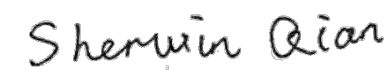
TEST REPORT
FCC Part 27

Report Reference No.....:	UNIA2018120611-5FR-01	
FCC ID.....:	2AI2O-OT303BL	
Compiled by (position+printed name+signature) . :	File administrators Kahn yang	
Supervised by (position+printed name+signature) . :	Technique principal Sherwin Qian	
Approved by (position+printed name+signature) . :	Manager Liuze	
Date of issue ..... :	Dec. 20, 2018	
Testing Laboratory Name ..... :	**Shenzhen United Testing Technology Co., Ltd.**	
Address..... :	2F, Annex Bldg, Jiahuangyuan Tech Park, #365 Baotian 1 Rd, Tiegang Community, Xixiang Str, Bao'an District, Shenzhen, China	
Applicant's name ..... :	**Shenzhen Omni Intelligent Technology Co., Ltd.**	
Address..... :	5th. Floor Block 4, Lianchuang Technical Zone, 21th. Bulan Road, Longgang, Shenzhen, China	
Test specification.....**:**		
Standard ..... :	**FCC CFR Title 47 Part 2, Part 27**	
TRF Originator..... :	Shenzhen United Testing Technology Co., Ltd.	

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Test item description .....:	Sharing scooter IOT controller
Trade Mark..... :	Omni
Manufacturer..... :	**Shenzhen Omni Intelligent Technology Co., Ltd.**
Model/Type reference..... :	OT303BL
Listed Models ..... :	N/A
Modulation Type ..... :	QPSK, 16QAM
Rating ..... :	DC 36V From Battery;
Hardware version ..... :	V2.0
Software version ..... :	V2.0
Result ..... :	**PASS**

T E S T R E P O R T

Test Report No. :	UNIA2018120611-5FR-01	Dec. 20, 2018 Date of issue

Equipment under Test	:	Sharing scooter IOT controller
Model /Type	:	OT303BL
Listed Models	:	N/A
Applicant	:	**Shenzhen Omni Intelligent Technology Co., Ltd.**
Address	:	5th. Floor Block 4, Lianchuang Technical Zone, 21th. Bulan Road, Longgang, Shenzhen, China
Manufacturer	:	**Shenzhen Omni Intelligent Technology Co., Ltd.**
Address	:	5th. Floor Block 4, Lianchuang Technical Zone, 21th. Bulan Road, Longgang, Shenzhen, China

Test result	Pass *

* In the configuration tested, the EUT complied with the standards specified page 4.

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.

Contents

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.
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
KDB971168 D01: v02r02 MEASUREMENT GUIDANCE FOR CERTIFICATION OF LICENSED DIGITAL TRANSMITTERS

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 United Testing Technology Co., Ltd.
2F, Annex Bldg, Jiahuangyuan Tech Park, #365 Baotian 1 Rd, Tiegang Community, Xixiang Str, Bao'an District, Shenzhen, China

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 United 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 Shenzhen United Testing Technology Co., Ltd. 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℃
Relative Humidity:	55 %
Air Pressure:	101 kPa

2.2 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. For the ERP/EIRP and radiated emission test, every axis (X, Y, Z) was verified, and show the worst resulton this report.
2. Test method and refer to 3GPP TS136521.

2.3 Equipments Used during the Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
CONDUCTED EMISSIONS TEST					
1	AMN	Schwarzbeck	NNLK8121	8121370	2019.9.9
2	AMN	ETS	3810/2	00020199	2019.9.9
3	EMI TEST RECEIVER	Rohde&Schwarz	ESCI	101210	2019.9.9
4	AAN	TESEQ	T8-Cat6	38888	2019.9.9
RADIATED EMISSION TEST					
1	Horn Antenna	Sunol	DRH-118	A101415	2019.9.29
2	BicoNlLog Antenna	Sunol	JB1 Antenna	A090215	2019.9.29
3	PREAMP	HP	8449B	3008A00160	2019.9.9
4	PREAMP	HP	8447D	2944A07999	2019.9.9
5	EMI TEST RECEIVER	Rohde&Schwarz	ESR3	101891	2019.9.9
6	VECTOR Signal Generator	Rohde&Schwarz	SMU200A	101521	2019.9.28
7	Signal Generator	Agilent	E4421B	MY4335105	2019.9.28
8	MXA Signal Analyzer	Agilent	N9020A	MY50510140	2019.9.28
9	MXA Signal Analyzer	Agilent	N9020A	MY51110104	2019.9.9
10	ANT Tower&Turn table Controller	Champro	EM 1000	60764	2019.9.28
11	Anechoic Chamber	Taihe Maorui	9m*6m*6m	966A0001	2019.9.9
12	Shielding Room	Taihe Maorui	6.4m*4m*3m	643A0001	2019.9.9
13	RF Power sensor	DARE	RPR3006W	15I00041SNO88	2019.3.14
14	RF Power sensor	DARE	RPR3006W	15I00041SNO89	2019.3.14
15	RF power divider	Anritsu	K241B	992289	2019.9.28
16	Wideband radio communication tester	Rohde&Schwarz	CMW500	154987	2019.9.28
17	Biconical antenna	Schwarzbeck	VHA 9103	91032360	2019.9.8
18	Biconical antenna	Schwarzbeck	VHA 9103	91032361	2019.9.8
19	Broadband Hybrid Antennas	Schwarzbeck	VULB9163	VULB9163#958	2019.9.8
20	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1680	2020.1.12
21	Active Receive Loop Antenna	Schwarzbeck	FMZB 1919B	00023	2019.11.02
22	Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170651	2019.03.14
23	Microwave Broadband Preamplifier	Schwarzbeck	BBV 9721	100472	2019.10.14
24	Active Loop Antenna	Com-Power	AL-130R	10160009	2019.05.10
25	Power Meter	KEYSIGHT	N1911A	MY50520168	2019.05.10
26	Frequency Meter	VICTOR	VC2000	997406086	2019.05.10
27	DC Power Source	HYELEC	HY5020E	055161818	2019.05.10

2.4 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: 2AI2O-OT303BL** filing to comply with of the FCC Part 24 Rules.

2.5 Modifications

No modifications were implemented to meet testing criteria.

3 TEST CONDITIONS AND RESULTS

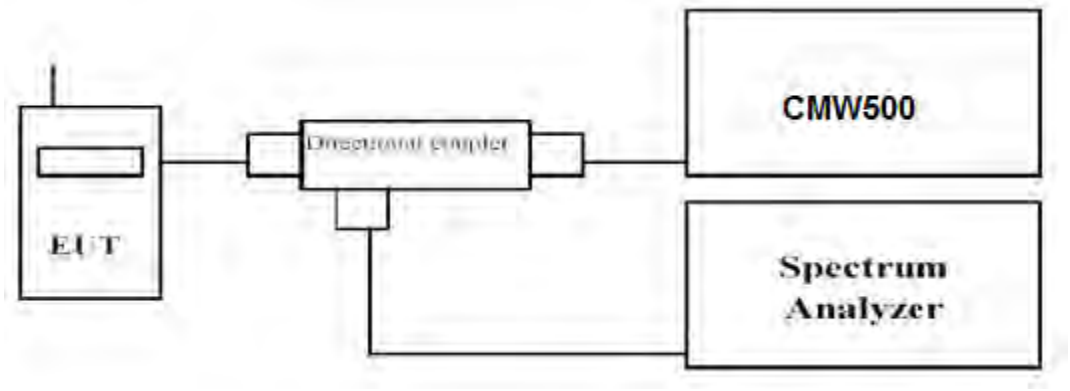
3.1 Output Power

LIMIT

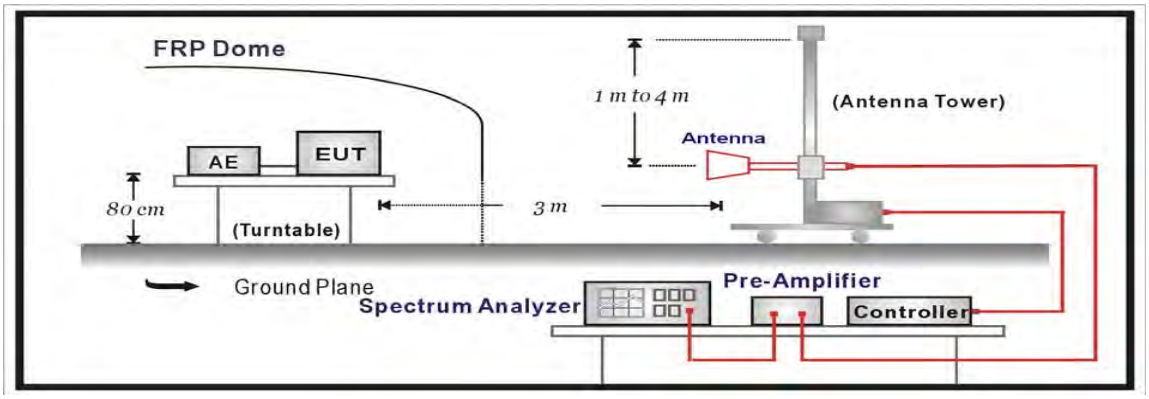
According to §27.50 (d) (4): Fixed, mobile, and portable (hand- held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP.

TEST CONFIGURATION

Conducted Power Measurement



Radiated Power Measurement:



TEST PROCEDURE

The EUT was setup according to EIA/TIA 603D

Conducted Power Measurement:

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

Radiated Power 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 thefrequency 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. Test site anechoic chamber refer to ANSI C63.4.

TEST RESULTS

Conducted Measurement:

LTE FDD Band 4				
TX Channel Bandwidth	Frequency (MHz)	RB Size/Offset	Average Power [dBm]	
			QPSK	16QAM
1.4 MHz	1710.7	1 RB low	22.83	22.61
		1 RB high	22.53	21.36
		50% RB mid	22.37	21.68
		100% RB	21.46	22.63
	1732.5	1 RB low	22.24	21.02
		1 RB high	22.95	21.69
		50% RB mid	22.03	20.72
		100% RB	21.16	22.53
	1754.3	1 RB low	21.95	21.71
		1 RB high	23.07	20.99
		50% RB mid	23.39	22.56
		100% RB	21.81	20.59
3 MHz	1711.5	1 RB low	22.62	21.52
		1 RB high	23.01	22.63
		50% RB mid	20.82	21.41
		100% RB	22.18	20.47
	1732.5	1 RB low	22.96	21.44
		1 RB high	23.39	21.76
		50% RB mid	21.71	21.22
		100% RB	21.14	21.21
	1753.5	1 RB low	21.87	20.87
		1 RB high	22.98	22.59
		50% RB mid	21.09	20.15
		100% RB	21.27	21.36
5 MHz	1712.	1 RB low	22.56	22.32
		1 RB high	22.84	22.03
		50% RB mid	22.27	21.64
		100% RB	22.19	20.87
	1732.5	1 RB low	22.25	21.78
		1 RB high	23.43	21.36
		50% RB mid	22.28	20.82
		100% RB	21.88	20.25
	1752.5	1 RB low	21.79	21.45
		1 RB high	22.42	21.75
		50% RB mid	21.99	20.73
		100% RB	20.87	21.25

10 MHz	1715.0	1 RB low	23.24	22.52
		1 RB high	22.39	21.43
		50% RB mid	20.85	20.33
		100% RB	22.26	20.65
	1732.5	1 RB low	21.42	21.02
		1 RB high	22.58	21.84
		50% RB mid	21.87	20.53
		100% RB	22.24	21.06
	1750.0	1 RB low	21.68	22.31
		1 RB high	21.42	21.05
		50% RB mid	22.36	21.32
		100% RB	21.39	21.28
15 MHz	1717.5	1 RB low	21.71	21.32
		1 RB high	22.07	22.63
		50% RB mid	20.73	20.06
		100% RB	21.24	20.84
	1732.5	1 RB low	22.91	21.84
		1 RB high	22.36	21.12
		50% RB mid	20.87	21.33
		100% RB	22.69	20.48
	1747.5	1 RB low	22.17	21.33
		1 RB high	23.15	21.31
		50% RB mid	21.08	21.27
		100% RB	20.82	19.84
20 MHz	1720.0	1 RB low	23.33	22.52
		1 RB high	22.54	22.54
		50% RB mid	21.68	22.37
		100% RB	21.64	22.34
	1732.5	1 RB low	21.72	21.19
		1 RB high	23.15	22.28
		50% RB mid	21.48	22.14
		100% RB	22.55	20.84
	1745.0	1 RB low	23.49	21.69
		1 RB high	22.82	22.33
		50% RB mid	21.75	20.95
		100% RB	21.43	21.52

Radiated Measurement:

Remark:

1. *We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE FDD Band 4; recorded worst case for each Channel Bandwidth of LTE FDD Band 4.*
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	-21.09	3.06	9.68	34.80	20.33	30.00	9.67	V
1732.5	-22.11	3.17	9.68	34.80	19.20	30.00	11.80	V
1754.3	-21.41	3.22	9.75	34.80	19.92	30.00	12.08	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	-19.42	3.06	9.68	34.80	22.00	30.00	8.00	V
1732.5	-21.85	3.17	9.68	34.80	19.46	30.00	11.54	V
1753.5	-19.94	3.22	9.75	34.80	21.39	30.00	10.61	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	-21.15	3.06	9.68	34.80	20.27	30.00	9.73	V
1732.5	-19.48	3.17	9.68	34.80	21.83	30.00	9.17	V
1752.5	-21.41	3.22	9.75	34.80	19.92	30.00	12.08	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	-21.91	3.06	9.68	34.80	19.51	30.00	10.49	V
1732.5	-20.49	3.17	9.68	34.80	20.82	30.00	10.18	V
1750.0	-22.24	3.22	9.75	34.80	19.09	30.00	12.91	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	-22.86	3.06	9.68	34.80	18.56	30.00	11.44	V
1732.5	-20.48	3.17	9.68	34.80	20.83	30.00	10.17	V
1747.5	-21.42	3.22	9.75	34.80	19.91	30.00	12.09	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	-21.79	3.06	9.68	34.80	19.63	30.00	10.37	V
1732.5	-21.02	3.17	9.68	34.80	20.29	30.00	10.71	V
1745.0	-21.59	3.22	9.75	34.80	19.74	30.00	12.26	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	-23.21	3.06	9.68	34.80	18.21	30.00	11.79	V
1732.5	-22.77	3.17	9.68	34.80	18.54	30.00	12.46	V
1754.3	-25.07	3.22	9.75	34.80	16.26	30.00	15.74	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	-23.58	3.06	9.68	34.80	17.84	30.00	12.16	V
1732.5	-21.81	3.17	9.68	34.80	19.50	30.00	11.50	V
1753.5	-23.03	3.22	9.75	34.80	18.30	30.00	13.70	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	-23.16	3.06	9.68	34.80	18.26	30.00	11.74	V
1732.5	-22.46	3.17	9.68	34.80	18.85	30.00	12.15	V
1752.5	-22.54	3.22	9.75	34.80	18.79	30.00	13.21	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	-22.96	3.06	9.68	34.80	18.46	30.00	11.54	V
1732.5	-21.23	3.17	9.68	34.80	20.08	30.00	10.92	V
1750.0	-22.03	3.22	9.75	34.80	19.30	30.00	12.70	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	-21.95	3.06	9.68	34.80	19.47	30.00	10.53	V
1732.5	-22.55	3.17	9.68	34.80	18.76	30.00	12.24	V
1747.5	-22.48	3.22	9.75	34.80	18.85	30.00	13.15	V

LTE FDD Band 4_Channel Bandwidth 20MHz_16QAM

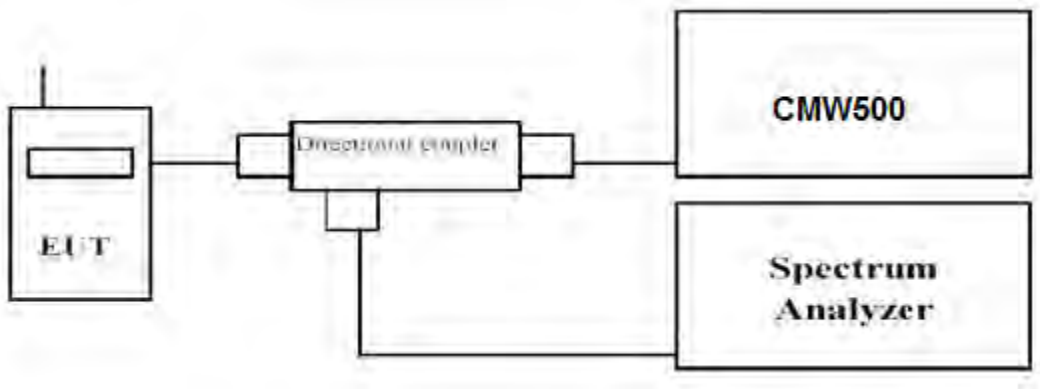
Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1720.0	-24.44	3.06	9.68	34.80	16.98	30.00	13.02	V
1732.5	-21.47	3.17	9.68	34.80	19.84	30.00	11.16	V
1745.0	-22.72	3.22	9.75	34.80	18.61	30.00	13.39	V

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 ≥ 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%.

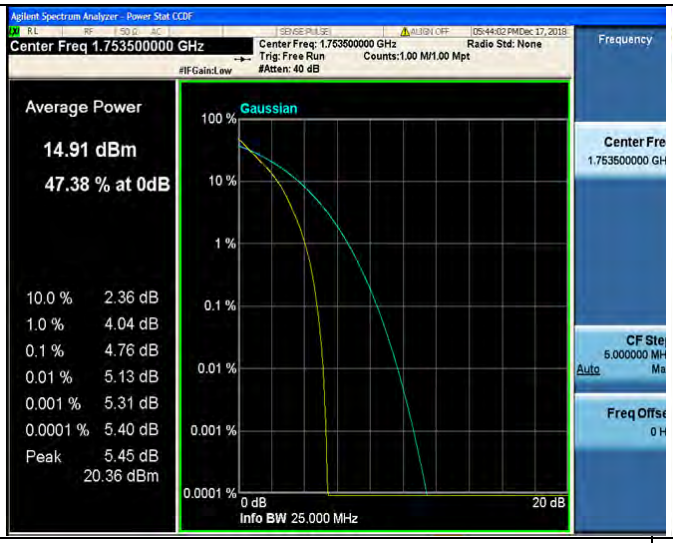
TEST RESULTS

Remark:

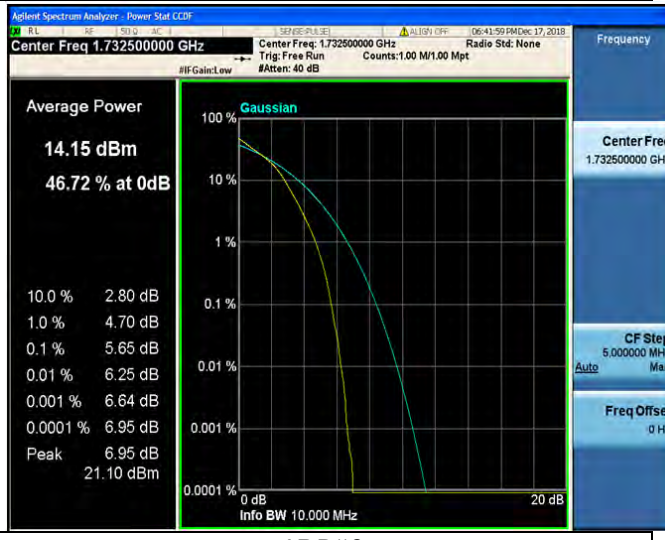
1. *We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE FDD Band 4; recorded worst case for each Channel Bandwidth of LTE FDD Band 4.*

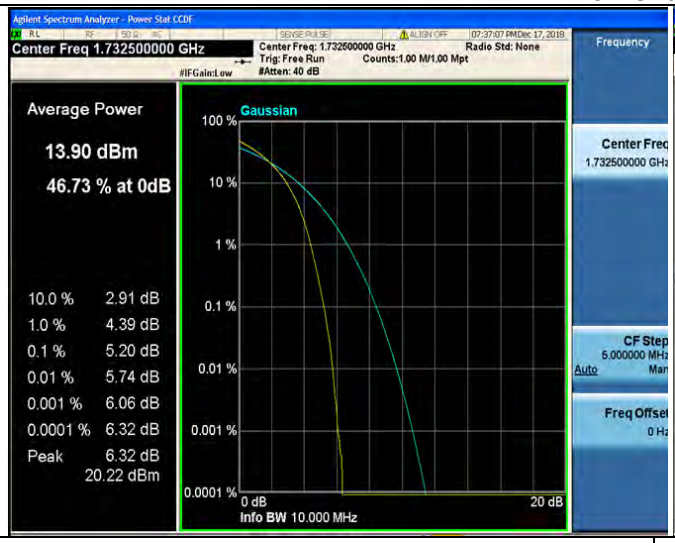
LTE FDD Band 4				
TX Channel Bandwidth	Frequency (MHz)	RB Size/Offset	PAPR (dB)	
			QPSK	16QAM
1.4 MHz	1710.7	*1RB#0*	4.09	4.86
	1732.5		4.58	5.35
	1754.3		4.70	5.54
3 MHz	1711.5	*1RB#0*	4.21	5.04
	1732.5		4.55	5.44
	1753.5		4.76	5.53
5 MHz	1712.5	*1RB#0*	4.31	4.99
	1732.5		4.59	5.30
	1752.5		4.91	5.71
10 MHz	1715.0	*1RB#0*	4.76	5.52
	1732.5		4.90	5.65
	1750.0		5.07	5.79
15 MHz	1717.5	*1RB#0*	5.17	6.19
	1732.5		5.20	6.18
	1747.5		5.15	6.21
20 MHz	1720.0	*1RB#0*	6.14	6.78
	1732.5		6.13	6.74
	1745.0		6.05	6.71

LTE FDD Band 4-1.4MHz Channel Bandwidth PAPR	
QPSK	16QAM
	
1RB#0	1RB#0
Low Channel	
	
1RB#0	1RB#0
Middle Channel	
	
1RB#0	1RB#0
High Channel	

LTE FDD Band 4-3MHz Channel Bandwidth PAPR	
QPSK	16QAM
	
1RB#0	1RB#0
Low Channel	
	
1RB#0	1RB#0
Middle Channel	
	
1RB#0	1RB#0
High Channel	

LTE FDD Band 4-5MHz Channel Bandwidth PAPR	
QPSK	16QAM
	
1RB#0	1RB#0
Low Channel	
	
1RB#0	1RB#0
Middle Channel	
	
1RB#0	1RB#0
High Channel	

LTE FDD Band 4-10MHz Channel Bandwidth PAPR	
QPSK	16QAM
	
1RB#0	1RB#0
Low Channel	
	
1RB#0	1RB#0
Middle Channel	
	
1RB#0	1RB#0
High Channel	

LTE FDD Band 4-15MHz Channel Bandwidth PAPR	
QPSK	16QAM
	
1RB#0	1RB#0
Low Channel	
	
1RB#0	1RB#0
Middle Channel	
	
1RB#0	1RB#0
High Channel	

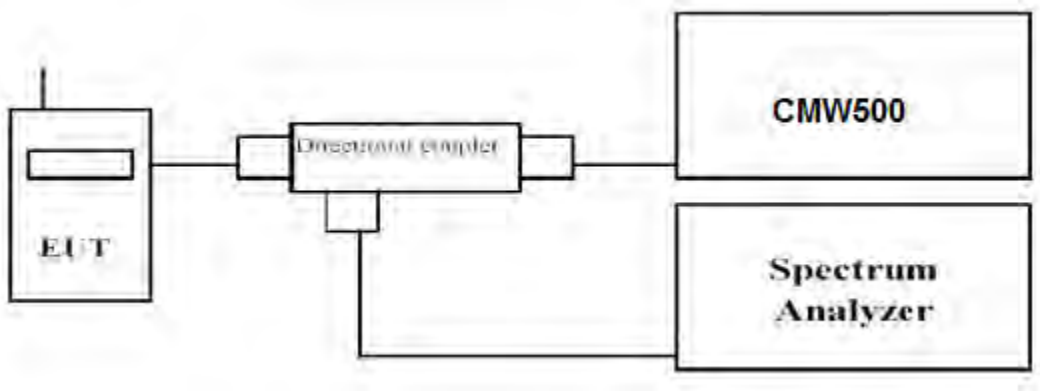
LTE FDD Band 4-20MHz Channel Bandwidth PAPR	
QPSK	16QAM
	
1RB#0	1RB#0
Low Channel	
	
1RB#0	1RB#0
Middle Channel	
	
1RB#0	1RB#0
High Channel	

3.4 Occupied Bandwidth and Emission Bandwidth

LIMIT

N/A

TEST CONFIGURATION



TEST PROCEDURE

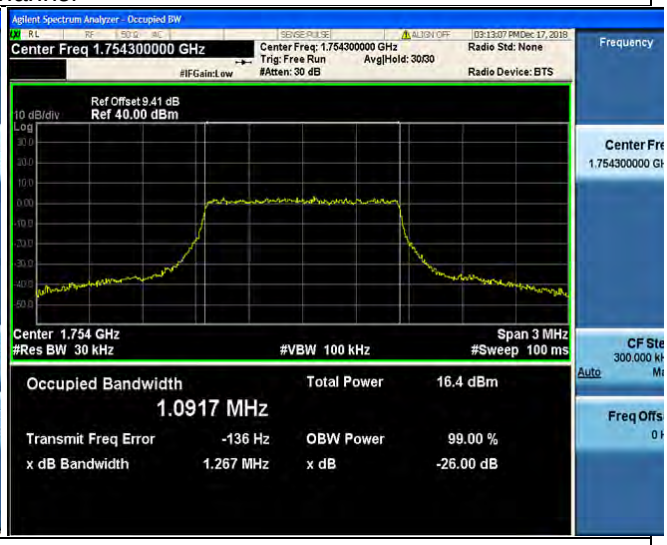
The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at low, middle and high channel in each band. The -26dBc Emission bandwidth was also measured and recorded. Set RBW was set to about 1% of emission BW, VBW≥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.

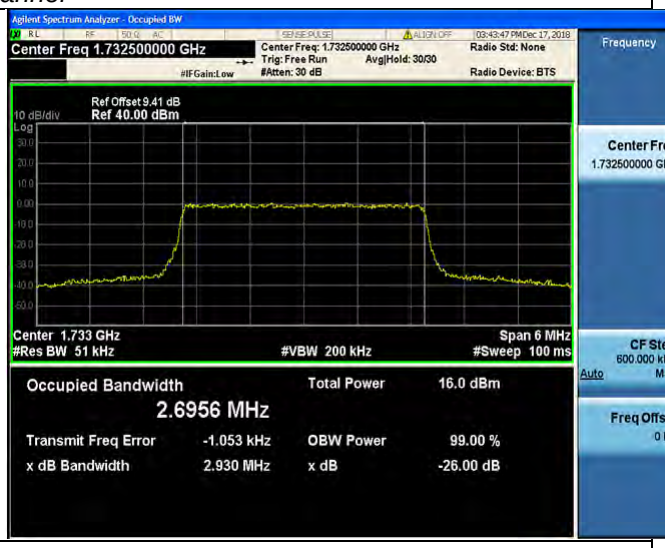
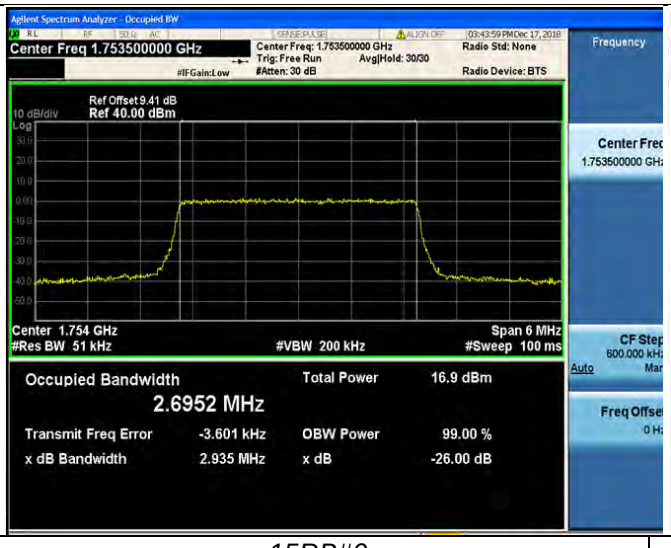
TEST RESULTS

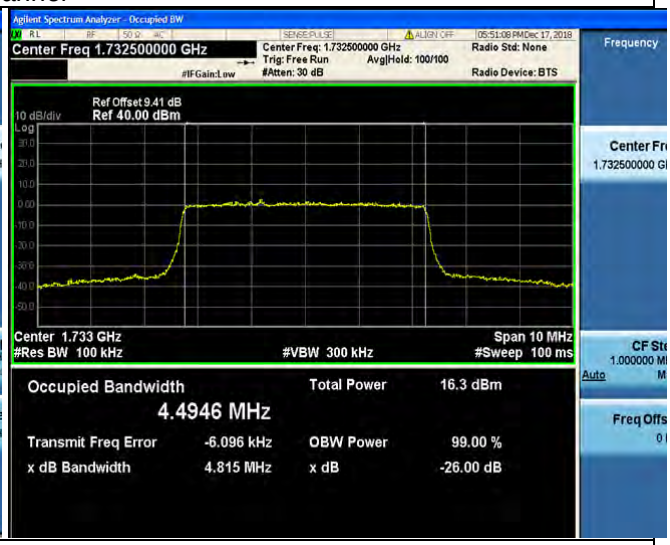
Remark:

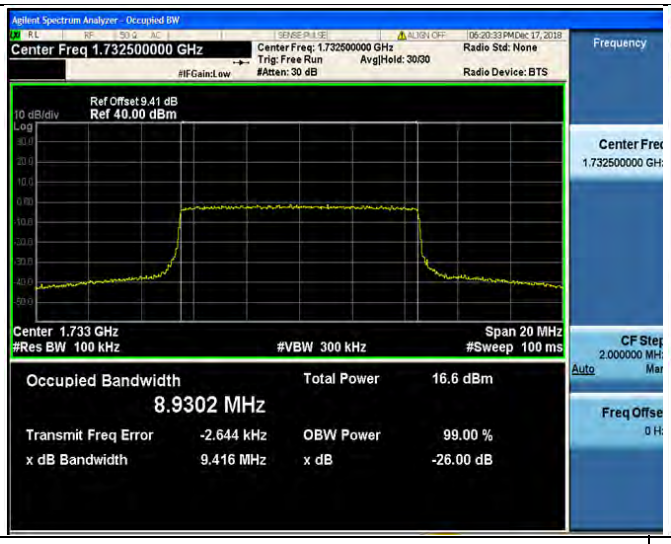
1. *We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE FDD Band 4; recorded worst case for each Channel Bandwidth of LTE FDD Band 4.*

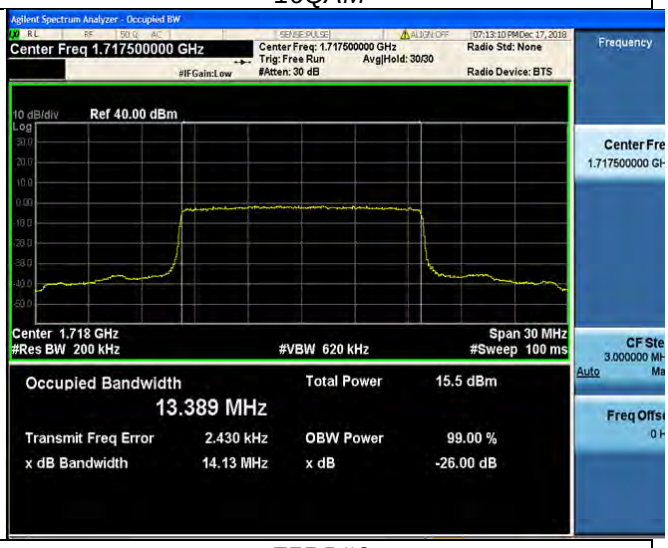
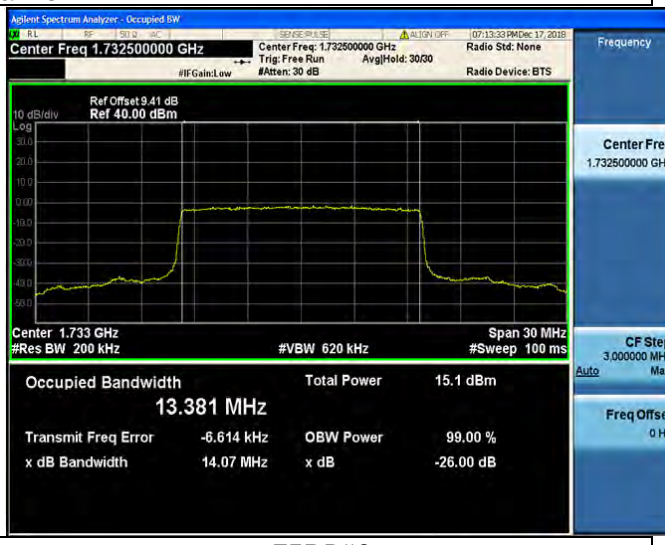
LTE FDD Band 4						
TX Channel Bandwidth	RB Size/Offset	Frequency (MHz)	-26dBc Emission bandwidth (MHz)		99% Occupied bandwidth (MHz)	
			QPSK	16QAM	QPSK	16QAM
1.4 MHz	*6RB#0*	1710.7	1.308	1.289	1.091	1.095
		1732.5	1.269	1.271	1.089	1.092
		1754.3	1.265	1.267	1.086	1.092
3 MHz	*15RB#0*	1711.5	2.958	2.952	2.696	2.698
		1732.5	2.929	2.930	2.692	2.696
		1753.5	2.935	2.921	2.695	2.692
5 MHz	*25RB#0*	1712.5	5.010	4.918	4.877	4.502
		1732.5	4.780	4.856	4.815	4.495
		1752.5	4.780	4.836	4.879	4.489
10 MHz	*50RB#0*	1715.0	9.557	9.376	8.928	8.932
		1732.5	9.416	9.474	8.930	8.921
		1750.0	9.450	9.407	8.921	8.926
15 MHz	*75RB#0*	1717.5	14.070	14.130	13.378	13.389
		1732.5	14.120	14.070	13.387	13.381
		1747.5	14.120	14.060	13.377	13.380
20 MHz	*100RB#0*	1720.0	18.590	18.610	17.818	17.816
		1732.5	18.610	18.550	17.804	17.805
		1745.0	18.580	18.590	17.816	17.823

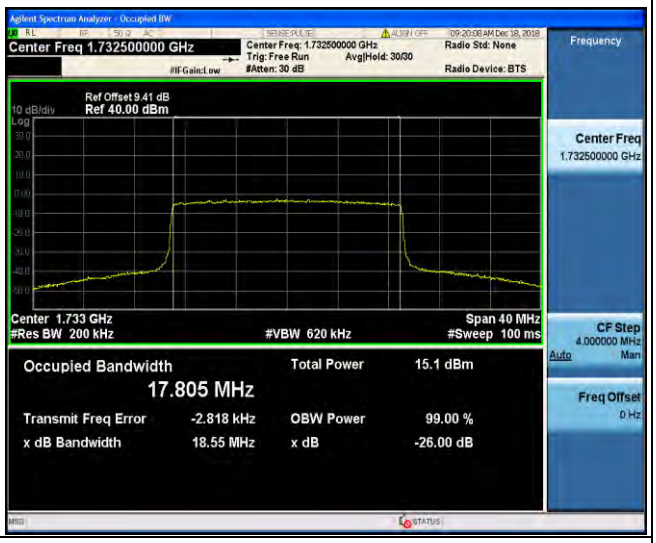
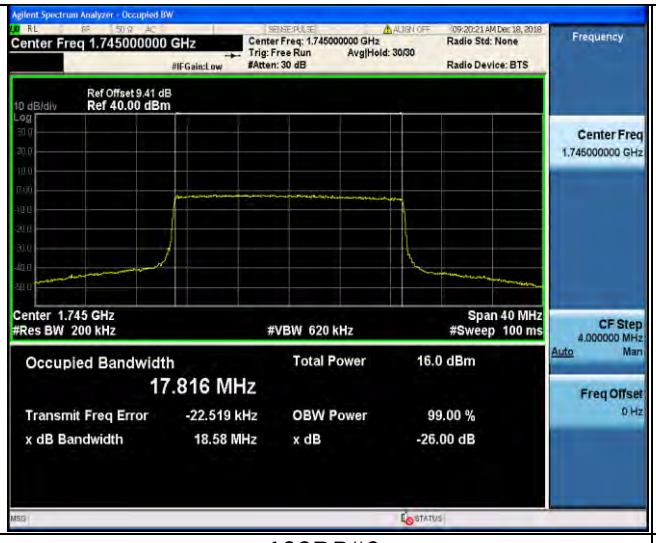
LTE FDD Band 4-1.4MHz Channel Bandwidth	
QPSK	16QAM
	
6RB#0	6RB#0
Low Channel	
	
6RB#0	6RB#0
Middle Channel	
	
6RB#0	6RB#0
High Channel	

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	

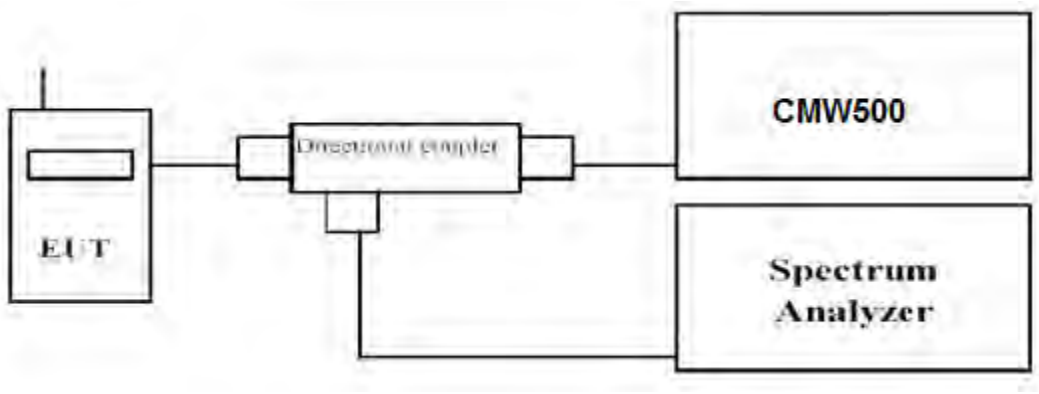
LTE FDD Band 4-20MHz Channel Bandwidth	
QPSK	16QAM
	
100RB#0	100RB#0
Low Channel	
	
100RB#0	100RB#0
Middle Channel	
	
100RB#0	100RB#0
High Channel	

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 log10(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 Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE FDD Band 4; recorded worst case for each Channel Bandwidth of LTE FDD Band 4.*

LTE FDD Band 4-1.4MHz Channel Bandwidth Band Edge Compliance	
QPSK	16QAM
	
6RB#0	6RB#0
Low Channel	
	
6RB#0	6RB#0
High Channel	

LTE FDD Band 4-3MHz Channel Bandwidth Band Edge Compliance	
QPSK	16QAM
	
15RB#0	15RB#0
Low Channel	
	
15RB#0	15RB#0
High Channel	

LTE FDD Band 4-5MHz Channel Bandwidth Band Edge Compliance	
QPSK	16QAM
	
25RB#0	25RB#0
Low Channel	
	
25RB#0	25RB#0
High Channel	

LTE FDD Band 4-10MHz Channel Bandwidth Band Edge Compliance	
QPSK	16QAM
	
50RB#0	50RB#0
Low Channel	
	
50RB#0	50RB#0
High Channel	

LTE FDD Band 4-15MHz Channel Bandwidth Band Edge Compliance	
QPSK	16QAM
	
75RB#0	75RB#0
Low Channel	
	
75RB#0	75RB#0
High Channel	

LTE FDD Band 4-20MHz Channel Bandwidth Band Edge Compliance	
QPSK	16QAM
	
100RB#0	100RB#0
Low Channel	
	
100RB#0	100RB#0
High Channel	

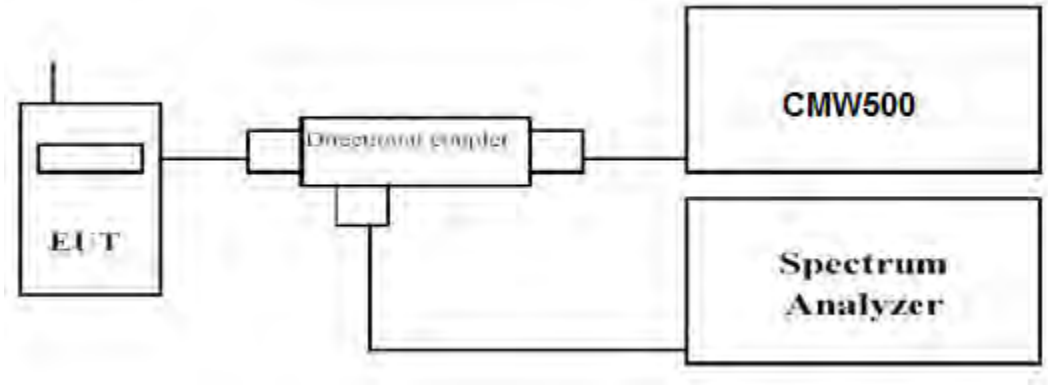
3.6 Spurious Emission

LIMIT

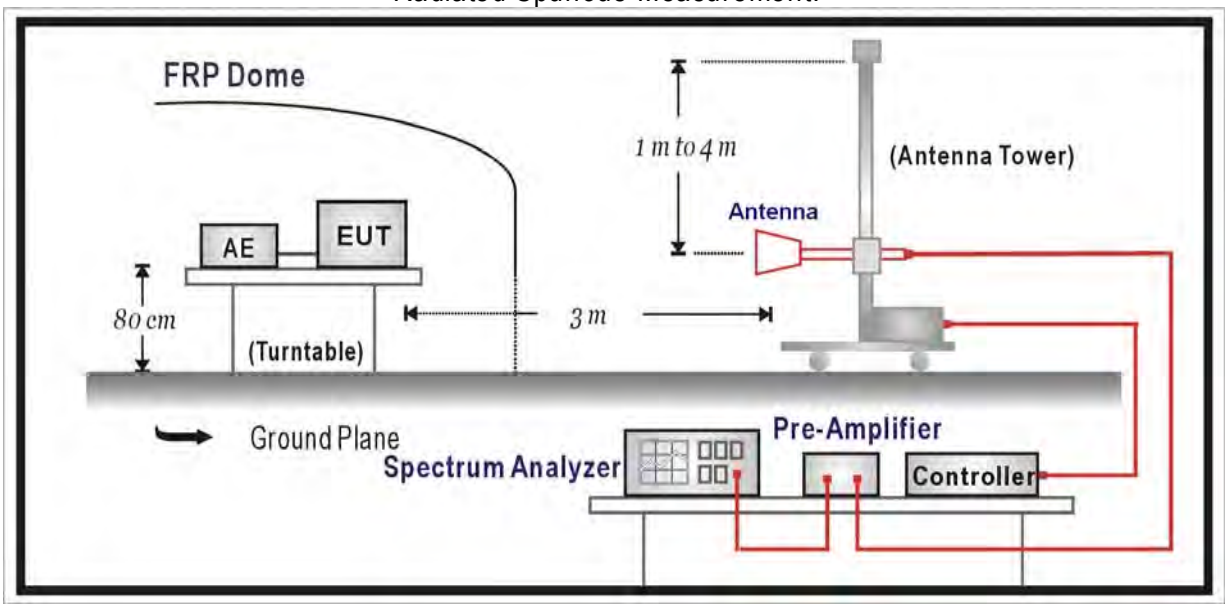
According to §27.53 (h): For operations in the 1710–1755 MHz and 2110–2155 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 + 10 log10(P) dB.

TEST CONFIGURATION

Conducted Spurious Measurement:



Radiated Spurious Measurement:



TEST PROCEDURE

The EUT was setup according to EIA/TIA 603D

Conducted Spurious Measurement:

a. Place the EUT on a bench and set it in transmitting mode.
b. Connect a low loss RF cable from the antenna port to a spectrum analyzer and CMW500 by a Directional Couple.
c. EUT Communicate with CMW500, 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 to10th harmonic.
f. Please refer to following tables for test antenna conducted emissions.

Working Frequency	Sub range (GHz)	RBW	VBW	Sweep time (s)
LTE FDD Band 4	0.000009~0.000015	1KHz	3KHz	Auto
	0.000015~0.03	10KHz	30KHz	Auto
	0.03~26.5	1 MHz	3 MHz	Auto

Radiated Spurious Measurement:

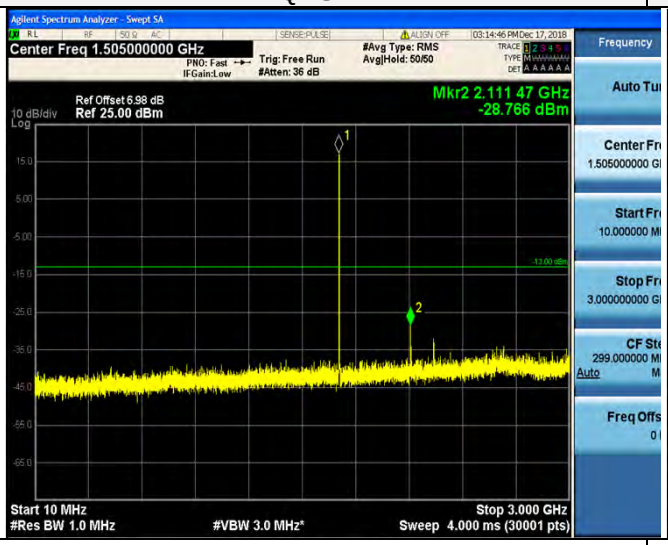
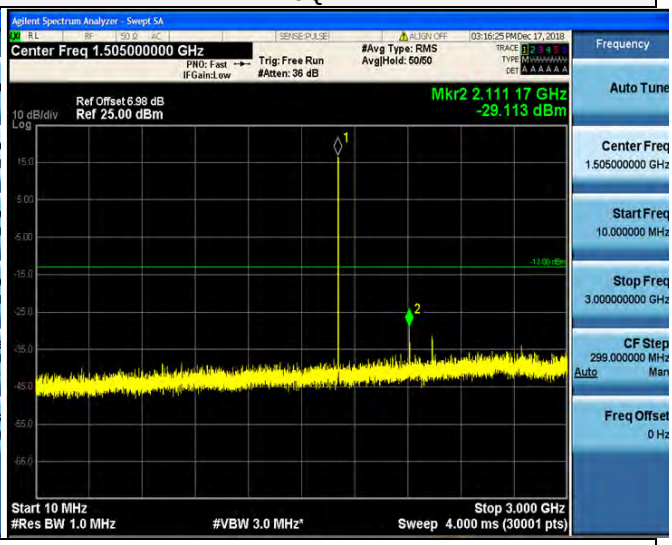
a. The EUT shall be placed at the specified height on a support, and in the position closest to normal use as declared by provider.
b. The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter
c. The output of the test 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:

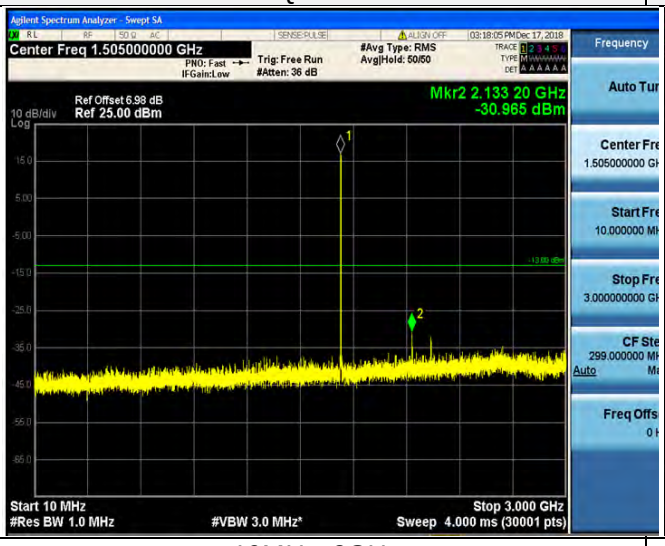
1. *We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE FDD Band 4; recorded worst case for each Channel Bandwidth of LTE FDD Band 4.*

Conducted Measurement:

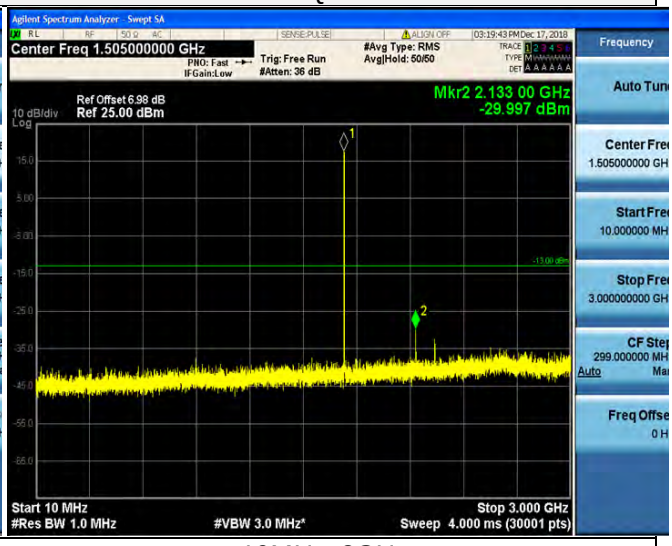
LTE FDD Band 4-1.4MHz Channel Bandwidth	
Low Channel	
QPSK	16QAM
	
10MHz~3GHz	10MHz~3GHz
	
3GHz ~9GHz	3GHz ~9GHz
	
9GHz ~15GHz	9GHz ~15GHz

15GHz ~20GHz	15GHz ~20GHz
1RB#0	1RB#0

LTE FDD Band 4-1.4MHz Channel Bandwidth	
Middle Channel	
QPSK	16QAM



10MHz~3GHz	10MHz~3GHz



3GHz ~9GHz	3GHz ~9GHz

9GHz ~15GHz

9GHz ~15GHz

15GHz ~20GHz

1RB#0

15GHz ~20GHz

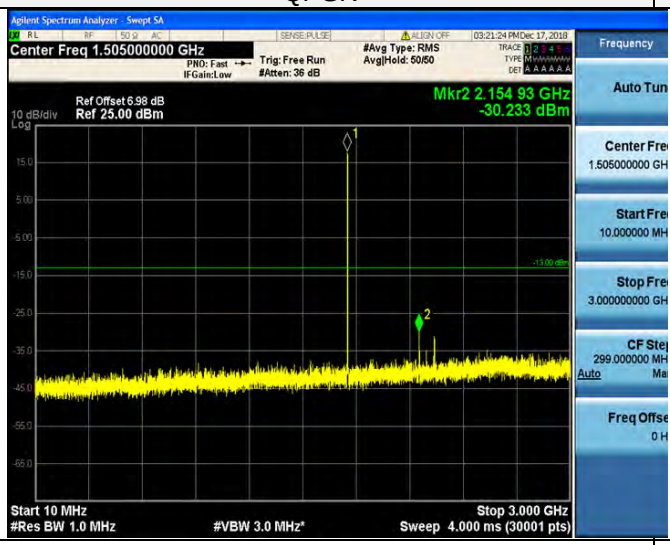
1RB#0

LTE FDD Band 4-1.4MHz Channel Bandwidth

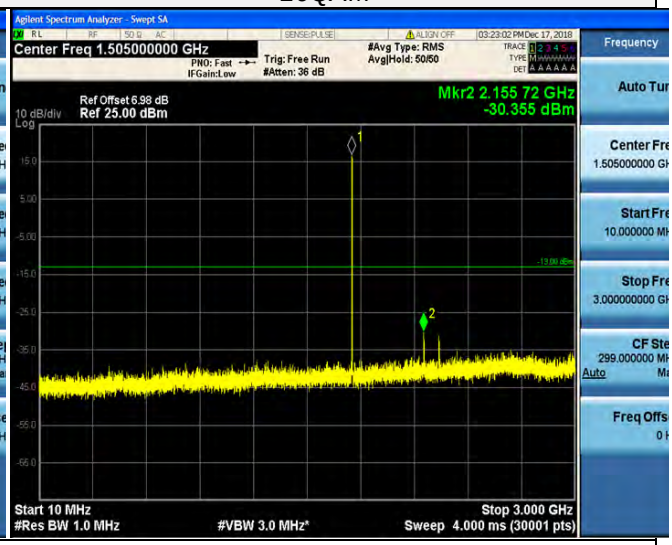
High Channel

QPSK

16QAM



10MHz~3GHz



10MHz~3GHz

3GHz ~9GHz

3GHz ~9GHz

9GHz ~15GHz

9GHz ~15GHz

15GHz ~20GHz

1RB#0

15GHz ~20GHz

1RB#0