



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

CERTIFICATION TEST REPORT

FOR

GSM/WCDMA/LTE Phone + Bluetooth, WLAN 2.4GHz b/g/n & NFC

MODEL NUMBER: SM-G313MU

FCC ID: A3LSMG313MU

REPORT NUMBER: 14I17974-1 REVISION A

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Prepared for

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.
EUT DESCRIPTION: GSM/WCDMA/LTE Phone + Bluetooth, WLAN 2.4GHz b/g/n & NFC
MODEL: SM-G313MU
SERIAL NUMBER: FL-215-A ,FL-215-B, FL-215-C
DATE TESTED: JUNE 5- 18, 2014

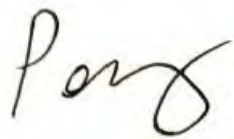
APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 22H, 24E, 27E and 27L	PASS

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

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

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with TIA-603-C, FCC CFR 47 Part 22, FCC CFR Part 24, FCC CFR 47 Part 27.

3. FACILITIES AND ACCREDITATION

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

47173 Benicia Street	47266 Benicia Street
☒ Chamber A	☐ 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 18000 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 Phone + Bluetooth, WLAN 2.4GHz b/g/n & NFC

5.2. MAXIMUM OUTPUT POWER

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

FCC Part 22/24						
Band	Frequency Range(MHz)	Modulation Peak	Conducted		Radiated	
			Peak(dBm)	Peak (mW)	Peak (dBm)	Peak (mW)
GSM850	824~849	GMSK	32.3	1698.24		
	824~849	GPRS	32.3	1698.24	28.74	748.86
	824~849	EGPRS	26.3	426.58	24.59	288.07
GSM1900	1850~1910	GMSK	29.8	954.99		
	1850~1910	GPRS	29.8	954.99	31.89	1544.83
	1850~1910	EGPRS	25.9	389.05	29.12	816.75

FCC Part 22/2 4/27						
Band	Frequency Range(MHz)	Modulation Peak	Conducted		Radiated	
			Avg (dBm)	Avg (mW)	Avg (dBm)	Avg (mW)
Band 5	824~849	REL99	22	158.49	17.46	55.72
	824~849	HSDPA	22.1	162.18	17.111	51.42
	824~849	HSUPA	21.2	131.83		
Band 2	1850~1910	REL99	21.7	147.91	23.26	211.91
	1850~1910	HSDPA	21.9	154.88	22.92	195.73
	1850~1910	HSUPA	20.7	117.49		
Band 4	1710~1750	REL99	21.3	134.90	23.02	200.45
	1710~1750	HSDPA	22.0	158.49	23.5	223.87
	1710~1750	HSUPA	21.2	131.83		

5.3. MAXIMUM OUTPUT POWER (LTE)

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

FCC Part 22/2 4/27							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation Peak	Conducted		Radiated	
				Avg (dBm)	Avg (mW)	Avg (dBm)	Avg (mW)
LTE2	1850~1910	20MHz	QPSK	22.98	198.61	22.75	188.22
	1850~1910	20MHz	16QAM	22.0	158.49	21.86	153.52

FCC Part 22/2 4/27							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation Peak	Conducted		Radiated	
				Avg (dBm)	Avg (mW)	Avg (dBm)	Avg (mW)
LTE2	1850~1910	15MHz	QPSK	22.74	187.93	22.72	186.92
	1850~1910	15MHz	16QAM	21.71	148.25	21.92	155.54

FCC Part 22/2 4/27							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation Peak	Conducted		Radiated	
				Avg (dBm)	Avg (mW)	Avg (dBm)	Avg (mW)
LTE2	1850~1910	10MHz	QPSK	22.88	194.09	22.62	182.97
	1850~1910	10MHz	16QAM	21.93	155.96	21.41	138.34

FCC Part 22/2 4/27							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation Peak	Conducted		Radiated	
				Avg (dBm)	Avg (mW)	Avg (dBm)	Avg (mW)
LTE2	1850~1910	5MHz	QPSK	23	199.53	23.10	204.38
	1850~1910	5MHz	16QAM	21.98	157.76	21.67	146.78

FCC Part 22/2 4/27							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation Peak	Conducted		Radiated	
				Avg (dBm)	Avg (mW)	Avg (dBm)	Avg (mW)
LTE2	1850~1910	3MHz	QPSK	22.89	194.54	22.37	172.45
	1850~1910	3MHz	16QAM	22	158.49	21.48	140.55

FCC Part 22/2 4/27							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation Peak	Conducted		Radiated	
				Avg (dBm)	Avg (mW)	Avg (dBm)	Avg (mW)
LTE2	1850~1910	1.4MHz	QPSK	22.89	194.54	22.95	197.54
	1850~1910	1.4MHz	16QAM	22	158.49	21.96	157.28

FCC Part 22/2 4/27							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation Peak	Conducted		Radiated	
				Avg (dBm)	Avg (mW)	Avg (dBm)	Avg (mW)
LTE4	1710~1755	20MHz	QPSK	22.93	196.34	23.46	221.82
	1710~1755	20MHz	16QAM	22	158.49	22.66	184.5

FCC Part 22/2 4/27							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation Peak	Conducted		Radiated	
				Avg (dBm)	Avg (mW)	Avg (dBm)	Avg (mW)
LTE4	1710~1755	15MHz	QPSK	22.82	191.43	24.68	293.76
	1710~1755	15MHz	16QAM	21.9	154.88	24.79	301.3

FCC Part 22/2 4/27							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation Peak	Conducted		Radiated	
				Avg (dBm)	Avg (mW)	Avg (dBm)	Avg (mW)
LTE4	1710~1755	10MHz	QPSK	22.93	196.34	23.46	221.82
	1710~1755	10MHz	16QAM	21.93	155.96	22.5	177.83

FCC Part 22/2 4/27							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation Peak	Conducted		Radiated	
				Avg (dBm)	Avg (mW)	Avg (dBm)	Avg (mW)
LTE4	1710~1755	5MHz	QPSK	23	199.53	22.39	173.38
	1710~1755	5MHz	16QAM	22	158.49	21.37	137.09

FCC Part 22/2 4/27							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation Peak	Conducted		Radiated	
				Avg (dBm)	Avg (mW)	Avg (dBm)	Avg (mW)
LTE4	1710~1755	3MHz	QPSK	22.92	195.88	22.15	164.06
	1710~1755	3MHz	16QAM	21.89	154.53	21.35	136.46

FCC Part 22/2 4/27							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation Peak	Conducted		Radiated	
				Avg (dBm)	Avg (mW)	Avg (dBm)	Avg (mW)
LTE4	1710~1755	1.4MHz	QPSK	22.92	195.88	23.79	239.33
	1710~1755	1.4MHz	16QAM	21.9	154.88	22.57	180.72

FCC Part 22/2 4/27							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation Peak	Conducted		Radiated	
				Avg (dBm)	Avg (mW)	Avg (dBm)	Avg (mW)
LTE5	824~849	10MHz	QPSK	22.73	187.50	19.573	90.64
	824~849	10MHz	16QAM	21.99	158.12	19.149	82.21

FCC Part 22/2 4/27							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation Peak	Conducted		Radiated	
				Avg (dBm)	Avg (mW)	Avg (dBm)	Avg (mW)
LTE5	824~849	5MHz	QPSK	22.82	191.43	19.491	88.94
	824~849	5MHz	16QAM	21.82	152.05	19.491	88.94

FCC Part 22/2 4/27							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation Peak	Conducted		Radiated	
				Avg (dBm)	Avg (mW)	Avg (dBm)	Avg (mW)
LTE5	824~849	3MHz	QPSK	22.79	190.11	19.85	96.61
	824~849	3MHz	16QAM	21.98	157.76	19.577	90.72

FCC Part 22/2 4/27							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation Peak	Conducted		Radiated	
				Avg (dBm)	Avg (mW)	Avg (dBm)	Avg (mW)
LTE5	824~849	1.4MHz	QPSK	22.72	187.07	19.948	98.81
	824~849	1.4MHz	16QAM	21.95	156.68	19.835	96.27

FCC Part 27							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation Peak	Conducted		Radiated	
				Avg (dBm)	Avg (mW)	Avg (dBm)	Avg (mW)
LTE17	704~716	10MHz	QPSK	22.48	177.01	17.54	56.75
	704~716	10MHz	16QAM	21.67	146.89	14.29	26.85

FCC Part 27							
Band	Frequency Range(MHz)	BandWidth (MHz)	Modulation Peak	Conducted		Radiated	
				Avg (dBm)	Avg (mW)	Avg (dBm)	Avg (mW)
LTE17	704~716	5MHz	QPSK	22.6	181.97	16.83	48.19
	704~716	5MHz	16QAM	21.53	142.23	15.43	34.91

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	-2.13
Band 2, 1850~1910MHz	-7.27
Band 4, 1710~1755MHz	-6.22
Band 17, 704~716MHz	-7.75

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	Samsung	ETA-U90CBC	N/A	N/A
Earphone	Samsung	GH59	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

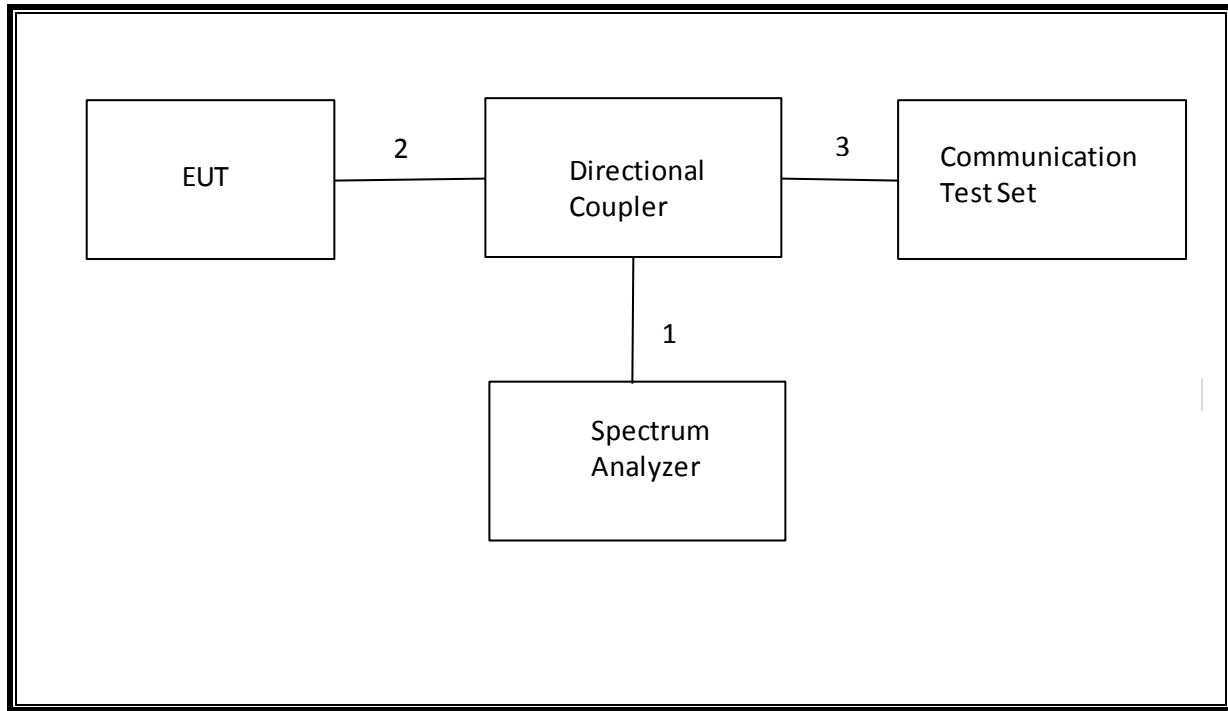
I/O CABLES (RADIATED SETUP)

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

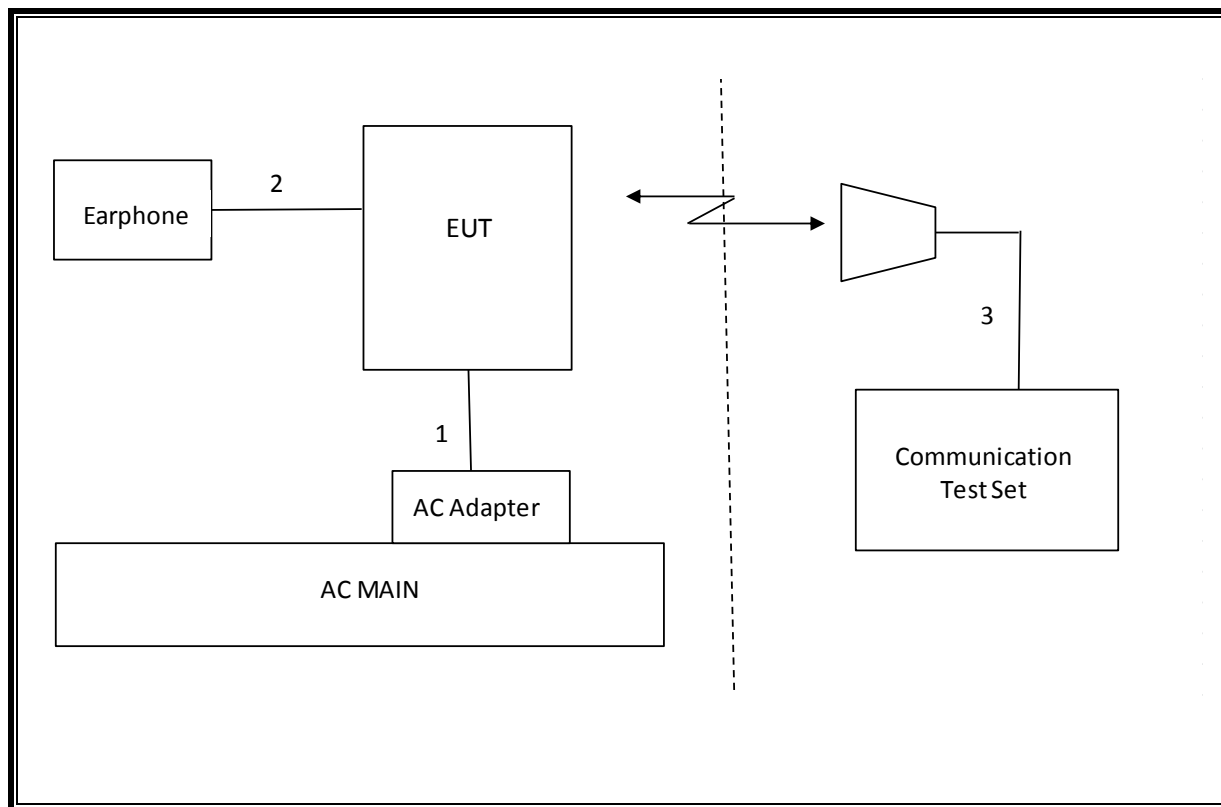
TEST SETUP

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	08/14/14
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
Directional Coupler	RF-Lambda	RFDC5M06G15	None	CNR
Antenna, Horn, 18- 26 GHz	ARA	MWH-1826/B	C00946	11/12/14

7. Summary Table

FCC Part Section	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Worst Case
2.1049	N/A	Occupied Band width (99%)	N/A	Conducted	Pass	17.97 MHz
22.917(a) 24.238(a) 27.53(g) 90.691	RSS-132(4.5.1) RSS-133(6.5.1) RSS-139(6.5.1)	Band Edge / Conducted Spurious Emission	-13dBm		Pass	-14.325 dBm
2.1046	N/A	Conducted output power	N/A		Pass	32.3 dBm
22.355 24.235 27.54 90.213	RSS-132(4.3) RSS-133(6.3) RSS-139(6.3) RSS-199(4.3)	Frequency Stability	2.5PPM		Pass	0.014 PPM
22.913(a)(2)	RSS-132(4.4)	Effective Radiated Power	38 dBm	Radiated	Pass	28.74 dBm
27.50(b)(10)	N/A		34.77 dBm		Pass	
24.232(c) 27.50(d)(4)	RSS-133(6.4) RSS-139(6.4)	Equivalent Isotropic Radiated Power	33dBm 30dBm		Pass	31.89 dBm
22.917(a) 24.238(a) 27.53(g)	RSS-132(4.5.1) RSS-133(6.5.1) RSS-139(6.5.1)	Radiated Spurious Emission	-13dBm		Pass	- 22.8dBm

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	32.3			
		190	836.6	32.3			
		251	848.8	32.3			
	GPRS	128	824.2	32.3	30.0	28.3	26.7
		190	836.6	32.3	30.0	28.3	26.8
		251	848.8	32.3	30.0	28.3	26.7
	EGPRS	128	824.2	26.1	23.4	21.6	20.3
		190	836.6	26.2	23.4	21.7	20.3
		251	848.8	26.3	23.4	21.7	20.3
GSM1900	GMSK	512	1850.2	29.7			
		661	1880	29.7			
		810	1909.8	29.8			
	GPRS	512	1850.2	29.7	27.2	25.6	24.1
		661	1880	29.7	27.2	25.7	24.2
		810	1909.8	29.8	27.2	25.7	24.2
	EGPRS	512	1850.2	25.9	22.8	20.9	19.8
		661	1880	25.9	22.8	21.0	19.9
		810	1909.8	25.8	22.8	20.9	19.8

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	UL Ch No.	Freq. (MHz)	MPR	Avg Pwr (dBm)
W-CDMA Band V	Rel 99 (RMC, 12.2 kbps)	4132	826.4	0	22.0
		4183	836.6	0	22.0
		4233	846.6	0	22.0

Band	Mode	UL Ch No.	Freq. (MHz)	MPR	Avg Pwr (dBm)
W-CDMA Band II	Rel 99 (RMC, 12.2 kbps)	9262	1852.4	0	21.6
		9400	1880.0	0	21.7
		9538	1907.6	0	21.5

Band	Mode	UL Ch No.	Freq. (MHz)	MPR	Avg Pwr (dBm)
W-CDMA Band IV	Rel 99 (RMC, 12.2 kbps)	1312	1712.4	0	21.2
		1413	1732.6	0	21.3
		1513	1752.6	0	21.3

8.3. UMTS HSDPA

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

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

8.3.1. UMTS HSDPA OUTPUT POWER RESULT

Band	Mode	UL Ch No.	Freq. (MHz)	MPR	Avg Pwr (dBm)
W-CDMA Band V	Subtest 1	4132	826.4	0	22.1
		4183	836.6	0	22.0
		4233	846.6	0	22.1
	Subtest 2	4132	826.4	0	22.0
		4183	836.6	0	22.1
		4233	846.6	0	22.1
	Subtest 3	4132	826.4	0.5	21.7
		4183	836.6	0.5	21.7
		4233	846.6	0.5	21.8
	Subtest 4	4132	826.4	0.5	21.7
		4183	836.6	0.5	21.7
		4233	846.6	0.5	21.8

Band	Mode	UL Ch No.	Freq. (MHz)	MPR	Avg Pwr (dBm)
W-CDMA Band II	Subtest 1	9262	1852.4	0	21.6
		9400	1880.0	0	21.7
		9538	1907.6	0	21.7
	Subtest 2	9262	1852.4	0	21.7
		9400	1880.0	0	21.9
		9538	1907.6	0	21.8
	Subtest 3	9262	1852.4	0.5	21.1
		9400	1880.0	0.5	21.3
		9538	1907.6	0.5	21.3
	Subtest 4	9262	1852.4	0.5	21.1
		9400	1880.0	0.5	21.3
		9538	1907.6	0.5	21.3

Band	Mode	UL Ch No.	Freq. (MHz)	MPR	Avg Pwr (dBm)
W-CDMA Band IV	Subtest 1	1312	1712.4	0	22.0
		1413	1732.6	0	21.8
		1513	1752.6	0	22.0
	Subtest 2	1312	1712.4	0	22.0
		1413	1732.6	0	22.0
		1513	1752.6	0	22.0
	Subtest 3	1312	1712.4	0.5	21.5
		1413	1732.6	0.5	21.5
		1513	1752.6	0.5	21.5
	Subtest 4	1312	1712.4	0.5	21.5
		1413	1732.6	0.5	21.5
		1513	1752.6	0.5	21.5

8.3.2. 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
	β_c/β_d	11/15	6/15	15/9	2/15	15/15
	Bhs	22/15	12/15	30/15	4/15	30/15
HSDPA Specific Settings	β_{ed} (note1)	1309/225	94/75	47/15 47/15	56/75	134/15
	MPR	0	2	1	2	0
	DACK	8				
	DNAK	8				
	DCQI	8				
	Ack-Nack repetition factor	3				
	CQI Feedback (Table 5.2B.4)	4ms				
	CQI Repetition Factor (Table 5.2B.4)	2				
HSUPA Specific Settings	$A_{hs} = \beta_{hs}/\beta_c$	30/15				
	D E-DPCCH	6	8	8	5	7
	DHARQ	0	0	0	0	0
	AG Index	20	12	15	17	21
	Reference E-TFCIs	5	5	2	5	5
	ETFCI (from 34.121 Table C.11.1.3)	75	67	92	71	81
	Associated Max UL Data Rate kbps	242.1	174.9	482.8	205.8	308.9
	Reference E_TFCIs	E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27		E-TFCI 11 E-TFCI PO 4 E-TFCI 92 E-TFCI PO 18		E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27

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

8.3.3. UMTS HSUPA OUTPUT POWER RESULT

Band	Mode	UL Ch No.	Freq. (MHz)	MPR	Avg Pwr (dBm)
W-CDMA Band V	Subtest 1	4132	826.4	0	20.4
		4183	836.6	0	19.7
		4233	846.6	0	19.8
	Subtest 2	4132	826.4	2	19.2
		4183	836.6	2	19.2
		4233	846.6	2	19.2
	Subtest 3	4132	826.4	1	20.2
		4183	836.6	1	20.2
		4233	846.6	1	20.2
	Subtest 4	4132	826.4	2	19.2
		4183	836.6	2	19.2
		4233	846.6	2	19.2
	Subtest 5	4132	826.4	0	21.2
		4183	836.6	0	21.2
		4233	846.6	0	21.2

Band	Mode	UL Ch No.	Freq. (MHz)	MPR	Avg Pwr (dBm)
W-CDMA Band II	Subtest 1	9262	1852.4	0	19.2
		9400	1880.0	0	19.8
		9538	1907.6	0	19.7
	Subtest 2	9262	1852.4	2	19.2
		9400	1880.0	2	19.2
		9538	1907.6	2	19.2
	Subtest 3	9262	1852.4	1	19.2
		9400	1880.0	1	19.2
		9538	1907.6	1	19.5
	Subtest 4	9262	1852.4	2	19.2
		9400	1880.0	2	19.2
		9538	1907.6	2	19.2
	Subtest 5	9262	1852.4	0	20.6
		9400	1880.0	0	20.7
		9538	1907.6	0	20.7

Band	Mode	UL Ch No.	Freq. (MHz)	MPR	Avg Pwr (dBm)
W-CDMA Band IV	Subtest 1	1312	1712.4	0	20.3
		1413	1732.6	0	19.9
		1513	1752.6	0	20.1
	Subtest 2	1312	1712.4	2	19.2
		1413	1732.6	2	19.2
		1513	1752.6	2	19.2
	Subtest 3	1312	1712.4	1	20.2
		1413	1732.6	1	20.2
		1513	1752.6	1	20.2
	Subtest 4	1312	1712.4	2	19.2
		1413	1732.6	2	19.2
		1513	1752.6	2	19.2
	Subtest 5	1312	1712.4	0	21.2
		1413	1732.6	0	21.2
		1513	1752.6	0	21.2

8.3.4. 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.		

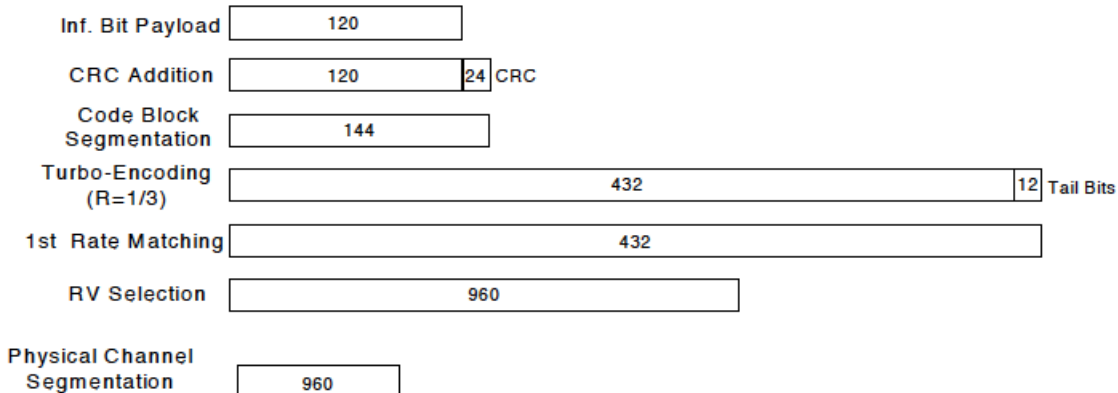


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

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} = β_{hs} / β_c	30/15			

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

8.3.1. UMTS DC-HSDPA OUTPUT POWER RESULT

Band	Mode	UL Ch No.	Freq. (MHz)	MPR	Avg Pwr (dBm)
W-CDMA Band V	Subtest 1	4132	826.4	0	22.2
		4183	836.6	0	22.2
		4233	846.6	0	22.2
	Subtest 2	4132	826.4	0	22.2
		4183	836.6	0	22.2
		4233	846.6	0	22.2
	Subtest 3	4132	826.4	0.5	21.9
		4183	836.6	0.5	21.9
		4233	846.6	0.5	22.0
	Subtest 4	4132	826.4	0.5	21.9
		4183	836.6	0.5	22.0
		4233	846.6	0.5	22.0

Band	Mode	UL Ch No.	Freq. (MHz)	MPR	Avg Pwr (dBm)
W-CDMA Band II	Subtest 1	9262	1852.4	0	21.1
		9400	1880.0	0	21.4
		9538	1907.6	0	21.6
	Subtest 2	9262	1852.4	0	21.5
		9400	1880.0	0	21.7
		9538	1907.6	0	21.7
	Subtest 3	9262	1852.4	0.5	21.1
		9400	1880.0	0.5	21.3
		9538	1907.6	0.5	21.2
	Subtest 4	9262	1852.4	0.5	21.0
		9400	1880.0	0.5	21.3
		9538	1907.6	0.5	21.3

Band	Mode	UL Ch No.	Freq. (MHz)	MPR	Avg Pwr (dBm)
W-CDMA Band IV	Subtest 1	1312	1712.4	0	21.8
		1413	1732.6	0	21.8
		1513	1752.6	0	21.8
	Subtest 2	1312	1712.4	0	21.8
		1413	1732.6	0	21.8
		1513	1752.6	0	21.8
	Subtest 3	1312	1712.4	0.5	21.5
		1413	1732.6	0.5	21.5
		1513	1752.6	0.5	21.5
	Subtest 4	1312	1712.4	0.5	21.5
		1413	1732.6	0.5	21.5
		1513	1752.6	0.5	21.5

8.5. LTE OUTPUT VERIFICATION

8.5.1. LTE OUTPUT RESULT

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)		
						18700	18900	19100
						1860 MHz	1880 MHz	1900 MHz
LTE Band 2	20	QPSK	1	0	0	22.68	22.87	22.98
			1	49	0	22.71	22.87	22.74
			1	99	0	22.70	22.92	22.78
			50	0	1	21.78	21.90	21.91
			50	25	1	21.83	21.90	21.90
			50	49	1	21.82	21.92	21.94
			100	0	1	21.85	21.90	21.97
		16QAM	1	0	1	21.49	21.70	21.16
			1	49	1	21.50	21.80	21.50
			1	99	1	21.45	21.80	22.00
			50	0	2	20.74	20.92	20.94
			50	25	2	20.77	20.94	20.91
			50	49	2	20.76	20.98	20.95
			100	0	2	20.82	20.90	20.94
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)		
						18675	18900	19124
						1857.5 MHz	1880 MHz	1902.5 MHz
LTE Band 2	15	QPSK	1	0	0	22.67	22.71	22.63
			1	37	0	22.72	22.74	22.64
			1	74	0	22.71	22.73	22.61
			36	0	1	21.74	21.73	21.82
			36	18	1	21.79	21.74	21.86
			36	35	1	21.83	21.75	21.87
			75	0	1	21.77	21.71	21.84
		16QAM	1	0	1	21.60	21.71	21.41
			1	37	1	21.58	21.70	21.44
			1	74	1	21.60	21.71	21.45
			36	0	2	20.73	20.70	20.78
			36	18	2	20.76	20.73	20.82
			36	35	2	20.78	20.75	20.86
			75	0	2	20.79	20.72	20.82

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)		
						18650	18900	19150
						1855 MHz	1880 MHz	1905 MHz
LTE Band 2	10	QPSK	1	0	0	22.67	22.73	22.87
			1	24	0	22.66	22.73	22.86
			1	49	0	22.72	22.74	22.88
			25	0	1	21.73	21.77	21.91
			25	12	1	21.74	21.79	21.92
			25	24	1	21.75	21.80	21.95
			50	0	1	21.71	21.76	21.90
		16QAM	1	0	1	21.50	21.77	21.93
			1	24	1	21.60	21.86	21.80
			1	49	1	21.70	21.79	21.80
			25	0	2	20.68	20.71	20.90
			25	12	2	20.70	20.70	20.93
			25	24	2	20.73	20.72	20.96
			50	0	2	20.73	20.82	20.94
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)		
						18625	18900	19174
						1852.5 MHz	1880 MHz	1907.5 MHz
LTE Band 2	5	QPSK	1	0	0	22.82	22.98	22.91
			1	12	0	22.84	23.00	22.91
			1	24	0	22.86	23.00	22.90
			12	0	1	21.84	21.88	21.87
			12	6	1	21.85	21.88	21.88
			12	11	1	21.86	21.89	21.90
			25	0	1	21.79	21.89	21.90
		16QAM	1	0	1	21.98	21.90	21.88
			1	12	1	21.97	21.80	21.87
			1	24	1	21.90	21.80	21.86
			12	0	2	20.62	20.85	20.83
			12	6	2	20.62	20.84	20.87
			12	11	2	20.62	20.87	20.87
			25	0	2	20.78	20.87	20.93

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)		
						18615	18900	19184
						1851.5 MHz	1880 MHz	1908.5 MHz
LTE Band 2	3	QPSK	1	0	0	22.58	22.77	22.88
			1	7	0	22.56	22.77	22.89
			1	14	0	22.55	22.81	22.85
			6	0	1	21.68	21.83	21.89
			6	3	1	21.65	21.88	21.87
			6	5	1	21.68	21.87	21.88
			15	0	1	21.68	21.86	21.86
		16QAM	1	0	1	21.99	21.86	21.98
			1	7	1	21.99	21.89	22.00
			1	14	1	21.94	21.84	21.96
			6	0	2	20.79	20.72	20.69
			6	3	2	20.80	20.74	20.70
			6	5	2	20.79	20.73	20.68
			15	0	2	20.57	20.78	20.89

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)		
						18607	18900	19192
						1850.7 MHz	1880 MHz	1909.3 MHz
LTE Band 2	1.4	QPSK	1	0	0	22.73	22.79	22.89
			1	2	0	22.71	22.81	22.87
			1	5	0	22.71	22.83	22.85
			3	0	0	22.75	22.75	22.83
			3	1	0	22.74	22.73	22.82
			3	2	0	22.71	22.74	22.82
			6	0	1	21.83	21.82	21.84
		16QAM	1	0	1	21.90	21.85	21.96
			1	2	1	21.95	21.80	21.95
			1	5	1	22.00	21.81	21.97
			3	0	1	22.00	21.80	21.91
			3	1	1	22.00	21.78	21.92
			3	2	1	22.00	21.81	21.96
			6	0	2	20.52	20.71	20.70

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)		
						20050	20175	20300
						1720 MHz	1732.5 MHz	1745 MHz
LTE Band 4	20	QPSK	1	0	0	22.77	22.88	22.83
			1	49	0	22.80	22.93	22.79
			1	99	0	22.83	22.87	22.66
			50	0	1	21.90	21.84	21.86
			50	25	1	21.90	21.84	21.83
			50	49	1	21.89	21.80	21.78
			100	0	1	21.95	21.96	21.92
		16QAM	1	0	1	21.87	21.11	22.00
			1	49	1	21.82	21.09	22.00
			1	99	1	21.75	21.10	22.00
			50	0	2	20.95	20.89	20.90
			50	25	2	20.92	20.86	20.90
			50	49	2	20.96	20.85	20.87
			100	0	2	21.00	20.94	20.95

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)		
						20025	20175	20325
						1717.5 MHz	1732.5 MHz	1747.5 MHz
LTE Band 4	15	QPSK	1	0	0	22.73	22.81	22.72
			1	37	0	22.74	22.82	22.65
			1	74	0	22.76	22.80	22.56
			36	0	1	21.75	21.76	21.83
			36	18	1	21.77	21.74	21.81
			36	35	1	21.79	21.74	21.80
			75	0	1	21.85	21.82	21.81
		16QAM	1	0	1	21.70	21.90	21.70
			1	37	1	21.70	21.76	21.63
			1	74	1	21.80	21.68	21.50
			36	0	2	20.79	20.79	20.82
			36	18	2	20.78	20.80	20.80
			36	35	2	20.82	20.81	20.77
			75	0	2	20.91	20.88	20.81

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)		
						20000	20175	20350
						1715 MHz	1732.5 MHz	1750 MHz
LTE Band 4	10	QPSK	1	0	0	22.73	22.93	22.93
			1	24	0	22.72	22.91	22.86
			1	49	0	22.74	22.90	22.80
			25	0	1	21.76	21.88	21.82
			25	12	1	21.77	21.88	21.77
			25	24	1	21.77	21.88	21.76
			50	0	1	21.78	21.89	21.74
		16QAM	1	0	1	21.70	21.91	21.87
			1	24	1	21.75	21.93	21.87
			1	49	1	21.77	21.83	21.84
			25	0	2	20.80	20.94	20.85
			25	12	2	20.79	20.90	20.83
			25	24	2	20.81	20.89	20.82
			50	0	2	20.86	21.00	20.82
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)		
						19975	20174	20374
						1712.5 MHz	1732.5 MHz	1752.5 MHz
LTE Band 4	5	QPSK	1	0	0	22.89	23.00	22.83
			1	12	0	22.88	23.00	22.79
			1	24	0	22.87	23.00	22.83
			12	0	1	21.71	21.84	21.70
			12	6	1	21.71	21.83	21.68
			12	11	1	21.75	21.78	21.66
			25	0	1	21.74	21.79	21.66
		16QAM	1	0	1	21.89	22.00	21.85
			1	12	1	21.89	22.00	21.83
			1	24	1	21.87	22.00	21.86
			12	0	2	20.69	20.88	20.69
			12	6	2	20.65	20.87	20.67
			12	11	2	20.65	20.86	20.69
			25	0	2	20.76	20.90	20.75

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)		
						19965	20174	20384
						1711.5 MHz	1732.5 MHz	1753.5 MHz
LTE Band 4	3	QPSK	1	0	0	22.83	22.91	22.91
			1	7	0	22.84	22.89	22.91
			1	14	0	22.82	22.90	22.86
			6	0	1	21.92	21.82	21.78
			6	3	1	21.88	21.82	21.79
			6	5	1	21.89	21.82	21.79
			15	0	1	21.86	21.81	21.74
		16QAM	1	0	1	21.81	21.80	21.85
			1	7	1	21.74	21.76	21.89
			1	14	1	21.76	21.81	21.86
			6	0	2	21.00	20.82	20.77
			6	3	2	21.00	20.81	20.77
			6	5	2	21.00	20.82	20.77
			15	0	2	20.95	20.75	20.93
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)		
						19957	20174	20392
						1710.7 MHz	1732.5 MHz	1754.3 MHz
LTE Band 4	1.4	QPSK	1	0	0	22.78	22.92	22.91
			1	2	0	22.78	22.88	22.91
			1	5	0	22.77	22.89	22.90
			3	0	0	22.73	22.80	22.89
			3	1	0	22.70	22.82	22.87
			3	2	0	22.72	22.80	22.87
			6	0	1	21.80	21.80	21.81
		16QAM	1	0	1	21.90	21.75	21.89
			1	2	1	21.90	21.77	21.87
			1	5	1	21.71	21.79	21.89
			3	0	1	21.80	21.81	21.96
			3	1	1	21.81	21.79	21.96
			3	2	1	22.00	21.81	21.96
			6	0	2	20.54	20.81	20.82

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)		
						20450	20525	20600
						829 MHz	836.5 MHz	844 MHz
LTE Band 5	10	QPSK	1	0	0	22.45	22.64	22.64
			1	24	0	22.49	22.73	22.66
			1	49	0	22.63	22.63	22.70
			25	0	1	21.39	21.62	21.54
			25	12	1	21.46	21.63	21.57
			25	24	1	21.51	21.60	21.58
		16QAM	50	0	1	21.41	21.61	21.53
			1	0	1	21.72	21.76	21.61
			1	24	1	21.99	21.74	21.64
			1	49	1	21.68	21.68	21.68
			25	0	2	20.20	20.47	20.34
			25	12	2	20.25	20.43	20.37
			25	24	2	20.31	20.39	20.42
			50	0	2	20.27	20.53	20.39
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)		
						20425	20525	20625
						826.5 MHz	836.5 MHz	846.5 MHz
LTE Band 5	5	QPSK	1	0	0	22.61	22.81	22.78
			1	12	0	22.59	22.79	22.81
			1	24	0	22.68	22.78	22.82
			12	0	1	21.46	21.63	21.64
			12	6	1	21.43	21.61	21.65
			12	11	1	21.47	21.60	21.66
			25	0	1	21.44	21.62	21.65
		16QAM	1	0	1	21.59	21.82	21.53
			1	12	1	21.55	21.80	21.53
			1	24	1	21.65	21.80	21.58
			12	0	2	20.18	20.44	20.38
			12	6	2	20.11	20.43	20.42
			12	11	2	20.13	20.41	20.44
			25	0	2	20.29	20.47	20.54

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)		
						20415	20525	20635
						825.5 MHz	836.5 MHz	847.5 MHz
LTE Band 5	3	QPSK	1	0	0	22.47	22.62	22.79
			1	7	0	22.41	22.60	22.77
			1	14	0	22.39	22.60	22.76
			6	0	1	21.32	21.55	21.64
			6	3	1	21.30	21.56	21.65
			6	5	1	21.31	21.56	21.65
			15	0	1	21.32	21.54	21.67
		16QAM	1	0	1	21.98	21.63	21.87
			1	7	1	21.95	21.61	21.85
			1	14	1	21.86	21.57	21.84
			6	0	2	20.28	20.27	20.36
			6	3	2	20.26	20.28	20.35
			6	5	2	20.28	20.30	20.33
			15	0	2	20.08	20.25	20.60
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)		
						20407	20525	20643
						824.7 MHz	836.5 MHz	848.3 MHz
LTE Band 5	1.4	QPSK	1	5	0	22.43	22.64	22.72
			3	0	0	22.49	22.59	22.70
			3	1	0	22.43	22.63	22.71
			3	2	0	22.53	22.60	22.72
			6	0	0	22.51	22.62	22.71
			1	0	0	22.49	22.61	22.72
			1	2	1	21.45	21.58	21.55
		16QAM	1	5	1	21.95	21.63	21.73
			3	0	1	21.95	21.63	21.75
			3	1	1	21.95	21.64	21.72
			3	2	1	21.68	21.57	21.62
			6	0	1	21.69	21.56	21.63
			3	3	1	21.69	21.56	21.65
			6	0	2	20.08	20.33	20.25

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)
						23790
						710 MHz
LTE Band 17	10	QPSK	1	0	0	22.33
			1	25	0	22.36
			1	49	0	22.48
			25	0	1	21.42
			25	12	1	21.38
			25	25	1	21.55
			50	0	1	21.34
		16QAM	1	0	1	21.44
			1	25	1	21.49
			1	49	1	21.67
			25	0	2	20.29
			25	12	2	20.26
			25	25	2	20.44
			50	0	2	20.33

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)
						23790
						710 MHz
LTE Band 17	5	QPSK	1	0	0	22.49
			1	12	0	22.45
			1	24	0	22.60
			12	0	1	21.47
			12	6	1	21.38
			12	11	1	21.44
			25	0	1	21.36
		16QAM	1	0	1	21.49
			1	12	1	21.40
			1	24	1	21.53
			12	0	2	20.33
			12	6	2	20.23
			12	11	2	20.27
			25	0	2	20.27

9. PEAK TO AVERAGE RATIO

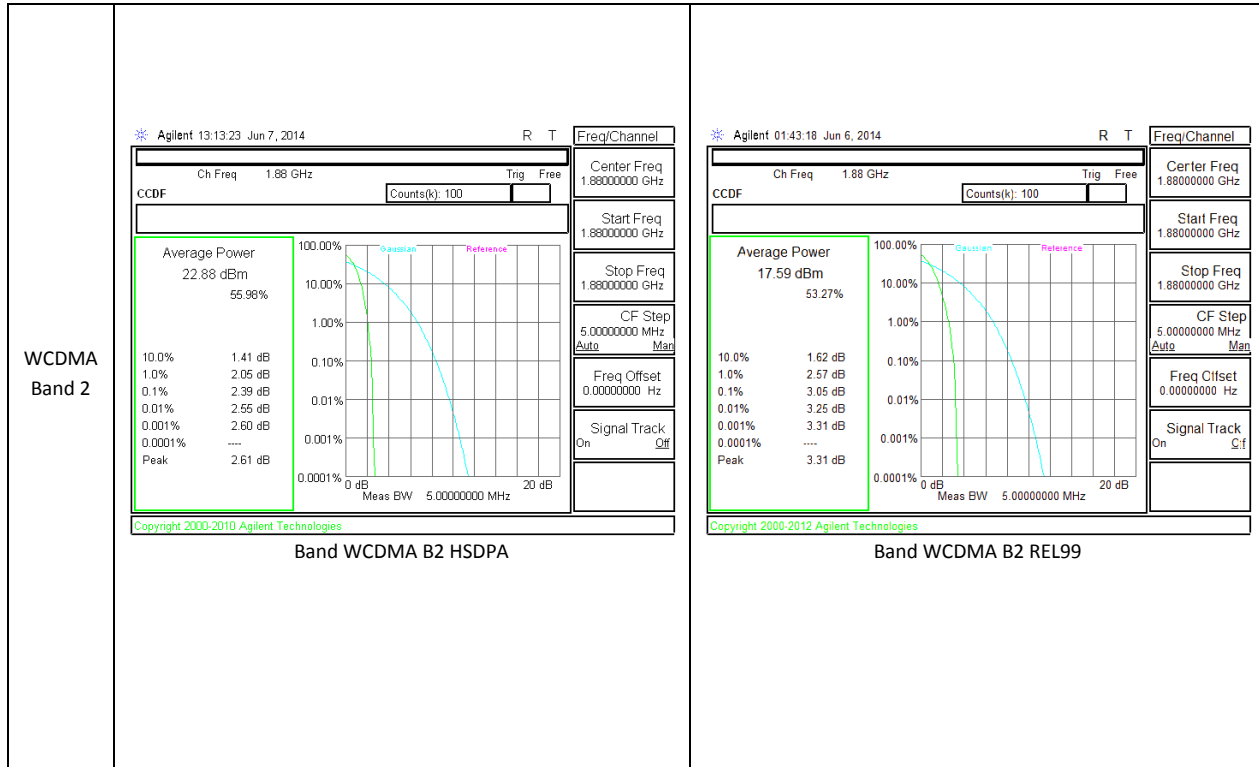
Test Procedure

Per KDB 971168 D01 Power Meas License Digital Systems v02r01

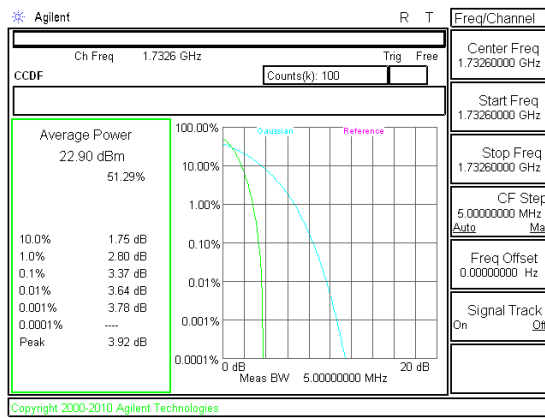
Test Spec

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.

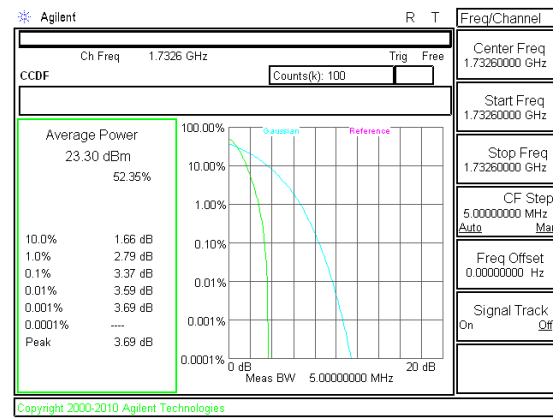
9.1. CONDUCTED PEAK TO AVERAGE RESULT



WCDMA
A
Band 4

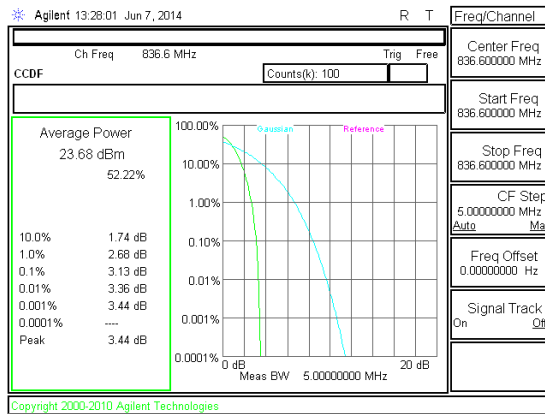


Band WCDMA B4 HSDPA

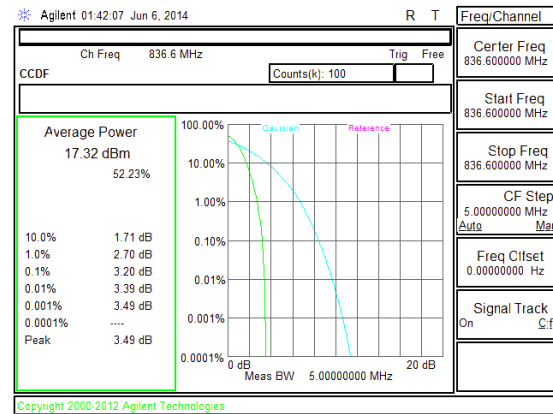


Band WCDMA B4 REL99

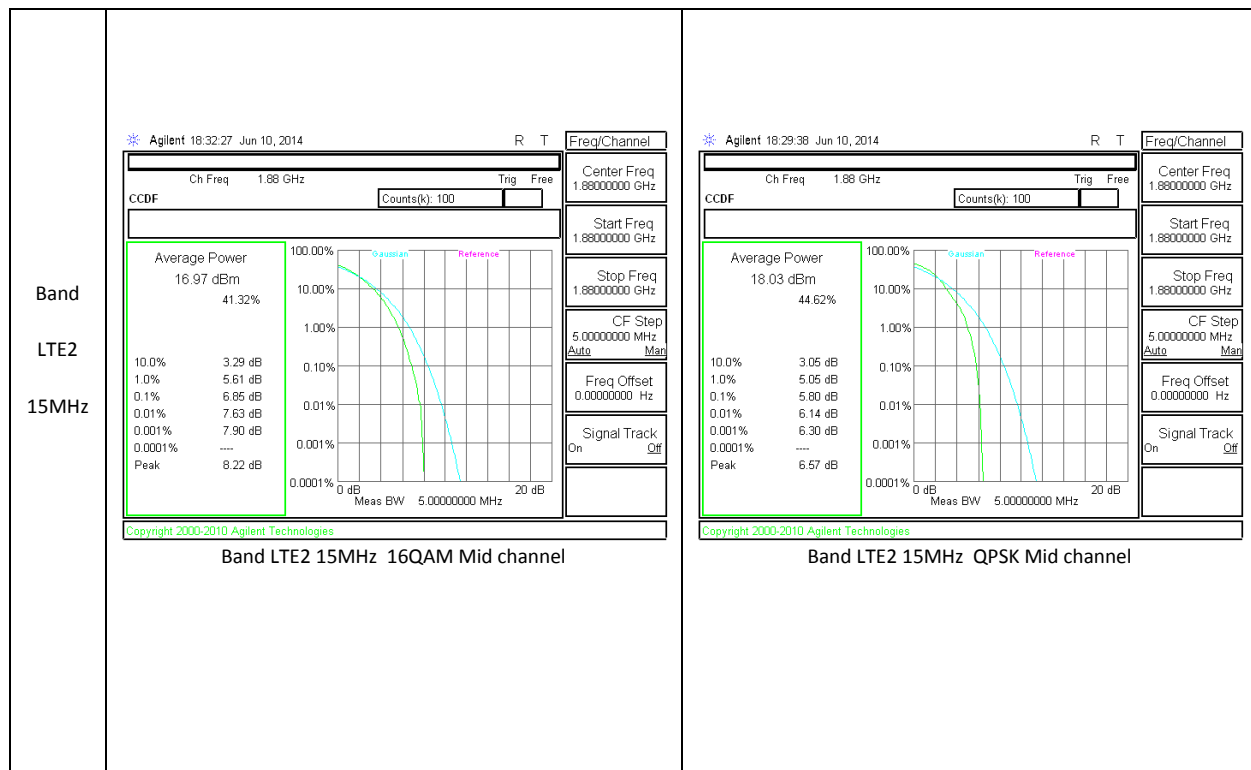
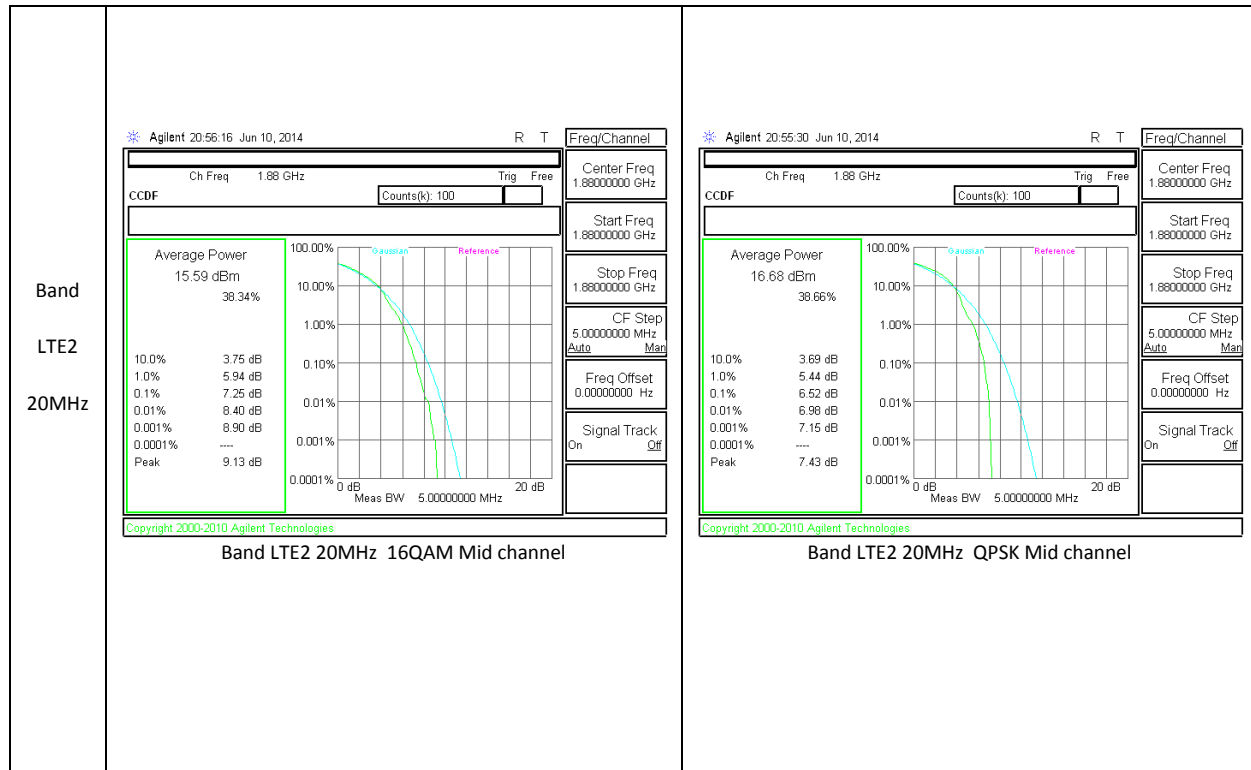
WCDMA
Band 5



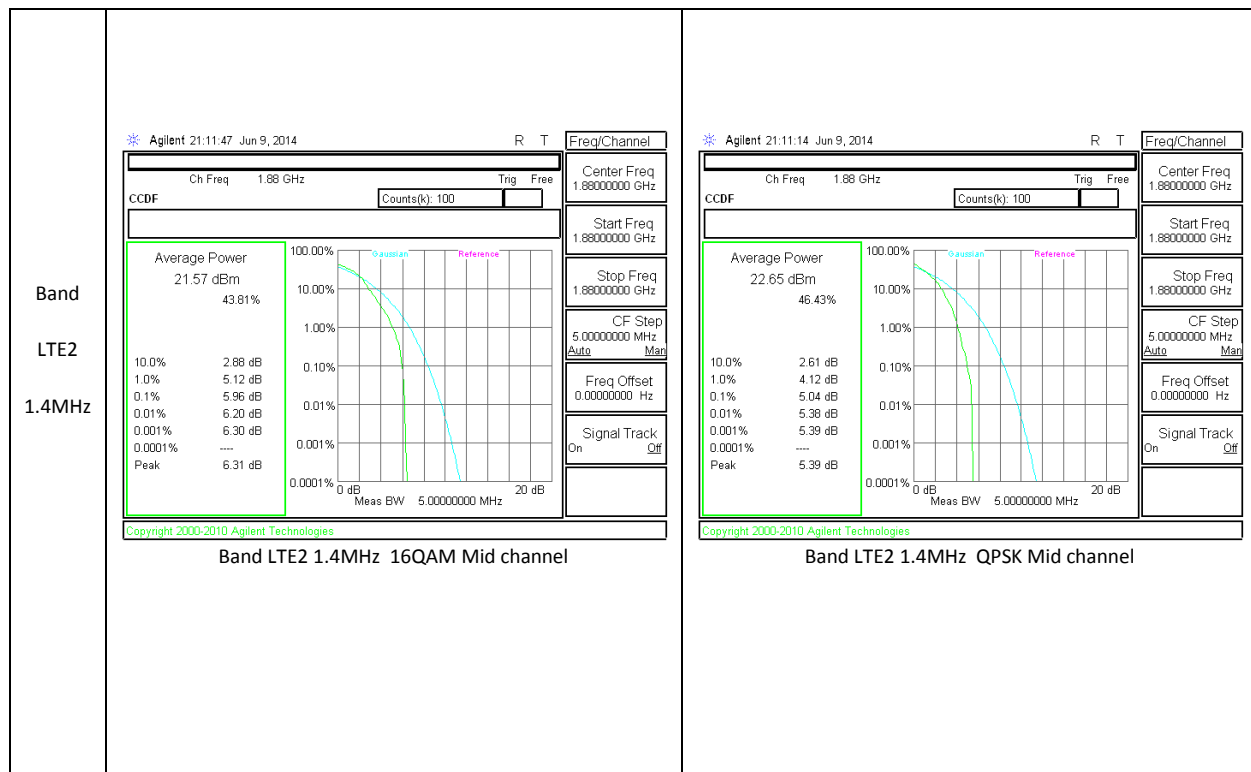
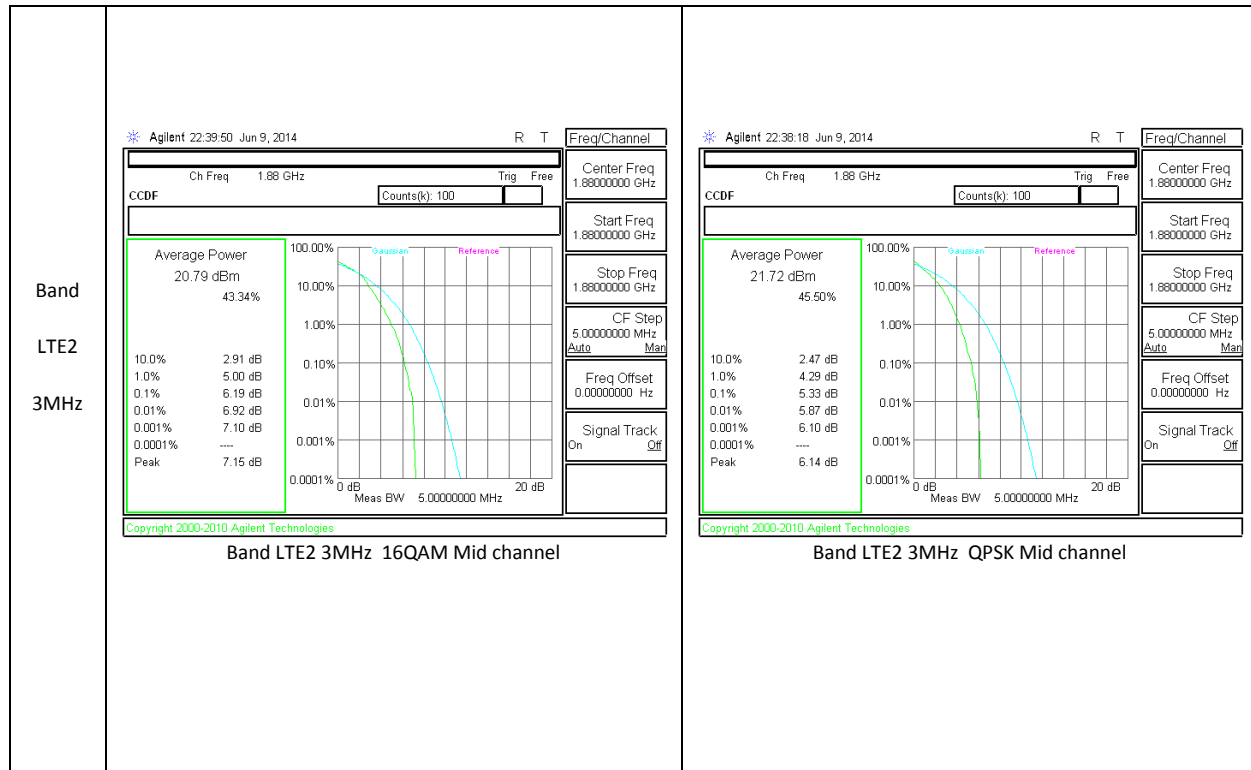
Band WCDMA B5 HSDPA

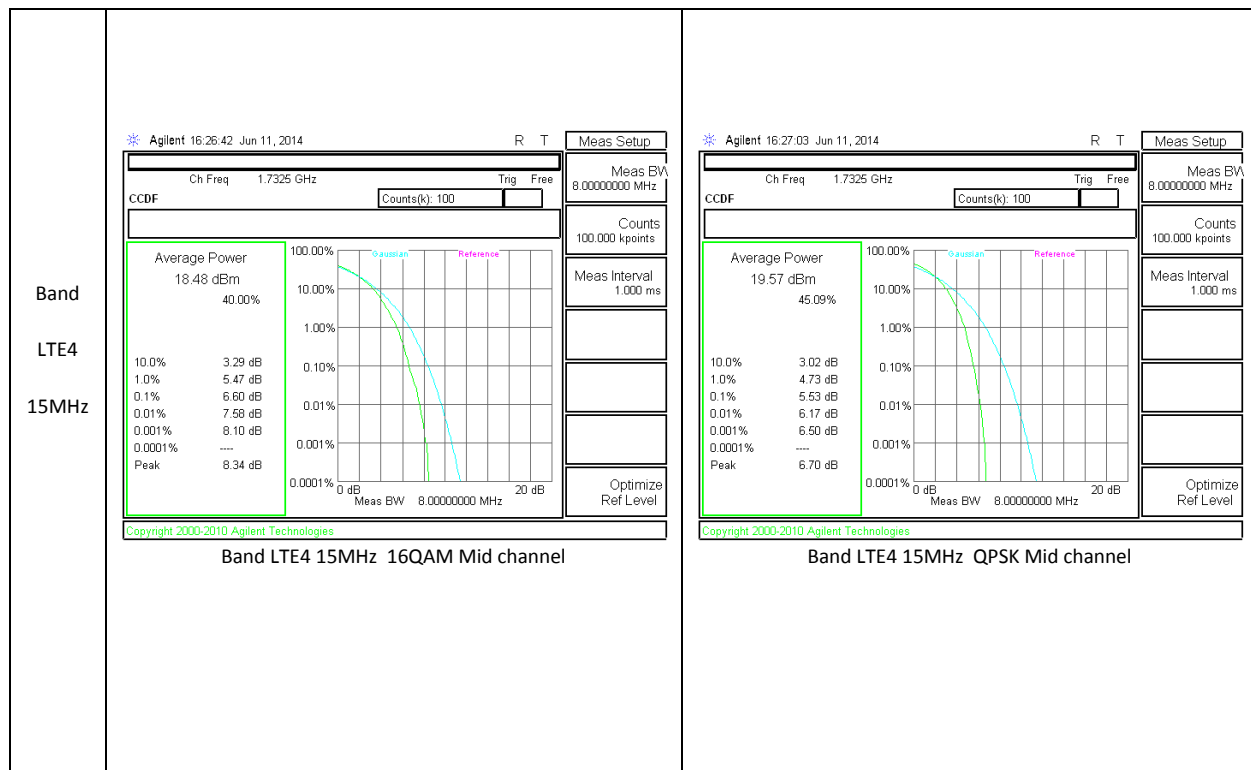
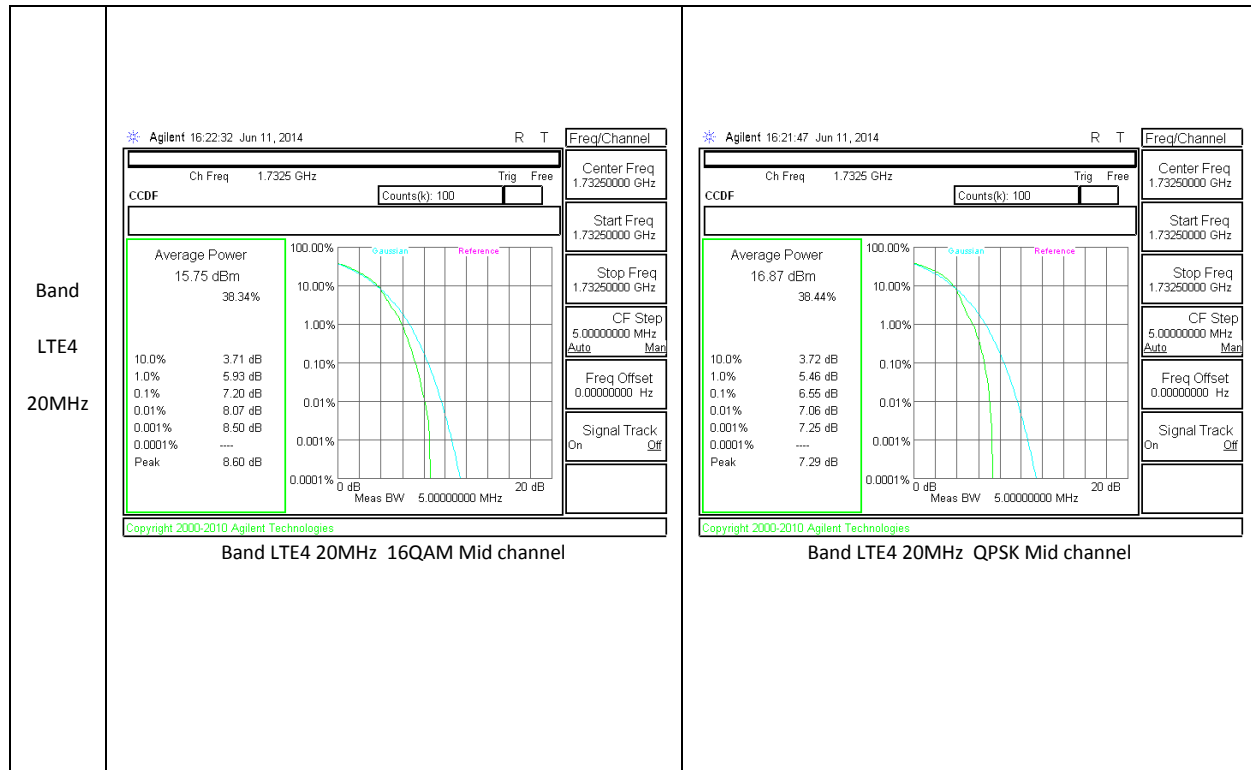


Band WCDMA B5 REL99



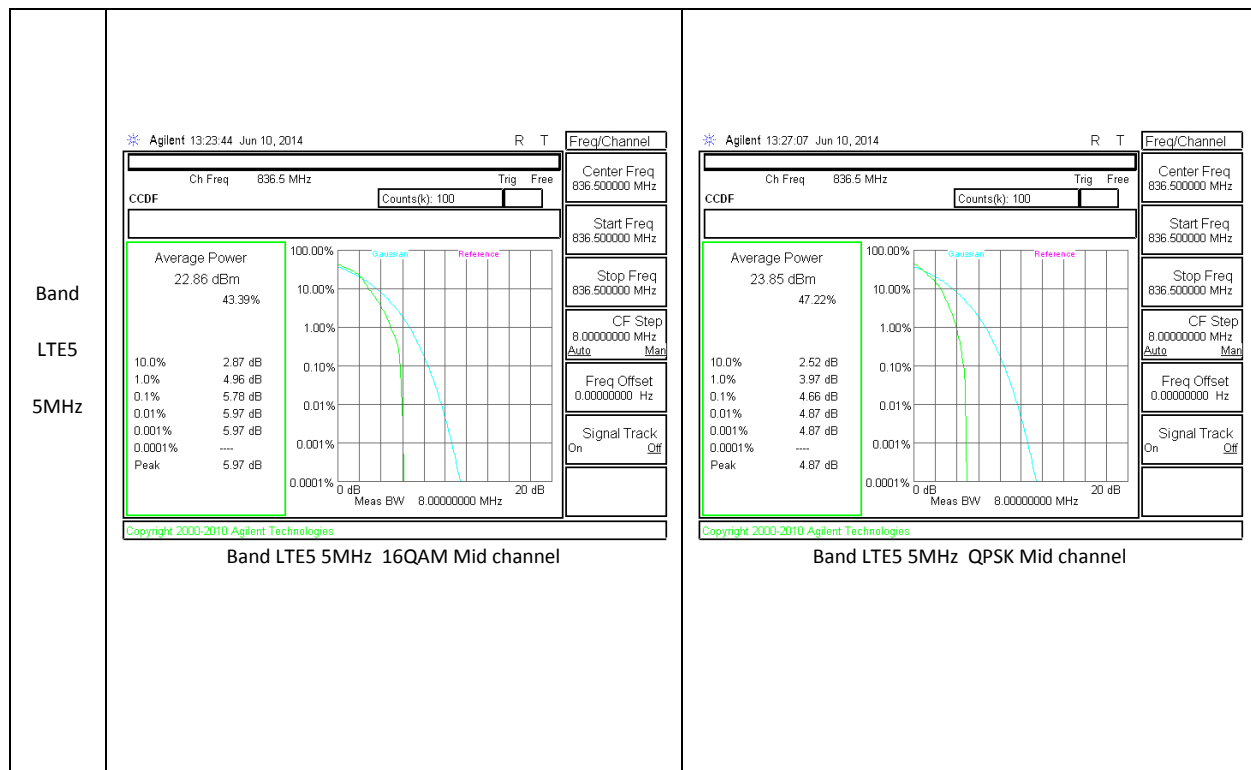
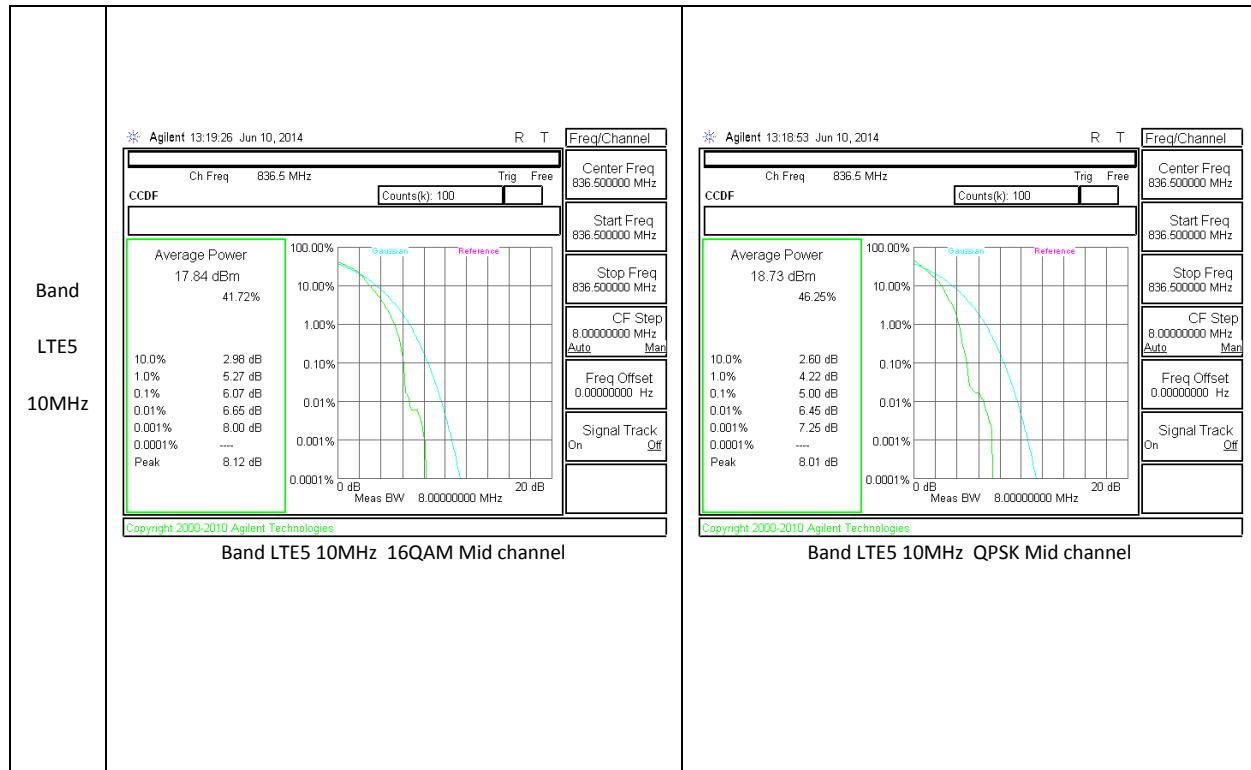
Band LTE2 10MHz	Agilent 01:08:02 Jun 10, 2014 R T Ch Freq 1.88 GHz Trig Free Center Freq 1.88000000 GHz Start Freq 1.88000000 GHz Stop Freq 1.88000000 GHz CF Step 5.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off CCDF Counts(k): 100 Average Power 18.26 dBm 41.96% 10.0% 3.27 dB 1.0% 5.13 dB 0.1% 6.19 dB 0.01% 6.78 dB 0.001% 7.20 dB 0.0001% ---- Peak 7.20 dB Meas BW 5.00000000 MHz 20 dB Copyright 2000-2010 Agilent Technologies Band LTE2 10MHz 16QAM Mid channel	Agilent 01:07:28 Jun 10, 2014 R T Ch Freq 1.88 GHz Trig Free Center Freq 1.88000000 GHz Start Freq 1.88000000 GHz Stop Freq 1.88000000 GHz CF Step 5.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off CCDF Counts(k): 100 Average Power 19.30 dBm 48.48% 10.0% 3.00 dB 1.0% 4.16 dB 0.1% 4.69 dB 0.01% 4.99 dB 0.001% 5.40 dB 0.0001% ---- Peak 5.99 dB Meas BW 5.00000000 MHz 20 dB Copyright 2000-2010 Agilent Technologies Band LTE2 10MHz QPSK Mid channel
Band LTE2 5MHz	Agilent 23:52:43 Jun 9, 2014 R T Ch Freq 1.88 GHz Trig Free Center Freq 1.88000000 GHz Start Freq 1.88000000 GHz Stop Freq 1.88000000 GHz CF Step 5.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off CCDF Counts(k): 100 Average Power 20.55 dBm 42.74% 10.0% 2.83 dB 1.0% 4.99 dB 0.1% 6.15 dB 0.01% 6.42 dB 0.001% 6.49 dB 0.0001% ---- Peak 6.49 dB Meas BW 5.00000000 MHz 20 dB Copyright 2000-2010 Agilent Technologies Band LTE2 5MHz 16QAM Mid channel	Agilent 23:51:17 Jun 9, 2014 R T Ch Freq 1.88 GHz Trig Free Center Freq 1.88000000 GHz Start Freq 1.88000000 GHz Stop Freq 1.88000000 GHz CF Step 5.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off CCDF Counts(k): 100 Average Power 21.77 dBm 47.29% 10.0% 2.53 dB 1.0% 4.01 dB 0.1% 4.74 dB 0.01% 4.98 dB 0.001% 5.08 dB 0.0001% ---- Peak 5.08 dB Meas BW 5.00000000 MHz 20 dB Copyright 2000-2010 Agilent Technologies Band LTE2 5MHz QPSK Mid channel

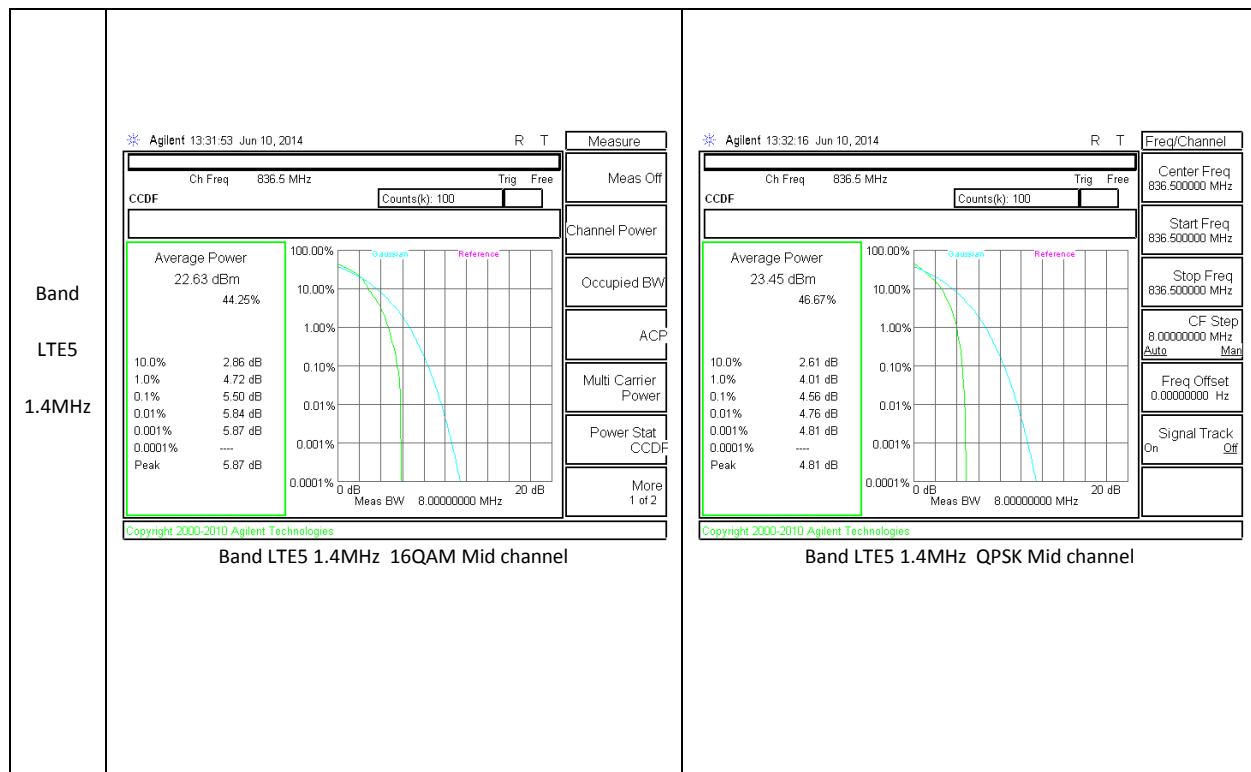
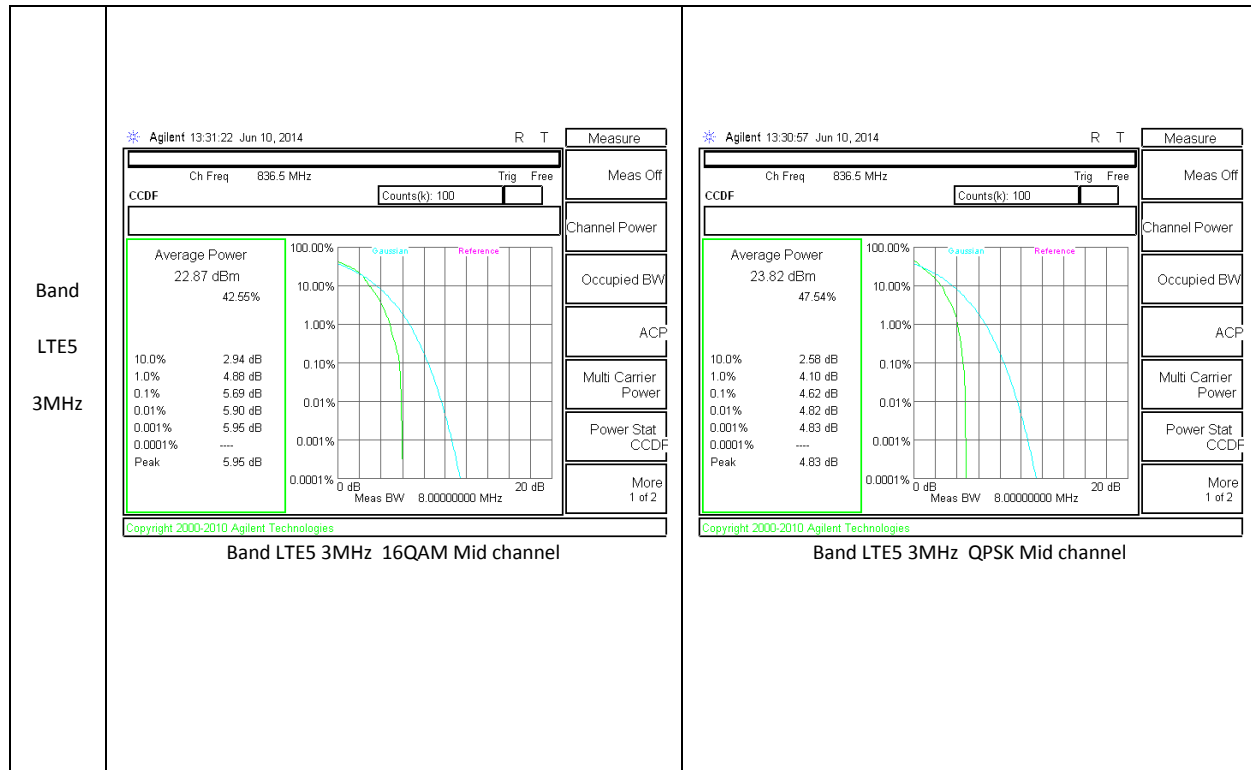


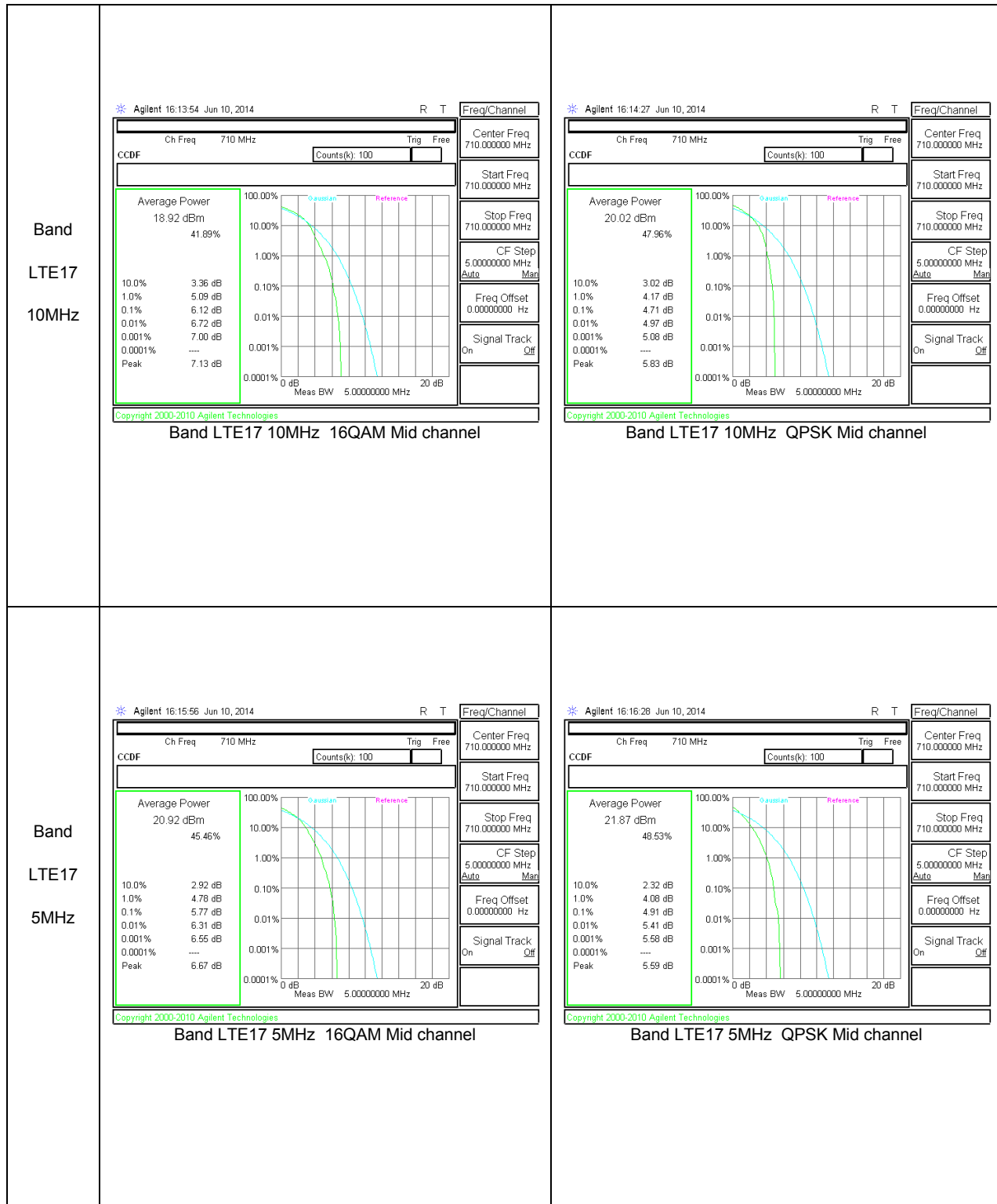


Band LTE4 10MHz	Agilent 15:47:39 Jun 11, 2014 Ch Freq 1.7325 GHz CCDF Average Power 17.53 dBm 43.56% 10.0% 2.91 dB 1.0% 4.97 dB 0.1% 5.55 dB 0.01% 6.67 dB 0.001% 7.90 dB 0.0001% ---- Peak 8.12 dB Meas BW 8.00000000 MHz Band LTE4 10MHz 16QAM Mid channel	Agilent 15:46:22 Jun 11, 2014 Ch Freq 1.7325 GHz CCDF Average Power 18.44 dBm 50.14% 10.0% 2.38 dB 1.0% 3.64 dB 0.1% 4.15 dB 0.01% 5.90 dB 0.001% 6.60 dB 0.0001% ---- Peak 7.09 dB Meas BW 8.00000000 MHz Band LTE4 10MHz QPSK Mid channel
Band LTE4 5MHz	Agilent 15:38:40 Jun 11, 2014 Ch Freq 1.7325 GHz CCDF Average Power 21.05 dBm 44.90% 10.0% 2.77 dB 1.0% 4.87 dB 0.1% 5.53 dB 0.01% 5.71 dB 0.001% 6.10 dB 0.0001% ---- Peak 6.24 dB Meas BW 5.00000000 MHz Band LTE4 5MHz 16QAM Mid channel	Agilent 15:39:07 Jun 11, 2014 Ch Freq 1.7325 GHz CCDF Average Power 21.93 dBm 48.49% 10.0% 2.36 dB 1.0% 3.93 dB 0.1% 4.53 dB 0.01% 4.76 dB 0.001% 5.15 dB 0.0001% ---- Peak 5.15 dB Meas BW 5.00000000 MHz Band LTE4 5MHz QPSK Mid channel

Band LTE4 3MHz	Agilent 15:36:22 Jun 11, 2014 R T Ch Freq 1.7325 GHz Trig Free Center Freq 1.73250000 GHz Start Freq 1.73250000 GHz Stop Freq 1.73250000 GHz CF Step 5.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off CCDF Counts(k): 100 Average Power 21.77 dBm 43.64% 10.0% 2.82 dB 1.0% 5.12 dB 0.1% 5.84 dB 0.01% 6.00 dB 0.001% 6.02 dB 0.0001% ---- Peak 6.02 dB Meas BW 5.00000000 MHz 20 dB Copyright 2000-2010 Agilent Technologies Band LTE4 3MHz 16QAM Mid channel	Agilent 15:37:00 Jun 11, 2014 R T Ch Freq 1.7325 GHz Trig Free Center Freq 1.73250000 GHz Start Freq 1.73250000 GHz Stop Freq 1.73250000 GHz CF Step 5.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off CCDF Counts(k): 100 Average Power 22.84 dBm 48.07% 10.0% 2.52 dB 1.0% 4.08 dB 0.1% 4.50 dB 0.01% 4.78 dB 0.001% 4.83 dB 0.0001% ---- Peak 4.83 dB Meas BW 5.00000000 MHz 20 dB Copyright 2000-2010 Agilent Technologies Band LTE4 3MHz QPSK Mid channel
Band LTE4 1.4MHz	Agilent 23:03:45 Jun 10, 2014 R T Ch Freq 1.7325 GHz Trig Free Center Freq 1.73250000 GHz Start Freq 1.73250000 GHz Stop Freq 1.73250000 GHz CF Step 5.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off CCDF Counts(k): 100 Average Power 22.60 dBm 46.61% 10.0% 2.79 dB 1.0% 4.49 dB 0.1% 5.00 dB 0.01% 5.09 dB 0.001% 5.10 dB 0.0001% ---- Peak 5.10 dB Meas BW 5.00000000 MHz 20 dB Copyright 2000-2010 Agilent Technologies Band LTE4 1.4MHz 16QAM Mid channel	Agilent 23:03:22 Jun 10, 2014 R T Ch Freq 1.7325 GHz Trig Free Center Freq 1.73250000 GHz Start Freq 1.73250000 GHz Stop Freq 1.73250000 GHz CF Step 5.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off CCDF Counts(k): 100 Average Power 23.23 dBm 49.87% 10.0% 2.43 dB 1.0% 3.71 dB 0.1% 4.14 dB 0.01% 4.24 dB 0.001% 4.24 dB 0.0001% ---- Peak 4.24 dB Meas BW 5.00000000 MHz 20 dB Copyright 2000-2010 Agilent Technologies Band LTE4 1.4MHz 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)

MODES TESTED

GSM850, GSM1900, WCDMA Band 5, Band 4, Band 2, LTE 2, LTE 4, LTE 5, LTE 17

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	244.7	326.3
		190	836.6	250	329.4
		251	848.8	247.83	322.8
	EGPRS	128	824.2	249.32	327.8
		190	836.6	249.3	327.8
		251	848.8	249	325.9
GSM1900	GMSK	512	1850.2		
		661	1880		
		810	1909.8		
	GPRS	512	1850.2	247.8	328.4
		661	1880	248.4	332.4
		810	1909.8	247.8	328.4
	EGPRS	512	1850.2	249.6	329.9
		661	1880	248.2	325.7
		810	1909.8	246.9	331.3

Band	Mode	Channel	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
Band 5	REL99	4132	826.4	4.16	4.71
		4183	836.6	4.22	4.68
		4233	846.6	4.16	4.71
	HSDPA	4132	826.4	4.16	4.68
		4183	836.6	4.15	4.67
		4233	846.6	4.19	4.91
	HSUPA	4132	826.4		
		4183	836.6		
		4233	846.6		
Band 2	REL99	9262	1852.4	4.25	4.71
		9400	1880	4.12	4.62
		9538	1907.6	4.18	4.64
	HSDPA	9262	1852.4	4.17	4.73
		9400	1880	4.2	4.79
		9538	1907.6	4.18	4.76
	HSUPA	9262	1852.4		
		9400	1880		
		9538	1907.6		
Band 4	REL99	1325	1712.4	4.14	4.73
		1413	1732.6	4.13	4.72
		1500	1752.6	4.16	4.73
	HSDPA	1325	1712.4	4.16	4.73
		1413	1732.6	4.12	4.74
		1500	1752.6	4.15	4.71

Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE2	20	QPSK	100/0	1860	17.84	19.75
			100/0	1880	17.94	19.82
			100/0	1900	17.96	19.48
		16QAM	100/0	1860	17.95	19.76
			100/0	1880	17.97	19.83
			100/0	1900	17.92	19.66

Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE2	15	QPSK	75/0	1857.5	13.35	14.567
			75/0	1880	13.41	14.49
			75/0	1902.5	13.39	14.47
		16QAM	75/0	1857.5	13.40	14.38
			75/0	1880	13.39	14.47
			75/0	1902.5	13.38	14.52

Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE2	10	QPSK	50/0	1855	8.95	9.69
			50/0	1880	8.96	9.85
			50/0	1905	8.96	9.72
		16QAM	50/0	1855	8.95	9.73
			50/0	1880	8.95	9.93
			50/0	1905	8.95	9.75

Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE2	5	QPSK	25/0	1852.5	4.48	4.89
			25/0	1880	4.47	4.88
			25/0	1907.5	4.46	4.83
		16QAM	25/0	1852.5	4.47	4.89
			25/0	1880	4.49	4.89

			25/0	1907.5	4.46	4.91
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Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE2	3	QPSK	15/0	1851.5	2.68	2.95
			15/0	1880	2.68	2.92
			15/0	1908.5	2.68	2.94
		16QAM	15/0	1851.5	2.68	2.93
			15/0	1880	2.68	2.93
			15/0	1908.5	2.68	2.90

Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE2	1.4	QPSK	6/0	1850.7	1.07	1.29
			6/0	1880	1.08	1.28
			6/0	1909.3	1.08	1.28
		16QAM	6/0	1850.7	1.08	1.33
			6/0	1880	1.08	1.29
			6/0	1909.3	1.08	1.32

Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE4	20	QPSK	100/0	1720	17.84	19.26
			100/0	1732.5	17.88	19.34
			100/0	1745	17.86	19.52
		16QAM	100/0	1720	17.84	19.11
			100/0	1732.5	17.85	19.34
			100/0	1745	17.83	19.49

Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE4	15	QPSK	75/0	1717.5	13.41	14.88
			75/0	1732.5	13.41	14.60
			75/0	1747.5	13.46	14.80
		16QAM	75/0	1717.5	13.40	14.59
			75/0	1732.5	13.43	14.62
			75/0	1747.5	13.44	14.82

Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE4	10	QPSK	50/0	1715	8.85	9.99
			50/0	1732.5	8.95	9.90
			50/0	1750	8.97	9.92
		16QAM	50/0	1715	8.95	9.91
			50/0	1732.5	8.95	9.94
			50/0	1750	8.94	10.07

Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE4	5	QPSK	25/0	1712.5	4.46	4.91
			25/0	1732.5	4.47	4.95
			25/0	1752.5	4.46	4.90
		16QAM	25/0	1712.5	4.46	4.94
			25/0	1732.5	4.47	4.90
			25/0	1752.5	4.49	4.93

Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE4	3	QPSK	15/0	1711.5	2.68	2.95
			15/0	1732.5	2.69	2.93
			15/0	1753.5	2.68	2.93
		16QAM	15/0	1711.5	2.69	2.93
			15/0	1732.5	2.69	2.93
			15/0	1753.5	2.69	2.94

Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE4	1.4	QPSK	6/0	1710.7	1.08	1.27
			6/0	1732.5	1.08	1.27
			6/0	1754.3	1.08	1.30
		16QAM	6/0	1710.7	1.07	1.28
			6/0	1732.5	1.08	1.30
			6/0	1754.3	1.08	1.32

Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE5	10	QPSK	50/0	829	9.08	10.49
			50/0	836.5	9.03	10.33
			50/0	844	9.06	10.38
		16QAM	50/0	829	9.07	10.36
			50/0	836.5	9.04	10.28
			50/0	844	9.09	10.39

Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE5	5	QPSK	25/0	826.5	4.52	5.00
			25/0	836.5	4.50	5.01
			25/0	846.5	4.52	4.98
		16QAM	25/0	826.5	4.50	4.99
			25/0	836.5	4.52	4.99
			25/0	846.5	4.50	5.01

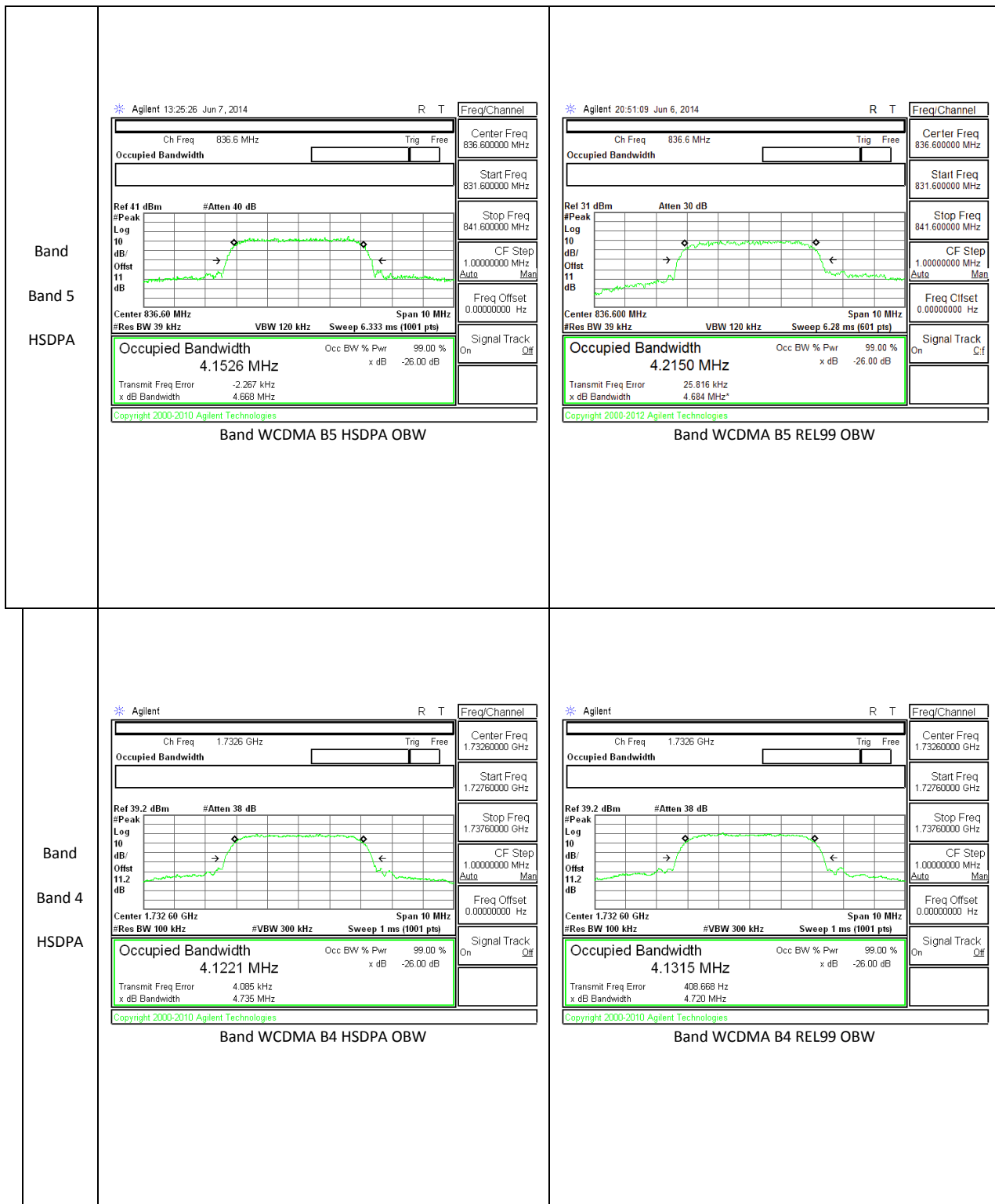
Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE5	3	QPSK	15/0	825.5	2.68	2.93
			15/0	836.5	2.67	2.92
			15/0	847.5	2.68	2.92
		16QAM	15/0	825.5	2.69	2.93
			15/0	836.5	2.69	2.94
			15/0	847.5	2.68	2.94

Band	BW(MHz)	Mode	RB/RB Size	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE5	1.4	QPSK	6/0	824.7	1.08	1.33
			6/0	836.5	1.08	1.31
			6/0	848.3	1.08	1.34
		16QAM	6/0	824.7	1.09	1.32
			6/0	836.5	1.08	1.31
			6/0	848.3	1.09	1.31

Band	BW(MHz)	Mode	RB/RB	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE17	10	QPSK	50/0	709	8.8	9.23
			50/0	710	8.78	9.18
			50/0	711	8.85	9.42
		16QAM	50/0	709	8.72	9.19
			50/0	710	8.57	9.33
			50/0	711	8.89	9.29

Band	BW(MHz)	Mode	RB/RB	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
LTE17	5	QPSK	25/0	706.5	4.43	4.62
			25/0	710	4.30	4.58
			25/0	713.5	4.44	4.2
		16QAM	25/0	706.5	4.46	4.67
			25/0	710	4.48	4.63
			25/0	713.5	4.48	4.7

10.1.2. OCCUPIED BANDWIDTH PLOTS**WCDMA**



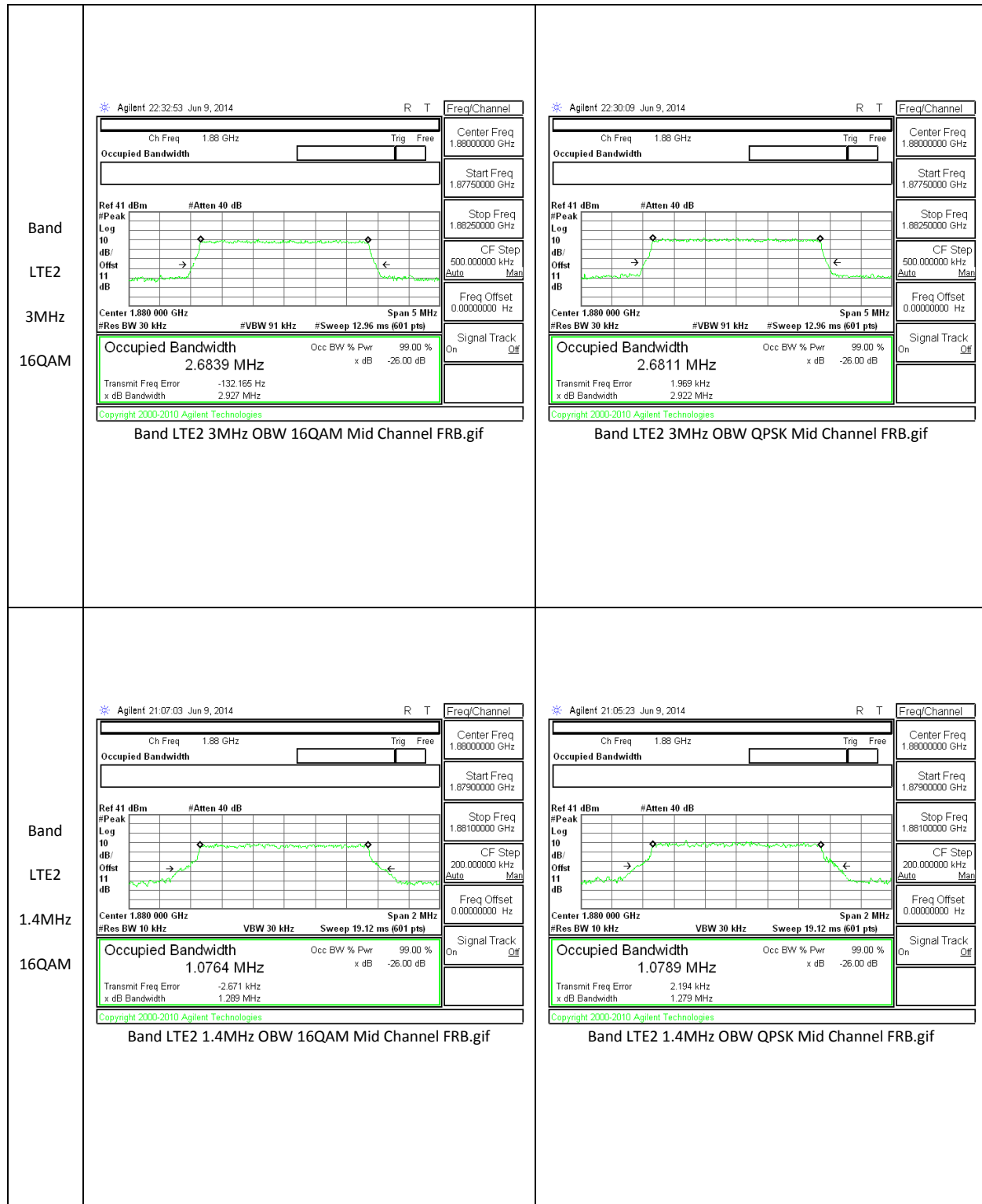
GSM

Band GSM1900 EGPRS	Agilent 15:09:00 Jun 7, 2014 Ch Freq 1.88 GHz Occupied Bandwidth Ref 41 dBm #Atten 40 dB Log 10 dB/Offst 11 dB Center 1.880 000 GHz #Res BW 24 kHz Span 1 MHz VBW 75 kHz Sweep 1.667 ms (1001 pts) Occupied Bandwidth 248.2415 kHz Transmit Freq Error 199.337 Hz x dB Bandwidth 325.663 kHz Occ BW % Pwr 99.00 % x dB -26.00 dB Copyright 2000-2010 Agilent Technologies Band GSM1900 EGPRS OBW Mid channel	Agilent 15:09:00 Jun 7, 2014 Ch Freq 1.88 GHz Occupied Bandwidth Ref 41 dBm #Atten 40 dB Log 10 dB/Offst 11 dB Center 1.880 000 GHz #Res BW 24 kHz Span 1 MHz VBW 75 kHz Sweep 1.667 ms (1001 pts) Occupied Bandwidth 248.2415 kHz Transmit Freq Error 199.337 Hz x dB Bandwidth 325.663 kHz Occ BW % Pwr 99.00 % x dB -26.00 dB Copyright 2000-2010 Agilent Technologies Band GSM1900 EGPRS OBW Mid channel	
Band GSM1900 GPRS	Agilent 14:08:46 Jun 7, 2014 Ch Freq 1.88 GHz Occupied Bandwidth Ref 41 dBm #Atten 40 dB Log 10 dB/Offst 11 dB Center 1.880 000 GHz #Res BW 24 kHz Span 1 MHz VBW 75 kHz Sweep 1.667 ms (1001 pts) Occupied Bandwidth 248.4423 kHz Transmit Freq Error -2.079 kHz x dB Bandwidth 332.362 kHz Occ BW % Pwr 99.00 % x dB -26.00 dB Copyright 2000-2010 Agilent Technologies Band GSM1900 GPRS OBW Mid channel	Agilent 14:08:46 Jun 7, 2014 Ch Freq 1.88 GHz Occupied Bandwidth Ref 41 dBm #Atten 40 dB Log 10 dB/Offst 11 dB Center 1.880 000 GHz #Res BW 24 kHz Span 1 MHz VBW 75 kHz Sweep 1.667 ms (1001 pts) Occupied Bandwidth 248.4423 kHz Transmit Freq Error -2.079 kHz x dB Bandwidth 332.362 kHz Occ BW % Pwr 99.00 % x dB -26.00 dB Copyright 2000-2010 Agilent Technologies Band GSM1900 GPRS OBW Mid channel	Agilent 14:08:46 Jun 7, 2014 Ch Freq 1.88 GHz Occupied Bandwidth Ref 41 dBm #Atten 40 dB Log 10 dB/Offst 11 dB Center 1.880 000 GHz #Res BW 24 kHz Span 1 MHz VBW 75 kHz Sweep 1.667 ms (1001 pts) Occupied Bandwidth 248.4423 kHz Transmit Freq Error -2.079 kHz x dB Bandwidth 332.362 kHz Occ BW % Pwr 99.00 % x dB -26.00 dB Copyright 2000-2010 Agilent Technologies Band GSM1900 GPRS OBW Mid channel
Band GSM850 EGPRS	Agilent 14:52:35 Jun 7, 2014 Ch Freq 836.6 MHz Occupied Bandwidth Ref 41 dBm #Atten 40 dB Log 10 dB/Offst 11 dB Center 836.600 MHz #Res BW 24 kHz Span 1 MHz VBW 75 kHz Sweep 1.667 ms (1001 pts) Occupied Bandwidth 249.2771 kHz Transmit Freq Error 206.211 Hz x dB Bandwidth 327.757 kHz Occ BW % Pwr 99.00 % x dB -26.00 dB Copyright 2000-2010 Agilent Technologies Band GSM850 EGPRS OBW Mid channel	Agilent 14:52:35 Jun 7, 2014 Ch Freq 836.6 MHz Occupied Bandwidth Ref 41 dBm #Atten 40 dB Log 10 dB/Offst 11 dB Center 836.600 MHz #Res BW 24 kHz Span 1 MHz VBW 75 kHz Sweep 1.667 ms (1001 pts) Occupied Bandwidth 249.2771 kHz Transmit Freq Error 206.211 Hz x dB Bandwidth 327.757 kHz Occ BW % Pwr 99.00 % x dB -26.00 dB Copyright 2000-2010 Agilent Technologies Band GSM850 EGPRS OBW Mid channel	Agilent 14:52:35 Jun 7, 2014 Ch Freq 836.6 MHz Occupied Bandwidth Ref 41 dBm #Atten 40 dB Log 10 dB/Offst 11 dB Center 836.600 MHz #Res BW 24 kHz Span 1 MHz VBW 75 kHz Sweep 1.667 ms (1001 pts) Occupied Bandwidth 249.2771 kHz Transmit Freq Error 206.211 Hz x dB Bandwidth 327.757 kHz Occ BW % Pwr 99.00 % x dB -26.00 dB Copyright 2000-2010 Agilent Technologies Band GSM850 EGPRS OBW Mid channel
Band GSM850 GPRS	Agilent 14:33:03 Jun 7, 2014 Ch Freq 836.6 MHz Occupied Bandwidth Ref 30 dBm #Atten 40 dB Log 10 dB/Offst 11 dB Center 836.600 MHz #Res BW 24 kHz Span 1 MHz VBW 75 kHz Sweep 1.667 ms (1001 pts) Occupied Bandwidth 250.0076 kHz Transmit Freq Error -1.221 kHz x dB Bandwidth 329.419 kHz Occ BW % Pwr 99.00 % x dB -26.00 dB Copyright 2000-2010 Agilent Technologies Band GSM850 GPRS OBW Mid channel	Agilent 14:33:03 Jun 7, 2014 Ch Freq 836.6 MHz Occupied Bandwidth Ref 30 dBm #Atten 40 dB Log 10 dB/Offst 11 dB Center 836.600 MHz #Res BW 24 kHz Span 1 MHz VBW 75 kHz Sweep 1.667 ms (1001 pts) Occupied Bandwidth 250.0076 kHz Transmit Freq Error -1.221 kHz x dB Bandwidth 329.419 kHz Occ BW % Pwr 99.00 % x dB -26.00 dB Copyright 2000-2010 Agilent Technologies Band GSM850 GPRS OBW Mid channel	Agilent 14:33:03 Jun 7, 2014 Ch Freq 836.6 MHz Occupied Bandwidth Ref 30 dBm #Atten 40 dB Log 10 dB/Offst 11 dB Center 836.600 MHz #Res BW 24 kHz Span 1 MHz VBW 75 kHz Sweep 1.667 ms (1001 pts) Occupied Bandwidth 250.0076 kHz Transmit Freq Error -1.221 kHz x dB Bandwidth 329.419 kHz Occ BW % Pwr 99.00 % x dB -26.00 dB Copyright 2000-2010 Agilent Technologies Band GSM850 GPRS OBW Mid channel

LTE Band 2

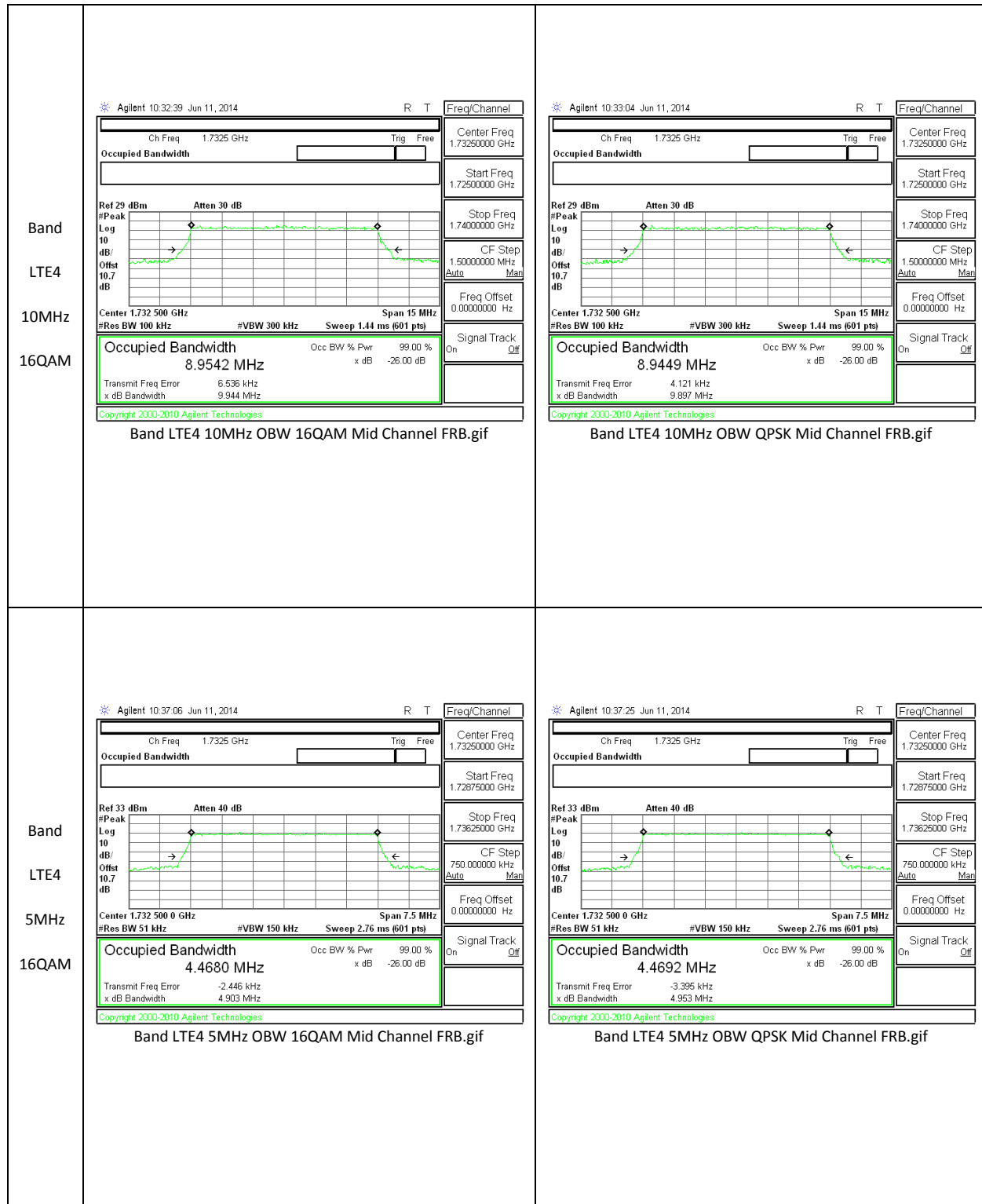
Band LTE2 20MHz 16QAM	Agilent 20:50:31 Jun 10, 2014 R T Ch Freq 1.88 GHz Trig Free Center Freq 1.8800000 GHz Start Freq 1.8600000 GHz Stop Freq 1.9000000 GHz CF Step 4.0000000 MHz Auto Mar Freq Offset 0.0000000 Hz Signal Track On Off Ref 41 dBm Atten 40 dB Log 10 dB/Offst 11 dB Center 1.880 00 GHz Span 40 MHz Res BW 390 kHz VBW 1.2 MHz Sweep 1 ms (601 pts) Occupied Bandwidth 17.9727 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error -15.117 kHz x dB Bandwidth 19.827 MHz Copyright 2000-2010 Agilent Technologies Band LTE2 20MHz OBW 16QAM Mid Channel FRB.gif
	Agilent 20:49:24 Jun 10, 2014 R T Ch Freq 1.88 GHz Trig Free Center Freq 1.8800000 GHz Start Freq 1.8600000 GHz Stop Freq 1.9000000 GHz CF Step 4.0000000 MHz Auto Mar Freq Offset 0.0000000 Hz Signal Track On Off Ref 41 dBm Atten 40 dB Log 10 dB/Offst 11 dB Center 1.880 00 GHz Span 40 MHz Res BW 390 kHz VBW 1.2 MHz Sweep 1 ms (601 pts) Occupied Bandwidth 17.9352 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error -15.469 kHz x dB Bandwidth 19.821 MHz Copyright 2000-2010 Agilent Technologies Band LTE2 20MHz OBW QPSK Mid Channel FRB.gif
Band LTE2 15MHz 16QAM	Agilent 18:23:37 Jun 10, 2014 R T Ch Freq 1.88 GHz Trig Free Center Freq 1.8800000 GHz Start Freq 1.8700000 GHz Stop Freq 1.8900000 GHz CF Step 2.0000000 MHz Auto Mar Freq Offset 0.0000000 Hz Signal Track On Off Ref 41 dBm Atten 40 dB Log 10 dB/Offst 11 dB Center 1.880 00 GHz Span 20 MHz Res BW 130 kHz VBW 390 kHz #Sweep 1.68 ms (601 pts) Occupied Bandwidth 13.3903 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error 870.559 Hz x dB Bandwidth 14.467 MHz Copyright 2000-2010 Agilent Technologies Band LTE2 15MHz OBW 16QAM Mid Channel FRB.gif
	Agilent 18:21:49 Jun 10, 2014 R T Ch Freq 1.88 GHz Trig Free Center Freq 1.8800000 GHz Start Freq 1.8700000 GHz Stop Freq 1.8900000 GHz CF Step 2.0000000 MHz Auto Mar Freq Offset 0.0000000 Hz Signal Track On Off Ref 41 dBm Atten 40 dB Log 10 dB/Offst 11 dB Center 1.880 00 GHz Span 20 MHz Res BW 130 kHz VBW 390 kHz Sweep 1.16 ms (601 pts) Occupied Bandwidth 13.4055 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error -1.013 kHz x dB Bandwidth 14.493 MHz Copyright 2000-2010 Agilent Technologies Band LTE2 15MHz OBW QPSK Mid Channel FRB.gif

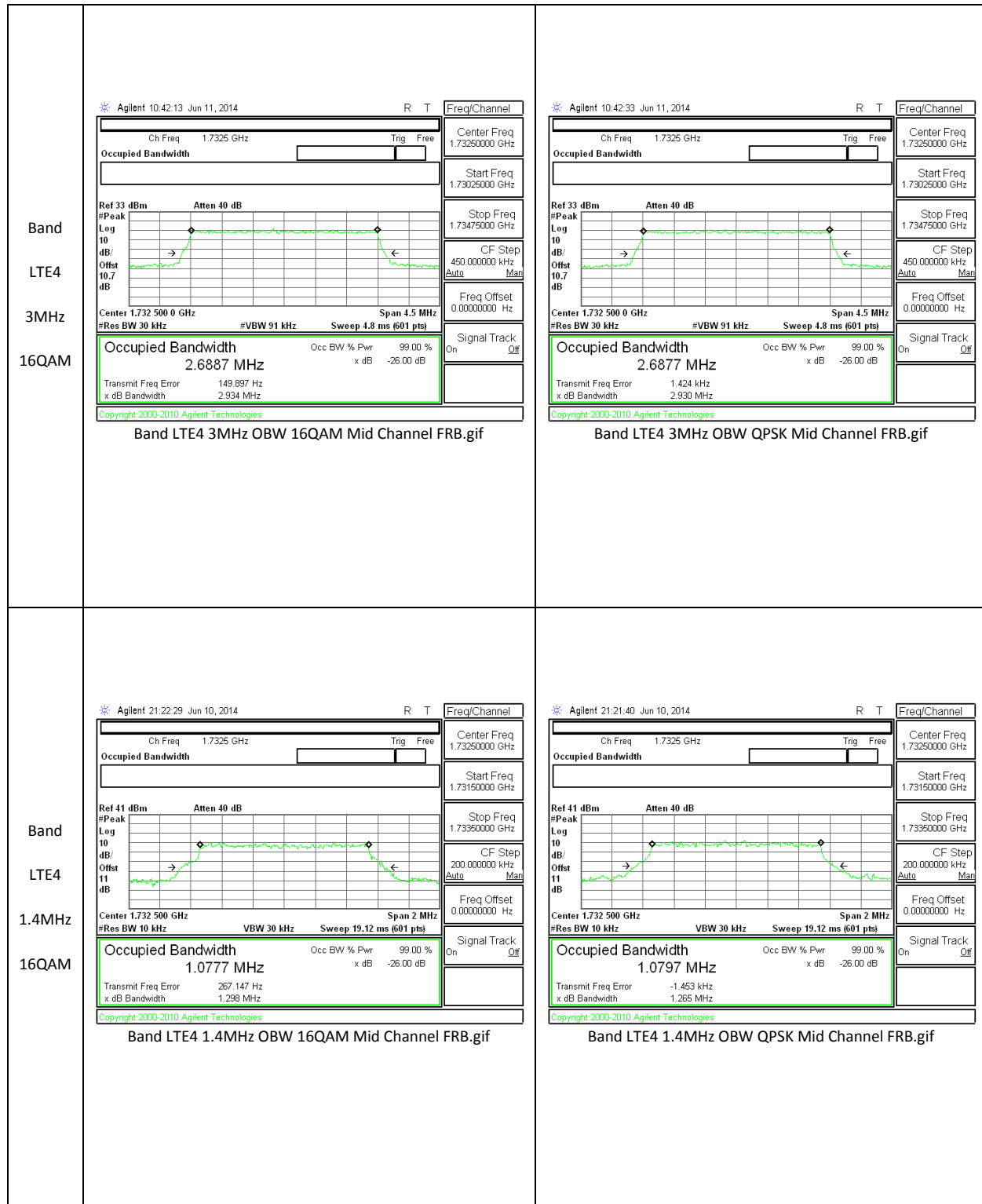
Band LTE2 10MHz 16QAM	Agilent 01.03.39 Jun 10, 2014 Ch Freq 1.88 GHz Trig Free Center Freq 1.88000000 GHz Start Freq 1.87000000 GHz Stop Freq 1.89000000 GHz CF Step 2.00000000 MHz Freq Offset 0.00000000 Hz Signal Track On Ref 41 dBm #Atten 40 dB Log 10 dB/Offst 11 dB Center 1.880 00 GHz #Res BW 91 kHz VBW 270 kHz Sweep 2.32 ms (601 pts) Span 20 MHz Occupied Bandwidth 8.9496 MHz Transmit Freq Error -9.965 kHz x dB Bandwidth 9.926 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Copyright 2000-2010 Agilent Technologies Band LTE2 10MHz OBW 16QAM Mid Channel FRB.gif	Agilent 01.02.34 Jun 10, 2014 Ch Freq 1.88 GHz Trig Free Center Freq 1.88000000 GHz Start Freq 1.87000000 GHz Stop Freq 1.89000000 GHz CF Step 2.00000000 MHz Freq Offset 0.00000000 Hz Signal Track On Ref 41 dBm #Atten 40 dB Log 10 dB/Offst 11 dB Center 1.880 00 GHz #Res BW 91 kHz VBW 270 kHz Sweep 2.32 ms (601 pts) Span 20 MHz Occupied Bandwidth 8.9644 MHz Transmit Freq Error -12.247 kHz x dB Bandwidth 9.846 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Copyright 2000-2010 Agilent Technologies Band LTE2 10MHz OBW QPSK Mid Channel FRB.gif
Band LTE2 5MHz 16QAM	Agilent 23.46.41 Jun 9, 2014 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 Signal Track On Ref 41 dBm #Atten 40 dB Log 10 dB/Offst 11 dB Center 1.880 000 GHz #Res BW 43 kHz VBW 130 kHz Sweep 5.2 ms (601 pts) Span 10 MHz Occupied Bandwidth 4.4877 MHz Transmit Freq Error -2.192 kHz x dB Bandwidth 4.891 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Copyright 2000-2010 Agilent Technologies Band LTE2 5MHz OBW 16QAM Mid Channel FRB.gif	Agilent 23.46.01 Jun 9, 2014 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 Signal Track On Ref 41 dBm #Atten 40 dB Log 10 dB/Offst 11 dB Center 1.880 000 GHz #Res BW 43 kHz VBW 130 kHz Sweep 5.2 ms (601 pts) Span 10 MHz Occupied Bandwidth 4.4680 MHz Transmit Freq Error -1.776 kHz x dB Bandwidth 4.879 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Copyright 2000-2010 Agilent Technologies Band LTE2 5MHz OBW QPSK Mid Channel FRB.gif



LTE Band 4

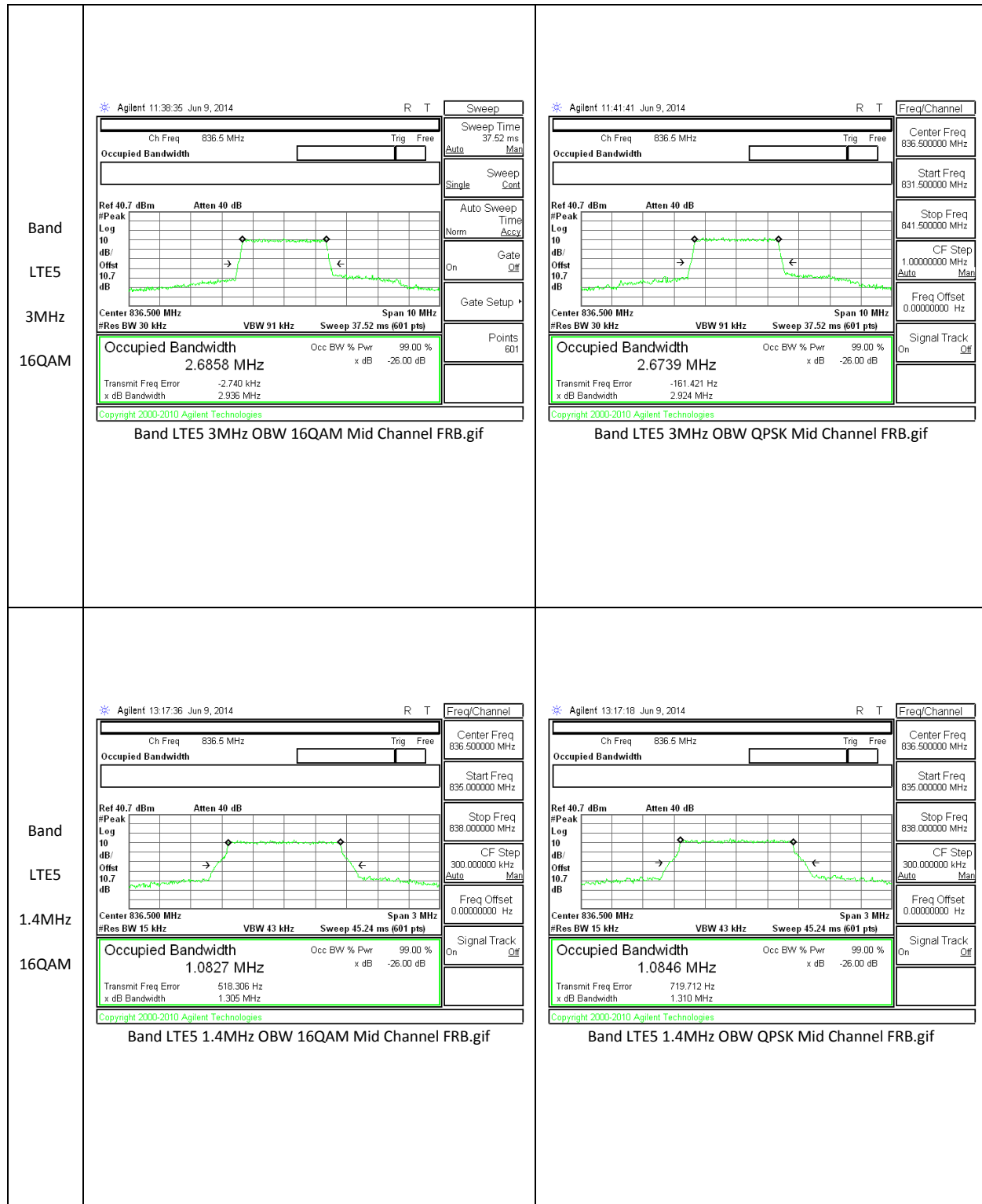
Band LTE4 20MHz 16QAM	Agilent 10:21:33 Jun 11, 2014 R T Freq/Channel Ch Freq 1.7325 GHz Trig Free Center Freq 1.73250000 GHz Occupied Bandwidth Start Freq 1.71750000 GHz Stop Freq 1.74750000 GHz CF Step 3.00000000 MHz Auto Mat Freq Offset 0.00000000 Hz Center 1.732 50 GHz Span 30 MHz #Res BW 200 kHz #VBW 620 kHz #Sweep 1.2 ms (601 pts) Occupied Bandwidth 17.8544 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error 638.600 Hz x dB Bandwidth 19.341 MHz Signal Track On Off Copyright 2000-2010 Agilent Technologies Band LTE4 20MHz OBW 16QAM Mid Channel FRB.gif
	Agilent 10:22:00 Jun 11, 2014 R T Freq/Channel Ch Freq 1.7325 GHz Trig Free Center Freq 1.73250000 GHz Occupied Bandwidth Start Freq 1.71750000 GHz Stop Freq 1.74750000 GHz CF Step 3.00000000 MHz Auto Mat Freq Offset 0.00000000 Hz Center 1.732 50 GHz Span 30 MHz #Res BW 200 kHz #VBW 620 kHz #Sweep 1.2 ms (601 pts) Occupied Bandwidth 17.8786 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error 2.006 kHz x dB Bandwidth 19.342 MHz Signal Track On Off Copyright 2000-2010 Agilent Technologies Band LTE4 20MHz OBW QPSK Mid Channel FRB.gif
Band LTE4 15MHz 16QAM	Agilent 10:26:35 Jun 11, 2014 R T Freq/Channel Ch Freq 1.7325 GHz Trig Free Center Freq 1.73250000 GHz Occupied Bandwidth Start Freq 1.72100000 GHz Stop Freq 1.74400000 GHz CF Step 2.30000000 MHz Auto Mat Freq Offset 0.00000000 Hz Center 1.732 50 GHz Span 23 MHz #Res BW 200 kHz #VBW 620 kHz #Sweep 1.2 ms (601 pts) Occupied Bandwidth 13.4262 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error -9.399 kHz x dB Bandwidth 14.619 MHz Signal Track On Off Copyright 2000-2010 Agilent Technologies Band LTE4 15MHz OBW 16QAM Mid Channel FRB.gif
	Agilent 10:27:03 Jun 11, 2014 R T Freq/Channel Ch Freq 1.7325 GHz Trig Free Center Freq 1.73250000 GHz Occupied Bandwidth Start Freq 1.72100000 GHz Stop Freq 1.74400000 GHz CF Step 2.30000000 MHz Auto Mat Freq Offset 0.00000000 Hz Center 1.732 50 GHz Span 23 MHz #Res BW 200 kHz #VBW 620 kHz #Sweep 1.2 ms (601 pts) Occupied Bandwidth 13.4101 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error -14.624 kHz x dB Bandwidth 14.696 MHz Signal Track On Off Copyright 2000-2010 Agilent Technologies Band LTE4 15MHz OBW QPSK Mid Channel FRB.gif





LTE Band 5

Band LTE5 10MHz 16QAM	Agilent 11:13:55 Jun 9, 2014 R T Ch Freq 836.5 MHz Trig Free Center Freq 836.500000 MHz Start Freq 826.500000 MHz Stop Freq 846.500000 MHz CF Step 2.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Ref 40.7 dBm Atten 40 dB Log 10 dB/ 10.7 dB Center 836.50 MHz Span 20 MHz #Res BW 270 kHz VBW 820 kHz Sweep 20 ms (601 pts) Occupied Bandwidth 9.0438 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error 3.592 kHz x dB Bandwidth 10.278 MHz Copyright 2000-2010 Agilent Technologies Band LTE5 10MHz OBW 16QAM Mid Channel FRB.gif	Agilent 11:13:28 Jun 9, 2014 R T Ch Freq 836.5 MHz Trig Free Center Freq 836.500000 MHz Start Freq 826.500000 MHz Stop Freq 846.500000 MHz CF Step 2.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Ref 40.7 dBm Atten 40 dB Log 10 dB/ 10.7 dB Center 836.50 MHz Span 20 MHz #Res BW 270 kHz VBW 820 kHz Sweep 20 ms (601 pts) Occupied Bandwidth 9.0302 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error 9.211 kHz x dB Bandwidth 10.325 MHz Copyright 2000-2010 Agilent Technologies Band LTE5 10MHz OBW QPSK Mid Channel FRB.gif
Band LTE5 5MHz 16QAM	Agilent 11:23:42 Jun 9, 2014 R T Ch Freq 836.5 MHz Trig Free Center Freq 836.500000 MHz Start Freq 831.500000 MHz Stop Freq 841.500000 MHz CF Step 1.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Ref 40.7 dBm Atten 40 dB Log 10 dB/ 10.7 dB Center 836.500 MHz Span 10 MHz #Res BW 100 kHz VBW 300 kHz Sweep 20 ms (601 pts) Occupied Bandwidth 4.5155 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error -11.199 kHz x dB Bandwidth 4.994 MHz Copyright 2000-2010 Agilent Technologies Band LTE5 5MHz OBW 16QAM Mid Channel FRB.gif	Agilent 11:24:37 Jun 9, 2014 R T Ch Freq 836.5 MHz Trig Free Center Freq 836.500000 MHz Start Freq 831.500000 MHz Stop Freq 841.500000 MHz CF Step 1.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off Ref 40.7 dBm Atten 40 dB Log 10 dB/ 10.7 dB Center 836.500 MHz Span 10 MHz #Res BW 100 kHz VBW 300 kHz Sweep 20 ms (601 pts) Occupied Bandwidth 4.5047 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error 261.575 Hz x dB Bandwidth 5.013 MHz Copyright 2000-2010 Agilent Technologies Band LTE5 5MHz OBW QPSK Mid Channel FRB.gif



LTE Band 17

Band LTE17 10MHz 16QAM	Agilent 15:10:28 Jun 10, 2014 R T Freq/Channel Ch Freq 710 MHz Trig Free Center Freq 710.000000 MHz Start Freq 702.500000 MHz Stop Freq 717.500000 MHz CF Step 1.50000000 MHz Freq Offset 0.00000000 Hz Signal Track On Occupied Bandwidth Ref 40 dBm Atten 40 dB Peak Log 10 dB/Offset 10.7 dB Center 710.000 MHz Span 15 MHz Res BW 100 kHz #VBW 300 kHz Sweep 1.44 ms (601 pts) Occupied Bandwidth 8.5720 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error 152.928 kHz x dB Bandwidth 9.329 MHz* Copyright 2000-2010 Agilent Technologies Band LTE17 10MHz OBW 16QAM Mid Channel FRB.gif
Band LTE17 5MHz 16QAM	Agilent 15:18:44 Jun 10, 2014 R T Freq/Channel Ch Freq 710 MHz Trig Free Center Freq 710.000000 MHz Start Freq 706.000000 MHz Stop Freq 714.000000 MHz CF Step 800.000000 kHz Freq Offset 0.00000000 Hz Signal Track On Occupied Bandwidth Ref 40 dBm Atten 40 dB Peak Log 10 dB/Offset 10.7 dB Center 710.000 MHz Span 8 MHz Res BW 51 kHz #VBW 150 kHz Sweep 2.96 ms (601 pts) Occupied Bandwidth 4.4816 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error -14.850 kHz x dB Bandwidth 4.625 MHz* Copyright 2000-2010 Agilent Technologies Band LTE17 5MHz OBW 16QAM Mid Channel FRB.gif
Agilent 15:09:34 Jun 10, 2014 R T Freq/Channel Ch Freq 710 MHz Trig Free Center Freq 710.000000 MHz Start Freq 702.500000 MHz Stop Freq 717.500000 MHz CF Step 1.50000000 MHz Freq Offset 0.00000000 Hz Signal Track On Occupied Bandwidth Ref 40 dBm Atten 40 dB Peak Log 10 dB/Offset 10.7 dB Center 710.000 MHz Span 15 MHz Res BW 100 kHz #VBW 300 kHz Sweep 1.44 ms (601 pts) Occupied Bandwidth 8.7817 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error 5.469 kHz x dB Bandwidth 9.179 MHz* Copyright 2000-2010 Agilent Technologies Band LTE17 10MHz OBW QPSK Mid Channel FRB.gif	Agilent 15:19:12 Jun 10, 2014 R T Freq/Channel Ch Freq 710 MHz Trig Free Center Freq 710.000000 MHz Start Freq 706.000000 MHz Stop Freq 714.000000 MHz CF Step 800.000000 kHz Freq Offset 0.00000000 Hz Signal Track On Occupied Bandwidth Ref 40 dBm Atten 40 dB Peak Log 10 dB/Offset 10.7 dB Center 710.000 MHz Span 8 MHz Res BW 51 kHz #VBW 150 kHz Sweep 2.96 ms (601 pts) Occupied Bandwidth 4.3033 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Transmit Freq Error -19.584 kHz x dB Bandwidth 4.584 MHz* Copyright 2000-2010 Agilent Technologies Band LTE17 5MHz OBW QPSK Mid Channel FRB.gif

10.2. BAND EDGE EMISSIONS

RULE PART(S)

FCC: §22.359, §24.238 and § 27

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

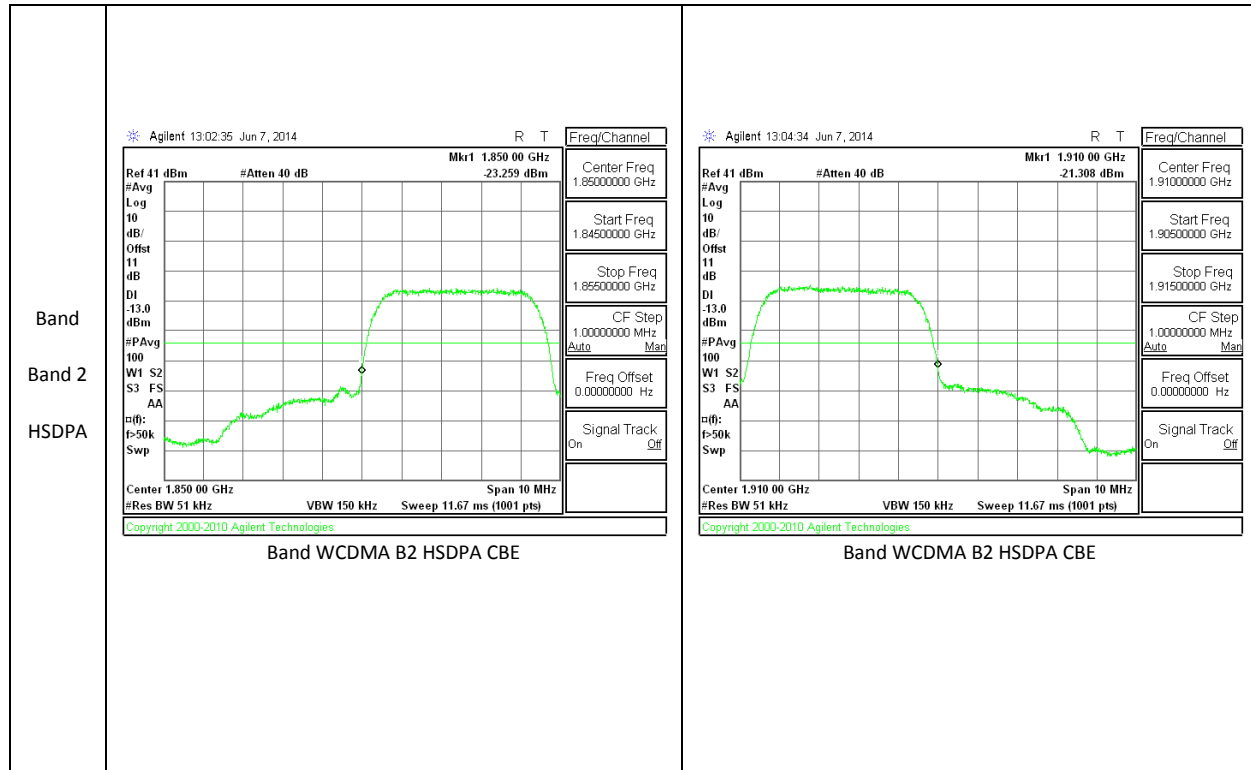
Per KDB 971168 D01 Power Meas License Digital Systems v02r01

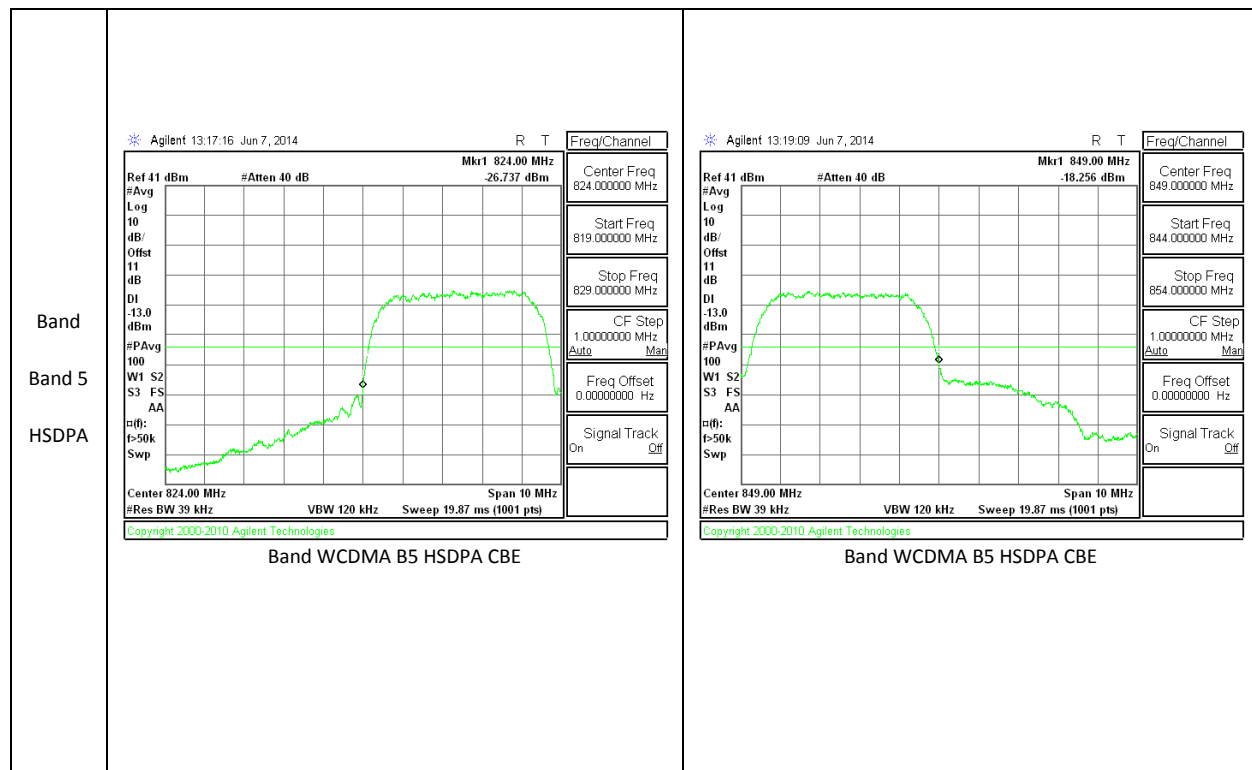
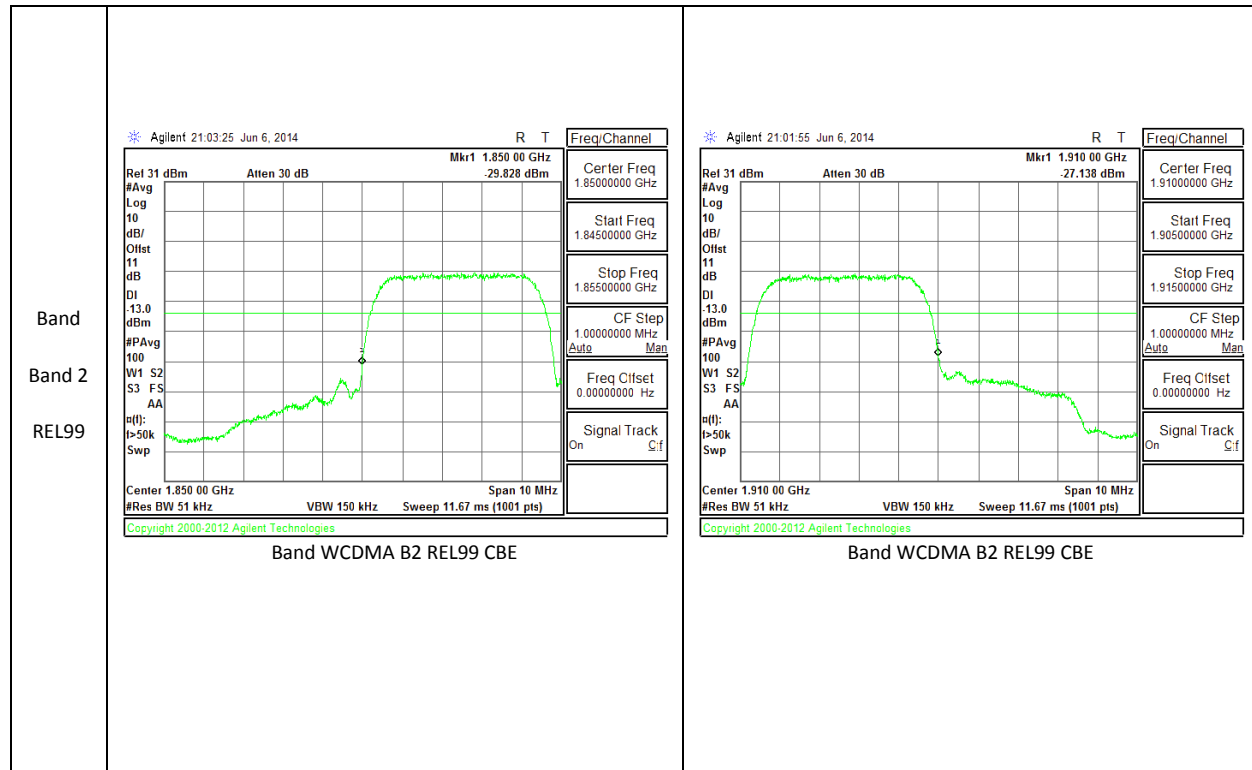
The transmitter output was connected to an Agilent 8960 or a CMW500 Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.

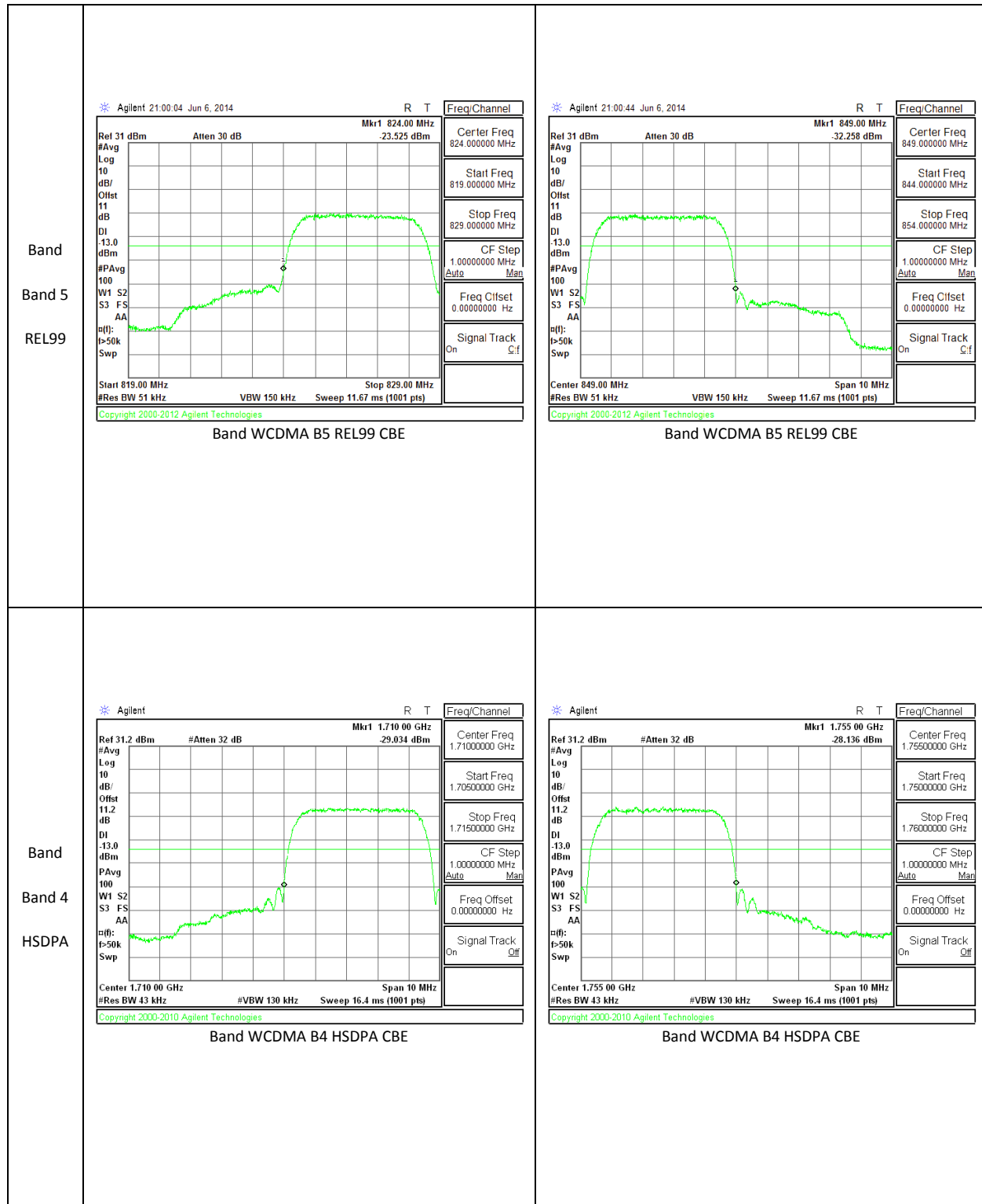
MODES TESTED

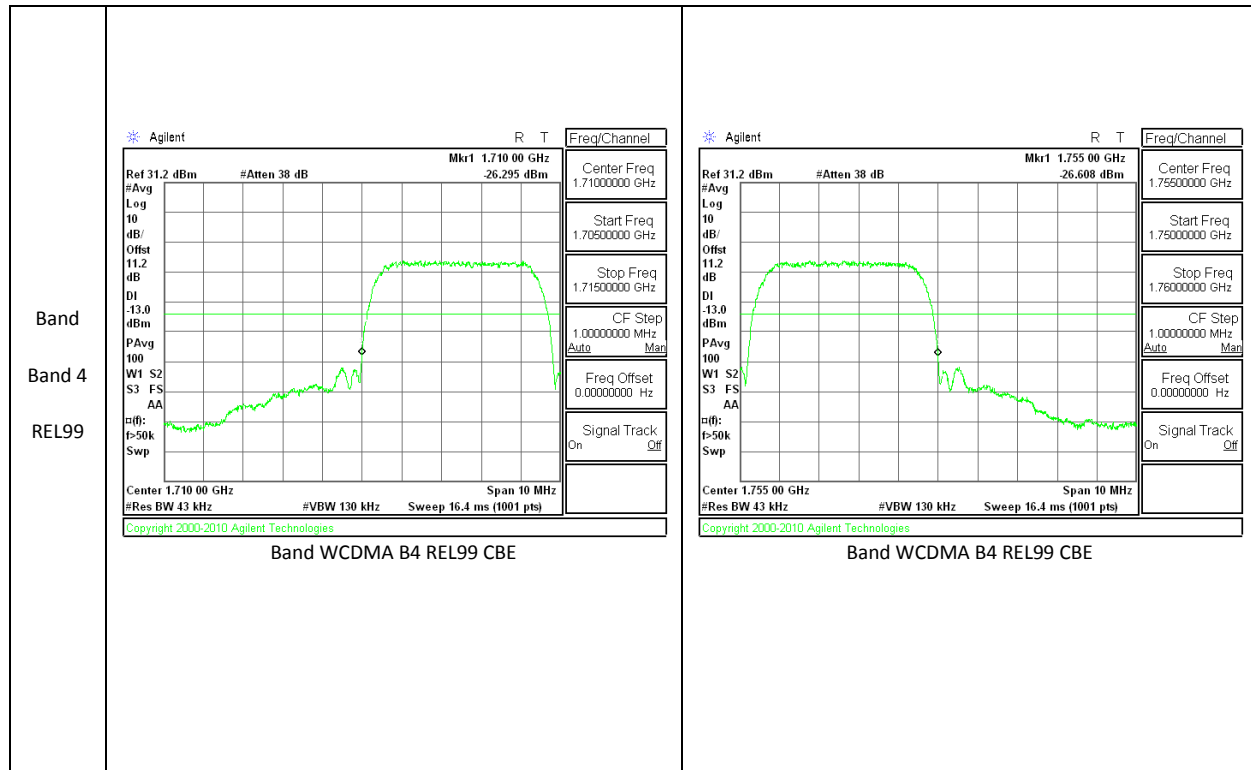
GSM850, GSM1900, WCDMA Band 5, Band 4, Band 2, LTE 2, LTE 4, LTE 5, LTE 17

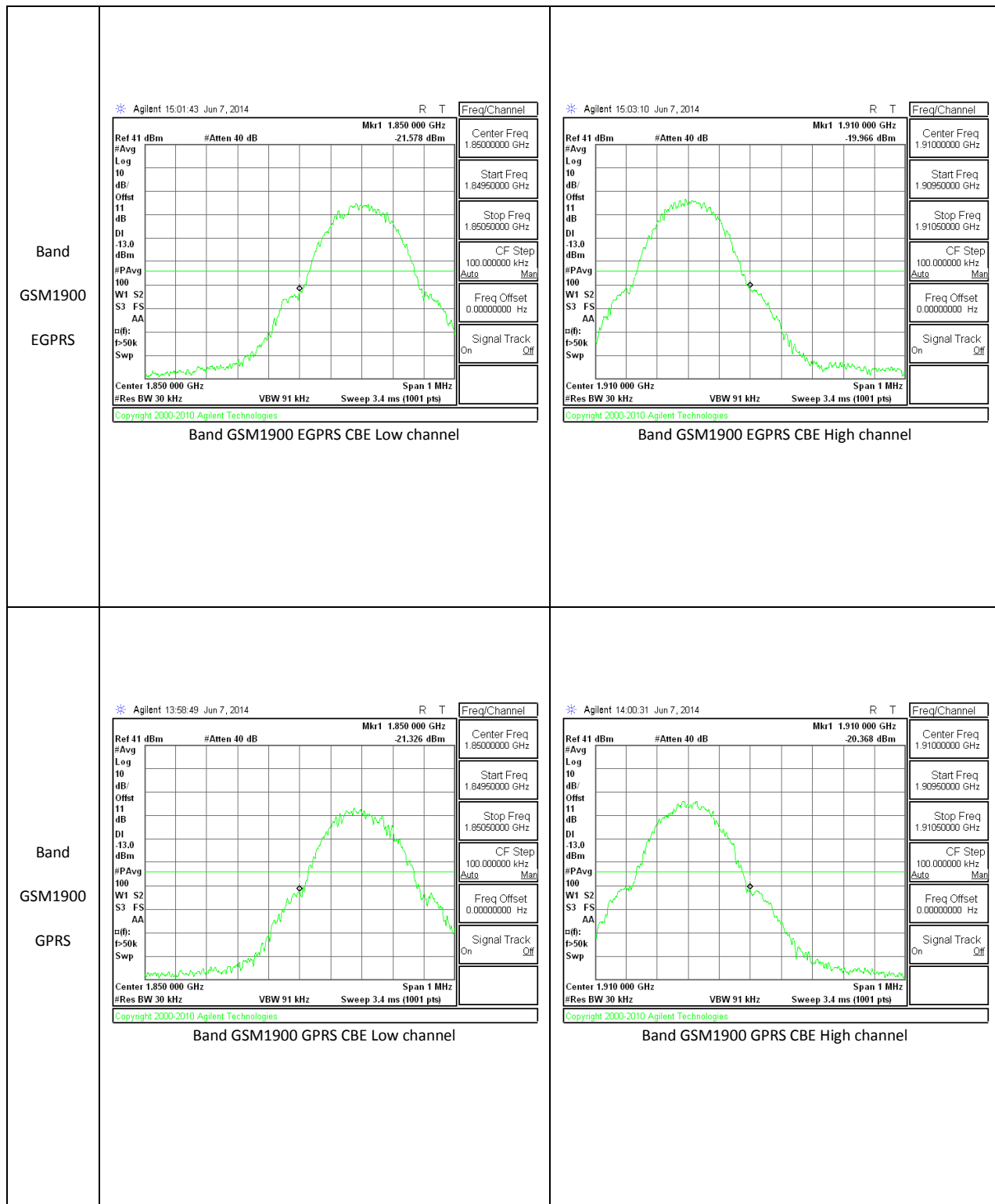
RESULTS

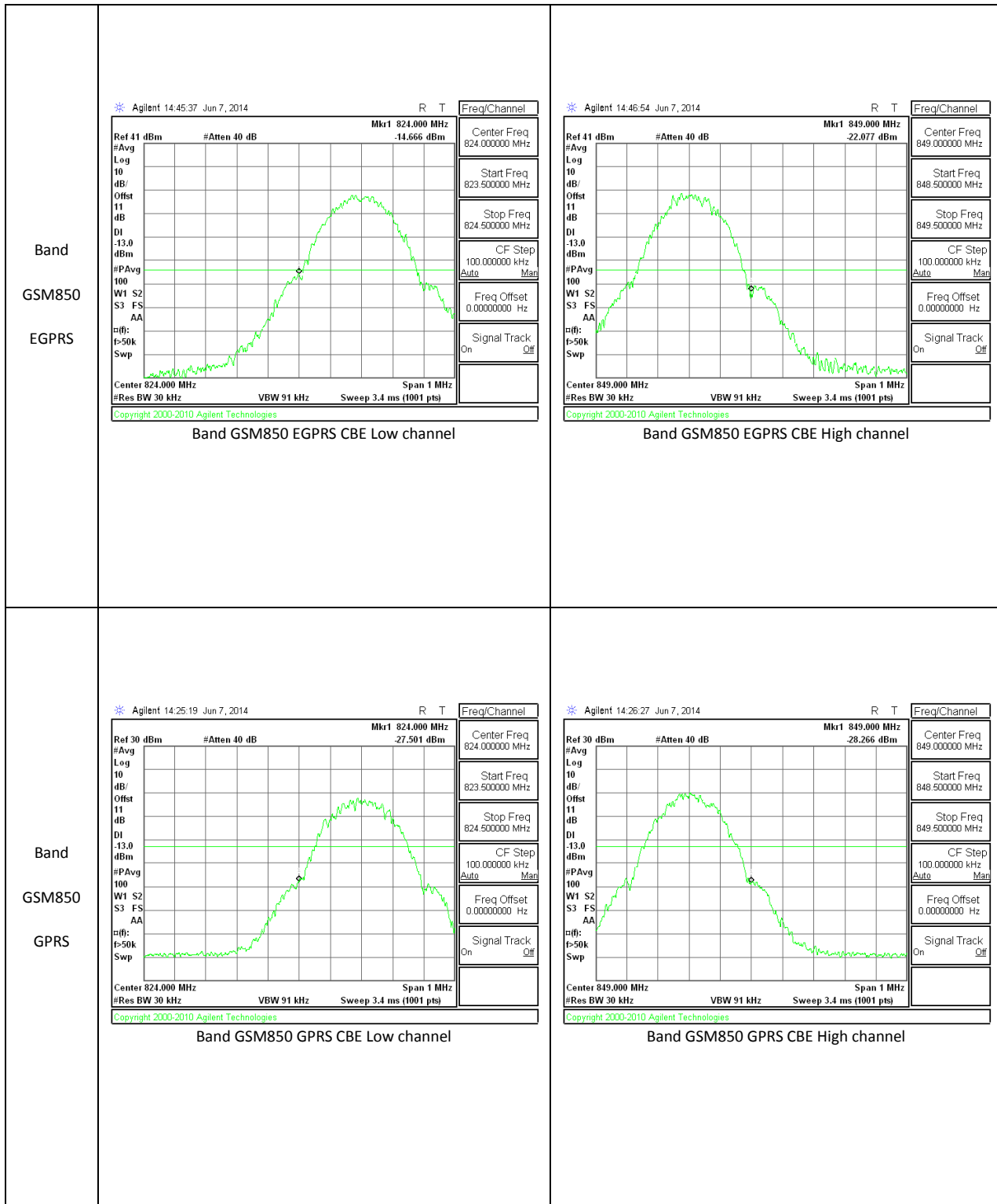
10.2.1. BAND EDGE PLOTS**WCDMA**

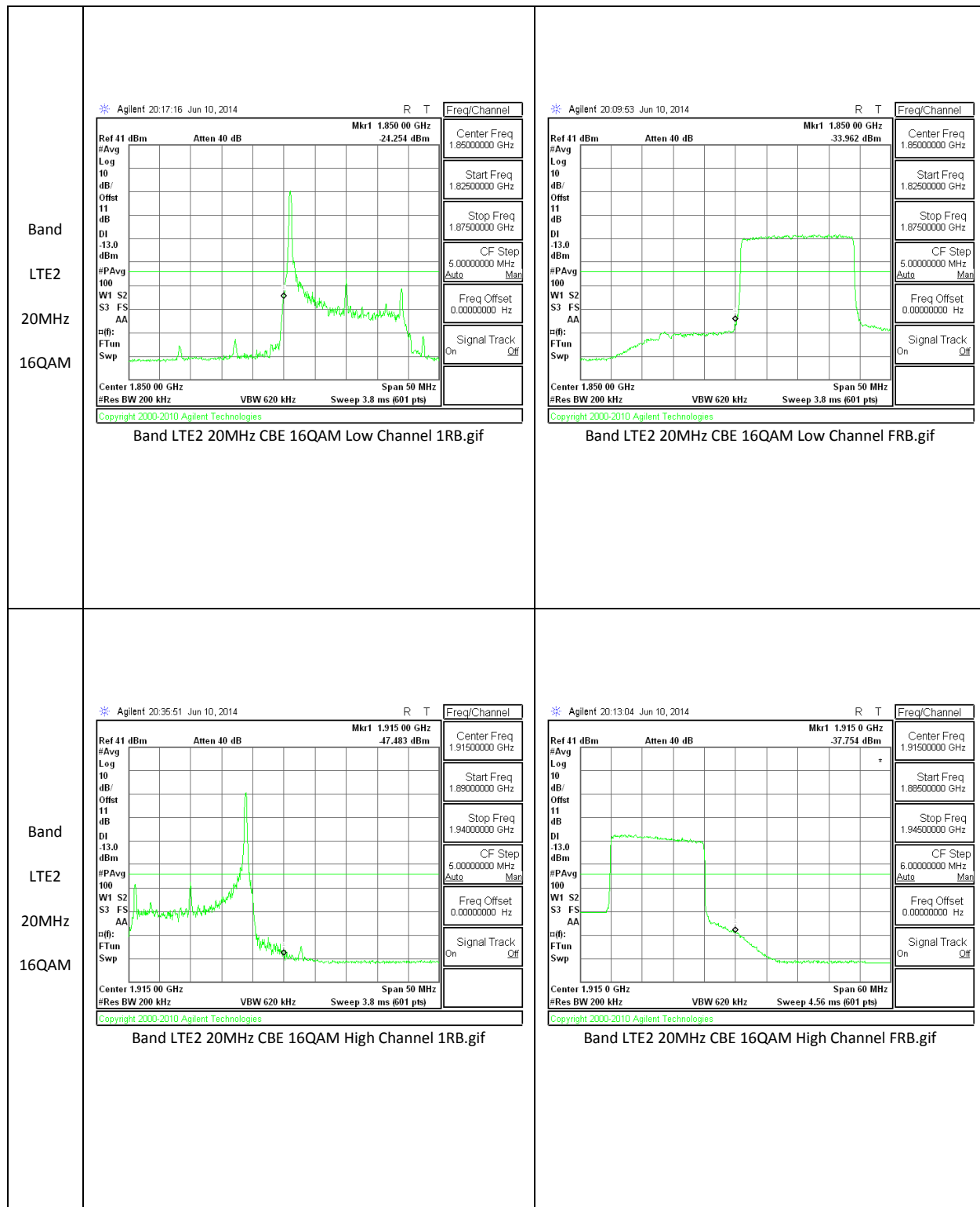


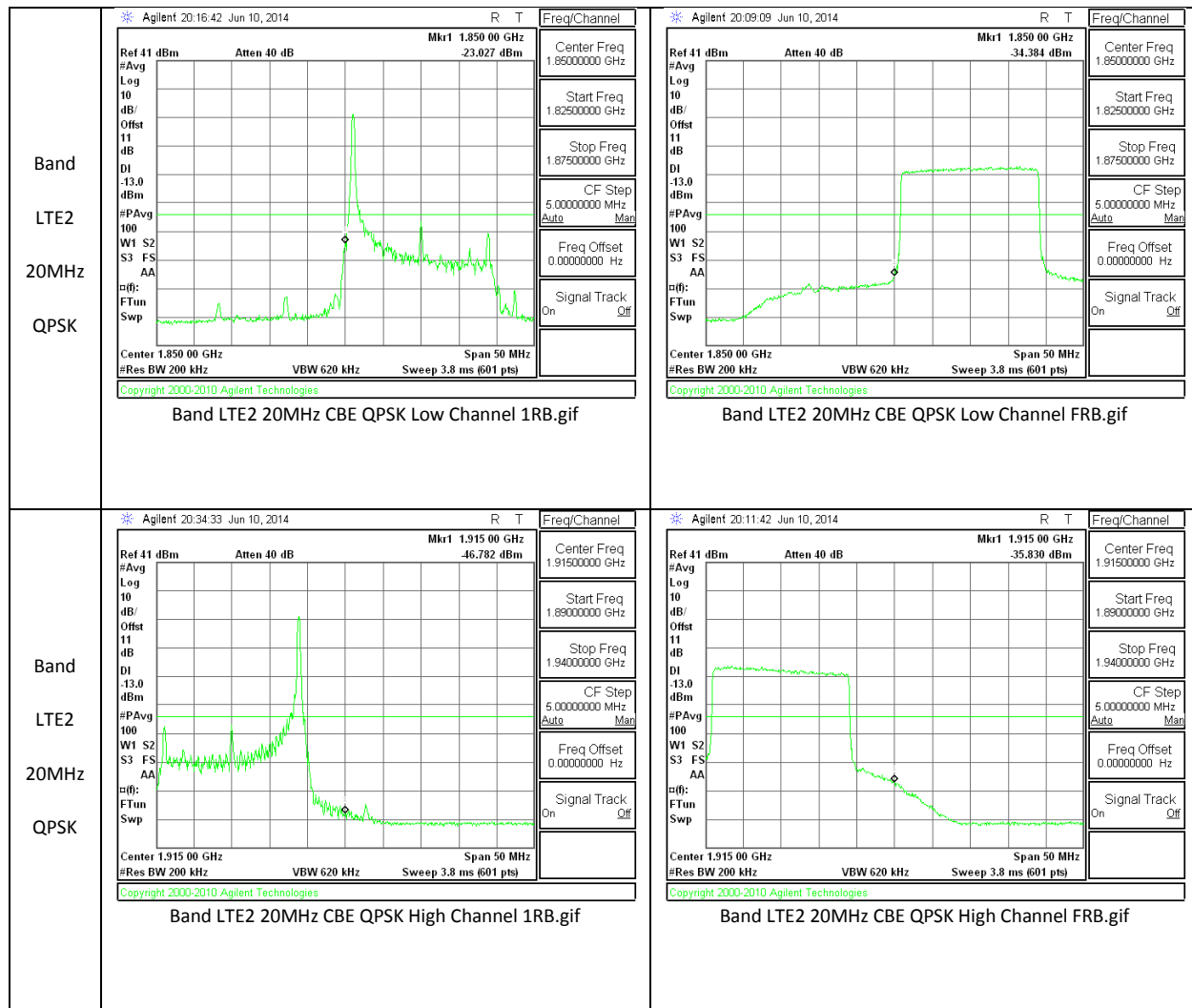


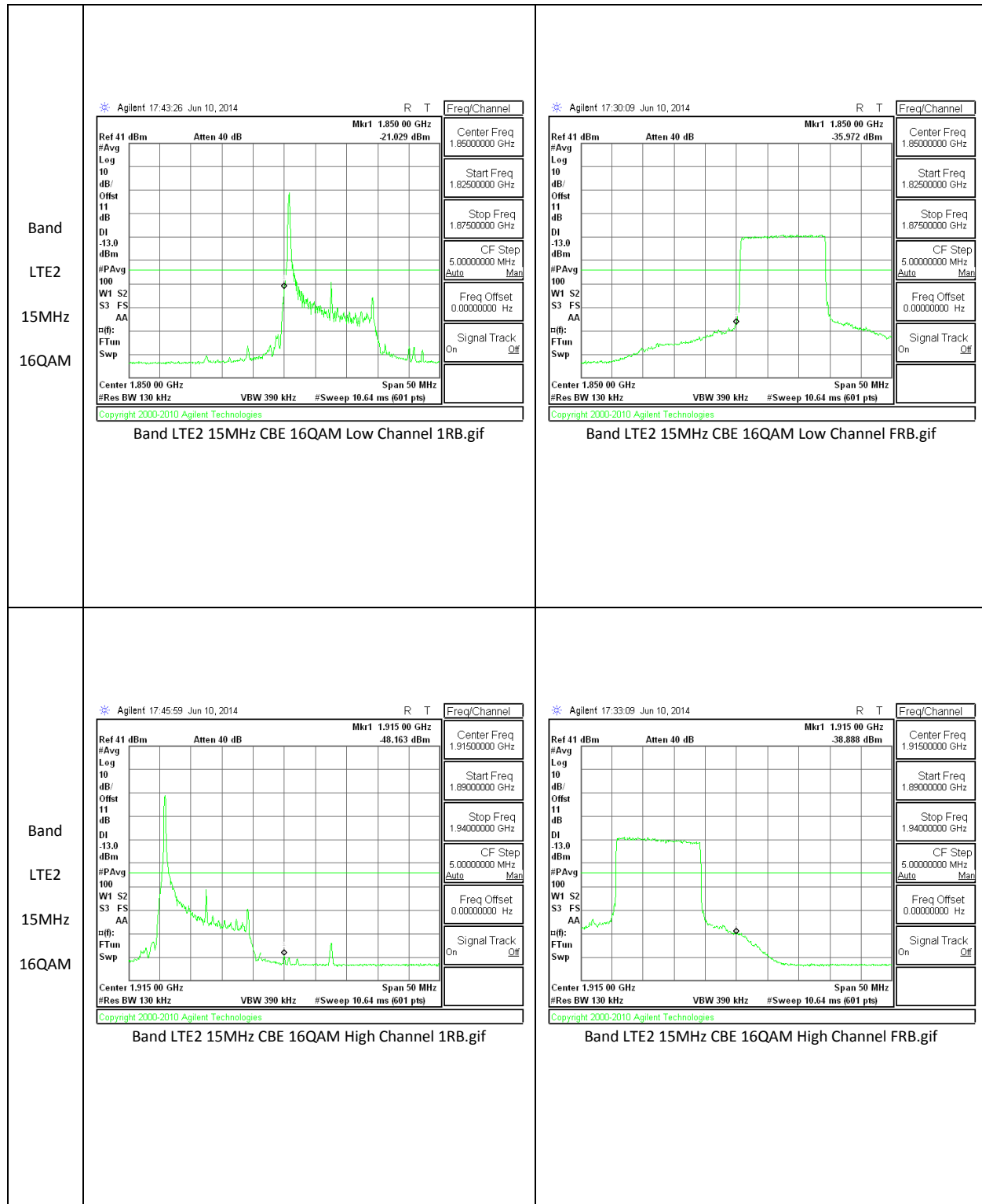


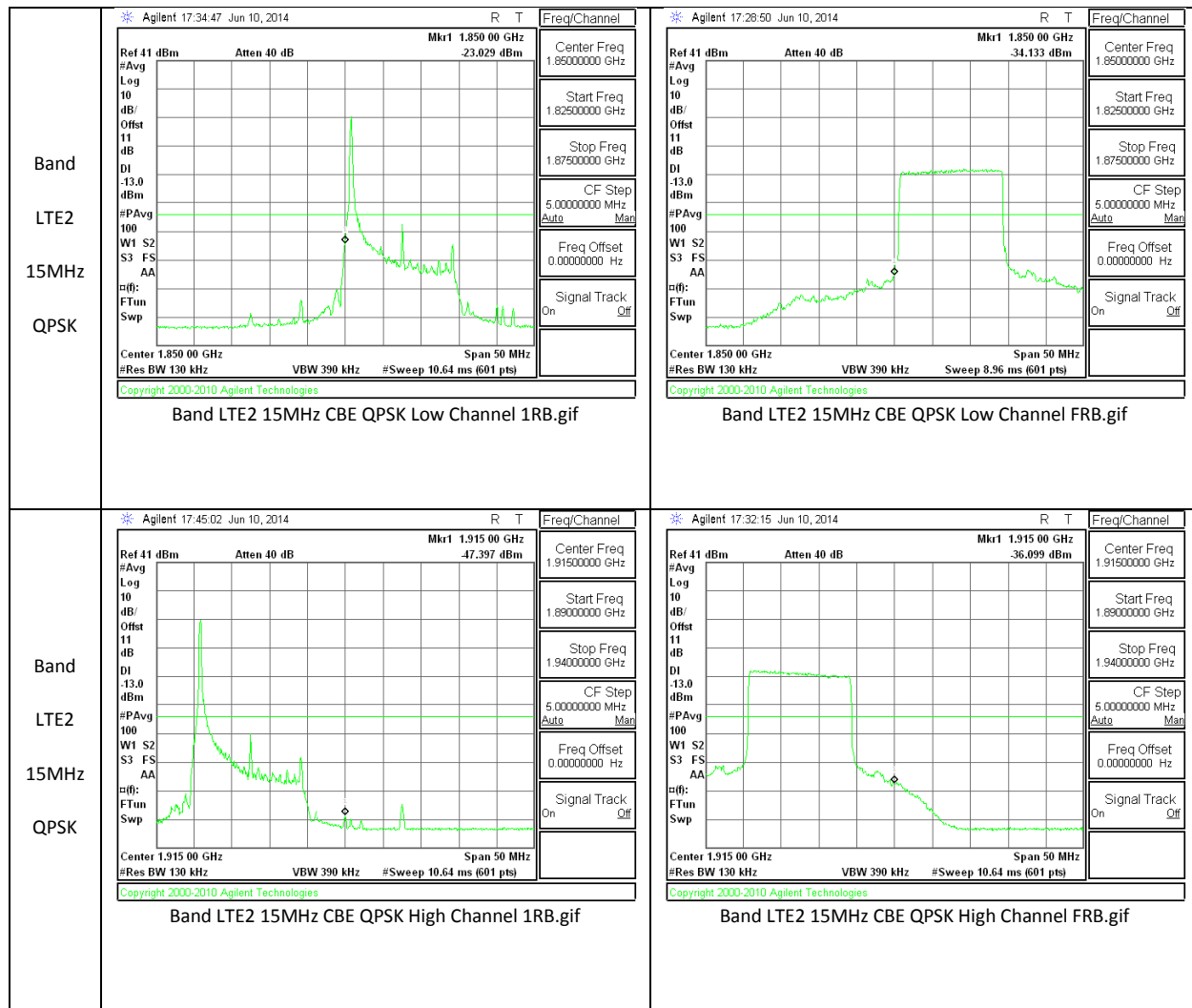
GSM

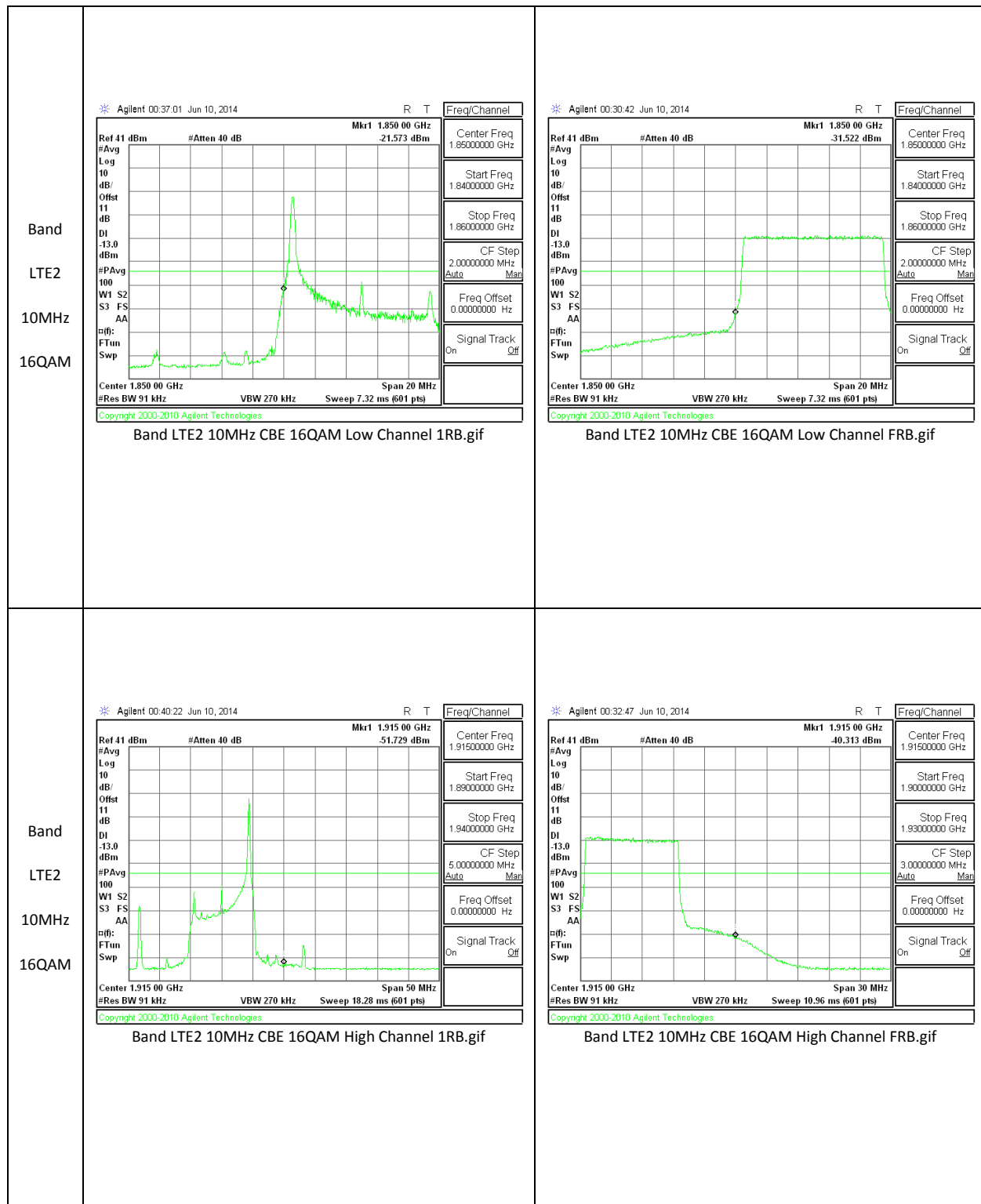


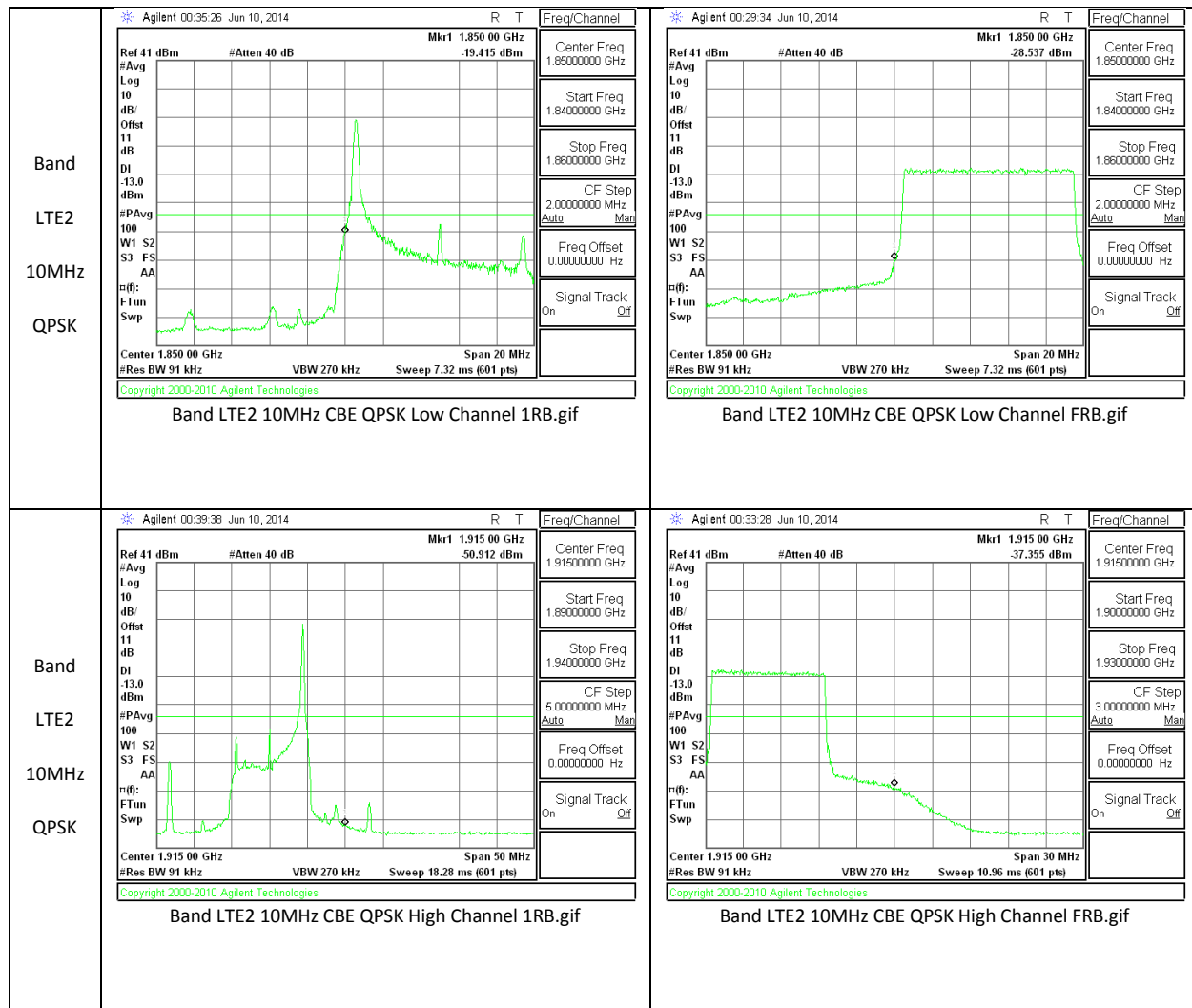
LTE Band 2











Band
LTE2
5MHz
16QAM

Agilent 23:16:54 Jun 9, 2014

Center Freq 1.850 000 GHz
Start Freq 1.84500000 GHz
Stop Freq 1.85500000 GHz
CF Step 1.00000000 MHz
Freq Offset 0.00000000 Hz
Signal Track On

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

Agilent 23:09:01 Jun 9, 2014

Center Freq 1.850 000 GHz
Start Freq 1.84500000 GHz
Stop Freq 1.85500000 GHz
CF Step 1.00000000 MHz
Freq Offset 0.00000000 Hz
Signal Track On

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

Band
LTE2
5MHz
16QAM

Agilent 23:21:52 Jun 9, 2014

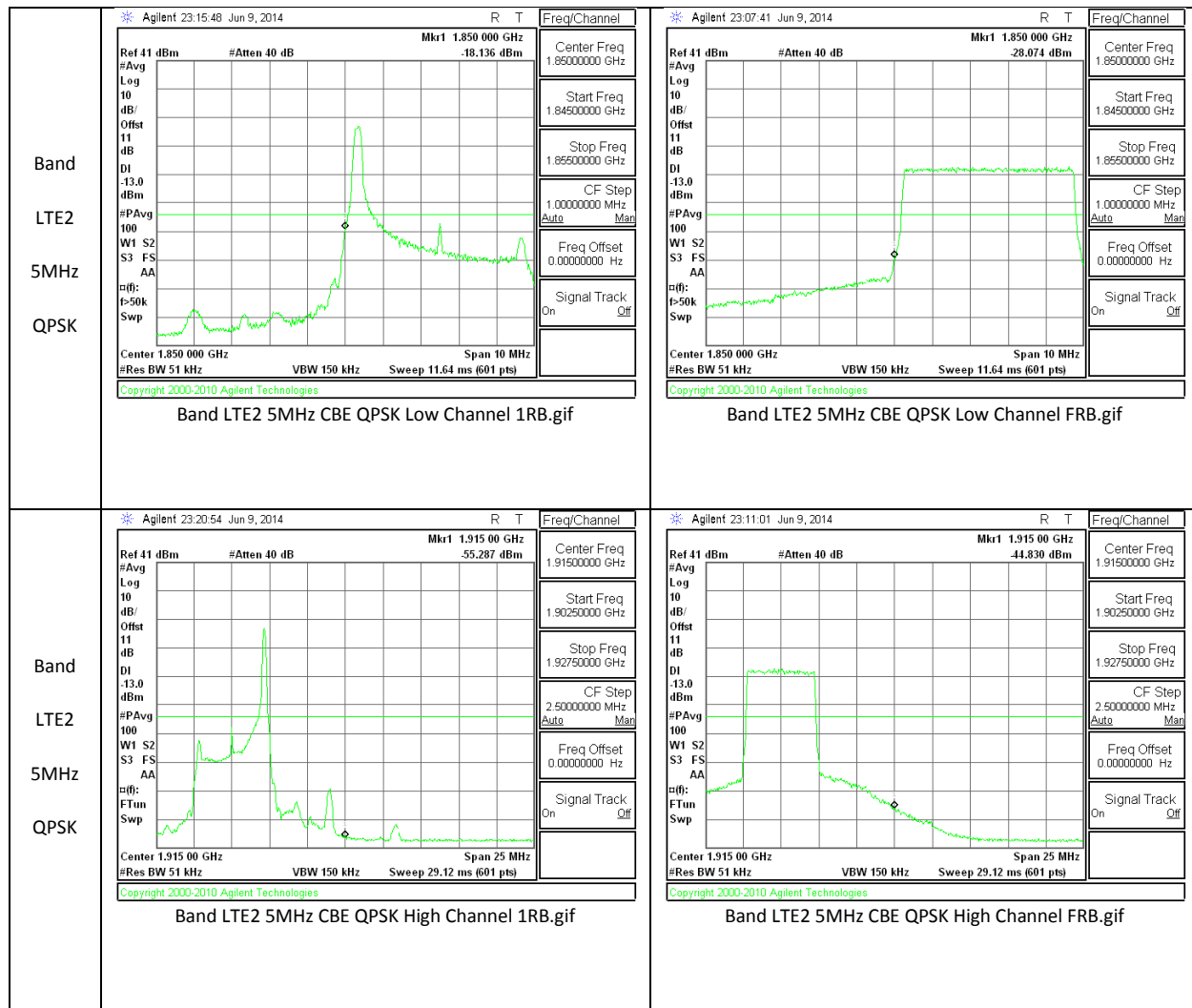
Center Freq 1.915 00 GHz
Start Freq 1.90250000 GHz
Stop Freq 1.92750000 GHz
CF Step 2.50000000 MHz
Freq Offset 0.00000000 Hz
Signal Track On

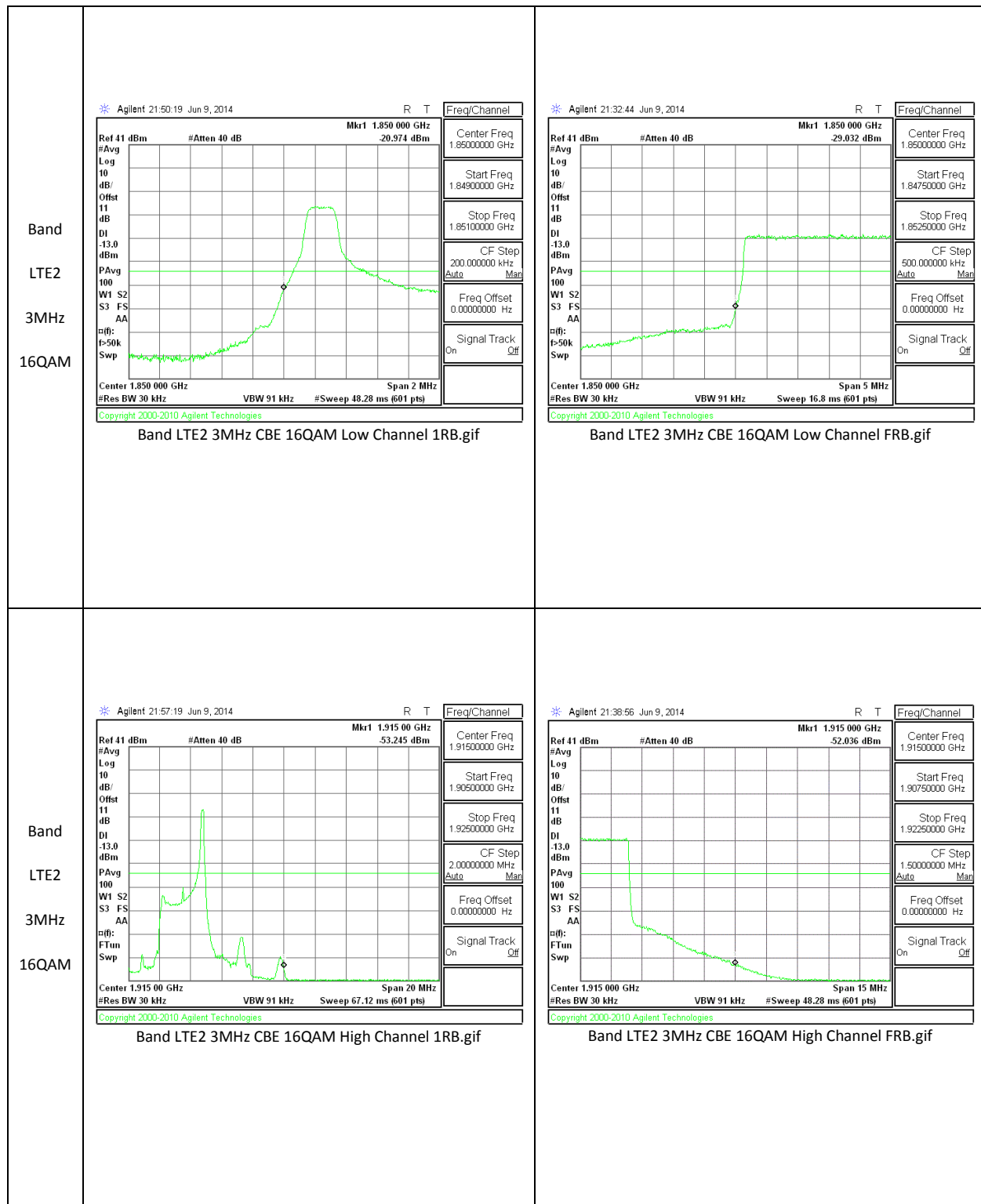
Band LTE2 5MHz CBE 16QAM High Channel 1RB.gif

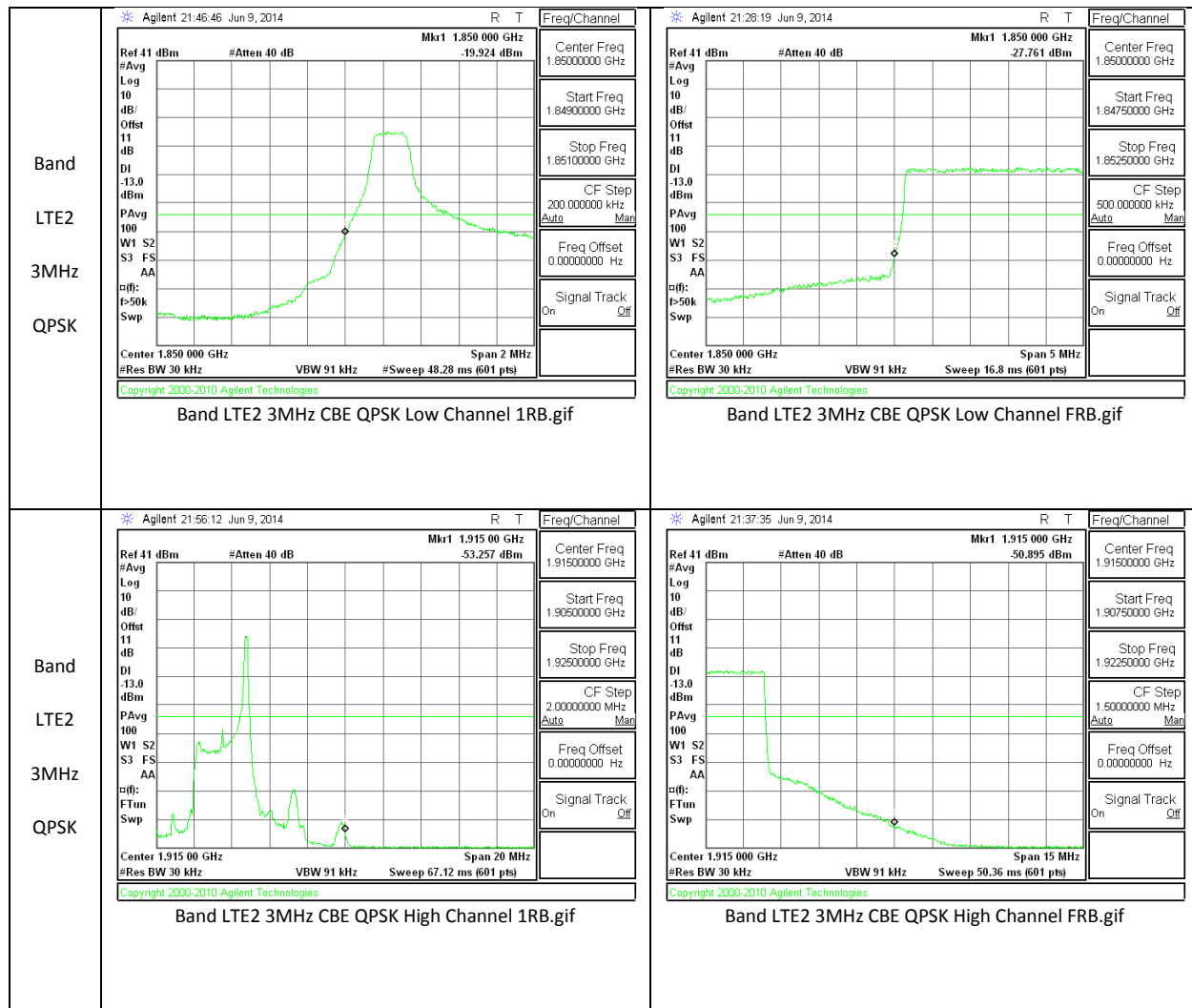
Agilent 23:11:46 Jun 9, 2014

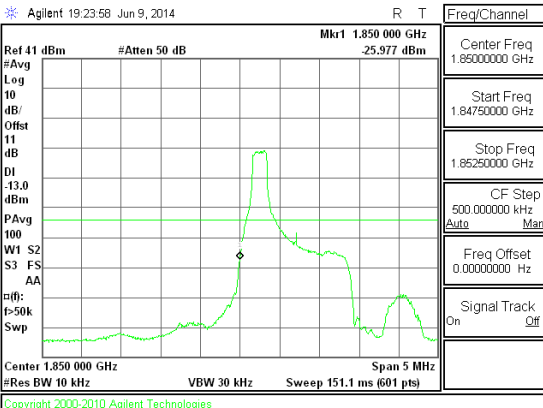
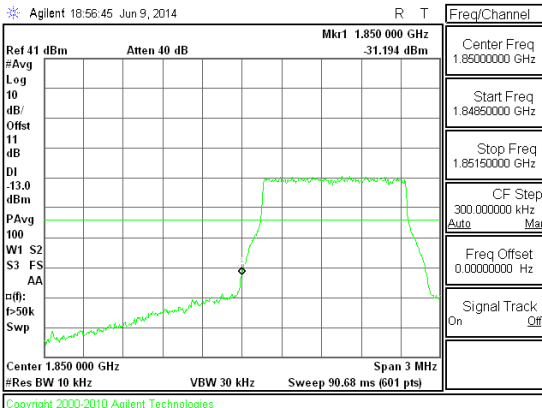
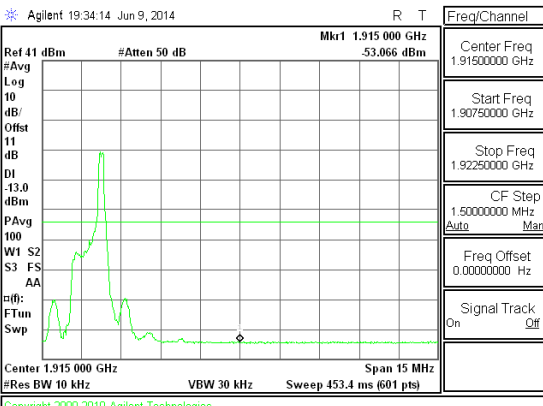
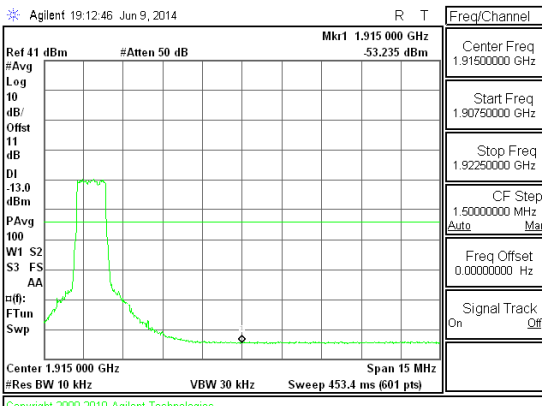
Center Freq 1.915 00 GHz
Start Freq 1.90250000 GHz
Stop Freq 1.92750000 GHz
CF Step 2.50000000 MHz
Freq Offset 0.00000000 Hz
Signal Track On

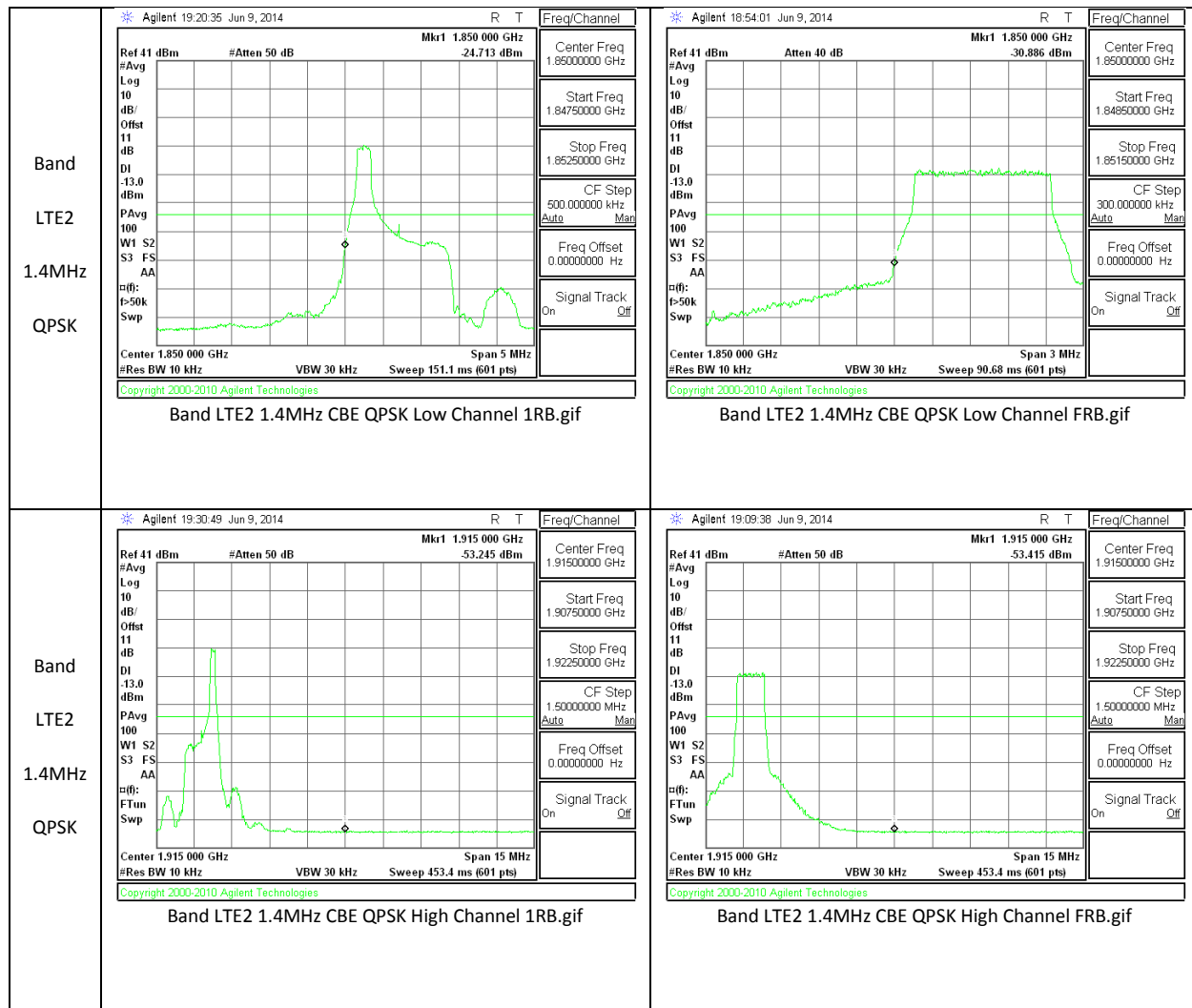
Band LTE2 5MHz CBE 16QAM High Channel FRB.gif

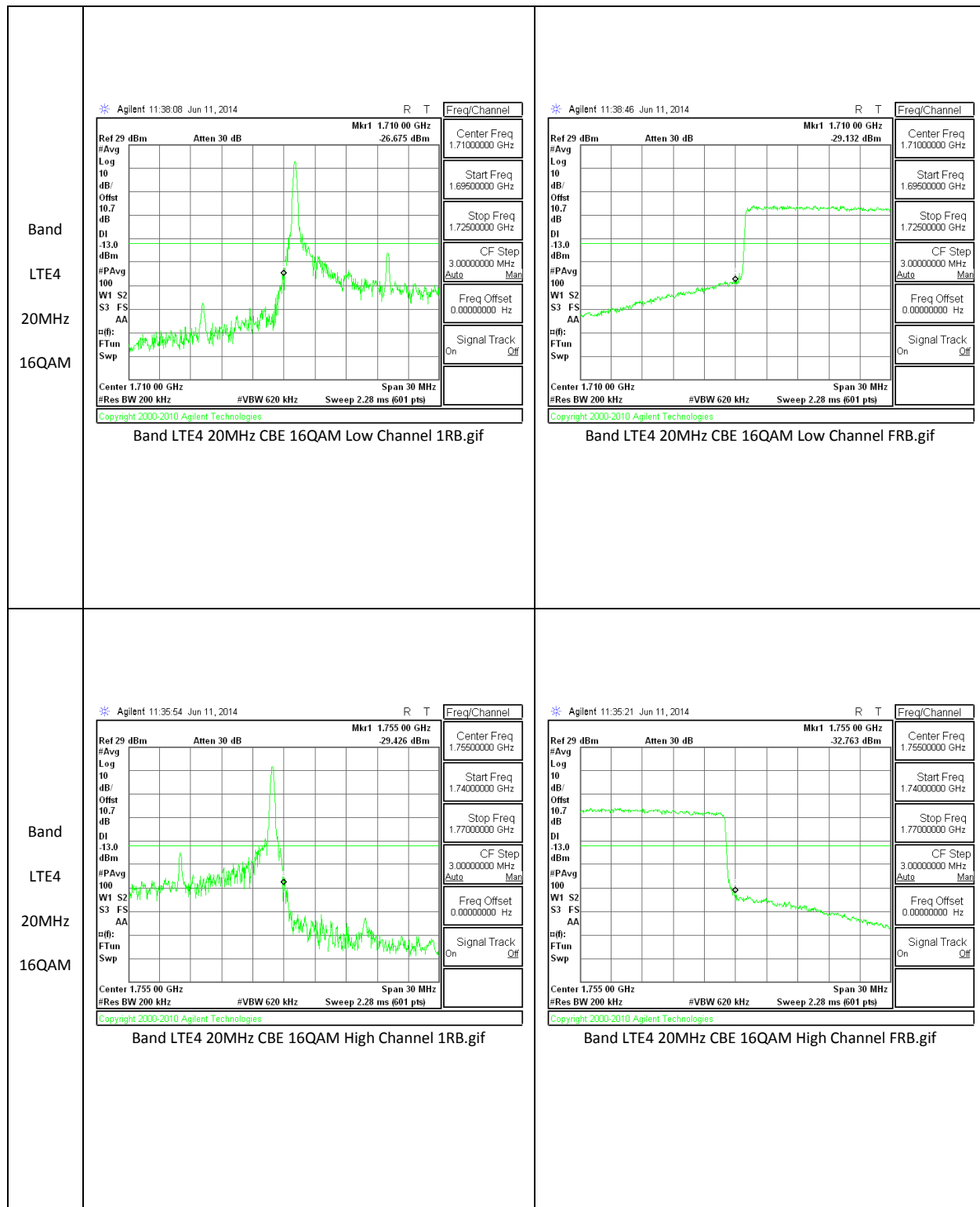


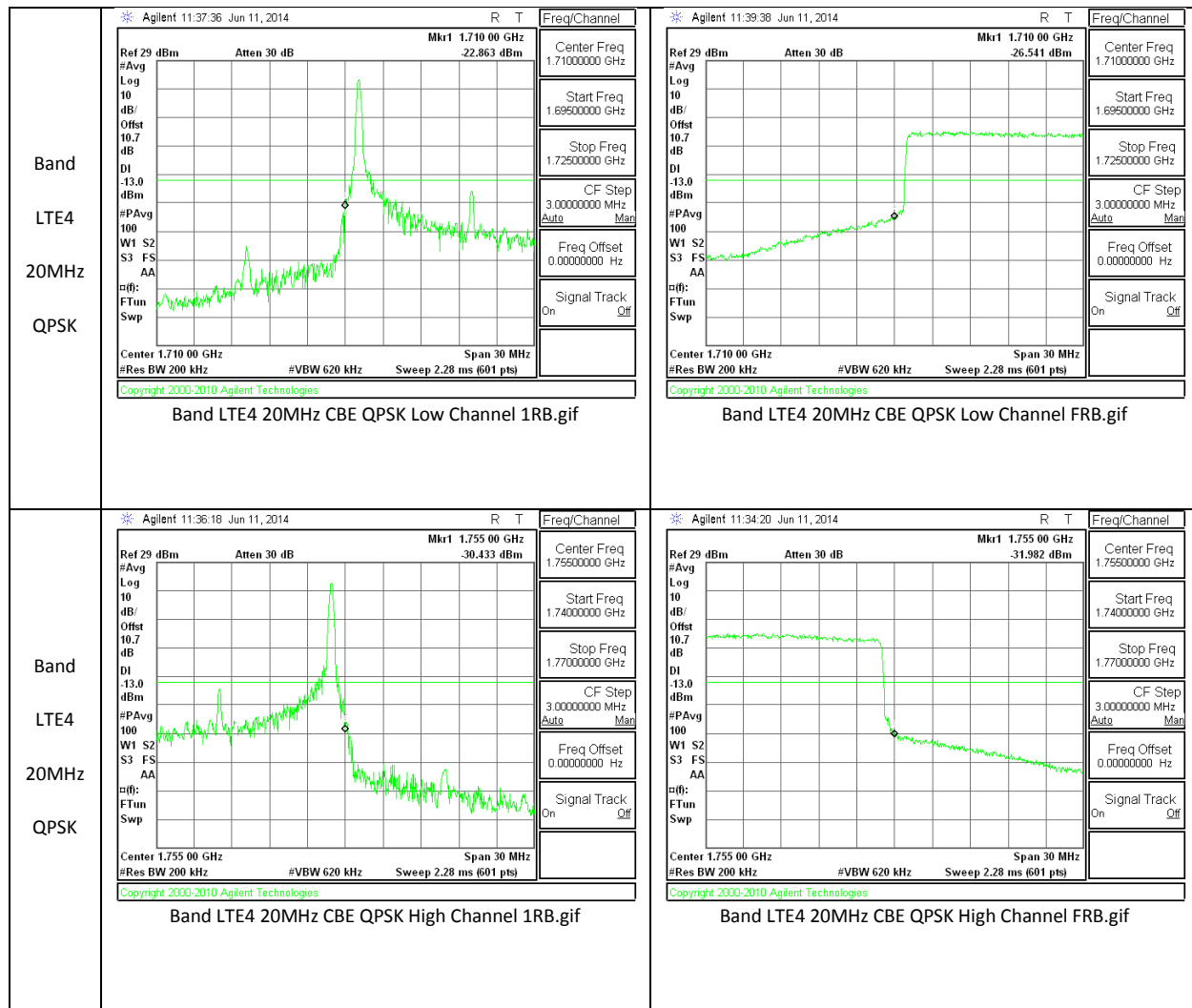


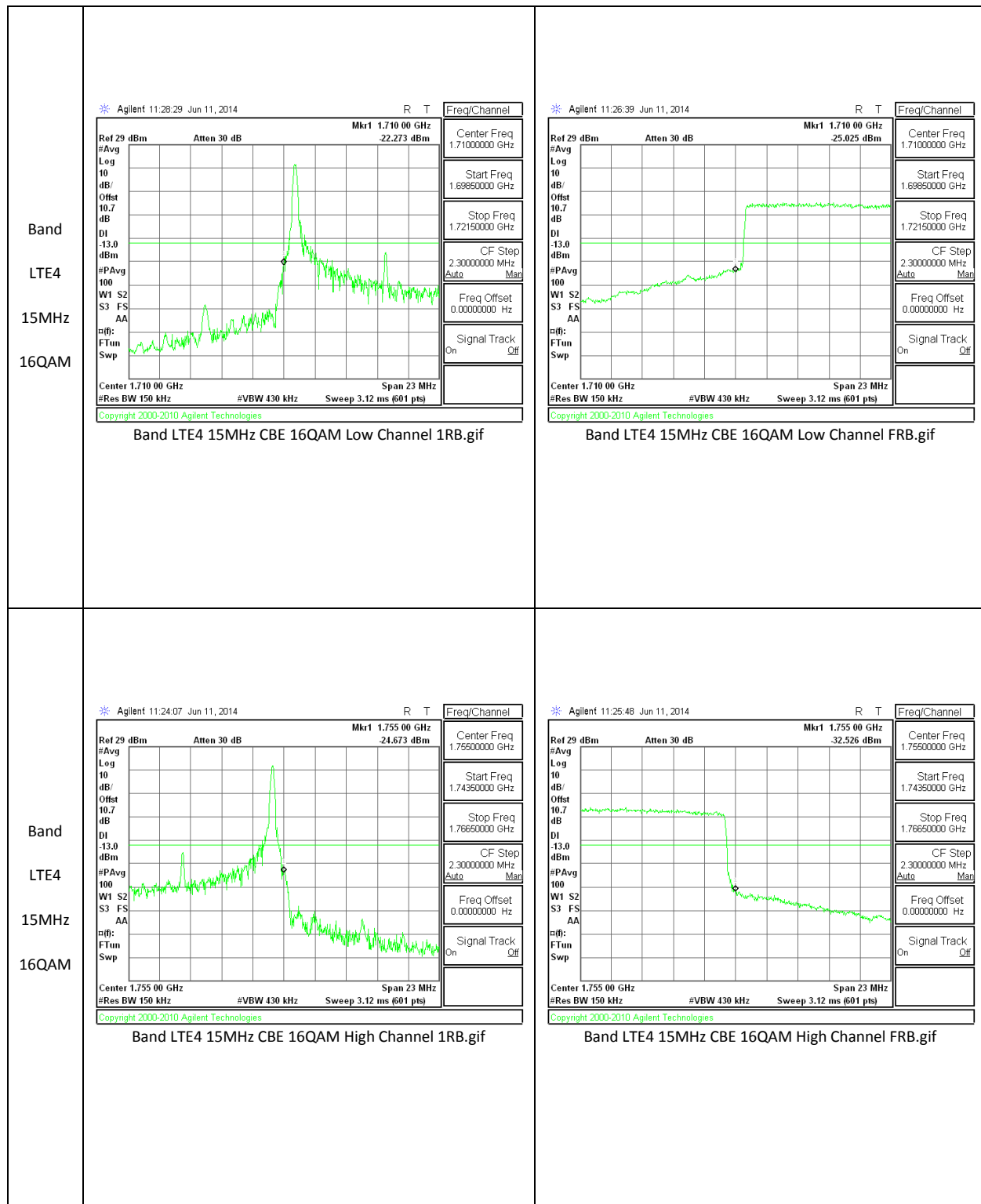


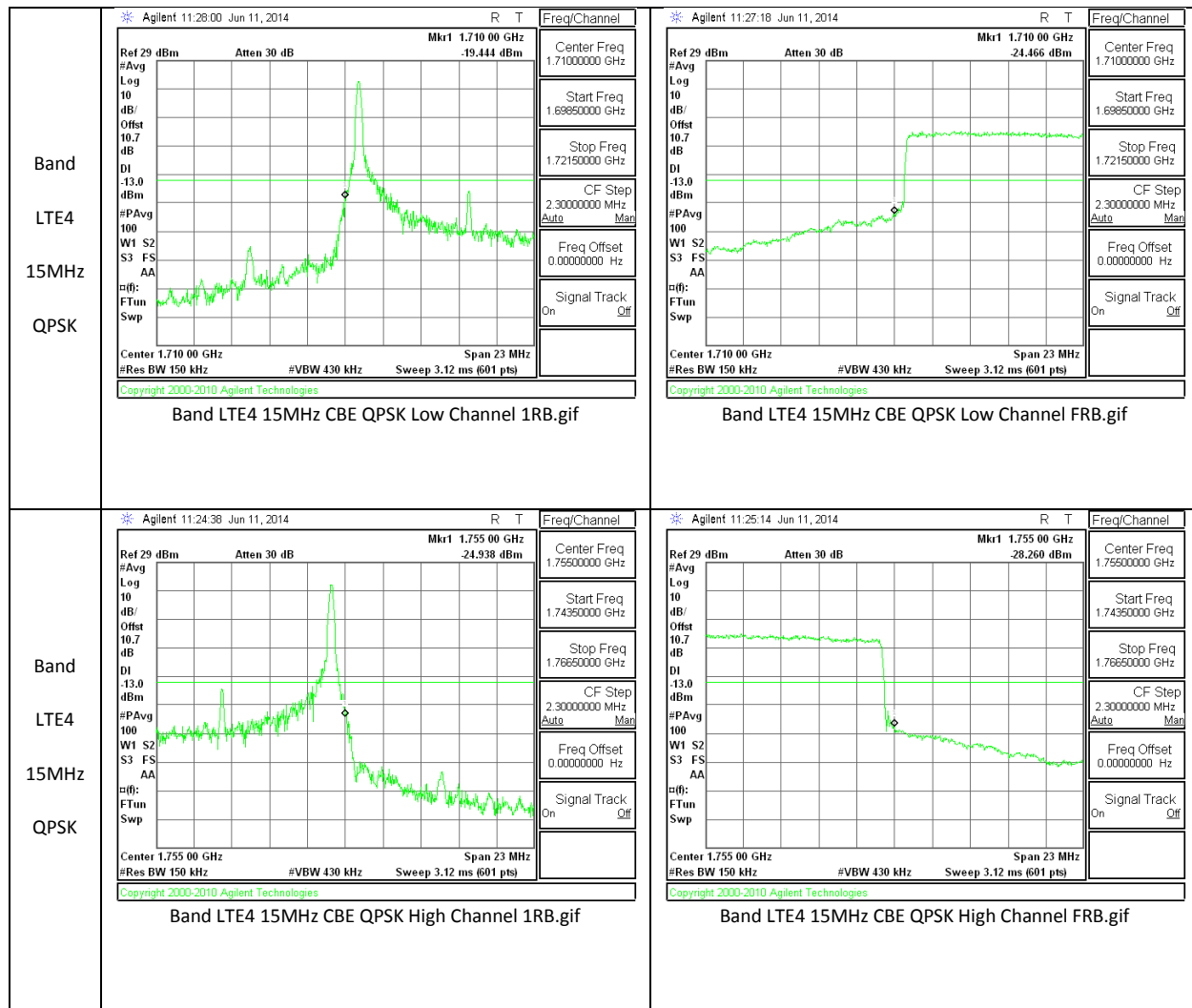
Band LTE2 1.4MHz 16QAM	 Agilent 19:23:58 Jun 9, 2014 Center Freq 1.850 000 GHz Start Freq 1.84750000 GHz Stop Freq 1.85250000 GHz CF Step 500.000000 kHz Freq Offset 0.00000000 Hz Signal Track On Band LTE2 1.4MHz CBE 16QAM Low Channel 1RB.gif	 Agilent 18:56:45 Jun 9, 2014 Center Freq 1.850 000 GHz Start Freq 1.84850000 GHz Stop Freq 1.85150000 GHz CF Step 300.000000 kHz Freq Offset 0.00000000 Hz Signal Track On Band LTE2 1.4MHz CBE 16QAM Low Channel FRB.gif
Band LTE2 1.4MHz 16QAM	 Agilent 19:34:14 Jun 9, 2014 Center Freq 1.915 000 GHz Start Freq 1.90750000 GHz Stop Freq 1.92250000 GHz CF Step 1.50000000 MHz Freq Offset 0.00000000 Hz Signal Track On Band LTE2 1.4MHz CBE 16QAM High Channel 1RB.gif	 Agilent 19:12:46 Jun 9, 2014 Center Freq 1.915 000 GHz Start Freq 1.90750000 GHz Stop Freq 1.92250000 GHz CF Step 1.50000000 MHz Freq Offset 0.00000000 Hz Signal Track On Band LTE2 1.4MHz CBE 16QAM High Channel FRB.gif

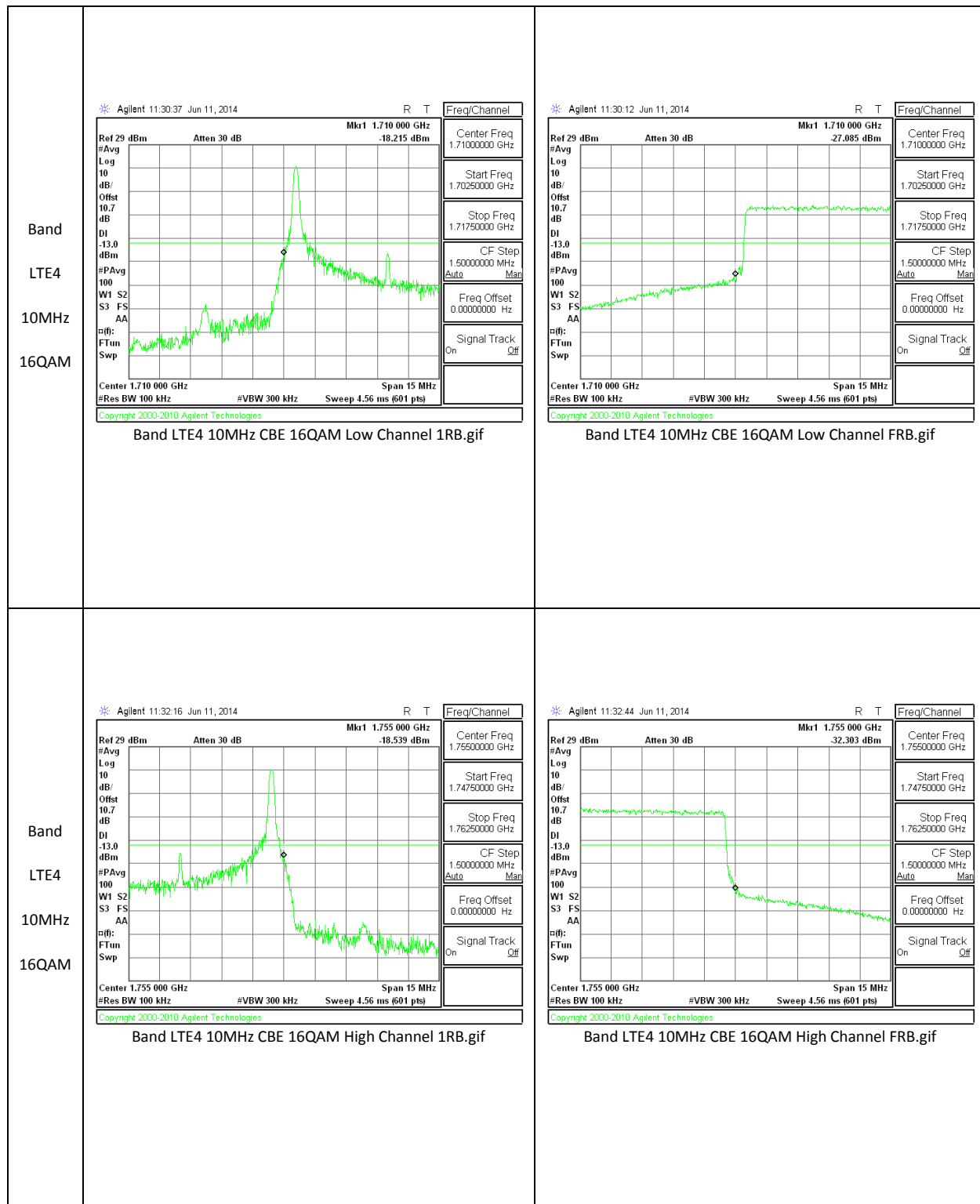


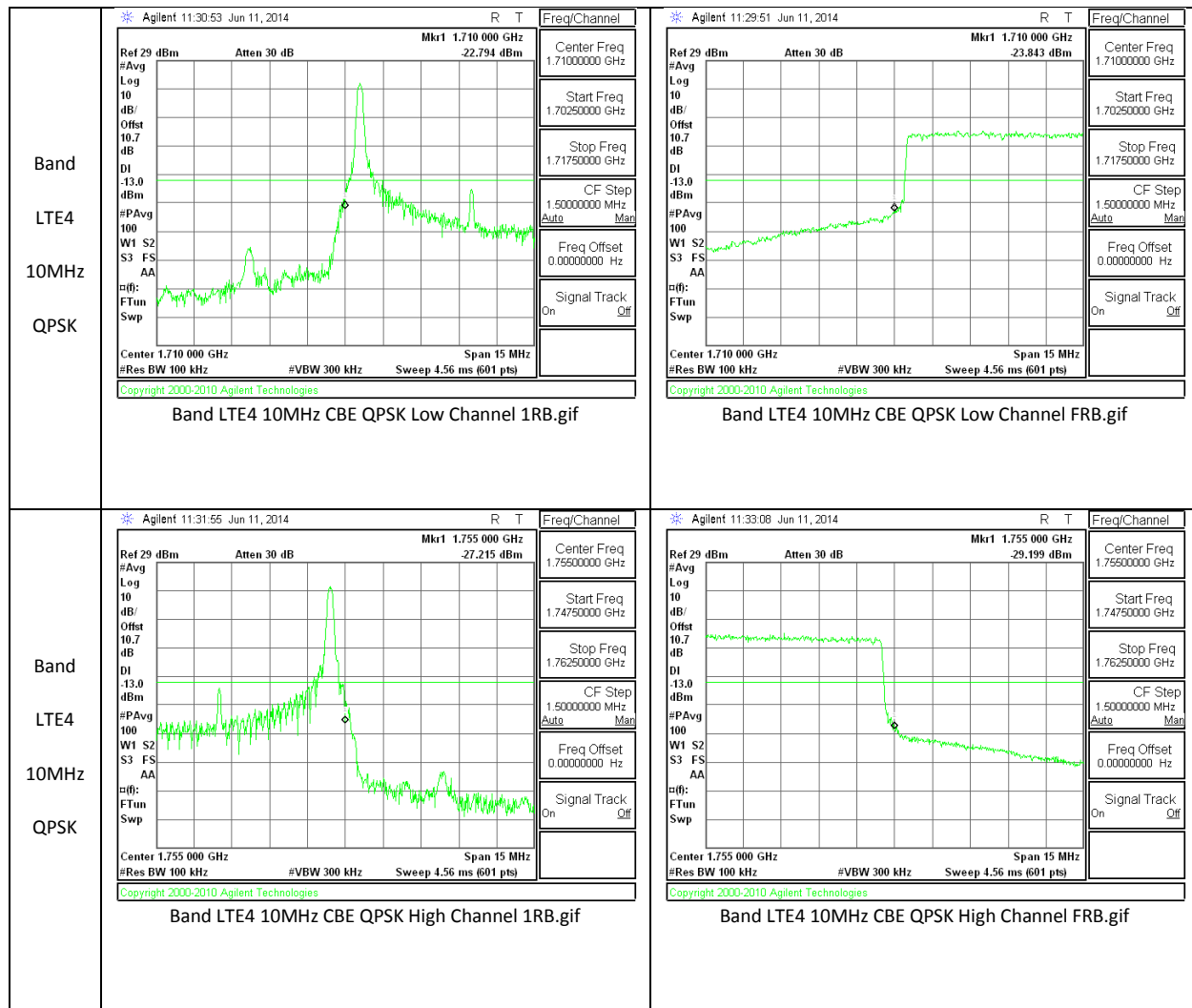
LTE Band 4











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