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TEST REPORT

FCC Part 27

Report Reference No.: **CTL1706302041-WF07**

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Product Name: Android All Mode Wireless Module

Model/Type reference: M100-QVCX-2G16G

List Model(s): See next page

Trade Mark: Temolin

FCC ID: 2AM5I-TML-M100

Applicant's name: **Temolin Technology Co., Ltd**

Address of applicant: Room 311, Building B, No.125 TianShan Road West, ChangNing District, Shanghai City, China

Test Firm: **Shenzhen CTL Testing Technology Co., Ltd.**

Address of Test Firm: Floor 1-A, Baisha Technology Park, No.3011, Shahexi Road, Nanshan District, Shenzhen, China 518055

Test specification

Standard.....: **FCC CFR Title 47 Part 2, Part 27**
EIA/TIA 603-D: 2010
KDB 971168 D01

TRF Originator: Shenzhen CTL Testing Technology Co., Ltd.

Master TRF: Dated 2011-01

Date of Receipt: Jun. 23, 2017

Date of Test Date: Jun. 24, 2017–Jul. 11, 2017

Data of Issue: Jul. 12, 2017

Result: Pass

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TEST REPORT

Test Report No. :	CTL1706302041-WF07	Jul. 12, 2017
		Date of issue

Equipment under Test : Android All Mode Wireless Module

Model /Type : M100-QVCX-2G16G

Listed Models : M100-OVCX-1G8G, M100-OVCX-2G16G, M100-OVWX-1G8G, M100-OVWX-2G16G, M100-OVTX-1G8G, M100-OVTX-2G16G, M100-QVCX-1G8G, M100-QVCX-2G16G, M100-QVWX-1G8G, M100-QVWX-2G16G, M100-QVTX-1G8G, M100-QVTX-2G16G, M100-OWNX-1G8G, M100-OWNX-2G16G, M100-QWNX-1G8G, M100-QWNX-2G16G

Applicant : Temolin Technology Co., Ltd

Address : Room 311, Building B, No.125 TianShan Road West, ChangNing District, Shanghai City, China

Manufacturer : Temolin Technology Co., Ltd

Address : Room 311, Building B, No.125 TianShan Road West, ChangNing District, Shanghai City, China

Test result	Pass *
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*In the configuration tested, the EUT complied with the standards specified page 5.

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

**** Modified History ****

Revisions	Description	Issued Data	Report No.	Remark
Version 1.0	Initial Test Report Release	2017-07-12	CTL1706302041-WF07	Tracy Qi



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1 SUMMARY

1.1 TEST STANDARDS

The tests were performed according to following standards:

[FCC Part 27](#) : MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES

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

[FCC Part 2](#): FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS

[KDB971168 D01: v02r02](#) MEASUREMENT GUIDANCE FOR CERTIFICATION OF LICENSED DIGITAL TRANSMITTERS

[ANSI C63.26-2015](#) American National Standard for Compliance Testing of Transmitters Used in Licensed Radio

[ANSI C63.4: 2014](#): –American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40GHz

Range of 9 kHz to 40GHz

1.2 Test Description

Test Item	Section in CFR 47	Result
RF Output Power	Part 2.1046 Part 27.50(h)(2)	Pass
Peak-to-Average Ratio	Part 27.50(a)	Pass
99% & -26 dB Occupied Bandwidth	Part 2.1049 Part 27.53(m)	Pass
Spurious Emissions at Antenna Terminal	Part 2.1051 Part 27.53(m)	Pass
Field Strength of Spurious Radiation	Part 2.1053 Part 27.53(m)	Pass
Out of band emission, Band Edge	Part 2.1051 Part 27.53(m)	Pass
Frequency stability	Part 2.1055 Part 27.54	Pass

1.3 Test Facility

1.3.1 Address of the test laboratory

Shenzhen CTL Testing Technology Co., Ltd.

Floor 1-A, Baisha Technology Park, No. 3011, Shahexi Road, Nanshan, Shenzhen 518055 China

There is one 3m semi-anechoic chamber and two line conducted labs for final test. The Test Sites meet the requirements in documents ANSI C63.4 and CISPR 32/EN 55032 requirements.

1.3.2 Laboratory accreditation

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

IC Registration No.: 9618B

The 3m alternate test site of Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration No.: 9618B on November 13, 2013.

FCC-Registration No.: 970318

Shenzhen CTL Testing Technology 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. Registration 970318, December 19, 2013.

1.4 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen CTL Testing Technology Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for CTL laboratory is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.10dB	(1)
Radiated Emission	Above 1GHz	4.32dB	(1)
Conducted Disturbance	0.15~30MHz	3.20dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

2 GENERAL INFORMATION

2.1 Environmental conditions

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

Normal Temperature:	25°C
Relative Humidity:	55 %
Air Pressure:	101 kPa

2.2 General Description of EUT

Product Name:	Android All Mode Wireless Module
Model/Type reference:	M100-QVCX-2G16G
Power supply:	DC 3.3V from host device
LTE	
Operation Band:	FDD-LTE: Band 2/4/5/7 TDD-LTE: Band 41
Modulation Type:	QPSK, 16QAM
Release Version:	Release 9
Category:	Cat 4
Antenna Type:	FPC antenna

Note: For more details, refer to the user's manual of the EUT.

2.3 Description of Test Modes

The EUT has been tested under typical operating condition. The CMW500 used to control the EUT staying in continuous transmitting and receiving mode for testing. Regards to the frequency band operation: the lowest, middle and highest frequency of channel were selected to perform the test, then shown on this report.

2.4 Equipments Used during the Test

Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
Bilog Antenna	Sunol Sciences Corp.	JB1	A061713	2017/06/02	2018/06/01
Bilog Antenna	Sunol Sciences Corp.	JB1	A061714	2017/06/02	2018/06/01
EMI Test Receiver	R&S	ESCI	103710	2017/06/02	2018/06/01
Spectrum Analyzer	Agilent	E4407B	MY41440676	2017/05/21	2018/05/20
Spectrum Analyzer	Agilent	N9020	US46220290	2017/01/16	2018/01/17
Controller	EM Electronics	Controller EM 1000	N/A	2017/05/21	2018/05/20
Horn Antenna	Sunol Sciences Corp.	DRH-118	A062013	2017/05/19	2018/05/18
Horn Antenna	Sunol Sciences Corp.	DRH-118	A062014	2017/05/19	2018/05/18
Active Loop Antenna	SCHWARZBECK	FMZB1519	1519-037	2017/05/19	2018/05/18
Amplifier	Agilent	8349B	3008A02306	2017/05/19	2018/05/18
Amplifier	Agilent	8447D	2944A10176	2017/05/19	2018/05/18
Temperature/Humidity Meter	Gangxing	CTH-608	02	2017/05/20	2018/05/19
Wideband Radio Communication Tester	R&S	CMW500	101814	2016/11/21	2017/11/20
High-Pass Filter	K&L	9SH10-2700/X12750-O/O	N/A	2017/05/20	2018/05/19

High-Pass Filter	K&L	41H10-1375/U12750-O/O	N/A	2017/05/20	2018/05/19
RF Cable	HUBER+SUHNER	RG214	N/A	2017/06/02	2018/06/01
Climate Chamber	ESPEC	EL-10KA	A20120523	2017/05/19	2018/05/18
SIGNAL GENERATOR	Agilent	E4421B	US40051744	2017/05/19	2018/05/18
Directional Coupler	Agilent	87300B	3116A03638	2017/05/19	2018/05/18

2.5 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended to comply with of the Part 27 Rules.

2.6 Modifications

No modifications were implemented to meet testing criteria.



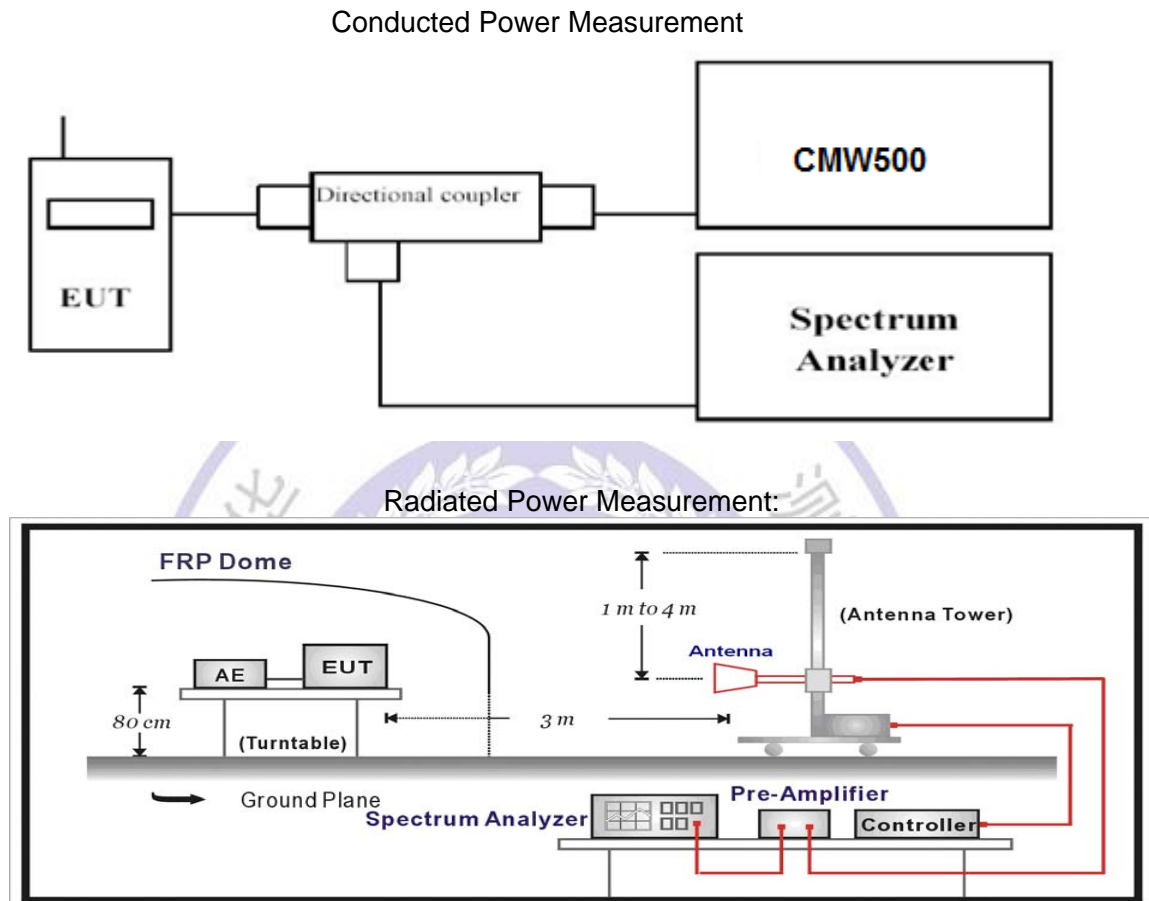
3 TEST CONDITIONS AND RESULTS

3.1 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

The EUT was setup according to EIA/TIA 603D

Conducted Power Measurement:

- Place the EUT on a bench and set it in transmitting mode.
- Connect a low loss RF cable from the antenna port to a spectrum analyzer and CMW500 by a Directional Couple.
- EUT Communicate with CMW500, then select a channel for testing.
- Add a correction factor to the display of spectrum, and then test.

Radiated Power Measurement:

- The EUT shall be placed at the specified height on a support, and in the position closest to normal use as declared by provider.
- The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter
- The output of the test antenna shall be connected to the measuring receiver.
- The transmitter shall be switched on and the measuring receiver shall be tuned to the frequency of the transmitter under test.
- The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
- The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.

- g. The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
- h. The maximum signal level detected by the measuring receiver shall be noted.
- i. The transmitter shall be replaced by a substitution antenna.
- j. The substitution antenna shall be orientated for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.
- k. The substitution antenna shall be connected to a calibrated signal generator.
- l. If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
- m. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
- n. The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.
- o. The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.
- p. The measure of the effective radiated power is the larger of the two levels recorded at the input to the substitution antenna, corrected for gain of the substitution antenna if necessary.
- q. Test site anechoic chamber refer to ANSI C63.4.

TEST RESULTS

Conducted Measurement:

LTE TDD Band 41				
TX Channel Bandwidth	RB Size/Offset	Frequency (MHz)	Average Power [dBm]	
			QPSK	16QAM
5 MHz	1 RB low	2498.5	23.31	22.58
		2593.0	23.34	22.51
		2687.5	23.25	22.78
	1 RB high	2498.5	22.32	21.78
		2593.0	23.44	22.97
		2687.5	22.65	22.19
	50% RB mid	2498.5	21.98	21.47
		2593.0	22.47	22.08
		2687.5	22.87	22.27
	100% RB	2498.5	21.51	21.07
		2593.0	22.84	22.00
		2687.5	22.44	21.69
10 MHz	1 RB low	2501.0	23.04	22.19
		2593.0	21.69	21.11
		2685.0	22.51	22.02
	1 RB high	2501.0	22.59	21.76
		2593.0	22.62	21.95
		2685.0	22.98	22.32
	50% RB mid	2501.0	22.23	21.74
		2593.0	22.20	21.78
		2685.0	21.79	21.41
	100% RB	2501.0	23.12	22.71
		2593.0	22.02	21.48
		2685.0	22.43	21.63
15 MHz	1 RB low	2503.5	22.06	21.42
		2593.0	23.39	22.68
		2682.5	22.67	22.24
	1 RB high	2503.5	22.19	21.61
		2593.0	22.21	21.45
		2682.5	22.27	21.91
	50% RB mid	2503.5	22.95	22.17
		2593.0	22.14	21.59
		2682.5	21.52	20.83
	100% RB	2503.5	22.78	22.01
		2593.0	22.05	21.60
		2682.5	21.51	21.11

20 MHz	1 RB low	2506.0	21.96	21.25
		2593.0	22.02	21.45
		2680.0	22.61	21.97
	1 RB high	2506.0	23.12	22.47
		2593.0	23.32	22.75
		2680.0	22.07	21.53
	50% RB mid	2506.0	23.21	22.75
		2593.0	23.04	22.30
		2680.0	23.31	22.73
	100% RB	2506.0	22.90	22.20
		2593.0	23.44	22.65
		2680.0	22.48	21.79



Radiated Measurement:*Remark:*

1. We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE FDD Band 41; recorded worst case for each Channel Bandwidth of LTE FDD Band 41.
2. $EIRP = P_{Mea}(dBm) - P_{cl}(dB) + P_{Ag}(dB) + G_a(dBi)$

LTE TDD Band 41_Channel Bandwidth 5MHz_QPSK

Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	G _a Antenna Gain(dB)	P _{Ag} (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2498.5	-20.04	3.65	10.77	34.50	21.58	33.01	11.43	V
2593.0	-19.97	3.71	11.10	34.44	21.86	33.01	11.15	V
2687.5	-20.05	3.78	11.05	34.40	21.62	33.01	11.39	V

LTE TDD Band 41_Channel Bandwidth 10MHz_QPSK

Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	G _a Antenna Gain(dB)	P _{Ag} (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2501.0	-20.30	3.65	10.77	34.50	21.32	33.01	11.69	V
2593.0	-20.42	3.71	11.10	34.44	21.41	33.01	11.60	V
2685.0	-20.42	3.78	11.05	34.40	21.25	33.01	11.76	V

LTE TDD Band 41_Channel Bandwidth 15MHz_QPSK

Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	G _a Antenna Gain(dB)	P _{Ag} (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2503.5	-20.64	3.65	10.77	34.50	20.98	33.01	12.03	V
2593.0	-20.38	3.71	11.10	34.44	21.45	33.01	11.56	V
2682.5	-19.81	3.78	11.05	34.40	21.86	33.01	11.15	V

LTE TDD Band 41_Channel Bandwidth 20MHz_QPSK

Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	G _a Antenna Gain(dB)	P _{Ag} (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2506.0	-20.50	3.65	10.77	34.50	21.12	33.01	11.89	V
2593.0	-20.61	3.71	11.10	34.44	21.22	33.01	11.79	V
2680.0	-20.51	3.78	11.05	34.40	21.16	33.01	11.85	V

LTE TDD Band 41_Channel Bandwidth 5MHz_16QAM

Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	G _a Antenna Gain(dB)	P _{Ag} (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2498.5	-20.64	3.65	10.77	34.50	20.98	33.01	12.03	V
2593.0	-20.80	3.71	11.10	34.44	21.03	33.01	11.98	V
2687.5	-20.53	3.78	11.05	34.40	21.14	33.01	11.87	V

LTE TDD Band 41_Channel Bandwidth 10MHz_16QAM

Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	G _a Antenna Gain(dB)	P _{Ag} (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2501.0	-20.76	3.65	10.77	34.50	20.86	33.01	12.15	V
2593.0	-20.62	3.71	11.10	34.44	21.21	33.01	11.80	V
2685.0	-20.52	3.78	11.05	34.40	21.15	33.01	11.86	V

LTE TDD Band 41_Channel Bandwidth 15MHz_16QAM

Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	G _a Antenna Gain(dB)	P _{Ag} (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2503.5	-20.58	3.65	10.77	34.50	21.04	33.01	11.97	V
2593.0	-20.97	3.71	11.10	34.44	20.86	33.01	12.15	V
2682.5	-20.55	3.78	11.05	34.40	21.12	33.01	11.89	V

LTE TDD Band 41_Channel Bandwidth 20MHz_16QAM

Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	G _a Antenna Gain(dB)	P _{Ag} (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2506.0	-20.56	3.65	10.77	34.50	21.06	33.01	11.95	V
2593.0	-20.84	3.71	11.10	34.44	20.99	33.01	12.02	V
2680.0	-20.51	3.78	11.05	34.40	21.16	33.01	11.85	V

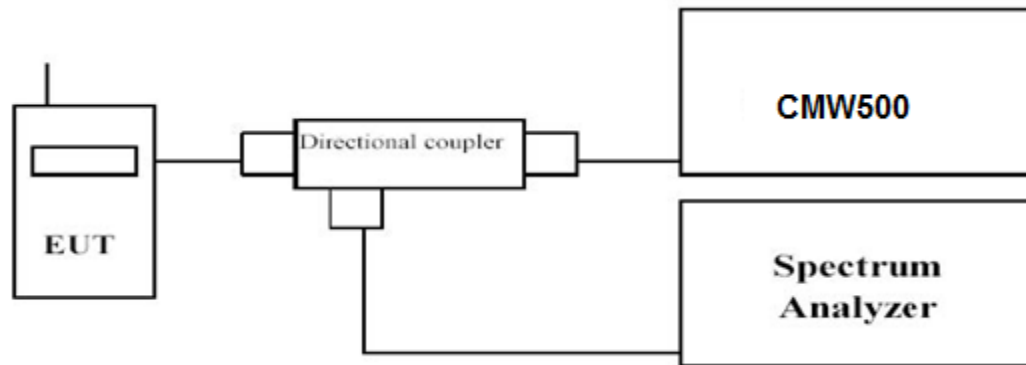


3.2 Peak-to-Average Ratio (PAR)

LIMIT

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

TEST CONFIGURATION



TEST PROCEDURE

According to KDB971168 D01 Power Meas License Digital Systems v02r02: Use one of the procedures presented in 4.1 to measure the total peak power and record as P_{Pk}. Use one of the applicable procedures presented 4.2 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:

$$\text{PAPR (dB)} = P_{\text{Pk}} \text{ (dBm)} - P_{\text{Avg}} \text{ (dBm)}.$$

TEST RESULTS

Remark:

1. We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE TDD Band 41; recorded worst case for each Channel Bandwidth of LTE FDD Band 41.

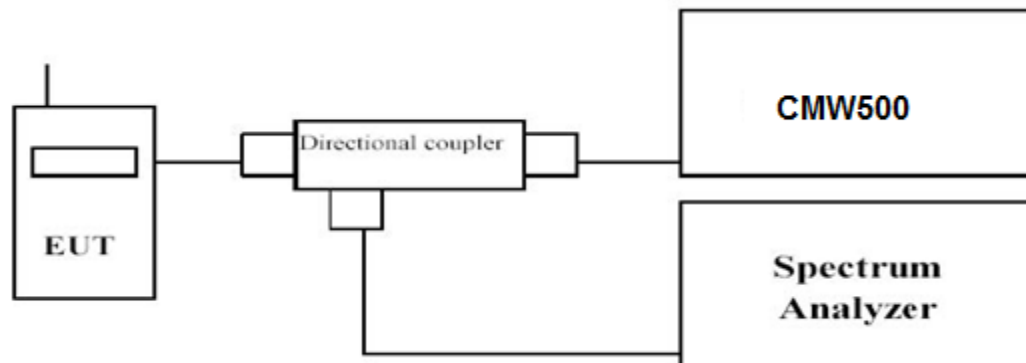
LTE TDD Band 41				
TX Channel Bandwidth	Frequency (MHz)	RB Size/Offset	PAPR (dB)	
			QPSK	16QAM
5 MHz	2498.5	1RB#0	6.23	7.98
	2593.0		7.54	8.56
	2687.5		7.26	8.10
10 MHz	2501.0	1RB#0	6.48	7.44
	2593.0		7.56	8.53
	2685.0		8.14	7.33
15 MHz	2503.5	1RB#0	5.25	7.12
	2593.0		6.33	7.56
	2682.5		5.45	6.45
20 MHz	2506.0	1RB#0	6.52	6.66
	2593.0		7.57	8.41
	2680.0		6.26	7.25

3.3 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 \geq 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

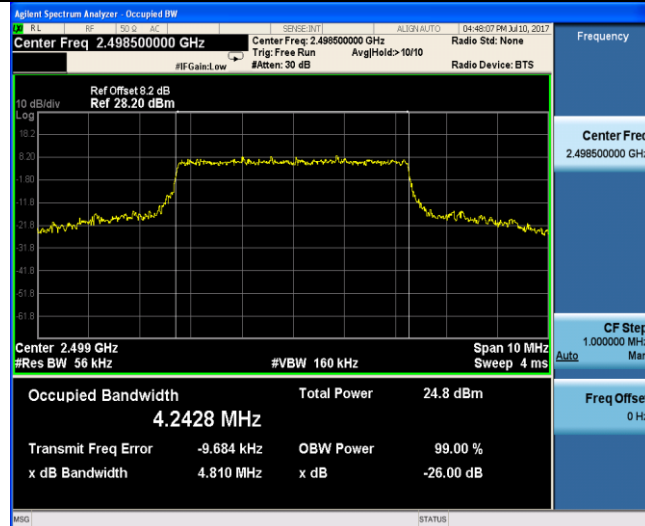
Remark:

1. We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE TDD Band 41; recorded worst case for each Channel Bandwidth of LTE TDD Band 41.

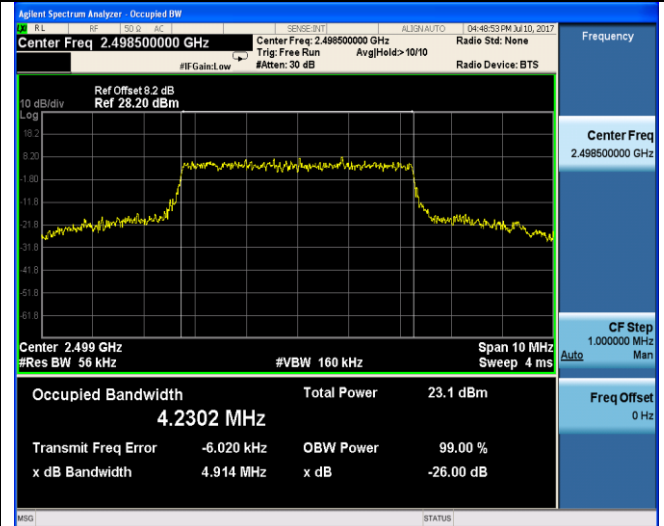
LTE TDD Band 41						
TX Channel Bandwidth	RB Size/Offset	Frequency (MHz)	-26dBc Emission bandwidth (MHz)		99% Occupied bandwidth (MHz)	
			QPSK	16QAM	QPSK	16QAM
5 MHz	25RB#0	2498.5	4.810	4.914	4.2428	4.2302
		2593.0	4.599	4.770	4.2288	4.2048
		2687.5	4.997	4.942	4.2350	4.2256
10 MHz	50RB#0	2501.0	9.969	9.377	8.9715	8.9851
		2593.0	9.993	9.644	9.0047	8.9848
		2685.0	9.679	9.911	8.9941	8.9799
15 MHz	75RB#0	2503.5	14.28	14.52	13.220	13.289
		2593.0	14.82	14.79	13.156	13.106
		2682.5	17.87	17.84	13.221	13.110
20 MHz	100RB#0	2506.0	19.88	19.93	17.932	17.950
		2593.0	19.77	19.79	17.935	17.890
		2680.0	19.89	19.43	17.911	17.109

LTE TDD Band 41-5MHz Channel Bandwidth

QPSK



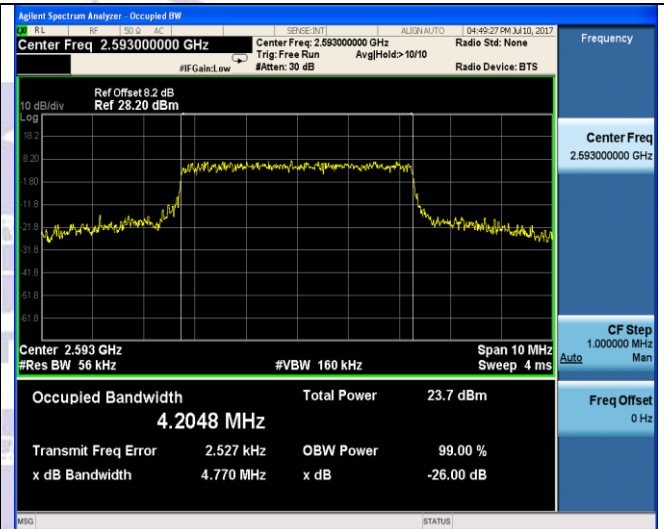
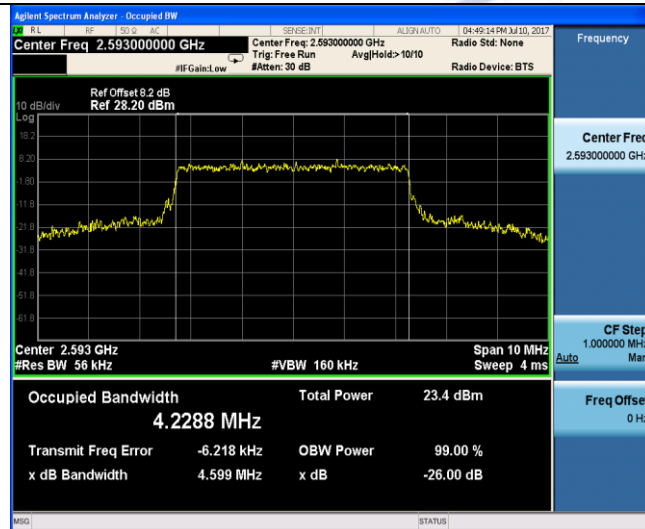
16QAM



25RB#0

25RB#0

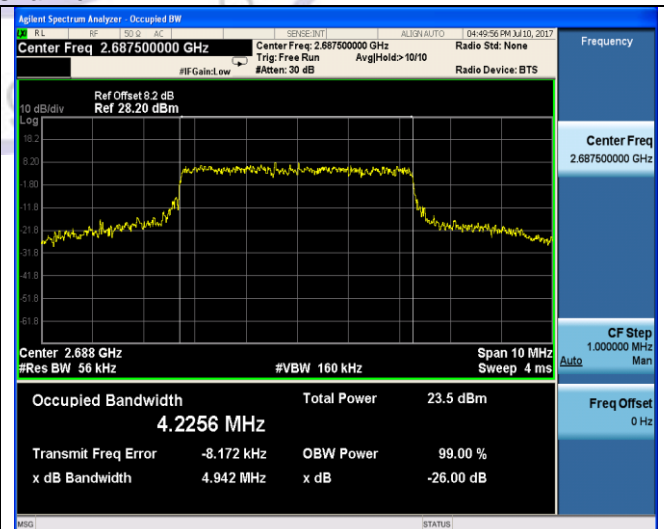
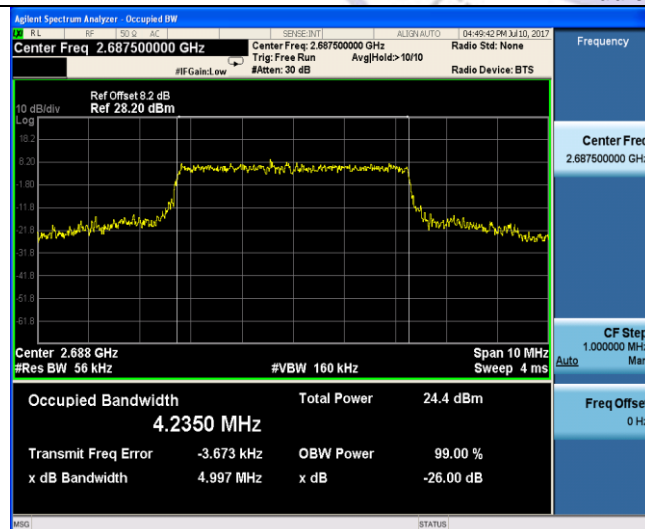
Low Channel



25RB#0

25RB#0

Middle Channel



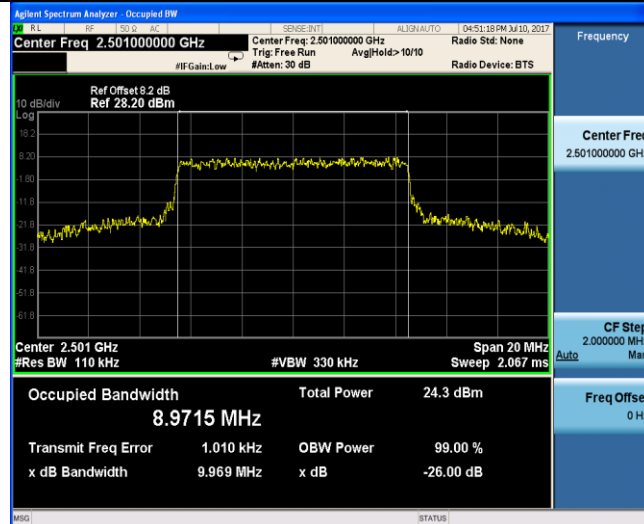
25RB#0

25RB#0

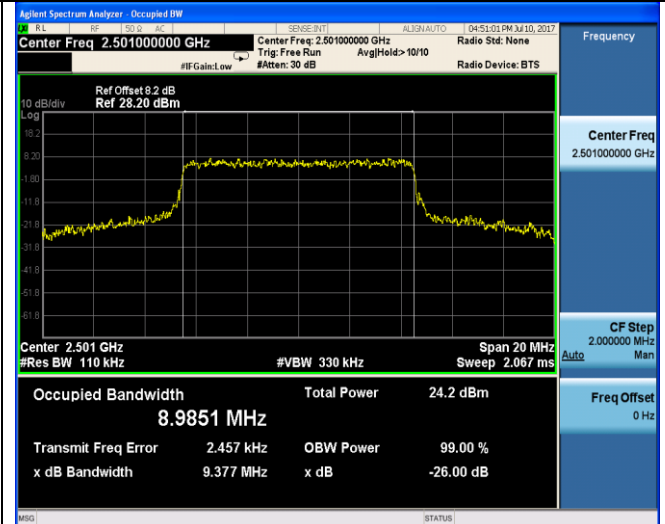
High Channel

LTE TDD Band 41-10MHz Channel Bandwidth

QPSK



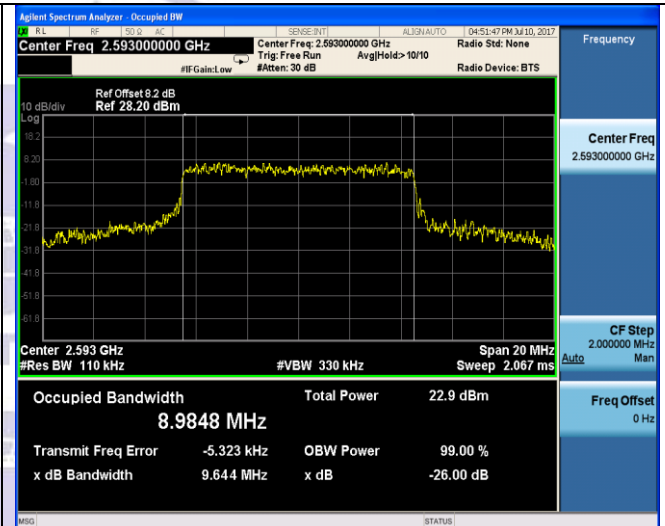
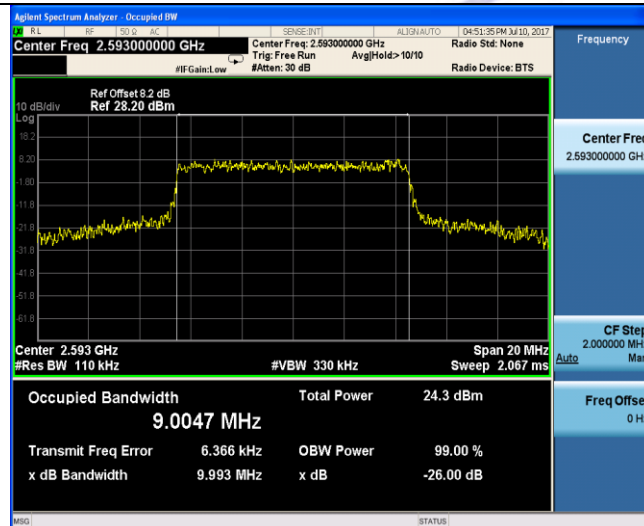
16QAM



50RB#0

50RB#0

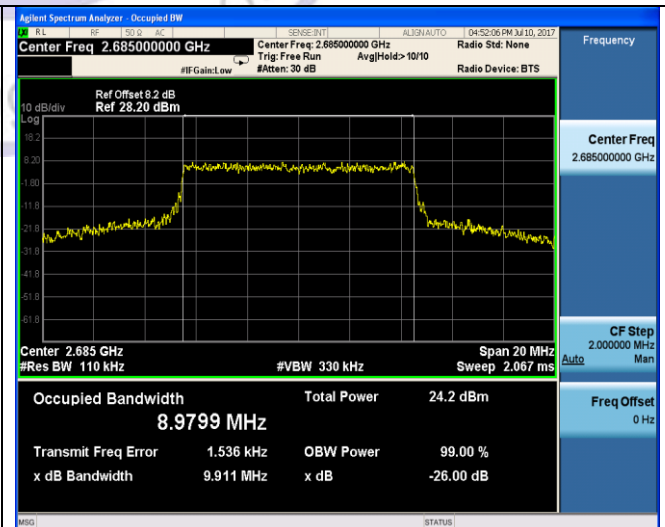
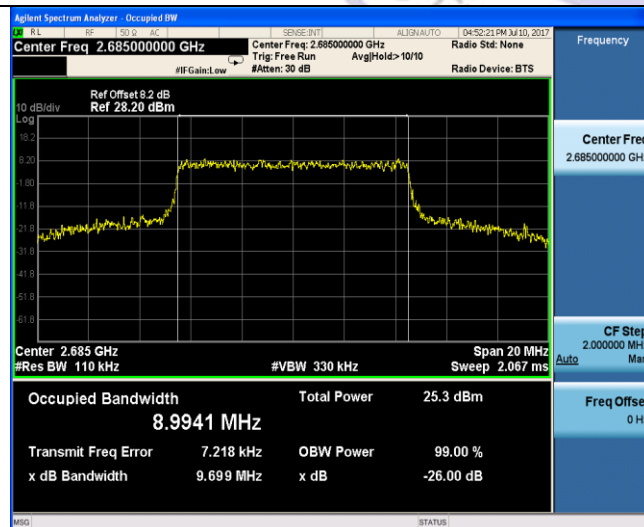
Low Channel



50RB#0

50RB#0

Middle Channel



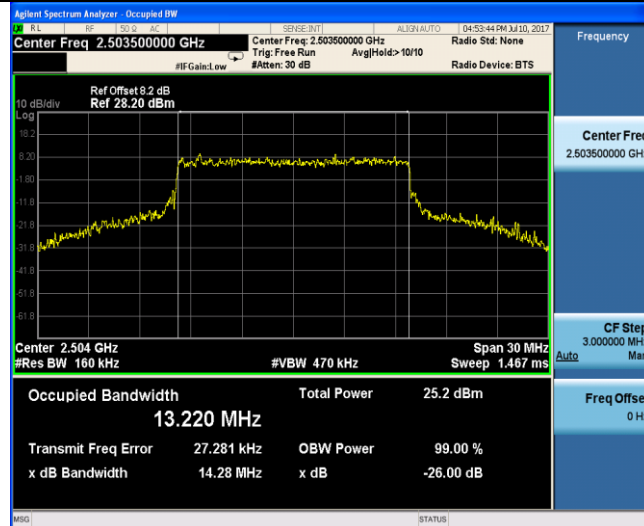
50RB#0

50RB#0

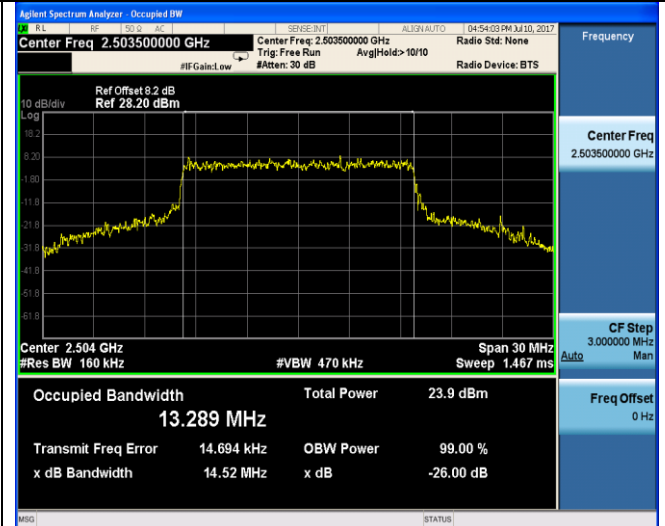
High Channel

LTE TDD Band 41-15MHz Channel Bandwidth

QPSK



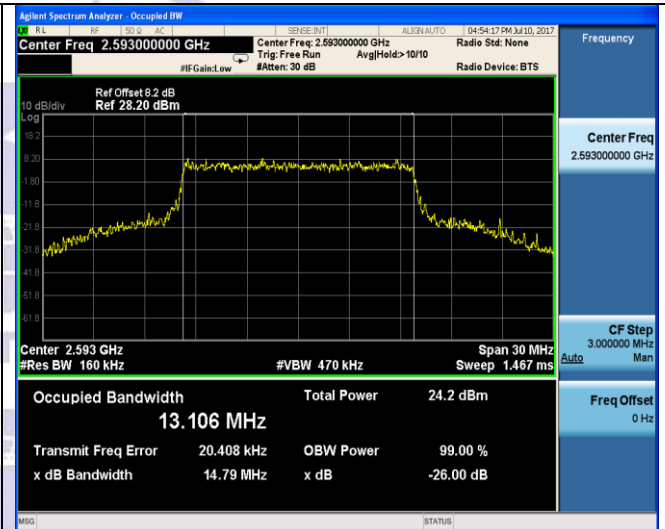
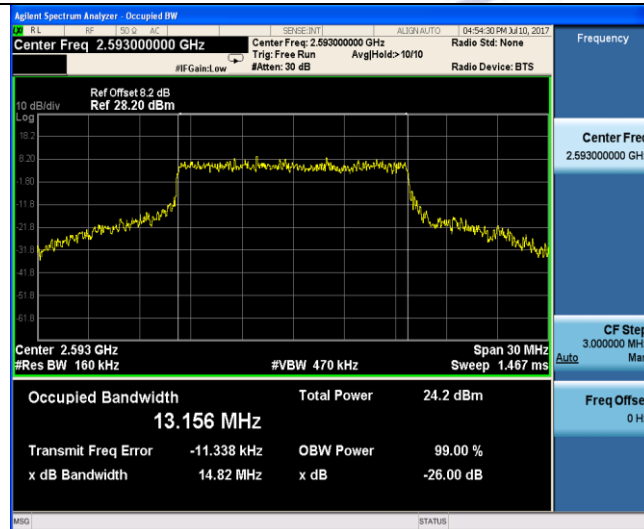
16QAM



75RB#0

75RB#0

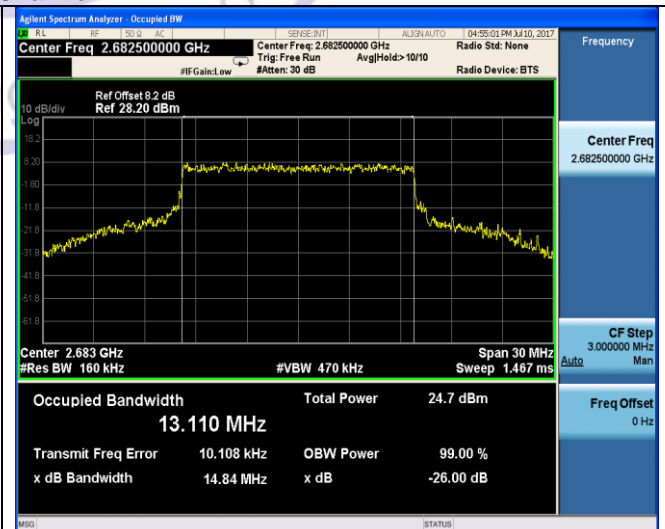
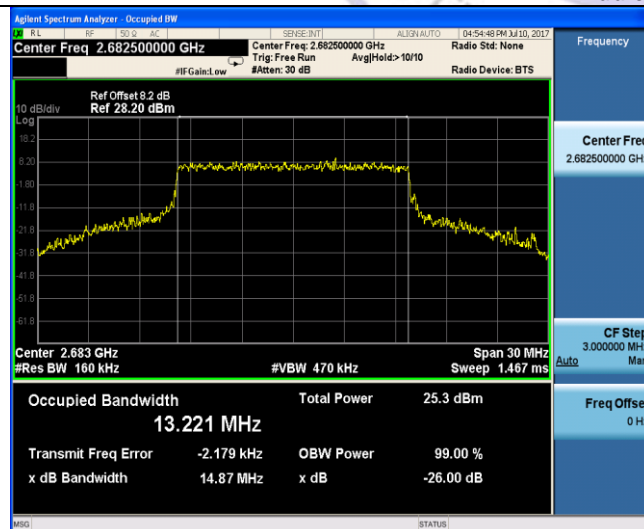
Low Channel



75RB#0

75RB#0

Middle Channel



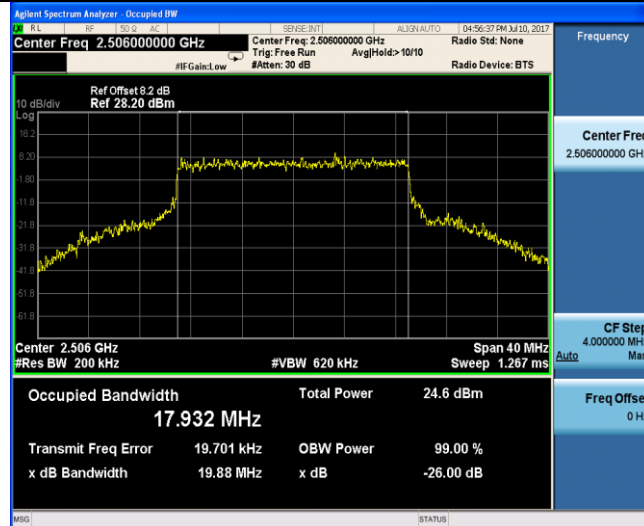
75RB#0

75RB#0

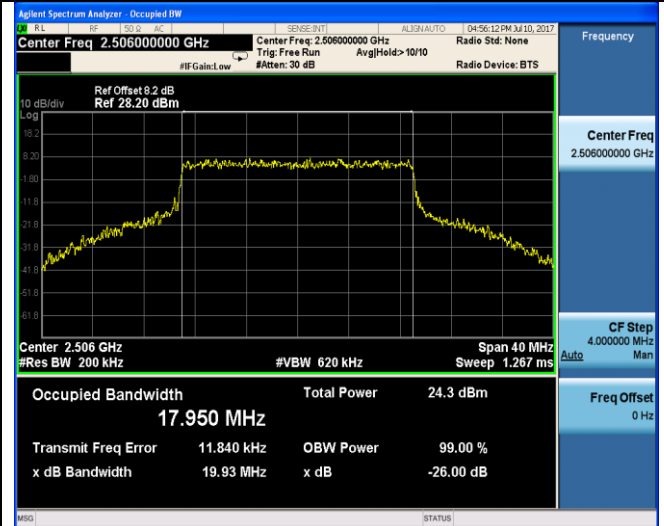
High Channel

LTE TDD Band 41-20MHz Channel Bandwidth

QPSK



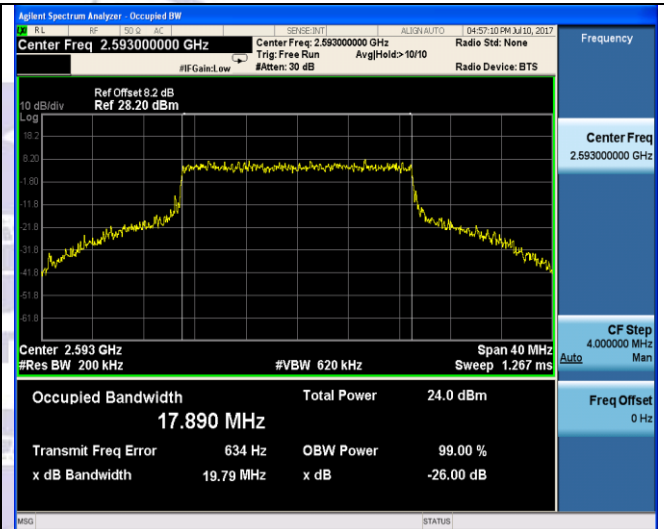
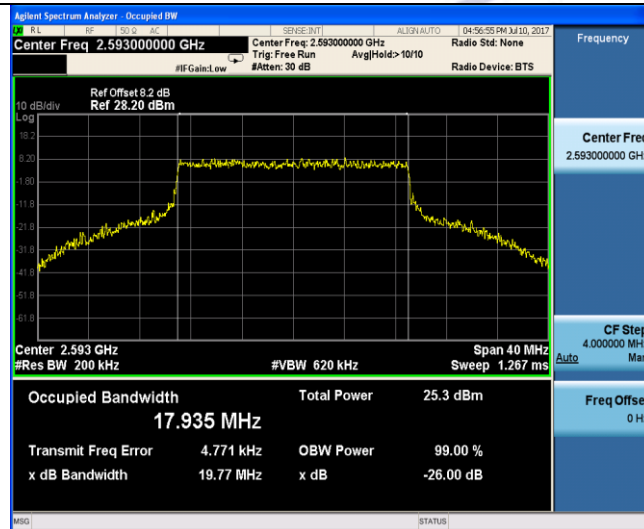
16QAM



100RB#0

100RB#0

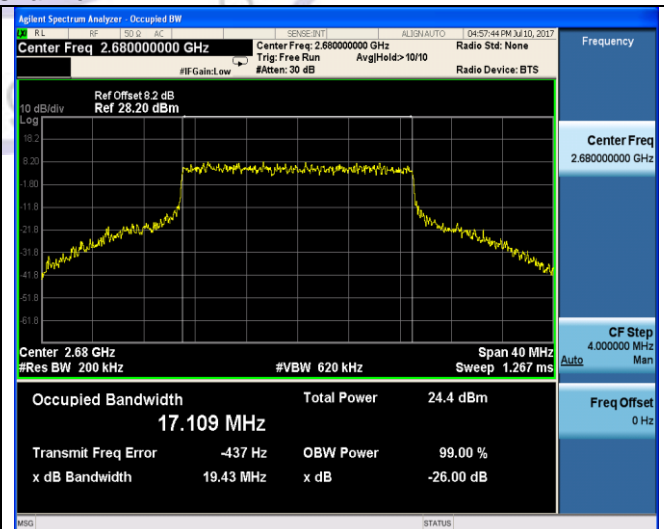
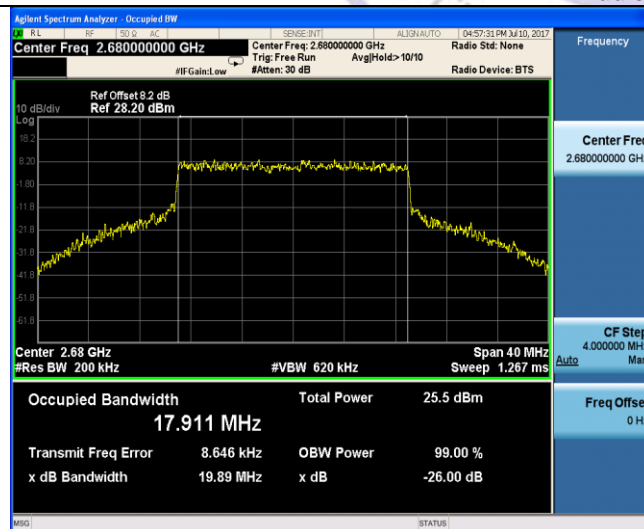
Low Channel



100RB#0

100RB#0

Middle Channel



100RB#0

100RB#0

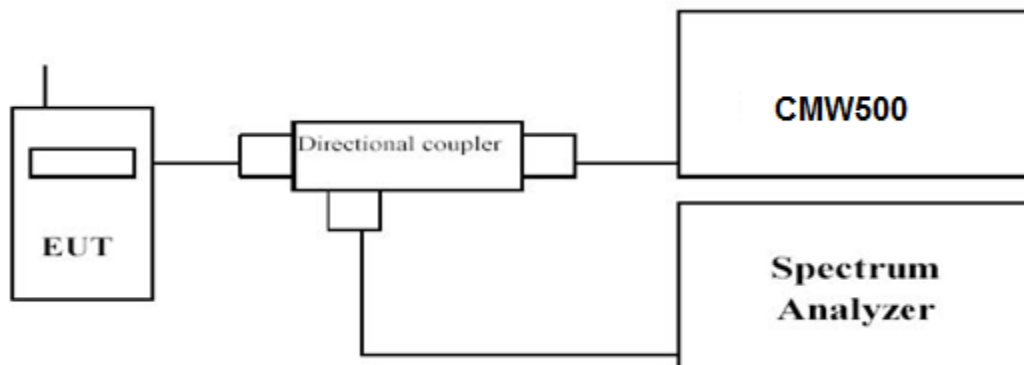
High Channel

3.4 Band Edge compliance

LIMIT

According to Part 27.83(m)(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 than $43 + 10 \log (P)$ 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. The transmitter output port was connected to base station.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator, the path loss was compensated to the results for each measurement.
3. Set EUT at maximum power through base station.
4. Select lowest and highest channels for each band and different modulation.
5. Measure Band edge using RMS (Average) detector by spectrum

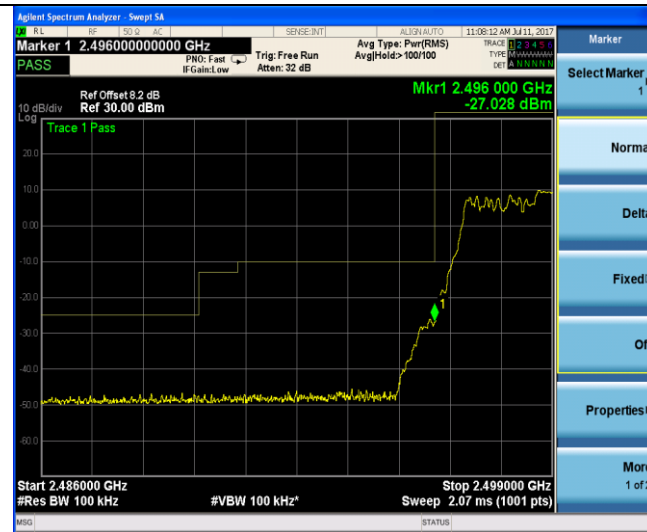
TEST RESULTS

Remark:

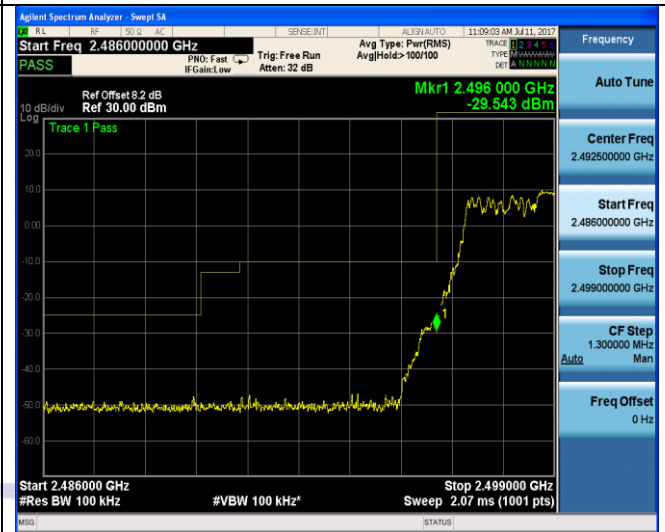
1. We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE TDD Band 41; recorded worst case for each Channel Bandwidth of LTE TDD Band 41.

LTE TDD Band 41-5MHz Channel Bandwidth Band Edge Compliance

QPSK



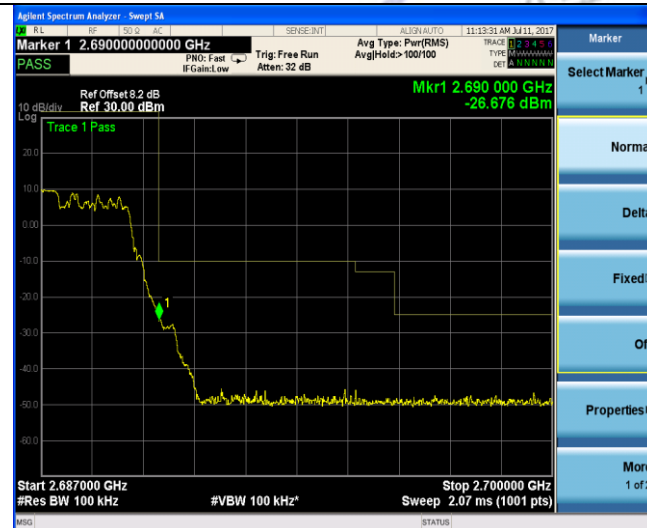
16QAM



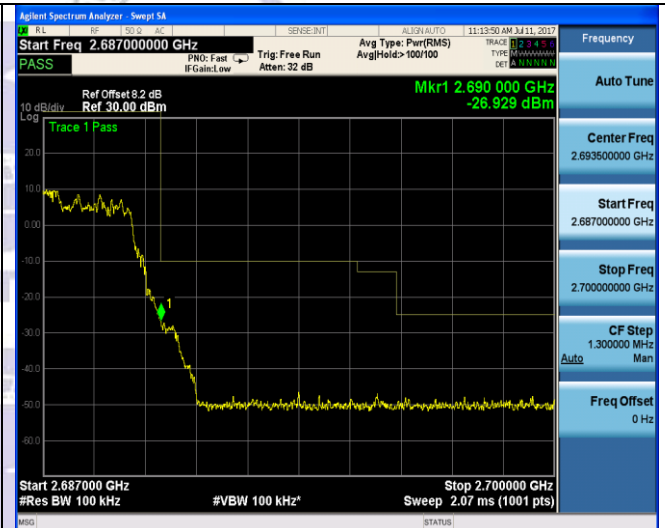
1RB#0

1RB#0

Low Channel

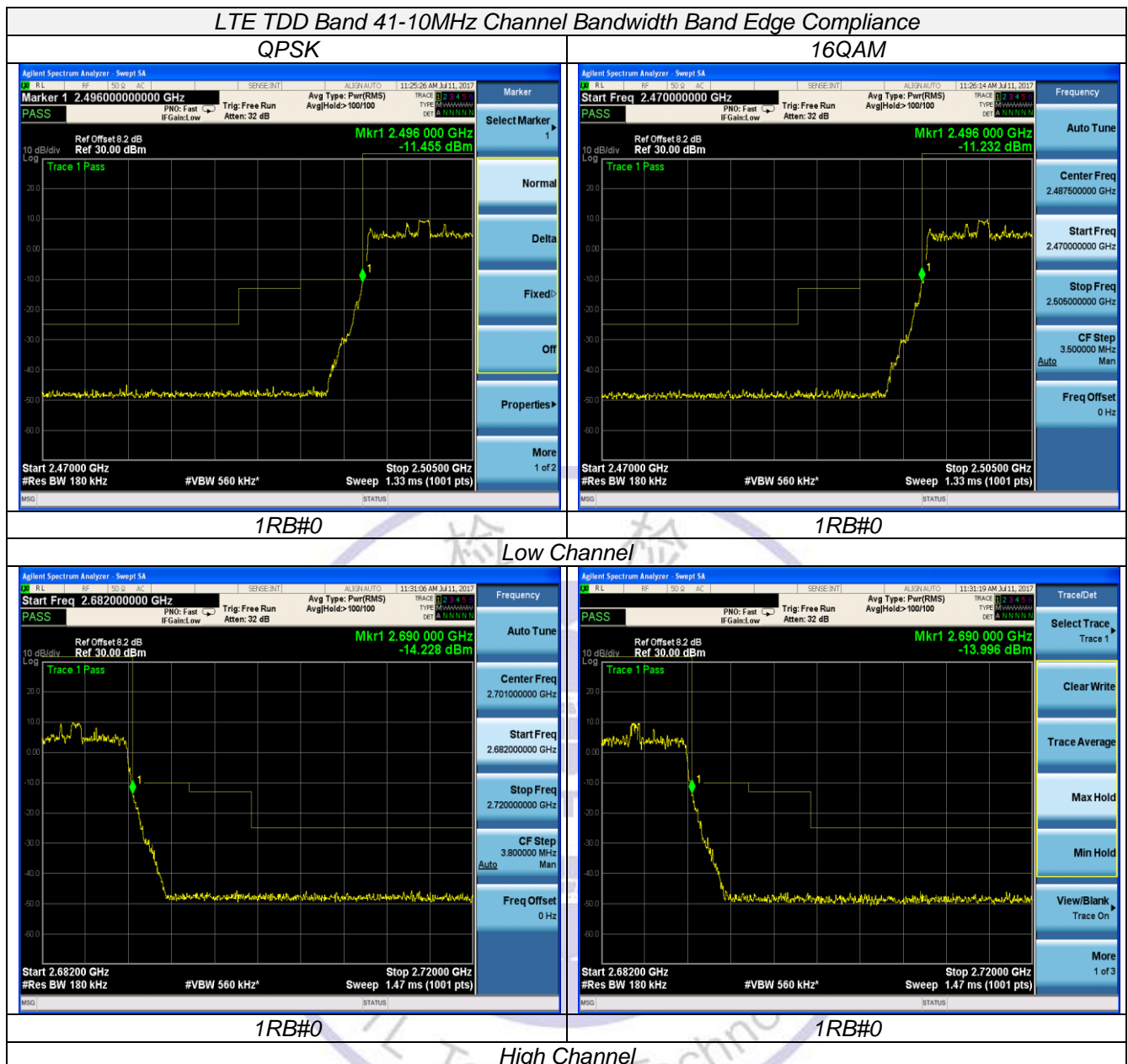


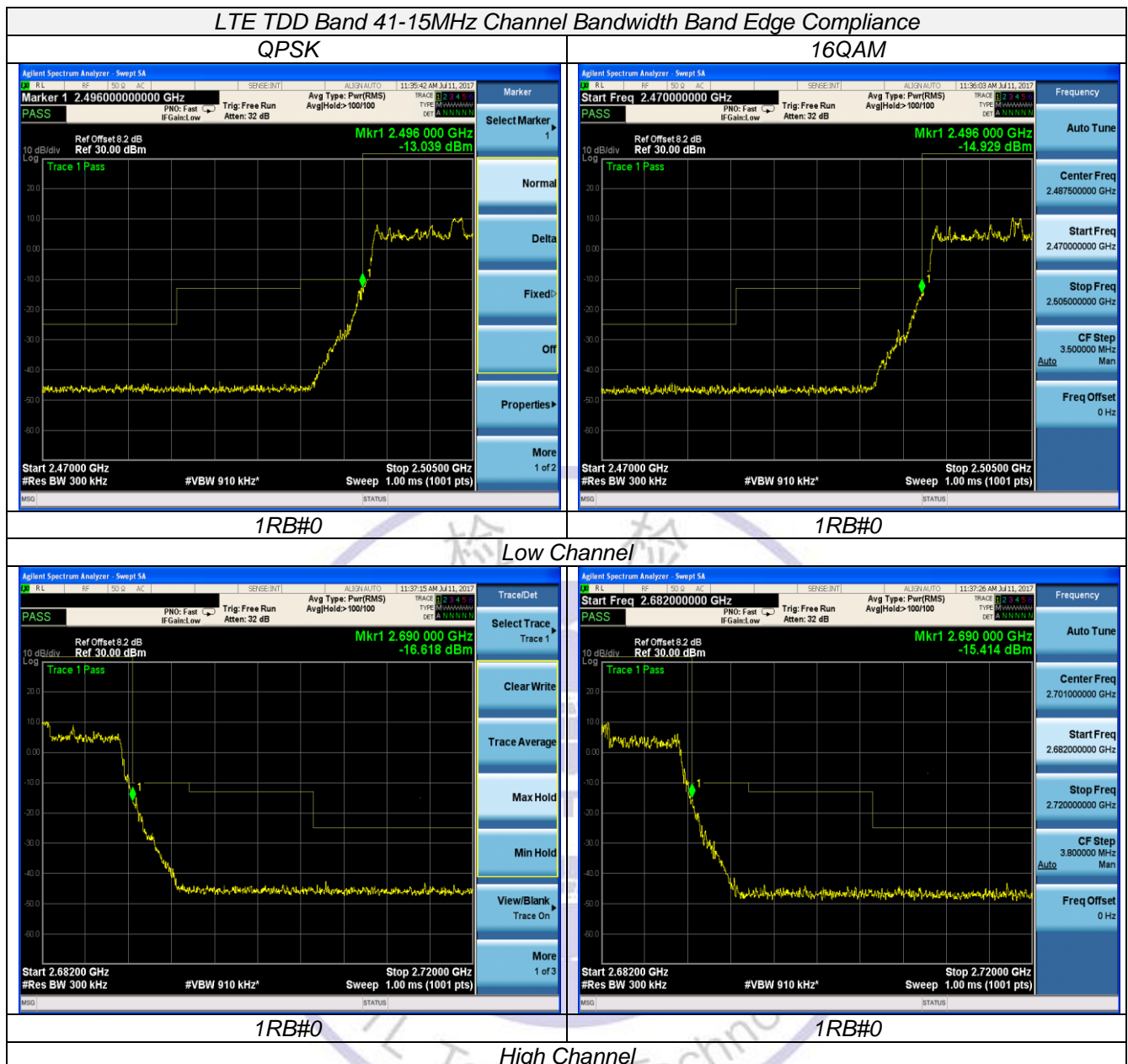
1RB#0

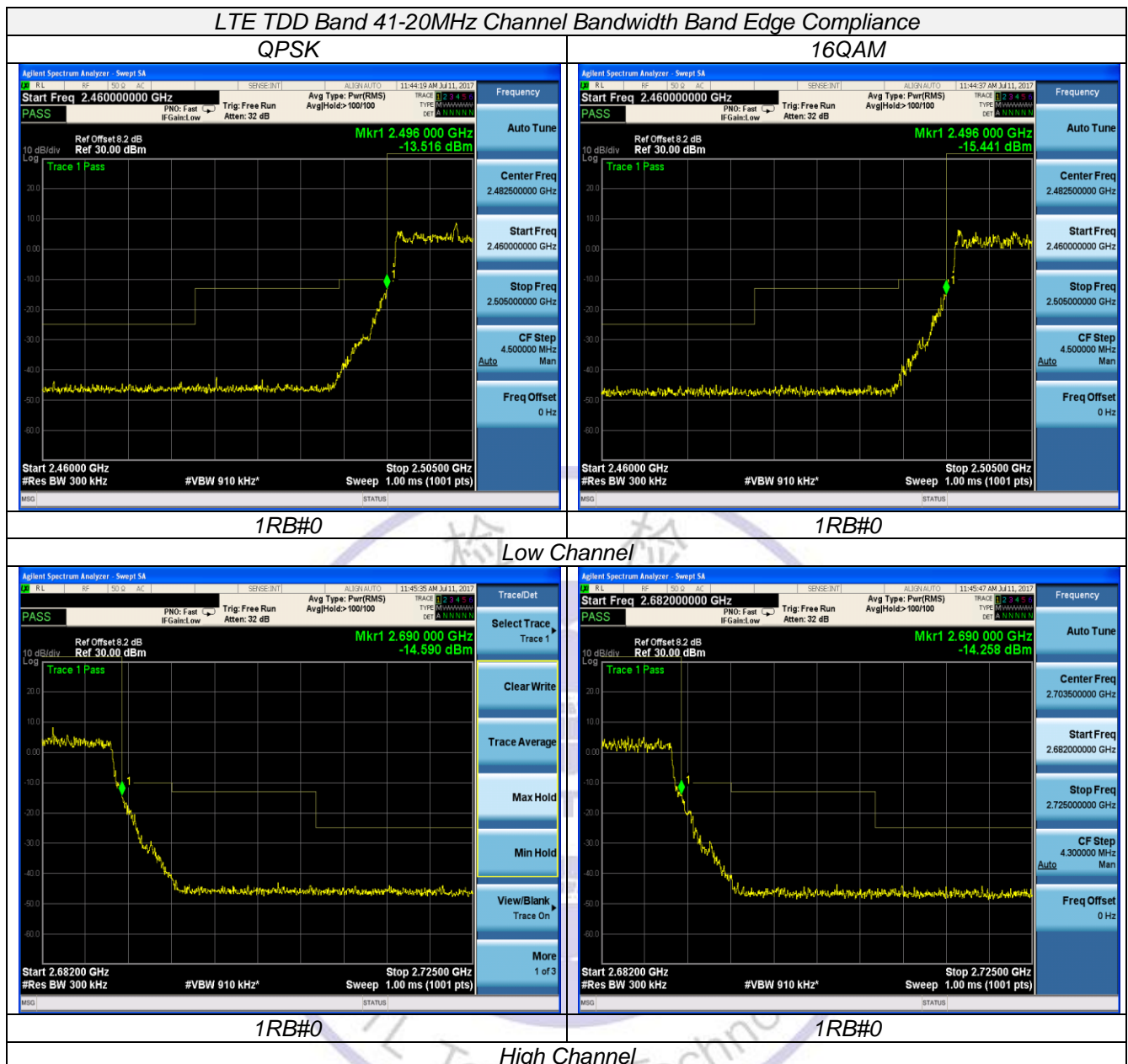


1RB#0

High Channel







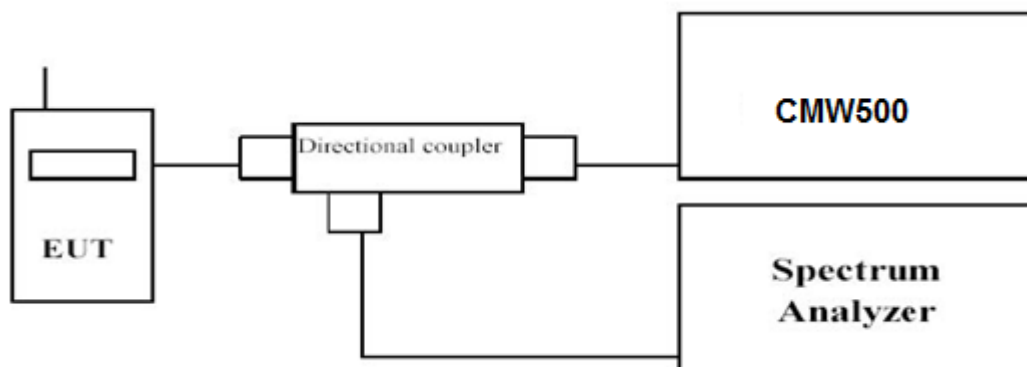
3.5 Spurious Emission

LIMIT

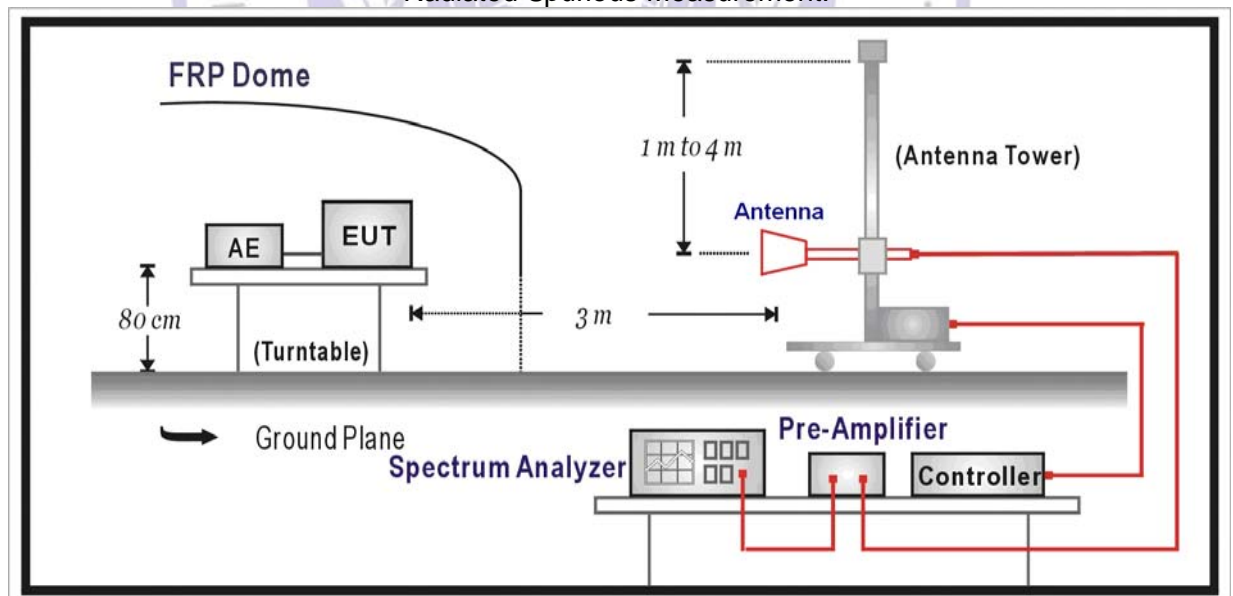
According to Part 27.83(m)(4) For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel 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 than $43 + 10 \log (P)$ 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

Conducted Spurious Measurement:



Radiated Spurious Measurement:



TEST PROCEDURE

The EUT was setup according to EIA/TIA 603D

Conducted Spurious Measurement:

- Place the EUT on a bench and set it in transmitting mode.
- Connect a low loss RF cable from the antenna port to a spectrum analyzer and CMW500 by a Directional Couple.
- EUT Communicate with CMW500, then select a channel for testing.
- 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 to 10th harmonic.
- f. Please refer to following tables for test antenna conducted emissions.

Working Frequency	Sub range (GHz)	RBW	VBW	Sweep time (s)
LTE TDD Band 41	0.000009~0.000015	1KHz	3KHz	Auto
	0.000015~0.03	10KHz	30KHz	Auto
	0.03~27.0*	1 MHz	3 MHz	Auto

Radiated Spurious Measurement:

- a. The EUT shall be placed at the specified height on a support, and in the position closest to normal use as declared by provider.
- b. The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter
- c. The output of the test antenna shall be connected to the measuring receiver.
- d. The transmitter shall be switched on and the measuring receiver shall be tuned to the frequency of the transmitter under test.
- e. The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
- f. The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
- g. The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
- h. The maximum signal level detected by the measuring receiver shall be noted.
- i. The transmitter shall be replaced by a substitution antenna.
- j. The substitution antenna shall be orientated for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.
- k. The substitution antenna shall be connected to a calibrated signal generator.
- l. If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
- m. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
- n. The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.
- o. The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.
- p. The measure of the effective radiated power is the larger of the two levels recorded at the input to the substitution antenna, corrected for gain of the substitution antenna if necessary.
- q. The resolution bandwidth of the spectrum analyzer was set at 100 kHz for Part 22 and 1MHz for Part 24. The frequency range was checked up to 10th harmonic.
- r. Test site anechoic chamber refer to ANSI C63.

TEST RESULTS

Remark:

1. We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE FDD Band 41; recorded worst case for each Channel Bandwidth of LTE FDD Band 41.
2. We tested from 9KHz to 27GHz and recorded 9KHz at 26GHz as the emission values from 26GHz to 27GHz too lower.

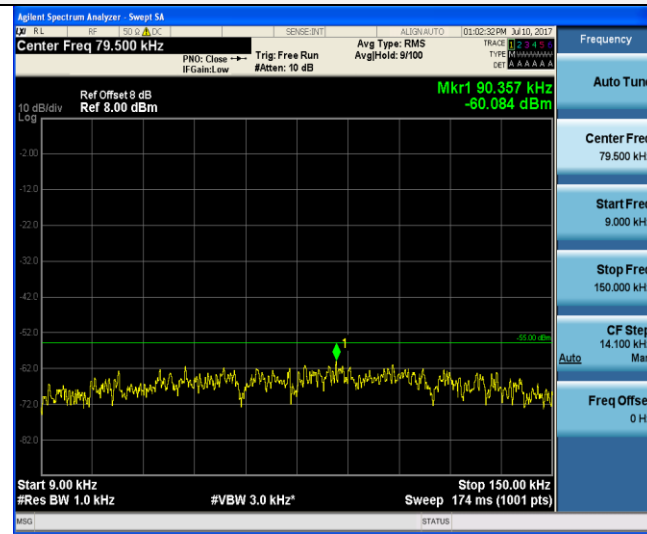
Conducted Measurement:

LTE TDD Band 41-5MHz Channel Bandwidth

Low Channel

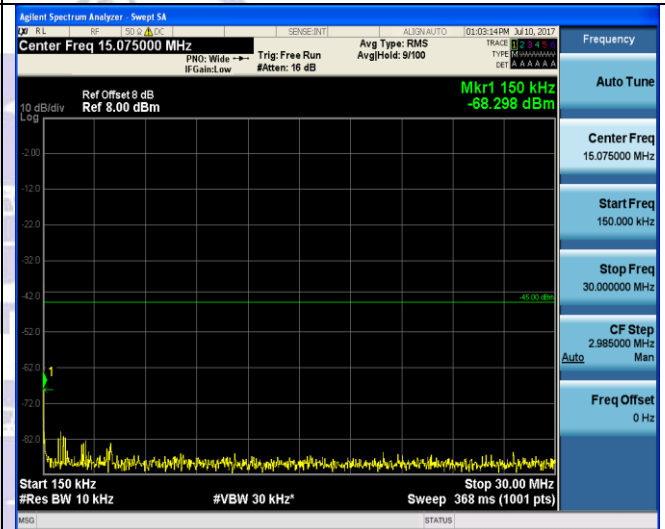
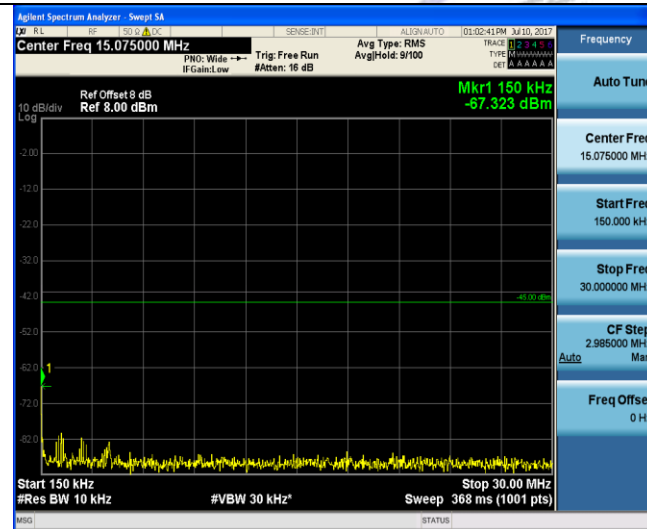
QPSK

16QAM



9KHz~150KHz

9KHz~150KHz



150KHz~30MHz

150KHz~30MHz



30MHz~26GHz

30MHz~26GHz

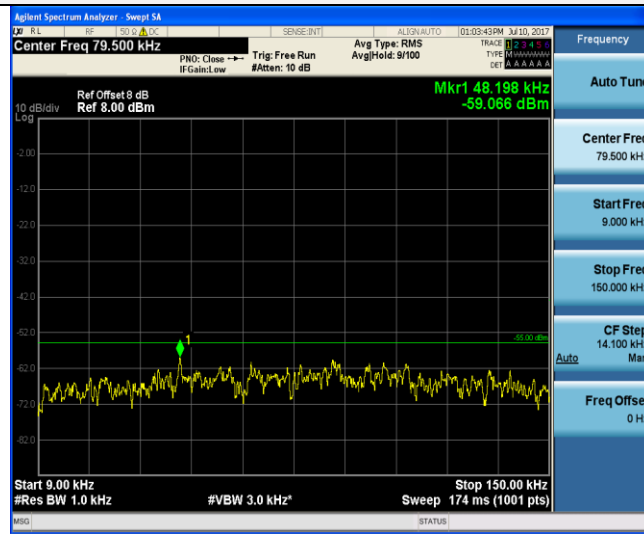
1RB#0

1RB#0

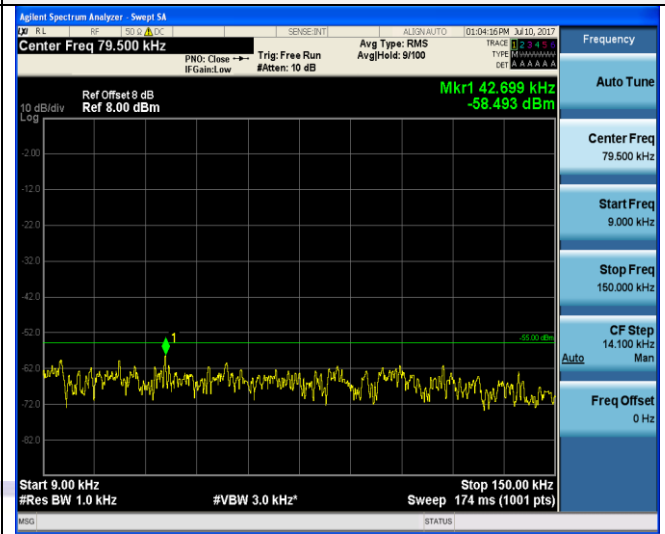
LTE TDD Band 41-5MHz Channel Bandwidth

Middle Channel

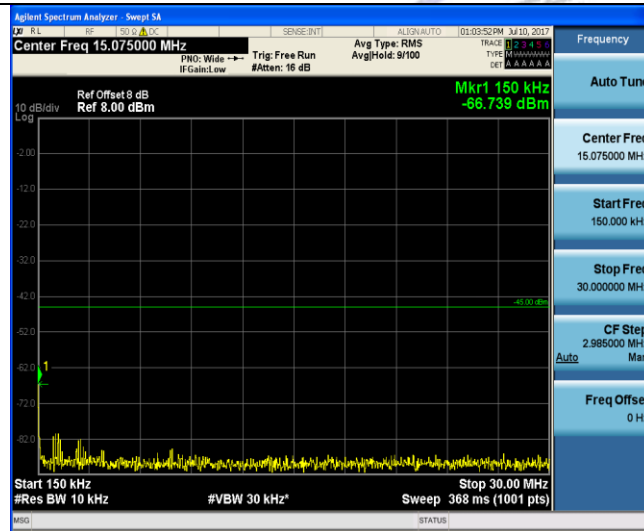
QPSK



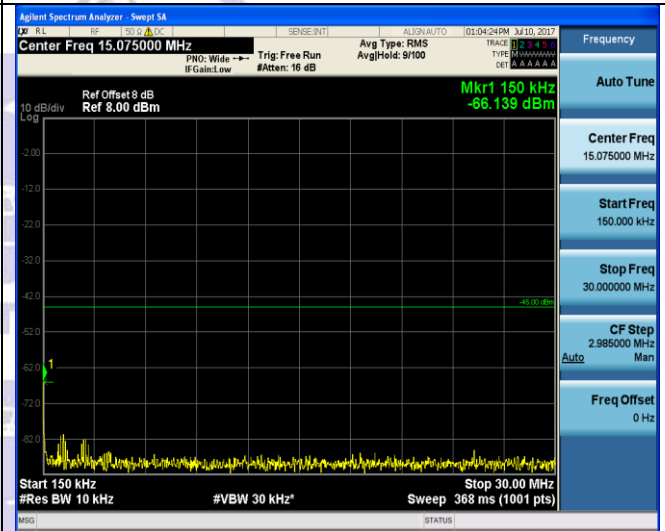
16QAM



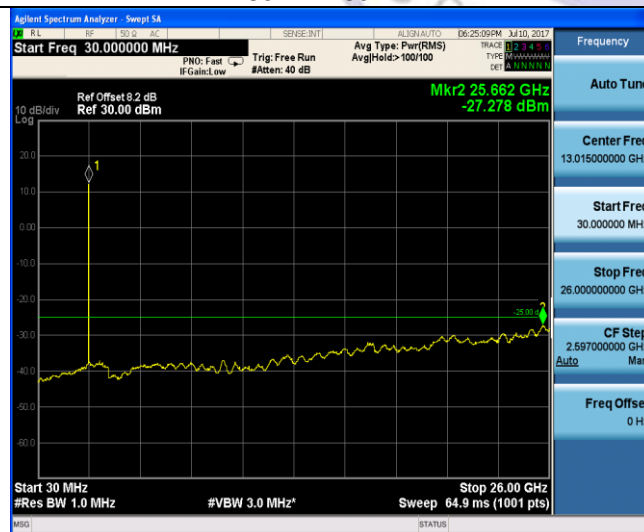
9KHz~150KHz



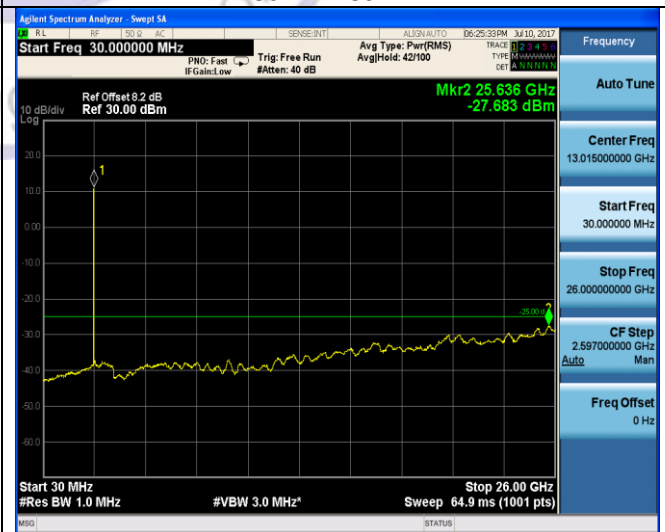
9KHz~150KHz



150KHz~30MHz



150KHz~30MHz



30MHz~26GHz

1RB#0

30MHz~26GHz

1RB#0