FCC PART 27 TEST REPORT

FCC Part 27 Subpart M

Report Reference No.....:	**JT.SY-06-160100101**	
FCC ID.....:	**XN3-QTS-25**	
Compiled by (position+printed name+signature)..:	File administrators Kevin Liu	kevin.Liu
Supervised by (position+printed name+signature)..:	Project Engineer Kevin Liu	kevin.Liu
Approved by (position+printed name+signature)..:	RF Manager Eric Wang	Eric Wang
Date of issue.....:	March 04, 2016	
Representative Laboratory Name.:	**SHENZHEN YIDAJIETONG TEST TECHNOLOGY CO., LTD**	
Address .....:	No.12 Building Shangsha, Innovation & Technology Park, Futian District, Shenzhen, P.R.China	
Testing Laboratory Name.....:	**CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd.**	
Address .....:	Electronic Testing Building, Shahe Road, Xili, Nanshan District,Shenzhen, 518055, P. R. China	
Applicant's name.....:	Mercury Networks, LLC	
Address .....:	6714 Pointe Inverness Way, Suite 230, Fort Wayne, Inited States	
Test specification.....**:**		
Standard .....:	**FCC CFR Title 47 Part 2, Part 27** **EIA/TIA 603-D: 2010** **KDB 971168 D01**	
TRF Originator.....:	SHENZHEN YIDAJIETONG TEST TECHNOLOGY CO., LTD	

Test item description .....:	QTS-25 / AIRSTREAM 4000
Trade Mark .....:	/
Manufacturer.....:	**KZ BroadBand Technologies, Ltd.**
Model/Type reference.....:	050-00525-XXX
Listed Models .....:	QTS-25-S, QTS-25-C, QTS-25-H, QTS-25-X / AIRSTREAM 4000-F25, AIRSTREAM 4000D-F25, AS4000D-F25
Modulation Type .....:	QPSK, 16QAM
Rating .....:	DC48V Adapter from AC 120V/60Hz
Hardware version .....:	V3.2
Software version .....:	MERCURY_AS4000D_F25_ODU_V1.4.3P5_R1764
Result.....:	**PASS**

TEST REPORT

Test Report No. :	JT.SY-06-160100101	March 04, 2016 Date of issue

Equipment under Test	:	QTS-25 / AIRSTREAM 4000
Model /Type	:	050-00525-XXX
Listed Models	:	QTS-25-S, QTS-25-C, QTS-25-H, QTS-25-X / AIRSTREAM 4000-F25, AIRSTREAM 4000D-F25, AS4000D-F25
Applicant	:	**Mercury Networks, LLC**
Address	:	6714 Pointe Inverness Way, Suite 230, Fort Wayne, Inited States
Manufacturer	:	**KZ BroadBand Technologies, Ltd.**
Address	:	1601 Tower C, Skyworth Building, High-Tech Industrial Park, Nanshan District, Shenzhen, China

Test Result:	**PASS**

Contents

1. TEST STANDARDS

The tests were performed according to following standards:

FCC Part 27(10-1-16 Edition): MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES

TIA/EIA 603 D June 2010: Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.

47 CFR FCC Part 15 Subpart B: - Unintentional Radiators

FCC Part 2: FREQUENCY ALLOCA-TIONS AND RADIO TREATY MAT-TERS; GENERAL RULES AND REG-ULATIONS

ANSI C63.4:2009: Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

FCC KDB971168D01 Power Meas License Digital Systems

FCC KDB971168D02 Misc OOBE License Digital Systems

FCC KDB 662911D01 Multiple Transmitter Output

2. SUMMARY

2.1. General Remarks

Date of receipt of test sample	:	Dec 27, 2015
Testing commenced on	:	Dec 27, 2015
Testing concluded on	:	Mar 04, 2016

2.2. Product Description

The **KZ BroadBand Technologies, Ltd.**'s Model: 050-00525-XXX or the "EUT" as referred to in this report; more general information as follows, for more details, refer to the user's manual of the EUT.

Name of EUT	QTS-25 / AIRSTREAM 4000
Model Number	050-00525-XXX
Modilation Type	QPSK,16QAM
Channel Bandwidth	7MHz/8.75MHz/10MHz
Antenna Type	External
MIMO	Support 2*2MIMO
Operation Frequency Band	2500-2690MHz

2.3. Equipment under Test

Power supply system utilised

Power supply voltage	:	○	120V / 60 Hz	○	115V / 60Hz
		○	12 V DC	○	24 V DC
		●	Other (specified in blank below)		

DC 48V Adapter From AC 120V/60Hz

2.4. Short description of the Equipment under Test (EUT)

2.4.1 General Description

Operation Frequency:

Bandwidth	Frequency	
7MHz	Low	2503.5MHz
	...	...
	Mid	2595 MHz
	...	...
	High	2686.5 MHz
8.75MHz	Low	2504.375 MHz
	...	...
	Mid	2595 MHz
	...	...
	High	2685.625 MHz
10MHz	Low	2505 MHz
	...	...
	Mid	2595 MHz
	...	...
	High	2685 MHz

NOTE: the Channel spacing of the EUT is 0.001MHz(1kHz)

2.5. Internal Identification of AE used during the test

AE ID*	Description
AE1	Charger

AE1
Model: G0549-480-032
INPUT: 100-240V 50/60Hz
OUTPUT: DC 48V 0.32A

*AE ID: is used to identify the test sample in the lab internally.

2.6. Normal Accessory setting

Fully charged battery was used during the test.

2.7. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

● - supplied by the manufacturer

○ - supplied by the lab

○	Power Cable	Length (m) :	/
		Shield :	/
		Detachable :	/
○	Multimeter	Manufacturer :	/
		Model No. :	/

2.8. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: XN3-QTS-25** filing to comply with FCC Part 27 Subpart M, Rules.

2.9. Modifications

No modifications were implemented to meet testing criteria.

2.10. General Test Conditions/Configurations

2.10.1 Test Environment

Environment Parameter	Selected Values During Tests	
Relative Humidity	Ambient	
Temperature	TN	Ambient
Voltage	VL	AC 108V
	VN	AC 120V
	VH	AC 132V

NOTE: VL=lower extreme test voltage VN=nominal voltage
VH=upper extreme test voltage TN=normal temperature

3. TEST ENVIRONMENT

3.1. Address of the test laboratory

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

Electronic Testing Building, Shahe Road，Xili, Nanshan District,Shenzhen, 518055, P. R. China
The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 (2003) and CISPR Publication 22.

3.2. Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

FCC-Registration No.: 406086
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 fr om the FCC is maintained in our files. Registration 406086, valid time is until October 28, 2017.

3.3. Environmental conditions

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

Temperature:	15-35 ° C
Humidity:	30-60 %
Atmospheric pressure:	950-1050mbar

3.4. Test Description

3.4.1 BRS&EBS Band 7 (2500-2570MHz pairedwith 2620-2690MHz)

Test Item	FCC RuleNo.	Requirements	Verdict
Effective(Isotropic) Radiated Power Output Data	§2.1046, §27.50(h)	EIRP ≤ 2W;	Pass
Peak-AverageRatio	§2.1046, §27.50(c)	Limit≤13dB	Pass
Modulation Characteristics	§2.1047	Digitalmodulation	N/A
Bandwidth	§2.1049	OBW: Nolimit. EBW: Nolimit.	Pass
BandEdges Compliance	§2.1051, §27.53(m)	≤ -13dBm/1%*EBW, In 1MHz bands immediately outside and adjacent to The frequency block.	Pass
Spurious Emissionat Antenna Terminals	§2.1051, §27.53(m)	≤-13dBm/1MHz, from 9kHz to10^{th} harmonics but outside authorized Operating frequency ranges.	Pass
Frequency Stability	§2.1055, §27.54	FCC: within authorized frequency block.	Pass
Radiated spurious emission	§2.1053, §27.53(m)	≤ -13dBm/1MHz.	Pass
NOTE 1: For the verdict, the “N/A” denotes “not applicable”, the “N/T” de notes “not tested”			

3.5. Equipments Used during the Test

Description	Manufacturer	Model	Serial No.	Test Date	Due Date
EMI Test Receiver	R&S	ESIB26	A0304218	2015.06.02	2016.06.01
Full-Anechoic Chamber	Albatross	12.8m*6.8m *6.4m	A0412372	2015.01.05	2016.01.04
Loop Antenna	Schwarz beck	HFH2-Z2	100047	2015.06.02	2016.06.01
Bilog Antenna	Schwarzbeck	VULB 9163	9163-274	2015.06.02	2016.06.01
Bilog Antenna	Schwarzbeck	VULB 9163	9163-276	2015.06.02	2016.06.01
Double ridge horn antenna	R&S	HF960	100150	2015.06.02	2016.06.01
Double ridge horn antenna	R&S	HF960	100155	2015.06.02	2016.06.01
Ultra-wideband antenna	R&S	HL562	100089	2015.06.02	2016.06.01
Ultra-wideband antenna	R&S	HL562	100090	2015.06.02	2016.06.01
Test Antenna – Horn (18-25GHz)	ETS	UG-596A/U	A0902607	2015.06.02	2016.06.01
Test Antenna – Horn (18-25GHz)	ETS	UG-596A/U	A0902611	2015.06.02	2016.06.01
Amplifier 20M~3GHz	R&S	PAP-0203H	22018	2015.06.02	2016.06.01
Ampilier 1G~18GHz	R&S	MITEQ AFS42-00101800	25-S-42	2015.06.02	2016.06.01
Ampilier 18G~40GHz	R&S	JS42-18002600-28-5A	12111.0980.00	2015.06.02	2016.06.01
System Simulator	R&S	CMW500	A130101034	2015.06.010	2016.06.09
Signal Generator	R&S	SMF100A	A0304267	2015.06.010	2016.06.09
Signal Analyzer	Agilent	N9030A	MY49430428	2015.06.010	2016.06.09
Power Sensor	R&S	NRP-Z4	823.3618.03	2015.06.02	2016.06.01
Power Meter	R&S	NRVS	1020.1809.02	2015.06.02	2016.06.01

The calibration interval was one year.

4. TEST CONDITIONS AND RESULTS

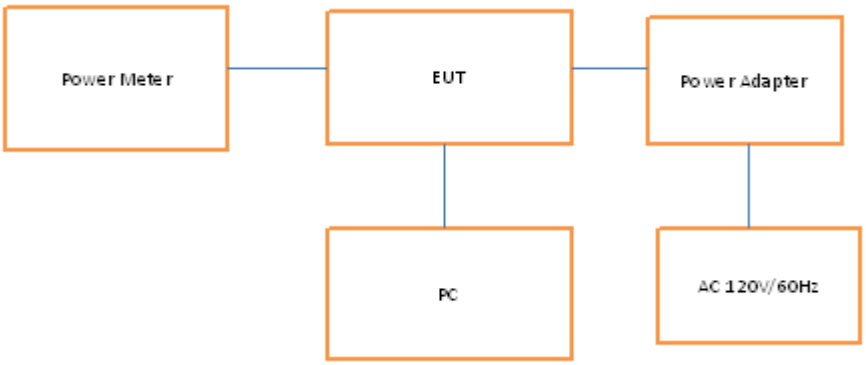
4.1. Output Power

TEST APPLICABLE

During the process of testing, the EUT was controlled by specific test software provided by manufacturer to ensure max power transmission and proper modulation. This result contains output power and EIRP measurements for the EUT. In all cases, output power is within the specified limits

4.1.1. Conducted Output Power

TEST CONFIGURATION



TEST PROCEDURE

Conducted Power Measurement:
a) Place the EUT on a bench and set it in transmitting mode by test software.
b) Connect a low loss RF cable from the antenna port to a power meter.
c) EUT states transmitting and selects a channel for testing.
d) We tested for single antenna port and recorded burst average values;
e) Calculte MOMO values according to KDB662911.

TEST RESULTS

For Single Antenna

ANT 1			
TX Channel Bandwidth	Frequency (MHz)	Burst Average Power [dBm]	
		QPSK	16QAM
7 MHz	2503.500	16.31	15.83
	2595.000	16.79	16.29
	2686.500	16.16	16.04
8.75MHz	2504.375	16.37	15.86
	2595.000	16.67	15.90
	2685.625	16.34	15.37
10 MHz	2505.000	16.77	15.50
	2595.000	16.06	15.88
	2685.000	16.34	15.12

ANT 2			
TX Channel Bandwidth	Frequency (MHz)	Burst Average Power [dBm]	
		QPSK	16QAM
7 MHz	2503.500	16.74	15.50
	2595.000	16.68	16.13
	2686.500	16.89	16.43
8.75MHz	2504.375	16.54	16.23
	2595.000	16.46	16.21
	2685.625	16.75	16.39
10 MHz	2505.000	16.97	16.24
	2595.000	16.03	15.59
	2685.000	16.77	16.01

For MIMO

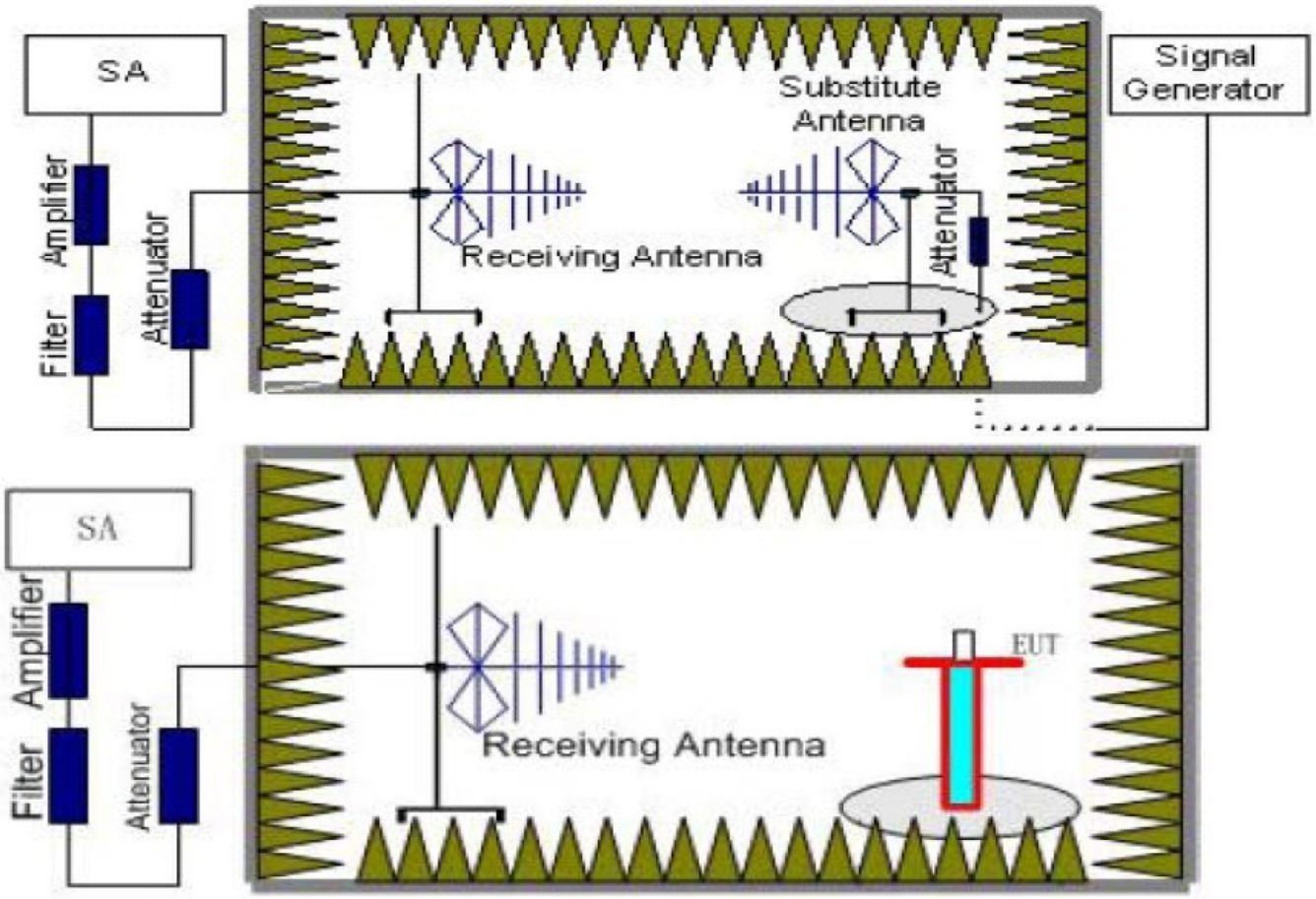
TX Channel Bandwidth	Frequency (MHz)	Burst Average Power [dBm]					
		QPSK			16QAM		
		Antenna 1	Antenna 2	Sum	Antenna 1	Antenna 2	Sum
7 MHz	2503.500	16.31	16.74	19.54	15.83	15.50	18.68
	2595.000	16.79	16.68	19.75	16.29	16.13	19.22
	2686.500	16.16	16.89	19.55	16.04	16.43	19.25
8.75MHz	2504.375	16.37	16.54	19.47	15.86	16.23	19.06
	2595.000	16.67	16.46	19.58	15.90	16.21	19.07
	2685.625	16.34	16.75	19.56	15.37	16.39	18.92
10 MHz	2505.000	16.77	16.97	19.88	15.50	16.24	18.90
	2595.000	16.06	16.03	19.06	15.88	15.59	18.75
	2685.000	16.34	16.77	19.57	15.12	16.01	18.60

4.1.2. Radiated Output Power

LIMIT

According to §27.50 (h) (2): *Mobile and other user stations.* Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power..

TEST CONFIGURATION



TEST PROCEDURE

1. EUT was placed on a 1.50 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.50m. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.
2. A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
3. The EUT is then put into continuously transmitting mode at its maximum power level during the test.Set Test Receiver or Spectrum RBW=1MHz,VBW=3MHz, And the maximum value of the receiver should be recorded as (P_r).
4. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (P_{Mea}) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (P_r). The power of signal source (P_{Mea}) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

5. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (P_{cl}) ,the Substitution Antenna Gain (G_a) and the Amplifier Gain (P_{Ag}) should be recorded after test.
   The measurement results are obtained as described below:
   Power(EIRP)=P_{Mea}- P_{Ag} - P_{cl} + G_a
   We used SMF100A micowave signal generator which signal level can up to 33dBm,so we not used power Amplifier for substituation test; The measurement results are amend as described below:
   Power(EIRP)=P_{Mea}- P_{cl} + G_a
6. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.
7. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP-2.15dBi.

TEST RESULTS

Note: We test the H direction and V direction and V direction is worse.

For Single Antenna

WIMAX_Channel Bandwidth 7MHz_QPSK _Antenna 1

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2503.500	-16.54	3.06	9.68	34.80	24.88	33.01	8.13	V
2595.000	-15.68	3.17	9.68	34.80	25.63	33.01	7.38	V
2686.500	-15.98	3.22	9.75	34.80	25.35	33.01	7.66	V

WIMAX _Channel Bandwidth 8.75MHz_QPSK Antenna 1

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2504.375	-15.85	3.06	9.68	34.80	25.57	33.01	7.44	V
2595.000	-15.87	3.17	9.68	34.80	25.44	33.01	7.57	V
2685.625	-16.21	3.22	9.75	34.80	25.12	33.01	7.89	V

WIMAX _Channel Bandwidth 10MHz_QPSK _ Antenna 1

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2505.000	-15.23	3.06	9.68	34.80	26.19	33.01	6.82	V
2595.000	-15.16	3.17	9.68	34.80	26.15	33.01	6.86	V
2685.000	-16.09	3.22	9.75	34.80	25.24	33.01	7.77	V

WIMAX_Channel Bandwidth 7MHz_16QAM _Antenna 1

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2503.500	-18.71	3.06	9.68	34.80	22.71	33.01	10.30	V
2595.000	-18.02	3.17	9.68	34.80	23.29	33.01	9.72	V
2686.500	-18.51	3.22	9.75	34.80	22.82	33.01	10.19	V

WIMAX _Channel Bandwidth 8.75MHz_16QAM Antenna 1

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2504.375	-18.44	3.06	9.68	34.80	22.98	33.01	10.03	V
2595.000	-17.86	3.17	9.68	34.80	23.45	33.01	9.56	V
2685.625	-18.06	3.22	9.75	34.80	23.27	33.01	9.74	V

WIMAX _Channel Bandwidth 10MHz_16QAM _ Antenna 1

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2505.000	-18.57	3.06	9.68	34.80	22.85	33.01	10.16	V
2595.000	-17.69	3.17	9.68	34.80	23.62	33.01	9.39	V
2685.000	-17.89	3.22	9.75	34.80	23.44	33.01	9.57	V

WIMAX_Channel Bandwidth 7MHz_QPSK _Antenna 2

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2503.500	-16.51	3.06	9.68	34.80	24.91	33.01	8.10	V
2595.000	-15.72	3.17	9.68	34.80	25.59	33.01	7.42	V
2686.500	-16.03	3.22	9.75	34.80	25.30	33.01	7.71	V

WIMAX _Channel Bandwidth 8.75MHz_QPSK Antenna 2

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2504.375	-15.79	3.06	9.68	34.80	25.63	33.01	7.38	V
2595.000	-15.80	3.17	9.68	34.80	25.51	33.01	7.50	V
2685.625	-16.09	3.22	9.75	34.80	25.24	33.01	7.77	V

WIMAX _Channel Bandwidth 10MHz_QPSK _ Antenna 2

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2505.000	-15.16	3.06	9.68	34.80	26.26	33.01	6.75	V
2595.000	-15.27	3.17	9.68	34.80	26.04	33.01	6.97	V
2685.000	-15.95	3.22	9.75	34.80	25.38	33.01	7.63	V

WIMAX_Channel Bandwidth 7MHz_16QAM _Antenna 2

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2503.500	-18.83	3.06	9.68	34.80	22.59	33.01	10.42	V
2595.000	-17.97	3.17	9.68	34.80	23.34	33.01	9.67	V
2686.500	-18.40	3.22	9.75	34.80	22.93	33.01	10.08	V

WIMAX _Channel Bandwidth 8.75MHz_16QAM _ Antenna 2

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2504.375	-18.28	3.06	9.68	34.80	23.14	33.01	9.87	V
2595.000	-17.79	3.17	9.68	34.80	23.52	33.01	9.49	V
2685.625	-18.13	3.22	9.75	34.80	23.20	33.01	9.81	V

WIMAX _Channel Bandwidth 10MHz_16QAM _ Antenna 2

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2505.000	-18.57	3.06	9.68	34.80	22.85	33.01	10.16	V
2595.000	-17.63	3.17	9.68	34.80	23.68	33.01	9.33	V
2685.000	-17.82	3.22	9.75	34.80	23.51	33.01	9.50	V

For MIMO

WIMAX_Channel Bandwidth 7MHz_QPSK _MIMO

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2503.500	-15.26	3.06	9.68	34.80	26.16	33.01	6.85	V
2595.000	-12.93	3.17	9.68	34.80	28.38	33.01	4.63	V
2686.500	-13.62	3.22	9.75	34.80	27.71	33.01	5.30	V

WIMAX _Channel Bandwidth 8.75MHz_QPSK MIMO

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2504.375	-13.55	3.06	9.68	34.80	27.87	33.01	5.14	V
2595.000	-13.20	3.17	9.68	34.80	28.11	33.01	4.90	V
2685.625	-13.44	3.22	9.75	34.80	27.89	33.01	5.12	V

WIMAX _Channel Bandwidth 10MHz_QPSK _ MIMO

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2505.000	-12.93	3.06	9.68	34.80	28.49	33.01	4.52	V
2595.000	-12.28	3.17	9.68	34.80	29.03	33.01	3.98	V
2685.000	-14.15	3.22	9.75	34.80	27.18	33.01	5.83	V

WIMAX_Channel Bandwidth 7MHz_16QAM _ MIMO

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2503.500	-16.71	3.06	9.68	34.80	24.71	33.01	8.30	V
2595.000	-15.29	3.17	9.68	34.80	26.02	33.01	6.99	V
2686.500	-16.19	3.22	9.75	34.80	25.14	33.01	7.87	V

WIMAX _Channel Bandwidth 8.75MHz_16QAM _ MIMO

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2504.375	-16.44	3.06	9.68	34.80	24.98	33.01	8.03	V
2595.000	-15.14	3.17	9.68	34.80	26.17	33.01	6.84	V
2685.625	-16.30	3.22	9.75	34.80	25.03	33.01	7.98	V

WIMAX _Channel Bandwidth 10MHz_16QAM _ MIMO

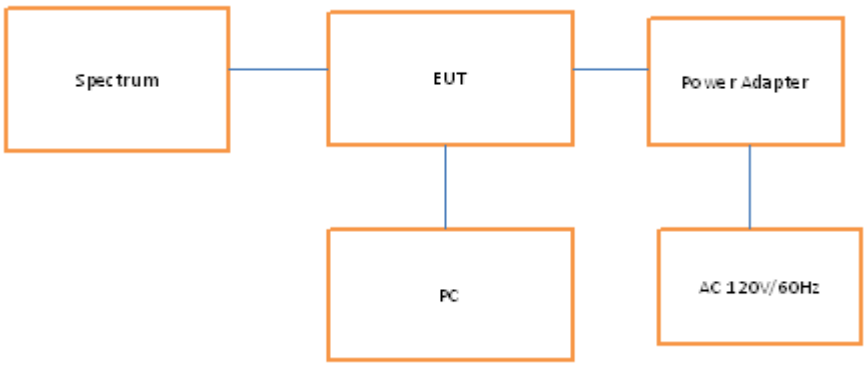
Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2505.000	-16.40	3.06	9.68	34.80	25.02	33.01	7.99	V
2595.000	-15.01	3.17	9.68	34.80	26.30	33.01	6.71	V
2685.000	-15.45	3.22	9.75	34.80	25.88	33.01	7.13	V

4.2. Peak-to-Average Ratio (PAR)

LIMIT

The Peak-to-Average Ratio (PAR) of the transmission may not exceed 13 dB.

TEST CONFIGURATION



TEST PROCEDURE

Use spectrum to measure the total peak power and record as P_{Pk}. Use spectrum to measure the total average power and record as P_{Avg}. Both the peak and average power levels must be expressed in the same logarithmic units (e.g., dBm).
Determine the PAPR from:
PAPR (dB) = P_{Pk} (dBm) - P_{Avg} (dBm).

TEST RESULTS

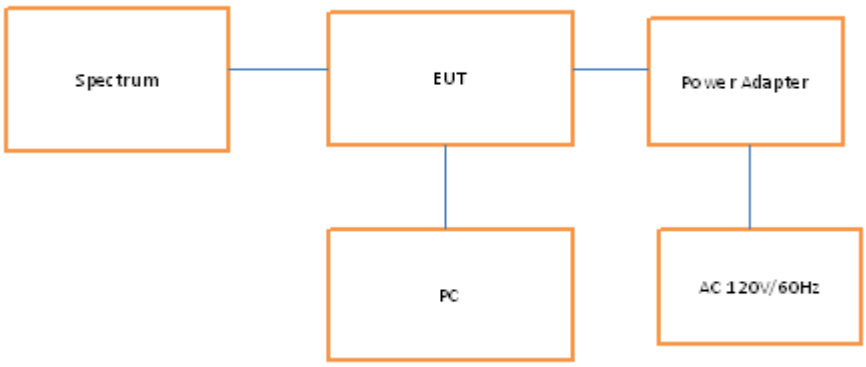
PAPR (dB)					
TX Channel Bandwidth	Frequency (MHz)	ANT 1		ANT 2	
		QPSK	16QAM	QPSK	16QAM
7 MHz	2503.500	7.66	7.34	7.67	7.78
	2595.000	8.62	7.70	7.42	7.71
	2686.500	7.75	8.04	7.59	7.58
8.75 MHz	2504.375	7.21	7.51	7.96	6.61
	2595.000	7.34	7.22	8.20	6.88
	2685.625	6.99	6.37	7.53	7.25
10 MHz	2505.000	6.59	7.04	6.34	7.50
	2595.000	6.95	6.94	6.35	7.16
	2685.000	6.91	7.48	6.79	6.47

4.3. Occupied Bandwidth and Emission Bandwidth

LIMIT

N/A

TEST CONFIGURATION



TEST PROCEDURE

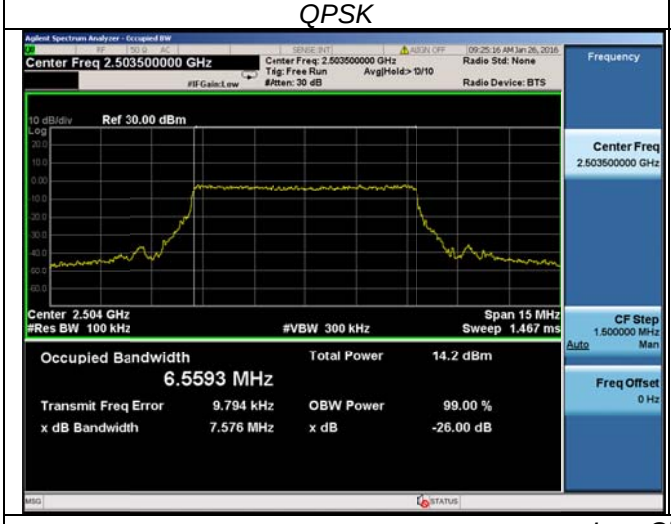
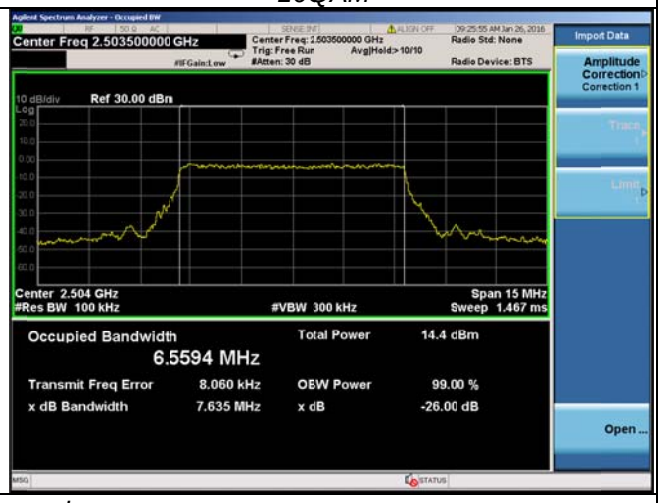
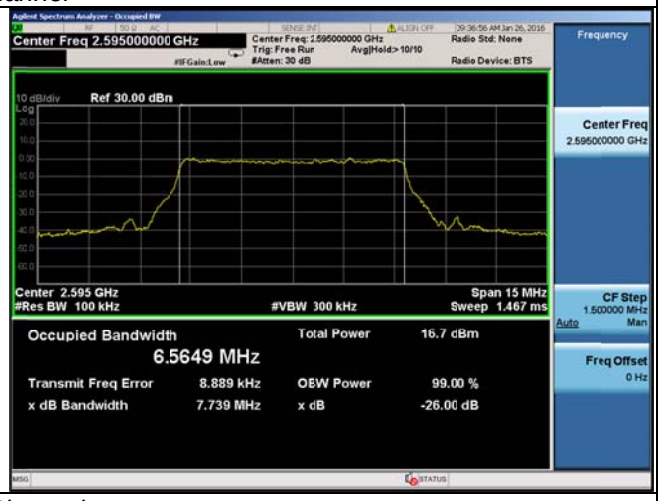
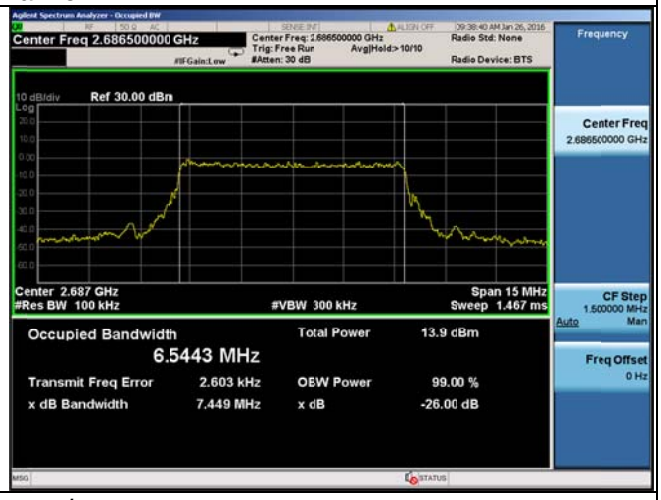
The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at low, middle and high channel in each band. The -26dBc Emission bandwidth was also measured and recorded. Set RBW was set to about 1% of emission BW, VBW≥3 times RBW.
-26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.

TEST RESULTS

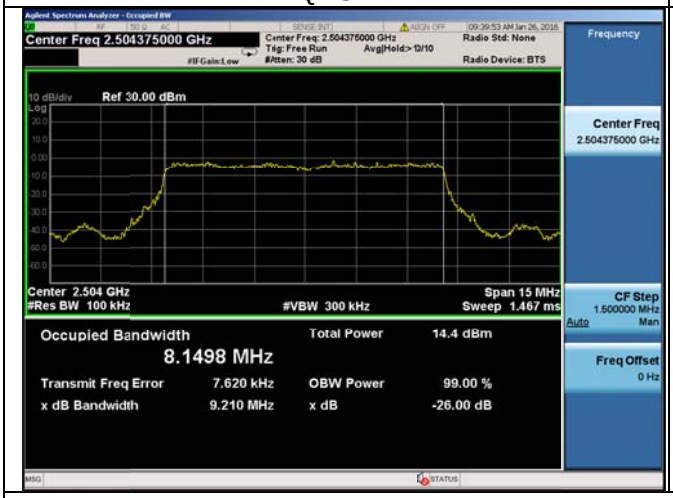
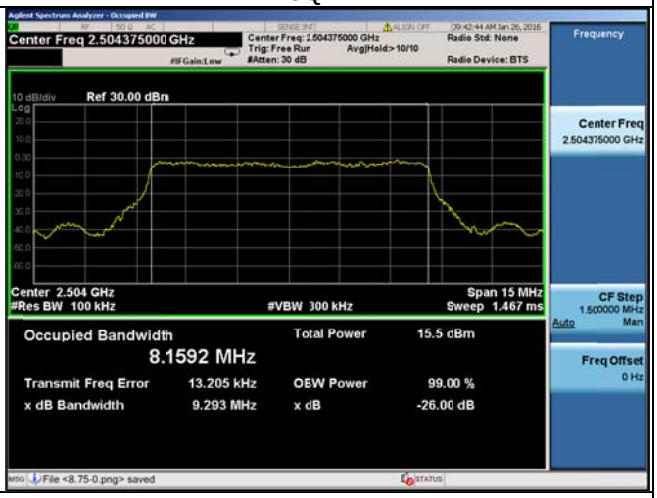
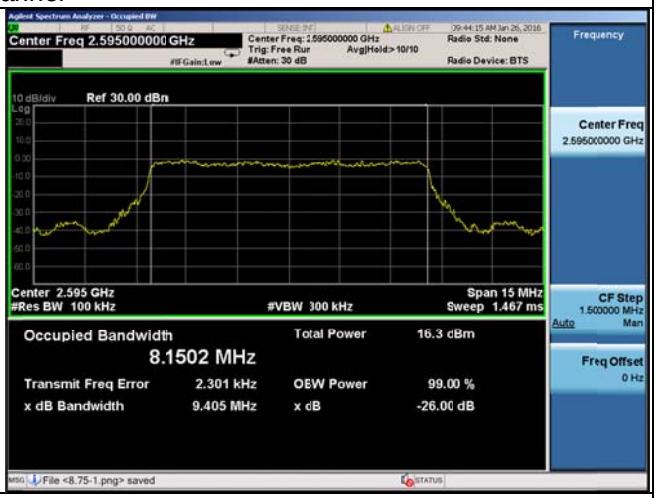
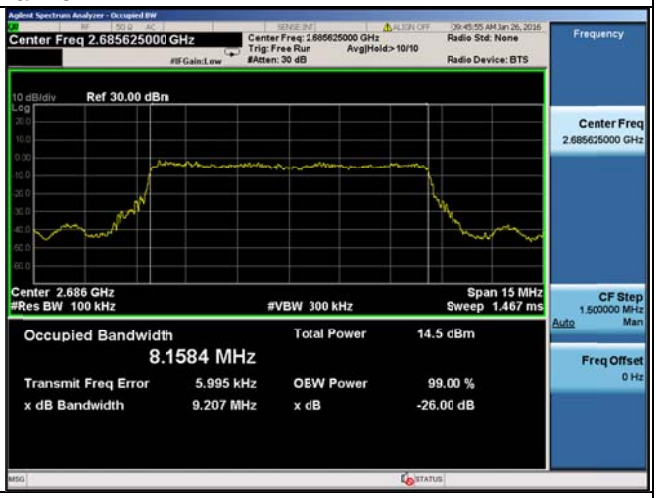
.

ANT 1					
TX Channel Bandwidth	Frequency (MHz)	-26dBc Emission bandwidth (MHz)		99% Occupied bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
7 MHz	2503.500	7.576	7.635	6.5593	6.5594
	2595.000	7.488	7.739	6.5562	6.5649
	2686.500	7.337	7.449	6.5486	6.5443
8.75 MHz	2504.375	9.210	9.293	8.1498	8.1592
	2595.000	9.409	9.405	8.1507	8.1502
	2685.625	9.332	9.207	8.1685	8.1584
10 MHz	2505.000	10.39	10.50	9.1269	9.1386
	2595.000	10.40	10.33	9.1220	9.1286
	2685.000	10.28	10.26	9.1363	9.1426

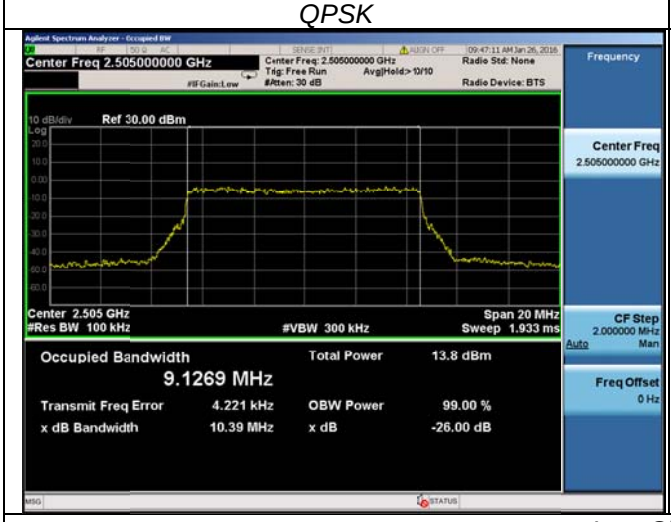
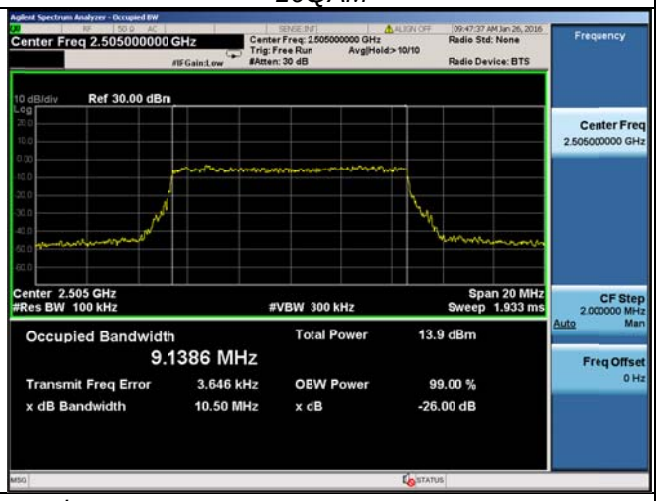
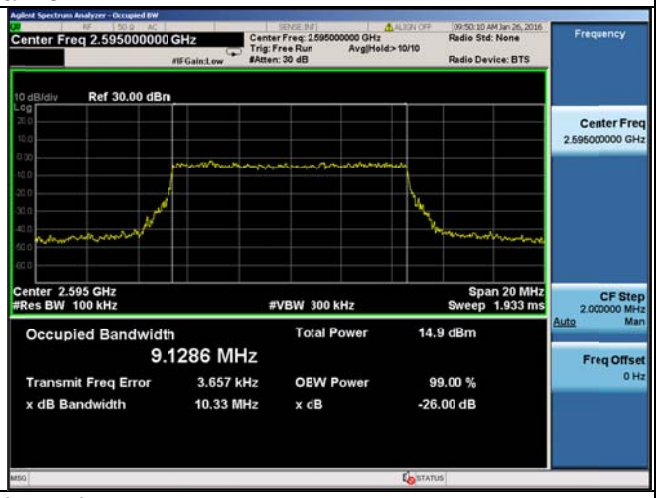
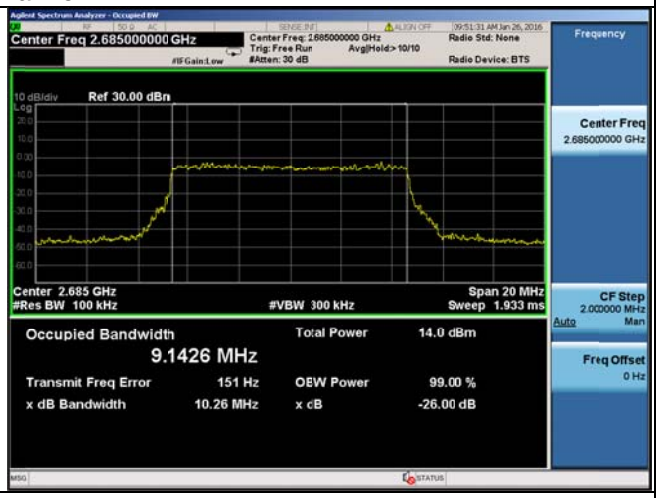
ANT 2					
TX Channel Bandwidth	Frequency (MHz)	-26dBc Emission bandwidth (MHz)		99% Occupied bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
7 MHz	2503.500	7.572	7.479	6.5575	6.5554
	2595.000	7.652	7.583	6.5576	6.5529
	2686.500	7.634	7.482	6.5494	6.5523
8.75 MHz	2504.375	9.069	9.187	8.1351	8.1447
	2595.000	9.301	9.250	8.1580	8.1518
	2685.625	9.188	9.258	8.1452	8.1651
10 MHz	2505.000	10.58	10.34	9.1370	9.1283
	2595.000	10.40	10.50	9.1573	9.1453
	2685.000	10.68	10.44	9.1455	9.1356

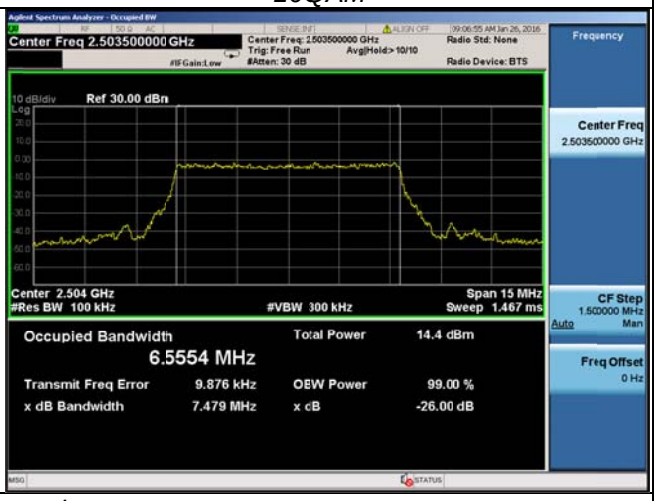
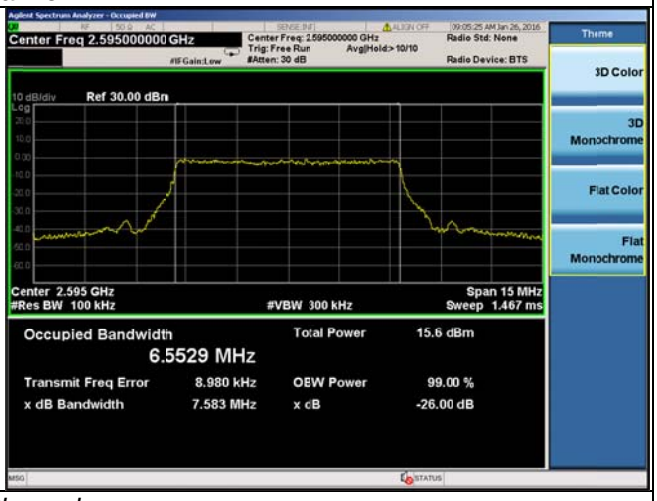
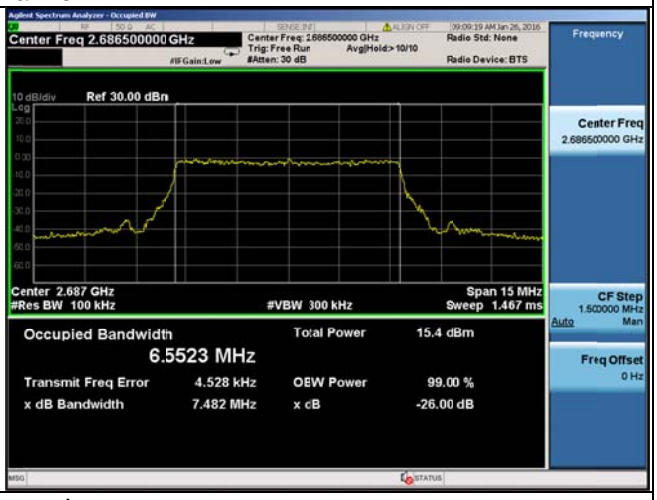
*7MHz Channel Bandwidth (*ANT 1)	
QPSK	*16QAM*
	
Low Channel	
	
Middle Channel	
	
High Channel	

*8.75MHz Channel Bandwidth (*ANT 1)

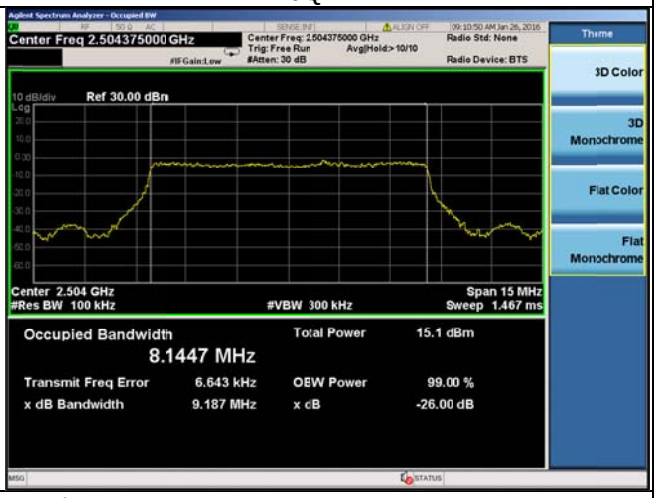
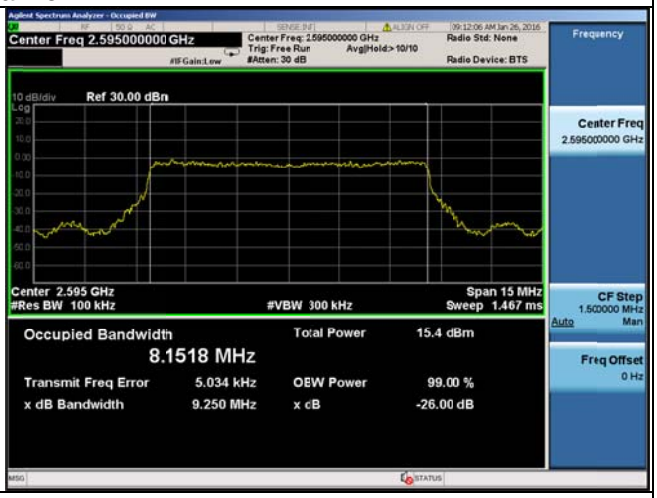
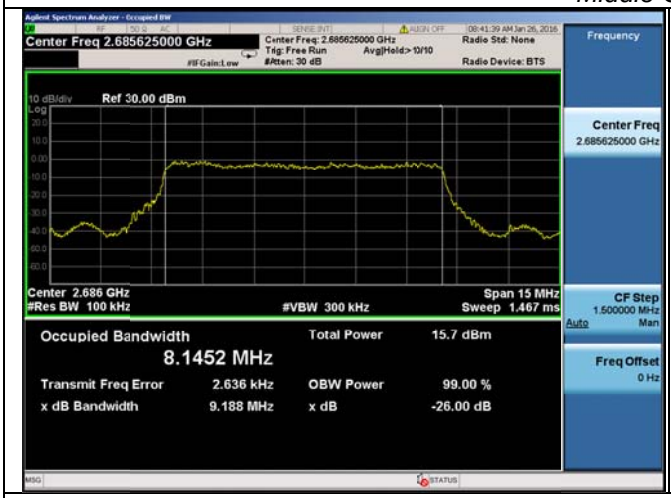
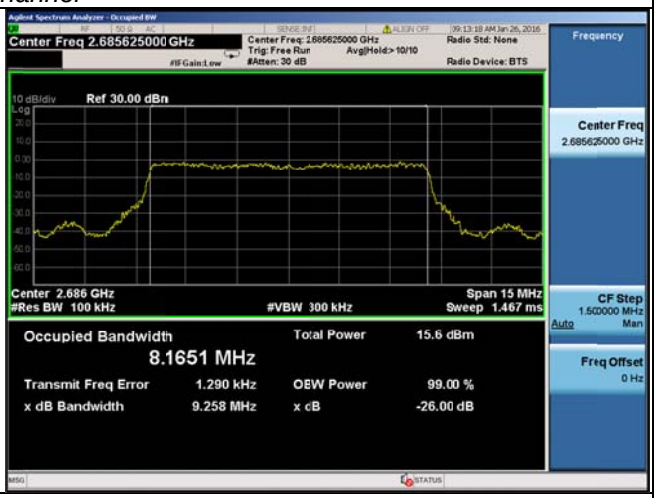
QPSK	*16QAM*
	
Low Channel	
	
Middle Channel	
	
High Channel	

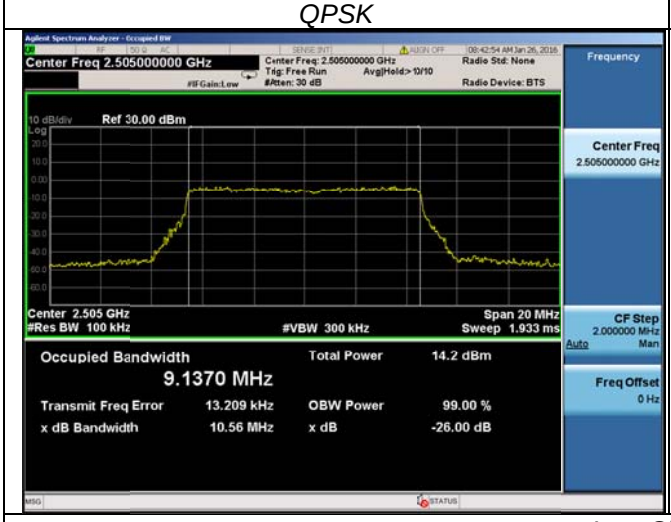
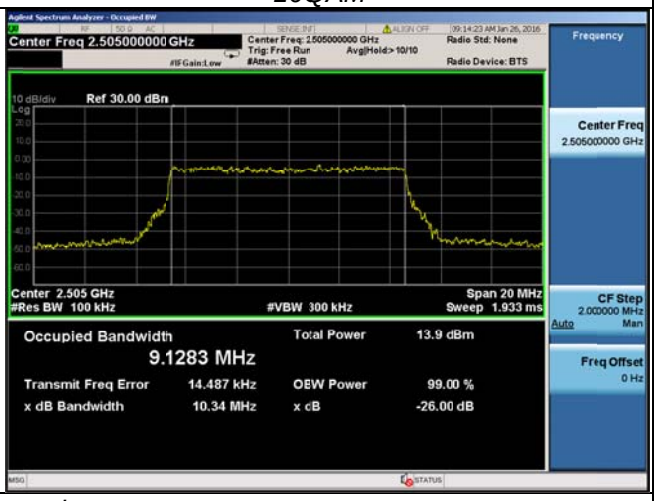
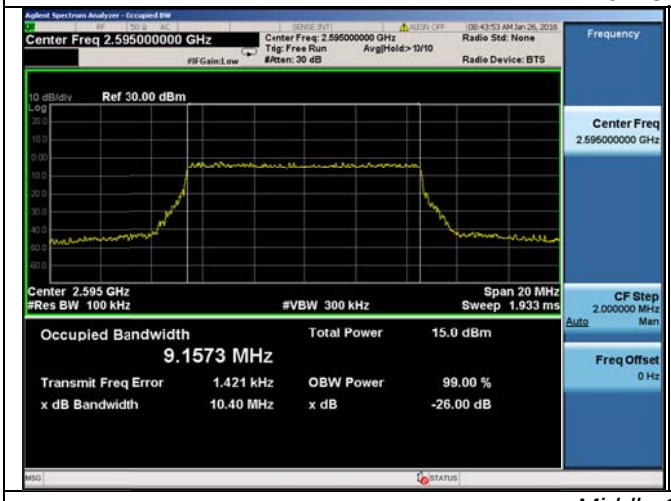
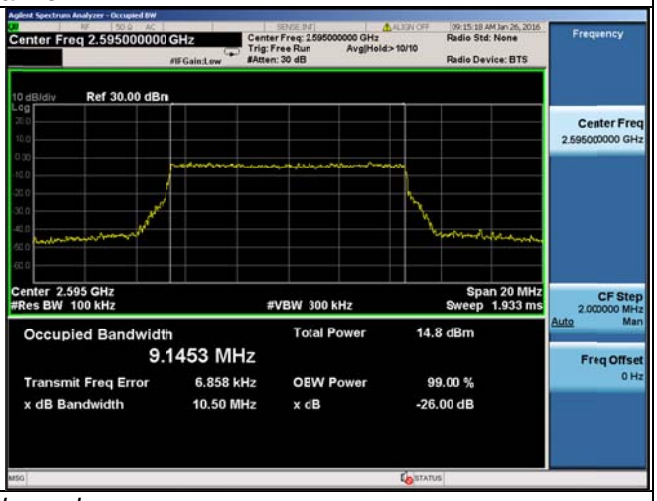
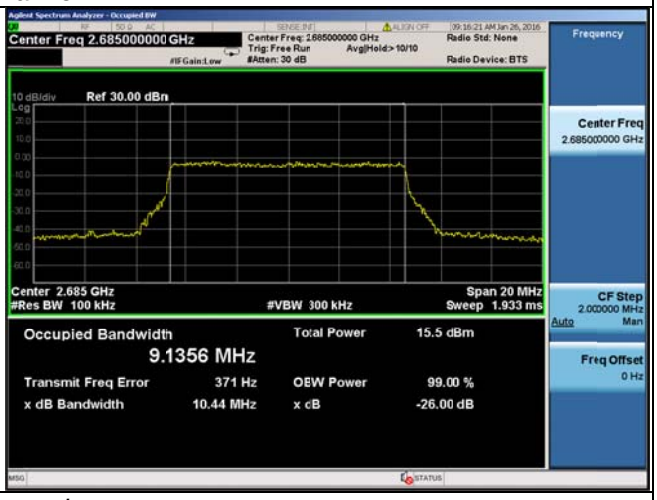
*10MHz Channel Bandwidth (*ANT 1)

QPSK	*16QAM*
	
Low Channel	
	
Middle Channel	
	
High Channel	

*7MHz Channel Bandwidth (*ANT 2)	
QPSK	*16QAM*
	
Low Channel	
	
Middle Channel	
	
High Channel	

*8.75MHz Channel Bandwidth (*ANT 2)

QPSK	*16QAM*
	
Low Channel	
	
Middle Channel	
	
High Channel	

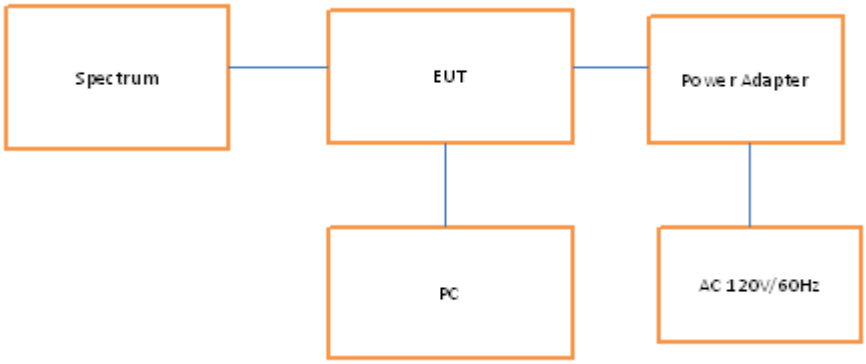
*10MHz Channel Bandwidth (*ANT 2)	
QPSK	*16QAM*
	
Low Channel	
	
Middle Channel	
	
High Channel	

4.4. Band Edge compliance

LIMIT

According to §27.53 (m): 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.

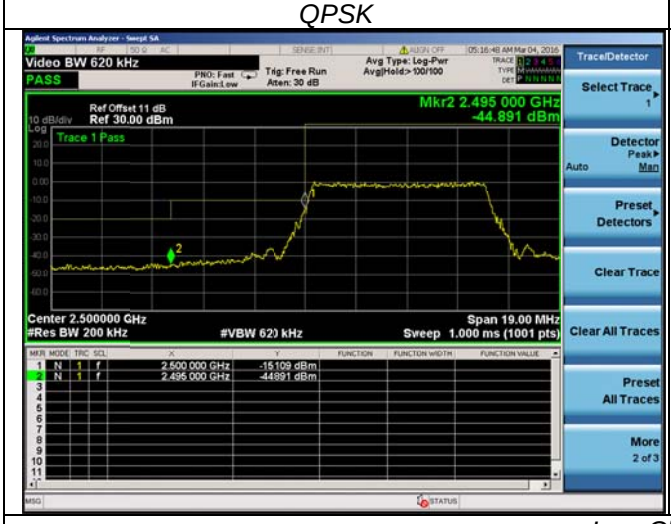
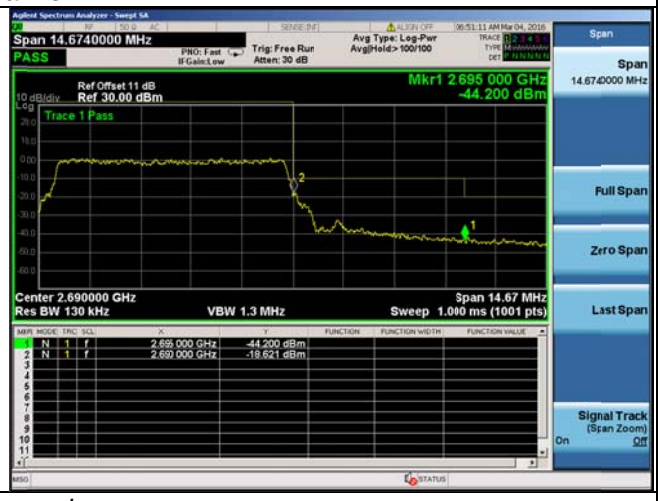
TEST CONFIGURATION

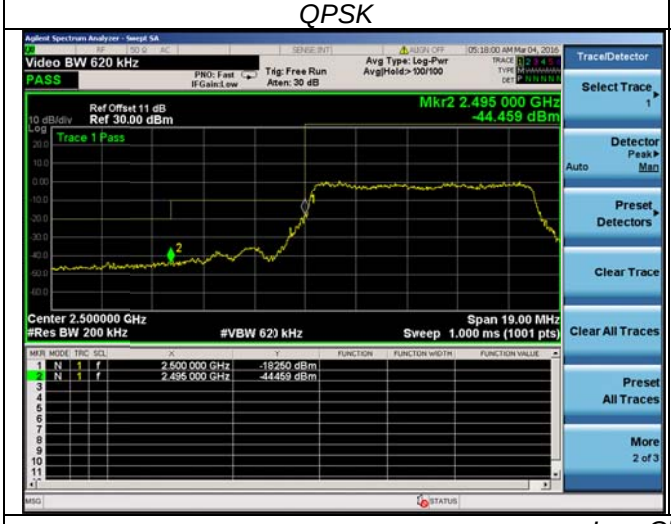


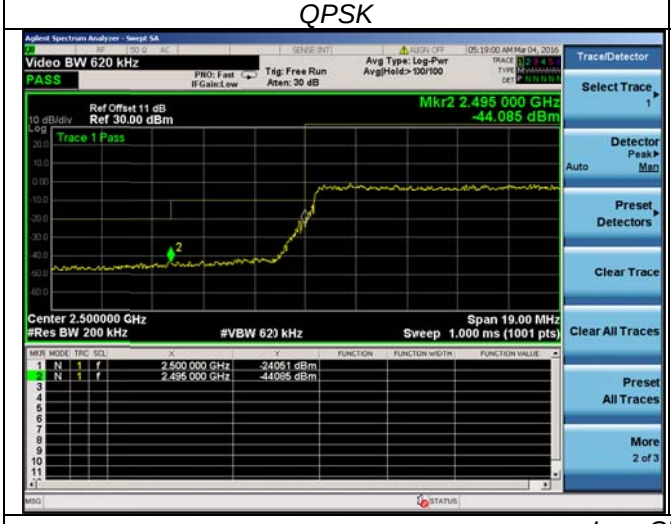
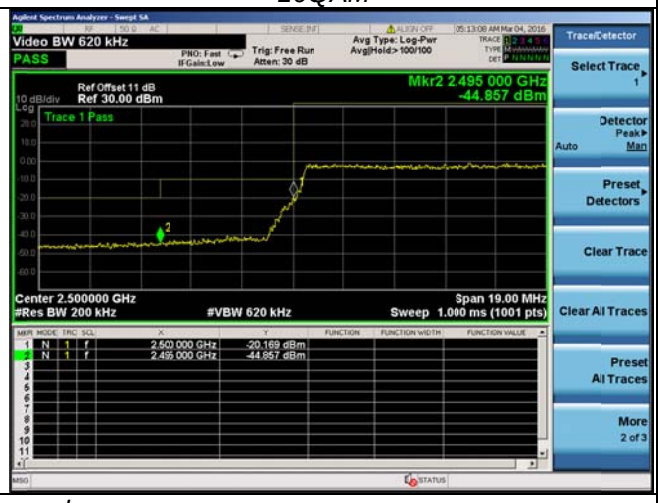
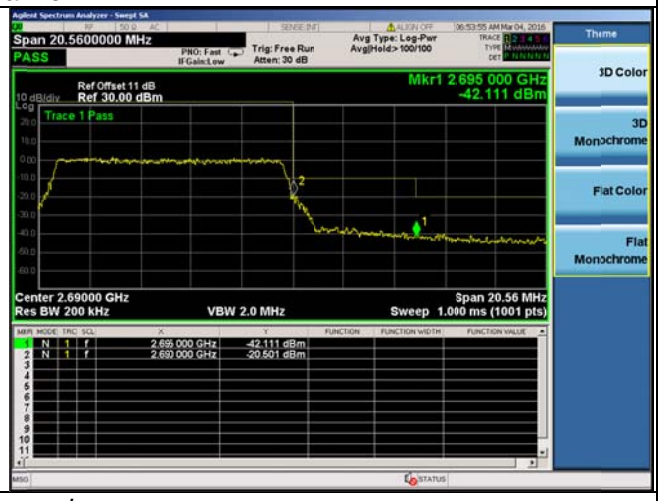
TEST PROCEDURE

1. Place the EUT on a bench and set it in transmitting mode by test software.
2. The RF output of EUT was connected to the spectrum by RF cable, the path loss was compensated to the results for each measurement.
3. Set EUT at maximum power by test software.
4. Select lowest and highest channels for each band and different modulation.
5. Measure Band edge using RMS (Average) detector by spectrum

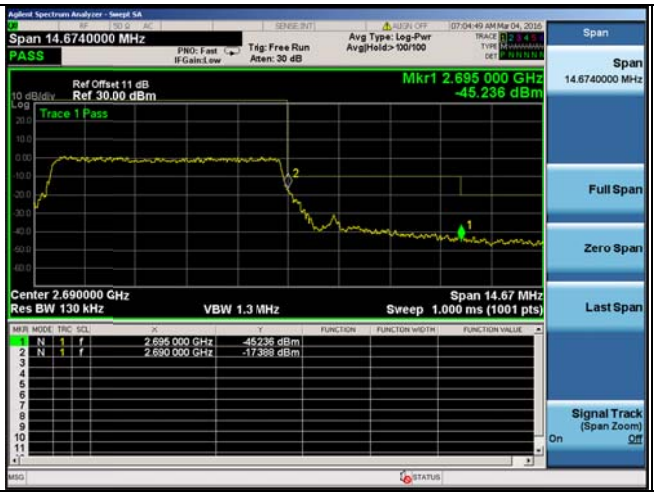
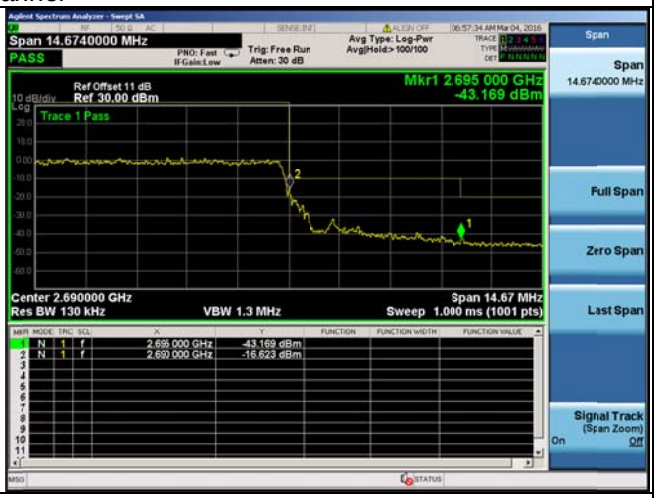
TEST RESULTS

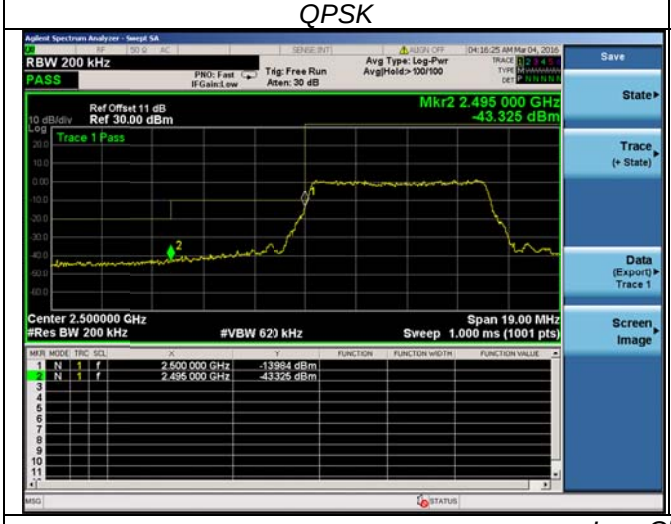
*7MHz Channel Bandwidth Band Edge Compliance (*ANT 1)	
QPSK	*16QAM*
	
Low Channel	
	
High Channel	

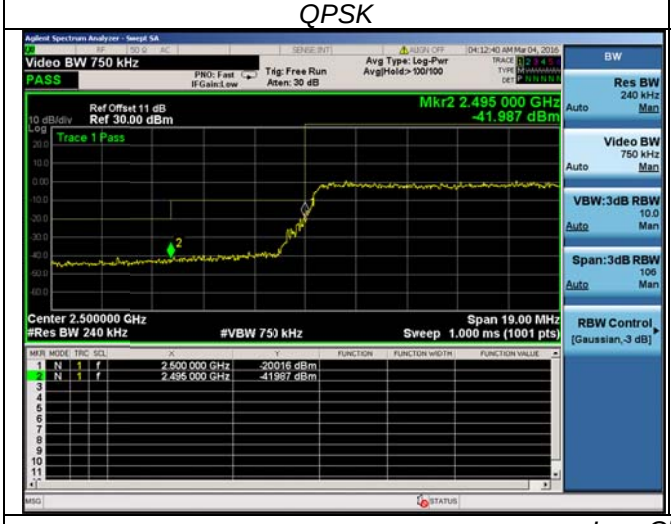
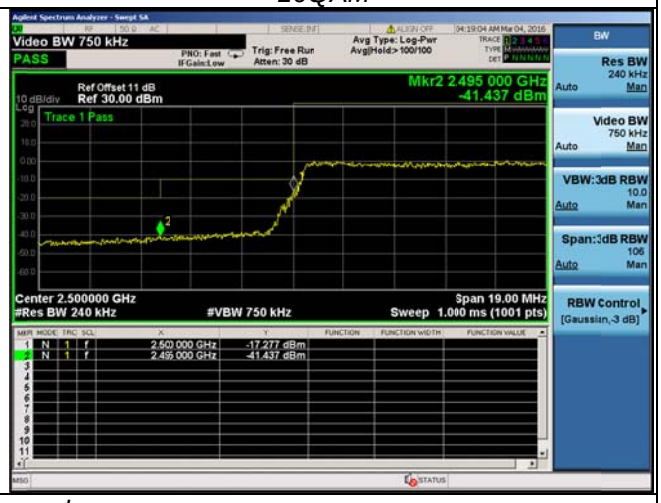
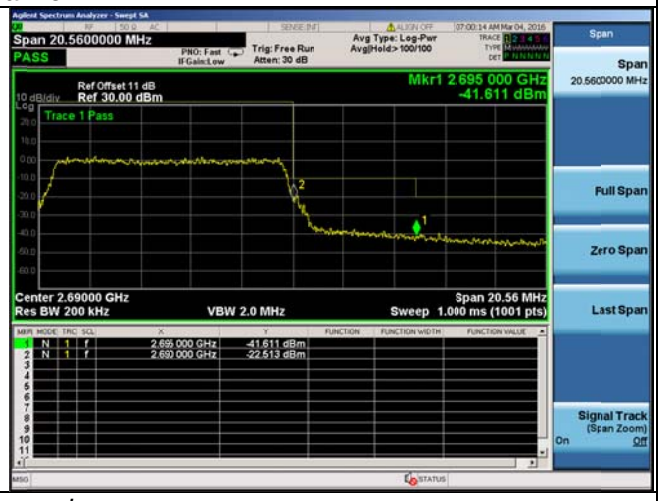
*8.75MHz Channel Bandwidth Band Edge Compliance (*ANT 1)	
QPSK	*16QAM*
	
Low Channel	
	
High Channel	

10MHz Channel Bandwidth Band Edge Compliance (ANT 1)	
QPSK	*16QAM*
	
Low Channel	
	
High Channel	

*7MHz Channel Bandwidth Band Edge Compliance (*ANT 2)

QPSK	*16QAM*
	
Low Channel	
	
High Channel	

*8.75MHz Channel Bandwidth Band Edge Compliance (*ANT 2)	
QPSK	*16QAM*
	
Low Channel	
	
High Channel	

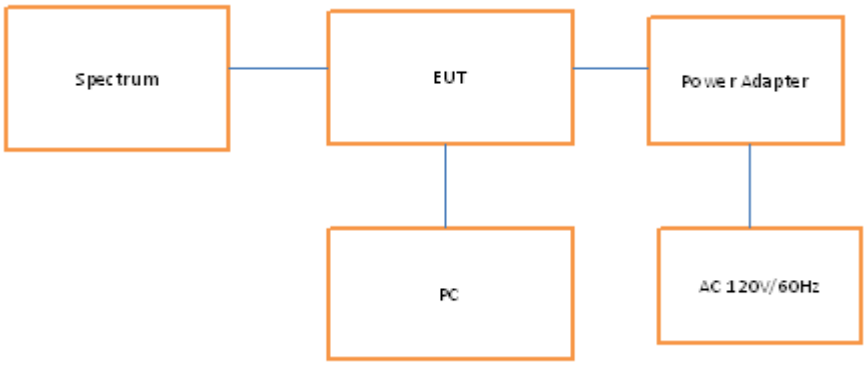
10MHz Channel Bandwidth Band Edge Compliance (ANT 2)	
QPSK	*16QAM*
	
Low Channel	
	
High Channel	

4.5. Spurious Emssion on Antenna Port

LIMIT

According to §27.53 (m): 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.

TEST CONFIGURATION



6. Place the EUT on a bench and set it in transmitting mode by test software.
7. The RF output of EUT was connected to the spectrum by RF cable, the path loss was compensated to the results for each measurement.
8. Set EUT at maximum power by test software.
9. Select lowest and highest channels for each band and different modulation.
10. Measure Band edge using RMS (Average) detector by spectrum

TEST PROCEDURE

The EUT was setup according to EIA/TIA 603D

a. Place the EUT on a bench and set it in transmitting mode by test software.
b. The RF output of EUT was connected to the spectrum by RF cable, the path loss was compensated to the results for each measurement.
c. Set EUT at maximum power by test software, then select a channel for testing.
d. Add a correction factor to the display of spectrum, and then test.
e. The resolution bandwidth of the spectrum analyzer was set sufficient scans were taken to show the out of band Emission if any up to10^{th} harmonic.
f. Please refer to following tables for test antenna conducted emissions.

Working Frequency	Sub range (GHz)	RBW	VBW	Sweep time (s)
2500-2690MHz	0.000009~0.000015	1KHz	3KHz	Auto
	0.000015~0.03	10KHz	30KHz	Auto
	0.03~30.0	1 MHz	3 MHz	Auto

TEST RESULTS

Note1: the Spurious Emssion of 26.5G-30G is Background noise(More 20dB less than Limit).So We do not record it.