FCC PART 24TEST REPORT

Part 24 Subpart E

Report Reference No.....: HK2009012691-6E

FCC ID.....: 2AJOTTA-1318

Compiled by
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Approved by
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Date of issue.....: Sept. 10, 2020

Testing Laboratory Name .....: **Shenzhen HUAK Testing Technology Co., Ltd.**

Address .....: 1F, B2 Building, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen,China

Applicant's name.....: **HMD global Oy**

Address .....: Bertel Jungin aukio 9, 02600 Espoo Finland

Test specification .....**:**

Standard .....: **FCC CFR Title 47 Part 2, Part 24E**

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

Test item description .....:	Mobile Phone
Trade Mark .....:	NOKIA
Manufacturer.....:	**HMD global Oy**
Model/Type reference.....:	TA-1318
Listed Models .....:	N/A
Modulation Type .....:	QPSK, 16QAM
Rating .....:	DC 3.8V from Battery or DC 5V from Adapter
Hardware version .....:	V2.0
Software version.....:	V2.0
Result.....:	**PASS**

TEST REPORT

Test Report No. :	HK2009012691-6E	Sept. 10, 2020 Date of issue

Equipment under Test	:	Mobile Phone
Model /Type	:	TA-1318
Listed Models	:	N/A
Applicant	:	**HMD global Oy**
Address	:	Bertel Jungin aukio 9, 02600 Espoo Finland
Manufacturer	:	**HMD global Oy**
Address	:	Bertel Jungin aukio 9, 02600 Espoo Finland

Test Result:	**PASS**

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.

Revison History

Revision	Issue Date	Revisions	Revised By
V1.0	2020-09-10	Initial Issue	Jasou Zhou

Contents

1 TEST STANDARDS

The tests were performed according to following standards:

FCC Part 24 :PUBLIC MOBILE 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:v02r02MEASUREMENT GUIDANCE FOR CERTIFICATION OF LICENSED DIGITAL TRANSMITTERS
FCC KDB 971168D01 v03r01 Power Meas License Digital Systems

2 SUMMARY

2.1 General Remarks

Date of receipt of test sample	:	Aug. 28, 2020
Testing commenced on	:	Aug. 29, 2020
Testing concluded on	:	Sept. 10, 2020

2.2 Product Description

The **HMD global Oy**'s Model:MAS-501 or the "EUT" as referred to in this report; more general information as follows,for more details, refer to the user's manual of the EUT.

Name of EUT	Mobile Phone
Model/Type reference:	TA-1318
List Model:	N/A
Power supply:	DC 3.8V from Battery or DC 5V from Adapter
Modilation Type	QPSK,16QAM
Antenna Type	Internal Antenna
Antenna Gain	0dBi
Operation Frequency Band	LTE Band 2
Operation frequency	LTE Band 2: 1850~1910 MHz(TX), 1930~1990 MHz(TX)
LTE Release	R8
Extreme temp. Tolerance	-30°C to +70°C
Extreme vol. Limits	3.42VDC to 4.17VDC (nominal: 3.8VDC)

2.3 Equipment under Test

Power supply system utilised

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

DC 3.8V from Battery or DC 5V from Adapter

2.4 Short description of the Equipment under Test (EUT)

2.4.1 GeneralDescription

This is a Mobile Phone .

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

2.5 Test frequency list

TX Channel Bandwidth	Frequency (MHz)	channel
1.4 MHz	1850.7	18607
	1880.0	18900
	1909.3	19193
3 MHz	1851.5	18615
	1880.0	18900
	1908.5	19185
5 MHz	1852.5	18625
	1880.0	18900
	1907.5	19175
10 MHz	1855.0	18650
	1880.0	18900
	1905.0	19150
15 MHz	1857.5	18675
	1880.0	18900
	1902.5	19125
20 MHz	1860.0	18700
	1880.0	18900
	1900.0	19100

2.6 Normal Accessory setting

Fully charged battery was used during the test.

2.7 EUT configuration

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

● - supplied by the manufacturer

○ - supplied by the lab

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

2.8 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID:** 2AJOTTA-1318 filing to comply with FCC Part 24, Rules.

2.9 Modifications

No modifications were implemented to meet testing criteria.

2.10 GeneralTest Conditions/Configurations

2.10.1 TestEnvironment

EnvironmentParameter	SelectedValuesDuringTests	
Relative Humidity	Ambient	
Temperature	TN	Ambient
Voltage	VL	3.42V
	VN	3.8V
	VH	4.18V

NOTE:VL=lowerextreme testvoltageVN=nominalvoltage
VH=upperextreme testvoltageTN=normaltemperature

3 TEST ENVIRONMENT

3.1 Address of the test laboratory

Shenzhen HUAK Testing Technology Co., Ltd.
1F, Building No. 13A, Zhonghaixin Science and Technology City, No.12,6 Road, Ganli Industrial Park, Buji Street, Longgang District, Shenzhen, Guangdong, China

3.2 Environmental conditions

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

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

3.3 Test Description

PCSBand (1850-1915MHz pairedwith 1930-1995MHz)

Test Item	FCCRuleNo.	Requirements	Verdict
Effective(Isotropic)RadiatedOutputPower	Part§2.1046, Part§24.232	EIRP ≤ 2W	Pass
Peak-AverageRatio	Part§2.1046, Part§24.232	FCC:Limit≤13dB	Pass
Bandwidth	Part§2.1049 RSS-133	OBW: Nolimit. EBW: Nolimit.	Pass
BandEdgesCompliance	Part§2.1051, Part§24.238	≤ -13dBm/1%*EBW, In1MHzbandsimmediatelyoutsideandadjacentto Thefrequency block.	Pass
SpuriousEmissionatAntennaTerminals	Part§2.1051, Part§24.238	≤-13dBm/1MHz, from9kHzto10thharmonicsbut outsideauthorized Operatingfrequency ranges.	Pass
Field Strengthof Spurious Radiation	Part§2.1053, Part§24.238	≤ -13dBm/1MHz.	Pass
Frequency Stability	Part§2.1055, Part§24.235	FCC:withinauthorizedfrequency block.	Pass
NOTE 1:For theverdict,the“N/A”denotes“not applicable”,the“N/T”denotes “nottested”.			

Remark:
1. The measurement uncertainty is not included in the test result.

3.4 Equipment Used during the Test

Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
LISN	ENV216	R&S	HKE-059	2019/12/26	2020/12/25
LISN	R&S	ENV216	HKE-002	2019/12/26	2020/12/25
Broadband antenna	Schwarzbeck	VULB 9163	HKE-012	2019/12/26	2020/12/25
Receiver	R&S	ESCI 7	HKE-010	2019/12/26	2020/12/25
Spectrum analyzer	Agilent	N9020A	HKE-048	2019/12/26	2020/12/25
RF automatic control unit	Tonscend	JS0806-2	HKE-060	2019/12/26	2020/12/25
Horn antenna	Schwarzbeck	9120D	HKE-013	2019/12/26	2020/12/25
Loop antenna	Schwarzbeck	FMZB 1519 B	HKE-014	2019/12/26	2020/12/25
Preamplifier	EMCI	EMC051845SE	HKE-015	2019/12/26	2020/12/25
Preamplifier	Agilent	83051A	HKE-016	2019/12/26	2020/12/25
Temperature and humidity meter	Boyang	HTC-1	HKE-075	2019/12/26	2020/12/25
High pass filter unit	Tonscend	JS0806-F	HKE-055	2019/12/26	2020/12/25
RF cable	Times	1-40G	HKE-034	2019/12/26	2020/12/25
Power meter	Agilent	E4419B	HKE-085	2019/12/26	2020/12/25
Power Sensor	Agilent	E9300A	HKE-086	2019/12/26	2020/12/25
Wireless Communication Test Set	R&S	CMW500	HKE-026	2019/12/26	2020/12/25
Wireless Communication Test Set	R&S	CMU200	HKE-029	2019/12/26	2020/12/25
High gain antenna	Schwarzbeck	LB-180400KF	HKE-054	2019/12/26	2020/12/25

4 TEST CONDITIONS AND RESULTS

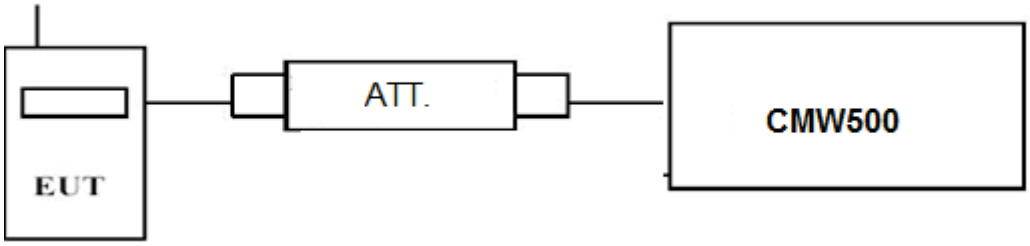
4.1 Output Power

4.1.1 Coducted Output Power

TEST APPLICABLE

During the process of testing, the EUT was controlled via R&S Digital Radio Communication tester (CMW500) to ensure max power transmission and proper modulation. This result contains output power and EIRP measurements for the EUT. In all cases, output power is within the specified limits.

TEST CONFIGURATION



TEST PROCEDURE

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 CMW500 by an Att.
c) EUT Communicate with CMW500 then selects a channel for testing.
d) Add a correction factor to the display CMW500, and then test.

TEST RESULTS

Remark:
1. *We measured all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE FDD Band 2;*

LTE FDD Band 2				
TX Channel Bandwidth	Frequency (MHz)	RB Size/Offset	Burst Average Power [dBm]	
			QPSK	16QAM
1.4 MHz	1850.7	1 RB low	24.28	23.51
		1 RB high	24.26	23.49
		50% RB mid	24.38	23.01
		100% RB	24.41	22.97
	1880.0	1 RB low	23.92	23.27
		1 RB high	23.94	23.33
		50% RB mid	24.02	22.79
		100% RB	24.08	22.84
	1909.3	1 RB low	23.93	23.49
		1 RB high	23.83	23.46
		50% RB mid	24.00	22.76
		100% RB	24.05	22.79
3 MHz	1851.5	1 RB low	24.29	23.36
		1 RB high	24.24	23.36
		50% RB mid	23.42	22.61
		100% RB	23.35	22.63
	1880.0	1 RB low	23.82	22.98
		1 RB high	23.76	22.99
		50% RB mid	22.92	22.20
		100% RB	22.92	22.25

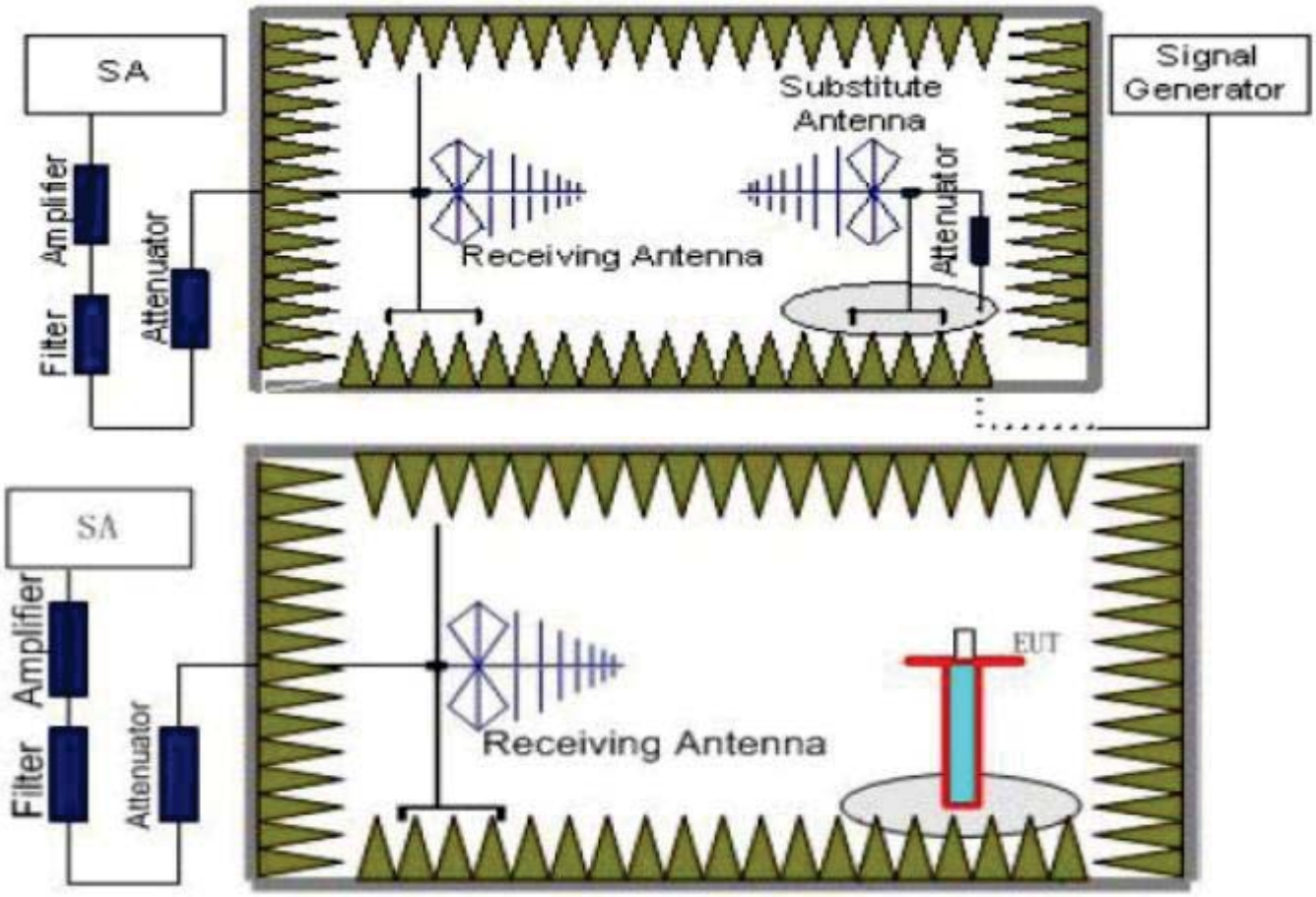
	1908.5	1 RB low	23.80	22.93
		1 RB high	23.87	22.88
		50% RB mid	22.92	22.24
		100% RB	22.99	22.24
5 MHz	1852.5	1 RB low	24.30	22.82
		1 RB high	24.31	22.80
		50% RB mid	23.36	22.35
		100% RB	23.37	22.36
	1880.0	1 RB low	23.86	23.13
		1 RB high	23.88	23.16
		50% RB mid	23.01	22.11
		100% RB	22.99	22.16
	1907.5	1 RB low	24.09	22.33
		1 RB high	23.99	22.37
		50% RB mid	22.97	22.04
		100% RB	22.96	21.98
10 MHz	1855.0	1 RB low	24.21	23.27
		1 RB high	24.40	23.13
		50% RB mid	23.29	22.41
		100% RB	23.37	22.52
	1880.0	1 RB low	23.88	23.59
		1 RB high	23.84	23.41
		50% RB mid	23.06	22.08
		100% RB	22.94	22.10
	1905.0	1 RB low	23.88	22.77
		1 RB high	23.81	22.69
		50% RB mid	22.92	21.90
		100% RB	22.87	21.96
15 MHz	1857.5	1 RB low	23.79	23.12
		1 RB high	23.66	22.89
		50% RB mid	23.14	22.89
		100% RB	22.91	23.11
	1880.0	1 RB low	23.84	23.62
		1 RB high	23.99	23.37
		50% RB mid	23.39	23.37
		100% RB	23.55	23.49
	1902.5	1 RB low	23.92	22.66
		1 RB high	23.93	22.71
		50% RB mid	22.71	22.73
		100% RB	22.77	22.73
20 MHz	1860.0	1 RB low	24.09	22.86
		1 RB high	24.31	22.78
		50% RB mid	23.25	22.47
		100% RB	23.33	22.44
	1880.0	1 RB low	24.43	23.47
		1 RB high	24.21	23.69
		50% RB mid	22.94	22.11
		100% RB	23.16	22.27
	1900.0	1 RB low	23.96	22.67
		1 RB high	23.86	22.78
		50% RB mid	22.97	22.22
		100% RB	23.03	22.04

4.1.2. Radiated Output Power

LIMIT

This is the test for the maximum radiated power from the EUT.
Rule Part 24.232(b) specifies, "Mobile/portable stations are limited to 2 watts e.i.r.p.

TEST CONFIGURATION



TEST PROCEDURE

1. EUT was placed on a 1.5 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.5m. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.
2. A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
3. The EUT is then put into continuously transmitting mode at its maximum power level during the test.Set Test Receiver or Spectrum RBW=1MHz,VBW=3MHz, And the maximum value of the receiver should be recorded as (P_r).
4. The EUT shall be replaced by a substitution antenna.In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest isconnected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (P_{Mea}) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (P_r). The power of signal source (P_{Mea}) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

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

TEST RESULTS

Radiated Measurement:

Remark:
1. *We measured all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE FDD Band 2; recorded worst case for each Channel Bandwidth of LTE FDD Band 2.*
2. *EIRP=P_{Mea}(dBm)-P_{cl}(dB)+P_{Ag}(dB)+G_a(dBi)*
3. *We measured both Horizontal and Vertical direction, recorded worst case direction.*

LTE FDD Band 2_Channel Bandwidth 1.4MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	Burst Average EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1850.7	-14.41	3.41	10.24	33.60	26.02	33.01	6.99	V
1880.0	-15.91	3.49	10.24	33.60	24.44	33.01	8.57	V
1909.3	-15.39	3.55	10.23	33.60	24.89	33.01	8.12	V
1850.7	-14.72	3.41	10.24	33.60	25.71	33.01	7.30	H
1880.0	-16.14	3.49	10.24	33.60	24.21	33.01	8.80	H
1909.3	-15.48	3.55	10.23	33.60	24.80	33.01	8.21	H

LTE FDD Band 2_Channel Bandwidth 3MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	Burst Average EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1851.5	-14.92	3.41	10.24	33.60	25.51	33.01	7.50	V
1880.0	-15.43	3.49	10.24	33.60	24.92	33.01	8.09	V
1908.5	-15.92	3.55	10.23	33.60	24.36	33.01	8.65	V
1851.5	-14.33	3.41	10.24	33.60	26.10	33.01	6.91	H
1880.0	-15.55	3.49	10.24	33.60	24.80	33.01	8.21	H
1908.5	-14.82	3.55	10.23	33.60	25.46	33.01	7.55	H

LTE FDD Band 2_Channel Bandwidth 5MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	Burst Average EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1852.5	-14.99	3.41	10.24	33.60	25.44	33.01	7.57	V
1880.0	-15.99	3.49	10.24	33.60	24.36	33.01	8.65	V
1907.5	-15.31	3.55	10.23	33.60	24.97	33.01	8.04	V
1852.5	-14.89	3.41	10.24	33.60	25.54	33.01	7.47	H
1880.0	-15.76	3.49	10.24	33.60	24.59	33.01	8.42	H
1907.5	-14.68	3.55	10.23	33.60	25.60	33.01	7.41	H

LTE FDD Band 2_Channel Bandwidth 10MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	Burst Average EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1855.0	-14.82	3.41	10.24	33.60	25.61	33.01	7.40	V
1880.0	-15.81	3.49	10.24	33.60	24.54	33.01	8.47	V
1905.0	-15.98	3.55	10.23	33.60	24.30	33.01	8.71	V
1855.0	-14.21	3.41	10.24	33.60	26.22	33.01	6.79	H
1880.0	-15.42	3.49	10.24	33.60	24.93	33.01	8.08	H
1905.0	-15.12	3.55	10.23	33.60	25.16	33.01	7.85	H

LTE FDD Band 2_Channel Bandwidth 15MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	Burst Average EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1857.5	-15.15	3.41	10.24	33.60	25.28	33.01	7.73	V
1880.0	-15.23	3.49	10.24	33.60	25.12	33.01	7.89	V
1902.5	-16.16	3.55	10.23	33.60	24.12	33.01	8.89	V
1857.5	-14.46	3.41	10.24	33.60	25.97	33.01	7.04	H
1880.0	-16.15	3.49	10.24	33.60	24.20	33.01	8.81	H
1902.5	-15.33	3.55	10.23	33.60	24.95	33.01	8.06	H

LTE FDD Band 2_Channel Bandwidth 20MHz_QPSK

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	Burst Average EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1860.0	-14.30	3.41	10.24	33.60	26.13	33.01	6.88	V
1880.0	-15.79	3.49	10.24	33.60	24.56	33.01	8.45	V
1900.0	-16.12	3.55	10.23	33.60	24.16	33.01	8.85	V
1860.0	-14.71	3.41	10.24	33.60	25.72	33.01	7.29	H
1880.0	-16.10	3.49	10.24	33.60	24.25	33.01	8.76	H
1900.0	-15.41	3.55	10.23	33.60	24.87	33.01	8.14	H

LTE FDD Band 2_Channel Bandwidth 1.4MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	Burst Average EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1850.7	-14.58	3.41	10.24	33.60	25.85	33.01	7.16	V
1880.0	-15.91	3.49	10.24	33.60	24.44	33.01	8.57	V
1909.3	-15.95	3.55	10.23	33.60	24.33	33.01	8.68	V
1850.7	-15.09	3.41	10.24	33.60	25.34	33.01	7.67	H
1880.0	-16.28	3.49	10.24	33.60	24.07	33.01	8.94	H
1909.3	-15.50	3.55	10.23	33.60	24.78	33.01	8.23	H

LTE FDD Band 2_Channel Bandwidth 3MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	Burst Average EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1851.5	-14.64	3.41	10.24	33.60	25.79	33.01	7.22	V
1880.0	-15.58	3.49	10.24	33.60	24.77	33.01	8.24	V
1908.5	-15.47	3.55	10.23	33.60	24.81	33.01	8.20	V
1851.5	-15.13	3.41	10.24	33.60	25.30	33.01	7.71	H
1880.0	-16.14	3.49	10.24	33.60	24.21	33.01	8.80	H
1908.5	-14.91	3.55	10.23	33.60	25.37	33.01	7.64	H

LTE FDD Band 2_Channel Bandwidth 5MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	Burst Average EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1852.5	-15.27	3.41	10.24	33.60	25.16	33.01	7.85	V
1880.0	-16.3	3.49	10.24	33.60	24.05	33.01	8.96	V
1907.5	-16.01	3.55	10.23	33.60	24.27	33.01	8.74	V
1852.5	-14.06	3.41	10.24	33.60	26.37	33.01	6.64	H
1880.0	-16.2	3.49	10.24	33.60	24.15	33.01	8.86	H
1907.5	-15.69	3.55	10.23	33.60	24.59	33.01	8.42	H

LTE FDD Band 2_Channel Bandwidth 10MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	Burst Average EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1855.0	-14.51	3.41	10.24	33.60	25.92	33.01	7.09	V
1880.0	-16.05	3.49	10.24	33.60	24.30	33.01	8.71	V
1905.0	-16.16	3.55	10.23	33.60	24.12	33.01	8.89	V
1855.0	-14.25	3.41	10.24	33.60	26.18	33.01	6.83	H
1880.0	-15.45	3.49	10.24	33.60	24.90	33.01	8.11	H
1905.0	-15.07	3.55	10.23	33.60	25.21	33.01	7.80	H

LTE FDD Band 2_Channel Bandwidth 15MHz_16QAM

Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	Burst Average EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1857.5	-15.01	3.41	10.24	33.60	25.42	33.01	7.59	V
1880.0	-15.27	3.49	10.24	33.60	25.08	33.01	7.93	V
1902.5	-15.48	3.55	10.23	33.60	24.80	33.01	8.21	V
1857.5	-14.92	3.41	10.24	33.60	25.51	33.01	7.50	H
1880.0	-15.51	3.49	10.24	33.60	24.84	33.01	8.17	H
1902.5	-14.86	3.55	10.23	33.60	25.42	33.01	7.59	H

LTE FDD Band 2_Channel Bandwidth 20MHz_16QAM

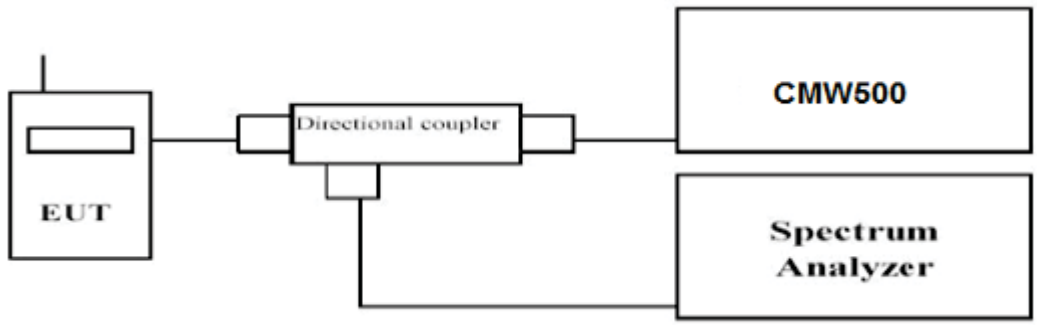
Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	G_a Antenna Gain(dB)	P_{Ag} (dB)	Burst Average EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1860.0	-14.56	3.41	10.24	33.60	25.87	33.01	7.14	V
1880.0	-15.26	3.49	10.24	33.60	25.09	33.01	7.92	V
1900.0	-15.63	3.55	10.23	33.60	24.65	33.01	8.36	V
1860.0	-14.84	3.41	10.24	33.60	25.59	33.01	7.42	H
1880.0	-16.34	3.49	10.24	33.60	24.01	33.01	9.00	H
1900.0	-14.54	3.55	10.23	33.60	25.74	33.01	7.27	H

4.2 Peak-to-Average Ratio (PAR)

LIMIT

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

TEST CONFIGURATION



TEST PROCEDURE

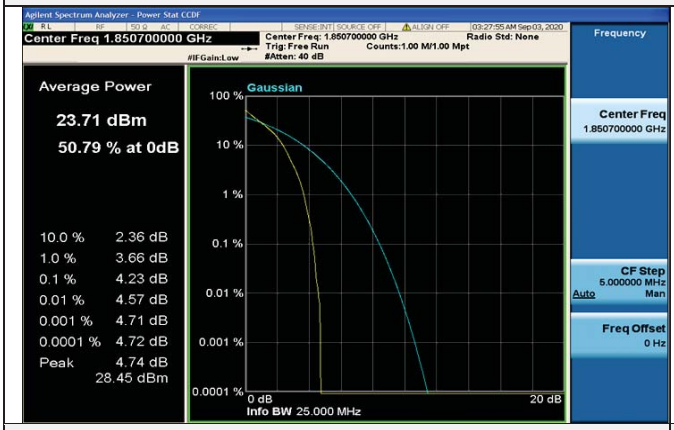
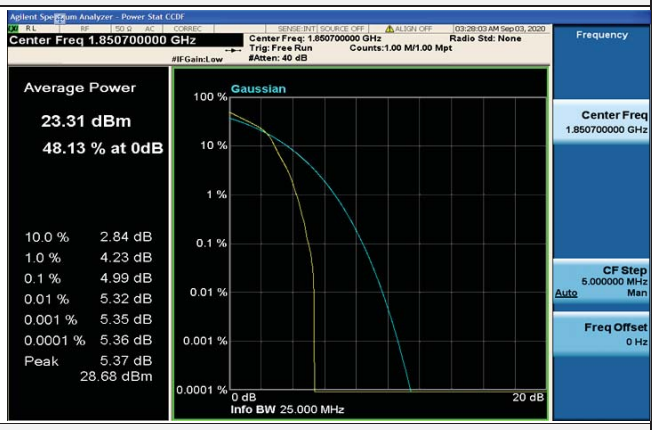
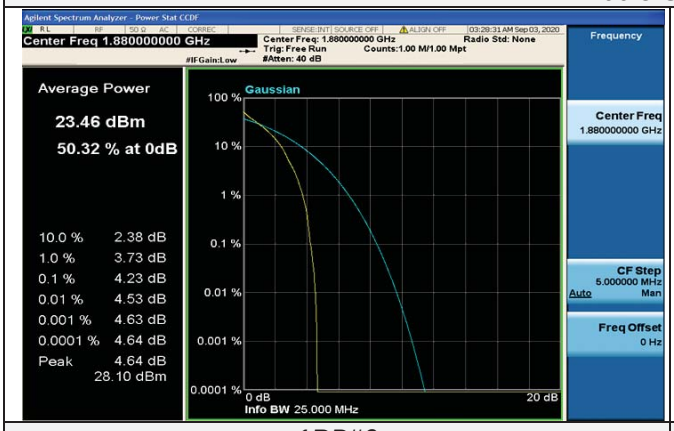
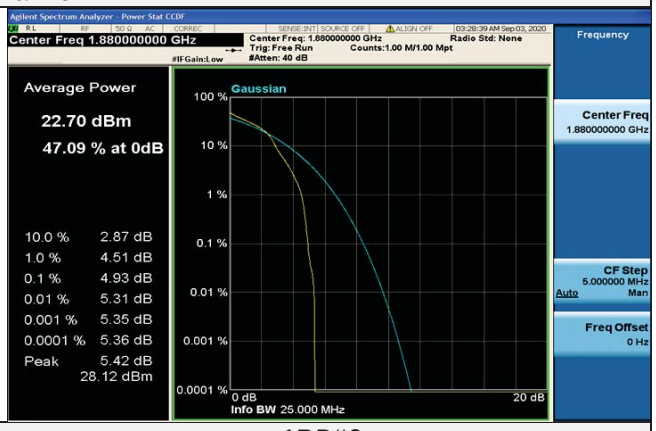
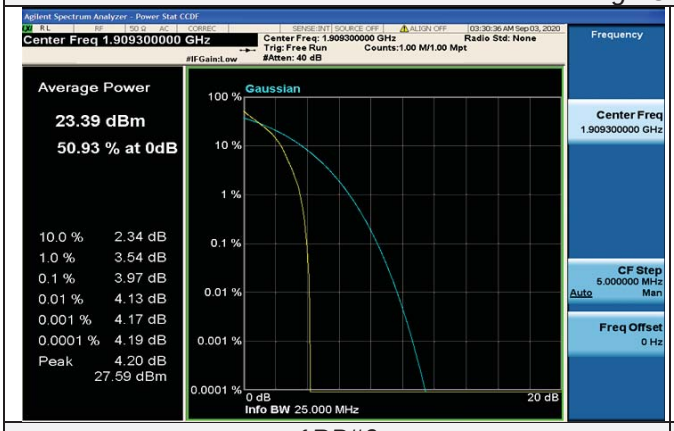
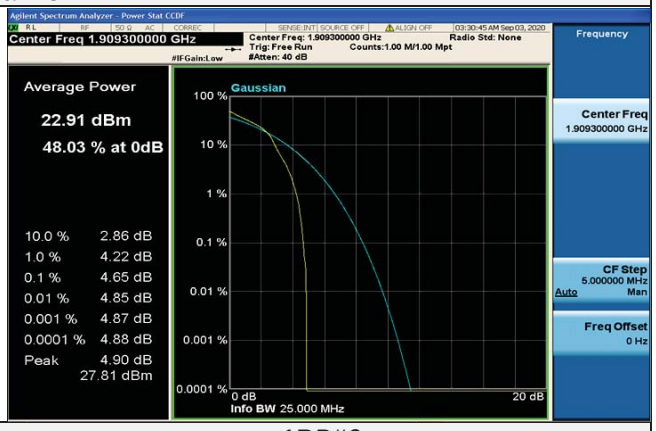
1. Refer to instrument's analyzer instruction manual for details on how to use the power statistics/CCDF function;
2. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
3. Set the number of counts to a value that stabilizes the measured CCDF curve;
4. Set the measurement interval as 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%.

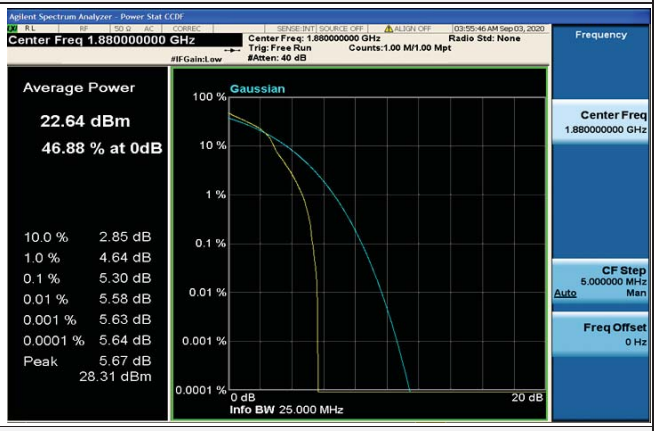
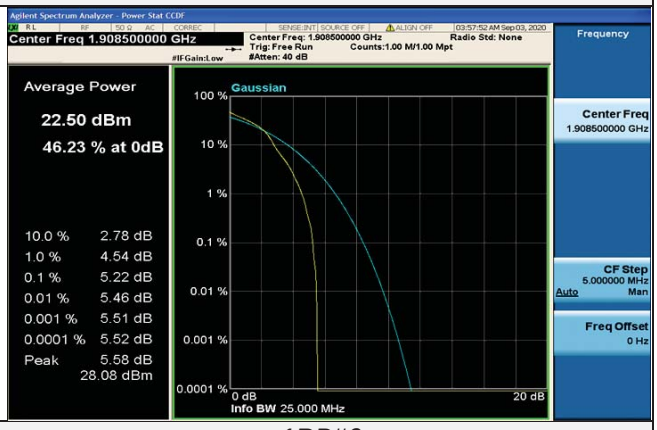
TEST RESULTS

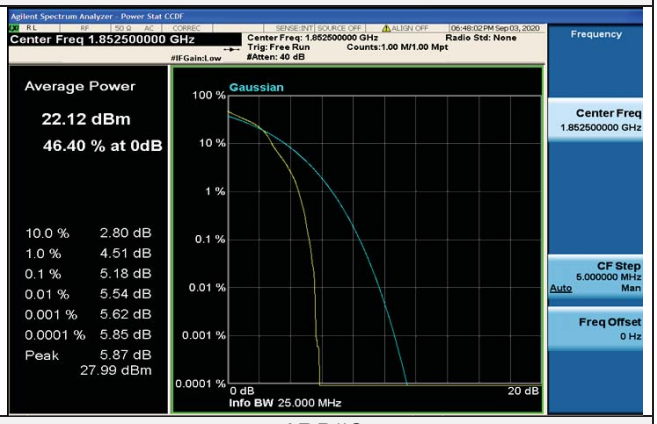
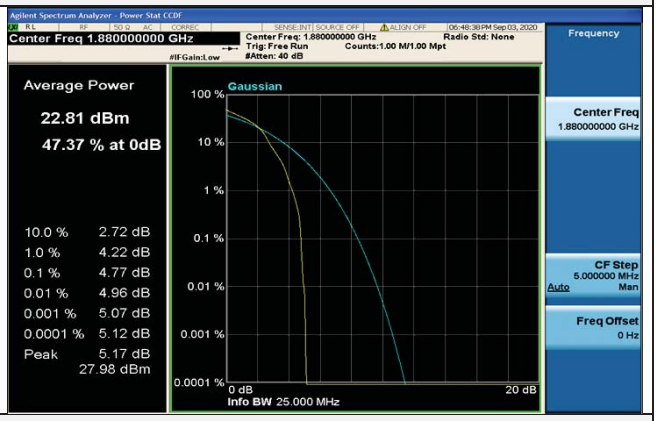
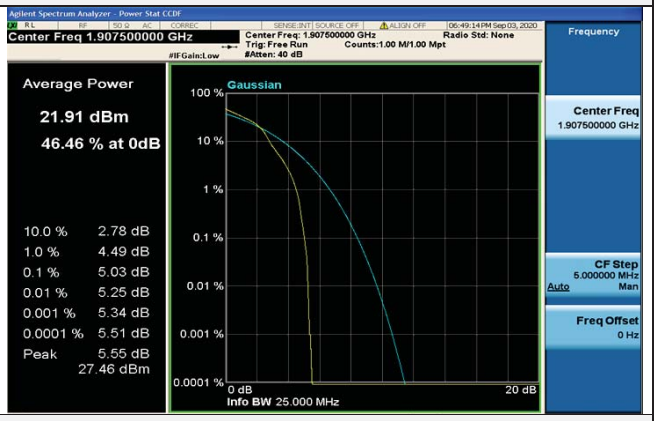
Remark:

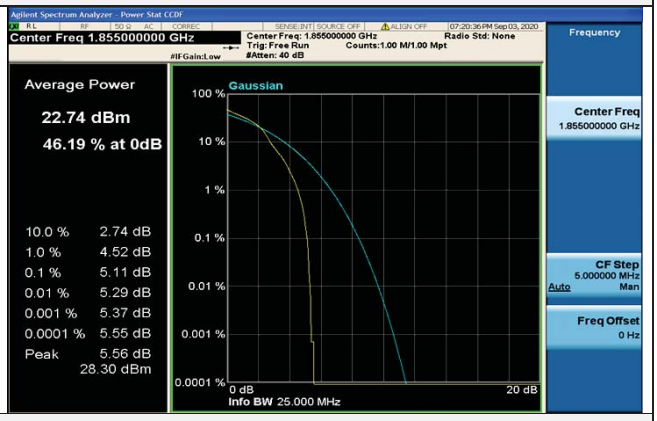
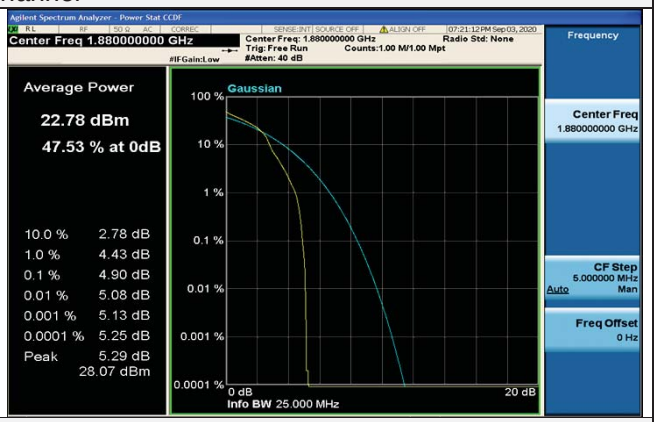
1. We measured all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE FDD Band 2; recorded worst case for each Channel Bandwidth of LTE FDD Band 2.

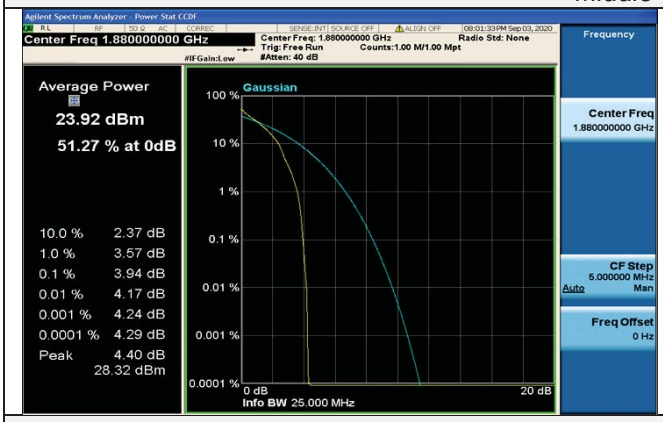
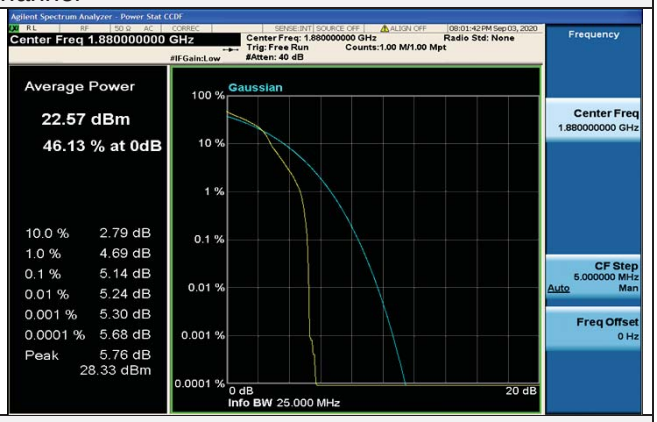
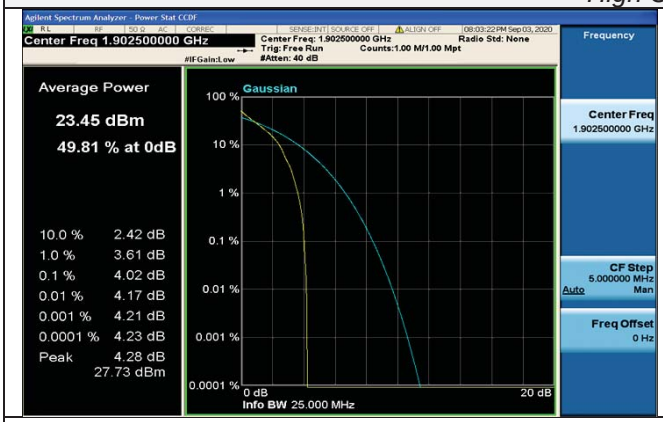
LTE FDD Band 2				
TX Channel Bandwidth	Frequency (MHz)	RB Size/Offset	PAPR(dB)	
			QPSK	16QAM
1.4 MHz	1850.7	*1RB#0*	4.23	4.99
	1880.0		4.23	4.93
	1909.3		3.97	4.65
3 MHz	1851.5	*1RB#0*	4.53	5.37
	1880.0		4.64	5.30
	1908.5		4.26	5.22
5 MHz	1852.5	*1RB#0*	4.26	5.18
	1880.0		3.99	4.77
	1907.5		3.97	5.03
10 MHz	1855.0	*1RB#0*	4.09	5.11
	1880.0		4.01	4.90
	1905.0		3.86	4.96
15 MHz	1857.5	*1RB#0*	4.14	5.09
	1880.0		3.94	5.14
	1902.5		4.02	5.06
20 MHz	1860.0	*1RB#0*	3.86	4.97
	1880.0		3.94	4.74
	1900.0		4.04	5.06

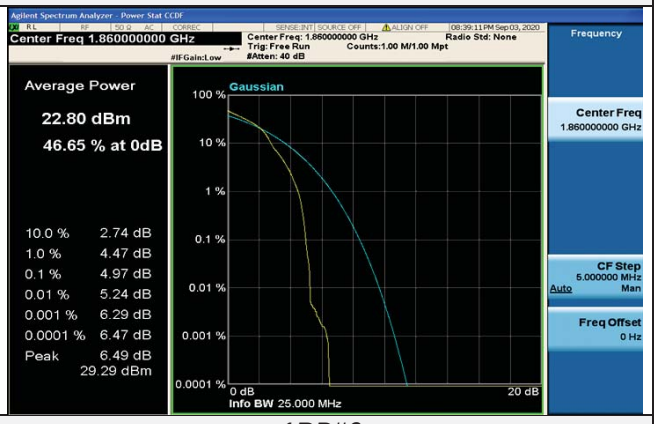
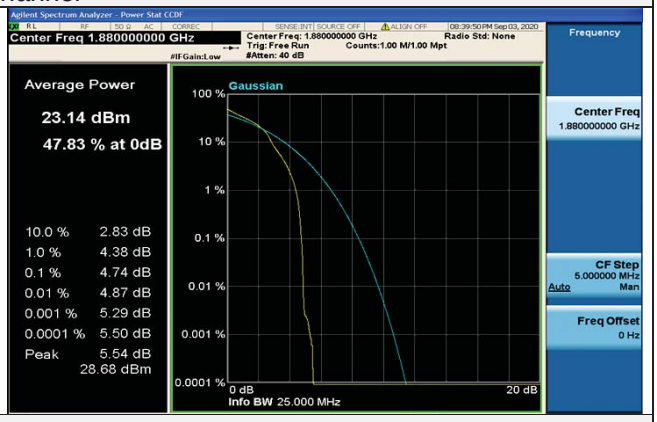
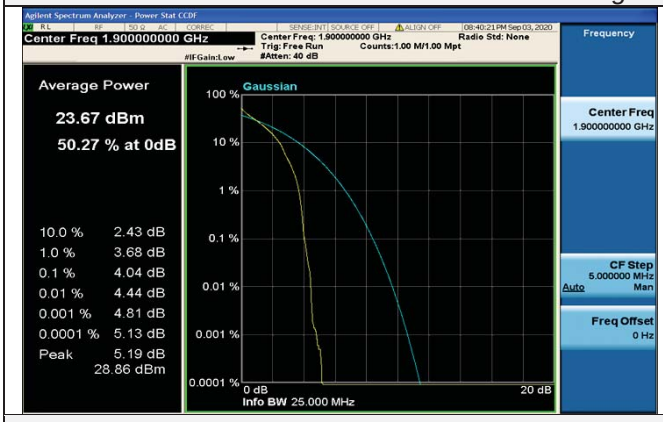
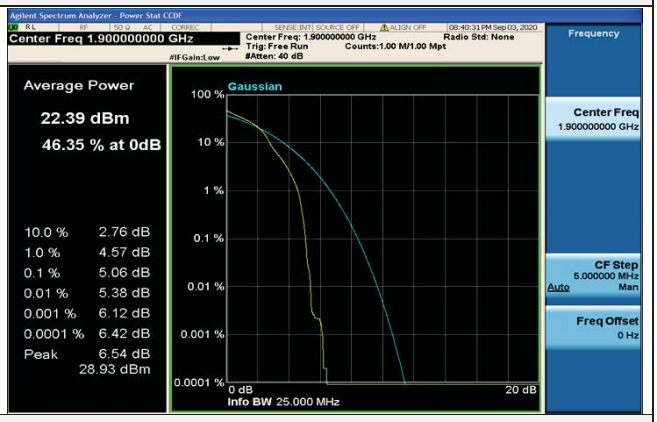
LTE FDD Band 2 – 1.4 MHz Channel BandwidthPAPR	
QPSK	16QAM
Low Channel	
	
1RB#0	1RB#0
Middle Channel	
	
1RB#0	1RB#0
High Channel	
	
1RB#0	1RB#0

LTE FDD Band 2–3MHz Channel BandwidthPAPR	
QPSK	16QAM
Low Channel	
	
1RB#0	1RB#0
Middle Channel	
	
1RB#0	1RB#0
High Channel	
	
1RB#0	1RB#0

LTE FDD Band 2–5MHz Channel BandwidthPAPR	
QPSK	16QAM
Low Channel	
	
1RB#0	1RB#0
Middle Channel	
	
1RB#0	1RB#0
High Channel	
	
1RB#0	1RB#0

LTE FDD Band 2–10MHz Channel BandwidthPAPR	
QPSK	16QAM
Low Channel	
	
1RB#0	1RB#0
Middle Channel	
	
1RB#0	1RB#0
High Channel	
	
1RB#0	1RB#0

LTE FDD Band 2– 15 MHz Channel BandwidthPAPR	
QPSK	16QAM
Low Channel	
	
1RB#0	1RB#0
Middle Channel	
	
1RB#0	1RB#0
High Channel	
	
1RB#0	1RB#0

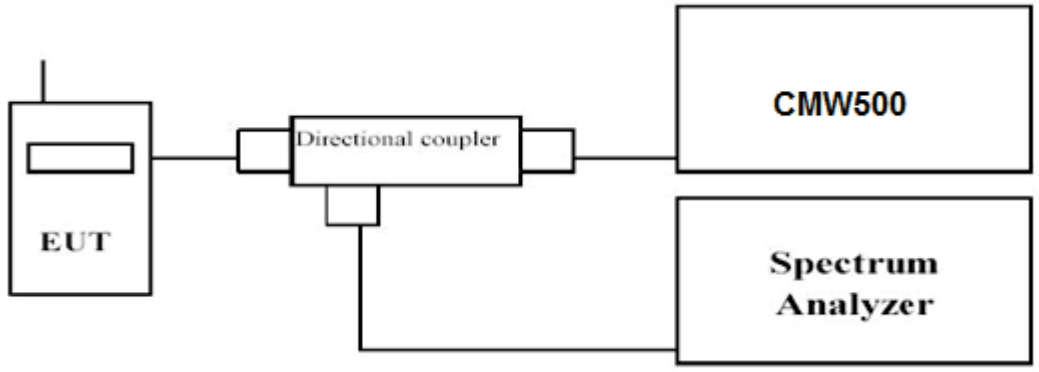
LTE FDD Band 2–20MHz Channel BandwidthPAPR	
QPSK	16QAM
Low Channel	
	
1RB#0	1RB#0
Middle Channel	
	
1RB#0	1RB#0
High Channel	
	
1RB#0	1RB#0

4.3 Occupied Bandwidth and Emission Bandwidth

LIMIT

N/A

TEST CONFIGURATION



TEST PROCEDURE

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at low, middle and high channel in each band. The -26dBc Emission bandwidth was also measured and recorded.
Set RBWwas 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 isthe delta frequency between the two points where the display line intersects the signal trace.

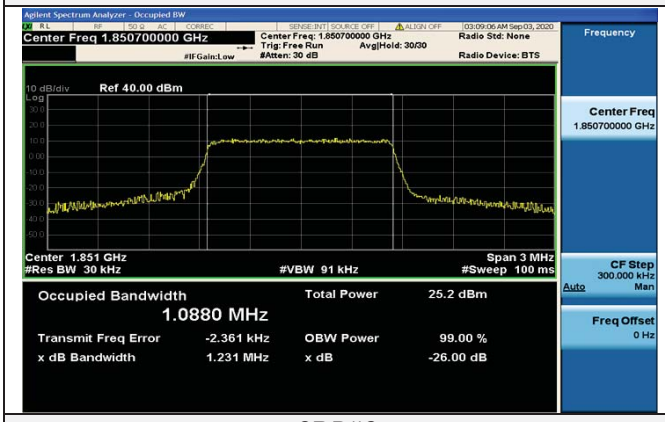
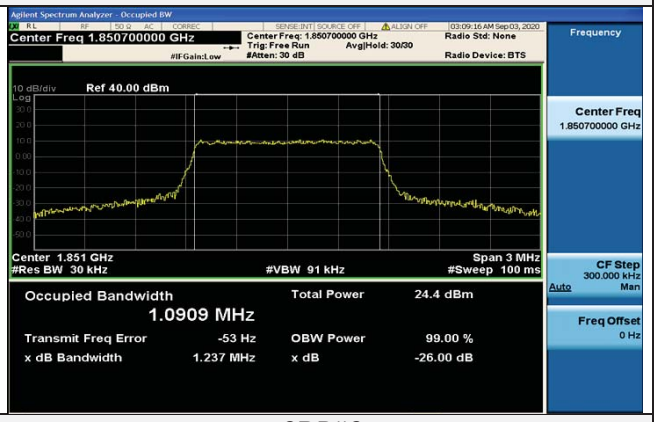
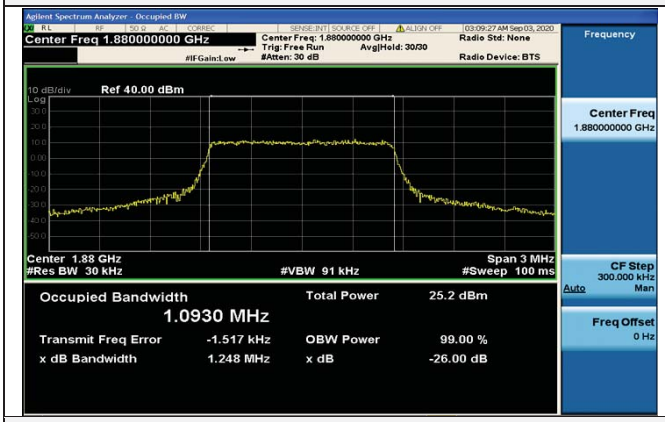
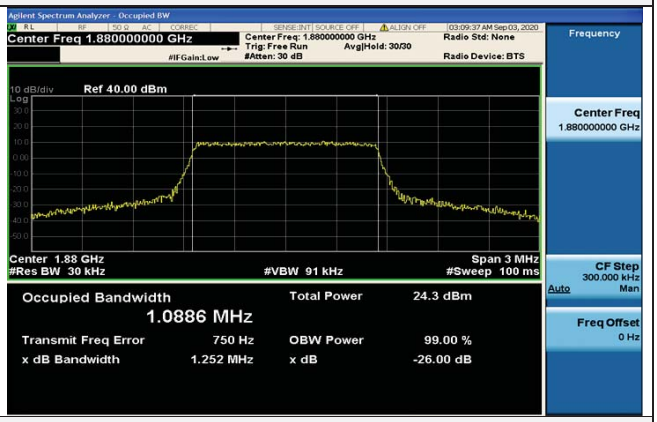
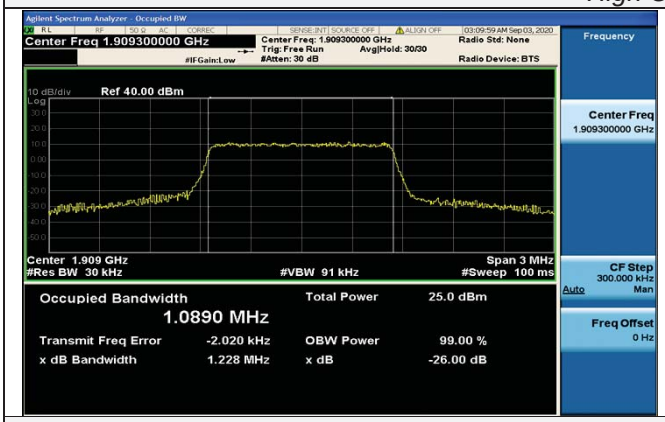
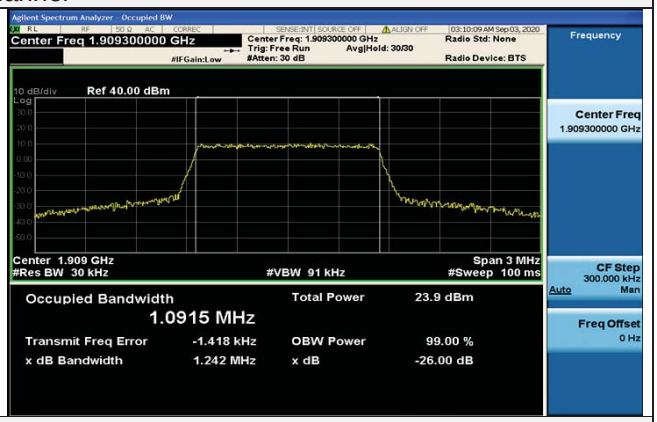
TEST RESULTS

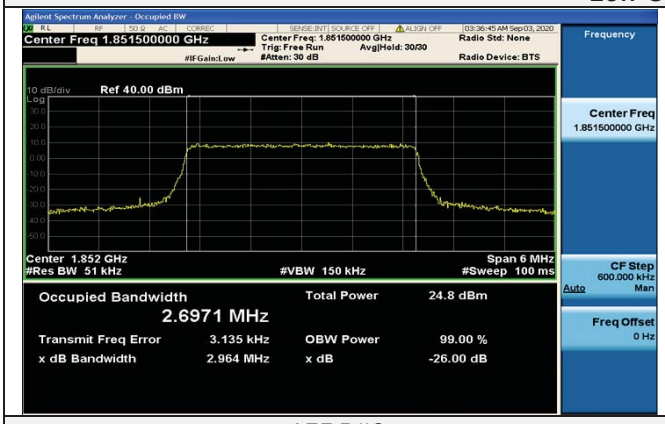
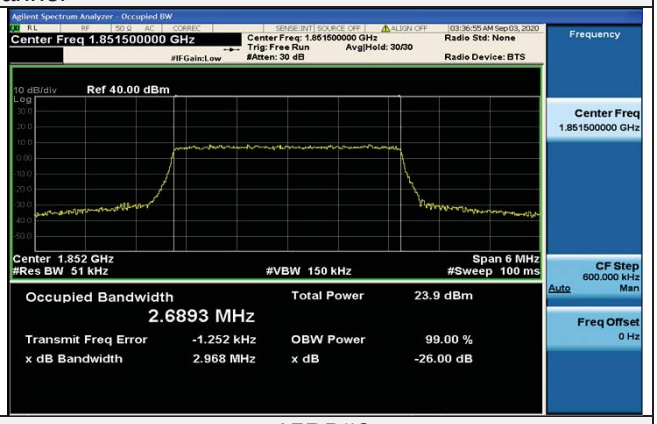
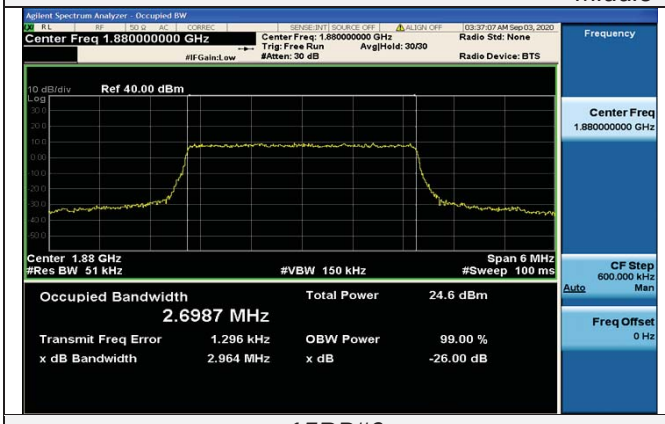
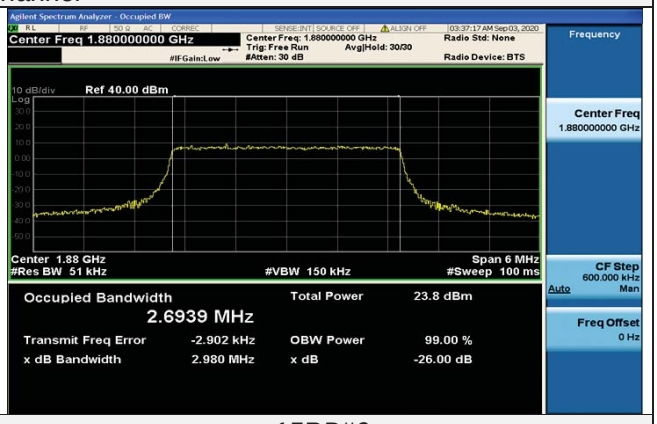
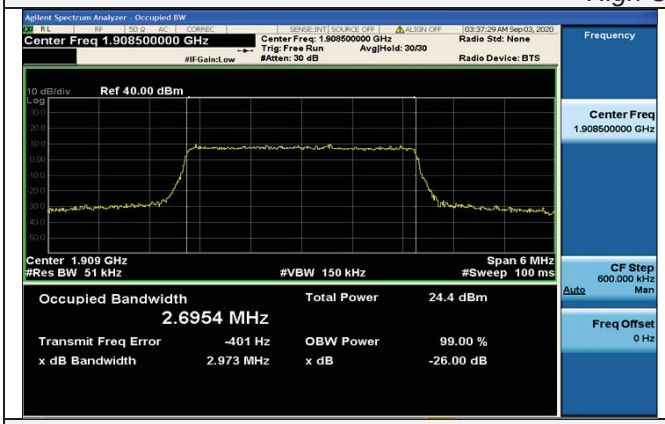
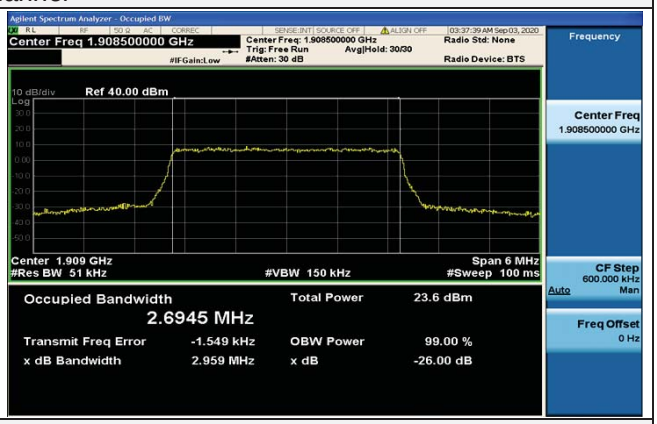
Remark:

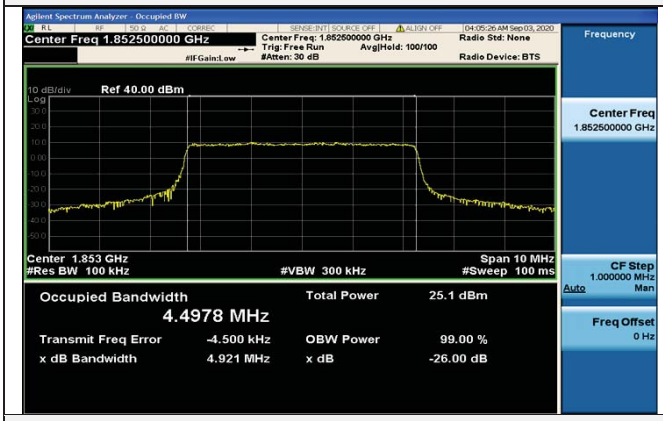
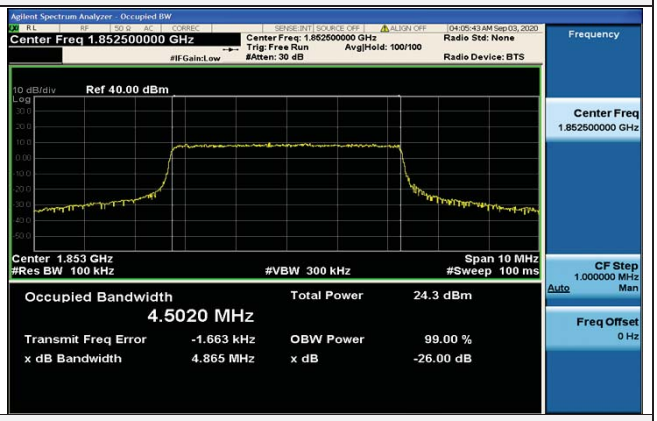
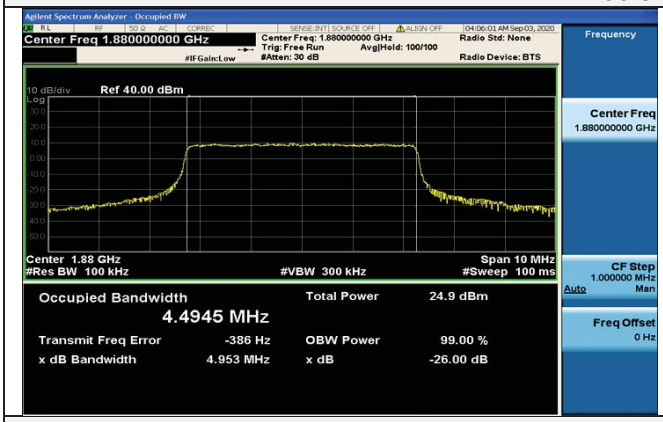
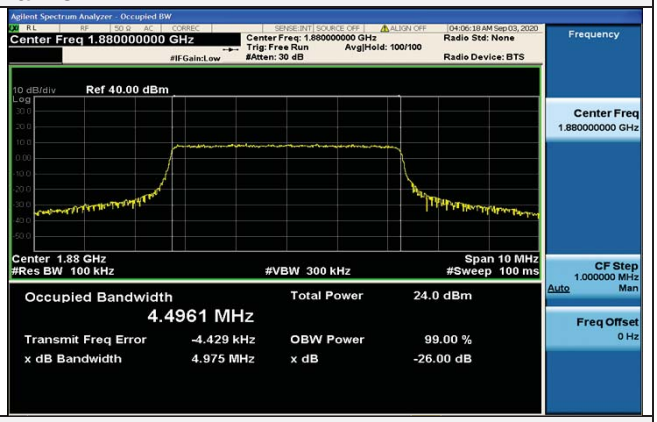
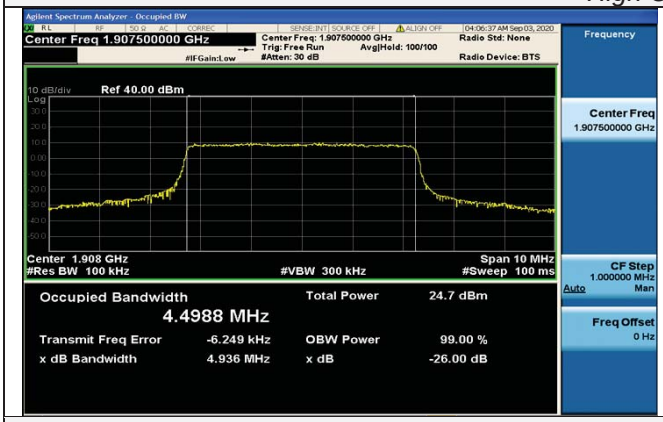
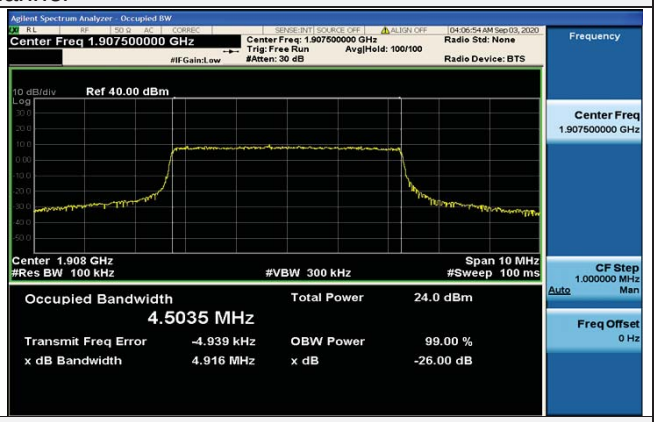
1. *We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE FDD Band 2; recorded worst case for each Channel Bandwidth of LTE FDD Band 2.*

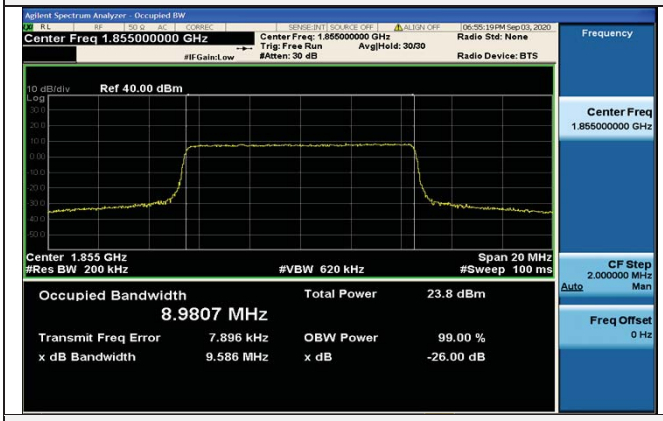
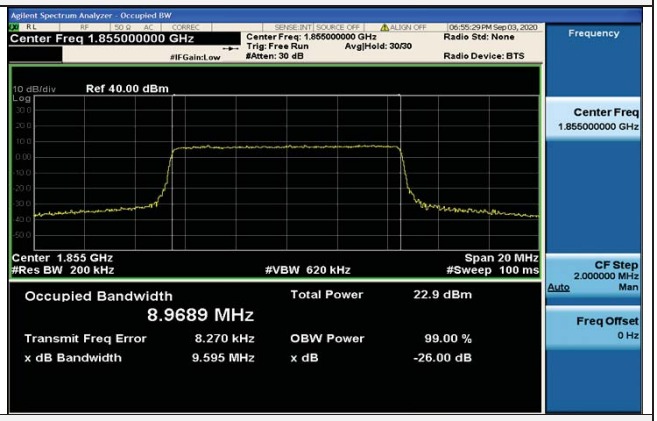
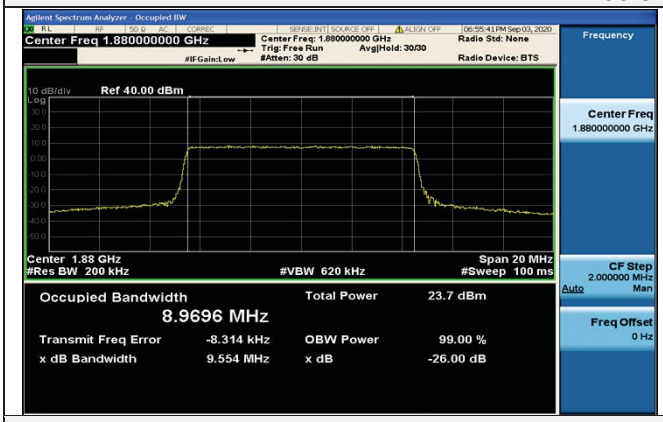
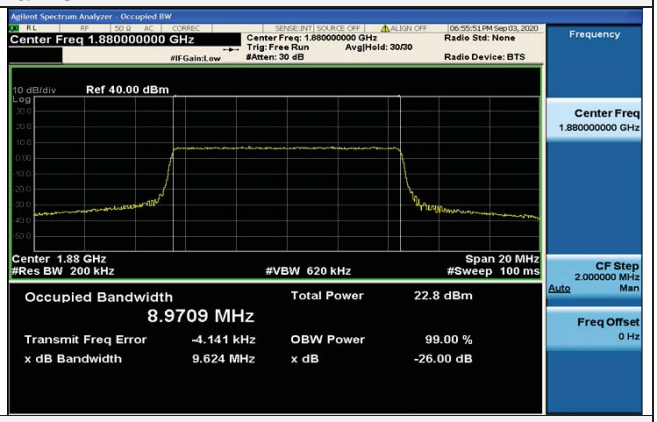
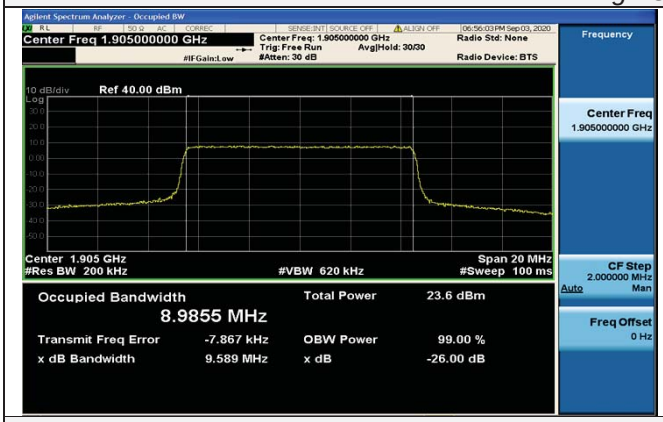
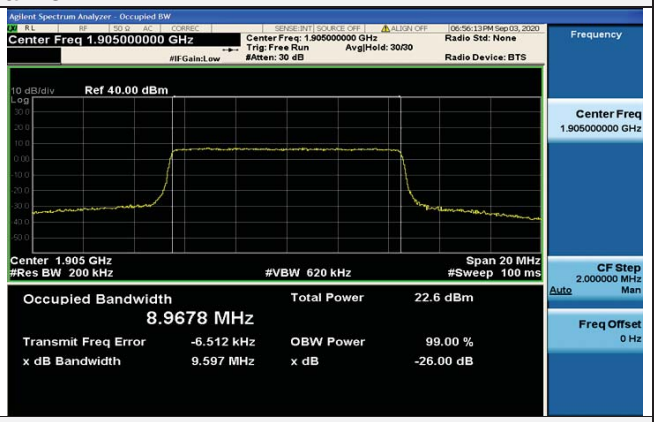
LTE FDD Band 2				
TX Channel Bandwidth	RB Size/Offset	Frequency (MHz)	99% Occupied bandwidth (MHz)	-26dBc Emission bandwidth (MHz)
			QPSK	QPSK
1.4 MHz	*6RB#0*	1850.7	1.0880	1.231
		1880.0	1.0930	1.248
		1909.3	1.0890	1.228
3 MHz	*15RB#0*	1851.5	2.6971	2.964
		1880.0	2.6987	2.964
		1908.5	2.6954	2.973
5 MHz	*25RB#0*	1852.5	4.4978	4.921
		1880.0	4.4945	4.953
		1907.5	4.4988	4.936
10 MHz	*50RB#0*	1855.0	8.9807	9.586
		1880.0	8.9696	9.554
		1905.0	8.9855	9.589
15 MHz	*75RB#0*	1857.5	13.449	14.31
		1880.0	13.452	14.33
		1902.5	13.458	14.29
20 MHz	*100RB#0*	1860.0	17.956	19.04
		1880.0	17.958	19.05
		1900.0	17.938	18.98

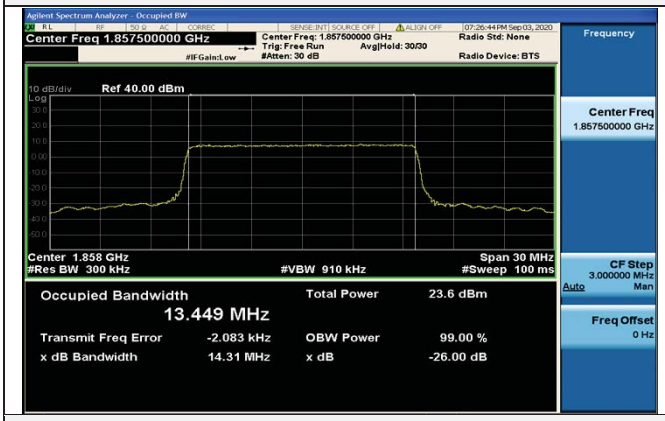
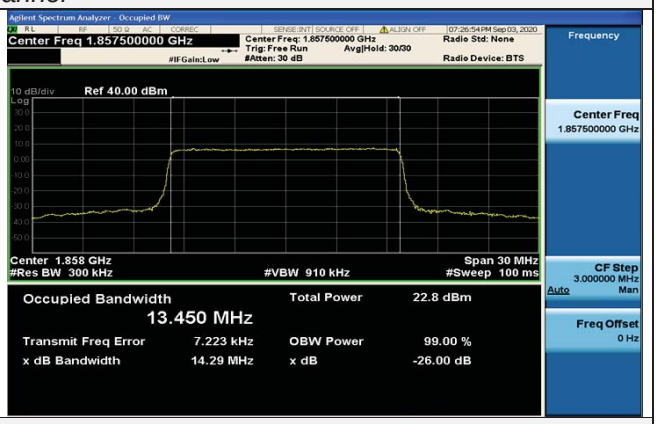
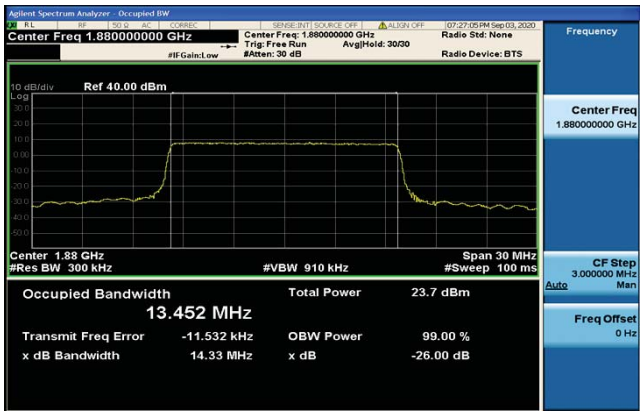
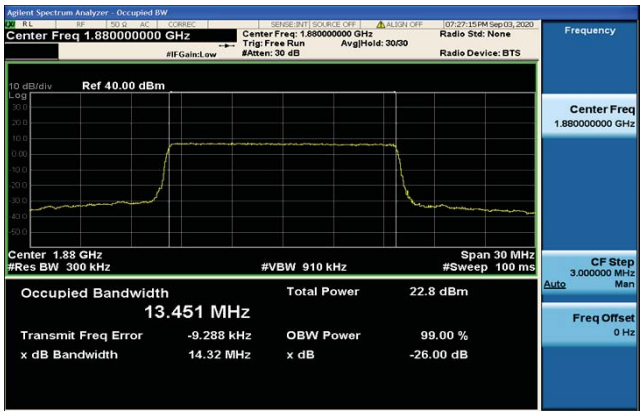
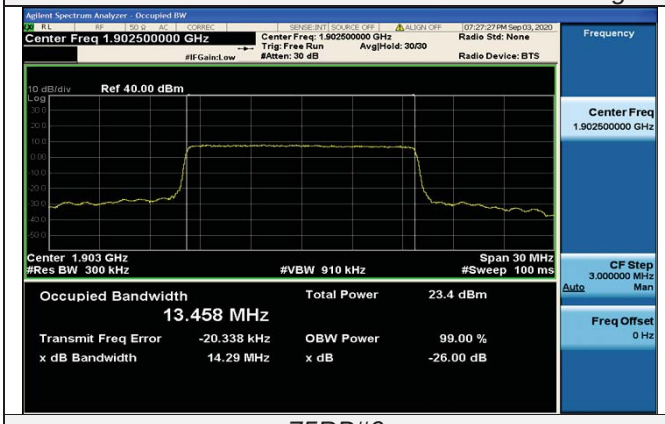
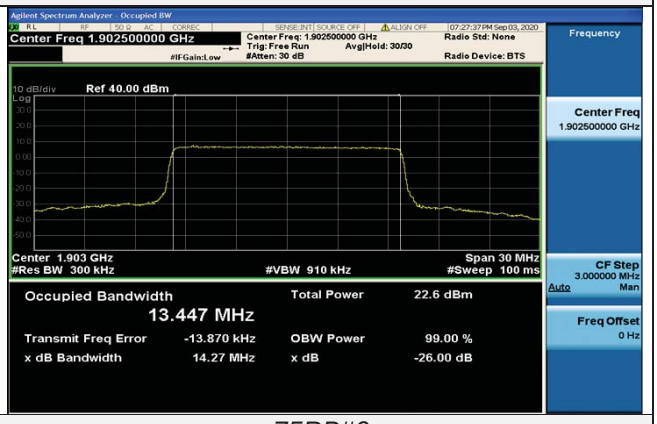
LTE FDD Band 2				
TX Channel Bandwidth	RB Size/Offset	Frequency (MHz)	99% Occupied bandwidth (MHz)	-26dBc Emission bandwidth (MHz)
			16QAM	16QAM
1.4 MHz	*6RB#0*	1850.7	1.0909	1.237
		1880.0	1.0886	1.252
		1909.3	1.0915	1.242
3 MHz	*15RB#0*	1851.5	2.6893	2.968
		1880.0	2.6939	2.980
		1908.5	2.6945	2.959
5 MHz	*25RB#0*	1852.5	4.5020	4.865
		1880.0	4.4961	4.975
		1907.5	4.5035	4.916
10 MHz	*50RB#0*	1855.0	8.9689	9.595
		1880.0	8.9709	9.624
		1905.0	8.9678	9.597
15 MHz	*75RB#0*	1857.5	13.450	14.29
		1880.0	13.451	14.32
		1902.5	13.447	14.27
20 MHz	*100RB#0*	1860.0	17.951	19.03
		1880.0	17.975	19.04
		1900.0	17.931	19.00

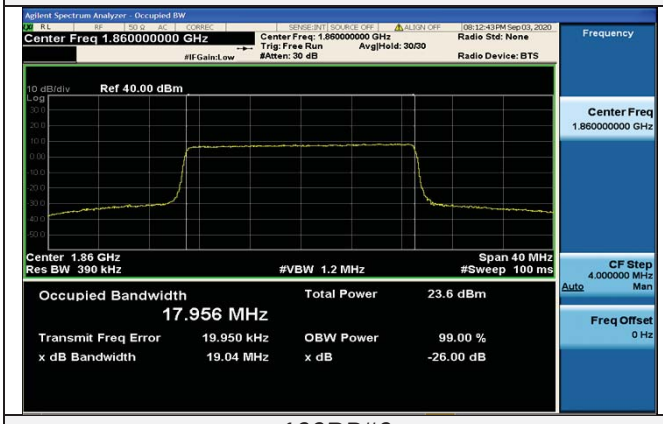
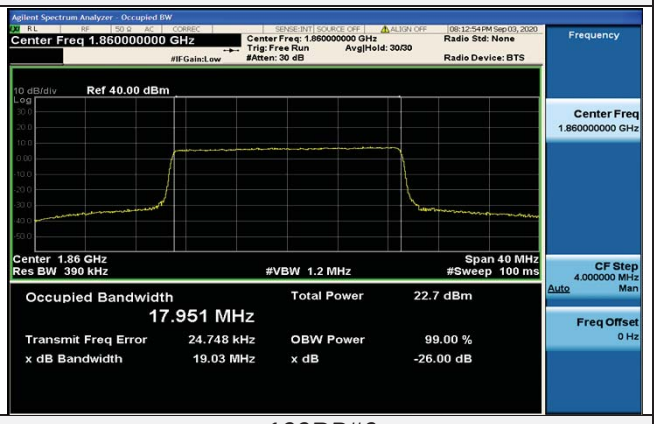
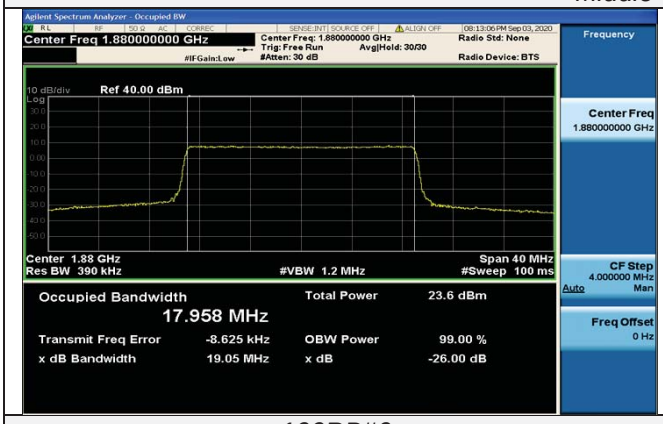
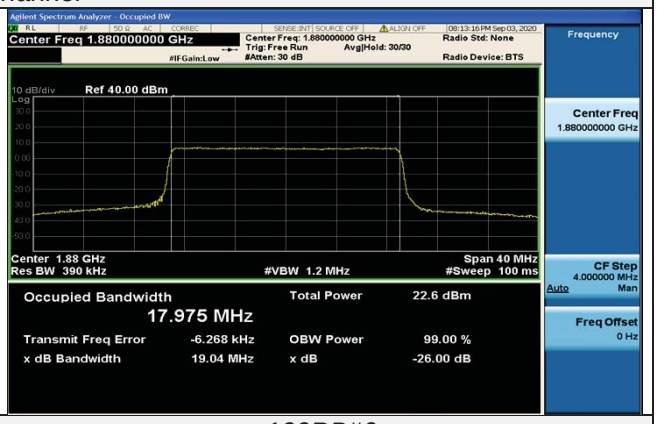
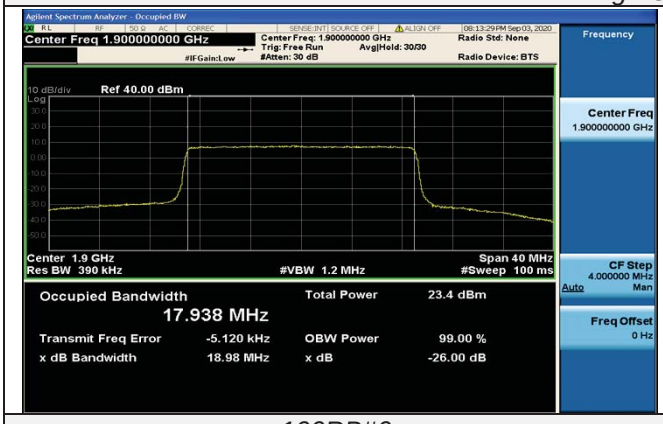
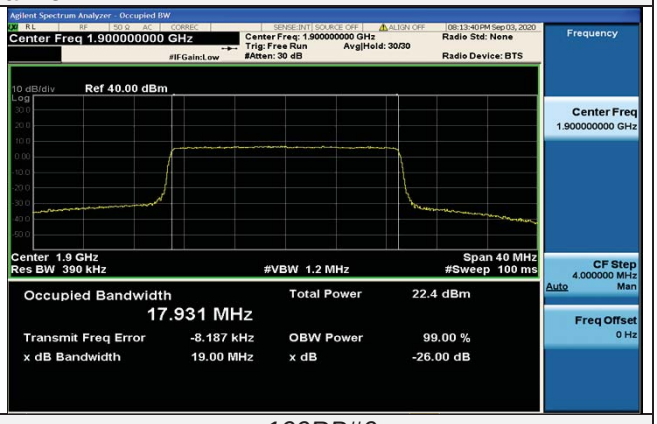
LTE FDD Band 2 – 1.4 MHz Channel Bandwidth Occupied Bandwidth and Emission Bandwidth	
QPSK	16QAM
Low Channel	
	
6RB#0	6RB#0
Middle Channel	
	
6RB#0	6RB#0
High Channel	
	
6RB#0	6RB#0

LTE FDD Band 2–3MHz Channel Bandwidth Occupied Bandwidth and Emission Bandwidth	
QPSK	16QAM
Low Channel	
	
15RB#0	15RB#0
Middle Channel	
	
15RB#0	15RB#0
High Channel	
	
15RB#0	15RB#0

LTE FDD Band 2–5MHz Channel Bandwidth Occupied Bandwidth and Emission Bandwidth	
QPSK	16QAM
Low Channel	
	
25RB#0	25RB#0
Middle Channel	
	
25RB#0	25RB#0
High Channel	
	
25RB#0	25RB#0

LTE FDD Band 2–10MHz Channel Bandwidth Occupied Bandwidth and Emission Bandwidth	
QPSK	16QAM
Low Channel	
	
50RB#0	50RB#0
Middle Channel	
	
50RB#0	50RB#0
High Channel	
	
50RB#0	50RB#0

LTE FDD Band 2–15MHz Channel Bandwidth Occupied Bandwidth and Emission Bandwidth	
QPSK	16QAM
Low Channel	
	
75RB#0	75RB#0
Middle Channel	
	
75RB#0	75RB#0
High Channel	
	
75RB#0	75RB#0

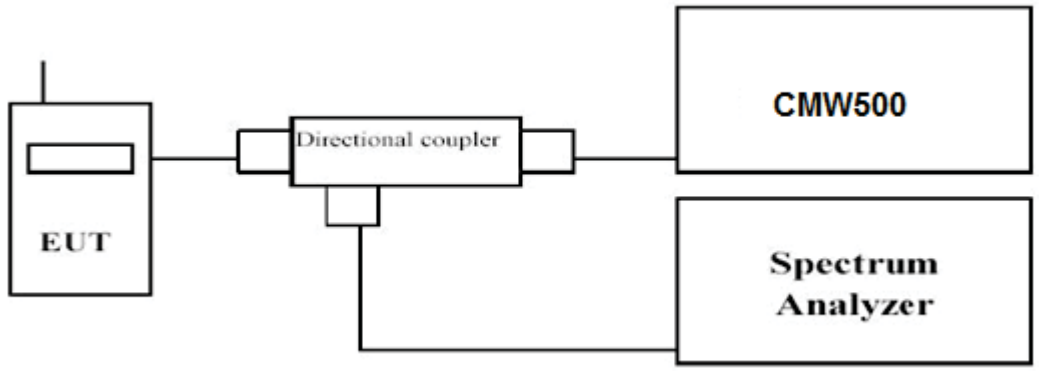
LTE FDD Band 2–20MHz Channel Bandwidth Occupied Bandwidth and Emission Bandwidth	
QPSK	16QAM
Low Channel	
	
100RB#0	100RB#0
Middle Channel	
	
100RB#0	100RB#0
High Channel	
	
100RB#0	100RB#0

4.4 Band Edge compliance

LIMIT

Per FCC §24.238 the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10log(P) dB.

TEST CONFIGURATION



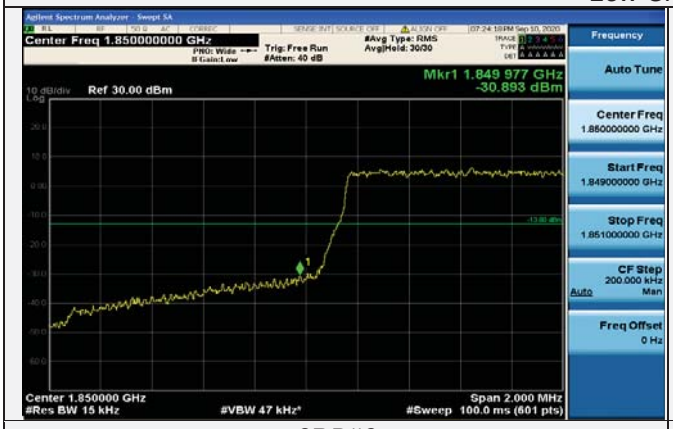
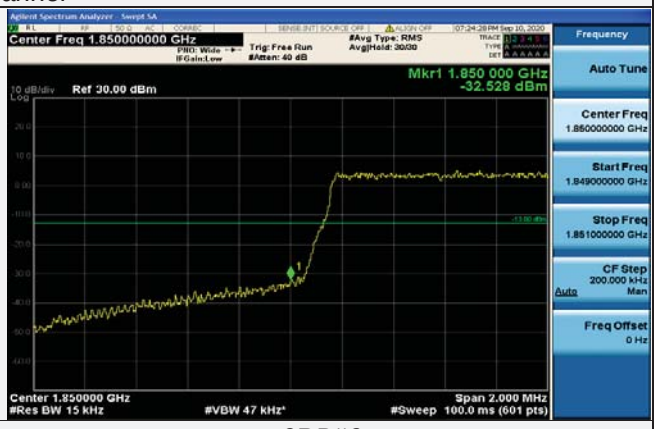
TEST PROCEDURE

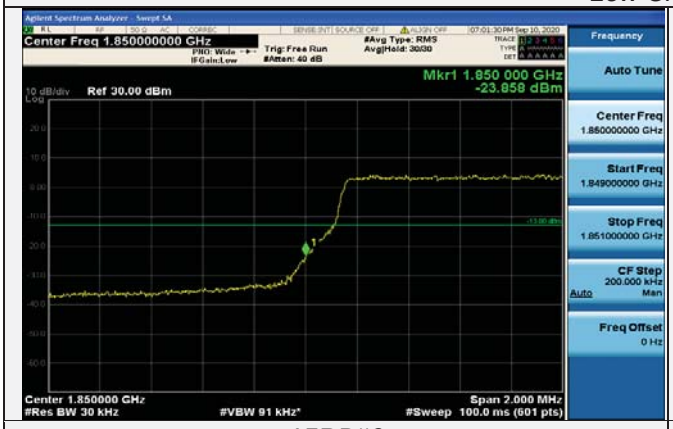
1. The transmitter output port was connected to base station.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator, the path loss was compensated to the results for each measurement.
3. Set EUT at maximum power through base station.
4. Select lowestand highest channels for each band and different modulation.
5. Measure Band edge using RMS (Average) detector by spectrum

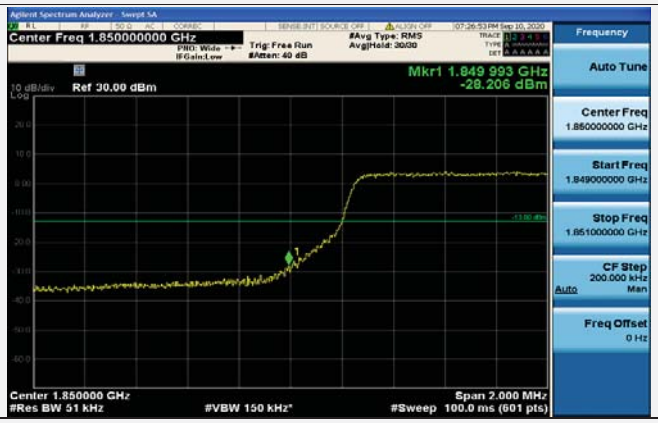
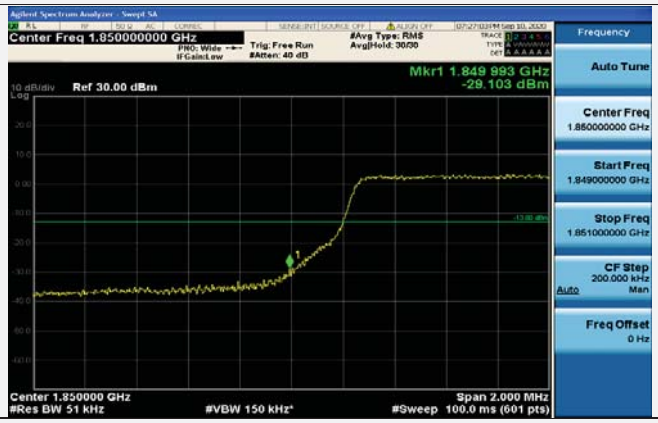
TEST RESULTS

Remark:

1. *We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE FDD Band 2; recorded worst case for each Channel Bandwidth of LTE FDD Band 2.*

LTE FDD Band 2 – 1.4 MHz Channel BandwidthBand Edge Compliance	
QPSK	16QAM
Low Channel	
	
6RB#0	6RB#0
High Channel	
	
6RB#0	6RB#0

LTE FDD Band 2–3MHz Channel BandwidthBand Edge Compliance	
QPSK	*16QAM*
Low Channel	
	
15RB#0	*15RB#0*
High Channel	
	
15RB#0	*15RB#0*

LTE FDD Band 2–5MHz Channel BandwidthBand Edge Compliance	
QPSK	16QAM
Low Channel	
	
25RB#0	25RB#0
High Channel	
	
25RB#0	25RB#0