



FCC CFR47 PART 22 SUBPART H
FCC CFR47 PART 24 SUBPART E

CERTIFICATION TEST REPORT

FOR

GSM/WCDMA/LTE WATCH + BLUETOOTH + WLAN b/g/n & NFC

MODEL NUMBER: LG-W200A, LGW200A, W200A

FCC ID: ZNFW200A

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1. ATTESTATION OF TEST RESULTS

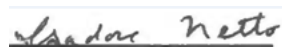
COMPANY NAME: LG ELECTRONICS MOBILECOMM U.S.A., INC.
EUT DESCRIPTION: GSM/WCDMA/LTE + BLUETOOTH + WLAN b/g/n & NFC WATCH
MODEL: LG-W200A, LGW200A, W200A
SERIAL NUMBER: 0a924099b827d8ec
DATE TESTED: JULY 6-27 and AUGUST 28-30, 2015

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC 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.

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2. TEST METHODOLOGY

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

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(IC: 2324B-1)	☐ Chamber D(IC: 2324B-4)
☒ Chamber B(IC: 2324B-2)	☐ Chamber E(IC: 2324B-5)
☒ Chamber C(IC: 2324B-3)	☐ Chamber F(IC: 2324B-6)
	☐ Chamber G(IC: 2324B-7)
	☐ Chamber H(IC: 2324B-8)

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://ts.nist.gov/standards/scopes/2000650.htm>.

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:

$$\text{EIRP} = \text{PSA reading with EUT worst orientation (dBm)} + \text{Path loss (dB)} - \text{cable loss(between the SG and substitution antenna)} + \text{Substitution Antenna Factor (dBi)}$$

$$\text{ERP} = \text{PSA reading with EUT worst orientation (dBm)} + \text{Path loss (dB)} - \text{cable loss(between the SG and substitution antenna)}$$

$$(\text{Path loss} = \text{Signal generator output} - \text{PSA reading with substitution antenna})$$

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
Radiated Disturbance, 1GHz to 40GHz	4.94 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a GSM/WCDMA/LTE + BLUETOOTH + WLAN b/g/n & NFC WATCH

5.2. MAXIMUM OUTPUT POWER

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

FCC Part 22/24						
Band	Frequency Range(MHz)	Modulation	Conducted		Radiated	
			AVG(dBm)	AVG(mW)	AVG(dBm)	AVG(mW)
GSM850	824~849	GMSK	33.2	2089.30		
	824~849	GPRS	33.2	2089.30	28.74	748.17
	824~849	EGPRS	27.7	588.84	24.0	251.19
GSM1900	1850~1910	GMSK	29.7	933.25		
	1850~1910	GPRS	29.7	933.25	30.5	1122.02
	1850~1910	EGPRS	26.6	457.09	29.10	812.83
Band 5	824~849	REL99	23.0	199.53	19.53	89.74
	824~849	HSDPA	23.1	204.17	19.30	85.11
	824~849	HSUPA	23.0	199.53		
Band 2	1850~1910	REL99	22.4	173.78	24.51	282.49
	1850~1910	HSDPA	22.4	173.78	24.01	251.77
	1850~1910	HSUPA	22.1	162.18		

5.3. MAXIMUM OUTPUT POWER (LTE)

LTE Band 2

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

FCC Part 24							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation	Conducted		Radiated	
				AVG(dBm)	AVG(mW)	AVG(dBm)	AVG(mW)
LTE2	1850~1910	20MHz	QPSK	21.7	147.91	19.11	81.47
			16QAM	20.7	117.49	17.96	62.52
		15MHz	QPSK	21.7	147.91	21.48	140.60
			16QAM	20.7	117.49	21.08	128.23
		10MHz	QPSK	21.7	147.91	21.29	134.59
			16QAM	20.7	117.49	20.49	111.94
		5MHz	QPSK	21.7	147.91	22.19	165.58
			16QAM	20.7	117.49	20.89	122.74
		3MHz	QPSK	21.7	147.91	21.59	144.21
			16QAM	20.7	117.49	21.39	137.72
		1.4MHz	QPSK	21.7	147.91	22.19	165.58
			16QAM	20.7	117.49	21.39	137.72

LTE Band 5

FCC Part 22							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation	Conducted		Radiated	
				AVG(dBm)	AVG(mW)	AVG(dBm)	AVG(mW)
LTE5	824~849	10MHz	QPSK	23.6	229.09	18.60	72.44
			16QAM	22.7	186.21	18.00	63.10
		5MHz	QPSK	23.7	234.42	19.10	81.28
			16QAM	22.7	186.21	18.60	72.44
		3MHz	QPSK	23.7	234.42	19.30	85.11
			16QAM	22.7	186.21	18.80	75.86
		1.4MHz	QPSK	23.7	234.42	19.90	97.72
			16QAM	22.7	186.21	19.20	83.18

5.4. 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)
GSM850, 824~849MHz	-4.9
GSM1900, 1850~1910MHz	1.3
Band 5, 824~849MHz	-4.9
Band 2, 1850~1910MHz	1.3
LTE2, 1850~1910MHz	1.3
LTE5, 824~849MHz	-4.9

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	LG	MCS-02WRE	RB550800170	N/A

I/O CABLES (CONDUCTED SETUP)

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

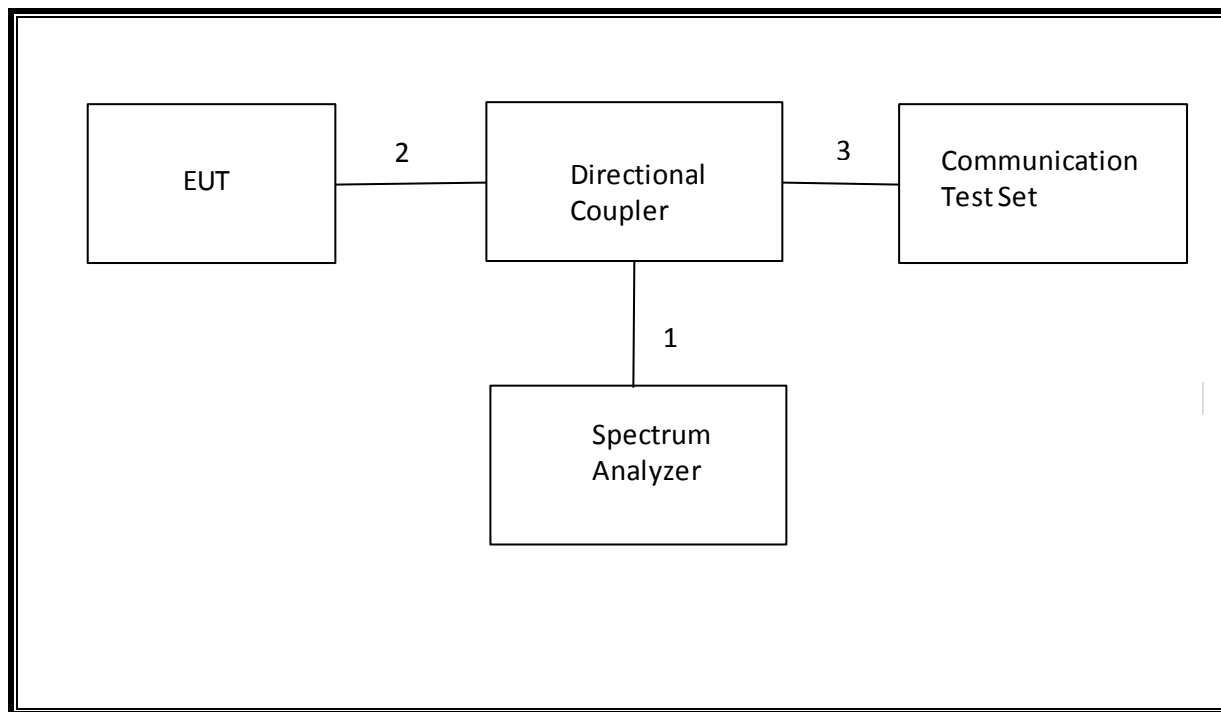
I/O CABLES (RADIATED SETUP)

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	USB	1	AC Adapter	Un-shielded	1.2m	NA
2	Jack	1	Headset	Shielded	1m	NA
3	RF In/out	1	Communication Test Set	Un-shielded	2m	NA

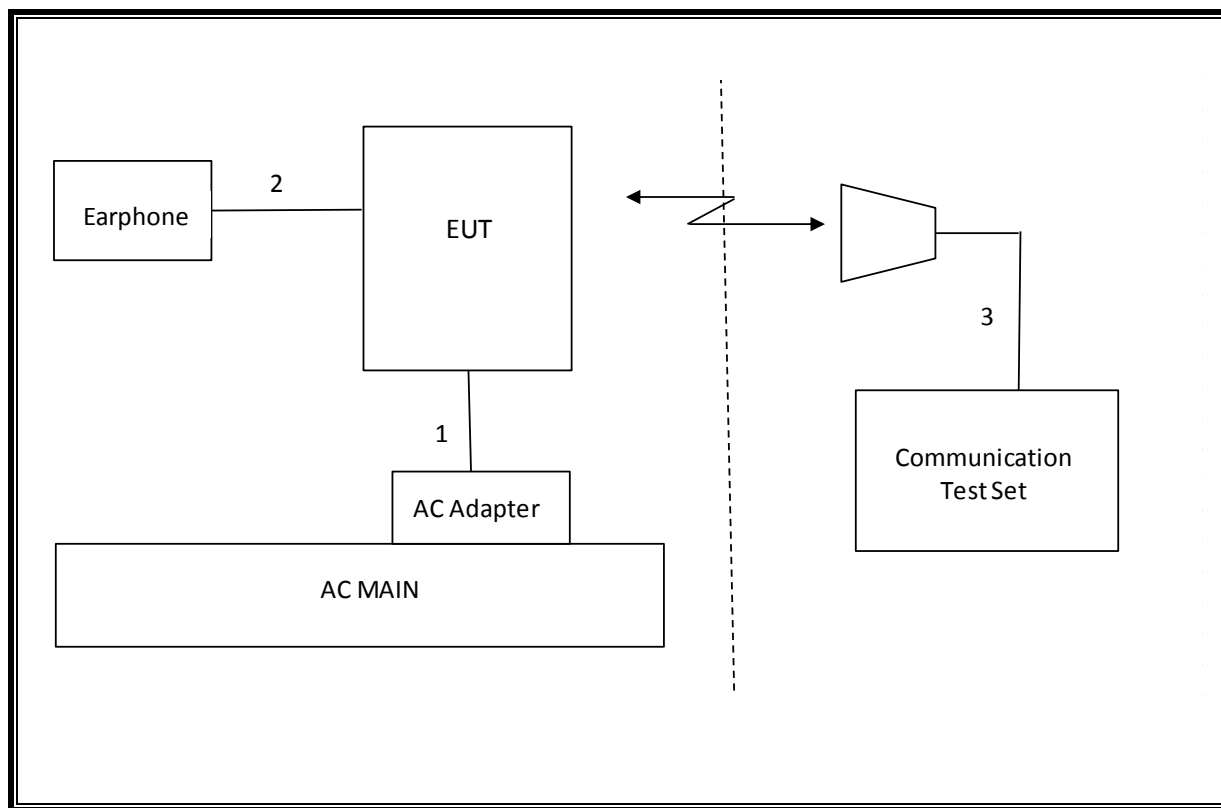
TEST SETUP

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

SETUP DIAGRAM FOR TESTS (CONDUCTED TEST SETUP)



SETUP DIAGRAM FOR TESTS (RADIATED TEST SETUP)



6. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Asset	Cal Due
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	123	10/28/15
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	T243	12/08/15
Antenna, Horn, 18 GHz	EMCO	3115	C00783	10/25/15
Antenna, Horn, 18 GHz	EMCO	3115	C00784	10/25/15
Highpass Filter, 2.7 GHz	Micro-Tronics	HPM13194	N02687	CNR
Highpass Filter, 1.5 GHz	Micro-Tronics	HPM13193	N02688	CNR
Temperature / Humidity Chamber	Thermotron	SE 600-10-10	C00930	11/08/15
Communications Test Set	R&S	CMW500	T159	07/02/16
DC power supply, 8 V @ 3 A or 15 V	Agilent / HP	E3610A	None	CNR
Vector signal generator, 6 GHz	Agilent / HP	E4438C	None	06/18/16
Antenna, Tuned Dipole 400~1000	ETS	6502	158071	10/14/15
Directional Coupler	RF-Lambda	RFDC5M06G15	None	CNR
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	C00589	12/17/15

Test Software List			
Description	Manufacturer	Model	Version
Radiated Software	UL	UL EMC	Version 9.5, 07/22/14
Conducted Software	UL	UL EMC	Version 9.5, 05/17/14
CLT Software	UL	UL RF	Version 1.0, 02/02/15
Antenna Port Software	UL	UL RF	Version 2.1.1.1, 1/20/15

7. SUMMARY TABLE

FCC Part Section	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Note
2.1049	N/A	Occupied Band width (99%)	N/A	Conducted	Pass	17.9 MHz
22.917(a) 24.238(a)	RSS-132(4.5.1) RSS-133(6.5.1)	Band Edge / Conducted Spurious Emission	-13dBm		Pass	-15.4 dBm
2.1046	N/A	Conducted output power	N/A		Pass	33.0 dBm
22.355 24.235	RSS-132(4.3) RSS-133(6.3)	Frequency Stability	2.5PPM		Pass	0.003PPM
22.913(a)(2)	RSS-132(4.4)	Effective Radiated Power	38 dBm	Radiated	Pass	29.50 dBm
24.232(c)	RSS-133(6.4)	Equivalent Isotropic Radiated Power	33dBm		Pass	30.50 dBm
22.917(a) 24.238(a)	RSS-132(4.5.1) RSS-133(6.5.1)	Radiated Spurious Emission	-13dBm		Pass	-42.7 dBm

8. RF POWER OUTPUT VERIFICATION

8.1. GSM/GPRS/EDGE

Function: Menu select > GSM Mobile Station > GSM 850/900/1800/1900
Press Connection control to choose the different menus
Press RESET > choose all to reset all settings
Connection Press Signal Off to turn off the signal and change settings
Network Support > GSM+GPRS or GSM+EGPRS
Main Service > Packet Data
Service selection > Test Mode A – Auto Slot Config. off
MS Signal Press Slot Config bottom on the right twice to select and change the number of time slots and power setting
 > Slot configuration > Uplink/Gamma
 > 33 dBm for GPRS 850/900
 > 30 dBm for GPRS1800/1900
BS Signal Enter the same channel number for TCH channel (test channel) and BCCH channel
Frequency Offset > + 0 Hz
Mode > BCCH and TCH
BCCH Level > -85 dBm (May need to adjust if link is not stable)
BCCH Channel > choose desire test channel [Enter the same channel number for TCH channel (test channel) and BCCH channel]
Channel Type > Off
P0> 4 dB
Slot Config > Unchanged (if already set under MS Signal)
TCH > choose desired test channel
Hopping > Off
Main Timeslot > 3 (Default)
Network Coding Scheme > CS4 (GPRS) and MCS5 ~ MCS9 (EGPRS)
 Bit Stream > 2E9-1PSR Bit Pattern
AF/RF Enter appropriate offsets for Ext. Att. Output and Ext. Att. Input
Connection Press Signal On to turn on the signal and change settings

8.1.1. GSM OUTPUT POWER RESULT

Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Burst Pwr (dBm)
GSM (Voice)	CS1	1	512	1850.2	29.7
			661	1880.0	29.6
			810	1909.8	29.7
GPRS (GMSK)	CS1	1	512	1850.2	29.7
			661	1880.0	29.6
			810	1909.8	29.7
		2	512	1850.2	27.7
			661	1880.0	27.6
			810	1909.8	27.7
EGPRS (8PSK)	MCS5	1	512	1850.2	26.6
			661	1880.0	26.5
			810	1909.8	26.5
		2	512	1850.2	26.4
			661	1880.0	26.4
			810	1909.8	26.4

8.2. UMTS REL 99

TEST PROCEDURE

The following summary of these settings are illustrated below:

	Mode	Rel99
	Subtest	-
WCDMA General Settings	Loopback Mode	Test Mode 1
	Rel99 RMC	12.2kbps RMC
	HSDPA FRC	Not Applicable
	HSUPA Test	Not Applicable
	Power Control Algorithm	Algorithm2
	β_c	Not Applicable
	β_d	Not Applicable
	β_{ec}	Not Applicable
	β_c/β_d	8/15
	β_{hs}	Not Applicable
	β_{ed}	Not Applicable

8.2.1. UMTS REL 99 OUTPUT POWER RESULT

Band	Mode	UL Ch No.	Freq. (MHz)	MPR	Avg Pwr (dBm)
W-CDMA Band V	Rel 99 (RMC, 12.2 kbps)	4132	826.4	0	22.9
		4183	836.6	0	23.0
		4233	846.6	0	23.0

Band	Mode	UL Ch No.	Freq. (MHz)	MPR	Avg Pwr (dBm)
W-CDMA Band II	Rel 99 (RMC, 12.2 kbps)	9262	1852.4	0	22.3
		9400	1880.0	0	22.4
		9538	1907.6	0	22.3

8.3. UMTS HSDPA

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

	Mode	Rel5 HSDPA			
	Subtest	1	2	3	4
WCDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set1			
	Power Control Algorithm	Algorithm 2			
	β_c	2/15	12/15	15/15	15/15
	β_d	15/15	15/15	8/15	4/15
	Bd (SF)	64			
	β_c/β_d	2/15	12/15	15/8	15/4
	β_{hs}	4/15	24/15	30/15	30/15
	MPR (dB)	0	0	0.5	0.5
HSDPA Specific Settings	D_{ACK}	8			
	D_{NAK}	8			
	DCQI	8			
	Ack-Nack repetition factor	3			
	CQI Feedback (Table 5.2B.4)	4ms			
	CQI Repetition Factor (Table 5.2B.4)	2			
	$A_{hs} = \beta_{hs}/\beta_c$	30/15			

8.3.1. UMTS HSDPA OUTPUT POWER RESULT

Band	Mode	UL Ch No.	Freq. (MHz)	MPR	Avg Pwr (dBm)
W-CDMA Band V	Subtest 1	4132	826.4	0	23.0
		4183	836.6	0	23.1
		4233	846.6	0	23.1
	Subtest 2	4132	826.4	0	23.1
		4183	836.6	0	23.1
		4233	846.6	0	23.1
	Subtest 3	4132	826.4	0.5	22.6
		4183	836.6	0.5	22.6
		4233	846.6	0.5	22.6
	Subtest 4	4132	826.4	0.5	22.6
		4183	836.6	0.5	22.6
		4233	846.6	0.5	22.6

Band	Mode	UL Ch No.	Freq. (MHz)	MPR	Avg Pwr (dBm)
W-CDMA Band II	Subtest 1	9262	1852.4	0	22.2
		9400	1880.0	0	22.4
		9538	1907.6	0	22.2
	Subtest 2	9262	1852.4	0	22.2
		9400	1880.0	0	22.3
		9538	1907.6	0	22.3
	Subtest 3	9262	1852.4	0.5	21.7
		9400	1880.0	0.5	21.9
		9538	1907.6	0.5	21.9
	Subtest 4	9262	1852.4	0.5	21.8
		9400	1880.0	0.5	21.9
		9538	1907.6	0.5	21.8

8.4. UMTS HSUPA

TEST PROCEDURE

The following summary of these settings are illustrated below: (ETSI TS 134.121-1 Table C.11.1)

	Mode	Rel6 HSUPA	Rel6 HSUPA	Rel6 HSUPA	Rel6 HSUPA	Rel6 HSUPA
	Subtest	1	2	3	4	5
WCDMA General Settings	Loopback Mode	Test Mode 1				
	P-CPICH (dB)	-10				
	P-CCPCH (dB)	-12				
	SCH (dB)	-12				
	PICH(dB)	-15				
	DPCH (dB)	-9				
	HS-SCCH_1 (dB)	-8				
	HS-PDSCH (dB)	-3				
	Rel99 RMC	12.2kbps RMC				
	HSDPA FRC	H-Set1				
	HSUPA Test	HSUPA Loopback				
	Power Control Algorithm	Algorithm2				
	Bc	11/15	6/15	15/15	2/15	15/15
	Bd	15/15	15/15	9/15	15/15	15/15
	Bec	209/225	12/15	30/15	2/15	5/15
	β_c/β_d	11/15	6/15	15/9	2/15	15/15
	Bhs	22/15	12/15	30/15	4/15	30/15
HSDPA Specific Settings	β_{ed} (note1)	1309/225	94/75	47/15	56/75	134/15
	MPR	0	2	1	2	0
	DACK	8				
	DNAK	8				
	DCQI	8				
	Ack-Nack repetition factor	3				
	CQI Feedback (Table 5.2B.4)	4ms				
HSUPA Specific Settings	CQI Repetition Factor (Table 5.2B.4)	2				
	Ahs = β_{hs}/β_c	30/15				
	D E-DPCCH	6	8	8	5	7
	DHARQ	0	0	0	0	0
	AG Index	20	12	15	17	21
	Reference E-TFCIs	5	5	2	5	5
	ETFCI (from 34.121 Table C.11.1.3)	75	67	92	71	81
	Associated Max UL Data Rate kbps	242.1	174.9	482.8	205.8	308.9
	Reference E_TFCIs	E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27		E-TFCI 11 E-TFCI PO 4 E-TFCI 92 E-TFCI PO 18		E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27

Note1: β_{ed} cannot be set directly, it is set by Absolute Grant Value.

8.4.1. UMTS HSUPA OUTPUT POWER RESULT

Band	Mode	UL Ch No.	Freq. (MHz)	MPR	Avg Pwr (dBm)
W-CDMA Band V	Subtest 1	4132	826.4	0	23.0
		4183	836.6	0	22.8
		4233	846.6	0	22.8
	Subtest 2	4132	826.4	2	21.2
		4183	836.6	2	21.2
		4233	846.6	2	21.2
	Subtest 3	4132	826.4	1	22.2
		4183	836.6	1	22.2
		4233	846.6	1	22.2
	Subtest 4	4132	826.4	2	21.2
		4183	836.6	2	21.2
		4233	846.6	2	21.2
	Subtest 5	4132	826.4	0	22.8
		4183	836.6	0	23.0
		4233	846.6	0	22.8

Band	Mode	UL Ch No.	Freq. (MHz)	MPR	Avg Pwr (dBm)
W-CDMA Band II	Subtest 1	9262	1852.4	0	22.1
		9400	1880.0	0	22.1
		9538	1907.6	0	22.0
	Subtest 2	9262	1852.4	2	20.4
		9400	1880.0	2	20.4
		9538	1907.6	2	20.4
	Subtest 3	9262	1852.4	1	21.2
		9400	1880.0	1	21.4
		9538	1907.6	1	21.2
	Subtest 4	9262	1852.4	2	20.4
		9400	1880.0	2	20.4
		9538	1907.6	2	20.4
	Subtest 5	9262	1852.4	0	22.1
		9400	1880.0	0	22.4
		9538	1907.6	0	22.3

8.5. LTE OUTPUT VERIFICATION

8.5.1. LTE OUTPUT RESULT

LTE Band 2

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)		
						18700	18900	19100
						1860 MHz	1880 MHz	1900 MHz
LTE Band 2	20	QPSK	1	0	0	21.7	21.6	21.7
			1	49	0	21.7	21.7	21.6
			1	99	0	21.6	21.7	21.7
			50	0	1	20.6	20.6	20.5
			50	24	1	20.6	20.6	20.5
			50	50	1	20.5	20.6	20.5
			100	0	1	20.6	20.6	20.5
		16QAM	1	0	1	20.5	20.4	20.7
			1	49	1	20.4	20.5	20.7
			1	99	1	20.5	20.5	20.7
			50	0	2	19.6	19.6	19.5
			50	24	2	19.6	19.6	19.5
			50	50	2	19.5	19.6	19.5
			100	0	2	19.6	19.5	19.5
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)		
						18675	18900	19125
						1857.5 MHz	1880 MHz	1902.5 MHz
LTE Band 2	15	QPSK	1	0	0	21.7	21.6	21.6
			1	37	0	21.7	21.6	21.6
			1	74	0	21.5	21.6	21.7
			36	0	1	20.7	20.7	20.7
			36	20	1	20.7	20.7	20.7
			36	39	1	20.7	20.7	20.7
			75	0	1	20.7	20.7	20.7
		16QAM	1	0	1	20.7	20.5	20.5
			1	37	1	20.7	20.5	20.5
			1	74	1	20.7	20.5	20.7
			36	0	2	19.7	19.7	19.7
			36	20	2	19.7	19.7	19.7
			36	39	2	19.7	19.7	19.7
			75	0	2	19.7	19.7	19.7

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)		
						18650	18900	19150
						1855 MHz	1880 MHz	1905 MHz
LTE Band 2	10	QPSK	1	0	0	21.7	21.6	21.6
			1	25	0	21.7	21.6	21.6
			1	49	0	21.7	21.6	21.7
			25	0	1	20.7	20.7	20.6
			25	12	1	20.7	20.6	20.6
			25	25	1	20.7	20.7	20.7
			50	0	1	20.7	20.7	20.6
		16QAM	1	0	1	20.7	20.5	20.5
			1	25	1	20.7	20.5	20.5
			1	49	1	20.7	20.5	20.6
			25	0	2	19.7	19.6	19.7
			25	12	2	19.7	19.6	19.7
			25	25	2	19.7	19.6	19.7
			50	0	2	19.7	19.7	19.6
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)		
						18625	18900	19175
						1852.5 MHz	1880 MHz	1907.5 MHz
LTE Band 2	5	QPSK	1	0	0	21.7	21.7	21.5
			1	12	0	21.7	21.6	21.6
			1	24	0	21.7	21.7	21.7
			12	0	1	20.7	20.7	20.7
			12	7	1	20.7	20.7	20.7
			12	13	1	20.7	20.7	20.7
			25	0	1	20.7	20.7	20.7
		16QAM	1	0	1	20.5	20.5	20.6
			P150	12	1	20.6	20.5	20.7
			P150	24	1	20.6	20.5	20.7
			P150	0	2	19.7	19.7	19.7
			P150	7	2	19.7	19.7	19.7
			P150	13	2	19.7	19.7	19.7
			P150	0	2	19.7	19.7	19.7

Band	BW (MHz)	P900	P150	RB offset	Target MPR	Avg Pwr (dBm)		
						18615	18900	19185
						1851.5 MHz	1880 MHz	1908.5 MHz
LTE Band 2	3	P900	P150	0	0	21.7	21.7	21.7
			P150	8	0	21.7	21.7	21.7
			P150	14	0	21.7	21.7	21.7
			P150	0	1	20.7	20.7	20.7
			P150	4	1	20.7	20.7	20.7
			P150	7	1	20.7	20.7	20.7
			P150	0	1	20.7	20.7	20.7
		P900	P150	0	1	20.7	20.6	20.6
			P150	8	1	20.7	20.5	20.6
			P150	14	1	20.7	20.6	20.6
			P150	0	2	19.7	19.7	19.7
			P150	4	2	19.7	19.7	19.7
			P150	7	2	19.7	19.7	19.7
			P150	0	2	19.7	19.6	19.7
Band	BW (MHz)	P900	P150	RB offset	Target MPR	Avg Pwr (dBm)		
						18607	18900	19193
						1850.7 MHz	1880 MHz	1909.3 MHz
LTE Band 2	1.4	P900	P150	0	0	21.7	21.7	21.7
			P150	3	0	21.7	21.6	21.7
			P150	5	0	21.7	21.7	21.7
			P150	0	0	21.7	21.7	21.7
			P150	1	0	21.7	21.7	21.7
			P150	3	0	21.7	21.7	21.7
			P150	0	1	20.7	20.7	20.7
		P900	P150	0	1	20.7	20.6	20.5
			P150	3	1	20.7	20.6	20.6
			P150	5	1	20.7	20.5	20.6
			P150	0	1	20.6	20.5	20.7
			P150	1	1	20.5	20.5	20.7
			P150	3	1	20.5	20.5	20.7
			P150	0	2	19.7	19.7	19.7

LTE Band 5

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)		
						20450 829 MHz	20525 836.5 MHz	20600 844 MHz
LTE Band 5	10	QPSK	1	0	0		23.6	
			1	25	0		23.6	
			1	49	0		23.6	
			25	0	1		22.6	
			25	12	1		22.6	
			25	25	1		22.6	
			50	0	1		22.7	
		16QAM	1	0	1		22.7	
			1	25	1		22.7	
			1	49	1		22.7	
			25	0	2		21.6	
			25	12	2		21.6	
			25	25	2		21.6	
			50	0	2		21.6	
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)		
						20425 826.5 MHz	20525 836.5 MHz	20625 846.5 MHz
LTE Band 5	5	QPSK	1	0	0	23.6	23.7	23.6
			1	12	0	23.5	23.6	23.5
			1	24	0	23.6	23.7	23.6
			12	0	1	22.6	22.7	22.7
			12	7	1	22.6	22.7	22.7
			12	13	1	22.6	22.7	22.7
			25	0	1	22.7	22.7	22.7
		16QAM	1	0	1	22.6	22.5	22.6
			1	12	1	22.5	22.5	22.7
			1	24	1	22.5	22.5	22.7
			12	0	2	21.6	21.6	21.6
			12	7	2	21.5	21.6	21.6
			12	13	2	21.6	21.6	21.6
			25	0	2	21.6	21.7	21.6

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)		
						20415	20525	20635
						825.5 MHz	836.5 MHz	847.5 MHz
LTE Band 5	3	QPSK	1	0	0	23.6	23.7	23.7
			1	8	0	23.6	23.6	23.6
			1	14	0	23.6	23.7	23.7
			8	0	1	22.5	22.7	22.6
			8	4	1	22.5	22.6	22.6
			8	7	1	22.6	22.6	22.6
			15	0	1	22.6	22.7	22.6
		16QAM	1	0	1	22.7	22.6	22.5
			1	8	1	22.7	22.6	22.5
			1	14	1	22.7	22.6	22.5
			8	0	2	21.5	21.7	21.5
			8	4	2	21.6	21.6	21.5
			8	7	2	21.6	21.7	21.5
			15	0	2	21.6	21.5	21.6
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)		
						20407	20525	20643
						824.7 MHz	836.5 MHz	848.3 MHz
LTE Band 5	1.4	QPSK	1	0	0	23.7	23.7	23.7
			1	3	0	23.7	23.7	23.7
			1	5	0	23.7	23.7	23.7
			3	0	0	23.7	23.6	23.6
			3	1	0	23.6	23.6	23.6
			3	3	0	23.7	23.7	23.7
			6	0	1	22.7	22.7	22.7
		16QAM	1	0	1	22.7	22.6	22.6
			1	3	1	22.7	22.6	22.6
			1	5	1	22.7	22.6	22.6
			3	0	1	22.5	22.7	22.7
			3	1	1	22.6	22.7	22.7
			3	3	1	22.5	22.7	22.7
			6	0	2	21.7	21.7	21.7

9. PEAK TO AVERAGE RATIO

Test Procedure

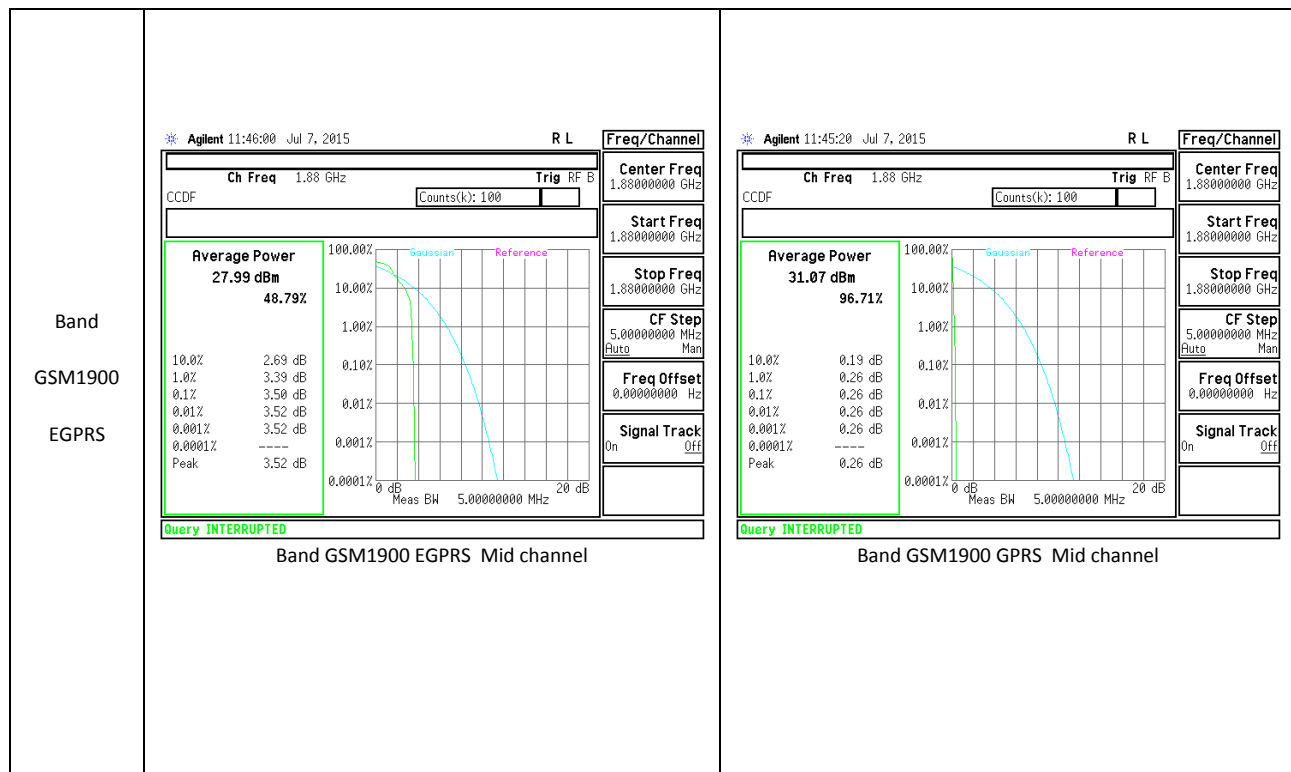
Per KDB 971168 D01 Power Meas License Digital Systems v02r02

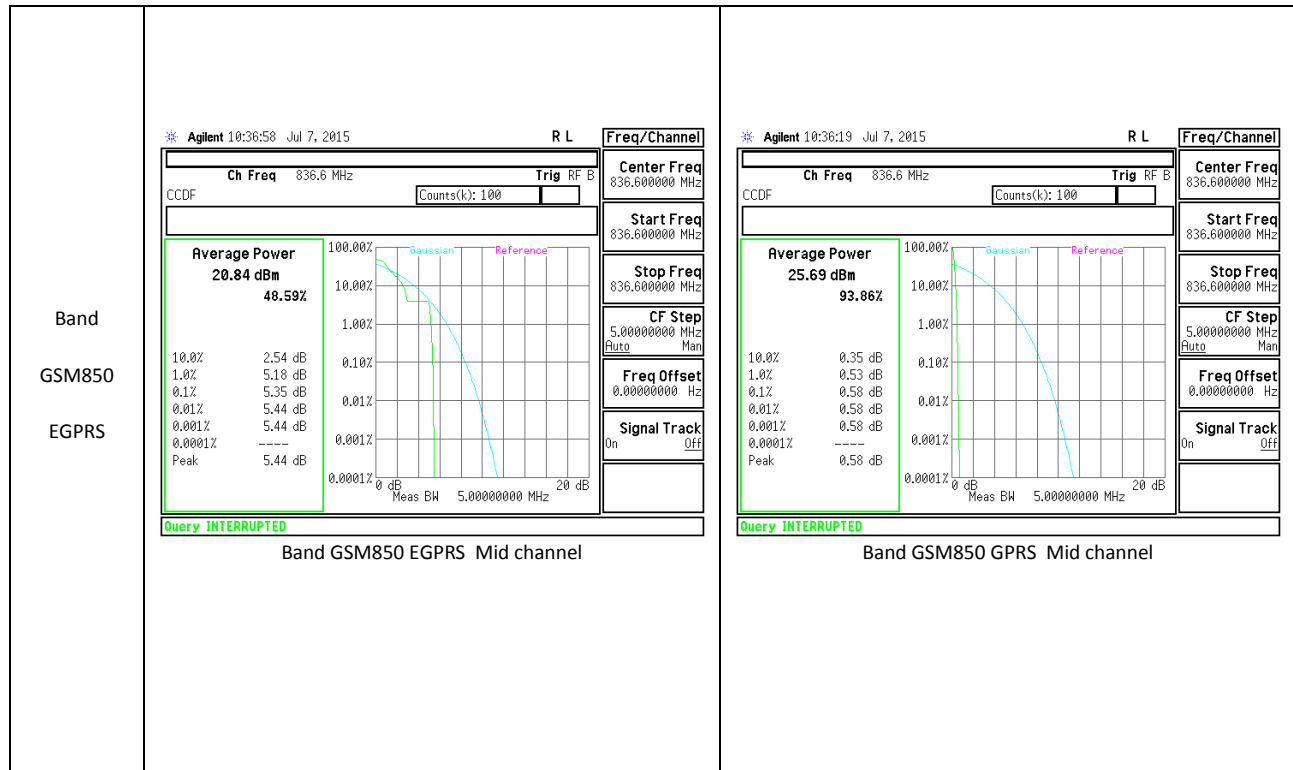
Test Spec

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.

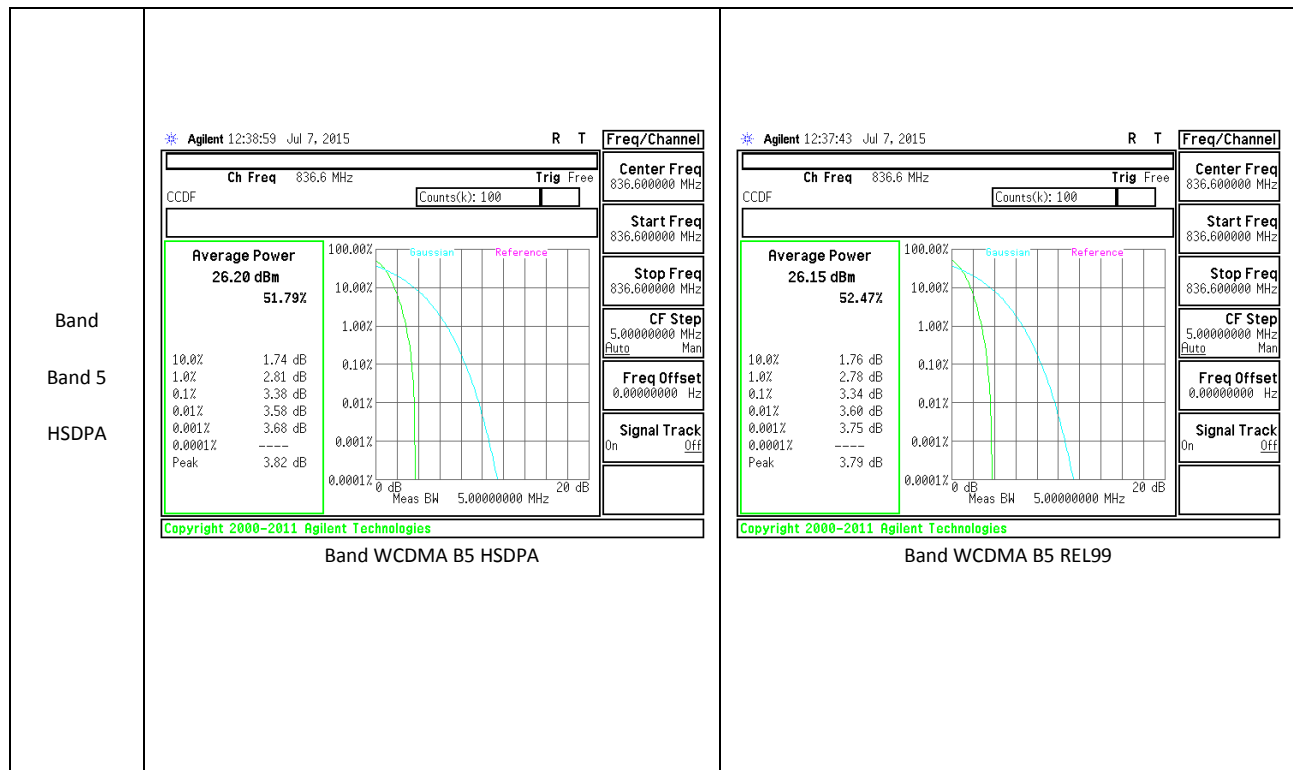
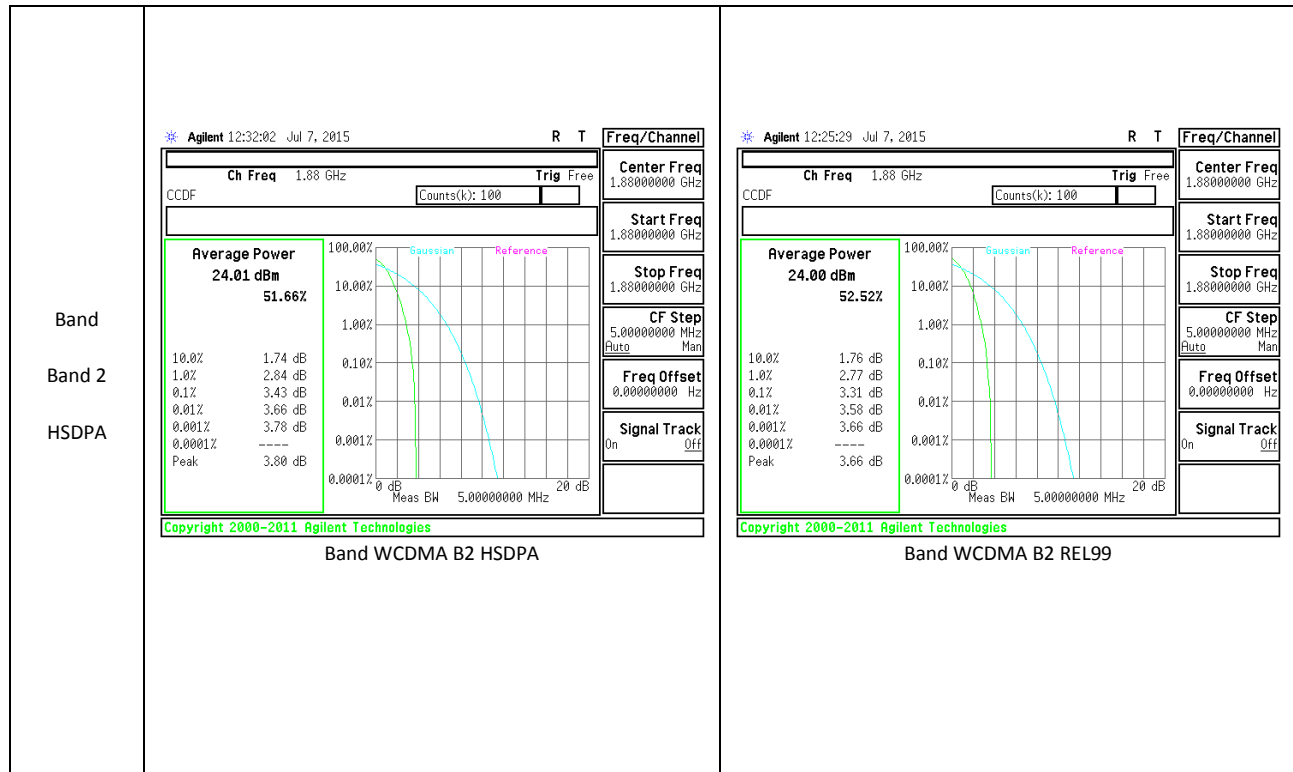
9.1. CONDUCTED PEAK TO AVERAGE RESULT

GSM

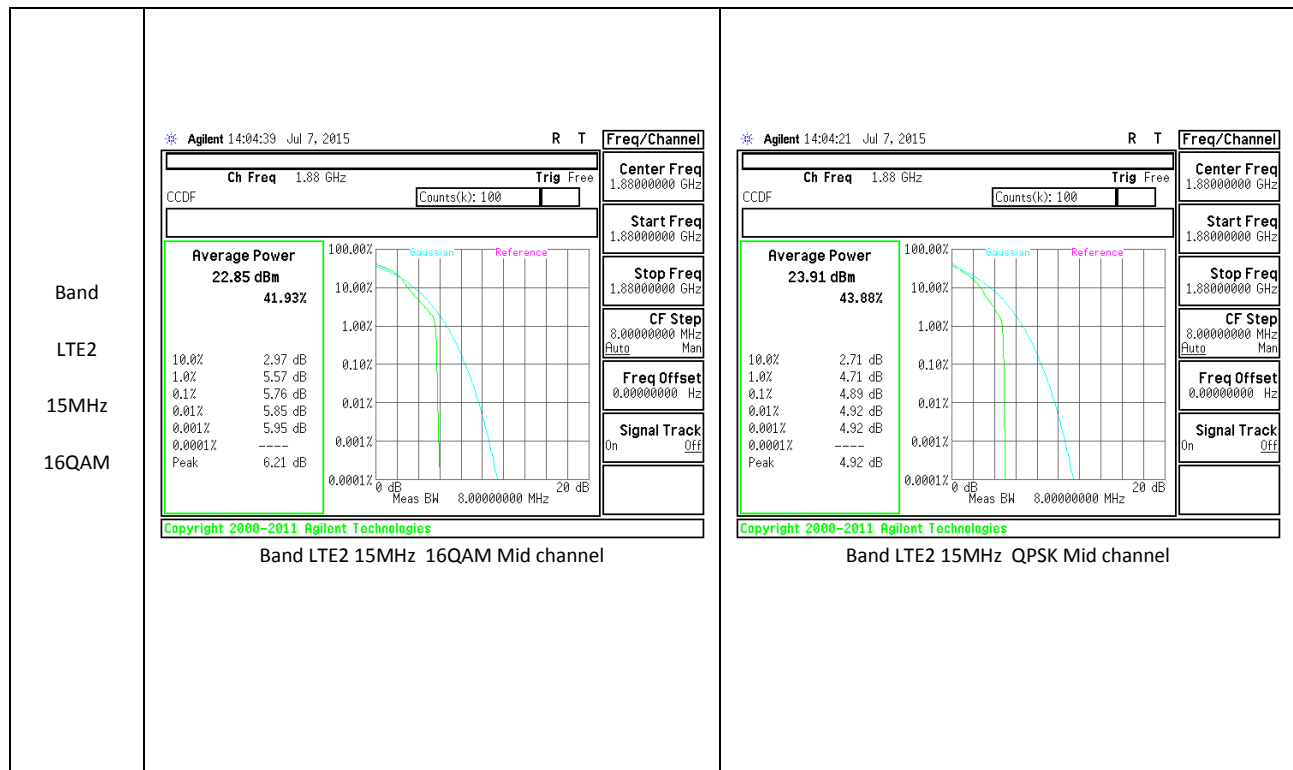
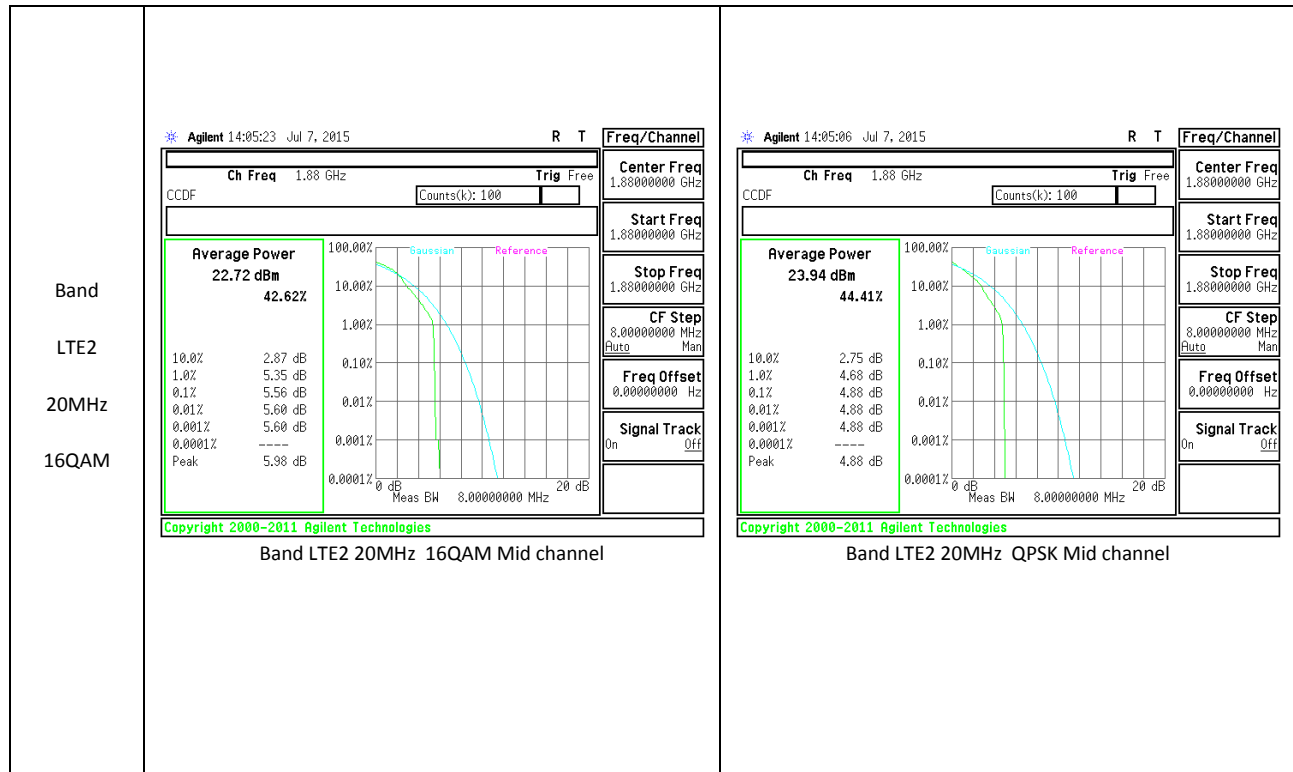


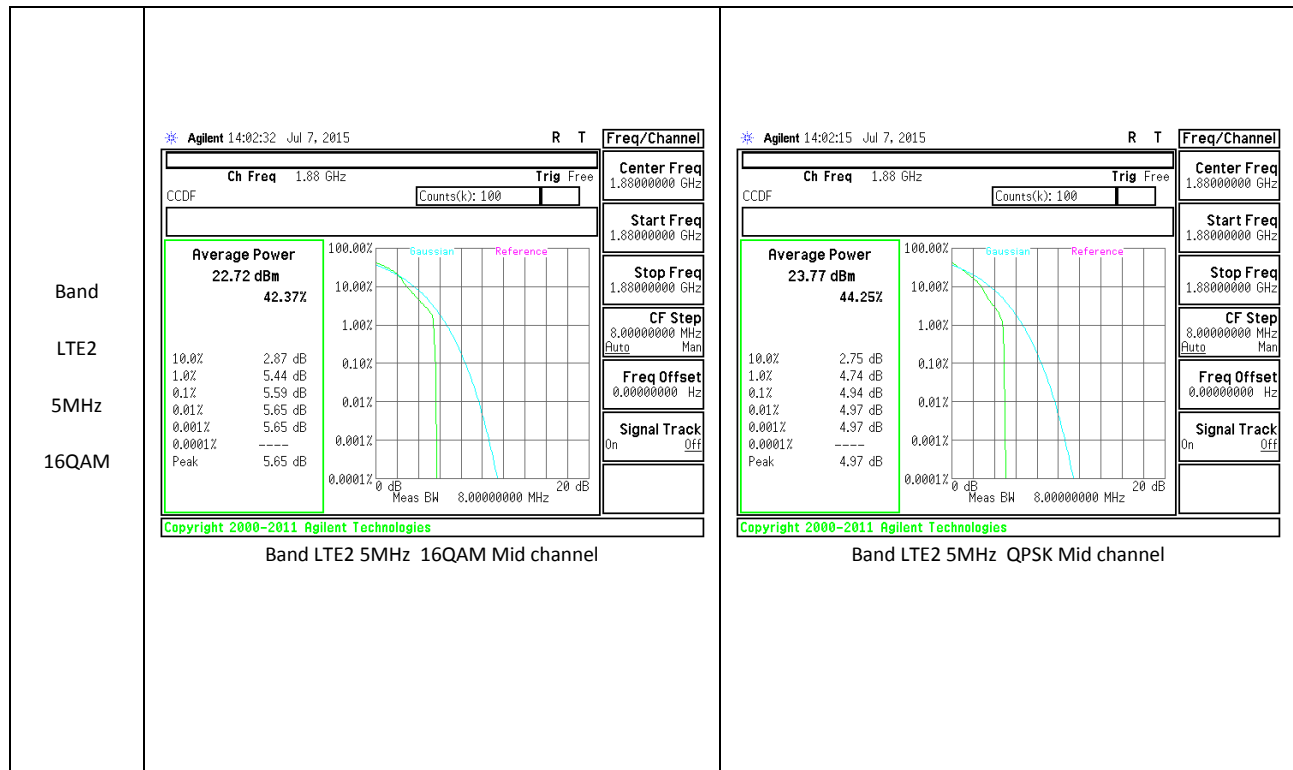
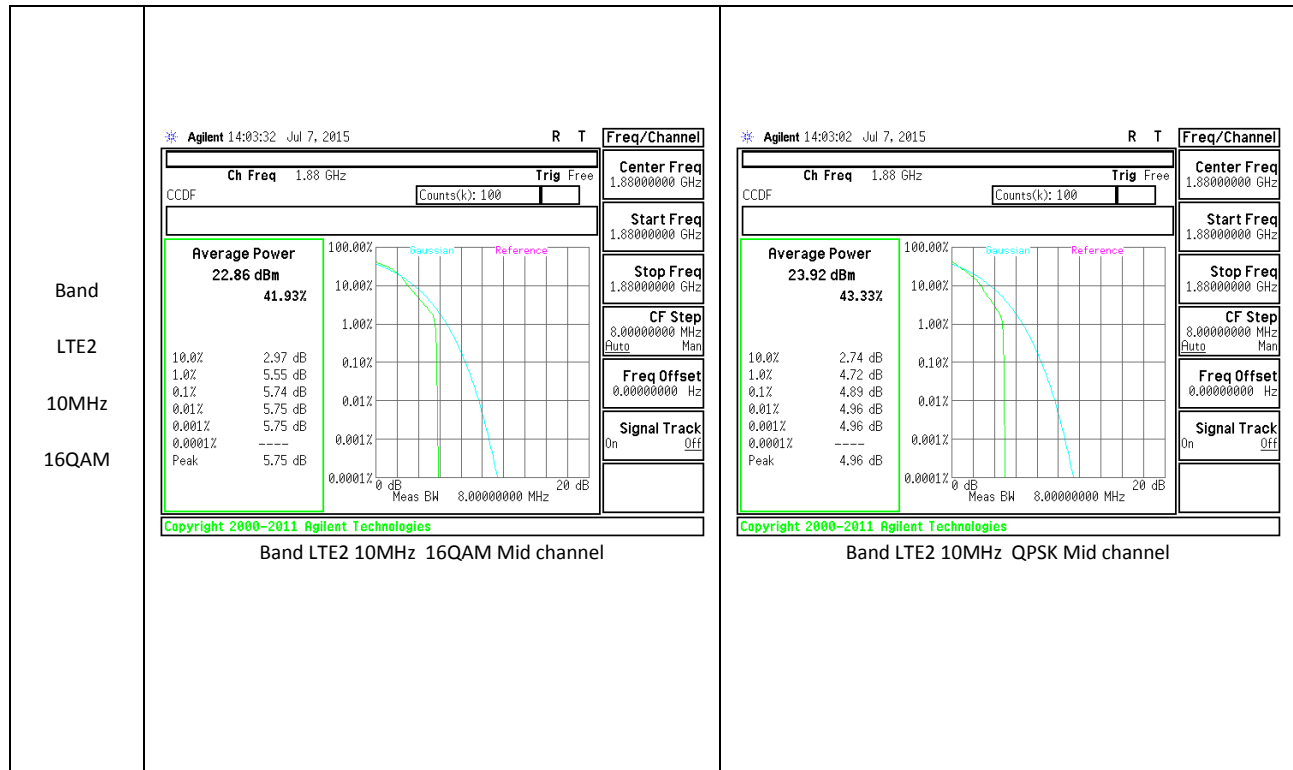


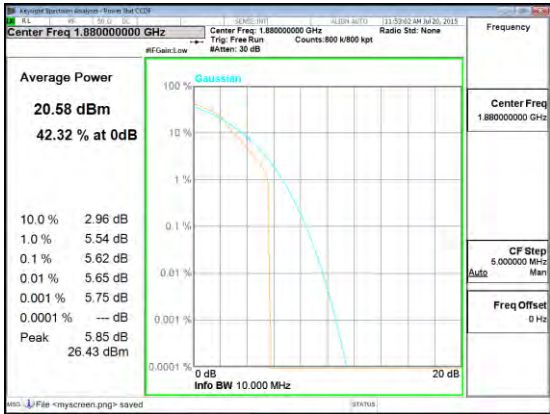
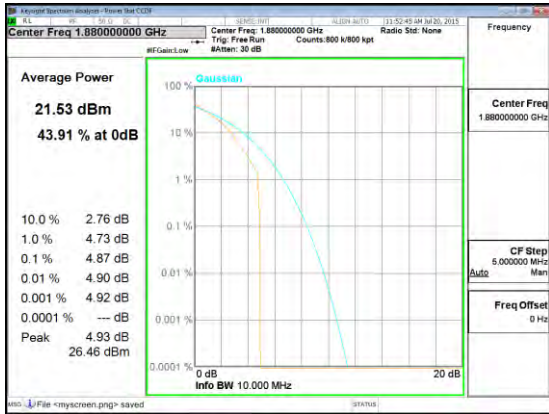
WCDMA

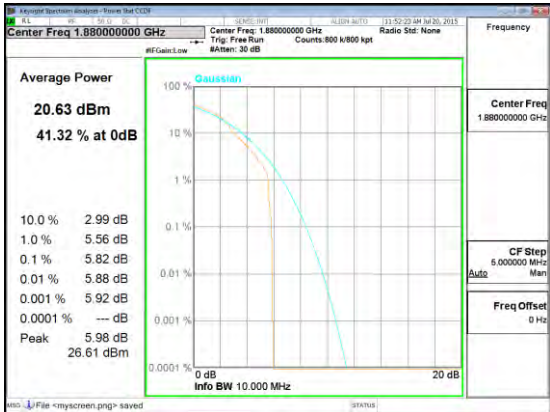
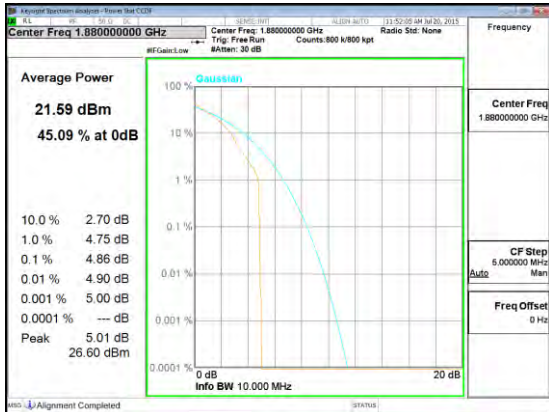


LTE Band 2

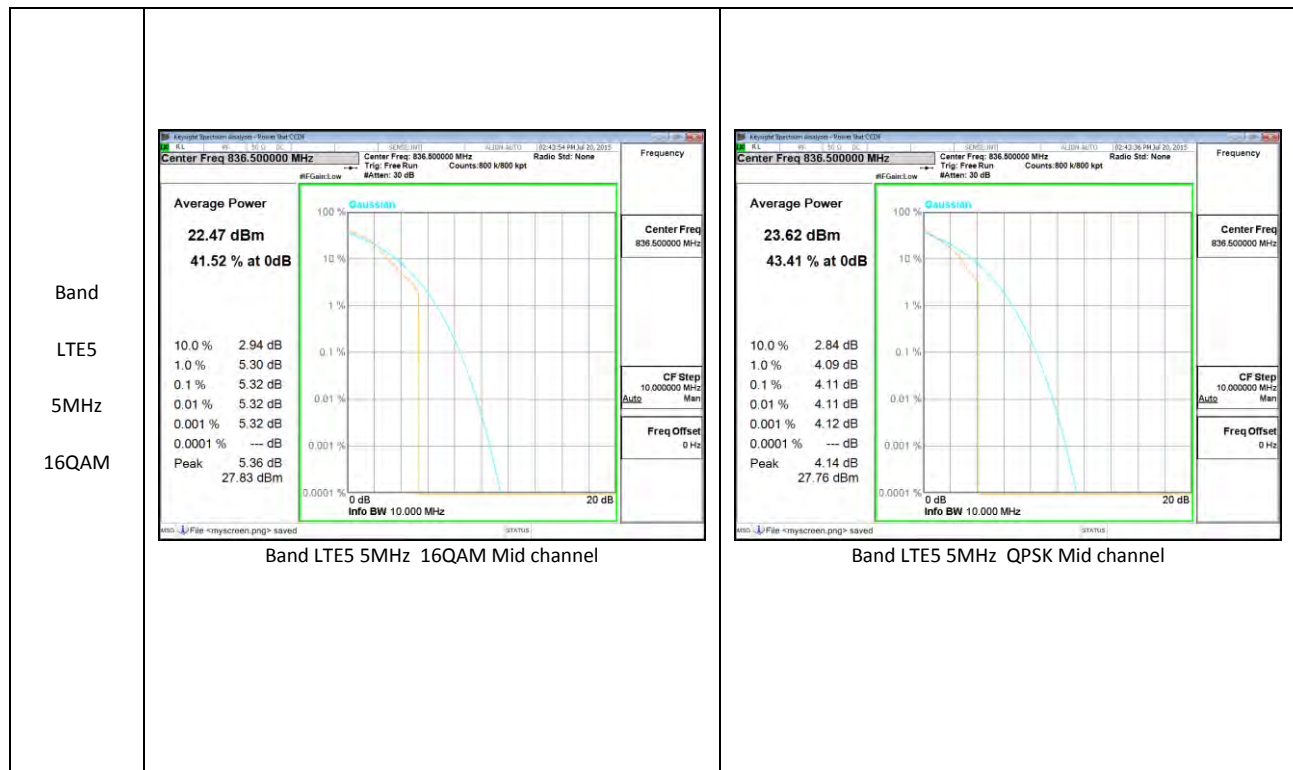
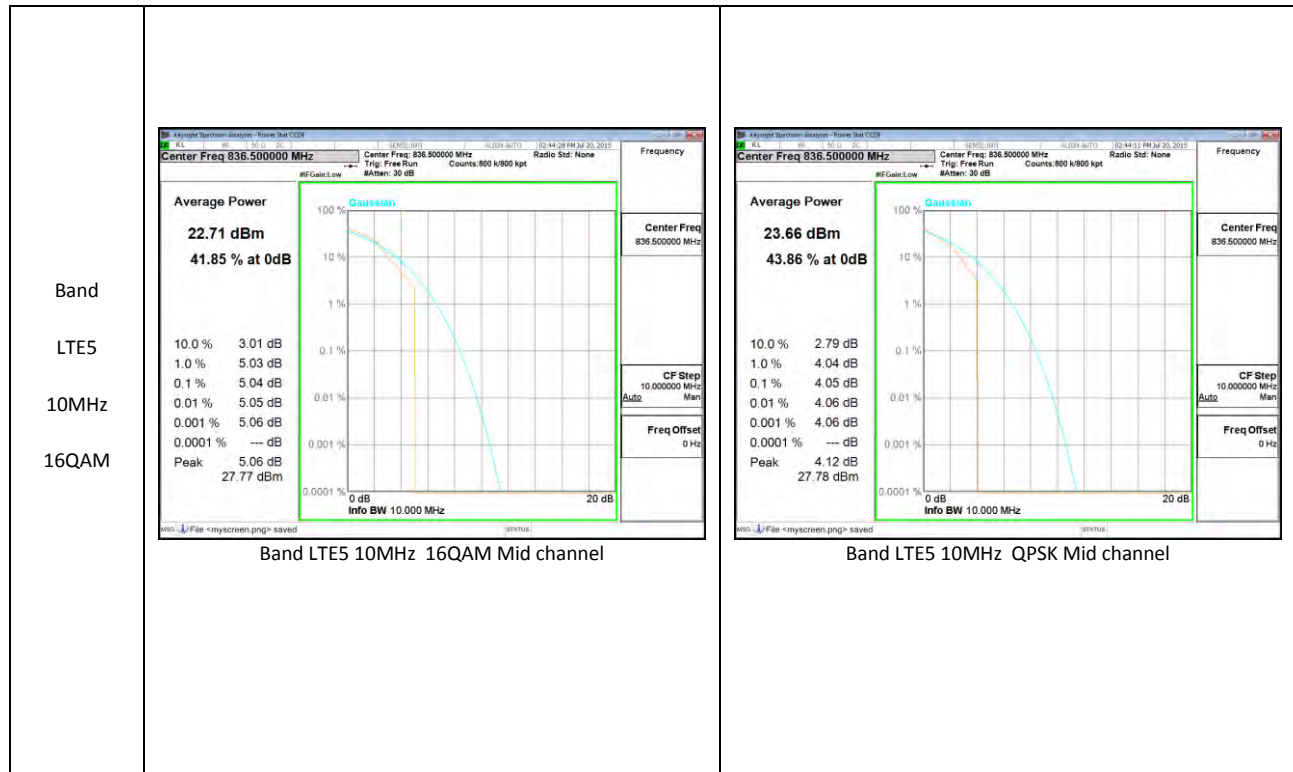


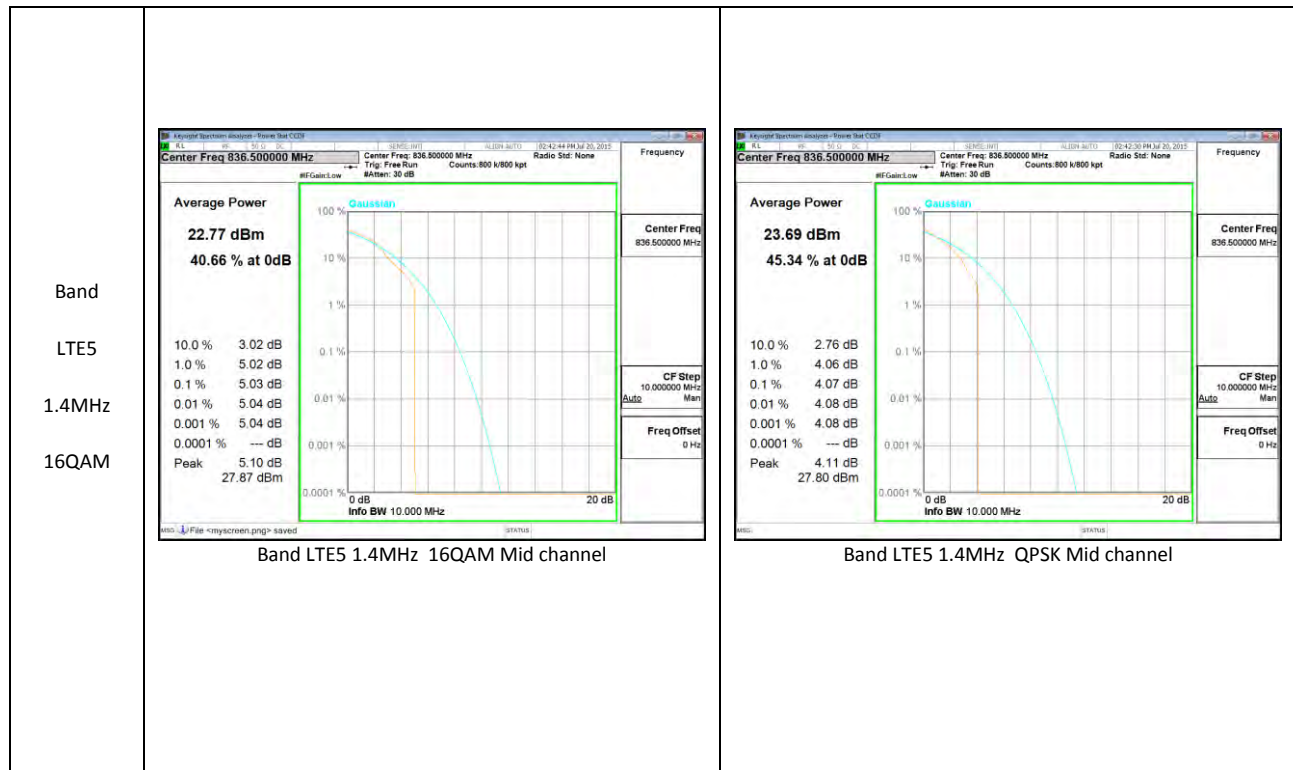
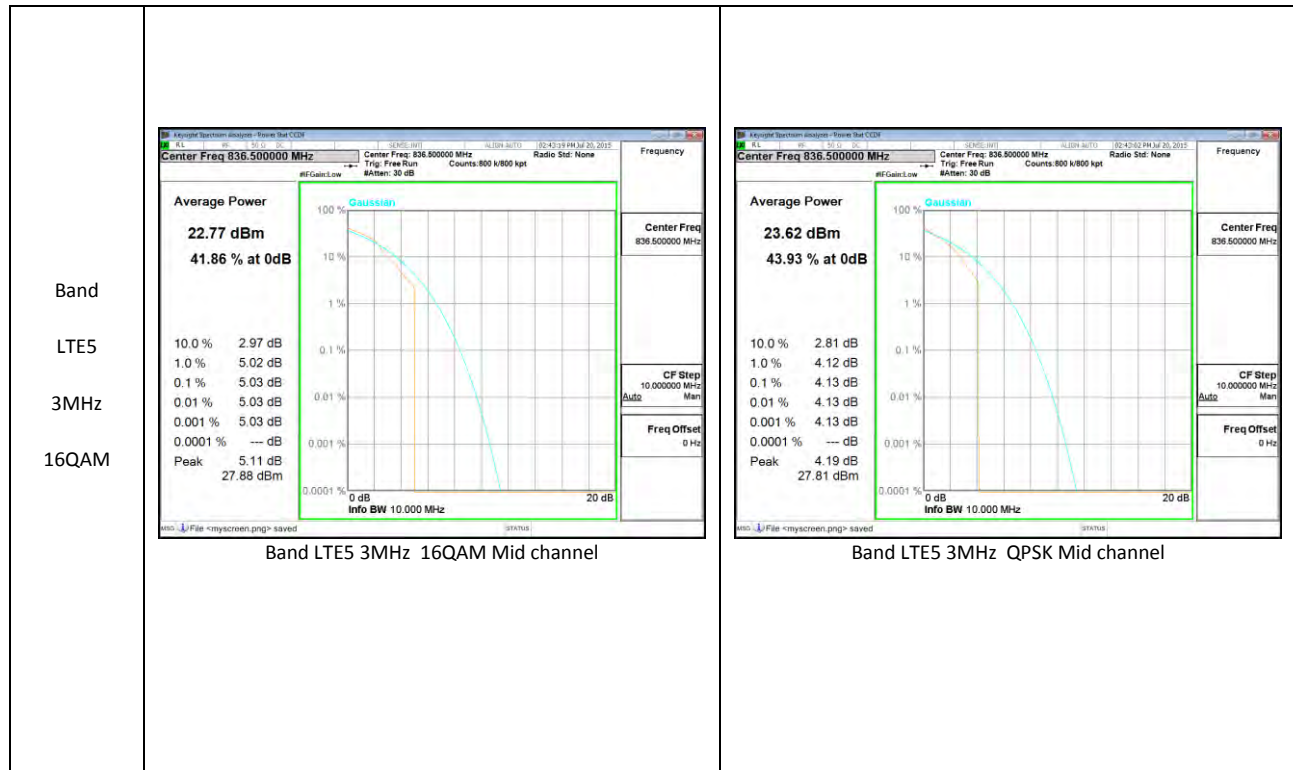


Band LTE2 3MHz 16QAM	 Average Power 20.58 dBm 42.32 % at 0dB 10.0 % 2.96 dB 1.0 % 5.54 dB 0.1 % 5.62 dB 0.01 % 5.65 dB 0.001 % 5.75 dB 0.0001 % --- dB Peak 5.85 dBm 26.43 dBm Center Freq 1.880000000 GHz CF Step 5.000000 MHz Auto Man Freq Offset 0 Hz Info BW 10.000 MHz Band LTE2 3MHz 16QAM Mid channel	 Average Power 21.53 dBm 43.91 % at 0dB 10.0 % 2.76 dB 1.0 % 4.73 dB 0.1 % 4.87 dB 0.01 % 4.90 dB 0.001 % 4.92 dB 0.0001 % --- dB Peak 4.93 dBm 26.46 dBm Center Freq 1.880000000 GHz CF Step 5.000000 MHz Auto Man Freq Offset 0 Hz Info BW 10.000 MHz Band LTE2 3MHz QPSK Mid channel
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Band LTE2 1.4MHz 16QAM	 Average Power 20.63 dBm 41.32 % at 0dB 10.0 % 2.99 dB 1.0 % 5.56 dB 0.1 % 5.82 dB 0.01 % 5.88 dB 0.001 % 5.92 dB 0.0001 % --- dB Peak 5.98 dBm 26.61 dBm Center Freq 1.880000000 GHz CF Step 5.000000 MHz Auto Man Freq Offset 0 Hz Info BW 10.000 MHz Band LTE2 1.4MHz 16QAM Mid channel	 Average Power 21.59 dBm 45.09 % at 0dB 10.0 % 2.70 dB 1.0 % 4.75 dB 0.1 % 4.86 dB 0.01 % 4.90 dB 0.001 % 5.00 dB 0.0001 % --- dB Peak 5.01 dBm 26.60 dBm Center Freq 1.880000000 GHz CF Step 5.000000 MHz Auto Man Freq Offset 0 Hz Info BW 10.000 MHz Band LTE2 1.4MHz QPSK Mid channel
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LTE Band 5





10. LIMITS AND CONDUCTED RESULTS

10.1. 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.

(KDB 971168 D01 Power Meas License Digital Systems v02r02)

MODES TESTED

GSM, WCDMA, and LTE

10.1.1. OCCUPIED BANDWIDTH RESULTS

GSM

Band	Mode	Channel	f (MHz)	99% BW (kHz)	-26dB BW (kHz)
GSM850	GPRS	128	824.2	247.9	319.1
		190	836.6	254.9	317.3
		251	848.8	248.5	316.9
	EGPRS	128	824.2	240.8	301.5
		190	836.6	246.9	306.8
		251	848.8	237.7	306.8
GSM1900	GPRS	512	1850.2	249	320.8
		661	1880	241.8	314.7
		810	1909.8	242.2	317.7
	EGPRS	512	1850.2	252	312.5
		661	1880	244.8	312.6
		810	1909.8	249.4	320.9

WCDMA

Band	Mode	Channel	f (MHz)	99% BW (MHz)	-26dB (MHz)
Band 5	REL99	4132	826.4	4.137	4.627
		4183	836.6	4.144	4.632
		4233	846.6	4.167	4.627
	HSDPA	4132	826.4	4.192	4.633
		4183	836.6	4.160	4.631
		4233	846.6	4.174	4.631
Band 2	REL99	9262	1852.4	4.174	4.606
		9400	1880	4.168	4.627
		9538	1907.6	4.167	4.640
	HSDPA	9262	1852.4	4.164	4.628
		9400	1880	4.168	4.618
		9538	1907.6	4.172	4.625

LTE Band 2

Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE2	20	16QAM	100/0	1860	17.81	19.17
			100/0	1880	17.82	19.15
			100/0	1900	17.77	19.07
		QPSK	100/0	1860	17.83	19.37
			100/0	1880	17.83	19.14
			100/0	1900	17.81	19.22
	15	16QAM	75/0	1857.5	13.37	14.49
			75/0	1880	13.41	14.52
			75/0	1902.5	13.39	14.51
		QPSK	75/0	1857.5	13.4	14.53
			75/0	1880	13.43	14.51
			75/0	1902.5	13.37	14.48
	10	16QAM	50/0	1855	8.959	9.702
			50/0	1880	8.914	9.642
			50/0	1905	8.944	9.729
		QPSK	50/0	1855	8.949	9.618
			50/0	1880	8.942	9.609
			50/0	1905	8.960	9.823
	5	16QAM	25/0	1852.5	4.503	4.853
			25/0	1880	4.505	4.890
			25/0	1907.5	4.493	4.958
		QPSK	25/0	1852.5	4.500	4.956
			25/0	1880	4.497	4.914
			25/0	1907.5	4.496	4.936

Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE2	3	16QAM	15/0	1851.5	2.693	2.997
			15/0	1880	2.703	2.988
			15/0	1908.5	2.697	2.977
		QPSK	15/0	1851.5	2.703	2.988
			15/0	1880	2.697	2.972
			15/0	1908.5	2.700	2.965
	1.4	16QAM	6/0	1850.7	1.085	1.294
			6/0	1880	1.086	1.283
			6/0	1909.3	1.094	1.296
		QPSK	6/0	1850.7	1.089	1.289
			6/0	1880	1.083	1.273
			6/0	1909.3	1.086	1.278

LTE Band 5

Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE5	10	16QAM	50/0	829	8.999	9.860
			50/0	836.5	8.992	9.894
			50/0	844	8.967	9.820
		QPSK	50/0	829	8.971	9.809
			50/0	836.5	8.986	9.856
			50/0	844	8.979	9.818
	5	16QAM	25/0	826.5	4.486	4.956
			25/0	836.5	4.496	5.013
			25/0	846.5	4.492	4.948
		QPSK	25/0	826.5	4.484	4.943
			25/0	836.5	4.498	4.976
			25/0	846.5	4.499	4.957
	3	16QAM	15/0	825.5	2.693	2.990
			15/0	836.5	2.699	2.991
			15/0	847.5	2.696	2.976
		QPSK	15/0	825.5	2.703	2.986
			15/0	836.5	2.697	2.964
			15/0	847.5	2.700	2.970
	1.4	16QAM	6/0	824.7	1.086	1.274
			6/0	836.5	1.086	1.289
			6/0	848.3	1.094	1.300
		QPSK	6/0	824.7	1.088	1.273
			6/0	836.5	1.083	1.266
			6/0	848.3	1.086	1.286

10.1.1. OCCUPIED BANDWIDTH PLOTS

GSM

Band GSM 1900	※ Agilent 11:51:19 Jul 7, 2015 R T Freq/Channel Ch Freq 1.88 GHz Trig Free Center Freq 1.88000000 GHz Start Freq 1.87950000 GHz Stop Freq 1.88050000 GHz CF Step 100.000000 kHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Ref 40 dBm #Peak Log 10 dB/ Offst 16.5 dB Center 1.880 000 0 GHz Span 1 MHz #Res BW 10 kHz VBW 30 kHz Sweep 9.56 ms (601 pts) Occupied Bandwidth 244.7357 kHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error 341.558 Hz x dB Bandwidth 312.552 kHz File Operation Status: C:PICTURE.6IF file saved Band GSM1900 EGPRS OBW Mid channel	※ Agilent 11:50:08 Jul 7, 2015 R T Freq/Channel Ch Freq 1.88 GHz Trig Free Center Freq 1.88000000 GHz Start Freq 1.87950000 GHz Stop Freq 1.88050000 GHz CF Step 100.000000 kHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Ref 40 dBm #Peak Log 10 dB/ Offst 16.5 dB Center 1.880 000 0 GHz Span 1 MHz #Res BW 10 kHz VBW 30 kHz Sweep 9.56 ms (601 pts) Occupied Bandwidth 241.7217 kHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error 623.982 Hz x dB Bandwidth 314.694 kHz File Operation Status: C:PICTURE.6IF file saved Band GSM1900 GPRS OBW Mid channel
Band GSM 850	※ Agilent 10:43:08 Jul 7, 2015 R T Freq/Channel Ch Freq 836.6 MHz Trig Free Center Freq 836.600000 MHz Start Freq 836.100000 MHz Stop Freq 837.100000 MHz CF Step 100.000000 kHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Ref 40 dBm #Peak Log 10 dB/ Offst 16.5 dB Center 836.600 0 MHz Span 1 MHz #Res BW 10 kHz VBW 30 kHz Sweep 9.56 ms (601 pts) Occupied Bandwidth 246.9013 kHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error -256.485 Hz x dB Bandwidth 306.776 kHz File Operation Status: C:PICTURE.6IF file saved Band GSM850 EGPRS OBW Mid channel	※ Agilent 10:41:57 Jul 7, 2015 R T Freq/Channel Ch Freq 836.6 MHz Trig Free Center Freq 836.600000 MHz Start Freq 836.100000 MHz Stop Freq 837.100000 MHz CF Step 100.000000 kHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Ref 40 dBm #Peak Log 10 dB/ Offst 16.5 dB Center 836.600 0 MHz Span 1 MHz #Res BW 10 kHz VBW 30 kHz Sweep 9.56 ms (601 pts) Occupied Bandwidth 254.8806 kHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error -176.665 Hz x dB Bandwidth 317.333 kHz File Operation Status: C:PICTURE.6IF file saved Band GSM850 GPRS OBW Mid channel

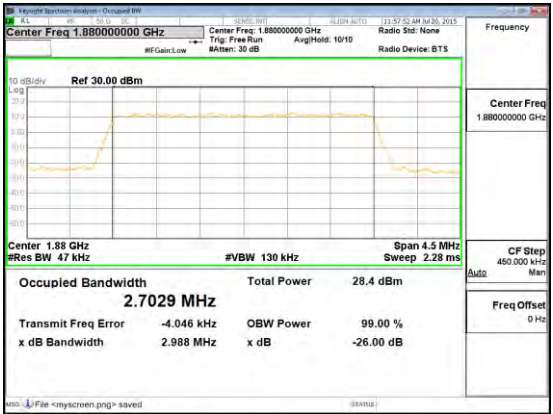
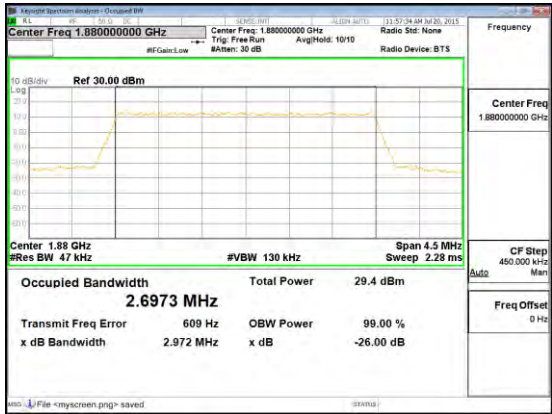
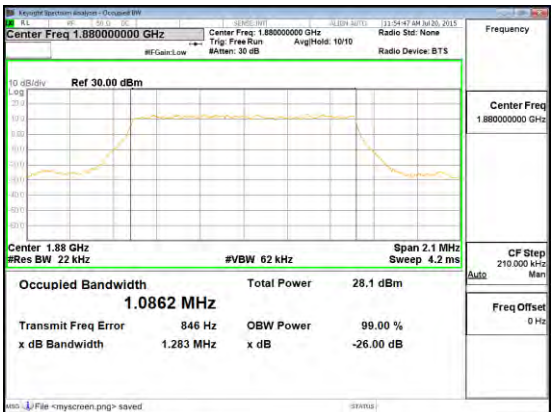
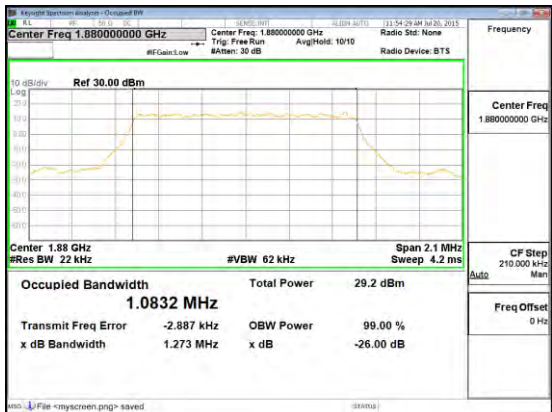
WCDMA

Band 2	Agilent 13:23:46 Jul 7, 2015 Ch Freq 1.88 GHz Occupied Bandwidth Ref 40 dBm Peak Log dB/Offst 16.7 dB Center 1.880 000 GHz Res BW 43 kHz VBW 130 kHz Sweep 5.2 ms (601 pts) Occupied Bandwidth 4.1677 MHz Transmit Freq Error 880.107 Hz x dB Bandwidth 4.618 MHz File Operation Status, C:PICTURE.GIF file saved Band WCDMA B2 HSDPA OBW Freq/Channel Center Freq 1.88000000 GHz Start Freq 1.87500000 GHz Stop Freq 1.88500000 GHz CF Step 1.00000000 MHz Freq Offset 0.00000000 Hz Signal Track On Off	Agilent 13:22:00 Jul 7, 2015 Ch Freq 1.88 GHz Occupied Bandwidth Ref 40 dBm Peak Log dB/Offst 16.7 dB Center 1.880 000 GHz Res BW 43 kHz VBW 130 kHz Sweep 5.2 ms (601 pts) Occupied Bandwidth 4.1678 MHz Transmit Freq Error -1.745 kHz x dB Bandwidth 4.627 MHz File Operation Status, C:PICTURE.GIF file saved Band WCDMA B2 REL99 OBW Freq/Channel Center Freq 1.88000000 GHz Start Freq 1.87500000 GHz Stop Freq 1.88500000 GHz CF Step 1.00000000 MHz Freq Offset 0.00000000 Hz Signal Track On Off
Band 5	Agilent 12:50:16 Jul 7, 2015 Ch Freq 836.6 MHz Occupied Bandwidth Ref 40 dBm Peak Log dB/Offst 16.5 dB Center 836.600 MHz Res BW 51 kHz VBW 150 kHz Sweep 3.68 ms (601 pts) Occupied Bandwidth 4.1598 MHz Transmit Freq Error -2.894 kHz x dB Bandwidth 4.631 MHz File Operation Status, C:PICTURE.GIF file saved Band WCDMA B5 HSDPA OBW Freq/Channel Center Freq 836.600000 MHz Start Freq 831.600000 MHz Stop Freq 841.600000 MHz CF Step 1.00000000 MHz Freq Offset 0.00000000 Hz Signal Track On Off	Agilent 12:48:35 Jul 7, 2015 Ch Freq 836.6 MHz Occupied Bandwidth Ref 40 dBm Peak Log dB/Offst 16.5 dB Center 836.600 MHz Res BW 51 kHz VBW 150 kHz Sweep 3.68 ms (601 pts) Occupied Bandwidth 4.1431 MHz Transmit Freq Error 294.724 Hz x dB Bandwidth 4.632 MHz File Operation Status, C:PICTURE.GIF file saved Band WCDMA B5 REL99 OBW Freq/Channel Center Freq 836.600000 MHz Start Freq 831.600000 MHz Stop Freq 841.600000 MHz CF Step 1.00000000 MHz Freq Offset 0.00000000 Hz Signal Track On Off

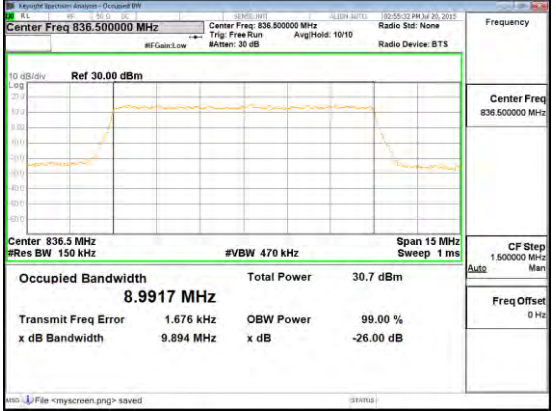
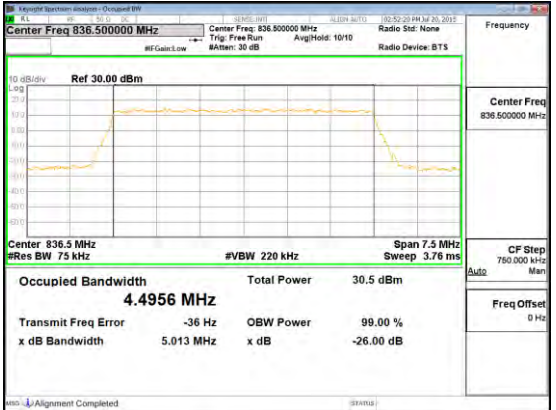
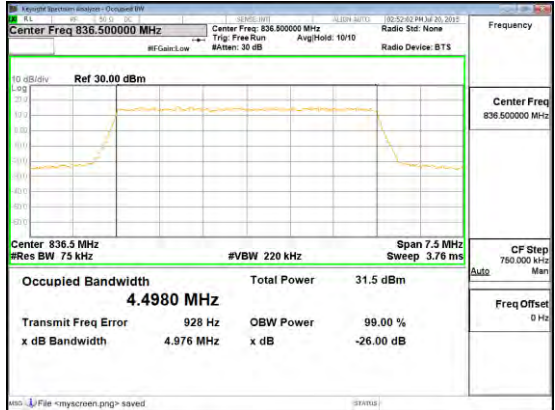
LTE Band 2

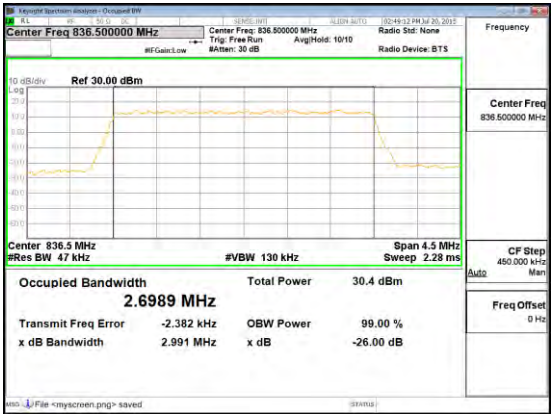
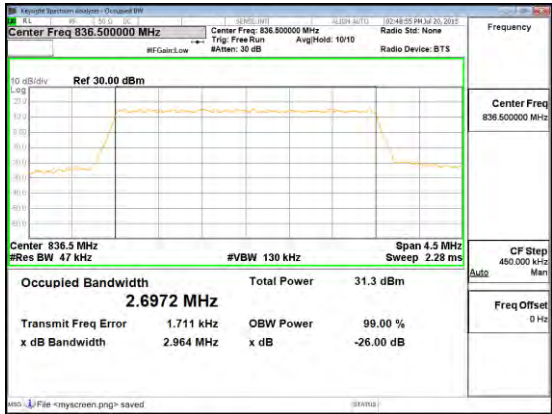
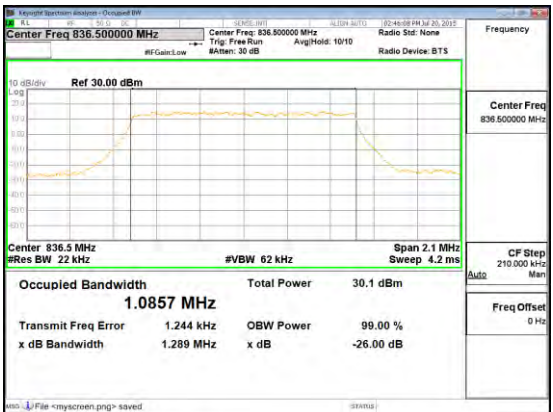
Band LTE2 20MHz	Agilent 15:17:46 Jul 7, 2015 R T Ch Freq 1.88 GHz Trig Free Center Freq 1.88000000 GHz Start Freq 1.86500000 GHz Stop Freq 1.89500000 GHz CF Step 3.00000000 MHz Freq Offset 0.00000000 Hz Signal Track On Occupied Bandwidth 17.8163 MHz Transmit Freq Error 2.291 kHz File Operation Status, C:PICTURE.GIF file saved Band LTE2 20MHz OBW 16QAM Mid Channel FRB.gif	Agilent 15:17:27 Jul 7, 2015 R T Ch Freq 1.88 GHz Trig Free Center Freq 1.88000000 GHz Start Freq 1.86500000 GHz Stop Freq 1.89500000 GHz CF Step 3.00000000 MHz Freq Offset 0.00000000 Hz Signal Track Off Occupied Bandwidth 17.8287 MHz Transmit Freq Error -5.595 kHz File Operation Status, C:PICTURE.GIF file saved Band LTE2 20MHz OBW QPSK Mid Channel FRB.gif
Band LTE2 15MHz	Agilent 15:14:05 Jul 7, 2015 R T Ch Freq 1.88 GHz Trig Free Center Freq 1.88000000 GHz Start Freq 1.86875000 GHz Stop Freq 1.89125000 GHz CF Step 2.25000000 MHz Freq Offset 0.00000000 Hz Signal Track On Occupied Bandwidth 13.4079 MHz Transmit Freq Error -14.220 kHz File Operation Status, C:PICTURE.GIF file saved Band LTE2 15MHz OBW 16QAM Mid Channel FRB.gif	Agilent 15:13:47 Jul 7, 2015 R T Ch Freq 1.88 GHz Trig Free Center Freq 1.88000000 GHz Start Freq 1.86875000 GHz Stop Freq 1.89125000 GHz CF Step 2.25000000 MHz Freq Offset 0.00000000 Hz Signal Track Off Occupied Bandwidth 13.4324 MHz Transmit Freq Error 25.489 kHz File Operation Status, C:PICTURE.GIF file saved Band LTE2 15MHz OBW QPSK Mid Channel FRB.gif

Band LTE2 10MHz	Agilent 14:18:18 Jul 7, 2015 R T Ch Freq 1.88 GHz Trig Free Center Freq 1.88000000 GHz Start Freq 1.87250000 GHz Stop Freq 1.88750000 GHz CF Step 1.50000000 MHz Freq Offset 0.00000000 Hz Signal On Off Ref 30 dBm •Atten 30 dB Peak Log 10 dB/Offst 16.8 dB Center 1.880 000 GHz Span 15 MHz Res BW 150 kHz VBW 430 kHz Sweep 1 ms (601 pts) Occupied Bandwidth 8.9139 MHz Transmit Freq Error 1.126 kHz x dB Bandwidth 3.642 MHz Occ BW % Pwr 99.00 Z x dB -26.00 dB File Operation Status: C:PICTURE.GIF file saved Band LTE2 10MHz OBW 16QAM Mid Channel FRB.gif	Agilent 14:17:59 Jul 7, 2015 R T Ch Freq 1.88 GHz Trig Free Center Freq 1.88000000 GHz Start Freq 1.87250000 GHz Stop Freq 1.88750000 GHz CF Step 1.50000000 MHz Freq Offset 0.00000000 Hz Signal On Off Ref 30 dBm •Atten 30 dB Peak Log 10 dB/Offst 16.8 dB Center 1.880 000 GHz Span 15 MHz Res BW 150 kHz VBW 430 kHz Sweep 1 ms (601 pts) Occupied Bandwidth 8.9421 MHz Transmit Freq Error 629.600 Hz x dB Bandwidth 3.609 MHz Occ BW % Pwr 99.00 Z x dB -26.00 dB File Operation Status: C:PICTURE.GIF file saved Band LTE2 10MHz OBW QPSK Mid Channel FRB.gif
Band LTE2 5MHz	Agilent 14:11:16 Jul 7, 2015 R T Ch Freq 1.88 GHz Trig Free Center Freq 1.88000000 GHz Start Freq 1.87625000 GHz Stop Freq 1.88375000 GHz CF Step 750.000000 kHz Freq Offset 0.00000000 Hz Signal On Off Ref 30 dBm •Atten 30 dB Peak Log 10 dB/Offst 16.8 dB Center 1.880 000 GHz Span 7.5 MHz Res BW 75 kHz VBW 220 kHz Sweep 1.28 ms (601 pts) Occupied Bandwidth 4.5049 MHz Transmit Freq Error -15.197 kHz x dB Bandwidth 4.890 MHz Occ BW % Pwr 99.00 Z x dB -26.00 dB File Operation Status: C:PICTURE.GIF file saved Band LTE2 5MHz OBW 16QAM Mid Channel FRB.gif	Agilent 14:10:58 Jul 7, 2015 R T Ch Freq 1.88 GHz Trig Free Center Freq 1.88000000 GHz Start Freq 1.87625000 GHz Stop Freq 1.88375000 GHz CF Step 750.000000 kHz Freq Offset 0.00000000 Hz Signal On Off Ref 30 dBm •Atten 30 dB Peak Log 10 dB/Offst 16.8 dB Center 1.880 000 GHz Span 7.5 MHz Res BW 75 kHz VBW 220 kHz Sweep 1.28 ms (601 pts) Occupied Bandwidth 4.4974 MHz Transmit Freq Error -10.433 kHz x dB Bandwidth 4.914 MHz Occ BW % Pwr 99.00 Z x dB -26.00 dB File Operation Status: C:PICTURE.GIF file saved Band LTE2 5MHz OBW QPSK Mid Channel FRB.gif

Band LTE2 3MHz	 Band LTE2 3MHz OBW 16QAM Mid Channel FRB.gif	 Band LTE2 3MHz OBW QPSK Mid Channel FRB.gif
Band LTE2 1.4MHz	 Band LTE2 1.4MHz OBW 16QAM Mid Channel FRB.gif	 Band LTE2 1.4MHz OBW QPSK Mid Channel FRB.gif

LTE Band 5

Band LTE5 10MHz	 Center Freq 836.500000 MHz #VBW 470 kHz Span 15 MHz Sweep 1 ms CF Step 1.500000 MHz Man Occupied Bandwidth 8.9917 MHz Total Power 30.7 dBm Transmit Freq Error 1.676 kHz OBW Power 99.00 % x dB Bandwidth 9.894 MHz x dB -26.00 dB File <myscreen.png> saved Band LTE5 10MHz OBW 16QAM Mid Channel FRB.gif	 Center Freq 836.500000 MHz #VBW 470 kHz Span 15 MHz Sweep 1 ms CF Step 1.500000 MHz Man Occupied Bandwidth 8.9860 MHz Total Power 31.7 dBm Transmit Freq Error 1.750 kHz OBW Power 99.00 % x dB Bandwidth 9.856 MHz x dB -26.00 dB File <myscreen.png> saved Band LTE5 10MHz OBW QPSK Mid Channel FRB.gif
Band LTE5 5MHz	 Center Freq 836.500000 MHz #VBW 220 kHz Span 7.5 MHz Sweep 3.76 ms CF Step 750.000 kHz Man Occupied Bandwidth 4.4956 MHz Total Power 30.5 dBm Transmit Freq Error -36 Hz OBW Power 99.00 % x dB Bandwidth 5.013 MHz x dB -26.00 dB Alignment Completed Band LTE5 5MHz OBW 16QAM Mid Channel FRB.gif	 Center Freq 836.500000 MHz #VBW 220 kHz Span 7.5 MHz Sweep 3.76 ms CF Step 750.000 kHz Man Occupied Bandwidth 4.4980 MHz Total Power 31.5 dBm Transmit Freq Error 928 Hz OBW Power 99.00 % x dB Bandwidth 4.976 MHz x dB -26.00 dB File <myscreen.png> saved Band LTE5 5MHz OBW QPSK Mid Channel FRB.gif

Band LTE5 3MHz	 Band LTE5 3MHz OBW 16QAM Mid Channel FRB.gif	 Band LTE5 3MHz OBW QPSK Mid Channel FRB.gif
Band LTE5 1.4MHz	 Band LTE5 1.4MHz OBW 16QAM Mid Channel FRB.gif	 Band LTE5 1.4MHz OBW QPSK Mid Channel FRB.gif

10.2. BAND EDGE EMISSIONS

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

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.

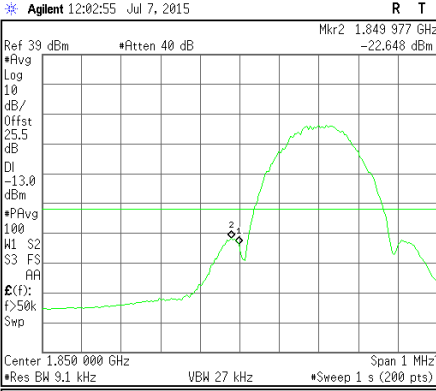
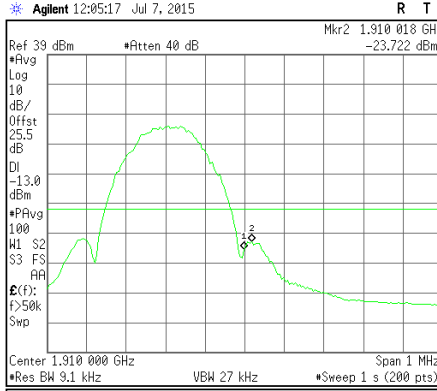
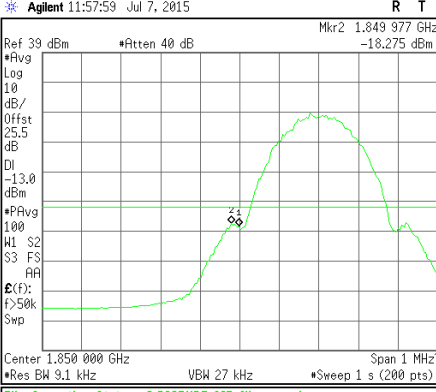
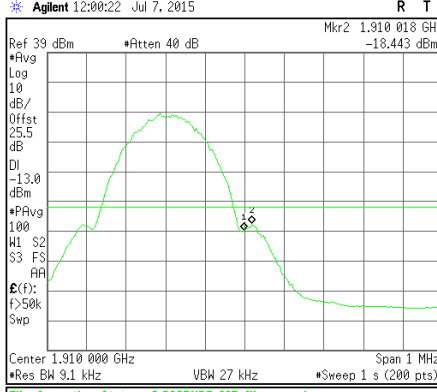
MODES TESTED

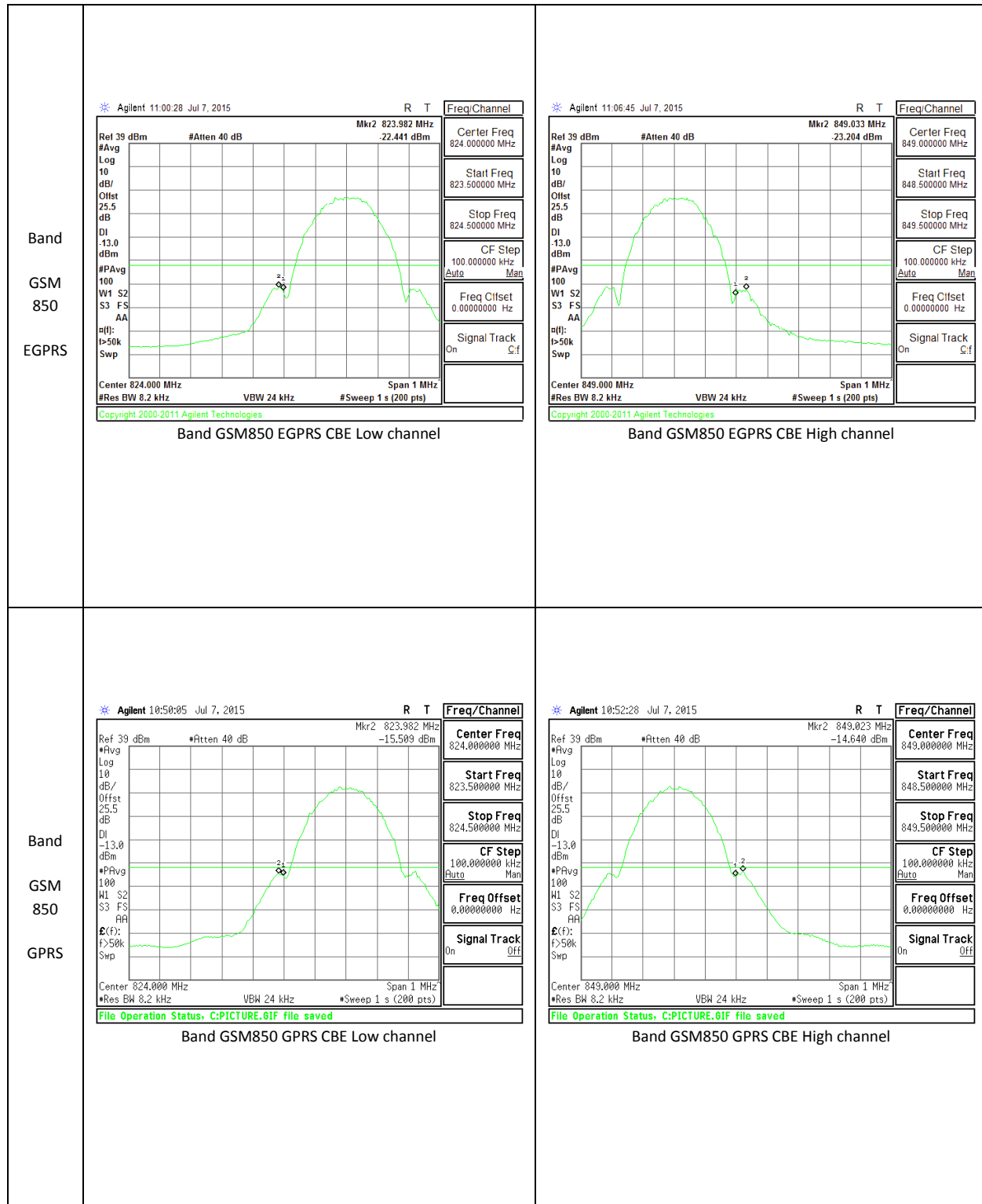
GSM, WCDMA, and LTE

RESULTS

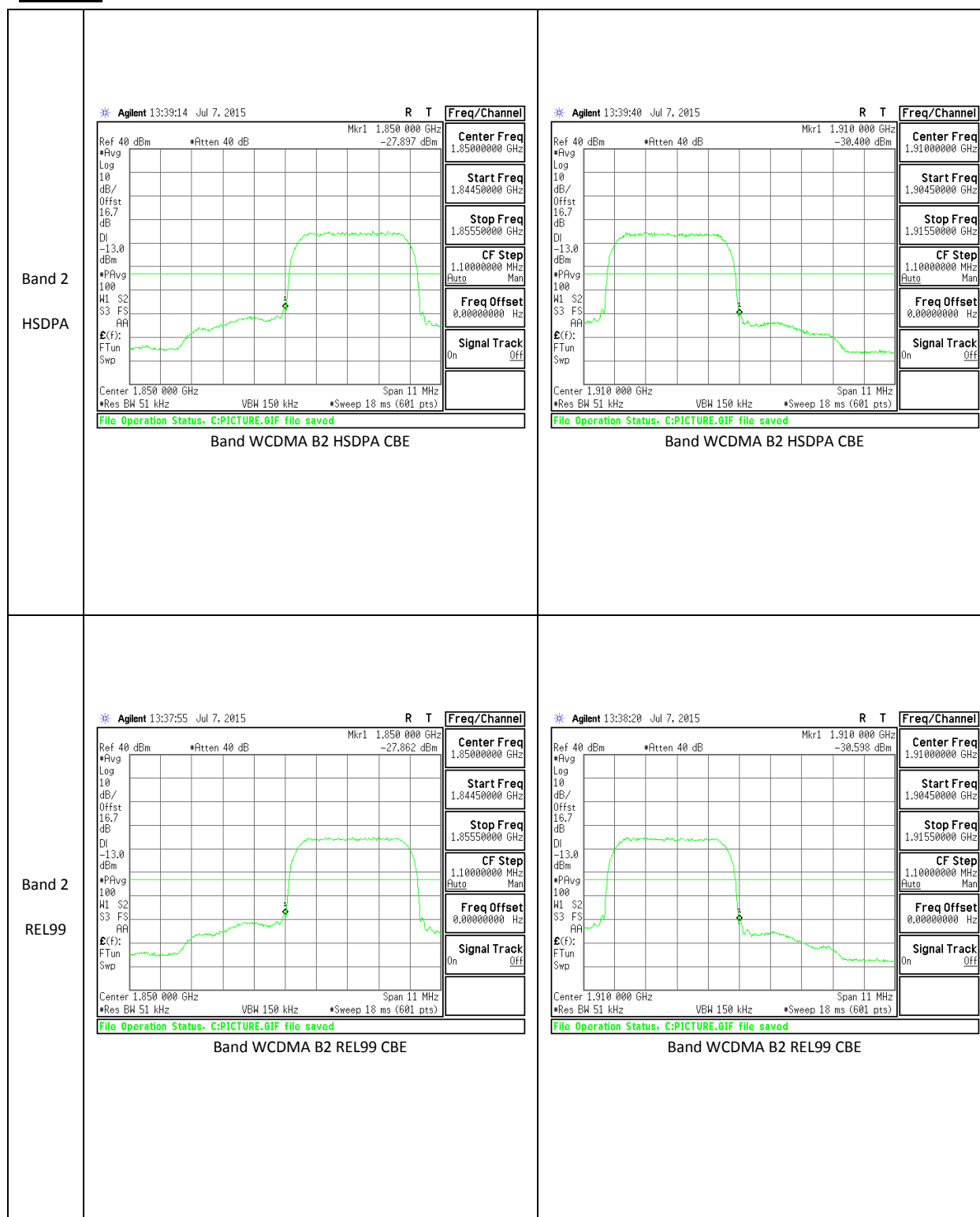
10.2.1. BAND EDGE PLOTS

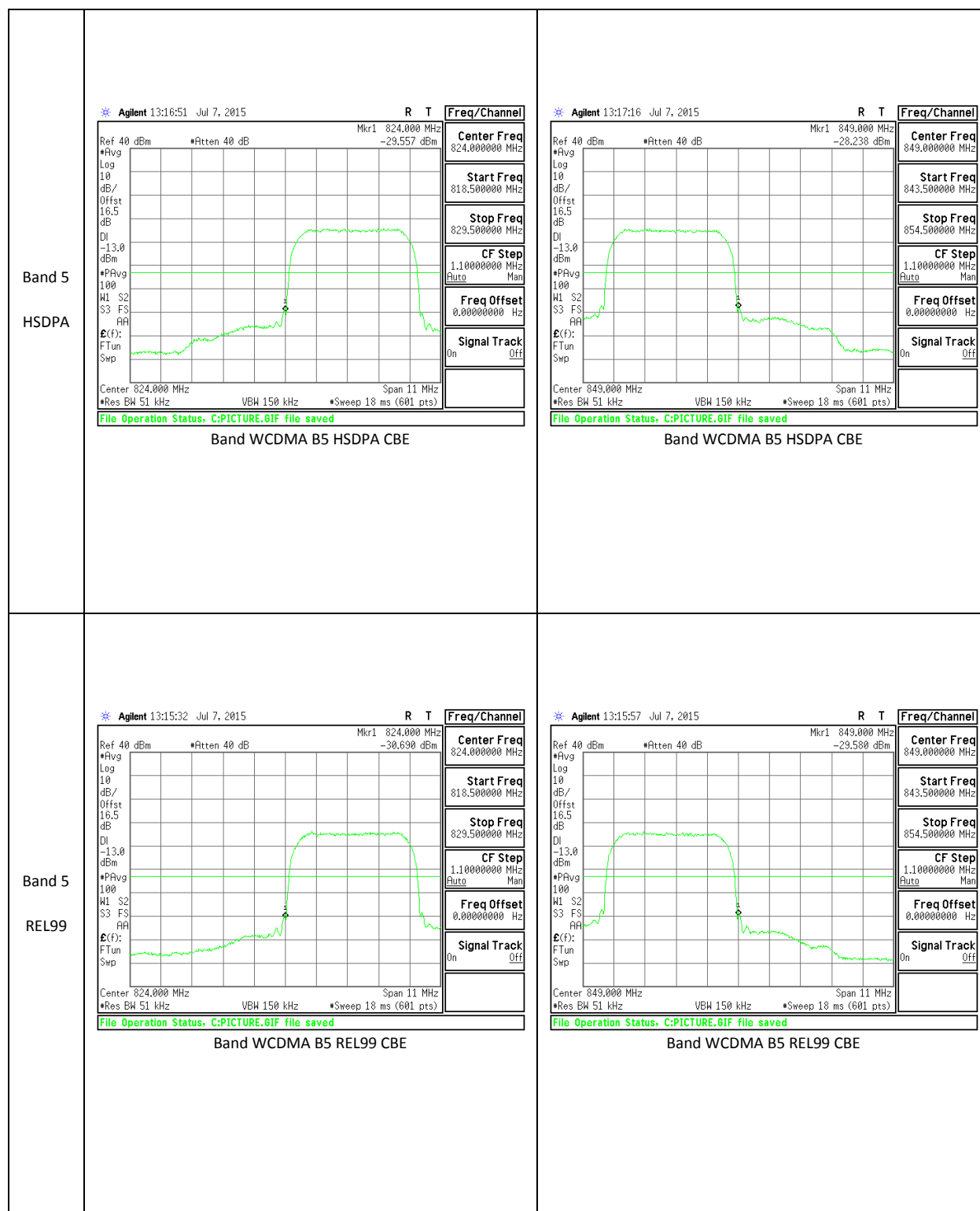
GSM

Band GSM 1900 EGPRS	* Agilent 12:02:55 Jul 7, 2015 R T  Center Freq 1.85000000 GHz Start Freq 1.84950000 GHz Stop Freq 1.85050000 GHz CF Step 100.000000 kHz Freq Offset 0.00000000 Hz Signal Track On Center 1.850 000 GHz Span 1 MHz Res BW 9.1 kHz VBW 27 kHz Sweep 1 s (200 pts) File Operation Status: C:PICTURE.GIF file saved Band GSM1900 EGPRS CBE Low channel	* Agilent 12:05:17 Jul 7, 2015 R T  Center Freq 1.91001800 GHz Start Freq 1.90950000 GHz Stop Freq 1.91050000 GHz CF Step 100.000000 kHz Freq Offset 0.00000000 Hz Signal Track On Center 1.910 000 GHz Span 1 MHz Res BW 9.1 kHz VBW 27 kHz Sweep 1 s (200 pts) File Operation Status: C:PICTURE.GIF file saved Band GSM1900 EGPRS CBE High channel
Band GSM 1900 GPRS	* Agilent 11:57:59 Jul 7, 2015 R T  Center Freq 1.85000000 GHz Start Freq 1.84950000 GHz Stop Freq 1.85050000 GHz CF Step 100.000000 kHz Freq Offset 0.00000000 Hz Signal Track On Center 1.850 000 GHz Span 1 MHz Res BW 9.1 kHz VBW 27 kHz Sweep 1 s (200 pts) File Operation Status: C:PICTURE.GIF file saved Band GSM1900 GPRS CBE Low channel	* Agilent 12:00:22 Jul 7, 2015 R T  Center Freq 1.91001800 GHz Start Freq 1.90950000 GHz Stop Freq 1.91050000 GHz CF Step 100.000000 kHz Freq Offset 0.00000000 Hz Signal Track On Center 1.910 000 GHz Span 1 MHz Res BW 9.1 kHz VBW 27 kHz Sweep 1 s (200 pts) File Operation Status: C:PICTURE.GIF file saved Band GSM1900 GPRS CBE High channel

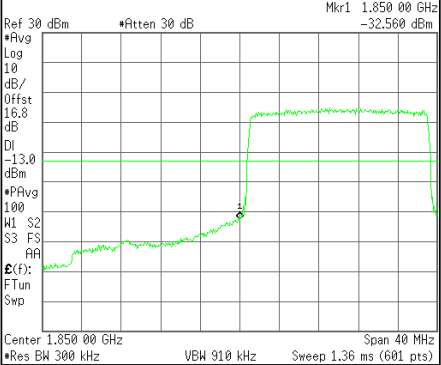
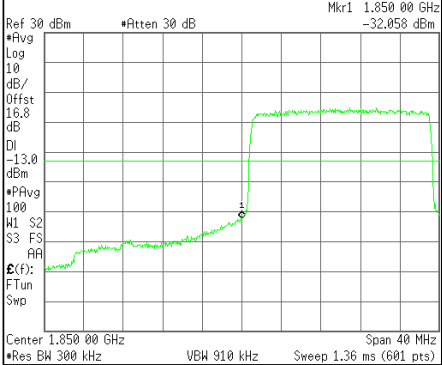
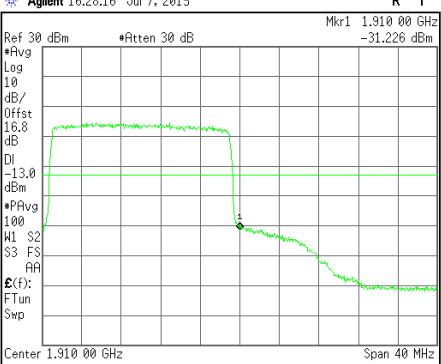
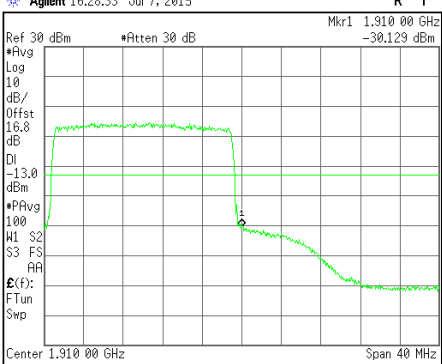


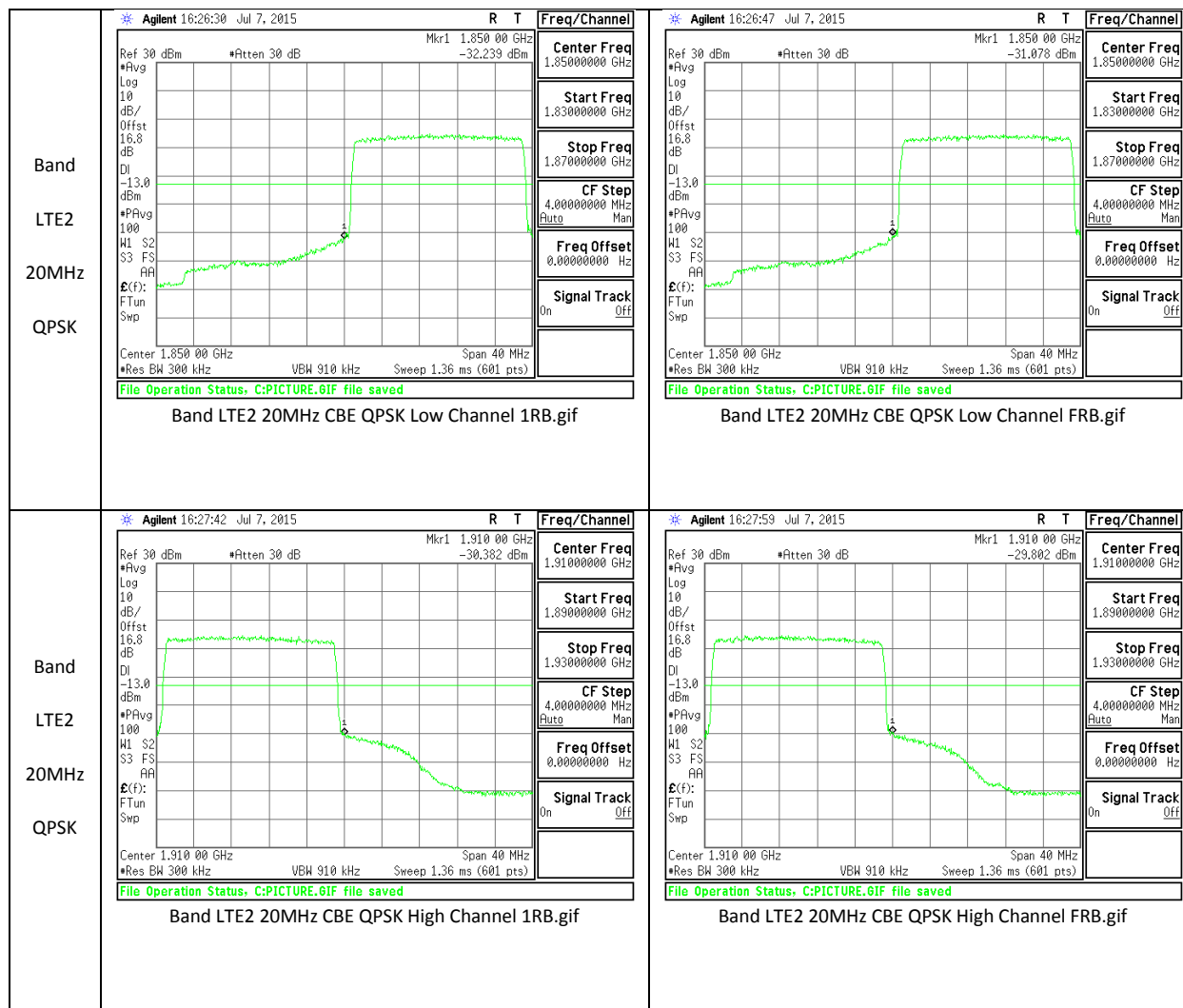
WCDMA





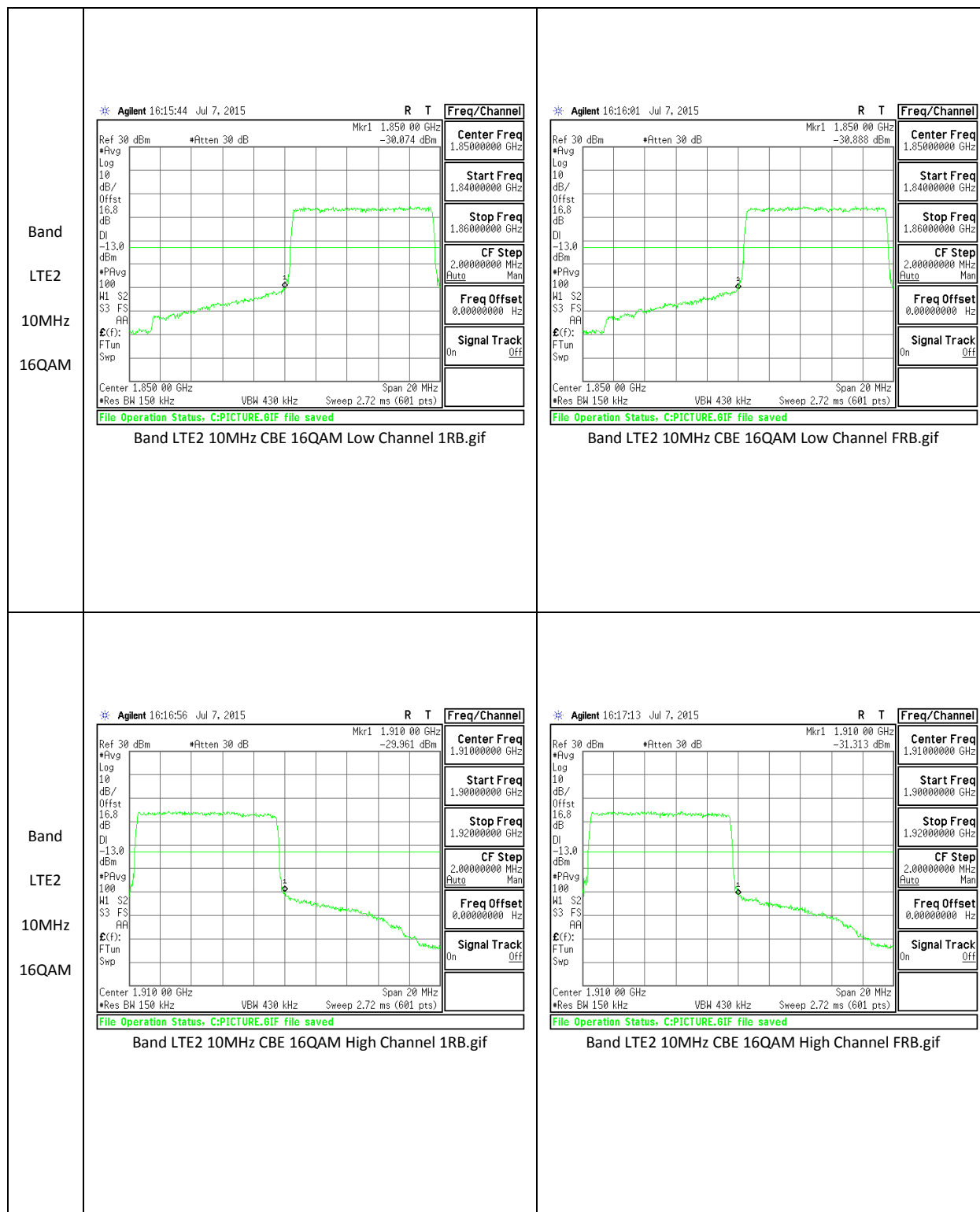
LTE Band 2

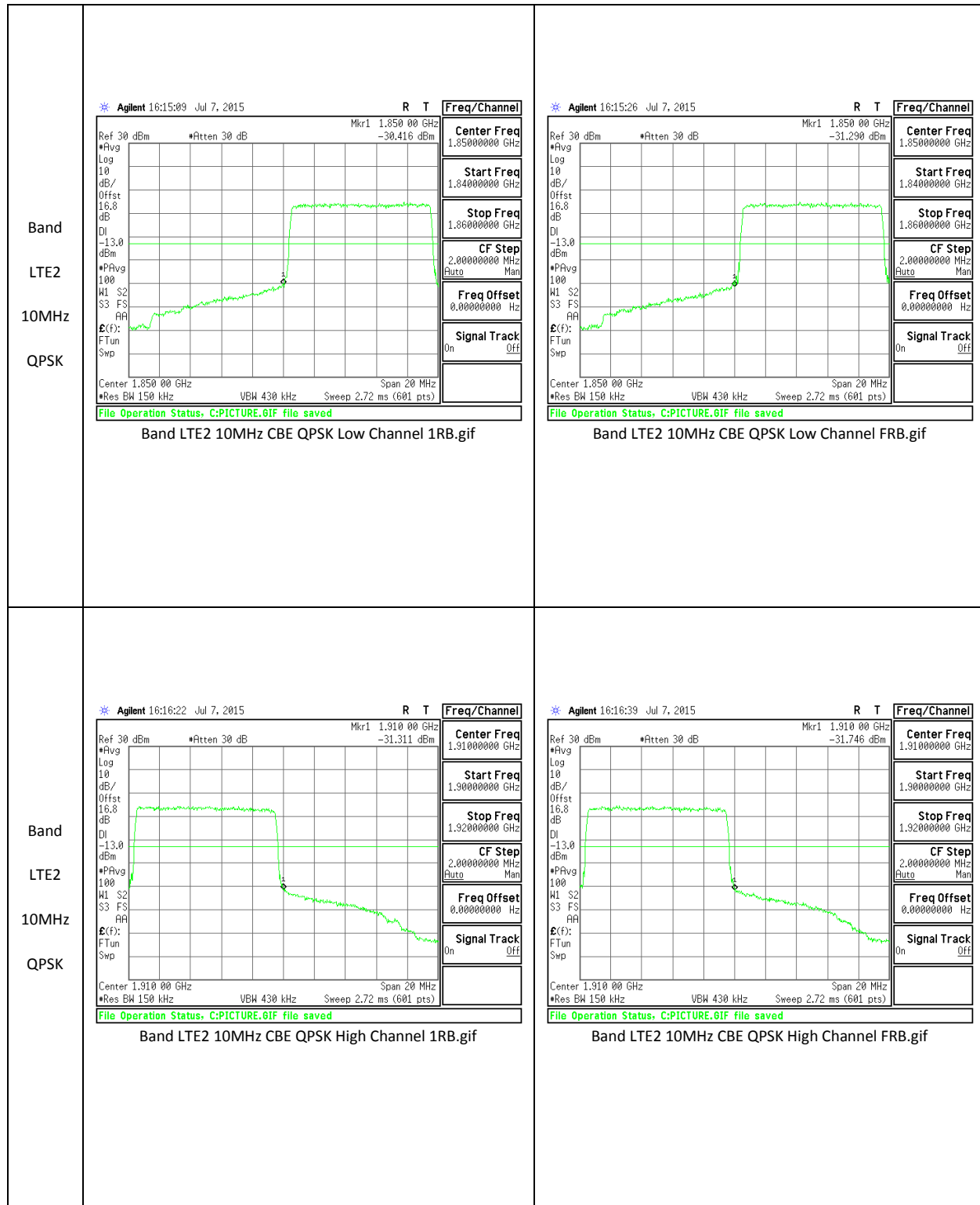
Band LTE2 20MHz 16QAM	Agilent 16:27:04 Jul 7, 2015  Center Freq 1.8500000 GHz Start Freq 1.8300000 GHz Stop Freq 1.8700000 GHz CF Step 4.0000000 MHz Freq Offset 0.0000000 Hz Signal Track On File Operation Status, C:PICTURE.GIF file saved Band LTE2 20MHz CBE 16QAM Low Channel 1RB.gif	Agilent 16:27:21 Jul 7, 2015  Center Freq 1.8500000 GHz Start Freq 1.8300000 GHz Stop Freq 1.8700000 GHz CF Step 4.0000000 MHz Freq Offset 0.0000000 Hz Signal Track On File Operation Status, C:PICTURE.GIF file saved Band LTE2 20MHz CBE 16QAM Low Channel FRB.gif
Band LTE2 20MHz 16QAM	Agilent 16:28:16 Jul 7, 2015  Center Freq 1.9100000 GHz Start Freq 1.8900000 GHz Stop Freq 1.9300000 GHz CF Step 4.0000000 MHz Freq Offset 0.0000000 Hz Signal Track On File Operation Status, C:PICTURE.GIF file saved Band LTE2 20MHz CBE 16QAM High Channel 1RB.gif	Agilent 16:28:33 Jul 7, 2015  Center Freq 1.9100000 GHz Start Freq 1.8900000 GHz Stop Freq 1.9300000 GHz CF Step 4.0000000 MHz Freq Offset 0.0000000 Hz Signal Track On File Operation Status, C:PICTURE.GIF file saved Band LTE2 20MHz CBE 16QAM High Channel FRB.gif

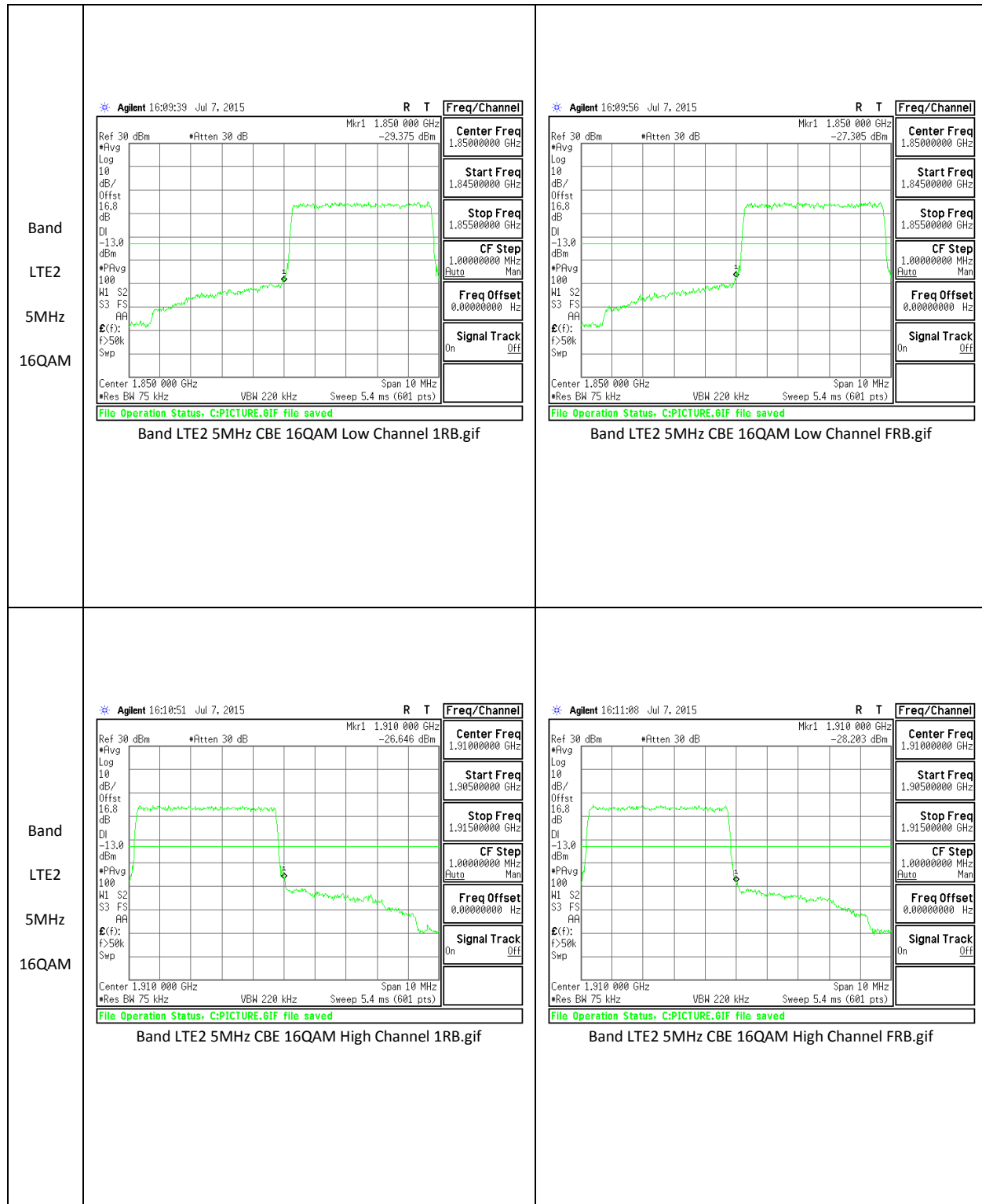


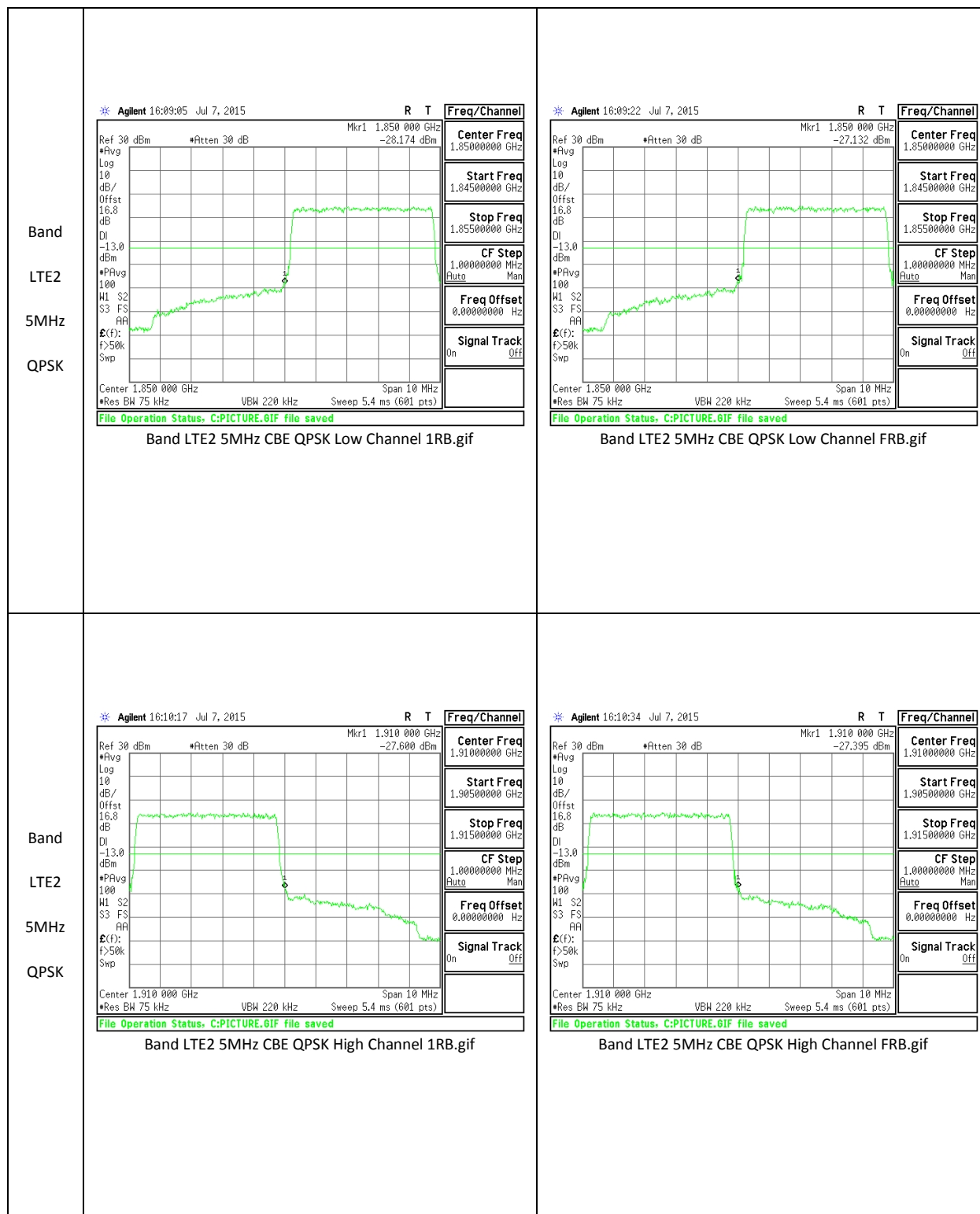
Band LTE2 15MHz 16QAM	Agilent 16:21:38 Jul 7, 2015 Ref 30 dBm #Atten 30 dB Mkr1 1.850 00 GHz -32.892 dBm Center Freq 1.85000000 GHz Start Freq 1.83500000 GHz Stop Freq 1.86500000 GHz CF Step 3.00000000 MHz Freq Offset 0.00000000 Hz Signal Track On File Operation Status. C:PICTURE.GIF file saved Band LTE2 15MHz CBE 16QAM Low Channel 1RB.gif	Agilent 16:21:55 Jul 7, 2015 Ref 30 dBm #Atten 30 dB Mkr1 1.850 00 GHz -32.222 dBm Center Freq 1.85000000 GHz Start Freq 1.83500000 GHz Stop Freq 1.86500000 GHz CF Step 3.00000000 MHz Freq Offset 0.00000000 Hz Signal Track On File Operation Status. C:PICTURE.GIF file saved Band LTE2 15MHz CBE 16QAM Low Channel FRB.gif
Band LTE2 15MHz 16QAM	Agilent 16:22:50 Jul 7, 2015 Ref 30 dBm #Atten 30 dB Mkr1 1.910 00 GHz -29.882 dBm Center Freq 1.91000000 GHz Start Freq 1.89500000 GHz Stop Freq 1.92500000 GHz CF Step 3.00000000 MHz Freq Offset 0.00000000 Hz Signal Track On File Operation Status. C:PICTURE.GIF file saved Band LTE2 15MHz CBE 16QAM High Channel 1RB.gif	Agilent 16:23:07 Jul 7, 2015 Ref 30 dBm #Atten 30 dB Mkr1 1.910 00 GHz -29.635 dBm Center Freq 1.91000000 GHz Start Freq 1.89500000 GHz Stop Freq 1.92500000 GHz CF Step 3.00000000 MHz Freq Offset 0.00000000 Hz Signal Track On File Operation Status. C:PICTURE.GIF file saved Band LTE2 15MHz CBE 16QAM High Channel FRB.gif

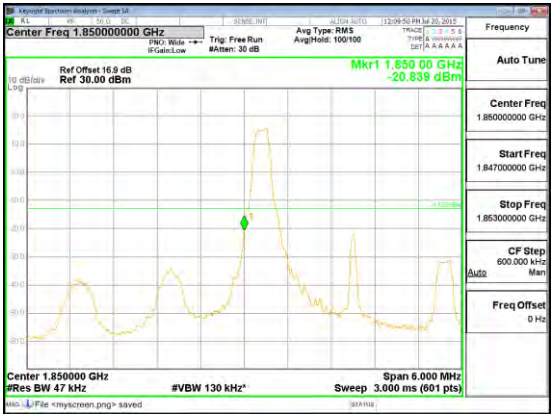
Band LTE2 15MHz QPSK	Agilent 16:21:04 Jul 7, 2015 Ref 30 dBm #Atten 30 dB Mkr1 1.850 00 GHz -30.198 dBm Center Freq 1.85000000 GHz Start Freq 1.83500000 GHz Stop Freq 1.86500000 GHz CF Step 3.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Center 1.850 00 GHz Span 30 MHz Res BW 220 kHz VBW 680 kHz Sweep 1.88 ms (601 pts) File Operation Status: C:PICTURE.GIF file saved Band LTE2 15MHz CBE QPSK Low Channel 1RB.gif	Agilent 16:21:21 Jul 7, 2015 Ref 30 dBm #Atten 30 dB Mkr1 1.850 00 GHz -32.220 dBm Center Freq 1.85000000 GHz Start Freq 1.83500000 GHz Stop Freq 1.86500000 GHz CF Step 3.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Center 1.850 00 GHz Span 30 MHz Res BW 220 kHz VBW 680 kHz Sweep 1.88 ms (601 pts) File Operation Status: C:PICTURE.GIF file saved Band LTE2 15MHz CBE QPSK Low Channel FRB.gif
Band LTE2 15MHz QPSK	Agilent 16:22:16 Jul 7, 2015 Ref 30 dBm #Atten 30 dB Mkr1 1.910 00 GHz -29.366 dBm Center Freq 1.91000000 GHz Start Freq 1.89500000 GHz Stop Freq 1.92500000 GHz CF Step 3.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Center 1.910 00 GHz Span 30 MHz Res BW 220 kHz VBW 680 kHz Sweep 1.88 ms (601 pts) File Operation Status: C:PICTURE.GIF file saved Band LTE2 15MHz CBE QPSK High Channel 1RB.gif	Agilent 16:22:33 Jul 7, 2015 Ref 30 dBm #Atten 30 dB Mkr1 1.910 00 GHz -29.262 dBm Center Freq 1.91000000 GHz Start Freq 1.89500000 GHz Stop Freq 1.92500000 GHz CF Step 3.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Center 1.910 00 GHz Span 30 MHz Res BW 220 kHz VBW 680 kHz Sweep 1.88 ms (601 pts) File Operation Status: C:PICTURE.GIF file saved Band LTE2 15MHz CBE QPSK High Channel FRB.gif

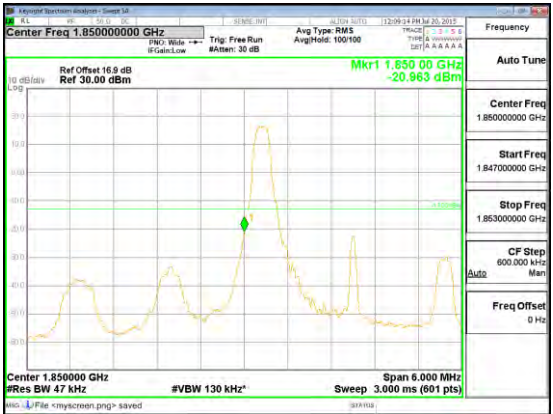
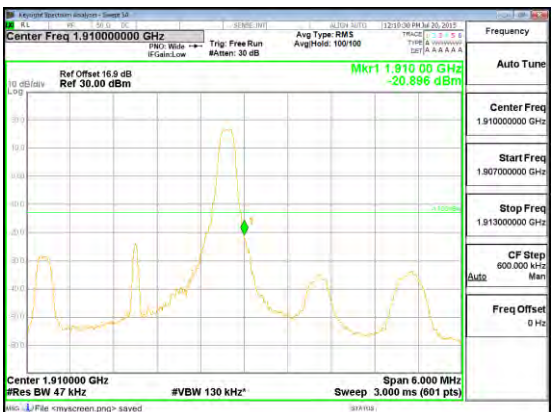
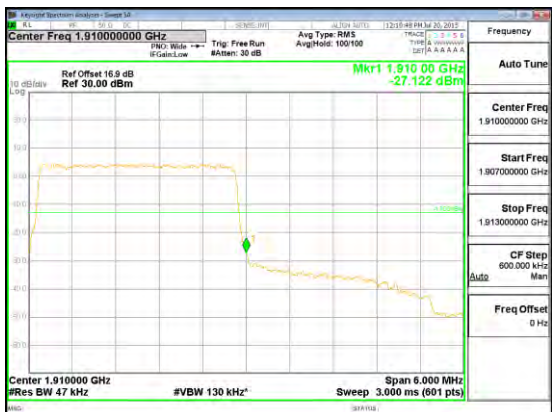


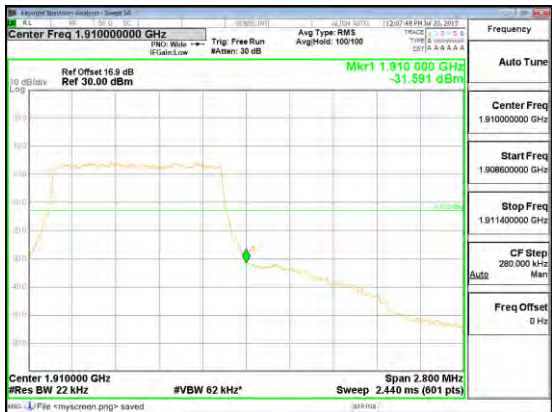


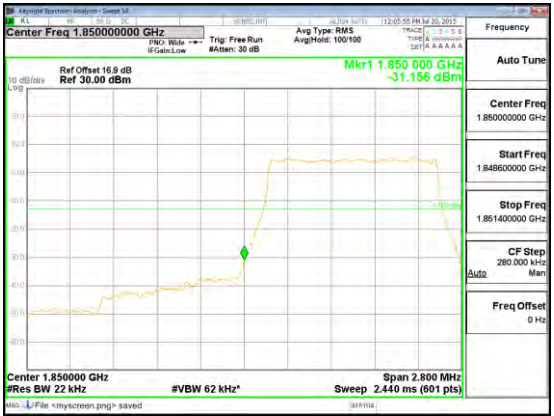
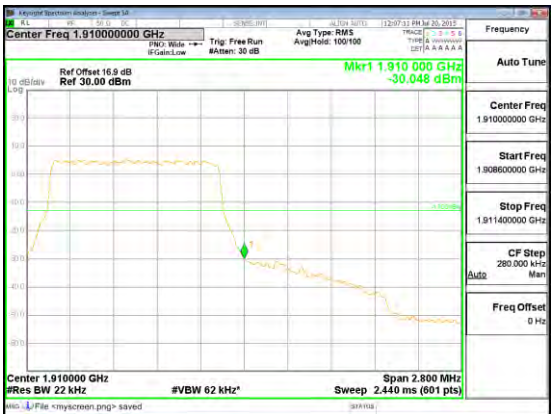




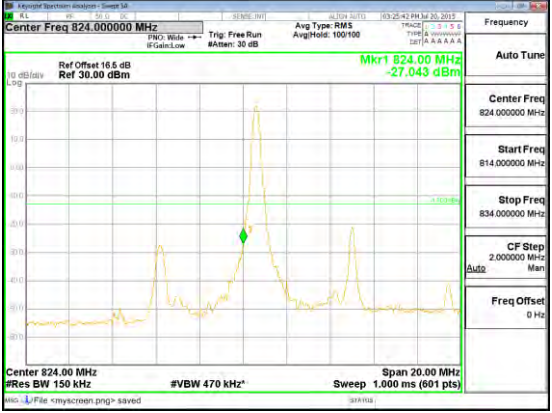
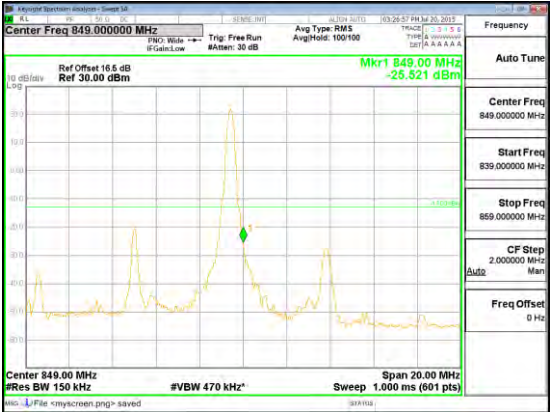
Band LTE2 3MHz 16QAM	 Band LTE2 3MHz CBE 16QAM Low Channel 1RB.gif	 Band LTE2 3MHz CBE 16QAM Low Channel FRB.gif
Band LTE2 3MHz 16QAM	 Band LTE2 3MHz CBE 16QAM High Channel 1RB.gif	 Band LTE2 3MHz CBE 16QAM High Channel FRB.gif

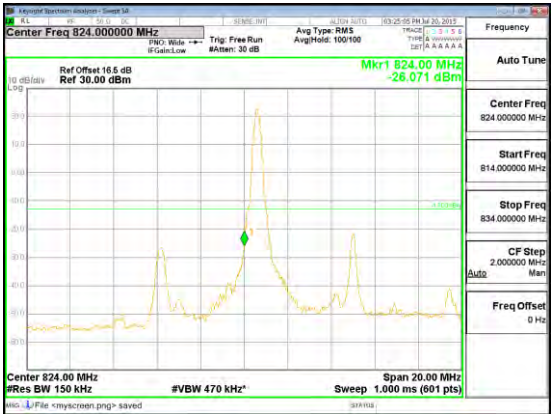
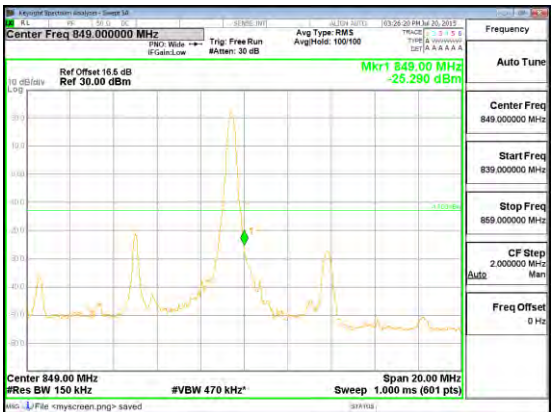
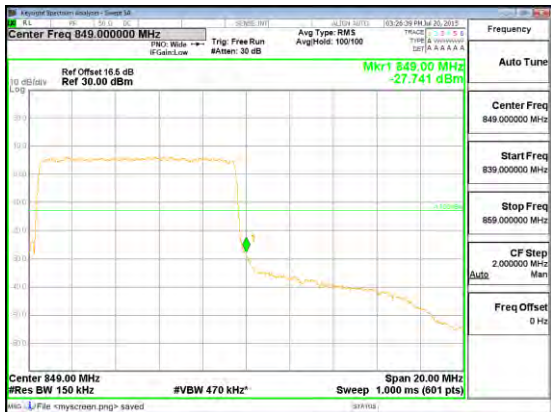
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Band LTE2 3MHz QPSK	 Band LTE2 3MHz CBE QPSK High Channel 1RB.gif	 Band LTE2 3MHz CBE QPSK High Channel FRB.gif

Band LTE2 1.4MHz 16QAM	 Band LTE2 1.4MHz CBE 16QAM Low Channel 1RB.gif	 Band LTE2 1.4MHz CBE 16QAM Low Channel FRB.gif
Band LTE2 1.4MHz 16QAM	 Band LTE2 1.4MHz CBE 16QAM High Channel 1RB.gif	 Band LTE2 1.4MHz CBE 16QAM High Channel FRB.gif

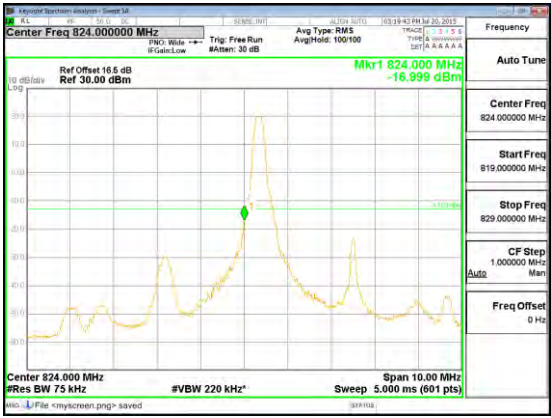
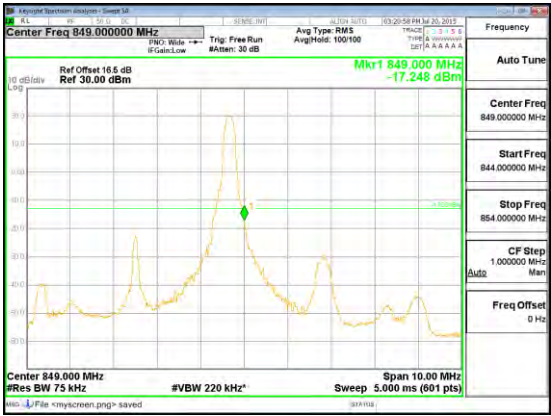
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Band LTE2 1.4MHz QPSK	 Band LTE2 1.4MHz CBE QPSK High Channel 1RB.gif	 Band LTE2 1.4MHz CBE QPSK High Channel FRB.gif

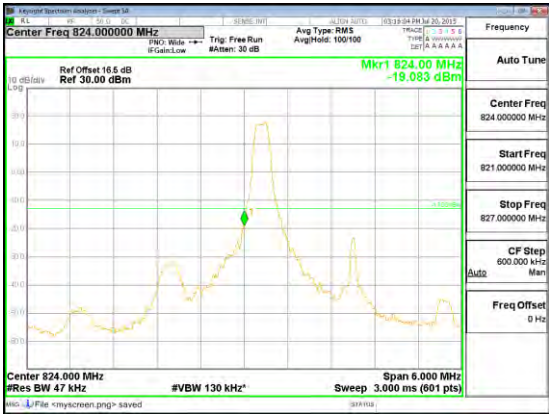
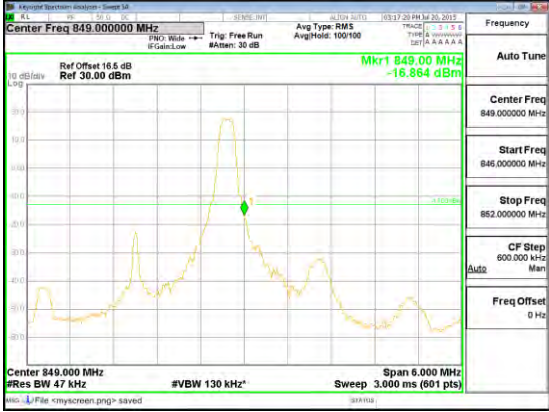
LTE Band 5

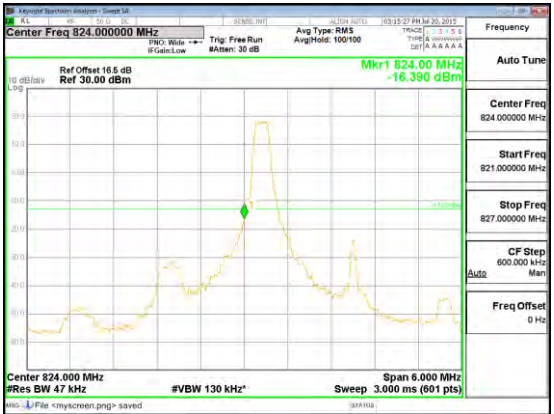
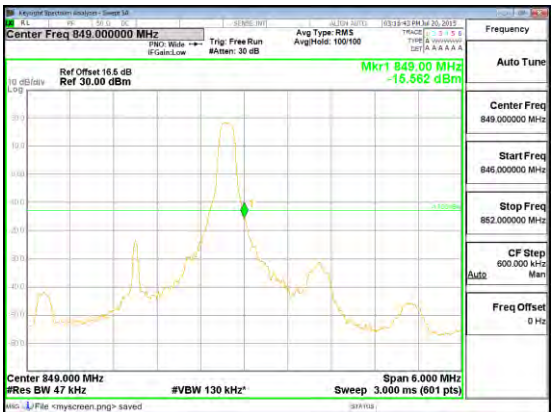
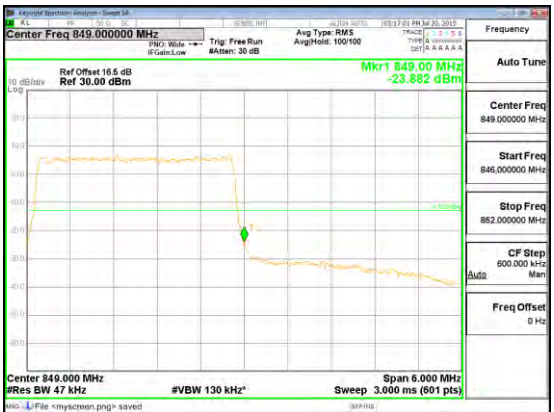
Band LTE5 10MHz 16QAM	 Band LTE5 10MHz CBE 16QAM Low Channel 1RB.gif	 Band LTE5 10MHz CBE 16QAM Low Channel FRB.gif
Band LTE5 10MHz 16QAM	 Band LTE5 10MHz CBE 16QAM High Channel 1RB.gif	 Band LTE5 10MHz CBE 16QAM High Channel FRB.gif

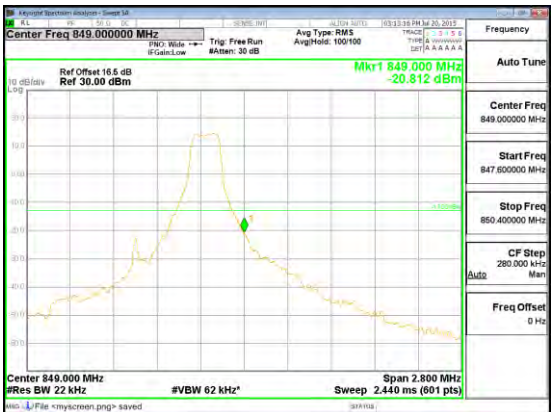
Band LTE5 10MHz QPSK	 Band LTE5 10MHz CBE QPSK Low Channel 1RB.gif	 Band LTE5 10MHz CBE QPSK Low Channel FRB.gif
Band LTE5 10MHz QPSK	 Band LTE5 10MHz CBE QPSK High Channel 1RB.gif	 Band LTE5 10MHz CBE QPSK High Channel FRB.gif

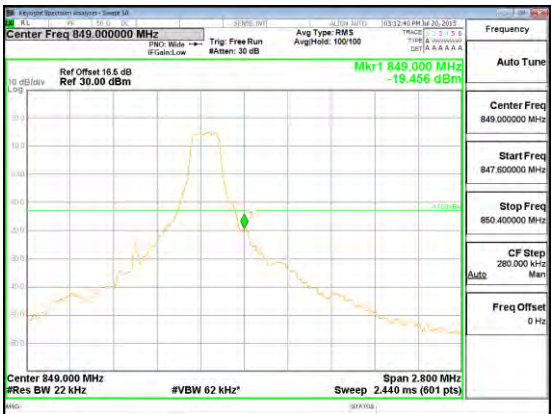
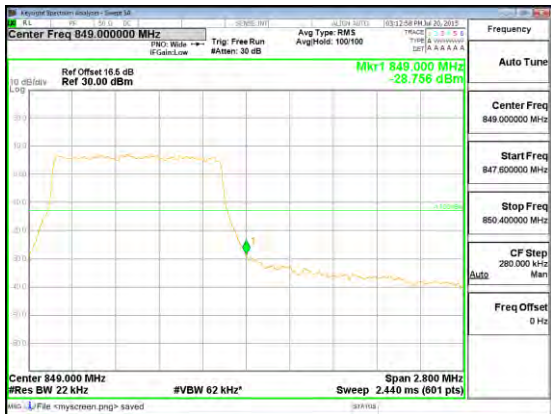
Band LTE5 5MHz 16QAM	Center Freq 824.000000 MHz Ref Offset 16.5 dB Ref 30.00 dBm Mkr1 824.000 MHz -21.469 dBm Span 10.00 MHz #VBW 220 kHz* Sweep 5.000 ms (601 pts) Band LTE5 5MHz CBE 16QAM Low Channel 1RB.gif	Center Freq 824.000000 MHz Ref Offset 16.5 dB Ref 30.00 dBm Mkr1 824.000 MHz -29.147 dBm Span 10.00 MHz #VBW 220 kHz* Sweep 5.000 ms (601 pts) Band LTE5 5MHz CBE 16QAM Low Channel FRB.gif
Band LTE5 5MHz 16QAM	Center Freq 849.000000 MHz Ref Offset 16.5 dB Ref 30.00 dBm Mkr1 849.000 MHz -17.184 dBm Span 10.00 MHz #VBW 220 kHz* Sweep 5.000 ms (601 pts) Band LTE5 5MHz CBE 16QAM High Channel 1RB.gif	Center Freq 849.000000 MHz Ref Offset 16.5 dB Ref 30.00 dBm Mkr1 849.000 MHz -26.952 dBm Span 10.00 MHz #VBW 220 kHz* Sweep 5.000 ms (601 pts) Band LTE5 5MHz CBE 16QAM High Channel FRB.gif

Band LTE5 5MHz QPSK	 Band LTE5 5MHz CBE QPSK Low Channel 1RB.gif	 Band LTE5 5MHz CBE QPSK Low Channel FRB.gif
Band LTE5 5MHz QPSK	 Band LTE5 5MHz CBE QPSK High Channel 1RB.gif	 Band LTE5 5MHz CBE QPSK High Channel FRB.gif

Band LTE5 3MHz 16QAM	 Band LTE5 3MHz CBE 16QAM Low Channel 1RB.gif	 Band LTE5 3MHz CBE 16QAM Low Channel FRB.gif
Band LTE5 3MHz 16QAM	 Band LTE5 3MHz CBE 16QAM High Channel 1RB.gif	 Band LTE5 3MHz CBE 16QAM High Channel FRB.gif

Band LTE5 3MHz QPSK	 Band LTE5 3MHz CBE QPSK Low Channel 1RB.gif	 Band LTE5 3MHz CBE QPSK Low Channel FRB.gif
Band LTE5 3MHz QPSK	 Band LTE5 3MHz CBE QPSK High Channel 1RB.gif	 Band LTE5 3MHz CBE QPSK High Channel FRB.gif

Band LTE5 1.4MHz 16QAM	 Band LTE5 1.4MHz CBE 16QAM Low Channel 1RB.gif	 Band LTE5 1.4MHz CBE 16QAM Low Channel FRB.gif
Band LTE5 1.4MHz 16QAM	 Band LTE5 1.4MHz CBE 16QAM High Channel 1RB.gif	 Band LTE5 1.4MHz CBE 16QAM High Channel FRB.gif

Band LTE5 1.4MHz QPSK	 Band LTE5 1.4MHz CBE QPSK Low Channel 1RB.gif	 Band LTE5 1.4MHz CBE QPSK Low Channel FRB.gif
Band LTE5 1.4MHz QPSK	 Band LTE5 1.4MHz CBE QPSK High Channel 1RB.gif	 Band LTE5 1.4MHz CBE QPSK High Channel FRB.gif

10.3. OUT OF BAND EMISSIONS

RULE PART(S)

FCC: §2.1051, §22.901, §22.917, and §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

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 maximum hold mode using a peak detector to ensure that the worst-case emissions were caught.

MODES TESTED

GSM, WCDMA, and LTE

RESULTS

10.3.1. OUT OF BAND EMISSIONS RESULT

GSM

Band	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
GSM 850	GPRS	824.2	-15.40	-13	-2.40
		836.6	-17.12	-13	-4.12
		848.8	-16.67	-13	-3.67
	EGPRS	824.2	-17.30	-13	-4.30
		836.6	-17.43	-13	-4.43
		848.8	-16.38	-13	-3.38
GSM 1900	GPRS	1850.2	-17.45	-13	-4.45
		1880	-17.07	-13	-4.07
		1909.8	-16.93	-13	-3.93
	EGPRS	1850.2	-16.87	-13	-3.87
		1880	-16.33	-13	-3.33
		1909.8	-17.09	-13	-4.09

WCDMA

Band	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
Band 5	REL99	826.4	-17.05	-13	-4.05
		836.6	-17.45	-13	-4.45
		846.6	-17.53	-13	-4.53
	HSDPA	826.4	-17.01	-13	-4.01
		836.6	-17.17	-13	-4.17
		846.6	-17.27	-13	-4.27
Band 4	REL99	1712.4	-27.69	-13	-14.69
		1732.6	-28.46	-13	-15.46
		1752.6	-28.13	-13	-15.13
	HSDPA	1712.4	-28.26	-13	-15.26
		1732.6	-28.08	-13	-15.08
		1752.6	-28.29	-13	-15.29
Band 2	REL99	1852.4	-16.58	-13	-3.58
		1880	-16.99	-13	-3.99
		1907.6	-17.52	-13	-4.52
	HSDPA	1852.4	-17.18	-13	-4.18
		1880	-17.27	-13	-4.27
		1907.6	-16.91	-13	-3.91

LTE Band 2

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE2	20	16QAM	1860	-23.75	-13	-10.75
			1880	-23.71	-13	-10.71
			1900	-23.98	-13	-10.98
		QPSK	1860	-24.40	-13	-11.40
			1880	-23.93	-13	-10.93
			1900	-24.20	-13	-11.20
	15	16QAM	1857.5	-24.18	-13	-11.18
			1880	-23.85	-13	-10.85
			1902.5	-24.04	-13	-11.04
		QPSK	1857.5	-24.31	-13	-11.31
			1880	-23.80	-13	-10.80
			1902.5	-24.04	-13	-11.04
	10	16QAM	1855	-24.21	-13	-11.21
			1880	-23.43	-13	-10.43
			1905	-23.24	-13	-10.24
		QPSK	1855	-24.14	-13	-11.14
			1880	-24.10	-13	-11.10
			1905	-24.31	-13	-11.31
	5	16QAM	1852.5	-24.53	-13	-11.53
			1880	-24.24	-13	-11.24
			1907.5	-23.59	-13	-10.59
		QPSK	1852.5	-23.88	-13	-10.88
			1880	-23.97	-13	-10.97
			1907.5	-24.15	-13	-11.15

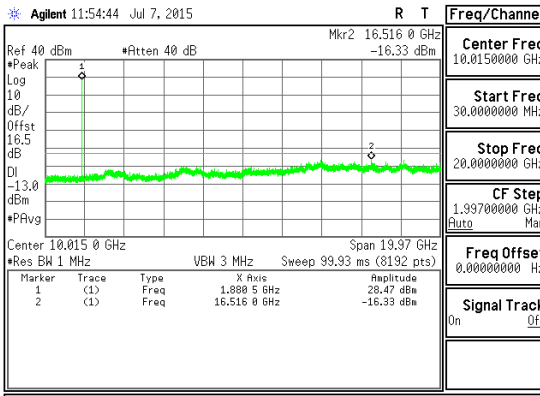
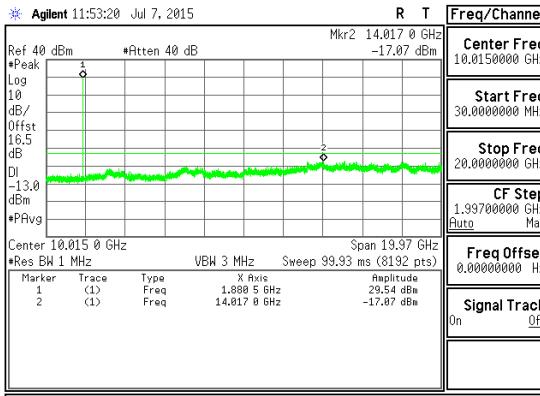
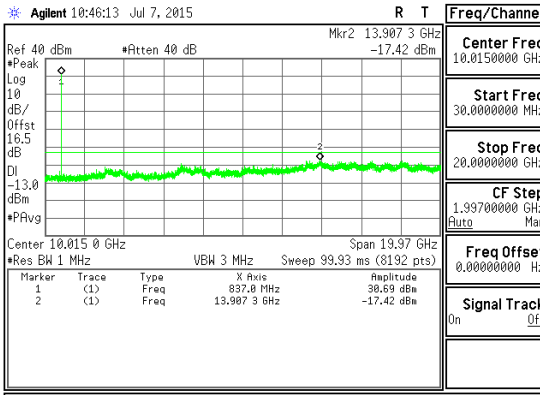
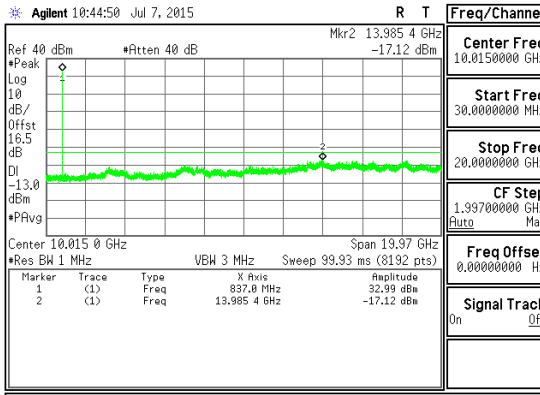
Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE2	3	16QAM	1851.5	-22.15	-13	-9.15
			1880	-21.02	-13	-8.02
			1908.5	-21.85	-13	-8.85
		QPSK	1851.5	-22.21	-13	-9.21
			1880	-21.30	-13	-8.30
			1908.5	-21.63	-13	-8.63
	1.4	16QAM	1850.7	-22.13	-13	-9.13
			1880	-21.83	-13	-8.83
			1909.3	-22.76	-13	-9.76
		QPSK	1850.7	-21.43	-13	-8.43
			1880	-21.56	-13	-8.56
			1909.3	-22.25	-13	-9.25

LTE Band 5

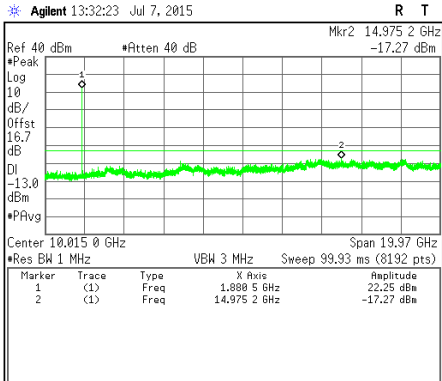
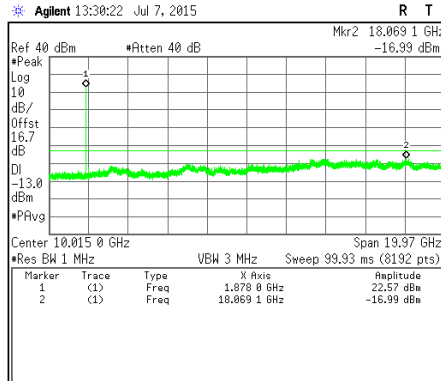
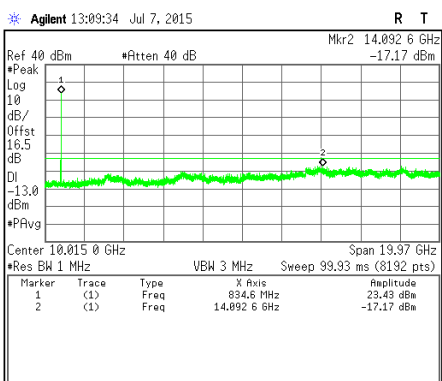
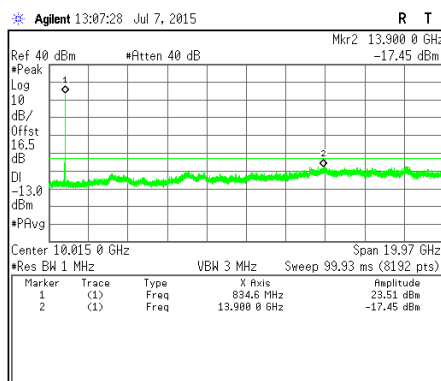
Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE5	10	16QAM	829	-22.44	-13	-9.44
			836.5	-22.52	-13	-9.52
			844	-21.94	-13	-8.94
		QPSK	829	-22.16	-13	-9.16
			836.5	-22.18	-13	-9.18
			844	-22.27	-13	-9.27
	5	16QAM	826.5	-21.92	-13	-8.92
			836.5	-22.31	-13	-9.31
			846.5	-22.49	-13	-9.49
		QPSK	826.5	-22.11	-13	-9.11
			836.5	-21.88	-13	-8.88
			846.5	-22.03	-13	-9.03
	3	16QAM	825.5	-21.34	-13	-8.34
			836.5	-22.16	-13	-9.16
			847.5	-21.37	-13	-8.37
		QPSK	825.5	-22.55	-13	-9.55
			836.5	-22.58	-13	-9.58
			847.5	-21.67	-13	-8.67
	1.4	16QAM	824.7	-22.42	-13	-9.42
			836.5	-21.79	-13	-8.79
			848.3	-21.99	-13	-8.99
		QPSK	824.7	-22.09	-13	-9.09
			836.5	-22.21	-13	-9.21
			848.3	-21.77	-13	-8.77

10.3.2. OUT OF BAND EMISSIONS PLOTS

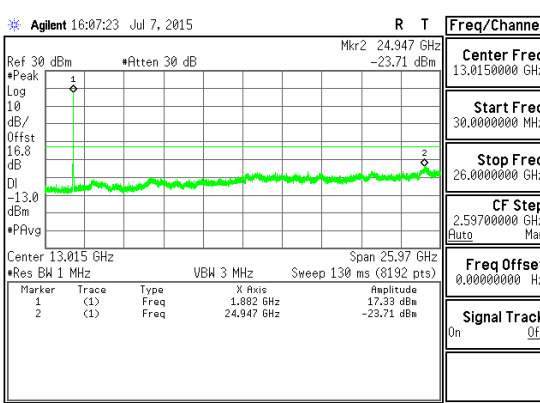
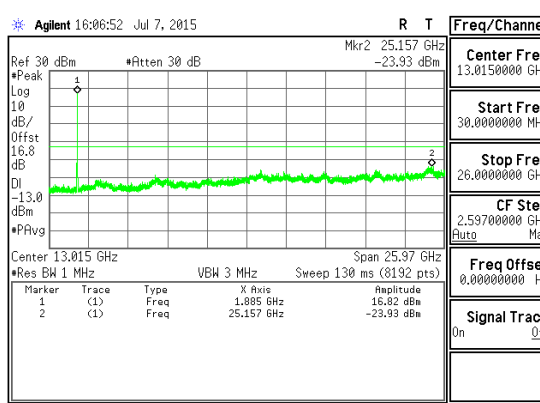
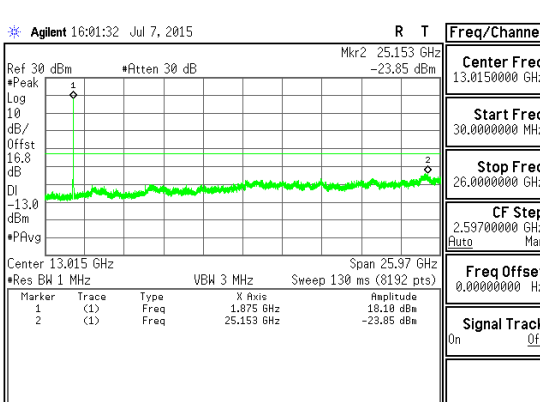
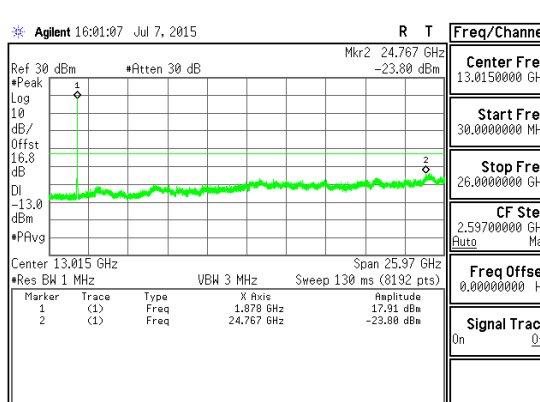
GSM

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Band GSM850	 File Operation Status: C:PICTURE.GIF file saved Band GSM850 EGPRS CSE Mid channel	 File Operation Status: C:PICTURE.GIF file saved Band GSM850 GPRS CSE Mid channel

WCDMA

Band Band 2	Agilent 13:32:23 Jul 7, 2015  Center Freq 10.0150000 GHz Start Freq 30.0000000 MHz Stop Freq 20.0000000 GHz CF Step 1.99700000 GHz Freq Offset 0.00000000 Hz Signal Track On File Operation Status: C:PICTURE.0IF file saved Band WCDMA B2 HSDPA CSE	Agilent 13:30:22 Jul 7, 2015  Center Freq 10.0150000 GHz Start Freq 30.0000000 MHz Stop Freq 20.0000000 GHz CF Step 1.99700000 GHz Freq Offset 0.00000000 Hz Signal Track On File Operation Status: C:PICTURE.0IF file saved Band WCDMA B2 REL99 CSE
Band Band 5	Agilent 13:09:34 Jul 7, 2015  Center Freq 10.0150000 GHz Start Freq 30.0000000 MHz Stop Freq 20.0000000 GHz CF Step 1.99700000 GHz Freq Offset 0.00000000 Hz Signal Track On File Operation Status: C:PICTURE.0IF file saved Band WCDMA B5 HSDPA CSE	Agilent 13:07:28 Jul 7, 2015  Center Freq 10.0150000 GHz Start Freq 30.0000000 MHz Stop Freq 20.0000000 GHz CF Step 1.99700000 GHz Freq Offset 0.00000000 Hz Signal Track On File Operation Status: C:PICTURE.0IF file saved Band WCDMA B5 REL99 CSE

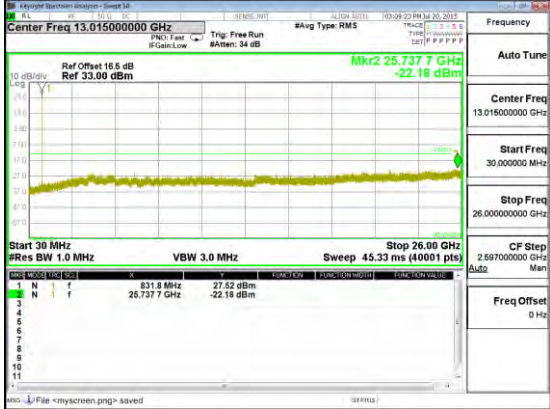
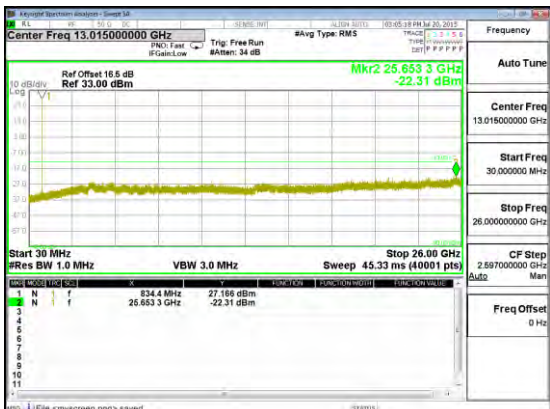
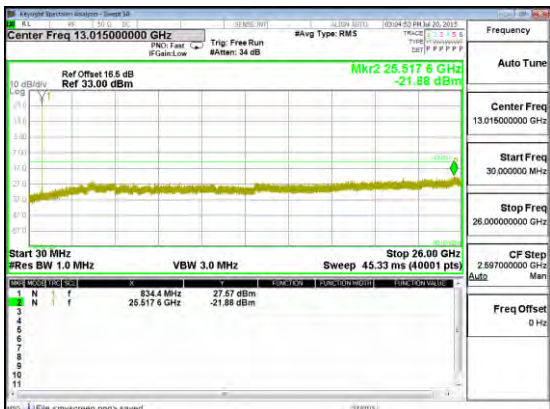
LTE Band 2

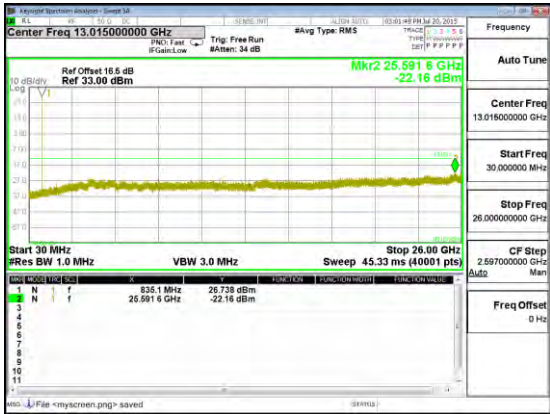
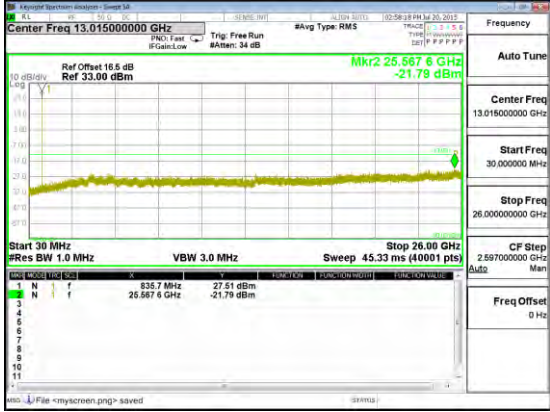
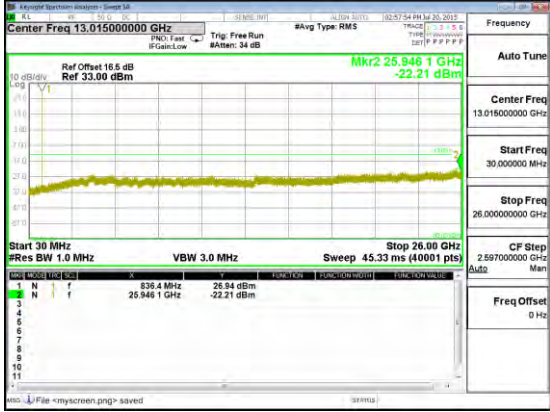
Band LTE2 20MHz	Agilent 16:07:23 Jul 7, 2015  Center Freq 13.0150000 GHz Start Freq 30.0000000 MHz Stop Freq 26.0000000 GHz CF Step 2.59700000 GHz Freq Offset 0.00000000 Hz Signal Track Off File Operation Status: C:PICTURE.6IF file saved Band LTE2 20MHz CSE 16QAM Mid channel	Agilent 16:06:52 Jul 7, 2015  Center Freq 13.0150000 GHz Start Freq 30.0000000 MHz Stop Freq 26.0000000 GHz CF Step 2.59700000 GHz Freq Offset 0.00000000 Hz Signal Track Off File Operation Status: C:PICTURE.6IF file saved Band LTE2 20MHz CSE QPSK Mid channel
Band LTE2 15MHz	Agilent 16:01:32 Jul 7, 2015  Center Freq 13.0150000 GHz Start Freq 30.0000000 MHz Stop Freq 26.0000000 GHz CF Step 2.59700000 GHz Freq Offset 0.00000000 Hz Signal Track Off File Operation Status: C:PICTURE.6IF file saved Band LTE2 15MHz CSE 16QAM Mid channel	Agilent 16:01:07 Jul 7, 2015  Center Freq 13.0150000 GHz Start Freq 30.0000000 MHz Stop Freq 26.0000000 GHz CF Step 2.59700000 GHz Freq Offset 0.00000000 Hz Signal Track Off File Operation Status: C:PICTURE.6IF file saved Band LTE2 15MHz CSE QPSK Mid channel

Band LTE2 10MHz	* Agilent 15:55:19 Jul 7, 2015 R T Freq/Channel Ref 30 dBm *Atten 30 dB Mkr2 25.819 GHz -23.43 dBm Center Freq 13.0150000 GHz Start Freq 30.0000000 MHz Stop Freq 26.0000000 GHz CF Step 2.53700000 GHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off File Operation Status: C:PICTURE.0IF file saved Band LTE2 10MHz CSE 16QAM Mid channel	* Agilent 15:54:54 Jul 7, 2015 R T Freq/Channel Ref 30 dBm *Atten 30 dB Mkr2 24.906 GHz -24.10 dBm Center Freq 13.0150000 GHz Start Freq 30.0000000 MHz Stop Freq 26.0000000 GHz CF Step 2.53700000 GHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off File Operation Status: C:PICTURE.0IF file saved Band LTE2 10MHz CSE QPSK Mid channel
Band LTE2 5MHz	* Agilent 15:49:09 Jul 7, 2015 R T Freq/Channel Ref 30 dBm *Atten 30 dB Mkr2 24.814 GHz -24.24 dBm Center Freq 13.0150000 GHz Start Freq 30.0000000 MHz Stop Freq 26.0000000 GHz CF Step 2.53700000 GHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off File Operation Status: C:PICTURE.0IF file saved Band LTE2 5MHz CSE 16QAM Mid channel	* Agilent 15:48:44 Jul 7, 2015 R T Freq/Channel Ref 30 dBm *Atten 30 dB Mkr2 24.998 GHz -23.97 dBm Center Freq 13.0150000 GHz Start Freq 30.0000000 MHz Stop Freq 26.0000000 GHz CF Step 2.53700000 GHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off File Operation Status: C:PICTURE.0IF file saved Band LTE2 5MHz CSE QPSK Mid channel



LTE Band 5

Band LTE5 10MHz	 Band LTE5 10MHz CSE 16QAM Mid channel	 Band LTE5 10MHz CSE QPSK Mid channel
Band LTE5 5MHz	 Band LTE5 5MHz CSE 16QAM Mid channel	 Band LTE5 5MHz CSE QPSK Mid channel

Band LTE5 3MHz	 Band LTE5 3MHz CSE 16QAM Mid channel	 Band LTE5 3MHz CSE QPSK Mid channel
Band LTE5 1.4MHz	 Band LTE5 1.4MHz CSE 16QAM Mid channel	 Band LTE5 1.4MHz CSE QPSK Mid channel

11. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §22.355, §24.235

LIMITS

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

§24.235 - The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v02r02

MODES TESTED

GSM, WCDMA and LTE

RESULTS

See the following pages.

11.1.1. FREQUENCY STABILITY RESULTS

LTE Band 2, – MID CHANNEL, Frequency 1880 MHz

Reference Frequency: PCS Mid Channel Limit: to stay +/- 2.5 ppm =			1880 4700.000	MHz @ 20°C Hz
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	1880.000007	0.001	2.5
3.80	40	1880.000011	-0.001	2.5
3.80	30	1880.000008	0.001	2.5
3.80	20	1880.000010	0	2.5
3.80	10	1880.000008	0.001	2.5
3.80	0	1880.000009	0.000	2.5
3.80	-10	1880.000008	0.001	2.5
3.80	-20	1880.000006	0.002	2.5
3.80	-30	1880.000008	0.001	2.5

Reference Frequency: PCS Mid Channel			1880	MHz @ 20°C
Limit: to stay +/- 2.5 ppm =			4700.000	Hz
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	20	1880.000010	0	2.5
4.37	20	1880.000007	0.001	2.5
3.23(End of Volt)	20	1880.000004	0.003	2.5

LTE Band 5, – MID CHANNEL, Frequency 836.5 MHz

Reference Frequency: PCS Mid Channel Limit: to stay +/- 2.5 ppm =				
		836.5	MHz @ 20°C	
		2091.250	Hz	
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	836.499995	0.001	2.5
3.80	40	836.500005	-0.012	2.5
3.80	30	836.499995	0.000	2.5
3.80	20	836.499996	0	2.5
3.80	10	836.499997	-0.002	2.5
3.80	0	836.499996	-0.001	2.5
3.80	-10	836.499995	0.000	2.5
3.80	-20	836.499996	-0.001	2.5
3.80	-30	836.499995	0.001	2.5

Reference Frequency: PCS Mid Channel Limit: to stay +/- 2.5 ppm =				
		836.5	MHz @ 20°C	
		2091.250	Hz	
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	20	836.499996	0	2.5
4.37	20	836.4999955	0.000	2.5
3.23(End of Volt)	20	836.4999967	-0.001	2.5

12. RADIATED TEST RESULTS

12.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §22.913, §24.232

LIMITS

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

24.232(c) - Mobile/portable stations are limited to 2 watts e.i.r.p. peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.

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 603C Clause 2.2.17; PSA setting reference to 971168 D01 v02r02

For peak power measurement with a PSA:

a) Set the RBW $\geq$ OBW; b) Set VBW $\geq 3 \times$ RBW; c) Set span $\geq 2 \times$ RBW; d) Sweep time = auto couple; e) Detector = peak; f) Ensure that the number of measurement points $\geq$ 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 $\geq 3 \times$ RBW; d) Set number of points in sweep $\geq 2 \times$ 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.

MODES TESTED

GSM, WCDMA, and LTE

TEST RESULTS

12.1.1. ERP/EIRP Results

GSM

Band	Mode	Channel	f(MHz)	EIRP	
				dBm	mW
GSM1900	GPRS	512	1850.2	30.50	1122.02
		661	1880	29.40	870.96
		810	1909.8	30.0	1000.00
	EGPRS	512	1850.2	29.10	812.83
		661	1880	29.0	794.33
		810	1909.8	28.50	707.95

Band	Mode	Channel	f(MHz)	ERP	
				dBm	mW
GSM850	GPRS	128	824.2	28.56	717.79
		190	836.6	28.74	748.17
		251	848.8	29.50	891.25
	EGPRS	128	824.2	23.92	246.60
		190	836.6	23.77	238.23
		251	848.8	24.0	251.19

WCDMA

Band	Mode	Channel	f(MHz)	EIRP	
				dBm	mW
Band 2	REL99	9262	1852.4	24.21	263.63
		9400	1880	24.51	282.49
		9538	1907.6	24.41	276.06
	HSDPA	9262	1852.4	23.71	234.96
		9400	1880	24.01	251.77
		9538	1907.6	23.91	246.04

Band	Mode	Channel	f(MHz)	ERP	
				dBm	mW
Band 5	REL99	4132	826.4	18.56	71.78
		4183	836.6	18.95	78.52
		4233	846.6	19.53	89.74
	HSDPA	4132	826.4	18.30	67.61
		4183	836.6	18.54	71.45
		4233	846.6	19.30	85.11

12.1.2. LTE ERP/EIRP Results

LTE Band 2

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	EIRP	
					dBm	mW
LTE2	20	QPSK	1/0	1860	18.92	77.98
			1/0	1880	17.90	61.66
			1/0	1900	19.11	81.47
		16QAM	1/0	1860	17.96	62.52
			1/0	1880	16.79	47.75
			1/0	1900	17.80	60.26
	15	QPSK	1/0	1857.5	21.48	140.60
			1/0	1880	19.87	97.05
			1/0	1902.5	20.86	121.90
		16QAM	1/0	1857.5	21.08	128.23
			1/0	1880	19.67	92.68
			1/0	1902.5	20.36	108.64
	10	QPSK	1/0	1855	21.29	134.59
			1/0	1880	19.47	88.51
			1/0	1905	20.67	116.68
		16QAM	1/0	1855	20.49	111.94
			1/0	1880	18.57	71.94
			1/0	1905	19.97	99.31
	5	QPSK	1/0	1852.5	22.19	165.58
			1/0	1880	20.07	101.62
			1/0	1907.5	21.68	147.23
		16QAM	1/0	1852.5	20.89	122.74
			1/0	1880	18.97	78.89
			1/0	1907.5	20.48	111.69

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	EIRP	
					dBm	mW
LTE2	3	QPSK	1/0	1851.5	21.59	144.21
			1/0	1880	20.37	108.89
			1/0	1908.5	20.88	122.46
		16QAM	1/0	1851.5	21.39	137.72
			1/0	1880	19.87	97.05
			1/0	1908.5	21.28	134.28
	1.4	QPSK	1/0	1850.7	22.19	165.58
			1/0	1880	20.67	116.68
			1/0	1909.3	20.78	119.67
		16QAM	1/0	1850.7	21.39	137.72
			1/0	1880	19.97	99.31
			1/0	1909.3	19.78	95.06

LTE Band 5

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP	
					dBm	mW
LTE5	10	QPSK	1/0	829	16.50	44.67
			1/0	836.5	18.60	72.44
			1/0	844	17.70	58.88
		16QAM	1/0	829	15.90	38.90
			1/0	836.5	18.0	63.10
			1/0	844	17.10	51.29
	5	QPSK	1/0	826.5	15.40	34.67
			1/0	836.5	19.10	81.28
			1/0	846.5	15.90	38.90
		16QAM	1/0	826.5	14.90	30.90
			1/0	836.5	18.60	72.44
			1/0	846.5	15.30	33.88
	3	QPSK	1/0	825.5	17.10	51.29
			1/0	836.5	19.30	85.11
			1/0	847.5	18.10	64.57
		16QAM	1/0	825.5	15.60	36.31
			1/0	836.5	18.80	75.86
			1/0	847.5	17.60	57.54
	1.4	QPSK	1/0	824.7	17.70	58.88
			1/0	836.5	19.90	97.72
			1/0	848.3	17.40	54.95
		16QAM	1/0	824.7	17.10	51.29
			1/0	836.5	19.20	83.18
			1/0	848.3	16.20	41.69

12.1.3. ERP/EIRP PLOTS

GSM

Band GSM 1900 EGPRS	High Frequency Substitution Measurement UL Verification Services, Inc. Company: LG Electronics Project #: 15I21604 Date: 8/28/2015 Test Engineer: Jude Semana Configuration: EUT (Y-Position) Location: Chamber C Mode: EGPRS 1900 Test Equipment: Receiving: Horn T119, and Chamber C SMA Cables Substitution: Horn T59, Xft SMA Cable (SN # SERIALNUMBER) Warehouse <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>f MHz</th> <th>SG reading (dBm)</th> <th>Ant. Pol. (H/V)</th> <th>Cable Loss (dB)</th> <th>Antenna Gain (dBi)</th> <th>EIRP (dBm)</th> <th>Limit (dBm)</th> <th>Margin (dB)</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td>Low Ch</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>1850.20</td> <td>18.30</td> <td>V</td> <td>0.9</td> <td>8.0</td> <td>25.40</td> <td>33.0</td> <td>-7.6</td> <td></td> </tr> <tr> <td>1850.20</td> <td>22.00</td> <td>H</td> <td>0.9</td> <td>8.0</td> <td>29.10</td> <td>33.0</td> <td>-3.9</td> <td></td> </tr> <tr> <td>Mid Ch</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>1880.00</td> <td>17.50</td> <td>V</td> <td>0.9</td> <td>8.0</td> <td>24.60</td> <td>33.0</td> <td>-8.4</td> <td></td> </tr> <tr> <td>1880.00</td> <td>21.90</td> <td>H</td> <td>0.9</td> <td>8.0</td> <td>29.00</td> <td>33.0</td> <td>-4.0</td> <td></td> </tr> <tr> <td>High Ch</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>1909.80</td> <td>17.40</td> <td>V</td> <td>0.9</td> <td>8.0</td> <td>24.50</td> <td>33.0</td> <td>-8.5</td> <td></td> </tr> <tr> <td>1909.80</td> <td>21.40</td> <td>H</td> <td>0.9</td> <td>8.0</td> <td>28.50</td> <td>33.0</td> <td>-4.5</td> <td></td> </tr> </tbody> </table> Rev. 3.17.11 Note: For Band 4 EIRP limit is 30dBm	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes	Low Ch									1850.20	18.30	V	0.9	8.0	25.40	33.0	-7.6		1850.20	22.00	H	0.9	8.0	29.10	33.0	-3.9		Mid Ch									1880.00	17.50	V	0.9	8.0	24.60	33.0	-8.4		1880.00	21.90	H	0.9	8.0	29.00	33.0	-4.0		High Ch									1909.80	17.40	V	0.9	8.0	24.50	33.0	-8.5		1909.80	21.40	H	0.9	8.0	28.50	33.0	-4.5	
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Band

GSM

850

EGPRS

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

LG

15I21604

8/27/2015

A. Escamilla

EUT + Charger

Chamber A

EGPRS 850 MHz Fundamentals

Test Equipment:

Receiving: Hybrid T477, and Chamber A SMA Cables

Substitution: Dipole T273, N-type cable (SN # 506392) Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
824.20	17.97	V	0.9	0.0	17.07	38.5	-21.4	
824.20	24.82	H	0.9	0.0	23.92	38.5	-14.6	
Mid Ch								
836.60	18.29	V	0.9	0.0	17.39	38.5	-21.1	
836.60	24.67	H	0.9	0.0	23.77	38.5	-14.7	
High Ch								
848.80	18.27	V	0.9	0.0	17.37	38.5	-21.1	
848.80	24.90	H	0.9	0.0	24.00	38.5	-14.5	

Band GSM 850 GPRS	High Frequency Substitution Measurement UL Verification Services, Inc. Company: LG Project #: 15I21604 Date: 8/27/2015 Test Engineer: A. Escamilla Configuration: EUT + Charger Location: Chamber A Mode: GPRS 850 MHz Fundamentals Test Equipment: Receiving: Hybrid T477, and Chamber A SMA Cables Substitution: Dipole T273, N-type cable (SN # 506392) Warehouse <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th>f MHz</th> <th>SG reading (dBm)</th> <th>Ant. Pol. (H/V)</th> <th>Cable Loss (dB)</th> <th>Antenna Gain (dBd)</th> <th>ERP (dBm)</th> <th>Limit (dBm)</th> <th>Delta (dB)</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td colspan="9">Low Ch</td> </tr> <tr> <td>824.20</td> <td>22.74</td> <td>V</td> <td>0.9</td> <td>0.0</td> <td>21.84</td> <td>38.5</td> <td>-16.7</td> <td></td> </tr> <tr> <td>824.20</td> <td>29.46</td> <td>H</td> <td>0.9</td> <td>0.0</td> <td>28.56</td> <td>38.5</td> <td>-9.9</td> <td></td> </tr> <tr> <td colspan="9">Mid Ch</td> </tr> <tr> <td>836.60</td> <td>23.54</td> <td>V</td> <td>0.9</td> <td>0.0</td> <td>22.64</td> <td>38.5</td> <td>-15.9</td> <td></td> </tr> <tr> <td>836.60</td> <td>29.64</td> <td>H</td> <td>0.9</td> <td>0.0</td> <td>28.74</td> <td>38.5</td> <td>-9.8</td> <td></td> </tr> <tr> <td colspan="9">High Ch</td> </tr> <tr> <td>848.80</td> <td>23.22</td> <td>V</td> <td>0.9</td> <td>0.0</td> <td>22.32</td> <td>38.5</td> <td>-16.2</td> <td></td> </tr> <tr> <td>848.80</td> <td>30.40</td> <td>H</td> <td>0.9</td> <td>0.0</td> <td>29.50</td> <td>38.5</td> <td>-9.0</td> <td></td> </tr> </tbody> </table>	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									824.20	22.74	V	0.9	0.0	21.84	38.5	-16.7		824.20	29.46	H	0.9	0.0	28.56	38.5	-9.9		Mid Ch									836.60	23.54	V	0.9	0.0	22.64	38.5	-15.9		836.60	29.64	H	0.9	0.0	28.74	38.5	-9.8		High Ch									848.80	23.22	V	0.9	0.0	22.32	38.5	-16.2		848.80	30.40	H	0.9	0.0	29.50	38.5	-9.0	
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WCDMA

Band Band 2 HSDPA	High Frequency Substitution Measurement UL Verification Services, Inc. Company: LG Electronics Project #: 15I21604 Date: 8/28/2015 Test Engineer: Jude Semana Configuration: EUT (Y-Position) Location: Chamber C Mode: HSDPA B2 Test Equipment: Receiving: Horn T119, and Chamber C SMA Cables Substitution: Horn T59, Xft SMA Cable (SN # SERIALNUMBER) Warehouse <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>f MHz</th> <th>SG reading (dBm)</th> <th>Ant. Pol. (H/V)</th> <th>Cable Loss (dB)</th> <th>Antenna Gain (dBi)</th> <th>EIRP (dBm)</th> <th>Limit (dBm)</th> <th>Margin (dB)</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td>Low Ch</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>1852.40</td> <td>7.00</td> <td>V</td> <td>0.9</td> <td>8.0</td> <td>14.11</td> <td>33.0</td> <td>-18.9</td> <td></td> </tr> <tr> <td>1852.40</td> <td>16.60</td> <td>H</td> <td>0.9</td> <td>8.0</td> <td>23.71</td> <td>33.0</td> <td>-9.3</td> <td></td> </tr> <tr> <td>Mid Ch</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>1880.00</td> <td>7.20</td> <td>V</td> <td>0.9</td> <td>8.0</td> <td>14.31</td> <td>33.0</td> <td>-18.7</td> <td></td> </tr> <tr> <td>1880.00</td> <td>16.90</td> <td>H</td> <td>0.9</td> <td>8.0</td> <td>24.01</td> <td>33.0</td> <td>-9.0</td> <td></td> </tr> <tr> <td>High Ch</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>1907.60</td> <td>7.50</td> <td>V</td> <td>0.9</td> <td>8.0</td> <td>14.61</td> <td>33.0</td> <td>-18.4</td> <td></td> </tr> <tr> <td>1907.60</td> <td>16.80</td> <td>H</td> <td>0.9</td> <td>8.0</td> <td>23.91</td> <td>33.0</td> <td>-9.1</td> <td></td> </tr> </tbody> </table> Rev. 3.17.11 Note: For Band 4 EIRP limit is 30dBm	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes	Low Ch									1852.40	7.00	V	0.9	8.0	14.11	33.0	-18.9		1852.40	16.60	H	0.9	8.0	23.71	33.0	-9.3		Mid Ch									1880.00	7.20	V	0.9	8.0	14.31	33.0	-18.7		1880.00	16.90	H	0.9	8.0	24.01	33.0	-9.0		High Ch									1907.60	7.50	V	0.9	8.0	14.61	33.0	-18.4		1907.60	16.80	H	0.9	8.0	23.91	33.0	-9.1	
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Band Band 2 REL99	High Frequency Substitution Measurement UL Verification Services, Inc. Company: LG Electronics Project #: 15I21604 Date: 8/28/2015 Test Engineer: Jude Semana Configuration: EUT (Y-Position) Location: Chamber C Mode: REL99 B2 Test Equipment: Receiving: Horn T119, and Chamber C SMA Cables Substitution: Horn T59, Xft SMA Cable (SN # SERIALNUMBER) Warehouse <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="width: 10%;">f MHz</th> <th style="width: 10%;">SG reading (dBm)</th> <th style="width: 10%;">Ant. Pol. (H/V)</th> <th style="width: 10%;">Cable Loss (dB)</th> <th style="width: 10%;">Antenna Gain (dBi)</th> <th style="width: 10%;">EIRP (dBm)</th> <th style="width: 10%;">Limit (dBm)</th> <th style="width: 10%;">Margin (dB)</th> <th style="width: 10%;">Notes</th> </tr> </thead> <tbody> <tr> <td colspan="9">Low Ch</td> </tr> <tr> <td>1852.40</td> <td>7.90</td> <td>V</td> <td>0.9</td> <td>8.0</td> <td>15.01</td> <td>33.0</td> <td>-18.0</td> <td></td> </tr> <tr> <td>1852.40</td> <td>17.10</td> <td>H</td> <td>0.9</td> <td>8.0</td> <td>24.21</td> <td>33.0</td> <td>-8.8</td> <td></td> </tr> <tr> <td colspan="9">Mid Ch</td> </tr> <tr> <td>1880.00</td> <td>7.05</td> <td>V</td> <td>0.9</td> <td>8.0</td> <td>14.16</td> <td>33.0</td> <td>-18.8</td> <td></td> </tr> <tr> <td>1880.00</td> <td>17.40</td> <td>H</td> <td>0.9</td> <td>8.0</td> <td>24.51</td> <td>33.0</td> <td>-8.5</td> <td></td> </tr> <tr> <td colspan="9">High Ch</td> </tr> <tr> <td>1907.60</td> <td>8.10</td> <td>V</td> <td>0.9</td> <td>8.0</td> <td>15.21</td> <td>33.0</td> <td>-17.8</td> <td></td> </tr> <tr> <td>1907.60</td> <td>17.30</td> <td>H</td> <td>0.9</td> <td>8.0</td> <td>24.41</td> <td>33.0</td> <td>-8.6</td> <td></td> </tr> </tbody> </table> Rev. 3.17.11 Note: For Band 4 EIRP limit is 30dBm	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes	Low Ch									1852.40	7.90	V	0.9	8.0	15.01	33.0	-18.0		1852.40	17.10	H	0.9	8.0	24.21	33.0	-8.8		Mid Ch									1880.00	7.05	V	0.9	8.0	14.16	33.0	-18.8		1880.00	17.40	H	0.9	8.0	24.51	33.0	-8.5		High Ch									1907.60	8.10	V	0.9	8.0	15.21	33.0	-17.8		1907.60	17.30	H	0.9	8.0	24.41	33.0	-8.6	
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Band

Band 5

HSDPA

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: LG
Project #: 15I21604
Date: 8/27/2015
Test Engineer: A. Escamilla
Configuration: EUT + Charger
Location: Chamber A
Mode: HSDPA Band 5 Fundamentals

Test Equipment:
Receiving: Hybrid T477, and Chamber A SMA Cables
Substitution: Dipole T273, N-type cable (SN # 506392) Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
826.40	16.80	V	0.9	0.0	15.90	38.5	-22.6	
826.40	19.20	H	0.9	0.0	18.30	38.5	-20.2	
Mid Ch								
836.60	17.02	V	0.9	0.0	16.12	38.5	-22.4	
836.60	19.44	H	0.9	0.0	18.54	38.5	-20.0	
High Ch								
846.60	17.51	V	0.9	0.0	16.61	38.5	-21.9	
846.60	20.20	H	0.9	0.0	19.30	38.5	-19.2	

Band Band 5 REL99	High Frequency Substitution Measurement UL Verification Services, Inc. Company: LG Project #: 15I21604 Date: 8/27/2015 Test Engineer: A. Escamilla Configuration: EUT + Charger Location: Chamber A Mode: Rel99 Band 5 Fundamentals Test Equipment: Receiving: Hybrid T477, and Chamber A SMA Cables Substitution: Dipole T273, N-type cable (SN # 506392) Warehouse <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th>f MHz</th> <th>SG reading (dBm)</th> <th>Ant. Pol. (H/V)</th> <th>Cable Loss (dB)</th> <th>Antenna Gain (dBd)</th> <th>ERP (dBm)</th> <th>Limit (dBm)</th> <th>Delta (dB)</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td colspan="9">Low Ch</td> </tr> <tr> <td>826.40</td> <td>16.69</td> <td>V</td> <td>0.9</td> <td>0.0</td> <td>15.79</td> <td>38.5</td> <td>-22.7</td> <td></td> </tr> <tr> <td>826.40</td> <td>19.46</td> <td>H</td> <td>0.9</td> <td>0.0</td> <td>18.56</td> <td>38.5</td> <td>-19.9</td> <td></td> </tr> <tr> <td colspan="9">Mid Ch</td> </tr> <tr> <td>836.60</td> <td>17.25</td> <td>V</td> <td>0.9</td> <td>0.0</td> <td>16.35</td> <td>38.5</td> <td>-22.2</td> <td></td> </tr> <tr> <td>836.60</td> <td>19.85</td> <td>H</td> <td>0.9</td> <td>0.0</td> <td>18.95</td> <td>38.5</td> <td>-19.6</td> <td></td> </tr> <tr> <td colspan="9">High Ch</td> </tr> <tr> <td>846.60</td> <td>17.46</td> <td>V</td> <td>0.9</td> <td>0.0</td> <td>16.56</td> <td>38.5</td> <td>-21.9</td> <td></td> </tr> <tr> <td>846.60</td> <td>20.43</td> <td>H</td> <td>0.9</td> <td>0.0</td> <td>19.53</td> <td>38.5</td> <td>-19.0</td> <td></td> </tr> </tbody> </table>	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									826.40	16.69	V	0.9	0.0	15.79	38.5	-22.7		826.40	19.46	H	0.9	0.0	18.56	38.5	-19.9		Mid Ch									836.60	17.25	V	0.9	0.0	16.35	38.5	-22.2		836.60	19.85	H	0.9	0.0	18.95	38.5	-19.6		High Ch									846.60	17.46	V	0.9	0.0	16.56	38.5	-21.9		846.60	20.43	H	0.9	0.0	19.53	38.5	-19.0	
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LTE Band 2

Band LTE2 20MHz 16QAM	High Frequency Substitution Measurement UL Verification Services, Inc.																																																																																																
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	Project #: 15I21604																																																																																																
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Band LTE2 20MHz QPSK	High Frequency Substitution Measurement UL Verification Services, Inc. Company: LG Project #: 15I21604 Date: 8/27/2015 Test Engineer: A. Escamilla Configuration: Y-pos EUT + Charger Location: Chamber A Mode: LTE_QPSK Band 2 Fundamentals, 20MHz Bandwidth Test Equipment: Receiving: Horn T136, and Chamber C SMA Cables Substitution: Horn T72, 4ft SMA Cable Warehouse <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th>f MHz</th> <th>SG reading (dBm)</th> <th>Ant. Pol. (H/V)</th> <th>Cable Loss (dB)</th> <th>Antenna Gain (dBi)</th> <th>EIRP (dBm)</th> <th>Limit (dBm)</th> <th>Delta (dB)</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td colspan="9">Low Ch</td> </tr> <tr> <td>1860.00</td> <td>8.05</td> <td>V</td> <td>0.9</td> <td>7.9</td> <td>15.03</td> <td>33.0</td> <td>-18.0</td> <td></td> </tr> <tr> <td>1860.00</td> <td>11.94</td> <td>H</td> <td>0.9</td> <td>7.9</td> <td>18.92</td> <td>33.0</td> <td>-14.1</td> <td></td> </tr> <tr> <td colspan="9">Mid Ch</td> </tr> <tr> <td>1880.00</td> <td>6.93</td> <td>V</td> <td>0.9</td> <td>7.9</td> <td>13.90</td> <td>33.0</td> <td>-19.1</td> <td></td> </tr> <tr> <td>1880.00</td> <td>10.93</td> <td>H</td> <td>0.9</td> <td>7.9</td> <td>17.90</td> <td>33.0</td> <td>-15.1</td> <td></td> </tr> <tr> <td colspan="9">High Ch</td> </tr> <tr> <td>1900.00</td> <td>8.30</td> <td>V</td> <td>0.9</td> <td>7.9</td> <td>15.26</td> <td>33.0</td> <td>-17.7</td> <td></td> </tr> <tr> <td>1900.00</td> <td>12.15</td> <td>H</td> <td>0.9</td> <td>7.9</td> <td>19.11</td> <td>33.0</td> <td>-13.9</td> <td></td> </tr> </tbody> </table>	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									1860.00	8.05	V	0.9	7.9	15.03	33.0	-18.0		1860.00	11.94	H	0.9	7.9	18.92	33.0	-14.1		Mid Ch									1880.00	6.93	V	0.9	7.9	13.90	33.0	-19.1		1880.00	10.93	H	0.9	7.9	17.90	33.0	-15.1		High Ch									1900.00	8.30	V	0.9	7.9	15.26	33.0	-17.7		1900.00	12.15	H	0.9	7.9	19.11	33.0	-13.9	
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Band LTE2 15MHz 16QAM	High Frequency Substitution Measurement UL Verification Services, Inc. Company: LG Electronics Project #: 15I21604 Date: 8/29/2015 Test Engineer: Jude Semana Configuration: EUT (Y-Position) Location: Chamber C Mode: LTE_16QAM Band 2 Fundamentals, 15MHz Bandwidth Test Equipment: Receiving: Horn T119, and Chamber C SMA Cables Substitution: Horn T60, 4ft SMA Cable Warehouse <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th>f MHz</th> <th>SG reading (dBm)</th> <th>Ant. Pol. (H/V)</th> <th>Cable Loss (dB)</th> <th>Antenna Gain (dBi)</th> <th>EIRP (dBm)</th> <th>Limit (dBm)</th> <th>Delta (dB)</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td colspan="9">Low Ch</td> </tr> <tr> <td>1857.50</td> <td>12.30</td> <td>V</td> <td>0.9</td> <td>7.9</td> <td>19.28</td> <td>33.0</td> <td>-13.7</td> <td></td> </tr> <tr> <td>1857.50</td> <td>14.10</td> <td>H</td> <td>0.9</td> <td>7.9</td> <td>21.08</td> <td>33.0</td> <td>-11.9</td> <td></td> </tr> <tr> <td colspan="9">Mid Ch</td> </tr> <tr> <td>1880.00</td> <td>10.10</td> <td>V</td> <td>0.9</td> <td>7.9</td> <td>17.07</td> <td>33.0</td> <td>-15.9</td> <td></td> </tr> <tr> <td>1880.00</td> <td>12.70</td> <td>H</td> <td>0.9</td> <td>7.9</td> <td>19.67</td> <td>33.0</td> <td>-13.3</td> <td></td> </tr> <tr> <td colspan="9">High Ch</td> </tr> <tr> <td>1902.50</td> <td>10.90</td> <td>V</td> <td>0.9</td> <td>7.9</td> <td>17.86</td> <td>33.0</td> <td>-15.1</td> <td></td> </tr> <tr> <td>1902.50</td> <td>13.40</td> <td>H</td> <td>0.9</td> <td>7.9</td> <td>20.36</td> <td>33.0</td> <td>-12.6</td> <td></td> </tr> </tbody> </table>	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									1857.50	12.30	V	0.9	7.9	19.28	33.0	-13.7		1857.50	14.10	H	0.9	7.9	21.08	33.0	-11.9		Mid Ch									1880.00	10.10	V	0.9	7.9	17.07	33.0	-15.9		1880.00	12.70	H	0.9	7.9	19.67	33.0	-13.3		High Ch									1902.50	10.90	V	0.9	7.9	17.86	33.0	-15.1		1902.50	13.40	H	0.9	7.9	20.36	33.0	-12.6	
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Band LTE2 15MHz QPSK	High Frequency Substitution Measurement UL Verification Services, Inc. Company: LG Electronics Project #: 15I21604 Date: 8/29/2015 Test Engineer: Jude Semana Configuration: EUT (Y-Position) Location: Chamber C Mode: LTE_QPSK Band 2 Fundamentals, 15MHz Bandwidth Test Equipment: Receiving: Horn T119, and Chamber C SMA Cables Substitution: Horn T60, 4ft SMA Cable Warehouse <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th>f MHz</th> <th>SG reading (dBm)</th> <th>Ant. Pol. (H/V)</th> <th>Cable Loss (dB)</th> <th>Antenna Gain (dBi)</th> <th>EIRP (dBm)</th> <th>Limit (dBm)</th> <th>Delta (dB)</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td colspan="9">Low Ch</td> </tr> <tr> <td>1857.50</td> <td>11.70</td> <td>V</td> <td>0.9</td> <td>7.9</td> <td>18.68</td> <td>33.0</td> <td>-14.3</td> <td></td> </tr> <tr> <td>1857.50</td> <td>14.50</td> <td>H</td> <td>0.9</td> <td>7.9</td> <td>21.48</td> <td>33.0</td> <td>-11.5</td> <td></td> </tr> <tr> <td colspan="9">Mid Ch</td> </tr> <tr> <td>1880.00</td> <td>10.60</td> <td>V</td> <td>0.9</td> <td>7.9</td> <td>17.57</td> <td>33.0</td> <td>-15.4</td> <td></td> </tr> <tr> <td>1880.00</td> <td>12.90</td> <td>H</td> <td>0.9</td> <td>7.9</td> <td>19.87</td> <td>33.0</td> <td>-13.1</td> <td></td> </tr> <tr> <td colspan="9">High Ch</td> </tr> <tr> <td>1902.50</td> <td>11.50</td> <td>V</td> <td>0.9</td> <td>7.9</td> <td>18.46</td> <td>33.0</td> <td>-14.5</td> <td></td> </tr> <tr> <td>1902.50</td> <td>13.90</td> <td>H</td> <td>0.9</td> <td>7.9</td> <td>20.86</td> <td>33.0</td> <td>-12.1</td> <td></td> </tr> </tbody> </table>	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									1857.50	11.70	V	0.9	7.9	18.68	33.0	-14.3		1857.50	14.50	H	0.9	7.9	21.48	33.0	-11.5		Mid Ch									1880.00	10.60	V	0.9	7.9	17.57	33.0	-15.4		1880.00	12.90	H	0.9	7.9	19.87	33.0	-13.1		High Ch									1902.50	11.50	V	0.9	7.9	18.46	33.0	-14.5		1902.50	13.90	H	0.9	7.9	20.86	33.0	-12.1	
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Band LTE2 10MHz QPSK	High Frequency Substitution Measurement UL Verification Services, Inc. Company: LG Electronics Project #: 15I21604 Date: 8/28/2015 Test Engineer: Jude Semana Configuration: EUT (Y-Position) Location: Chamber C Mode: LTE_QPSK Band 2 Fundamentals, 10MHz Bandwidth Test Equipment: Receiving: Horn T119, and Chamber C SMA Cables Substitution: Horn T72, 4ft SMA Cable Warehouse <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th>f MHz</th> <th>SG reading (dBm)</th> <th>Ant. Pol. (H/V)</th> <th>Cable Loss (dB)</th> <th>Antenna Gain (dBi)</th> <th>EIRP (dBm)</th> <th>Limit (dBm)</th> <th>Delta (dB)</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td colspan="9">Low Ch</td> </tr> <tr> <td>1855.00</td> <td>11.70</td> <td>V</td> <td>0.9</td> <td>7.9</td> <td>18.69</td> <td>33.0</td> <td>-14.3</td> <td></td> </tr> <tr> <td>1855.00</td> <td>14.30</td> <td>H</td> <td>0.9</td> <td>7.9</td> <td>21.29</td> <td>33.0</td> <td>-11.7</td> <td></td> </tr> <tr> <td colspan="9">Mid Ch</td> </tr> <tr> <td>1880.00</td> <td>9.80</td> <td>V</td> <td>0.9</td> <td>7.9</td> <td>16.77</td> <td>33.0</td> <td>-16.2</td> <td></td> </tr> <tr> <td>1880.00</td> <td>12.50</td> <td>H</td> <td>0.9</td> <td>7.9</td> <td>19.47</td> <td>33.0</td> <td>-13.5</td> <td></td> </tr> <tr> <td colspan="9">High Ch</td> </tr> <tr> <td>1905.00</td> <td>10.80</td> <td>V</td> <td>0.9</td> <td>7.9</td> <td>17.77</td> <td>33.0</td> <td>-15.2</td> <td></td> </tr> <tr> <td>1905.00</td> <td>13.70</td> <td>H</td> <td>0.9</td> <td>7.9</td> <td>20.67</td> <td>33.0</td> <td>-12.3</td> <td></td> </tr> </tbody> </table>	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	Low Ch									1855.00	11.70	V	0.9	7.9	18.69	33.0	-14.3		1855.00	14.30	H	0.9	7.9	21.29	33.0	-11.7		Mid Ch									1880.00	9.80	V	0.9	7.9	16.77	33.0	-16.2		1880.00	12.50	H	0.9	7.9	19.47	33.0	-13.5		High Ch									1905.00	10.80	V	0.9	7.9	17.77	33.0	-15.2		1905.00	13.70	H	0.9	7.9	20.67	33.0	-12.3	
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Band

LTE2

5MHz

16QAM

High Frequency Substitution Measurement

UL Verification Services, Inc.

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Test Equipment:

Receiving: Horn T119, and Chamber C SMA Cables

Substitution: Horn T72, 4ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1852.50	11.00	V	0.9	7.9	17.99	33.0	-15.0	
1852.50	13.90	H	0.9	7.9	20.89	33.0	-12.1	
Mid Ch								
1880.00	9.40	V	0.9	7.9	16.37	33.0	-16.6	
1880.00	12.00	H	0.9	7.9	18.97	33.0	-14.0	
High Ch								
1907.50	10.80	V	0.9	7.9	17.78	33.0	-15.2	
1907.50	13.50	H	0.9	7.9	20.48	33.0	-12.5	

Band

LTE2

5MHz

QPSK

High Frequency Substitution Measurement

UL Verification Services, Inc.

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

LG Electronics

15I21604

8/28/2015

Jude Semana

EUT (Y-Position)

Chamber C

LTE_QPSK Band 2 Fundamentals, 5MHz Bandwidth

Test Equipment:

Receiving: Horn T119, and Chamber C SMA Cables

Substitution: Horn T72, 4ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1852.50	11.10	V	0.9	7.9	18.09	33.0	-14.9	
1852.50	15.20	H	0.9	7.9	22.19	33.0	-10.8	
Mid Ch								
1880.00	10.20	V	0.9	7.9	17.17	33.0	-15.8	
1880.00	13.10	H	0.9	7.9	20.07	33.0	-12.9	
High Ch								
1907.50	12.20	V	0.9	7.9	19.18	33.0	-13.8	
1907.50	14.70	H	0.9	7.9	21.68	33.0	-11.3	

Band

LTE2

3MHz

16QAM

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: LG Electronics

Project #: 15I21604

Date: 8/28/2015

Test Engineer: Jude Semana

Configuration: EUT (Y-Position)

Location: Chamber C

Mode: LTE_16QAM Band 2 Fundamentals, 3MHz Bandwidth

Test Equipment:

Receiving: Horn T119, and Chamber C SMA Cables

Substitution: Horn T72, 4ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1851.50	11.40	V	0.9	7.9	18.39	33.0	-14.6	
1851.50	14.40	H	0.9	7.9	21.39	33.0	-11.6	
Mid Ch								
1880.00	9.90	V	0.9	7.9	16.87	33.0	-16.1	
1880.00	12.90	H	0.9	7.9	19.87	33.0	-13.1	
High Ch								
1908.50	11.50	V	0.9	7.9	18.48	33.0	-14.5	
1908.50	14.30	H	0.9	7.9	21.28	33.0	-11.7	

Band

LTE2

3MHz

QPSK

High Frequency Substitution Measurement

UL Verification Services, Inc.

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

LG Electronics

15I21604

8/28/2015

Jude Semana

EUT (Y-Position)

Chamber C

LTE_QPSK Band 2 Fundamentals, 3MHz Bandwidth

Test Equipment:

Receiving: Horn T119, and Chamber C SMA Cables

Substitution: Horn T72, 4ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1851.50	12.00	V	0.9	7.9	18.99	33.0	-14.0	
1851.50	14.60	H	0.9	7.9	21.59	33.0	-11.4	
Mid Ch								
1880.00	10.60	V	0.9	7.9	17.57	33.0	-15.4	
1880.00	13.40	H	0.9	7.9	20.37	33.0	-12.6	
High Ch								
1908.50	11.20	V	0.9	7.9	18.18	33.0	-14.8	
1908.50	13.90	H	0.9	7.9	20.88	33.0	-12.1	

Band

LTE2

1.4MHz

16QAM

High Frequency Substitution Measurement

UL Verification Services, Inc.

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

LG Electronics

15I21604

8/28/2015

Jude Semana

EUT (Y-Position)

Chamber C

LTE_16QAM Band 2 Fundamentals, 1.4MHz Bandwidth

Test Equipment:

Receiving: Horn T119, and Chamber C SMA Cables

Substitution: Horn T72, 4ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1850.70	11.40	V	0.9	7.9	18.39	33.0	-14.6	
1850.70	14.40	H	0.9	7.9	21.39	33.0	-11.6	
Mid Ch								
1880.00	9.90	V	0.9	7.9	16.87	33.0	-16.1	
1880.00	13.00	H	0.9	7.9	19.97	33.0	-13.0	
High Ch								
1909.30	10.20	V	0.9	7.9	17.18	33.0	-15.8	
1909.30	12.80	H	0.9	7.9	19.78	33.0	-13.2	

Band

LTE2

1.4MHz

QPSK

High Frequency Substitution Measurement

UL Verification Services, Inc.

Company:

Project #:

Date:

Test Engineer:

Configuration:

Location:

Mode:

Test Equipment:

Receiving: Horn T119, and Chamber C SMA Cables

Substitution: Horn T72, 4ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1850.70	12.20	V	0.9	7.9	19.19	33.0	-13.8	
1850.70	15.20	H	0.9	7.9	22.19	33.0	-10.8	
Mid Ch								
1880.00	10.80	V	0.9	7.9	17.77	33.0	-15.2	
1880.00	13.70	H	0.9	7.9	20.67	33.0	-12.3	
High Ch								
1909.30	10.90	V	0.9	7.9	17.88	33.0	-15.1	
1909.30	13.80	H	0.9	7.9	20.78	33.0	-12.2	

LTE Band 5

Band LTE5 10MHz 16QAM	High Frequency Substitution Measurement UL Verification Services, Inc. Company: LG Electronics Project #: 15I21604 Date: 08/29/15 Test Engineer: Jude Semana Configuration: EUT Only Mode: LTE5 10MHz 16QAM Test Equipment: Receiving: Sunol T185 and 3m Chamber C N-type Cable Substitution: Dipole T416, 4ft SMA Cable Warehouse. <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th>f MHz</th> <th>SG reading (dBm)</th> <th>Ant. Pol. (H/V)</th> <th>Cable Loss (dB)</th> <th>Antenna Gain (dBd)</th> <th>ERP (dBm)</th> <th>Limit (dBm)</th> <th>Margin (dB)</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td colspan="9">Low Ch</td> </tr> <tr> <td>829.00</td> <td>12.00</td> <td>V</td> <td>0.9</td> <td></td> <td>11.10</td> <td>38.5</td> <td>-27.4</td> <td></td> </tr> <tr> <td>829.00</td> <td>16.80</td> <td>H</td> <td>0.9</td> <td></td> <td>15.90</td> <td>38.5</td> <td>-22.6</td> <td></td> </tr> <tr> <td colspan="9">Mid Ch</td> </tr> <tr> <td>836.50</td> <td>14.30</td> <td>V</td> <td>0.9</td> <td></td> <td>13.40</td> <td>38.5</td> <td>-25.1</td> <td></td> </tr> <tr> <td>836.50</td> <td>18.90</td> <td>H</td> <td>0.9</td> <td></td> <td>18.00</td> <td>38.5</td> <td>-20.5</td> <td></td> </tr> <tr> <td colspan="9">High Ch</td> </tr> <tr> <td>844.00</td> <td>15.50</td> <td>V</td> <td>0.9</td> <td></td> <td>14.60</td> <td>38.5</td> <td>-23.9</td> <td></td> </tr> <tr> <td>844.00</td> <td>18.00</td> <td>H</td> <td>0.9</td> <td></td> <td>17.10</td> <td>38.5</td> <td>-21.4</td> <td></td> </tr> </tbody> </table> Rev. 3.17.11 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes	Low Ch									829.00	12.00	V	0.9		11.10	38.5	-27.4		829.00	16.80	H	0.9		15.90	38.5	-22.6		Mid Ch									836.50	14.30	V	0.9		13.40	38.5	-25.1		836.50	18.90	H	0.9		18.00	38.5	-20.5		High Ch									844.00	15.50	V	0.9		14.60	38.5	-23.9		844.00	18.00	H	0.9		17.10	38.5	-21.4	
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes																																																																																			
Low Ch																																																																																											
829.00	12.00	V	0.9		11.10	38.5	-27.4																																																																																				
829.00	16.80	H	0.9		15.90	38.5	-22.6																																																																																				
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Band LTE5 10MHz QPSK	High Frequency Substitution Measurement UL Verification Services, Inc.								
	Company:		LG Electronics						
	Project #:		15I21604						
	Date:		08/29/15						
	Test Engineer:		Jude Semana						
	Configuration:		EUT Only						
	Mode:		LTE5 10MHz QPSK						
	Test Equipment:								
	Receiving: Sunol T185 and 3m Chamber C N-type Cable								
	Substitution: Dipole T416, 4ft SMA Cable Warehouse.								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
	Low Ch								
	829.00	12.60	V	0.9		11.70	38.5	-26.8	
	829.00	17.40	H	0.9		16.50	38.5	-22.0	
	Mid Ch								
	836.50	15.90	V	0.9		15.00	38.5	-23.5	
	836.50	19.50	H	0.9		18.60	38.5	-19.9	
	High Ch								
	844.00	15.00	V	0.9		14.10	38.5	-24.4	
	844.00	18.60	H	0.9		17.70	38.5	-20.8	
Rev. 3.17.11 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm									

Band

LTE5

5MHz

16QAM

High Frequency Substitution Measurement

UL Verification Services, Inc.

Company:

Project #:

Date:

Test Engineer:

Configuration:

Mode:

LG Electronics

15I21604

08/29/15

Jude Semana

EUT Only

LTE5 5MHz 16QAM

Test Equipment:

Receiving: Sunol T185 and 3m Chamber C N-type Cable

Substitution: Dipole T416, 4ft SMA Cable Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
826.50	11.40	V	0.9		10.50	38.5	-28.0	
826.50	15.80	H	0.9		14.90	38.5	-23.6	
Mid Ch								
836.50	15.70	V	0.9		14.80	38.5	-23.7	
836.50	19.50	H	0.9		18.60	38.5	-19.9	
High Ch								
846.50	12.70	V	0.9		11.80	38.5	-26.7	
846.50	16.20	H	0.9		15.30	38.5	-23.2	

Rev. 3.17.11

Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm

Band

LTE5

5MHz

QPSK

High Frequency Substitution Measurement

UL Verification Services, Inc.

Company:

Project #:

Date:

Test Engineer:

Configuration:

Mode:

Test Equipment:

Receiving: Sunol T185 and 3m Chamber C N-type Cable

Substitution: Dipole T416, 4ft SMA Cable Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
826.50	11.80	V	0.9		10.90	38.5	-27.6	
826.50	16.30	H	0.9		15.40	38.5	-23.1	
Mid Ch								
836.50	16.20	V	0.9		15.30	38.5	-23.2	
836.50	20.00	H	0.9		19.10	38.5	-19.4	
High Ch								
846.50	13.30	V	0.9		12.40	38.5	-26.1	
846.50	16.80	H	0.9		15.90	38.5	-22.6	

Rev. 3.17.11

Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm

Band

LTE5

3MHz

16QAM

High Frequency Substitution Measurement

UL Verification Services, Inc. Chamber

Company:

Project #:

Date:

Test Engineer:

Configuration:

Mode:

Test Equipment:

Receiving: Sunol T185 and 3m Chamber C N-type Cable

Substitution: Dipole T416, 4ft SMA Cable Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
825.50	11.90	V	0.9		11.00	38.5	-27.5	
825.50	16.50	H	0.9		15.60	38.5	-22.9	
Mid Ch								
836.50	14.70	V	0.9		13.80	38.5	-24.7	
836.50	19.70	H	0.9		18.80	38.5	-19.7	
High Ch								
847.50	14.90	V	0.9		14.00	38.5	-24.5	
847.50	18.50	H	0.9		17.60	38.5	-20.9	

Rev. 3.17.11

Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm

Band

LTE5

3MHz

QPSK

High Frequency Substitution Measurement

UL Verification Services, Inc.

Company:

Project #:

Date:

Test Engineer:

Configuration:

Mode:

LG Electronics

15I21604

08/29/15

Jude Semana

EUT Only

LTE5 3MHz QPSK

Test Equipment:

Receiving: Sunol T185 and 3m Chamber C N-type Cable

Substitution: Dipole T416, 4ft SMA Cable Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
825.50	13.00	V	0.9		12.10	38.5	-26.4	
825.50	18.00	H	0.9		17.10	38.5	-21.4	
Mid Ch								
836.50	15.60	V	0.9		14.70	38.5	-23.8	
836.50	20.20	H	0.9		19.30	38.5	-19.2	
High Ch								
847.50	15.40	V	0.9		14.50	38.5	-24.0	
847.50	19.00	H	0.9		18.10	38.5	-20.4	

Rev. 3.17.11

Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm

Band

LTE5

1.4MHz

16QAM

High Frequency Substitution Measurement

UL Verification Services, Inc.

Company:

Project #:

Date:

Test Engineer:

Configuration:

Mode:

LG Electronics

15I21604

08/29/15

Jude Semana

EUT Only X Position

LTE5 1.4MHz 16QAM

Test Equipment:

Receiving: Sunol T185 and 3m Chamber C N-type Cable

Substitution: Dipole T416, 4ft SMA Cable Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
824.70	13.50	V	0.9		12.60	38.5	-25.9	
824.70	18.00	H	0.9		17.10	38.5	-21.4	
Mid Ch								
836.50	15.60	V	0.9		14.70	38.5	-23.8	
836.50	20.10	H	0.9		19.20	38.5	-19.3	
High Ch								
848.30	14.10	V	0.9		13.20	38.5	-25.3	
848.30	17.10	H	0.9		16.20	38.5	-22.3	

Rev. 3.17.11

Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm

Band

LTE5

1.4MHz

QPSK

High Frequency Substitution Measurement

UL Verification Services, Inc.

Company:

Project #:

Date:

Test Engineer:

Configuration:

Mode:

LG Electronics

15I21604

08/29/15

Jude Semana

EUT Only X Position

LTE5 1.4MHz QPSK

Test Equipment:

Receiving: Sunol T185 and 3m Chamber C N-type Cable

Substitution: Dipole T416, 4ft SMA Cable Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
824.70	14.10	V	0.9		13.20	38.5	-25.3	
824.70	18.60	H	0.9		17.70	38.5	-20.8	
Mid Ch								
836.50	16.50	V	0.9		15.60	38.5	-22.9	
836.50	20.80	H	0.9		19.90	38.5	-18.6	
High Ch								
848.30	14.60	V	0.9		13.70	38.5	-24.8	
848.30	18.30	H	0.9		17.40	38.5	-21.1	

Rev. 3.17.11

Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm

12.2. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

FCC: §2.1053, §22.917, §24.238

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.

MODES TESTED

GSM, WCDMA, and LTE

RESULTS

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement Company: LG Project #: 15I21604 Date: 8/30/2015 Test Engineer: D. Mun Configuration: EUT + AC Adapter Location: Chamber B Mode: GPRS 1900 MHz Harmonics									
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1850.2									
3700.40	-21.6	V	3.0	35.9	1.0	-56.5	-13.0	-43.5	
5550.60	-16.0	V	3.0	35.5	1.0	-50.5	-13.0	-37.5	
7400.80	-11.0	V	3.0	35.7	1.0	-45.8	-13.0	-32.8	
3700.40	-21.0	H	3.0	35.9	1.0	-55.9	-13.0	-42.9	
5550.60	-15.2	H	3.0	35.5	1.0	-49.6	-13.0	-36.6	
7400.80	-8.9	H	3.0	35.7	1.0	-43.6	-13.0	-30.6	
Mid Ch, 1880									
3760.00	-19.4	V	3.0	35.8	1.0	-54.2	-13.0	-41.2	
5640.00	-15.9	V	3.0	35.5	1.0	-50.4	-13.0	-37.4	
7520.00	-9.6	V	3.0	35.7	1.0	-44.3	-13.0	-31.3	
3760.00	-19.9	H	3.0	35.8	1.0	-54.7	-13.0	-41.7	
5640.00	-14.0	H	3.0	35.5	1.0	-48.5	-13.0	-35.5	
7520.00	-8.1	H	3.0	35.7	1.0	-42.8	-13.0	-29.8	
High Ch, 1909.8									
3819.60	-20.8	V	3.0	35.8	1.0	-55.5	-13.0	-42.5	
5729.40	-16.0	V	3.0	35.5	1.0	-50.5	-13.0	-37.5	
7639.20	-9.2	V	3.0	35.8	1.0	-44.0	-13.0	-31.0	
3819.60	-21.0	H	3.0	35.8	1.0	-55.8	-13.0	-42.8	
5729.40	-15.4	H	3.0	35.5	1.0	-49.9	-13.0	-36.9	
7639.20	-10.9	H	3.0	35.8	1.0	-45.6	-13.0	-32.6	

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement Company: LG Project #: 15I21604 Date: 8/30/2015 Test Engineer: D. Mun Configuration: EUT + AC Adapter Location: Chamber B Mode: EGPRS 850 MHz Harmonics									
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamplifier (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 824.2									
1648.40	-25.2	V	3.0	37.0	1.0	-61.3	-13.0	-48.3	
2472.60	-23.3	V	3.0	36.4	1.0	-58.7	-13.0	-45.7	
3296.80	-19.1	V	3.0	36.2	1.0	-54.3	-13.0	-41.3	
1648.40	-25.0	H	3.0	37.0	1.0	-61.0	-13.0	-48.0	
2472.60	-25.8	H	3.0	36.4	1.0	-61.2	-13.0	-48.2	
3296.80	-18.9	H	3.0	36.2	1.0	-54.1	-13.0	-41.1	
Mid Ch, 836.6									
1673.20	-26.6	V	3.0	37.0	1.0	-62.6	-13.0	-49.6	
2509.80	-23.5	V	3.0	36.4	1.0	-58.9	-13.0	-45.9	
3346.40	-19.3	V	3.0	36.1	1.0	-54.4	-13.0	-41.4	
1673.20	-24.7	H	3.0	37.0	1.0	-60.7	-13.0	-47.7	
2509.80	-25.7	H	3.0	36.4	1.0	-61.1	-13.0	-48.1	
3346.40	-20.2	H	3.0	36.1	1.0	-55.4	-13.0	-42.4	
High Ch, 848.8									
1697.60	-26.7	V	3.0	37.0	1.0	-62.6	-13.0	-49.6	
2546.40	-20.8	V	3.0	36.4	1.0	-56.3	-13.0	-43.3	
3395.20	-21.3	V	3.0	36.1	1.0	-56.4	-13.0	-43.4	
1697.60	-24.0	H	3.0	37.0	1.0	-59.9	-13.0	-46.9	
2546.40	-24.9	H	3.0	36.4	1.0	-60.3	-13.0	-47.3	
3395.20	-22.7	H	3.0	36.1	1.0	-57.7	-13.0	-44.7	

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement Company: LG Project #: 15I21604 Date: 8/30/2015 Test Engineer: D. Mun Configuration: EUT + AC Adapter Location: Chamber B Mode: GPRS 850 MHz Harmonics									
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamplifier (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 824.2									
1648.40	-25.4	V	3.0	37.0	1.0	-61.5	-13.0	-48.5	
2472.60	-23.6	V	3.0	36.4	1.0	-59.1	-13.0	-46.1	
3296.80	-19.5	V	3.0	36.2	1.0	-54.7	-13.0	-41.7	
1648.40	-25.3	H	3.0	37.0	1.0	-61.3	-13.0	-48.3	
2472.60	-25.9	H	3.0	36.4	1.0	-61.4	-13.0	-48.4	
3296.80	-19.1	H	3.0	36.2	1.0	-54.3	-13.0	-41.3	
Mid Ch, 836.6									
1673.20	-26.7	V	3.0	37.0	1.0	-62.7	-13.0	-49.7	
2509.80	-23.7	V	3.0	36.4	1.0	-59.1	-13.0	-46.1	
3346.40	-19.8	V	3.0	36.1	1.0	-54.9	-13.0	-41.9	
1673.20	-24.9	H	3.0	37.0	1.0	-60.9	-13.0	-47.9	
2509.80	-25.8	H	3.0	36.4	1.0	-61.2	-13.0	-48.2	
3346.40	-21.8	H	3.0	36.1	1.0	-56.9	-13.0	-43.9	
High Ch, 848.8									
1697.60	-26.8	V	3.0	37.0	1.0	-62.7	-13.0	-49.7	
2546.40	-21.0	V	3.0	36.4	1.0	-56.5	-13.0	-43.5	
3395.20	-21.8	V	3.0	36.1	1.0	-56.8	-13.0	-43.8	
1697.60	-24.3	H	3.0	37.0	1.0	-60.3	-13.0	-47.3	
2546.40	-26.1	H	3.0	36.4	1.0	-61.5	-13.0	-48.5	
3395.20	-22.8	H	3.0	36.1	1.0	-57.9	-13.0	-44.9	

WCDMA

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement Company: LG Project #: 15I21604 Date: 8/30/2015 Test Engineer: D. Mun Configuration: EUT + AC Adapter Location: Chamber B Mode: HSDPA Band 2 Harmonics									
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamplifier (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1852.4									
3704.80	-18.9	V	3.0	35.9	1.0	-53.7	-13.0	-40.7	
5557.20	-17.3	V	3.0	35.5	1.0	-51.8	-13.0	-38.8	
7409.60	-16.6	V	3.0	35.7	1.0	-51.4	-13.0	-38.4	
3704.80	-18.9	H	3.0	35.9	1.0	-53.7	-13.0	-40.7	
5557.20	-16.2	H	3.0	35.5	1.0	-50.7	-13.0	-37.7	
7409.60	-14.4	H	3.0	35.7	1.0	-49.2	-13.0	-36.2	
Mid Ch, 1880									
3760.00	-18.0	V	3.0	35.8	1.0	-52.8	-13.0	-39.8	
5640.00	-16.1	V	3.0	35.5	1.0	-50.6	-13.0	-37.6	
7520.00	-16.3	V	3.0	35.7	1.0	-51.0	-13.0	-38.0	
3760.00	-18.0	H	3.0	35.8	1.0	-52.8	-13.0	-39.8	
5640.00	-16.0	H	3.0	35.5	1.0	-50.5	-13.0	-37.5	
7520.00	-14.6	H	3.0	35.7	1.0	-49.3	-13.0	-36.3	
High Ch, 1907.6									
3815.20	-18.3	V	3.0	35.8	1.0	-53.0	-13.0	-40.0	
5722.80	-17.4	V	3.0	35.5	1.0	-51.9	-13.0	-38.9	
7630.40	-14.8	V	3.0	35.8	1.0	-49.5	-13.0	-36.5	
3815.20	-17.8	H	3.0	35.8	1.0	-52.5	-13.0	-39.5	
5722.80	-16.0	H	3.0	35.5	1.0	-50.5	-13.0	-37.5	
7630.40	-12.9	H	3.0	35.8	1.0	-47.6	-13.0	-34.6	

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement Company: LG Project #: 15I21604 Date: 8/30/2015 Test Engineer: D. Mun Configuration: EUT + AC Adapter Location: Chamber B Mode: Rel99 Band 2 Harmonics									
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamplifier (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1852.4									
3704.80	-18.2	V	3.0	35.9	1.0	-53.0	-13.0	-40.0	
5557.20	-17.0	V	3.0	35.5	1.0	-51.4	-13.0	-38.4	
Band 2									
7409.60	-16.0	V	3.0	35.7	1.0	-50.8	-13.0	-37.8	
3704.80	-17.9	H	3.0	35.9	1.0	-52.8	-13.0	-39.8	
5557.20	-16.0	H	3.0	35.5	1.0	-50.5	-13.0	-37.5	
REL99									
7409.60	-14.6	H	3.0	35.7	1.0	-49.4	-13.0	-36.4	
Mid Ch, 1880									
3760.00	-17.6	V	3.0	35.8	1.0	-52.4	-13.0	-39.4	
5640.00	-16.0	V	3.0	35.5	1.0	-50.5	-13.0	-37.5	
7520.00	-15.9	V	3.0	35.7	1.0	-50.6	-13.0	-37.6	
3760.00	-17.6	H	3.0	35.8	1.0	-52.4	-13.0	-39.4	
5640.00	-15.8	H	3.0	35.5	1.0	-50.3	-13.0	-37.3	
7520.00	-14.1	H	3.0	35.7	1.0	-48.9	-13.0	-35.9	
High Ch, 1907.6									
3815.20	-18.1	V	3.0	35.8	1.0	-52.9	-13.0	-39.9	
5722.80	-16.8	V	3.0	35.5	1.0	-51.3	-13.0	-38.3	
7630.40	-13.9	V	3.0	35.8	1.0	-48.6	-13.0	-35.6	
3815.20	-17.6	H	3.0	35.8	1.0	-52.4	-13.0	-39.4	
5722.80	-14.4	H	3.0	35.5	1.0	-48.9	-13.0	-35.9	
7630.40	-11.8	H	3.0	35.8	1.0	-46.6	-13.0	-33.6	

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement Company: LG Project #: 15I21604 Date: 8/30/2015 Test Engineer: D. Mun Configuration: EUT + AC Adapter Location: Chamber B Mode: HSDPA Band 5 Harmonics									
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 826.4									
1652.80	-26.8	V	3.0	37.0	1.0	-62.8	-13.0	-49.8	
2479.20	-22.5	V	3.0	36.4	1.0	-58.0	-13.0	-45.0	
Band 5									
3305.60	-19.4	V	3.0	36.1	1.0	-54.5	-13.0	-41.5	
1652.80	-26.4	H	3.0	37.0	1.0	-62.5	-13.0	-49.5	
2479.20	-23.0	H	3.0	36.4	1.0	-58.4	-13.0	-45.4	
HSDPA									
3305.60	-19.8	H	3.0	36.1	1.0	-54.9	-13.0	-41.9	
Mid Ch, 836.6									
1673.20	-26.2	V	3.0	37.0	1.0	-62.2	-13.0	-49.2	
2509.80	-21.4	V	3.0	36.4	1.0	-56.8	-13.0	-43.8	
3346.40	-20.5	V	3.0	36.1	1.0	-55.6	-13.0	-42.6	
1673.20	-26.5	H	3.0	37.0	1.0	-62.5	-13.0	-49.5	
2509.80	-24.4	H	3.0	36.4	1.0	-59.8	-13.0	-46.8	
3346.40	-20.3	H	3.0	36.1	1.0	-55.4	-13.0	-42.4	
High Ch, 846.6									
1693.20	-25.8	V	3.0	37.0	1.0	-61.7	-13.0	-48.7	
2539.80	-21.4	V	3.0	36.4	1.0	-56.8	-13.0	-43.8	
3386.40	-19.7	V	3.0	36.1	1.0	-54.8	-13.0	-41.8	
1693.20	-26.2	H	3.0	37.0	1.0	-62.1	-13.0	-49.1	
2539.80	-22.9	H	3.0	36.4	1.0	-58.3	-13.0	-45.3	
3386.40	-20.3	H	3.0	36.1	1.0	-55.4	-13.0	-42.4	

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement Company: LG Project #: 15I21604 Date: 8/30/2015 Test Engineer: D. Mun Configuration: EUT + AC Adapter Location: Chamber B Mode: Rel99 Band 5 Harmonics									
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 826.4									
1652.80	-26.8	V	3.0	37.0	1.0	-62.8	-13.0	-49.8	
2479.20	-22.4	V	3.0	36.4	1.0	-57.8	-13.0	-44.8	
3305.60	-19.1	V	3.0	36.1	1.0	-54.3	-13.0	-41.3	
1652.80	-26.2	H	3.0	37.0	1.0	-62.2	-13.0	-49.2	
2479.20	-22.5	H	3.0	36.4	1.0	-57.9	-13.0	-44.9	
3305.60	-19.8	H	3.0	36.1	1.0	-55.0	-13.0	-42.0	
Mid Ch, 836.6									
1673.20	-25.9	V	3.0	37.0	1.0	-61.9	-13.0	-48.9	
2509.80	-21.3	V	3.0	36.4	1.0	-56.7	-13.0	-43.7	
3346.40	-20.4	V	3.0	36.1	1.0	-55.5	-13.0	-42.5	
1673.20	-26.3	H	3.0	37.0	1.0	-62.3	-13.0	-49.3	
2509.80	-24.4	H	3.0	36.4	1.0	-59.8	-13.0	-46.8	
3346.40	-20.4	H	3.0	36.1	1.0	-55.6	-13.0	-42.6	
High Ch, 846.6									
1693.20	-24.7	V	3.0	37.0	1.0	-60.7	-13.0	-47.7	
2539.80	-21.4	V	3.0	36.4	1.0	-56.8	-13.0	-43.8	
3386.40	-19.5	V	3.0	36.1	1.0	-54.6	-13.0	-41.6	
1693.20	-25.6	H	3.0	37.0	1.0	-61.6	-13.0	-48.6	
2539.80	-21.8	H	3.0	36.4	1.0	-57.2	-13.0	-44.2	
3386.40	-20.0	H	3.0	36.1	1.0	-55.1	-13.0	-42.1	

Band	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement Company: LG Project #: 15I21604 Date: 8/29/2015 Test Engineer: A. Escamilla Configuration: EUT + Charger Location: Chamber A Mode: LTE_16QAM Band 2 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, 1857.5									
LTE2	3715.00	-17.0	V	3.0	35.8	1.0	-51.9	-13.0	-38.9	
	5572.50	-15.0	V	3.0	35.5	1.0	-49.5	-13.0	-36.5	
15MHz	7430.00	-13.8	V	3.0	35.7	1.0	-48.5	-13.0	-35.5	
	3715.00	-17.1	H	3.0	35.8	1.0	-51.9	-13.0	-38.9	
16QAM	5572.50	-14.7	H	3.0	35.5	1.0	-49.2	-13.0	-36.2	
	7430.00	-12.8	H	3.0	35.7	1.0	-47.5	-13.0	-34.5	
	Mid Ch, 1880									
	3760.00	-16.6	V	3.0	35.8	1.0	-51.4	-13.0	-38.4	
	5640.00	-15.4	V	3.0	35.5	1.0	-49.9	-13.0	-36.9	
	7520.00	-13.2	V	3.0	35.7	1.0	-48.0	-13.0	-35.0	
	3760.00	-17.2	H	3.0	35.8	1.0	-52.0	-13.0	-39.0	
	5640.00	-14.8	H	3.0	35.5	1.0	-49.3	-13.0	-36.3	
	7520.00	-12.5	H	3.0	35.7	1.0	-47.3	-13.0	-34.3	
	High Ch, 1902.5									
	3805.00	-17.5	V	3.0	35.8	1.0	-52.3	-13.0	-39.3	
	5707.50	-15.9	V	3.0	35.5	1.0	-50.4	-13.0	-37.4	
	7610.00	-13.1	V	3.0	35.8	1.0	-47.9	-13.0	-34.9	
	3805.00	-16.7	H	3.0	35.8	1.0	-51.5	-13.0	-38.5	
	5707.50	-15.0	H	3.0	35.5	1.0	-49.5	-13.0	-36.5	
	7610.00	-12.5	H	3.0	35.8	1.0	-47.2	-13.0	-34.2	

Band	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement Company: LG Project #: 15I21604 Date: 8/29/2015 Test Engineer: A. Escamilla Configuration: EUT + Charger Location: Chamber A Mode: LTE_QPSK Band 2 Harmonics, 15MHz Bandwidth									
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamplifier (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch, 1857.5									
LTE2	3715.00	-17.4	V	3.0	35.8	1.0	-52.2	-13.0	-39.2	
	5572.50	-15.4	V	3.0	35.5	1.0	-49.8	-13.0	-36.8	
15MHz	7430.00	-13.2	V	3.0	35.7	1.0	-47.9	-13.0	-34.9	
	3715.00	-16.7	H	3.0	35.8	1.0	-51.5	-13.0	-38.5	
QPSK	5572.50	-14.7	H	3.0	35.5	1.0	-49.2	-13.0	-36.2	
	7430.00	-11.5	H	3.0	35.7	1.0	-46.2	-13.0	-33.2	
	Mid Ch, 1880									
	3760.00	-16.3	V	3.0	35.8	1.0	-51.2	-13.0	-38.2	
	5640.00	-14.8	V	3.0	35.5	1.0	-49.3	-13.0	-36.3	
	7520.00	-13.0	V	3.0	35.7	1.0	-47.8	-13.0	-34.8	
	3760.00	-16.6	H	3.0	35.8	1.0	-51.4	-13.0	-38.4	
	5640.00	-14.4	H	3.0	35.5	1.0	-48.9	-13.0	-35.9	
	7520.00	-12.0	H	3.0	35.7	1.0	-46.7	-13.0	-33.7	
	High Ch, 1902.5									
	3805.00	-16.2	V	3.0	35.8	1.0	-51.0	-13.0	-38.0	
	5707.50	-15.4	V	3.0	35.5	1.0	-49.9	-13.0	-36.9	
	7610.00	-12.8	V	3.0	35.8	1.0	-47.5	-13.0	-34.5	
	3805.00	-16.7	H	3.0	35.8	1.0	-51.5	-13.0	-38.5	
	5707.50	-14.7	H	3.0	35.5	1.0	-49.2	-13.0	-36.2	
	7610.00	-11.9	H	3.0	35.8	1.0	-46.7	-13.0	-33.7	

Band	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement Company: LG Project #: 15I21604 Date: 8/29/2015 Test Engineer: A. Escamilla Configuration: EUT + Charger Location: Chamber A Mode: LTE_16QAM Band 2 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, 1855 3710.00 -17.1 V 3.0 35.9 1.0 -52.0 -13.0 -39.0 5565.00 -15.1 V 3.0 35.5 1.0 -49.6 -13.0 -36.6 7420.00 -13.8 V 3.0 35.7 1.0 -48.5 -13.0 -35.5 3710.00 -17.6 H 3.0 35.9 1.0 -52.4 -13.0 -39.4 5565.00 -14.8 H 3.0 35.5 1.0 -49.3 -13.0 -36.3 7420.00 -12.3 H 3.0 35.7 1.0 -47.1 -13.0 -34.1 Mid Ch, 1880 3760.00 -17.6 V 3.0 35.8 1.0 -52.4 -13.0 -39.4 5640.00 -15.6 V 3.0 35.5 1.0 -50.1 -13.0 -37.1 7520.00 -13.4 V 3.0 35.7 1.0 -48.1 -13.0 -35.1 3760.00 -16.2 H 3.0 35.8 1.0 -51.0 -13.0 -38.0 5640.00 -15.1 H 3.0 35.5 1.0 -49.6 -13.0 -36.6 7520.00 -11.3 H 3.0 35.7 1.0 -46.0 -13.0 -33.0 High Ch, 1905 3810.00 -16.2 V 3.0 35.8 1.0 -50.9 -13.0 -37.9 5715.00 -15.4 V 3.0 35.5 1.0 -49.9 -13.0 -36.9 7620.00 -13.3 V 3.0 35.8 1.0 -48.0 -13.0 -35.0 3810.00 -16.6 H 3.0 35.8 1.0 -51.4 -13.0 -38.4 5715.00 -14.8 H 3.0 35.5 1.0 -49.3 -13.0 -36.3 7620.00 -12.5 H 3.0 35.8 1.0 -47.2 -13.0 -34.2									

Band	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement Company: LG Project #: 15I21604 Date: 8/29/2015 Test Engineer: A. Escamilla Configuration: EUT + Charger Location: Chamber A Mode: LTE_QPSK Band 2 Harmonics, 10MHz Bandwidth									
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamplifier (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
10MHz	Low Ch, 1855									
	3710.00	-16.9	V	3.0	35.9	1.0	-51.8	-13.0	-38.8	
	5565.00	-15.2	V	3.0	35.5	1.0	-49.7	-13.0	-36.7	
	7420.00	-13.1	V	3.0	35.7	1.0	-47.8	-13.0	-34.8	
	3710.00	-16.8	H	3.0	35.9	1.0	-51.7	-13.0	-38.7	
	5565.00	-14.7	H	3.0	35.5	1.0	-49.2	-13.0	-36.2	
	7420.00	-12.4	H	3.0	35.7	1.0	-47.1	-13.0	-34.1	
	Mid Ch, 1880									
	3760.00	-16.5	V	3.0	35.8	1.0	-51.3	-13.0	-38.3	
	5640.00	-15.7	V	3.0	35.5	1.0	-50.2	-13.0	-37.2	
	7520.00	-12.9	V	3.0	35.7	1.0	-47.6	-13.0	-34.6	
	3760.00	-16.3	H	3.0	35.8	1.0	-51.1	-13.0	-38.1	
	5640.00	-14.6	H	3.0	35.5	1.0	-49.1	-13.0	-36.1	
	7520.00	-11.6	H	3.0	35.7	1.0	-46.3	-13.0	-33.3	
	High Ch, 1905									
	3810.00	-16.5	V	3.0	35.8	1.0	-51.3	-13.0	-38.3	
	5715.00	-15.0	V	3.0	35.5	1.0	-49.5	-13.0	-36.5	
	7620.00	-13.0	V	3.0	35.8	1.0	-47.7	-13.0	-34.7	
	3810.00	-16.8	H	3.0	35.8	1.0	-51.6	-13.0	-38.6	
	5715.00	-14.3	H	3.0	35.5	1.0	-48.8	-13.0	-35.8	
	7620.00	-11.6	H	3.0	35.8	1.0	-46.3	-13.0	-33.3	

Band	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement Company: LG Project #: 15I21604 Date: 8/29/2015 Test Engineer: A. Escamilla Configuration: EUT + Charger Location: Chamber A Mode: LTE_QPSK Band 2 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
LTE2 5MHz QPSK	Low Ch, 1852.5									
	3705.00	-16.3	V	3.0	35.9	1.0	-51.2	-13.0	-38.2	
	5557.50	-15.1	V	3.0	35.5	1.0	-49.5	-13.0	-36.5	
	7410.00	-13.1	V	3.0	35.7	1.0	-47.8	-13.0	-34.8	
	3705.00	-16.6	H	3.0	35.9	1.0	-51.5	-13.0	-38.5	
	5557.50	-14.6	H	3.0	35.5	1.0	-49.1	-13.0	-36.1	
	7410.00	-12.1	H	3.0	35.7	1.0	-46.9	-13.0	-33.9	
	Mid Ch, 1880									
	3760.00	-16.9	V	3.0	35.8	1.0	-51.7	-13.0	-38.7	
	5640.00	-14.5	V	3.0	35.5	1.0	-49.0	-13.0	-36.0	
	7520.00	-12.6	V	3.0	35.7	1.0	-47.4	-13.0	-34.4	
	3760.00	-16.5	H	3.0	35.8	1.0	-51.3	-13.0	-38.3	
	5640.00	-14.6	H	3.0	35.5	1.0	-49.1	-13.0	-36.1	
	7520.00	-11.7	H	3.0	35.7	1.0	-46.4	-13.0	-33.4	
	High Ch, 1907.5									
	3815.00	-16.5	V	3.0	35.8	1.0	-51.3	-13.0	-38.3	
	5722.50	-15.2	V	3.0	35.5	1.0	-49.7	-13.0	-36.7	
	7630.00	-12.6	V	3.0	35.8	1.0	-47.3	-13.0	-34.3	
	3815.00	-16.3	H	3.0	35.8	1.0	-51.1	-13.0	-38.1	
	5722.50	-14.4	H	3.0	35.5	1.0	-48.9	-13.0	-35.9	
	7630.00	-12.1	H	3.0	35.8	1.0	-46.9	-13.0	-33.9	

Band	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement Company: LG Project #: 15I21604 Date: 8/29/2015 Test Engineer: A. Escamilla Configuration: EUT + Charger Location: Chamber A Mode: LTE_16QAM Band 2 Harmonics, 3MHz Bandwidth									
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamplifier (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch, 1851.5 3703.00 -17.0 V 3.0 35.9 1.0 -51.8 -13.0 -38.8 5554.50 -15.2 V 3.0 35.5 1.0 -49.6 -13.0 -36.6 7406.00 -13.4 V 3.0 35.7 1.0 -48.1 -13.0 -35.1 3703.00 -16.9 H 3.0 35.9 1.0 -51.8 -13.0 -38.8 5554.50 -14.7 H 3.0 35.5 1.0 -49.2 -13.0 -36.2 7406.00 -12.1 H 3.0 35.7 1.0 -46.8 -13.0 -33.8 Mid Ch, 1880 3760.00 -16.7 V 3.0 35.8 1.0 -51.5 -13.0 -38.5 5640.00 -14.7 V 3.0 35.5 1.0 -49.2 -13.0 -36.2 7520.00 -12.9 V 3.0 35.7 1.0 -47.7 -13.0 -34.7 3760.00 -16.4 H 3.0 35.8 1.0 -51.2 -13.0 -38.2 5640.00 -13.9 H 3.0 35.5 1.0 -48.4 -13.0 -35.4 7520.00 -11.8 H 3.0 35.7 1.0 -46.5 -13.0 -33.5 High Ch, 1908.5 3817.00 -16.5 V 3.0 35.8 1.0 -51.3 -13.0 -38.3 5725.50 -15.2 V 3.0 35.5 1.0 -49.7 -13.0 -36.7 7634.00 -12.9 V 3.0 35.8 1.0 -47.7 -13.0 -34.7 3817.00 -16.1 H 3.0 35.8 1.0 -50.9 -13.0 -37.9 5725.50 -14.5 H 3.0 35.5 1.0 -49.0 -13.0 -36.0 7634.00 -11.7 H 3.0 35.8 1.0 -46.5 -13.0 -33.5									

Band	UL Verification Services Above 1GHz High Frequency Substitution Measurement Company: LG Project #: 15I21604 Date: 8/29/2015 Test Engineer: A. Escamilla Configuration: EUT + Charger Location: Chamber A Mode: LTE_16QAM Band 2 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
LTE2	Low Ch, 1850.7									
	3701.40	-17.0	V	3.0	35.9	1.0	-51.9	-13.0	-38.9	
1.4MHz	5552.10	-15.4	V	3.0	35.5	1.0	-49.9	-13.0	-36.9	
	7402.80	-13.7	V	3.0	35.7	1.0	-48.4	-13.0	-35.4	
16QAM	3701.40	-16.2	H	3.0	35.9	1.0	-51.1	-13.0	-38.1	
	5552.10	-13.9	H	3.0	35.5	1.0	-48.4	-13.0	-35.4	
	7402.80	-12.7	H	3.0	35.7	1.0	-47.4	-13.0	-34.4	
	Mid Ch, 1880									
	3760.00	-16.4	V	3.0	35.8	1.0	-51.2	-13.0	-38.2	
	5640.00	-14.6	V	3.0	35.5	1.0	-49.1	-13.0	-36.1	
	7520.00	-13.3	V	3.0	35.7	1.0	-48.0	-13.0	-35.0	
	3760.00	-16.1	H	3.0	35.8	1.0	-50.9	-13.0	-37.9	
	5640.00	-13.8	H	3.0	35.5	1.0	-48.3	-13.0	-35.3	
	7520.00	-12.4	H	3.0	35.7	1.0	-47.2	-13.0	-34.2	
	High Ch, 1909.3									
	3818.60	-16.5	V	3.0	35.8	1.0	-51.3	-13.0	-38.3	
	5727.90	-15.0	V	3.0	35.5	1.0	-49.5	-13.0	-36.5	
	7637.20	-12.8	V	3.0	35.8	1.0	-47.6	-13.0	-34.6	
	3818.60	-15.9	H	3.0	35.8	1.0	-50.7	-13.0	-37.7	
	5727.90	-13.9	H	3.0	35.5	1.0	-48.4	-13.0	-35.4	
	7637.20	-12.1	H	3.0	35.8	1.0	-46.9	-13.0	-33.9	

Band	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement Company: LG Project #: 15I21604 Date: 8/29/2015 Test Engineer: A. Escamilla Configuration: EUT + Charger Location: Chamber A Mode: LTE_QPSK Band 2 Harmonics, 1.4MHz Bandwidth									
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamplifier (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
LTE2	Low Ch, 1850.7									
	3701.40	-16.7	V	3.0	35.9	1.0	-51.6	-13.0	-38.6	
1.4MHz	5552.10	-15.5	V	3.0	35.5	1.0	-50.0	-13.0	-37.0	
	7402.80	-13.1	V	3.0	35.7	1.0	-47.8	-13.0	-34.8	
QPSK	3701.40	-16.9	H	3.0	35.9	1.0	-51.7	-13.0	-38.7	
	5552.10	-13.8	H	3.0	35.5	1.0	-48.3	-13.0	-35.3	
	7402.80	-12.5	H	3.0	35.7	1.0	-47.2	-13.0	-34.2	
	Mid Ch, 1880									
	3760.00	-16.2	V	3.0	35.8	1.0	-51.1	-13.0	-38.1	
	5640.00	-14.8	V	3.0	35.5	1.0	-49.2	-13.0	-36.2	
	7520.00	-13.1	V	3.0	35.7	1.0	-47.9	-13.0	-34.9	
	3760.00	-16.0	H	3.0	35.8	1.0	-50.8	-13.0	-37.8	
	5640.00	-13.5	H	3.0	35.5	1.0	-48.0	-13.0	-35.0	
	7520.00	-11.8	H	3.0	35.7	1.0	-46.5	-13.0	-33.5	
	High Ch, 1909.3									
	3818.60	-16.5	V	3.0	35.8	1.0	-51.3	-13.0	-38.3	
	5727.90	-15.2	V	3.0	35.5	1.0	-49.7	-13.0	-36.7	
	7637.20	-12.2	V	3.0	35.8	1.0	-47.0	-13.0	-34.0	
	3818.60	-15.3	H	3.0	35.8	1.0	-50.1	-13.0	-37.1	
	5727.90	-13.3	H	3.0	35.5	1.0	-47.8	-13.0	-34.8	
	7637.20	-12.0	H	3.0	35.8	1.0	-46.8	-13.0	-33.8	

Band	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement Company: LG Project #: 15I21604 Date: 8/30/2015 Test Engineer: D. Mun Configuration: EUT + AC Adapter Location: Chamber B Mode: LTE_QPSK Band 5 Harmonics, 10MHz Bandwidth									
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamplifier (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch, 829									
LTE5	1658.00	-26.4	V	3.0	37.0	1.0	-62.5	-13.0	-49.5	
	2487.00	-24.1	V	3.0	36.4	1.0	-59.5	-13.0	-46.5	
	3316.00	-19.7	V	3.0	36.1	1.0	-54.8	-13.0	-41.8	
	1658.00	-26.1	H	3.0	37.0	1.0	-62.1	-13.0	-49.1	
	2487.00	-23.1	H	3.0	36.4	1.0	-58.5	-13.0	-45.5	
	3316.00	-20.9	H	3.0	36.1	1.0	-56.0	-13.0	-43.0	
10MHz	Mid Ch, 836.5									
	1673.00	-26.3	V	3.0	37.0	1.0	-62.3	-13.0	-49.3	
	2509.50	-19.6	V	3.0	36.4	1.0	-55.0	-13.0	-42.0	
	3346.00	-18.0	V	3.0	36.1	1.0	-53.1	-13.0	-40.1	
	1673.00	-25.5	H	3.0	37.0	1.0	-61.5	-13.0	-48.5	
	2509.50	-23.2	H	3.0	36.4	1.0	-58.6	-13.0	-45.6	
QPSK	3346.00	-20.0	H	3.0	36.1	1.0	-55.1	-13.0	-42.1	
	High Ch, 844									
	1688.00	-22.7	V	3.0	37.0	1.0	-58.6	-13.0	-45.6	
	2532.00	-20.3	V	3.0	36.4	1.0	-55.7	-13.0	-42.7	
	3376.00	-19.8	V	3.0	36.1	1.0	-54.9	-13.0	-41.9	
	1688.00	-26.1	H	3.0	37.0	1.0	-62.0	-13.0	-49.0	
	2532.00	-24.2	H	3.0	36.4	1.0	-59.6	-13.0	-46.6	
	3376.00	-18.0	H	3.0	36.1	1.0	-53.1	-13.0	-40.1	

Band	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement Company: LG Project #: 15I21604 Date: 8/30/2015 Test Engineer: D. Mun Configuration: EUT + AC Adapter Location: Chamber B Mode: LTE_16QAM Band 5 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, 825.5									
LTE5	1651.00	-27.4	V	3.0	37.0	1.0	-63.4	-13.0	-50.4	
	2476.50	-20.1	V	3.0	36.4	1.0	-55.5	-13.0	-42.5	
3MHz	3302.00	-19.1	V	3.0	36.2	1.0	-54.2	-13.0	-41.2	
	1651.00	-26.9	H	3.0	37.0	1.0	-62.9	-13.0	-49.9	
16QAM	2476.50	-22.7	H	3.0	36.4	1.0	-58.1	-13.0	-45.1	
	3302.00	-21.5	H	3.0	36.2	1.0	-56.7	-13.0	-43.7	
	Mid Ch, 836.5									
	1673.00	-28.2	V	3.0	37.0	1.0	-64.2	-13.0	-51.2	
	2509.50	-21.0	V	3.0	36.4	1.0	-56.4	-13.0	-43.4	
	3346.00	-22.3	V	3.0	36.1	1.0	-57.4	-13.0	-44.4	
	1673.00	-22.6	H	3.0	37.0	1.0	-58.6	-13.0	-45.6	
	2509.50	-25.3	H	3.0	36.4	1.0	-60.8	-13.0	-47.8	
	3346.00	-22.0	H	3.0	36.1	1.0	-57.1	-13.0	-44.1	
	High Ch, 847.5									
	1695.00	-21.9	V	3.0	37.0	1.0	-57.9	-13.0	-44.9	
	2542.50	-20.1	V	3.0	36.4	1.0	-55.5	-13.0	-42.5	
	3390.00	-22.0	V	3.0	36.1	1.0	-57.1	-13.0	-44.1	
	1695.00	-23.3	H	3.0	37.0	1.0	-59.2	-13.0	-46.2	
	2542.50	-26.4	H	3.0	36.4	1.0	-61.8	-13.0	-48.8	
	3390.00	-24.9	H	3.0	36.1	1.0	-60.0	-13.0	-47.0	

Band	UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement Company: LG Project #: 15I21604 Date: 8/30/2015 Test Engineer: D. Mun Configuration: EUT + AC Adapter Location: Chamber B Mode: LTE_ 16QAM Band 5 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, 824.7									
LTE5	1649.40	-28.7	V	3.0	37.0	1.0	-64.7	-13.0	-51.7	
	2474.10	-23.9	V	3.0	36.4	1.0	-59.3	-13.0	-46.3	
1.4MHz	3298.80	-20.0	V	3.0	36.2	1.0	-55.1	-13.0	-42.1	
	1649.40	-28.4	H	3.0	37.0	1.0	-64.5	-13.0	-51.5	
16QAM	2474.10	-24.5	H	3.0	36.4	1.0	-59.9	-13.0	-46.9	
	3298.80	-21.9	H	3.0	36.2	1.0	-57.1	-13.0	-44.1	
	Mid Ch, 836.5									
	1673.00	-27.9	V	3.0	37.0	1.0	-63.9	-13.0	-50.9	
	2509.50	-24.3	V	3.0	36.4	1.0	-59.7	-13.0	-46.7	
	3346.00	-20.1	V	3.0	36.1	1.0	-55.2	-13.0	-42.2	
	1673.00	-28.0	H	3.0	37.0	1.0	-64.0	-13.0	-51.0	
	2509.50	-25.5	H	3.0	36.4	1.0	-60.9	-13.0	-47.9	
	3346.00	-20.6	H	3.0	36.1	1.0	-55.8	-13.0	-42.8	
	High Ch, 848.3									
	1696.60	-28.9	V	3.0	37.0	1.0	-64.9	-13.0	-51.9	
	2544.90	-23.2	V	3.0	36.4	1.0	-58.6	-13.0	-45.6	
	3393.20	-22.1	V	3.0	36.1	1.0	-57.2	-13.0	-44.2	
	1696.60	-27.2	H	3.0	37.0	1.0	-63.2	-13.0	-50.2	
	2544.90	-23.5	H	3.0	36.4	1.0	-58.9	-13.0	-45.9	
	3393.20	-19.9	H	3.0	36.1	1.0	-55.0	-13.0	-42.0	

