C2PC CERTIFICATION TEST REPORT

Report Number. : 16U23577-E2V2

Applicant : SONY MOBILE COMMUNICATIONS INC.
4-12-3 HIGASHI-SHINAGAWA,
SHINAGAWA -KU,TOKYO, 140-0002, JAPAN

FCC ID : PY7-PM0903

EUT Description : GSM/WCDMA/LTE PHONE + BLUETOOTH, DTS/UNII a/b/g/n/ac, ANT+ & NFC

Test Standard(s) : FCC CFR47 PART 22 SUBPART H
FCC CFR47 PART 90 SUBPART S

Date of Issue:
Tuesday, June 07, 2016

Prepared by:
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	6/3/2016	Initial Issue	C.S.OOI
V2	6/7/2016	Updated Section 14.1 and 15	J. WU

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15. SETUP PHOTOS 50

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	**SONY MOBILE COMMUNICATIONS, INC.**
EUT DESCRIPTION:	**GSM/WCDMA/LTE PHONE + BLUETOOTH, DTS/UNII a/b/g/n/ac, ANT+ & NFC**
SERIAL NUMBER:	**BH9000QY4F (Conducted), BH9000A33N (Radiated), BH9000EM3N (Radiated)**
DATE TESTED:	**June 2- 3, 2016**

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 22H, 90S	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.

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with TIA-603-D, FCC CFR 47 Part 22, and FCC CFR 47 Part 90.

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
	☐ Chamber G
	☐ Chamber H

The above test sites and facilities are covered under FCC Test Firm Registration # 208313.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0.

Chambers A through H are covered under Industry Canada company address code 2324B with site numbers 2324B -1 through 2324B-8, respectively.

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:

EIRP = PSA reading with EUT worst orientation (dBm) + Path loss (dB) – cable loss(between the SG and substitution antenna) + Substitution Antenna Factor (dBi)

ERP = PSA reading with EUT worst orientation (dBm) + Path loss (dB) – cable loss(between the SG and substitution antenna)

(Path loss = Signal generator output – PSA reading with substitution antenna)

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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, 9KHz to 30 MHz	2.14 dB
Radiated Disturbance, 30 to 1000 MHz	4.98 dB
Radiated Disturbance,1000 to 6000 MHz	3.86 dB
Radiated Disturbance,6000 to 18000 MHz	4.23 dB
Radiated Disturbance,18000 to 26000 MHz	5.30 dB
Radiated Disturbance,26000 to 40000 MHz	5.23 dB

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

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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

This EUT is a GSM/WCDMA/LTE PHONE + BLUETOOTH, DTS/UNII a/b/g/n/ac, ANT+ & NFC

C2PC Reason: Adding LTE Band 26

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5.2. MAXIMUM OUTPUT POWER (LTE)

The transmitter has a maximum peak conducted and radiated ERP output powers as follows:

LTE Band 26 PART 90

FCC Part 90							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation	Conducted		Radiated	
				AVG(dBm)	AVG(mW)	AVG(dBm)	AVG(mW)
LTE26	814~824	1.4MHz	QPSK	23.9	245.47	22.01	158.85
			16QAM	22.9	194.98	19.50	89.13
		3MHz	QPSK	23.9	245.47	21.45	139.64
			16QAM	23.1	204.17	20.82	120.78
		5MHz	QPSK	23.9	245.47	21.50	141.25
			16QAM	23.0	199.53	20.63	115.61
		10MHz	QPSK	23.9	245.47	21.83	152.41
			16QAM	23.20	208.93	20.74	118.58

LTE Band 26 PART 22

FCC Part 22							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation	Conducted		Radiated	
				AVG(dBm)	AVG(mW)	AVG(dBm)	AVG(mW)
LTE26	824~849	1.4MHz	QPSK	23.7	234.42	21.00	125.89
			16QAM	22.9	194.98	20.20	104.71
		3MHz	QPSK	23.7	234.42	20.89	122.74
			16QAM	22.9	194.98	20.57	114.02
		5MHz	QPSK	23.9	245.47	21.02	126.47
			16QAM	23.0	199.53	20.09	102.09
		10MHz	QPSK	23.9	245.47	21.22	132.43
			16QAM	23.0	199.53	20.30	107.15
		15MHz	QPSK	23.9	245.47	21.69	147.57
			16QAM	23.1	204.17	20.88	122.46

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5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a PIFA antenna for the [List the bands supported] with a maximum peak gain as follow:

Frequency (MHz)	Peak Gain (dBi)
LTE Band 26, 814~849MHz	-3.3

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5.4. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
AC Adapter	SONY	SEM0809	5815W29100038	N/A
Earphone	SONY	N/A	N/A	N/A

I/O CABLES (CONDUCTED SETUP)

I/O Cable List						
Cable No	**Port**	**# of Identical ports**	**Connector Type**	**Serial Type**	**Cable Length (m)**	**Remarks**
1	RF Out	1	Spectrum Analyzer	Shielded	None	NA
2	Antenna Port	1	EUT	Shielded	0.1m	NA
3	RF In/Out	1	Communication Test Set	Shielded	1m	NA

I/O CABLES (RADIATED SETUP)

I/O Cable List						
Cable No	**Port**	**# of Identical ports**	**Connector Type**	**Serial Type**	**Cable Length (m)**	**Remarks**
1	USB	1	AC Adapter	Un-shielded	1.2m	No
2	Jack	1	Headset	Shielded	1m	No
3	RF In/out	1	Communication Test Set	Un-shielded	2m	Yes

TEST SETUP

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

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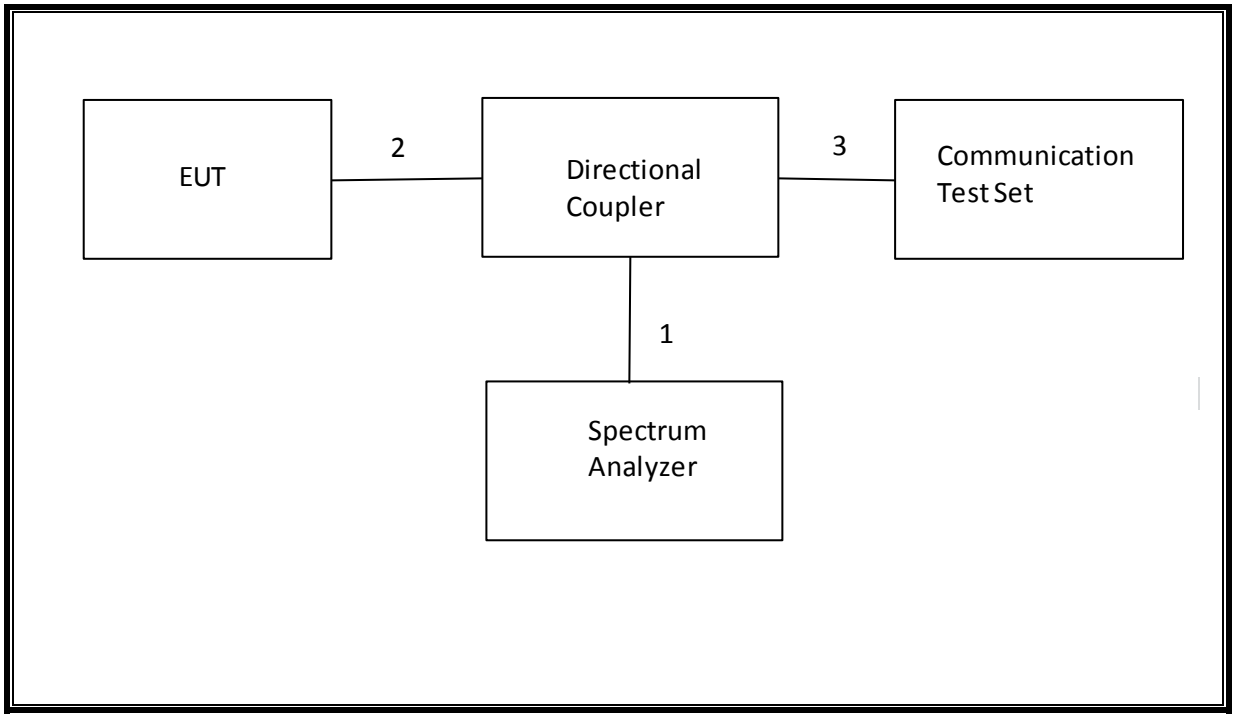
SETUP DIAGRAM FOR TESTS (CONDUCTED TEST SETUP)



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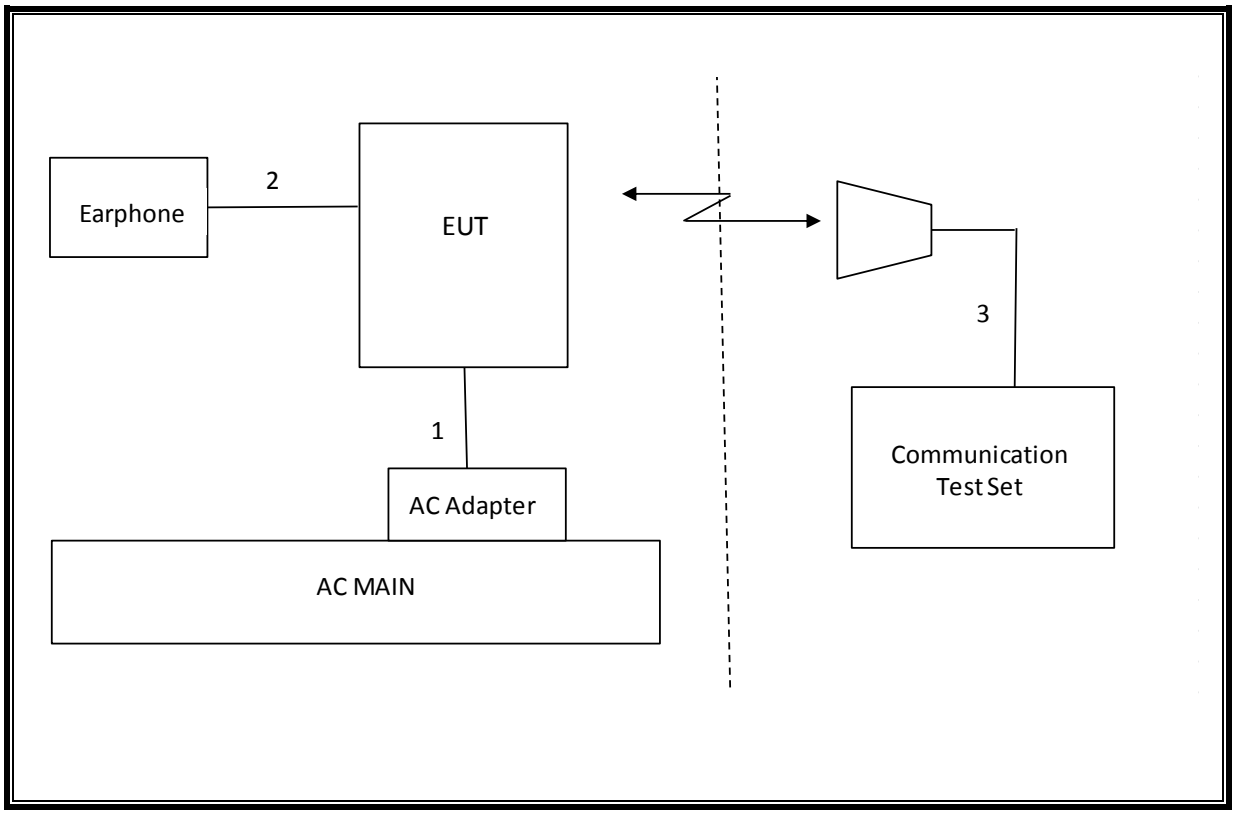
SETUP DIAGRAM FOR TESTS (RADIATED TEST SETUP)



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6. TEST AND MEASUREMENT EQUIPMENT

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

Test Software List				
Description	**Manufacturer**	**Model**	**T Number**	**Cal Due**
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	123	10/22/16
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	130	06/10/16
Antenna, Horn, 18 GHz	EMCO	3115	59	11/18/16
Highpass Filter, 2.7 GHz	Micro-Tronics	HPM13194	151	CNR
Highpass Filter, 1.5 GHz	Micro-Tronics	HPM13193	153	CNR
Temperature / Humidity Chamber	Thermotron	SE 600-10-10	80	11/16/16
Communications Test Set	R&S	CMW500	958	05/26/17
DC power supply, 8 V @ 3 A or 15 V @ 2 A	Agilent / HP	E3610A	None	CNR
Vector signal generator, 6 GHz	Agilent / HP	E4438C	None	06/16/16
Antenna, Tuned Dipole 400~1000 MHz	ETS	3121C DB4	273	05/16/17
Directional Coupler	RF-Lambda	RFDC5M06G15	None	CNR

Test Software List			
Description	**Manufacturer**	**Model**	**Version**
Radiated Software	UL	UL EMC	Ver 9.5, June 24, 2015
Conducted Software	UL	UL EMC	Ver 9.5, May 26, 2015
CLT Software	UL	UL RF	Ver 1.0, Feb 2, 2015
Antenna Port Software	UL	UL RF	Ver 3.7, Nov 12, 2015

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7. SUMMARY TABLE

FCC Part Section	Test Description	Test Limit	Test Condition	Test Result
2.1049	Occupied Bandwidth (99%)	N/A	Conducted	Pass
22.917(a) 90.691	Band Edge / Conducted Spurious Emission	-13dBm		Pass
2.1046	Conducted output power	N/A		Pass
90.691	Emission Mask			Pass
22.355 90.213	Frequency Stability	2.5PPM		Pass
22.913(a)(2)	Effective Radiated Power	38dBm	Radiated	Pass
90.635		50dBm		Pass
22.917(a)	Radiated Spurious Emission	-13dBm		Pass

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8. RF POWER OUTPUT VERIFICATION

8.1. LTE OUTPUT POWER RESULT

LTE Band 26

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Avg Pwr (dBm)		
						26697	26865	27033
						814.7 MHz	831.5 MHz	848.3 MHz
LTE Band 26	1.4	QPSK	1	0	0	23.80	23.60	23.60
			1	3	0	23.80	23.60	23.40
			1	5	0	23.90	23.70	23.50
			3	0	0	23.60	23.50	23.30
			3	1	0	23.70	23.50	23.30
			3	3	0	23.60	23.50	23.30
			6	0	1	22.60	22.50	22.20
		16QAM	1	0	1	22.80	22.90	22.80
			1	3	1	22.90	22.80	22.90
			1	5	1	22.90	22.90	22.70
			3	0	1	22.70	22.60	22.40
			3	1	1	22.80	22.60	22.40
			3	3	1	22.70	22.50	22.40
			6	0	2	21.80	21.60	21.20
Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Avg Pwr (dBm)		
						26705	26865	27025
						815.5 MHz	831.5 MHz	847.5 MHz
LTE Band 26	3	QPSK	1	0	0	23.90	23.60	23.50
			1	8	0	23.70	23.70	23.50
			1	14	0	23.80	23.70	23.40
			8	0	1	22.60	22.60	22.30
			8	4	1	22.70	22.50	22.30
			8	7	1	22.60	22.60	22.30
			15	0	1	22.60	22.60	22.20
		16QAM	1	0	1	22.90	22.60	22.90
			1	8	1	22.80	22.50	22.60
			1	14	1	23.10	22.70	22.90
			8	0	2	21.60	21.60	21.30
			8	4	2	21.60	21.60	21.30
			8	7	2	21.60	21.60	21.30
			15	0	2	21.60	21.60	21.30

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Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Avg Pwr (dBm)		
						26715	26865	27015
						816.5 MHz	831.5 MHz	846.5 MHz
LTE Band 26	5	QPSK	1	0	0	23.90	23.90	23.50
			1	12	0	23.80	23.80	23.20
			1	24	0	23.80	23.90	23.30
			12	0	1	22.70	22.60	22.30
			12	7	1	22.60	22.70	22.30
			12	13	1	22.70	22.60	22.10
			25	0	1	22.70	22.60	22.30
		16QAM	1	0	1	23.00	22.80	23.00
			1	12	1	22.60	22.80	22.80
			1	24	1	22.90	22.80	22.80
			12	0	2	21.70	21.60	21.50
			12	7	2	21.70	21.70	21.40
			12	13	2	21.70	21.70	21.30
			25	0	2	21.70	21.60	21.30

Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Avg Pwr (dBm)		
						26740	26865	26990
						819 MHz	831.5 MHz	844 MHz
LTE Band 26	10	QPSK	1	0	0	23.90	23.90	23.70
			1	25	0	23.80	23.60	23.60
			1	49	0	23.80	23.80	23.60
			25	0	1	22.70	22.70	22.40
			25	12	1	22.70	22.60	22.40
			25	25	1	22.70	22.70	22.40
			50	0	1	22.70	22.70	22.40
		16QAM	1	0	1	23.20	23.00	22.90
			1	25	1	23.20	22.70	22.90
			1	49	1	23.20	23.00	22.80
			25	0	2	21.80	21.70	21.40
			25	12	2	21.80	21.60	21.40
			25	25	2	21.80	21.70	21.40
			50	0	2	21.80	21.60	21.30

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Band	BW (MHz)	Mode	RB Allocation	RB offset	MPR	Avg Pwr (dBm)		
						26765	26865	26965
						821.5 MHz	831.5 MHz	841.5 MHz
LTE Band 26	15	QPSK	1	0	0	24.00	23.90	23.90
			1	37	0	23.70	23.50	23.60
			1	74	0	23.80	23.80	23.80
			36	0	1	22.90	22.60	22.70
			36	20	1	22.90	22.70	22.70
			36	39	1	22.80	22.60	22.70
			75	0	1	22.90	22.60	22.70
		16QAM	1	0	1	23.20	22.80	23.10
			1	37	1	23.20	22.50	22.90
			1	74	1	23.20	22.80	23.00
			36	0	2	21.80	21.60	21.70
			36	20	2	21.80	21.60	21.70
			36	39	2	21.80	21.60	21.60
			75	0	2	21.90	21.60	21.70

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9. PEAK TO AVERAGE RATIO

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v02r02

TEST SPEC

In addition, when the transmitter power is measured in terms of average value, the peak-to-average ratio of the power shall not exceed 13 dB.

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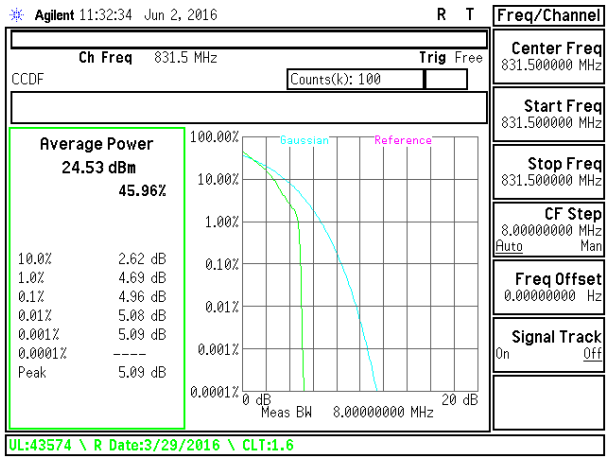
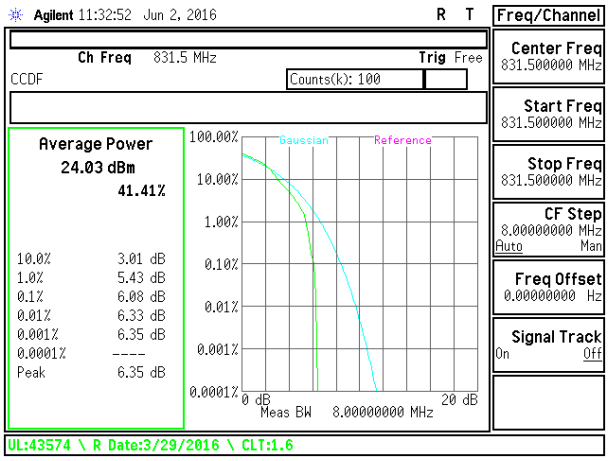
9.1. CONDUCTED PEAK TO AVERAGE RESULT

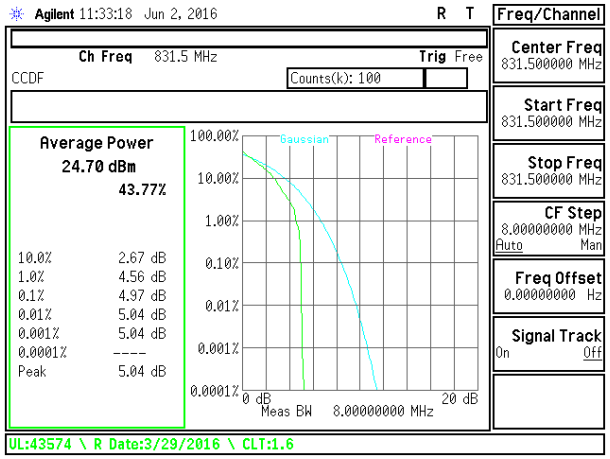
LTE Band 26



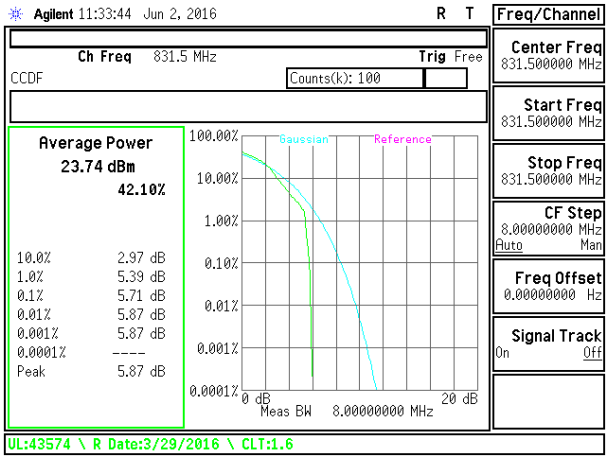
LTE B26 1.4MHz QPSK Middle Channel



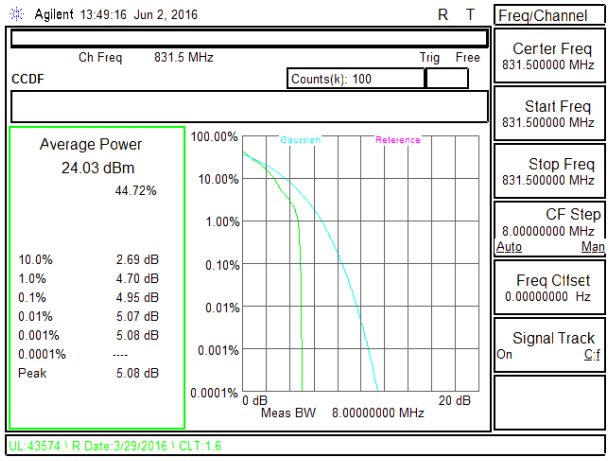
LTE B26 1.4MHz 16QAM Middle Channel



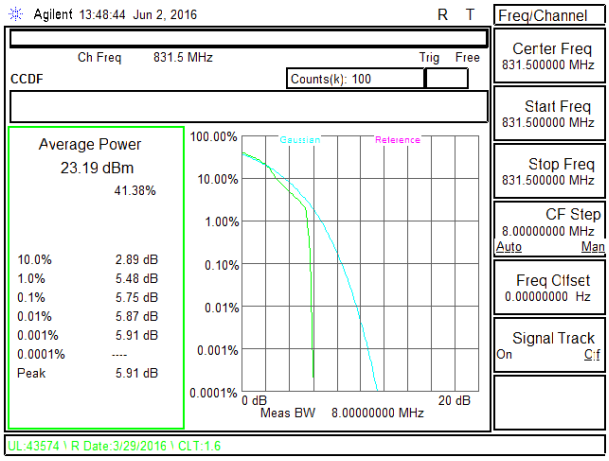
LTE B26 3MHz QPSK Middle Channel



LTE B26 3MHz 16QAM Middle Channel



LTE B26 5MHz QPSK Middle Channel



LTE B26 5MHz 16QAM Middle Channel

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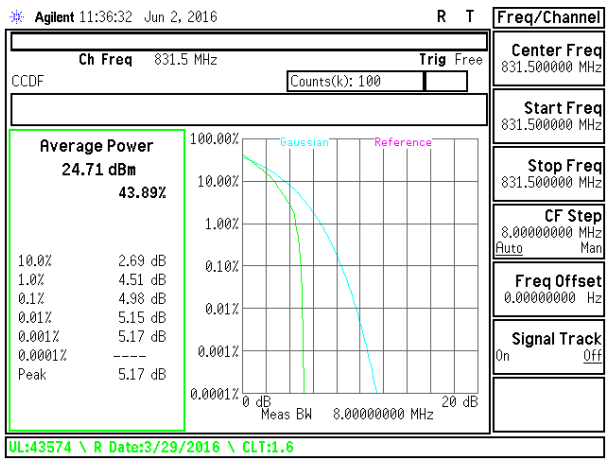
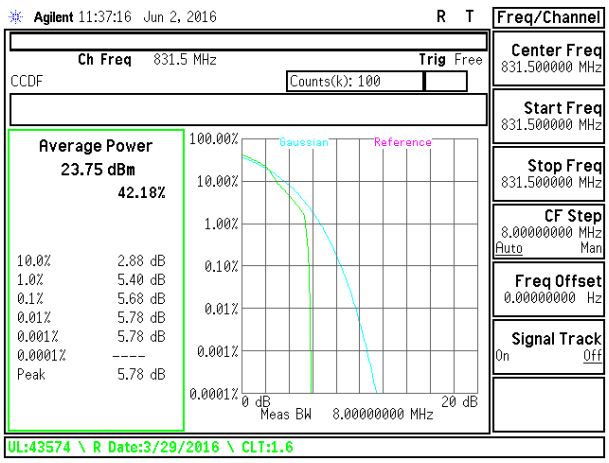
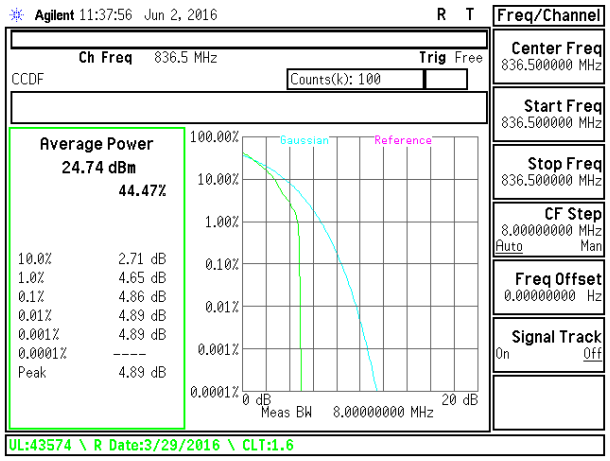


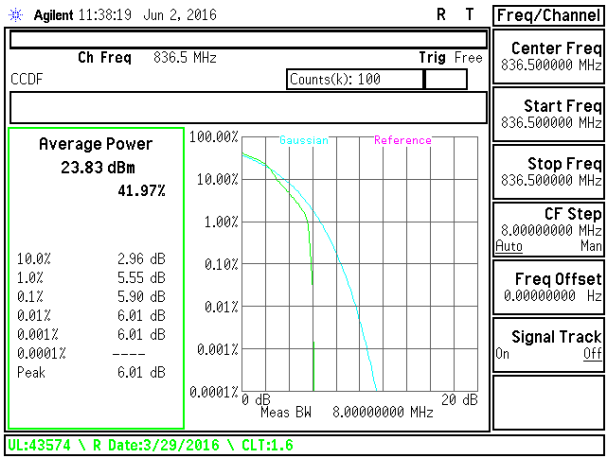
LTE B26 10MHz QPSK Middle Channel



LTE B26 10MHz 16QAM Middle Channel



LTE B26 15MHz QPSK Middle Channel



LTE B26 15MHz 16QAM Middle Channel

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10. 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.

(KDB 971168 D01 Power Meas License Digital Systems v02r02)

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10.1. OCCUPIED BANDWIDTH RESULTS AND PLOTS

LTE Band 26

BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
1.4	QPSK	6/0	814.7	1.08	1.21
1.4	QPSK	6/0	831.5	1.08	1.22
1.4	QPSK	6/0	848.3	1.08	1.22
1.4	16QAM	6/0	814.7	1.08	1.22
1.4	16QAM	6/0	831.5	1.08	1.22
1.4	16QAM	6/0	848.3	1.09	1.24
3	QPSK	15/0	815.5	2.68	2.94
3	QPSK	15/0	831.5	2.68	2.94
3	QPSK	15/0	847.5	2.69	2.99
3	16QAM	15/0	815.5	2.69	2.99
3	16QAM	15/0	831.5	2.69	2.97
3	16QAM	15/0	847.5	2.68	2.96
5	QPSK	25/0	816.5	4.51	4.95
5	QPSK	25/0	831.5	4.49	4.93
5	QPSK	25/0	846.5	4.5	4.9
5	16QAM	25/0	816.5	4.48	4.9
5	16QAM	25/0	831.5	4.49	4.88
5	16QAM	25/0	846.5	4.5	4.94
10	QPSK	50/0	819	8.97	9.61
10	QPSK	50/0	831.5	8.98	9.71
10	QPSK	50/0	844	8.95	9.67
10	16QAM	50/0	819	8.95	9.73
10	16QAM	50/0	831.5	8.96	9.64
10	16QAM	50/0	844	8.96	9.69
15	QPSK	75/0	831.5	13.42	14.4
15	QPSK	75/0	836.5	13.42	14.5
15	QPSK	75/0	841.5	13.39	14.36
15	16QAM	75/0	831.5	13.43	14.48
15	16QAM	75/0	836.5	13.43	14.32
15	16QAM	75/0	841.5	13.39	14.44

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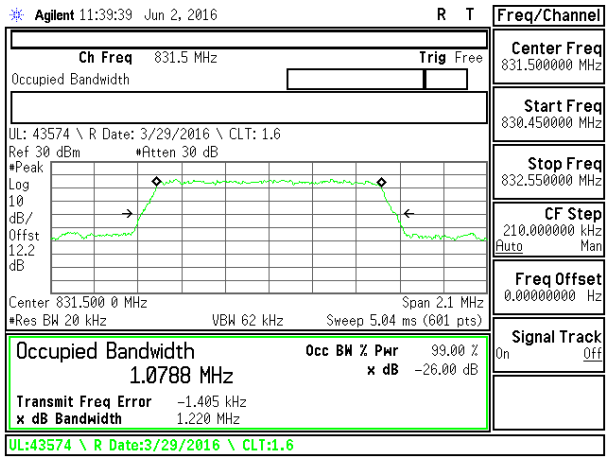
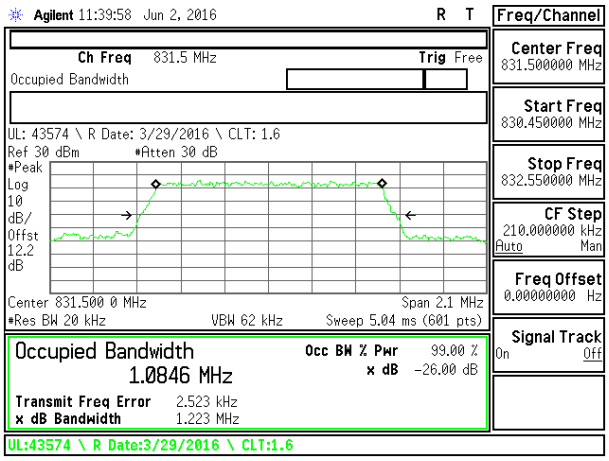
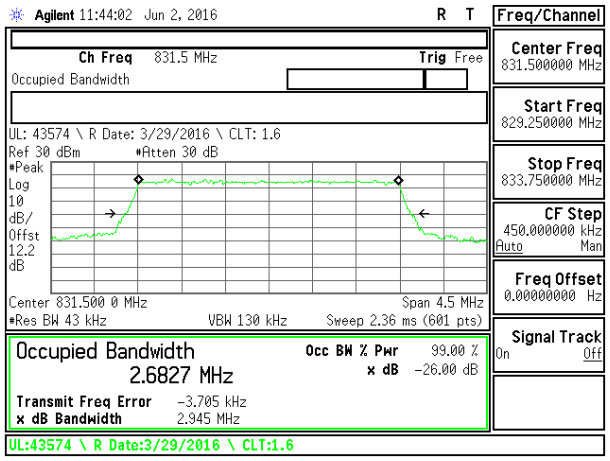


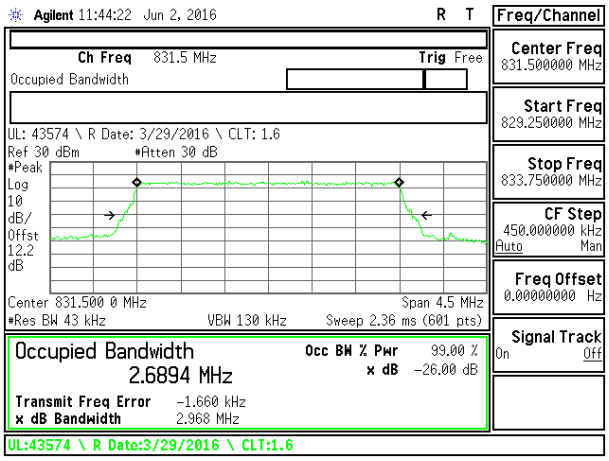
LTE B26 1.4MHz QPSK Middle Channel



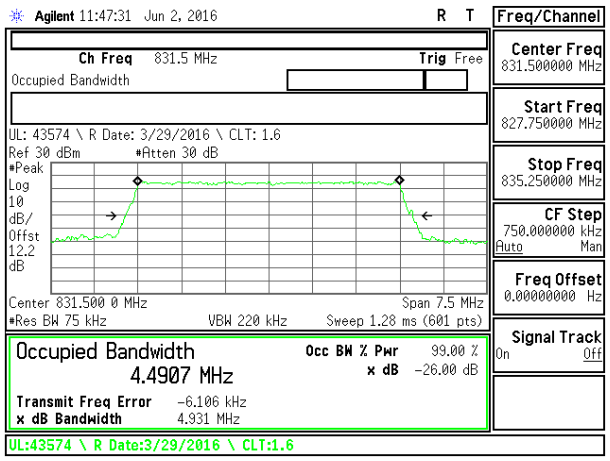
LTE B26 1.4MHz 16QAM Middle Channel



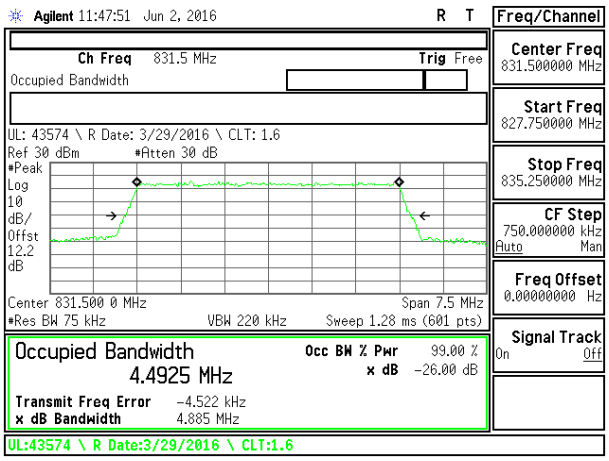
LTE B26 3MHz QPSK Middle Channel



LTE B26 3MHz 16QAM Middle Channel



LTE B26 5MHz QPSK Middle Channel



LTE B26 5MHz 16QAM Middle Channel

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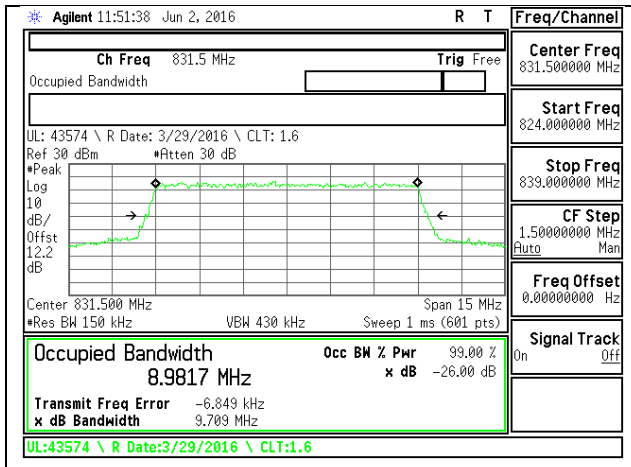
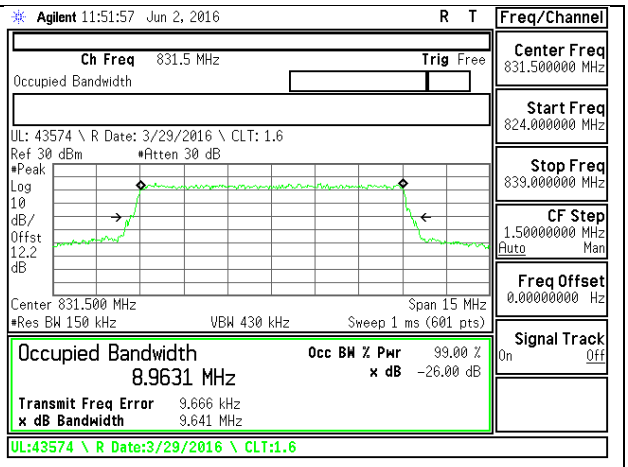


LTE B26 10MHz QPSK Middle Channel



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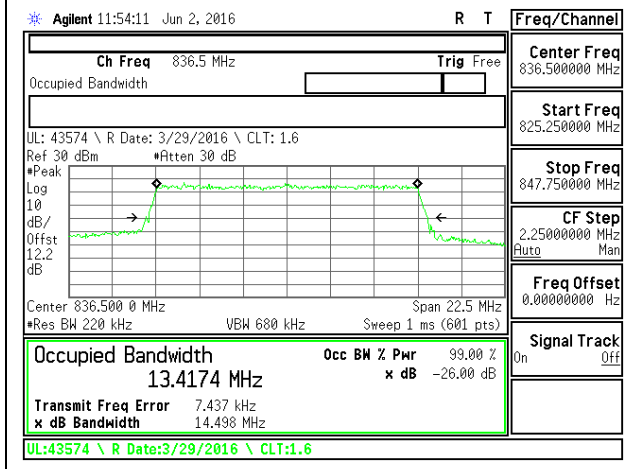
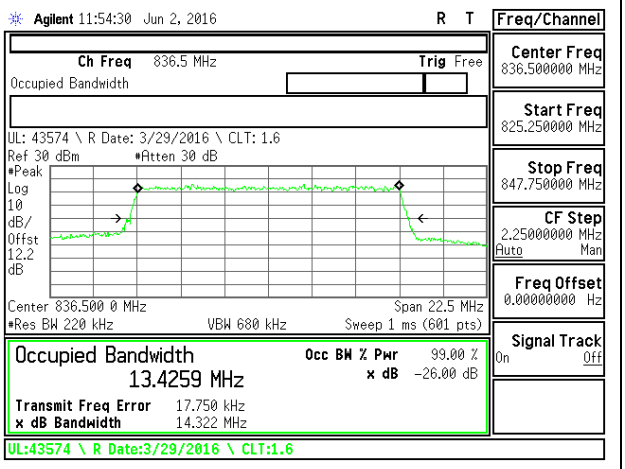


LTE B26 15MHz QPSK Middle Channel



LTE B26 15MHz 16QAM Middle Channel

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11. BAND EDGE EMISSIONS

RULE PART(S)

FCC: §22.359 and § 90.691

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.

Part 90:
(a)(1)For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116 Log10 (f/6.1) decibels or 50 + 10 Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.
(a)(2)For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 43 + 10Log10 (P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz. {NOTE: Use 100 kHz reference bandwidth.}

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v02r02
The transmitter output was connected to an Agilent 8960 or 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.

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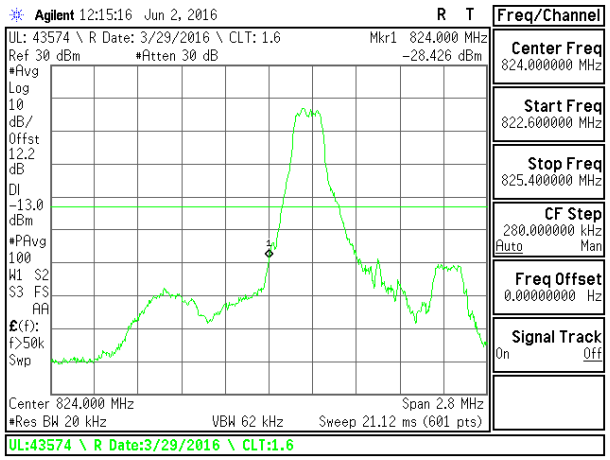
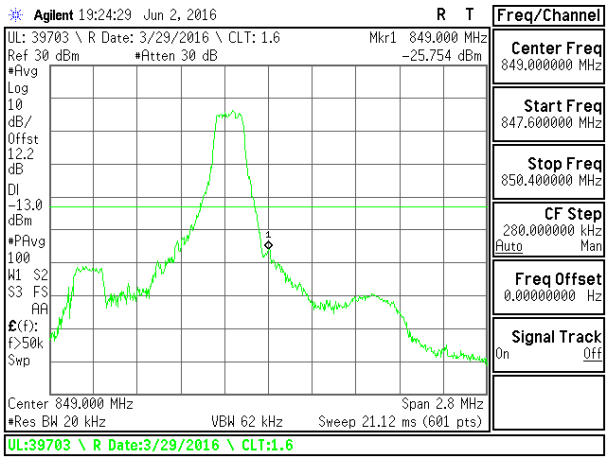
11.1. BAND EDGE PLOTS

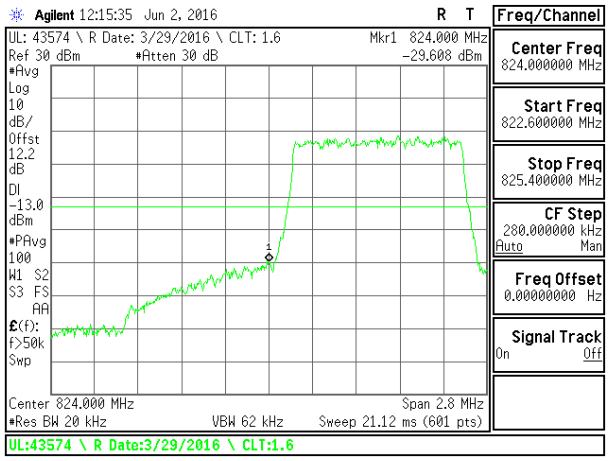
LTE Band 26



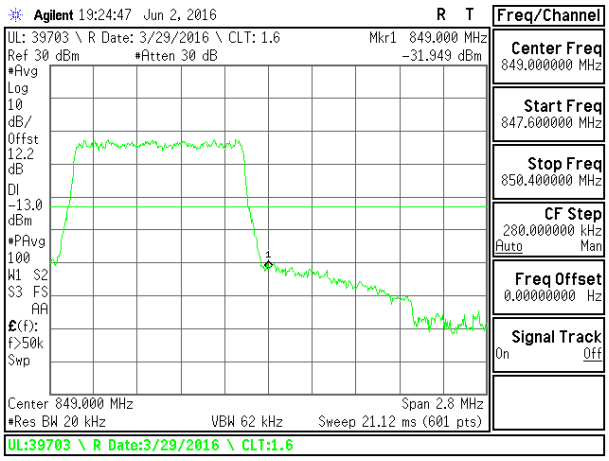
LTE B26 1.4MHz QPSK Low Channel 1RB



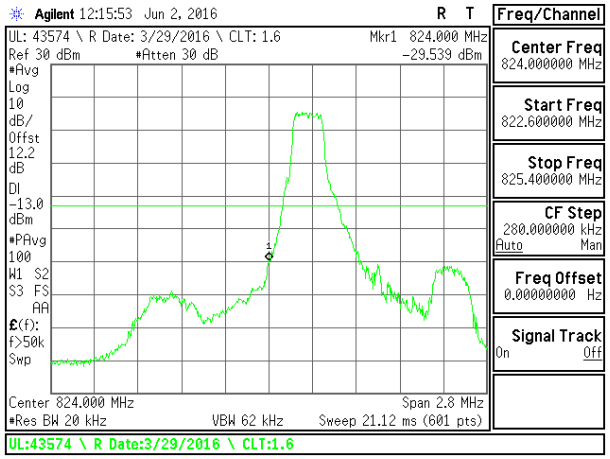
LTE B26 1.4MHz QPSK High Channel 1RB



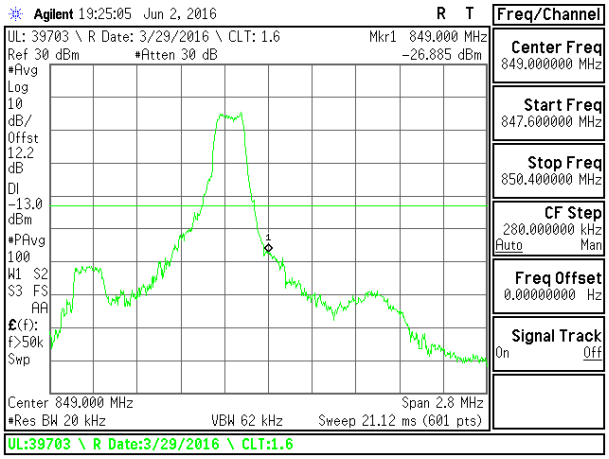
LTE B26 1.4MHz QPSK Low Channel FRB



LTE B26 1.4MHz QPSK High Channel FRB



LTE B26 1.4MHz 16QAM Low Channel 1RB



LTE B26 1.4MHz 16QAM High Channel 1RB

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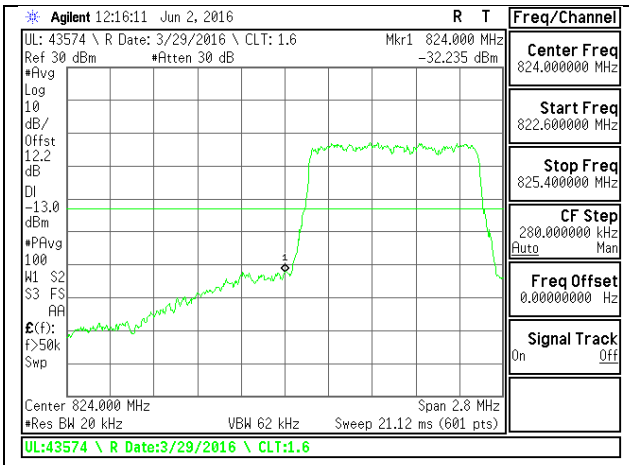
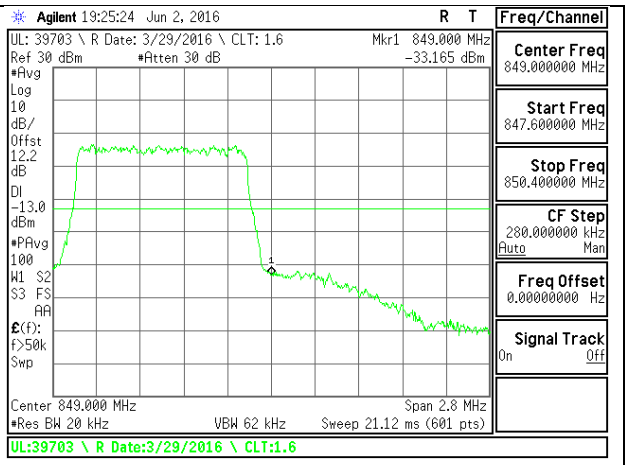
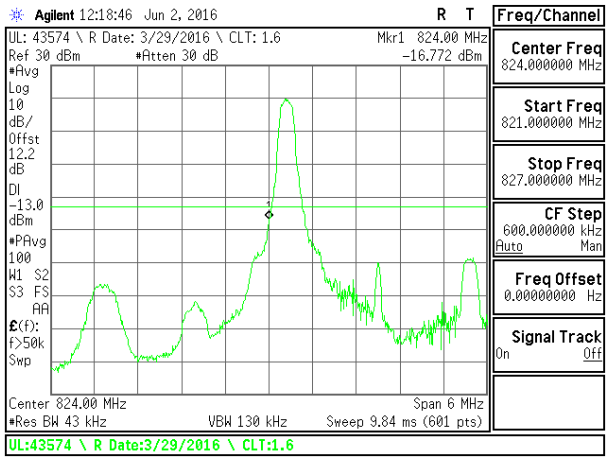


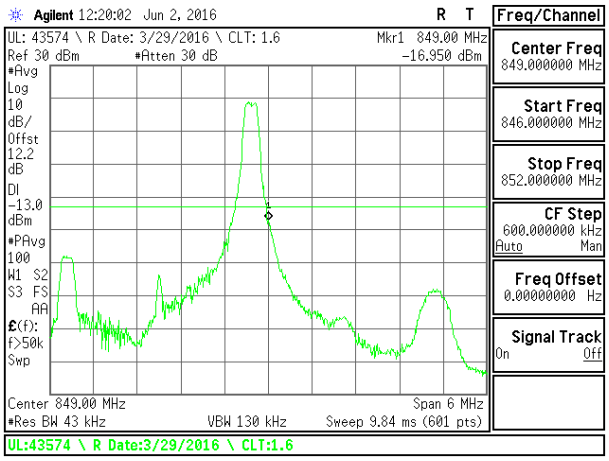
LTE B26 1.4MHz 16QAM Low Channel FRB



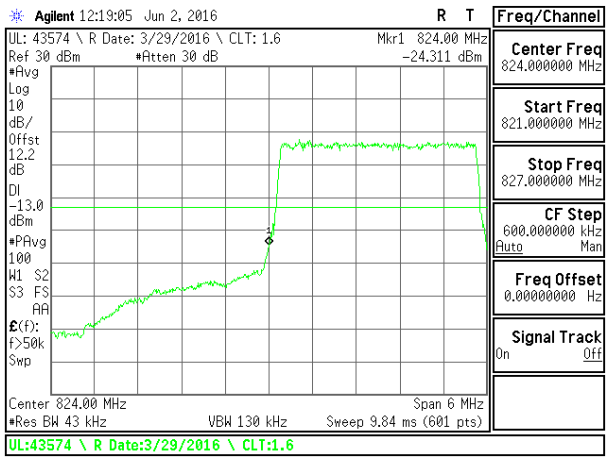
LTE B26 1.4MHz 16QAM High Channel FRB



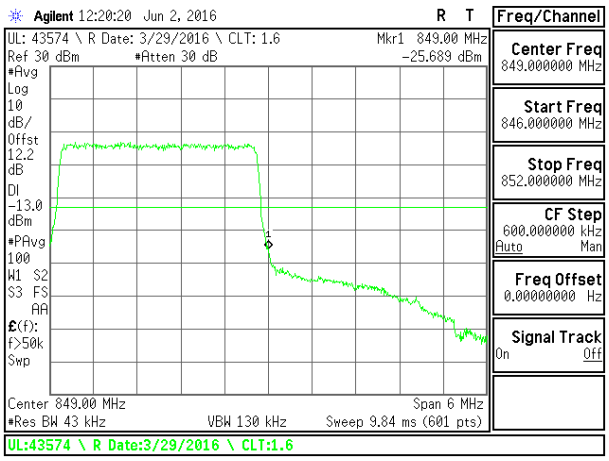
LTE B26 3MHz QPSK Low Channel 1RB



LTE B26 3MHz QPSK High Channel 1RB



LTE B26 3MHz QPSK Low Channel FRB



LTE B26 3MHz QPSK High Channel FRB

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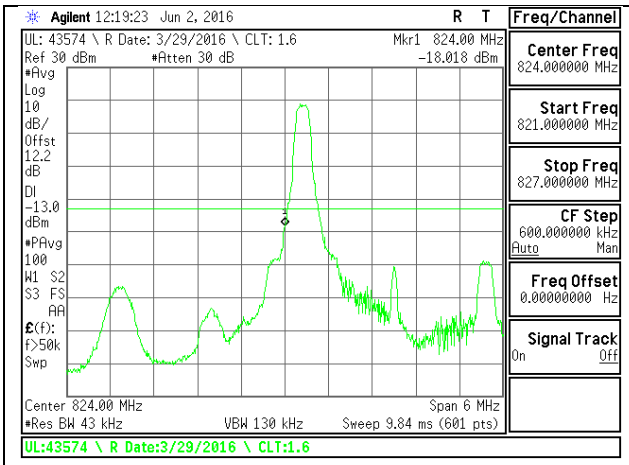
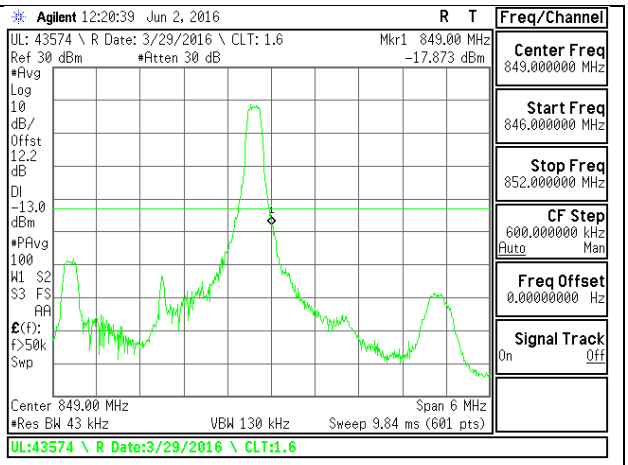
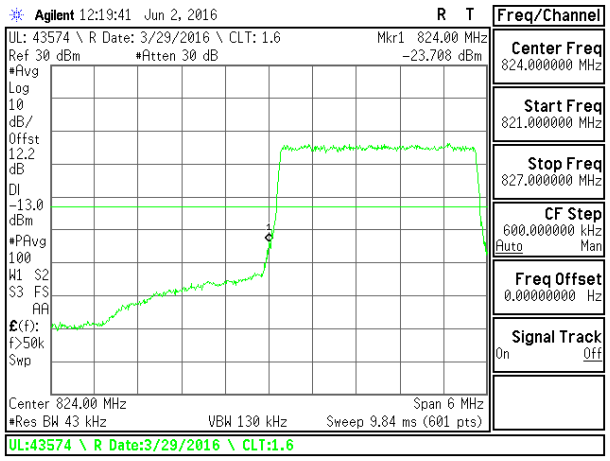


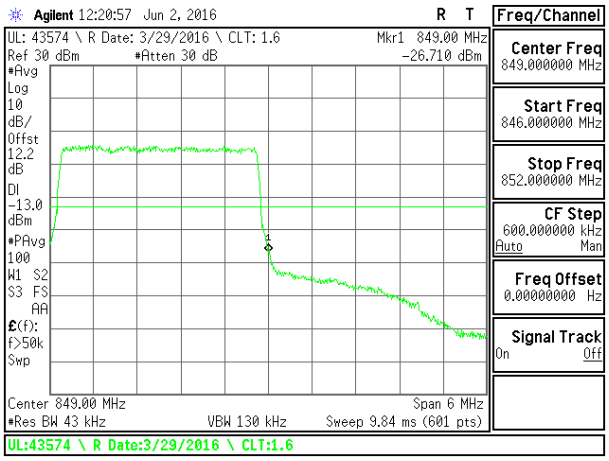
LTE B26 3MHz 16QAM Low Channel 1RB



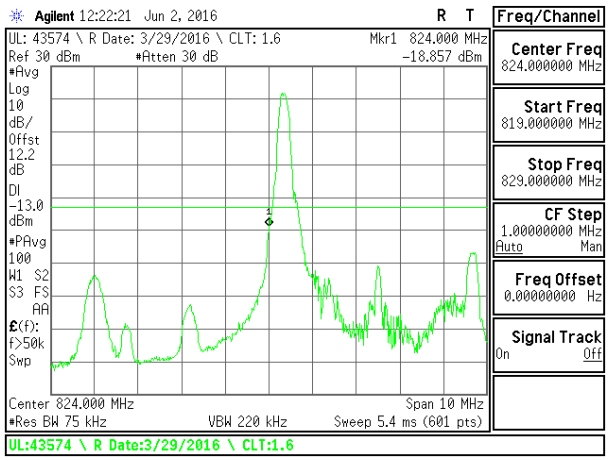
LTE B26 3MHz 16QAM High Channel 1RB



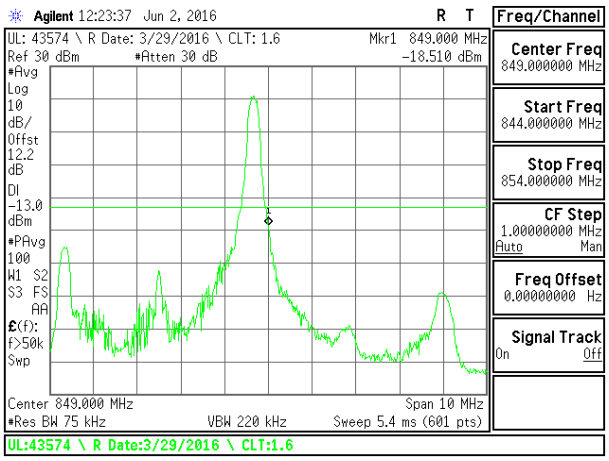
LTE B26 3MHz 16QAM Low Channel FRB



LTE B26 3MHz 16QAM High Channel FRB



LTE B26 5MHz QPSK Low Channel 1RB



LTE B26 5MHz QPSK High Channel 1RB

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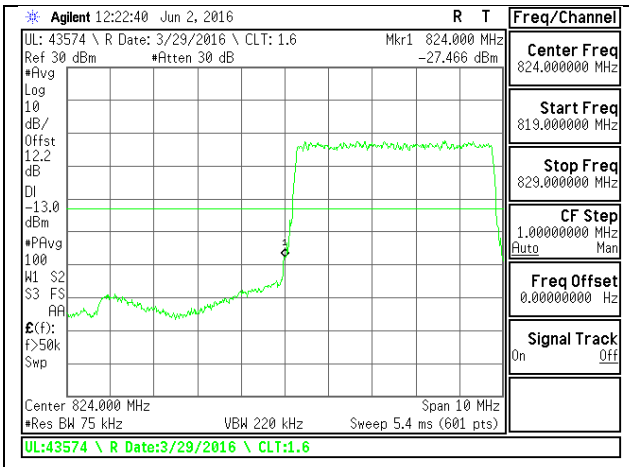
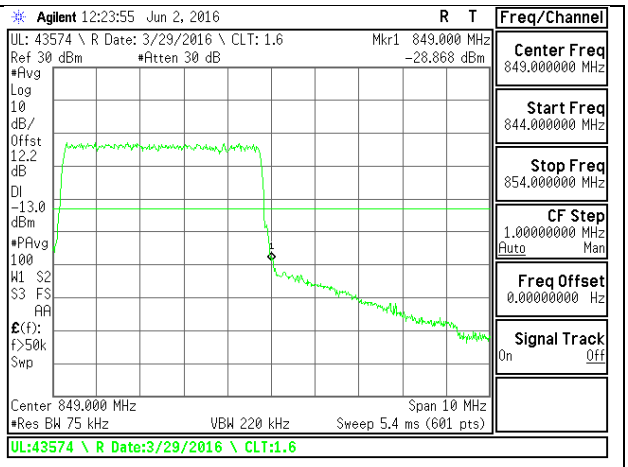
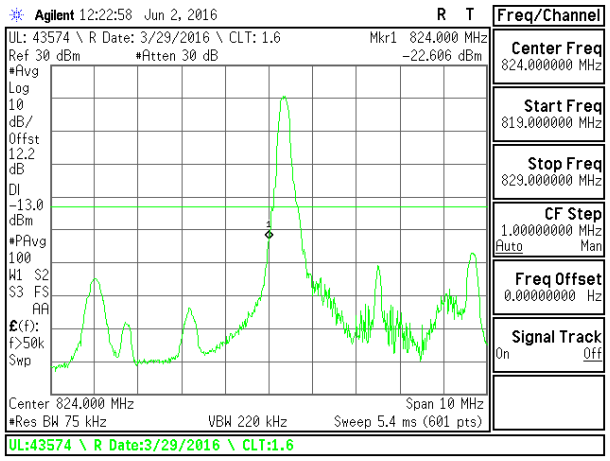


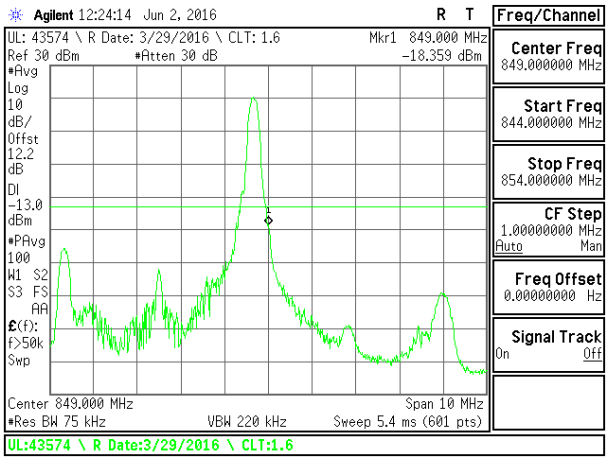
LTE B26 5MHz QPSK Low Channel FRB



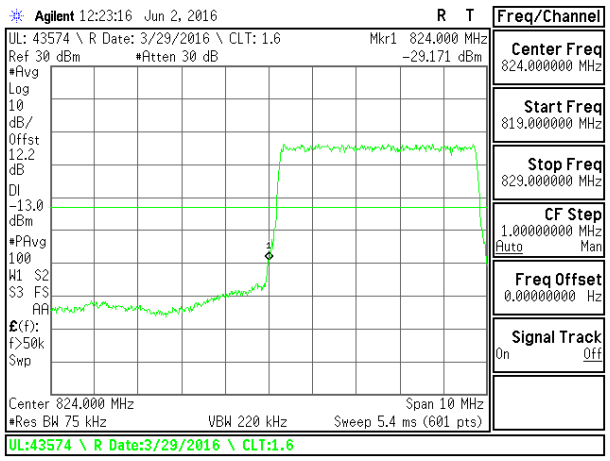
LTE B26 5MHz QPSK High Channel FRB



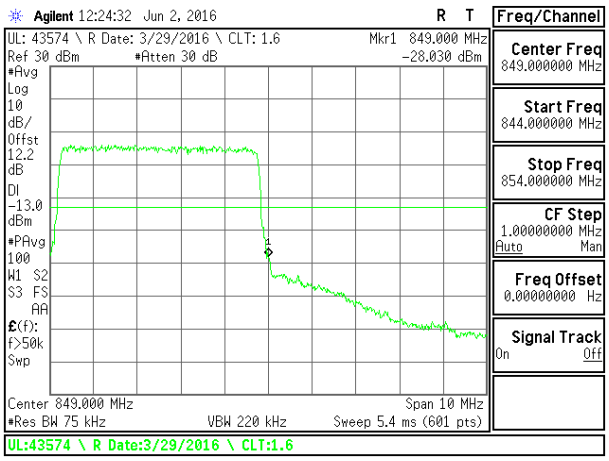
LTE B26 5MHz 16QAM Low Channel 1RB



LTE B26 5MHz 16QAM High Channel 1RB



LTE B26 5MHz 16QAM Low Channel FRB



LTE B26 5MHz 16QAM High Channel FRB

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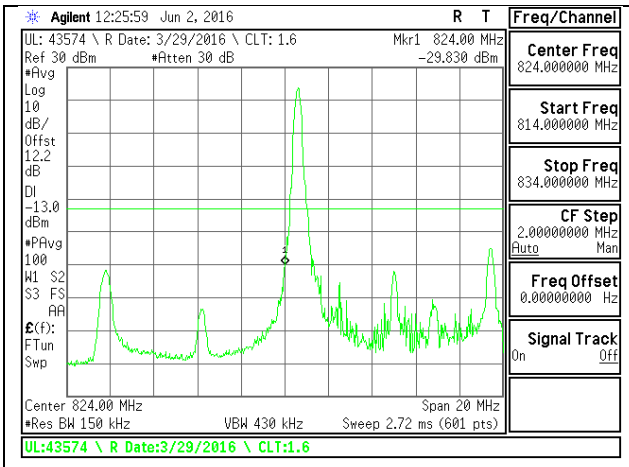
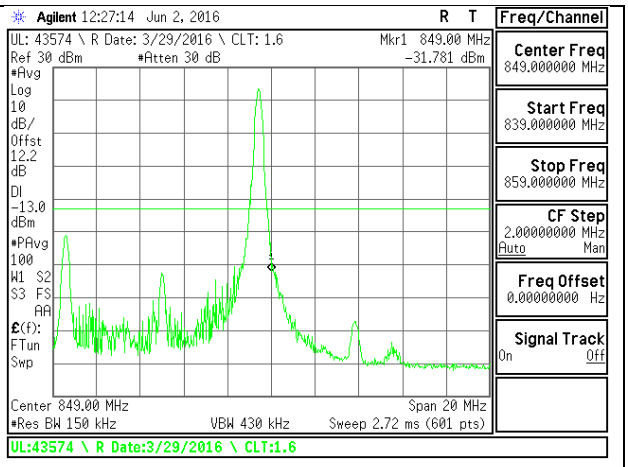
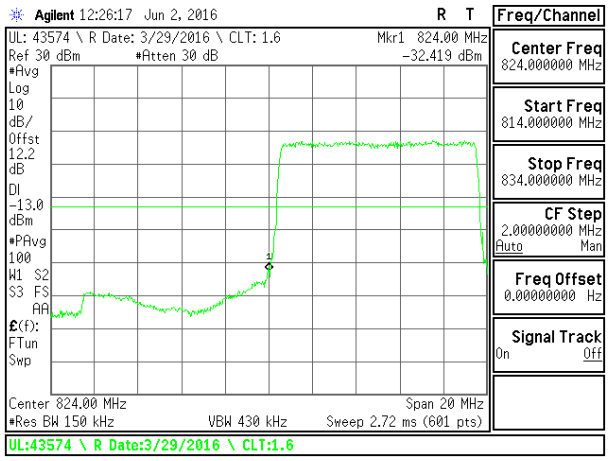


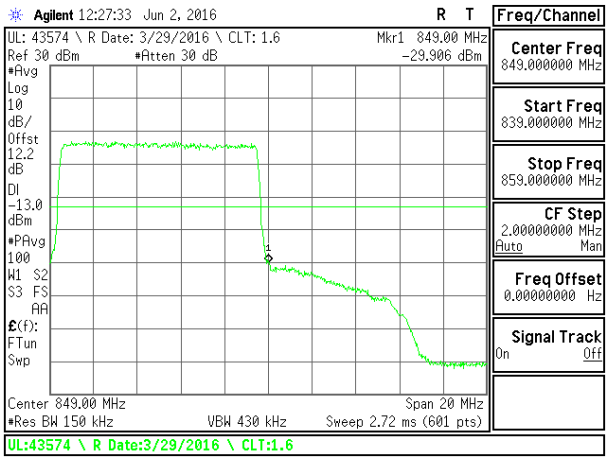
LTE B26 10MHz QPSK Low Channel 1RB



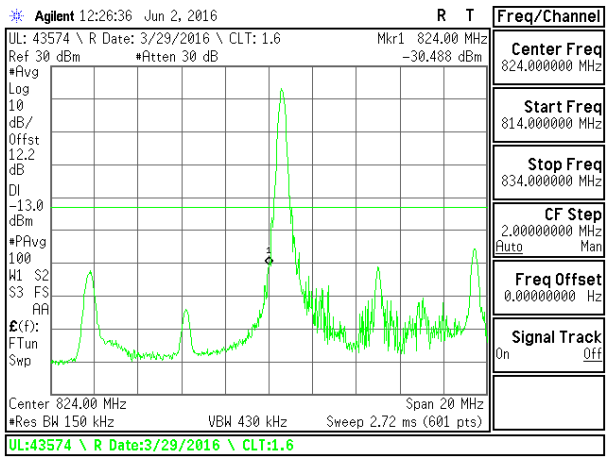
LTE B26 10MHz QPSK High Channel 1RB



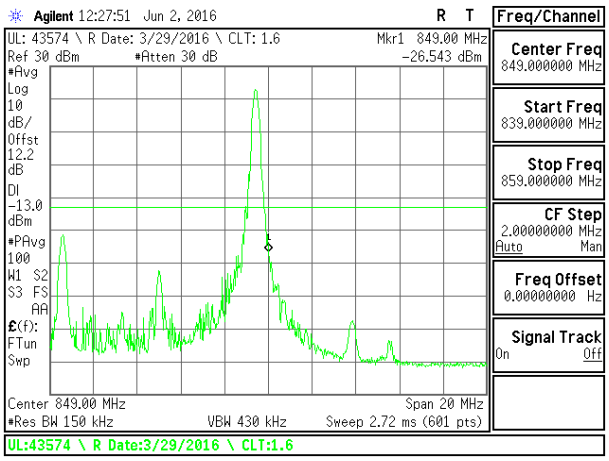
LTE B26 10MHz QPSK Low Channel FRB



LTE B26 10MHz QPSK High Channel FRB



LTE B26 10MHz 16QAM Low Channel 1RB



LTE B26 10MHz 16QAM High Channel 1RB

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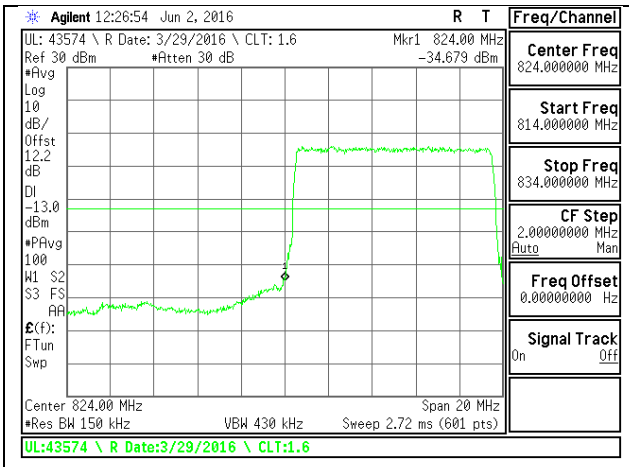
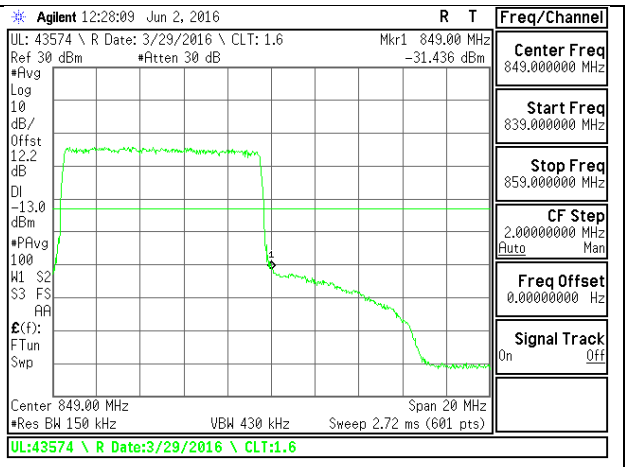
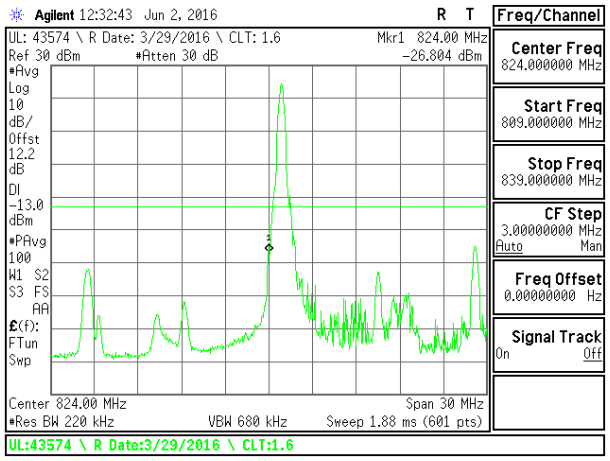


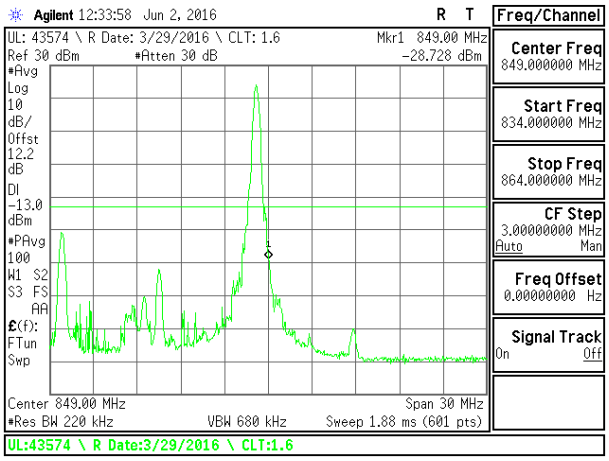
LTE B26 10MHz 16QAM Low Channel FRB



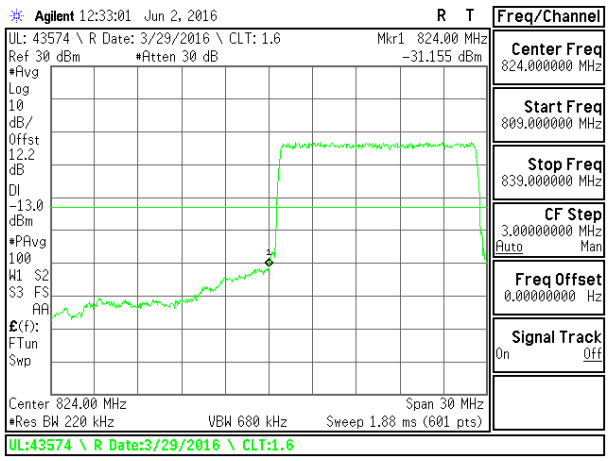
LTE B26 10MHz 16QAM High Channel FRB



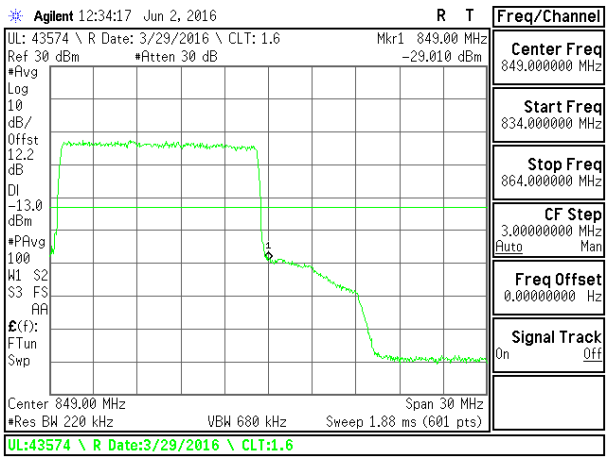
LTE B26 15MHz QPSK Low Channel 1RB



LTE B26 15MHz QPSK High Channel 1RB



LTE B26 15MHz QPSK Low Channel FRB



LTE B26 15MHz QPSK High Channel FRB

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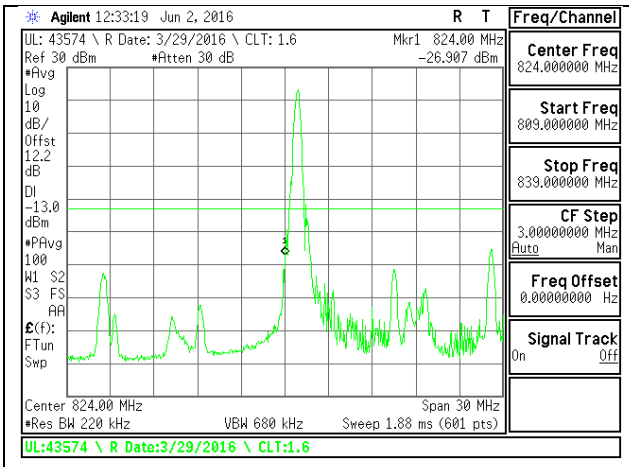
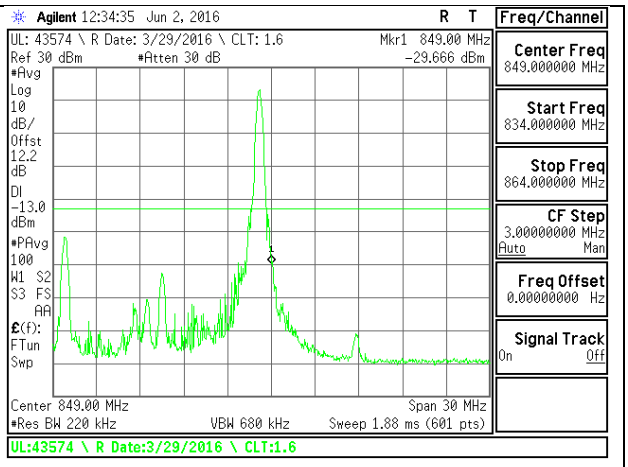
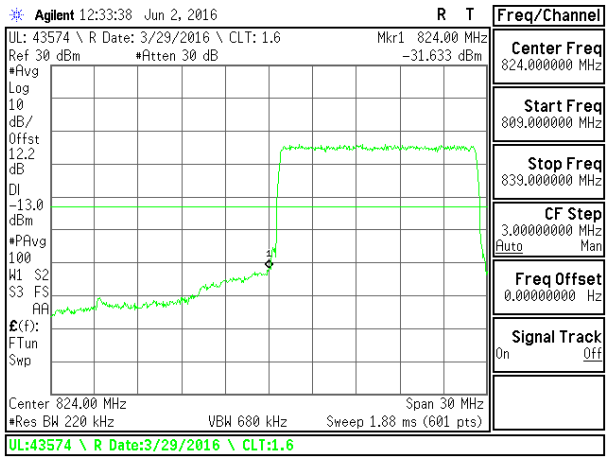


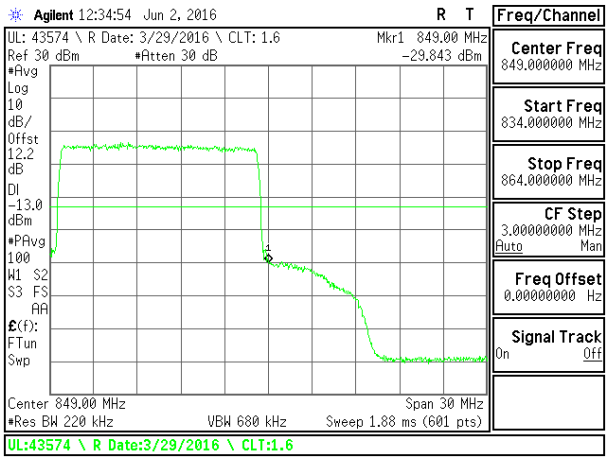
LTE B26 15MHz 16QAM Low Channel 1RB



LTE B26 15MHz 16QAM High Channel 1RB



LTE B26 15MHz 16QAM Low Channel FRB



LTE B26 15MHz 16QAM High Channel FRB

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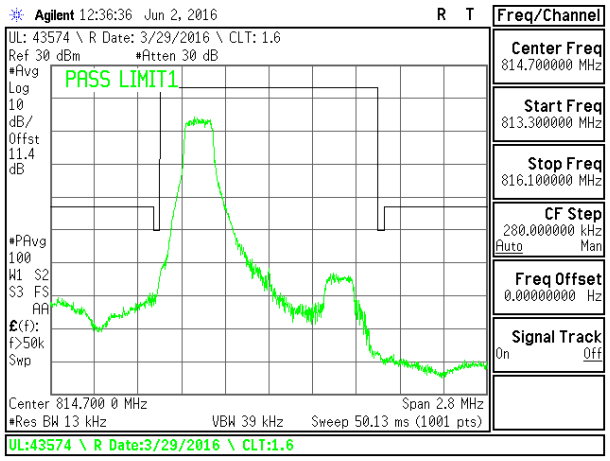
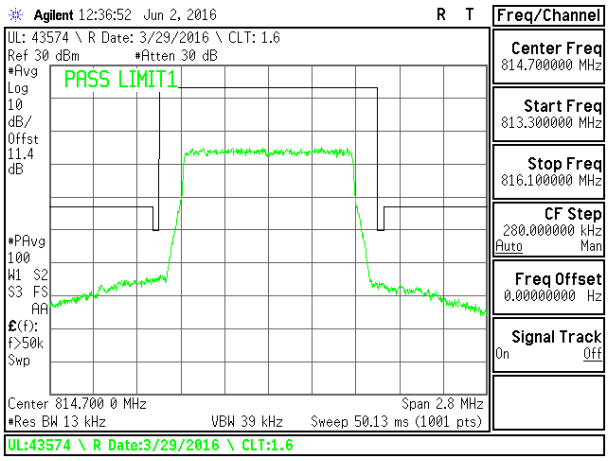
11.2. EMISSION MASK PLOTS

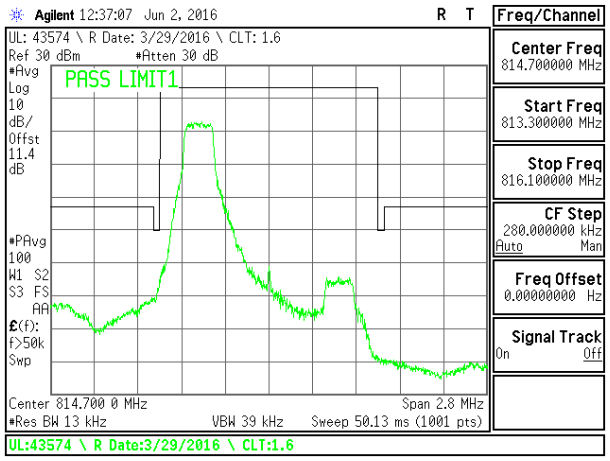
LTE Band 26



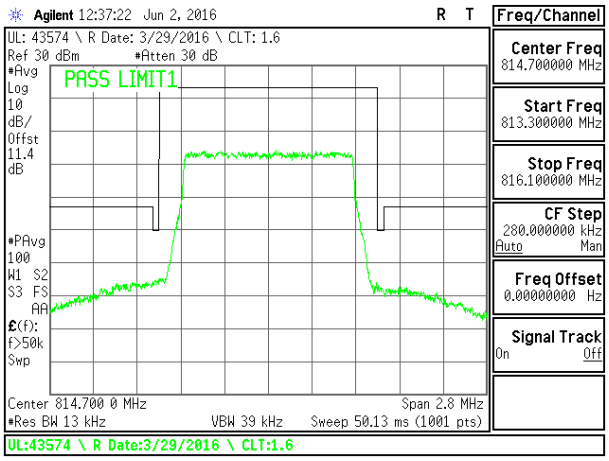
LTE B26 1.4MHz QPSK Low Channel 1RB



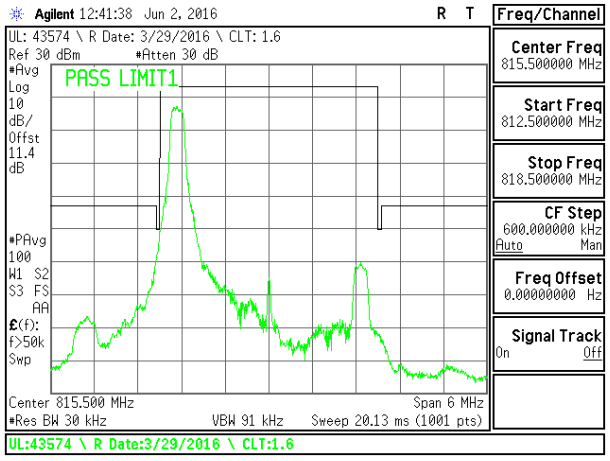
LTE B26 1.4MHz QPSK Low Channel FRB



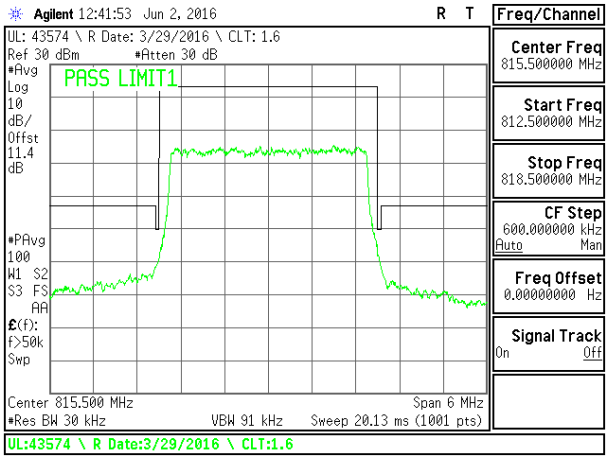
LTE B26 1.4MHz 16QAM Low Channel 1RB



LTE B26 1.4MHz 16QAM Low Channel FRB



LTE B26 3MHz QPSK Low Channel 1RB



LTE B26 3MHz QPSK Low Channel FRB

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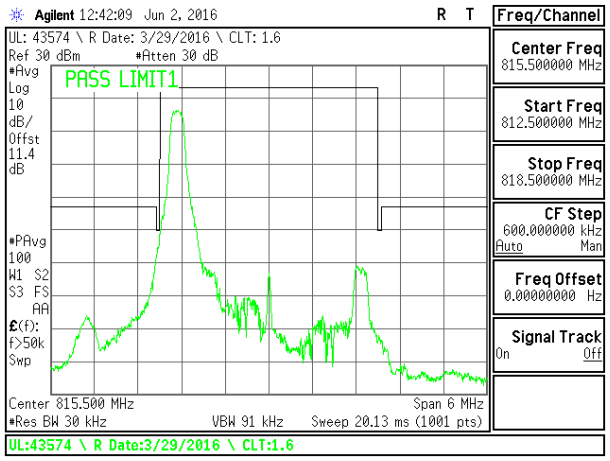
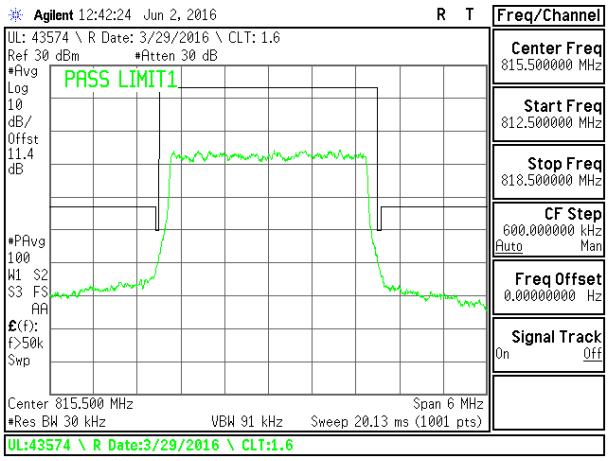
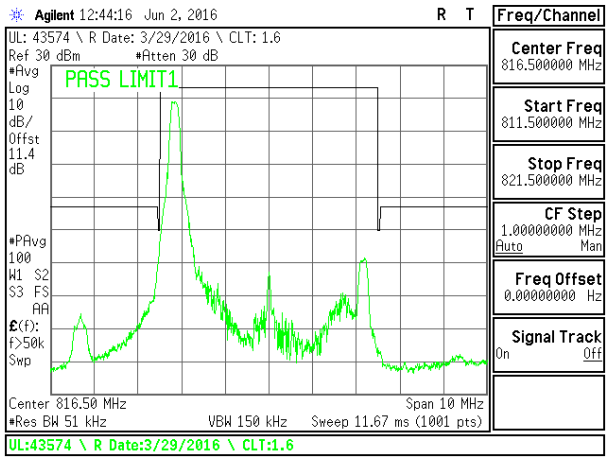


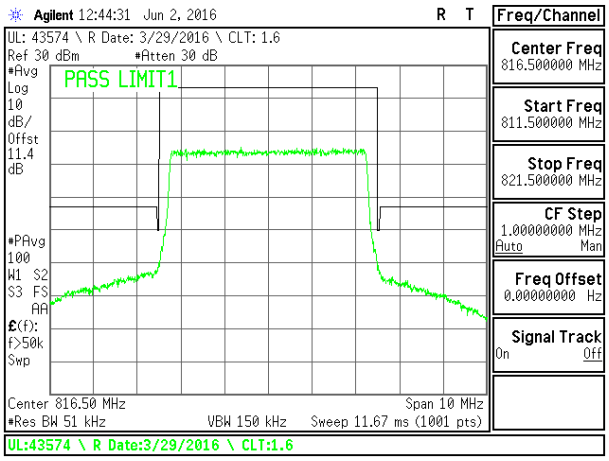
LTE B26 3MHz 16QAM Low Channel 1RB



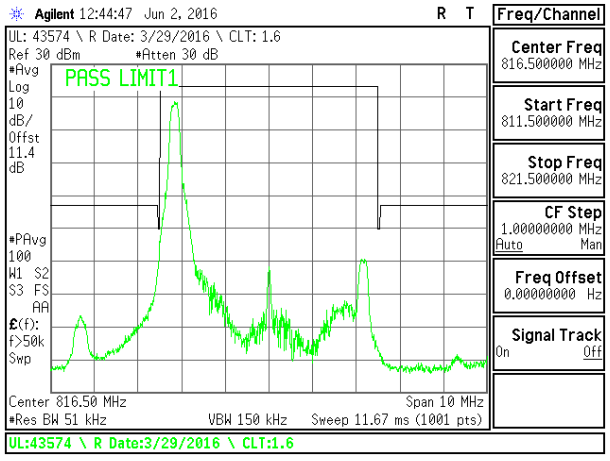
LTE B26 3MHz 16QAM Low Channel FRB



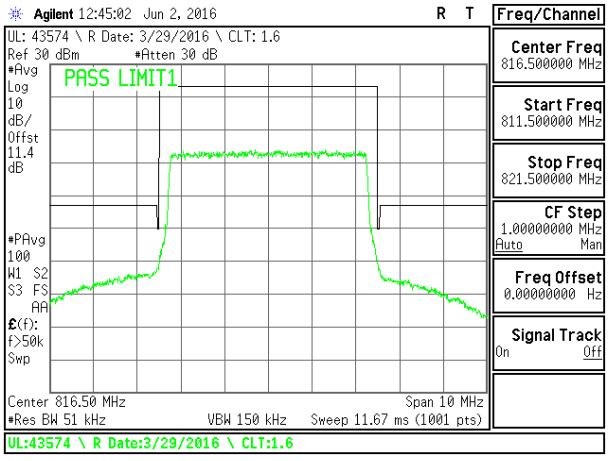
LTE B26 5MHz QPSK Low Channel 1RB



LTE B26 5MHz QPSK Low Channel FRB



LTE B26 5MHz 16QAM Low Channel 1RB



LTE B26 5MHz 16QAM Low Channel FRB

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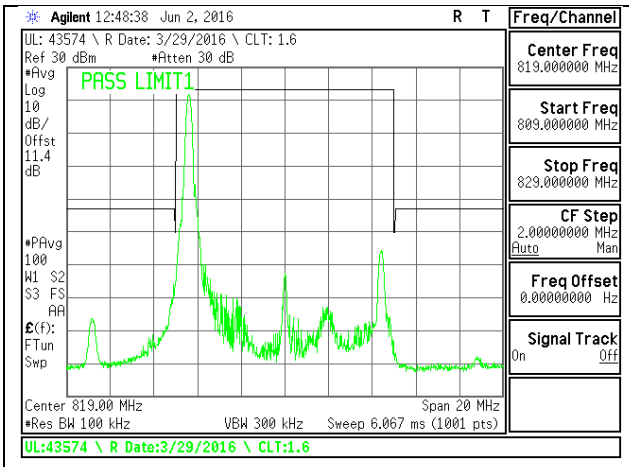
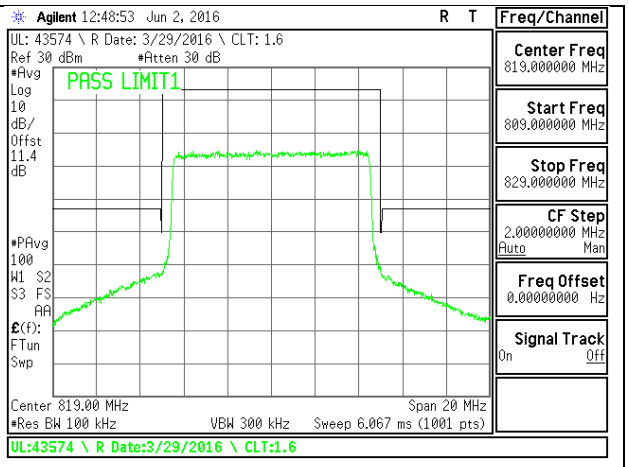
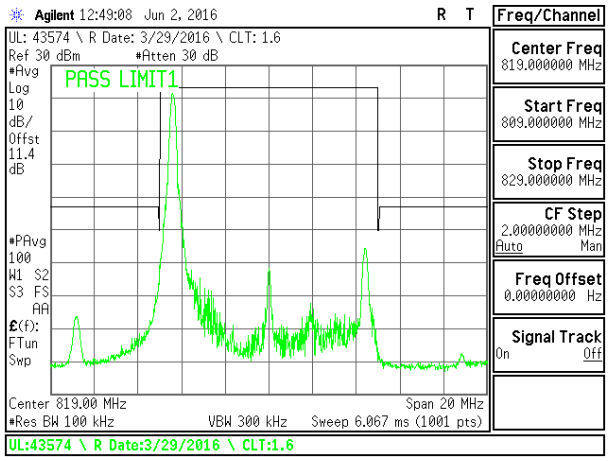


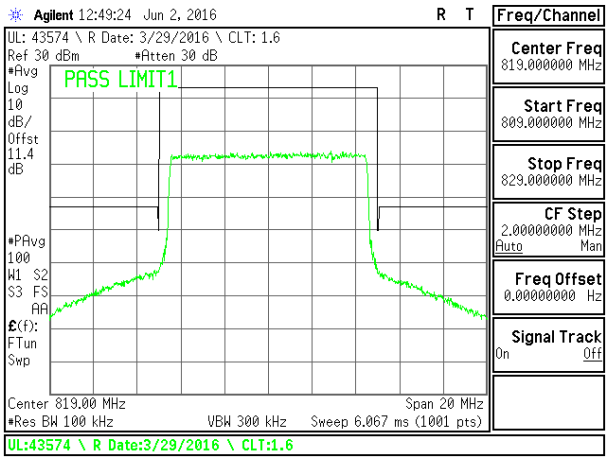
LTE B26 10MHz QPSK Low Channel 1RB



LTE B26 10MHz QPSK Low Channel FRB



LTE B26 10MHz 16QAM Low Channel 1RB



LTE B26 10MHz 16QAM Low Channel FRB

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12. OUT OF BAND EMISSIONS

RULE PART(S)

FCC: §2.1051, §22.901, §22.917 and §90.691

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.

Part 27: (m)(4) (4) For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v02r02

The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic. Multiple sweeps were recorded in a maximum hold mode using a peak detector to ensure that the worst-case emissions were caught.

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12.1. OUT OF BAND EMISSIONS RESULT AND PLOTS

LTE Band 26

BW(MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
1.4	QPSK	814.7	-33.24	-13	-20.24
1.4	QPSK	831.5	-33.37	-13	-20.37
1.4	QPSK	848.3	-34.01	-13	-21.01
1.4	16QAM	814.7	-32.56	-13	-19.56
1.4	16QAM	831.5	-32.9	-13	-19.9
1.4	16QAM	848.3	-32.56	-13	-19.56
3	QPSK	815.5	-33.45	-13	-20.45
3	QPSK	831.5	-33.41	-13	-20.41
3	QPSK	847.5	-33.1	-13	-20.1
3	16QAM	815.5	-33.34	-13	-20.34
3	16QAM	831.5	-33.13	-13	-20.13
3	16QAM	847.5	-33.62	-13	-20.62
5	QPSK	816.5	-32.94	-13	-19.94
5	QPSK	831.5	-32.86	-13	-19.86
5	QPSK	846.5	-33.4	-13	-20.4
5	16QAM	816.5	-33.02	-13	-20.02
5	16QAM	831.5	-32.71	-13	-19.71
5	16QAM	846.5	-33.7	-13	-20.7
10	QPSK	819	-33	-13	-20
10	QPSK	831.5	-32.95	-13	-19.95
10	QPSK	844	-33.09	-13	-20.09
10	16QAM	819	-33.05	-13	-20.05
10	16QAM	831.5	-33.46	-13	-20.46
10	16QAM	844	-33.61	-13	-20.61
15	QPSK	831.5	-32.91	-13	-19.91
15	QPSK	836.5	-33.17	-13	-20.17
15	QPSK	841.5	--33.59	-13	46.59
15	16QAM	831.5	-33.85	-13	-20.85
15	16QAM	836.5	-33.29	-13	-20.29
15	16QAM	841.5	-33.04	-13	-20.04

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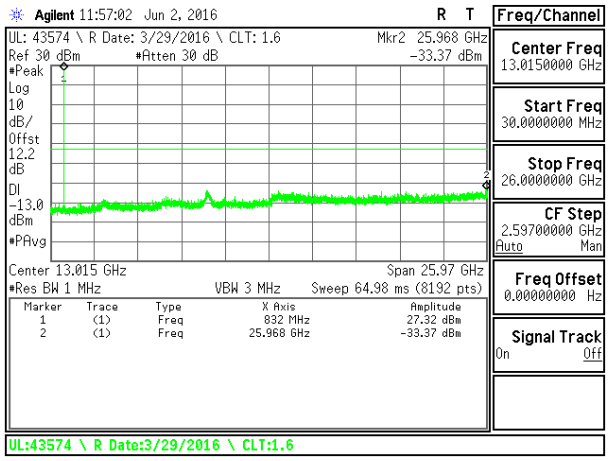
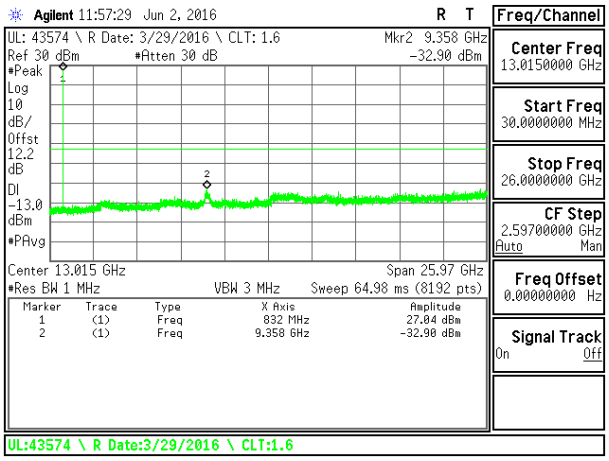
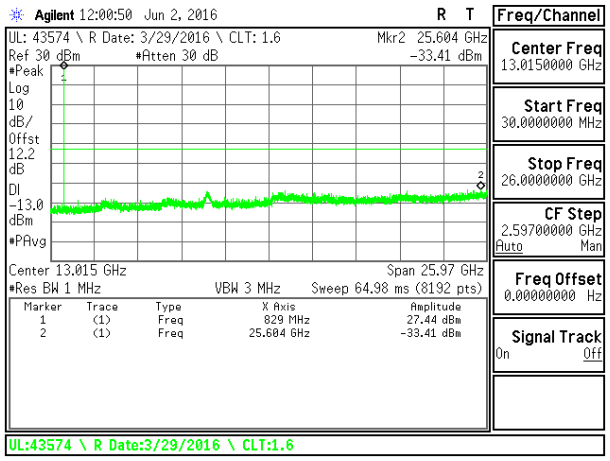


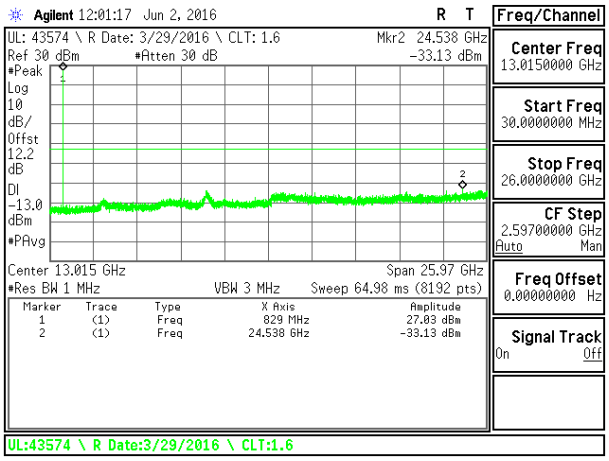
LTE B26 1.4MHz QPSK Middle Channel



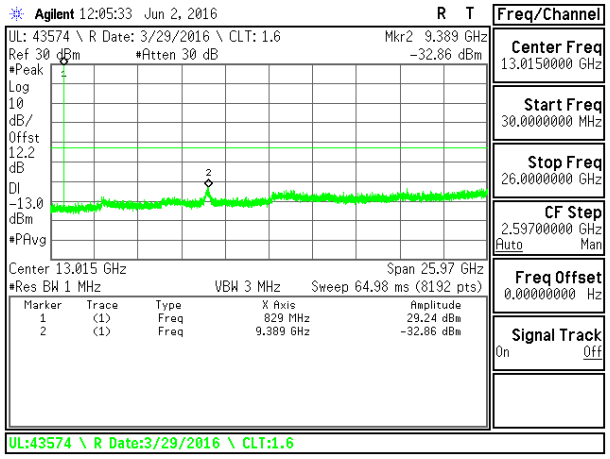
LTE B26 1.4MHz 16QAM Middle Channel



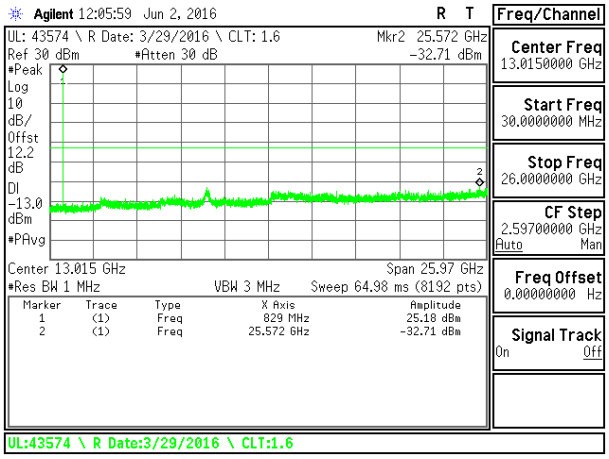
LTE B26 3MHz QPSK Middle Channel



LTE B26 3MHz 16QAM Middle Channel



LTE B26 5MHz QPSK Middle Channel



LTE B26 5MHz 16QAM Middle Channel

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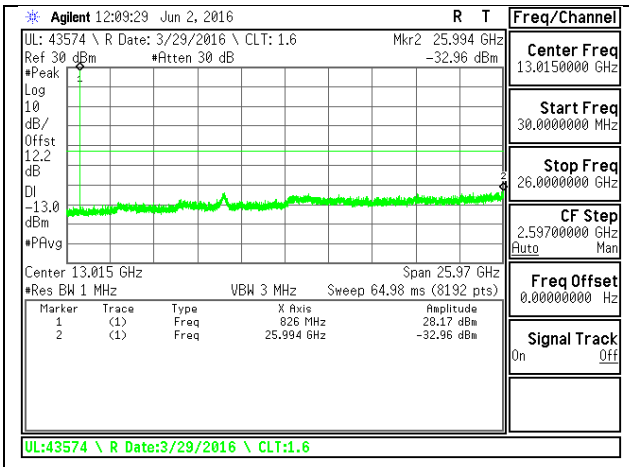
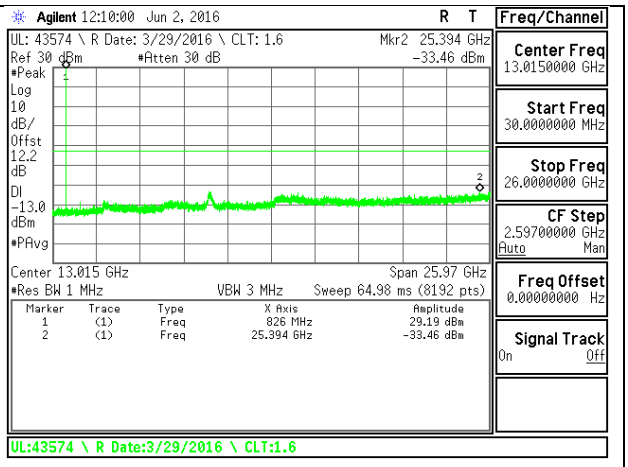
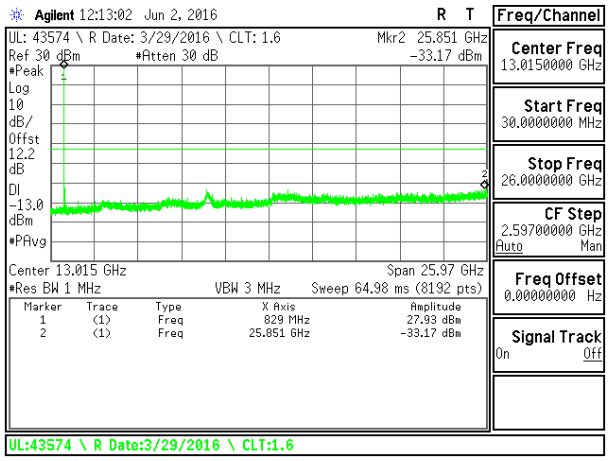


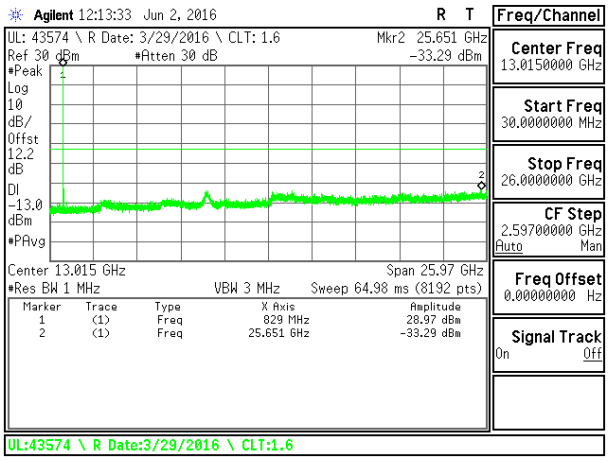
LTE B26 10MHz QPSK Middle Channel



LTE B26 10MHz 16QAM Middle Channel



LTE B26 15MHz QPSK Middle Channel



LTE B26 15MHz 16QAM Middle Channel

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701H
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888

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13. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §22.355 and §90.213

LIMITS

§22.355 - The carrier frequency shall not depart from the reference frequency in excess of ±2.5 ppm for mobile stations.

§90.213 - The carrier frequency shall not depart from the reference frequency in excess of ±2.5 ppm for mobile stations.

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v02r02

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13.1. FREQUENCY STABILITY RESULTS

LTE Band 26

Reference Frequency: PCS Mid Channel 831.5 MHz @ 20°C Limit: to stay +- 2.5 ppm = 2078.750 Hz				
Power Supply (Vdc)	**Environment Temperature (°C)**	**Frequency Deviation Measureed with Time Elapse**		
		(MHz)	**Delta (ppm)**	**Limit (ppm)**
3.80	50	831.499993	0.016	2.5
3.80	40	831.499995	0.012	2.5
3.80	30	831.499993	0.015	2.5
3.80	***20***	**831.500006**	**0**	***2.5***
3.80	10	831.500006	0.000	2.5
3.80	0	831.500007	-0.001	2.5
3.80	-10	831.500005	0.000	2.5
3.80	-20	831.500006	0.000	2.5
3.80	-30	831.500005	0.001	2.5

Reference Frequency: PCS Mid Channel 831.5 MHz @ 20°C Limit: to stay +- 2.5 ppm = 2078.750 Hz				
Power Supply (Vdc)	**Environment Temperature (°C)**	**Frequency Deviation Measureed with Time Elapse**		
		(MHz)	**Delta (ppm)**	**Limit (ppm)**
3.80	**20**	**831.500006**	**0.000**	**2.5**
4.37	20	831.5000054	*0.000*	2.5
3.23(End of volt)	20	831.5000076	-0.002	2.5

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14. RADIATED TEST RESULTS

14.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2. 1046, §22. 913 and § 90.635.

LIMITS

22.913 (a) - The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

90.635 (b) - The maximum output power of the transmitter for mobile stations is 100 watts (20 dBw). (LTE B26)

In addition, when the transmitter power is measured in terms of average value, the peak-to-average ratio of the power shall not exceed 13dB.

TEST PROCEDURE

ANSI / TIA / EIA 603D Clause 2.2.17; PSA setting reference to 971168 D01 v02r02

For peak power measurement with a PSA:

a) Set the RBW ≥ OBW; b) Set VBW ≥ 3 × RBW; c) Set span ≥ 2 x RBW; d) Sweep time = auto couple; e) Detector = peak; f) Ensure that the number of measurement points ≥ span/RBW; g) Trace mode = max hold;

For average power measurement with a PSA:

a) Set span to at least 1.5 times the OBW; b) Set RBW = 1-5% of the OBW, not to exceed 1 MHz; c) Set VBW ≥ 3 x RBW; d) Set number of points in sweep ≥ 2 × span / RBW; e) Sweep time = auto-couple; f) Detector = RMS (power averaging); g) Use free run trigger If burst duty cycle ≥ 98; h) Use trigger to capture bursts If burst duty cycle < 98; i) Trace average at least 100 traces in power averaging (*i.e.*, RMS) mode. j) Compute the power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function.

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14.1.1. ERP/EIRP RESULTS AND TABLE

LTE Band 26

BW (MHz)	Mode	RB/RB Size	f(MHz)	ERP	
				dBm	mW
1.4	QPSK	1/0	814.7	22.01	158.85
1.4	QPSK	1/0	831.5	21.00	125.89
1.4	QPSK	1/0	848.3	20.54	113.24
1.4	16QAM	1/0	814.7	19.50	89.13
1.4	16QAM	1/0	831.5	20.20	104.71
1.4	16QAM	1/0	848.3	19.80	95.50
3	QPSK	1/0	815.5	21.45	139.64
3	QPSK	1/0	831.5	20.89	122.74
3	QPSK	1/0	847.5	20.28	106.66
3	16QAM	1/0	815.5	20.82	120.78
3	16QAM	1/0	831.5	20.57	114.02
3	16QAM	1/0	847.5	19.81	95.72
5	QPSK	1/0	816.5	21.50	141.25
5	QPSK	1/0	831.5	21.02	126.47
5	QPSK	1/0	846.5	20.35	108.39
5	16QAM	1/0	816.5	20.63	115.61
5	16QAM	1/0	831.5	20.09	102.09
5	16QAM	1/0	846.5	19.74	94.19
10	QPSK	1/0	819	21.83	152.41
10	QPSK	1/0	831.5	21.22	132.43
10	QPSK	1/0	844	20.72	118.03
10	16QAM	1/0	819	20.74	118.58
10	16QAM	1/0	831.5	20.30	107.15
10	16QAM	1/0	844	20.00	100.00
15	QPSK	1/0	831.5	21.34	136.14
15	QPSK	1/0	836.5	20.99	125.60
15	QPSK	1/0	841.5	21.69	147.57
15	16QAM	1/0	831.5	20.34	108.14
15	16QAM	1/0	836.5	19.99	99.77
15	16QAM	1/0	841.5	20.88	122.46

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High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: SOMC
Project #: 16U23577
Date: 6/2/2016
Test Engineer: 44350 JH
Configuration: EUT Only
Location: Chamber C
Mode: LTE_QPSK Band 26 Fundamentals, 1.4MHz Bandwidth

Test Equipment:
Receiving: Hybrid T185, and Chamber C SMA Cables
Substitution: Dipole T416, 6ft SMA Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
814.70	15.87	V	0.9	0.0	14.97	50.0	-35.0	
814.70	22.91	H	0.9	0.0	22.01	50.0	-28.0	
Mid Ch								
831.50	15.06	V	0.9	0.0	14.16	38.5	-24.3	
831.50	21.90	H	0.9	0.0	21.00	38.5	-17.5	
High Ch								
848.30	14.79	V	0.9	0.0	13.89	38.5	-24.6	
848.30	21.44	H	0.9	0.0	20.54	38.5	-18.0	

LTE B26 1.4MHz QPSK

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: SOMC
Project #: 16U23577
Date: 6/2/2016
Test Engineer: 44350 JH
Configuration: EUT Only
Location: Chamber C
Mode: LTE_16QAM Band 26 Fundamentals, 1.4MHz Bandwidth

Test Equipment:
Receiving: Hybrid T185, and Chamber C SMA Cables
Substitution: Dipole T416, 6ft SMA Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
814.70	13.78	V	0.9	0.0	12.88	50.0	-37.1	
814.70	20.40	H	0.9	0.0	19.50	50.0	-30.5	
Mid Ch								
831.50	14.26	V	0.9	0.0	13.36	38.5	-25.1	
831.50	21.10	H	0.9	0.0	20.20	38.5	-18.3	
High Ch								
848.30	14.09	V	0.9	0.0	13.19	38.5	-25.3	
848.30	20.70	H	0.9	0.0	19.80	38.5	-18.7	

LTE B26 1.4MHz 16QAM

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: SOMC
Project #: 16U23577
Date: 6/2/2016
Test Engineer: 44350 JH
Configuration: EUT Only
Location: Chamber C
Mode: LTE_QPSK Band 26 Fundamentals, 3MHz Bandwidth

Test Equipment:
Receiving: Hybrid T185, and Chamber C SMA Cables
Substitution: Dipole T416, 6ft SMA Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
815.50	16.31	V	0.9	0.0	15.41	50.0	-34.6	
815.50	22.35	H	0.9	0.0	21.45	50.0	-28.6	
Mid Ch								
831.50	15.29	V	0.9	0.0	14.39	38.5	-24.1	
831.50	21.79	H	0.9	0.0	20.89	38.5	-17.6	
High Ch								
847.50	14.75	V	0.9	0.0	13.85	38.5	-24.6	
847.50	21.18	H	0.9	0.0	20.28	38.5	-18.2	

LTE B26 3MHz QPSK

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: SOMC
Project #: 16U23577
Date: 6/2/2016
Test Engineer: 44350 JH
Configuration: EUT Only
Location: Chamber C
Mode: LTE_16QAM Band 26 Fundamentals, 3MHz Bandwidth

Test Equipment:
Receiving: Hybrid T185, and Chamber C SMA Cables
Substitution: Dipole T416, 6ft SMA Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
815.50	15.54	V	0.9	0.0	14.64	50.0	-35.4	
815.50	21.72	H	0.9	0.0	20.82	50.0	-29.2	
Mid Ch								
831.50	14.18	V	0.9	0.0	13.28	38.5	-25.2	
831.50	21.47	H	0.9	0.0	20.57	38.5	-17.9	
High Ch								
847.50	14.29	V	0.9	0.0	13.39	38.5	-25.1	
847.50	20.71	H	0.9	0.0	19.81	38.5	-18.7	

LTE B26 3MHz 16QAM

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: SOMC
Project #: 16U23577
Date: 6/2/2016
Test Engineer: 43575 OS
Configuration: EUT Only
Location: Chamber C
Mode: LTE_QPSK Band 26 Fundamentals, 5MHz Bandwidth

Test Equipment:
Receiving: Hybrid T185, and Chamber C SMA Cables
Substitution: Dipole T416, 6ft SMA Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
816.50	16.15	V	0.9	0.0	15.25	50.0	-34.8	
816.50	22.40	H	0.9	0.0	21.50	50.0	-28.5	
Mid Ch								
831.50	15.67	V	0.9	0.0	14.77	38.5	-23.7	
831.50	21.92	H	0.9	0.0	21.02	38.5	-17.5	
High Ch								
846.50	15.21	V	0.9	0.0	14.31	38.5	-24.2	
846.50	21.25	H	0.9	0.0	20.35	38.5	-18.2	

LTE B26 5MHz QPSK

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: SOMC
Project #: 16U23577
Date: 6/2/2016
Test Engineer: 43575 OS
Configuration: EUT Only
Location: Chamber C
Mode: LTE_16QAM Band 26 Fundamentals, 5MHz Bandwidth

Test Equipment:
Receiving: Hybrid T185, and Chamber C SMA Cables
Substitution: Dipole T416, 6ft SMA Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
816.50	15.46	V	0.9	0.0	14.56	50.0	-35.4	
816.50	21.53	H	0.9	0.0	20.63	50.0	-29.4	
Mid Ch								
831.50	14.37	V	0.9	0.0	13.47	38.5	-25.0	
831.50	20.99	H	0.9	0.0	20.09	38.5	-18.4	
High Ch								
846.50	14.40	V	0.9	0.0	13.50	38.5	-25.0	
846.50	20.64	H	0.9	0.0	19.74	38.5	-18.8	

LTE B26 5MHz 16QAM

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High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: SOMC
Project #: 16U23577
Date: 6/2/2016
Test Engineer: 43575 OS
Configuration: EUT Only
Location: Chamber C
Mode: LTE_QPSK Band 26 Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: Hybrid T185, and Chamber C SMA Cables
Substitution: Dipole T416, 6ft SMA Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
819.00	16.13	V	0.9	0.0	15.23	50.0	-34.8	
819.00	22.73	H	0.9	0.0	21.83	50.0	-28.2	
Mid Ch								
831.50	15.28	V	0.9	0.0	14.38	38.5	-24.1	
831.50	22.12	H	0.9	0.0	21.22	38.5	-17.3	
High Ch								
844.00	15.58	V	0.9	0.0	14.68	38.5	-23.8	
844.00	21.62	H	0.9	0.0	20.72	38.5	-17.8	

LTE B26 10MHz QPSK

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: SOMC
Project #: 16U23577
Date: 6/2/2016
Test Engineer: 43575 OS
Configuration: EUT Only
Location: Chamber C
Mode: LTE_16QAM Band 26 Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: Hybrid T185, and Chamber C SMA Cables
Substitution: Dipole T416, 6ft SMA Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
819.00	15.13	V	0.9	0.0	14.23	50.0	-35.8	
819.00	21.64	H	0.9	0.0	20.74	50.0	-29.3	
Mid Ch								
831.50	14.57	V	0.9	0.0	13.67	38.5	-24.8	
831.50	21.20	H	0.9	0.0	20.30	38.5	-18.2	
High Ch								
844.00	15.00	V	0.9	0.0	14.10	38.5	-24.4	
844.00	20.90	H	0.9	0.0	20.00	38.5	-18.5	

LTE B26 10MHz 16QAM

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: SOMC
Project #: 16U23577
Date: 6/2/2016
Test Engineer: 43575 OS
Configuration: EUT Only
Location: Chamber C
Mode: LTE_QPSK Band 26 Fundamentals, 15MHz Bandwidth

Test Equipment:
Receiving: Hybrid T185, and Chamber C SMA Cables
Substitution: Dipole T416, 6ft SMA Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
831.50	15.47	V	0.9	0.0	14.57	38.5	-23.9	
831.50	22.24	H	0.9	0.0	21.34	38.5	-17.2	
Mid Ch								
836.50	15.45	V	0.9	0.0	14.55	38.5	-23.9	
836.50	21.89	H	0.9	0.0	20.99	38.5	-17.5	
High Ch								
841.50	15.99	V	0.9	0.0	15.09	38.5	-23.4	
841.50	22.59	H	0.9	0.0	21.69	38.5	-16.8	

LTE B26 15MHz QPSK

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: SOMC
Project #: 16U23577
Date: 6/2/2016
Test Engineer: 43575 OS
Configuration: EUT Only
Location: Chamber C
Mode: LTE_16QAM Band 26 Fundamentals, 15MHz Bandwidth

Test Equipment:
Receiving: Hybrid T185, and Chamber C SMA Cables
Substitution: Dipole T416, 6ft SMA Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
831.50	14.49	V	0.9	0.0	13.59	38.5	-24.9	
831.50	21.24	H	0.9	0.0	20.34	38.5	-18.2	
Mid Ch								
836.50	14.36	V	0.9	0.0	13.46	38.5	-25.0	
836.50	20.89	H	0.9	0.0	19.99	38.5	-18.5	
High Ch								
841.50	15.04	V	0.9	0.0	14.14	38.5	-24.4	
841.50	21.78	H	0.9	0.0	20.88	38.5	-17.6	

LTE B26 15MHz 16QAM

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14.2. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

FCC: §2.1053, §22.917 and §90.691

LIMIT

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

For Cellular equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. 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. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

For PCS equipment - 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. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 MHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

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14.2.1. SPURIOUS RADIATION PLOTS

LTE Band 26

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: SOMC
Project #: 16U23577
Date: 6/2/2016
Test Engineer: 43575 OS
Configuration: EUT Only
Location: Chamber C
Mode: LTE_QPSK Band 26 Harmonics, 1.4MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 814.7									
1629.40	-31.5	V	3.0	36.4	1.0	-66.9	-13.0	-53.9	
2444.10	-27.9	V	3.0	35.0	1.0	-62.0	-13.0	-49.0	
3258.80	-24.8	V	3.0	34.3	1.0	-58.1	-13.0	-45.1	
1629.40	-32.7	H	3.0	36.4	1.0	-68.1	-13.0	-55.1	
2444.10	-28.5	H	3.0	35.0	1.0	-62.5	-13.0	-49.5	
3258.80	-25.7	H	3.0	34.3	1.0	-59.0	-13.0	-46.0	
Mid Ch, 831.5									
1663.00	-32.2	V	3.0	36.3	1.0	-67.5	-13.0	-54.5	
2494.50	-28.5	V	3.0	34.9	1.0	-62.5	-13.0	-49.5	
3326.00	-24.7	V	3.0	34.2	1.0	-57.9	-13.0	-44.9	
1663.00	-33.0	H	3.0	36.3	1.0	-68.3	-13.0	-55.3	
2494.50	-27.3	H	3.0	34.9	1.0	-61.3	-13.0	-48.3	
3326.00	-25.5	H	3.0	34.2	1.0	-58.8	-13.0	-45.8	
High Ch, 848.3									
1696.60	-31.3	V	3.0	36.3	1.0	-66.6	-13.0	-53.6	
2544.90	-27.6	V	3.0	34.9	1.0	-61.5	-13.0	-48.5	
3393.20	-24.5	V	3.0	34.2	1.0	-57.7	-13.0	-44.7	
1696.60	-32.6	H	3.0	36.3	1.0	-67.9	-13.0	-54.9	
2544.90	-27.5	H	3.0	34.9	1.0	-61.4	-13.0	-48.4	
3393.20	-25.1	H	3.0	34.2	1.0	-58.3	-13.0	-45.3	

LTE B26 1.4MHz QPSK

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: SOMC
Project #: 16U23577
Date: 6/2/2016
Test Engineer: 43575 OS
Configuration: EUT Only
Location: Chamber C
Mode: LTE_16QAM Band 26 Harmonics, 1.4MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 814.7									
1629.40	-32.5	V	3.0	36.4	1.0	-67.9	-13.0	-54.9	
2444.10	-28.2	V	3.0	35.0	1.0	-62.2	-13.0	-49.2	
3258.80	-24.4	V	3.0	34.3	1.0	-57.7	-13.0	-44.7	
1629.40	-32.8	H	3.0	36.4	1.0	-68.2	-13.0	-55.2	
2444.10	-27.8	H	3.0	35.0	1.0	-61.8	-13.0	-48.8	
3258.80	-25.7	H	3.0	34.3	1.0	-59.0	-13.0	-46.0	
Mid Ch, 831.5									
1663.00	-31.7	V	3.0	36.3	1.0	-67.0	-13.0	-54.0	
2494.50	-28.0	V	3.0	34.9	1.0	-61.9	-13.0	-48.9	
3326.00	-24.1	V	3.0	34.2	1.0	-57.3	-13.0	-44.3	
1663.00	-32.7	H	3.0	36.3	1.0	-68.1	-13.0	-55.1	
2494.50	-27.8	H	3.0	34.9	1.0	-61.7	-13.0	-48.7	
3326.00	-25.5	H	3.0	34.2	1.0	-58.8	-13.0	-45.8	
High Ch, 848.3									
1696.60	-32.3	V	3.0	36.3	1.0	-67.6	-13.0	-54.6	
2544.90	-27.8	V	3.0	34.9	1.0	-61.7	-13.0	-48.7	
3393.20	-24.3	V	3.0	34.2	1.0	-57.5	-13.0	-44.5	
1696.60	-32.8	H	3.0	36.3	1.0	-68.1	-13.0	-55.1	
2544.90	-26.6	H	3.0	34.9	1.0	-60.5	-13.0	-47.5	
3393.20	-24.9	H	3.0	34.2	1.0	-58.1	-13.0	-45.1	

LTE B26 1.4MHz 16QAM

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: SOMC
Project #: 16U23577
Date: 6/2/2016
Test Engineer: 43575 OS
Configuration: EUT Only
Location: Chamber C
Mode: LTE_QPSK Band 26 Harmonics, 3MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 815.5									
1631.00	-31.6	V	3.0	36.4	1.0	-67.0	-13.0	-54.0	
2446.50	-28.2	V	3.0	35.0	1.0	-62.2	-13.0	-49.2	
3262.00	-24.7	V	3.0	34.3	1.0	-58.0	-13.0	-45.0	
1631.00	-33.2	H	3.0	36.4	1.0	-68.6	-13.0	-55.6	
2446.50	-27.9	H	3.0	35.0	1.0	-61.9	-13.0	-48.9	
3262.00	-25.7	H	3.0	34.3	1.0	-59.0	-13.0	-46.0	
Mid Ch, 831.5									
1663.00	-32.1	V	3.0	36.3	1.0	-67.5	-13.0	-54.5	
2494.50	-27.7	V	3.0	34.9	1.0	-61.7	-13.0	-48.7	
3326.00	-24.8	V	3.0	34.2	1.0	-58.1	-13.0	-45.1	
1663.00	-32.7	H	3.0	36.3	1.0	-68.0	-13.0	-55.0	
2494.50	-28.3	H	3.0	34.9	1.0	-62.2	-13.0	-49.2	
3326.00	-25.1	H	3.0	34.2	1.0	-58.3	-13.0	-45.3	
High Ch, 847.5									
1695.00	-32.2	V	3.0	36.3	1.0	-67.5	-13.0	-54.5	
2542.50	-27.3	V	3.0	34.9	1.0	-61.2	-13.0	-48.2	
3390.00	-24.6	V	3.0	34.2	1.0	-57.8	-13.0	-44.8	
1695.00	-32.4	H	3.0	36.3	1.0	-67.7	-13.0	-54.7	
2542.50	-27.7	H	3.0	34.9	1.0	-61.6	-13.0	-48.6	
3390.00	-25.0	H	3.0	34.2	1.0	-58.2	-13.0	-45.2	

LTE B26 3MHz QPSK

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: SOMC
Project #: 16U23577
Date: 6/2/2016
Test Engineer: 43575 OS
Configuration: EUT Only
Location: Chamber C
Mode: LTE_16QAM Band 26 Harmonics, 3MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 815.5									
1631.00	-32.1	V	3.0	36.4	1.0	-67.5	-13.0	-54.5	
2446.50	-28.4	V	3.0	35.0	1.0	-62.4	-13.0	-49.4	
3262.00	-24.7	V	3.0	34.3	1.0	-58.1	-13.0	-45.1	
1631.00	-33.3	H	3.0	36.4	1.0	-68.6	-13.0	-55.6	
2446.50	-28.1	H	3.0	35.0	1.0	-62.1	-13.0	-49.1	
3262.00	-25.0	H	3.0	34.3	1.0	-58.3	-13.0	-45.3	
Mid Ch, 831.5									
1663.00	-32.0	V	3.0	36.3	1.0	-67.4	-13.0	-54.4	
2494.50	-28.0	V	3.0	34.9	1.0	-61.9	-13.0	-48.9	
3326.00	-24.2	V	3.0	34.2	1.0	-57.4	-13.0	-44.4	
1663.00	-33.3	H	3.0	36.3	1.0	-68.7	-13.0	-55.7	
2494.50	-27.5	H	3.0	34.9	1.0	-61.5	-13.0	-48.5	
3326.00	-25.1	H	3.0	34.2	1.0	-58.3	-13.0	-45.3	
High Ch, 847.5									
1695.00	-31.5	V	3.0	36.3	1.0	-66.7	-13.0	-53.7	
2542.50	-27.9	V	3.0	34.9	1.0	-61.8	-13.0	-48.8	
3390.00	-24.4	V	3.0	34.2	1.0	-57.6	-13.0	-44.6	
1695.00	-33.1	H	3.0	36.3	1.0	-68.4	-13.0	-55.4	
2542.50	-27.4	H	3.0	34.9	1.0	-61.3	-13.0	-48.3	
3390.00	-25.3	H	3.0	34.2	1.0	-58.5	-13.0	-45.5	

LTE B26 3MHz 16QAM

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: SOMC
Project #: 16U23577
Date: 6/2/2016
Test Engineer: 43575 OS
Configuration: EUT Only
Location: Chamber C
Mode: LTE_QPSK Band 26 Harmonics, 5MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 816.5									
1633.00	-32.5	V	3.0	36.4	1.0	-67.9	-13.0	-54.9	
2449.50	-28.1	V	3.0	35.0	1.0	-62.1	-13.0	-49.1	
3266.00	-24.8	V	3.0	34.3	1.0	-58.1	-13.0	-45.1	
1633.00	-32.4	H	3.0	36.4	1.0	-67.8	-13.0	-54.8	
2449.50	-28.3	H	3.0	35.0	1.0	-62.3	-13.0	-49.3	
3266.00	-25.3	H	3.0	34.3	1.0	-58.6	-13.0	-45.6	
Mid Ch, 831.5									
1663.00	-32.1	V	3.0	36.3	1.0	-67.4	-13.0	-54.4	
2494.50	-27.5	V	3.0	34.9	1.0	-61.5	-13.0	-48.5	
3326.00	-24.6	V	3.0	34.2	1.0	-57.8	-13.0	-44.8	
1663.00	-33.0	H	3.0	36.3	1.0	-68.3	-13.0	-55.3	
2494.50	-27.9	H	3.0	34.9	1.0	-61.9	-13.0	-48.9	
3326.00	-25.3	H	3.0	34.2	1.0	-58.6	-13.0	-45.6	
High Ch, 846.5									
1693.00	-31.5	V	3.0	36.3	1.0	-66.8	-13.0	-53.8	
2539.50	-27.1	V	3.0	34.9	1.0	-61.1	-13.0	-48.1	
3386.00	-24.9	V	3.0	34.2	1.0	-58.0	-13.0	-45.0	
1693.00	-32.3	H	3.0	36.3	1.0	-67.6	-13.0	-54.6	
2539.50	-27.5	H	3.0	34.9	1.0	-61.4	-13.0	-48.4	
3386.00	-25.9	H	3.0	34.2	1.0	-59.1	-13.0	-46.1	

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: SOMC
Project #: 16U23577
Date: 6/2/2016
Test Engineer: 43575 OS
Configuration: EUT Only
Location: Chamber C
Mode: LTE_16QAM Band 26 Harmonics, 5MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 816.5									
1633.00	-32.5	V	3.0	36.4	1.0	-67.9	-13.0	-54.9	
2449.50	-27.8	V	3.0	35.0	1.0	-61.9	-13.0	-48.9	
3266.00	-24.8	V	3.0	34.3	1.0	-58.1	-13.0	-45.1	
1633.00	-33.3	H	3.0	36.4	1.0	-68.7	-13.0	-55.7	
2449.50	-28.3	H	3.0	35.0	1.0	-62.3	-13.0	-49.3	
3266.00	-25.5	H	3.0	34.3	1.0	-58.8	-13.0	-45.8	
Mid Ch, 831.5									
1663.00	-32.3	V	3.0	36.3	1.0	-67.6	-13.0	-54.6	
2494.50	-27.4	V	3.0	34.9	1.0	-61.4	-13.0	-48.4	
3326.00	-24.7	V	3.0	34.2	1.0	-58.0	-13.0	-45.0	
1663.00	-32.3	H	3.0	36.3	1.0	-67.6	-13.0	-54.6	
2494.50	-27.8	H	3.0	34.9	1.0	-61.7	-13.0	-48.7	
3326.00	-25.5	H	3.0	34.2	1.0	-58.8	-13.0	-45.8	
High Ch, 846.5									
1693.00	-31.6	V	3.0	36.3	1.0	-66.9	-13.0	-53.9	
2539.50	-28.1	V	3.0	34.9	1.0	-62.0	-13.0	-49.0	
3386.00	-24.8	V	3.0	34.2	1.0	-58.0	-13.0	-45.0	
1693.00	-32.5	H	3.0	36.3	1.0	-67.8	-13.0	-54.8	
2539.50	-27.8	H	3.0	34.9	1.0	-61.7	-13.0	-48.7	
3386.00	-25.5	H	3.0	34.2	1.0	-58.7	-13.0	-45.7	

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LTE B26 5MHz QPSK

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: SOMC
Project #: 16U23577
Date: 6/2/2016
Test Engineer: 43575 OS
Configuration: EUT Only
Location: Chamber C
Mode: LTE_QPSK Band 26 Harmonics, 10MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 819									
1638.00	-31.6	V	3.0	36.4	1.0	-66.9	-13.0	-53.9	
2457.00	-28.0	V	3.0	35.0	1.0	-62.0	-13.0	-49.0	
3276.00	-24.9	V	3.0	34.3	1.0	-58.2	-13.0	-45.2	
1638.00	-33.0	H	3.0	36.4	1.0	-68.4	-13.0	-55.4	
2457.00	-28.0	H	3.0	35.0	1.0	-62.0	-13.0	-49.0	
3276.00	-25.2	H	3.0	34.3	1.0	-58.5	-13.0	-45.5	
Mid Ch, 831.5									
1663.00	-32.1	V	3.0	36.3	1.0	-67.5	-13.0	-54.5	
2494.50	-27.8	V	3.0	34.9	1.0	-61.7	-13.0	-48.7	
3326.00	-25.1	V	3.0	34.2	1.0	-58.4	-13.0	-45.4	
1663.00	-33.1	H	3.0	36.3	1.0	-68.4	-13.0	-55.4	
2494.50	-27.7	H	3.0	34.9	1.0	-61.7	-13.0	-48.7	
3326.00	-24.0	H	3.0	34.2	1.0	-57.3	-13.0	-44.3	
High Ch, 844									
1688.00	-31.8	V	3.0	36.3	1.0	-67.1	-13.0	-54.1	
2532.00	-27.8	V	3.0	34.9	1.0	-61.7	-13.0	-48.7	
3376.00	-24.6	V	3.0	34.2	1.0	-57.8	-13.0	-44.8	
1688.00	-32.1	H	3.0	36.3	1.0	-67.4	-13.0	-54.4	
2532.00	-27.6	H	3.0	34.9	1.0	-61.5	-13.0	-48.5	
3376.00	-25.4	H	3.0	34.2	1.0	-58.6	-13.0	-45.6	

LTE B26 5MHz 16QAM

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: SOMC
Project #: 16U23577
Date: 6/2/2016
Test Engineer: 43575 OS
Configuration: EUT Only
Location: Chamber C
Mode: LTE_16QAM Band 26 Harmonics, 10MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 819									
1638.00	-32.7	V	3.0	36.4	1.0	-68.1	-13.0	-55.1	
2457.00	-27.2	V	3.0	35.0	1.0	-61.2	-13.0	-48.2	
3276.00	-24.9	V	3.0	34.3	1.0	-58.2	-13.0	-45.2	
1638.00	-33.0	H	3.0	36.4	1.0	-68.4	-13.0	-55.4	
2457.00	-28.0	H	3.0	35.0	1.0	-62.0	-13.0	-49.0	
3276.00	-25.1	H	3.0	34.3	1.0	-58.4	-13.0	-45.4	
Mid Ch, 831.5									
1663.00	-31.8	V	3.0	36.3	1.0	-67.2	-13.0	-54.2	
2494.50	-27.6	V	3.0	34.9	1.0	-61.5	-13.0	-48.5	
3326.00	-24.3	V	3.0	34.2	1.0	-57.5	-13.0	-44.5	
1663.00	-33.0	H	3.0	36.3	1.0	-68.4	-13.0	-55.4	
2494.50	-27.0	H	3.0	34.9	1.0	-60.9	-13.0	-47.9	
3326.00	-25.2	H	3.0	34.2	1.0	-58.4	-13.0	-45.4	
High Ch, 844									
1688.00	-31.6	V	3.0	36.3	1.0	-66.9	-13.0	-53.9	
2532.00	-27.7	V	3.0	34.9	1.0	-61.6	-13.0	-48.6	
3376.00	-24.7	V	3.0	34.2	1.0	-57.9	-13.0	-44.9	
1688.00	-32.6	H	3.0	36.3	1.0	-67.9	-13.0	-54.9	
2532.00	-27.8	H	3.0	34.9	1.0	-61.7	-13.0	-48.7	
3376.00	-25.4	H	3.0	34.2	1.0	-58.6	-13.0	-45.6	

LTE B26 10MHz QPSK

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: SOMC
Project #: 16U23577
Date: 6/2/2016
Test Engineer: 43575 OS
Configuration: EUT Only
Location: Chamber C
Mode: LTE_QPSK Band 26 Harmonics, 15MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 831.5									
1663.00	-31.2	V	3.0	36.3	1.0	-66.6	-13.0	-53.6	
2494.50	-28.0	V	3.0	34.9	1.0	-62.0	-13.0	-49.0	
3326.00	-24.5	V	3.0	34.2	1.0	-57.8	-13.0	-44.8	
1663.00	-31.5	H	3.0	36.3	1.0	-66.9	-13.0	-53.9	
2494.50	-27.8	H	3.0	34.9	1.0	-61.7	-13.0	-48.7	
3326.00	-24.9	H	3.0	34.2	1.0	-58.2	-13.0	-45.2	
Mid Ch, 836.5									
1673.00	-31.8	V	3.0	36.3	1.0	-67.2	-13.0	-54.2	
2509.50	-27.5	V	3.0	34.9	1.0	-61.5	-13.0	-48.5	
3346.00	-25.2	V	3.0	34.2	1.0	-58.4	-13.0	-45.4	
1673.00	-32.7	H	3.0	36.3	1.0	-68.1	-13.0	-55.1	
2509.50	-28.2	H	3.0	34.9	1.0	-62.1	-13.0	-49.1	
3346.00	-25.3	H	3.0	34.2	1.0	-58.6	-13.0	-45.6	
High Ch, 841.5									
1683.00	-31.9	V	3.0	36.3	1.0	-67.2	-13.0	-54.2	
2524.50	-27.6	V	3.0	34.9	1.0	-61.5	-13.0	-48.5	
3366.00	-24.9	V	3.0	34.2	1.0	-58.1	-13.0	-45.1	
1683.00	-32.3	H	3.0	36.3	1.0	-67.6	-13.0	-54.6	
2524.50	-27.6	H	3.0	34.9	1.0	-61.5	-13.0	-48.5	
3366.00	-25.5	H	3.0	34.2	1.0	-58.7	-13.0	-45.7	

LTE B26 10MHz 16QAM

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: SOMC
Project #: 16U23577
Date: 6/2/2016
Test Engineer: 43575 OS
Configuration: EUT Only
Location: Chamber C
Mode: LTE_16QAM Band 26 Harmonics, 15MHz Bandwidth

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 831.5									
1663.00	-31.9	V	3.0	36.3	1.0	-67.2	-13.0	-54.2	
2494.50	-28.3	V	3.0	34.9	1.0	-62.3	-13.0	-49.3	
3326.00	-24.6	V	3.0	34.2	1.0	-57.8	-13.0	-44.8	
1663.00	-32.8	H	3.0	36.3	1.0	-68.2	-13.0	-55.2	
2494.50	-27.7	H	3.0	34.9	1.0	-61.6	-13.0	-48.6	
3326.00	-26.0	H	3.0	34.2	1.0	-59.2	-13.0	-46.2	
Mid Ch, 836.5									
1673.00	-31.3	V	3.0	36.3	1.0	-66.7	-13.0	-53.7	
2509.50	-27.9	V	3.0	34.9	1.0	-61.8	-13.0	-48.8	
3346.00	-24.2	V	3.0	34.2	1.0	-57.4	-13.0	-44.4	
1673.00	-32.2	H	3.0	36.3	1.0	-67.5	-13.0	-54.5	
2509.50	-27.5	H	3.0	34.9	1.0	-61.5	-13.0	-48.5	
3346.00	-25.5	H	3.0	34.2	1.0	-58.7	-13.0	-45.7	
High Ch, 841.5									
1683.00	-31.6	V	3.0	36.3	1.0	-66.9	-13.0	-53.9	
2524.50	-27.7	V	3.0	34.9	1.0	-61.6	-13.0	-48.6	
3366.00	-25.2	V	3.0	34.2	1.0	-58.4	-13.0	-45.4	
1683.00	-33.1	H	3.0	36.3	1.0	-68.4	-13.0	-55.4	
2524.50	-27.3	H	3.0	34.9	1.0	-61.3	-13.0	-48.3	
3366.00	-25.5	H	3.0	34.2	1.0	-58.7	-13.0	-45.7	

LTE B26 15MHz QPSK

LTE B26 15MHz 16QAM

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