FCC CFR47 PART 22 SUBPART H
FCC CFR47 PART 24 SUBPART E
FCC CFR47 PART 27 SUBPART F

CERTIFICATION TEST REPORT

For

GSM/WCDMA/LTE PHONE + BLUETOOTH, & DTS b/g/n

MODEL NUMBER: LG-L33L, LGL33L, L33L

FCC ID: ZNFL33L

REPORT NUMBER: 14I19561-E1 Revision A

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Prepared for
LG ELECTRONICS MOBILECOMM U.S.A., INC
1000 SYLVAN AVENUE
ENGLEWOOD CLIFFS,
NEW JERSEY, 07632, U.S.A

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

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	LG ELECTRONICS MOBILECOMM U.S.A., INC
EUT DESCRIPTION:	GSM/WCDMA/LTE PHONE + BLUETOOTH, & DTS b/g/n
MODEL:	LG-L33L, LGL33L, L33L
SERIAL NUMBER:	1HRKA8 (CONDUCTED), 1HRL1 (RADIATED)
DATE TESTED:	DECEMBER 8-16, 2014

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 22H, 24E and 27F	PASS

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

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For
UL Verification Services Inc. By:

DAN CORONIA
CONSUMER TECHNOLOGY DIVISION
WiSE PROJECT LEAD
UL VERIFICATION SERVICES INC

Tested By:

STEVEN TRAN
CONSUMER TECHNOLOGY DIVISION
WiSE LAB ENGINEER
UL VERIFICATION SERVICES INC

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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, and FCC CFR 47 Part 27

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, Fremont, California, USA. Line conducted emissions are measured only at the 47173 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

47173 Benicia Street	47266 Benicia Street
☐ Chamber A(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:

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

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

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

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4.3. MEASUREMENT UNCERTAINTY

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

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

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

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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a GSM/WCDMA/LTE PHONE + BLUETOOTH, & DTS b/g/n

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5.2. MAXIMUM OUTPUT POWER

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

FCC Part 22/2 4/27						
Band	Frequency Range(MHz)	Modulation mW	Conducted		Radiated	
			AVG(dBm)	AVG(mW)	AVG(dBm)	AVG(mW)
GSM850	824~849	GMSK	33.5	2238.72		
	824~849	GPRS	33.5	2238.72	31.211	1321.6
	824~849	EGPRS	27.5	562.34	27.061	508.28
GSM1900	1850~1910	GMSK	30.5	1122.02		
	1850~1910	GPRS	30.5	1122.02	30.48	1116.86
	1850~1910	EGPRS	26.5	446.68	26.24	420.73
Band 5	824~849	REL99	23.9	245.47	20.501	112.23
	824~849	HSDPA	22.9	194.98	19.711	93.56
	824~849	HSUPA	23.2	208.93		
Band 2	1850~1910	REL99	24.1	257.04	24.05	254.1
	1850~1910	HSDPA	23.1	204.17	23.06	202.3
	1850~1910	HSUPA	23.2	208.93		

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5.3. MAXIMUM OUTPUT POWER (LTE)

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

FCC Part 22/2 4/27							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation	Conducted		Radiated	
			mW	AVG(dBm)	AVG(mW)	AVG(dBm)	AVG(mW)
LTE17	704~716	10MHz	QPSK	24.2	263.03	19.341	85.92
	704~716	10MHz	16QAM	23	199.53	19.004	79.51

FCC Part 22/2 4/27							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation	Conducted		Radiated	
			mW	AVG(dBm)	AVG(mW)	AVG(dBm)	AVG(mW)
LTE17	704~716	5MHz	QPSK	24.1	257.04	19.061	80.56
	704~716	5MHz	16QAM	22.6	181.97	18.134	65.07

FCC Part 22/2 4/27							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation	Conducted		Radiated	
			mW	AVG(dBm)	AVG(mW)	AVG(dBm)	AVG(mW)
LTE5	824~849	10MHz	QPSK	24.1	257.04	21.191	131.55
	824~849	10MHz	16QAM	23	199.53	20.451	110.94

FCC Part 22/2 4/27							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation	Conducted		Radiated	
			mW	AVG(dBm)	AVG(mW)	AVG(dBm)	AVG(mW)
LTE5	824~849	5MHz	QPSK	23.8	239.88	21.191	131.55
	824~849	5MHz	16QAM	23	199.53	20.121	102.83

FCC Part 22/2 4/27							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation	Conducted		Radiated	
			mW	AVG(dBm)	AVG(mW)	AVG(dBm)	AVG(mW)
LTE4	1710~1755	10MHz	QPSK	24.2	263.03	23.988	250.5
	1710~1755	10MHz	16QAM	23.2	208.93	23.448	221.21

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FCC Part 22/2 4/27							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation mW	Conducted		Radiated	
				AVG(dBm)	AVG(mW)	AVG(dBm)	AVG(mW)
LTE4	1710~1755	5MHz	QPSK	24.2	263.03	23.368	217.17
	1710~1755	5MHz	16QAM	23.2	208.93	21.487	140.83

FCC Part 22/2 4/27							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation mW	Conducted		Radiated	
				AVG(dBm)	AVG(mW)	AVG(dBm)	AVG(mW)
LTE2	1850~1910	10MHz	QPSK	24	251.19	24.635	290.74
	1850~1910	10MHz	16QAM	23.1	204.17	23.565	227.25

FCC Part 22/2 4/27							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation mW	Conducted		Radiated	
				AVG(dBm)	AVG(mW)	AVG(dBm)	AVG(mW)
LTE2	1850~1910	5MHz	QPSK	24.2	263.03	23.775	238.51
	1850~1910	5MHz	16QAM	23	199.53	22.645	183.87

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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	-3.25
GSM1900, 1850~1910MHz	0.56
Band 5, 824~849MHz	-3.25
Band 2, 1850~1910MHz	-0.56
LTE2, 1850~1910MHz	-0.56
LTE4, 1710~1755MHz	-0.56
LTE5, 824~849MHz	-3.25
LTE17, 704~716MHz	-3.25

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5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
AC Adapter	LG	MCS-01WR	RD4X0891946	N/A
Earphone	LG	LG-L33L	N/A	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	No
2	Jack	1	Headset	Shielded	1m	No
3	RF In/out	1	Communication Test Set	Un-shielded	2m	Yes

TEST SETUP

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

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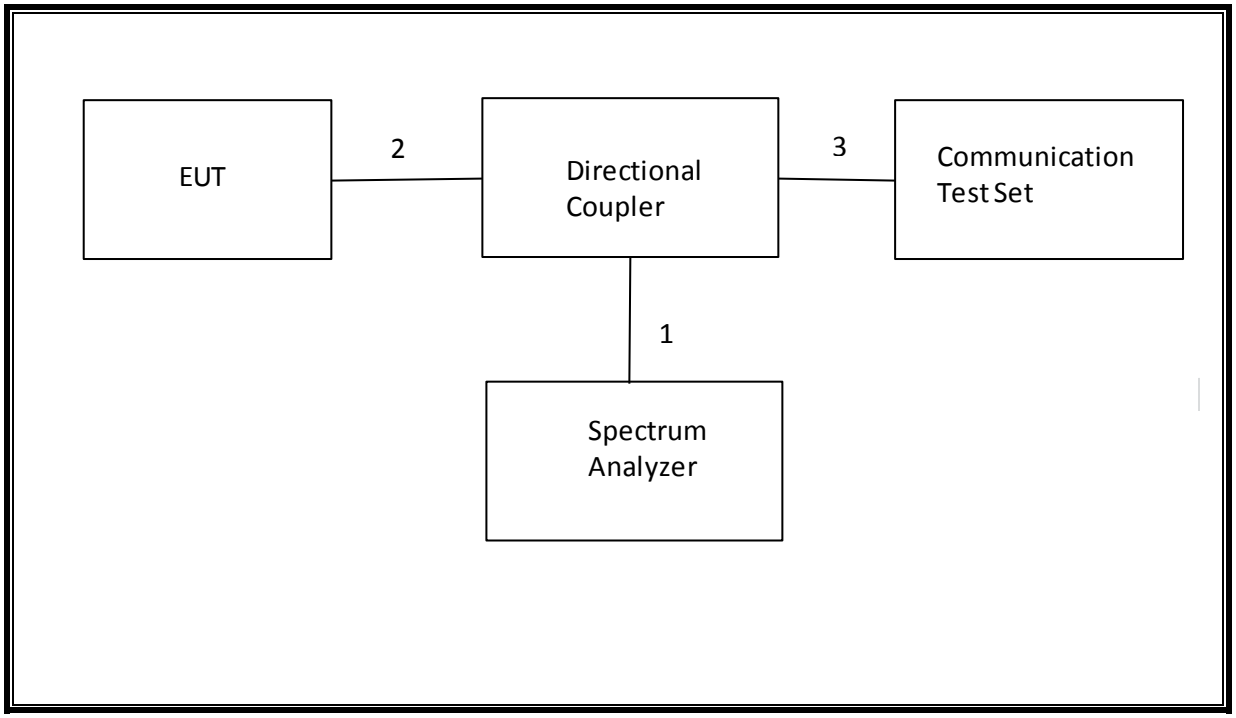
SETUP DIAGRAM FOR TESTS (CONDUCTED TEST SETUP)



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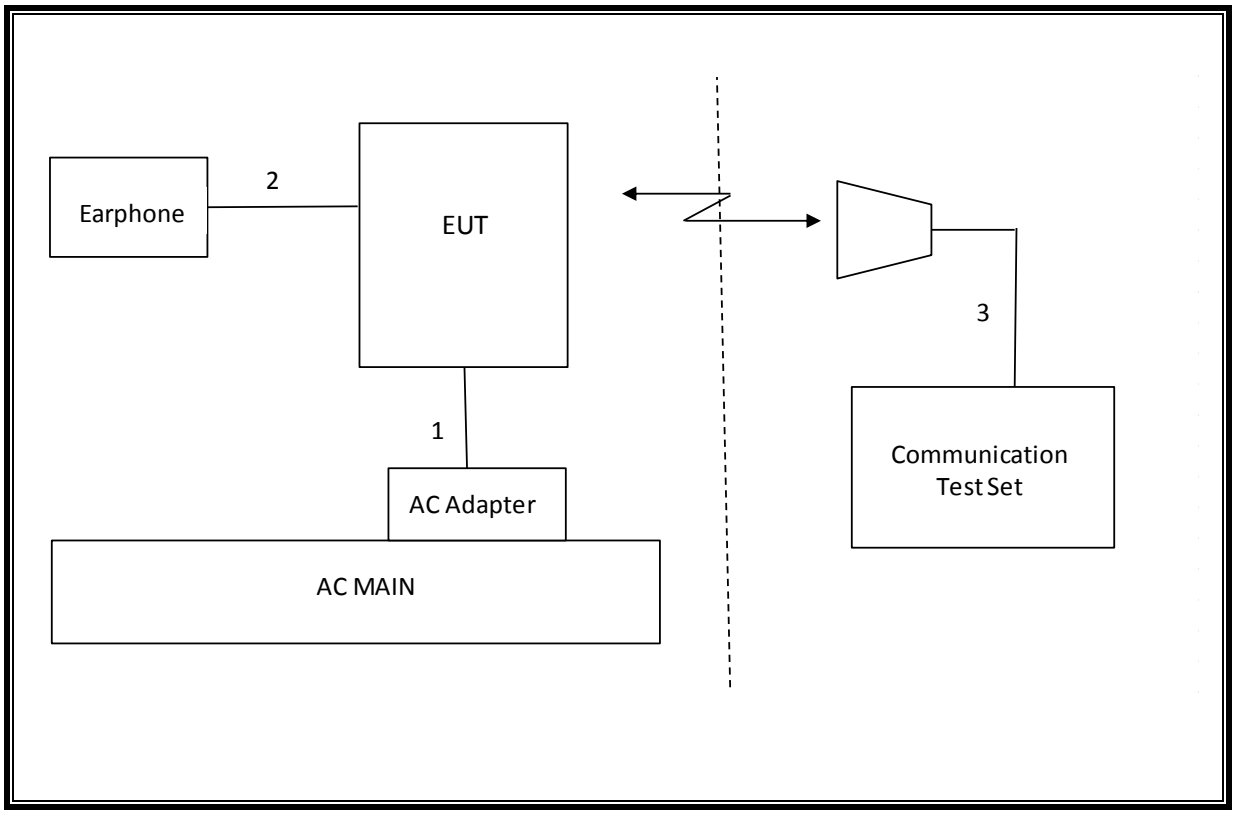
SETUP DIAGRAM FOR TESTS (RADIATED TEST SETUP)



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6. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Asset**	**Cal Due**
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01179	02/26/15
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01011	04/22/15
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	01/09/15
Communications Test Set	R&S	CMW500	T159	07/02/15
DC power supply, 8 V @ 3 A or 15 V	Agilent / HP	E3610A	None	CNR
Vector signal generator, 6 GHz	Agilent / HP	E4438C	None	06/18/15
Antenna, Tuned Dipole 400~1000	ETS	3121C DB4	C00993	02/14/15
Directional Coupler	RF-Lambda	RFDC5M06G15	None	CNR
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	C00589	12/17/15

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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	9.0 MHz
22.917(a) 24.238(a) 27.53(g) 90.691	RSS-132(4.5.1) RSS-133(6.5.1) RSS-139(6.5.1)	Band Edge / Conducted Spurious Emission	-13dBm		Pass	-15.2 dBm
2.1046	N/A	Conducted output power	N/A		Pass	33.5 dBm
22.355 24.235 27.54 90.213	RSS-132(4.3) RSS-133(6.3) RSS-139(6.3) RSS-199(4.3)	Frequency Stability	2.5PPM		Pass	1.67 PPM
22.913(a)(2)	RSS-132(4.4)	Effective Radiated Power	38 dBm	Radiated	Pass	31.2 dBm
27.50(b)(10)	N/A		34.77 dBm		Pass	19.3 dBm
24.232(c) 27.50(h)(2)	RSS-133(6.4) RSS-199(4.4)	Equivalent Isotropic Radiated Power	33dBm		Pass	30.5 dBm
27.50(d)(4)	RSS-139(6.4)		30dBm		Pass	24.0 dBm
22.917(a) 24.238(a) 27.53(g)	RSS-132(4.5.1) RSS-133(6.5.1) RSS-139(6.5.1)	Radiated Spurious Emission	-13dBm		Pass	-25.2 dBm

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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

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8.1.1. GSM OUTPUT POWER RESULT

Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Burst Pwr (dBm)
GSM (Voice)	CS1	1	128	824.2	33.5
			190	836.6	33.5
			251	848.8	33.5
GPRS (GMSK)	CS1	1	128	824.2	33.5
			190	836.6	33.5
			251	848.8	33.5
		2	128	824.2	31.0
			190	836.6	31.2
			251	848.8	31.2
EGPRS (8PSK)	MCS5	1	128	824.2	27.5
			190	836.6	27.5
			251	848.8	27.5
		2	128	824.2	25.7
			190	836.6	25.6
			251	848.8	25.5

Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Burst Pwr (dBm)
GSM (Voice)	CS1	1	512	1850.2	30.5
			661	1880.0	30.5
			810	1909.8	30.5
GPRS (GMSK)	CS1	1	512	1850.2	30.5
			661	1880.0	30.5
			810	1909.8	30.5
		2	512	1850.2	29.2
			661	1880.0	29.2
			810	1909.8	29.1
EGPRS (8PSK)	MCS5	1	512	1850.2	26.4
			661	1880.0	26.5
			810	1909.8	26.4
		2	512	1850.2	24.4
			661	1880.0	24.5
			810	1909.8	24.5

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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
	βc	Not Applicable
	βd	Not Applicable
	βec	Not Applicable
	βc/βd	8/15
	βhs	Not Applicable
	βed	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	23.9
		4183	836.6	0	23.8
		4233	846.6	0	23.9
W-CDMA Band II	Rel 99 (RMC, 12.2 kbps)	9262	1852.4	0	24.0
		9400	1880.0	0	24.1
		9538	1907.6	0	24.1

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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			
	βc	2/15	12/15	15/15	15/15
	βd	15/15	15/15	8/15	4/15
	Bd (SF)	64			
	βc/βd	2/15	12/15	15/8	15/4
	βhs	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			
	Ahs =βhs/βc	30/15			

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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	22.8
		4183	836.6	0	22.8
		4233	846.6	0	22.9
	Subtest 2	4132	826.4	0	22.5
		4183	836.6	0	22.5
		4233	846.6	0	22.3
	Subtest 3	4132	826.4	0.5	21.8
		4183	836.6	0.5	21.7
		4233	846.6	0.5	21.7
	Subtest 4	4132	826.4	0.5	21.9
		4183	836.6	0.5	21.9
		4233	846.6	0.5	21.8

Band	Mode	UL Ch No.	Freq. (MHz)	MPR	Avg Pwr (dBm)
W-CDMA Band II	Subtest 1	9262	1852.4	0	23.0
		9400	1880.0	0	23.0
		9538	1907.6	0	23.1
	Subtest 2	9262	1852.4	0	23.1
		9400	1880.0	0	23.1
		9538	1907.6	0	23.1
	Subtest 3	9262	1852.4	0.5	22.5
		9400	1880.0	0.5	22.5
		9538	1907.6	0.5	22.5
	Subtest 4	9262	1852.4	0.5	22.6
		9400	1880.0	0.5	22.5
		9538	1907.6	0.5	22.6

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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
	βc/βd	11/15	6/15	15/9	2/15	15/15
	Bhs	22/15	12/15	30/15	4/15	30/15
	βed (note1)	1309/225	94/75	47/15 47/15	56/75	134/15
	MPR	0	2	1	2	0
HSDPA Specific Settings	DACK	8				
	DNAK	8				
	DCQI	8				
	Ack-Nack repetition factor	3				
	CQI Feedback (Table 5.2B.4)	4ms				
	CQI Repetition Factor (Table 5.2B.4)	2				
	Ahs = βhs/βc	30/15				
HSUPA Specific Settings	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: βed cannot be set directly, it is set by Absolute Grant Value.

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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	22.3
		4183	836.6	0	23.0
		4233	846.6	0	23.0
	Subtest 2	4132	826.4	2	21.8
		4183	836.6	2	21.9
		4233	846.6	2	22.2
	Subtest 3	4132	826.4	1	22.2
		4183	836.6	1	22.1
		4233	846.6	1	21.6
	Subtest 4	4132	826.4	2	22.1
		4183	836.6	2	22.2
		4233	846.6	2	22.1
	Subtest 5	4132	826.4	0	23.0
		4183	836.6	0	23.2
		4233	846.6	0	23.0

Band	Mode	UL Ch No.	Freq. (MHz)	MPR	Avg Pwr (dBm)
W-CDMA Band II	Subtest 1	9262	1852.4	0	22.4
		9400	1880.0	0	22.6
		9538	1907.6	0	22.4
	Subtest 2	9262	1852.4	2	21.4
		9400	1880.0	2	21.8
		9538	1907.6	2	21.8
	Subtest 3	9262	1852.4	1	21.9
		9400	1880.0	1	21.9
		9538	1907.6	1	21.5
	Subtest 4	9262	1852.4	2	22.0
		9400	1880.0	2	22.2
		9538	1907.6	2	22.2
	Subtest 5	9262	1852.4	0	23.0
		9400	1880.0	0	23.1
		9538	1907.6	0	23.2

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8.5. LTE OUTPUT VERIFICATION

8.5.1. LTE OUTPUT RESULT

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm) 23790 710 MHz
LTE Band 17	10	QPSK	1	0	0	24.20
			1	25	0	24.20
			1	49	0	24.10
			25	0	1	23.20
			25	12	1	23.20
			25	25	1	23.20
			50	0	1	23.20
		16QAM	1	0	1	23.00
			1	25	1	23.20
			1	49	1	23.20
			25	0	2	21.90
			25	12	2	22.00
			25	25	2	21.90
			50	0	2	22.00

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm) 23790 710 MHz
LTE Band 17	5	QPSK	1	0	0	24.10
			1	12	0	24.20
			1	24	0	23.80
			12	0	1	22.70
			12	7	1	22.70
			12	13	1	22.70
			25	0	1	22.70
		16QAM	1	0	1	22.60
			1	12	1	22.60
			1	24	1	22.60
			12	0	2	22.00
			12	7	2	22.10
			12	13	2	22.00
			25	0	2	21.80

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Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)		
						20450	20525	20600
						829 MHz	836.5 MHz	844 MHz
LTE Band 5	10	QPSK	1	0	0	24.10	24.10	23.90
			1	25	0	23.80	23.90	23.90
			1	49	0	23.90	23.90	23.80
			25	0	1	22.70	22.70	22.70
			25	12	1	22.70	22.70	22.70
			25	25	1	22.70	22.70	22.70
			50	0	1	22.70	22.70	22.70
		16QAM	1	0	1	22.80	23.00	23.00
			1	25	1	22.80	22.60	22.80
			1	49	1	22.70	22.40	22.90
			25	0	2	22.00	21.60	21.90
			25	12	2	21.90	21.70	21.90
			25	25	2	21.60	21.70	21.80
			50	0	2	21.50	21.60	21.60

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)		
						20425	20525	20625
						826.5 MHz	836.5 MHz	846.5 MHz
LTE Band 5	5	QPSK	1	0	0	23.80	23.70	23.70
			1	12	0	23.80	23.60	23.70
			1	24	0	23.60	23.70	23.50
			12	0	1	22.80	22.60	22.60
			12	7	1	22.70	22.70	22.60
			12	13	1	22.60	22.60	22.70
			25	0	1	22.70	22.70	22.60
		16QAM	1	0	1	23.00	22.50	22.40
			1	12	1	22.60	22.70	22.50
			1	24	1	22.50	22.80	22.30
			12	0	2	21.70	21.90	21.70
			12	7	2	21.80	21.80	21.40
			12	13	2	21.70	21.80	21.60
			25	0	2	21.90	21.80	21.60

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Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)		
						20000	20175	20350
						1715 MHz	1732.5 MHz	1750 MHz
LTE Band 4	10	QPSK	1	0	0	24.20	24.20	24.20
			1	25	0	24.20	24.20	24.20
			1	49	0	24.10	24.20	24.20
			25	0	1	23.10	23.00	23.20
			25	12	1	23.00	23.04	23.20
			25	25	1	23.10	23.00	23.10
			50	0	1	23.00	23.00	23.20
		16QAM	1	0	1	23.20	23.00	22.90
			1	25	1	23.00	22.70	22.80
			1	49	1	22.90	22.70	22.30
			25	0	2	22.10	21.90	22.20
			25	12	2	22.00	22.00	22.20
			25	25	2	22.00	22.10	22.20
			50	0	2	22.00	21.90	22.10

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)		
						19975	20175	20375
						1712.5 MHz	1732.5 MHz	1752.5 MHz
LTE Band 4	5	QPSK	1	0	0	23.80	23.90	24.00
			1	12	0	24.00	24.00	24.20
			1	24	0	23.80	23.80	24.00
			12	0	1	22.90	22.80	23.20
			12	7	1	22.90	22.90	23.10
			12	13	1	22.90	23.00	23.00
			25	0	1	22.90	22.90	23.10
		16QAM	1	0	1	23.20	22.80	23.20
			1	12	1	23.20	22.60	23.10
			1	24	1	23.20	22.40	23.20
			12	0	2	22.00	21.70	22.20
			12	7	2	21.90	21.70	22.20
			12	13	2	21.90	22.00	22.20
			25	0	2	21.90	22.20	22.00

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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	23.90	24.00	23.90
			1	25	0	23.80	23.90	23.70
			1	49	0	23.80	23.90	23.80
			25	0	1	22.80	23.00	22.80
			25	12	1	22.70	23.00	22.80
			25	25	1	22.80	22.90	22.80
			50	0	1	22.80	22.90	22.70
		16QAM	1	0	1	22.80	23.00	22.80
			1	25	1	22.80	23.10	22.70
			1	49	1	23.00	23.00	22.60
			25	0	2	21.90	22.00	22.00
			25	12	2	22.00	22.00	21.80
			25	25	2	21.80	21.90	22.00
			50	0	2	21.70	21.90	21.70

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	23.60	23.90	23.80
			1	12	0	23.70	24.20	24.00
			1	24	0	23.60	23.90	23.70
			12	0	1	22.70	23.00	22.80
			12	7	1	22.80	22.90	22.70
			12	13	1	22.80	23.00	22.70
			25	0	1	22.80	23.00	22.80
		16QAM	1	0	1	22.20	22.40	23.00
			1	12	1	22.20	22.90	23.00
			1	24	1	22.20	23.10	23.00
			12	0	2	21.90	22.00	22.00
			12	7	2	21.80	21.70	21.90
			12	13	2	21.70	22.00	21.80
			25	0	2	22.00	21.90	21.90

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9. PEAK TO AVERAGE RATIO

Test Procedure

Per KDB 971168 D01 Power Meas License Digital Systems v02r01

Test Spec

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

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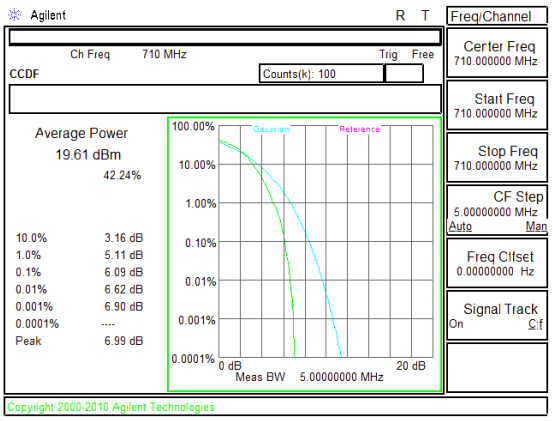
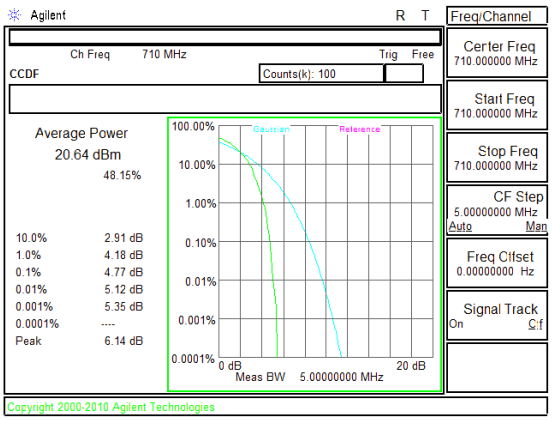
9.1. CONDUCTED PEAK TO AVERAGE RESULT

Band LTE17 10MHz 16QAM

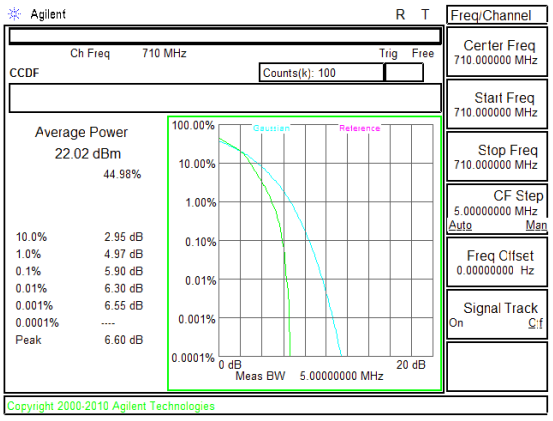


Band LTE17 10MHz 16QAM Mid channel

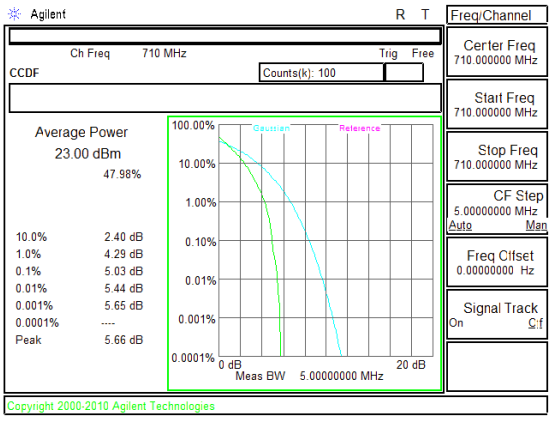


Band LTE17 10MHz QPSK Mid channel

Band LTE17 5MHz 16QAM



Band LTE17 5MHz 16QAM Mid channel



Band LTE17 5MHz QPSK Mid channel

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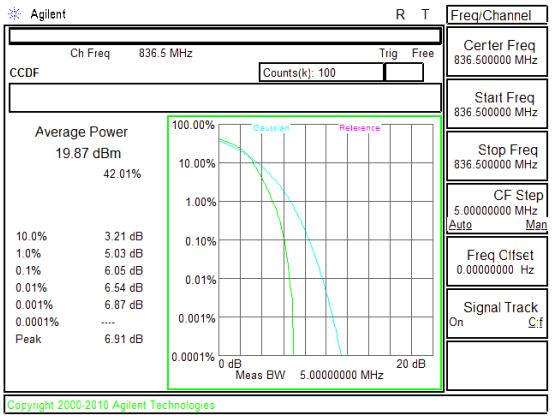
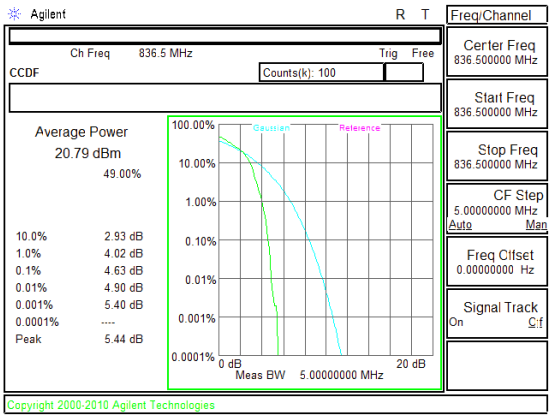
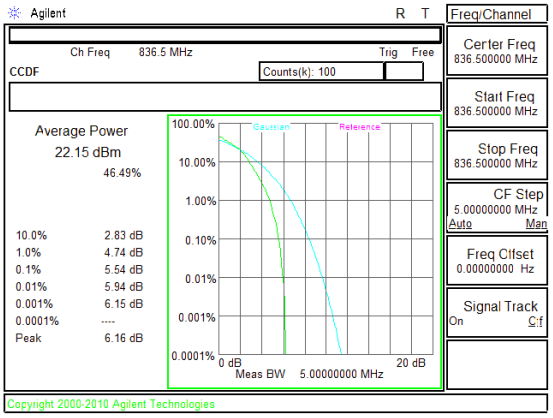
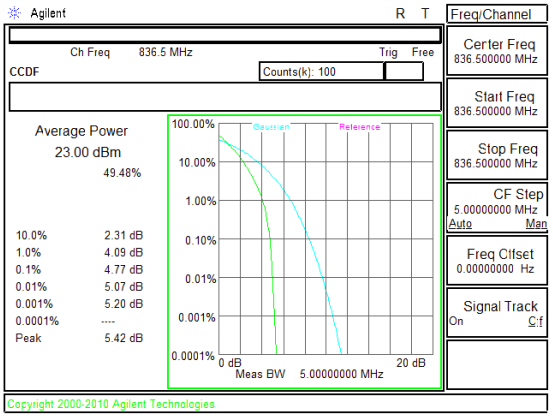
Band LTE5 10MHz 16QAM	 Band LTE5 10MHz 16QAM Mid channel	 Band LTE5 10MHz QPSK Mid channel
Band LTE5 5MHz 16QAM	 Band LTE5 5MHz 16QAM Mid channel	 Band LTE5 5MHz QPSK Mid channel

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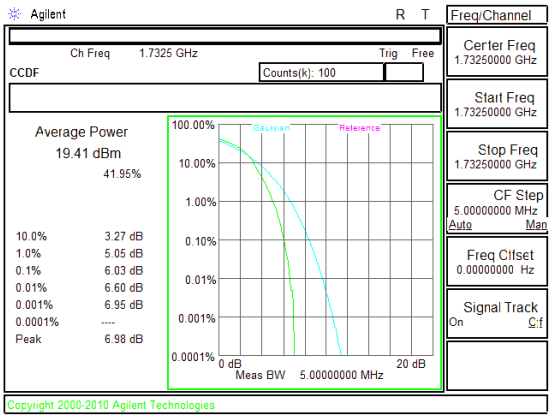
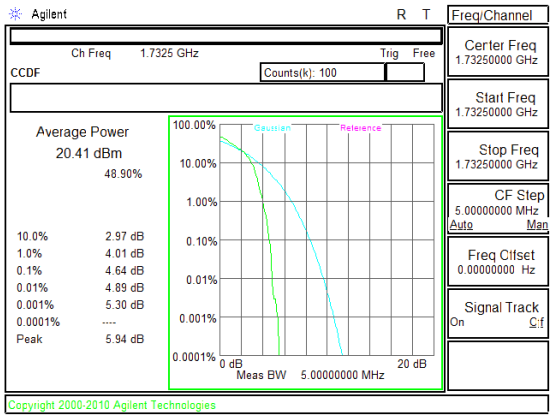
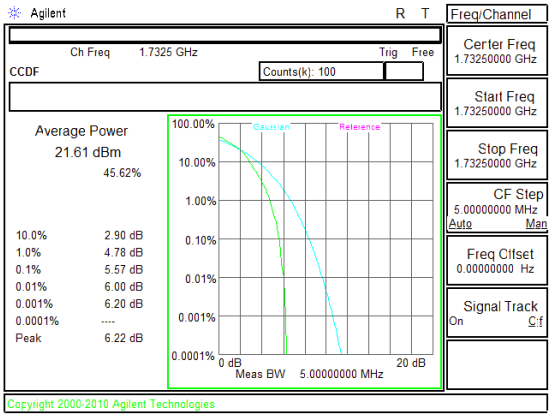
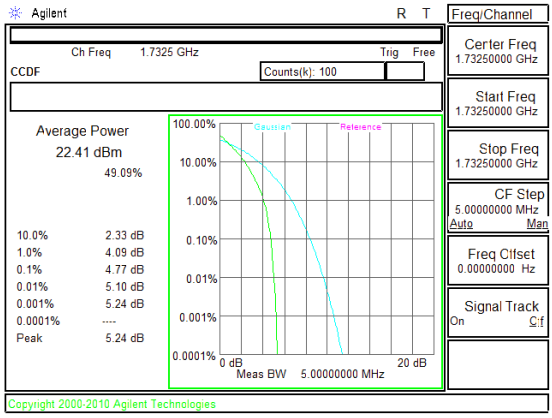
Band LTE4 10MHz 16QAM	 Band LTE4 10MHz 16QAM Mid channel	 Band LTE4 10MHz QPSK Mid channel
Band LTE4 5MHz 16QAM	 Band LTE4 5MHz 16QAM Mid channel	 Band LTE4 5MHz QPSK Mid channel

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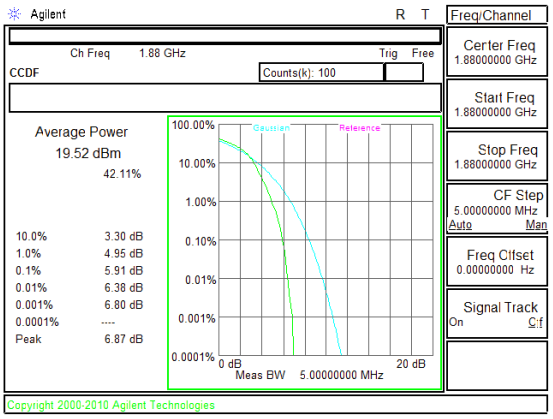
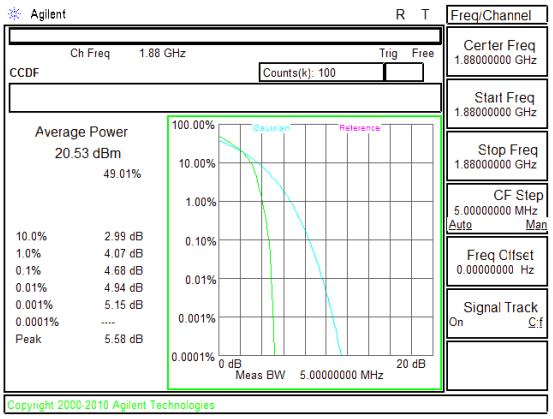
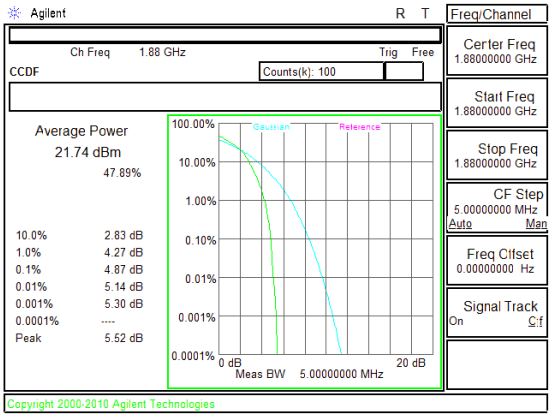
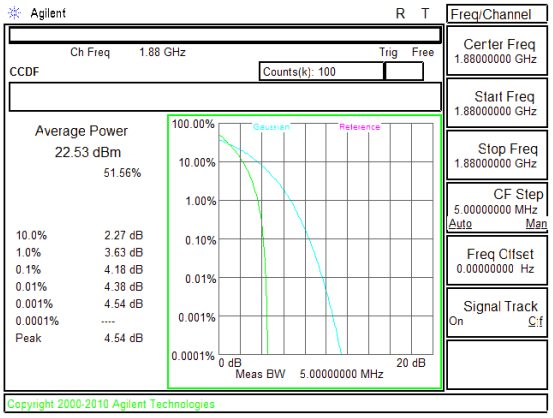
Band LTE2 10MHz 16QAM	 Band LTE2 10MHz 16QAM Mid channel	 Band LTE2 10MHz QPSK Mid channel
Band LTE2 5MHz 16QAM	 Band LTE2 5MHz 16QAM Mid channel	 Band LTE2 5MHz QPSK Mid channel

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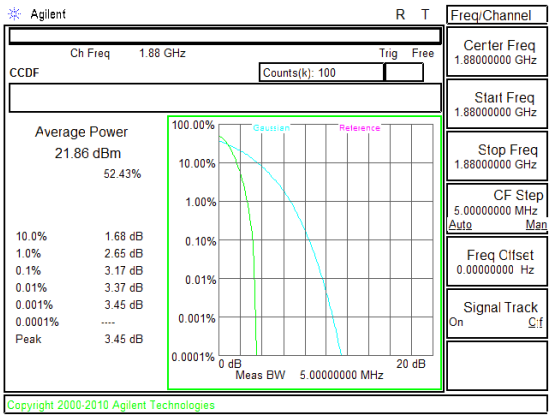
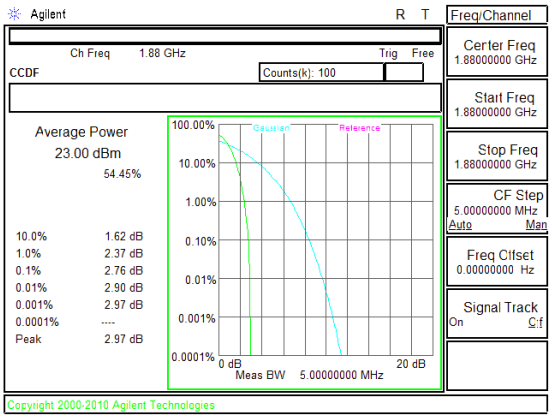
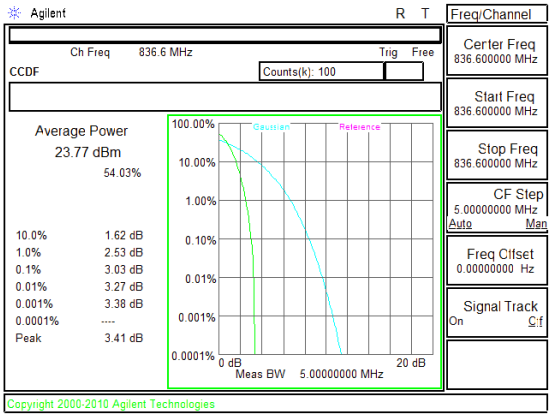
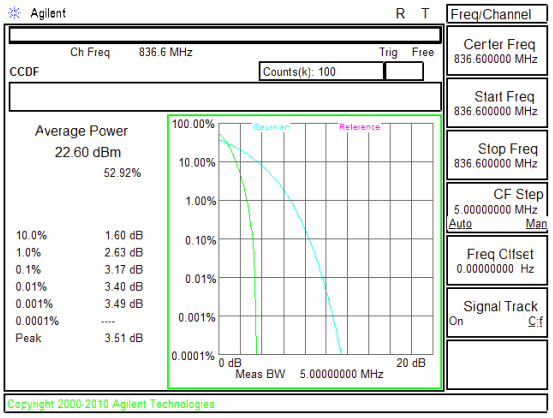
Band Band 2 HSDPA	 Band WCDMA B2 HSDPA	 Band WCDMA B2 REL99
Band Band 5 REL99	 Band WCDMA B5 REL99	 Band WCDMA B5 HSDPA

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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 v02r01 - 06/07/2013)

MODES TESTED

GSM, WCDMA, LTE

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10.1.1. OCCUPIED BANDWIDTH RESULTS

Band	Mode	Channel	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
GSM850	GMSK	128	824.2		
		190	836.6		
		251	848.8		
	GPRS	128	824.2	249.1	318.3
		190	836.6	244.6	314.3
		251	848.8	246.9	320.7
	EGPRS	128	824.2	243.5	310.9
		190	836.6	235.7	304.3
		251	848.8	247	314.6
GSM1900	GMSK	512	1850.2		
		661	1880		
		810	1909.8		
	GPRS	512	1850.2	255.6	315.4
		661	1880	245.9	317.4
		810	1909.8	245.2	316.4
	EGPRS	512	1850.2	235.1	296.4
		661	1880	245.2	304.9
		810	1909.8	243.9	309.9

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Band	Mode	Channel	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
Band 5	REL99	4132	826.4	4.145	4.645
		4183	836.6	4.164	4.648
		4233	846.6	4.174	4.638
	HSDPA	4132	826.4	4.138	4.657
		4183	836.6	4.15	4.618
		4233	846.6	4.166	4.639
	HSUPA	4132	826.4		
		4183	836.6		
		4233	846.6		
Band 2	REL99	9262	1852.4	4.164	4.644
		9400	1880	4.185	4.652
		9538	1907.6	4.179	4.664
	HSDPA	9262	1852.4	4.166	4.638
		9400	1880	4.173	4.649
		9538	1907.6	4.183	4.647
	HSUPA	9262	1852.4		
		9400	1880		
		9538	1907.6		

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10.1.2. LTE OCCUPIED BANDWIDTH RESULTS

Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (KHz)	-26dB BW (KHz)
LTE17	10	QPSK	50/0	709	8.966	9.77
			50/0	710	8.99	9.802
			50/0	711	9.001	9.761
		16QAM	50/0	709	8.971	9.767
			50/0	710	8.965	9.664
			50/0	711	9.02	9.843

Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (KHz)	-26dB BW (KHz)
LTE17	5	QPSK	25/0	706.5	4.508	4.955
			25/0	710	4.512	4.997
			25/0	713.5	4.504	4.947
		16QAM	25/0	706.5	4.506	4.922
			25/0	710	4.529	4.981
			25/0	713.5	4.517	4.971

Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (KHz)	-26dB BW (KHz)
LTE5	10	QPSK	50/0	829	8.956	9.723
			50/0	836.5	8.963	9.97
			50/0	844	8.977	9.737
		16QAM	50/0	829	8.95	9.802
			50/0	836.5	8.969	9.815
			50/0	844	8.963	9.792

Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (KHz)	-26dB BW (KHz)
LTE5	5	QPSK	25/0	826.5	4.499	4.92
			25/0	836.5	4.502	4.934
			25/0	846.5	4.493	4.958
		16QAM	25/0	826.5	4.486	4.978
			25/0	836.5	4.516	4.896
			25/0	846.5	4.512	5.015

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Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (KHz)	-26dB BW (KHz)
LTE4	10	QPSK	50/0	1715	8.956	9.901
			50/0	1732.5	8.974	9.852
			50/0	1750	8.961	9.769
		16QAM	50/0	1715	8.959	9.741
			50/0	1732.5	8.957	9.797
			50/0	1750	8.982	9.725

Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (KHz)	-26dB BW (KHz)
LTE4	5	QPSK	25/0	1712.5	4.498	4.928
			25/0	1732.5	4.506	4.994
			25/0	1752.5	4.507	4.955
		16QAM	25/0	1712.5	4.515	5.029
			25/0	1732.5	4.514	5.002
			25/0	1752.5	4.52	4.985

Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (KHz)	-26dB BW (KHz)
LTE2	10	QPSK	50/0	1855	8.962	9.735
			50/0	1880	8.951	9.827
			50/0	1905	8.976	9.954
		16QAM	50/0	1855	8.985	9.838
			50/0	1880	8.974	9.816
			50/0	1905	8.986	9.887

Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (KHz)	-26dB BW (KHz)
LTE2	5	QPSK	25/0	1852.5	4.497	5.024
			25/0	1880	4.502	5.042
			25/0	1907.5	4.499	5.006
		16QAM	25/0	1852.5	4.508	5.004
			25/0	1880	4.519	5.017
			25/0	1907.5	4.519	4.976

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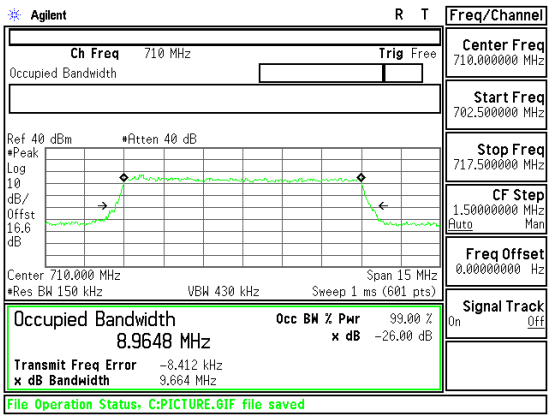
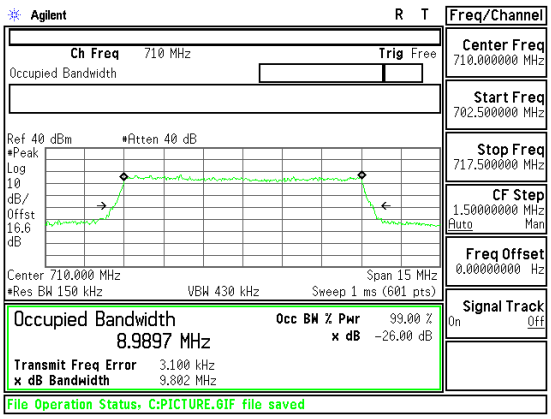
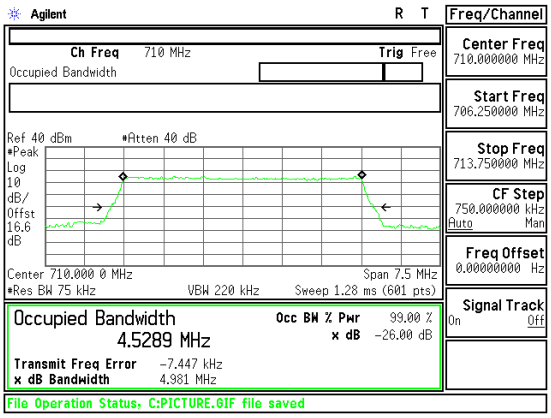
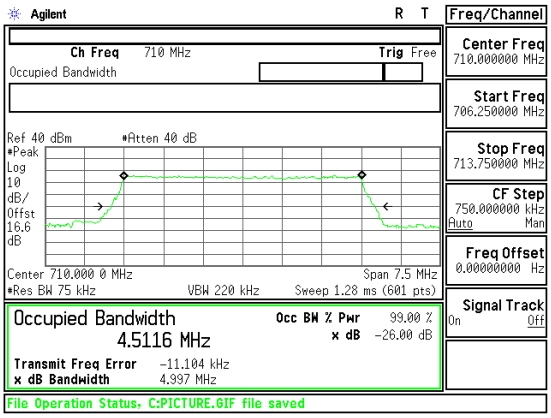
10.1.1. OCCUPIED BANDWIDTH PLOTS

Band LTE17 10MHz 16QAM	 Band LTE17 10MHz OBW 16QAM Mid Channel FRB.gif	 Band LTE17 10MHz OBW QPSK Mid Channel FRB.gif
Band LTE17 5MHz 16QAM	 Band LTE17 5MHz OBW 16QAM Mid Channel FRB.gif	 Band LTE17 5MHz OBW QPSK Mid Channel FRB.gif

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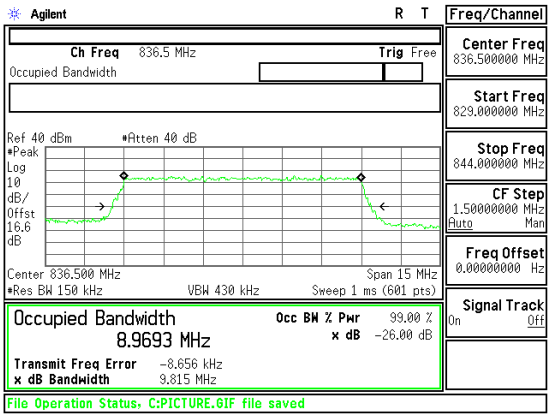
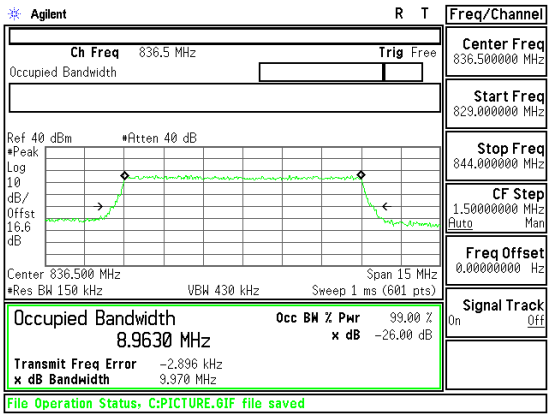
Band LTE5 10MHz 16QAM

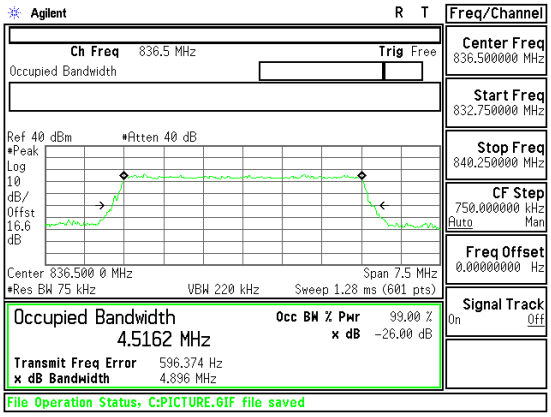


Band LTE5 10MHz OBW 16QAM Mid Channel FRB.gif

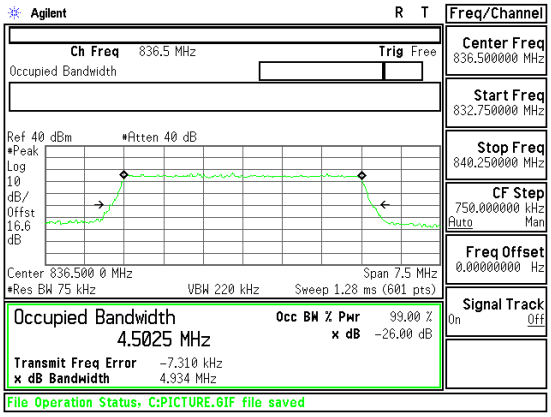


Band LTE5 10MHz OBW QPSK Mid Channel FRB.gif

Band LTE5 5MHz 16QAM



Band LTE5 5MHz OBW 16QAM Mid Channel FRB.gif



Band LTE5 5MHz OBW QPSK Mid Channel FRB.gif

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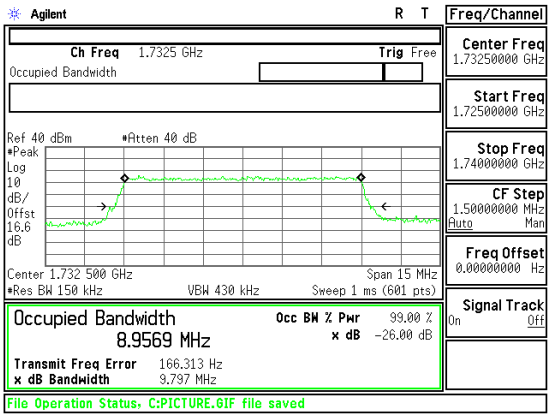
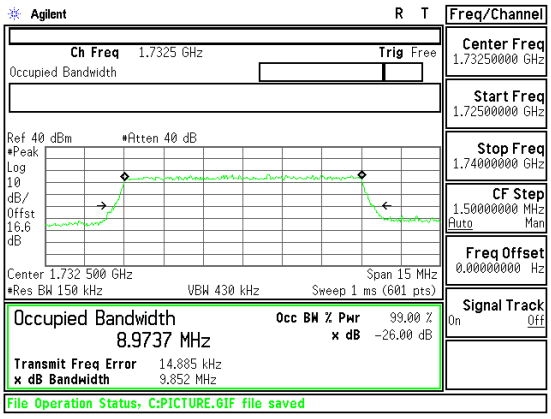
Band LTE4 10MHz 16QAM

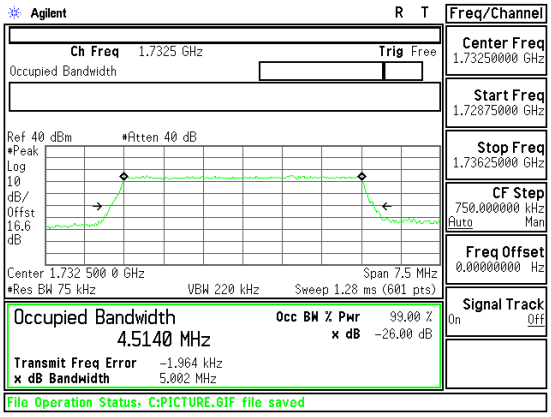


Band LTE4 10MHz OBW 16QAM Mid Channel FRB.gif

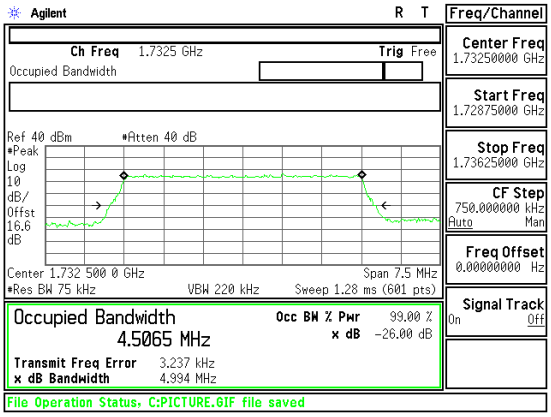


Band LTE4 10MHz OBW QPSK Mid Channel FRB.gif

Band LTE4 5MHz 16QAM



Band LTE4 5MHz OBW 16QAM Mid Channel FRB.gif



Band LTE4 5MHz OBW QPSK Mid Channel FRB.gif

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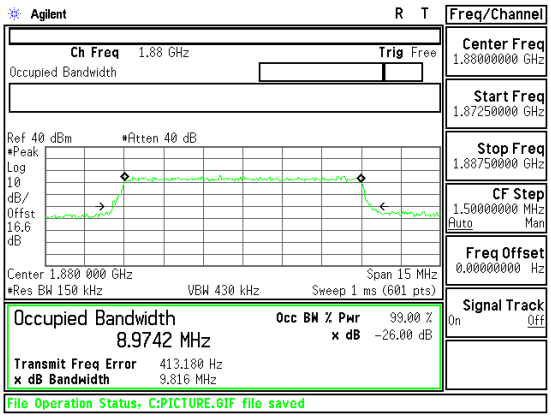
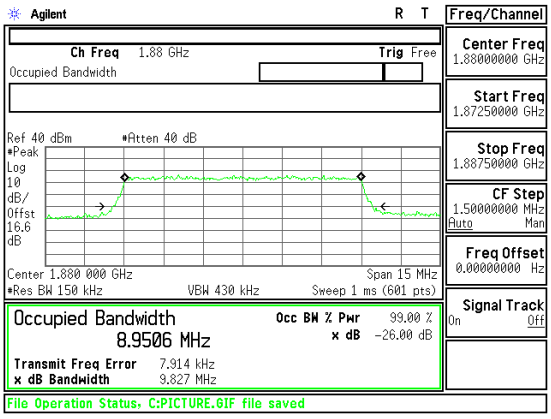
Band LTE2 10MHz 16QAM

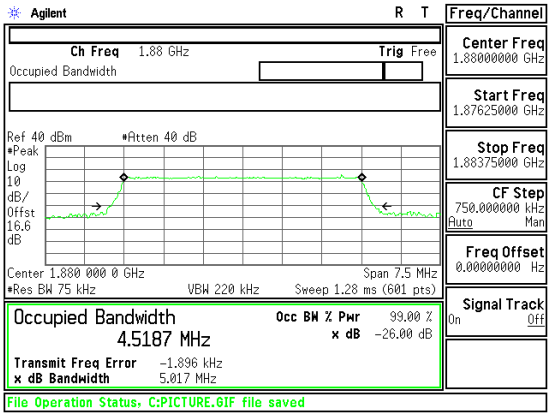


Band LTE2 10MHz OBW 16QAM Mid Channel FRB.gif

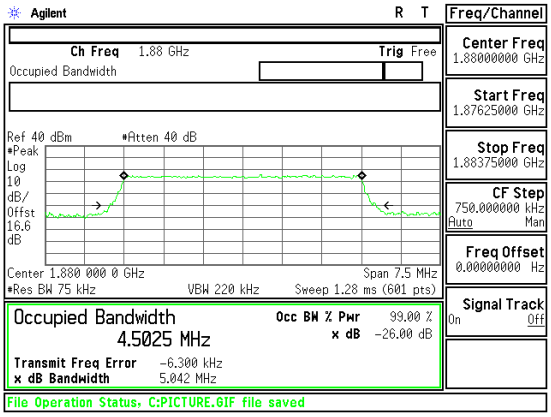


Band LTE2 10MHz OBW QPSK Mid Channel FRB.gif

Band LTE2 5MHz 16QAM



Band LTE2 5MHz OBW 16QAM Mid Channel FRB.gif



Band LTE2 5MHz OBW QPSK Mid Channel FRB.gif

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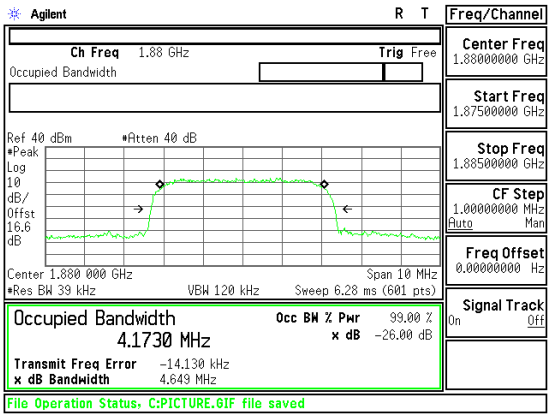
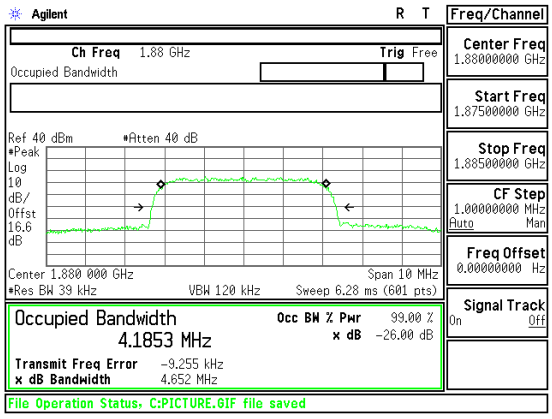
Band

Band 2

HSDPA



Band WCDMA B2 HSDPA OBW

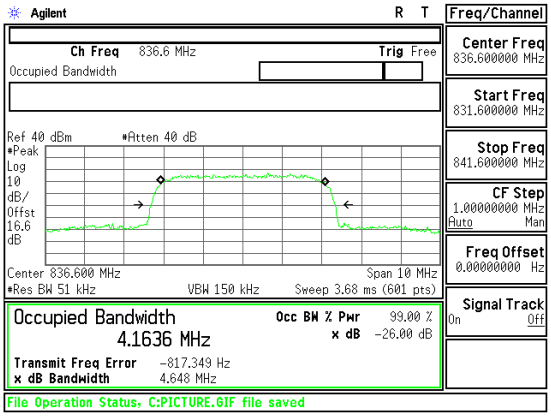


Band WCDMA B2 REL99 OBW

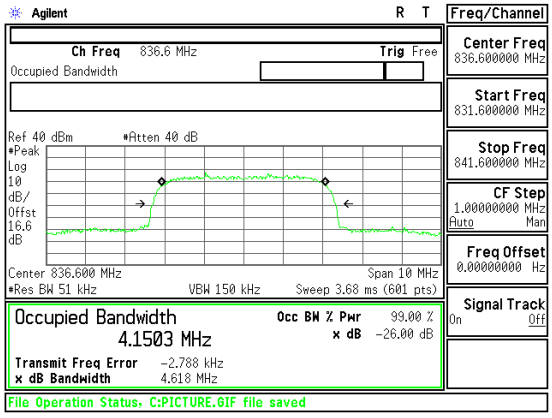
Band

Band 5

REL99



Band WCDMA B5 REL99 OBW



Band WCDMA B5 HSDPA OBW

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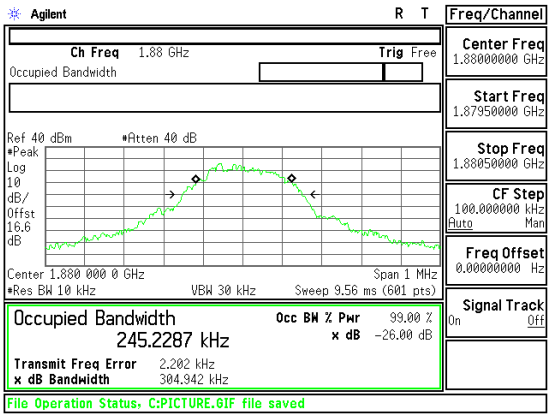
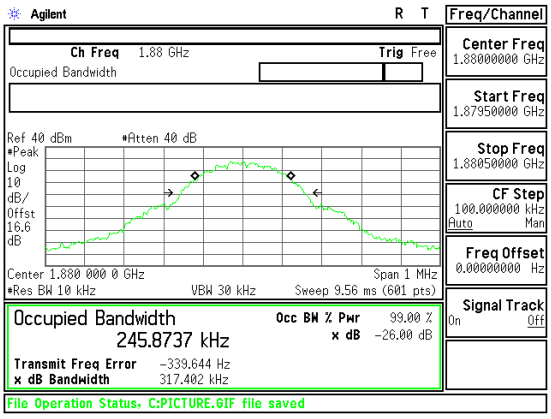
Band GSM 1900 EGPRS

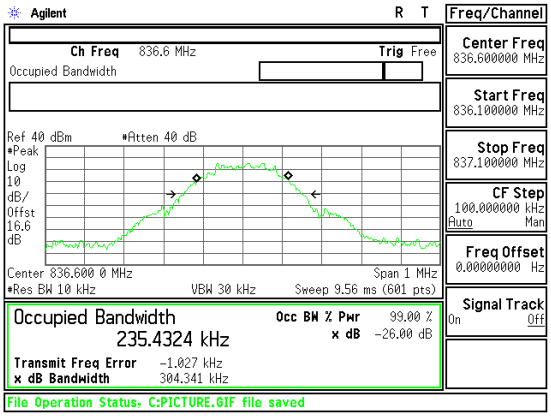


Band GSM1900 EGPRS OBW Mid channel

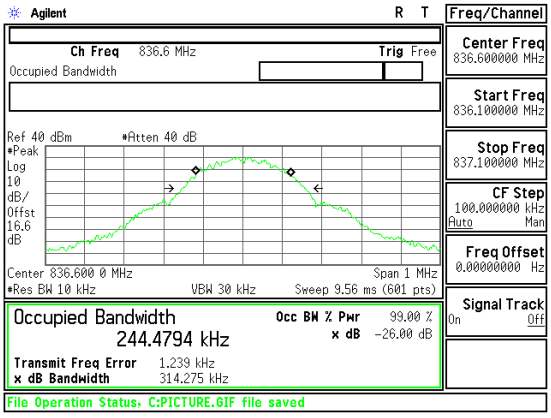


Band GSM1900 GPRS OBW Mid channel

Band GSM 850 EGPRS



Band GSM850 EGPRS OBW Mid channel



Band GSM850 GPRS OBW Mid channel

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10.2. BAND EDGE EMISSIONS

RULE PART(S)

FCC: §22.359, §24.238, §27. 53 and § 90.691

LIMITS

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

Part 27: (m)(4) For mobile station, the attenuation factor shall be not less than 43+10Log(P)dB at the channel edge and (55+10Log(P)dB) at 5.5MHz from the channel edges.

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v02r01
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, LTE

RESULTS

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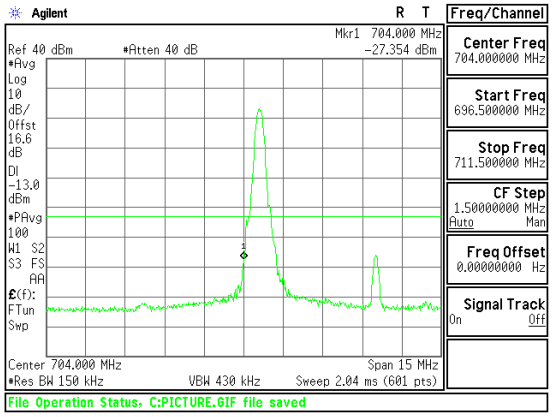
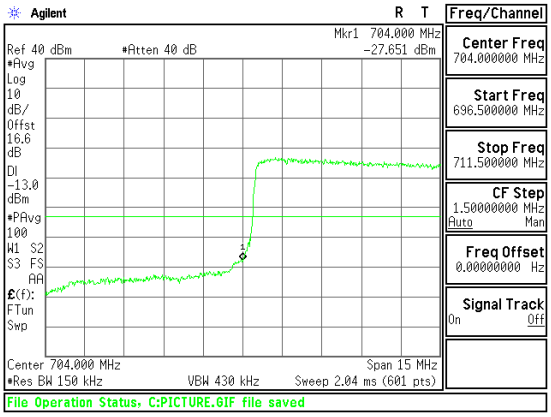
10.2.1. BAND EDGE PLOTS

Band LTE17 10MHz 16QAM

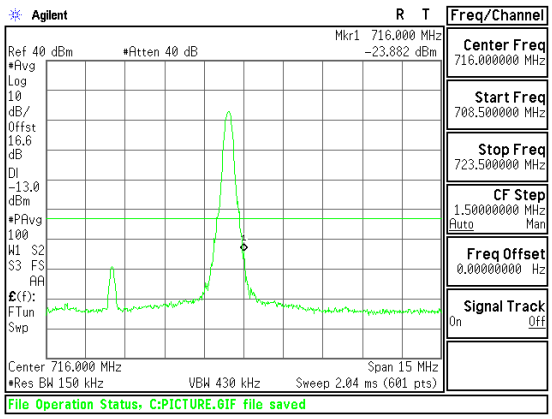


Band LTE17 10MHz CBE 16QAM Low Channel 1RB.gif

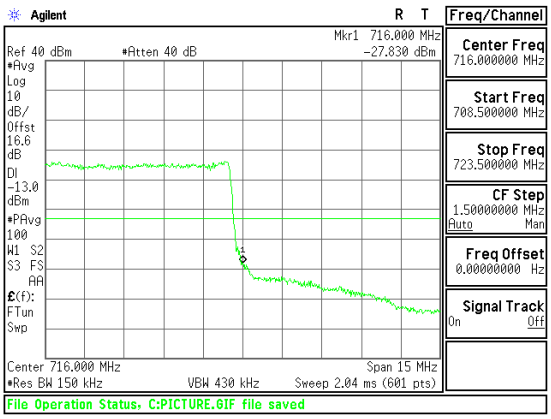


Band LTE17 10MHz CBE 16QAM Low Channel FRB.gif

Band LTE17 10MHz 16QAM



Band LTE17 10MHz CBE 16QAM High Channel 1RB.gif



Band LTE17 10MHz CBE 16QAM High Channel FRB.gif

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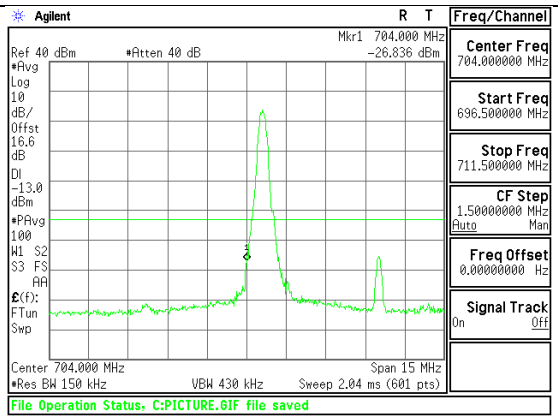
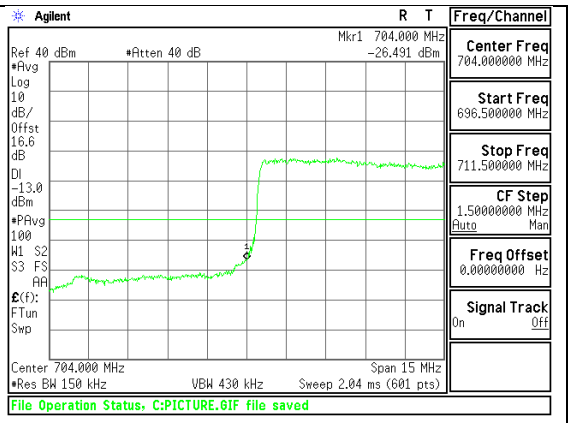
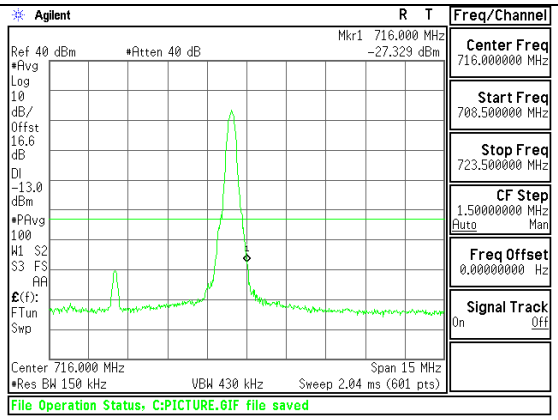
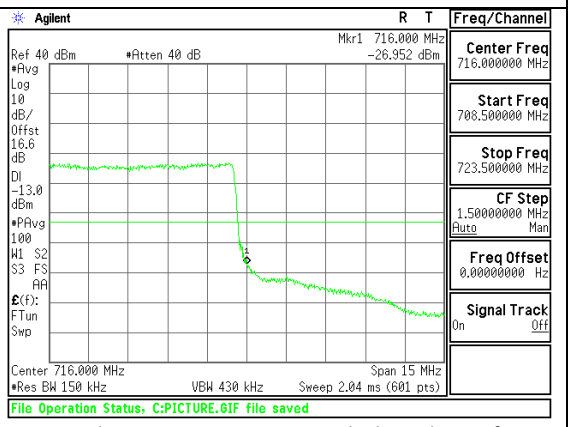
Band LTE17 10MHz QPSK	 Band LTE17 10MHz CBE QPSK Low Channel 1RB.gif	 Band LTE17 10MHz CBE QPSK Low Channel FRB.gif
Band LTE17 10MHz QPSK	 Band LTE17 10MHz CBE QPSK High Channel 1RB.gif	 Band LTE17 10MHz CBE QPSK High Channel FRB.gif

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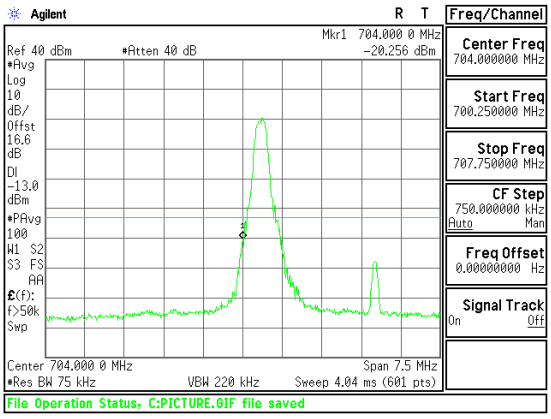
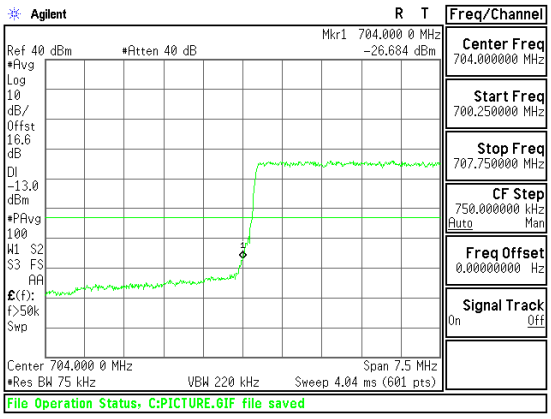
Band LTE17 5MHz 16QAM

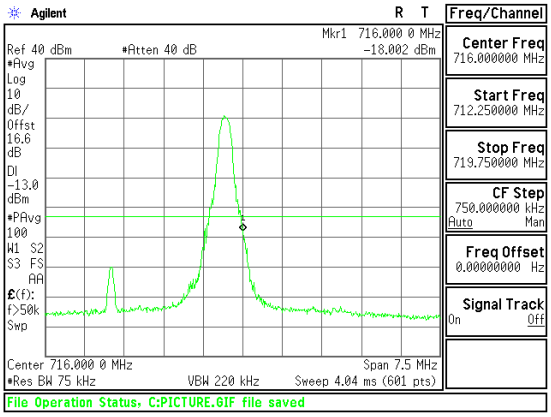


Band LTE17 5MHz CBE 16QAM Low Channel 1RB.gif

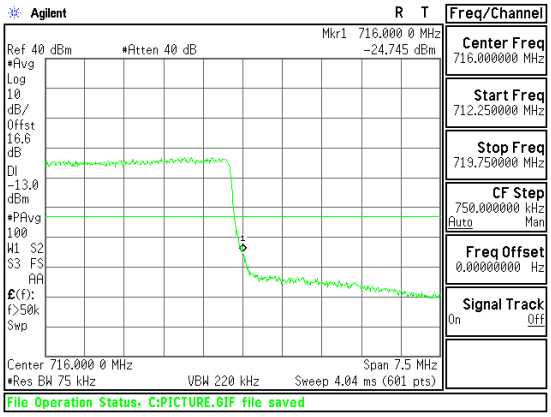


Band LTE17 5MHz CBE 16QAM Low Channel FRB.gif

Band LTE17 5MHz 16QAM



Band LTE17 5MHz CBE 16QAM High Channel 1RB.gif



Band LTE17 5MHz CBE 16QAM High Channel FRB.gif

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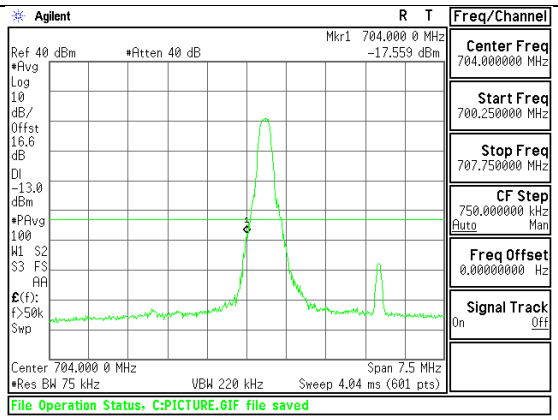
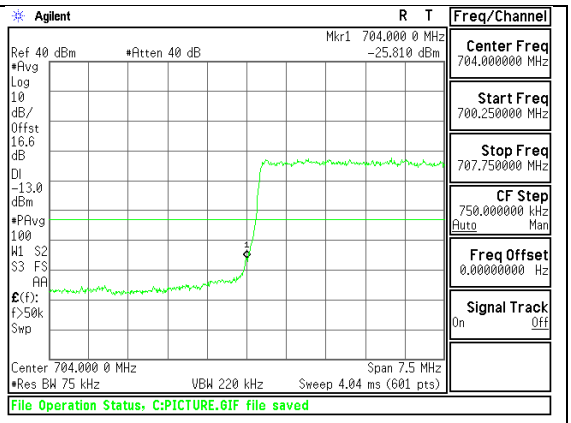
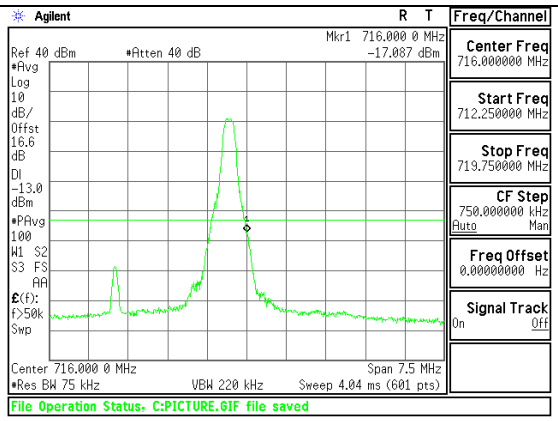
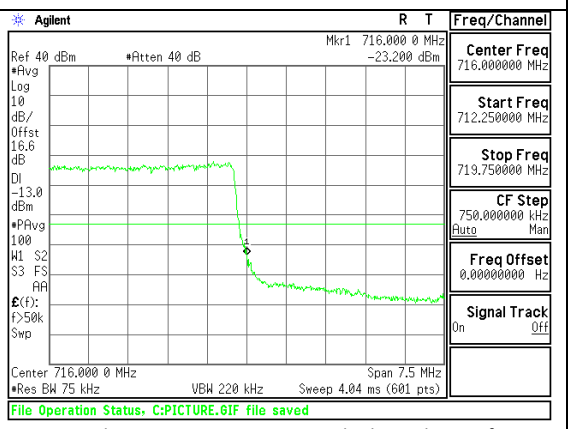
Band LTE17 5MHz QPSK	 Band LTE17 5MHz CBE QPSK Low Channel 1RB.gif	 Band LTE17 5MHz CBE QPSK Low Channel FRB.gif
Band LTE17 5MHz QPSK	 Band LTE17 5MHz CBE QPSK High Channel 1RB.gif	 Band LTE17 5MHz CBE QPSK High Channel FRB.gif

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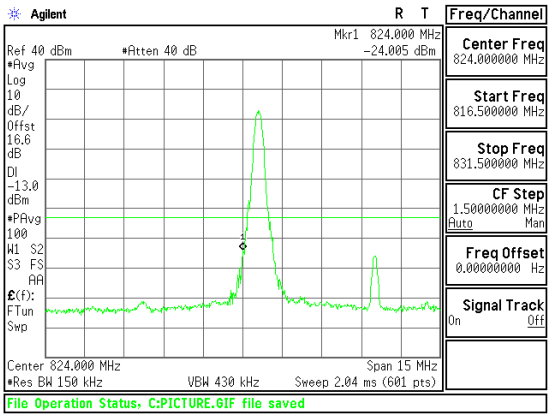
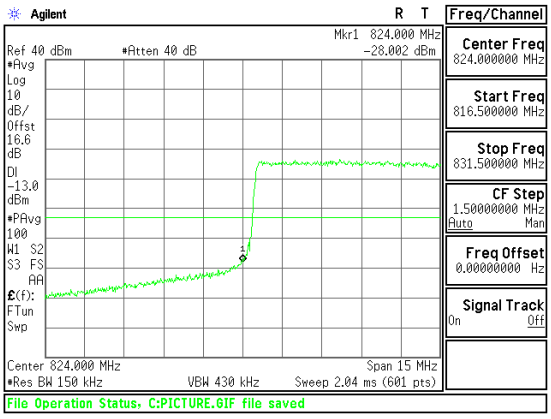
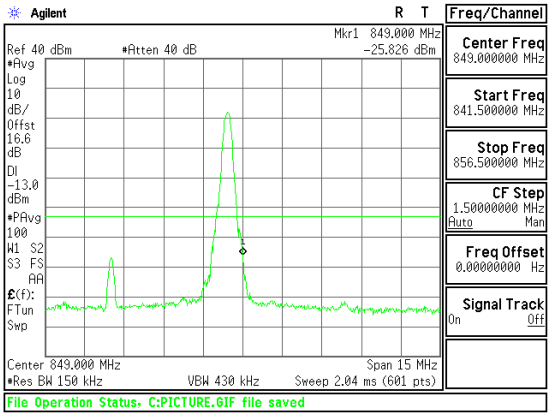
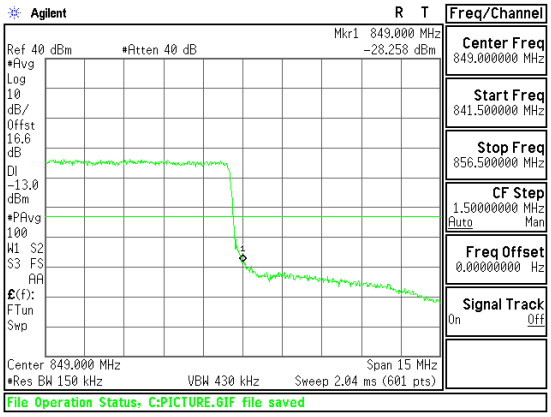
Band LTE5 10MHz 16QAM	 Band LTE5 10MHz CBE 16QAM Low Channel 1RB.gif	 Band LTE5 10MHz CBE 16QAM Low Channel FRB.gif
Band LTE5 10MHz 16QAM	 Band LTE5 10MHz CBE 16QAM High Channel 1RB.gif	 Band LTE5 10MHz CBE 16QAM High Channel FRB.gif

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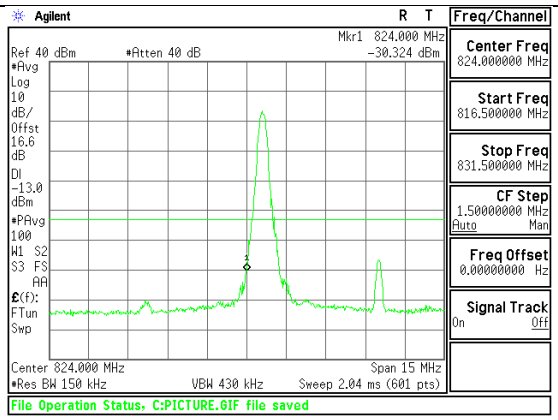
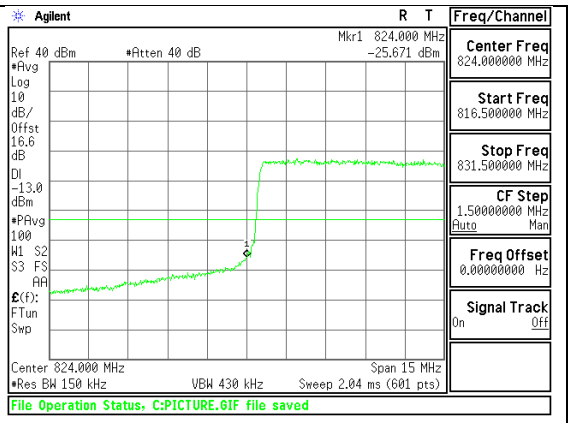
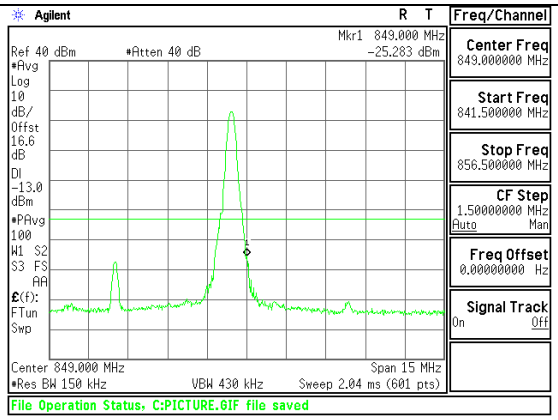
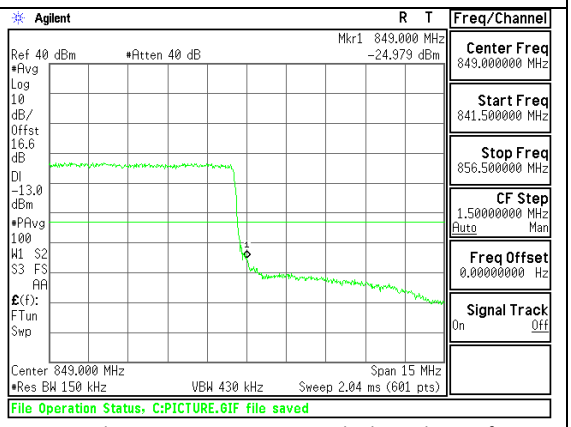
Band LTE5 10MHz QPSK	 Band LTE5 10MHz CBE QPSK Low Channel 1RB.gif	 Band LTE5 10MHz CBE QPSK Low Channel FRB.gif
Band LTE5 10MHz QPSK	 Band LTE5 10MHz CBE QPSK High Channel 1RB.gif	 Band LTE5 10MHz CBE QPSK High Channel FRB.gif

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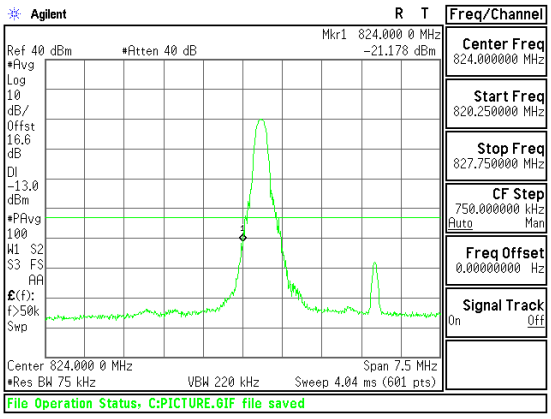
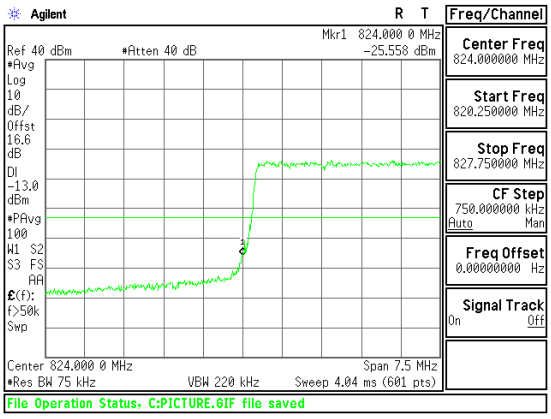
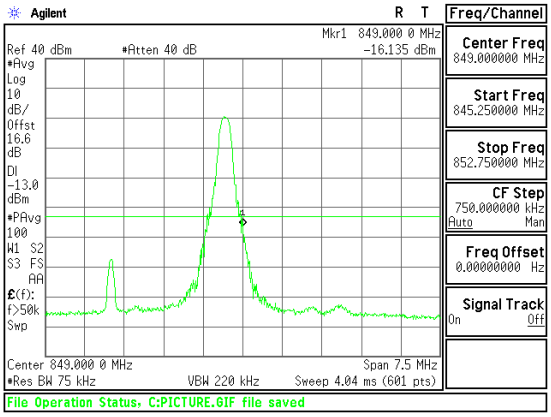
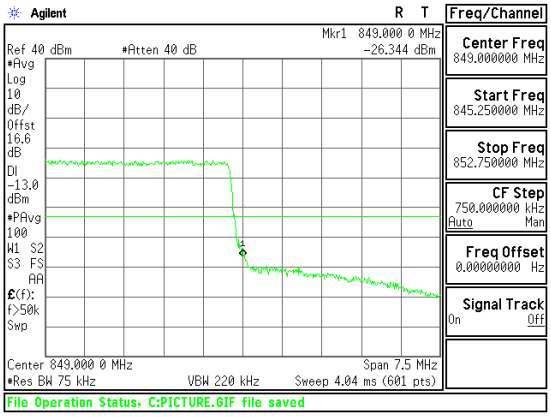
Band LTE5 5MHz 16QAM	 Band LTE5 5MHz CBE 16QAM Low Channel 1RB.gif	 Band LTE5 5MHz CBE 16QAM Low Channel FRB.gif
Band LTE5 5MHz 16QAM	 Band LTE5 5MHz CBE 16QAM High Channel 1RB.gif	 Band LTE5 5MHz CBE 16QAM High Channel FRB.gif

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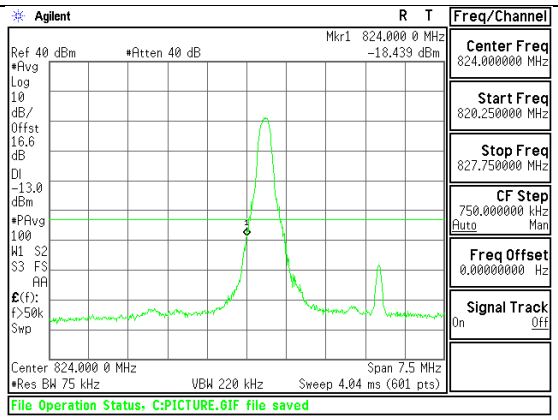
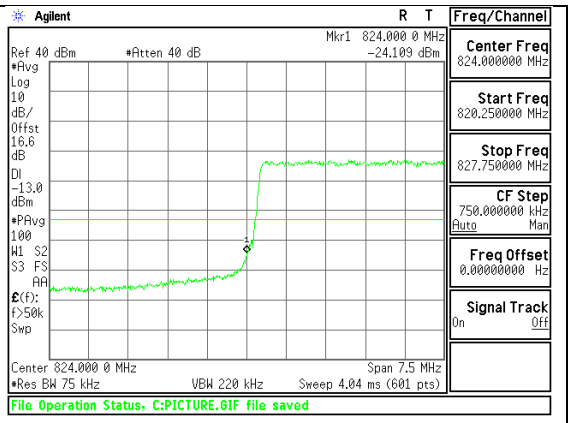
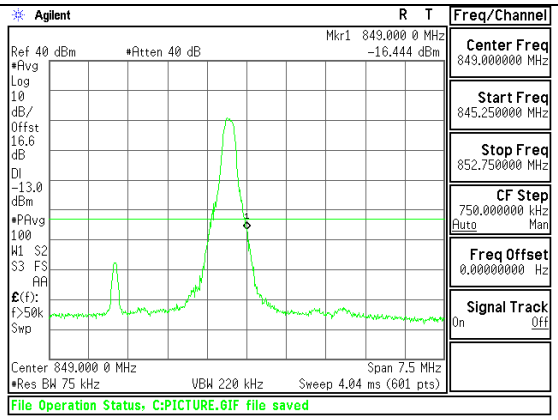
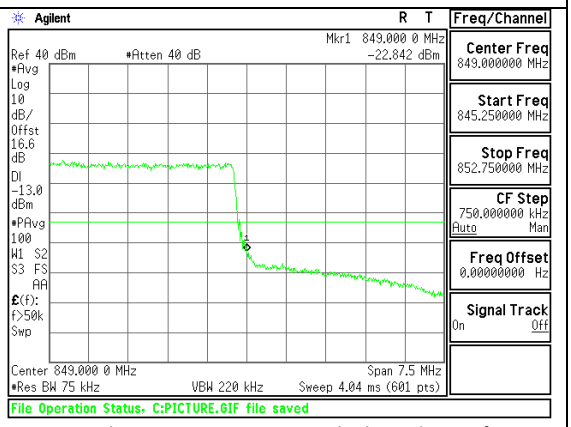
Band LTE5 5MHz QPSK	 Band LTE5 5MHz CBE QPSK Low Channel 1RB.gif	 Band LTE5 5MHz CBE QPSK Low Channel FRB.gif
Band LTE5 5MHz QPSK	 Band LTE5 5MHz CBE QPSK High Channel 1RB.gif	 Band LTE5 5MHz CBE QPSK High Channel FRB.gif

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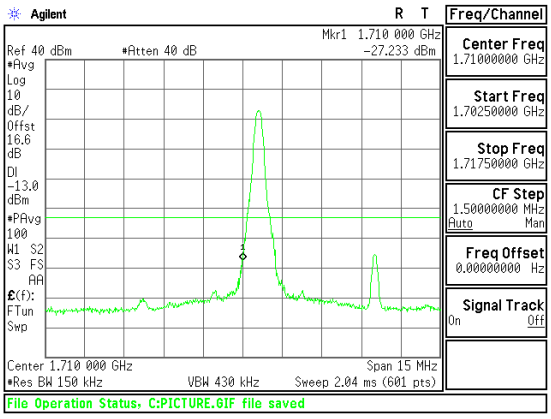
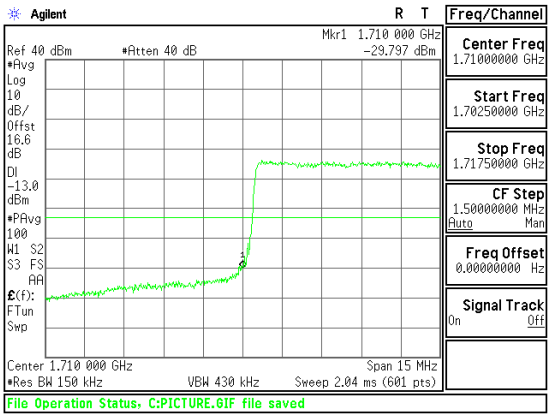
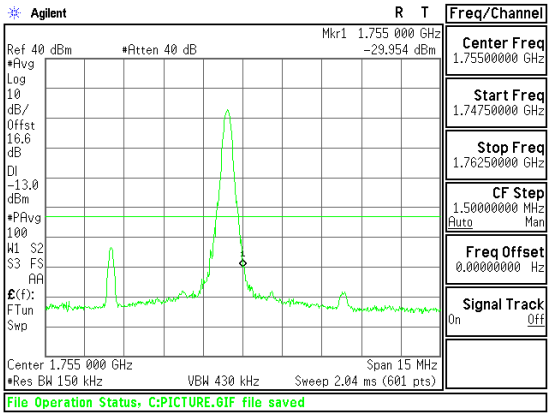
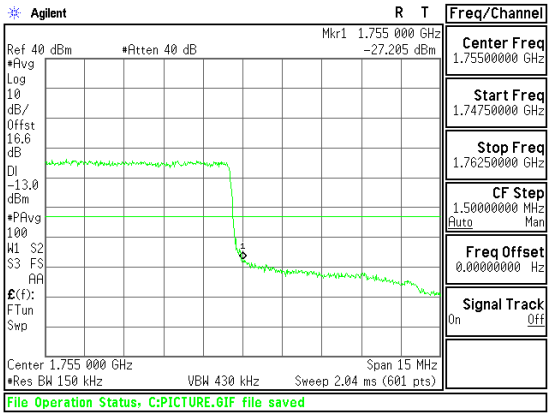
Band LTE4 10MHz 16QAM	 Band LTE4 10MHz CBE 16QAM Low Channel 1RB.gif	 Band LTE4 10MHz CBE 16QAM Low Channel FRB.gif
Band LTE4 10MHz 16QAM	 Band LTE4 10MHz CBE 16QAM High Channel 1RB.gif	 Band LTE4 10MHz CBE 16QAM High Channel FRB.gif

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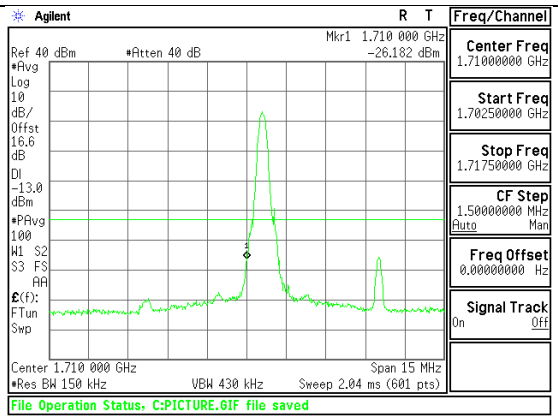
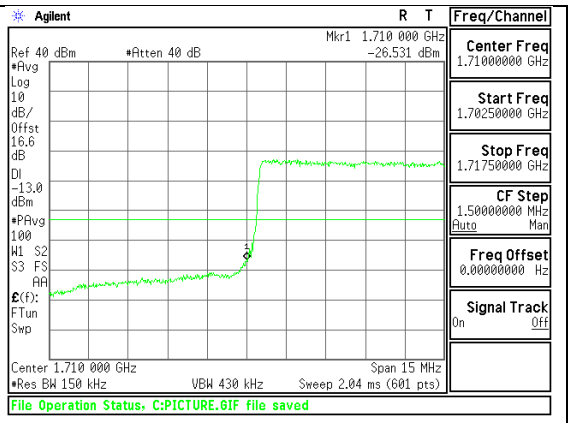
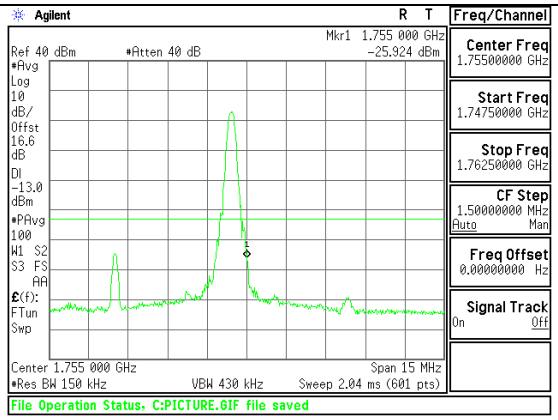
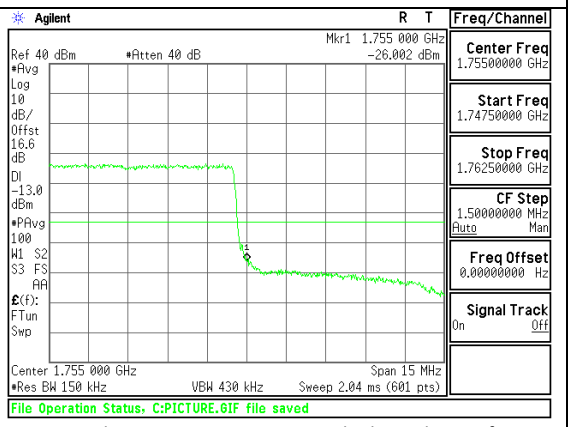
Band LTE4 10MHz QPSK	 Band LTE4 10MHz CBE QPSK Low Channel 1RB.gif	 Band LTE4 10MHz CBE QPSK Low Channel FRB.gif
Band LTE4 10MHz QPSK	 Band LTE4 10MHz CBE QPSK High Channel 1RB.gif	 Band LTE4 10MHz CBE QPSK High Channel FRB.gif

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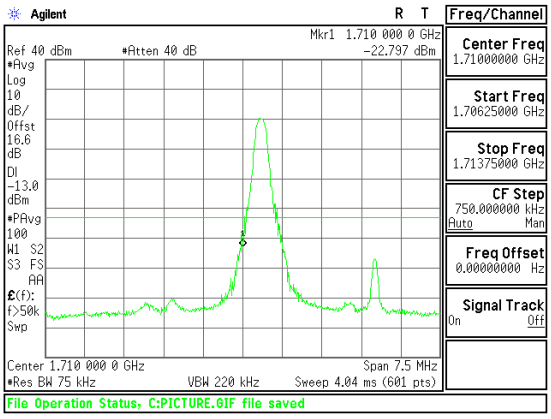
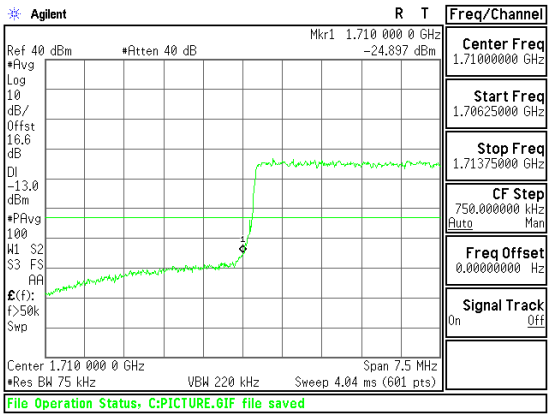
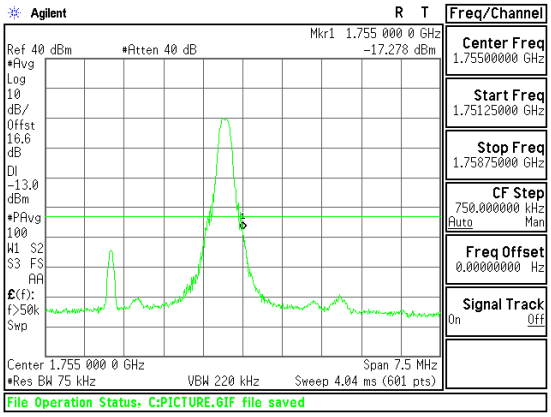
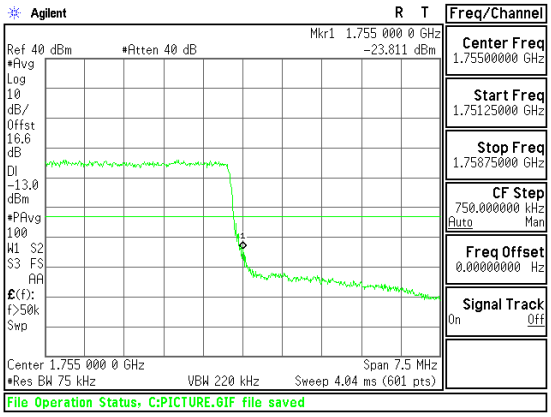
Band LTE4 5MHz 16QAM	 Band LTE4 5MHz CBE 16QAM Low Channel 1RB.gif	 Band LTE4 5MHz CBE 16QAM Low Channel FRB.gif
Band LTE4 5MHz 16QAM	 Band LTE4 5MHz CBE 16QAM High Channel 1RB.gif	 Band LTE4 5MHz CBE 16QAM High Channel FRB.gif

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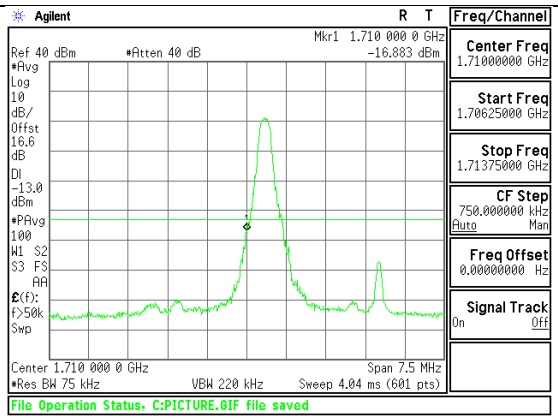
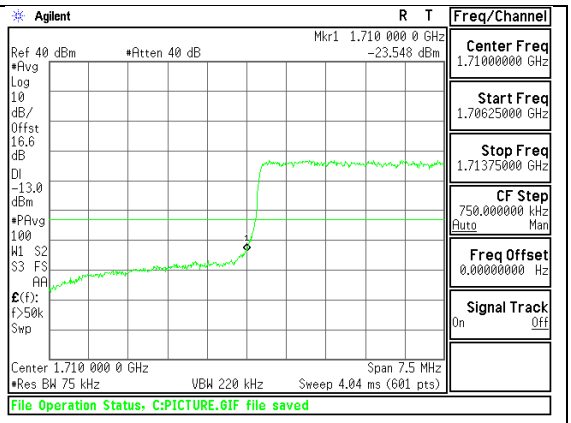
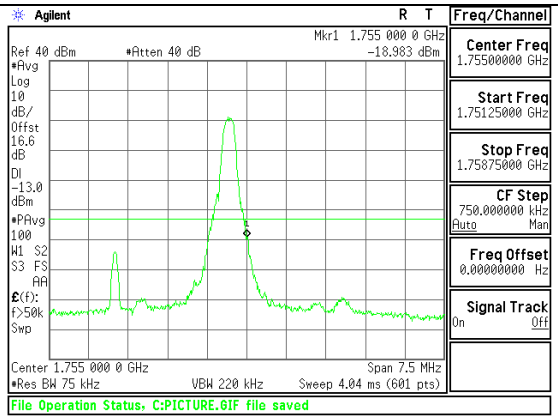
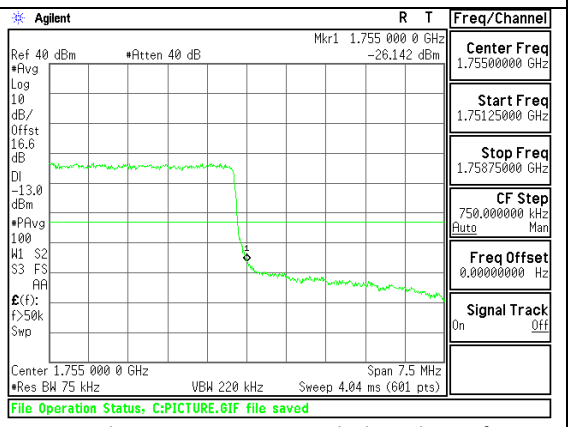
Band LTE4 5MHz QPSK	 Band LTE4 5MHz CBE QPSK Low Channel 1RB.gif	 Band LTE4 5MHz CBE QPSK Low Channel FRB.gif
Band LTE4 5MHz QPSK	 Band LTE4 5MHz CBE QPSK High Channel 1RB.gif	 Band LTE4 5MHz CBE QPSK High Channel FRB.gif

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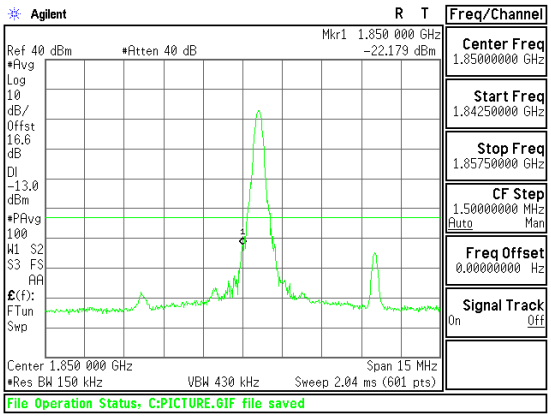
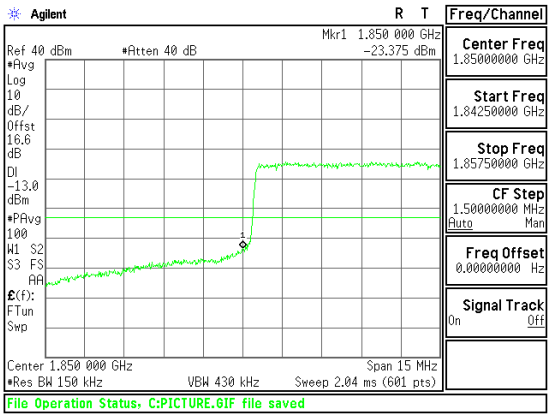
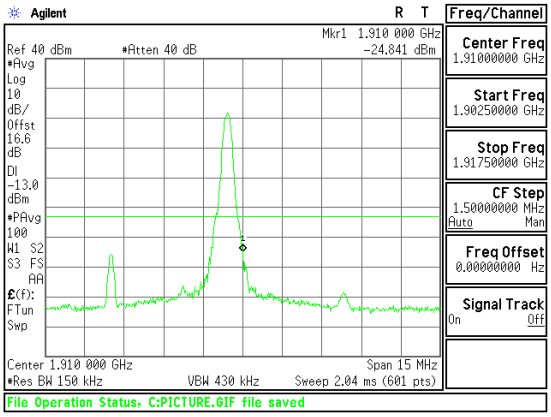
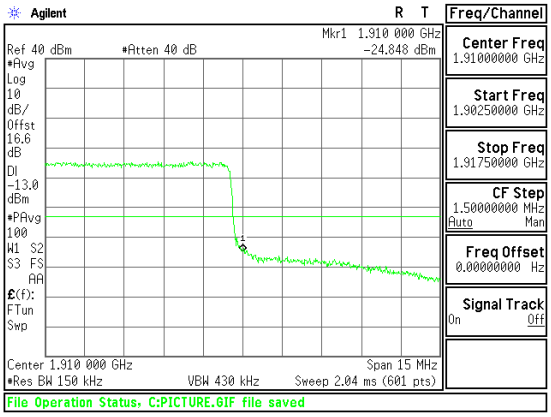
Band LTE2 10MHz 16QAM	 Band LTE2 10MHz CBE 16QAM Low Channel 1RB.gif	 Band LTE2 10MHz CBE 16QAM Low Channel FRB.gif
Band LTE2 10MHz 16QAM	 Band LTE2 10MHz CBE 16QAM High Channel 1RB.gif	 Band LTE2 10MHz CBE 16QAM High Channel FRB.gif

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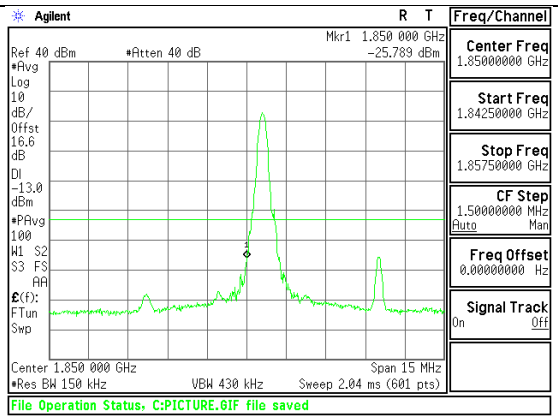
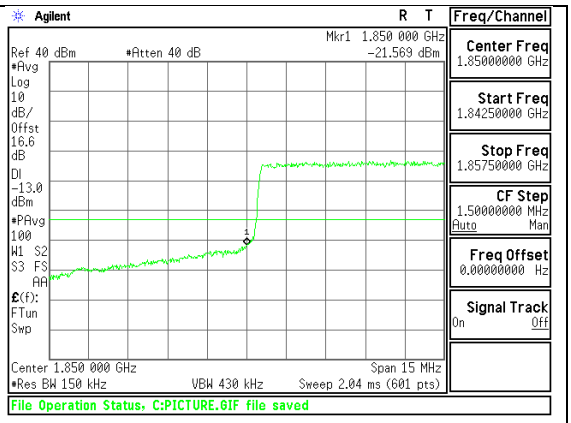
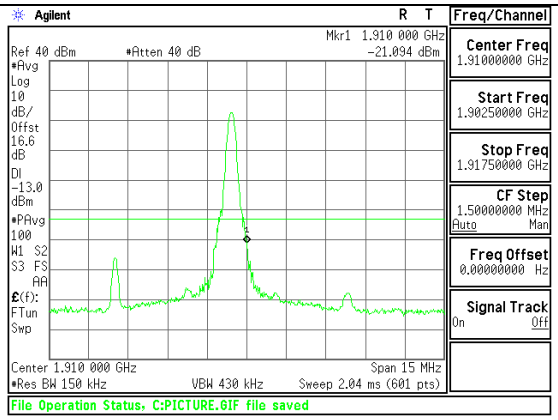
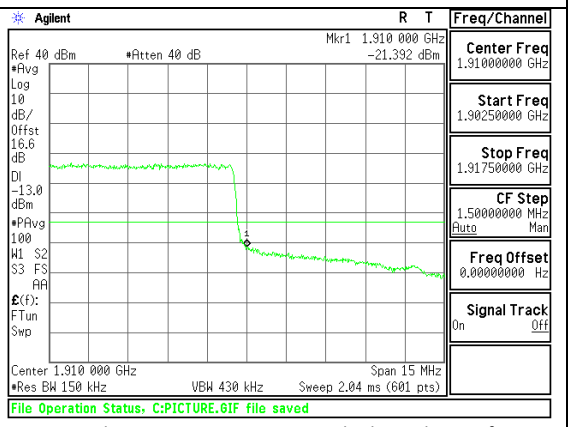
Band LTE2 10MHz QPSK	 Band LTE2 10MHz CBE QPSK Low Channel 1RB.gif	 Band LTE2 10MHz CBE QPSK Low Channel FRB.gif
Band LTE2 10MHz QPSK	 Band LTE2 10MHz CBE QPSK High Channel 1RB.gif	 Band LTE2 10MHz CBE QPSK High Channel FRB.gif

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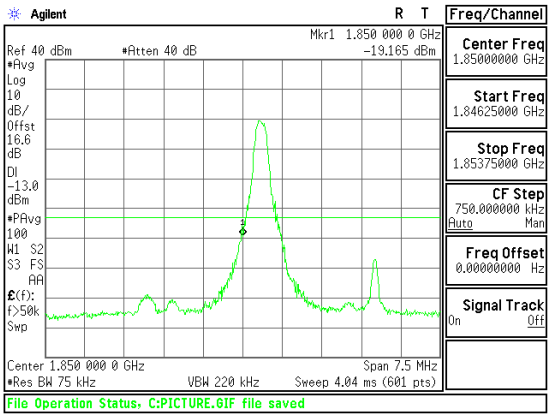
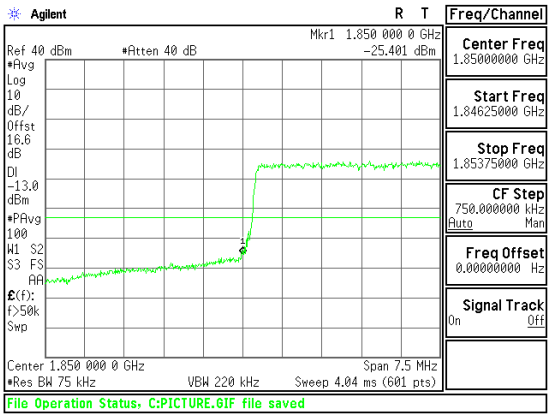
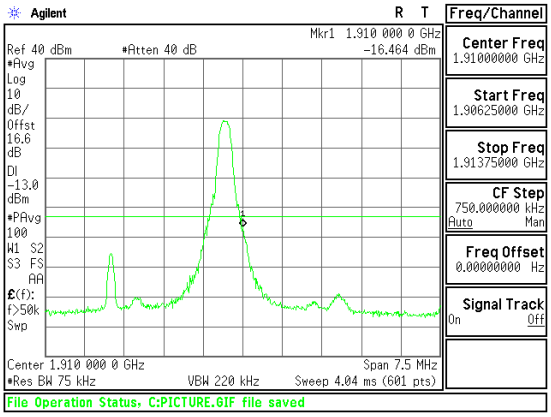
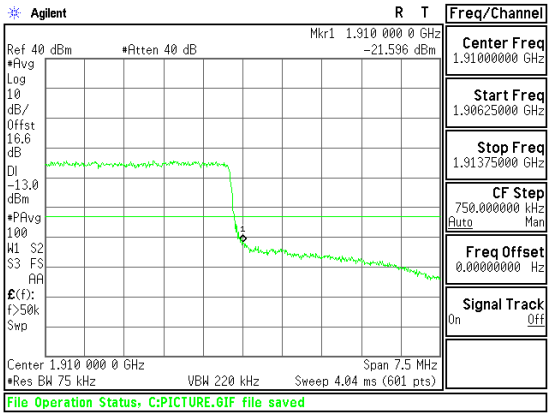
Band LTE2 5MHz 16QAM	 Band LTE2 5MHz CBE 16QAM Low Channel 1RB.gif	 Band LTE2 5MHz CBE 16QAM Low Channel FRB.gif
Band LTE2 5MHz 16QAM	 Band LTE2 5MHz CBE 16QAM High Channel 1RB.gif	 Band LTE2 5MHz CBE 16QAM High Channel FRB.gif

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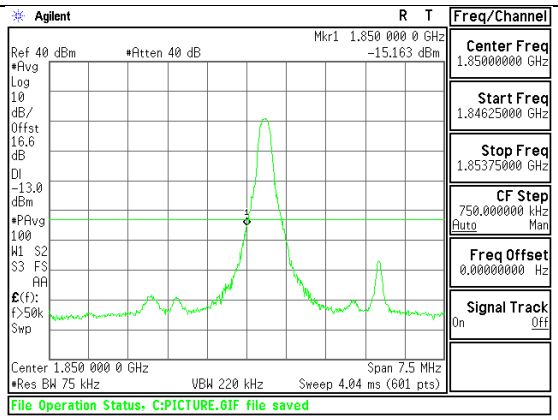
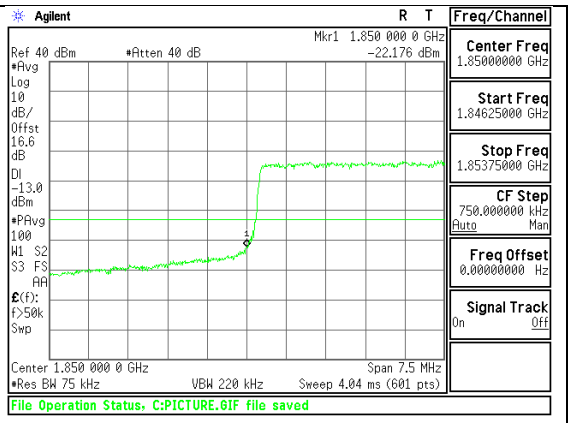
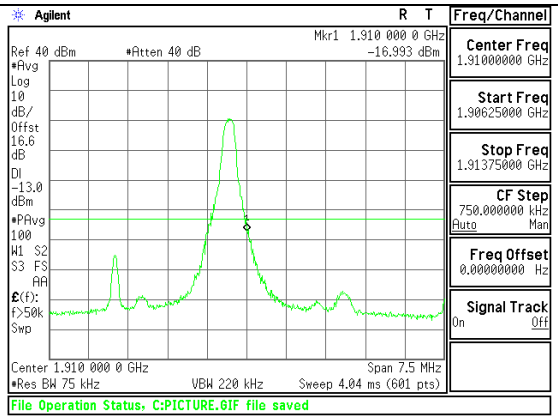
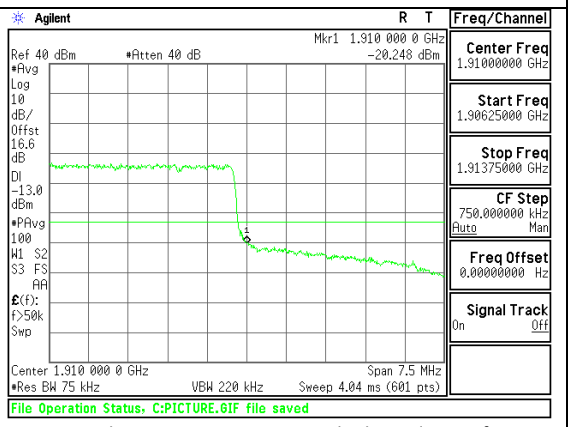
Band LTE2 5MHz QPSK	 Band LTE2 5MHz CBE QPSK Low Channel 1RB.gif	 Band LTE2 5MHz CBE QPSK Low Channel FRB.gif
Band LTE2 5MHz QPSK	 Band LTE2 5MHz CBE QPSK High Channel 1RB.gif	 Band LTE2 5MHz CBE QPSK High Channel FRB.gif

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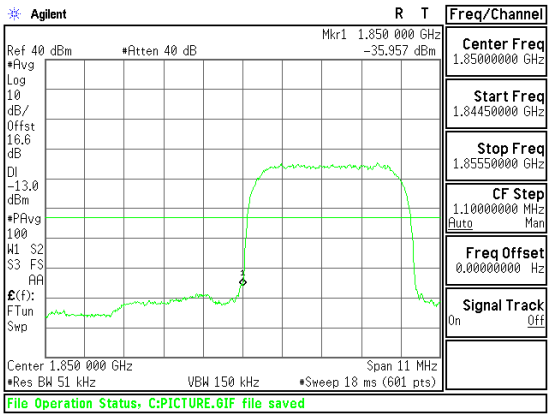
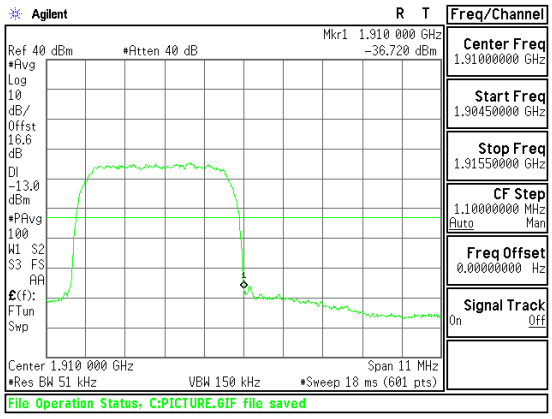
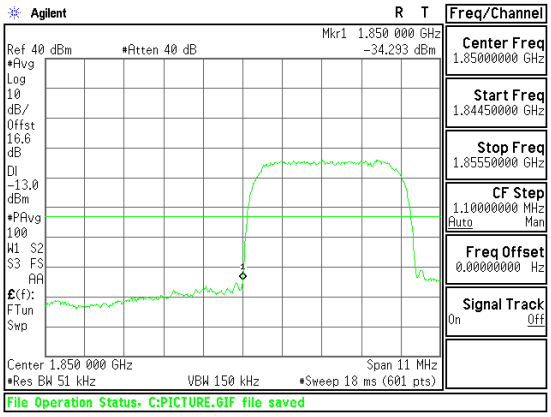
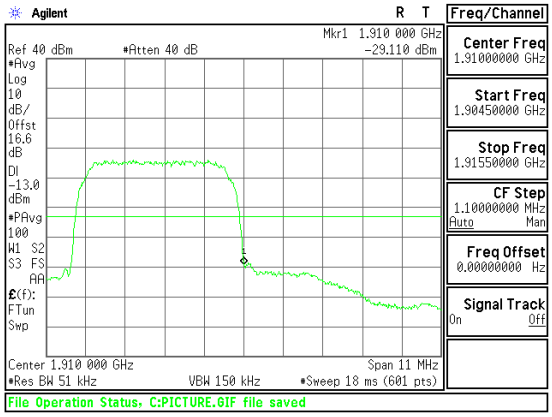
Band Band 2 HSDPA	 Band WCDMA B2 HSDPA CBE	 Band WCDMA B2 HSDPA CBE
Band Band 2 REL99	 Band WCDMA B2 REL99 CBE	 Band WCDMA B2 REL99 CBE

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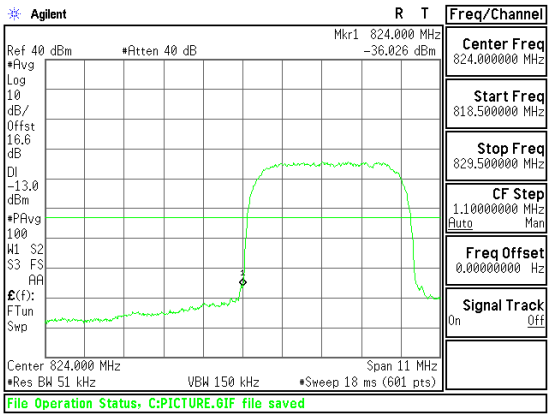
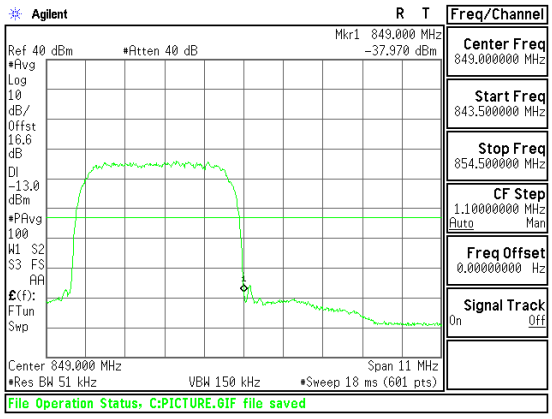
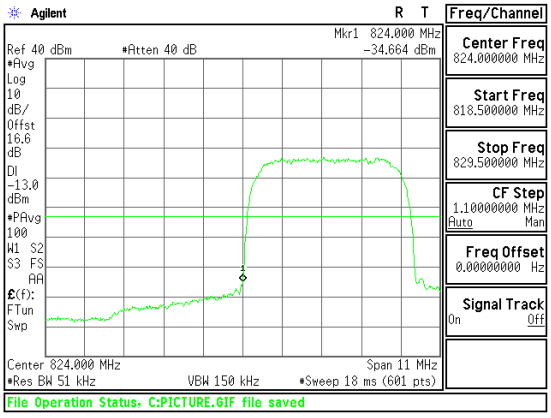
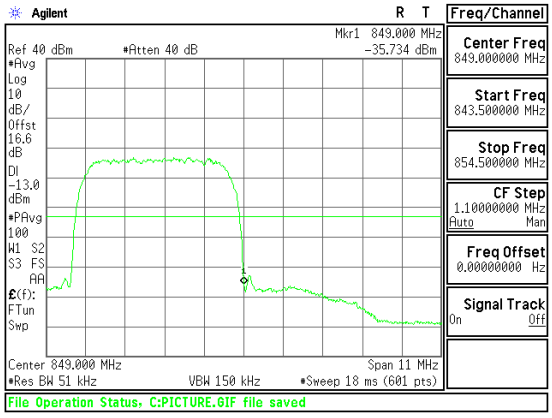
Band Band 5 HSDPA	 Band WCDMA B5 HSDPA CBE	 Band WCDMA B5 HSDPA CBE
Band Band 5 REL99	 Band WCDMA B5 REL99 CBE	 Band WCDMA B5 REL99 CBE

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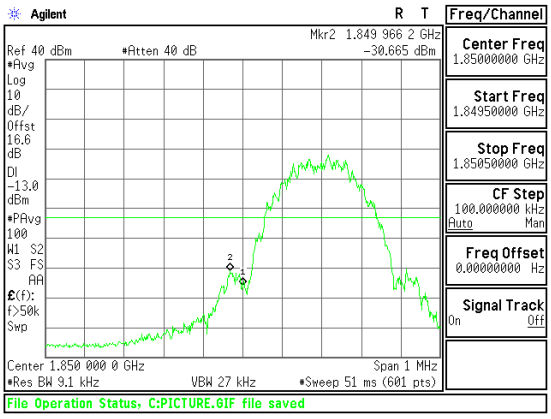
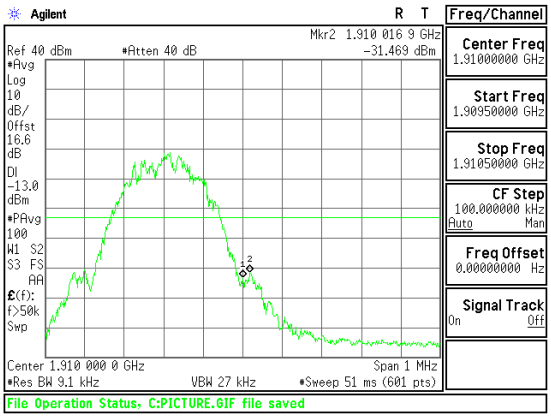
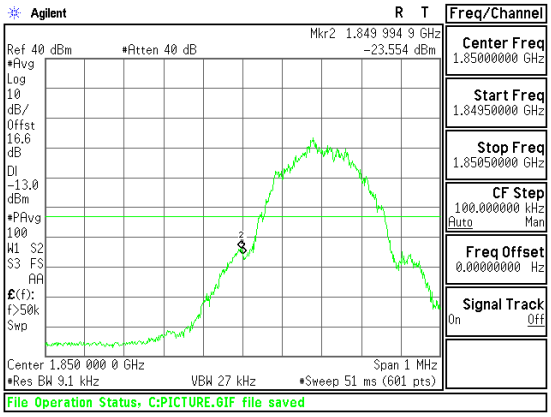
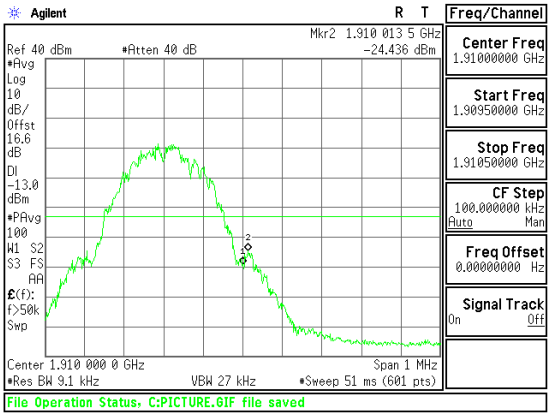
Band GSM 1900 EGPRS	 Band GSM1900 EGPRS CBE Low channel	 Band GSM1900 EGPRS CBE High channel
Band GSM 1900 GPRS	 Band GSM1900 GPRS CBE Low channel	 Band GSM1900 GPRS CBE High channel

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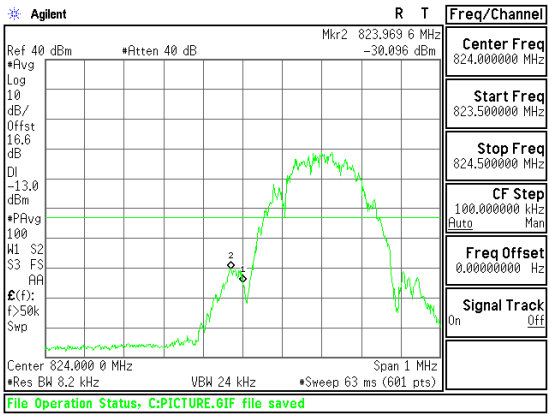
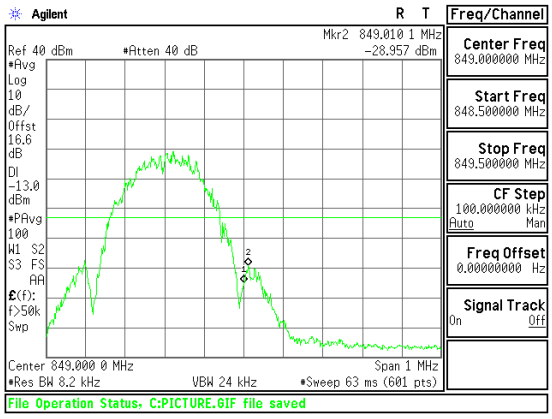
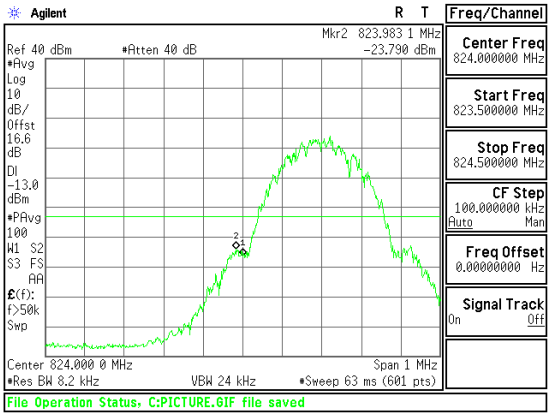
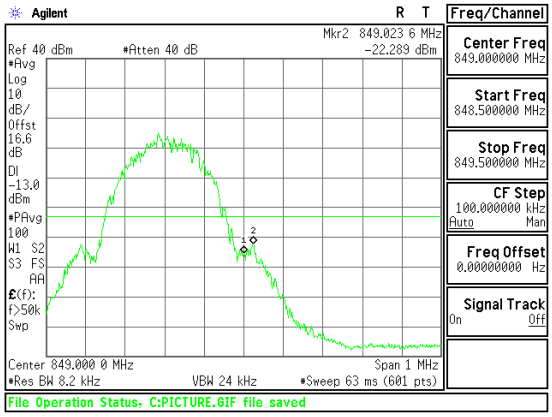
Band GSM 850 EGPRS	 Band GSM850 EGPRS CBE Low channel	 Band GSM850 EGPRS CBE High channel
Band GSM 850 GPRS	 Band GSM850 GPRS CBE Low channel	 Band GSM850 GPRS CBE High channel

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10.3. OUT OF BAND EMISSIONS

RULE PART(S)

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

LIMITS

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

Part 27: (m)(4) For mobile station, the attenuation factor shall be not less than 43+10Log(P)dB at the channel edge and (55+10Log(P)dB) at 5.5MHz from the channel edges.

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v02r01

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

RESULTS

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10.3.1. OUT OF BAND EMISSIONS RESULT

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE17	10	QPSK	709	-24.642	-13	-11.642
			710	-24.493	-13	-11.493
			711	-24.614	-13	-11.614
		16QAM	709	-24.774	-13	-11.774
			710	-25.193	-13	-12.193
			711	-23.632	-13	-10.632

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE17	5	QPSK	706.5	-24.172	-13	-11.172
			710	-24.219	-13	-11.219
			713.5	-24.664	-13	-11.664
		16QAM	706.5	-24.506	-13	-11.506
			710	-24.848	-13	-11.848
			713.5	-24.577	-13	-11.577

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE5	10	QPSK	829	-24.251	-13	-11.251
			836.5	-24.777	-13	-11.777
			844	-23.983	-13	-10.983
		16QAM	829	-24.391	-13	-11.391
			836.5	-24.248	-13	-11.248
			844	-24.94	-13	-11.94

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE5	5	QPSK	826.5	-24.191	-13	-11.191
			836.5	-22.89	-13	-9.89
			846.5	-23.928	-13	-10.928
		16QAM	826.5	-24.362	-13	-11.362
			836.5	-24.134	-13	-11.134
			846.5	-24.931	-13	-11.931

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Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE4	10	QPSK	1715	-21.972	-13	-8.972
			1732.5	-25.502	-13	-12.502
			1750	-24.354	-13	-11.354
		16QAM	1715	-27.82	-13	-14.82
			1732.5	-24.478	-13	-11.478
			1750	-24.689	-13	-11.689

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE4	5	QPSK	1712.5	-24.684	-13	-11.684
			1732.5	-24.596	-13	-11.596
			1752.5	-27.409	-13	-14.409
		16QAM	1712.5	-24.458	-13	-11.458
			1732.5	-25.115	-13	-12.115
			1752.5	-29.543	-13	-16.543

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE2	10	QPSK	1855	-28.045	-13	-15.045
			1880	-29.486	-13	-16.486
			1905	-28.65	-13	-15.65
		16QAM	1855	-29.573	-13	-16.573
			1880	-29.901	-13	-16.901
			1905	-28.397	-13	-15.397

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE2	5	QPSK	1852.5	-30.236	-13	-17.236
			1880	-30.342	-13	-17.342
			1907.5	-30.028	-13	-17.028
		16QAM	1852.5	-30.566	-13	-17.566
			1880	-29.037	-13	-16.037
			1907.5	-30.146	-13	-17.146

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Band	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
GSM850	GMSK	824.2			
		836.6			
		848.8			
	GPRS	824.2	-17.001	-13	-4.001
		836.6	-16.89	-13	-3.89
		848.8	-16.966	-13	-3.966
	EGPRS	824.2	-16.898	-13	-3.898
		836.6	-17.446	-13	-4.446
		848.8	-17.423	-13	-4.423
GSM1900	GMSK	1850.2			
		1880			
		1909.8			
	GPRS	1850.2	-16.953	-13	-3.953
		1880	-17.195	-13	-4.195
		1909.8	-17.052	-13	-4.052
	EGPRS	1850.2	-17.261	-13	-4.261
		1880	-17.14	-13	-4.14
		1909.8	-16.19	-13	-3.19

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Band	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
Band 5	REL99	826.4	-16.975	-13	-3.975
		836.6	-17.441	-13	-4.441
		846.6	-16.909	-13	-3.909
		1852.4	-16.583	-13	-3.583
		1880	-16.991	-13	-3.991
		1907.6	-17.175	-13	-4.175
Band 2	HSDPA	826.4	-16.619	-13	-3.619
		836.6	-16.931	-13	-3.931
		846.6	-17.552	-13	-4.552
		1852.4	-16.574	-13	-3.574
		1880	-16.54	-13	-3.54
		1907.6	-17.515	-13	-4.515

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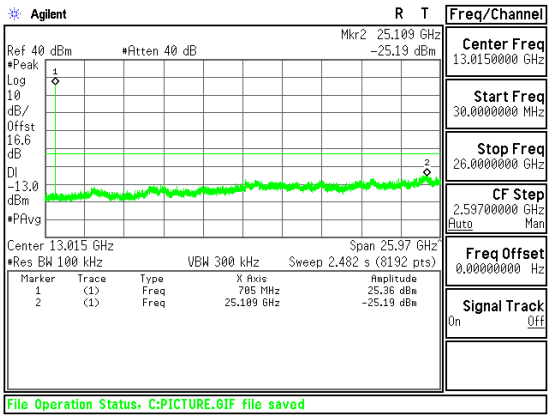
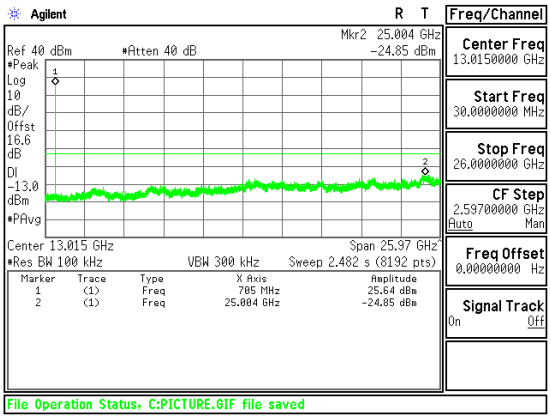
10.3.2. OUT OF BAND EMISSIONS PLOTS

Band LTE17 10MHz 16QAM

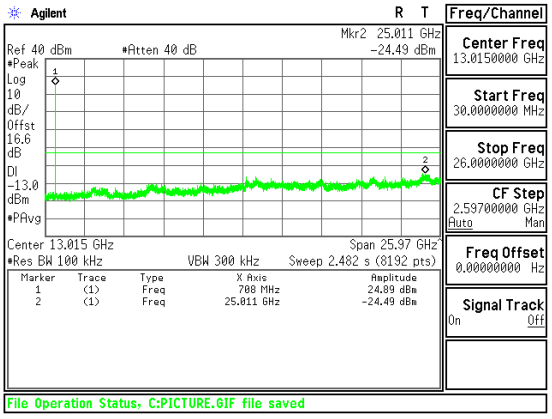


Band LTE17 10MHz CSE 16QAM Mid channel

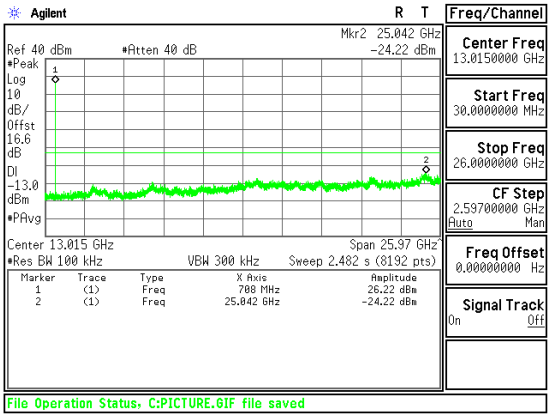


Band LTE17 10MHz CSE QPSK Mid channel

Band LTE17 5MHz 16QAM



Band LTE17 5MHz CSE 16QAM Mid channel



Band LTE17 5MHz CSE QPSK Mid channel

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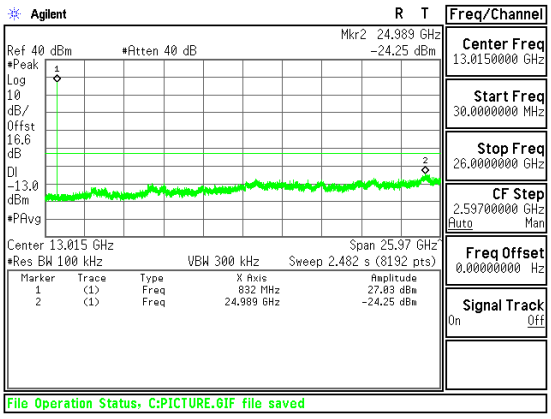
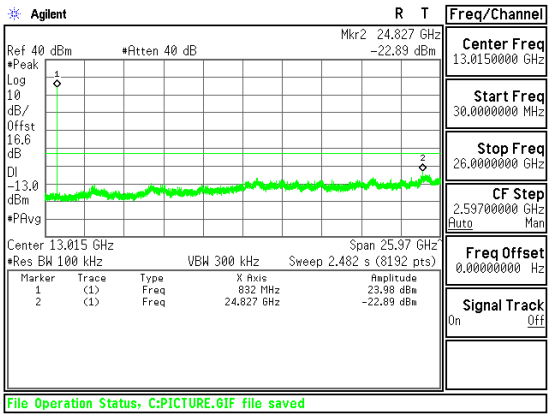
Band LTE5 10MHz 16QAM

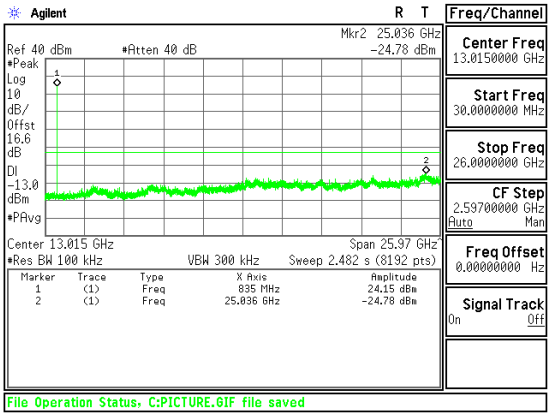


Band LTE5 10MHz CSE 16QAM Mid channel

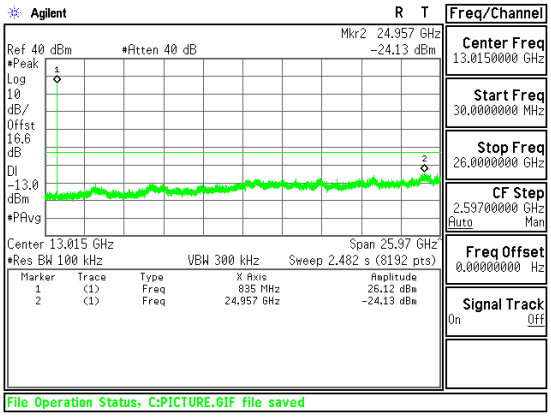


Band LTE5 10MHz CSE QPSK Mid channel

Band LTE5 5MHz 16QAM



Band LTE5 5MHz CSE 16QAM Mid channel



Band LTE5 5MHz CSE QPSK Mid channel

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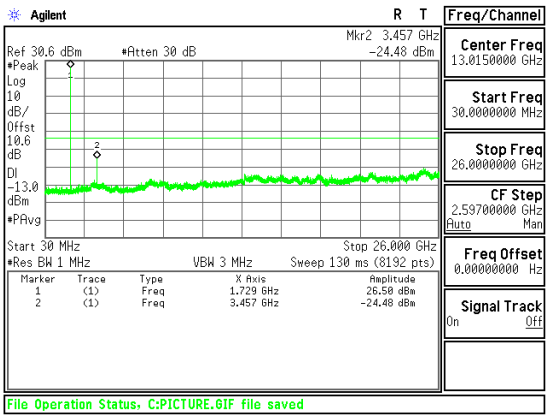
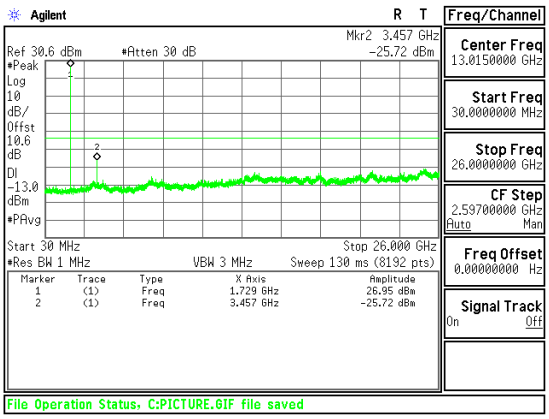
Band LTE4 10MHz 16QAM

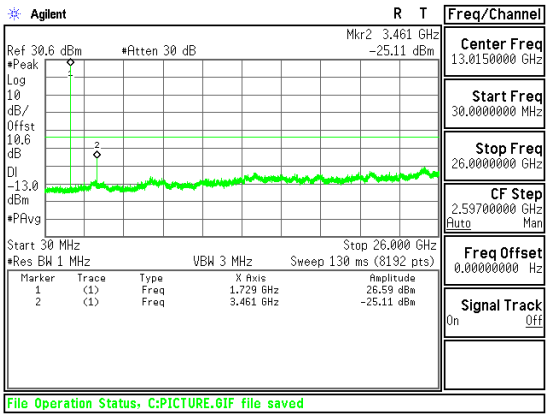


Band LTE4 10MHz CSE 16QAM Mid channel

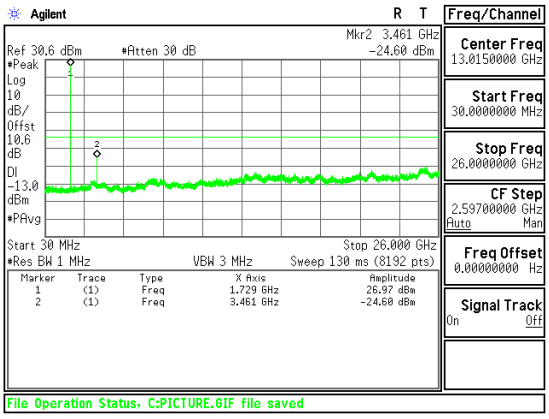


Band LTE4 10MHz CSE QPSK Mid channel

Band LTE4 5MHz 16QAM



Band LTE4 5MHz CSE 16QAM Mid channel



Band LTE4 5MHz CSE QPSK Mid channel

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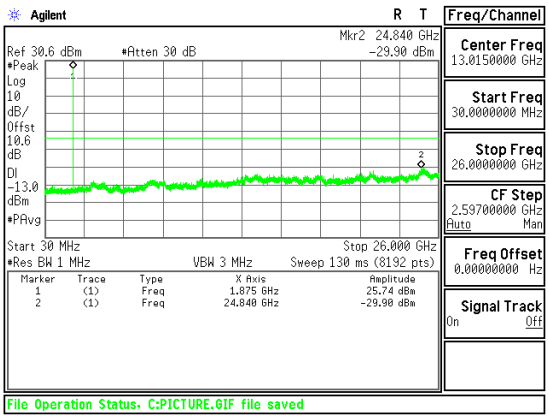
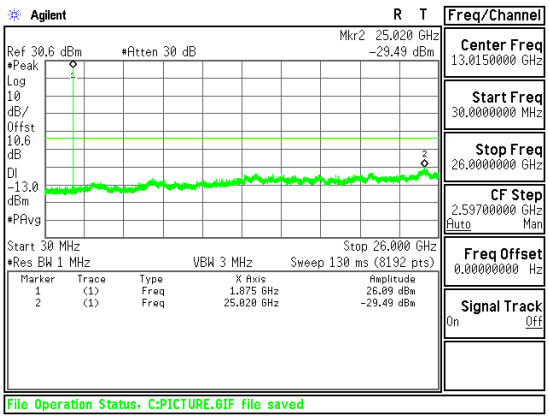
Band LTE2 10MHz 16QAM

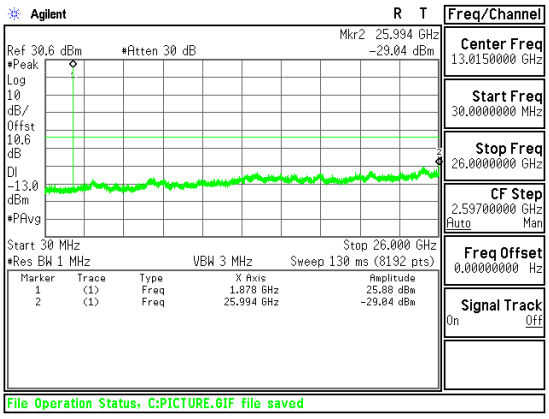


Band LTE2 10MHz CSE 16QAM Mid channel

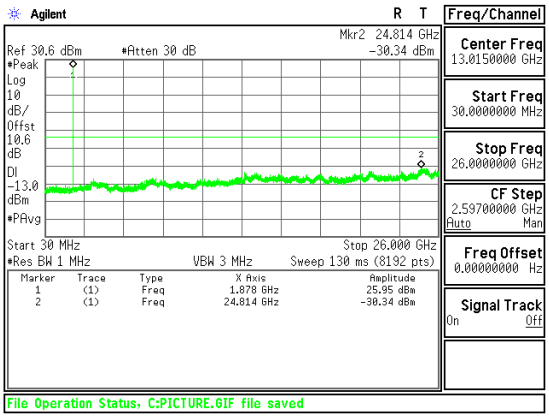


Band LTE2 10MHz CSE QPSK Mid channel

Band LTE2 5MHz 16QAM



Band LTE2 5MHz CSE 16QAM Mid channel



Band LTE2 5MHz CSE QPSK Mid channel

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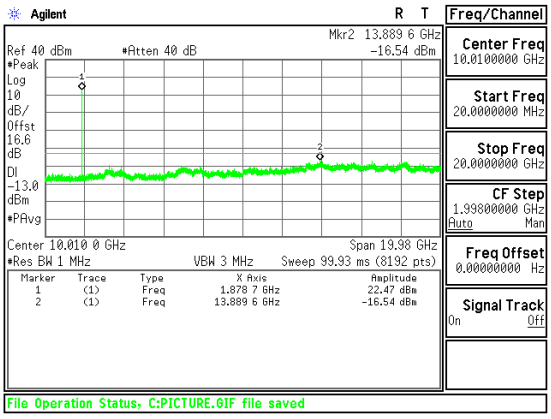
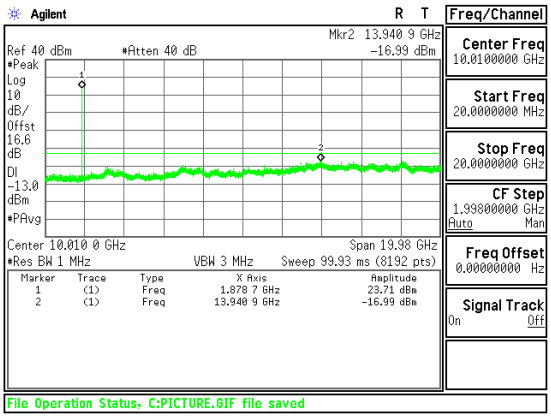
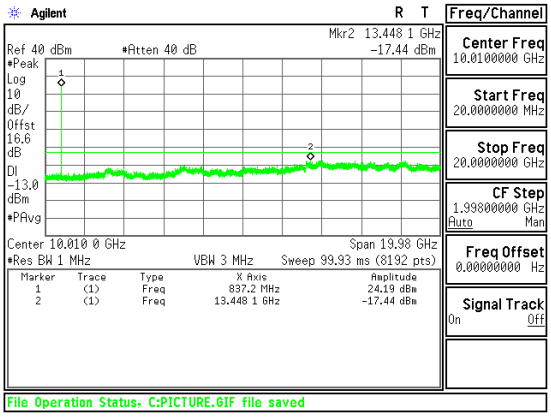
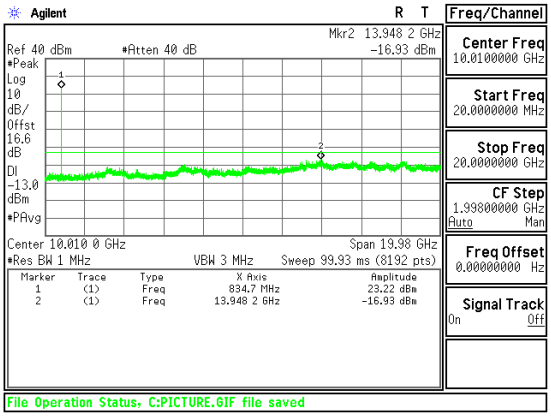
Band Band 2 HSDPA	 Band WCDMA B2 HSDPA CSE	 Band WCDMA B2 REL99 CSE
Band Band 5 REL99	 Band WCDMA B5 REL99 CSE	 Band WCDMA B5 HSDPA CSE

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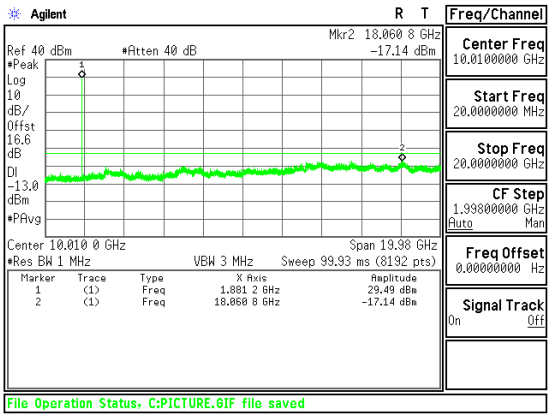
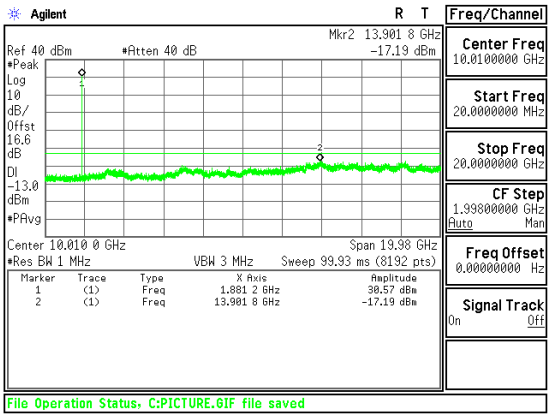
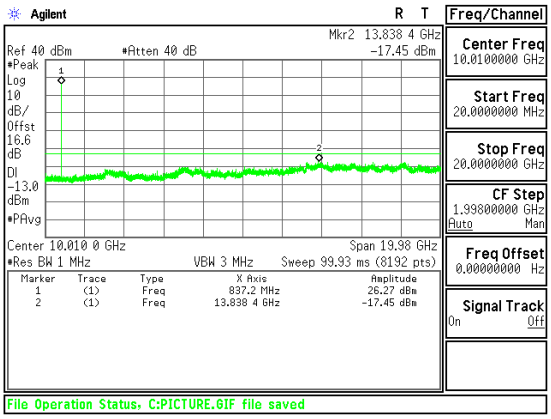
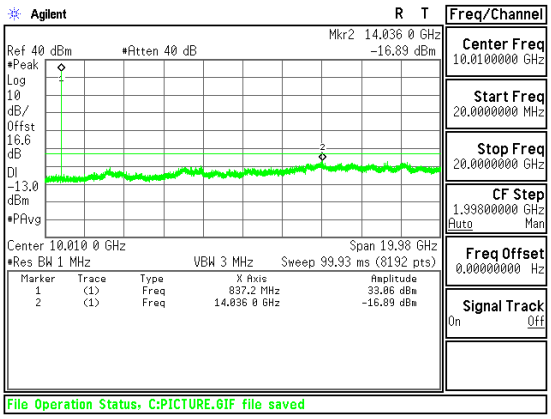
Band GSM 1900 EGPRS	 Band GSM1900 EGPRS CSE Mid channel	 Band GSM1900 GPRS CSE Mid channel
Band GSM 850 EGPRS	 Band GSM850 EGPRS CSE Mid channel	 Band GSM850 GPRS CSE Mid channel

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10.4. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §22.355, §24.235, and §27.54

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.

§27.54 - The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v02r01

MODES TESTED

RESULTS

See the following pages.

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10.4.1. FREQUENCY STABILITY RESULTS

BAND 5, Freq: 836.6MHz – MID CHANNEL

Reference Frequency: Cellular Mid Channel 836.500007MHz @ 20°C Limit: to stay +- 2.5 ppm = 2091.249 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.70	50	836.499510	0.094	2.5
3.70	40	836.499438	0.181	2.5
3.70	30	836.499481	0.129	2.5
3.70	***20***	***836.499589***	***0***	2.5
3.70	10	836.499669	-0.096	2.5
3.70	0	836.499585	0.005	2.5
3.70	-10	836.499591	-0.002	2.5
3.70	-20	836.499552	0.044	2.5
3.70	-30	836.499613	-0.029	2.5

Reference Frequency: Cellular Mid Channel 707.499994MHz @ 20°C Limit: to stay +- 2.5 ppm = 2091.249 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.70	***20***	***836.499609***	***0***	***2.5***
3.15	20	836.499581	*0.033*	2.5
4.26	20	836.499586	*0.027*	2.5

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BAND 2, Freq: 1880MHz – MID CHANNEL

Reference Frequency: PCS Mid Channel 1879.999998MHz @ 20°C Limit: to stay +- 2.5 ppm = 4699.989 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.70	50	1879.994900	0.420	2.5
3.70	40	1879.994280	0.750	2.5
3.70	30	1879.994790	0.479	2.5
3.70	***20***	***1879.995690***	***0***	2.5
3.70	10	1879.996440	-0.399	2.5
3.70	0	1879.995750	-0.032	2.5
3.70	-10	1879.995610	0.043	2.5
3.70	-20	1879.995720	-0.016	2.5
3.70	-30	1879.996330	-0.340	2.5

Reference Frequency: Cellular Mid Channel 707.499994MHz @ 20°C Limit: to stay +- 2.5 ppm = 4699.991 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.70	***20***	***1879.996290***	***0***	***2.5***
3.15	20	1879.995940	*0.186*	2.5
4.26	20	1879.995760	*0.282*	2.5

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BAND 4 – Freq: 1732.5 MHz - MID CHANNEL

Reference Frequency: Cellular Mid Channel 707.499994MHz @ 20°C Limit: to stay +- 2.5 ppm = 4331.242 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.70	50	1732.493900	1.668	2.5
3.70	40	1732.495280	0.872	2.5
3.70	30	1732.496790	0.000	2.5
3.70	***20***	***1732.496790***	***0***	2.5
3.70	10	1732.497390	-0.346	2.5
3.70	0	1732.496650	0.081	2.5
3.70	-10	1732.496880	-0.052	2.5
3.70	-20	1732.496220	0.329	2.5
3.70	-30	1732.496970	-0.104	2.5

Reference Frequency: Cellular Mid Channel 707.499994MHz @ 20°C Limit: to stay +- 2.5 ppm = 4331.242 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.70	***20***	***1732.496790***	***0***	***2.5***
3.15	20	1732.495810	*0.566*	2.5
4.26	20	1732.495860	*0.537*	2.5

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11. RADIATED TEST RESULTS

11.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §22.913, §24.232, and §27

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.

27.50(c) - (10) Portable stations (hand-held devices) are limited to 3 watts ERP; (LTE B17)

27.50(d) - (4) Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.(Band 4)

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 v02r01

For peak power measurement with a PSA:

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

For average power measurement with a PSA:

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

MODES TESTED

GSM, WCDMA, LTE

TEST RESULTS

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11.1.1. ERP/EIRP Results

Band	Mode	Channel	f(MHz)	ERP / EIRP	
				dBm	mW
Band 2	REL99	9262	1852.4	23.56	226.99
		9400	1880	24.05	254.1
		9538	1907.6	23.43	220.29
	HSDPA	9262	1852.4	22.07	161.06
		9400	1880	23.06	202.3
		9538	1907.6	22.76	188.8

Band	Mode	Channel	f(MHz)	ERP / EIRP	
				dBm	mW
Band 5	REL99	4132	826.4	19.271	84.55
		4183	836.6	20.101	102.35
		4233	846.6	20.501	112.23
	HSDPA	4132	826.4	18.321	67.94
		4183	836.6	19.201	83.2
		4233	846.6	19.711	93.56

Band	Mode	Channel	f(MHz)	ERP / EIRP	
				dBm	mW
GSM1900	GPRS	512	1850.2	30.48	1116.86
		661	1880	30.45	1109.17
		810	1909.8	30.4	1096.48
	EGPRS	512	1850.2	26.17	414
		661	1880	26.01	399.02
		810	1909.8	26.24	420.73

Band	Mode	Channel	f(MHz)	ERP / EIRP	
				dBm	mW
GSM850	GPRS	128	824.2	30.391	1094.21
		190	836.6	30.835	1211.99
		251	848.8	31.211	1321.6
	EGPRS	128	824.2	25.721	373.34
		190	836.6	26.281	424.72
		251	848.8	27.061	508.28

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11.1.2. LTE ERP/EIRP Results

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP / EIRP	
					dBm	mW
LTE17	10	QPSK	1/0	709	19.214	83.44
			1/0	710	18.762	75.2
			1/0	711	19.341	85.92
		16QAM	1/0	709	19.004	79.51
			1/0	710	18.372	68.74
			1/0	711	18.221	66.39

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP / EIRP	
					dBm	mW
LTE17	5	QPSK	1/0	706.5	18.754	75.06
			1/0	710	18.982	79.1
			1/0	713.5	19.061	80.56
		16QAM	1/0	706.5	18.134	65.07
			1/0	710	18.132	65.04
			1/0	713.5	17.721	59.17

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP / EIRP	
					dBm	mW
LTE5	10	QPSK	1/0	829	21.121	129.45
			1/0	836.5	21.181	131.25
			1/0	844	21.191	131.55
		16QAM	1/0	829	20.191	104.5
			1/0	836.5	20.111	102.59
			1/0	844	20.451	110.94

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Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP / EIRP	
					dBm	mW
LTE5	5	QPSK	1/0	826.5	21.171	130.95
			1/0	836.5	21.101	128.85
			1/0	846.5	21.191	131.55
		16QAM	1/0	826.5	20.011	100.25
			1/0	836.5	20.081	101.88
			1/0	846.5	20.121	102.83

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP / EIRP	
					dBm	mW
LTE4	10	QPSK	1/0	1715	23.677	233.18
			1/0	1732.5	23.988	250.5
			1/0	1750	23.809	240.38
		16QAM	1/0	1715	22.667	184.8
			1/0	1732.5	23.448	221.21
			1/0	1750	22.39	173.38

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP / EIRP	
					dBm	mW
LTE4	5	QPSK	1/0	1712.5	23.057	202.16
			1/0	1732.5	23.368	217.17
			1/0	1752.5	22.02	159.22
		16QAM	1/0	1712.5	21.487	140.83
			1/0	1732.5	22.008	158.78
			1/0	1752.5	21.31	135.21

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Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP / EIRP	
					dBm	mW
LTE2	10	QPSK	1/0	1855	24.635	290.74
			1/0	1880	23.734	236.27
			1/0	1905	23.665	232.54
		16QAM	1/0	1855	23.565	227.25
			1/0	1880	22.794	190.28
			1/0	1905	23.235	210.62

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP / EIRP	
					dBm	mW
LTE2	5	QPSK	1/0	1852.5	23.095	203.94
			1/0	1880	21.514	141.71
			1/0	1907.5	23.775	238.51
		16QAM	1/0	1852.5	22.405	173.98
			1/0	1880	20.544	113.34
			1/0	1907.5	22.645	183.87

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11.1.3. ERP/EIRP PLOTS

Band

LTE17

10MHz

16QAM

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: LG
Project #: 14I19561
Date: 12/30/14
Test Engineer: O. Stoelting
Configuration: X-pos EUT only
Location: Chamber B
Mode: LTE_16QAM Band 17 Fundamentals, 10MHz Bandwidth

Test Equipment:
Receiving: Hybrid T243, and Chamber B SMA Cables
Substitution: Dipole T273, 6ft SMA Cable 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								
709.00	11.16	V	0.9	0.0	10.26	34.8	-24.5	
709.00	19.90	H	0.9	0.0	19.00	34.8	-15.8	
Mid Ch								
710.00	10.40	V	0.9	0.0	9.50	34.8	-25.3	
710.00	19.27	H	0.9	0.0	18.37	34.8	-16.4	
High Ch								
711.00	11.23	V	0.9	0.0	10.33	34.8	-24.4	
711.00	19.12	H	0.9	0.0	18.22	34.8	-16.5	

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Band

LTE17

10MHz

QPSK

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: LG
Project #: 14I19561
Date: 12/30/14
Test Engineer: O. Stoelting
Configuration: X-pos EUT only
Location: Chamber B
Mode: LTE_QPSK Band 17 Fundamentals, 10MHz Bandwidth

Test Equpment:
Receiving: Hybrid T243, and Chamber B SMA Cables
Substitution: Dipole T273, 6ft SMA Cable 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								
709.00	11.52	V	0.9	0.0	10.62	34.8	-24.1	
709.00	20.11	H	0.9	0.0	19.21	34.8	-15.6	
Mid Ch								
710.00	10.59	V	0.9	0.0	9.69	34.8	-25.1	
710.00	19.66	H	0.9	0.0	18.76	34.8	-16.0	
High Ch								
711.00	12.03	V	0.9	0.0	11.13	34.8	-23.6	
711.00	20.24	H	0.9	0.0	19.34	34.8	-15.4	

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Band

LTE17

5MHz

16QAM

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: LG
Project #: 14I19561
Date: 12/30/14
Test Engineer: O. Stoelting
Configuration: X-pos EUT only
Location: Chamber B
Mode: LTE_16QAM Band 17 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: Hybrid T243, and Chamber B SMA Cables
Substitution: Dipole T273, 6ft SMA Cable 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								
706.50	10.90	V	0.9	0.0	10.00	34.8	-24.8	
706.50	19.03	H	0.9	0.0	18.13	34.8	-16.6	
Mid Ch								
710.00	10.98	V	0.9	0.0	10.08	34.8	-24.7	
710.00	19.03	H	0.9	0.0	18.13	34.8	-16.6	
High Ch								
713.50	9.93	V	0.9	0.0	9.03	34.8	-25.7	
713.50	18.62	H	0.9	0.0	17.72	34.8	-17.0	

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Band

LTE17

5MHz

QPSK

High Frequency Substitution Measurement
UL Verification Services, Inc.

Company: LG
Project #: 14I19561
Date: 12/30/14
Test Engineer: O. Stoelting
Configuration: X-pos EUT only
Location: Chamber B
Mode: LTE_QPSK Band 17 Fundamentals, 5MHz Bandwidth

Test Equpment:
Receiving: Hybrid T243, and Chamber B SMA Cables
Substitution: Dipole T273, 6ft SMA Cable 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								
706.50	11.70	V	0.9	0.0	10.80	34.8	-24.0	
706.50	19.65	H	0.9	0.0	18.75	34.8	-16.0	
Mid Ch								
710.00	11.80	V	0.9	0.0	10.90	34.8	-23.9	
710.00	19.88	H	0.9	0.0	18.98	34.8	-15.8	
High Ch								
713.50	11.25	V	0.9	0.0	10.35	34.8	-24.4	
713.50	19.96	H	0.9	0.0	19.06	34.8	-15.7	

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Band

LTE5

10MHz

16QAM

High Frequency Substitution Measurement
UL Verification Services, Inc. Chamber B

Company: LG
Project #: 14I19561
Date: 12/10/14
Test Engineer: R. Alegre
Configuration: Y-pos EUT
Mode: LTE5 16QAM 10M

Test Equipment:
Receiving: Sunol T243, and 5m Chamber B N-type Cable
Substitution: Dipole T276, 4ft SMA Cable (SN: 244639 002) 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	16.05	V	0.9	0.0	15.15	38.5	-23.3	
829.00	21.09	H	0.9	0.0	20.19	38.5	-18.3	
Mid Ch								
836.50	16.07	V	0.9	0.0	15.17	38.5	-23.3	
836.50	21.01	H	0.9	0.0	20.11	38.5	-18.3	
High Ch								
844.00	16.42	V	0.9	0.0	15.52	38.5	-22.9	
844.00	21.35	H	0.9	0.0	20.45	38.5	-18.0	

Rev. 3.17.11
Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm

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Band

LTE5

10MHz

QPSK

High Frequency Substitution Measurement
UL Verification Services, Inc. Chamber B

Company: LG
Project #: 14I19561
Date: 12/10/14
Test Engineer: R. Alegre
Configuration: Y-pos EUT
Mode: LTE5 QPSK 10M

Test Equipment:
Receiving: Sunol T243, and 5m Chamber B N-type Cable
Substitution: Dipole T276, 4ft SMA Cable (SN: 244639 002) 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	16.93	V	0.9	0.0	16.03	38.5	-22.4	
829.00	22.02	H	0.9	0.0	21.12	38.5	-17.3	
Mid Ch								
836.50	17.19	V	0.9	0.0	16.29	38.5	-22.2	
836.50	22.08	H	0.9	0.0	21.18	38.5	-17.3	
High Ch								
844.00	17.38	V	0.9	0.0	16.48	38.5	-22.0	
844.00	22.09	H	0.9	0.0	21.19	38.5	-17.3	

Rev. 3.17.11
Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm

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Band

LTE5

5MHz

16QAM

High Frequency Substitution Measurement
UL Verification Services, Inc. Chamber B

Company: LG
Project #: 14I19561
Date: 12/10/14
Test Engineer: R. Alegre
Configuration: Y-pos EUT
Mode: LTE5 16QAM 5M

Test Equipment:
Receiving: Sunol T243, and 5m Chamber B N-type Cable
Substitution: Dipole T276, 4ft SMA Cable (SN: 244639 002) 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	16.03	V	0.9	0.0	15.13	38.5	-23.3	
826.50	20.91	H	0.9	0.0	20.01	38.5	-18.4	
Mid Ch								
836.50	16.35	V	0.9	0.0	15.45	38.5	-23.0	
836.50	20.98	H	0.9	0.0	20.08	38.5	-18.4	
High Ch								
846.50	16.74	V	0.9	0.0	15.84	38.5	-22.6	
846.50	21.02	H	0.9	0.0	20.12	38.5	-18.3	

Rev. 3.17.11
Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm

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Band

LTE5

5MHz

QPSK

High Frequency Substitution Measurement
UL Verification Services, Inc. Chamber B

Company: LG
Project #: 14I19561
Date: 12/10/14
Test Engineer: R. Alegre
Configuration: Y-pos EUT
Mode: LTE5 QPSK 5M

Test Equipment:
Receiving: Sunol T243, and 5m Chamber B N-type Cable
Substitution: Dipole T276, 4ft SMA Cable (SN: 244639 002) 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	17.15	V	0.9	0.0	16.25	38.5	-22.2	
826.50	22.07	H	0.9	0.0	21.17	38.5	-17.3	
Mid Ch								
836.50	17.18	V	0.9	0.0	16.28	38.5	-22.2	
836.50	22.00	H	0.9	0.0	21.10	38.5	-17.3	
High Ch								
846.50	17.43	V	0.9	0.0	16.53	38.5	-21.9	
846.50	22.09	H	0.9	0.0	21.19	38.5	-17.3	

Rev. 3.17.11
Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm

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Band

LTE4

10MHz

16QAM

High Frequency Substitution Measurement
UL Verification Services, Inc. Chamber B

Company: LG
Project #: 14I19561
Date: 12/30/14
Test Engineer: O. Stoelting
Configuration: X-pos EUT only
Mode: LTE_B4_10MHz_16QAM

Test Equipment:
Receiving: Horn T345, and Chamber B SMA Cables
Substitution: Horn T60 Substitution, 4ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1715.00	11.41	V	0.90	8.30	18.81	30.0	-11.2	
1715.00	15.27	H	0.90	8.30	22.67	30.0	-7.3	
Mid Ch								
1732.50	13.46	V	0.90	8.30	20.86	30.0	-9.1	
1732.50	16.05	H	0.90	8.30	23.45	30.0	-6.6	
High Ch								
1750.00	12.09	V	0.90	7.90	19.09	30.0	-10.9	
1750.00	15.39	H	0.90	7.90	22.39	30.0	-7.6	

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Note: For Band 4 EIRP limit is 30dBm

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Band

LTE4

10MHz

QPSK

High Frequency Substitution Measurement
UL Verification Services, Inc. Chamber B

Company: LG
Project #: 14I19561
Date: 12/30/14
Test Engineer: O. Stoelting
Configuration: X-pos EUT only
Mode: LTE_B4_10MHz_QPSK

Test Equipment:
Receiving: Horn T345, and Chamber B SMA Cables
Substitution: Horn T60 Substitution, 4ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1715.00	12.71	V	0.90	8.56	20.37	30.0	-9.6	
1715.00	16.02	H	0.90	8.56	23.68	30.0	-6.3	
Mid Ch								
1732.50	14.00	V	0.90	8.60	21.70	30.0	-8.3	
1732.50	16.29	H	0.90	8.60	23.99	30.0	-6.0	
High Ch								
1750.00	13.18	V	0.90	8.64	20.91	30.0	-9.1	
1750.00	16.07	H	0.90	8.64	23.81	30.0	-6.2	

Rev. 3.17.11
Note: For Band 4 EIRP limit is 30dBm

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Band

LTE4

5MHz

16QAM

High Frequency Substitution Measurement
UL Verification Services, Inc. Chamber B

Company: LG
Project #: 14I19561
Date: 12/30/14
Test Engineer: O. Stoelting
Configuration: X-pos EUT only
Mode: LTE_B4_5MHz_16QAM

Test Equipment:
Receiving: Horn T345, and Chamber B SMA Cables
Substitution: Horn T60 Substitution, 4ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1712.50	11.69	V	0.90	8.30	19.09	30.0	-10.9	
1712.50	14.09	H	0.90	8.30	21.49	30.0	-8.5	
Mid Ch								
1732.50	11.78	V	0.90	8.30	19.18	30.0	-10.8	
1732.50	14.61	H	0.90	8.30	22.01	30.0	-8.0	
High Ch								
1752.50	12.59	V	0.90	7.90	19.59	30.0	-10.4	
1752.50	14.31	H	0.90	7.90	21.31	30.0	-8.7	

Rev. 3.17.11
Note: For Band 4 EIRP limit is 30dBm

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Band

LTE4

5MHz

QPSK

High Frequency Substitution Measurement
UL Verification Services, Inc. Chamber B

Company: LG
Project #: 14I19561
Date: 12/30/14
Test Engineer: O. Stoelting
Configuration: X-pos EUT only
Mode: LTE_B4_5MHz_QPSK

Test Equipment:
Receiving: Horn T345, and Chamber B SMA Cables
Substitution: Horn T60 Substitution, 4ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1712.50	12.52	V	0.90	8.30	19.92	30.0	-10.1	
1712.50	15.66	H	0.90	8.30	23.06	30.0	-6.9	
Mid Ch								
1732.50	7.80	V	0.90	8.30	15.20	30.0	-14.8	
1732.50	15.97	H	0.90	8.30	23.37	30.0	-6.6	
High Ch								
1752.50	13.47	V	0.90	7.90	20.47	30.0	-9.5	
1752.50	15.02	H	0.90	7.90	22.02	30.0	-8.0	

Rev. 3.17.11
Note: For Band 4 EIRP limit is 30dBm

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Band

LTE2

10MHz

16QAM

High Frequency Substitution Measurement
UL Verification Services, Inc. Chamber B

Company: LG
Project #: 14I19561
Date: 12/30/14
Test Engineer: O. Stoelting
Configuration: X-pos EUT only
Mode: LTE 2 10MHz 16QAM FUND

Test Equipment:
Receiving: Horn T345, and Chamber B SMA Cables
Substitution: Horn T60 Substitution, 4ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1855.00	14.47	V	0.9	8.5	22.12	33.0	-10.9	
1855.00	15.92	H	0.9	8.5	23.57	33.0	-9.4	
Mid Ch								
1880.00	13.89	V	0.9	8.3	21.34	33.0	-11.7	
1880.00	15.34	H	0.9	8.3	22.79	33.0	-10.2	
High Ch								
1905.00	13.36	V	0.9	8.2	20.71	33.0	-12.3	
1905.00	15.89	H	0.9	8.2	23.24	33.0	-9.8	

Rev. 3.17.11
Note: For Band 4 EIRP limit is 30dBm

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Band

LTE2

10MHz

QPSK

High Frequency Substitution Measurement
UL Verification Services, Inc. Chamber B

Company: LG
Project #: 14I19561
Date: 12/30/14
Test Engineer: O. Stoelting
Configuration: X-pos EUT only
Mode: LTE 2 10MHz QPSK FUND

Test Equipment:
Receiving: Horn T345, and Chamber B SMA Cables
Substitution: Horn T60 Substitution, 4ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1855.00	14.73	V	0.9	8.5	22.38	33.0	-10.6	
1855.00	16.99	H	0.9	8.5	24.64	33.0	-8.4	
Mid Ch								
1880.00	14.25	V	0.9	8.3	21.70	33.0	-11.3	
1880.00	16.28	H	0.9	8.3	23.73	33.0	-9.3	
High Ch								
1905.00	13.82	V	0.9	8.2	21.17	33.0	-11.8	
1905.00	16.32	H	0.9	8.2	23.67	33.0	-9.3	

Rev. 3.17.11
Note: For Band 4 EIRP limit is 30dBm

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Band

LTE2

5MHz

16QAM

High Frequency Substitution Measurement
UL Verification Services, Inc. Chamber B

Company: LG
Project #: 14I19561
Date: 12/30/14
Test Engineer: O. Stoelting
Configuration: X-pos EUT only
Mode: LTE 2 5MHz 16QAM FUND

Test Equipment:
Receiving: Horn T345, and Chamber B SMA Cables
Substitution: Horn T60 Substitution, 4ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1852.50	13.81	V	0.9	8.5	21.46	33.0	-11.5	
1852.50	14.76	H	0.9	8.5	22.41	33.0	-10.6	
Mid Ch								
1880.00	6.52	V	0.9	8.3	13.97	33.0	-19.0	
1880.00	13.09	H	0.9	8.3	20.54	33.0	-12.5	
High Ch								
1907.50	13.48	V	0.9	8.2	20.83	33.0	-12.2	
1907.50	15.30	H	0.9	8.2	22.65	33.0	-10.4	

Rev. 3.17.11
Note: For Band 4 EIRP limit is 30dBm

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Band

LTE2

5MHz

QPSK

High Frequency Substitution Measurement
UL Verification Services, Inc. Chamber B

Company: LG
Project #: 14I19561
Date: 12/30/14
Test Engineer: O. Stoelting
Configuration: X-pos EUT only
Mode: LTE 2 5MHz QPSK FUND

Test Equipment:
Receiving: Horn T345, and Chamber B SMA Cables
Substitution: Horn T60 Substitution, 4ft SMA Cable Warehouse

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1852.50	14.55	V	0.9	8.5	22.20	33.0	-10.8	
1852.50	15.45	H	0.9	8.5	23.10	33.0	-9.9	
Mid Ch								
1880.00	7.68	V	0.9	8.3	15.13	33.0	-17.9	
1880.00	14.06	H	0.9	8.3	21.51	33.0	-11.5	
High Ch								
1907.50	14.49	V	0.9	8.2	21.84	33.0	-11.2	
1907.50	16.43	H	0.9	8.2	23.78	33.0	-9.2	

Rev. 3.17.11
Note: For Band 4 EIRP limit is 30dBm

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Band

Band 2

HSDPA

High Frequency Substitution Measurement
UL Verification Services, Inc. Chamber B

Company: LG
Project #: 14I19561
Date: 12/10/2014
Test Engineer: R. Alegre
Configuration: EUT Only X-position
Mode: HSDPA B2

Test Equipment:
Receiving: Horn T345, and Chamber B SMA Cables
Substitution: Horn T59 Substitution, 4ft SMA Cable Warehouse

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	11.95	V	0.9	7.9	18.90	33.0	-14.1	
1852.40	15.12	H	0.9	7.9	22.07	33.0	-10.9	
Mid Ch								
1880.00	11.22	V	0.9	7.9	18.17	33.0	-14.8	
1880.00	16.11	H	0.9	7.9	23.06	33.0	-9.9	
High Ch								
1907.60	10.69	V	0.9	7.9	17.64	33.0	-15.4	
1907.60	15.81	H	0.9	7.9	22.76	33.0	-10.2	

Rev. 3.17.11
Note: For Band 4 EIRP limit is 30dBm

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Band

Band 2

REL99

High Frequency Substitution Measurement
UL Verification Services, Inc. Chamber B

Company: LG
Project #: 14I19561
Date: 12/10/2014
Test Engineer: R. Alegre
Configuration: EUT Only X-position
Mode: Rel99 B2

Test Equipment:
Receiving: Horn T345, and Chamber B SMA Cables
Substitution: Horn T59 Substitution, 4ft SMA Cable Warehouse

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	12.80	V	0.9	7.9	19.75	33.0	-13.3	
1852.40	16.61	H	0.9	7.9	23.56	33.0	-9.4	
Mid Ch								
1880.00	12.01	V	0.9	7.9	18.96	33.0	-14.0	
1880.00	17.10	H	0.9	7.9	24.05	33.0	-9.0	
High Ch								
1907.60	11.28	V	0.9	7.9	18.23	33.0	-14.8	
1907.60	16.48	H	0.9	7.9	23.43	33.0	-9.6	

Rev. 3.17.11
Note: For Band 4 EIRP limit is 30dBm

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Band

Band 5

HSDPA

High Frequency Substitution Measurement
UL Verification Services, Inc. Chamber B

Company: LG
Project #: 14I19561
Date: 12/10/14
Test Engineer: R. Alegre
Configuration: Y-pos EUT
Mode: WCDMA Band 5 HSDPA

Test Equipment:
Receiving: Sunol T243, and 5m Chamber B N-type Cable
Substitution: Dipole T276, 4ft SMA Cable (SN: 244639 002) 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								
826.40	13.26	V	0.9	0.0	12.36	38.5	-26.1	
826.40	19.22	H	0.9	0.0	18.32	38.5	-20.1	
Mid Ch								
836.60	13.76	V	0.9	0.0	12.86	38.5	-25.6	
836.60	20.10	H	0.9	0.0	19.20	38.5	-19.2	
High Ch								
846.60	13.82	V	0.9	0.0	12.92	38.5	-25.5	
846.60	20.61	H	0.9	0.0	19.71	38.5	-18.7	

Rev. 3.17.11
Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm

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Band

Band 5

REL99

High Frequency Substitution Measurement
UL Verification Services, Inc. Chamber B

Company: LG
Project #: 14I19561
Date: 12/10/14
Test Engineer: R. Alegre
Configuration: Y-pos EUT
Mode: WCDMA Band 5 Rel 99

Test Equipment:
Receiving: Sunol T243, and 5m Chamber B N-type Cable
Substitution: Dipole T276, 4ft SMA Cable (SN: 244639 002) 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								
826.40	14.06	V	0.9	0.0	13.16	38.5	-25.3	
826.40	20.17	H	0.9	0.0	19.27	38.5	-19.2	
Mid Ch								
836.60	14.53	V	0.9	0.0	13.63	38.5	-24.8	
836.60	21.00	H	0.9	0.0	20.10	38.5	-18.3	
High Ch								
846.60	14.74	V	0.9	0.0	13.84	38.5	-24.6	
846.60	21.40	H	0.9	0.0	20.50	38.5	-17.9	

Rev. 3.17.11
Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm

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Band

GSM 1900

EGPRS

High Frequency Substitution Measurement
UL Verification Services, Inc. Chamber B

Company: LG
Project #: 14I19561
Date: 12/10/2014
Test Engineer: R. Alegre
Configuration: EUT only X-Position
Mode: EGPRS 1900

Test Equipment:
Receiving: Horn T345, and Chamber B SMA Cables
Substitution: Horn T59 Substitution, 4ft SMA Cable Warehouse

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	14.64	V	0.9	7.9	21.59	33.0	-11.4	
1850.20	19.22	H	0.9	7.9	26.17	33.0	-6.8	
Mid Ch								
1880.00	16.57	V	0.9	7.9	23.52	33.0	-9.5	
1880.00	19.06	H	0.9	7.9	26.01	33.0	-7.0	
High Ch								
1909.80	15.15	V	0.9	7.9	22.10	33.0	-10.9	
1909.80	19.29	H	0.9	7.9	26.24	33.0	-6.8	

Rev. 3.17.11
Note: For Band 4 EIRP limit is 30dBm

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Band

GSM 1900

GPRS

High Frequency Substitution Measurement
UL Verification Services, Inc. Chamber B

Company: LG
Project #: 14I19561
Date: 12/10/2014
Test Engineer: R. Alegre
Configuration: EUT only X-Position
Mode: GPRS 1880

Test Equipment:
Receiving: Horn T345 and Chamber B SMA Cables
Substitution: Horn T59 Substitution, 4ft SMA Cable Warehouse

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	17.95	V	0.9	7.9	24.90	33.0	-8.1	
1850.20	23.53	H	0.9	7.9	30.48	33.0	-2.5	
Mid Ch								
1880.00	19.71	V	0.9	7.9	26.66	33.0	-6.3	
1880.00	23.50	H	0.9	7.9	30.45	33.0	-2.6	
High Ch								
1909.80	18.46	V	0.9	7.9	25.41	33.0	-7.6	
1909.80	23.45	H	0.9	7.9	30.40	33.0	-2.6	

Rev. 3.17.11
Note: For Band 4 EIRP limit is 30dBm

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Band

GSM 850

EGPRS

High Frequency Substitution Measurement
UL Verification Services, Inc. Chamber B

Company: LG
Project #: 14I19561
Date: 12/10/14
Test Engineer: R. Alegre
Configuration: Y-pos EUT
Mode: EGPRS850

Test Equipment:
Receiving: Sunol T243, and 5m Chamber B N-type Cable
Substitution: Dipole T276, 4ft SMA Cable (SN: 244639 002) 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								
824.20	17.35	V	0.9	0.0	16.45	38.5	-22.0	
824.20	26.62	H	0.9	0.0	25.72	38.5	-12.7	
Mid Ch								
836.60	18.87	V	0.9	0.0	17.97	38.5	-20.5	
836.60	27.18	H	0.9	0.0	26.28	38.5	-12.2	
High Ch								
848.80	19.89	V	0.9	0.0	18.99	38.5	-19.5	
848.80	27.96	H	0.9	0.0	27.06	38.5	-11.4	

Rev. 3.17.11
Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm

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High Frequency Substitution Measurement
UL Verification Services, Inc. Chamber B

Company: LG
Project #: 14I19561
Date: 12/10/14
Test Engineer: R. Alegre
Configuration: Y-pos EUT
Mode: GPRS850

Test Equipment:
Receiving: Sunol T243, and 5m Chamber B N-type Cable
Substitution: Dipole T276, 4ft SMA Cable (SN: 244639 002) Warehouse.

Band

GSM 850

GPRS

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
824.20	21.97	V	0.9	0.0	21.07	38.5	-17.4	
824.20	31.29	H	0.9	0.0	30.39	38.5	-8.1	
Mid Ch								
836.60	23.24	V	0.9	0.0	22.34	38.5	-16.1	
836.60	31.73	H	0.9	0.0	30.84	38.5	-7.6	
High Ch								
848.80	24.57	V	0.9	0.0	23.67	38.5	-14.8	
848.80	32.11	H	0.9	0.0	31.21	38.5	-7.2	

Rev. 3.17.11
Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm

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11.2. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

FCC: §2.1053, §22.917, §24.238, §27.53

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.

Part 27: (m)(4) For mobile station, the attenuation factor shall be not less than 43+10Log(P)dB at the channel edge and (55+10Log(P)dB) at 5.5MHz from the channel edges.

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, LTE

RESULTS

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11.2.1. SPURIOUS RADIATION PLOTS

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

Company: LG
Project #: 14I19561
Date: 12/30/14
Test Engineer: O. Stoelting
Configuration: EUT w/ AC Adaptor + HS, X-pos
Location: Chamber B
Mode: LTE_16QAM Band 17 Harmonics, 10MHz Bandwidth

Band
LTE17
10MHz
16QAM

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 709									
1418.00	-14.3	V	3.0	37.4	1.0	-50.7	-13.0	-37.7	
2127.00	-21.4	V	3.0	36.6	1.0	-57.0	-13.0	-44.0	
2836.00	-20.3	V	3.0	36.4	1.0	-55.6	-13.0	-42.6	
1418.00	-11.7	H	3.0	37.4	1.0	-48.0	-13.0	-35.0	
2127.00	-18.6	H	3.0	36.6	1.0	-54.2	-13.0	-41.2	
2836.00	-20.9	H	3.0	36.4	1.0	-56.2	-13.0	-43.2	
Mid Ch, 710									
1420.00	-16.7	V	3.0	37.3	1.0	-53.1	-13.0	-40.1	
2130.00	-18.2	V	3.0	36.6	1.0	-53.7	-13.0	-40.7	
2840.00	-20.0	V	3.0	36.4	1.0	-55.4	-13.0	-42.4	
1420.00	-12.7	H	3.0	37.3	1.0	-49.0	-13.0	-36.0	
2130.00	-22.8	H	3.0	36.6	1.0	-58.3	-13.0	-45.3	
2840.00	-21.4	H	3.0	36.4	1.0	-56.7	-13.0	-43.7	
High Ch, 711									
1422.00	-12.6	V	3.0	37.3	1.0	-48.9	-13.0	-35.9	
2133.00	-21.5	V	3.0	36.6	1.0	-57.0	-13.0	-44.0	
2844.00	-20.2	V	3.0	36.4	1.0	-55.6	-13.0	-42.6	
1422.00	-10.6	H	3.0	37.3	1.0	-47.0	-13.0	-34.0	
2133.00	-17.4	H	3.0	36.6	1.0	-53.0	-13.0	-40.0	
2844.00	-21.1	H	3.0	36.4	1.0	-56.5	-13.0	-43.5	

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

Company: LG
Project #: 14I19561
Date: 12/30/14
Test Engineer: O. Stoelting
Configuration: EUT w/ AC Adaptor + HS, X-pos
Location: Chamber B
Mode: LTE_QPSK Band 17 Harmonics, 10MHz Bandwidth

Band LTE17 10MHz QPSK

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 709									
1418.00	-14.3	V	3.0	37.4	1.0	-50.7	-13.0	-37.7	
2127.00	-21.3	V	3.0	36.6	1.0	-56.9	-13.0	-43.9	
2836.00	-19.9	V	3.0	36.4	1.0	-55.3	-13.0	-42.3	
1418.00	-11.4	H	3.0	37.4	1.0	-47.8	-13.0	-34.8	
2127.00	-19.2	H	3.0	36.6	1.0	-54.7	-13.0	-41.7	
2836.00	-21.3	H	3.0	36.4	1.0	-56.6	-13.0	-43.6	
Mid Ch, 710									
1420.00	-13.2	V	3.0	37.3	1.0	-49.5	-13.0	-36.5	
2130.00	-10.1	V	3.0	36.6	1.0	-45.7	-13.0	-32.7	
2840.00	-18.5	V	3.0	36.4	1.0	-53.8	-13.0	-40.8	
1420.00	-12.9	H	3.0	37.3	1.0	-49.3	-13.0	-36.3	
2130.00	-21.9	H	3.0	36.6	1.0	-57.5	-13.0	-44.5	
2840.00	-21.7	H	3.0	36.4	1.0	-57.1	-13.0	-44.1	
High Ch, 711									
1422.00	-12.1	V	3.0	37.3	1.0	-48.5	-13.0	-35.5	
2133.00	-23.7	V	3.0	36.6	1.0	-59.3	-13.0	-46.3	
2844.00	-20.2	V	3.0	36.4	1.0	-55.6	-13.0	-42.6	
1422.00	-11.4	H	3.0	37.3	1.0	-47.8	-13.0	-34.8	
2133.00	-18.2	H	3.0	36.6	1.0	-53.8	-13.0	-40.8	
2844.00	-10.8	H	3.0	36.4	1.0	-46.2	-13.0	-33.2	

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

Company: LG
Project #: 14I19561
Date: 12/30/14
Test Engineer: O. Stoelting
Configuration: EUT w/ AC Adaptor + HS, X-pos
Location: Chamber B
Mode: LTE_16QAM Band 17 Harmonics, 5MHz Bandwidth

Band
LTE17
5MHz
16QAM

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 706.5									
1413.00	-15.2	V	3.0	37.4	1.0	-51.6	-13.0	-38.6	
2119.50	-21.9	V	3.0	36.6	1.0	-57.4	-13.0	-44.4	
2826.00	-20.4	V	3.0	36.4	1.0	-55.8	-13.0	-42.8	
1413.00	-12.7	H	3.0	37.4	1.0	-49.1	-13.0	-36.1	
2119.50	-21.9	H	3.0	36.6	1.0	-57.5	-13.0	-44.5	
2826.00	-20.8	H	3.0	36.4	1.0	-56.2	-13.0	-43.2	
Mid Ch, 710									
1420.00	-16.5	V	3.0	37.3	1.0	-52.9	-13.0	-39.9	
2130.00	-20.8	V	3.0	36.6	1.0	-56.3	-13.0	-43.3	
2840.00	-19.1	V	3.0	36.4	1.0	-54.4	-13.0	-41.4	
1420.00	-9.0	H	3.0	37.3	1.0	-45.3	-13.0	-32.3	
2130.00	-18.1	H	3.0	36.6	1.0	-53.7	-13.0	-40.7	
2840.00	-21.3	H	3.0	36.4	1.0	-56.7	-13.0	-43.7	
High Ch, 713.5									
1427.00	-14.1	V	3.0	37.3	1.0	-50.4	-13.0	-37.4	
2140.50	-21.4	V	3.0	36.6	1.0	-57.0	-13.0	-44.0	
2854.00	-20.2	V	3.0	36.4	1.0	-55.6	-13.0	-42.6	
1427.00	-12.8	H	3.0	37.3	1.0	-49.1	-13.0	-36.1	
2140.50	-22.6	H	3.0	36.6	1.0	-58.2	-13.0	-45.2	
2854.00	-20.9	H	3.0	36.4	1.0	-56.3	-13.0	-43.3	

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

Company: LG
Project #: 14I19561
Date: 12/30/14
Test Engineer: O. Stoelting
Configuration: EUT w/ AC Adaptor + HS, X-pos
Location: Chamber B
Mode: LTE_QPSK Band 17 Harmonics, 5MHz Bandwidth

Band
LTE17
5MHz
QPSK

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 706.5									
1413.00	-14.7	V	3.0	37.4	1.0	-51.1	-13.0	-38.1	
2119.50	-21.7	V	3.0	36.6	1.0	-57.3	-13.0	-44.3	
2826.00	-20.4	V	3.0	36.4	1.0	-55.8	-13.0	-42.8	
1413.00	-13.0	H	3.0	37.4	1.0	-49.4	-13.0	-36.4	
2119.50	-21.8	H	3.0	36.6	1.0	-57.4	-13.0	-44.4	
2826.00	-21.1	H	3.0	36.4	1.0	-56.5	-13.0	-43.5	
Mid Ch, 710									
1420.00	-17.0	V	3.0	37.3	1.0	-53.4	-13.0	-40.4	
2130.00	-20.1	V	3.0	36.6	1.0	-55.7	-13.0	-42.7	
2840.00	-18.6	V	3.0	36.4	1.0	-54.0	-13.0	-41.0	
1420.00	-8.4	H	3.0	37.3	1.0	-44.7	-13.0	-31.7	
2130.00	-16.3	H	3.0	36.6	1.0	-51.9	-13.0	-38.9	
2840.00	-20.2	H	3.0	36.4	1.0	-55.6	-13.0	-42.6	
High Ch, 713.5									
1427.00	-14.6	V	3.0	37.3	1.0	-51.0	-13.0	-38.0	
2140.50	-21.6	V	3.0	36.6	1.0	-57.1	-13.0	-44.1	
2854.00	-20.0	V	3.0	36.4	1.0	-55.4	-13.0	-42.4	
1427.00	-11.8	H	3.0	37.3	1.0	-48.1	-13.0	-35.1	
2140.50	-22.1	H	3.0	36.6	1.0	-57.7	-13.0	-44.7	
2854.00	-20.9	H	3.0	36.4	1.0	-56.3	-13.0	-43.3	

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UL Verification Services
Above 1GHz High Frequency Substitution Measurement

Company: LG
Project #: 14I19561
Date: 12/29/14
Test Engineer: O. Stoelting
Configuration: EUT Y-pos w/ AC charger, headset
Mode: LTE5 10MHz 16QAM HARM

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	T34 8449B	Filter 1	Part 22

Band
LTE5
10MHz
16QAM

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 829MHz									
1.658	-18.8	V	3.0	37.4	1.0	-55.1	-13.0	-42.1	
2.487	-16.7	V	3.0	36.4	1.0	-52.1	-13.0	-39.1	
3.316	-20.4	V	3.0	35.8	1.0	-55.1	-13.0	-42.1	
1.658	-21.7	H	3.0	37.4	1.0	-58.0	-13.0	-45.0	
2.487	-23.3	H	3.0	36.4	1.0	-58.7	-13.0	-45.7	
3.316	-20.2	H	3.0	35.8	1.0	-55.0	-13.0	-42.0	
Mid Ch, 836.5MHz									
1.673	-20.0	V	3.0	37.3	1.0	-56.3	-13.0	-43.3	
2.510	-21.0	V	3.0	36.4	1.0	-56.3	-13.0	-43.3	
3.346	-20.0	V	3.0	35.8	1.0	-54.8	-13.0	-41.8	
1.673	-20.5	H	3.0	37.3	1.0	-56.8	-13.0	-43.8	
2.510	-23.1	H	3.0	36.4	1.0	-58.4	-13.0	-45.4	
3.346	-20.4	H	3.0	35.8	1.0	-55.2	-13.0	-42.2	
High Ch, 844MHz									
1.688	-24.5	V	3.0	37.3	1.0	-60.9	-13.0	-47.9	
2.532	-19.0	V	3.0	36.3	1.0	-54.4	-13.0	-41.4	
3.376	-19.5	V	3.0	35.7	1.0	-54.2	-13.0	-41.2	
1.688	-24.6	H	3.0	37.3	1.0	-61.0	-13.0	-48.0	
2.532	-23.8	H	3.0	36.3	1.0	-59.2	-13.0	-46.2	
3.376	-19.9	H	3.0	35.7	1.0	-54.6	-13.0	-41.6	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701I
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UL Verification Services
Above 1GHz High Frequency Substitution Measurement

Company: LG
Project #: 14I19561
Date: 12/29/14
Test Engineer: O. Stoelting
Configuration: EUT Y-pos w/ AC charger, headset
Mode: LTE5 10MHz QPSK HARM

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	T34 8449B	Filter 1	Part 22

Band
LTE5
10MHz
QPSK

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 829MHz									
1.658	-18.7	V	3.0	37.4	1.0	-55.1	-13.0	-42.1	
2.487	-17.5	V	3.0	36.4	1.0	-52.8	-13.0	-39.8	
3.316	-20.4	V	3.0	35.8	1.0	-55.2	-13.0	-42.2	
1.658	-21.7	H	3.0	37.4	1.0	-58.0	-13.0	-45.0	
2.487	-23.3	H	3.0	36.4	1.0	-58.7	-13.0	-45.7	
3.316	-20.3	H	3.0	35.8	1.0	-55.1	-13.0	-42.1	
Mid Ch, 836.5MHz									
1.673	-20.7	V	3.0	37.3	1.0	-57.0	-13.0	-44.0	
2.510	-21.6	V	3.0	36.4	1.0	-57.0	-13.0	-44.0	
3.346	-20.3	V	3.0	35.8	1.0	-55.0	-13.0	-42.0	
1.673	-20.6	H	3.0	37.3	1.0	-57.0	-13.0	-44.0	
2.510	-24.3	H	3.0	36.4	1.0	-59.7	-13.0	-46.7	
3.346	-20.2	H	3.0	35.8	1.0	-55.0	-13.0	-42.0	
High Ch, 844 MHz									
1.688	-25.1	V	3.0	37.3	1.0	-61.4	-13.0	-48.4	
2.532	-18.5	V	3.0	36.3	1.0	-53.8	-13.0	-40.8	
3.376	-19.6	V	3.0	35.7	1.0	-54.3	-13.0	-41.3	
1.688	-25.5	H	3.0	37.3	1.0	-61.9	-13.0	-48.9	
2.532	-22.9	H	3.0	36.3	1.0	-58.3	-13.0	-45.3	
3.376	-19.8	H	3.0	35.7	1.0	-54.5	-13.0	-41.5	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

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UL Verification Services
Above 1GHz High Frequency Substitution Measurement

Company: LG
Project #: 14I19561
Date: 12/29/14
Test Engineer: O. Stoelting
Configuration: EUT Y-pos w/ AC charger, headset
Mode: LTE5 5M 16QAM

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	T34 8449B	Filter 1	Part 22

Band

LTE5

5MHz

16QAM

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 826.5MHz									
1.653	-20.0	V	3.0	37.4	1.0	-56.3	-13.0	-43.3	
2.480	-21.7	V	3.0	36.4	1.0	-57.1	-13.0	-44.1	
3.306	-20.4	V	3.0	35.8	1.0	-55.2	-13.0	-42.2	
1.653	-21.8	H	3.0	37.4	1.0	-58.2	-13.0	-45.2	
2.480	-24.0	H	3.0	36.4	1.0	-59.4	-13.0	-46.4	
3.306	-20.9	H	3.0	35.8	1.0	-55.7	-13.0	-42.7	
Mid Ch, 836.5MHz									
1.673	-20.6	V	3.0	37.3	1.0	-57.0	-13.0	-44.0	
2.510	-22.5	V	3.0	36.4	1.0	-57.8	-13.0	-44.8	
3.346	-20.0	V	3.0	35.8	1.0	-54.8	-13.0	-41.8	
1.673	-21.4	H	3.0	37.3	1.0	-57.8	-13.0	-44.8	
2.510	-24.3	H	3.0	36.4	1.0	-59.7	-13.0	-46.7	
3.346	-20.6	H	3.0	35.8	1.0	-55.3	-13.0	-42.3	
High Ch, 846.5MHz									
1.693	-18.1	V	3.0	37.3	1.0	-54.4	-13.0	-41.4	
2.540	-22.4	V	3.0	36.3	1.0	-57.7	-13.0	-44.7	
3.386	-20.3	V	3.0	35.7	1.0	-55.0	-13.0	-42.0	
1.693	-25.6	H	3.0	37.3	1.0	-61.9	-13.0	-48.9	
2.540	-24.4	H	3.0	36.3	1.0	-59.8	-13.0	-46.8	
3.386	-20.1	H	3.0	35.7	1.0	-54.8	-13.0	-41.8	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

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UL Verification Services
Above 1GHz High Frequency Substitution Measurement

Company: LG
Project #: 14I19561
Date: 12/29/14
Test Engineer: O. Stoelting
Configuration: EUT Y-pos w/ AC charger, headset
Mode: LTE5 5M QPSK

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	T34 8449B	Filter 1	Part 22

Band

LTE5

5MHz

QPSK

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 826.5MHz									
1.653	-18.9	V	3.0	37.4	1.0	-55.3	-13.0	-42.3	
2.480	-22.1	V	3.0	36.4	1.0	-57.5	-13.0	-44.5	
3.306	-20.2	V	3.0	35.8	1.0	-55.0	-13.0	-42.0	
1.653	-21.7	H	3.0	37.4	1.0	-58.1	-13.0	-45.1	
2.480	-24.5	H	3.0	36.4	1.0	-59.8	-13.0	-46.8	
3.306	-20.8	H	3.0	35.8	1.0	-55.6	-13.0	-42.6	
Mid Ch, 836.5MHz									
1.673	-20.9	V	3.0	37.3	1.0	-57.3	-13.0	-44.3	
2.510	-21.6	V	3.0	36.4	1.0	-57.0	-13.0	-44.0	
3.346	-20.6	V	3.0	35.8	1.0	-55.3	-13.0	-42.3	
1.673	-21.8	H	3.0	37.3	1.0	-58.1	-13.0	-45.1	
2.510	-24.3	H	3.0	36.4	1.0	-59.6	-13.0	-46.6	
3.346	-20.4	H	3.0	35.8	1.0	-55.2	-13.0	-42.2	
High Ch, 846.5MHz									
1.693	-18.0	V	3.0	37.3	1.0	-54.3	-13.0	-41.3	
2.540	-22.2	V	3.0	36.3	1.0	-57.6	-13.0	-44.6	
3.386	-20.6	V	3.0	35.7	1.0	-55.3	-13.0	-42.3	
1.693	-25.0	H	3.0	37.3	1.0	-61.3	-13.0	-48.3	
2.540	-24.2	H	3.0	36.3	1.0	-59.5	-13.0	-46.5	
3.386	-20.4	H	3.0	35.7	1.0	-55.1	-13.0	-42.1	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

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

Company: LG
Project #: 14I19561
Date: 12/30/14
Test Engineer: O. Stoelting
Configuration: EUT w/ AC Adaptor + HS, X-pos
Mode: TX, LTE band 4, 10MHz BW, 16QAM

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	T145 8449B	Filter 1	Part 27

Band
LTE4
10MHz
16QAM

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1715 MHz)									
3.430	1.4	V	3.0	30.4	1.0	-28.0	-13.0	-15.0	
5.145	-13.1	V	3.0	28.8	1.0	-40.8	-13.0	-27.8	
6.860	-13.0	V	3.0	27.1	1.0	-39.1	-13.0	-26.1	
3.430	3.3	H	3.0	30.4	1.0	-26.1	-13.0	-13.1	
5.145	-12.8	H	3.0	28.8	1.0	-40.6	-13.0	-27.6	
6.860	-12.0	H	3.0	27.1	1.0	-38.1	-13.0	-25.1	
Mid Ch, (1732.5 MHz)									
3.465	0.3	V	3.0	30.4	1.0	-29.1	-13.0	-16.1	
5.198	-11.7	V	3.0	28.7	1.0	-39.4	-13.0	-26.4	
6.930	-12.5	V	3.0	27.1	1.0	-38.6	-13.0	-25.6	
3.465	4.0	H	3.0	30.4	1.0	-25.4	-13.0	-12.4	
5.198	-11.7	H	3.0	28.7	1.0	-39.4	-13.0	-26.4	
6.930	-11.5	H	3.0	27.1	1.0	-37.6	-13.0	-24.6	
High Ch, (1750 MHz)									
3.500	-1.4	V	3.0	30.4	1.0	-30.8	-13.0	-17.8	
5.250	-12.3	V	3.0	28.7	1.0	-39.9	-13.0	-26.9	
7.000	-12.6	V	3.0	27.0	1.0	-38.6	-13.0	-25.6	
3.500	-0.3	H	3.0	30.4	1.0	-29.7	-13.0	-16.7	
5.250	-12.5	H	3.0	28.7	1.0	-40.1	-13.0	-27.1	
7.000	-10.8	H	3.0	27.0	1.0	-36.8	-13.0	-23.8	

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

Company: LG
Project #: 14I19561
Date: 12/30/14
Test Engineer: O. Stoelting
Configuration: EUT w/ AC Adaptor + HS, X-pos
Mode: TX, LTE band 4, 10MHz BW, QPSK

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	T145 8449B	Filter 1	Part 27

Band
LTE4
10MHz
QPSK

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1715 MHz)									
3.430	2.0	V	3.0	30.4	1.0	-27.4	-13.0	-14.4	
5.145	-13.4	V	3.0	28.8	1.0	-41.2	-13.0	-28.2	
6.860	-13.5	V	3.0	27.1	1.0	-39.6	-13.0	-26.6	
3.430	4.0	H	3.0	30.4	1.0	-25.4	-13.0	-12.4	
5.145	-12.5	H	3.0	28.8	1.0	-40.2	-13.0	-27.2	
6.860	-11.9	H	3.0	27.1	1.0	-38.0	-13.0	-25.0	
Mid Ch, (1732.5 MHz)									
3.465	-0.3	V	3.0	30.4	1.0	-29.7	-13.0	-16.7	
5.198	-11.8	V	3.0	28.7	1.0	-39.5	-13.0	-26.5	
6.930	-12.8	V	3.0	27.1	1.0	-38.8	-13.0	-25.8	
3.465	3.7	H	3.0	30.4	1.0	-25.7	-13.0	-12.7	
5.198	-10.4	H	3.0	28.7	1.0	-38.1	-13.0	-25.1	
6.930	-11.3	H	3.0	27.1	1.0	-37.4	-13.0	-24.4	
High Ch, (1750 MHz)									
3.500	-3.3	V	3.0	30.4	1.0	-32.7	-13.0	-19.7	
5.250	-13.3	V	3.0	28.7	1.0	-40.9	-13.0	-27.9	
7.000	-12.7	V	3.0	27.0	1.0	-38.7	-13.0	-25.7	
3.500	-0.3	H	3.0	30.4	1.0	-29.7	-13.0	-16.7	
5.250	-12.0	H	3.0	28.7	1.0	-39.6	-13.0	-26.6	
7.000	-11.7	H	3.0	27.0	1.0	-37.7	-13.0	-24.7	

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UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701I
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UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: LG
Project #: 14I19561
Date: 12/30/14
Test Engineer: O. Stoelting
Configuration: EUT w/ AC Adaptor + HS, X-pos
Mode: TX, LTE band 4, 5MHz BW, 16 QAM

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	T145 8449B	Filter 1	Part 27

Band
LTE4
5MHz
16QAM

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1712.5 MHz)									
3.425	-0.7	V	3.0	30.4	1.0	-30.1	-13.0	-17.1	
5.138	-13.6	V	3.0	28.8	1.0	-41.4	-13.0	-28.4	
6.850	-13.4	V	3.0	27.1	1.0	-39.6	-13.0	-26.6	
3.425	4.3	H	3.0	30.4	1.0	-25.2	-13.0	-12.2	
5.138	-11.9	H	3.0	28.8	1.0	-39.7	-13.0	-26.7	
6.850	-11.2	H	3.0	27.1	1.0	-37.4	-13.0	-24.4	
Mid Ch, (1732.5 MHz)									
3.465	1.2	V	3.0	30.4	1.0	-28.2	-13.0	-15.2	
5.198	-12.4	V	3.0	28.7	1.0	-40.1	-13.0	-27.1	
6.930	-13.2	V	3.0	27.1	1.0	-39.3	-13.0	-26.3	
3.465	2.0	H	3.0	30.4	1.0	-27.4	-13.0	-14.4	
5.198	-12.7	H	3.0	28.7	1.0	-40.4	-13.0	-27.4	
6.930	-11.3	H	3.0	27.1	1.0	-37.3	-13.0	-24.3	
High Ch, (1752.5 MHz)									
3.505	-4.3	V	3.0	30.4	1.0	-33.7	-13.0	-20.7	
5.258	-11.7	V	3.0	28.6	1.0	-39.4	-13.0	-26.4	
7.010	-12.9	V	3.0	27.0	1.0	-38.9	-13.0	-25.9	
3.505	-4.0	H	3.0	30.4	1.0	-33.3	-13.0	-20.3	
5.258	-13.1	H	3.0	28.6	1.0	-40.7	-13.0	-27.7	
7.010	-11.3	H	3.0	27.0	1.0	-37.3	-13.0	-24.3	

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

Company: LG
Project #: 14I19561
Date: 12/30/14
Test Engineer: O. Stoelting
Configuration: EUT w/ AC Adaptor + HS, X-pos
Mode: TX, LTE band 4, 5MHz BW, QPSK

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	T145 8449B	Filter 1	Part 27

Band
LTE4
5MHz
QPSK

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1712.5 MHz)									
3.425	-0.5	V	3.0	30.4	1.0	-29.9	-13.0	-16.9	
5.138	-12.7	V	3.0	28.8	1.0	-40.4	-13.0	-27.4	
6.850	-13.6	V	3.0	27.1	1.0	-39.7	-13.0	-26.7	
3.425	4.6	H	3.0	30.4	1.0	-24.8	-13.0	-11.8	
5.138	-12.4	H	3.0	28.8	1.0	-40.2	-13.0	-27.2	
6.850	-11.1	H	3.0	27.1	1.0	-37.3	-13.0	-24.3	
Mid Ch, (1732.5 MHz)									
3.465	1.7	V	3.0	30.4	1.0	-27.7	-13.0	-14.7	
5.198	-12.9	V	3.0	28.7	1.0	-40.6	-13.0	-27.6	
6.930	-12.7	V	3.0	27.1	1.0	-38.7	-13.0	-25.7	
3.465	1.9	H	3.0	30.4	1.0	-27.5	-13.0	-14.5	
5.198	-13.3	H	3.0	28.7	1.0	-41.0	-13.0	-28.0	
6.930	-10.9	H	3.0	27.1	1.0	-37.0	-13.0	-24.0	
High Ch, (1752.5 MHz)									
3.505	-4.4	V	3.0	30.4	1.0	-33.8	-13.0	-20.8	
5.258	-10.7	V	3.0	28.6	1.0	-38.4	-13.0	-25.4	
7.010	-13.3	V	3.0	27.0	1.0	-39.3	-13.0	-26.3	
3.505	-2.3	H	3.0	30.4	1.0	-31.7	-13.0	-18.7	
5.258	-12.4	H	3.0	28.6	1.0	-40.1	-13.0	-27.1	
7.010	-10.8	H	3.0	27.0	1.0	-36.7	-13.0	-23.7	

Rev. 03.03.09

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701I
47173 BENICIA STREET, FREMONT, CA 94538, USA TEL: (510) 771-1000 FAX: (510) 661-0888
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UL Verification Services, Inc. Chamber B
Above 1GHz High Frequency Substitution Measurement

Company: LG
Project #: 14I19561
Date: 12/30/14
Test Engineer: O. Stoelting
Configuration: EUT w/ AC Adaptor + HS, X-pos
Mode: LTE2 16QAM 10MHz Harm

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	T34 8449B	Filter 1	Part 24

Band

LTE2

10MHz

16QAM

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1855MHz									
3.710	3.3	V	3.0	35.4	1.0	-31.1	-13.0	-18.1	
5.565	-12.9	V	3.0	34.7	1.0	-46.6	-13.0	-33.6	
7.420	-13.1	V	3.0	34.9	1.0	-47.0	-13.0	-34.0	
3.710	0.9	H	3.0	35.4	1.0	-33.4	-13.0	-20.4	
5.565	-12.6	H	3.0	34.7	1.0	-46.4	-13.0	-33.4	
7.420	-10.8	H	3.0	34.9	1.0	-44.7	-13.0	-31.7	
Mid Ch,1880MHz									
3.760	3.2	V	3.0	35.3	1.0	-31.1	-13.0	-18.1	
5.640	-12.2	V	3.0	34.7	1.0	-45.9	-13.0	-32.9	
7.520	-12.2	V	3.0	34.9	1.0	-46.1	-13.0	-33.1	
3.760	1.0	H	3.0	35.3	1.0	-33.3	-13.0	-20.3	
5.640	-11.2	H	3.0	34.7	1.0	-45.0	-13.0	-32.0	
7.520	-11.1	H	3.0	34.9	1.0	-45.0	-13.0	-32.0	
High Ch, 1905MHz									
3.810	4.6	V	3.0	35.3	1.0	-29.7	-13.0	-16.7	
5.715	-14.0	V	3.0	34.7	1.0	-47.7	-13.0	-34.7	
7.620	-12.7	V	3.0	34.9	1.0	-46.6	-13.0	-33.6	
3.810	0.9	H	3.0	35.3	1.0	-33.4	-13.0	-20.4	
5.715	-12.6	H	3.0	34.7	1.0	-46.3	-13.0	-33.3	
7.620	-11.1	H	3.0	34.9	1.0	-45.1	-13.0	-32.1	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

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

Company: LG
Project #: 14I19561
Date: 12/30/14
Test Engineer: O. Stoelting
Configuration: EUT w/ AC Adaptor + HS, X-pos
Mode: LTE2 QPSK 10MHz Harm

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	T34 8449B	Filter 1	Part 24

Band

LTE2

10MHz

QPSK

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1855MHz									
3.710	3.1	V	3.0	35.4	1.0	-31.3	-13.0	-18.3	
5.565	-13.0	V	3.0	34.7	1.0	-46.7	-13.0	-33.7	
7.420	-12.6	V	3.0	34.9	1.0	-46.5	-13.0	-33.5	
3.710	0.8	H	3.0	35.4	1.0	-33.6	-13.0	-20.6	
5.565	-12.8	H	3.0	34.7	1.0	-46.5	-13.0	-33.5	
7.420	-11.1	H	3.0	34.9	1.0	-45.0	-13.0	-32.0	
Mid Ch,1880MHz									
3.760	3.0	V	3.0	35.3	1.0	-31.3	-13.0	-18.3	
5.640	-12.6	V	3.0	34.7	1.0	-46.3	-13.0	-33.3	
7.520	-13.4	V	3.0	34.9	1.0	-47.3	-13.0	-34.3	
3.760	0.0	H	3.0	35.3	1.0	-34.3	-13.0	-21.3	
5.640	-11.8	H	3.0	34.7	1.0	-45.6	-13.0	-32.6	
7.520	-11.6	H	3.0	34.9	1.0	-45.5	-13.0	-32.5	
High Ch, 1905MHz									
3.810	4.8	V	3.0	35.3	1.0	-29.5	-13.0	-16.5	
5.715	-12.9	V	3.0	34.7	1.0	-46.6	-13.0	-33.6	
7.620	-12.7	V	3.0	34.9	1.0	-46.7	-13.0	-33.7	
3.810	0.3	H	3.0	35.3	1.0	-34.0	-13.0	-21.0	
5.715	-12.0	H	3.0	34.7	1.0	-45.7	-13.0	-32.7	
7.620	-10.3	H	3.0	34.9	1.0	-44.2	-13.0	-31.2	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

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

Company: LG
Project #: 14I19561
Date: 12/30/14
Test Engineer: O. Stoelting
Configuration: EUT w/ AC Adaptor + HS, X-pos
Mode: LTE2 16QAM 5MHz Harm

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	T34 8449B	Filter 1	Part 24

Band

LTE2

5MHz

16QAM

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1852.5MHz									
3.705	-4.3	V	3.0	35.4	1.0	-38.7	-13.0	-25.7	
5.558	-11.5	V	3.0	34.7	1.0	-45.2	-13.0	-32.2	
7.410	-13.2	V	3.0	34.9	1.0	-47.1	-13.0	-34.1	
3.705	-2.6	H	3.0	35.4	1.0	-37.0	-13.0	-24.0	
5.558	-12.4	H	3.0	34.7	1.0	-46.1	-13.0	-33.1	
7.410	-11.2	H	3.0	34.9	1.0	-45.1	-13.0	-32.1	
Mid Ch,1880MHz									
3.760	3.7	V	3.0	35.3	1.0	-30.6	-13.0	-17.6	
5.640	-13.3	V	3.0	34.7	1.0	-47.1	-13.0	-34.1	
7.520	-13.2	V	3.0	34.9	1.0	-47.1	-13.0	-34.1	
3.760	1.0	H	3.0	35.3	1.0	-33.4	-13.0	-20.4	
5.640	-11.9	H	3.0	34.7	1.0	-45.7	-13.0	-32.7	
7.520	-11.4	H	3.0	34.9	1.0	-45.3	-13.0	-32.3	
High Ch, 1907.5MHz									
3.815	3.8	V	3.0	35.3	1.0	-30.5	-13.0	-17.5	
5.723	-9.5	V	3.0	34.7	1.0	-43.2	-13.0	-30.2	
7.630	-11.9	V	3.0	34.9	1.0	-45.9	-13.0	-32.9	
3.815	-1.4	H	3.0	35.3	1.0	-35.7	-13.0	-22.7	
5.723	-7.9	H	3.0	34.7	1.0	-41.6	-13.0	-28.6	
7.630	-10.8	H	3.0	34.9	1.0	-44.8	-13.0	-31.8	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

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

Company: LG
Project #: 14I19561
Date: 12/30/14
Test Engineer: O. Stoelting
Configuration: EUT w/ AC Adaptor + HS, X-pos
Mode: LTE2 QPSK 5MHz Harm

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	T34 8449B	Filter 1	Part 24

Band

LTE2

5MHz

QPSK

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1852.5MHz									
3.705	-3.4	V	3.0	35.4	1.0	-37.8	-13.0	-24.8	
5.558	-9.9	V	3.0	34.7	1.0	-43.6	-13.0	-30.6	
7.410	-12.8	V	3.0	34.9	1.0	-46.8	-13.0	-33.8	
3.705	-3.1	H	3.0	35.4	1.0	-37.5	-13.0	-24.5	
5.558	-12.0	H	3.0	34.7	1.0	-45.7	-13.0	-32.7	
7.410	-11.4	H	3.0	34.9	1.0	-45.3	-13.0	-32.3	
Mid Ch,1880MHz									
3.760	3.1	V	3.0	35.3	1.0	-31.3	-13.0	-18.3	
5.640	-12.8	V	3.0	34.7	1.0	-46.6	-13.0	-33.6	
7.520	-12.4	V	3.0	34.9	1.0	-46.4	-13.0	-33.4	
3.760	0.8	H	3.0	35.3	1.0	-33.5	-13.0	-20.5	
5.640	-12.4	H	3.0	34.7	1.0	-46.1	-13.0	-33.1	
7.520	-11.2	H	3.0	34.9	1.0	-45.1	-13.0	-32.1	
High Ch, 1907.5MHz									
3.815	3.5	V	3.0	35.3	1.0	-30.8	-13.0	-17.8	
5.723	-9.3	V	3.0	34.7	1.0	-43.1	-13.0	-30.1	
7.630	-11.5	V	3.0	34.9	1.0	-45.4	-13.0	-32.4	
3.815	-6.4	H	3.0	35.3	1.0	-40.7	-13.0	-27.7	
5.723	-9.3	H	3.0	34.7	1.0	-43.0	-13.0	-30.0	
7.630	-11.3	H	3.0	34.9	1.0	-45.3	-13.0	-32.3	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

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Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: LG
Project #: 14I19561
Date: 12/11/14
Test Engineer: J. Jackson
Configuration: X-Pos EUT w/ AC charger, headset
Mode: HSDPA B2

Chamber	Pre-amplifer	Filter	Limit
3m Chamber	T34 8449B	Filter 1	Part 24

Band

Band 2

HSDPA

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1852.4MHz									
3.705	-17.8	V	3.0	35.4	1.0	-52.1	-13.0	-39.1	
5.557	-17.7	V	3.0	34.7	1.0	-51.5	-13.0	-38.5	
7.410	-14.4	V	3.0	34.9	1.0	-48.3	-13.0	-35.3	
3.705	-15.1	H	3.0	35.4	1.0	-49.5	-13.0	-36.5	
5.557	-15.4	H	3.0	34.7	1.0	-49.1	-13.0	-36.1	
7.410	-12.0	H	3.0	34.9	1.0	-45.9	-13.0	-32.9	
Mid Ch, 1880MHz									
3.760	-17.7	V	3.0	35.3	1.0	-52.0	-13.0	-39.0	
5.640	-17.8	V	3.0	34.7	1.0	-51.5	-13.0	-38.5	
7.520	-14.3	V	3.0	34.9	1.0	-48.2	-13.0	-35.2	
3.760	-17.3	H	3.0	35.3	1.0	-51.6	-13.0	-38.6	
5.640	-15.2	H	3.0	34.7	1.0	-48.9	-13.0	-35.9	
7.520	-11.9	H	3.0	34.9	1.0	-45.8	-13.0	-32.8	
High Ch, 1907.6MHz									
3.815	-20.2	V	3.0	35.3	1.0	-54.5	-13.0	-41.5	
5.723	-16.1	V	3.0	34.7	1.0	-49.8	-13.0	-36.8	
7.630	-13.9	V	3.0	34.9	1.0	-47.8	-13.0	-34.8	
3.815	-16.2	H	3.0	35.3	1.0	-50.5	-13.0	-37.5	
5.723	-15.7	H	3.0	34.7	1.0	-49.4	-13.0	-36.4	
7.630	-12.2	H	3.0	34.9	1.0	-46.1	-13.0	-33.1	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

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Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: LG
Project #: 14I19561
Date: 12/11/14
Test Engineer: J. Jackson
Configuration: X-Pos EUT w/ AC charger, headset
Mode: REL99 B2

Chamber	Pre-amplifer	Filter	Limit
3m Chamber	T34 8449B	Filter 1	Part 24

Band

Band 2

REL99

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1852.4MHz									
3.705	-18.1	V	3.0	35.4	1.0	-52.5	-13.0	-39.5	
5.557	-17.6	V	3.0	34.7	1.0	-51.3	-13.0	-38.3	
7.410	-14.0	V	3.0	34.9	1.0	-47.9	-13.0	-34.9	
3.705	-20.4	H	3.0	35.4	1.0	-54.8	-13.0	-41.8	
5.557	-17.0	H	3.0	34.7	1.0	-50.8	-13.0	-37.8	
7.410	-13.4	H	3.0	34.9	1.0	-47.3	-13.0	-34.3	
Mid Ch, 1880MHz									
3.760	-18.2	V	3.0	35.3	1.0	-52.5	-13.0	-39.5	
5.640	-16.9	V	3.0	34.7	1.0	-50.6	-13.0	-37.6	
7.520	-16.4	V	3.0	34.9	1.0	-50.3	-13.0	-37.3	
3.760	-15.6	H	3.0	35.3	1.0	-50.0	-13.0	-37.0	
5.640	-17.2	H	3.0	34.7	1.0	-51.0	-13.0	-38.0	
7.520	-13.8	H	3.0	34.9	1.0	-47.7	-13.0	-34.7	
High Ch, 1907.6MHz									
3.815	-13.4	V	3.0	35.3	1.0	-47.6	-13.0	-34.6	
5.723	-16.9	V	3.0	34.7	1.0	-50.6	-13.0	-37.6	
7.630	-14.5	V	3.0	34.9	1.0	-48.5	-13.0	-35.5	
3.815	-12.6	H	3.0	35.3	1.0	-46.9	-13.0	-33.9	
5.723	-15.2	H	3.0	34.7	1.0	-48.9	-13.0	-35.9	
7.630	-12.5	H	3.0	34.9	1.0	-46.5	-13.0	-33.5	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701I
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UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: LG
Project #: 14I19561
Date: 12/29/14
Test Engineer: O. Stoelting
Configuration: EUT Y-pos w/ AC charger, headset
Mode: HSDPA_B5

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	T34 8449B	Filter 1	Part 22

Band

Band 5

HSDPA

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 826.4MHz									
1.653	-23.4	V	3.0	37.4	1.0	-59.8	-13.0	-46.8	
2.479	-21.9	V	3.0	36.4	1.0	-57.3	-13.0	-44.3	
3.306	-20.1	V	3.0	35.8	1.0	-54.9	-13.0	-41.9	
1.653	-26.7	H	3.0	37.4	1.0	-63.1	-13.0	-50.1	
2.479	-24.3	H	3.0	36.4	1.0	-59.6	-13.0	-46.6	
3.306	-20.3	H	3.0	35.8	1.0	-55.1	-13.0	-42.1	
Mid Ch, 836.6MHz									
1.673	-25.3	V	3.0	37.3	1.0	-61.6	-13.0	-48.6	
2.510	-19.7	V	3.0	36.4	1.0	-55.1	-13.0	-42.1	
3.346	-20.2	V	3.0	35.8	1.0	-55.0	-13.0	-42.0	
1.673	-25.2	H	3.0	37.3	1.0	-61.5	-13.0	-48.5	
2.510	-23.5	H	3.0	36.4	1.0	-58.9	-13.0	-45.9	
3.346	-20.3	H	3.0	35.8	1.0	-55.1	-13.0	-42.1	
High Ch, 846.6MHz									
1.693	-19.0	V	3.0	37.3	1.0	-55.3	-13.0	-42.3	
2.540	-22.1	V	3.0	36.3	1.0	-57.4	-13.0	-44.4	
3.386	-20.3	V	3.0	35.7	1.0	-55.0	-13.0	-42.0	
1.693	-22.5	H	3.0	37.3	1.0	-58.8	-13.0	-45.8	
2.540	-24.4	H	3.0	36.3	1.0	-59.7	-13.0	-46.7	
3.386	-19.8	H	3.0	35.7	1.0	-54.5	-13.0	-41.5	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

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

Company: LG
Project #: 14I19561
Date: 12/29/14
Test Engineer: O. Stoelting
Configuration: EUT Y-pos w/ AC charger, headset
Mode: REL99 B5

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	T34 8449B	Filter 1	Part 22

Band

Band 5

REL99

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 826.4MHz									
1.653	-24.5	V	3.0	37.4	1.0	-60.9	-13.0	-47.9	
2.479	-20.8	V	3.0	36.4	1.0	-56.2	-13.0	-43.2	
3.306	-20.0	V	3.0	35.8	1.0	-54.8	-13.0	-41.8	
1.653	-26.3	H	3.0	37.4	1.0	-62.7	-13.0	-49.7	
2.479	-23.4	H	3.0	36.4	1.0	-58.8	-13.0	-45.8	
3.306	-20.8	H	3.0	35.8	1.0	-55.6	-13.0	-42.6	
Mid Ch, 836.6MHz									
1.673	-24.7	V	3.0	37.3	1.0	-61.0	-13.0	-48.0	
2.510	-21.0	V	3.0	36.4	1.0	-56.4	-13.0	-43.4	
3.346	-20.4	V	3.0	35.8	1.0	-55.1	-13.0	-42.1	
1.673	-24.0	H	3.0	37.3	1.0	-60.3	-13.0	-47.3	
2.510	-23.4	H	3.0	36.4	1.0	-58.7	-13.0	-45.7	
3.346	-20.2	H	3.0	35.8	1.0	-54.9	-13.0	-41.9	
High Ch, 846.6MHz									
1.693	-22.6	V	3.0	37.3	1.0	-58.9	-13.0	-45.9	
2.540	-22.0	V	3.0	36.3	1.0	-57.3	-13.0	-44.3	
3.386	-20.4	V	3.0	35.7	1.0	-55.1	-13.0	-42.1	
1.693	-23.9	H	3.0	37.3	1.0	-60.2	-13.0	-47.2	
2.540	-23.9	H	3.0	36.3	1.0	-59.2	-13.0	-46.2	
3.386	-20.2	H	3.0	35.7	1.0	-54.9	-13.0	-41.9	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

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

Company: LG
Project #: 14I19561
Date: 12/11/14
Test Engineer: J. Jackson
Configuration: EUT w/ AC Adaptor + HS, X-pos
Mode: EPRS1900 Harm

Chamber	Pre-amplifer	Filter	Limit
3m Chamber	T34 8449B	Filter 1	Part 24

Band	f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch, 1850.2MHz									
GSM 1900	3.700	-15.7	V	3.0	35.4	1.0	-50.1	-13.0	-37.1	
	5.551	-12.7	V	3.0	34.7	1.0	-46.5	-13.0	-33.5	
	7.401	-8.0	V	3.0	34.9	1.0	-42.0	-13.0	-29.0	
	3.700	-11.7	H	3.0	35.4	1.0	-46.1	-13.0	-33.1	
EGPRS	5.551	-7.7	H	3.0	34.7	1.0	-41.4	-13.0	-28.4	
	7.401	-1.7	H	3.0	34.9	1.0	-35.7	-13.0	-22.7	
	Mid Ch, 1880.0MHz									
	3.760	-12.2	V	3.0	35.3	1.0	-46.6	-13.0	-33.6	
	5.640	-9.5	V	3.0	34.7	1.0	-43.2	-13.0	-30.2	
	7.520	-4.8	V	3.0	34.9	1.0	-38.8	-13.0	-25.8	
	3.760	-10.3	H	3.0	35.3	1.0	-44.7	-13.0	-31.7	
	5.640	-7.3	H	3.0	34.7	1.0	-41.0	-13.0	-28.0	
	7.520	-1.7	H	3.0	34.9	1.0	-35.6	-13.0	-22.6	
	High Ch, 1909.8MHz									
	3.820	-12.8	V	3.0	35.3	1.0	-47.1	-13.0	-34.1	
	5.729	-9.3	V	3.0	34.7	1.0	-43.0	-13.0	-30.0	
	7.639	-3.8	V	3.0	35.0	1.0	-37.7	-13.0	-24.7	
	3.820	-14.7	H	3.0	35.3	1.0	-49.0	-13.0	-36.0	
	5.729	-10.6	H	3.0	34.7	1.0	-44.4	-13.0	-31.4	
	7.639	-4.8	H	3.0	35.0	1.0	-38.8	-13.0	-25.8	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701I
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Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: LG
Project #: 14I19561
Date: 12/11/14
Test Engineer: J. Jackson
Configuration: EUT w/ AC Adaptor and HS
Mode: GPRS1900 Harm

Chamber	Pre-amplifer	Filter	Limit
3m Chamber	T34 8449B	Filter 1	Part 24

Band	f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch, 1850.2MHz									
GSM 1900	3.700	-9.5	V	3.0	35.4	1.0	-43.9	-13.0	-30.9	
	5.551	-8.2	V	3.0	34.7	1.0	-41.9	-13.0	-28.9	
	7.401	-2.4	V	3.0	34.9	1.0	-36.3	-13.0	-23.3	
GPRS	3.700	-9.9	H	3.0	35.4	1.0	-44.3	-13.0	-31.3	
	5.551	-6.0	H	3.0	34.7	1.0	-39.8	-13.0	-26.8	
	7.401	0.2	H	3.0	34.9	1.0	-33.7	-13.0	-20.7	
	Mid Ch, 1880.0MHz									
	3.760	-6.3	V	3.0	35.3	1.0	-40.6	-13.0	-27.6	
	5.640	-10.5	V	3.0	34.7	1.0	-44.3	-13.0	-31.3	
	7.520	-5.8	V	3.0	34.9	1.0	-39.8	-13.0	-26.8	
	3.760	-11.4	H	3.0	35.3	1.0	-45.7	-13.0	-32.7	
	5.640	-6.6	H	3.0	34.7	1.0	-40.4	-13.0	-27.4	
	7.520	-2.0	H	3.0	34.9	1.0	-35.9	-13.0	-22.9	
	High Ch, 1909.8MHz									
	3.820	-10.3	V	3.0	35.3	1.0	-44.6	-13.0	-31.6	
	5.729	-7.4	V	3.0	34.7	1.0	-41.1	-13.0	-28.1	
	7.639	-1.7	V	3.0	35.0	1.0	-35.7	-13.0	-22.7	
	3.820	-9.4	H	3.0	35.3	1.0	-43.7	-13.0	-30.7	
	5.729	-5.6	H	3.0	34.7	1.0	-39.4	-13.0	-26.4	
	7.639	0.5	H	3.0	35.0	1.0	-33.4	-13.0	-20.4	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

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

Company: LG
Project #: 14I19561
Date: 12/29/14
Test Engineer: O. Stoelting
Configuration: EUT Y-pos w/ AC charger, headset
Mode: EGPRS850

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	T34 8449B	Filter 1	Part 22

Band: GSM 850 EGPRS

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 824.2MHz									
1.648	-22.0	V	3.0	37.4	1.0	-58.4	-13.0	-45.4	
2.473	-20.0	V	3.0	36.4	1.0	-55.4	-13.0	-42.4	
3.297	-20.6	V	3.0	35.8	1.0	-55.4	-13.0	-42.4	
1.648	-27.1	H	3.0	37.4	1.0	-63.5	-13.0	-50.5	
2.473	-23.3	H	3.0	36.4	1.0	-58.7	-13.0	-45.7	
3.297	-21.3	H	3.0	35.8	1.0	-56.1	-13.0	-43.1	
Mid Ch, 836.6MHz									
1.673	-18.4	V	3.0	37.3	1.0	-54.8	-13.0	-41.8	
2.510	-22.8	V	3.0	36.4	1.0	-58.1	-13.0	-45.1	
3.346	-20.9	V	3.0	35.8	1.0	-55.6	-13.0	-42.6	
1.673	-25.5	H	3.0	37.3	1.0	-61.9	-13.0	-48.9	
2.510	-21.7	H	3.0	36.4	1.0	-57.1	-13.0	-44.1	
3.346	-20.1	H	3.0	35.8	1.0	-54.9	-13.0	-41.9	
High Ch, 848.8MHz									
1.698	-15.7	V	3.0	37.3	1.0	-52.0	-13.0	-39.0	
2.546	-22.5	V	3.0	36.3	1.0	-57.9	-13.0	-44.9	
3.395	-19.0	V	3.0	35.7	1.0	-53.7	-13.0	-40.7	
1.698	-25.1	H	3.0	37.3	1.0	-61.4	-13.0	-48.4	
2.546	-24.2	H	3.0	36.3	1.0	-59.5	-13.0	-46.5	
3.395	-19.8	H	3.0	35.7	1.0	-54.5	-13.0	-41.5	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

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

Company: LG
Project #: 14I19561
Date: 12/29/14
Test Engineer: O. Stoelting
Configuration: EUT Y-pos w/ AC charger, headset
Mode: GPRS850

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	T34 8449B	Filter 1	Part 22

Band	f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch, 824.2MHz									
GSM 850	1.648	-18.0	V	3.0	37.4	1.0	-54.4	-13.0	-41.4	
	2.473	-20.8	V	3.0	36.4	1.0	-56.2	-13.0	-43.2	
	3.297	-19.8	V	3.0	35.8	1.0	-54.6	-13.0	-41.6	
	1.648	-19.9	H	3.0	37.4	1.0	-56.2	-13.0	-43.2	
GPRS	2.473	-22.9	H	3.0	36.4	1.0	-58.3	-13.0	-45.3	
	3.297	-20.8	H	3.0	35.8	1.0	-55.6	-13.0	-42.6	
	Mid Ch, 836.6MHz									
	1.673	-11.6	V	3.0	37.3	1.0	-48.0	-13.0	-35.0	
	2.510	-17.5	V	3.0	36.4	1.0	-52.8	-13.0	-39.8	
	3.346	-20.2	V	3.0	35.8	1.0	-54.9	-13.0	-41.9	
	1.673	-19.5	H	3.0	37.3	1.0	-55.9	-13.0	-42.9	
	2.510	-19.2	H	3.0	36.4	1.0	-54.5	-13.0	-41.5	
	3.346	-18.7	H	3.0	35.8	1.0	-53.4	-13.0	-40.4	
	High Ch, 848.8MHz									
	1.698	-12.8	V	3.0	37.3	1.0	-49.1	-13.0	-36.1	
	2.546	-19.4	V	3.0	36.3	1.0	-54.8	-13.0	-41.8	
	3.395	-18.7	V	3.0	35.7	1.0	-53.4	-13.0	-40.4	
	1.698	-24.2	H	3.0	37.3	1.0	-60.5	-13.0	-47.5	
	2.546	-22.0	H	3.0	36.3	1.0	-57.3	-13.0	-44.3	
	3.395	-19.3	H	3.0	35.7	1.0	-54.0	-13.0	-41.0	

Rev. 03.03.09
Note: No other emissions were detected above the system noise floor.

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