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

CERTIFICATION TEST REPORT

FOR

GSM/WCDMA/LTE Phone + Bluetooth, DTS/UNII a/b/g/n & NFC

MODEL NUMBER: SM-C115; SM-C111

FCC ID: A3LSMC115

REPORT NUMBER: 14U17033-1, Revision B

ISSUE DATE: April 9, 2014

Prepared for

SAMSUNG ELECTRONICS CO., LTD.
416, MAETAN 3-DONG, YEONGTONG-GU
SUWON-CITY, GYEONGGI-DO 443-742, SOUTH KOREA

Prepared by

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

NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	3/20/14	Initial Issue	P. Kim
A	4/4/14	Updated the model number	P. Kim
B	4/9/14	Updated EUT Description	AAumentado

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	**SAMSUNG ELECTRONICS CO., LTD.**
EUT DESCRIPTION:	**GSM/WCDMA/LTE Phone + Bluetooth & DTS/UNII a/b/g/n + NFC**
MODEL:	**SM-C115; SM-C111**
SERIAL NUMBER:	**FL-032-S (Radiated& Conducted)**
DATE TESTED:	**FEBRUARY 25 – MARCH 18, 2014**

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

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

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

Approved & Released For

UL Verification Services Inc. By:

PHILIP KIM

CONSUMER TECHNOLOGY DIVISION
PROGRAM MANAGER
UL Verification Services Inc.

Tested By:

CHARLES VERGONIO

CONSUMER TECHNOLOGY DIVISION
LAB TECHNICIAN
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.

3. FACILITIES AND ACCREDITATION

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

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

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

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)

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 18000 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/UNII a/b/g/n + NFC.

5.1. MAXIMUM OUTPUT POWER

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

FCC Part 22/24						
Band	Frequency Range(MHz)	Modulation Peak	Conducted		Radiated	
			Peak(dBm)	Peak (mW)	Peak (dBm)	Peak (mW)
GSM850	824~849	GMSK	33.4	2187.76		
	824~849	GPRS	33.4	2187.76	27.251	531.01
	824~849	EGPRS	27.3	537.03	24.891	308.39
GSM1900	1850~1910	GMSK	30.4	1096.48		
	1850~1910	GPRS	30.4	1096.48	30.93	1238.8
	1850~1910	EGPRS	26.1	407.38	28.14	651.63

FCC Part 22/24						
Band	Frequency Range(MHz)	Modulation Peak	Conducted		Radiated	
			Avg (dBm)	Avg (mW)	Avg (dBm)	Avg (mW)
Band 5	824~849	REL99	23.5	223.87	17.321	53.96
	824~849	HSDPA	22.5	177.83	16.991	50.01
	824~849	HSUPA	22	158.49		
Band 2	1850~1910	REL99	22.4	173.78	23.25	211.35
	1850~1910	HSDPA	22.5	177.83	23.09	203.7
	1850~1910	HSUPA	22.3	169.82		

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5.2. 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	
			Peak	Avg (dBm)	Avg (mW)	Avg (dBm)	Avg (mW)
LTE5	824~849	10MHz	QPSK	22.1	128.82	17.171	52.13
	824~849	10MHz	16QAM	21.4	138.04	16.221	41.89

FCC Part 22/2 4/27							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation	Conducted		Radiated	
			Peak	Peak (dBm)	Peak (mW)	Peak (dBm)	Peak (mW)
LTE5	824~849	5MHz	QPSK	22.2	165.96	17.461	55.73
	824~849	5MHz	16QAM	21.9	154.88	16.571	45.4

FCC Part 22/2 4/27							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation	Conducted		Radiated	
			Peak	Peak (dBm)	Peak (mW)	Peak (dBm)	Peak (mW)
LTE5	824~849	3MHz	QPSK	22.2	165.96	17.331	54.09
	824~849	3MHz	16QAM	21.4	138.04	16.231	41.99

FCC Part 22/2 4/27							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation	Conducted		Radiated	
			Peak	Peak (dBm)	Peak (mW)	Peak (dBm)	Peak (mW)
LTE5	824~849	1.4MHz	QPSK	22.1	162.18	17.071	50.94
	824~849	1.4MHz	16QAM	21.4	138.04	16.341	43.06

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FCC Part 22/2 4/27							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation	Conducted		Radiated	
			Peak	Peak (dBm)	Peak (mW)	Peak (dBm)	Peak (mW)
LTE2	1850~1915	20MHz	QPSK	22	158.49	24.24	265.46
	1850~1915	20MHz	16QAM	20.9	123.03	23.54	225.94

FCC Part 22/2 4/27							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation	Conducted		Radiated	
			Peak	Peak (dBm)	Peak (mW)	Peak (dBm)	Peak (mW)
LTE2	1850~1915	15MHz	QPSK	22	158.49	24.12	258.23
	1850~1915	15MHz	16QAM	21	125.89	23.4	218.78

FCC Part 22/2 4/27							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation	Conducted		Radiated	
			Peak	Peak (dBm)	Peak (mW)	Peak (dBm)	Peak (mW)
LTE2	1850~1915	10MHz	QPSK	21.9	154.88	23.92	246.6
	1850~1915	10MHz	16QAM	21	125.89	23.4	218.78

FCC Part 22/2 4/27							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation	Conducted		Radiated	
			Peak	Peak (dBm)	Peak (mW)	Peak (dBm)	Peak (mW)
LTE2	1850~1915	5MHz	QPSK	21.9	154.88	23.84	242.1
	1850~1915	5MHz	16QAM	21	125.89	23.07	202.77

FCC Part 22/2 4/27							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation	Conducted		Radiated	
			Peak	Peak (dBm)	Peak (mW)	Peak (dBm)	Peak (mW)
LTE2	1850~1915	3MHz	QPSK	21.6	144.54	23.91	246.04
	1850~1915	3MHz	16QAM	20.5	112.20	23.17	207.49

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FCC Part 22/2 4/27							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation	Conducted		Radiated	
			Peak	Peak (dBm)	Peak (mW)	Peak (dBm)	Peak (mW)
LTE2	1850~1915	1.4MHz	QPSK	21.8	151.36	24.17	261.22
	1850~1915	1.4MHz	16QAM	21	125.89	23.77	238.23

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5.3. DESCRIPTION OF AVAILABLE ANTENNAS

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

Frequency (MHz)	Peak Gain (dBi)
B2, 1850~1910MHz	2.86
B5, 824~849MHz	-0.15

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5.4. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	SAMSUNG	EP-TA10EWE	N/A	N/A
Earphone	SAMSUNG	N/A	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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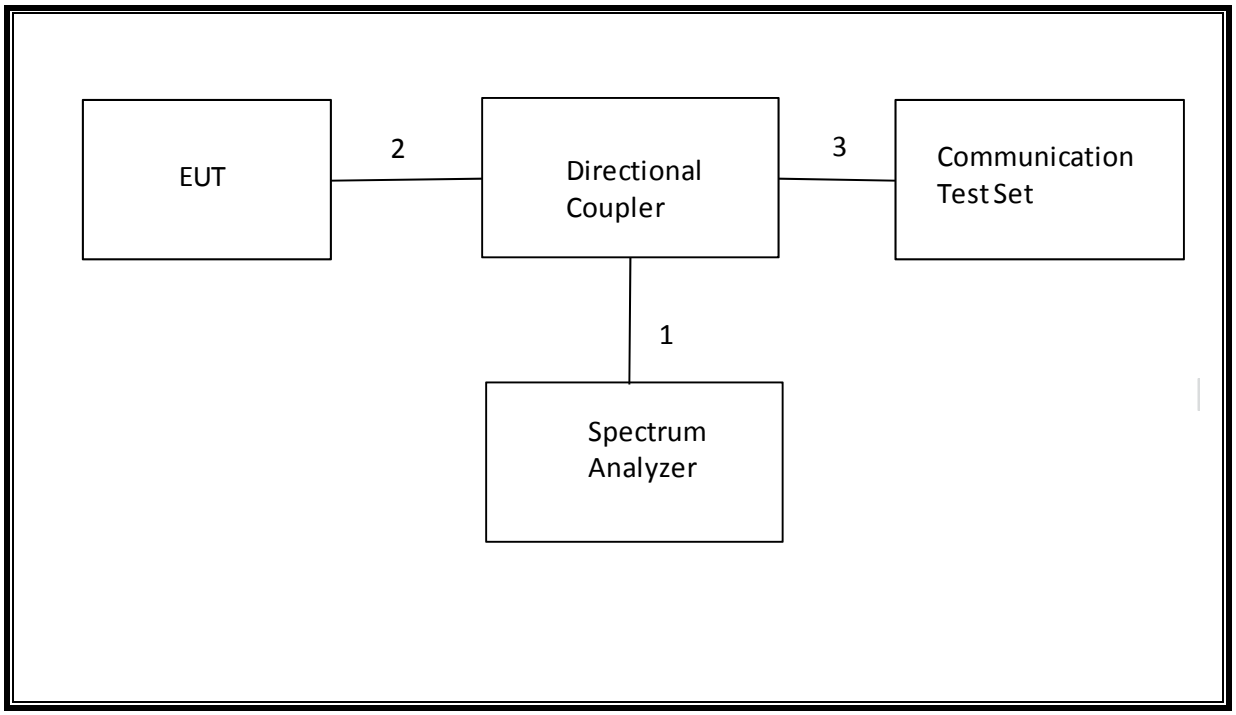
SETUP DIAGRAM FOR TESTS (CONDUCTED TEST SETUP)



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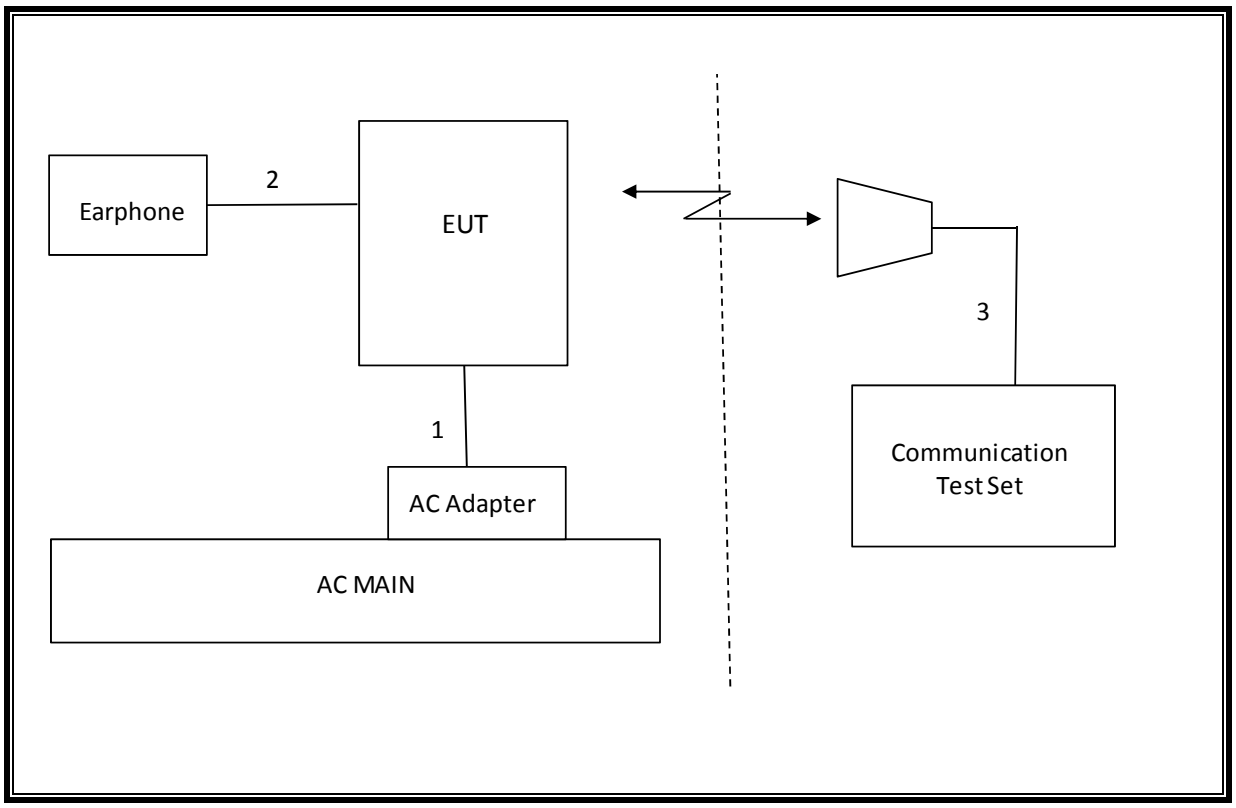
SETUP DIAGRAM FOR TESTS (RADIATED TEST SETUP)



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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	08/14/14
Antenna, Horn, 18 GHz	EMCO	3115	C00783	10/25/14
Antenna, Horn, 18 GHz	EMCO	3115	C00784	09/25/14
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	07/02/14
DC power supply, 8 V @ 3 A or 15 V	Agilent / HP	E3610A	None	CNR
Vector signal generator, 6 GHz	Agilent / HP	E4438C	None	07/06/14
Antenna, Tuned Dipole 400~1000	ETS	3121C DB4	C00993	02/14/15
Antenna, Horn, 25.5 GHz	ARA	MWH-1826/B	C00980	11/14/14
Directional Coupler	RF-Lambda	RFDC5M06G15	None	CNR

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7. Summary Table

FCC Part Section	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Worst Case
2.1049	RSS Gen	Occupied Band width (99%)	N/A	Conducted	Pass	17.91 MHz
22.917(a) 24.238(a) 27.53(g)	RSS-132(4.5.1) RSS-133(6.5.1) RSS-139(6.5.1)	Band Edge / Conducted Spurious Emission	-13dBm		Pass	-13.455 dBm
2.1046	N/A	Conducted output power	N/A		Pass	33.4 dBm
22.355 24.235 27.54	RSS-132(4.3) RSS-133(6.3) RSS-139(6.3)	Frequency Stability	2.5PPM		Pass	0.005 PPM
22.913(a)(2)	RSS-132(4.4)	Effective Radiated Power	38 dBm	Radiated	Pass	30.93 dBm
24.232(c)	RSS-133(6.4)	Equivalent Isotropic Radiated Power	33dBm		Pass	27.25 dBm
27.50(d)(4)	RSS-139(6.4)		30dBm		Pass	
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	-41.9 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

Band	Mode	Ch.	f(MHz)	1 time slot	2 time slot	3 time slot	4 time slot
				Peak (dBm)	Peak (dBm)	Peak (dBm)	Peak (dBm)
GSM850	GMSK	128	824.2	33.3			
		190	836.6	33.4			
		251	848.8	33.3			
	GPRS	128	824.2	33.3	31.8	30.1	28.8
		190	836.6	33.4	32.0	30.2	29.0
		251	848.8	33.3	31.9	30.2	28.9
	EGPRS	128	824.2	27.3	25.9	25.0	23.5
		190	836.6	27.1	25.8	24.9	23.4
		251	848.8	27.0	25.6	24.8	23.2
GSM1900	GMSK	512	1850.2	29.7			
		661	1880	30.2			
		810	1909.8	30.4			
	GPRS	512	1850.2	29.7	26.5	24.9	23.9
		661	1880	30.2	26.8	25.3	24.3
		810	1909.8	30.4	27.0	25.5	24.5
	EGPRS	512	1850.2	26.2	24.8	23.7	22.8
		661	1880	26.2	24.9	23.7	22.8
		810	1909.8	26.1	24.9	23.7	22.8

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8.1. 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

8.1.1. UMTS REL 99 OUTPUT POWER RESULT

Band	Mode	Ch.	f(MHz)	Conducted Power (dBm)
				Avg (dBm)
Band 5	REL99	4145	826.4	23.5
		4183	836.6	23.5
		4220	846.6	23.5
Band 2	REL99	9275	1852.4	22.1
		9400	1880	22.3
		9525	1907.6	22.4

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8.2. 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			

8.2.1. UMTS HSDPA OUTPUT POWER RESULT

Band	Mode	Subset	Ch.	f(MHz)	Conducted Power (dBm) Avg (dBm)
Band 5	HSDPA	1	4145	826.4	22.3
			4183	836.6	22.5
			4220	846.6	22.5
		2	4145	826.4	22.2
			4183	836.6	22.4
			4220	846.6	22.3
		3	4145	826.4	22.0
			4183	836.6	22.1
			4220	846.6	22.1
		4	4145	826.4	21.8
			4183	836.6	21.9
			4220	846.6	21.9

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Band 2	HSDPA	1	9275	1852.4	21.9
			9400	1880	22.3
			9525	1907.6	22.3
		2	9275	1852.4	22.0
			9400	1880	22.5
			9525	1907.6	22.5
		3	9275	1852.4	22.0
			9400	1880	22.4
			9525	1907.6	22.5
		4	9275	1852.4	21.7
			9400	1880	22.2
			9525	1907.6	22.3

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8.2.2. 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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8.2.3. UMTS HSUPA OUTPUT POWER RESULT

Band	Mode	Subset	Ch.	f(MHz)	Conducted Power (dBm) Avg (dBm)
Band 5	HSUPA	1	4145	826.4	21.8
			4183	836.6	21.8
			4220	846.6	21.8
		2	4145	826.4	20.6
			4183	836.6	20.6
			4220	846.6	20.6
		3	4145	826.4	21.4
			4183	836.6	21.4
			4220	846.6	21.4
		4	4145	826.4	20.8
			4183	836.6	20.9
			4220	846.6	20.9
		5	4145	826.4	22.0
			4183	836.6	22.0
			4220	846.6	22.0
Band 2	HSUPA	1	9275	1852.4	21.3
			9400	1880	21.6
			9525	1907.6	21.6
		2	9275	1852.4	20.5
			9400	1880	20.9
			9525	1907.6	21.0
		3	9275	1852.4	21.2
			9400	1880	21.6
			9525	1907.6	21.8
		4	9275	1852.4	20.6
			9400	1880	20.9
			9525	1907.6	20.6
		5	9275	1852.4	22.2
			9400	1880	22.3
			9525	1907.6	22.3

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8.3. LTE OUTPUT VERIFICATION

8.3.1. LTE OUTPUT RESULT

Band	Frequency	Modulation	BW (MHz)	RB Size	RB Offset	Average
LTE5	829	QPSK	10	1	0	22.1
				1	24	22.0
				1	49	22.0
				25	0	21.2
				25	11	21.2
				25	24	21.0
				50	0	21.2
	829	16QAM		1	0	21.1
				1	24	21.1
				1	49	21.0
				25	0	20.4
				25	11	20.3
				25	24	20.2
				50	0	20.3
	836.5	QPSK		1	0	22.0
				1	24	22.0
				1	49	22.0
				25	0	21.1
				25	11	21.1
				25	24	21.0
				50	0	21.1
	836.5	16QAM		1	0	21.4
				1	24	21.4
				1	49	21.2
				25	0	20.3
				25	11	20.2
				25	24	20.2
				50	0	20.2
	844	QPSK		1	0	22.0
				1	24	22.0
				1	49	22.0
				25	0	21.1
				25	11	21.1
				25	24	21.1
				50	0	21.1
	844	16QAM		1	0	21.0
				1	24	21.0
				1	49	21.0
				25	0	20.3
				25	11	20.3
				25	24	20.2
				50	0	20.2

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Band	Frequency	Modulation	BW (MHz)	RB Size	RB Offset	Average
LTE5	826.5	QPSK	5	1	0	22.2
				1	11	22.2
				1	24	22.1
				12	0	21.3
				12	5	21.3
				12	11	21.2
				25	0	21.2
	826.5	16QAM		1	0	21.2
				1	11	21.2
				1	24	21.1
				12	0	20.4
				12	5	20.3
				12	11	20.3
				25	0	20.4
	836.5	QPSK		1	0	22.1
				1	11	22.0
				1	24	22.0
				12	0	21.1
				12	5	21.1
				12	11	21.1
				25	0	21.1
	836.5	16QAM		1	0	21.4
				1	11	21.4
				1	24	21.3
				12	0	20.3
				12	5	20.3
				12	11	20.3
				25	0	20.2
	846.5	QPSK		1	0	22.0
				1	11	22.0
				1	24	22.0
				12	0	21.2
				12	5	21.1
				12	11	21.1
				25	0	21.1
	846.5	16QAM		1	0	21.9
				1	11	21.8
				1	24	21.7
				12	0	20.3
				12	5	20.3
				12	11	20.2
				25	0	20.1

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Band	Frequency	Modulation	BW (MHz)	RB Size	RB Offset	Average
LTE5	825.5	QPSK	3	1	0	22.1
				1	7	22.1
				1	14	22.0
				7	0	21.3
				7	2	21.3
				7	6	21.3
				15	0	21.3
	825.5	16QAM		1	0	21.1
				1	7	21.1
				1	14	21.0
				7	0	20.5
				7	2	20.6
				7	6	20.5
				15	0	20.4
	836.5	QPSK		1	0	22.1
				1	7	22.0
				1	14	22.0
				7	0	21.1
				7	2	21.1
				7	6	21.1
				15	0	21.2
	836.5	16QAM		1	0	21.4
				1	7	21.4
				1	14	21.4
				7	0	20.2
				7	2	20.2
				7	6	20.2
				15	0	20.3
	847.5	QPSK		1	0	22.2
				1	7	22.0
				1	14	22.1
				7	0	21.2
				7	2	21.2
				7	6	21.1
				15	0	21.2
	847.5	16QAM		1	0	21.1
				1	7	21.0
				1	14	21.0
				7	0	20.5
				7	2	20.5
				7	6	20.5
				15	0	20.2

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Band	Frequency	Modulation	BW (MHz)	RB Size	RB Offset	Average
LTE5	824.7	QPSK	1.4	1	0	22.1
				1	2	22.1
				1	5	22.1
				3	0	22.2
				3	0	22.2
				3	2	22.1
				6	0	21.2
	824.7	16QAM		1	0	21.3
				1	2	21.3
				1	5	21.3
				3	0	21.3
				3	0	21.3
				3	2	21.3
				6	0	20.5
	836.5	QPSK		1	0	22.0
				1	2	22.0
				1	5	22.0
				3	0	22.0
				3	0	22.0
				3	2	22.0
				6	0	21.1
	836.5	16QAM		1	0	21.5
				1	2	21.4
				1	5	21.4
				3	0	21.2
				3	0	21.2
				3	2	21.2
				6	0	20.1
	848.3	QPSK		1	0	22.1
				1	2	22.1
				1	5	22.1
				3	0	22.0
				3	0	22.0
				3	2	22.0
				6	0	21.1
	848.3	16QAM		1	0	21.0
				1	2	21.0
				1	5	21.1
				3	0	21.3
				3	0	21.3
				3	2	21.3
				6	0	20.4

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Band	Frequency	Modulation	BW (MHz)	RB Size	RB Offset	Average
LTE2	1860	QPSK	20	1	0	22.0
				1	49	21.5
				1	99	21.4
				50	0	21.0
				50	24	20.6
				50	49	20.6
				100	0	20.8
	1860	16QAM		1	0	20.8
				1	49	20.9
				1	99	20.8
				50	0	19.9
				50	24	19.6
				50	49	19.5
				100	0	19.7
	1880	QPSK		1	0	21.8
				1	49	21.5
				1	99	21.3
				50	0	20.8
				50	24	20.5
				50	49	20.5
				100	0	20.6
	1880	16QAM		1	0	20.9
				1	49	20.8
				1	99	20.5
				50	0	19.7
				50	24	19.5
				50	49	19.4
				100	0	19.6
	1900	QPSK		1	0	22.0
				1	49	21.5
				1	99	21.2
				50	0	21.0
				50	24	20.7
				50	49	20.7
				100	0	20.9
	1900	16QAM		1	0	20.9
				1	49	20.9
				1	99	20.6
				50	0	19.9
				50	24	19.6
				50	49	19.5
				100	0	19.7

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Band	Frequency	Modulation	BW (MHz)	RB Size	RB Offset	Average
LTE2	1857.5	QPSK	15	1	0	22.0
				1	37	21.5
				1	74	21.7
				37	0	21.0
				37	17	20.7
				37	36	20.6
				75	0	20.8
	1857.5	16QAM		1	0	21.0
				1	37	20.5
				1	74	20.5
				37	0	20.0
				37	17	19.6
				37	36	19.6
				75	0	19.7
	1880	QPSK		1	0	21.8
				1	37	21.7
				1	74	21.5
				37	0	20.8
				37	17	20.7
				37	36	20.6
				75	0	20.6
	1880	16QAM		1	0	21.0
				1	37	20.9
				1	74	20.7
				37	0	19.8
				37	17	19.6
				37	36	19.5
				75	0	19.6
	1902.5	QPSK		1	0	22.0
				1	37	21.8
				1	74	21.4
				37	0	21.0
				37	17	20.8
				37	36	20.7
				75	0	20.8
	1902.5	16QAM		1	0	21.0
				1	37	21.0
				1	74	20.6
				37	0	19.9
				37	17	19.7
				37	36	19.5
				75	0	19.7

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Band	Frequency	Modulation	BW (MHz)	RB Size	RB Offset	Average
LTE2	1855	QPSK	10	1	0	21.9
				1	24	21.6
				1	49	21.6
				25	0	20.8
				25	11	20.6
				25	24	20.6
				50	0	20.7
	1855	16QAM		1	0	20.8
				1	24	20.5
				1	49	20.4
				25	0	19.8
				25	11	19.6
				25	24	19.6
				50	0	19.6
	1880	QPSK		1	0	21.9
				1	24	21.6
				1	49	21.7
				25	0	20.7
				25	11	20.6
				25	24	20.6
				50	0	20.6
	1880	16QAM		1	0	21.0
				1	24	20.9
				1	49	20.9
				25	0	19.7
				25	11	19.6
				25	24	19.5
				50	0	19.6
	1905	QPSK		1	0	22.0
				1	24	21.7
				1	49	21.6
				25	0	20.9
				25	11	20.7
				25	24	20.6
				50	0	20.7
	1905	16QAM		1	0	21.0
				1	24	20.6
				1	49	20.5
				25	0	19.9
				25	11	19.7
				25	24	19.6
				50	0	19.7

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Band	Frequency	Modulation	BW (MHz)	RB Size	RB Offset	Average
LTE2	1852.5	QPSK	5	1	0	21.9
				1	11	21.9
				1	24	21.7
				12	0	20.7
				12	5	20.7
				12	11	20.7
				25	0	20.7
	1852.5	16QAM		1	0	20.7
				1	11	20.7
				1	24	20.6
				12	0	19.7
				12	5	19.6
				12	11	19.6
				25	0	19.7
	1880	QPSK		1	0	21.8
				1	11	21.7
				1	24	21.7
				12	0	20.6
				12	5	20.6
				12	11	20.6
				25	0	20.6
	1880	16QAM		1	0	20.9
				1	11	20.8
				1	24	20.8
				12	0	19.7
				12	5	19.6
				12	11	19.6
				25	0	19.6
	1907.5	QPSK		1	0	21.8
				1	11	21.7
				1	24	21.6
				12	0	20.8
				12	5	20.7
				12	11	20.6
				25	0	20.7
	1907.5	16QAM		1	0	21.0
				1	11	20.8
				1	24	20.9
				12	0	19.7
				12	5	19.6
				12	11	19.5
				25	0	19.5

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Band	Frequency	Modulation	BW (MHz)	RB Size	RB Offset	Average
LTE2	1851.5	QPSK	3	1	0	21.6
				1	7	21.6
				1	14	21.6
				7	0	20.7
				7	2	20.7
				7	6	20.6
				15	0	20.6
	1851.5	16QAM		1	0	20.5
				1	7	20.4
				1	14	20.4
				7	0	19.8
				7	2	19.8
				7	6	19.7
				15	0	19.6
	1880	QPSK		1	0	21.6
				1	7	21.6
				1	14	21.5
				7	0	20.6
				7	2	20.6
				7	6	20.5
				15	0	20.5
	1880	16QAM		1	0	20.5
				1	7	20.5
				1	14	20.4
				7	0	19.8
				7	2	19.7
				7	6	19.7
				15	0	19.4
	1908.5	QPSK		1	0	21.6
				1	7	21.5
				1	14	21.4
				7	0	20.7
				7	2	20.6
				7	6	20.5
				15	0	20.6
	1908.5	16QAM		1	0	20.5
				1	7	20.4
				1	14	20.3
				7	0	19.7
				7	2	19.7
				7	6	19.6
				15	0	19.6

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Band	Frequency	Modulation	BW (MHz)	RB Size	RB Offset	Average
LTE2	1850.7	QPSK	1.4	1	0	21.6
				1	2	21.7
				1	5	21.7
				3	0	21.7
				3	0	21.7
				3	2	21.7
				6	0	20.7
	1850.7	16QAM		1	0	20.7
				1	2	20.7
				1	5	20.7
				3	0	20.7
				3	0	20.7
				3	2	20.7
				6	0	19.8
	1880	QPSK		1	0	21.7
				1	2	21.7
				1	5	21.7
				3	0	21.7
				3	0	21.7
				3	2	21.7
				6	0	20.7
	1880	16QAM		1	0	21.0
				1	2	21.0
				1	5	21.0
				3	0	20.9
				3	0	20.8
				3	2	20.9
				6	0	19.5
	1909.3	QPSK		1	0	21.7
				1	2	21.7
				1	5	21.7
				3	0	21.8
				3	0	21.8
				3	2	21.7
				6	0	20.7
	1909.3	16QAM		1	0	20.7
				1	2	20.6
				1	5	20.6
				3	0	20.9
				3	0	20.9
				3	2	20.9
				6	0	19.8

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9. PEAK TO AVERAGE RATIO

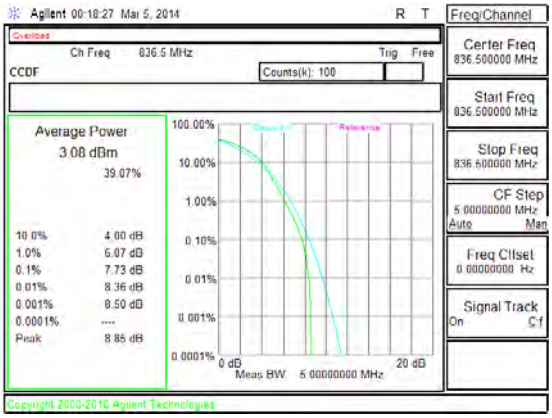
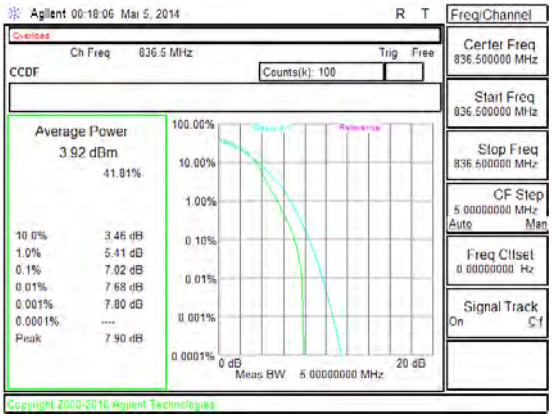
Test Procedure

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.

9.1. CONDUCTED PEAK TO AVERAGE RESULT

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

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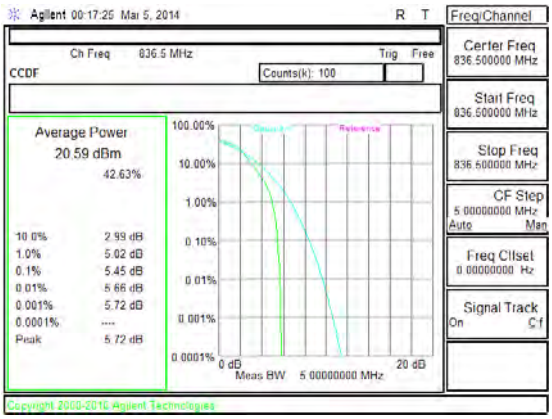
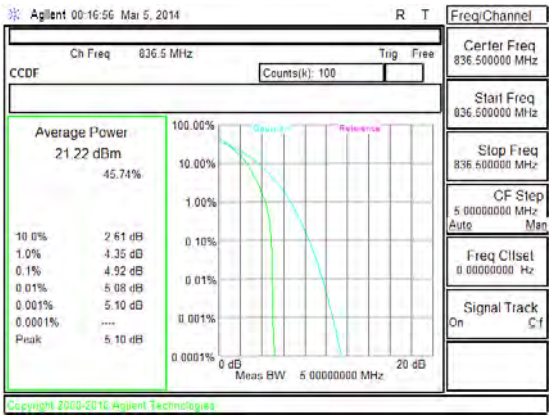
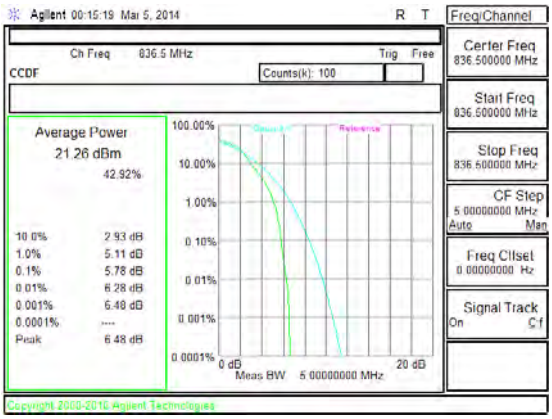
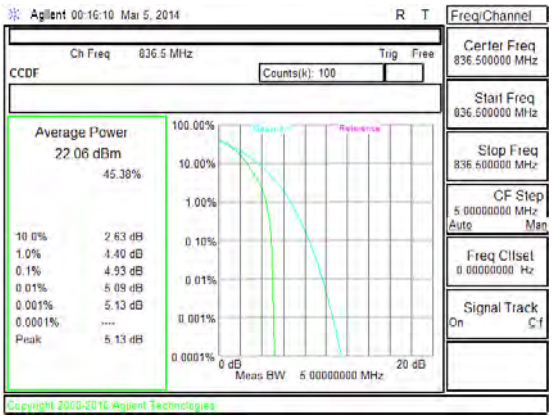
Band LTE5 5MHz 16QAM	 Band LTE5 5MHz 16QAM Mid channel	 Band LTE5 5MHz QPSK Mid channel
Band LTE5 3MHz 16QAM	 Band LTE5 3MHz 16QAM Mid channel	 Band LTE5 3MHz QPSK Mid channel

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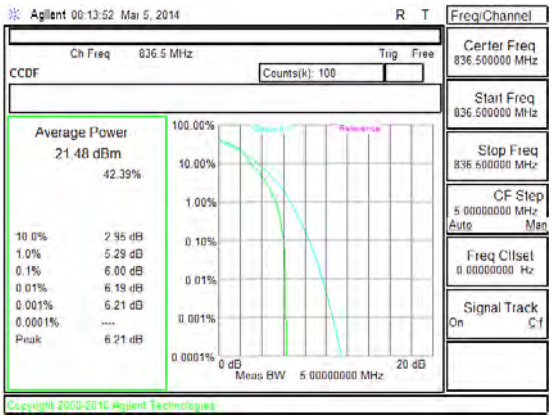
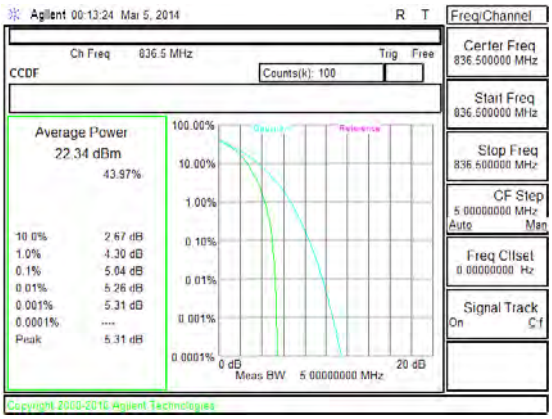
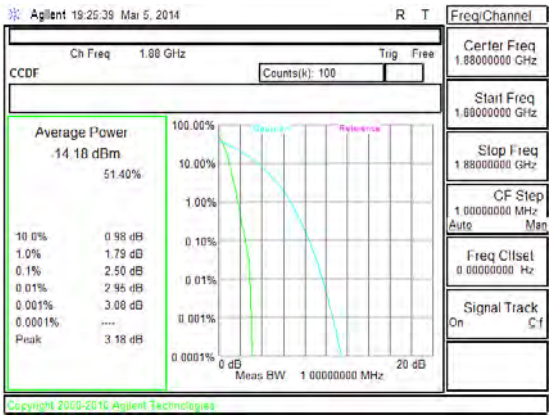
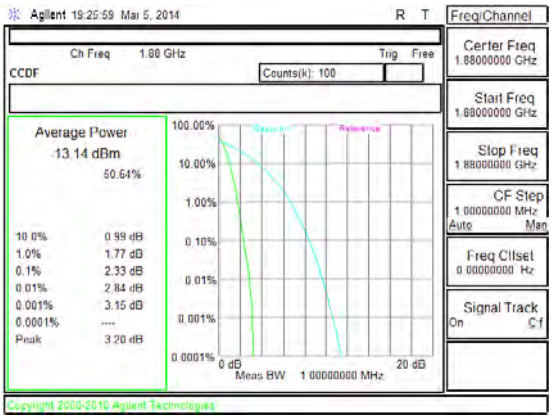
Band LTE5 1.4MHz 16QAM	 Band LTE5 1.4MHz 16QAM Mid channel	 Band LTE5 1.4MHz QPSK Mid channel
Band LTE2 20MHz 16QAM	 Band LTE2 20MHz 16QAM Mid channel	 Band LTE2 20MHz QPSK Mid channel

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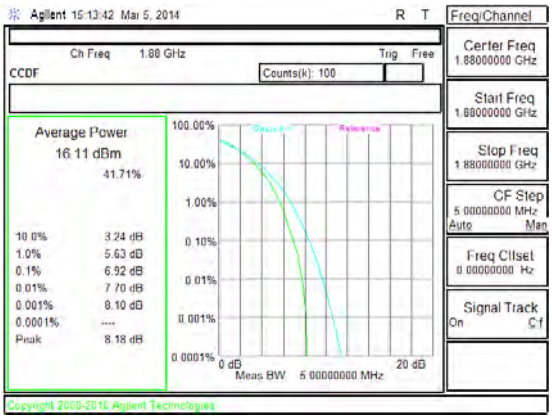
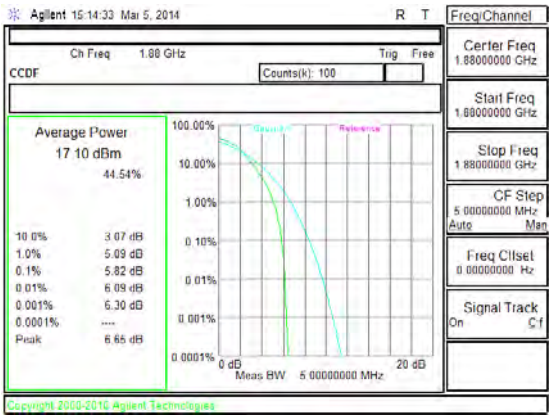
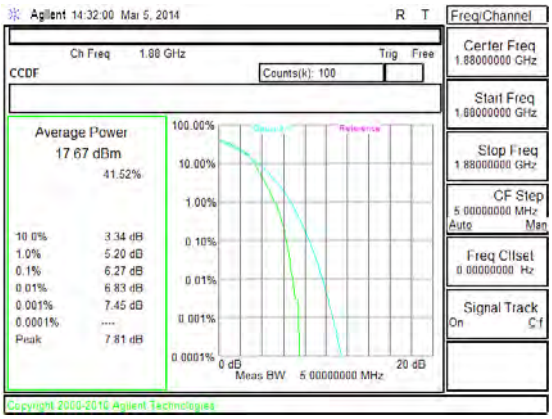
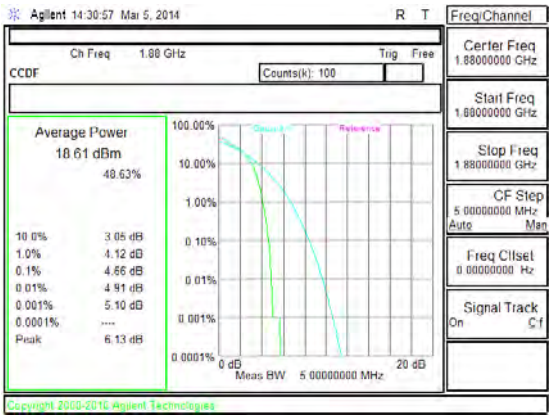
Band LTE2 15MHz 16QAM	 Band LTE2 15MHz 16QAM Mid channel	 Band LTE2 15MHz QPSK Mid channel
Band LTE2 10MHz 16QAM	 Band LTE2 10MHz 16QAM Mid channel	 Band LTE2 10MHz QPSK Mid channel

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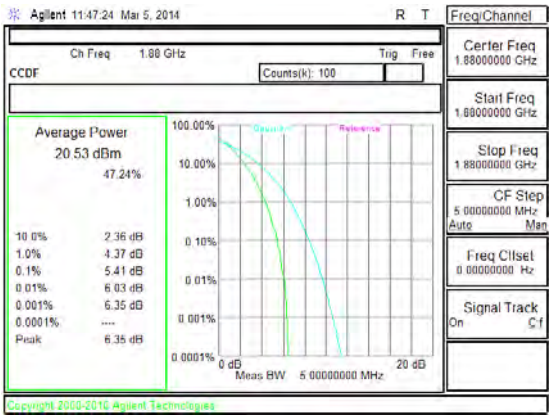
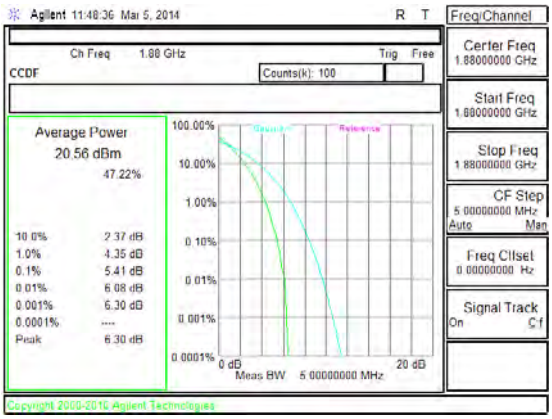
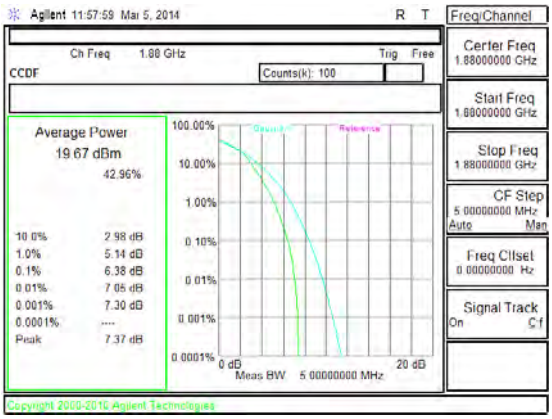
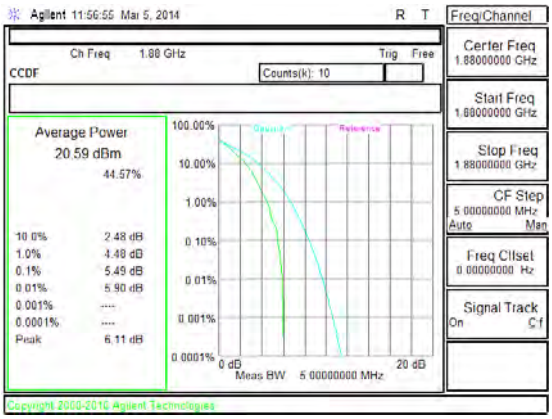
Band LTE2 5MHz 16QAM	 Band LTE2 5MHz 16QAM Mid channel	 Band LTE2 5MHz QPSK Mid channel
Band LTE2 3MHz 16QAM	 Band LTE2 3MHz 16QAM Mid channel	 Band LTE2 3MHz QPSK Mid channel

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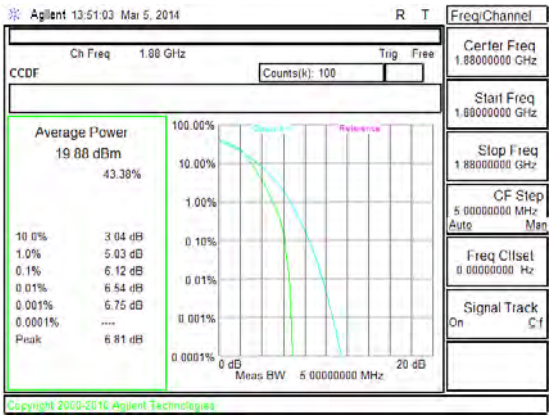
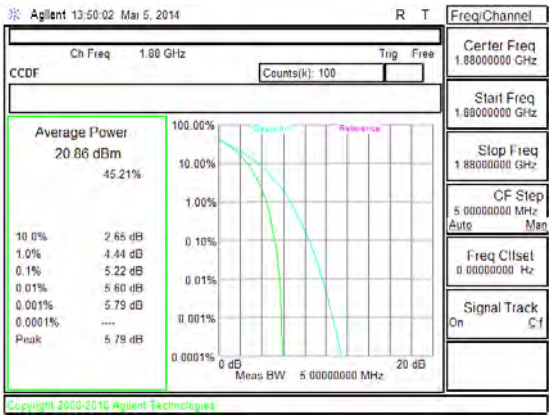
Band LTE2 1.4MHz 16QAM	 Band LTE2 1.4MHz 16QAM Mid channel	 Band LTE2 1.4MHz QPSK Mid channel
Band Band 2	 Band WCDMA B2 HSDPA	 Band WCDMA B2 REL99

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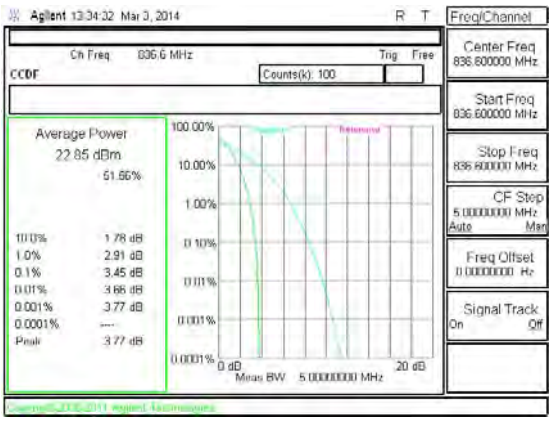
Band Band 5	 Band WCDMA B5 HSDPA	 Band WCDMA B5 REL99

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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 850/1900 WCDMA B2/B5 LTE B2/B5

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10.1.1. OCCUPIED BANDWIDTH RESULTS

Band	Mode	Channel	f (MHz)	99% BW (KHz)	-26dB BW (KHz)
GSM850	GMSK	128	824.2		
		190	836.6		
		251	848.8		
	GPRS	128	824.2	244.2	316.47
		190	836.6	248.42	321
		251	848.8	244.79	326.26
	EGPRS	128	824.2	247.39	330.33
		190	836.6	245.16	323.46
		251	848.8	240.96	312.85
GSM1900	GMSK	512	1850.2		
		661	1880		
		810	1909.8		
	GPRS	512	1850.2	240.93	313.14
		661	1880	245.29	319.1
		810	1909.8	244.3	318.64
	EGPRS	512	1850.2	247.62	315.89
		661	1880	252.87	328.36
		810	1909.8	246.66	321.48

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Band	Mode	Channel	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
Band 5	REL99	4145	826.4	4.0582	4.589
		4183	836.6	4.0612	4.578
		4220	846.6	4.0547	4.602
	HSDPA	4145	826.4	4.0473	4.593
		4183	836.6	4.0559	4.627
		4220	846.6	4.0473	4.613
Band 2	REL99	9275	1852.4	4.0464	4.6
		9400	1880	4.0471	4.583
		9525	1907.6	4.0589	4.596
	HSDPA	9275	1852.4	4.0585	4.644
		9400	1880	4.0501	4.605
		9525	1907.6	4.0405	4.562

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10.1.2. LTE OCCUPIED BANDWIDTH RESULTS

Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE5	10	QPSK	50/0	829	8.8934	9.408
			50/0	836.5	8.9306	9.31
			50/0	844	8.7064	9.468
		16QAM	50/0	829	8.7421	9.147
			50/0	836.5	8.9391	9.594
			50/0	844	8.8314	9.335

Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE5	5	QPSK	25/0	826.5	4.4694	4.583
			25/0	836.5	4.4455	4.685
			25/0	846.5	4.4934	4.793
		16QAM	25/0	826.5	4.4667	4.933
			25/0	836.5	4.4269	4.773
			25/0	846.5	4.4833	4.685

Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE5	3	QPSK	15/0	825.5	2.6812	2.833
			15/0	836.5	2.6603	2.854
			15/0	847.5	2.667	2.779
		16QAM	15/0	825.5	2.6669	2.857
			15/0	836.5	2.674	2.832
			15/0	847.5	2.6833	2.793

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Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE5	1.4	QPSK	6/0	824.7	1.0816	1.69
			6/0	836.5	1.0743	1.533
			6/0	848.3	1.0749	1.616
		16QAM	6/0	824.7	1.0768	1.625
			6/0	836.5	1.0755	1.697
			6/0	848.3	1.087	1.699

Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE2	20	QPSK	100/0	1860	17.6891	18.497
			100/0	1880	17.8319	18.903
			100/0	1900	17.6415	18.388
		16QAM	100/0	1860	17.9083	18.439
			100/0	1880	17.6988	18.864
			100/0	1900	17.7536	18.385

Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE2	15	QPSK	75/0	1857.5	13.5423	16.164
			75/0	1880	13.5569	15.826
			75/0	1902.5	13.5645	16.111
		16QAM	75/0	1857.5	13.5781	16.058
			75/0	1880	13.5553	15.918
			75/0	1902.5	13.5465	15.98

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Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE2	10	QPSK	50/0	1855	8.941	9.97
			50/0	1880	8.9588	10.056
			50/0	1905	8.9517	10.081
		16QAM	50/0	1855	8.9621	10.015
			50/0	1880	8.9449	10.002
			50/0	1905	8.9435	9.865

Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE2	5	QPSK	25/0	1852.5	4.5635	5.579
			25/0	1880	4.5553	5.551
			25/0	1907.5	4.5394	5.558
		16QAM	25/0	1852.5	4.5914	5.69
			25/0	1880	4.579	5.604
			25/0	1907.5	4.5869	5.6

Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE2	3	QPSK	15/0	1851.5	2.7331	3.128
			15/0	1880	2.7303	3.133
			15/0	1908.5	2.7377	3.126
		16QAM	15/0	1851.5	2.7328	3.107
			15/0	1880	2.7379	3.134
			15/0	1908.5	2.7402	3.112

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Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE2	1.4	QPSK	6/0	1850.7	1.0795	1.416
			6/0	1880	1.08	1.468
			6/0	1909.3	1.0802	1.566
		16QAM	6/0	1850.7	1.0811	1.373
			6/0	1880	1.0819	1.433
			6/0	1909.3	1.0797	1.496

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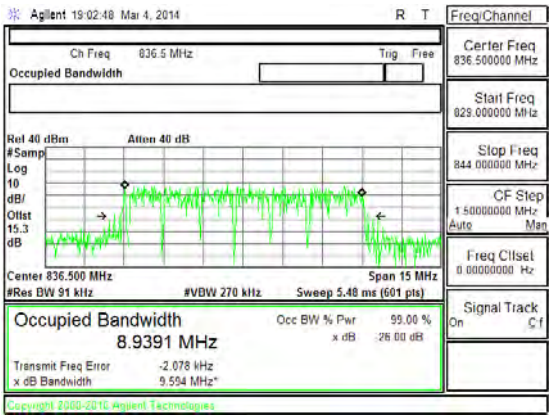
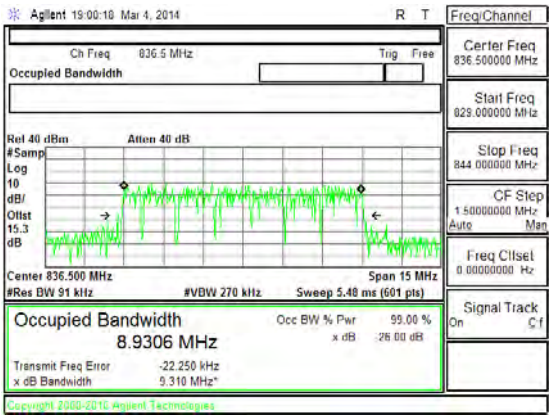
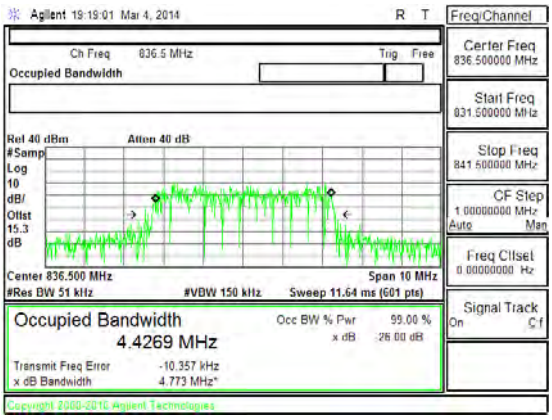
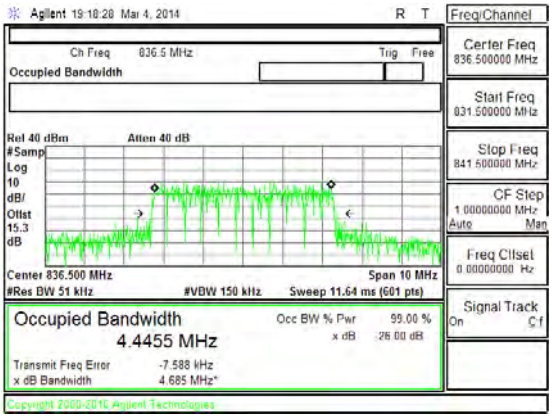
10.1.1. OCCUPIED BANDWIDTH PLOTS

Band LTE5 10MHz	 Band LTE5 10MHz OBW 16QAM Mid Channel FRB.gif	 Band LTE5 10MHz OBW QPSK Mid Channel FRB.gif
Band LTE5 5MHz	 Band LTE5 5MHz OBW 16QAM Mid Channel FRB.gif	 Band LTE5 5MHz OBW QPSK Mid Channel FRB.gif

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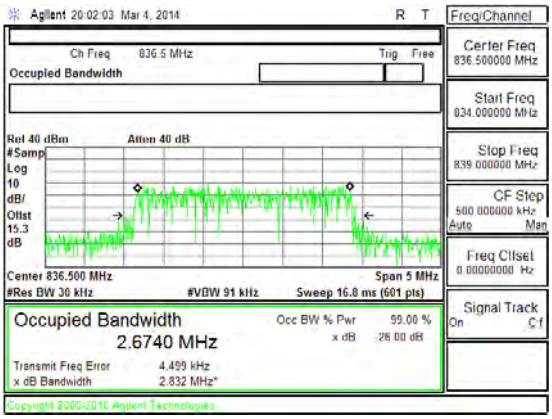
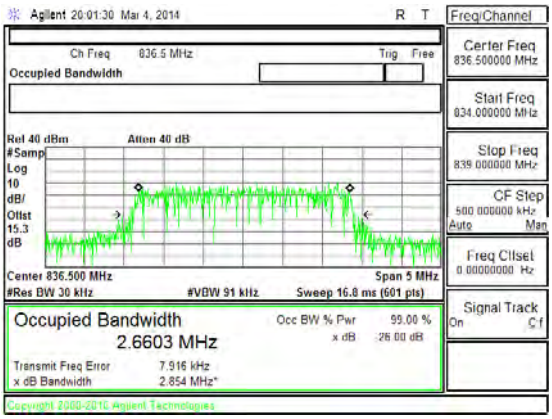
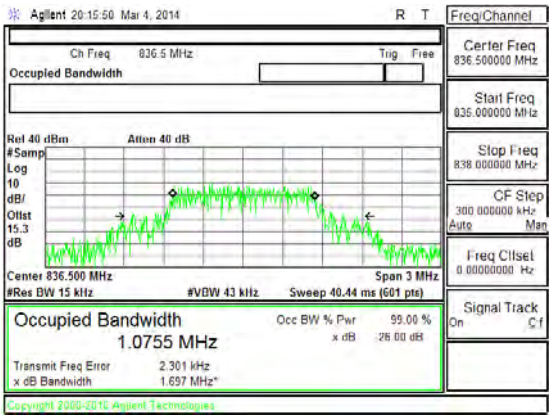
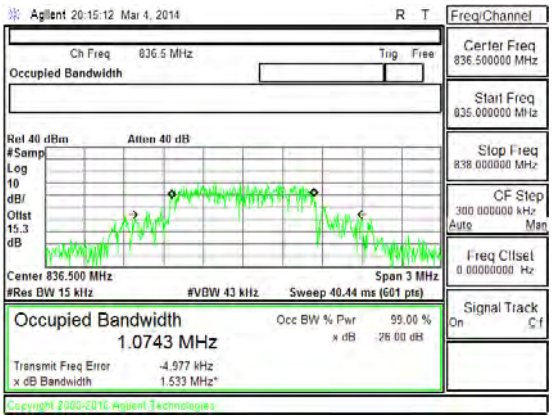
Band LTE5 3MHz	 Band LTE5 3MHz OBW 16QAM Mid Channel FRB.gif	 Band LTE5 3MHz OBW QPSK Mid Channel FRB.gif
Band LTE5 1.4MHz	 Band LTE5 1.4MHz OBW 16QAM Mid Channel FRB.gif	 Band LTE5 1.4MHz OBW QPSK Mid Channel FRB.gif

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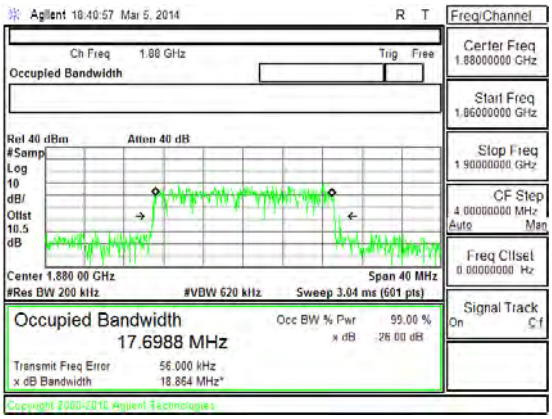
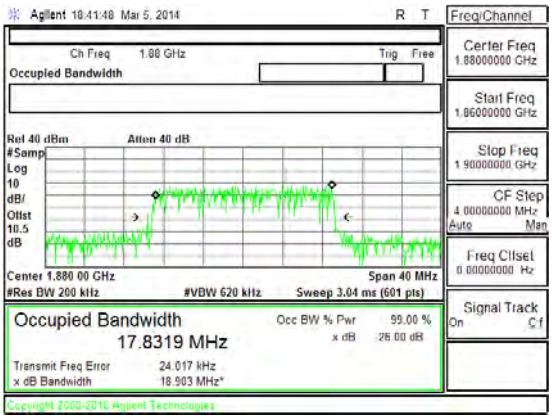
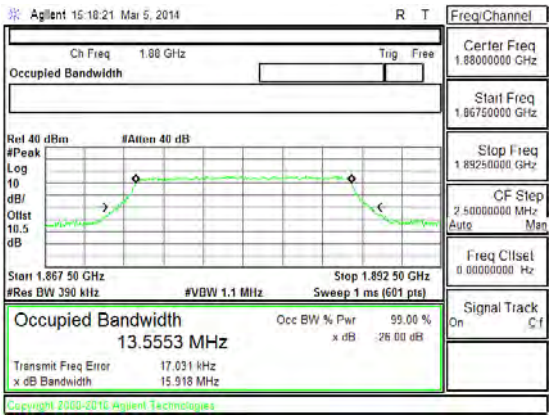
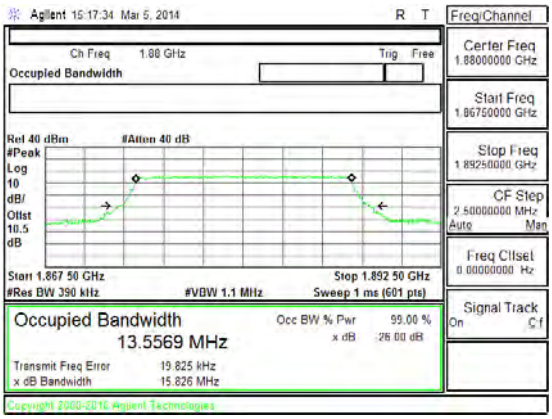
Band LTE2 20MHz 16QAM	 Band LTE2 20MHz OBW 16QAM Mid Channel FRB.gif	 Band LTE2 20MHz OBW QPSK Mid Channel FRB.gif
Band LTE2 15MHz 16QAM	 Band LTE2 15MHz OBW 16QAM Mid Channel FRB.gif	 Band LTE2 15MHz OBW QPSK Mid Channel FRB.gif

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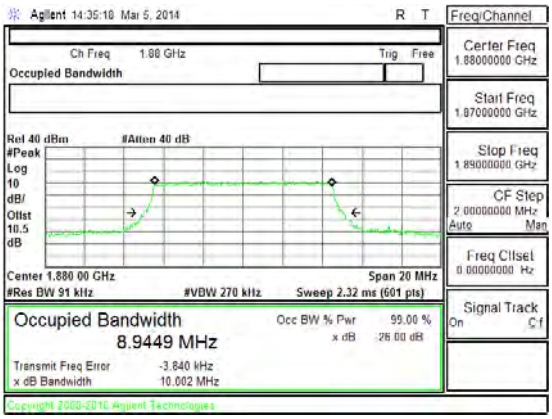
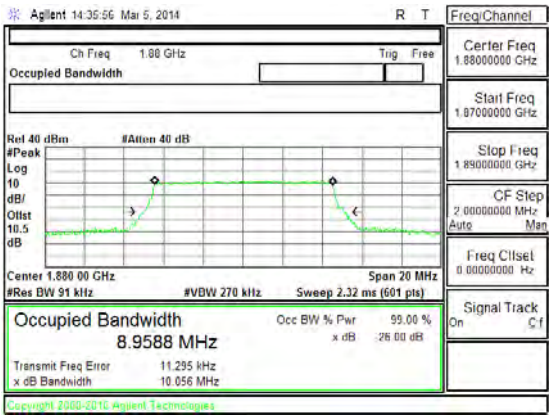
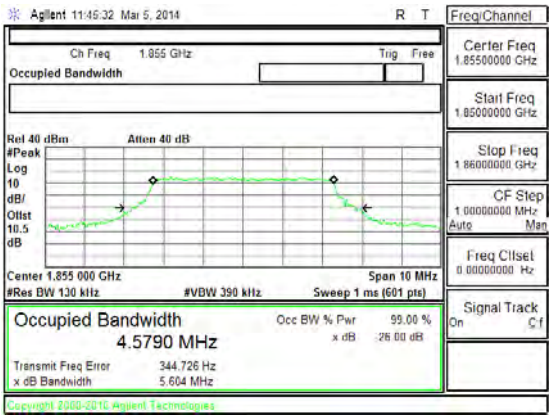
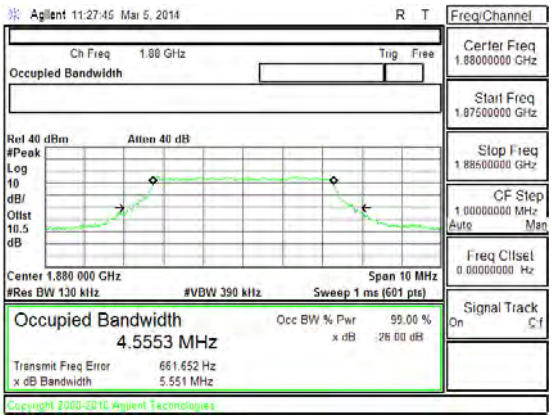
Band LTE2 10MHz 16QAM	 Band LTE2 10MHz OBW 16QAM Mid Channel FRB.gif	 Band LTE2 10MHz OBW QPSK Mid Channel FRB.gif
Band LTE2 5MHz 16QAM	 Band LTE2 5MHz OBW 16QAM Mid Channel FRB.gif	 Band LTE2 5MHz OBW QPSK Mid Channel FRB.gif

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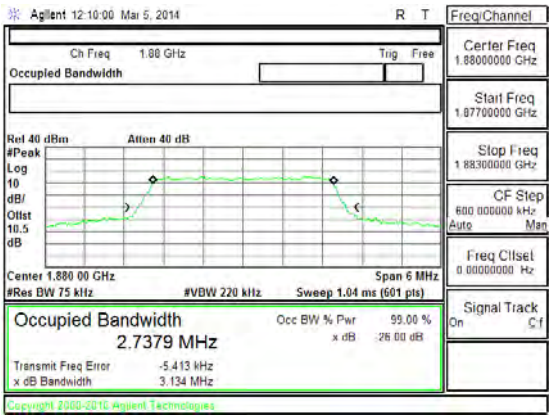
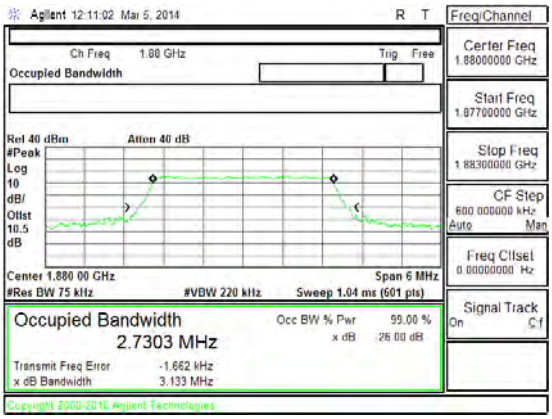
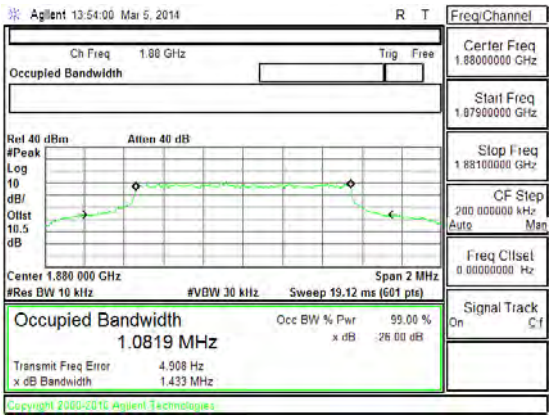
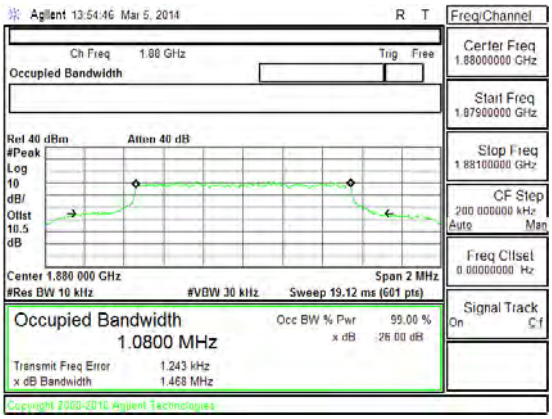
Band LTE2 3MHz 16QAM	 Band LTE2 3MHz OBW 16QAM Mid Channel FRB.gif	 Band LTE2 3MHz OBW QPSK Mid Channel FRB.gif
Band LTE2 1.4MHz 16QAM	 Band LTE2 1.4MHz OBW 16QAM Mid Channel FRB.gif	 Band LTE2 1.4MHz OBW QPSK Mid Channel FRB.gif

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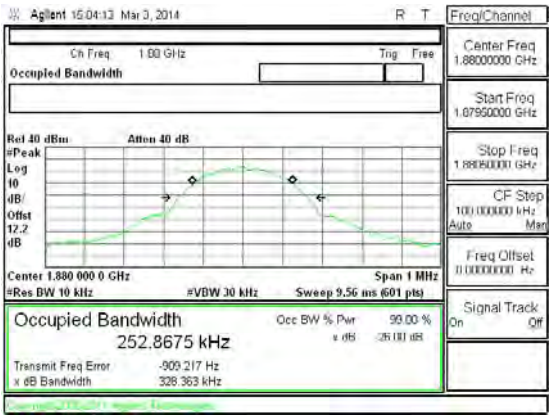
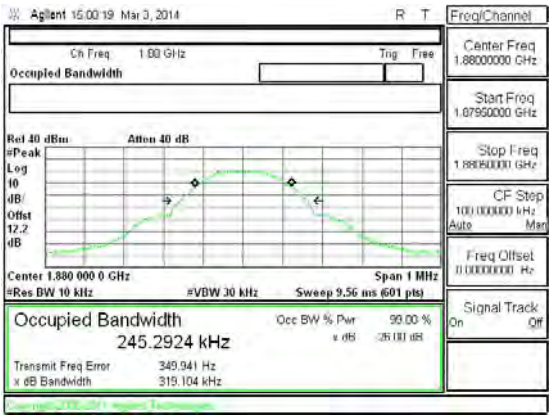
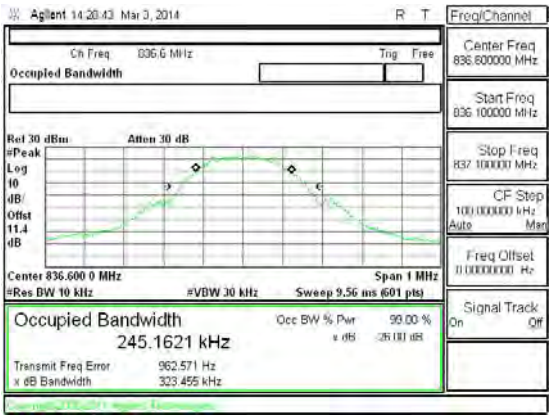
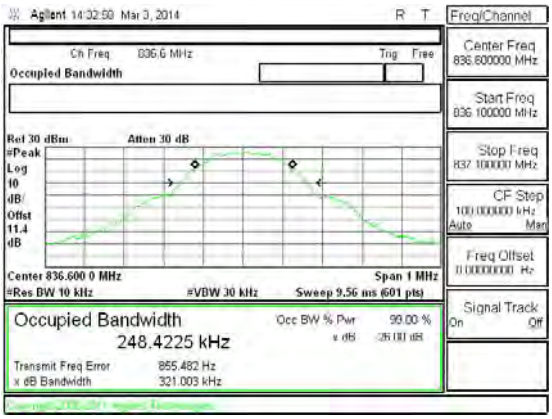
Band GSM1 900	 Band GSM1900 EGPRS OBW Mid channel	 Band GSM1900 GPRS OBW Mid channel
Band GSM8 50 EGPR S	 Band GSM850 EGPRS OBW Mid channel	 Band GSM850 GPRS OBW Mid channel

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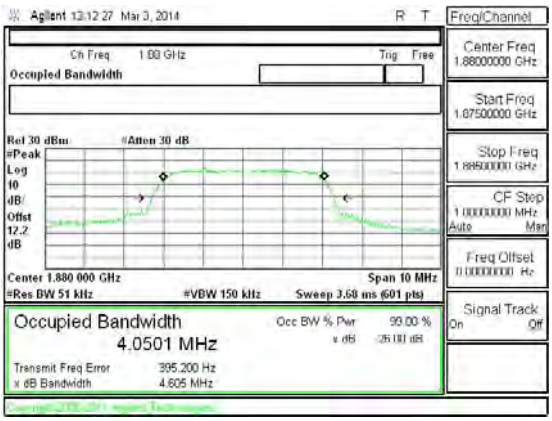
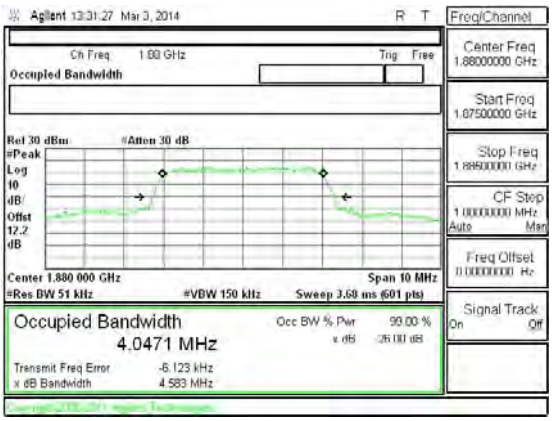
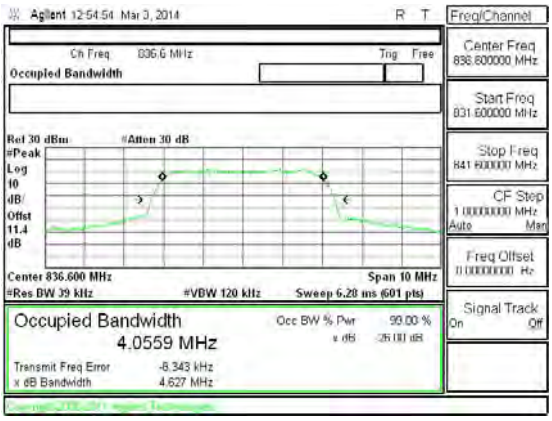
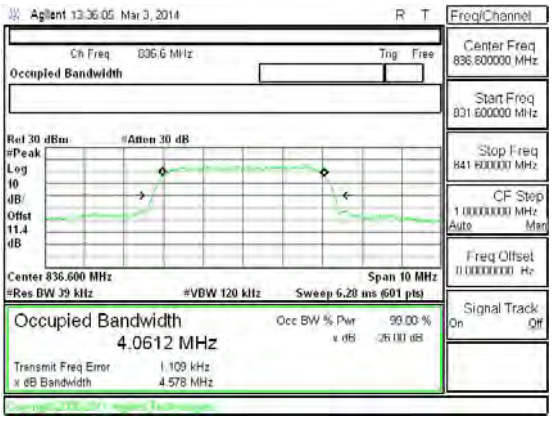
Band Band 2	 Band WCDMA B2 HSDPA OBW	 Band WCDMA B2 REL99 OBW
Band Band 5	 Band WCDMA B5 HSDPA OBW	 Band WCDMA B5 REL99 OBW

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10.2. BAND EDGE EMISSIONS

RULE PART(S)

FCC: §22.359, §24.238

LIMITS

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

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems 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 850/1900 WCDMA B2/B5 LTE B2/B5

RESULTS

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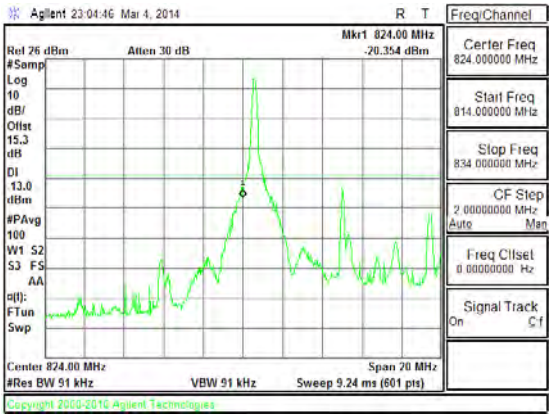
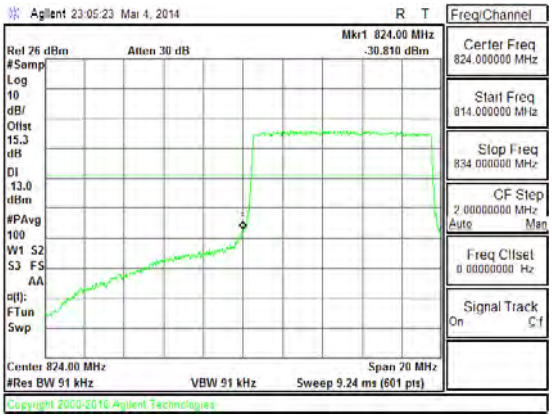
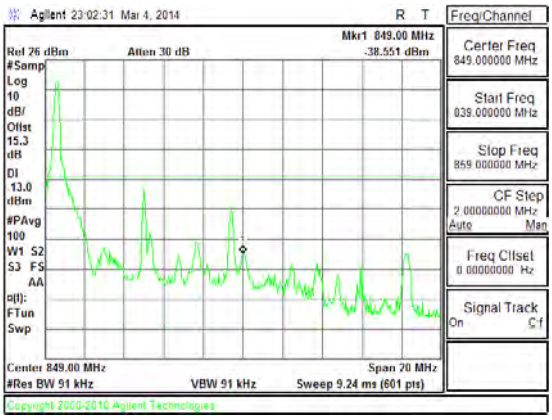
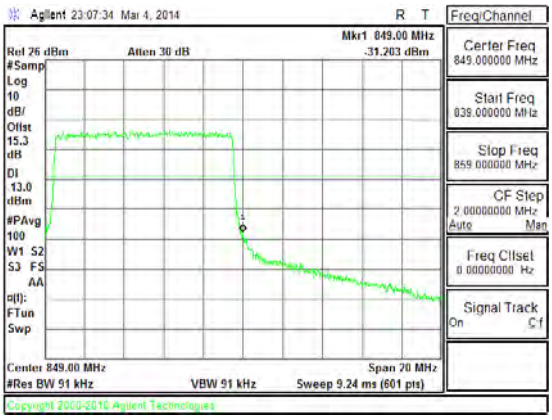
10.2.1. BAND EDGE PLOTS

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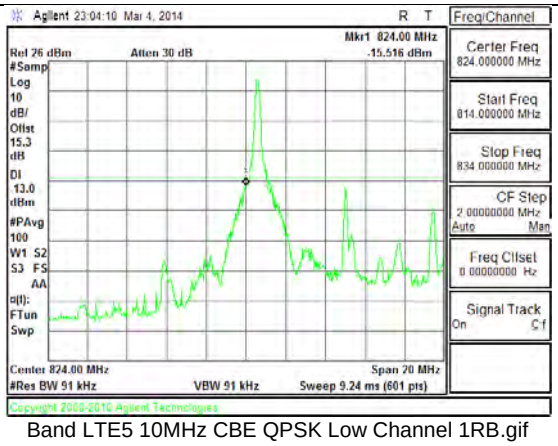
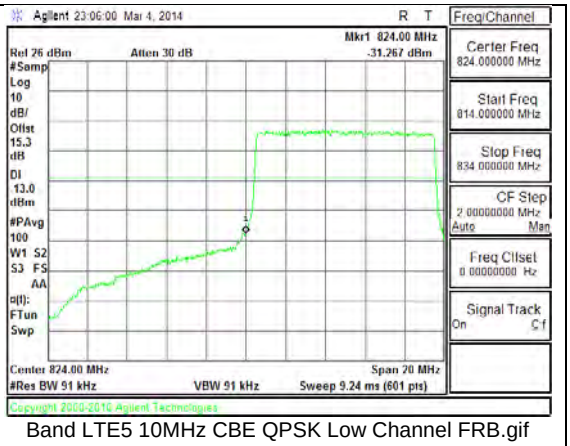
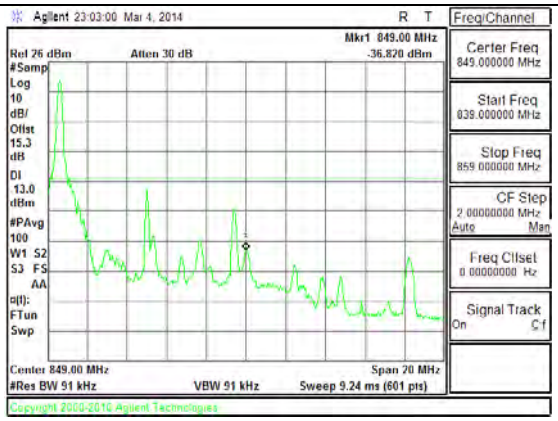
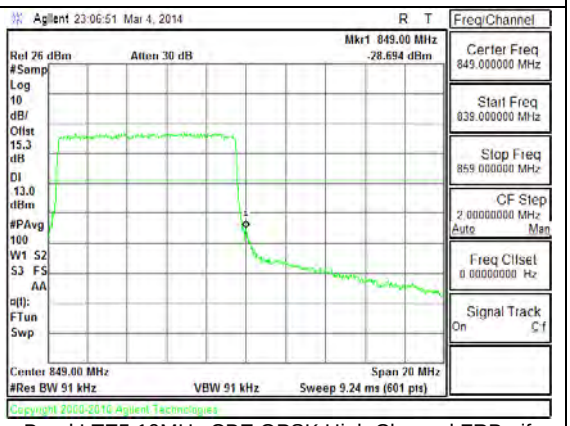
Band LTE5 10MHz QPSK	 Band LTE5 10MHz CBE QPSK Low Channel 1RB.gif	 Band LTE5 10MHz CBE QPSK Low Channel FRB.gif
Band LTE5 10MHz QPSK	 Band LTE5 10MHz CBE QPSK High Channel 1RB.gif	 Band LTE5 10MHz CBE QPSK High Channel FRB.gif

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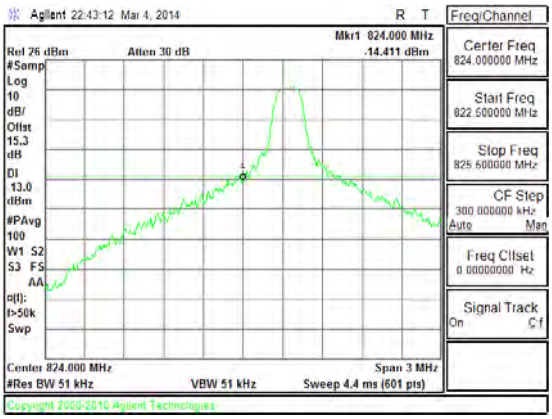
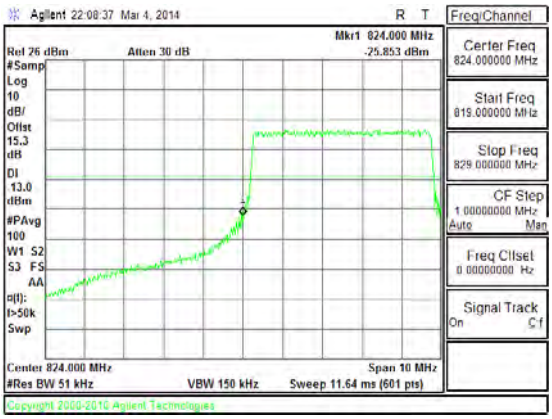
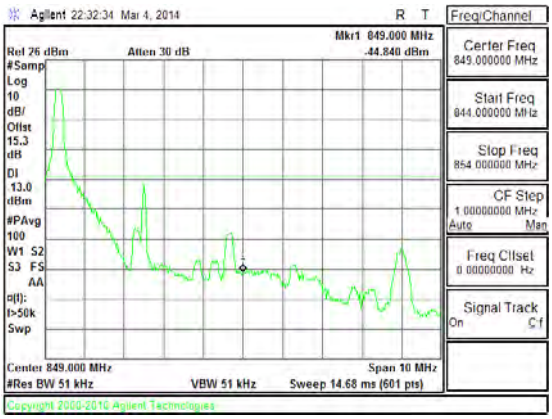
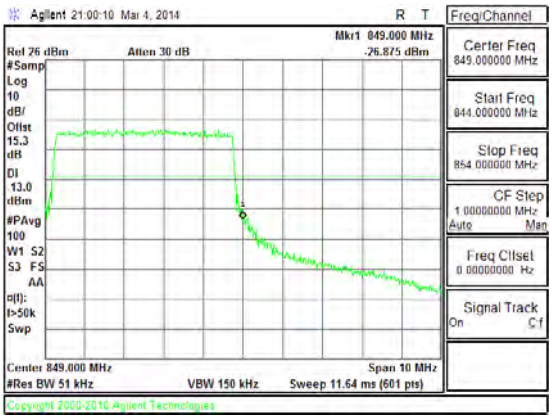
Band LTE5 5MHz 16QAM	 Band LTE5 5MHz CBE 16QAM Low Channel 1RB.gif	 Band LTE5 5MHz CBE 16QAM Low Channel FRB.gif
Band LTE5 5MHz 16QAM	 Band LTE5 5MHz CBE 16QAM High Channel 1RB.gif	 Band LTE5 5MHz CBE 16QAM High Channel FRB.gif

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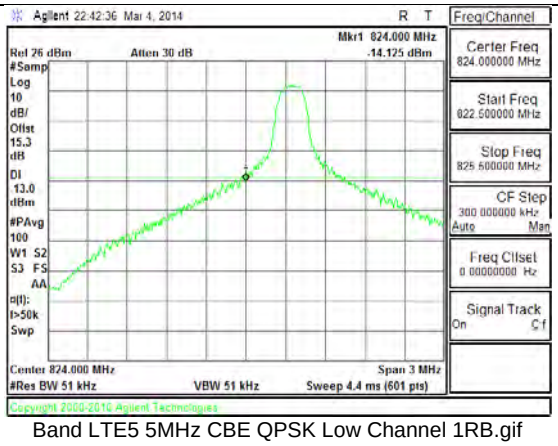
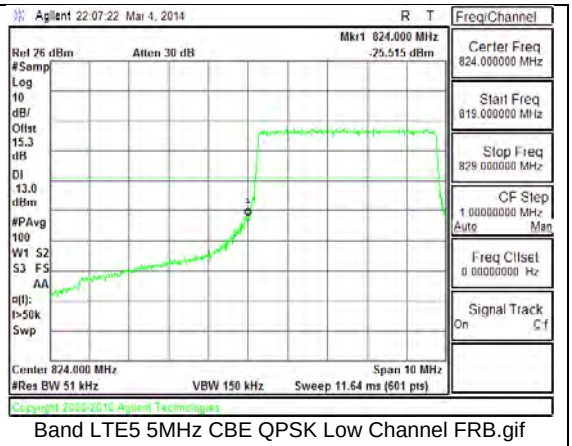
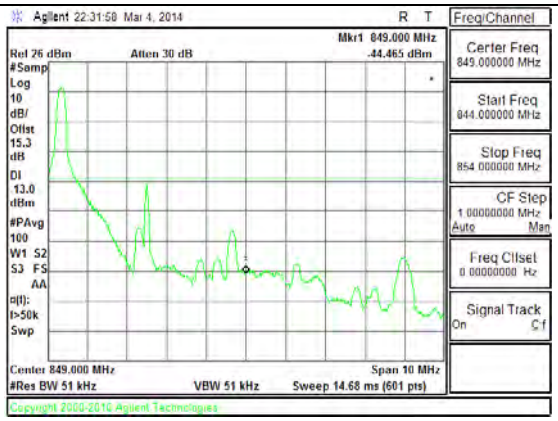
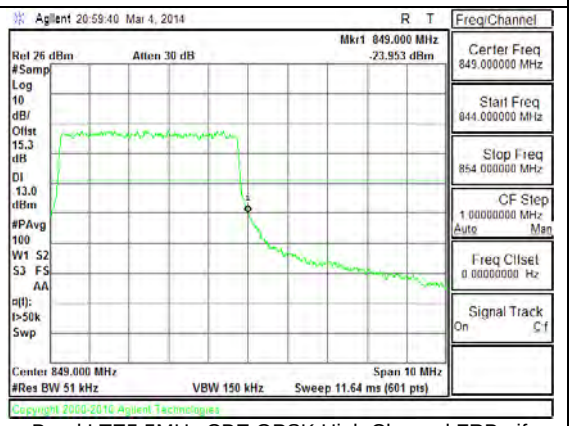
Band LTE5 5MHz QPSK	 Band LTE5 5MHz CBE QPSK Low Channel 1RB.gif	 Band LTE5 5MHz CBE QPSK Low Channel FRB.gif
Band LTE5 5MHz QPSK	 Band LTE5 5MHz CBE QPSK High Channel 1RB.gif	 Band LTE5 5MHz CBE QPSK High Channel FRB.gif

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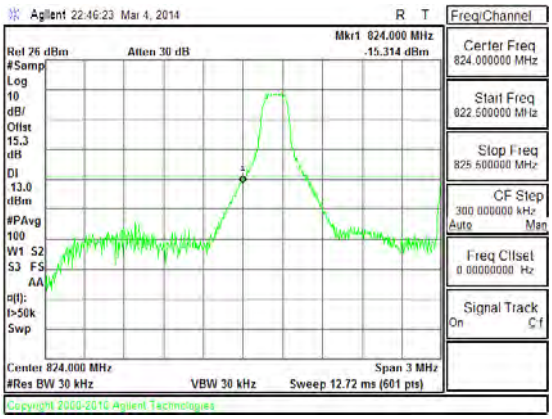
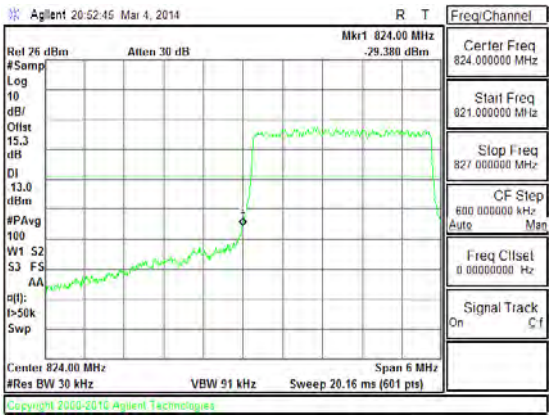
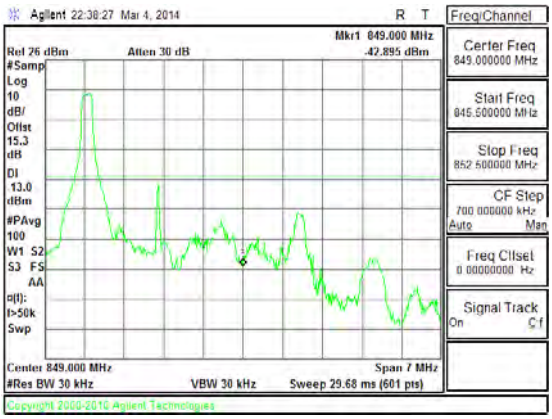
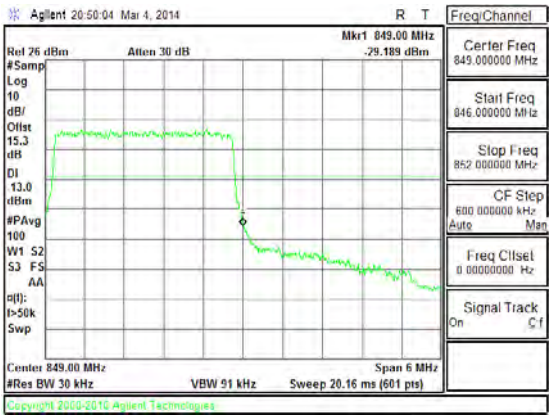
Band LTE5 3MHz 16QAM	 Band LTE5 3MHz CBE 16QAM Low Channel 1RB.gif	 Band LTE5 3MHz CBE 16QAM Low Channel FRB.gif
Band LTE5 3MHz 16QAM	 Band LTE5 3MHz CBE 16QAM High Channel 1RB.gif	 Band LTE5 3MHz CBE 16QAM High Channel FRB.gif

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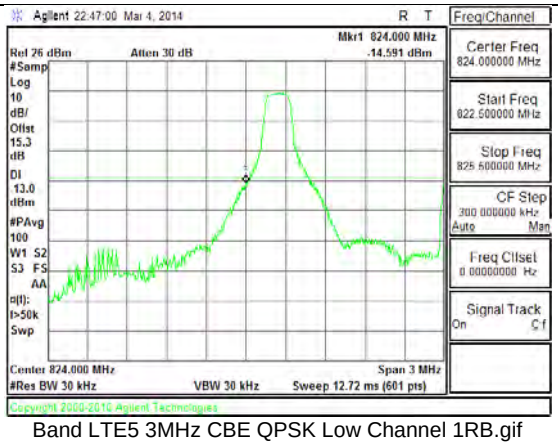
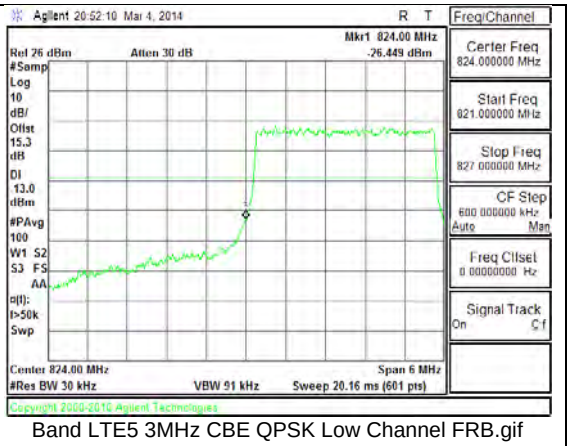
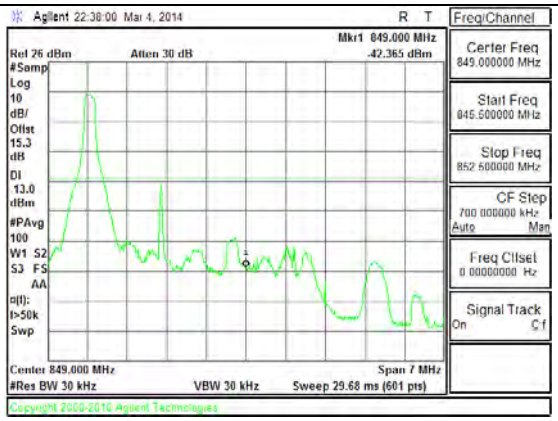
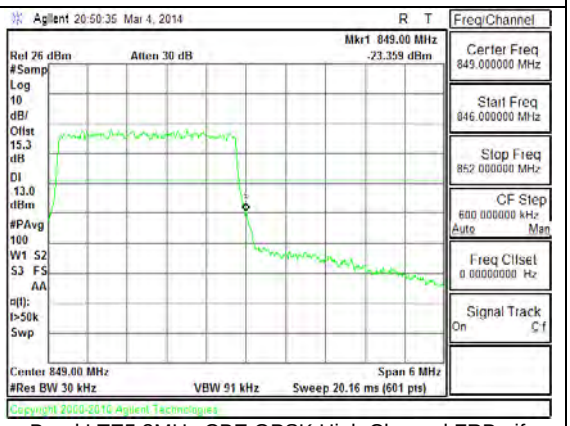
Band LTE5 3MHz QPSK	 Band LTE5 3MHz CBE QPSK Low Channel 1RB.gif	 Band LTE5 3MHz CBE QPSK Low Channel FRB.gif
Band LTE5 3MHz QPSK	 Band LTE5 3MHz CBE QPSK High Channel 1RB.gif	 Band LTE5 3MHz CBE QPSK High Channel FRB.gif

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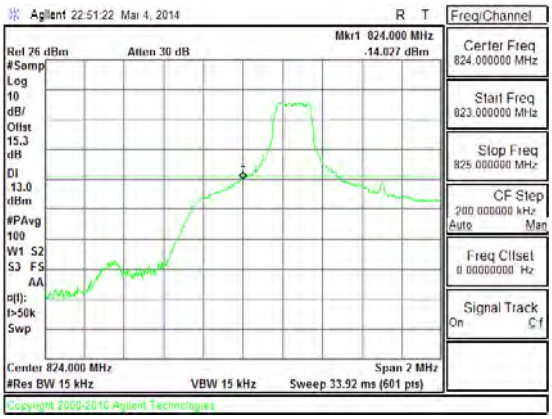
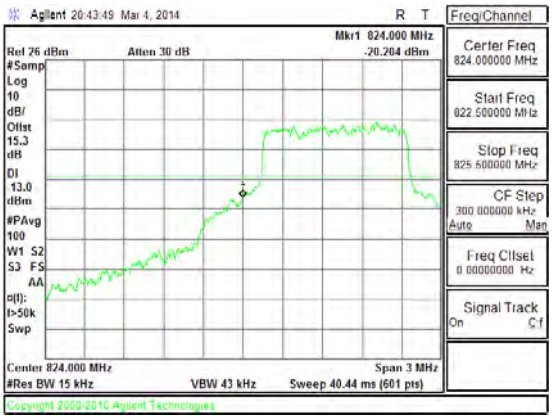
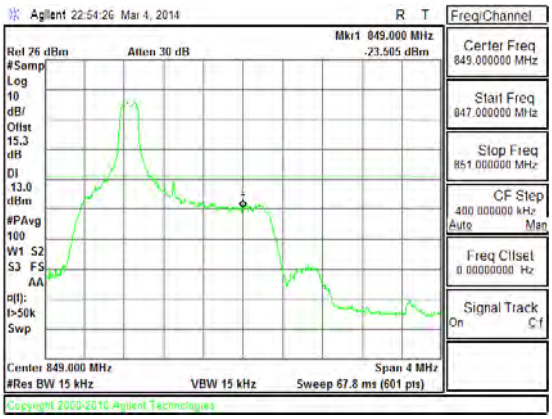
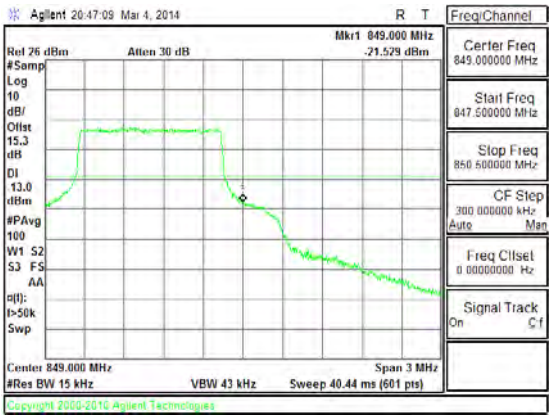
Band LTE5 1.4MHz 16QAM	 Band LTE5 1.4MHz CBE 16QAM Low Channel 1RB.gif	 Band LTE5 1.4MHz CBE 16QAM Low Channel FRB.gif
Band LTE5 1.4MHz 16QAM	 Band LTE5 1.4MHz CBE 16QAM High Channel 1RB.gif	 Band LTE5 1.4MHz CBE 16QAM High Channel FRB.gif

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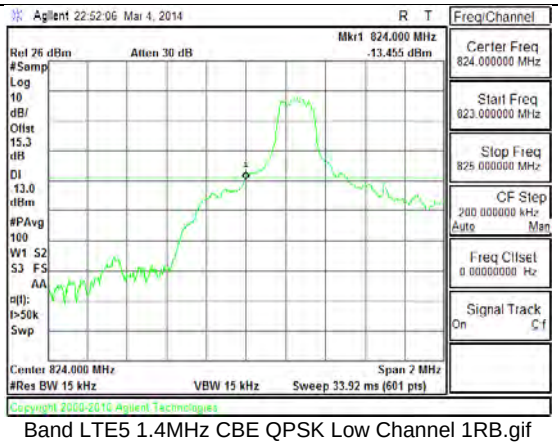
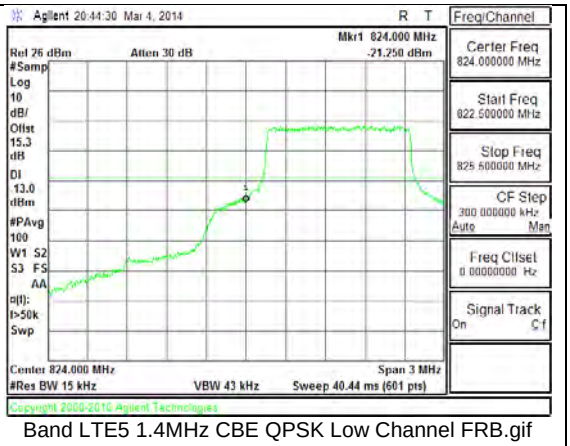
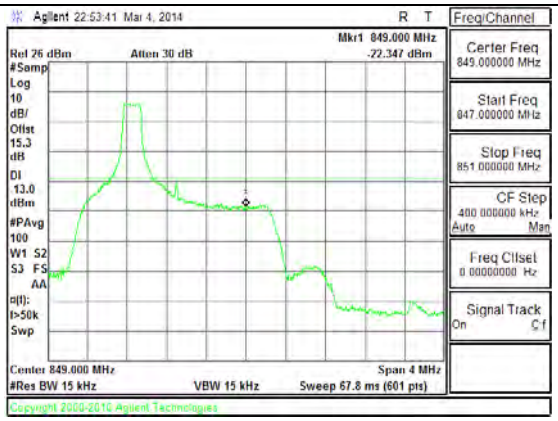
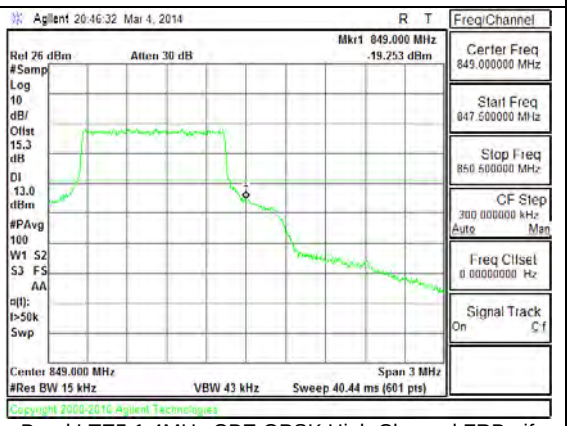
Band LTE5 1.4MHz QPSK	 Band LTE5 1.4MHz CBE QPSK Low Channel 1RB.gif	 Band LTE5 1.4MHz CBE QPSK Low Channel FRB.gif
Band LTE5 1.4MHz QPSK	 Band LTE5 1.4MHz CBE QPSK High Channel 1RB.gif	 Band LTE5 1.4MHz CBE QPSK High Channel FRB.gif

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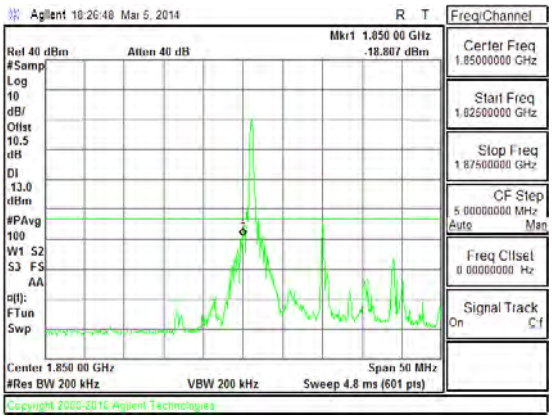
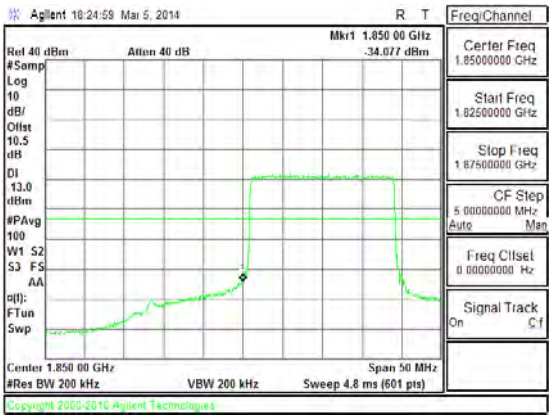
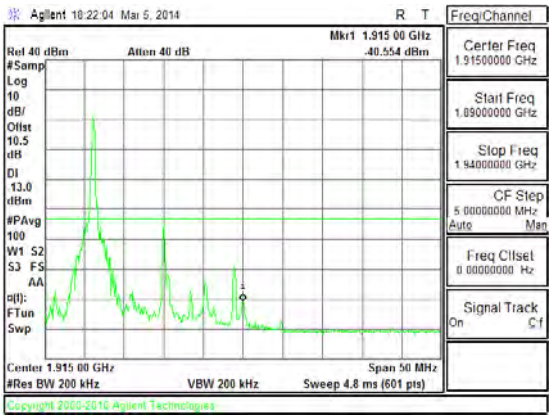
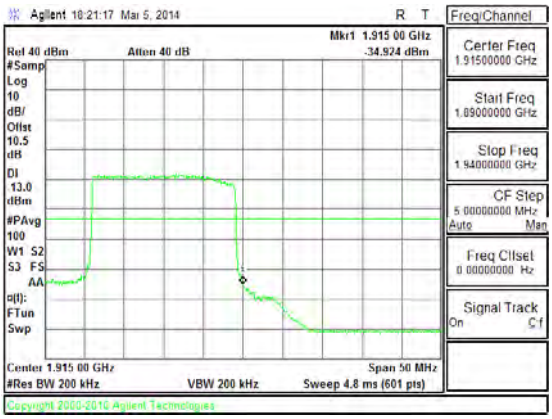
Band LTE2 20MHz 16QAM	 Band LTE2 20MHz CBE 16QAM Low Channel 1RB.gif	 Band LTE2 20MHz CBE 16QAM Low Channel FRB.gif
Band LTE2 20MHz 16QAM	 Band LTE2 20MHz CBE 16QAM High Channel 1RB.gif	 Band LTE2 20MHz CBE 16QAM High Channel FRB.gif

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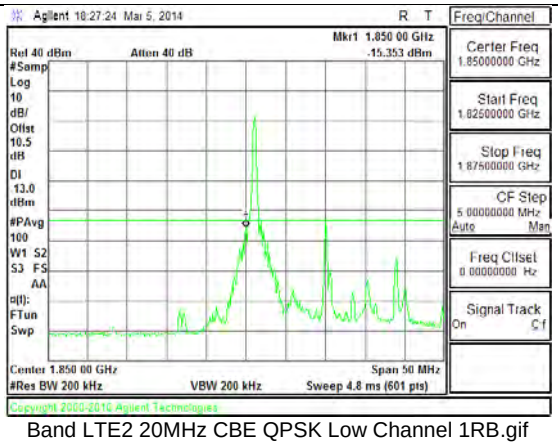
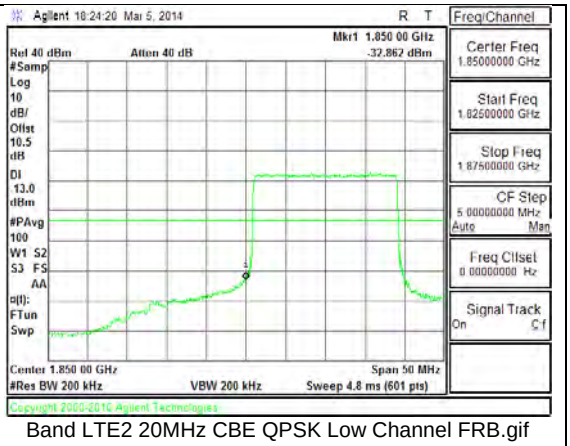
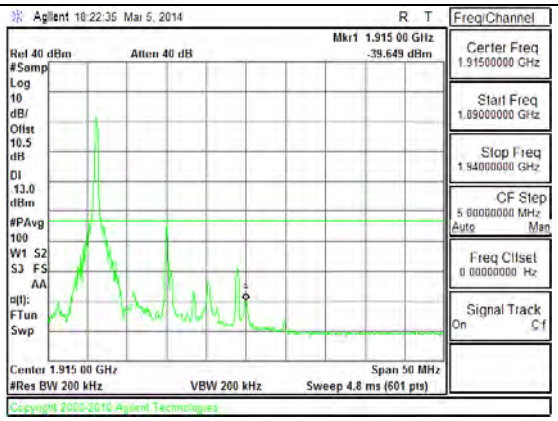
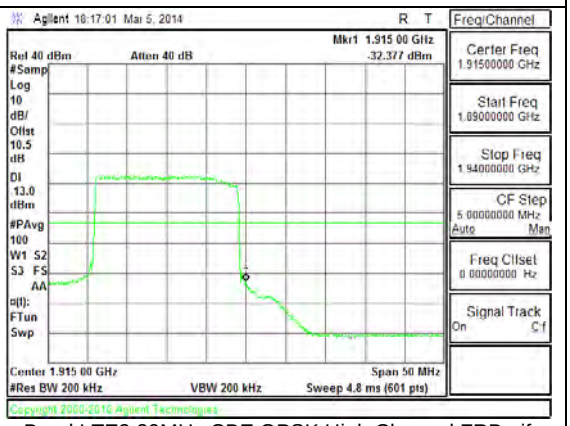
Band LTE2 20MHz QPSK	 Band LTE2 20MHz CBE QPSK Low Channel 1RB.gif	 Band LTE2 20MHz CBE QPSK Low Channel FRB.gif
Band LTE2 20MHz QPSK	 Band LTE2 20MHz CBE QPSK High Channel 1RB.gif	 Band LTE2 20MHz CBE QPSK High Channel FRB.gif

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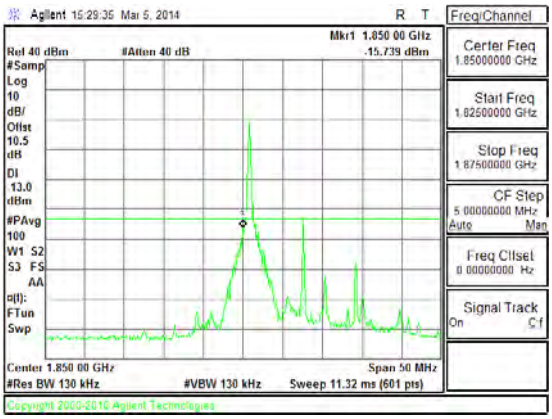
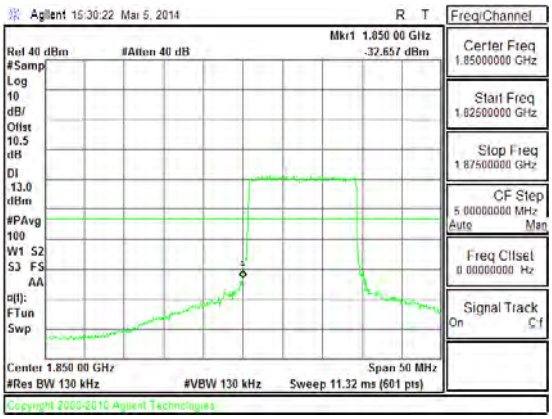
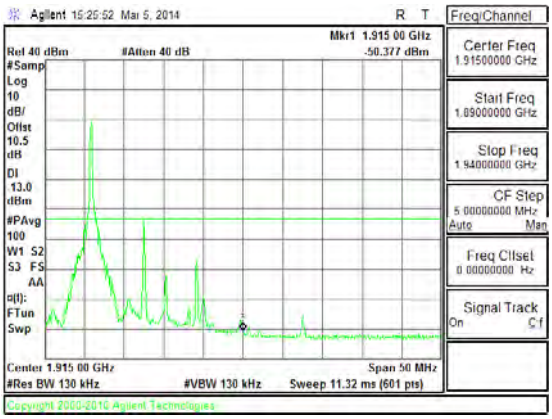
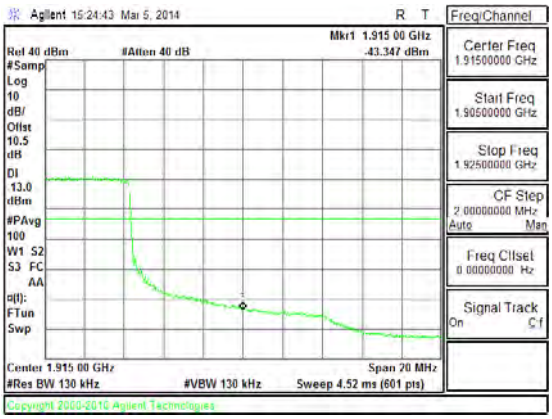
Band LTE2 15MHz 16QAM	 Band LTE2 15MHz CBE 16QAM Low Channel 1RB.gif	 Band LTE2 15MHz CBE 16QAM Low Channel FRB.gif
Band LTE2 15MHz 16QAM	 Band LTE2 15MHz CBE 16QAM High Channel 1RB.gif	 Band LTE2 15MHz CBE 16QAM High Channel FRB.gif

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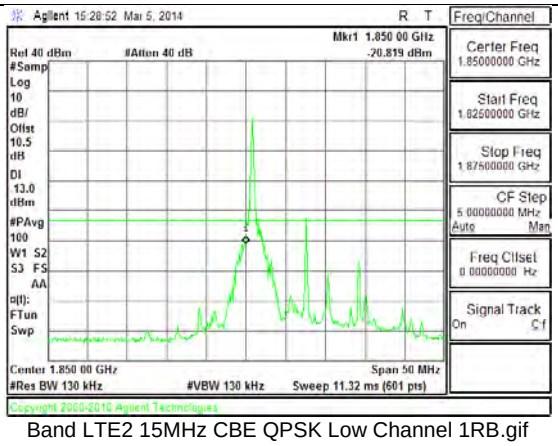
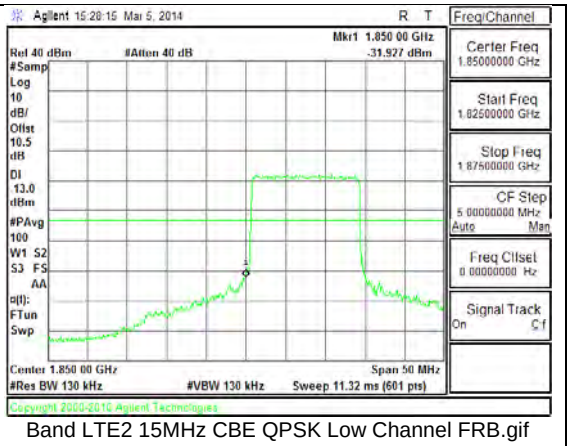
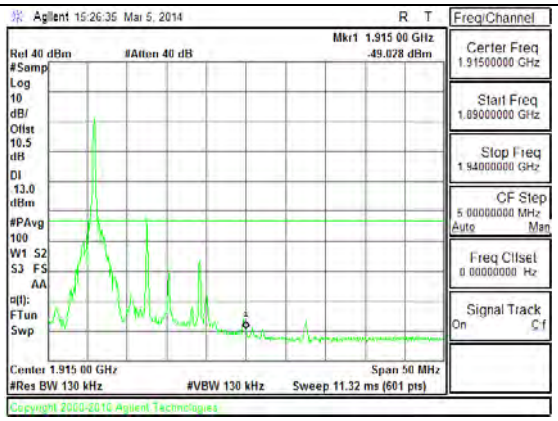
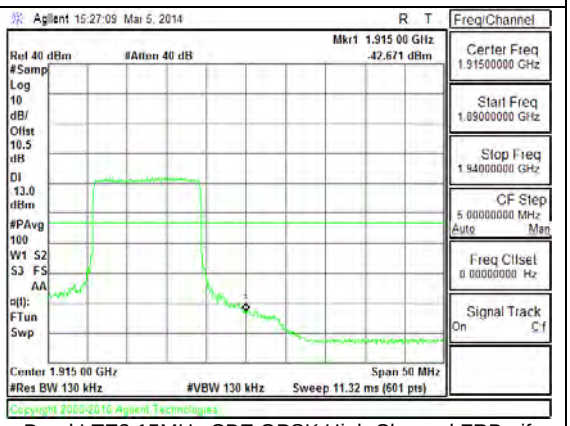
Band LTE2 15MHz QPSK	 Band LTE2 15MHz CBE QPSK Low Channel 1RB.gif	 Band LTE2 15MHz CBE QPSK Low Channel FRB.gif
Band LTE2 15MHz QPSK	 Band LTE2 15MHz CBE QPSK High Channel 1RB.gif	 Band LTE2 15MHz CBE QPSK High Channel FRB.gif

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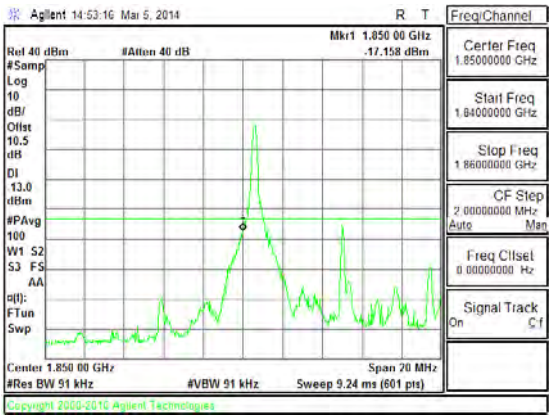
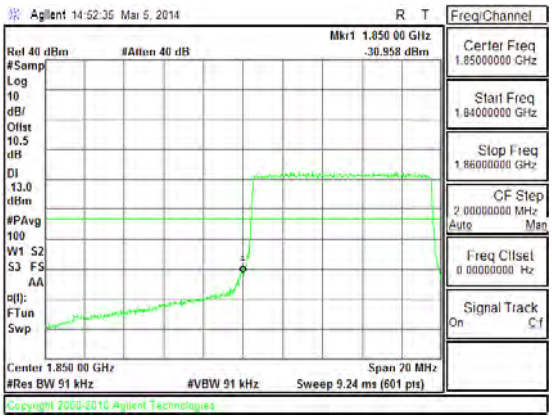
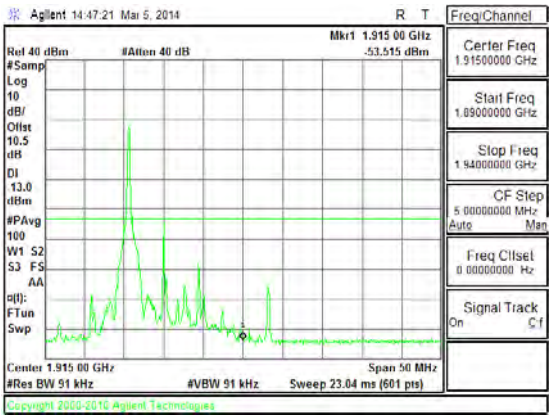
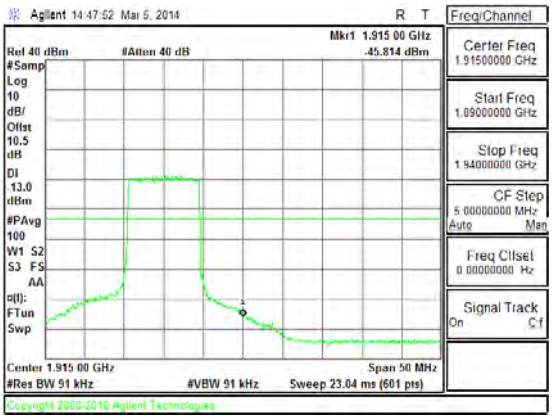
Band LTE2 10MHz 16QAM	 Band LTE2 10MHz CBE 16QAM Low Channel 1RB.gif	 Band LTE2 10MHz CBE 16QAM Low Channel FRB.gif
Band LTE2 10MHz 16QAM	 Band LTE2 10MHz CBE 16QAM High Channel 1RB.gif	 Band LTE2 10MHz CBE 16QAM High Channel FRB.gif

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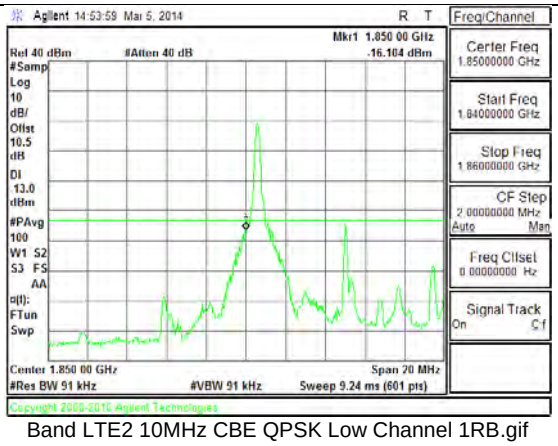
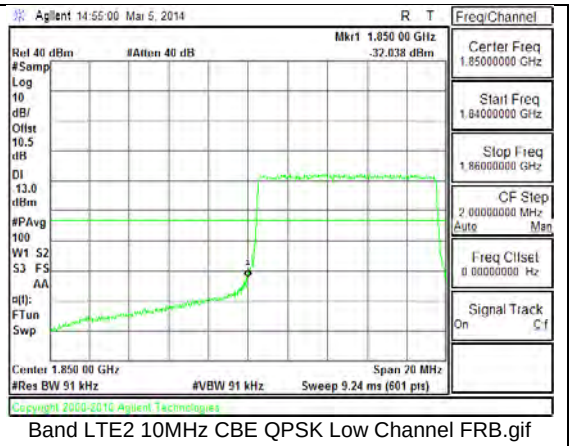
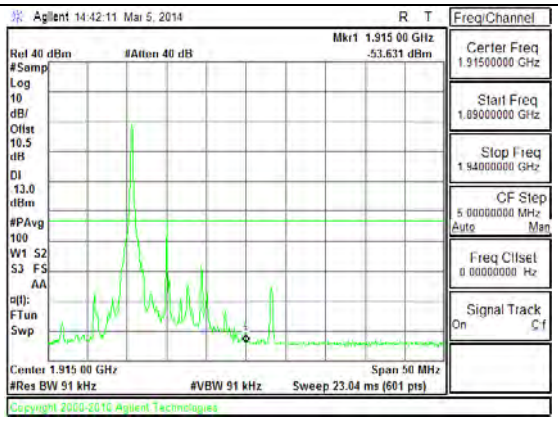
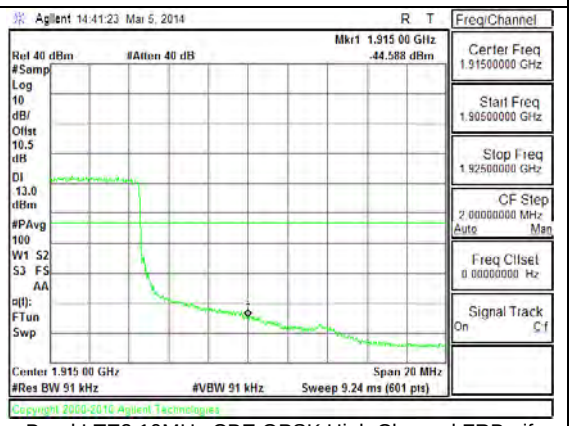
Band LTE2 10MHz QPSK	 Band LTE2 10MHz CBE QPSK Low Channel 1RB.gif	 Band LTE2 10MHz CBE QPSK Low Channel FRB.gif
Band LTE2 10MHz QPSK	 Band LTE2 10MHz CBE QPSK High Channel 1RB.gif	 Band LTE2 10MHz CBE QPSK High Channel FRB.gif

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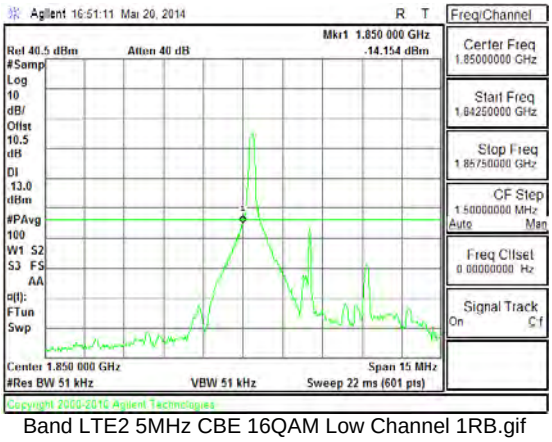
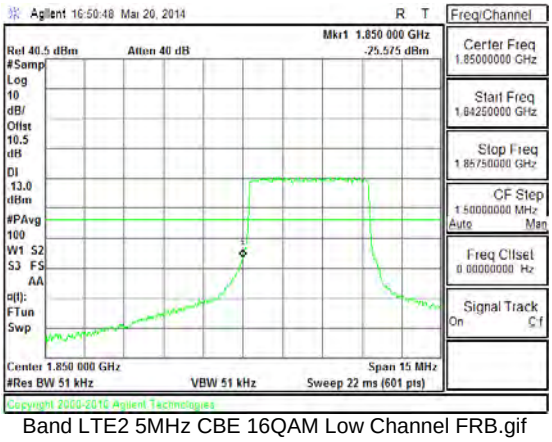
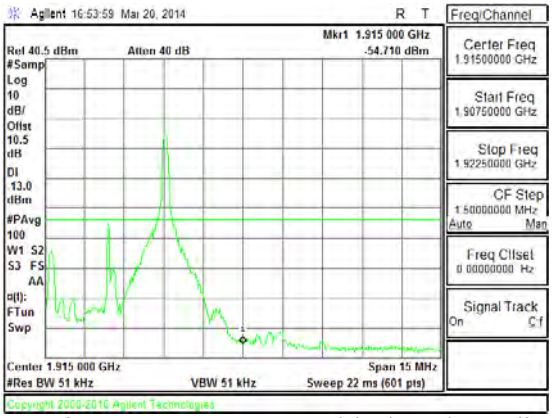
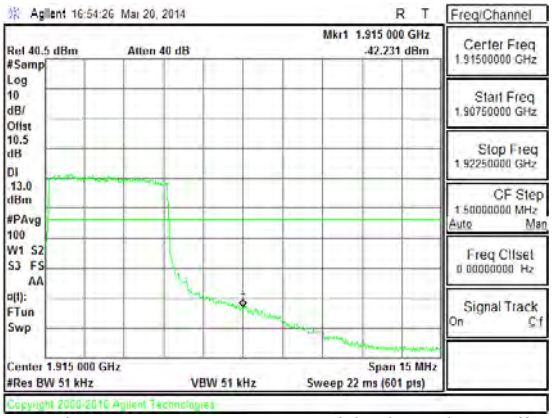
Band LTE2 5MHz 16QAM	 Band LTE2 5MHz CBE 16QAM Low Channel 1RB.gif	 Band LTE2 5MHz CBE 16QAM Low Channel FRB.gif
Band LTE2 5MHz 16QAM	 Band LTE2 5MHz CBE 16QAM High Channel 1RB.gif	 Band LTE2 5MHz CBE 16QAM High Channel FRB.gif

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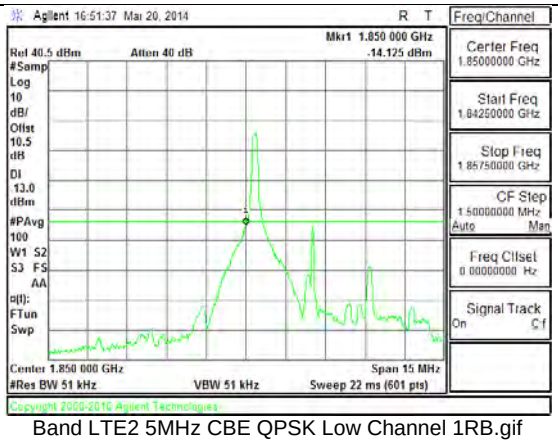
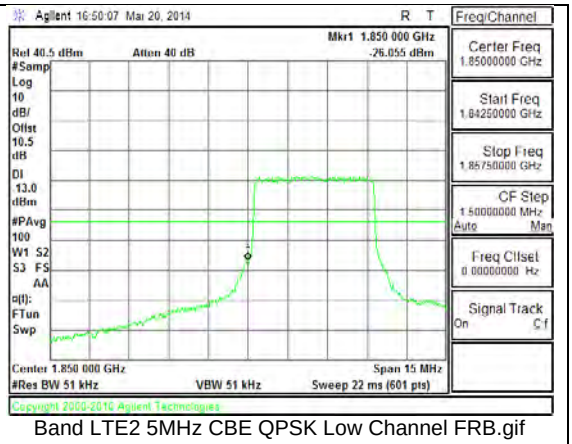
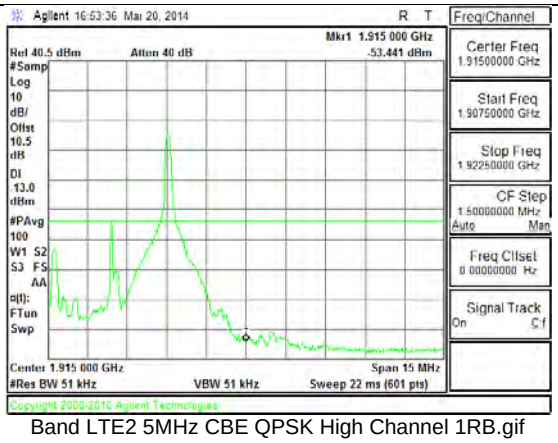
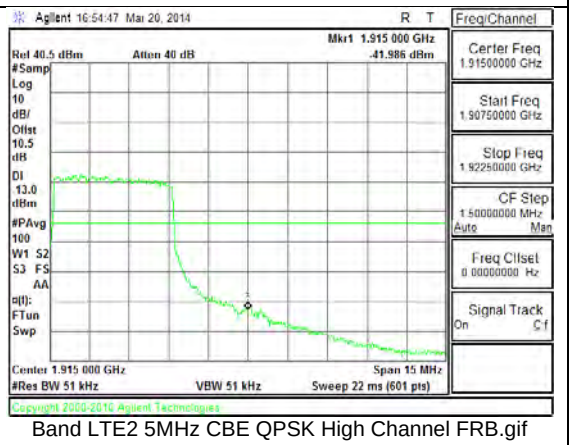
Band LTE2 5MHz QPSK	 Band LTE2 5MHz CBE QPSK Low Channel 1RB.gif	 Band LTE2 5MHz CBE QPSK Low Channel FRB.gif
Band LTE2 5MHz QPSK	 Band LTE2 5MHz CBE QPSK High Channel 1RB.gif	 Band LTE2 5MHz CBE QPSK High Channel FRB.gif

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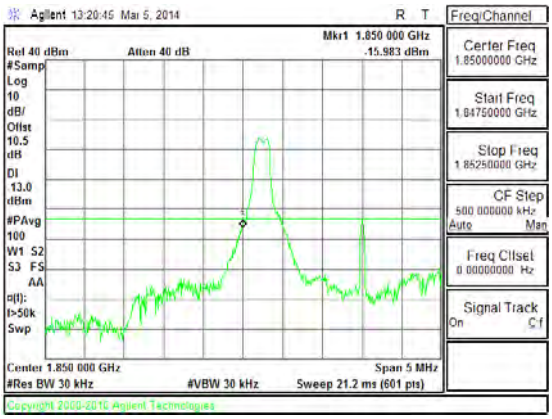
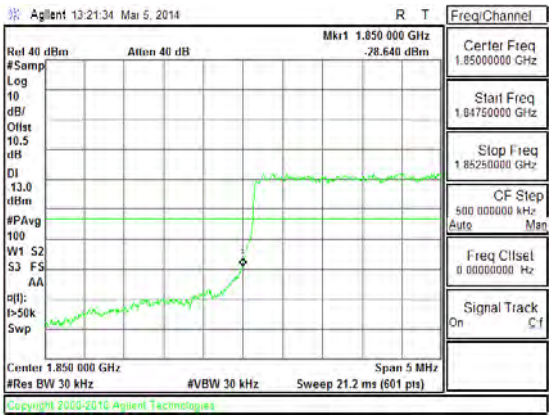
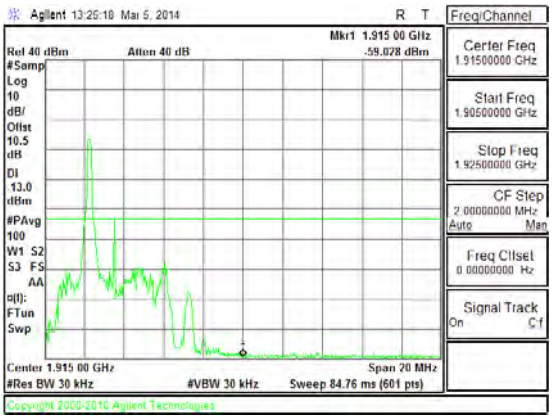
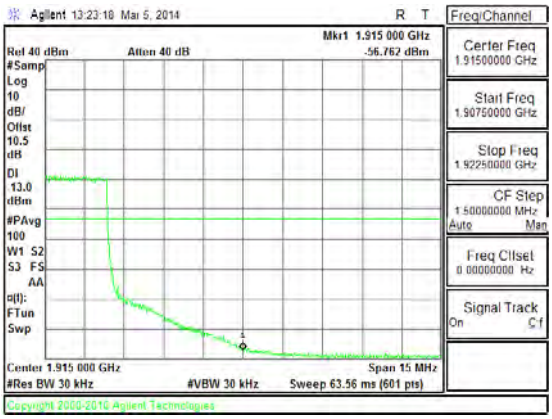
Band LTE2 3MHz 16QAM	 Band LTE2 3MHz CBE 16QAM Low Channel 1RB.gif	 Band LTE2 3MHz CBE 16QAM Low Channel FRB.gif
Band LTE2 3MHz 16QAM	 Band LTE2 3MHz CBE 16QAM High Channel 1RB.gif	 Band LTE2 3MHz CBE 16QAM High Channel FRB.gif

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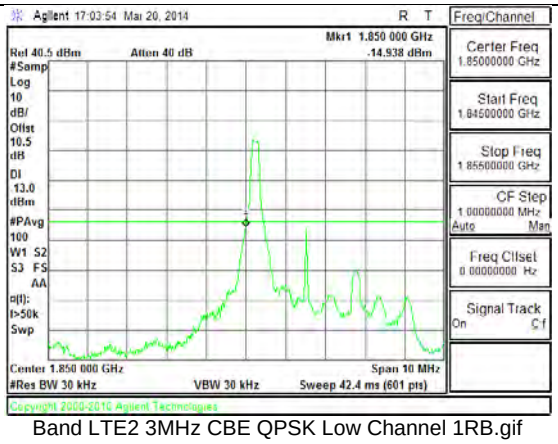
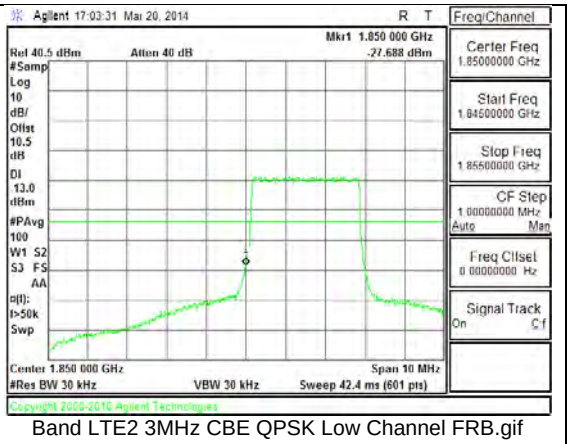
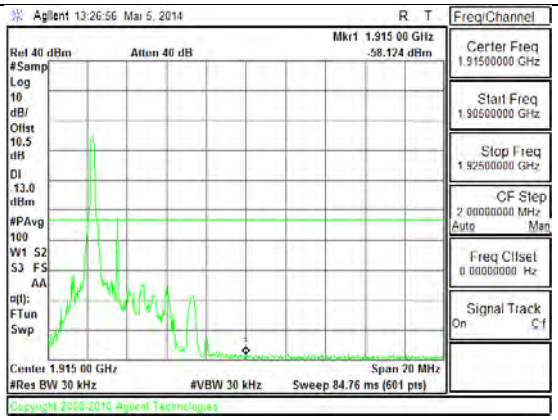
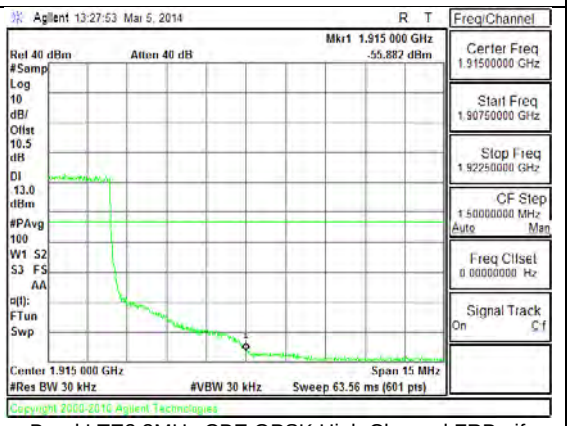
Band LTE2 3MHz QPSK	 Band LTE2 3MHz CBE QPSK Low Channel 1RB.gif	 Band LTE2 3MHz CBE QPSK Low Channel FRB.gif
Band LTE2 3MHz QPSK	 Band LTE2 3MHz CBE QPSK High Channel 1RB.gif	 Band LTE2 3MHz CBE QPSK High Channel FRB.gif

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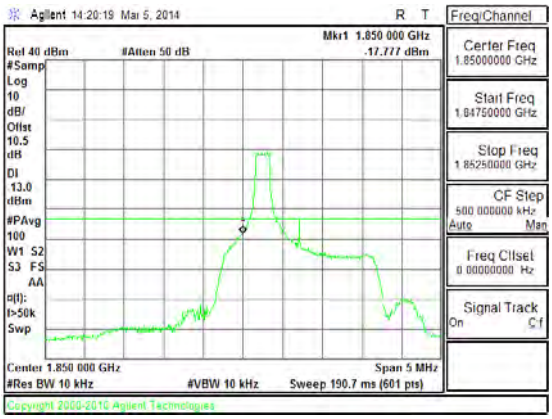
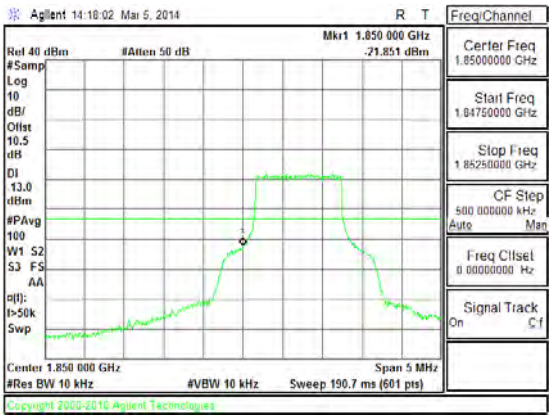
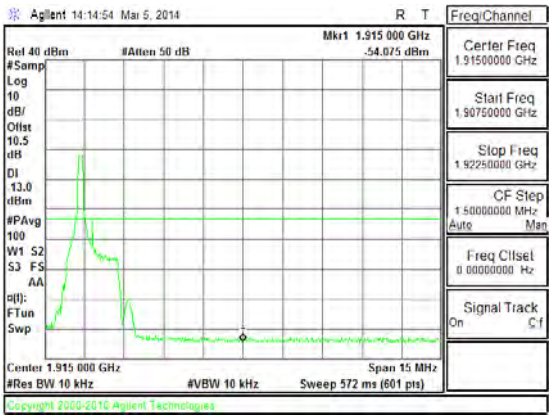
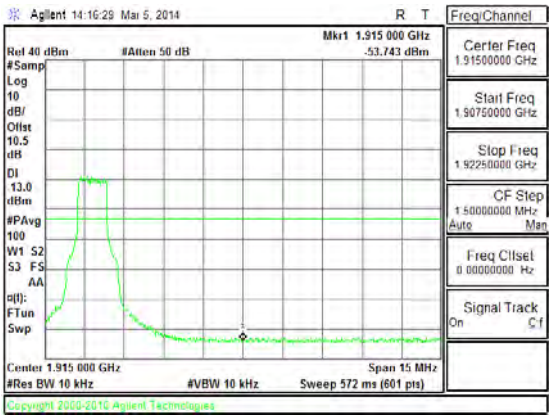
Band LTE2 1.4MHz 16QAM	 Band LTE2 1.4MHz CBE 16QAM Low Channel 1RB.gif	 Band LTE2 1.4MHz CBE 16QAM Low Channel FRB.gif
Band LTE2 1.4MHz 16QAM	 Band LTE2 1.4MHz CBE 16QAM High Channel 1RB.gif	 Band LTE2 1.4MHz CBE 16QAM High Channel FRB.gif

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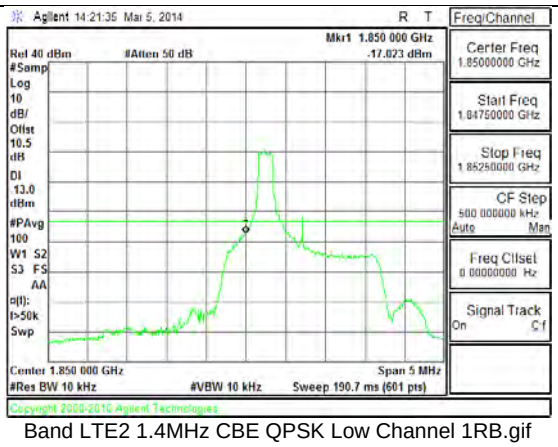
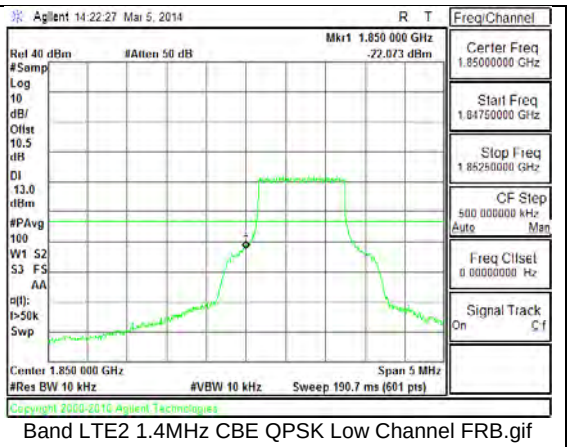
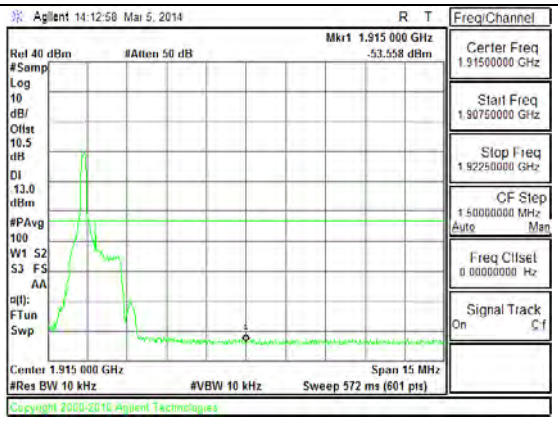
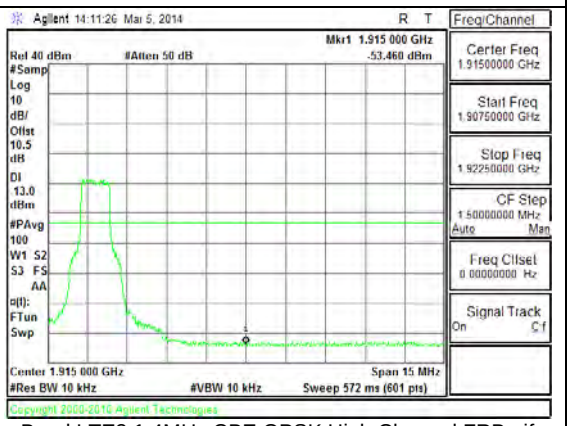
Band LTE2 1.4MHz QPSK	 Band LTE2 1.4MHz CBE QPSK Low Channel 1RB.gif	 Band LTE2 1.4MHz CBE QPSK Low Channel FRB.gif
Band LTE2 1.4MHz QPSK	 Band LTE2 1.4MHz CBE QPSK High Channel 1RB.gif	 Band LTE2 1.4MHz CBE QPSK High Channel FRB.gif

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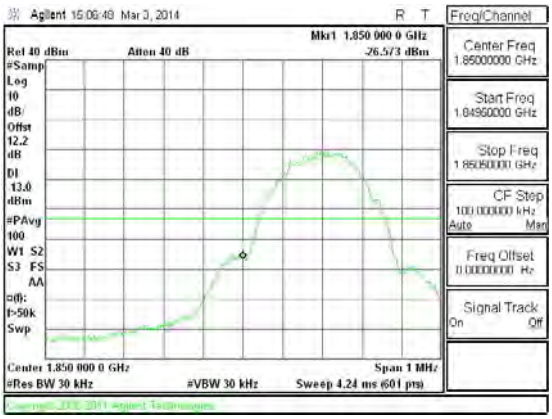
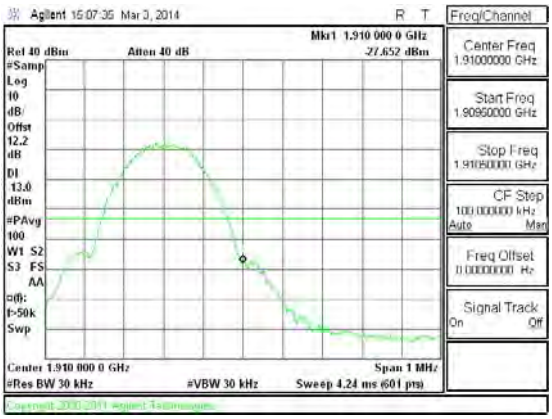
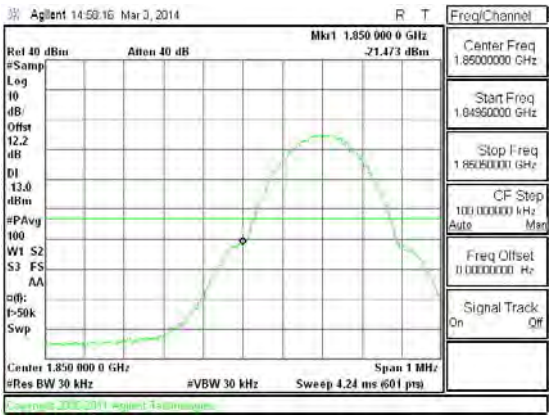
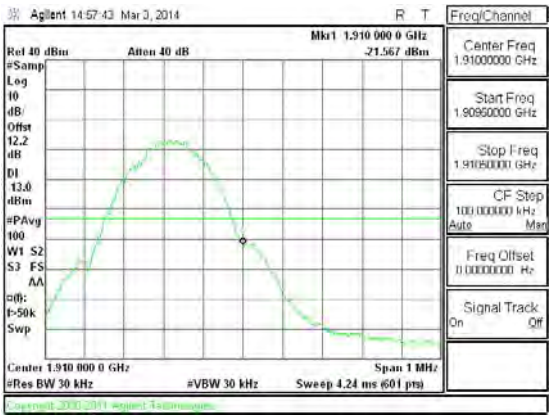
Band GSM1900 EGPRS	 Band GSM1900 EGPRS CBE Low channel	 Band GSM1900 EGPRS CBE High channel
Band GSM1900 GPRS	 Band GSM1900 GPRS CBE Low channel	 Band GSM1900 GPRS CBE High channel

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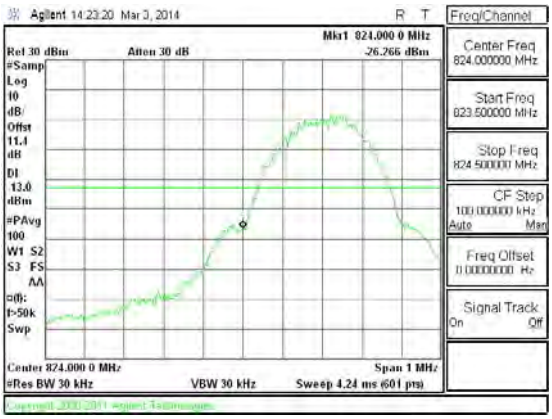
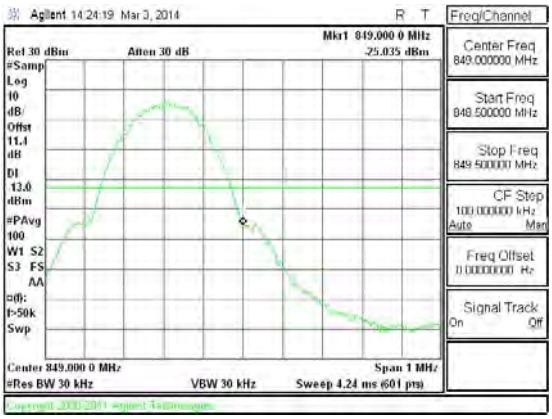
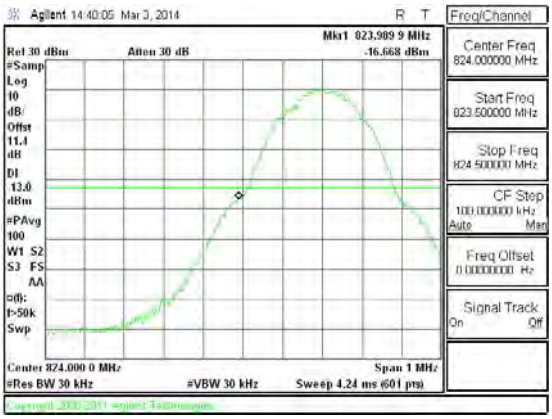
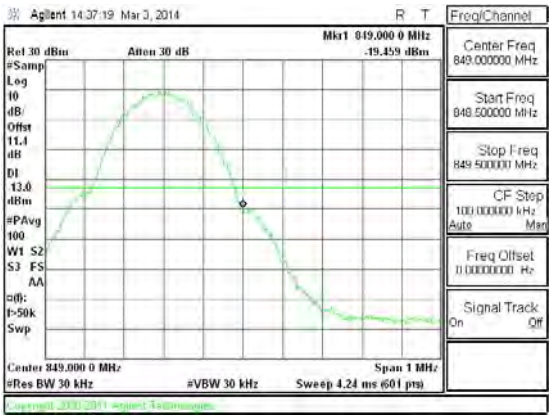
Band GSM850 EGPRS	 Band GSM850 EGPRS CBE Low channel	 Band GSM850 EGPRS CBE High channel
Band GSM850 GPRS	 Band GSM850 GPRS CBE Low channel	 Band GSM850 GPRS CBE High channel

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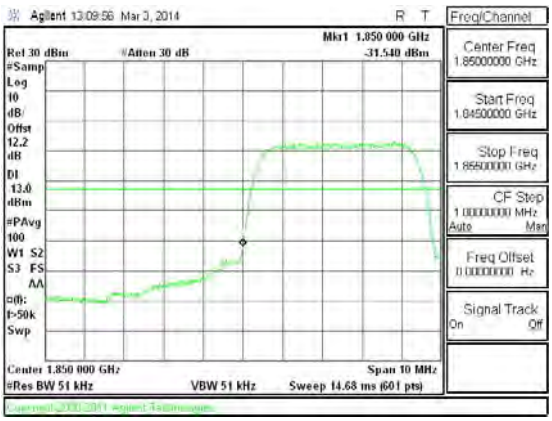
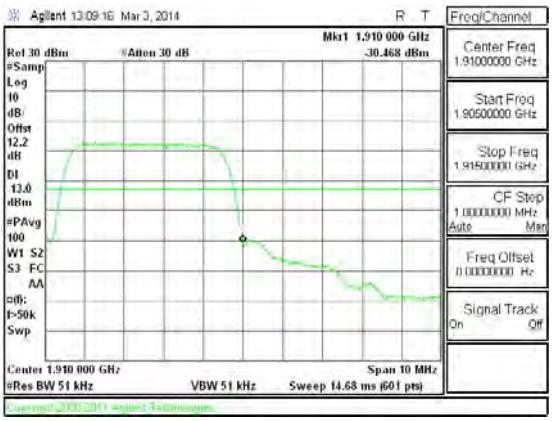
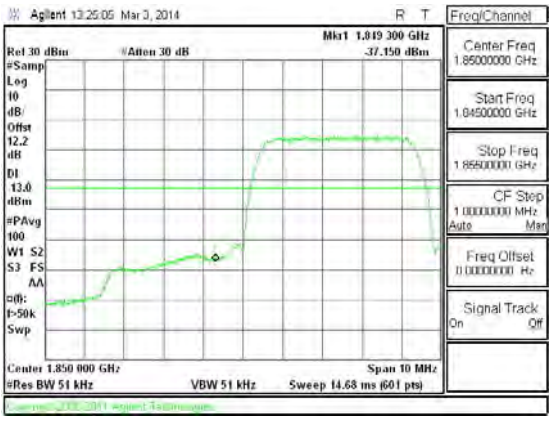
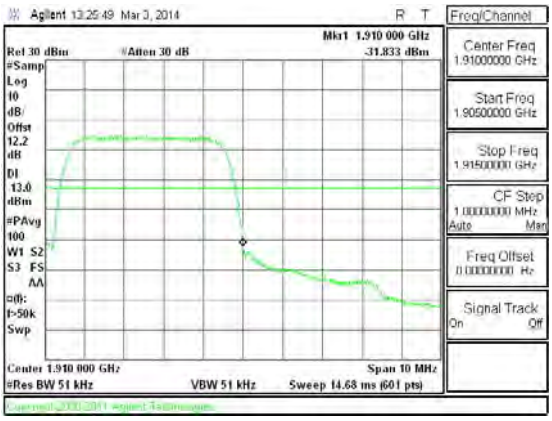
Band Band 2	 Band WCDMA B2 HSDPA CBE	 Band WCDMA B2 HSDPA CBE
Band Band 2 REL99	 Band WCDMA B2 REL99 CBE	 Band WCDMA B2 REL99 CBE

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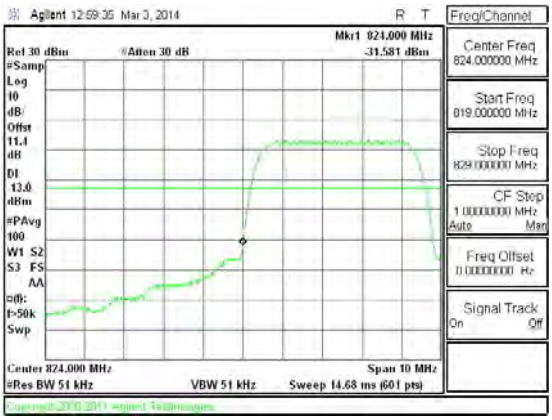
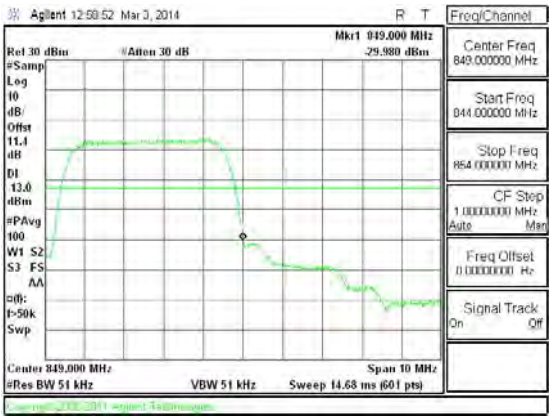
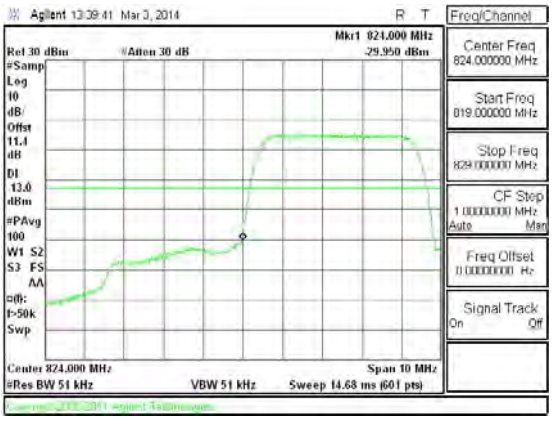
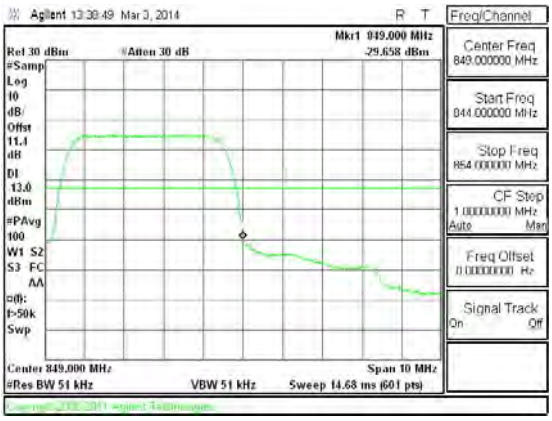
Band Band 5 HSDPA	 Band WCDMA B5 HSDPA CBE	 Band WCDMA B5 HSDPA CBE
Band Band 5 REL99	 Band WCDMA B5 REL99 CBE	 Band WCDMA B5 REL99 CBE

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10.3. OUT OF BAND EMISSIONS

RULE PART(S)

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

LIMITS

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

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems 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

GSM 850/1900 WCDMA B2/B5 LTE B2/B5

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)
LTE5	10	QPSK	829	-41.27	-13	-28.27
			836.5	-40.83	-13	-27.83
			844	-42.71	-13	-29.71
		16QAM	829	-41.09	-13	-28.09
			836.5	-40.7	-13	-27.7
			844	-41.47	-13	-28.47

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE5	5	QPSK	826.5	-42.98	-13	-29.98
			836.5	-42.28	-13	-29.28
			846.5	-41.2	-13	-28.2
		16QAM	826.5	-41.72	-13	-28.72
			836.5	-41.92	-13	-28.92
			846.5	-42.45	-13	-29.45

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE5	3	QPSK	825.5	-41.96	-13	-28.96
			836.5	-42.26	-13	-29.26
			847.5	-41.44	-13	-28.44
		16QAM	825.5	-42.46	-13	-29.46
			836.5	-41.5	-13	-28.5
			847.5	-41.27	-13	-28.27

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE5	1.4	QPSK	824.7	-42.13	-13	-29.13
			836.5	-42.01	-13	-29.01
			848.3	-41.8	-13	-28.8
		16QAM	824.7	-42.5	-13	-29.5
			836.5	-40.86	-13	-27.86
			848.3	-41.35	-13	-28.35

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Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE2	20	QPSK	1860	-36.11	-13	-23.11
			1880	-37.52	-13	-24.52
			1900	-39.4	-13	-26.4
		16QAM	1860	-36.04	-13	-23.04
			1880	-35.67	-13	-22.67
			1900	-34.98	-13	-21.98

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE2	15	QPSK	1857.5	-29.3	-13	-16.3
			1880	-29.63	-13	-16.63
			1902.5	-29.3	-13	-16.3
		16QAM	1857.5	-29.76	-13	-16.76
			1880	-29.05	-13	-16.05
			1902.5	-29.25	-13	-16.25

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE2	10	QPSK	1855	-28.46	-13	-15.46
			1880	-28.88	-13	-15.88
			1905	-28.74	-13	-15.74
		16QAM	1855	-28.58	-13	-15.58
			1880	-28.37	-13	-15.37
			1905	-28.59	-13	-15.59

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Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE2	5	QPSK	1852.5	-29.83	-13	-16.83
			1880	-26.07	-13	-13.07
			1907.5	-27.7	-13	-14.7
		16QAM	1852.5	-28.41	-13	-15.41
			1880	-29.06	-13	-16.06
			1907.5	-27.44	-13	-14.44

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE2	3	QPSK	1851.5	-28.43	-13	-15.43
			1880	-28.68	-13	-15.68
			1908.5	-27.52	-13	-14.52
		16QAM	1851.5	-27.88	-13	-14.88
			1880	-26.52	-13	-13.52
			1908.5	-26.87	-13	-13.87

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE2	1.4	QPSK	1850.7	-30.02	-13	-17.02
			1880	-28.68	-13	-15.68
			1909.3	-28.67	-13	-15.67
		16QAM	1850.7	-28.83	-13	-15.83
			1880	-29.21	-13	-16.21
			1909.3	-28.81	-13	-15.81

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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	-26.31	-13	-13.31
		836.6	-24.84	-13	-11.84
		848.8	-25.32	-13	-12.32
	EGPRS	824.2	-35.45	-13	-22.45
		836.6	-35.43	-13	-22.43
		848.8	-35.36	-13	-22.36
GSM1900	GMSK	1850.2			
		1880			
		1909.8			
	GPRS	1850.2	-22.8	-13	-9.8
		1880	-23.77	-13	-10.77
		1909.8	-25.63	-13	-12.63
	EGPRS	1850.2	-24.47	-13	-11.47
		1880	-24.17	-13	-11.17
		1909.8	-24.13	-13	-11.13

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Band	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
Band 5	REL99	826.4	-36.17	-13	-23.17
		836.6	-34.94	-13	-21.94
		846.6	-35.54	-13	-22.54
	HSDPA	826.4	-36.17	-13	-23.17
		836.6	-34.83	-13	-21.83
		846.6	-35.39	-13	-22.39
Band 2	REL99	1852.4	-34.55	-13	-21.55
		1880	-34.55	-13	-21.55
		1907.6	-34.04	-13	-21.04
	HSDPA	1852.4	-34.58	-13	-21.58
		1880	-37.41	-13	-24.41
		1907.6	-34.43	-13	-21.43

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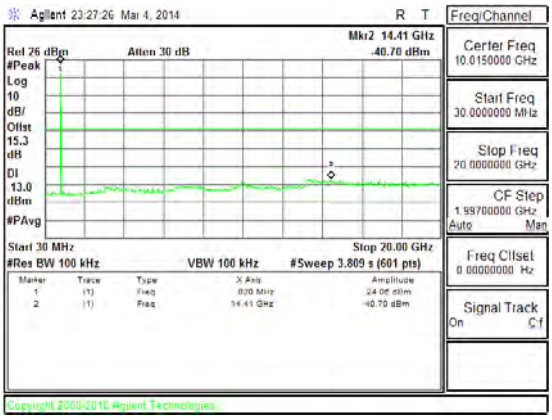
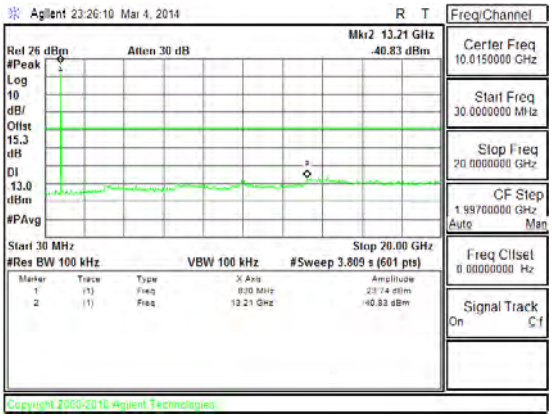
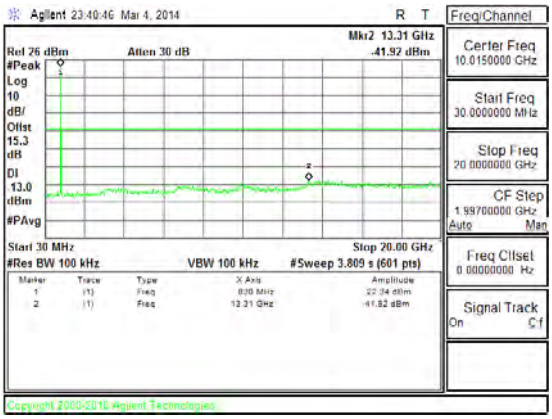
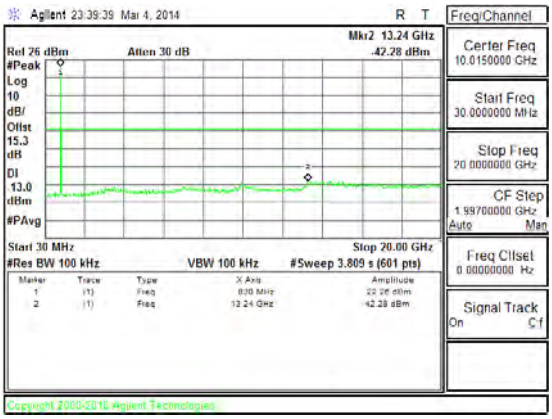
10.3.2. OUT OF BAND EMISSIONS PLOTS

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

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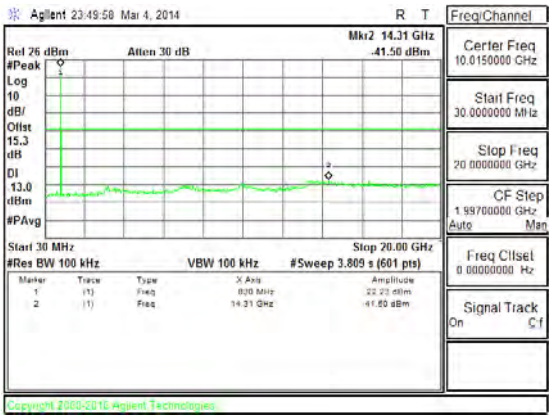
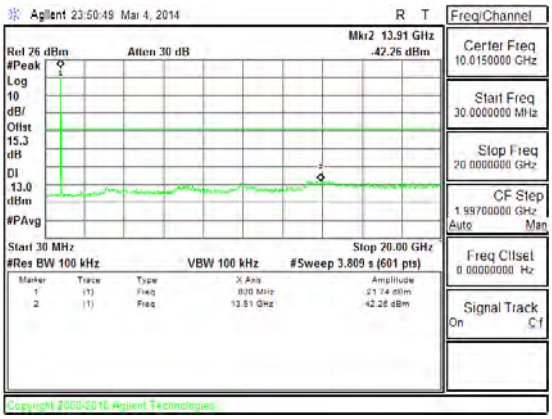
Band LTE5 3MHz	 Band LTE5 3MHz CSE 16QAM Mid channel	 Band LTE5 3MHz CSE QPSK Mid channel

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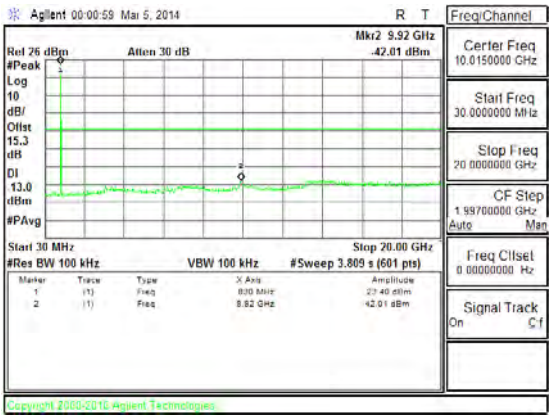
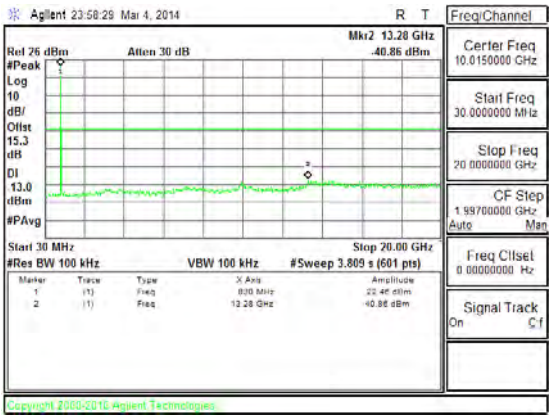
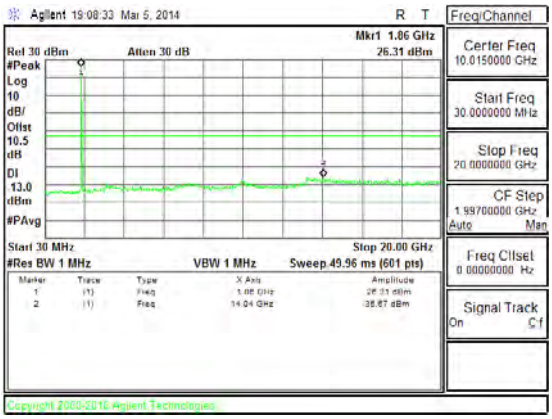
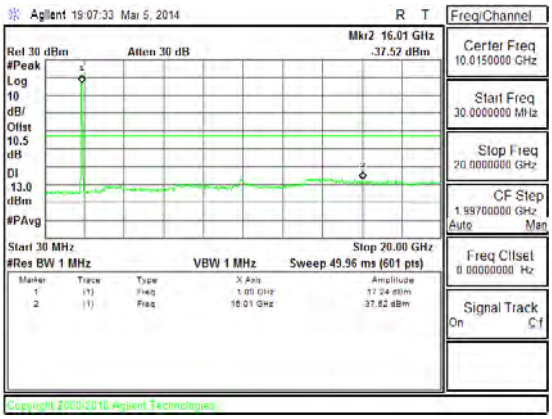
Band LTE5 1.4MHz	 Band LTE5 1.4MHz CSE 16QAM Mid channel	 Band LTE5 1.4MHz CSE QPSK Mid channel
Band LTE2 20MHz	 Band LTE2 20MHz CSE 16QAM Mid channel	 Band LTE2 20MHz CSE QPSK Mid channel

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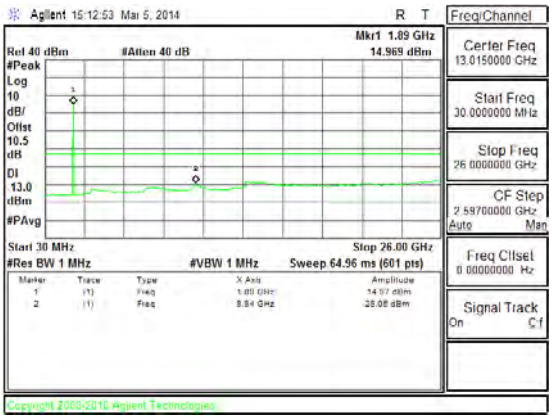
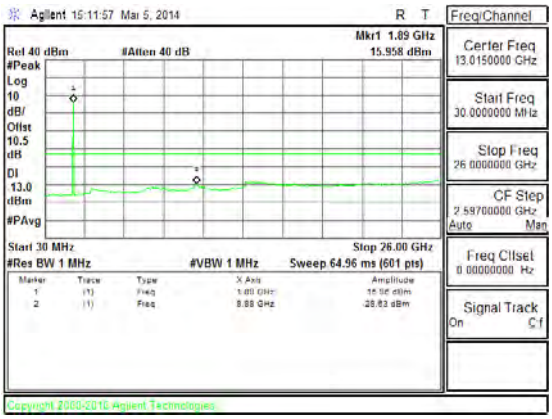
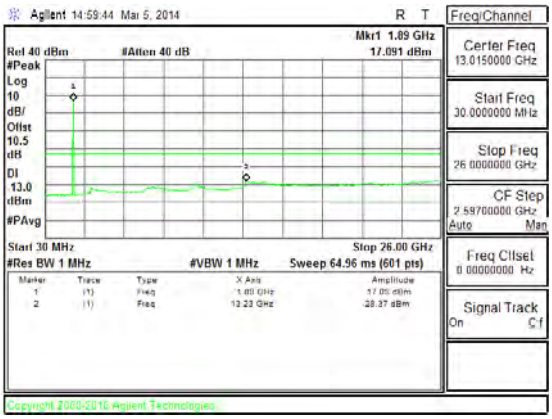
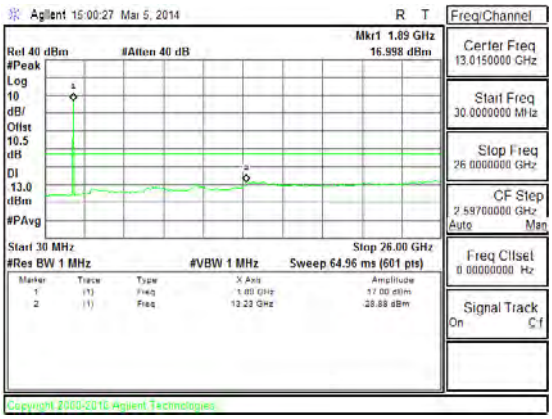
Band LTE2 15MHz	 Band LTE2 15MHz CSE 16QAM Mid channel	 Band LTE2 15MHz CSE QPSK Mid channel
Band LTE2 10MHz	 Band LTE2 10MHz CSE 16QAM Mid channel	 Band LTE2 10MHz CSE QPSK Mid channel

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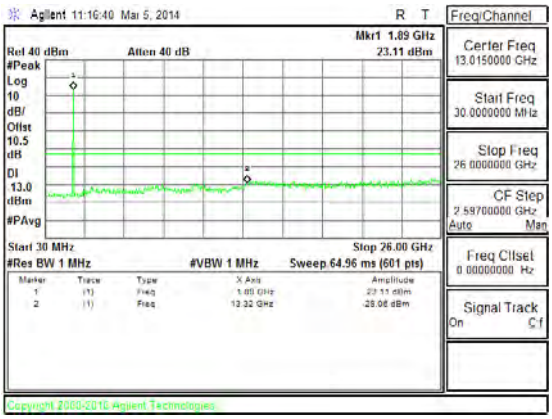
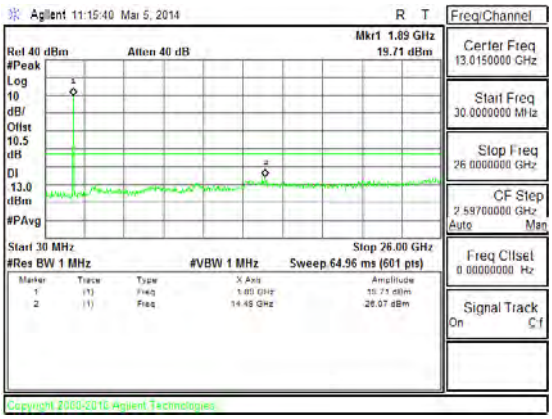
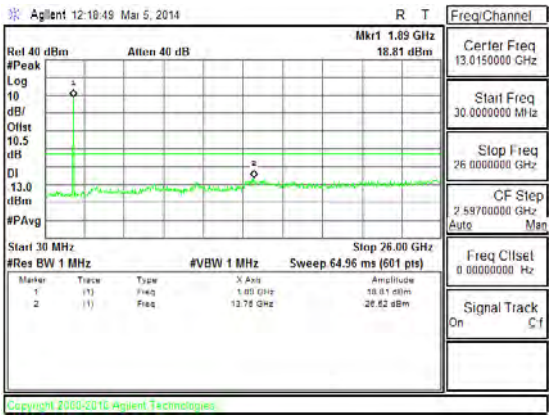
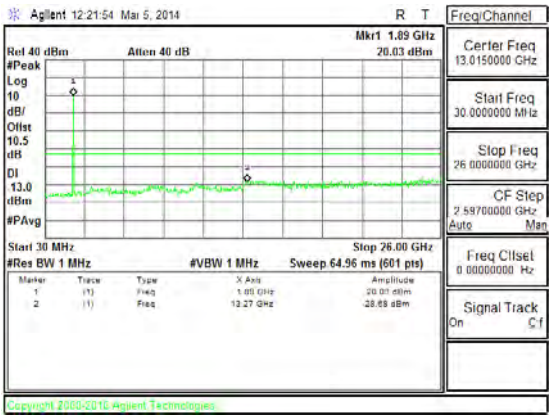
Band LTE2 5MHz	 Band LTE2 5MHz CSE 16QAM Mid channel	 Band LTE2 5MHz CSE QPSK Mid channel
Band LTE2 3MHz	 Band LTE2 3MHz CSE 16QAM Mid channel	 Band LTE2 3MHz CSE QPSK Mid channel

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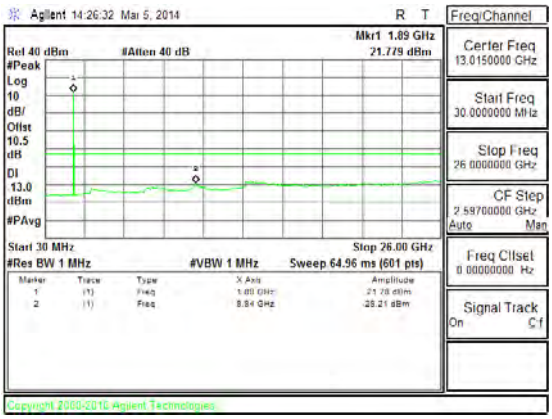
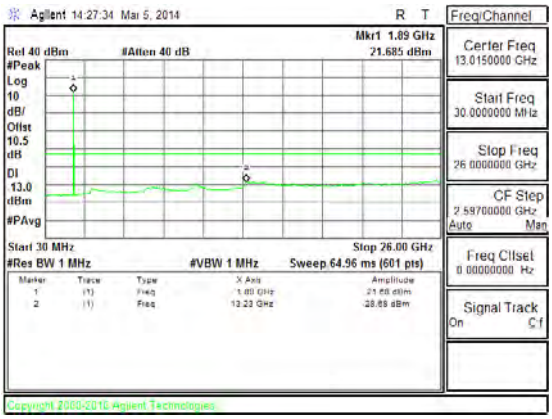
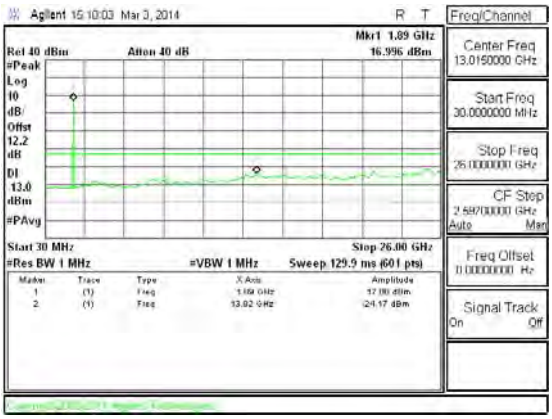
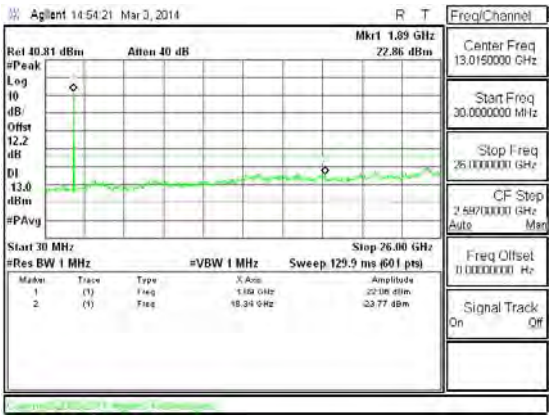
Band LTE2 1.4MHz	 Band LTE2 1.4MHz CSE 16QAM Mid channel	 Band LTE2 1.4MHz CSE QPSK Mid channel
Band GSM1900	 Band GSM1900 EGPRS CSE Mid channel	 Band GSM1900 GPRS CSE Mid channel

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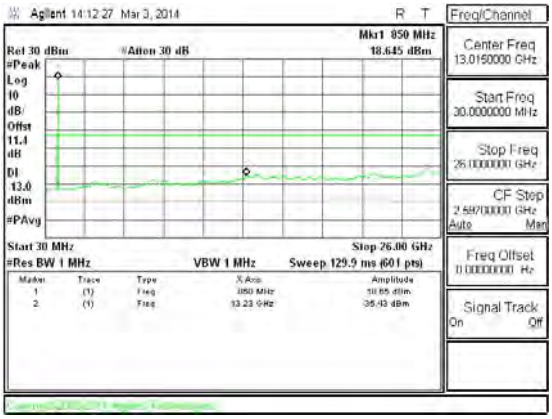
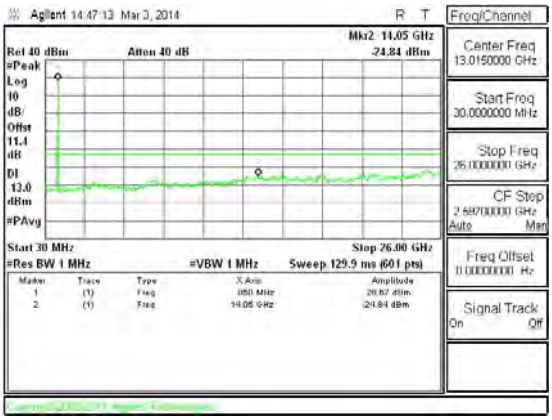
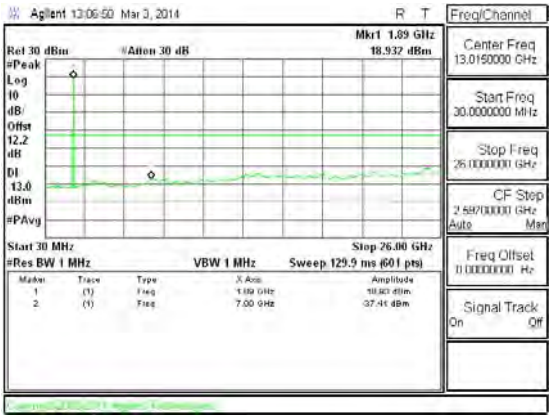
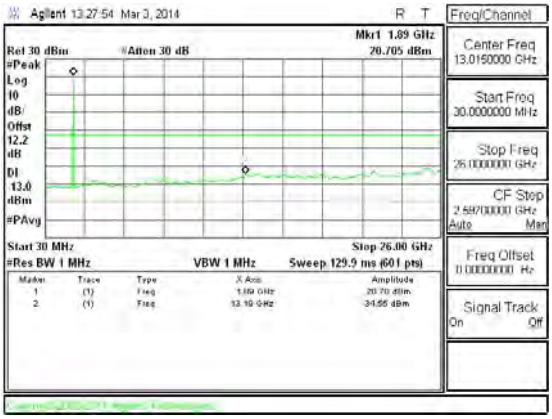
Band GSM850	 Band GSM850 EGPRS CSE Mid channel	 Band GSM850 GPRS CSE Mid channel
Band Band 2	 Band WCDMA B2 HSDPA CSE	 Band WCDMA B2 REL99 CSE

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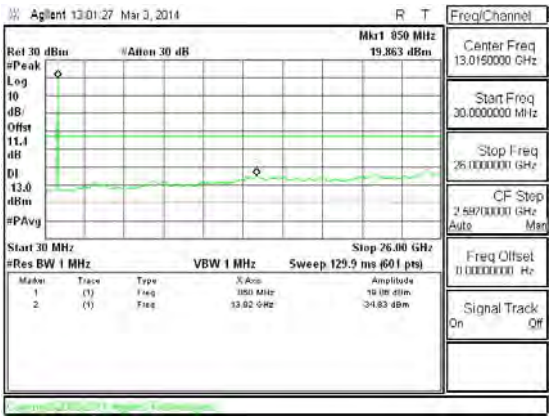
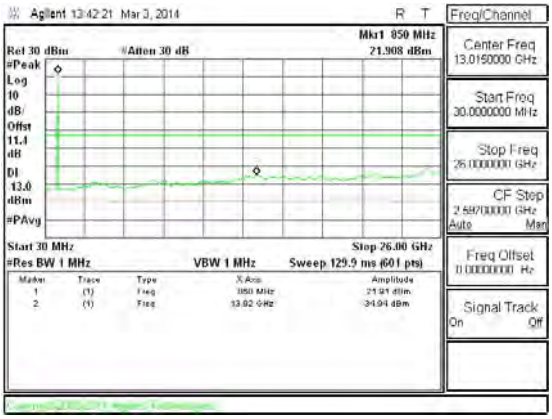
Band Band 5	 Band WCDMA B5 HSDPA CSE	 Band WCDMA B5 REL99 CSE

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10.4. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §22.355, §24.235

LIMITS

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

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

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v02r01

MODES TESTED

GSM 850/1900 WCDMA B2/B5 LTE B2/B5

RESULTS

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10.4.1. FREQUENCY STABILITY RESULTS

BAND V, Channel 4183, Freq: 836.6MHz – MID CHANNEL

Reference Frequency: Cell Mid Channel 836.6 MHz @ 20ºC Limit: +- 2.5 ppm = 2091.500 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.70	50	836.599993	-0.001	2.5
3.70	40	836.599992	0.000	2.5
3.70	30	836.599993	-0.001	2.5
3.70	***20***	***836.599992***	***0***	***2.5***
3.70	10	836.599993	-0.001	2.5
3.70	0	836.599992	0.000	2.5
3.70	-10	836.599991	0.001	2.5
3.70	-20	836.599992	0.000	2.5
3.70	-30	836.599994	-0.002	2.5

Reference Frequency: Mid Channel 836.6 MHz @ 20ºC Limit: +- 2.5 ppm = 2091.500 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measureed with Time Elapse		
			Delta (ppm)	Limit (ppm)
3.70	***20***	***836.599992***	***0.00000***	***2.5***
4.20	20	836.599994	*-0.00239*	2.5
3.4(End vdc)	20	836.599993	*-0.00120*	2.5

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BAND II, Channel 9400 Freq: 1880MHz– MID CHANNEL

Reference Frequency: PC S Mid Channel 1880MHz @ 20°C Limit: to stay +- 2.5 ppm = 4700.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.70	50	1879.999989	-0.001	2.5
3.70	40	1879.999985	0.002	2.5
3.70	30	1879.999987	0.001	2.5
3.70	***20***	***1879.999988***	***0***	***2.5***
3.70	10	1879.999985	0.002	2.5
3.70	0	1879.999984	0.002	2.5
3.70	-10	1879.999992	-0.002	2.5
3.70	-20	1879.999994	-0.003	2.5
3.70	-30	1879.999993	-0.003	2.5

Reference Frequency: PCS Mid Channel 1880 MHz @ 20°C Limit: to stay +- 2.5 ppm = 4700.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.70	***20***	***1879.999988***	***0***	***2.5***
4.20	20	1879.999989	*-0.001*	2.5
3.4(End vdc)	20	1879.999995	*-0.004*	2.5

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Reference Frequency: LTE2 Channel 18900 Freq : 1880MHz @ 20C

Limit: to stay +- 2.5 ppm = 4700.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.70	50	1879.999983	0.003	2.5
3.70	40	1879.999985	0.002	2.5
3.70	30	1879.999984	0.002	2.5
3.70	***20***	***1879.999988***	***0***	***2.5***
3.70	10	1879.999987	0.001	2.5
3.70	0	1879.999988	0.000	2.5
3.70	-10	1879.999984	0.002	2.5
3.70	-20	1879.999987	0.001	2.5
3.70	-30	1879.999986	0.001	2.5

Reference Frequency: PCS Mid Channel 1880 MHz @ 20°C Limit: to stay +- 2.5 ppm = 4700.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.70	***20***	***1879.999988***	***0***	***2.5***
4.20	20	1879.999987	*0.001*	2.5
3.4(End vdc)	20	1879.999987	*0.001*	2.5

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LTE 5, Channel 20524, Freq: 836.5MHz – MID CHANNEL

Reference Frequency: Cell Mid Channel 836.5 MHz @ 20ºC Limit: +- 2.5 ppm = 2091.250 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.70	50	836.500010	-0.002	2.5
3.70	40	836.500009	-0.001	2.5
3.70	30	836.500009	-0.001	2.5
3.70	***20***	***836.500008***	***0***	***2.5***
3.70	10	836.500009	-0.001	2.5
3.70	0	836.500008	0.000	2.5
3.70	-10	836.500010	-0.002	2.5
3.70	-20	836.500010	-0.002	2.5
3.70	-30	836.500012	-0.005	2.5

Reference Frequency: PCS Mid Channel 1880 MHz @ 20ºC Limit: +- 2.5 ppm = 4700.000 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measureed with Time Elapse		
			Delta (ppm)	Limit (ppm)
3.70	***20***	***836.500008***	***0.00000***	***2.5***
4.20	20	836.500010	*-0.00106*	2.5
3.4(End vdc)	20	836.500008	*0.00000*	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

LIMITS

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

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

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

TEST PROCEDURE

ANSI / TIA / EIA 603C Clause 2.2.17

MODES TESTED

GSM 850/1900 WCDMA B2/B5 LTE B2/B5

TEST RESULTS

11.1.1. ERP/EIRP Results

Band	Mode	Channel	f(MHz)	EIRP	
				dBm	mW
GSM1900	GPRS	512	1850.2	30.93	1238.8
		661	1880	30.04	1009.25
		810	1909.8	29.21	833.68
	EGPRS	512	1850.2	28.14	651.63
		661	1880	27.29	535.8
		810	1909.8	27.959	625.03
Band	Mode	Channel	f(MHz)	ERP	
				dBm	mW
GSM850	GPRS	128	824.2	27.251	531.01
		190	836.6	23.321	214.83
		251	848.8	21.381	137.44
	EGPRS	128	824.2	24.891	308.39
		190	836.6	20.241	105.71
		251	848.8	18.701	74.15
Band	Mode	Channel	f(MHz)	EIRP	

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				dBm	mW
Band 2	REL99	9262	1852.4	23.25	211.35
		9400	1880	22.92	195.88
		9538	1907.6	20.54	113.24
	HSDPA	9262	1852.4	23.09	203.7
		9400	1880	22.95	197.24
		9538	1907.6	20.55	113.5

Band	Mode	Channel	f(MHz)	ERP	
				dBm	mW
Band 5	REL99	4132	826.4	17.321	53.96
		4183	836.6	12.651	18.41
		4233	846.6	11.541	14.26
	HSDPA	4132	826.4	16.991	50.01
		4183	836.6	12.411	17.42
		4233	846.6	11.241	13.31

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11.1.2. LTE ERP/EIRP Results

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP / EIRP	
					dBm	mW
LTE5	10	QPSK	1/0	829	17.171	52.13
			1/0	836.5	14.101	25.71
			1/0	844	13.211	20.95
		16QAM	1/0	829	16.221	41.89
			1/0	836.5	13.251	21.14
			1/0	844	11.851	15.31

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP / EIRP	
					dBm	mW
LTE5	5	QPSK	1/0	826.5	17.461	55.73
			1/0	836.5	14.181	26.19
			1/0	846.5	11.541	14.26
		16QAM	1/0	826.5	16.571	45.4
			1/0	836.5	13.161	20.71
			1/0	846.5	10.501	11.22

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP / EIRP	
					dBm	mW
LTE5	3	QPSK	1/0	825.5	17.331	54.09
			1/0	836.5	14.791	30.14
			1/0	847.5	11.481	14.06
		16QAM	1/0	825.5	16.231	41.99
			1/0	836.5	13.601	22.91
			1/0	847.5	10.561	11.38

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP / EIRP	
					dBm	mW
LTE5	1.4	QPSK	1/0	824.7	17.071	50.94
			1/0	836.5	14.521	28.32

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			1/0	848.3	12.031	15.96
		16QAM	1/0	824.7	16.341	43.06
			1/0	836.5	13.341	21.58
			1/0	848.3	11.001	12.59

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP / EIRP	
					dBm	mW
LTE2	20	QPSK	1/0	1860	24.24	265.46
			1/0	1880	23.96	248.89
			1/0	1900	23.86	243.22
		16QAM	1/0	1860	23.54	225.94
			1/0	1880	23.48	222.84
			1/0	1900	23.32	214.78

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP / EIRP	
					dBm	mW
LTE2	15	QPSK	1/0	1857.5	24.12	258.23
			1/0	1880	23.28	212.81
			1/0	1902.5	24.09	256.45
		16QAM	1/0	1857.5	23.4	218.78
			1/0	1880	22.4	173.78
			1/0	1902.5	22.75	188.36

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP / EIRP	
					dBm	mW
LTE2	10	QPSK	1/0	1855	23.92	246.6
			1/0	1880	23.48	222.84
			1/0	1905	23.4	218.78
		16QAM	1/0	1855	23.13	205.59
			1/0	1880	22.96	197.7
			1/0	1905	22.5	177.83

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Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP / EIRP	
					dBm	mW
LTE2	5	QPSK	1/0	1852.5	23.84	242.1
			1/0	1880	22.54	179.47
			1/0	1907.5	23.3	213.8
		16QAM	1/0	1852.5	23.07	202.77
			1/0	1880	21.82	152.05
			1/0	1907.5	22.46	176.2

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP / EIRP	
					dBm	mW
LTE2	3	QPSK	1/0	1851.5	23.91	246.04
			1/0	1880	22.25	167.88
			1/0	1908.5	22.6	181.97
		16QAM	1/0	1851.5	23.17	207.49
			1/0	1880	21.57	143.55
			1/0	1908.5	21.78	150.66

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP / EIRP	
					dBm	mW
LTE2	1.4	QPSK	1/0	1850.7	24.17	261.22
			1/0	1880	21.61	144.88
			1/0	1909.3	21.64	145.88
		16QAM	1/0	1850.7	23.77	238.23
			1/0	1880	20.98	125.31
			1/0	1909.3	21.47	140.28

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11.1.3. ERP/EIRP Data

Band

LTE5

10MHz

16QAM

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company: SAMSUNG
Project #: 14U17033
Date: 03/10/14
Test Engineer: R. Alegre
Configuration: EUT Only
Mode: LTE Band 5_10MHz_ 16QAM

Test Equipment:
Receiving: Sunol T477, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 4ft SMA Cable (SN # 245200 001) 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	16.72	V	0.5	0.0	16.22	38.5	-22.2	
829.00	15.81	H	0.5	0.0	15.31	38.5	-23.1	
Mid Ch								
836.50	9.15	V	0.5	0.0	8.65	38.5	-29.8	
836.50	13.75	H	0.5	0.0	13.25	38.5	-25.2	
High Ch								
844.00	6.85	V	0.5	0.0	6.35	38.5	-32.1	
844.00	12.35	H	0.5	0.0	11.85	38.5	-26.6	

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Band

LTE5

10MHz

QPSK

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company: SAMSUNG
Project #: 14U17033
Date: 03/10/14
Test Engineer: R. Alegre
Configuration: EUT Only
Mode: LTE Band 5_10MHz_ QPSK

Test Equipment:
Receiving: Sunol T477, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 4ft SMA Cable (SN # 245200 001) 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	17.67	V	0.5	0.0	17.17	38.5	-21.3	
829.00	16.84	H	0.5	0.0	16.34	38.5	-22.1	
Mid Ch								
836.50	9.86	V	0.5	0.0	9.36	38.5	-29.1	
836.50	14.60	H	0.5	0.0	14.10	38.5	-24.3	
High Ch								
844.00	7.78	V	0.5	0.0	7.28	38.5	-31.2	
844.00	13.71	H	0.5	0.0	13.21	38.5	-25.2	

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Band

LTE5

5MHz

16QAM

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company: SAMSUNG
Project #: 14U17033
Date: 03/10/14
Test Engineer: R. Alegre
Configuration: EUT Only
Mode: LTE Band 5_5MHz_ 16QAM

Test Equipment:
Receiving: Sunol T477, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 4ft SMA Cable (SN # 245200 001) 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	15.61	V	0.5	0.0	15.11	38.5	-23.3	
826.50	17.07	H	0.5	0.0	16.57	38.5	-21.9	
Mid Ch								
836.50	7.97	V	0.5	0.0	7.47	38.5	-31.0	
836.50	13.66	H	0.5	0.0	13.16	38.5	-25.3	
High Ch								
846.50	6.33	V	0.5	0.0	5.83	38.5	-32.6	
846.50	11.00	H	0.5	0.0	10.50	38.5	-27.9	

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Band

LTE5

5MHz

QPSK

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company: SAMSUNG
Project #: 14U17033
Date: 03/10/14
Test Engineer: R. Alegre
Configuration: EUT Only
Mode: LTE Band 5_5MHz_ QPSK,

Test Equipment:
Receiving: Sunol T477, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 4ft SMA Cable (SN # 245200 001) 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	16.65	V	0.5	0.0	16.15	38.5	-22.3	
826.50	17.96	H	0.5	0.0	17.46	38.5	-21.0	
Mid Ch								
836.50	8.98	V	0.5	0.0	8.48	38.5	-30.0	
836.50	14.68	H	0.5	0.0	14.18	38.5	-24.3	
High Ch								
846.50	7.37	V	0.5	0.0	6.87	38.5	-31.6	
846.50	12.04	H	0.5	0.0	11.54	38.5	-26.9	

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Band

LTE5

3MHz

16QAM

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company: SAMSUNG
Project #: 14U17033
Date: 03/10/14
Test Engineer: R. Alegre
Configuration: EUT Only
Mode: LTE Band 5_3MHz_ 16QAM

Test Equipment:
Receiving: Sunol T477, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 4ft SMA Cable (SN # 245200 001) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
825.50	16.60	V	0.5	0.0	16.10	38.5	-22.3	
825.50	16.73	H	0.5	0.0	16.23	38.5	-22.2	
Mid Ch								
836.50	8.53	V	0.5	0.0	8.03	38.5	-30.4	
836.50	14.10	H	0.5	0.0	13.60	38.5	-24.8	
High Ch								
847.50	5.86	V	0.5	0.0	5.36	38.5	-33.1	
847.50	11.06	H	0.5	0.0	10.56	38.5	-27.9	

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Band

LTE5

3MHz

QPSK

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company: SAMSUNG
Project #: 14U17033
Date: 03/10/14
Test Engineer: R. Alegre
Configuration: EUT Only
Mode: LTE Band 5_3MHz_ QPSK

Test Equipment:
Receiving: Sunol T477, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 4ft SMA Cable (SN # 245200 001) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
825.50	17.57	V	0.5	0.0	17.07	38.5	-21.4	
825.50	17.83	H	0.5	0.0	17.33	38.5	-21.1	
Mid Ch								
836.50	9.55	V	0.5	0.0	9.05	38.5	-29.4	
836.50	15.29	H	0.5	0.0	14.79	38.5	-23.7	
High Ch								
847.50	6.79	V	0.5	0.0	6.29	38.5	-32.2	
847.50	11.98	H	0.5	0.0	11.48	38.5	-27.0	

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Band

LTE5

1.4MHz

16QAM

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company: SAMSUNG
Project #: 14U17033
Date: 03/10/14
Test Engineer: R. Alegre
Configuration: EUT Only
Mode: LTE Band 5_1.4MHz_16QAM

Test Equipment:
Receiving: Sunol T477, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 4ft SMA Cable (SN # 245200 001) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
824.70	16.50	V	0.5	0.0	16.00	38.5	-22.4	
824.70	16.84	H	0.5	0.0	16.34	38.5	-22.1	
Mid Ch								
836.50	3.03	V	0.5	0.0	2.53	38.5	-35.9	
836.50	13.84	H	0.5	0.0	13.34	38.5	-25.1	
High Ch								
848.30	2.48	V	0.5	0.0	1.98	38.5	-36.5	
848.30	11.50	H	0.5	0.0	11.00	38.5	-27.4	

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Band

LTE5

1.4MHz

QPSK

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company: SAMSUNG
Project #: 14U17033
Date: 03/10/14
Test Engineer: R. Alegre
Configuration: EUT Only
Mode: LTE Band 5_1.4MHz_QPSK

Test Equipment:
Receiving: Sunol T477, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 4ft SMA Cable (SN # 245200 001) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
824.70	17.42	V	0.5	0.0	16.92	38.5	-21.5	
824.70	17.57	H	0.5	0.0	17.07	38.5	-21.4	
Mid Ch								
836.50	4.51	V	0.5	0.0	4.01	38.5	-34.4	
836.50	15.02	H	0.5	0.0	14.52	38.5	-23.9	
High Ch								
848.30	3.68	V	0.5	0.0	3.18	38.5	-35.3	
848.30	12.53	H	0.5	0.0	12.03	38.5	-26.4	

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Band

LTE2

20MHz

16QAM

High Frequency Fundamental Measurement
Compliance Certification Services Chamber C

Company: Samsung
Project #: 14U17033
Date: 03/17/14
Test Engineer: Charles Vergonio
Configuration: Y Position, EUT only
Mode: LTE Band 2_20MHz_16QAM

Test Equipment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59 Substitution, 4ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.860	14.9	V	0.85	7.92	21.93	33.0	-11.1	
1.860	16.5	H	0.85	7.92	23.54	33.0	-9.5	
Mid Ch								
1.880	15.3	V	0.85	7.92	22.33	33.0	-10.7	
1.880	16.4	H	0.85	7.92	23.48	33.0	-9.5	
High Ch								
1.900	16.3	V	0.85	7.85	23.32	33.0	-9.7	
1.900	16.1	H	0.85	7.85	23.14	33.0	-9.9	

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Band

LTE2

20MHz

QPSK

High Frequency Fundamental Measurement
Compliance Certification Services Chamber C

Company: Samsung
Project #: 14U17033
Date: 03/17/14
Test Engineer: Charles Vergonio
Configuration: Y Position, EUT only
Mode: LTE Band 2_20MHz_QPSK

Test Equipment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59 Substitution, 4ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.860	15.9	V	0.85	7.92	22.94	33.0	-10.1	
1.860	17.2	H	0.85	7.92	24.24	33.0	-8.8	
Mid Ch								
1.880	15.7	V	0.85	7.92	22.77	33.0	-10.2	
1.880	16.9	H	0.85	7.92	23.96	33.0	-9.0	
High Ch								
1.900	16.7	V	0.85	7.85	23.71	33.0	-9.3	
1.900	16.9	H	0.85	7.85	23.86	33.0	-9.1	

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Band

LTE2

15MHz

16QAM

High Frequency Fundamental Measurement
Compliance Certification Services Chamber C

Company: Samsung
Project #: 14U17033
Date: 03/17/14
Test Engineer: Charles Vergonio
Configuration: Y Position, EUT only
Mode: LTE Band 2_15MHz_16QAM

Test Equipment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59 Substitution, 4ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.858	16.1	V	0.85	7.92	23.12	33.0	-9.9	
1.858	16.3	H	0.85	7.92	23.40	33.0	-9.6	
Mid Ch								
1.880	15.1	V	0.85	7.92	22.13	33.0	-10.9	
1.880	15.3	H	0.85	7.92	22.40	33.0	-10.6	
High Ch								
1.903	15.3	V	0.85	7.85	22.27	33.0	-10.7	
1.903	15.8	H	0.85	7.85	22.75	33.0	-10.3	

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Band

LTE2

15MHz

QPSK

High Frequency Fundamental Measurement
Compliance Certification Services Chamber C

Company: Samsung
Project #: 14U17033
Date: 03/17/14
Test Engineer: Charles Vergonio
Configuration: Y Position, EUT only
Mode: LTE Band 2_15MHz_QPSK

Test Equipment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59 Substitution, 4ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.858	16.5	V	0.85	7.92	23.59	33.0	-9.4	
1.858	17.1	H	0.85	7.92	24.12	33.0	-8.9	
Mid Ch								
1.880	15.4	V	0.85	7.92	22.50	33.0	-10.5	
1.880	16.2	H	0.85	7.92	23.28	33.0	-9.7	
High Ch								
1.903	15.8	V	0.85	7.85	22.84	33.0	-10.2	
1.903	17.1	H	0.85	7.85	24.09	33.0	-8.9	

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Band

LTE2

10MHz

16QAM

High Frequency Fundamental Measurement
Compliance Certification Services Chamber C

Company: Samsung
Project #: 14U17033
Date: 03/17/14
Test Engineer: Charles Vergonio
Configuration: Y Position, EUT only
Mode: LTE Band 2_10MHz_16QAM

Test Equipment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59 Substitution, 4ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.855	15.7	V	0.85	7.92	22.80	33.0	-10.2	
1.855	16.1	H	0.85	7.92	23.13	33.0	-9.9	
Mid Ch								
1.880	14.1	V	0.85	7.92	21.21	33.0	-11.8	
1.880	15.9	H	0.85	7.92	22.96	33.0	-10.0	
High Ch								
1.905	12.4	V	0.85	7.85	19.44	33.0	-13.6	
1.905	15.5	H	0.85	7.85	22.50	33.0	-10.5	

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Band

LTE2

10MHz

QPSK

High Frequency Fundamental Measurement
Compliance Certification Services Chamber C

Company: Samsung
Project #: 14U17033
Date: 03/17/14
Test Engineer: Charles Vergonio
Configuration: Y Position, EUT only
Mode: LTE Band 2_10MHz_QPSK

Test Equipment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59 Substitution, 4ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.855	16.0	V	0.85	7.92	23.02	33.0	-10.0	
1.855	16.9	H	0.85	7.92	23.92	33.0	-9.1	
Mid Ch								
1.880	14.9	V	0.85	7.92	21.97	33.0	-11.0	
1.880	16.4	H	0.85	7.92	23.48	33.0	-9.5	
High Ch								
1.905	13.1	V	0.85	7.85	20.07	33.0	-12.9	
1.905	16.4	H	0.85	7.85	23.40	33.0	-9.6	

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Band

LTE2

5MHz

16QAM

High Frequency Fundamental Measurement
Compliance Certification Services Chamber C

Company: Samsung
Project #: 14U17033
Date: 03/17/14
Test Engineer: Charles Vergonio
Configuration: Y Position, EUT only
Mode: LTE Band 2_5MHz_16QAM

Test Equipment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59 Substitution, 4ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.853	15.8	V	0.85	7.92	22.86	33.0	-10.1	
1.853	16.0	H	0.85	7.92	23.07	33.0	-9.9	
Mid Ch								
1.880	14.7	V	0.85	7.92	21.73	33.0	-11.3	
1.880	14.8	H	0.85	7.92	21.82	33.0	-11.2	
High Ch								
1.908	12.4	V	0.85	7.85	19.42	33.0	-13.6	
1.908	15.5	H	0.85	7.85	22.46	33.0	-10.5	

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High Frequency Fundamental Measurement
Compliance Certification Services Chamber C

Company: Samsung
Project #: 14U17033
Date: 03/17/14
Test Engineer: Charles Vergonio
Configuration: Y Position, EUT only
Mode: LTE Band 2_5MHz_QPSK

Band
LTE2
5MHz
QPSK

Test Equipment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59 Substitution, 4ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.853	16.0	V	0.85	7.92	23.07	33.0	-9.9	
1.853	16.8	H	0.85	7.92	23.84	33.0	-9.2	
Mid Ch								
1.880	14.7	V	0.85	7.92	21.74	33.0	-11.3	
1.880	15.5	H	0.85	7.92	22.54	33.0	-10.5	
High Ch								
1.908	13.7	V	0.85	7.85	20.72	33.0	-12.3	
1.908	16.3	H	0.85	7.85	23.30	33.0	-9.7	

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Band

LTE2

3MHz

16QAM

High Frequency Fundamental Measurement
Compliance Certification Services Chamber C

Company: Samsung
Project #: 14U17033
Date: 03/17/14
Test Engineer: Charles Vergonio
Configuration: Y Position, EUT only
Mode: LTE Band_2_3MHz_16QAM

Test Equipment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59 Substitution, 4ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.852	14.8	V	0.85	7.92	21.91	33.0	-11.1	
1.852	16.1	H	0.85	7.92	23.17	33.0	-9.8	
Mid Ch								
1.880	13.8	V	0.85	7.92	20.86	33.0	-12.1	
1.880	14.5	H	0.85	7.92	21.57	33.0	-11.4	
High Ch								
1.909	12.7	V	0.85	7.85	19.74	33.0	-13.3	
1.909	14.8	H	0.85	7.85	21.78	33.0	-11.2	

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High Frequency Fundamental Measurement
Compliance Certification Services Chamber C

Company: Samsung
Project #: 14U17033
Date: 03/17/14
Test Engineer: Charles Vergonio
Configuration: Y Position, EUT only
Mode: LTE Band_2_3MHz_QPSK

Band
LTE2
3MHz
QPSK

Test Equipment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59 Substitution, 4ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.852	15.7	V	0.85	7.92	22.73	33.0	-10.3	
1.852	16.8	H	0.85	7.92	23.91	33.0	-9.1	
Mid Ch								
1.880	14.4	V	0.85	7.92	21.50	33.0	-11.5	
1.880	15.2	H	0.85	7.92	22.25	33.0	-10.8	
High Ch								
1.909	13.6	V	0.85	7.85	20.59	33.0	-12.4	
1.909	15.6	H	0.85	7.85	22.60	33.0	-10.4	

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Band

LTE2

1.4MHz

16QAM

High Frequency Fundamental Measurement
Compliance Certification Services Chamber C

Company: Samsung
Project #: 14U17033
Date: 03/17/14
Test Engineer: Charles Vergonio
Configuration: Y Position, EUT only
Mode: LTE Band 2_1.4MHz_16QAM

Test Equipment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59 Substitution, 4ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.851	16.7	V	0.85	7.92	23.77	33.0	-9.2	
1.851	15.9	H	0.85	7.92	22.98	33.0	-10.0	
Mid Ch								
1.880	13.4	V	0.85	7.92	20.48	33.0	-12.5	
1.880	13.9	H	0.85	7.92	20.98	33.0	-12.0	
High Ch								
1.909	13.5	V	0.85	7.85	20.54	33.0	-12.5	
1.909	14.5	H	0.85	7.85	21.47	33.0	-11.5	

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Band

LTE2

1.4MHz

QPSK

High Frequency Fundamental Measurement
Compliance Certification Services Chamber C

Company: Samsung
Project #: 14U17033
Date: 03/17/14
Test Engineer: Charles Vergonio
Configuration: Y Position, EUT only
Mode: LTE Band 2_1.4MHz_QPSK

Test Equipment:
Receiving: Horn T119, and Chamber C SMA Cables
Substitution: Horn T59 Substitution, 4ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.851	17.1	V	0.85	7.92	24.17	33.0	-8.8	
1.851	17.0	H	0.85	7.92	24.08	33.0	-8.9	
Mid Ch								
1.880	14.4	V	0.85	7.92	21.46	33.0	-11.5	
1.880	14.5	H	0.85	7.92	21.61	33.0	-11.4	
High Ch								
1.909	14.6	V	0.85	7.85	21.64	33.0	-11.4	
1.909	14.5	H	0.85	7.85	21.47	33.0	-11.5	

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Band

GSM1900

EGPRS

High Frequency Fundamental Measurement
Compliance Certification Services Chamber C

Company: Samsung
Project #: 14U17033
Date: 02/26/14
Test Engineer: R. Alegre
Configuration: EUT ONLY, Y Position
Mode: EGPRS 1900MHz

Test Equipment:
Receiving: T60, and Chamber C SMA Cables
Substitution: Horn T59 Substitution, 4ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.850	21.1	V	0.85	7.90	28.14	33.0	-4.9	
1.850	20.9	H	0.85	7.90	27.91	33.0	-5.1	
Mid Ch								
1.880	19.7	V	0.85	7.90	26.78	33.0	-6.2	
1.880	20.2	H	0.85	7.90	27.29	33.0	-5.7	
High Ch								
1.910	18.2	V	0.85	7.80	25.14	33.0	-7.9	
1.910	21.0	H	0.85	7.80	27.96	33.0	-5.0	

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Band

GSM1 900

GPRS

High Frequency Fundamental Measurement
Compliance Certification Services Chamber C

Company: Samsung
Project #: 14U17033
Date: 02/26/14
Test Engineer: R. Alegre
Configuration: EUT ONLY, Y Position
Mode: GPRS 1900MHz

Test Equipment:
Receiving: T60, and Chamber C SMA Cables
Substitution: Horn T59 Substitution, 4ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.850	23.9	V	0.85	7.90	30.93	33.0	-2.1	
1.850	23.8	H	0.85	7.90	30.84	33.0	-2.2	
Mid Ch								
1.880	21.9	V	0.85	7.90	28.92	33.0	-4.1	
1.880	23.0	H	0.85	7.90	30.04	33.0	-3.0	
High Ch								
1.910	21.4	V	0.85	7.80	28.30	33.0	-4.7	
1.910	22.3	H	0.85	7.80	29.21	33.0	-3.8	

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Band

GSM850

EGPRS

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company: SAMSUNG
Project #: 14U17033
Date: 03/11/14
Test Engineer: K.Kedida
Configuration: EUT Only Y position
Mode: EGRPS 850MHz

Test Equipment:
Receiving: Sunol T243, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 4ft SMA Cable (SN # 245200 001) 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	18.25	V	0.9	0.0	17.35	38.5	-21.1	
824.20	25.79	H	0.9	0.0	24.89	38.5	-13.6	
Mid Ch								
836.60	14.60	V	0.9	0.0	13.70	38.5	-24.7	
836.60	21.14	H	0.9	0.0	20.24	38.5	-18.2	
High Ch								
848.80	13.28	V	0.9	0.0	12.38	38.5	-26.1	
848.80	19.60	H	0.9	0.0	18.70	38.5	-19.7	

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Band

GSM850

GPRS

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company: SAMSUNG
Project #: 14U17033
Date: 03/11/14
Test Engineer: K.Kedida
Configuration: EUT Only Y position
Mode: GRPS 850MHz

Test Equipment:
Receiving: Sunol T243, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 4ft SMA Cable (SN # 245200 001) 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	21.20	V	0.9	0.0	20.30	38.5	-18.1	
824.20	28.15	H	0.9	0.0	27.25	38.5	-11.2	
Mid Ch								
836.60	17.40	V	0.9	0.0	16.50	38.5	-21.9	
836.60	24.22	H	0.9	0.0	23.32	38.5	-15.1	
High Ch								
848.80	16.13	V	0.9	0.0	15.23	38.5	-23.2	
848.80	22.28	H	0.9	0.0	21.38	38.5	-17.1	

Rev. 3.17.11

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Band

Band 2

HSDPA

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: Samsung
Project #: 14U17033
Date: 03/05/14
Test Engineer: R.Alegre
Configuration: EUT ONLY, Y Position
Mode: HSDPA 1900MHz

Test Equipment:
Receiving: T344, and Chamber C SMA Cables
Substitution: Horn T59 Substitution, 4ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.852	15.5	V	0.85	7.92	22.53	33.0	-10.5	
1.852	16.0	H	0.85	7.92	23.09	33.0	-9.9	
Mid Ch								
1.880	15.9	V	0.85	7.92	22.95	33.0	-10.1	
1.880	15.0	H	0.85	7.92	22.10	33.0	-10.9	
High Ch								
1.908	13.5	V	0.85	7.92	20.55	33.0	-12.5	
1.908	13.2	H	0.85	7.92	20.24	33.0	-12.8	

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Band

Band 2

REL99

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: Samsung
Project #: 14U17033
Date: 03/05/14
Test Engineer: R. Alegre
Configuration: EUT ONLY, Y Position
Mode: REL99 1900MHz

Test Equipment:
Receiving: T344, and Chamber C SMA Cables
Substitution: Horn T59 Substitution, 4ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch								
1.852	16.0	V	0.85	7.92	23.06	33.0	-9.9	
1.852	16.2	H	0.85	7.92	23.25	33.0	-9.8	
Mid Ch								
1.880	15.9	V	0.85	7.92	22.92	33.0	-10.1	
1.880	14.8	H	0.85	7.92	21.87	33.0	-11.1	
High Ch								
1.907	13.5	V	0.85	7.92	20.54	33.0	-12.5	
1.907	13.0	H	0.85	7.92	20.09	33.0	-12.9	

Rev. 3.17.11

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Band

Band 5

HSDPA

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company: Samsung
Project #: 14U17033
Date: 03/05/14
Test Engineer: R. Alegre
Configuration: EUT only, Y Position
Mode: WCDMA_HSDPA_ 850

Test Equipment:
Receiving: Sunol T243, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 4ft SMA Cable (SN # 245200 001) 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	8.92	V	0.9	0.0	8.02	38.5	-30.4	
826.40	17.89	H	0.9	0.0	16.99	38.5	-21.5	
Mid Ch								
836.60	5.84	V	0.9	0.0	4.94	38.5	-33.5	
836.60	13.31	H	0.9	0.0	12.41	38.5	-26.0	
High Ch								
846.60	5.69	V	0.9	0.0	4.79	38.5	-33.7	
846.60	12.14	H	0.9	0.0	11.24	38.5	-27.2	

Rev. 3.17.11

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Band

Band 5

REL99

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company: Samsung
Project #: 14U17033
Date: 03/05/14
Test Engineer: R. Alegre
Configuration: EUT only, Y position
Mode: WCDMA_Rel 99_850

Test Equipment:
Receiving: Sunol T243, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 4ft SMA Cable (SN # 245200 001) 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	9.00	V	0.9	0.0	8.10	38.5	-30.3	
826.40	18.22	H	0.9	0.0	17.32	38.5	-21.1	
Mid Ch								
836.60	6.14	V	0.9	0.0	5.24	38.5	-33.2	
836.60	13.55	H	0.9	0.0	12.65	38.5	-25.8	
High Ch								
846.60	5.71	V	0.9	0.0	4.81	38.5	-33.6	
846.60	12.44	H	0.9	0.0	11.54	38.5	-26.9	

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11.2. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

FCC: §2.1053, §22.917, §24.238

LIMIT

§22.917 (e) and §24.238 (a): Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB

TEST PROCEDURE

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

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

MODES TESTED

GSM 850/1900 WCDMA B2/B5 LTE B2/B5

RESULTS

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701I
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11.2.1. SPURIOUS RADIATION PLOTS

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 14U17033
Date: 03/10/14
Test Engineer: Kiya Kedida
Configuration: X Position, EUT and AC Adapter
Mode: TX, LTE B5 10MHZ 16QAM

Chamber	Pre-amplifer	Filter	Limit
5m Chamber	T145 8449B	Filter 1	Part 22

Band: LTE5 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, (829MHz)									
1.658	-18.8	V	3.0	32.6	1.0	-50.4	-13.0	-37.4	
2.487	-16.9	V	3.0	31.4	1.0	-47.3	-13.0	-34.3	
3.316	-15.2	V	3.0	30.5	1.0	-44.7	-13.0	-31.7	
1.658	-19.8	H	3.0	32.6	1.0	-51.4	-13.0	-38.4	
2.487	-19.6	H	3.0	31.4	1.0	-50.0	-13.0	-37.0	
3.316	-14.6	H	3.0	30.5	1.0	-44.1	-13.0	-31.1	
Mid Ch, (836.5MHz)									
1.673	-19.3	V	3.0	32.6	1.0	-50.9	-13.0	-37.9	
2.509	-16.5	V	3.0	31.5	1.0	-46.9	-13.0	-33.9	
3.346	-14.6	V	3.0	30.5	1.0	-44.1	-13.0	-31.1	
1.673	-18.9	H	3.0	32.6	1.0	-50.5	-13.0	-37.5	
2.509	-18.2	H	3.0	31.5	1.0	-48.7	-13.0	-35.7	
3.346	-15.2	H	3.0	30.5	1.0	-44.7	-13.0	-31.7	
High Ch, (844MHz)									
1.688	-18.9	V	3.0	32.6	1.0	-50.5	-13.0	-37.5	
2.532	-16.5	V	3.0	31.5	1.0	-46.9	-13.0	-33.9	
3.376	-14.4	V	3.0	30.5	1.0	-43.8	-13.0	-30.8	
1.688	-17.9	H	3.0	32.6	1.0	-49.5	-13.0	-36.5	
2.532	-18.7	H	3.0	31.5	1.0	-49.1	-13.0	-36.1	
3.376	-14.4	H	3.0	30.5	1.0	-43.9	-13.0	-30.9	

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: Samsung
Project #: 14U17033
Date: 03/10/14
Test Engineer: Kiya Kedida
Configuration: X Position, EUT and AC Adapter
Mode: TX, LTE B5 10MHZ QPSK

Chamber	Pre-amplifer	Filter	Limit
5m Chamber	T145 8449B	Filter 1	Part 22

Band

LTE5

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, (829MHz)									
1.658	-18.2	V	3.0	32.6	1.0	-49.9	-13.0	-36.9	
2.487	-16.6	V	3.0	31.4	1.0	-47.0	-13.0	-34.0	
3.316	-14.0	V	3.0	30.5	1.0	-43.5	-13.0	-30.5	
1.658	-19.1	H	3.0	32.6	1.0	-50.7	-13.0	-37.7	
2.487	-18.8	H	3.0	31.4	1.0	-49.2	-13.0	-36.2	
3.316	-13.9	H	3.0	30.5	1.0	-43.4	-13.0	-30.4	
Mid Ch, (836.5MHz)									
1.673	-19.1	V	3.0	32.6	1.0	-50.7	-13.0	-37.7	
2.509	-16.0	V	3.0	31.5	1.0	-46.5	-13.0	-33.5	
3.346	-14.0	V	3.0	30.5	1.0	-43.5	-13.0	-30.5	
1.673	-18.1	H	3.0	32.6	1.0	-49.7	-13.0	-36.7	
2.509	-17.9	H	3.0	31.5	1.0	-48.4	-13.0	-35.4	
3.346	-14.1	H	3.0	30.5	1.0	-43.6	-13.0	-30.6	
High Ch, (844MHz)									
1.688	-18.5	V	3.0	32.6	1.0	-50.1	-13.0	-37.1	
2.532	-15.6	V	3.0	31.5	1.0	-46.1	-13.0	-33.1	
3.376	-13.4	V	3.0	30.5	1.0	-42.9	-13.0	-29.9	
1.688	-16.9	H	3.0	32.6	1.0	-48.5	-13.0	-35.5	
2.532	-17.7	H	3.0	31.5	1.0	-48.1	-13.0	-35.1	
3.376	-13.8	H	3.0	30.5	1.0	-43.3	-13.0	-30.3	

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: Samsung
Project #: 14U17033
Date: 03/10/14
Test Engineer: Kiya Kedida
Configuration: X Position, EUT and AC Adapter
Mode: TX, LTE B5 5MHZ 16QAM

Chamber	Pre-amplifer	Filter	Limit
5m Chamber	T145 8449B	Filter 1	Part 22

Band: LTE5 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, (826.5MHz)									
1.653	-18.4	V	3.0	32.7	1.0	-50.0	-13.0	-37.0	
2.479	-15.9	V	3.0	31.4	1.0	-46.3	-13.0	-33.3	
3.306	-13.8	V	3.0	30.5	1.0	-43.4	-13.0	-30.4	
1.653	-19.9	H	3.0	32.7	1.0	-51.6	-13.0	-38.6	
2.479	-19.5	H	3.0	31.4	1.0	-49.9	-13.0	-36.9	
3.306	-14.4	H	3.0	30.5	1.0	-44.0	-13.0	-31.0	
Mid Ch, (836.5MHz)									
1.673	-18.0	V	3.0	32.6	1.0	-49.6	-13.0	-36.6	
2.509	-16.1	V	3.0	31.5	1.0	-46.5	-13.0	-33.5	
3.346	-14.3	V	3.0	30.5	1.0	-43.8	-13.0	-30.8	
1.673	-19.9	H	3.0	32.6	1.0	-51.5	-13.0	-38.5	
2.509	-18.4	H	3.0	31.5	1.0	-48.9	-13.0	-35.9	
3.346	-14.0	H	3.0	30.5	1.0	-43.5	-13.0	-30.5	
High Ch, (846.5MHz)									
1.693	-17.3	V	3.0	32.6	1.0	-48.9	-13.0	-35.9	
2.539	-16.7	V	3.0	31.4	1.0	-47.1	-13.0	-34.1	
3.386	-14.0	V	3.0	30.5	1.0	-43.5	-13.0	-30.5	
1.693	-19.4	H	3.0	32.6	1.0	-51.0	-13.0	-38.0	
2.539	-18.4	H	3.0	31.4	1.0	-48.9	-13.0	-35.9	
3.386	-13.9	H	3.0	30.5	1.0	-43.4	-13.0	-30.4	

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: Samsung
Project #: 14U17033
Date: 03/10/14
Test Engineer: Kiya Kedida
Configuration: X Position, EUT and AC Adapter
Mode: TX, LTE B5 5MHZ QPSK

Chamber	Pre-amplifer	Filter	Limit
5m Chamber	T145 8449B	Filter 1	Part 22

Band	f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch, (826.5MHz)									
LTE5	1.653	-17.8	V	3.0	32.7	1.0	-49.5	-13.0	-36.5	
	2.479	-15.4	V	3.0	31.4	1.0	-45.8	-13.0	-32.8	
5MHz	3.306	-13.2	V	3.0	30.5	1.0	-42.8	-13.0	-29.8	
	1.653	-19.4	H	3.0	32.7	1.0	-51.0	-13.0	-38.0	
QPSK	2.479	-19.0	H	3.0	31.4	1.0	-49.4	-13.0	-36.4	
	3.306	-13.6	H	3.0	30.5	1.0	-43.1	-13.0	-30.1	
	Mid Ch, (836.5MHz)									
	1.673	-17.7	V	3.0	32.6	1.0	-49.3	-13.0	-36.3	
	2.509	-15.6	V	3.0	31.5	1.0	-46.1	-13.0	-33.1	
	3.346	-13.8	V	3.0	30.5	1.0	-43.3	-13.0	-30.3	
	1.673	-19.4	H	3.0	32.6	1.0	-51.0	-13.0	-38.0	
	2.509	-17.7	H	3.0	31.5	1.0	-48.2	-13.0	-35.2	
	3.346	-13.4	H	3.0	30.5	1.0	-42.9	-13.0	-29.9	
	High Ch, (846.5MHz)									
	1.693	-16.3	V	3.0	32.6	1.0	-47.9	-13.0	-34.9	
	2.539	-15.9	V	3.0	31.4	1.0	-46.4	-13.0	-33.4	
	3.386	-13.8	V	3.0	30.5	1.0	-43.3	-13.0	-30.3	
	1.693	-18.6	H	3.0	32.6	1.0	-50.1	-13.0	-37.1	
	2.539	-18.2	H	3.0	31.4	1.0	-48.6	-13.0	-35.6	
	3.386	-13.3	H	3.0	30.5	1.0	-42.8	-13.0	-29.8	

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: Samsung
Project #: 14U17033
Date: 03/10/14
Test Engineer: Kiya Kedida
Configuration: X Position, EUT and AC Adapter
Mode: TX, LTE B5 3MHZ 16QAM

Chamber	Pre-amplifer	Filter	Limit
5m Chamber	T145 8449B	Filter 1	Part 22

Band: LTE5 3MHz 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, (825.5MHz)									
1.651	-17.4	V	3.0	32.7	1.0	-49.0	-13.0	-36.0	
2.477	-16.1	V	3.0	31.4	1.0	-46.5	-13.0	-33.5	
3.302	-14.7	V	3.0	30.5	1.0	-44.3	-13.0	-31.3	
1.651	-20.2	H	3.0	32.7	1.0	-51.8	-13.0	-38.8	
2.477	-18.4	H	3.0	31.4	1.0	-48.7	-13.0	-35.7	
3.302	-15.3	H	3.0	30.5	1.0	-44.9	-13.0	-31.9	
Mid Ch, (836.5MHz)									
1.673	-19.6	V	3.0	32.6	1.0	-51.2	-13.0	-38.2	
2.509	-16.3	V	3.0	31.5	1.0	-46.7	-13.0	-33.7	
3.346	-14.4	V	3.0	30.5	1.0	-43.9	-13.0	-30.9	
1.673	-20.0	H	3.0	32.6	1.0	-51.6	-13.0	-38.6	
2.509	-18.8	H	3.0	31.5	1.0	-49.3	-13.0	-36.3	
3.346	-14.1	H	3.0	30.5	1.0	-43.6	-13.0	-30.6	
High Ch, (847.5MHz)									
1.695	-16.0	V	3.0	32.6	1.0	-47.5	-13.0	-34.5	
2.542	-16.8	V	3.0	31.4	1.0	-47.2	-13.0	-34.2	
3.390	-14.7	V	3.0	30.5	1.0	-44.2	-13.0	-31.2	
1.695	-17.7	H	3.0	32.6	1.0	-49.3	-13.0	-36.3	
2.542	-18.0	H	3.0	31.4	1.0	-48.4	-13.0	-35.4	
3.390	-15.0	H	3.0	30.5	1.0	-44.5	-13.0	-31.5	

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: Samsung
Project #: 14U17033
Date: 03/10/14
Test Engineer: Kiya Kedida
Configuration: X Position, EUT and AC Adapter
Mode: TX, LTE B5 3MHZ QPSK

Chamber	Pre-amplifer	Filter	Limit
5m Chamber	T145 8449B	Filter 1	Part 22

Band	f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
	Low Ch, (825.5MHz)									
LTE5	1.651	-16.8	V	3.0	32.7	1.0	-48.5	-13.0	-35.5	
	2.477	-15.7	V	3.0	31.4	1.0	-46.1	-13.0	-33.1	
3MHz	3.302	-14.0	V	3.0	30.5	1.0	-43.5	-13.0	-30.5	
	1.651	-19.8	H	3.0	32.7	1.0	-51.4	-13.0	-38.4	
	2.477	-18.0	H	3.0	31.4	1.0	-48.4	-13.0	-35.4	
QPSK	3.302	-14.5	H	3.0	30.5	1.0	-44.0	-13.0	-31.0	
	Mid Ch, (836.5MHz)									
	1.673	-18.7	V	3.0	32.6	1.0	-50.3	-13.0	-37.3	
	2.509	-15.5	V	3.0	31.5	1.0	-46.0	-13.0	-33.0	
	3.346	-13.8	V	3.0	30.5	1.0	-43.3	-13.0	-30.3	
	1.673	-19.4	H	3.0	32.6	1.0	-51.0	-13.0	-38.0	
	2.509	-18.3	H	3.0	31.5	1.0	-48.8	-13.0	-35.8	
	3.346	-13.4	H	3.0	30.5	1.0	-42.9	-13.0	-29.9	
	High Ch, (847.5MHz)									
	1.695	-15.4	V	3.0	32.6	1.0	-46.9	-13.0	-33.9	
	2.542	-16.3	V	3.0	31.4	1.0	-46.8	-13.0	-33.8	
	3.390	-13.9	V	3.0	30.5	1.0	-43.3	-13.0	-30.3	
	1.695	-17.0	H	3.0	32.6	1.0	-48.6	-13.0	-35.6	
	2.542	-17.8	H	3.0	31.4	1.0	-48.2	-13.0	-35.2	
	3.390	-14.0	H	3.0	30.5	1.0	-43.5	-13.0	-30.5	

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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Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 14U17033
Date: 03/10/14
Test Engineer: Kiya Kedida
Configuration: X Position, EUT and AC Adapter
Mode: TX, LTE B5 1.4MHZ 16QAM

Chamber	Pre-amplifer	Filter	Limit
5m Chamber	T145 8449B	Filter 1	Part 22

Band LTE5 1.4MHz 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, (824.7MHz)									
1.649	-18.1	V	3.0	32.7	1.0	-49.7	-13.0	-36.7	
2.474	-16.9	V	3.0	31.4	1.0	-47.2	-13.0	-34.2	
3.298	-15.1	V	3.0	30.5	1.0	-44.7	-13.0	-31.7	
1.649	-20.9	H	3.0	32.7	1.0	-52.6	-13.0	-39.6	
2.474	-19.1	H	3.0	31.4	1.0	-49.5	-13.0	-36.5	
3.298	-15.7	H	3.0	30.5	1.0	-45.2	-13.0	-32.2	
Mid Ch, (836.5MHz)									
1.673	-20.0	V	3.0	32.6	1.0	-51.6	-13.0	-38.6	
2.509	-16.7	V	3.0	31.5	1.0	-47.2	-13.0	-34.2	
3.346	-14.6	V	3.0	30.5	1.0	-44.1	-13.0	-31.1	
1.673	-19.4	H	3.0	32.6	1.0	-51.0	-13.0	-38.0	
2.509	-19.6	H	3.0	31.5	1.0	-50.0	-13.0	-37.0	
3.346	-15.1	H	3.0	30.5	1.0	-44.6	-13.0	-31.6	
High Ch, (848.3MHz)									
1.696	-19.8	V	3.0	32.6	1.0	-51.4	-13.0	-38.4	
2.544	-17.5	V	3.0	31.4	1.0	-47.9	-13.0	-34.9	
3.393	-14.9	V	3.0	30.5	1.0	-44.3	-13.0	-31.3	
1.696	-17.9	H	3.0	32.6	1.0	-49.4	-13.0	-36.4	
2.544	-19.1	H	3.0	31.4	1.0	-49.6	-13.0	-36.6	
3.393	-15.1	H	3.0	30.5	1.0	-44.5	-13.0	-31.5	

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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Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 14U17033
Date: 03/10/14
Test Engineer: Kiya Kedida
Configuration: X Position, EUT and AC Adapter
Mode: TX, LTE B5 1.4MHZ QPSK

Chamber	Pre-amplifer	Filter	Limit
5m Chamber	T145 8449B	Filter 1	Part 22

Band LTE5 1.4MHz 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, (824.7MHz)									
1.649	-17.3	V	3.0	32.7	1.0	-49.0	-13.0	-36.0	
2.474	-16.1	V	3.0	31.4	1.0	-46.5	-13.0	-33.5	
3.298	-14.4	V	3.0	30.5	1.0	-43.9	-13.0	-30.9	
1.649	-20.2	H	3.0	32.7	1.0	-51.8	-13.0	-38.8	
2.474	-18.4	H	3.0	31.4	1.0	-48.7	-13.0	-35.7	
3.298	-14.9	H	3.0	30.5	1.0	-44.5	-13.0	-31.5	
Mid Ch, (836.5MHz)									
1.673	-19.3	V	3.0	32.6	1.0	-50.9	-13.0	-37.9	
2.509	-16.0	V	3.0	31.5	1.0	-46.4	-13.0	-33.4	
3.346	-13.8	V	3.0	30.5	1.0	-43.3	-13.0	-30.3	
1.673	-18.6	H	3.0	32.6	1.0	-50.2	-13.0	-37.2	
2.509	-18.8	H	3.0	31.5	1.0	-49.3	-13.0	-36.3	
3.346	-14.4	H	3.0	30.5	1.0	-43.9	-13.0	-30.9	
High Ch, (848.3MHz)									
1.696	-19.1	V	3.0	32.6	1.0	-50.6	-13.0	-37.6	
2.544	-16.7	V	3.0	31.4	1.0	-47.2	-13.0	-34.2	
3.393	-14.1	V	3.0	30.5	1.0	-43.6	-13.0	-30.6	
1.696	-17.1	H	3.0	32.6	1.0	-48.7	-13.0	-35.7	
2.544	-18.4	H	3.0	31.4	1.0	-48.8	-13.0	-35.8	
3.393	-14.3	H	3.0	30.5	1.0	-43.8	-13.0	-30.8	

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: Samsung
Project #: 14U17033
Date: 03/10/14
Test Engineer: Kiya Kedida
Configuration: Y Position, EUT and AC Adapter
Mode: LTE2_20M_16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber	T343 8449B	Filter 1	Part 24

Band

LTE2

20MHz

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, 1860MHz									
3.720	-18.8	V	3.0	35.4	1.0	-53.2	-13.0	-40.2	
5.580	-14.9	V	3.0	34.7	1.0	-48.6	-13.0	-35.6	
7.440	-9.5	V	3.0	34.9	1.0	-43.4	-13.0	-30.4	
3.720	-21.2	H	3.0	35.4	1.0	-55.6	-13.0	-42.6	
5.580	-14.9	H	3.0	34.7	1.0	-48.7	-13.0	-35.7	
7.440	-9.3	H	3.0	34.9	1.0	-43.3	-13.0	-30.3	
Mid Ch, 1880.0MHz									
3.760	-18.0	V	3.0	35.3	1.0	-52.3	-13.0	-39.3	
5.640	-16.1	V	3.0	34.7	1.0	-49.8	-13.0	-36.8	
7.520	-10.4	V	3.0	34.9	1.0	-44.3	-13.0	-31.3	
3.760	-20.3	H	3.0	35.3	1.0	-54.6	-13.0	-41.6	
5.640	-16.5	H	3.0	34.7	1.0	-50.2	-13.0	-37.2	
7.520	-11.4	H	3.0	34.9	1.0	-45.4	-13.0	-32.4	
High Ch, 1900 MHz									
3.800	-18.5	V	3.0	35.3	1.0	-52.8	-13.0	-39.8	
5.700	-15.5	V	3.0	34.7	1.0	-49.2	-13.0	-36.2	
7.600	-9.3	V	3.0	34.9	1.0	-43.3	-13.0	-30.3	
3.800	-19.5	H	3.0	35.3	1.0	-53.8	-13.0	-40.8	
5.700	-16.7	H	3.0	34.7	1.0	-50.4	-13.0	-37.4	
7.600	-9.1	H	3.0	34.9	1.0	-43.0	-13.0	-30.0	

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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Band

LTE2

20MHz

QPSK

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 14U17033
Date: 03/10/14
Test Engineer: Kiya Kedida
Configuration: Y Position, EUT and AC Adapter
Mode: LTE2_20M_QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber	T343 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1860MHz									
3.720	-18.2	V	3.0	35.4	1.0	-52.6	-13.0	-39.6	
5.580	-14.3	V	3.0	34.7	1.0	-48.1	-13.0	-35.1	
7.440	-8.2	V	3.0	34.9	1.0	-42.1	-13.0	-29.1	
3.720	-20.1	H	3.0	35.4	1.0	-54.5	-13.0	-41.5	
5.580	-14.5	H	3.0	34.7	1.0	-48.2	-13.0	-35.2	
7.440	-8.5	H	3.0	34.9	1.0	-42.5	-13.0	-29.5	
Mid Ch, 1880.0MHz									
3.760	-17.1	V	3.0	35.3	1.0	-51.4	-13.0	-38.4	
5.640	-15.2	V	3.0	34.7	1.0	-49.0	-13.0	-36.0	
7.520	-9.3	V	3.0	34.9	1.0	-43.2	-13.0	-30.2	
3.760	-19.5	H	3.0	35.3	1.0	-53.8	-13.0	-40.8	
5.640	-15.2	H	3.0	34.7	1.0	-48.9	-13.0	-35.9	
7.520	-10.0	H	3.0	34.9	1.0	-43.9	-13.0	-30.9	
High Ch, 1900 MHz									
3.800	-17.7	V	3.0	35.3	1.0	-52.0	-13.0	-39.0	
5.700	-14.8	V	3.0	34.7	1.0	-48.5	-13.0	-35.5	
7.600	-8.3	V	3.0	34.9	1.0	-42.3	-13.0	-29.3	
3.800	-18.8	H	3.0	35.3	1.0	-53.1	-13.0	-40.1	
5.700	-15.3	H	3.0	34.7	1.0	-49.0	-13.0	-36.0	
7.600	-8.0	H	3.0	34.9	1.0	-41.9	-13.0	-28.9	

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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Band

LTE2

15MHz

16QAM

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 14U17033
Date: 03/10/14
Test Engineer: Kiya Kedida
Configuration: Y Position, EUT and AC Adapter
Mode: LTE2_15M_16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber	T343 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1857.5MHz									
3.715	-20.1	V	3.0	35.4	1.0	-54.5	-13.0	-41.5	
5.572	-16.6	V	3.0	34.7	1.0	-50.3	-13.0	-37.3	
7.424	-9.0	V	3.0	34.9	1.0	-43.0	-13.0	-30.0	
3.715	-20.7	H	3.0	35.4	1.0	-55.1	-13.0	-42.1	
5.572	-16.9	H	3.0	34.7	1.0	-50.7	-13.0	-37.7	
7.424	-9.9	H	3.0	34.9	1.0	-43.8	-13.0	-30.8	
Mid Ch, 1880.0MHz									
3.760	-19.7	V	3.0	35.3	1.0	-54.0	-13.0	-41.0	
5.640	-16.6	V	3.0	34.7	1.0	-50.3	-13.0	-37.3	
7.520	-8.8	V	3.0	34.9	1.0	-42.7	-13.0	-29.7	
3.760	-19.4	H	3.0	35.3	1.0	-53.7	-13.0	-40.7	
5.640	-15.8	H	3.0	34.7	1.0	-49.5	-13.0	-36.5	
7.520	-9.5	H	3.0	34.9	1.0	-43.5	-13.0	-30.5	
High Ch, 1902.5 MHz									
3.805	-19.1	V	3.0	35.3	1.0	-53.4	-13.0	-40.4	
5.707	-15.9	V	3.0	34.7	1.0	-49.6	-13.0	-36.6	
7.610	-9.1	V	3.0	34.9	1.0	-43.0	-13.0	-30.0	
3.805	-19.7	H	3.0	35.3	1.0	-54.0	-13.0	-41.0	
5.707	-16.4	H	3.0	34.7	1.0	-50.1	-13.0	-37.1	
7.610	-9.2	H	3.0	34.9	1.0	-43.2	-13.0	-30.2	

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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Band

LTE2

15MHz

QPSK

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 14U17033
Date: 03/10/14
Test Engineer: Kiya Kedida
Configuration: Y Position, EUT and AC Adapter
Mode: LTE2_15M_QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber	T343 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1857.5MHz									
3.715	-19.4	V	3.0	35.4	1.0	-53.8	-13.0	-40.8	
5.572	-16.0	V	3.0	34.7	1.0	-49.7	-13.0	-36.7	
7.424	-8.6	V	3.0	34.9	1.0	-42.5	-13.0	-29.5	
3.715	-19.5	H	3.0	35.4	1.0	-53.9	-13.0	-40.9	
5.572	-16.6	H	3.0	34.7	1.0	-50.3	-13.0	-37.3	
7.424	-9.4	H	3.0	34.9	1.0	-43.4	-13.0	-30.4	
Mid Ch, 1880.0MHz									
3.760	-19.0	V	3.0	35.3	1.0	-53.3	-13.0	-40.3	
5.640	-15.8	V	3.0	34.7	1.0	-49.5	-13.0	-36.5	
7.520	-8.2	V	3.0	34.9	1.0	-42.1	-13.0	-29.1	
3.760	-18.5	H	3.0	35.3	1.0	-52.8	-13.0	-39.8	
5.640	-15.3	H	3.0	34.7	1.0	-49.0	-13.0	-36.0	
7.520	-8.2	H	3.0	34.9	1.0	-42.2	-13.0	-29.2	
High Ch, 1902.5 MHz									
3.805	-18.0	V	3.0	35.3	1.0	-52.3	-13.0	-39.3	
5.707	-15.1	V	3.0	34.7	1.0	-48.8	-13.0	-35.8	
7.610	-7.9	V	3.0	34.9	1.0	-41.8	-13.0	-28.8	
3.805	-19.0	H	3.0	35.3	1.0	-53.3	-13.0	-40.3	
5.707	-15.4	H	3.0	34.7	1.0	-49.1	-13.0	-36.1	
7.610	-8.0	H	3.0	34.9	1.0	-41.9	-13.0	-28.9	

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

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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Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 14U17033
Date: 03/07/14
Test Engineer: Kiya Kedida
Configuration: Y Position, EUT and AC Adapter
Mode: LTE2_10M_16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber	T343 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, 1855.0MHz									
3.735	-22.1	V	3.0	35.4	1.0	-56.4	-13.0	-43.4	
5.615	-18.9	V	3.0	34.7	1.0	-52.7	-13.0	-39.7	
7.495	-15.1	V	3.0	34.9	1.0	-49.1	-13.0	-36.1	
3.735	-23.0	H	3.0	35.4	1.0	-57.4	-13.0	-44.4	
5.615	-19.6	H	3.0	34.7	1.0	-53.3	-13.0	-40.3	
7.495	-15.0	H	3.0	34.9	1.0	-48.9	-13.0	-35.9	
Mid Ch, 1880.0MHz									
3.760	-22.3	V	3.0	35.3	1.0	-56.6	-13.0	-43.6	
5.640	-18.7	V	3.0	34.7	1.0	-52.4	-13.0	-39.4	
7.520	-14.8	V	3.0	34.9	1.0	-48.7	-13.0	-35.7	
3.760	-23.4	H	3.0	35.3	1.0	-57.7	-13.0	-44.7	
5.640	-19.5	H	3.0	34.7	1.0	-53.2	-13.0	-40.2	
7.520	-15.6	H	3.0	34.9	1.0	-49.6	-13.0	-36.6	
High Ch, 1908 MHz									
3.816	-21.5	V	3.0	35.3	1.0	-55.8	-13.0	-42.8	
5.724	-17.9	V	3.0	34.7	1.0	-51.7	-13.0	-38.7	
7.632	-13.7	V	3.0	34.9	1.0	-47.6	-13.0	-34.6	
3.816	-23.1	H	3.0	35.3	1.0	-57.4	-13.0	-44.4	
5.724	-19.4	H	3.0	34.7	1.0	-53.2	-13.0	-40.2	
7.632	-14.2	H	3.0	34.9	1.0	-48.2	-13.0	-35.2	

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

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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Band

LTE2

10MHz

QPSK

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 14U17033
Date: 03/07/14
Test Engineer: Kiya Kedida
Configuration: Y Position, EUT and AC Adapter
Mode: LTE2_10M_QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber	T343 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1855.0MHz									
3.735	-21.4	V	3.0	35.4	1.0	-55.7	-13.0	-42.7	
5.615	-18.5	V	3.0	34.7	1.0	-52.3	-13.0	-39.3	
7.495	-14.2	V	3.0	34.9	1.0	-48.1	-13.0	-35.1	
3.735	-22.0	H	3.0	35.4	1.0	-56.3	-13.0	-43.3	
5.615	-19.0	H	3.0	34.7	1.0	-52.7	-13.0	-39.7	
7.495	-14.2	H	3.0	34.9	1.0	-48.2	-13.0	-35.2	
Mid Ch, 1880.0MHz									
3.760	-21.6	V	3.0	35.3	1.0	-56.0	-13.0	-43.0	
5.640	-17.9	V	3.0	34.7	1.0	-51.7	-13.0	-38.7	
7.520	-14.3	V	3.0	34.9	1.0	-48.2	-13.0	-35.2	
3.760	-22.6	H	3.0	35.3	1.0	-56.9	-13.0	-43.9	
5.640	-18.8	H	3.0	34.7	1.0	-52.5	-13.0	-39.5	
7.520	-14.5	H	3.0	34.9	1.0	-48.5	-13.0	-35.5	
High Ch, 1908 MHz									
3.816	-20.6	V	3.0	35.3	1.0	-54.9	-13.0	-41.9	
5.724	-17.2	V	3.0	34.7	1.0	-51.0	-13.0	-38.0	
7.632	-13.0	V	3.0	34.9	1.0	-46.9	-13.0	-33.9	
3.816	-22.6	H	3.0	35.3	1.0	-56.9	-13.0	-43.9	
5.724	-18.0	H	3.0	34.7	1.0	-51.8	-13.0	-38.8	
7.632	-13.3	H	3.0	34.9	1.0	-47.3	-13.0	-34.3	

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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Band

LTE2

5MHz

16QAM

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 14U17033
Date: 03/07/14
Test Engineer: Trina Noor
Configuration: Y Position, EUT and AC Adapter
Mode: LTE2_5M_16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber	T343 8449B	Filter 1	Part 24

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	-22.0	V	3.0	35.4	1.0	-56.4	-13.0	-43.4	
5.557	-19.8	V	3.0	34.7	1.0	-53.5	-13.0	-40.5	
7.409	-14.8	V	3.0	34.9	1.0	-48.8	-13.0	-35.8	
3.705	-23.3	H	3.0	35.4	1.0	-57.7	-13.0	-44.7	
5.557	-18.8	H	3.0	34.7	1.0	-52.5	-13.0	-39.5	
7.409	-15.6	H	3.0	34.9	1.0	-49.5	-13.0	-36.5	
Mid Ch, 1880.0MHz									
3.760	-22.4	V	3.0	35.3	1.0	-56.7	-13.0	-43.7	
5.640	-20.3	V	3.0	34.7	1.0	-54.0	-13.0	-41.0	
7.520	-15.3	V	3.0	34.9	1.0	-49.2	-13.0	-36.2	
3.760	-22.7	H	3.0	35.3	1.0	-57.0	-13.0	-44.0	
5.640	-18.8	H	3.0	34.7	1.0	-52.6	-13.0	-39.6	
7.520	-14.7	H	3.0	34.9	1.0	-48.7	-13.0	-35.7	
High Ch, 1907.6 MHz									
3.820	-21.9	V	3.0	35.3	1.0	-56.2	-13.0	-43.2	
5.723	-19.5	V	3.0	34.7	1.0	-53.2	-13.0	-40.2	
7.630	-14.5	V	3.0	34.9	1.0	-48.5	-13.0	-35.5	
3.820	-22.3	H	3.0	35.3	1.0	-56.6	-13.0	-43.6	
5.723	-18.9	H	3.0	34.7	1.0	-52.7	-13.0	-39.7	
7.630	-15.9	H	3.0	34.9	1.0	-49.8	-13.0	-36.8	

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: Samsung
Project #: 14U17033
Date: 03/07/14
Test Engineer: Trina Noor
Configuration: Y Position, EUT and AC Adapter
Mode: LTE2_5M_16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber	T343 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, 1851.0MHz									
3.702	-21.7	V	3.0	35.4	1.0	-56.1	-13.0	-43.1	
5.553	-16.9	V	3.0	34.7	1.0	-50.6	-13.0	-37.6	
7.404	-15.8	V	3.0	34.9	1.0	-49.7	-13.0	-36.7	
3.702	-22.2	H	3.0	35.4	1.0	-56.6	-13.0	-43.6	
5.553	-19.4	H	3.0	34.7	1.0	-53.1	-13.0	-40.1	
7.404	-13.8	H	3.0	34.9	1.0	-47.7	-13.0	-34.7	
Mid Ch, 1880.0MHz									
3.760	-22.9	V	3.0	35.3	1.0	-57.3	-13.0	-44.3	
5.640	-20.0	V	3.0	34.7	1.0	-53.7	-13.0	-40.7	
7.520	-15.7	V	3.0	34.9	1.0	-49.7	-13.0	-36.7	
3.760	-23.2	H	3.0	35.3	1.0	-57.6	-13.0	-44.6	
5.640	-19.8	H	3.0	34.7	1.0	-53.6	-13.0	-40.6	
7.520	-14.9	H	3.0	34.9	1.0	-48.8	-13.0	-35.8	
High Ch, 1908 MHz									
3.816	-22.7	V	3.0	35.3	1.0	-57.0	-13.0	-44.0	
5.724	-19.7	V	3.0	34.7	1.0	-53.4	-13.0	-40.4	
7.632	-14.2	V	3.0	34.9	1.0	-48.1	-13.0	-35.1	
3.816	-22.9	H	3.0	35.3	1.0	-57.2	-13.0	-44.2	
5.724	-18.8	H	3.0	34.7	1.0	-52.6	-13.0	-39.6	
7.632	-14.9	H	3.0	34.9	1.0	-48.8	-13.0	-35.8	

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

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Band

LTE2

3MHz

16QAM

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 14U17033
Date: 03/07/14
Test Engineer: Kiya Kedida
Configuration: Y Position, EUT and AC Adapter
Mode: LTE2_5M_16QAM

Chamber	Pre-amplifer	Filter	Limit
3m Chamber	T343 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1851.5MHz									
3.703	-23.2	V	3.0	35.4	1.0	-57.6	-13.0	-44.6	
5.554	-20.3	V	3.0	34.7	1.0	-54.1	-13.0	-41.1	
7.406	-12.7	V	3.0	34.9	1.0	-46.6	-13.0	-33.6	
3.703	-22.4	H	3.0	35.4	1.0	-56.8	-13.0	-43.8	
5.554	-19.2	H	3.0	34.7	1.0	-52.9	-13.0	-39.9	
7.406	-15.4	H	3.0	34.9	1.0	-49.3	-13.0	-36.3	
Mid Ch, 1880.0MHz									
3.760	-22.7	V	3.0	35.3	1.0	-57.0	-13.0	-44.0	
5.640	-19.7	V	3.0	34.7	1.0	-53.4	-13.0	-40.4	
7.520	-9.3	V	3.0	34.9	1.0	-43.2	-13.0	-30.2	
3.760	-23.4	H	3.0	35.3	1.0	-57.7	-13.0	-44.7	
5.640	-19.6	H	3.0	34.7	1.0	-53.3	-13.0	-40.3	
7.520	-13.4	H	3.0	34.9	1.0	-47.4	-13.0	-34.4	
High Ch, 1908.5 MHz									
3.817	-22.7	V	3.0	35.3	1.0	-57.0	-13.0	-44.0	
5.725	-19.2	V	3.0	34.7	1.0	-53.0	-13.0	-40.0	
7.634	-9.8	V	3.0	34.9	1.0	-43.7	-13.0	-30.7	
3.817	-22.4	H	3.0	35.3	1.0	-56.7	-13.0	-43.7	
5.725	-19.0	H	3.0	34.7	1.0	-52.8	-13.0	-39.8	
7.634	-15.0	H	3.0	34.9	1.0	-49.0	-13.0	-36.0	

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: Samsung
Project #: 14U17033
Date: 03/07/14
Test Engineer: Kiya Kedida
Configuration: Y Position, EUT and AC Adapter
Mode: LTE2_5M_QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber	T343 8449B	Filter 1	Part 24

Band
LTE2
3MHz
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, 1851.5MHz									
3.703	-22.4	V	3.0	35.4	1.0	-56.8	-13.0	-43.8	
5.554	-19.7	V	3.0	34.7	1.0	-53.4	-13.0	-40.4	
7.406	-12.3	V	3.0	34.9	1.0	-46.2	-13.0	-33.2	
3.703	-21.8	H	3.0	35.4	1.0	-56.2	-13.0	-43.2	
5.554	-18.9	H	3.0	34.7	1.0	-52.7	-13.0	-39.7	
7.406	-14.1	H	3.0	34.9	1.0	-48.0	-13.0	-35.0	
Mid Ch, 1880.0MHz									
3.760	-22.1	V	3.0	35.3	1.0	-56.4	-13.0	-43.4	
5.640	-19.5	V	3.0	34.7	1.0	-53.2	-13.0	-40.2	
7.520	-8.0	V	3.0	34.9	1.0	-41.9	-13.0	-28.9	
3.760	-22.8	H	3.0	35.3	1.0	-57.1	-13.0	-44.1	
5.640	-18.8	H	3.0	34.7	1.0	-52.5	-13.0	-39.5	
7.520	-12.7	H	3.0	34.9	1.0	-46.6	-13.0	-33.6	
High Ch, 1908.5 MHz									
3.817	-21.9	V	3.0	35.3	1.0	-56.2	-13.0	-43.2	
5.725	-18.7	V	3.0	34.7	1.0	-52.4	-13.0	-39.4	
7.634	-8.7	V	3.0	34.9	1.0	-42.7	-13.0	-29.7	
3.817	-21.8	H	3.0	35.3	1.0	-56.1	-13.0	-43.1	
5.725	-18.6	H	3.0	34.7	1.0	-52.3	-13.0	-39.3	
7.634	-14.0	H	3.0	34.9	1.0	-47.9	-13.0	-34.9	

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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Band

LTE2

1.4MHz

16QAM

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 14U17033
Date: 03/07/14
Test Engineer: Kiay Kedida
Configuration: Y Position, EUT and AC Adapter
Mode: LTE2_1.4M_QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber	T343 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1851.0MHz									
3.702	-22.6	V	3.0	35.4	1.0	-57.0	-13.0	-44.0	
5.553	-19.2	V	3.0	34.7	1.0	-53.0	-13.0	-40.0	
7.404	-11.0	V	3.0	34.9	1.0	-44.9	-13.0	-31.9	
3.702	-22.2	H	3.0	35.4	1.0	-56.6	-13.0	-43.6	
5.553	-18.2	H	3.0	34.7	1.0	-51.9	-13.0	-38.9	
7.404	-14.4	H	3.0	34.9	1.0	-48.3	-13.0	-35.3	
Mid Ch, 1880.0MHz									
3.760	-22.2	V	3.0	35.3	1.0	-56.5	-13.0	-43.5	
5.640	-16.9	V	3.0	34.7	1.0	-50.6	-13.0	-37.6	
7.520	-10.2	V	3.0	34.9	1.0	-44.1	-13.0	-31.1	
3.760	-20.6	H	3.0	35.3	1.0	-54.9	-13.0	-41.9	
5.640	-16.9	H	3.0	34.7	1.0	-50.6	-13.0	-37.6	
7.520	-12.6	H	3.0	34.9	1.0	-46.5	-13.0	-33.5	
High Ch, 1908 MHz									
3.816	-22.2	V	3.0	35.3	1.0	-56.5	-13.0	-43.5	
5.724	-19.5	V	3.0	34.7	1.0	-53.3	-13.0	-40.3	
7.632	-10.0	V	3.0	34.9	1.0	-43.9	-13.0	-30.9	
3.816	-21.7	H	3.0	35.3	1.0	-56.0	-13.0	-43.0	
5.724	-17.8	H	3.0	34.7	1.0	-51.6	-13.0	-38.6	
7.632	-15.0	H	3.0	34.9	1.0	-49.0	-13.0	-36.0	

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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Band

LTE2

1.4MHz

QPSK

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 14U17033
Date: 03/07/14
Test Engineer: Kiay Kedida
Configuration: Y Position, EUT and AC Adapter
Mode: LTE2_1.4M_QPSK

Chamber	Pre-amplifer	Filter	Limit
3m Chamber	T343 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1851.0MHz									
3.702	-22.2	V	3.0	35.4	1.0	-56.6	-13.0	-43.6	
5.553	-19.3	V	3.0	34.7	1.0	-53.0	-13.0	-40.0	
7.404	-10.2	V	3.0	34.9	1.0	-44.1	-13.0	-31.1	
3.702	-22.0	H	3.0	35.4	1.0	-56.4	-13.0	-43.4	
5.553	-18.7	H	3.0	34.7	1.0	-52.4	-13.0	-39.4	
7.404	-13.7	H	3.0	34.9	1.0	-47.6	-13.0	-34.6	
Mid Ch, 1880.0MHz									
3.760	-22.2	V	3.0	35.3	1.0	-56.5	-13.0	-43.5	
5.640	-16.9	V	3.0	34.7	1.0	-50.6	-13.0	-37.6	
7.520	-10.2	V	3.0	34.9	1.0	-44.1	-13.0	-31.1	
3.760	-20.6	H	3.0	35.3	1.0	-54.9	-13.0	-41.9	
5.640	-16.9	H	3.0	34.7	1.0	-50.6	-13.0	-37.6	
7.520	-12.6	H	3.0	34.9	1.0	-46.5	-13.0	-33.5	
High Ch, 1908 MHz									
3.816	-21.8	V	3.0	35.3	1.0	-56.1	-13.0	-43.1	
5.724	-18.8	V	3.0	34.7	1.0	-52.6	-13.0	-39.6	
7.632	-9.0	V	3.0	34.9	1.0	-43.0	-13.0	-30.0	
3.816	-21.2	H	3.0	35.3	1.0	-55.5	-13.0	-42.5	
5.724	-17.4	H	3.0	34.7	1.0	-51.2	-13.0	-38.2	
7.632	-14.5	H	3.0	34.9	1.0	-48.4	-13.0	-35.4	

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: Samsung
Project #: 14U17033
Date: 03/05/14
Test Engineer: R. Alegre
Configuration: Y Position, AC Charger and headphones
Mode: EGPRS 1900

Chamber	Pre-amplifer	Filter	Limit
3m Chamber A	T343 8449B	Filter 1	Part 24

Band: GSM1900 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, 1850.2MHz									
3.700	-16.6	V	3.0	35.4	1.0	-51.0	-13.0	-38.0	
5.550	-13.0	V	3.0	34.7	1.0	-46.8	-13.0	-33.8	
7.400	-11.3	V	3.0	34.9	1.0	-45.2	-13.0	-32.2	
3.700	-17.1	H	3.0	35.4	1.0	-51.5	-13.0	-38.5	
5.550	-13.6	H	3.0	34.7	1.0	-47.4	-13.0	-34.4	
7.400	-9.8	H	3.0	34.9	1.0	-43.7	-13.0	-30.7	
Mid Ch, 1880.0MHz									
3.760	-18.8	V	3.0	35.3	1.0	-53.1	-13.0	-40.1	
5.640	-13.9	V	3.0	34.7	1.0	-47.6	-13.0	-34.6	
7.520	-11.6	V	3.0	34.9	1.0	-45.6	-13.0	-32.6	
3.760	-17.7	H	3.0	35.3	1.0	-52.0	-13.0	-39.0	
5.640	-14.6	H	3.0	34.7	1.0	-48.4	-13.0	-35.4	
7.520	-8.7	H	3.0	34.9	1.0	-42.6	-13.0	-29.6	
High Ch, 1909.8 MHz									
3.820	-16.6	V	3.0	35.3	1.0	-50.8	-13.0	-37.8	
5.729	-14.3	V	3.0	34.7	1.0	-48.1	-13.0	-35.1	
7.640	-8.8	V	3.0	35.0	1.0	-42.8	-13.0	-29.8	
3.820	-15.2	H	3.0	35.3	1.0	-49.5	-13.0	-36.5	
5.729	-12.5	H	3.0	34.7	1.0	-46.3	-13.0	-33.3	
7.640	-9.4	H	3.0	35.0	1.0	-43.3	-13.0	-30.3	

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

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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Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 14U17033
Date: 03/05/14
Test Engineer: R. Alegre
Configuration: Y Position, EUT and AC Adapter
Mode: GPRS 1900

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T343 8449B	Filter 1	Part 24

Band: GSM1900 GPRS

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									
3.700	-16.6	V	3.0	35.4	1.0	-51.0	-13.0	-38.0	
5.551	-13.1	V	3.0	34.7	1.0	-46.8	-13.0	-33.8	
7.401	-11.1	V	3.0	34.9	1.0	-45.1	-13.0	-32.1	
3.700	-19.2	H	3.0	35.4	1.0	-53.6	-13.0	-40.6	
5.551	-13.3	H	3.0	34.7	1.0	-47.0	-13.0	-34.0	
7.401	-9.1	H	3.0	34.9	1.0	-43.0	-13.0	-30.0	
Mid Ch, 1880.0MHz									
3.760	-19.8	V	3.0	35.3	1.0	-54.1	-13.0	-41.1	
5.640	-13.2	V	3.0	34.7	1.0	-47.0	-13.0	-34.0	
7.520	-10.5	V	3.0	34.9	1.0	-44.4	-13.0	-31.4	
3.760	-19.1	H	3.0	35.3	1.0	-53.5	-13.0	-40.5	
5.640	-10.5	H	3.0	34.7	1.0	-44.2	-13.0	-31.2	
7.520	-8.2	H	3.0	34.9	1.0	-42.1	-13.0	-29.1	
High Ch, 1909.8 MHz									
3.820	-17.6	V	3.0	35.3	1.0	-51.8	-13.0	-38.8	
5.729	-12.1	V	3.0	34.7	1.0	-45.9	-13.0	-32.9	
7.639	-9.4	V	3.0	35.0	1.0	-43.4	-13.0	-30.4	
3.820	-16.9	H	3.0	35.3	1.0	-51.2	-13.0	-38.2	
5.729	-13.8	H	3.0	34.7	1.0	-47.6	-13.0	-34.6	
7.639	-8.8	H	3.0	35.0	1.0	-42.8	-13.0	-29.8	

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: Samsung
Project #: 14U17033
Date: 03/11/14
Test Engineer: K.Kedida
Configuration: Y Position with Hp and AC Charger
Mode: EGPRS 850

Chamber	Pre-amplifer	Filter	Limit
3m Chamber	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									
GSM850	1.648	-12.7	V	3.0	37.4	1.0	-49.1	-13.0	-36.1	
	2.473	-17.1	V	3.0	36.4	1.0	-52.5	-13.0	-39.5	
	3.297	-16.6	V	3.0	35.8	1.0	-51.4	-13.0	-38.4	
	1.648	-18.0	H	3.0	37.4	1.0	-54.4	-13.0	-41.4	
EGPRS	2.473	-17.9	H	3.0	36.4	1.0	-53.3	-13.0	-40.3	
	3.297	-13.4	H	3.0	35.8	1.0	-48.2	-13.0	-35.2	
	Mid Ch, 836.6MHz									
	1.673	-11.8	V	3.0	37.3	1.0	-48.2	-13.0	-35.2	
	2.510	-16.1	V	3.0	36.4	1.0	-51.5	-13.0	-38.5	
	3.346	-15.3	V	3.0	35.8	1.0	-50.1	-13.0	-37.1	
	1.673	-16.3	H	3.0	37.3	1.0	-52.6	-13.0	-39.6	
	2.510	-18.0	H	3.0	36.4	1.0	-53.4	-13.0	-40.4	
	3.346	-15.2	H	3.0	35.8	1.0	-50.0	-13.0	-37.0	
	High Ch, 848.8MHz									
	1.698	-12.3	V	3.0	37.3	1.0	-48.6	-13.0	-35.6	
	2.547	-16.3	V	3.0	36.3	1.0	-51.6	-13.0	-38.6	
	3.395	-15.1	V	3.0	35.7	1.0	-49.8	-13.0	-36.8	
	1.698	-17.5	H	3.0	37.3	1.0	-53.8	-13.0	-40.8	
	2.547	-17.3	H	3.0	36.3	1.0	-52.6	-13.0	-39.6	
	3.395	-15.1	H	3.0	35.7	1.0	-49.8	-13.0	-36.8	

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

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Band

GSM850

GPRS

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 14U17033
Date: 03/11/14
Test Engineer: K.Kedida
Configuration: Y Position with Hp and AC Charger
Mode: GPRS 850

Chamber	Pre-amplifer	Filter	Limit
3m Chamber	T34 8449B	Filter 1	Part 22

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	-8.8	V	3.0	37.4	1.0	-45.2	-13.0	-32.2	
2.473	-14.8	V	3.0	36.4	1.0	-50.2	-13.0	-37.2	
3.297	-16.1	V	3.0	35.8	1.0	-50.9	-13.0	-37.9	
1.648	-16.5	H	3.0	37.4	1.0	-52.9	-13.0	-39.9	
2.473	-17.9	H	3.0	36.4	1.0	-53.3	-13.0	-40.3	
3.297	-15.2	H	3.0	35.8	1.0	-50.0	-13.0	-37.0	
Mid Ch, 836.6MHz									
1.673	-8.4	V	3.0	37.3	1.0	-44.7	-13.0	-31.7	
2.510	-14.1	V	3.0	36.4	1.0	-49.5	-13.0	-36.5	
3.346	-13.8	V	3.0	35.8	1.0	-48.5	-13.0	-35.5	
1.673	-13.9	H	3.0	37.3	1.0	-50.3	-13.0	-37.3	
2.510	-16.4	H	3.0	36.4	1.0	-51.8	-13.0	-38.8	
3.346	-14.7	H	3.0	35.8	1.0	-49.4	-13.0	-36.4	
High Ch, 848.8MHz									
1.698	-8.8	V	3.0	37.3	1.0	-45.1	-13.0	-32.1	
2.547	-13.4	V	3.0	36.3	1.0	-48.7	-13.0	-35.7	
3.395	-13.9	V	3.0	35.7	1.0	-48.6	-13.0	-35.6	
1.698	-14.6	H	3.0	37.3	1.0	-50.9	-13.0	-37.9	
2.547	-17.4	H	3.0	36.3	1.0	-52.8	-13.0	-39.8	
3.395	-13.2	H	3.0	35.7	1.0	-47.9	-13.0	-34.9	

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: Samsung
Project #: 14U17033
Date: 03/07/14
Test Engineer: Trina Noor
Configuration: Y Position, EUT and AC Adapter
Mode: WCDMA_HSDPA 1900

Chamber	Pre-amplifer	Filter	Limit
3m Chamber	T343 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	-22.1	V	3.0	35.4	1.0	-56.5	-13.0	-43.5	
5.557	-17.2	V	3.0	34.7	1.0	-51.0	-13.0	-38.0	
7.409	-16.0	V	3.0	34.9	1.0	-49.9	-13.0	-36.9	
3.705	-22.1	H	3.0	35.4	1.0	-56.5	-13.0	-43.5	
5.557	-16.1	H	3.0	34.7	1.0	-49.8	-13.0	-36.8	
7.409	-14.2	H	3.0	34.9	1.0	-48.2	-13.0	-35.2	
Mid Ch, 1880.0MHz									
3.760	-21.9	V	3.0	35.3	1.0	-56.2	-13.0	-43.2	
5.640	-16.6	V	3.0	34.7	1.0	-50.4	-13.0	-37.4	
7.520	-15.6	V	3.0	34.9	1.0	-49.5	-13.0	-36.5	
3.760	-22.9	H	3.0	35.3	1.0	-57.2	-13.0	-44.2	
5.640	-16.3	H	3.0	34.7	1.0	-50.0	-13.0	-37.0	
7.520	-14.1	H	3.0	34.9	1.0	-48.0	-13.0	-35.0	
High Ch, 1907.6 MHz									
3.820	-20.4	V	3.0	35.3	1.0	-54.7	-13.0	-41.7	
5.723	-17.6	V	3.0	34.7	1.0	-51.3	-13.0	-38.3	
7.630	-15.6	V	3.0	34.9	1.0	-49.5	-13.0	-36.5	
3.820	-22.5	H	3.0	35.3	1.0	-56.8	-13.0	-43.8	
5.723	-16.4	H	3.0	34.7	1.0	-50.1	-13.0	-37.1	
7.630	-13.2	H	3.0	34.9	1.0	-47.2	-13.0	-34.2	

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: Samsung
Project #: 14U17033
Date: 03/07/14
Test Engineer: Trina Noor
Configuration: Y Position, EUT and AC Adapter
Mode: WCDMA_Rel 1900

Chamber	Pre-amplifer	Filter	Limit
3m Chamber	T343 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, 1852.4MHz									
Band 2	3.705	-22.0	V	3.0	35.4	1.0	-56.4	-13.0	-43.4	
	5.557	-15.8	V	3.0	34.7	1.0	-49.5	-13.0	-36.5	
	7.409	-15.1	V	3.0	34.9	1.0	-49.0	-13.0	-36.0	
REL99	3.705	-22.7	H	3.0	35.4	1.0	-57.1	-13.0	-44.1	
	5.557	-15.0	H	3.0	34.7	1.0	-48.7	-13.0	-35.7	
	7.409	-14.0	H	3.0	34.9	1.0	-47.9	-13.0	-34.9	
	Mid Ch, 1880.0MHz									
	3.760	-22.7	V	3.0	35.3	1.0	-57.1	-13.0	-44.1	
	5.640	-16.3	V	3.0	34.7	1.0	-50.1	-13.0	-37.1	
	7.520	-15.7	V	3.0	34.9	1.0	-49.6	-13.0	-36.6	
	3.760	-22.6	H	3.0	35.3	1.0	-56.9	-13.0	-43.9	
	5.640	-16.3	H	3.0	34.7	1.0	-50.1	-13.0	-37.1	
	7.520	-13.0	H	3.0	34.9	1.0	-46.9	-13.0	-33.9	
	High Ch, 1907.6 MHz									
	3.820	-22.3	V	3.0	35.3	1.0	-56.6	-13.0	-43.6	
	5.723	-15.9	V	3.0	34.7	1.0	-49.6	-13.0	-36.6	
	7.630	-14.8	V	3.0	34.9	1.0	-48.8	-13.0	-35.8	
	3.820	-22.5	H	3.0	35.3	1.0	-56.8	-13.0	-43.8	
	5.723	-16.6	H	3.0	34.7	1.0	-50.3	-13.0	-37.3	
	7.630	-13.7	H	3.0	34.9	1.0	-47.6	-13.0	-34.6	

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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Band

Band 5

HSDPA

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 14I17033
Date: 03/07/14
Test Engineer: Trina Noor
Configuration: Y Position with AC adapter
Mode: WCDMA_HSDPA_ 850

Chamber	Pre-amplifer	Filter	Limit
3m Chamber	T34 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 826.6MHz									
1.653	-23.2	V	3.0	37.4	1.0	-59.5	-13.0	-46.5	
2.480	-25.3	V	3.0	36.4	1.0	-60.7	-13.0	-47.7	
3.306	-23.6	V	3.0	35.8	1.0	-58.4	-13.0	-45.4	
1.653	-24.5	H	3.0	37.4	1.0	-60.9	-13.0	-47.9	
2.480	-27.1	H	3.0	36.4	1.0	-62.5	-13.0	-49.5	
3.306	-22.5	H	3.0	35.8	1.0	-57.3	-13.0	-44.3	
Mid Ch, 836.6MHz									
1.673	-22.5	V	3.0	37.3	1.0	-58.9	-13.0	-45.9	
2.510	-25.2	V	3.0	36.4	1.0	-60.5	-13.0	-47.5	
3.346	-17.2	V	3.0	35.8	1.0	-52.0	-13.0	-39.0	
1.673	-22.1	H	3.0	37.3	1.0	-58.5	-13.0	-45.5	
2.510	-26.8	H	3.0	36.4	1.0	-62.1	-13.0	-49.1	
3.346	-22.3	H	3.0	35.8	1.0	-57.1	-13.0	-44.1	
High Ch, 846.4MHz									
1.693	-22.4	V	3.0	37.3	1.0	-58.8	-13.0	-45.8	
2.539	-24.7	V	3.0	36.3	1.0	-60.1	-13.0	-47.1	
3.386	-22.9	V	3.0	35.7	1.0	-57.6	-13.0	-44.6	
1.693	-25.0	H	3.0	37.3	1.0	-61.3	-13.0	-48.3	
2.539	-26.6	H	3.0	36.3	1.0	-61.9	-13.0	-48.9	
3.386	-22.0	H	3.0	35.7	1.0	-56.8	-13.0	-43.8	

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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Band

Band 5

REL99

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 14I17033
Date: 03/07/14
Test Engineer: Trina Noor
Configuration: Y Position with AC adapter
Mode: WCDMA_REL 99_ 850

Chamber	Pre-amplifer	Filter	Limit
3m Chamber	T34 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 826.6MHz									
1.653	-27.7	V	3.0	37.4	1.0	-64.1	-13.0	-51.1	
2.480	-23.7	V	3.0	36.4	1.0	-59.1	-13.0	-46.1	
3.306	-23.9	V	3.0	35.8	1.0	-58.7	-13.0	-45.7	
1.653	-29.3	H	3.0	37.4	1.0	-65.7	-13.0	-52.7	
2.480	-25.1	H	3.0	36.4	1.0	-60.5	-13.0	-47.5	
3.306	-23.6	H	3.0	35.8	1.0	-58.4	-13.0	-45.4	
Mid Ch, 836.6MHz									
1.673	-29.9	V	3.0	37.3	1.0	-66.2	-13.0	-53.2	
2.510	-25.2	V	3.0	36.4	1.0	-60.5	-13.0	-47.5	
3.346	-23.4	V	3.0	35.8	1.0	-58.2	-13.0	-45.2	
1.673	-29.6	H	3.0	37.3	1.0	-66.0	-13.0	-53.0	
2.510	-26.7	H	3.0	36.4	1.0	-62.1	-13.0	-49.1	
3.346	-23.4	H	3.0	35.8	1.0	-58.2	-13.0	-45.2	
High Ch, 846.4MHz									
1.693	-29.5	V	3.0	37.3	1.0	-65.8	-13.0	-52.8	
2.539	-25.8	V	3.0	36.3	1.0	-61.1	-13.0	-48.1	
3.386	-23.4	V	3.0	35.7	1.0	-58.1	-13.0	-45.1	
1.693	-29.2	H	3.0	37.3	1.0	-65.5	-13.0	-52.5	
2.539	-27.2	H	3.0	36.3	1.0	-62.6	-13.0	-49.6	
3.386	-23.3	H	3.0	35.7	1.0	-58.0	-13.0	-45.0	

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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