FCC TEST REPORT

(PART 24)

Applicant:	Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd
Address:	Building B, Boton Science Park, Chaguang Road, Xili Town, Nanshan District, Shenzhen

Manufacturer or Supplier:	Yulong Computer Telecommunication Scientific (Shenzhen) Co., Ltd
Address:	Building B, Boton Science Park, Chaguang Road, Xili Town, Nanshan District, Shenzhen
Product:	Feature phone
Brand Name:	coolpad
Model Name:	Coolpad 3312A
FCC ID:	R38YL3312A
Date of tests:	Oct. 12, 2018 ~ Nov. 30, 2018

The tests have been carried out according to the requirements of the following standard:

☒ **FCC PART 24, Subpart E** ☒ **ANSI C63.26-2015**
☒ **ANSI/TIA/EIA-603-D** ☒ **ANSI/TIA/EIA-603-E**

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

Issued by Evans He Engineer / Mobile Department	Approved by David Huang Manager / Mobile Department
Date: Nov. 30, 2018	Date: Nov. 30, 2018

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
FV181011N013-4	Original release	Nov. 30, 2018

1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 24 & Part 2			
STANDARD SECTION	**TEST TYPE**	**RESULT**	**REMARK**
2.1046 24.232	Equivalent Isotropic Radiated Power	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.
24.232(d)	Peak to average ratio	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 -12.16dB at 3720MHz.

NOTE : Test Lab Information:

Lab: Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch

Test Lab Address: Zone A, Floor 1, Building 2 Wan Ye Long Technology Park South Side of Zhoushi Road, Bao'an District Shenzhen, Guangdong, 518108, People's Republic of China

1.1 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	UNCERTAINTY
Conducted emissions	9kHz~30MHz	3.11dB
Radiated emissions	9KHz ~ 30MHz	3.11dB
	30MHz ~ 1GHz	5.12dB
	1GHz ~ 18GHz	5.34dB
	18GHz ~ 40GHz	5.02dB

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

1.2 TEST SITE AND INSTRUMENTS

Instrument	Model	Serial #	Cal Date	Cal Due
EMI test receiver	ESL6	100262	Jan. 05, 18	Jan. 04, 19
Active Antenna	AL-130	121031	Feb. 08, 18	Feb. 07, 19
3m Semi-anechoic Chamber	9m*6m*6m	N/A	Oct. 18, 18	Oct. 17, 19
Signal Amplifier	8447E	443008	Jan. 25, 18	Jan. 24, 19
MXA signal analyzer	N9020A	MY49100060	Jan. 05, 18	Jan. 04, 19
Horn Antenna	HAH-118	71259	Jan. 26, 18	Jan. 25, 19
Horn Antenna	HAH-118	71283	Feb. 02, 18	Feb. 01, 19
AMPLIFIER	EM01G26G	60613	Feb. 25, 18	Feb. 24, 19
AMPLIFIER	Emc012645	980077	Jan. 05, 18	Jan. 04, 19
Bilog Antenna (30MHz~6GHz)	JB6	A110712	Feb. 08, 18	Feb. 07, 19
DC Power Supply	E3640A	MY40004013	Jan. 05, 18	Jan. 04, 19
MXA Signal Analyzer	N9020A	MY49100060	Jan. 05, 18	Jan. 04, 19
MXG Vector Signal Generator	N5182A	MY50140530	Jan. 05, 18	Jan. 04, 19
Series Signal Generator	E4421B	US40051152	May. 12, 18	May. 11, 19
RF control unit	JS0806-0806-2	188060112	Apr. 25, 18	Apr. 24, 19
Wireless Connectivity Tester	CMW270	1201.0002K75-101601-PE	Apr. 25, 18	Apr. 24, 19
Universal Radio Communication Tester	CMU200	121393	Jan. 05, 18	Jan. 04, 19
Programmable Temperature &Humidity Chamber	HYL-TH-225DH	DG-180746	Jul. 15, 18	Jul. 14, 19
Test Software	EZ-EMC	ver.Icp-03A1	N/A	N/A

NOTE: 1. The calibration interval of the above test instruments is 12 months or 24 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

2. The test was performed in 3m Semi-anechoic Chamber and RF Oven Room.

3. The horn antenna is used only for the measurement of emission frequency above 1GHz if tested.

4. The FCC Site Registration No. is 535293.

2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Feature phone	
BRAND NAME	coolpad	
MODEL NAME	Coolpad 3312A	
POWER SUPPLY	5.0Vdc (adapter or host equipment) 3.7Vdc (Li-ion, ion battery)	
MODULATION TYPE	**GSM, GPRS:** GMSK **EDGE:** GMSK, 8PSK **CDMA :** GMSK **LTE Band 2/25:** QPSK, 16QAM	
FREQUENCY RANGE	**GSM, GPRS, EDGE**	1850.2MHz ~ 1909.8MHz
	CDMA BC1	1851.25MHz ~1908.75MHz
	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
	LTE Band 25 Channel Bandwidth: 1.4MHz	1850.7MHz ~ 1914.3MHz
	LTE Band 25 Channel Bandwidth: 3MHz	1851.5MHz ~ 1913.5MHz
	LTE Band 25 Channel Bandwidth: 5MHz	1852.5MHz ~ 1912.5MHz
	LTE Band 25 Channel Bandwidth: 10MHz	1855MHz ~ 1910MHz
	LTE Band 25 Channel Bandwidth: 15MHz	1857.5MHz ~ 1907.5MHz
	LTE Band 25 Channel Bandwidth: 20MHz	1860MHz ~ 1905MHz
MAX. EIRP POWER	**GSM**	676.08mW
	EDGE	215.28mW
	CDMA BC1	217.77mW
	LTE Band 2 Channel Bandwidth: 1.4MHz	181.55mW

	LTE Band 2 Channel Bandwidth: 3MHz	165.96mW
	LTE Band 2 Channel Bandwidth: 5MHz	165.96mW
	LTE Band 2 Channel Bandwidth: 10MHz	169.43mW
	LTE Band 2 Channel Bandwidth: 15MHz	171.79mW
	LTE Band 2 Channel Bandwidth: 20MHz	180.30mW
	LTE Band 25 Channel Bandwidth: 1.4MHz	177.83mW
	LTE Band 25 Channel Bandwidth: 3MHz	167.49mW
	LTE Band 25 Channel Bandwidth: 5MHz	174.58mW
	LTE Band 25 Channel Bandwidth: 10MHz	169.04mW
	LTE Band 25 Channel Bandwidth: 15MHz	165.20mW
	LTE Band 25 Channel Bandwidth: 20MHz	168.66mW
EMISSION DESIGNATOR	**GSM**	245KGXW
	EDGE	248KG7W
	CDMA BC1	1M28F9W
	LTE Band 2 Channel Bandwidth: 1.4MHz	QPSK: 1M09G7D
		16QAM: 1M09W7D
	LTE Band 2 Channel Bandwidth: 3MHz	QPSK: 2M69G7D
		16QAM: 2M68W7D
	LTE Band 2 Channel Bandwidth: 5MHz	QPSK: 4M48G7D
		16QAM: 4M48W7D
	LTE Band 2 Channel Bandwidth: 10MHz	QPSK: 8M94G7D
		16QAM: 8M94W7D
	LTE Band 2 Channel Bandwidth: 15MHz	QPSK: 13M4G7D
		16QAM: 13M4W7D
	LTE Band 2 Channel Bandwidth: 20MHz	QPSK: 17M8G7D
		16QAM: 17M8W7D
	LTE Band 25 Channel Bandwidth: 1.4MHz	QPSK: 1M09G7D
		16QAM: 1M09W7D

	LTE Band 25 Channel Bandwidth: 3MHz	QPSK: 2M69G7D
		16QAM: 2M69W7D
	LTE Band 25 Channel Bandwidth: 5MHz	QPSK: 4M48G7D
		16QAM: 4M48W7D
	LTE Band 25 Channel Bandwidth: 10MHz	QPSK: 8M93G7D
		16QAM: 8M93W7D
	LTE Band 25 Channel Bandwidth: 15MHz	QPSK: 13M4G7D
		16QAM: 13M4W7D
	LTE Band 25 Channel Bandwidth: 20MHz	QPSK: 17M9G7D
		16QAM: 17M9W7D
ANTENNA TYPE	3.8dBi gain for GSM1900/ CDMA BC 1/LTE Band 2 1.3dBi gain for LTE Band 25	
HW VERSION	P1	
SW VERSION	3312A.SPRINT.181214.0D	
I/O PORTS	Refer to user's manual	
CABLE SUPPLIED	USB cable: non-shielded, detachable, 1.0m Earphone cable: non-shielded, detachable, 1.2m	

NOTE:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. The EUT was powered by the following adapter:

ADAPTER	
BRAND:	N/A
MODEL:	RD0501000-USBA-18MG
INPUT:	AC 100-240V~50/60Hz, 0.25A MAX
OUTPUT:	DC 5V,1000mA

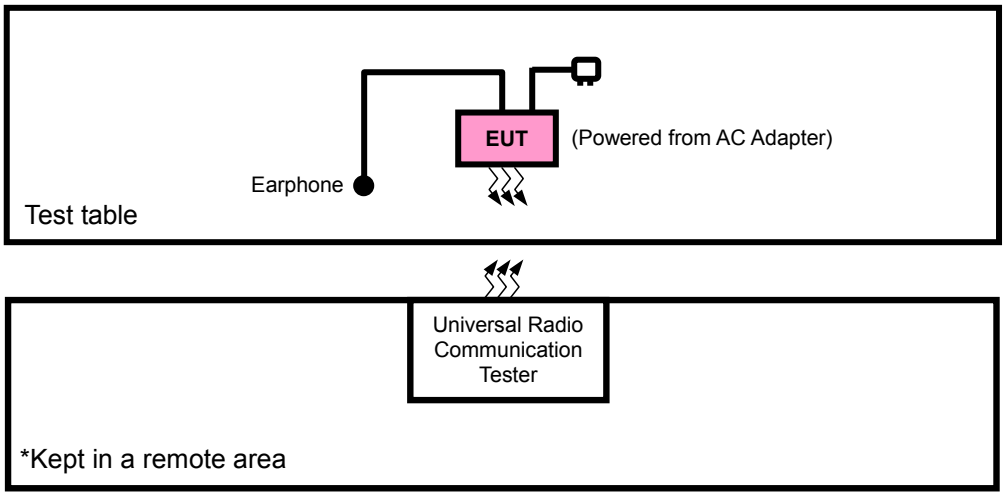
3. The EUT matched the following USB cable:

USB CABLE	
BRAND:	N/A
MODEL:	N/A
SIGNAL LINE:	1.0 METER

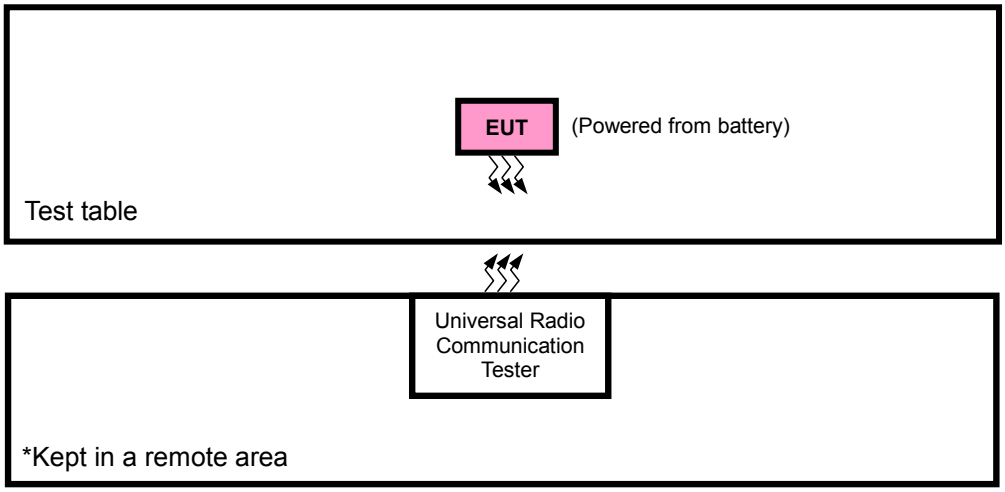
4. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

2.2 CONFIGURATION OF SYSTEM UNDER TEST

FOR RADIATION EMISSION TEST



FOR CONDUCTED & E.I.R.P. TEST



2.3 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	Laptop	Lenovo	E40	LR-1EHRX	N/A
2					

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 no shielded (1.8m).

2.4 TEST ITEM AND TEST CONFIGURATION

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 in EIRP and radiated emission was found when positioned on X-plane for GSM/EDGE/WCDMA/ LTE. Following channel(s) was (were) selected for the final test as listed below:

EUT CONFIGURE MODE	DESCRIPTION
A	EUT + Adapter + USB Cable + Earphone with GSM ,CDMA or LTE link
B	EUT + Battery with GSM ,CDMA or LTE link

GSM MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
B	EIRP	512 to 810	512, 661, 810	GSM, EDGE
B	FREQUENCY STABILITY	512 to 810	512, 810	GSM, EDGE
B	OCCUPIED BANDWIDTH	512 to 810	512, 661, 810	GSM, EDGE
B	PEAK TO AVERAGE RATIO	512 to 810	512, 661, 810	GSM, EDGE
B	BAND EDGE	512 to 810	512, 810	GSM, EDGE
B	CONDCUDETED EMISSION	512 to 810	512, 661, 810	GSM, EDGE
A	RADIATED EMISSION	512 to 810	512, 661, 810	GSM, EDGE

CDMA BC 1 MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
B	ERP	25 to 1175	25, 600, 1175	CDMA BC 1
B	FREQUENCY STABILITY	25 to 1175	25, 1175	CDMA BC 1
B	OCCUPIED BANDWIDTH	25 to 1175	25, 600, 1175	CDMA BC 1
B	PEAK TO AVERAGE RATIO	25 to 1175	25, 600, 1175	CDMA BC 1
B	BAND EDGE	25 to 1175	25, 1175	CDMA BC 1
B	CONDCUDETED EMISSION	25 to 1175	25, 600, 1175	CDMA BC 1
A	RADIATED EMISSION	25 to 1175	25, 600, 1175	CDMA BC 1

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	18607, 19193	1.4MHz	QPSK	1 RB / 0 RB Offset
		18615 to 19185	18615, 19185	3MHz	QPSK	1 RB / 0 RB Offset
		18625 to 19175	18625, 19175	5MHz	QPSK	1 RB / 0 RB Offset
		18650 to 19150	18650, 19150	10MHz	QPSK	1 RB / 0 RB Offset
		18675 to 19125	18675, 19125	15MHz	QPSK	1 RB / 0 RB Offset
		18700 to 19100	18700, 19100	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	18607, 18900, 19193	1.4MHz	QPSK	1 RB / 0 RB Offset
		18615 to 19185	18615, 18900, 19185	3MHz	QPSK	1 RB / 0 RB Offset
		18625 to 19175	18625, 18900, 19175	5MHz	QPSK	1 RB / 0 RB Offset
		18650 to 19150	18650, 18900, 19150	10MHz	QPSK	1 RB / 0 RB Offset
		18675 to 19125	18675, 18900, 19125	15MHz	QPSK	1 RB / 0 RB Offset
		18700 to 19100	18700, 18900, 19100	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	18650, 18900, 19150	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

LTE BAND 25 MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
B	EIRP	26047 to 26683	26047, 26365, 26683	1.4MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
		26055 to 26675	26055, 26365, 26675	3MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
		26065 to 26665	26065, 26365, 26665	5MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
		26090 to 26640	26090, 26365 26640	10MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
		26115 to 26615	26115, 26365, 26615	15MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
		26140 to 26590	26140, 26365, 26590	20MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
B	FREQUENCY STABILITY	26047 to 26683	26047, 26683	1.4MHz	QPSK	1 RB / 0 RB Offset
		26055 to 26675	26055, 26675	3MHz	QPSK	1 RB / 0 RB Offset
		26065 to 26665	26065, 26665	5MHz	QPSK	1 RB / 0 RB Offset
		26090 to 26640	26090, 26640	10MHz	QPSK	1 RB / 0 RB Offset
		26115 to 26615	26115, 26615	15MHz	QPSK	1 RB / 0 RB Offset
		26140 to 26590	26140, 26590	20MHz	QPSK	1 RB / 0 RB Offset
B	OCCUPIED BANDWIDTH	26047 to 26683	26047, 26365, 26683	1.4MHz	QPSK,16QAM, 64QAM	6 RB / 0 RB Offset
		26055 to 26675	26055, 26365, 26675	3MHz	QPSK,16QAM, 64QAM	15 RB / 0 RB Offset
		26065 to 26665	26065, 26365, 26665	5MHz	QPSK,16QAM, 64QAM	25 RB / 0 RB Offset
		26090 to 26640	26090, 26365 26640	10MHz	QPSK,16QAM, 64QAM	50 RB / 0 RB Offset
		26115 to 26615	26115, 26365, 26615	15MHz	QPSK,16QAM, 64QAM	75 RB / 0 RB Offset
		26140 to 26590	26140, 26365, 26590	20MHz	QPSK,16QAM, 64QAM	100 RB / 0 RB Offset
B	PEAK TO AVERAGE RATIO	26047 to 26683	26047, 26365, 26683	1.4MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
		26055 to 26675	26055, 26365, 26675	3MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
		26065 to 26665	26065, 26365, 26665	5MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
		26090 to 26640	26090, 26365 26640	10MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
		26115 to 26615	26115, 26365, 26615	15MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
		26140 to 26590	26140, 26365, 26590	20MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset

B	BAND EDGE	26047 to 26683	26047	1.4MHz	QPSK	1 RB / 0 RB Offset
						6 RB / 0 RB Offset
			26683	1.4MHz	QPSK	1 RB / 5 RB Offset
						6 RB / 0 RB Offset
		26055 to 26675	26055	3MHz	QPSK	1 RB / 0 RB Offset
						15 RB / 0 RB Offset
			26675	3MHz	QPSK	1 RB / 14 RB Offset
						15 RB / 0 RB Offset
		26065 to 26665	26065	5MHz	QPSK	1 RB / 0 RB Offset
						25 RB / 0 RB Offset
			26665	5MHz	QPSK	1 RB / 24 RB Offset
						25 RB / 0 RB Offset
		26090 to 26640	26090	10MHz	QPSK	1 RB / 0 RB Offset
						50 RB / 0 RB Offset
			26640	10MHz	QPSK	1 RB / 49 RB Offset
						50 RB / 0 RB Offset
		26115 to 26615	26115	15MHz	QPSK	1 RB / 0 RB Offset
						75 RB / 0 RB Offset
			26615	15MHz	QPSK	1 RB / 74 RB Offset
						75 RB / 0 RB Offset
		26140 to 26590	26140	20MHz	QPSK	1 RB / 0 RB Offset
						100 RB / 0 RB Offset
			26590	20MHz	QPSK	1 RB / 99 RB Offset
						100 RB / 0 RB Offset
B	CONDCUDETED EMISSION	26047 to 26683	26047, 26365, 26683	1.4MHz	QPSK	1 RB / 0 RB Offset
		26055 to 26675	26055, 26365, 26675	3MHz	QPSK	1 RB / 0 RB Offset
		26065 to 26665	26065, 26365, 26665	5MHz	QPSK	1 RB / 0 RB Offset
		26090 to 26640	26090, 26365 26640	10MHz	QPSK	1 RB / 0 RB Offset
		26115 to 26615	26115, 26365, 26615	15MHz	QPSK	1 RB / 0 RB Offset
		26140 to 26590	26140, 26365, 26590	20MHz	QPSK	1 RB / 0 RB Offset
A	RADIATED EMISSION	26047 to 26683	26047, 26365, 26683	1.4MHz	QPSK	1 RB / 0 RB Offset
		26055 to 26675	26365	3MHz	QPSK	1 RB / 0 RB Offset
		26065 to 26665	26365	5MHz	QPSK	1 RB / 0 RB Offset
		26090 to 26640	26365	10MHz	QPSK	1 RB / 0 RB Offset
		26115 to 26615	26365	15MHz	QPSK	1 RB / 0 RB Offset
		26140 to 26590	26365	20MHz	QPSK	1 RB / 0 RB Offset

TEST CONDITION:

TEST ITEM	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
EIRP	24deg. C, 60%RH	3.7Vdc from Battery	Evans He
FREQUENCY STABILITY	24deg. C, 60%RH	DC 3.4V/3.7V/4.2V	Aaron Liang
OCCUPIED BANDWIDTH	24deg. C, 60%RH	3.7Vdc from Battery	Aaron Liang
PEAK TO AVERAGE RATIO	24deg. C, 60%RH	3.7Vdc from Battery	Aaron Liang
BAND EDGE	24deg. C, 60%RH	3.7Vdc from Battery	Aaron Liang
CONDCUDETED EMISSION	24deg. C, 60%RH	3.7Vdc from Battery	Evans He
RADIATED EMISSION	26deg. C, 62.5%RH	5Vdc from adapter	Evans He

2.5 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

2.6 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

KDB 971168 D01 Power Meas License Digital Systems v03

ANSI/TIA/EIA-603-D

ANSI/TIA/EIA-603-E

ANSI C63.26-2015

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

3 TEST TYPES AND RESULTS

3.1 OUTPUT POWER MEASUREMENT

3.1.1 LIMITS OF OUTPUT POWER MEASUREMENT

Mobile and portable stations are limited to 2 watts EIRP.

3.1.2 TEST PROCEDURES

EIRP MEASUREMENT:

a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 1MHz for GSM & GPRS, 5MHz for WCDMA mode and 10MHz for LTE 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

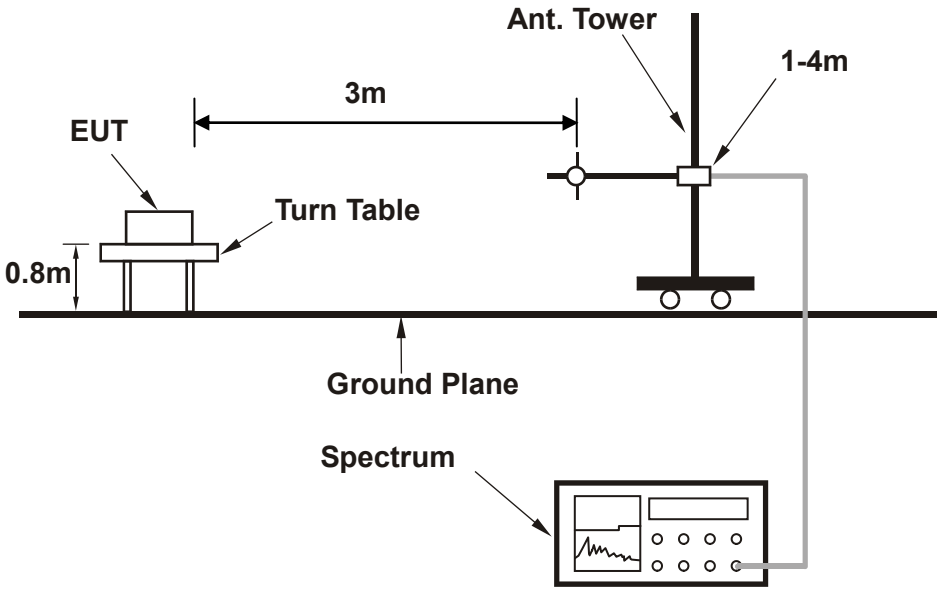
d. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.

CONDUCTED POWER MEASUREMENT:

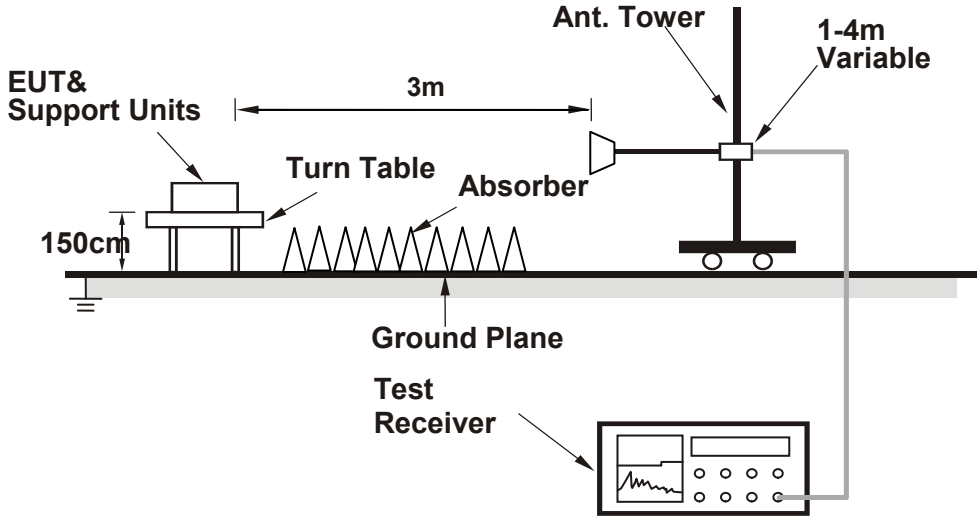
The EUT was set up for the maximum power with GSM, GPRS, EDGE & WCDMA link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

3.1.3 TEST SETUP

EIRP / ERP Measurement:
<Radiated Emission below or equal 1 GHz>

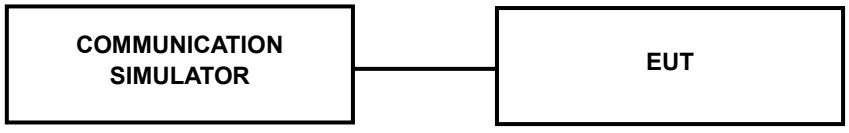


<Radiated Emission above 1 GHz>



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

CONDUCTED POWER MEASUREMENT:



3.1.4 TEST RESULTS

CONDUCTED OUTPUT POWER (dBm)

Band	GSM1900		
Channel	512	661	810
Frequency (MHz)	1850.2	1880.0	1909.8
GSM	29.32	29.48	**29.57**
GPRS 8	29.09	29.25	29.34
GPRS 10	26.11	26.27	26.36
GPRS 11	24.92	25.08	25.17
GPRS 12	23.65	23.81	23.90
EDGE 8 (MCS9)	24.79	24.95	25.04
EDGE 10 (MCS9)	23.50	23.66	23.75
EDGE 11 (MCS9)	20.25	20.41	20.50
EDGE 12 (MCS9)	20.07	20.23	20.32

Band	CDMA2000 BC1		
Channel	25	600	1175
Frequency (MHz)	1851.25	1880	1908.8
RC1+SO55	23.66	23.73	**23.75**
RC3+SO55	23.55	23.64	23.68
RC3+SO32(FCH)	23.46	23.56	23.57
RC3+SO32(SCH)	23.51	23.62	23.64
RTAP 153.6	23.49	23.51	23.53
RETAP 4096	23.45	23.49	23.51
RC1+SO3	23.56	23.57	23.59
RC3+SO3	23.53	23.63	23.66

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	23.00	22.92	23.07	0
		1	2	22.94	22.86	23.01	0
		1	5	22.83	22.75	22.90	0
		3	0	22.99	22.91	23.06	0
		3	1	22.93	22.85	23.00	0
		3	3	22.82	22.74	22.89	0
		6	0	21.82	21.74	21.89	1
	16QAM	1	0	21.58	21.50	21.65	1
		1	2	21.55	21.47	21.62	1
		1	5	21.42	21.34	21.49	1
		3	0	21.56	21.48	21.63	1
		3	1	21.53	21.45	21.60	1
		3	3	21.40	21.32	21.47	1
		6	0	20.93	20.85	21.00	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	23.03	22.95	23.10	0
		1	7	22.97	22.89	23.04	0
		1	14	22.86	22.78	22.93	0
		8	0	21.94	21.86	22.01	1
		8	3	21.88	21.80	21.95	1
		8	7	21.79	21.71	21.86	1
		15	0	21.85	21.77	21.92	1
	16QAM	1	0	21.61	21.53	21.68	1
		1	7	21.58	21.50	21.65	1
		1	14	21.45	21.37	21.52	1
		8	0	20.98	20.90	21.05	2
		8	3	20.94	20.86	21.01	2
		8	7	20.90	20.82	20.97	2
		15	0	20.96	20.88	21.03	2

LTE Band 2							
BW	Modulation	RB Size	RB Offset	Low CH 18625 Frequency 1852.5 MHz	Mid CH 18900 Frequency 1880 MHz	High CH 19175 Frequency 1907.5 MHz	3GPP MPR (dB)
5 MHz	QPSK	1	0	23.06	22.98	23.13	0
		1	12	23.00	22.92	23.07	0
		1	24	22.89	22.81	22.96	0
		12	0	21.97	21.89	22.04	1
		12	6	21.91	21.83	21.98	1
		12	13	21.82	21.74	21.89	1
		25	0	21.88	21.80	21.95	1
	16QAM	1	0	21.64	21.56	21.71	1
		1	12	21.61	21.53	21.68	1
		1	24	21.48	21.40	21.55	1
		12	0	21.01	20.93	21.08	2
		12	6	20.97	20.89	21.04	2
		12	13	20.93	20.85	21.00	2
		25	0	20.99	20.91	21.06	2
BW	Modulation	RB Size	RB Offset	Low CH 18650 Frequency 1855 MHz	Mid CH 18900 Frequency 1880 MHz	High CH 19150 Frequency 1905 MHz	3GPP MPR (dB)
10 MHz	QPSK	1	0	23.08	23.00	23.15	0
		1	24	23.02	22.94	23.09	0
		1	49	22.91	22.83	22.98	0
		25	0	21.99	21.91	22.06	1
		25	12	21.93	21.85	22.00	1
		25	25	21.84	21.76	21.91	1
		50	0	21.90	21.82	21.97	1
	16QAM	1	0	21.66	21.58	21.73	1
		1	24	21.63	21.55	21.70	1
		1	49	21.50	21.42	21.57	1
		25	0	21.03	20.95	21.10	2
		25	12	20.99	20.91	21.06	2
		25	25	20.95	20.87	21.02	2
		50	0	21.01	20.93	21.08	2

LTE Band 2							
BW	Modulation	RB Size	RB Offset	Low CH 18675 Frequency 1857.5 MHz	Mid CH 18900 Frequency 1880 MHz	High CH 19125 Frequency 1902.5 MHz	3GPP MPR (dB)
15 MHz	QPSK	1	0	23.11	23.03	23.18	0
		1	37	23.05	22.97	23.12	0
		1	74	22.94	22.86	23.01	0
		36	0	22.02	21.94	22.09	1
		36	19	21.96	21.88	22.03	1
		36	39	21.87	21.79	21.94	1
		75	0	21.93	21.85	22.00	1
	16QAM	1	0	21.69	21.61	21.76	1
		1	37	21.66	21.58	21.73	1
		1	74	21.53	21.45	21.60	1
		36	0	21.06	20.98	21.13	2
		36	19	21.02	20.94	21.09	2
		36	39	20.98	20.90	21.05	2
		75	0	21.04	20.96	21.11	2
BW	Modulation	RB Size	RB Offset	Low CH 18700 Frequency 1860 MHz	Mid CH 18900 Frequency 1880 MHz	High CH 19100 Frequency 1900 MHz	3GPP MPR (dB)
20MHz	QPSK	1	0	23.16	23.08	**23.23**	0
		1	50	23.10	23.02	23.17	0
		1	99	22.99	22.91	23.06	0
		50	0	22.07	21.99	22.14	1
		50	25	22.01	21.93	22.08	1
		50	50	21.92	21.84	21.99	1
		100	0	21.98	21.90	22.05	1
	16QAM	1	0	21.74	21.66	21.81	1
		1	50	21.71	21.63	21.78	1
		1	99	21.58	21.50	21.65	1
		50	0	21.11	21.03	21.18	2
		50	25	21.07	20.99	21.14	2
		50	50	21.03	20.95	21.10	2
		100	0	21.09	21.01	21.16	2

LTE Band 25							
BW	Modulation	RB Size	RB Offset	Low CH 26047	Mid CH 26365	High CH 26683	3GPP MPR (dB)
				Frequency 1850.7 MHz	Frequency 1882.5 MHz	Frequency 1914.3 MHz	
1.4MHz	QPSK	1	0	23.08	23.02	23.04	0
		1	2	23.04	22.98	23.00	0
		1	5	22.98	22.92	22.94	0
		3	0	22.09	22.03	22.05	1
		3	1	22.04	21.98	22.00	1
		3	3	21.99	21.93	21.95	1
		6	0	21.94	21.88	21.90	1
	16QAM	1	0	21.61	21.55	21.57	1
		1	2	21.77	21.71	21.73	1
		1	5	21.45	21.39	21.41	1
		3	0	21.09	21.03	21.05	2
		3	1	21.05	20.99	21.01	2
		3	3	21.11	21.05	21.07	2
		6	0	20.96	20.90	20.92	2

LTE Band 25							
BW	Modulation	RB Size	RB Offset	Low CH 26055	Mid CH 26365	High CH 26675	3GPP MPR (dB)
				Frequency 1851.5 MHz	Frequency 1882.5 MHz	Frequency 1913.5 MHz	
3MHz	QPSK	1	0	23.10	23.04	23.06	0
		1	7	23.06	23.00	23.02	0
		1	14	23.00	22.94	22.96	0
		8	0	22.11	22.05	22.07	1
		8	3	22.06	22.00	22.02	1
		8	7	22.01	21.95	21.97	1
		15	0	21.96	21.90	21.92	1
	16QAM	1	0	21.63	21.57	21.59	1
		1	7	21.79	21.73	21.75	1
		1	14	21.47	21.41	21.43	1
		8	0	21.11	21.05	21.07	2
		8	3	21.07	21.01	21.03	2
		8	7	21.13	21.07	21.09	2
		15	0	20.98	20.92	20.94	2

LTE Band 25							
BW	Modulation	RB Size	RB Offset	Low CH 26065	Mid CH 26365	High CH 26665	3GPP MPR (dB)
				Frequency 1852.5 MHz	Frequency 1882.5 MHz	Frequency 1912.5 MHz	
5MHz	QPSK	1	0	23.13	23.07	23.09	0
		1	12	23.09	23.03	23.05	0
		1	24	23.03	22.97	22.99	0
		12	0	22.14	22.08	22.10	1
		12	6	22.09	22.03	22.05	1
		12	13	22.04	21.98	22.00	1
		25	0	21.99	21.93	21.95	1
	16QAM	1	0	21.66	21.60	21.62	1
		1	12	21.82	21.76	21.78	1
		1	24	21.50	21.44	21.46	1
		12	0	21.14	21.08	21.10	2
		12	6	21.10	21.04	21.06	2
		12	13	21.16	21.10	21.12	2
		25	0	21.01	20.95	20.97	2

LTE Band 25							
BW	Modulation	RB Size	RB Offset	Low CH 26090	Mid CH 26365	High CH 26640	3GPP MPR (dB)
				Frequency 1855 MHz	Frequency 1882.5 MHz	Frequency 1910 MHz	
10MHz	QPSK	1	0	23.10	23.04	23.06	0
		1	24	23.06	23.00	23.02	0
		1	49	23.00	22.94	22.96	0
		25	0	22.11	22.05	22.07	1
		25	12	22.06	22.00	22.02	1
		25	25	22.01	21.95	21.97	1
		50	0	21.96	21.90	21.92	1
	16QAM	1	0	21.63	21.57	21.59	1
		1	24	21.79	21.73	21.75	1
		1	49	21.47	21.41	21.43	1
		25	0	21.11	21.05	21.07	2
		25	12	21.07	21.01	21.03	2
		25	25	21.13	21.07	21.09	2
		50	0	20.98	20.92	20.94	2

LTE Band 25							
BW	Modulation	RB Size	RB Offset	Low CH 26115	Mid CH 26365	High CH 26615	3GPP MPR (dB)
				Frequency 1857.5 MHz	Frequency 1882.5 MHz	Frequency 1907.5 MHz	
15MHz	QPSK	1	0	23.12	23.06	23.08	0
		1	37	23.08	23.02	23.04	0
		1	74	23.02	22.96	22.98	0
		36	0	22.13	22.07	22.09	1
		36	19	22.08	22.02	22.04	1
		36	39	22.03	21.97	21.99	1
		75	0	21.98	21.92	21.94	1
	16QAM	1	0	21.65	21.59	21.61	1
		1	37	21.81	21.75	21.77	1
		1	74	21.49	21.43	21.45	1
		36	0	21.13	21.07	21.09	2
		36	19	21.09	21.03	21.05	2
		36	39	21.15	21.09	21.11	2
		75	0	21.00	20.94	20.96	2

LTE Band 25							
BW	Modulation	RB Size	RB Offset	Low CH 26140	Mid CH 26365	High CH 26590	3GPP MPR (dB)
				Frequency 1860 MHz	Frequency 1882.5 MHz	Frequency 1905 MHz	
20MHz	QPSK	1	0	**23.15**	23.09	23.11	0
		1	50	23.11	23.05	23.07	0
		1	99	23.05	22.99	23.01	0
		50	0	22.16	22.10	22.12	1
		50	25	22.11	22.05	22.07	1
		50	50	22.06	22.00	22.02	1
		100	0	22.01	21.95	21.97	1
	16QAM	1	0	21.68	21.62	21.64	1
		1	50	21.84	21.78	21.80	1
		1	99	21.52	21.46	21.48	1
		50	0	21.16	21.10	21.12	2
		50	25	21.12	21.06	21.08	2
		50	50	21.18	21.12	21.14	2
		100	0	21.03	20.97	20.99	2

EIRP POWER (dBm)

GSM

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
512	1850.2	-18.38	44.22	25.84	383.71	H
661	1880	-18.67	44.92	26.25	421.7	H
810	1909.8	-18	43.98	25.98	396.28	H
512	1850.2	-16.43	44.73	28.3	676.08	V
661	1880	-17.58	45.69	28.11	647.14	V
810	1909.8	-16.65	44.86	28.21	662.22	V

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

EDGE

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
512	1850.2	-22.37	44.22	21.85	153.11	H
661	1880	-24.86	44.92	20.06	101.39	H
810	1909.8	-23.15	43.98	20.83	121.06	H
512	1850.2	-21.86	44.73	22.87	193.64	V
661	1880	-22.74	45.69	22.95	197.24	V
810	1909.8	-21.53	44.86	23.33	215.28	V

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

CDMA2000 BC1

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
25	1851.25	-23.96	44.66	20.7	117.49	H
600	1880	-25.08	45.9	20.82	120.78	H
1175	1908.75	-23.99	44.98	20.99	125.6	H
25	1851.25	-22.38	45.43	23.05	201.84	V
600	1880	-22.17	45.35	23.18	207.97	V
1175	1908.75	-22.53	45.91	23.38	217.77	V

REMARKS: 1. EIRP Output Power (dBm) = SPA 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)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18607	1850.7	-19.28	40.44	21.16	130.62	H	2
18900	1880	-19.65	40.95	21.3	134.9	H	2
19193	1909.3	-19.55	41.16	21.61	144.88	H	2
18607	1850.7	-19.77	42.03	22.26	168.27	V	2
18900	1880	-19.86	42.45	22.59	181.55	V	2
19193	1909.3	-19.29	41.58	22.29	169.43	V	2

CHANNEL BANDWIDTH: 1.4MHz 16QAM

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18607	1850.7	-19.34	40.44	21.1	128.82	H	2
18900	1880	-19.77	40.95	21.18	131.22	H	2
19193	1909.3	-19.46	41.16	21.7	147.91	H	2
18607	1850.7	-20.63	42.03	21.4	138.04	V	2
18900	1880	-19.87	42.45	22.58	181.13	V	2
19193	1909.3	-19.67	41.58	21.91	155.24	V	2

CHANNEL BANDWIDTH: 3MHz QPSK

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18615	1851.5	-20.84	41.55	20.71	117.76	H	2
18900	1880	-19.3	40.63	21.33	135.83	H	2
19185	1908.5	-19.59	40.28	20.69	117.22	H	2
18615	1851.5	-20.2	41.86	21.66	146.55	V	2
18900	1880	-20	41.65	21.65	146.22	V	2
19185	1908.5	-19.6	41.22	21.62	145.21	V	2

CHANNEL BANDWIDTH: 3MHz 16QAM

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18615	1851.5	-21.03	41.55	20.52	112.72	H	2
18900	1880	-18.43	40.63	22.2	165.96	H	2
19185	1908.5	-18.34	40.28	21.94	156.31	H	2
18615	1851.5	-19.85	41.86	22.01	158.85	V	2
18900	1880	-20.18	41.65	21.47	140.28	V	2
19185	1908.5	-19.98	41.22	21.24	133.05	V	2

CHANNEL BANDWIDTH: 5MHz QPSK

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18625	1852.5	-21.21	41.79	20.58	114.29	H	2
18900	1880	-19.29	41.1	21.81	151.71	H	2
19175	1907.5	-20.41	41.33	20.92	123.59	H	2
18625	1852.5	-19.49	41.51	22.02	159.22	V	2
18900	1880	-19.83	41.36	21.53	142.23	V	2
19175	1907.5	-20.98	42.19	21.21	132.13	V	2

CHANNEL BANDWIDTH: 5MHz 16QAM

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18625	1852.5	-19.59	41.79	22.2	165.96	H	2
18900	1880	-20.55	41.1	20.55	113.5	H	2
19175	1907.5	-20.71	41.33	20.62	115.35	H	2
18625	1852.5	-19.91	41.51	21.6	144.54	V	2
18900	1880	-20.07	41.36	21.29	134.59	V	2
19175	1907.5	-20.68	42.19	21.51	141.58	V	2

CHANNEL BANDWIDTH: 10MHz QPSK

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18650	1855	-19.45	40.99	21.54	142.56	H	2
18900	1880	-19.47	40.28	20.81	120.5	H	2
19150	1905	-19.76	40.39	20.63	115.61	H	2
18650	1855	-20.11	41.55	21.44	139.32	V	2
18900	1880	-19.75	41.21	21.46	139.96	V	2
19150	1905	-19.75	41.4	21.65	146.22	V	2

CHANNEL BANDWIDTH: 10MHz 16QAM

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18650	1855	-18.7	40.99	22.29	169.43	H	2
18900	1880	-19.59	40.28	20.69	117.22	H	2
19150	1905	-18.94	40.39	21.45	139.64	H	2
18650	1855	-20.28	41.55	21.27	133.97	V	2
18900	1880	-18.93	41.21	22.28	169.04	V	2
19150	1905	-19.93	41.4	21.47	140.28	V	2

CHANNEL BANDWIDTH: 15MHz QPSK

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18675	1857.5	-19.78	40.75	20.97	125.03	H	2
18900	1880	-20.02	41.65	21.63	145.55	H	2
19125	1902.5	-19.3	41.44	22.14	163.68	H	2
18675	1857.5	-19.52	41.87	22.35	171.79	V	2
18900	1880	-19.94	41.17	21.23	132.74	V	2
19125	1902.5	-19.95	41.73	21.78	150.66	V	2

CHANNEL BANDWIDTH: 15MHz 16QAM

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18675	1857.5	-19	40.75	21.75	149.62	H	2
18900	1880	-19.78	41.65	21.87	153.82	H	2
19125	1902.5	-20.6	41.44	20.84	121.34	H	2
18675	1857.5	-19.61	41.87	22.26	168.27	V	2
18900	1880	-18.85	41.17	22.32	170.61	V	2
19125	1902.5	-19.84	41.73	21.89	154.53	V	2

CHANNEL BANDWIDTH: 20MHz QPSK

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18700	1860	-19.06	41.11	22.05	160.32	H	2
18900	1880	-19.52	41.32	21.8	151.36	H	2
19100	1900	-20.79	41.34	20.55	113.5	H	2
18700	1860	-19.91	41.71	21.8	151.36	V	2
18900	1880	-19.2	41.39	22.19	165.58	V	2
19100	1900	-19.41	41.5	22.09	161.81	V	2

CHANNEL BANDWIDTH: 20MHz 16QAM

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18700	1860	-19.26	41.11	21.85	153.11	H	2
18900	1880	-19.59	41.32	21.73	148.94	H	2
19100	1900	-20.59	41.34	20.75	118.85	H	2
18700	1860	-19.42	41.71	22.29	169.43	V	2
18900	1880	-20.1	41.39	21.29	134.59	V	2
19100	1900	-18.94	41.5	22.56	180.3	V	2

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CHANNEL BANDWIDTH: 1.4MHz QPSK

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)	Polarization (H/V)	LIMIT (W)
26047	1850.7	-23.73	45.11	21.38	137.4	H	2
26365	1882.5	-24.84	45.9	21.06	127.64	H	2
26683	1914.3	-23.79	45.18	21.39	137.72	H	2
26047	1850.7	-23.73	45.08	21.35	136.46	V	2
26365	1882.5	-24.18	45.89	21.71	148.25	V	2
26683	1914.3	-22.33	44.83	22.5	177.83	V	2

CHANNEL BANDWIDTH: 1.4MHz 16QAM

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)	Polarization (H/V)	LIMIT (W)
26047	1850.7	-23.55	45.11	21.56	143.22	H	2
26365	1882.5	-24.77	45.9	21.13	129.72	H	2
26683	1914.3	-23.67	45.18	21.51	141.58	H	2
26047	1850.7	-23.83	45.08	21.25	133.35	V	2
26365	1882.5	-24.63	45.89	21.26	133.66	V	2
26683	1914.3	-22.36	44.83	22.47	176.6	V	2

CHANNEL BANDWIDTH: 3MHz QPSK

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)	Polarization (H/V)	LIMIT (W)
26055	1851.5	-23.73	44.97	21.24	133.05	H	2
26365	1882.5	-22.87	44.12	21.25	133.35	H	2
26675	1913.5	-22.94	44.27	21.33	135.83	H	2
26055	1851.5	-23.76	44.87	21.11	129.12	V	2
26365	1882.5	-23.08	45.23	22.15	164.06	V	2
26675	1913.5	-23.53	44.88	21.35	136.46	V	2

CHANNEL BANDWIDTH: 3MHz 16QAM

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)	Polarization (H/V)	LIMIT (W)
26055	1851.5	-23.85	44.97	21.12	129.42	H	2
26365	1882.5	-23.02	44.12	21.1	128.82	H	2
26675	1913.5	-22.72	44.27	21.55	142.89	H	2
26055	1851.5	-23.47	44.87	21.4	138.04	V	2
26365	1882.5	-23.52	45.23	21.71	148.25	V	2
26675	1913.5	-22.64	44.88	22.24	167.49	V	2

CHANNEL BANDWIDTH: 5MHz QPSK

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)	Polarization (H/V)	LIMIT (W)
26065	1852.5	-22.85	43.96	21.11	129.12	H	2
26365	1882.5	-23.84	45.05	21.21	132.13	H	2
26665	1912.5	-23.98	45.06	21.08	128.23	H	2
26065	1852.5	-23.01	45.04	22.03	159.59	V	2
26365	1882.5	-23.82	45.09	21.27	133.97	V	2
26665	1912.5	-22.67	45	22.33	171	V	2

CHANNEL BANDWIDTH: 5MHz 16QAM

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)	Polarization (H/V)	LIMIT (W)
26065	1852.5	-22.37	43.96	21.59	144.21	H	2
26365	1882.5	-24.01	45.05	21.04	127.06	H	2
26665	1912.5	-23.47	45.06	21.59	144.21	H	2
26065	1852.5	-23.05	45.04	21.99	158.12	V	2
26365	1882.5	-23.02	45.09	22.07	161.06	V	2
26665	1912.5	-22.58	45	22.42	174.58	V	2

CHANNEL BANDWIDTH: 10MHz QPSK

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)	Polarization (H/V)	LIMIT (W)
26090	1855	-24.32	45.87	21.55	142.89	H	2
26365	1882.5	-23.88	44.91	21.03	126.77	H	2
26640	1910	-23.47	44.57	21.1	128.82	H	2
26090	1855	-24.88	46.03	21.15	130.32	V	2
26365	1882.5	-24.64	46.11	21.47	140.28	V	2
26640	1910	-23.27	45.55	22.28	169.04	V	2

CHANNEL BANDWIDTH: 10MHz 16QAM

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)	Polarization (H/V)	LIMIT (W)
26090	1855	-24.69	45.87	21.18	131.22	H	2
26365	1882.5	-23.37	44.91	21.54	142.56	H	2
26640	1910	-23.24	44.57	21.33	135.83	H	2
26090	1855	-24.79	46.03	21.24	133.05	V	2
26365	1882.5	-24.88	46.11	21.23	132.74	V	2
26640	1910	-23.31	45.55	22.24	167.49	V	2

CHANNEL BANDWIDTH: 15MHz QPSK

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)	Polarization (H/V)	LIMIT (W)
26115	1857.5	-24.51	45.73	21.22	132.43	H	2
26365	1882.5	-23.5	44.63	21.13	129.72	H	2
26615	1907.5	-23.54	44.8	21.26	133.66	H	2
26115	1857.5	-24.4	46.02	21.62	145.21	V	2
26365	1882.5	-23.92	45.5	21.58	143.88	V	2
26615	1907.5	-24.55	45.74	21.19	131.52	V	2

CHANNEL BANDWIDTH: 15MHz 16QAM

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)	Polarization (H/V)	LIMIT (W)
26115	1857.5	-24.25	45.73	21.48	140.6	H	2
26365	1882.5	-23.56	44.63	21.07	127.94	H	2
26615	1907.5	-23.58	44.8	21.22	132.43	H	2
26115	1857.5	-23.84	46.02	22.18	165.2	V	2
26365	1882.5	-24.09	45.5	21.41	138.36	V	2
26615	1907.5	-24.1	45.74	21.64	145.88	V	2

CHANNEL BANDWIDTH: 20MHz QPSK

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)	Polarization (H/V)	LIMIT (W)
26140	1860	-23.49	44.92	21.43	139	H	2
26365	1882.5	-24.2	45.64	21.44	139.32	H	2
26590	1905	-24.44	45.57	21.13	129.72	H	2
26140	1860	-23.66	45.4	21.74	149.28	V	2
26365	1882.5	-23.46	45.68	22.22	166.72	V	2
26590	1905	-23.86	46.13	22.27	168.66	V	2

CHANNEL BANDWIDTH: 20MHz 16QAM

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	ERP(dBm)	ERP(mW)	Polarization (H/V)	LIMIT (W)
26140	1860	-23.4	44.92	21.52	141.91	H	2
26365	1882.5	-24.14	45.64	21.5	141.25	H	2
26590	1905	-24.14	45.57	21.43	139	H	2
26140	1860	-23.87	45.4	21.53	142.23	V	2
26365	1882.5	-24.07	45.68	21.61	144.88	V	2
26590	1905	-24.4	46.13	21.73	148.94	V	2

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

3.2 FREQUENCY STABILITY MEASUREMENT

3.2.1 LIMITS OF FREQUENCY STABILIITY MEASUREMENT

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

3.2.2 TEST PROCEDURE

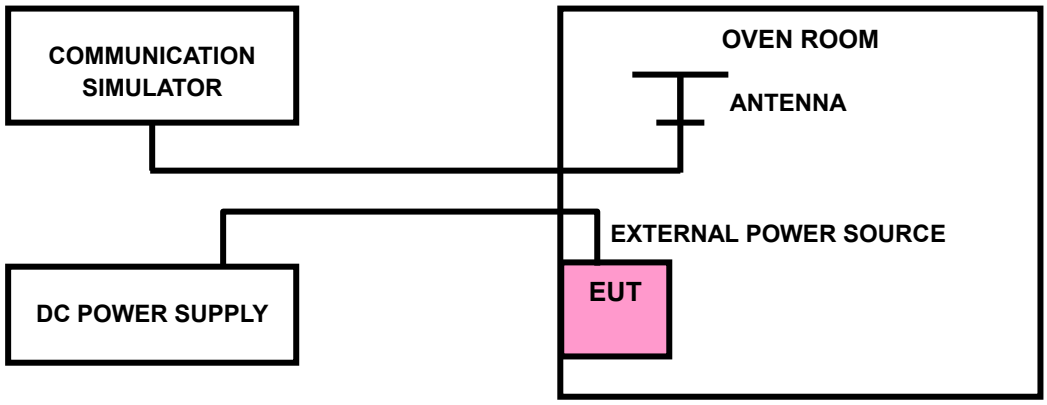
a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.

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.

3.2.3 TEST SETUP



3.2.4 TEST RESULTS

GSM1900

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	FREQUENCY ERROR (ppm)		LIMIT (ppm)
	Low Channel	High Channel	
3.8	0.0009	0.0012	2.5
3.4(BEP)	-0.0012	-0.0012	2.5
4.2	0.0009	0.0011	2.5

NOTE: The applicant defined the normal working voltage of the battery is from 3.55Vdc to 4.35Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (℃)	FREQUENCY ERROR (ppm)		LIMIT (ppm)
	Low Channel	High Channel	
-30	-0.0055	-0.0053	2.5
-20	-0.0051	-0.0048	2.5
-10	-0.0046	-0.0043	2.5
0	-0.0037	-0.0035	2.5
10	-0.0030	-0.0028	2.5
20	-0.0023	-0.0021	2.5
30	-0.0017	-0.0015	2.5
40	-0.0014	-0.0012	2.5
50	-0.0005	-0.0003	2.5
60	-0.0055	-0.0053	2.5

EDGE 1900

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	FREQUENCY ERROR (ppm)		LIMIT (ppm)
	Low Channel	High Channel	
3.8	0.0012	0.0011	2.5
3.4(BEP)	-0.0013	-0.0012	2.5
4.2	0.0010	0.0009	2.5

NOTE: The applicant defined the normal working voltage of the battery is from 3.55Vdc to 4.35Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (℃)	FREQUENCY ERROR (ppm)		LIMIT (ppm)
	Low Channel	High Channel	
-30	-0.0057	-0.0053	2.5
-20	-0.0050	-0.0047	2.5
-10	-0.0045	-0.0043	2.5
0	-0.0038	-0.0036	2.5
10	-0.0029	-0.0027	2.5
20	-0.0024	-0.0022	2.5
30	-0.0017	-0.0016	2.5
40	-0.0012	-0.0011	2.5
50	-0.0005	-0.0004	2.5
60	-0.0057	-0.0053	2.5

CDMA BC1

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	FREQUENCY ERROR (ppm)		LIMIT (ppm)
	Low Channel	High Channel	
3.8	0.0015	0.0017	2.5
3.4(BEP)	-0.0021	-0.0021	2.5
4.2	0.0018	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)
	Low Channel	High Channel	
-30	-0.0123	-0.0118	2.5
-20	-0.0113	-0.0108	2.5
-10	-0.0100	-0.0095	2.5
0	-0.0087	-0.0083	2.5
10	-0.0066	-0.0063	2.5
20	-0.0051	-0.0049	2.5
30	-0.0047	-0.0045	2.5
40	-0.0028	-0.0027	2.5
50	-0.0015	-0.0014	2.5

LTE BAND 2

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	1.4MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
3.8	0.0008	0.0009	2.5
3.4(BEP)	-0.0009	-0.0010	2.5
4.2	0.0007	0.0009	2.5

NOTE: The applicant defined the normal working voltage of the battery is from 3.55Vdc to 4.35Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (℃)	1.4MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	-0.0055	-0.0055	2.5
-20	-0.0050	-0.0051	2.5
-10	-0.0044	-0.0045	2.5
0	-0.0039	-0.0039	2.5
10	-0.0030	-0.0030	2.5
20	-0.0024	-0.0023	2.5
30	-0.0018	-0.0018	2.5
40	-0.0006	-0.0006	2.5
50	-0.0003	-0.0004	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	3MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
3.8	0.0008	0.0010	2.5
3.4(BEP)	-0.0010	-0.0010	2.5
4.2	0.0010	0.0009	2.5

NOTE: The applicant defined the normal working voltage of the battery is from 3.55Vdc to 4.35Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (℃)	3MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	-0.0055	-0.0057	2.5
-20	-0.0050	-0.0048	2.5
-10	-0.0044	-0.0041	2.5
0	-0.0035	-0.0033	2.5
10	-0.0030	-0.0029	2.5
20	-0.0018	-0.0025	2.5
30	-0.0015	-0.0014	2.5
40	-0.0009	-0.0008	2.5
50	-0.0003	-0.0002	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	5MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
3.8	0.0009	0.0011	2.5
3.4(BEP)	-0.0011	-0.0012	2.5
4.2	0.0010	0.0010	2.5

NOTE: The applicant defined the normal working voltage of the battery is from 3.55Vdc to 4.35Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (℃)	5MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	-0.0053	-0.0053	2.5
-20	-0.0046	-0.0048	2.5
-10	-0.0041	-0.0039	2.5
0	-0.0036	-0.0034	2.5
10	-0.0030	-0.0028	2.5
20	-0.0023	-0.0020	2.5
30	-0.0014	-0.0013	2.5
40	-0.0008	-0.0007	2.5
50	-0.0002	0.0002	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	10MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
3.8	0.0010	0.0008	2.5
3.4(BEP)	-0.0012	-0.0009	2.5
4.2	0.0009	0.0008	2.5

NOTE: The applicant defined the normal working voltage of the battery is from 3.55Vdc to 4.35Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (℃)	10MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	-0.0051	-0.0052	2.5
-20	-0.0044	-0.0046	2.5
-10	-0.0039	-0.0040	2.5
0	-0.0034	-0.0034	2.5
10	-0.0028	-0.0025	2.5
20	-0.0021	-0.0019	2.5
30	-0.0015	-0.0013	2.5
40	-0.0010	-0.0008	2.5
50	0.0003	0.0002	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	15MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
3.8	0.0012	0.0011	2.5
3.4(BEP)	-0.0011	-0.0012	2.5
4.2	0.0009	0.0010	2.5

NOTE: The applicant defined the normal working voltage of the battery is from 3.55Vdc to 4.35Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (℃)	15MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	-0.0051	-0.0049	2.5
-20	-0.0047	-0.0043	2.5
-10	-0.0039	-0.0036	2.5
0	-0.0030	-0.0028	2.5
10	-0.0024	-0.0025	2.5
20	-0.0019	-0.0013	2.5
30	-0.0011	-0.0010	2.5
40	-0.0007	-0.0003	2.5
50	0.0002	0.0002	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	20MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
3.8	0.0011	0.0011	2.5
3.4(BEP)	-0.0012	-0.0011	2.5
4.2	0.0010	0.0012	2.5

NOTE: The applicant defined the normal working voltage of the battery is from 3.55Vdc to 4.35Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (℃)	20MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	-0.0048	-0.0051	2.5
-20	-0.0041	-0.0042	2.5
-10	-0.0037	-0.0036	2.5
0	-0.0028	-0.0029	2.5
10	-0.0022	-0.0023	2.5
20	-0.0018	-0.0013	2.5
30	-0.0008	-0.0009	2.5
40	-0.0005	-0.0001	2.5
50	0.0002	0.0002	2.5

LTE BAND 25

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	1.4MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
3.8	0.0004	0.0005	2.5
3.4(BEP)	-0.0008	-0.0009	2.5
4.2	0.0005	0.0006	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. (℃)	1.4MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	-0.0054	-0.0059	2.5
-20	-0.0044	-0.0046	2.5
-10	-0.0042	-0.0043	2.5
0	-0.0039	-0.0040	2.5
10	-0.0026	-0.0028	2.5
20	-0.0024	-0.0024	2.5
30	-0.0014	-0.0019	2.5
40	-0.0005	-0.0009	2.5
50	-0.0004	-0.0005	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	3MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
3.8	0.0008	0.0010	2.5
3.4(BEP)	-0.0010	-0.0010	2.5
4.2	0.0010	0.0010	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. (℃)	3MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	-0.0056	-0.0055	2.5
-20	-0.0052	-0.0052	2.5
-10	-0.0045	-0.0046	2.5
0	-0.0037	-0.0038	2.5
10	-0.0030	-0.0031	2.5
20	-0.0023	-0.0025	2.5
30	-0.0018	-0.0019	2.5
40	-0.0010	-0.00011	2.5
50	-0.0003	-0.0003	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	5MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
3.8	0.0009	0.0010	2.5
3.4(BEP)	-0.0012	-0.0013	2.5
4.2	0.0009	0.0010	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. (℃)	5MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	-0.0052	-0.0055	2.5
-20	-0.0045	-0.0048	2.5
-10	-0.0039	-0.0040	2.5
0	-0.0032	-0.0033	2.5
10	-0.0028	-0.0029	2.5
20	-0.0018	-0.0018	2.5
30	-0.0008	-0.0010	2.5
40	-0.0006	-0.0007	2.5
50	-0.0001	0.0002	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	10MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
3.8	0.0012	0.0013	2.5
3.4(BEP)	-0.0010	-0.0012	2.5
4.2	0.0008	0.0009	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. (℃)	10MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	-0.0051	-0.0053	2.5
-20	-0.0044	-0.0046	2.5
-10	-0.0039	-0.0040	2.5
0	-0.0034	-0.0039	2.5
10	-0.0028	-0.0029	2.5
20	-0.0022	-0.0025	2.5
30	-0.0013	-0.0014	2.5
40	-0.0008	-0.0009	2.5
50	0.0002	0.0003	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	15MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
3.8	0.0011	0.0012	2.5
3.4(BEP)	-0.0010	-0.0013	2.5
4.2	0.0009	0.0011	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. (℃)	15MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	-0.0055	-0.0059	2.5
-20	-0.0044	-0.0046	2.5
-10	-0.0040	-0.0041	2.5
0	-0.0027	-0.0028	2.5
10	-0.0024	-0.0026	2.5
20	-0.0019	-0.0023	2.5
30	-0.0010	-0.0013	2.5
40	-0.0004	-0.0005	2.5
50	0.0001	0.0004	2.5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	20MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
3.8	0.0012	0.0015	2.5
3.4(BEP)	-0.0011	-0.0013	2.5
4.2	0.0009	0.0010	2.5

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

FREQUENCY ERROR vs. TEMPERATURE.

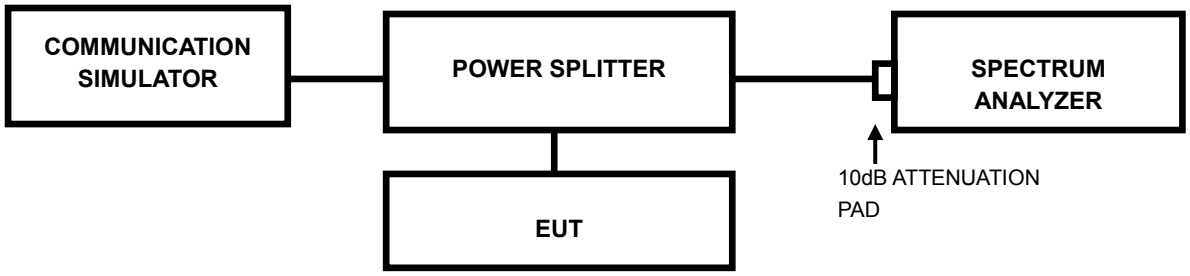
TEMP. (℃)	20MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	-0.0049	-0.0053	2.5
-20	-0.0040	-0.0045	2.5
-10	-0.0036	-0.0037	2.5
0	-0.0029	-0.0031	2.5
10	-0.0021	-0.0023	2.5
20	-0.0014	-0.0016	2.5
30	-0.0009	-0.0010	2.5
40	-0.0001	-0.0002	2.5
50	0.0002	0.0004	2.5

3.3 OCCUPIED BANDWIDTH MEASUREMENT

3.3.1 TEST PROCEDURES

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.

3.3.2 TEST SETUP

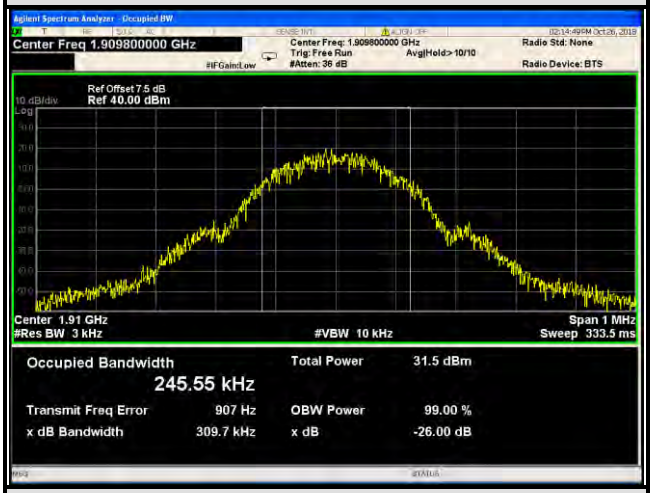


3.3.3 TEST RESULTS

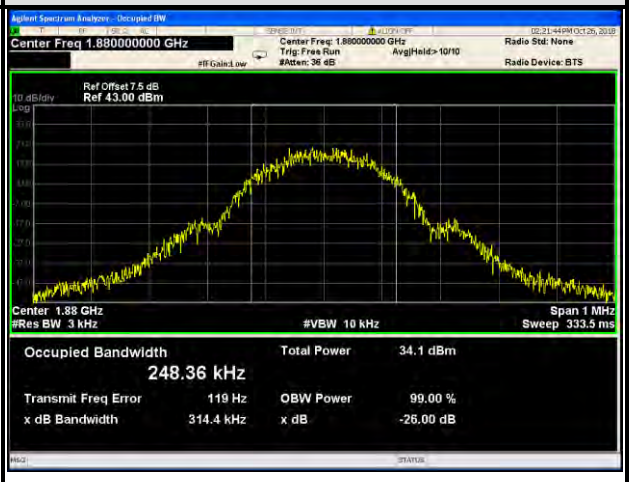
Channel	Frequency (MHz)	99% Occupied bandwidth (kHz)		Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		GSM	EDGE			GSM	EDGE
512	1850.2	244.61	245.89	512	1850.2	294.7	314.3
661	1880.0	242.89	248.36	661	1880.0	302.7	314.4
810	1909.8	245.55	247.96	810	1909.8	309.7	315.0

SPECTRUM PLOT OF WORST VALUE

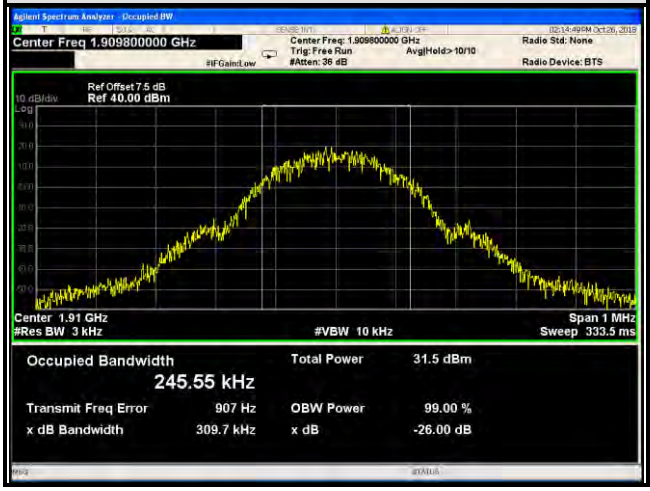
99% OCCUPIED Bandwidth



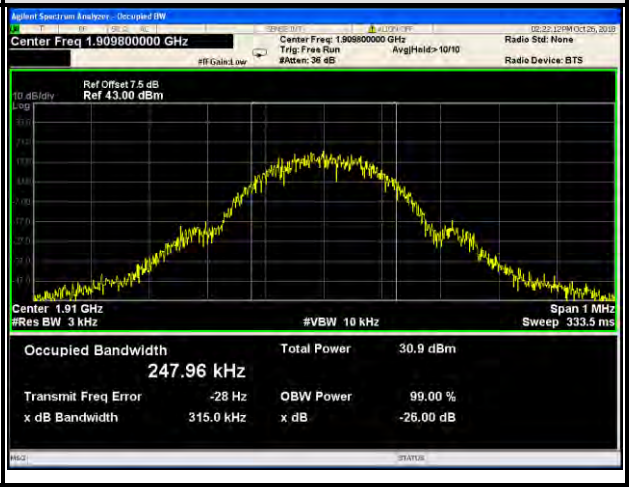
99% OCCUPIED Bandwidth



26dB Bandwidth



26dB Bandwidth



CDMA BC 1

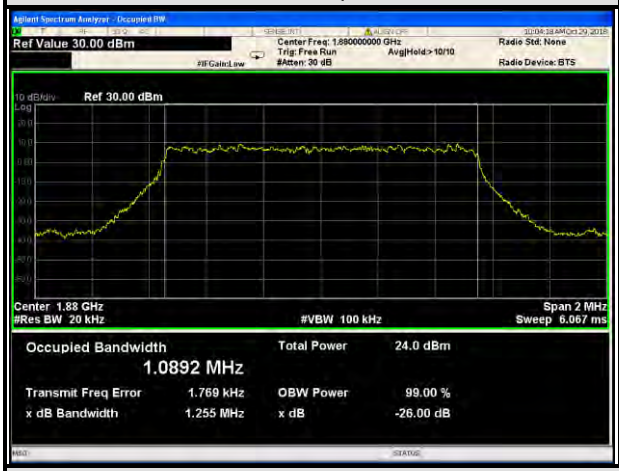
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (MHz)	CHANNEL	Frequency (MHz)	26dB Bandwidth (MHz)
25	1851.25	1.2758	25	1851.25	1.429
600	1880.00	1.2765	600	1880.00	1.422
1175	1908.75	1.2760	1175	1908.75	1.430

SPECTRUM PLOT OF WORST VALUE	
99% OCCUPIED Bandwidth	26dB Bandwidth
	

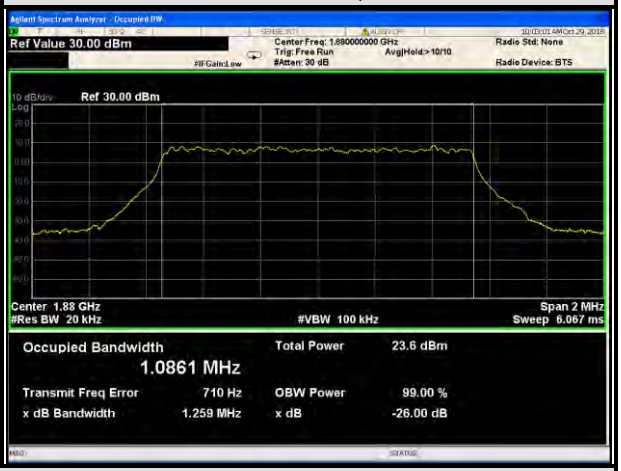
LTE band 2							
Channel Bandwidth : 1.4MHz							
Channel	Frequency (MHz)	99% Occupied bandwidth (MHz)		Channel	Frequency (MHz)	26dB bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
18607	1850.7	1.0799	1.0796	18607	1850.7	1.261	1.269
18900	1880	1.0892	1.0861	18900	1880	1.255	1.259
19193	1909.3	1.0856	1.0831	19193	1909.3	1.280	1.269

SPECTRUM PLOT OF WORST VALUE of 99% Occupied Bandwidth

1.4MHz/QPSK



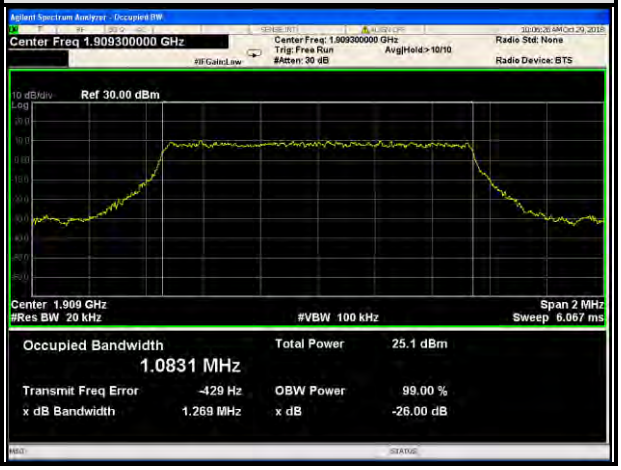
1.4MHz/16QAM



SPECTRUM PLOT OF WORST VALUE of 26dB Bandwidth

1.4MHz/QPSK

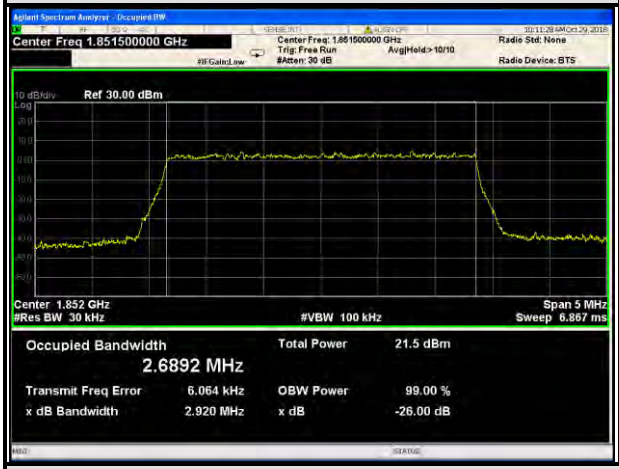
1.4MHz/16QAM



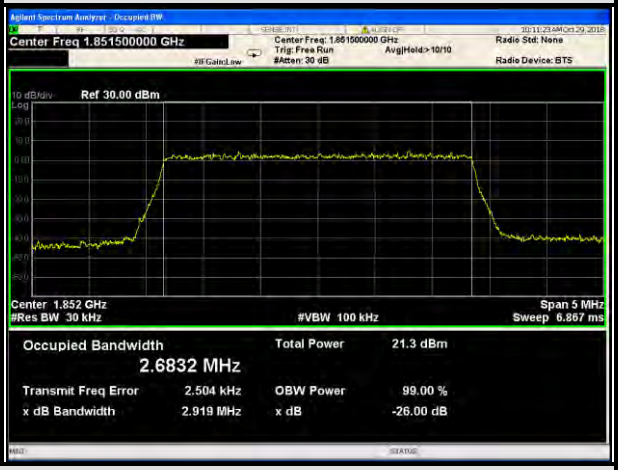
LTE band 2							
Channel Bandwidth : 3MHz							
Channel	Frequency (MHz)	99% Occupied bandwidth (MHz)		Channel	Frequency (MHz)	26dB bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
18615	1851.5	2.6892	2.6833	18615	1851.5	2.920	2.919
18900	1880	2.6802	2.6813	18900	1880	2.901	2.924
19185	1908.5	2.6808	2.6824	19185	1908.5	2.931	2.928

SPECTRUM PLOT OF WORST VALUE of 99% Occupied Bandwidth

3MHz/QPSK

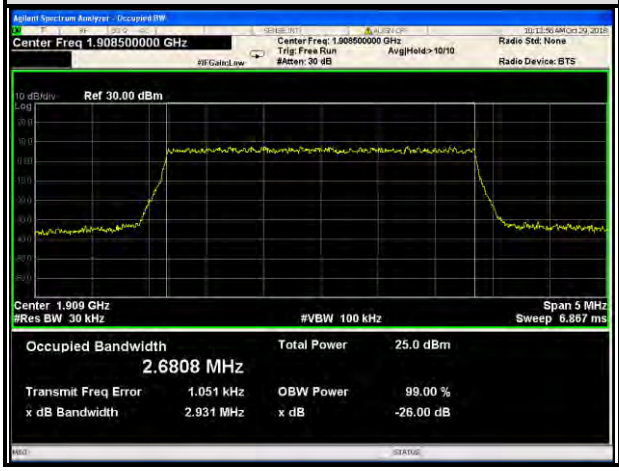


3MHz/16QAM

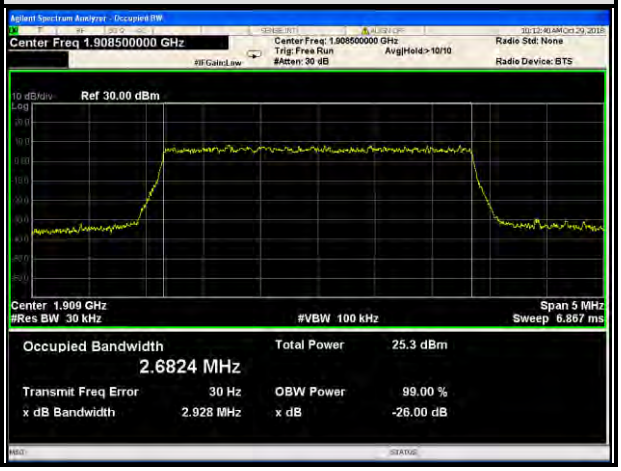


SPECTRUM PLOT OF WORST VALUE of 26dB Occupied Bandwidth

3MHz/QPSK



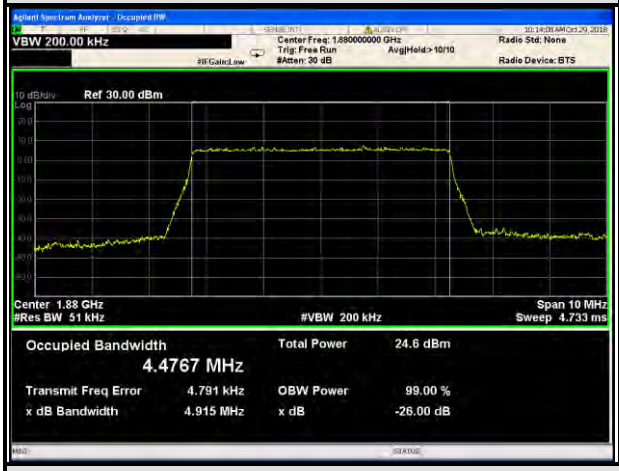
3MHz/16QAM



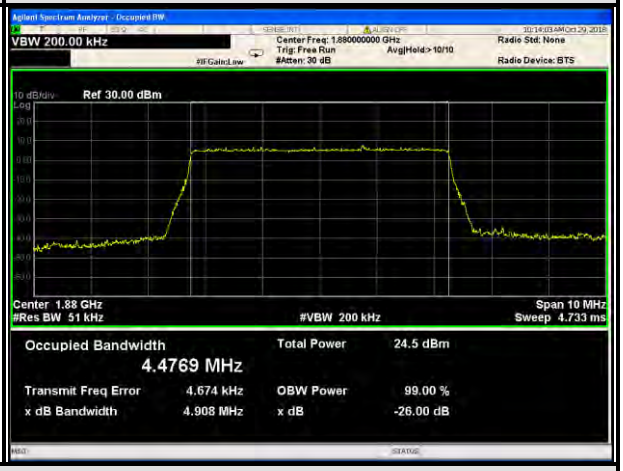
LTE band 2							
Channel Bandwidth : 5 MHz							
Channel	Frequency (MHz)	99% Occupied bandwidth (MHz)		Channel	Frequency (MHz)	26dB bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
18625	1852.5	4.4697	4.4692	18625	1852.5	4.863	4.880
18900	1880	4.4767	4.4769	18900	1880	4.915	4.908
19175	1907.5	4.4635	4.4571	19175	1907.5	4.875	4.877

SPECTRUM PLOT OF WORST VALUE of 99% Occupied Bandwidth

5MHz/QPSK

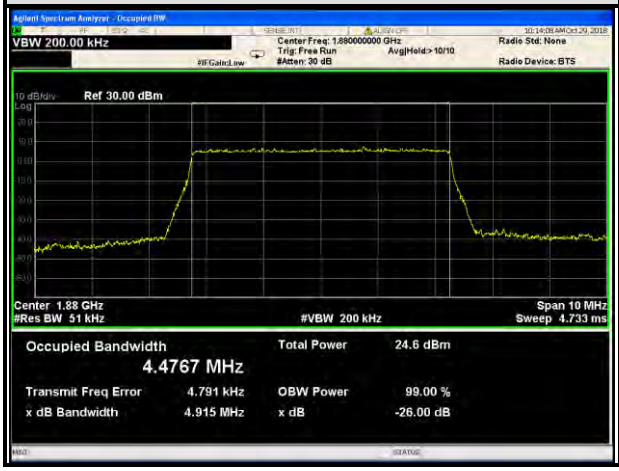


5MHz/16QAM

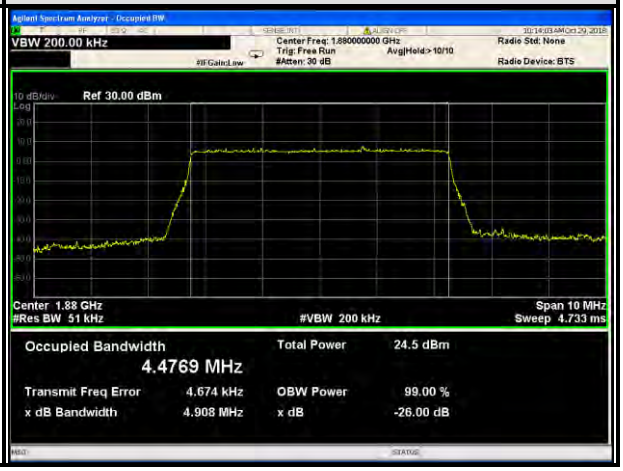


SPECTRUM PLOT OF WORST VALUE of 26dB Occupied Bandwidth

5MHz/QPSK



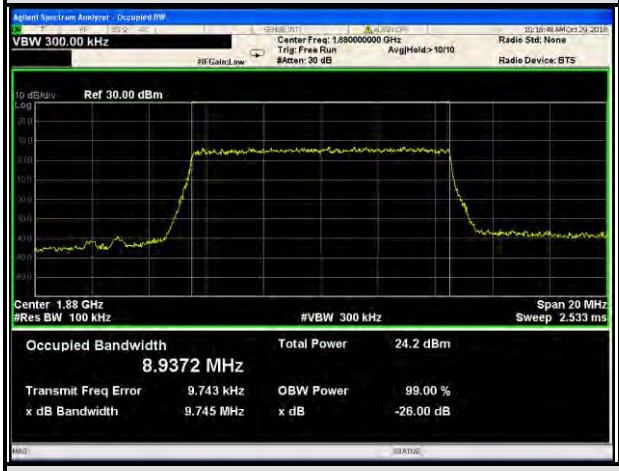
5MHz/16QAM



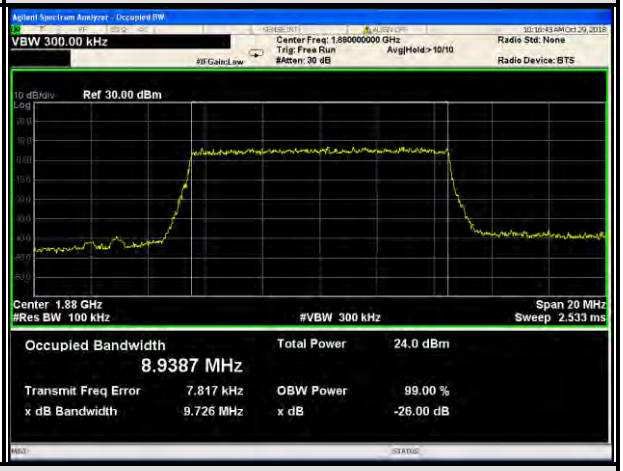
LTE band 2							
Channel Bandwidth : 10 MHz							
Channel	Frequency (MHz)	99% Occupied bandwidth (MHz)		Channel	Frequency (MHz)	26dB bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
18650	1855	8.9182	8.9169	18650	1855	9.667	9.654
18900	1880	8.9372	8.9387	18900	1880	9.745	9.726
19150	1905	8.9258	8.9245	19150	1905	9.607	9.621

SPECTRUM PLOT OF WORST VALUE of 99% Occupied Bandwidth

10MHz/QPSK

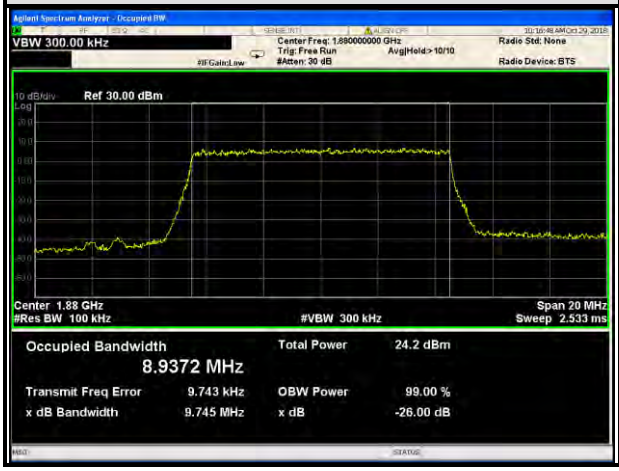


10MHz/16QAM

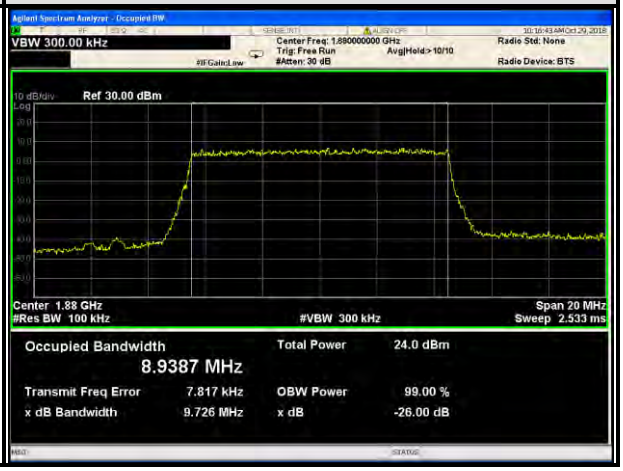


SPECTRUM PLOT OF WORST VALUE of 26dB Occupied Bandwidth

10MHz/QPSK



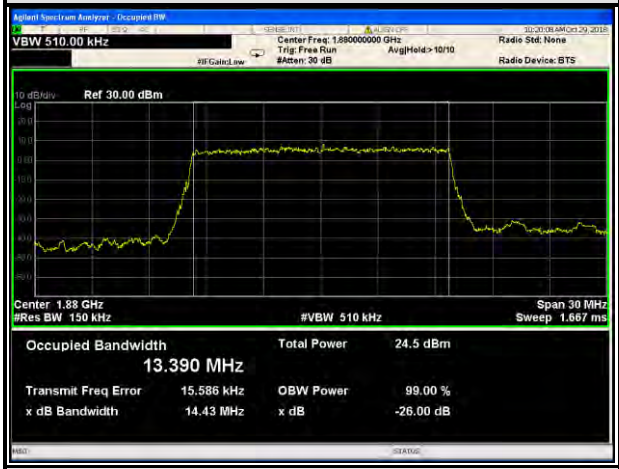
10MHz/16QAM



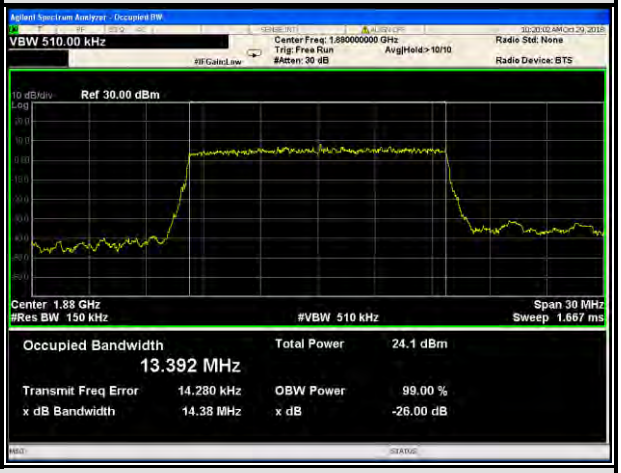
LTE band 2							
Channel Bandwidth : 15 MHz							
Channel	Frequency (MHz)	99% Occupied bandwidth (MHz)		Channel	Frequency (MHz)	26dB bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
18675	1857.5	13.320	13.330	18675	1857.5	14.37	14.28
18900	1880	13.390	13.392	18900	1880	14.43	14.38
19125	1902.5	13.385	13.392	19125	1902.5	14.40	14.48

SPECTRUM PLOT OF WORST VALUE of 99% Occupied Bandwidth

15MHz/QPSK

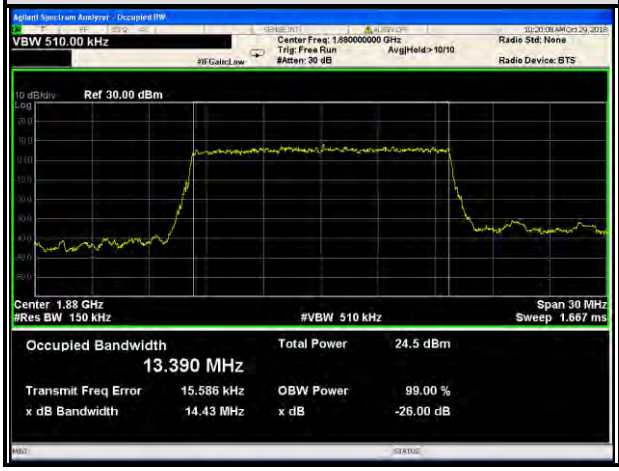


15MHz/16QAM

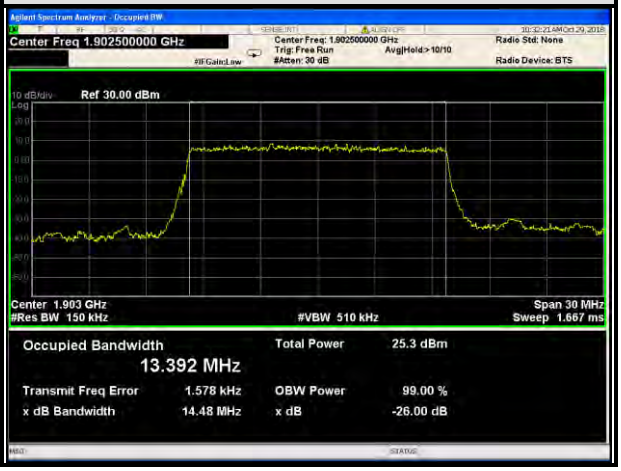


SPECTRUM PLOT OF WORST VALUE of 26dB Occupied Bandwidth

15MHz/QPSK



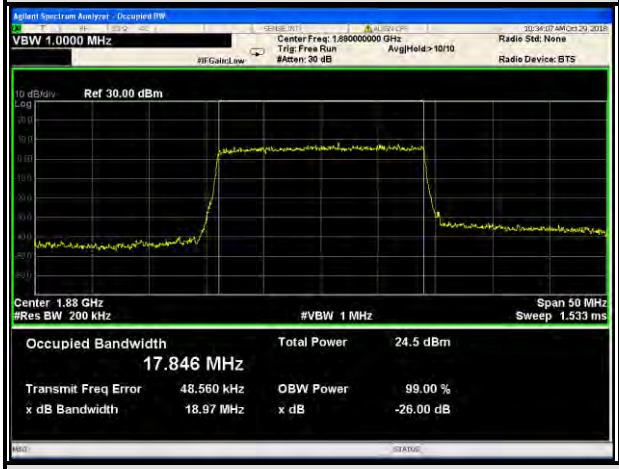
15MHz/16QAM



LTE band 2							
Channel Bandwidth : 20 MHz							
Channel	Frequency (MHz)	99% Occupied bandwidth (MHz)		Channel	Frequency (MHz)	26dB bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
18700	1860	17.801	17.794	18700	1860	18.92	18.90
18900	1880	17.846	17.845	18900	1880	18.97	19.02
19100	1900	17.834	17.839	19100	1900	19.07	19.04

SPECTRUM PLOT OF WORST VALUE of 99% Occupied Bandwidth

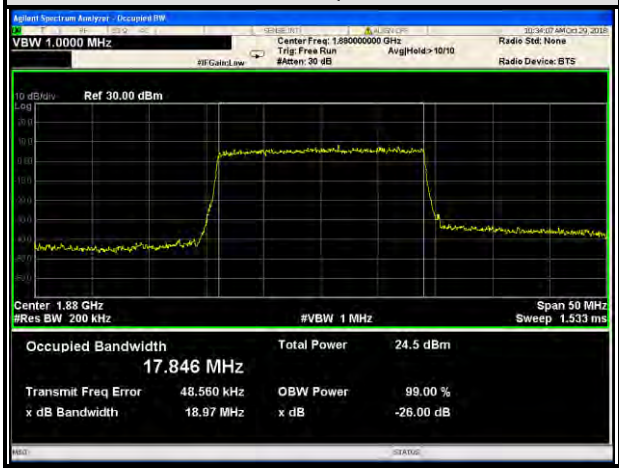
20MHz/QPSK



20MHz/16QAM

SPECTRUM PLOT OF WORST VALUE of 26dB Occupied Bandwidth

20MHz/QPSK



20MHz/16QAM

LTE band 25							
Channel Bandwidth : 1.4MHz							
Channel	Frequency (MHz)	99% Occupied bandwidth (MHz)		Channel	Frequency (MHz)	26dB bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
26047	1850.7	1.0854	1.0830	26047	1850.7	1.288	1.282
26365	1880	1.0836	1.0840	26365	1880	1.262	1.261
26683	1914.3	1.0854	1.0909	26683	1914.3	1.307	1.264

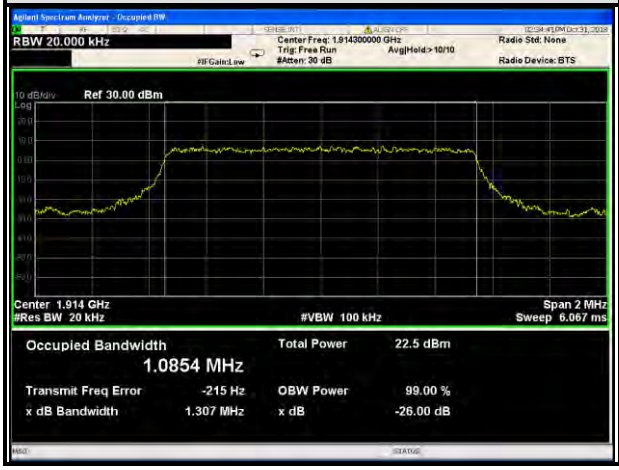
SPECTRUM PLOT OF WORST VALUE of 99% Occupied Bandwidth

1.4MHz/QPSK

1.4MHz/16QAM

SPECTRUM PLOT OF WORST VALUE of 26dB Occupied Bandwidth

1.4MHz/QPSK

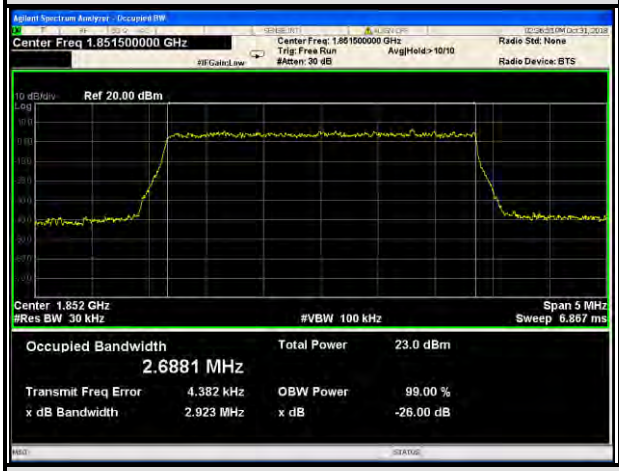


1.4MHz/16QAM

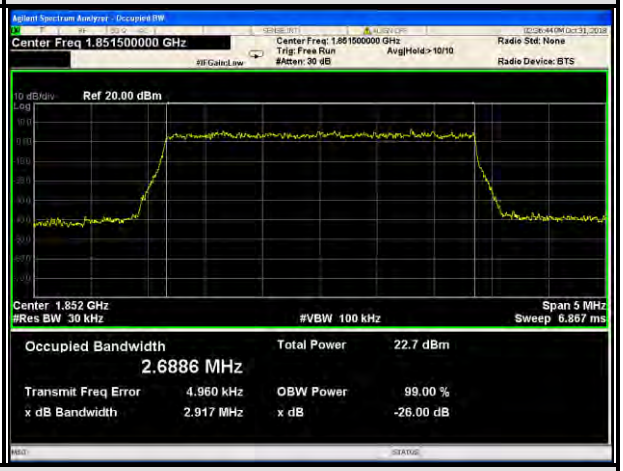
LTE band 25							
Channel Bandwidth : 3MHz							
Channel	Frequency (MHz)	99% Occupied bandwidth (MHz)		Channel	Frequency (MHz)	26dB bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
26055	1851.5	2.6881	2.6886	26055	1851.5	2.923	2.917
26365	1880	2.6800	2.6830	26365	1880	2.930	2.927
26675	1913.5	2.6840	2.6847	26675	1913.5	2.941	2.933

SPECTRUM PLOT OF WORST VALUE of 99% Occupied Bandwidth

3MHz/QPSK

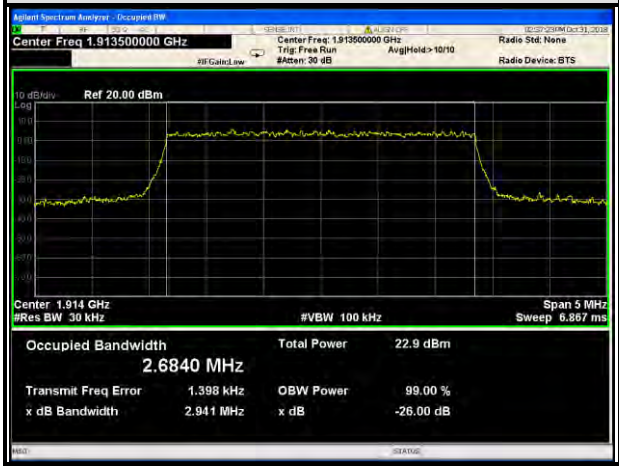


3MHz/16QAM

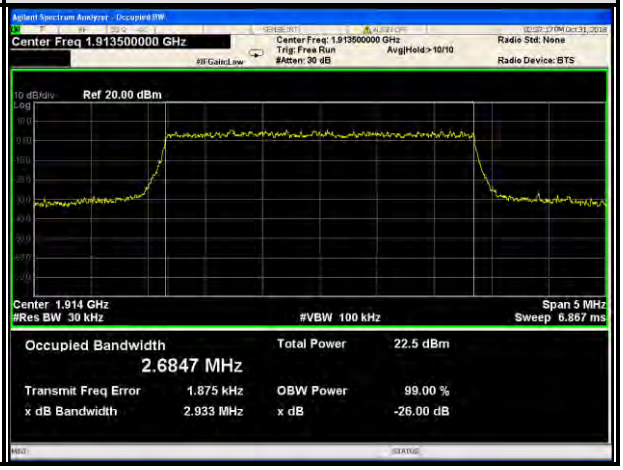


SPECTRUM PLOT OF WORST VALUE of 26dB Occupied Bandwidth

3MHz/QPSK



3MHz/16QAM



LTE band 25							
Channel Bandwidth : 5MHz							
Channel	Frequency (MHz)	99% Occupied bandwidth (MHz)		Channel	Frequency (MHz)	26dB bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
26065	1852.5	4.4715	4.4715	26065	1852.5	4.869	4.869
26365	1880	4.4825	4.4754	26365	1880	4.927	4.908
26665	1912.5	4.4604	4.4613	26665	1912.5	4.875	4.874

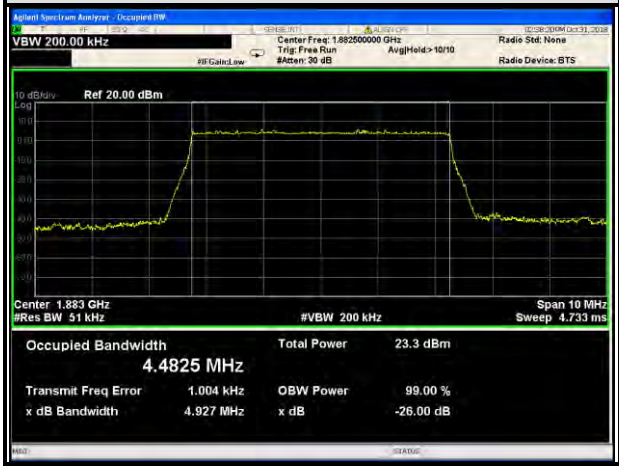
SPECTRUM PLOT OF WORST VALUE of 99% Occupied Bandwidth

5MHz/QPSK

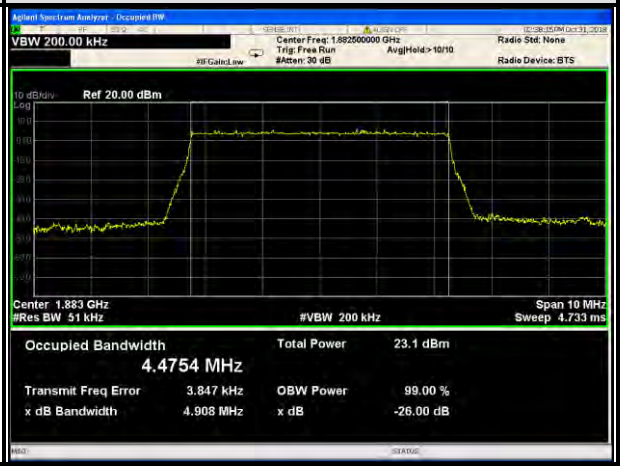
5MHz/16QAM

SPECTRUM PLOT OF WORST VALUE of 26dB Occupied Bandwidth

5MHz/QPSK



5MHz/16QAM

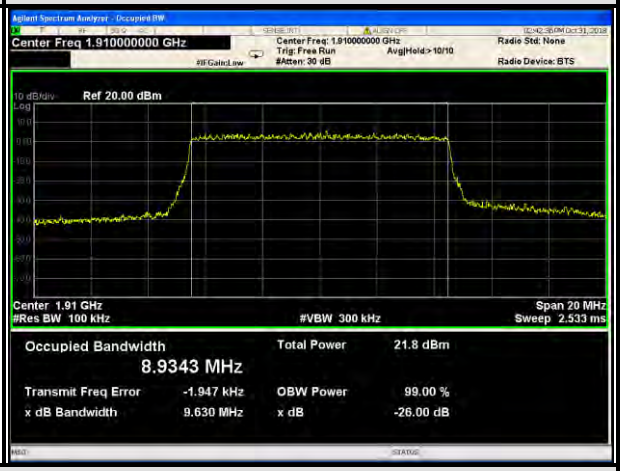


LTE band 25							
Channel Bandwidth : 10MHz							
Channel	Frequency (MHz)	99% Occupied bandwidth (MHz)		Channel	Frequency (MHz)	26dB bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
26090	1855	8.9185	8.9260	26090	1855	9.586	9.625
26365	1880	8.9253	8.9291	26365	1880	9.591	9.635
26640	1910	8.9302	8.9343	26640	1910	9.631	9.630

SPECTRUM PLOT OF WORST VALUE of 99% Occupied Bandwidth

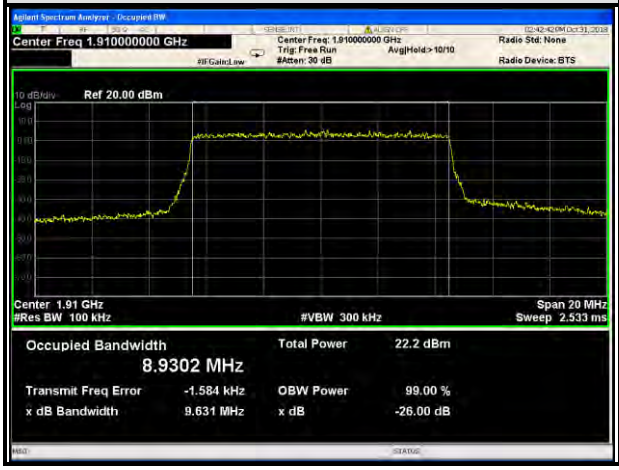
10MHz/QPSK

10MHz/16QAM

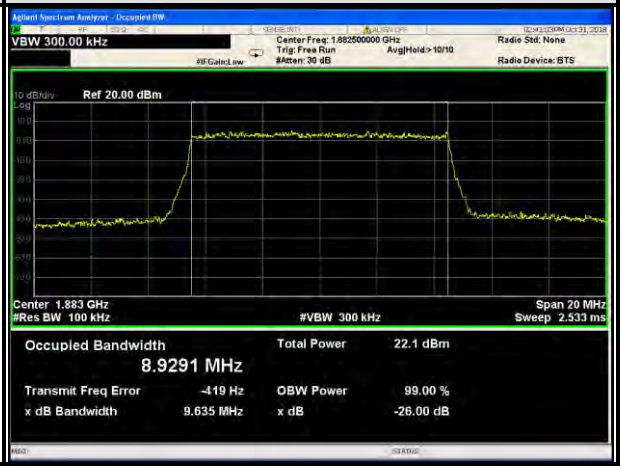


SPECTRUM PLOT OF WORST VALUE of 26dB Occupied Bandwidth

10MHz/QPSK



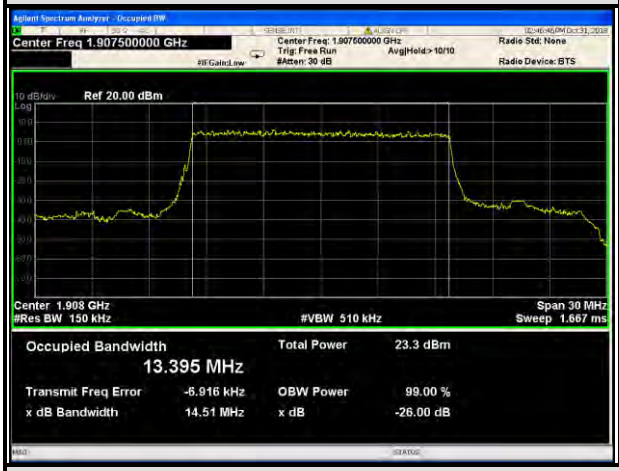
10MHz/16QAM



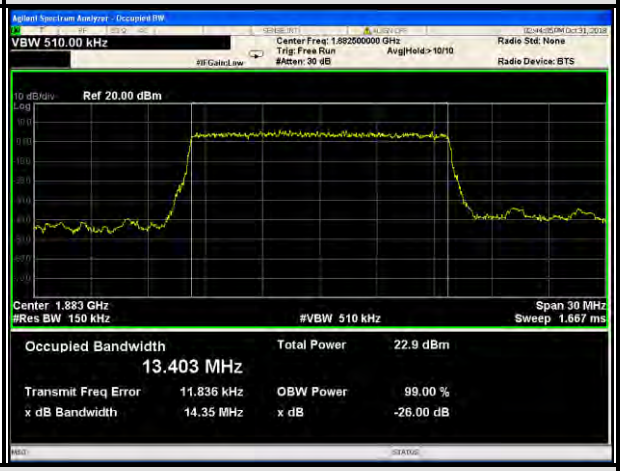
LTE band 25							
Channel Bandwidth : 15MHz							
Channel	Frequency (MHz)	99% Occupied bandwidth (MHz)		Channel	Frequency (MHz)	26dB bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
26115	1857.5	13.366	13.349	26115	1857.5	14.32	14.36
26365	1880	13.393	13.403	26365	1880	14.47	14.35
26615	1907.5	13.395	13.378	26615	1907.5	14.51	14.42

SPECTRUM PLOT OF WORST VALUE of 99% Occupied Bandwidth

15MHz/QPSK

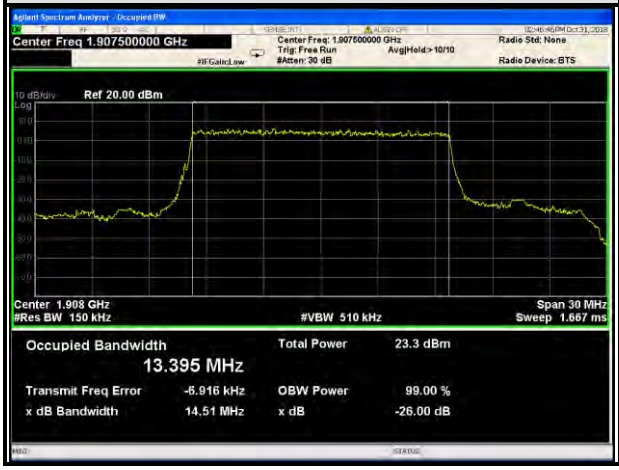


15MHz/16QAM

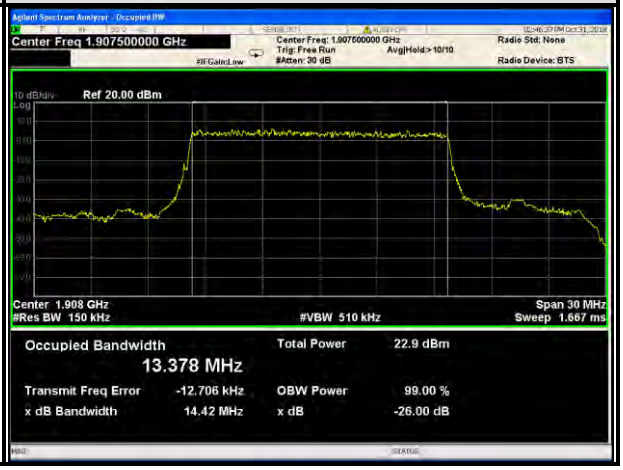


SPECTRUM PLOT OF WORST VALUE of 26dB Occupied Bandwidth

15MHz/QPSK



15MHz/16QAM



LTE band 25							
Channel Bandwidth : 20MHz							
Channel	Frequency (MHz)	99% Occupied bandwidth (MHz)		Channel	Frequency (MHz)	26dB bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
26140	1860	17.787	17.797	26140	1860	19.04	18.95
26365	1880	17.856	17.844	26365	1880	19.00	19.01
26590	1905	17.874	17.864	26590	1905	19.15	19.20

SPECTRUM PLOT OF WORST VALUE of 99% Occupied Bandwidth

20MHz/QPSK

20MHz/16QAM

SPECTRUM PLOT OF WORST VALUE of 26dB Occupied Bandwidth

20MHz/QPSK

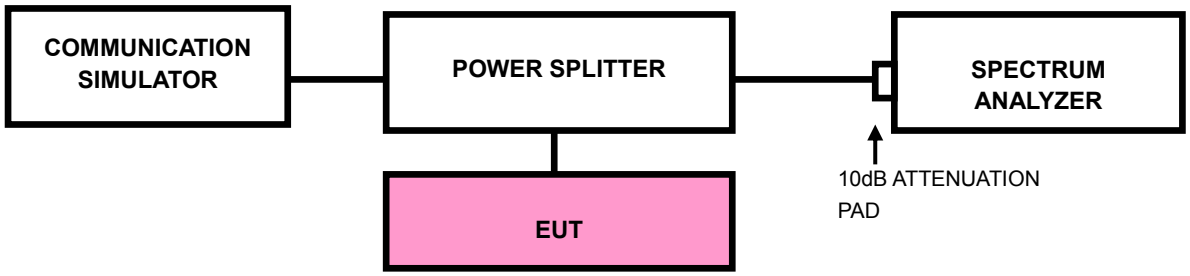
20MHz/16QAM

3.4 BAND EDGE MEASUREMENT

3.4.1 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.

3.4.2 TEST SETUP



3.4.3 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 1.5 MHz. RBW of the spectrum is 10kHz and VBW of the spectrum is 30kHz (GSM/GPRS/ EDGE).

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

d. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 20kHz and VBW 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. RBW of the spectrum is 30kHz and VBW 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. RBW of the spectrum is 50kHz and VBW 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. RBW of the spectrum is 100kHz and VBW 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. RBW of the spectrum is 200kHz and VBW 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. RBW of the spectrum is 200kHz and VBW of the spectrum is 1MHz. (LTE bandwidth 20MHz)

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

3.4.4. TEST RESULTS

GSM			
CHANNEL	512	CHANNEL	810
GSM			
			
EDGE			
CHANNEL	512	CHANNEL	810
			
CDMA BC 1			
CHANNEL	1013	CHANNEL	777
			

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
					

LTE BAND 25

Channel Bandwidth: 1.4MHz					
CHANNEL	26407	1 RB	CHANNEL	26683	1 RB
					
CHANNEL	26407	Full RB	CHANNEL	26683	Full RB
					

LTE BAND 25

Channel Bandwidth: 3MHz					
CHANNEL	26055	1 RB	CHANNEL	26675	1 RB
					
CHANNEL	26055	Full RB	CHANNEL	26675	Full RB
					

LTE BAND 25

Channel Bandwidth: 5MHz					
CHANNEL	26065	1 RB	CHANNEL	26665	1 RB
					
CHANNEL	26065	Full RB	CHANNEL	26665	Full RB
					

LTE BAND 25

Channel Bandwidth: 10MHz					
CHANNEL	26090	1 RB	CHANNEL	26640	1 RB
					
CHANNEL	26090	Full RB	CHANNEL	26640	Full RB
					

LTE BAND 25

Channel Bandwidth: 15MHz					
CHANNEL	26115	1 RB	CHANNEL	26615	1 RB
					
CHANNEL	26115	Full RB	CHANNEL	26615	Full RB
					

LTE BAND 25

Channel Bandwidth: 20MHz					
CHANNEL	26140	1 RB	CHANNEL	26590	1 RB
					
CHANNEL	26140	Full RB	CHANNEL	26590	Full RB
					

3.5 CONDUCTED SPURIOUS EMISSIONS

3.5.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

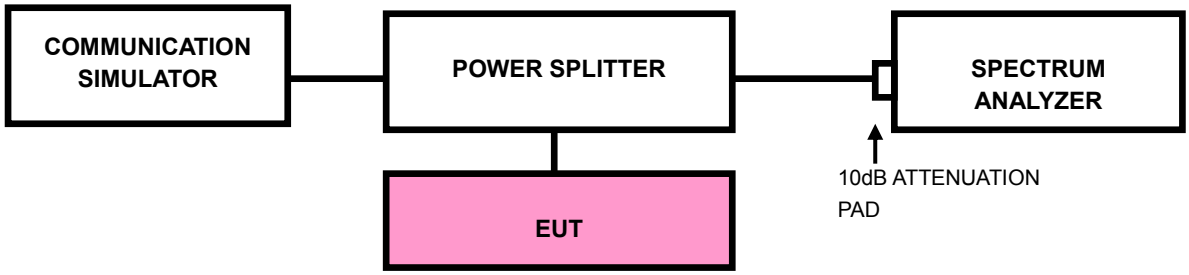
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. The emission limit equal to –13dBm.

3.5.2 TEST PROCEDURE

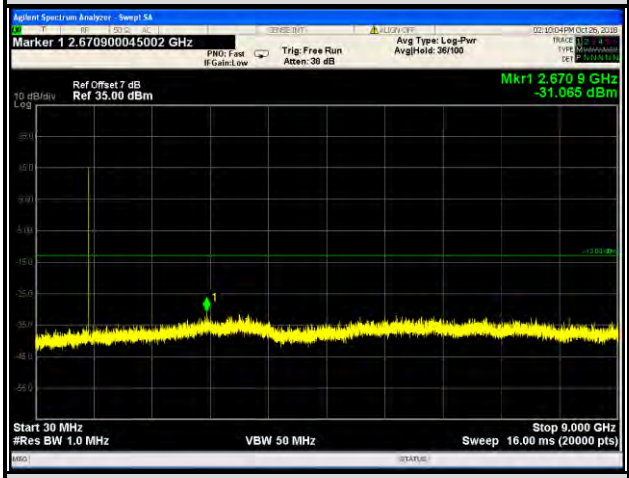
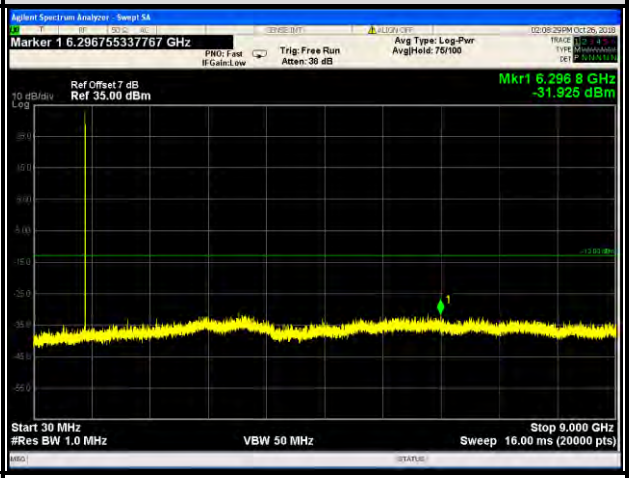
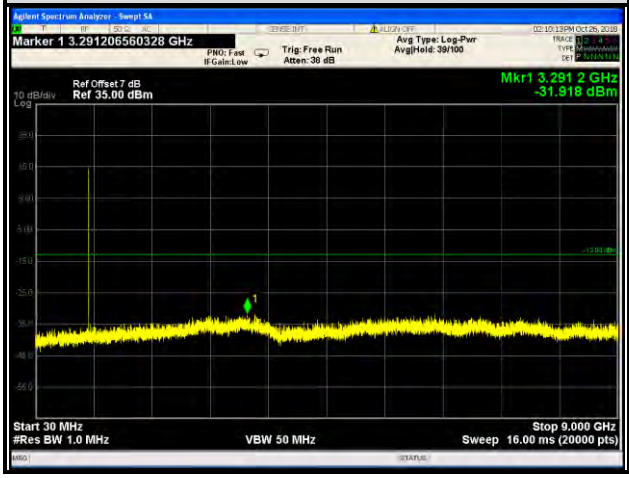
a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.

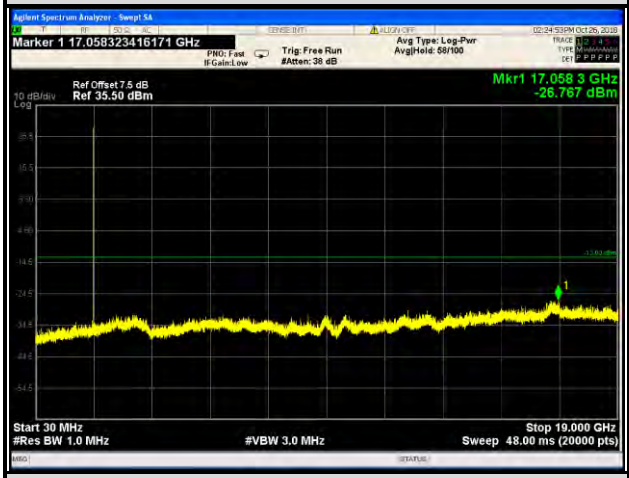
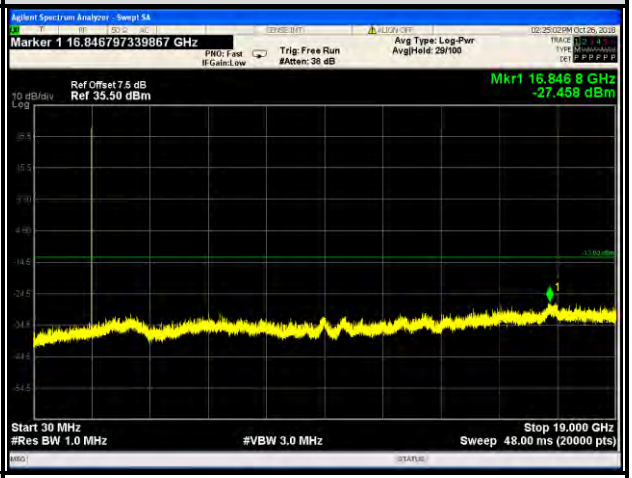
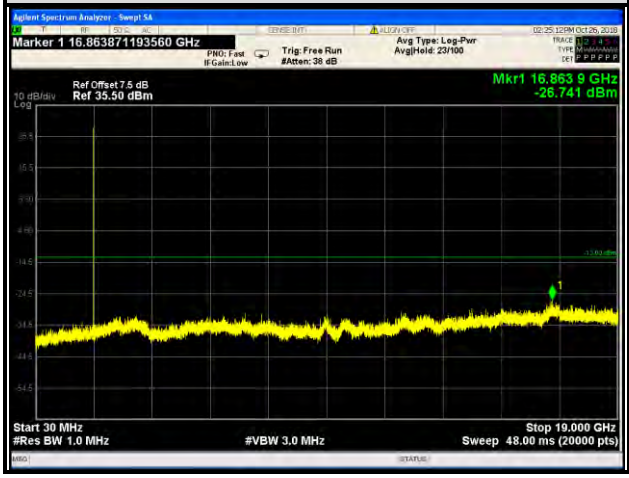
b. Measuring frequency range is from 9 kHz to 19.1GHz. 10dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.

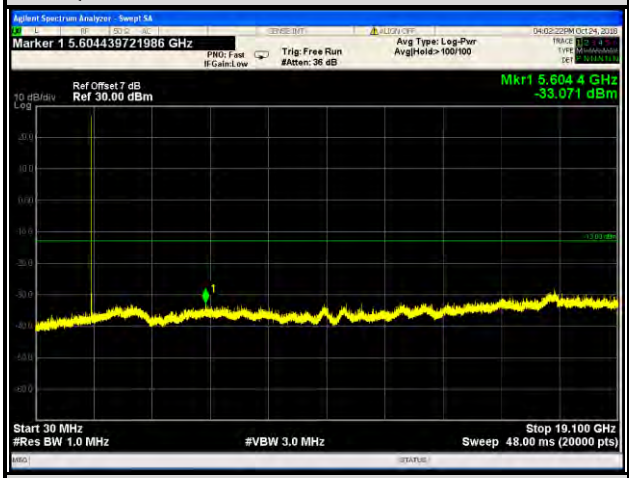
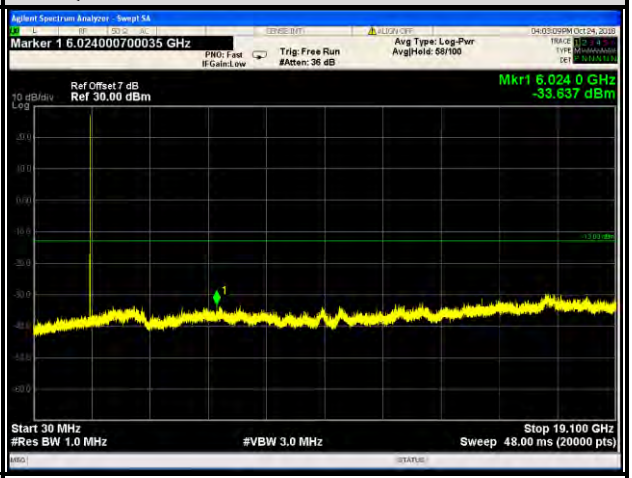
3.5.3 TEST SETUP



3.5.4 TEST RESULTS

GSM	
CHANNEL 512	**CHANNEL 661**
FREQUENCY RANGE : 30MHz~19.1GHz	**FREQUENCY RANGE : 30MHz~19.1GHz**
	
CHANNEL 810	
FREQUENCY RANGE : 30MHz~19.1GHz	
	

EDGE	
CHANNEL 512	CHANNEL 661
FREQUENCY RANGE : 30MHz~19.1GHz	FREQUENCY RANGE : 30MHz~19.1GHz
	
CHANNEL 810	
FREQUENCY RANGE : 30MHz~19.1GHz	
	

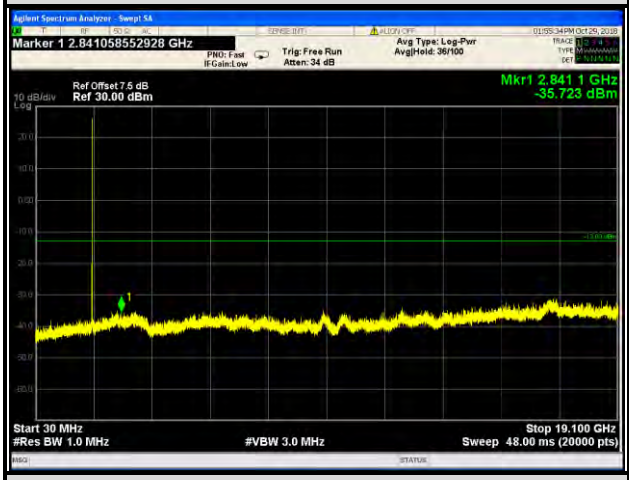
CDMA BC1	
CHANNEL 25	CHANNEL 600
FREQUENCY RANGE : 30MHz~19.0GHz	FREQUENCY RANGE : 30MHz~19.0GHz
	
CHANNEL 1175	
FREQUENCY RANGE : 30MHz~19.0GHz	
	

LTE BAND 2

1.4MHz / QPSK

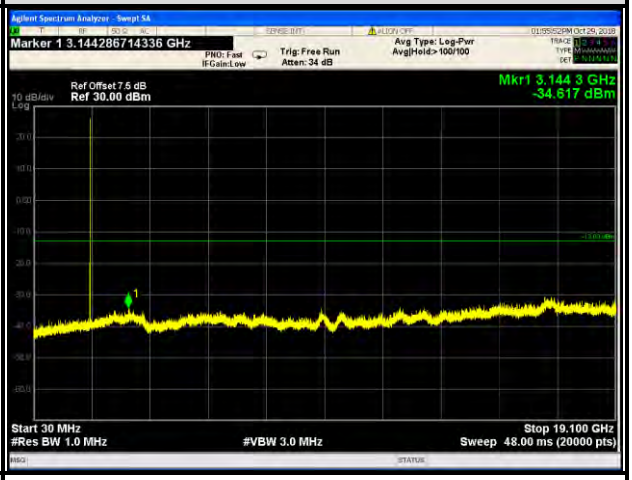
CHANNEL 18607

FREQUENCY RANGE : 30MHz~19.1GHz



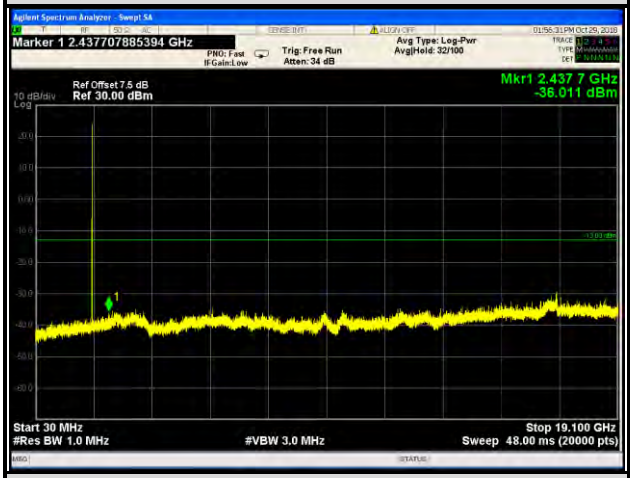
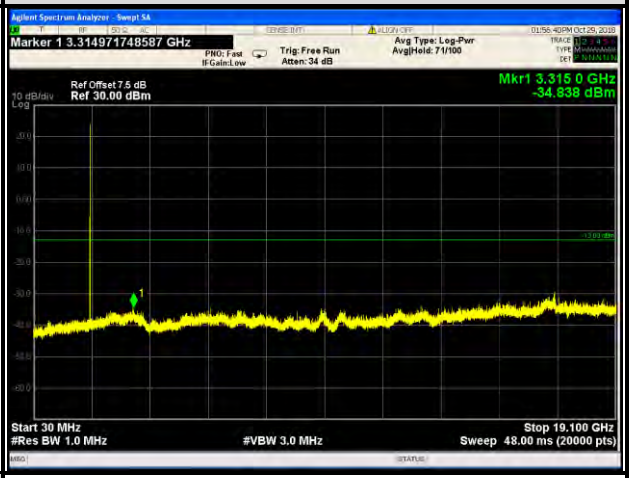
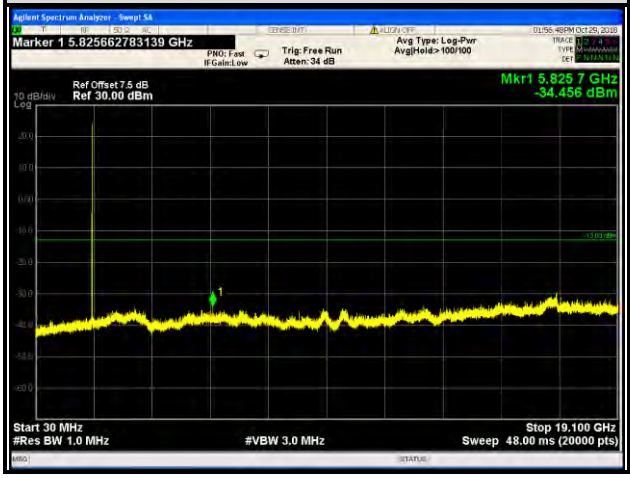
CHANNEL 18900

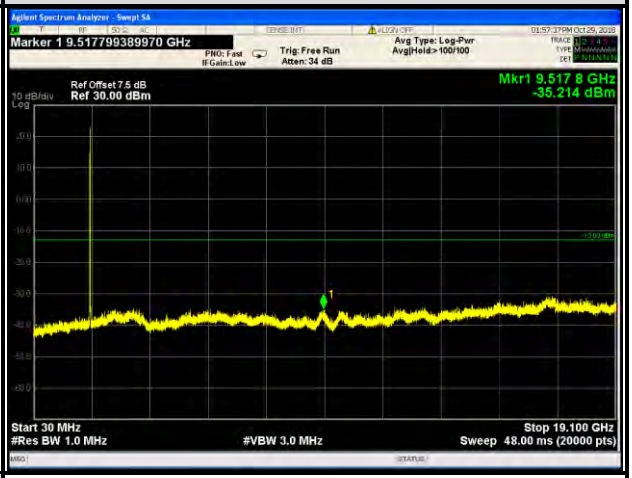
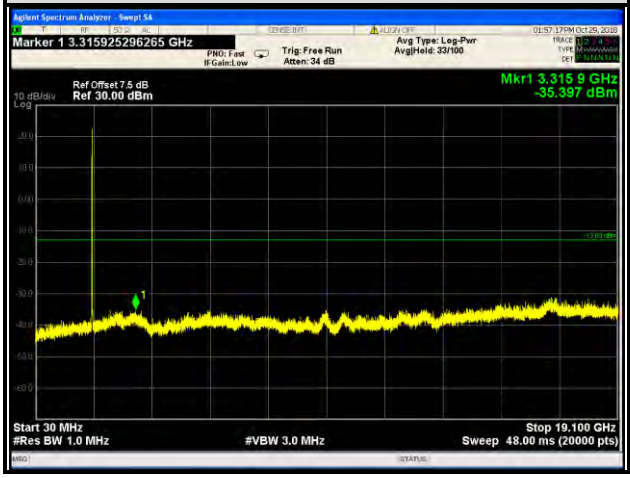
FREQUENCY RANGE : 30MHz~19.1GHz

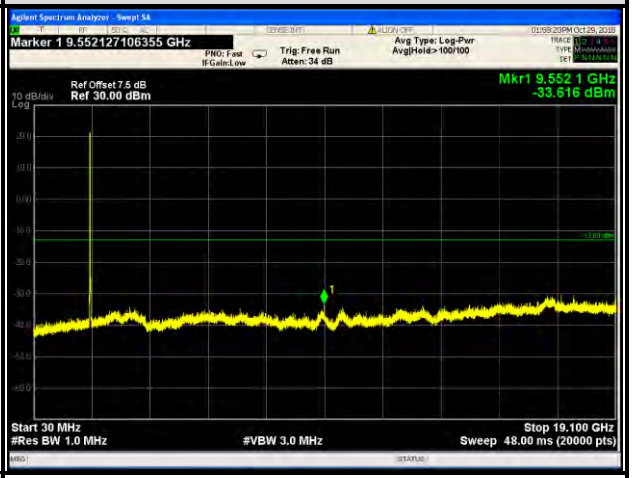
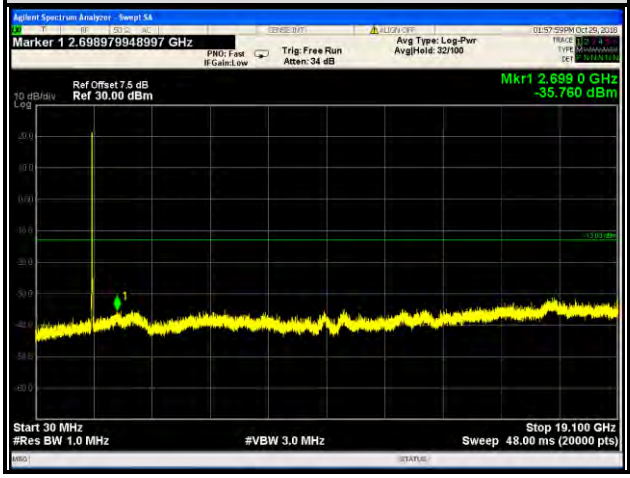


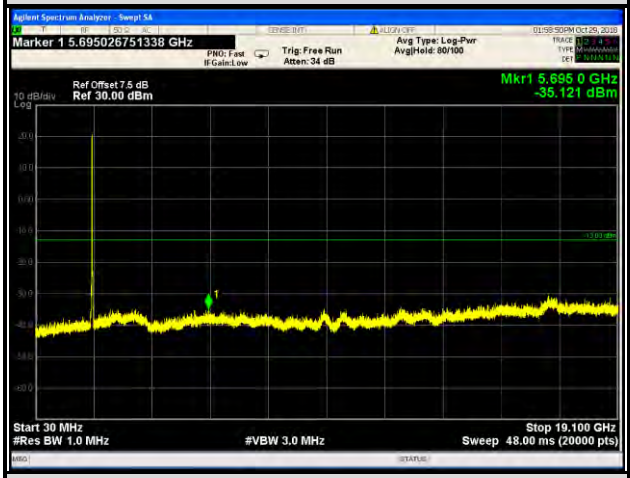
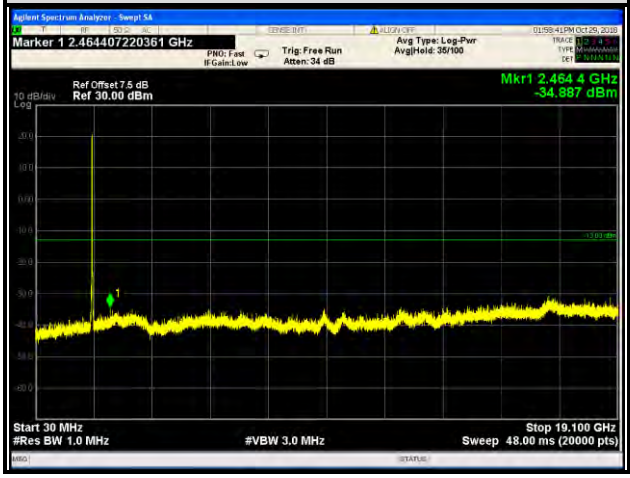
CHANNEL 19193

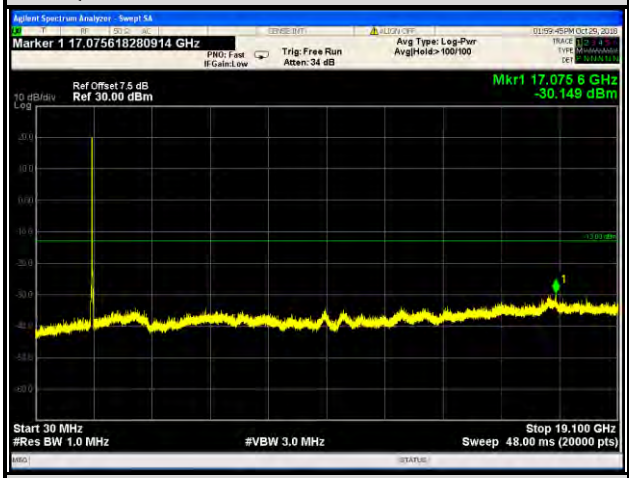
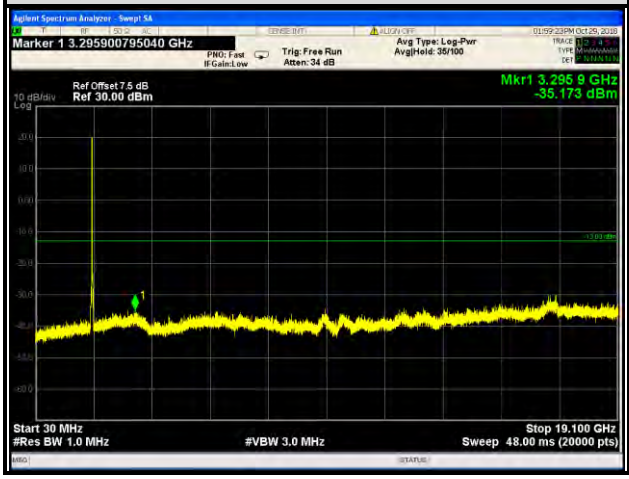
FREQUENCY RANGE : 30MHz~19.1GHz

3MHz / QPSK	
CHANNEL 18615	CHANNEL 18900
FREQUENCY RANGE : 30MHz~19.1GHz	FREQUENCY RANGE : 30MHz~19.1GHz
	
CHANNEL 19185	
FREQUENCY RANGE : 30MHz~19.1GHz	
	

5MHz / QPSK	
CHANNEL 18625	CHANNEL 18900
FREQUENCY RANGE : 30MHz~19.1GHz	FREQUENCY RANGE : 30MHz~19.1GHz
	
CHANNEL 19175	
FREQUENCY RANGE : 30MHz~19.1GHz	
	

10MHz / QPSK	
CHANNEL 18650	CHANNEL 18900
FREQUENCY RANGE : 30MHz~19.1GHz	FREQUENCY RANGE : 30MHz~19.1GHz
	
CHANNEL 19150	
FREQUENCY RANGE : 30MHz~19.1GHz	
	

15MHz / QPSK	
CHANNEL 18675	CHANNEL 18900
FREQUENCY RANGE : 30MHz~19.1GHz	FREQUENCY RANGE : 30MHz~19.1GHz
	
CHANNEL 19125	
FREQUENCY RANGE : 30MHz~19.1GHz	
	

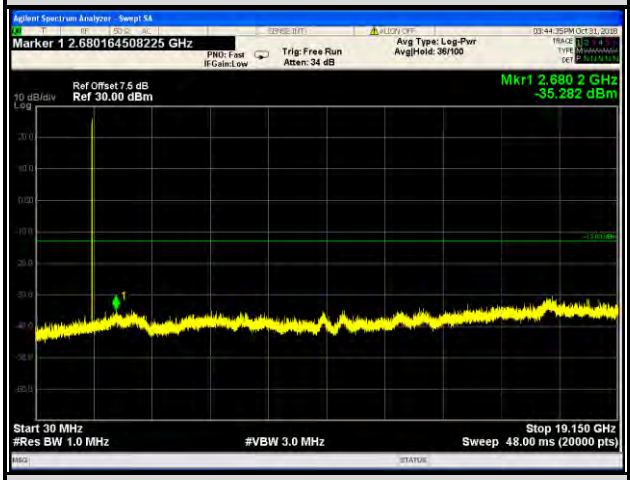
20MHz / QPSK	
CHANNEL 18700	CHANNEL 18900
FREQUENCY RANGE : 30MHz~19.1GHz	FREQUENCY RANGE : 30MHz~19.1GHz
	
CHANNEL 19100	
FREQUENCY RANGE : 30MHz~19.1GHz	
	

LTE BAND 25

1.4MHz / QPSK

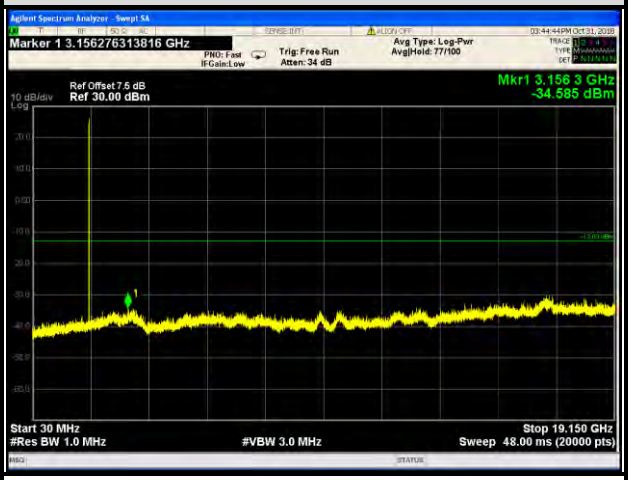
CHANNEL 26047

FREQUENCY RANGE : 30MHz~19.15GHz



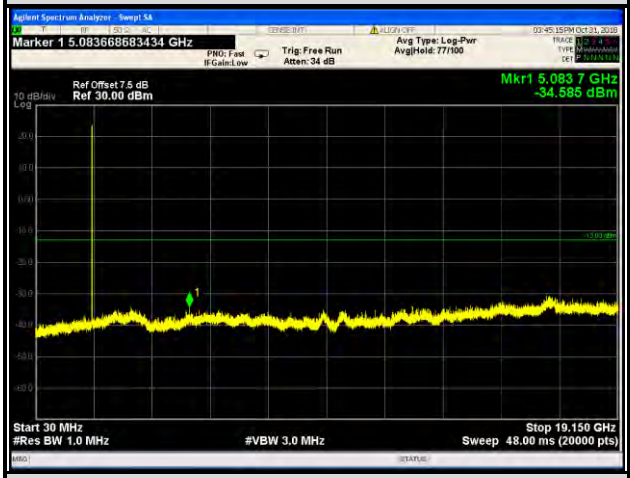
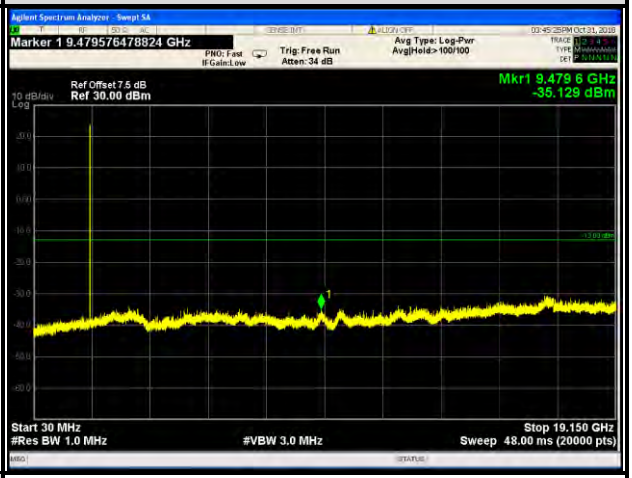
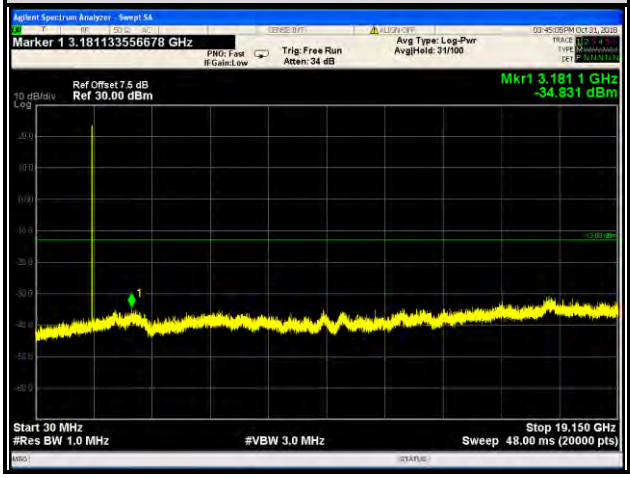
CHANNEL 26365

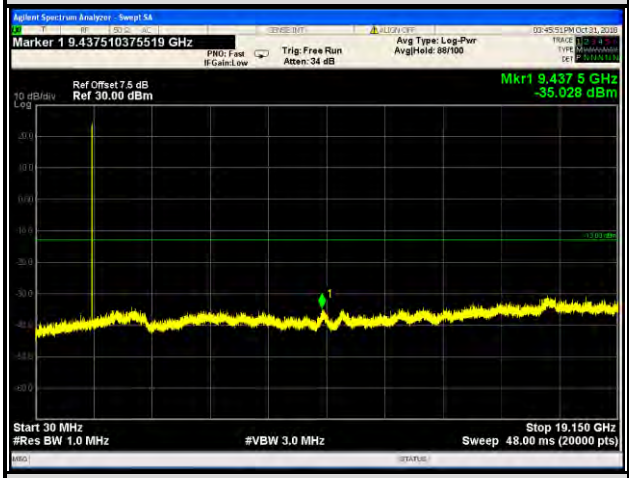
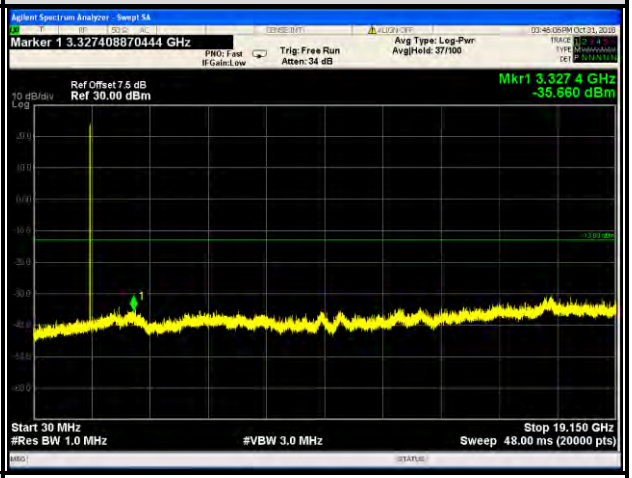
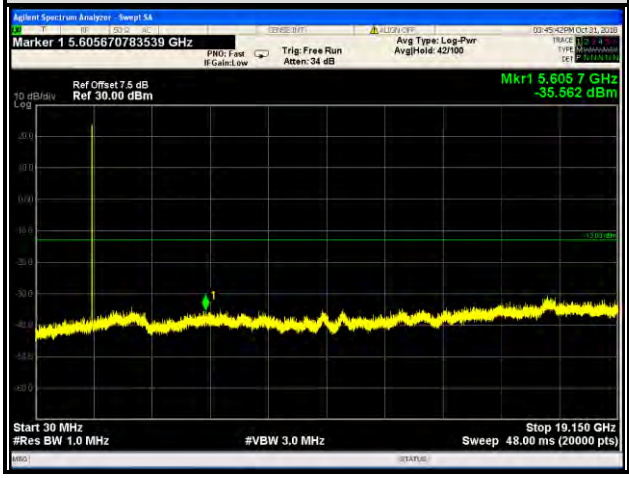
FREQUENCY RANGE : 30MHz~19.15GHz

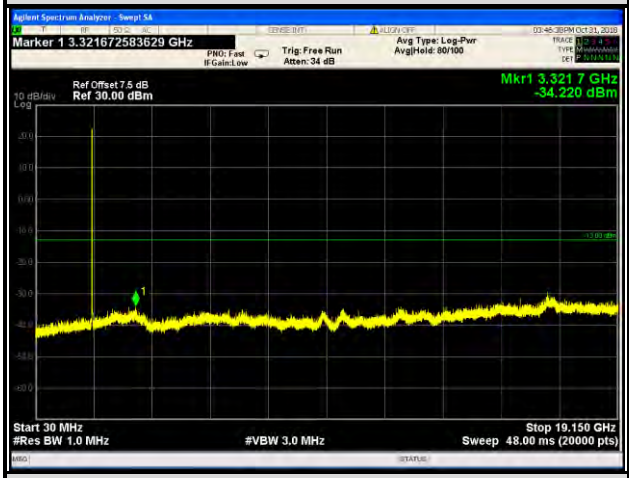
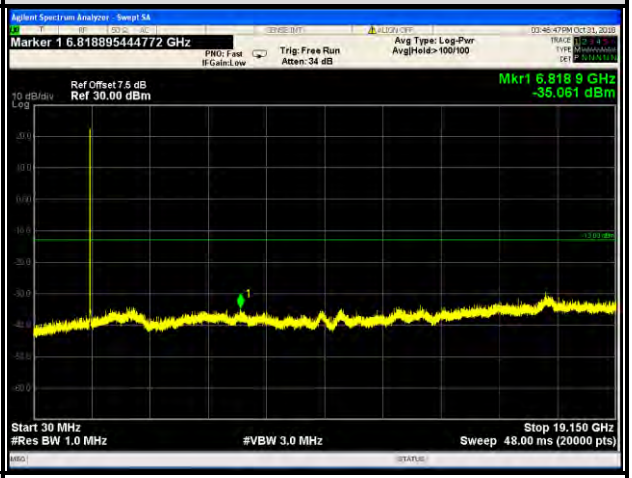
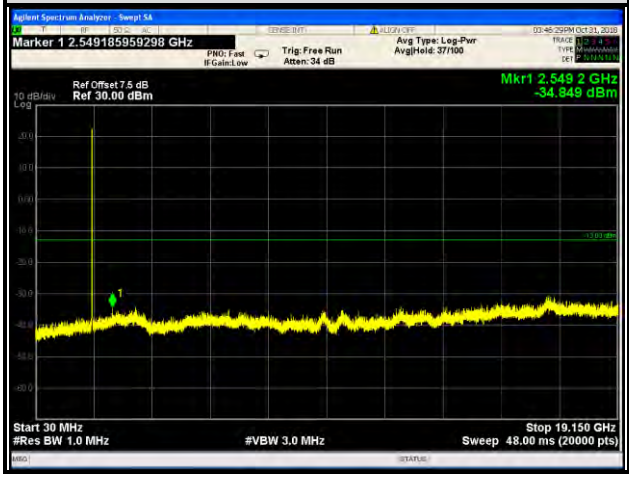


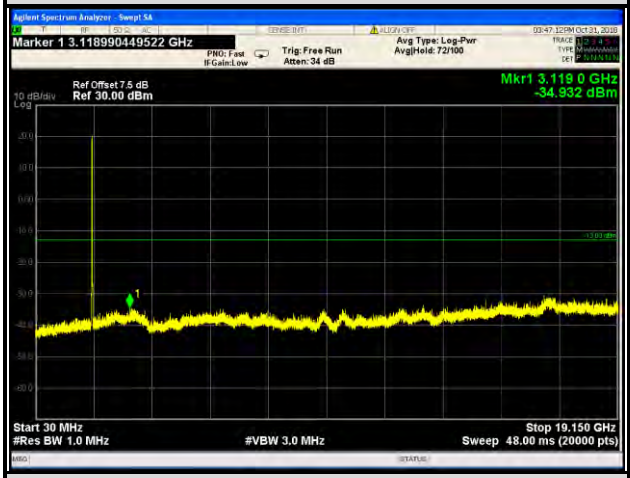
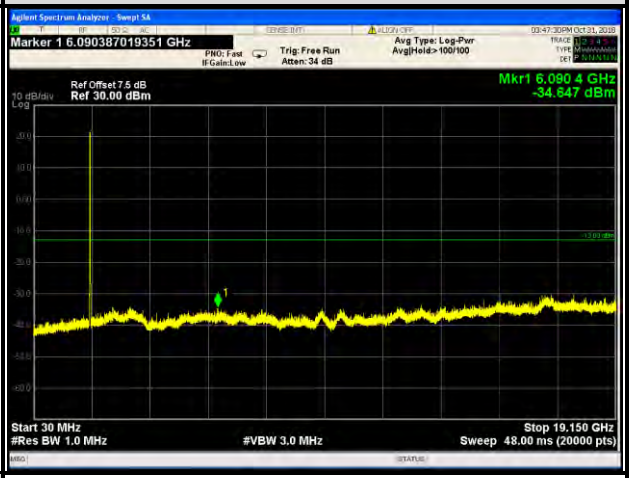
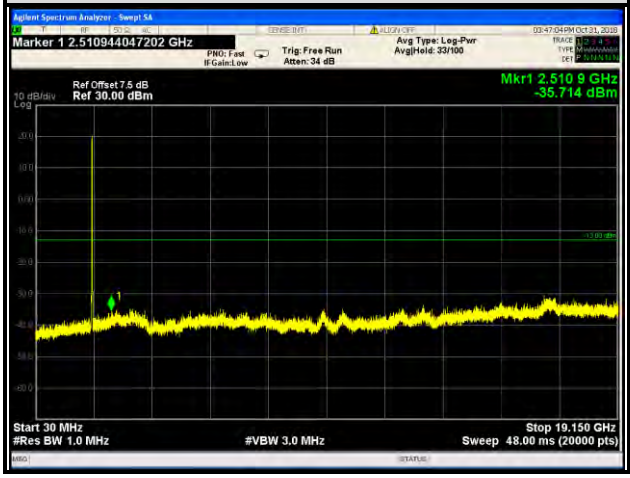
CHANNEL 26683

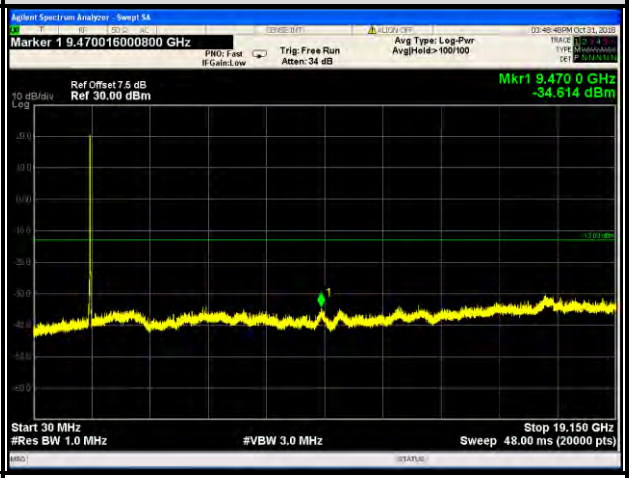
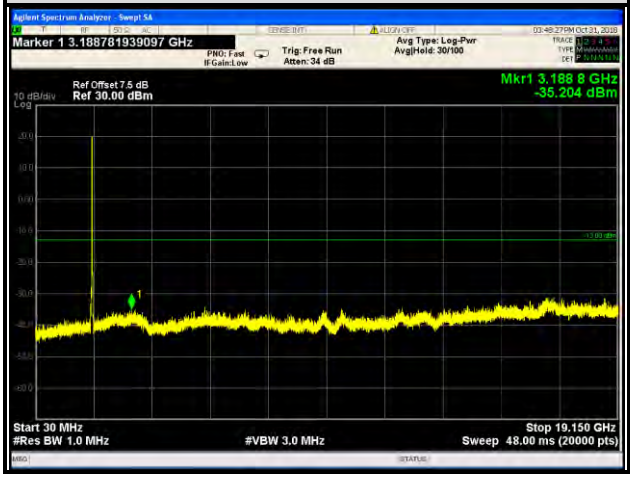
FREQUENCY RANGE : 30MHz~19.15GHz

3MHz / QPSK	
CHANNEL 26055	CHANNEL 26365
FREQUENCY RANGE : 30MHz~19.15GHz	FREQUENCY RANGE : 30MHz~19.15GHz
	
CHANNEL 26675	
FREQUENCY RANGE : 30MHz~19.15GHz	
	

5MHz / QPSK	
CHANNEL 26065	CHANNEL 26365
FREQUENCY RANGE : 30MHz~19.15GHz	FREQUENCY RANGE : 30MHz~19.15GHz
	
CHANNEL 26665	
FREQUENCY RANGE : 30MHz~19.15GHz	
	

10MHz / QPSK	
CHANNEL 26090	CHANNEL 26365
FREQUENCY RANGE : 30MHz~19.15GHz	FREQUENCY RANGE : 30MHz~19.15GHz
	
CHANNEL 26640	
FREQUENCY RANGE : 30MHz~19.15GHz	
	

15MHz / QPSK	
CHANNEL 26115	CHANNEL 26365
FREQUENCY RANGE : 30MHz~19.15GHz	FREQUENCY RANGE : 30MHz~19.15GHz
	
CHANNEL 26615	
FREQUENCY RANGE : 30MHz~19.15GHz	
	

20MHz / QPSK	
CHANNEL 26140	CHANNEL 26365
FREQUENCY RANGE : 30MHz~19.15GHz	FREQUENCY RANGE : 30MHz~19.15GHz
	
CHANNEL 26590	
FREQUENCY RANGE : 30MHz~19.15GHz	
	

3.6 RADIATED EMISSION MEASUREMENT

3.6.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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 + 10 log(P) dB. The emission limit equal to –13dBm.

3.6.2 TEST PROCEDURES

a. 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.

b. 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 a. Record the power level of S.G

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

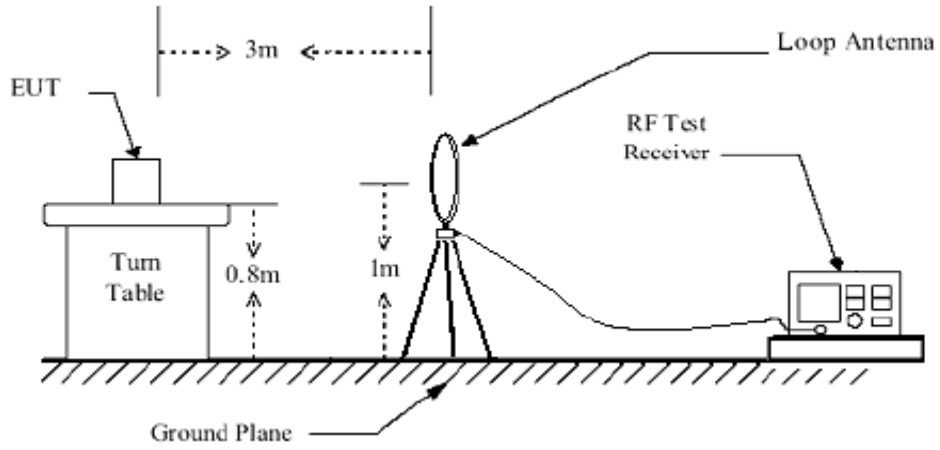
NOTE: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

3.6.3 DEVIATION FROM TEST STANDARD

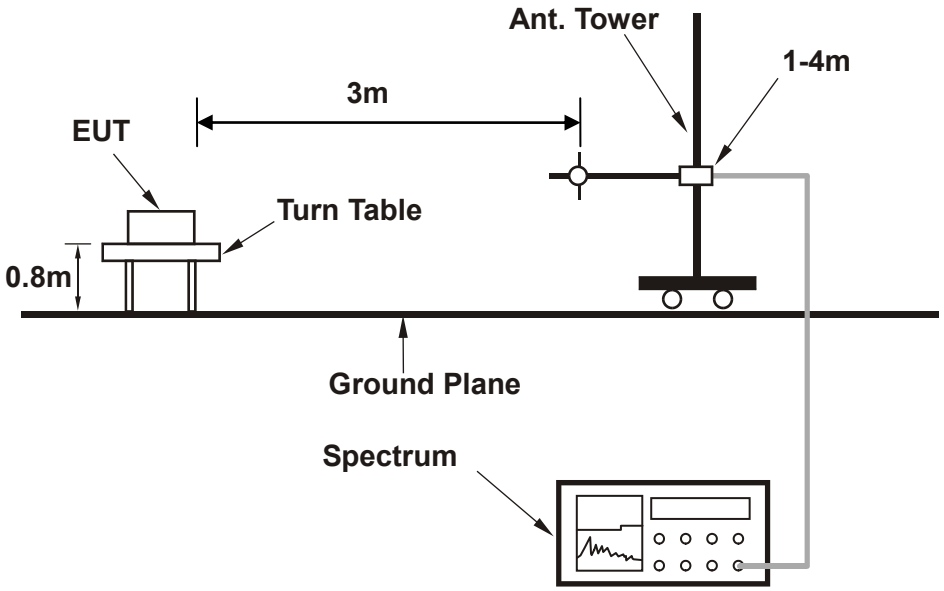
No deviation

3.6.4 TEST SETUP

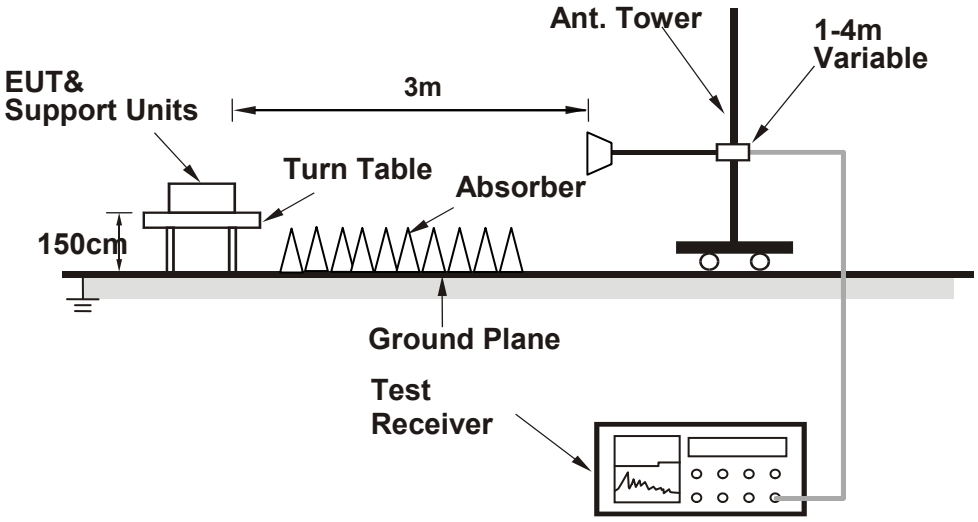
<Below 30MHz>



< Frequency Range 30MHz~1GHz >



< Frequency Range above 1GHz >



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

3.6.5 TEST RESULTS

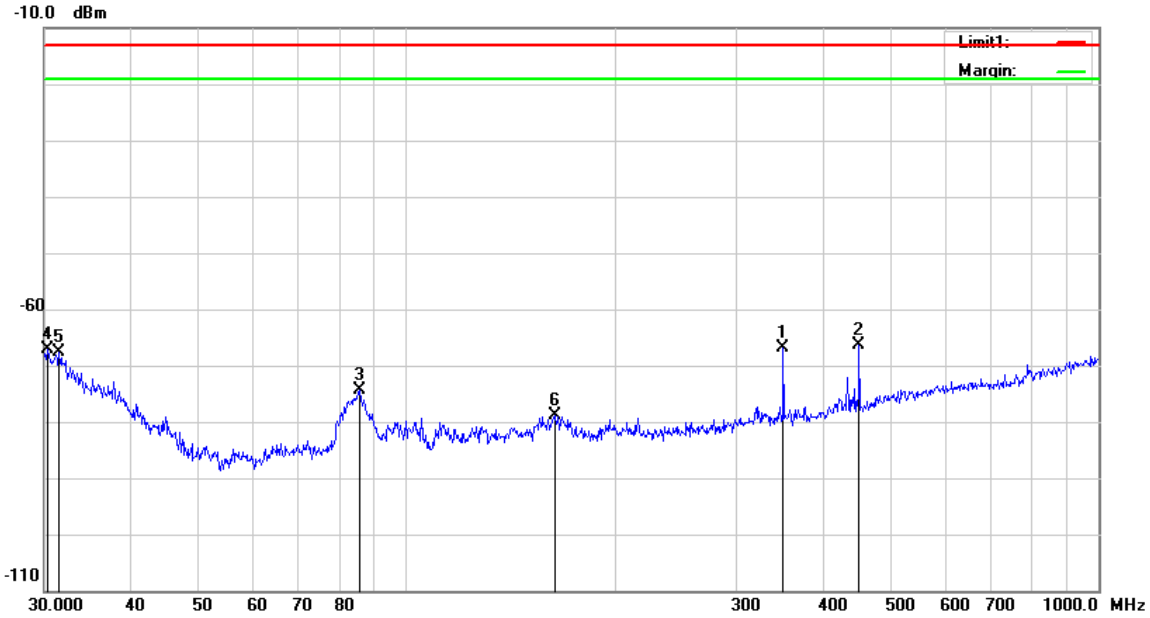
BELOW 1GHz WORST-CASE DATA

9 KHz – 30 KHz data: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required in the report.

30 MHz – 1GHz data:

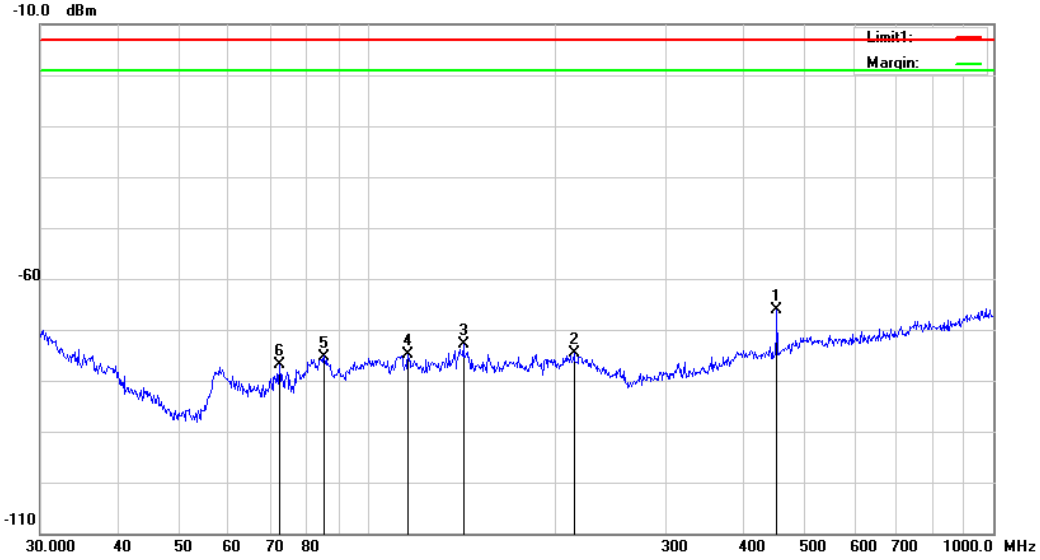
EDGE 1900:

MODE	TX channel 189	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	22deg. C, 68%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Simon Lin		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			



No.	Frequency	Reading	Result	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dBm)	(dB)
1	350.4768	-69.12	-66.76	-13.00	-53.76
2	451.1350	-70.78	-66.40	-13.00	-53.40
3	85.5977	-71.13	-74.35	-13.00	-61.35
4	30.3173	-80.86	-67.03	-13.00	-54.03
5	31.5095	-80.48	-67.74	-13.00	-54.74
6	164.3302	-79.43	-78.92	-13.00	-65.92

MODE	TX channel 189	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	22deg. C, 68%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Simon Lin		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			



No.	Frequency	Reading	Result	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dBm)	(dB)
1	451.1350	-72.85	-66.04	-13.00	-53.04
2	213.7634	-77.61	-74.70	-13.00	-61.70
3	142.3244	-77.89	-72.90	-13.00	-59.90
4	116.1321	-80.08	-74.77	-13.00	-61.77
5	85.2981	-77.07	-75.25	-13.00	-62.25
6	72.3376	-75.84	-76.98	-13.00	-63.98

ABOVE 1GHz DATA

Note: For higher frequency, the emission is too low to be detected.

PCS 1900:

Low channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3700.4	V	-30.82	-13	-17.82
3700.4	H	-37.47	-13	-24.47

Middle channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3760	V	-35.99	-13	-22.99
3760	H	-31.53	-13	-18.53

High channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3819.6	V	-29.68	-13	-16.68
3819.6	H	-29.65	-13	-16.65

Note:

*1, The testing has been conformed to 10*1909.8MHz=19,098MHz*
2, All other emissions more than 30 dB below the limit
3, X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case.
4, The radiated spurious test above 18GHz is subcontracted to Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch Laboratories and found 30dB below the limit at least.

EDGE 1900:

Low channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3700.4	V	-30.88	-13	-17.88
3700.4	H	-33.09	-13	-20.09

Middle channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3760	V	-32.34	-13	-19.34
3760	H	-35.84	-13	-22.84

High channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3819.6	V	-34.7	-13	-21.7
3819.6	H	-36.1	-13	-23.1

Note:

*1, The testing has been conformed to 10*1909.8MHz=19,098MHz*
2, All other emissions more than 30 dB below the limit
3, X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case.
4, The radiated spurious test above 18GHz is subcontracted to Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch Laboratories and found 30dB below the limit at least.

CDMA2000 BC1:

Low channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3702.5	V	-31.31	-13	-18.31
3702.5	H	-33.37	-13	-20.37

Middle channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3760	V	-31.61	-13	-18.61
3760	H	-38.1	-13	-25.1

High channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3817.5	V	-32.78	-13	-19.78
3817.5	H	-29.85	-13	-16.85

Note:

*1, The testing has been conformed to 10*1908.75MHz=19,088MHz*
2, All other emissions more than 30 dB below the limit
3, X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case.
4, The radiated spurious test above 18GHz is subcontracted to Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch Laboratories and found 30dB below the limit at least.

LTE Band 2:

20M QPSK

Low channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3720	V	-25.16	-13	-12.16
3720	H	-25.88	-13	-12.88

Middle channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3760	V	-28.63	-13	-15.63
3760	H	-26.79	-13	-13.79

High channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3800	V	-32.31	-13	-19.31
3800	H	-32.97	-13	-19.97

Note:

*1, The testing has been conformed to 10*1909.3MHz=19,093MHz*
2, All other emissions more than 30 dB below the limit
3, X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case.
4, The radiated spurious test above 18GHz is subcontracted to Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch Laboratories and found 30dB below the limit at least.

LTE Band 25:

20M QPSK

Low channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3720	V	-28.55	-13	-15.55
3720	H	-29.18	-13	-16.18

Middle channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3765	V	-28.78	-13	-15.78
3765	H	-28.28	-13	-15.28

High channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3810	V	-34.86	-13	-21.86
3810	H	-27.6	-13	-14.6

Note:

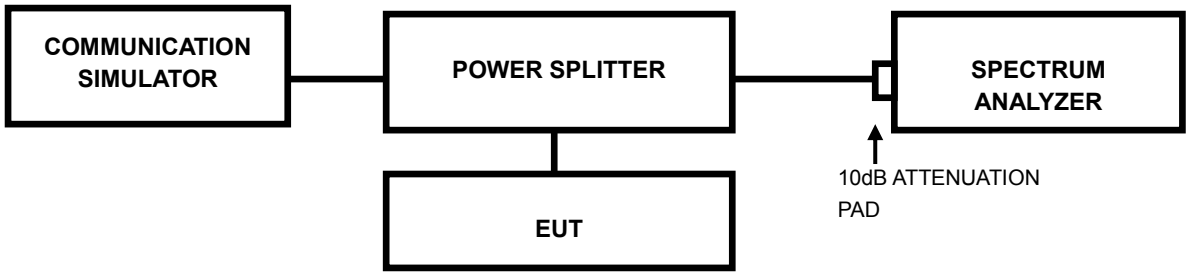
*1, The testing has been conformed to 10*1914.3MHz=19,143MHz*
2, All other emissions more than 30 dB below the limit
3, X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case.
4, The radiated spurious test above 18GHz is subcontracted to Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch Laboratories and found 30dB below the limit at least.

3.7 PEAK TO AVERAGE RATIO

3.7.1 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

3.7.2 TEST SETUP



3.7.3 TEST PROCEDURES

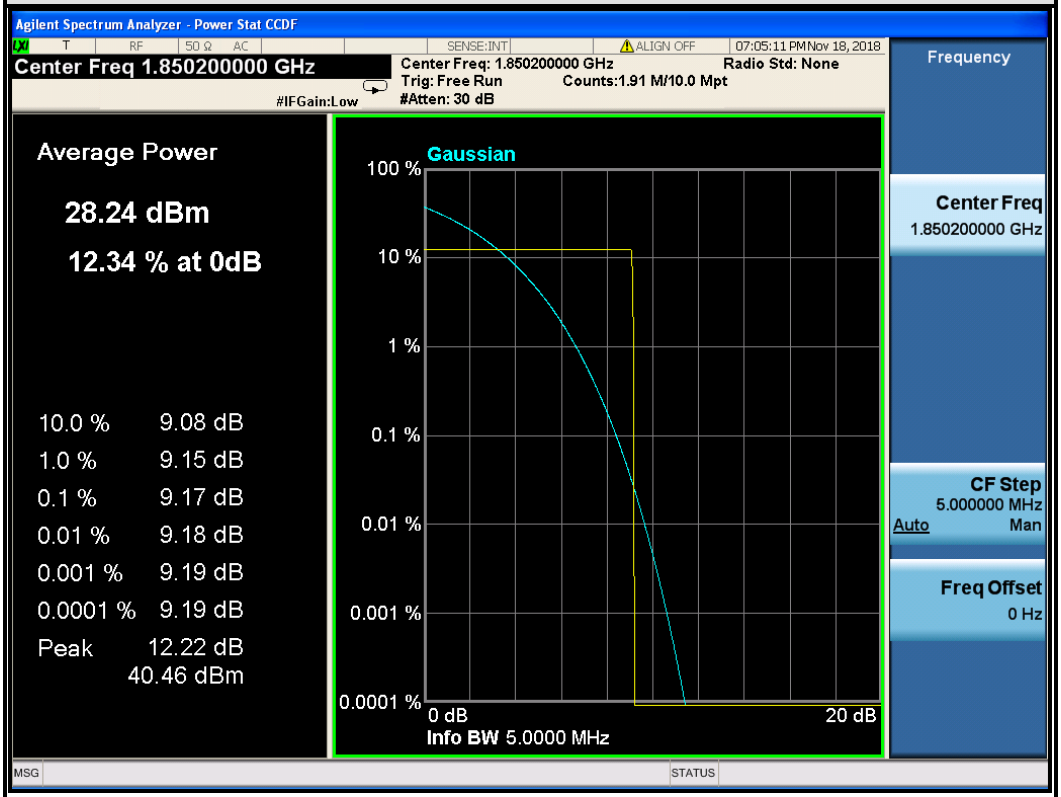
1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1%.

3.7.4 TEST RESULTS

GSM

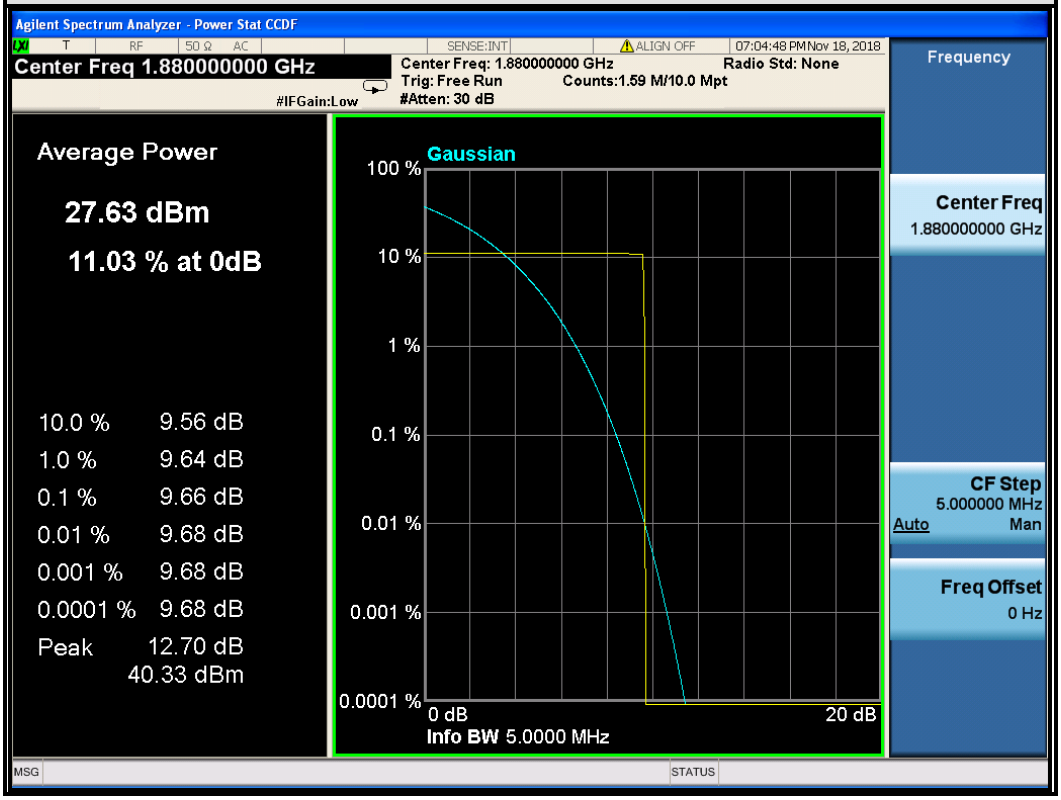
CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
512	1850.2	9.17

SPECTRUM PLOT OF WORST VALUE



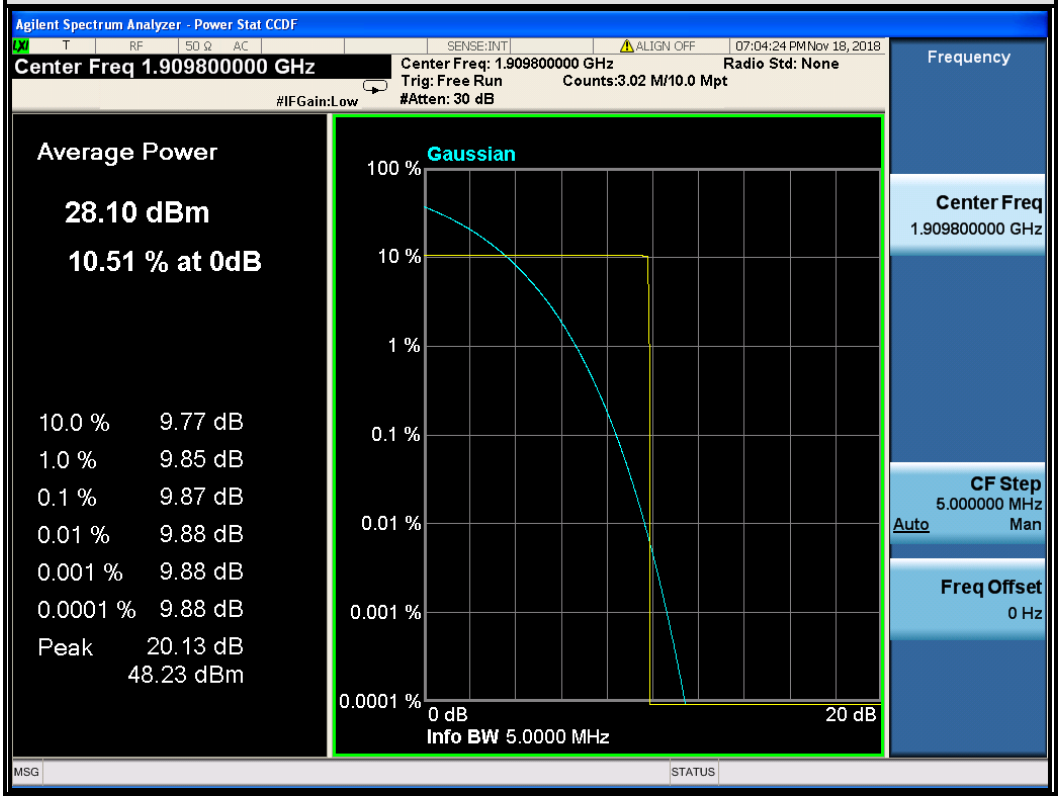
CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
661	1880	9.66

SPECTRUM PLOT OF WORST VALUE



CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
810	1909.8	9.87

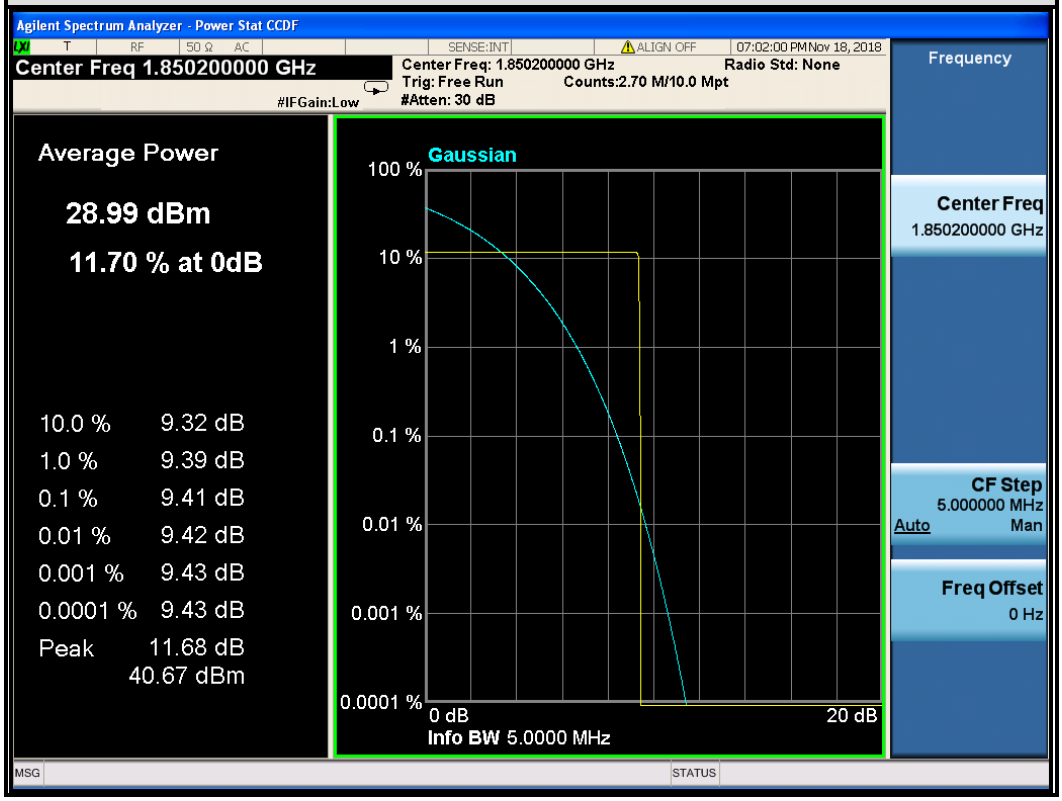
SPECTRUM PLOT OF WORST VALUE



EDGE

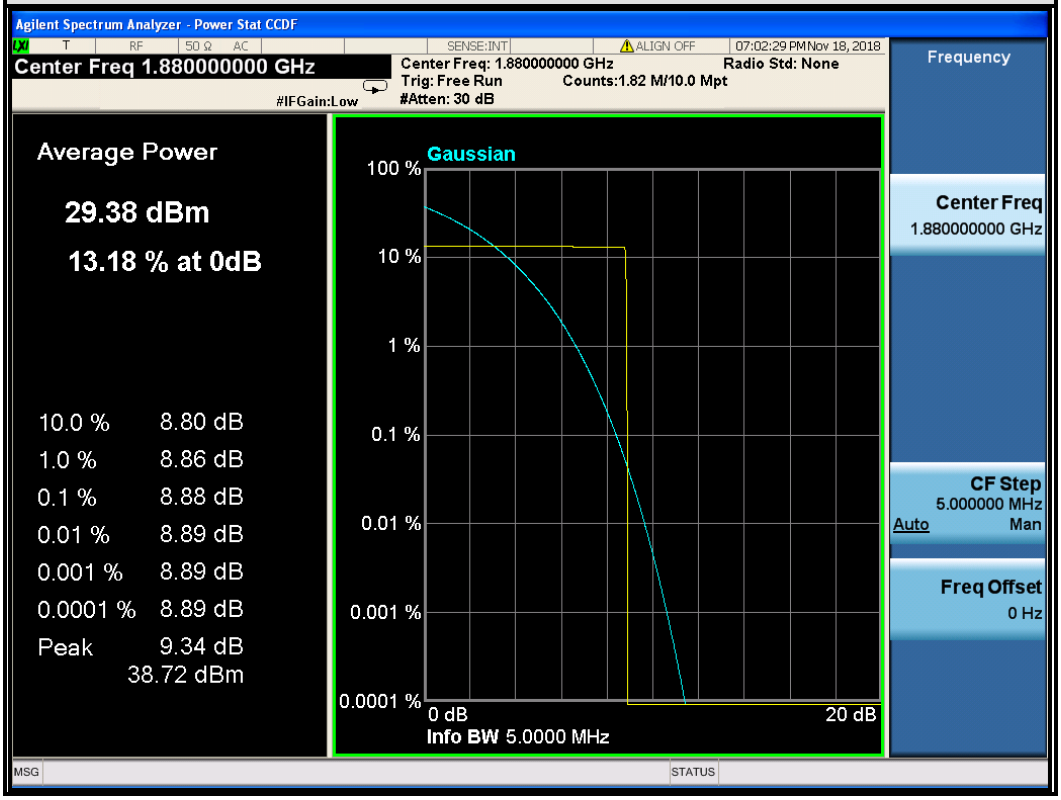
CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
512	1850.2	9.41

SPECTRUM PLOT OF WORST VALUE



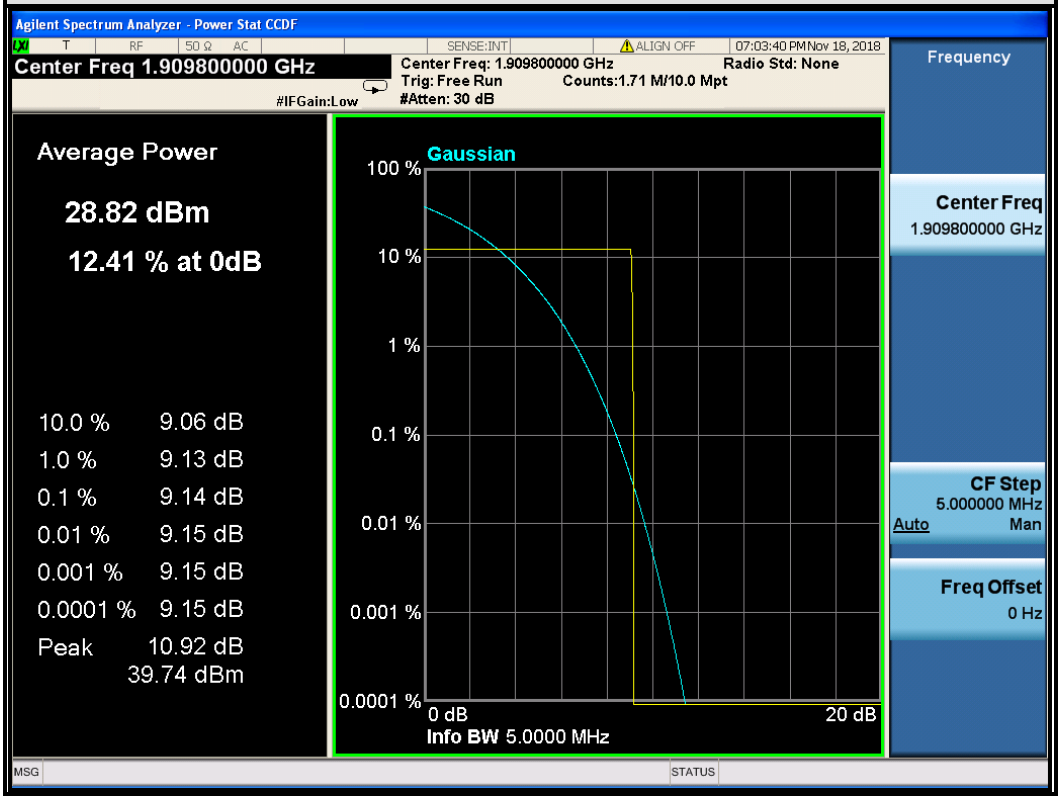
CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
661	1880	8.88

SPECTRUM PLOT OF WORST VALUE



CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
810	1909.8	9.14

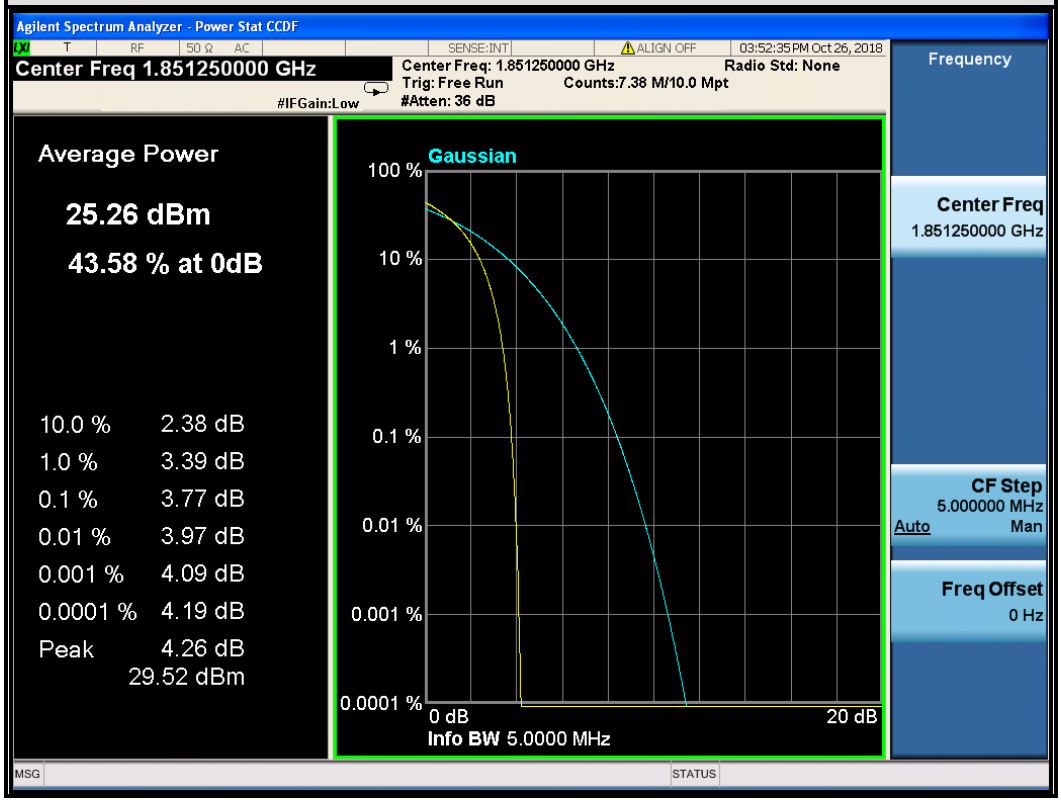
SPECTRUM PLOT OF WORST VALUE



CDMA BC1

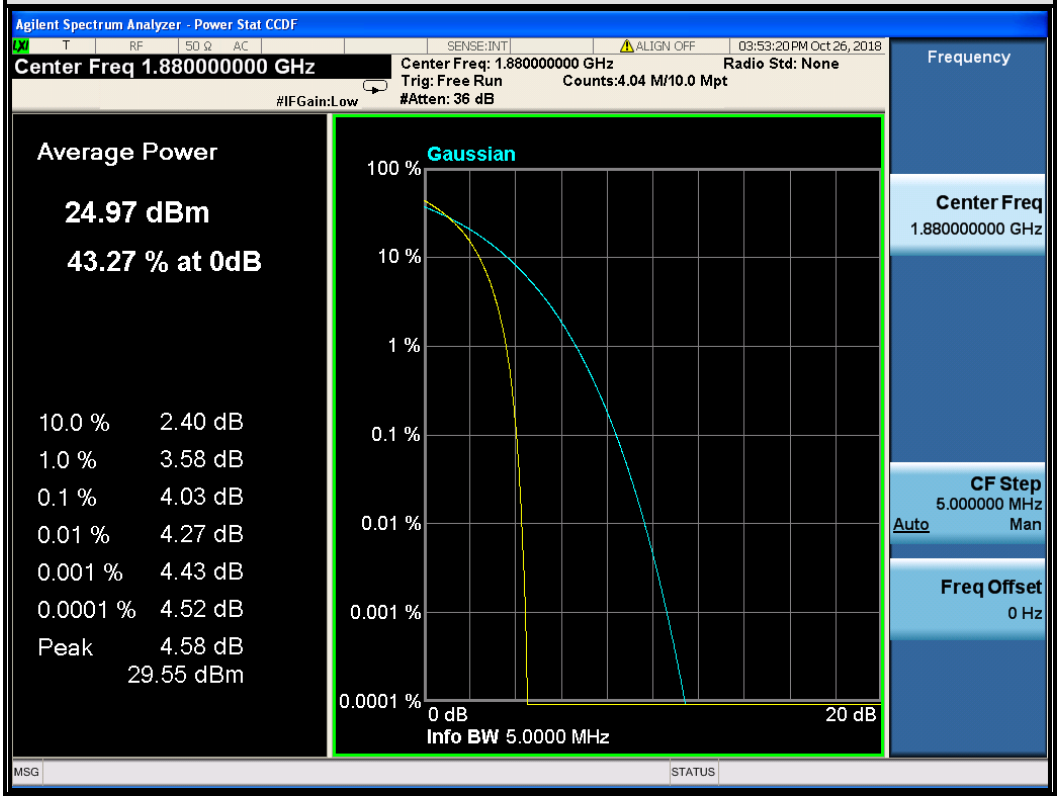
CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
25	1851.2	3.77

SPECTRUM PLOT OF WORST VALUE



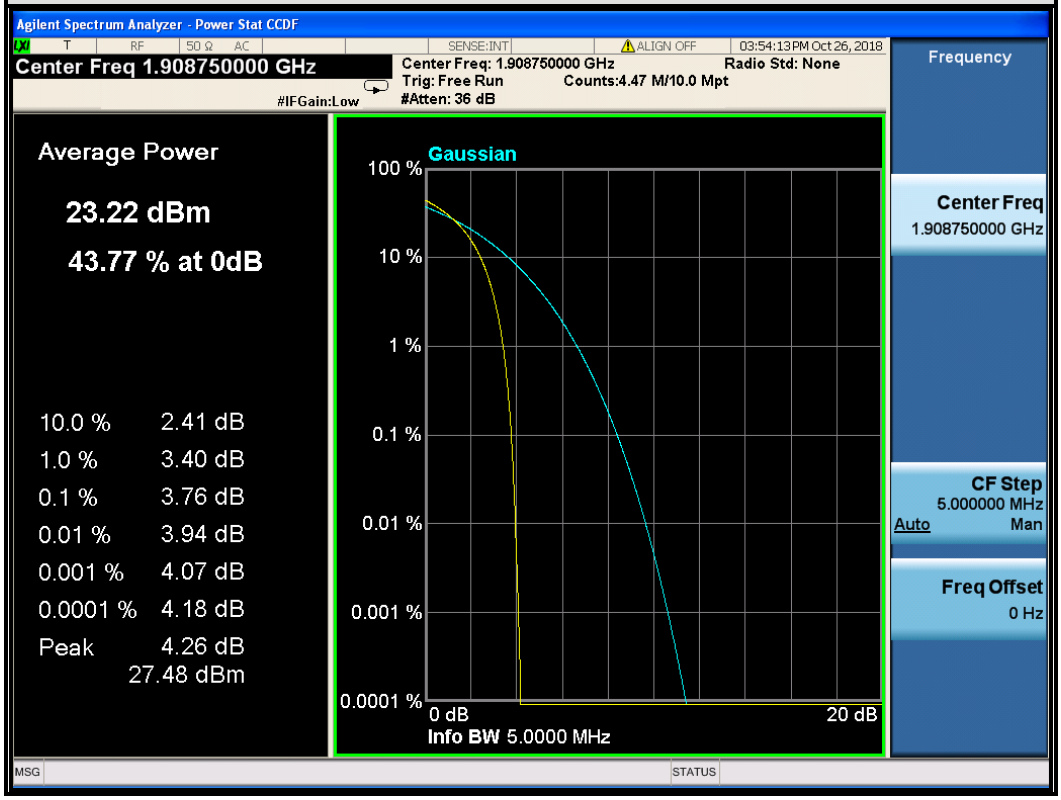
CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
600	1880	4.03

SPECTRUM PLOT OF WORST VALUE



CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
1175	1908.8	3.76

SPECTRUM PLOT OF WORST VALUE



LTE BAND 2

CHANNEL BANDWIDTH: 1.4MHz				CHANNEL BANDWIDTH: 3MHz			
CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)		CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM			QPSK	16QAM
18607	1850.7	4.60	5.45	18615	1851.5	4.86	4.77
18900	1880	4.76	5.57	18900	1880	4.94	5.63
19193	1909.3	4.65	5.28	19185	1908.5	4.96	5.68

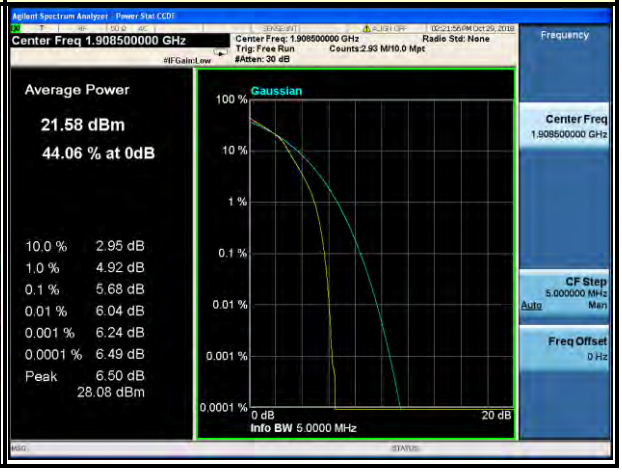
SPECTRUM PLOT OF WORST VALUE

1.4MHz / QPSK

1.4MHz / 16QAM

3MHz / QPSK

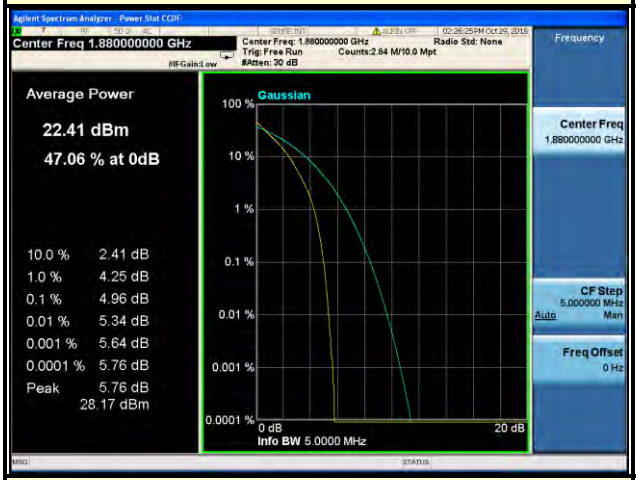
3MHz / 16QAM



CHANNEL BANDWIDTH: 5MHz				CHANNEL BANDWIDTH: 10MHz			
CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)		CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM			QPSK	16QAM
18625	1852.5	4.86	5.65	18650	1855	4.62	4.77
18900	1880	4.96	5.07	18900	1880	4.63	6.02
19175	1907.5	4.90	5.68	19150	1905	4.58	5.99

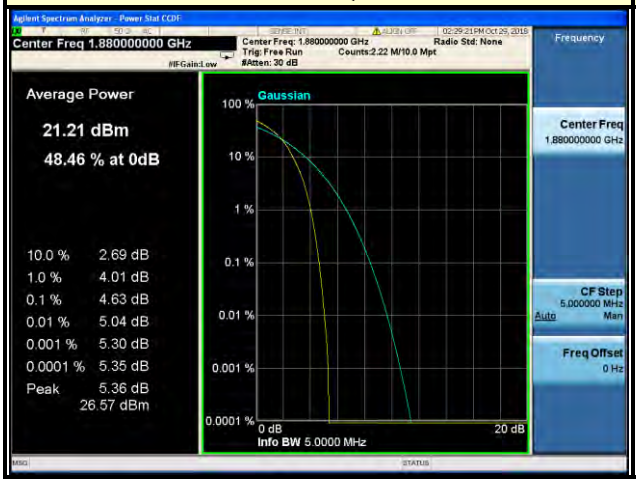
SPECTRUM PLOT OF WORST VALUE

5MHz / QPSK



5MHz / 16QAM

10MHz / QPSK

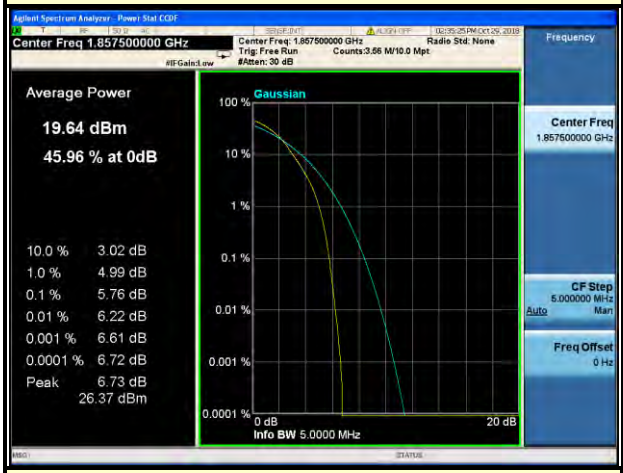


10MHz / 16QAM

CHANNEL BANDWIDTH: 15MHz				CHANNEL BANDWIDTH: 20MHz			
CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)		CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM			QPSK	16QAM
18675	1857.5	5.76	5.97	18700	1860	6.48	6.61
18900	1880	5.63	6.41	18900	1880	6.48	6.71
19125	1902.5	5.75	5.87	19100	1900	6.40	6.58

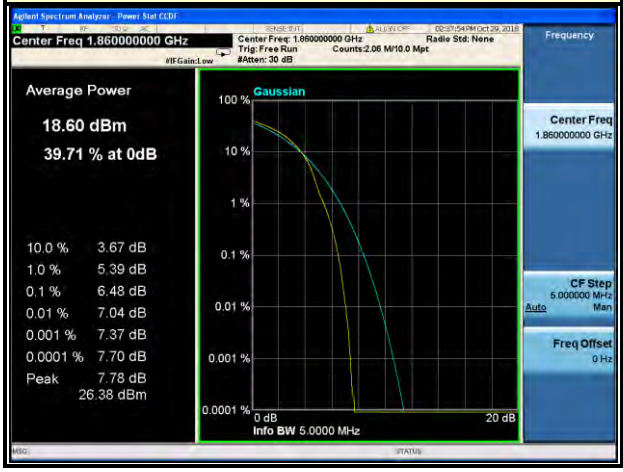
SPECTRUM PLOT OF WORST VALUE

15MHz / QPSK

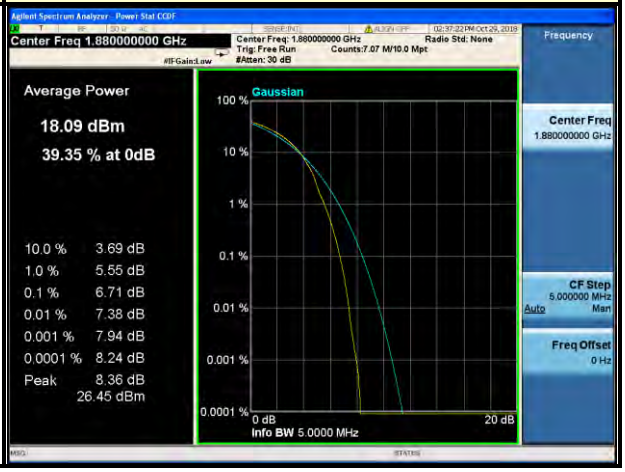


15MHz / 16QAM

20MHz / QPSK



20MHz / 16QAM



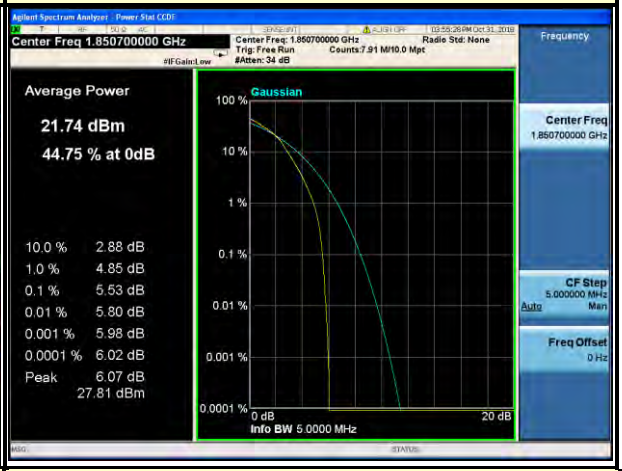
LTE BAND 25

CHANNEL BANDWIDTH: 1.4MHz				CHANNEL BANDWIDTH: 3MHz			
CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)		CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM			QPSK	16QAM
26047	1850.7	4.80	5.53	26055	1851.5	4.78	5.64
26365	1880	4.94	5.21	26365	1880	4.99	5.80
26683	1914.3	4.05	4.94	26675	1913.5	4.21	4.87

SPECTRUM PLOT OF WORST VALUE

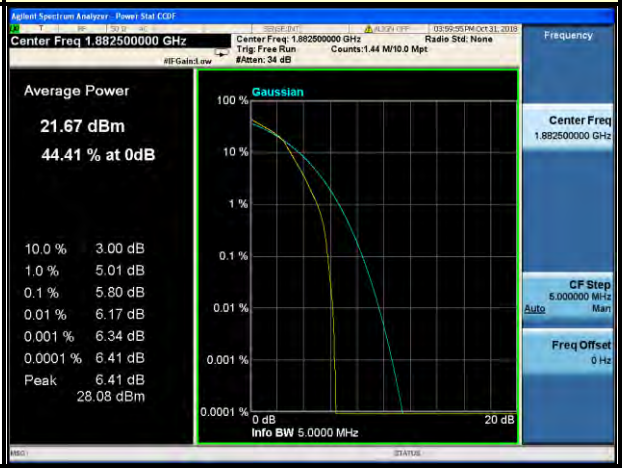
1.4MHz / QPSK

1.4MHz / 16QAM



3MHz / QPSK

3MHz / 16QAM

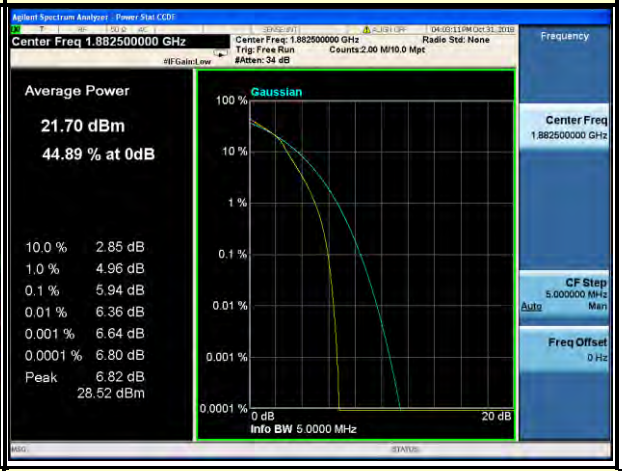


CHANNEL BANDWIDTH: 5MHz				CHANNEL BANDWIDTH: 10MHz			
CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)		CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM			QPSK	16QAM
26065	1852.5	5.06	5.32	26090	1855	4.63	5.77
26365	1880	5.17	5.94	26365	1880	5.73	5.20
26665	1912.5	4.73	5.05	26640	1910	4.65	5.13

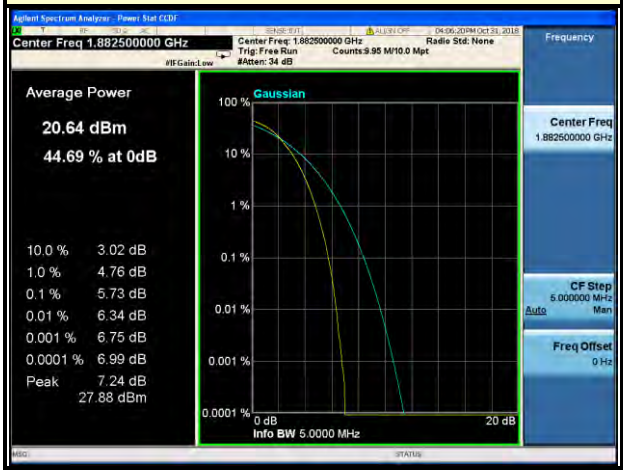
SPECTRUM PLOT OF WORST VALUE

5MHz / QPSK

5MHz / 16QAM



10MHz / QPSK



10MHz / 16QAM

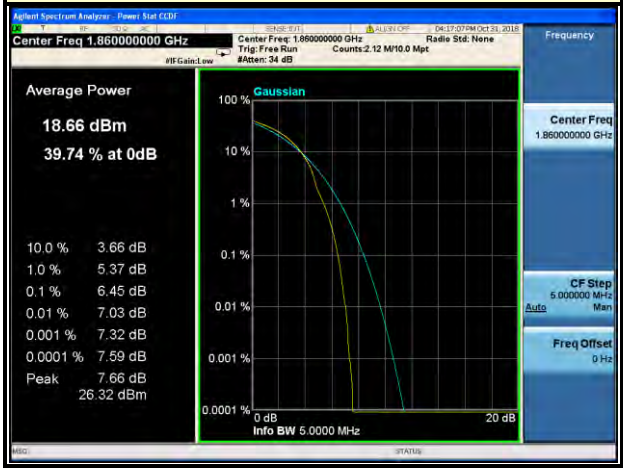
CHANNEL BANDWIDTH: 15MHz				CHANNEL BANDWIDTH: 20MHz			
CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)		CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM			QPSK	16QAM
26115	1857.5	5.76	5.90	26140	1860	6.45	6.58
26365	1880	5.76	5.91	26365	1880	6.45	6.58
26615	1907.5	5.79	6.20	26590	1905	6.44	6.79

SPECTRUM PLOT OF WORST VALUE

15MHz / QPSK

15MHz / 16QAM

20MHz / QPSK



20MHz / 16QAM

4 INFORMATION ON THE TESTING LABORATORIES

We, BV 7LAYERS COMMUNICATIONS TECHNOLOGY (SHENZHEN) CO. LTD., were founded in 2015 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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Email: customerservice.dg@cn.bureauveritas.com
Web Site: www.adt.com.tw

The address and road map of all our labs can be found in our web site also.

5 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

---END---