



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

WWAN

CERTIFICATION TEST REPORT

FOR

WCDMA/LTE Tablet + Bluetooth/BLE, DTS/UNII a/b/g/n/ac and ANT+

MODEL NUMBER : SM-T818V

FCC ID: A3LSMT818V

REPORT NUMBER: 16K23802-E6V2

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Revision History

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.

EUT DESCRIPTION: WCDMA/LTE Tablet + Bluetooth/BLE, DTS/UNII a/b/g/n/ac and ANT+

MODEL NUMBER: SM-T818V

SERIAL NUMBER: R32H5003EKB, R32H7007CDF (RADIATED);
R32H5003EJN, R32H7007MGE (CONDUCTED)

DATE TESTED: JUL 11, 2016 - SEP 05, 2016

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

UL Korea, Ltd. 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 Korea, Ltd. 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.

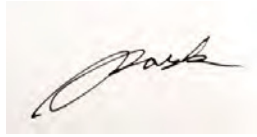
Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Korea, Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Korea, Ltd. 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 IAS, any agency of the Federal Government, or any agency of any government.

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1.1. INTRODUCTION OF TEST DATA REUSE

This report referenced from the FCC ID: A3LSMT818T, PCB (FCC CFR47 Part 22H,24E,27H,27L). And the applicant takes full responsibility that the test data as referenced in this report represent compliance for this FCC ID.

1.2. DIFFERENCE

The FCC ID: A3LSMT818V shares the same enclosure and circuit board as FCC ID: A3LSMT818T. The re-used circuitry and layout are identical between these two units. And the re-used antennas and surrounding circuitry are same between these two units. The only differences between the A3LSMT818T and the A3LSMT818V are that LTE B13 is added and WCDMA B4 is deleted.

After confirming through preliminary radiated emissions that the performance of the FCC ID: A3LSMT818T remains representative of FCC ID: A3LSMT818V. The test data for FCC ID: A3LSMT818T is being submitted for this application to cover WCDMA B2, WCDMA B5, LTE B2, LTE B4 and LTE B5 features.

1.3. SPOT CECK VERIFICATION DATA

Band		Test Item	Worst Mode	Worst Ch.	Worst Freq. (MHz)	Worst Bandwidth (MHz)	Test Limit (dBm)	Original Model SM-T818T (FCC ID : A3LSMT818T)	Spot Check Model SM-T818V (FCC ID : A3LSMT818V)	Deviation
								Measured Power (dBm)	Measured Power (dBm)	
WCDMA	Band 2	EIRP	REL99	High	1907.6		33.0	23.29	23.06	-0.23
		RSE	REL99	High	1907.6		-13.0	-53.00	-53.20	-0.20
	Band 5	ERP	HSDPA	Low	826.4		38.5	20.91	19.88	-1.03
		RSE	REL99	Mid	836.6		-13.0	-59.40	-59.70	-0.30
LTE	Band 2	EIRP	QPSK	Low	1857.5	15	33.0	22.47	23.16	0.69
		RSE	16QAM	High	1909.3	1.4	-13.0	-42.70	-44.60	-1.90
	Band 4	EIRP	QPSK	High	1750.0	10	30.0	23.41	22.62	-0.79
		RSE	QPSK	Mid	1732.5	1.4	-13.0	-45.70	-46.10	-0.40
	Band 5	ERP	QPSK	Low	829.0	10	38.5	20.41	18.10	-2.31
		RSE	QPSK	Low	824.7	1.4	-13.0	-52.00	-51.80	0.20

Comparison of two models, Deviation is within The EMC Lab Measurement Uncertainty range and all test results are under FCC Technical Limits.

1.4. REFERENCE DETAIL

Reference application that contains the reused reference data.

Equipment Class	Reference FCC ID	Type Grant/Permissive Change	Reference Application	Folder Test/RF Exposure	Report Title / Section
DTS	A3LSMT818T	Grant	16K23624-E1V1	Test	FCC Report DTS WLAN / All sections
			16K23795-S1V1	RF Exposure	FCC Report SAR / Section 9.3, 10.8
DSS	A3LSMT818T	Grant	16K23624-E3V1	Test	FCC Report BT / All sections
			16K23795-S1V1	RF Exposure	FCC Report SAR / Section 9.5, 10.10
NII	A3LSMT818T	Grant	16K23624-E4V1	Test	FCC Report UNII DFS WLAN / All sections (Except DFS)
			16K23795-S1V1	RF Exposure	FCC Report SAR / Section 9.4, 10.9
DXX	A3LSMT818T	Grant	16K23624-E5V1	Test	FCC Report ANT+ / All sections
PCB	A3LSMT818T	Grant	16K23624-E6V1	Test	FCC Report WWAN / All sections for WCDMA B2, B5 LTE B2/B4/B5
			16K23795-S1V1	RF Exposure	FCC Report SAR / Section for WCDMA B2 (9.1, 10.1), WCDMA B5 (9.1, 10.3), LTE B2 (9.2, 10.4), LTE B4 (9.2, 10.5), LTE B5 (9.2, 10.6)

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with TIA-603-D, FCC CFR 47 Part 2, FCC CFR 47 Part 22, FCC CFR Part 24 and FCC CFR Part 27.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea. Line conducted emissions are measured only at the 218 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.

218 Maeyeong-ro	
☐	Chamber 1
☒	Chamber 2

UL Korea, Ltd. is accredited by IAS, Laboratory Code TL-637. The full scope of accreditation can be viewed at <http://www.iasonline.org/PDF/TL/TL-637.pdf>.

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:

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

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

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

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	2.32 dB
Radiated Disturbance, Below 1GHz	4.14 dB
Radiated Disturbance, Above 1 GHz	5.97 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a WCDMA/LTE Tablet + Bluetooth/BLE, DTS/UNII a/b/g/n/ac and ANT+.

5.2. MAXIMUM OUTPUT POWER (WCDMA)

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

FCC Part 22/24						
Band	Frequency Range	Modulation	Conducted		Radiated	
	[MHz]	Peak	Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]
Band 5	824~849	REL99	23.16	207.01	20.70	117.49
		HSDPA	21.72	148.59	20.91	123.31
		HSUPA	21.70	147.91		
		DC-HSDPA	21.62	145.21		
Band 2	1850~1910	REL99	23.67	232.81	23.29	213.30
		HSDPA	22.49	177.42	22.59	181.55
		HSUPA	22.51	178.24		
		DC-HSDPA	22.48	177.01		

5.3. MAXIMUM OUTPUT POWER (LTE)

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

LTE Band 5

FCC Part 22							
Band	Frequency Range [MHz]	BandWidth [MHz]	Modulation Peak	Conducted		Radiated	
				Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]
Band 5	824 ~ 849	10	QPSK	22.89	194.54	20.41	109.90
			16QAM	21.41	138.36	19.42	87.50
		5	QPSK	23.28	212.81	20.31	107.40
			16QAM	22.11	162.55	19.32	85.51
		3	QPSK	23.02	200.45	20.40	109.65
			16QAM	22.19	165.58	19.36	86.30
		1.4	QPSK	22.88	194.09	18.31	67.76
			16QAM	22.07	161.06	17.50	56.23

LTE Band 4

FCC Part 27							
Band	Frequency Range [MHz]	BandWidth [MHz]	Modulation Peak	Conducted		Radiated	
				Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]
Band 4	1710 ~ 1755	20	QPSK	24.54	284.45	22.60	181.97
			16QAM	22.99	199.07	21.65	146.22
		15	QPSK	24.16	260.62	23.23	210.38
			16QAM	23.40	218.78	22.24	167.49
		10	QPSK	24.14	259.42	23.41	219.28
			16QAM	23.18	207.97	22.37	172.58
		5	QPSK	24.66	292.42	22.52	178.65
			16QAM	23.43	220.29	21.44	139.32
		3	QPSK	24.36	272.90	22.68	185.35
			16QAM	23.24	210.86	21.73	148.94
		1.4	QPSK	24.24	265.46	20.88	122.46
			16QAM	23.36	216.77	19.85	96.61

LTE Band 2

FCC Part 24							
Band	Frequency Range [MHz]	BandWidth [MHz]	Modulation Peak	Conducted		Radiated	
				Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]
Band 2	1850 ~ 1910	20	QPSK	24.33	271.02	22.33	171.00
			16QAM	22.84	192.31	21.25	133.35
		15	QPSK	23.98	250.03	22.47	176.60
			16QAM	23.19	208.45	21.53	142.23
		10	QPSK	23.93	247.17	22.34	171.40
			16QAM	23.26	211.84	21.33	135.83
		5	QPSK	24.05	254.10	22.20	165.96
			16QAM	23.05	201.84	21.10	128.82
		3	QPSK	24.26	266.69	21.76	149.97
			16QAM	23.12	205.12	20.85	121.62
		1.4	QPSK	23.95	248.31	19.97	99.31
			16QAM	23.14	206.06	19.10	81.28

LTE Band 13

FCC Part 27							
Band	Frequency Range [MHz]	BandWidth [MHz]	Modulation Peak	Conducted		Radiated	
				Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]
Band 13	777 ~ 787	10	QPSK	23.87	243.78	19.03	79.98
			16QAM	23.13	205.65	17.99	62.95
		5	QPSK	24.04	253.42	20.21	104.95
			16QAM	22.76	188.82	19.12	81.66

5.4. DESCRIPTION OF AVAILABLE ANTENNAS

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

Frequency (MHz)	Peak Gain (dBi)
WCDMA Band 5 / LTE Band 5 824 ~ 849 MHz	4.5
WCDMA Band 2 / LTE Band 2 1850 ~ 1910 MHz	-1.0
LTE Band 12 699 ~ 716 MHz	0.0
WCDMA Band 4 / LTE Band 4 1710 ~ 1755 MHz	-1.8

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Charger	SAMSUNG	EP-TA12JWE	DK3H518VS/B- E	N/A
Data Cable	SAMSUNG	DG925UWE	N/A	N/A
Earphone	SAMSUNG	EHS64AVFWE	N/A	N/A

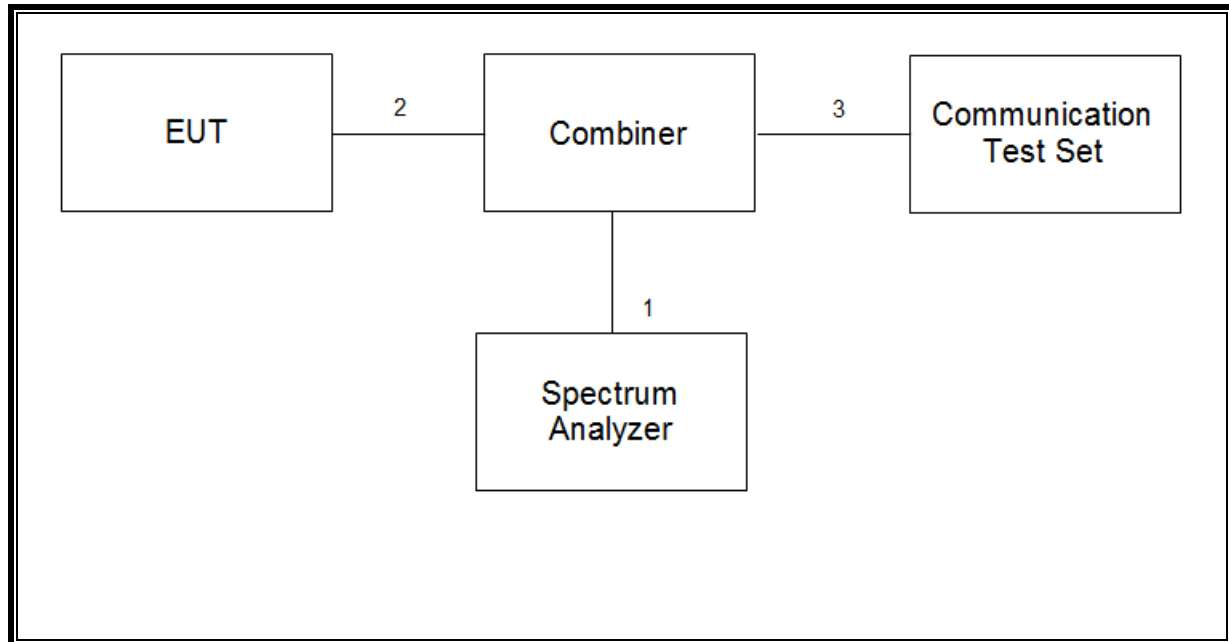
I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC Power	1	Mini-USB	Shielded	0.8m	N/A
2	Audio	1	Mini-Jack	Unshielded	1.0m	N/A

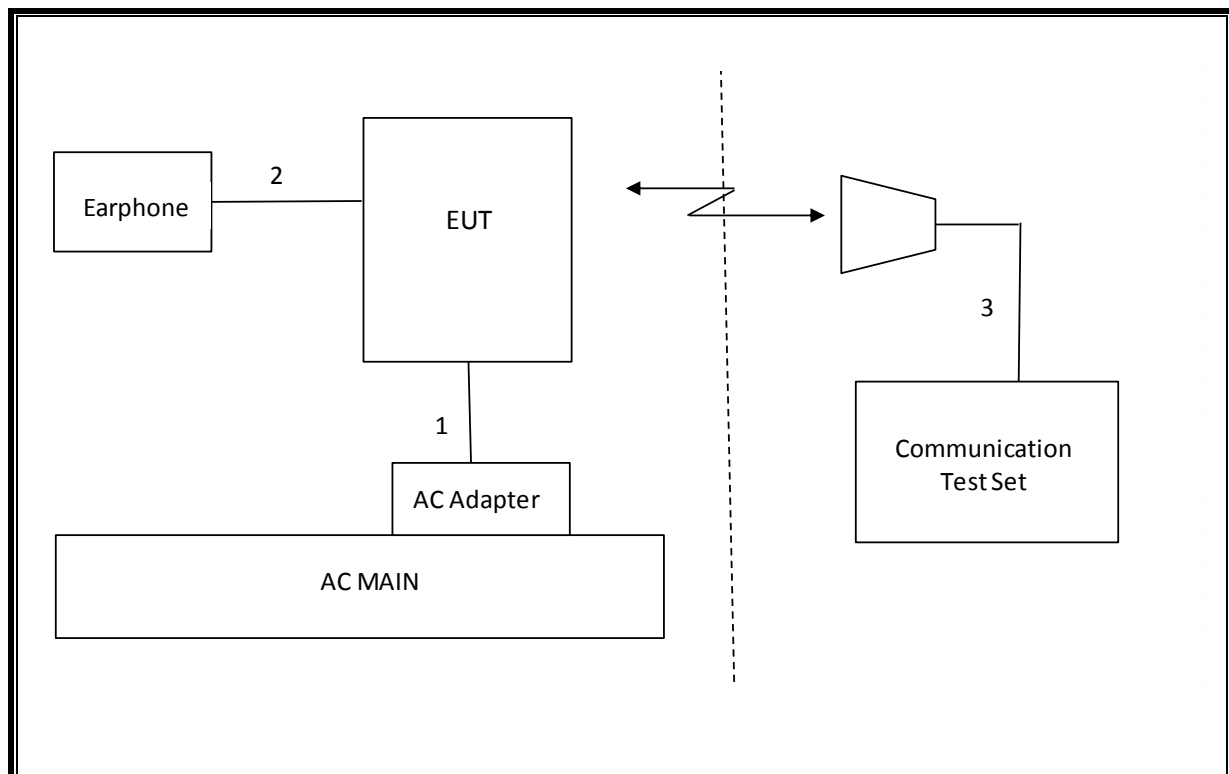
TEST SETUP

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	S/N	Cal Due
Antenna, Tuned Dipole 400~1000 MHz	ETS	3121D DB4	00164753	07-28-17
Antenna, Horn, 40 GHz	ETS	3116C	00166155	11-30-17
Antenna, Horn, 40 GHz	ETS	3116C-PA	00168841	12-15-17
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	750	11-17-16
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	749	04-25-17
Antenna, Horn, 18 GHz	ETS	3115	00167211	09-20-16
Antenna, Horn, 18 GHz	ETS	3115	00161451	05-17-17
Antenna, Horn, 18 GHz	ETS	3117	00168724	06-17-17
Antenna, Horn, 18 GHz	ETS	3117	00168717	06-17-17
Combiner	WEINSCHTEL	1575	2152	08-16-17
Communications Test Set	R&S	CMW500	150312	08-17-17
Communications Test Set	R&S	CMW500	115331	08-17-17
DC Power Supply	Agilent / HP	E3640A	MY54226395	08-16-17
Preamplifier, 1000 MHz	Sonoma	310N	341282	08-17-17
Preamplifier, 1000 MHz	Sonoma	310N	351741	08-16-17
Preamplifier	ETS	3115-PA	00167475	08-17-17
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	08-16-17
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	08-17-17
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	08-16-17
Bluetooth Tester	TESCOM	TC-3000C	3000C000546	08-18-17
Average Power Sensor	R&S	NRZ-Z91	102681	08-16-17
Average Power Sensor	Agilent / HP	U2000	MY54270007	08-17-17
EMI Test Receive, 40 GHz	R&S	ESU40	100439	08-17-17
EMI Test Receive, 40 GHz	R&S	ESU40	100457	08-16-17
EMI Test Receive, 3 GHz	R&S	ESR3	101832	08-16-17
Attenuator / Switch driver	HP	11713A	3748A04272	N/A
High Pass Filter 1.2GHz	Micro-Tronics	HPM50108-02	G005	08-17-17
High Pass Filter 1.2GHz	Micro-Tronics	HPM50108-02	G006	08-17-17
High Pass Filter 2.8GHz	Micro-Tronics	HPM50111-02	010	08-17-17
High Pass Filter 2.8GHz	Micro-Tronics	HPM50111-02	011	08-17-17
High Pass Filter 4GHz	Micro-Tronics	HPM50118-02	G001	08-17-17
High Pass Filter 4GHz	Micro-Tronics	HPM50118-02	G002	08-17-17
LISN	R&S	ENV-216	101836	08-16-17
LISN	R&S	ENV-216	101837	08-16-17
Attenuator	PASTERNAK	PE7087-10	A009	08-16-17

7. Summary Table

FCC Part Section	Test Description	Test Limit	Test Condition	Test Result	Note
2.1049	Occupied Band width (99%)	N/A	Conducted	Pass	
22.917(a) 24.238(a) 27.53(g)	Band Edge / Conducted Spurious Emission	-13dBm		Pass	
2.1046	Conducted output power	N/A		Pass	
22.355 24.235 27.54	Frequency Stability	2.5PPM		Pass	
22.913(a)(2)	Effective Radiated Power	38 dBm	Radiated	Pass	
27.50(c)(10)		34.77 dBm		Pass	
24.232(c)	Equivalent Isotropic Radiated Power	33dBm		Pass	
27.50(d)(4)		30dBm		Pass	
22.917(a) 24.238(a) 27.53(g)	Radiated Spurious Emission	-13dBm		Pass	

FCC Rule Part	Frequency Range [MHz]	Output Power [W]	Frequency Tolerance	Emission Designator	Emission Bandwidth [MHz]	Communication Type
WCDMA						
22H	826.4 - 846.6	0.123	2.5 ppm	4M11F9W		WCDMA B5
24E	1852.4 - 1907.6	0.213	2.5 ppm	4M13F9W		WCDMA B2
LTE Band 2						
24E	1860.0 - 1900.0	0.171	2.5 ppm	17M9G7W	20	QPSK
24E	1860.0 - 1900.0	0.133	2.5 ppm	17M8D7W	20	16QAM
24E	1857.5 - 1902.5	0.177	2.5 ppm	13M4G7W	15	QPSK
24E	1857.5 - 1902.5	0.142	2.5 ppm	13M4D7W	15	16QAM
LTE Band 4						
27L	1720.0 - 1745.0	0.182	2.5 ppm	17M9G7W	20	QPSK
27L	1720.0 - 1745.0	0.146	2.5 ppm	17M9D7W	20	16QAM
27L	1715.0 - 1750.0	0.219	2.5 ppm	8M95G7W	10	QPSK
27L	1715.0 - 1750.0	0.173	2.5 ppm	8M96D7W	10	16QAM
LTE Band 5						
22H	829.0 - 844.0	0.110	2.5 ppm	8M94G7W	10	QPSK
22H	829.0 - 844.0	0.087	2.5 ppm	8M96D7W	10	16QAM
LTE Band 13						
27H	782	0.080	2.5 ppm	8M91G7W	10	QPSK
27H	782	0.063	2.5 ppm	8M92D7W	10	16QAM
27H	779.5 - 784.5	0.105	2.5 ppm	4M48G7W	5	QPSK
27H	779.5 - 784.5	0.082	2.5 ppm	4M48D7W	5	16QAM

8. RF POWER OUTPUT VERIFICATION

8.1. W-CDMA

Release 99 Setup Procedures used to establish the test signals

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 specification. The DUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7).

Mode	Subtest	Rel99
WCDMA General Settings	Loopback Mode	Test Mode 2
	Rel99 RMC	12.2kbps RMC
	Power Control Algorithm	Algorithm2
	β_c/β_d	8/15

HSDPA Setup Procedures used to establish the test signals

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	HSDPA	HSDPA	HSDPA	HSDPA
	Subtest	1	2	3	4
W-CDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set 1			
	Power Control Algorithm	Algorithm 2			
	β_c	2/15	11/15	15/15	15/15
	β_d	15/15	15/15	8/15	4/15
	Bd (SF)	64			
	β_c/β_d	2/15	11/15	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} = β_{hs}/β_c	30/15			

HSPA (HSDPA & HSUPA) Setup Procedures used to establish the test signals

The following 5 Sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

	Mode	HSPA				
	Subtest	1	2	3	4	5
WCDMA General Settings	Loopback Mode	Test Mode 1				
	Rel99 RMC	12.2 kbps RMC				
	HSDPA FRC	H-Set 1				
	HSUPA Test	HSPA				
	Power Control Algorithm	Algorithm 2				Algorithm 1
	β_c	11/15	6/15	15/15	2/15	15/15
	β_d	15/15	15/15	9/15	15/15	0
	β_{ec}	209/225	12/15	30/15	2/15	5/15
	β_c/β_d	11/15	6/15	15/9	2/15	15/1
	β_{hs}	22/15	12/15	30/15	4/15	5/15
	β_{ed}	1309/225	94/75	47/15	56/75	47/15
	CM (dB)	1	3	2	3	1
	MPR (dB)	0	2	1	2	0
HSDPA Specific Settings	DACK	8				0
	DNAK	8				0
	DCQI	8				0
	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				
HSUPA Specific Settings	E-DPDCH	6	8	8	5	7
	DHARQ	0	0	0	0	0
	AG Index	20	12	15	17	21
	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	5	5	2	5	1
	Reference E-TFCI	11	11	11	11	67
	Reference E-TFCI PO	4	4	4	4	18
	Reference E-TFCI	67	67	92	67	67
	Reference E-TFCI PO	18	18	18	18	18
	Reference E-TFCI	71	71	71	71	71
	Reference E-TFCI PO	23	23	23	23	23
	Reference E-TFCI	75	75	75	75	75
	Reference E-TFCI PO	26	26	26	26	26
	Reference E-TFCI	81	81	81	81	81
	Reference E-TFCI PO	27	27	27	27	27
	Maximum Channelization Codes	2xSF2				SF4

DC-HSDPA Setup Procedures used to establish the test signals

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.		

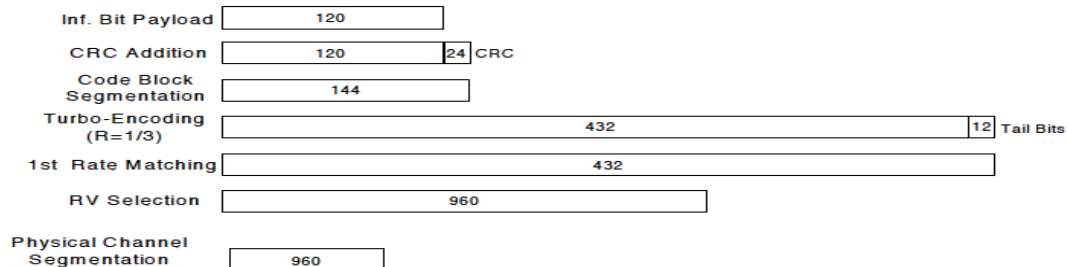


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

The following 4 Sub-tests for HSDPA were completed according to Release 8 procedures in section 5.2 of 3GPP TS34.121. A summary of subtest settings are illustrated below:

	Mode	HSDPA	HSDPA	HSDPA	HSDPA
	Subtest	1	2	3	4
WCDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set 1			
	Power Control Algorithm	Algorithm2			
	β_c	2/15	11/15	15/15	15/15
	β_d	15/15	15/15	8/15	4/15
	β_d (SF)	64			
	β_c/β_d	2/15	11/15	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
	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			

HSPA+

Since 16QAM is not used for uplink, the uplink Category and release is same as HSUPA, i.e., Rel. 7. Therefore, the RF conducted power is not measured.

8.1.1. WCDMA OUTPUT POWER RESULT

WCDMA Band 5 Measured Results

Band	Mode		UL Ch No.	Freq. [MHz]	MPR [dB]	Avg Pwr [dBm]
W-CDMA Band V	Rel 99	RMC, 12.2 kbps	4132	826.4	0	22.90
			4183	836.6	0	23.05
			4233	846.6	0	23.16
	HSDPA	Subtest 1	4132	826.4	0	21.43
			4183	836.6	0	21.66
			4233	846.6	0	21.72
		Subtest 2	4132	826.4	0	21.09
			4183	836.6	0	21.26
			4233	846.6	0	21.36
		Subtest 3	4132	826.4	0.5	20.93
			4183	836.6	0.5	21.17
			4233	846.6	0.5	21.23
		Subtest 4	4132	826.4	0.5	20.92
			4183	836.6	0.5	21.18
			4233	846.6	0.5	21.25
	HSUPA	Subtest 1	4132	826.4	0	21.28
			4183	836.6	0	21.65
			4233	846.6	0	21.69
		Subtest 2	4132	826.4	2	19.42
			4183	836.6	2	19.64
			4233	846.6	2	19.66
		Subtest 3	4132	826.4	1	20.43
			4183	836.6	1	20.64
			4233	846.6	1	20.69
		Subtest 4	4132	826.4	2	19.43
			4183	836.6	2	19.65
			4233	846.6	2	19.67
		Subtest 5	4132	826.4	0	21.47
			4183	836.6	0	21.66
			4233	846.6	0	21.70
	DC-HSDPA	Subtest 1	4132	826.4	0	21.36
			4183	836.6	0	21.59
			4233	846.6	0	21.62
		Subtest 2	4132	826.4	0	21.01
			4183	836.6	0	21.33
			4233	846.6	0	21.39
		Subtest 3	4132	826.4	0.5	20.89
			4183	836.6	0.5	21.17
			4233	846.6	0.5	21.18
		Subtest 4	4132	826.4	0.5	20.95
			4183	836.6	0.5	21.15
			4233	846.6	0.5	21.21

WCDMA Band 2 Measured Results

Band	Mode		UL Ch No.	Freq. [MHz]	MPR [dB]	Avg Pwr [dBm]
W-CDMA Band II	Rel 99	RMC, 12.2 kbps	9262	1852.4	0	23.48
			9400	1880.0	0	23.67
			9538	1907.6	0	23.38
	HSDPA	Subtest 1	9262	1852.4	0	22.24
			9400	1880.0	0	22.49
			9538	1907.6	0	22.31
		Subtest 2	9262	1852.4	0	21.89
			9400	1880.0	0	22.05
			9538	1907.6	0	21.78
		Subtest 3	9262	1852.4	0.5	21.76
			9400	1880.0	0.5	22.04
			9538	1907.6	0.5	21.68
		Subtest 4	9262	1852.4	0.5	21.73
			9400	1880.0	0.5	22.01
			9538	1907.6	0.5	21.73
	HSUPA	Subtest 1	9262	1852.4	0	22.31
			9400	1880.0	0	22.44
			9538	1907.6	0	22.31
		Subtest 2	9262	1852.4	2	20.30
			9400	1880.0	2	20.53
			9538	1907.6	2	20.25
		Subtest 3	9262	1852.4	1	21.22
			9400	1880.0	1	21.48
			9538	1907.6	1	21.30
		Subtest 4	9262	1852.4	2	20.30
			9400	1880.0	2	20.50
			9538	1907.6	2	20.26
		Subtest 5	9262	1852.4	0	22.30
			9400	1880.0	0	22.51
			9538	1907.6	0	22.28
	HSDPA	Subtest 1	9262	1852.4	0	22.20
			9400	1880.0	0	22.48
			9538	1907.6	0	22.26
		Subtest 2	9262	1852.4	0	21.91
			9400	1880.0	0	22.16
			9538	1907.6	0	21.95
		Subtest 3	9262	1852.4	0.5	21.75
			9400	1880.0	0.5	22.04
			9538	1907.6	0.5	21.77
		Subtest 4	9262	1852.4	0.5	21.75
			9400	1880.0	0.5	22.04
			9538	1907.6	0.5	21.76

8.2. LTE OUTPUT VERIFICATION

The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS36.101 specification.

UE Power Class: 3 (23 +/- 2dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101.

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3

Modulation	Channel bandwidth / Transmission bandwidth (RB)						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2

The allowed A-MPR values specified below in Table 6.2.4.-1 of 3GPP TS36.101 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signalling Value of "NS_01".

Table 6.2.4-1: Additional Maximum Power Reduction (A-MPR)

Network Signalling value	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks (N_{RB})	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	NA
NS_03	6.6.2.2.1	2, 4, 10, 23, 25, 35, 36	3	>5	≤ 1
			5	>6	≤ 1
			10	>6	≤ 1
			15	>8	≤ 1
			20	>10	≤ 1
NS_04	6.6.2.2.2	41	5	>6	≤ 1
			10, 15, 20	See Table 6.2.4-4	
NS_05	6.6.3.3.1	1	10,15,20	≥ 50	≤ 1
NS_06	6.6.2.2.3	12, 13, 14, 17	1.4, 3, 5, 10	Table 5.6-1	n/a
NS_07	6.6.2.2.3	13	10	Table 6.2.4-2	Table 6.2.4-2
	6.6.3.3.2				
NS_08	6.6.3.3.3	19	10, 15	> 44	≤ 3
NS_09	6.6.3.3.4	21	10, 15	> 40	≤ 1
				> 55	≤ 2
NS_10		20	15, 20	Table 6.2.4-3	Table 6.2.4-3
NS_11	6.6.2.2.1	23 ¹	1.4, 3, 5, 10	Table 6.2.4-5	Table 6.2.4-5
..					
NS_32	-	-	-	-	-

Note 1: Applies to the lower block of Band 23, i.e. a carrier placed in the 2000-2010 MHz region.

8.2.1. LTE OUTPUT POWER RESULT

LTE Band 5

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr [dBm]		
						Max. Power		
						829 MHz	836.5 MHz	844 MHz
LTE Band 5	10	QPSK	1	0	0		22.71	
			1	25	0		22.89	
			1	49	0		22.83	
			25	0	1		21.86	
			25	12	1		21.74	
			25	25	1		21.66	
		16QAM	50	0	1		21.68	
			1	0	1		21.29	
			1	25	1		21.41	
			1	49	1		21.03	
			25	0	2		20.68	
			25	12	2		20.77	
			25	25	2		20.90	
			50	0	2		20.83	
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr [dBm]		
						Max. Power		
						826.5 MHz	836.5 MHz	846.5 MHz
LTE Band 5	5	QPSK	1	0	0	22.53	22.84	22.81
			1	12	0	22.82	23.28	23.23
			1	24	0	22.53	22.86	22.74
			12	0	1	21.73	21.79	21.82
			12	7	1	21.76	21.72	21.79
			12	13	1	21.69	21.62	21.77
		16QAM	25	0	1	21.67	21.70	21.69
			1	0	1	21.38	21.64	21.71
			1	12	1	21.70	22.11	21.95
			1	24	1	21.47	21.20	21.77
			12	0	2	20.73	20.58	20.76
			12	7	2	20.96	20.70	20.82
			12	13	2	20.70	20.79	20.82
			25	0	2	20.75	20.70	20.84
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr [dBm]		
						Max. Power		
						825.5 MHz	836.5 MHz	847.5 MHz
LTE Band 5	3	QPSK	1	0	0	22.72	22.76	22.69
			1	8	0	22.97	23.02	22.90
			1	14	0	22.78	22.70	22.75
			8	0	1	21.65	21.77	21.79
			8	4	1	21.63	21.75	21.78
			8	7	1	21.64	21.73	21.80
		16QAM	15	0	1	21.66	21.73	21.76
			1	0	1	21.81	21.56	21.64
			1	8	1	22.19	22.02	21.85
			1	14	1	21.91	21.71	21.43
			8	0	2	21.18	20.49	20.76
			8	4	2	21.14	20.76	20.92
			8	7	2	21.16	20.56	20.84
			15	0	2	20.89	20.72	20.82
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr [dBm]		
						Max. Power		
						824.7 MHz	836.5 MHz	848.3 MHz
LTE Band 5	1.4	QPSK	1	0	0	22.66	22.69	22.72
			1	3	0	22.76	22.65	22.58
			1	5	0	22.78	22.61	22.57
			3	0	0	22.77	22.76	22.72
			3	1	0	22.81	22.70	22.73
			3	3	0	22.81	22.69	22.88
		16QAM	6	0	1	21.68	21.68	21.70
			1	0	1	21.87	21.70	21.68
			1	3	1	22.07	21.63	21.86
			1	5	1	22.03	21.62	21.72
			3	0	1	21.92	21.39	21.65
			3	1	1	21.77	21.77	21.66
			3	3	1	21.86	21.81	21.61
			6	0	2	20.94	20.55	20.76

LTE Band 4 Measured Results

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		24.30	
			1	49	0		24.54	
			1	99	0		24.02	
			50	0	1		23.07	
			50	24	1		23.10	
			50	50	1		22.97	
			100	0	1		23.05	
		16QAM	1	0	1		22.78	
			1	49	1		22.99	
			1	99	1		22.56	
			50	0	2		22.08	
			50	24	2		22.09	
			50	50	2		22.06	
			100	0	2		22.03	
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	24.08	23.99	24.07
			1	37	0	23.81	24.16	24.13
			1	74	0	23.98	23.85	23.82
			36	0	1	22.96	23.12	22.81
			36	20	1	22.94	23.11	22.81
			36	39	1	22.95	22.99	22.69
			75	0	1	22.95	23.02	22.76
		16QAM	1	0	1	23.16	22.80	23.11
			1	37	1	23.18	23.40	22.97
			1	74	1	22.60	22.52	22.62
			36	0	2	22.01	22.08	21.69
			36	20	2	21.99	22.24	21.63
			36	39	2	21.92	22.19	21.69
			75	0	2	22.04	22.11	21.78
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)		
						20000	20175	20350
						1715 MHz	1732.5 MHz	1750 MHz
LTE Band 4	10	QPSK	1	0	0	24.14	24.08	23.68
			1	25	0	24.02	24.03	23.95
			1	49	0	23.84	24.04	23.86
			25	0	1	23.02	23.04	22.82
			25	12	1	22.92	23.08	22.76
			25	25	1	22.94	23.01	22.65
			50	0	1	22.96	23.07	22.74
		16QAM	1	0	1	23.18	22.92	23.01
			1	25	1	23.14	22.96	23.16
			1	49	1	23.03	22.84	22.99
			25	0	2	22.02	22.29	21.77
			25	12	2	21.92	22.26	21.62
			25	25	2	22.05	22.01	21.65
			50	0	2	22.04	21.96	21.68

LTE Band 4 Measured Results (continued)

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)		
						19975	20175	20375
						1712.5 MHz	1732.5 MHz	1752.5 MHz
LTE Band 4	5	QPSK	1	0	0	23.94	24.13	23.84
			1	12	0	23.92	24.66	23.79
			1	24	0	23.92	24.32	23.73
			12	0	1	22.98	23.11	22.72
			12	7	1	22.93	23.10	22.77
			12	13	1	22.95	23.06	22.68
			25	0	1	23.03	23.13	22.74
		16QAM	1	0	1	23.36	22.73	22.68
			1	12	1	23.43	22.98	22.67
			1	24	1	23.06	22.67	22.60
			12	0	2	22.10	21.76	21.56
			12	7	2	22.03	21.85	21.63
			12	13	2	21.95	21.77	21.64
			25	0	2	22.13	22.13	21.59
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)		
						19965	20175	20385
						1711.5 MHz	1732.5 MHz	1753.5 MHz
LTE Band 4	3	QPSK	1	0	0	23.89	24.05	23.67
			1	8	0	24.03	24.36	23.76
			1	14	0	23.94	24.02	23.74
			8	0	1	22.87	23.04	22.68
			8	4	1	22.93	23.09	22.82
			8	7	1	22.88	22.98	22.79
			15	0	1	22.90	23.00	22.72
		16QAM	1	0	1	23.11	22.92	23.14
			1	8	1	23.24	23.21	22.97
			1	14	1	23.08	22.92	23.04
			8	0	2	21.88	22.07	21.68
			8	4	2	21.82	22.27	21.69
			8	7	2	21.88	22.28	21.71
			15	0	2	21.89	22.08	21.59
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm)		
						19957	20175	20393
						1710.7 MHz	1732.5 MHz	1754.3 MHz
LTE Band 4	1.4	QPSK	1	0	0	24.24	23.81	23.66
			1	3	0	24.22	23.96	23.88
			1	5	0	24.10	23.92	23.76
			3	0	0	24.00	24.06	23.67
			3	1	0	24.05	24.21	23.63
			3	3	0	24.06	24.21	23.80
			6	0	1	22.95	23.07	22.90
		16QAM	1	0	1	22.84	22.90	23.21
			1	3	1	23.20	22.96	23.36
			1	5	1	22.99	22.79	23.16
			3	0	1	22.92	22.80	22.84
			3	1	1	22.98	22.87	22.65
			3	3	1	22.92	22.88	22.36
			6	0	2	21.72	21.99	21.60

LTE Band 2

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr [dBm]		
						Max. Power		
						1860 MHz	1880 MHz	1900 MHz
LTE Band 2	20	QPSK	1	0	0	23.52	23.86	23.66
			1	49	0	23.55	24.33	23.75
			1	99	0	23.68	23.90	23.73
			50	0	1	22.80	22.89	22.84
			50	24	1	22.77	22.93	22.74
			50	50	1	22.73	22.81	22.68
			100	0	1	22.67	22.84	22.79
		16QAM	1	0	1	22.47	22.37	22.49
			1	49	1	22.57	22.84	22.26
			1	99	1	22.04	22.55	22.01
			50	0	2	21.63	21.80	21.64
			50	24	2	21.83	22.04	21.52
			50	50	2	21.72	21.81	21.55
			100	0	2	21.70	21.73	21.79
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr [dBm]		
						Max. Power		
						1857.5 MHz	1880 MHz	1902.5 MHz
LTE Band 2	15	QPSK	1	0	0	23.66	23.82	23.69
			1	37	0	23.91	23.98	23.92
			1	74	0	23.53	23.88	23.39
			36	0	1	22.64	22.85	22.63
			36	20	1	22.64	22.89	22.66
			36	39	1	22.72	22.74	22.66
			75	0	1	22.66	22.78	22.64
		16QAM	1	0	1	22.89	22.75	23.05
			1	37	1	23.13	23.09	23.19
			1	74	1	22.97	22.36	22.78
			36	0	2	21.61	21.75	21.60
			36	20	2	21.65	21.76	21.65
			36	39	2	21.62	21.72	21.62
			75	0	2	21.59	21.80	21.45
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr [dBm]		
						Max. Power		
						1855 MHz	1880 MHz	1905 MHz
LTE Band 2	10	QPSK	1	0	0	23.89	23.80	23.84
			1	25	0	23.83	23.84	23.85
			1	49	0	23.93	23.91	23.57
			25	0	1	22.63	22.83	22.73
			25	12	1	22.56	22.89	22.66
			25	25	1	22.58	22.83	22.67
			50	0	1	22.63	22.86	22.63
		16QAM	1	0	1	23.02	22.21	22.55
			1	25	1	23.26	22.70	22.85
			1	49	1	23.15	22.69	22.63
			25	0	2	21.73	21.75	21.80
			25	12	2	21.42	21.81	21.73
			25	25	2	21.57	21.75	21.68
			50	0	2	21.65	21.68	21.40

LTE Band 2 Measured Results (continued)

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr [dBm]		
						Max. Power		
						1852.5 MHz	1880 MHz	1907.5 MHz
LTE Band 2	5	QPSK	1	0	0	23.84	23.80	23.59
			1	12	0	23.89	24.05	23.83
			1	24	0	23.38	23.93	23.46
			12	0	1	22.55	22.91	22.69
			12	7	1	22.61	22.84	22.53
			12	13	1	22.49	22.76	22.58
			25	0	1	22.62	22.89	22.56
		16QAM	1	0	1	23.05	22.79	22.00
			1	12	1	22.98	22.99	22.00
			1	24	1	22.77	22.33	22.00
			12	0	2	21.53	21.80	21.50
			12	7	2	21.70	21.87	21.35
			12	13	2	21.55	21.95	21.31
			25	0	2	21.66	21.91	21.64
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr [dBm]		
						Max. Power		
						1851.5 MHz	1880 MHz	1908.5 MHz
LTE Band 2	3	QPSK	1	0	0	23.65	23.96	23.78
			1	8	0	23.73	24.14	23.50
			1	14	0	23.48	24.26	23.52
			8	0	1	22.51	22.84	22.62
			8	4	1	22.75	22.93	22.61
			8	7	1	22.64	22.95	22.58
			15	0	1	22.65	22.88	22.60
		16QAM	1	0	1	22.89	22.71	22.78
			1	8	1	22.97	23.12	22.40
			1	14	1	22.58	22.78	22.57
			8	0	2	21.30	21.77	21.45
			8	4	2	21.41	21.88	21.63
			8	7	2	21.32	21.99	21.61
			15	0	2	21.51	21.84	21.63
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr [dBm]		
						Max. Power		
						1850.7 MHz	1880 MHz	1909.3 MHz
LTE Band 2	1.4	QPSK	1	0	0	23.91	23.88	23.39
			1	3	0	23.88	23.81	23.83
			1	5	0	23.74	23.69	23.68
			3	0	0	23.77	23.89	23.73
			3	1	0	23.76	23.95	23.74
			3	3	0	23.83	23.95	23.72
			6	0	1	22.75	22.82	22.71
		16QAM	1	0	1	22.97	22.86	22.28
			1	3	1	23.14	22.83	22.82
			1	5	1	23.08	22.69	22.71
			3	0	1	22.71	22.81	22.82
			3	1	1	22.56	22.85	22.87
			3	3	1	22.76	22.95	22.95
			6	0	2	21.78	21.62	21.66

LTE Band 13 Measured Results

Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)		
							2310 MHz	
LTE Band 13	10	QPSK	1	0	0		23.87	
			1	25	0		23.74	
			1	49	0		23.87	
			25	0	1		22.74	
			25	12	1		22.69	
			25	25	1		22.73	
			50	0	1		22.77	
		16QAM	1	0	1		22.84	
			1	25	1		22.52	
			1	49	1		23.13	
			25	0	2		21.80	
			25	12	2		21.71	
			25	25	2		21.70	
			50	0	2		21.72	
Band	BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Max. Avg Pwr (dBm)		
						2307.5 MHz	2310 MHz	2312.5 MHz
LTE Band 13	5	QPSK	1	0	0		23.96	
			1	12	0		23.65	
			1	24	0		24.04	
			12	0	1		22.74	
			12	7	1		22.64	
			12	13	1		22.58	
			25	0	1		22.70	
		16QAM	1	0	1		22.76	
			1	12	1		22.33	
			1	24	1		22.67	
			12	0	2		21.66	
			12	7	2		21.55	
			12	13	2		21.68	
			25	0	2		21.85	

9. PEAK TO AVERAGE RATIO

Test Procedure

Per KDB 971168 D01 Power Meas License Digital Systems v02r02;

The transmitter output was connected to a CMW500 Test Set and configured to operate at maximum power. The PAR were measured on the Spectrum Analyzer.

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

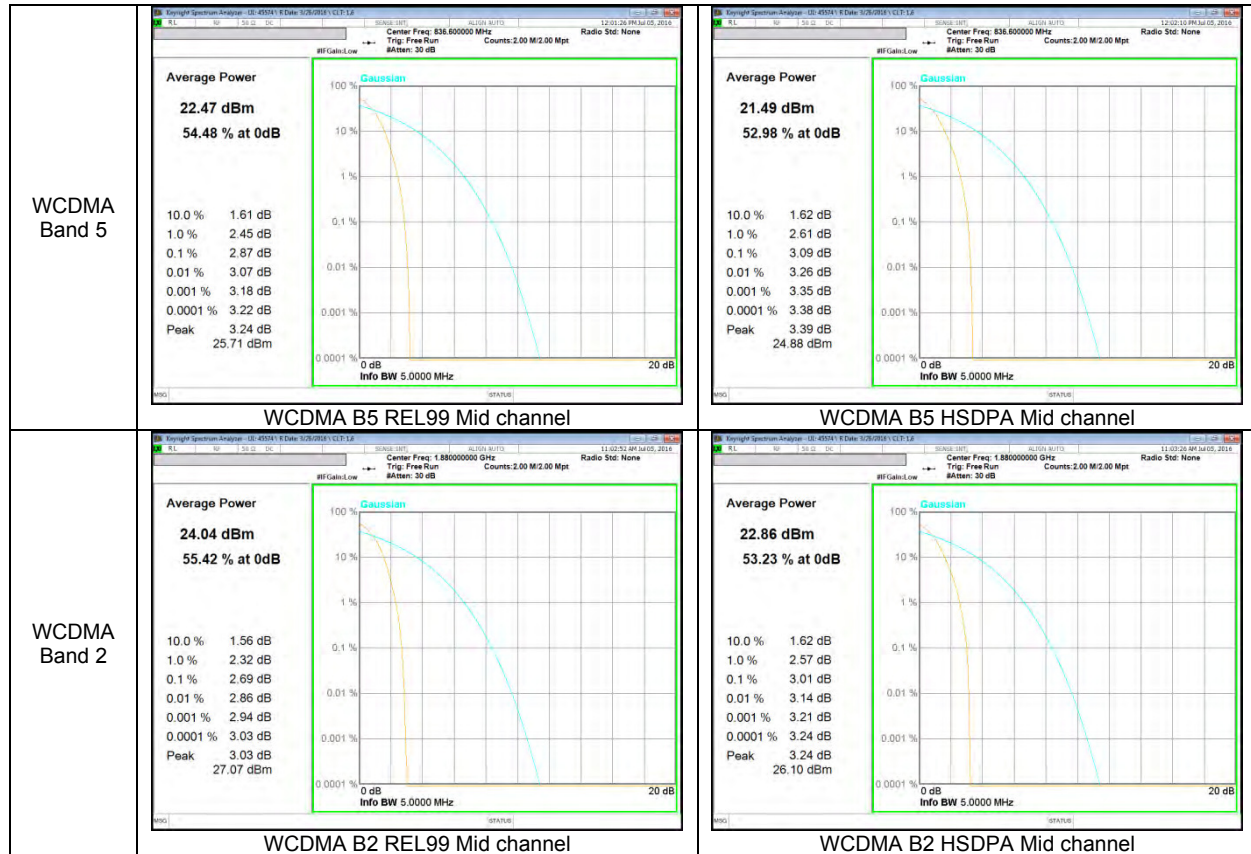
Band	Channel	f [MHz]	Mode	Ratio [dB]	Limit [dB]
Band 5	4183	836.6	REL99	2.87	13.00
			HSDPA	3.09	
Band 2	9400	1880.0	REL99	2.69	
			HSDPA	3.01	

LTE

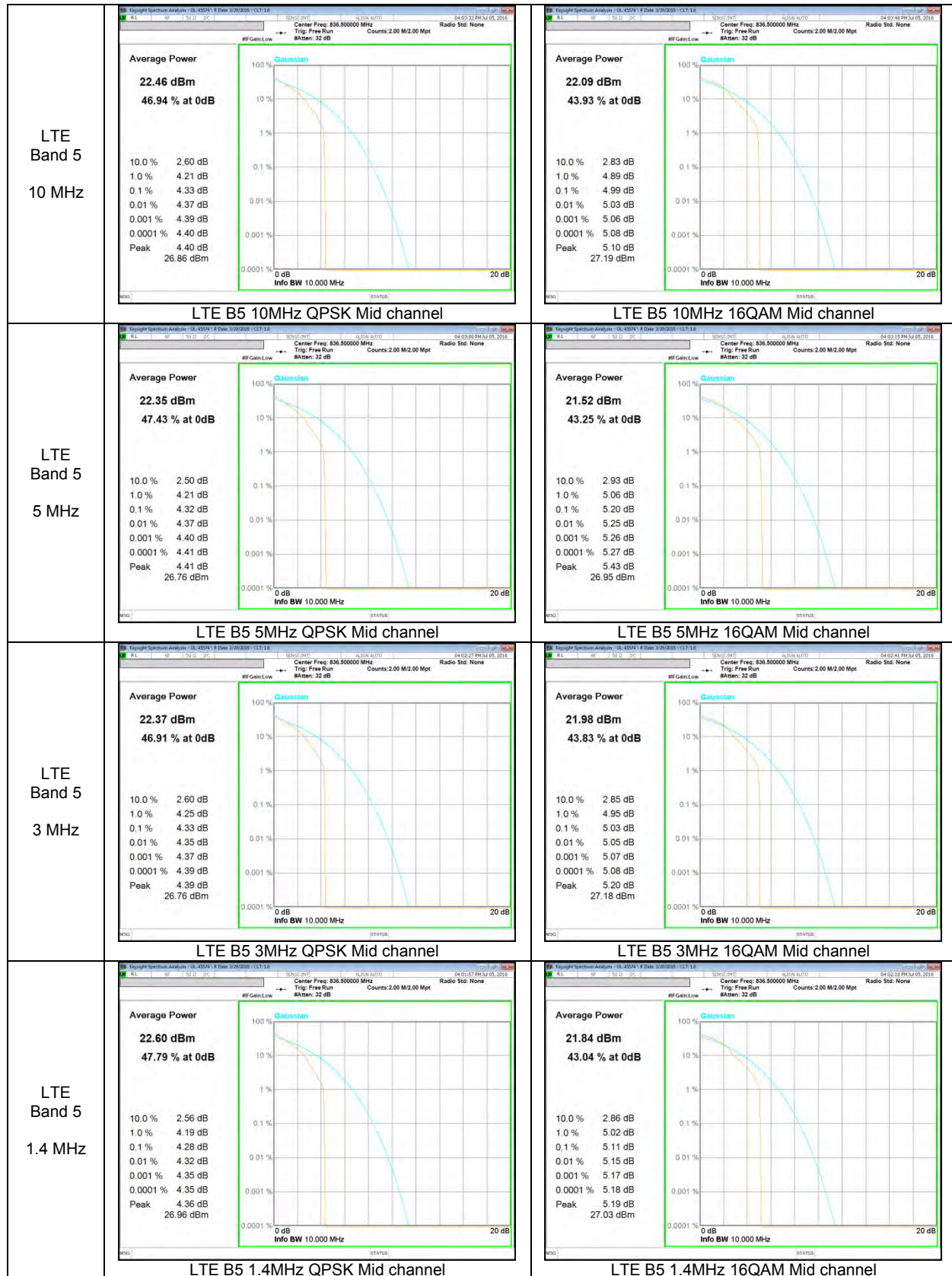
Band	BW [MHz]	Channel	f [MHz]	Mode	Ratio [dB]	Limit [dB]
Band 5	10	20525	836.5	QPSK	4.33	13.00
				16QAM	4.99	
	5			QPSK	4.32	
				16QAM	5.20	
	3			QPSK	4.33	
				16QAM	5.03	
	1.4			QPSK	4.28	
				16QAM	5.11	
Band 4	20	20174	1732.5	QPSK	4.08	
				16QAM	4.88	
	15			QPSK	4.10	
				16QAM	4.91	
	10			QPSK	4.06	
				16QAM	4.92	
	5			QPSK	4.08	
				16QAM	5.05	
	3			QPSK	4.07	
				16QAM	4.97	
	1.4			QPSK	4.02	
				16QAM	5.00	
Band 2	20	18900	1880.0	QPSK	3.28	
				16QAM	4.30	
	15			QPSK	3.47	
				16QAM	4.20	
	10			QPSK	3.42	
				16QAM	4.00	
	5			QPSK	3.48	
				16QAM	4.37	
	3			QPSK	3.40	
				16QAM	3.85	
	1.4			QPSK	3.30	
				16QAM	4.33	
Band 13	10	23230	782	QPSK	3.53	
				16QAM	4.33	
	5			QPSK	3.56	
				16QAM	4.54	

9.2. CONDUCTED PEAK TO AVERAGE PLOTS

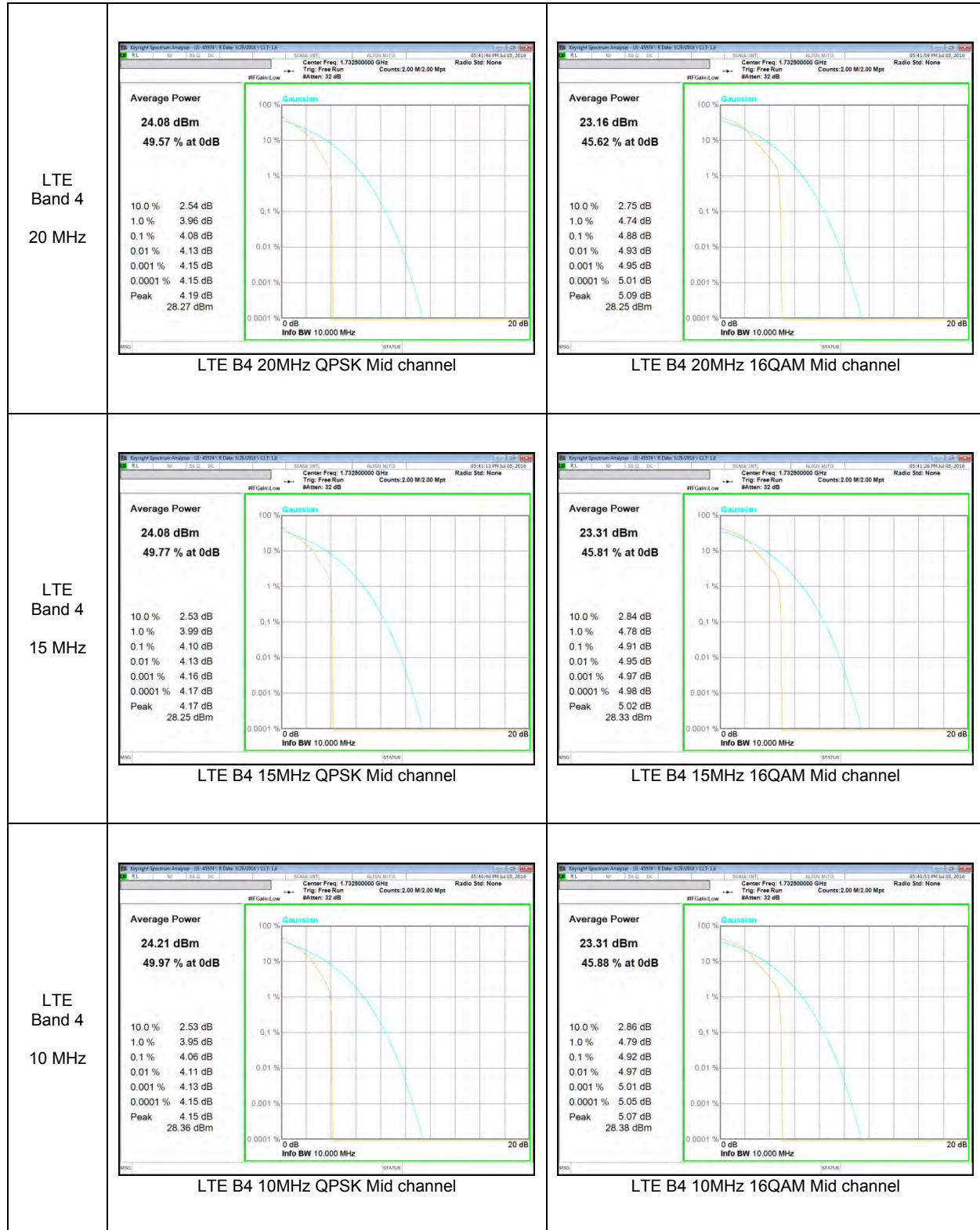
WCDMA

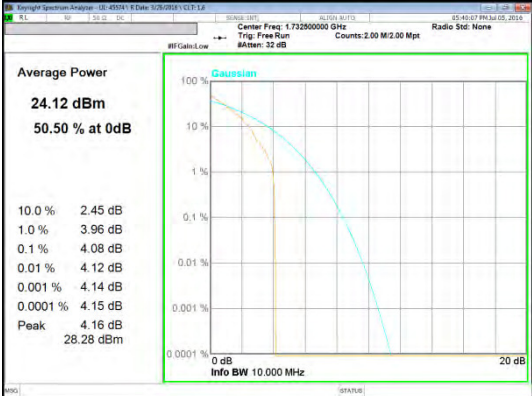
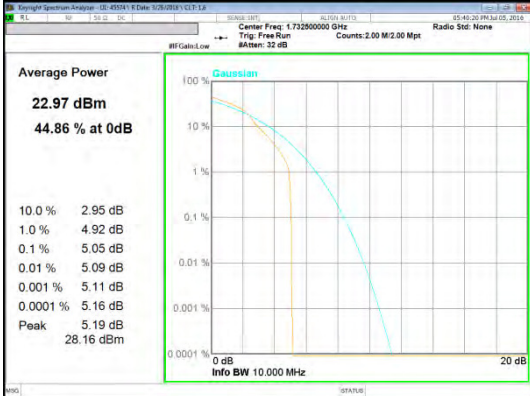
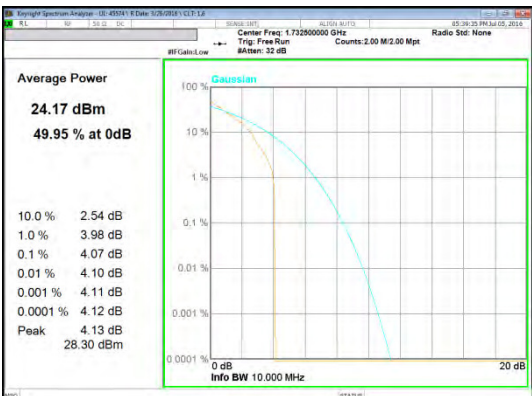
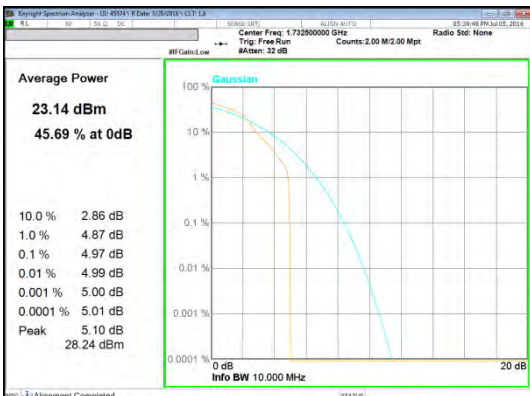
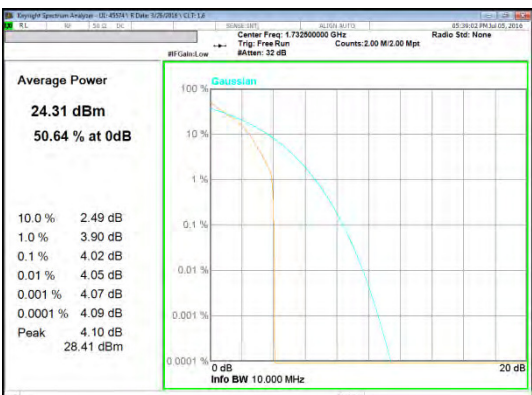
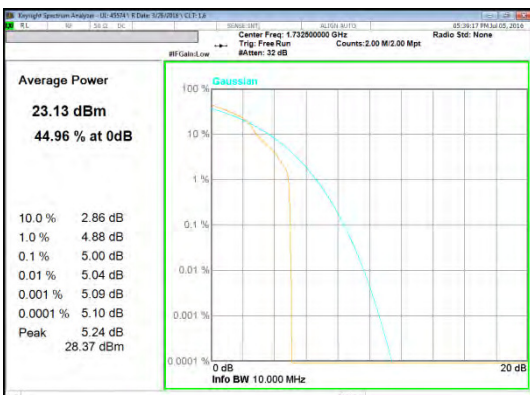


LTE Band 5

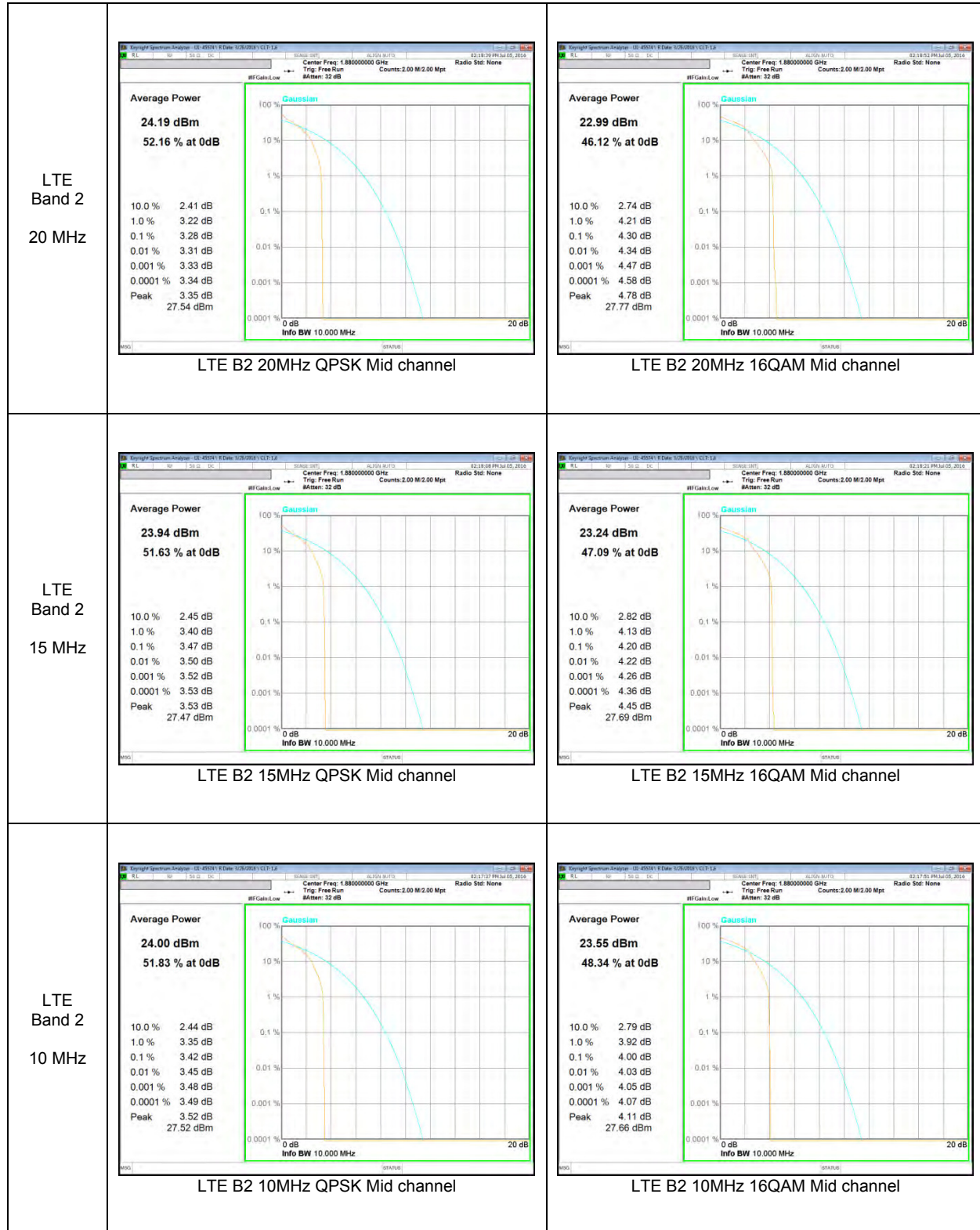


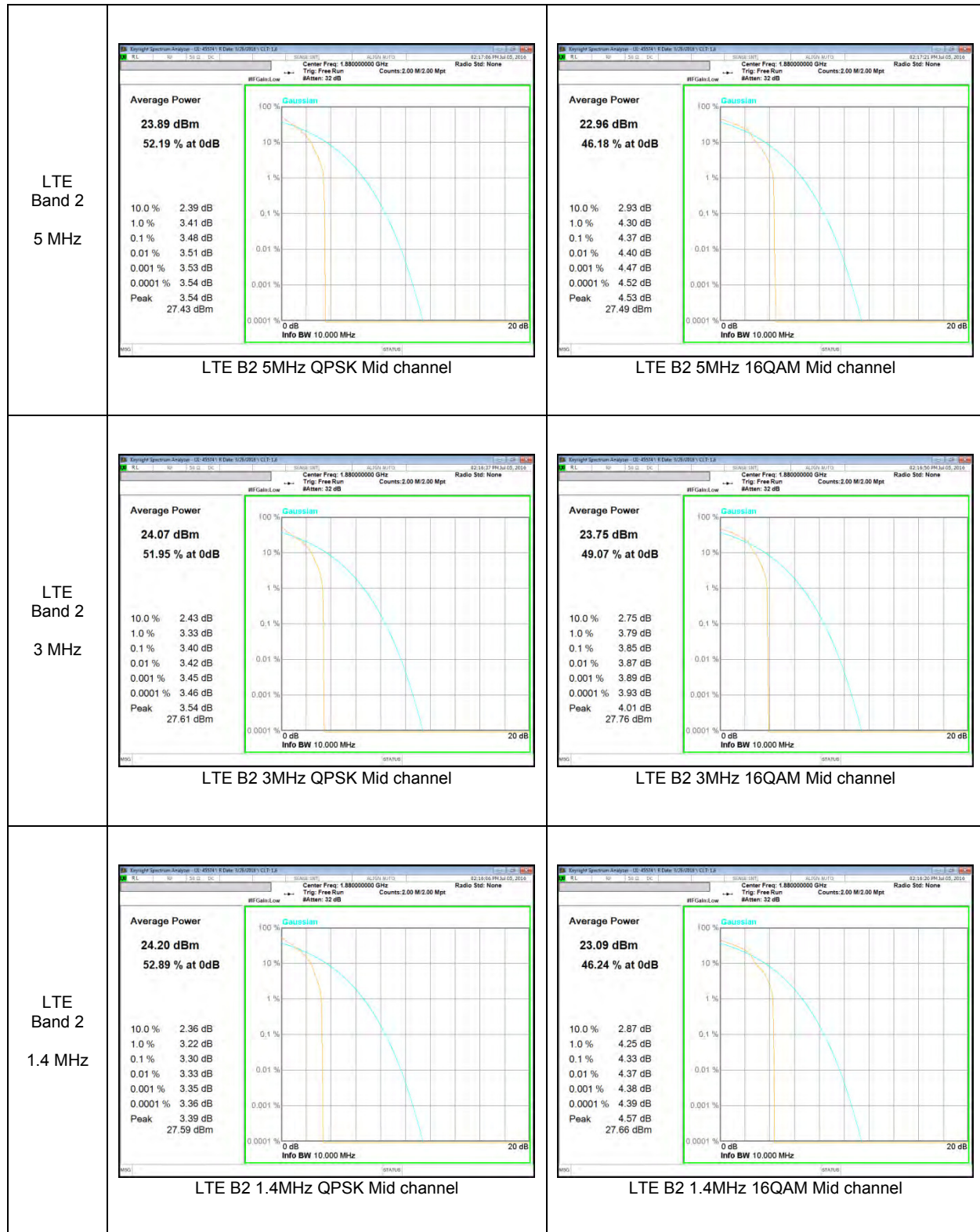
LTE Band 4



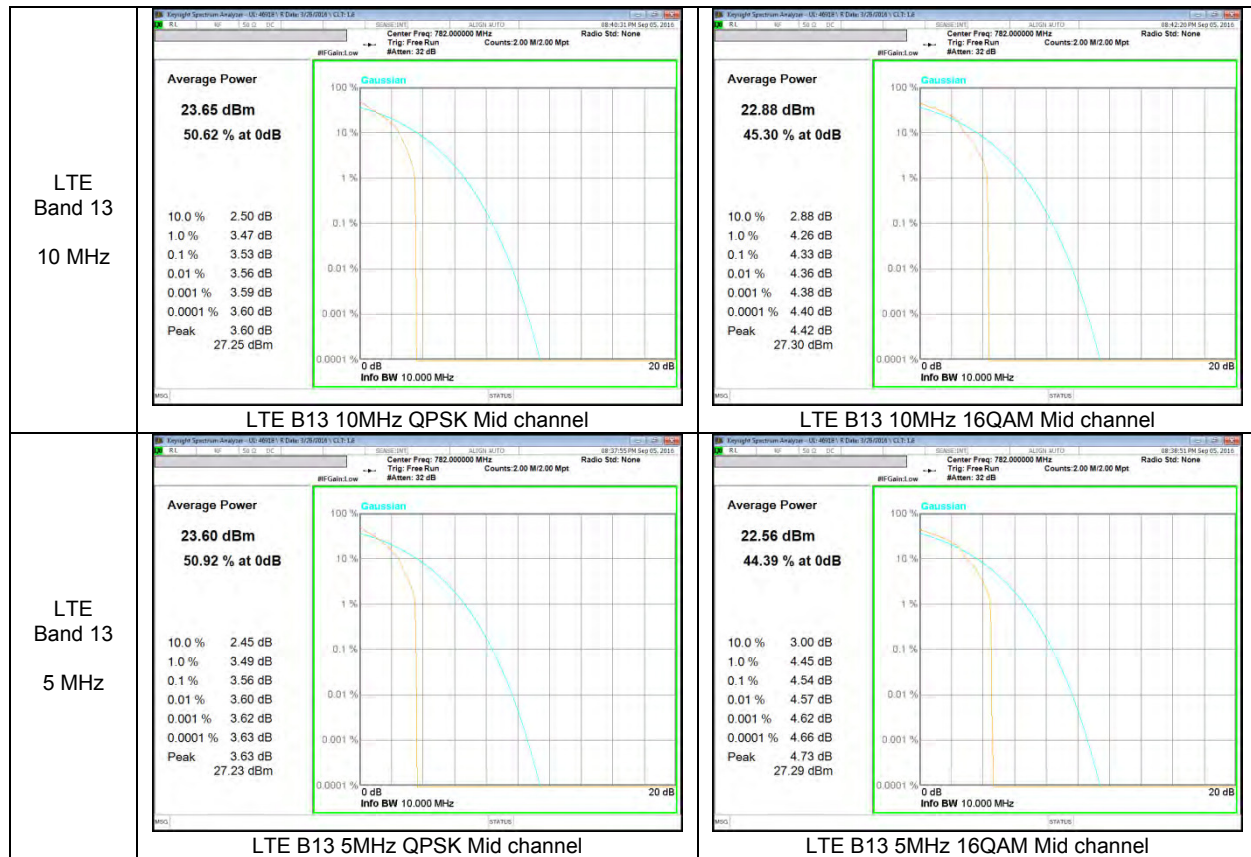
LTE Band 4 5 MHz	 LTE B4 5MHz QPSK Mid channel	 LTE B4 5MHz 16QAM Mid channel
LTE Band 4 3 MHz	 LTE B4 3MHz QPSK Mid channel	 LTE B4 3MHz 16QAM Mid channel
LTE Band 4 1.4 MHz	 LTE B4 1.4MHz QPSK Mid channel	 LTE B4 1.4MHz 16QAM Mid channel

LTE Band 2





LTE Band 13



10. LIMITS AND CONDUCTED RESULTS

10.1. OCCUPIED BANDWIDTH

RULE PART(S)

FCC: §2.1049

LIMITS

For reporting purposes only

TEST PROCEDURE

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at the low, middle and high channel in each band. The -26dB bandwidth was also measured and recorded.

(KDB 971168 D01 Power Meas License Digital Systems v02r02)

10.1.1. OCCUPIED BANDWIDTH RESULTS

WCDMA

Band	Mode	Channel	f [MHz]	99% BW [MHz]	26dB BW [MHz]
Band 5	REL99	4132	826.4	4.1097	4.682
		4183	836.6	4.1106	4.676
		4233	846.6	4.1077	4.657
	HSDPA	4132	826.4	4.1159	4.668
		4183	836.6	4.1073	4.674
		4233	846.6	4.1196	4.675
Band 2	REL99	9262	1852.4	4.1094	4.679
		9400	1880.0	4.1129	4.680
		9538	1907.6	4.1165	4.705
	HSDPA	9262	1852.4	4.1174	4.677
		9400	1880.0	4.1345	4.696
		9538	1907.6	4.1207	4.688

LTE Band 5

Band	BW [MHz]	Channel	f [MHz]	Mode	99% BW [MHz]	26dB BW [MHz]
Band 5	10	20450	829.0	QPSK	8.9358	9.793
				16QAM	8.9634	9.795
		20524	836.5	QPSK	8.9325	9.797
				16QAM	8.9470	9.784
		20599	844.0	QPSK	8.9405	9.768
				16QAM	8.9314	9.698
	5	20425	826.5	QPSK	4.4812	4.903
				16QAM	4.4880	4.952
		20524	836.5	QPSK	4.4766	4.960
				16QAM	4.4861	4.959
		20624	846.5	QPSK	4.4729	4.925
				16QAM	4.4830	4.962
	3	20415	825.5	QPSK	2.6914	2.955
				16QAM	2.6944	2.962
		20524	836.5	QPSK	2.6894	2.953
				16QAM	2.6900	2.963
		20634	847.5	QPSK	2.6938	2.970
				16QAM	2.6886	2.977
	1.4	20407	824.7	QPSK	1.0863	1.288
				16QAM	1.0816	1.276
		20524	836.5	QPSK	1.0793	1.270
				16QAM	1.0830	1.274
		20624	848.3	QPSK	1.0843	1.285
				16QAM	1.0919	1.305

LTE Band 4

Band	BW [MHz]	Channel	f [MHz]	Mode	99% BW [MHz]	26dB BW [MHz]
Band 4	20	20050	1720.0	QPSK	17.805	19.13
				16QAM	17.843	19.19
		20174	1732.5	QPSK	17.887	19.17
				16QAM	17.85	19.35
		20299	1745.0	QPSK	17.824	19.29
				16QAM	17.821	19.19
	15	20025	1717.5	QPSK	13.367	14.56
				16QAM	13.381	14.55
		20174	1732.5	QPSK	13.358	14.44
				16QAM	13.384	14.58
		20324	1747.5	QPSK	13.384	14.45
				16QAM	13.362	14.52
	10	20000	1715.0	QPSK	8.9408	9.818
				16QAM	8.9319	9.761
		20174	1732.5	QPSK	8.9528	9.778
				16QAM	8.9223	9.766
		20349	1750.0	QPSK	8.9241	9.767
				16QAM	8.9579	9.770
	5	19975	1712.5	QPSK	4.4854	4.920
				16QAM	4.4861	4.945
		20174	1732.5	QPSK	4.4835	4.951
				16QAM	4.4848	4.971
		20374	1752.5	QPSK	4.4785	4.930
				16QAM	4.4866	5.004
	3	19965	1711.5	QPSK	2.6919	2.953
				16QAM	2.6962	2.980
		20174	1732.5	QPSK	2.6901	2.950
				16QAM	2.6948	2.984
		20384	1753.5	QPSK	2.6937	2.979
				16QAM	2.6916	2.970
	1.4	19957	1710.7	QPSK	1.0863	1.298
				16QAM	1.0936	1.301
		20174	1732.5	QPSK	1.0870	1.277
				16QAM	1.0847	1.288
		20392	1754.3	QPSK	1.0857	1.282
				16QAM	1.0916	1.309

LTE Band 2

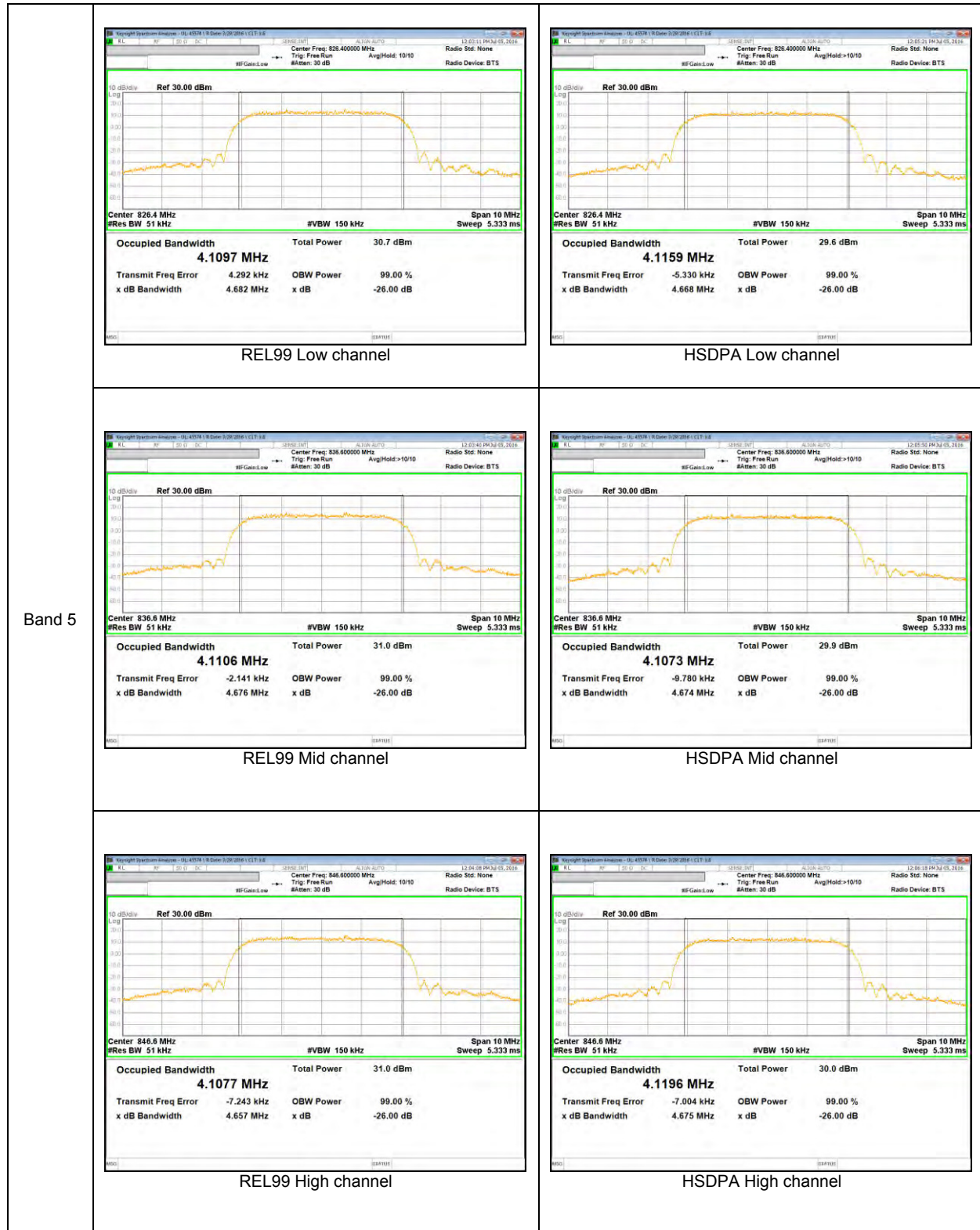
Band	BW [MHz]	Channel	f [MHz]	Mode	99% BW [MHz]	26dB BW [MHz]
Band 2	20	18700	1860.0	QPSK	17.822	19.10
				16QAM	17.831	19.28
		18900	1880.0	QPSK	17.884	19.22
				16QAM	17.844	19.32
		19099	1900.0	QPSK	17.890	19.31
				16QAM	17.813	19.17
	15	18675	1857.5	QPSK	13.378	14.54
				16QAM	13.383	14.51
		18900	1880.0	QPSK	13.378	14.47
				16QAM	13.368	14.44
		19124	1902.5	QPSK	13.383	14.52
				16QAM	13.386	14.50
	10	18650	1955.0	QPSK	8.9275	9.745
				16QAM	8.9650	9.818
		18900	1880.0	QPSK	8.9497	9.788
				16QAM	8.9176	9.805
		19149	1905.0	QPSK	8.9650	9.782
				16QAM	8.9235	9.813
	5	18625	1852.5	QPSK	4.4877	4.923
				16QAM	4.4869	4.953
		18900	1880.0	QPSK	4.4920	4.954
				16QAM	4.4841	4.971
		18175	1907.5	QPSK	4.4758	4.945
				16QAM	4.4893	4.977
	3	18615	1815.5	QPSK	2.6941	2.956
				16QAM	2.6935	2.982
		18900	1880.0	QPSK	2.6897	2.990
				16QAM	2.6914	2.973
		19184	1908.5	QPSK	2.6943	2.967
				16QAM	2.6897	2.988
	1.4	18607	1850.7	QPSK	1.0864	1.270
				16QAM	1.0835	1.279
		18900	1880.0	QPSK	1.0810	1.274
				16QAM	1.0840	1.296
		19192	1909.3	QPSK	1.0860	1.308
				16QAM	1.0947	1.314

LTE Band 13

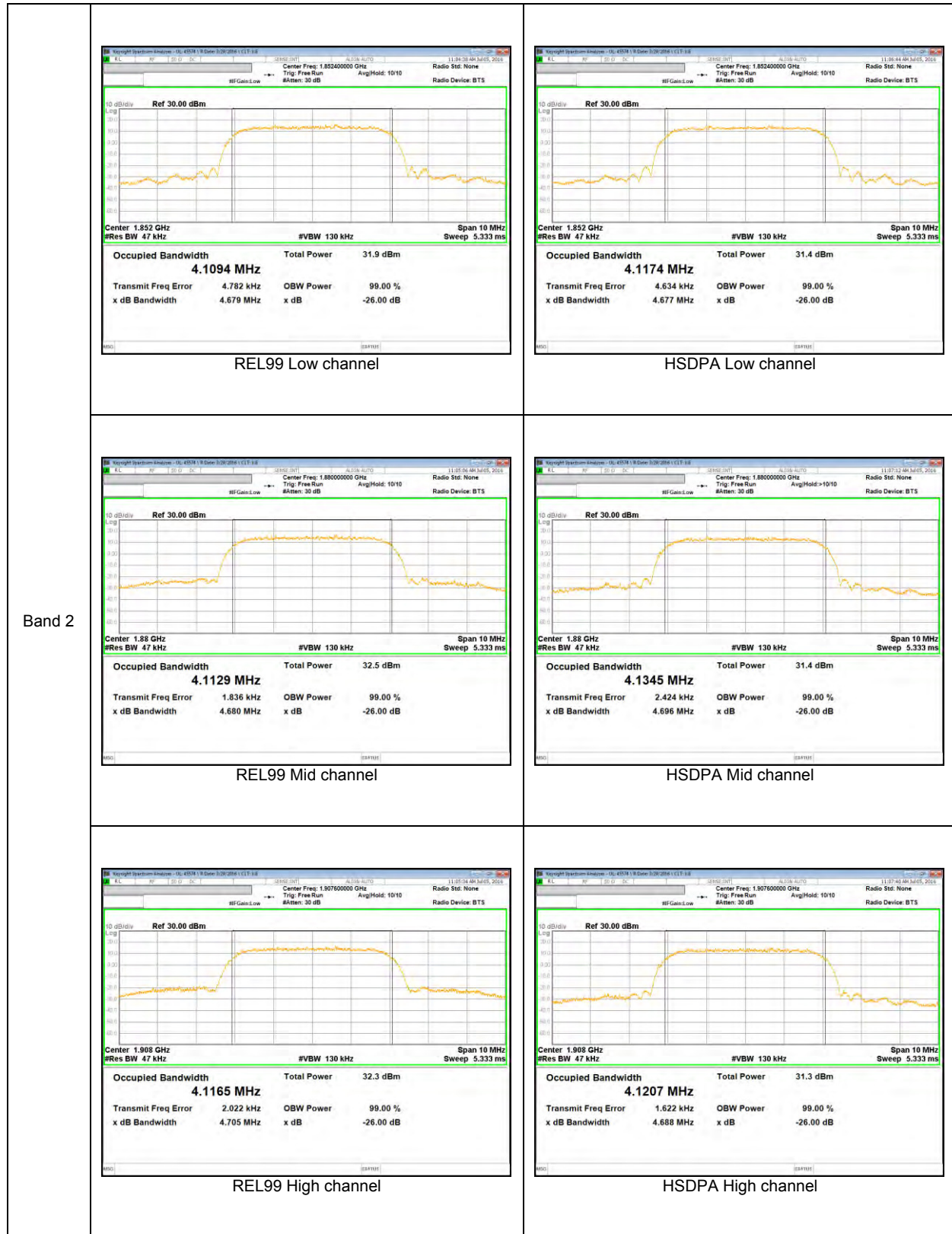
Band	BW [MHz]	Channel	f [MHz]	Mode	99% BW [MHz]	26dB BW [MHz]
Band 13	10	23230	782.0	QPSK	8.9109	9.794
				16QAM	8.9162	9.713
	5	23207	779.5	QPSK	4.4698	4.939
				16QAM	4.4742	4.908
		23230	782.0	QPSK	4.4752	4.935
				16QAM	4.4839	4.943
		23255	784.5	QPSK	4.4765	4.910
				16QAM	4.4823	4.940

10.1.2. OCCUPIED BANDWIDTH PLOTS

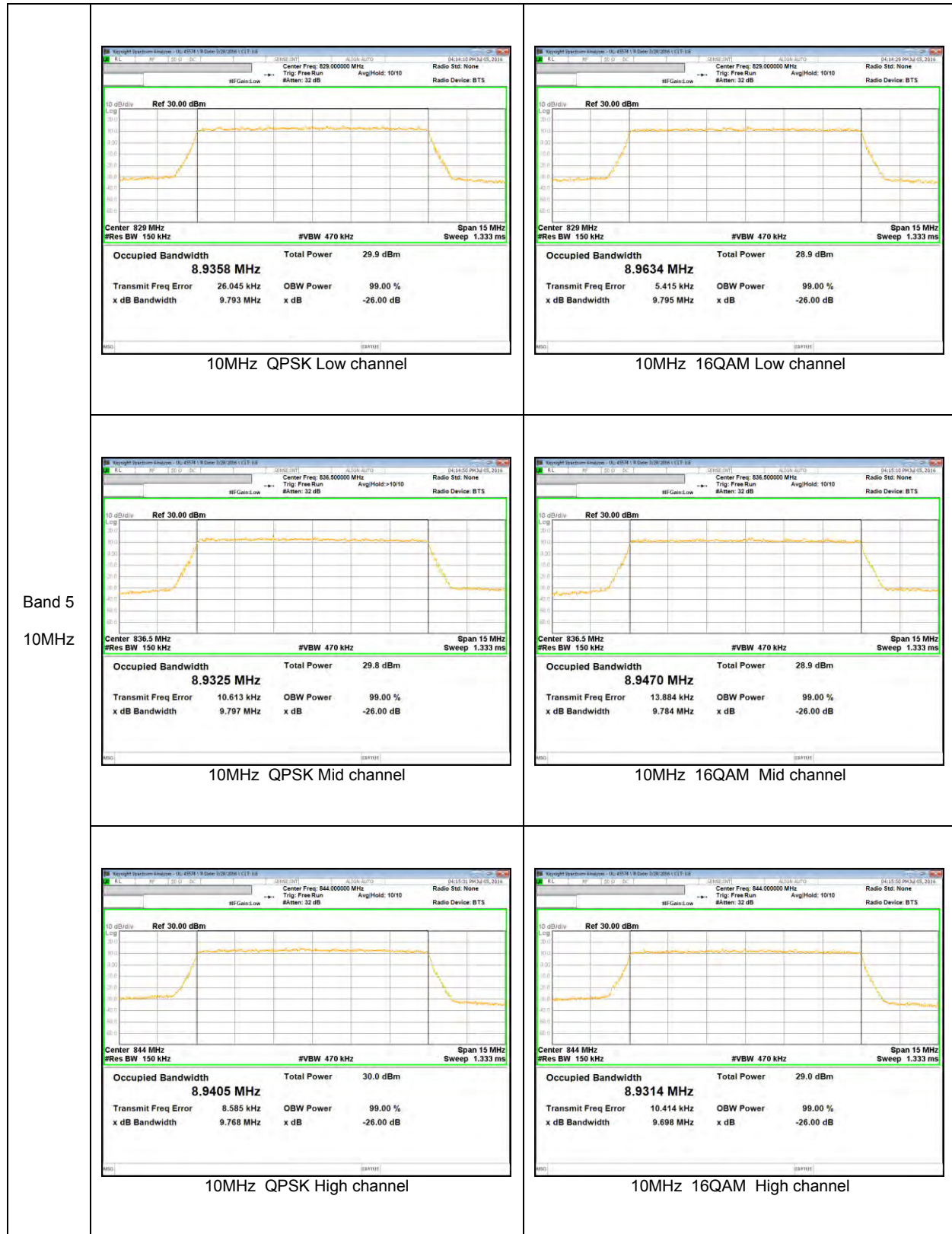
WCDMA Band 5

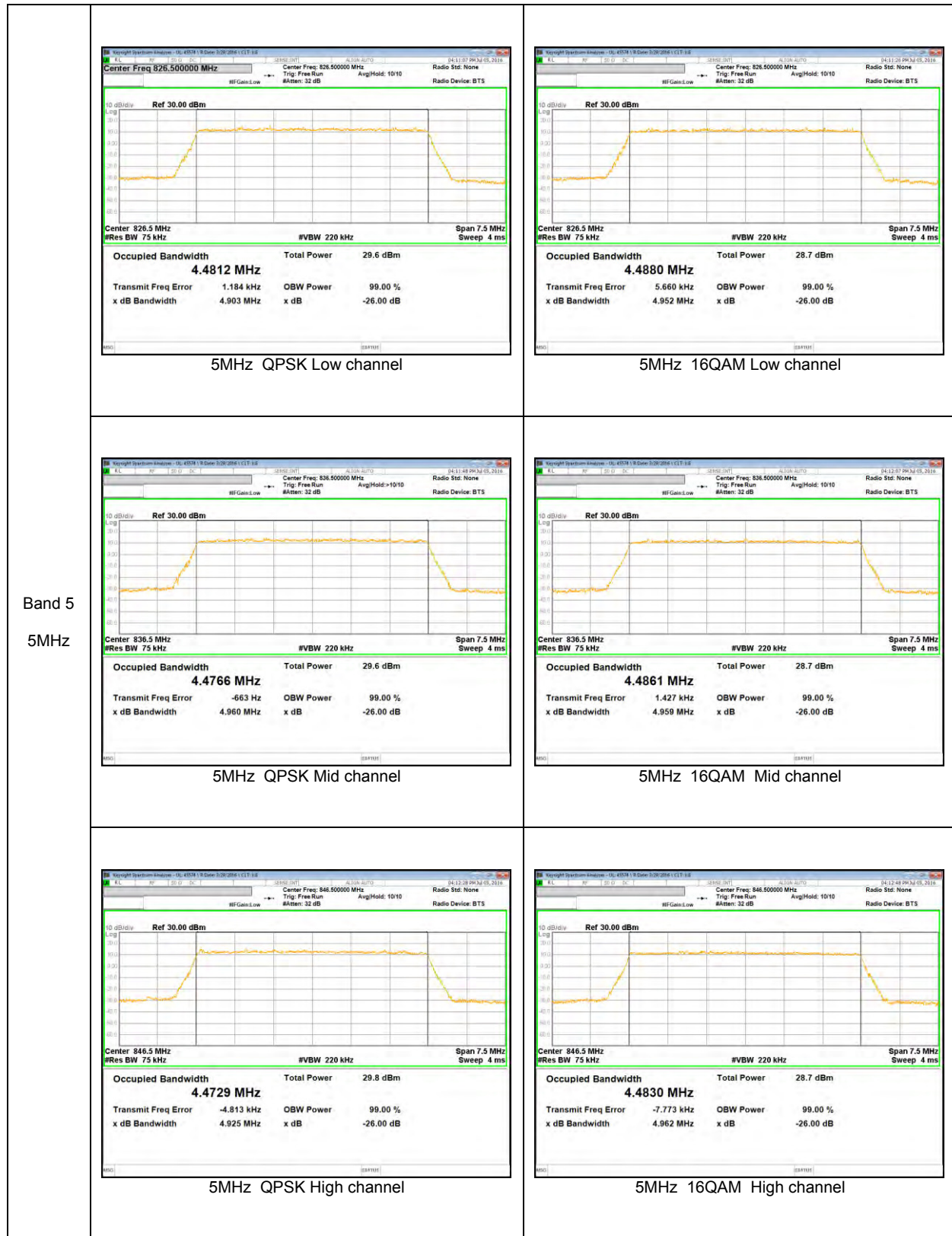


WCDMA Band 2

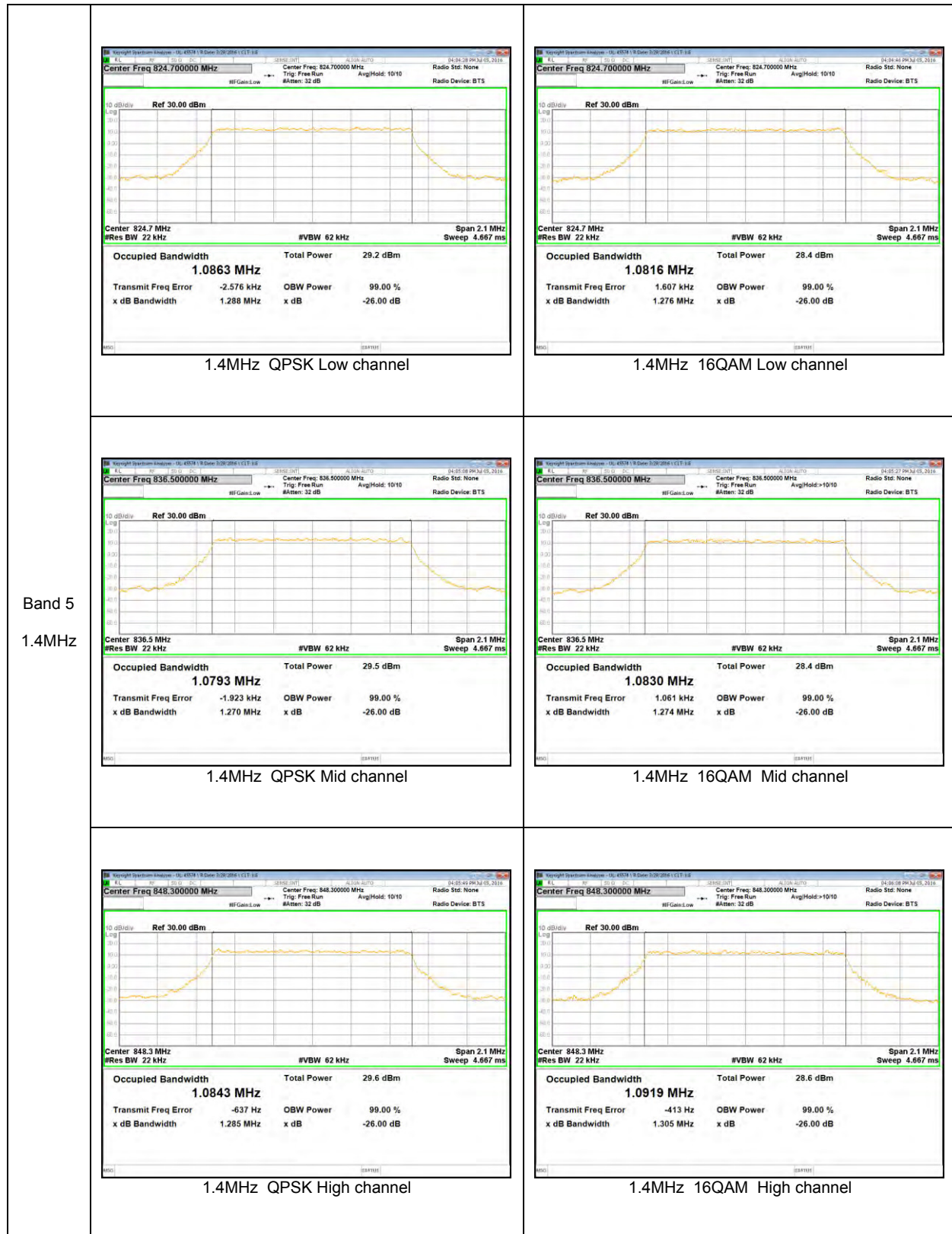


LTE Band 5

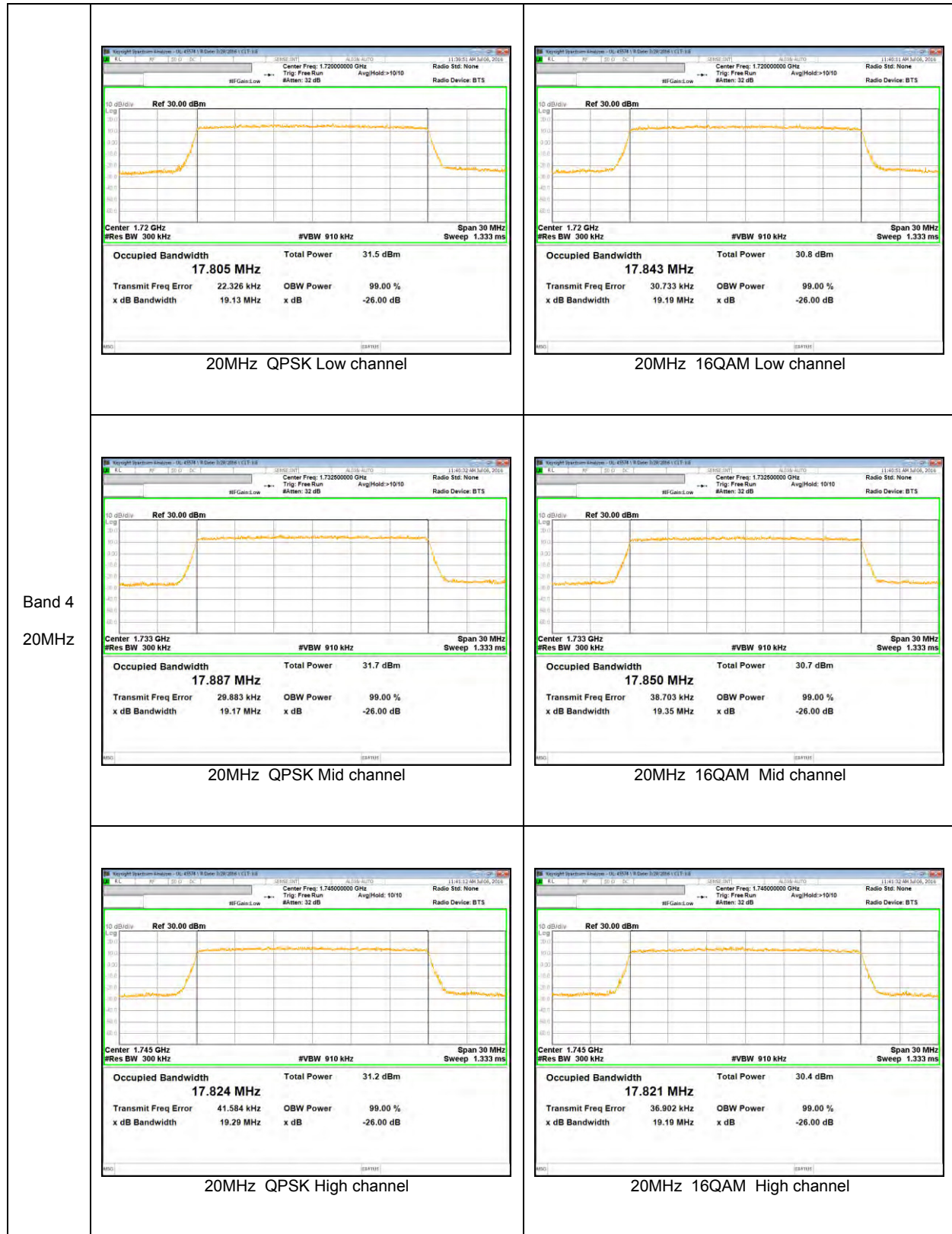


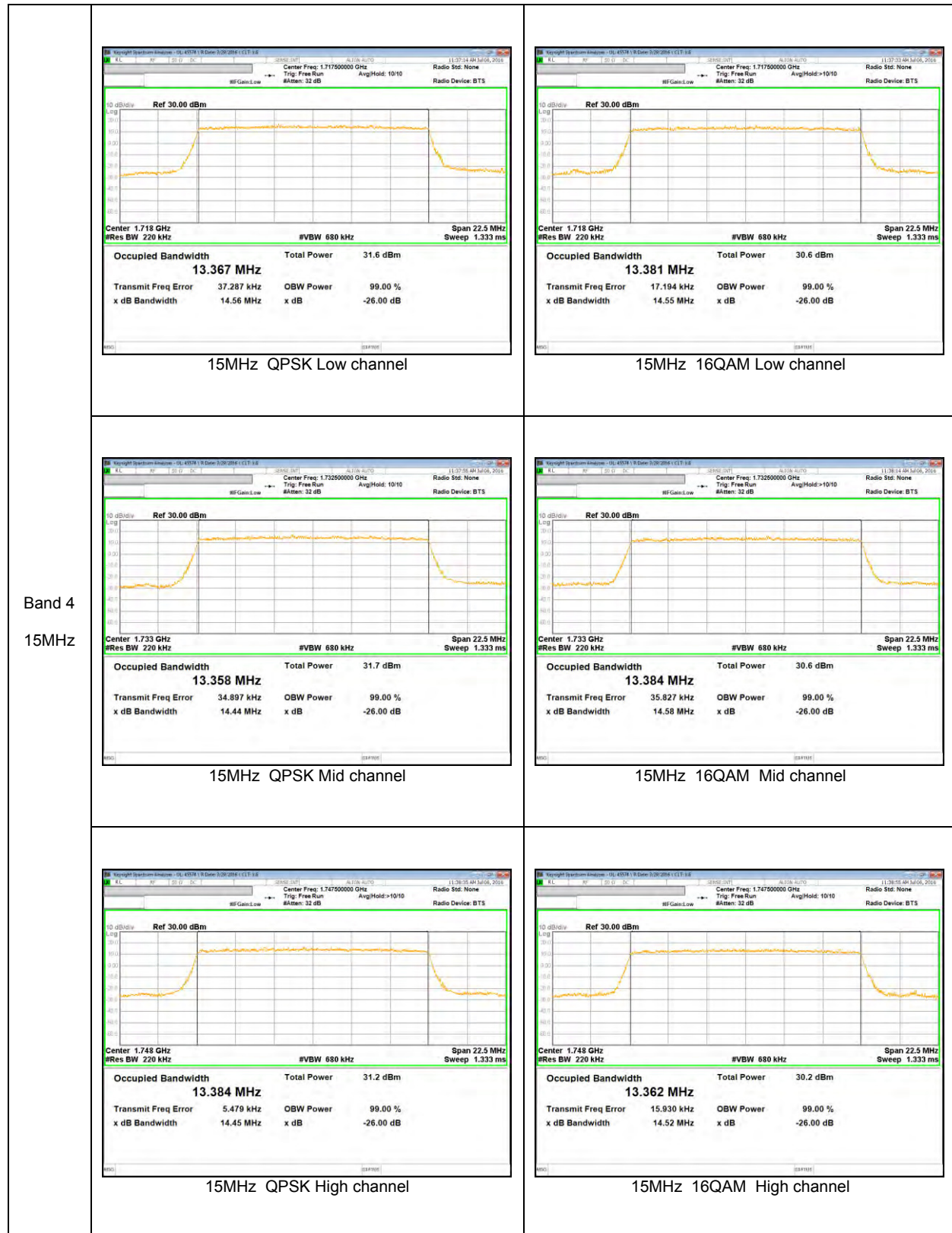






LTE Band 4





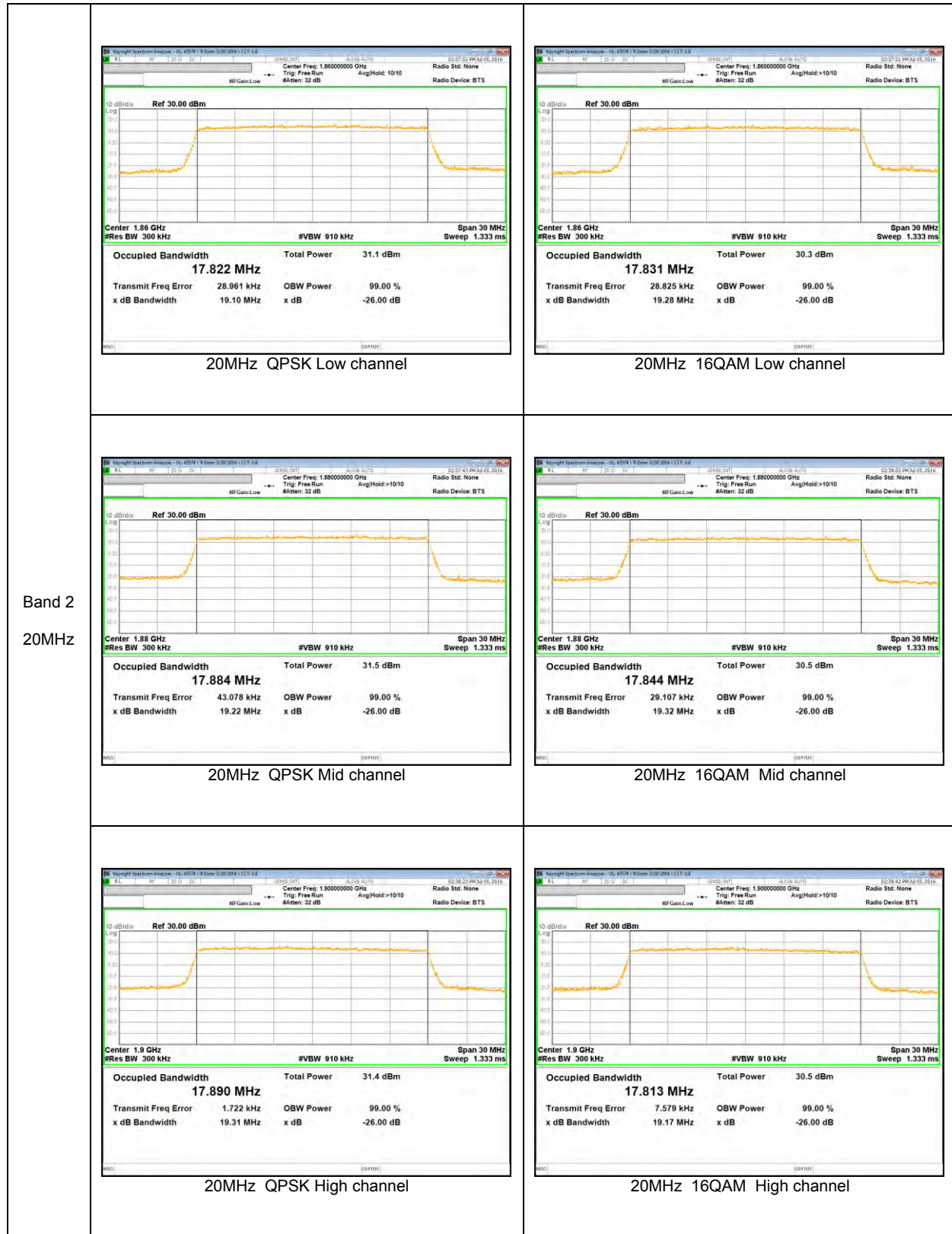


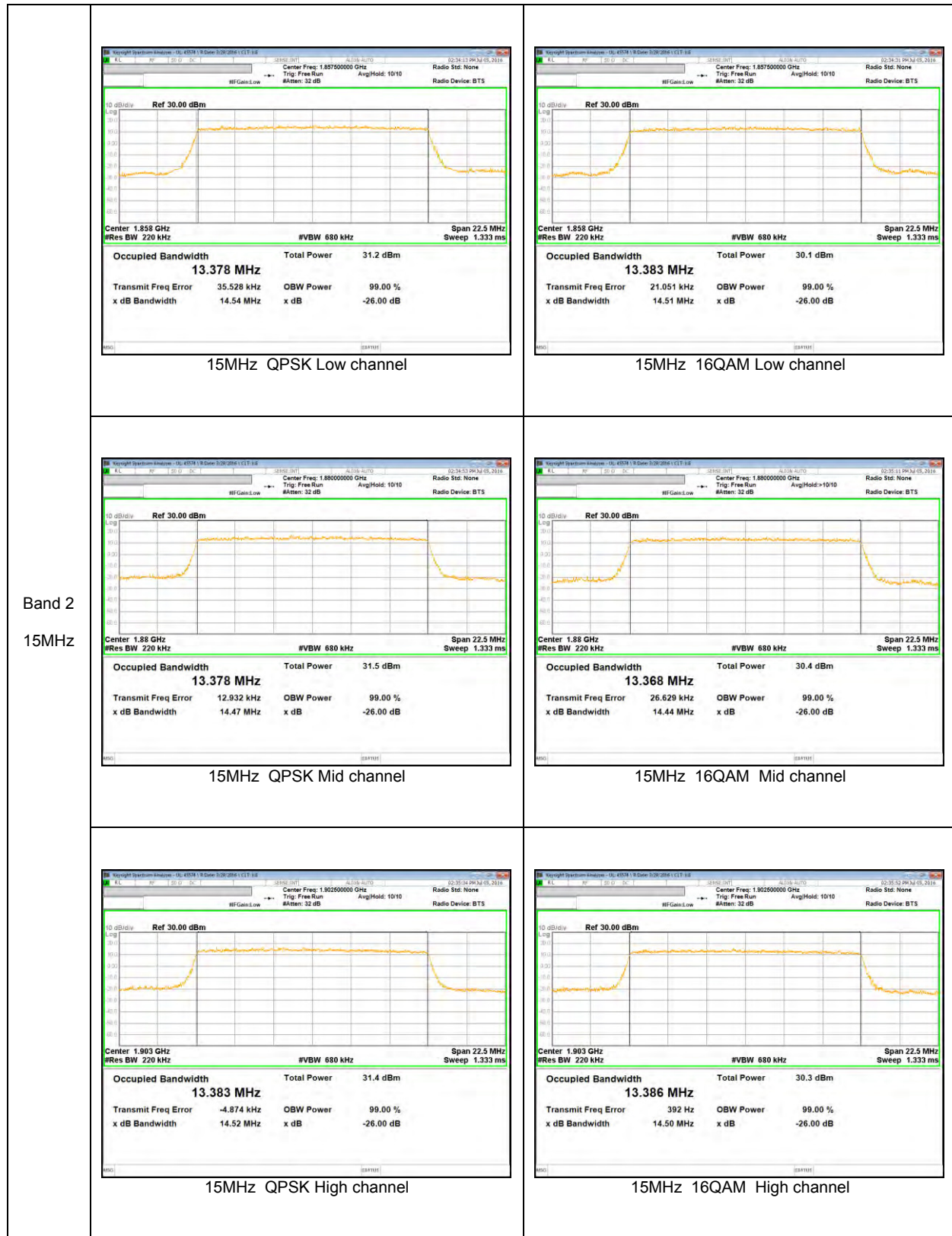




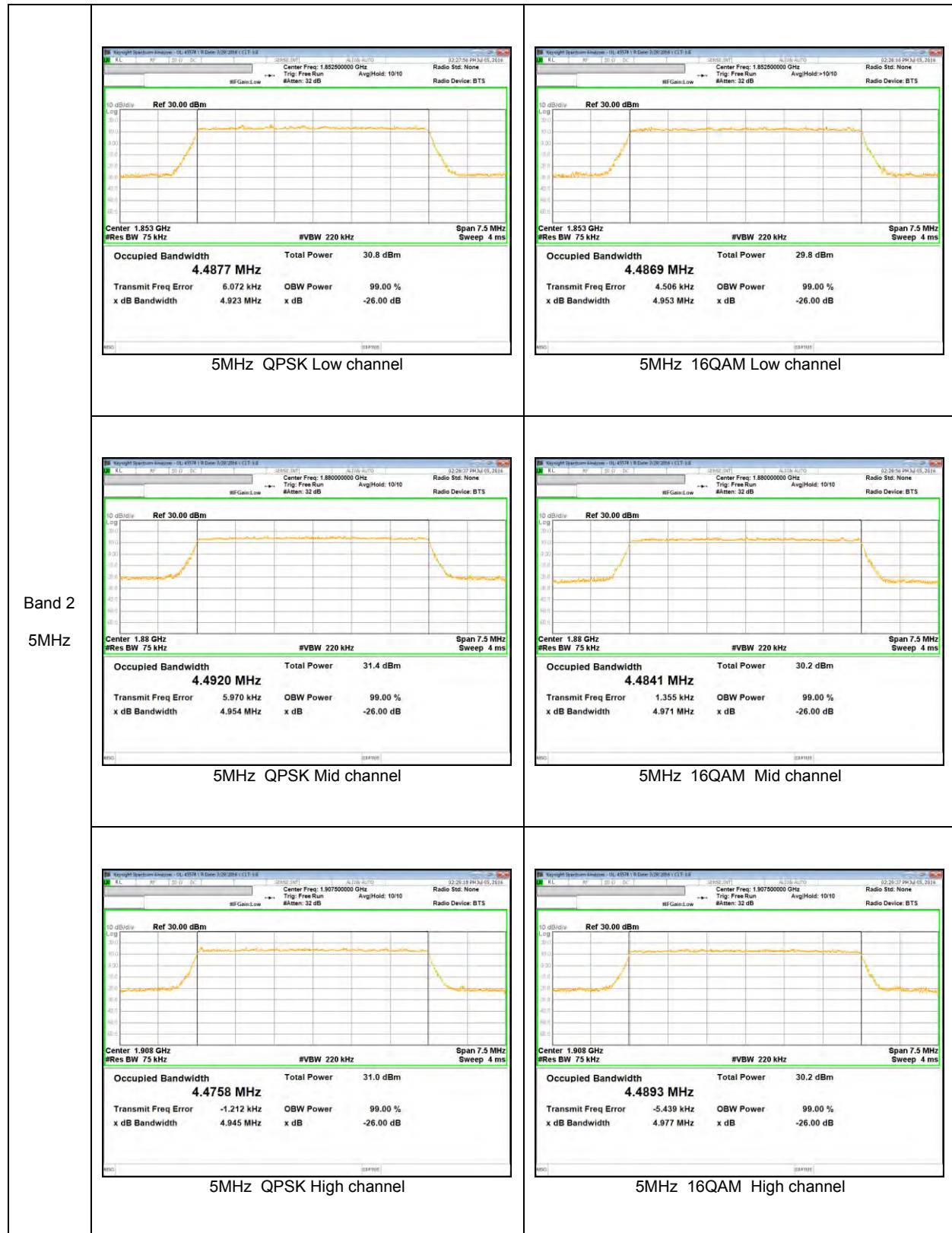


LTE Band 2





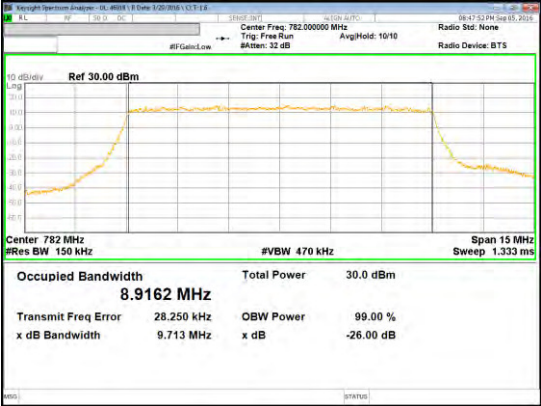
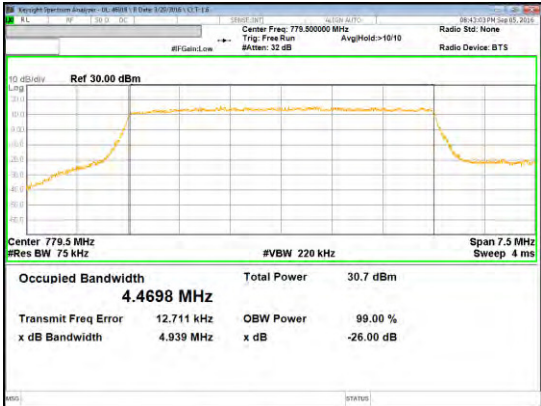
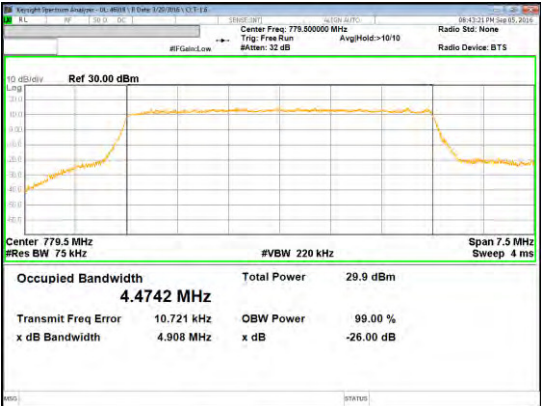
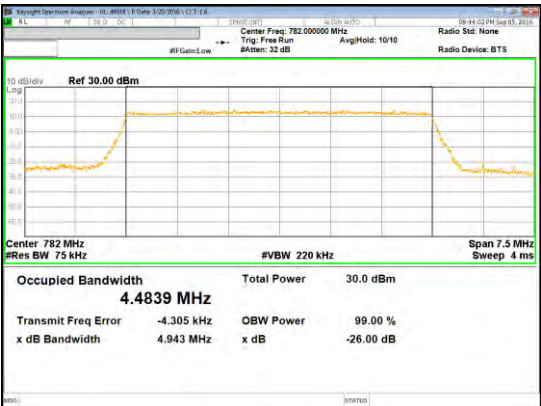


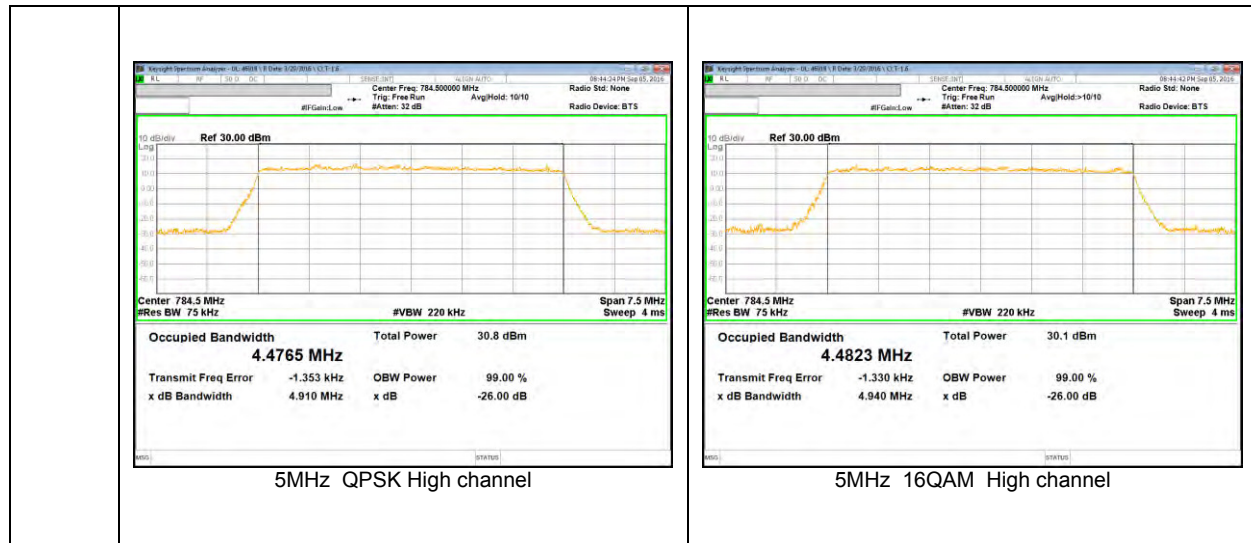






LTE Band 13

Band 13 10MHz	 10MHz QPSK Low channel	 10MHz 16QAM Low channel
Band 13 5MHz	 5MHz QPSK Low channel	 5MHz 16QAM Low channel
	 5MHz QPSK Mid channel	 5MHz 16QAM Mid channel



10.2. BAND EDGE EMISSIONS

RULE PART(S)

FCC: §22.359, §24.238 and §27. 53

LIMITS

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

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v02r02

The transmitter output was connected to 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

WCDMA

Band	Mode	Side	f [MHz]	Level [dBm]	Limit [dBm]
Band 5	REL99	Lower	824.000	-28.110	-13.00
		Upper	849.000	-28.392	
	HSDPA	Lower	824.000	-30.297	
		Upper	849.000	-29.894	
Band 2	REL99	Lower	1850.000	-26.820	
		Upper	1910.000	-23.621	
	HSDPA	Lower	1850.000	-31.079	
		Upper	1910.000	-28.121	

LTE 5

Bandwidth	Mode	Side	RB Status	f [MHz]	Level [dBm]	Limit [dBm]
10 MHz	QPSK	Lower	1RB	824.000	-30.537	-13.00
			FRB	824.000	-32.581	
		Upper	1RB	849.000	-27.250	
			FRB	849.000	-31.921	
	16QAM	Lower	1RB	824.000	-29.384	
			FRB	824.000	-34.041	
		Upper	1RB	849.000	-29.031	
			FRB	849.000	-31.955	
5 MHz	QPSK	Lower	1RB	824.000	-24.609	
			FRB	824.000	-28.210	
		Upper	1RB	849.000	-19.787	
			FRB	849.000	-28.413	
	16QAM	Lower	1RB	824.000	-20.996	
			FRB	824.000	-27.281	
		Upper	1RB	849.000	-20.787	
			FRB	849.000	-31.141	
3 MHz	QPSK	Lower	1RB	824.000	-20.783	
			FRB	824.000	-29.250	
		Upper	1RB	849.000	-19.713	
			FRB	849.000	-28.265	
	16QAM	Lower	1RB	824.000	-22.988	
			FRB	824.000	-30.964	
		Upper	1RB	849.000	-20.847	
			FRB	849.000	-26.214	
1.4 MHz	QPSK	Lower	1RB	824.000	-25.599	
			FRB	824.000	-30.671	
		Upper	1RB	849.000	-23.516	
			FRB	849.000	-28.970	
	16QAM	Lower	1RB	824.000	-26.500	
			FRB	824.000	-31.739	
		Upper	1RB	849.000	-25.820	
			FRB	849.000	-29.625	

LTE 4

Bandwidth	Mode	Side	RB Status	f [MHz]	Level [dBm]	Limit [dBm]
20 MHz	QPSK	Lower	1RB	1710.000	-26.267	-13.00
			FRB	1710.000	-31.889	
		Upper	1RB	1755.000	-26.649	
			FRB	1755.000	-32.709	
	16QAM	Lower	1RB	1710.000	-32.601	
			FRB	1710.000	-31.881	
		Upper	1RB	1755.000	-35.529	
			FRB	1755.000	-34.121	
15 MHz	QPSK	Lower	1RB	1710.000	-25.251	
			FRB	1710.000	-31.713	
		Upper	1RB	1755.000	-28.419	
			FRB	1755.000	-31.328	
	16QAM	Lower	1RB	1710.000	-29.076	
			FRB	1710.000	-31.483	
		Upper	1RB	1755.000	-24.381	
			FRB	1755.000	-31.787	
10 MHz	QPSK	Lower	1RB	1710.000	-29.497	
			FRB	1710.000	-28.481	
		Upper	1RB	1755.000	-30.849	
			FRB	1755.000	-29.043	
	16QAM	Lower	1RB	1710.000	-28.824	
			FRB	1710.000	-31.889	
		Upper	1RB	1755.000	-26.080	
			FRB	1755.000	-30.239	
5 MHz	QPSK	Lower	1RB	1710.000	-17.356	
			FRB	1710.000	-25.276	
		Upper	1RB	1755.000	-17.969	
			FRB	1755.000	-27.308	
	16QAM	Lower	1RB	1710.000	-19.419	
			FRB	1710.000	-27.583	
		Upper	1RB	1755.000	-20.088	
			FRB	1755.000	-28.412	

Bandwidth	Mode	Side	RB Status	f [MHz]	Level [dBm]	Limit [dBm]
3 MHz	QPSK	Lower	1RB	1710.000	-17.329	-13.00
			FRB	1710.000	-23.478	
		Upper	1RB	1755.000	-16.314	
			FRB	1755.000	-26.058	
	16QAM	Lower	1RB	1710.000	-17.767	
			FRB	1710.000	-25.539	
		Upper	1RB	1755.000	-18.428	
			FRB	1755.000	-26.577	
1.4 MHz	QPSK	Lower	1RB	1710.000	-20.618	-13.00
			FRB	1710.000	-24.490	
		Upper	1RB	1755.000	-19.945	
			FRB	1755.000	-27.899	
	16QAM	Lower	1RB	1710.000	-21.629	
			FRB	1710.000	-26.547	
		Upper	1RB	1755.000	-22.787	
			FRB	1755.000	-29.423	

LTE 2

Bandwidth	Mode	Side	RB Status	f [MHz]	Level [dBm]	Limit [dBm]
20 MHz	QPSK	Lower	1RB	1850.000	-28.176	-13.00
			FRB	1850.000	-30.909	
		Upper	1RB	1910.000	-26.793	
			FRB	1910.000	-25.858	
	16QAM	Lower	1RB	1850.000	-27.429	
			FRB	1850.000	-32.783	
		Upper	1RB	1910.000	-35.653	
			FRB	1910.000	-29.306	
15 MHz	QPSK	Lower	1RB	1850.000	-32.523	-13.00
			FRB	1850.000	-28.762	
		Upper	1RB	1910.000	-29.870	
			FRB	1910.000	-25.285	
	16QAM	Lower	1RB	1850.000	-26.409	
			FRB	1850.000	-30.897	
		Upper	1RB	1910.000	-22.351	
			FRB	1910.000	-28.846	

Bandwidth	Mode	Side	RB Status	f [MHz]	Level [dBm]	Limit [dBm]
10 MHz	QPSK	Lower	1RB	1850.000	-30.560	-13.00
			FRB	1850.000	-28.201	
		Upper	1RB	1910.000	-22.998	
			FRB	1910.000	-25.591	
	16QAM	Lower	1RB	1850.000	-29.357	
			FRB	1850.000	-31.456	
		Upper	1RB	1910.000	-27.872	
			FRB	1910.000	-27.808	
5 MHz	QPSK	Lower	1RB	1850.000	-16.357	
			FRB	1850.000	-26.632	
		Upper	1RB	1910.000	-15.465	
			FRB	1910.000	-23.885	
	16QAM	Lower	1RB	1850.000	-18.836	
			FRB	1850.000	-27.260	
		Upper	1RB	1910.000	-15.906	
			FRB	1910.000	-26.457	
3 MHz	QPSK	Lower	1RB	1850.000	-15.863	
			FRB	1850.000	-27.851	
		Upper	1RB	1910.000	-14.684	
			FRB	1910.000	-24.384	
	16QAM	Lower	1RB	1850.000	-17.724	
			FRB	1850.000	-26.908	
		Upper	1RB	1910.000	-16.103	
			FRB	1910.000	-25.543	
1.4 MHz	QPSK	Lower	1RB	1850.000	-20.159	
			FRB	1850.000	-26.609	
		Upper	1RB	1910.000	-18.259	
			FRB	1910.000	-23.491	
	16QAM	Lower	1RB	1850.000	-21.593	
			FRB	1850.000	-27.474	
		Upper	1RB	1910.000	-21.138	
			FRB	1910.000	-25.690	

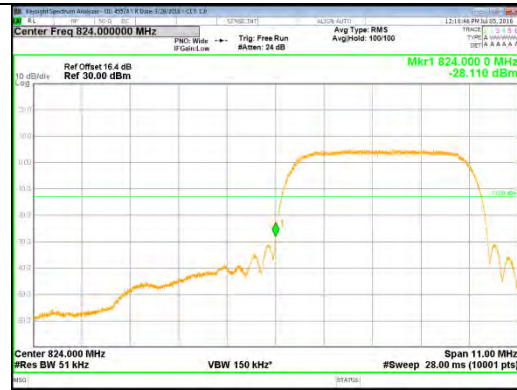
LTE 13

Bandwidth	Mode	Side	RB Status	f [MHz]	Level [dBm]	Limit [dBm]
10 MHz	QPSK	Lower	1RB	777.000	-29.510	-13.00
			FRB	777.000	-29.914	
		Upper	1RB	787.000	-28.660	
			FRB	787.000	-28.532	
	16QAM	Lower	1RB	777.000	-34.593	
			FRB	777.000	-32.973	
		Upper	1RB	787.000	-27.797	
			FRB	787.000	-28.222	
5 MHz	QPSK	Lower	1RB	777.000	-18.977	-13.00
			FRB	777.000	-26.533	
		Upper	1RB	787.000	-18.704	
			FRB	787.000	-28.222	
	16QAM	Lower	1RB	777.000	-20.916	
			FRB	777.000	-29.106	
		Upper	1RB	787.000	-21.241	
			FRB	787.000	-27.374	

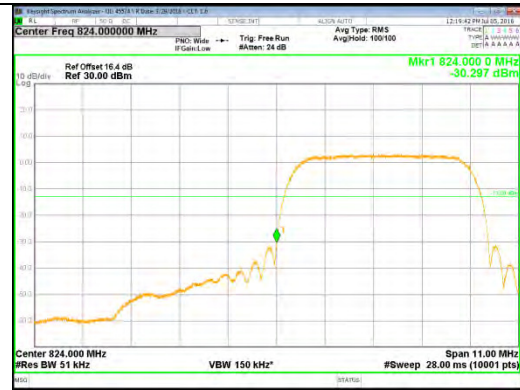
10.2.1. BAND EDGE PLOTS

WCDMA

Band 5



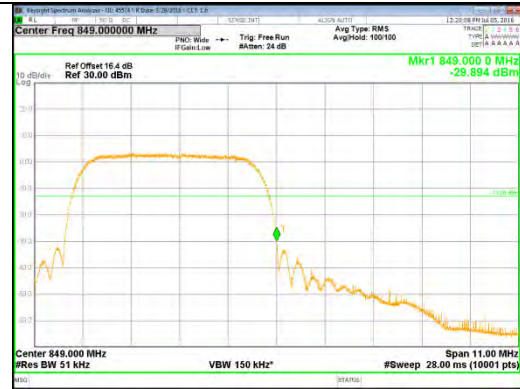
REL99 Low channel



HSDPA Low channel



REL99 High channel



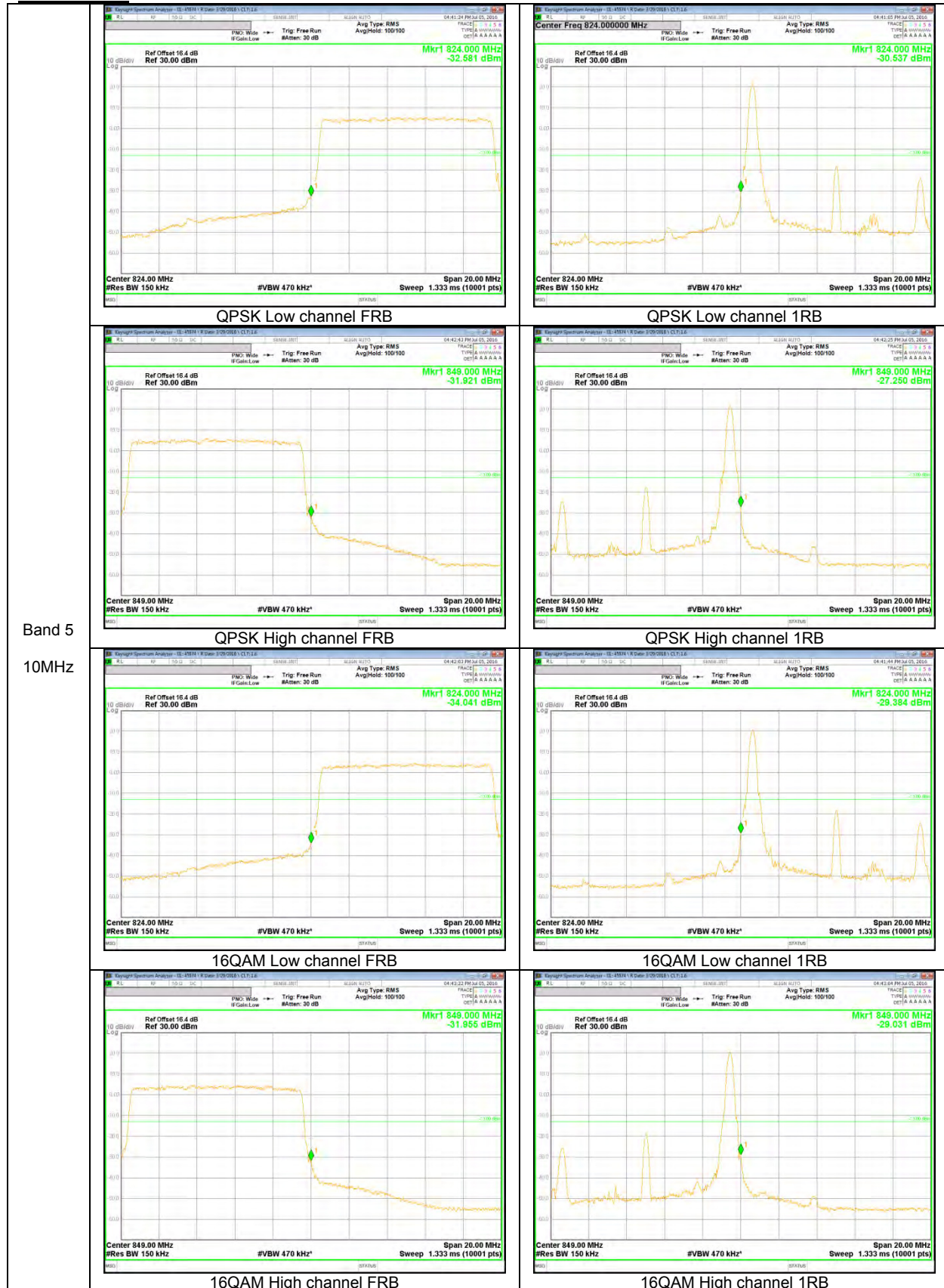
HSDPA High channel

WCDMA

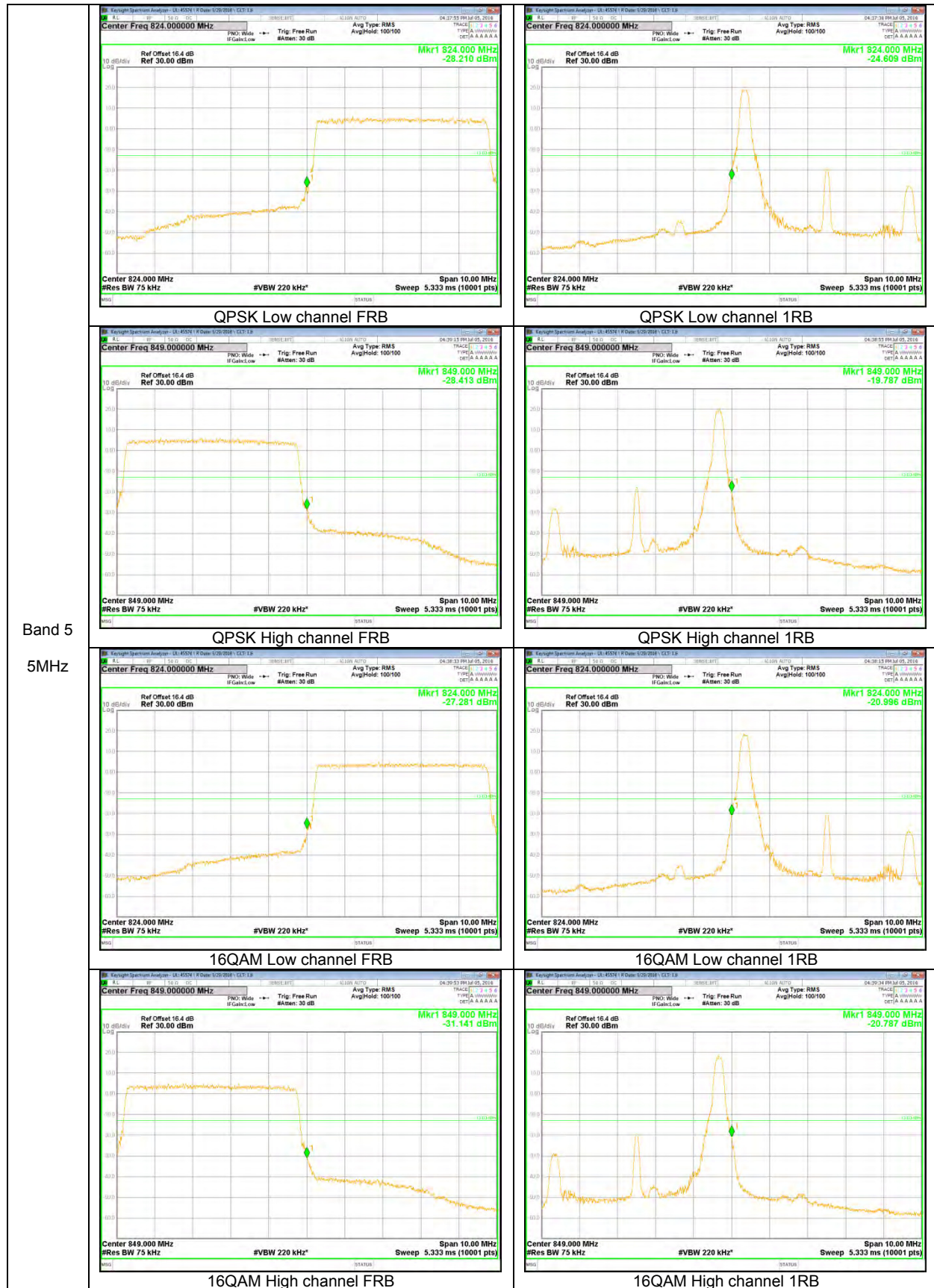
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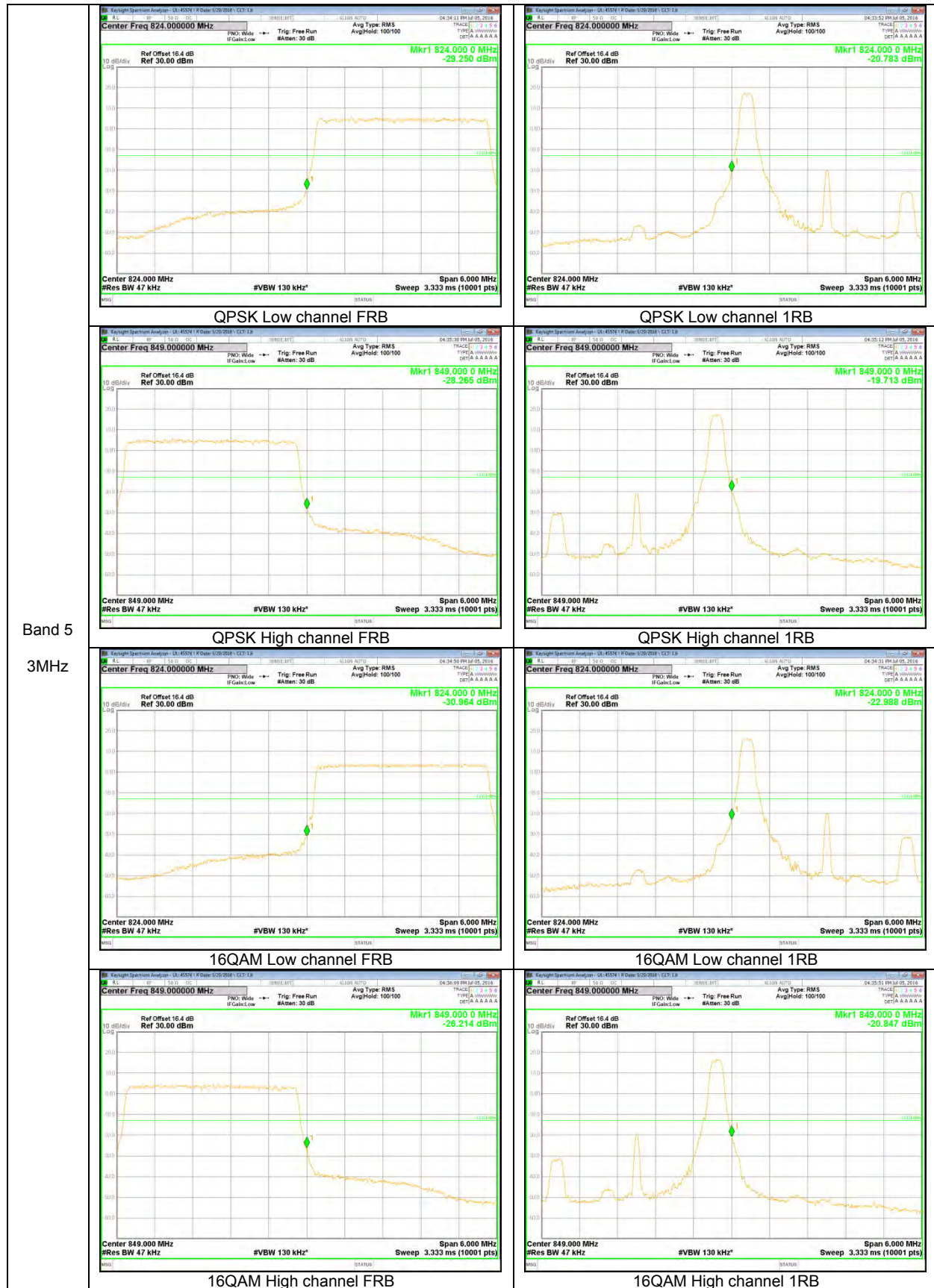


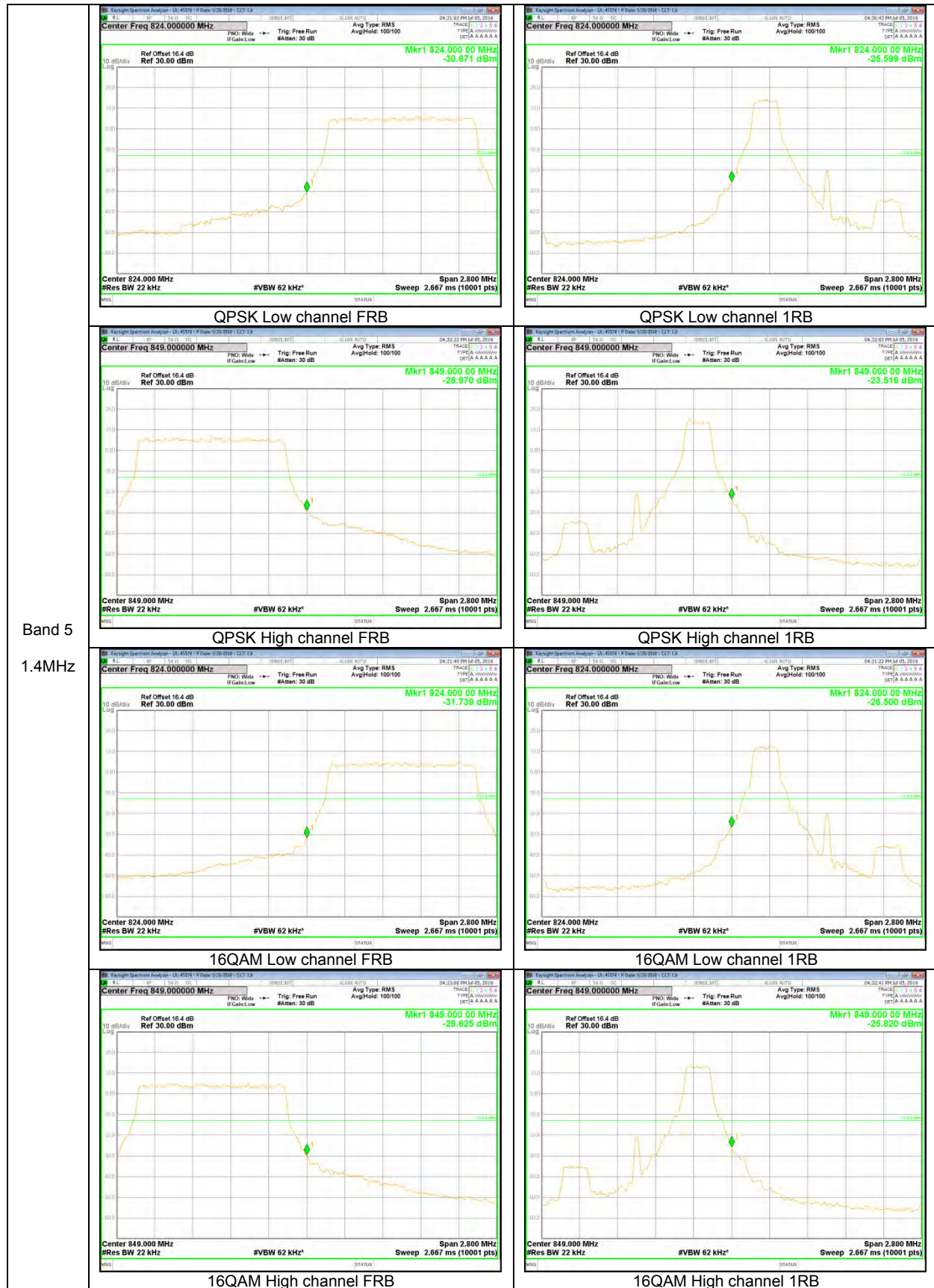
LTE Band 5



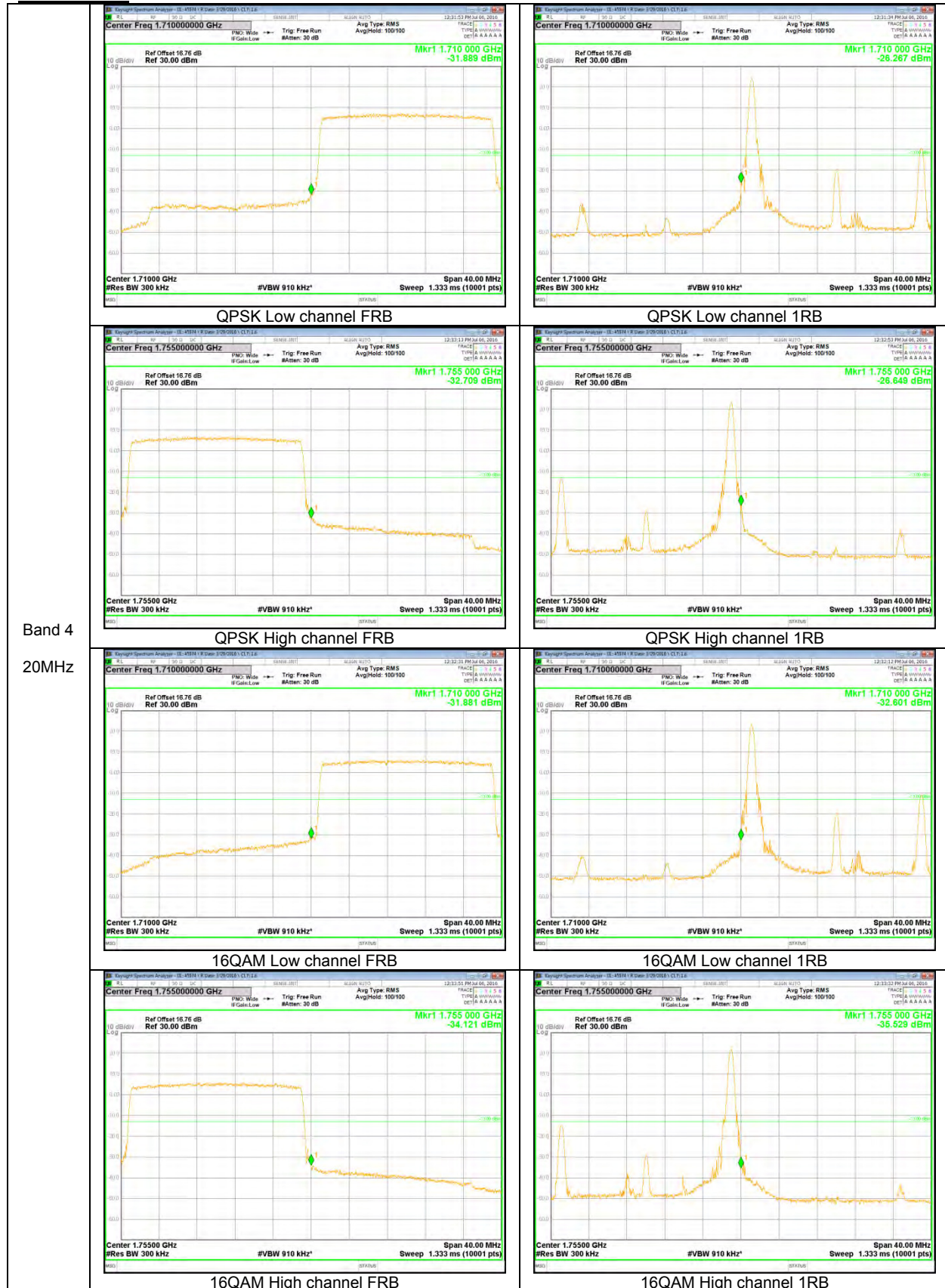
Band 5
10MHz







LTE Band 4



Band 4
20MHz

