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TEST REPORT

FCC Part 27

Report Reference No.: **CTL151214663-WF-02**

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Tracy Qi

Product Name: 4G LTE Router

Model/Type reference: TN500

List Model(s): /

Brand Name: PCD

FCC ID: 2AGP4-PCDTN500

Applicant's name: **Quality One Wireless, LLC**

Address of applicant.....: 1500 Tradeport Drive, Suite A, Orlando, FL. 32824, USA

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.....:

FCC CFR Title 47 Part 2, Part 27

Standard.....: **EIA/TIA 603-D: 2010**

KDB 971168 D01

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

Master TRF: Dated 2011-01

Date of Receipt: Dec. 24, 2015

Date of Test Date: Dec. 24, 2015–Jan. 05, 2016

Data of Issue: Jan. 06, 2016

Result: Positive

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TEST REPORT

Test Report No. :	CTL151214663-WF-02	Jan. 06, 2016
		Date of issue

Equipment under Test : 4G LTE Router

Model /Type : TN500

Listed Models : /

Applicant : **Quality One Wireless, LLC**

Address : 1500 Tradeport Drive, Suite A, Orlando, FL. 32824, USA

Manufacturer : **Asiatelco Technologies Co.**

Address : #289 Bisheng Road, Building-8, 3F, Zhangjiang Hi-Tech Park, Pudong, Shanghai 201204, 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	2016-01-06	CTL151214663-WF-02	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 C63.4:2014](#): Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

1.2 Test Description

Test Item	Section in CFR 47	Result
RF Output Power	Part 2.1046 Part 27.50(d)(4)	Pass
Peak-to-Average Ratio	Part 27.50(d)(4)	Pass
99% & -26 dB Occupied Bandwidth	Part 2.1049 Part 27.53(h)	Pass
Spurious Emissions at Antenna Terminal	Part 2.1051 Part 27.53(h)	Pass
Field Strength of Spurious Radiation	Part 2.1053 Part 27.53(h)	Pass
Out of band emission, Band Edge	Part 2.1051 Part 27.53(h)	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 22/EN 55022 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:	4G LTE Router
Model/Type reference:	TN500
Power supply:	DC 3.7V from battery or DC 12V from adapter
Serial number:	Prototype
Adapter information:	Model:ASSA1A-120100 Input: 100-240V, 50/60Hz 0.45A Output:12V ---1.0A
WIFI	
Supported type:	802.11b/802.11g/802.11n(H20)/802.11n(H40)
Modulation:	802.11b: DSSS 802.11g/802.11n(H20)/802.11n(H40): OFDM
Operation frequency:	802.11b/802.11g/802.11n(H20): 2412MHz~2462MHz 802.11n(H40): 2422MHz~2452MHz
Channel number:	802.11b/802.11g/802.11n(H20): 11 802.11n(H40): 7
Channel separation:	5MHz
Antenna type:	PCB Antenna : 2*TX 2*RX
Antenna gain:	2.0dBi
LTE	
Operation Band:	FDD-LTE: Band 4
Modulation Type:	QPSK, 16QAM
Release Version:	Release 9
Category:	Cat 3
Antenna Type:	External Omni-antenna: 1*TX 2*RX
Antenna gain:	2.0dBi

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.

Note:

1. All tests performed with alternate AC power supply and DC power supply , recorded the worst case at AC mode except frequency stability test.
2. Test method and refer to 3GPP TS136521.

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	2015/06/02	2016/06/01
Bilog Antenna	Sunol Sciences Corp.	JB1	A061714	2015/06/02	2016/06/01
EMI Test Receiver	R&S	ESCI	103710	2015/06/02	2016/06/01
Spectrum Analyzer	Agilent	E4407B	MY41440676	2015/05/21	2016/05/20
Spectrum Analyzer	Agilent	N9020	US46220290	2015/11/11	2016/11/10
Controller	EM Electronics	Controller EM 1000	N/A	2015/05/21	2016/05/20
Horn Antenna	Sunol Sciences Corp.	DRH-118	A062013	2015/05/19	2016/05/18
Horn Antenna	Sunol Sciences Corp.	DRH-118	A062014	2015/05/19	2016/05/18
Active Loop Antenna	SCHWARZBEC K	FMZB1519	1519-037	2015/05/19	2016/05/18
Amplifier	Agilent	8349B	3008A02306	2015/05/19	2016/05/18
Amplifier	Agilent	8447D	2944A10176	2015/05/19	2016/05/18
Temperature/Humidity Meter	Gangxing	CTH-608	02	2015/05/20	2016/05/19
Radio Communication Tester	R&S	CMU200	115419	2015/05/22	2016/05/21
Wideband Radio Communication Tester	R&S	CMW500	101814	2014/11/23	2015/11/22
High-Pass Filter	K&L	9SH10-2700/X12750-O/O	N/A	2015/05/20	2016/05/19
High-Pass Filter	K&L	41H10-1375/U12750-O/O	N/A	2015/05/20	2016/05/19
Climate Chamber	ESPEC	EL-10KA	A20120523	2015/05/20	2016/05/19
SIGNAL GENERATOR	Agilent	E4421B	US40051744	2015/05/20	2016/05/19
Directional Coupler	Agilent	87300B	3116A03638	2015/05/20	2016/05/19
Coaxial Cables	HUBER+SUHNER	SUCOFLEX 104PEA-10M	10m	2015/06/02	2016/06/01
Coaxial Cables	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	2015/06/02	2016/06/01
Coaxial Cables	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	2015/06/02	2016/06/01
RF Cable	Megalon	RF-A303	N/A	2015/06/02	2016/06/01

2.5 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID:2AGP4-PCDTN500 filing comply with of the FCC Part 27 Rules.

2.6 Modifications

No modifications were implemented to meet testing criteria.

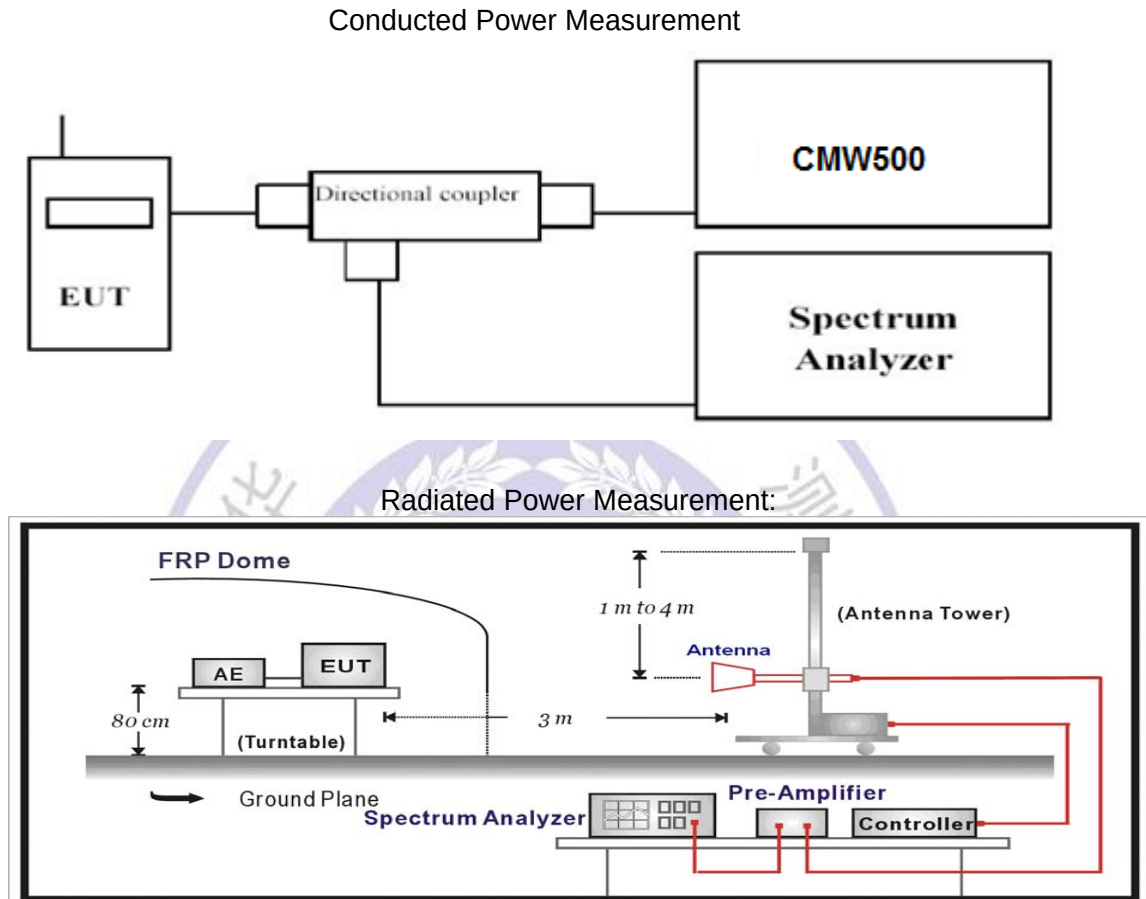
3 TEST CONDITIONS AND RESULTS

3.1 Output Power

LIMIT

According to §27.50 (d) (4): Fixed, mobile, and portable (hand- held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP.

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 Coupler.
- 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.

- 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. Test site anechoic chamber refer to ANSI C63.4: 2014.

TEST RESULTS

Conducted Measurement:

LTE FDD Band 4				
TX Channel Bandwidth	RB Size/Offset	Frequency (MHz)	Average Power [dBm]	
			QPSK	16QAM
1.4 MHz	1 RB low	1710.7	23.58	22.76
		1732.5	23.71	23.09
		1754.3	23.59	23.23
	1 RB high	1710.7	23.57	22.78
		1732.5	23.81	23.06
		1754.3	23.53	23.18
	50% RB mid	1710.7	23.68	22.67
		1732.5	23.75	22.90
		1754.3	24.02	22.91
	100% RB	1710.7	22.51	21.56
		1732.5	22.92	21.98
		1754.3	22.81	21.69
3 MHz	1 RB low	1711.5	23.51	22.98
		1732.5	23.75	23.17
		1753.5	23.66	23.38
	1 RB high	1711.5	23.58	22.79
		1732.5	23.88	23.34
		1753.5	23.62	23.44
	50% RB mid	1711.5	22.73	21.79
		1732.5	22.84	22.01
		1753.5	23.62	21.74
	100% RB	1711.5	22.67	21.71
		1732.5	22.88	21.96
		1753.5	23.18	21.97
5 MHz	1 RB low	1712.5	23.64	23.42
		1732.5	23.81	23.22
		1752.5	23.88	23.24
	1 RB high	1712.5	23.51	23.49
		1732.5	24.04	23.27
		1752.5	23.82	23.40

	50% RB mid	1712.5	22.85	21.82
		1732.5	22.90	22.08
		1752.5	23.11	22.08
	100% RB	1712.5	22.77	21.76
		1732.5	22.86	21.99
		1752.5	23.07	21.81
10 MHz	1 RB low	1715.0	23.89	23.29
		1732.5	23.81	23.17
		1750.0	23.79	23.11
	1 RB high	1715.0	23.72	23.09
		1732.5	23.96	23.46
		1750.0	23.63	23.13
	50% RB mid	1715.0	22.86	21.70
		1732.5	23.02	22.06
		1750.0	23.04	21.89
	100% RB	1715.0	22.89	21.84
		1732.5	22.73	21.82
		1750.0	22.99	21.83
15 MHz	1 RB low	1717.5	23.88	23.11
		1732.5	23.75	23.17
		1747.5	23.97	23.42
	1 RB high	1717.5	23.55	23.08
		1732.5	23.89	23.32
		1747.5	23.91	23.33
	50% RB mid	1717.5	22.75	21.90
		1732.5	23.09	22.15
		1747.5	23.25	21.89
	100% RB	1717.5	22.96	22.02
		1732.5	22.85	21.97
		1747.5	23.14	22.07
20 MHz	1 RB low	1720.0	24.13	23.16
		1732.5	23.89	23.13
		1745.0	24.12	23.33
	1 RB high	1720.0	23.97	23.21
		1732.5	24.34	23.45
		1745.0	24.01	23.32
	50% RB mid	1720.0	22.85	21.87
		1732.5	23.18	22.13
		1745.0	23.23	21.87
	100% RB	1720.0	22.74	21.77
		1732.5	22.81	21.82
		1745.0	23.13	21.95

Radiated Measurement:

Remark:

1. We were tested all RB and RB offset Configuration according to 3GPP TS136 521 for each Channel Bandwidth of LTE FDD Band 4, the worst case for each Channel Bandwidth of LTE FDD Band 4 were reported.
2. $EIRP = P_{Mea}(dBm) - P_{cl}(dB) + P_{Ag}(dB) + G_a(dBi)$

LTE FDD Band 4_Channel Bandwidth 1.4MHz_QPSK

Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	G _a Antenna Gain(dB)	P _{Ag} (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1710.7	-18.87	3.06	9.68	34.80	22.55	30.00	7.45	V
1732.5	-18.57	3.17	9.68	34.80	22.74	30.00	7.26	V
1754.3	-18.09	3.22	9.75	34.80	23.24	30.00	6.76	V

LTE FDD Band 4_Channel Bandwidth 3MHz_QPSK

Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	G _a Antenna Gain(dB)	P _{Ag} (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1711.5	-18.87	3.06	9.68	34.80	22.55	30.00	7.45	V
1732.5	-17.90	3.17	9.68	34.80	23.41	30.00	6.59	V
1753.5	-17.49	3.22	9.75	34.80	23.84	30.00	6.16	V

LTE FDD Band 4_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
1712.5	-18.17	3.06	9.68	34.80	23.25	30.00	6.75	V
1732.5	-18.44	3.17	9.68	34.80	22.87	30.00	7.13	V
1752.5	-17.79	3.22	9.75	34.80	23.54	30.00	6.46	V

LTE FDD Band 4_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
1715.0	-18.88	3.06	9.68	34.80	22.54	30.00	7.46	V
1732.5	-18.19	3.17	9.68	34.80	23.12	30.00	6.88	V
1750.0	-17.32	3.22	9.75	34.80	24.01	30.00	5.99	V

LTE FDD Band 4_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
1717.5	-19.27	3.06	9.68	34.80	22.15	30.00	7.85	V
1732.5	-17.46	3.17	9.68	34.80	23.85	30.00	6.15	V
1747.5	-18.81	3.22	9.75	34.80	22.52	30.00	7.48	V

LTE FDD Band 4_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
1720.0	-18.31	3.06	9.68	34.80	23.11	30.00	6.89	V
1732.5	-18.33	3.17	9.68	34.80	22.98	30.00	7.02	V
1745.0	-17.92	3.22	9.75	34.80	23.41	30.00	6.59	V

LTE FDD Band 4_Channel Bandwidth 1.4MHz_16QAM

Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	G _a Antenna Gain(dB)	P _{Ag} (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1710.7	-19.55	3.06	9.68	34.80	21.87	30.00	8.13	V
1732.5	-18.09	3.17	9.68	34.80	23.22	30.00	6.78	V
1754.3	-18.08	3.22	9.75	34.80	23.25	30.00	6.75	V

LTE FDD Band 4_Channel Bandwidth 3MHz_16QAM

Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	G _a Antenna Gain(dB)	P _{Ag} (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1711.5	-19.20	3.06	9.68	34.80	22.22	30.00	7.78	V
1732.5	-18.57	3.17	9.68	34.80	22.74	30.00	7.26	V
1753.5	-18.68	3.22	9.75	34.80	22.65	30.00	7.35	V

LTE FDD Band 4_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
1712.5	-18.74	3.06	9.68	34.80	22.68	30.00	7.32	V
1732.5	-17.90	3.17	9.68	34.80	23.41	30.00	6.59	V
1752.5	-17.67	3.22	9.75	34.80	23.66	30.00	6.34	V

LTE FDD Band 4_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
1715.0	-18.57	3.06	9.68	34.80	22.85	30.00	7.15	V
1732.5	-17.84	3.17	9.68	34.80	23.47	30.00	6.53	V
1750.0	-16.97	3.22	9.75	34.80	24.36	30.00	5.64	V

LTE FDD Band 4_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
1717.5	-17.90	3.06	9.68	34.80	23.52	30.00	6.48	V
1732.5	-18.05	3.17	9.68	34.80	23.26	30.00	6.74	V
1747.5	-16.92	3.22	9.75	34.80	24.41	30.00	5.59	V

LTE FDD Band 4_Channel Bandwidth 20MHz_16QAM

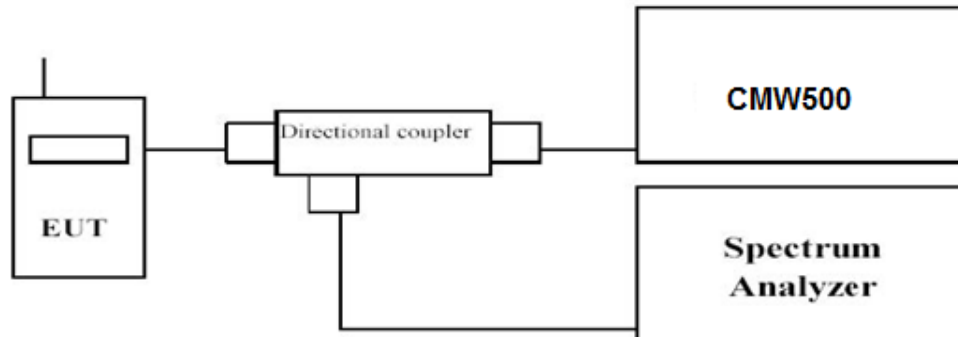
Frequency (MHz)	P _{Mea} (dBm)	P _{cl} (dB)	G _a Antenna Gain(dB)	P _{Ag} (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1720.0	-19.01	3.06	9.68	34.80	22.41	30.00	7.59	V
1732.5	-17.46	3.17	9.68	34.80	23.85	30.00	6.15	V
1745.0	-16.77	3.22	9.75	34.80	24.56	30.00	5.44	V

3.3 Peak-to-Average Ratio (PAR)

LIMIT

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

TEST CONFIGURATION



TEST PROCEDURE

1. Refer to instrument's analyzer instruction manual for details on how to use the power statistics/CCDF function;
2. Set resolution/measurement bandwidth $\geq$ signal's occupied bandwidth;
3. Set the number of counts to a value that stabilizes the measured CCDF curve;
4. Set the measurement interval as follows:
 - 1). for continuous transmissions, set to 1 ms,
 - 2). for burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize and set the measurement interval to a time that is less than or equal to the burst duration.
5. Record the maximum PAPR level associated with a probability of 0.1%.

TEST RESULTS

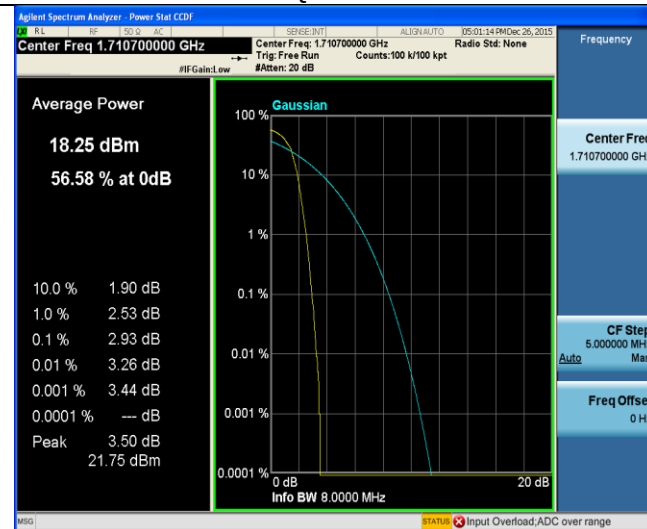
Remark:

1. We were tested all RB and RB offset Configuration according to 3GPP TS136 521 for each Channel Bandwidth of LTE FDD Band 4, the worst case for each Channel Bandwidth of LTE FDD Band 4 were reported.

LTE FDD Band 4				
TX Channel Bandwidth	Frequency (MHz)	RB Size/Offset	PAPR (dB)	
			QPSK	16QAM
1.4 MHz	1710.7	100% RB/#0	2.92	3.74
	1732.5		3.90	4.93
	1754.3		3.14	4.13
3 MHz	1711.5	100% RB/#0	4.31	5.34
	1732.5		3.52	4.26
	1753.5		3.33	4.06
5 MHz	1712.5	100% RB/#0	2.42	2.70
	1732.5		2.32	2.07
	1752.5		2.49	3.06
10 MHz	1715.0	100% RB/#0	4.10	5.17
	1732.5		1.88	2.94
	1750.0		3.46	4.40
15 MHz	1717.5	100% RB/#0	3.74	4.77
	1732.5		2.80	3.92
	1747.5		3.49	4.40
20 MHz	1720.0	100% RB/#0	3.39	4.53
	1732.5		2.38	3.50
	1745.0		3.71	4.53

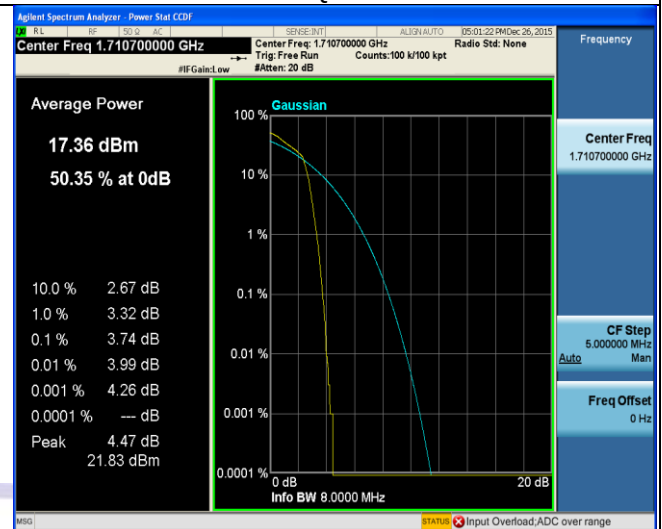
LTE FDD Band 4-1.4MHz Channel Bandwidth PAPR

QPSK



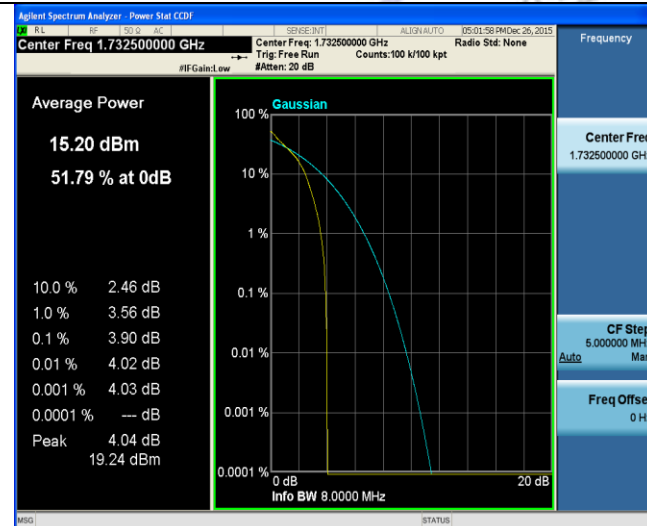
100% RB/#0

16QAM



100% RB/#0

Low Channel

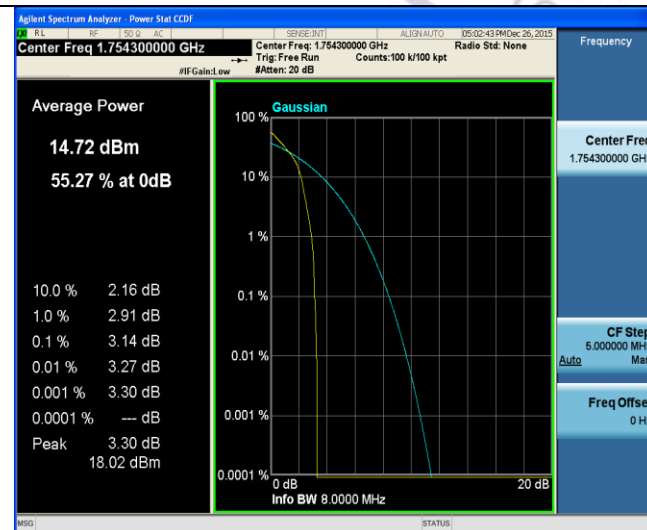


100% RB/#0

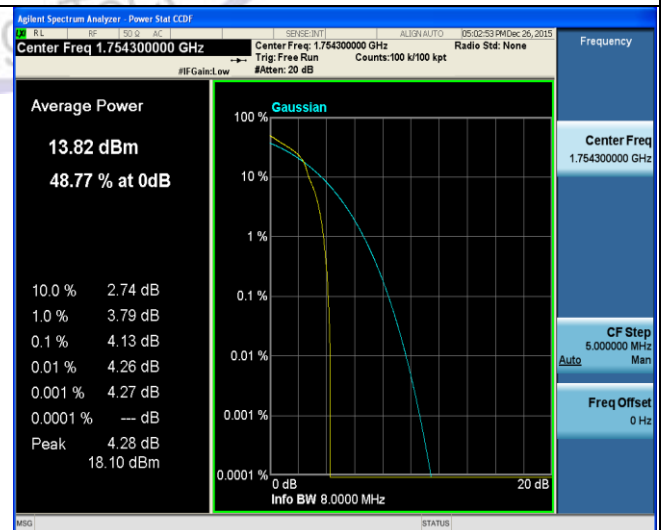


100% RB/#0

Middle Channel



100% RB/#0

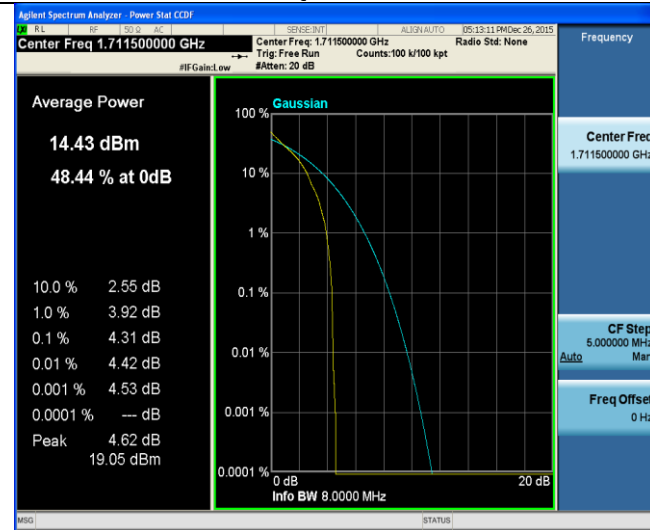


100% RB/#0

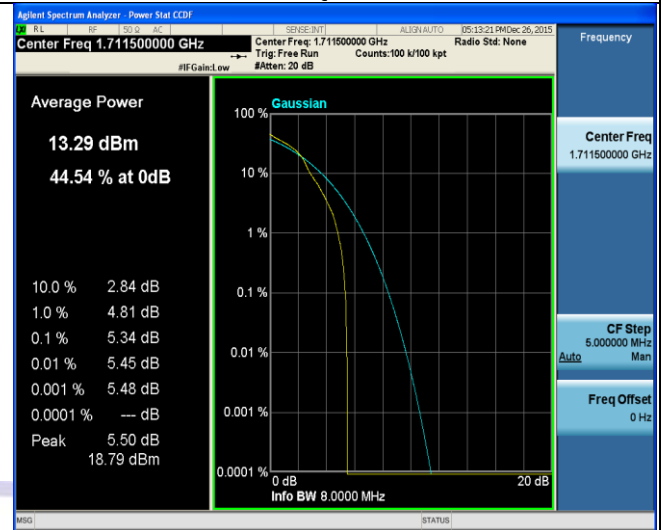
High Channel

LTE FDD Band 4-3MHz Channel Bandwidth PAPR

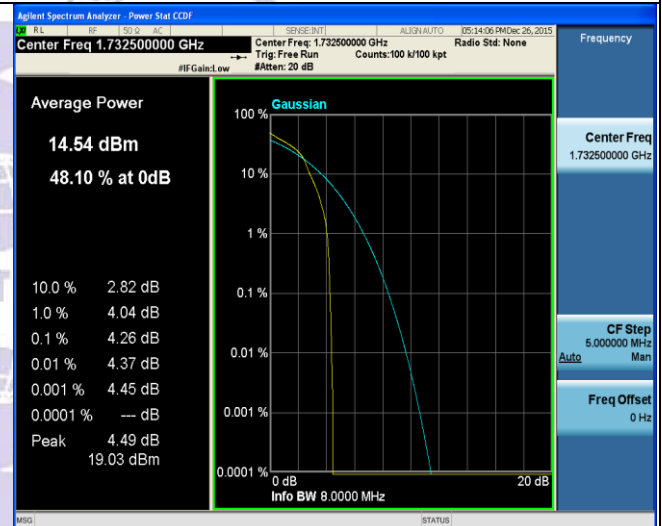
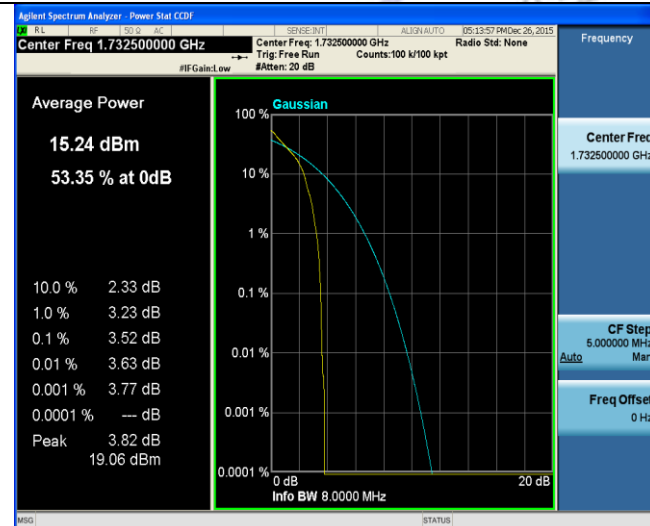
QPSK



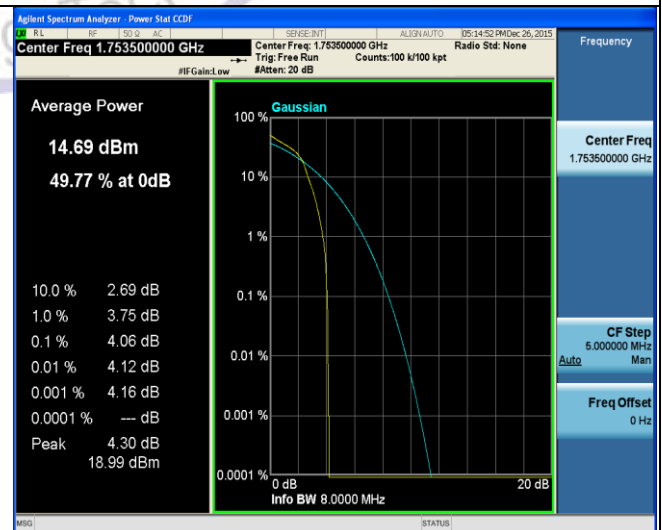
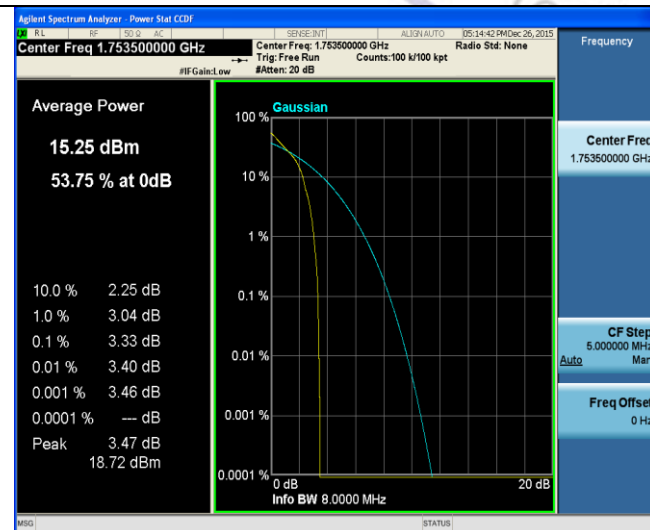
16QAM



Low Channel



Middle Channel

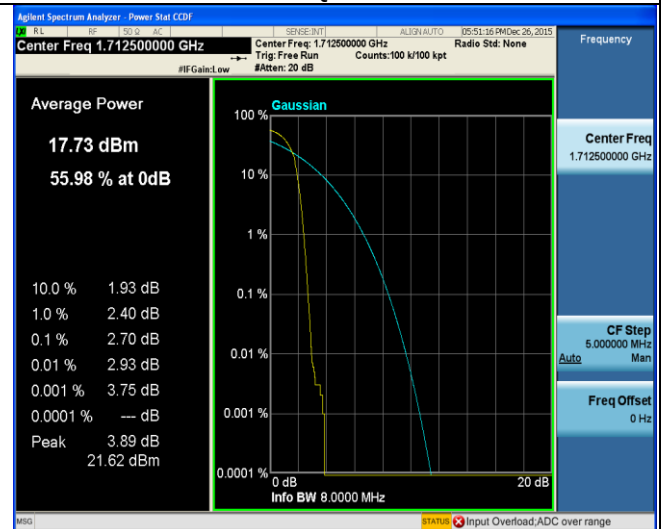
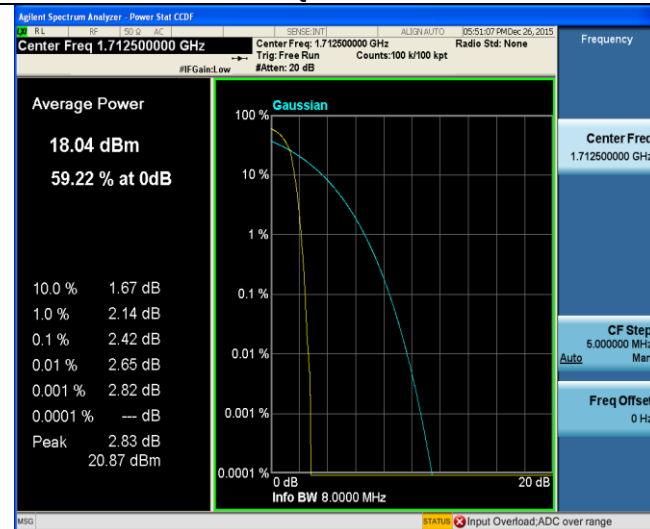


High Channel

LTE FDD Band 4-5MHz Channel Bandwidth PAPR

QPSK

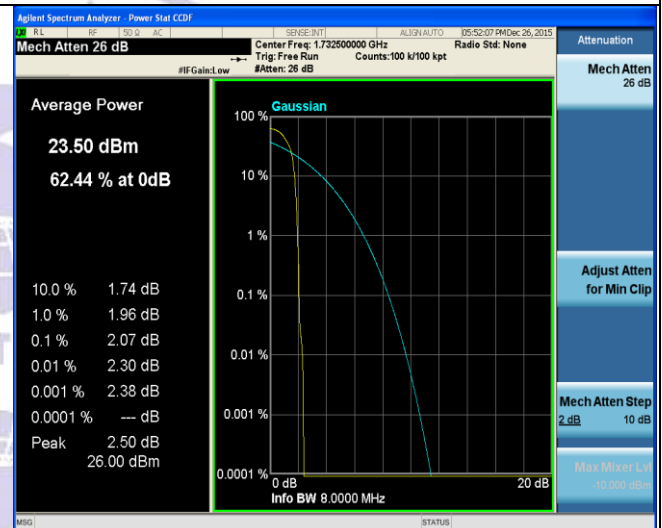
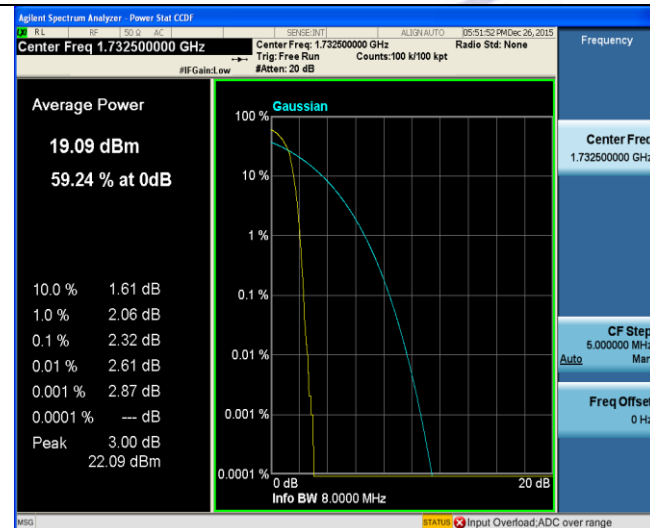
16QAM



100% RB/#0

100% RB/#0

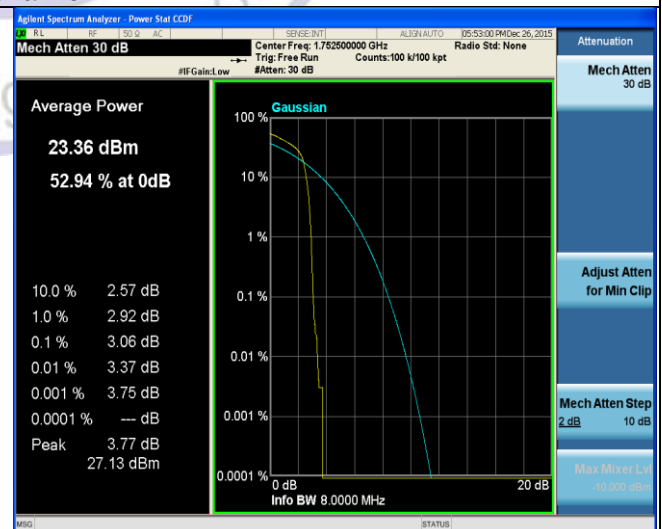
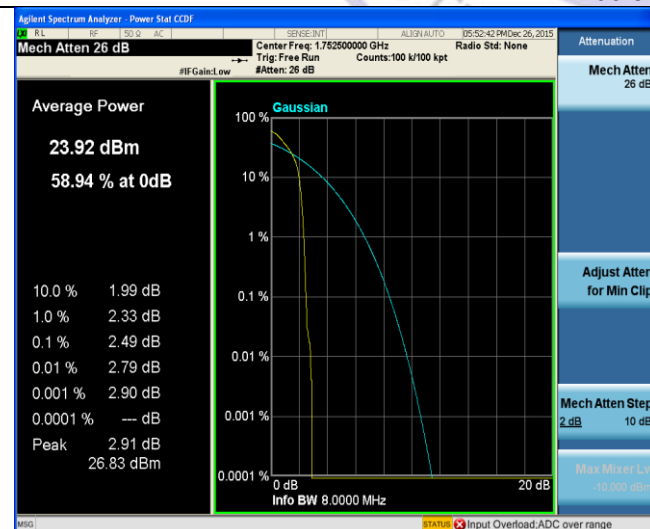
Low Channel



100% RB/#0

100% RB/#0

Middle Channel



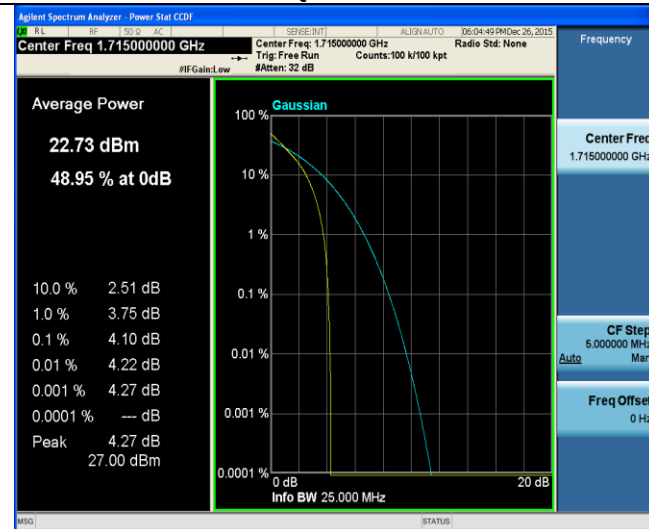
100% RB/#0

100% RB/#0

High Channel

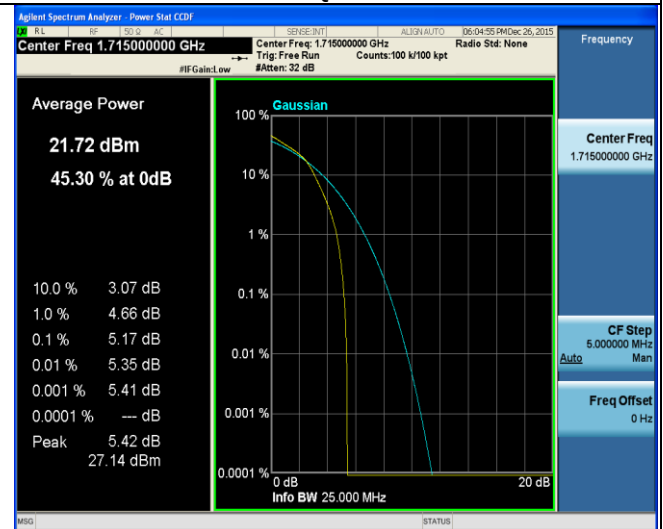
LTE FDD Band 4-10MHz Channel Bandwidth PAPR

QPSK



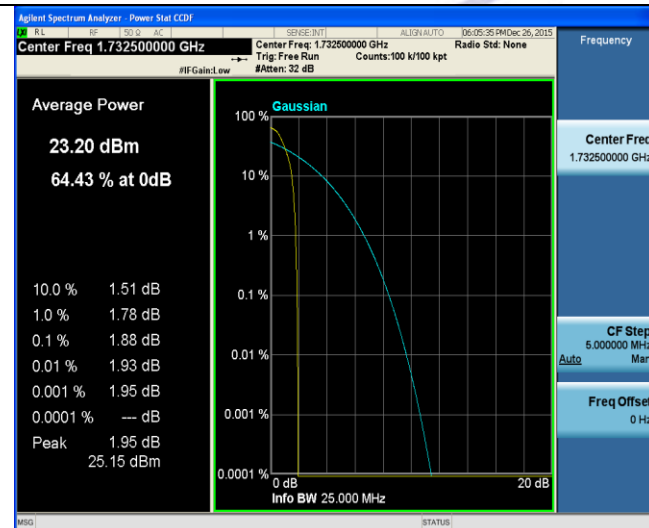
100% RB/#0

16QAM

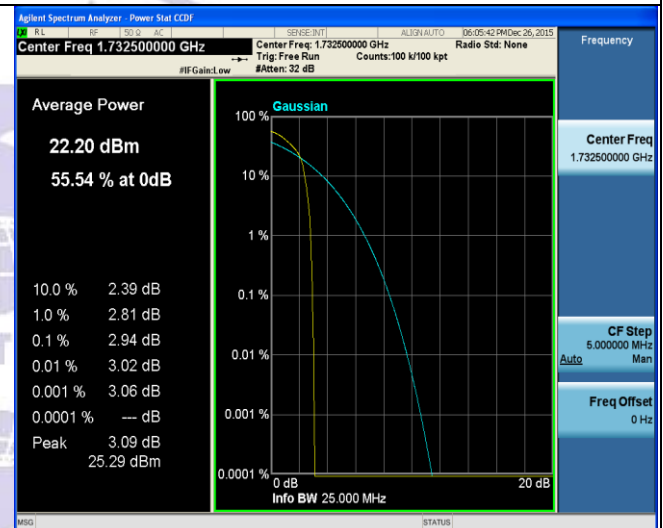


100% RB/#0

Low Channel

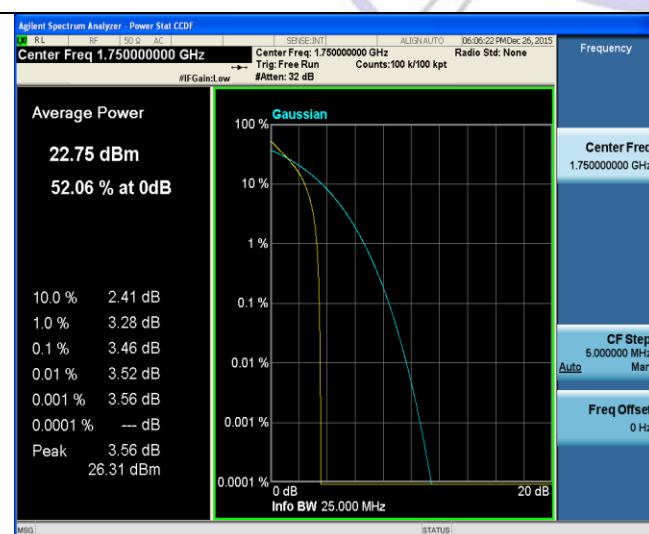


100% RB/#0



100% RB/#0

Middle Channel



100% RB/#0



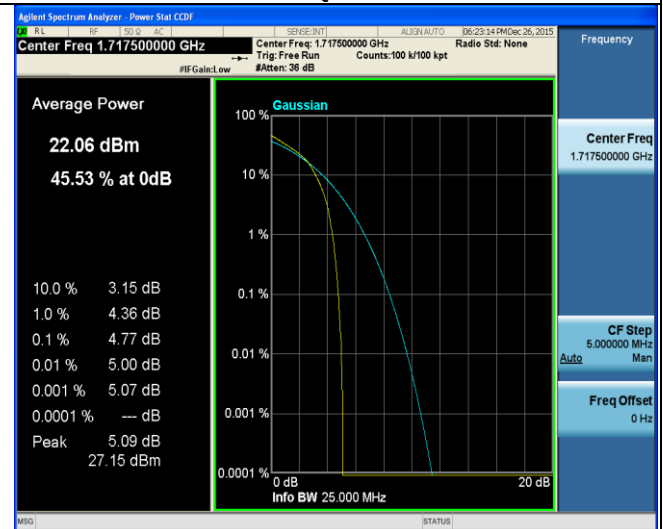
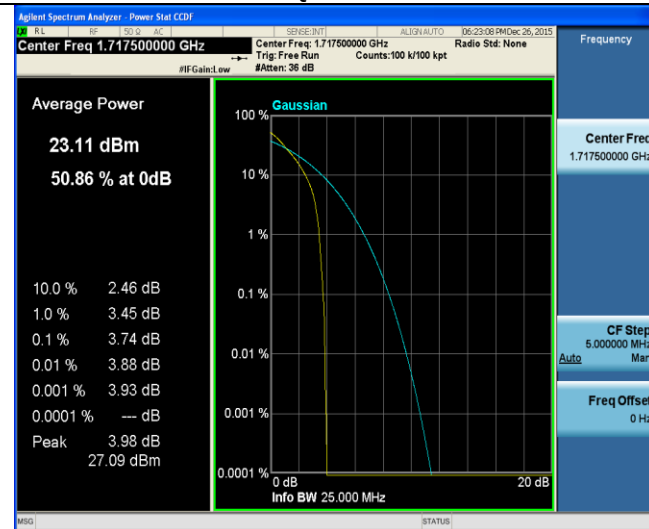
100% RB/#0

High Channel

LTE FDD Band 4-15MHz Channel Bandwidth PAPR

QPSK

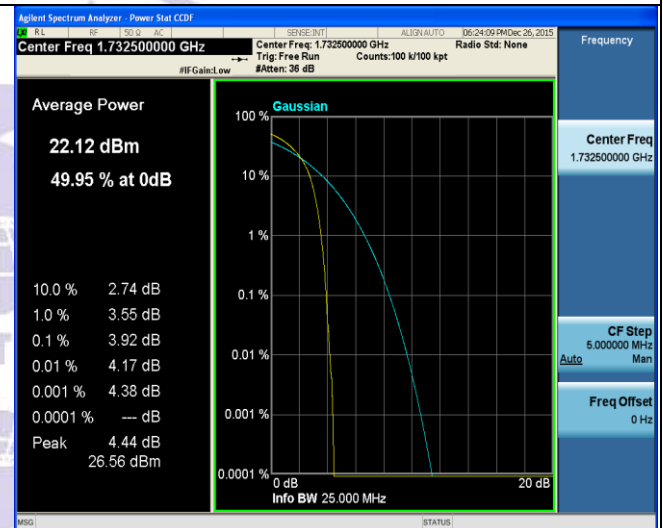
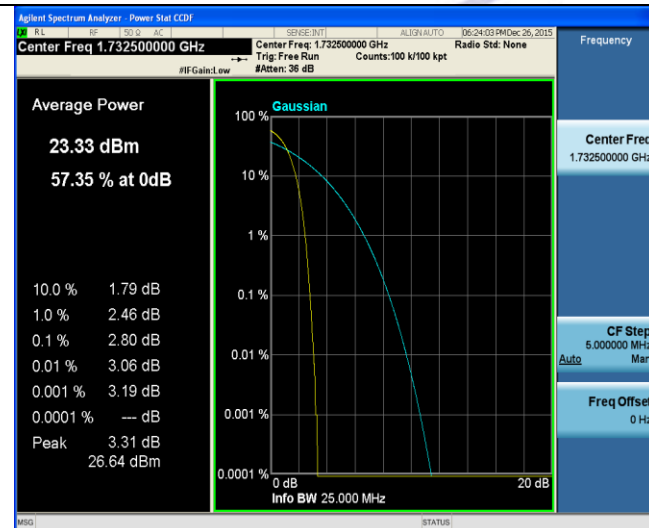
16QAM



100% RB/#0

100% RB/#0

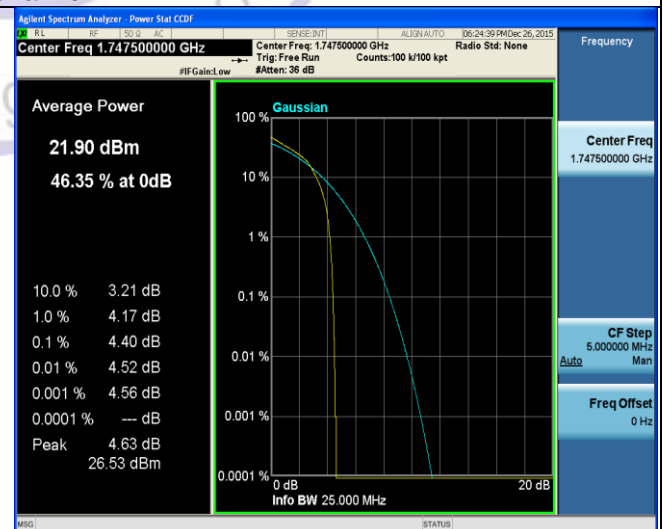
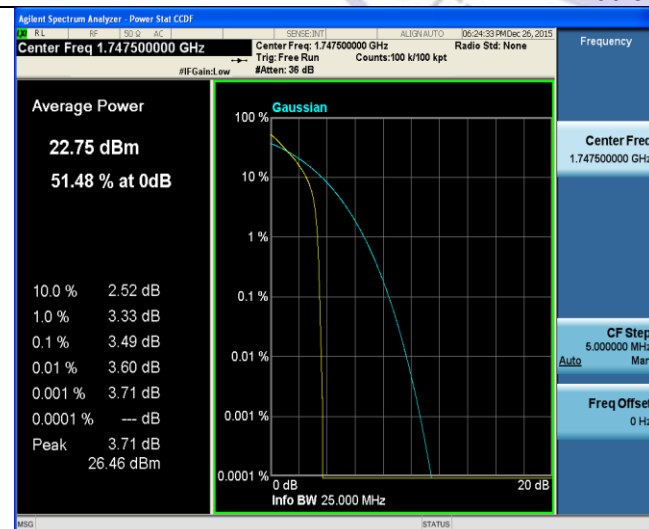
Low Channel



100% RB/#0

100% RB/#0

Middle Channel



100% RB/#0

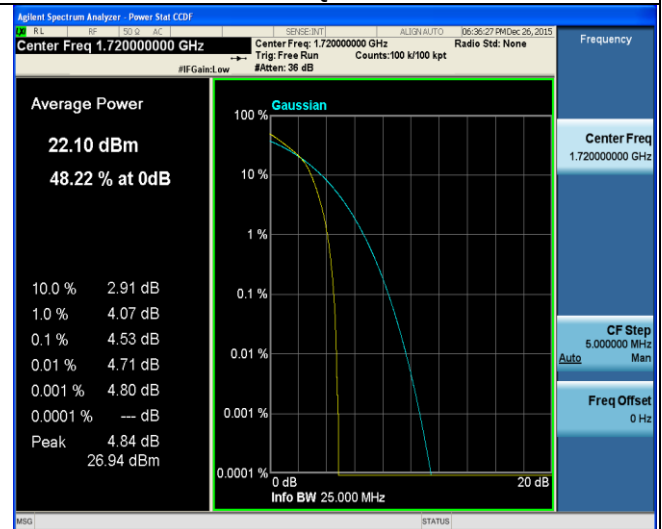
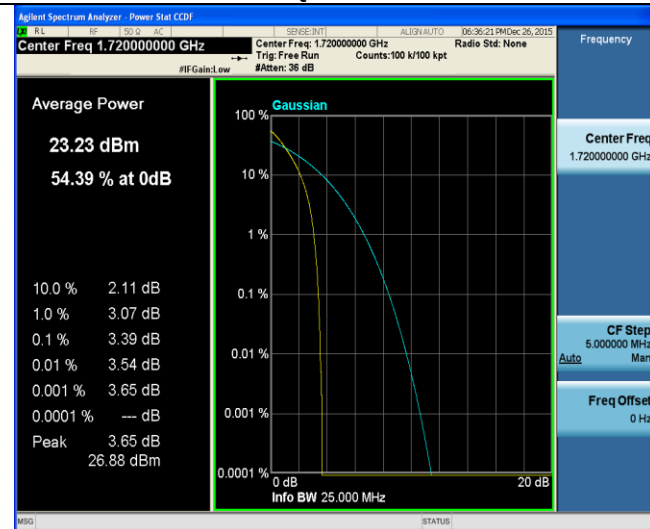
100% RB/#0

High Channel

LTE FDD Band 4-20MHz Channel Bandwidth PAPR

QPSK

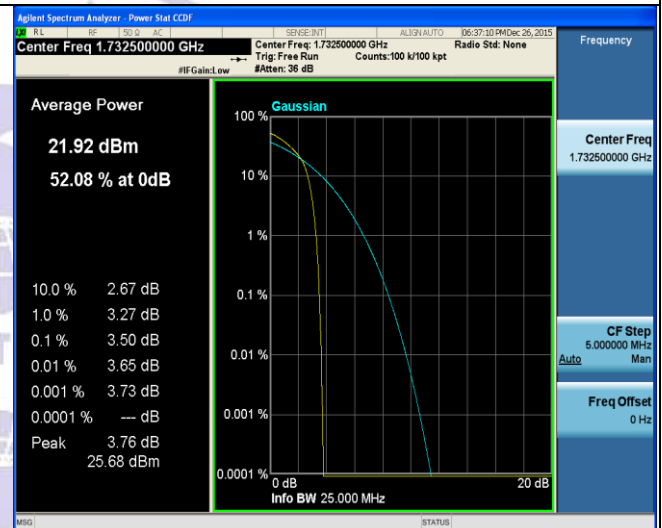
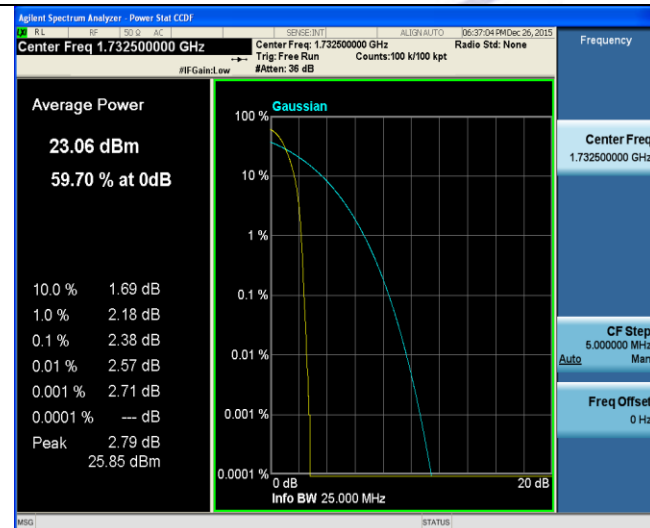
16QAM



100% RB/#0

100% RB/#0

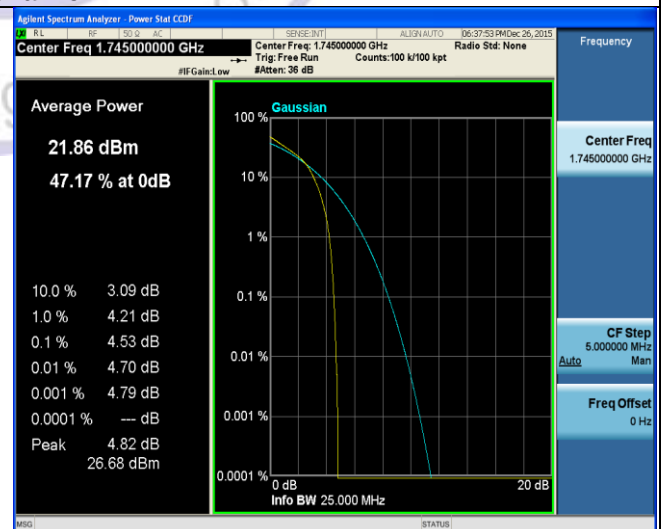
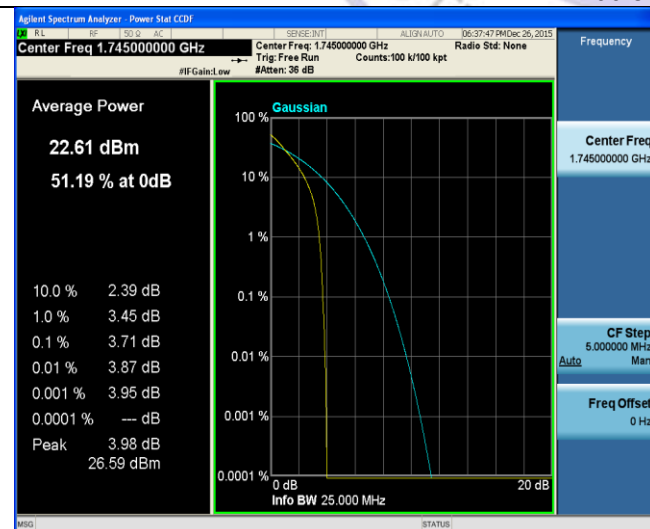
Low Channel



100% RB/#0

100% RB/#0

Middle Channel



100% RB/#0

100% RB/#0

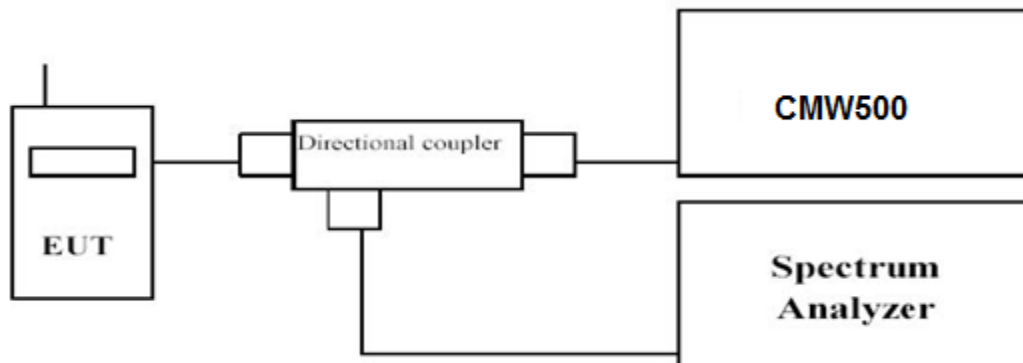
High Channel

3.4 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

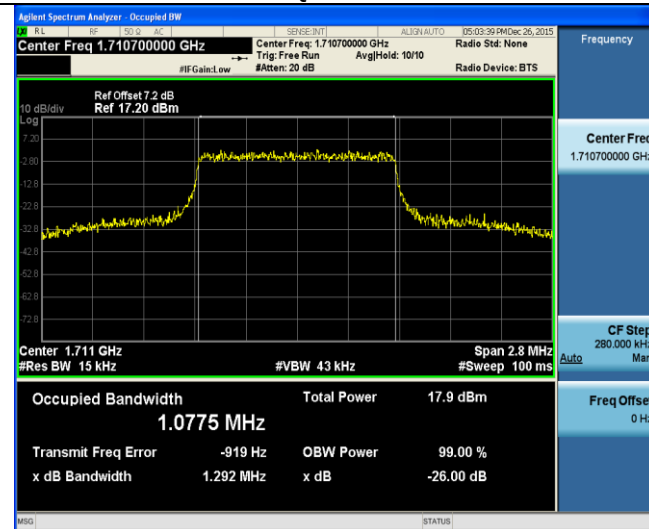
Remark:

1. We were tested all RB and RB offset Configuration according to 3GPP TS136 521 for each Channel Bandwidth of LTE FDD Band 4, the worst case for each Channel Bandwidth of LTE FDD Band 4 were reported.

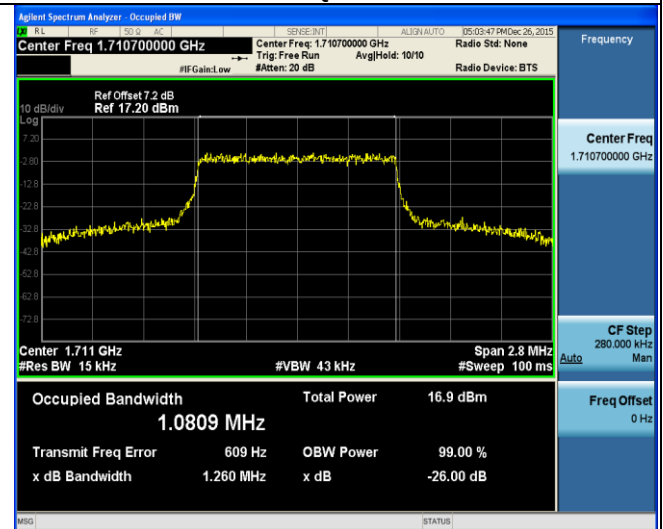
LTE FDD Band 4						
TX Channel Bandwidth	RB Size/Offset	Frequency (MHz)	-26dBc Emission bandwidth (MHz)		99% Occupied bandwidth (MHz)	
			QPSK	16QAM	QPSK	16QAM
1.4 MHz	6RB#0	1710.7	1.292	1.260	1.0775	1.0809
		1732.5	2.062	1.718	1.0918	1.0899
		1754.3	1.224	1.241	1.0790	1.0813
3 MHz	15RB#0	1711.5	2.997	3.624	2.6883	2.6914
		1732.5	3.674	3.244	2.6942	2.6867
		1753.5	4.425	4.173	2.6941	2.6994
5 MHz	25RB#0	1712.5	4.786	4.785	4.4773	4.4847
		1732.5	7.489	5.931	4.5078	4.4873
		1752.5	5.636	6.030	4.4899	4.4920
10 MHz	50RB#0	1715.0	9.421	9.596	8.9437	8.9558
		1732.5	15.54	13.13	9.0087	8.9646
		1750.0	10.02	11.05	8.9512	8.9587
15 MHz	75RB#0	1717.5	14.02	14.01	13.417	13.443
		1732.5	24.41	17.69	13.513	13.464
		1747.5	19.55	17.49	13.472	13.466
20 MHz	100RB#0	1720.0	18.66	18.60	17.832	17.872
		1732.5	23.34	20.11	17.866	17.851
		1745.0	20.25	20.06	17.915	17.927

LTE FDD Band 4-1.4MHz Channel Bandwidth

QPSK



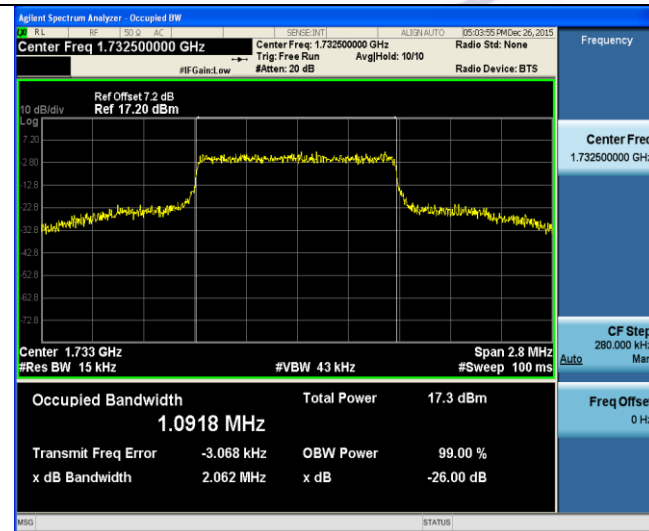
16QAM



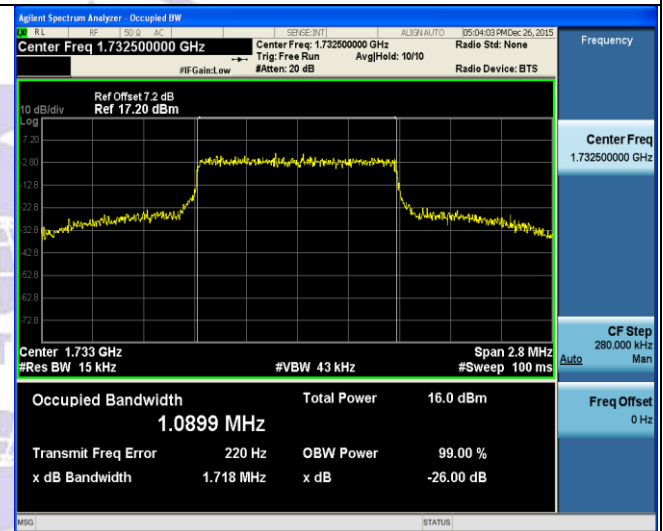
6RB#0

6RB#0

Low Channel

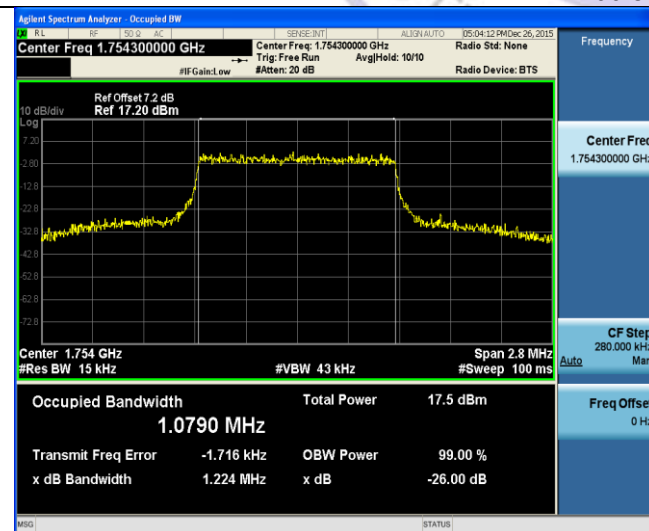


6RB#0

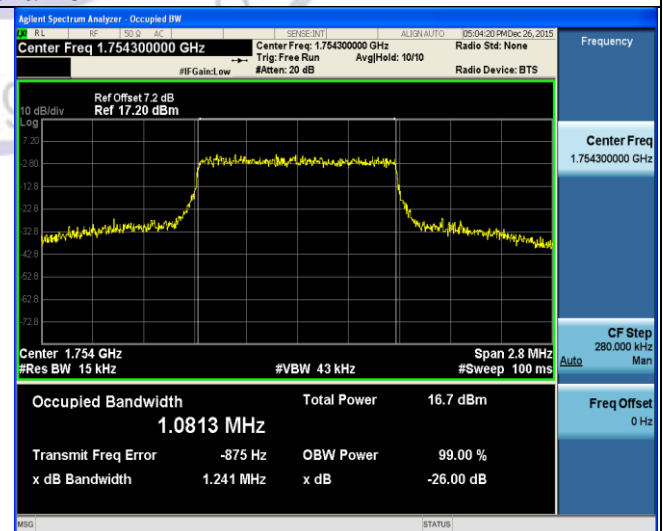


6RB#0

Middle Channel



6RB#0

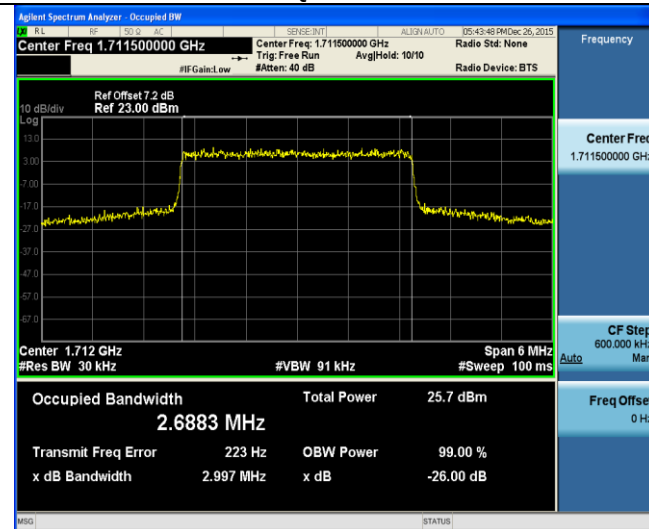


6RB#0

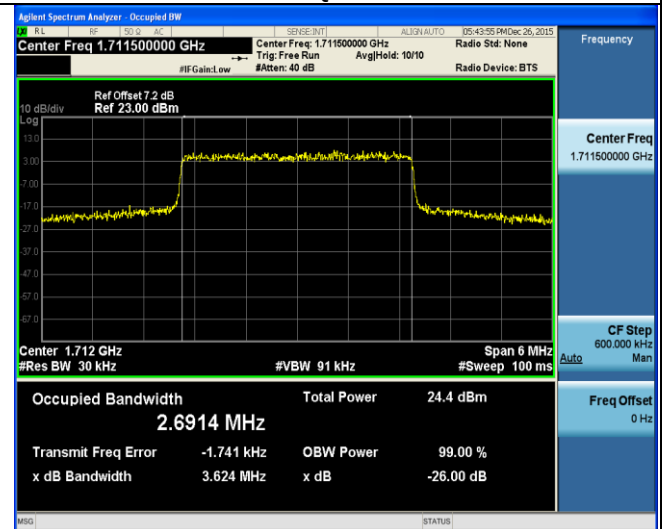
High Channel

LTE FDD Band 4-3MHz Channel Bandwidth

QPSK



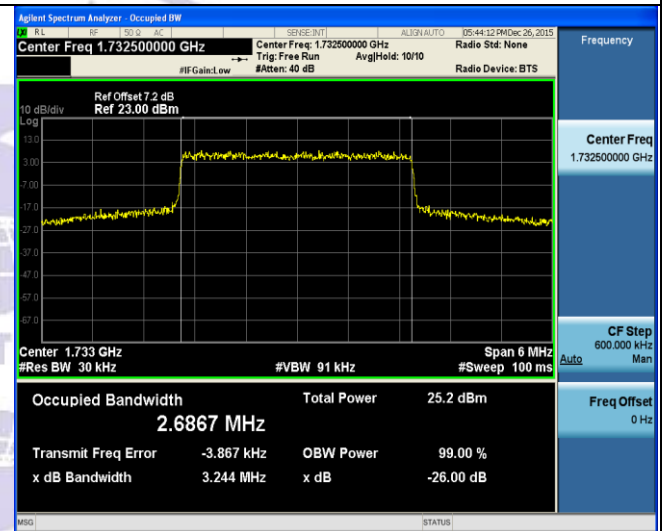
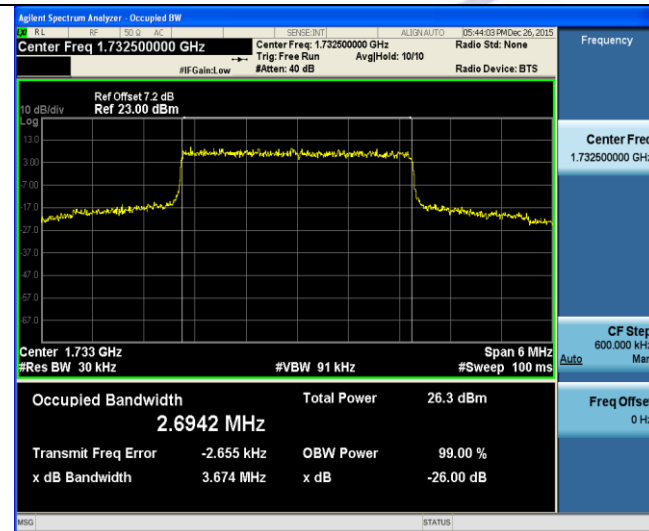
16QAM



15RB#0

15RB#0

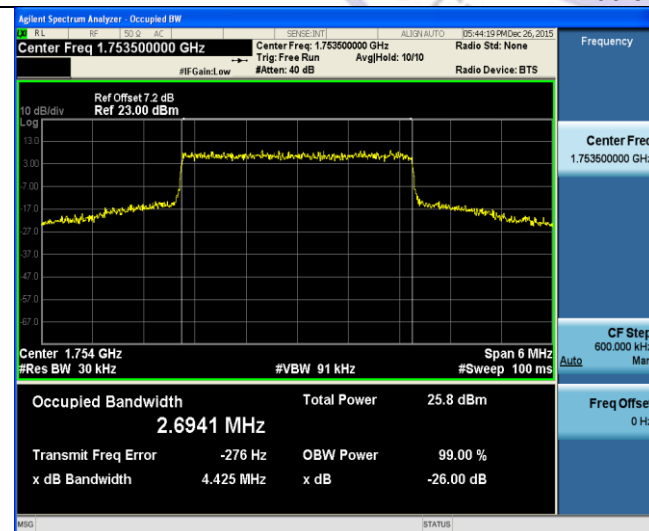
Low Channel



15RB#0

15RB#0

Middle Channel



15RB#0

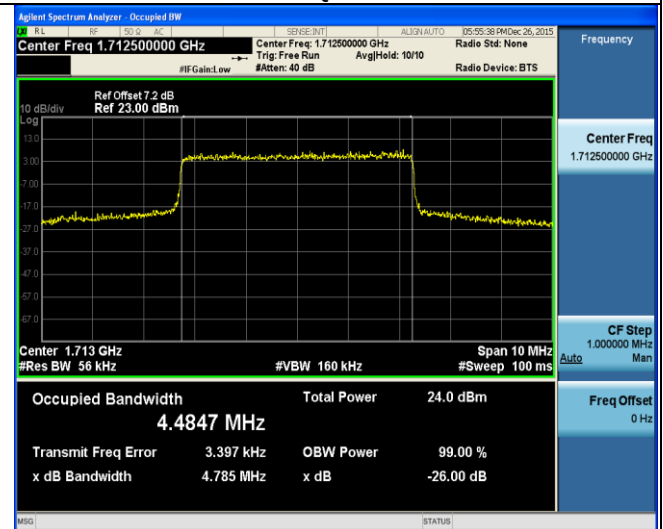
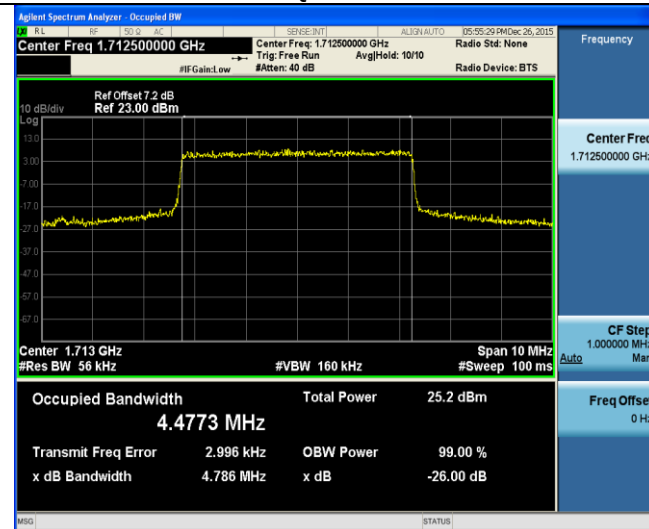
15RB#0

High Channel

LTE FDD Band 4-5MHz Channel Bandwidth

QPSK

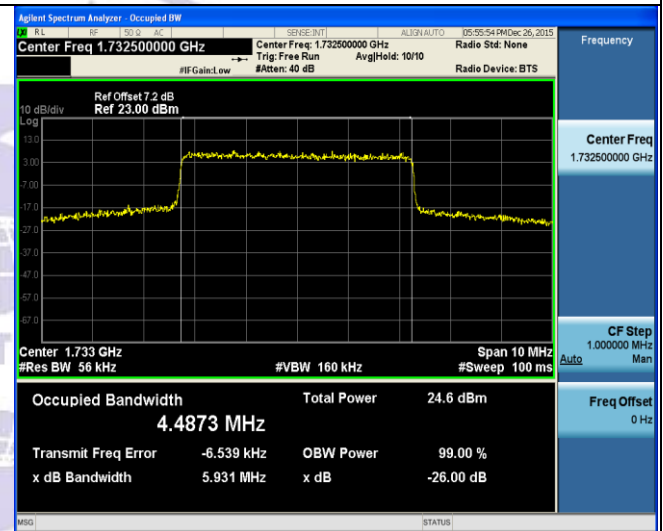
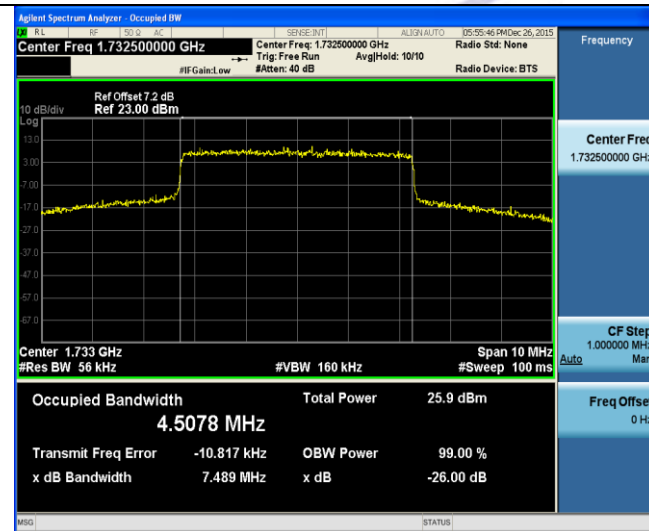
16QAM



25RB#0

25RB#0

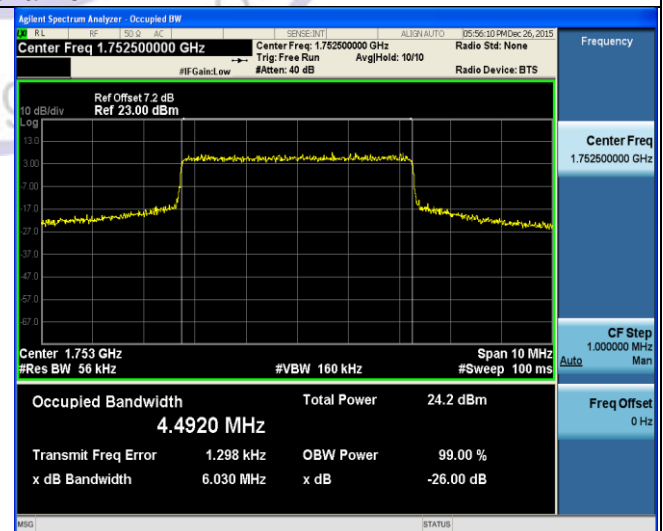
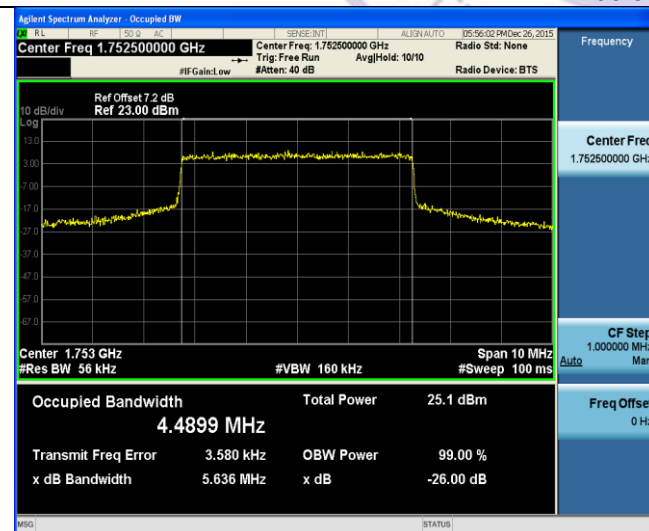
Low Channel



25RB#0

25RB#0

Middle Channel



25RB#0

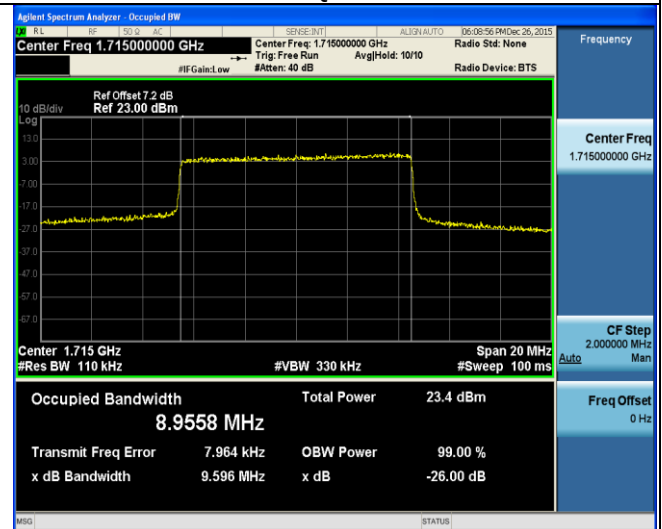
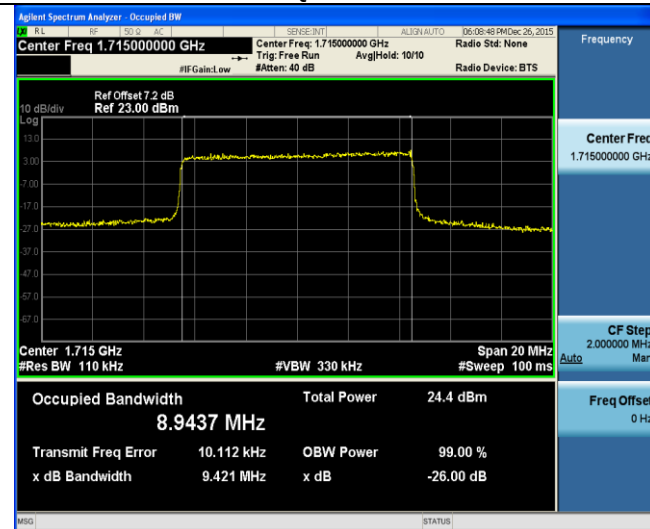
25RB#0

High Channel

LTE FDD Band 4-10MHz Channel Bandwidth

QPSK

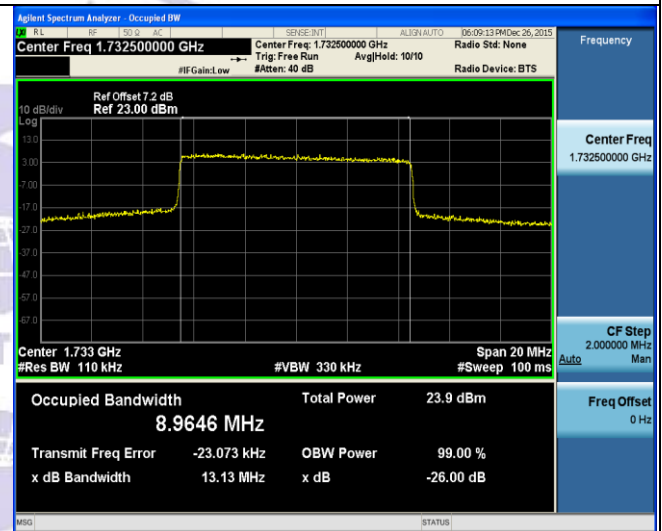
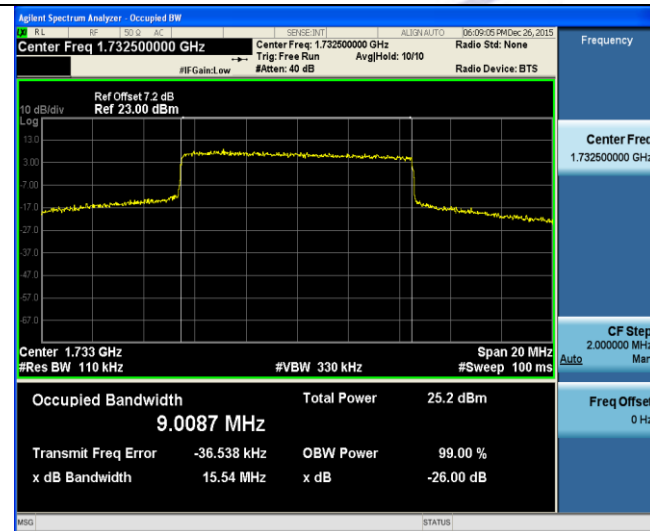
16QAM



50RB#0

50RB#0

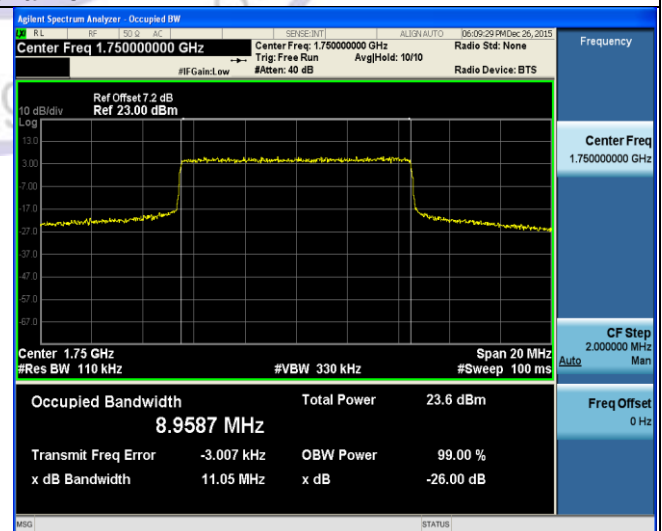
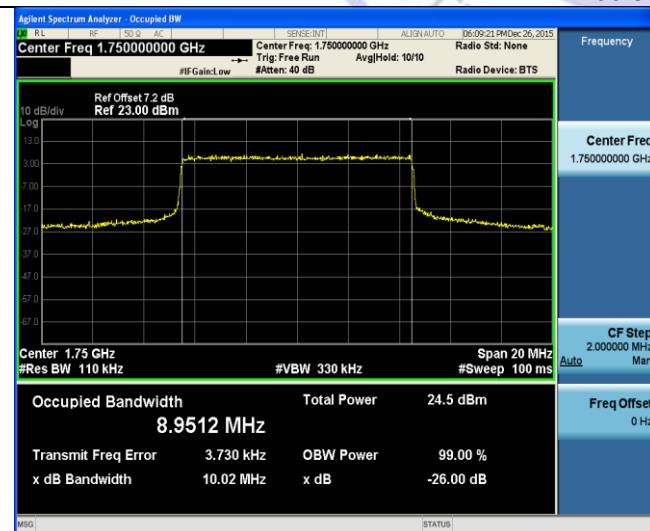
Low Channel



50RB#0

50RB#0

Middle Channel



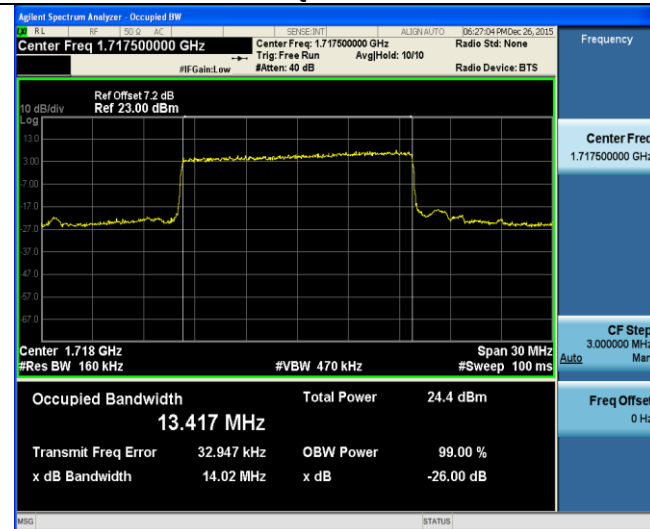
50RB#0

50RB#0

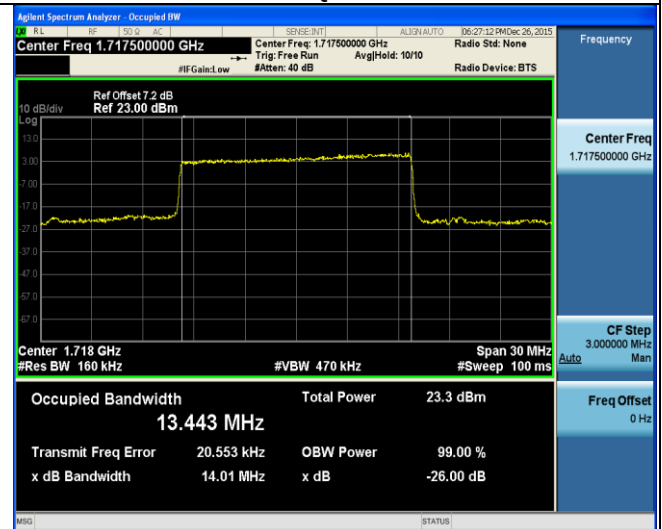
High Channel

LTE FDD Band 4-15MHz Channel Bandwidth

QPSK



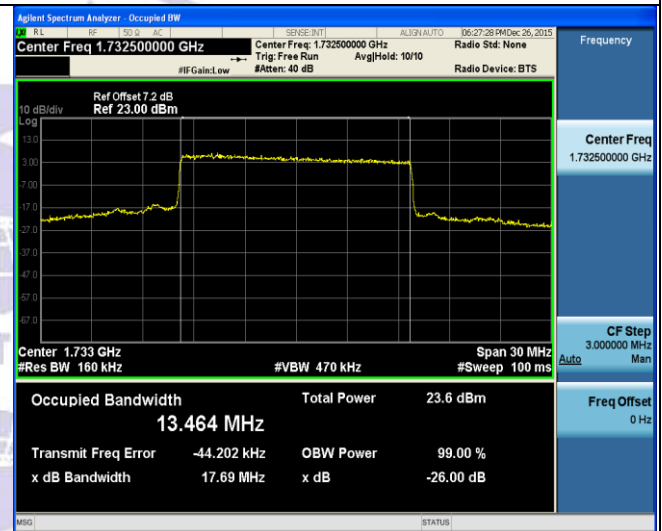
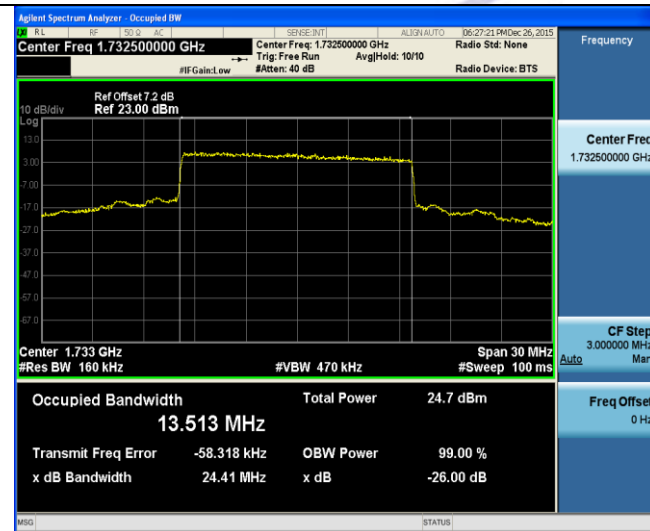
16QAM



75RB#0

75RB#0

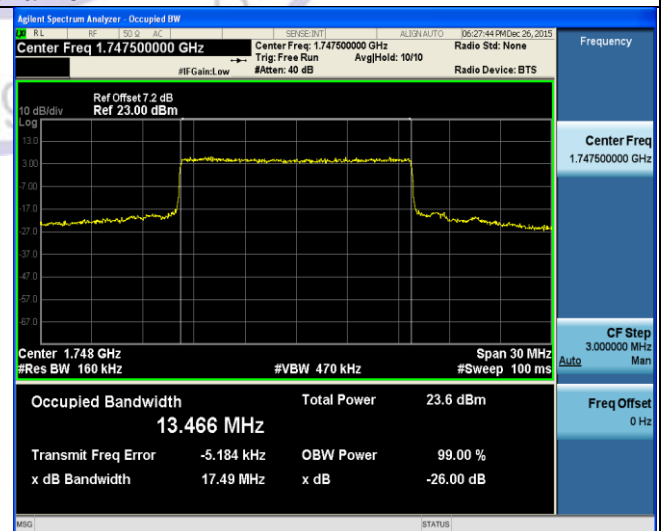
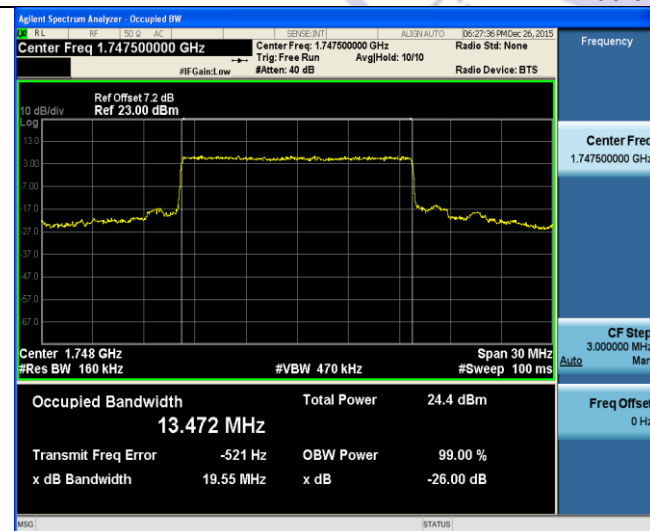
Low Channel



75RB#0

75RB#0

Middle Channel



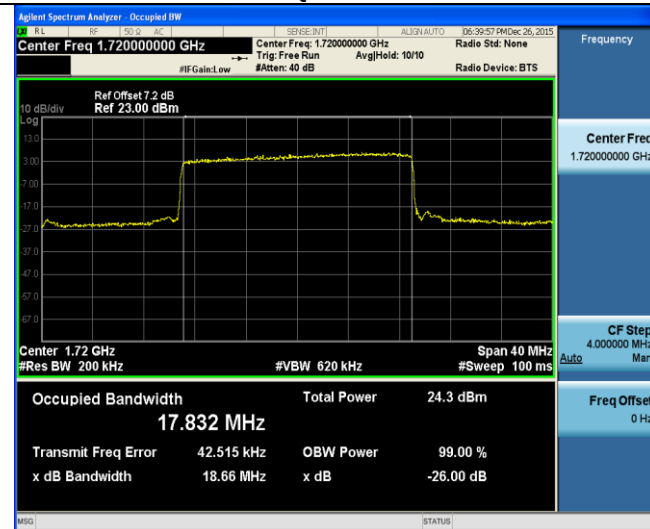
75RB#0

75RB#0

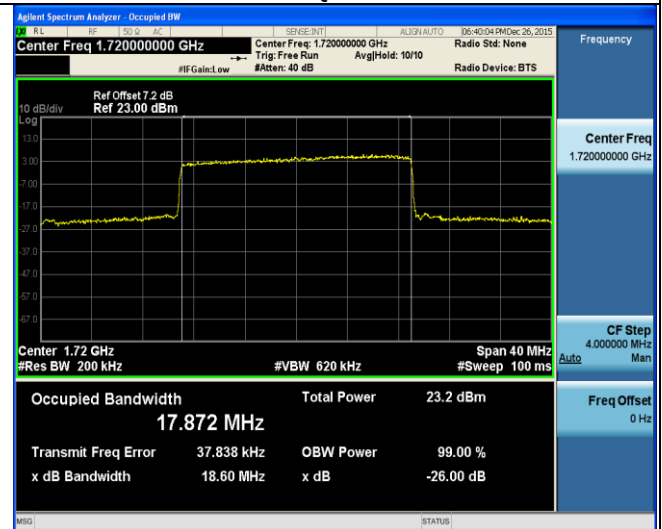
High Channel

LTE FDD Band 4-20MHz Channel Bandwidth

QPSK



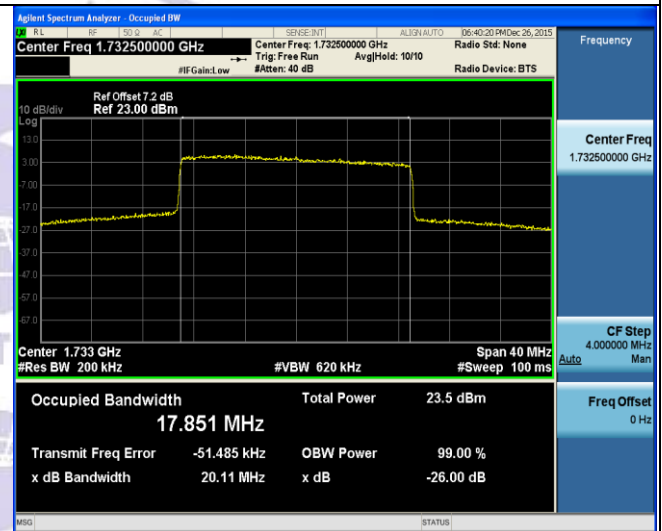
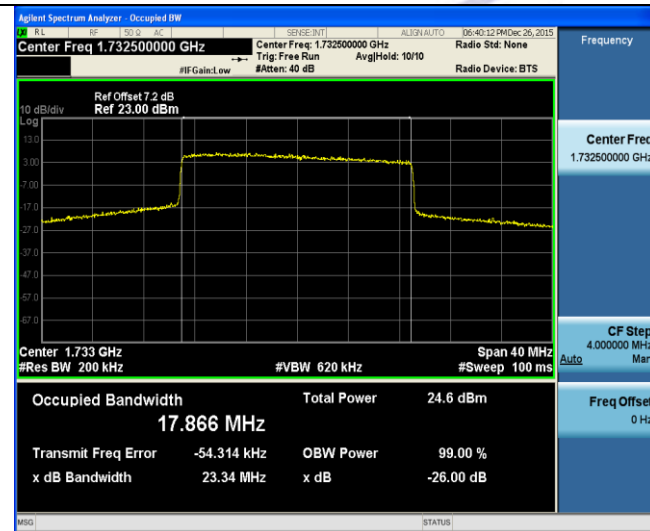
16QAM



100RB#0

100RB#0

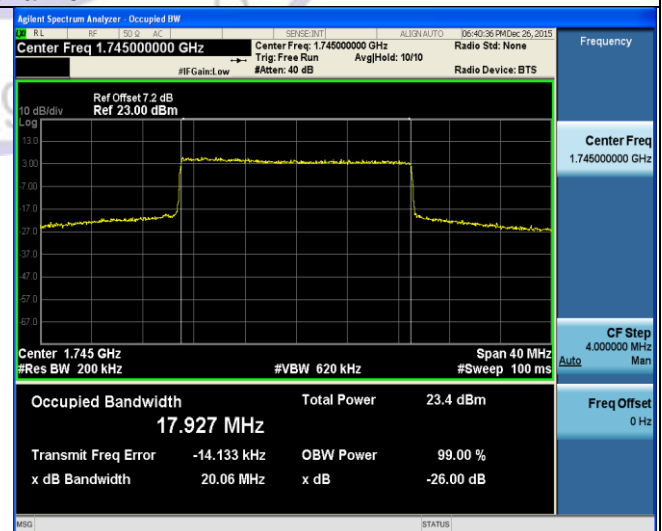
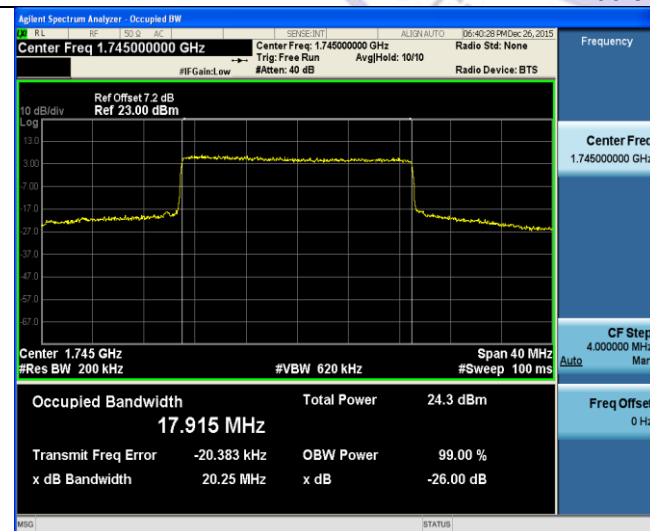
Low Channel



100RB#0

100RB#0

Middle Channel



100RB#0

100RB#0

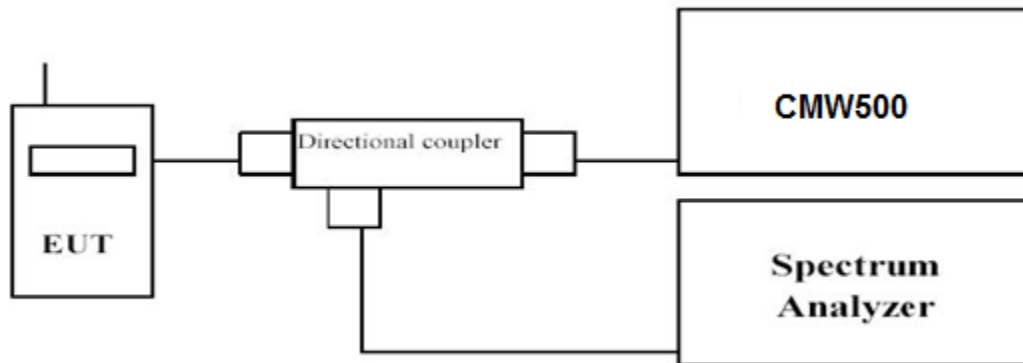
High Channel

3.5 Band Edge compliance

LIMIT

According to §27.53 (h): For operations in the 1710–1755 MHz and 2110–2155 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB.

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 and RB offset Configuration according to 3GPP TS136 521 for each Channel Bandwidth of LTE FDD Band 4, the worst case for each Channel Bandwidth of LTE FDD Band 4 were reported.