



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

CERTIFICATION TEST REPORT

FOR

GSM/WCDMA/LTE Phablet + Bluetooth, WLAN DTS/UNII a/b/g/n, ANT+ and NFC

MODEL NUMBER: SM-T365

FCC ID: A3LSMT365

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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**



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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.
EUT DESCRIPTION: GSM/WCDMA/LTE Phablet + Bluetooth & WLAN DTS/UNII a/b/g/n + ANT+ and NFC
MODEL: SM-T365
SERIAL NUMBER: 1934661 (Radiated and Conducted)
DATE TESTED: AUGUST 8-19, 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:



PENG ZHANG
CONSUMER TECHNOLOGY DIVISION
PROJECT LEAD
UL Verification Services Inc.

Tested By:



STEVEN TRAN
CONSUMER TECHNOLOGY DIVISION
LAB ENGINEER
UL Verification Services Inc.

2. TEST METHODOLOGY

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

3. FACILITIES AND ACCREDITATION

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

47173 Benicia Street	47266 Benicia Street
☒ Chamber A	☐ Chamber D
☒ Chamber B	☐ Chamber E
☒ Chamber C	☐ Chamber F

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

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

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

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

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

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

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

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	3.52 dB
Radiated Disturbance, 30 to 26000 MHz	4.94 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a GSM/WCDMA/LTE Phablet + Bluetooth & WLAN DTS/UNII a/b/g/n + ANT+ and NFC

5.2. MAXIMUM OUTPUT POWER

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

FCC Part 22/2.4						
Band	Frequency Range(MHz)	Modulation Peak	Conducted		Radiated	
			Avg	mW	Avg	mW
GSM850	824~849	GMSK	32.8	1905.46		
	824~849	GPRS	32.8	1905.46	31.14	1299.57
	824~849	EGPRS	27.3	537.03	28.72	744.73
GSM1900	1850~1910	GMSK	29.9	977.24		
	1850~1910	GPRS	29.9	977.24	30.65	1162.25
	1850~1910	EGPRS	26.5	446.68	28.62	727.44
Band 5	824~849	REL99	22.9	194.98	20.568	113.97
	824~849	HSDPA	21.5	141.25	18.57	71.99
	824~849	HSUPA	21.3	134.90		
Band 2	1850~1910	REL99	23.0	199.53	24.23	264.85
	1850~1910	HSDPA	22.0	158.49	23.5	223.87
	1850~1910	HSUPA	22.0	158.49		

5.3. MAXIMUM OUTPUT POWER (LTE)

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

FCC Part 22							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation Peak	Conducted		Radiated	
				Avg	mW	Avg	mW
LTE5	824~849	10MHz	QPSK	23.64	231.21	19.59	90.99
	824~849	10MHz	16QAM	22.80	190.55	18.73	74.64

FCC Part 22							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation Peak	Conducted		Radiated	
				Avg	mW	Avg	mW
LTE5	824~849	5MHz	QPSK	23.64	231.21	19.42	87.46
	824~849	5MHz	16QAM	22.80	190.55	18.53	71.29

FCC Part 22							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation Peak	Conducted		Radiated	
				Avg	mW	Avg	mW
LTE5	824~849	3MHz	QPSK	23.61	229.61	19.67	92.64
	824~849	3MHz	16QAM	22.76	188.80	18.68	73.76

FCC Part 22							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation Peak	Conducted		Radiated	
				Avg	mW	Avg	mW
LTE5	824~849	1.4MHz	QPSK	23.63	230.67	20.07	101.58
	824~849	1.4MHz	16QAM	22.71	186.64	19.07	80.69

5.4. DESCRIPTION OF AVAILABLE ANTENNAS

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

Frequency (MHz)	Peak Gain (dBi)
Band 5, 824~849MHz	-3.61
Band 2, 1850~1910MHz	0.27

5.5. 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
Back cover with touch pen	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

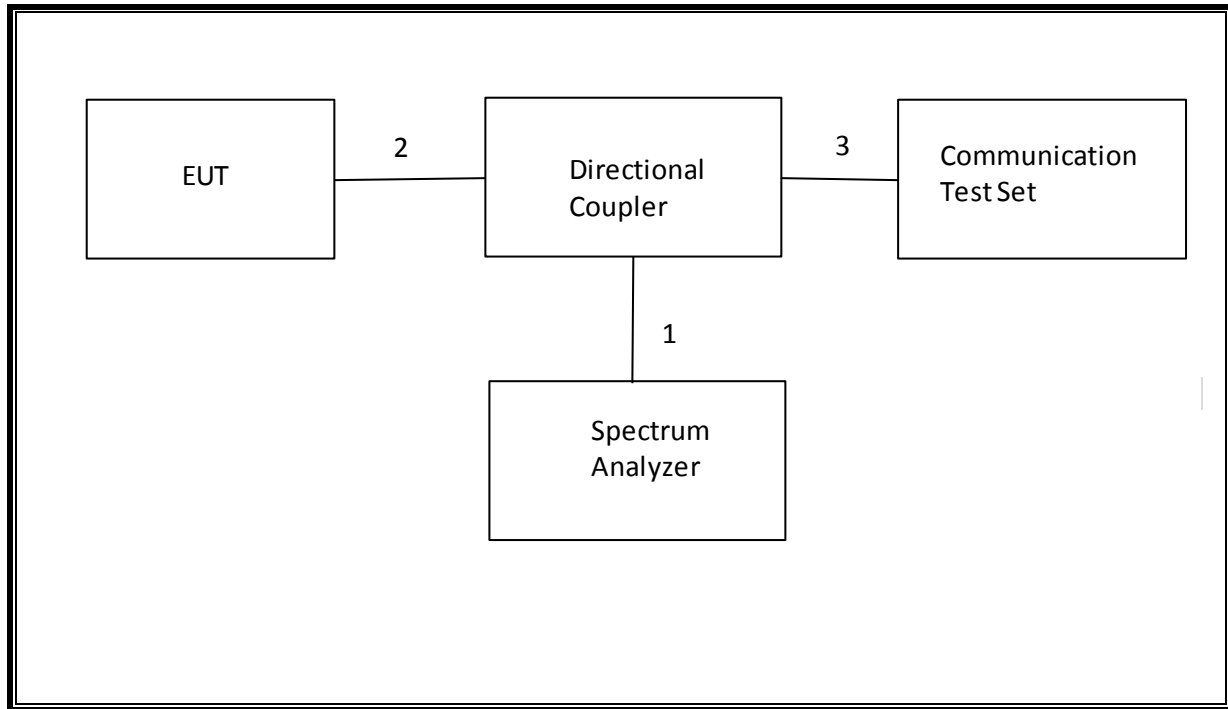
I/O CABLES (RADIATED SETUP)

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

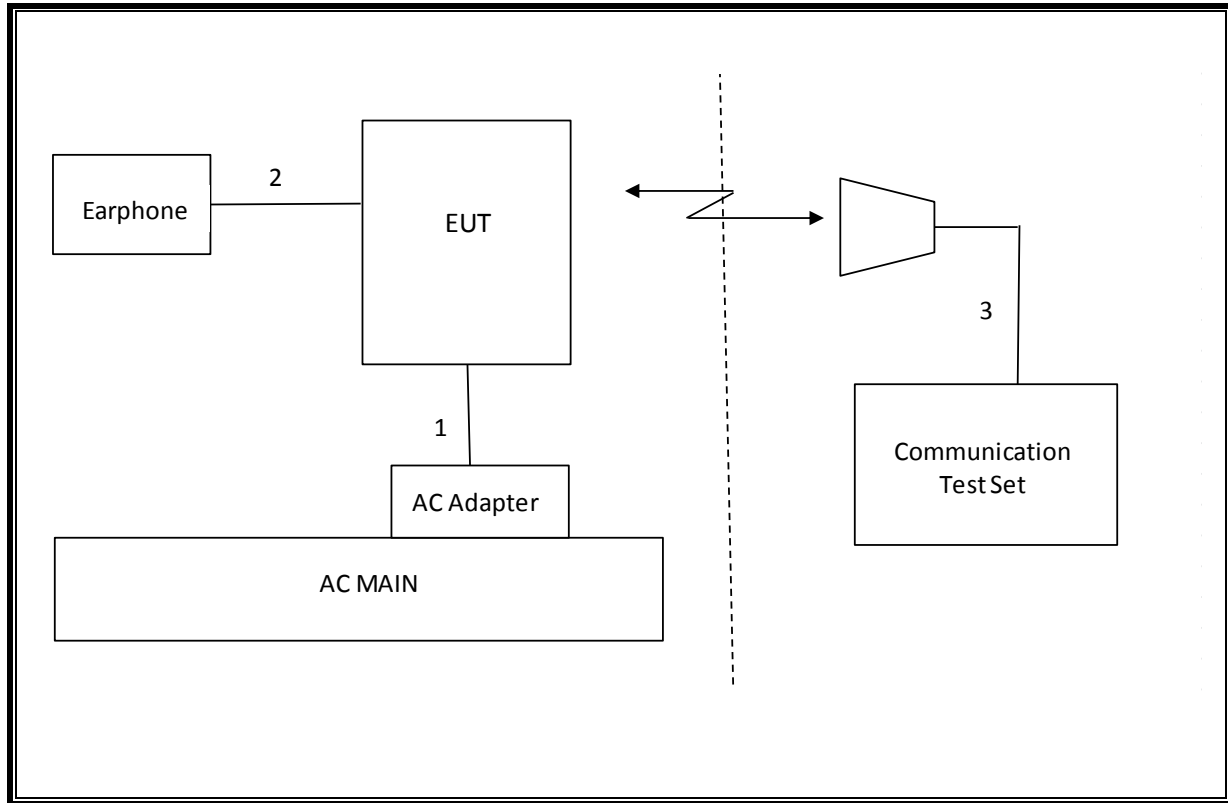
TEST SETUP

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

SETUP DIAGRAM FOR TESTS (CONDUCTED TEST SETUP)



SETUP DIAGRAM FOR TESTS (RADIATED TEST SETUP)



6. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Asset	Cal Due
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01179	02/26/15
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01011	08/14/15
Antenna, Horn, 18 GHz	EMCO	3115	C00783	10/25/14
Antenna, Horn, 18 GHz	EMCO	3115	C00784	10/25/14
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	07/02/15
DC power supply, 8 V @ 3 A or 15 V	Agilent / HP	E3610A	None	CNR
Vector signal generator, 6 GHz	Agilent / HP	E4438C	None	07/06/15
Antenna, Tuned Dipole 400~1000	ETS	3121C DB4	C00993	02/14/15
Directional Coupler	RF-Lambda	RFDC5M06G15	None	CNR
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	C00589	12/17/14

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	8.962MHz
22.917(a) 24.238(a)	RSS-132(4.5.1) RSS-133(6.5.1)	Band Edge / Conducted Spurious Emission	-13dBm		Pass	-14.680dBm
2.1046	N/A	Conducted output power	N/A		Pass	32.8dBm
22.355 24.235	RSS-132(4.3) RSS-133(6.3)	Frequency Stability	2.5PPM		Pass	0.008PPM
22.913(a)(2)	RSS-132(4.4)	Effective Radiated Power	38 dBm	Radiated	Pass	31.14dBm
24.232(c)	RSS-133(6.4)	Equivalent Isotropic Radiated Power	33dBm		Pass	30.65dBm
22.917(a) 24.238(a)	RSS-132(4.5.1) RSS-133(6.5.1)	Radiated Spurious Emission	-13dBm		Pass	-46.3dBm

8. RF POWER OUTPUT VERIFICATION

8.1. GSM/GPRS/EDGE

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

8.1.1. GSM OUTPUT POWER RESULT

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	32.8			
		190	836.6	32.6			
		251	848.8	32.5			
	GPRS	128	824.2	32.8	30.2	28.4	27.3
		190	836.6	32.6	30.1	28.4	27.2
		251	848.8	32.5	30.0	28.2	27.0
	EGPRS	128	824.2	27.3	26.0	24.6	23.5
		190	836.6	27.2	25.8	24.5	23.4
		251	848.8	27.0	25.6	24.3	23.2
GSM1900	GMSK	512	1850.2	29.9			
		661	1880	29.9			
		810	1909.8	29.9			
	GPRS	512	1850.2	29.9	28.7	26.5	25.4
		661	1880	29.9	28.7	26.5	25.5
		810	1909.8	29.9	28.7	26.6	25.5
	EGPRS	512	1850.2	26.5	25.2	23.8	22.8
		661	1880	26.5	25.2	23.8	22.8
		810	1909.8	26.5	25.2	23.9	22.8

8.2. UMTS REL 99

TEST PROCEDURE

The following summary of these settings are illustrated below:

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

8.2.1. UMTS REL 99 OUTPUT POWER RESULT

Band	Mode	Ch.	f(MHz)	Conducted Power (dBm)
				Avg (dBm)
Band 5	REL99	4132	826.4	22.7
		4183	836.6	22.8
		4233	846.6	22.9
Band 2	REL99	9262	1852.4	22.7
		9400	1880	22.7
		9538	1907.6	23.0

8.3. UMTS HSDPA

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

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

8.3.1. UMTS HSDPA OUTPUT POWER RESULT

Band	Mode	Subset	Ch.	f(MHz)	Conducted Power (dBm)
					Avg (dBm)
Band 5	HSDPA	1	4132	826.4	21.4
			4183	836.6	21.4
			4233	846.6	21.5
		2	4132	826.4	21.5
			4183	836.6	21.5
			4233	846.6	21.5
		3	4132	826.4	21.0
			4183	836.6	21.0
			4233	846.6	21.0
		4	4132	826.4	21.0
			4183	836.6	21.0
			4233	846.6	21.0
Band 2	HSDPA	1	9262	1852.4	21.8
			9400	1880	21.9
			9538	1907.6	22.0
		2	9262	1852.4	21.8
			9400	1880	21.9
			9538	1907.6	22.0
		3	9262	1852.4	21.3
			9400	1880	21.4
			9538	1907.6	21.5
		4	9262	1852.4	21.3
			9400	1880	21.4
			9538	1907.6	21.5

8.4. UMTS HSUPA

TEST PROCEDURE

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

	Mode	Rel6 HSUPA		Rel6 HSUPA	Rel6 HSUPA	Rel6 HSUPA
	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.

8.4.1. UMTS HSUPA OUTPUT POWER RESULT

Band	Mode	Subset	Ch.	f(MHz)	Conducted Power (dBm)
					Avg (dBm)
Band 5	HSUPA	1	4132	826.4	20.7
			4183	836.6	21.0
			4233	846.6	21.0
		2	4132	826.4	20.3
			4183	836.6	20.4
			4233	846.6	19.9
		3	4132	826.4	20.1
			4183	836.6	20.2
			4233	846.6	20.0
		4	4132	826.4	20.5
			4183	836.6	20.5
			4233	846.6	20.2
		5	4132	826.4	21.2
			4183	836.6	21.2
			4233	846.6	21.3
Band 2	HSUPA	1	9262	1852.4	21.6
			9400	1880	21.5
			9538	1907.6	21.5
		2	9262	1852.4	20.4
			9400	1880	20.5
			9538	1907.6	20.5
		3	9262	1852.4	20.5
			9400	1880	20.4
			9538	1907.6	20.6
		4	9262	1852.4	20.5
			9400	1880	20.9
			9538	1907.6	21.0
		5	9262	1852.4	21.8
			9400	1880	21.9

			9538	1907.6	22.0
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8.5. DC-HSDPA

The following tests were completed according to procedures in section 7.3.13 of 3GPP TS34.108 v9.5.0. A summary of these settings are illustrated below:

Downlink Physical Channels are set as per 3GPP TS34.121-1 v9.0.0 E.5.0

Table E.5.0: Levels for HSDPA connection setup

Parameter During Connection setup	Unit	Value
P-CPICH_Ec/Ior	dB	-10
P-CCPCH and SCH_Ec/Ior	dB	-12
PICH_Ec/Ior	dB	-15
HS-PDSCH	dB	off
HS-SCCH_1	dB	off
DPCH_Ec/Ior	dB	-5
OCNS_Ec/Ior	dB	-3.1

Call is set up as per 3GPP TS34.108 v9.5.0 sub clause 7.3.13

The configurations of the fixed reference channels for HSDPA RF tests are described in 3GPP TS 34.121, annex C for FDD and 3GPP TS 34.122.

Table C.8.1.12: Fixed Reference Channel H-Set 12

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	Processes	6
Information Bit Payload (N_{INF})	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK
Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table. Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.		

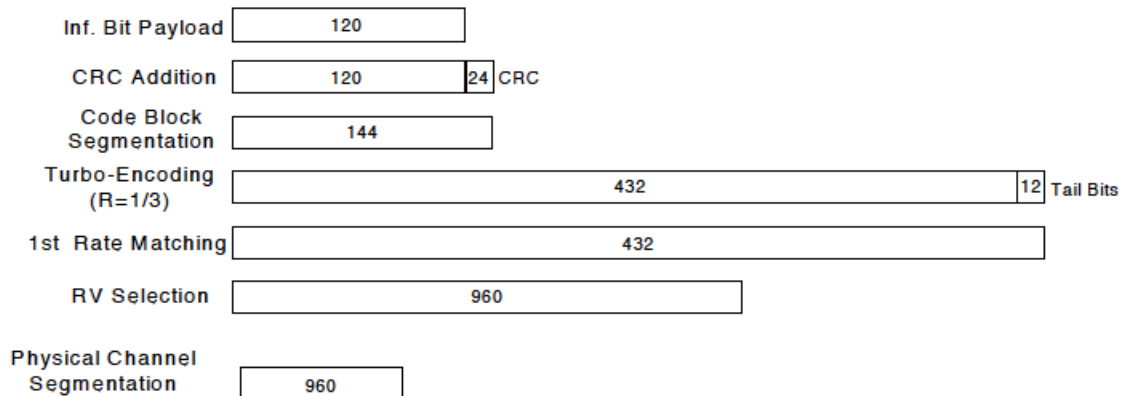


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

The following 4 Sub-tests for HSDPA were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121. A summary of subtest settings are illustrated below:

	Mode	Rel6 HSDPA	Rel6 HSDPA	Rel6 HSDPA	Rel6 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	Algorithm2			
	β_c	2/15	12/15	15/15	15/15
	β_d	15/15	15/15	8/15	4/15
	β_d (SF)	64			
	β_c/β_d	2/15	12/15	15/8	15/4
	β_{hs}	4/15	24/15	30/15	30/15
	MPR	0	0	0.5	0.5
HSDPA Specific Settings	DACK	8			
	DNAK	8			
	DCQI	8			
	Ack-Nack Repetition factor	3			
	CQI Feedback	4ms			
	CQI Repetition Factor	2			
	$A_{hs} = \beta_{hs} / \beta_c$	30/15			

Up commands are set continuously to set the UE to Max power.

UMTS DC-HSDPA OUTPUT POWER RESULT

8.5.1. UMTS HSDPA OUTPUT POWER RESULT

Band	Mode	Subset	Ch.	f(MHz)	Conducted Power (dBm)
					Avg (dBm)
Band 5	HSDPA	1	4132	826.4	21.4
			4183	836.6	21.4
			4233	846.6	21.5
		2	4132	826.4	21.5
			4183	836.6	21.5
			4233	846.6	21.5
		3	4132	826.4	21.0
			4183	836.6	21.0
			4233	846.6	21.0
		4	4132	826.4	21.0
			4183	836.6	21.0
			4233	846.6	21.0
Band 2	HSDPA	1	9262	1852.4	21.8
			9400	1880	21.9
			9538	1907.6	22.0
		2	9262	1852.4	21.8
			9400	1880	21.9
			9538	1907.6	22.0
		3	9262	1852.4	21.3
			9400	1880	21.4
			9538	1907.6	21.5
		4	9262	1852.4	21.3
			9400	1880	21.4
			9538	1907.6	21.5

8.6. LTE OUTPUT VERIFICATION

8.6.1. LTE OUTPUT RESULT

Band	Frequency	Modulation	BW (MHz)	RB Size	RB Offset	Average
LTE5	829	QPSK	10	1	0	23.54
				1	24	23.45
				1	49	23.52
				25	0	22.60
				25	11	22.64
				25	24	22.59
	829	16QAM		50	0	22.71
				1	0	22.49
				1	24	22.35
				1	49	22.42
				25	0	21.57
				25	11	21.64
	829	16QAM		25	24	21.60
				50	0	21.67
				1	0	23.59
				1	24	23.56
				1	49	23.64
				25	0	22.60
	836.5	QPSK		25	11	22.59
				25	24	22.57
				50	0	22.59
				1	0	22.80
				1	24	22.70
				1	49	22.80
	836.5	16QAM		25	0	21.64
				25	11	21.55
				25	24	21.56
				50	0	21.56
				1	0	23.64
				1	24	23.46
	844	QPSK		1	49	23.47
				25	0	22.55
				25	11	22.56
				25	24	22.55
				50	0	22.58
				1	0	22.57
	844	16QAM		1	24	22.38
				1	49	22.41
				25	0	21.57
				25	11	21.53
				25	24	21.56
				50	0	21.60

Band	Frequency	Modulation	BW (MHz)	RB Size	RB Offset	Average
LTE5	826.5	QPSK	5	1	0	23.53
				1	11	23.47
				1	24	23.45
				12	0	22.61
				12	5	22.56
				12	11	22.53
				25	0	22.60
	826.5	16QAM		1	0	22.38
				1	11	22.34
				1	24	22.36
				12	0	21.63
				12	5	21.61
				12	11	21.60
				25	0	21.66
	836.5	QPSK		1	0	23.52
				1	11	23.47
				1	24	23.47
				12	0	22.56
				12	5	22.59
				12	11	22.54
				25	0	22.60
	836.5	16QAM		1	0	22.36
				1	11	22.32
				1	24	22.37
				12	0	21.64
				12	5	21.61
				12	11	21.57
				25	0	21.66
	846.5	QPSK		1	0	23.61
				1	11	23.59
				1	24	23.64
				12	0	22.62
				12	5	22.59
				12	11	22.58
				25	0	22.58
	846.5	16QAM		1	0	22.80
				1	11	22.80
				1	24	22.80
				12	0	21.54
				12	5	21.53
				12	11	21.56
				25	0	21.53

Band	Frequency	Modulation	BW (MHz)	RB Size	RB Offset	Average
LTE5	825.5	QPSK	3	1	0	23.59
				1	7	23.47
				1	14	23.52
				7	0	22.63
				7	2	22.60
				7	6	22.57
				15	0	22.61
	825.5	16QAM		1	0	22.49
				1	7	22.40
				1	14	22.44
				7	0	21.62
				7	2	21.60
				7	6	21.58
				15	0	21.61
	836.5	QPSK		1	0	23.60
				1	7	23.56
				1	14	23.61
				7	0	22.60
				7	2	22.60
				7	6	22.58
				15	0	22.57
	836.5	16QAM		1	0	22.76
				1	7	22.69
				1	14	22.74
				7	0	21.40
				7	2	21.39
				7	6	21.40
				15	0	21.60
	847.5	QPSK		1	0	23.55
				1	7	23.51
				1	14	23.58
				7	0	22.62
				7	2	22.60
				7	6	22.62
				15	0	22.61
	847.5	16QAM		1	0	22.47
				1	7	22.39
				1	14	22.46
				7	0	21.63
				7	2	21.60
				7	6	21.61
				15	0	21.58

Band	Frequency	Modulation	BW (MHz)	RB Size	RB Offset	Average
LTE5	824.7	QPSK	1.4	1	0	23.62
				1	2	23.53
				1	5	23.57
				3	0	23.64
				3	0	23.56
				3	2	23.54
				6	0	22.67
	824.7	16QAM		1	0	22.71
				1	2	22.63
				1	5	22.67
				3	0	22.59
				3	0	22.54
				3	2	22.55
				6	0	21.69
	836.5	QPSK		1	0	23.61
				1	2	23.51
				1	5	23.60
				3	0	23.57
				3	0	23.59
				3	2	23.58
				6	0	22.62
	836.5	16QAM		1	0	22.68
				1	2	22.63
				1	5	22.64
				3	0	22.55
				3	0	22.52
				3	2	22.51
				6	0	21.67
	848.3	QPSK		1	0	23.63
				1	2	23.54
				1	5	23.62
				3	0	23.61
				3	0	23.60
				3	2	23.58
				6	0	22.70
	848.3	16QAM		1	0	22.69
				1	2	22.64
				1	5	22.70
				3	0	22.59
				3	0	22.56
				3	2	22.55
				6	0	21.68

9. PEAK TO AVERAGE RATIO

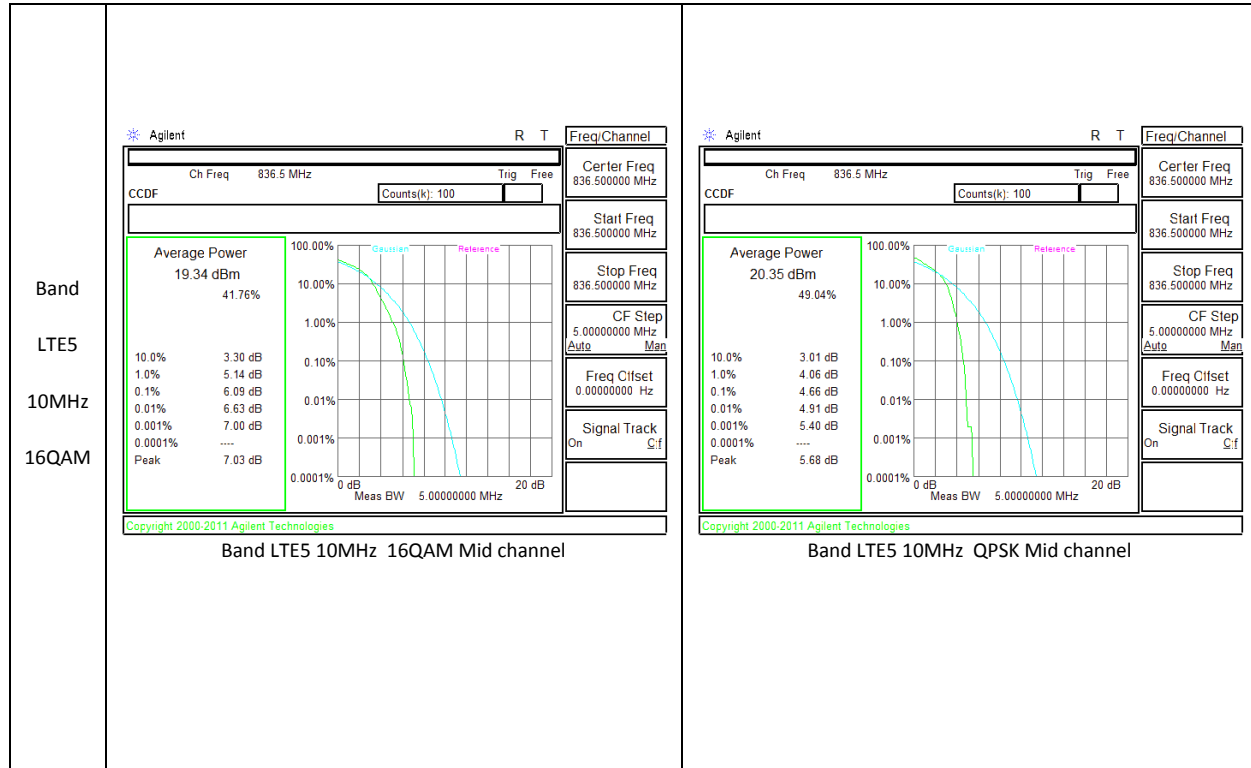
Test Procedure

Per KDB 971168 D01 Power Meas License Digital Systems v02r01

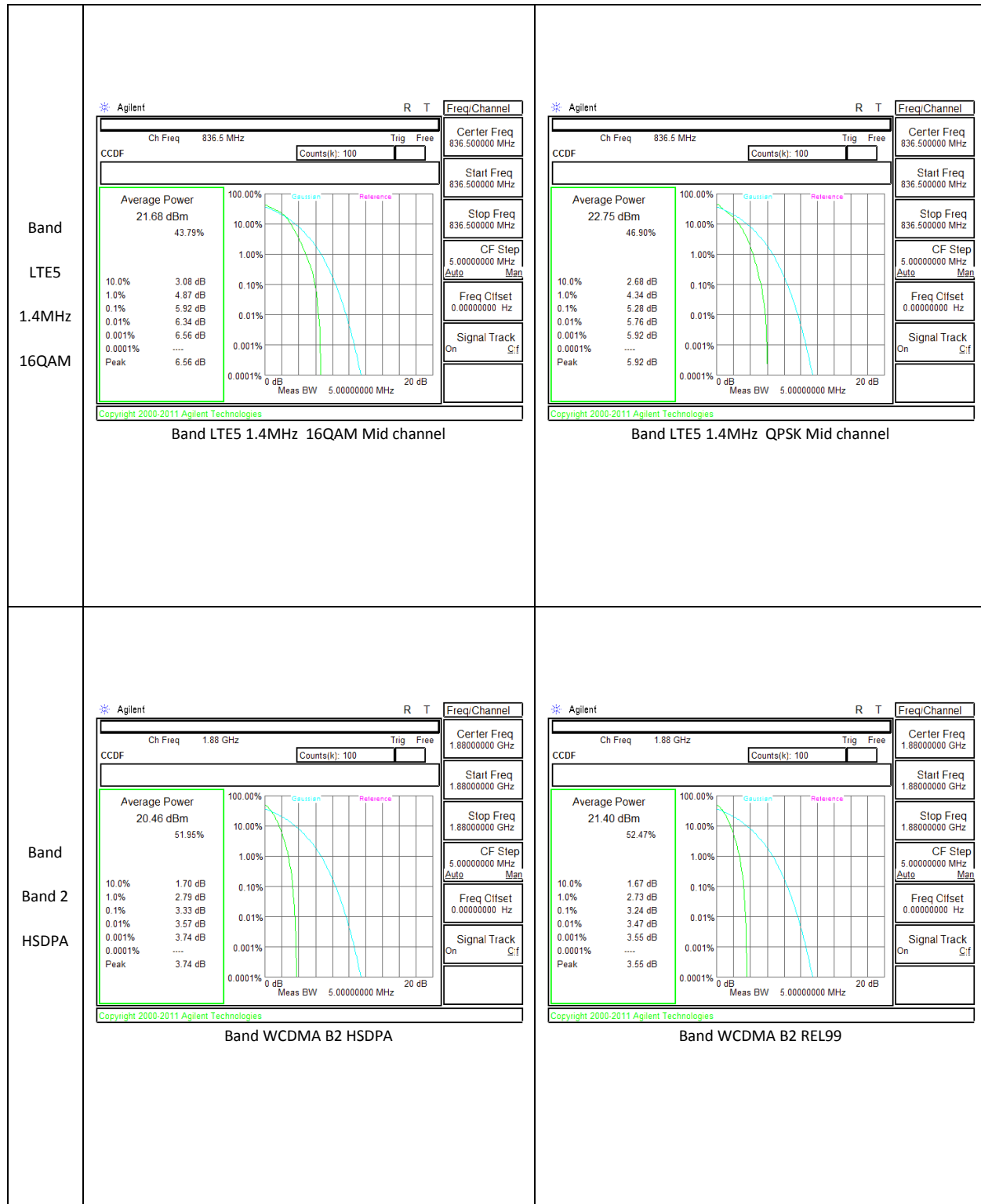
Test Spec

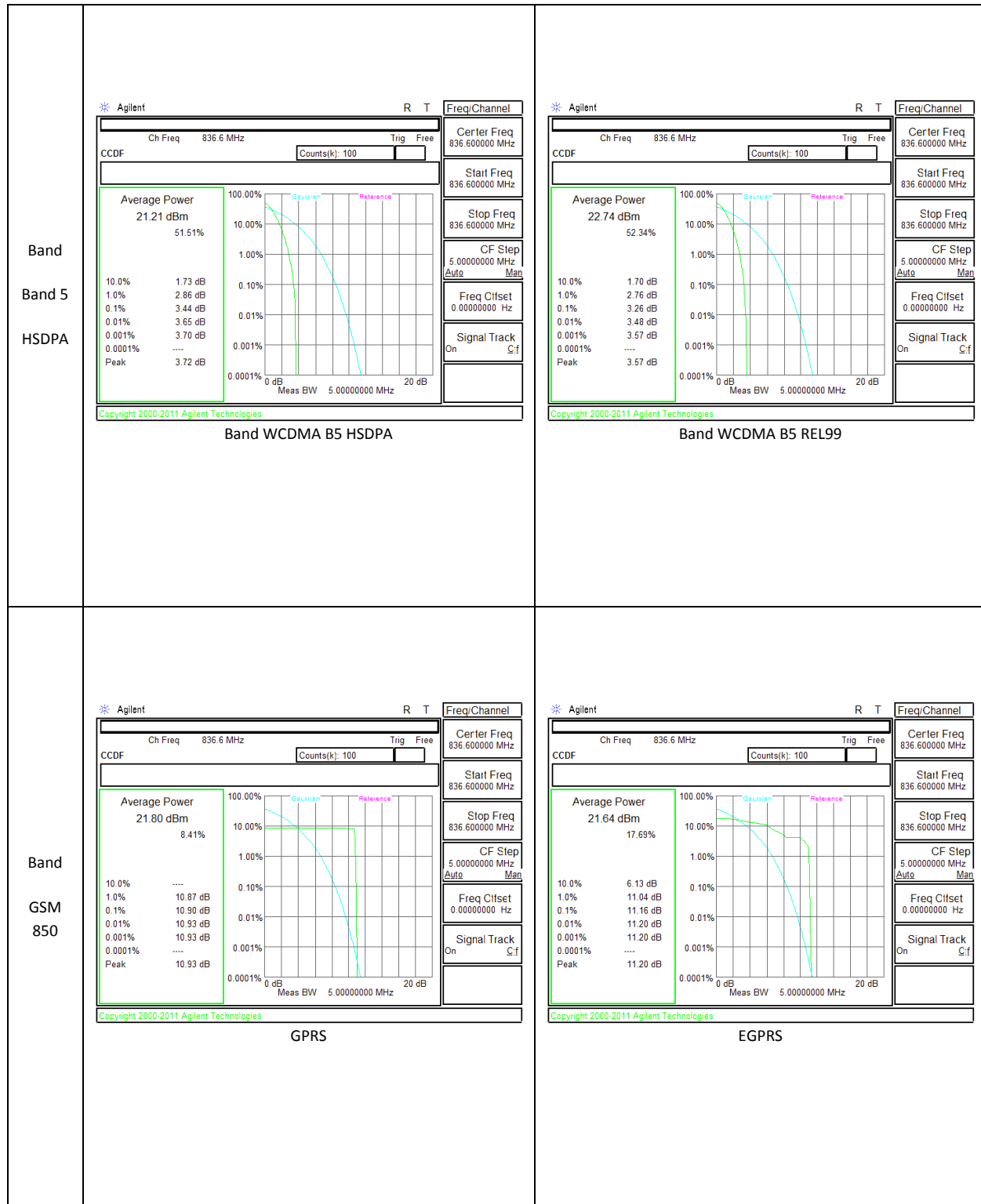
In addition, when the transmitter power is measured in terms of average value, the peak-to-average ratio of the power shall not exceed 13 dB.

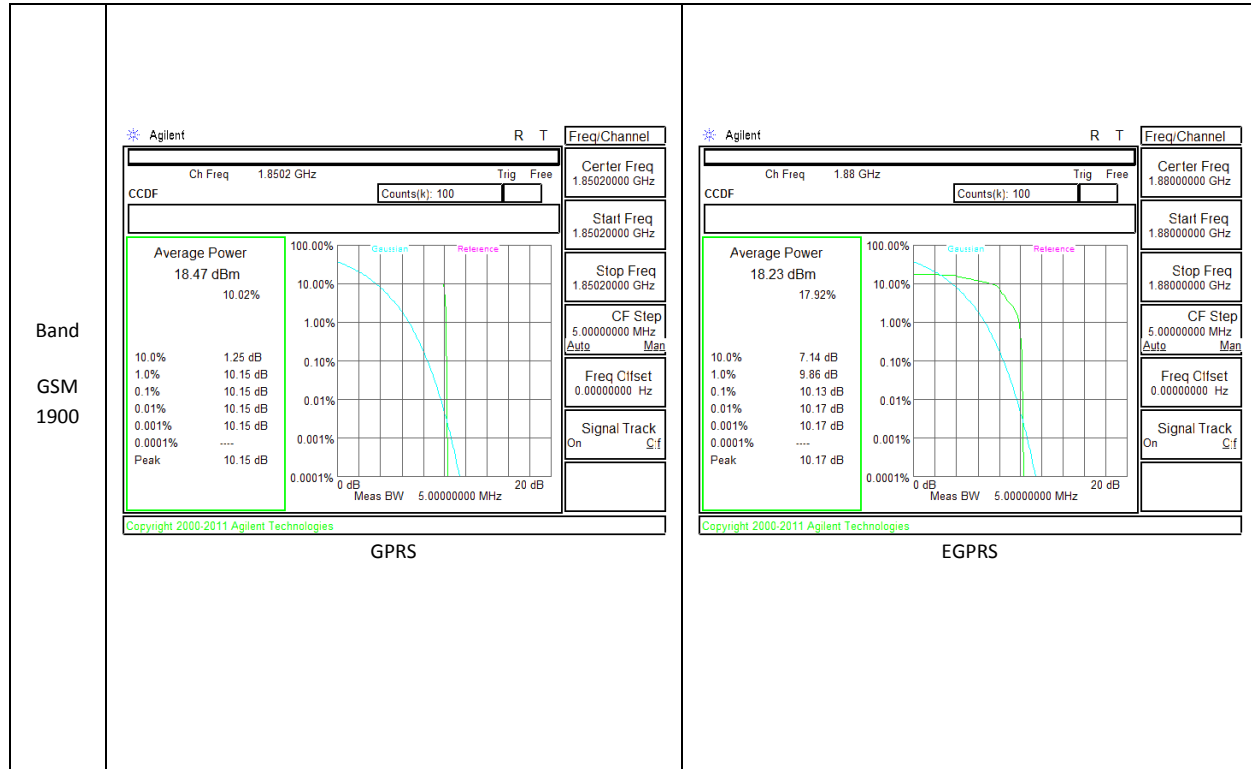
9.1. CONDUCTED PEAK TO AVERAGE RESULT



Band LTE5 5MHz 16QAM	Agilent R T Measure Ch Freq 836.5 MHz Trig Free CCDF Counts(k): 100 Average Power 21.24 dBm 45.44% 10.0% 2.93 dB 1.0% 4.82 dB 0.1% 5.89 dB 0.01% 6.48 dB 0.001% 6.70 dB Peak 6.76 dB Meas BW 5.00000000 MHz 20 dB Copyright 2000-2011 Agilent Technologies Band LTE5 5MHz 16QAM Mid channel	Agilent R T Freq/Channel Ch Freq 836.5 MHz Trig Free CCDF Counts(k): 100 Average Power 22.34 dBm 48.18% 10.0% 2.36 dB 1.0% 4.17 dB 0.1% 5.13 dB 0.01% 5.57 dB 0.001% 5.90 dB Peak 5.95 dB Meas BW 5.00000000 MHz 20 dB Copyright 2000-2011 Agilent Technologies Band LTE5 5MHz QPSK Mid channel
Band LTE5 3MHz 16QAM	Agilent R T Freq/Channel Ch Freq 836.5 MHz Trig Free CCDF Counts(k): 100 Average Power 21.62 dBm 43.50% 10.0% 3.04 dB 1.0% 5.01 dB 0.1% 6.27 dB 0.01% 6.88 dB 0.001% 7.07 dB Peak 7.08 dB Meas BW 5.00000000 MHz 20 dB Copyright 2000-2011 Agilent Technologies Band LTE5 3MHz 16QAM Mid channel	Agilent R T Freq/Channel Ch Freq 836.5 MHz Trig Free CCDF Counts(k): 100 Average Power 22.63 dBm 46.17% 10.0% 2.51 dB 1.0% 4.33 dB 0.1% 5.32 dB 0.01% 5.92 dB 0.001% 6.16 dB Peak 6.16 dB Meas BW 5.00000000 MHz 20 dB Copyright 2000-2011 Agilent Technologies Band LTE5 3MHz QPSK Mid channel







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)

10.1.1. OCCUPIED BANDWIDTH RESULTS

Band	Mode	Channel	f (MHz)	99% BW (KHz)	-26dB BW (KHz)
GSM850	GPRS	128	824.2	243.08	313.52
		190	836.6	243.53	323.12
		251	848.8	242.31	320.94
	EGPRS	128	824.2	243.17	312.48
		190	836.6	240.03	321.88
		251	848.8	245.96	313.04
GSM1900	GPRS	512	1850.2	248.37	325.64
		661	1880	245.47	316.93
		810	1909.8	243.16	318.52
	EGPRS	512	1850.2	247.37	310.72
		661	1880	247.19	316.24
		810	1909.8	238.14	316.39

Band	Mode	Channel	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
Band 5	REL99	4132	826.4	4.157	4.625
		4183	836.6	4.157	4.638
		4233	846.6	4.151	4.616
	HSDPA	4132	826.4	4.160	4.617
		4183	836.6	4.169	4.608
		4233	846.6	4.135	4.630
Band 2	REL99	9262	1852.4	4.157	4.627
		9400	1880	4.145	4.628
		9538	1907.6	4.169	4.675
	HSDPA	9262	1852.4	4.174	4.611
		9400	1880	4.155	4.618
		9538	1907.6	4.165	4.630

10.1.2. LTE OCCUPIED BANDWIDTH RESULTS

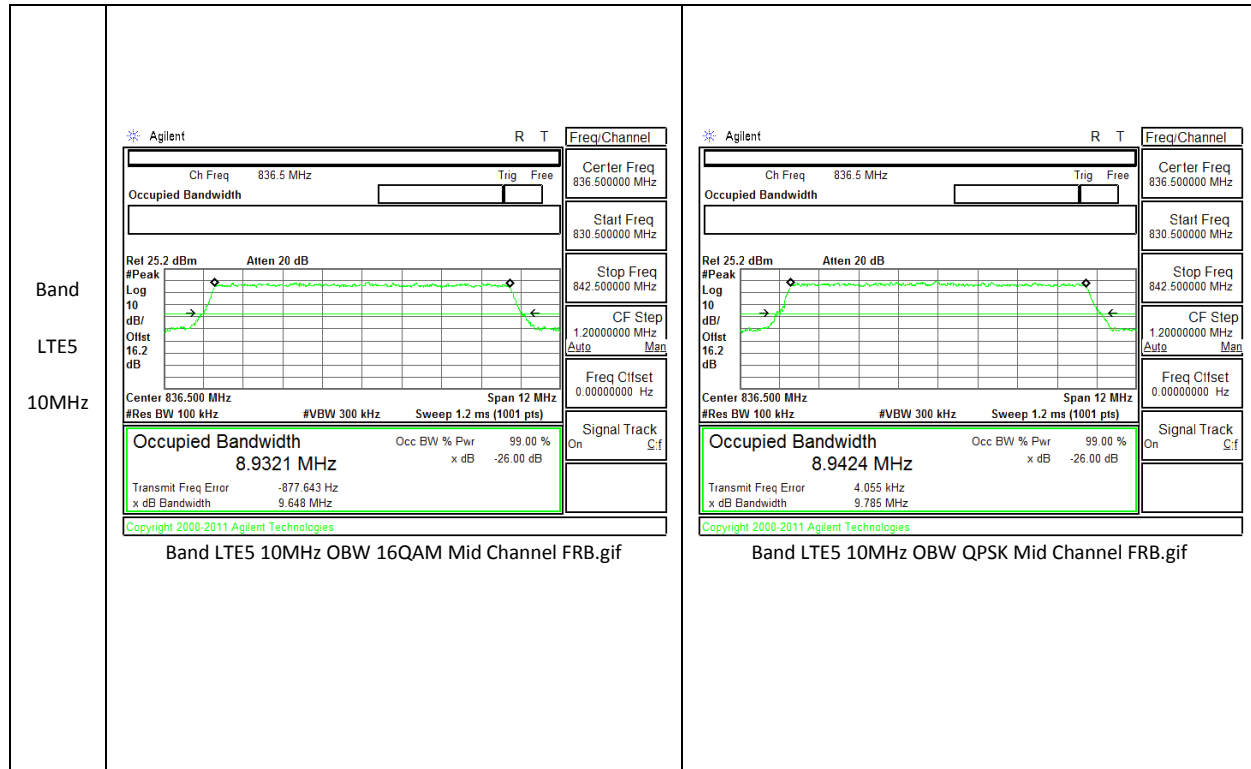
Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (MHz)	-26dB BW (KHz)
LTE5	10	QPSK	50/0	829	8.942	9.773
			50/0	836.5	8.942	9.785
			50/0	844	8.962	9.772
		16QAM	50/0	829	8.940	9.713
			50/0	836.5	8.932	9.648
			50/0	844	8.939	9.788

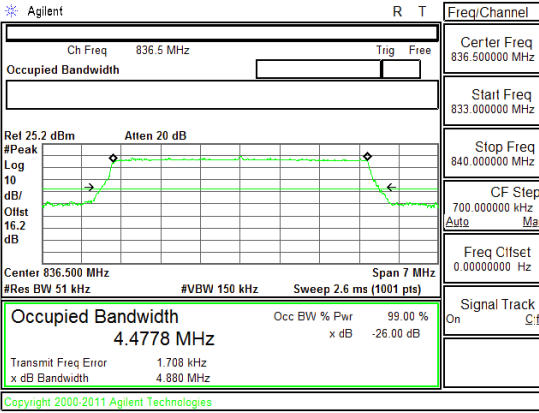
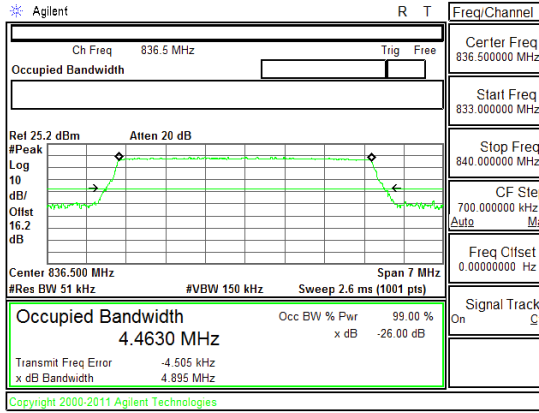
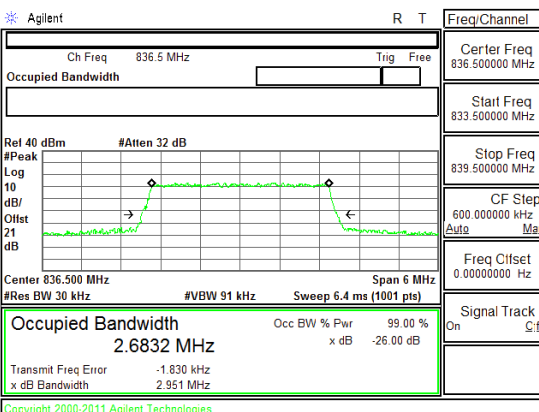
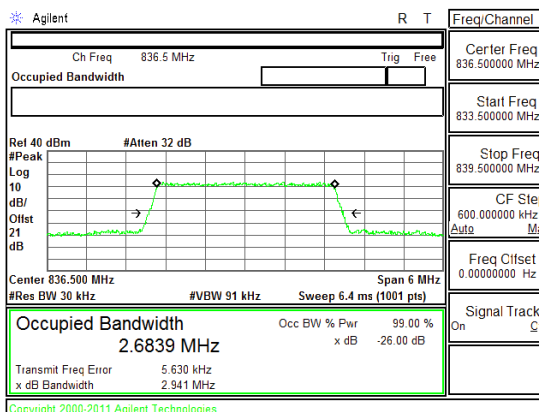
Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (MHz)	-26dB BW (KHz)
LTE5	5	QPSK	25/0	826.5	4.467	4.890
			25/0	836.5	4.463	4.895
			25/0	846.5	4.458	4.895
		16QAM	25/0	826.5	4.473	4.926
			25/0	836.5	4.478	4.880
			25/0	846.5	4.468	4.884

Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (MHz)	-26dB BW (KHz)
LTE5	3	QPSK	15/0	825.5	2.469	2.934
			15/0	836.5	2.689	2.941
			15/0	847.5	2.684	2.947
		16QAM	15/0	825.5	2.683	2.939
			15/0	836.5	2.683	2.951
			15/0	847.5	2.688	2.907

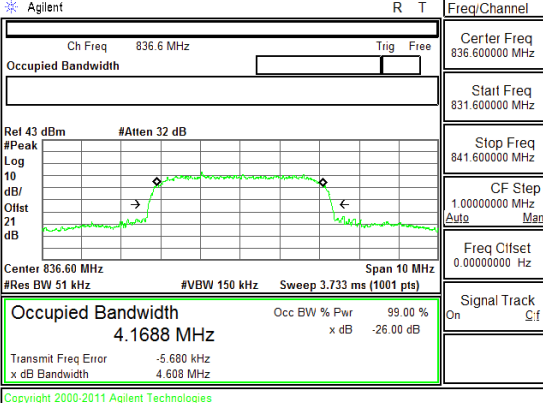
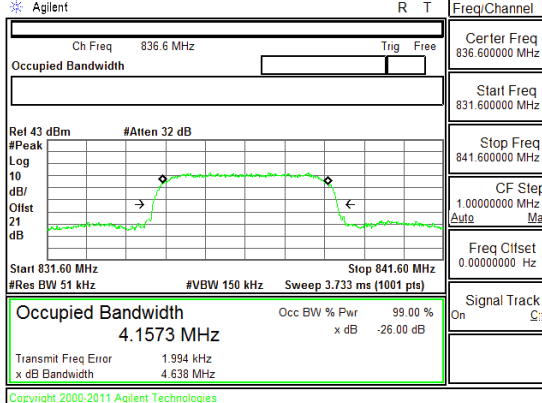
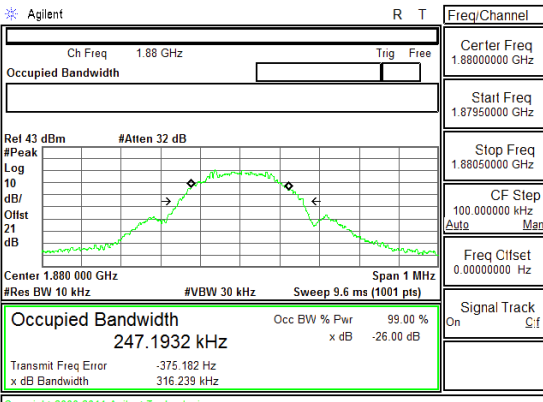
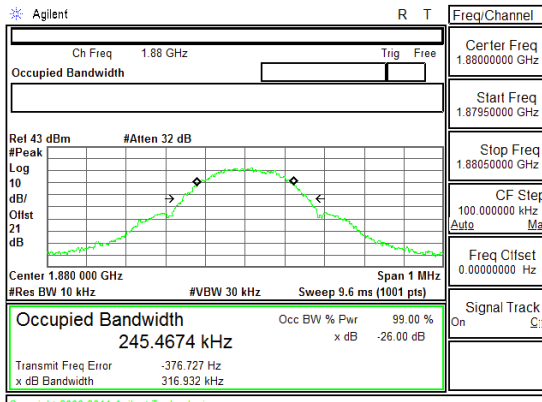
Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (MHz)	-26dB BW (KHz)
LTE5	1.4	QPSK	6/0	824.7	1.084	1.280
			6/0	836.5	1.089	1.279
			6/0	848.3	1.093	1.297
		16QAM	6/0	824.7	1.084	1.266
			6/0	836.5	1.092	1.281
			6/0	848.3	1.087	1.295

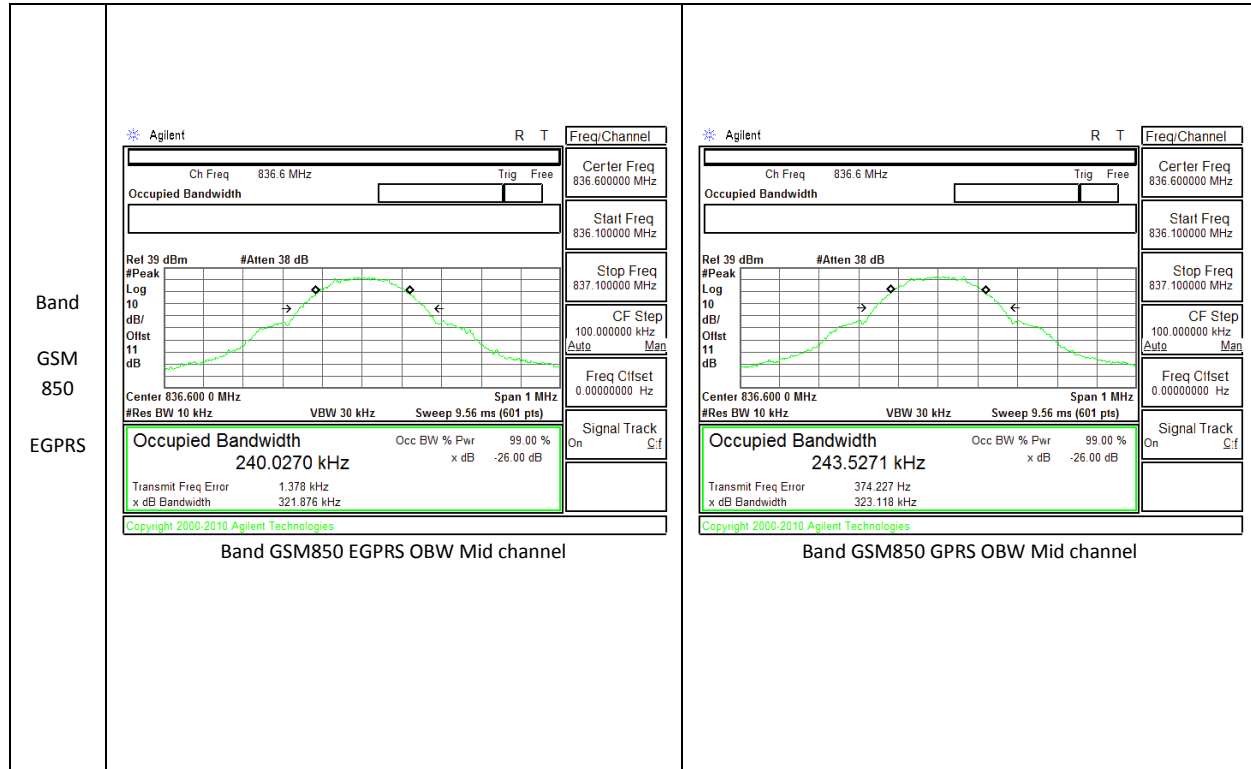
10.1.1. OCCUPIED BANDWIDTH PLOTS



Band LTE5 5MHz	 Agilent R T Freq/Channel Ch Freq 836.5 MHz Trig Free Center Freq 836.500000 MHz Start Freq 833.000000 MHz Stop Freq 840.000000 MHz CF Step 700.000000 kHz Freq Offset 0.000000 Hz Center 836.500 MHz Span 7 MHz #Res BW 51 kHz #VBW 150 kHz Sweep 2.6 ms (1001 pts) Occupied Bandwidth 4.4778 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error 1.708 kHz x dB Bandwidth 4.880 MHz Copyright 2000-2011 Agilent Technologies Band LTE5 5MHz OBW 16QAM Mid Channel FRB.gif	 Agilent R T Freq/Channel Ch Freq 836.5 MHz Trig Free Center Freq 836.500000 MHz Start Freq 833.000000 MHz Stop Freq 840.000000 MHz CF Step 700.000000 kHz Freq Offset 0.000000 Hz Center 836.500 MHz Span 7 MHz #Res BW 51 kHz #VBW 150 kHz Sweep 2.6 ms (1001 pts) Occupied Bandwidth 4.4630 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error -4.505 kHz x dB Bandwidth 4.895 MHz Copyright 2000-2011 Agilent Technologies Band LTE5 5MHz OBW QPSK Mid Channel FRB.gif
Band LTE5 3MHz	 Agilent R T Freq/Channel Ch Freq 836.5 MHz Trig Free Center Freq 836.500000 MHz Start Freq 833.500000 MHz Stop Freq 839.500000 MHz CF Step 600.000000 kHz Freq Offset 0.000000 Hz Center 836.500 MHz Span 6 MHz #Res BW 30 kHz #VBW 91 kHz Sweep 6.4 ms (1001 pts) Occupied Bandwidth 2.6832 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error -1.830 kHz x dB Bandwidth 2.951 MHz Copyright 2000-2011 Agilent Technologies Band LTE5 3MHz OBW 16QAM Mid Channel FRB.gif	 Agilent R T Freq/Channel Ch Freq 836.5 MHz Trig Free Center Freq 836.500000 MHz Start Freq 833.500000 MHz Stop Freq 839.500000 MHz CF Step 600.000000 kHz Freq Offset 0.000000 Hz Center 836.500 MHz Span 6 MHz #Res BW 30 kHz #VBW 91 kHz Sweep 6.4 ms (1001 pts) Occupied Bandwidth 2.6839 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error 5.630 kHz x dB Bandwidth 2.941 MHz Copyright 2000-2011 Agilent Technologies Band LTE5 3MHz OBW QPSK Mid Channel FRB.gif

Band LTE5 1.4MHz	Agilent R T Freq/Channel Ch Freq 836.5 MHz Trig Free Center Freq 836.500000 MHz Start Freq 835.000000 MHz Stop Freq 838.000000 MHz CF Step 300.000000 kHz Freq Offset 0.000000 Hz Rel 43 dBm #Atten 32 dB #Peak Log 10 dB/ Offset 21 dB Center 836.500 MHz #Res BW 20 kHz #VBW 62 kHz Sweep 7.2 ms (1001 pts) Span 3 MHz Occupied Bandwidth 1.0915 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error -2.153 kHz x dB Bandwidth 1.281 MHz Copyright 2000-2011 Agilent Technologies Band LTE5 1.4MHz OBW 16QAM Mid Channel FRB.gif	Agilent R T Freq/Channel Ch Freq 836.5 MHz Trig Free Center Freq 836.500000 MHz Start Freq 835.000000 MHz Stop Freq 838.000000 MHz CF Step 300.000000 kHz Freq Offset 0.000000 Hz Rel 43 dBm #Atten 32 dB #Peak Log 10 dB/ Offset 21 dB Center 836.500 MHz #Res BW 20 kHz #VBW 62 kHz Sweep 7.2 ms (1001 pts) Span 3 MHz Occupied Bandwidth 1.0886 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error -2.135 kHz x dB Bandwidth 1.279 MHz Copyright 2000-2011 Agilent Technologies Band LTE5 1.4MHz OBW QPSK Mid Channel FRB.gif
Band 2 WCDMA	Agilent R T Freq/Channel Ch Freq 1.88 GHz Trig Free Center Freq 1.88000000 GHz Start Freq 1.87500000 GHz Stop Freq 1.88500000 GHz CF Step 1.00000000 MHz Freq Offset 0.00000000 Hz Rel 43 dBm #Atten 32 dB #Peak Log 10 dB/ Offset 21 dB Center 1.880 00 GHz #Res BW 51 kHz #VBW 150 kHz Sweep 3.733 ms (1001 pts) Span 10 MHz Occupied Bandwidth 4.1548 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error -11.756 kHz x dB Bandwidth 4.618 MHz Copyright 2000-2011 Agilent Technologies Band WCDMA B2 HSDPA OBW	Agilent R T Freq/Channel Ch Freq 1.88 GHz Trig Free Center Freq 1.88000000 GHz Start Freq 1.87500000 GHz Stop Freq 1.88500000 GHz CF Step 1.00000000 MHz Freq Offset 0.00000000 Hz Rel 41 dBm #Atten 32 dB #Peak Log 10 dB/ Offset 21 dB Center 1.880 00 GHz #Res BW 51 kHz #VBW 150 kHz Sweep 3.733 ms (1001 pts) Span 10 MHz Occupied Bandwidth 4.1450 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error -9.064 kHz x dB Bandwidth 4.628 MHz Copyright 2000-2011 Agilent Technologies Band WCDMA B2 REL99 OBW

Band 5 WCDMA	 Agilent R T Freq/Channel Ch Freq 836.6 MHz Trig Free Center Freq 836.600000 MHz Start Freq 831.600000 MHz Stop Freq 841.600000 MHz CF Step 1.00000000 MHz Freq Offset 0.00000000 Hz Signal Track On Occupied Bandwidth 4.1688 MHz Transmit Freq Error -5.680 kHz x dB Bandwidth 4.608 MHz Copyright 2000-2011 Agilent Technologies Band WCDMA B5 HSDPA OBW	 Agilent R T Freq/Channel Ch Freq 836.6 MHz Trig Free Center Freq 836.600000 MHz Start Freq 831.600000 MHz Stop Freq 841.600000 MHz CF Step 1.00000000 MHz Freq Offset 0.00000000 Hz Signal Track On Occupied Bandwidth 4.1573 MHz Transmit Freq Error 1.994 kHz x dB Bandwidth 4.638 MHz Copyright 2000-2011 Agilent Technologies Band WCDMA B5 REL99 OBW
Band GSM 1900 EGPRS	 Agilent R T Freq/Channel Ch Freq 1.88 GHz Trig Free Center Freq 1.88000000 GHz Start Freq 1.87950000 GHz Stop Freq 1.88050000 GHz CF Step 100.000000 kHz Freq Offset 0.00000000 Hz Signal Track On Occupied Bandwidth 247.1932 kHz Transmit Freq Error -375.182 Hz x dB Bandwidth 316.239 kHz Copyright 2000-2011 Agilent Technologies Band GSM1900 EGPRS OBW Mid channel	 Agilent R T Freq/Channel Ch Freq 1.88 GHz Trig Free Center Freq 1.88000000 GHz Start Freq 1.87950000 GHz Stop Freq 1.88050000 GHz CF Step 100.000000 kHz Freq Offset 0.00000000 Hz Signal Track On Occupied Bandwidth 245.4674 kHz Transmit Freq Error -376.727 Hz x dB Bandwidth 316.932 kHz Copyright 2000-2011 Agilent Technologies Band GSM1900 GPRS OBW Mid channel



10.2. BAND EDGE EMISSIONS

RULE PART(S)

FCC: §22.359 and §24.238

LIMITS

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

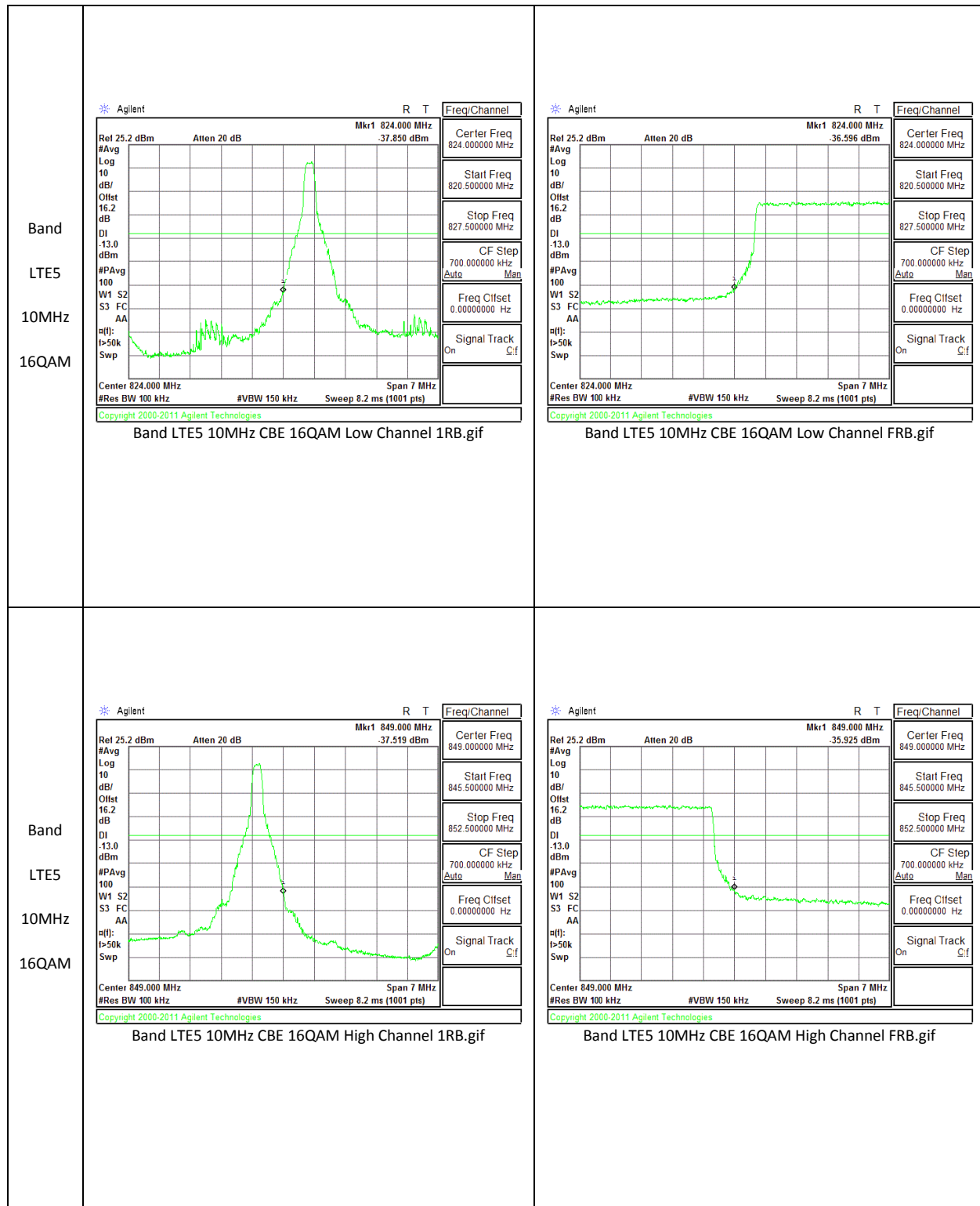
TEST PROCEDURE

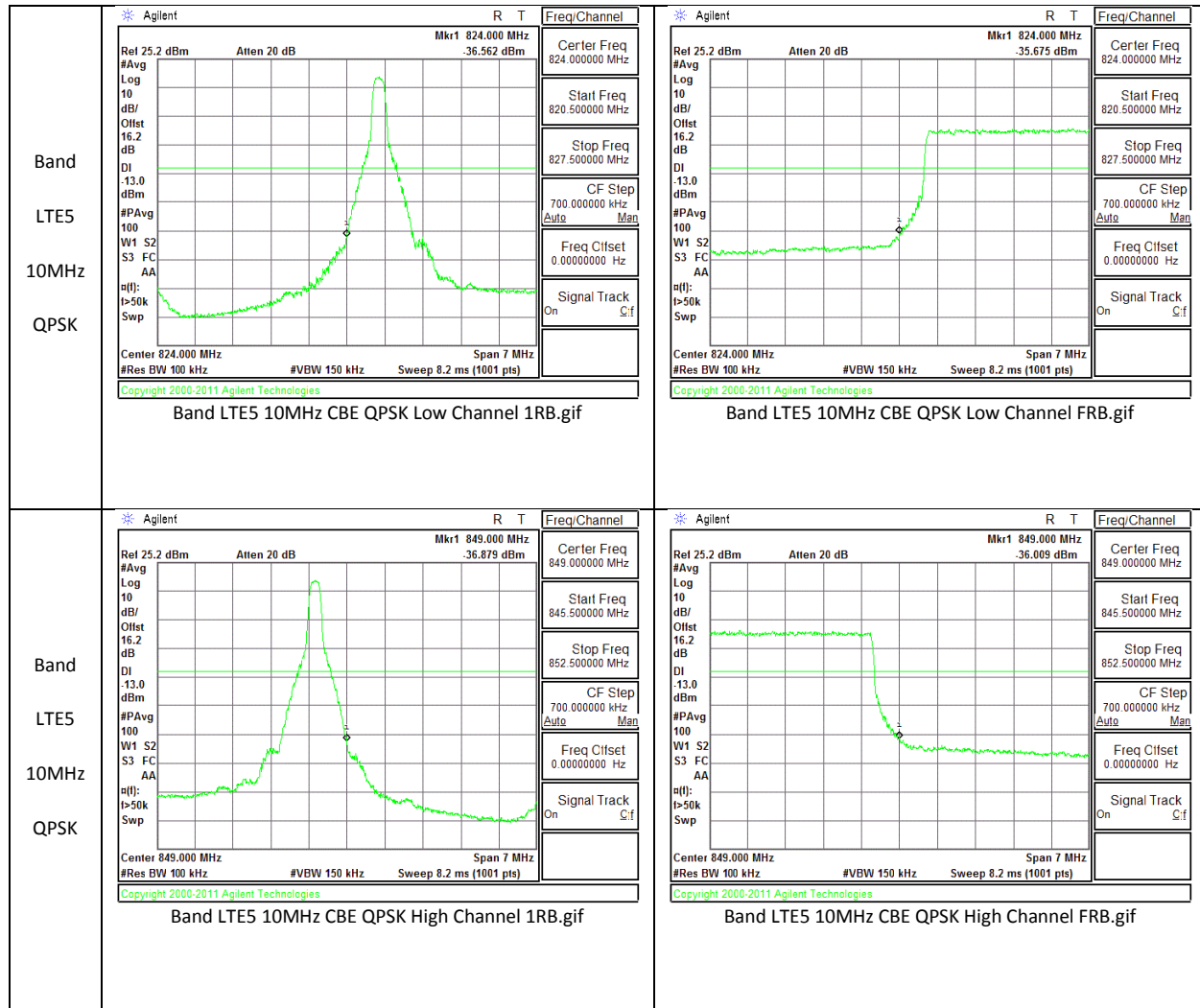
Per KDB 971168 D01 Power Meas License Digital Systems v02r01

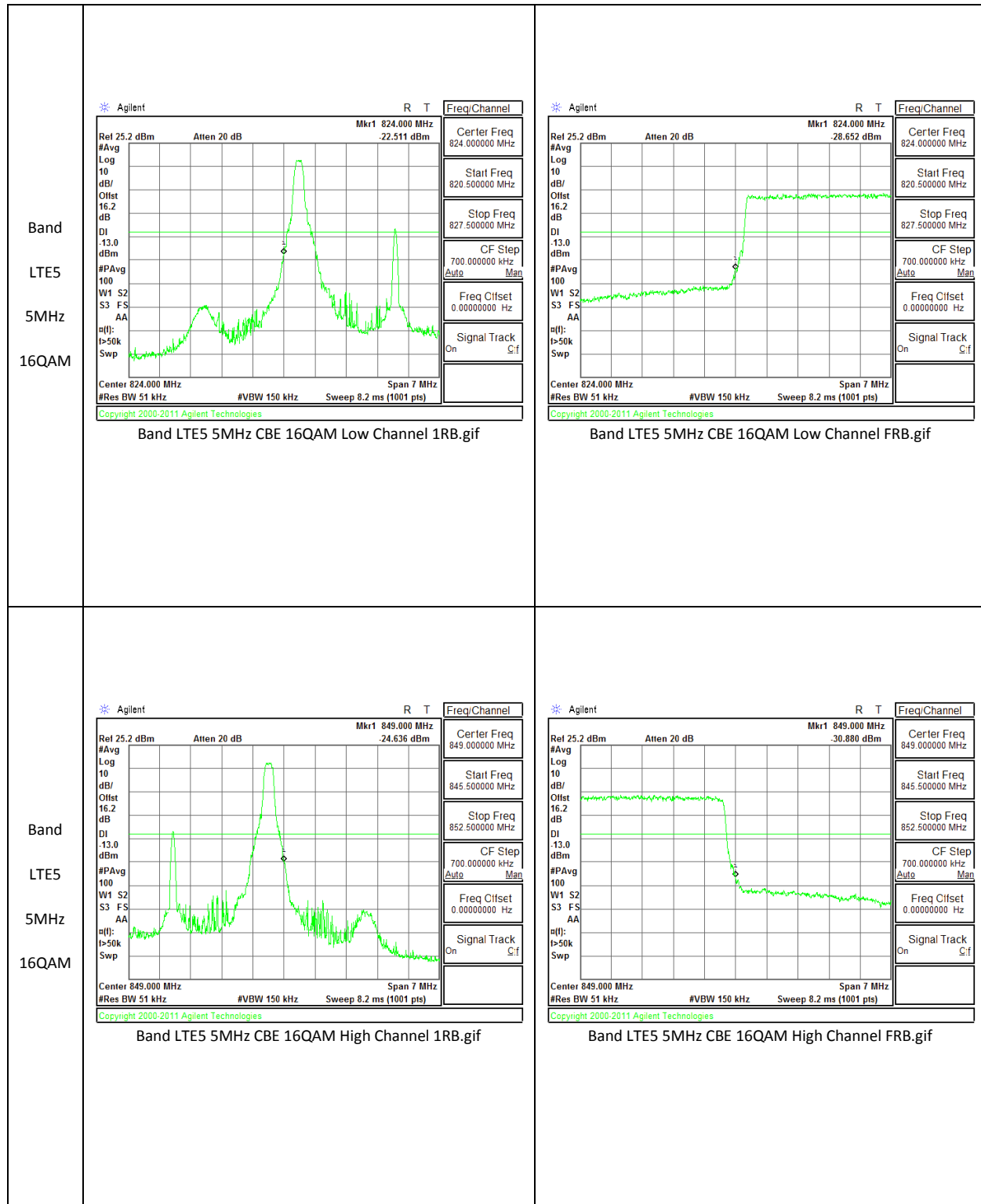
The transmitter output was connected to an Agilent 8960 or a CMW500 Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.

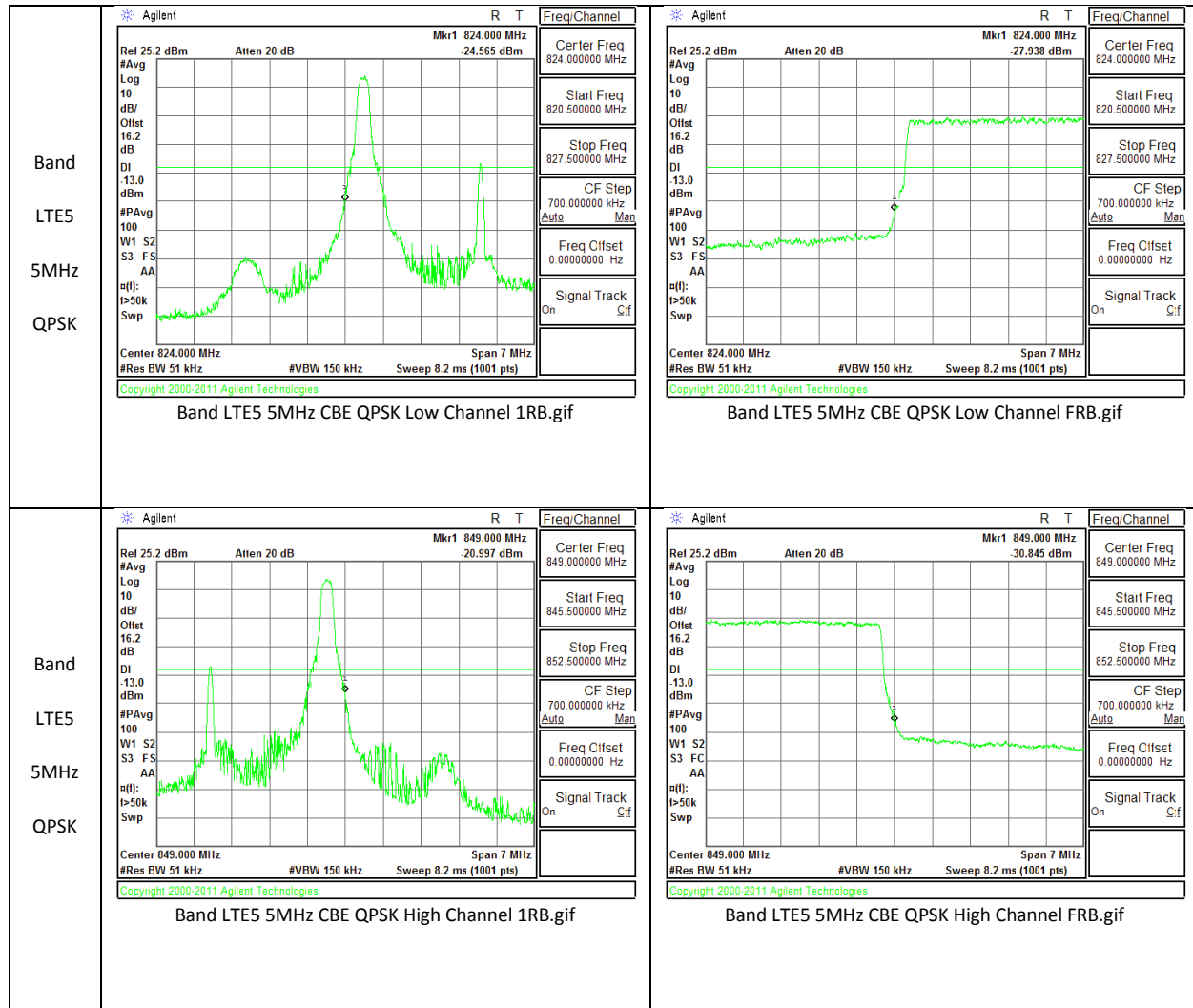
RESULTS

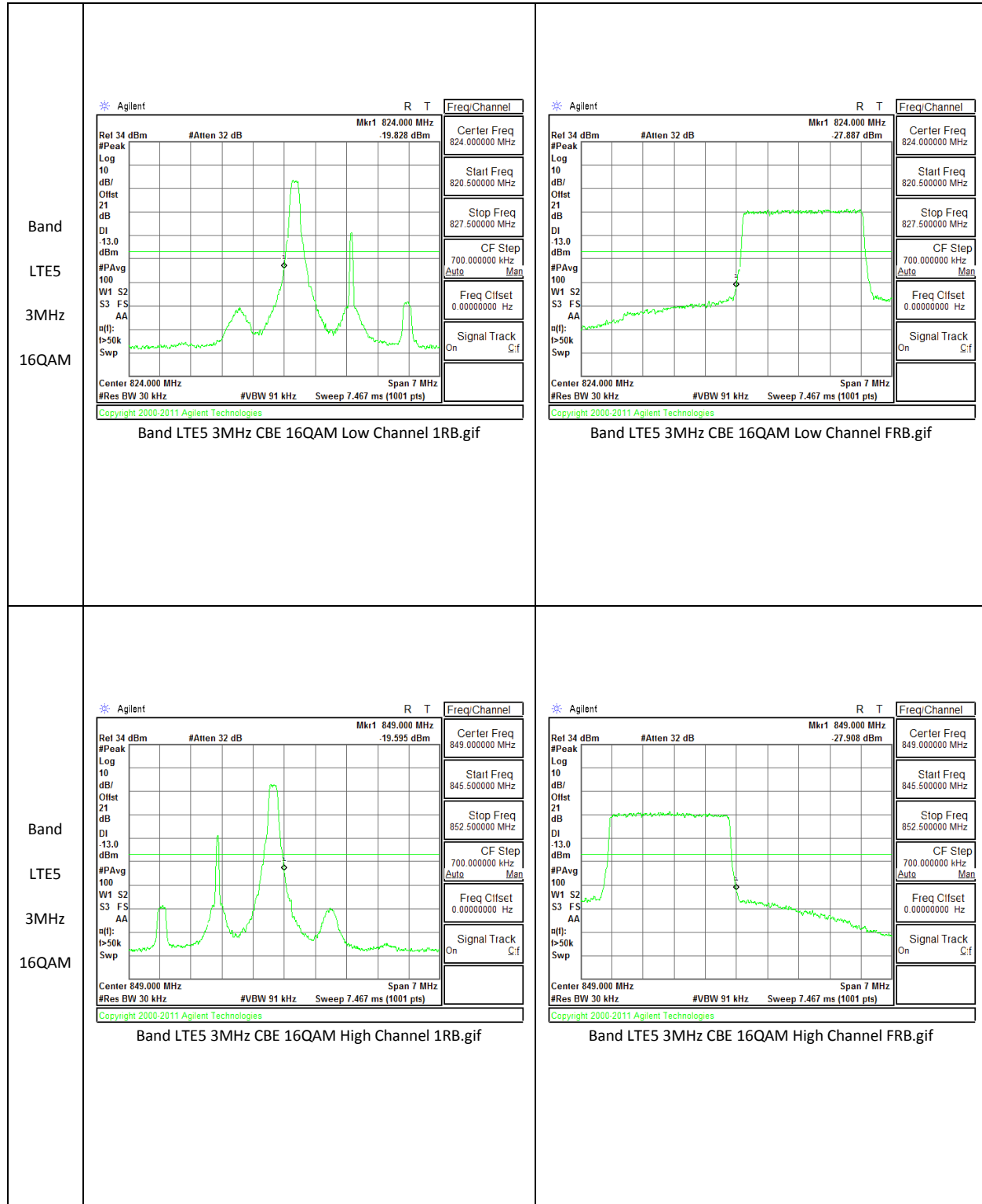
10.2.1. BAND EDGE PLOTS

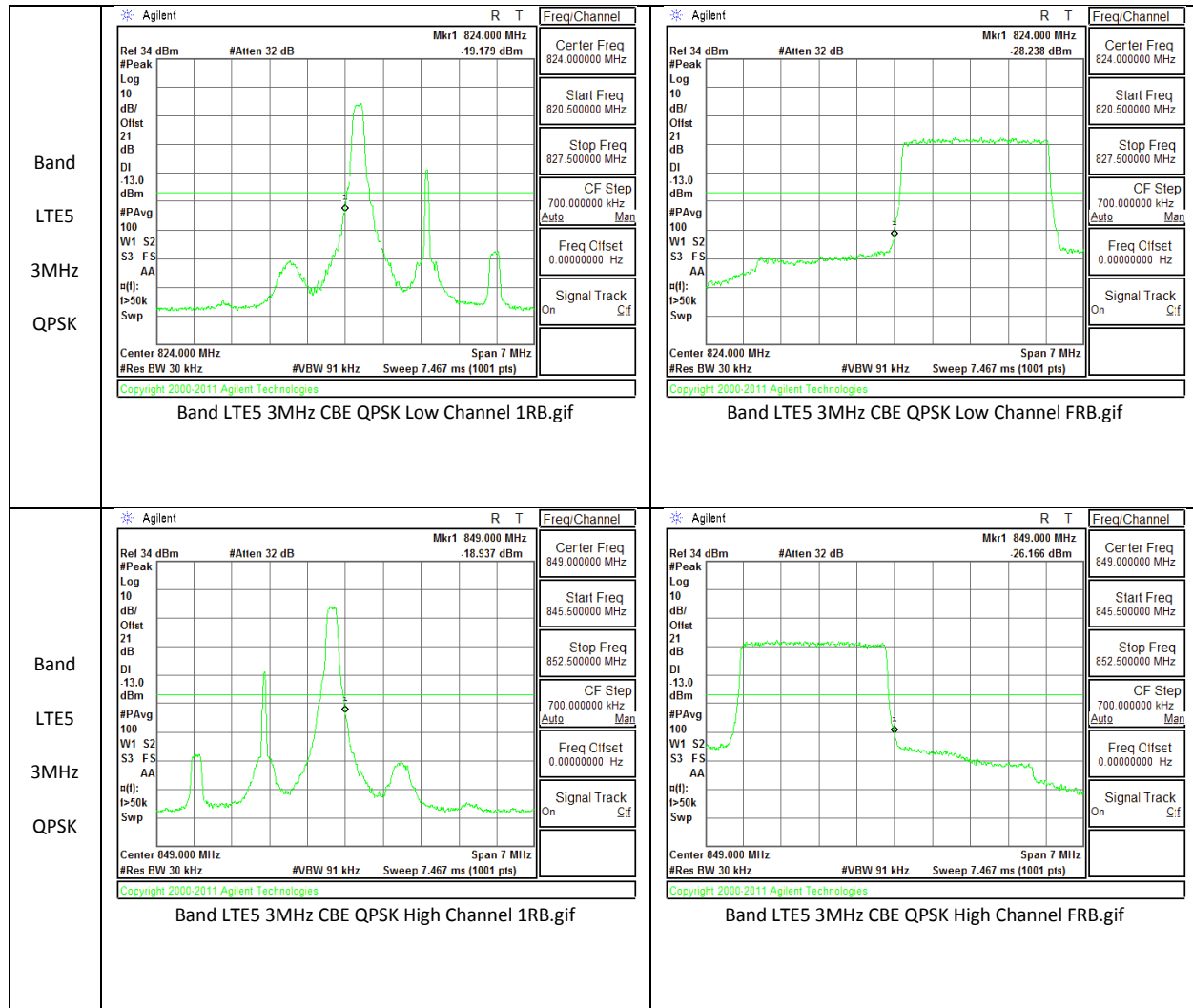


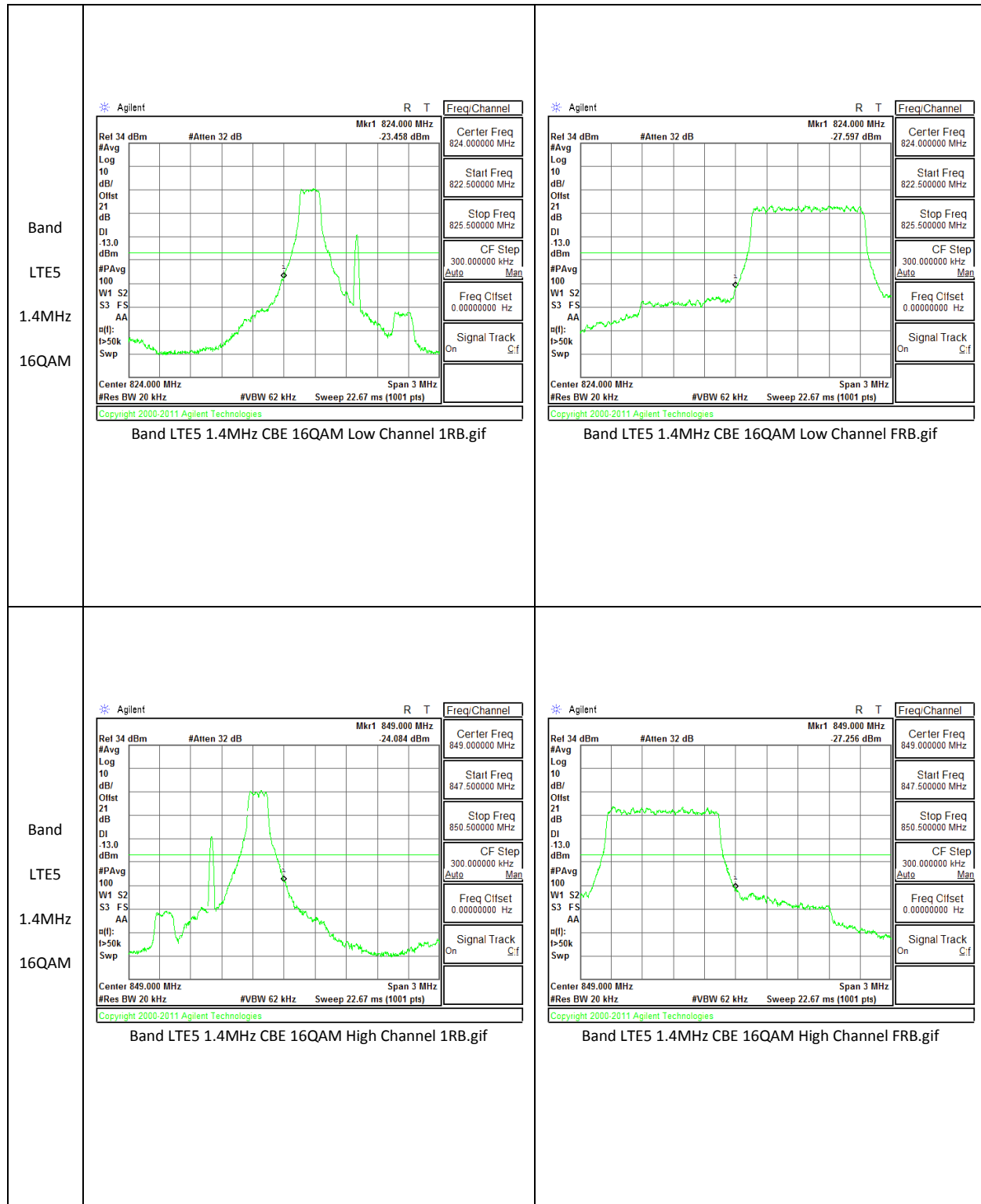


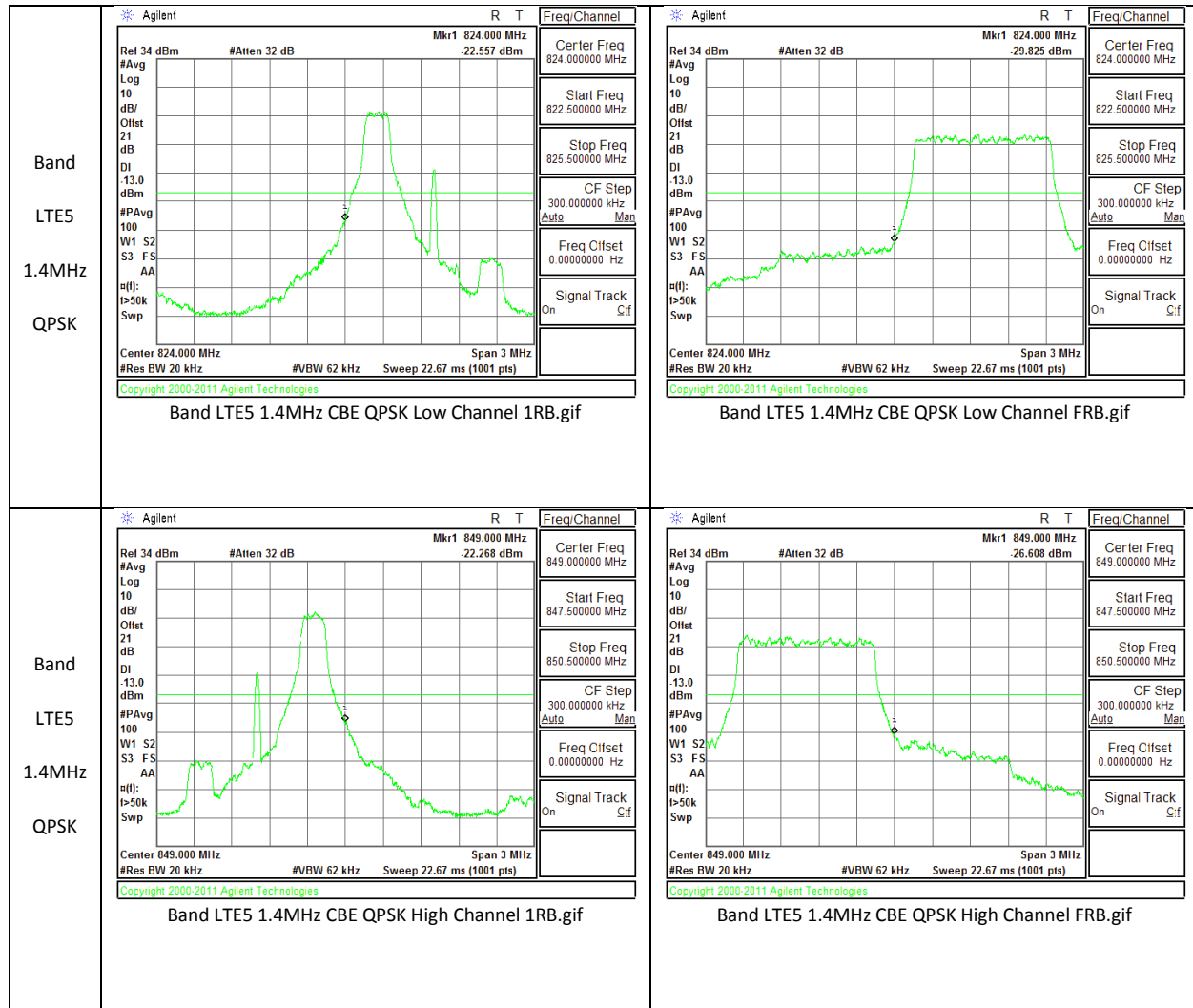


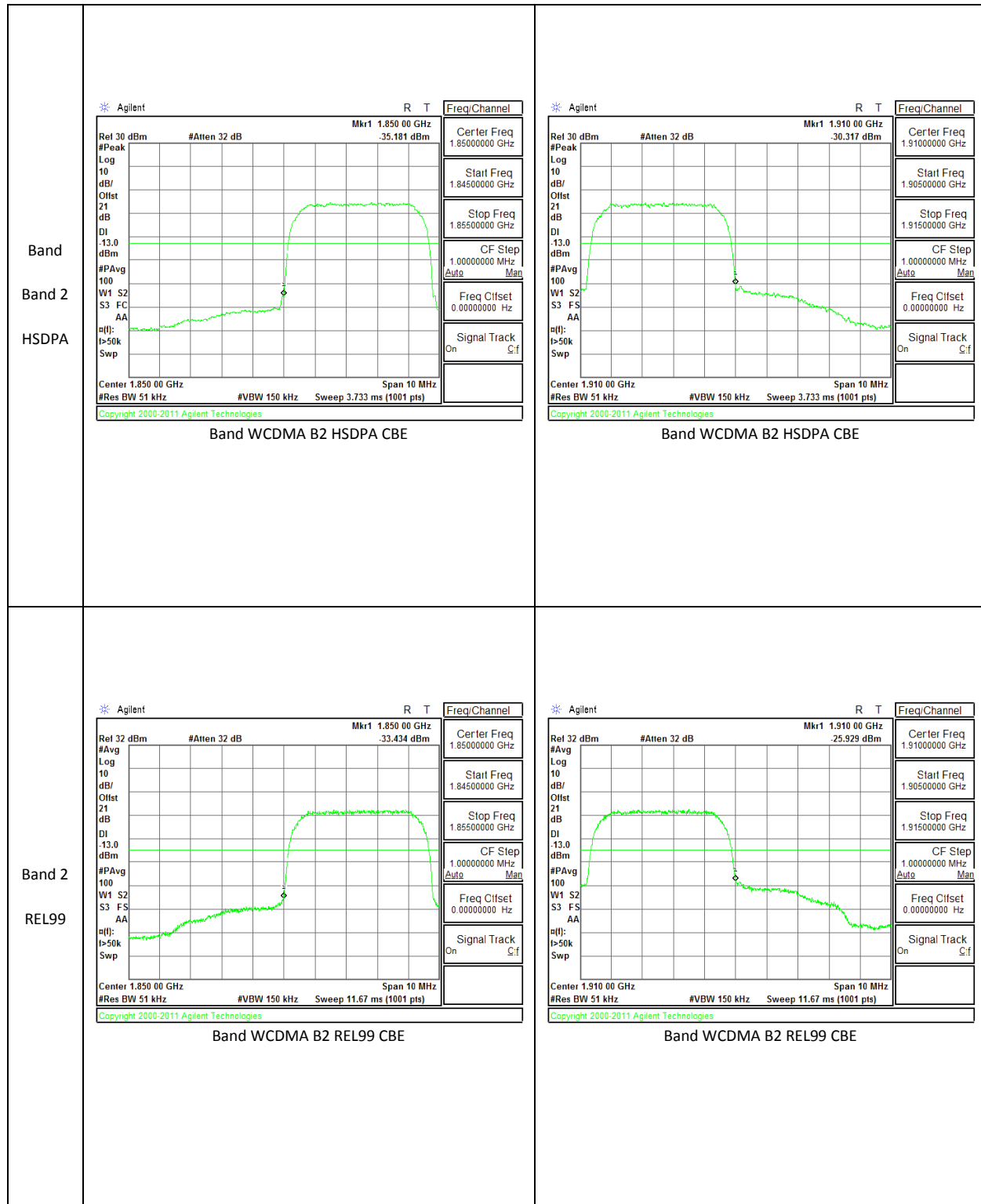


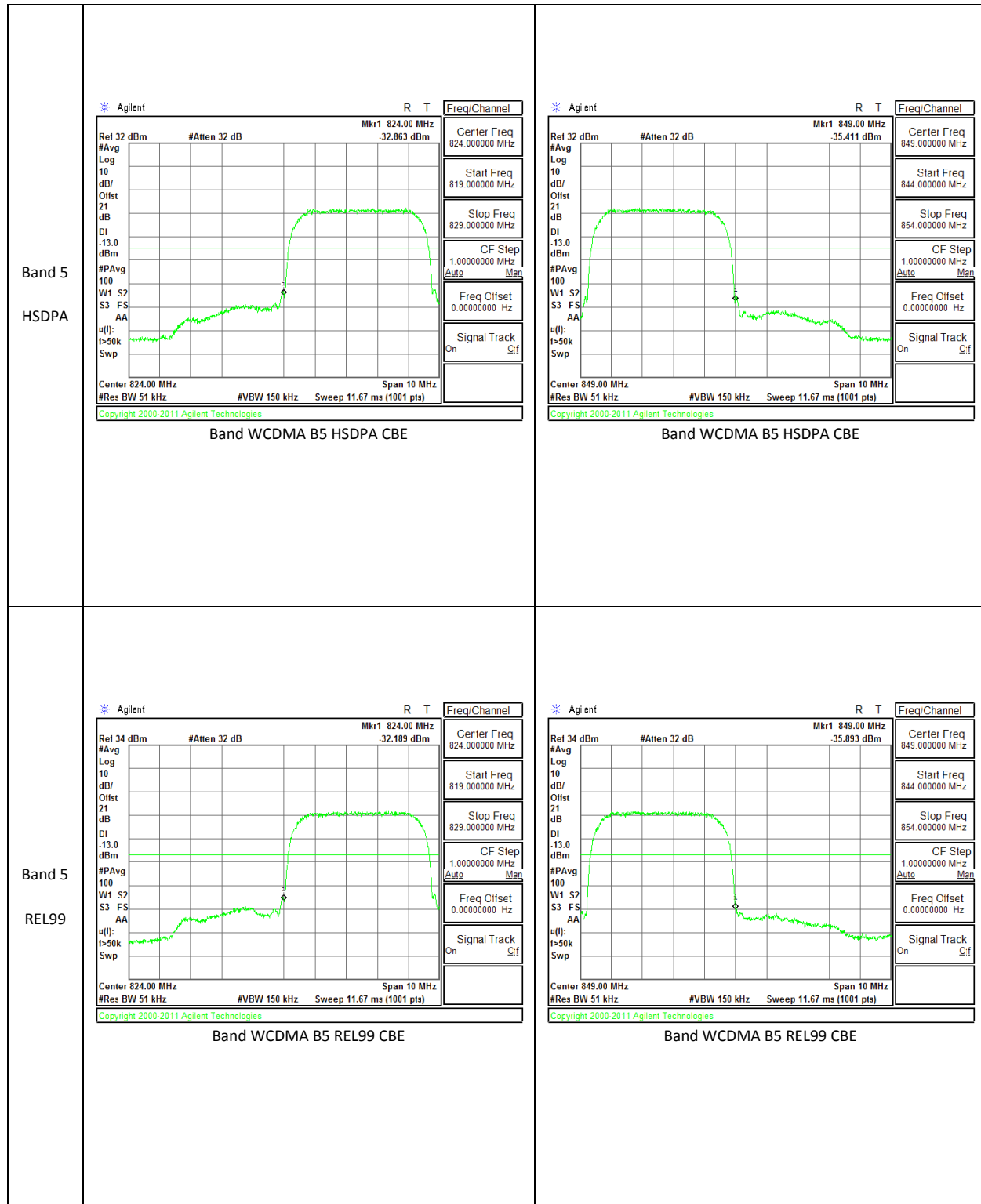


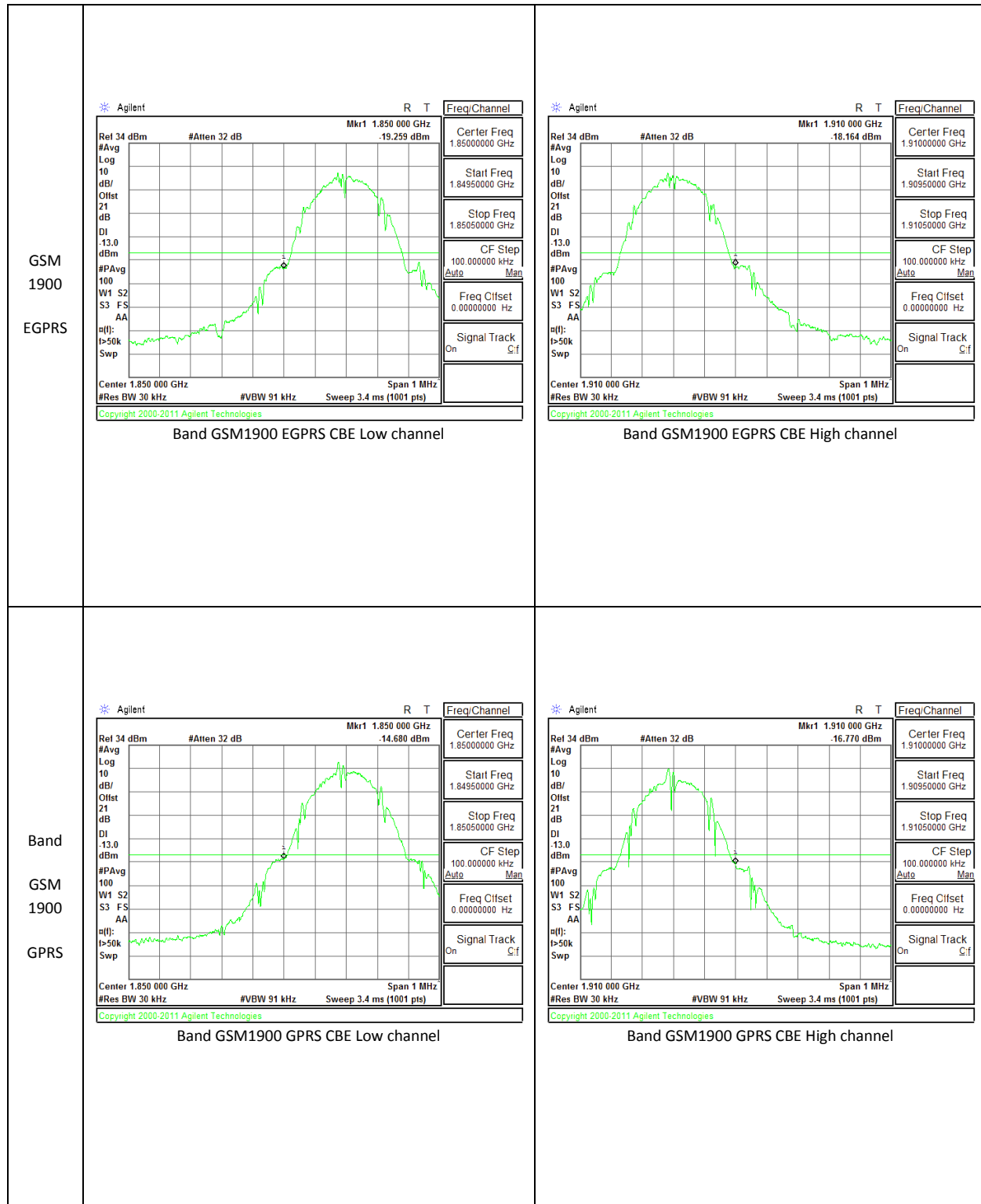


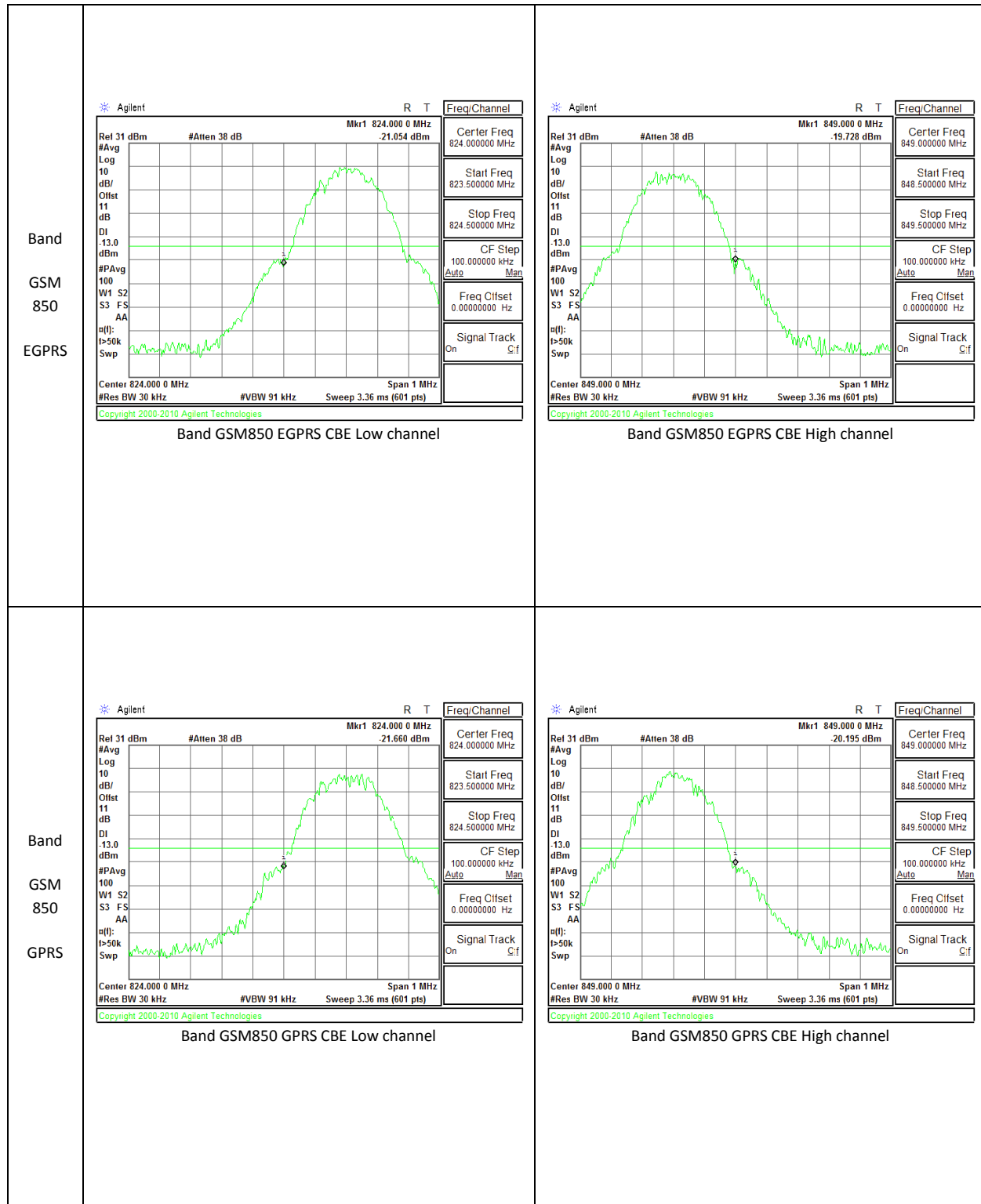












10.3. OUT OF BAND EMISSIONS

RULE PART(S)

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

LIMITS

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

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems 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.

RESULTS

10.3.1. OUT OF BAND EMISSIONS RESULT

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE5	10	QPSK	829	-65.22	-13	-52.22
			836.5	-67.87	-13	-54.87
			844	-67.95	-13	-54.95
		16QAM	829	-65.88	-13	-52.88
			836.5	-67.96	-13	-54.96
			844	-67.79	-13	-54.79

Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE5	5	QPSK	826.5	-61.53	-13	-48.53
			836.5	-66.36	-13	-53.36
			846.5	-63.04	-13	-50.04
		16QAM	826.5	-62.16	-13	-49.16
			836.5	-66.25	-13	-53.25
			846.5	-63.78	-13	-50.78

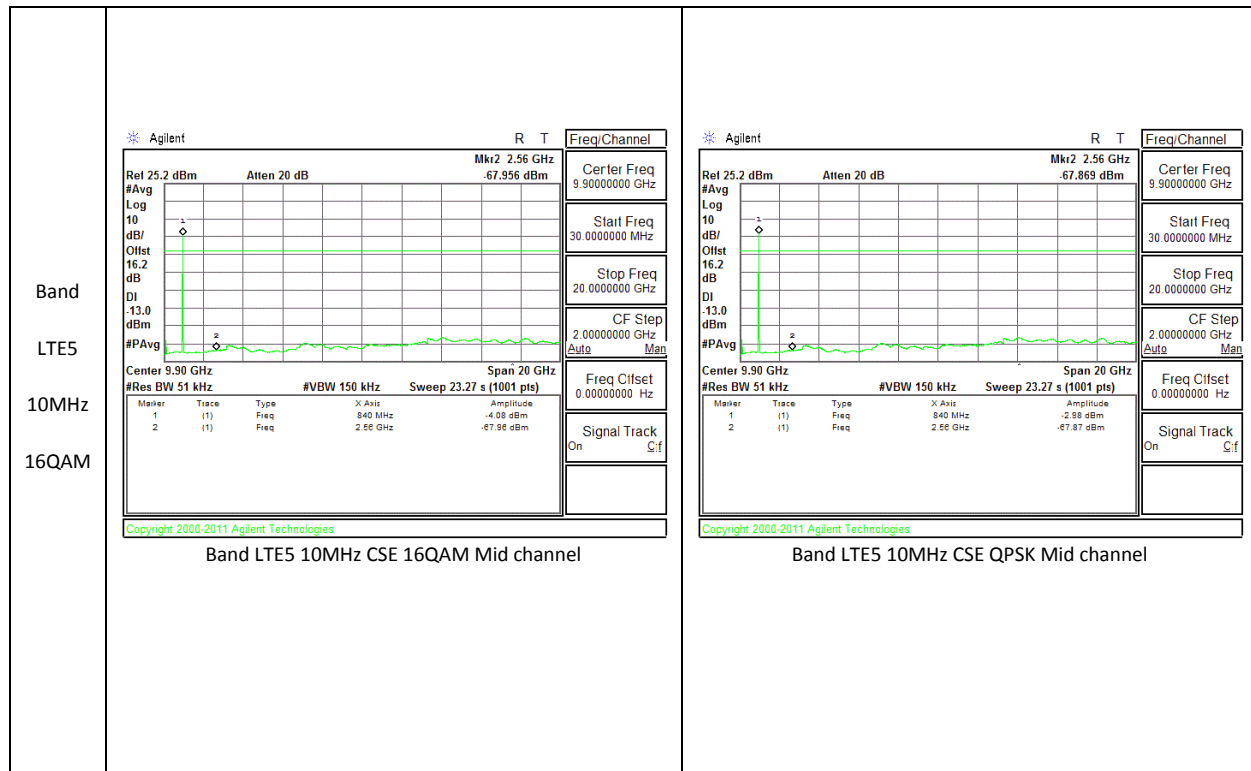
Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE5	3	QPSK	825.5	-21.55	-13	-8.55
			836.5	-21.52	-13	-8.52
			847.5	-22.95	-13	-9.95
		16QAM	825.5	-21.67	-13	-8.67
			836.5	-20.02	-13	-7.02
			847.5	-23.9	-13	-10.9

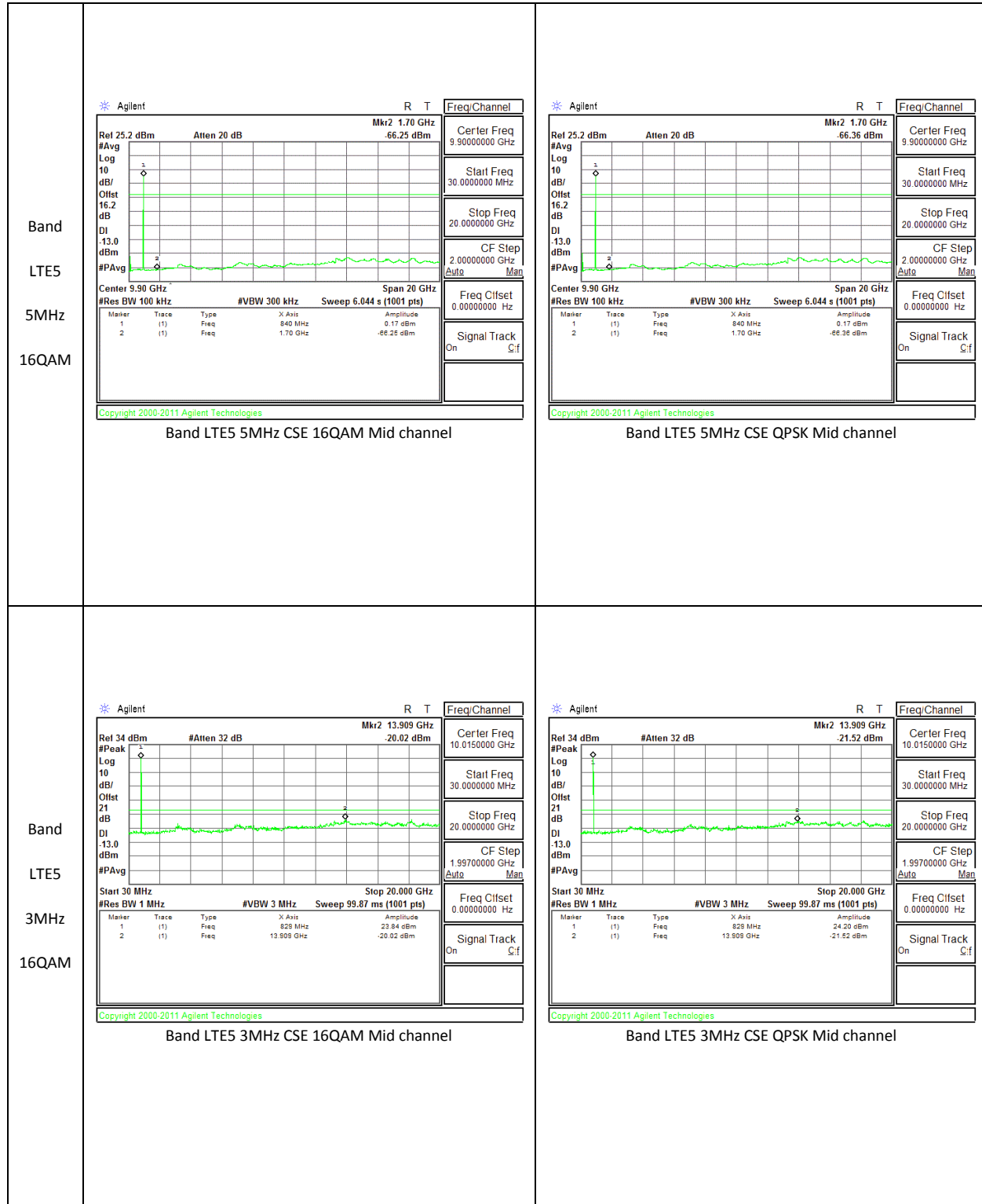
Band	BW (MHz)	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
LTE5	1.4	QPSK	824.7	-20.64	-13	-7.64
			836.5	-20.28	-13	-7.28
			848.3	-20.84	-13	-7.84
		16QAM	824.7	-21.82	-13	-8.82
			836.5	-21.65	-13	-8.65
			848.3	-21.35	-13	-8.35

Band	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
GSM850	GPRS	824.2	-24.96	-13	-11.96
		836.6	-23.79	-13	-10.79
		848.8	-24.29	-13	-11.29
	EGPRS	824.2	-20.61	-13	-7.61
		836.6	-19.92	-13	-6.92
		848.8	-24.36	-13	-11.36
GSM1900	GPRS	1850.2	-20.7	-13	-7.7
		1880	-19.76	-13	-6.76
		1909.8	-21.59	-13	-8.59
	EGPRS	1850.2	-21.66	-13	-8.66
		1880	-20.96	-13	-7.96
		1909.8	-21.55	-13	-8.55

Band	Mode	f (MHz)	Spur (dBm)	Spec (dBm)	Delta (dB)
WCDMA Band 5	REL99	826.4	-20.9	-13	-7.9
		836.6	-21.01	-13	-8.01
		846.6	-20.53	-13	-7.53
	HSDPA	826.4	-21.7	-13	-8.7
		836.6	-21.59	-13	-8.59
		846.6	-20.6	-13	-7.6
WCDMA Band 2	REL99	1852.4	-21.81	-13	-8.81
		1880	-20.78	-13	-7.78
		1907.6	-21.34	-13	-8.34
	HSDPA	1852.4	-21.25	-13	-8.25
		1880	-20.42	-13	-7.42
		1907.6	-21.06	-13	-8.06

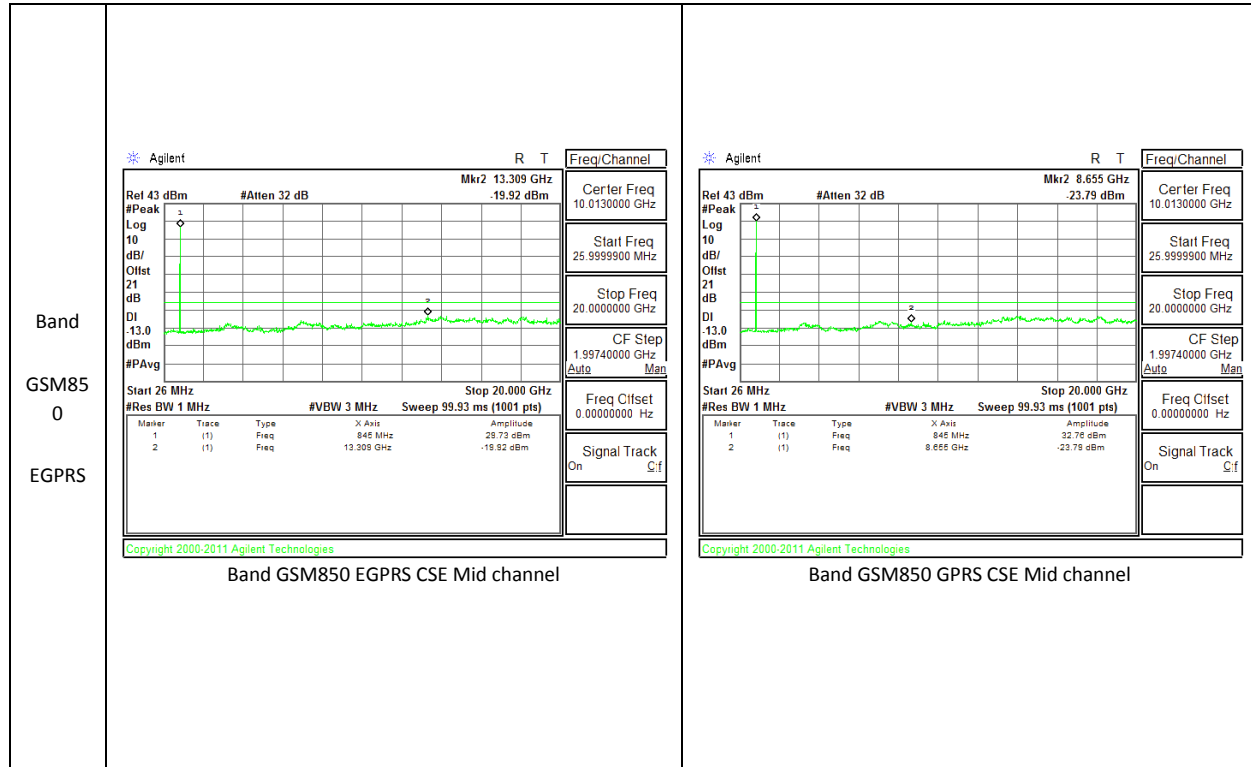
10.3.2. OUT OF BAND EMISSIONS PLOTS











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

RESULTS

See the following pages.

10.4.1. FREQUENCY STABILITY RESULTS

WCDMA Band 5 – Mid Channel

Reference Frequency: Cell Mid Channel 836.6 MHz @ 20°C				
Limit: +- 2.5 ppm = 2091.500 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	836.599996	0.000	2.5
3.80	40	836.599998	-0.002	2.5
3.80	30	836.599997	-0.001	2.5
3.80	20	836.599996	0	2.5
3.80	10	836.599996	0.000	2.5
3.80	0	836.600001	-0.006	2.5
3.80	-10	836.600003	-0.008	2.5
3.80	-20	836.599998	-0.002	2.5
3.80	-30	836.599996	0.000	2.5

Reference Frequency: Mid Channel 836.6 MHz @ 20°C				
Limit: +- 2.5 ppm = 2091.500 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measured with Time Elapse		
			Delta (ppm)	Limit (ppm)
3.80	20	836.599996	0.00000	2.5
4.30	20	836.599997	-0.00117	2.5
3.40	20	836.599997	-0.00097	2.5

WCDMA Band 2 – 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 Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	1880.000006	0.002	2.5
3.80	40	1880.000008	0.002	2.5
3.80	30	1880.000007	0.002	2.5
3.80	20	1880.000011	0	2.5
3.80	10	1880.000008	0.001	2.5
3.80	0	1880.000008	0.001	2.5
3.80	-10	1880.000007	0.002	2.5
3.80	-20	1880.000007	0.002	2.5
3.80	-30	1880.000005	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 Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	20	1880.000011	0	2.5
4.30	20	1880.000006	0.002	2.5
3.40	20	1880.000007	0.002	2.5

11. RADIATED TEST RESULTS

11.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §22.913, §24.232, §27 and § 90.635.

LIMITS

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

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

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

TEST PROCEDURE

ANSI / TIA / EIA 603C Clause 2.2.17; PSA setting reference to 971168 D01 v02r01

For peak power measurement with a PSA:

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

For average power measurement with a PSA:

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

TEST RESULTS

11.1.1. ERP/EIRP Results

Band	Mode	Channel	f(MHz)	ERP / EIRP	
				dBm	mW
Band 2	REL99	9262	1852.4	23.58	228.03
		9400	1880	23.34	215.77
		9538	1907.6	24.23	264.85
	HSDPA	9262	1852.4	22.91	195.43
		9400	1880	22.37	172.58
		9538	1907.6	23.5	223.87

Band	Mode	Channel	f(MHz)	ERP / EIRP	
				dBm	mW
Band 5	REL99	4132	826.4	19.65	92.3
		4183	836.6	19.92	98.15
		4233	846.6	20.57	113.97
	HSDPA	4132	826.4	17.76	59.70
		4183	836.6	18.45	70
		4233	846.6	18.57	71.99

Band	Mode	Channel	f(MHz)	ERP / EIRP	
				dBm	mW
GSM1900	GPRS	512	1850.2	30.65	1162.25
		661	1880	30.12	1028.73
		810	1909.8	30.45	1107.9
	EGPRS	512	1850.2	28.62	727.44
		661	1880	27.51	564.03
		810	1909.8	27.66	583.85

Band	Mode	Channel	f(MHz)	ERP / EIRP	
				dBm	mW
GSM850	GPRS	128	824.2	30.98	1253.72
		190	836.6	31.11	1291.22
		251	848.8	31.14	1299.57
	EGPRS	128	824.2	28.57	719.78
		190	836.6	28.72	744.73
		251	848.8	27.74	594.02

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	18.37	68.74
			1/0	836.5	19.59	90.99
			1/0	844	18.89	77.41
		16QAM	1/0	829	17.37	54.6
			1/0	836.5	18.73	74.64
			1/0	844	17.95	62.34

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP / EIRP	
					dBm	mW
LTE5	5	QPSK	1/0	826.5	18.90	77.66
			1/0	836.5	19.39	86.9
			1/0	846.5	19.42	87.46
		16QAM	1/0	826.5	17.99	62.98
			1/0	836.5	18.53	71.29
			1/0	846.5	18.23	66.5

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP / EIRP	
					dBm	mW
LTE5	3	QPSK	1/0	825.5	18.53	71.32
			1/0	836.5	18.81	76.03
			1/0	847.5	19.67	92.64
		16QAM	1/0	825.5	17.67	58.51
			1/0	836.5	17.84	60.81
			1/0	847.5	18.68	73.76

Band	BW (MHz)	Mode	RB/RB Size	f (MHz)	ERP / EIRP	
					dBm	mW
LTE5	1.4	QPSK	1/0	824.7	19.05	80.39
			1/0	836.5	19.48	88.72
			1/0	848.3	20.07	101.58
		16QAM	1/0	824.7	17.93	62.12
			1/0	836.5	18.63	72.95
			1/0	848.3	19.07	80.69

11.1.3. ERP/EIRP PLOTS

LTE Band 5

Band

LTE5

10MHz

16QAM

High Frequency Substitution Measurement

UL Verification Services, Inc. Chamber C

Company:

Project #:

Date:

Test Engineer:

Configuration:

Mode:

Samsung

14U18519

08/10/14

O. Stoelting

EUT, X Position

LTE5 10MHz FUND 16QAM

Test Equipment:

Receiving: Hybrid T243 and Chamber B SMA Cables

Substitution: Dipole T416, 8ft SMA Cable (SN # 245185 003) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
829.00	12.28	V	0.9	0.0	11.38	38.5	-27.1	
829.00	18.27	H	0.9	0.0	17.37	38.5	-21.1	
Mid Ch								
836.50	12.70	V	0.9	0.0	11.80	38.5	-26.7	
836.50	19.63	H	0.9	0.0	18.73	38.5	-19.7	
High Ch								
844.00	12.89	V	0.9	0.0	11.99	38.5	-26.5	
844.00	18.85	H	0.9	0.0	17.95	38.5	-20.5	

Rev. 3.17.11

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

Band LTE5 10MHz QPSK	High Frequency Substitution Measurement UL Verification Services, Inc. Chamber C Company: Samsung Project #: 14U18519 Date: 08/10/14 Test Engineer: O. Stoelting Configuration: EUT, X Position Mode: LTE5 10MHz FUND QPSK Test Equipment: Receiving: Hybrid T243 and Chamber B SMA Cables Substitution: Dipole T416, 8ft SMA Cable (SN # 245185 003) Warehouse. <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>f MHz</th> <th>SG reading (dBm)</th> <th>Ant. Pol. (H/V)</th> <th>Cable Loss (dB)</th> <th>Antenna Gain (dBd)</th> <th>ERP (dBm)</th> <th>Limit (dBm)</th> <th>Margin (dB)</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td>Low Ch</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>829.00</td> <td>13.23</td> <td>V</td> <td>0.9</td> <td>0.0</td> <td>12.33</td> <td>38.5</td> <td>-26.1</td> <td></td> </tr> <tr> <td>829.00</td> <td>19.27</td> <td>H</td> <td>0.9</td> <td>0.0</td> <td>18.37</td> <td>38.5</td> <td>-20.1</td> <td></td> </tr> <tr> <td>Mid Ch</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>836.50</td> <td>13.61</td> <td>V</td> <td>0.9</td> <td>0.0</td> <td>12.71</td> <td>38.5</td> <td>-25.7</td> <td></td> </tr> <tr> <td>836.50</td> <td>20.49</td> <td>H</td> <td>0.9</td> <td>0.0</td> <td>19.59</td> <td>38.5</td> <td>-18.9</td> <td></td> </tr> <tr> <td>High Ch</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>844.00</td> <td>13.80</td> <td>V</td> <td>0.9</td> <td>0.0</td> <td>12.90</td> <td>38.5</td> <td>-25.6</td> <td></td> </tr> <tr> <td>844.00</td> <td>19.79</td> <td>H</td> <td>0.9</td> <td>0.0</td> <td>18.89</td> <td>38.5</td> <td>-19.6</td> <td></td> </tr> </tbody> </table> Rev. 3.17.11 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes	Low Ch									829.00	13.23	V	0.9	0.0	12.33	38.5	-26.1		829.00	19.27	H	0.9	0.0	18.37	38.5	-20.1		Mid Ch									836.50	13.61	V	0.9	0.0	12.71	38.5	-25.7		836.50	20.49	H	0.9	0.0	19.59	38.5	-18.9		High Ch									844.00	13.80	V	0.9	0.0	12.90	38.5	-25.6		844.00	19.79	H	0.9	0.0	18.89	38.5	-19.6	
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes																																																																																			
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829.00	13.23	V	0.9	0.0	12.33	38.5	-26.1																																																																																				
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844.00	13.80	V	0.9	0.0	12.90	38.5	-25.6																																																																																				
844.00	19.79	H	0.9	0.0	18.89	38.5	-19.6																																																																																				

Band

LTE5

5MHz

16QAM

High Frequency Substitution Measurement

UL Verification Services, Inc. Chamber C

Company:

Project #:

Date:

Test Engineer:

Configuration:

Mode:

Test Equipment:

Receiving: Hybrid T243 and Chamber B SMA Cables

Substitution: Dipole T416, 8ft SMA Cable (SN # 245185 003) 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	12.22	V	0.9	0.0	11.32	38.5	-27.1	
826.50	18.89	H	0.9	0.0	17.99	38.5	-20.5	
Mid Ch								
836.50	12.81	V	0.9	0.0	11.91	38.5	-26.5	
836.50	19.43	H	0.9	0.0	18.53	38.5	-19.9	
High Ch								
846.50	12.61	V	0.9	0.0	11.71	38.5	-26.7	
846.50	19.13	H	0.9	0.0	18.23	38.5	-20.2	

Rev. 3.17.11

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

Band LTE5 3MHz 16QAM	High Frequency Substitution Measurement UL Verification Services, Inc. Chamber C Company: Samsung Project #: 14U18519 Date: 08/10/14 Test Engineer: O. Stoelting Configuration: EUT, X Position Mode: LTE5 3MHz FUND 16QAM Test Equipment: Receiving: Hybrid T243 and Chamber B SMA Cables Substitution: Dipole T416, 8ft SMA Cable (SN # 245185 003) Warehouse. <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>f MHz</th> <th>SG reading (dBm)</th> <th>Ant. Pol. (H/V)</th> <th>Cable Loss (dB)</th> <th>Antenna Gain (dBd)</th> <th>ERP (dBm)</th> <th>Limit (dBm)</th> <th>Margin (dB)</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td>Low Ch</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>825.50</td> <td>12.10</td> <td>V</td> <td>0.9</td> <td>0.0</td> <td>11.20</td> <td>38.5</td> <td>-27.2</td> <td></td> </tr> <tr> <td>825.50</td> <td>18.57</td> <td>H</td> <td>0.9</td> <td>0.0</td> <td>17.67</td> <td>38.5</td> <td>-20.8</td> <td></td> </tr> <tr> <td>Mid Ch</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>836.50</td> <td>12.64</td> <td>V</td> <td>0.9</td> <td>0.0</td> <td>11.74</td> <td>38.5</td> <td>-26.7</td> <td></td> </tr> <tr> <td>836.50</td> <td>18.74</td> <td>H</td> <td>0.9</td> <td>0.0</td> <td>17.84</td> <td>38.5</td> <td>-20.6</td> <td></td> </tr> <tr> <td>High Ch</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>847.50</td> <td>13.19</td> <td>V</td> <td>0.9</td> <td>0.0</td> <td>12.29</td> <td>38.5</td> <td>-26.2</td> <td></td> </tr> <tr> <td>847.50</td> <td>19.58</td> <td>H</td> <td>0.9</td> <td>0.0</td> <td>18.68</td> <td>38.5</td> <td>-19.8</td> <td></td> </tr> </tbody> </table> Rev. 3.17.11 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes	Low Ch									825.50	12.10	V	0.9	0.0	11.20	38.5	-27.2		825.50	18.57	H	0.9	0.0	17.67	38.5	-20.8		Mid Ch									836.50	12.64	V	0.9	0.0	11.74	38.5	-26.7		836.50	18.74	H	0.9	0.0	17.84	38.5	-20.6		High Ch									847.50	13.19	V	0.9	0.0	12.29	38.5	-26.2		847.50	19.58	H	0.9	0.0	18.68	38.5	-19.8	
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes																																																																																			
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Band LTE5 3MHz QPSK	High Frequency Substitution Measurement UL Verification Services, Inc. Chamber C Company: Samsung Project #: 14U18519 Date: 08/10/14 Test Engineer: O. Stoelting Configuration: EUT, X Position Mode: LTE5 3MHz FUND QPSK Test Equipment: Receiving: Hybrid T243 and Chamber B SMA Cables Substitution: Dipole T416, 8ft SMA Cable (SN # 245185 003) Warehouse. <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>f MHz</th> <th>SG reading (dBm)</th> <th>Ant. Pol. (H/V)</th> <th>Cable Loss (dB)</th> <th>Antenna Gain (dBd)</th> <th>ERP (dBm)</th> <th>Limit (dBm)</th> <th>Margin (dB)</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td>Low Ch</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>825.50</td> <td>13.07</td> <td>V</td> <td>0.9</td> <td>0.0</td> <td>12.17</td> <td>38.5</td> <td>-26.3</td> <td></td> </tr> <tr> <td>825.50</td> <td>19.43</td> <td>H</td> <td>0.9</td> <td>0.0</td> <td>18.53</td> <td>38.5</td> <td>-19.9</td> <td></td> </tr> <tr> <td>Mid Ch</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>836.50</td> <td>13.53</td> <td>V</td> <td>0.9</td> <td>0.0</td> <td>12.63</td> <td>38.5</td> <td>-25.8</td> <td></td> </tr> <tr> <td>836.50</td> <td>19.71</td> <td>H</td> <td>0.9</td> <td>0.0</td> <td>18.81</td> <td>38.5</td> <td>-19.6</td> <td></td> </tr> <tr> <td>High Ch</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>847.50</td> <td>14.03</td> <td>V</td> <td>0.9</td> <td>0.0</td> <td>13.13</td> <td>38.5</td> <td>-25.3</td> <td></td> </tr> <tr> <td>847.50</td> <td>20.57</td> <td>H</td> <td>0.9</td> <td>0.0</td> <td>19.67</td> <td>38.5</td> <td>-18.8</td> <td></td> </tr> </tbody> </table> Rev. 3.17.11 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes	Low Ch									825.50	13.07	V	0.9	0.0	12.17	38.5	-26.3		825.50	19.43	H	0.9	0.0	18.53	38.5	-19.9		Mid Ch									836.50	13.53	V	0.9	0.0	12.63	38.5	-25.8		836.50	19.71	H	0.9	0.0	18.81	38.5	-19.6		High Ch									847.50	14.03	V	0.9	0.0	13.13	38.5	-25.3		847.50	20.57	H	0.9	0.0	19.67	38.5	-18.8	
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes																																																																																			
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825.50	13.07	V	0.9	0.0	12.17	38.5	-26.3																																																																																				
825.50	19.43	H	0.9	0.0	18.53	38.5	-19.9																																																																																				
Mid Ch																																																																																											
836.50	13.53	V	0.9	0.0	12.63	38.5	-25.8																																																																																				
836.50	19.71	H	0.9	0.0	18.81	38.5	-19.6																																																																																				
High Ch																																																																																											
847.50	14.03	V	0.9	0.0	13.13	38.5	-25.3																																																																																				
847.50	20.57	H	0.9	0.0	19.67	38.5	-18.8																																																																																				

Band

LTE5

1.4MHz

16QAM

High Frequency Substitution Measurement

UL Verification Services, Inc. Chamber C

Company:

Project #:

Date:

Test Engineer:

Configuration:

Mode:

Samsung

14U18519

08/10/14

O. Stoelting

EUT, X Position

LTE5 1.4MHz FUND 16QAM

Test Equipment:

Receiving: Hybrid T243 and Chamber B SMA Cables

Substitution: Dipole T416, 8ft SMA Cable (SN # 245185 003) 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	12.03	V	0.9	0.0	11.13	38.5	-27.3	
824.70	18.83	H	0.9	0.0	17.93	38.5	-20.5	
Mid Ch								
836.50	12.35	V	0.9	0.0	11.45	38.5	-27.0	
836.50	19.53	H	0.9	0.0	18.63	38.5	-19.8	
High Ch								
848.30	13.23	V	0.9	0.0	12.33	38.5	-26.1	
848.30	19.97	H	0.9	0.0	19.07	38.5	-19.4	

Rev. 3.17.11

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

WCDMA

Band Band 2 HSDPA	High Frequency Substitution Measurement UL Verification Services, Inc. Chamber C Company: Samsung Project #: 14U18519 Date: 08/08/14 Test Engineer: K. Huynh, T.Oeur Configuration: EUT Mode: HSDPA B2 FUND (Unit Max 2) Test Equipment: Receiving: Horn T119, and Chamber C SMA Cables Substitution: Horn T217 Substitution, 4ft SMA Cable Warehouse								
	f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
	Low Ch								
	1852.40	14.72	V	0.9	7.9	21.72	33.0	-11.3	
	1852.40	15.91	H	0.9	7.9	22.91	33.0	-10.1	
	Mid Ch								
	1880.00	14.17	V	0.9	7.9	21.17	33.0	-11.8	
	1880.00	15.37	H	0.9	7.9	22.37	33.0	-10.6	
	High Ch								
	1907.60	14.95	V	0.9	7.9	21.95	33.0	-11.1	
	1907.60	16.50	H	0.9	7.9	23.50	33.0	-9.5	
Rev. 3.17.11 Note: For Band 4 EIRP limit is 30dBm									

Band Band 5 HSDPA	High Frequency Substitution Measurement UL Verification Services, Inc. Chamber C Company: Samsung Project #: 14U18519 Date: 08/10/14 Test Engineer: O. Stoelting Configuration: EUT, X Position Mode: WCDMA_HSDPA_850 Test Equipment: Receiving: Hybrid T243 and Chamber B SMA Cables Substitution: Dipole T416, 8ft SMA Cable (SN # 245185 003) Warehouse.							
	f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	ERP	Limit	Notes
	MHz	(dBm)	(H/V)	(dB)	(dBd)	(dBm)	(dBm)	
	Low Ch							
	826.40	12.12	V	0.9	0.0	11.22	38.5	-27.2
	826.40	18.66	H	0.9	0.0	17.76	38.5	-20.7
	Mid Ch							
	836.60	12.42	V	0.9	0.0	11.52	38.5	-26.9
	836.60	19.35	H	0.9	0.0	18.45	38.5	-20.0
	High Ch							
	846.60	13.07	V	0.9	0.0	12.17	38.5	-26.3
	846.60	19.47	H	0.9	0.0	18.57	38.5	-19.9
Rev. 3.17.11 Note: For Band 13/17 ERP limit is 34.77dBm; For Band 26 limit is 50dBm								

GSM

Band GSM 1900 EGPRS	High Frequency Substitution Measurement UL Verification Services, Inc. Chamber B Company: Samsung Project #: 14U18519 Date: 08/11/14 Test Engineer: K. Ros Configuration: EUT, X-pos Mode: EGPRS1900 FUND Test Equipment: Receiving: Horn T59, and Chamber B SMA Cables Substitution: Horn T217 Substitution, 4ft SMA Cable Warehouse								
	f	SG reading	Ant. Pol.	Cable Loss	Antenna Gain	EIRP	Limit	Margin	Notes
	MHz	(dBm)	(H/V)	(dB)	(dBi)	(dBm)	(dBm)	(dB)	
	Low Ch								
	1850.20	19.79	V	0.9	7.9	26.79	33.0	-6.2	
	1850.20	21.62	H	0.9	7.9	28.62	33.0	-4.4	
	Mid Ch								
	1880.00	17.52	V	0.9	7.9	24.52	33.0	-8.5	
	1880.00	20.51	H	0.9	7.9	27.51	33.0	-5.5	
	High Ch								
	1909.80	18.61	V	0.9	7.9	25.61	33.0	-7.4	
	1909.80	20.66	H	0.9	7.9	27.66	33.0	-5.3	
Rev. 3.17.11 Note: For Band 4 EIRP limit is 30dBm									

Band

GSM

850

EGPRS

High Frequency Substitution Measurement

UL Verification Services, Inc. Chamber B

Company:

Project #:

Date:

Test Engineer:

Configuration:

Mode:

Test Equipment:

Receiving: Hybrid T243 and Chamber B SMA Cables

Substitution: Dipole T416, 8ft SMA Cable (SN # 245185 003) 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	19.42	V	0.9	0.0	18.57	38.5	-19.9	
824.20	29.42	H	0.9	0.0	28.57	38.5	-9.9	
Mid Ch								
836.60	19.43	V	0.9	0.0	18.58	38.5	-19.9	
836.60	29.57	H	0.9	0.0	28.72	38.5	-9.7	
High Ch								
848.80	19.25	V	0.9	0.0	18.40	38.5	-20.1	
848.80	28.59	H	0.9	0.0	27.74	38.5	-10.7	

Rev. 3.17.11

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

Band

GSM

850

GPRS

High Frequency Substitution Measurement

UL Verification Services, Inc. Chamber B

Company:

Project #:

Date:

Test Engineer:

Configuration:

Mode:

Samsung

14U18519

08/11/14

K. Ros

EUT, X Position

GPRS 850MHz

Test Equipment:

Receiving: Hybrid T243 and Chamber B SMA Cables

Substitution: Dipole T416, 8ft SMA Cable (SN # 245185 003) 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	23.22	V	0.9	0.0	22.32	38.5	-16.1	
824.20	31.88	H	0.9	0.0	30.98	38.5	-7.5	
Mid Ch								
836.60	23.09	V	0.9	0.0	22.19	38.5	-16.3	
836.60	32.01	H	0.9	0.0	31.11	38.5	-7.3	
High Ch								
848.80	23.95	V	0.9	0.0	23.05	38.5	-15.4	
848.80	32.04	H	0.9	0.0	31.14	38.5	-7.3	

Rev. 3.17.11

11.2. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

FCC: §2.1053, §22.917, and §24.238

LIMIT

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

TEST PROCEDURE

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

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

RESULTS

11.2.1. SPURIOUS RADIATION DATA

LTE Band 5

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement										
Company:		Samsung								
Project #:		14U18519								
Date:		08/11/14								
Test Engineer:		K. Ros								
Configuration:		EUT, X Position								
Mode:		LTE5 16QAM 10MHz Harm								
Chamber		Pre-amplifier		Filter		Limit				
5m Chamber B		T34 8449B		Filter 1		Part 22				
Band	f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
LTE5 10MHz 16QAM	Low Ch, 829MHz									
	1.658	-29.7	V	3.0	37.4	1.0	-66.0	-13.0	-53.0	
	2.487	-22.9	V	3.0	36.4	1.0	-58.3	-13.0	-45.3	
	3.316	-20.0	V	3.0	35.8	1.0	-54.8	-13.0	-41.8	
	1.658	-28.7	H	3.0	37.4	1.0	-65.1	-13.0	-52.1	
	2.487	-24.3	H	3.0	36.4	1.0	-59.7	-13.0	-46.7	
	3.316	-20.2	H	3.0	35.8	1.0	-55.0	-13.0	-42.0	
	Mid Ch, 836.5MHz									
	1.673	-29.3	V	3.0	37.3	1.0	-65.6	-13.0	-52.6	
	2.510	-22.3	V	3.0	36.4	1.0	-57.7	-13.0	-44.7	
	3.346	-19.7	V	3.0	35.8	1.0	-54.5	-13.0	-41.5	
	1.673	-29.4	H	3.0	37.3	1.0	-65.7	-13.0	-52.7	
	2.510	-24.5	H	3.0	36.4	1.0	-59.9	-13.0	-46.9	
	3.346	-20.4	H	3.0	35.8	1.0	-55.1	-13.0	-42.1	
	High Ch, 844MHz									
	1.688	-29.1	V	3.0	37.3	1.0	-65.4	-13.0	-52.4	
	2.532	-22.9	V	3.0	36.3	1.0	-58.3	-13.0	-45.3	
	3.376	-20.3	V	3.0	35.7	1.0	-55.0	-13.0	-42.0	
1.688	-29.0	H	3.0	37.3	1.0	-65.3	-13.0	-52.3		
2.532	-24.3	H	3.0	36.3	1.0	-59.6	-13.0	-46.6		
3.376	-20.2	H	3.0	35.7	1.0	-54.9	-13.0	-41.9		
Rev. 03.03.09										
Note: No other emissions were detected above the system noise floor.										

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement											
Company: Project #: Date: Test Engineer: Configuration: Mode:		Samsung 14U18519 08/11/14 K. Ros EUT, X Position LTE5 QPSK 10MHz Harm									
Chamber		Pre-amplifier		Filter		Limit					
5m Chamber B		T34 8449B		Filter 1		Part 22					
Band	f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes	
10MHz	Low Ch, 829MHz										
	LTE5	1.658	-28.9	V	3.0	37.4	1.0	-65.3	-13.0	-52.3	
		2.487	-22.6	V	3.0	36.4	1.0	-58.0	-13.0	-45.0	
		3.316	-19.9	V	3.0	35.8	1.0	-54.6	-13.0	-41.6	
	QPSK	1.658	-28.4	H	3.0	37.4	1.0	-64.7	-13.0	-51.7	
		2.487	-25.4	H	3.0	36.4	1.0	-60.7	-13.0	-47.7	
		3.316	-20.3	H	3.0	35.8	1.0	-55.1	-13.0	-42.1	
	Mid Ch, 836.5MHz										
		1.673	-29.4	V	3.0	37.3	1.0	-65.7	-13.0	-52.7	
		2.510	-22.4	V	3.0	36.4	1.0	-57.7	-13.0	-44.7	
		3.346	-20.2	V	3.0	35.8	1.0	-55.0	-13.0	-42.0	
		1.673	-28.6	H	3.0	37.3	1.0	-64.9	-13.0	-51.9	
		2.510	-24.5	H	3.0	36.4	1.0	-59.8	-13.0	-46.8	
		3.346	-20.2	H	3.0	35.8	1.0	-55.0	-13.0	-42.0	
	High Ch, 844MHz										
		1.688	-28.9	V	3.0	37.3	1.0	-65.2	-13.0	-52.2	
		2.532	-23.1	V	3.0	36.3	1.0	-58.4	-13.0	-45.4	
		3.376	-20.7	V	3.0	35.7	1.0	-55.4	-13.0	-42.4	
	1.688	-28.9	H	3.0	37.3	1.0	-65.2	-13.0	-52.2		
	2.532	-24.4	H	3.0	36.3	1.0	-59.7	-13.0	-46.7		
	3.376	-20.0	H	3.0	35.7	1.0	-54.7	-13.0	-41.7		
Rev. 03.03.09 Note: No other emissions were detected above the system noise floor.											

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement										
Company: Project #: Date: Test Engineer: Configuration: Mode:	Samsung 14U18519 08/11/14 K. Ros EUT, X Position LTE5 16QAM 5MHz Harm									
Chamber		Pre-amplifier		Filter		Limit				
5m Chamber B		T34 8449B		Filter 1		Part 22				
Band	f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
LTE5 5MHz 16QAM	Low Ch, 826.5MHz									
	1.653	-30.0	V	3.0	37.4	1.0	-66.3	-13.0	-53.3	
	2.480	-23.1	V	3.0	36.4	1.0	-58.5	-13.0	-45.5	
	3.306	-20.5	V	3.0	35.8	1.0	-55.3	-13.0	-42.3	
	1.653	-28.8	H	3.0	37.4	1.0	-65.1	-13.0	-52.1	
	2.480	-24.7	H	3.0	36.4	1.0	-60.1	-13.0	-47.1	
	3.306	-20.0	H	3.0	35.8	1.0	-54.8	-13.0	-41.8	
	Mid Ch, 836.5MHz									
	1.673	-29.7	V	3.0	37.3	1.0	-66.0	-13.0	-53.0	
	2.510	-22.9	V	3.0	36.4	1.0	-58.2	-13.0	-45.2	
	3.346	-20.2	V	3.0	35.8	1.0	-55.0	-13.0	-42.0	
	1.673	-29.0	H	3.0	37.3	1.0	-65.4	-13.0	-52.4	
	2.510	-24.8	H	3.0	36.4	1.0	-60.2	-13.0	-47.2	
	3.346	-20.5	H	3.0	35.8	1.0	-55.3	-13.0	-42.3	
	High Ch, 846.5MHz									
	1.693	-29.0	V	3.0	37.3	1.0	-65.4	-13.0	-52.4	
	2.540	-23.0	V	3.0	36.3	1.0	-58.4	-13.0	-45.4	
	3.386	-20.4	V	3.0	35.7	1.0	-55.1	-13.0	-42.1	
1.693	-28.9	H	3.0	37.3	1.0	-65.2	-13.0	-52.2		
2.540	-24.3	H	3.0	36.3	1.0	-59.6	-13.0	-46.6		
3.386	-20.1	H	3.0	35.7	1.0	-54.8	-13.0	-41.8		
Rev. 03.03.09 Note: No other emissions were detected above the system noise floor.										

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement										
Company:	Samsung									
Project #:	14U18519									
Date:	08/11/14									
Test Engineer:	K. Ros									
Configuration:	EUT, X Position									
Mode:	LTE5 QPSK 5MHz Harm									
Chamber Pre-amplifier Filter Limit 5m Chamber B T34 8449B Filter 1 Part 22										
Band	f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
LTE5 5MHz QPSK	Low Ch, 826.5MHz									
	1.653	-28.8	V	3.0	37.4	1.0	-65.1	-13.0	-52.1	
	2.480	-22.8	V	3.0	36.4	1.0	-58.2	-13.0	-45.2	
	3.306	-20.1	V	3.0	35.8	1.0	-54.9	-13.0	-41.9	
	1.653	-29.3	H	3.0	37.4	1.0	-65.7	-13.0	-52.7	
	2.480	-24.4	H	3.0	36.4	1.0	-59.8	-13.0	-46.8	
	3.306	-19.3	H	3.0	35.8	1.0	-54.1	-13.0	-41.1	
	Mid Ch, 836.5MHz									
	1.673	-29.4	V	3.0	37.3	1.0	-65.7	-13.0	-52.7	
	2.510	-22.7	V	3.0	36.4	1.0	-58.1	-13.0	-45.1	
	3.346	-20.0	V	3.0	35.8	1.0	-54.7	-13.0	-41.7	
	1.673	-28.6	H	3.0	37.3	1.0	-64.9	-13.0	-51.9	
	2.510	-23.9	H	3.0	36.4	1.0	-59.3	-13.0	-46.3	
	3.346	-20.4	H	3.0	35.8	1.0	-55.1	-13.0	-42.1	
	High Ch, 846.5MHz									
	1.693	-29.2	V	3.0	37.3	1.0	-65.5	-13.0	-52.5	
	2.540	-22.6	V	3.0	36.3	1.0	-57.9	-13.0	-44.9	
	3.386	-20.7	V	3.0	35.7	1.0	-55.4	-13.0	-42.4	
1.693	-28.9	H	3.0	37.3	1.0	-65.2	-13.0	-52.2		
2.540	-24.9	H	3.0	36.3	1.0	-60.3	-13.0	-47.3		
3.386	-20.4	H	3.0	35.7	1.0	-55.1	-13.0	-42.1		
Rev. 03.03.09 Note: No other emissions were detected above the system noise floor.										

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement										
Company: Project #: Date: Test Engineer: Configuration: Mode:	Samsung 14U18519 08/11/14 K. Ros EUT, X Position LTE5 16QAM 3MHz Harm									
Chamber		Pre-amplifier		Filter		Limit				
5m Chamber B		T34 8449B		Filter 1		Part 22				
Band	f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
LTE5 3MHz 16QAM	Low Ch, 825.5MHz									
	1.651	-29.3	V	3.0	37.4	1.0	-65.7	-13.0	-52.7	
	2.477	-23.1	V	3.0	36.4	1.0	-58.5	-13.0	-45.5	
	3.302	-20.3	V	3.0	35.8	1.0	-55.1	-13.0	-42.1	
	1.651	-29.4	H	3.0	37.4	1.0	-65.7	-13.0	-52.7	
	2.477	-25.1	H	3.0	36.4	1.0	-60.4	-13.0	-47.4	
	3.302	-20.0	H	3.0	35.8	1.0	-54.8	-13.0	-41.8	
	Mid Ch, 836.5MHz									
	1.673	-29.6	V	3.0	37.3	1.0	-66.0	-13.0	-53.0	
	2.510	-22.8	V	3.0	36.4	1.0	-58.2	-13.0	-45.2	
	3.346	-20.6	V	3.0	35.8	1.0	-55.3	-13.0	-42.3	
	1.673	-29.4	H	3.0	37.3	1.0	-65.7	-13.0	-52.7	
	2.510	-24.5	H	3.0	36.4	1.0	-59.8	-13.0	-46.8	
	3.346	-20.5	H	3.0	35.8	1.0	-55.3	-13.0	-42.3	
	High Ch, 847.5MHz									
	1.695	-29.2	V	3.0	37.3	1.0	-65.6	-13.0	-52.6	
	2.543	-23.0	V	3.0	36.3	1.0	-58.3	-13.0	-45.3	
	3.390	-20.0	V	3.0	35.7	1.0	-54.7	-13.0	-41.7	
1.695	-28.5	H	3.0	37.3	1.0	-64.8	-13.0	-51.8		
2.543	-24.9	H	3.0	36.3	1.0	-60.2	-13.0	-47.2		
3.390	-20.5	H	3.0	35.7	1.0	-55.2	-13.0	-42.2		
Rev. 03.03.09 Note: No other emissions were detected above the system noise floor.										

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement										
Company:	Samsung									
Project #:	14U18519									
Date:	08/11/14									
Test Engineer:	K. Ros									
Configuration:	EUT, X Position									
Mode:	LTE5 QPSK 3MHz Harm									
Chamber Pre-amplifier Filter Limit 5m Chamber B T34 8449B Filter 1 Part 22										
Band	f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
LTE5 3MHz QPSK	Low Ch, 825.5MHz									
	1.651	-29.8	V	3.0	37.4	1.0	-66.2	-13.0	-53.2	
	2.477	-23.2	V	3.0	36.4	1.0	-58.6	-13.0	-45.6	
	3.302	-19.9	V	3.0	35.8	1.0	-54.7	-13.0	-41.7	
	1.651	-29.2	H	3.0	37.4	1.0	-65.6	-13.0	-52.6	
	2.477	-25.0	H	3.0	36.4	1.0	-60.4	-13.0	-47.4	
	3.302	-20.7	H	3.0	35.8	1.0	-55.5	-13.0	-42.5	
	Mid Ch, 836.5MHz									
	1.673	-29.7	V	3.0	37.3	1.0	-66.0	-13.0	-53.0	
	2.510	-22.9	V	3.0	36.4	1.0	-58.3	-13.0	-45.3	
	3.346	-20.7	V	3.0	35.8	1.0	-55.4	-13.0	-42.4	
	1.673	-29.2	H	3.0	37.3	1.0	-65.5	-13.0	-52.5	
	2.510	-25.0	H	3.0	36.4	1.0	-60.3	-13.0	-47.3	
	3.346	-20.6	H	3.0	35.8	1.0	-55.3	-13.0	-42.3	
	High Ch, 847.5MHz									
	1.695	-29.2	V	3.0	37.3	1.0	-65.5	-13.0	-52.5	
	2.543	-23.0	V	3.0	36.3	1.0	-58.3	-13.0	-45.3	
	3.390	-19.7	V	3.0	35.7	1.0	-54.5	-13.0	-41.5	
1.695	-29.1	H	3.0	37.3	1.0	-65.4	-13.0	-52.4		
2.543	-24.7	H	3.0	36.3	1.0	-60.1	-13.0	-47.1		
3.390	-20.5	H	3.0	35.7	1.0	-55.2	-13.0	-42.2		
Rev. 03.03.09 Note: No other emissions were detected above the system noise floor.										

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:
Project #:
Date:
Test Engineer:
Configuration:
Mode:

Samsung
 14U18519
 08/11/14
 K. Ros
 EUT, X Position
 LTE5 16QAM 1.4MHz Harm

Chamber

5m Chamber B

Pre-amplifier

T34 8449B

Filter

Filter 1

Limit

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, 824.7MHz										
LTE5	1.649	-29.8	V	3.0	37.4	1.0	-66.2	-13.0	-53.2	
	2.474	-23.1	V	3.0	36.4	1.0	-58.5	-13.0	-45.5	
1.4MHz	3.299	-20.2	V	3.0	35.8	1.0	-55.0	-13.0	-42.0	
	1.649	-29.7	H	3.0	37.4	1.0	-66.1	-13.0	-53.1	
16QAM	2.474	-24.9	H	3.0	36.4	1.0	-60.3	-13.0	-47.3	
	3.299	-20.1	H	3.0	35.8	1.0	-54.9	-13.0	-41.9	
Mid Ch, 836.5MHz										
	1.673	-29.5	V	3.0	37.3	1.0	-65.9	-13.0	-52.9	
	2.510	-23.0	V	3.0	36.4	1.0	-58.3	-13.0	-45.3	
	3.346	-20.1	V	3.0	35.8	1.0	-54.8	-13.0	-41.8	
	1.673	-29.3	H	3.0	37.3	1.0	-65.6	-13.0	-52.6	
	2.510	-25.0	H	3.0	36.4	1.0	-60.4	-13.0	-47.4	
	3.346	-19.8	H	3.0	35.8	1.0	-54.6	-13.0	-41.6	
High Ch, 848.3MHz										
	1.697	-29.4	V	3.0	37.3	1.0	-65.7	-13.0	-52.7	
	2.545	-22.8	V	3.0	36.3	1.0	-58.1	-13.0	-45.1	
	3.393	-20.5	V	3.0	35.7	1.0	-55.2	-13.0	-42.2	
	1.697	-28.9	H	3.0	37.3	1.0	-65.2	-13.0	-52.2	
	2.545	-24.8	H	3.0	36.3	1.0	-60.2	-13.0	-47.2	
	3.393	-20.3	H	3.0	35.7	1.0	-55.0	-13.0	-42.0	

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

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement										
Company: Project #: Date: Test Engineer: Configuration: Mode:	Samsung 14U18519 08/11/14 K. Ros EUT, X Position LTE5 QPSK 1.4MHz Harm									
Chamber		Pre-amplifier		Filter		Limit				
5m Chamber B		T34 8449B		Filter 1		Part 22				
Band	f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.4MHz QPSK	Low Ch, 824.7MHz									
	1.649	-29.8	V	3.0	37.4	1.0	-66.2	-13.0	-53.2	
	2.474	-22.8	V	3.0	36.4	1.0	-58.2	-13.0	-45.2	
	3.299	-20.5	V	3.0	35.8	1.0	-55.3	-13.0	-42.3	
	1.649	-29.2	H	3.0	37.4	1.0	-65.6	-13.0	-52.6	
	2.474	-24.9	H	3.0	36.4	1.0	-60.2	-13.0	-47.2	
	3.299	-20.2	H	3.0	35.8	1.0	-55.0	-13.0	-42.0	
	Mid Ch, 836.5MHz									
	1.673	-29.9	V	3.0	37.3	1.0	-66.2	-13.0	-53.2	
	2.510	-22.7	V	3.0	36.4	1.0	-58.1	-13.0	-45.1	
	3.346	-20.1	V	3.0	35.8	1.0	-54.9	-13.0	-41.9	
	1.673	-29.4	H	3.0	37.3	1.0	-65.8	-13.0	-52.8	
	2.510	-25.0	H	3.0	36.4	1.0	-60.4	-13.0	-47.4	
	3.346	-19.9	H	3.0	35.8	1.0	-54.7	-13.0	-41.7	
	High Ch, 848.3MHz									
	1.697	-29.1	V	3.0	37.3	1.0	-65.4	-13.0	-52.4	
	2.545	-22.8	V	3.0	36.3	1.0	-58.2	-13.0	-45.2	
	3.393	-20.6	V	3.0	35.7	1.0	-55.3	-13.0	-42.3	
1.697	-28.9	H	3.0	37.3	1.0	-65.2	-13.0	-52.2		
2.545	-24.5	H	3.0	36.3	1.0	-59.8	-13.0	-46.8		
3.393	-20.5	H	3.0	35.7	1.0	-55.2	-13.0	-42.2		
Rev. 03.03.09 Note: No other emissions were detected above the system noise floor.										

WCDMA

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement										
Company: Project #: Date: Test Engineer: Configuration: Mode:		Samsung 14U18462 08/08/14 K. Huynh, T. Oeur X-Pos EUT w/ AC charger, headset, case (Unit Max 2) HSDPA B2								
		Chamber	Pre-amplifier	Filter	Limit					
		3m Chamber	T34 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
Band	Low Ch, 1852.4MHz									
	3.705	-19.8	V	3.0	35.4	1.0	-54.2	-13.0	-41.2	
Band 2	5.557	-17.3	V	3.0	34.7	1.0	-51.0	-13.0	-38.0	
	7.410	-15.0	V	3.0	34.9	1.0	-48.9	-13.0	-35.9	
HSDPA	3.705	-20.4	H	3.0	35.4	1.0	-54.8	-13.0	-41.8	
	5.557	-18.4	H	3.0	34.7	1.0	-52.1	-13.0	-39.1	
	7.410	-14.0	H	3.0	34.9	1.0	-47.9	-13.0	-34.9	
	Mid Ch, 1880MHz									
	3.760	-20.6	V	3.0	35.3	1.0	-55.0	-13.0	-42.0	
	5.640	-17.5	V	3.0	34.7	1.0	-51.2	-13.0	-38.2	
	7.520	-14.6	V	3.0	34.9	1.0	-48.5	-13.0	-35.5	
	3.760	-21.6	H	3.0	35.3	1.0	-55.9	-13.0	-42.9	
	5.640	-18.3	H	3.0	34.7	1.0	-52.0	-13.0	-39.0	
	7.520	-13.8	H	3.0	34.9	1.0	-47.8	-13.0	-34.8	
	High Ch, 1907.6MHz									
	3.815	-20.9	V	3.0	35.3	1.0	-55.2	-13.0	-42.2	
	5.723	-17.8	V	3.0	34.7	1.0	-51.6	-13.0	-38.6	
	7.630	-14.4	V	3.0	34.9	1.0	-48.3	-13.0	-35.3	
	3.815	-21.5	H	3.0	35.3	1.0	-55.8	-13.0	-42.8	
	5.723	-16.0	H	3.0	34.7	1.0	-49.8	-13.0	-36.8	
7.630	-13.4	H	3.0	34.9	1.0	-47.4	-13.0	-34.4		
Rev. 03.03.09 Note: No other emissions were detected above the system noise floor.										

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement										
Company: Project #: Date: Test Engineer: Configuration: Mode:		Samsung 14U18462 08/08/14 K. Huynh, T. Oeur X-Pos EUT w/ AC charger, headset, case (Unit Max 2) REL99 B2								
		Chamber	Pre-amplifier	Filter	Limit					
		3m Chamber	T34 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
Band	Low Ch, 1852.4MHz									
	3.705	-19.6	V	3.0	35.4	1.0	-54.0	-13.0	-41.0	
	5.557	-17.5	V	3.0	34.7	1.0	-51.2	-13.0	-38.2	
Band 2	7.410	-14.7	V	3.0	34.9	1.0	-48.6	-13.0	-35.6	
	3.705	-19.7	H	3.0	35.4	1.0	-54.1	-13.0	-41.1	
	5.557	-19.0	H	3.0	34.7	1.0	-52.7	-13.0	-39.7	
REL99	7.410	-14.1	H	3.0	34.9	1.0	-48.0	-13.0	-35.0	
	Mid Ch, 1880MHz									
	3.760	-20.1	V	3.0	35.3	1.0	-54.4	-13.0	-41.4	
	5.640	-18.1	V	3.0	34.7	1.0	-51.8	-13.0	-38.8	
	7.520	-14.3	V	3.0	34.9	1.0	-48.2	-13.0	-35.2	
	3.760	-19.9	H	3.0	35.3	1.0	-54.2	-13.0	-41.2	
	5.640	-17.8	H	3.0	34.7	1.0	-51.5	-13.0	-38.5	
	7.520	-13.9	H	3.0	34.9	1.0	-47.9	-13.0	-34.9	
	High Ch, 1907.6MHz									
	3.815	-20.4	V	3.0	35.3	1.0	-54.6	-13.0	-41.6	
	5.723	-16.6	V	3.0	34.7	1.0	-50.4	-13.0	-37.4	
	7.630	-14.3	V	3.0	34.9	1.0	-48.2	-13.0	-35.2	
	3.815	-20.0	H	3.0	35.3	1.0	-54.3	-13.0	-41.3	
	5.723	-16.8	H	3.0	34.7	1.0	-50.5	-13.0	-37.5	
	7.630	-13.8	H	3.0	34.9	1.0	-47.8	-13.0	-34.8	
Rev. 03.03.09 Note: No other emissions were detected above the system noise floor.										

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company: Project #: Date: Test Engineer: Configuration: Mode:		Samsung 14u18519 08/11/14 E. Lee, M. Zarin X-Pos EUT HSDPA B5							
Chamber		Pre-amplifier		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, 826.4MHz									
Band	1.653	-33.0	V	3.0	37.4	1.0	-69.3	-13.0	-56.3
	2.479	-28.2	V	3.0	36.4	1.0	-63.6	-13.0	-50.6
	3.306	-25.4	V	3.0	35.8	1.0	-60.2	-13.0	-47.2
Band 5	1.653	-33.2	H	3.0	37.4	1.0	-69.6	-13.0	-56.6
	2.479	-29.9	H	3.0	36.4	1.0	-65.3	-13.0	-52.3
	3.306	-25.6	H	3.0	35.8	1.0	-60.4	-13.0	-47.4
Mid Ch, 836.6MHz									
HSDPA	1.673	-32.8	V	3.0	37.3	1.0	-69.1	-13.0	-56.1
	2.510	-27.1	V	3.0	36.4	1.0	-62.4	-13.0	-49.4
	3.346	-25.0	V	3.0	35.8	1.0	-59.8	-13.0	-46.8
	1.673	-32.7	H	3.0	37.3	1.0	-69.1	-13.0	-56.1
	2.510	-29.1	H	3.0	36.4	1.0	-64.5	-13.0	-51.5
	3.346	-25.3	H	3.0	35.8	1.0	-60.1	-13.0	-47.1
High Ch, 846.6MHz									
	1.693	-32.2	V	3.0	37.3	1.0	-68.5	-13.0	-55.5
	2.540	-28.4	V	3.0	36.3	1.0	-63.8	-13.0	-50.8
	3.386	-26.2	V	3.0	35.7	1.0	-61.0	-13.0	-48.0
	1.693	-32.5	H	3.0	37.3	1.0	-68.8	-13.0	-55.8
	2.540	-29.1	H	3.0	36.3	1.0	-64.4	-13.0	-51.4
	3.386	-26.6	H	3.0	35.7	1.0	-61.3	-13.0	-48.3
Rev. 03.03.09 Note: No other emissions were detected above the system noise floor.									

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company: Project #: Date: Test Engineer: Configuration: Mode:		Samsung 14U18519 08/06/14 E. Lee, M. Zarin X-Pos EUT REL99 B5							
Chamber		Pre-amplifier		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, 826.4MHz									
Band	1.653	-32.8	V	3.0	37.4	1.0	-69.2	-13.0	-56.2
	2.479	-28.2	V	3.0	36.4	1.0	-63.5	-13.0	-50.5
	3.306	-26.0	V	3.0	35.8	1.0	-60.8	-13.0	-47.8
Band 5	1.653	-33.0	H	3.0	37.4	1.0	-69.4	-13.0	-56.4
	2.479	-29.7	H	3.0	36.4	1.0	-65.1	-13.0	-52.1
	3.306	-25.4	H	3.0	35.8	1.0	-60.2	-13.0	-47.2
Mid Ch, 836.6MHz									
REL99	1.673	-32.2	V	3.0	37.3	1.0	-68.5	-13.0	-55.5
	2.510	-27.9	V	3.0	36.4	1.0	-63.2	-13.0	-50.2
	3.346	-25.0	V	3.0	35.8	1.0	-59.7	-13.0	-46.7
	1.673	-32.8	H	3.0	37.3	1.0	-69.1	-13.0	-56.1
	2.510	-29.4	H	3.0	36.4	1.0	-64.7	-13.0	-51.7
	3.346	-25.3	H	3.0	35.8	1.0	-60.1	-13.0	-47.1
High Ch, 846.6MHz									
	1.693	-32.2	V	3.0	37.3	1.0	-68.5	-13.0	-55.5
	2.540	-27.7	V	3.0	36.3	1.0	-63.0	-13.0	-50.0
	3.386	-26.2	V	3.0	35.7	1.0	-60.9	-13.0	-47.9
	1.693	-32.5	H	3.0	37.3	1.0	-68.8	-13.0	-55.8
	2.540	-29.1	H	3.0	36.3	1.0	-64.4	-13.0	-51.4
	3.386	-26.5	H	3.0	35.7	1.0	-61.2	-13.0	-48.2
Rev. 03.03.09 Note: No other emissions were detected above the system noise floor.									

GSM

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:	Samsung								
Project #:	14U18524								
Date:	08/12/14								
Test Engineer:	K. Ros								
Configuration:	EUT w/ AC Adaptor + HS, X-pos								
Mode:	EPRS1900 Harm								
Chamber Pre-amplifier Filter Limit 5m Chamber B T34 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
Band									
Low Ch, 1850.2MHz									
3.700	-18.0	V	3.0	35.4	1.0	-52.4	-13.0	-39.4	
5.551	-17.0	V	3.0	34.7	1.0	-50.7	-13.0	-37.7	
7.401	-16.1	V	3.0	34.9	1.0	-50.0	-13.0	-37.0	
3.700	-18.8	H	3.0	35.4	1.0	-53.2	-13.0	-40.2	
5.551	-16.5	H	3.0	34.7	1.0	-50.3	-13.0	-37.3	
7.401	-14.8	H	3.0	34.9	1.0	-48.7	-13.0	-35.7	
Mid Ch, 1880.0MHz									
3.760	-19.6	V	3.0	35.3	1.0	-53.9	-13.0	-40.9	
5.640	-16.3	V	3.0	34.7	1.0	-50.1	-13.0	-37.1	
7.520	-15.3	V	3.0	34.9	1.0	-49.3	-13.0	-36.3	
3.760	-17.9	H	3.0	35.3	1.0	-52.3	-13.0	-39.3	
5.640	-16.4	H	3.0	34.7	1.0	-50.1	-13.0	-37.1	
7.520	-15.2	H	3.0	34.9	1.0	-49.1	-13.0	-36.1	
High Ch, 1909.8MHz									
3.820	-18.3	V	3.0	35.3	1.0	-52.6	-13.0	-39.6	
5.729	-17.1	V	3.0	34.7	1.0	-50.8	-13.0	-37.8	
7.639	-16.2	V	3.0	35.0	1.0	-50.2	-13.0	-37.2	
3.820	-18.9	H	3.0	35.3	1.0	-53.1	-13.0	-40.1	
5.729	-16.5	H	3.0	34.7	1.0	-50.2	-13.0	-37.2	
7.639	-14.5	H	3.0	35.0	1.0	-48.4	-13.0	-35.4	
Rev. 03.03.09 Note: No other emissions were detected above the system noise floor.									

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement										
Company:	Samsung									
Project #:	14U18462									
Date:	08/11/14									
Test Engineer:	K. Ros									
Configuration:	EUT w/ AC Adaptor and HS									
Mode:	GPRS1900 Harm									
Chamber Pre-amplifier Filter Limit 5m Chamber B T34 8449B Filter 1 Part 24										
Band	f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
GSM 1900	Low Ch, 1850.2MHz									
	3.700	-17.1	V	3.0	35.4	1.0	-51.5	-13.0	-38.5	
	5.551	-14.6	V	3.0	34.7	1.0	-48.4	-13.0	-35.4	
	7.401	-14.4	V	3.0	34.9	1.0	-48.3	-13.0	-35.3	
	3.700	-16.4	H	3.0	35.4	1.0	-50.8	-13.0	-37.8	
	5.551	-13.8	H	3.0	34.7	1.0	-47.5	-13.0	-34.5	
	7.401	-12.4	H	3.0	34.9	1.0	-46.3	-13.0	-33.3	
	Mid Ch, 1880.0MHz									
	3.760	-17.4	V	3.0	35.3	1.0	-51.8	-13.0	-38.8	
	5.640	-15.3	V	3.0	34.7	1.0	-49.1	-13.0	-36.1	
GPRS	7.520	-13.7	V	3.0	34.9	1.0	-47.7	-13.0	-34.7	
	3.760	-16.7	H	3.0	35.3	1.0	-51.1	-13.0	-38.1	
	5.640	-13.7	H	3.0	34.7	1.0	-47.5	-13.0	-34.5	
	7.520	-13.4	H	3.0	34.9	1.0	-47.4	-13.0	-34.4	
	High Ch, 1909.8MHz									
	3.820	-17.1	V	3.0	35.3	1.0	-51.4	-13.0	-38.4	
	5.729	-14.6	V	3.0	34.7	1.0	-48.3	-13.0	-35.3	
	7.639	-13.5	V	3.0	35.0	1.0	-47.4	-13.0	-34.4	
	3.820	-16.6	H	3.0	35.3	1.0	-50.9	-13.0	-37.9	
	5.729	-14.5	H	3.0	34.7	1.0	-48.2	-13.0	-35.2	
7.639	-12.5	H	3.0	35.0	1.0	-46.5	-13.0	-33.5		
Rev. 03.03.09 Note: No other emissions were detected above the system noise floor.										

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:	Samsung								
Project #:	14U18462								
Date:	08/11/14								
Test Engineer:	K. Ros								
Configuration:	EUT w/ AC Adaptor and HS								
Mode:	EGPRS850 Harm								
Chamber Pre-amplifier Filter Limit 5m Chamber B 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
Band									
Low Ch, 824.2MHz									
1.648	-27.6	V	3.0	37.4	1.0	-64.0	-13.0	-51.0	
2.473	-23.2	V	3.0	36.4	1.0	-58.6	-13.0	-45.6	
GSM									
3.297	-20.2	V	3.0	35.8	1.0	-55.0	-13.0	-42.0	
1.648	-27.3	H	3.0	37.4	1.0	-63.7	-13.0	-50.7	
2.473	-25.0	H	3.0	36.4	1.0	-60.4	-13.0	-47.4	
850									
3.297	-19.8	H	3.0	35.8	1.0	-54.6	-13.0	-41.6	
EGPRS									
Mid Ch, 836.6MHz									
1.673	-27.5	V	3.0	37.3	1.0	-63.9	-13.0	-50.9	
2.510	-22.0	V	3.0	36.4	1.0	-57.4	-13.0	-44.4	
3.346	-19.2	V	3.0	35.8	1.0	-54.0	-13.0	-41.0	
1.673	-26.6	H	3.0	37.3	1.0	-62.9	-13.0	-49.9	
2.510	-23.9	H	3.0	36.4	1.0	-59.2	-13.0	-46.2	
3.346	-20.1	H	3.0	35.8	1.0	-54.8	-13.0	-41.8	
High Ch, 848.8MHz									
1.698	-26.2	V	3.0	37.3	1.0	-62.5	-13.0	-49.5	
2.547	-22.3	V	3.0	36.3	1.0	-57.6	-13.0	-44.6	
3.395	-20.2	V	3.0	35.7	1.0	-54.9	-13.0	-41.9	
1.698	-26.2	H	3.0	37.3	1.0	-62.5	-13.0	-49.5	
2.547	-24.3	H	3.0	36.3	1.0	-59.7	-13.0	-46.7	
3.395	-20.5	H	3.0	35.7	1.0	-55.2	-13.0	-42.2	
Rev. 03.03.09 Note: No other emissions were detected above the system noise floor.									

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:	Samsung								
Project #:	14U18462								
Date:	08/11/14								
Test Engineer:	K. Ros								
Configuration:	EUT w/ AC Adaptor and HS								
Mode:	GPRS850 Harm								
Chamber Pre-amplifier Filter Limit 5m Chamber B 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
Band									
Low Ch, 824.2MHz									
	1.648	-27.9	V	3.0	37.4	1.0	-64.3	-13.0	-51.3
GSM	2.473	-23.1	V	3.0	36.4	1.0	-58.5	-13.0	-45.5
	3.297	-20.8	V	3.0	35.8	1.0	-55.6	-13.0	-42.6
	1.648	-27.3	H	3.0	37.4	1.0	-63.6	-13.0	-50.6
850	2.473	-24.6	H	3.0	36.4	1.0	-60.0	-13.0	-47.0
	3.297	-20.8	H	3.0	35.8	1.0	-55.6	-13.0	-42.6
Mid Ch, 836.6MHz									
	1.673	-26.5	V	3.0	37.3	1.0	-62.8	-13.0	-49.8
	2.510	-22.4	V	3.0	36.4	1.0	-57.7	-13.0	-44.7
	3.346	-20.1	V	3.0	35.8	1.0	-54.8	-13.0	-41.8
	1.673	-25.6	H	3.0	37.3	1.0	-61.9	-13.0	-48.9
	2.510	-24.0	H	3.0	36.4	1.0	-59.3	-13.0	-46.3
	3.346	-20.3	H	3.0	35.8	1.0	-55.0	-13.0	-42.0
High Ch, 848.8MHz									
	1.698	-26.9	V	3.0	37.3	1.0	-63.2	-13.0	-50.2
	2.547	-22.5	V	3.0	36.3	1.0	-57.8	-13.0	-44.8
	3.395	-20.1	V	3.0	35.7	1.0	-54.8	-13.0	-41.8
	1.698	-26.2	H	3.0	37.3	1.0	-62.5	-13.0	-49.5
	2.547	-24.8	H	3.0	36.3	1.0	-60.1	-13.0	-47.1
	3.395	-20.5	H	3.0	35.7	1.0	-55.2	-13.0	-42.2
Rev. 03.03.09 Note: No other emissions were detected above the system noise floor.									