FCC Test Report

(PART 24)

Report No.:	RF150723C09-4
FCC ID:	O57PB1750M
Test Model:	Lenovo PB1-750M
Received Date:	Jul. 23, 2015
Test Date:	Jul. 23, 2015 ~ Aug. 12, 2015
Issued Date:	Aug. 13, 2015
Applicant:	Lenovo (Shanghai) Electronics Technology Co., Ltd.
Address:	No. 68 Building, 199 Fenju Road, Wai Gao Qiao FTZ , Shanghai , China
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lab Address:	No. 47-2, 14th Ling, Chia Cau Vil., Lin Kou Dist., New Taipei City, Taiwan (R.O.C.)
Test Location:	No. 19, Hwa Ya 2nd Rd., Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

This report should not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.

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RELEASE CONTROL RECORD

Issue No.	Description	Date Issued
RF150723C09-4	Original release	Aug. 13, 2015

1 Certificate of Conformity

Product:	Portable Tablet Computer
Brand:	Lenovo
Test Model:	Lenovo PB1-750M
Sample Status:	Production unit
Applicant:	Lenovo (Shanghai) Electronics Technology Co., Ltd.
Test Date:	Jul. 23, 2015 ~ Aug. 12, 2015
Standards:	FCC Part 24, Subpart E

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by : _____ , **Date:** Aug. 13, 2015

Amyee Qian / Engineer

Approved by : _____ , **Date:** Aug. 13, 2015

William Chung / Manager

2 Summary of Test Results

Applied Standard: FCC Part 24 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 24.232	Effective Radiated Power	PASS	Meet the requirement of limit.
2.1046 24.232(d)	Peak To Average Ratio	PASS	Meet the requirement of limit.
2.1055 24.235	Frequency Stability	PASS	Meet the requirement of limit.
2.1049 24.238(b)	Occupied Bandwidth	PASS	Meet the requirement of limit.
24.238(b)	Band Edge Measurements	PASS	Meet the requirement of limit.
2.1051 24.238	Conducted Spurious Emissions	PASS	Meet the requirement of limit.
2.1053 24.238	Radiated Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -21.54dB at 5640.00MHz.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expended Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.44 dB
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	2.93 dB
	200MHz ~1000MHz	2.95 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

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

2.2 Test Site And Instruments

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Spectrum Analyzer Agilent Technologies	N9038A	MY52260177	May 19, 2015	May 18, 2016
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Dec. 10, 2014	Dec. 09, 2015
BILOG Antenna ETS-Lindgren	3142E	117536	Feb. 24, 2014	Feb. 23, 2015
HORN Antenna ETS-Lindgren	3117	00143293	Aug. 28, 2014	Aug. 27, 2015
Bluetooth Tester	CBT	100980	Apr. 27, 2015	Apr. 26, 2016
Agilent Communications Tester-Wireless	8960 Series 10	MY53201073	Jul. 06, 2015	Jul. 05, 2017
Preamplifier Agilent	310N	187226	Jun. 29, 2015	Jun. 28, 2016
Preamplifier Agilent	83017A	980116	Jan. 09, 2015	Jan. 08, 2016
Power Meter Anritsu	ML2495A	1232002	Sep. 17, 2014	Sep. 16, 2015
Power Sensor Anritsu	MA2411B	1207325	Sep. 17, 2014	Sep. 16, 2015
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(RFC-SMS-100-SMS-120+RFC-SMS-100-SMS-400)	Jun. 27, 2015	Jun. 26, 2016
RF signal cable ETS-LINDGREN	8D-FB	Cable-CH1-02(RFC-SMS-100-SMS-24)	Jun. 27, 2015	Jun. 26, 2016
Software BV ADT	E38.130425b	NA	NA	NA
Antenna Tower MF	NA	NA	NA	NA
Turn Table MF	NA	NA	NA	NA
Antenna Tower &Turn Table Controller MF	MF-7802	NA	NA	NA

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The calibration interval of the loop antenna is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in HwaYa Chamber 4.
4. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
5. The FCC Site Registration No. is 460141.
6. The IC Site Registration No. is IC7450F-4.

3 General Information

3.1 General Description of EUT

PRODUCT	Portable Tablet Computer	
BRAND	Lenovo	
MODEL NAME	Lenovo PB1-750M	
POWER SUPPLY	5.0Vdc (adapter or host equipment) 3.8Vdc (battery)	
MODULATION TYPE	**GSM, GPRS:** GMSK **EDGE:** GMSK, 8PSK **WCDMA :** BPSK **LTE Band 2:** QPSK, 16QAM	
FREQUENCY RANGE	**GSM, GPRS, EDGE:** 1850.2MHz ~ 1909.8MHz	
	WCDMA: 1852.4MHz ~ 1907.6MHz	
	LTE Band 2 **Channel Bandwidth: 1.4MHz**	1850.7MHz ~ 1909.3MHz
	LTE Band 2 **Channel Bandwidth: 3MHz**	1851.5MHz ~ 1908.5MHz
	LTE Band 2 **Channel Bandwidth: 5MHz**	1852.5MHz ~ 1907.5MHz
	LTE Band 2 **Channel Bandwidth: 10MHz**	1855.0MHz ~ 1905.0MHz
	LTE Band 2 **Channel Bandwidth: 15MHz**	1857.5MHz ~ 1902.5MHz
	LTE Band 2 **Channel Bandwidth: 20MHz**	1860.0MHz ~ 1900.0MHz
MAX. EIRP POWER	**GSM:** 1143mW	
	EDGE: 482mW	
	WCDMA: 247mW	
	LTE Band 2 **Channel Bandwidth: 1.4MHz**	243mW
	LTE Band 2 **Channel Bandwidth: 3MHz**	248mW
	LTE Band 2 **Channel Bandwidth: 5MHz**	204mW
	LTE Band 2 **Channel Bandwidth: 10MHz**	228mW
	LTE Band 2 **Channel Bandwidth: 15MHz**	240mW
	LTE Band 2 **Channel Bandwidth: 20MHz**	236mW
EMISSION DESIGNATOR	**GSM**	247KGXW
	EDGE	248KG7W

	WCDMA	4M19F9W
	LTE Band 2 Channel Bandwidth: 1.4MHz	1M11W7D
	LTE Band 2 Channel Bandwidth: 3MHz	2M69W7D
	LTE Band 2 Channel Bandwidth: 5MHz	4M48G7D
	LTE Band 2 Channel Bandwidth: 10MHz	8M94W7D
	LTE Band 2 Channel Bandwidth: 15MHz	13M4W7D
	LTE Band 2 Channel Bandwidth: 20MHz	17M9W7D
ANTENNA TYPE	Fixed Internal antenna with -1dBi gain	
HW VERSION	LenovoPad PB1-750M	
SW VERSION	PB1-750M_150717	
ACCESSORY DEVICE	Refer to note as below	
DATA CABLE	USB cable: Unshielded, detachable, 1.0m Earphone cable: Unshielded, detachable,1.1m	

Note:

1. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.
2. The EUT was powered by the following adapters:

ADAPTER 1	
BRAND:	Lenovo
MODEL:	C-P62
INPUT:	AC 100-240V, 300mA
OUTPUT:	DC 5V, 1500mA
MANUFACTURER:	Acbel

ADAPTER 2	
BRAND:	Lenovo
MODEL:	C-P62
INPUT:	AC 100-240V, 300mA
OUTPUT:	DC 5V, 1500mA
MANUFACTURER:	Huntkey

3. The EUT matched the following USB Cable and Earphone.

USB CABLE	
BRAND:	Lenovo
MODEL:	0154-117
SIGNAL LINE:	1.0 METER

EARPHONE	
BRAND:	Lenovo
MODEL:	LS-118M-09
SIGNAL LINE:	1.1 METER

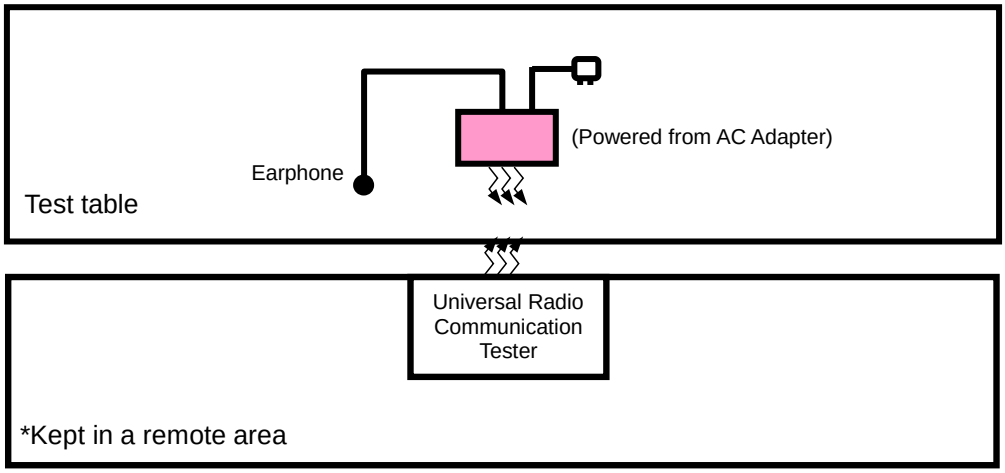
4. Sample A and Sample B were tested for this project and the differences are as below:

	Sample A		Sample B	
Parts	Brand	Model Name	Brand	Model Name
Battery	Lenovo(Sun woda)	L15D1P32	Lenovo (SCUD)	L15D1P32
LCD Panel	BOE	TV070HDM	DSBJ	DO0700HHF00
Front Camera	O-film	L545F00	AVC	CPLBF05003
Rear Camera	Sunny	F13V01L	Qtech	ECM13M0166QF
Main Broad	Chinabuilder	08B05112C	js-huashen	82AD005A0
eMCP	Samsung	KMR820001M-B609(2G+16G) KMQ82000SM-B418 (1G+16G)	Hynix	H9TQ17A8GTMCUR-K UM(1G+16G)
CPU	Qualcomm	MSM8916	Qualcomm	MSM8916

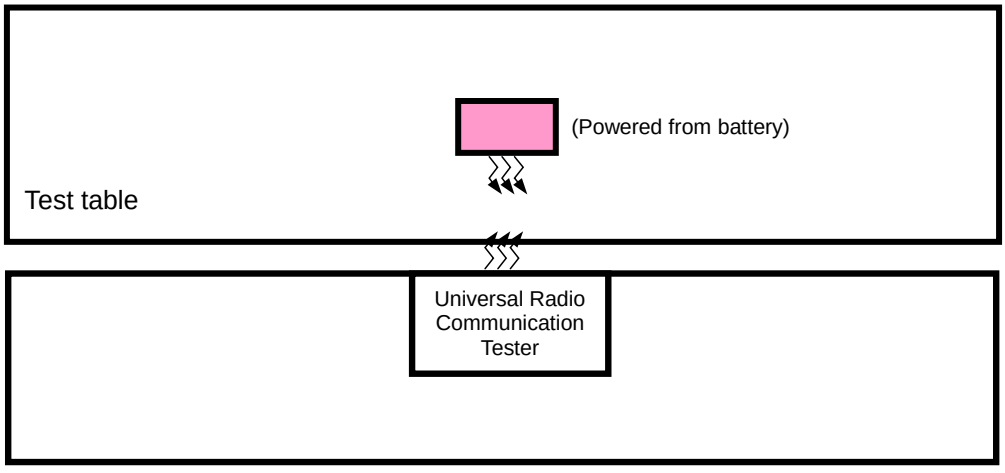
5. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

3.2 Configuration Of System Under Test

FOR RADIATION EMISSION TEST



FOR E.R.P. TEST



3.2.1 Description Of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	DC source	LONG WEI	PS-6403D	010934269	N/A
2	PC	HP	A6608CN	3CR83825X3	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	DC Line: Unshielded, Detachable 1.0m
2	AC Line: Unshielded, Detachable 1.5m

NOTE:

1. All power cords of the above support units are non shielded (1.8m).

3.3 Test Mode Applicability and Tested Channel Detail

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports
The worst case was found when positioned on Z-plane. Following channel(s) was (were) selected for the final test as listed below:

Test results are presented in the report as below.

Test Mode	Test Condition
A	Power from adapter
B	Power from battery

GSM MODE

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
A	EIRP	512 to 810	512, 661, 810	GSM
B	Frequency Stability	512 to 810	661	GSM
A	Occupied Bandwidth	512 to 810	512, 661, 810	GSM, EDGE
A	Band Edge	512 to 810	512, 810	GSM, EDGE
A	Peak To Average Ratio	512 to 810	512, 661, 810	GSM, EDGE
A	Condcudeted Emission	512 to 810	512, 661, 810	GSM, EDGE
A	Radiated Emission Below 1GHz	512 to 810	512	GSM
A	Radiated Emission Above 1GHz	512 to 810	512, 661, 810	GSM

WCDMA MODE

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
A	EIRP	9262 to 9538	9262, 9400, 9538	WCDMA
B	Frequency Stability	9262 to 9538	9400	WCDMA
A	Occupied Bandwidth	9262 to 9538	9262, 9400, 9538	WCDMA
A	Band Edge	9262 to 9538	9262, 9538	WCDMA
A	Peak To Average Ratio	9262 to 9538	9262, 9400, 9538	WCDMA
A	Condcudeted Emission	9262 to 9538	9262, 9400, 9538	WCDMA
A	Radiated Emission Below 1GHz	9262 to 9538	9262	WCDMA
A	Radiated Emission Above 1GHz	9262 to 9538	9262, 9400, 9538	WCDMA

LTE BAND 2

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
B	EIRP	18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		18615 to 19185	18615, 18900, 19185	3MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		18625 to 19175	18625, 18900, 19175	5MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		18650 to 19150	18650, 18900, 19150	10MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		18675 to 19125	18675, 18900, 19125	15MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		18700 to 19100	18700, 18900, 19100	20MHz	QPSK, 16QAM	1 RB / 0 RB Offset
B	FREQUENCY STABILITY	18607 to 19193	18900	1.4MHz	QPSK	1 RB / 0 RB Offset
		18615 to 19185	18900	3MHz	QPSK	1 RB / 0 RB Offset
		18625 to 19175	18900	5MHz	QPSK	1 RB / 0 RB Offset
		18650 to 19150	18900	10MHz	QPSK	1 RB / 0 RB Offset
		18675 to 19125	18900	15MHz	QPSK	1 RB / 0 RB Offset
		18700 to 19100	18900	20MHz	QPSK	1 RB / 0 RB Offset
B	OCCUPIED BANDWIDTH	18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK, 16QAM	6 RB / 0 RB Offset
		18615 to 19185	18615, 18900, 19185	3MHz	QPSK, 16QAM	15 RB / 0 RB Offset
		18625 to 19175	18625, 18900, 19175	5MHz	QPSK, 16QAM	25 RB / 0 RB Offset
		18650 to 19150	18650, 18900, 19150	10MHz	QPSK, 16QAM	50 RB / 0 RB Offset
		18675 to 19125	18675, 18900, 19125	15MHz	QPSK, 16QAM	75 RB / 0 RB Offset
		18700 to 19100	18700, 18900, 19100	20MHz	QPSK, 16QAM	100 RB / 0 RB Offset
B	PEAK TO AVERAGE RATIO	18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		18615 to 19185	18615, 18900, 19185	3MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		18625 to 19175	18625, 18900, 19175	5MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		18650 to 19150	18650, 18900, 19150	10MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		18675 to 19125	18675, 18900, 19125	15MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		18700 to 19100	18700, 18900, 19100	20MHz	QPSK, 16QAM	1 RB / 0 RB Offset

B	BAND EDGE	18607 to 19193	18607	1.4MHz	QPSK	1 RB / 0 RB Offset
						6 RB / 0 RB Offset
			19193	1.4MHz	QPSK	1 RB / 5 RB Offset
						6 RB / 0 RB Offset
		18615 to 19185	18615	3MHz	QPSK	1 RB / 0 RB Offset
						15 RB / 0 RB Offset
			19185	3MHz	QPSK	1 RB / 14 RB Offset
						15 RB / 0 RB Offset
		18625 to 19175	18625	5MHz	QPSK	1 RB / 0 RB Offset
						25 RB / 0 RB Offset
			19175	5MHz	QPSK	1 RB / 24 RB Offset
						25 RB / 0 RB Offset
		18650 to 19150	18650	10MHz	QPSK	1 RB / 0 RB Offset
						50 RB / 0 RB Offset
			19150	10MHz	QPSK	1 RB / 49 RB Offset
						50 RB / 0 RB Offset
		18675 to 19125	18675	15MHz	QPSK	1 RB / 0 RB Offset
						75 RB / 0 RB Offset
			19125	15MHz	QPSK	1 RB / 74 RB Offset
						75 RB / 0 RB Offset
		18700 to 19100	18700	20MHz	QPSK	1 RB / 0 RB Offset
						100 RB / 0 RB Offset
			19100	20MHz	QPSK	1 RB / 99 RB Offset
						100 RB / 0 RB Offset
B	CONDCUDETED EMISSION	18607 to 19193	18900	1.4MHz	QPSK	1 RB / 0 RB Offset
		18615 to 19185	18900	3MHz	QPSK	1 RB / 0 RB Offset
		18625 to 19175	18900	5MHz	QPSK	1 RB / 0 RB Offset
		18650 to 19150	18900	10MHz	QPSK	1 RB / 0 RB Offset
		18675 to 19125	18900	15MHz	QPSK	1 RB / 0 RB Offset
		18700 to 19100	18900	20MHz	QPSK	1 RB / 0 RB Offset
A	RADIATED EMISSION	18607 to 19193	18900	1.4MHz	QPSK	1 RB / 0 RB Offset
		18615 to 19185	18900	3MHz	QPSK	1 RB / 0 RB Offset
		18625 to 19175	18900	5MHz	QPSK	1 RB / 0 RB Offset
		18650 to 19150	18900	10MHz	QPSK	1 RB / 0 RB Offset
		18675 to 19125	18900	15MHz	QPSK	1 RB / 0 RB Offset
		18700 to 19100	18900	20MHz	QPSK	1 RB / 0 RB Offset

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
EIRP	21deg. C, 71%RH 22deg. C, 71%RH	120Vac, 60Hz	Nick Hsu
Frequency Stability	24deg. C, 64%RH	3.8Vdc	Match Tsui
Occupied Bandwidth	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
Band Edge	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
Peak To Average Ratio	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
Condcudeted Emission	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
Radiated Emission	21deg. C, 71%RH	120Vac, 60Hz	Nick Hsu

3.4 EUT Operating Conditions

The EUT makes a call to the communication simulator. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency

3.5 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC 47 CFR Part 2

FCC 47 CFR Part 24

ANSI/TIA/EIA-603-C 2004

NOTE: All test items have been performed and recorded as per the above standards.

4 Test Types and Results

4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

Mobile / Portable station are limited to 2 watts e.i.r.p.

4.1.2 Test Procedures

EIRP / ERP Measurement:

a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 1MHz for GSM, GPRS and 5MHz for WCDMA mode.

b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.

c. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a tx cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value“ of step b. Record the power level of S.G

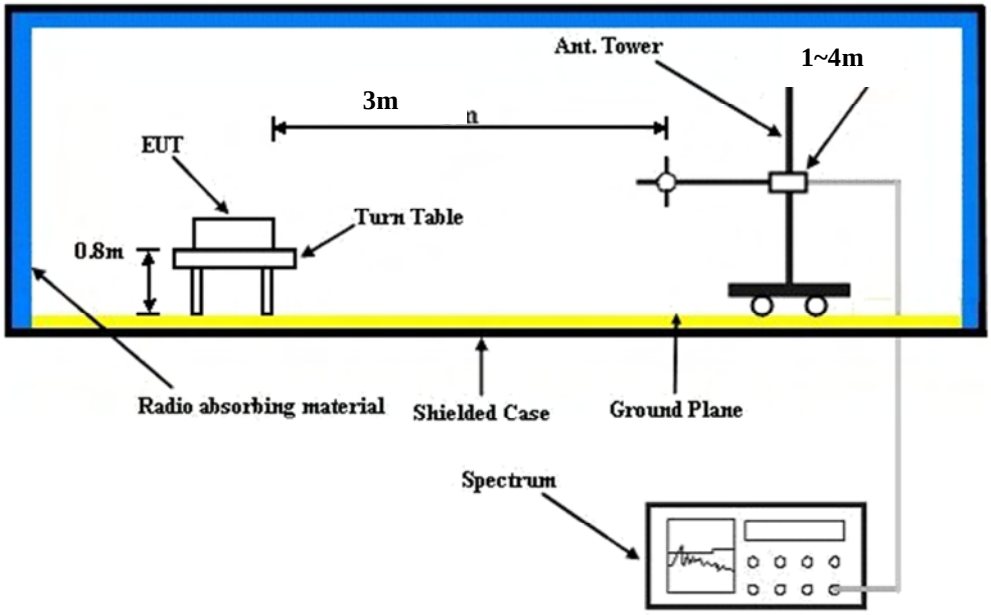
d. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.

Conducted Power Measurement:

The EUT was set up for the maximum power with GSM, GPRS & WCDMA link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

4.1.3 Test Setup

EIRP / ERP MEASUREMENT:



For the actual test configuration, please refer to the attached file (Test Setup Photo).

CONDUCTED POWER MEASUREMENT:

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.4 Test Results

CONDUCTED OUTPUT POWER (dBm)

Band	GSM1900		
Channel	512	661	810
Frequency (MHz)	1850.2	1880.0	1909.8
GSM	30.29	30.53	30.54
GPRS 8	30.20	30.48	30.53
GPRS 10	26.99	27.15	27.05
EDGE 8 (MCS1)	30.09	30.47	30.48
EDGE 10 (MCS1)	26.86	27.06	26.96
EDGE 8 (MCS9)	26.43	26.46	26.44
EDGE 10 (MCS9)	24.71	24.71	24.78

Band	WCDMA II		
Channel	9262	9400	9538
Frequency (MHz)	1852.4	1880.0	1907.6
RMC 12.2K	23.03	22.98	22.94
HSPA			
HSDPA Subtest-1	22.25	22.10	22.15
HSDPA Subtest-2	22.23	22.16	22.20
HSDPA Subtest-3	21.69	21.61	21.62
HSDPA Subtest-4	21.64	21.60	21.74
HSUPA Subtest-1	21.28	21.36	21.10
HSUPA Subtest-2	19.17	19.14	19.09
HSUPA Subtest-3	20.77	20.59	20.34
HSUPA Subtest-4	19.08	19.24	19.03
HSUPA Subtest-5	21.84	21.96	21.69

LTE Band 2							
BW	Modulation	RB Size	RB Offset	Low CH 18607 Frequency 1850.7 MHz	Mid CH 18900 Frequency 1880 MHz	High CH 19193 Frequency 1909.3 MHz	3GPP MPR (dB)
1.4MHz	QPSK	1	0	23.38	23.18	**23.45**	0
		1	2	23.31	23.14	23.17	0
		1	5	22.93	22.94	23.22	0
		3	0	23.37	23.17	**23.44**	0
		3	1	23.3	23.13	23.16	0
		3	3	22.92	22.93	23.21	0
		6	0	**22.29**	22.04	22.28	1
	16QAM	1	0	22.12	22.14	**22.39**	1
		1	2	22.35	22.09	22.24	1
		1	5	22.03	21.94	22.17	1
		3	0	22.1	22.12	**22.37**	1
		3	1	22.33	22.07	22.22	1
		3	3	22.01	21.92	22.15	1
		6	0	21.69	**21.72**	21.7	2

LTE Band 2							
BW	Modulation	RB Size	RB Offset	Low CH 18615 Frequency 1851.5 MHz	Mid CH 18900 Frequency 1880 MHz	High CH 19185 Frequency 1908.5 MHz	3GPP MPR (dB)
3 MHz	QPSK	1	0	23.41	23.21	**23.48**	0
		1	7	23.34	23.17	23.2	0
		1	14	22.96	22.97	23.25	0
		8	0	22.36	22.31	**22.51**	1
		8	3	22.24	22.22	22.43	1
		8	7	22.29	22.24	22.42	1
		15	0	**22.32**	22.07	22.31	1
	16QAM	1	0	22.15	22.17	**22.42**	1
		1	7	22.38	22.12	22.27	1
		1	14	22.06	21.97	22.2	1
		8	0	21.71	21.69	**21.72**	2
		8	3	21.64	21.62	21.6	2
		8	7	21.65	21.6	21.65	2
		15	0	21.72	**21.75**	21.73	2

BW	Modulation	RB Size	RB Offset	Low CH 18625	Mid CH 18900	High CH 19175	3GPP MPR (dB)
				Frequency 1852.5 MHz	Frequency 1880 MHz	Frequency 1907.5 MHz	
5 MHz	QPSK	1	0	23.44	23.24	**23.51**	0
		1	12	23.37	23.2	23.23	0
		1	24	22.99	23	23.28	0
		12	0	22.39	22.34	**22.54**	1
		12	6	22.27	22.25	22.46	1
		12	13	22.32	22.27	22.45	1
		25	0	**22.35**	22.1	22.34	1
	16QAM	1	0	22.18	22.2	**22.45**	1
		1	12	22.41	22.15	22.3	1
		1	24	22.09	22	22.23	1
		12	0	21.74	21.72	**21.75**	2
		12	6	21.67	21.65	21.63	2
		12	13	21.68	21.63	21.68	2
		25	0	21.75	**21.78**	21.76	2
LTE Band 2							
BW	Modulation	RB Size	RB Offset	Low CH 18650	Mid CH 18900	High CH 19150	3GPP MPR (dB)
				Frequency 1855 MHz	Frequency 1880 MHz	Frequency 1905 MHz	
10 MHz	QPSK	1	0	23.46	23.26	**23.53**	0
		1	24	23.39	23.22	23.25	0
		1	49	23.01	23.02	23.3	0
		25	0	22.41	22.36	**22.56**	1
		25	12	22.29	22.27	22.48	1
		25	25	22.34	22.29	22.47	1
		50	0	**22.37**	22.12	22.36	1
	16QAM	1	0	22.2	22.22	**22.47**	1
		1	24	22.43	22.17	22.32	1
		1	49	22.11	22.02	22.25	1
		25	0	21.76	21.74	**21.77**	2
		25	12	21.69	21.67	21.65	2
		25	25	21.7	21.65	21.7	2
		50	0	21.77	**21.8**	21.78	2
BW	Modulation	RB Size	RB Offset	Low CH 18675	Mid CH 18900	High CH 19125	3GPP MPR (dB)
				Frequency 1857.5 MHz	Frequency 1880 MHz	Frequency 1902.5 MHz	
15 MHz	QPSK	1	0	23.49	23.29	**23.56**	0

		1	37	23.42	23.25	23.28	0
		1	74	23.04	23.05	23.33	0
		36	0	22.44	22.39	**22.59**	1
		36	19	22.32	22.3	22.51	1
		36	39	22.37	22.32	22.5	1
		75	0	**22.4**	22.15	22.39	1
		1	0	22.23	22.25	**22.5**	1
		1	37	22.46	22.2	22.35	1
		1	74	22.14	22.05	22.28	1
	16QAM	36	0	21.79	21.77	**21.8**	2
		36	19	21.72	21.7	21.68	2
		36	39	21.73	21.68	21.73	2
		75	0	21.8	**21.83**	21.81	2

LTE Band 2

BW	**Modulation**	**RB Size**	**RB Offset**	**Low CH 18700**	**Mid CH 18900**	**High CH 19100**	**3GPP MPR (dB)**
				Frequency 1860 MHz	**Frequency 1880 MHz**	**Frequency 1900 MHz**	
20MHz	**QPSK**	1	0	23.54	23.34	**23.61**	0
		1	50	23.47	23.3	23.33	0
		1	99	23.09	23.1	23.38	0
		50	0	22.49	22.44	**22.64**	1
		50	25	22.37	22.35	22.56	1
		50	50	22.42	22.37	22.55	1
		100	0	**22.45**	22.2	22.44	1
	16QAM	1	0	22.28	22.3	**22.55**	1
		1	50	22.51	22.25	22.4	1
		1	99	22.19	22.1	22.33	1
		50	0	21.84	21.82	**21.85**	2
		50	25	21.77	21.75	21.73	2
		50	50	21.78	21.73	21.78	2
		100	0	21.85	**21.88**	21.86	2

EIRP POWER (dBm)

GSM

Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
512	1850.2	-14.16	44.70	30.54	1132.40	H
661	1880.0	-14.12	44.70	30.58	**1142.88**	H
810	1909.8	-14.47	44.57	30.10	1024.00	H
512	1850.2	-19.38	44.27	24.89	308.32	V
661	1880.0	-20.09	44.87	24.78	300.61	V
810	1909.8	-19.64	44.61	24.97	314.27	V

EDGE

Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
512	1850.2	-17.87	44.70	26.83	**481.95**	H
661	1880.0	-18.24	44.70	26.46	442.59	H
810	1909.8	-18.13	44.57	26.44	440.86	H
512	1850.2	-23.32	44.27	20.95	124.45	V
661	1880.0	-24.33	44.87	20.54	113.24	V
810	1909.8	-24.41	44.61	20.20	104.79	V

WCDMA

Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
9262	1852.4	-21.02	44.70	23.68	233.35	H
9400	1880.0	-21.24	44.70	23.46	221.82	H
9538	1907.6	-20.65	44.57	23.92	**246.77**	H
9262	1852.4	-26.48	44.27	17.79	60.12	V
9400	1880.0	-27.76	44.87	17.11	51.40	V
9538	1907.6	-26.63	44.61	17.98	62.85	V

REMARKS: 1. EIRP Output Power (dBm) = LVL (dBm) + Correction Factor (dB).
2. Correction factor (dB) = Free Space Loss + Antenna Factor + Cable Loss

LTE BAND 2

CHANNEL BANDWIDTH: 1.4MHz QPSK

Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18607	1850.7	-20.96	44.70	23.74	236.59	H	1
18900	1880.0	-20.84	44.70	23.86	**243.22**	H	1
19193	1909.3	-20.79	44.57	23.78	238.95	H	1
18607	1850.7	-26.70	44.27	17.57	57.15	V	1
18900	1880.0	-27.51	44.87	17.36	54.45	V	1
19193	1909.3	-26.65	44.61	17.96	62.56	V	1

NOTE: EIRP (dBm) = LVL (dBm) + Correction Factor (dB)

CHANNEL BANDWIDTH: 1.4MHz 16QAM

Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18607	1850.7	-21.99	44.70	22.71	186.64	H	1
18900	1880.0	-22.06	44.70	22.64	183.65	H	1
19193	1909.3	-21.73	44.57	22.84	192.44	H	1
18607	1850.7	-27.77	44.27	16.50	44.67	V	1
18900	1880.0	-28.43	44.87	16.44	44.06	V	1
19193	1909.3	-28.42	44.61	16.19	41.62	V	1

NOTE: EIRP (dBm) = LVL (dBm) + Correction Factor (dB)

CHANNEL BANDWIDTH: 3MHz QPSK

Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18615	1851.5	-21.70	44.70	23.00	199.53	H	1
18900	1880.0	-20.75	44.70	23.95	**248.31**	H	1
19185	1908.5	-21.29	44.57	23.28	212.96	H	1
18615	1851.5	-26.76	44.27	17.51	56.36	V	1
18900	1880.0	-27.10	44.87	17.77	59.84	V	1
19185	1908.5	-27.59	44.61	17.02	50.38	V	1

NOTE: EIRP (dBm) = LVL (dBm) + Correction Factor (dB)

CHANNEL BANDWIDTH: 3MHz 16QAM

Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18615	1851.5	-21.81	44.70	22.89	194.54	H	1
18900	1880.0	-21.98	44.70	22.72	187.07	H	1
19185	1908.5	-21.99	44.57	22.58	181.26	H	1
18615	1851.5	-27.75	44.27	16.52	44.87	V	1
18900	1880.0	-28.35	44.87	16.52	44.87	V	1
19185	1908.5	-27.76	44.61	16.85	48.45	V	1

NOTE: EIRP (dBm) = LVL (dBm) + Correction Factor (dB)

CHANNEL BANDWIDTH: 5MHz QPSK

Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18625	1852.5	-21.60	44.70	23.10	**204.17**	H	1
18900	1880.0	-21.60	44.70	23.10	204.17	H	1
19175	1907.5	-21.49	44.57	23.08	203.38	H	1
18625	1852.5	-26.56	44.27	17.71	59.02	V	1
18900	1880.0	-27.79	44.87	17.08	51.05	V	1
19175	1907.5	-27.53	44.61	17.08	51.09	V	1

NOTE: EIRP (dBm) = LVL (dBm) + Correction Factor (dB)

CHANNEL BANDWIDTH: 5MHz 16QAM

Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18625	1852.5	-21.83	44.70	22.87	193.64	H	1
18900	1880.0	-21.76	44.70	22.94	196.79	H	1
19175	1907.5	-22.39	44.57	22.18	165.31	H	1
18625	1852.5	-27.41	44.27	16.86	48.53	V	1
18900	1880.0	-28.80	44.87	16.07	40.46	V	1
19175	1907.5	-27.89	44.61	16.72	47.02	V	1

NOTE: EIRP (dBm) = LVL (dBm) + Correction Factor (dB)

CHANNEL BANDWIDTH: 10MHz QPSK

Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18650	1855.0	-21.18	44.70	23.52	224.91	H	1
18900	1880.0	-21.12	44.70	23.58	228.03	H	1
19150	1905.0	-20.99	44.57	23.58	**228.19**	H	1
18650	1855.0	-27.05	44.27	17.22	52.72	V	1
18900	1880.0	-27.69	44.87	17.18	52.24	V	1
19150	1905.0	-27.26	44.61	17.35	54.36	V	1

NOTE: EIRP (dBm) = LVL (dBm) + Correction Factor (dB)

CHANNEL BANDWIDTH: 10MHz 16QAM

Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18650	1855.0	-22.10	44.70	22.60	181.97	H	1
18900	1880.0	-22.05	44.70	22.65	184.08	H	1
19150	1905.0	-22.12	44.57	22.45	175.91	H	1
18650	1855.0	-28.02	44.27	16.25	42.17	V	1
18900	1880.0	-28.07	44.87	16.80	47.86	V	1
19150	1905.0	-28.08	44.61	16.53	45.01	V	1

NOTE: EIRP (dBm) = LVL (dBm) + Correction Factor (dB)

CHANNEL BANDWIDTH: 15MHz QPSK

Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18675	1857.5	-21.44	44.70	23.26	211.84	H	1
18900	1880.0	-20.99	44.70	23.71	234.96	H	1
19125	1902.5	-20.78	44.57	23.79	**239.50**	H	1
18675	1857.5	-27.11	44.27	17.16	52.00	V	1
18900	1880.0	-27.86	44.87	17.01	50.23	V	1
19125	1902.5	-26.69	44.61	17.92	61.99	V	1

NOTE: EIRP (dBm) = LVL (dBm) + Correction Factor (dB)

CHANNEL BANDWIDTH: 15MHz 16QAM

Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18675	1857.5	-22.53	44.70	22.17	164.82	H	1
18900	1880.0	-22.08	44.70	22.62	182.81	H	1
19125	1902.5	-22.04	44.57	22.53	179.18	H	1
18675	1857.5	-27.87	44.27	16.40	43.65	V	1
18900	1880.0	-27.93	44.87	16.94	49.43	V	1
19125	1902.5	-27.98	44.61	16.63	46.06	V	1

NOTE: EIRP (dBm) = LVL (dBm) + Correction Factor (dB)

CHANNEL BANDWIDTH: 20MHz QPSK

Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18700	1860.0	-21.36	44.70	23.34	215.77	H	1
18900	1880.0	-20.97	44.70	23.73	**236.05**	H	1
19100	1900.0	-20.97	44.57	23.60	229.25	H	1
18700	1860.0	-26.83	44.27	17.44	55.46	V	1
18900	1880.0	-27.60	44.87	17.27	53.33	V	1
19100	1900.0	-26.71	44.61	17.90	61.70	V	1

NOTE: EIRP (dBm) = LVL (dBm) + Correction Factor (dB)

CHANNEL BANDWIDTH: 20MHz 16QAM

Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18700	1860.0	-22.32	44.70	22.38	172.98	H	1
18900	1880.0	-22.20	44.70	22.50	177.83	H	1
19100	1900.0	-22.02	44.57	22.55	180.01	H	1
18700	1860.0	-27.70	44.27	16.57	45.39	V	1
18900	1880.0	-27.93	44.87	16.94	49.43	V	1
19100	1900.0	-27.74	44.61	16.87	48.67	V	1

NOTE: EIRP (dBm) = LVL (dBm) + Correction Factor (dB)

4.2 Frequency Stability Measurement

4.2.1 Limits of Frequency Stabiliity Measurement

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

4.2.2 Test Procedure

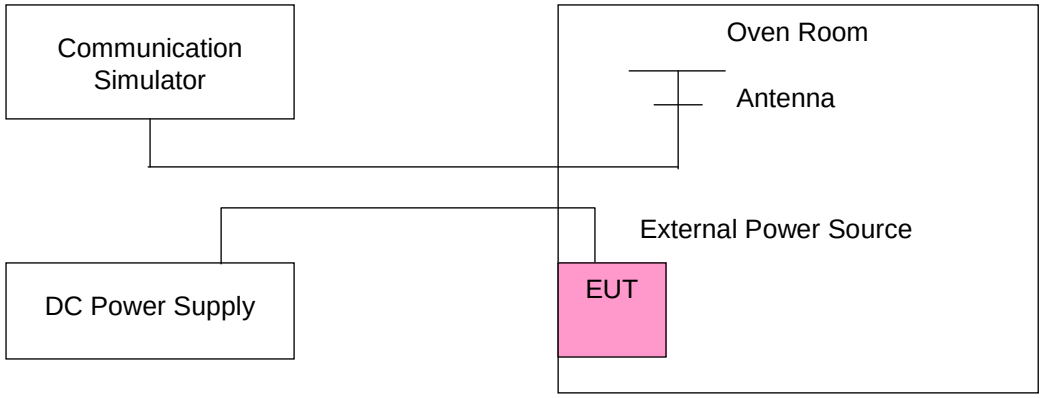
a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.

b. EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.

c. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ± 0.5℃ during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

NOTE: The frequency error was recorded frequency error from the communication simulator.

4.2.3 Test Setup



4.2.4 Test Results

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	FREQUENCY ERROR (ppm)			LIMIT (ppm)
	GSM	EDGE	WCDMA	
3.8	0.0012	0.0015	0.0005	2.5
3.5	-0.0009	-0.0011	-0.0013	2.5
4.2	0.0018	0.0015	-0.0017	2.5

NOTE: The applicant defined the normal working voltage of the battery is from 3.5Vdc to 4.2Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (℃)	FREQUENCY ERROR (ppm)			LIMIT (ppm)
	GSM	EDGE	WCDMA	
-30	-0.0060	-0.0061	-0.0055	2.5
-20	-0.0054	-0.0054	-0.0049	2.5
-10	-0.0050	-0.0050	-0.0044	2.5
0	-0.0044	-0.0046	-0.0035	2.5
10	-0.0037	-0.0036	-0.0027	2.5
20	-0.0031	-0.0027	-0.0018	2.5
30	-0.0023	-0.0023	-0.0011	2.5
40	-0.0014	-0.0015	-0.0005	2.5
50	-0.0006	-0.0009	-0.0001	2.5
60	-0.0003	0.0005	0.0004	2.5

LTE BAND 2

AFC FREQUENCY ERROR vs. VOLTAGE							
VOLTAGE (Volts)	FREQUENCY ERROR (ppm)						LIMIT (ppm)
	1.4MHz	3MHz	5MHz	10MHz	15MHz	20MHz	
3.8	0.0016	0.0025	0.0017	0.0009	0.0014	0.0003	2.5
3.5	-0.0051	-0.0041	-0.0027	-0.0025	-0.0029	-0.0038	2.5
4.2	-0.0064	-0.0051	-0.0035	-0.0039	-0.0038	-0.0052	2.5

NOTE: The applicant defined the normal working voltage of the battery is from 3.5Vdc to 4.2Vdc.

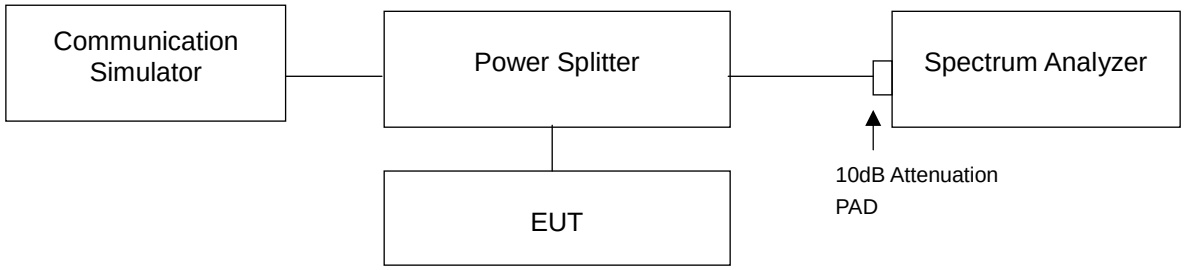
AFC FREQUENCY ERROR vs. TEMPERATURE							
TEMP. (℃)	FREQUENCY ERROR (ppm)						LIMIT (ppm)
	1.4MHz	3MHz	5MHz	10MHz	15MHz	20MHz	
-30	-0.0058	-0.0057	-0.0060	-0.0057	-0.0057	-0.0054	2.5
-20	-0.0051	-0.0050	-0.0053	-0.0051	-0.0050	-0.0050	2.5
-10	-0.0045	-0.0045	-0.0045	-0.0044	-0.0044	-0.0047	2.5
0	-0.0039	-0.0039	-0.0038	-0.0039	-0.0038	-0.0037	2.5
10	-0.0034	-0.0035	-0.0035	-0.0032	-0.0034	-0.0029	2.5
20	-0.0025	-0.0026	-0.0027	-0.0023	-0.0026	-0.0025	2.5
30	-0.0017	-0.0017	-0.0020	-0.0017	-0.0018	-0.0017	2.5
40	-0.0012	-0.0011	-0.0012	-0.0011	-0.0011	-0.0015	2.5
50	-0.0007	-0.0011	-0.0006	-0.0006	-0.0006	-0.0010	2.5
60	0.0004	-0.0002	0.0002	0.0003	-0.0002	-0.0005	2.5

4.3 Occupied Bandwidth Measurement

4.3.1 Test Procedure

The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

4.3.2 Test Setup

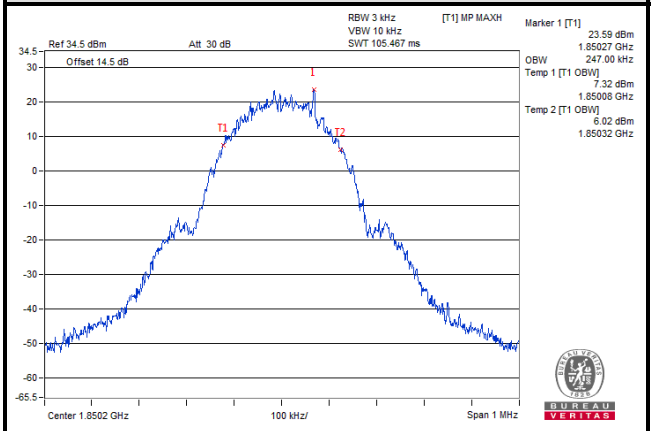


4.3.3 Test Result

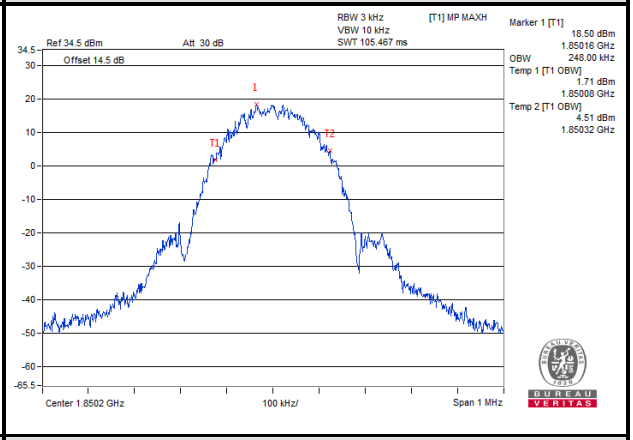
CHANNEL	FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH (kHz)		CHANNEL	FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH (MHz)
		GSM	EDGE			WCDMA
512	1850.2	247.00	248.00	9262	1852.4	4.19
661	1880.0	247.00	248.00	9400	1880.0	4.19
810	1909.8	245.00	245.00	9538	1907.6	4.18

SPECTRUM PLOT OF WORST VALUE

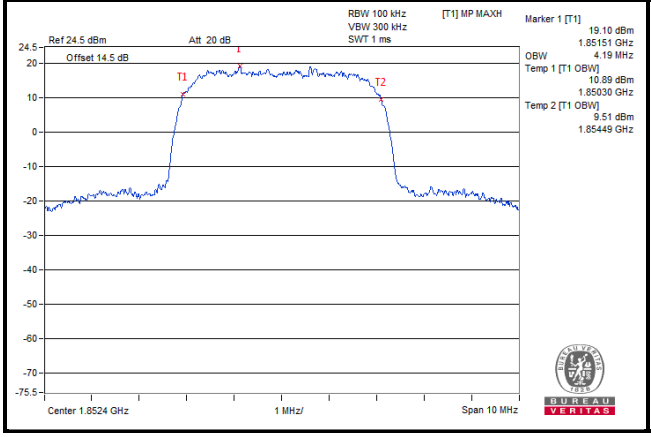
GSM



EDGE



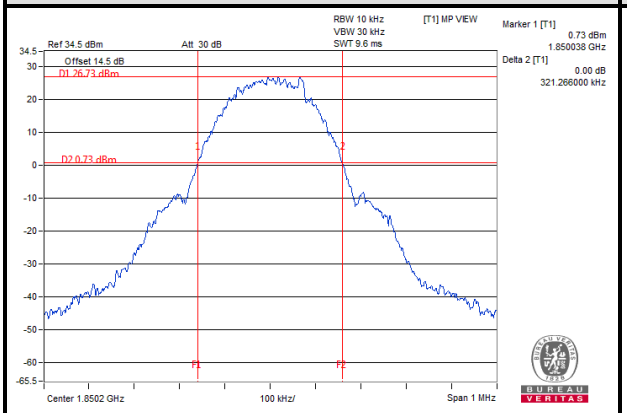
WCDMA



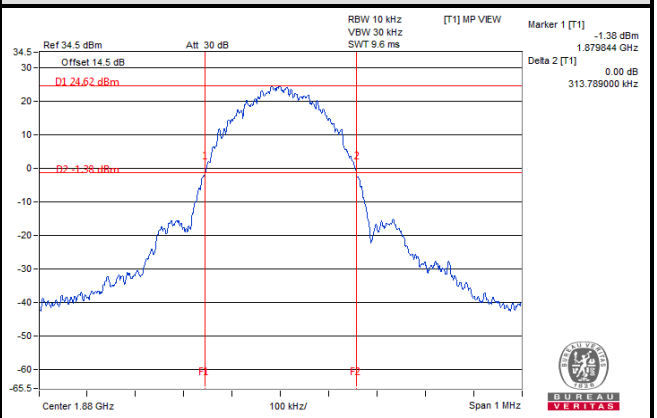
CHANNEL	FREQUENCY (MHz)	26dB BANDWIDTH (kHz)		CHANNEL	FREQUENCY (MHz)	26dB BANDWIDTH (MHz)
		GSM	EDGE			WCDMA
512	1850.2	321.27	309.28	9262	1852.4	4.69
661	1880.0	316.51	313.79	9400	1880.0	4.70
810	1909.8	320.21	313.05	9538	1907.6	4.69

SPECTRUM PLOT OF WORST VALUE

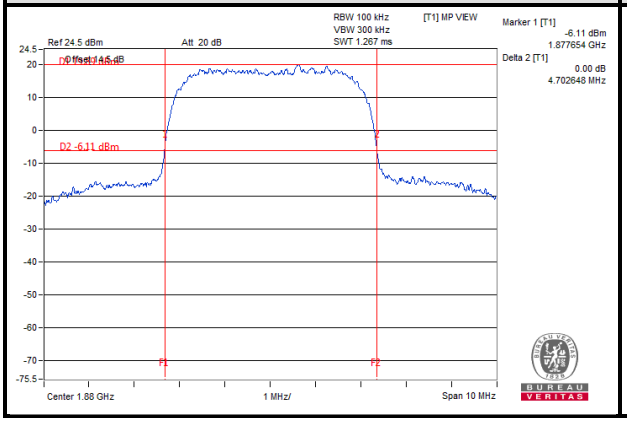
GSM



EDGE



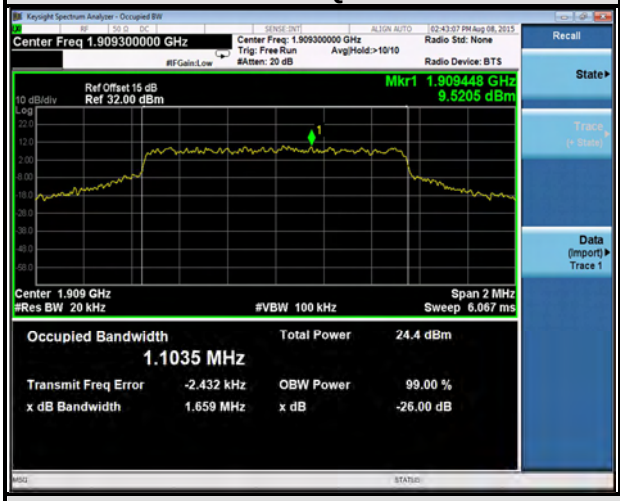
WCDMA



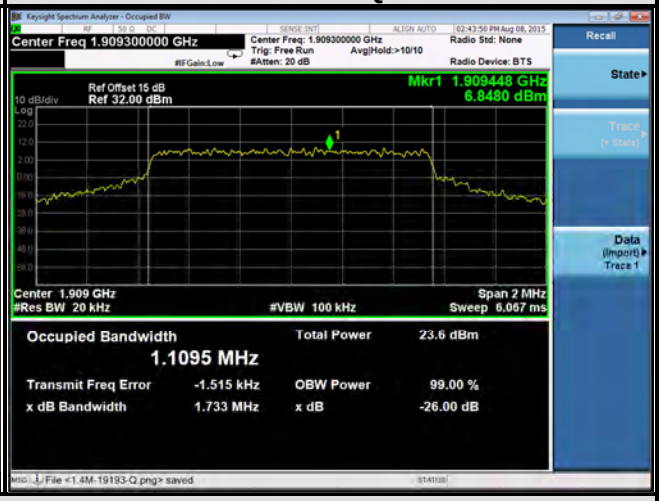
LTE band 2							
Channel Bandwidth : 1.4MHz							
Channel	Frequency (MHz)	99% Occupied bandwidth (MHz)		Channel	Frequency (MHz)	26 dB bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
18607	1850.7	1.10	1.09	18607	1850.7	1.28	1.29
18900	1880	1.10	1.09	18900	1880	1.28	1.27
19193	1909.3	1.10	1.11	19193	1909.3	1.29	1.28

SPECTRUM PLOT OF WORST VALUE of 99% Occupied Bandwidth

1.4MHz/QPSK

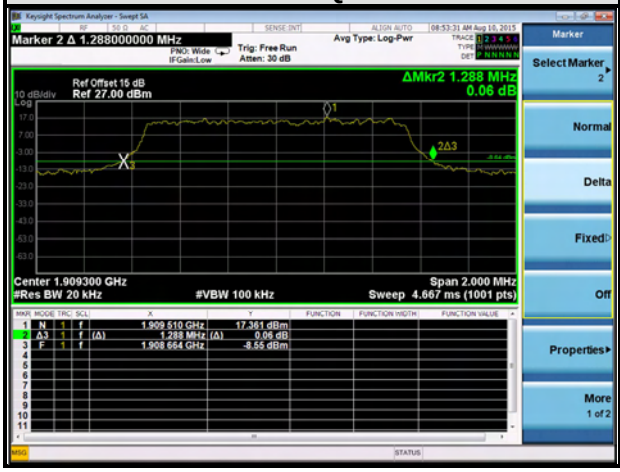


1.4MHz/16QAM



SPECTRUM PLOT OF WORST VALUE of 26dB Bandwidth

1.4MHz/QPSK

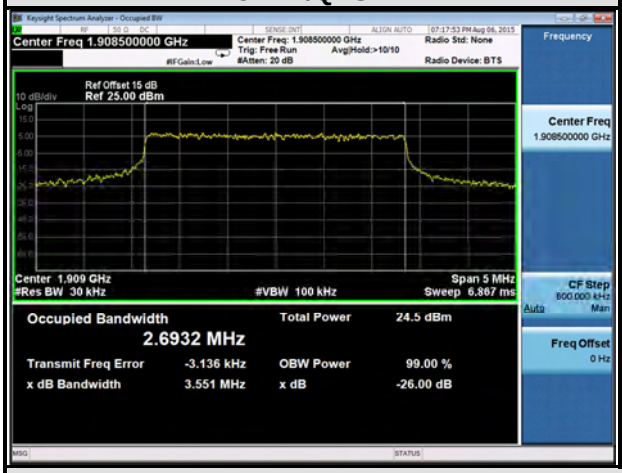


1.4MHz/16QAM

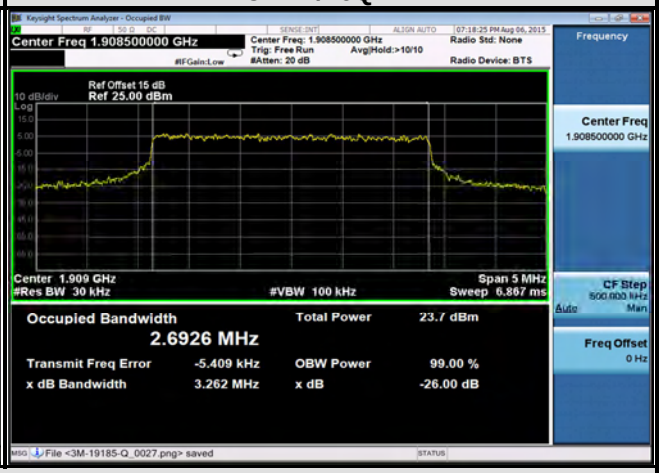
LTE band 2							
Channel Bandwidth : 3MHz							
Channel	Frequency (MHz)	99% Occupied bandwidth (MHz)		Channel	Frequency (MHz)	26 dB bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
18615	1851.5	2.69	2.69	18615	1851.5	3.09	3.07
18900	1880	2.69	2.68	18900	1880	3.12	3.07
19185	1908.5	2.69	2.69	19185	1908.5	3.20	3.16

SPECTRUM PLOT OF WORST VALUE of 99% Occupied Bandwidth

3MHz/QPSK



3MHz/16QAM



SPECTRUM PLOT OF WORST VALUE of 26dB Occupied Bandwidth

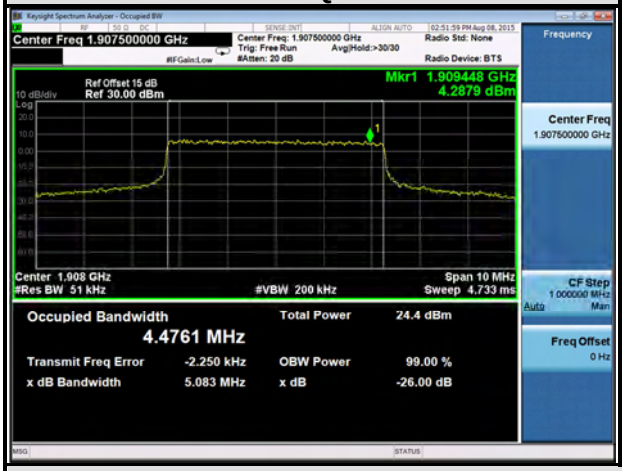
3MHz/QPSK

3MHz/16QAM

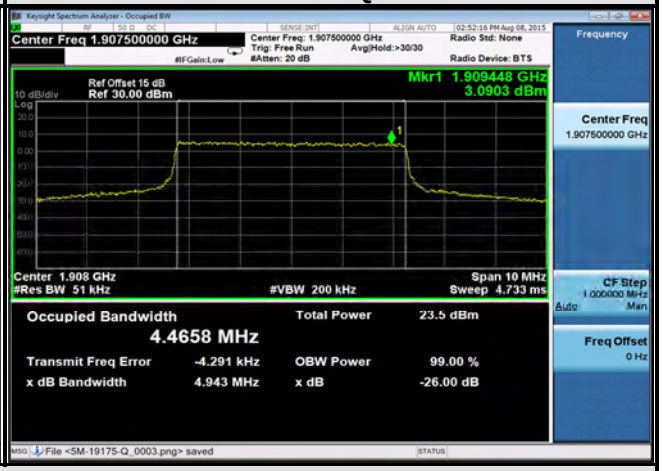
LTE band 2							
Channel Bandwidth : 5 MHz							
Channel	Frequency (MHz)	99% Occupied bandwidth (MHz)		Channel	Frequency (MHz)	26 dB bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
18625	1852.5	4.47	4.46	18625	1852.5	5.04	5.02
18900	1880	4.48	4.47	18900	1880	4.97	4.97
19175	1907.5	4.48	4.47	19175	1907.5	5.07	4.97

SPECTRUM PLOT OF WORST VALUE of 99% Occupied Bandwidth

5MHz/QPSK

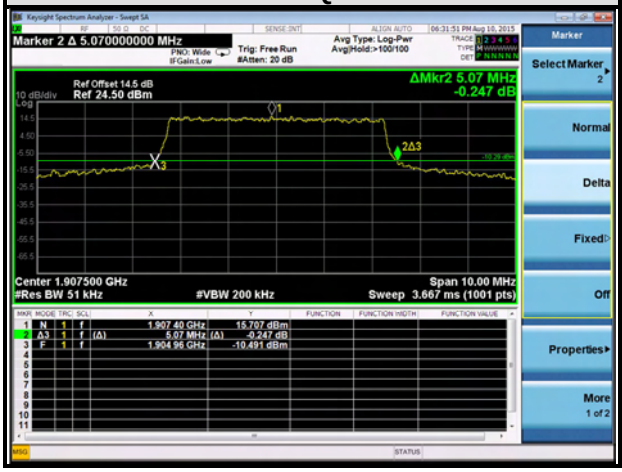


5MHz/16QAM



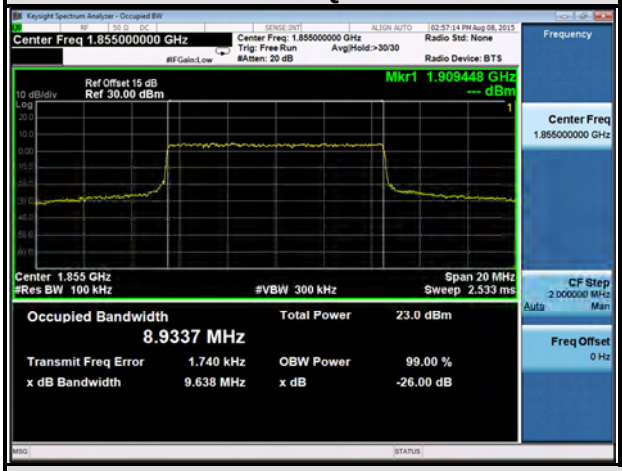
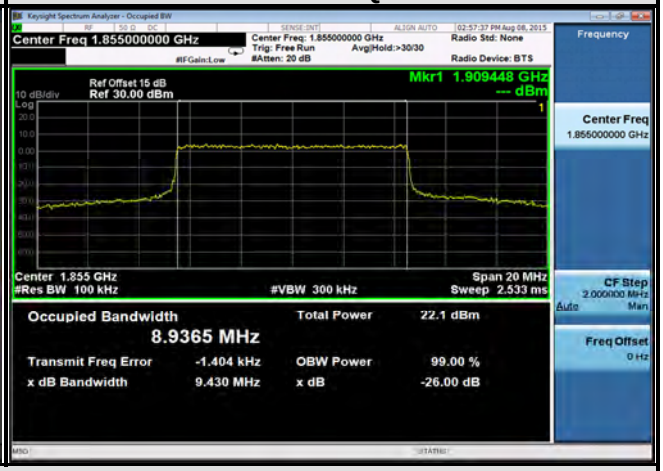
SPECTRUM PLOT OF WORST VALUE of 26dB Occupied Bandwidth

5MHz/QPSK



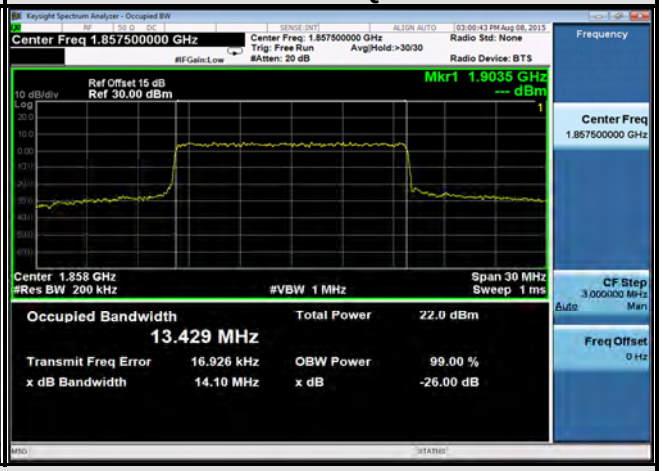
5MHz/16QAM

LTE band 2							
Channel Bandwidth : 10 MHz							
Channel	Frequency (MHz)	99% Occupied bandwidth (MHz)		Channel	Frequency (MHz)	26 dB bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
18650	1855	8.93	8.94	18650	1855	9.84	9.84
18900	1880	8.92	8.93	18900	1880	9.88	9.82
19150	1905	8.93	8.94	19150	1905	9.88	9.82

SPECTRUM PLOT OF WORST VALUE of 99% Occupied Bandwidth	
10MHz/QPSK	10MHz/16QAM
	

SPECTRUM PLOT OF WORST VALUE of 26dB Occupied Bandwidth	
10MHz/QPSK	10MHz/16QAM
	

LTE band 2							
Channel Bandwidth : 15 MHz							
Channel	Frequency (MHz)	99% Occupied bandwidth (MHz)		Channel	Frequency (MHz)	26 dB bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
18675	1857.5	13.41	13.43	18675	1857.5	14.76	14.70
18900	1880	13.43	13.42	18900	1880	14.67	14.67
19125	1902.5	13.42	13.41	19125	1902.5	14.73	14.70

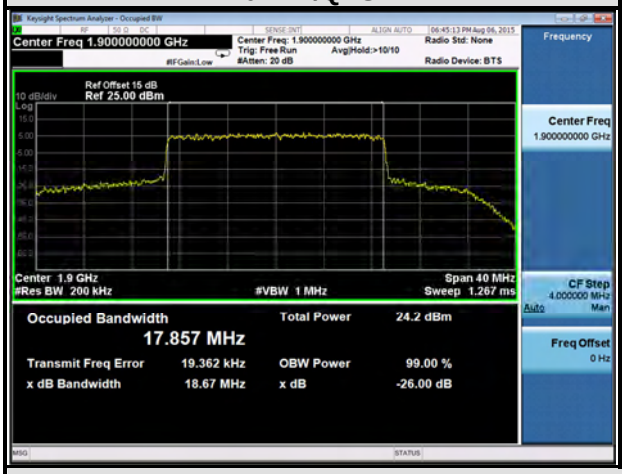
SPECTRUM PLOT OF WORST VALUE of 99% Occupied Bandwidth	
15MHz/QPSK	15MHz/16QAM
	

SPECTRUM PLOT OF WORST VALUE of 26dB Occupied Bandwidth	
15MHz/QPSK	15MHz/16QAM
	

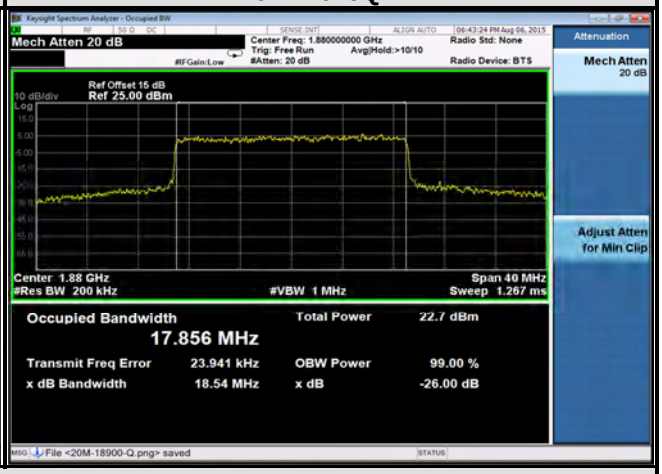
LTE band 2							
Channel Bandwidth : 20 MHz							
Channel	Frequency (MHz)	99% Occupied bandwidth (MHz)		Channel	Frequency (MHz)	26 dB bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
18700	1860	17.86	17.83	18700	1860	19.48	19.28
18900	1880	17.85	17.86	18900	1880	19.36	19.12
19100	1900	17.86	17.82	19100	1900	19.40	19.28

SPECTRUM PLOT OF WORST VALUE of 99% Occupied Bandwidth

20MHz/QPSK

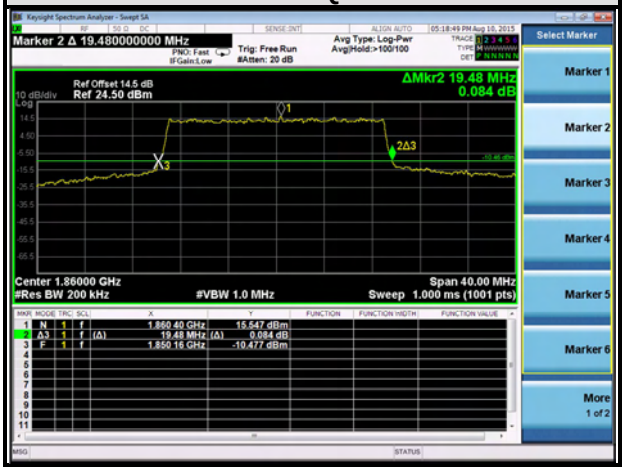


20MHz/16QAM



SPECTRUM PLOT OF WORST VALUE of 26dB Occupied Bandwidth

20MHz/QPSK



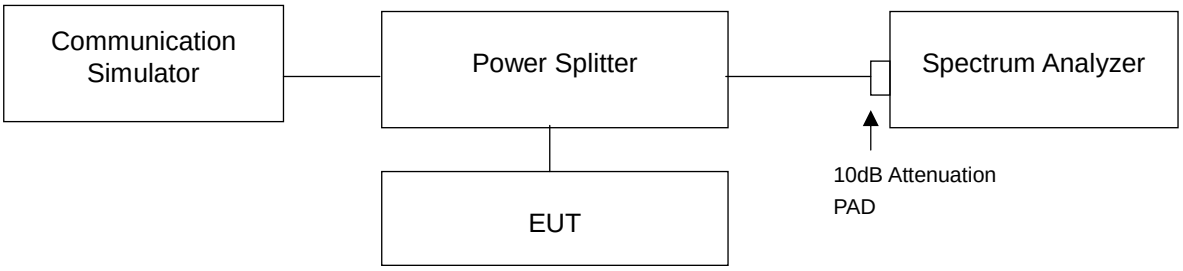
20MHz/16QAM

4.4 Band Edge Measurement

4.4.1 Limits of Band Edge Measurement

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 + 10 log(P) dB. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

4.4.2 Test Setup



4.4.3 Test Procedures

a. All measurements were done at low and high operational frequency range.

b. The center frequency of spectrum is the band edge frequency and span is 1.5MHz. RB of the spectrum is 3kHz and VB of the spectrum is 10kHz (GSM/ GPRS/EDGE).

c. The center frequency of spectrum is the band edge frequency and span is 10MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (WCDMA).

d. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RB of the spectrum is 20kHz and VB of the spectrum is 100 kHz. (LTE bandwidth 1.4MHz)

e. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RB of the spectrum is 30kHz and VB of the spectrum is 100kHz. (LTE bandwidth 3MHz)

f. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RB of the spectrum is 50kHz and VB of the spectrum is 200kHz. (LTE bandwidth 5MHz)

g. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz. (LTE bandwidth 10MHz)

h. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RB of the spectrum is 200kHz and VB of the spectrum is 1MHz. (LTE bandwidth 15MHz)

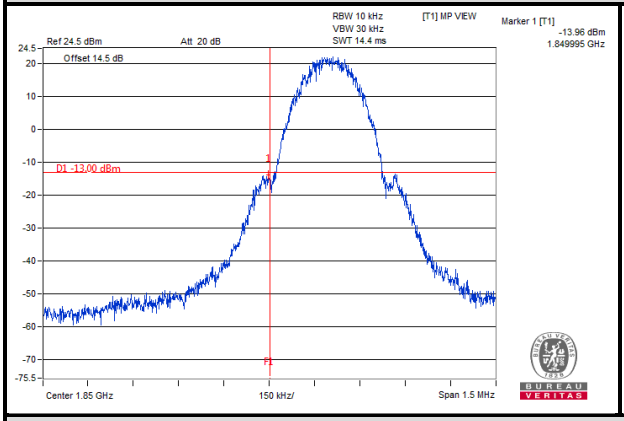
i. he center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RB of the spectrum is 200kHz and VB of the spectrum is 1MHz. (LTE bandwidth 20MHz)

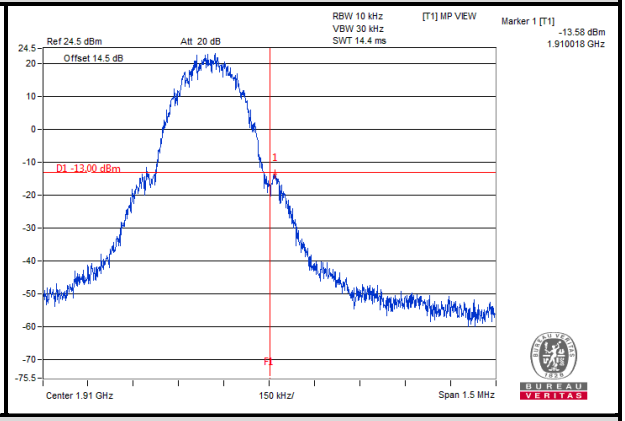
j. Record the max trace plot into the test report.

4.4.4 Test Results

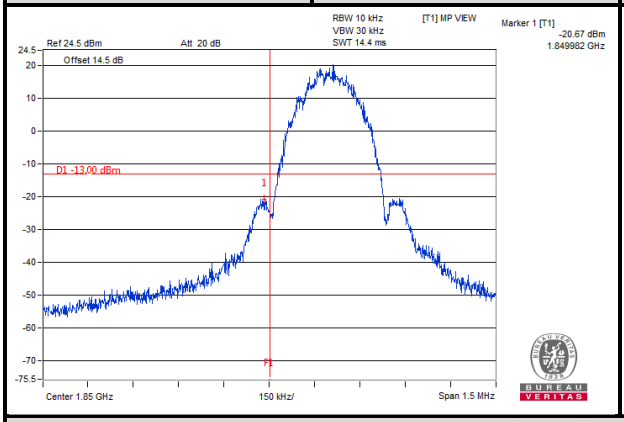
GSM			
CHANNEL	512	CHANNEL	810

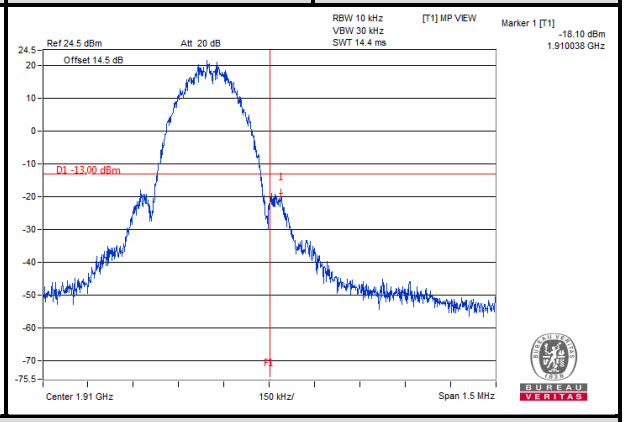
GSM



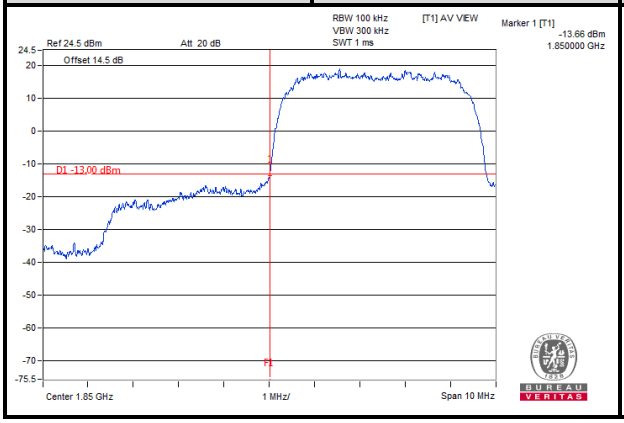


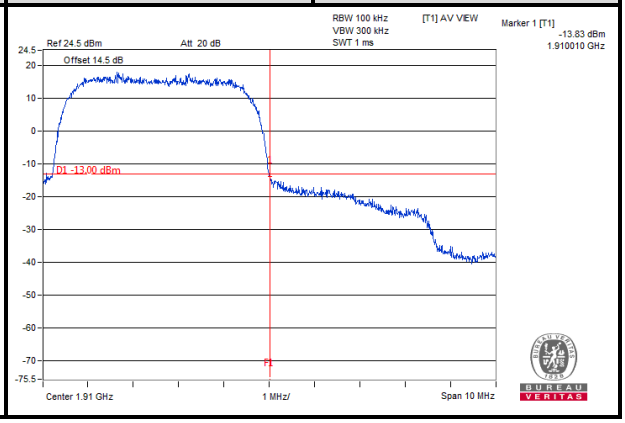
EDGE			
CHANNEL	512	CHANNEL	810





WCDMA			
CHANNEL	9262	CHANNEL	9538





LTE BAND 2

Channel Bandwidth: 1.4MHz					
CHANNEL	18607	1 RB	CHANNEL	19193	1 RB
					
CHANNEL	18607	Full RB	CHANNEL	19193	Full RB
					

LTE BAND 2

Channel Bandwidth: 3MHz					
CHANNEL	18615	1 RB	CHANNEL	19185	1 RB
					
CHANNEL	18615	Full RB	CHANNEL	19185	Full RB
					

LTE BAND 2

Channel Bandwidth: 5MHz					
CHANNEL	18625	1 RB	CHANNEL	19175	1 RB
					
CHANNEL	18625	Full RB	CHANNEL	19175	Full RB
					

LTE BAND 2

Channel Bandwidth: 10MHz					
CHANNEL	18650	1 RB	CHANNEL	19150	1 RB
					
CHANNEL	18650	Full RB	CHANNEL	19150	Full RB
					

LTE BAND 2

Channel Bandwidth: 15MHz					
CHANNEL	18675	1 RB	CHANNEL	19125	1 RB
					
CHANNEL	18675	Full RB	CHANNEL	19125	Full RB
					

LTE BAND 2

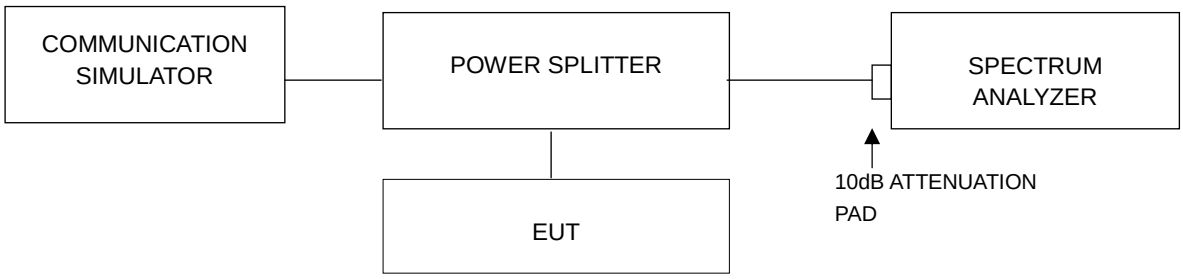
Channel Bandwidth: 20MHz					
CHANNEL	18700	1 RB	CHANNEL	19100	1 RB
					
CHANNEL	18700	Full RB	CHANNEL	19100	Full RB
					

4.5 Peak To Average Ratio

4.5.1 Limits of Peak To Average Ratio Measurement

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB.

4.5.2 Test Setup



4.5.3 Test Procedures

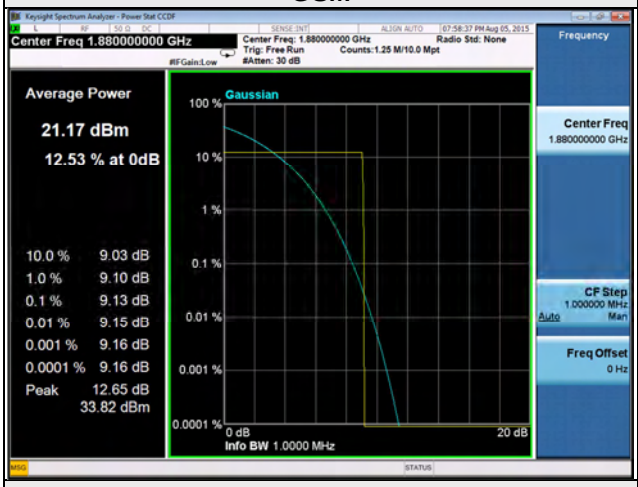
1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1%.

4.5.4 Test Results

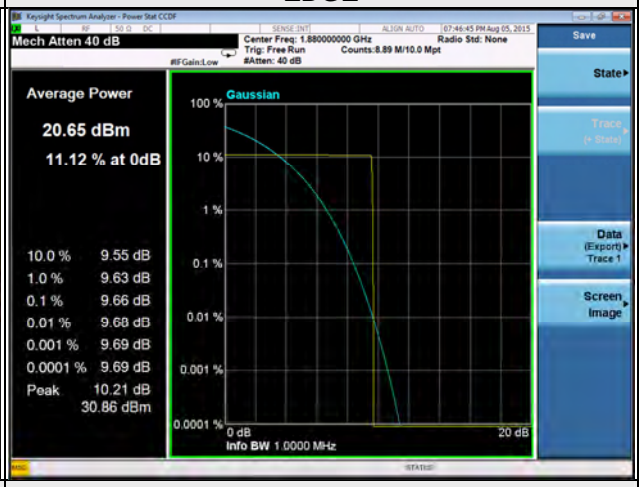
Channel	Frequency (MHz)	Peak To Average Ratio (dB)		Channel	Frequency (MHz)	Peak To Average Ratio (dB)
		GSM	EDGE			WCDMA
661	1880.0	9.13	9.66	9400	1880.0	2.73

SPECTRUM PLOT OF WORST VALUE

GSM



EDGE



WCDMA