Test Lab
Cert 2951.01

FCC TEST REPORT

(PART 24)

Product:	WCDMA Digital Mobile Handset
Model Name:	ZTE Blade L315
FCC ID:	SRQ-L315
Applicant:	ZTE Corporation
Address:	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, P.R.China
Manufacturer:	ZTE Corporation
Address:	ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, P.R.China
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Report No.:	RF160728W004-4
Received Date:	Jul. 28, 2016
Test Date:	Jul. 29, 2016 ~ Aug. 14, 2016
Issued Date:	Aug. 15, 2016

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF160728W004-4	Original release	Aug. 15, 2016

1 CERTIFICATION

PRODUCT: WCDMA Digital Mobile Handset
BRAND NAME: ZTE
MODEL NAME: ZTE Blade L315
APPLICANT: ZTE Corporation
TESTED: Jul. 29, 2016 ~ Aug. 14, 2016
TEST SAMPLE: Identical Prototype
STANDARDS: **FCC Part 24, Subpart E**

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

PREPARED BY : _____ , **DATE:** Aug. 15, 2016
(Yuqiang Yin / Engineer)

APPROVED BY : _____ , **DATE:** Aug. 15, 2016
(Bill Yao / Manager)

2 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 -16.96dB at 44.55MHz.

2.1 MEASUREMENT UNCERTAINTY

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

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz~30MHz	2.66dB
Radiated emissions	9KHz ~ 30MHz	2.74dB
	30MHz ~ 1GHz	3.55dB
	1GHz ~ 18GHz	4.84dB
	18GHz ~ 40GHz	1.94dB

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

2.2 TEST SITE AND INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR7	101494	Apr. 05,16	Apr. 04,17
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV7	102331	Nov. 09,15	Nov. 08,16
Bilog Antenna 1	Teseq	CBL 6111D	30643	Jul. 14, 16	Jul. 13, 17
Bilog Antenna 2	Teseq	CBL 6111D	27089	Jul. 14, 16	Jul. 13, 17
Horn Antenna (1GHz -18GHz)	ETS -Lindgren	3117	00062558	May 18,16	May 17,17
GPS Generator+ Antenna	TOJOIN	GNSS-5000A	E1-010119	Aug. 02, 15	Aug. 01, 17
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	NSEMC003	Mar. 12,16	Mar. 11,18
Test Software	ADT	ADT_Radiated _V7.6.15.9.2	N/A	N/A	N/A
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170242	Mar. 12,16	Mar. 11,17
Amplifier (9kHz-1GHz)	SONOMA	310D	186955	Mar. 04,16	Mar. 03, 17
Pre-Amplifier(1-18G)	HP	8449B	3008A00409	Apr. 25,16	Apr. 24,17
Pre-Amplifier (18GHz-40GHz)	EMCI	EMC 184045	980102	Nov. 20,15	Nov. 19,16
Test Software	ADT	ADT_Radiated _V7.6.15.9.2	N/A	N/A	N/A
BLUETOOTH TESTER	Rohde&Schwarz	CBT32	100811	Sep. 01,15	Aug. 31,16
Power Sensor	Keysight	U2021XA	MY55060016	May 04,16	May 03,17
Power Sensor	Keysight	U2021XA	MY55060018	May 04,16	May 03,17
Digital Multimeter	FLUKE	15B	A1220010DG	Oct. 12, 15	Oct.11, 16
Humid & Temp Programmable Tester	Haida	HD-2257	110807201	Sep.07,15	Sep. 06,16
Oscilloscope	Agilent	DSO9254A	MY51260160	Nov. 28,15	Nov. 27,16
Signal Analyzer	Rohde & Schwarz	FSV7	102331	Nov. 09,15	Nov. 08,16
Signal Generator	Agilent	N5183A	MY50140980	Nov. 09,15	Nov. 08,16
ESG Vector Signal Generator	Agilent	E4438C	MY49072505	Apr. 22, 16	Apr. 21, 17
BLUETOOTH TESTER	Rohde&Schwarz	CBT32	100811	Sep. 01,15	Aug. 31,16

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 Dongguan 966 Chamber.

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

4. The FCC Site Registration No. is 502831.

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	WCDMA Digital Mobile Handset	
MODEL NAME	ZTE Blade L315	
POWER SUPPLY	5.0Vdc (adapter or host equipment) 3.8Vdc (Li-ion, battery)	
MODULATION TYPE	**GSM, GPRS:** GMSK **EDGE:** GMSK, 8PSK **WCDMA :** BPSK	
FREQUENCY RANGE	**GSM, GPRS, EDGE:** 1850.2MHz ~ 1909.8MHz	
	WCDMA: 1852.4MHz ~ 1907.6MHz	
MAX. EIRP POWER	**GSM**	1169mW
	EDGE	439mW
	WCDMA	240mW
EMISSION DESIGNATOR	**GSM**	251KGXW
	EDGE	247KG7W
	WCDMA	4M17F9W
ANTENNA TYPE	Fixed Internal antenna with -2.3dBi gain	
HW VERSION	L315_V1AMB_B	
SW VERSION	ZTE_Blade_L315_MXATT_T01	
I/O PORTS	Refer to user's manual	
CABLE SUPPLIED	USB cable: non-shielded, detachable, 0.7m 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 adapters:

ADAPTER 1	
BRAND:	ZTE
MODEL:	STC-A22O50I1000USBA-C
INPUT:	AC 100-240V, 300mA
OUTPUT:	DC 5V, 1000mA
MANUFACTURER:	RUIDE

ADAPTER 2	
BRAND:	ZTE
MODEL:	STC-A22O50I1000USBA-C
INPUT:	AC 100-240V, 300mA
OUTPUT:	DC 5V, 1000mA
MANUFACTURER:	KOSUN

3. The EUT matched the following USB cable and Earphone:

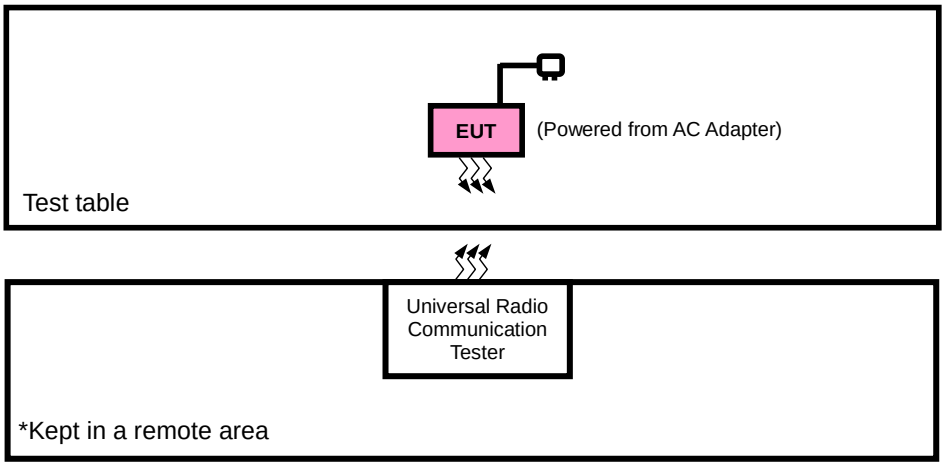
USB CABLE	
BRAND:	pengyi
MODEL:	ZXMT1305001
SIGNAL LINE:	0.7 METER

EARPHONE	
BRAND:	REEWIN
MODEL:	HMT3-C4-CTIA-C
SIGNAL LINE:	1.2 METER

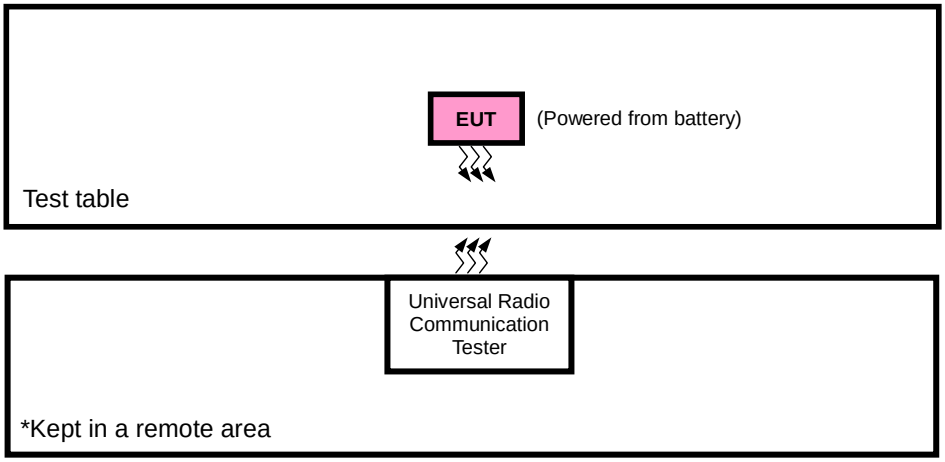
4. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

3.2 CONFIGURATION OF SYSTEM UNDER TEST

FOR RADIATION EMISSION TEST



FOR E.I.R.P. TEST



3.3 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	DC source	LONG WEI	PS-6403D	010934269	N/A
2	PC	HP	A6608CN	3CR83825X3	N/A

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

NOTE:

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

3.4 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 and Z-plane for LTE. Following channel(s) was (were) selected for the final test as listed below:

EUT CONFIGURE MODE	DESCRIPTION
A	**EUT + Adapter + USB Cable with GSM ,WCDMA**
B	EUT + Battery+ USB Cable with **GSM ,WCDMA**

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	661	GSM, EDGE
B	OCCUPIED BANDWIDTH	512 to 810	512, 661, 810	GSM, EDGE
B	PEAK TO AVERAGE RATIO	512 to 810	661	GSM, EDGE
B	BAND EDGE	512 to 810	512, 810	GSM, EDGE
B	CONDCUDETED EMISSION	512 to 810	661	GSM, EDGE
A	RADIATED EMISSION	512 to 810	661	GSM, EDGE

WCDMA MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
B	EIRP	9262 to 9538	9262, 9400, 9538	WCDMA
B	FREQUENCY STABILITY	9262 to 9538	9400	WCDMA
B	OCCUPIED BANDWIDTH	9262 to 9538	9262, 9400, 9538	WCDMA
B	PEAK TO AVERAGE RATIO	9262 to 9538	9400	WCDMA
B	BAND EDGE	9262 to 9538	9262, 9538	WCDMA
B	CONDCUDETED EMISSION	9262 to 9538	9400	WCDMA
A	RADIATED EMISSION	9262 to 9538	9400	WCDMA

TEST CONDITION:

TEST ITEM	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
EIRP	25deg. C, 57%RH	5Vdc from adapter	Alex Chen
FREQUENCY STABILITY	23deg. C, 61%RH	3.8Vdc from Battery	Yuqiang Yin
OCCUPIED BANDWIDTH	23deg. C, 61%RH	3.8Vdc from Battery	Yuqiang Yin
PEAK TO AVERAGE RATIO	23deg. C, 61%RH	3.8Vdc from Battery	Yuqiang Yin
BAND EDGE	23deg. C, 61%RH	3.8Vdc from Battery	Yuqiang Yin
CONDCUDETED EMISSION	23deg. C, 61%RH	3.8Vdc from Battery	Yuqiang Yin
RADIATED EMISSION	25deg. C, 57%RH	5Vdc from adapter	Alex Chen

3.5 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

3.6 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 v02r02

ANSI/TIA/EIA-603-D

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

4 TEST TYPES AND RESULTS

4.1 OUTPUT POWER MEASUREMENT

4.1.1 LIMITS OF OUTPUT POWER MEASUREMENT

Mobile and portable stations are limited to 2 watts EIRP.

4.1.2 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 & EDGE, and 5MHz for WCDMA mode.

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

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

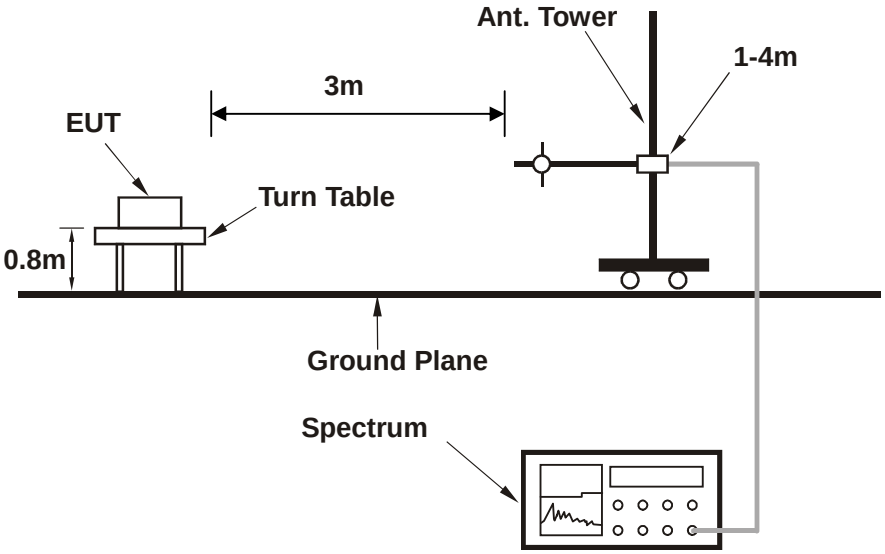
d. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.

CONDUCTED POWER MEASUREMENT:

The EUT was set up for the maximum power with GSM, GPRS, 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.

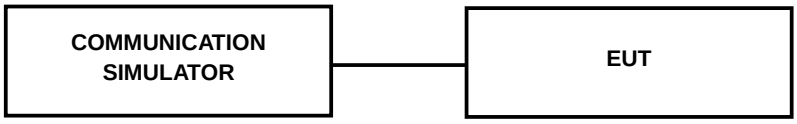
4.1.3 TEST SETUP

EIRP MEASUREMENT:



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

CONDUCTED POWER MEASUREMENT:



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

4.1.4 TEST RESULTS

CONDUCTED OUTPUT POWER (dBm)

Band	GSM1900		
Channel	512	661	810
Frequency (MHz)	1850.2	1880.0	1909.8
GSM	**28.95**	28.94	28.83
GPRS 8	28.94	28.93	28.82

GPRS 10	28.01	28.01	27.91
GPRS 11	26.33	26.33	26.22
GPRS 12	25.57	25.56	25.47
EDGE 8 (MCS9)	24.43	24.46	24.33
EDGE 10 (MCS9)	23.38	23.39	23.30
EDGE 11 (MCS9)	21.20	21.26	21.13
EDGE 12 (MCS9)	20.00	20.01	19.93

Band	**WCDMA II**		
Channel	**9262**	**9400**	**9538**
Frequency (MHz)	**1852.4**	**1880.0**	**1907.6**
RMC 12.2K	21.20	**21.40**	21.38
HSPA			
HSDPA Subtest-1	20.23	20.51	20.45
HSDPA Subtest-2	20.29	20.49	20.47
HSDPA Subtest-3	19.74	19.98	19.96
HSDPA Subtest-4	19.76	20.01	19.94
HSUPA Subtest-1	20.29	20.52	20.47
HSUPA Subtest-2	18.28	18.56	18.50
HSUPA Subtest-3	19.32	19.52	19.50
HSUPA Subtest-4	18.32	18.56	18.54
HSUPA Subtest-5	20.45	20.68	20.60

EIRP POWER (dBm)

GSM

Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
512	1850.2	-19.77	43.83	24.06	254.68	H
661	1880.0	-20.15	43.57	23.42	219.79	H
810	1909.8	-21.15	44.57	23.42	219.79	H
512	1850.2	-17.02	46.39	29.37	864.97	V
661	1880.0	-16.42	47.10	30.68	**1168.96**	V
810	1909.8	-16.52	45.98	29.46	882.27	V

EDGE

Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
512	1850.2	-23.37	43.83	20.46	111.17	H
661	1880.0	-23.87	43.57	19.70	93.33	H
810	1909.8	-24.58	44.57	19.99	99.77	H
512	1850.2	-20.17	46.39	26.22	418.79	V
661	1880.0	-20.67	47.10	26.43	**439.34**	V
810	1909.8	-20.39	45.98	25.59	361.91	V

WCDMA

Channel	Frequency (MHz)	LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
9262	1852.4	-27.47	43.83	16.36	43.25	H
9400	1880.0	-27.09	43.57	16.48	44.46	H
9538	1907.6	-27.99	44.57	16.58	45.50	H
9262	1852.4	-23.25	46.39	23.14	206.06	V
9400	1880.0	-23.30	47.10	23.80	**239.77**	V
9538	1907.6	-23.20	45.98	22.78	189.50	V

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

4.2 FREQUENCY STABILITY MEASUREMENT

4.2.1 LIMITS OF FREQUENCY STABILIITY MEASUREMENT

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

4.2.2 TEST PROCEDURE

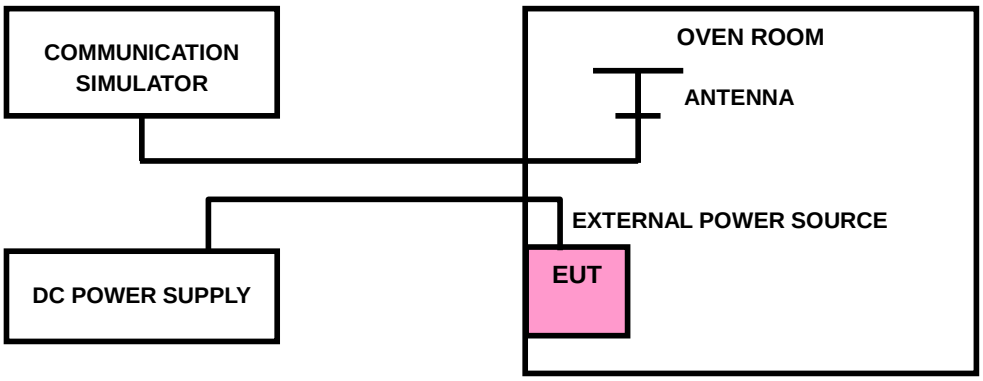
a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.

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

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

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

4.2.3 TEST SETUP



4.2.4 TEST RESULTS

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	FREQUENCY ERROR (ppm)			LIMIT (ppm)
	GSM	EDGE	WCDMA	
3.8	0.0013	0.0013	0.0013	2.5
3.3	0.0012	0.0012	0.0012	2.5
4.35	0.0011	0.0011	0.0011	2.5

NOTE: The applicant defined the normal working voltage of the battery is from 3.3Vdc to 4.35Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

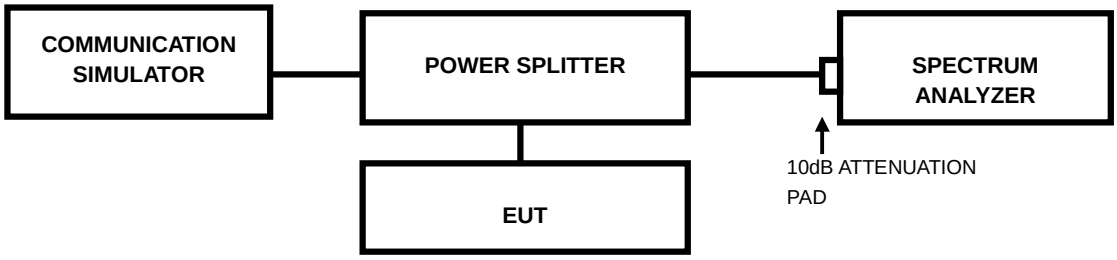
TEMP. (℃)	FREQUENCY ERROR (ppm)			LIMIT (ppm)
	GSM	EDGE	WCDMA	
-30	0.0051	0.0051	0.0046	2.5
-20	0.0048	0.0048	0.0043	2.5
-10	0.0046	0.0045	0.0035	2.5
0	0.0040	0.0044	0.0032	2.5
10	0.0039	0.0040	0.0031	2.5
20	0.0036	0.0038	0.0027	2.5
30	0.0034	0.0033	0.0023	2.5
40	0.0030	0.0032	0.0020	2.5
50	0.0024	0.0029	0.0019	2.5
60	0.0020	0.0022	0.0046	2.5

4.3 OCCUPIED BANDWIDTH MEASUREMENT

4.3.1 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.

4.3.2 TEST SETUP

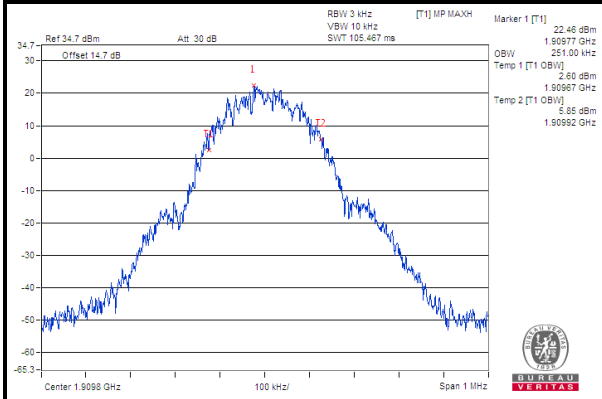


4.3.3 TEST RESULTS

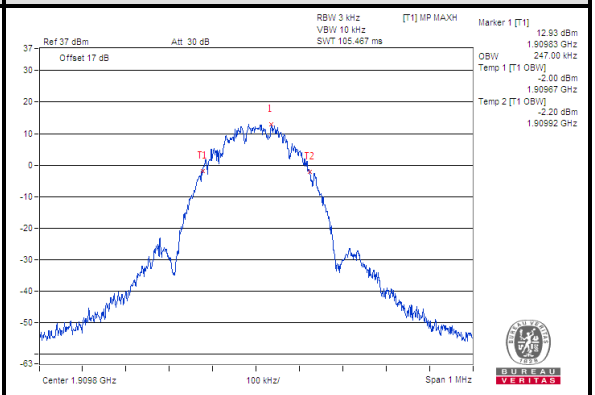
CHANNEL	FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH (kHz)		CHANNEL	FREQUENCY (MHz)	99% OCCUPIED BANDWIDTH (MHz)
		GSM	EDGE			WCDMA
512	1850.2	246.06	246.00	9262	1852.4	4.15
661	1880.0	243.00	242.00	9400	1880.0	4.17
810	1909.8	251.00	247.00	9538	1907.6	4.16

SPECTRUM PLOT OF WORST VALUE

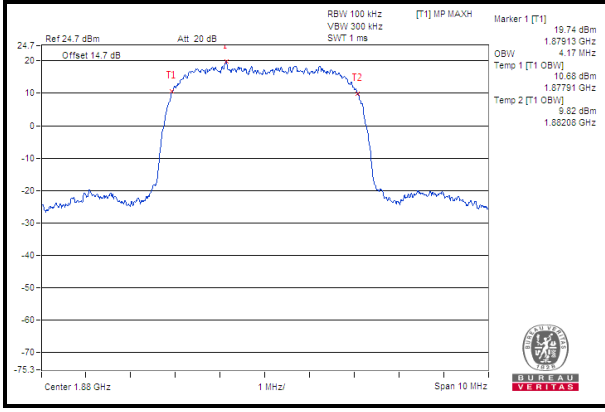
GSM



EDGE



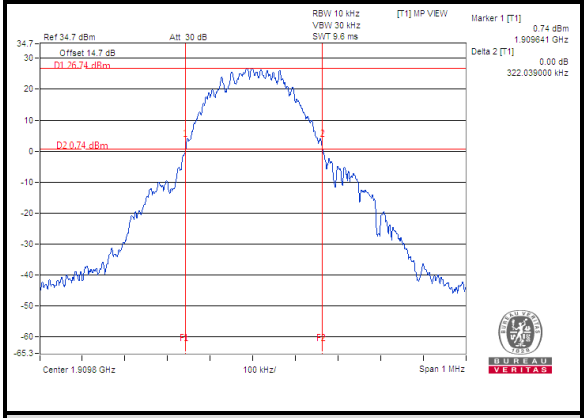
WCDMA



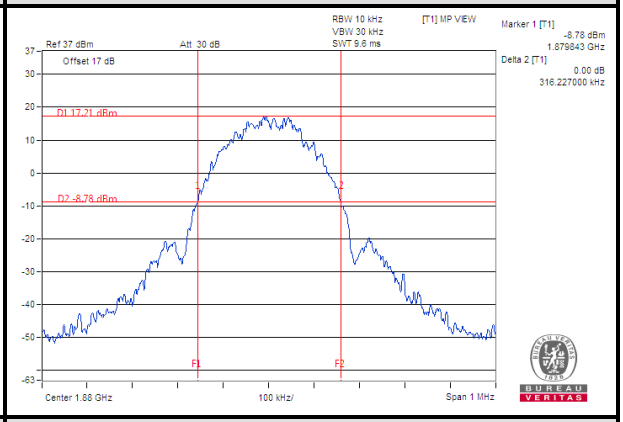
CHANNEL	FREQUENCY (MHz)	26dB BANDWIDTH (kHz)		CHANNEL	FREQUENCY (MHz)	26dB BANDWIDTH (MHz)
		GSM	EDGE			WCDMA
512	1850.2	316.13	305.69	9262	1852.4	4.68
661	1880.0	318.18	316.23	9400	1880.0	4.69
810	1909.8	322.04	315.95	9538	1907.6	4.71

SPECTRUM PLOT OF WORST VALUE

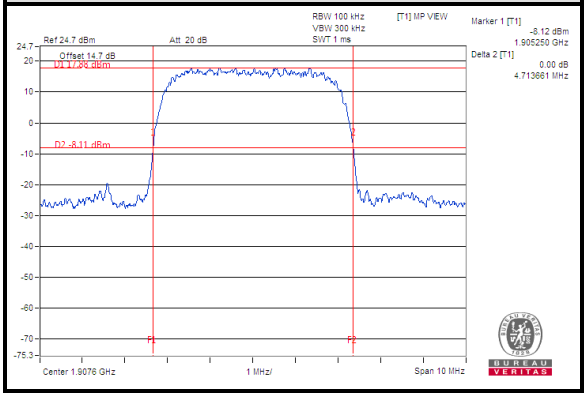
GSM



EDGE



WCDMA

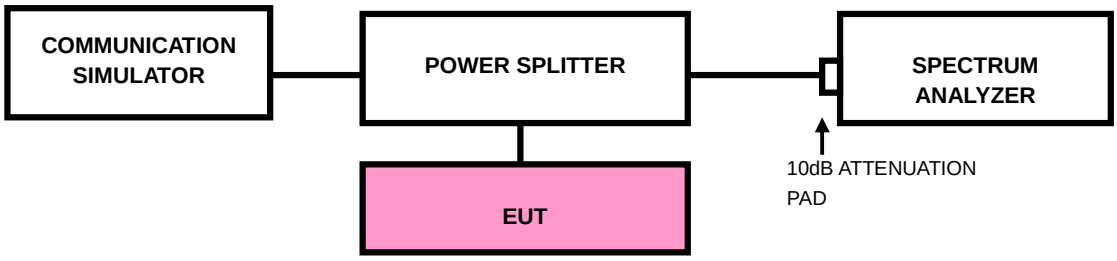


4.4 BAND EDGE MEASUREMENT

4.4.1 LIMITS OF BAND EDGE MEASUREMENT

Power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

4.4.2 TEST SETUP



4.4.3 TEST PROCEDURES

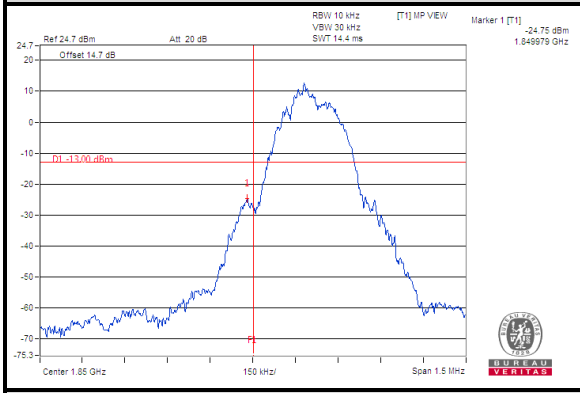
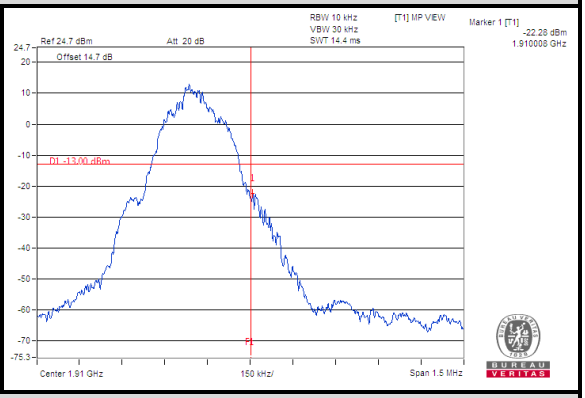
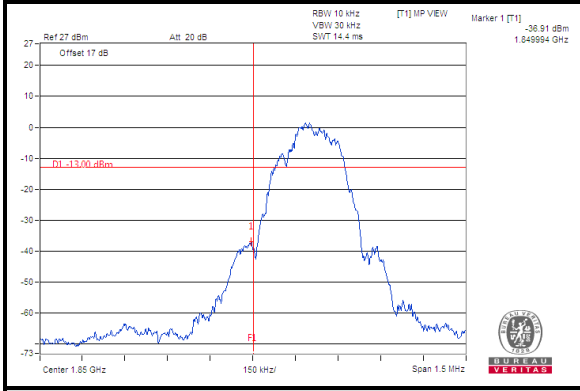
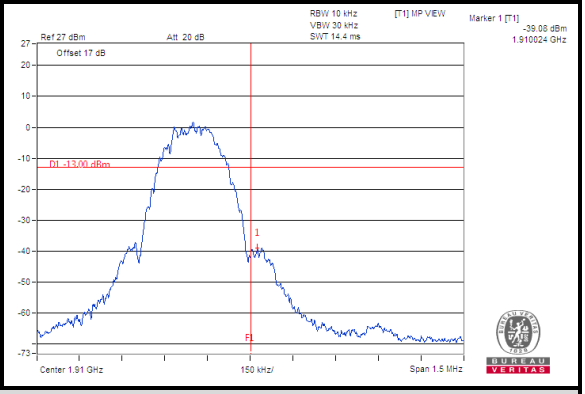
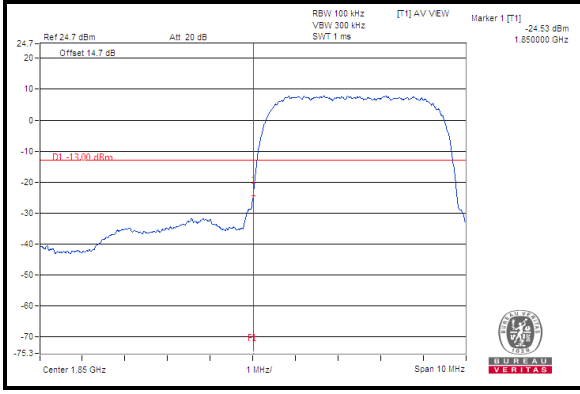
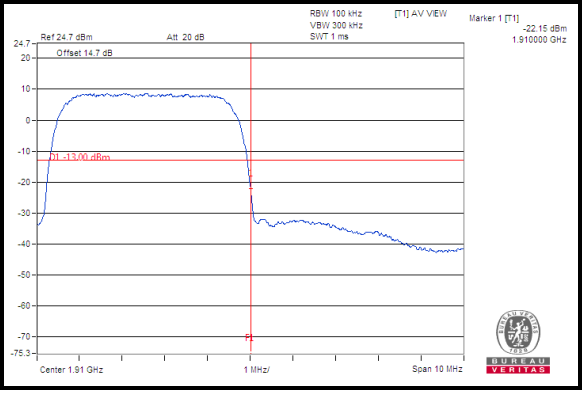
a. All measurements were done at low and high operational frequency range.

b. The center frequency of spectrum is the band edge frequency and span is 1.5 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. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (WCDMA).

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

4.4.4. TEST RESULTS

GSM			
CHANNEL	512	CHANNEL	810
GSM			
			
EDGE			
CHANNEL	512	CHANNEL	810
			
WCDMA			
CHANNEL	9262	CHANNEL	9538
			

4.5 CONDUCTED SPURIOUS EMISSIONS

4.5.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

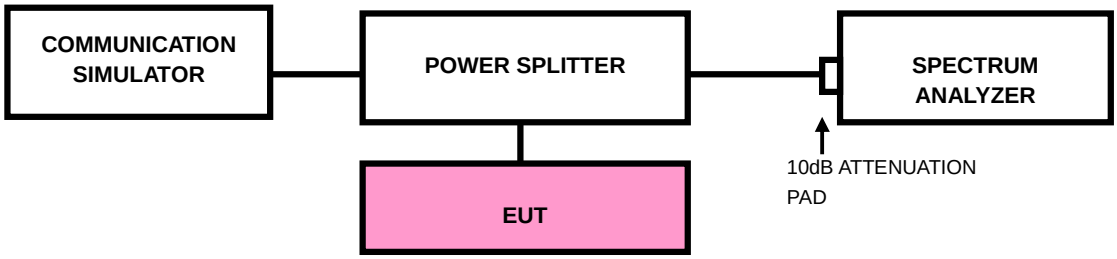
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. The emission limit equal to –13dBm.

4.5.2 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. 20dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.

4.5.3 TEST SETUP

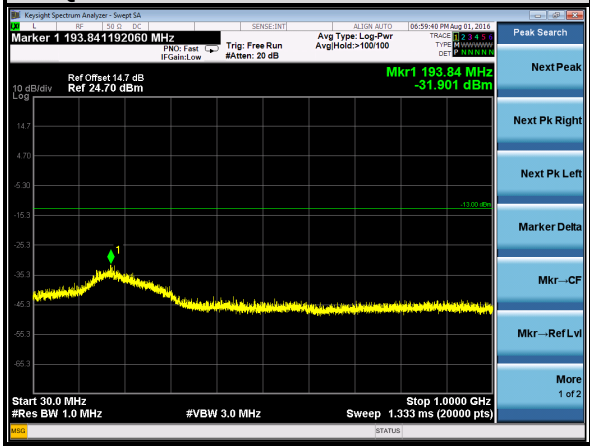


4.5.4 TEST RESULTS

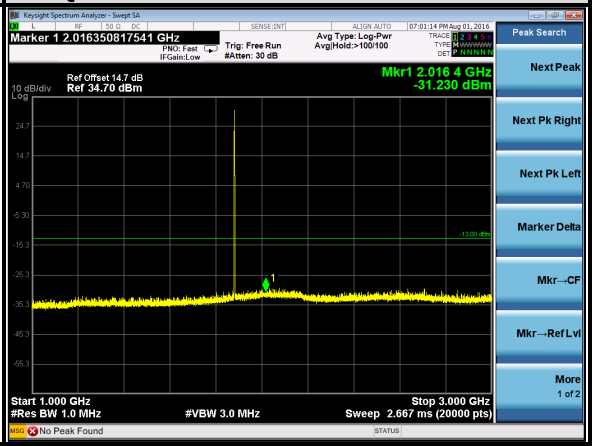
GSM

CHANNEL 661

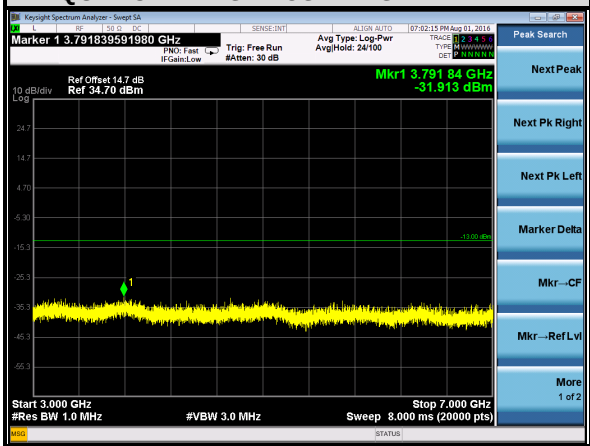
FREQUENCY RANGE : 30MHz~1GHz



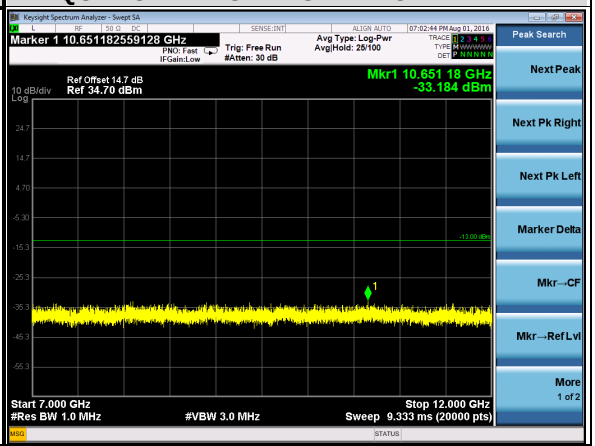
FREQUENCY RANGE : 1GHz~3GHz



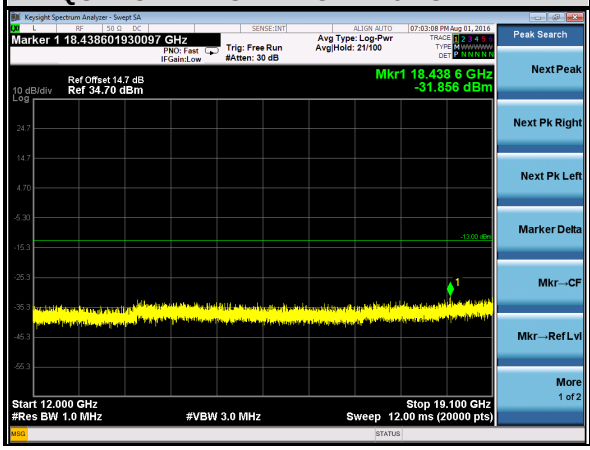
FREQUENCY RANGE : 3GHz~7GHz



FREQUENCY RANGE : 7GHz~12GHz



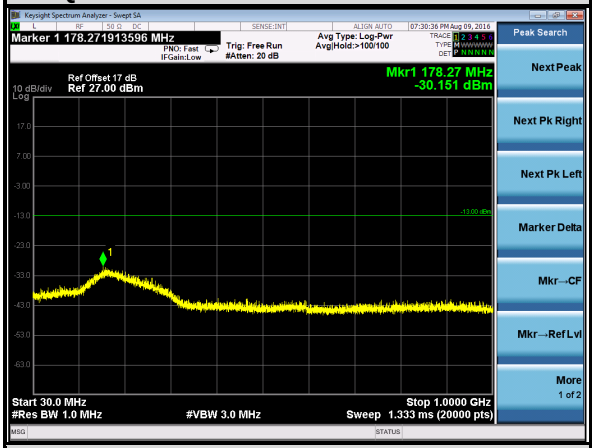
FREQUENCY RANGE : 12GHz~19.1GHz



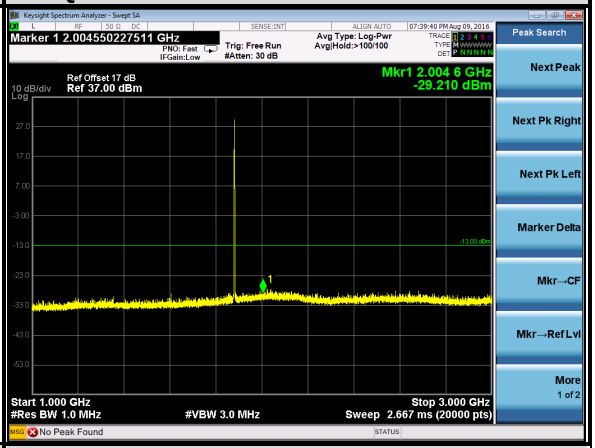
EDGE

CHANNEL 661

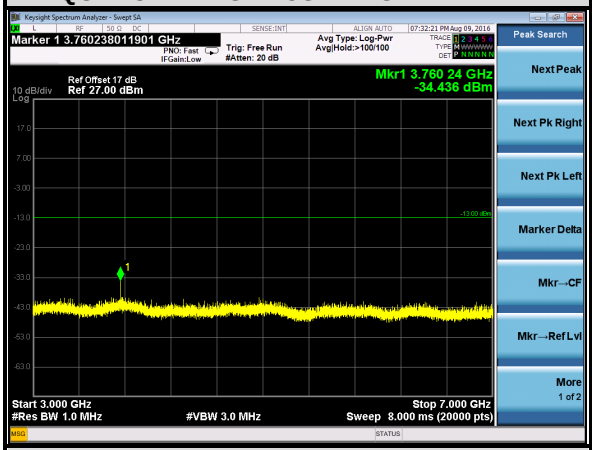
FREQUENCY RANGE : 30MHz~1GHz



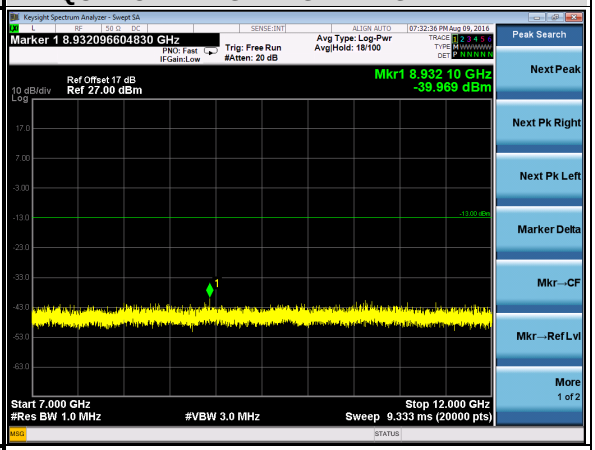
FREQUENCY RANGE : 1GHz~3GHz



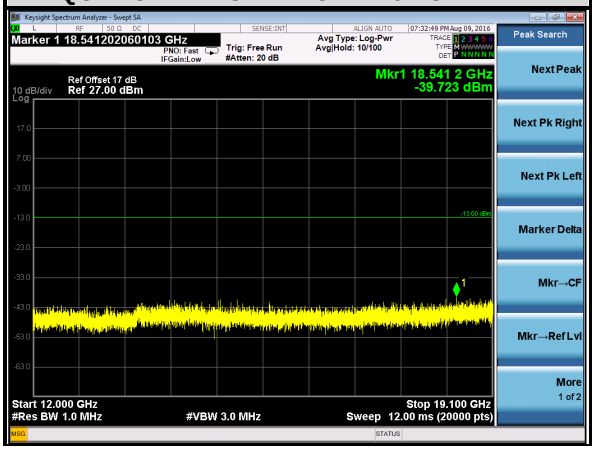
FREQUENCY RANGE : 3GHz~7GHz



FREQUENCY RANGE : 7GHz~12GHz



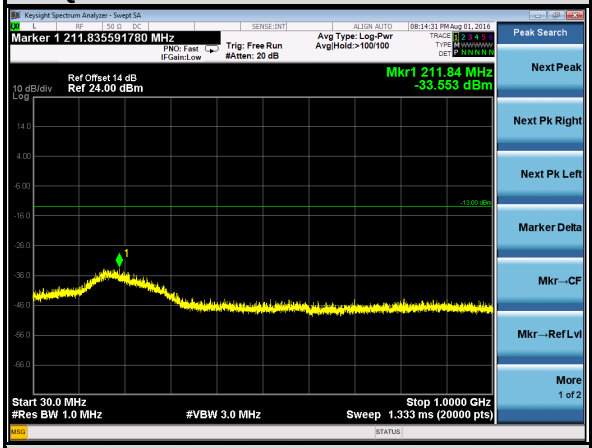
FREQUENCY RANGE : 12GHz~19.1GHz



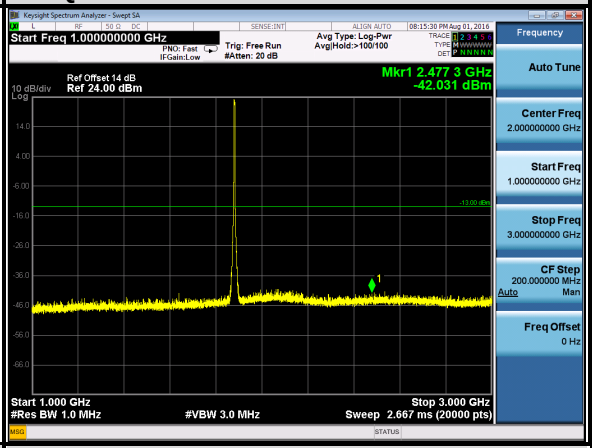
WCDMA

CHANNEL 9400

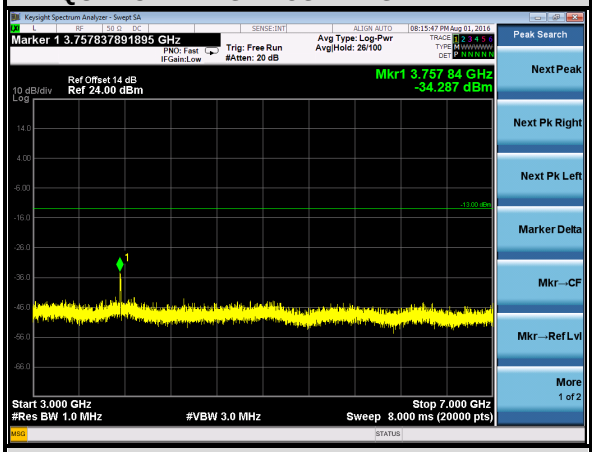
FREQUENCY RANGE : 30MHz~1GHz



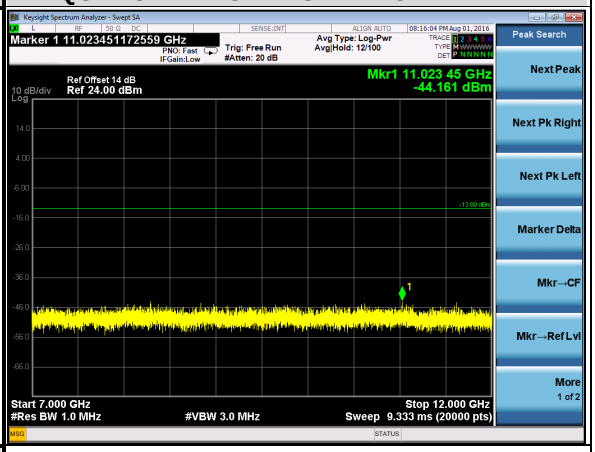
FREQUENCY RANGE : 1GHz~3GHz



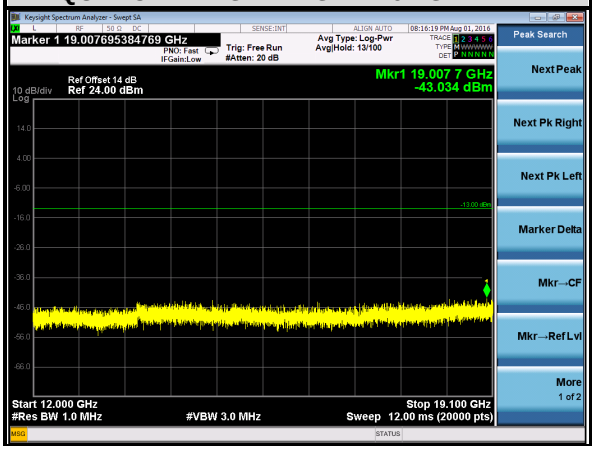
FREQUENCY RANGE : 3GHz~7GHz



FREQUENCY RANGE : 7GHz~12GHz



FREQUENCY RANGE : 12GHz~19.1GHz



4.6 RADIATED EMISSION MEASUREMENT

4.6.1 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.

4.6.2 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

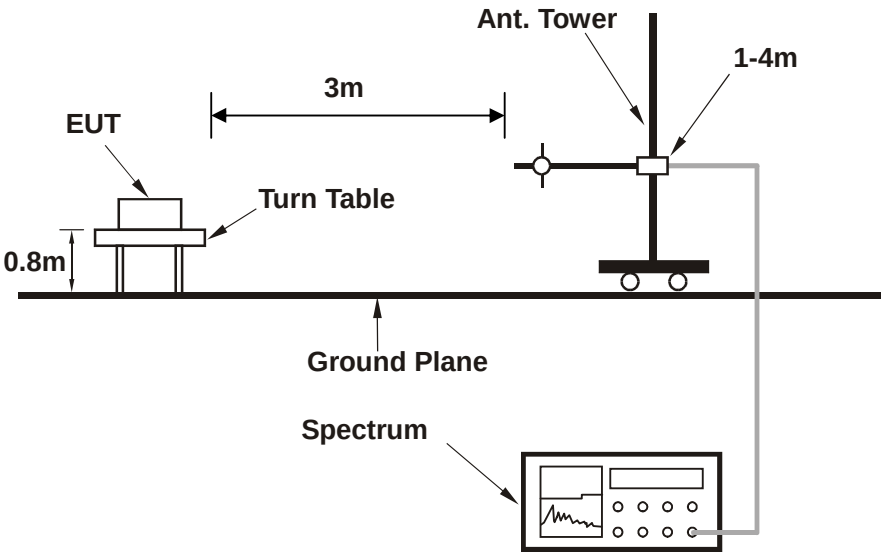
c. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.

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

4.6.3 DEVIATION FROM TEST STANDARD

No deviation

4.6.4 TEST SETUP



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

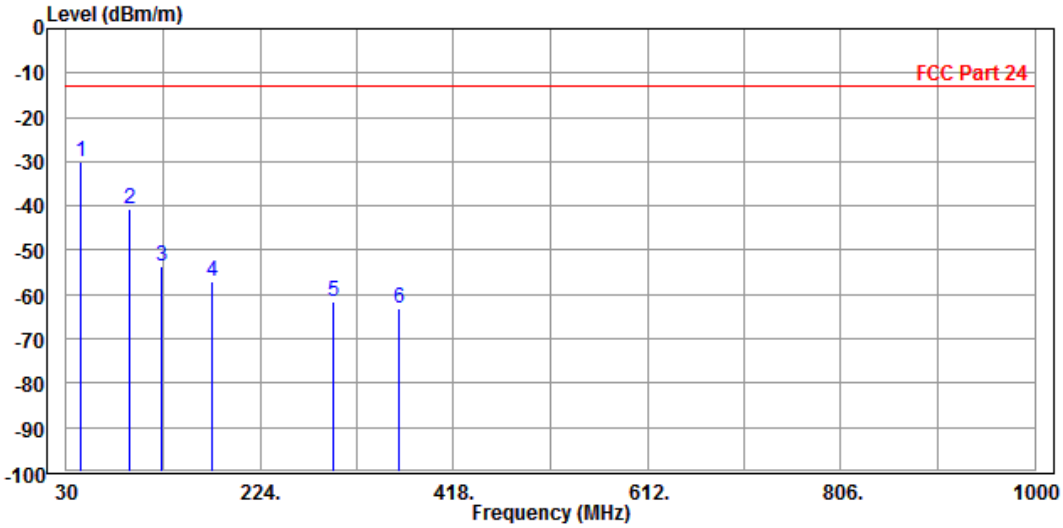
4.6.5 TEST RESULTS

BELOW 1GHz WORST-CASE DATA

PCS 1900:

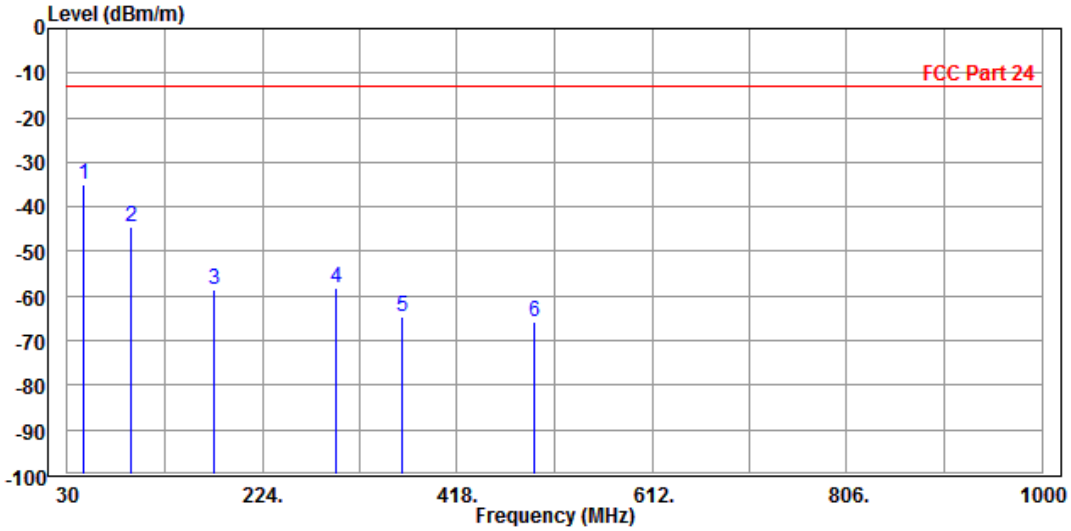
MODE	TX channel 661	**FREQUENCY RANGE**	Below 1000MHz
ENVIRONMENTAL CONDITIONS	26deg. C, 56%RH	**INPUT POWER**	DC 5V from adapter
TESTED BY	Alex Chen		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1 PP	44.550	-29.96	-38.06	-13.00	-16.96	8.10	Peak	Horizontal
2	94.020	-40.79	-30.89	-13.00	-27.79	-9.90	Peak	Horizontal
3	125.060	-53.47	-37.65	-13.00	-40.47	-15.82	Peak	Horizontal
4	175.500	-57.02	-39.10	-13.00	-44.02	-17.92	Peak	Horizontal
5	296.750	-61.61	-47.64	-13.00	-48.61	-13.97	Peak	Horizontal
6	362.710	-63.09	-51.38	-13.00	-50.09	-11.71	Peak	Horizontal



MODE	TX channel 661	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	26deg. C, 56%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Alex Chen		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1 PP	46.490	-35.03	-31.39	-13.00	-22.03	-3.64	Peak	Vertical
2	94.020	-44.47	-33.88	-13.00	-31.47	-10.59	Peak	Vertical
3	176.470	-58.70	-45.16	-13.00	-45.70	-13.54	Peak	Vertical
4	296.750	-58.24	-46.93	-13.00	-45.24	-11.31	Peak	Vertical
5	362.710	-64.47	-53.40	-13.00	-51.47	-11.07	Peak	Vertical
6	494.630	-65.87	-58.43	-13.00	-52.87	-7.44	Peak	Vertical

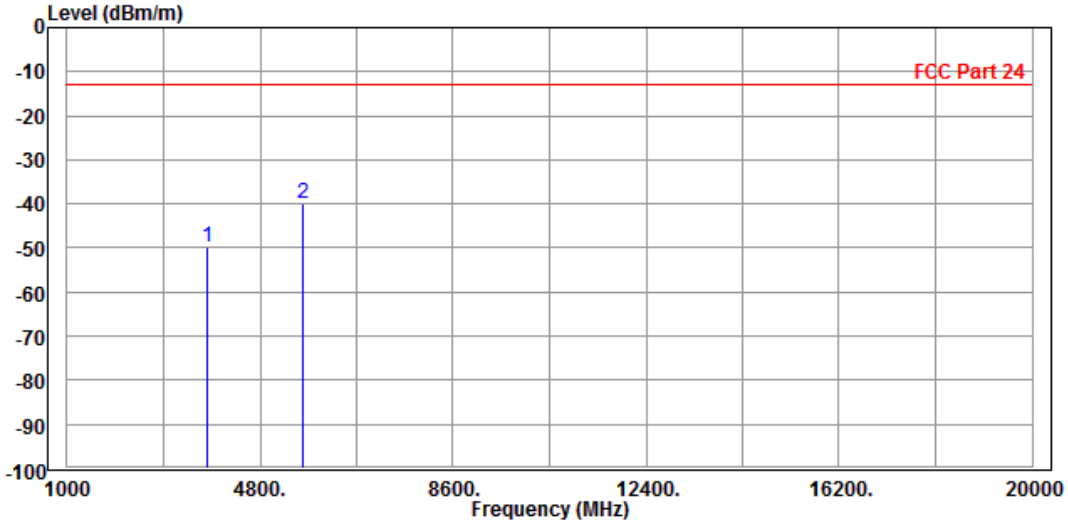


ABOVE 1GHz DATA

PCS 1900:

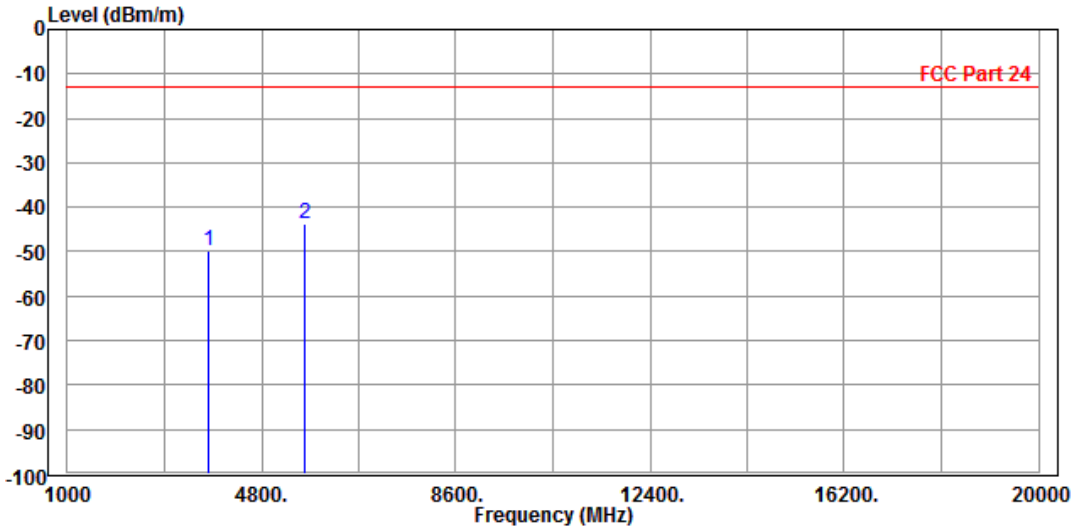
MODE	TX channel 661	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	26deg. C, 56%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Alex Chen		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3755.000	-49.76	-53.15	-13.00	-36.76	3.39	Peak	Horizontal
2 PP	5640.000	-40.04	-49.16	-13.00	-27.04	9.12	Peak	Horizontal



MODE	TX channel 661	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	26deg. C, 56%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Alex Chen		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

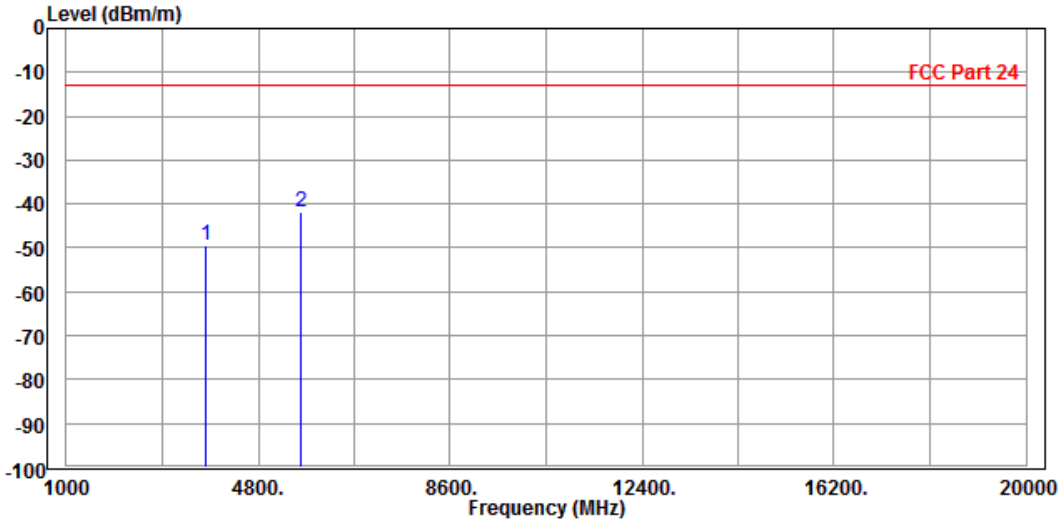
		Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
		MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1		3755.000	-49.87	-53.72	-13.00	-36.87	3.85	Peak	Vertical
2	PP	5640.000	-43.66	-51.92	-13.00	-30.66	8.26	Peak	Vertical



EDGE 1900:

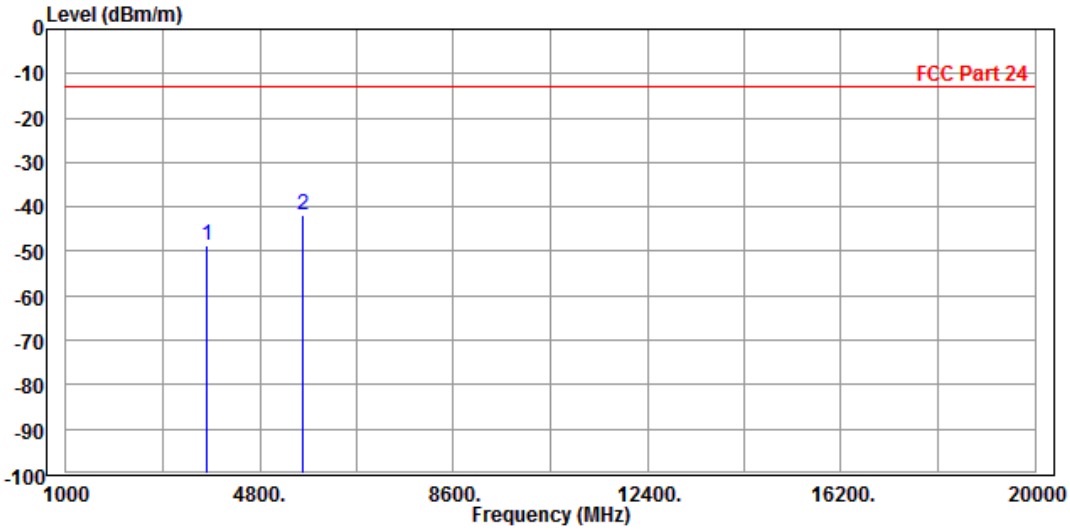
MODE	TX channel 661	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	26deg. C, 56%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Alex Chen		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

		Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
		MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1		3755.000	-49.50	-52.89	-13.00	-36.50	3.39	Peak	Horizontal
2	PP	5640.000	-41.68	-50.80	-13.00	-28.68	9.12	Peak	Horizontal



MODE	TX channel 661	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	26deg. C, 56%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Alex Chen		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

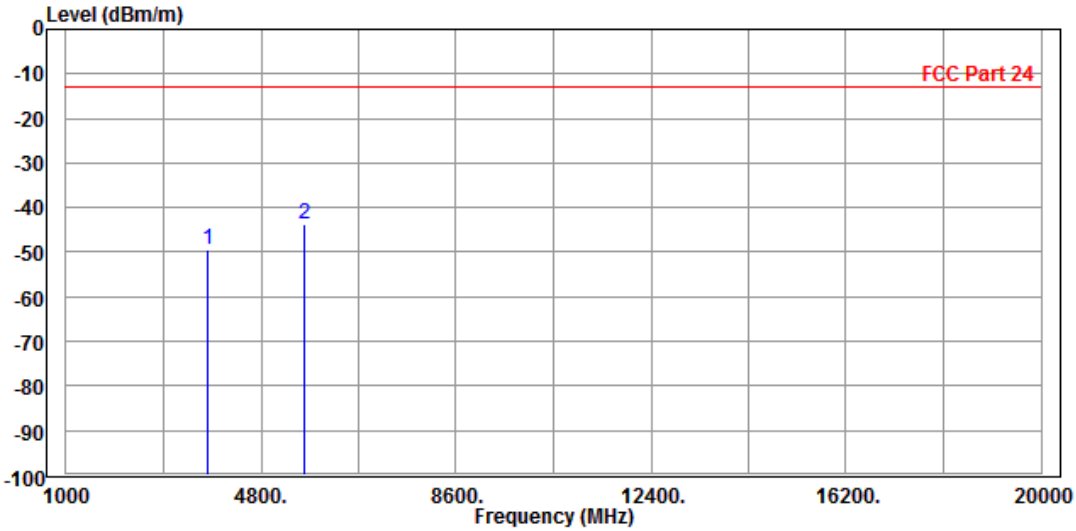
		Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
		MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1		3755.000	-48.71	-52.56	-13.00	-35.71	3.85	Peak	Vertical
2	PP	5640.000	-41.90	-50.16	-13.00	-28.90	8.26	Peak	Vertical



WCDMA Band II:

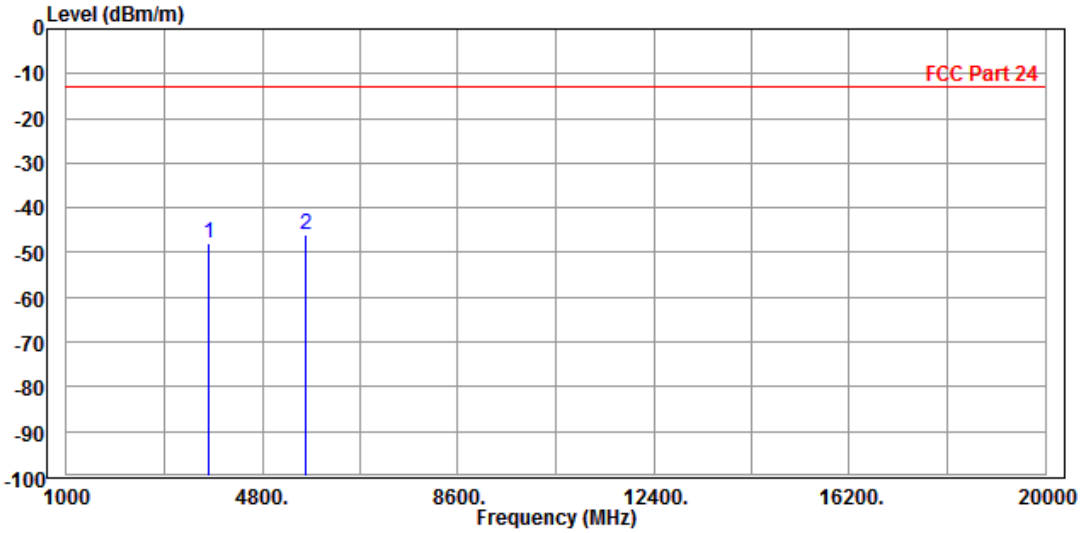
MODE	TX channel 9400	**FREQUENCY RANGE**	Above 1000MHz
ENVIRONMENTAL CONDITIONS	26deg. C, 56%RH	**INPUT POWER**	DC 5V from adapter
TESTED BY	Alex Chen		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	3755.000	-49.53	-52.92	-13.00	-36.53	3.39	Peak	Horizontal
2 PP	5640.000	-43.67	-52.79	-13.00	-30.67	9.12	Peak	Horizontal



MODE	TX channel 9400	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	26deg. C, 56%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Alex Chen		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

		Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
		MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1		3755.000	-48.09	-51.94	-13.00	-35.09	3.85	Peak	Vertical
2	PP	5640.000	-45.95	-54.21	-13.00	-32.95	8.26	Peak	Vertical

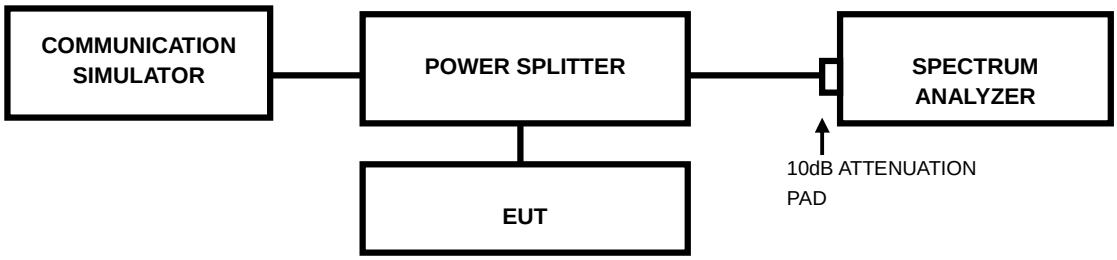


4.7 PEAK TO AVERAGE RATIO

4.7.1 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

4.7.2 TEST SETUP



4.7.3 TEST PROCEDURES

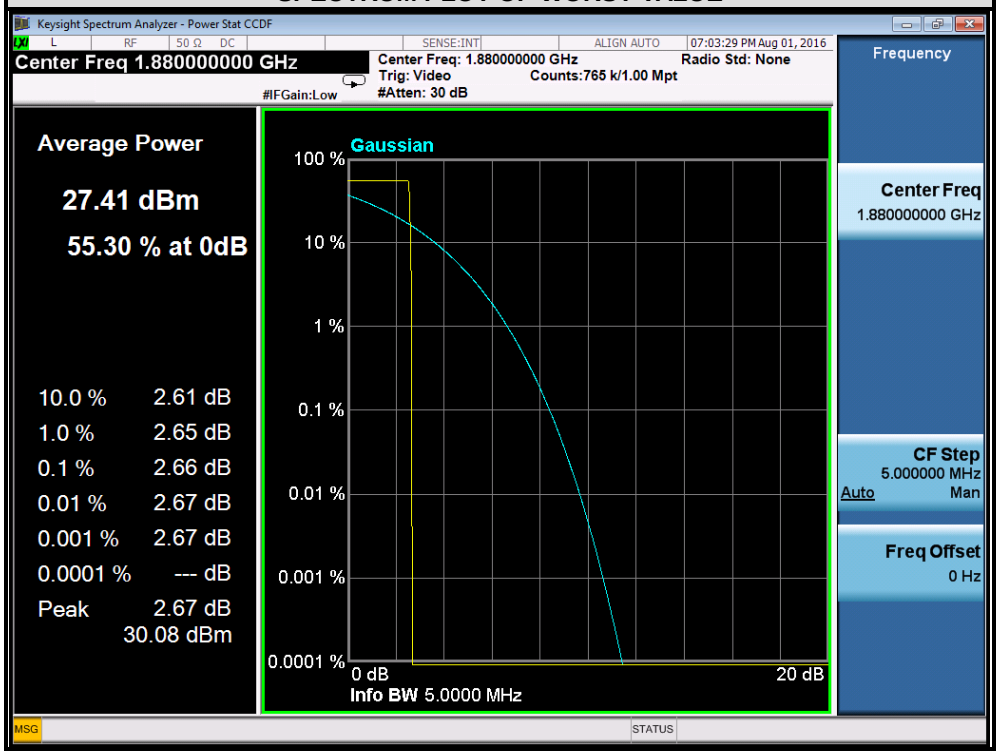
1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1%.

4.7.4 TEST RESULTS

GSM

CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
661	1880	2.66

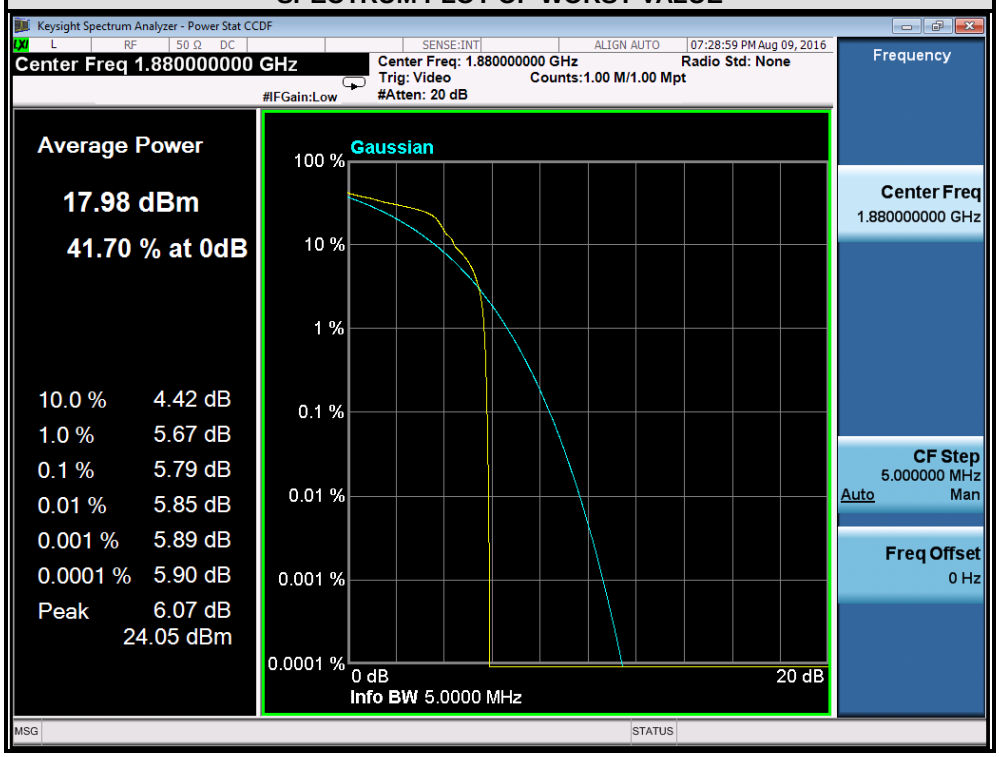
SPECTRUM PLOT OF WORST VALUE



EDGE

CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
661	1880	5.79

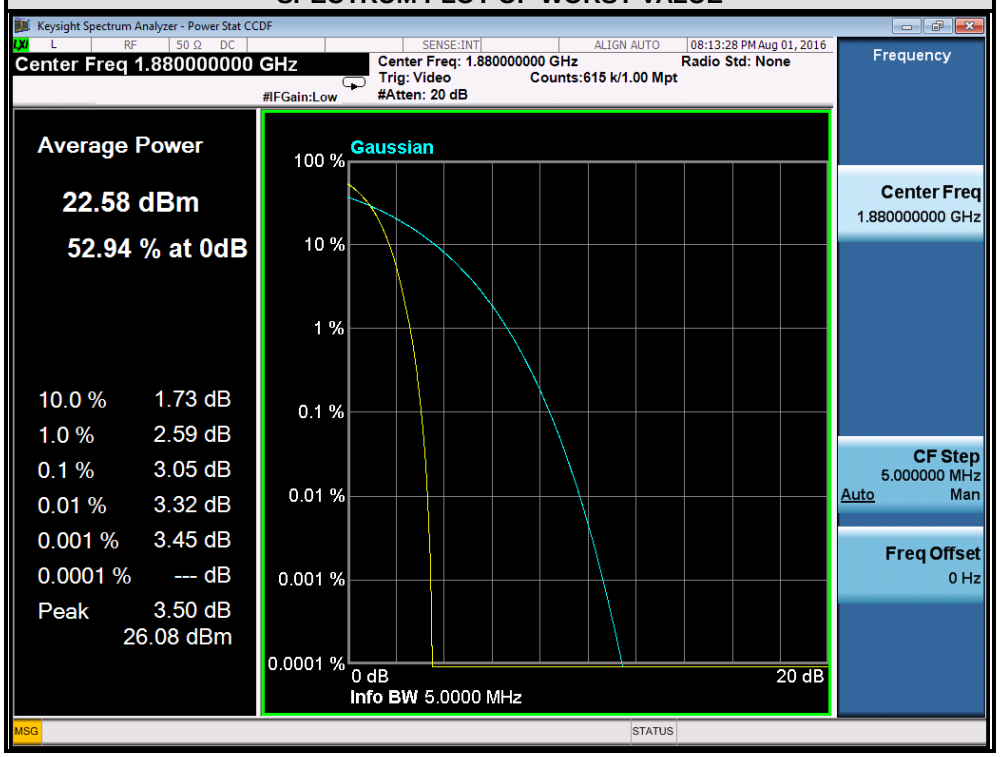
SPECTRUM PLOT OF WORST VALUE



WCDMA

CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
9400	1880	3.05

SPECTRUM PLOT OF WORST VALUE



5 INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch, were founded in 2002 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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Tel: +86-769-85935656
Fax: +86-769-85931080

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.

6 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---