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

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

MODEL NUMBER : SM-T719

FCC ID: A3LSMT719

REPORT NUMBER: 16K22866-E6V2

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Prepared for
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ACCREDITED
TL-637

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	03/18/16	Initial issue	Junwhan Lee
V2	03/31/16	Revised channel information on page 128	Junwhan Lee

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	SAMSUNG ELECTRONICS CO., LTD.
EUT DESCRIPTION:	GSM/WCDMA/LTE Tablet + BT/BLE, DTS/UNII a/b/g/n/ac and ANT+
MODEL NUMBER:	SM-T719
SERIAL NUMBER:	R32H2000GSF (RADIATED); B03656B7 (CONDUCTED)
DATE TESTED:	FEB 18, 2016 - MAR 8, 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.

Approved & Released For
UL Korea, Ltd. By:

CY Choi
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UL Korea, Ltd.

Tested By:

Junwhan Lee
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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with TIA-603-D, 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:

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

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

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

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	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 GSM/WCDMA/LTE Tablet + BT/BLE, DTS/UNII a/b/g/n/ac and ANT+.

5.2. MAXIMUM OUTPUT POWER (GSM)

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]
GSM850	824~849	GMSK	32.42	1745.82		
		GPRS	32.44	1753.88	26.75	473.15
		EGPRS	27.20	524.81	21.84	152.76
GSM1900	1850~1910	GMSK	30.45	1109.17		
		GPRS	30.32	1076.47	31.65	1462.18
		EGPRS	26.82	480.84	30.01	1002.31

5.3. 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	22.67	184.93	16.10	40.74
		HSDPA	22.64	183.65	16.92	49.20
		HSUPA	22.50	177.83		
Band 2	1850~1910	REL99	21.98	157.76	24.22	264.24
		HSDPA	21.88	154.17	23.72	235.50
		HSUPA	21.70	147.91		

5.4. MAXIMUM OUTPUT POWER (LTE)

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

LTE Band 17

FCC Part 27							
Band	Frequency Range [MHz]	BandWidth [MHz]	Modulation Peak	Conducted		Radiated	
				Avg [dBm]	Avg [mW]	Avg [dBm]	Avg [mW]
Band 17	704 ~ 716	10	QPSK	23.17	207.49	10.56	11.38
			16QAM	21.95	156.68	9.44	8.79
		5	QPSK	23.26	211.84	10.92	12.36
			16QAM	22.06	160.69	9.90	9.77

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	23.41	219.28	17.10	51.29
			16QAM	22.50	177.83	16.11	40.83
		5	QPSK	23.50	223.87	17.02	50.35
			16QAM	22.35	171.79	16.09	40.64
		3	QPSK	23.41	219.28	16.53	44.98
			16QAM	22.50	177.83	15.48	35.32
		1.4	QPSK	23.50	223.87	14.29	26.85
			16QAM	22.45	175.79	13.35	21.63

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	23.50	223.87	24.64	291.07
			16QAM	22.50	177.83	24.02	252.35
		15	QPSK	23.86	243.22	24.07	255.27
			16QAM	22.71	186.64	23.16	207.01
		10	QPSK	23.91	246.04	24.61	289.07
			16QAM	22.50	177.83	23.58	228.03
		5	QPSK	23.80	239.88	24.45	278.61
			16QAM	22.67	184.93	23.37	217.27
		3	QPSK	24.00	251.19	23.42	219.79
			16QAM	22.68	185.35	22.57	180.72
		1.4	QPSK	24.00	251.19	21.75	149.62
			16QAM	22.62	182.81	20.57	114.02

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	21.95	156.68	22.70	186.21
			16QAM	20.78	119.67	21.86	153.46
		15	QPSK	21.99	158.12	21.97	157.40
			16QAM	21.00	125.89	21.06	127.64
		10	QPSK	21.92	155.60	22.24	167.49
			16QAM	20.84	121.34	21.08	128.23
		5	QPSK	22.00	158.49	21.86	153.46
			16QAM	20.64	115.88	20.94	124.17
		3	QPSK	22.00	158.49	21.98	157.76
			16QAM	20.97	125.03	21.65	146.22
		1.4	QPSK	22.00	158.49	20.14	103.28
			16QAM	20.94	124.17	19.12	81.66

5.5. 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)
GSM850 / WCDMA Band 5 / LTE Band 5 824 ~ 849 MHz	-3.82
GSM1900 / WCDMA Band 2 / LTE Band 2 1850 ~ 1910 MHz	-1.12
LTE Band 17 704 ~ 716 MHz	-6.28
WCDMA Band 4 / LTE Band 4 1710 ~ 1755 MHz	-0.78

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Charger	SAMSUNG	EP-TA20EWE	R37G4AH1402DK3	N/A
Data Cable	SAMSUNG	EP-DG925UWE	N/A	N/A
Earphone	SAMSUNG	EO-EG900BW	N/A	N/A

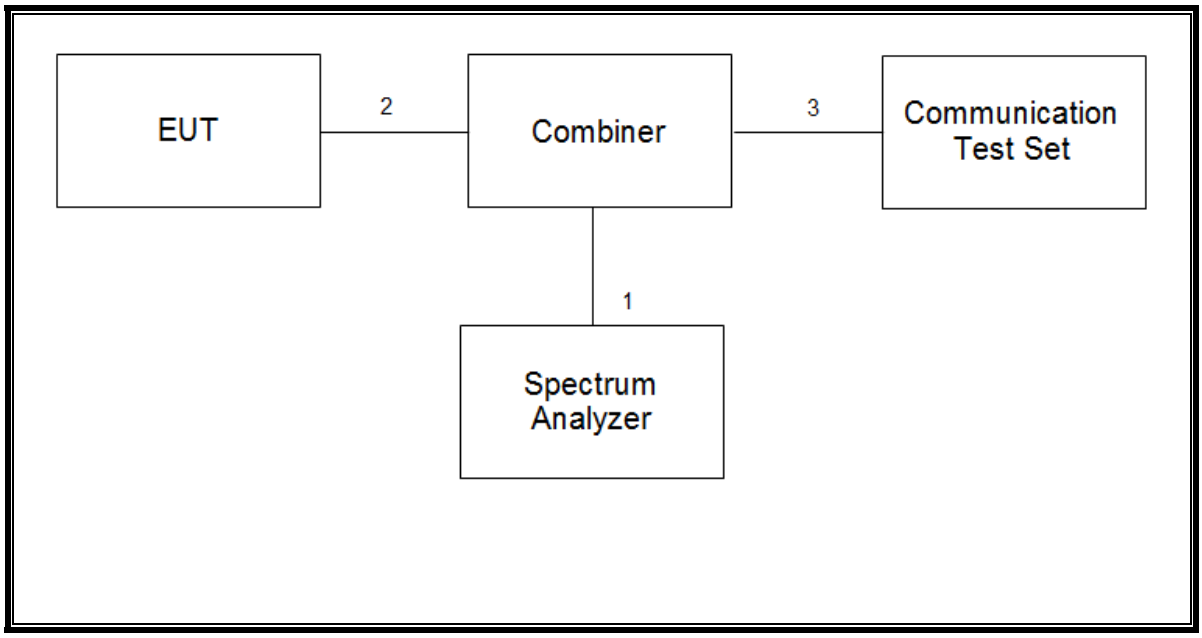
I/O CABLES

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

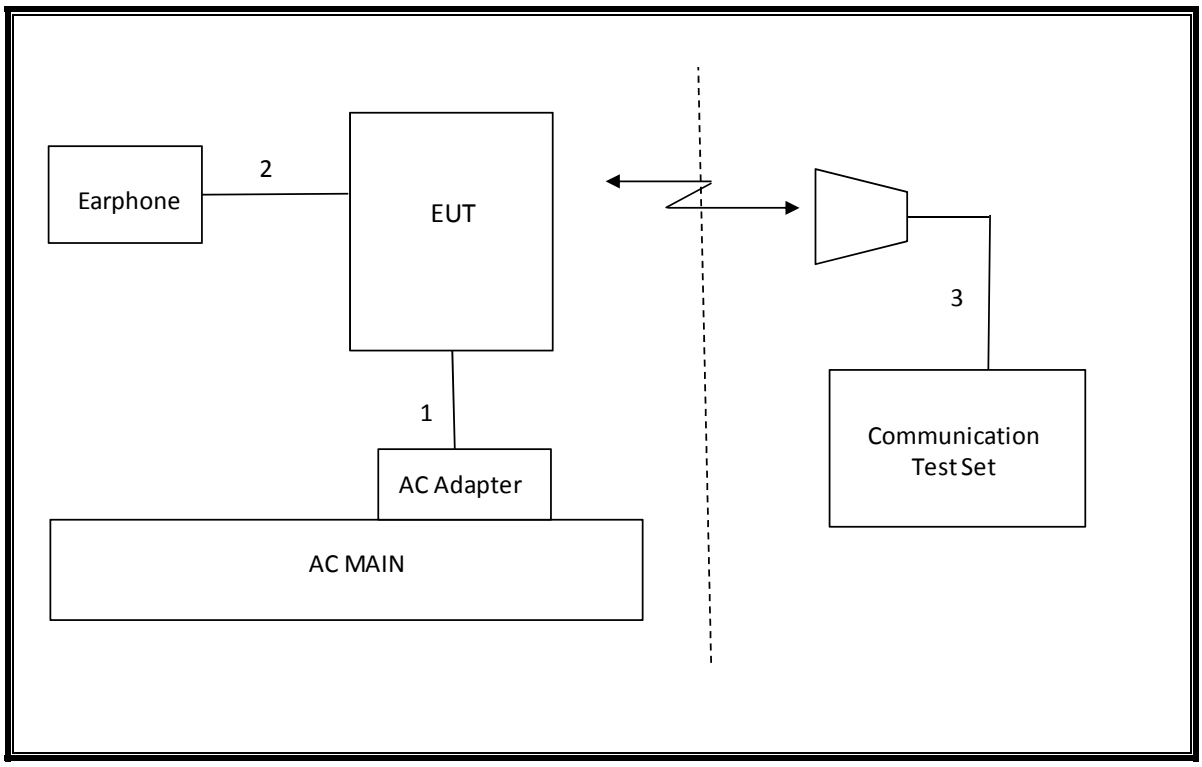
TEST SETUP

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	07-28-16
Antenna, Horn, 40 GHz	ETS	3116C	00166155	09-23-16
Antenna, Horn, 40 GHz	ETS	3116C-PA	00168841	08-24-17
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	WEINSCHEL	1575	2151	08-20-16
Communications Test Set	R&S	CMW500	150312	08-18-16
Communications Test Set	R&S	CMW500	115331	08-18-16
Communications Test Set	R&S	CMW500	102271	08-18-16
DC Power Supply	Agilent / HP	E3640A	MY54226395	08-18-16
Preamplifier, 1000 MHz	Sonoma	310N	341282	08-18-16
Preamplifier, 1000 MHz	Sonoma	310N	351741	08-18-16
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1876511	08-18-16
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	08-18-16
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	08-19-16
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	08-19-16
Bluetooth Tester	TESCOM	TC-3000C	3000C000546	08-18-16
Average Power Sensor	R&S	NRZ-Z91	102681	08-18-16
Average Power Sensor	Agilent / HP	U2000	MY54270007	08-18-16
EMI Test Receive, 40 GHz	R&S	ESU40	100439	08-19-16
EMI Test Receive, 40 GHz	R&S	ESU40	100457	08-19-16
EMI Test Receive, 3 GHz	R&S	ESR3	101832	08-19-16
Attenuator / Switch driver	HP	11713A	3748A04272	N/A
Low Pass Filter 3GHz	Micro-Tronics	LPS17541	009	08-18-16
Low Pass Filter 3GHz	Micro-Tronics	LPS17541	015	08-18-16
High Pass Filter 5GHz	Micro-Tronics	HPS17542	009	08-18-16
High Pass Filter 6GHz	Micro-Tronics	HPM17543	010	08-18-16
High Pass Filter 5GHz	Micro-Tronics	HPS17542	016	08-18-16
High Pass Filter 6GHz	Micro-Tronics	HPM17543	015	08-18-16
LISN	R&S	ENV-216	101836	08-19-16
LISN	R&S	ENV-216	101837	08-19-16

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	17.868 MHz
22.917(a) 24.238(a) 27.53(g)	Band Edge / Conducted Spurious Emission	-13dBm		Pass	-14.509 dBm
2.1046	Conducted output power	N/A		Pass	32.44 dBm
22.355 24.235 27.54	Frequency Stability	2.5PPM		Pass	0.01 PPM
22.913(a)(2)	Effective Radiated Power	38 dBm	Radiated	Pass	26.75 dBm
27.50(c)(10)		34.77 dBm		Pass	10.92 dBm
24.232(c)	Equivalent Isotropic Radiated Power	33dBm		Pass	31.65 dBm
27.50(d)(4)		30dBm		Pass	24.64dBm
22.917(a) 24.238(a) 27.53(g)	Radiated Spurious Emission	-13dBm		Pass	-31.9 dBm

FCC Rule Part	Frequency Range [MHz]	Output Power [W]	Frequency Tolerance	Emission Designator	Emission Bandwidth [MHz]	Communication Type
GSM						
22H	824.2 - 848.8	0.473	2.5 ppm	241KGXW		GSM850
22H	824.2 - 848.8	0.153	2.5 ppm	251KG7W		EDGE850
24E	1850.2 - 1909.8	1.462	2.5 ppm	244KGXW		GSM1900
24E	1850.2 - 1909.8	1.002	2.5 ppm	251KG7W		EDGE1900
WCDMA						
22H	826.4 - 846.6	0.049	2.5 ppm	4M15F9W		WCDMA B5
24E	1852.4 - 1907.6	0.264	2.5 ppm	4M12F9W		WCDMA B2
LTE Band 2						
24E	1860.0 - 1900.0	0.186	2.5 ppm	17M9G7W	20	QPSK
24E	1860.0 - 1900.0	0.153	2.5 ppm	17M9D7W	20	16QAM
LTE Band 4						
27L	1720.0 - 1745.0	0.291	2.5 ppm	17M9G7W	20	QPSK
27L	1720.0 - 1745.0	0.252	2.5 ppm	17M9D7W	20	16QAM
LTE Band 5						
22H	829.0 - 844.0	0.051	2.5 ppm	8M95G7W	10	QPSK
22H	829.0 - 844.0	0.041	2.5 ppm	8M96D7W	10	16QAM
LTE Band 17						
27H	709.0 - 711.0	0.011	2.5 ppm	8M95G7W	10	QPSK
27H	709.0 - 711.0	0.009	2.5 ppm	8M96D7W	10	16QAM
27H	706.5 - 713.5	0.012	2.5 ppm	4M49G7W	5	QPSK
27H	706.5 - 713.5	0.010	2.5 ppm	4M49D7W	5	16QAM

8. RF POWER OUTPUT VERIFICATION

8.1. GSM/GPRS/EDGE

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

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8.1.1. GSM OUTPUT POWER RESULT

GSM850 Measured Results

Band	Mode	Coding Scheme	Time Slots	Ch No.	Freq. [MHz]	Max. Power	
						Burst Pwr [dBm]	Frame Pwr [dBm]
850	GSM (Voice)	CS1	1	128	824.2	32.42	23.39
				190	836.6	32.42	23.39
				251	848.8	32.42	23.39
	GPRS (GMSK)	CS1	1	128	824.2	32.44	23.41
				190	836.6	32.43	23.40
				251	848.8	32.43	23.40
			2	128	824.2	31.48	25.46
				190	836.6	31.18	25.16
				251	848.8	31.13	25.11
			3	128	824.2	29.60	25.34
				190	836.6	29.38	25.12
				251	848.8	29.18	24.92
			4	128	824.2	27.89	24.88
				190	836.6	27.77	24.76
				251	848.8	27.57	24.56
	EGPRS (8PSK)	MCS5	1	128	824.2	27.20	18.17
				190	836.6	27.01	17.98
				251	848.8	26.83	17.80
			2	128	824.2	25.62	19.60
				190	836.6	25.39	19.37
				251	848.8	25.19	19.17
			3	128	824.2	23.96	19.70
				190	836.6	23.72	19.47
				251	848.8	23.51	19.25
			4	128	824.2	22.31	19.30
				190	836.6	22.08	19.07
				251	848.8	21.85	18.84

GSM1900 Measured Results

Band	Mode	Coding Scheme	Time Slots	Ch No.	Freq. [MHz]	Max. Power	
						Burst Pwr [dBm]	Frame Pwr [dBm]
1900	GSM (Voice)	CS1	1	512	1850.2	30.38	21.35
				661	1880.0	30.21	21.18
				810	1909.8	30.45	21.41
	GPRS (GMSK)	CS1	1	512	1850.2	30.32	21.29
				661	1880.0	30.12	21.09
				810	1909.8	30.32	21.29
			2	512	1850.2	28.47	22.45
				661	1880.0	28.50	22.48
				810	1909.8	28.50	22.48
			3	512	1850.2	25.73	21.47
				661	1880.0	26.16	21.90
				810	1909.8	26.04	21.78
			4	512	1850.2	24.53	21.52
				661	1880.0	25.17	22.16
				810	1909.8	24.91	21.90
	EGPRS (8PSK)	MCS5	1	512	1850.2	26.65	17.62
				661	1880.0	26.81	17.78
				810	1909.8	26.82	17.79
			2	512	1850.2	25.11	19.09
				661	1880.0	25.38	19.36
				810	1909.8	25.33	19.31
			3	512	1850.2	23.50	19.24
				661	1880.0	23.79	19.53
				810	1909.8	23.70	19.44
			4	512	1850.2	21.87	18.86
				661	1880.0	22.18	19.17
				810	1909.8	22.07	19.06

8.2. UMTS REL 99

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
	βc/βd	8/15

HSDPA Setup Procedures used to establish the test signals

The following 4 Sub-tests were completed according to Release 7 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			
	βc	2/15	11/15	15/15	15/15
	βd	15/15	15/15	8/15	4/15
	Bd (SF)	64			
	βc/βd	2/15	12/15	15/8	15/4
	βhs	4/15	24/15	30/15	30/15
	MPR (dB)	0	0	0.5	0.5
HSDPA Specific Settings	D_{ACK}	8			
	D_{NAK}	8			
	DCQI	8			
	Ack-Nack repetition factor	3			
	CQI Feedback (Table 5.2B.4)	4ms			
	CQI Repetition Factor (Table 5.2B.4)	2			
	Ahs=βhs/βc	30/15			

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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
	βc	11/15	6/15	15/15	2/15	15/15
	βd	15/15	15/15	9/15	15/15	0
	βec	209/225	12/15	30/15	2/15	5/15
	βc/βd	11/15	6/15	15/9	2/15	15/1
	βhs	22/15	12/15	30/15	4/15	5/15
	βed	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				
	Ahs = βhs/βc	30/15				
HSUPA Specific Settings	E-DPDCCH	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 Channelisation Codes	2xSF2				SF4

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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.		

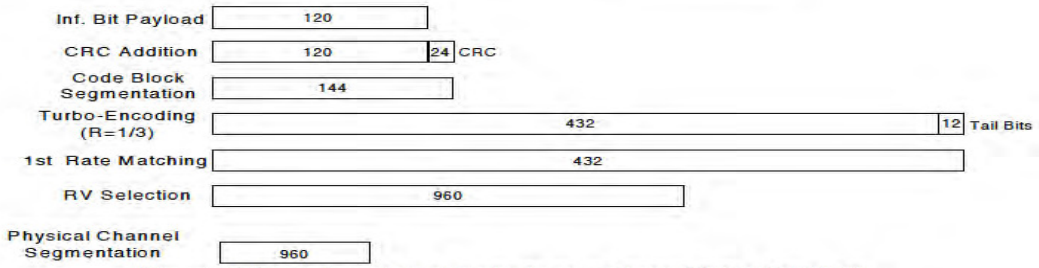

Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

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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			
	βc	2/15	11/15	15/15	15/15
	βd	15/15	15/15	8/15	4/15
	βd (SF)	64			
	βc/βd	2/15	11/15	15/8	15/4
	βhs	4/15	24/15	30/15	30/15
	MPR (dB)	0	0	0.5	0.5
HSDPA Specific Settings	DACK	8			
	DNAK	8			
	DCQI	8			
	Ack-Nack Repetition factor	3			
	CQI Feedback	4ms			
	CQI Repetition Factor	2			
	Ahs = βhs/ βc	30/15			

HSPA+

Since 16QAM is not used for uplink, the uplink Category and release is same as HSUPA, i.e., CAT 6 Rel 6. Therefore, the RF conducted power is not measured.

8.2.1. 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	22.67
			4183	836.6	0	22.52
			4233	846.6	0	22.46
	HSDPA	Subtest 1	4132	826.4	0	22.64
			4183	836.6	0	22.48
			4233	846.6	0	22.42
		Subtest 2	4132	826.4	0	22.31
			4183	836.6	0	22.16
			4233	846.6	0	22.07
		Subtest 3	4132	826.4	0.5	22.19
			4183	836.6	0.5	21.99
			4233	846.6	0.5	21.93
		Subtest 4	4132	826.4	0.5	22.17
			4183	836.6	0.5	22.07
			4233	846.6	0.5	21.91
	HSUPA	Subtest 1	4132	826.4	0	22.43
			4183	836.6	0	21.46
			4233	846.6	0	22.06
		Subtest 2	4132	826.4	2	18.82
			4183	836.6	2	18.67
			4233	846.6	2	18.57
		Subtest 3	4132	826.4	1	19.72
			4183	836.6	1	19.60
			4233	846.6	1	19.51
		Subtest 4	4132	826.4	2	18.82
			4183	836.6	2	18.65
			4233	846.6	2	18.55
		Subtest 5	4132	826.4	0	22.50
			4183	836.6	0	22.50
			4233	846.6	0	22.49

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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	21.67
			9400	1880.0	0	21.73
			9538	1907.6	0	21.98
	HSDPA	Subtest 1	9262	1852.4	0	21.68
			9400	1880.0	0	21.75
			9538	1907.6	0	21.88
		Subtest 2	9262	1852.4	0	21.24
			9400	1880.0	0	21.28
			9538	1907.6	0	21.58
		Subtest 3	9262	1852.4	0.5	21.06
			9400	1880.0	0.5	21.22
			9538	1907.6	0.5	21.47
		Subtest 4	9262	1852.4	0.5	21.06
			9400	1880.0	0.5	21.13
			9538	1907.6	0.5	21.45
	HSUPA	Subtest 1	9262	1852.4	0	21.29
			9400	1880.0	0	21.37
			9538	1907.6	0	21.36
		Subtest 2	9262	1852.4	2	17.70
			9400	1880.0	2	17.72
			9538	1907.6	2	17.99
		Subtest 3	9262	1852.4	1	18.70
			9400	1880.0	1	18.72
			9538	1907.6	1	18.93
		Subtest 4	9262	1852.4	2	17.70
			9400	1880.0	2	17.73
			9538	1907.6	2	17.98
		Subtest 5	9262	1852.4	0	21.62
			9400	1880.0	0	21.70
			9538	1907.6	0	21.70

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8.3. 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 6.6.3.3.2	13	10	Table 6.2.4-2	Table 6.2.4-2
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.					

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8.3.1. LTE OUTPUT POWER RESULT

LTE Band 17 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm) 23790 710 MHz
10	QPSK	1	0	0	23.08
		1	25	0	23.17
		1	49	0	22.93
		25	0	1	22.09
		25	12	1	22.13
		25	25	1	22.00
		50	0	1	22.01
	16QAM	1	0	1	21.95
		1	25	1	21.87
		1	49	1	21.46
		25	0	2	21.08
		25	12	2	21.11
		25	25	2	21.06
		50	0	2	21.03
BW (MHz)	Mode	RB Allocation	RB offset	Target MPR	Avg Pwr (dBm) 23790 710 MHz
5	QPSK	1	0	0	23.16
		1	12	0	23.26
		1	24	0	23.12
		12	0	1	22.00
		12	7	1	22.12
		12	13	1	21.94
		25	0	1	22.00
	16QAM	1	0	1	21.82
		1	12	1	22.06
		1	24	1	21.73
		12	0	2	20.75
		12	7	2	20.99
		12	13	2	21.08
		25	0	2	20.96

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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	23.41	23.13	23.06
			1	25	0	23.36	23.35	23.31
			1	49	0	23.09	23.02	23.04
			25	0	1	22.36	22.31	22.28
			25	12	1	22.31	22.27	22.18
			25	25	1	22.25	22.18	22.17
			50	0	1	22.30	22.23	22.21
		16QAM	1	0	1	22.14	22.03	22.19
			1	25	1	22.02	21.86	22.50
			1	49	1	22.04	21.47	21.75
			25	0	2	21.33	21.27	21.27
			25	12	2	21.37	21.44	21.29
			25	25	2	21.21	21.31	21.21
			50	0	2	21.26	21.13	21.11

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	23.19	23.01	23.12
			1	12	0	23.33	23.50	23.40
			1	24	0	23.10	23.30	23.18
			12	0	1	22.31	22.27	22.21
			12	7	1	22.32	22.27	22.19
			12	13	1	22.25	22.18	22.18
			25	0	1	22.25	22.19	22.11
		16QAM	1	0	1	22.08	21.98	21.72
			1	12	1	22.35	22.21	22.26
			1	24	1	22.02	21.74	22.20
			12	0	2	21.29	21.23	20.99
			12	7	2	21.30	21.33	21.10
			12	13	2	21.23	21.25	21.07
			25	0	2	21.29	21.23	20.74

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	23.11	23.06	22.95
			1	8	0	23.33	23.41	23.30
			1	14	0	23.30	23.11	23.21
			8	0	1	22.25	22.21	22.16
			8	4	1	22.18	22.30	22.16
			8	7	1	22.18	22.31	22.20
			15	0	1	22.22	22.23	22.08
		16QAM	1	0	1	22.10	22.43	22.02
			1	8	1	22.21	22.50	22.15
			1	14	1	22.07	21.97	21.96
			8	0	2	21.38	20.89	21.12
			8	4	2	21.50	20.91	21.20
			8	7	2	21.50	20.92	21.07
			15	0	2	21.29	21.14	20.97

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	23.50	22.98	23.14
			1	3	0	23.43	23.19	23.34
			1	5	0	23.27	23.13	23.25
			3	0	0	23.26	23.15	23.38
			3	1	0	23.31	23.20	23.32
			3	3	0	23.31	23.29	23.38
			6	0	1	22.32	22.15	22.18
		16QAM	1	0	1	22.31	21.98	22.14
			1	3	1	22.30	21.78	22.33
			1	5	1	22.26	21.99	22.20
			3	0	1	22.09	21.76	22.45
			3	1	1	22.22	21.99	22.42
			3	3	1	22.34	22.13	22.35
			6	0	2	21.31	21.03	21.28

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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	23.50	23.50	23.40
			1	49	0	23.48	23.15	23.41
			1	99	0	23.39	23.21	23.50
			50	0	1	22.50	22.38	22.46
			50	24	1	22.40	22.41	22.44
			50	50	1	22.32	22.47	22.50
			100	0	1	22.44	22.39	22.45
		16QAM	1	0	1	22.01	22.46	22.28
			1	49	1	21.81	22.50	22.30
			1	99	1	22.09	22.36	22.50
			50	0	2	21.50	21.32	21.28
			50	24	2	21.30	21.26	21.30
			50	50	2	21.28	21.41	21.41
			100	0	2	21.36	21.35	21.33

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	23.33	23.43	23.42
			1	37	0	23.26	23.50	23.50
			1	74	0	23.17	23.29	23.86
			36	0	1	22.42	22.37	22.49
			36	20	1	22.32	22.36	22.61
			36	39	1	22.31	22.40	22.59
			75	0	1	22.38	22.25	22.65
		16QAM	1	0	1	22.08	22.19	22.36
			1	37	1	21.83	22.50	22.71
			1	74	1	21.78	22.29	22.38
			36	0	2	21.44	21.34	21.35
			36	20	2	21.30	21.30	21.49
			36	39	2	21.24	21.32	21.59
			75	0	2	21.39	21.18	21.58

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	23.32	23.45	23.34
			1	25	0	23.33	23.50	23.45
			1	49	0	23.30	23.30	23.91
			25	0	1	22.50	22.37	22.74
			25	12	1	22.48	22.33	22.55
			25	25	1	22.44	22.38	22.61
			50	0	1	22.48	22.35	22.63
		16QAM	1	0	1	22.30	22.34	22.42
			1	25	1	22.50	22.30	22.40
			1	49	1	22.25	22.31	22.26
			25	0	2	21.50	21.38	21.66
			25	12	2	21.50	21.27	21.59
			25	25	2	21.47	21.37	21.54
			50	0	2	21.48	21.28	21.54

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	23.36	23.46	23.47
			1	12	0	23.48	23.50	23.73
			1	24	0	23.35	23.41	23.80
			12	0	1	22.39	22.41	22.79
			12	7	1	22.44	22.36	22.62
			12	13	1	22.29	22.31	22.75
			25	0	1	22.45	22.43	22.70
		16QAM	1	0	1	22.26	22.27	22.65
			1	12	1	22.39	22.17	22.67
			1	24	1	22.34	22.06	22.59
			12	0	2	21.49	21.13	21.37
			12	7	2	21.40	21.08	21.79
			12	13	2	21.50	21.13	21.75
			25	0	2	21.45	21.20	21.70

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	23.35	23.31	23.86
			1	8	0	23.50	23.50	23.77
			1	14	0	23.38	23.50	24.00
			8	0	1	22.31	22.39	22.68
			8	4	1	22.41	22.40	22.71
			8	7	1	22.28	22.31	22.87
			15	0	1	22.35	22.30	22.73
		16QAM	1	0	1	22.44	22.11	22.64
			1	8	1	22.50	22.50	22.42
			1	14	1	22.10	22.07	22.68
			8	0	2	21.30	20.98	21.57
			8	4	2	21.25	21.08	21.72
			8	7	2	21.23	20.90	21.70
			15	0	2	21.32	21.33	21.64

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	23.48	23.23	23.59
			1	3	0	23.49	23.29	23.97
			1	5	0	23.41	23.14	23.78
			3	0	0	23.39	23.36	23.93
			3	1	0	23.33	23.41	24.00
			3	3	0	23.36	23.31	23.93
			6	0	1	22.32	22.31	22.90
		16QAM	1	0	1	22.36	22.09	22.62
			1	3	1	22.30	22.16	22.62
			1	5	1	22.36	22.02	22.56
			3	0	1	22.26	22.14	22.52
			3	1	1	22.33	22.40	22.54
			3	3	1	22.28	22.40	22.61
			6	0	2	21.28	21.05	21.61

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	21.46	21.43	21.82
			1	49	0	21.84	21.71	21.95
			1	99	0	21.49	21.55	21.80
			50	0	1	20.54	20.75	20.90
			50	24	1	20.56	20.82	20.95
			50	50	1	20.62	20.83	20.93
			100	0	1	20.57	20.83	20.99
		16QAM	1	0	1	20.04	20.42	20.58
			1	49	1	20.69	20.59	20.49
			1	99	1	20.70	20.38	20.78
			50	0	2	19.54	19.82	19.78
			50	24	2	19.55	19.77	19.68
			50	50	2	19.71	19.76	19.64
			100	0	2	19.50	19.72	19.95

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	21.43	21.64	21.94
			1	37	0	21.77	21.95	21.99
			1	74	0	21.80	21.98	21.84
			36	0	1	20.54	20.81	20.91
			36	20	1	20.59	20.78	20.92
			36	39	1	20.59	20.75	20.91
			75	0	1	20.48	20.76	20.93
		16QAM	1	0	1	20.55	20.69	20.59
			1	37	1	20.83	20.98	21.00
			1	74	1	20.77	20.56	20.65
			36	0	2	19.50	19.85	19.88
			36	20	2	19.46	19.83	19.80
			36	39	2	19.47	19.70	19.79
			75	0	2	19.36	19.65	19.92

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	21.56	21.74	21.77
			1	25	0	21.57	21.92	21.86
			1	49	0	21.71	21.77	21.71
			25	0	1	20.56	20.76	20.96
			25	12	1	20.52	20.75	20.94
			25	25	1	20.63	20.80	20.96
			50	0	1	20.47	20.80	20.88
		16QAM	1	0	1	20.57	20.53	20.79
			1	25	1	20.84	20.45	20.83
			1	49	1	20.24	20.56	20.79
			25	0	2	19.60	19.87	19.89
			25	12	2	19.46	19.89	19.96
			25	25	2	19.53	19.80	20.00
			50	0	2	19.52	19.80	19.95

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	21.29	21.66	21.61
			1	12	0	21.61	21.74	21.89
			1	24	0	21.48	21.62	22.00
			12	0	1	20.44	20.77	20.97
			12	7	1	20.46	20.74	20.95
			12	13	1	20.48	20.72	20.99
			25	0	1	20.49	20.76	21.00
		16QAM	1	0	1	20.05	20.64	20.52
			1	12	1	20.10	20.32	20.58
			1	24	1	19.86	20.32	20.62
			12	0	2	19.30	19.66	20.00
			12	7	2	19.43	19.68	19.99
			12	13	2	19.22	19.68	19.86
			25	0	2	19.59	19.72	19.84

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	21.31	21.66	22.00
			1	8	0	21.40	21.78	21.97
			1	14	0	21.40	21.78	21.84
			8	0	1	20.49	20.64	21.00
			8	4	1	20.56	20.71	21.00
			8	7	1	20.54	20.71	21.00
			15	0	1	20.47	20.64	21.00
		16QAM	1	0	1	20.41	20.41	20.71
			1	8	1	20.25	20.78	20.97
			1	14	1	20.38	20.65	20.77
			8	0	2	19.64	19.61	20.00
			8	4	2	19.70	19.56	20.00
			8	7	2	19.70	19.37	20.00
			15	0	2	19.48	19.75	19.97

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	21.37	21.59	21.79
			1	3	0	21.42	21.86	21.90
			1	5	0	21.39	21.78	21.75
			3	0	0	21.41	21.59	21.92
			3	1	0	21.42	21.63	22.00
			3	3	0	21.48	21.63	21.96
			6	0	1	20.41	20.78	21.00
		16QAM	1	0	1	20.34	20.39	20.94
			1	3	1	20.44	20.41	20.75
			1	5	1	20.20	20.26	20.92
			3	0	1	20.21	20.32	20.82
			3	1	1	20.24	20.41	20.89
			3	3	1	20.30	20.12	20.73
			6	0	2	19.44	19.42	19.82

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

GSM

Band	Channel	f [MHz]	Mode	Ratio [dB]	Limit [dB]
GSM850	190	836.6	GPRS	2.80	13.00
			EGPRS	5.74	
GSM1900	661	1880.0	GPRS	2.74	
			EGPRS	5.77	

WCDMA

Band	Channel	f [MHz]	Mode	Ratio [dB]	Limit [dB]
Band 5	4183	836.6	REL99	2.87	13.00
			HSDPA	2.93	
Band 2	9400	1880.0	REL99	3.00	
			HSDPA	3.11	

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LTE

Band	BW [MHz]	Channel	f [MHz]	Mode	Ratio [dB]	Limit [dB]
Band 17	10	23790	710	QPSK	3.82	13.00
				16QAM	4.46	
	5			QPSK	3.72	
				16QAM	4.69	
Band 5	10	20525	836.5	QPSK	3.84	
				16QAM	4.55	
	5			QPSK	3.79	
				16QAM	4.63	
	3			QPSK	3.84	
				16QAM	4.64	
	1.4			QPSK	3.81	
				16QAM	4.62	
Band 4	20	20174	1732.5	QPSK	3.90	
				16QAM	4.92	
	15			QPSK	3.97	
				16QAM	4.71	
	10			QPSK	3.89	
				16QAM	4.80	
	5			QPSK	3.78	
				16QAM	4.68	
	3			QPSK	4.00	
				16QAM	4.76	
	1.4			QPSK	3.70	
				16QAM	4.88	
Band 2	20	18900	1880.0	QPSK	3.78	
				16QAM	4.66	
	15			QPSK	3.91	
				16QAM	4.55	
	10			QPSK	3.73	
				16QAM	4.56	
	5			QPSK	3.93	
				16QAM	4.71	
	3			QPSK	3.87	
				16QAM	4.61	
	1.4			QPSK	3.73	
				16QAM	4.70	

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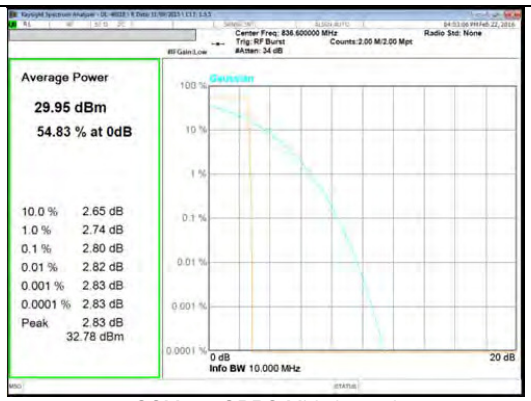
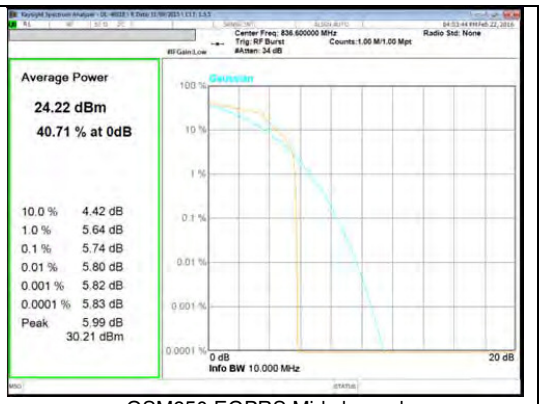
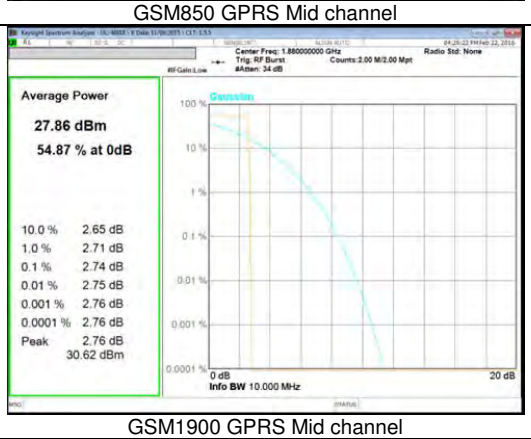
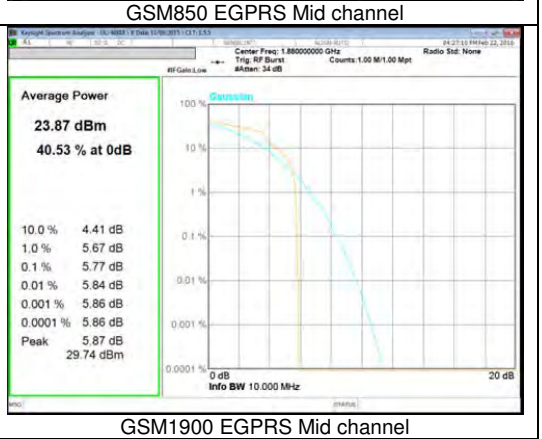
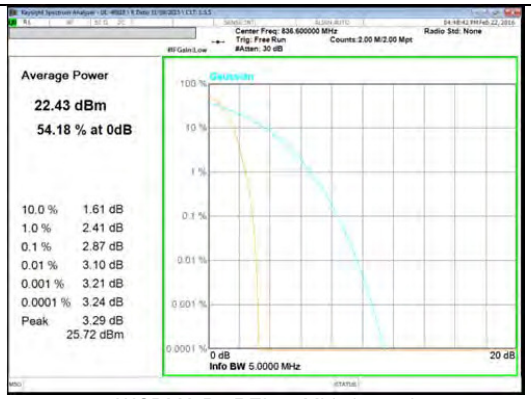
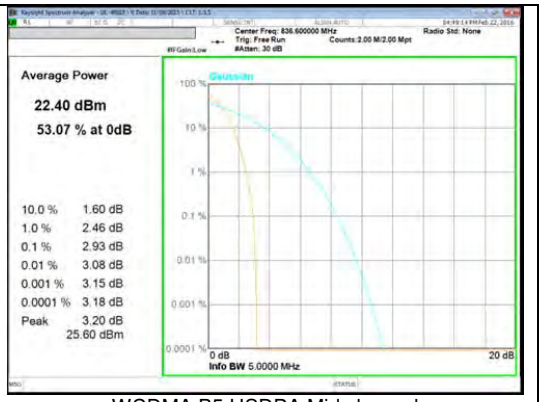
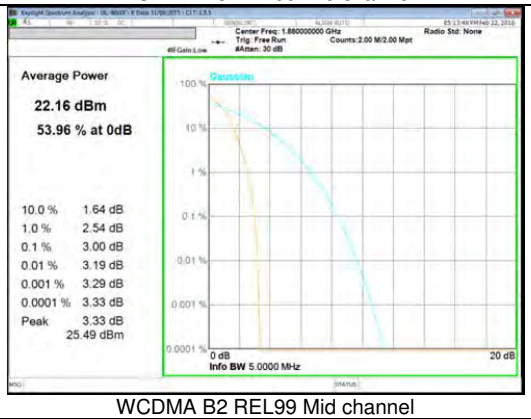
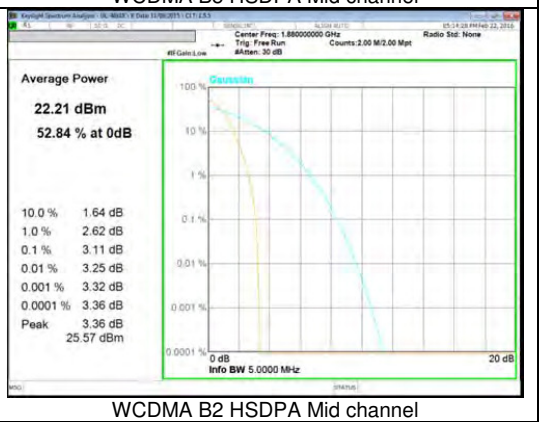
9.2. CONDUCTED PEAK TO AVERAGE PLOTS

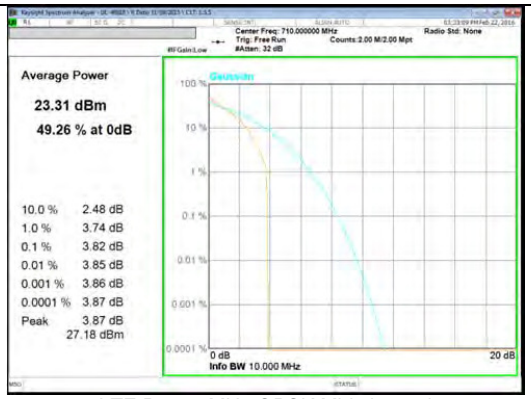
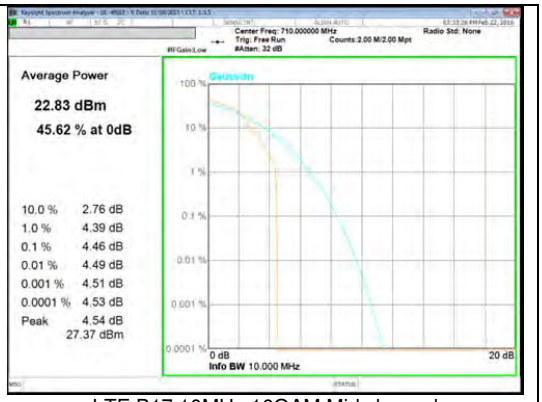
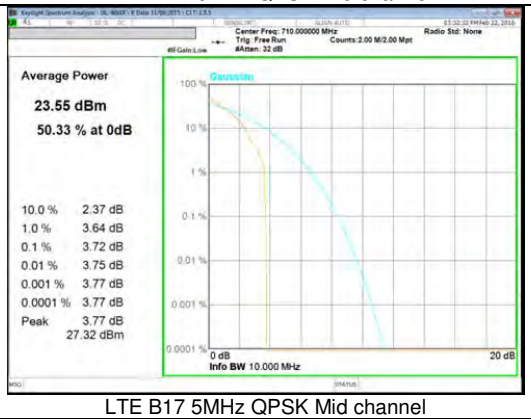
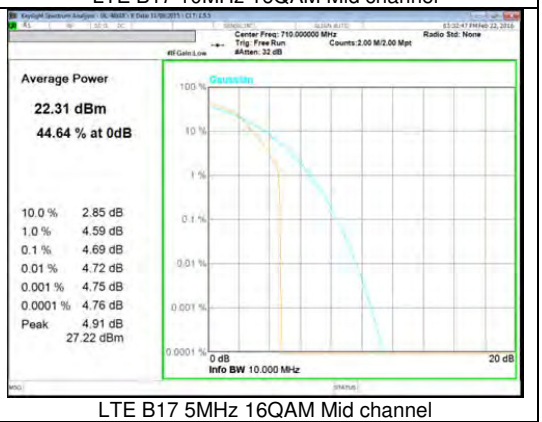
GSM

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

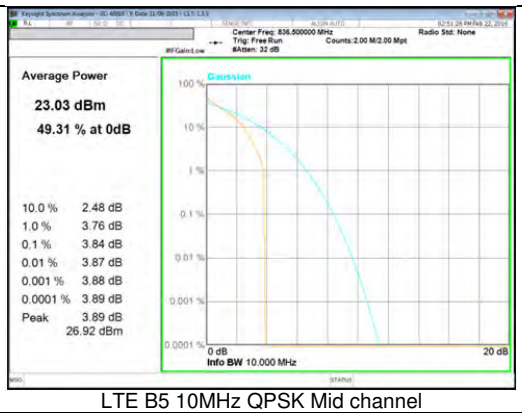
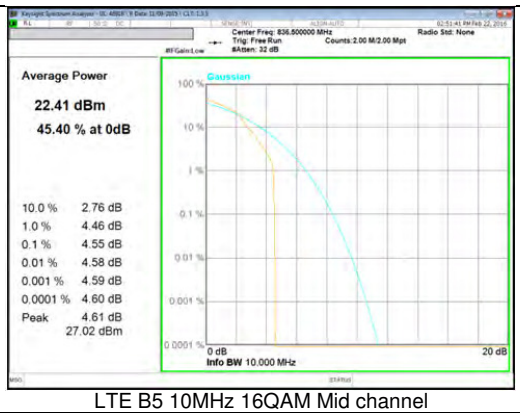
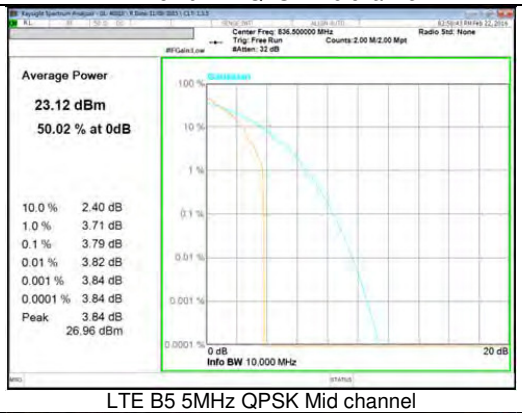
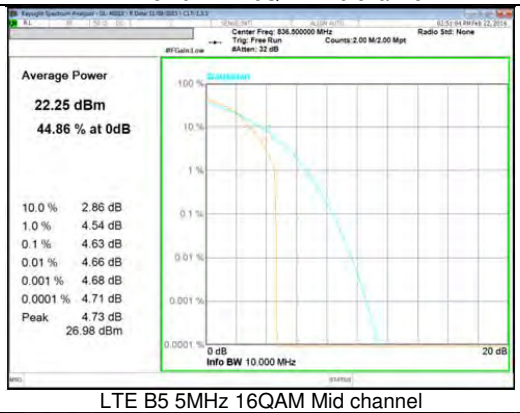
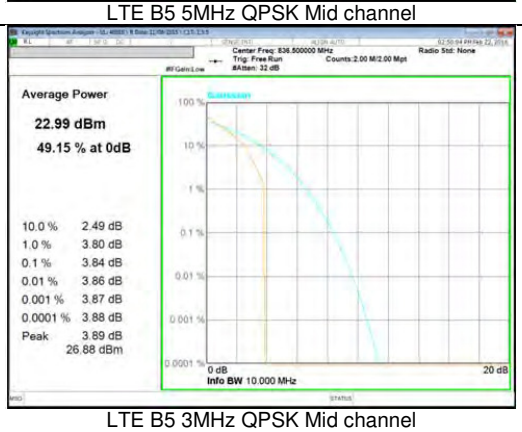
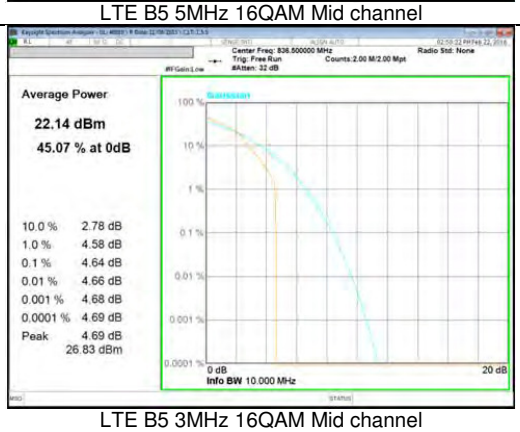
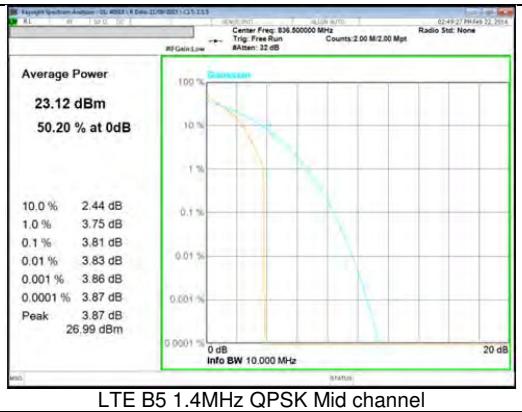
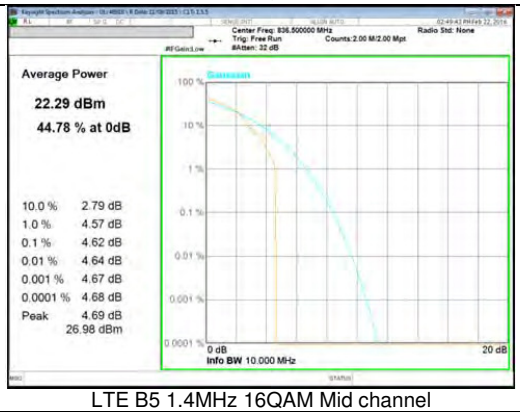
WCDMA

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

LTE Band 17

LTE Band 17 10 MHz	 LTE B17 10MHz QPSK Mid channel	 LTE B17 10MHz 16QAM Mid channel
LTE Band 17 5 MHz	 LTE B17 5MHz QPSK Mid channel	 LTE B17 5MHz 16QAM Mid channel

LTE Band 5

LTE Band 5 10 MHz	 LTE B5 10MHz QPSK Mid channel	 LTE B5 10MHz 16QAM Mid channel
LTE Band 5 5 MHz	 LTE B5 5MHz QPSK Mid channel	 LTE B5 5MHz 16QAM Mid channel
LTE Band 5 3 MHz	 LTE B5 3MHz QPSK Mid channel	 LTE B5 3MHz 16QAM Mid channel
LTE Band 5 1.4 MHz	 LTE B5 1.4MHz QPSK Mid channel	 LTE B5 1.4MHz 16QAM Mid channel

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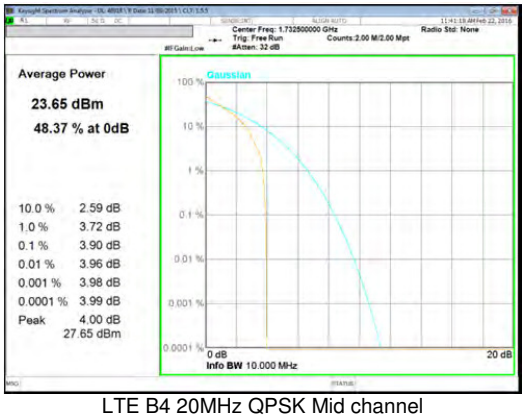
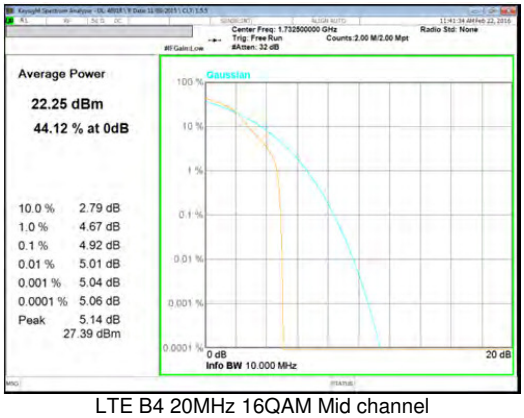
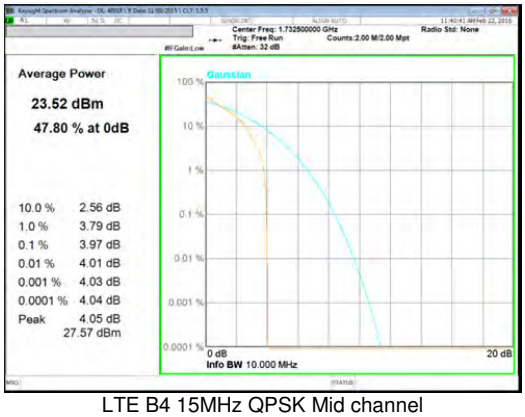
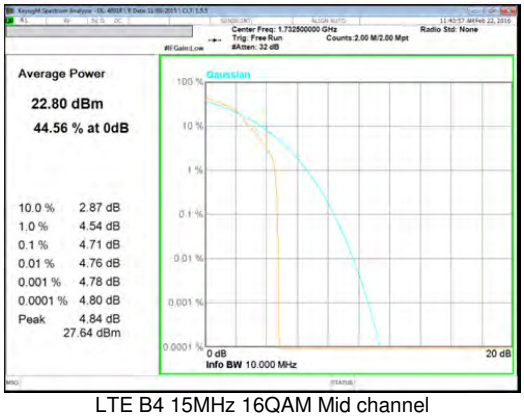
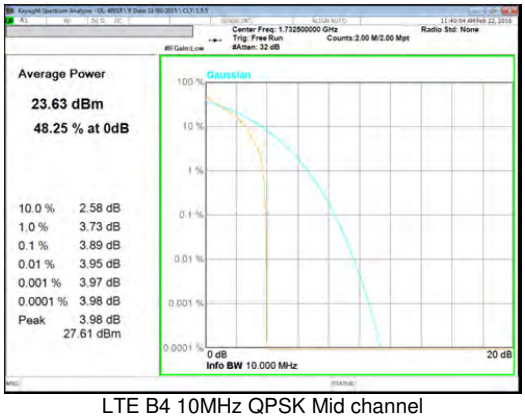
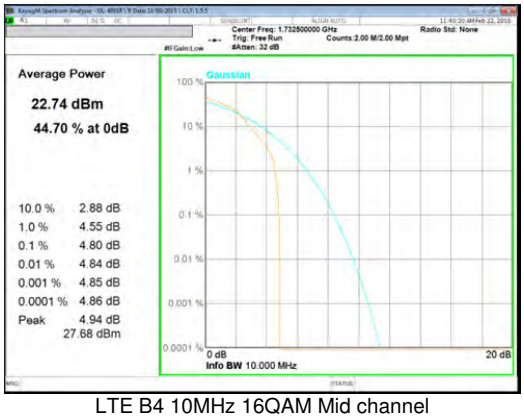
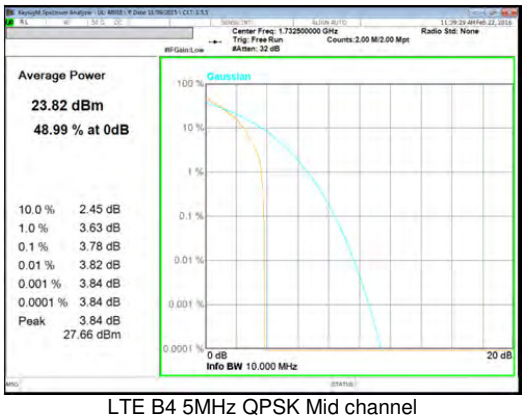
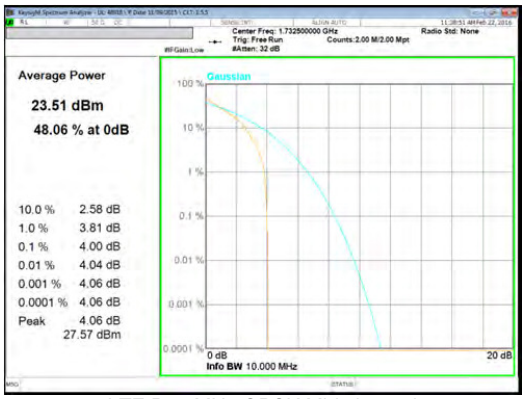
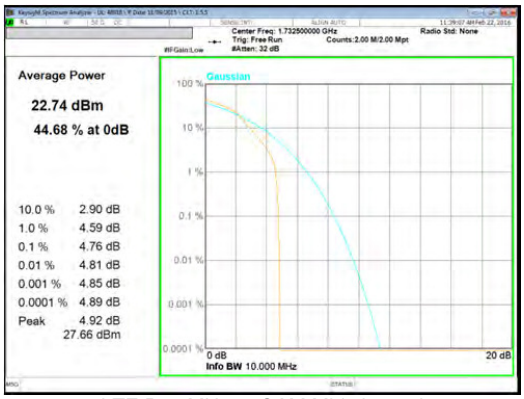
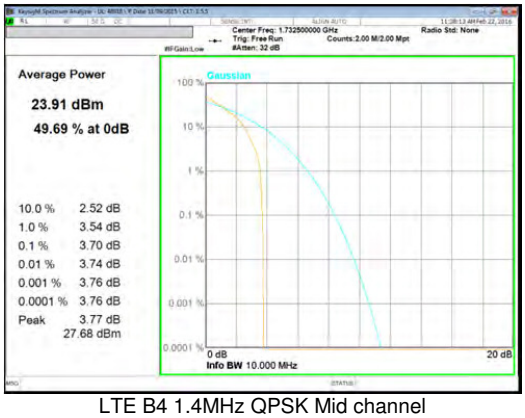
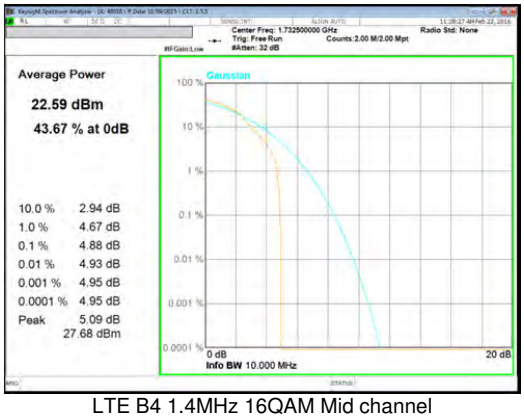
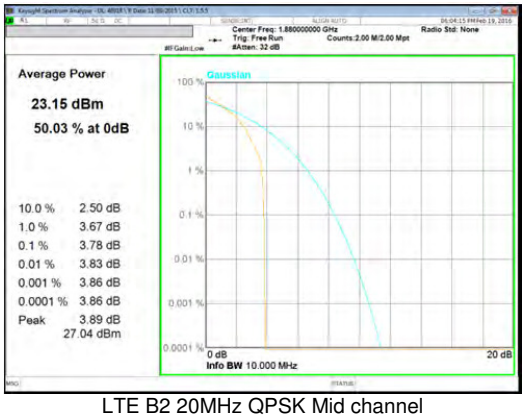
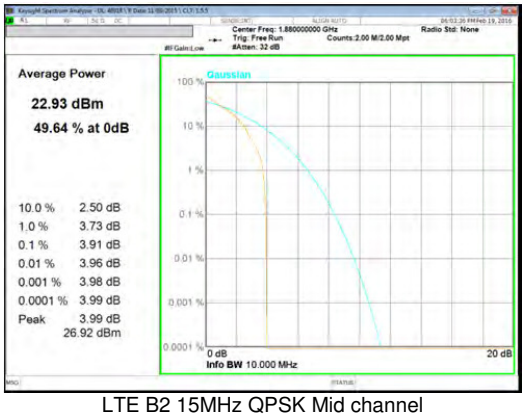
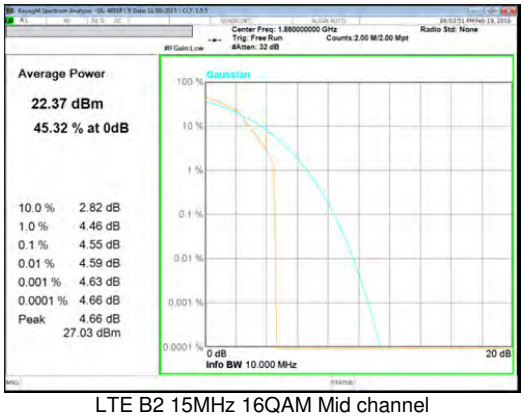
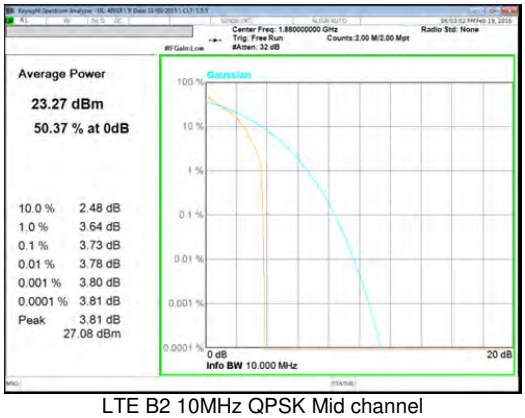
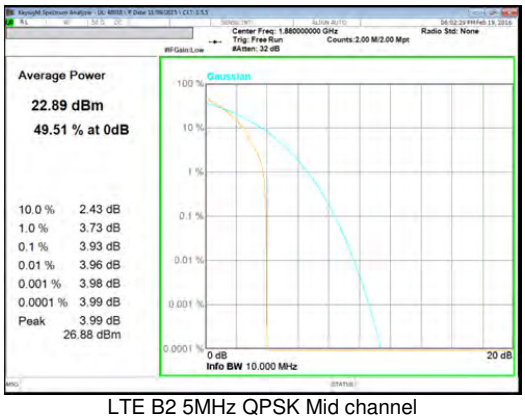
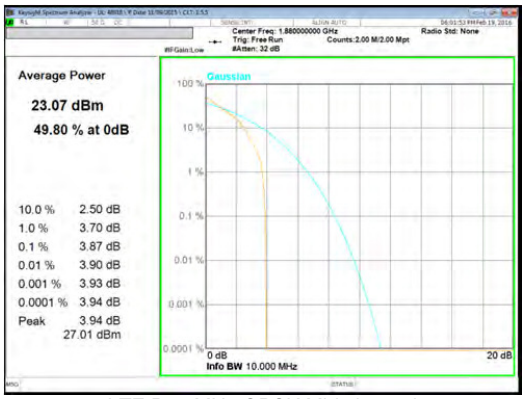
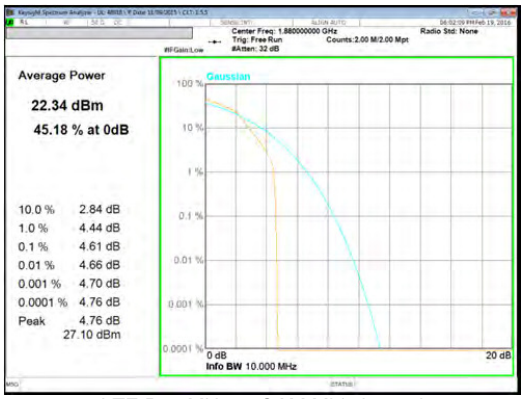
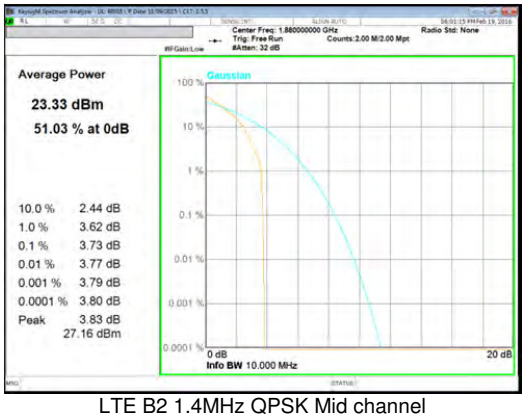
LTE Band 4

LTE Band 4 20 MHz	 LTE B4 20MHz QPSK Mid channel	 LTE B4 20MHz 16QAM Mid channel
LTE Band 4 15 MHz	 LTE B4 15MHz QPSK Mid channel	 LTE B4 15MHz 16QAM Mid channel
LTE Band 4 10 MHz	 LTE B4 10MHz QPSK Mid channel	 LTE B4 10MHz 16QAM Mid channel

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 2 20 MHz	 LTE B2 20MHz QPSK Mid channel	 LTE B2 20MHz 16QAM Mid channel
LTE Band 2 15 MHz	 LTE B2 15MHz QPSK Mid channel	 LTE B2 15MHz 16QAM Mid channel
LTE Band 2 10 MHz	 LTE B2 10MHz QPSK Mid channel	 LTE B2 10MHz 16QAM Mid channel

LTE Band 2 5 MHz	 LTE B2 5MHz QPSK Mid channel	 LTE B2 5MHz 16QAM Mid channel
LTE Band 2 3 MHz	 LTE B2 3MHz QPSK Mid channel	 LTE B2 3MHz 16QAM Mid channel
LTE Band 2 1.4 MHz	 LTE B2 1.4MHz QPSK Mid channel	 LTE B2 1.4MHz 16QAM Mid channel

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

GSM

Band	Mode	Channel	f [MHz]	99% BW [KHz]	26dB BW [KHz]
GSM850	GPRS	128	824.2	240.82	313.9
		190	836.6	241.45	313.8
		251	848.8	241.36	308.6
	EGPRS	128	824.2	242.00	313.1
		190	836.6	250.58	318.2
		251	848.8	241.12	297.8
GSM1900	GPRS	512	1850.2	243.53	313.4
		661	1880.0	242.26	313.7
		810	1909.8	243.42	315.9
	EGPRS	512	1850.2	243.03	305.6
		661	1880.0	243.88	307.8
		810	1909.8	251.06	307.5

WCDMA

Band	Mode	Channel	f [MHz]	99% BW [MHz]	26dB BW [MHz]
Band 5	REL99	4132	826.4	4.1439	4.689
		4183	836.6	4.1452	4.697
		4233	846.6	4.1339	4.710
	HSDPA	4132	826.4	4.1392	4.687
		4183	836.6	4.1546	4.694
		4233	846.6	4.1456	4.706
Band 2	REL99	9262	1852.4	4.1064	4.676
		9400	1880.0	4.1165	4.671
		9538	1907.6	4.1064	4.675
	HSDPA	9262	1852.4	4.1150	4.635
		9400	1880.0	4.1223	4.658
		9538	1907.6	4.1148	4.655

LTE Band 17

Band	BW [MHz]	Channel	f [MHz]	Mode	99% BW [MHz]	26dB BW [MHz]
Band 17	10	23780	709.0	QPSK	8.9297	9.763
				16QAM	8.9635	9.811
		23790	710.0	QPSK	8.9446	9.786
				16QAM	8.9571	9.820
		23799	711.0	QPSK	8.9479	9.714
				16QAM	8.9190	9.741
	5	23755	706.5	QPSK	4.4863	4.969
				16QAM	4.4925	4.963
		23790	710.0	QPSK	4.4741	4.934
				16QAM	4.4882	4.984
		23824	713.5	QPSK	4.4770	4.925
				16QAM	4.4904	4.932

LTE Band 5

Band	BW [MHz]	Channel	f [MHz]	Mode	99% BW [MHz]	26dB BW [MHz]
Band 5	10	20450	829.0	QPSK	8.9500	9.839
				16QAM	8.9501	9.865
		20524	836.5	QPSK	8.9484	9.774
				16QAM	8.9313	9.805
		20599	844.0	QPSK	8.9389	9.836
				16QAM	8.9623	9.756
	5	20425	826.5	QPSK	4.4806	4.941
				16QAM	4.4827	4.966
		20524	836.5	QPSK	4.4901	4.940
				16QAM	4.4857	4.963
		20624	846.5	QPSK	4.4761	4.939
				16QAM	4.4925	4.995
	3	20415	825.5	QPSK	2.6882	2.955
				16QAM	2.6941	2.971
		20524	836.5	QPSK	2.6834	2.963
				16QAM	2.6916	2.970
		20634	847.5	QPSK	2.6984	2.977
				16QAM	2.6904	2.987
	1.4	20407	824.7	QPSK	1.0867	1.279
				16QAM	1.0842	1.292
		20524	836.5	QPSK	1.0802	1.266
				16QAM	1.0846	1.298
		20624	848.3	QPSK	1.0863	1.296
				16QAM	1.0940	1.305

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LTE Band 4

Band	BW [MHz]	Channel	f [MHz]	Mode	99% BW [MHz]	26dB BW [MHz]
Band 4	20	20050	1720.0	QPSK	17.808	19.26
				16QAM	17.835	19.09
		20174	1732.5	QPSK	17.863	19.14
				16QAM	17.863	19.31
		20299	1745.0	QPSK	17.846	19.22
				16QAM	17.830	19.28
	15	20025	1717.5	QPSK	13.360	14.64
				16QAM	13.370	14.52
		20174	1732.5	QPSK	13.388	14.52
				16QAM	13.368	14.49
		20324	1747.5	QPSK	13.371	14.48
				16QAM	13.379	14.43
	10	20000	1715.0	QPSK	8.9423	9.816
				16QAM	8.9378	9.784
		20174	1732.5	QPSK	8.9394	9.772
				16QAM	8.9089	9.844
		20349	1750.0	QPSK	8.9321	9.788
				16QAM	8.9709	9.777
	5	19975	1712.5	QPSK	4.4791	4.920
				16QAM	4.4807	4.939
		20174	1732.5	QPSK	4.4870	4.979
				16QAM	4.4908	4.941
		20374	1752.5	QPSK	4.4776	4.937
				16QAM	4.4907	4.987
	3	19965	1711.5	QPSK	2.6917	2.961
				16QAM	2.6929	2.980
		20174	1732.5	QPSK	2.6892	2.971
				16QAM	2.6902	2.972
		20384	1753.5	QPSK	2.6950	2.988
				16QAM	2.6888	2.987
	1.4	19957	1710.7	QPSK	1.0867	1.269
				16QAM	1.0838	1.282
		20174	1732.5	QPSK	1.0800	1.277
				16QAM	1.0837	1.292
		20392	1754.3	QPSK	1.0879	1.303
				16QAM	1.0936	1.299

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LTE Band 2

Band	BW [MHz]	Channel	f [MHz]	Mode	99% BW [MHz]	26dB BW [MHz]
Band 2	20	18700	1860.0	QPSK	17.868	19.17
				16QAM	17.856	19.22
		18900	1880.0	QPSK	17.846	19.10
				16QAM	17.821	19.22
		19099	1900.0	QPSK	17.820	19.26
				16QAM	17.815	19.24
	15	18675	1857.5	QPSK	13.389	14.49
				16QAM	13.387	14.52
		18900	1880.0	QPSK	13.377	14.40
				16QAM	13.389	14.55
		19124	1902.5	QPSK	13.384	14.47
				16QAM	13.373	14.50
	10	18650	1955.0	QPSK	8.9499	9.687
				16QAM	8.9550	9.753
		18900	1880.0	QPSK	8.9433	9.726
				16QAM	8.9189	9.802
		19149	1905.0	QPSK	8.9270	9.766
				16QAM	8.9571	9.756
	5	18625	1852.5	QPSK	4.4864	4.912
				16QAM	4.4908	4.951
		18900	1880.0	QPSK	4.4847	4.966
				16QAM	4.4896	4.956
		18175	1907.5	QPSK	4.4754	4.924
				16QAM	4.4888	5.021
	3	18615	1815.5	QPSK	2.6873	2.944
				16QAM	2.6952	2.956
		18900	1880.0	QPSK	2.6941	2.985
				16QAM	2.6943	2.977
		19184	1908.5	QPSK	2.6925	2.994
				16QAM	2.6892	2.990
	1.4	18607	1850.7	QPSK	1.0867	1.284
				16QAM	1.0837	1.308
		18900	1880.0	QPSK	1.0812	1.291
				16QAM	1.0846	1.300
		19192	1909.3	QPSK	1.0869	1.299
				16QAM	1.0852	1.323

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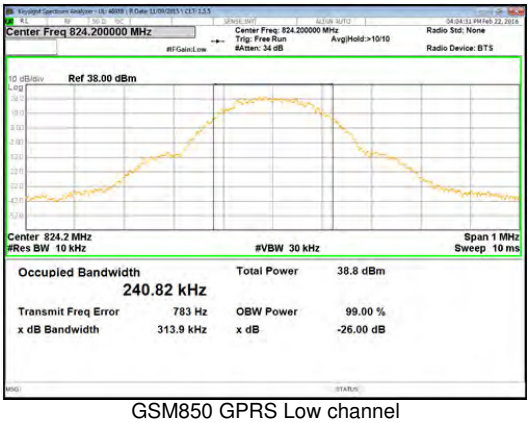
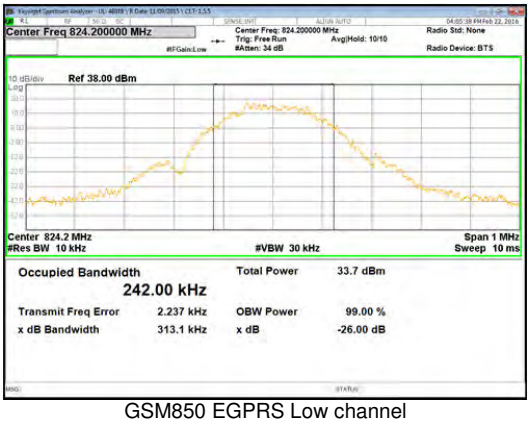
10.1.2. OCCUPIED BANDWIDTH PLOTS

GSM 850

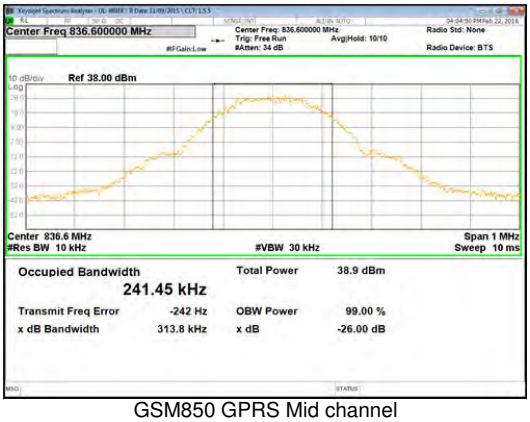
GSM 850



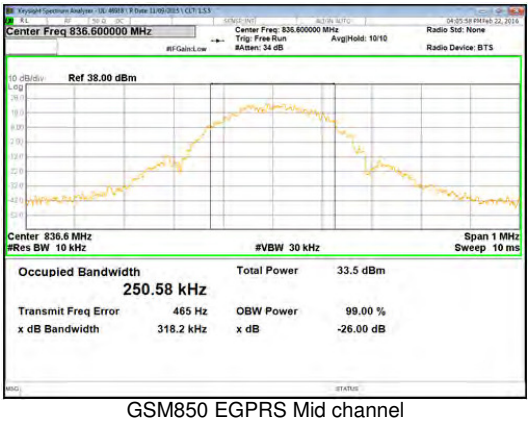
GSM850 GPRS Low channel



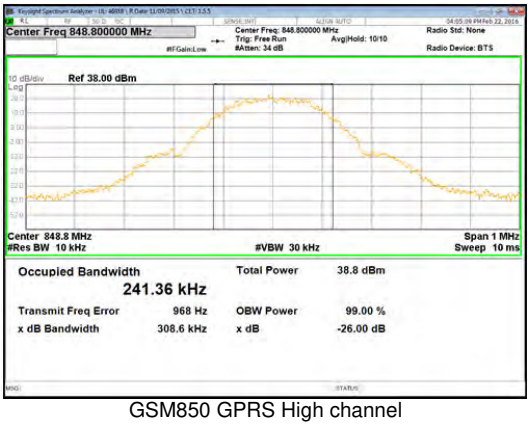
GSM850 EGPRS Low channel



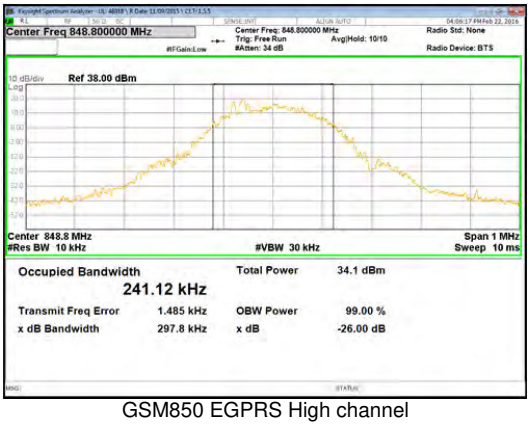
GSM850 GPRS Mid channel



GSM850 EGPRS Mid channel



GSM850 GPRS High channel



GSM850 EGPRS High channel

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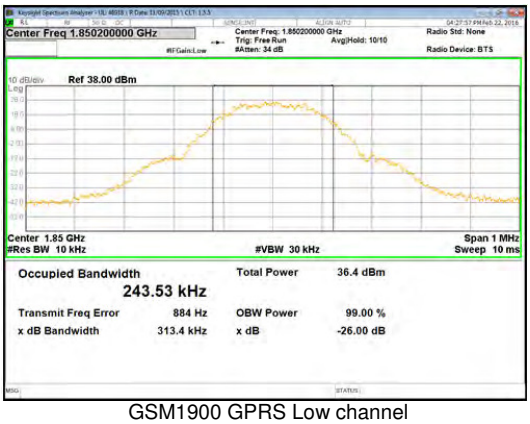
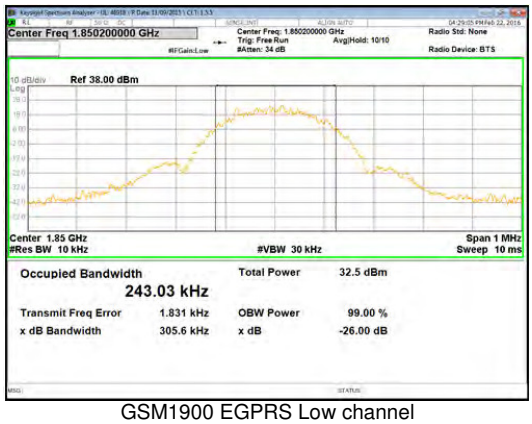
GSM 1900

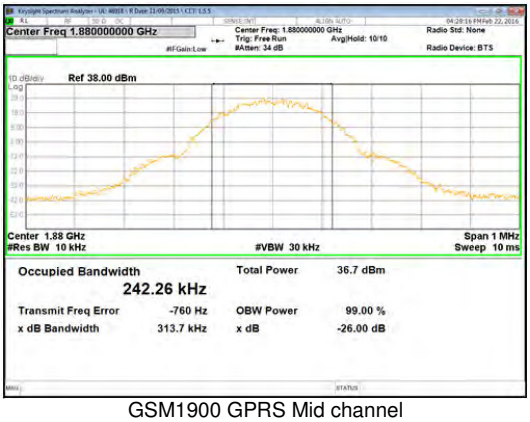
GSM 1900



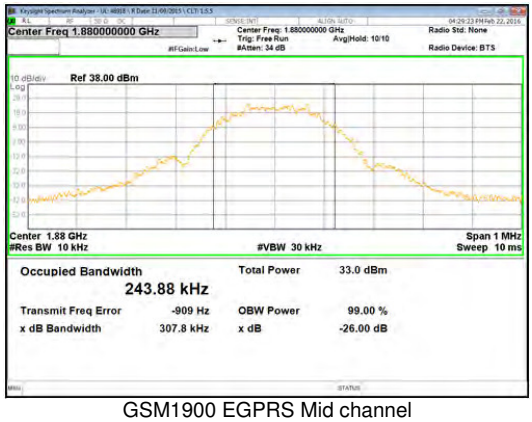
GSM1900 GPRS Low channel



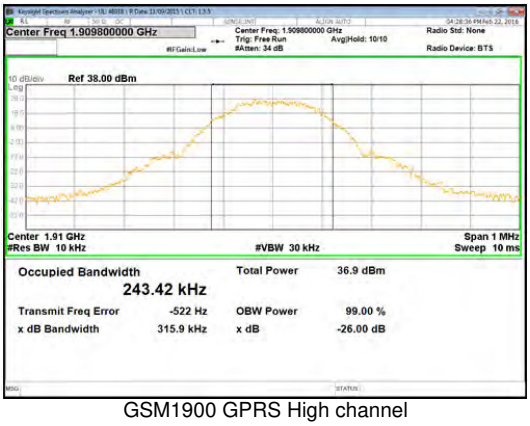
GSM1900 EGPRS Low channel



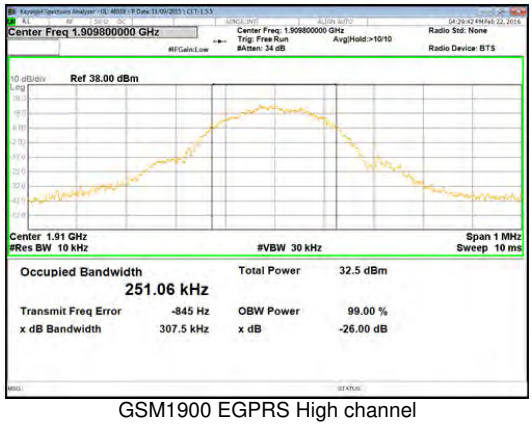
GSM1900 GPRS Mid channel



GSM1900 EGPRS Mid channel

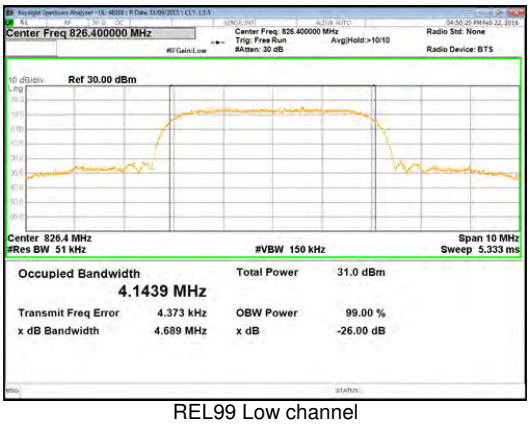
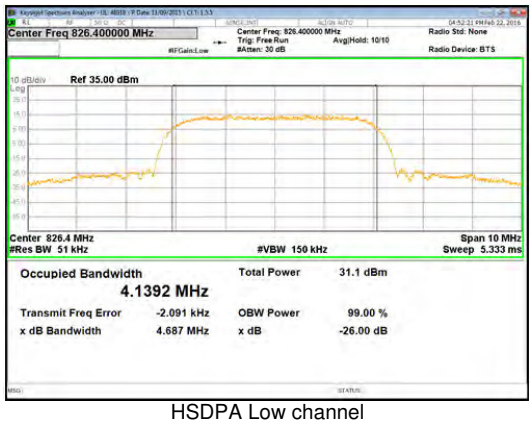
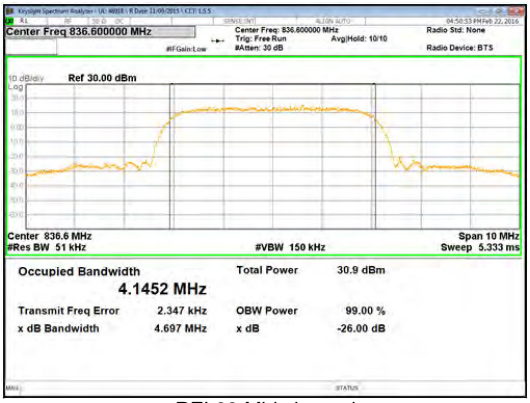
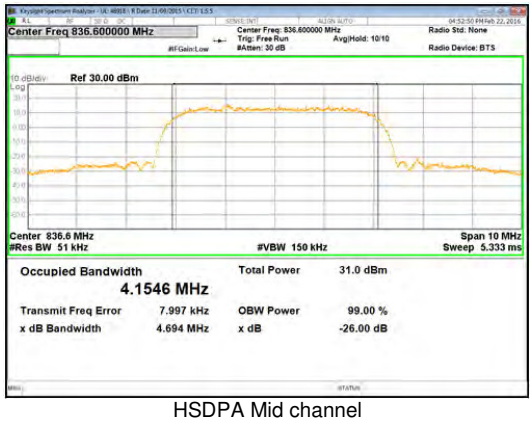
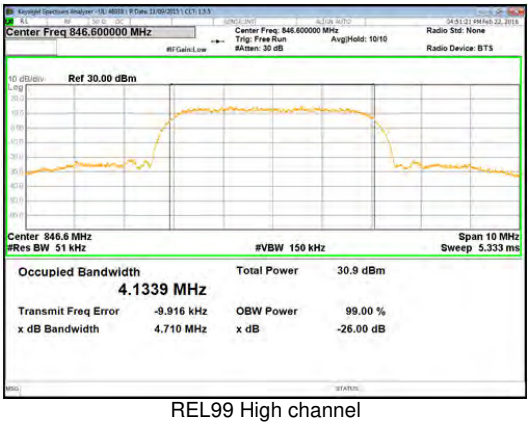
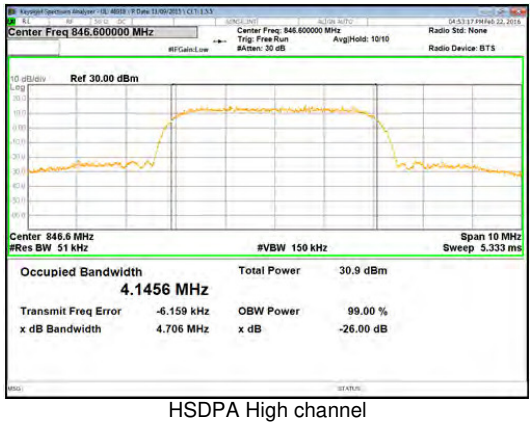


GSM1900 GPRS High channel



GSM1900 EGPRS High channel

WCDMA Band 5

Band 5	 REL99 Low channel	 HSDPA Low channel
	 REL99 Mid channel	 HSDPA Mid channel
	 REL99 High channel	 HSDPA High channel

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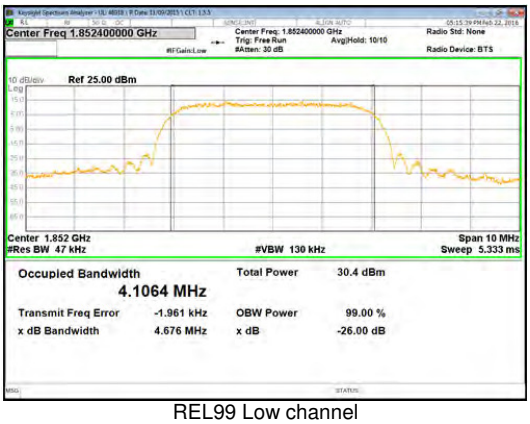
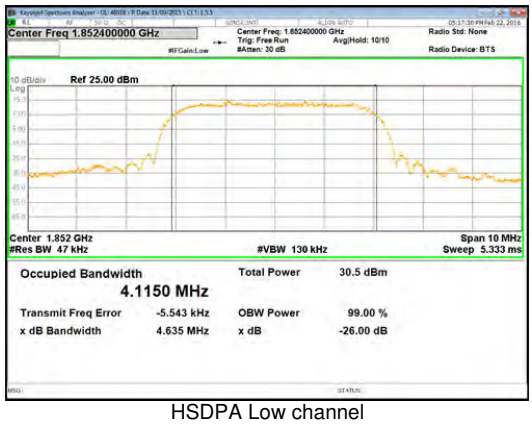
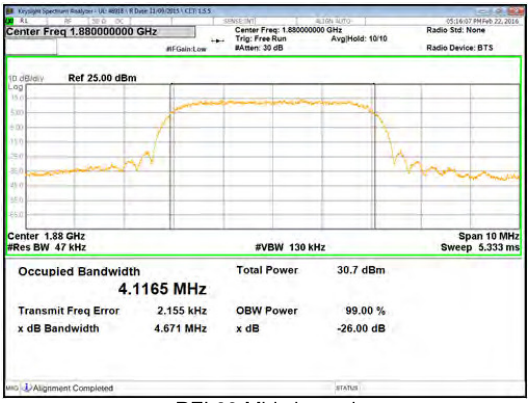
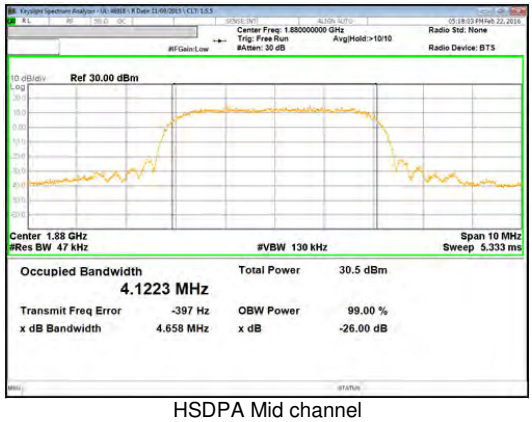
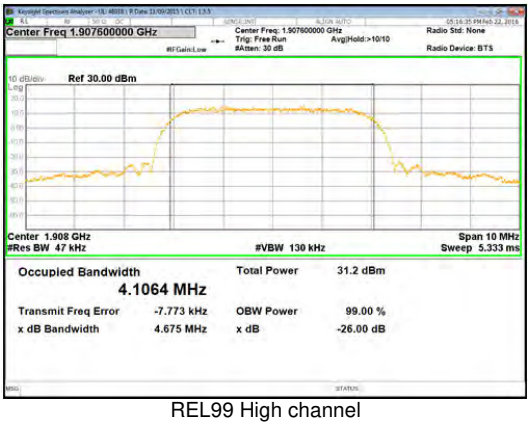
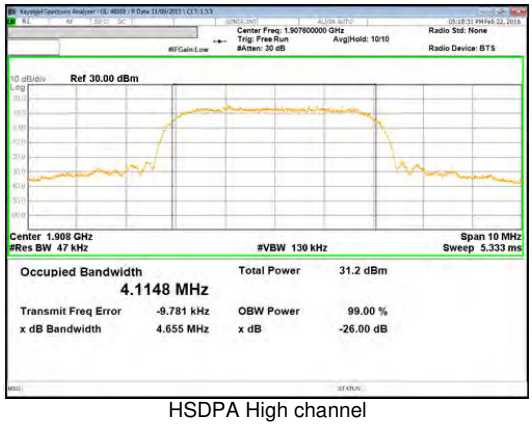
WCDMA Band 2

Band 2	 REL99 Low channel	 HSDPA Low channel
	 REL99 Mid channel	 HSDPA Mid channel
	 REL99 High channel	 HSDPA High channel

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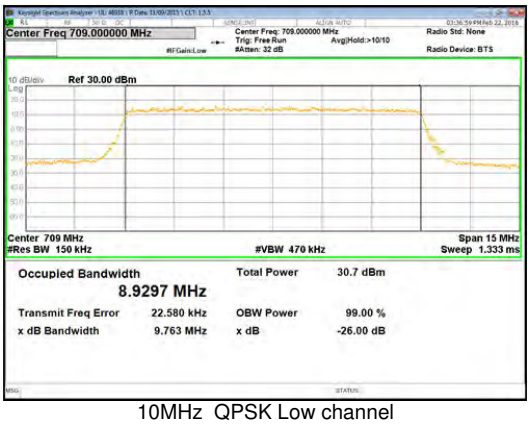
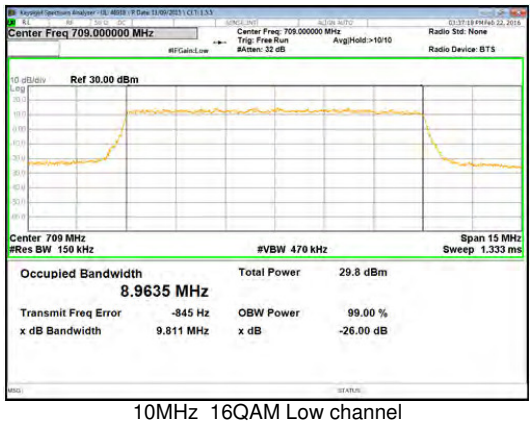
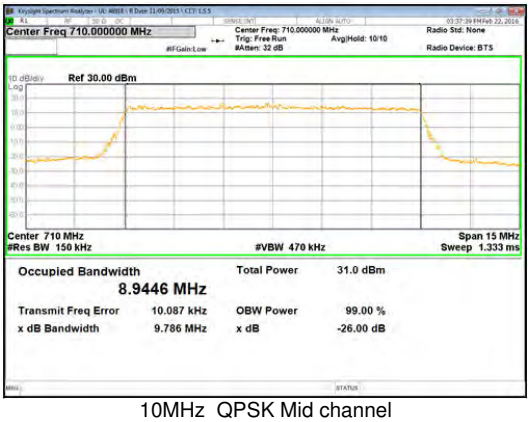
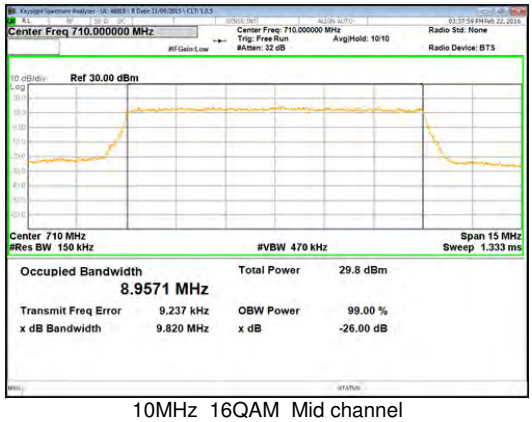
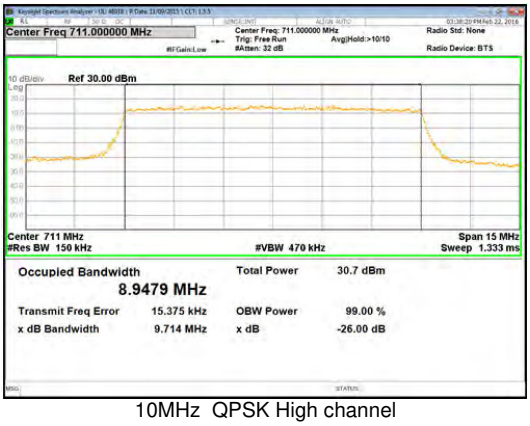
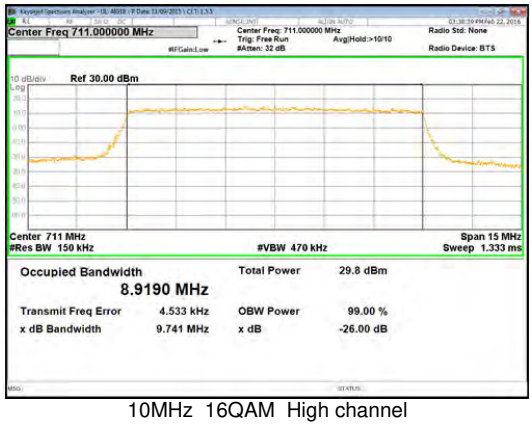
LTE Band 17

Band 17 10MHz	 10MHz QPSK Low channel	 10MHz 16QAM Low channel
	 10MHz QPSK Mid channel	 10MHz 16QAM Mid channel
	 10MHz QPSK High channel	 10MHz 16QAM High channel

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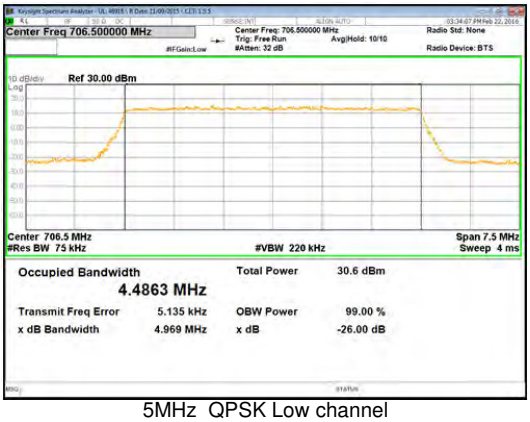
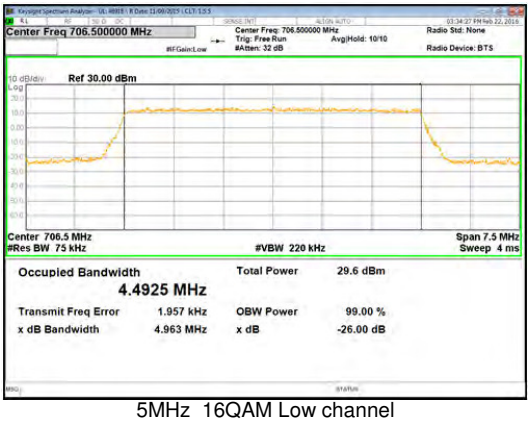
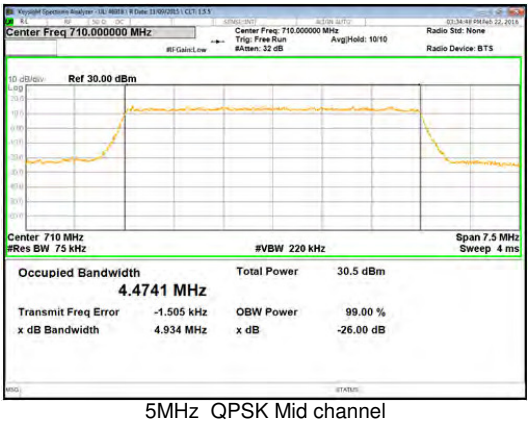
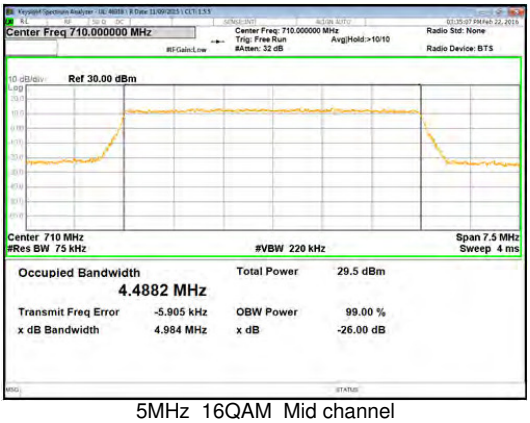
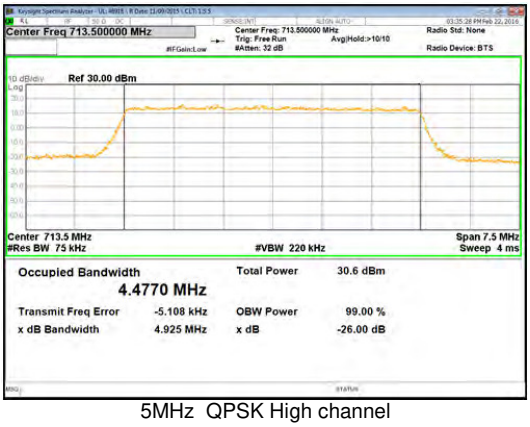
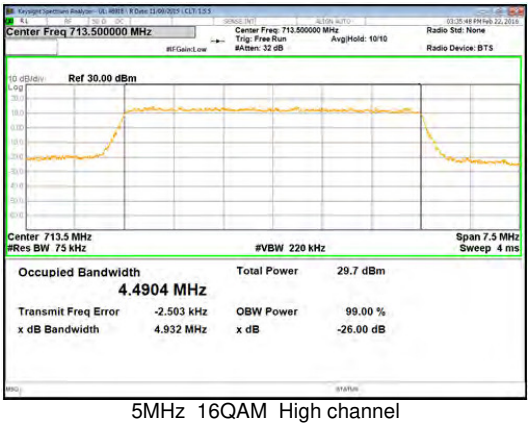
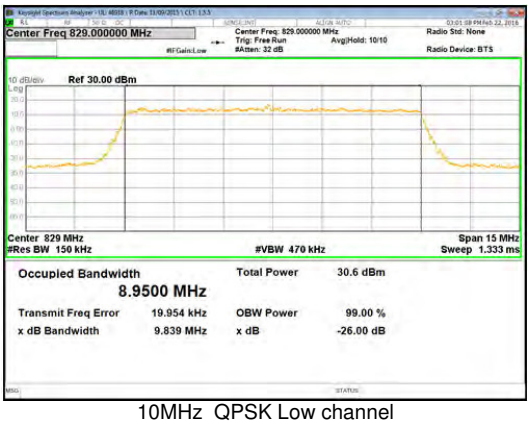
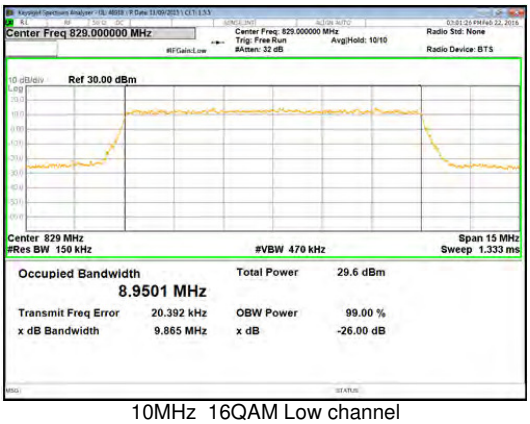
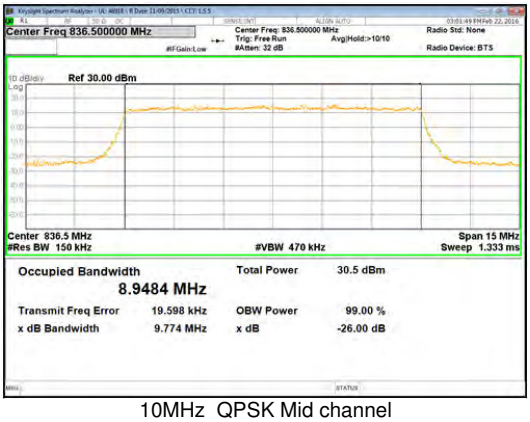
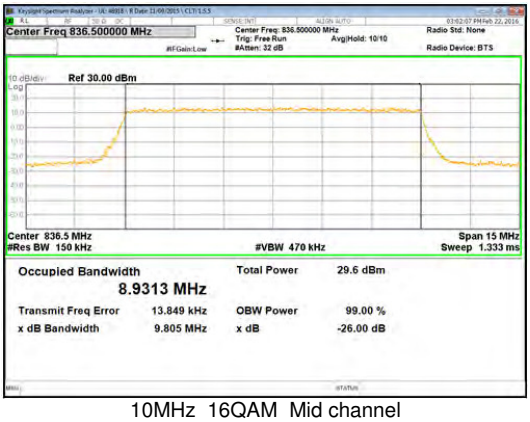
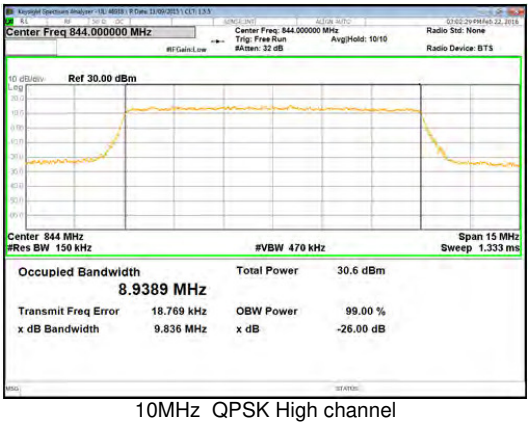
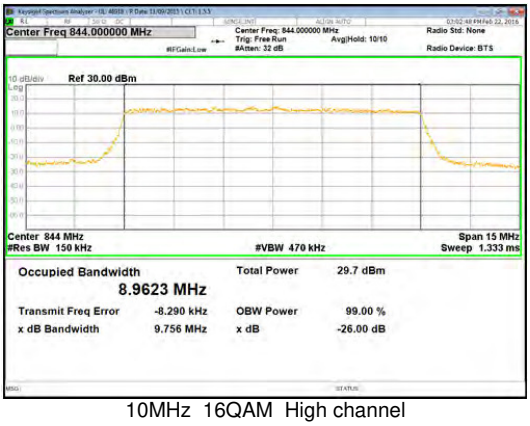
Band 17 5MHz	 5MHz QPSK Low channel	 5MHz 16QAM Low channel
	 5MHz QPSK Mid channel	 5MHz 16QAM Mid channel
	 5MHz QPSK High channel	 5MHz 16QAM High channel

LTE Band 5

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

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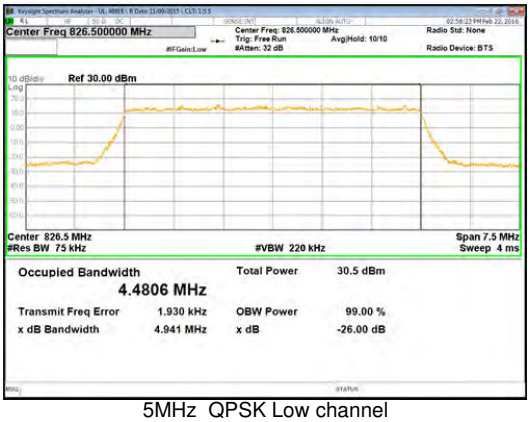
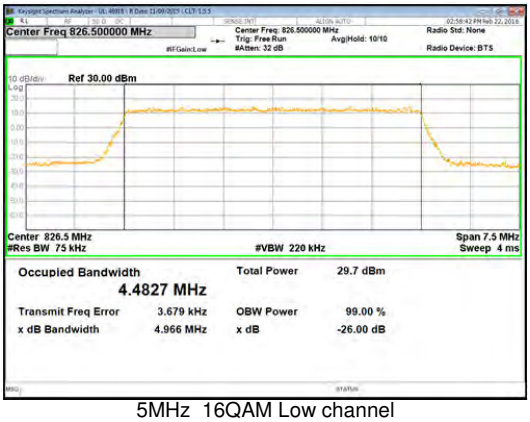
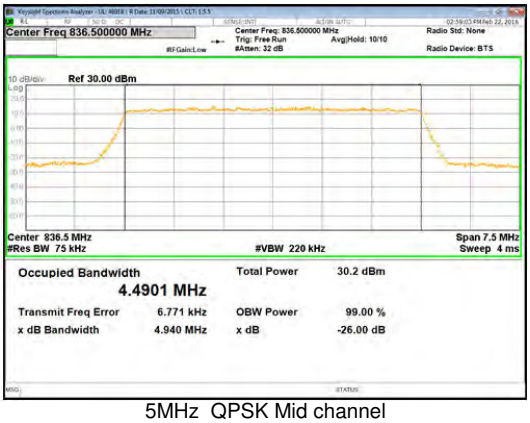
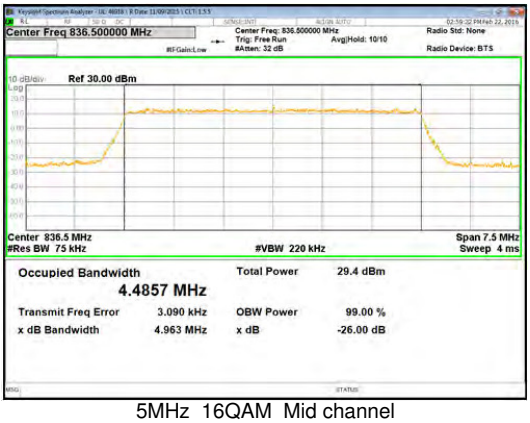
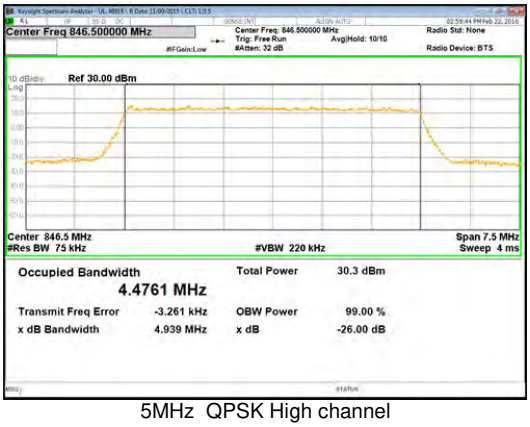
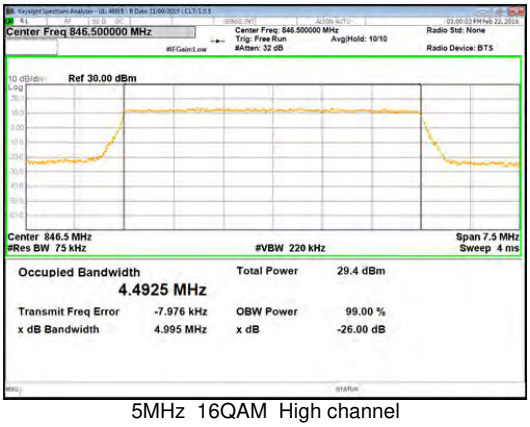
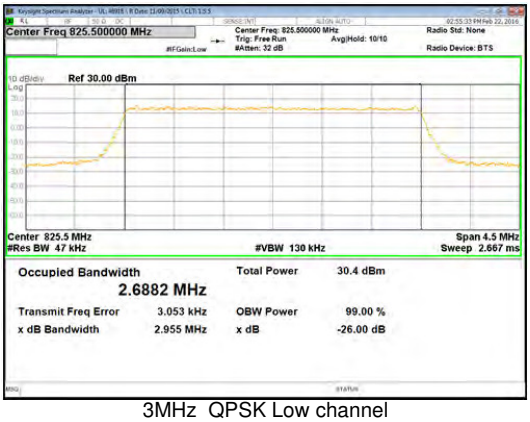
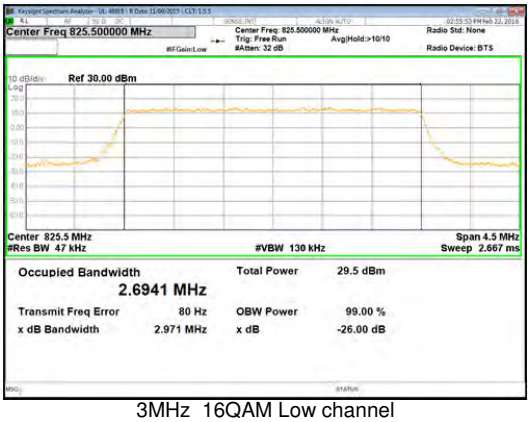
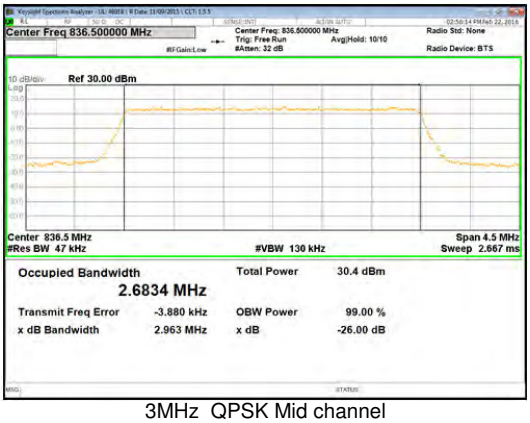
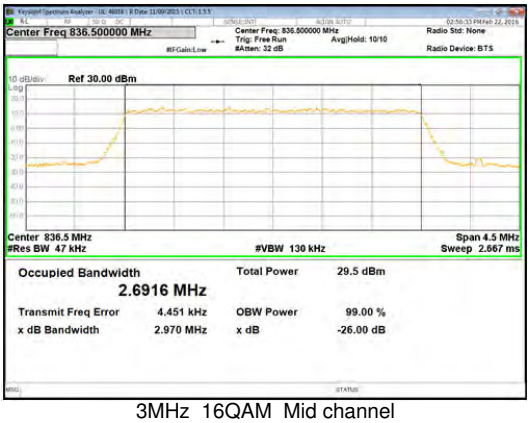
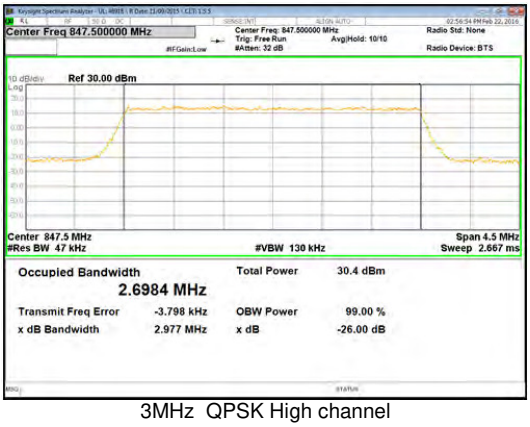
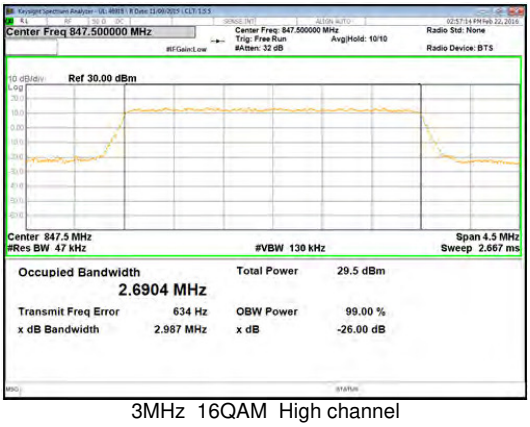
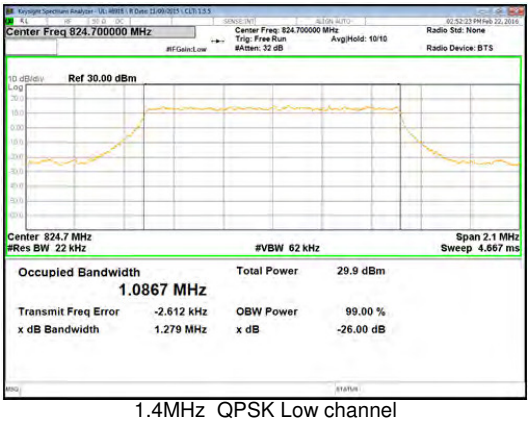
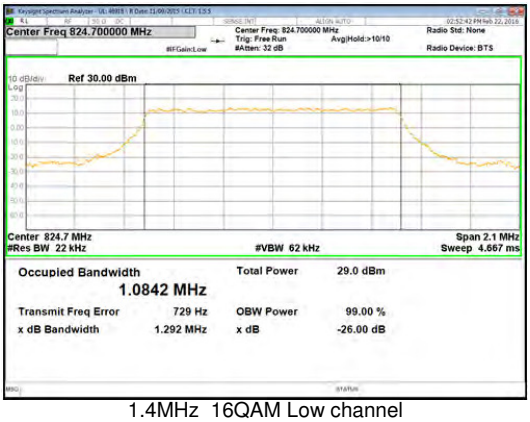
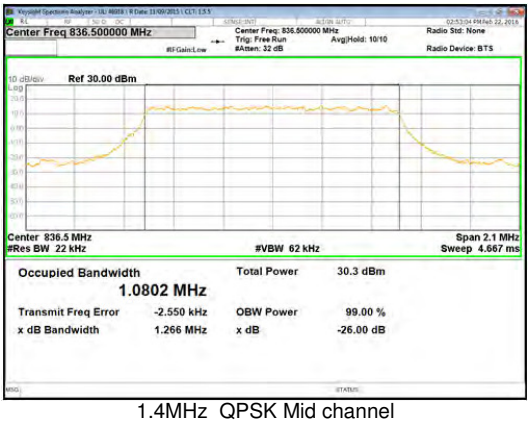
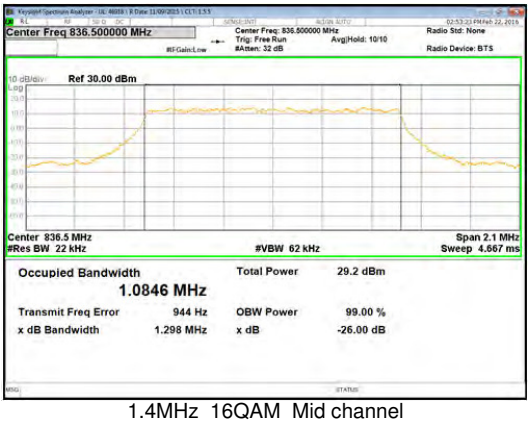
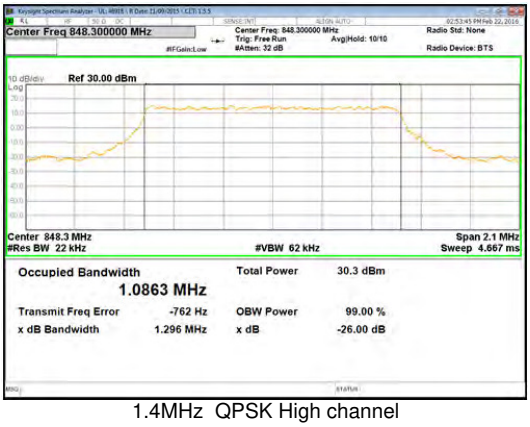
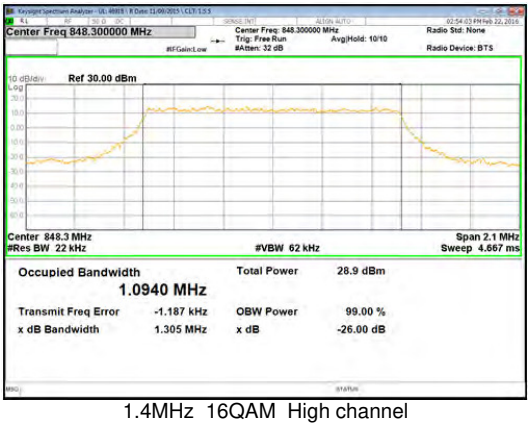
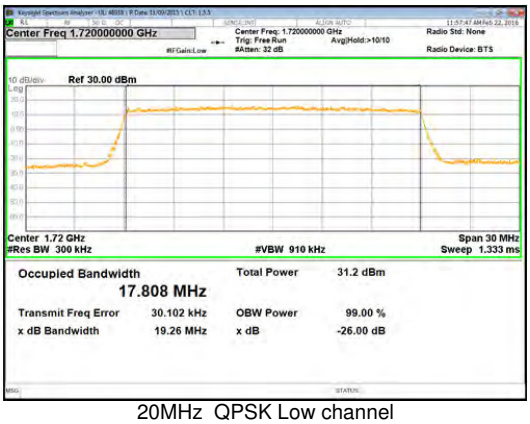
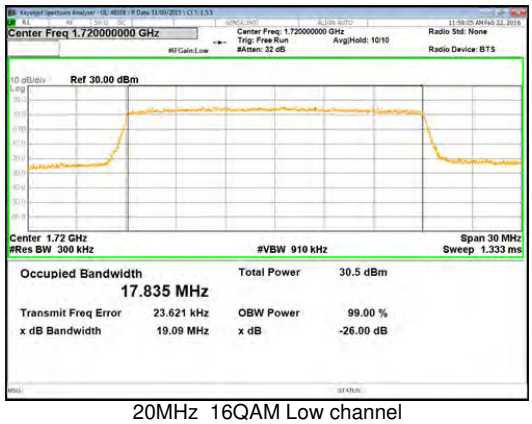
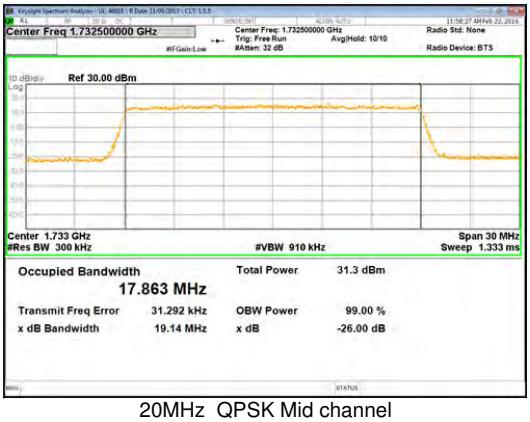
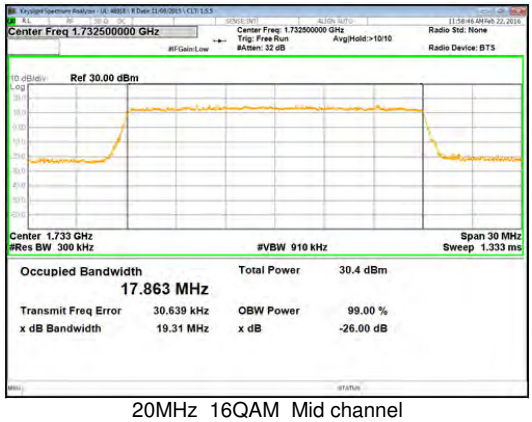
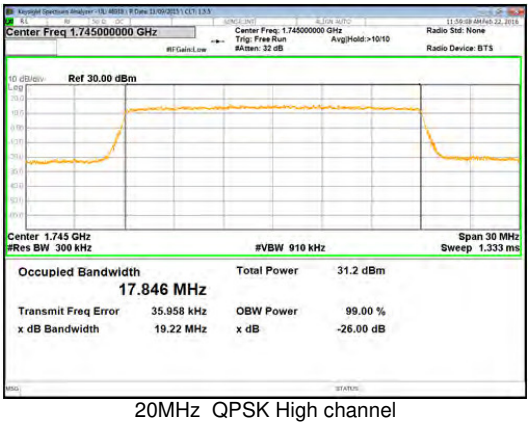
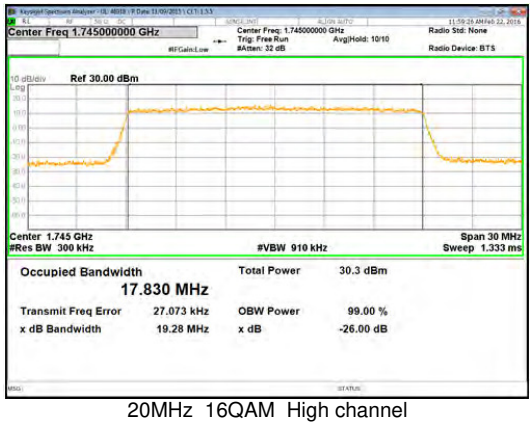
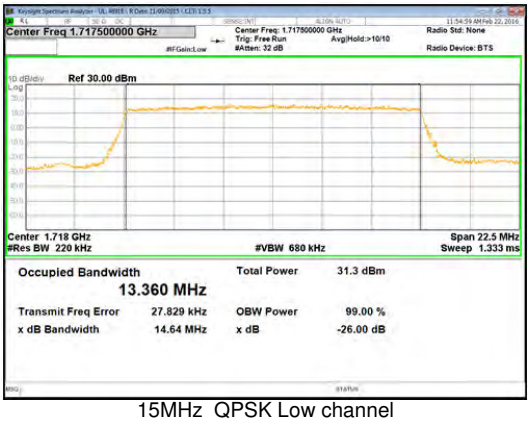
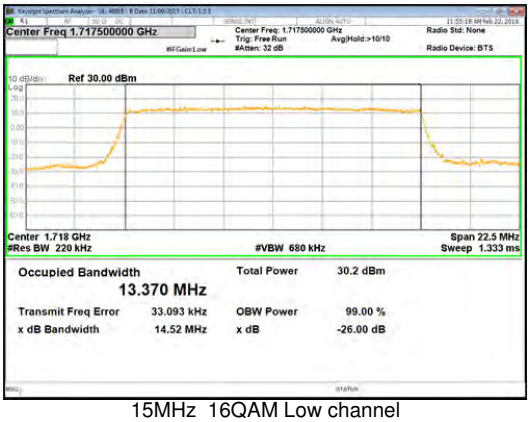
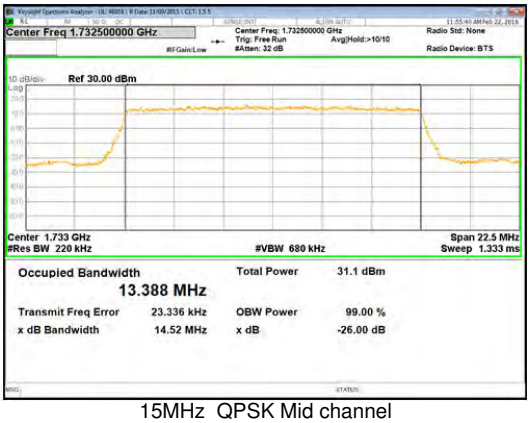
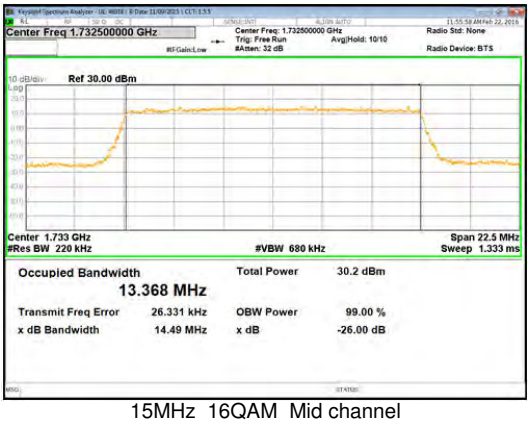
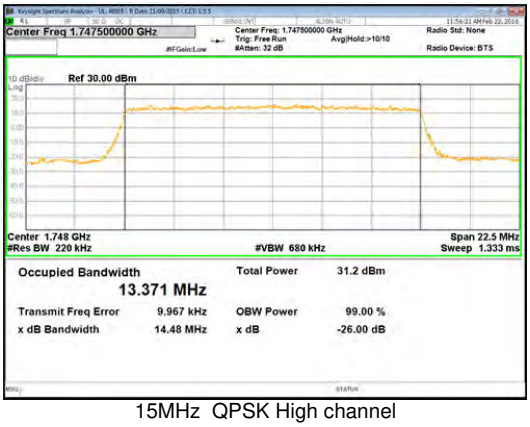
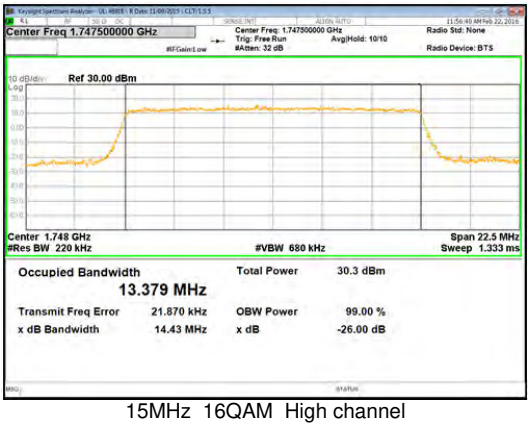
Band 5 5MHz	 5MHz QPSK Low channel	 5MHz 16QAM Low channel
	 5MHz QPSK Mid channel	 5MHz 16QAM Mid channel
	 5MHz QPSK High channel	 5MHz 16QAM High channel

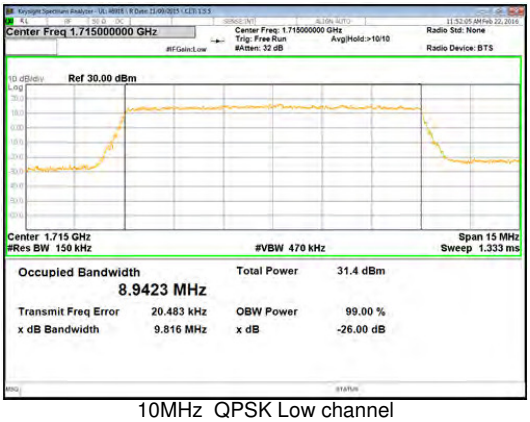
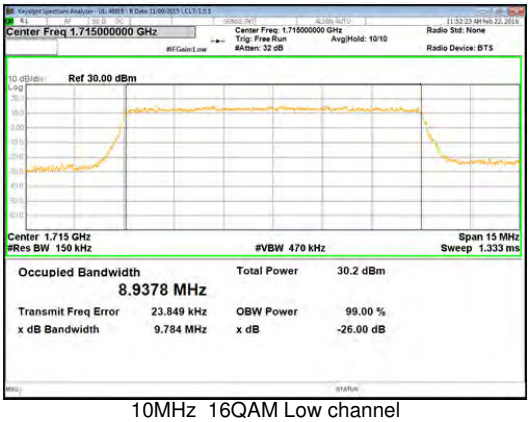
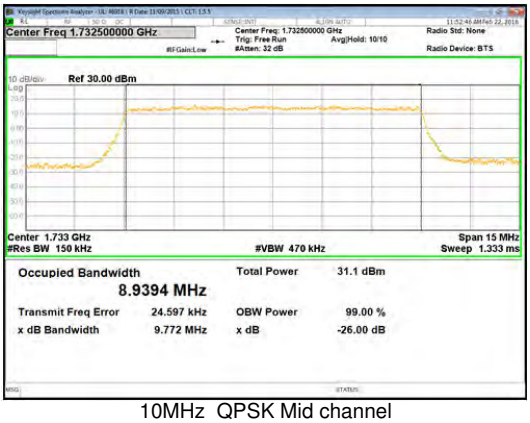
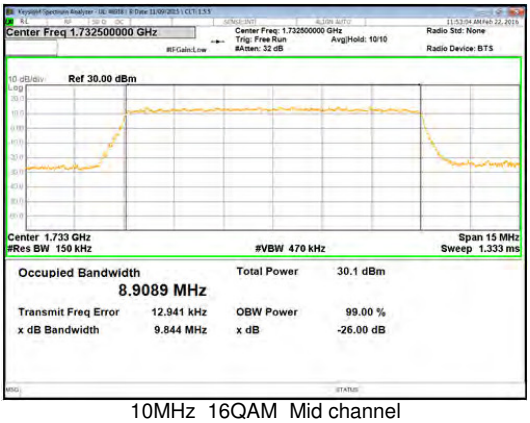
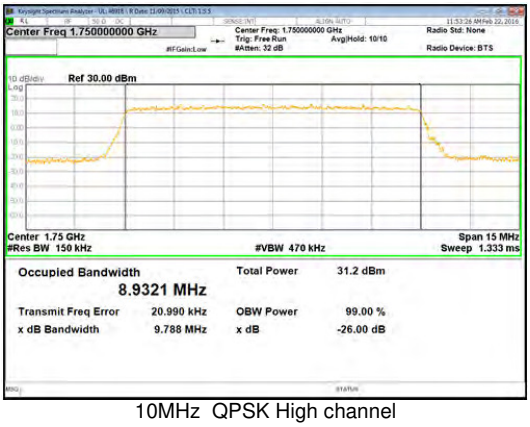
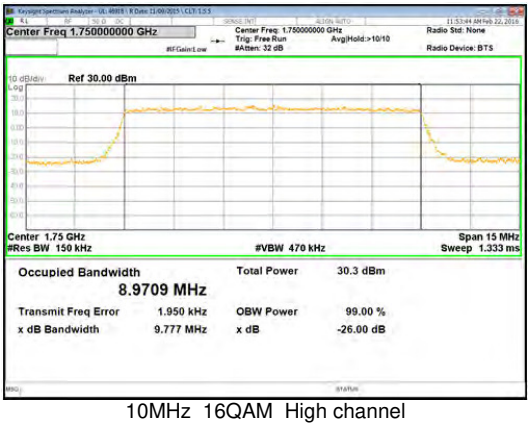
Band 5 3MHz	 3MHz QPSK Low channel	 3MHz 16QAM Low channel
	 3MHz QPSK Mid channel	 3MHz 16QAM Mid channel
	 3MHz QPSK High channel	 3MHz 16QAM High channel

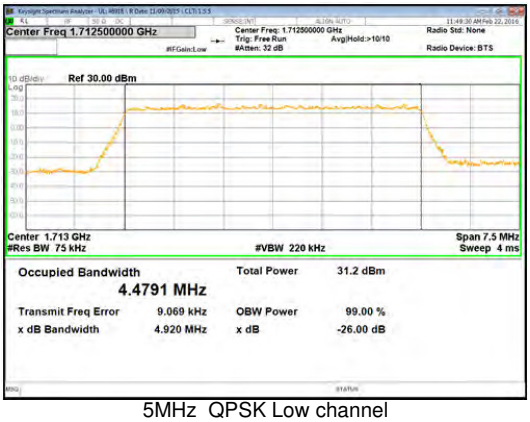
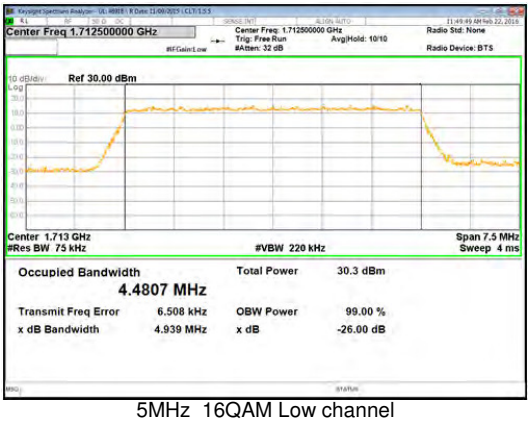
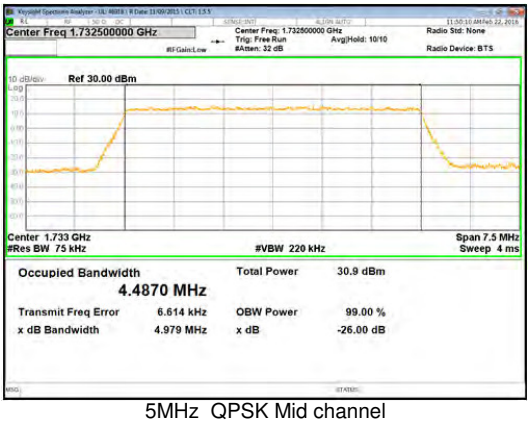
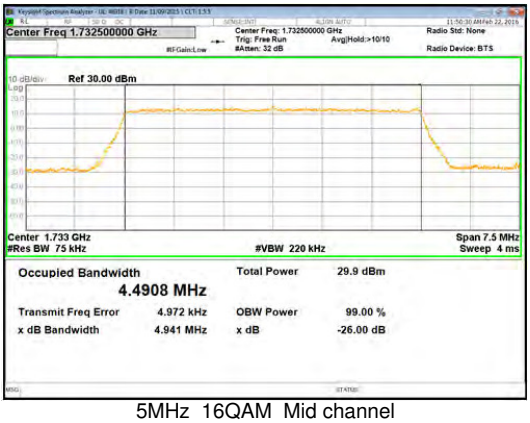
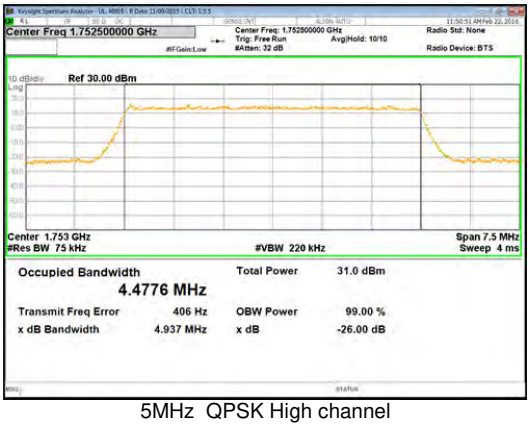
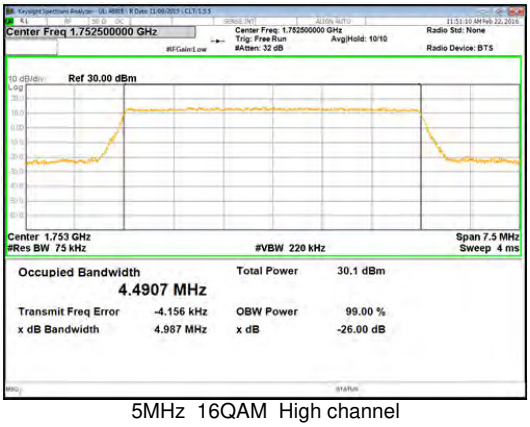
Band 5 1.4MHz	 1.4MHz QPSK Low channel	 1.4MHz 16QAM Low channel
	 1.4MHz QPSK Mid channel	 1.4MHz 16QAM Mid channel
	 1.4MHz QPSK High channel	 1.4MHz 16QAM High channel

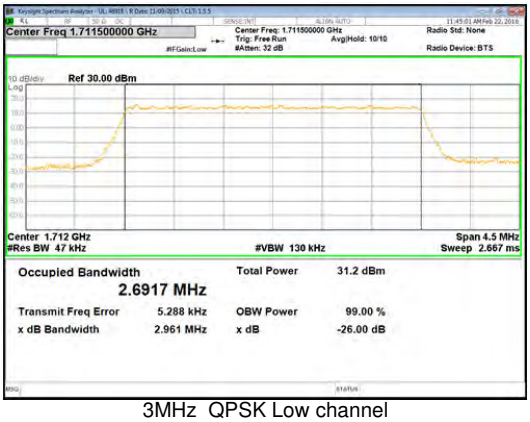
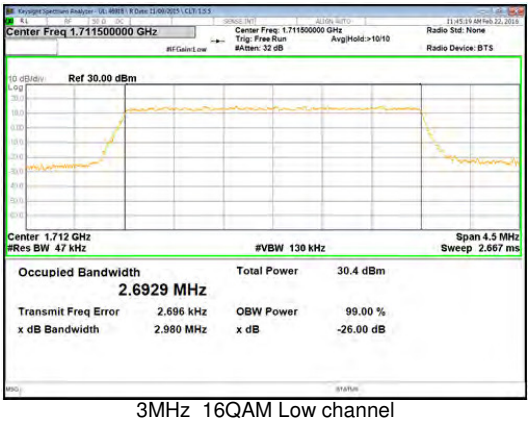
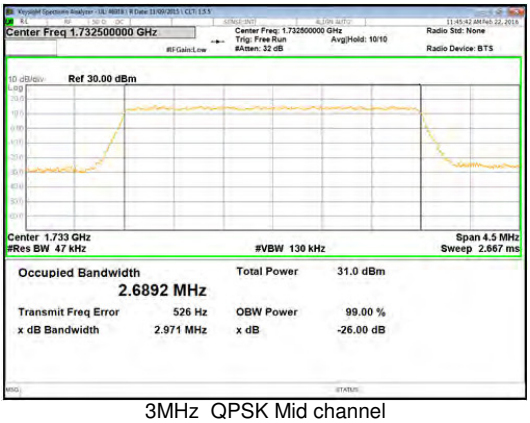
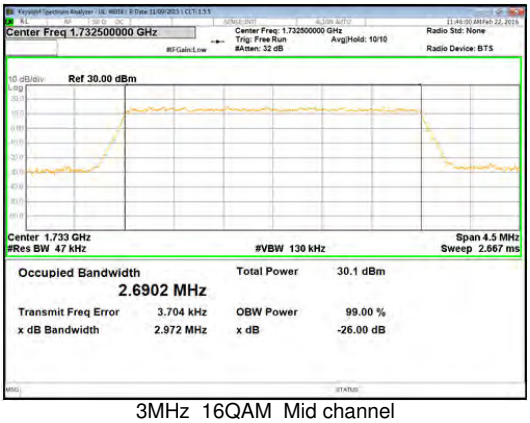
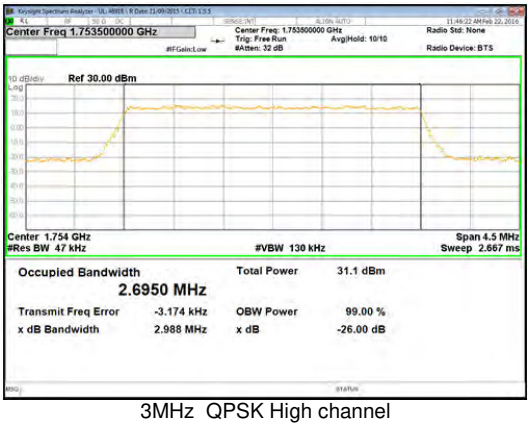
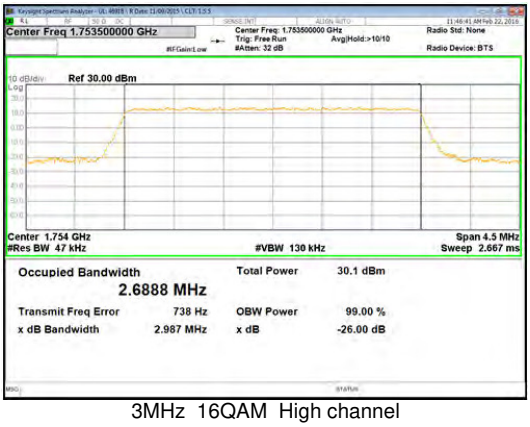
LTE Band 4

Band 4 20MHz	 20MHz QPSK Low channel	 20MHz 16QAM Low channel
	 20MHz QPSK Mid channel	 20MHz 16QAM Mid channel
	 20MHz QPSK High channel	 20MHz 16QAM High channel

Band 4 15MHz	 15MHz QPSK Low channel	 15MHz 16QAM Low channel
	 15MHz QPSK Mid channel	 15MHz 16QAM Mid channel
	 15MHz QPSK High channel	 15MHz 16QAM High channel

Band 4 10MHz	 10MHz QPSK Low channel	 10MHz 16QAM Low channel
	 10MHz QPSK Mid channel	 10MHz 16QAM Mid channel
	 10MHz QPSK High channel	 10MHz 16QAM High channel

Band 4 5MHz	 5MHz QPSK Low channel	 5MHz 16QAM Low channel
	 5MHz QPSK Mid channel	 5MHz 16QAM Mid channel
	 5MHz QPSK High channel	 5MHz 16QAM High channel

Band 4 3MHz	 3MHz QPSK Low channel	 3MHz 16QAM Low channel
	 3MHz QPSK Mid channel	 3MHz 16QAM Mid channel
	 3MHz QPSK High channel	 3MHz 16QAM High channel

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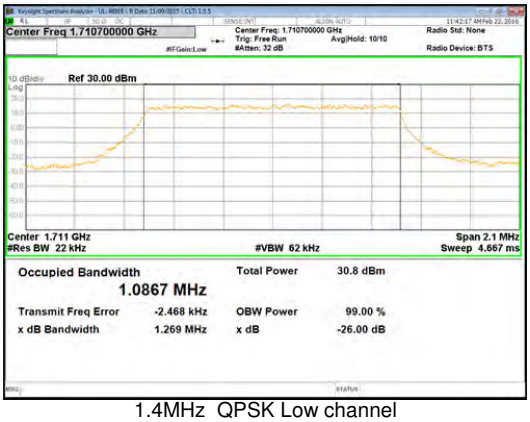
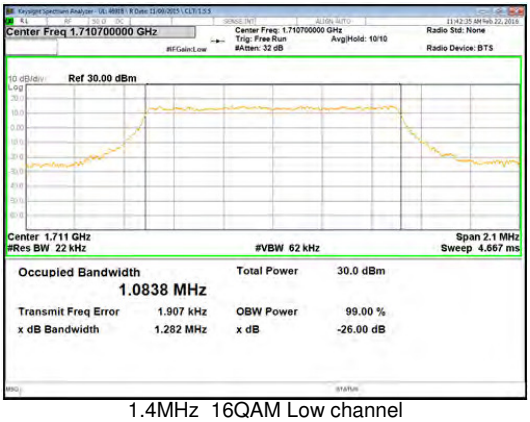
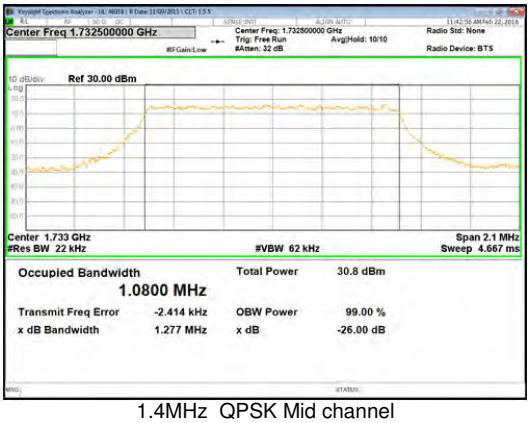
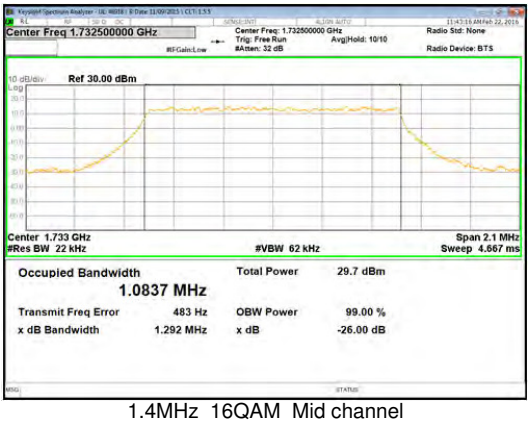
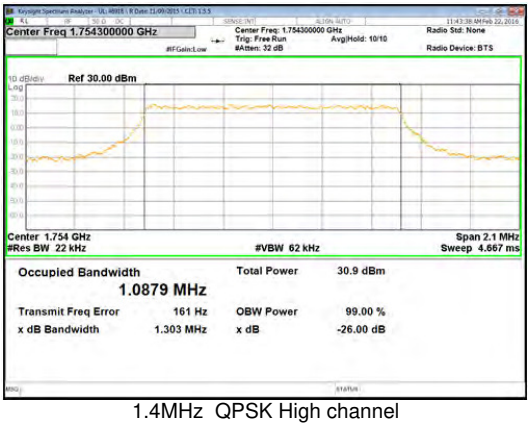
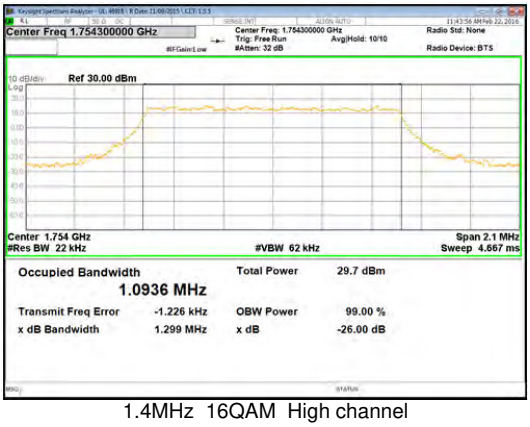
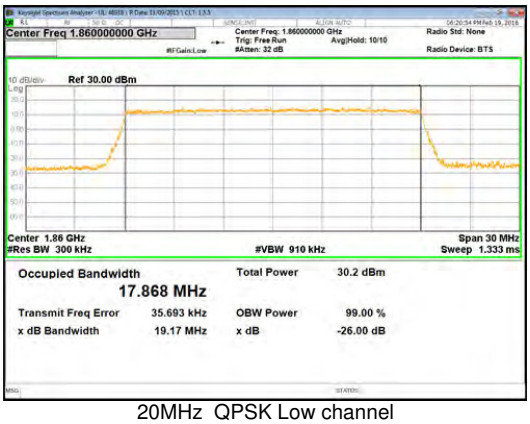
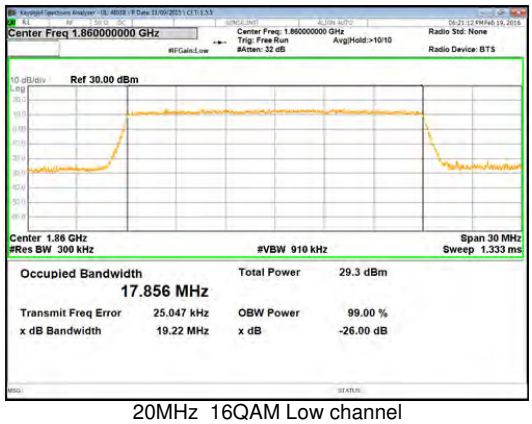
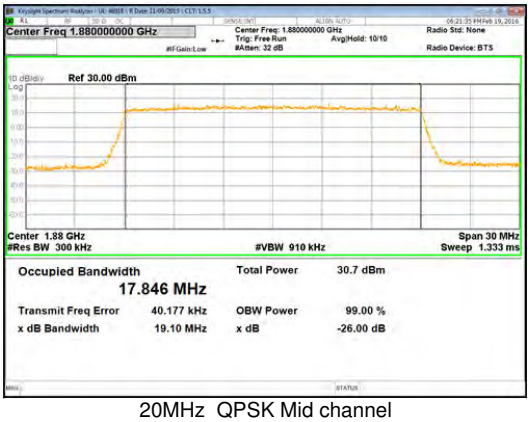
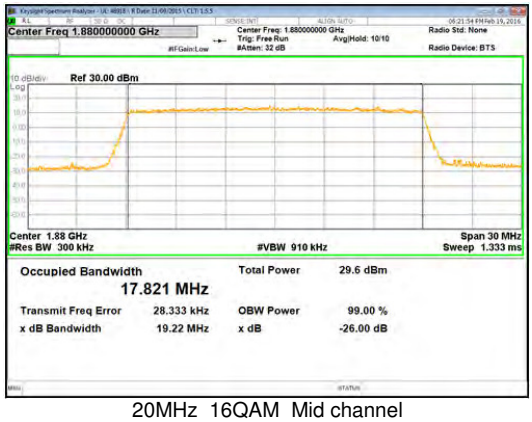
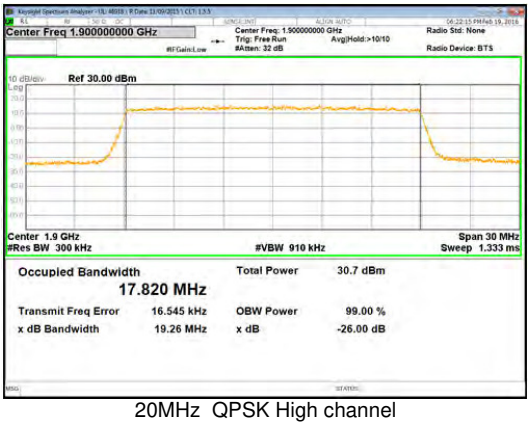
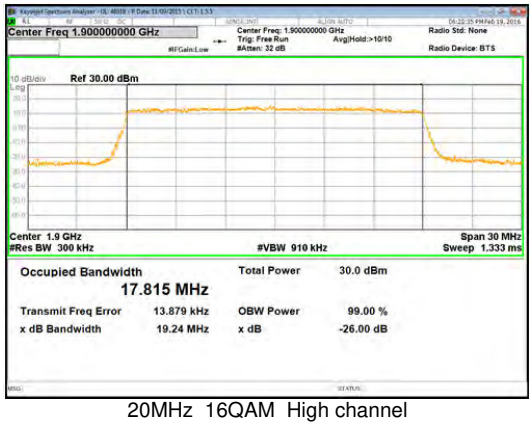
Band 4 1.4MHz	 1.4MHz QPSK Low channel	 1.4MHz 16QAM Low channel
	 1.4MHz QPSK Mid channel	 1.4MHz 16QAM Mid channel
	 1.4MHz QPSK High channel	 1.4MHz 16QAM High channel

LTE Band 2

Band 2 20MHz	 20MHz QPSK Low channel	 20MHz 16QAM Low channel
	 20MHz QPSK Mid channel	 20MHz 16QAM Mid channel
	 20MHz QPSK High channel	 20MHz 16QAM High channel

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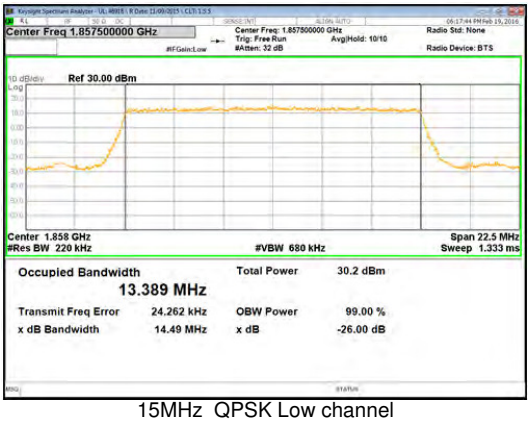
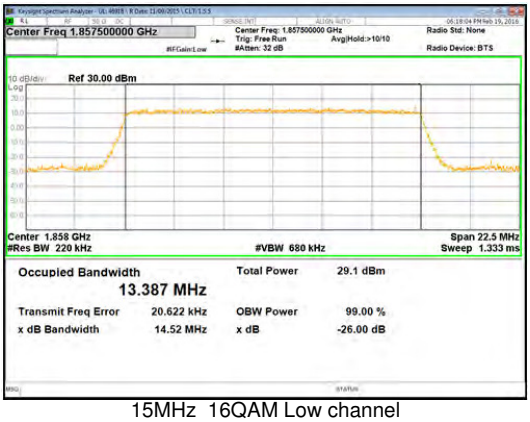
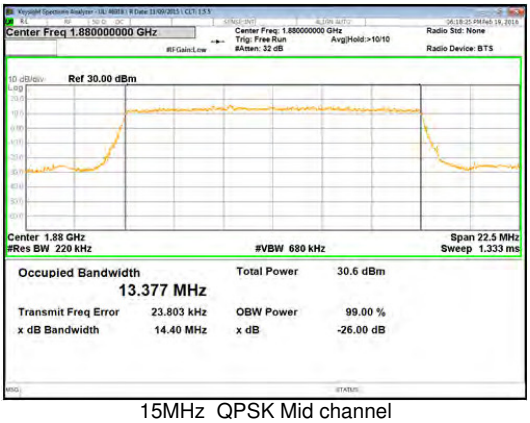
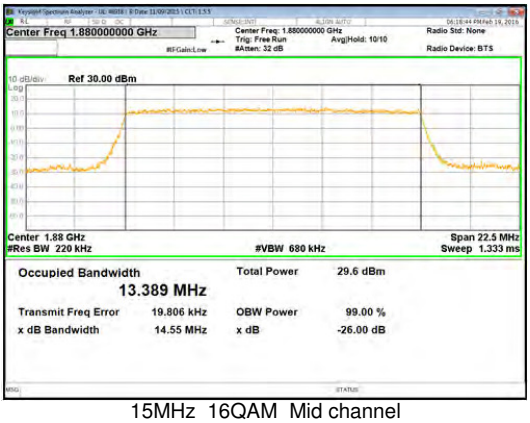
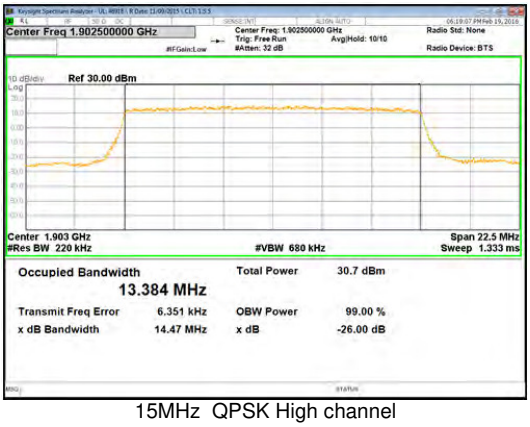
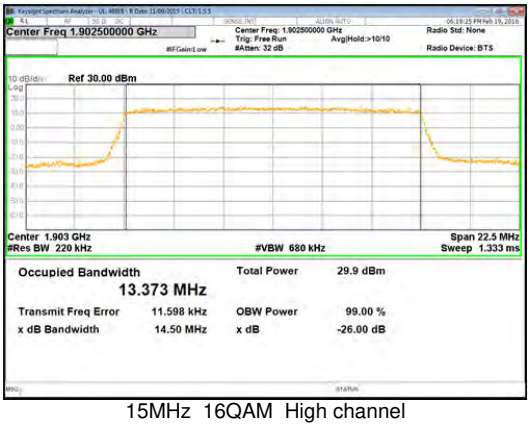
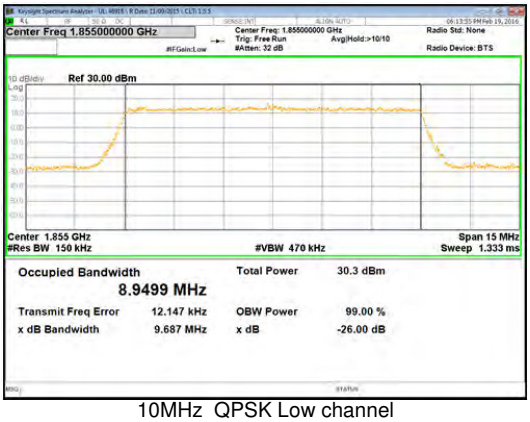
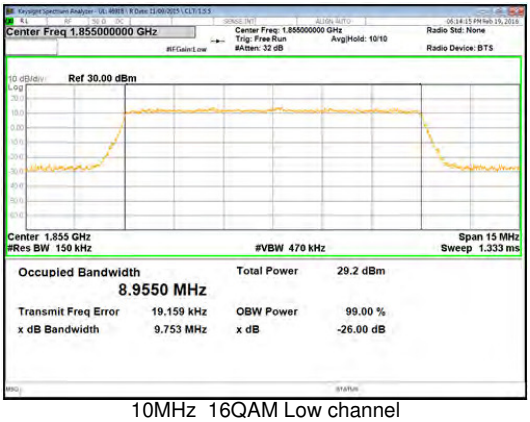
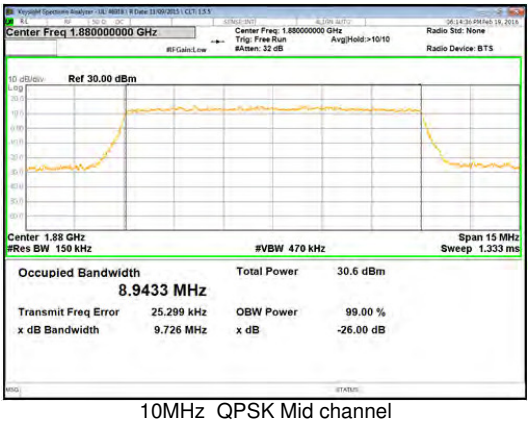
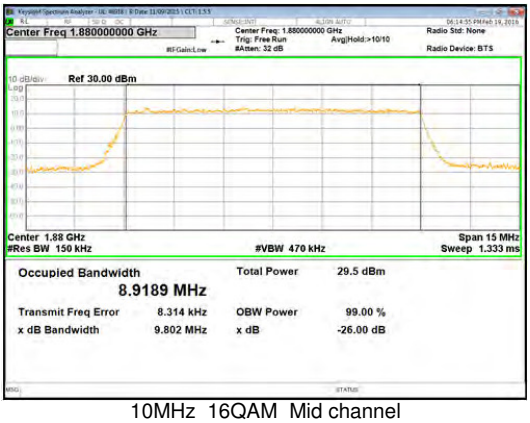
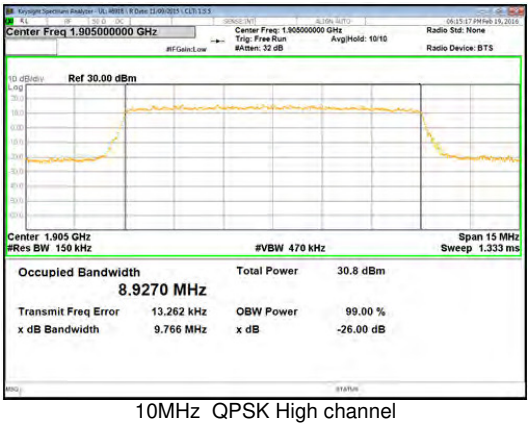
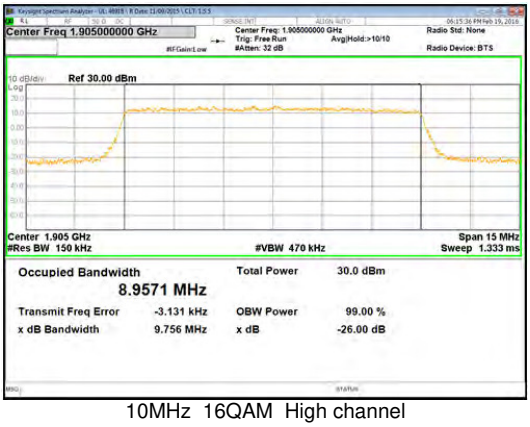
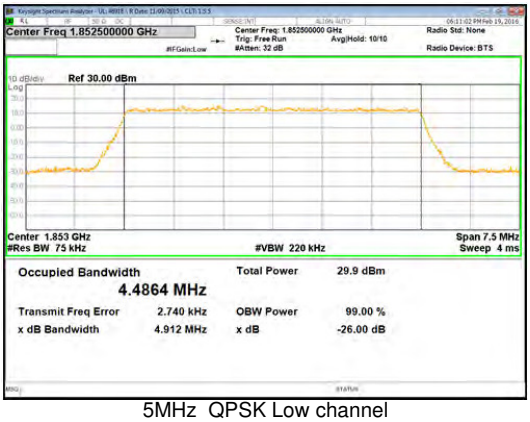
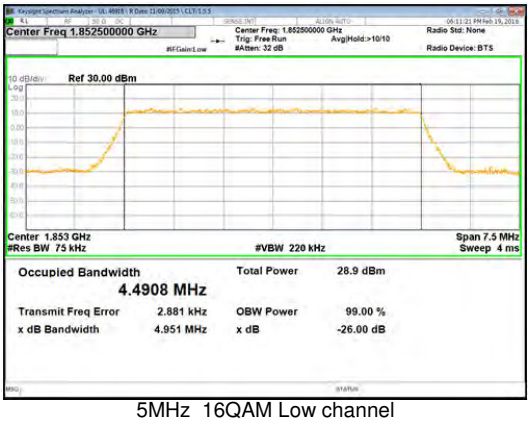
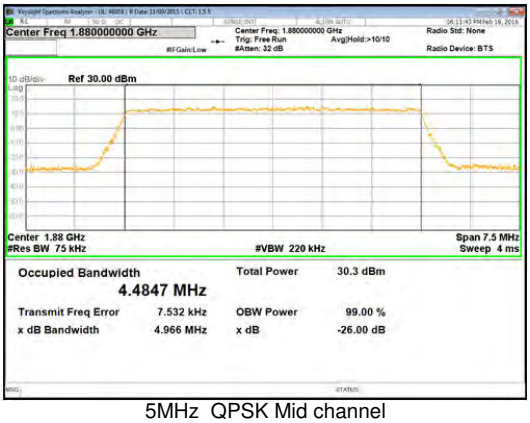
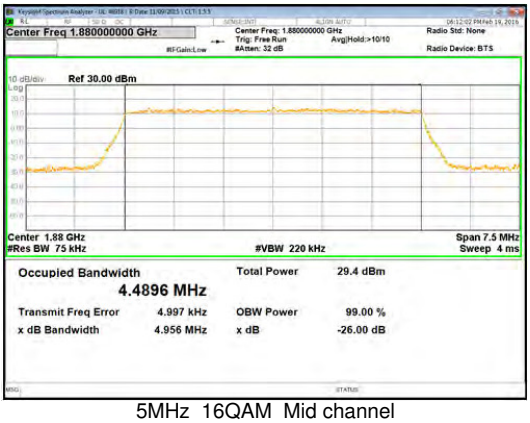
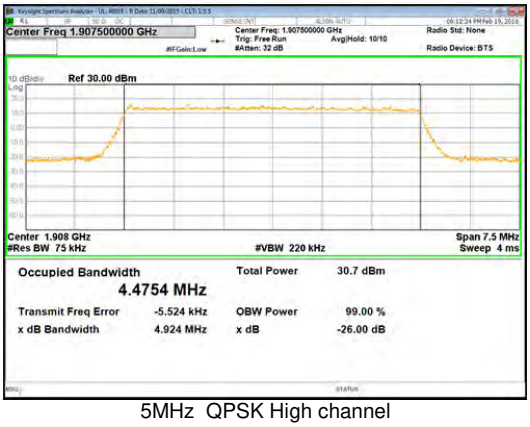
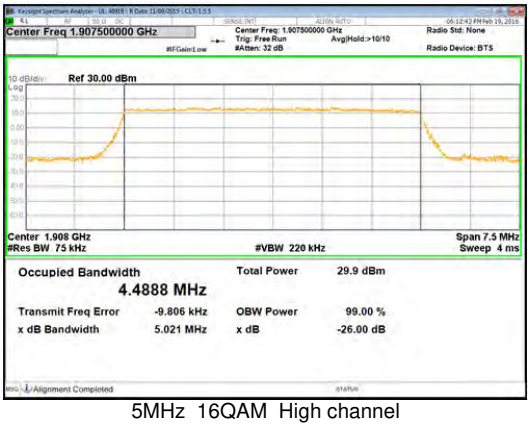
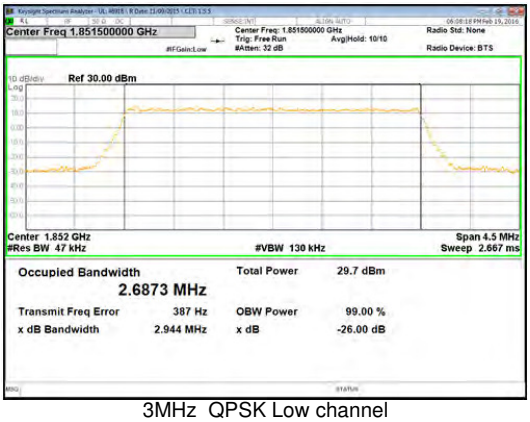
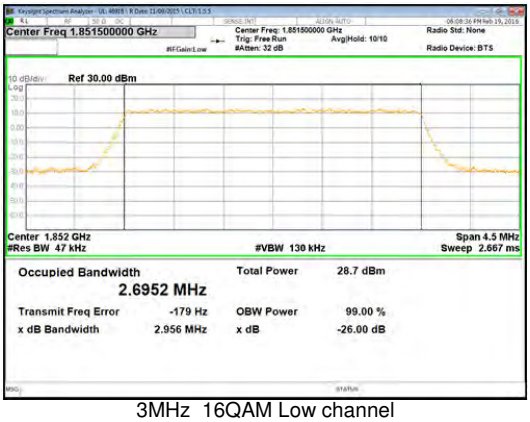
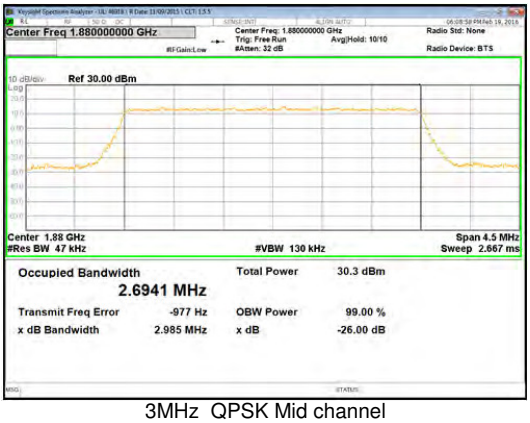
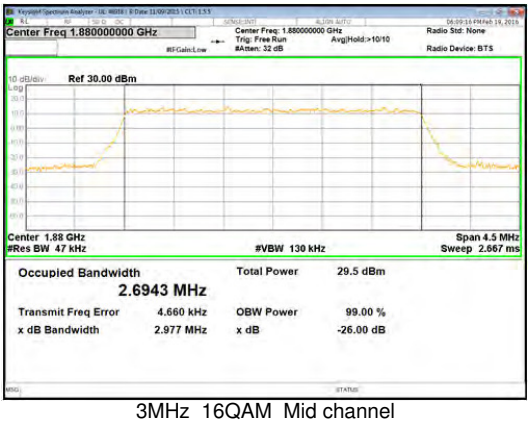
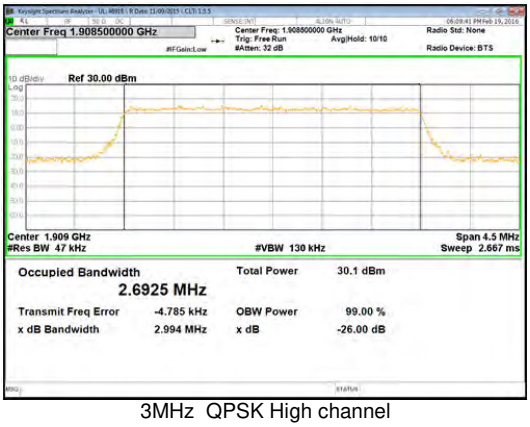
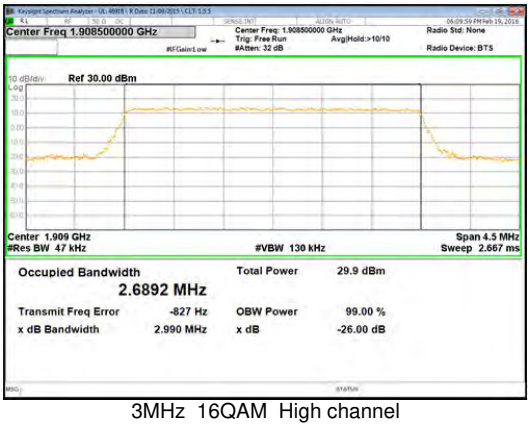
Band 2 15MHz	 15MHz QPSK Low channel	 15MHz 16QAM Low channel
	 15MHz QPSK Mid channel	 15MHz 16QAM Mid channel
	 15MHz QPSK High channel	 15MHz 16QAM High channel

Band 2 10MHz	 10MHz QPSK Low channel	 10MHz 16QAM Low channel
	 10MHz QPSK Mid channel	 10MHz 16QAM Mid channel
	 10MHz QPSK High channel	 10MHz 16QAM High channel

Band 2 5MHz	 5MHz QPSK Low channel	 5MHz 16QAM Low channel
	 5MHz QPSK Mid channel	 5MHz 16QAM Mid channel
	 5MHz QPSK High channel	 5MHz 16QAM High channel

Band 2 3MHz	 3MHz QPSK Low channel	 3MHz 16QAM Low channel
	 3MHz QPSK Mid channel	 3MHz 16QAM Mid channel
	 3MHz QPSK High channel	 3MHz 16QAM High channel

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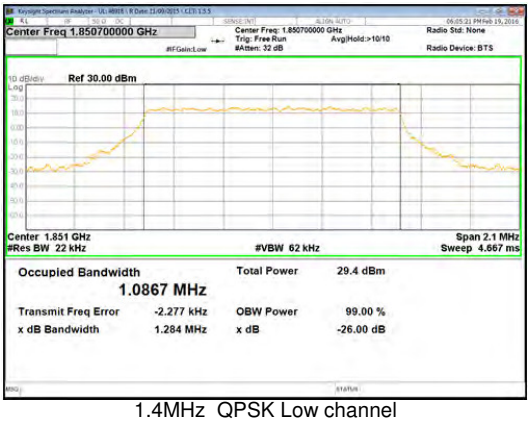
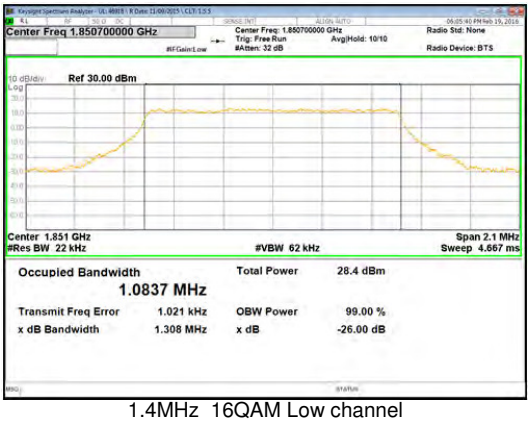
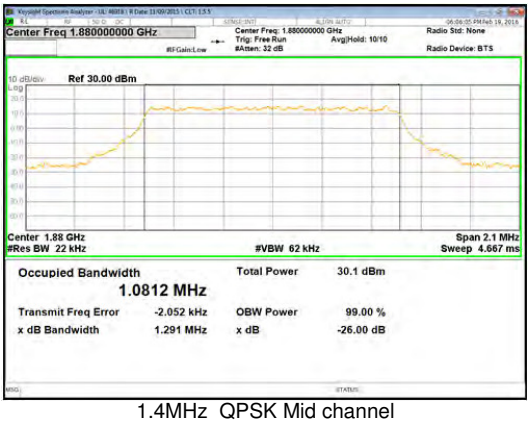
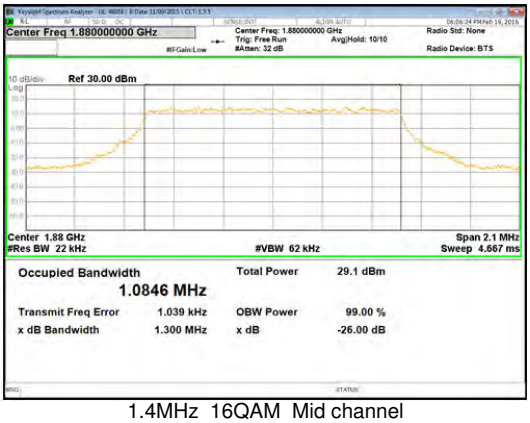
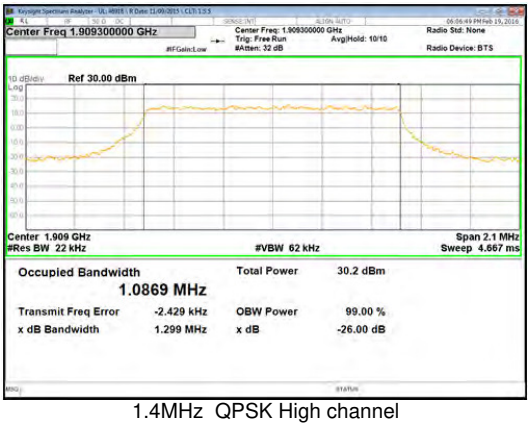
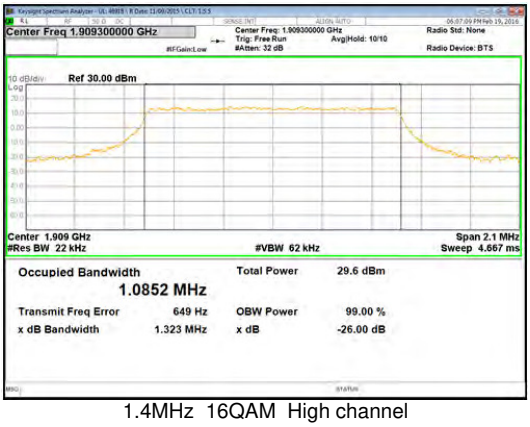
Band 2 1.4MHz	 1.4MHz QPSK Low channel	 1.4MHz 16QAM Low channel
	 1.4MHz QPSK Mid channel	 1.4MHz 16QAM Mid channel
	 1.4MHz QPSK High channel	 1.4MHz 16QAM High channel

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

GSM

Band	Mode	Side	f [MHz]	Level [dBm]	Limit [dBm]
GSM850	GPRS	Lower	823.982	-16.278	-13.00
		Upper	849.023	-15.925	
	EGPRS	Lower	823.987	-22.658	
		Upper	849.023	-24.226	
GSM1900	GPRS	Lower	1849.982	-17.991	
		Upper	1910.023	-17.145	
	EGPRS	Lower	1849.992	-21.274	
		Upper	1910.008	-23.572	

WCDMA

Band	Mode	Side	f [MHz]	Level [dBm]	Limit [dBm]
Band 5	REL99	Lower	824.000	-24.979	-13.00
		Upper	849.000	-25.666	
	HSDPA	Lower	824.000	-26.594	
		Upper	849.000	-25.425	
Band 2	REL99	Lower	1850.000	-28.528	
		Upper	1910.000	-28.344	
	HSDPA	Lower	1850.000	-29.300	
		Upper	1910.000	-28.545	

LTE 17

Bandwidth	Mode	Side	RB Status	f [MHz]	Level [dBm]	Limit [dBm]
10 MHz	QPSK	Lower	1RB	704.000	-29.526	-13.00
			FRB	704.000	-27.190	
		Upper	1RB	716.000	-28.693	
			FRB	716.000	-28.357	
	16QAM	Lower	1RB	704.000	-28.770	
			FRB	704.000	-29.329	
		Upper	1RB	716.000	-26.563	
			FRB	716.000	-30.051	
5 MHz	QPSK	Lower	1RB	704.000	-20.989	
			FRB	704.000	-25.168	
		Upper	1RB	716.000	-16.379	
			FRB	716.000	-25.813	
	16QAM	Lower	1RB	704.000	-20.516	
			FRB	704.000	-26.024	
		Upper	1RB	716.000	-19.738	
			FRB	716.000	-27.359	

LTE 5

Bandwidth	Mode	Side	RB Status	f [MHz]	Level [dBm]	Limit [dBm]
10 MHz	QPSK	Lower	1RB	824.000	-29.833	-13.00
			FRB	824.000	-27.980	
		Upper	1RB	849.000	-23.285	
			FRB	849.000	-28.164	
	16QAM	Lower	1RB	824.000	-32.563	
			FRB	824.000	-29.369	
		Upper	1RB	849.000	-28.261	
			FRB	849.000	-29.058	
5 MHz	QPSK	Lower	1RB	824.000	-20.136	
			FRB	824.000	-27.563	
		Upper	1RB	849.000	-19.212	
			FRB	849.000	-25.393	
	16QAM	Lower	1RB	824.000	-19.625	
			FRB	824.000	-29.245	
		Upper	1RB	849.000	-20.241	
			FRB	849.000	-27.428	
3 MHz	QPSK	Lower	1RB	824.000	-17.457	
			FRB	824.000	-24.716	
		Upper	1RB	849.000	-15.298	
			FRB	849.000	-25.317	
	16QAM	Lower	1RB	824.000	-17.372	
			FRB	824.000	-25.377	
		Upper	1RB	849.000	-18.040	
			FRB	849.000	-25.769	
1.4 MHz	QPSK	Lower	1RB	824.000	-22.468	
			FRB	824.000	-26.973	
		Upper	1RB	849.000	-20.949	
			FRB	849.000	-25.706	
	16QAM	Lower	1RB	824.000	-23.341	
			FRB	824.000	-28.548	
		Upper	1RB	849.000	-21.700	
			FRB	849.000	-27.063	

LTE 4

Bandwidth	Mode	Side	RB Status	f [MHz]	Level [dBm]	Limit [dBm]
20 MHz	QPSK	Lower	1RB	1710.000	-28.461	-13.00
			FRB	1710.000	-30.186	
		Upper	1RB	1755.000	-25.380	
			FRB	1755.000	-27.712	
	16QAM	Lower	1RB	1710.000	-28.684	
			FRB	1710.000	-32.259	
		Upper	1RB	1755.000	-25.596	
			FRB	1755.000	-31.320	
15 MHz	QPSK	Lower	1RB	1710.000	-24.297	
			FRB	1710.000	-29.172	
		Upper	1RB	1755.000	-20.224	
			FRB	1755.000	-24.253	
	16QAM	Lower	1RB	1710.000	-24.813	
			FRB	1710.000	-31.719	
		Upper	1RB	1755.000	-27.898	
			FRB	1755.000	-29.868	
10 MHz	QPSK	Lower	1RB	1710.000	-25.183	
			FRB	1710.000	-30.572	
		Upper	1RB	1755.000	-24.743	
			FRB	1755.000	-26.849	
	16QAM	Lower	1RB	1710.000	-34.705	
			FRB	1710.000	-31.505	
		Upper	1RB	1755.000	-27.479	
			FRB	1755.000	-29.580	
5 MHz	QPSK	Lower	1RB	1710.000	-18.609	
			FRB	1710.000	-27.571	
		Upper	1RB	1755.000	-16.833	
			FRB	1755.000	-24.999	
	16QAM	Lower	1RB	1710.000	-18.980	
			FRB	1710.000	-28.009	
		Upper	1RB	1755.000	-18.450	
			FRB	1755.000	-27.799	

Bandwidth	Mode	Side	RB Status	f [MHz]	Level [dBm]	Limit [dBm]
3 MHz	QPSK	Lower	1RB	1710.000	-15.873	-13.00
			FRB	1710.000	-26.362	
		Upper	1RB	1755.000	-14.529	
			FRB	1755.000	-24.054	
	16QAM	Lower	1RB	1710.000	-19.166	
			FRB	1710.000	-25.699	
		Upper	1RB	1755.000	-16.898	
			FRB	1755.000	-26.068	
1.4 MHz	QPSK	Lower	1RB	1710.000	-19.830	
			FRB	1710.000	-27.291	
		Upper	1RB	1755.000	-18.899	
			FRB	1755.000	-23.586	
	16QAM	Lower	1RB	1710.000	-23.581	
			FRB	1710.000	-29.661	
		Upper	1RB	1755.000	-18.987	
			FRB	1755.000	-26.699	

LTE 2

Bandwidth	Mode	Side	RB Status	f [MHz]	Level [dBm]	Limit [dBm]
20 MHz	QPSK	Lower	1RB	1850.000	-29.265	-13.00
			FRB	1850.000	-32.093	
		Upper	1RB	1910.000	-30.084	
			FRB	1910.000	-30.209	
	16QAM	Lower	1RB	1850.000	-30.988	
			FRB	1850.000	-35.782	
		Upper	1RB	1910.000	-31.564	
			FRB	1910.000	-32.616	
15 MHz	QPSK	Lower	1RB	1850.000	-29.966	
			FRB	1850.000	-31.648	
		Upper	1RB	1910.000	-23.540	
			FRB	1910.000	-29.478	
	16QAM	Lower	1RB	1850.000	-26.230	
			FRB	1850.000	-35.716	
		Upper	1RB	1910.000	-22.298	
			FRB	1910.000	-31.109	

Bandwidth	Mode	Side	RB Status	f [MHz]	Level [dBm]	Limit [dBm]
10 MHz	QPSK	Lower	1RB	1850.000	-30.184	-13.00
			FRB	1850.000	-31.621	
		Upper	1RB	1910.000	-25.715	
			FRB	1910.000	-27.647	
	16QAM	Lower	1RB	1850.000	-33.722	
			FRB	1850.000	-31.379	
		Upper	1RB	1910.000	-25.783	
			FRB	1910.000	-29.866	
5 MHz	QPSK	Lower	1RB	1850.000	-18.416	
			FRB	1850.000	-27.922	
		Upper	1RB	1910.000	-15.707	
			FRB	1910.000	-26.907	
	16QAM	Lower	1RB	1850.000	-19.741	
			FRB	1850.000	-30.312	
		Upper	1RB	1910.000	-18.450	
			FRB	1910.000	-27.091	
3 MHz	QPSK	Lower	1RB	1850.000	-16.580	
			FRB	1850.000	-25.394	
		Upper	1RB	1910.000	-14.509	
			FRB	1910.000	-24.068	
	16QAM	Lower	1RB	1850.000	-17.965	
			FRB	1850.000	-27.213	
		Upper	1RB	1910.000	-18.279	
			FRB	1910.000	-26.608	
1.4 MHz	QPSK	Lower	1RB	1850.000	-21.179	
			FRB	1850.000	-25.905	
		Upper	1RB	1910.000	-18.633	
			FRB	1910.000	-24.283	
	16QAM	Lower	1RB	1850.000	-21.931	
			FRB	1850.000	-27.087	
		Upper	1RB	1910.000	-21.937	
			FRB	1910.000	-26.955	

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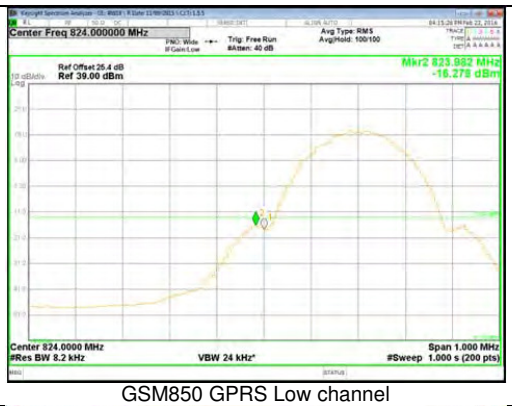
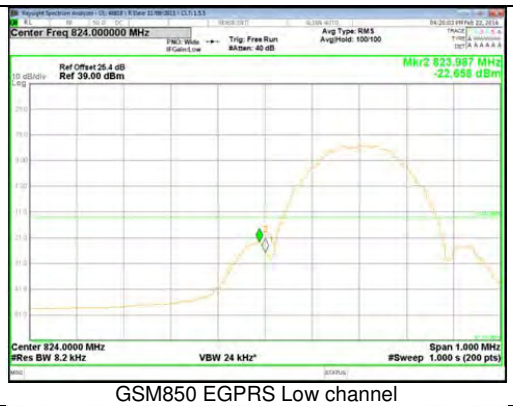
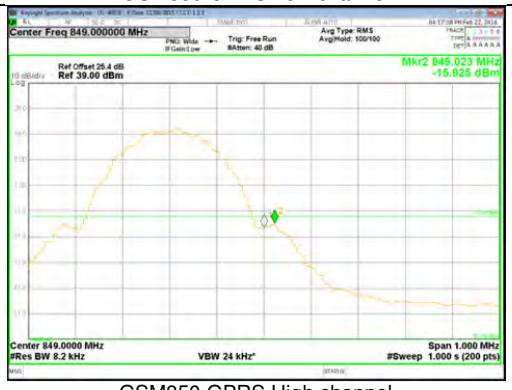
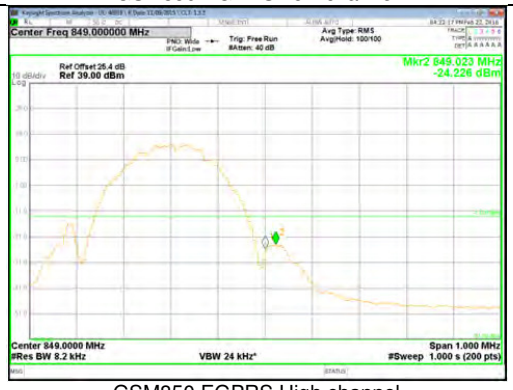
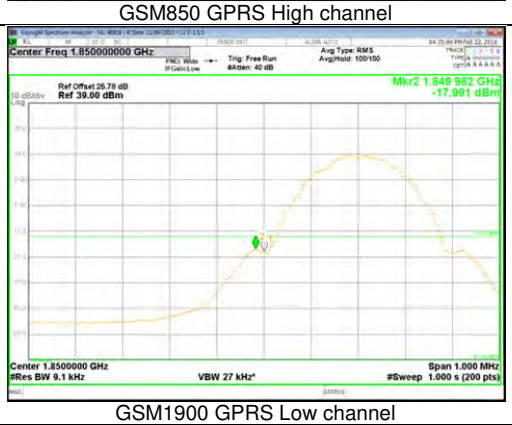
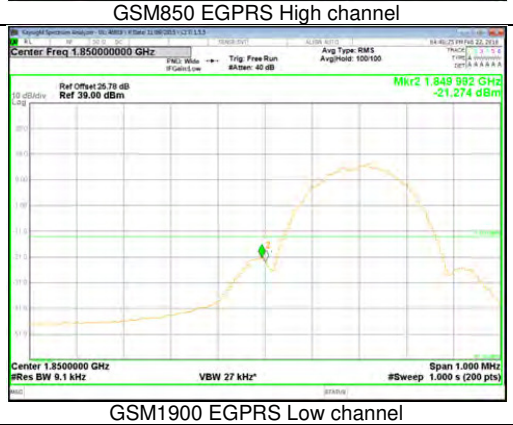
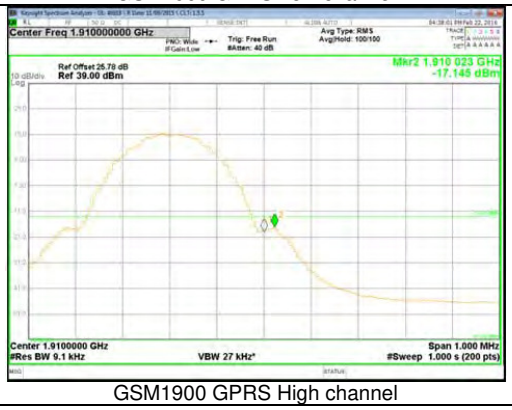
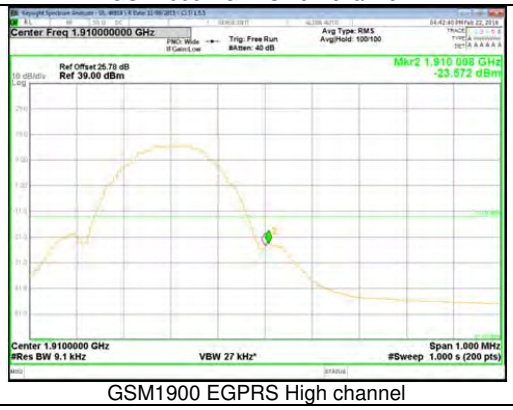
10.2.1. BAND EDGE PLOTS

GSM

GSM 850	 GSM850 GPRS Low channel	 GSM850 EGPRS Low channel
	 GSM850 GPRS High channel	 GSM850 EGPRS High channel
GSM 1900	 GSM1900 GPRS Low channel	 GSM1900 EGPRS Low channel
	 GSM1900 GPRS High channel	 GSM1900 EGPRS High channel

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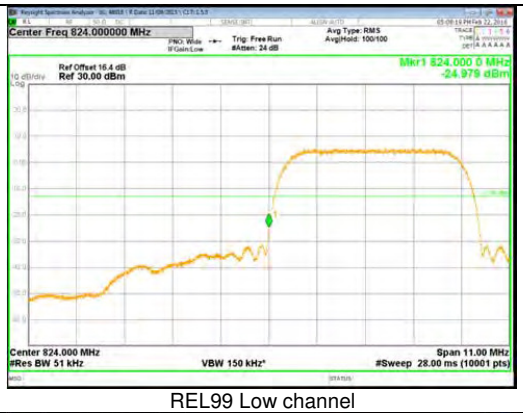
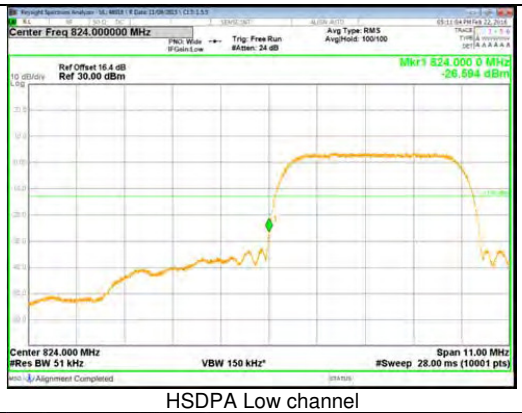
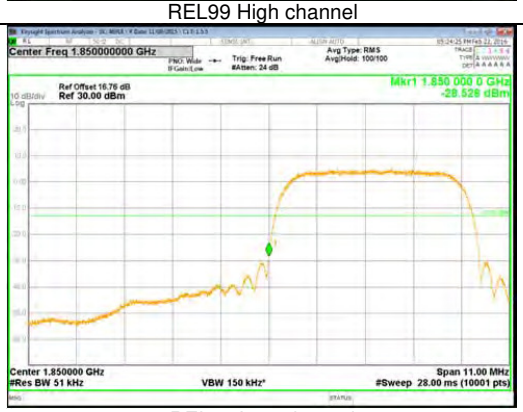
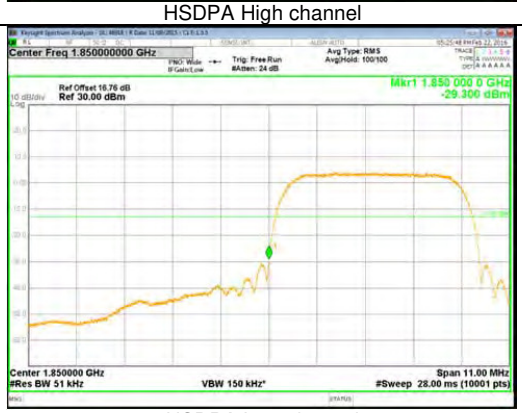
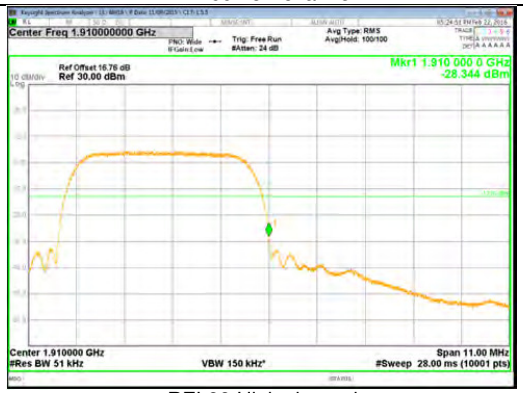
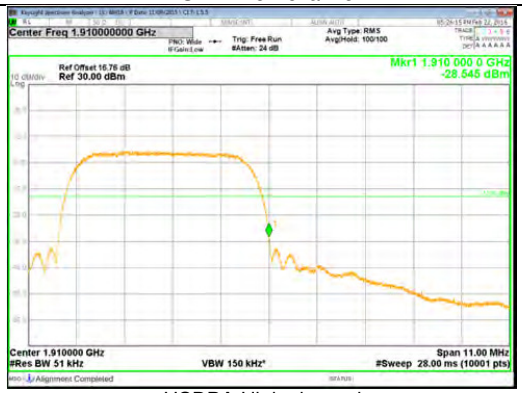
WCDMA

Band 5	 REL99 Low channel	 HSDPA Low channel
	 REL99 High channel	 HSDPA High channel
Band 2	 REL99 Low channel	 HSDPA Low channel
	 REL99 High channel	 HSDPA High channel

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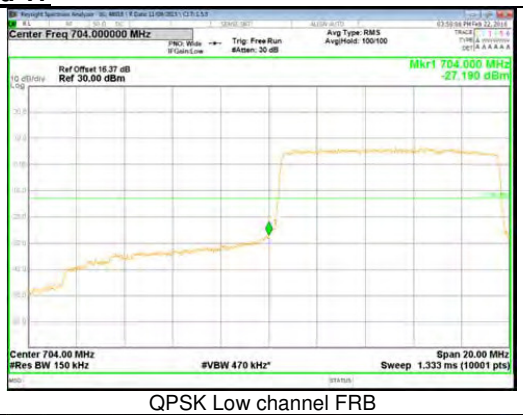
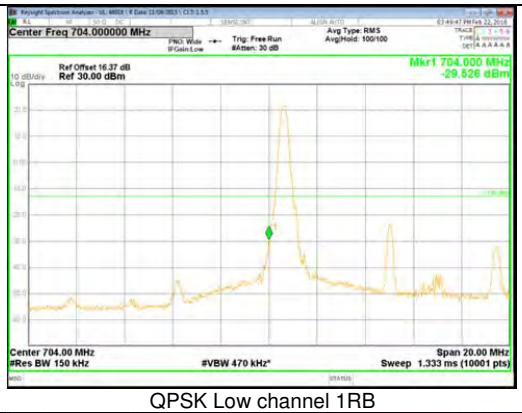
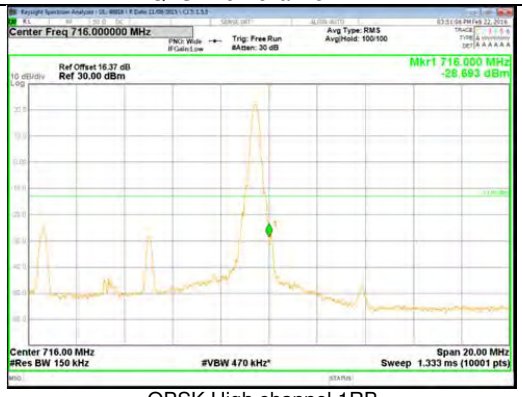
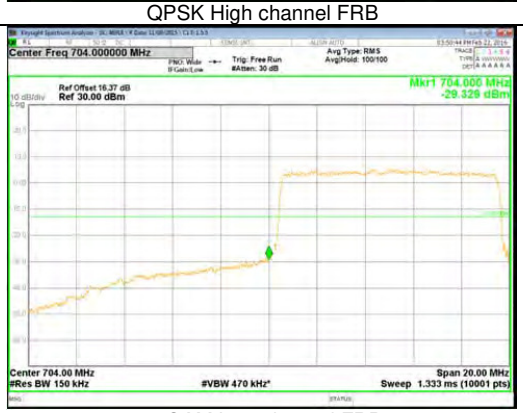
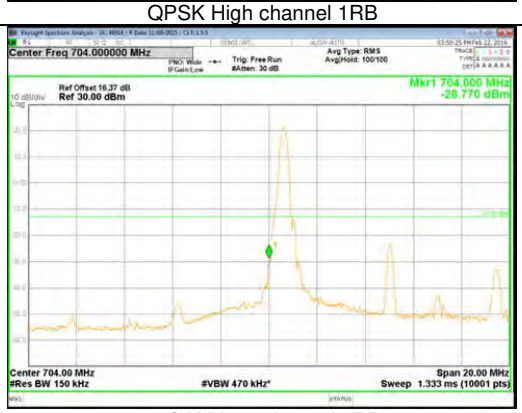
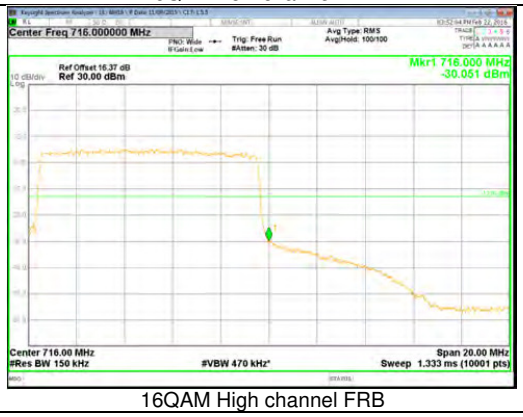
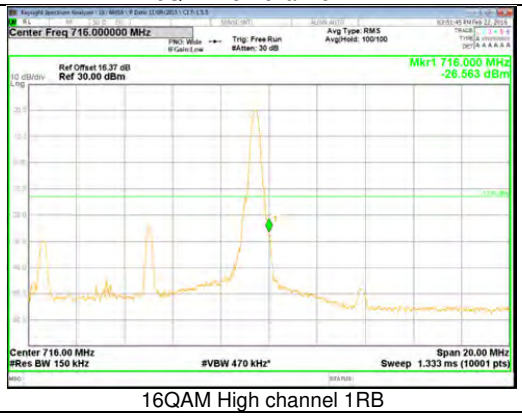
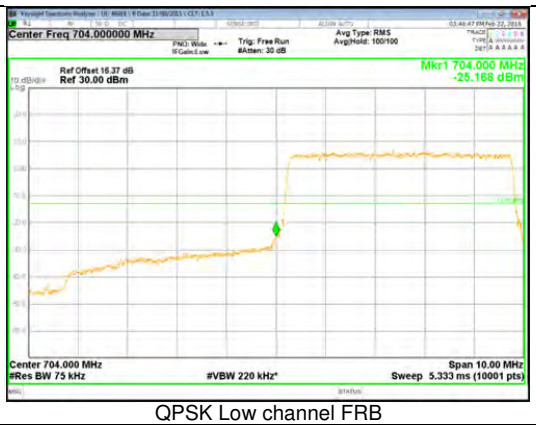
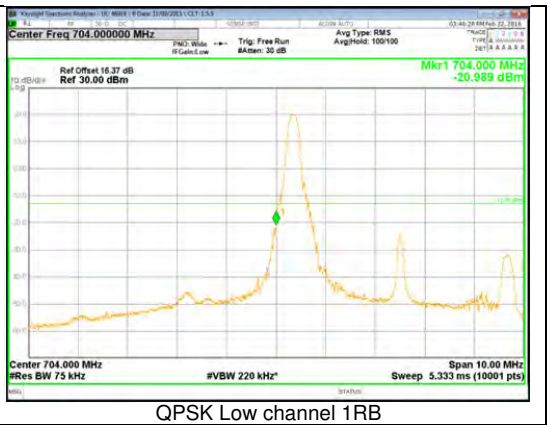
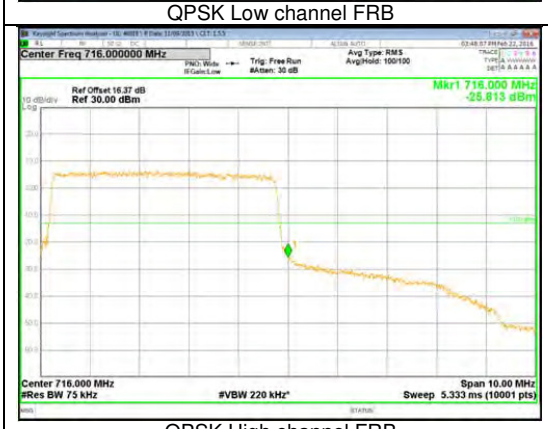
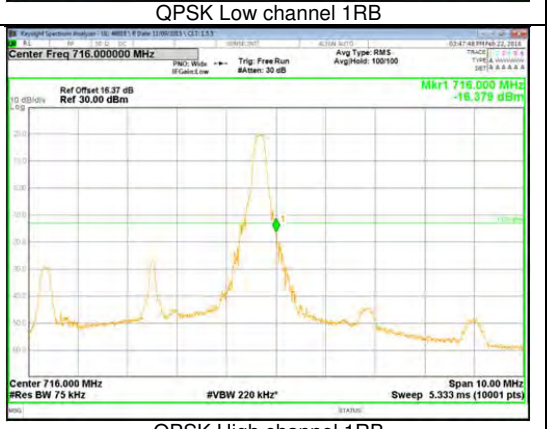
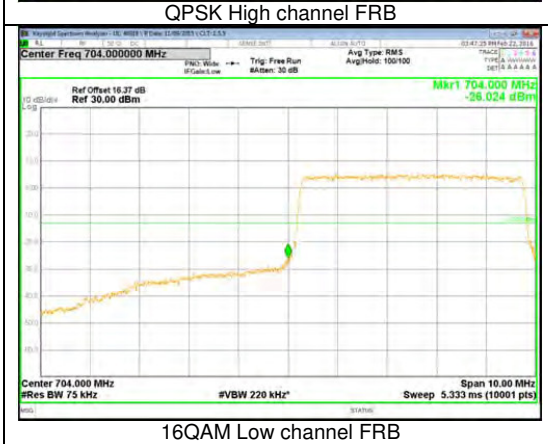
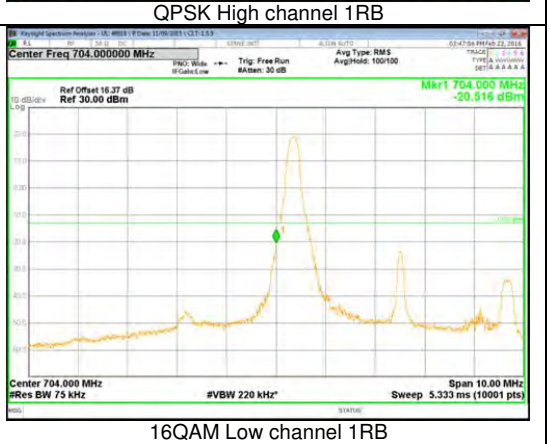
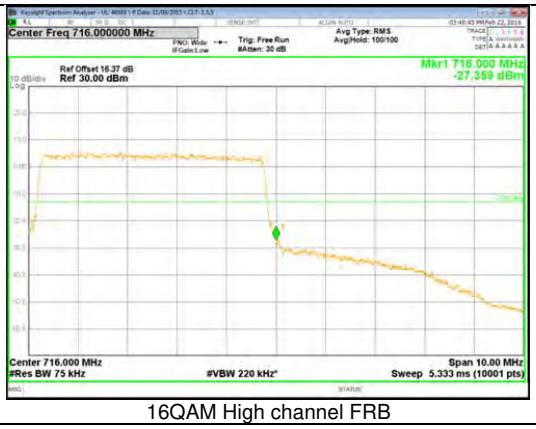
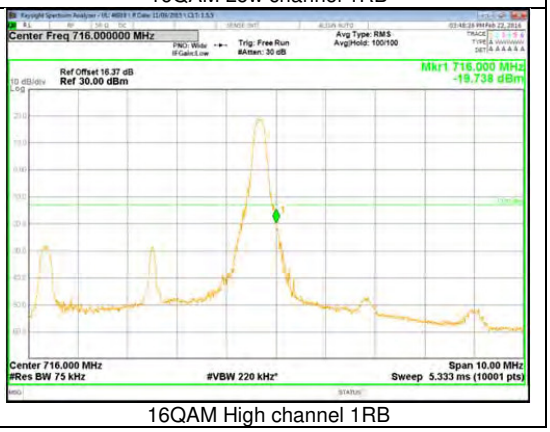
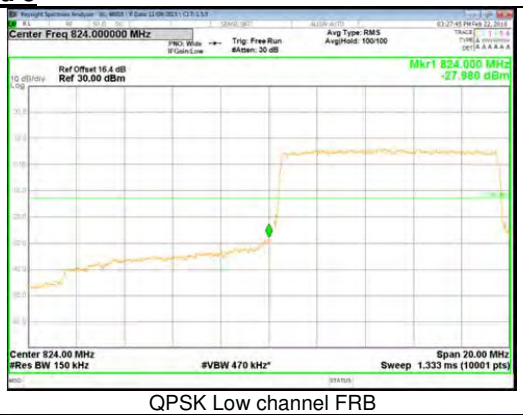
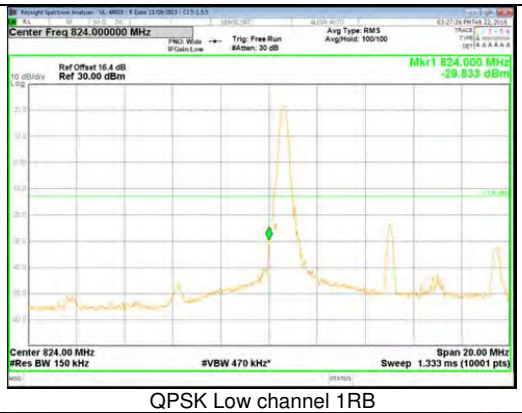
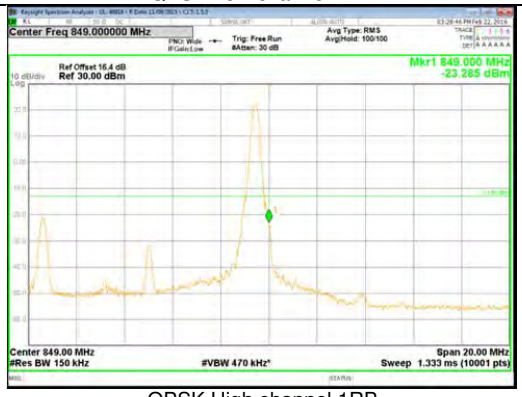
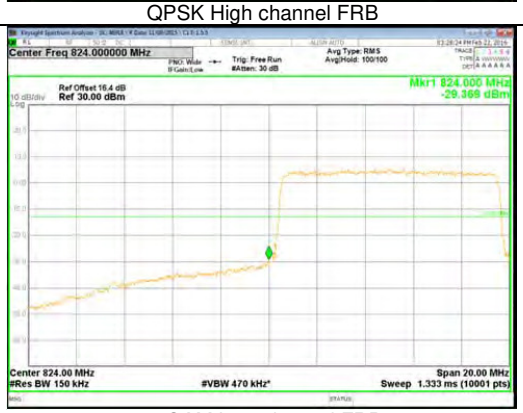
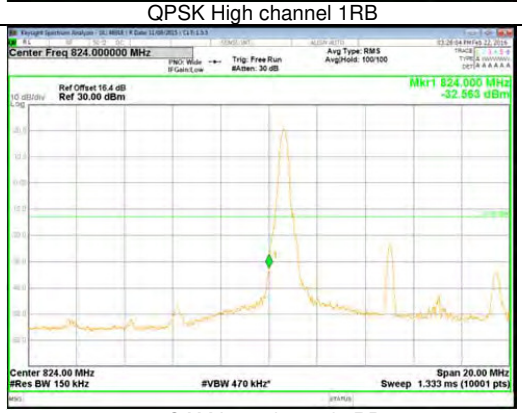
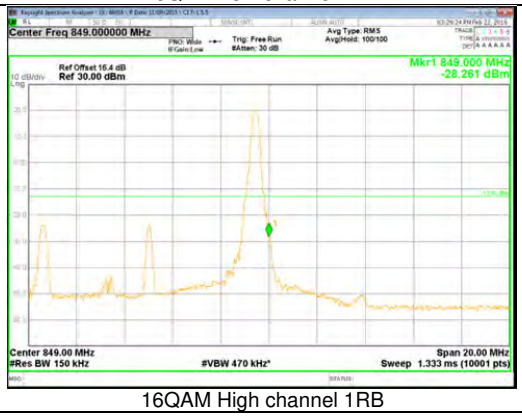
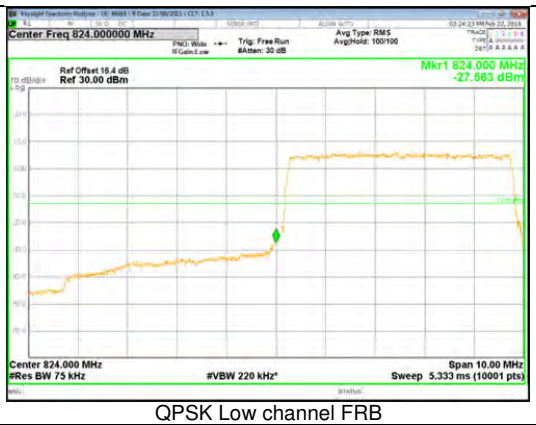
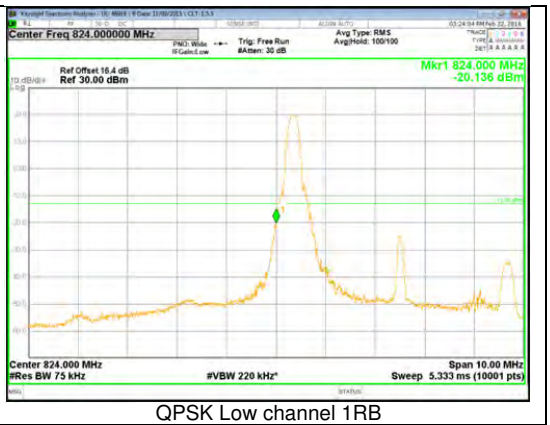
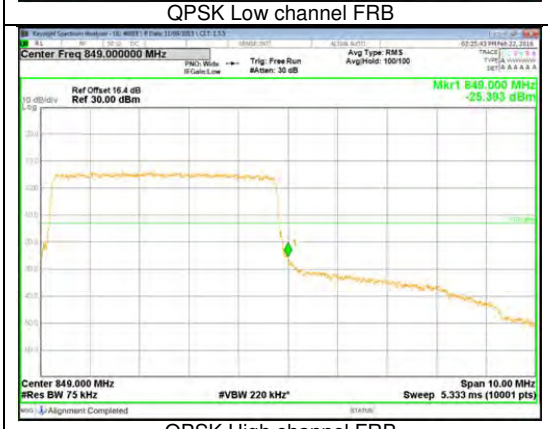
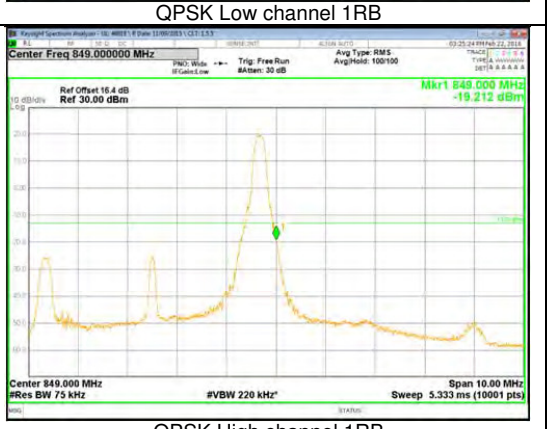
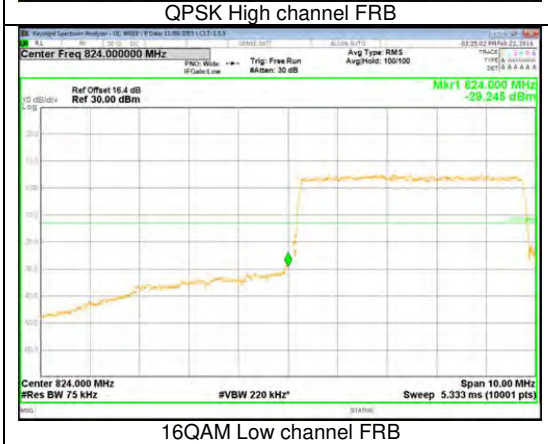
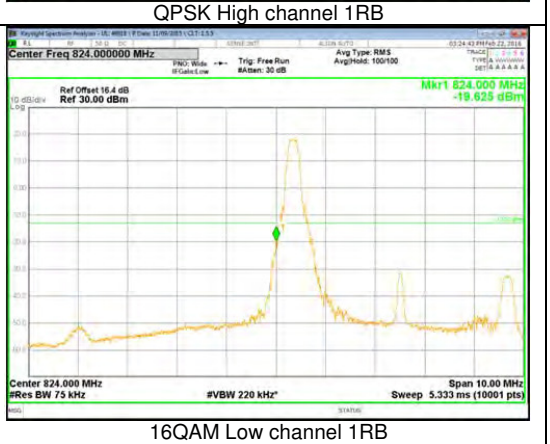
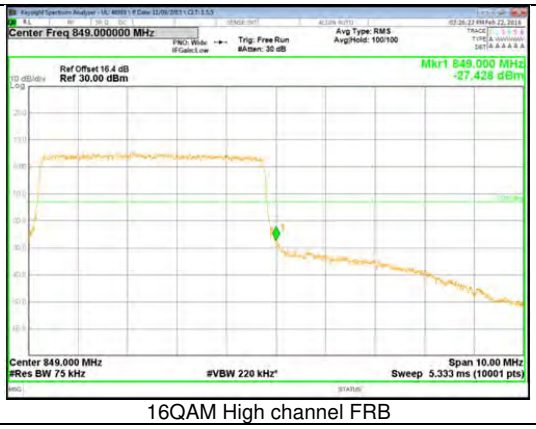
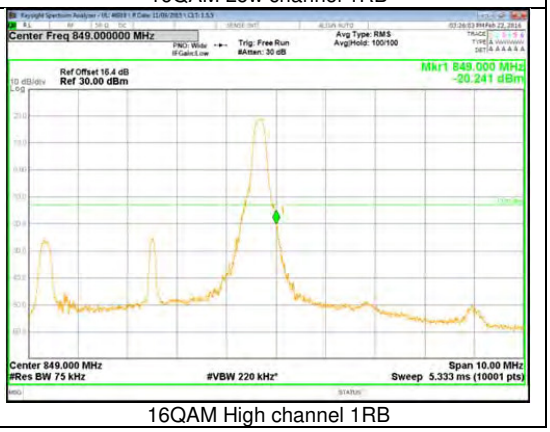
LTE Band 17

Band 17 10MHz	 QPSK Low channel FRB	 QPSK Low channel 1RB
	 QPSK High channel FRB	 QPSK High channel 1RB
	 16QAM Low channel FRB	 16QAM Low channel 1RB
	 16QAM High channel FRB	 16QAM High channel 1RB

Band 17 5MHz	 QPSK Low channel FRB	 QPSK Low channel 1RB
	 QPSK High channel FRB	 QPSK High channel 1RB
	 16QAM Low channel FRB	 16QAM Low channel 1RB
	 16QAM High channel FRB	 16QAM High channel 1RB

LTE Band 5

Band 5 10MHz	 QPSK Low channel FRB	 QPSK Low channel 1RB
	 QPSK High channel FRB	 QPSK High channel 1RB
	 16QAM Low channel FRB	 16QAM Low channel 1RB
	 16QAM High channel FRB	 16QAM High channel 1RB

Band 5 5MHz	 QPSK Low channel FRB	 QPSK Low channel 1RB
	 QPSK High channel FRB	 QPSK High channel 1RB
	 16QAM Low channel FRB	 16QAM Low channel 1RB
	 16QAM High channel FRB	 16QAM High channel 1RB

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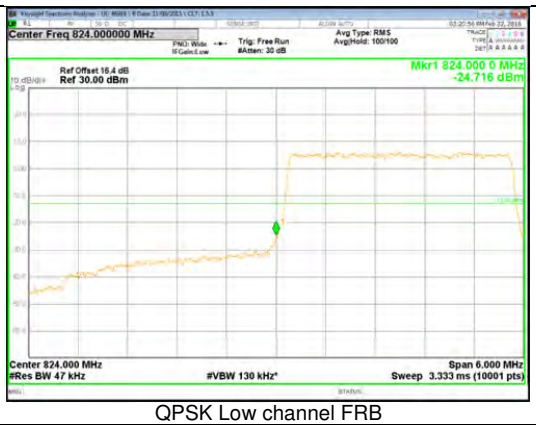
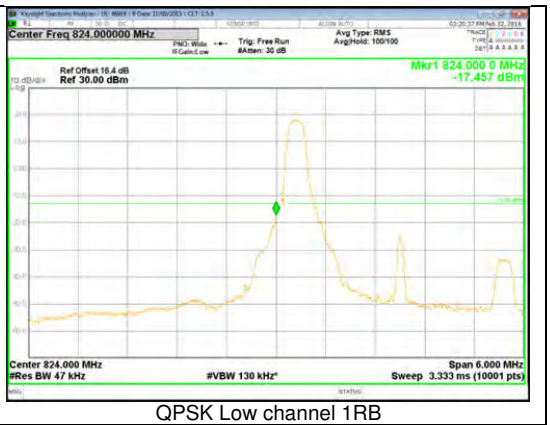
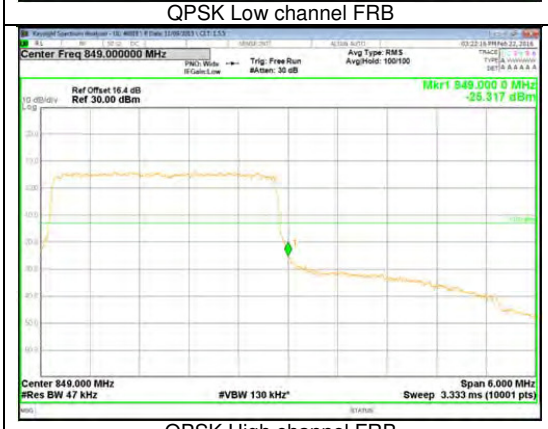
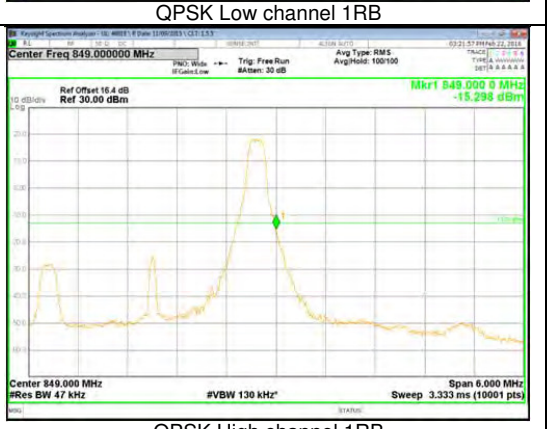
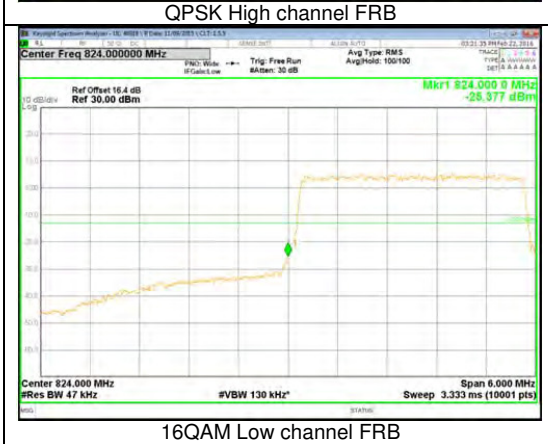
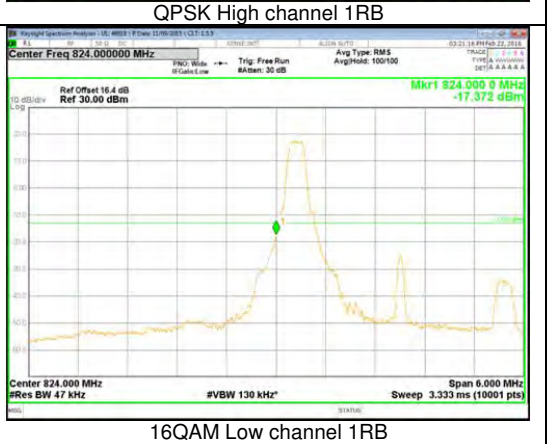
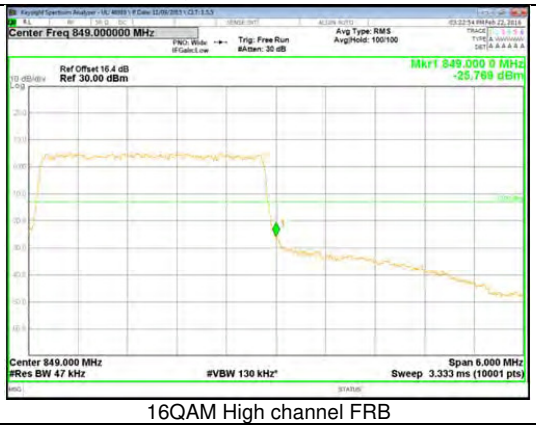
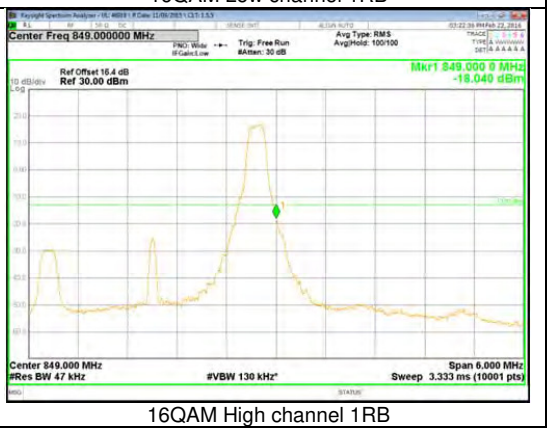
Band 5 3MHz	 QPSK Low channel FRB	 QPSK Low channel 1RB
	 QPSK High channel FRB	 QPSK High channel 1RB
	 16QAM Low channel FRB	 16QAM Low channel 1RB
	 16QAM High channel FRB	 16QAM High channel 1RB

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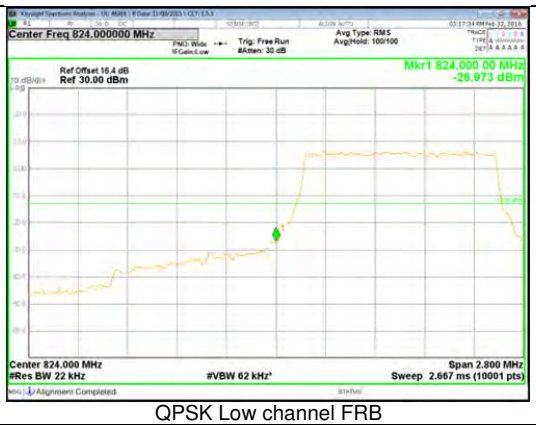
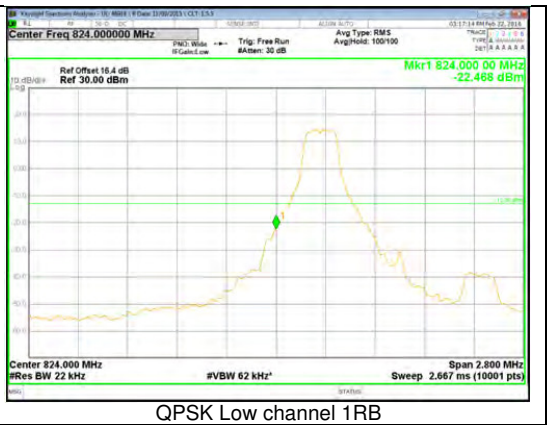
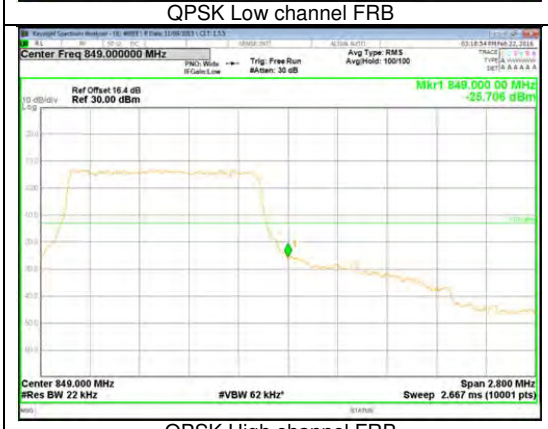
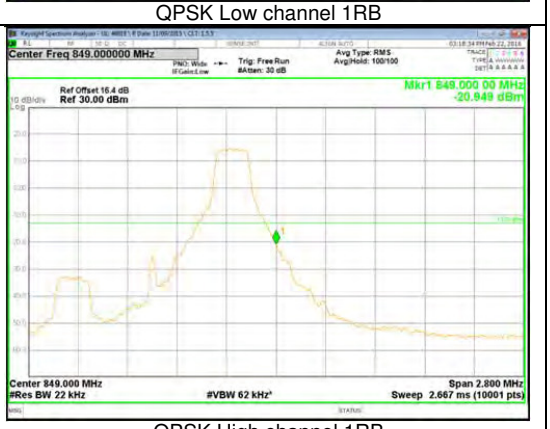
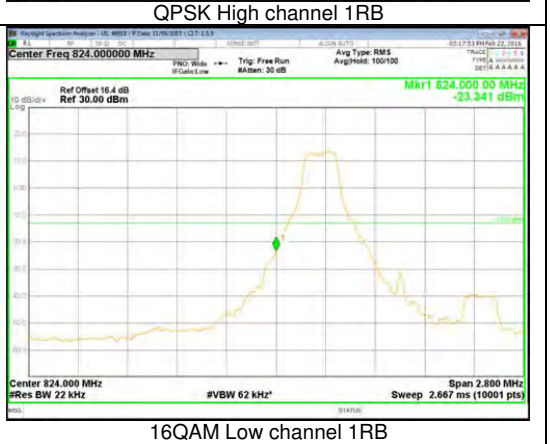
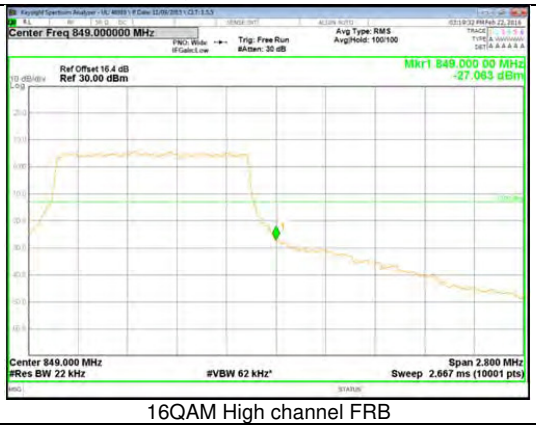
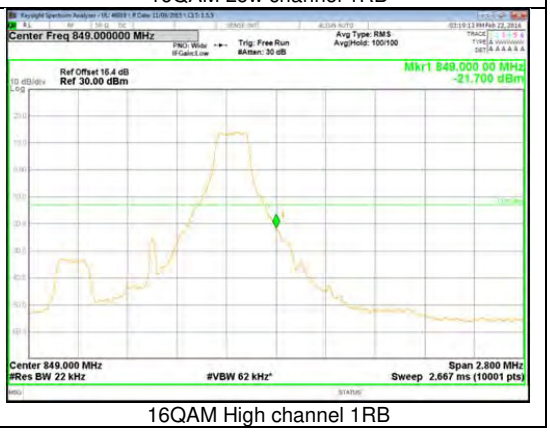
Band 5 1.4MHz	 QPSK Low channel FRB	 QPSK Low channel 1RB
	 QPSK High channel FRB	 QPSK High channel 1RB
	 16QAM Low channel FRB	 16QAM Low channel 1RB
	 16QAM High channel FRB	 16QAM High channel 1RB

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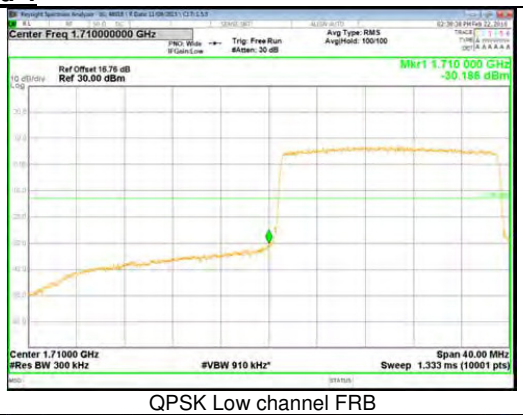
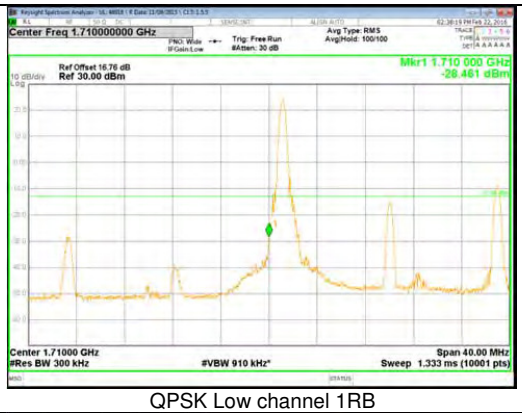
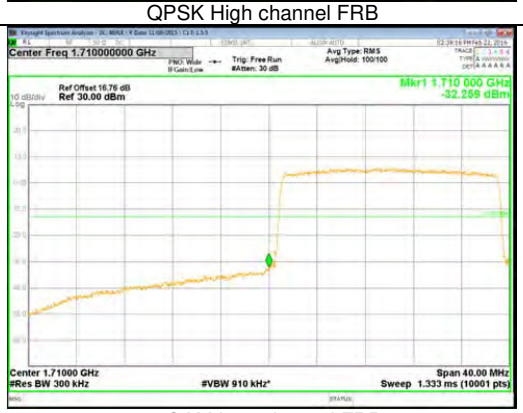
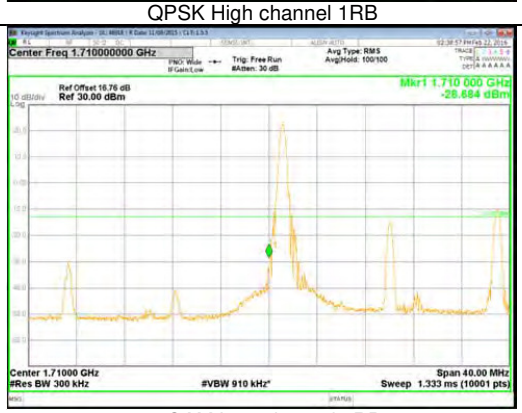
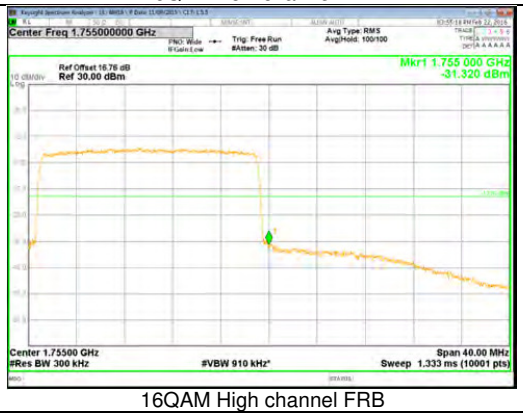
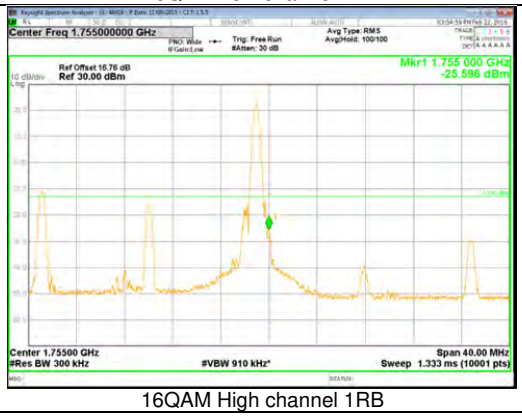
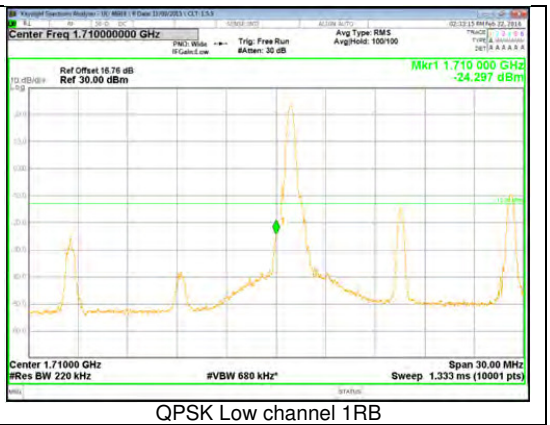
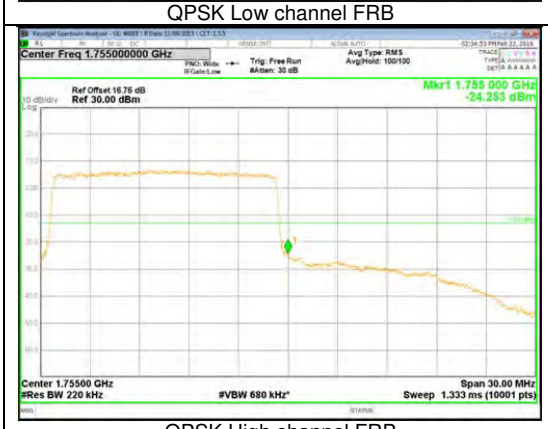
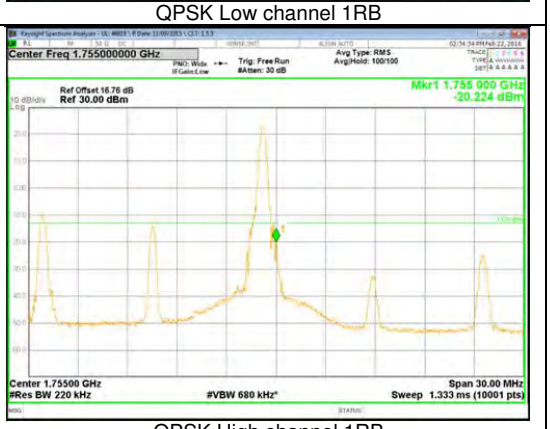
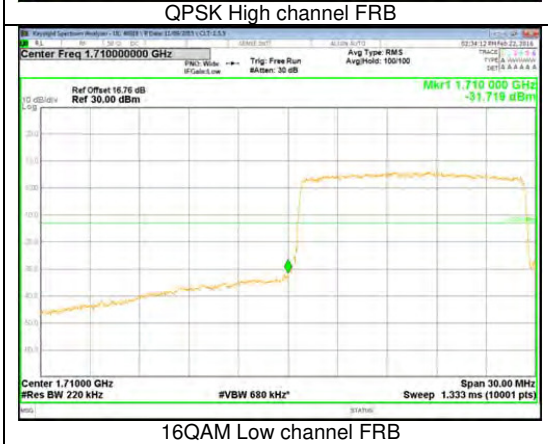
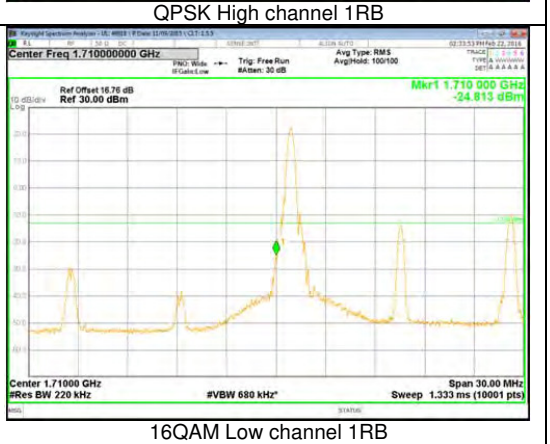
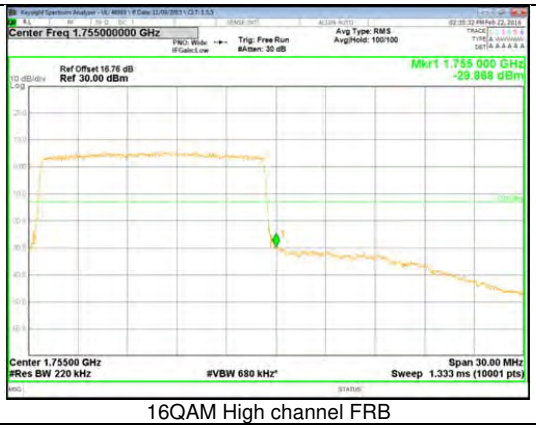
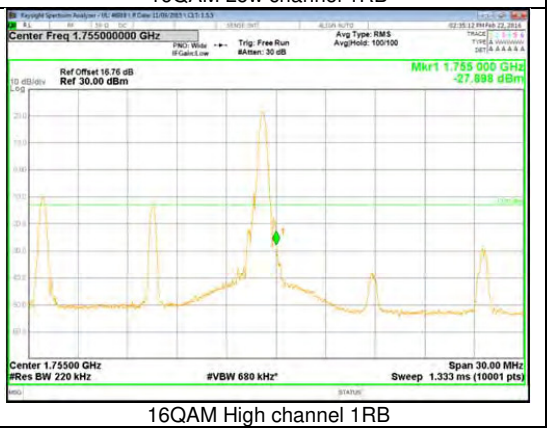
LTE Band 4

Band 4 20MHz	 QPSK Low channel FRB	 QPSK Low channel 1RB
	 QPSK High channel FRB	 QPSK High channel 1RB
	 16QAM Low channel FRB	 16QAM Low channel 1RB
	 16QAM High channel FRB	 16QAM High channel 1RB

Band 4 15MHz	 QPSK Low channel FRB	 QPSK Low channel 1RB
	 QPSK High channel FRB	 QPSK High channel 1RB
	 16QAM Low channel FRB	 16QAM Low channel 1RB
	 16QAM High channel FRB	 16QAM High channel 1RB

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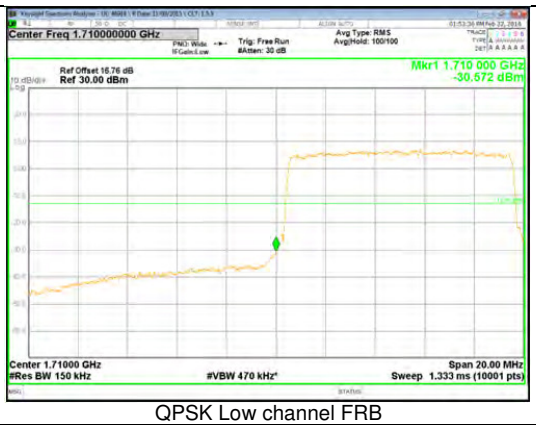
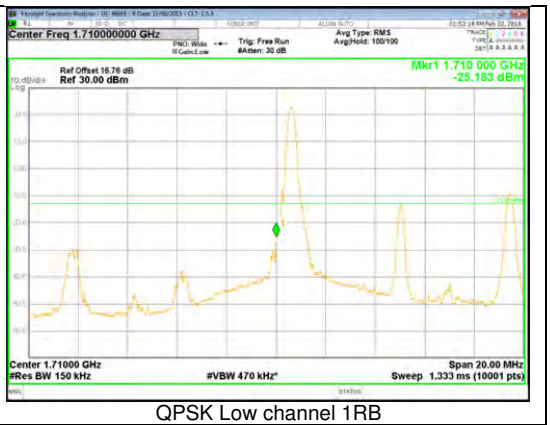
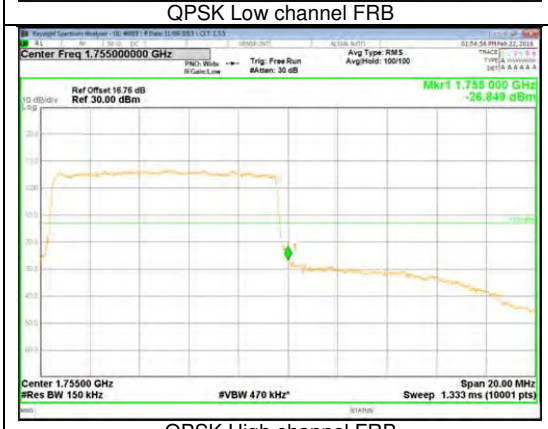
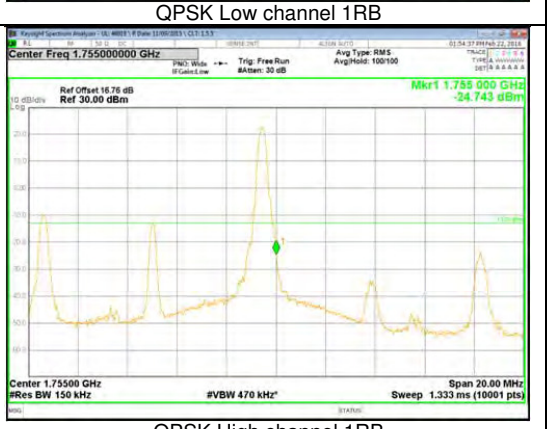
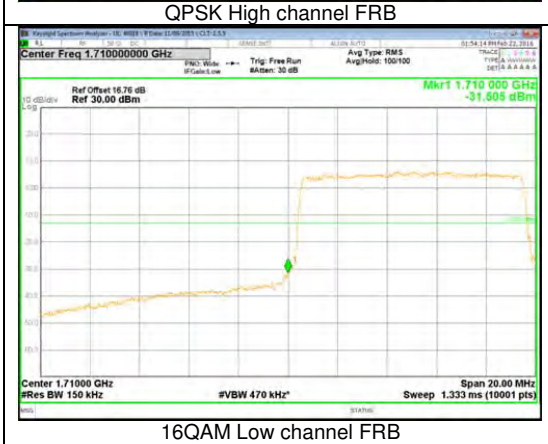
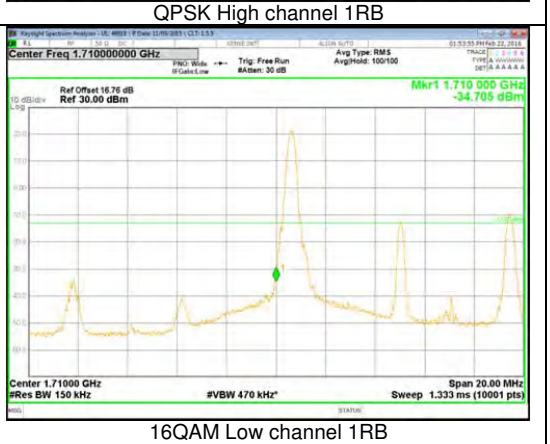
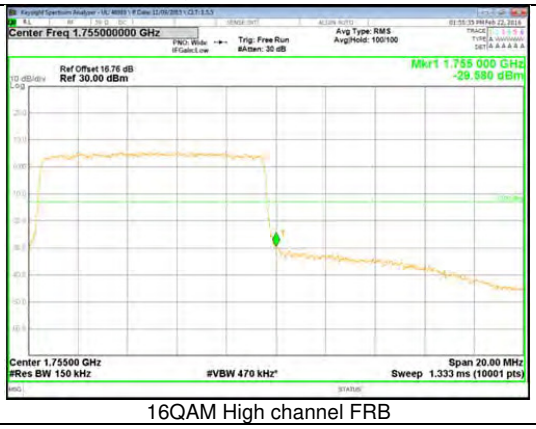
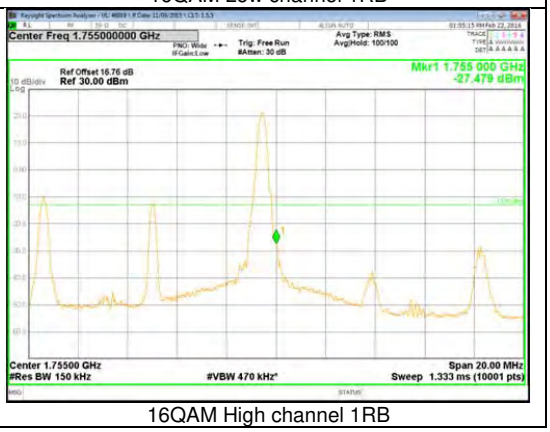
Band 4 10MHz	 QPSK Low channel FRB	 QPSK Low channel 1RB
	 QPSK High channel FRB	 QPSK High channel 1RB
	 16QAM Low channel FRB	 16QAM Low channel 1RB
	 16QAM High channel FRB	 16QAM High channel 1RB

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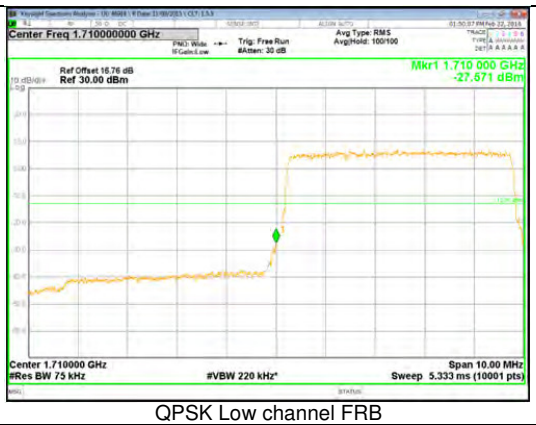
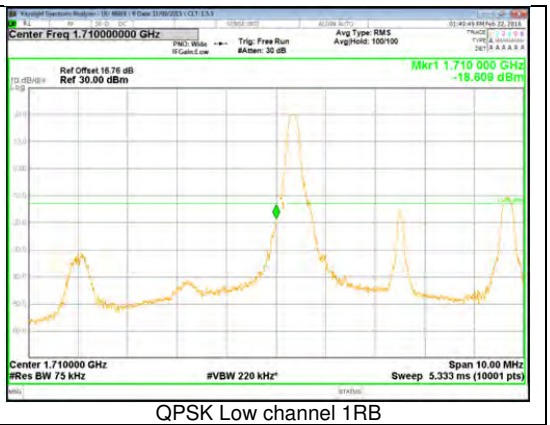
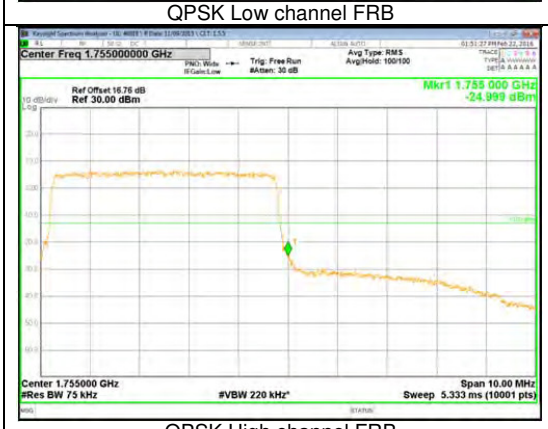
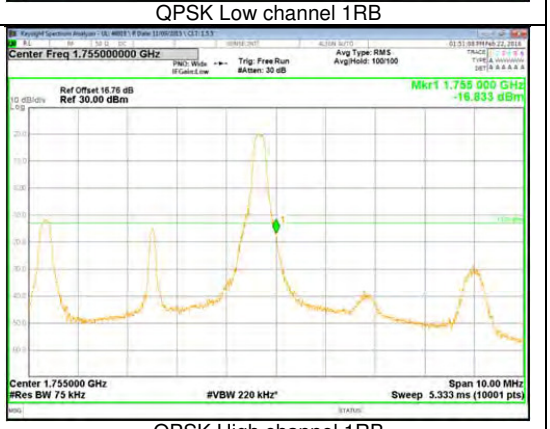
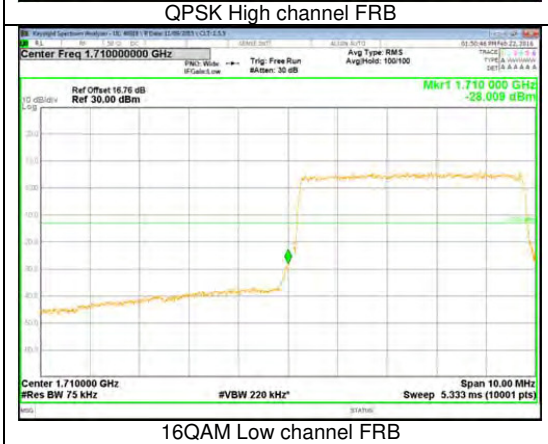
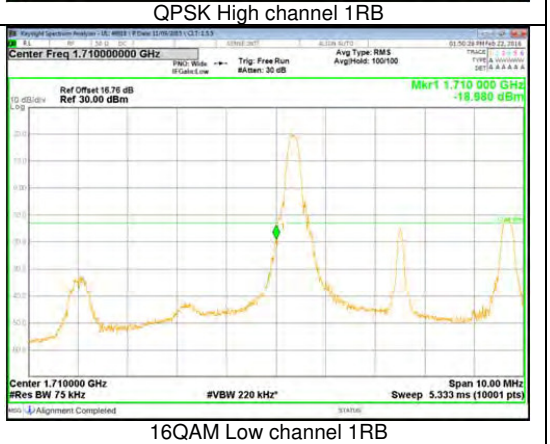
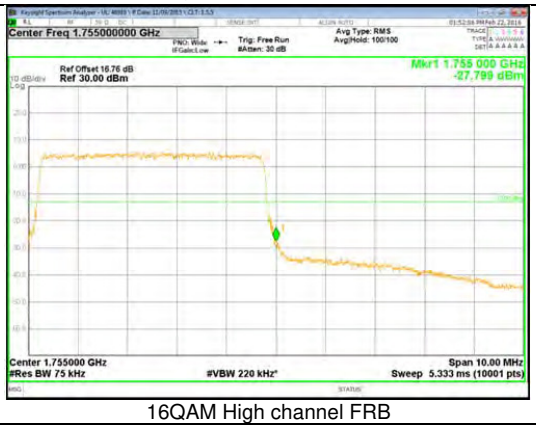
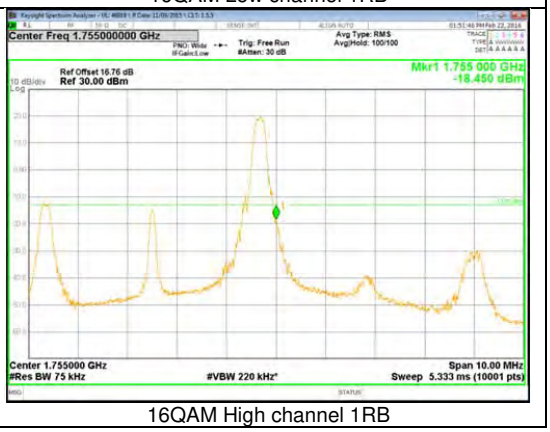
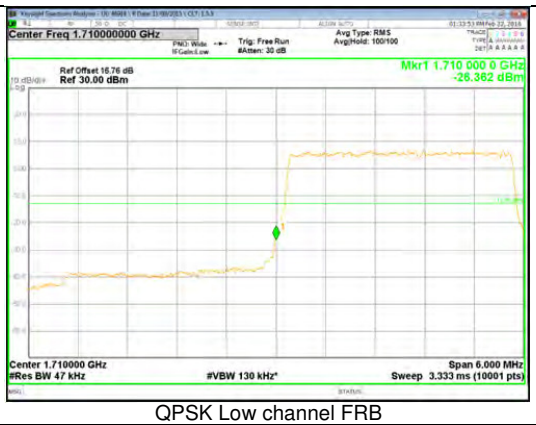
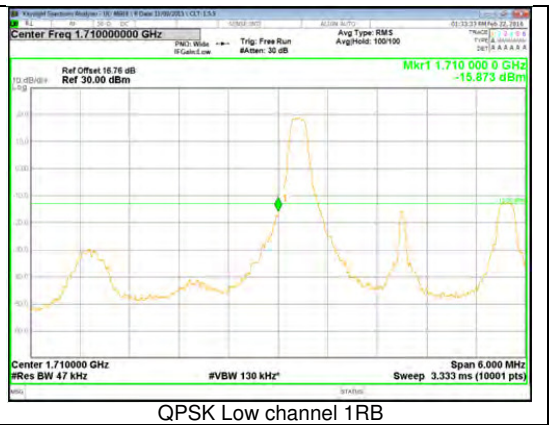
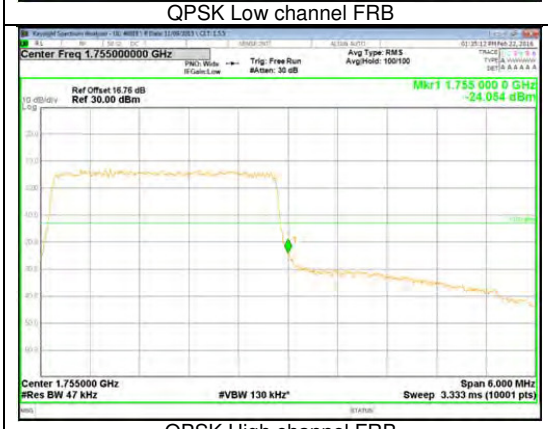
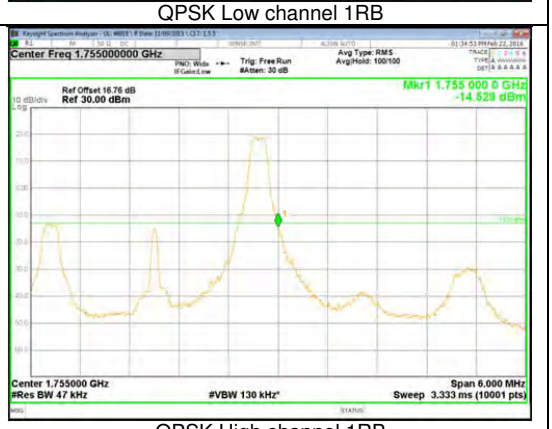
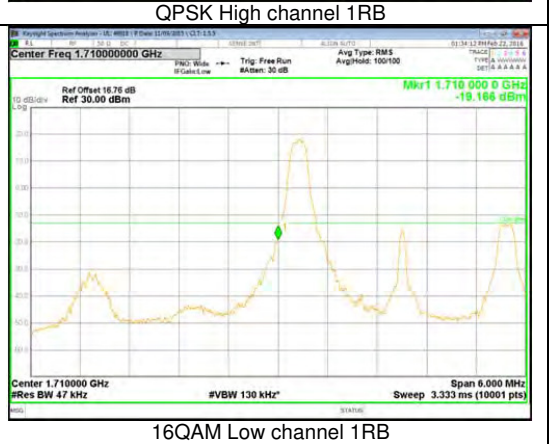
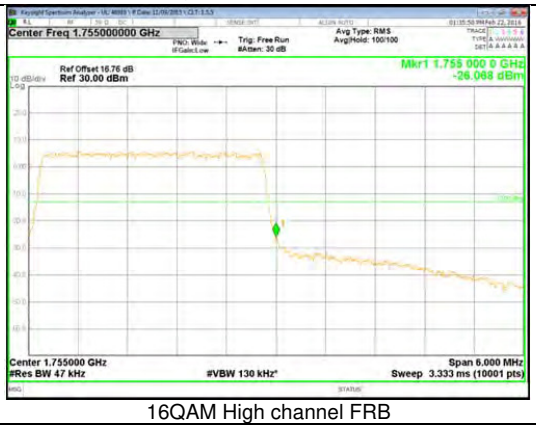
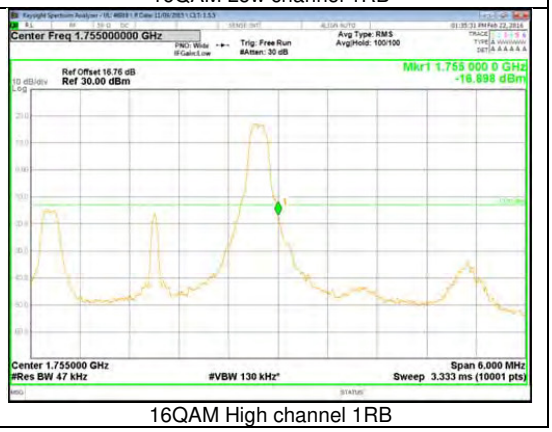
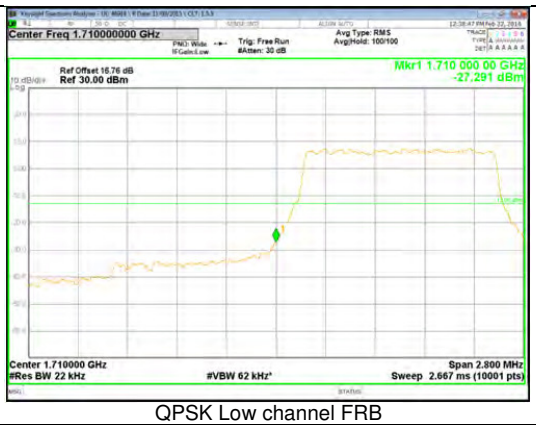
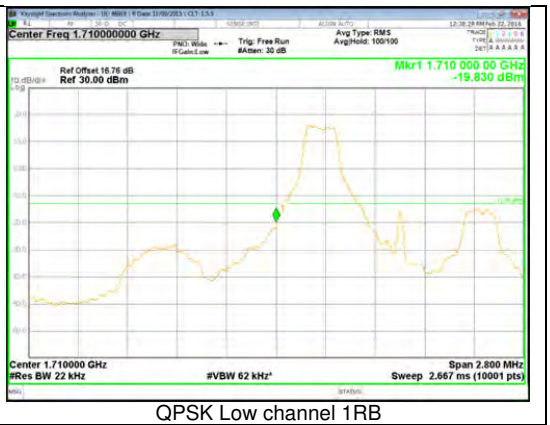
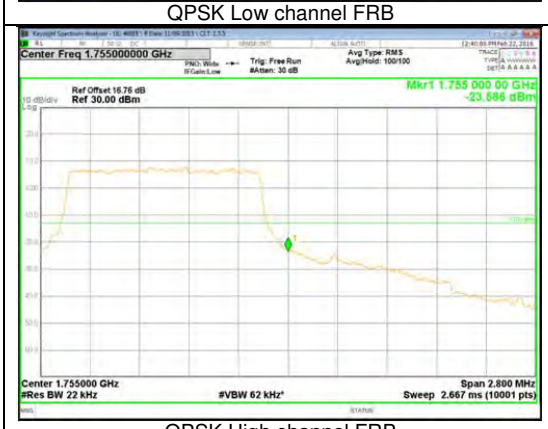
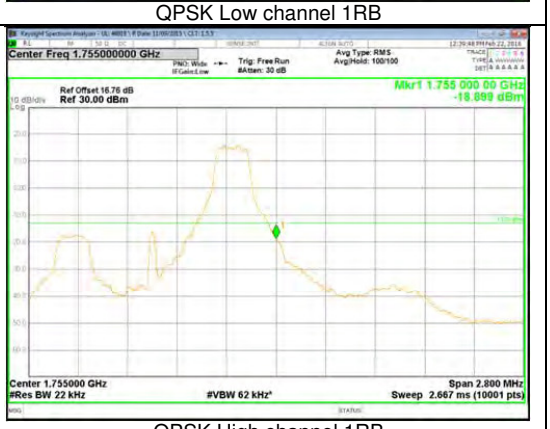
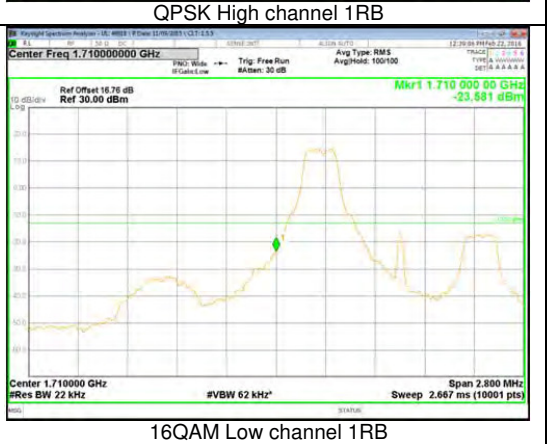
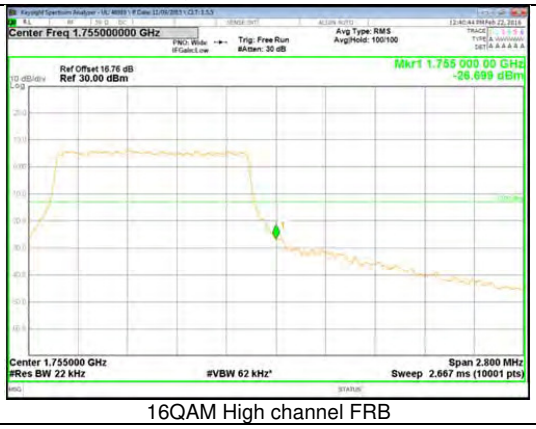
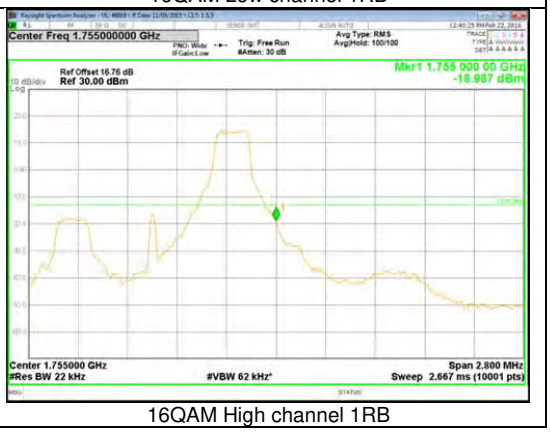
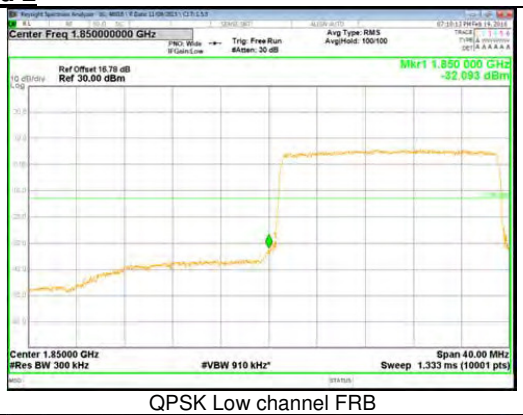
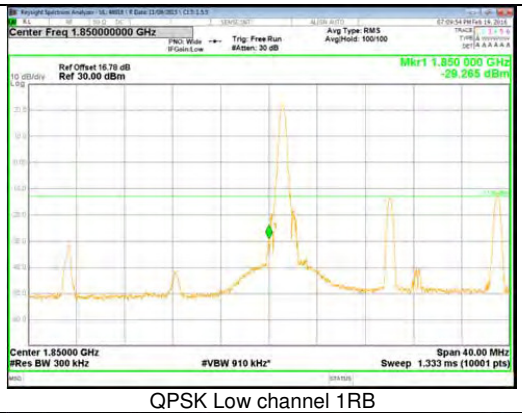
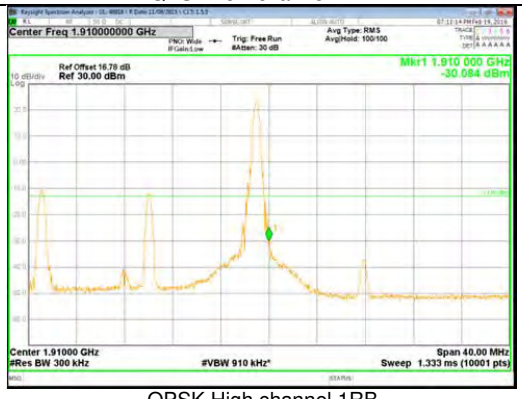
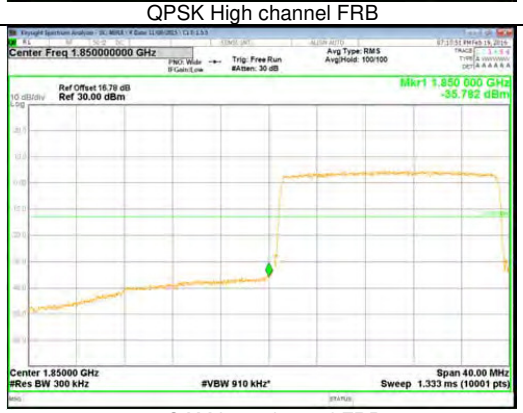
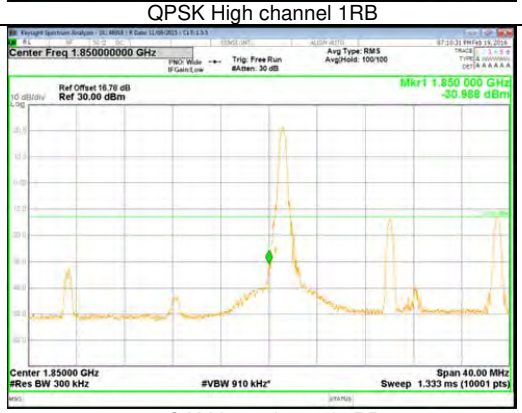
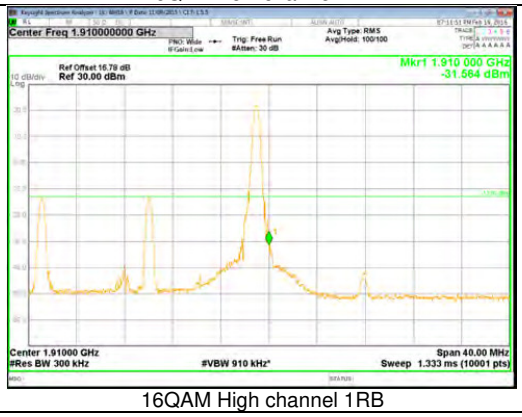
Band 4 5MHz	 QPSK Low channel FRB	 QPSK Low channel 1RB
	 QPSK High channel FRB	 QPSK High channel 1RB
	 16QAM Low channel FRB	 16QAM Low channel 1RB
	 16QAM High channel FRB	 16QAM High channel 1RB

Band 4 3MHz	 QPSK Low channel FRB	 QPSK Low channel 1RB
	 QPSK High channel FRB	 QPSK High channel 1RB
	 16QAM Low channel FRB	 16QAM Low channel 1RB
	 16QAM High channel FRB	 16QAM High channel 1RB

Band 4 1.4MHz	 QPSK Low channel FRB	 QPSK Low channel 1RB
	 QPSK High channel FRB	 QPSK High channel 1RB
	 16QAM Low channel FRB	 16QAM Low channel 1RB
	 16QAM High channel FRB	 16QAM High channel 1RB

LTE Band 2

Band 2 20MHz	 QPSK Low channel FRB	 QPSK Low channel 1RB
	 QPSK High channel FRB	 QPSK High channel 1RB
	 16QAM Low channel FRB	 16QAM Low channel 1RB
	 16QAM High channel FRB	 16QAM High channel 1RB

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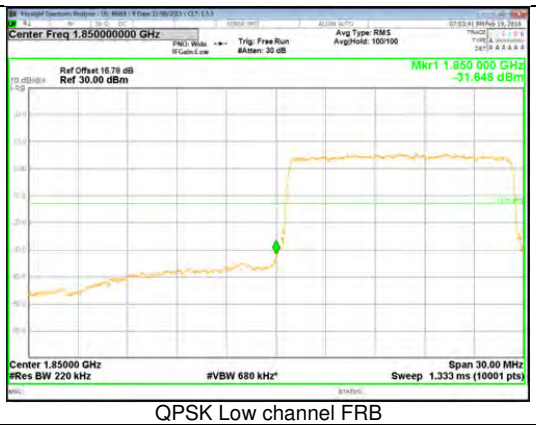
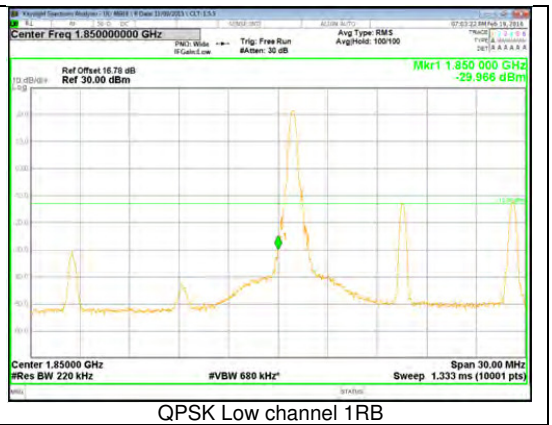
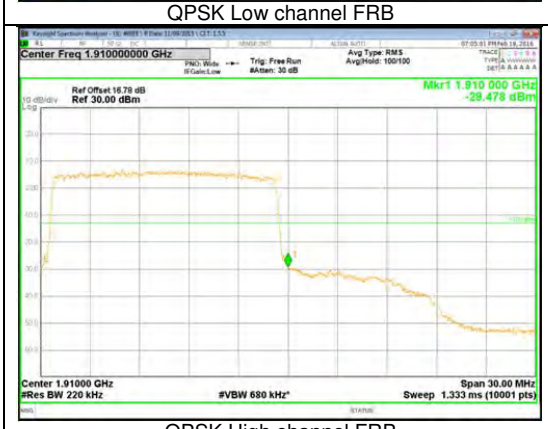
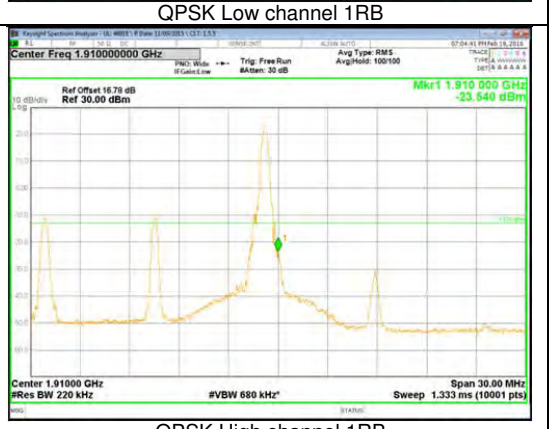
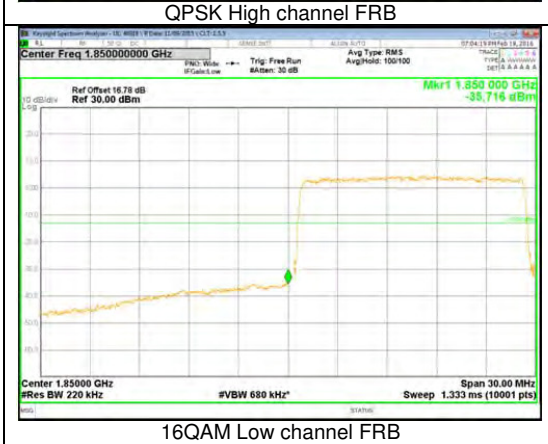
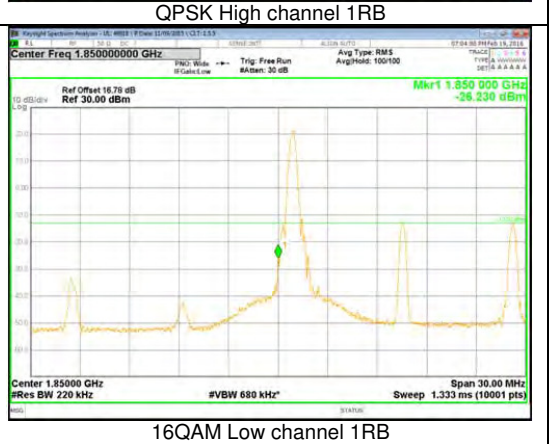
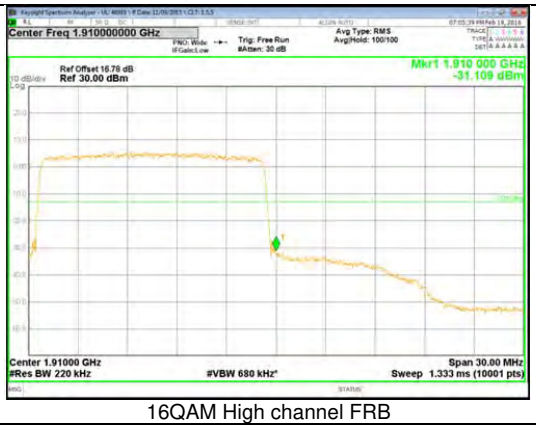
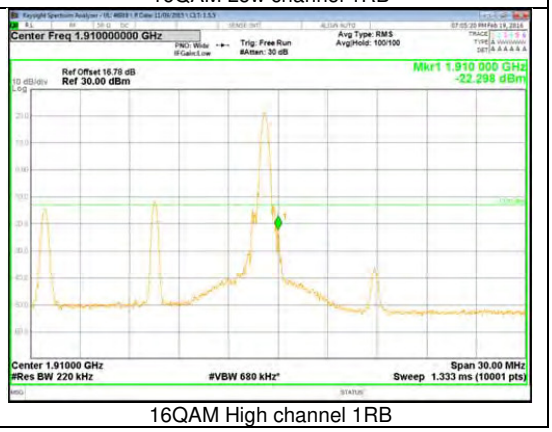
Band 2 15MHz	 QPSK Low channel FRB	 QPSK Low channel 1RB
	 QPSK High channel FRB	 QPSK High channel 1RB
	 16QAM Low channel FRB	 16QAM Low channel 1RB
	 16QAM High channel FRB	 16QAM High channel 1RB

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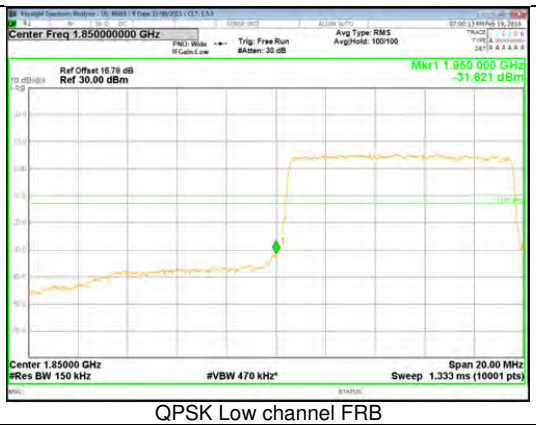
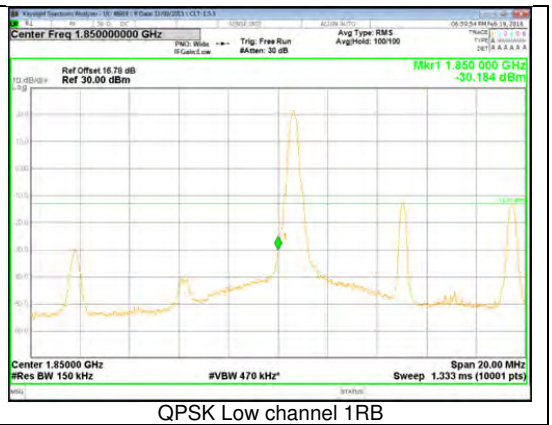
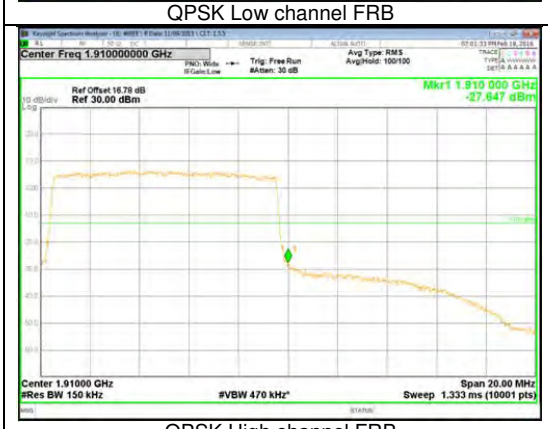
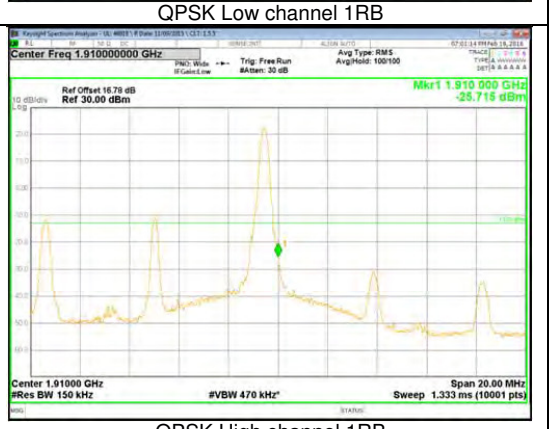
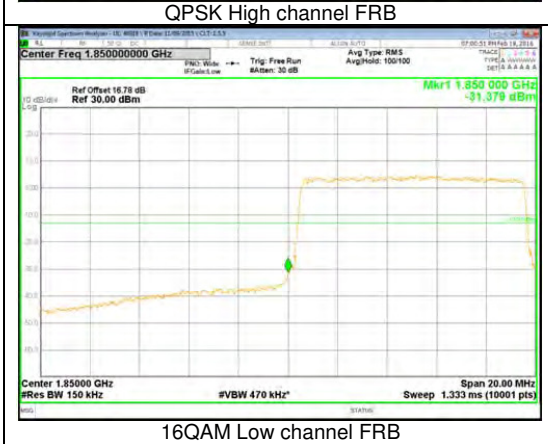
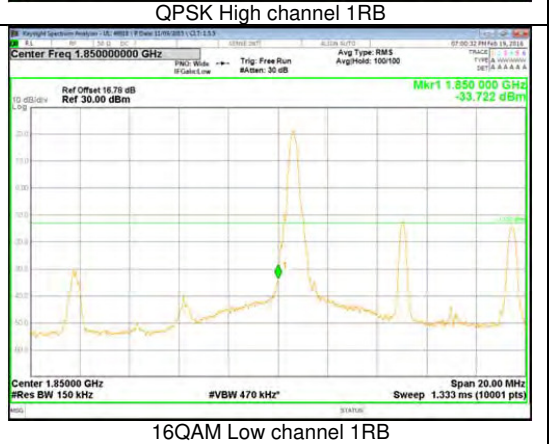
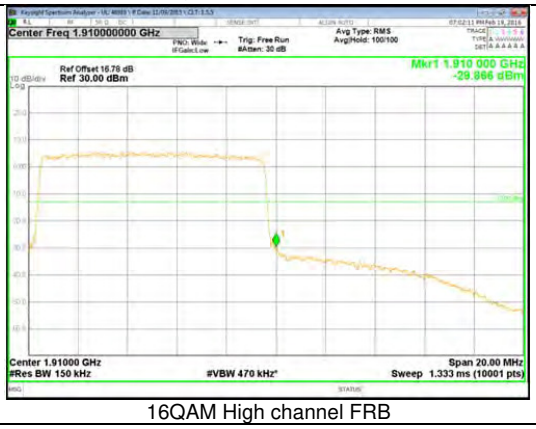
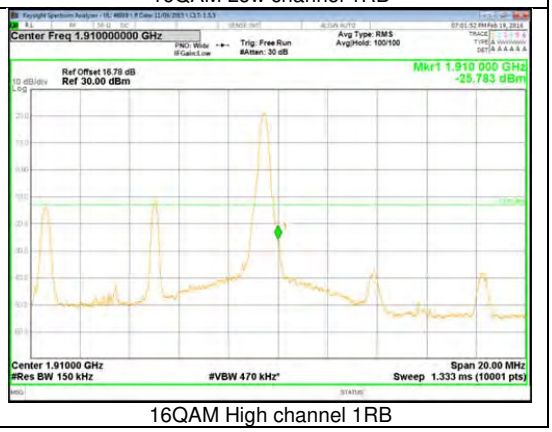
Band 2 10MHz	 QPSK Low channel FRB	 QPSK Low channel 1RB
	 QPSK High channel FRB	 QPSK High channel 1RB
	 16QAM Low channel FRB	 16QAM Low channel 1RB
	 16QAM High channel FRB	 16QAM High channel 1RB

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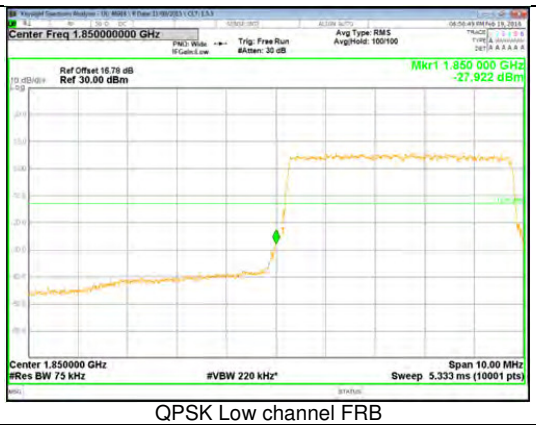
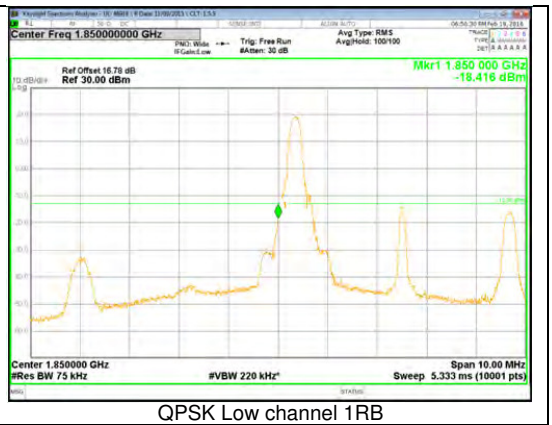
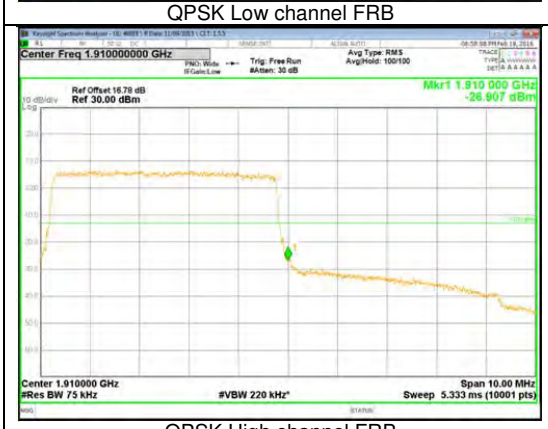
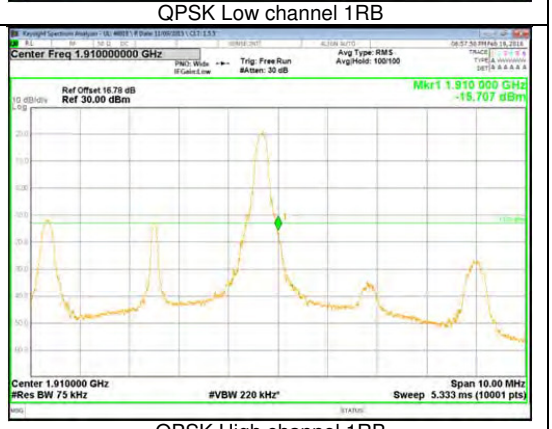
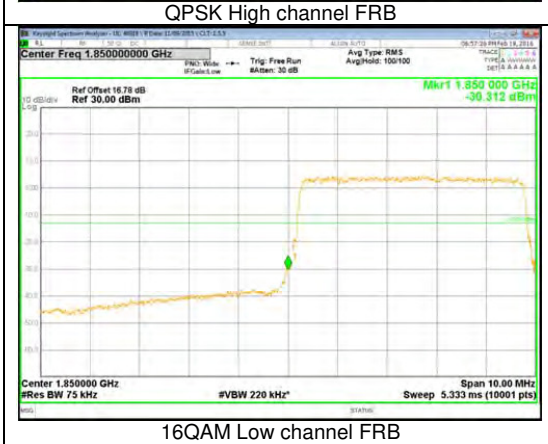
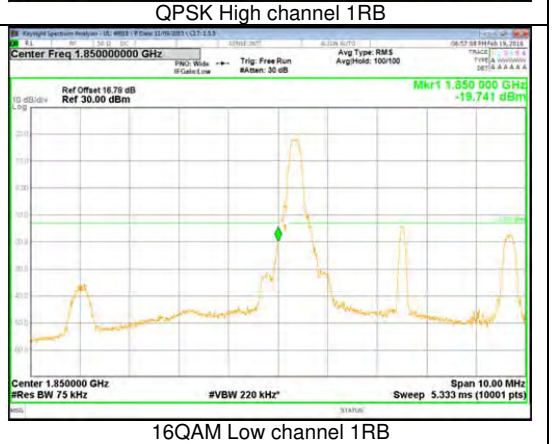
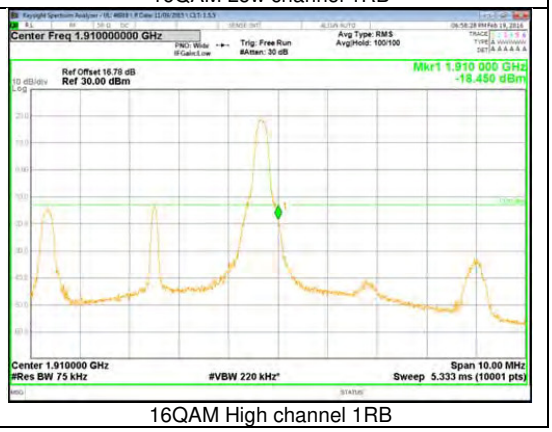
Band 2 5MHz	 QPSK Low channel FRB	 QPSK Low channel 1RB
	 QPSK High channel FRB	 QPSK High channel 1RB
	 16QAM Low channel FRB	 16QAM Low channel 1RB
	 16QAM High channel FRB	 16QAM High channel 1RB

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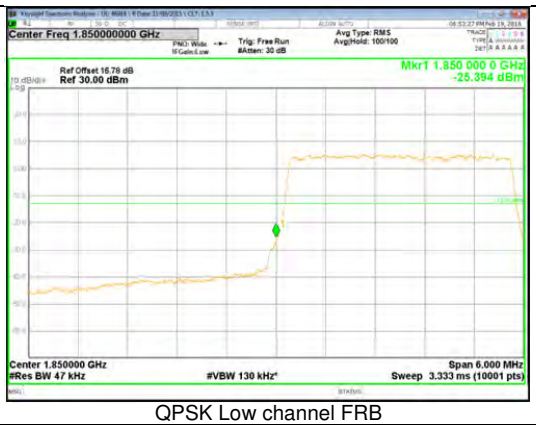
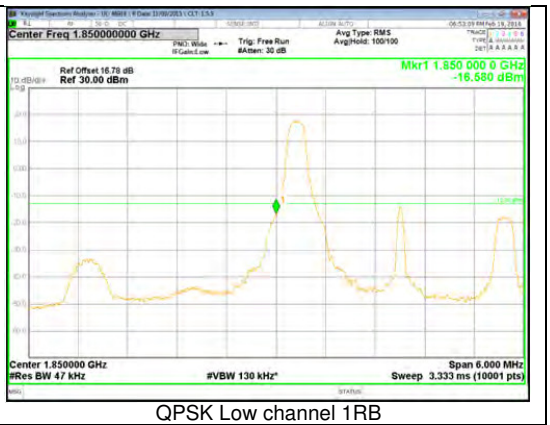
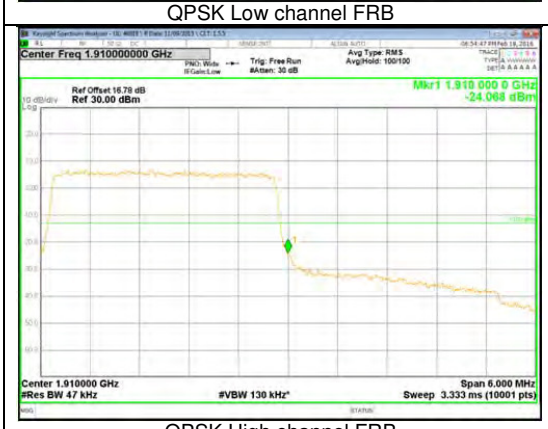
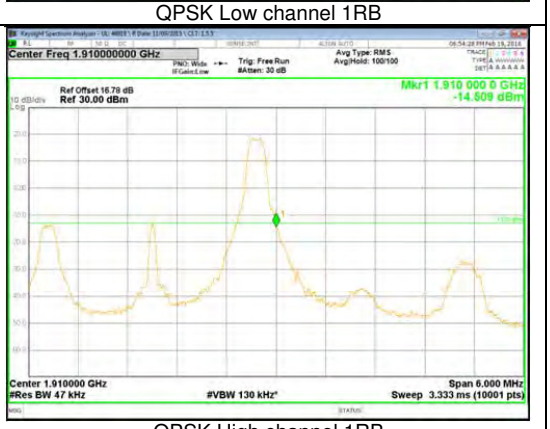
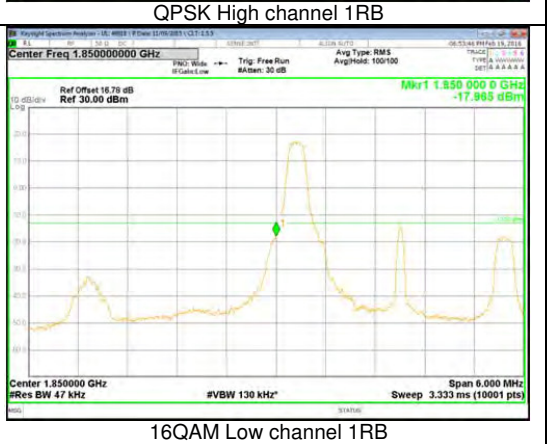
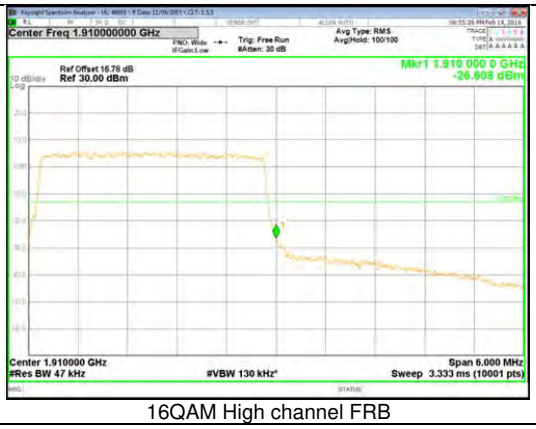
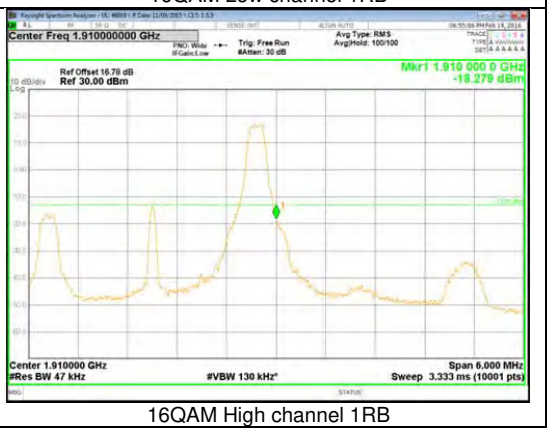
Band 2 3MHz	 QPSK Low channel FRB	 QPSK Low channel 1RB
	 QPSK High channel FRB	 QPSK High channel 1RB
	 16QAM Low channel FRB	 16QAM Low channel 1RB
	 16QAM High channel FRB	 16QAM High channel 1RB

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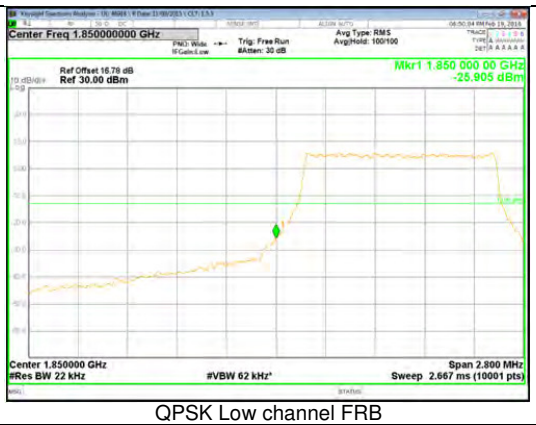
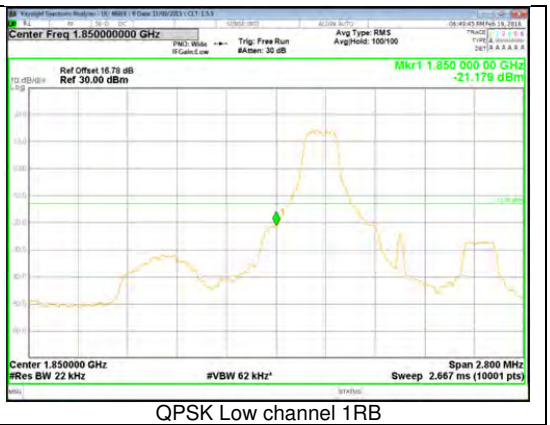
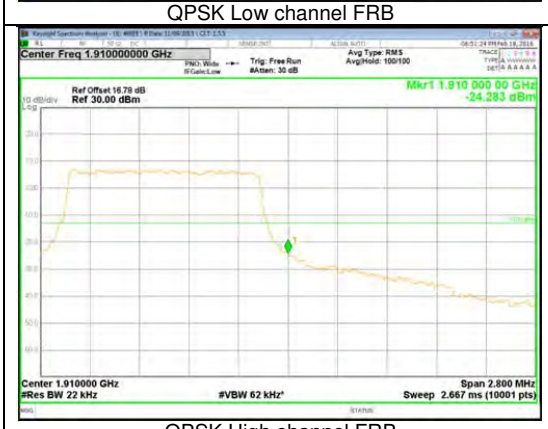
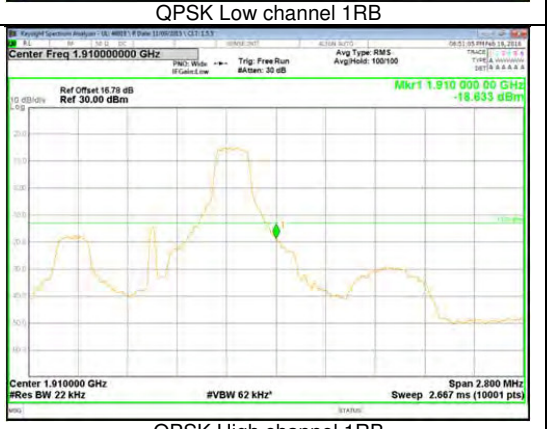
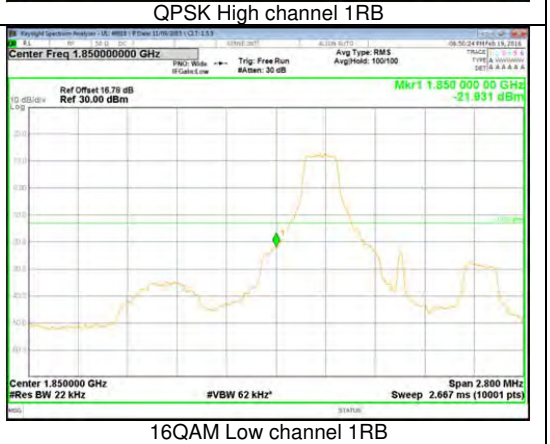
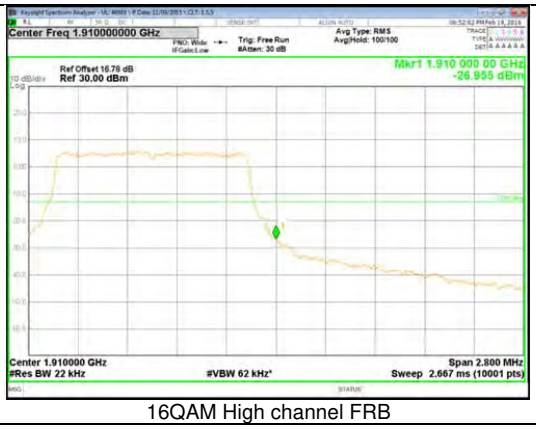
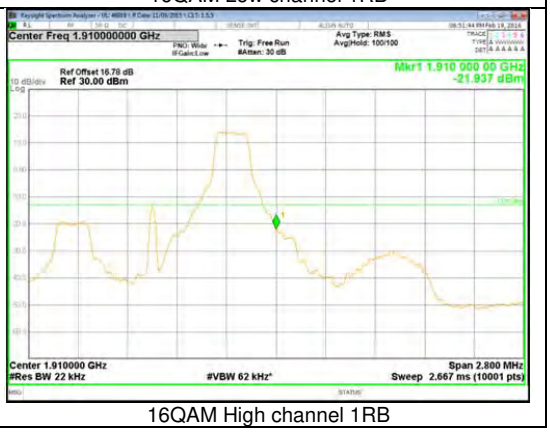
Band 2 1.4MHz	 QPSK Low channel FRB	 QPSK Low channel 1RB
	 QPSK High channel FRB	 QPSK High channel 1RB
	 16QAM Low channel FRB	 16QAM Low channel 1RB
	 16QAM High channel FRB	 16QAM High channel 1RB

10.3 OUT OF BAND EMISSIONS

RULE PART(S)

FCC: §2.1051, §22.901, §22.917, §24.238 and §27. 53

LIMITS

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

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v02r02
The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic. Multiple sweeps were recorded in maximum hold mode using a peak detector to ensure that the worst-case emissions were caught.

RESULTS

10.3.1. OUT OF BAND EMISSIONS RESULT

GSM

Band	Mode	f [MHz]	Spurious [dBm]	Limit [dBm]	Margin [dB]
GSM850	GPRS	824.2	-22.87	-13.00	9.87
		836.6	-22.80		9.8
		848.8	-22.72		9.72
	EGPRS	824.2	-22.56		9.56
		836.6	-22.45		9.45
		848.8	-22.52		9.52
GSM1900	GPRS	1850.2	-22.51		9.51
		1880.0	-22.19		9.19
		1909.8	-21.96		8.96
	EGPRS	1850.2	-22.30		9.3
		1880.0	-22.41		9.41
		1909.8	-22.35		9.35

WCDMA

Band	Mode	f [MHz]	Spurious [dBm]	Limit [dBm]	Margin [dB]
Band 5	REL99	826.4	-33.18	-13.00	20.18
		836.6	-33.12		20.12
		846.6	-33.47		20.47
	HSDPA	826.4	-33.10		20.1
		836.6	-33.02		20.02
		846.6	-32.72		19.72
Band 2	REL99	1852.4	-32.32		19.32
		1880.0	-31.96		18.96
		1907.6	-32.35		19.35
	HSDPA	1852.4	-32.03		19.03
		1880.0	-32.70		19.7
		1907.6	-32.76		19.76

LTE 17

Bandwidth	Mode	f [MHz]	Spurious [dBm]	Limit [dBm]	Margin [dB]
10 MHz	QPSK	709.0	-27.06	-13.00	14.06
		710.0	-27.29		14.29
		711.0	-26.86		13.86
	16QAM	709.0	-26.24		13.24
		710.0	-26.27		13.27
		711.0	-26.59		13.59
5 MHz	QPSK	706.5	-26.55		13.55
		710.0	-27.74		14.74
		713.5	-27.02		14.02
	16QAM	706.5	-27.25		14.25
		710.0	-26.03		13.03
		713.5	-25.93		12.93

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LTE 5

Bandwidth	Mode	f [MHz]	Spurious [dBm]	Limit [dBm]	Margin [dB]
10 MHz	QPSK	829.0	-27.62	-13.00	14.62
		836.5	-26.88		13.88
		844.0	-26.87		13.87
	16QAM	829.0	-26.94		13.94
		836.5	-26.38		13.38
		844.0	-27.37		14.37
5 MHz	QPSK	826.5	-27.15		14.15
		836.5	-26.85		13.85
		846.5	-26.54		13.54
	16QAM	826.5	-26.70		13.7
		836.5	-26.49		13.49
		846.5	-27.45		14.45
3 MHz	QPSK	825.5	-26.89		13.89
		836.5	-26.97		13.97
		847.5	-26.54		13.54
	16QAM	825.5	-26.26		13.26
		836.5	-26.35		13.35
		847.5	-26.69		13.69
1.4 MHz	QPSK	824.7	-26.50		13.5
		836.5	-26.05		13.05
		848.3	-27.20		14.2
	16QAM	824.7	-27.28		14.28
		836.5	-27.28		14.28
		848.3	-26.60		13.6

LTE 4

Bandwidth	Mode	f [MHz]	Spurious [dBm]	Limit [dBm]	Margin [dB]
20 MHz	QPSK	1720.0	-26.28	-13.00	13.28
		1732.5	-27.06		14.06
		1745.0	-25.72		12.72
	16QAM	1720.0	-26.69		13.69
		1732.5	-26.49		13.49
		1745.0	-26.46		13.46
15 MHz	QPSK	1717.5	-26.83		13.83
		1732.5	-26.50		13.5
		1747.5	-26.80		13.8
	16QAM	1717.5	-27.08		14.08
		1732.5	-25.48		12.48
		1747.5	-27.01		14.01
10 MHz	QPSK	1715.0	-26.70		13.7
		1732.5	-26.07		13.07
		1750.0	-26.93		13.93
	16QAM	1715.0	-27.02		14.02
		1732.5	-26.35		13.35
		1750.0	-27.34		14.34
5 MHz	QPSK	1712.5	-26.40		13.4
		1732.5	-27.35		14.35
		1752.5	-25.89		12.89
	16QAM	1712.5	-26.87		13.87
		1732.5	-26.58		13.58
		1752.5	-27.15		14.15
3 MHz	QPSK	1711.5	-27.65		14.65
		1732.5	-27.05		14.05
		1753.5	-26.08		13.08
	16QAM	1711.5	-26.42		13.42
		1732.5	-27.19		14.19
		1753.5	-26.82		13.82
1.4 MHz	QPSK	1710.7	-26.45		13.45
		1732.5	-25.97		12.97
		1754.3	-26.97		13.97
	16QAM	1710.7	-26.87		13.87
		1732.5	-26.51		13.51
		1754.3	-27.40		14.4

LTE 2

Bandwidth	Mode	f [MHz]	Spurious [dBm]	Limit [dBm]	Margin [dB]
20 MHz	QPSK	1860.0	-26.73	-13.00	13.73
		1880.0	-26.99		13.99
		1900.0	-26.56		13.56
	16QAM	1860.0	-26.40		13.4
		1880.0	-25.92		12.92
		1900.0	-25.80		12.8
15 MHz	QPSK	1857.5	-25.84		12.84
		1880.0	-26.14		13.14
		1902.5	-26.31		13.31
	16QAM	1857.5	-26.48		13.48
		1880.0	-26.64		13.64
		1902.5	-25.33		12.33
10 MHz	QPSK	1855.0	-25.11		12.11
		1880.0	-26.94		13.94
		1905.0	-26.08		13.08
	16QAM	1855.0	-25.96		12.96
		1880.0	-25.99		12.99
		1905.0	-25.76		12.76
5 MHz	QPSK	1852.5	-26.18		13.18
		1880.0	-26.75		13.75
		1907.5	-25.56		12.56
	16QAM	1852.5	-26.36		13.36
		1880.0	-27.33		14.33
		1907.5	-26.27		13.27
3 MHz	QPSK	1851.5	-26.51		13.51
		1880.0	-26.67		13.67
		1908.5	-26.47		13.47
	16QAM	1851.5	-27.07		14.07
		1880.0	-26.74		13.74
		1908.5	-26.60		13.6
1.4 MHz	QPSK	1850.7	-26.51		13.51
		1880.0	-27.19		14.19
		1909.3	-26.40		13.4
	16QAM	1850.7	-26.55		13.55
		1880.0	-26.47		13.47
		1909.3	-26.94		13.94