

# FCC RADIO TEST REPORT

No. GCCT16CFR01-RF

For

OBI Connect FZE

Product Name: Mobile Phone

Model Name: Obi Worldphone SF1

Trade Name: OBI

Issued Date: 2016-03-28

**Note:**

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To verify test report authenticity, send full test report to Email: gaoxiaoqing0310@126.com

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**GENERAL SUMMARY**

<b>Product Name</b>	Mobile Phone
<b>Model Name</b>	Obi Worldphone SF1
<b>Trade Name</b>	OBI
<b>Applicant</b>	OBI Connect FZE
<b>Manufacturer</b>	CK Telecom Limited
<b>Test Laboratory</b>	GCCT, Guangdong Telecommunications Terminal Products Quality Supervision and Testing Center
<b>Reference Standards</b>	FCC CFR 47 Part 22(H):“FCC CFR 47 Part 22:Public Mobile Services” FCC CFR 47 Part 24(E):“FCC CFR 47 Part 24:Radio Frequency Devices”
<b>Test Conclusion</b>	This portable wireless equipment has been measured in all cases requested by the relevant standards. Test results in annex B of this test report are below limits specified in the relevant standards.  General Judgment: <b>Pass</b>
	Date of issue: 2016.03.28
<b>Comment</b>	The test results in this report apply only to the tested sample of the stated device/equipment.

*Approved by:*LuoJian  
Manager*Reviewed by:*Dong Xiaobo  
Deputy Manager*Tested by:*Wu Xuan  
Test Engineer

## 1. Test Laboratory

### 1.1 Testing Location

<b>Company Name</b>	GCCT, Guangdong Telecommunications Terminal Products Quality Supervision and Testing Center
<b>Address</b>	Keji Road, High-tech Zone, Heyuan, Guangdong Province, PR.China
<b>CNAS Registration No.</b>	L4992
<b>Postal Code</b>	517001
<b>Telephone</b>	+86-762-3607221
<b>Fax</b>	+86-762-3603336

### 1.2 Testing Environment

Environment Data	Temperature(°C)	Humidity(%)
Maximum Ambient	15.6	42
Minimum Ambient	23.7	67

EUT is under testing environment.

### 1.3 Project Data

<b>Project Leader:</b>	Dong Xiaobo
<b>Testing Start Date:</b>	2016-03-15
<b>Testing End Date:</b>	2016-03-28

## 2.Client Information

### 2.1Applicant Information

<b>Company Name</b>	OBI Connect FZE
<b>Address</b>	B-21,Dubai Airport Free zone, PO BOX 371475, United Arab Emirates
<b>City</b>	Dubai
<b>Postal Code</b>	/
<b>Country</b>	United Arab Emirates

### 2.2Manufacturer Information

<b>Company Name</b>	CK Telecom Limited
<b>Address</b>	Technology Road.High-Tech Development Zone. Heyuan, Guangdong,P.R.China.
<b>City</b>	Heyuan
<b>Postal Code</b>	/
<b>Country</b>	China

### 3.Equipment Under Test (EUT) and Ancillary Equipment (AE)

#### 3.1 About EUT

<b>Model Name</b>	Obi Worldphone SF1
<b>FCC ID</b>	2AGBLSF1
<b>Tx Frequency</b>	GSM850:824 ~ 848 MHz PCS1900 : 1850 ~ 1909MHz WCDMA Band II: 1852 ~ 1908MHz WCDMA Band V: 826 ~ 846MHz Bluetooth& BLE: 2402 ~ 2480MHz WIFI(802.11b/g/n-20): 2412 ~ 2462MHz WIFI(802.11n-40): 2422 ~ 2452MHz
<b>Rx Frequency</b>	GSM850: 869 ~ 893MHz GSM1900: 1930 ~ 1989MHz WCDMA Band II: 1932 ~ 1987MHz WCDMA Band V: 871 ~ 891MHz Bluetooth& BLE: 2402 ~ 2480MHz WIFI(802.11b/g/n-20): 2412 ~ 2462MHz WIFI(802.11n-40): 2422 ~ 2452MHz GPS:1575MHz
<b>Number of Channels</b>	GSM850 :25 GSM1900 : 60 WCDMA Band II: 60 WCDMA Band V: 25 Bluetooth:79 BLE:40 WIFI(802.11b/g/n-20):11 WIFI(802.11n-40):7
<b>Modulation</b>	GSM:GMSK WCDMA:BPSK/QPSK BLE:GFSK Bluetooth: GFSK& $\pi$ /4-DQPSK&8DPSK WIFI:CCK/OFDM
<b>Antenna Type</b>	PIFA(GSM/DCS/WCDMA); MONOPOLE (Bluetooth/WIFI)
<b>Antenna Gain</b>	GSM850&1900:-0.5dBi GSM900&1800:-0.5dBi WCDMA Band II&V: -1dBi Bluetooth&BLE&WIFI: -1dBi GPS: -1dBi
<b>Normal Voltage</b>	3.8V

<b>Extreme Low Voltage</b>	3.6V
<b>Extreme High Voltage</b>	4.2V
<b>Extreme Low Temperature</b>	0°C
<b>Extreme High Temperature</b>	40°C

Note: Photographs of EUT are shown in ANNEX A of this test report.

Note: high and low voltage values in extreme condition test are given by manufacturer

### **3.2 Internal Identification of EUT**

<b>EUT ID *</b>	<b>IMEI</b>	<b>HW Version</b>	<b>SW Version</b>
GCCT16CFR01-M01	/	MIRAGE03-V1.0	/
GCCT16CFR01-M03	/	MIRAGE03-V1.0	/

\*EUT ID: is used to identify the test sample in the lab internally.GCCT16CFR01-M01 and GCCT16CFR01-M03 are the same mobile phone.

### **3.3 Internal Identification of AE**

<b>AE ID *</b>	<b>Description</b>	<b>Model</b>	<b>Manufacturer</b>
GCCT16CFR01-B01	Battery	OB3000CK	DONG GUAN DRN NEW ENERGY CO.,LTD.
GCCT16CFR01-C01	Adapter	AOD2A5V	DONGGUAN AOHAI POWER TECHNOLOGY CO,LTD.
GCCT16CFR01-B03	Battery	OB3000CK	DONG GUAN DRN NEW ENERGY CO.,LTD.
GCCT16CFR01-C03	Adapter	AOD2A5V	DONGGUAN AOHAI POWER TECHNOLOGY CO,LTD.

\*AE ID: is used to identify the test sample in the lab internally.GCCT16CFR01-B01 and GCCT16CFR01-B03 are the same accessories, GCCT16CFR01-C01 and GCCT16CFR01-C03 are the same accessories.

## 4. Test Results

### 4.1 Summary of Test Results

Items	List	Clause in FCC	Verdict
1	Output Power	22.913(a)/24.232(b)	Pass
2	Frequency Stability	22.355/24.235	Pass
3	Occupied Bandwidth	22.917(a)/24.238(b)	Pass
4	Emission Limit	22.917(b)/ 24.238(b)	Pass
5	Band Edge Compliance	22.917(b)/ 24.238	Pass
6	Conducted Spurious Emission	22.917(a)/24.238(a)	Pass
7	Peak-to-average ratio	24.232(d))	Pass

Note: please refer to Annex B in this test report for the detailed test results.

### 4.2 Statements

GCCT has evaluated the test cases requested by the applicant/manufacturer as listed in section 4.1 of this report, for the EUT specified in section 3, according to the standards or reference documents listed in general summary.

## 5. Test Equipments Utilized

### 5.1 List of Measuring Equipment

**Table 1. RF Test Equipments**

No.	Name	Type	SN	Manufacturer	Cal Date	Cal Due Date
1	Signaling Tester	E5515E	E0111-8	Agilent	2015.08.21	2016.08.20
2	Spectrum Analyzer	N9020A	E0111-9	Agilent	2015.08.21	2016.08.20
3	Switching Unit	/	E0112	/	/	

**Table 2. EMC Test Equipments**

<b>Hardware</b>						
No.	Name	Type	SN	Manufacturer	Cal Date	Cal Due Date
1	Spectrum	E4440A	MY48250641	Agilent	2015.08.21	2016.08.20
2	RF Preselector	N9039A	MY48260024	Agilent	2015.08.21	2016.08.20
3	BiCoNilog Antenna	3142E	00142015	ETS-Lindgren	2015-09-15	2017-09-14
4	Horn Antenna	3117	00129169	ETS-Lindgren	2015-09-15	2017-09-14
5	RF Notch filter	/	/	ETS-Lindgren	2015.08.21	2016.08.20
6	Power Meter	N1913A	MY50000213	Agilent	2015.08.21	2016.08.20
7	Universal Radio Communication Tester	8960	MY48367105	Agilent	2015.08.21	2016.08.20
<b>Software</b>						
1	Software	TILE4.5	/	ETS-Lindgren	/	

**Table 3. OTA Test Equipments**

<b>Hardware</b>						
No.	Name	Type	SN	Manufacturer	Cal Date	Cal Due Date
1	Spectrum	N9020A	MY49101012	Agilent	2015.08.21	2016.08.20
2	Universal Radio	E5515C	MY48367103	Agilent	2015.08.21	2016.08.20
3	Switch/Control Mainframe	3499C	MY42000534	Agilent	2015.08.21	2016.08.20
4	Positioning	2090	00119389	ETS-Lindgren	2015.08.21	2016.08.20

<b>Software</b>					
1	Software	EMQuest™	/	ETS-Lindgren	/
2	Software	EMQ-108	/	ETS-Lindgren	/

## 5.2 Climate Chamber

No.	Name	Type	SN	Manufacturer	Cal Date	Cal Due Date
1	Climate Chamber	MW3030	09114081	ESPEC	2015.08.21	2016.08.20

## ANNEX A: EUT Photograph

EUT Front View



EUT behind View



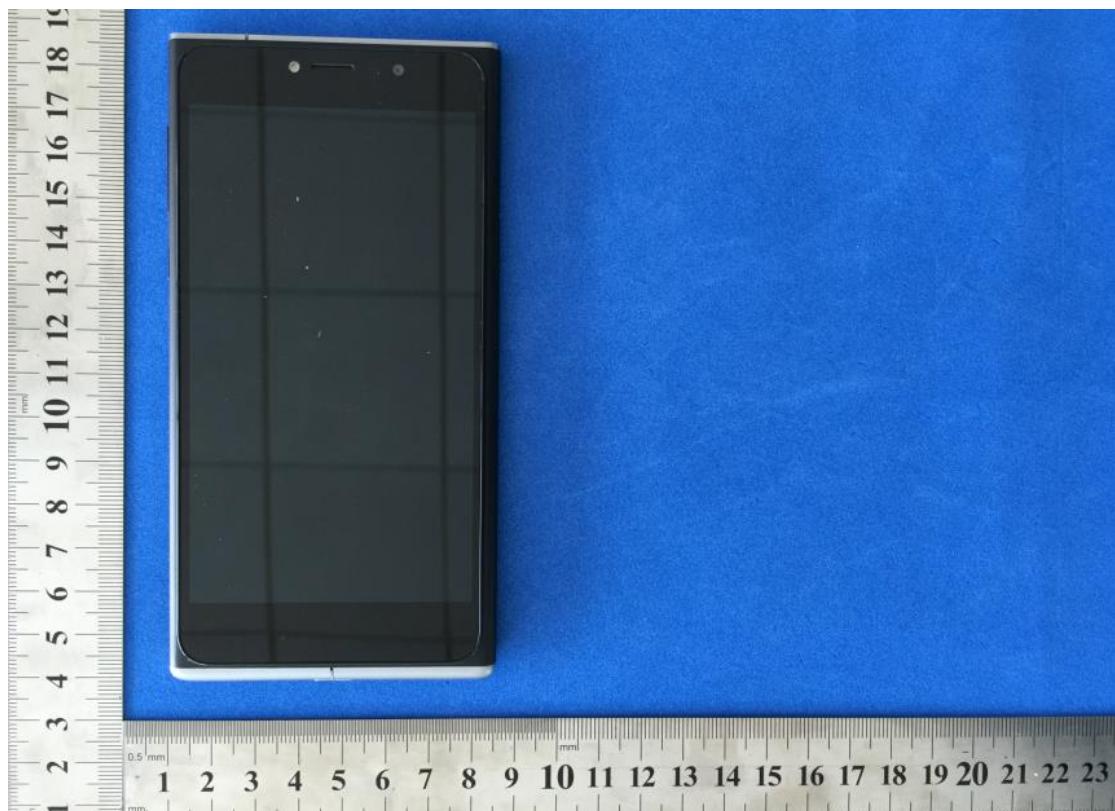
EUT Left View



EUT Right View



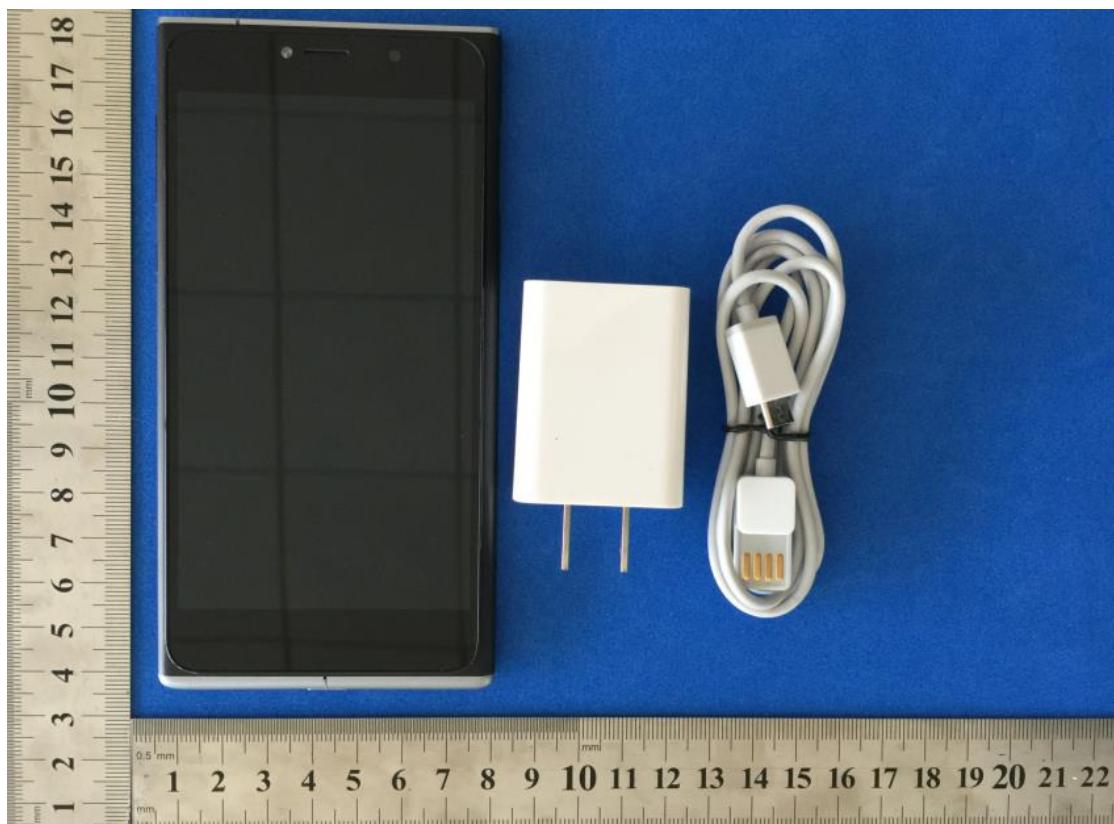
EUT Top View



EUT Rear View



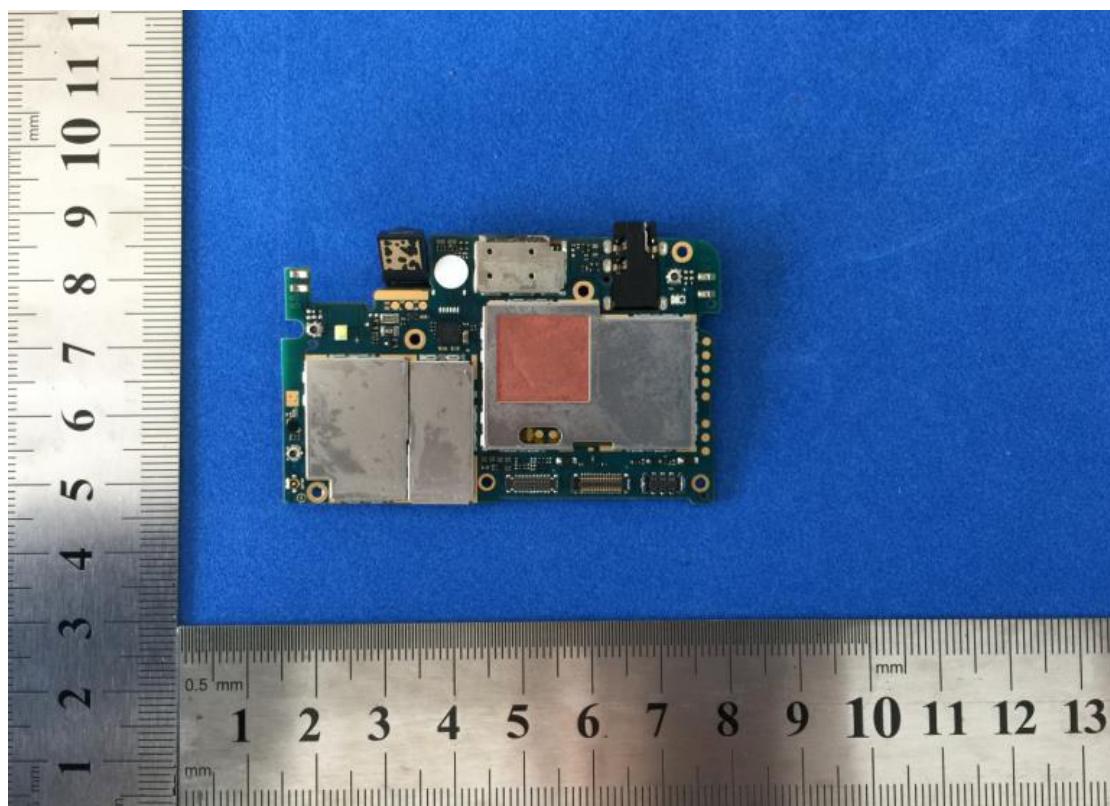
All



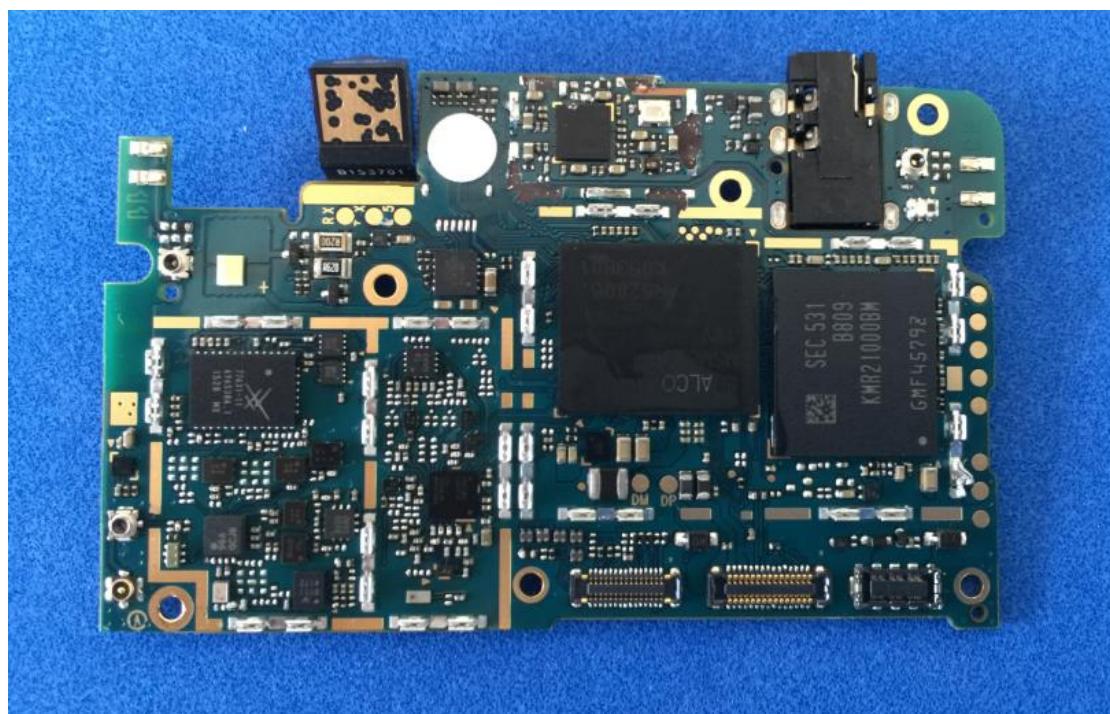
Cover off



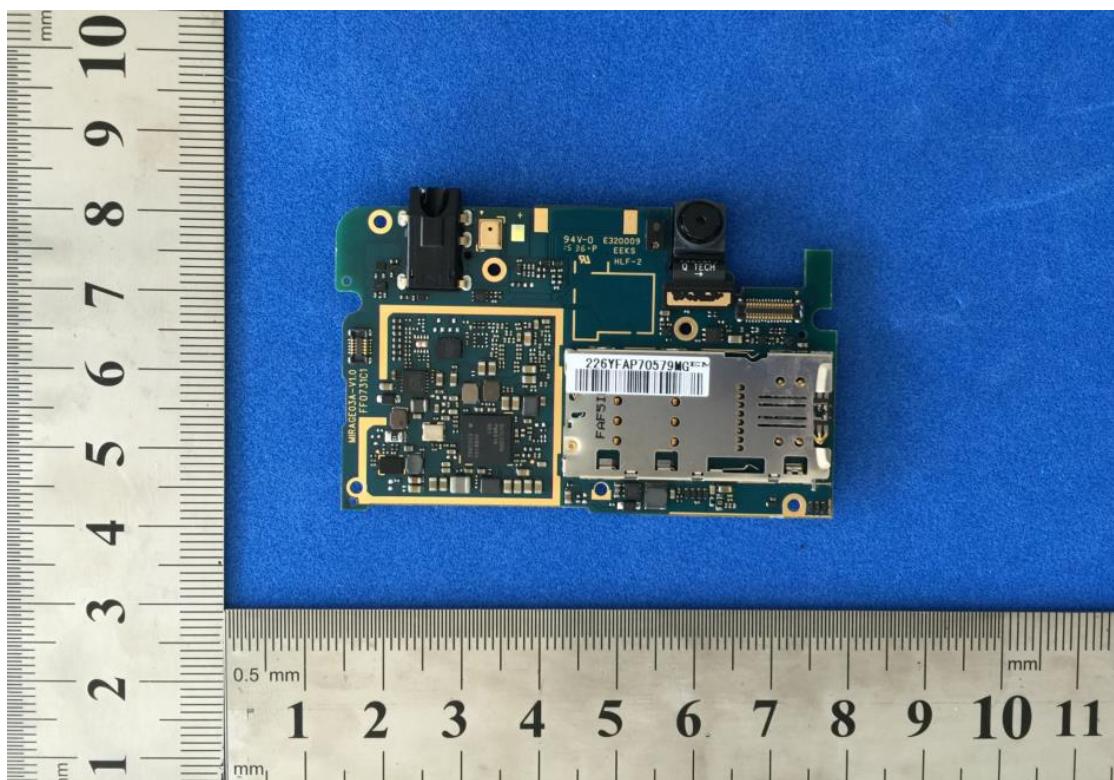
Main board with shielding Front View



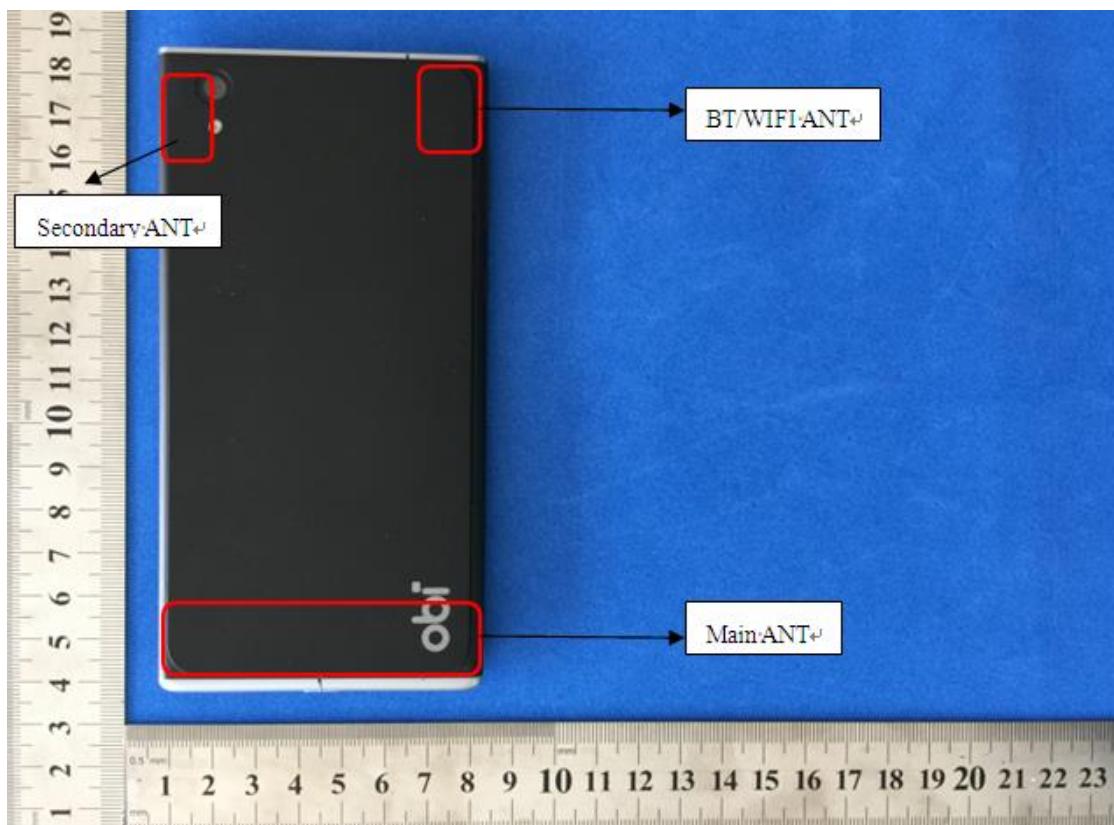
Main board without shielding Front View



Main board Rear View



Antenna View



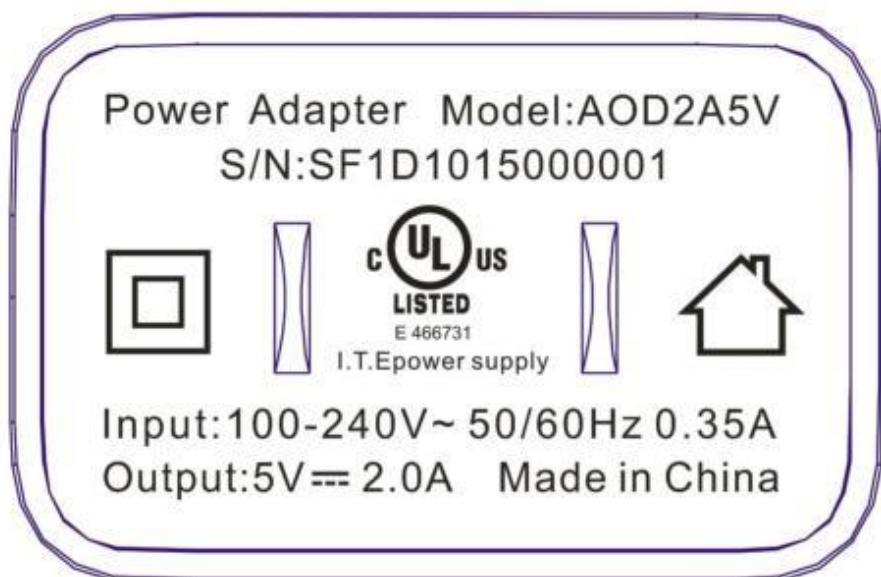
### Battery label View



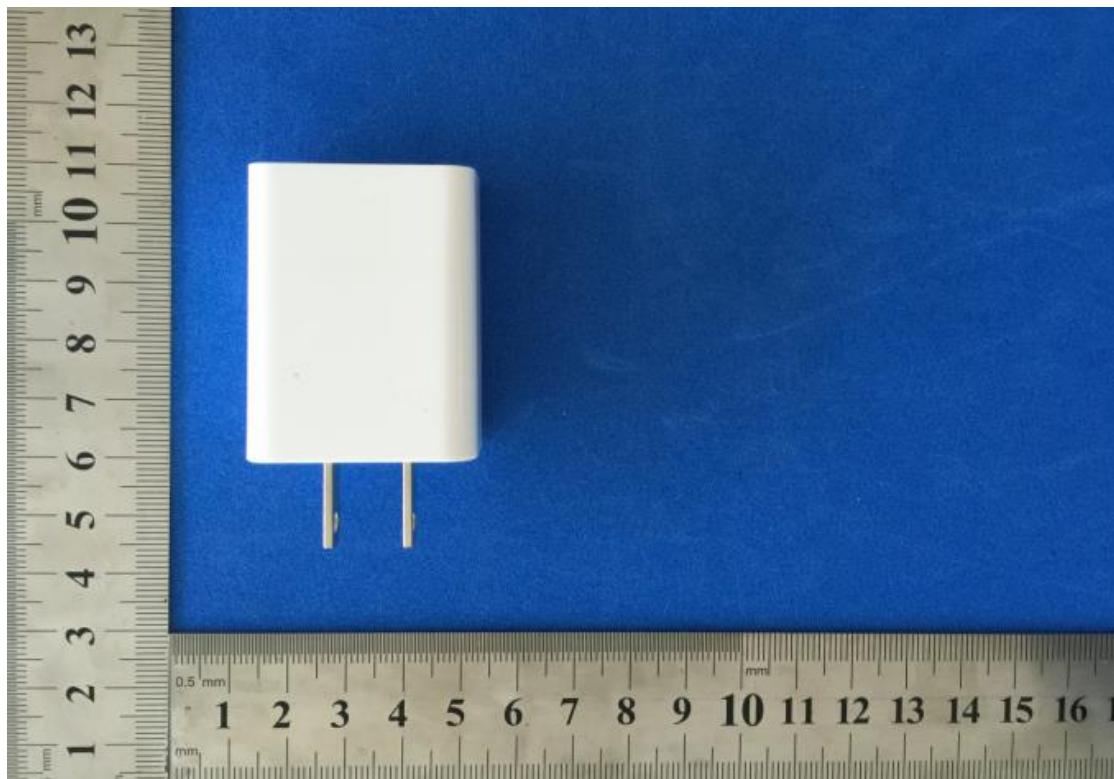
### Battery View



**Adapter label view**



**Adapter view**



## ANNEX B: Detailed Test Results

### B.1 Output Power(22.913(a)/24.232(b))

#### B.1.1 Conducted Output Power Measurement

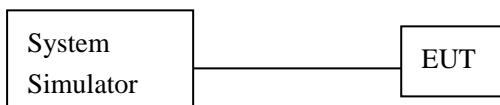
##### B.1.1.1 Description

A base station simulator was used to establish communication with the EUT. Its parameters were set to transmit the maximum power on the EUT. The measured power in the radio frequency on the transmitter output terminals shall be reported.

##### B.1.1.2 Test Procedures

1. The transmitter output port was connected to base station.
2. Set EUT as maximum power through base station.
3. There measurements were done at 3 frequencies, 824.2MHz, 836.6MHz and 848.8MHz for GSM850 band; 1850.2MHz, 1880.0MHz and 1909.8MHz for PCS1900 band.

##### B.1.1.3 Test Setup



##### B.1.1.4 Test Results

###### GSM850

###### Limit

Power step	Peak output power(dBm)	Tolerance(dB)
5	$\leq 33\text{dBm}(2\text{W})$	$\pm 2$

###### Measurement result

###### GSM

Frequency(MHz)	Channel No.	Power Step	Peak output power(dBm)	Verdict
824.2	128	5	32.33	Pass
836.6	190		32.68	Pass
848.8	251		32.66	Pass

###### GPRS

Frequency(MHz)	Channel No.	Power Step	Peak output power(dBm)	Verdict
824.2	128	5	32.49	Pass
836.6	190		32.63	Pass
848.8	251		32.73	Pass

###### PCS1900

###### Limit

Power step	Peak output power(dBm)	Tolerance(dB)
0	$\leq 30\text{dBm}(1\text{W})$	$\pm 2$

###### Measurement result

###### GSM

Frequency(MHz)	Channel No.	Power Step	Peak output power(dBm)	Verdict
1850.2	512	0	29.34	Pass
1880.0	661	0	29.36	Pass
1909.8	810	0	29.22	Pass

## GPRS

Frequency(MHz)	Channel No.	Power Step	Peak output power(dBm)	Verdict
1850.2	512	5	29.35	Pass
1880.0	661		29.32	Pass
1909.8	810		29.16	Pass

## WCDMA Band V and Band II

### Limit

Band	Power step	Peak output power(dBm)	Tolerance(dB)
II,V	3	≤24dBm(1W)	+1.7/-3.7

## Band II

Band/Time slot configuration	Frequency(MHz)	Channel	Power Class	Peak output power(dBm)	Verdict
RMC (12.2kbps)	1852.6	9263	3	22.97	Pass
	1880.0	9400		22.99	
	1907.6	9538		22.98	
HSDPA Subtest 1	1852.6	9263	3	22.13	Pass
	1880.0	9400		22.13	
	1907.6	9538		22.00	
HSDPA Subtest 2	1852.6	9263	3	22.14	Pass
	1880.0	9400		22.06	
	1907.6	9538		22.04	
HSDPA Subtest 3	1852.6	9263	3	21.63	Pass
	1880.0	9400		21.51	
	1907.6	9538		21.54	
HSDPA Subtest 4	1852.6	9263	3	21.62	Pass
	1880.0	9400		21.49	
	1907.6	9538		21.63	
HSUPA Subtest 1	1852.6	9263	3	22.11	Pass
	1880.0	9400		21.58	
	1907.6	9538		21.69	
HSUPA Subtest 2	1852.6	9263	3	20.81	Pass
	1880.0	9400		21.03	
	1907.6	9538		20.66	
HSUPA Subtest 3	1852.6	9263	3	20.48	Pass
	1880.0	9400		20.47	
	1907.6	9538		20.37	

HSUPA Subtest 4	1852.6	9263		21.04	Pass
	1880.0	9400		20.79	
	1907.6	9538		20.75	
HSUPA Subtest 5	1852.6	9263		22.04	Pass
	1880.0	9400		20.68	
	1907.6	9538		21.56	

## Band V

Band/Time slot configuration	Frequency( MHz)	Channel	Power Class	Peak output power(dBm)	Verdict
RMC (12.2kbps)	826.6	4133		23.30	Pass
	835.0	4175		23.30	
	846.4	4232		23.28	
HSDPA Subtest 1	826.6	4133		22.27	Pass
	835.0	4175		22.31	
	846.4	4232		22.25	
HSDPA Subtest 2	826.6	4133		22.28	Pass
	835.0	4175		22.34	
	846.4	4232		22.19	
HSDPA Subtest 3	826.6	4133		21.89	Pass
	835.0	4175		21.84	
	846.4	4232		21.79	
HSDPA Subtest 4	826.6	4133		21.78	Pass
	835.0	4175		21.68	
	846.4	4232		21.58	
HSUPA Subtest 1	826.6	4133		21.65	Pass
	835.0	4175		21.63	
	846.4	4232		21.65	
HSUPA Subtest 2	826.6	4133		21.24	Pass
	835.0	4175		20.70	
	846.4	4232		21.09	
HSUPA Subtest 3	826.6	4133		20.84	Pass
	835.0	4175		20.95	
	846.4	4232		20.91	
HSUPA Subtest 4	826.6	4133		21.28	Pass
	835.0	4175		21.10	
	846.4	4232		20.25	
HSUPA Subtest 5	826.6	4133		21.13	Pass
	835.0	4175		21.07	
	846.4	4232		21.23	

### B.1.2 Radiated Power

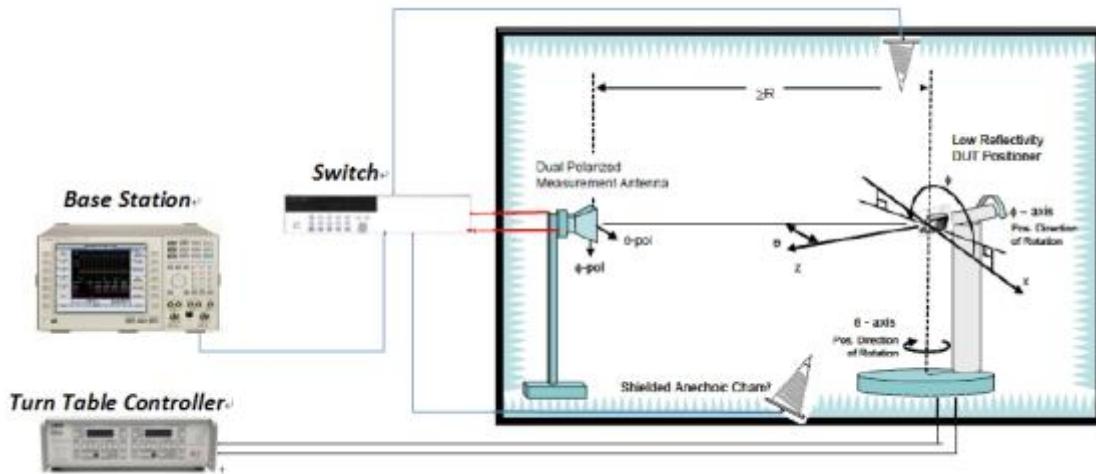
#### B.1.2.1 Description

This is the test for the maximum radiated power from the EUT. Rule Part 24.232(b) specifies, "Mobile/portable stations are limited to 2 watts e.i.r.p. Peak power and 24.232(c) specifies that "Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage." Rule Part 22.913(a) specifies "Maximum ERP. The effective radiated power (ERP) of base transmitters and cellular repeaters must not exceed 500 Watts. The ERP of mobile transmitter sand auxiliary test transmitters must not exceed 7 Watts."

#### B.1.2.2 Test Procedures

1. In an anechoic antenna test chamber, a half-wave dipole antenna for the frequency band of interest is placed at the reference centre of the chamber. An RF Signal source for the frequency band of interest is connected to the dipole with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A known (measured) power ( $P_{in}$ ) is applied to the input of the dipole, and the power received ( $P_r$ ) at the chamber's probe antenna is recorded.
2. A "reference path loss" is established as  $P_{in} + 2.15 - P_r$ .
3. The EUT is substituted for the dipole at the reference centre of the chamber and a scan is performed to obtain the radiation pattern.
4. From the radiation pattern, the co-ordinates where the maximum antenna gain occurs are identified.
5. The EUT is then put into pulse mode at its maximum power level (Power Step 0 for PCS1900,5 for GSM 850).
6. "Gated mode" power measurements are performed with the receiving antenna placed at the coordinates determined in Step 3 to determine the output power as defined in Rule 24.232 (b) and (c). The "reference path loss" from Step1 is added to this result.
7. This value is EIRP since the measurement is calibrated using a half-wave dipole antenna of known gain (2.15 dBi) and known input power ( $P_{in}$ ).
8. ERP can be calculated from EIRP by subtracting the gain of the dipole,  $ERP = EIRP - 2.15\text{dBi}$ .

#### B.1.2.3 Test Setup



#### B.1.2.4 Test Result of ERP

##### GSM850

Frequency(MHz)	Channel No.	Power Step	ERP(dBm)	Verdict
824.2	128	5	29.79	Pass
836.6	190	5	29.58	Pass

848.8	251	5	29.43	Pass
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**WCDMA Band V**

Frequency(MHz)	Channel No.	Power Step	ERP(dBm)	Verdict
826.6	4133	3	21.06	Pass
835	4175	3	19.59	Pass
846.4	4232	3	20.26	Pass

**B1.2.4 Test Result of EIRP****GSM1900**

Frequency(MHz)	Channel	Power Step	EIRP(dBm)	Verdict
1850.2	512	0	30.26	Pass
1880.0	661	0	30.98	Pass
1909.8	810	0	30.77	Pass

**WCDMA Band II**

Frequency(MHz)	Channel	Power Class	EIRP(dBm)	Verdict
1852.6	9263	3	22.69	Pass
1880.0	9400	3	22.49	Pass
1907.6	9538	3	22.32	Pass

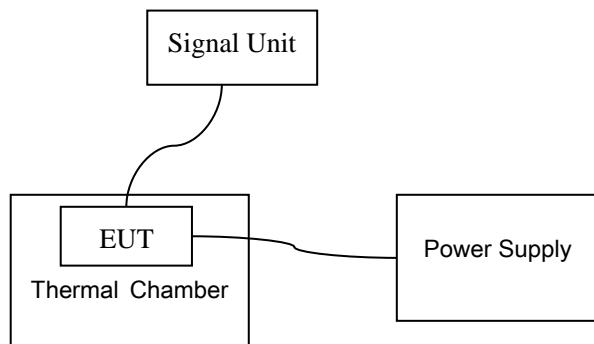
**B.2 Frequency Stability(22.355/24.235)****B.2.1 Description**

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that fundamental emission stays within the authorized frequency block. The frequency stability of transmitter shall be maintained within  $\pm 0.00023\%$  ( $\pm 2.5\text{ppm}$ ) of the center frequency.

**B.2.2 Test Procedure for Temperature Variation**

1. The EUT was set up in the thermal chamber and connected with the base station.
2. With power OFF, the temperature was decreased to  $-20^\circ\text{C}$  and the EUT was stabilized for three hours. Power was applied and maximum change in frequency was recorded within one minute.
3. With power OFF, the temperature was raised in  $10^\circ\text{C}$  step to  $50^\circ\text{C}$ . The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.
4. if the EUT cannot be turned on at  $-30^\circ\text{C}$ , the testing lowest temperature will be raised in  $10^\circ\text{C}$  step until the EUT can be turned on.

**B.2.2.1 Test Setup**



### B.2.2.2 Test Results

#### GSM850

Temperature (°C)	Frequency Error (Hz)	ppm	Limit	Verdict
-20	/	/	$\leq \pm 2.5\text{ppm}$	/
-10	/	/		/
0	1.69	0.0020		Pass
10	10.69	0.0128		Pass
20	13.54	0.0162		Pass
30	3.29	0.0039		Pass
40	5.92	0.0071		Pass
50	/	/		/
55	/	/		/

#### GSM1900

Temperature (°C)	Frequency Error (Hz)	ppm	Limit	Verdict
-20	/	/	$\leq \pm 2.5\text{ppm}$	/
-10	/	/		/
0	-4.6	-0.0024		Pass
10	22.93	0.0122		Pass
20	12.83	0.0068		Pass
30	-14.9	-0.0079		Pass
40	-3.93	-0.0021		Pass
50	/	/		/
55	/	/		/

#### WCDMA Band II

Temperature (°C)	Frequency Error (Hz)	ppm	Limit	Verdict
-20	/	/	$\leq \pm 2.5\text{ppm}$	/
-10	/	/		/
0	13.25	0.0070		Pass
10	14.33	0.0076		Pass
20	21.36	0.0114		Pass
30	19.36	0.0103		Pass

40	-12.33	-0.0066		Pass
50	/	/		/
55	/	/		/

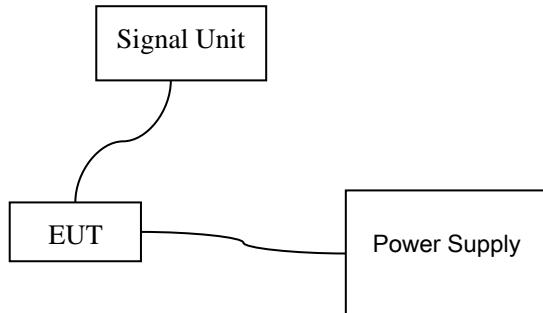
### WCDMA Band V

Temperature (°C)	Frequency Error (Hz)	ppm	Limit	Verdict
-20	/	/	$\leq \pm 2.5\text{ppm}$	/
-10	/	/		/
0	6.59	0.0079		Pass
10	3.64	0.0044		Pass
20	2.88	0.0034		Pass
30	5.36	0.0064		Pass
40	4.98	0.0060		Pass
50	/	/		/
55	/	/		/

### B.2.3 Test Procedure for Voltage Variation

1. The EUT was placed in a temperature chamber at  $25 \pm 5^\circ\text{C}$  and connected with the base station.
2. The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency was measured.

#### B.2.3.1 Test Setup



#### B.2.3.2 Test Results:

Band	Voltage (V)	Freq.Dev.(Hz)	Dev.(ppm)	Limit(ppm)	Verdict
GSM850	3.6	3.27	0.0039	$\leq \pm 2.5\text{ppm}$	Pass
	3.8	1.27	0.0015		Pass
	4.2	10.37	0.0124		Pass
GSM1900	3.6	7.64	0.0041		Pass
	3.8	-14.47	-0.0077		Pass
	4.2	-6.93	-0.0037		Pass
WCDMA Band II	3.6	-10.36	-0.0055		Pass
	3.8	11.22	0.0060		Pass

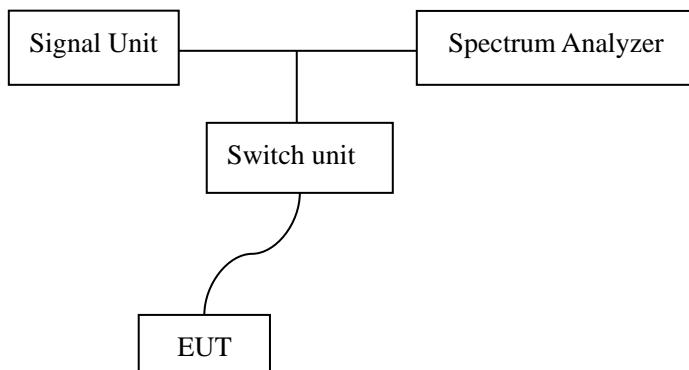
	4.2	13.24	0.0070		Pass
WCDMA Band V	3.6	6.89	0.0083		Pass
	3.8	7.39	0.0089		Pass
	4.2	8.21	0.0098		Pass

### B.3 Occupied Bandwidth(22.917(a)/24.238(b))

#### B.3.1 Description

Similar to conducted emissions; occupied bandwidth measurements are only provided for selected frequencies in order to reduce the amount of submitted data. Data were taken at the extreme and mid frequencies of the USPCS frequency band. The table below lists the measured -20dBc BW(99%). Spectrum analyzer plots are included on the following pages.

#### B.3.2 Test Setup



#### B.3.3 Test Results

Band	CH	Frequency(MHz)	Result	Verdict
GSM850	128	824.2	Fig.1	Pass
	190	836.6	Fig.2	Pass
	251	848.8	Fig.3	Pass
GSM1900	512	1850.2	Fig.4	Pass
	661	1880.0	Fig.5	Pass
	810	1909.8	Fig.6	Pass
WCDMA Band V	4133	824.2	Fig.7	Pass
	4175	835	Fig.8	Pass
	4233	848.8	Fig.9	Pass
WCDMA Band V HSDPA Subtest 1	4133	824.2	Fig.10	Pass
	4175	835	Fig.11	Pass
	4233	848.8	Fig.12	Pass
WCDMA Band V HSUPA Subtest 5	4133	824.2	Fig.13	Pass
	4175	835	Fig.14	Pass
	4233	848.8	Fig.15	Pass
WCDMA Band II	9263	1850.2	Fig.16	Pass

	9400	1880.0	Fig.17	Pass
	9538	1909.8	Fig.18	Pass
WCDMA Band II HSDPA Subtest 1	9263	1850.2	Fig.19	Pass
	9400	1880.0	Fig.20	Pass
	9538	1909.8	Fig.21	Pass
WCDMA Band II HSUPA Subtest 5	9263	1850.2	Fig.22	Pass
	9400	1880.0	Fig.23	Pass
	9538	1909.8	Fig.24	Pass

Fig.1 GSM850-CH128 Occupied Bandwidth

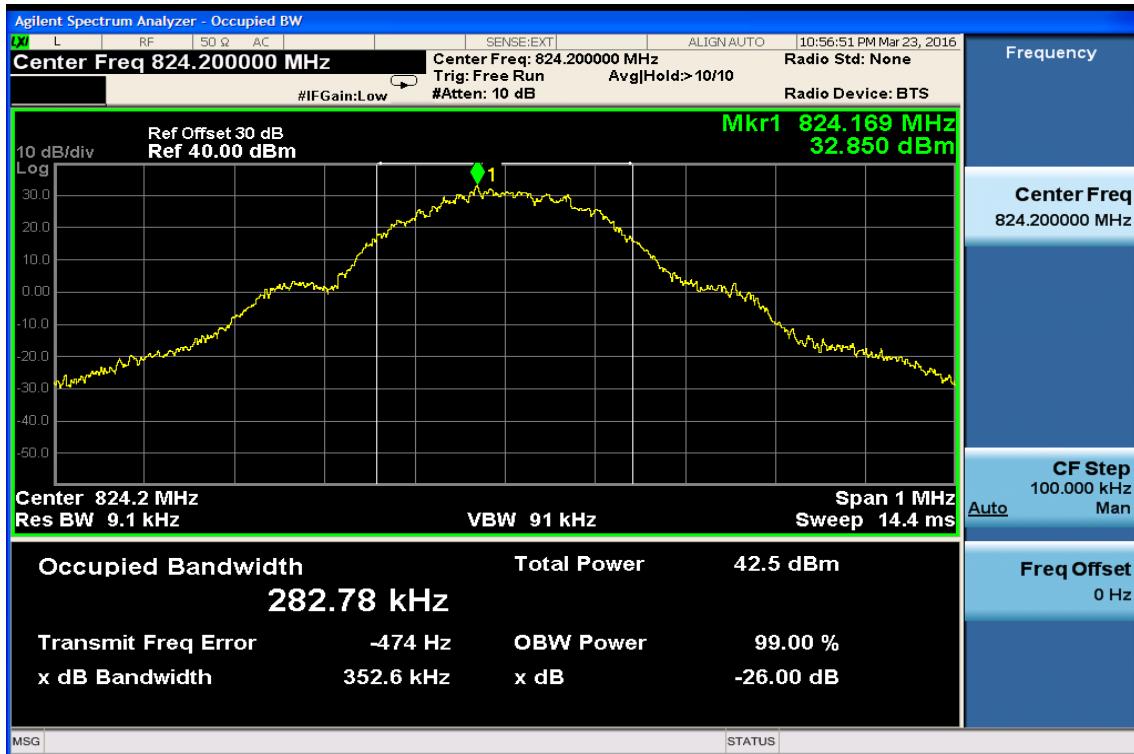


Fig.2 GSM850-CH190 Occupied Bandwidth

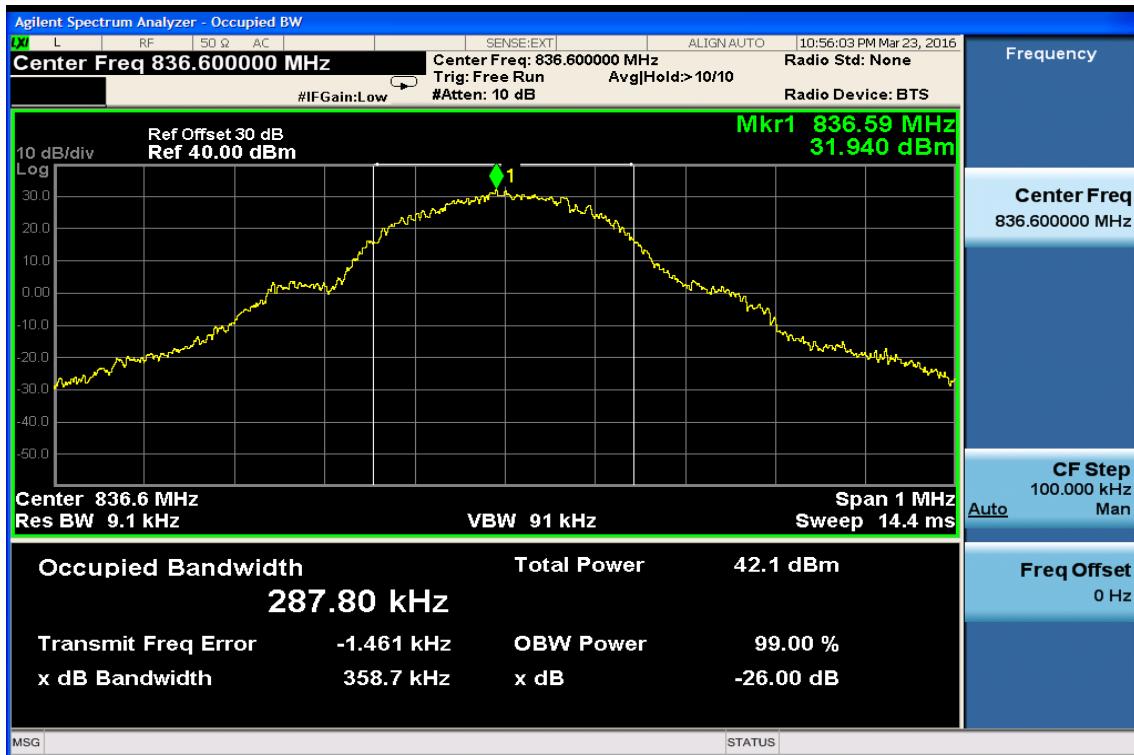


Fig.3 GSM850-CH251 Occupied Bandwidth

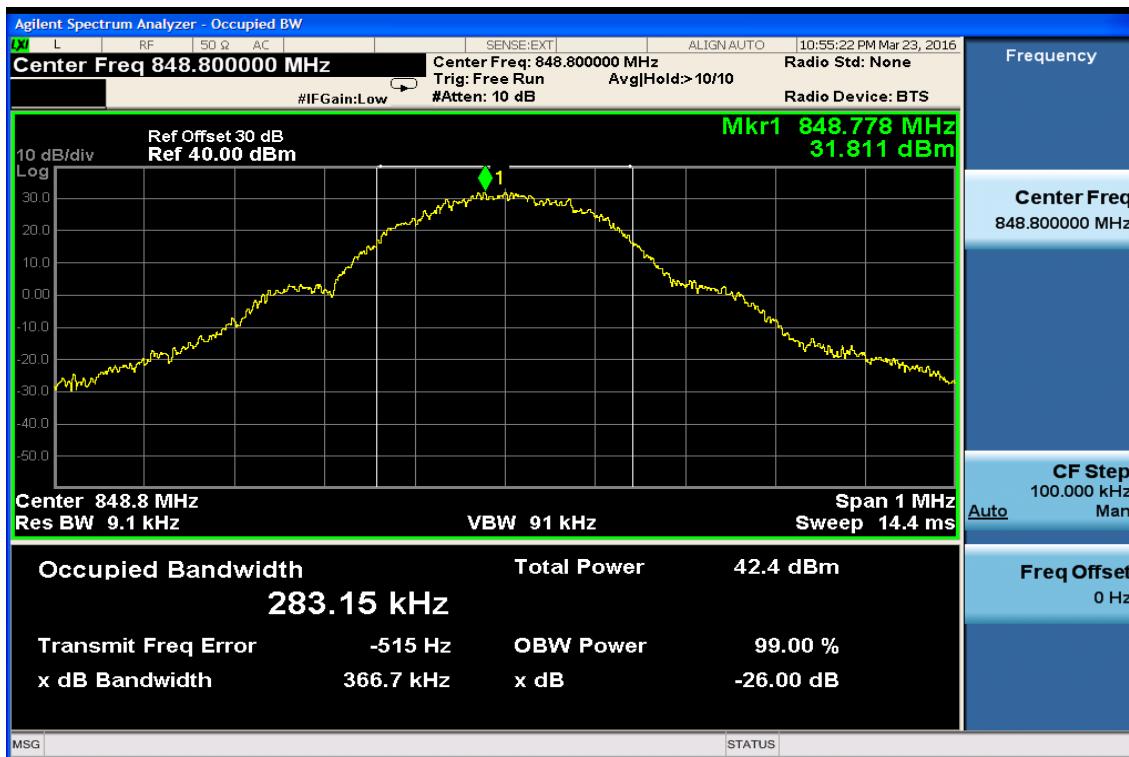


Fig.4 GSM1900-CH512 Occupied Bandwidth

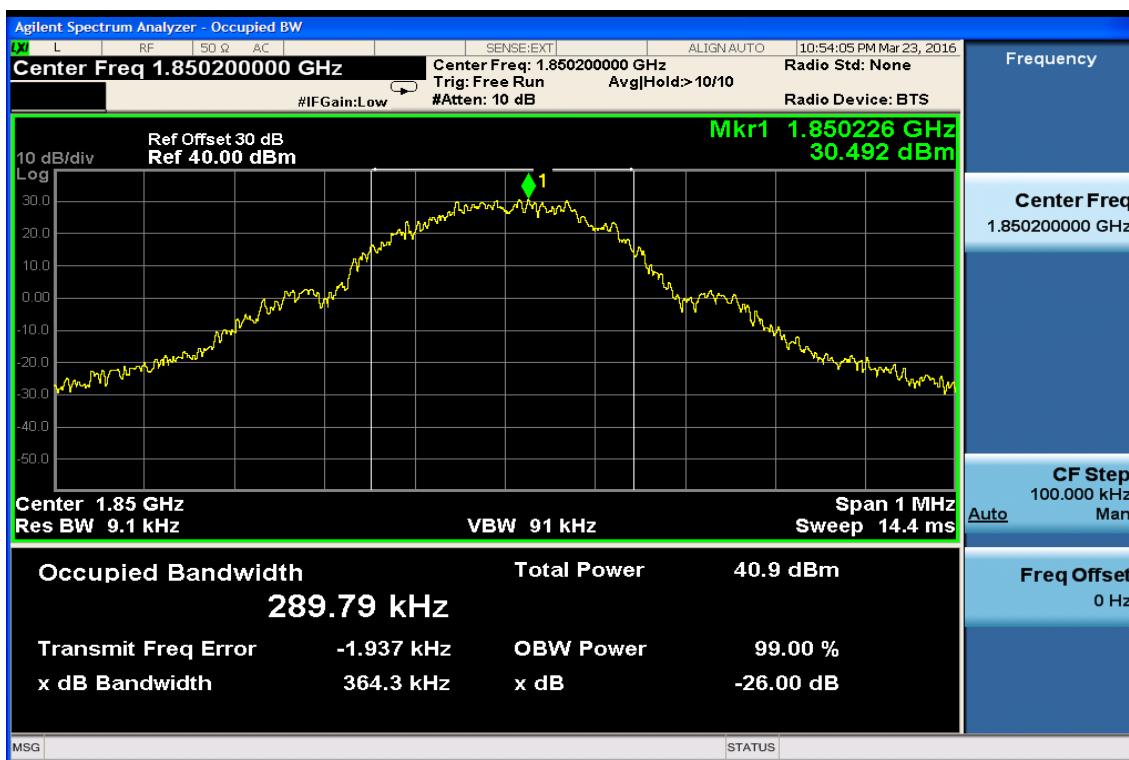


Fig.5 GSM1900-CH661 Occupied Bandwidth

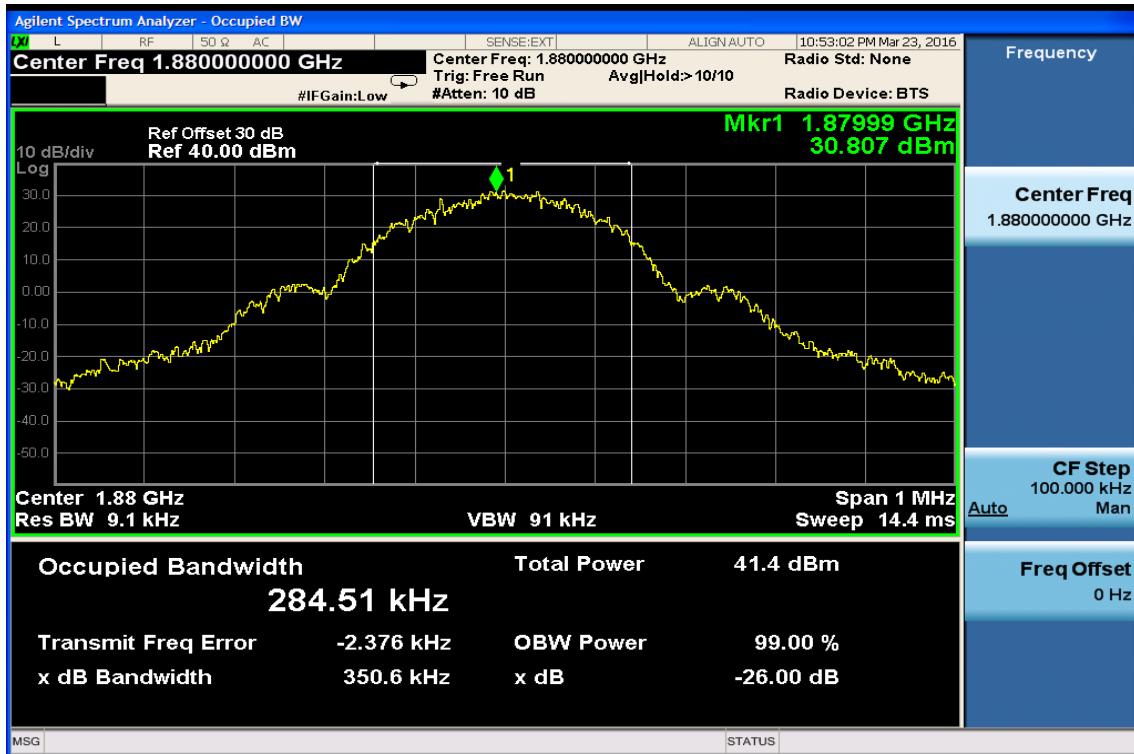


Fig.6 GSM1900-CH810 Occupied Bandwidth



Fig.7 WCDMA Band V-CH4133 Occupied Bandwidth

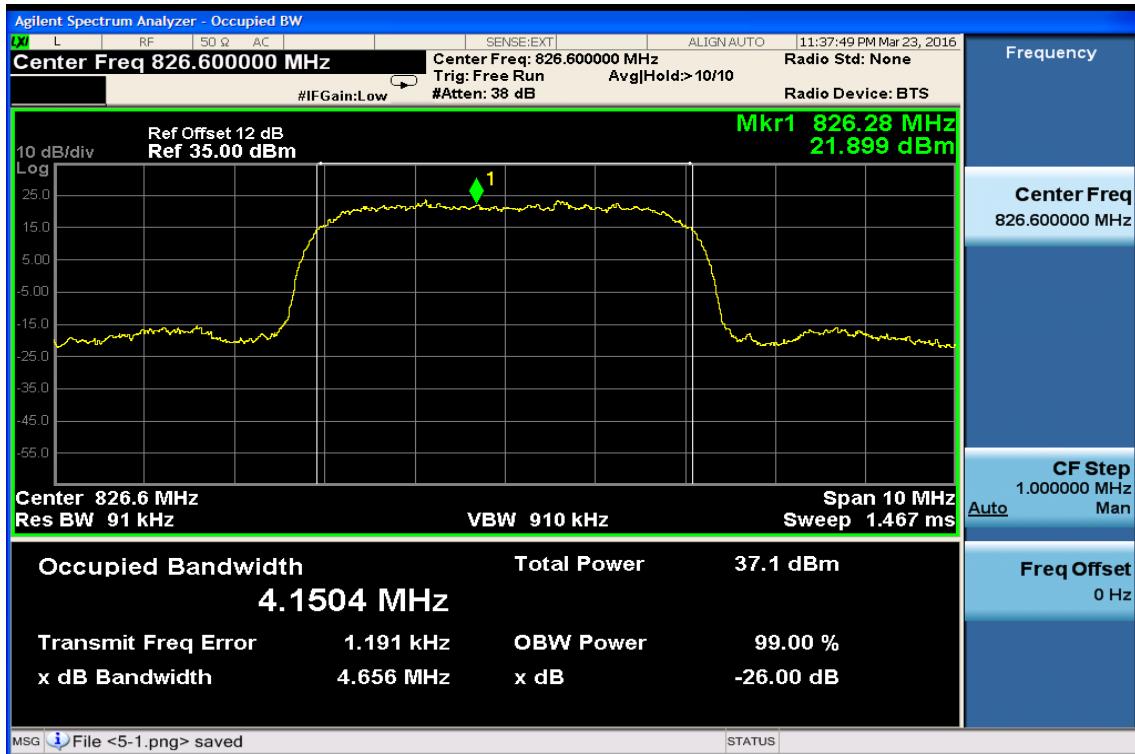


Fig.8 WCDMA Band V-CH4175 Occupied Bandwidth

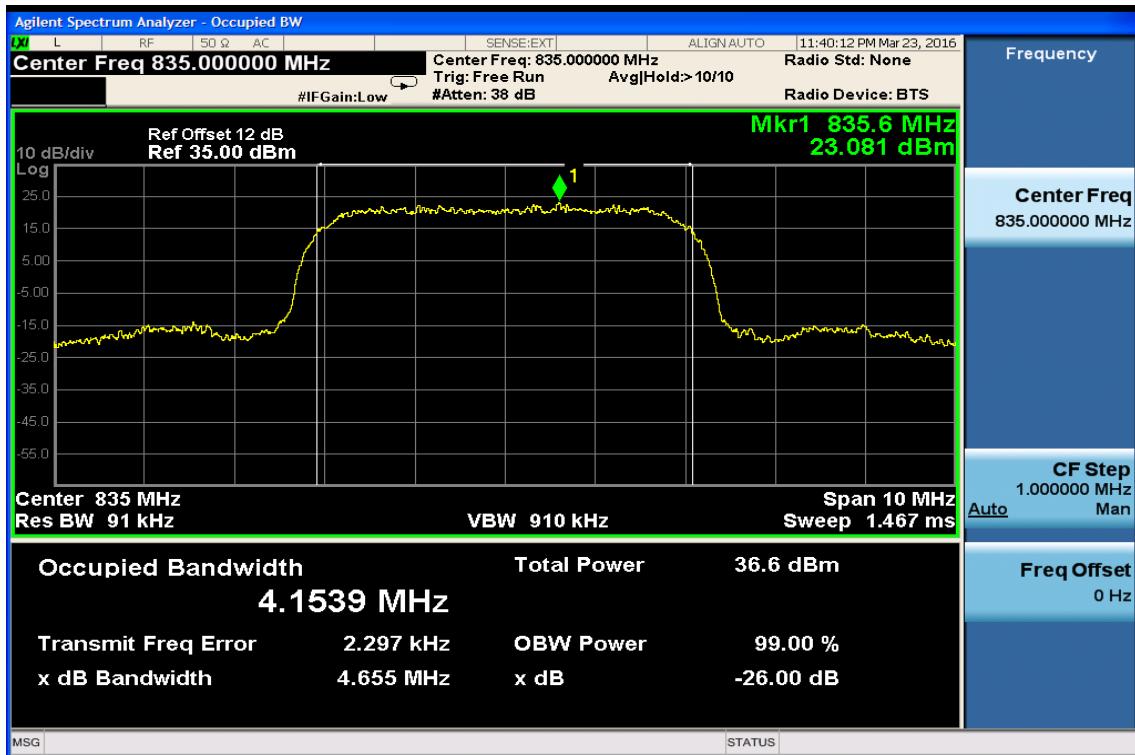


Fig.9 WCDMA Band V-CH4232 Occupied Bandwidth

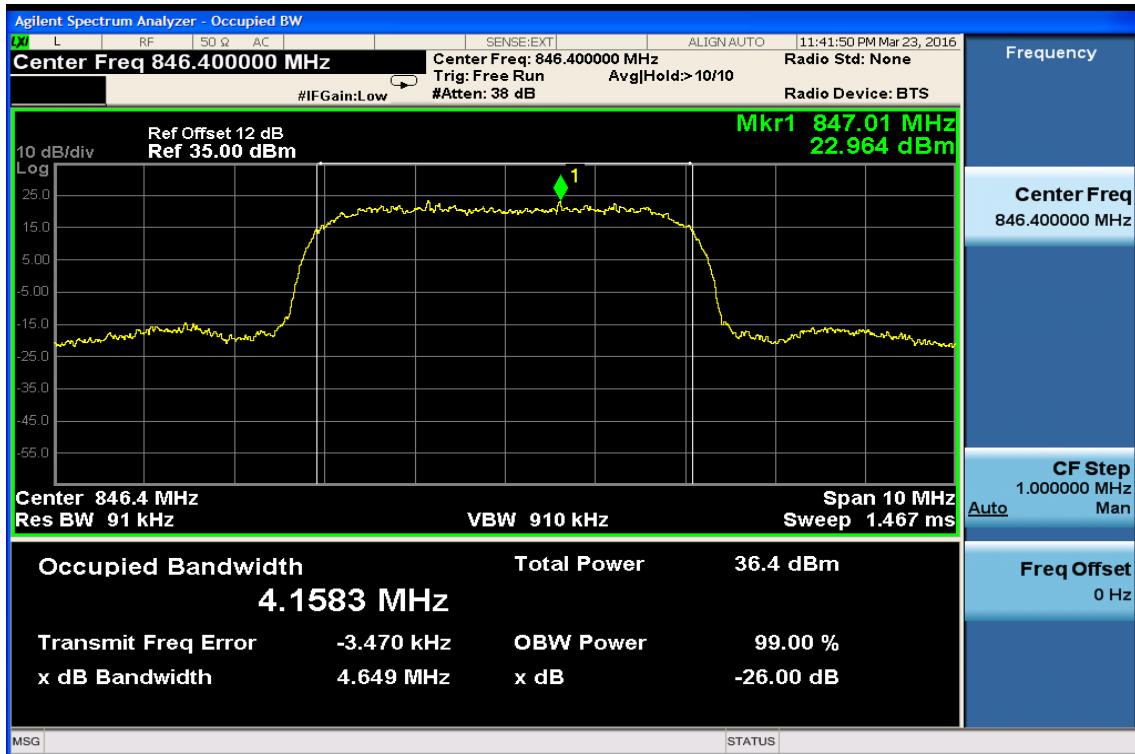


Fig.10 WCDMA Band V-CH4133 Occupied Bandwidth (HSDPA Subtest 1)

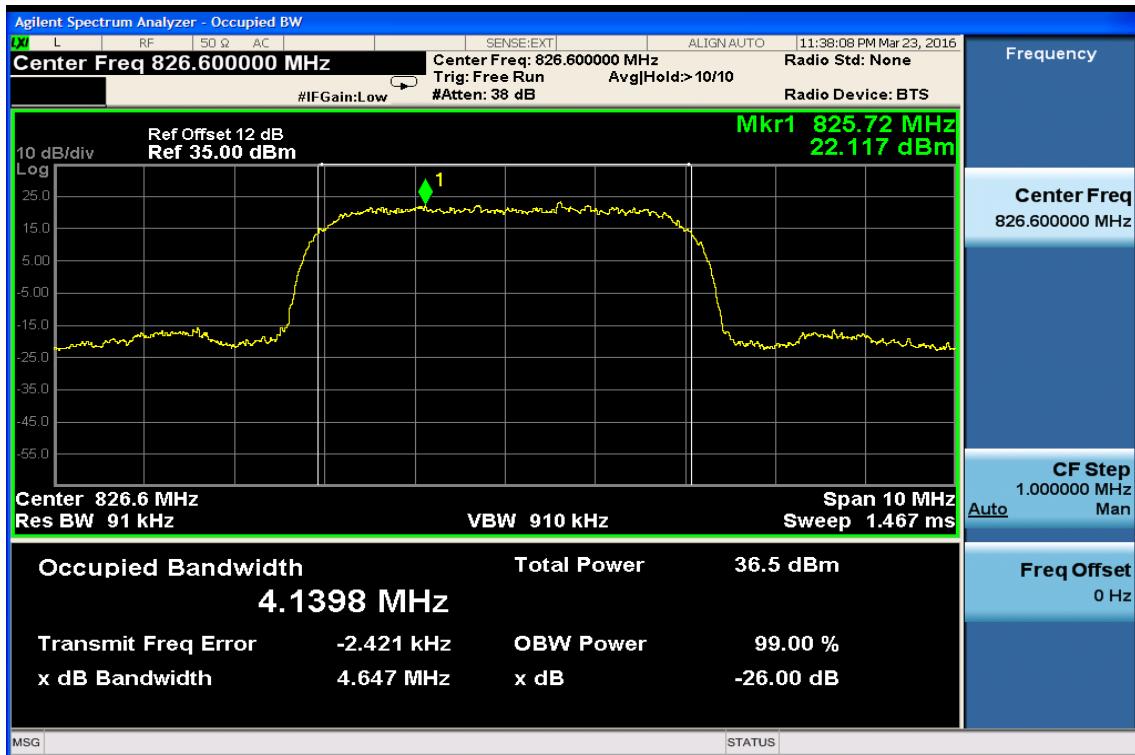


Fig.11 WCDMA Band V-CH4175 Occupied Bandwidth (HSDPA Subtest 1)

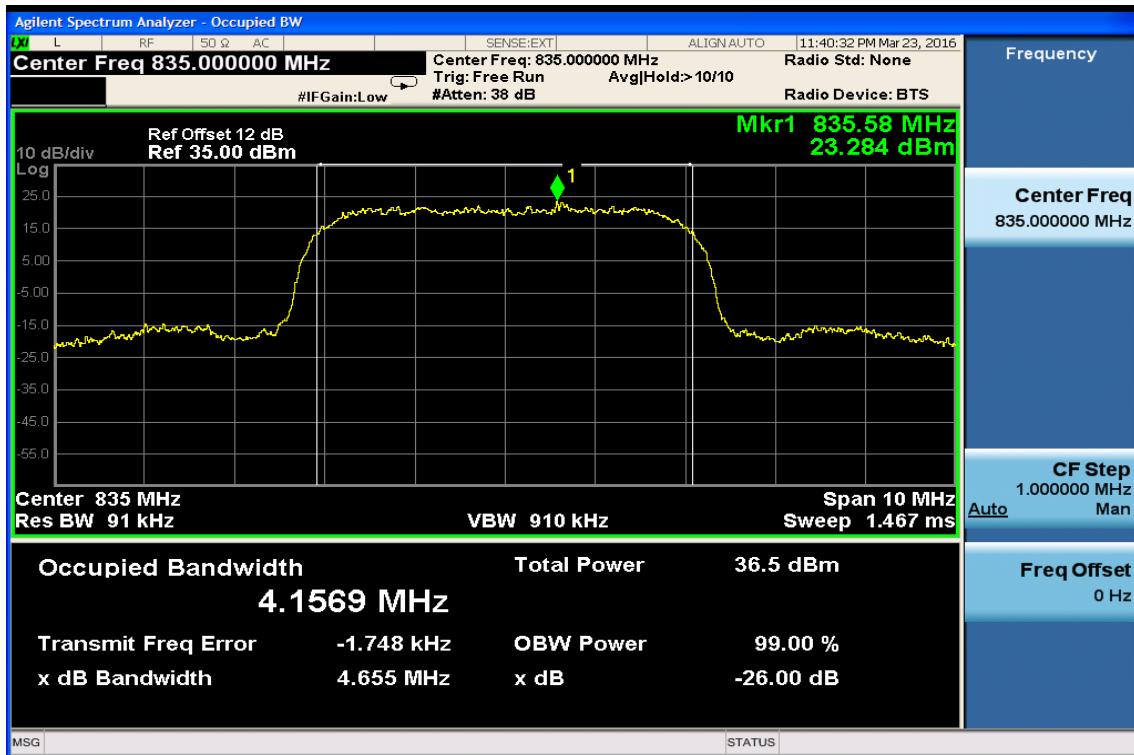


Fig.12 WCDMA Band V-CH4232 Occupied Bandwidth (HSDPA Subtest 1)

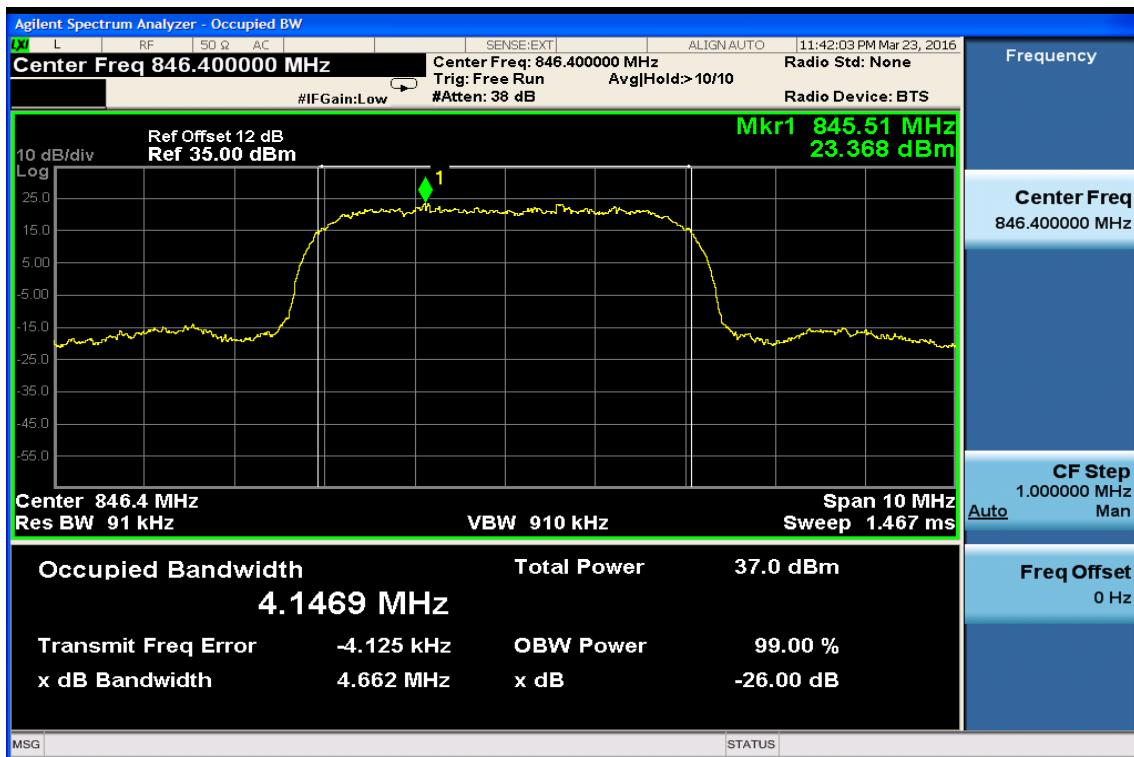


Fig.13 WCDMA Band V-CH4133 Occupied Bandwidth (HSUPA Subtest 1)

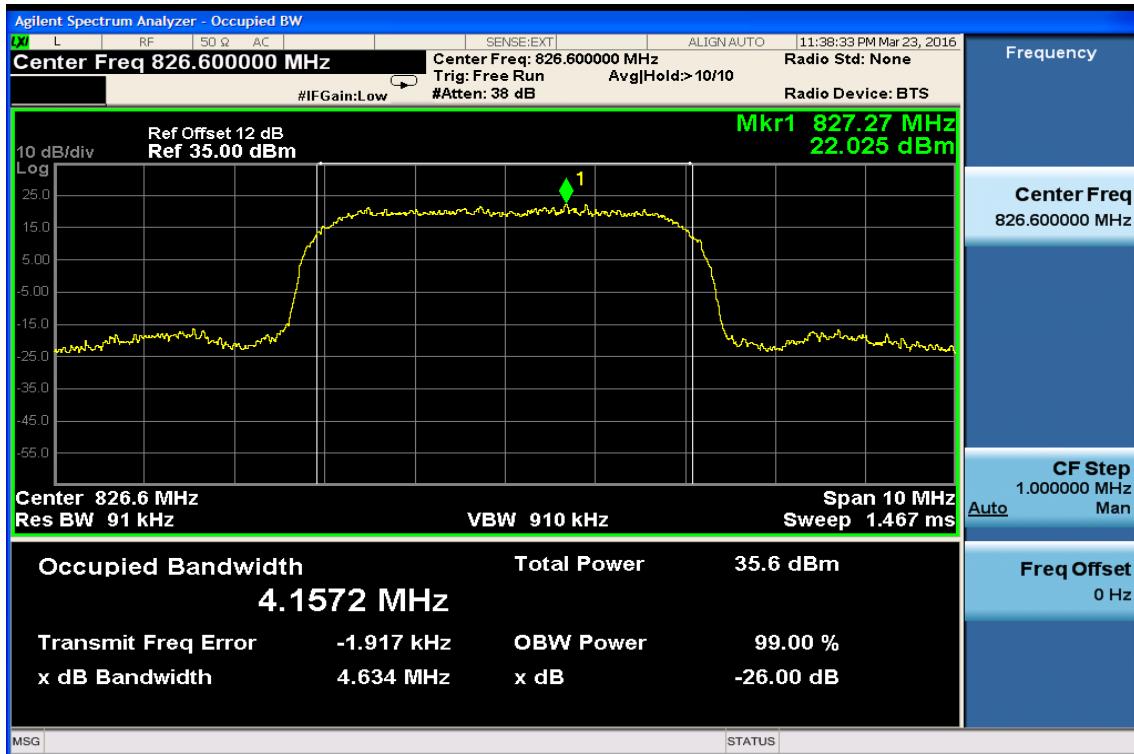


Fig.14 WCDMA Band V-CH4175 Occupied Bandwidth (HSUPA Subtest 1)

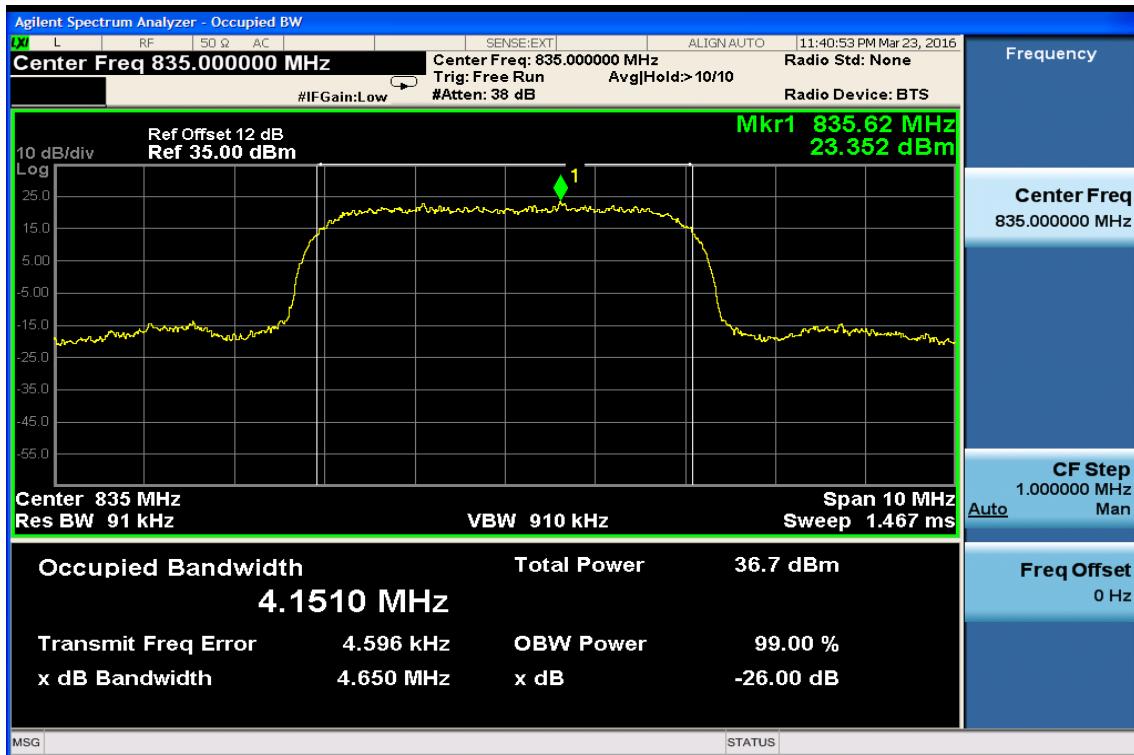


Fig.15 WCDMA Band V-CH4232 Occupied Bandwidth (HSUPA Subtest 1)

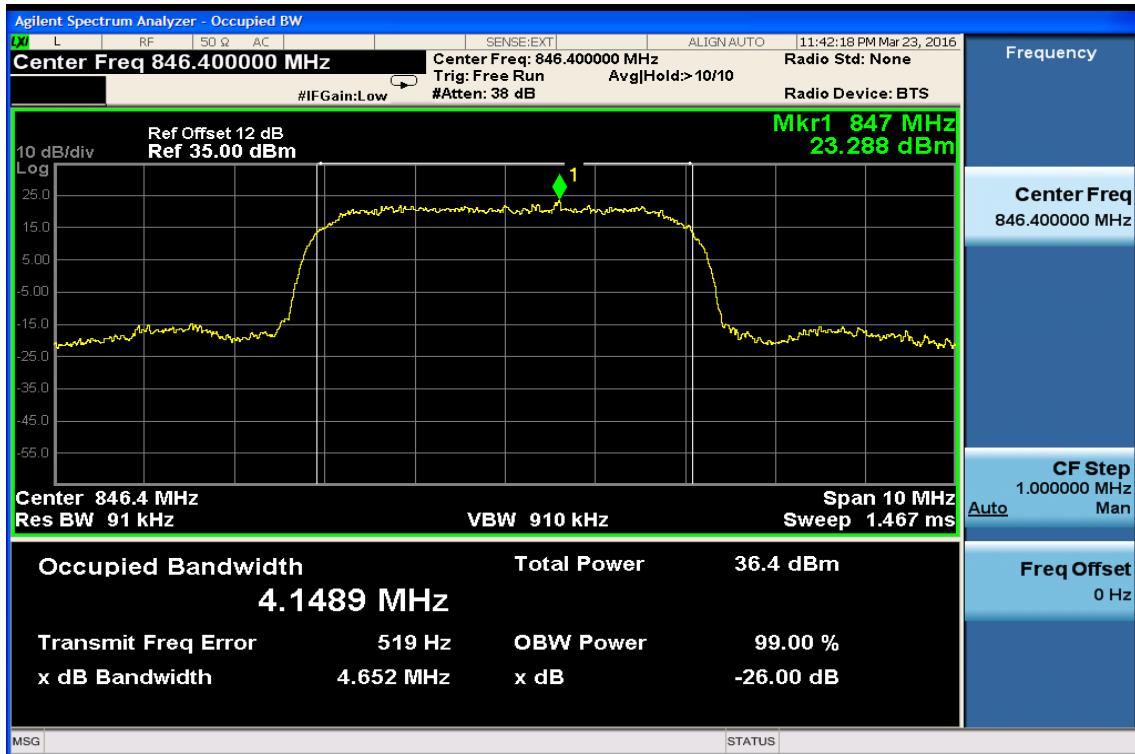


Fig.16 WCDMA Band II-CH9263 Occupied Bandwidth

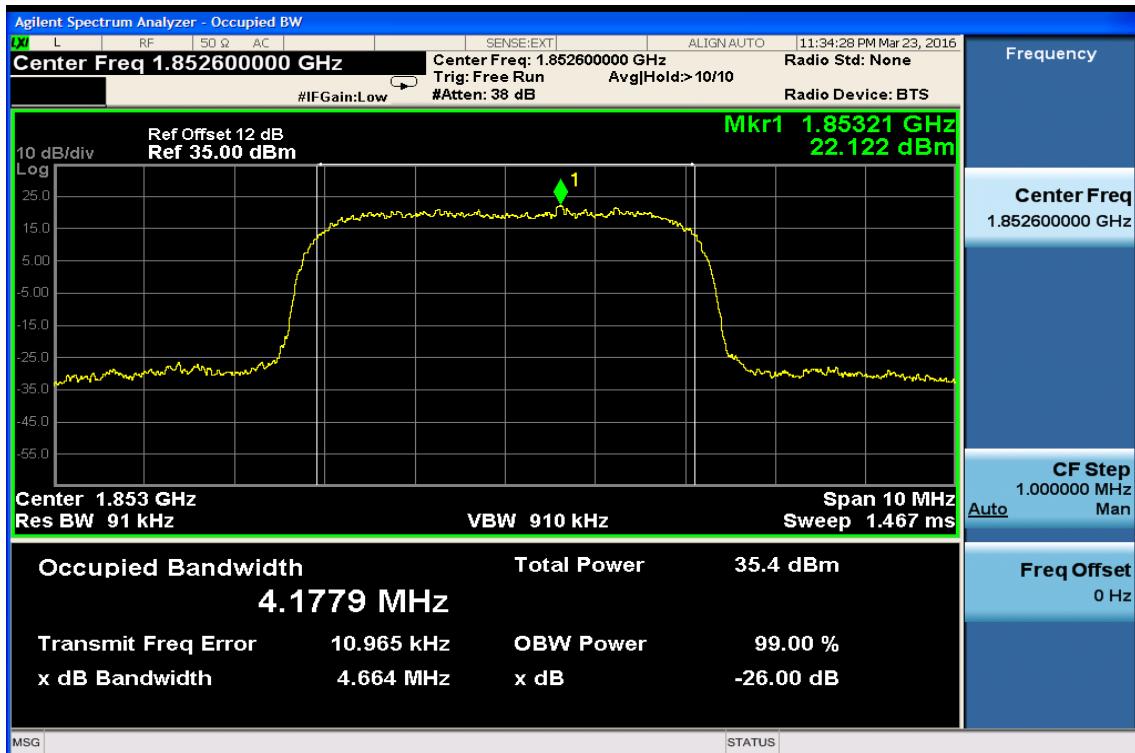


Fig.17 WCDMA Band II-CH9400 Occupied Bandwidth

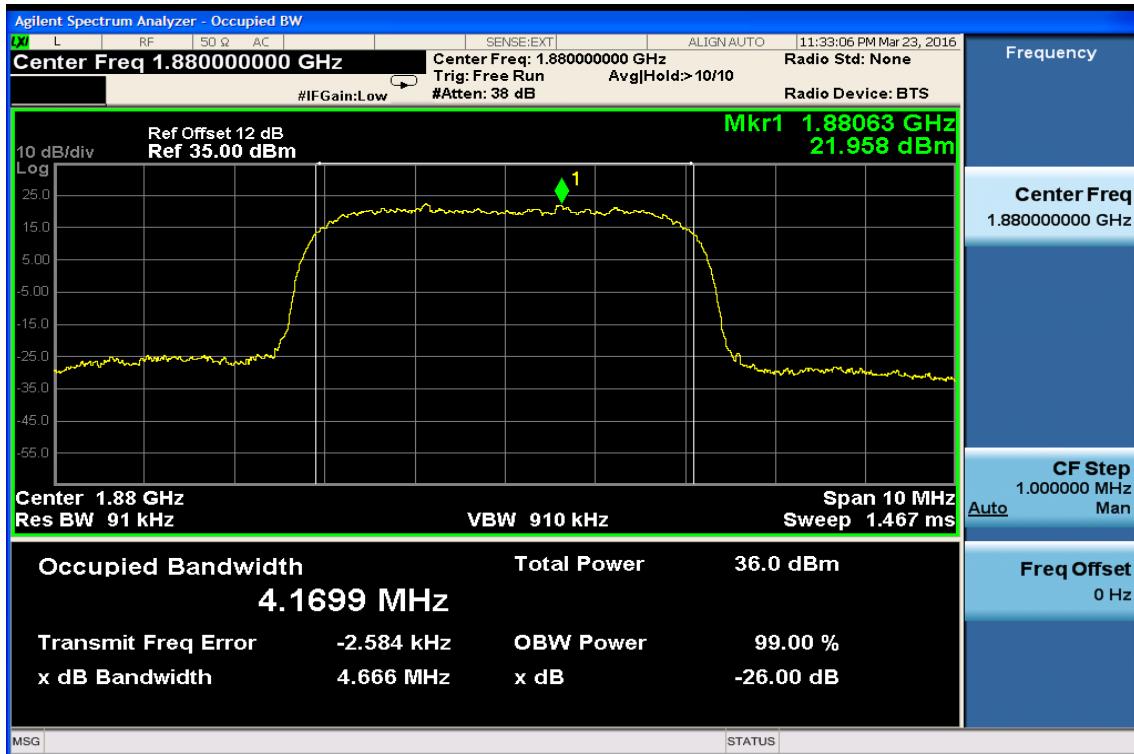


Fig.18 WCDMA Band II-CH9538 Occupied Bandwidth

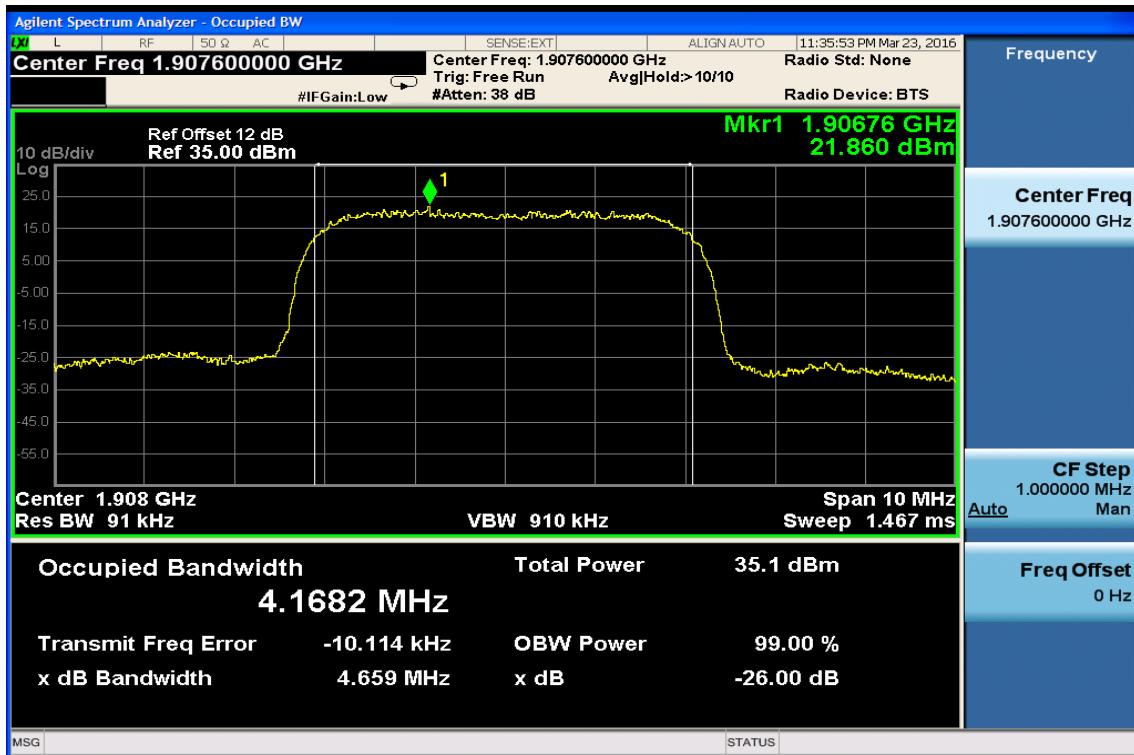


Fig.19 WCDMA Band II-CH9263 Occupied Bandwidth (HSDPA Subtest 1)

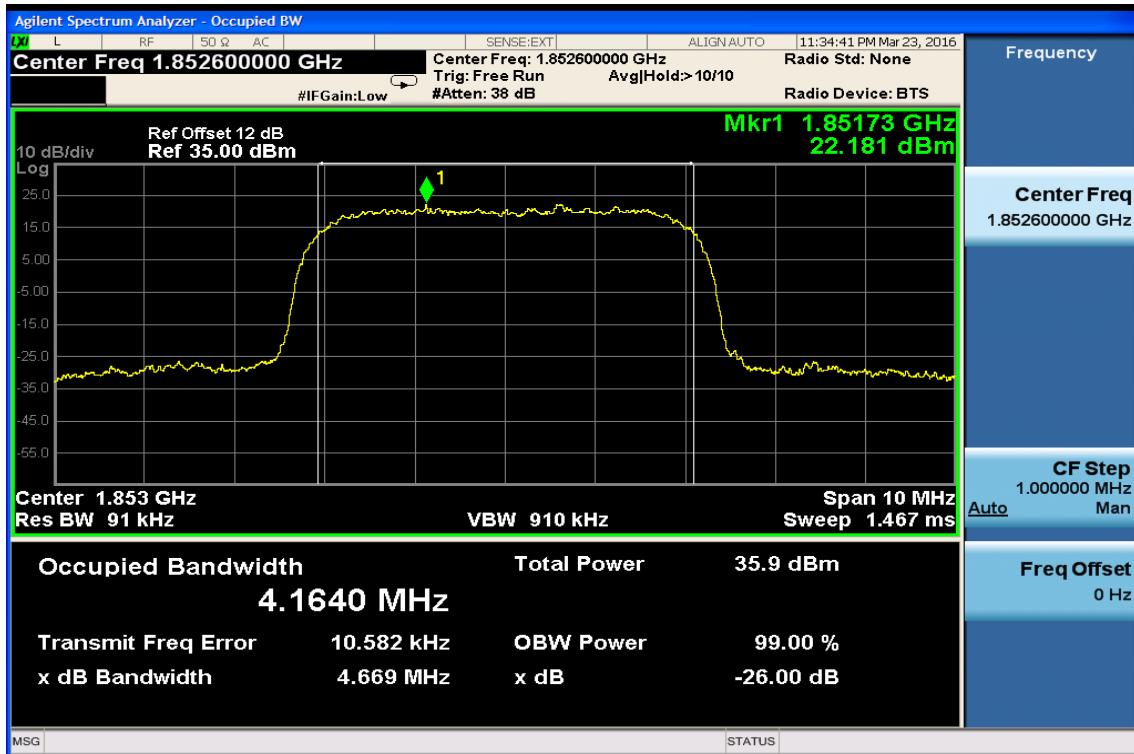


Fig.20 WCDMA Band II-CH9400 Occupied Bandwidth (HSDPA Subtest 1)

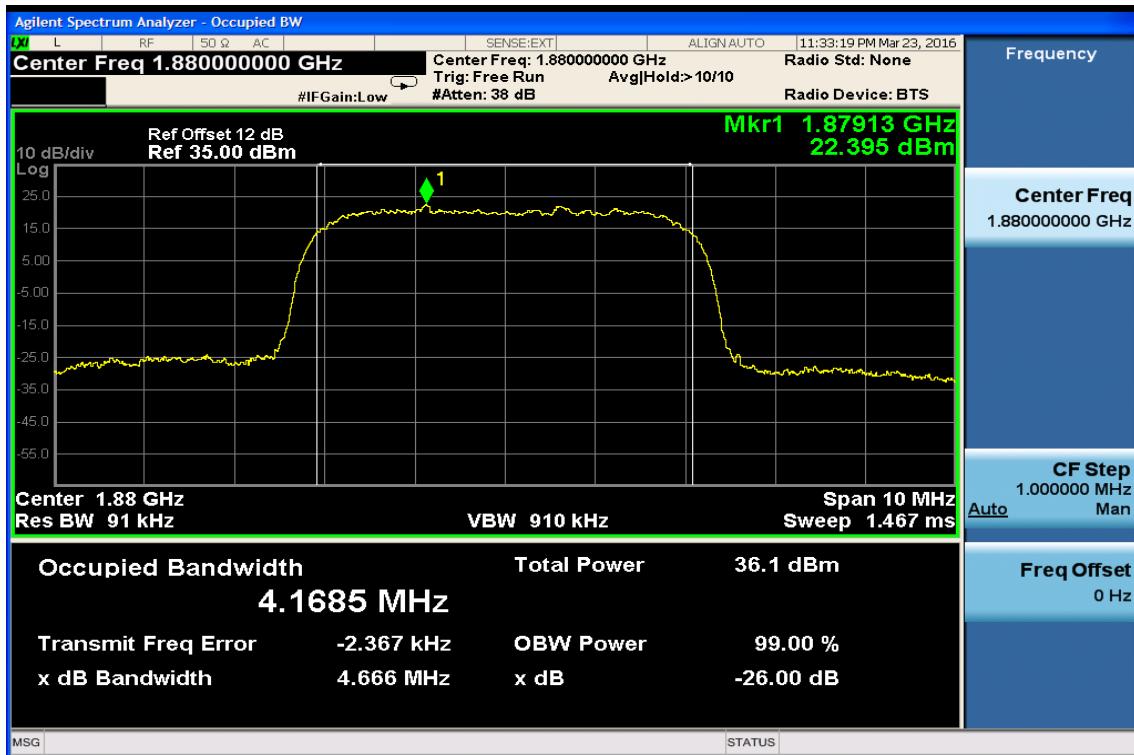


Fig.21 WCDMA Band II-CH9538 Occupied Bandwidth (HSDPA Subtest 1)

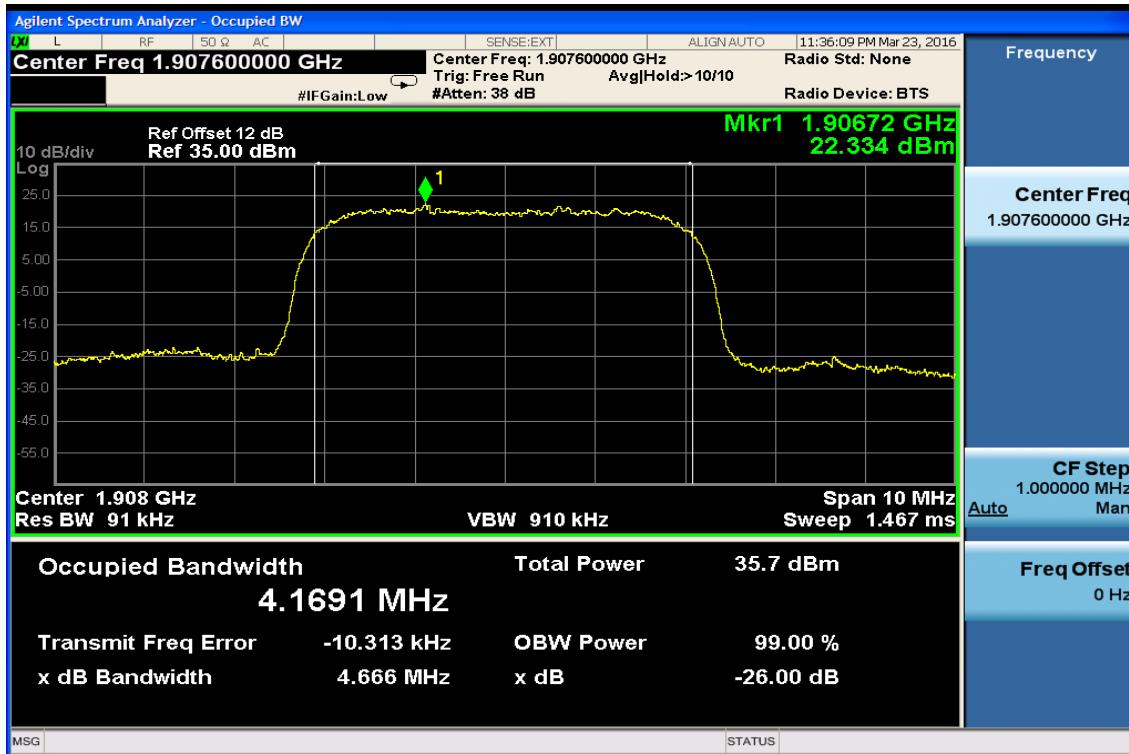


Fig.22 WCDMA Band II-CH92633 Occupied Bandwidth (HSUPA Subtest 1)

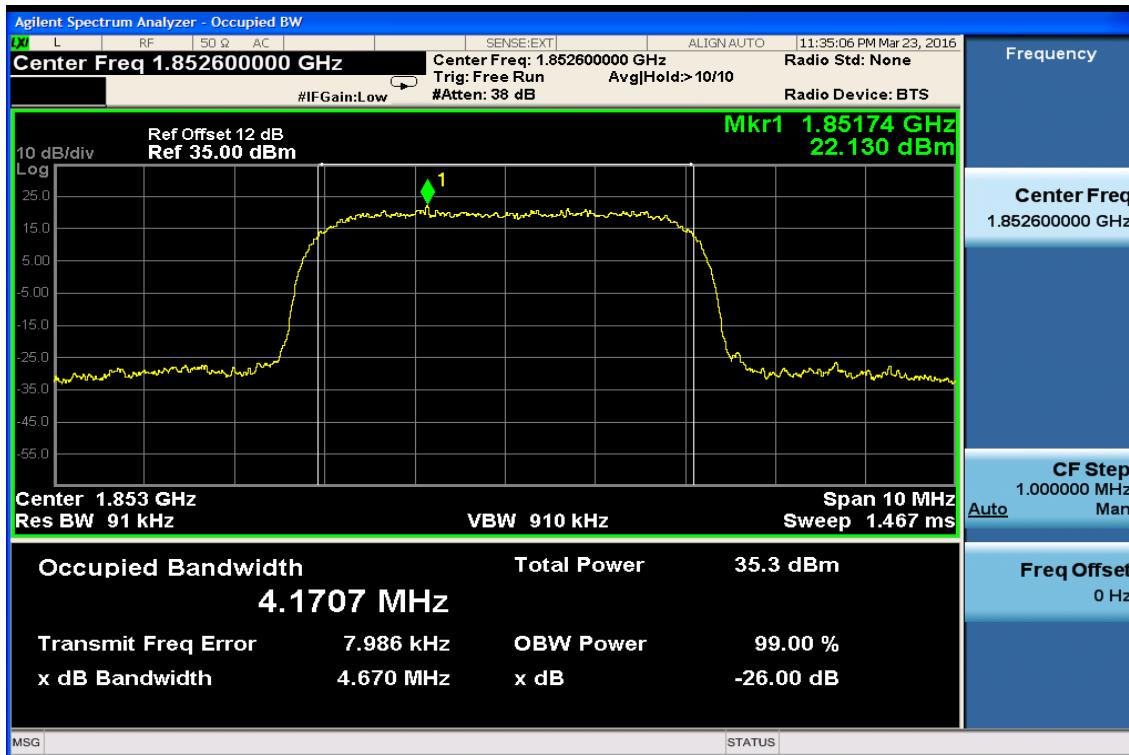


Fig.23 WCDMA Band II-CH9400 Occupied Bandwidth (HSUPA Subtest 1)

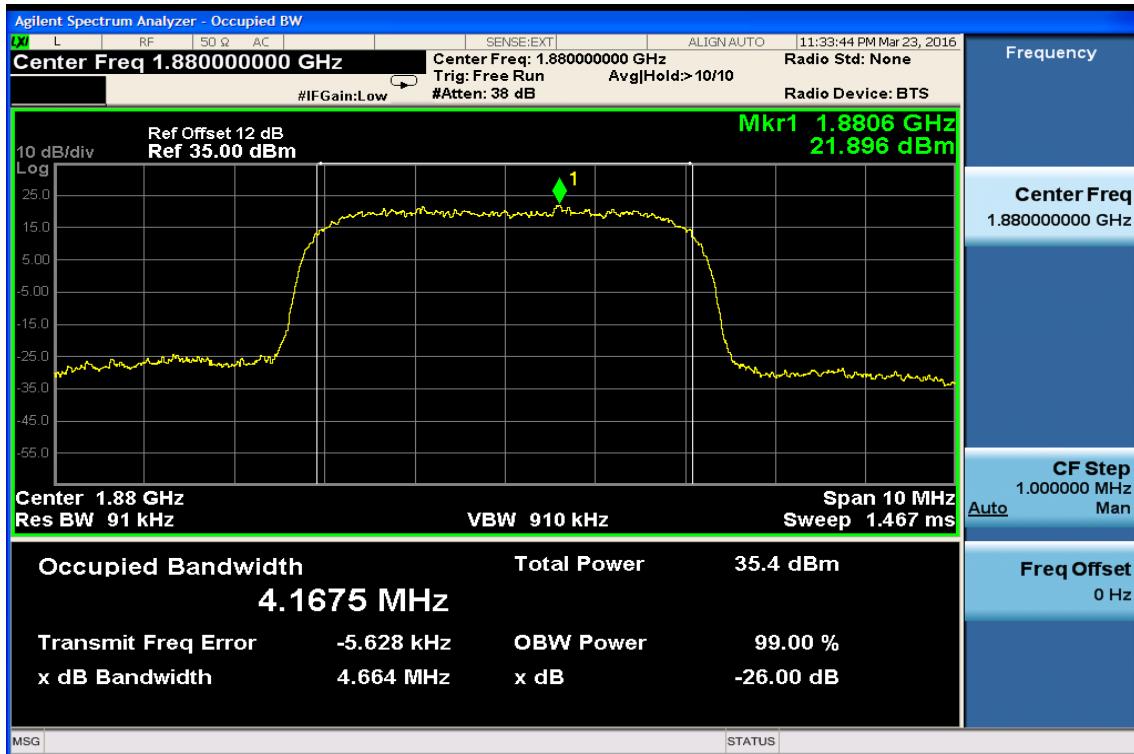
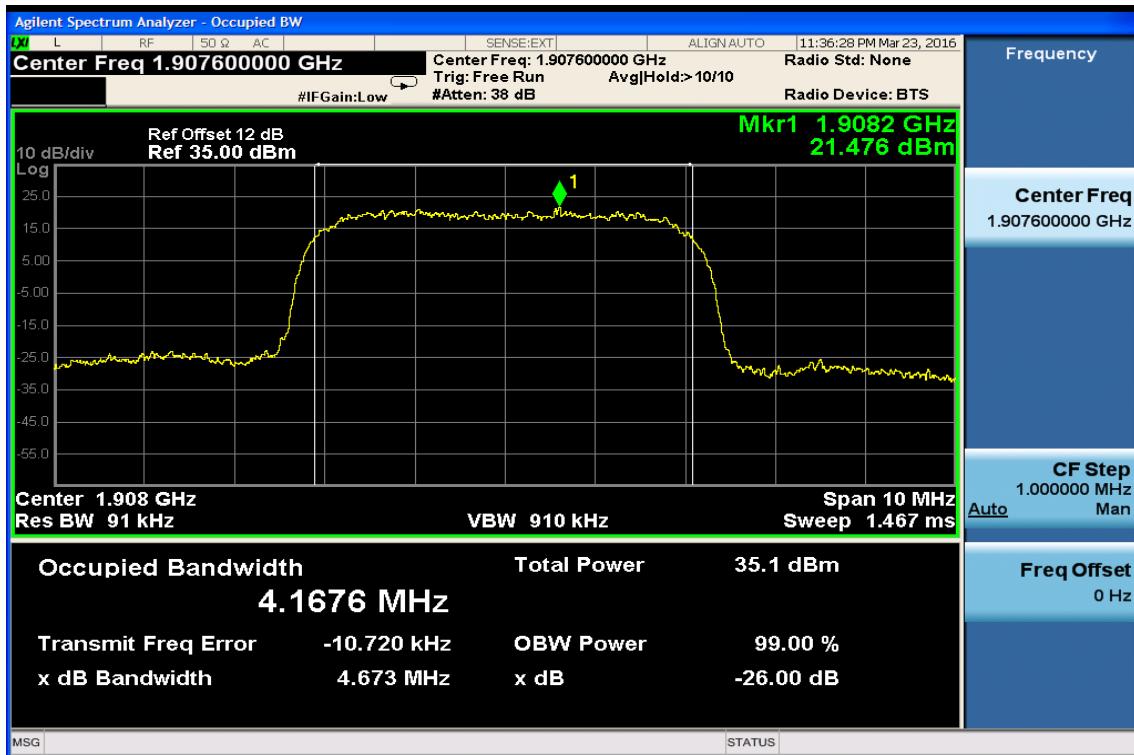


Fig.24 WCDMA Band II-CH9538 Occupied Bandwidth (HSUPA Subtest 1)



## B.4 Emission Limit(22.917(b)/ 24.238(b))

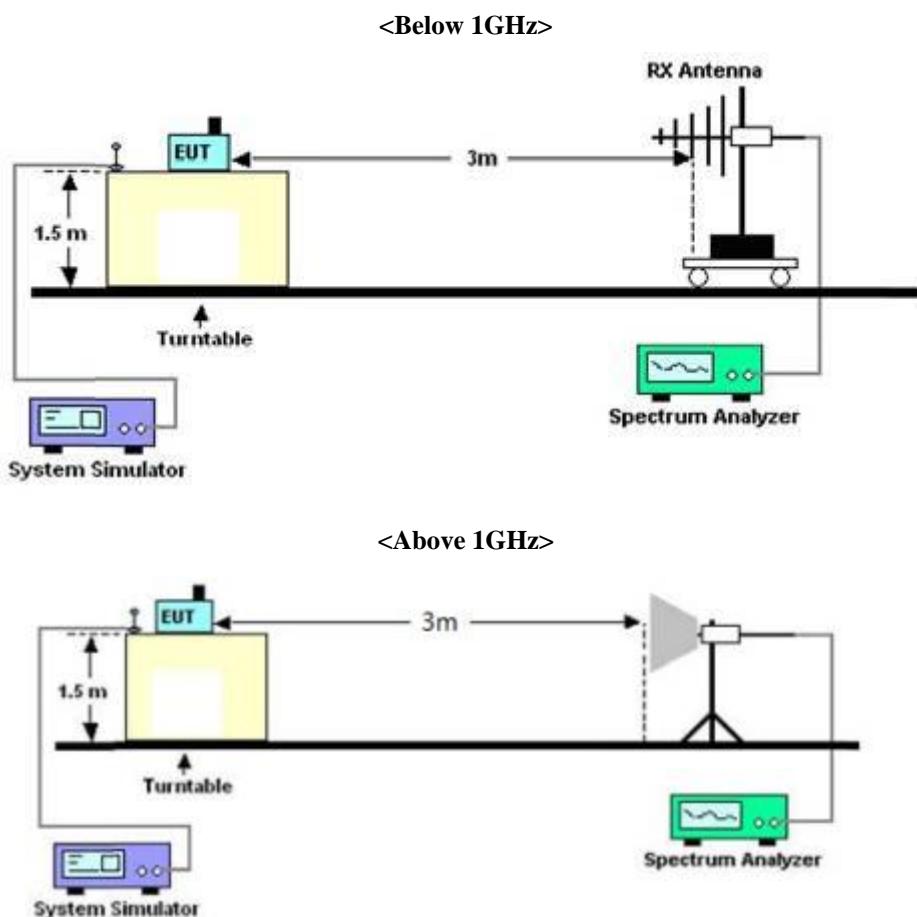
### B.4.1 Description

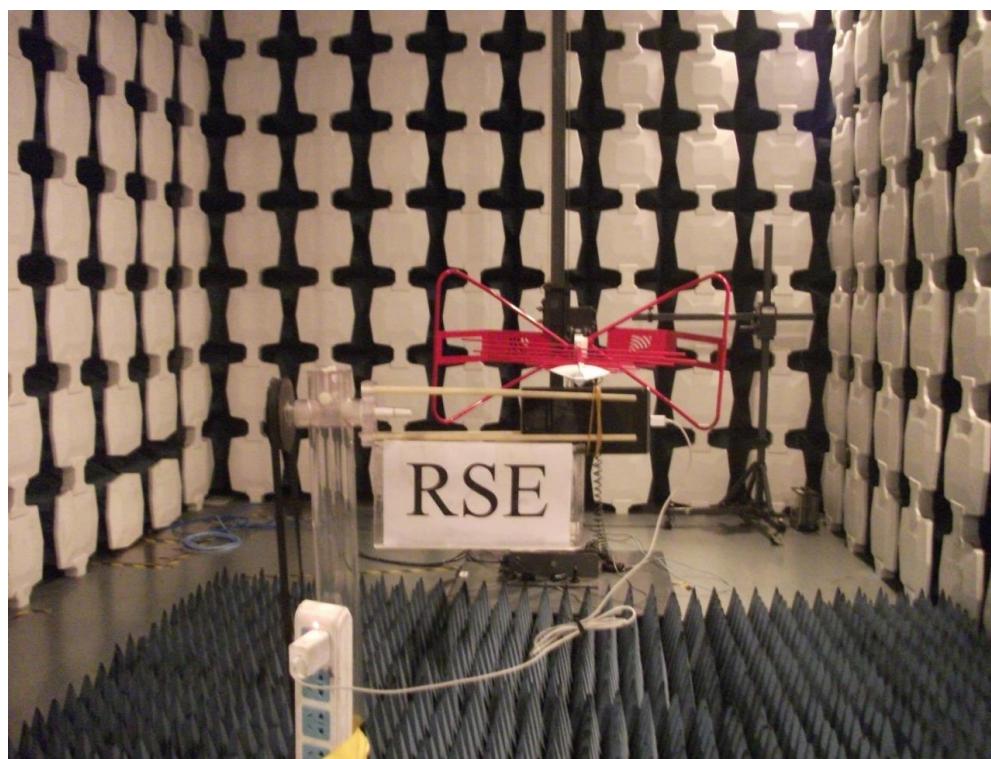
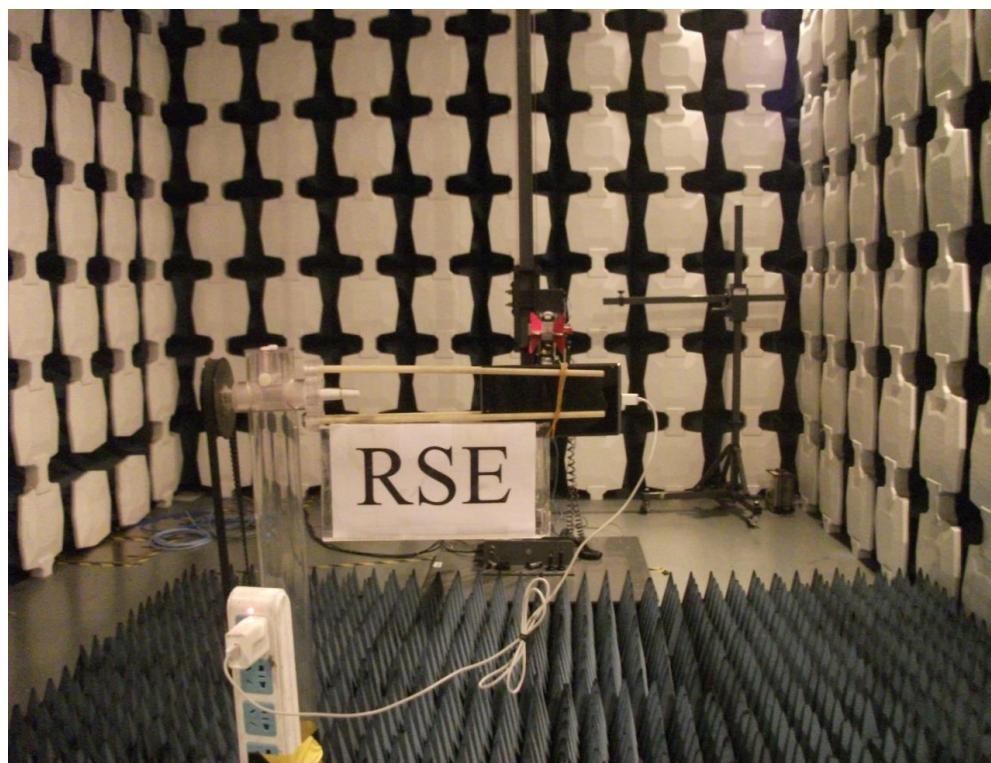
The radiated spurious emission was measured by substitution method according to TIA-603C-2004. The power of any emission outside of the authorized operating frequency ranges must be lower than transmitter power by a factor of at least  $43+10\log(P)$  dB. The spectrum is scanned from 30MHz up to a frequency including its 10th harmonic.

### B.4.2 Test Procedure

1. The EUT was placed on a 0.8 meter high rotatable wooden table.
2. The EUT was set 3 meters test distance from the receive antenna.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search maximum spurious emission for both horizontal and vertical polarizations.

### B.4.3 Test Setup





#### B.4.4 Measurement Uncertainty

RSE Uncertainty Evaluation (30MHz~1000MHz)	
Uncertainty for 95% Confidence	3.4dB
RSE Uncertainty Evaluation (1GHz~13GHz)	

Uncertainty for 95% Confidence

3.4dB

**B.4.5 Test Results**

<b>Band</b>	<b>CH</b>	<b>Frequency(MHz)</b>	<b>Result</b>	<b>Verdict</b>
GSM850	190	836.6	Fig.25	Pass
			Fig.26	Pass
GSM1900	661	1880.0	Fig.27	Pass
			Fig.28	Pass
WCDMA Band V	4175	835	Fig.29	Pass
			Fig.30	Pass
WCDMA Band II	9400	1880.0	Fig.31	Pass
			Fig.32	Pass

Fig.25 GSM850 on Channel 190 30MHz~3GHz

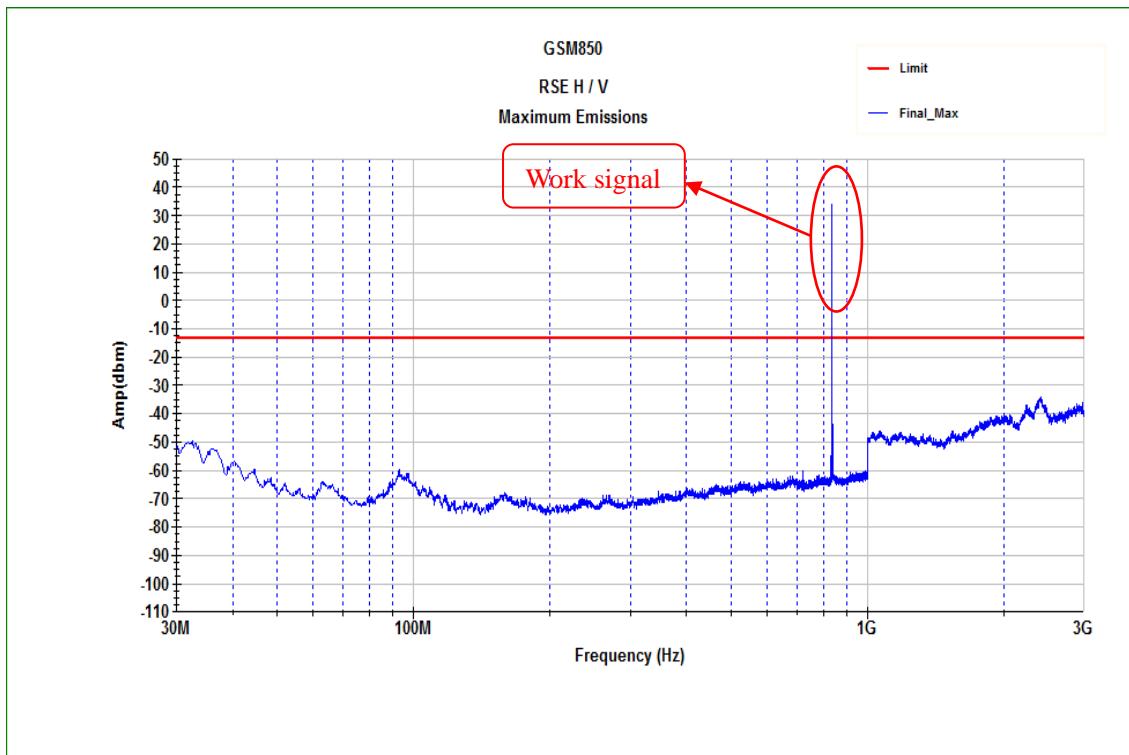
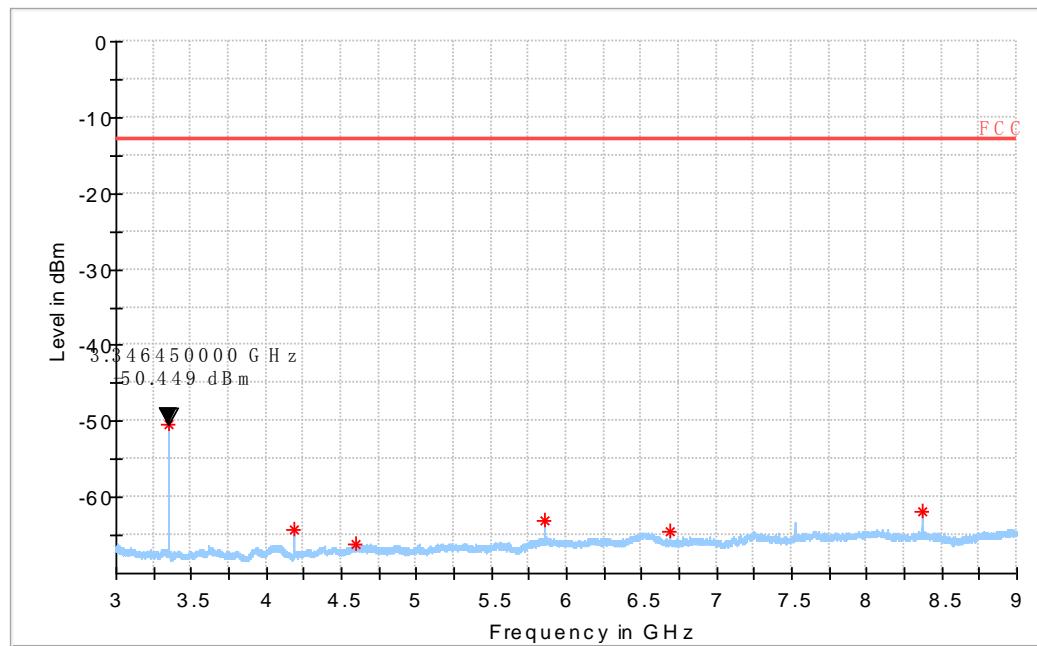


Fig.26 GSM850 on Channel 190 3GHz~9GHz



GSM850

Fig.27 GSM1900 on Channel 661 30MHz~3GHz

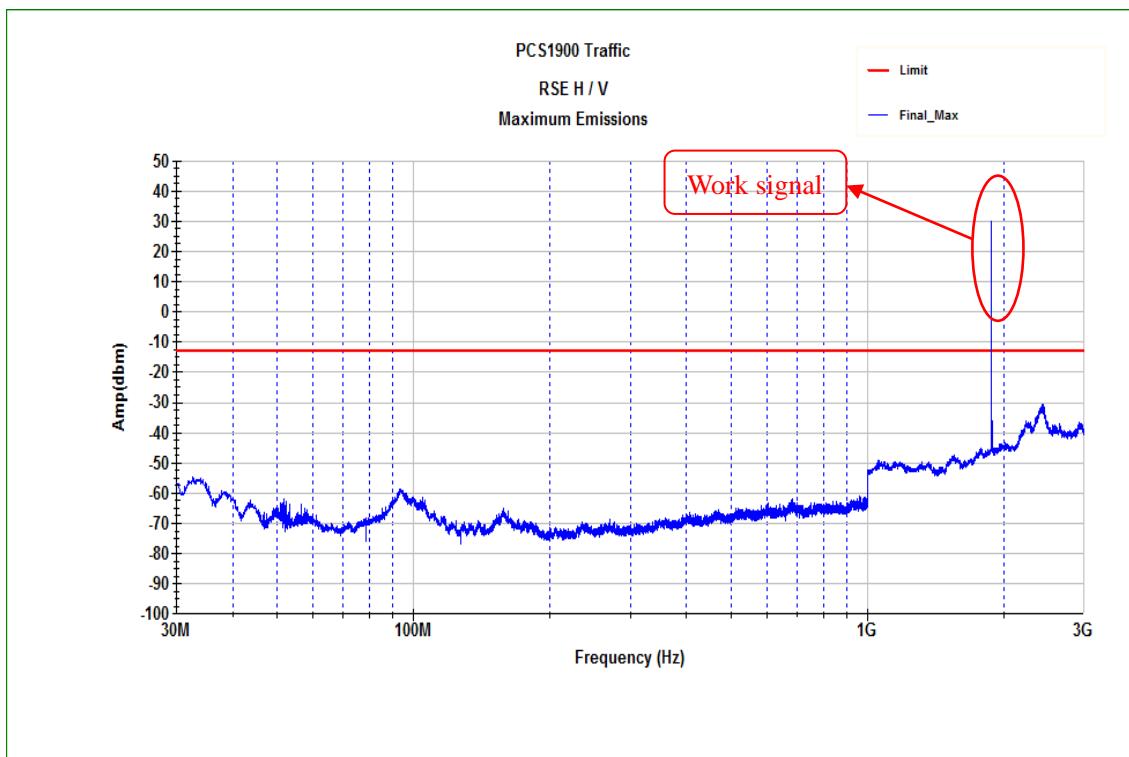
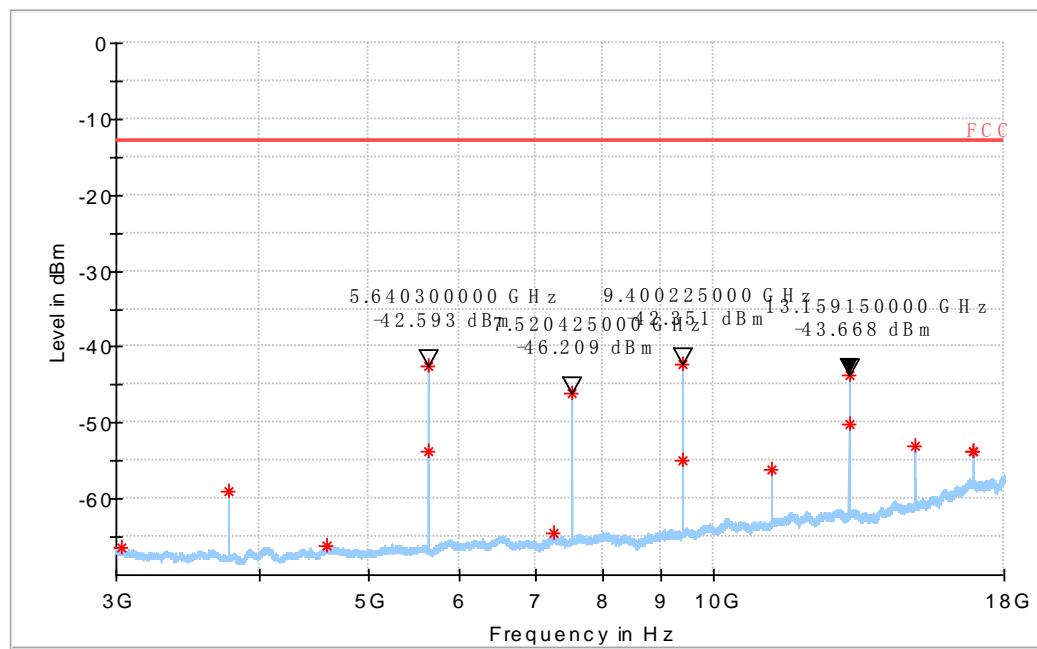


Fig.28 GSM1900 on Channel 661 3GHz~19.1GHz



GSM1900

Fig.29 WCDMA Band V on Channel 4175 30MHz~3GHz

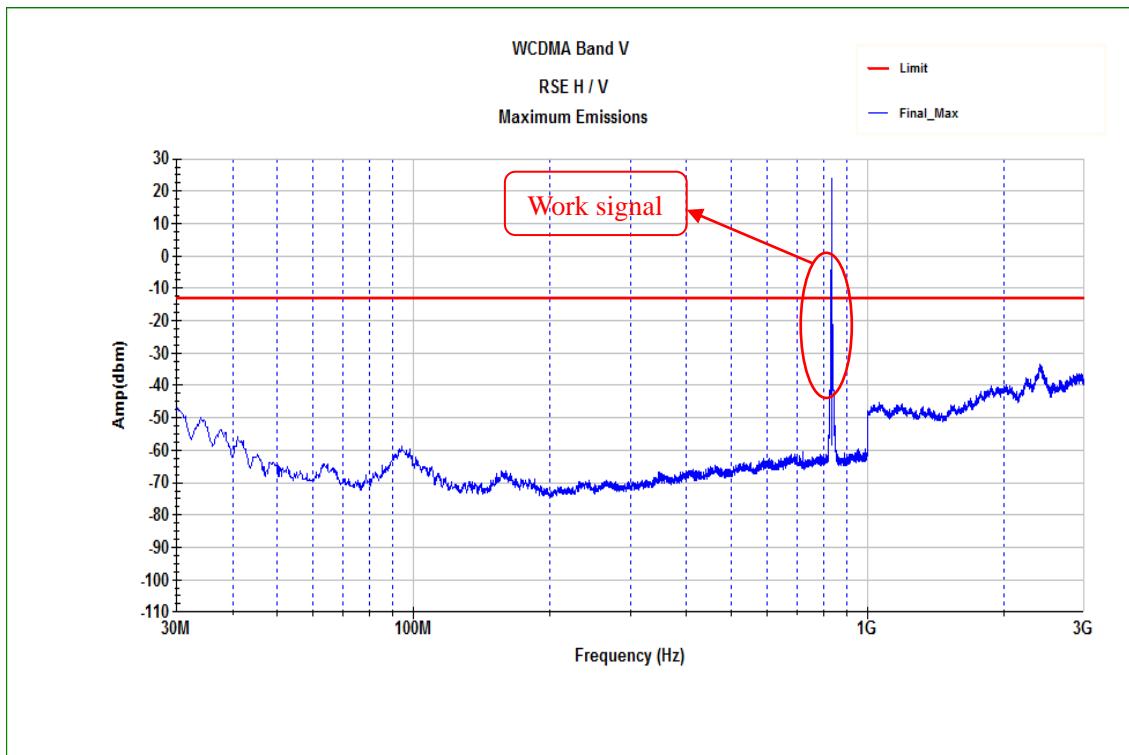


Fig.30 WCDMA Band V on Channel 4175 3GHz~9GHz

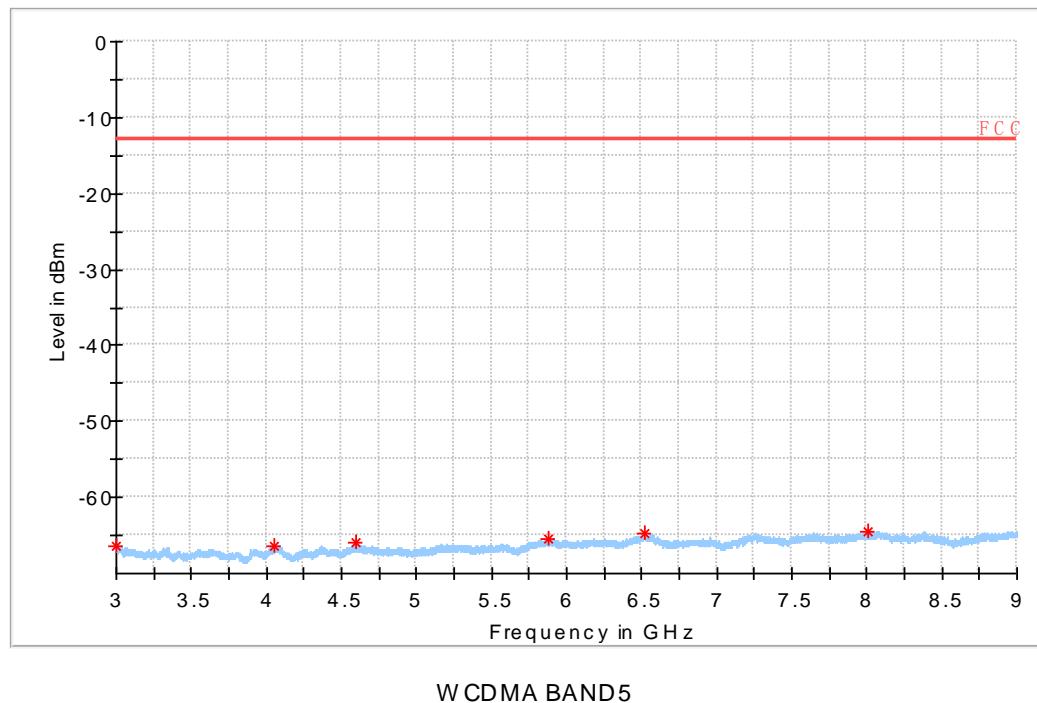


Fig.31 WCDMA Band II Channel 9400 30MHz~3GHz

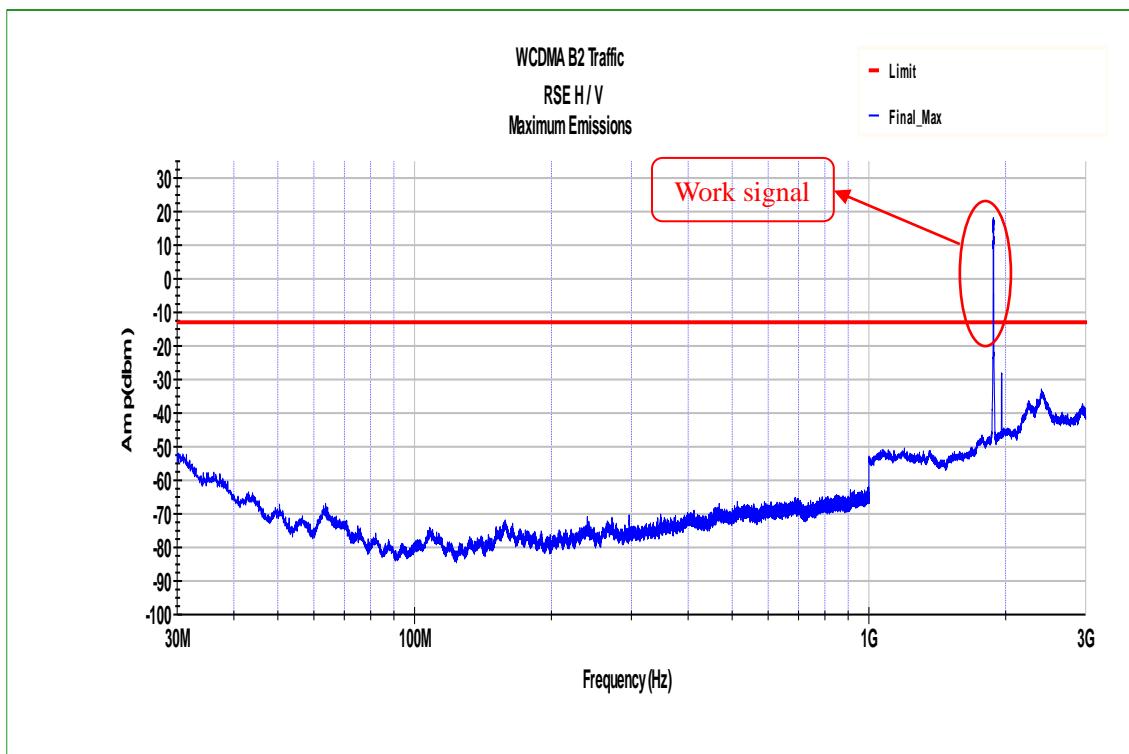
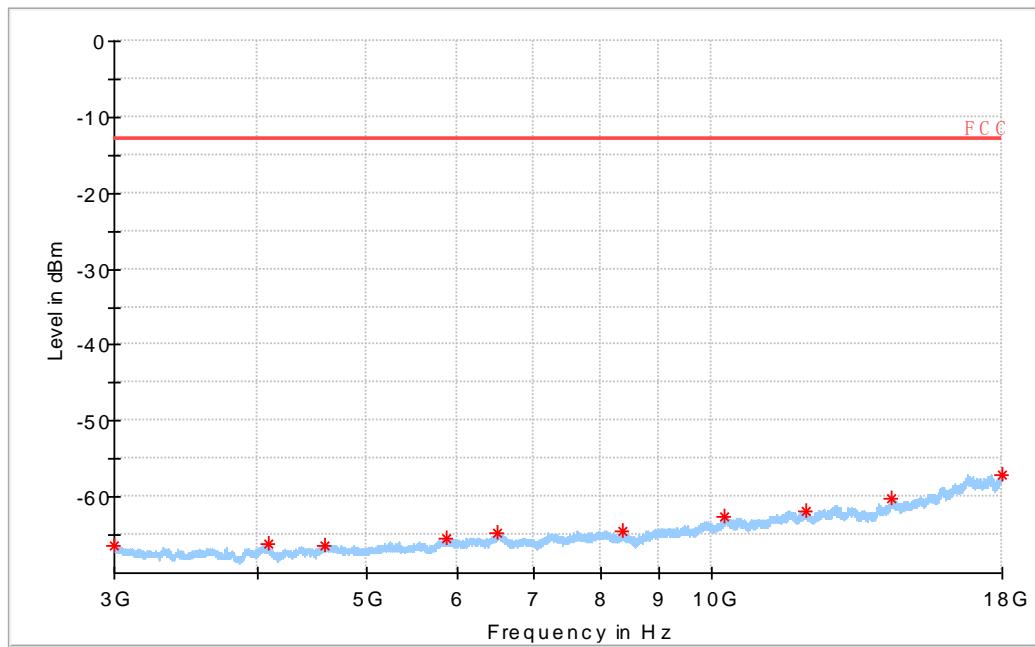


Fig.32 WCDMA Band II Channel 9400 3GHz~19.1GHz



W CDMA BAND2

## B.5 Band Edge Compliance(22.917(b)/ 24.238)

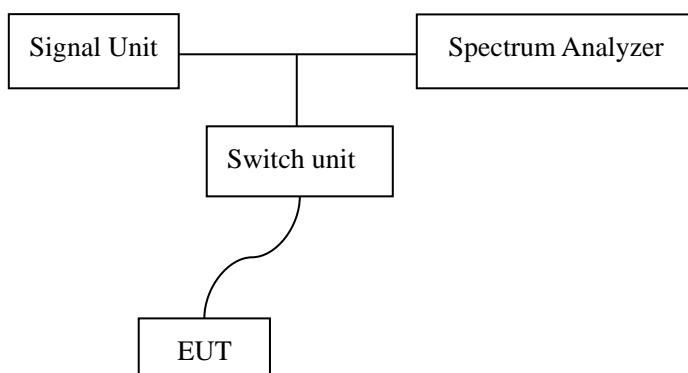
### B.5.1 Description

The power of any emission outside of the authorized operating frequency ranges must be lower than transmitter power by a factor of at least  $43+10\log(P)$  dB.

### B.5.2 Test Procedure

1. The EUT was connected to Spectrum Analyzer and Base Station.
2. The band edge of low and high channel for maximum RF power was measured. Setting RBW is as roughly BW/100.

### B.5.3 Test Setup



### B.5.4 Test Results

Band	CH	Frequency(MHz)	Result	Verdict
GSM850	128	824.2	Fig.33	Pass
	251	848.8	Fig.34	Pass
GSM1900	512	1850.2	Fig.35	Pass
	810	1909.8	Fig.36	Pass
WCDMA Band V	4133	824.2	Fig.37	Pass
	4232	848.8	Fig.38	Pass
WCDMA Band VHSDPA Subtest 1	4133	824.2	Fig.39	Pass
	4232	848.8	Fig.40	Pass
WCDMA Band VHSUPA Subtest 5	4133	824.2	Fig.41	Pass
	4232	848.8	Fig.42	Pass
WCDMA Band II	9263	1850.2	Fig.43	Pass
	9538	1909.8	Fig.44	Pass
WCDMA Band IIHSDPA Subtest 1	9263	1850.2	Fig.45	Pass
	9538	1909.8	Fig.46	Pass
WCDMA Band IIHSUPA Subtest 5	9263	1850.2	Fig.47	Pass
	9538	1909.8	Fig.48	Pass

Note: The offset of test: GSM:5dB; WCDMA:12dB

Fig.33 GSM850-CH128 Band Edge Compliance

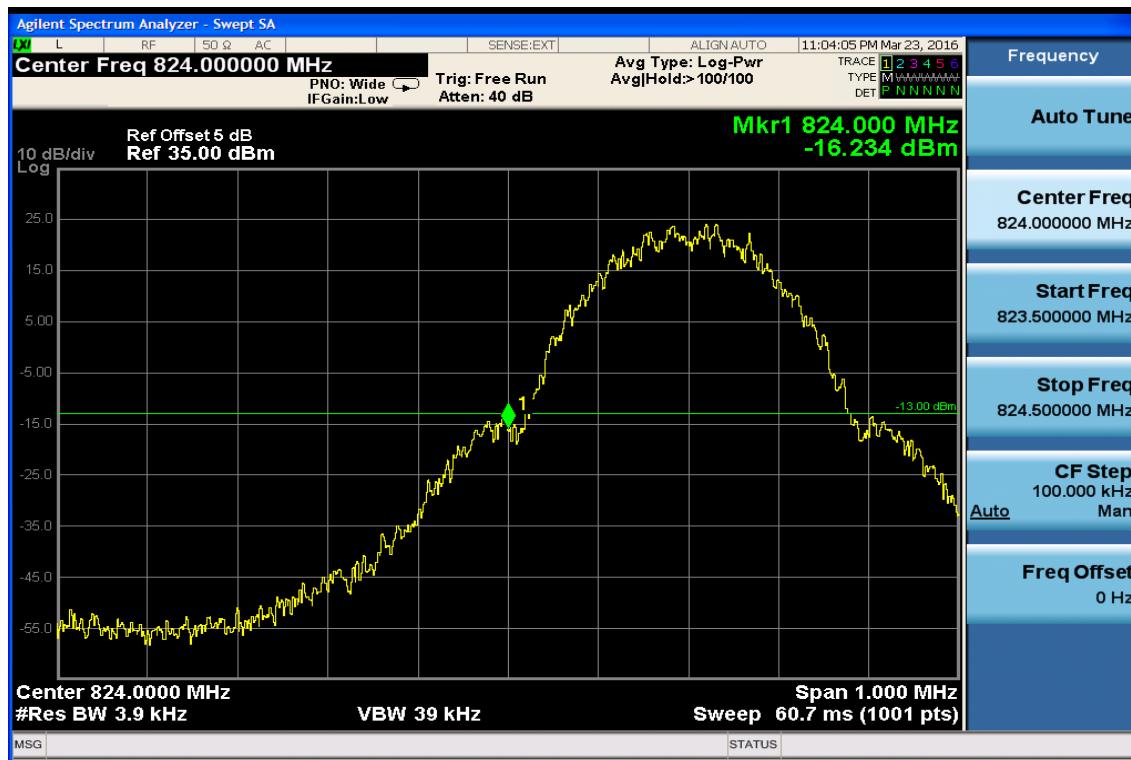


Fig.34 GSM850-CH251 Band Edge Compliance



Fig.35 GSM1900-CH512 Band Edge Compliance

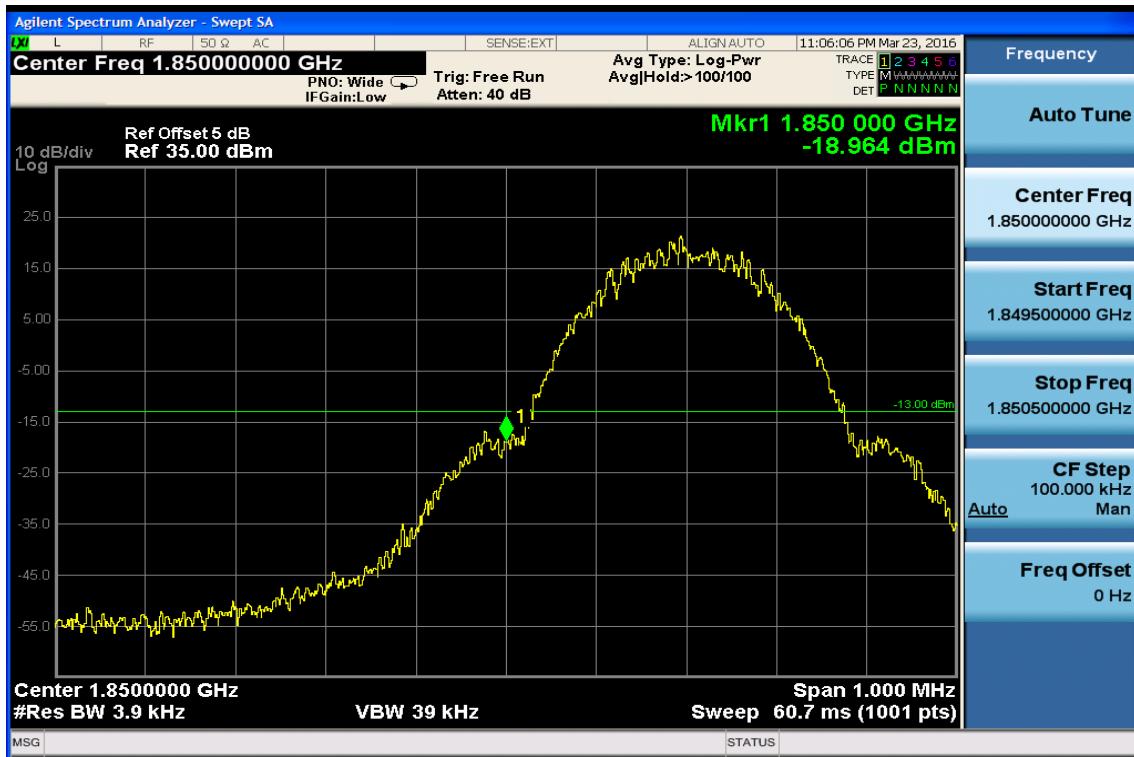


Fig.36 GSM1900-CH810 Band Edge Compliance

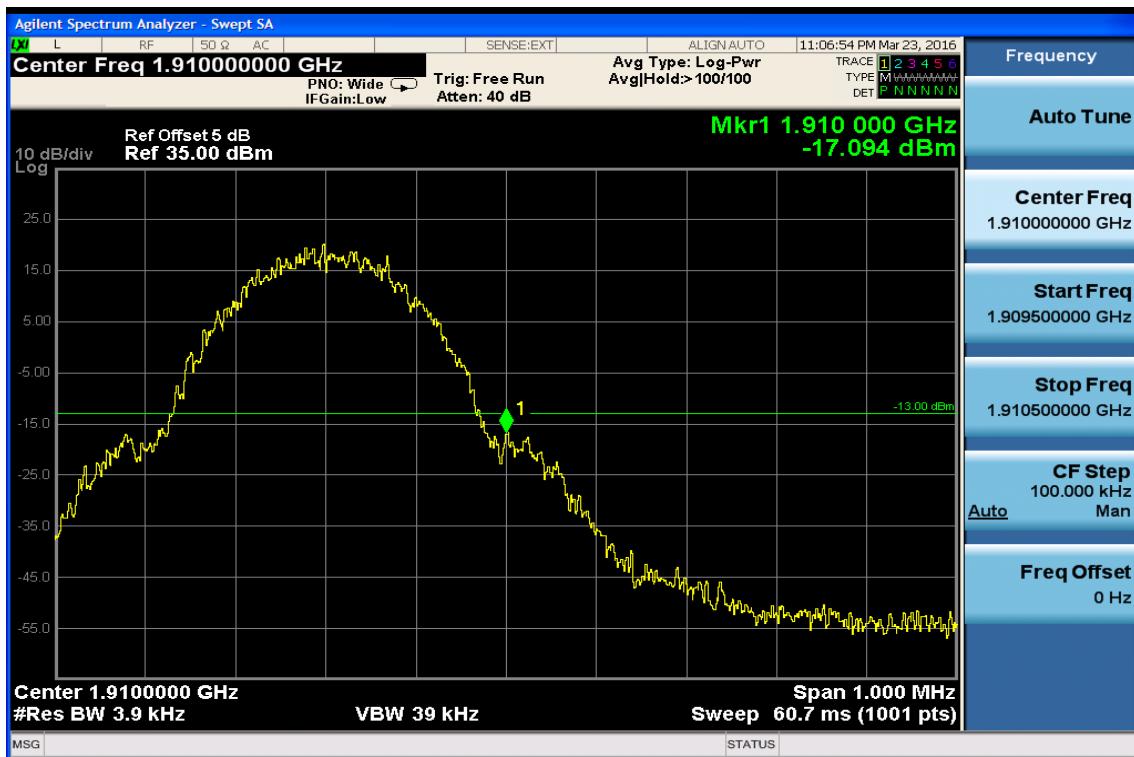


Fig.37 WCDMA Band V-CH4133 Band Edge Compliance

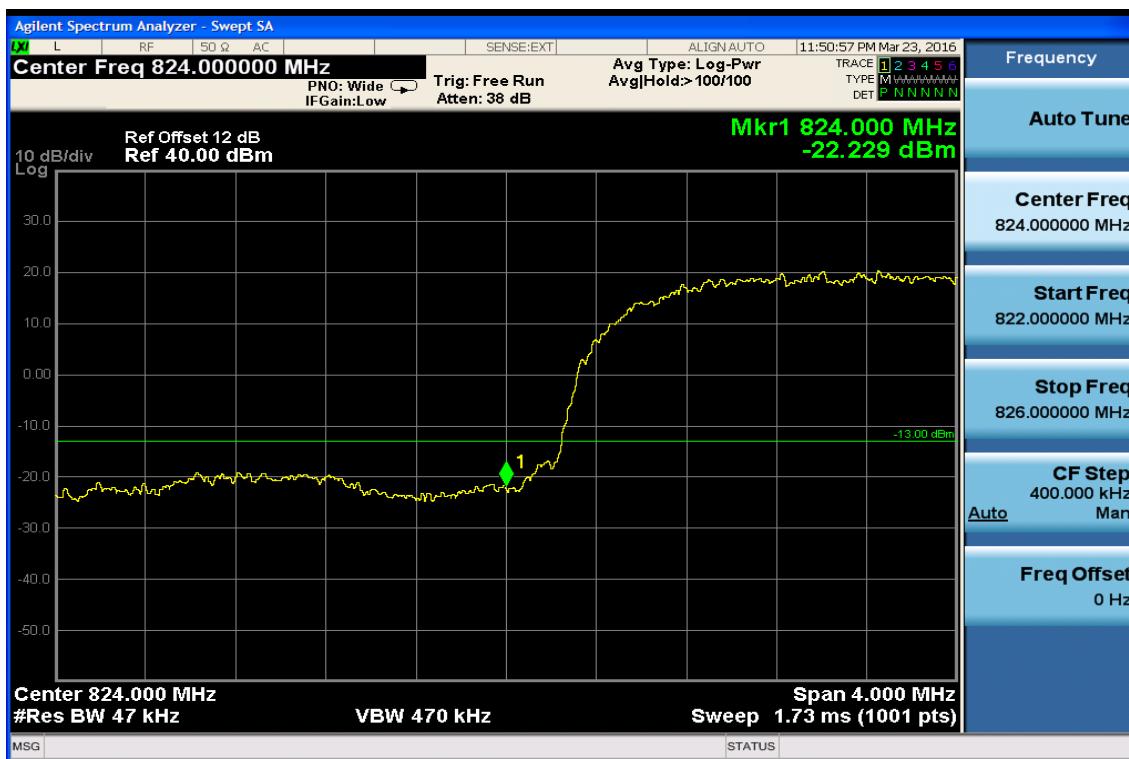


Fig.38 WCDMA Band V-CH4232 Band Edge Compliance



Fig.39 WCDMA Band V-CH4133 Band Edge Compliance HSDPA Subtest 1



Fig.40 WCDMA Band V-CH4232 Band Edge Compliance HSDPA Subtest 1



Fig.41 WCDMA Band V-CH4133 Band Edge Compliance HSUPA Subtest 1

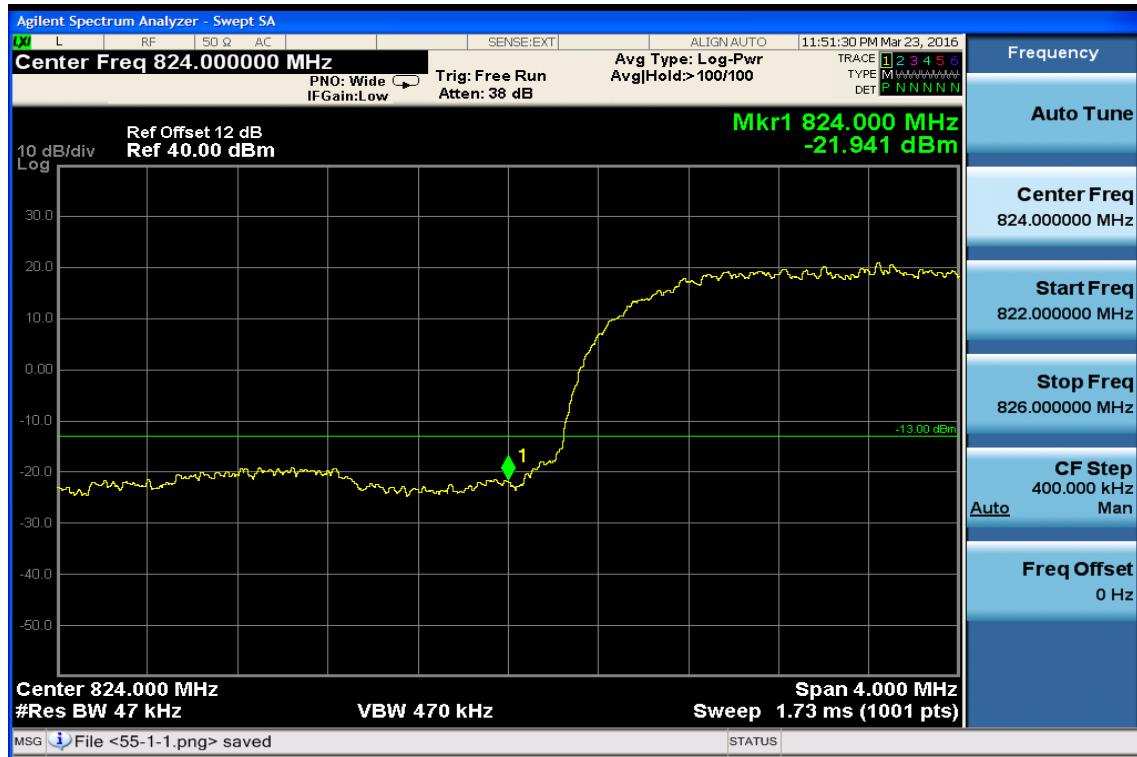


Fig.42 WCDMA Band V-CH4232 Band Edge Compliance HSUPA Subtest 1



Fig.43 WCDMA Band II-CH9263Band Edge Compliance



Fig.44 WCDMA Band II-CH9538Band Edge Compliance



Fig.45 WCDMA Band II-CH9263 Band Edge Compliance HSDPA Subtest 1



Fig.46 WCDMA Band II-CH9538 Band Edge Compliance HSDPA Subtest 1



Fig.47 WCDMA Band II-CH9263 Band Edge Compliance HSUPA Subtest 1



Fig.48 WCDMA Band II-CH9538 Band Edge Compliance HSUPA Subtest 1



## B.6 Conducted Spurious Emission(22.917(a)/24.238(a))

### B.6.1 Description

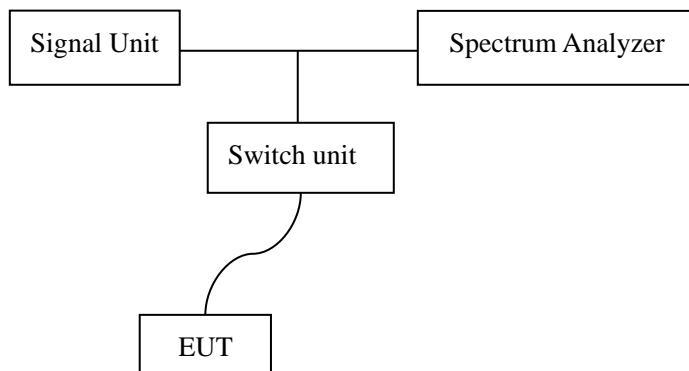
The power of any emission outside of the authorized operating frequency ranges must be lower than transmitter power by a factor of at least  $43+10\log(P)$  dB. For all power levels +30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm. It is measured by means of spectrum analyzer and scanned from 30MHz up to a frequency including its 10<sup>th</sup> harmonic.

For the equipment of PCS1900 band, this equates to a frequency range of 30MHz to 19.1GHz, data is taken from 30 MHz to 20 GHz. For GSM 850, data is taken from 30 MHz to 9 GHz.

### B.6.2 Test Procedures

1. The EUT was connected to Spectrum Analyzer and Base Station.
2. The middle channel for maximum RF power within the transmitting frequency was measured.
3. The conducted spurious emission for the whole frequency range was taken.

### B.6.3 Test Setup



### B.6.4 Test Results

Band	CH	Frequency(MHz)	Result	Verdict
GSM850	190	836.6	Fig.49	Pass
			Fig.50	Pass
GSM1900	661	1880.0	Fig.51	Pass
			Fig.52	Pass
WCDMA Band V	4175	835	Fig.53	Pass
			Fig.54	Pass
WCDMA Band II	9400	1880.0	Fig.55	Pass
			Fig.56	Pass

Fig.49 GSM850 on Channel 190 30MHz~3GHz

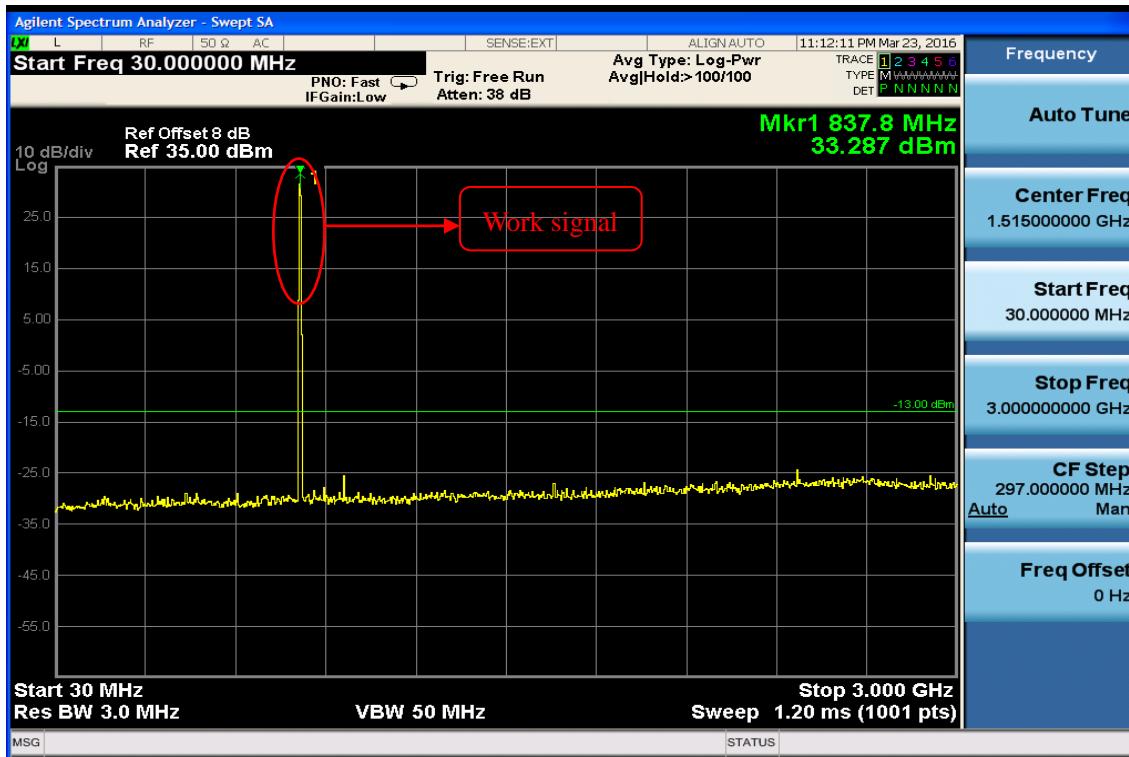


Fig.50 GSM850 on Channel 190 3GHz~9GHz

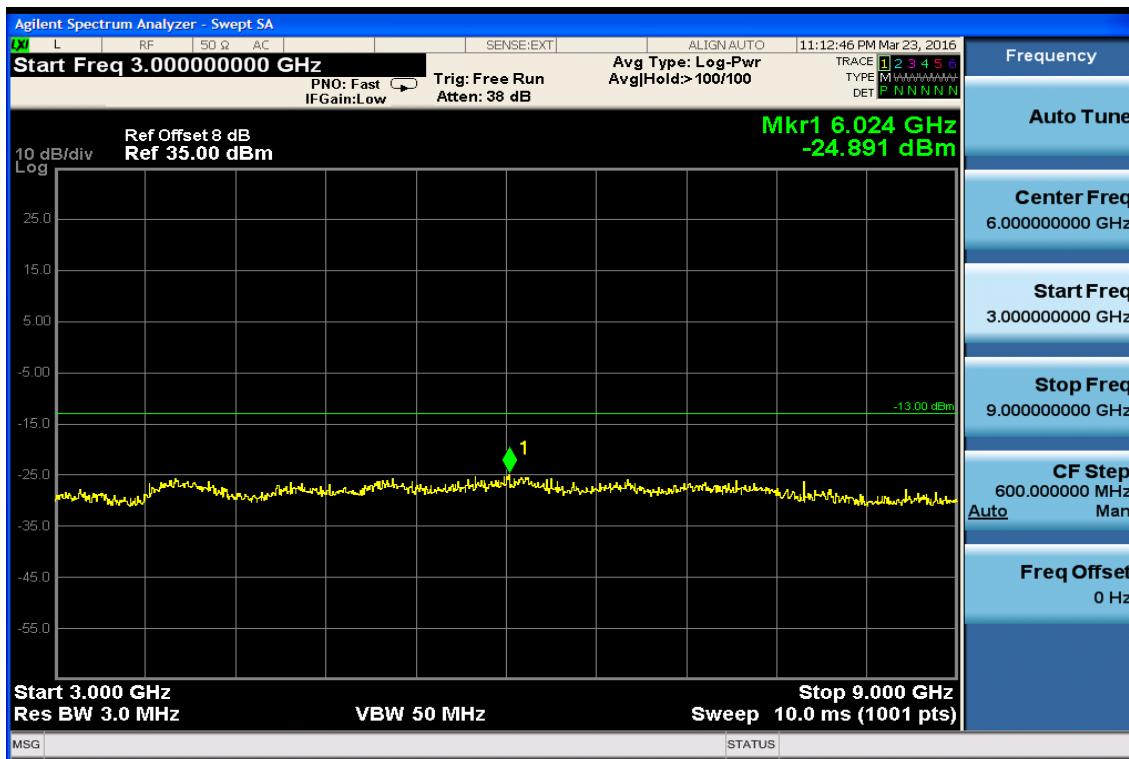


Fig.51 GSM1900 on Channel 661 30MHz~3GHz

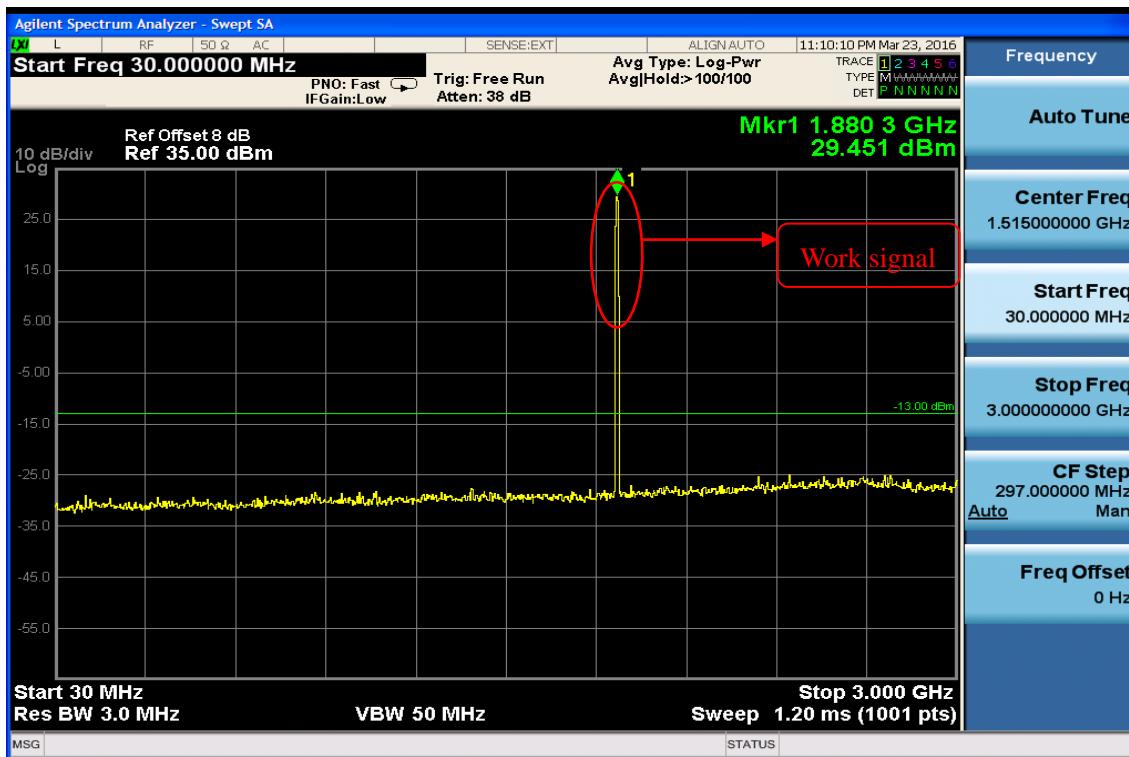
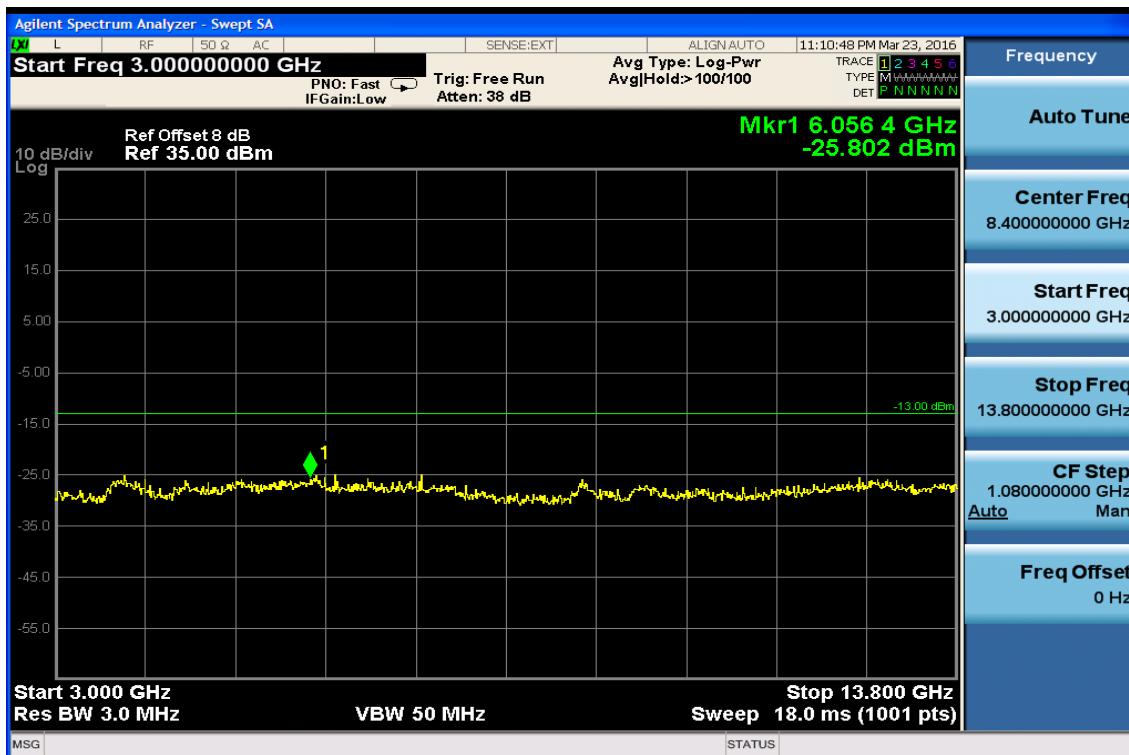


Fig.52 GSM1900 on Channel 661 3GHz~19.1GHz



The Conducted Spurious Emissions was checked. No emissions were found and only noise floor in 13.8GHz~19.1GHz.

Fig.53 WCDMA Band V on Channel 4175 30MHz~3GHz

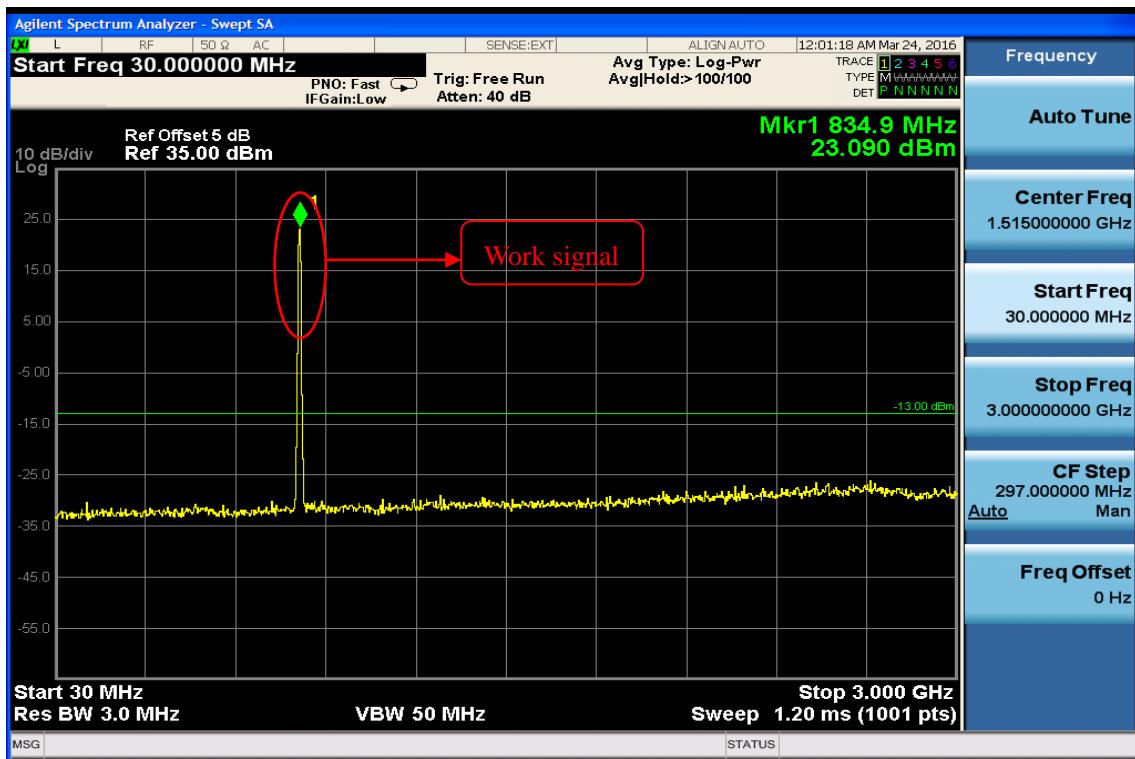


Fig.54 WCDMA Band V on Channel 4175 3GHz~9GHz

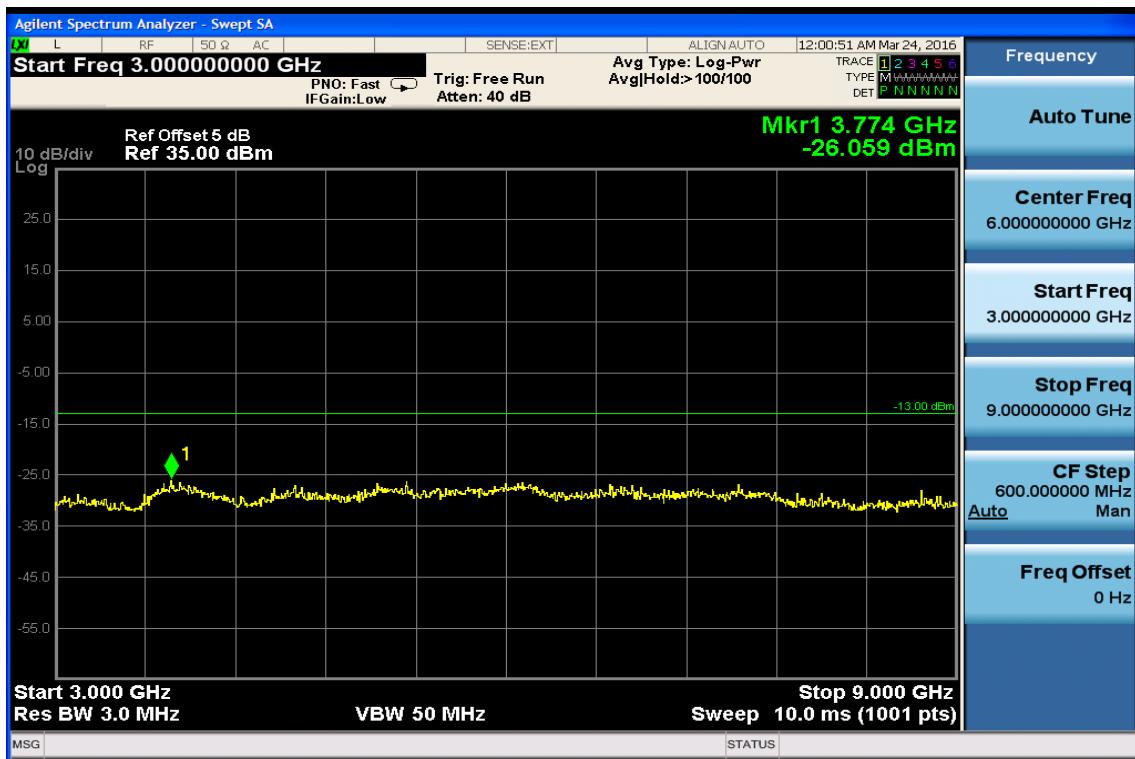


Fig.55 WCDMA Band II Channel 9400 30MHz~3GHz

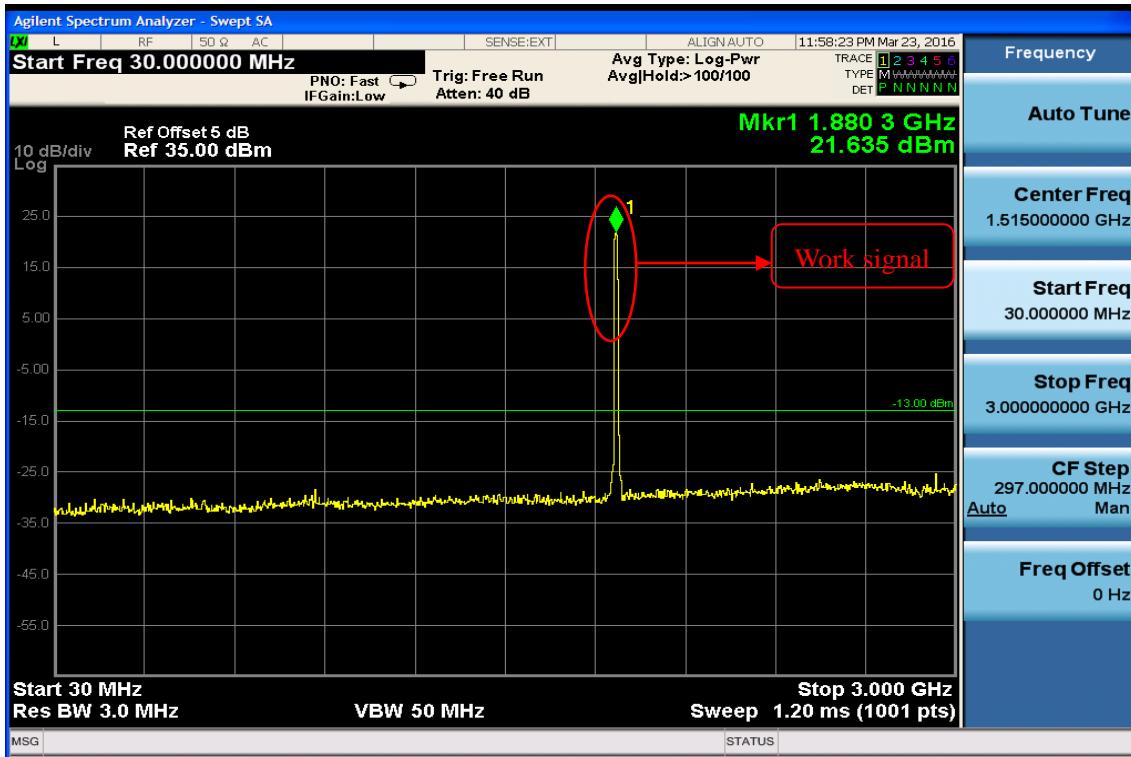


Fig.56 WCDMA Band II on Channel 9400 3GHz~19.1GHz



The Conducted Spurious Emissions was checked. No emissions were found and only noise floor in 13.8GHz~19.1GHz

## B.7 Peak-to-average ratio(24.232(d))

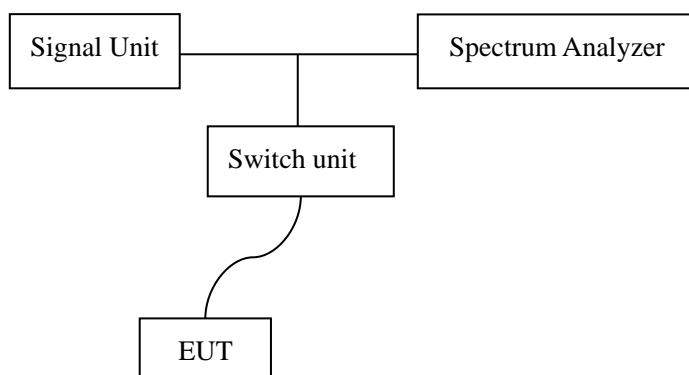
### B.8.1 Description

Power Complementary Cumulative Distribution Function (CCDF) curves provide a means for characterizing the power peaks of a digitally modulated signal on a statistical basis. A CCDF curve depicts the probability of the peak signal amplitude exceeding the average power level.

### B.8.2 Test Procedure

1. The EUT was connected to Spectrum Analyzer and Base Station.
2. The CCDF of middle channel for the highest powers were measured.

### B.8.3 Test Setup



### B.7.4 Test Results

#### Limit

Peak-to-average ratio
≤13dBm

Band		CH	Frequency(MHz)	Result(dBm)	Verdict	
GSM850	GSM	128	824.2	0.08	Pass	
		189	836.6	0.11	Pass	
		251	848.8	0.06	Pass	
	GPRS	128	824.2	0.12	Pass	
		189	836.6	0.13	Pass	
		251	848.8	0.05	Pass	
GSM1900	GSM	512	1850.2	0.1	Pass	
		661	1880.0	0.12	Pass	
		810	1909.8	0.09	Pass	
	GPRS	512	1850.2	0.06	Pass	
		661	1880.0	0.07	Pass	
		810	1909.8	0.08	Pass	
WCDMA Band V		4132	824.2	0.03	Pass	
		4175	835	0.04	Pass	
		4233	848.8	0.09	Pass	

WCDMA Band V HSDPA Subtest 1	4132	824.2	0.08	Pass
	4175	835	0.07	Pass
	4233	848.8	0.04	Pass
WCDMA Band V HSUPA Subtest 5	4132	824.2	0.03	Pass
	4175	835	0.11	Pass
	4233	848.8	0.02	Pass
WCDMA Band II	9263	1850.2	0.01	Pass
	9400	1880.0	0.03	Pass
	9538	1909.8	0.1	Pass
WCDMA Band II HSDPA Subtest 1	9263	1850.2	0.14	Pass
	9400	1880.0	0.08	Pass
	9538	1909.8	0.06	Pass
WCDMA Band II HSUPA Subtest 5	9263	1850.2	0.07	Pass
	9400	1880.0	0.12	Pass
	9538	1909.8	0.08	Pass

**ANNEX C: Report Revision History**

<b>Report No.</b>	<b>Report Version</b>	<b>Description</b>	<b>Issue Date</b>
GCCT16CFR01-GRF	None	Original	2016.03.28

**\*\*\* END OF REPORT\*\*\***