RF TEST REPORT

Report No.: SET2019-00936

Product: LTE/WCDMA/GSM(GPRS) Mutil-Mode Digital Mobile Phone

FCC ID: SRQ-ZTEA52019

Model No.: ZTE Blade A5 2019

Applicant: ZTE Corporation.

Address: ZTE Plaza, Keji Road South, Shenzhen, China

Dates of Testing: 12/01/2018 — 01/29/2019

Issued by: CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd.

Lab Location: Building 28/29, East of Shigu Xili Industrial Zone, Nanshan District Shenzhen, Guangdong 518055, China

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Test Report

Product ..... :	LTE/WCDMA/GSM(GPRS) Mutil-Mode Digital Mobile Phone
Brand Name..... :	ZTE
Trade Name ..... :	ZTE
Applicant ..... :	ZTE Corporation.
Applicant Address ..... :	ZTE Plaza, Keji Road South, Shenzhen, China
Manufacturer ..... :	ZTE Corporation.
Manufacturer Address..... :	ZTE Plaza, Keji Road South, Shenzhen, China
Test Standards ..... :	47 CFR Part 2: Frequency Allocations and Radio Treaty Matters; General Rules and Regulations 47 CFR Part 22(H): Cellular Radiotelephone Service 47 CFR Part 24(E): Personal Communications Services 47CFR Part 27: Miscellaneous wireless communications services
Test Result……..:	PASS

Tested by ……..: Shallwe Yang 2019.01.29

Shallwe Yang, Test Engineer

Reviewed by...……: Chris You 2019.01.29.

Chris You, Senior Egineer

Approved by……..: Shuangwen Zhang 2019.01.29

Shuangwen Zhang，Manager

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Change History		
Issue	Date	Reason for change
1.0	2019.01.29	First edition

1. GENERAL INFORMATION

1.1 EUT Description

EUT Type	LTE/WCDMA/GSM(GPRS) Mutil-Mode Digital Mobile Phone
EUT supports Radios application	LTE Band 2/4/5/7
Frequency Range	LTE Band 2: 1850.7MHz~1909.3MHz LTE Band 4: 1710.7MHz~1754.3MHz LTE Band 5: 824.7MHz~848.3MHz LTE Band 7: 2502.5MHz~2567.5MHz
Maximum Output Power to Antenna	LTE Band 2: 21.85dBm LTE Band 4: 21.99dBm LTE Band 5: 22.68dBm LTE Band 7: 21.28dBm
Bandwidth	LTE Band 2: 1.4MHz/3MHz/5MHz/10MHz/15MHz/20MHz LTE Band 4: 1.4MHz/3MHz/5MHz/10MHz/15MHz/20MHz LTE Band 5: 1.4MHz/3MHz/5MHz/10MHz LTE Band 7: 5MHz/10MHz/15MHz/20MHz
Modulation Type	QPSK/16QAM/64QAM(downlink only)
Antenna Type	Internal Antenna
Antenna Gain	LTE Band 2:-1.5dBi LTE Band 4: -2.1dBi LTE Band 5: -4.4dBi LTE Band 7: 1dBi
Power supply	DC 3.85V from battery DC 5V from adapter

1.2 Maximum ERP/EIRP Power, Frequency Tolerance, and Emission Designator

Band	Type of Modulation	BW (MHz)	Emission Designator	Frequency Tolerance (ppm)	Maximum ERP/EIRP(W)
LTE Band 2	QPSK	1.4	1M09G7D	—	0.148
LTE Band 2	16QAM	1.4	1M09W7D	—	0.105
LTE Band 2	QPSK	3	2M68G7D	—	0.147
LTE Band 2	16QAM	3	2M68W7D	—	0.108
LTE Band 2	QPSK	5	4M49G7D	—	0.147
LTE Band 2	16QAM	5	4M48W7D	—	0.106
LTE Band 2	QPSK	10	8M93G7D	0.025	0.147
LTE Band 2	16QAM	10	8M92W7D	—	0.117
LTE Band 2	QPSK	15	13M5G7D	—	0.164
LTE Band 2	16QAM	15	13M5W7D	—	0.121
LTE Band 2	QPSK	20	17M9G7D	—	0.171
LTE Band 2	16QAM	20	17M9W7D	—	0.127
LTE Band 4	QPSK	1.4	1M09G7D	__	0.167
LTE Band 4	16QAM	1.4	1M09W7D	__	0.120
LTE Band 4	QPSK	3	2M68G7D	__	0.166
LTE Band 4	16QAM	3	2M68W7D	__	0.119
LTE Band 4	QPSK	5	4M49G7D	__	0.168
LTE Band 4	16QAM	5	4M49W7D	__	0.119
LTE Band 4	QPSK	10	8M93G7D	0.013	0.160
LTE Band 4	16QAM	10	8M92W7D	__	0.114
LTE Band 4	QPSK	15	13M4G7D	__	0.163
LTE Band 4	16QAM	15	13M4W7D	__	0.115
LTE Band 4	QPSK	20	17M9G7D	__	0.161
LTE Band 4	16QAM	20	17M9W7D	—	0.112

LTE Band 5	QPSK	1.4	1M09G7D	__	0.151
LTE Band 5	16QAM	1.4	1M09W7D	__	0.125
LTE Band 5	QPSK	3	2M68G7D	__	0.177
LTE Band 5	16QAM	3	2M68W7D	__	0.120
LTE Band 5	QPSK	5	4M49G7D	—	0.177
LTE Band 5	16QAM	5	4M48W7D	__	0.124
LTE Band 5	QPSK	10	8M92G7D	0.024	0.133
LTE Band 5	16QAM	10	8M92W7D	—	0.086
LTE Band 7	QPSK	5	4M49G7D	—	0.135
LTE Band 7	16QAM	5	4M48W7D	—	0.086
LTE Band 7	QPSK	10	8M93G7D	0.022	0.133
LTE Band 7	16QAM	10	8M92W7D	—	0.093
LTE Band 7	QPSK	15	13M4G7D	—	0.139
LTE Band 7	16QAM	15	13M4W7D	—	0.092
LTE Band 7	QPSK	20	17M9G7D	—	0.123
LTE Band 7	16QAM	20	17M9W7D	—	0.135

1.3 Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 2, Part24, Part27 ， Part90，for the EUT FCC ID Certification:

1.47 CFR Part 2, 24(E), 27(F), 27(L), 27(H), 27(M)

2. ANSI/TIA/EIA-603-D-2010

3. FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01

Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Limit	Result
1	2.1046	Conducted RF Output Power	Reporting Only	PASS
2	24.232(d) 27.50(d)(5)	Peak to Average Radio	＜13dB	PASS
3	27.50(h)(2) 24.232(c)	Effective Radiated Power(Band 2/7)	EIRP＜2Watt	PASS PASS
	27.50(d)(4)	Effective Radiated Power(Band 4)	EIRP＜1Watt	PASS
	22.913(a)(2)	Effective Radiated Power(Band 5)	ERP＜7Watt	PASS
4	2.1049 22.917(b) 24.238(b) 27.53(h)(3) 27.53(g)(3) 27.53(i)(6)	Occupied Bandwidth	Reporting Only	PASS
5	2.1051 22.917(a) 24.238(b) 27.53(g) 27.53(h)	Conducted Band Edge(Band 2/4/5)	＜43+10log10(P[watt])	PASS
	2.1051 27.53(i)(4)	Conducted Band Edge(Band 7)	＜5.5MHz: -13dBm ≥5.5MHz: -25dBm	PASS
6	2.1051 22.917(a) 24.238(a) 27.53(g)	Conducted Spurious Emission (Band 2/4/5)	＜43+10log10(P[watt])	PASS

	27.53(h)			
	2.1051 27.53(i)(4)	Conducted Spurious Emission (Band 7)	＜55+10log10(P[watt])	PASS
7	2.1053 22.917(a) 24.238(a) 27.53(g) 27.53(h)	Radiated Spurious Emission (Band 2/4/5)	＜43+10log10(P[watt])	PASS
	2.1053 27.53(i)(4)	Radiated Spurious Emission (Band 7)	＜55+10log10(P[watt])	PASS
8	2.1055, 22.355 24.235 27.54	Frequency Stability	＜2.5ppm	PASS

Remark：

1. All test items were verified and recorded according to the standards and without any deviation during the test.

2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

1.4 Test Configuration of Equipment Under Test

Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas. License Digital Systems v03r01 with maximum output power.

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes to find the maximum emission.

Test Items	Band	Bandwidth(MHz)						Modulation		RB#			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	1	Half	Full	L	M	H
Max. Output Power	2	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	4	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	5	√	√	√	√			√	√	√	√	√	√	√	√
	7			√	√	√	√	√	√	√	√	√	√	√	√
Peak-to-Average Ratio	2				√				√	√		√	√	√	√
	4				√				√	√		√	√	√	√
	5				√				√	√		√	√	√	√
	7				√				√	√		√	√	√	√
26dB and 99% Bandwidth	2	√	√	√	√	√	√	√	√			√		√	
	4	√	√	√	√	√	√	√	√			√		√	
	5	√	√	√	√			√	√			√		√	
	7			√	√	√	√	√	√			√		√	
Conducted Band Edge	2	√	√	√	√	√	√	√	√	√		√	√		√
	4	√	√	√	√	√	√	√	√	√		√	√		√
	5	√	√	√	√			√	√	√		√	√		√
	7			√	√	√	√	√	√	√		√	√		√
Conducted Spurious Emission	2	√						√		√			√	√	√
	4	√						√		√			√	√	√
	5	√						√		√			√	√	√
	7			√				√		√			√	√	√
Frequency Stability	2				√			√				√		√	
	4				√			√				√		√	
	5				√			√				√		√	
	7				√			√				√		√	
ERP/EIRP	2	√	√	√	√	√	√	√	√	√			√	√	√
	4	√	√	√	√	√	√	√	√	√			√	√	√
	5	√	√	√	√			√	√	√			√	√	√
	7			√	√	√	√	√	√	√			√	√	√
Radiated Spurious Emission	2	√	√	√	√	√	√	√		√			√	√	√
	4	√	√	√	√	√	√	√		√			√	√	√

	5	√	√	√	√			√		√			√	√	√
	7			√	√	√	√	√		√			√	√	√
Note	**1. The mark “ √ ” means that this configuration is chosen for testing.** **2. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported.** **3. For E.R.P/E.I.R.P. measurement, the widest bandwidth and the bandwidth with the highest conducted power of each band is chosen for testing. Besides, the lowest bandwidth of each band is also measured for reporting only.**														

1.5 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 7dB and 10dB attenuator.

Example:

Offset (dB) = RF cable loss(dB) + attenuator factor(dB).

= 7 + 10 = 17 (dB)

1.6 Facilities and Accreditations

1.6.1 Test Facilities

CNAS-Lab Code: L1659

CCIC-SET is a third party testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L1659.

FCC-Registration No.: CN5031

CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Designation Number: CN5031, valid time is until December 31, 2019.

ISED Registration: 11185A-1

CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd. EMC Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 11185A-1 on Aug. 04, 2016, valid time is until Aug. 03, 2019.

NVLAP Lab Code: 201008-0

CCIC-SET is a third party testing organization accredited by NVLAP according to ISO/IEC 17025. The accreditation certificate number is 201008-0.

1.6.2 Test Environment Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15℃- 35℃
Relative Humidity (%):	30% -60%
Atmospheric Pressure (kPa):	86KPa-106KPa

2. 47 CFR PART 2 REQUIREMENTS

2.1 Conducted RF Output Power

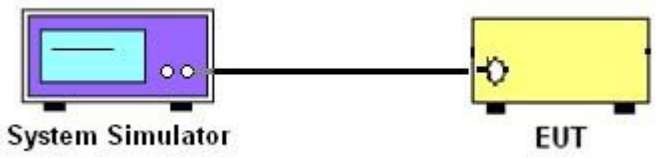
2.1.1 Requirement

According to FCC section 2.1046(a), for transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in FCC section 2.1033(c)(8).

2.1.2 Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.1.3 Test Setup



2.1.4 Test Procedures

1. The transmitter output port was connected to the system simulator.

2. Set EUT at maximum power through system simulator.

3. Select lowest, middle, and highest channels for each band and different modulation.

4. Measure and record the power level from the system simulator.

2.1.5 Test Results

Please refer to Appendix A for detail

2.2 Peak to Average Radio

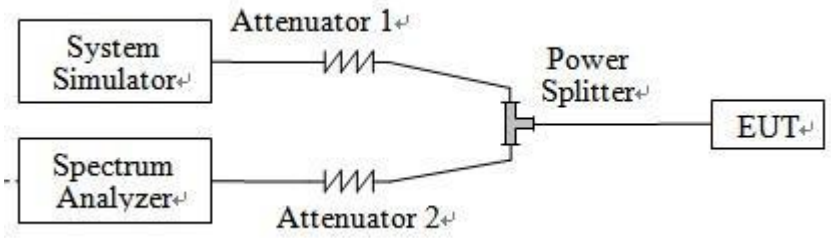
2.2.1 Definition

Power Complementary Cumulative Distribution Function (CCDF) curves provide a means for characterizing the power peaks of a digitally modulated signal on a statistical basis. A CCDF curve depicts the probability of the peak signal amplitude exceeding the average power level. Most contemporary measurement instrumentation include the capability to produce CCDF curves for an input signal provided that the instrument's resolution bandwidth can be set wide enough to accommodate the entire input signal bandwidth. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

2.2.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

2.2.3 Test Description



2.2.4 Test Procedures

1. The EUT was connected to spectrum and system simulator via a power divider.
2. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
3. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.
4. Record the deviation as Peak to Average Ratio.

2.2.5 Test Results of Peak-to-Average Ratio

Please refer to Appendix A for detail

2.3 99% Occupied Bandwidth and 26dB Bandwidth

2.3.1 Definition

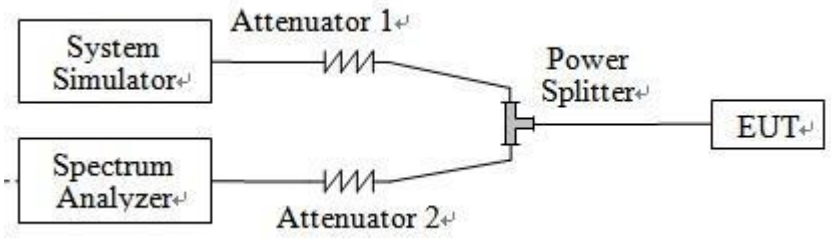
According to FCC section 2.1049, the occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean transmitted power.

The 26 dB emission bandwidth is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated 26 dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth equal to approximately 1.0% of the emission bandwidth.

2.3.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

2.3.3 Test Setup



2.3.4 Test Procedures

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The 26dB and 99% occupied bandwidth (BW) of the middle channel for the highest RF power with full RB sizes were measured.

2.3.5 Test Result of 99% Occupied Bandwidth and 26dB Bandwidth

Please refer to Appendix A for detail

2.4 Frequency Stability

2.4.1 Requirement

According to FCC requirement, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5ppm) of the center frequency. According to FCC section 2.1055, the test conditions are:

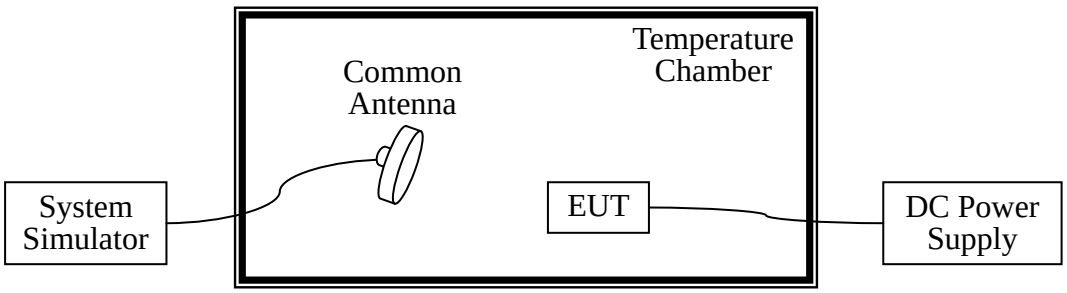
(a) The temperature is varied from -30°C to +50°C at intervals of not more than 10°C.

(b) For hand carried battery powered equipment, the primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacture. The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

2.4.2 Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.4.3 Test Setup



2.4.4 Test Procedures

1. The EUT was set up in the thermal chamber and connected with the system simulator.

2. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized

before testing. Power was applied and the maximum change in frequency was recorded within one minute.

3. With power OFF, the temperature was raised in 10°C step up to 50°C. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.
4. The nominal, highest and lowest extreme voltages were tested, which are specified by the applicant; the normal temperature here used is 25°C.
5. The variation in frequency was measured for the worst case.

2.4.5 Test Result of Frequency Stability

Please refer to Appendix A for detail

2.5 Conducted Out of Band Emissions

2.5.1 Requirement

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

For Band 7:

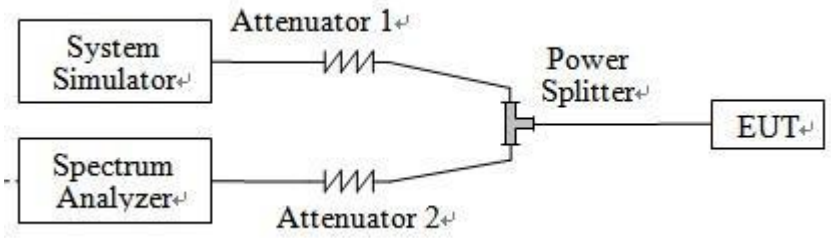
The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 55 + 10 log (P) dB.

It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

2.5.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

2.5.3 Test Setup



2.5.4 Test Procedures

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The middle channel for the highest RF power within the transmitting frequency was measured.
4. The conducted spurious emission for the whole frequency range was taken.

5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
7. The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)

   = P(W)- [43 + 10log(P)] (dB)

   = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)

   = -13dBm.
8. For Band 7

   The limit line is derived from 55 + 10log(P)dB below the transmitter power P(Watts)

   = P(W)- [55 + 10log(P)] (dB)

   = [30 + 10log(P)] (dBm) - [55 + 10log(P)] (dB)

   = -25dBm.
9. For 9KHz to 30MHz: the amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

2.5.5 Test Result of Conducted Spurious Emission

Please refer to Appendix A for detail

2.6 Conducted Band Edge

2.6.1 Description of Conducted Band Edge Measurement

22.917(a)

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

24.238(a)

For operations in the 1850 -1910 MHz band, the FCC limit is 43 + 10log10 (P [Watts]) dB below the transmitter power P(Watts) in a 1MHz bandwidth. However, in the 1MHz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

27.53(h)

For operations in the 1710 – 1755 MHz band, the FCC limit is 43 + 10log10(P[Watts]) dB below the transmitter power P(Watts) in a 1 MHz bandwidth. However, in the 1MHz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

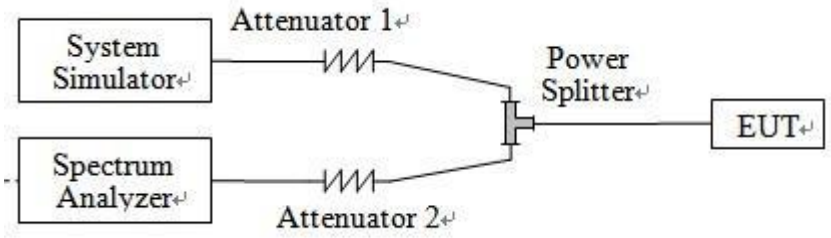
27.53m(4)

For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

2.6.2 Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.6.3 Test Setup



2.6.4 Test Procedures

1. The testing follows FCC KDB 971168 v03r01 Section 6.0.
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The band edges of low and high channels for the highest RF powers were measured.
4. Set RBW >= 1% EBW in the 1MHz band immediately outside and adjacent to the band edge.
5. Beyond the 1 MHz band from the band edge, RBW=1MHz was used.
6. Set spectrum analyzer with RMS detector.
7. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
8. Checked that all the results comply with the emission limit line.
   The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)
9. For LTE Band 7 the other 40 dB, and 55 dB have additionally applied same calculation above.

2.6.5 Test Result of Conducted Band Edge

Please refer to Appendix A for detail

2.7 Transmitter Radiated Power (EIRP/ERP)

2.7.1 Requirement

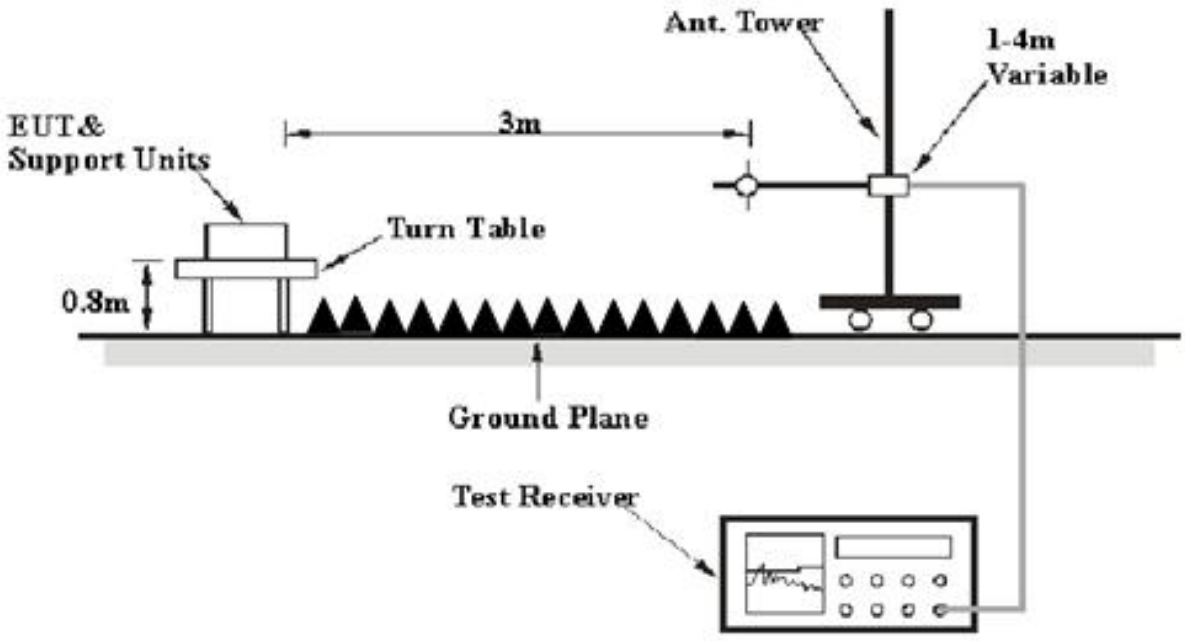
Effective radiated power output measurements by substitution method according to ANSI / TIA / EIA-603-D-2010, and the spectrum analyzer configuration follows KDB 971168 D01 Power Meas. License Digital Systems v03r01. Mobile and portable (hand-held) stations operating are limited to average ERP of 7 watts with LTE band 5

Equivalent isotropic radiated power output measurements by substitution method according to ANSI / TIA / EIA-603-D-2010, and the spectrum analyzer configuration follows KDB 971168 D01 Power Meas. License Digital Systems v03r01. Mobile and portable (hand-held) stations operating are limited to average EIRP of 2 watts with LTE band 2/7 and 1 watt with LTE band 4

2.7.2 Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.7.3 Test Setup



2.7.4 Test Procedures

1. The EUT was placed on a turntable with 1.5 meter height in a fully anechoic chamber.
2. The EUT was set at 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and a spectrum analyzer which used a channel power option across EUT's signal bandwidth per section 4.0 of KDB 971168 D01v03r01.
4. The table was rotated 360 degrees to determine the position of the highest radiated power.
5. The height of the receiving antenna is adjusted to look for the maximum ERP/EIRP.
6. Taking the record of maximum ERP/EIRP.
7. A dipole antenna was substituted in place of the EUT and was driven by a signal generator.
8. The conducted power at the terminal of the dipole antenna is measured.
9. Repeat step 3 to step 5 to get the maximum ERP/EIRP of the substitution antenna.
10. ERP/EIRP = Ps + Et – Es + Gs = Ps + Rt – Rs + Gs

    Ps (dBm)：Input power to substitution antenna.

    Gs (dBi or dBd)：Substitution antenna Gain.

    Et = Rt + AF

    Es = Rs + AF

    AF (dB/m)：Receive antenna factor

    Rt：The highest received signal in spectrum analyzer for EUT.

    Rs：The highest received signal in spectrum analyzer for substitution antenna.

2.7.5 Test Result of ERP/EIRP

1. LTE Band 2 Test Verdict:

LTE Band	BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	EIRP (dBm)	H/V	Verdict
			RB Size	RB Offset				
2	1.4	QPSK	1	2	1850.7	21.70	H	PASS
2	1.4	QPSK	1	5	1880	21.68	H	PASS
2	1.4	QPSK	3	2	1909.3	**21.71**	H	PASS
2	1.4	QPSK	1	2	1850.7	21.12	V	PASS
2	1.4	QPSK	1	5	1880	21.02	V	PASS
2	1.4	QPSK	3	2	1909.3	21.04	V	PASS
2	1.4	16QAM	1	0	1850.7	20.11	H	PASS
2	1.4	16QAM	1	2	1880	20.12	H	PASS
2	1.4	16QAM	3	2	1909.3	20.20	H	PASS
2	1.4	16QAM	1	0	1850.7	19.49	V	PASS
2	1.4	16QAM	1	2	1880	19.44	V	PASS
2	1.4	16QAM	3	2	1909.3	19.52	V	PASS
2	3	QPSK	1	7	1851.5	21.66	H	PASS
2	3	QPSK	1	14	1880	21.64	H	PASS
2	3	QPSK	1	0	1908.5	**21.67**	H	PASS
2	3	QPSK	1	7	1851.5	21.19	V	PASS
2	3	QPSK	1	14	1880	21.11	V	PASS
2	3	QPSK	1	0	1908.5	21.14	V	PASS
2	3	16QAM	1	14	1851.5	20.26	H	PASS
2	3	16QAM	1	0	1880	20.30	H	PASS
2	3	16QAM	1	0	1908.5	20.33	H	PASS
2	3	16QAM	1	14	1851.5	19.39	V	PASS
2	3	16QAM	1	0	1880	19.62	V	PASS
2	3	16QAM	1	0	1908.5	19.47	V	PASS
2	5	QPSK	1	0	1852.5	21.65	H	PASS
2	5	QPSK	1	0	1880	21.59	H	PASS
2	5	QPSK	1	24	1907.5	**21.66**	H	PASS
2	5	QPSK	1	0	1852.5	21.10	V	PASS
2	5	QPSK	1	0	1880	21.07	V	PASS
2	5	QPSK	1	24	1907.5	21.13	V	PASS
2	5	16QAM	1	12	1852.5	20.24	H	PASS
2	5	16QAM	1	0	1880	20.17	H	PASS
2	5	16QAM	1	12	1907.5	20.25	H	PASS
2	5	16QAM	1	12	1852.5	19.53	V	PASS
2	5	16QAM	1	0	1880	19.52	V	PASS

LTE Band	BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	EIRP (dBm)	H/V	Verdict
			RB Size	RB Offset				
2	5	16QAM	1	12	1907.5	19.97	V	PASS
2	10	QPSK	1	0	1855	21.18	H	PASS
2	10	QPSK	1	0	1880	21.07	H	PASS
2	10	QPSK	1	49	1905	21.16	H	PASS
2	10	QPSK	1	0	1855	21.58	V	PASS
2	10	QPSK	1	0	1880	21.67	V	PASS
2	10	QPSK	1	49	1905	21.61	V	PASS
2	10	16QAM	1	0	1855	20.67	H	PASS
2	10	16QAM	1	0	1880	20.65	H	PASS
2	10	16QAM	1	24	1905	20.68	H	PASS
2	10	16QAM	1	0	1855	19.84	V	PASS
2	10	16QAM	1	0	1880	19.85	V	PASS
2	10	16QAM	1	24	1905	19.78	V	PASS
2	15	QPSK	1	0	1857.5	22.04	H	PASS
2	15	QPSK	1	0	1880	22.14	H	PASS
2	15	QPSK	1	74	1902.5	22.08	H	PASS
2	15	QPSK	1	0	1857.5	21.65	V	PASS
2	15	QPSK	1	0	1880	21.74	V	PASS
2	15	QPSK	1	74	1902.5	21.73	V	PASS
2	15	16QAM	1	0	1857.5	20.78	H	PASS
2	15	16QAM	1	0	1880	20.80	H	PASS
2	15	16QAM	1	74	1902.5	20.82	H	PASS
2	15	16QAM	1	0	1857.5	19.92	V	PASS
2	15	16QAM	1	0	1880	19.95	V	PASS
2	15	16QAM	1	74	1902.5	20.03	V	PASS
2	20	QPSK	1	0	1860	22.19	H	PASS
2	20	QPSK	1	0	1880	22.30	H	PASS
2	20	QPSK	1	0	1900	22.34	H	PASS
2	20	QPSK	1	0	1860	21.83	V	PASS
2	20	QPSK	1	0	1880	21.77	V	PASS
2	20	QPSK	1	0	1900	21.76	V	PASS
2	20	16QAM	1	0	1860	21.01	H	PASS
2	20	16QAM	1	0	1880	20.96	H	PASS
2	20	16QAM	1	49	1900	21.03	H	PASS
2	20	16QAM	1	0	1860	19.49	V	PASS
2	20	16QAM	1	0	1880	19.44	V	PASS
2	20	16QAM	1	49	1900	19.97	V	PASS

2. LTE Band 4 Test Verdict:

LTE Band	BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	EIRP (dBm)	H/V	Verdict
			RB Size	RB Offset				
4	1.4	QPSK	1	0	1710.7	22.24	H	PASS
4	1.4	QPSK	1	0	1732.5	22.23	H	PASS
4	1.4	QPSK	1	0	1754.3	22.16	H	PASS
4	1.4	QPSK	1	0	1710.7	21.76	V	PASS
4	1.4	QPSK	1	0	1732.5	21.84	V	PASS
4	1.4	QPSK	1	0	1754.3	21.77	V	PASS
4	1.4	16QAM	1	0	1710.7	20.79	H	PASS
4	1.4	16QAM	1	0	1732.5	20.80	H	PASS
4	1.4	16QAM	1	0	1754.3	20.77	H	PASS
4	1.4	16QAM	1	0	1710.7	19.97	V	PASS
4	1.4	16QAM	1	0	1732.5	19.88	V	PASS
4	1.4	16QAM	1	0	1754.3	20.02	V	PASS
4	3	QPSK	1	0	1711.5	22.19	H	PASS
4	3	QPSK	1	0	1732.5	22.21	H	PASS
4	3	QPSK	1	0	1753.5	22.15	H	PASS
4	3	QPSK	1	0	1711.5	21.75	V	PASS
4	3	QPSK	1	0	1732.5	21.64	V	PASS
4	3	QPSK	1	0	1753.5	21.76	V	PASS
4	3	16QAM	1	14	1711.5	20.72	H	PASS
4	3	16QAM	1	14	1732.5	20.74	H	PASS
4	3	16QAM	1	14	1753.5	20.71	H	PASS
4	3	16QAM	1	14	1711.5	19.97	V	PASS
4	3	16QAM	1	14	1732.5	20.02	V	PASS
4	3	16QAM	1	14	1753.5	19.95	V	PASS
4	5	QPSK	1	24	1712.5	22.25	H	PASS
4	5	QPSK	1	24	1732.5	22.22	H	PASS
4	5	QPSK	1	24	1752.5	22.17	H	PASS
4	5	QPSK	1	24	1712.5	21.81	V	PASS
4	5	QPSK	1	24	1732.5	21.70	V	PASS
4	5	QPSK	1	24	1752.5	21.76	V	PASS
4	5	16QAM	1	24	1712.5	20.75	H	PASS
4	5	16QAM	1	0	1732.5	20.68	H	PASS
4	5	16QAM	1	0	1752.5	20.76	H	PASS
4	5	16QAM	1	0	1712.5	19.92	V	PASS
4	5	16QAM	1	0	1732.5	20.05	V	PASS
4	5	16QAM	1	0	1752.5	19.98	V	PASS

LTE Band	BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	EIRP (dBm)	H/V	Verdict
			RB Size	RB Offset				
4	10	QPSK	1	0	1715	22.01	H	PASS
4	10	QPSK	1	0	1732.5	21.99	H	PASS
4	10	QPSK	1	0	1750	22.04	H	PASS
4	10	QPSK	1	0	1715	21.63	V	PASS
4	10	QPSK	1	0	1732.5	21.58	V	PASS
4	10	QPSK	1	0	1750	21.59	V	PASS
4	10	16QAM	1	24	1715	20.53	H	PASS
4	10	16QAM	1	0	1732.5	20.55	H	PASS
4	10	16QAM	1	24	1750	20.49	H	PASS
4	10	16QAM	1	24	1715	19.68	V	PASS
4	10	16QAM	1	0	1732.5	19.61	V	PASS
4	10	16QAM	1	24	1750	19.69	V	PASS
4	15	QPSK	1	74	1717.5	22.13	H	PASS
4	15	QPSK	1	74	1732.5	22.07	H	PASS
4	15	QPSK	1	0	1747.5	22.03	H	PASS
4	15	QPSK	1	74	1717.5	21.59	V	PASS
4	15	QPSK	1	74	1732.5	21.51	V	PASS
4	15	QPSK	1	0	1747.5	21.65	V	PASS
4	15	16QAM	1	74	1717.5	20.60	H	PASS
4	15	16QAM	1	0	1732.5	20.58	H	PASS
4	15	16QAM	1	0	1747.5	20.61	H	PASS
4	15	16QAM	1	74	1717.5	19.72	V	PASS
4	15	16QAM	1	0	1732.5	19.77	V	PASS
4	15	16QAM	1	0	1747.5	19.65	V	PASS
4	20	QPSK	1	0	1720	21.99	H	PASS
4	20	QPSK	1	0	1732.5	22.06	H	PASS
4	20	QPSK	1	0	1745	22.08	H	PASS
4	20	QPSK	1	0	1720	21.55	V	PASS
4	20	QPSK	1	0	1732.5	21.60	V	PASS
4	20	QPSK	1	0	1745	21.54	V	PASS
4	20	16QAM	1	0	1720	20.49	H	PASS
4	20	16QAM	1	0	1732.5	20.46	H	PASS
4	20	16QAM	1	0	1745	20.51	H	PASS
4	20	16QAM	1	0	1720	19.69	V	PASS
4	20	16QAM	1	0	1732.5	19.62	V	PASS
4	20	16QAM	1	0	1745	19.70	V	PASS

3. LTE Band 5 Test Verdict:

LTE Band	BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	ERP (dBm)	H/V	Verdict
			RB Size	RB Offset				
5	1.4	QPSK	1	5	824.7	21.52	H	PASS
5	1.4	QPSK	1	2	836.5	21.42	H	PASS
5	1.4	QPSK	1	5	848.3	21.49	H	PASS
5	1.4	QPSK	1	5	824.7	21.76	V	PASS
5	1.4	QPSK	1	2	836.5	21.80	V	PASS
5	1.4	QPSK	1	5	848.3	21.79	V	PASS
5	1.4	16QAM	1	5	824.7	20.95	H	PASS
5	1.4	16QAM	1	2	836.5	20.88	H	PASS
5	1.4	16QAM	1	0	848.3	20.97	H	PASS
5	1.4	16QAM	1	5	824.7	20.02	V	PASS
5	1.4	16QAM	1	2	836.5	19.95	V	PASS
5	1.4	16QAM	1	0	848.3	20.09	V	PASS
5	3	QPSK	1	5	825.5	22.47	H	PASS
5	3	QPSK	1	5	836.5	22.49	H	PASS
5	3	QPSK	1	5	848.3	22.46	H	PASS
5	3	QPSK	1	5	825.5	21.67	V	PASS
5	3	QPSK	1	5	836.5	21.58	V	PASS
5	3	QPSK	1	5	848.3	21.63	V	PASS
5	3	16QAM	1	5	825.5	20.79	H	PASS
5	3	16QAM	1	14	836.5	20.68	H	PASS
5	3	16QAM	1	5	848.3	20.73	H	PASS
5	3	16QAM	1	5	825.5	20.02	V	PASS
5	3	16QAM	1	14	836.5	19.95	V	PASS
5	3	16QAM	1	5	848.3	20.03	V	PASS
5	5	QPSK	1	14	826.5	22.47	H	PASS
5	5	QPSK	1	14	836.5	22.42	H	PASS
5	5	QPSK	1	14	846.5	22.48	H	PASS
5	5	QPSK	1	14	826.5	21.76	V	PASS
5	5	QPSK	1	14	836.5	21.80	V	PASS
5	5	QPSK	1	14	846.5	21.75	V	PASS
5	5	16QAM	1	12	826.5	20.92	H	PASS
5	5	16QAM	1	24	836.5	20.88	H	PASS
5	5	16QAM	1	0	846.5	20.91	H	PASS
5	5	16QAM	1	12	826.5	19.82	V	PASS
5	5	16QAM	1	24	836.5	19.95	V	PASS
5	5	16QAM	1	0	846.5	19.89	V	PASS

2.

LTE Band	BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	ERP (dBm)	H/V	Verdict
			RB Size	RB Offset				
5	10	QPSK	1	24	829	21.19	H	PASS
5	10	QPSK	1	24	836.5	21.21	H	PASS
5	10	QPSK	1	24	844	21.23	H	PASS
5	10	QPSK	1	24	829	20.39	V	PASS
5	10	QPSK	1	24	836.5	20.34	V	PASS
5	10	QPSK	1	24	844	20.25	V	PASS
5	10	16QAM	1	24	829	19.31	H	PASS
5	10	16QAM	1	49	836.5	19.27	H	PASS
5	10	16QAM	1	24	844	19.35	H	PASS
5	10	16QAM	1	24	829	18.54	V	PASS
5	10	16QAM	1	49	836.5	18.67	V	PASS
5	10	16QAM	1	24	844	18.65	V	PASS

4. LTE Band 7 Test Verdict:

LTE Band	BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	EIRP (dBm)	H/V	Verdict
			RB Size	RB Offset				
7	5	QPSK	1	12	2502.5	21.26	H	PASS
7	5	QPSK	1	0	2535	21.20	H	PASS
7	5	QPSK	1	24	2567.5	21.29	H	PASS
7	5	QPSK	1	12	2502.5	20.36	V	PASS
7	5	QPSK	1	0	2535	20.40	V	PASS
7	5	QPSK	1	24	2567.5	20.46	V	PASS
7	5	16QAM	1	24	2502.5	19.35	H	PASS
7	5	16QAM	1	24	2535	19.28	H	PASS
7	5	16QAM	1	0	2567.5	19.37	H	PASS
7	5	16QAM	1	24	2502.5	18.52	V	PASS
7	5	16QAM	1	24	2535	18.45	V	PASS
7	5	16QAM	1	0	2567.5	18.50	V	PASS
7	10	QPSK	1	24	2505	21.17	H	PASS
7	10	QPSK	1	49	2535	21.25	H	PASS
7	10	QPSK	1	24	2565	21.21	H	PASS
7	10	QPSK	1	24	2505	20.43	V	PASS
7	10	QPSK	1	49	2535	20.38	V	PASS
7	10	QPSK	1	24	2565	20.33	V	PASS
7	10	16QAM	1	24	2505	19.61	H	PASS
7	10	16QAM	1	49	2535	19.67	H	PASS
7	10	16QAM	1	24	2565	19.65	H	PASS
7	10	16QAM	1	24	2505	18.74	V	PASS

LTE Band	BW (MHz)	Modulation	RB Configuration		Freq. (MHz)	EIRP (dBm)	H/V	Verdict
			RB Size	RB Offset				
7	10	16QAM	1	49	2535	18.67	V	PASS
7	10	16QAM	1	24	2565	18.65	V	PASS
7	15	QPSK	1	37	2507.5	21.43	H	PASS
7	15	QPSK	1	74	2535	21.38	H	PASS
7	15	QPSK	1	0	2562.5	21.41	H	PASS
7	15	QPSK	1	37	2507.5	20.55	V	PASS
7	15	QPSK	1	74	2535	20.57	V	PASS
7	15	QPSK	1	0	2562.5	20.51	V	PASS
7	15	16QAM	1	37	2507.5	19.56	H	PASS
7	15	16QAM	1	18	2535	19.54	H	PASS
7	15	16QAM	1	0	2562.5	19.63	H	PASS
7	15	16QAM	1	37	2507.5	18.68	V	PASS
7	15	16QAM	1	18	2535	18.73	V	PASS
7	15	16QAM	1	0	2562.5	18.71	V	PASS
7	20	QPSK	1	0	2510	20.84	H	PASS
7	20	QPSK	1	0	2535	20.81	H	PASS
7	20	QPSK	1	0	2560	20.89	H	PASS
7	20	QPSK	1	0	2510	20.15	V	PASS
7	20	QPSK	1	0	2535	20.23	V	PASS
7	20	QPSK	1	0	2560	20.21	V	PASS
7	20	16QAM	1	0	2510	19.09	H	PASS
7	20	16QAM	1	0	2535	19.15	H	PASS
7	20	16QAM	1	0	2560	19.11	H	PASS
7	20	16QAM	1	0	2510	21.26	V	PASS
7	20	16QAM	1	0	2535	21.20	V	PASS
7	20	16QAM	1	0	2560	21.29	V	PASS

2.8 Radiated Out of Band Emissions

2.8.1 Requirement

The radiated spurious emission was measured by substitution method according to ANSI / TIA /EIA-603-C-2004. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.

For Band 7

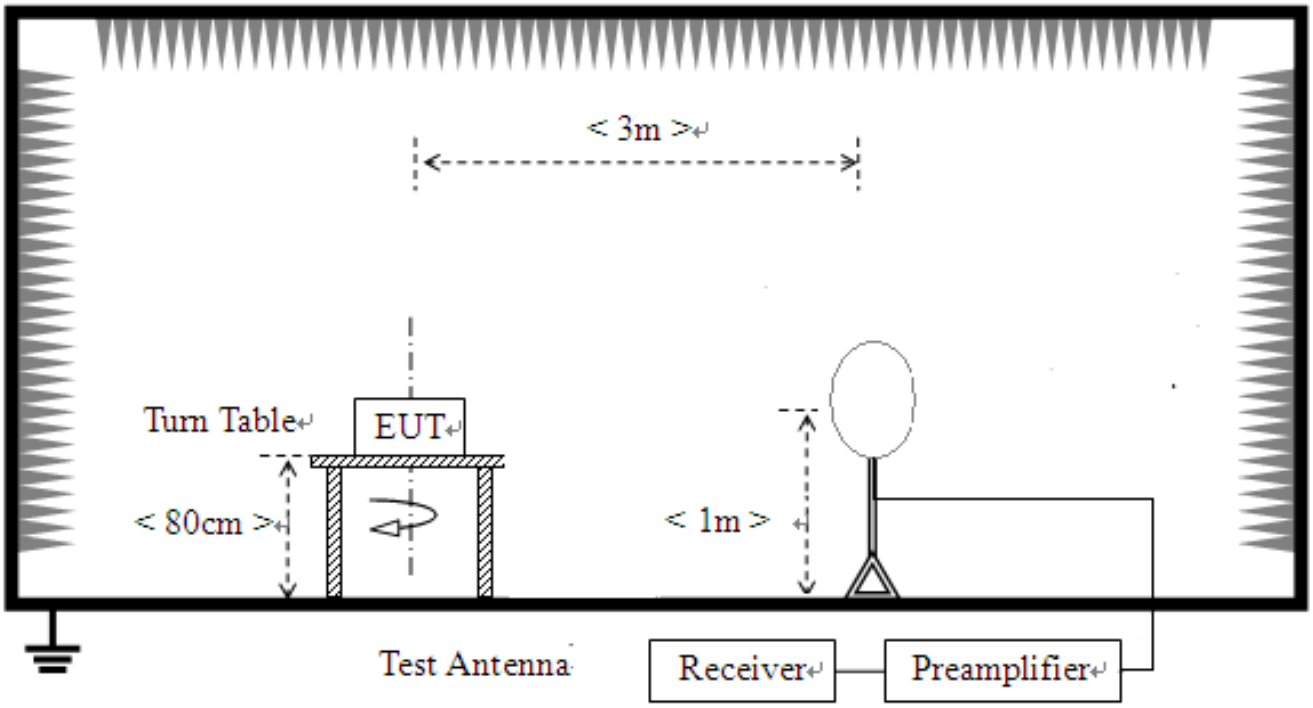
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 55 + 10 log (P) dB.

2.8.2 Measuring Instruments

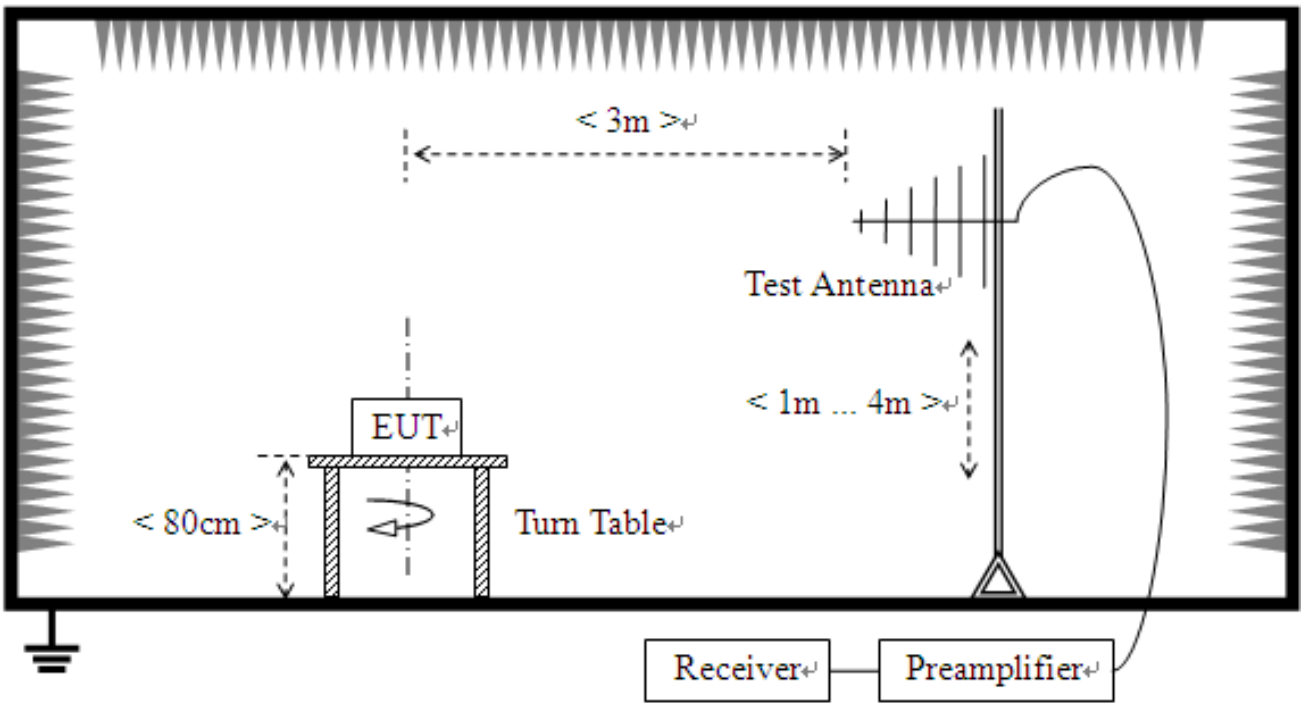
The measuring equipment is listed in the section 3 of this test report.

2.8.3 Test Setup

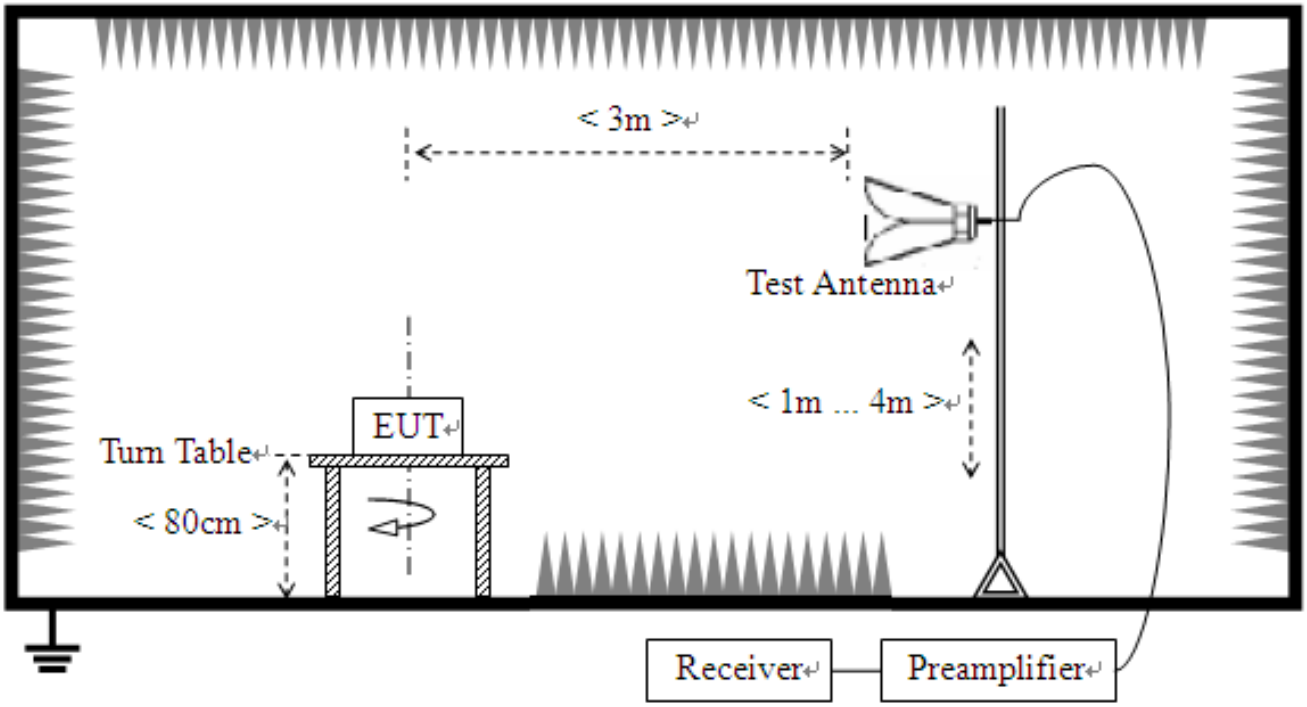
For radiated emissions from 9kHz to 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



2.8.4 Test Procedures

1. The EUT was placed on a rotatable wooden table with 0.8 meter above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

    The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)

    = P(W)- [43 + 10log(P)] (dB)

    = [30 + 10log(P)] (dBm) - [43 + 10log(P)] (dB)

    = -13dBm.

    <For Band 7>

    The limit line is derived from 55+ 10log(P)dB below the transmitter power P(Watts)

    = P(W)- [55 + 10log(P)] (dB)

    = [30 + 10log(P)] (dBm) - [55 + 10log(P)] (dB)

    = -25dBm.
11. All Spurious Emission tests were performed in X, Y, Z axis direction and low, middle, high channel. And only the worst axis test condition was recorded in this test report.
12. The spectrum is measured from 9 KHz to the 10^{th} harmonic of the fundamental frequency of the transmitter using CISPR quasi peak detector below 1GHz. The worst case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.

13. The maximum RB configurations of the Radiated Spurious Emissions as RB Size 1, RB Offset 0

2.8.5 Test Result (Plots) of Radiated Spurious Emission

Note: 1. within 30MHz-1GHz were found more than 20dB below limit line

Note: 2. Absolute Level=Reading Level + Factor

LTE Band 2 QPSK 20MHz BW Middle Channel

Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	3960.48	-53.96	-45.29	-13.00	32.29	8.67	Horizontal
2	5947.47	-55.06	-41.79	-13.00	28.79	13.27	Horizontal
3	14590.2	-58.07	-34.52	-13.00	21.52	23.55	Horizontal

Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	3174.08	-53.76	-45.23	-13.00	32.23	8.53	Vertical
2	5246.62	-53.24	-42.98	-13.00	29.98	10.26	Vertical
3	7374.68	-55.03	-40.96	-13.00	27.96	14.07	Vertical

Note:other spurious emissions are 20dB below limit line and no need to report

LTE Band 4 QPSK 20MHz BW Middle Channel

Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	3807.40	-53.50	-44.71	-13.00	31.71	8.79	Horizontal
2	6504.25	-55.47	-40.50	-13.00	27.50	14.97	Horizontal
3	13977.9	-59.05	-35.68	-13.00	22.68	23.37	Horizontal

Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	3991.99	-53.94	-45.24	-13.00	32.24	8.70	Vertical
2	5857.42	-54.17	-42.06	-13.00	29.06	12.11	Vertical
3	7416.70	-55.11	-41.05	-13.00	28.05	14.06	Vertical

Note:other spurious emissions are 20dB below limit line and no need to report

LTE Band 5 QPSK 10MHz BW Middle Channel

Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	1749.37	-46.57	-48.30	-13.00	35.30	-1.73	Horizontal
2	2415.70	-45.11	-42.00	-13.00	29.00	3.11	Horizontal
3	7110.55	-55.25	-40.51	-13.00	27.51	14.74	Horizontal

Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	1910.45	-50.37	-51.45	-13.00	38.45	-1.08	Vertical
2	3150.07	-53.53	-45.59	-13.00	32.59	7.94	Vertical
3	6444.22	-55.38	-41.21	-13.00	28.21	14.17	Vertical

Note:other spurious emissions are 20dB below limit line and no need to report

LTE Band 7 QPSK 20MHz BW Middle Channel

Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	3931.96	-53.26	-44.77	-13.00	31.77	8.49	Horizontal
2	5858.92	-53.80	-40.84	-13.00	27.84	12.96	Horizontal
3	10508.2	-57.56	-40.49	-13.00	27.49	17.07	Horizontal

Suspected List							
NO.	Freq. [MHz]	Reading [dBm]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Polarity
1	3949.97	-53.79	-45.36	-13.00	32.36	8.43	Vertical
2	6108.05	-55.71	-42.19	-13.00	29.19	13.52	Vertical
3	14296.1	-57.33	-34.89	-13.00	21.89	22.44	Vertical

Note:other spurious emissions are 20dB below limit line and no need to report

3. LIST OF MEASURING EQUIPMENT

Description	Manufacturer	Model	Serial No.	Cal. Date	Due Date	Remark
EMI Test Receiver	R&S	ESIB26	A0304218	2018.05.25	2019.05.24	Radiation
Loop Antenna	Schwarz beck	HFH2-Z2	100047	2018.05.25	2019.05.24	Radiation
Bilog Antenna	Schwarzbeck	VULB 9163	9163-274	2018.05.25	2019.05.24	Radiation
Broadband antenna (30MHz~1GHz)	R&S	HL562	101341	2018.05.25	2019.05.24	Radiation
Broadband antenna (30MHz~1GHz)	R&S	HL562	101339	2018.05.25	2019.05.24	Radiation
Double ridge horn antenna (1GHz~18GHz)	R&S	HF906	100150	2018.05.25	2019.05.24	Radiation
Double ridge horn antenna (1GHz~18GHz)	R&S	HF906	100148	2018.05.25	2019.05.24	Radiation
Horn antenna (18GHz~26.5GHz)	R&S	HM118	101286	2018.05.25	2019.05.24	Radiation
Horn antenna (18GHz~26.5GHz)	R&S	HM118	101284	2018.05.25	2019.05.24	Radiation
Amplifier 20M~3GHz	R&S	PAP-0203H	22018	2018.05.25	2019.05.24	Radiation
Ampilier 1G~18GHz	R&S	MITEQ AFS42-00101800	25-S-42	2018.05.25	2019.05.24	Radiation
Ampilier 18G~40GHz	R&S	JS42-18002600-28-5A	12111.0980.00	2018.05.25	2019.05.24	Radiation
Spectrum Analyzer	Keysight	N9030A	A160702554	2018.10.15	2019.10.14	Conducted
LISN	ROHDE&SCHWARZ	ESH2-Z5	A0304221	2018.05.25	2019.05.24	Conducted
Test Receiver	R&S	ESCS30	A0304260	2018.05.25	2019.05.24	Conducted
Cable	SUNHNER	SUCOFLEX 100	/	2018.05.25	2019.05.24	Radiation
Cable	SUNHNER	SUCOFLEX 104	/	2018.05.25	2019.05.24	Radiation
Temperature chamber	espec	SU-642	93008519	2017.08.25	2018.08.24	Conducted
Wideband Radio Communication tester	R&S	CMW500	149332	2018.05.04	2019.05.03	Conducted
Power Supply	R&S	NGMO1	101037	2018.05.04	2019.05.03	Conducted

The calibration interval was one year.

APPENDIX A

Conducted RF (Average) Output Power

Test Result and Data

1. LTE Band 2 Conducted Power Test Verdict:

LTE FDD Band 2				Conducted Power(dBm)		
Bandwidth	Modulation	RB size	RB offset	Channel 18607	Channel 18900	Channel 19193
1.4MHz	QPSK	1	0	20.45	20.85	20.61
		1	3	20.32	20.75	20.49
		1	5	20.34	20.74	20.48
		3	0	19.62	20.03	19.76
		3	2	19.63	20.02	19.73
		3	3	19.64	20.04	19.74
		6	0	19.5	19.91	19.63
	16QAM	1	0	19.32	19.7	19.5
		1	3	19.17	19.59	19.37
		1	5	19.3	19.67	19.49
		3	0	18.39	18.78	18.68
		3	2	18.47	18.88	18.71
		3	3	18.49	18.89	18.65
		6	0	18.37	18.79	18.5
Bandwidth	Modulation	RB size	RB offset	Channel 18615	Channel 18900	Channel 19185
3MHz	QPSK	1	0	20.85	20.99	20.74
		1	7	20.72	20.89	20.62
		1	14	20.74	20.88	20.61
		8	0	20.02	20.17	19.89
		8	4	20.03	20.16	19.86
		8	7	20.04	20.18	19.87
		15	0	19.9	20.05	19.76
	16QAM	1	0	19.72	19.84	19.63
		1	7	19.57	19.73	19.5
		1	14	19.7	19.81	19.62
		8	0	18.79	18.92	18.81
		8	4	18.87	19.02	18.84

		8	7	18.89	19.03	18.78
		15	0	18.77	18.93	18.63

Bandwidth	Modulation	RB size	RB offset	Channel 18625	Channel 18900	Channel 19175
5MHz	QPSK	1	0	21.05	21.07	21.16
		1	13	20.92	20.97	21.04
		1	24	20.94	20.96	21.03
		12	0	20.22	20.25	20.31
		12	6	20.23	20.24	20.28
		12	13	20.24	20.26	20.29
		25	0	20.1	20.13	20.18
	16QAM	1	0	19.92	19.92	20.05
		1	13	19.77	19.81	19.92
		1	24	19.9	19.89	20.04
		12	0	18.99	19	19.23
		12	6	19.07	19.1	19.26
		12	13	19.09	19.11	19.2
		25	0	18.97	19.01	19.05
Bandwidth	Modulation	RB size	RB offset	Channel 18650	Channel 18900	Channel 19150
10MHz	QPSK	1	0	21.33	21.42	21.25
		1	25	21.20	21.32	21.13
		1	49	21.22	21.31	21.12
		25	0	20.50	20.60	20.40
		25	13	20.51	20.59	20.37
		25	25	20.52	20.61	20.38
		50	0	20.38	20.48	20.27
	16QAM	1	0	20.2	20.27	20.14
		1	25	20.05	20.16	20.01
		1	49	20.18	20.24	20.13
		25	0	19.27	19.35	19.32
		25	13	19.35	19.45	19.35
		25	25	19.37	19.46	19.29
		50	0	19.25	19.36	19.14

Bandwidth	Modulation	RB size	RB offset	Channel 18675	Channel 18900	Channel 19125
15MHz	QPSK	1	0	21.36	21.61	21.55
		1	38	21.23	21.51	21.43
		1	74	21.25	21.5	21.42
		36	0	20.53	20.79	20.7
		36	18	20.54	20.78	20.67
		36	39	20.55	20.8	20.68
		75	0	20.41	20.67	20.57
	16QAM	1	0	20.23	20.46	20.44
		1	38	20.08	20.35	20.31
		1	74	20.21	20.43	20.43
		36	0	19.3	19.54	19.62
		36	18	19.38	19.64	19.65
		36	39	19.4	19.65	19.59
		75	0	19.28	19.55	19.44
Bandwidth	Modulation	RB size	RB offset	Channel 18700	Channel 18900	Channel 19100
20MHz	QPSK	1	0	21.71	21.85	21.66
		1	50	21.58	21.75	21.54
		1	99	21.6	21.74	21.53
		50	0	20.88	21.03	20.81
		50	25	20.89	21.02	20.78
		50	50	20.9	21.04	20.79
		100	0	20.76	20.91	20.68
	16QAM	1	0	20.58	20.7	20.55
		1	50	20.43	20.59	20.42
		1	99	20.56	20.67	20.54
		50	0	19.65	19.78	19.73
		50	25	19.73	19.88	19.76
		50	50	19.75	19.89	19.7
		100	0	19.63	19.79	19.55

2. LTE Band 4 Conducted Power Test Verdict:

LTE FDD Band 4				Conducted Power(dBm)		
Bandwidth	Modulation	RB size	RB offset	Channel 19957	Channel 20175	Channel 20393
1.4MHz	QPSK	1	0	21.12	21.23	21.21
		1	3	20.99	21.13	21.09
		1	5	21.01	21.12	21.08
		3	0	20.29	20.41	20.36
		3	2	20.3	20.4	20.33
		3	3	20.31	20.42	20.34
		6	0	20.17	20.29	20.23
	16QAM	1	0	19.99	20.08	20.1
		1	3	19.84	19.97	19.97
		1	5	19.97	20.05	20.09
		3	0	19.06	19.16	19.28
		3	2	19.14	19.26	19.31
		3	3	19.16	19.27	19.25
		6	0	19.04	19.17	19.1
Bandwidth	Modulation	RB size	RB offset	Channel 19965	Channel 20175	Channel 20385
3MHz	QPSK	1	0	21.35	21.26	21.25
		1	7	21.22	21.16	21.13
		1	14	21.24	21.15	21.12
		8	0	20.52	20.44	20.4
		8	4	20.53	20.43	20.37
		8	7	20.54	20.45	20.38
		15	0	20.4	20.32	20.27
	16QAM	1	0	20.22	20.11	20.14
		1	7	20.07	20	20.01
		1	14	20.2	20.08	20.13
		8	0	19.29	19.19	19.32
		8	4	19.37	19.29	19.35
		8	7	19.39	19.3	19.29
		15	0	19.27	19.2	19.14

Bandwidth	Modulation	RB size	RB offset	Channel 19975	Channel 20175	Channel 20375
5MHz	QPSK	1	0	21.33	21.21	21.42
		1	13	21.2	21.11	21.3
		1	24	21.22	21.1	21.29
		12	0	20.5	20.39	20.57
		12	6	20.51	20.38	20.54
		12	13	20.52	20.4	20.55
		25	0	20.38	20.27	20.44
	16QAM	1	0	20.2	20.06	20.31
		1	13	20.05	19.95	20.18
		1	24	20.18	20.03	20.3
		12	0	19.27	19.14	19.49
		12	6	19.35	19.24	19.52
		12	13	19.37	19.25	19.46
		25	0	19.25	19.15	19.31
Bandwidth	Modulation	RB size	RB offset	Channel 20000	Channel 20175	Channel 20350
10MHz	QPSK	1	0	21.51	21.46	21.33
		1	25	21.38	21.36	21.21
		1	49	21.4	21.35	21.2
		25	0	20.68	20.64	20.48
		25	13	20.69	20.63	20.45
		25	25	20.7	20.65	20.46
		50	0	20.56	20.52	20.35
	16QAM	1	0	20.38	20.31	20.22
		1	25	20.23	20.2	20.09
		1	49	20.36	20.28	20.21
		25	0	19.45	19.39	19.4
		25	13	19.53	19.49	19.43
		25	25	19.55	19.5	19.37
		50	0	19.43	19.4	19.22

Bandwidth	Modulation	RB size	RB offset	Channel 20025	Channel 20175	Channel 20325
15MHz	QPSK	1	0	21.44	21.48	21.43
		1	38	21.31	21.38	21.31
		1	74	21.33	21.37	21.3
		36	0	20.61	20.66	20.58
		36	18	20.62	20.65	20.55
		36	39	20.63	20.67	20.56
		75	0	20.49	20.54	20.45
	16QAM	1	0	20.31	20.33	20.32
		1	38	20.16	20.22	20.19
		1	74	20.29	20.3	20.31
		36	0	19.38	19.41	19.5
		36	18	19.46	19.51	19.53
		36	39	19.48	19.52	19.47
		75	0	19.36	19.42	19.32
Bandwidth	Modulation	RB size	RB offset	Channel 20050	Channel 20175	Channel 20300
20MHz	QPSK	1	0	21.75	21.99	21.83
		1	50	21.62	21.89	21.71
		1	99	21.64	21.88	21.7
		50	0	20.92	21.17	20.98
		50	25	20.93	21.16	20.95
		50	50	20.94	21.18	20.96
		100	0	20.8	21.05	20.85
	16QAM	1	0	20.62	20.84	20.72
		1	50	20.47	20.73	20.59
		1	99	20.6	20.81	20.71
		50	0	19.69	19.92	19.9
		50	25	19.77	20.02	19.93
		50	50	19.79	20.03	19.87
		100	0	19.67	19.93	19.72

3. LTE Band 5 Conducted Power Test Verdict:

LTE FDD Band 5				Conducted Power(dBm)		
Bandwidth	Modulation	RB size	RB offset	Channel 20407	Channel 20525	Channel 20643
1.4MHz	QPSK	1	0	22.15	22.21	22.33
		1	3	22.02	22.1	22.22
		1	5	22	22.06	22.19
		3	0	21.34	21.35	21.47
		3	2	21.3	21.38	21.51
		3	3	21.31	21.37	21.46
		6	0	21.16	21.18	21.36
	16QAM	1	0	21.02	21.09	21.18
		1	3	20.91	20.94	21.07
		1	5	21	21.05	21.16
		3	0	20.11	20.17	20.35
		3	2	20.14	20.26	20.41
		3	3	20.2	20.28	20.32
		6	0	20.06	20.1	20.11
Bandwidth	Modulation	RB size	RB offset	Channel 20415	Channel 20525	Channel 20635
3MHz	QPSK	1	0	22.16	22.33	22.35
		1	7	22.01	22.19	22.21
		1	14	22.05	22.2	22.2
		8	0	21.34	21.48	21.52
		8	4	21.35	21.51	21.54
		8	7	21.36	21.49	21.47
		15	0	21.18	21.36	21.36
	16QAM	1	0	21.04	21.2	21.18
		1	7	20.89	21.05	21.03
		1	14	21.01	21.14	21.15
		8	0	20.12	20.26	20.37
		8	4	20.18	20.38	20.46
		8	7	20.23	20.36	20.35
		15	0	20.08	20.2	20.11

Bandwidth	Modulation	RB size	RB offset	Channel 20425	Channel 20525	Channel 20625
5MHz	QPSK	1	0	22.36	22.51	22.37
		1	13	22.21	22.36	22.26
		1	24	22.23	22.39	22.22
		12	0	21.54	21.68	21.56
		12	6	21.55	21.67	21.53
		12	13	21.53	21.64	21.52
		25	0	21.39	21.52	21.37
	16QAM	1	0	21.22	21.39	21.21
		1	13	21.09	21.25	21.07
		1	24	21.17	21.37	21.14
		12	0	20.28	20.47	20.36
		12	6	20.41	20.53	20.49
		12	13	20.4	20.56	20.35
		25	0	20.25	20.45	20.11
Bandwidth	Modulation	RB size	RB offset	Channel 20450	Channel 20525	Channel 20600
10MHz	QPSK	1	0	22.51	22.68	22.44
		1	25	22.33	22.56	22.29
		1	49	22.35	22.56	22.33
		25	0	21.7	21.85	21.61
		25	13	21.66	21.84	21.62
		25	25	21.68	21.87	21.63
		50	0	21.57	21.72	21.43
	16QAM	1	0	21.38	21.53	21.29
		1	25	21.27	21.42	21.18
		1	49	21.33	21.45	21.26
		25	0	20.47	20.59	20.45
		25	13	20.52	20.64	20.53
		25	25	20.53	20.67	20.41
		50	0	20.4	20.5	20.19

4. LTE Band 7 Conducted Power Test Verdict:

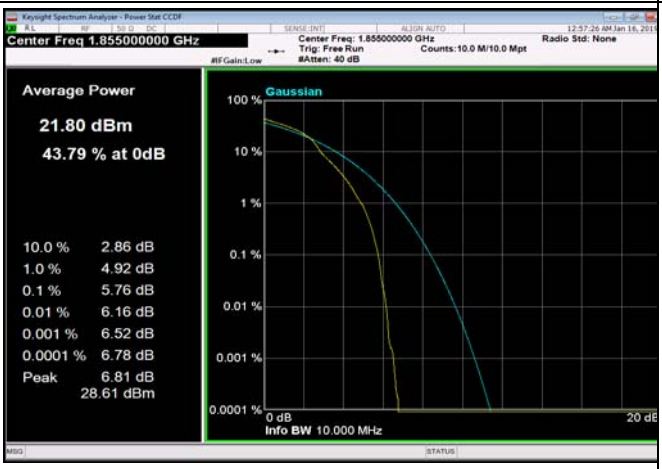
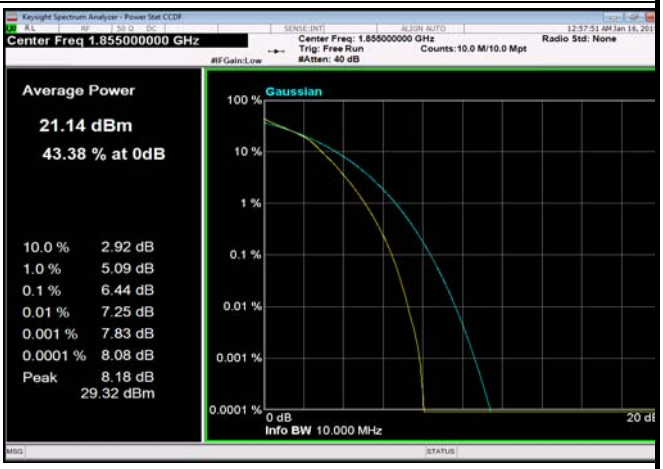
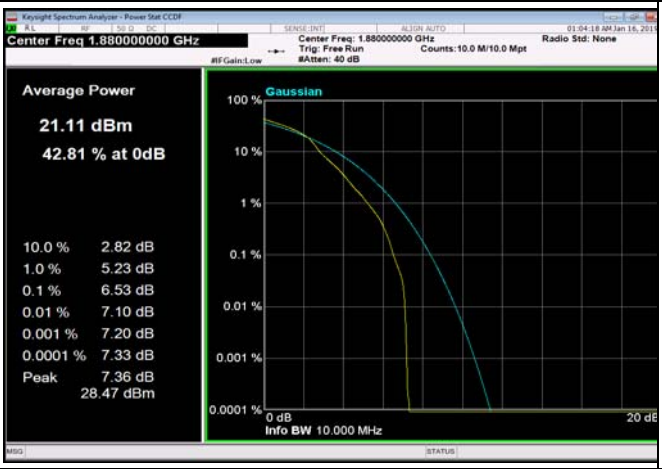
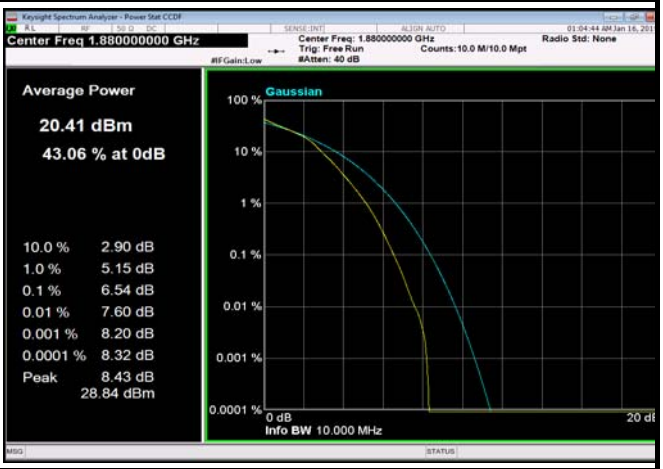
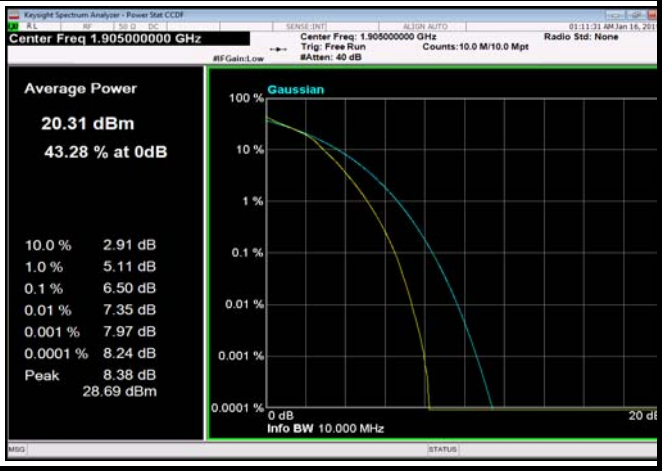
LTE FDD Band 7				Conducted Power(dBm)		
Bandwidth	Modulation	RB size	RB offset	Channel 20775	Channel 21100	Channel 21425
5MHz	QPSK	1	0	20.51	20.36	20.42
		1	13	20.4	20.21	20.27
		1	24	20.38	20.23	20.31
		12	0	19.63	19.51	19.59
		12	6	19.66	19.55	19.56
		12	13	19.68	19.53	19.57
		25	0	19.52	19.33	19.48
	16QAM	1	0	19.4	19.24	19.26
		1	13	19.28	19.11	19.15
		1	24	19.35	19.19	19.25
		12	0	18.49	18.26	18.41
		12	6	18.52	18.4	18.5
		12	13	18.54	18.35	18.43
		25	0	18.43	18.2	18.31
Bandwidth	Modulation	RB size	RB offset	Channel 20800	Channel 21100	Channel 21400
10MHz	QPSK	1	0	20.64	20.71	20.58
		1	25	20.53	20.56	20.43
		1	49	20.51	20.58	20.47
		25	0	19.76	19.86	19.75
		25	13	19.79	19.9	19.72
		25	25	19.81	19.88	19.73
		50	0	19.65	19.68	19.64
	16QAM	1	0	19.53	19.59	19.42
		1	25	19.41	19.46	19.31
		1	49	19.48	19.54	19.41
		25	0	18.62	18.61	18.57
		25	13	18.65	18.75	18.66
		25	25	18.67	18.7	18.59
		50	0	18.56	18.55	18.47

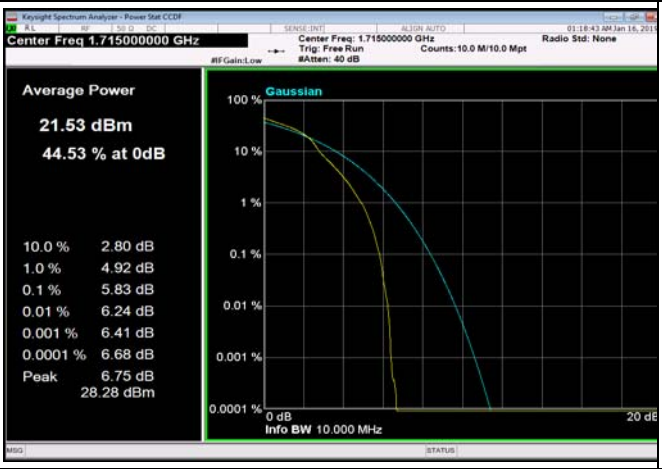
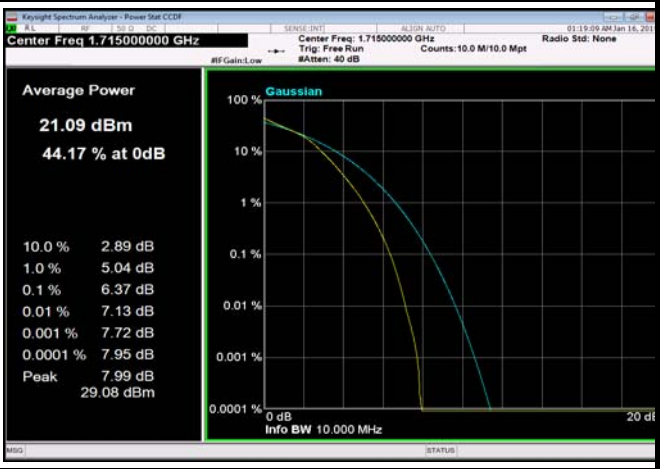
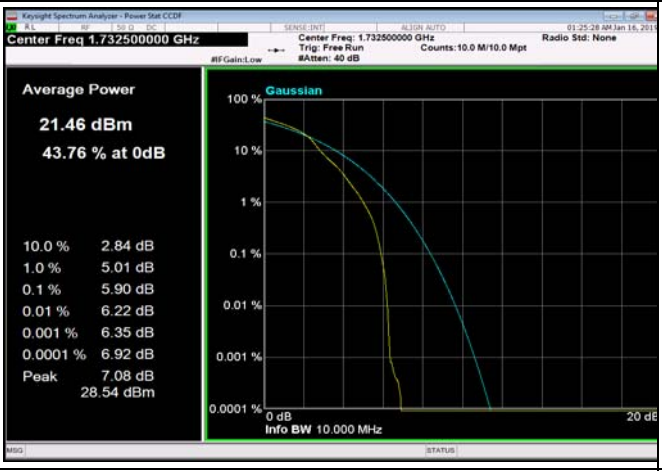
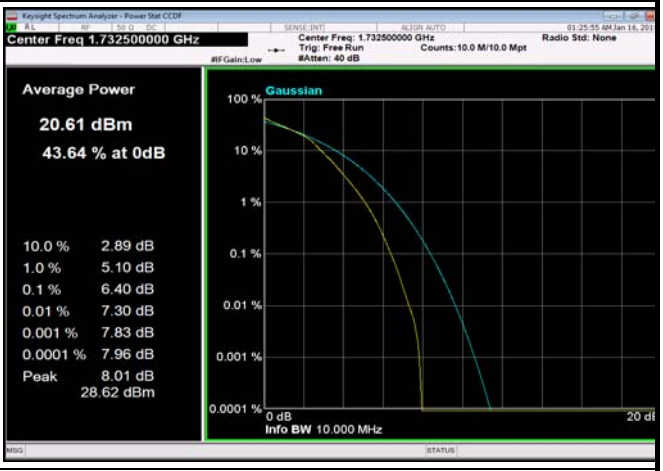
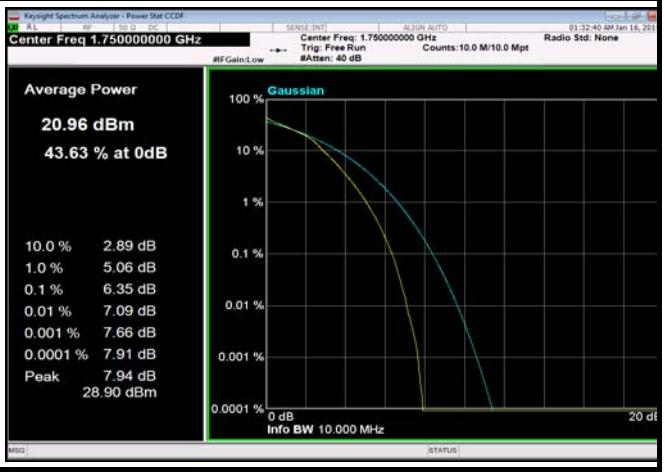
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				20825	21100	21375
15MHz	QPSK	1	0	20.85	20.91	21.05
		1	38	20.74	20.76	20.9
		1	74	20.72	20.78	20.94
		36	0	19.97	20.06	20.22
		36	18	20	20.1	20.19
		36	39	20.02	20.08	20.2
		75	0	19.86	19.88	20.11
	16QAM	1	0	19.74	19.79	19.89
		1	38	19.62	19.66	19.78
		1	74	19.69	19.74	19.88
		36	0	18.83	18.81	19.04
		36	18	18.86	18.95	19.13
		36	39	18.88	18.9	19.06
		75	0	18.77	18.75	18.94
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				20850	21100	21350
20MHz	QPSK	1	0	21.15	21.28	21.03
		1	50	21.04	21.13	20.88
		1	99	21.02	21.15	20.92
		50	0	20.27	20.43	20.2
		50	25	20.3	20.47	20.17
		50	50	20.32	20.45	20.18
		100	0	20.16	20.25	20.09
	16QAM	1	0	20.04	20.16	19.87
		1	50	19.92	20.03	19.76
		1	99	19.99	20.11	19.86
		50	0	19.13	19.18	19.02
		50	25	19.16	19.32	19.11
		50	50	19.18	19.27	19.04
		100	0	19.07	19.12	18.92

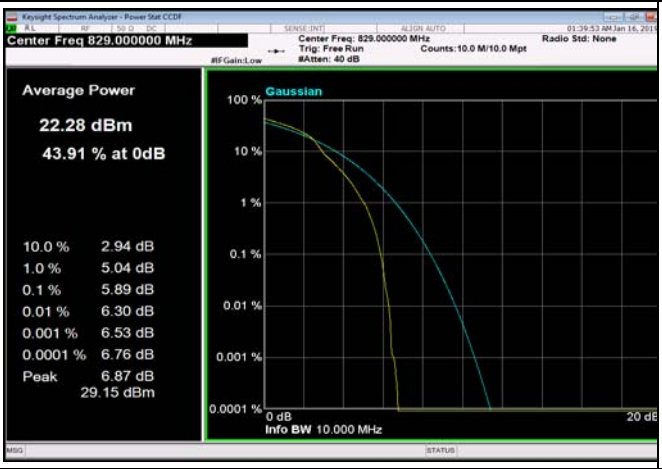
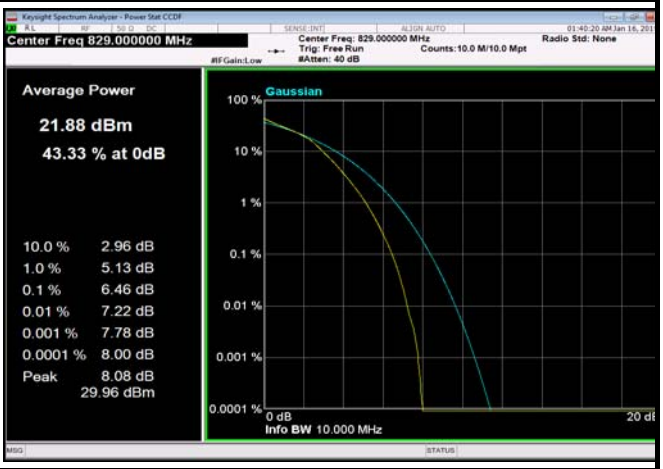
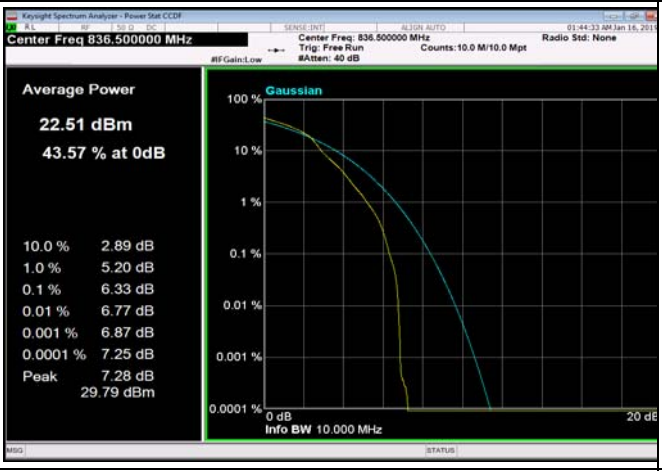
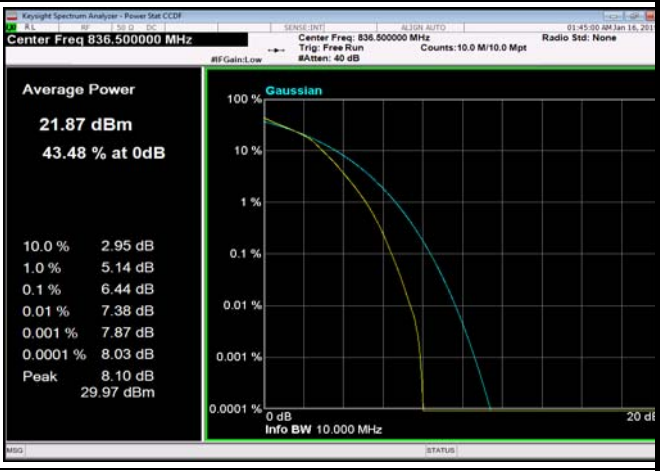
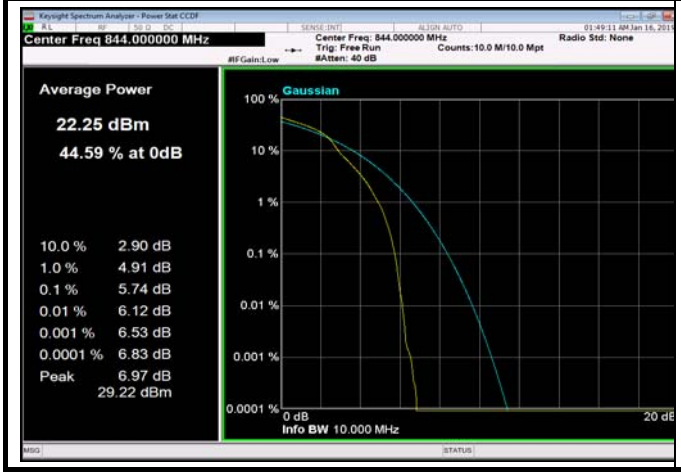
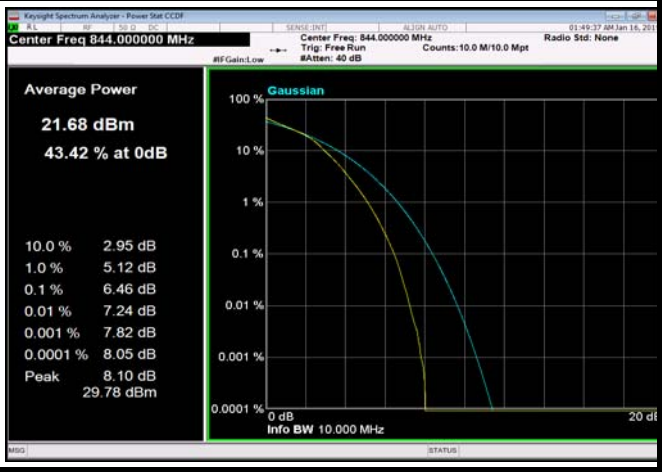
Peak To Average Ratio

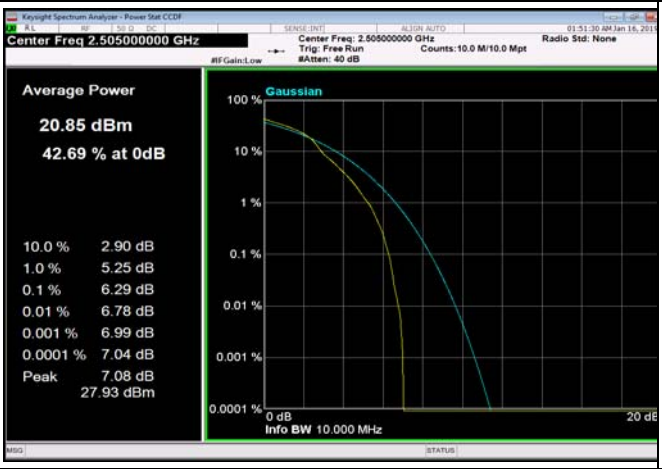
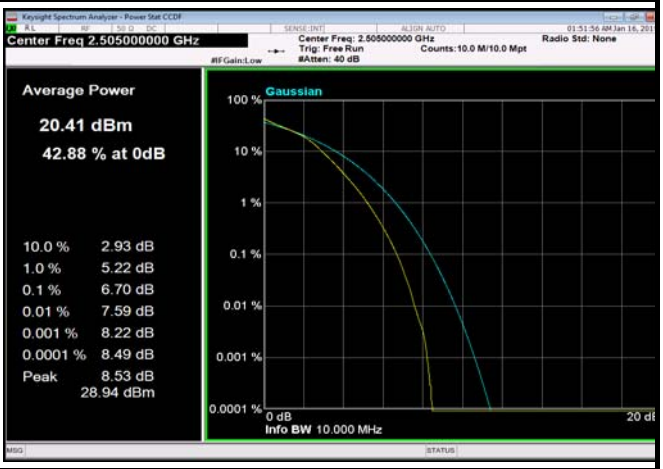
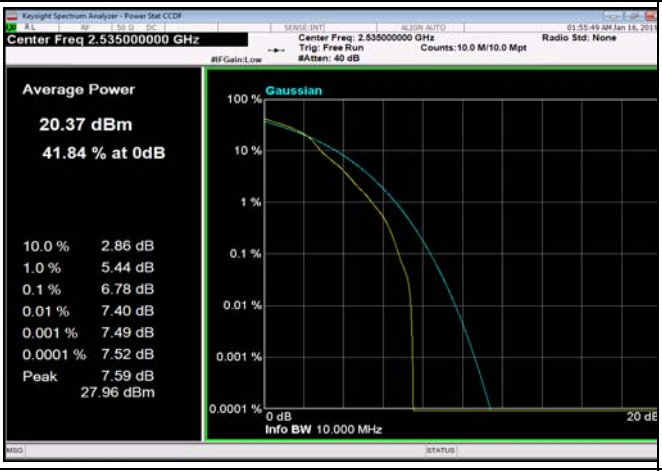
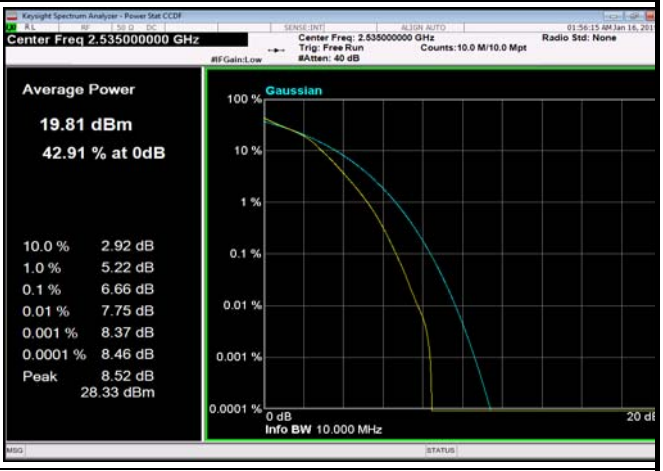
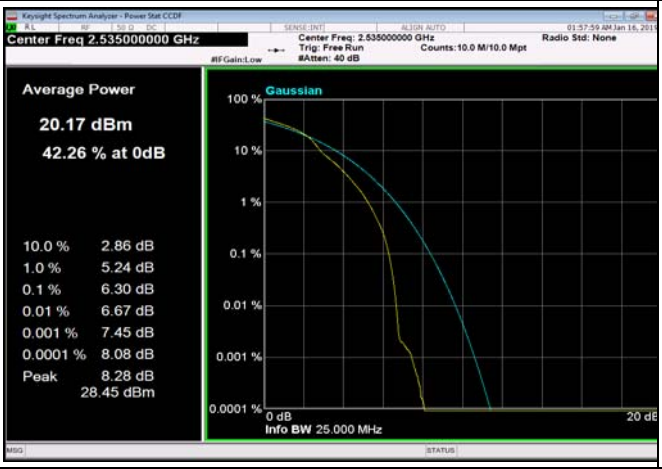
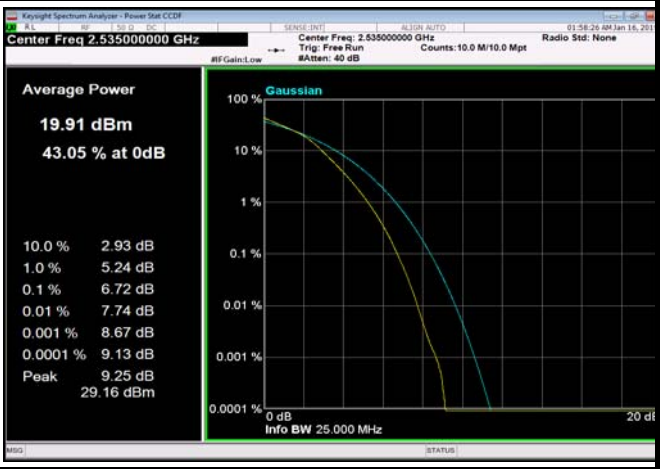
Test Result and Data

PeakToAveragePowerRatio NormalTC_NormalVol							
Band	Range	BandWidth	RbMode	Modulation	PAPR (dBm)	Limit (dBm)	Result
FDD02	LowRange	10	OneRB_high	Q16	5.76	13.00	Pass
FDD02	LowRange	10	fullRB	Q16	6.44	13.00	Pass
FDD02	MidRange	10	OneRB_high	Q16	6.53	13.00	Pass
FDD02	MidRange	10	fullRB	Q16	6.54	13.00	Pass
FDD02	HighRange	10	OneRB_high	Q16	5.79	13.00	Pass
FDD02	HighRange	10	fullRB	Q16	6.50	13.00	Pass
FDD04	LowRange	10	OneRB_high	Q16	5.83	13.00	Pass
FDD04	LowRange	10	fullRB	Q16	6.37	13.00	Pass
FDD04	MidRange	10	OneRB_high	Q16	5.90	13.00	Pass
FDD04	MidRange	10	fullRB	Q16	6.40	13.00	Pass
FDD04	HighRange	10	OneRB_high	Q16	5.64	13.00	Pass
FDD04	HighRange	10	fullRB	Q16	6.35	13.00	Pass
FDD05	LowRange	10	OneRB_high	Q16	5.89	13.00	Pass
FDD05	LowRange	10	fullRB	Q16	6.46	13.00	Pass
FDD05	MidRange	10	OneRB_high	Q16	6.32	13.00	Pass
FDD05	MidRange	10	fullRB	Q16	6.44	13.00	Pass
FDD05	HighRange	10	OneRB_high	Q16	5.74	13.00	Pass
FDD05	HighRange	10	fullRB	Q16	6.46	13.00	Pass
FDD07	LowRange	10	OneRB_high	Q16	6.29	13.00	Pass
FDD07	LowRange	10	fullRB	Q16	6.70	13.00	Pass
FDD07	MidRange	10	OneRB_high	Q16	6.78	13.00	Pass
FDD07	MidRange	10	fullRB	Q16	6.66	13.00	Pass
FDD07	HighRange	10	OneRB_high	Q16	6.30	13.00	Pass
FDD07	HighRange	10	fullRB	Q16	6.72	13.00	Pass

FDD02_10MHz_1855_OneRB_high_Q16	FDD02_10MHz_1855_fullRB_Q16
	
FDD02_10MHz_1880_OneRB_high_Q16	FDD02_10MHz_1880_fullRB_Q16
	
FDD02_10MHz_1905_OneRB_high_Q16	FDD02_10MHz_1905_fullRB_Q16
	

FDD04_10MHz_1715_OneRB_high_Q16	FDD04_10MHz_1715_fullRB_Q16
	
FDD04_10MHz_1732.5_OneRB_high_Q16	FDD04_10MHz_1732.5_fullRB_Q16
	
FDD04_10MHz_1750_OneRB_high_Q16	FDD04_10MHz_1750_fullRB_Q16
	

FDD05_10MHz_829_OneRB_high_Q16	FDD05_10MHz_829_fullRB_Q16
	
FDD05_10MHz_836.5_OneRB_high_Q16	FDD05_10MHz_836.5_fullRB_Q16
	
FDD05_10MHz_844_OneRB_high_Q16	FDD05_10MHz_844_fullRB_Q16
	

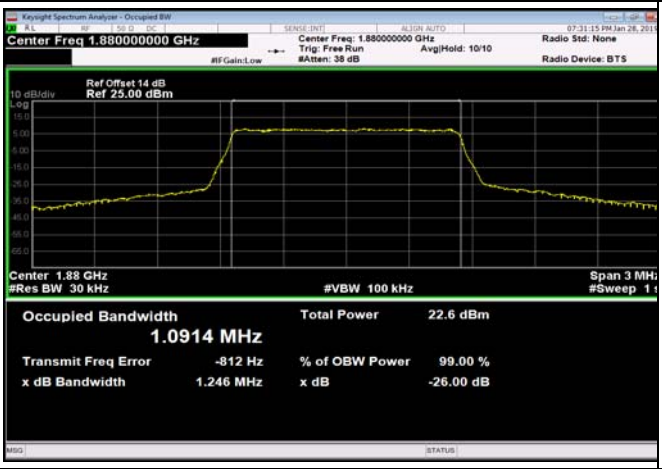
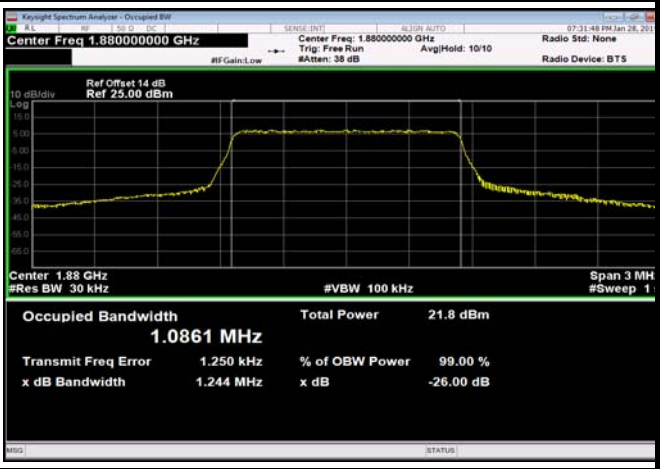
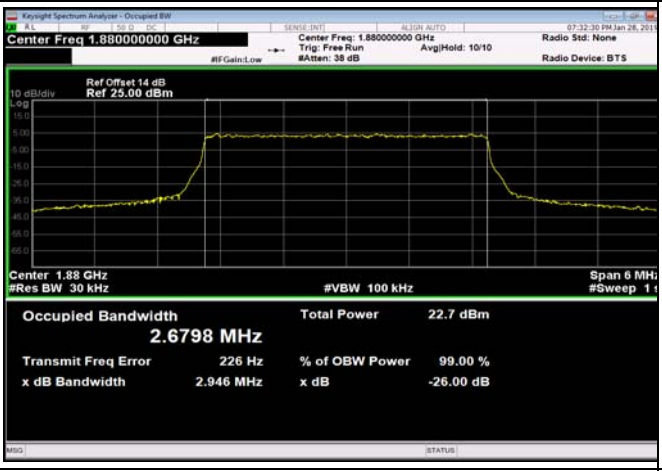
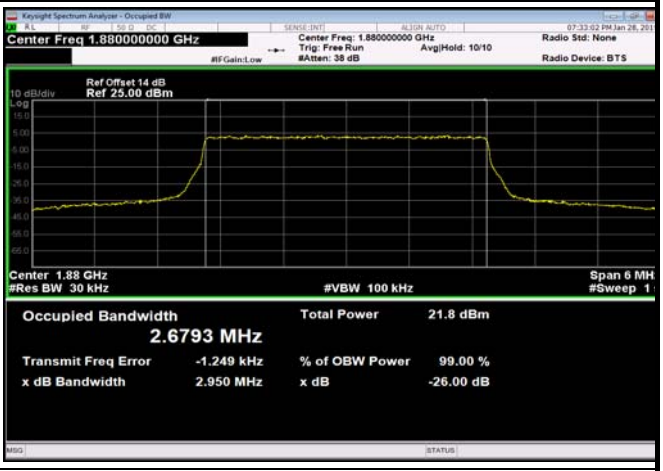
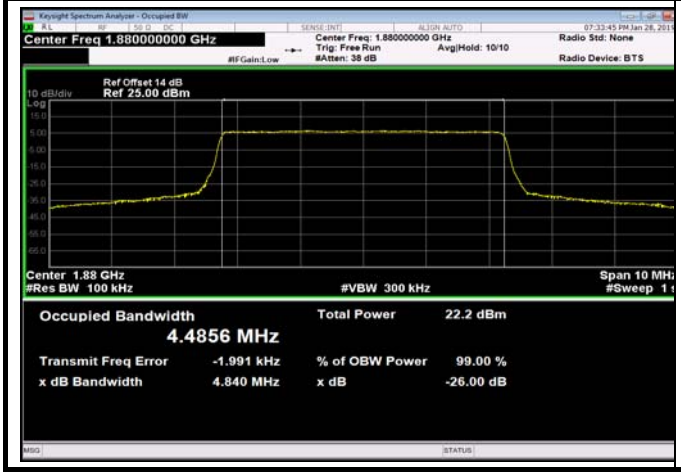
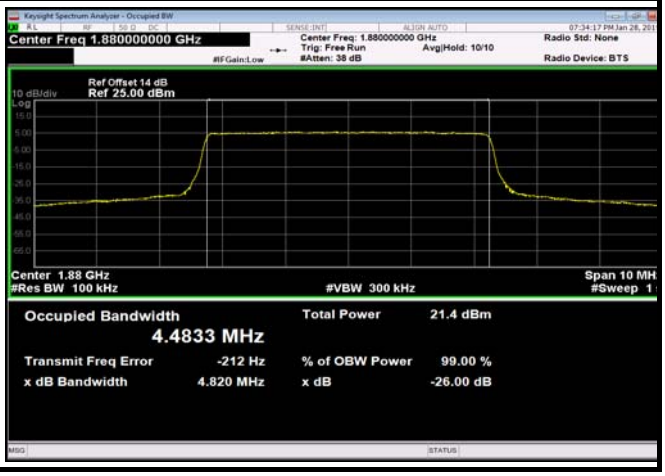
FDD07_10MHz_2505_OneRB_high_Q16	FDD07_10MHz_2505_fullRB_Q16
	
FDD07_10MHz_2535_OneRB_high_Q16	FDD07_10MHz_2535_fullRB_Q16
	
FDD07_10MHz_2560_OneRB_high_Q16	FDD07_10MHz_2560_fullRB_Q16
	

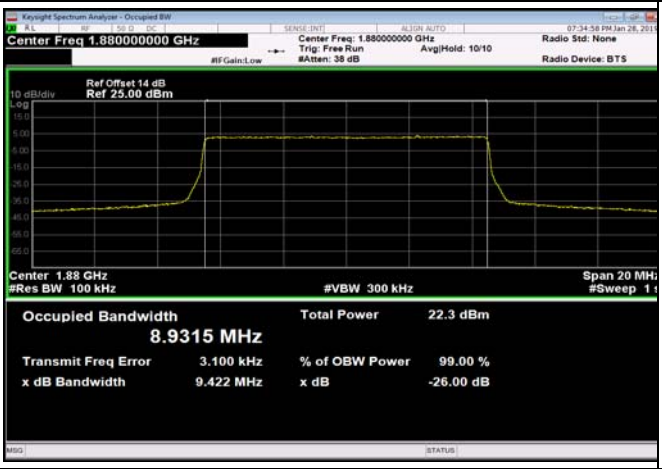
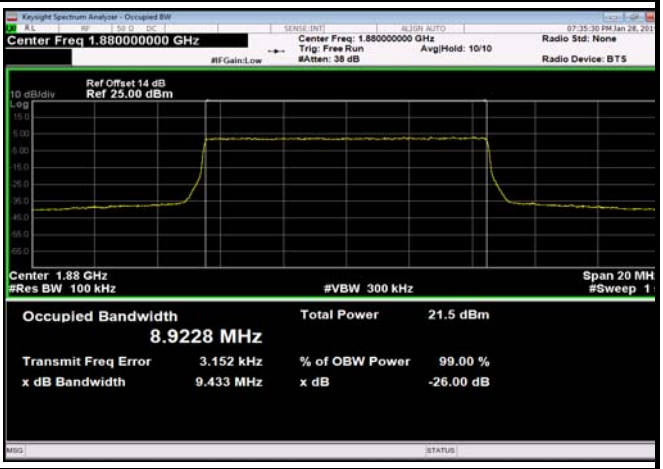
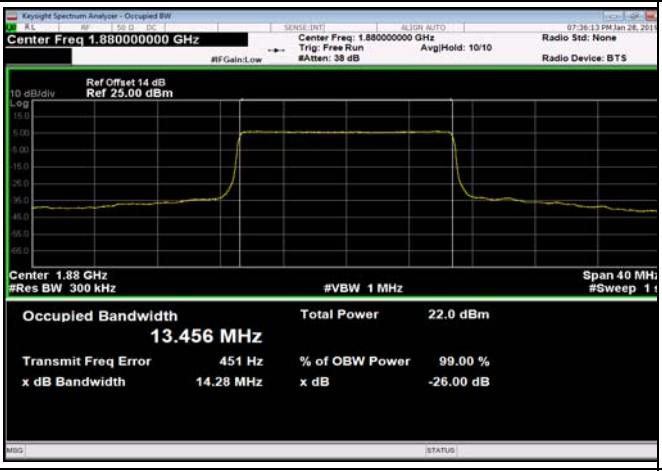
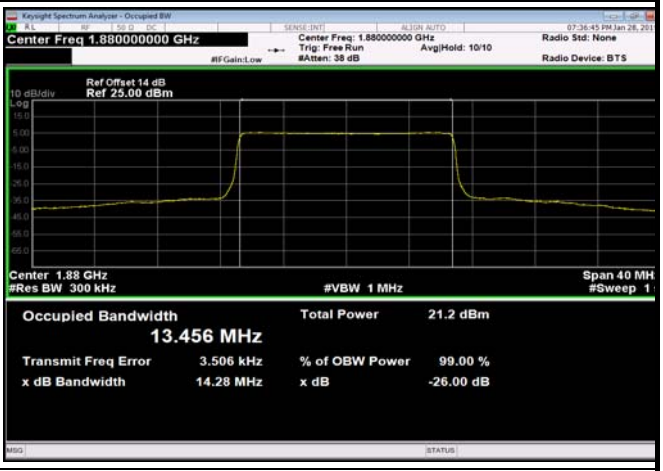
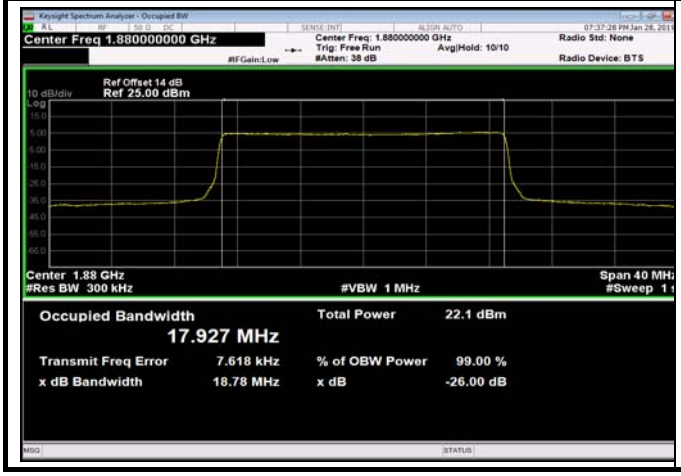
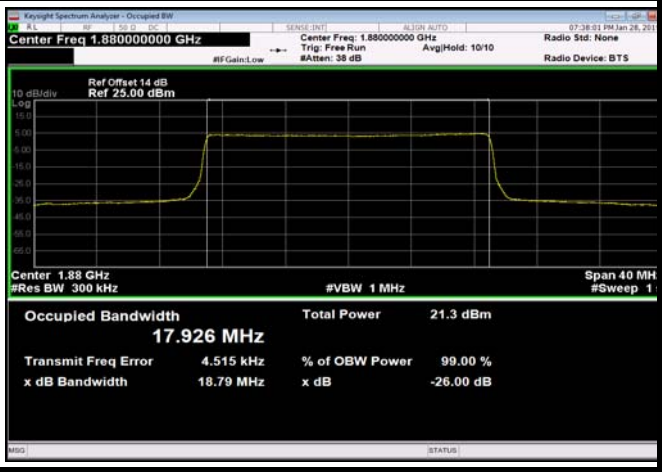
99% Occupied Bandwidth

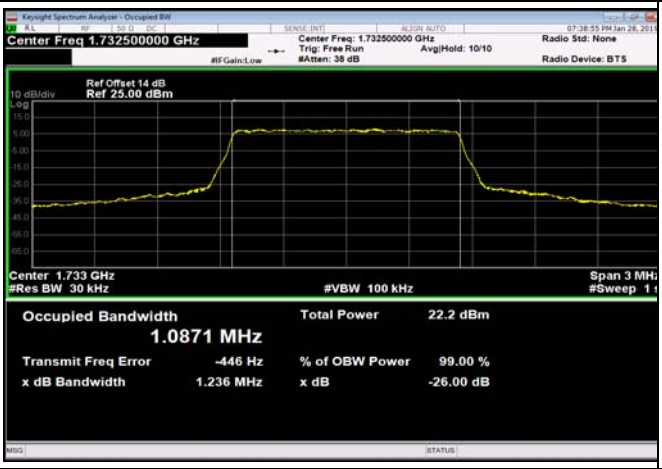
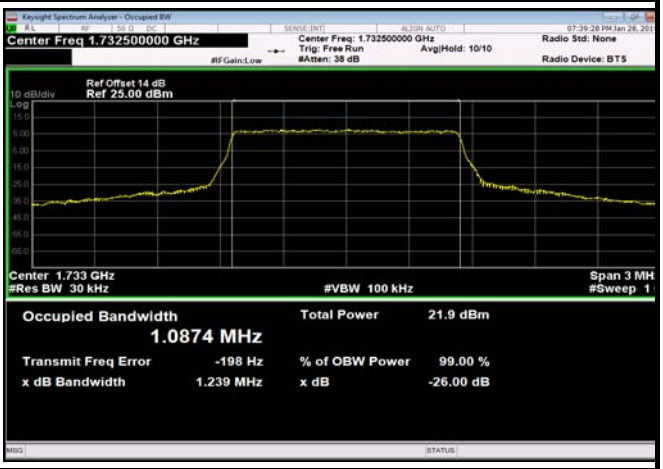
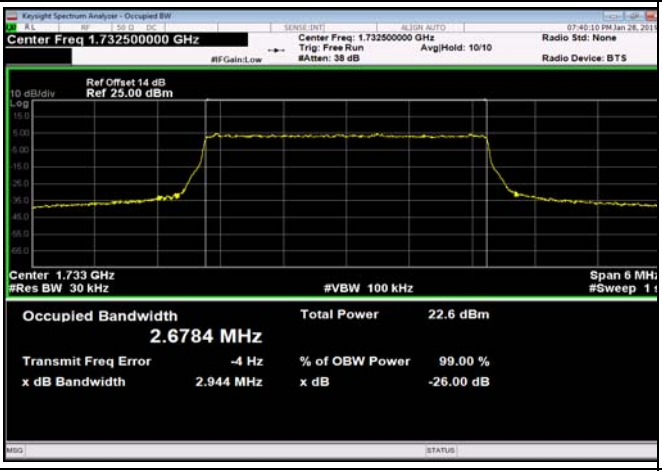
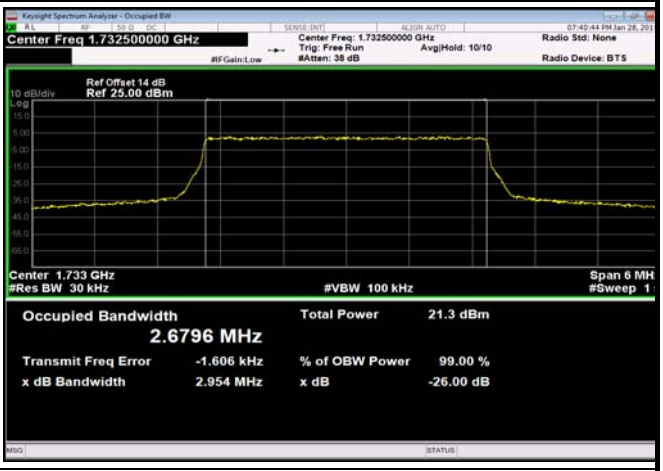
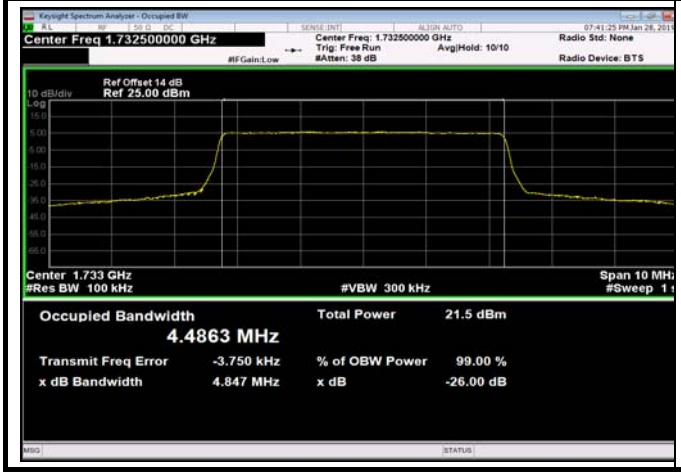
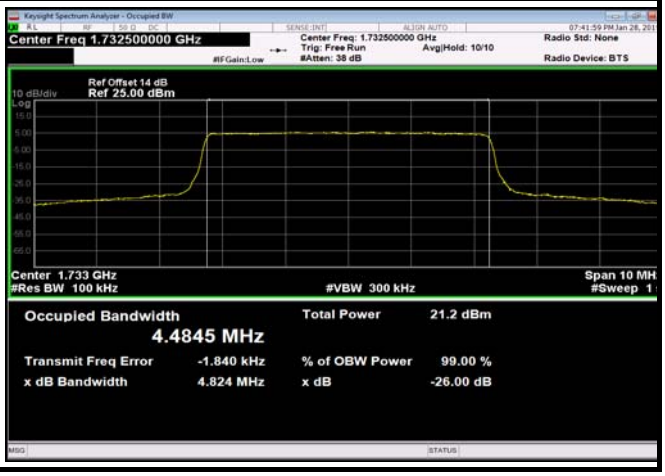
Test Result and Data

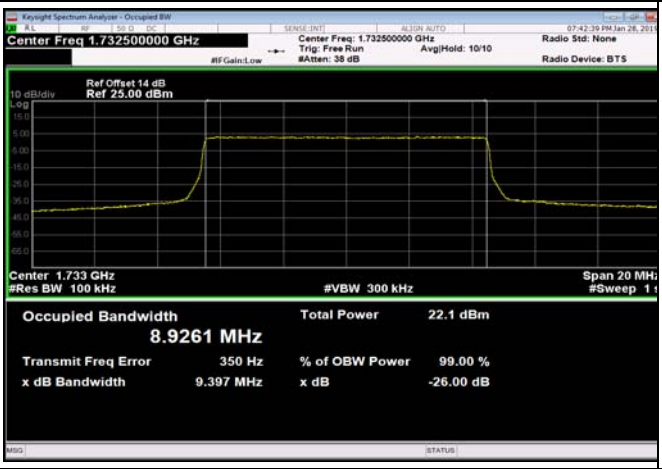
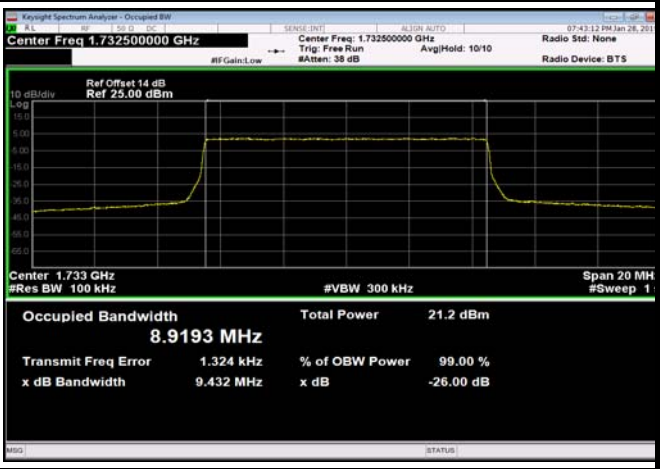
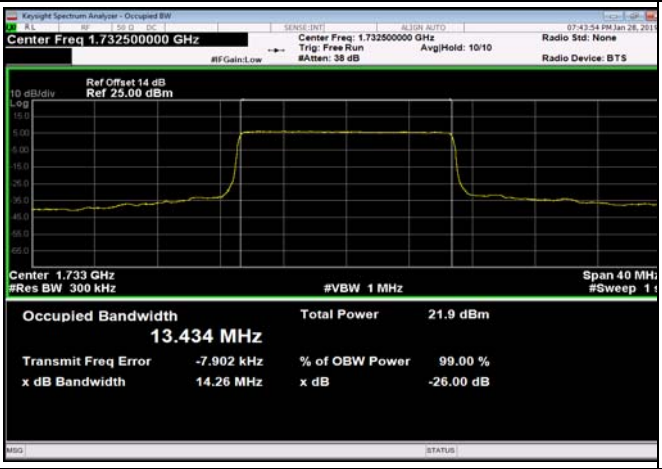
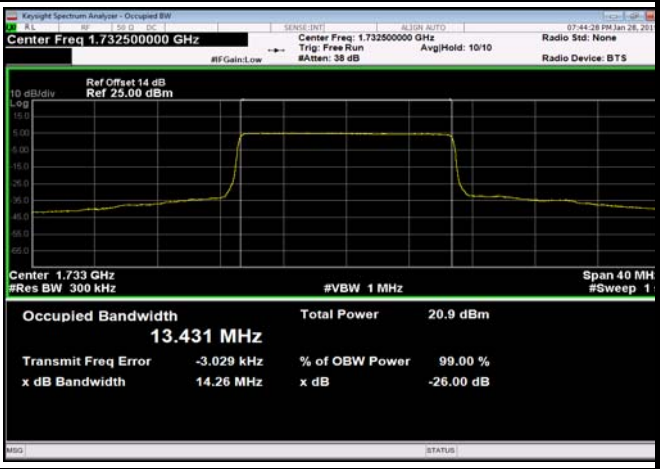
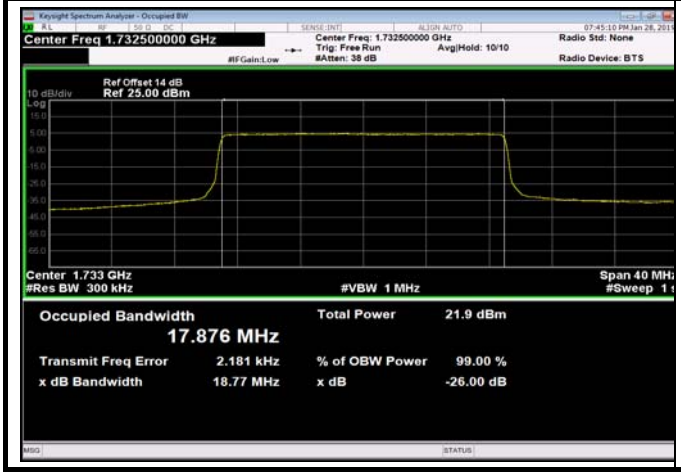
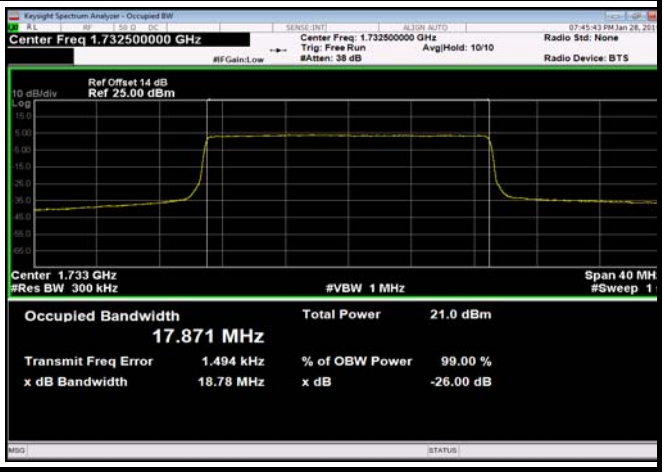
Occupied Bandwidth NormalTC_NormalVol					
Band	Range	BandWidth	Frequency (MHz)	Modulation	Occupied Bandwidth(99%) (MHz)
FDD02	MidRange	1.4	1880	QPSK	1.091
FDD02	MidRange	1.4	1880	Q16	1.086
FDD02	MidRange	3	1880	QPSK	2.68
FDD02	MidRange	3	1880	Q16	2.679
FDD02	MidRange	5	1880	QPSK	4.486
FDD02	MidRange	5	1880	Q16	4.483
FDD02	MidRange	10	1880	QPSK	8.931
FDD02	MidRange	10	1880	Q16	8.923
FDD02	MidRange	15	1880	QPSK	13.456
FDD02	MidRange	15	1880	Q16	13.456
FDD02	MidRange	20	1880	QPSK	17.927
FDD02	MidRange	20	1880	Q16	17.926
FDD04	MidRange	1.4	1732.5	QPSK	1.087
FDD04	MidRange	1.4	1732.5	Q16	1.087
FDD04	MidRange	3	1732.5	QPSK	2.678
FDD04	MidRange	3	1732.5	Q16	2.68
FDD04	MidRange	5	1732.5	QPSK	4.486
FDD04	MidRange	5	1732.5	Q16	4.485
FDD04	MidRange	10	1732.5	QPSK	8.926
FDD04	MidRange	10	1732.5	Q16	8.919
FDD04	MidRange	15	1732.5	QPSK	13.434
FDD04	MidRange	15	1732.5	Q16	13.431
FDD04	MidRange	20	1732.5	QPSK	17.876
FDD04	MidRange	20	1732.5	Q16	17.871
FDD05	MidRange	1.4	836.5	QPSK	1.087
FDD05	MidRange	1.4	836.5	Q16	1.089

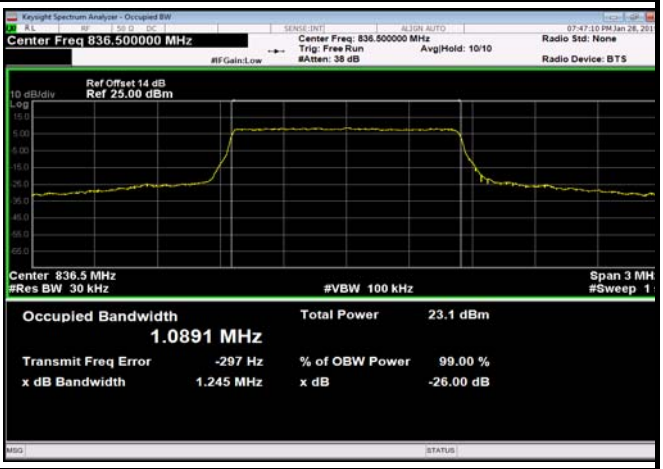
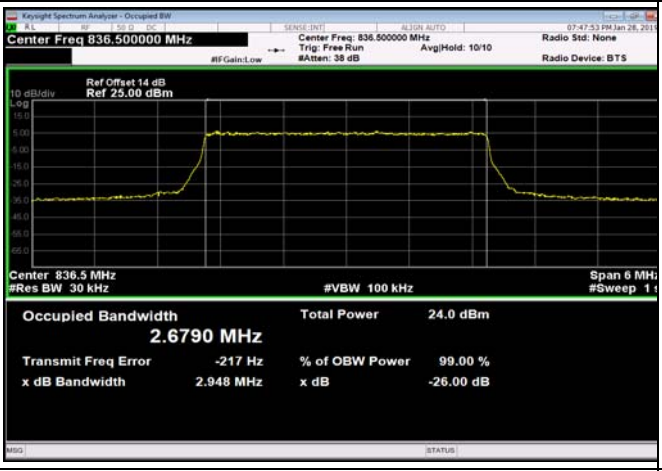
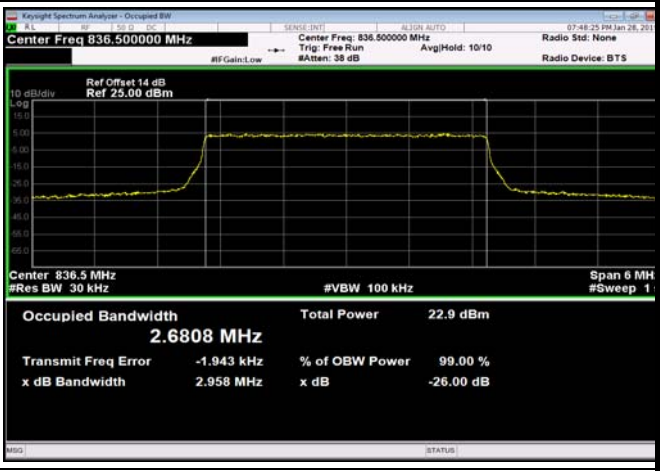
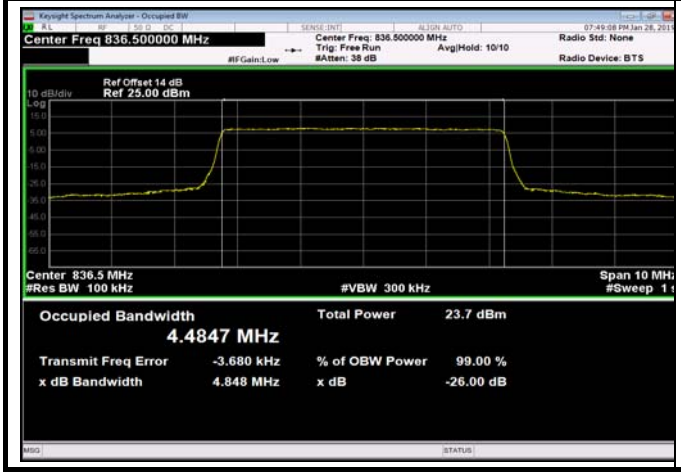
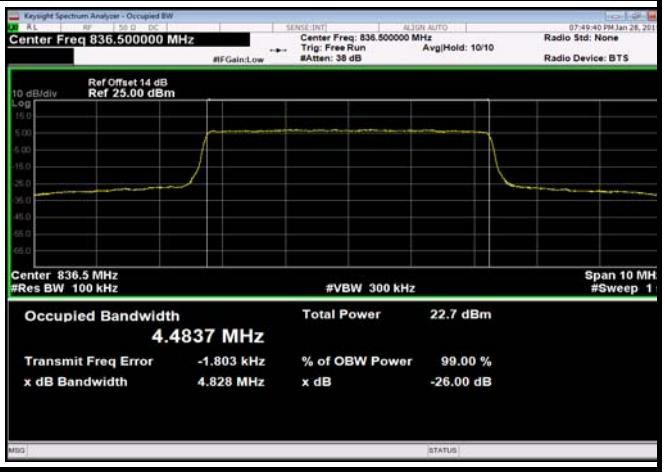
FDD05	MidRange	3	836.5	QPSK	2.679
FDD05	MidRange	3	836.5	Q16	2.681
FDD05	MidRange	5	836.5	QPSK	4.485
FDD05	MidRange	5	836.5	Q16	4.484
FDD05	MidRange	10	836.5	QPSK	8.923
FDD05	MidRange	10	836.5	Q16	8.919
FDD07	MidRange	5	2535	QPSK	4.486
FDD07	MidRange	5	2535	Q16	4.483
FDD07	MidRange	10	2535	QPSK	8.925
FDD07	MidRange	10	2535	Q16	8.915
FDD07	MidRange	15	2535	QPSK	13.43
FDD07	MidRange	15	2535	Q16	13.428
FDD07	MidRange	20	2535	QPSK	17.875
FDD07	MidRange	20	2535	Q16	17.865

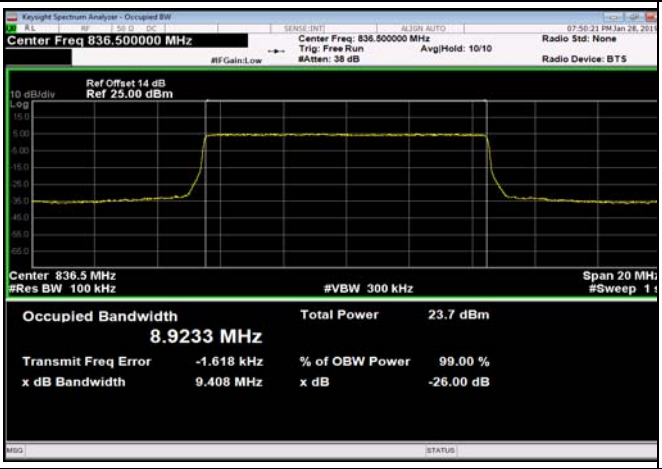
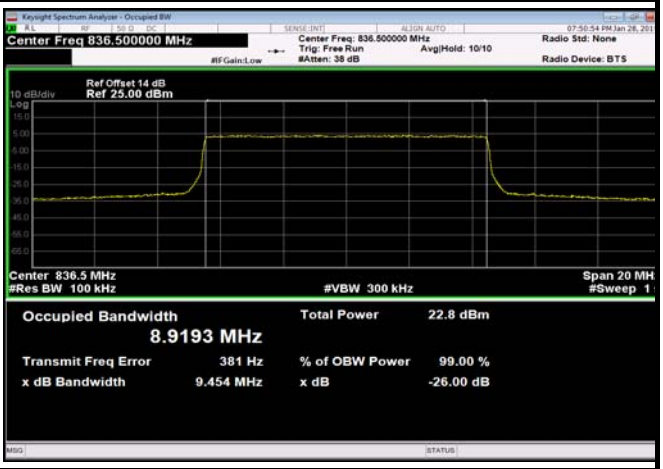
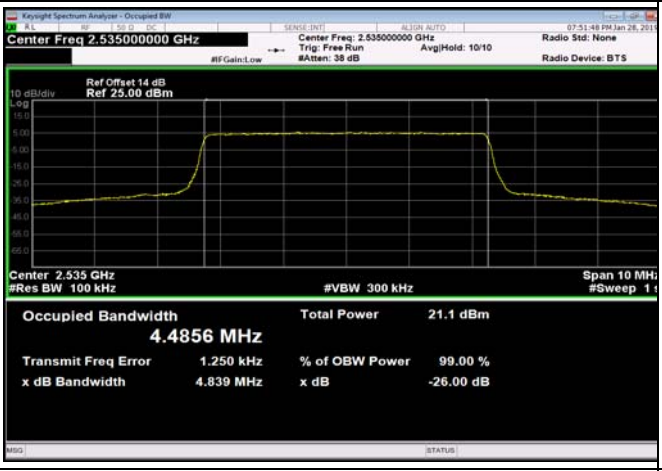
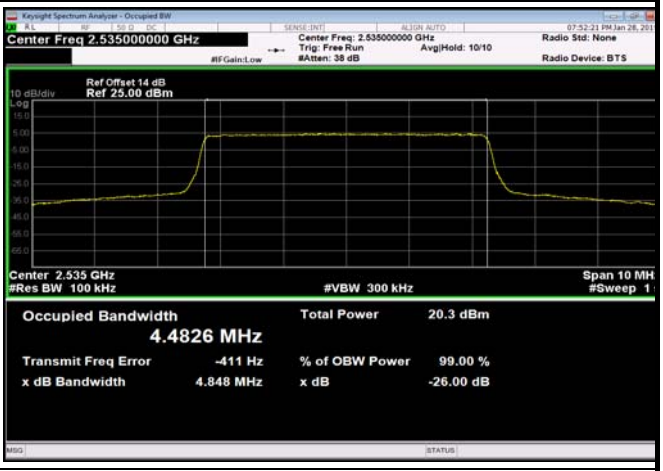
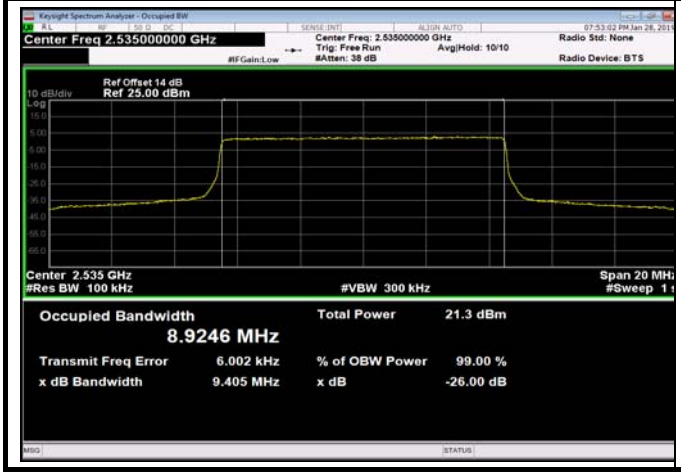
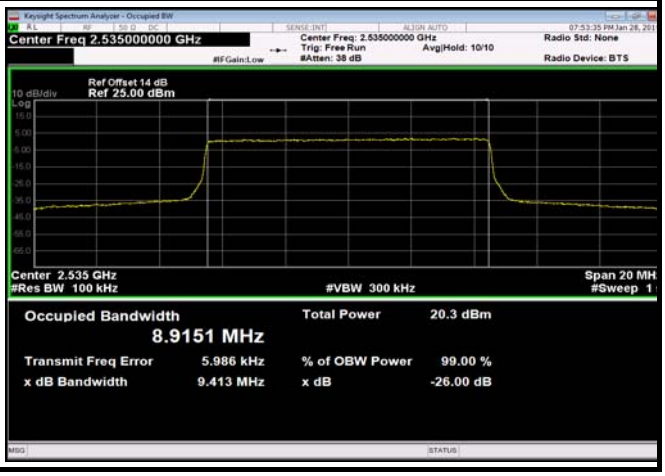
FDD02_MidRange_1.4_1880_QPSK	FDD02_MidRange_1.4_1880_Q16
	
FDD02_MidRange_3_1880_QPSK	FDD02_MidRange_3_1880_Q16
	
FDD02_MidRange_5_1880_QPSK	FDD02_MidRange_5_1880_Q16
	

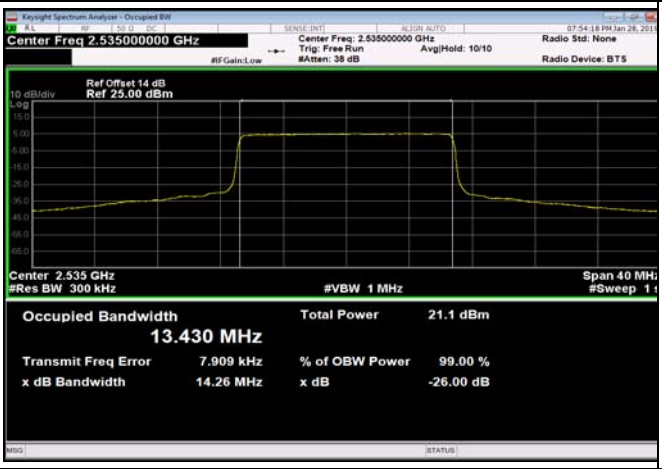
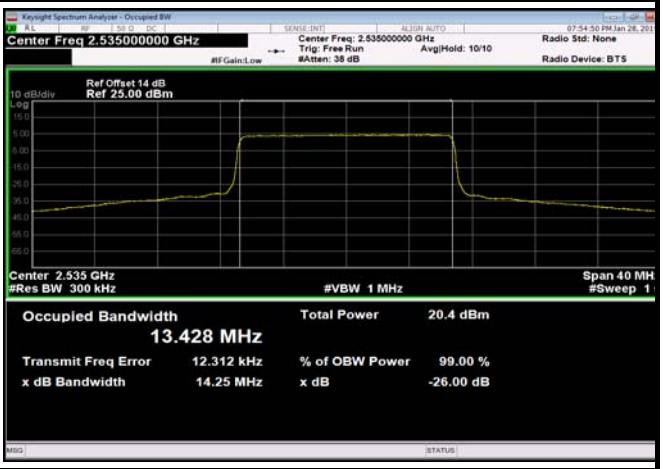
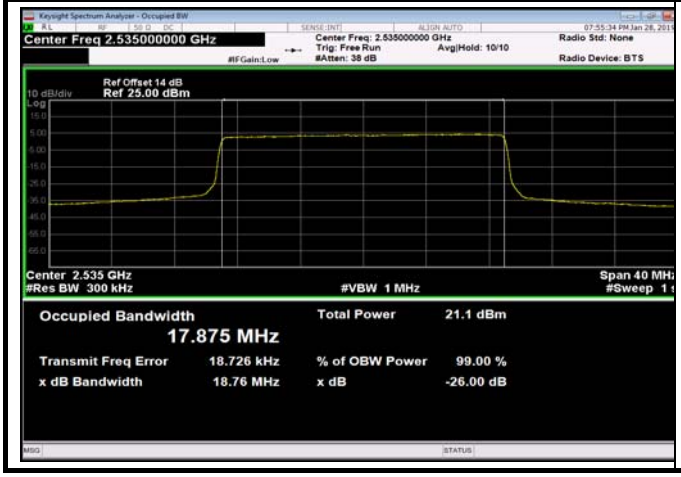
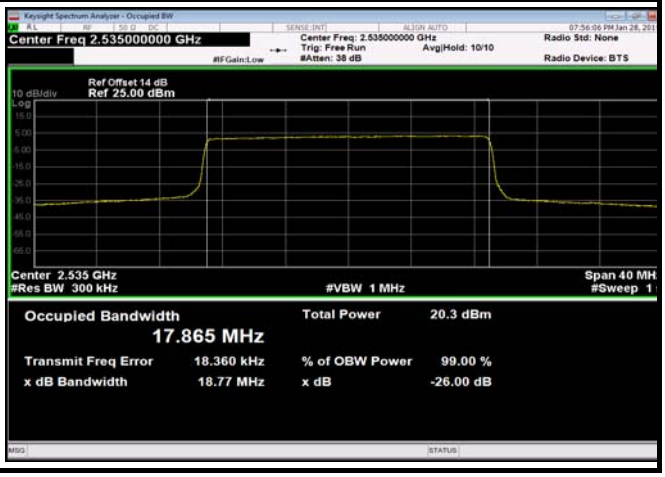
FDD02_MidRange_10_1880_QPSK	FDD02_MidRange_10_1880_Q16
	
FDD02_MidRange_15_1880_QPSK	FDD02_MidRange_15_1880_Q16
	
FDD02_MidRange_20_1880_QPSK	FDD02_MidRange_20_1880_Q16
	

FDD04_MidRange_1.4_1732.5_QPSK	FDD04_MidRange_1.4_1732.5_Q16
	
FDD04_MidRange_3_1732.5_QPSK	FDD04_MidRange_3_1732.5_Q16
	
FDD04_MidRange_5_1732.5_QPSK	FDD04_MidRange_5_1732.5_Q16
	

FDD04_MidRange_10_1732.5_QPSK	FDD04_MidRange_10_1732.5_Q16
	
FDD04_MidRange_15_1732.5_QPSK	FDD04_MidRange_15_1732.5_Q16
	
FDD04_MidRange_20_1732.5_QPSK	FDD04_MidRange_20_1732.5_Q16
	

FDD05_MidRange_1.4_836.5_QPSK	FDD05_MidRange_1.4_836.5_Q16
	
FDD05_MidRange_3_836.5_QPSK	FDD05_MidRange_3_836.5_Q16
	
FDD05_MidRange_5_836.5_QPSK	FDD05_MidRange_5_836.5_Q16
	

FDD05_MidRange_10_836.5_QPSK	FDD05_MidRange_10_836.5_Q16
	
FDD07_MidRange_5_2535_QPSK	FDD07_MidRange_5_2535_Q16
	
FDD07_MidRange_10_2535_QPSK	FDD07_MidRange_10_2535_Q16
	

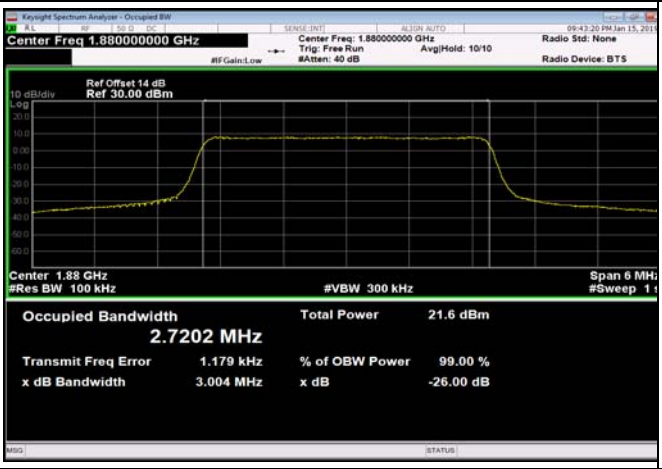
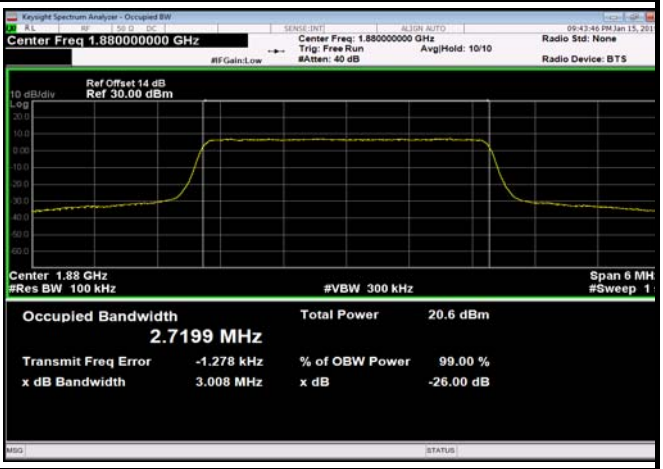
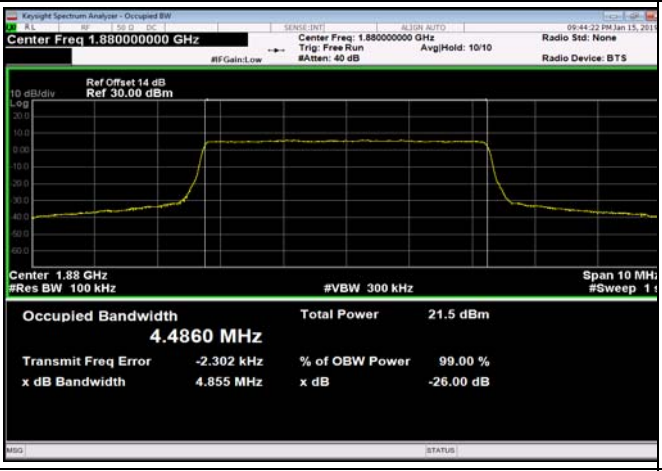
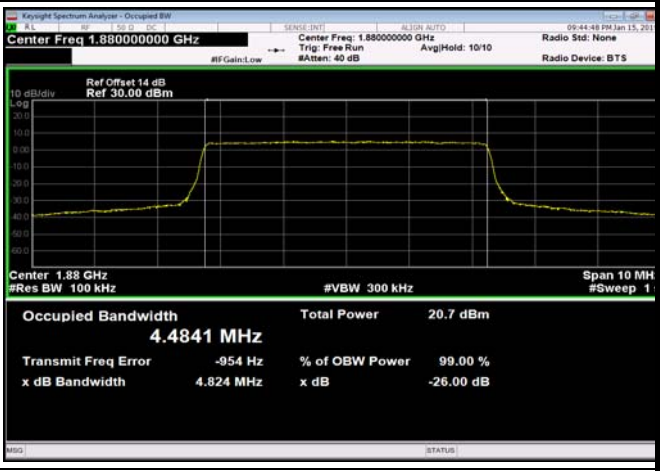
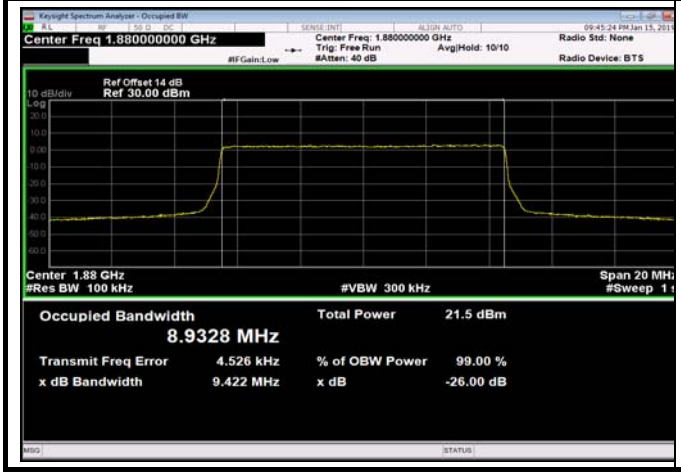
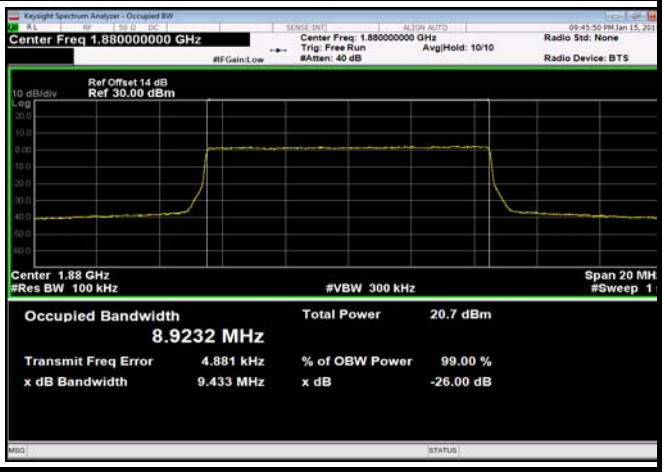
FDD07_MidRange_15_2535_QPSK	FDD07_MidRange_15_2535_Q16
	
FDD07_MidRange_20_2535_QPSK	FDD07_MidRange_20_2535_Q16
	

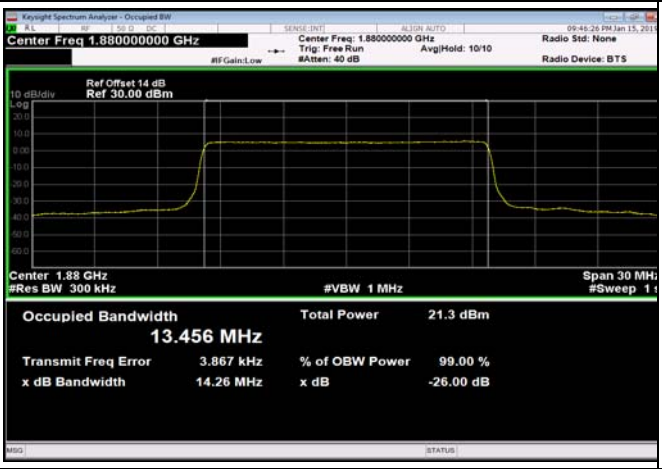
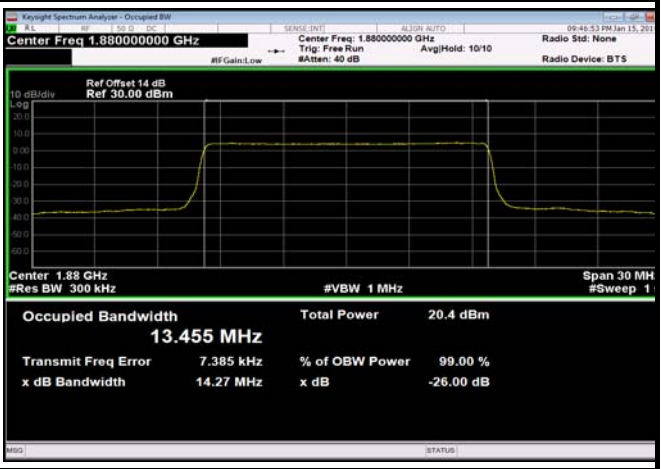
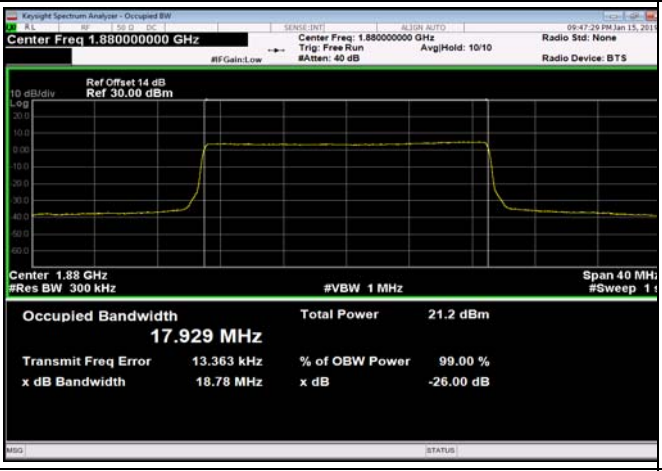
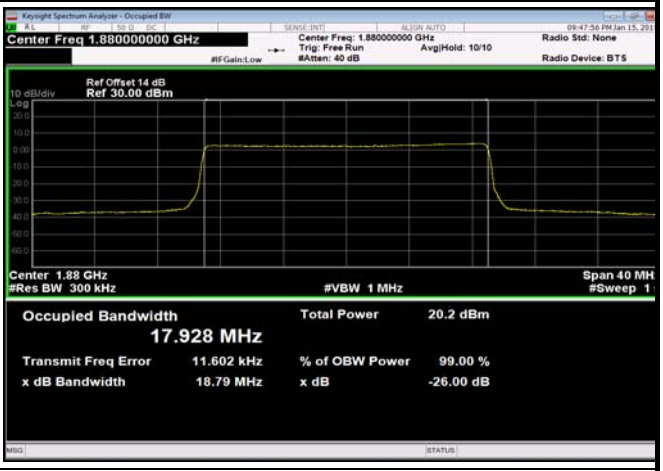
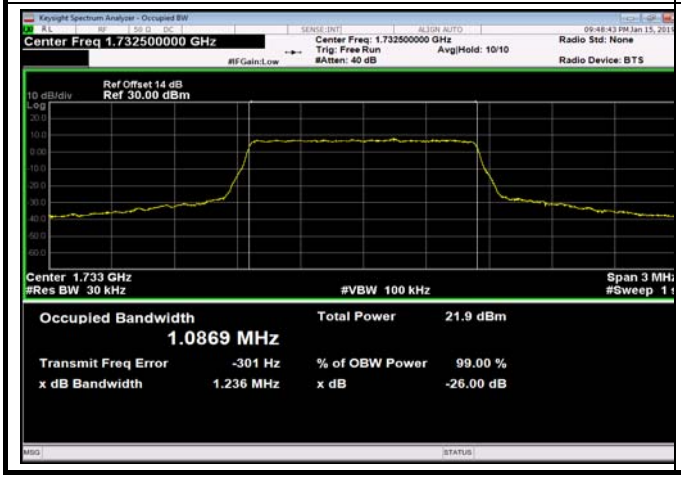
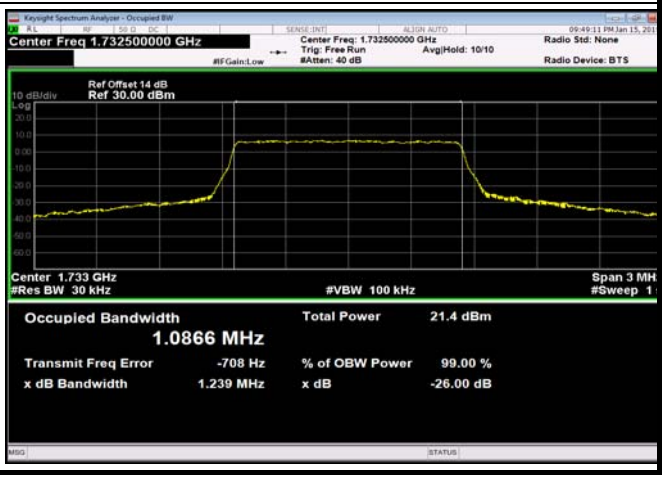
26dB Bandwidth

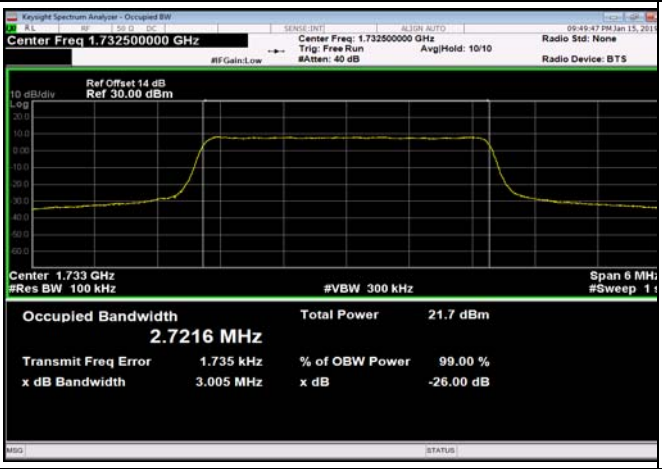
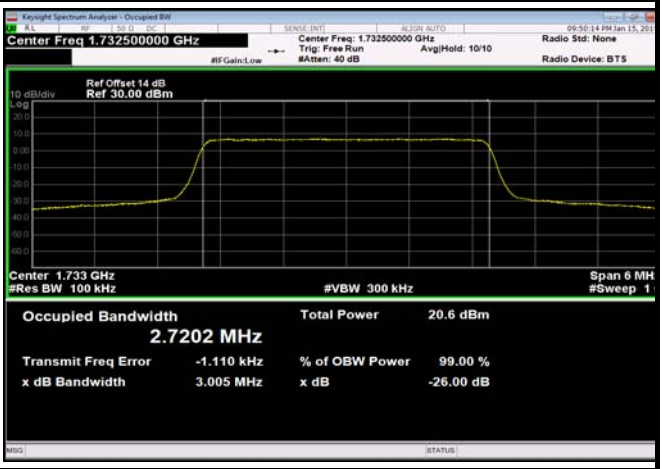
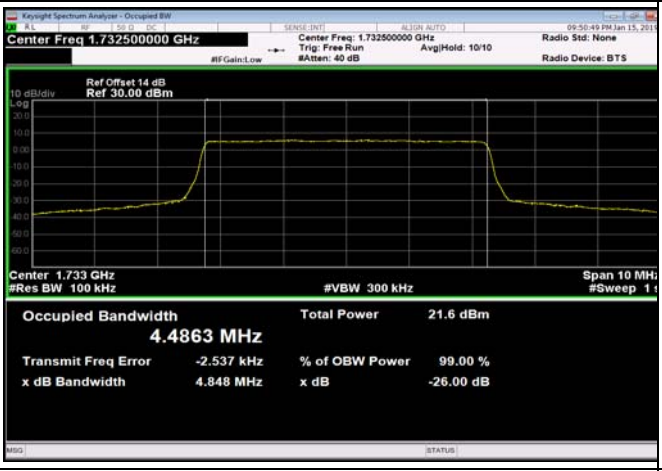
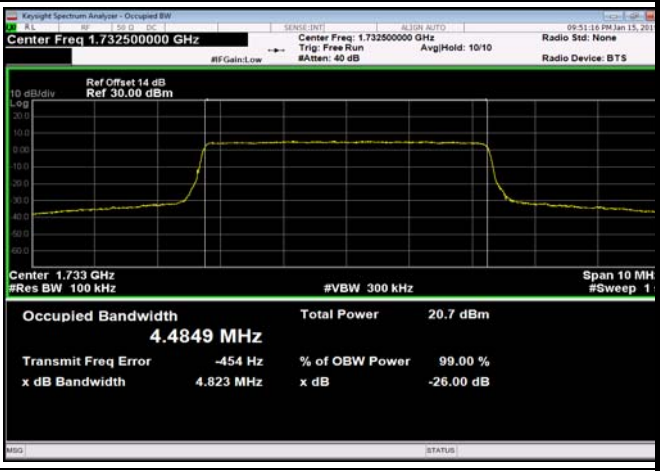
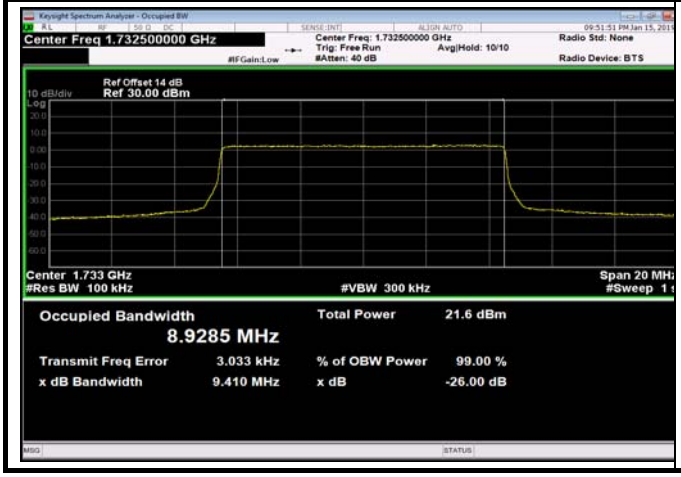
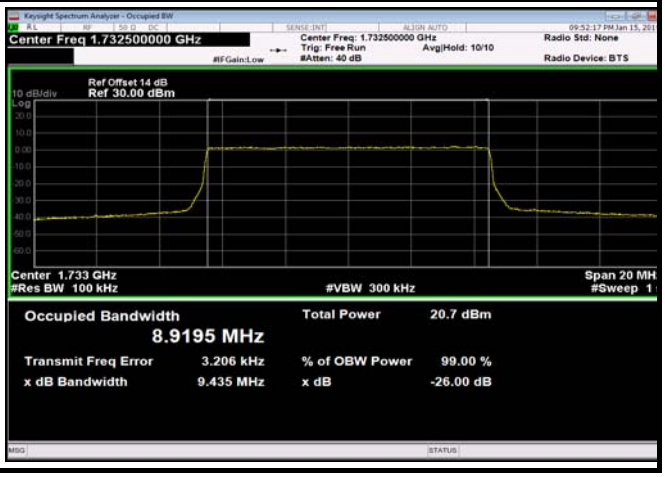
Test Result and Data

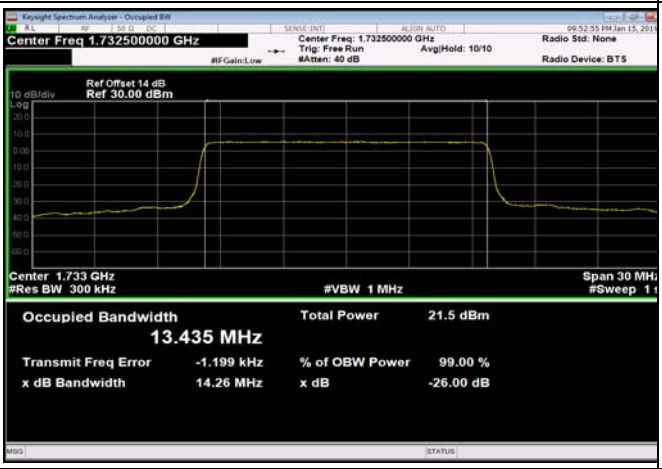
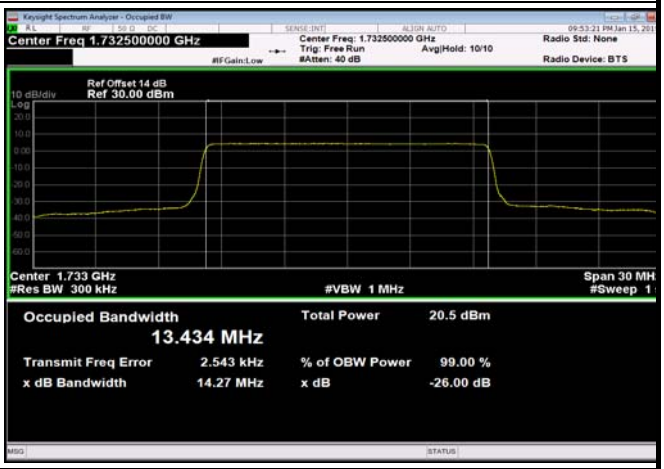
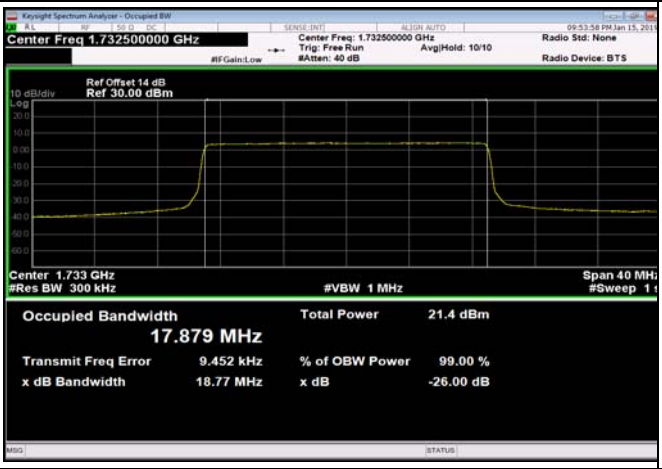
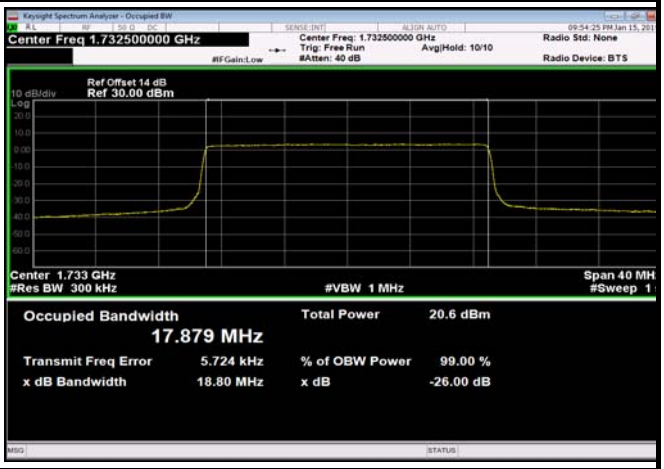
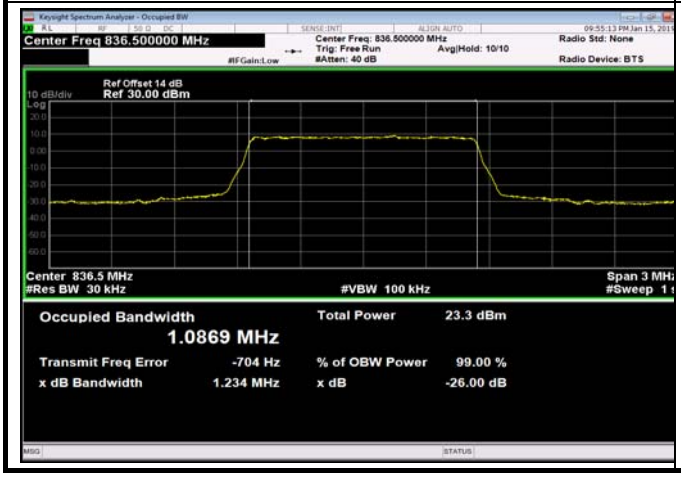
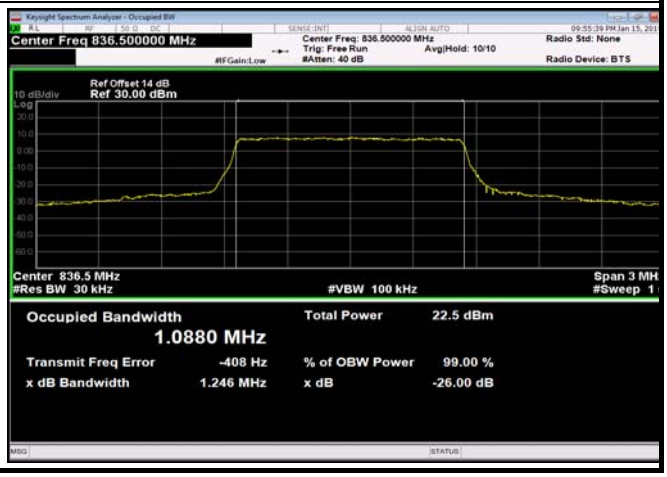
Emission Bandwidth NormalTC_NormalVol					
Band	Range	BandWidth	Frequency (MHz)	Modulation	EmissionBandwidth (MHz)
FDD02	MidRange	3	1880	QPSK	3
FDD02	MidRange	3	1880	Q16	3.01
FDD02	MidRange	5	1880	QPSK	4.86
FDD02	MidRange	5	1880	Q16	4.82
FDD02	MidRange	10	1880	QPSK	9.42
FDD02	MidRange	10	1880	Q16	9.43
FDD02	MidRange	15	1880	QPSK	14.26
FDD02	MidRange	15	1880	Q16	14.27
FDD02	MidRange	20	1880	QPSK	18.78
FDD02	MidRange	20	1880	Q16	18.79
FDD04	MidRange	1.4	1732.5	QPSK	1.24
FDD04	MidRange	1.4	1732.5	Q16	1.24
FDD04	MidRange	3	1732.5	QPSK	3.01
FDD04	MidRange	3	1732.5	Q16	3
FDD04	MidRange	5	1732.5	QPSK	4.85
FDD04	MidRange	5	1732.5	Q16	4.82
FDD04	MidRange	10	1732.5	QPSK	9.41
FDD04	MidRange	10	1732.5	Q16	9.43
FDD04	MidRange	15	1732.5	QPSK	14.26
FDD04	MidRange	15	1732.5	Q16	14.27
FDD04	MidRange	20	1732.5	QPSK	18.77
FDD04	MidRange	20	1732.5	Q16	18.8
FDD05	MidRange	1.4	836.5	QPSK	1.23
FDD05	MidRange	1.4	836.5	Q16	1.25
FDD05	MidRange	3	836.5	QPSK	3
FDD05	MidRange	3	836.5	Q16	3.01
FDD05	MidRange	5	836.5	QPSK	4.84

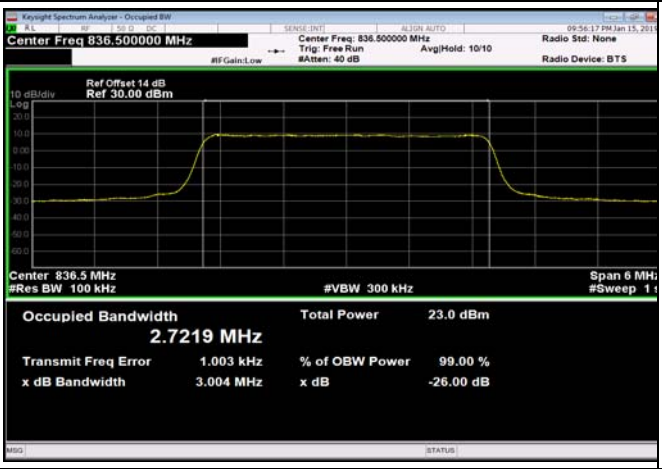
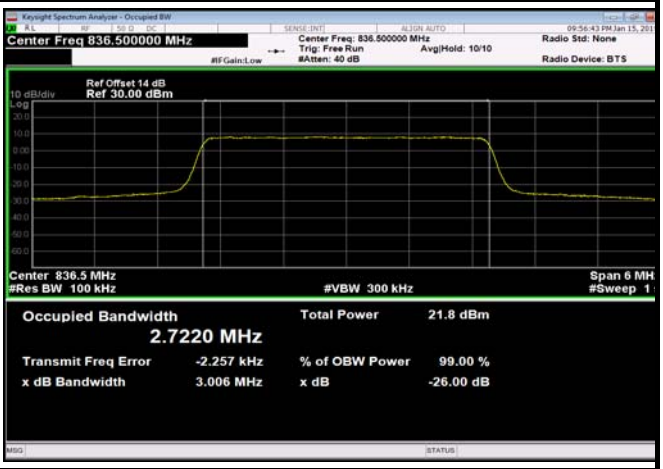
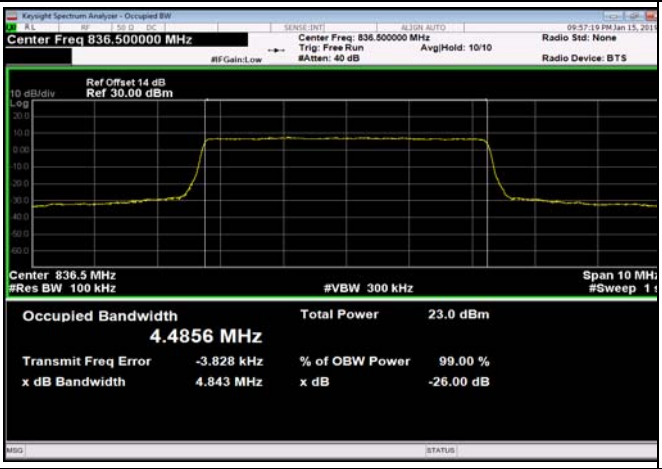
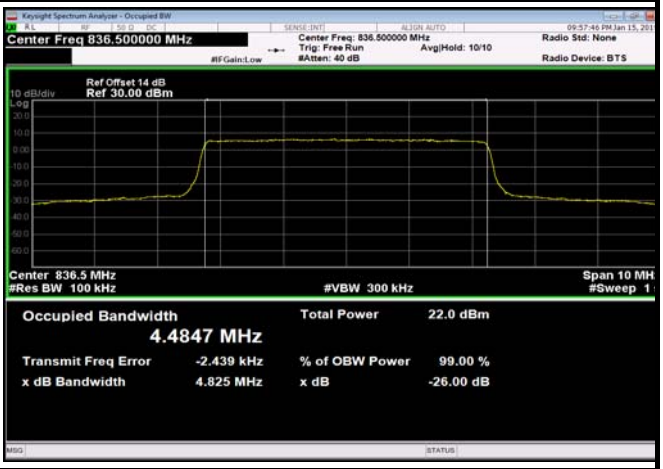
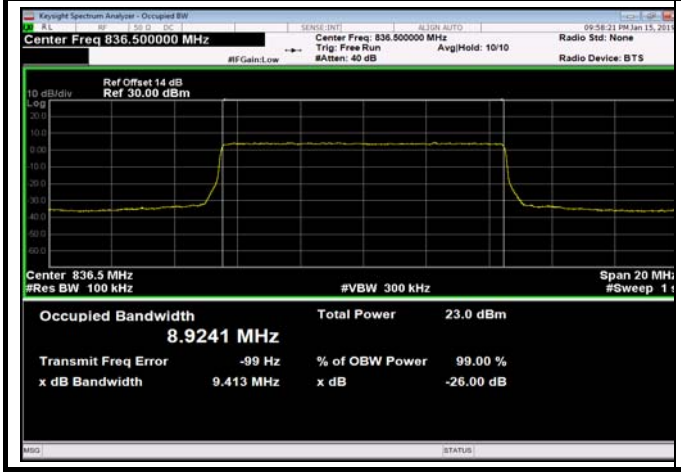
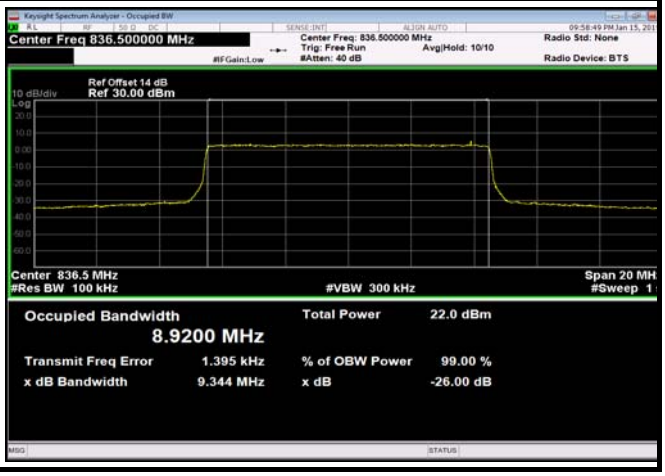
FDD05	MidRange	5	836.5	Q16	4.83
FDD05	MidRange	10	836.5	QPSK	9.41
FDD05	MidRange	10	836.5	Q16	9.34
FDD07	MidRange	5	2535	QPSK	4.84
FDD07	MidRange	5	2535	Q16	4.86
FDD07	MidRange	10	2535	QPSK	9.41
FDD07	MidRange	10	2535	Q16	9.43
FDD07	MidRange	15	2535	QPSK	14.27
FDD07	MidRange	15	2535	Q16	14.27
FDD07	MidRange	20	2535	QPSK	18.78
FDD07	MidRange	20	2535	Q16	18.8

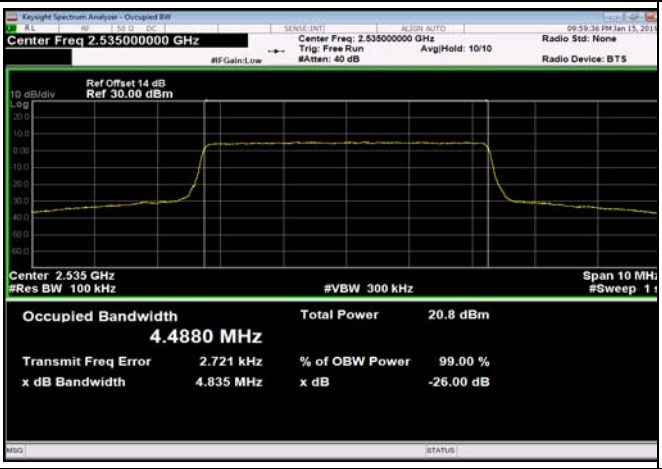
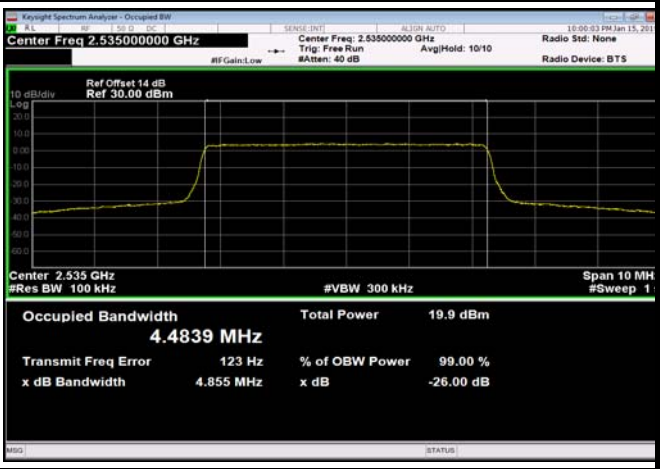
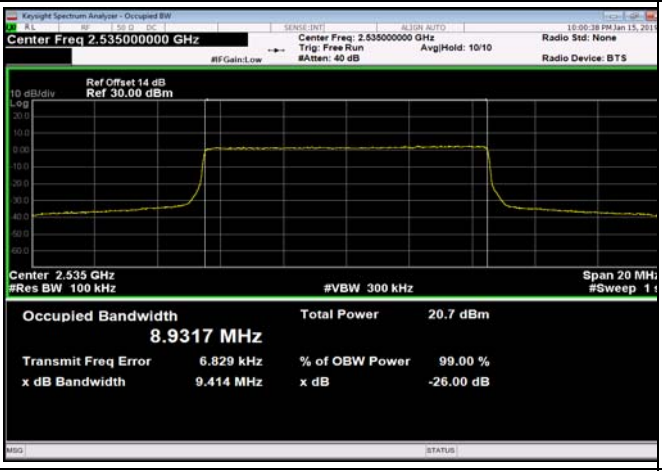
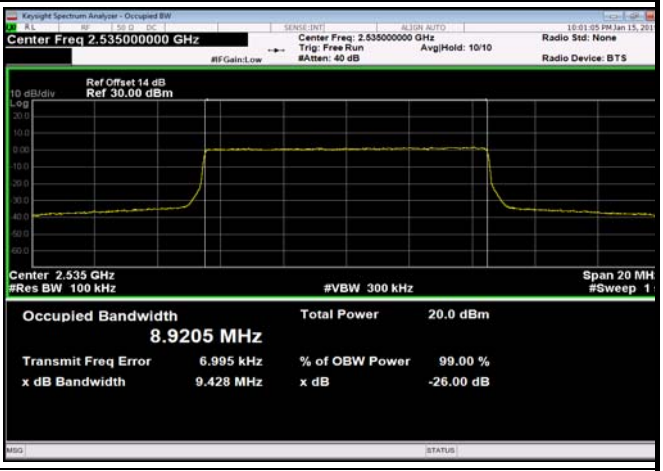
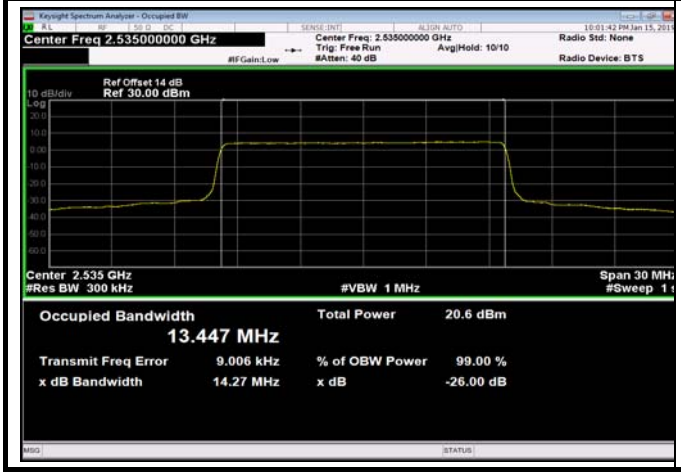
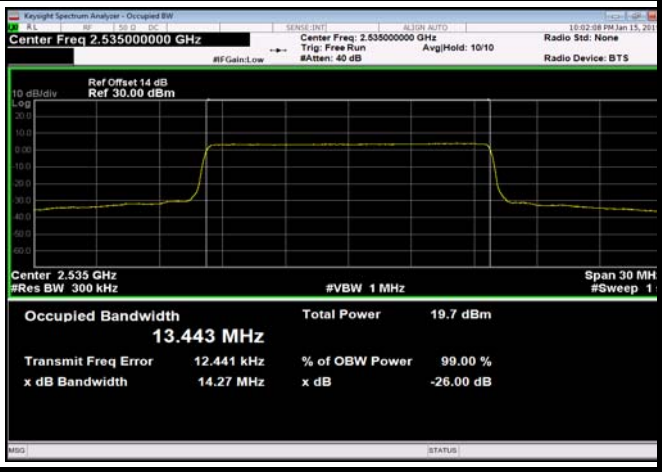
FDD02_MidRange_3MHz_1880MHz_QPSK	FDD02_MidRange_3MHz_1880MHz_Q16
	
FDD02_MidRange_5MHz_1880MHz_QPSK	FDD02_MidRange_5MHz_1880MHz_Q16
	
FDD02_MidRange_10MHz_1880MHz_QPSK	FDD02_MidRange_10MHz_1880MHz_Q16
	

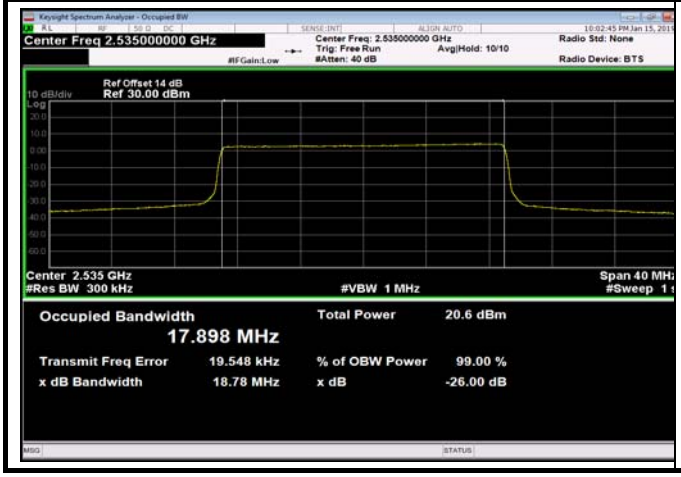
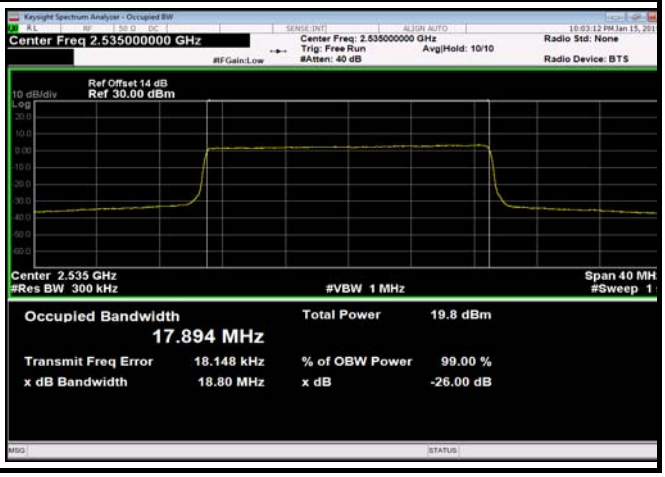
FDD02_MidRange_15MHz_1880MHz_QPSK	FDD02_MidRange_15MHz_1880MHz_Q16
	
FDD02_MidRange_20MHz_1880MHz_QPSK	FDD02_MidRange_20MHz_1880MHz_Q16
	
FDD04_MidRange_1.4MHz_1732.5MHz _QPSK	FDD04_MidRange_1.4MHz_1732.5MHz _Q16
	

FDD04_MidRange_3MHz_1732.5MHz_QPSK	FDD04_MidRange_3MHz_1732.5MHz_Q16
	
FDD04_MidRange_5MHz_1732.5MHz_QPSK	FDD04_MidRange_5MHz_1732.5MHz_Q16
	
FDD04_MidRange_10MHz_1732.5MHz _QPSK	FDD04_MidRange_10MHz_1732.5MHz _Q16
	

FDD04_MidRange_15MHz_1732.5MHz _QPSK	FDD04_MidRange_15MHz_1732.5MHz _Q16
	
FDD04_MidRange_20MHz_1732.5MHz _QPSK	FDD04_MidRange_20MHz_1732.5MHz _Q16
	
FDD05_MidRange_1.4MHz_836.5MHz _QPSK	FDD05_MidRange_1.4MHz_836.5MHz _Q16
	

FDD05_MidRange_3MHz_836.5MHz_QPSK	FDD05_MidRange_3MHz_836.5MHz_Q16
	
FDD05_MidRange_5MHz_836.5MHz_QPSK	FDD05_MidRange_5MHz_836.5MHz_Q16
	
FDD05_MidRange_10MHz_836.5MHz_QPSK	FDD05_MidRange_10MHz_836.5MHz_Q16
	

FDD07_MidRange_5MHz_2535MHz_QPSK	FDD07_MidRange_5MHz_2535MHz_Q16
	
FDD07_MidRange_10MHz_2535MHz_QPSK	FDD07_MidRange_10MHz_2535MHz_Q16
	
FDD07_MidRange_15MHz_2535MHz_QPSK	FDD07_MidRange_15MHz_2535MHz_Q16
	

FDD07_MidRange_20MHz_2535MHz_QPSK	FDD07_MidRange_20MHz_2535MHz_Q16
	

Frequency Stability

Test Result and Data

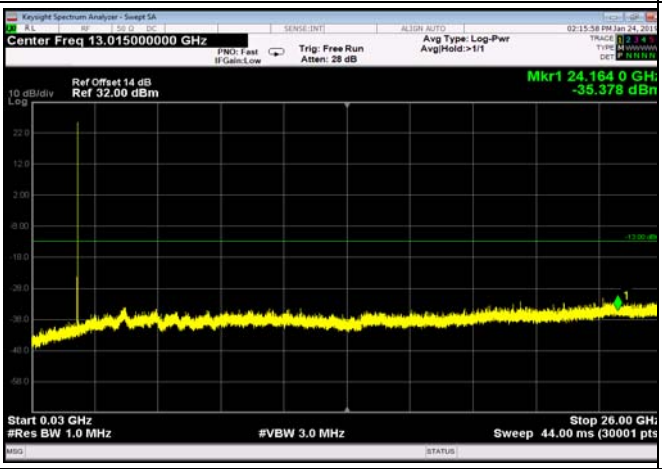
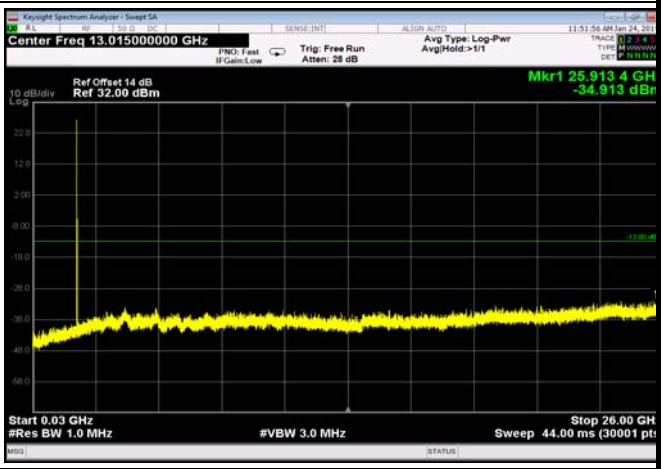
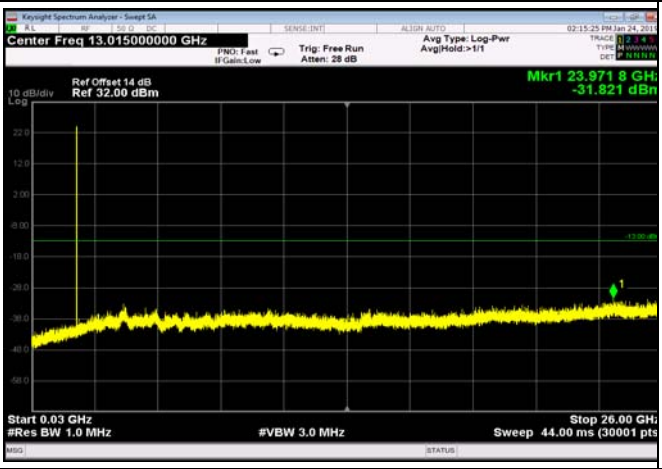
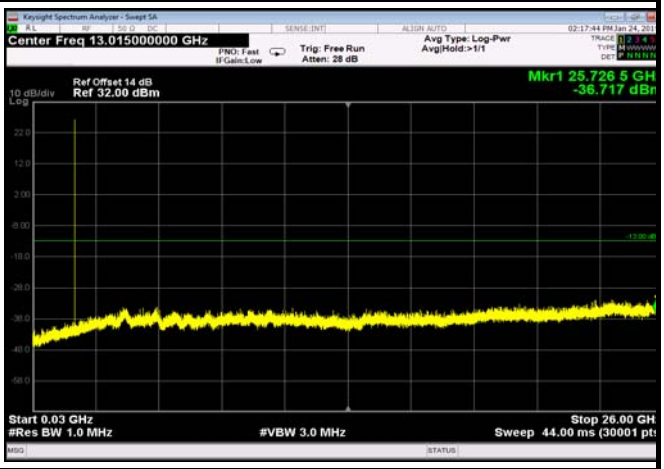
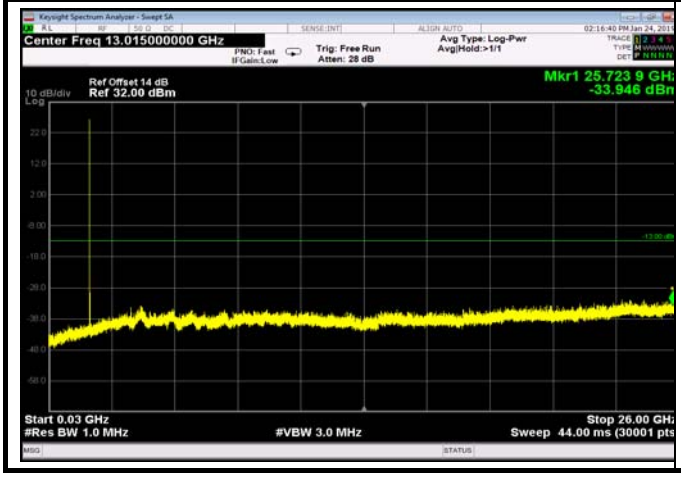
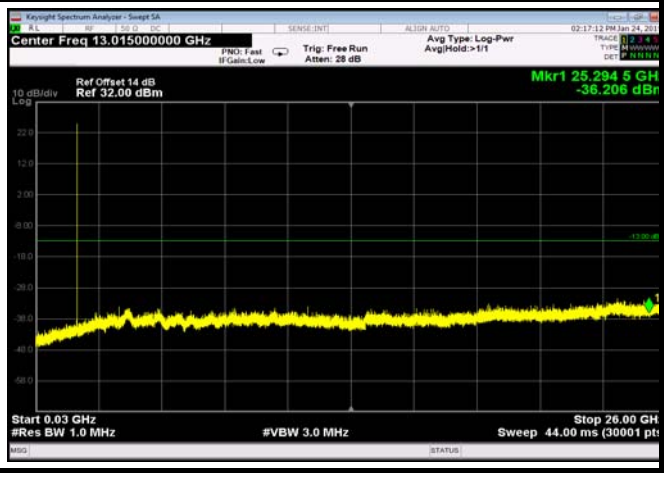
Frequency Stability NormalTC_NormalVol									
Temperature	Voltage	Band	BW (MHz)	RbMode	Modulation	Freq Error (Hz)	Freq Error (ppm)	Limit (ppm)	Result
Normal	Low	FDD02	10	fullRB	QPSK	25.077	0.013	0.10	Pass
Normal	Normal	FDD02	10	fullRB	QPSK	-9.871	0.005	0.10	Pass
Normal	High	FDD02	10	fullRB	QPSK	-8.469	0.005	0.10	Pass
50	Normal	FDD02	10	fullRB	QPSK	-6.666	0.004	0.10	Pass
40	Normal	FDD02	10	fullRB	QPSK	-16.980	0.009	0.10	Pass
30	Normal	FDD02	10	fullRB	QPSK	-36.893	0.020	0.10	Pass
20	Normal	FDD02	10	fullRB	QPSK	-44.260	0.024	0.10	Pass
10	Normal	FDD02	10	fullRB	QPSK	-46.606	0.025	0.10	Pass
0	Normal	FDD02	10	fullRB	QPSK	-10.943	0.006	0.10	Pass
-10	Normal	FDD02	10	fullRB	QPSK	6.709	0.004	0.10	Pass
-20	Normal	FDD02	10	fullRB	QPSK	-15.249	0.008	0.10	Pass
-30	Normal	FDD02	10	fullRB	QPSK	-14.248	0.008	0.10	Pass
Normal	Low	FDD04	10	fullRB	QPSK	8.898	0.005	0.10	Pass
Normal	Normal	FDD04	10	fullRB	QPSK	22.788	0.013	0.10	Pass
Normal	High	FDD04	10	fullRB	QPSK	12.002	0.007	0.10	Pass
50	Normal	FDD04	10	fullRB	QPSK	16.022	0.009	0.10	Pass
40	Normal	FDD04	10	fullRB	QPSK	16.680	0.010	0.10	Pass
30	Normal	FDD04	10	fullRB	QPSK	20.900	0.012	0.10	Pass
20	Normal	FDD04	10	fullRB	QPSK	20.356	0.012	0.10	Pass
10	Normal	FDD04	10	fullRB	QPSK	13.289	0.008	0.10	Pass
0	Normal	FDD04	10	fullRB	QPSK	10.500	0.006	0.10	Pass
-10	Normal	FDD04	10	fullRB	QPSK	10.929	0.006	0.10	Pass
-20	Normal	FDD04	10	fullRB	QPSK	7.310	0.004	0.10	Pass
-30	Normal	FDD04	10	fullRB	QPSK	7.610	0.004	0.10	Pass
Normal	Low	FDD05	10	fullRB	QPSK	19.698	0.024	0.10	Pass
Normal	Normal	FDD05	10	fullRB	QPSK	19.426	0.023	0.10	Pass

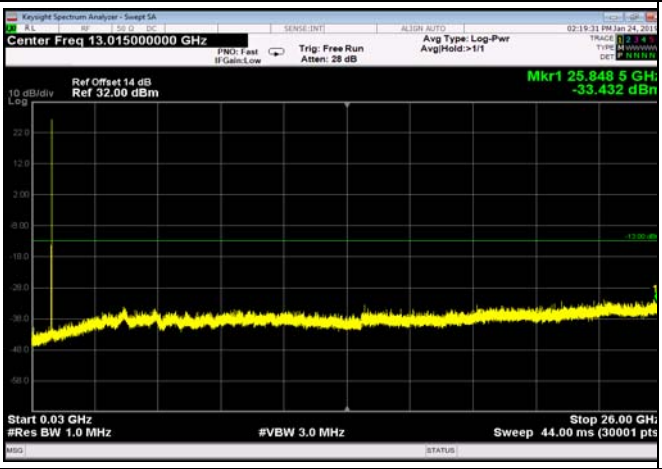
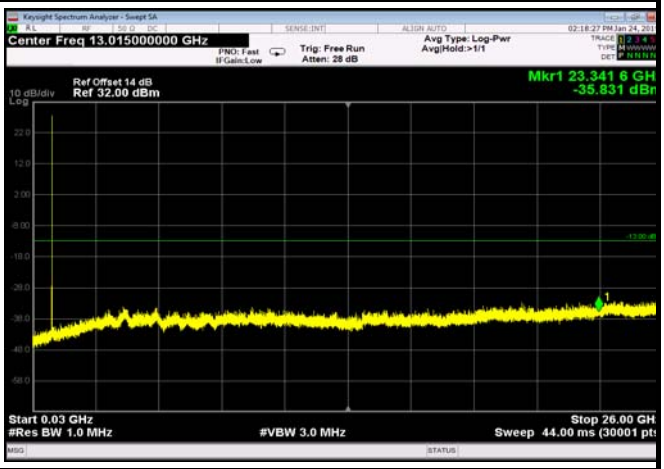
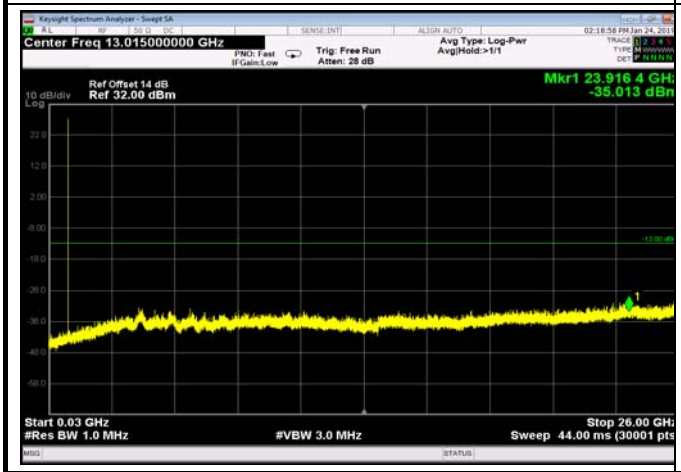
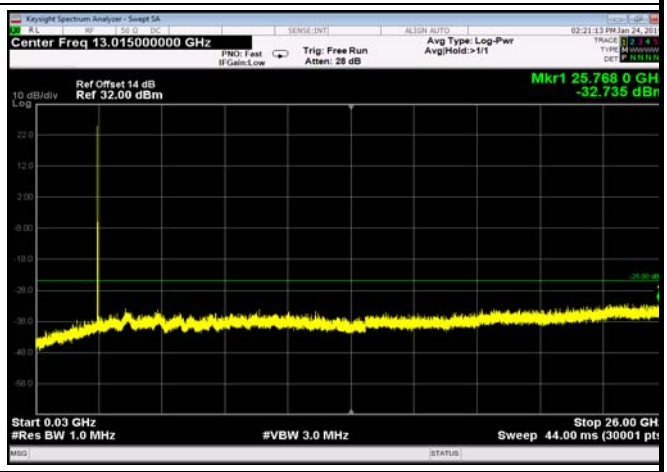
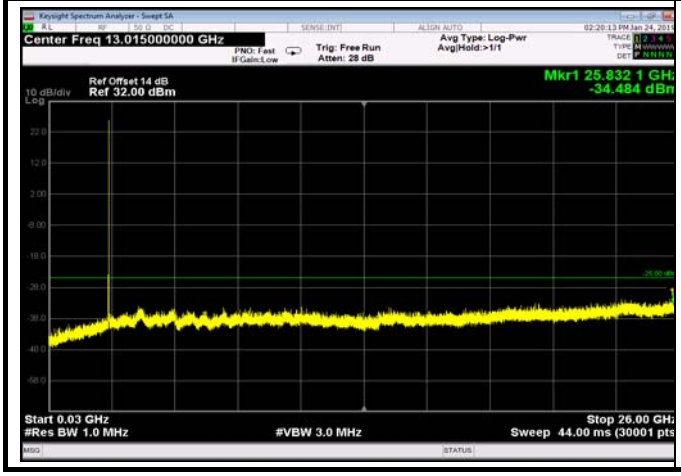
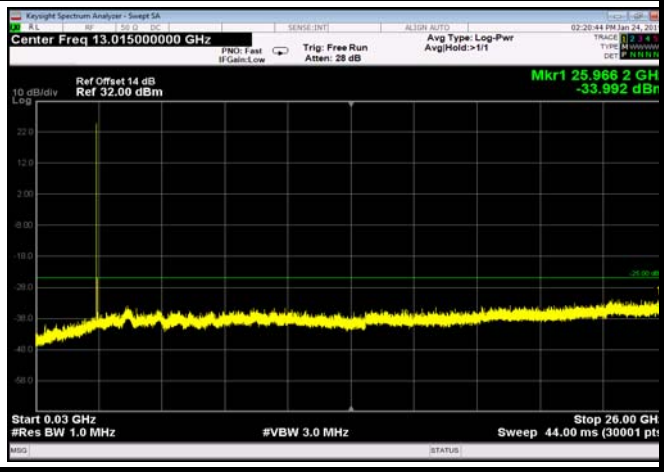
Normal	High	FDD05	10	fullRB	QPSK	15.106	0.018	0.10	Pass
50	Normal	FDD05	10	fullRB	QPSK	19.169	0.023	0.10	Pass
40	Normal	FDD05	10	fullRB	QPSK	16.851	0.020	0.10	Pass
30	Normal	FDD05	10	fullRB	QPSK	12.646	0.015	0.10	Pass
20	Normal	FDD05	10	fullRB	QPSK	13.890	0.017	0.10	Pass
10	Normal	FDD05	10	fullRB	QPSK	10.414	0.012	0.10	Pass
0	Normal	FDD05	10	fullRB	QPSK	5.350	0.006	0.10	Pass
-10	Normal	FDD05	10	fullRB	QPSK	3.891	0.005	0.10	Pass
-20	Normal	FDD05	10	fullRB	QPSK	-6.094	0.007	0.10	Pass
-30	Normal	FDD05	10	fullRB	QPSK	-10.171	0.012	0.10	Pass
Normal	Low	FDD07	10	fullRB	QPSK	17.109	0.007	0.10	Pass
Normal	Normal	FDD07	10	fullRB	QPSK	-50.926	0.020	0.10	Pass
Normal	High	FDD07	10	fullRB	QPSK	-52.471	0.021	0.10	Pass
50	Normal	FDD07	10	fullRB	QPSK	-47.550	0.019	0.10	Pass
40	Normal	FDD07	10	fullRB	QPSK	-45.018	0.018	0.10	Pass
30	Normal	FDD07	10	fullRB	QPSK	-37.422	0.015	0.10	Pass
20	Normal	FDD07	10	fullRB	QPSK	-28.353	0.011	0.10	Pass
10	Normal	FDD07	10	fullRB	QPSK	-55.361	0.022	0.10	Pass
0	Normal	FDD07	10	fullRB	QPSK	-14.663	0.006	0.10	Pass
-10	Normal	FDD07	10	fullRB	QPSK	-22.044	0.009	0.10	Pass
-20	Normal	FDD07	10	fullRB	QPSK	-30.913	0.012	0.10	Pass
-30	Normal	FDD07	10	fullRB	QPSK	-12.903	0.005	0.10	Pass

Note：Normal=3.85V, Low=3.5V, High=4.2V

Conducted Out of Band Emissions

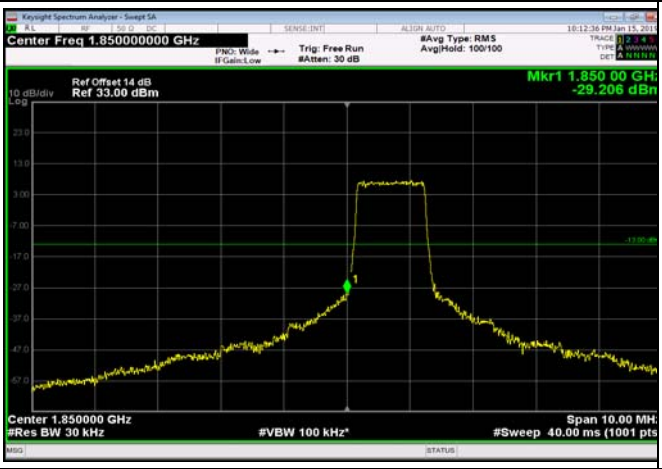
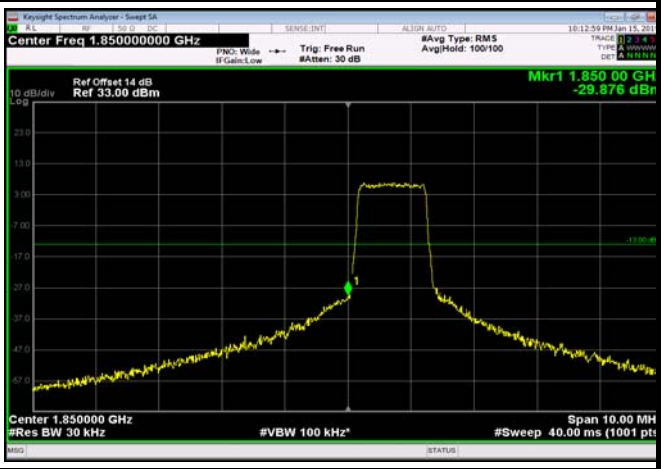
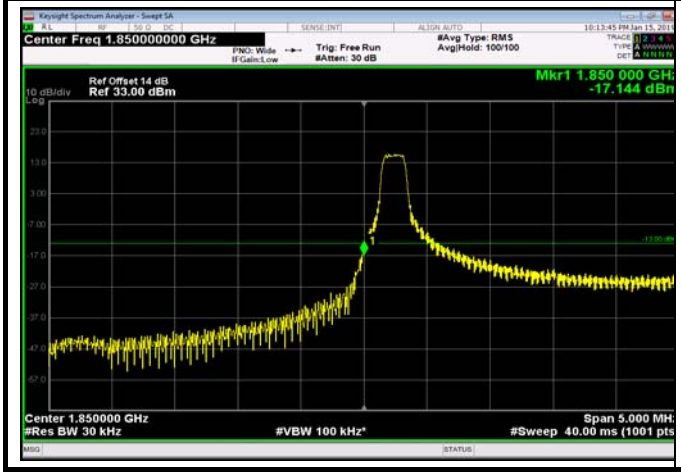
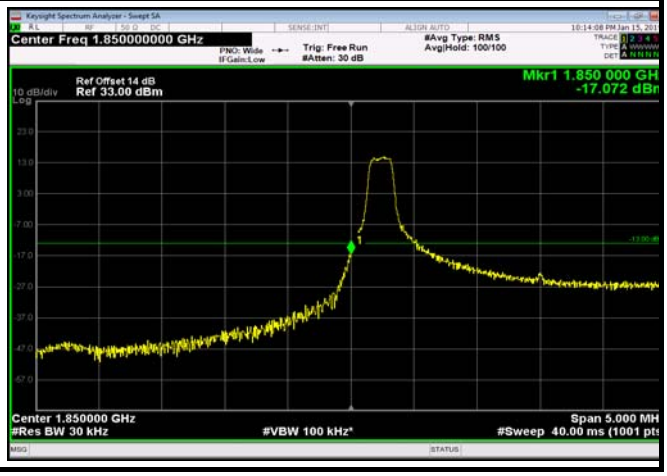
Test Result and Data

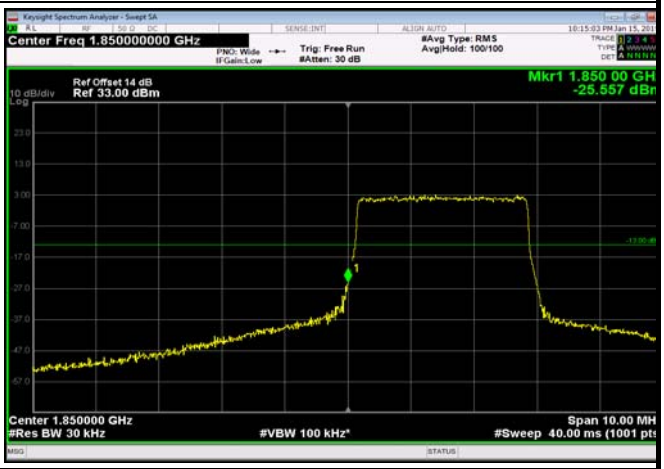
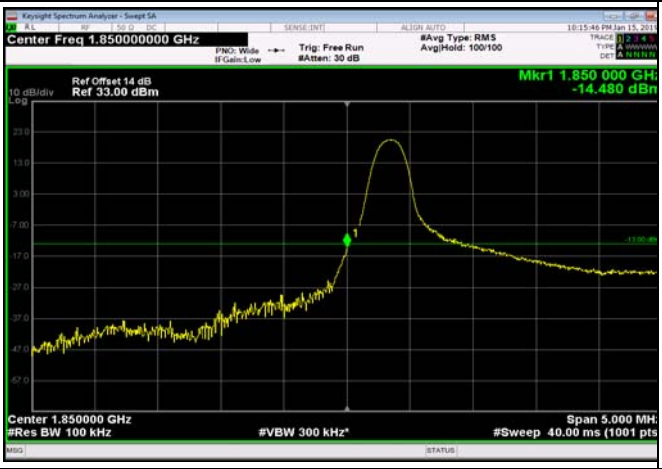
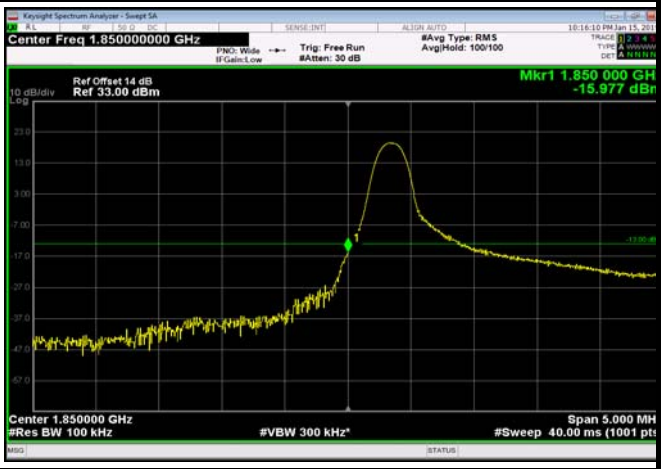
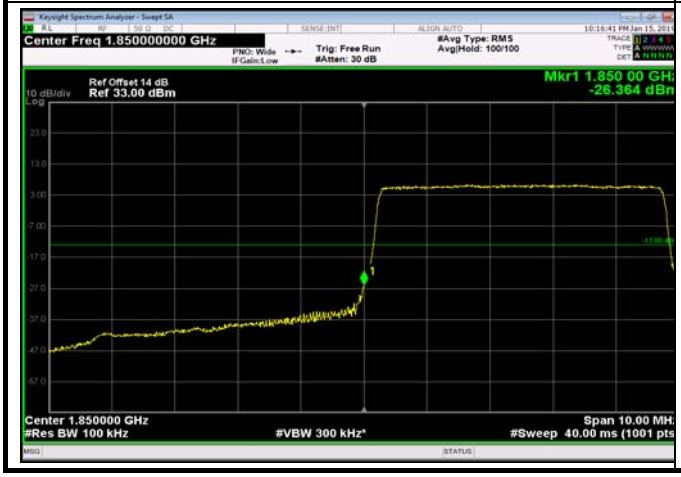
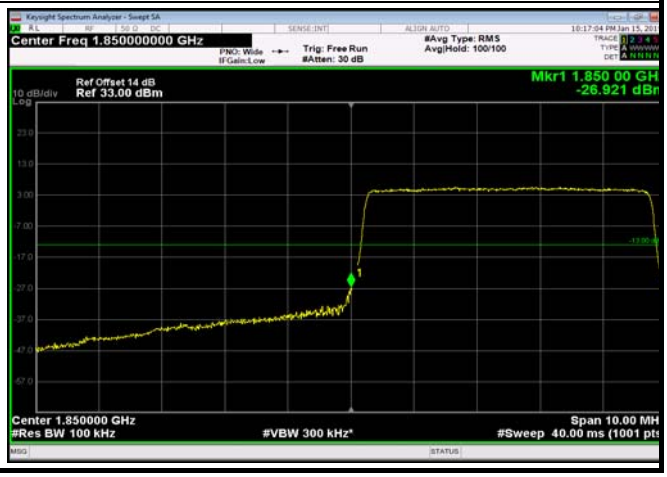
FDD02_HighRange_1.4MHz_30MHz~26GHz	FDD02_LowRange_1.4MHz_30MHz~26GHz
	
FDD02_MidRange_1.4MHz_30MHz~26GHz	FDD04_HighRange_1.4MHz_30MHz~26GHz
	
FDD04_LowRange_1.4MHz_30MHz~26GHz	FDD04_MidRange_1.4MHz_30MHz~26GHz
	

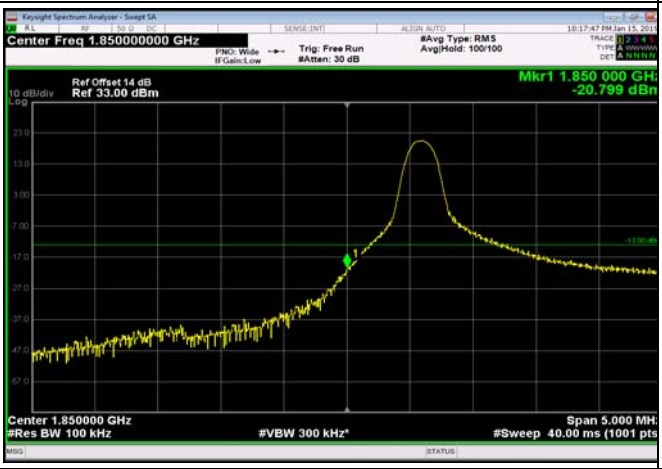
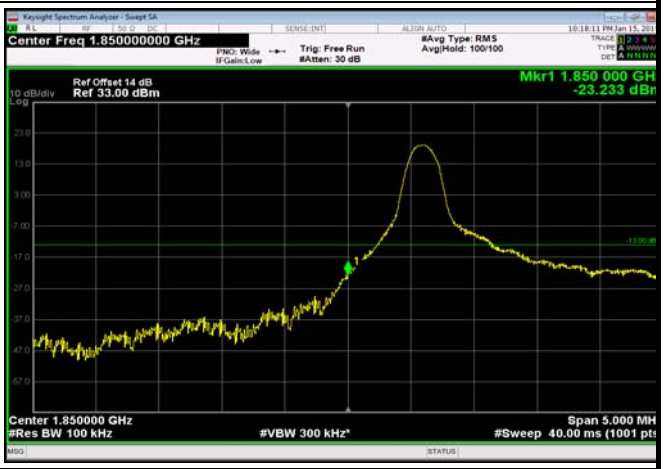
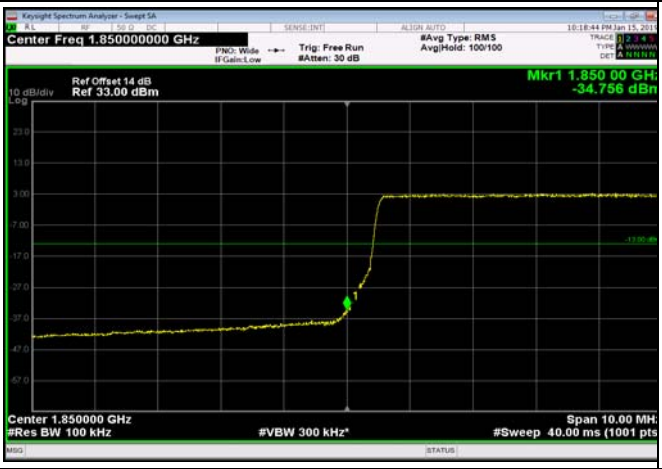
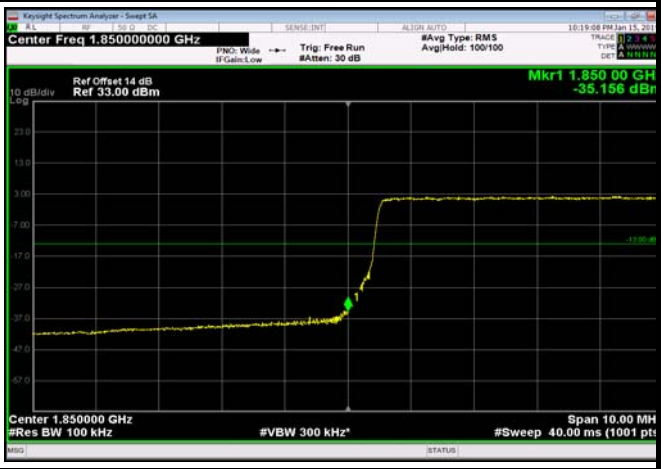
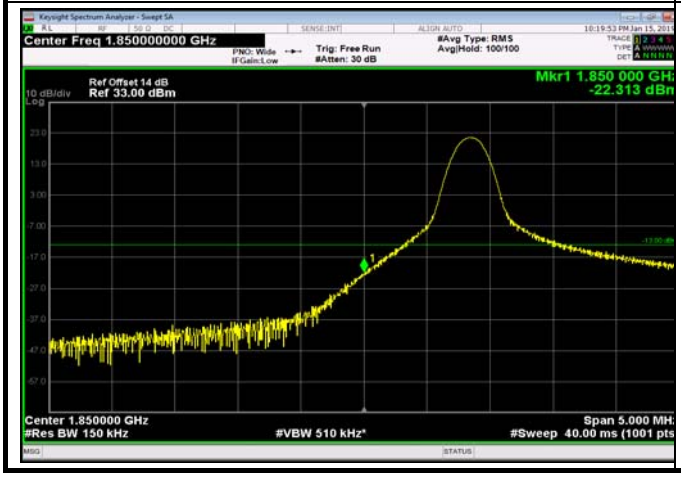
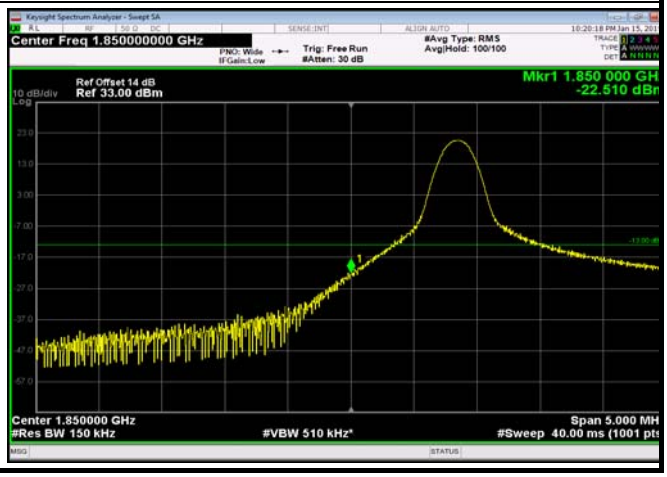
FDD05_HighRange_1.4MHz_30MHz~26GHz	FDD05_LowRange_1.4MHz_30MHz~26GHz
	
FDD05_MidRange_1.4MHz_30MHz~26GHz	FDD07_HighRange_5MHz_30MHz~26GHz
	
FDD07_LowRange_5MHz_30MHz~26GHz	FDD07_MidRange_5MHz_30MHz~26GHz
	

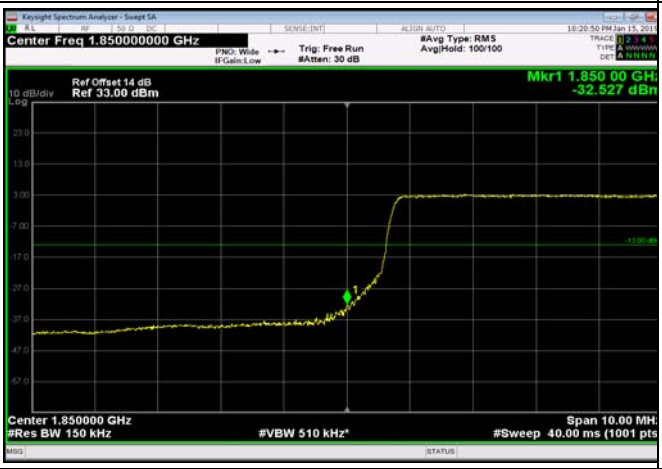
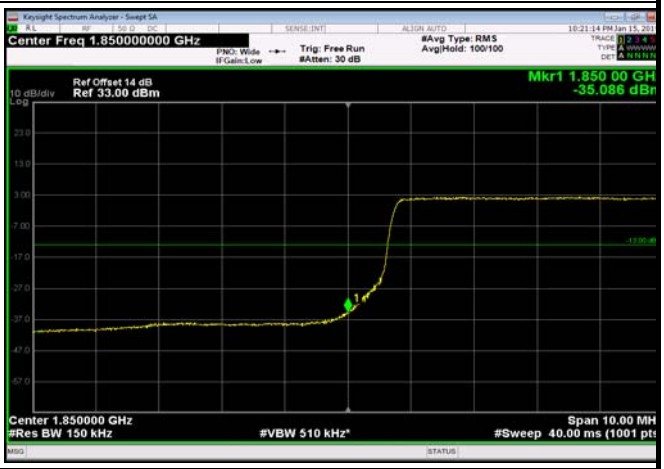
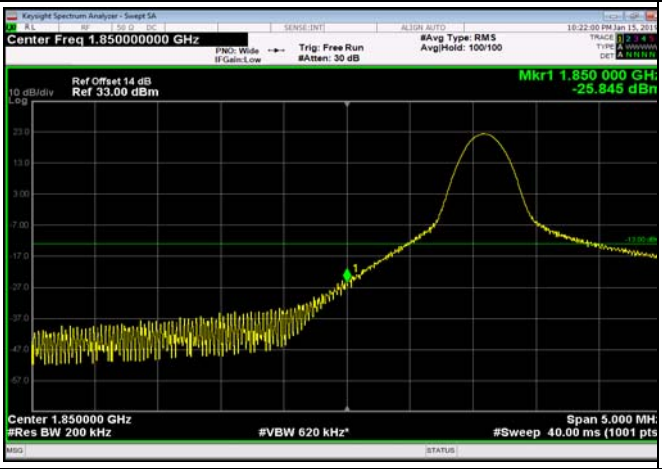
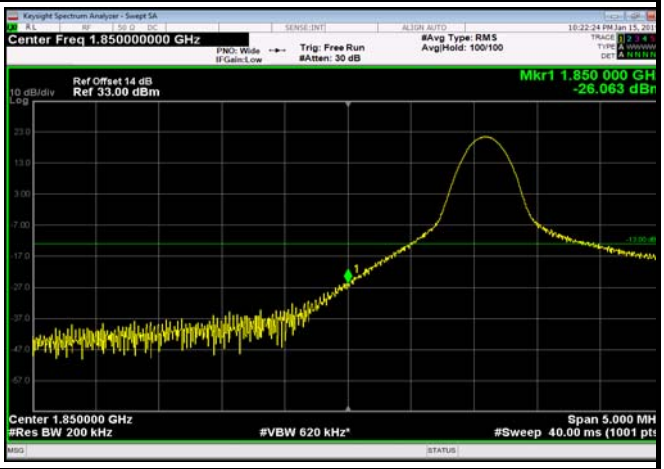
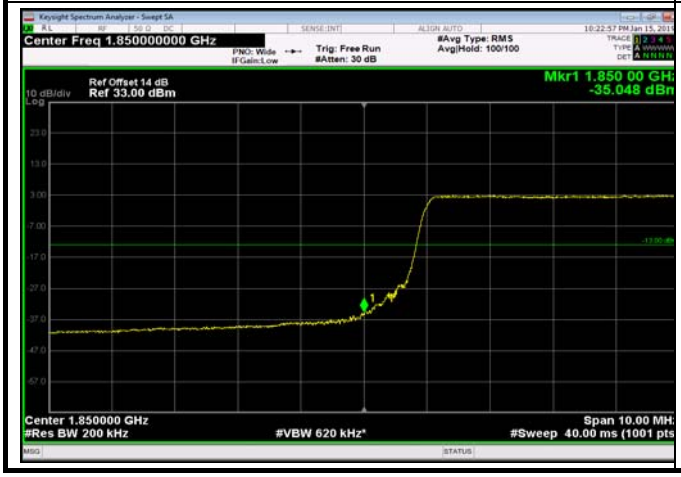
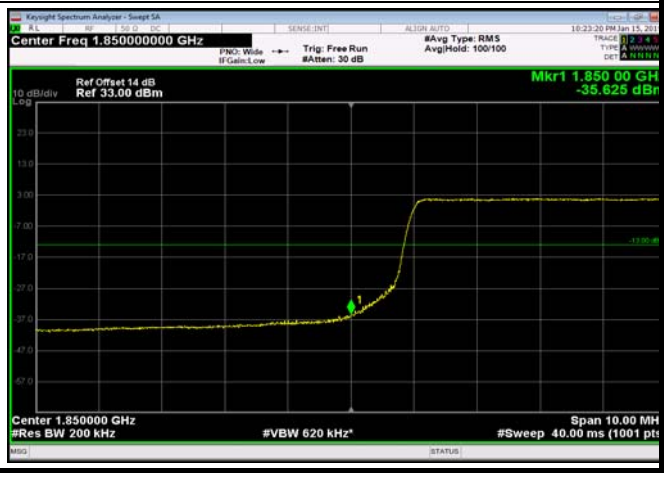
Conducted Band Edge

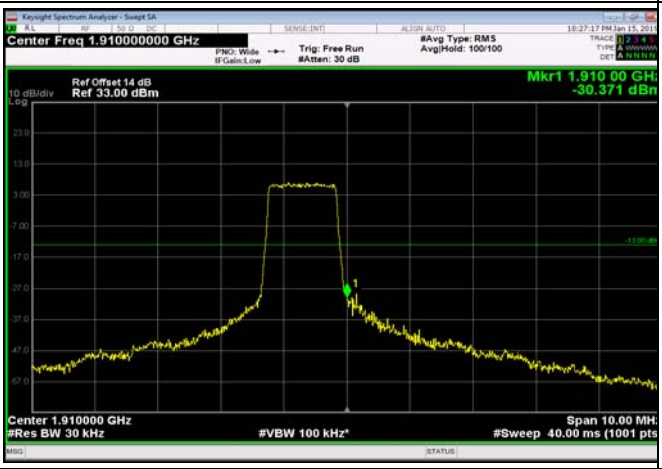
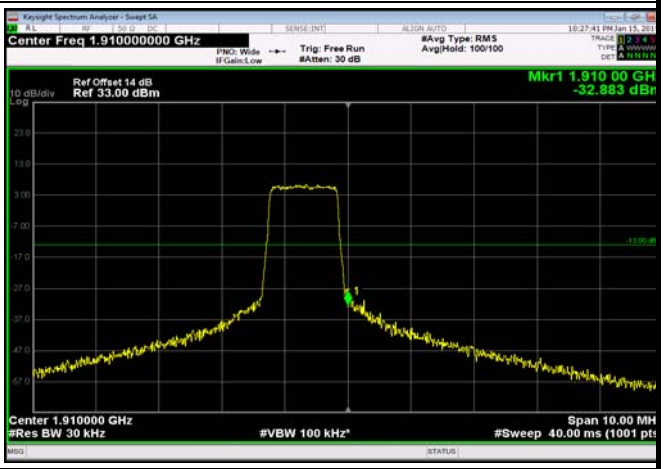
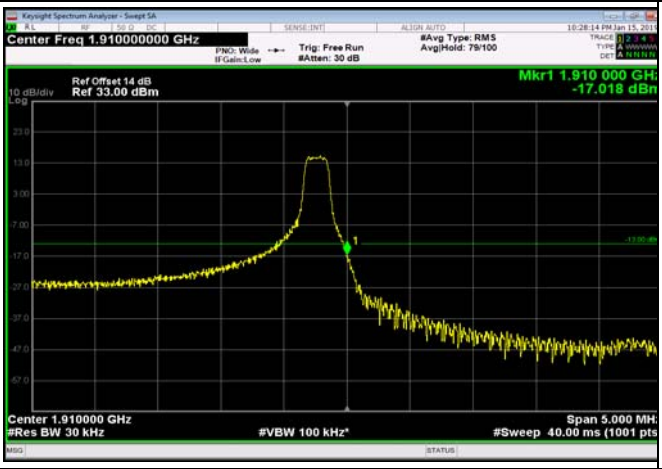
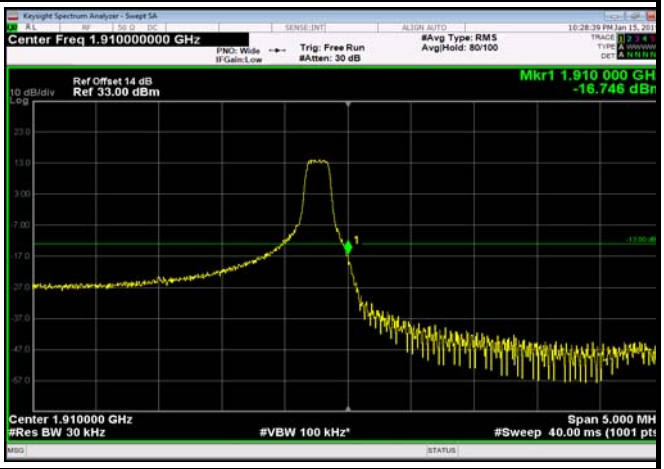
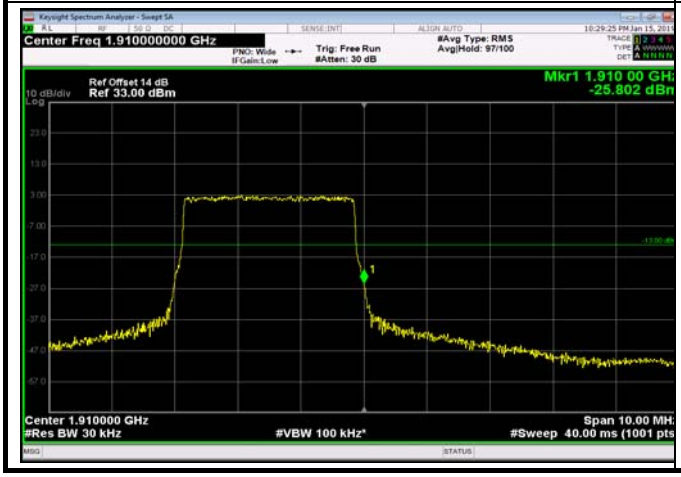
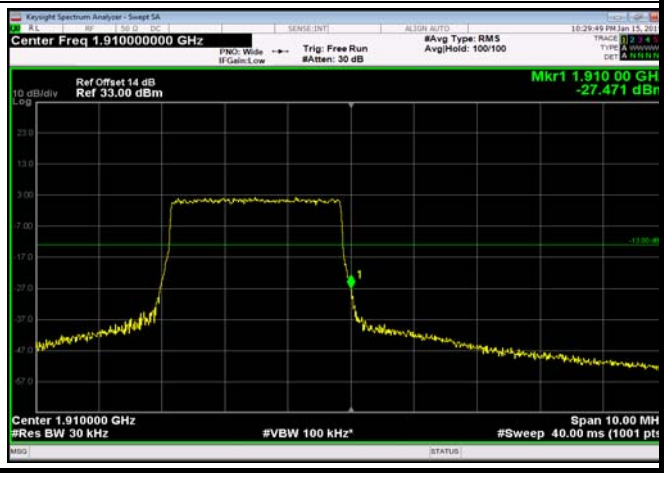
Test Result and Data

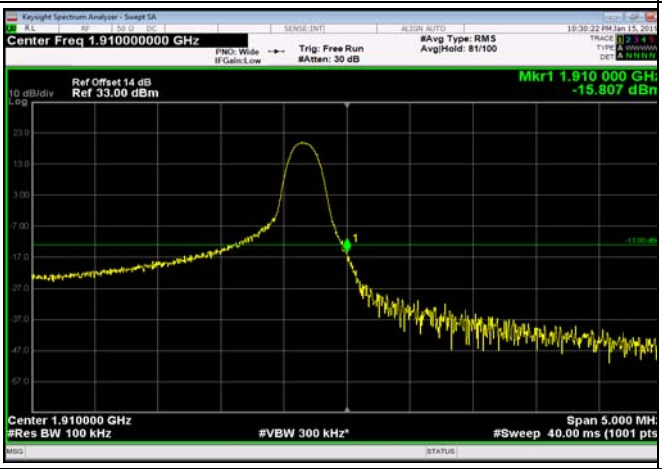
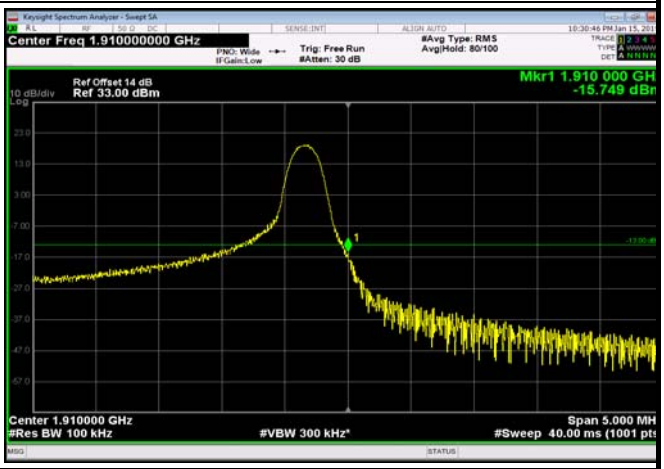
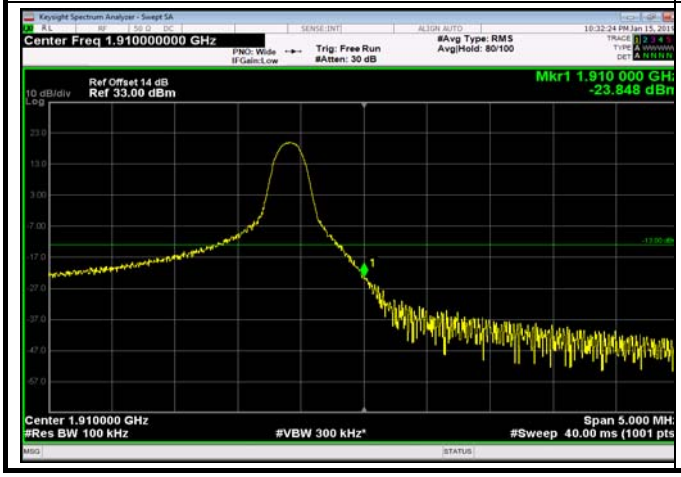
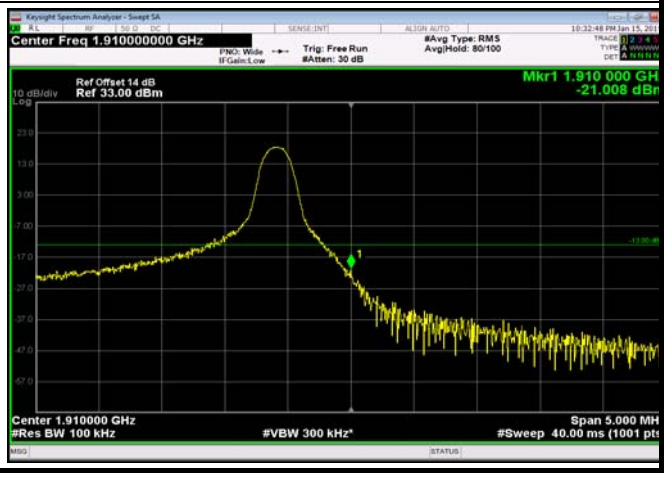
LowRange_ FDD02_1.4MHz_1850.7_fullRB _Low_QPSK	LowRange_ FDD02_1.4MHz_1850.7_fullRB _Low_Q16
	
LowRange_FDD02_3MHz_1851.5_OneRB _low_QPSK	LowRange_FDD02_3MHz_1851.5_OneRB _low_Q16
	

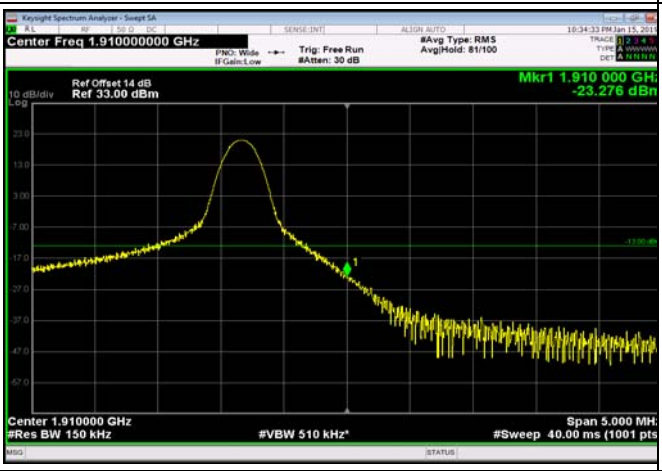
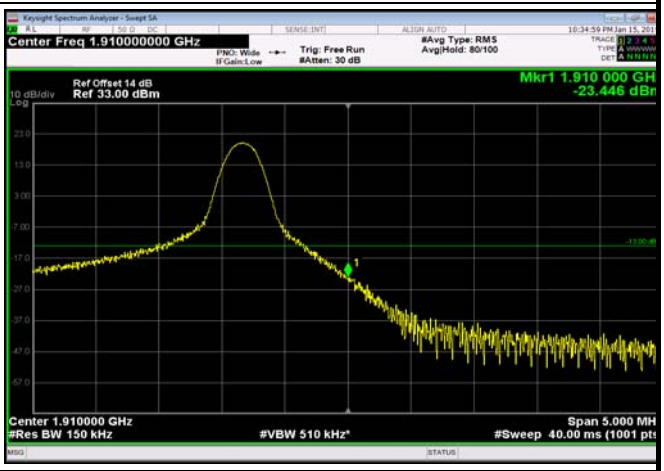
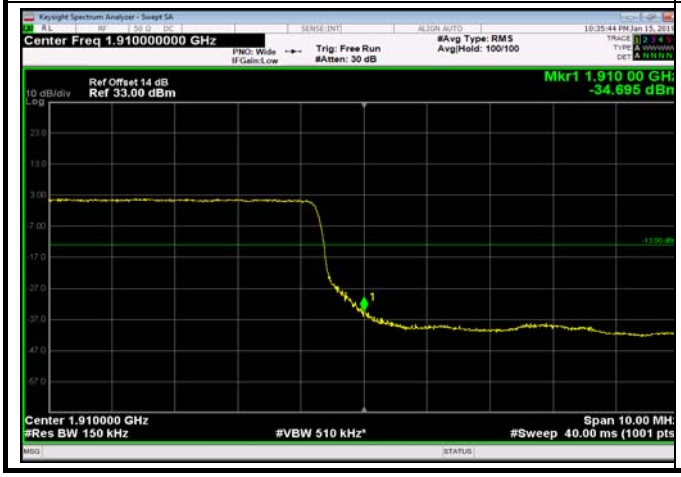
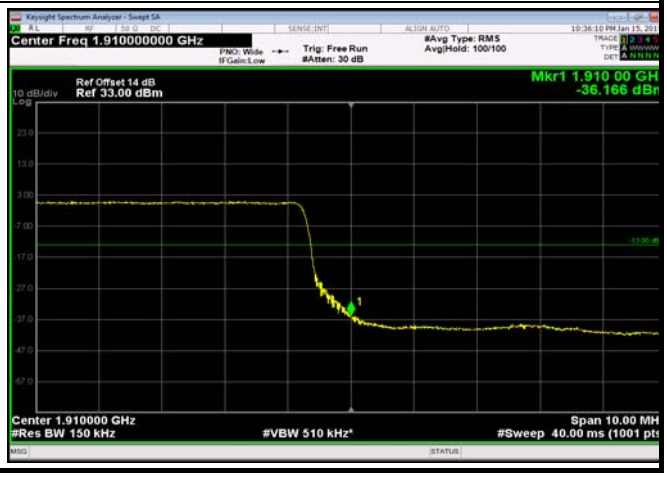
LowRange_ FDD02_3MHz_1851.5_fullRB _Low_QPSK	LowRange_ FDD02_3MHz_1851.5_fullRB _Low_Q16
	
LowRange_FDD02_5MHz_1852.5_OneRB _low_QPSK	LowRange_FDD02_5MHz_1852.5_OneRB _low_Q16
	
LowRange_ FDD02_5MHz_1852.5_fullRB _Low_QPSK	LowRange_ FDD02_5MHz_1852.5_fullRB _Low_Q16
	

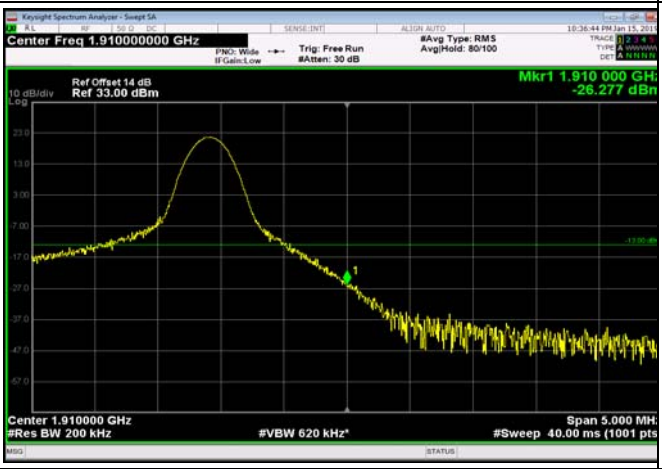
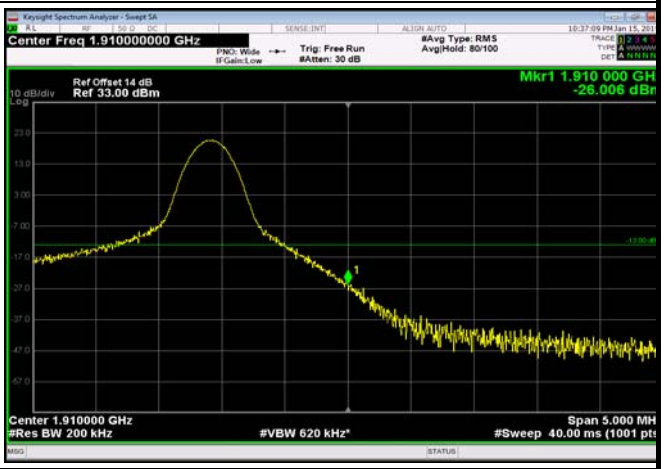
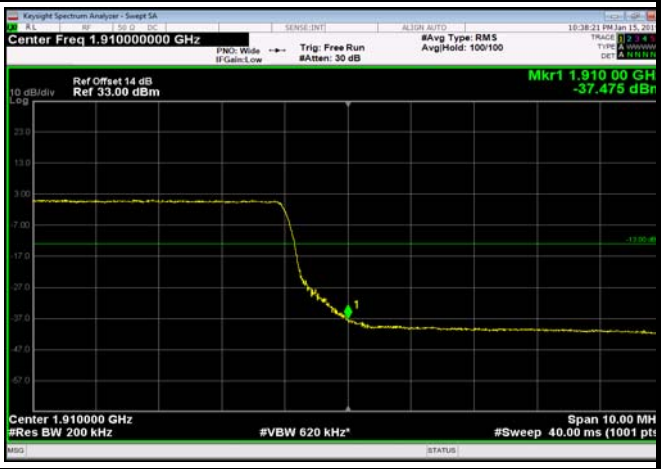
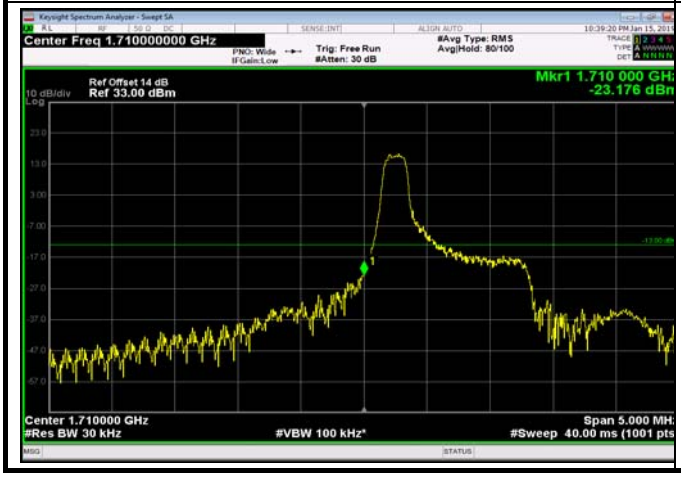
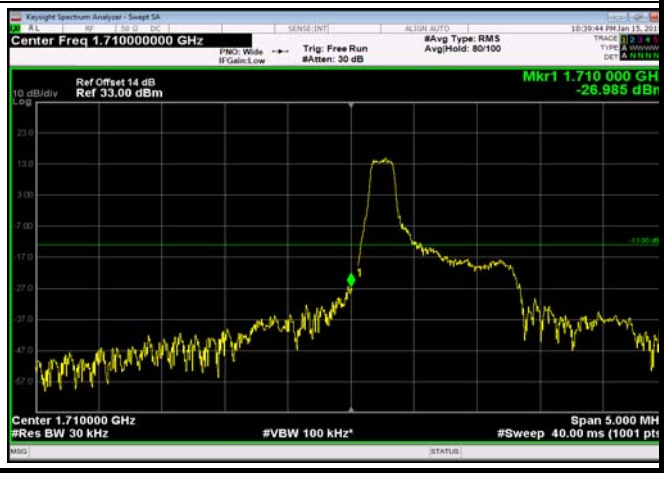
LowRange_FDD02_10MHz_1855_OneRB _low_QPSK	LowRange_FDD02_10MHz_1855_OneRB _low_Q16
	
LowRange_ FDD02_10MHz_1855_fullRB _Low_QPSK	LowRange_ FDD02_10MHz_1855_fullRB _Low_Q16
	
LowRange_FDD02_15MHz_1857.5_OneRB _low_QPSK	LowRange_FDD02_15MHz_1857.5_OneRB _low_Q16
	

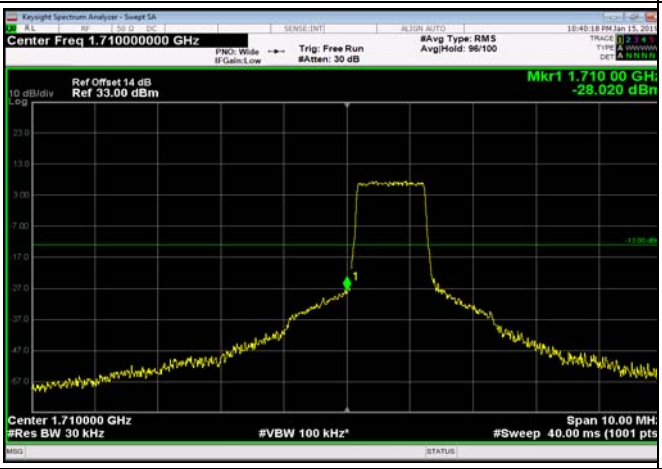
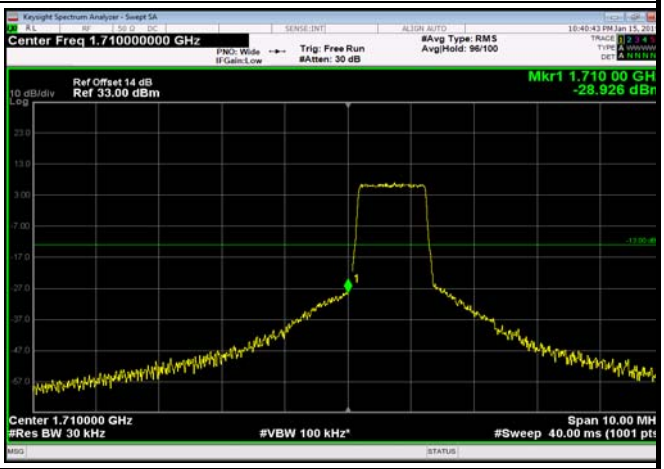
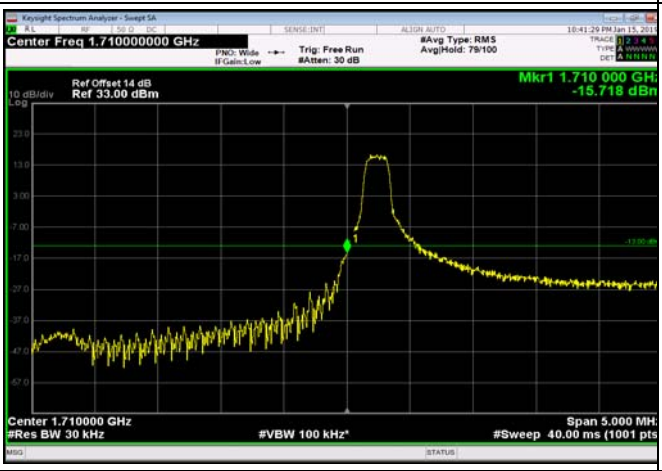
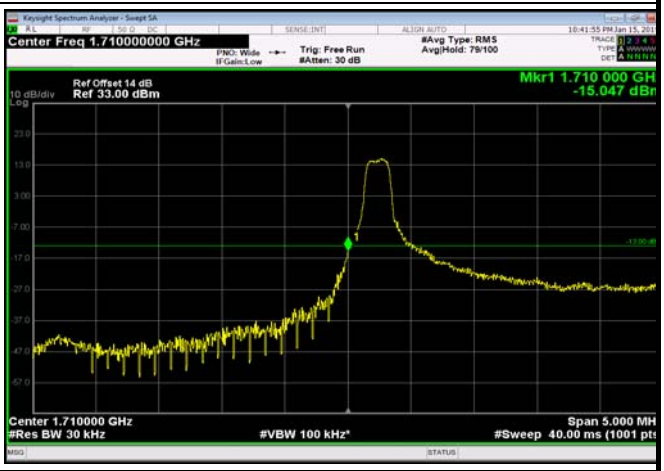
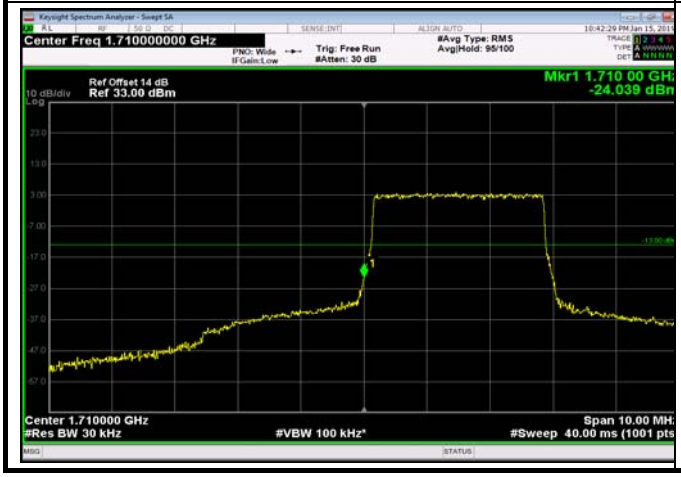
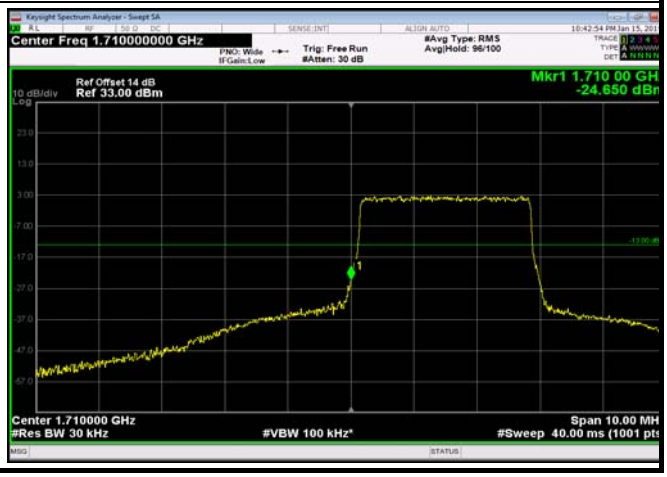
LowRange_ FDD02_15MHz_1857.5_fullRB _Low_QPSK	LowRange_ FDD02_15MHz_1857.5_fullRB _Low_Q16
	
LowRange_FDD02_20MHz_1860_OneRB _low_QPSK	LowRange_FDD02_20MHz_1860_OneRB _low_Q16
	
LowRange_ FDD02_20MHz_1860_fullRB _Low_QPSK	LowRange_ FDD02_20MHz_1860_fullRB _Low_Q16
	

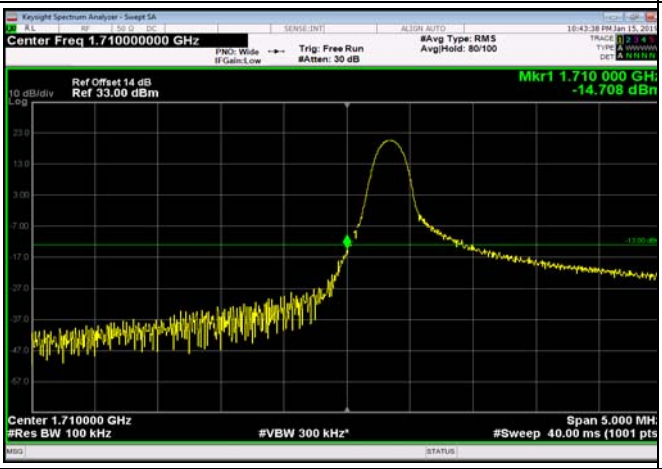
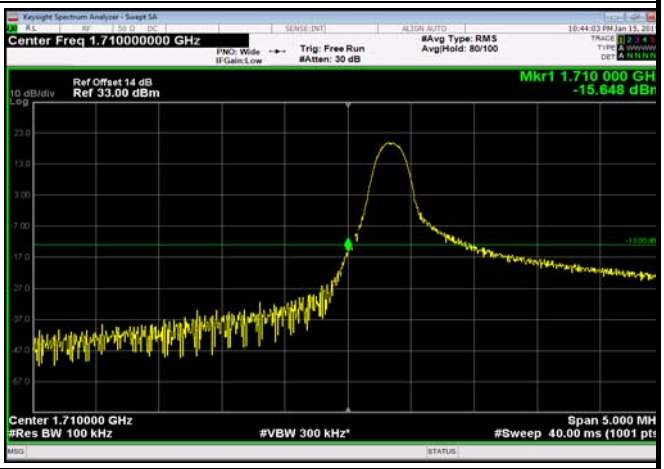
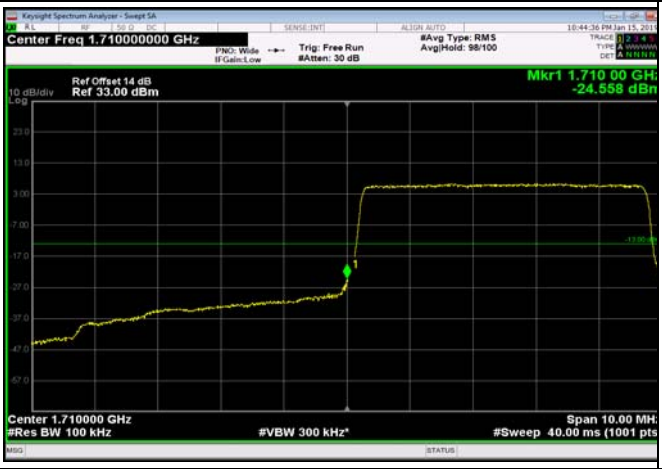
HighRange_ FDD02_1.4MHz_1909.3 _fullRB_High_QPSK	HighRange_ FDD02_1.4MHz_1909.3 _fullRB_High_Q16
	
HighRange_FDD02_3MHz_1908.5_OneRB _high_QPSK	HighRange_FDD02_3MHz_1908.5_OneRB _high_Q16
	
HighRange_ FDD02_3MHz_1908.5_fullRB _High_QPSK	HighRange_ FDD02_3MHz_1908.5_fullRB _High_Q16
	

HighRange_FDD02_5MHz_1907.5_OneRB _high_QPSK	HighRange_FDD02_5MHz_1907.5_OneRB _high_Q16
	
HighRange_ FDD02_5MHz_1907.5_fullRB _High_QPSK	HighRange_ FDD02_5MHz_1907.5_fullRB _High_Q16
	
HighRange_FDD02_10MHz_1905_OneRB _high_QPSK	HighRange_FDD02_10MHz_1905_OneRB _high_Q16
	

HighRange_ FDD02_10MHz_1905_fullRB _High_QPSK	HighRange_ FDD02_10MHz_1905_fullRB _High_Q16
	
HighRange_FDD02_15MHz_1902.5_OneRB _high_QPSK	HighRange_FDD02_15MHz_1902.5_OneRB _high_Q16
	
HighRange_ FDD02_15MHz_1902.5_fullRB _High_QPSK	HighRange_ FDD02_15MHz_1902.5_fullRB _High_Q16
	

HighRange_FDD02_20MHz_1900_OneRB_high_QPSK	HighRange_FDD02_20MHz_1900_OneRB_high_Q16
	
HighRange_ FDD02_20MHz_1900_fullRB_High_QPSK	HighRange_ FDD02_20MHz_1900_fullRB_High_Q16
	
LowRange_FDD04_1.4MHz_1710.7_OneRB_low_QPSK	LowRange_FDD04_1.4MHz_1710.7_OneRB_low_Q16
	

LowRange_ FDD04_1.4MHz_1710.7_fullRB _Low_QPSK	LowRange_ FDD04_1.4MHz_1710.7_fullRB _Low_Q16
	
LowRange_FDD04_3MHz_1711.5_OneRB _low_QPSK	LowRange_FDD04_3MHz_1711.5_OneRB _low_Q16
	
LowRange_ FDD04_3MHz_1711.5_fullRB _Low_QPSK	LowRange_ FDD04_3MHz_1711.5_fullRB _Low_Q16
	

LowRange_FDD04_5MHz_1712.5_OneRB _low_QPSK	LowRange_FDD04_5MHz_1712.5_OneRB _low_Q16
	
LowRange_ FDD04_5MHz_1712.5_fullRB _Low_QPSK	LowRange_ FDD04_5MHz_1712.5_fullRB _Low_Q16
	
LowRange_FDD04_10MHz_1715_OneRB _low_QPSK	LowRange_FDD04_10MHz_1715_OneRB _low_Q16