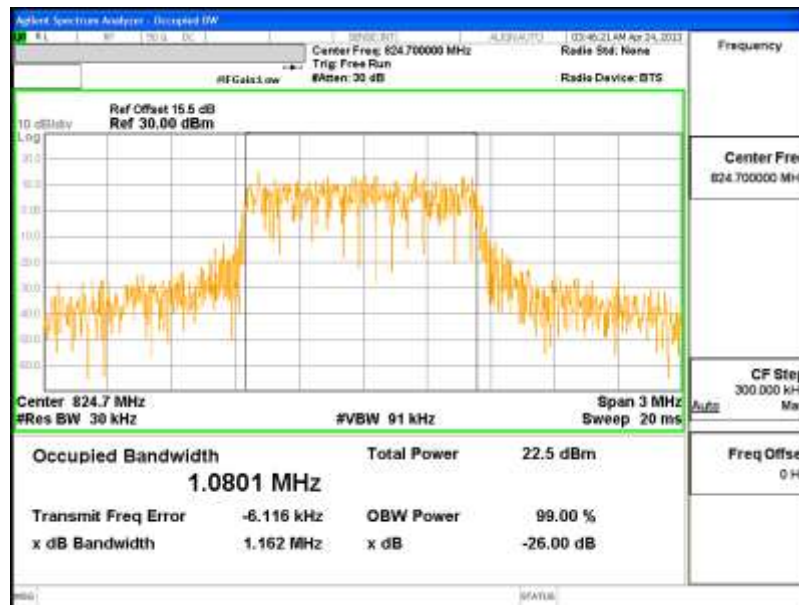
Band 5 (1.4 MHz BAND WIDTH)

LTE 16QAM

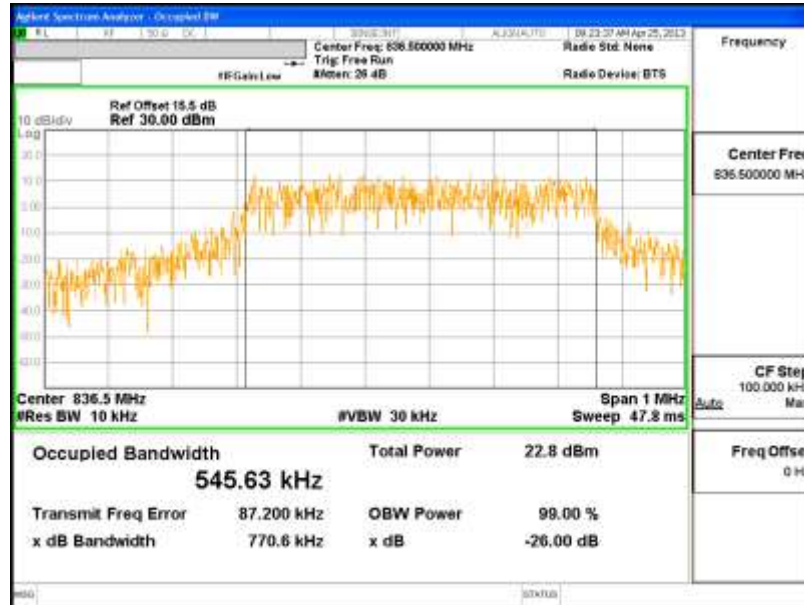
LOW CH, RB3_2



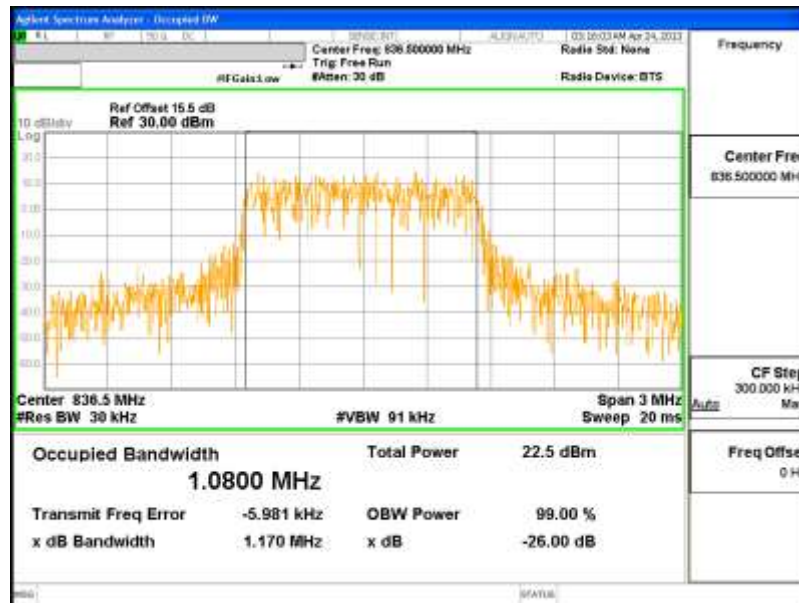
LOW CH, RB6_0



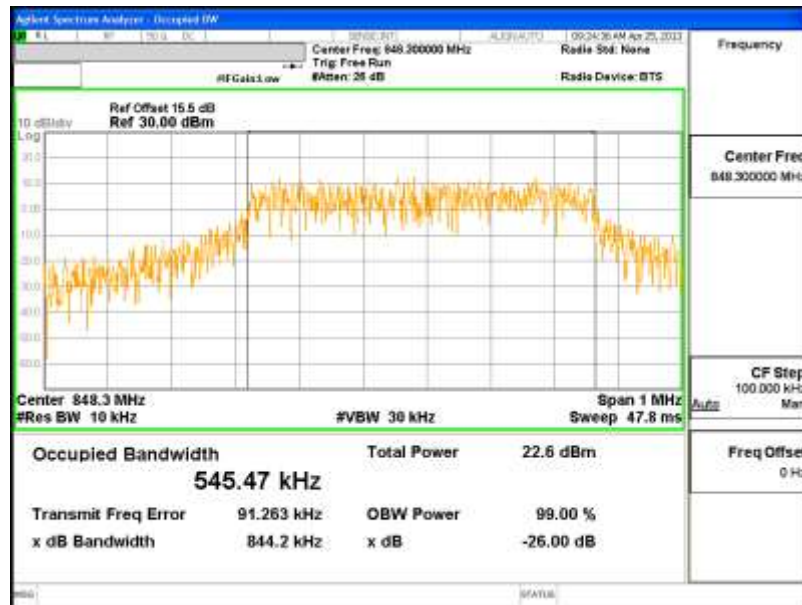
MID CH, RB3_2



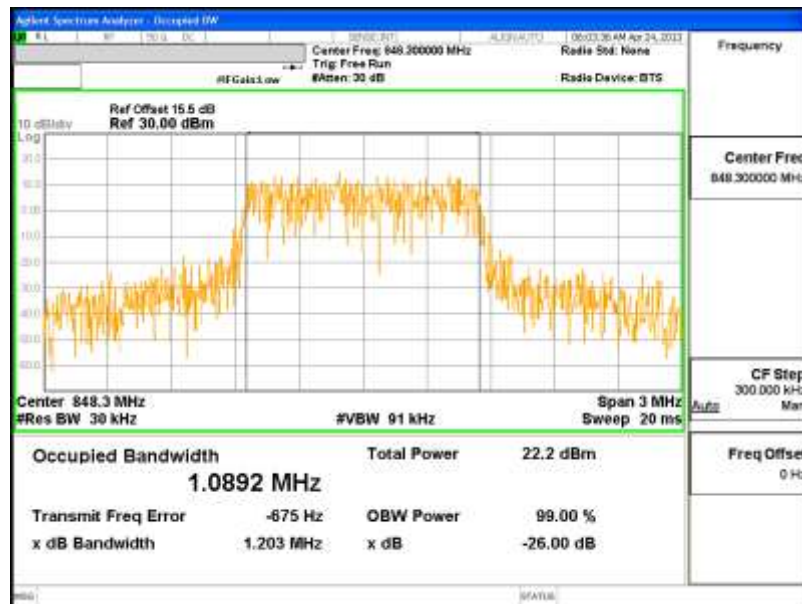
MID CH, RB6_0



HI CH, RB3_2



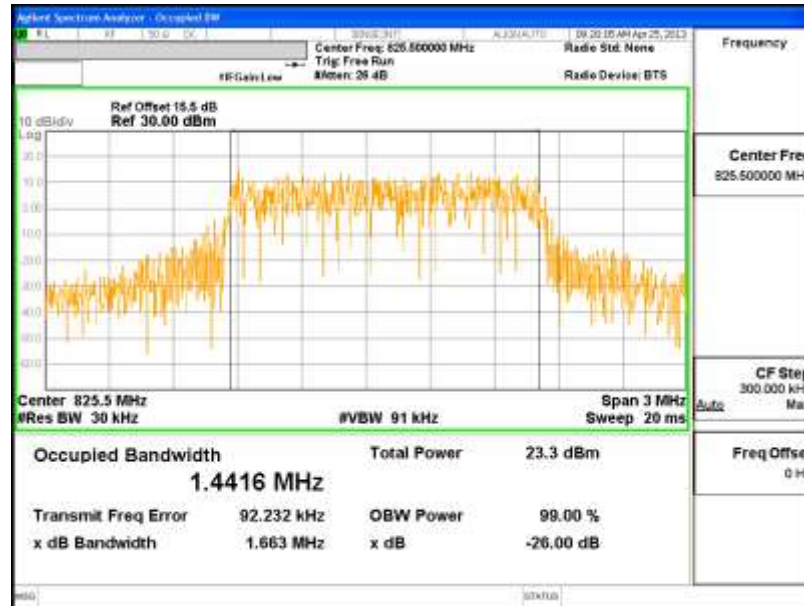
HI CH, RB6_0



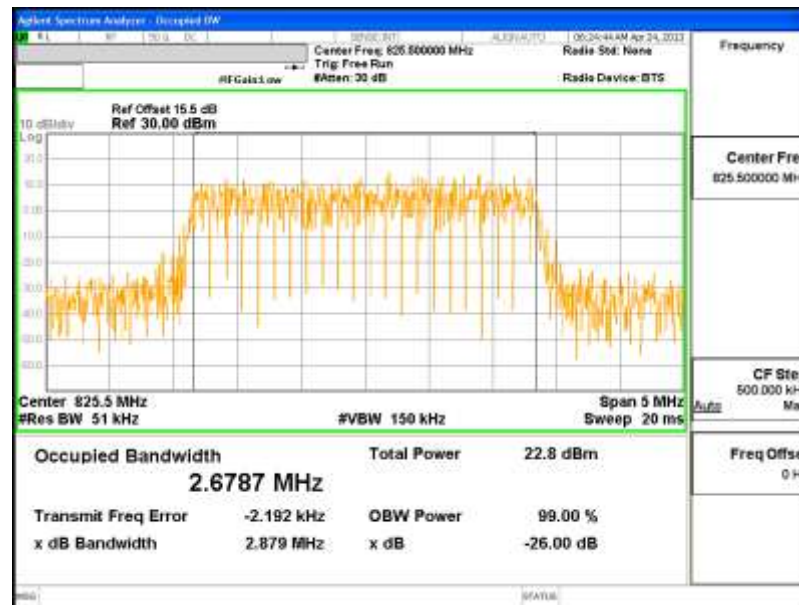
Band 5 (3.0 MHz BAND WIDTH)

LTE QPSK

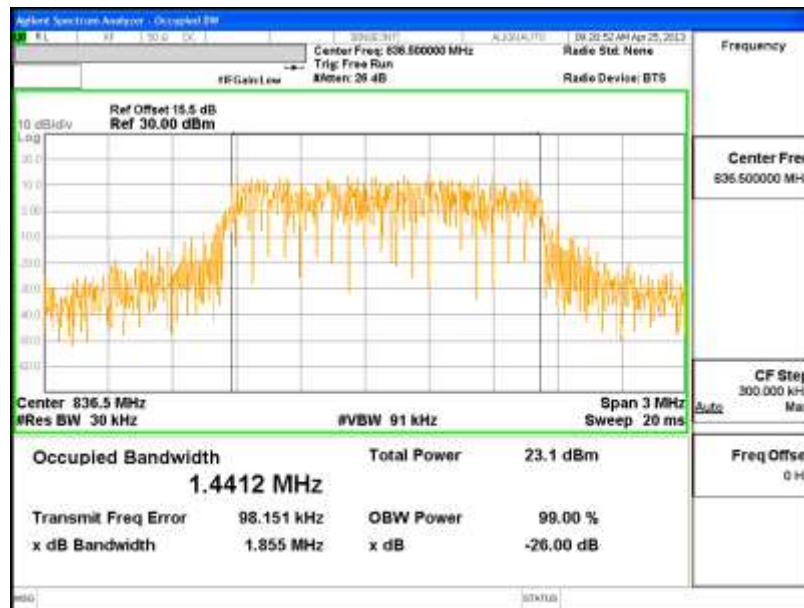
LOW CH, RB8_4



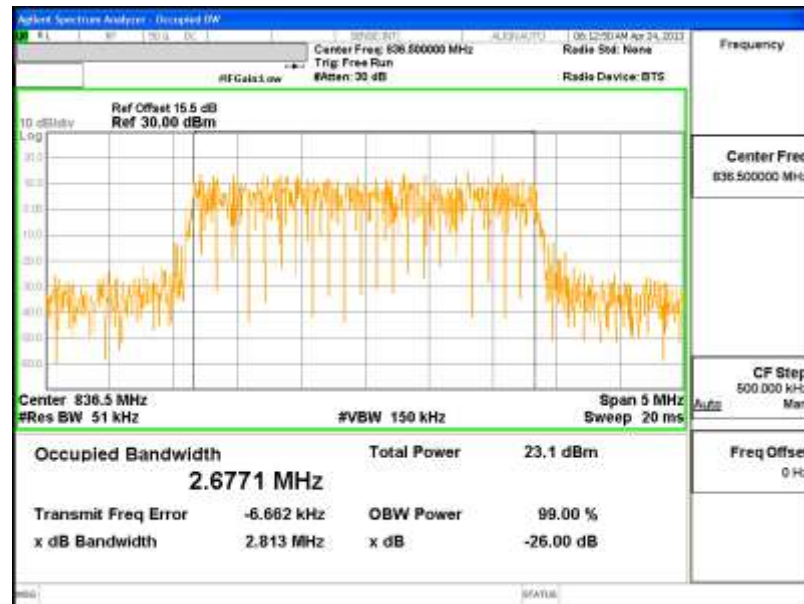
LOW CH, RB15_0



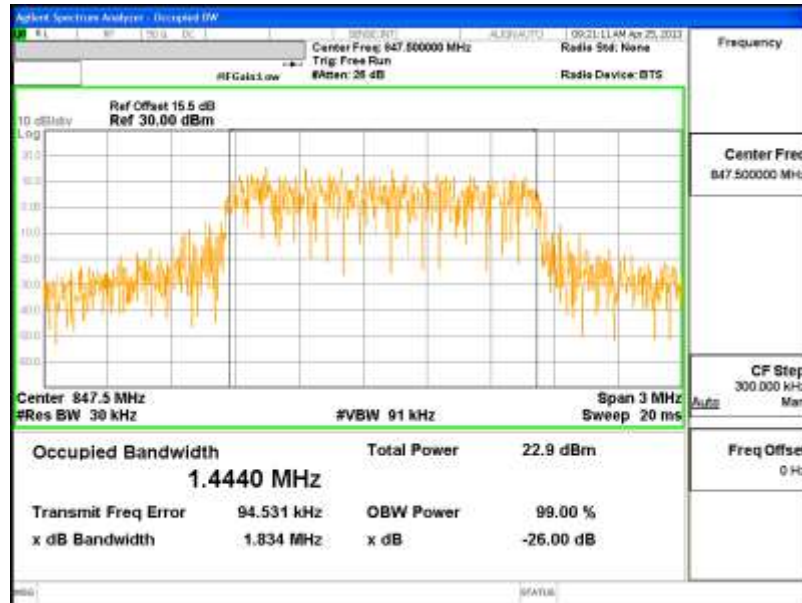
MID CH, RB8_4



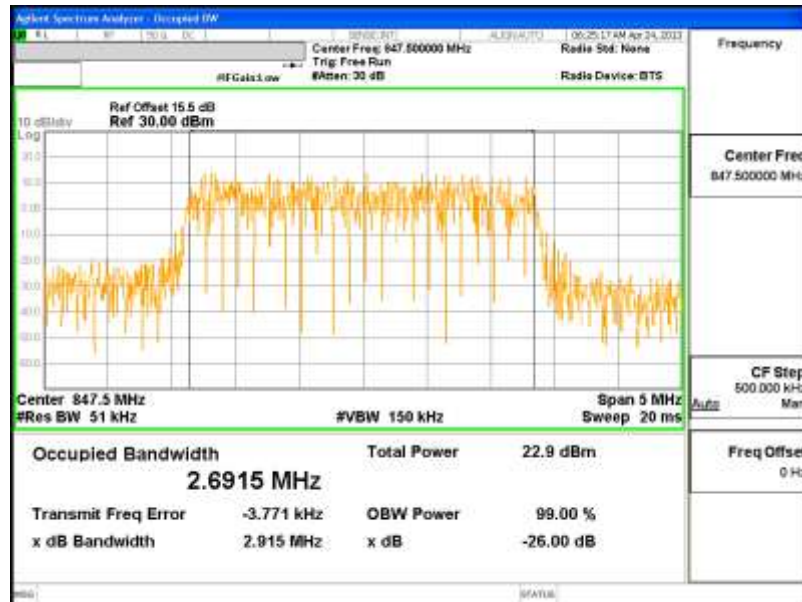
MID CH, RB15_0



HI CH, RB8_4



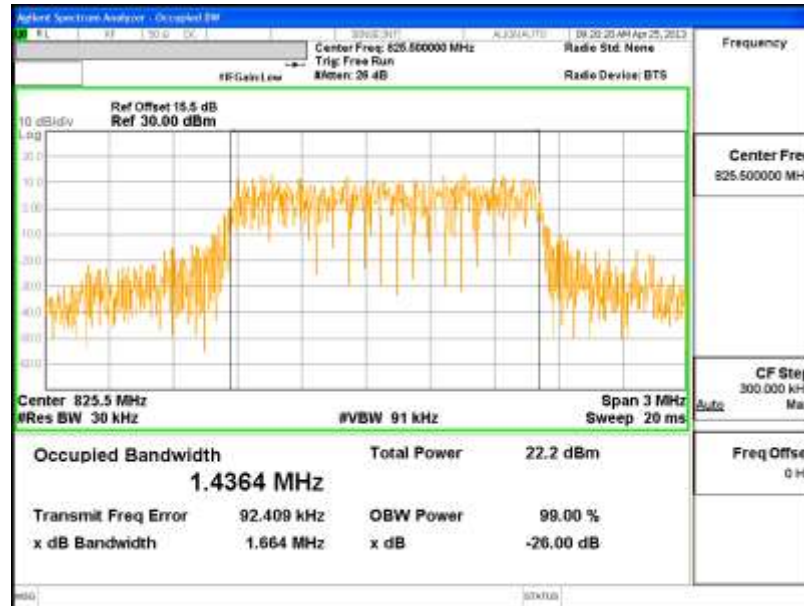
HI CH, RB15_0



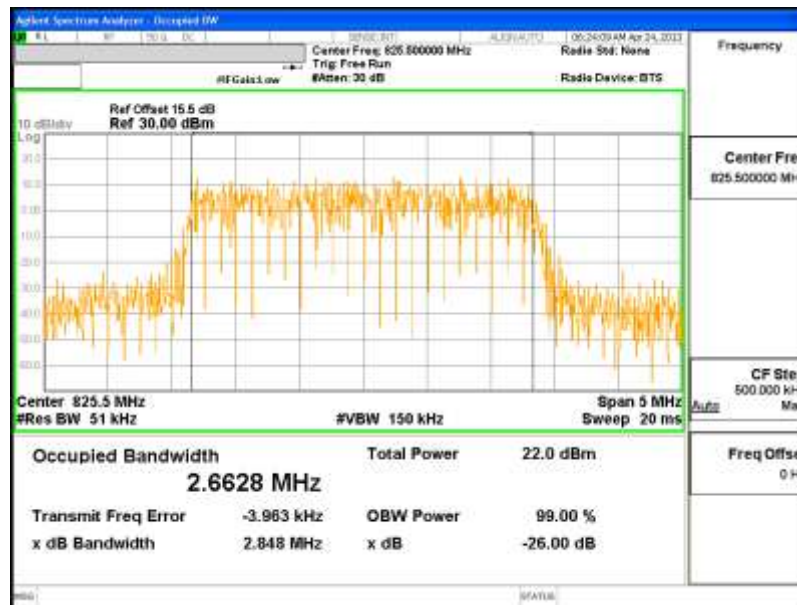
Band 5 (3.0 MHz BAND WIDTH)

LTE 16QAM

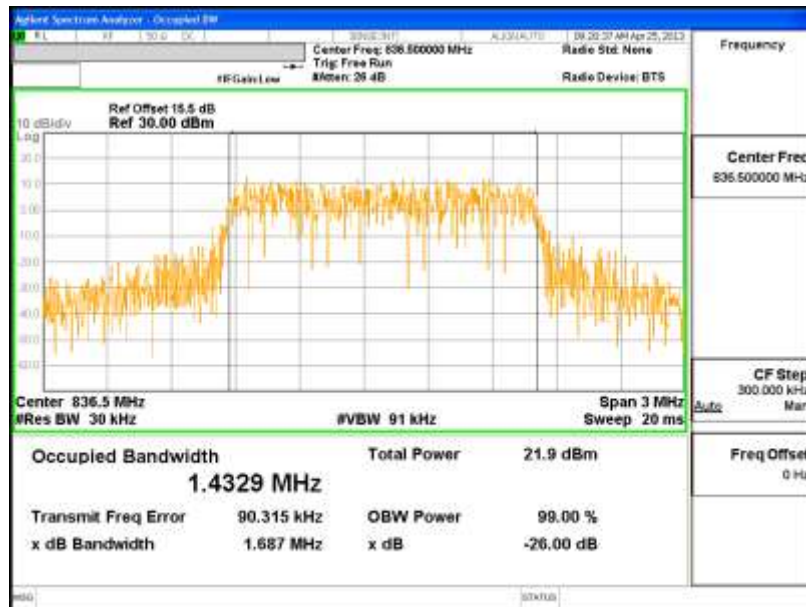
LOW CH, RB8_4



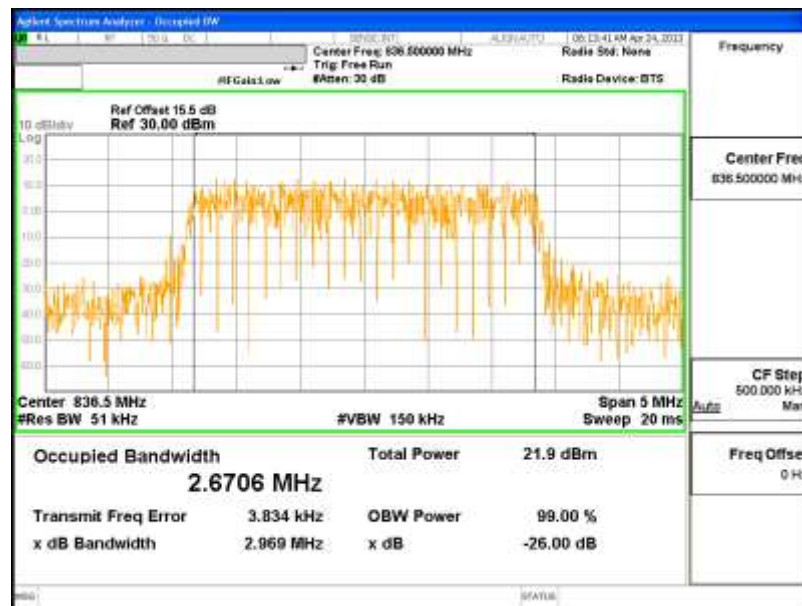
LOW CH, RB15_0



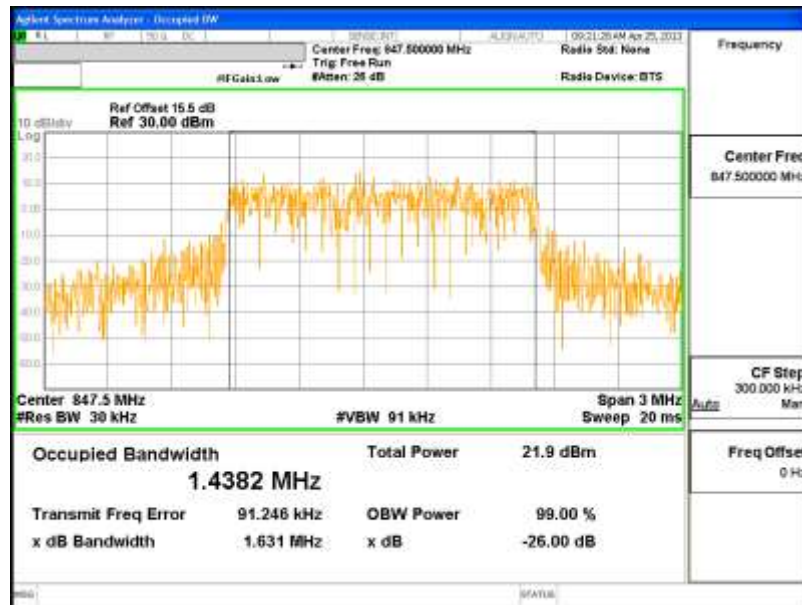
MID CH, RB8_4



MID CH, RB15_0



HI CH, RB8_4



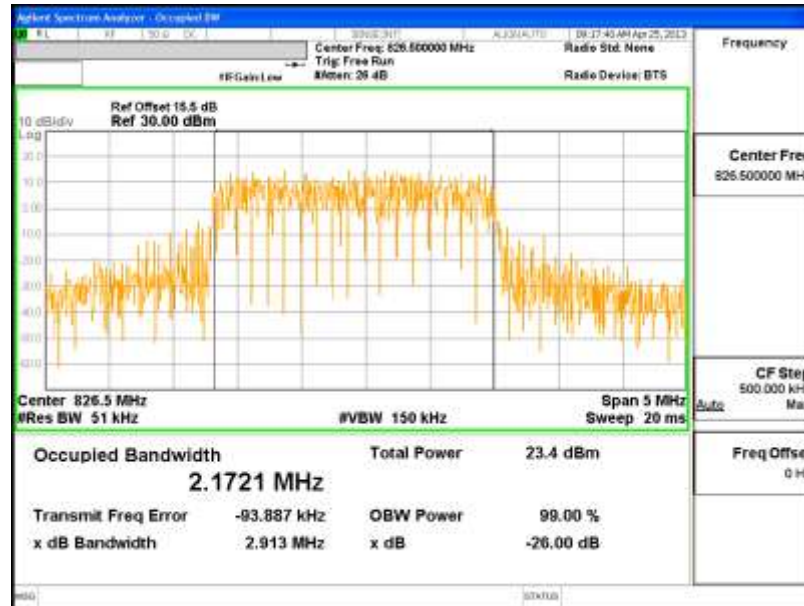
HI CH, RB15_0



Band 5 (5.0 MHz BAND WIDTH)

LTE QPSK

LOW CH, RB12_6



LOW CH, RB25_0



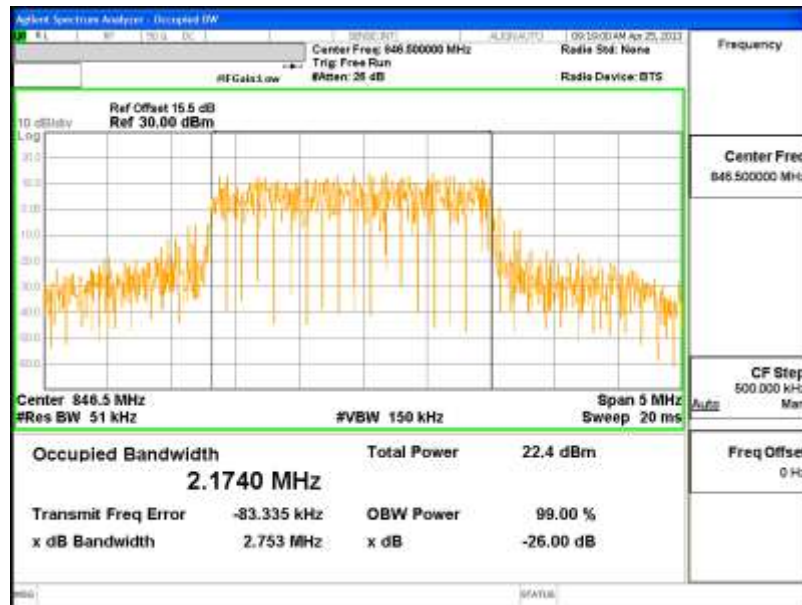
MID CH, RB12_6



MID CH, RB25_0



HI CH, RB12_6



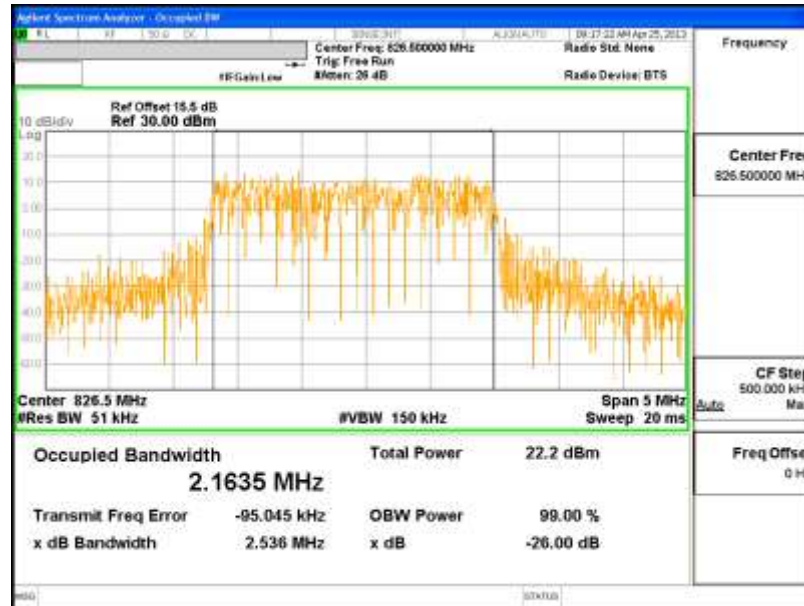
HI CH, RB25_0



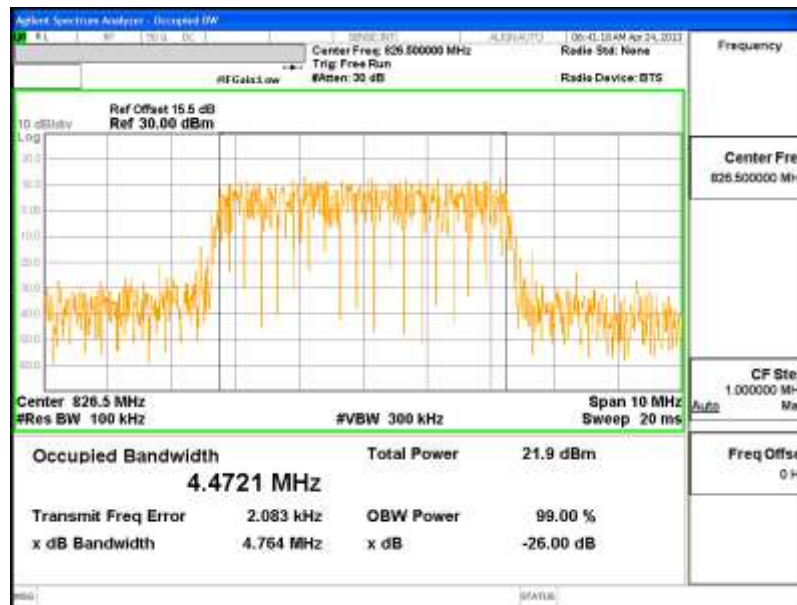
Band 5 (5 MHz BAND WIDTH)

LTE 16QAM

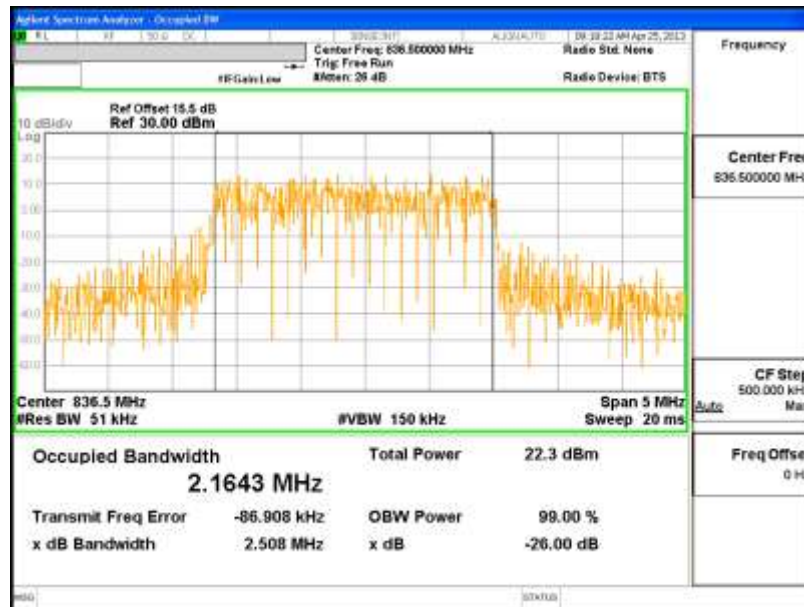
LOW CH, RB12_6



LOW CH, RB25_0



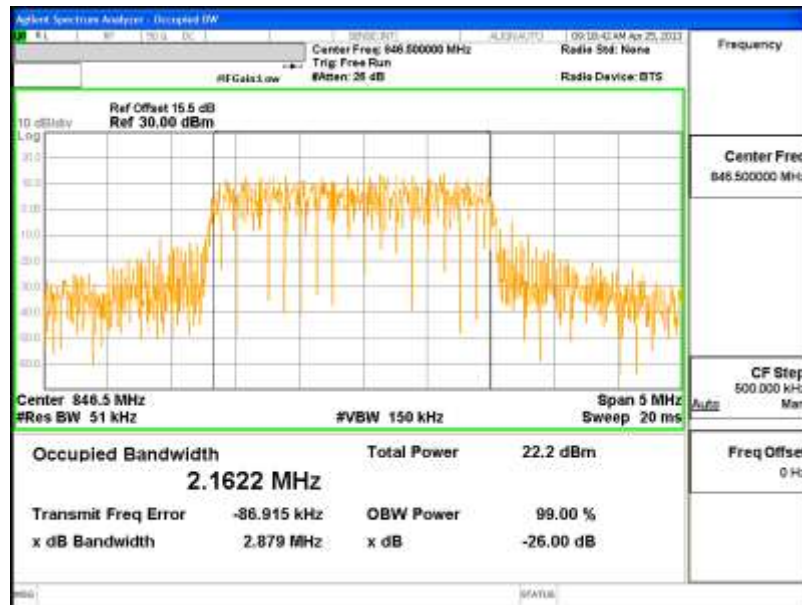
MID CH, RB12_6



MID CH, RB25_0



HI CH, RB12_6



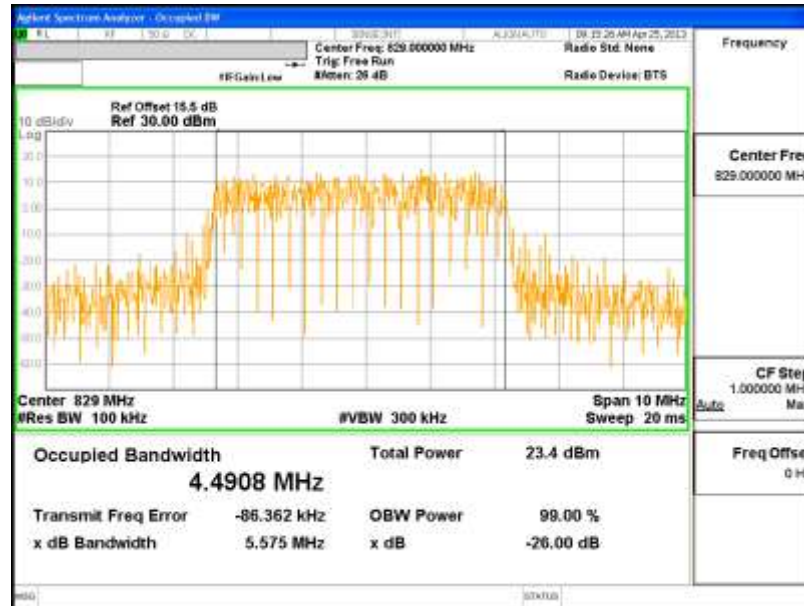
HI CH, RB25_0



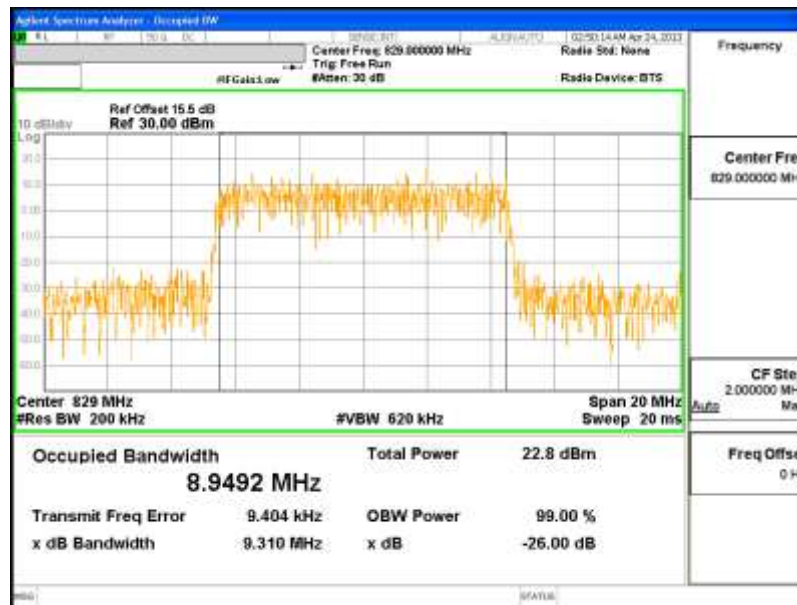
Band 5 (10.0 MHz BAND WIDTH)

LTE QPSK

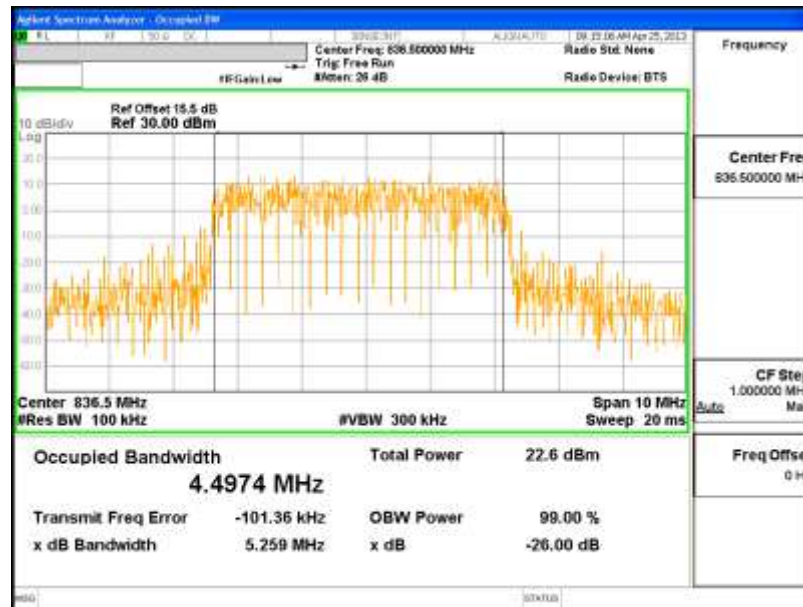
LOW CH, RB25_12



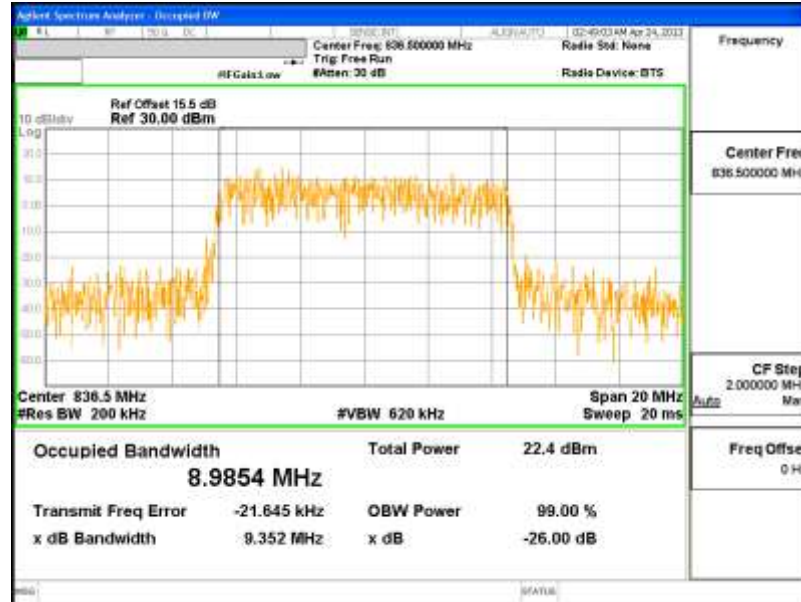
LOW CH, RB50_0



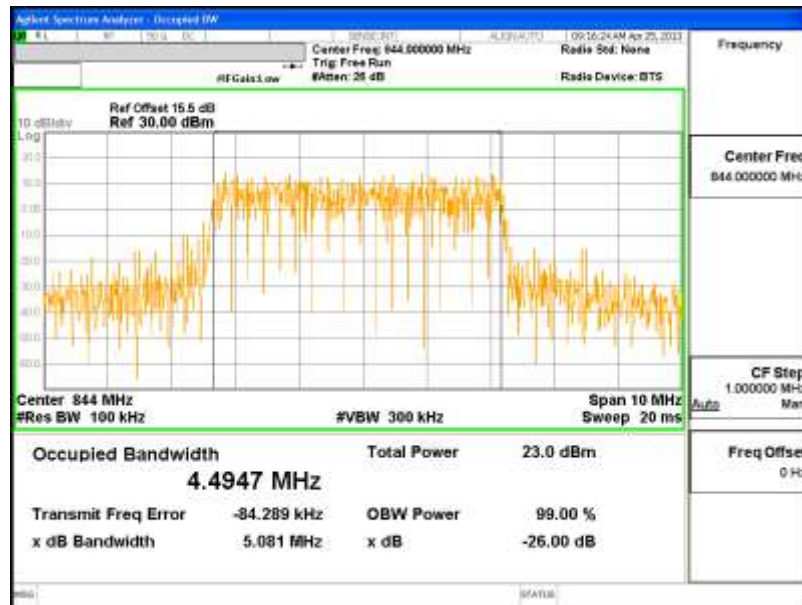
MID CH, RB25_12



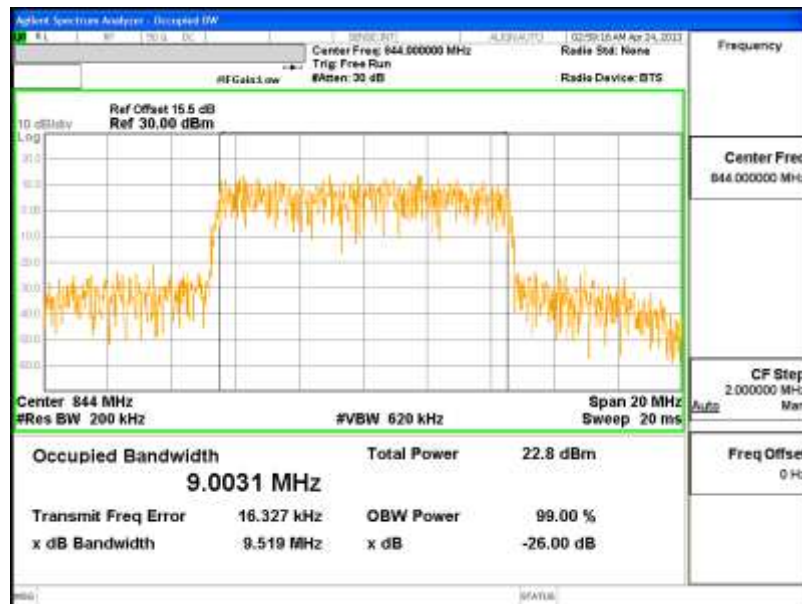
MID CH, RB50_0



HI CH, RB25_12



HI CH, RB50_0



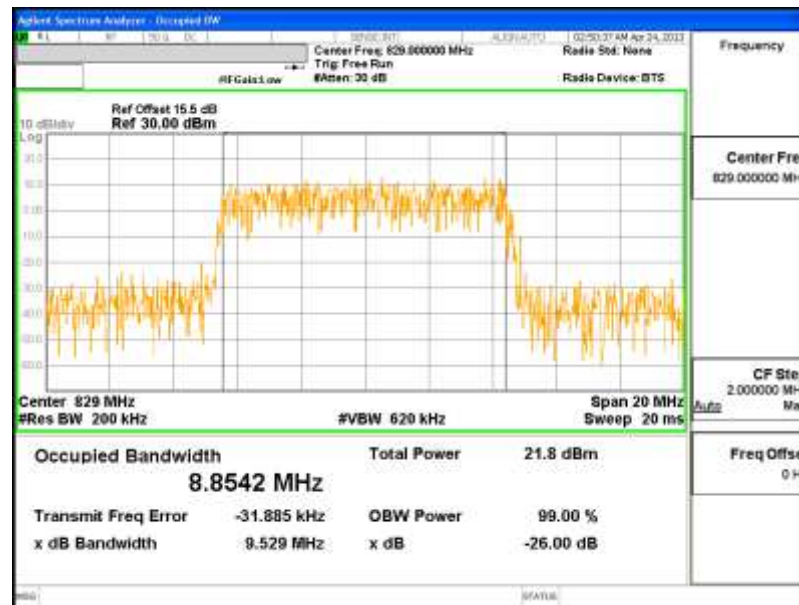
Band 5 (10 MHz BAND WIDTH)

LTE 16QAM

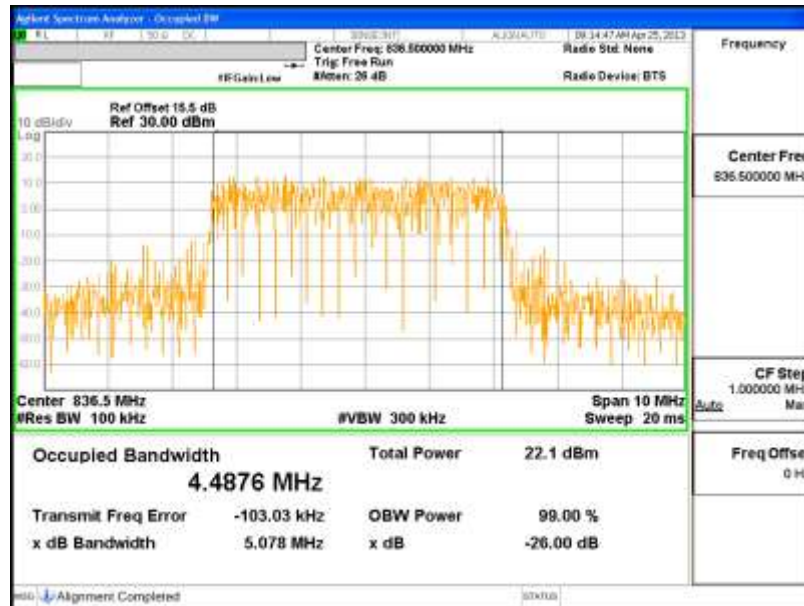
LOW CH, RB25_12



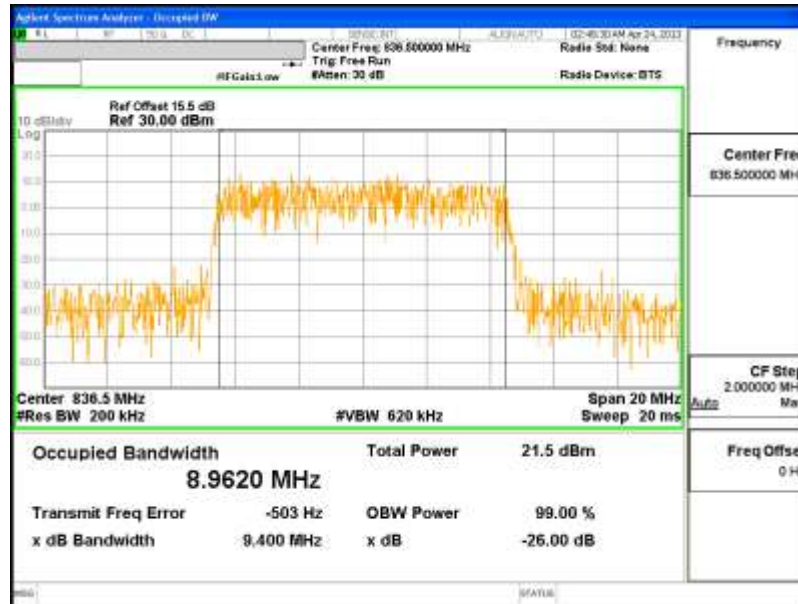
LOW CH, RB50_0



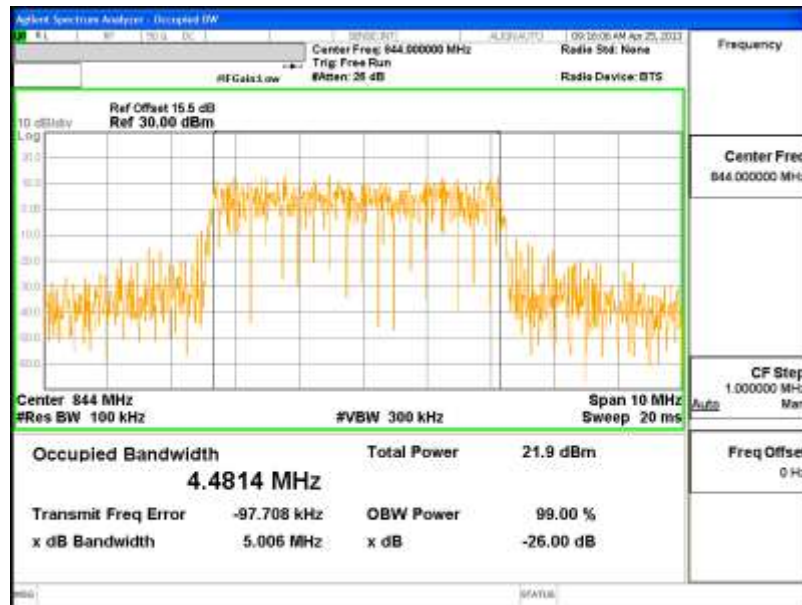
MID CH, RB25_12



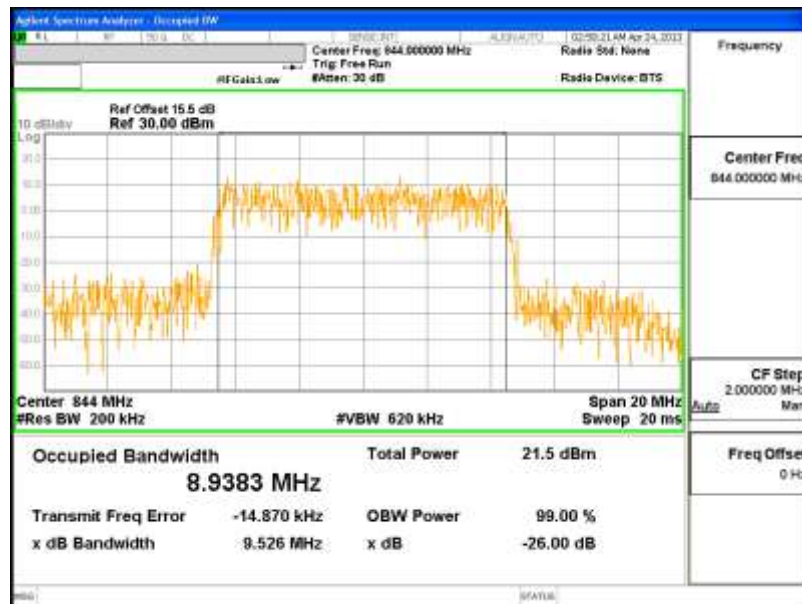
MID CH, RB50_0



HI CH, RB25_12



HI CH, RB50_0



8.2. BAND EDGE

RULE PART(S)

FCC: §22.359, 24.238

LIMITS

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.

TEST PROCEDURE

The transmitter output was connected to a Agilent 8960 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 (824, 849, 1850, 1910MHz)
- 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.

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:

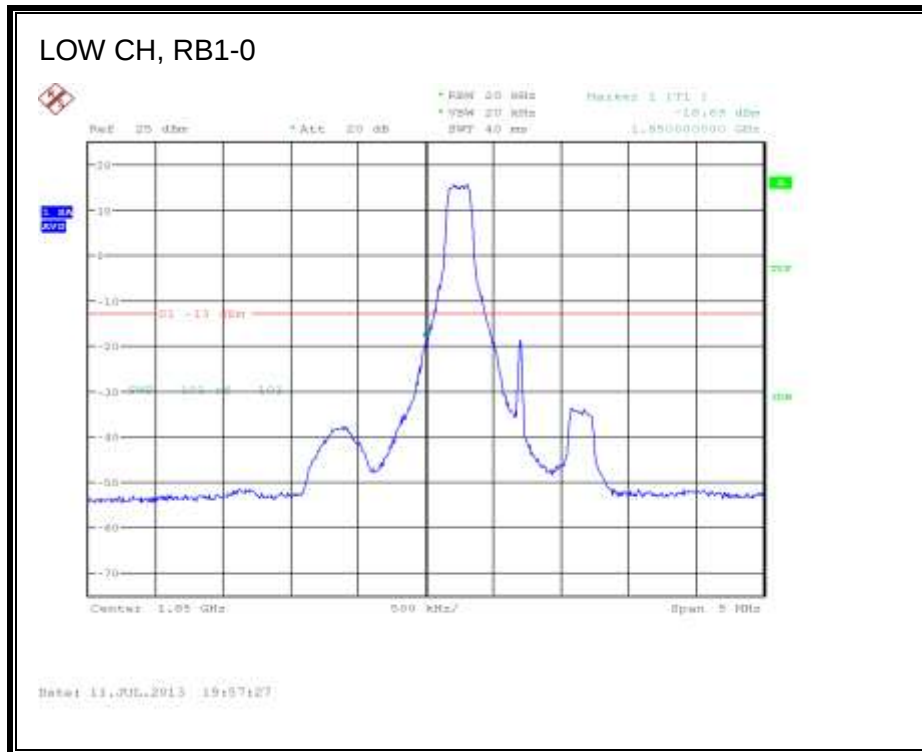
- Set the spectrum analyzer span to include the block edge frequency.
- Set a marker to point the corresponding band edge frequency in each test case.
- Set display line at -13dBm
- Set resolution bandwidth to at least 1% of emission bandwidth.

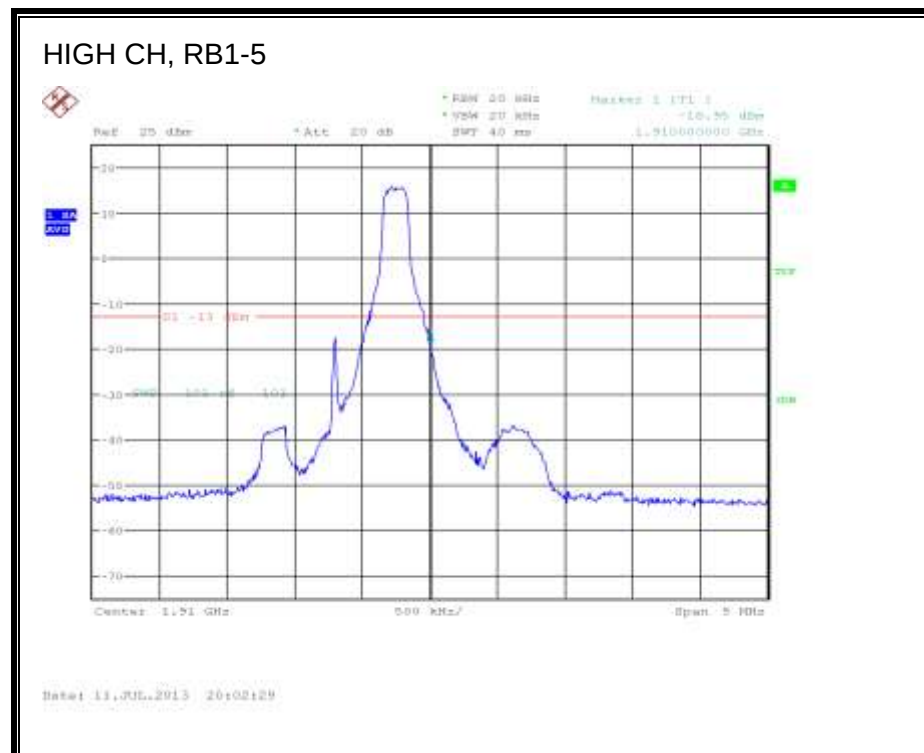
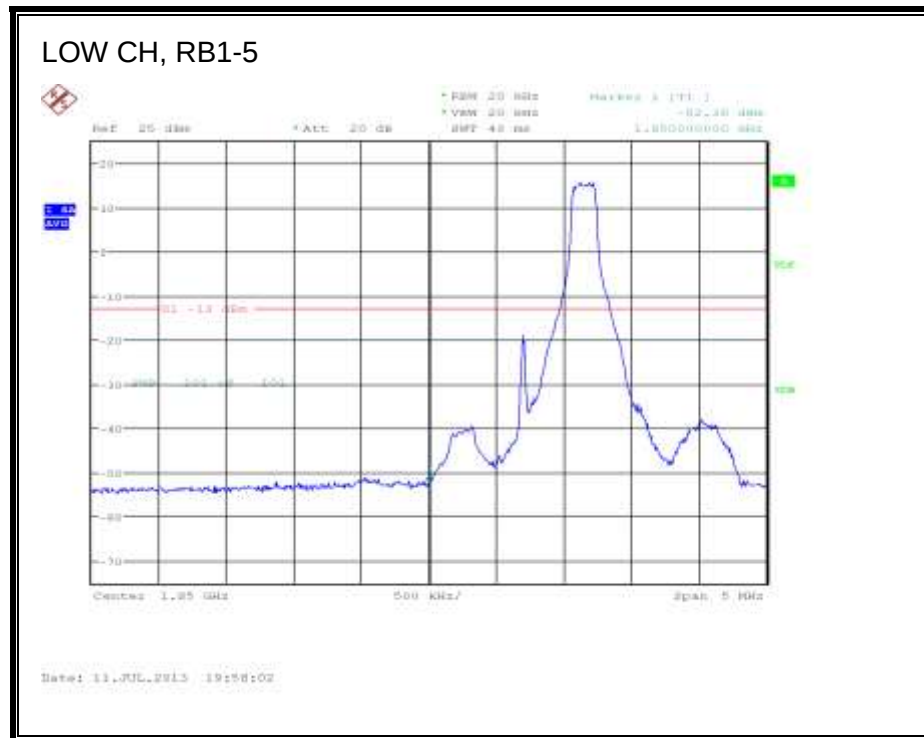
MODES TESTED

- LTE BAND 2
- LTE BAND 5

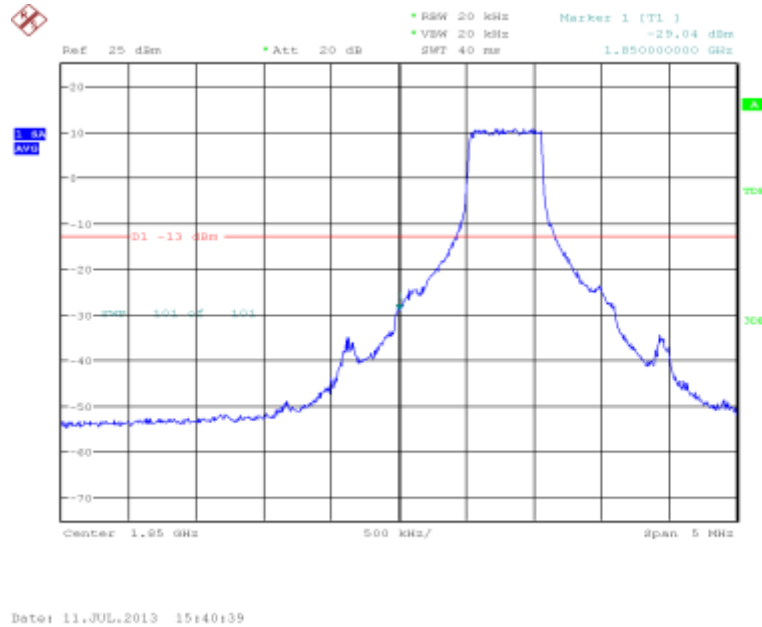
8.2.1. LTE BAND 2

QPSK Band 2 (1.4 MHz BANDWIDTH)

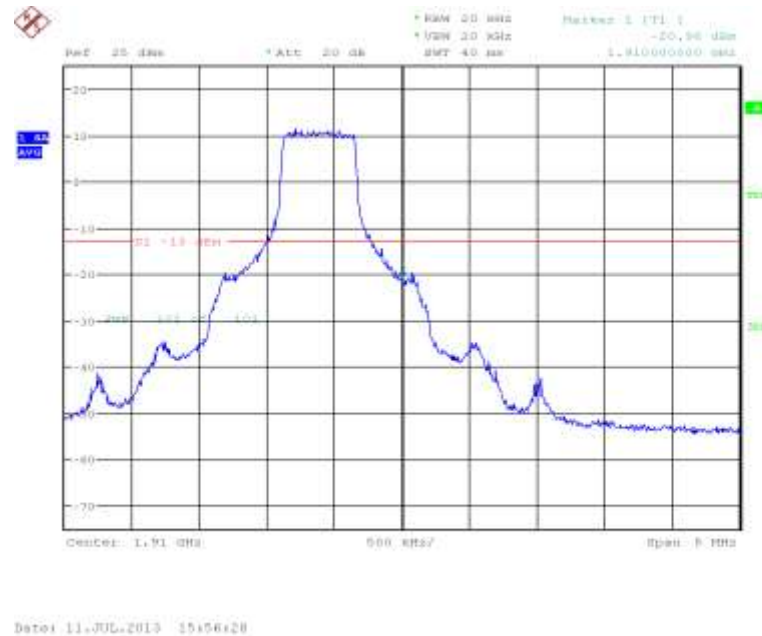


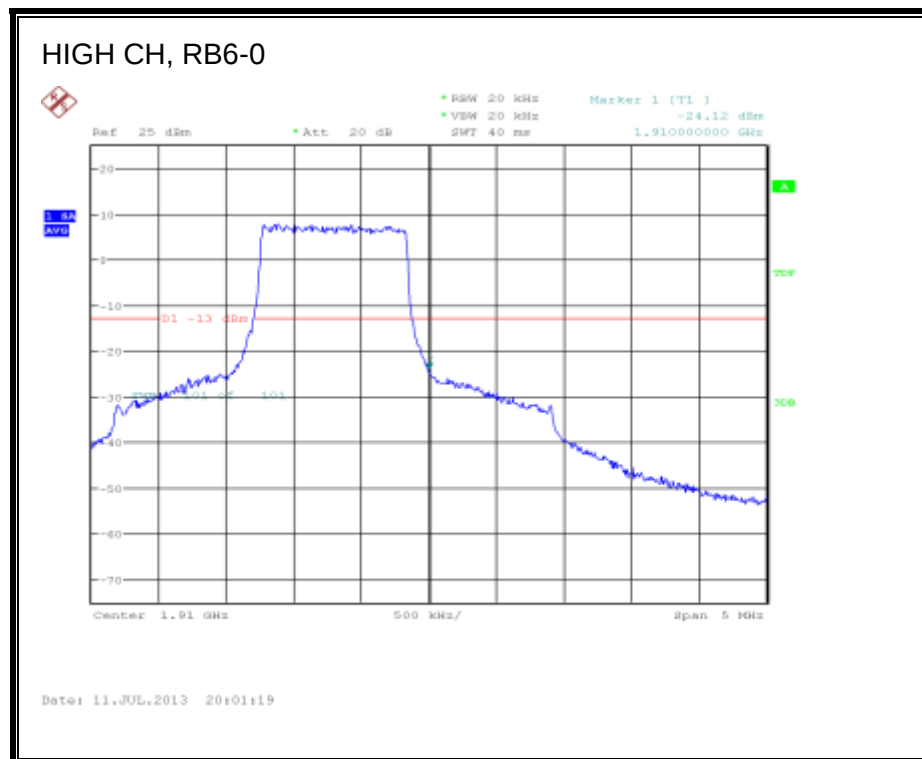
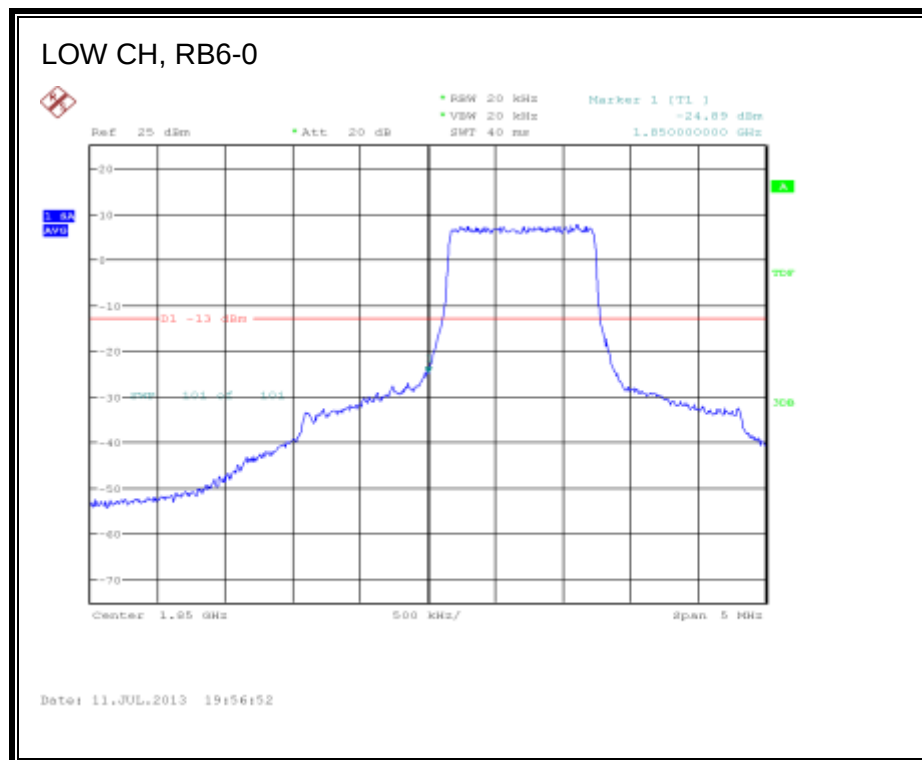


LOW CH, RB3-2

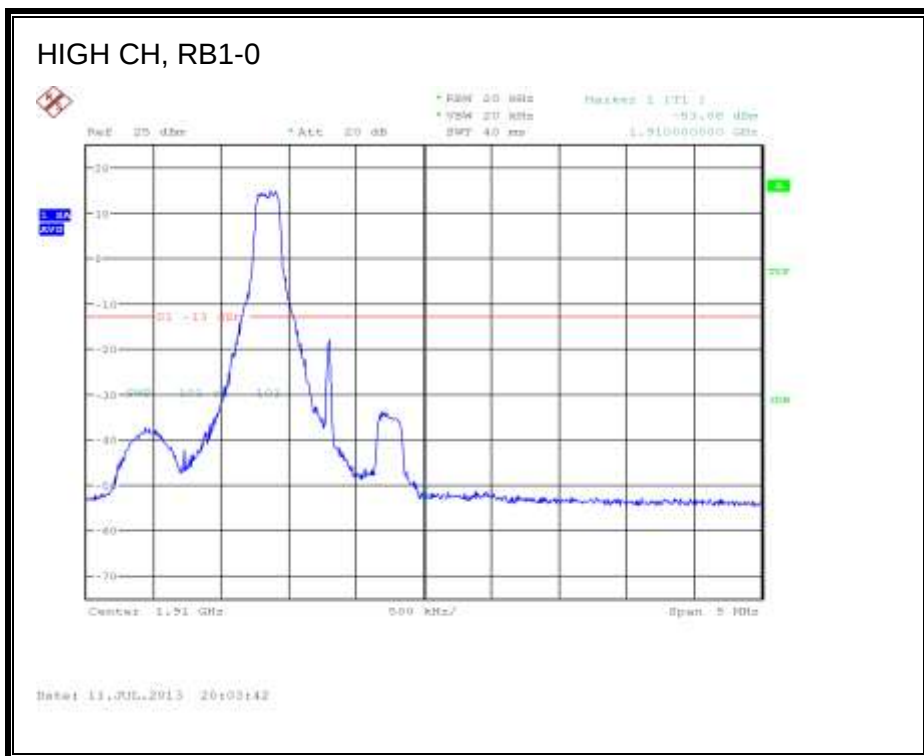
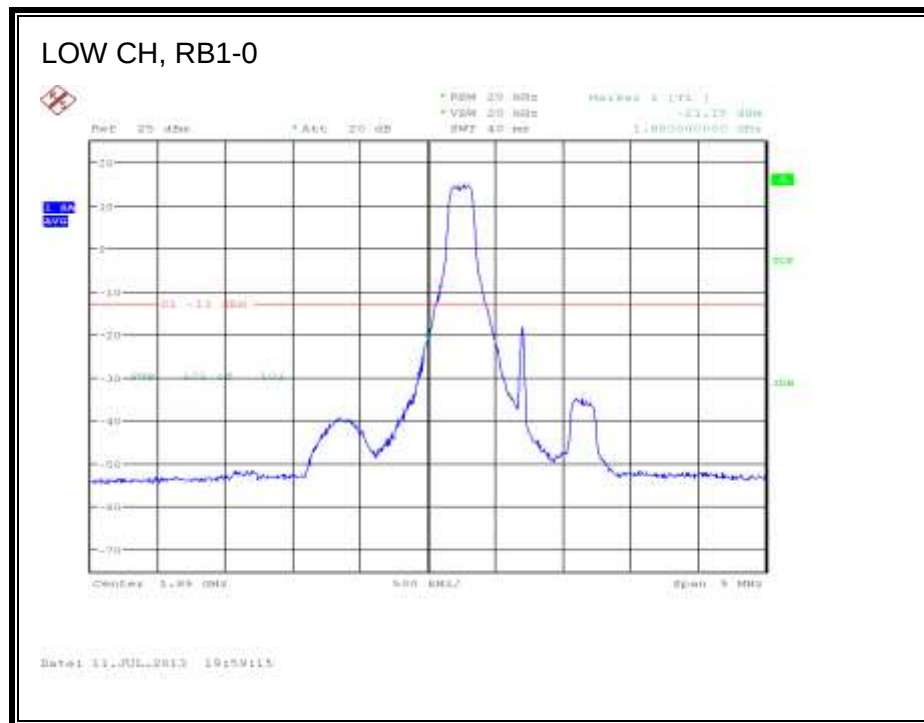


HIGH CH, RB3-2

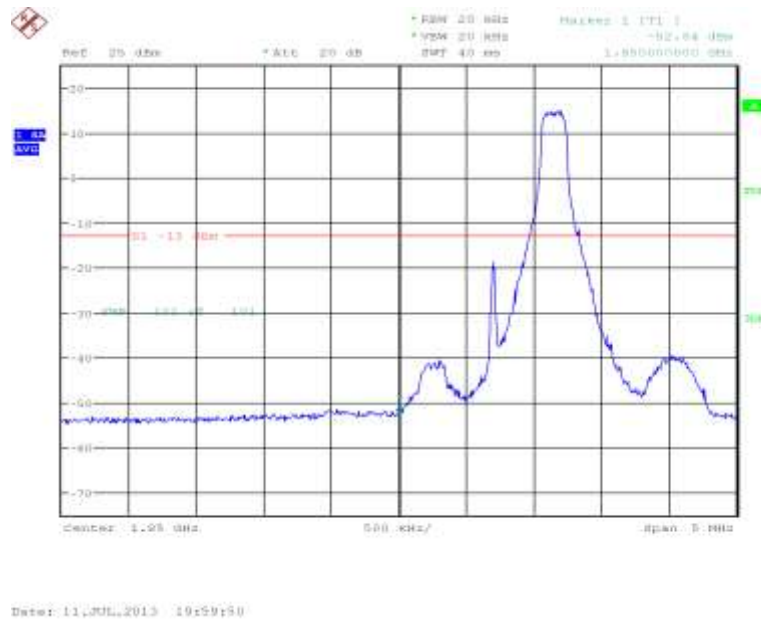




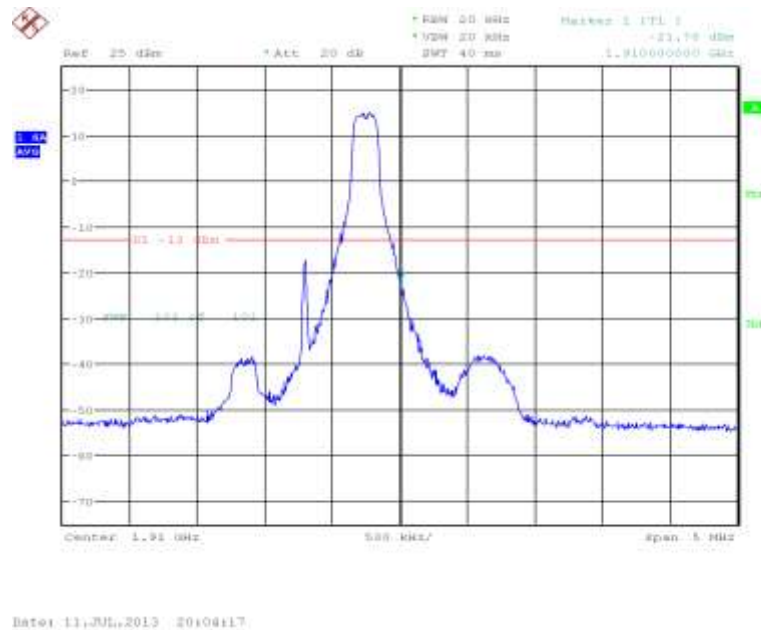
16QAM Band 2 (1.4 MHz BANDWIDTH)

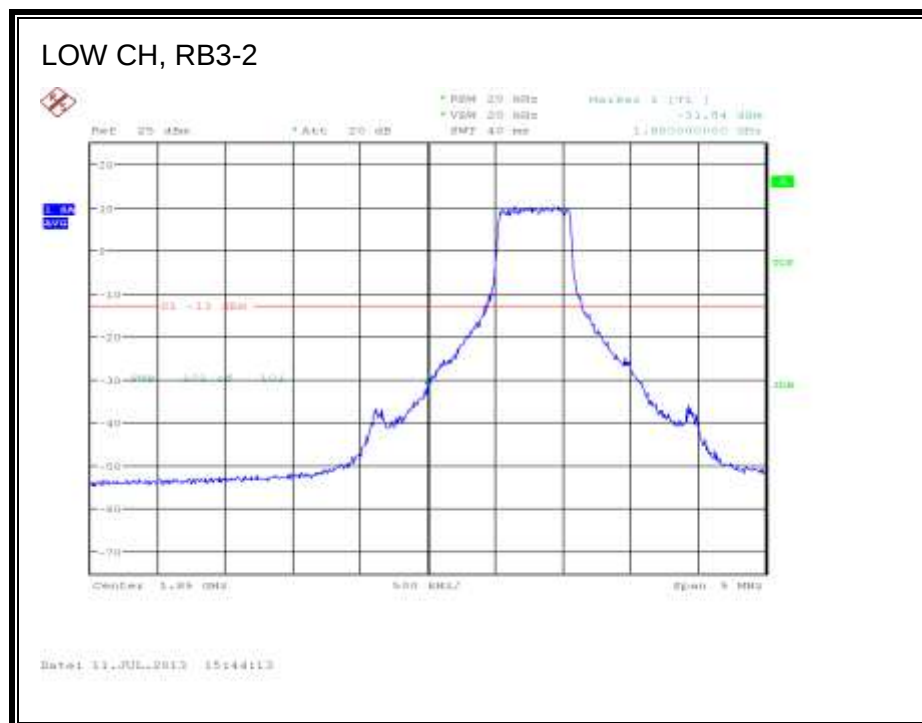


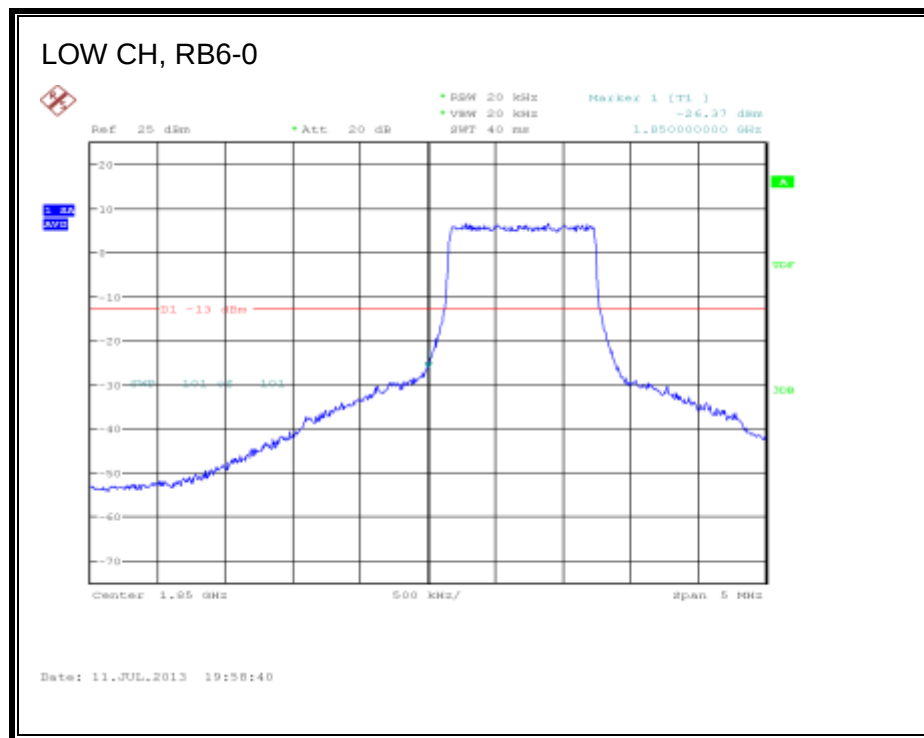
LOW CH, RB1-5



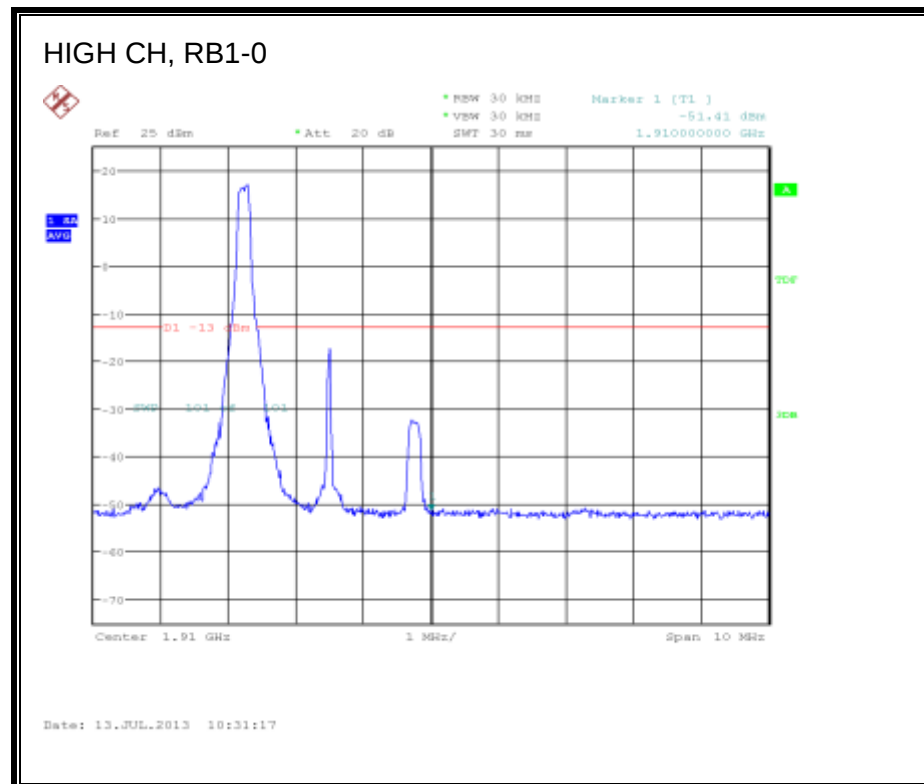
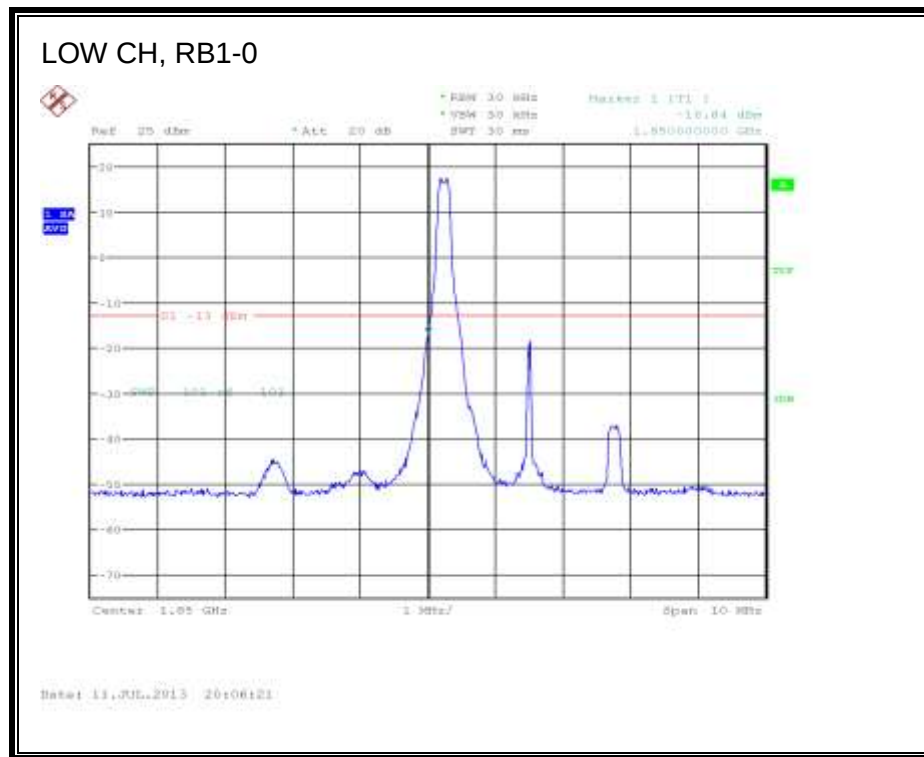
HIGH CH, RB1-5



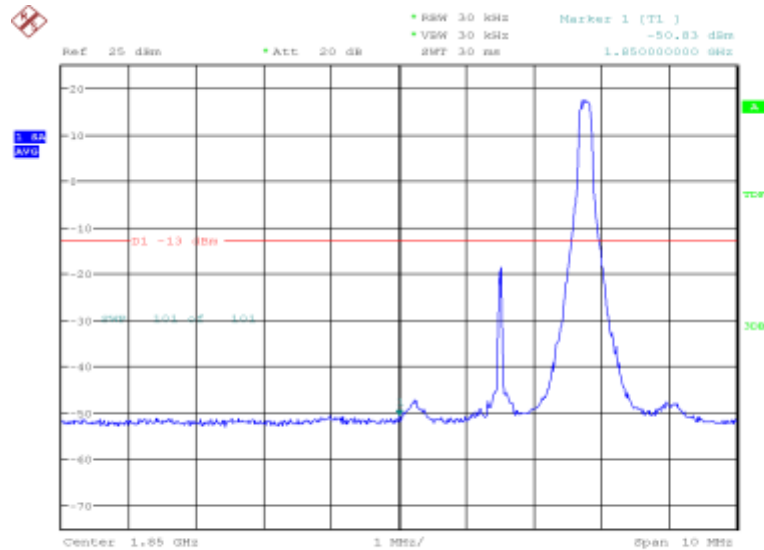




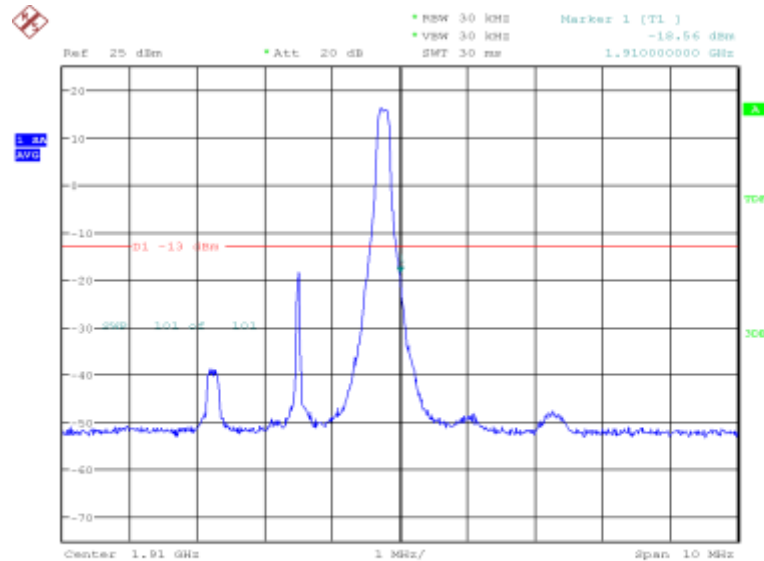
QPSK Band 2 (3 MHz BANDWIDTH)



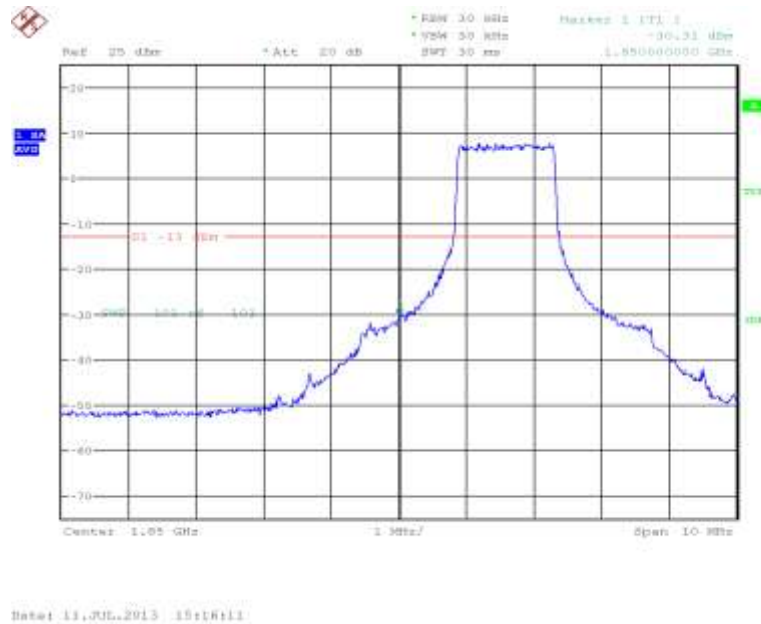
LOW CH, RB1-14



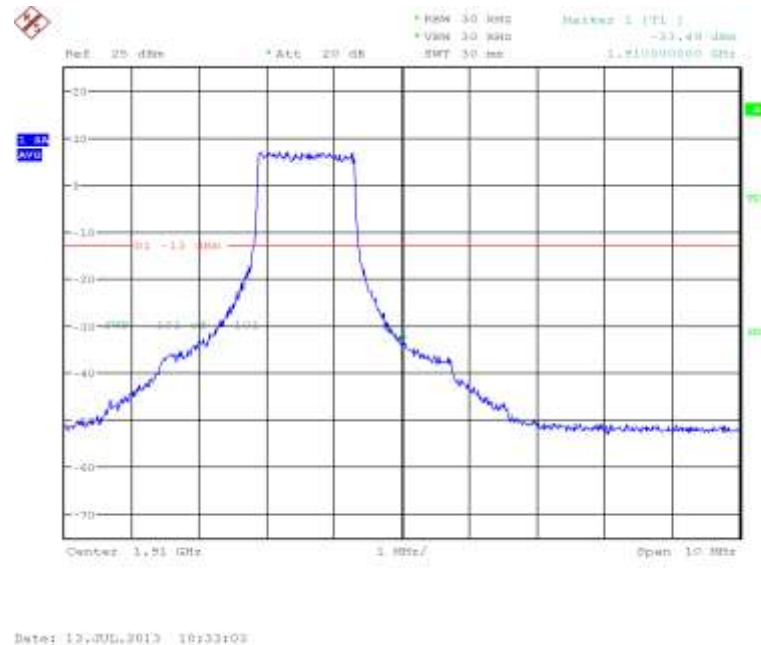
HIGH CH, RB1-14

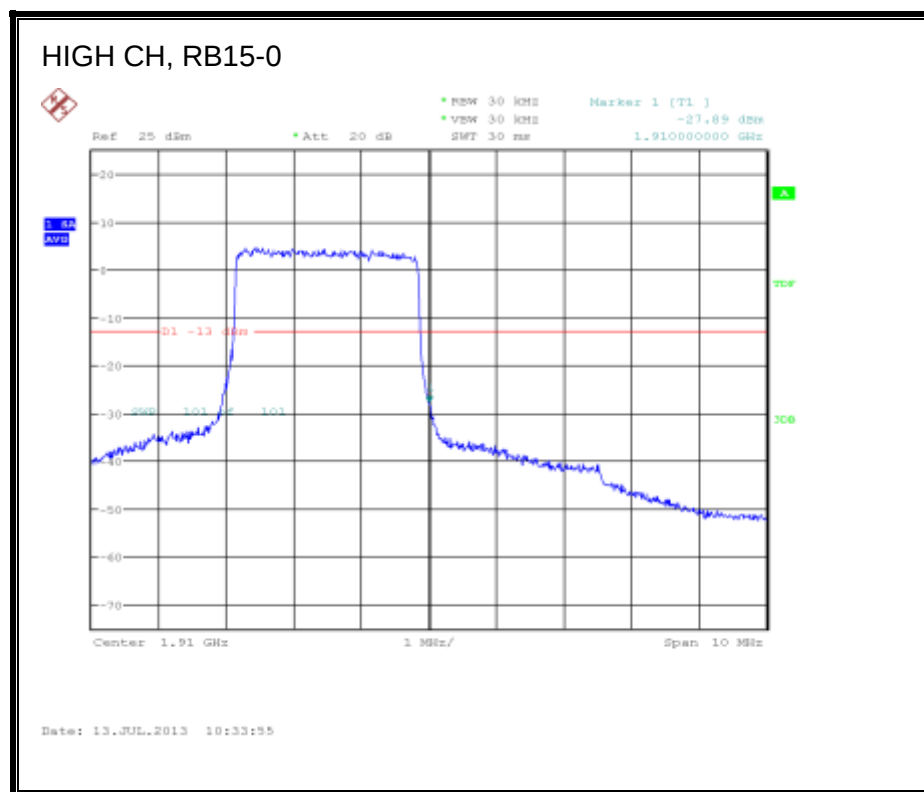
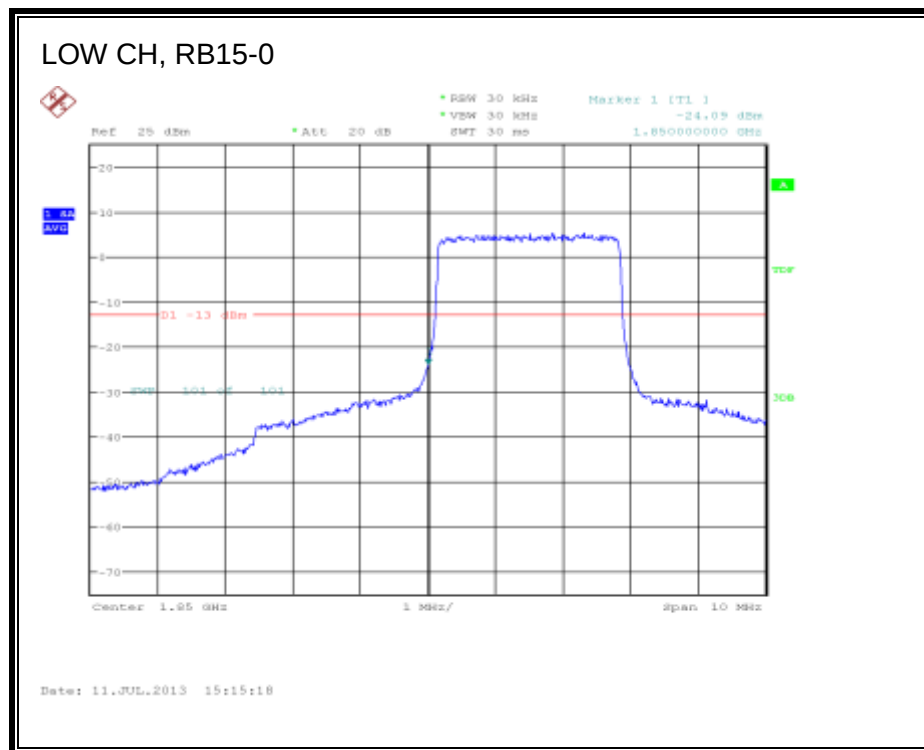


LOW CH, RB8-4

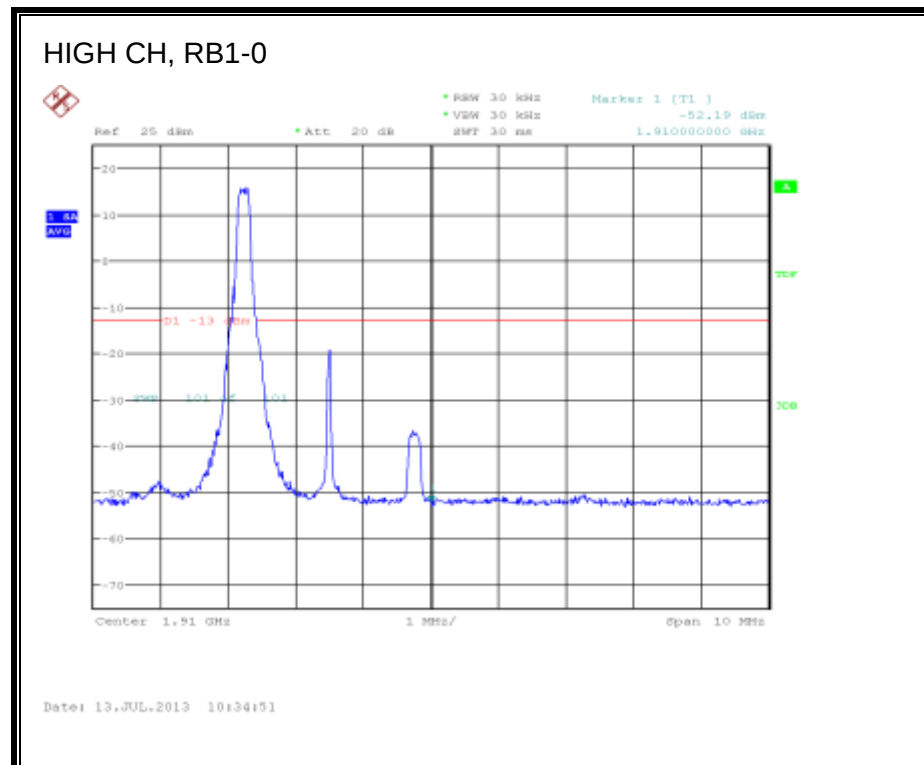
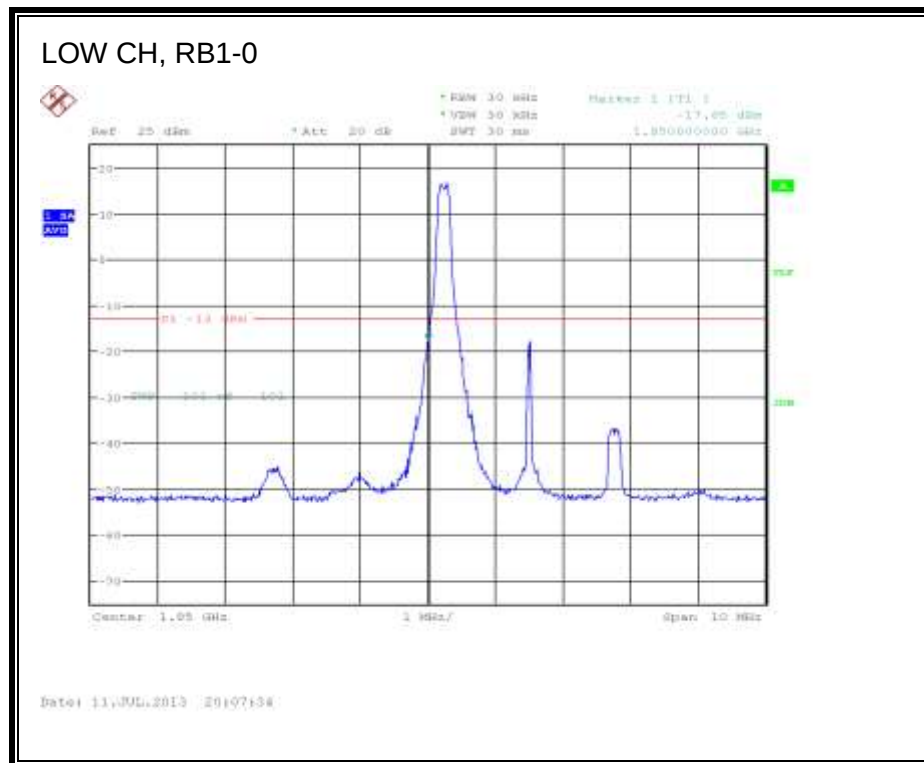


HIGH CH, RB8-4

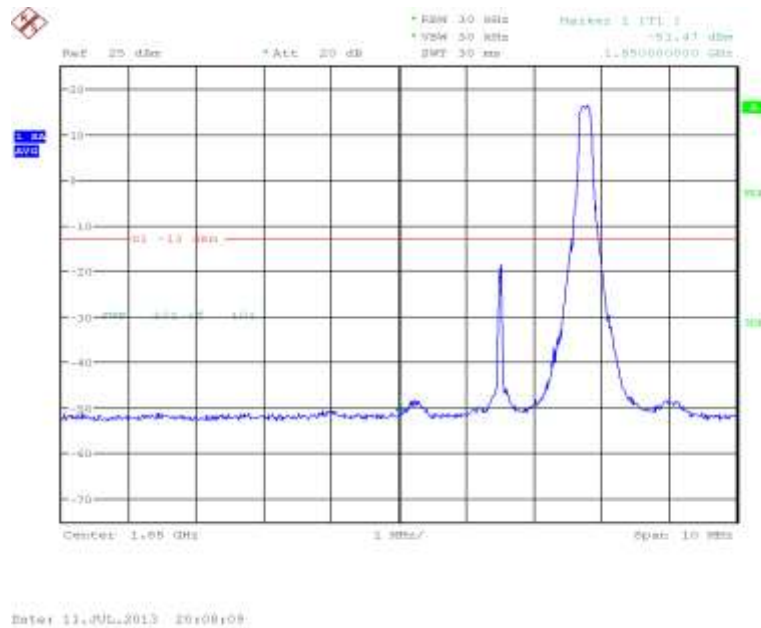




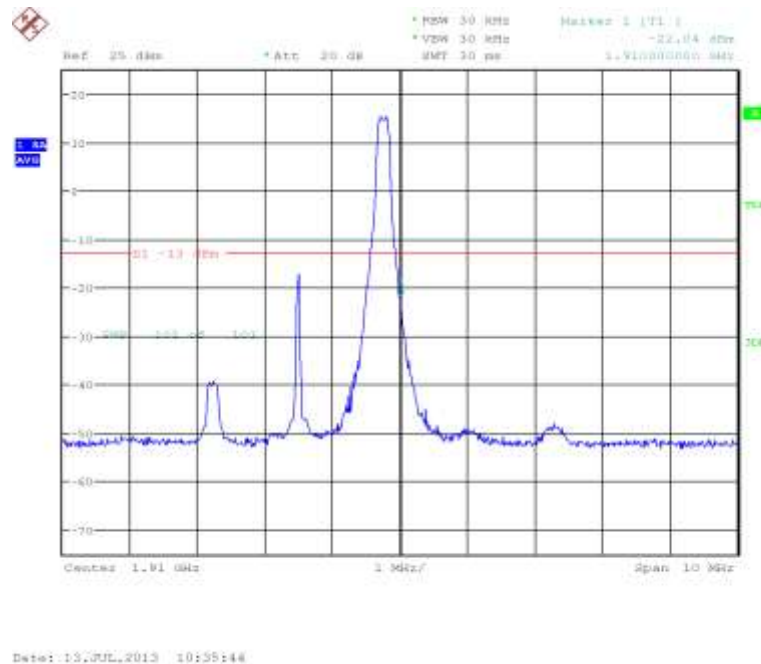
16QAM Band 2 (3 MHz BANDWIDTH)

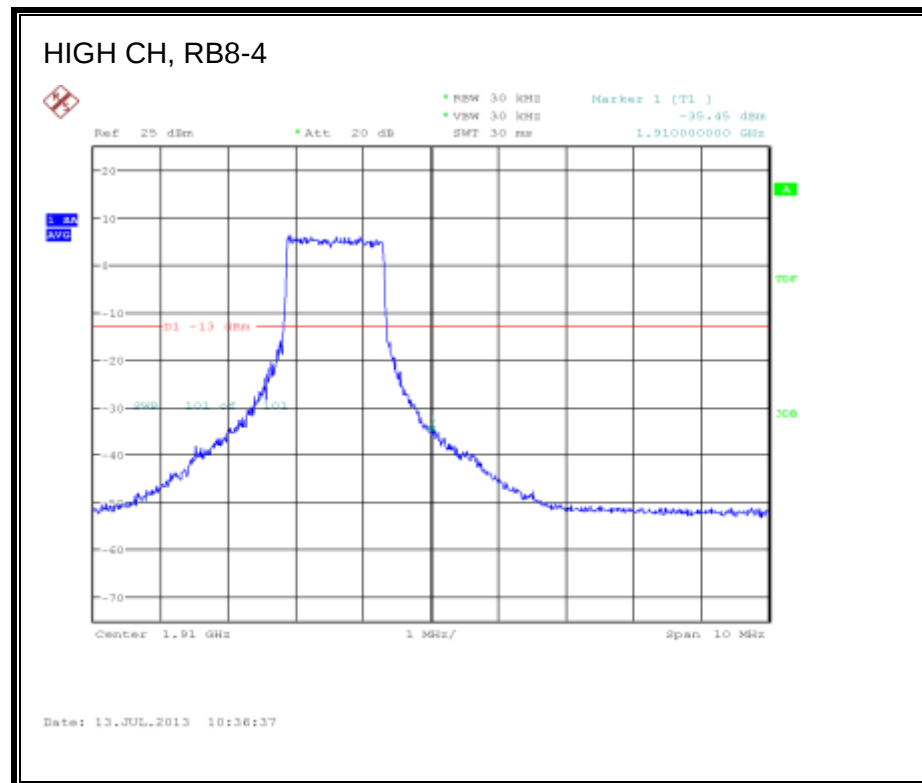


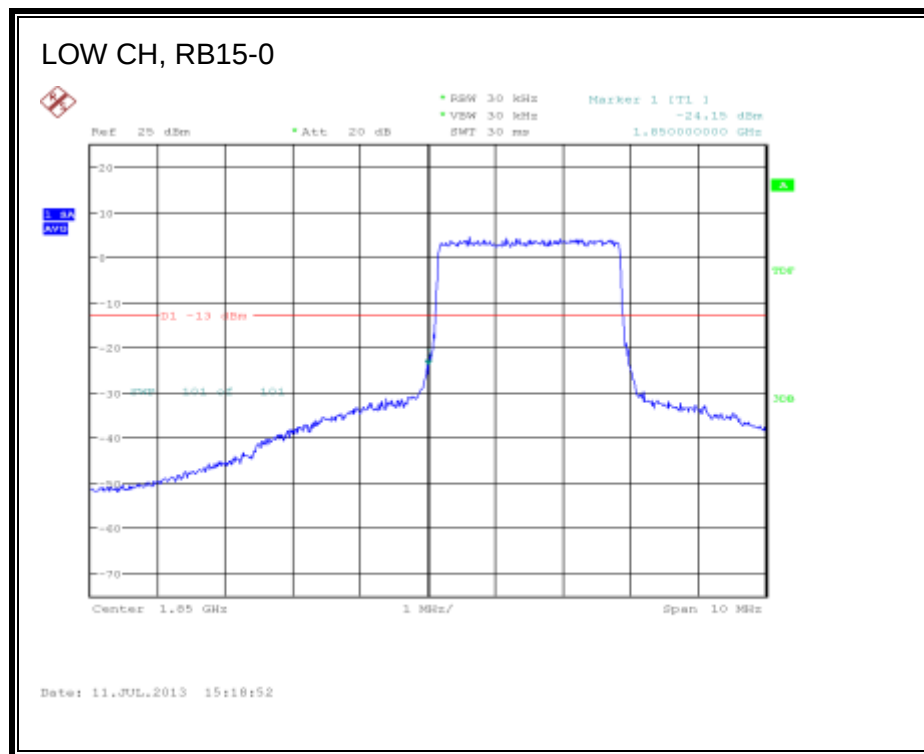
LOW CH, RB1-14



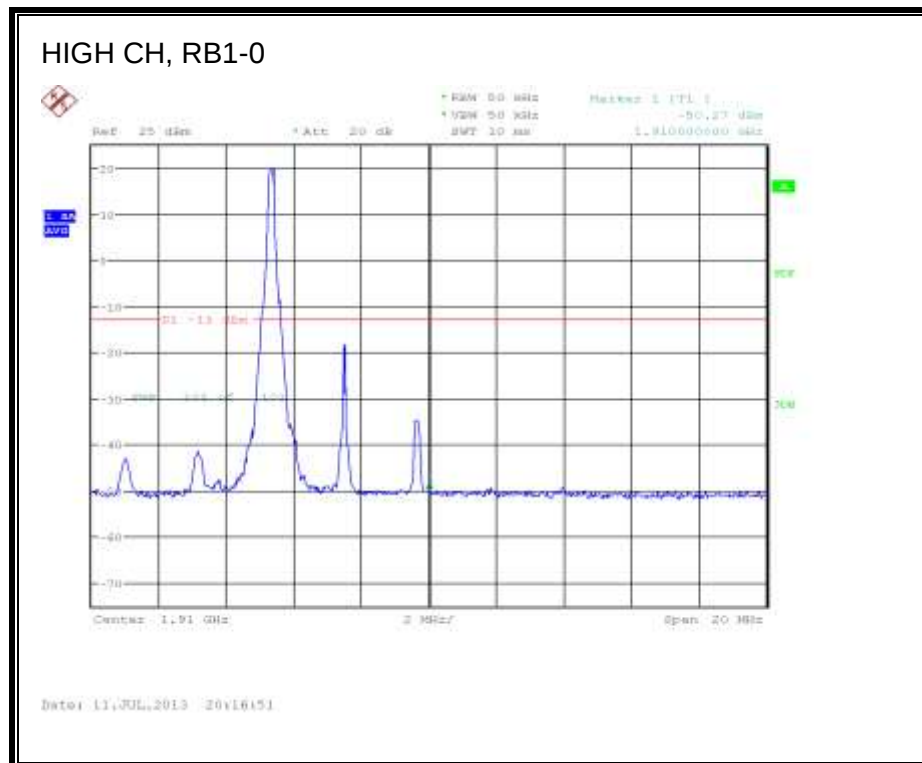
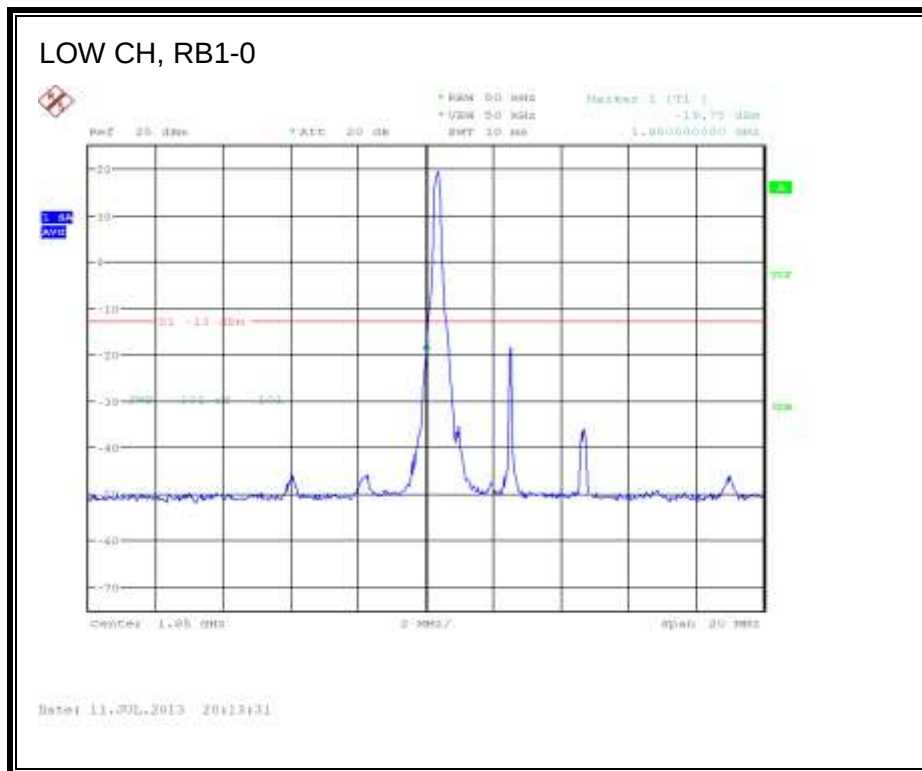
HIGH CH, RB1-14



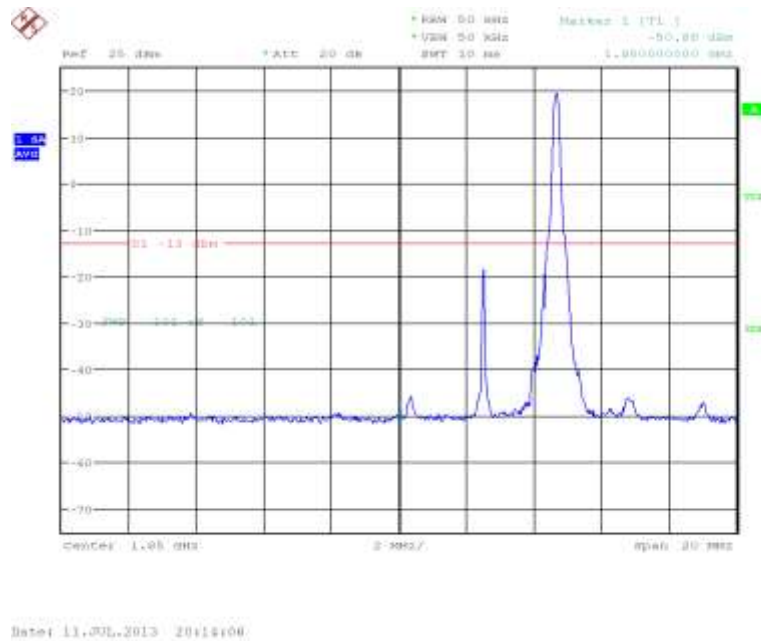




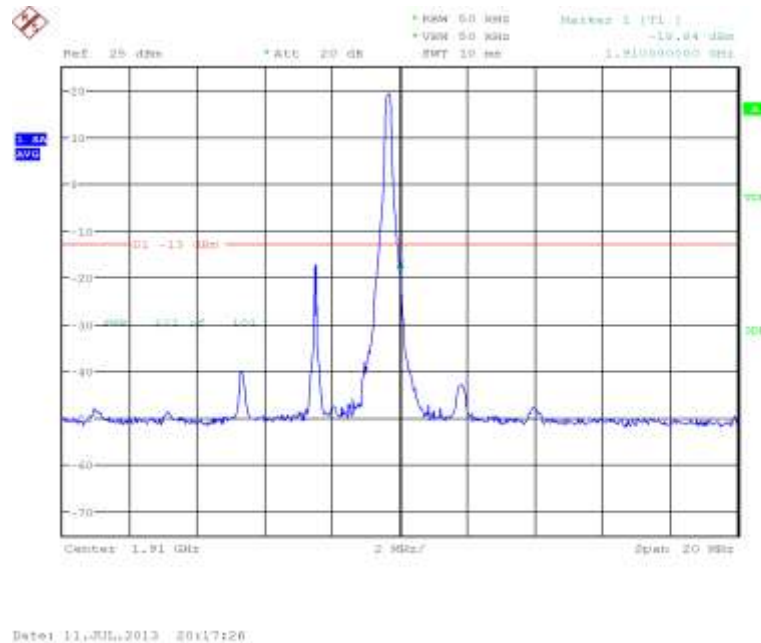
QPSK Band 2 (5 MHz BANDWIDTH)



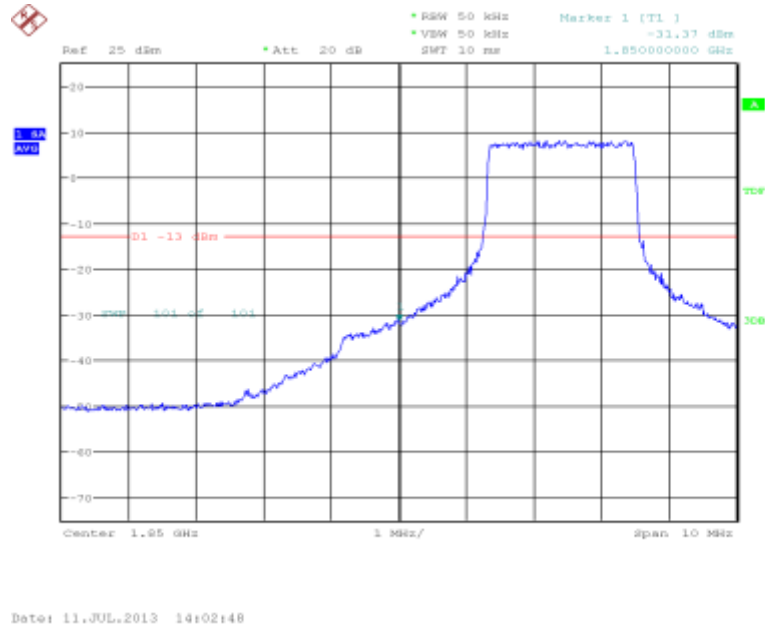
LOW CH, RB1-24



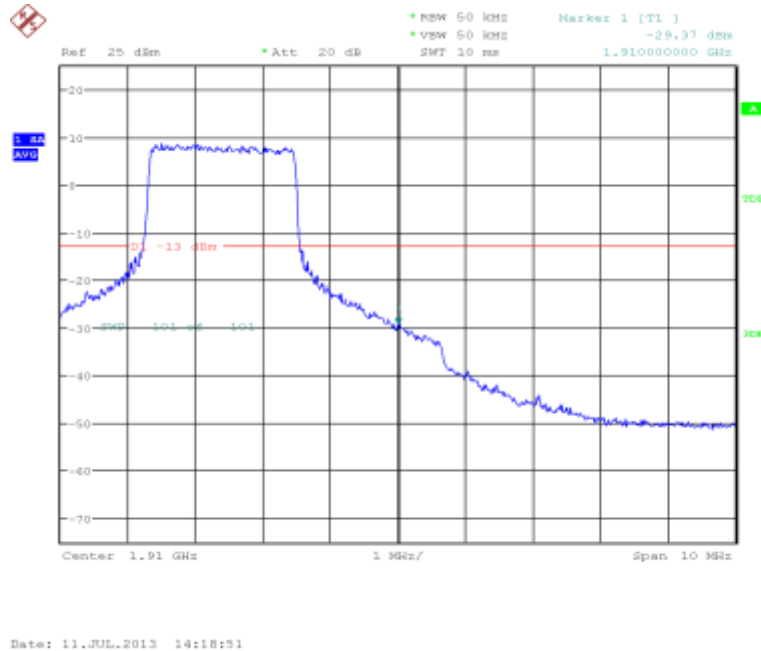
HIGH CH, RB1-24



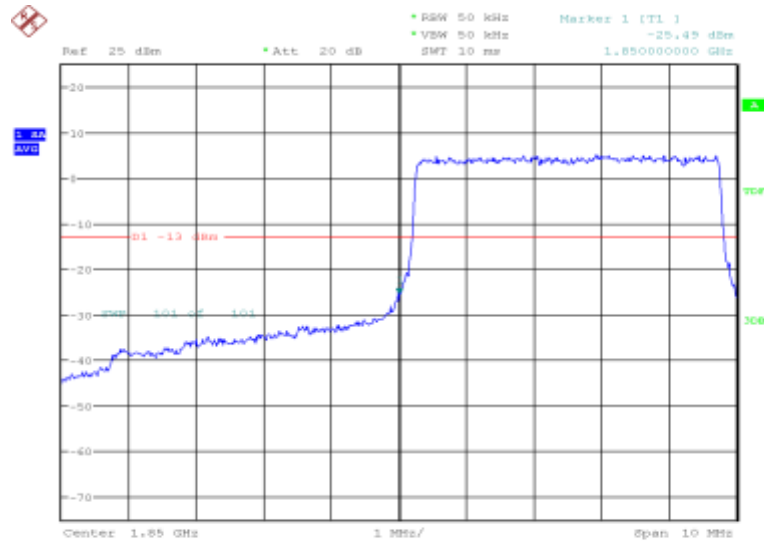
LOW CH, RB12-6



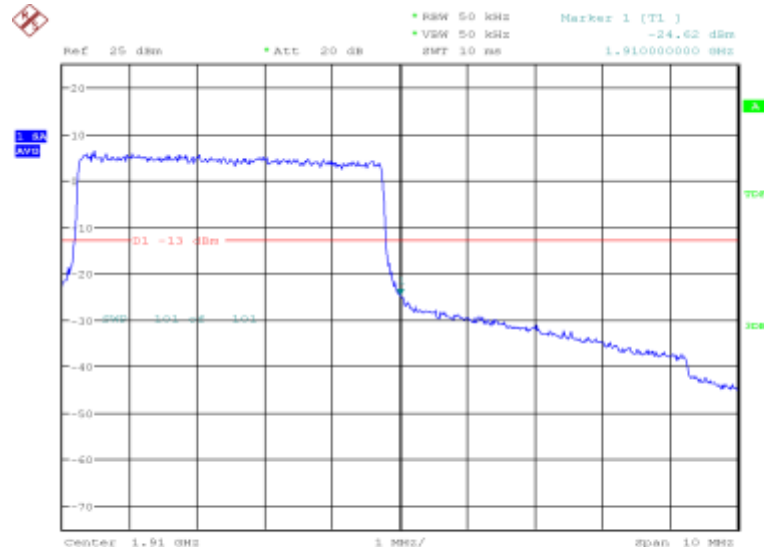
HIGH CH, RB12-6



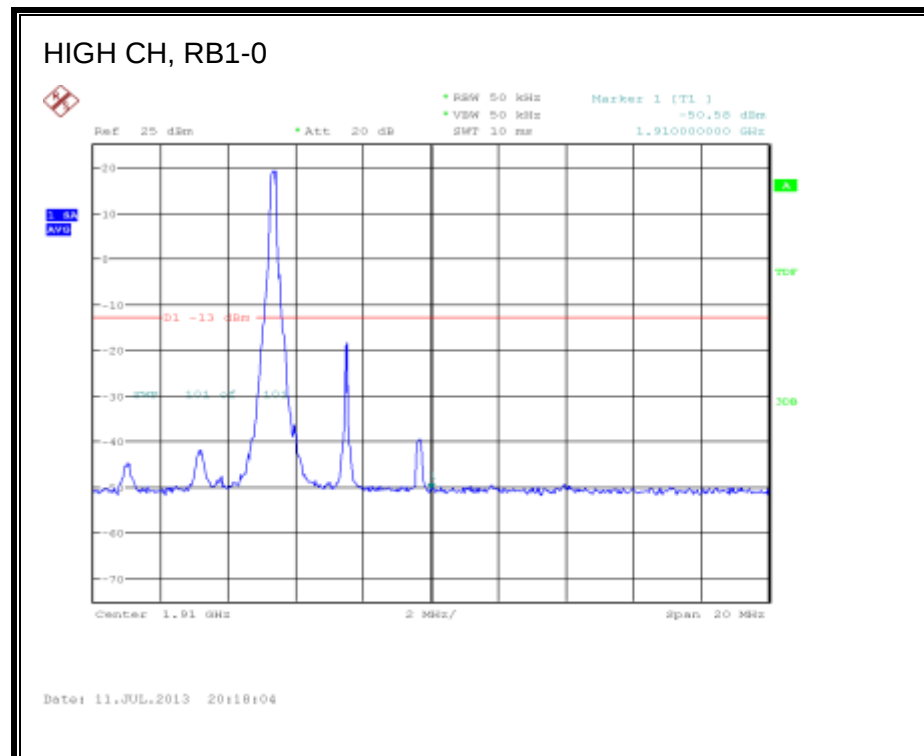
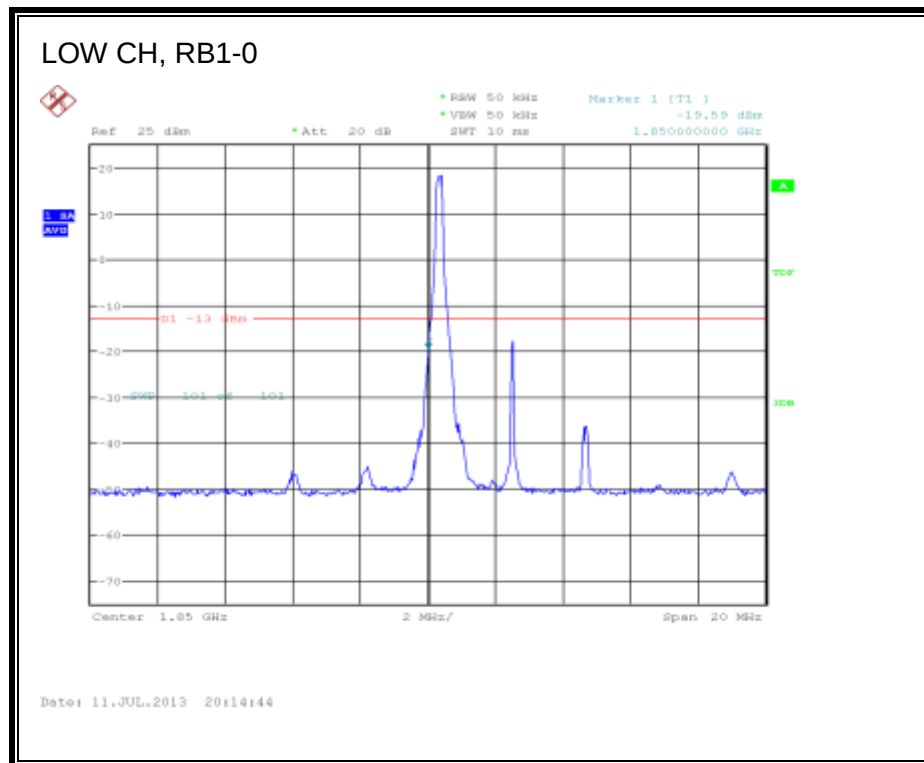
LOW CH, RB25-0



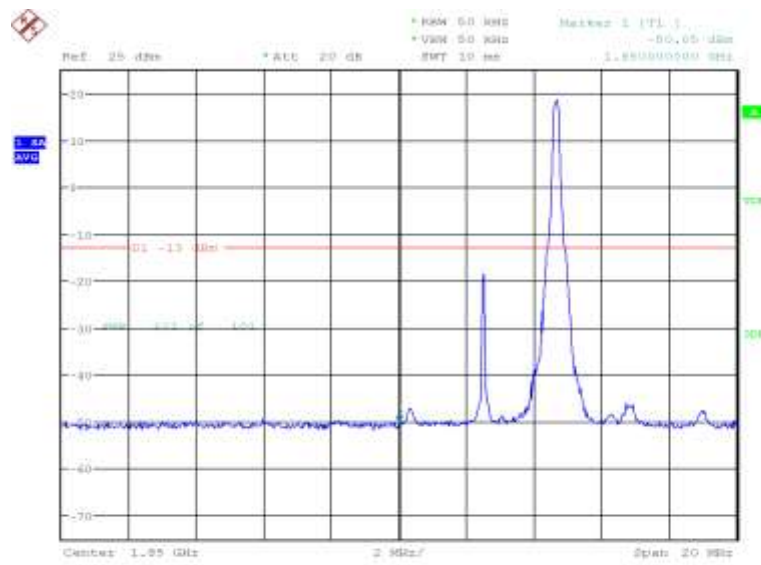
HIGH CH, RB25-0



16QAM Band 2 (5 MHz BANDWIDTH)

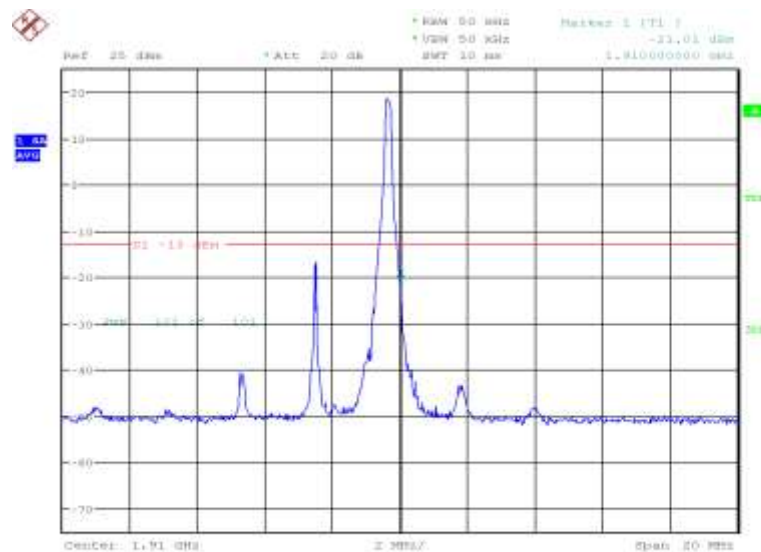


LOW CH, RB1-24

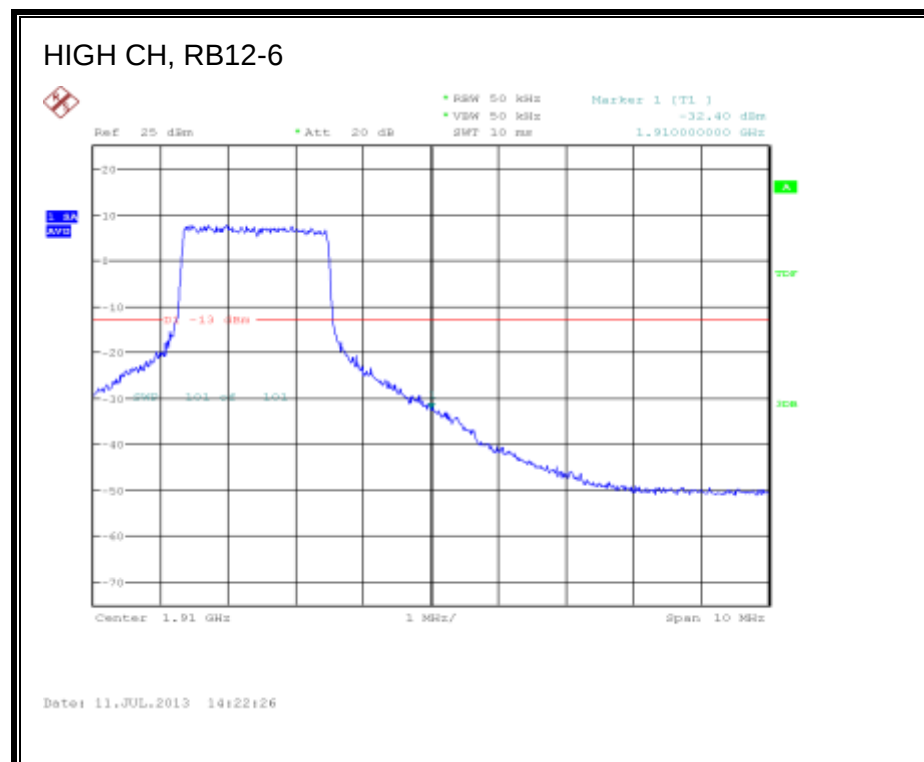
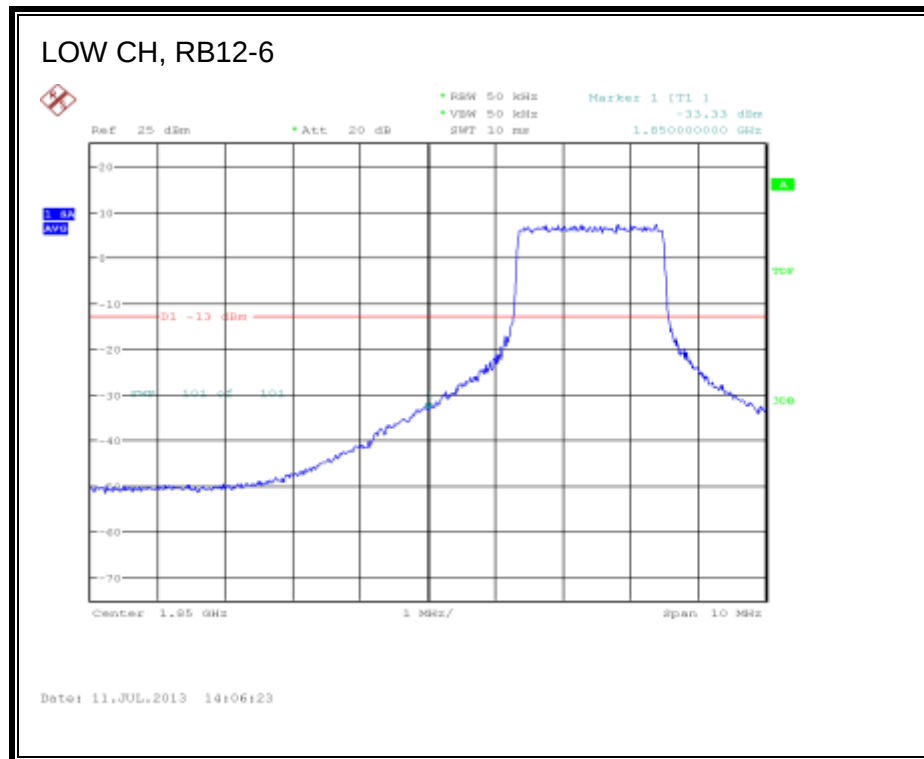


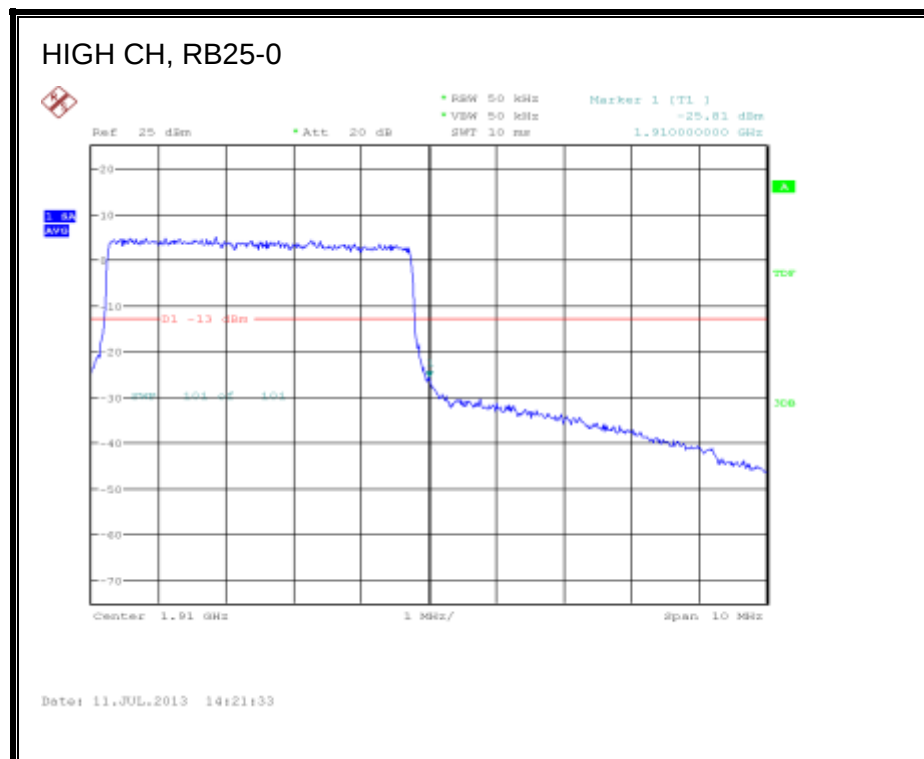
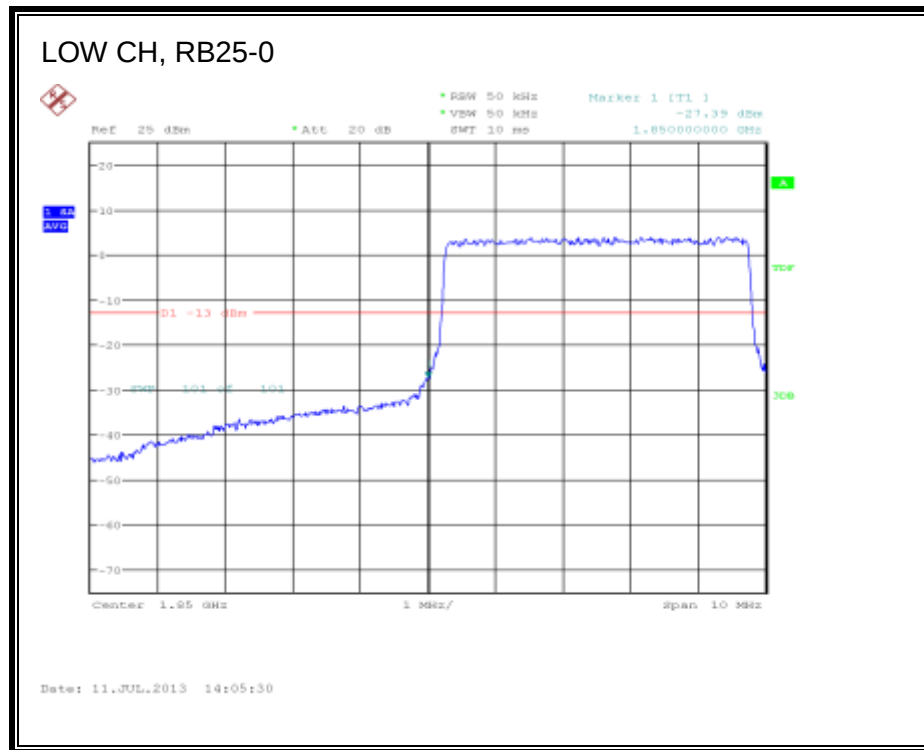
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HIGH CH, RB1-24

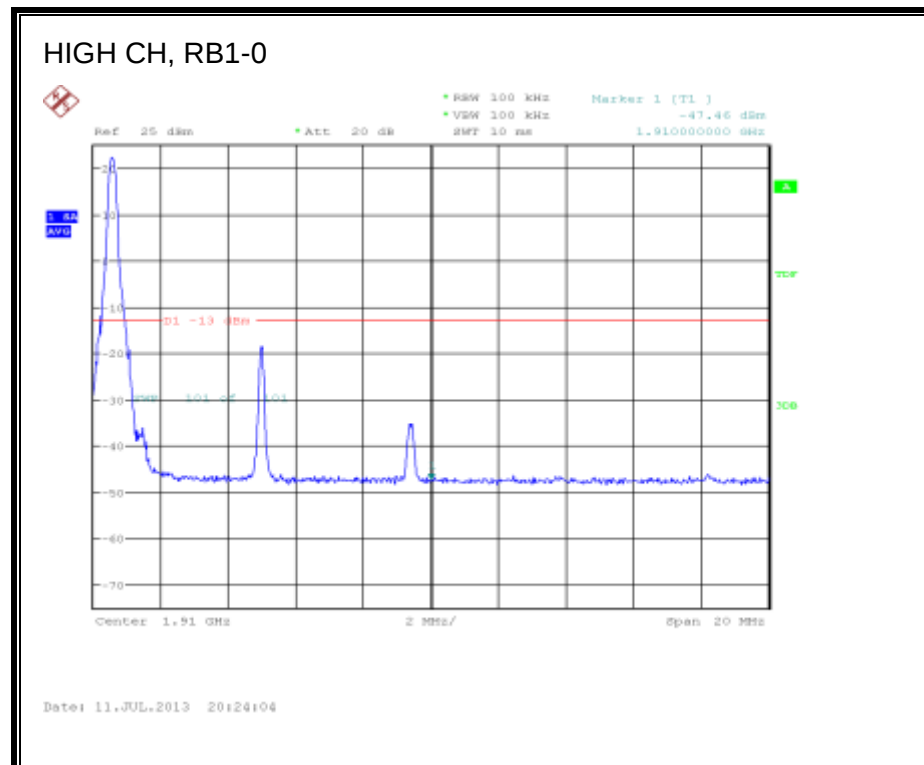
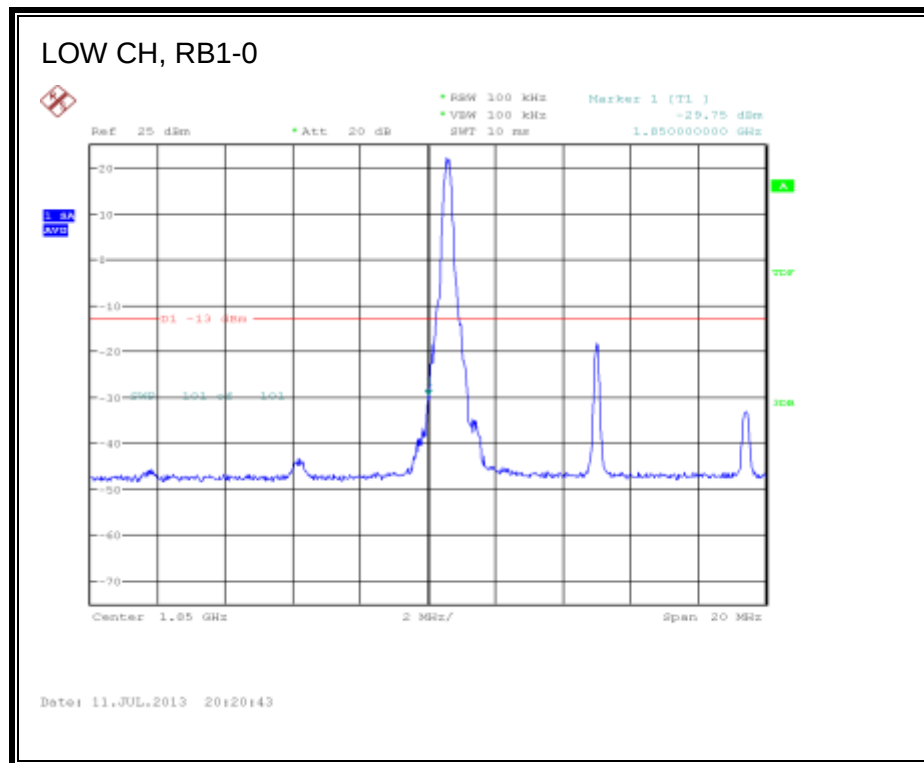


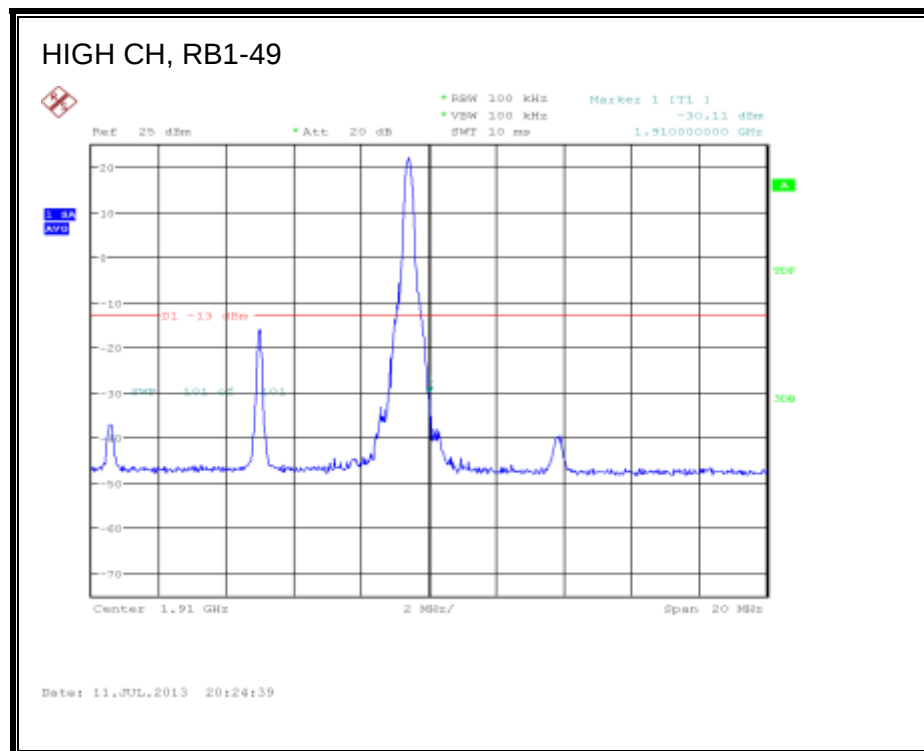
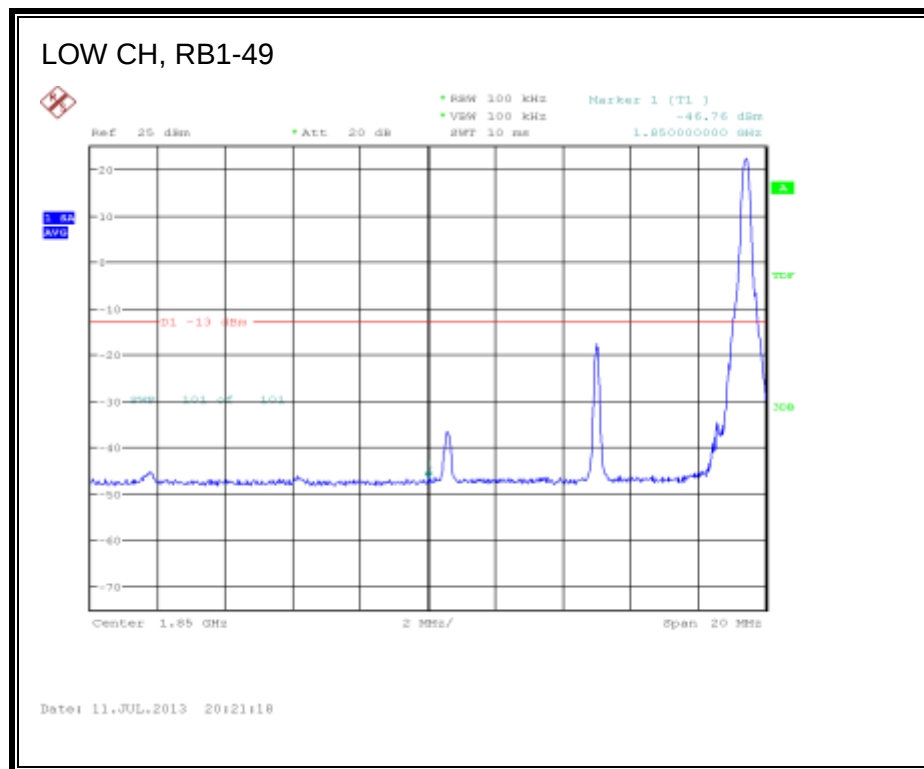
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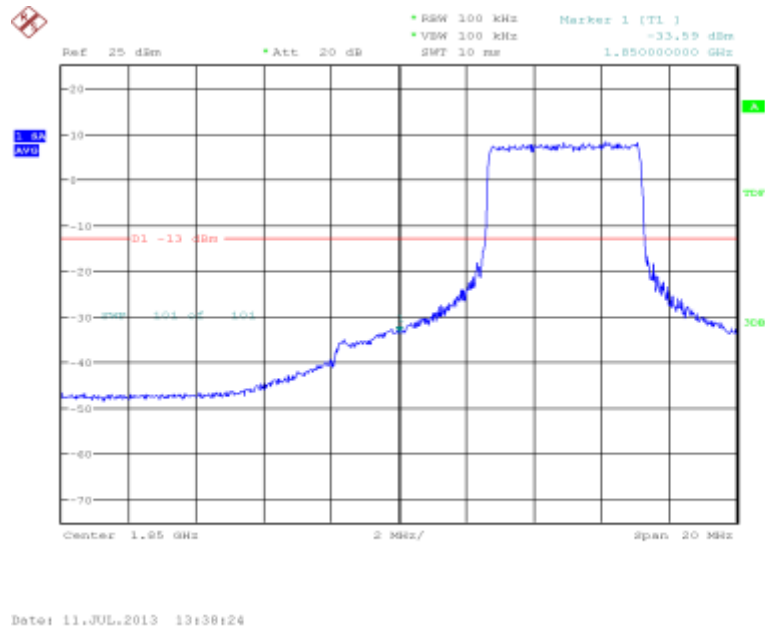


QPSK Band 2 (10 MHz BANDWIDTH)

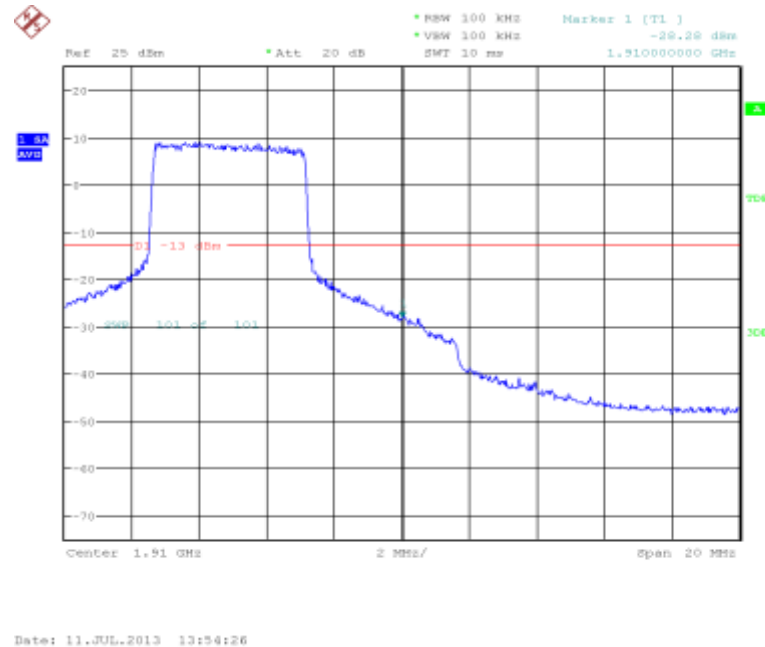


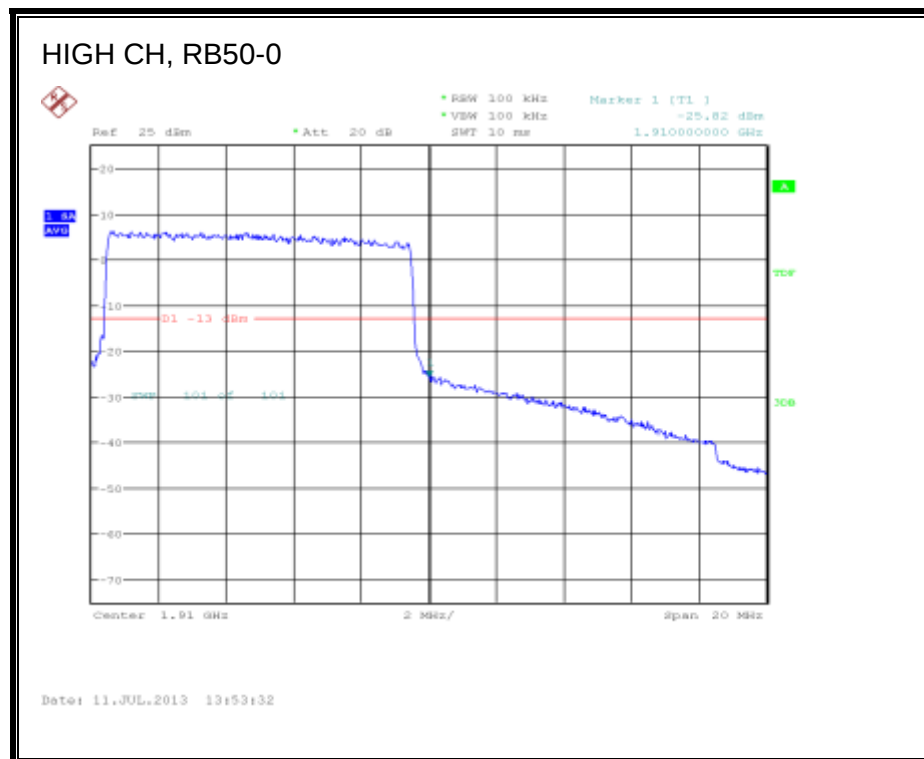
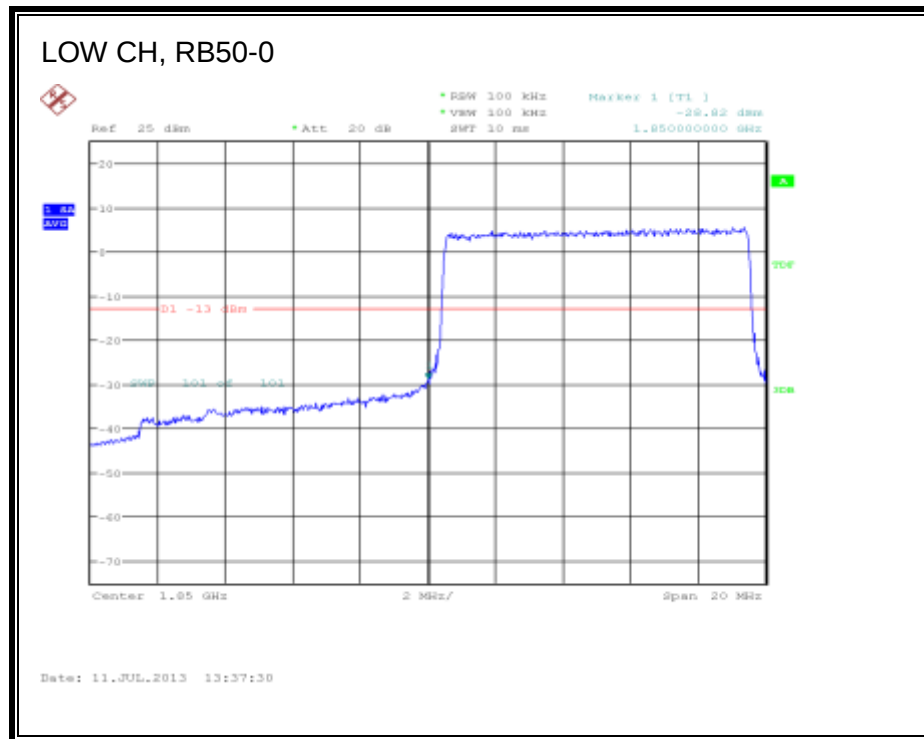


LOW CH, RB25-12

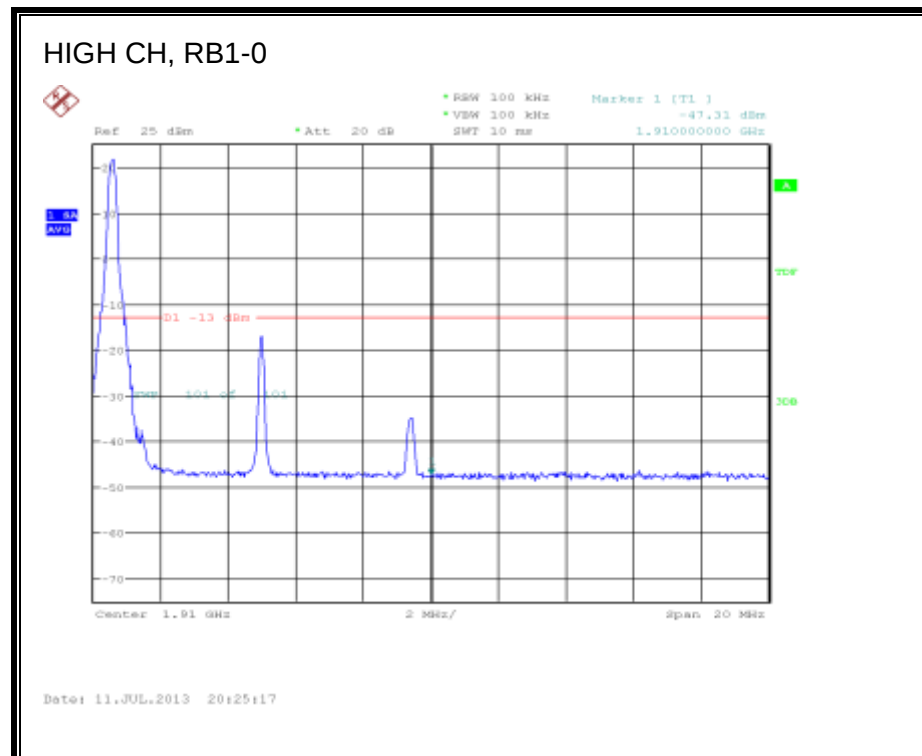
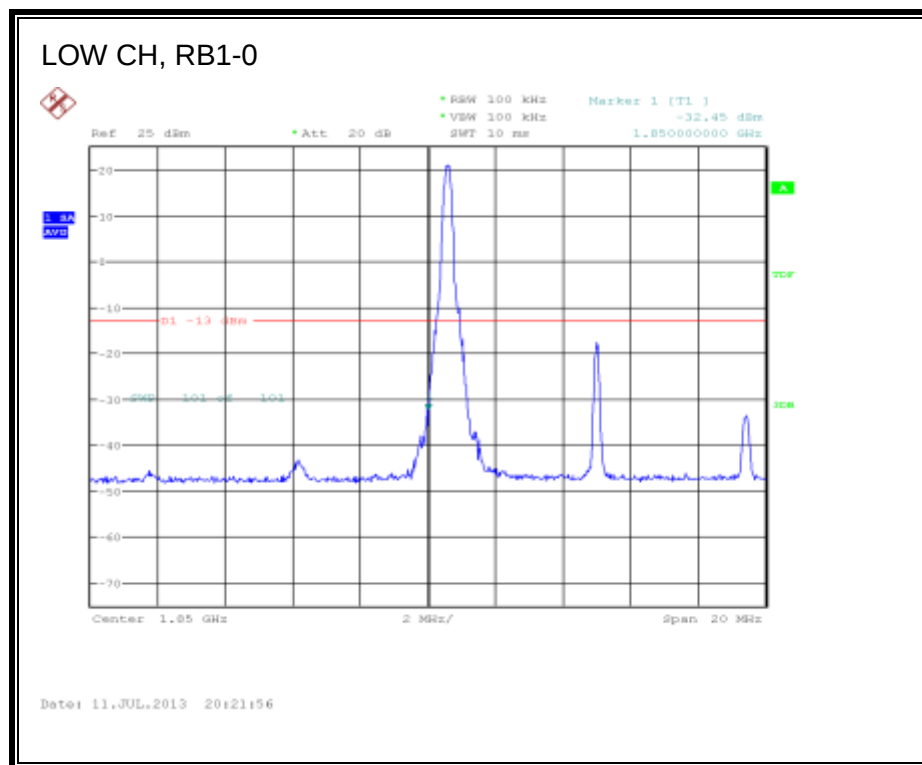


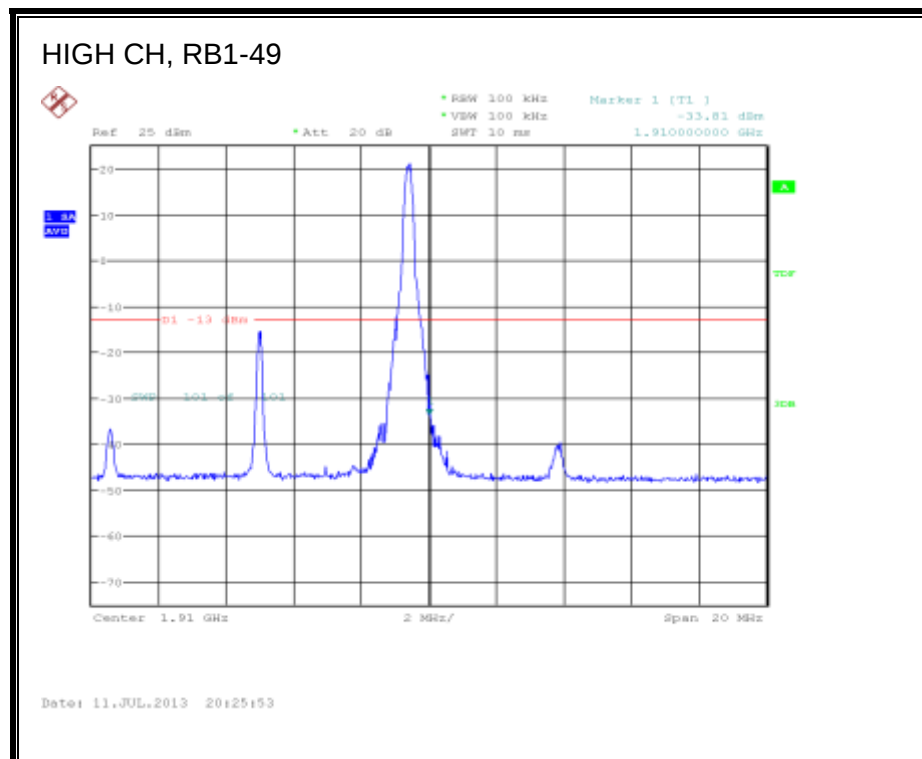
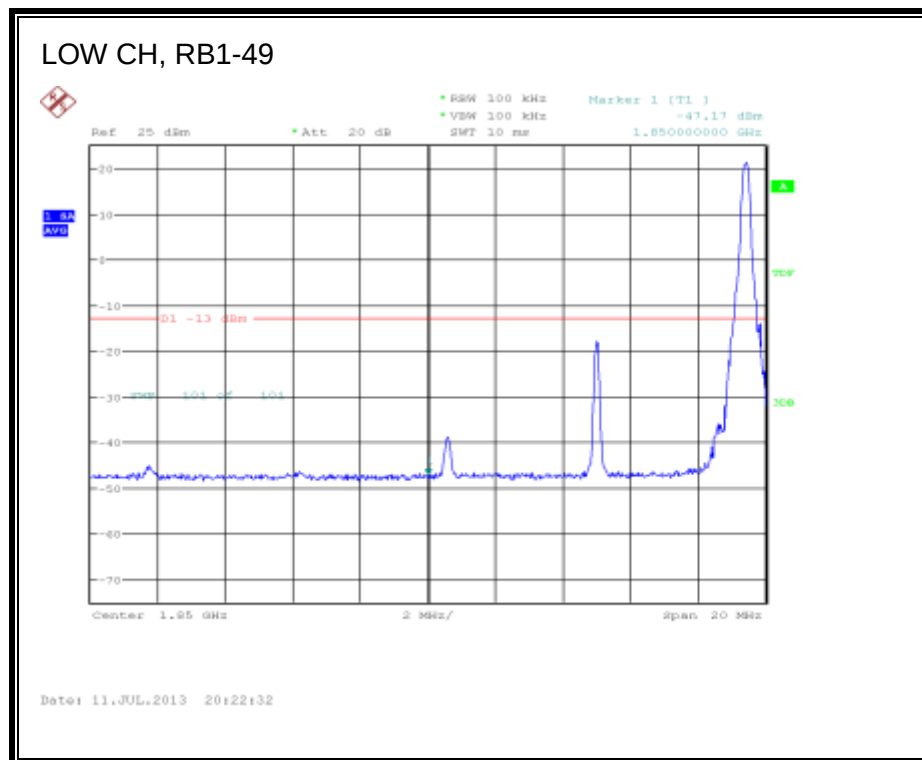
HIGH CH, RB25-12

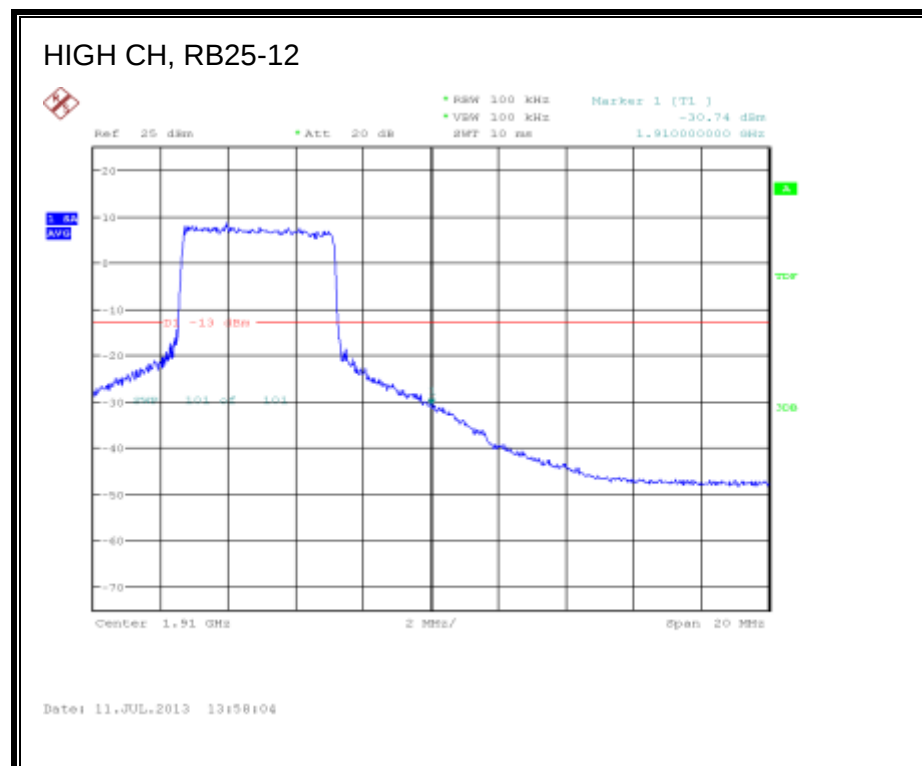
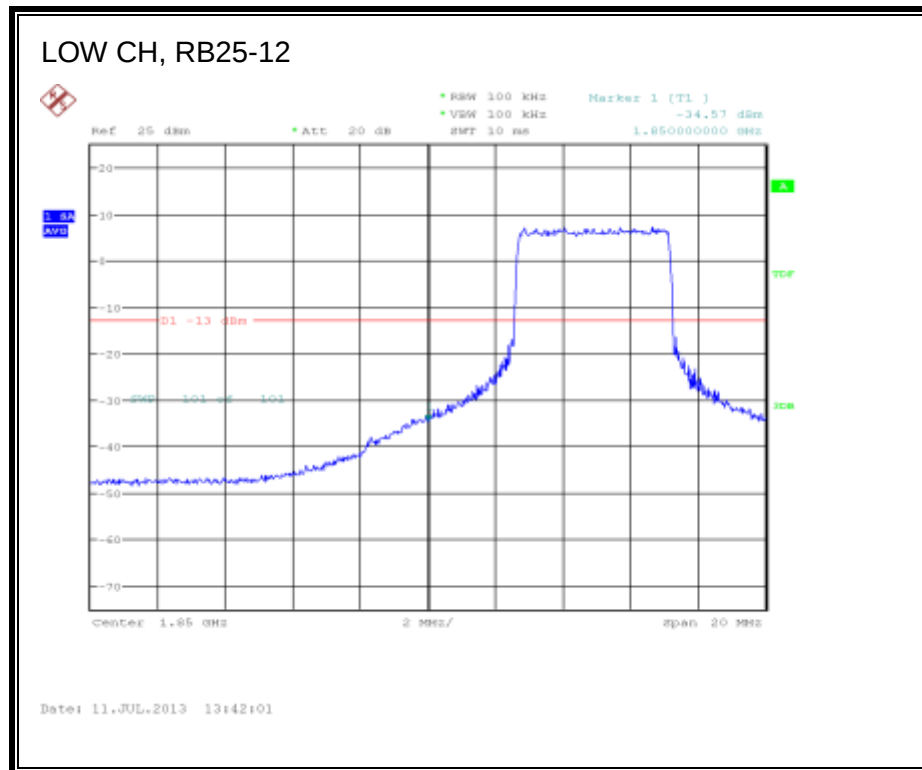




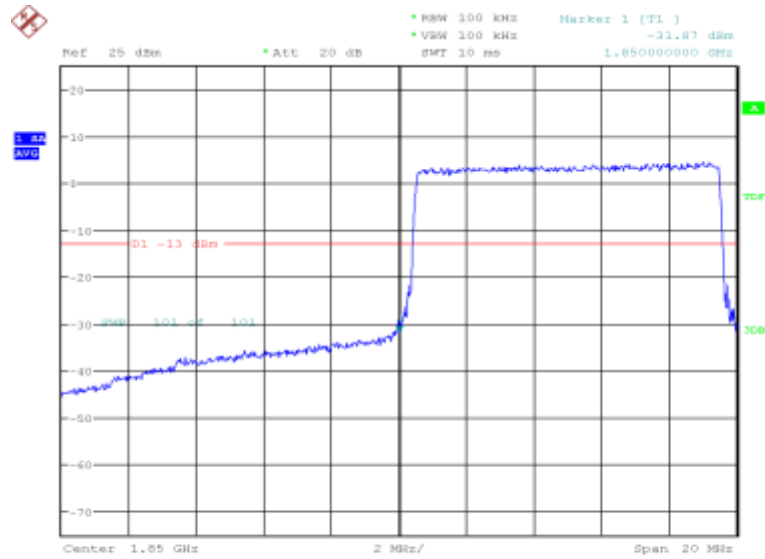
16QAM Band 2 (10 MHz BANDWIDTH)





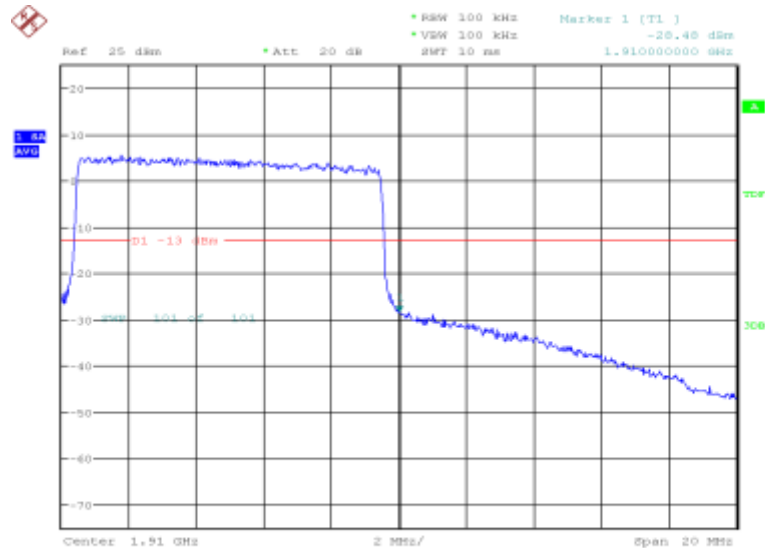


LOW CH, RB50-0

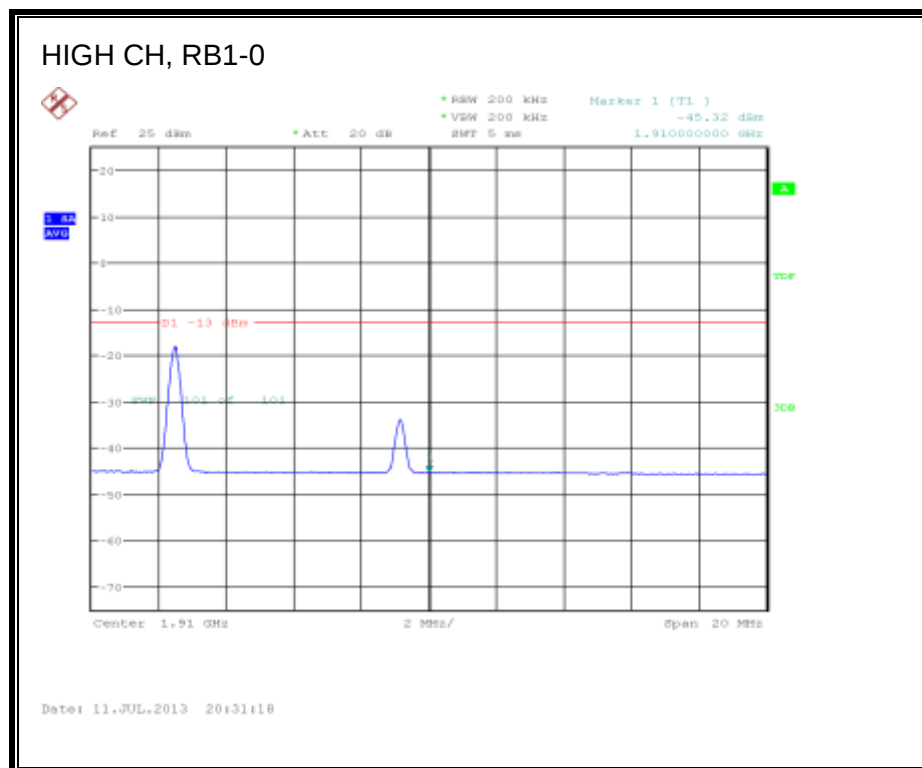
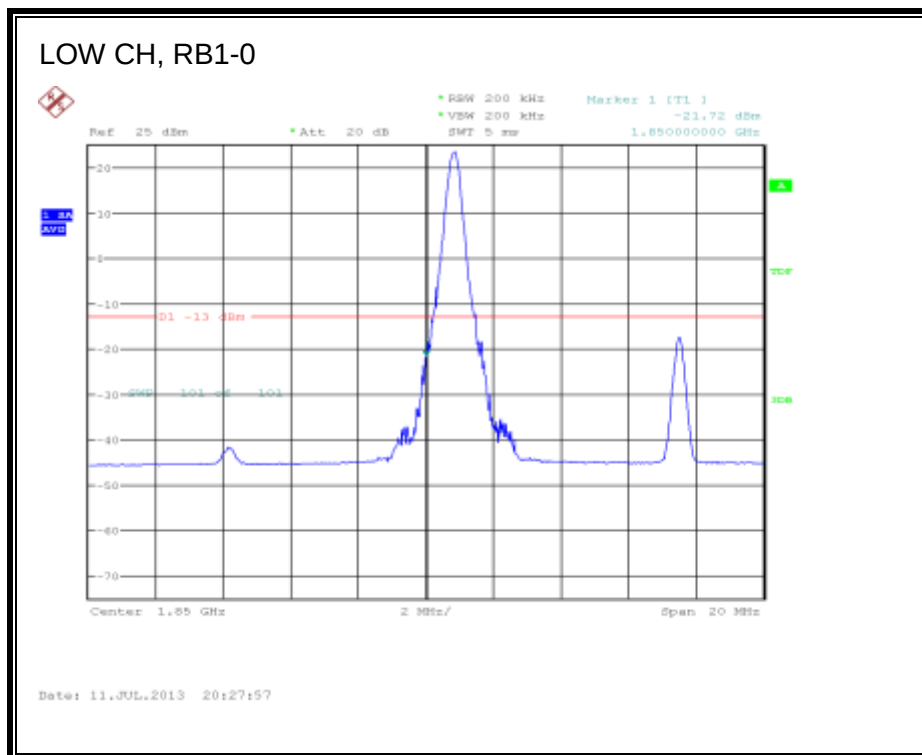


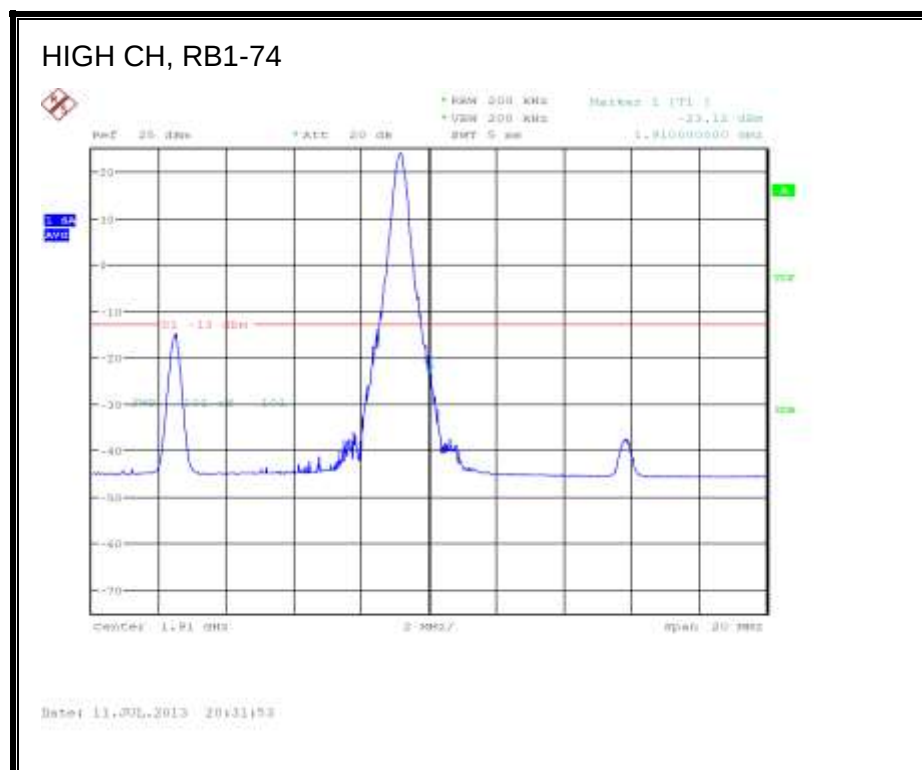
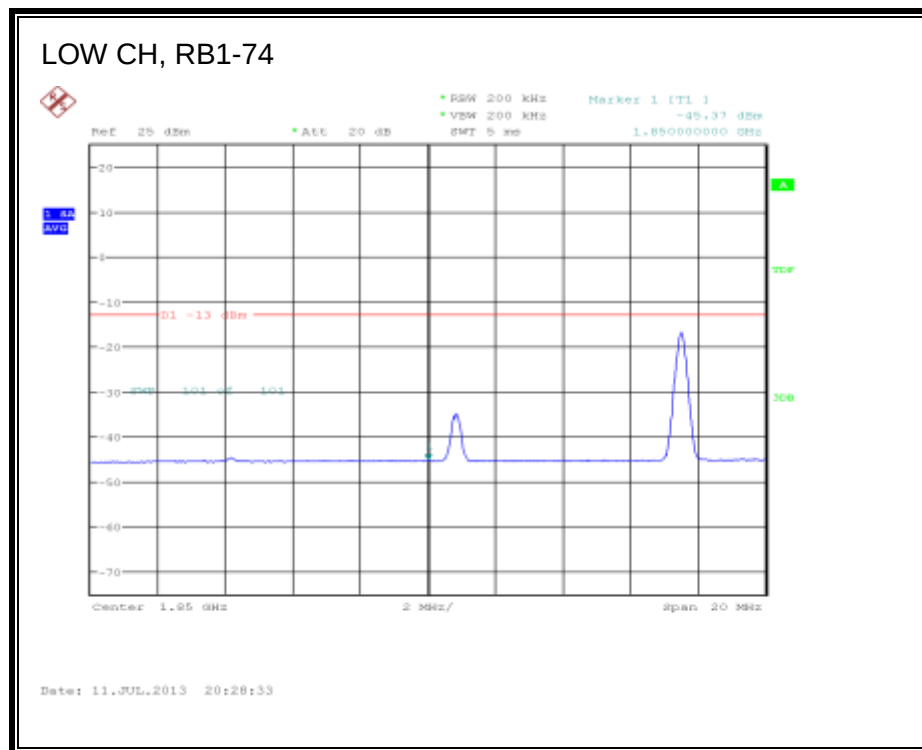
Date: 11.JUL.2013 13:41:07

HIGH CH, RB50-0

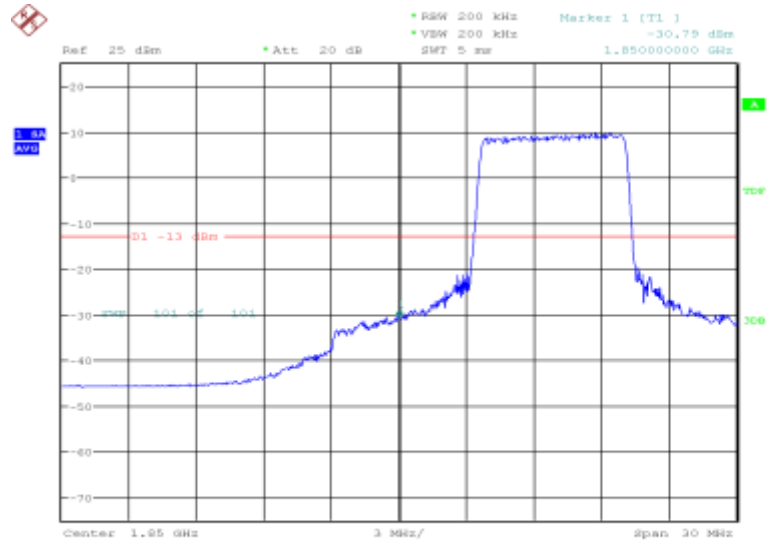


Date: 11.JUL.2013 13:57:09



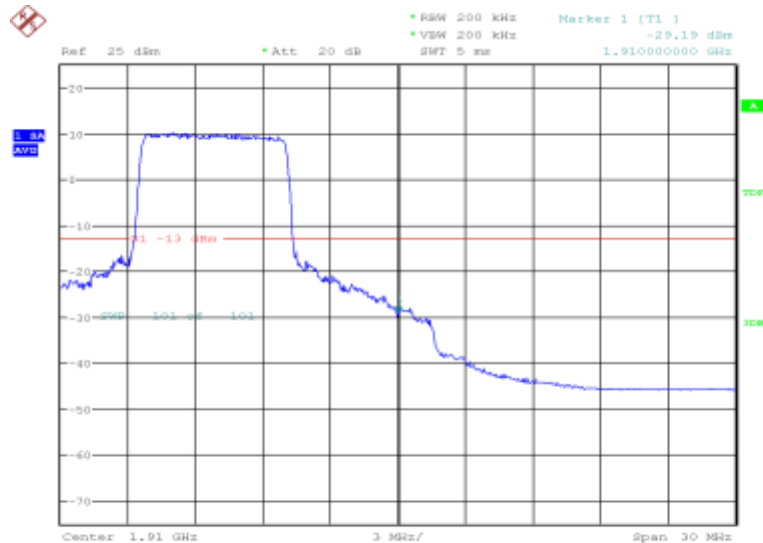


LOW CH, RB36-16



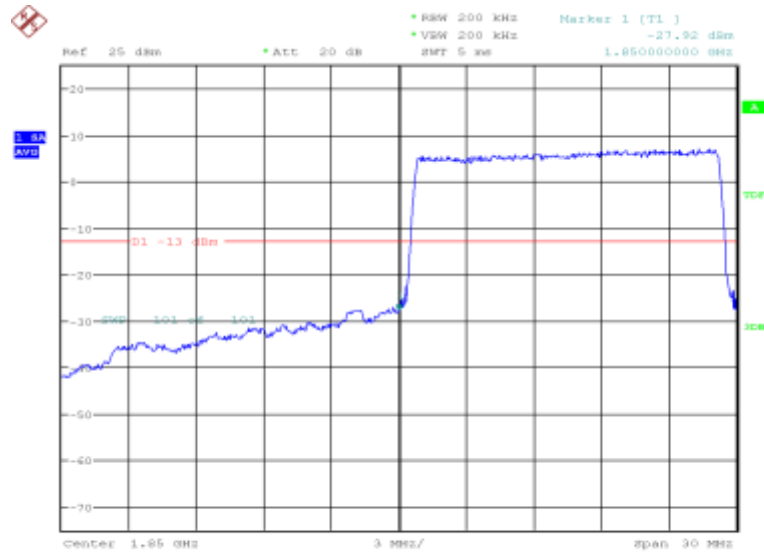
Date: 11.JUL.2013 14:27:23

HIGH CH, RB36-16



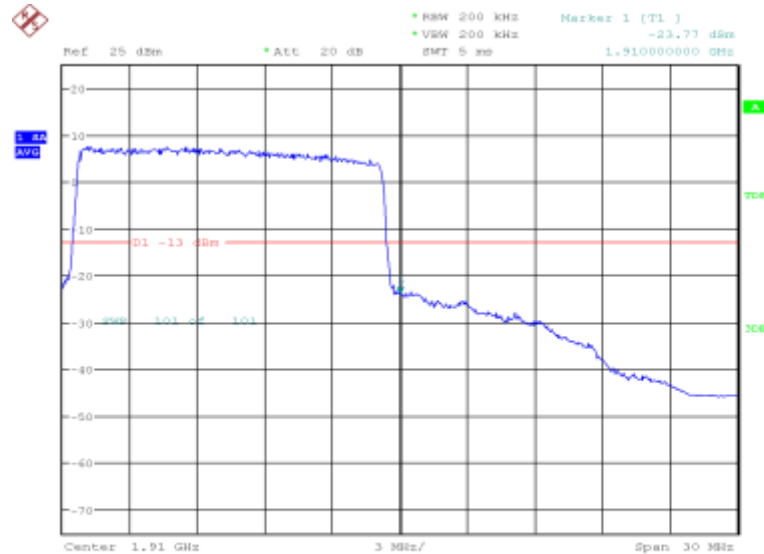
Date: 11.JUL.2013 14:43:22

LOW CH, RB75-0



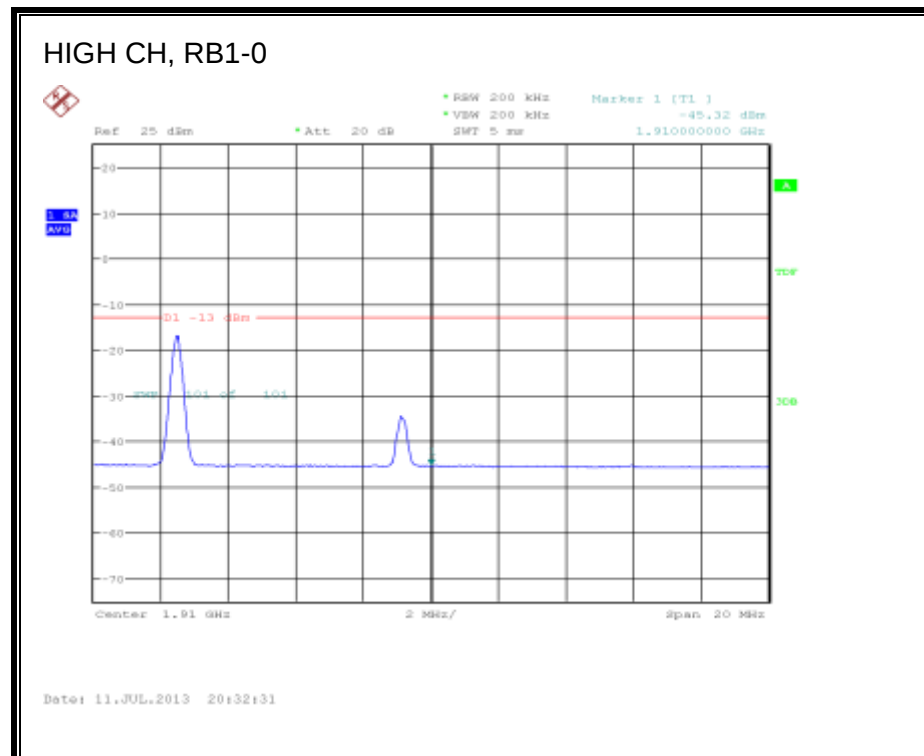
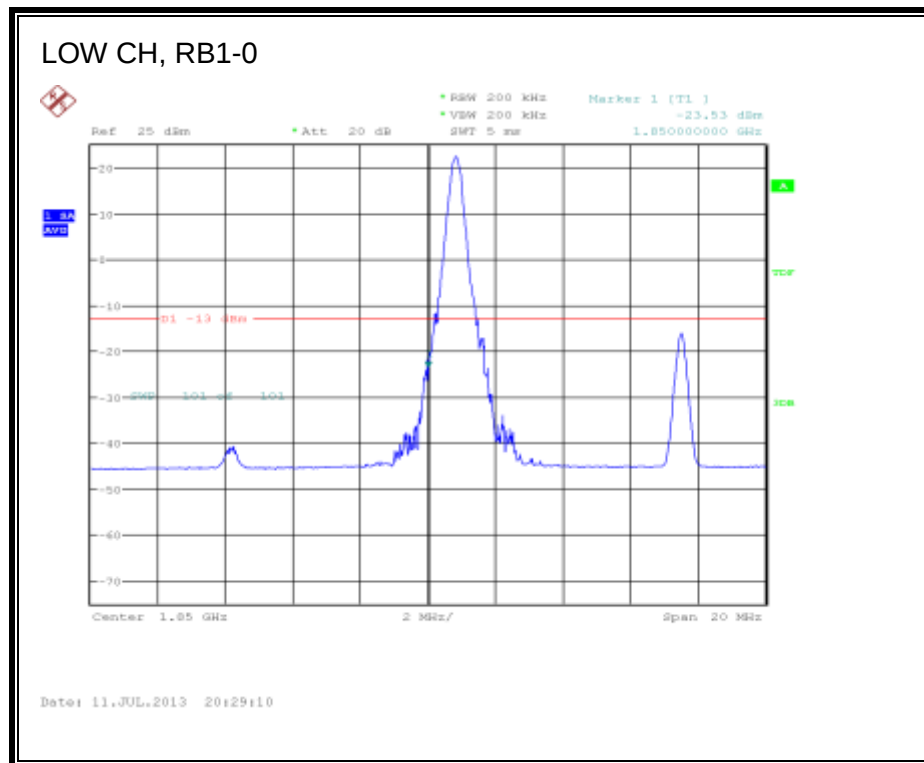
Date: 11.JUL.2013 14:26:29

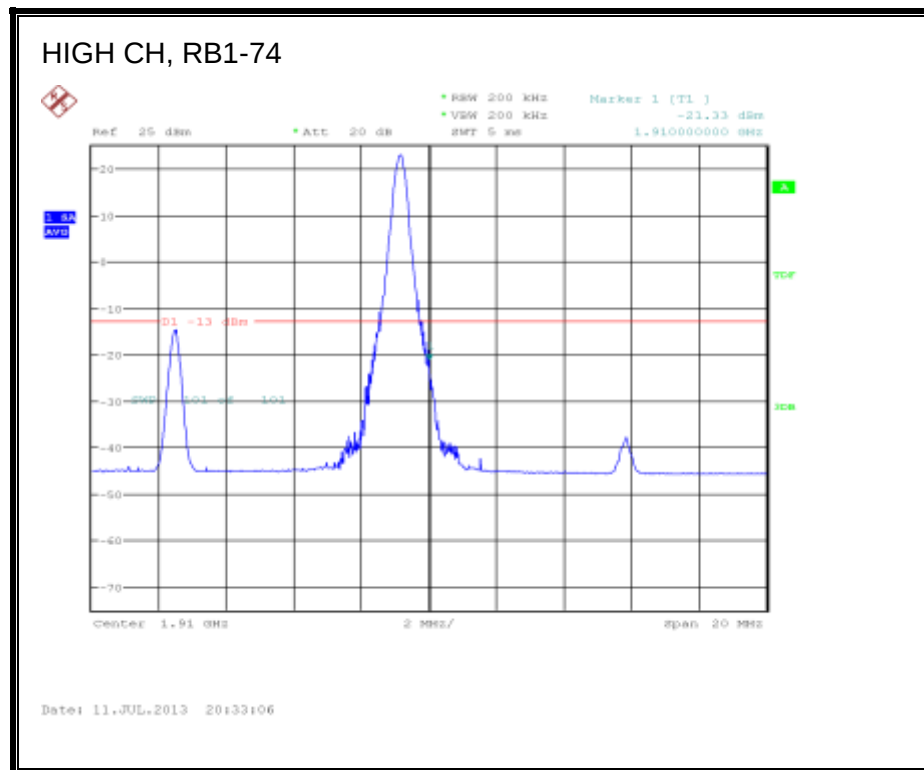
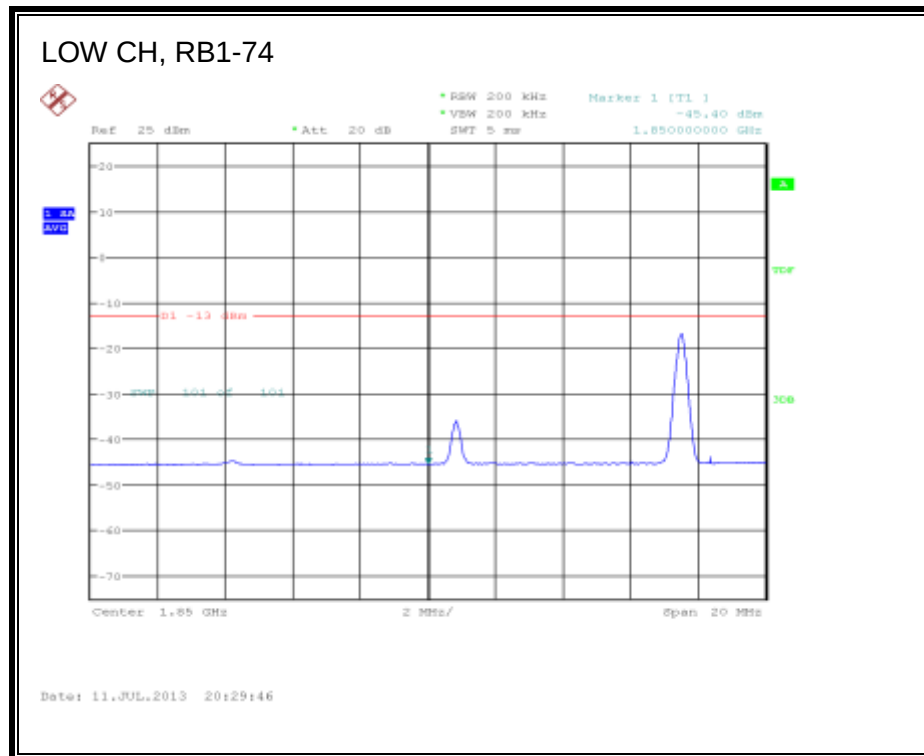
HIGH CH, RB75-0



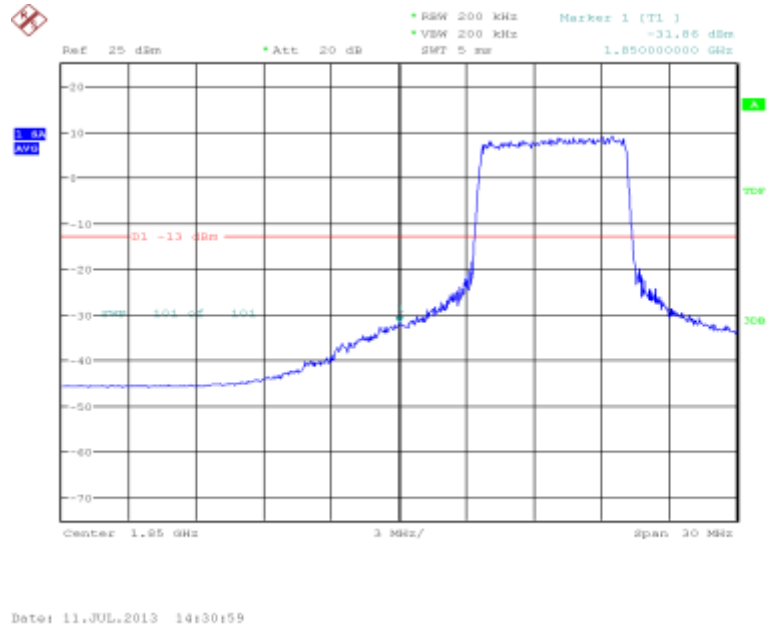
Date: 11.JUL.2013 14:42:28

16QAM Band 2 (15.0 MHz BAND WIDTH)

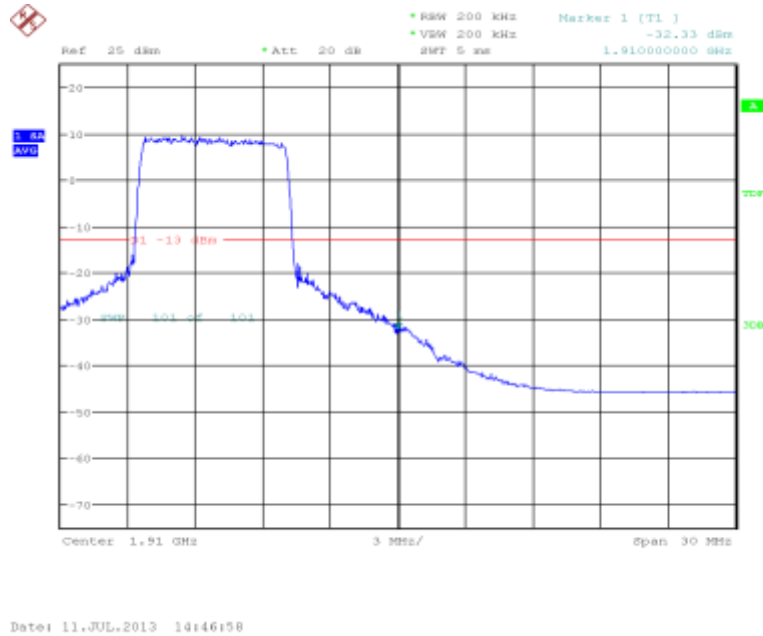


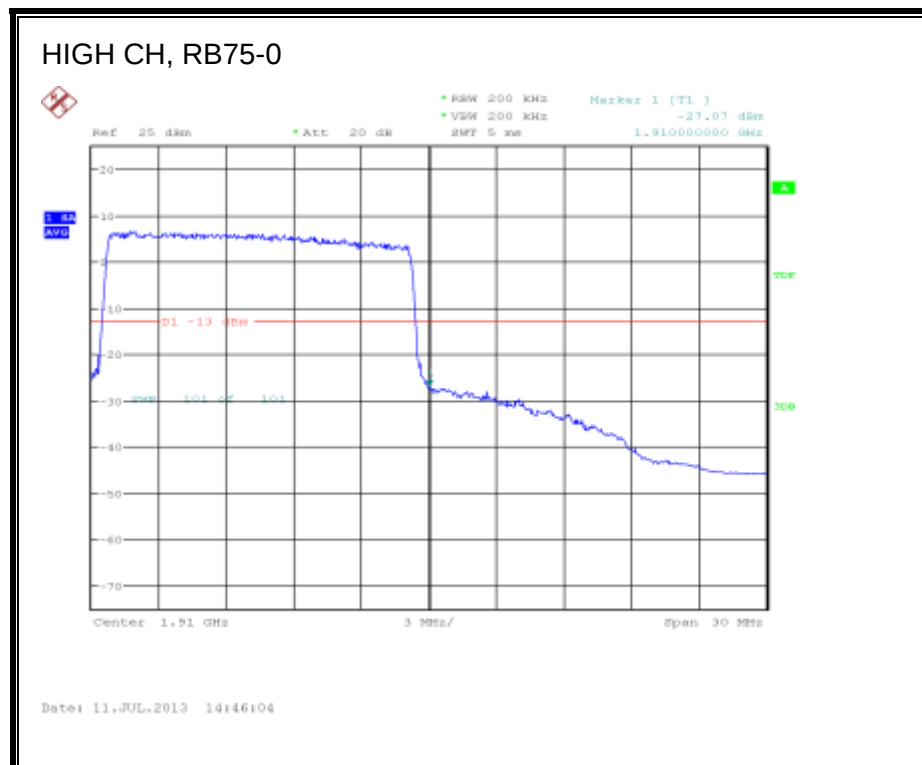
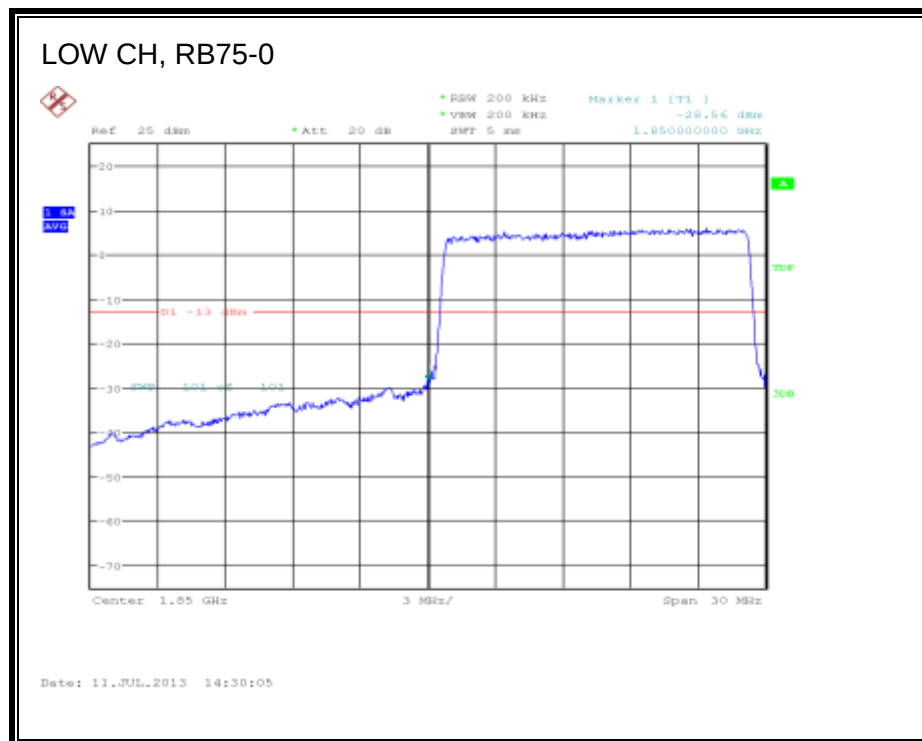


LOW CH, RB36-16

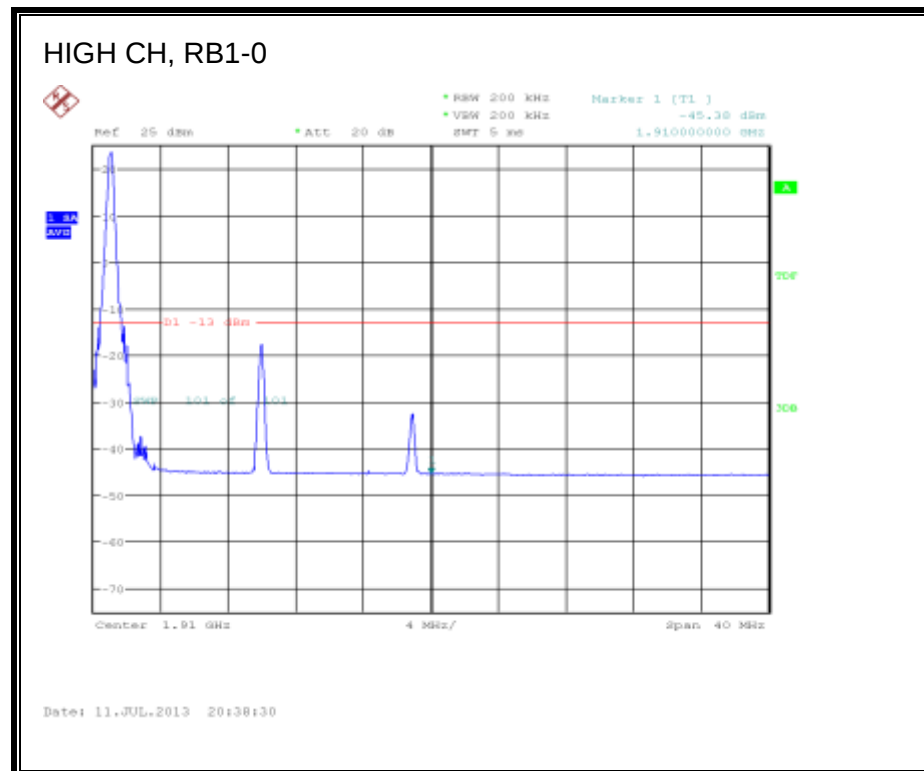
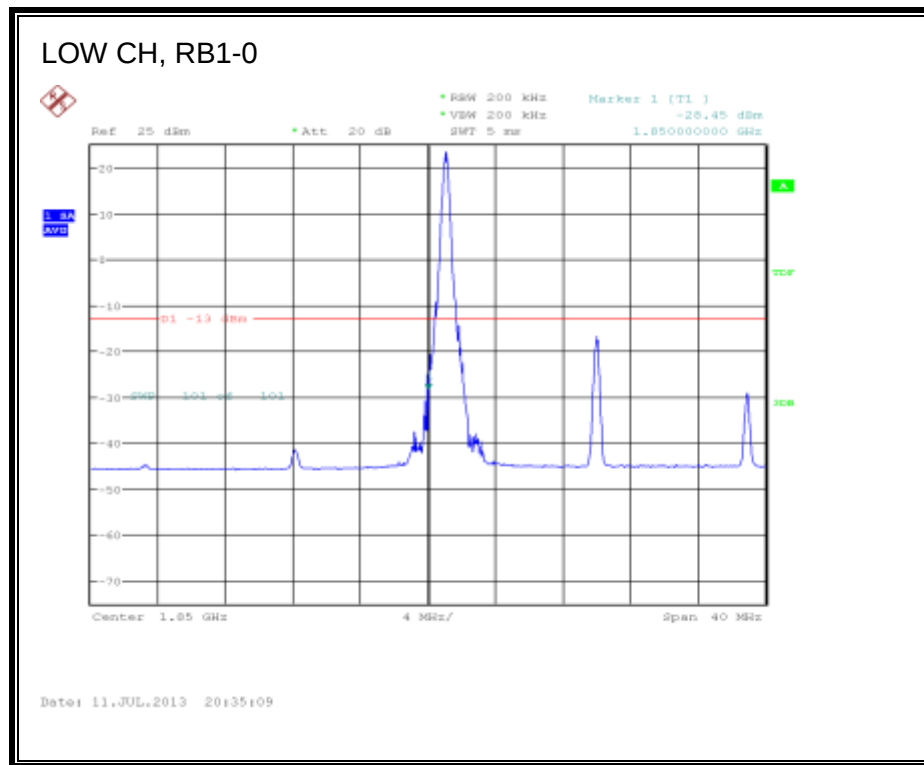


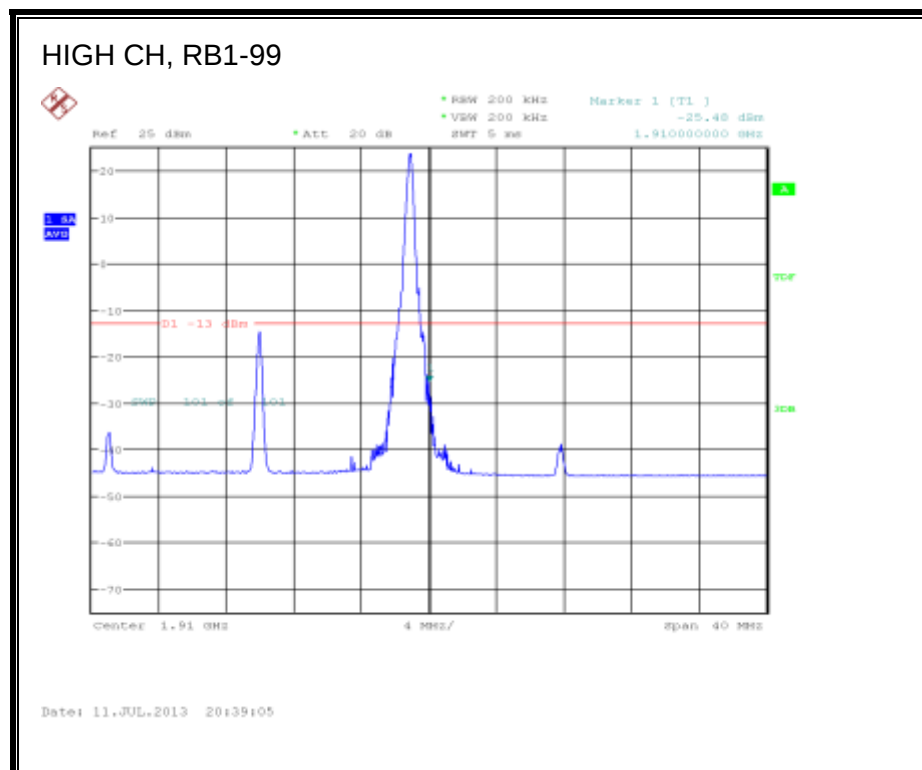
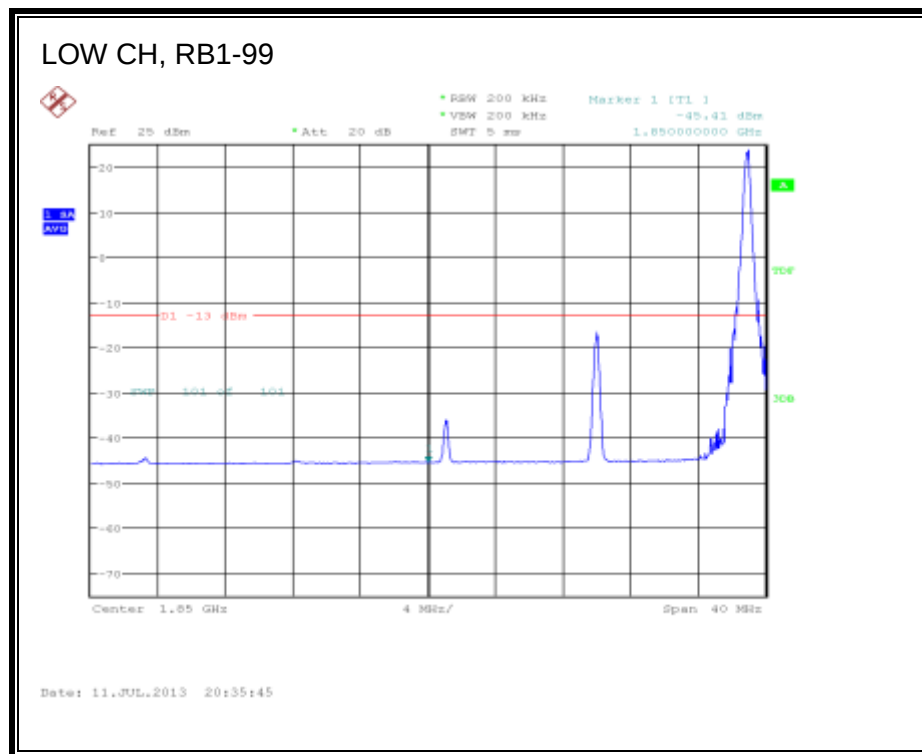
HIGH CH, RB36-16



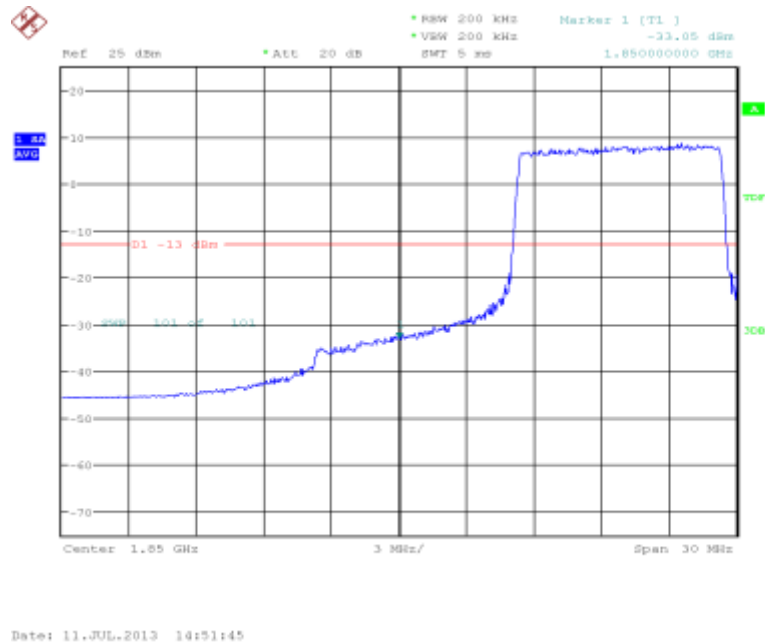


QPSK Band 2 (20.0 MHz BAND WIDTH)

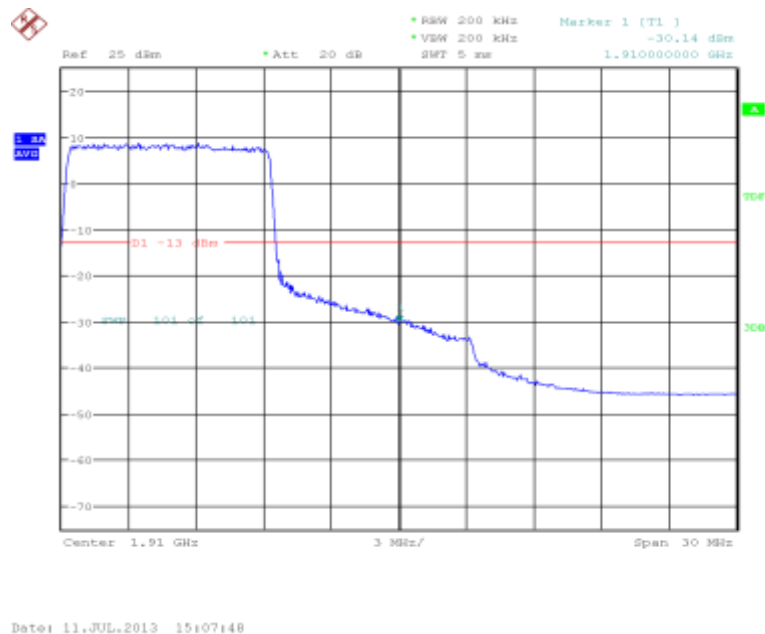


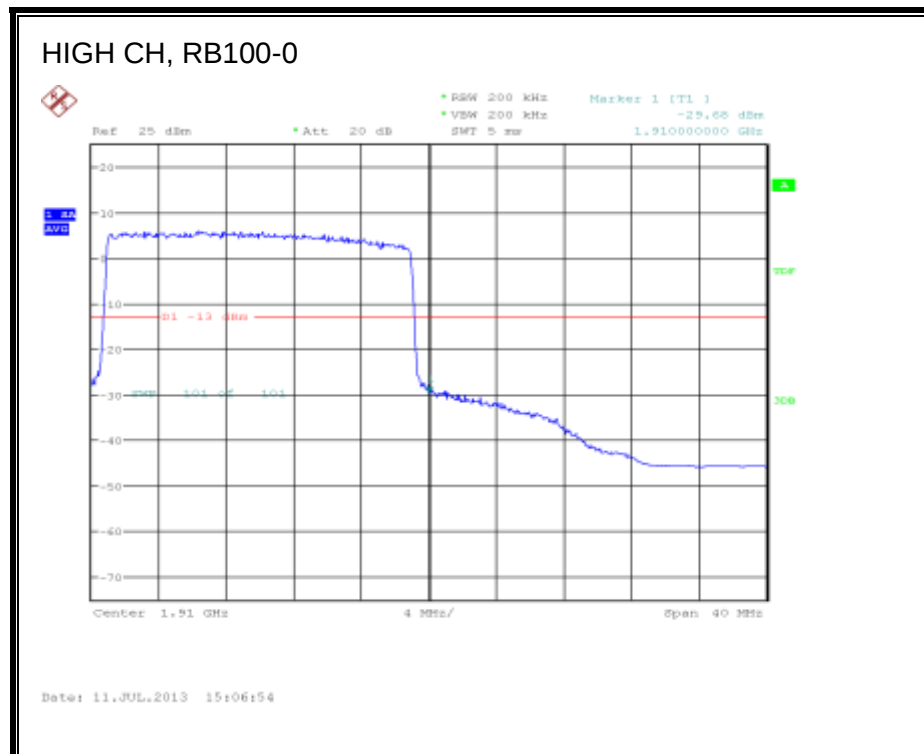
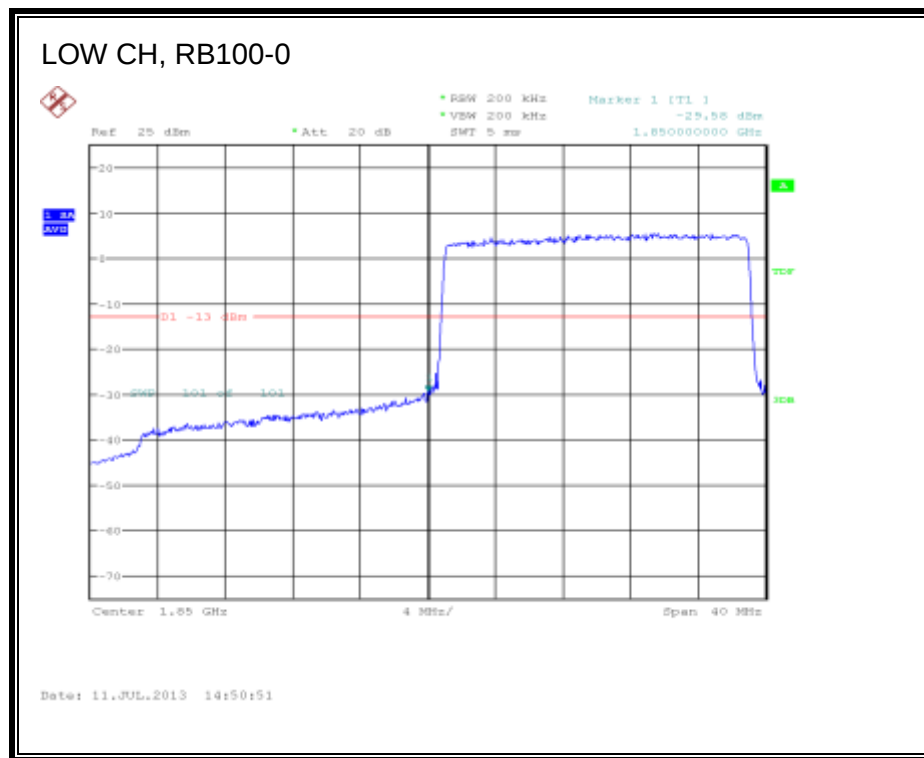


LOW CH, RB50-24

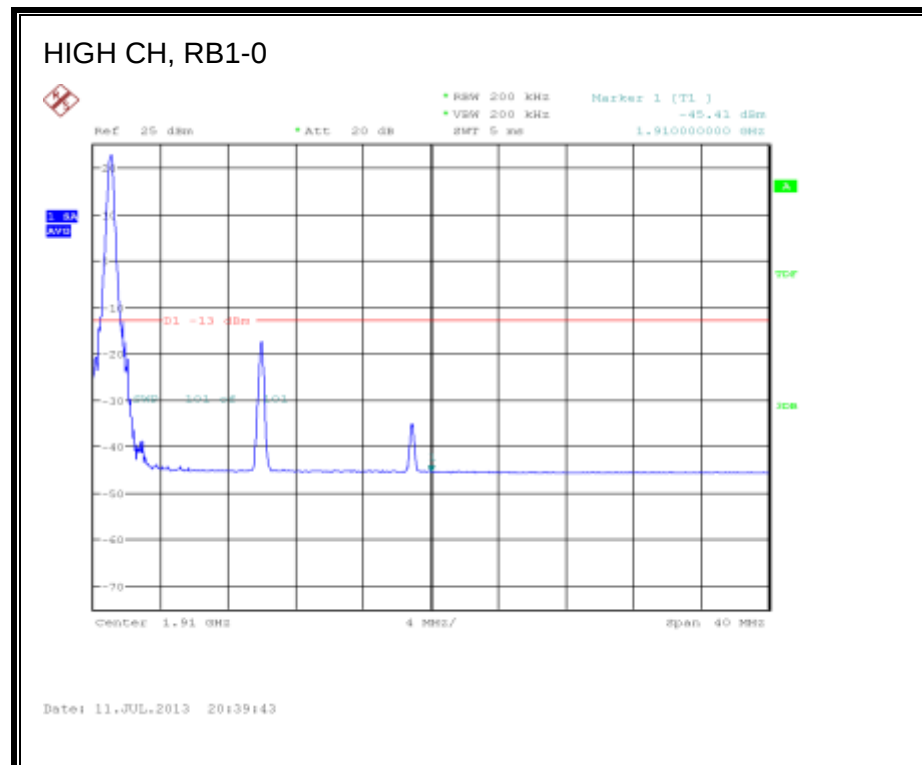
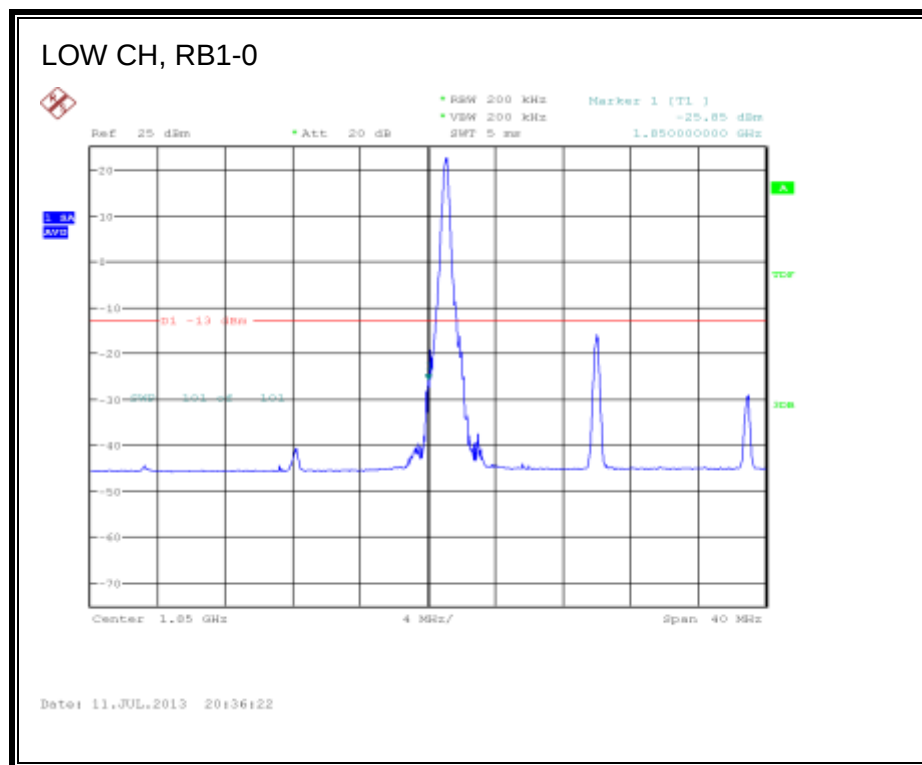


HIGH CH, RB50-24

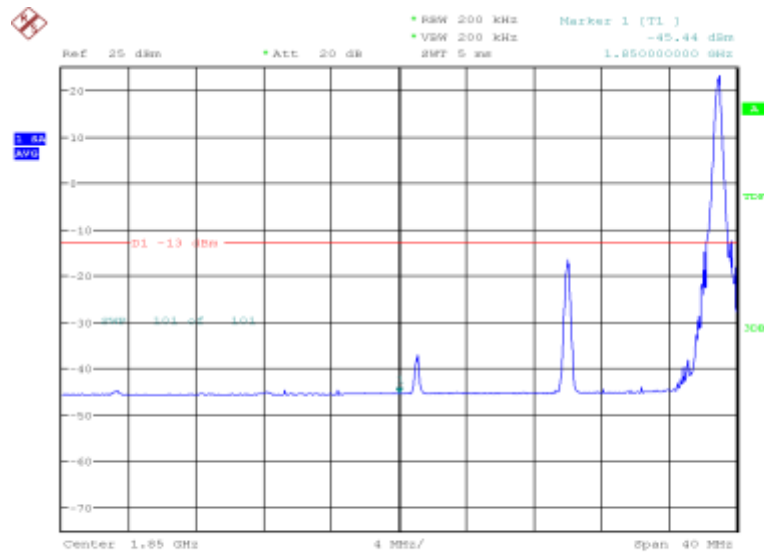




16QAM Band 2 (20.0 MHz BAND WIDTH)

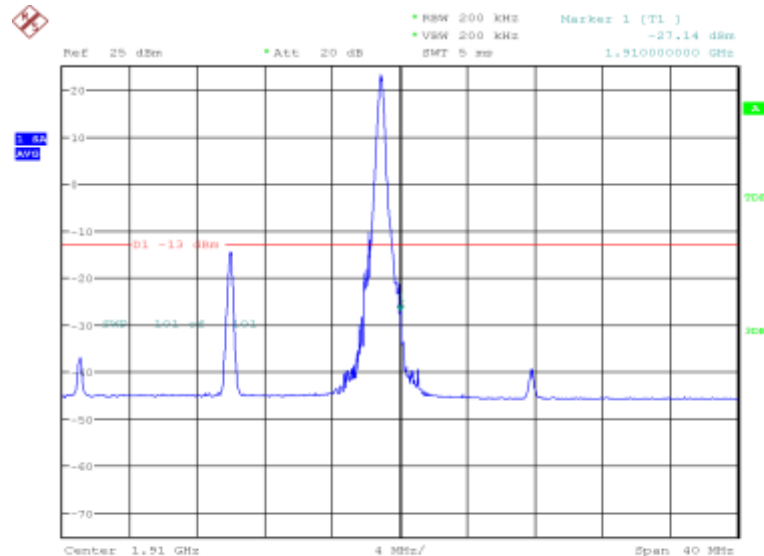


LOW CH, RB1-99



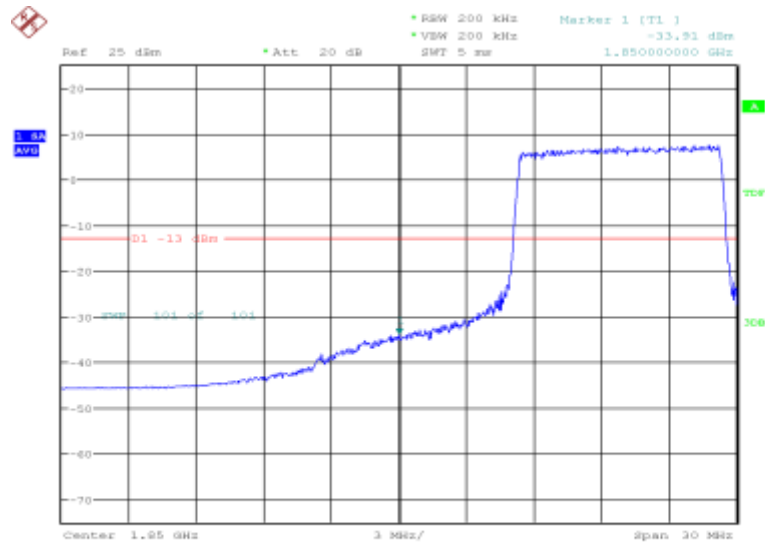
Date: 11.JUL.2013 20:36:58

HIGH CH, RB1-99



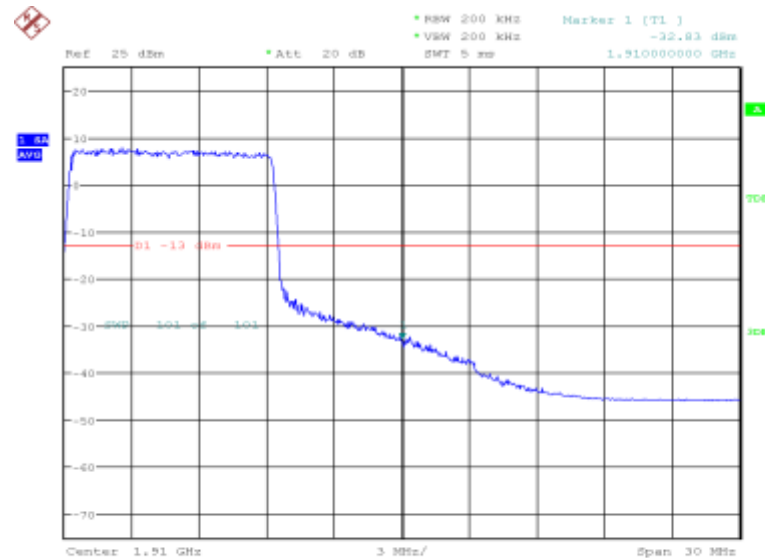
Date: 11.JUL.2013 20:40:18

LOW CH, RB50-24

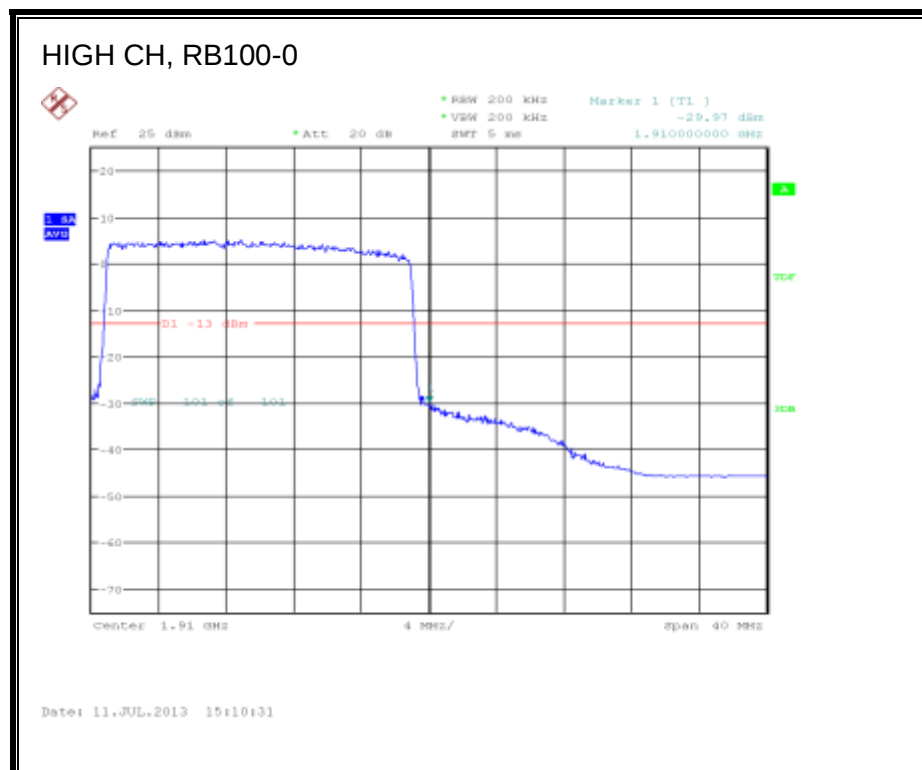
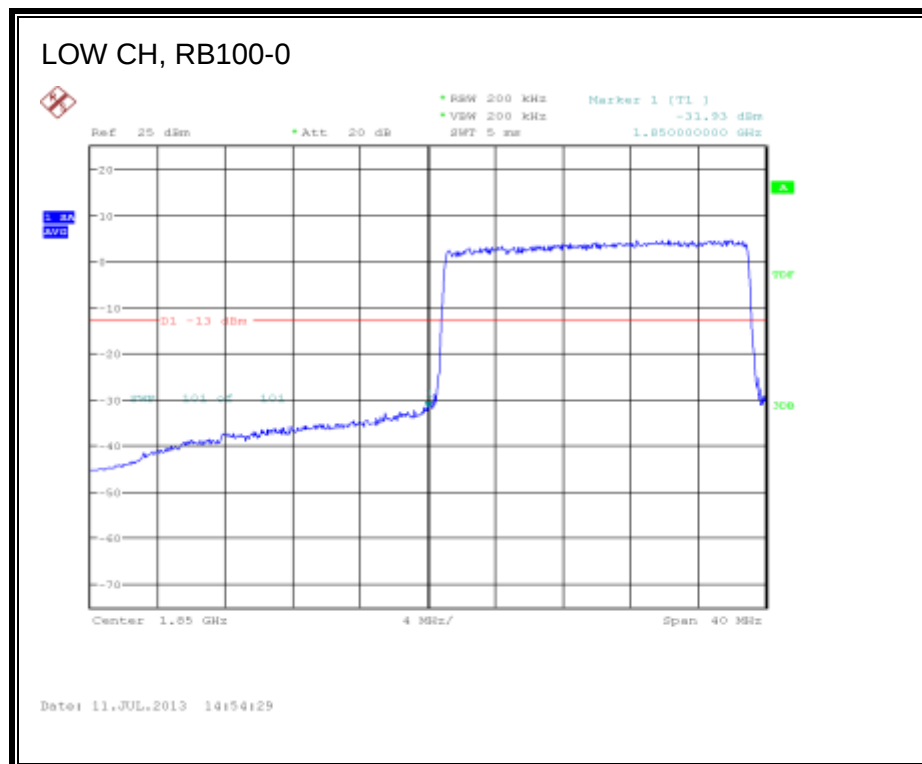


Date: 11.JUL.2013 14:55:23

HIGH CH, RB50-24

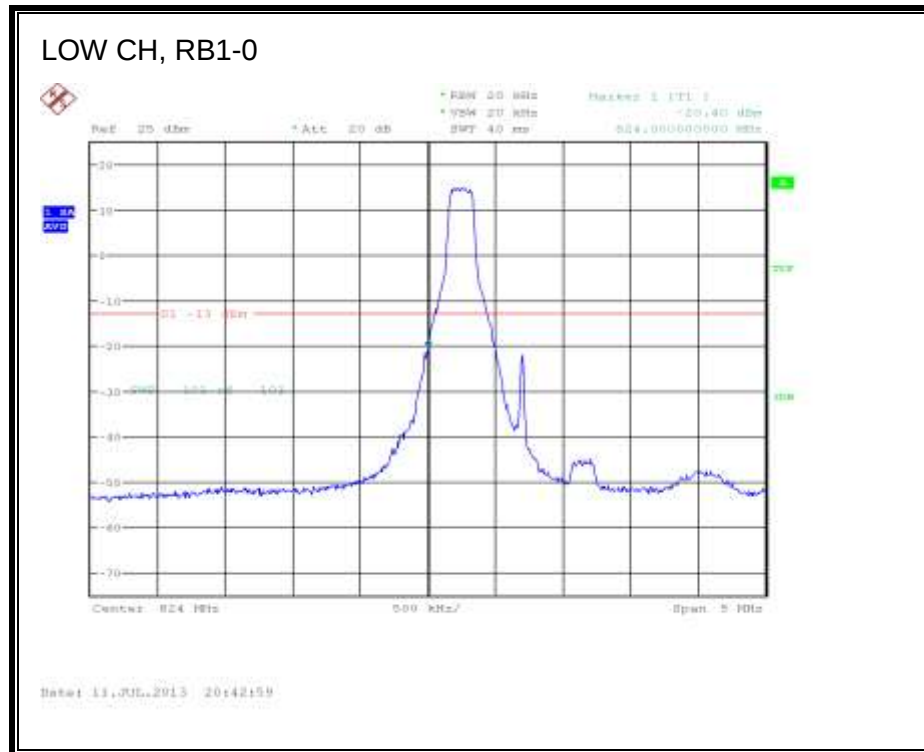


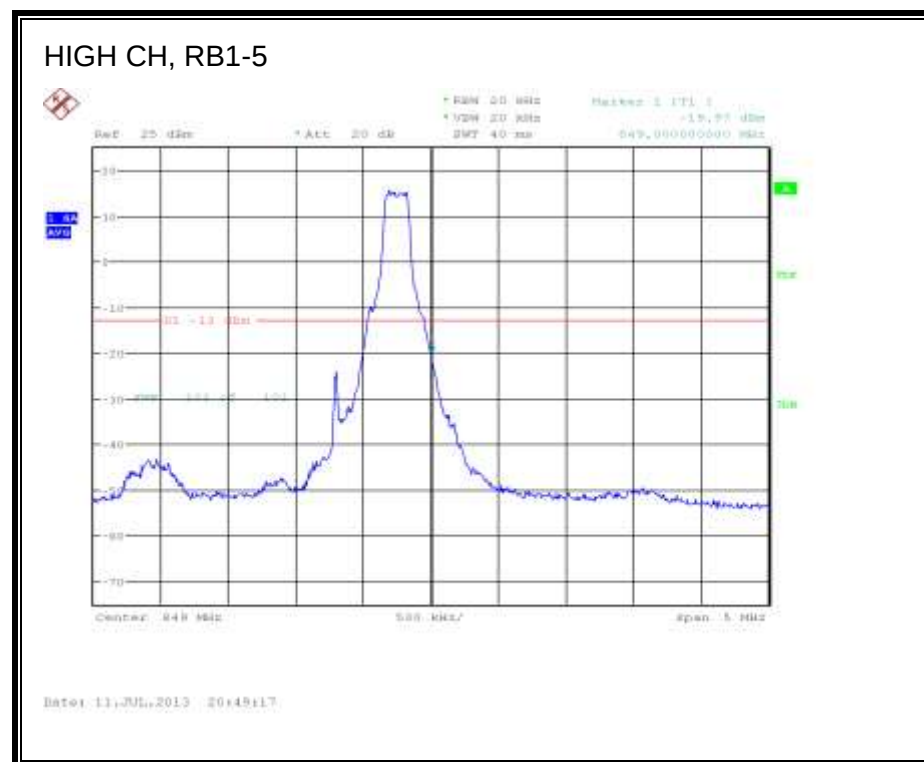
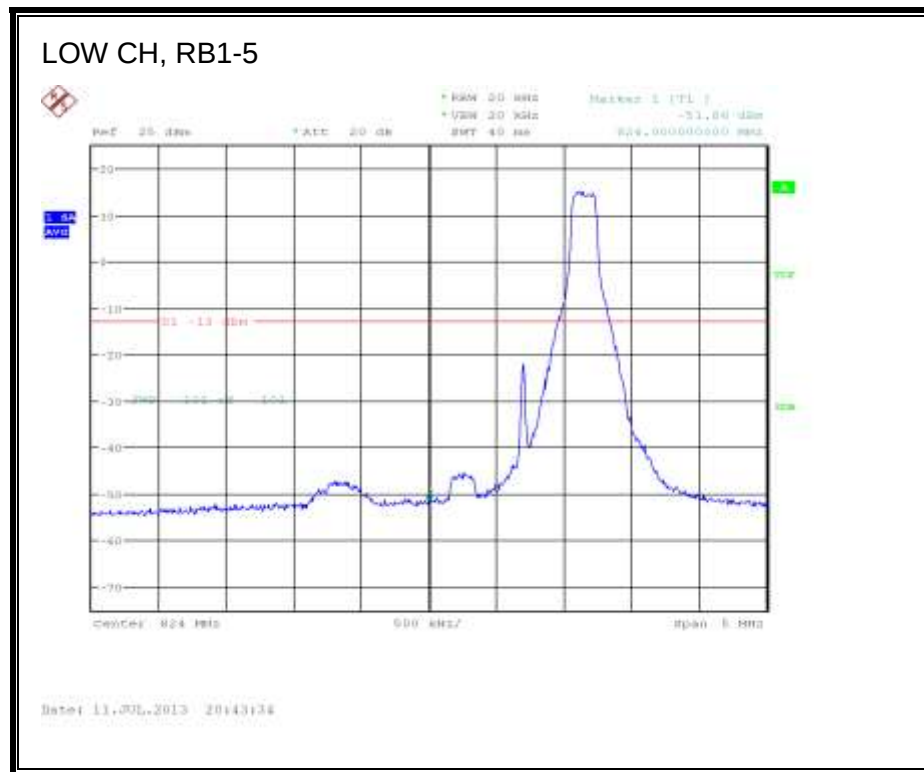
Date: 11.JUL.2013 15:11:26



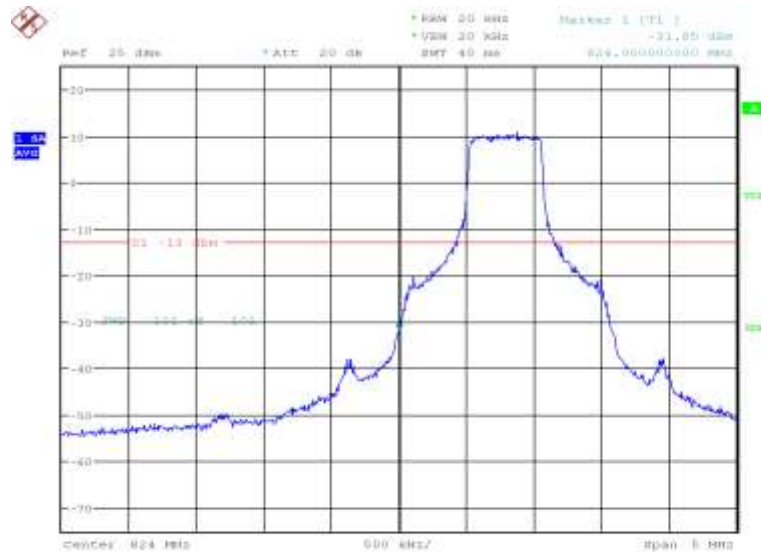
8.2.2. LTE BAND 5

QPSK Band 5 (1.4 MHz BANDWIDTH)



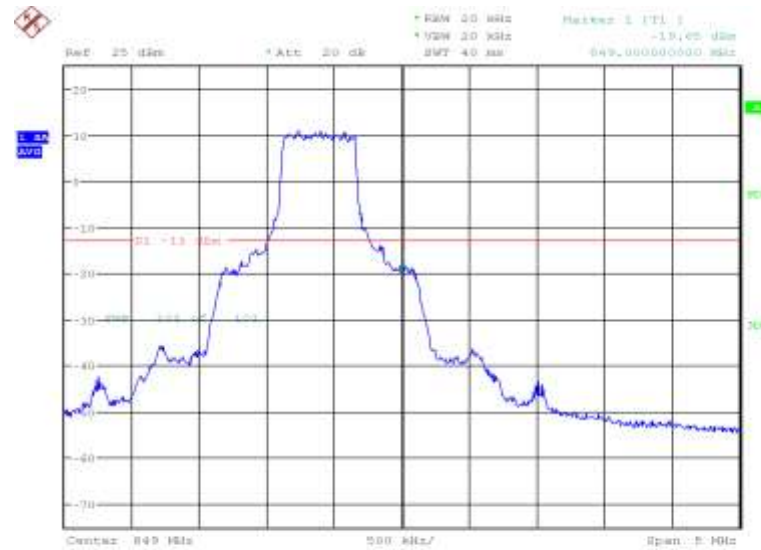


LOW CH, RB3-2

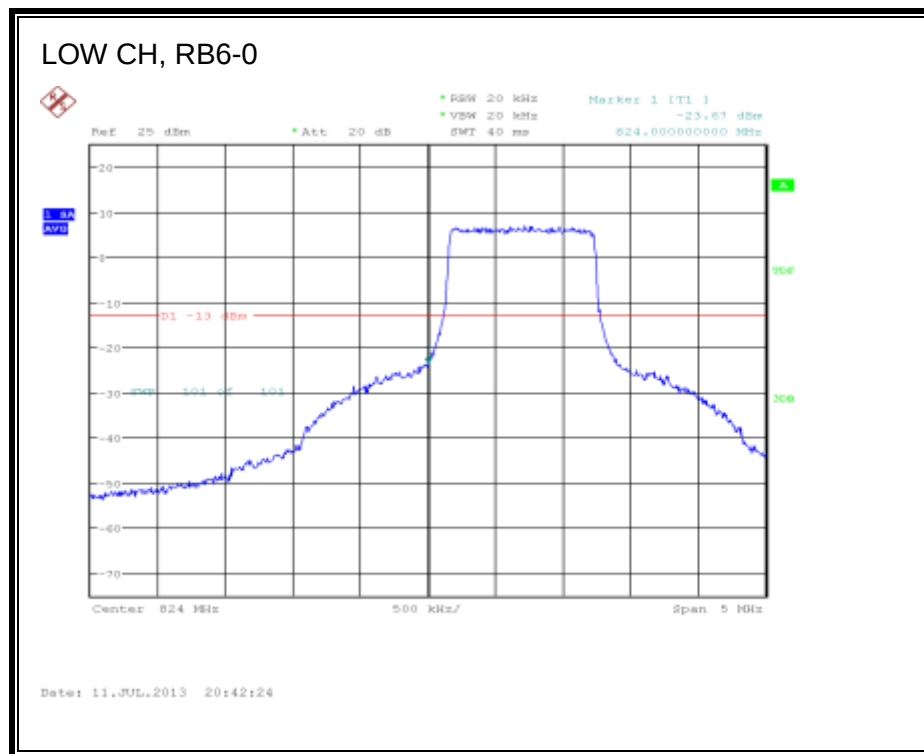


Date: 11 JUL 2013 17:18:20

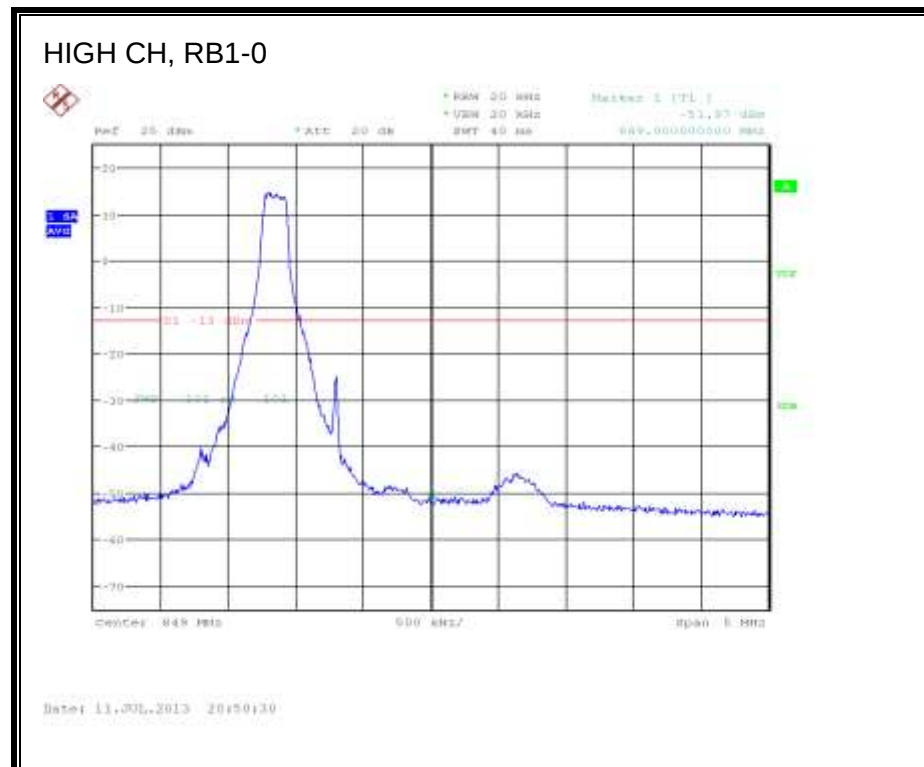
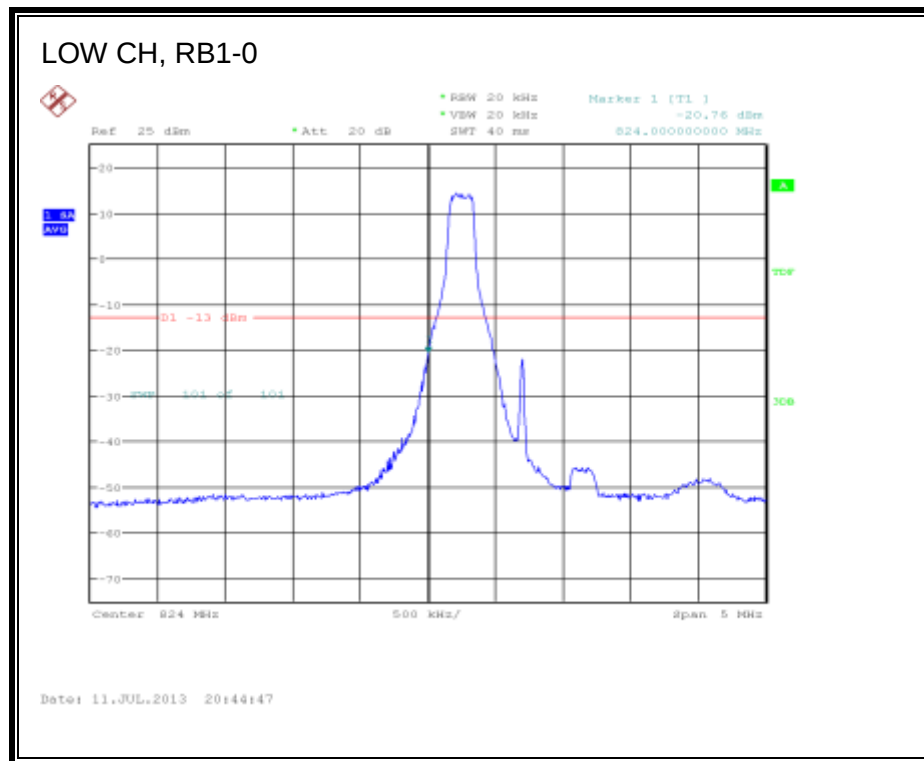
HIGH CH, RB3-2

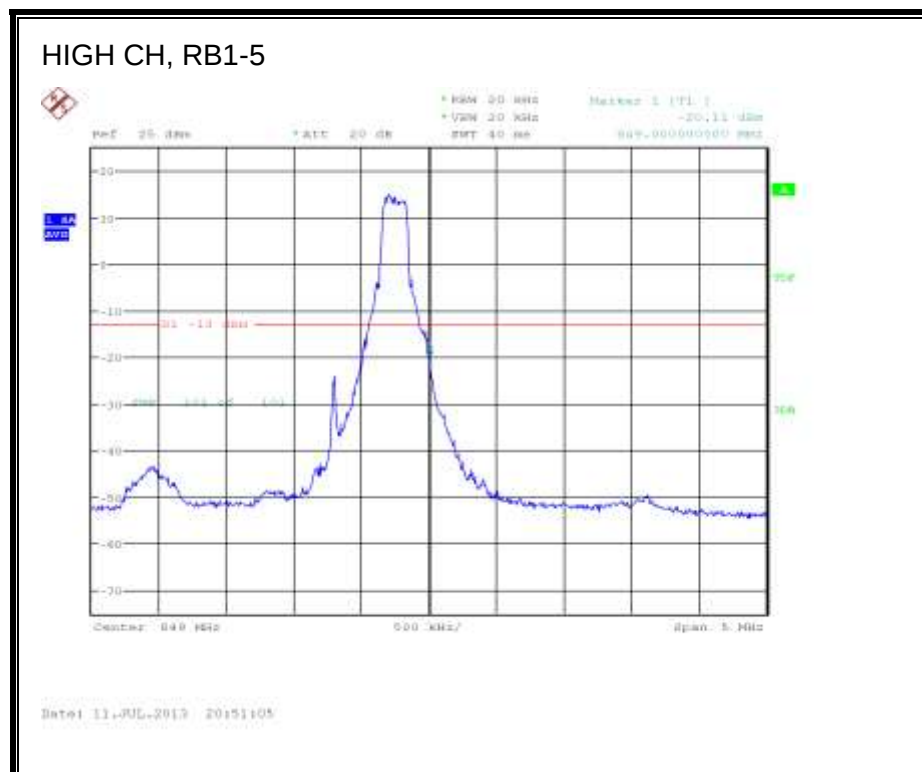
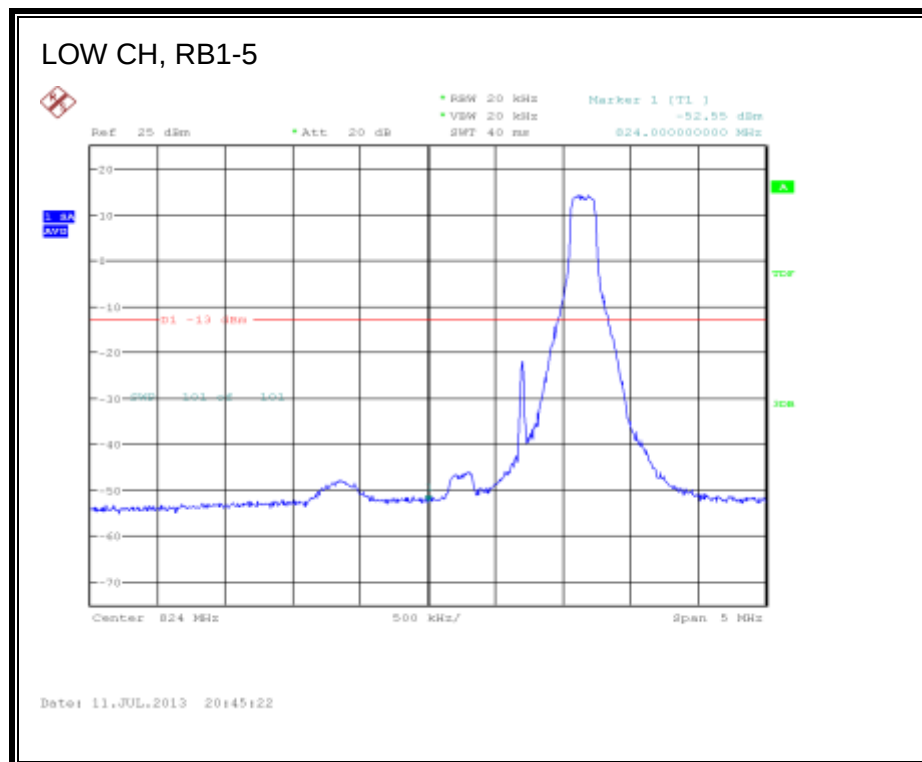


Date: 11 JUL 2013 17:34:22

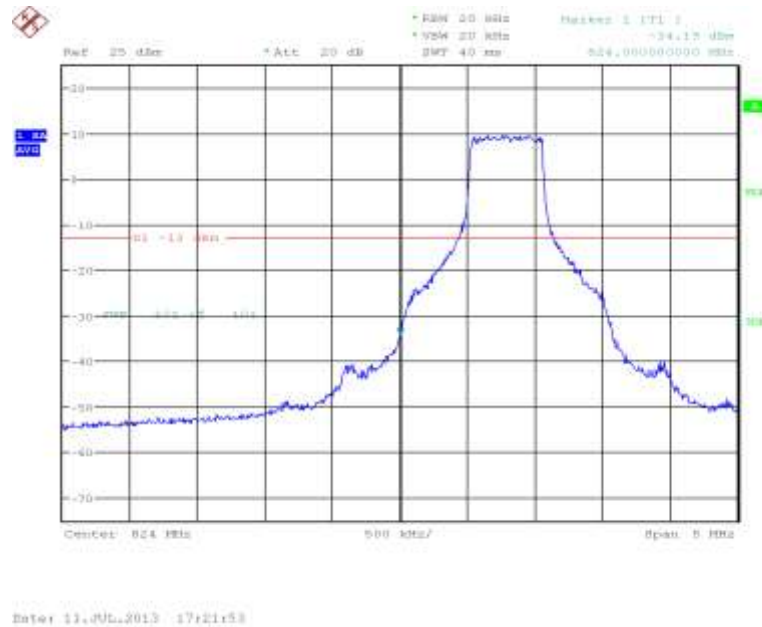


16QAM Band 5 (1.4 MHz BANDWIDTH)

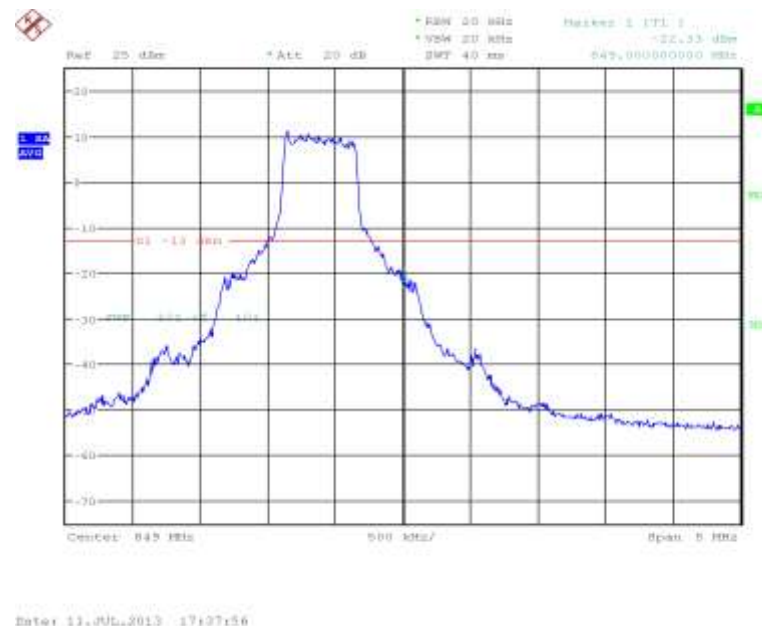




LOW CH, RB3-2

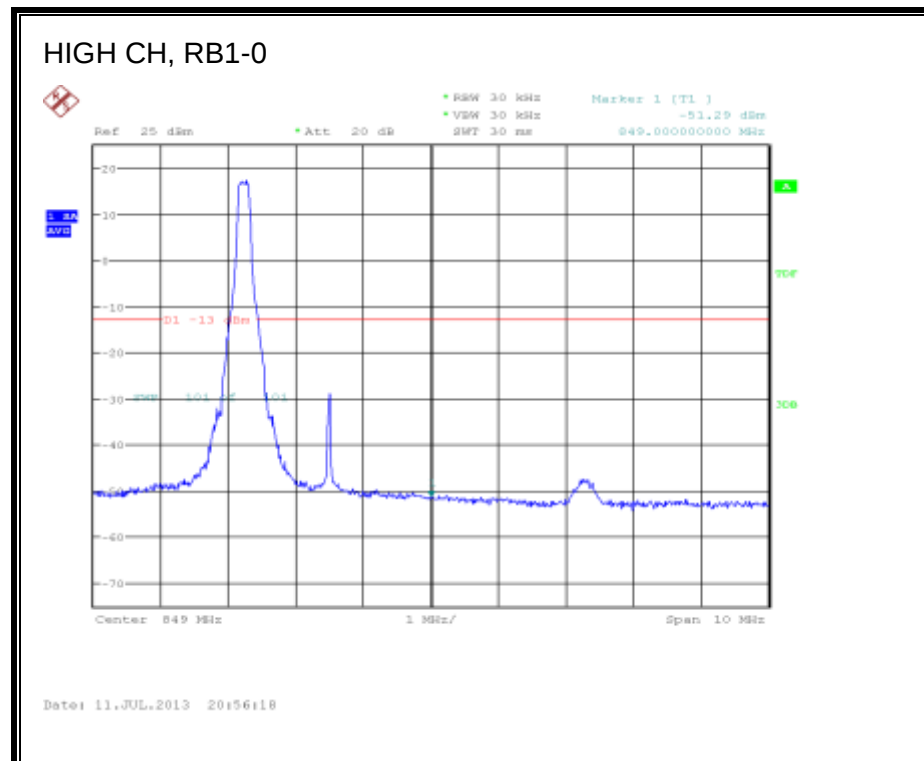
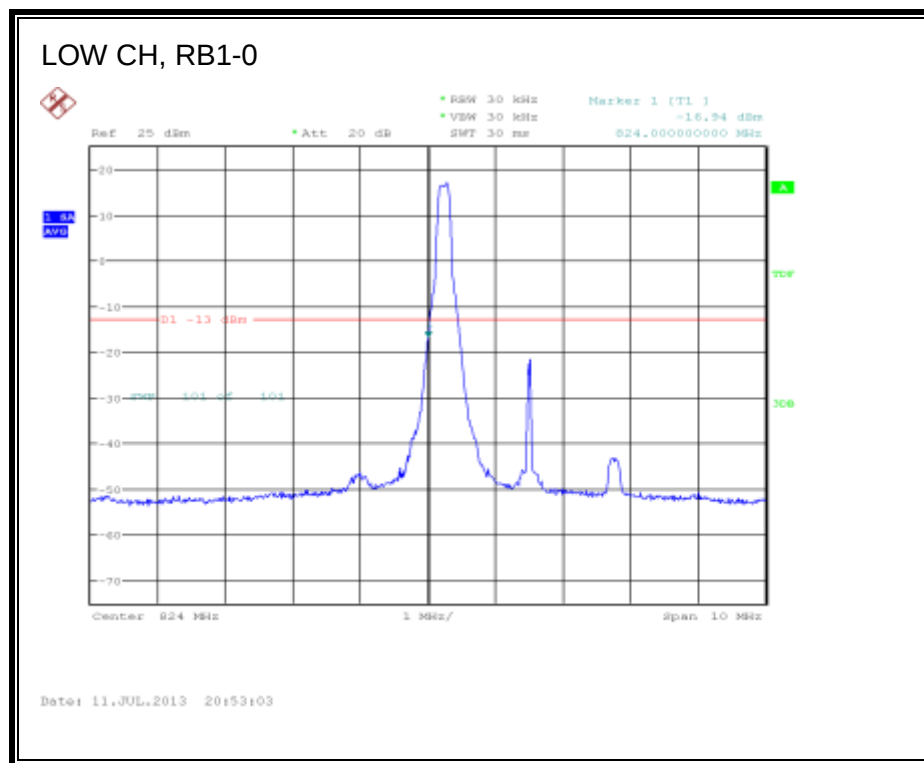


HIGH CH, RB3-2

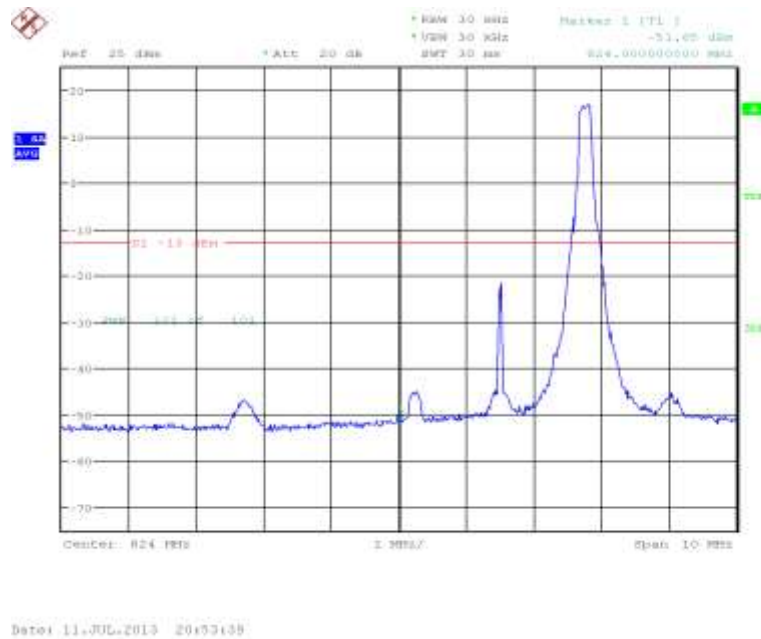




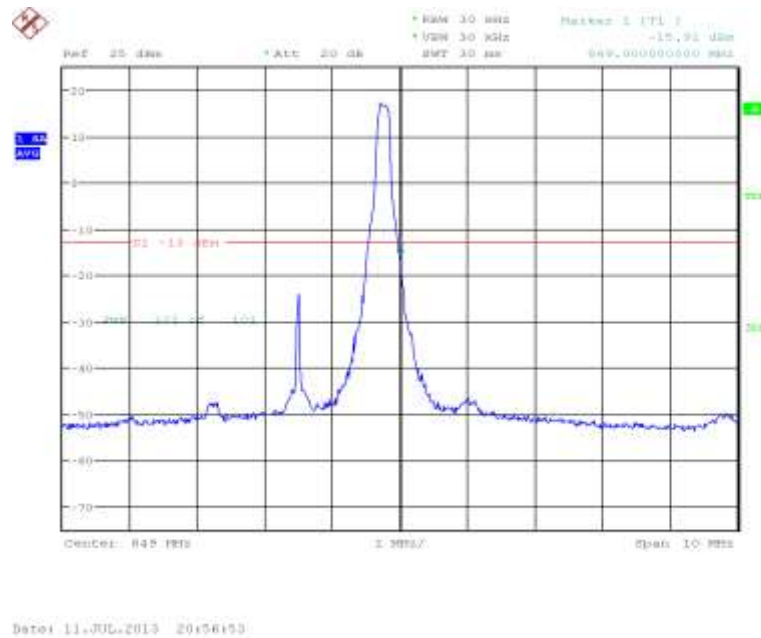
QPSK Band 5 (3 MHz BANDWIDTH)



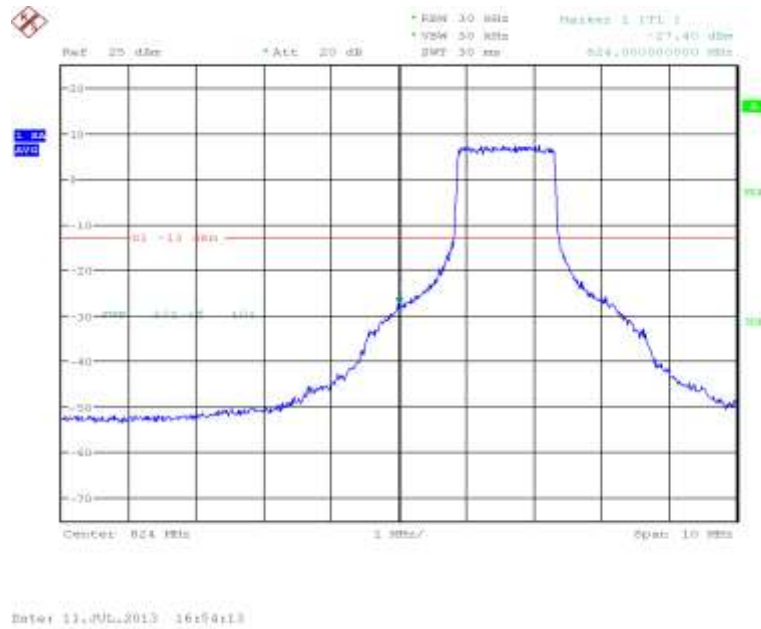
LOW CH, RB1-14



HIGH CH, RB1-14



LOW CH, RB8-4



HIGH CH, RB8-4

