

FCC RADIO TEST REPORT

No. 150106-RF

for

Bullitt Group

Mobile Phone

Model IM5

Trade Name: Kodak

Issued Date: 2015-02-06

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of GCCT.

Test Laboratory:

GCCT, Guangdong Telecommunications Terminal Products Quality Supervision and Testing Center

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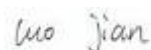
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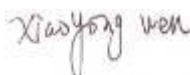
GENERAL SUMMARY

Product Name	Mobile Phone
Model Name	IM5
Applicant	Bullitt Group
Manufacturer	CK Telecom Limited
Test Laboratory	GCCT, Guangdong Telecommunications Terminal Products Quality Supervision and Testing Center
Reference Standards	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”
Test Conclusion	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: Pass Date of issue:2015.02.06
Comment	The test results in this report apply only to the tested sample of the stated device/equipment.

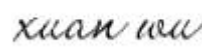
Approved by:

LuoJian
Manager

Reviewed by:

Wen Xiaoyong
Deputy Manager

Tested by:

Wu Xuan
Test Engineer

1. Test Laboratory

1.1 Testing Location

Company Name:	GCCT, Guangdong Telecommunications Terminal Products Quality Supervision and Testing Center
Address:	Technology Road, High-tech Zone, Heyuan, Guangdong Province, PR.China
CNAS Registration No.	L4992
FCC Registration No.	303878
Postal Code:	517001
Telephone:	+86-762-3607181
Fax:	+86-762-3603336

1.2 Testing Environment

Environment Data	Temperature(°C)	Humidity(%)
Maximum Ambient	26.9	45
Minimum Ambient	20.9	27

EUT is under testing environment.

1.3. Project Data

Project Leader:	Wen Xiaoyong
Testing Start Date:	2015-01-26
Testing End Date:	2015-02-06

2. Client Information

2.1 Applicant Information

Company Name:	Bullitt Group
Address:	4 The Aquarium, 1-7 King Street, Reading, RG1 2AN, UK
City:	/
Postal Code:	/
Country:	/
Telephone:	+44 1189 580 449
Fax:	/

2.2 Manufacturer Information

Company Name:	CK Telecom Limited
----------------------	--------------------

Address:	Technology Road.High-Tech Development Zone. Heyuan
City:	Heyuan
Postal Code:	/
Country:	China
Telephone:	0755-26738515
Fax:	0755-26739500

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

3.1 About EUT

Model Name	IM5
FCC ID	ZL5IM5
Tx Frequency	GSM850 Tx: 824.2~848.8 MHz UMTS Band V Tx: 826.4~846.6 MHz PCS1900 Tx: 1850.2~1909.8 MHz UMTS Band II Tx: 1852.4~1907.6 MHz Bluetooth & BLE: 2402~ 2480 MHz WIFI(b/g/n-20): 2412 ~ 2462 MHz WIFI(n-40): 2422 ~ 2452 MHz
Rx Frequency	GSM850Rx: 869.2~893.8 MHz UMTS Band V Rx: 871.4~891.6 MHz PCS1900 Rx: 1930.2~1989.8 MHz UMTS Band II Rx: 1932.4~1987.6 MHz Bluetooth & BLE: 2402~ 2480 MHz WIFI(b/g/n-20): 2412 ~ 2462 MHz WIFI(n-40): 2422 ~ 2452 MHz
Number of Channels	GSM850&WCDMA Band V:25 PCS1900&WCDMA Band II: 60 Bluetooth:79 WIFI(802.11b/g/n-20):11 WIFI(802.11 n-40):7 BLE:40
Modulation	GSM&DCS:GMSK WCDMA:BPSK/QPSK Bluetooth: GFSK& $\pi/4$ -DQPSK&8DPSK WIFI:CCK/OFDM BLE:GFSK
Antenna Type	PIFA(GSM/DCS/WCDMA); MONOPOLE (Bluetooth/wifi)

Antenna Gain	GSM850:-1dBi DCS1900: 1dBi WCDMA850: -1dBi WCDMA1900: 1dBi Bluetooth/wifi: -2dBi
Normal Voltage	3.7V
Extreme Low Voltage	3.6V
Extreme High Voltage	4.2V
Extreme Low Temperature	0°C
Extreme High Temperature	40°C
Equipment Category	PCE
Emission Designator	GSM850:245KGXW DCS1900:246KGXW WCDMA850:4M16F9W WCDMA1900:4M17F9W

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

EUT ID *	IMEI	HW Version	SW Version
150106-M01	355616029939281	XL-V2.0	XL01D-S13A_BULLITT_L7EN_202_141230
	355616029940735	XL-V2.0	XL01D-S13A_BULLITT_L7EN_202_141230
150106-M04	355616029939216	XL-V2.0	XL01D-S13A_BULLITT_L7EN_202_141230
	355616029940699	XL-V2.0	XL01D-S13A_BULLITT_L7EN_202_141230

*EUT ID: is used to identify the test sample in the lab internally.150106-M01 and 150106-M04 are the same mobile phone.

3.3 Internal Identification of AE

AE ID *	Description	Type	SN
150106-C01	Charger	A8-501000	/
150106-B01	Battery	CA366069HV	/
150106-C04	Charger	A8-501000	/
150106-B04	Battery	CA366069HV	/

*AE ID: is used to identify the test sample in the lab internally.

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/manufacture 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	2014.08.13	2015.08.13
2	Spectrum Analyzer	N9020A	E0111-9	Agilent	2014.08.13	2015.08.13
3	Switching Unit	/	E0112	/	/	

Table 2. EMC Test Equipments

Hardware						
No.	Name	Type	SN	Manufacturer	Cal Date	Cal Due Date
1	Spectrum	E4440A	MY48250641	Agilent	2014.08.13	2015.08.13
2	RF Preselector	N9039A	MY48260024	Agilent	2014.08.13	2015.08.13
3	BiCoNilog	3142E	00142015	ETS-Lindgren	2014.08.13	2015.08.13
4	Horn Antenna	3117	00129169	ETS-Lindgren	2014.08.13	2015.08.13

5	RF Notch filter	/	/	ETS-Lindgren	2014.08.13	2015.08.13
6	Power Meter	N1913A	MY50000213	Agilent	2014.08.13	2015.08.13
7	Universal Radio Communication Tester	8960	MY48367105	Agilent	2014.08.13	2015.08.13
Software						
1	Software	TILE4.5	/	ETS-Lindgren	/	

Table 3. OTA Test Equipments

Hardware						
No.	Name	Type	SN	Manufacturer	Cal Date	Cal Due Date
1	Spectrum	N9020A	MY49101012	Agilent	2014.08.13	2015.08.13
2	Universal Radio	E5515C	MY48367103	Agilent	2014.08.13	2015.08.13
3	Switch/Control Mainframe	3499C	MY42000534	Agilent	2014.08.13	2015.08.13
4	Positioning	2090	00119389	ETS-Lindgren	2014.08.13	2015.08.13
Software						
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	SH-241	92003546	ESPEC	2014.08.13	2015.08.13

ANNEX A: EUT Photograph

EUT Front View



EUT behind View



EUT Left View



EUT Right View



EUT Top View



EUT Rear View



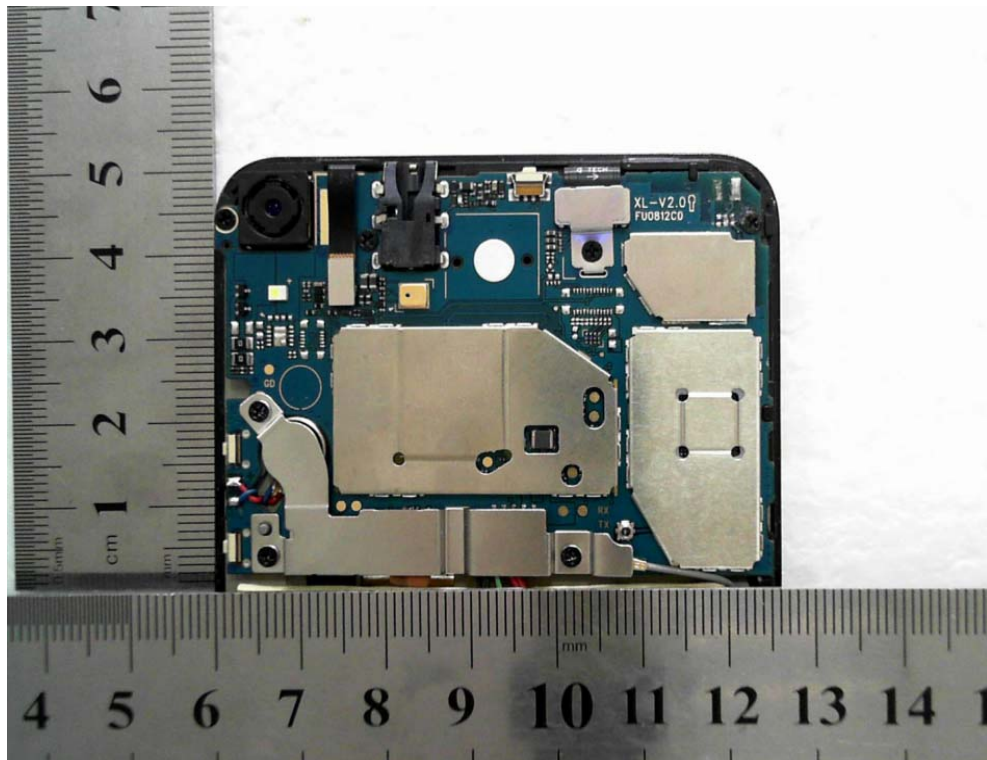
All



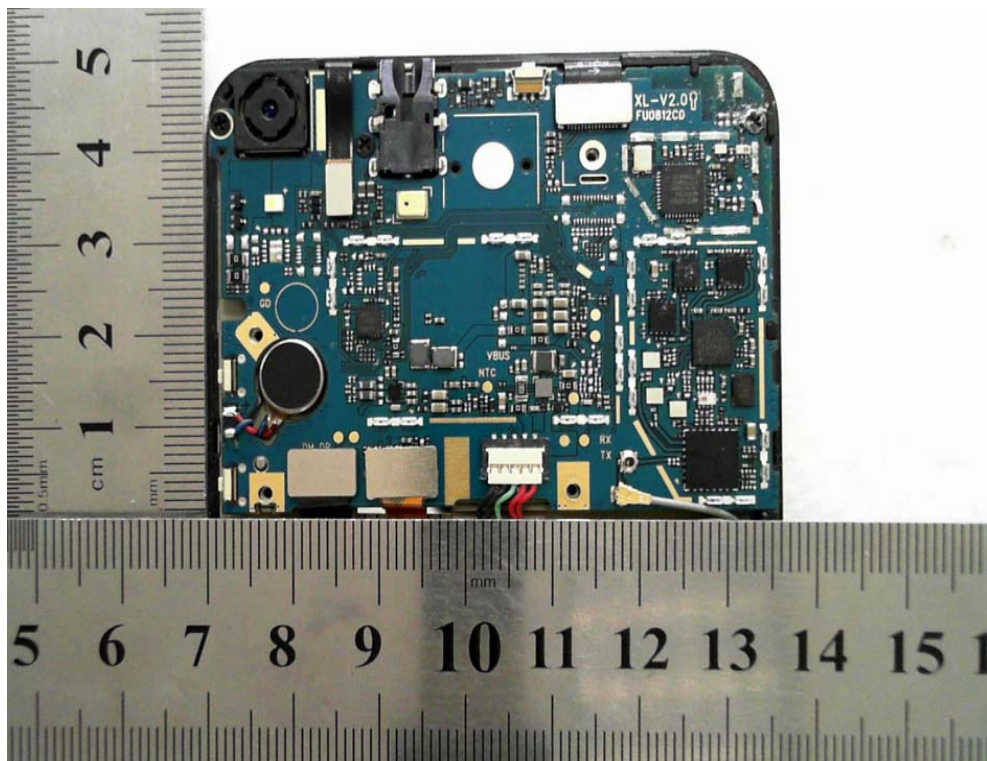
cover off



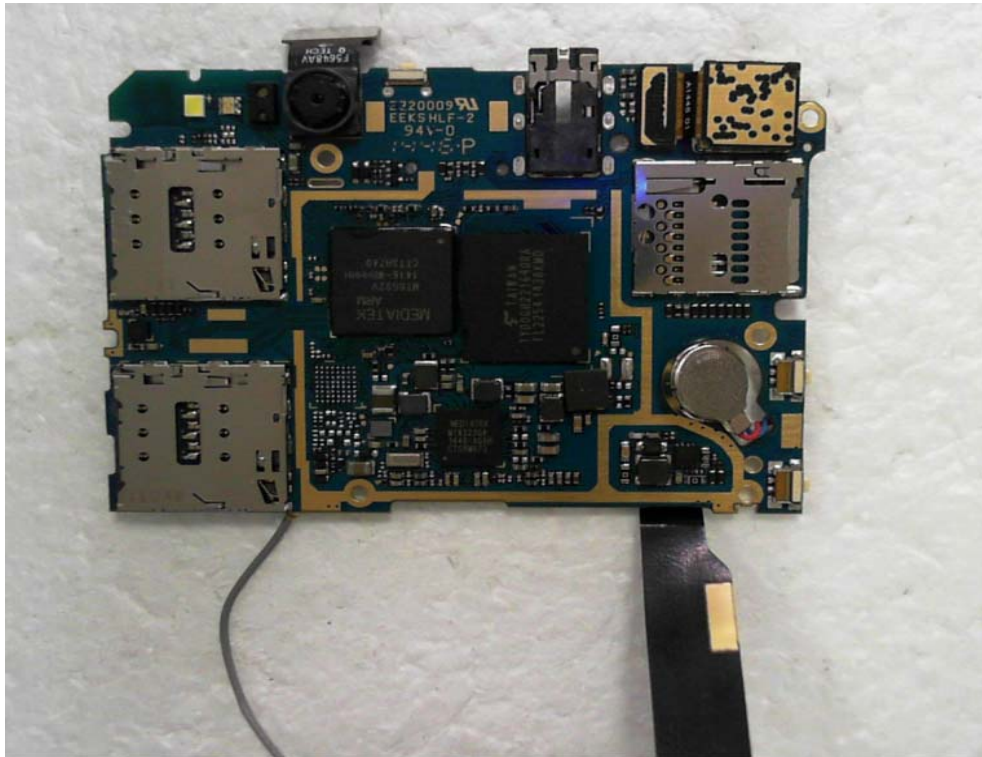
Main board With shielding Front View



Main board Without shielding Front View



Main board Rear



Battery



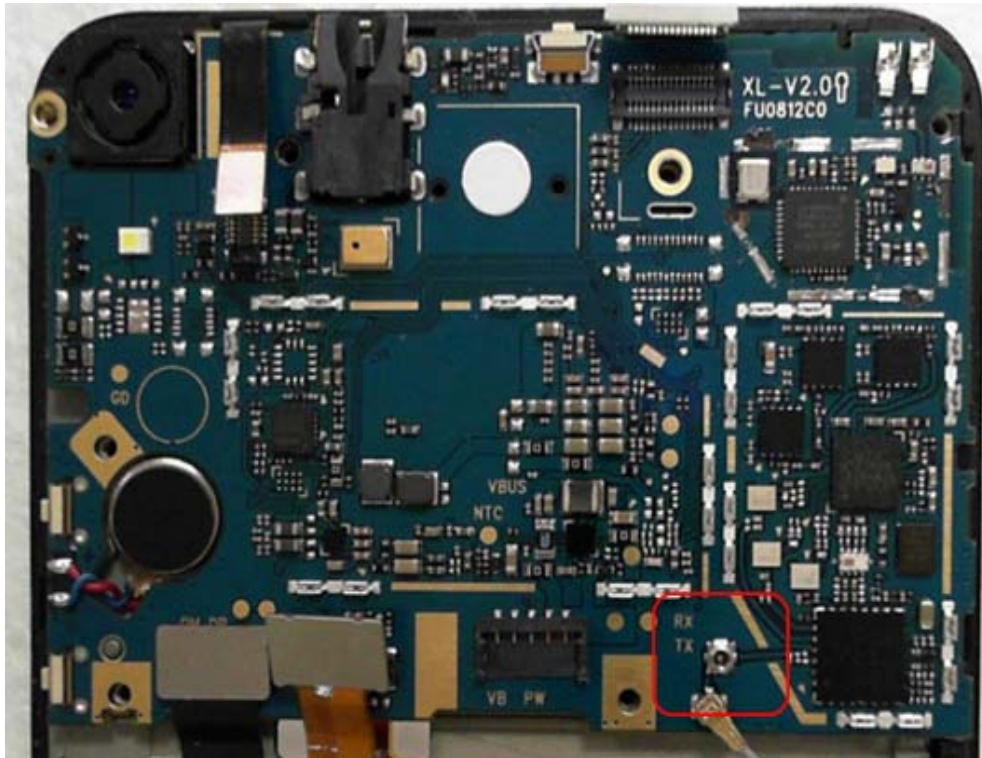
USB Cable



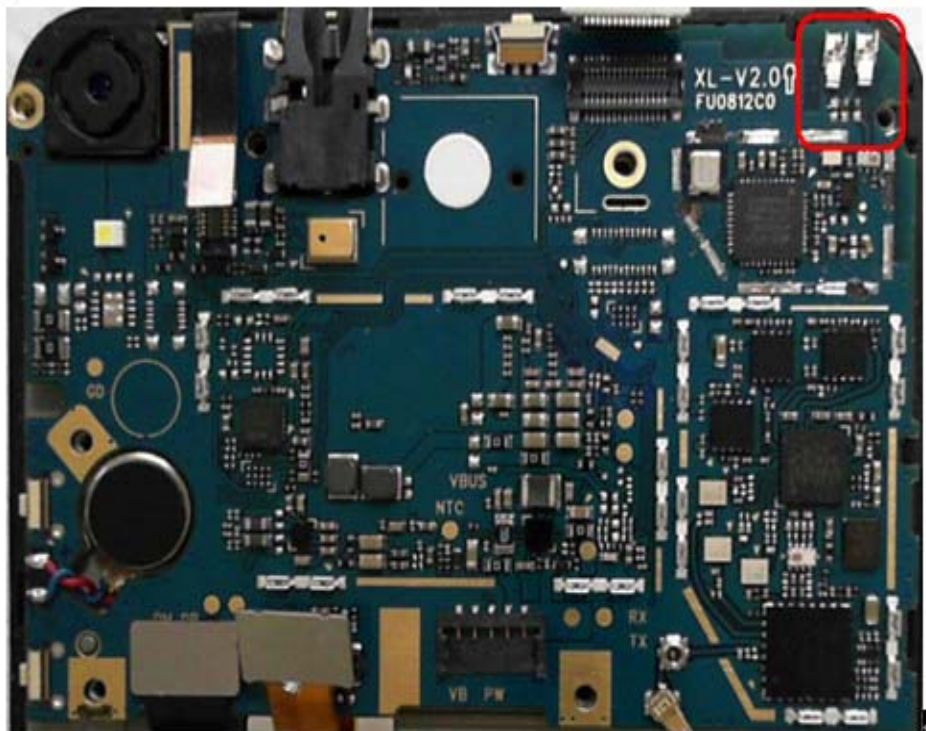
Headset



GSM/DCS/UMTS Antenna View



BT/WIFI Antenna View



Adapter



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	≤33dBm(2W)	±2

Measurement result**GSM**

Frequency(MHz)	Channel No.	Power Step	Peak output power(dBm)	Verdict
824.2	128	5	32.13	Pass
836.6	190		32.05	Pass
848.8	251		32.09	Pass

GPRS

Frequency(MHz)	Channel No.	Power Step	Peak output power(dBm)	Verdict
824.2	128	5	32.19	Pass
836.6	190		32.15	Pass
848.8	251		32.17	Pass

PCS1900**Limit**

Power step	Peak output power(dBm)	Tolerance(dB)
0	≤30dBm(1W)	±2

Measurement result**GSM**

Frequency(MHz)	Channel No.	Power Step	Peak output power(dBm)	Verdict
1850.2	512	0	29.72	Pass
1880.0	661	0	29.67	Pass
1909.8	810	0	29.56	Pass

GPRS

Frequency(MHz)	Channel No.	Power Step	Peak output power(dBm)	Verdict
1850.2	512	5	29.70	Pass
1880.0	661		29.62	Pass
1909.8	810		29.51	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	21.48	Pass
	1880.0	9400		21.42	
	1907.6	9538		21.17	
HSDPA Subtest 1	1852.6	9263		21.37	Pass
	1880.0	9400		21.12	
	1907.6	9538		21.12	
HSDPA Subtest 2	1852.6	9263		21.36	Pass
	1880.0	9400		21.11	
	1907.6	9538		21.12	
HSDPA Subtest 3	1852.6	9263		20.90	Pass
	1880.0	9400		20.66	
	1907.6	9538		20.66	
HSDPA Subtest 4	1852.6	9263		20.87	Pass
	1880.0	9400		20.63	
	1907.6	9538		20.63	
HSUPA Subtest 1	1852.6	9263		19.34	Pass
	1880.0	9400		19.31	
	1907.6	9538		19.14	
HSUPA Subtest 2	1852.6	9263		19.32	Pass
	1880.0	9400		19.29	
	1907.6	9538		19.10	
HSUPA Subtest 3	1852.6	9263		20.33	Pass
	1880.0	9400		20.28	

	1907.6	9538		20.1	
HSUPA Subtest 4	1852.6	9263		18.8	Pass
	1880.0	9400		18.79	
	1907.6	9538		18.58	
HSUPA Subtest 5	1852.6	9263		21.33	Pass
	1880.0	9400		21.28	
	1907.6	9538		21.10	

Band V

Band/Time slot configuration	Frequency(MHz)	Channel	Power Class	Peak output power(dBm)	Verdict
RMC (12.2kbps)	826.6	4133	3	23.96	Pass
	835.0	4175		24.04	
	846.4	4232		23.89	
HSDPA Subtest 1	826.6	4133		22.5	Pass
	835.0	4175		22.3	
	846.4	4232		22.44	
HSDPA Subtest 2	826.6	4133		22.5	Pass
	835.0	4175		22.31	
	846.4	4232		22.45	
HSDPA Subtest 3	826.6	4133		22.04	Pass
	835.0	4175		21.84	
	846.4	4232		21.78	
HSDPA Subtest 4	826.6	4133		22.02	Pass
	835.0	4175		21.82	
	846.4	4232		21.95	
HSUPA Subtest 1	826.6	4133		20.83	Pass
	835.0	4175		19.82	
	846.4	4232		20.06	
HSUPA Subtest 2	826.6	4133		20.84	Pass
	835.0	4175		19.82	
	846.4	4232		20.04	
HSUPA Subtest 3	826.6	4133		21.83	Pass
	835.0	4175		20.81	
	846.4	4232		21.02	
HSUPA Subtest 4	826.6	4133		20.31	Pass
	835.0	4175		19.28	
	846.4	4232		19.5	
HSUPA Subtest 5	826.6	4133		22.82	Pass
	835.0	4175		21.79	
	846.4	4232		22.02	

B.1.2 Radiated Power

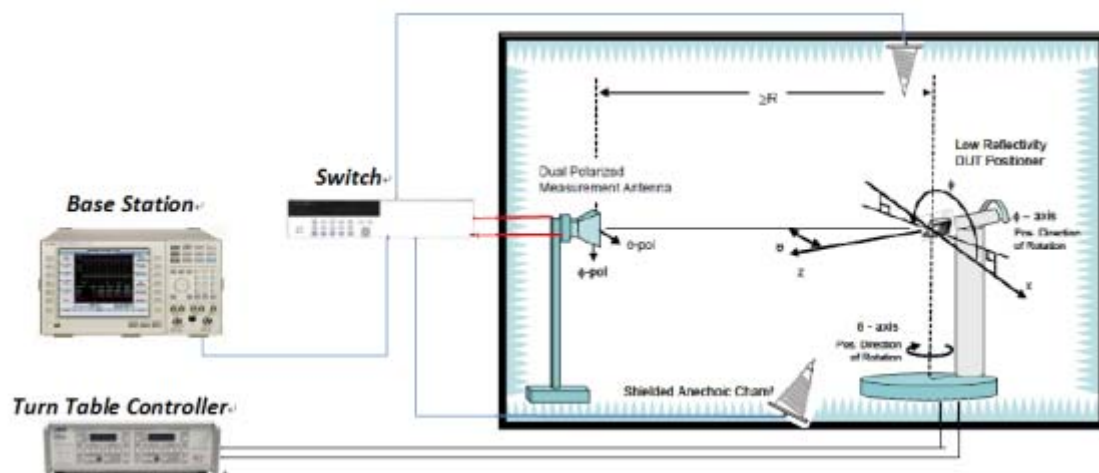
B.1.2.1 Description

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 transmitters and 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	29.25	Pass

836.6	190	5	30.34	Pass
848.8	251	5	30.74	Pass

WCDMA Band V

Frequency(MHz)	Channel No.	Power Step	ERP(dBm)	Verdict
826.6	4133	3	19.55	Pass
835	4175	3	21.56	Pass
846.4	4232	3	21.44	Pass

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

Frequency(MHz)	Channel	Power Step	EIRP(dBm)	Verdict
1850.2	512	0	31.18	Pass
1880.0	661	0	32.14	Pass
1909.8	810	0	31.68	Pass

WCDMA Band II

Frequency(MHz)	Channel	Power Class	EIRP(dBm)	Verdict
1852.6	9263	3	22.34	Pass
1880.0	9400	3	23.81	Pass
1907.6	9538	3	21.14	Pass

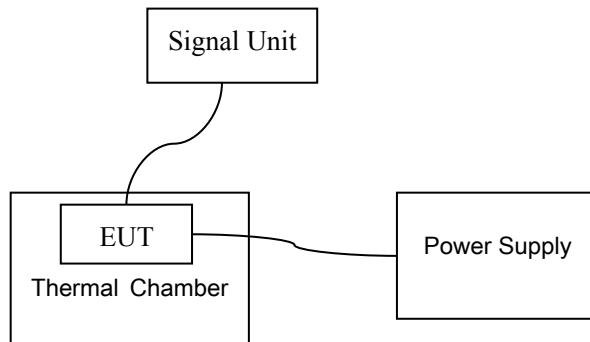
B.2 Frequency Stability (22.355/24.235)**B.2.1 Description**

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°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°C step to 50°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°C , the testing lowest temperature will be raised in 10°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	/	/	$\leq \pm 2.5 \text{ ppm}$	Pass
-10	/	/		Pass
0	-1.83	0.00		Pass
10	6.16	0.01		Pass
20	5.05	0.01		Pass
30	6.32	0.01		Pass
40	1.23	0.00		Pass
50	/	/		Pass
55	/	/		Pass

GSM1900

Temperature (°C)	Frequency Error (Hz)	ppm	Limit	Verdict
-20	/	/	$\leq \pm 2.5 \text{ ppm}$	Pass
-10	/	/		Pass
0	19.29	0.01		Pass
10	23.43	0.01		Pass
20	14.50	0.01		Pass
30	3.83	0.00		Pass
40	8.07	0.00		Pass
50	/	/		Pass
55	/	/		Pass

WCDMA Band II

Temperature (°C)	Frequency Error (Hz)	ppm	Limit	Verdict
-20	/	/	$\leq \pm 2.5 \text{ ppm}$	Pass
-10	/	/		Pass
0	3.20	0.00		Pass
10	2.50	0.00		Pass
20	2.80	0.00		Pass
30	3.30	0.00		Pass

40	3.80	0.00		Pass
50	/	/		Pass
55	/	/		Pass

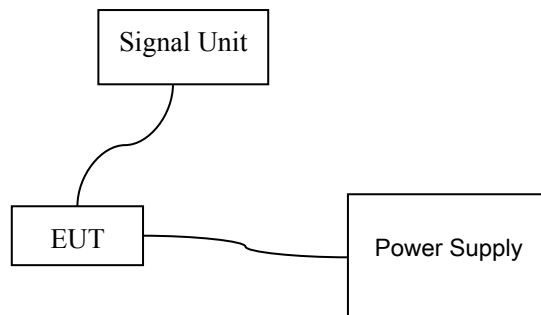
WCDMA Band V

Temperature (°C)	Frequency Error (Hz)	ppm	Limit	Verdict
-20	/	/	$\leq \pm 2.5 \text{ ppm}$	Pass
-10	/	/		Pass
0	1.80	0.00		Pass
10	-0.80	0.00		Pass
20	1.60	0.00		Pass
30	-1.40	0.00		Pass
40	1.20	0.00		Pass
50	/	/		Pass
55	/	/		Pass

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	5.64	0.01	$\leq \pm 2.5 \text{ ppm}$	Pass
	3.7	6.38	0.01		Pass
	4.2	-2.06	0.00		Pass
GSM1900	3.6	13.82	0.01		Pass
	3.7	15.78	0.01		Pass
	4.2	7.80	0.00		Pass
WCDMA Band II	3.6	3.10	0.00		Pass
	3.7	2.90	0.00		Pass

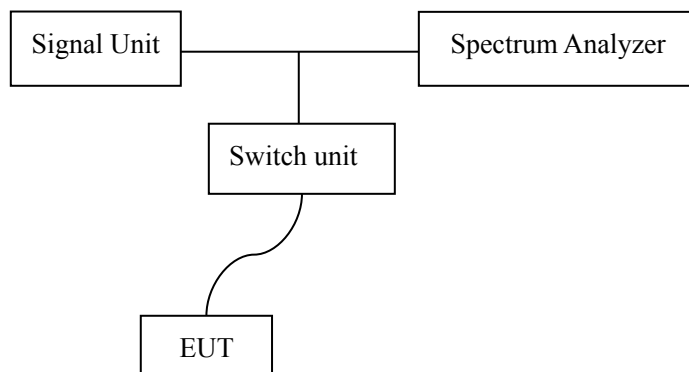
	4.2	2.60	0.00		Pass
WCDMA Band V	3.6	1.30	0.00		Pass
	3.7	1.50	0.00		Pass
	4.2	1.70	0.00		Pass

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
	189	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	4132	824.2	Fig.7	Pass
	4175	835	Fig.8	Pass
	4233	848.8	Fig.9	Pass
WCDMA Band V HSDPA Subtest 1	4132	824.2	Fig.10	Pass
	4175	835	Fig.11	Pass
	4233	848.8	Fig.12	Pass
WCDMA Band V HSUPA Subtest 5	4132	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

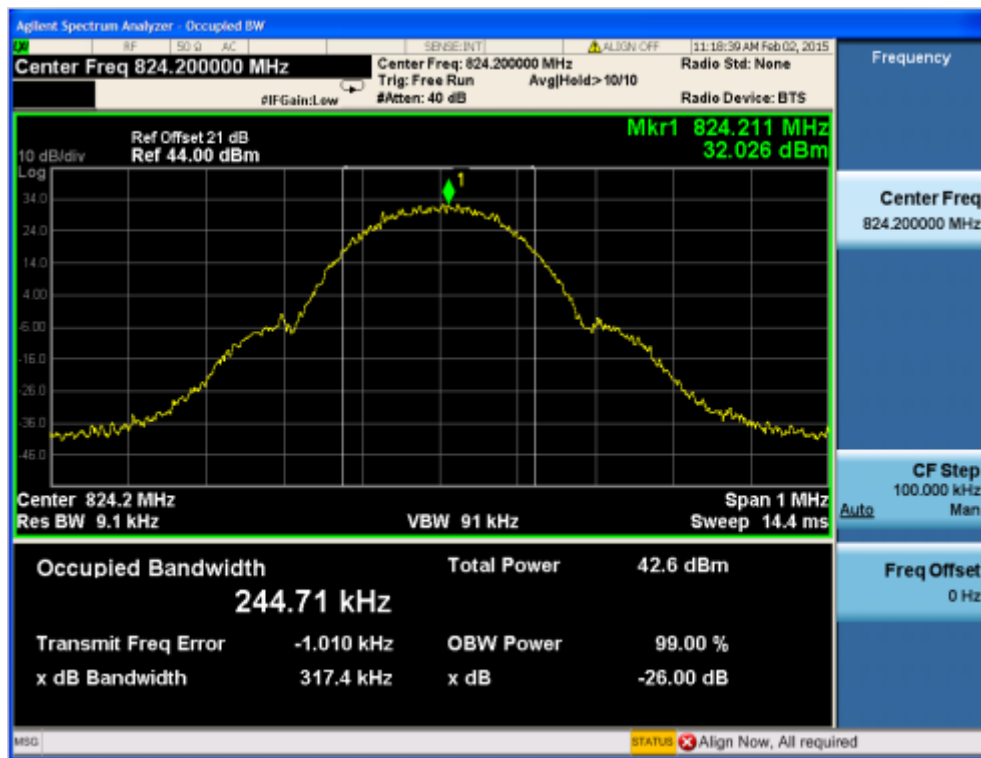


Fig.2 GSM850-CH189 Occupied Bandwidth

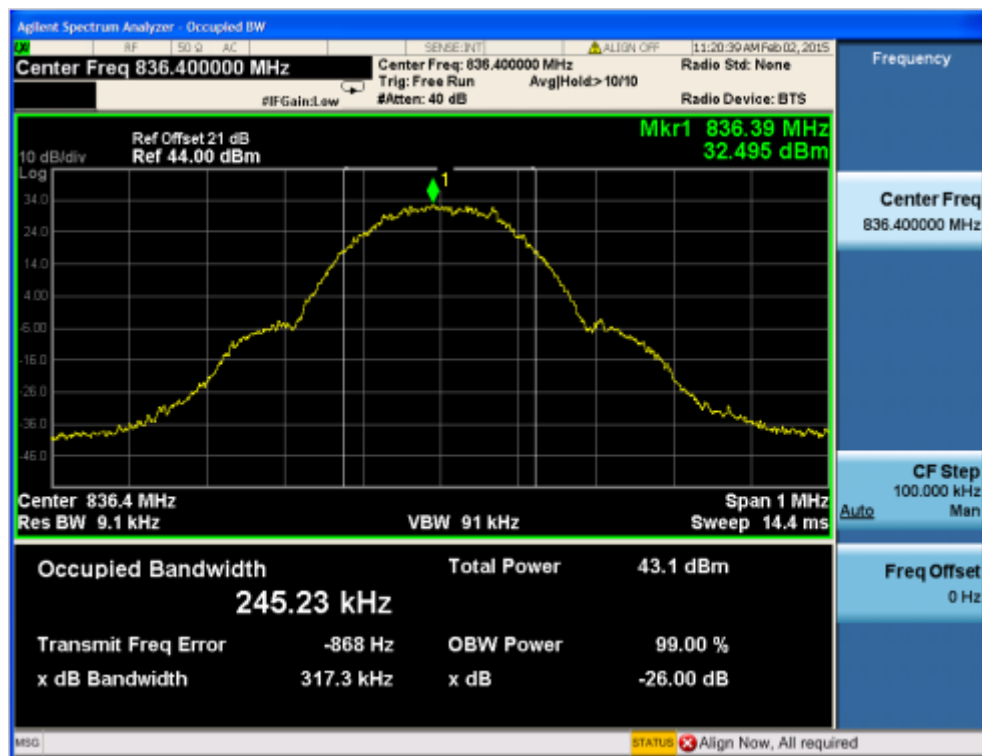


Fig.3 GSM850-CH251 Occupied Bandwidth

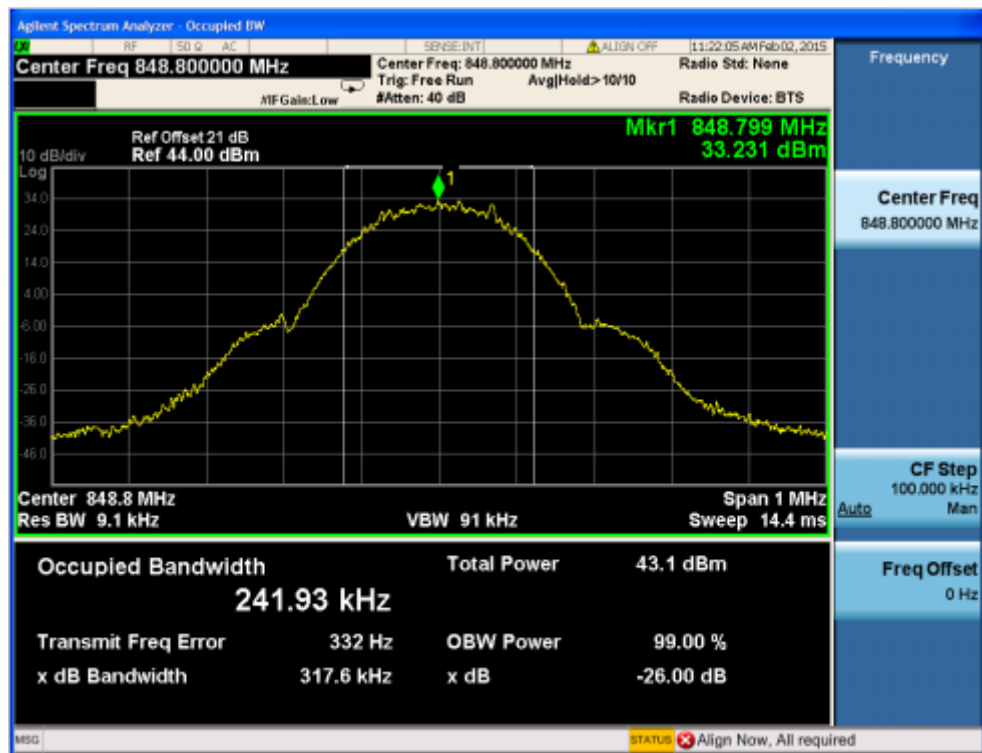


Fig.4 GSM1900-CH512 Occupied Bandwidth

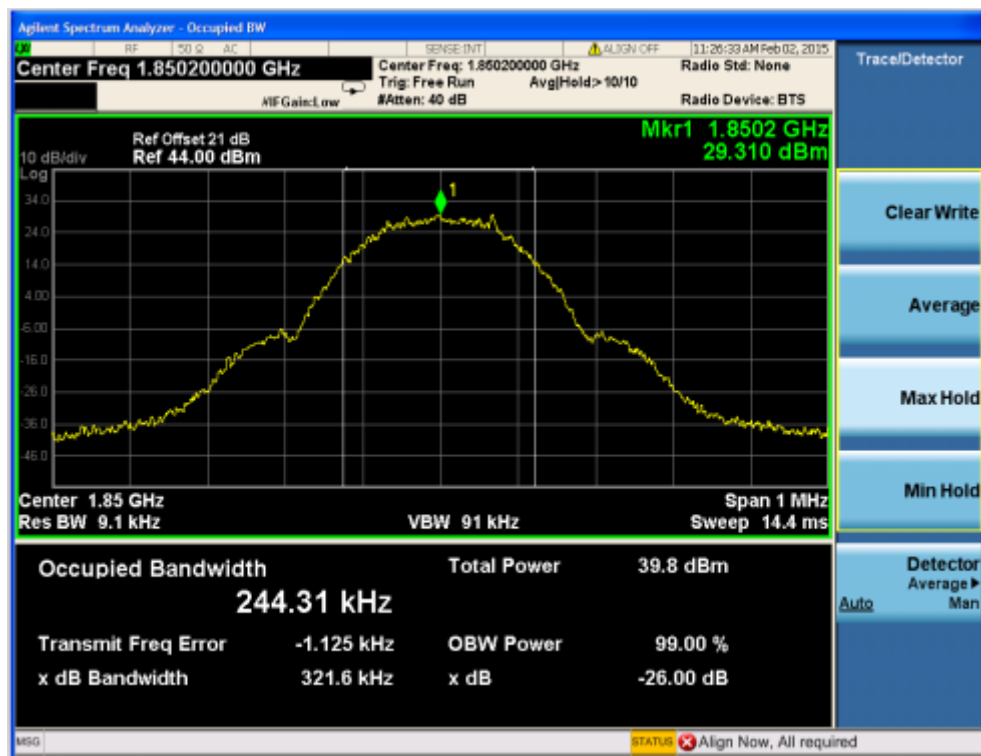


Fig.5 GSM1900-CH661 Occupied Bandwidth

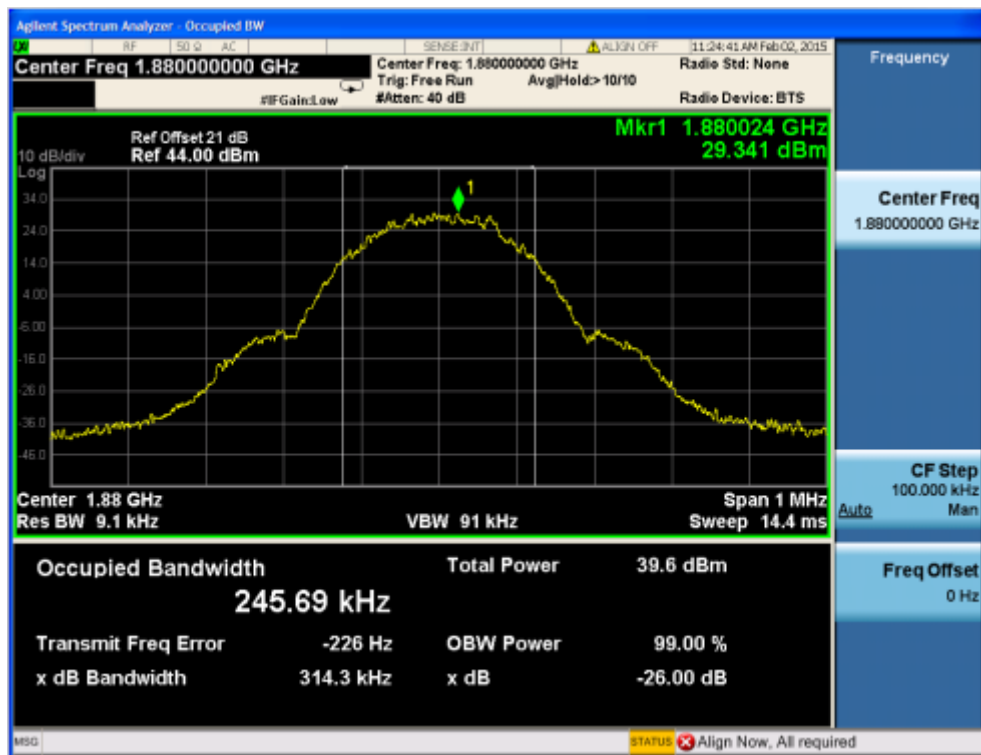


Fig.6 GSM1900-CH810 Occupied Bandwidth

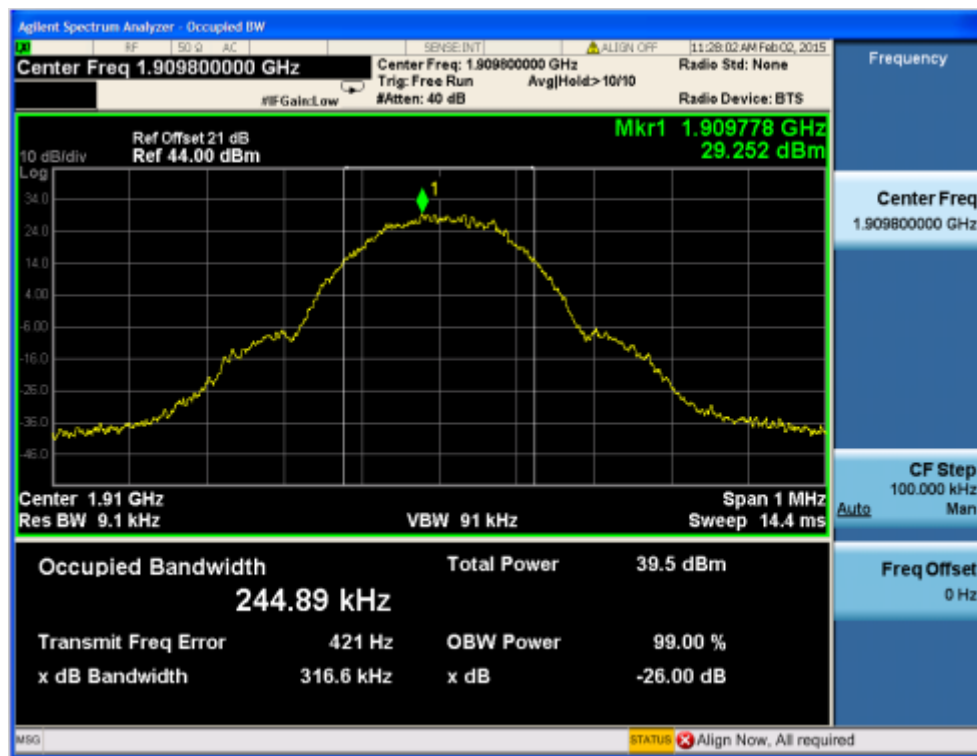


Fig.7 WCDMA Band V-CH4132 Occupied Bandwidth

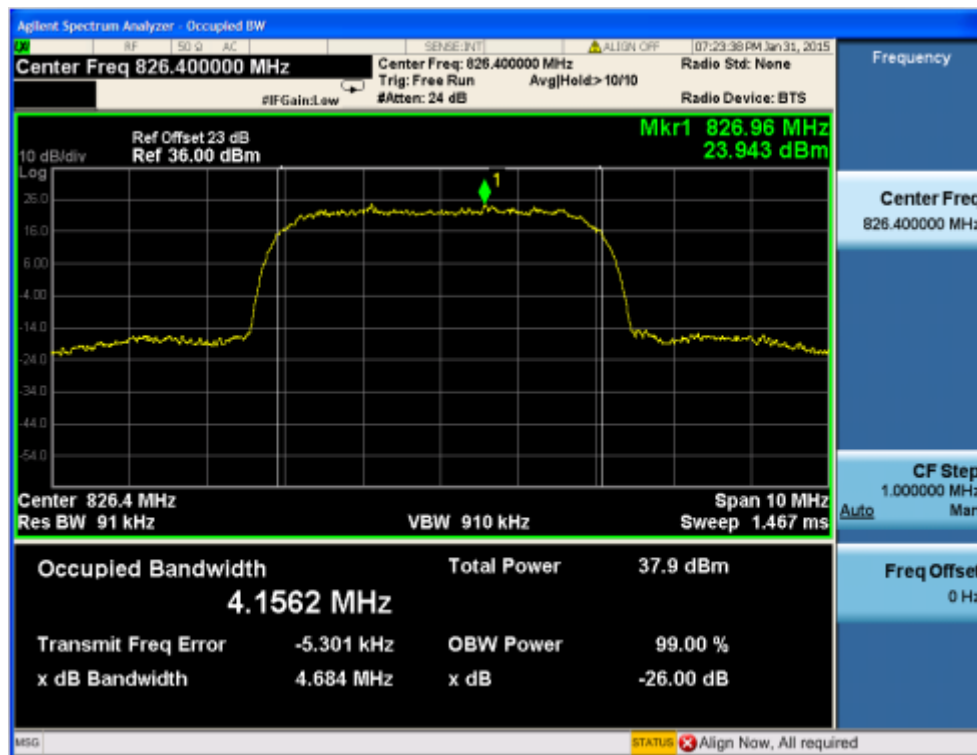


Fig.8 WCDMA Band V-CH4175 Occupied Bandwidth

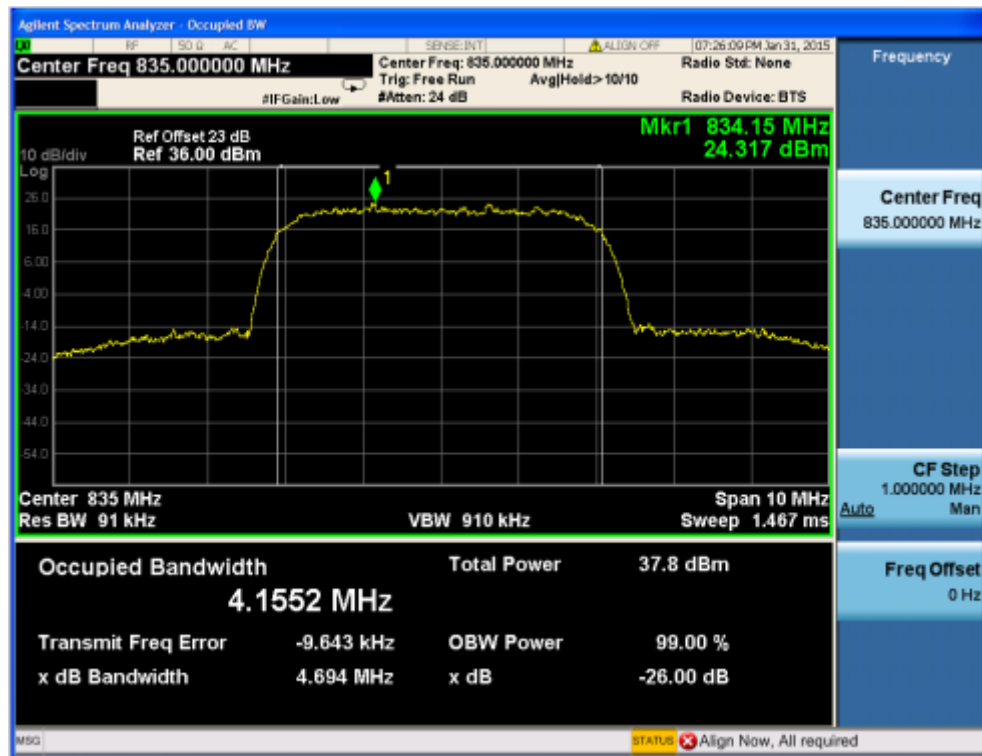


Fig.9 WCDMA Band V-CH4232 Occupied Bandwidth

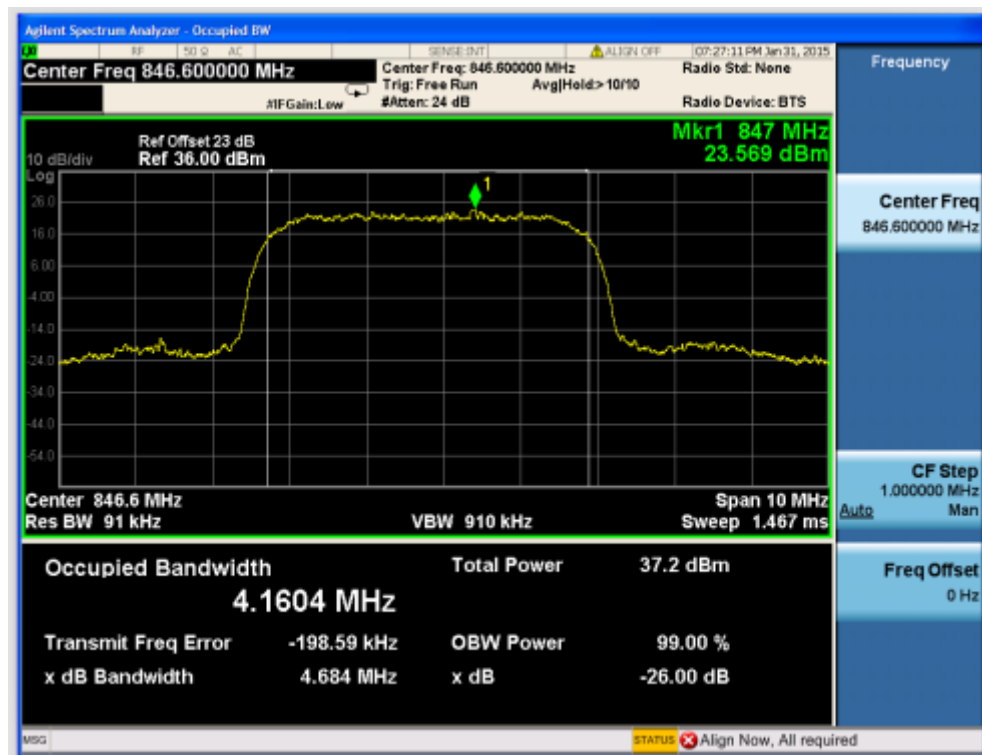


Fig.10 WCDMA Band V-CH4132 Occupied Bandwidth(HSDPA Subtes1)

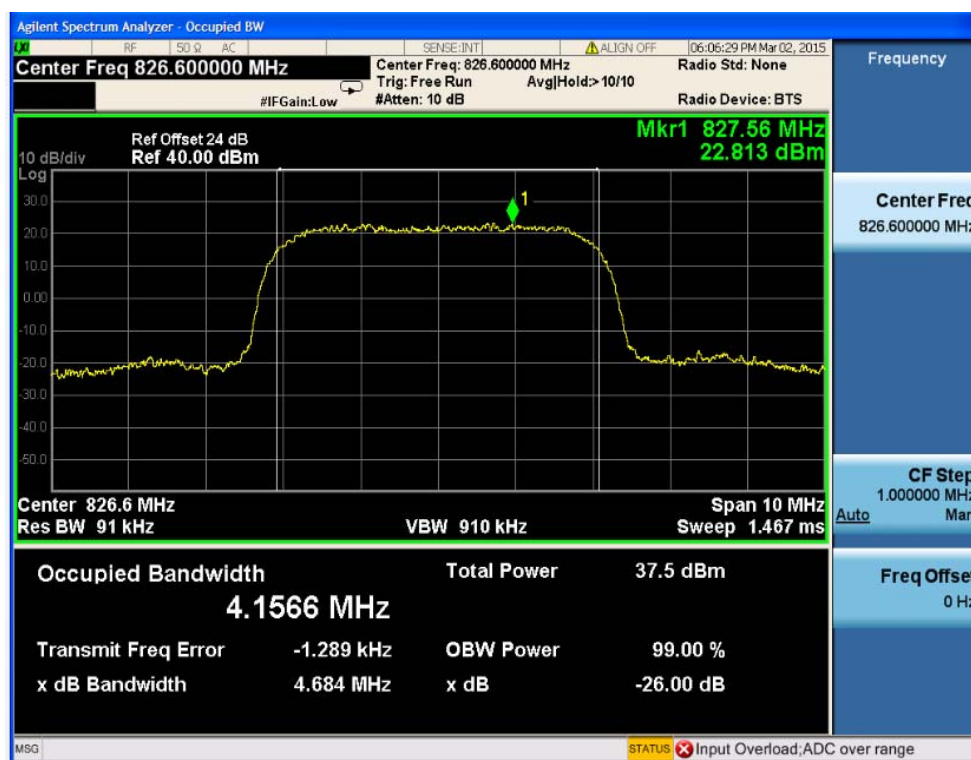


Fig.11 WCDMA Band V-CH4175 Occupied Bandwidth(HSDPA Subtes1)

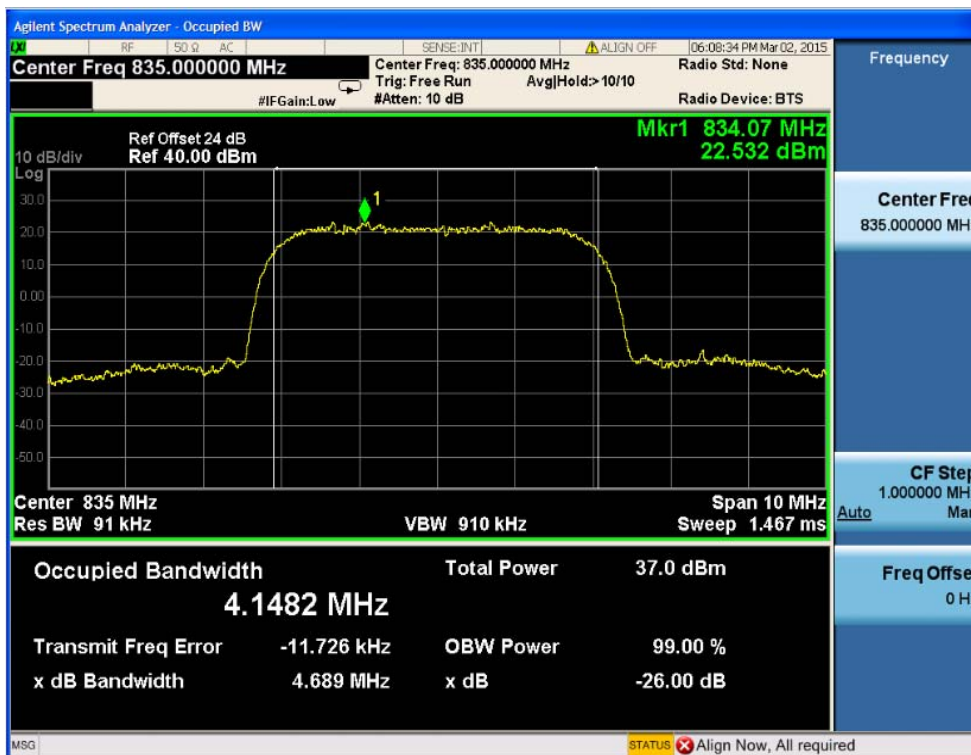


Fig.12 WCDMA Band V-CH4233 Occupied Bandwidth(HSDPA Subtes1)

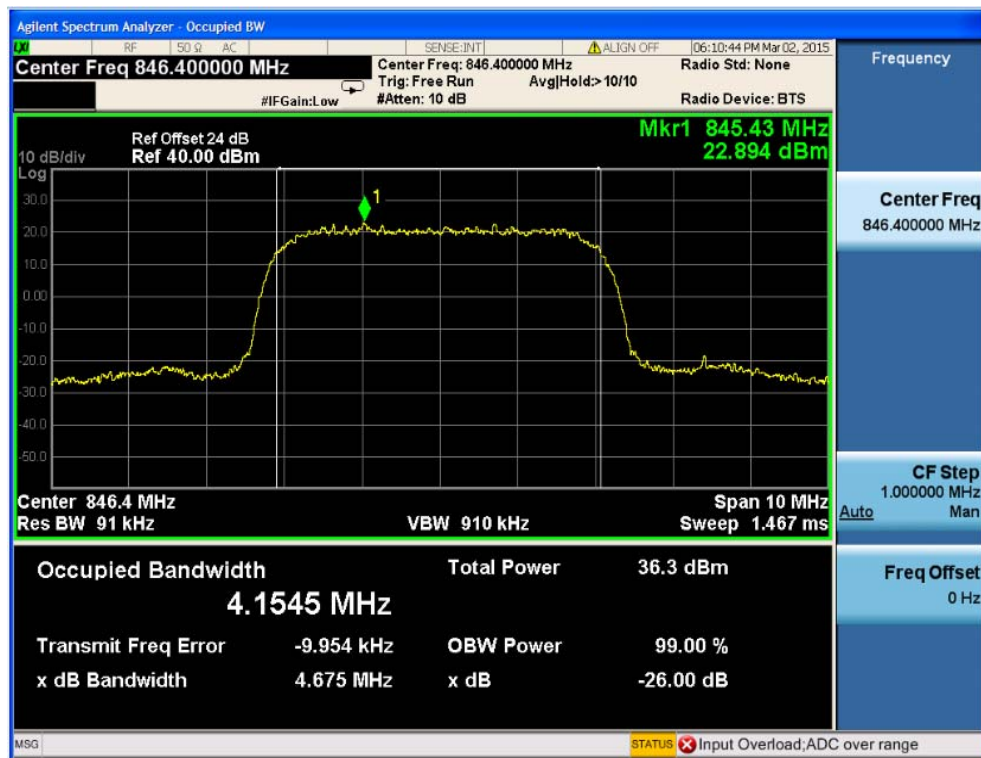


Fig.13 WCDMA Band V-CH4132 Occupied Bandwidth(HSUPA Subtes5)

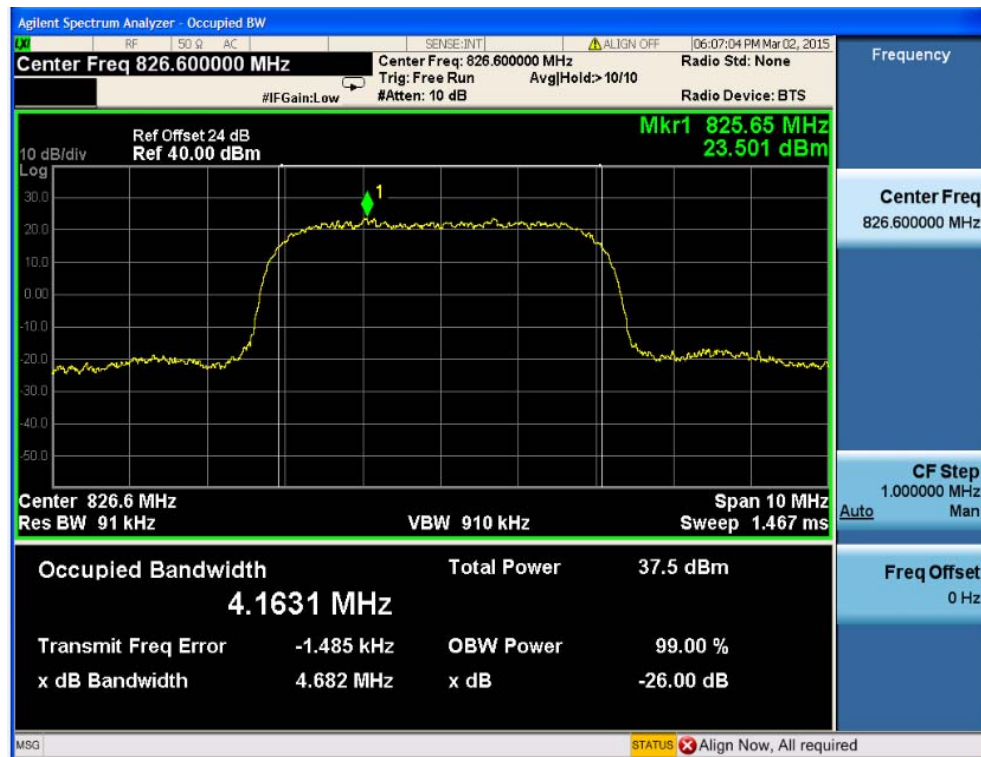


Fig.14 WCDMA Band V-CH4175 Occupied Bandwidth(HSUPA Subtes5)

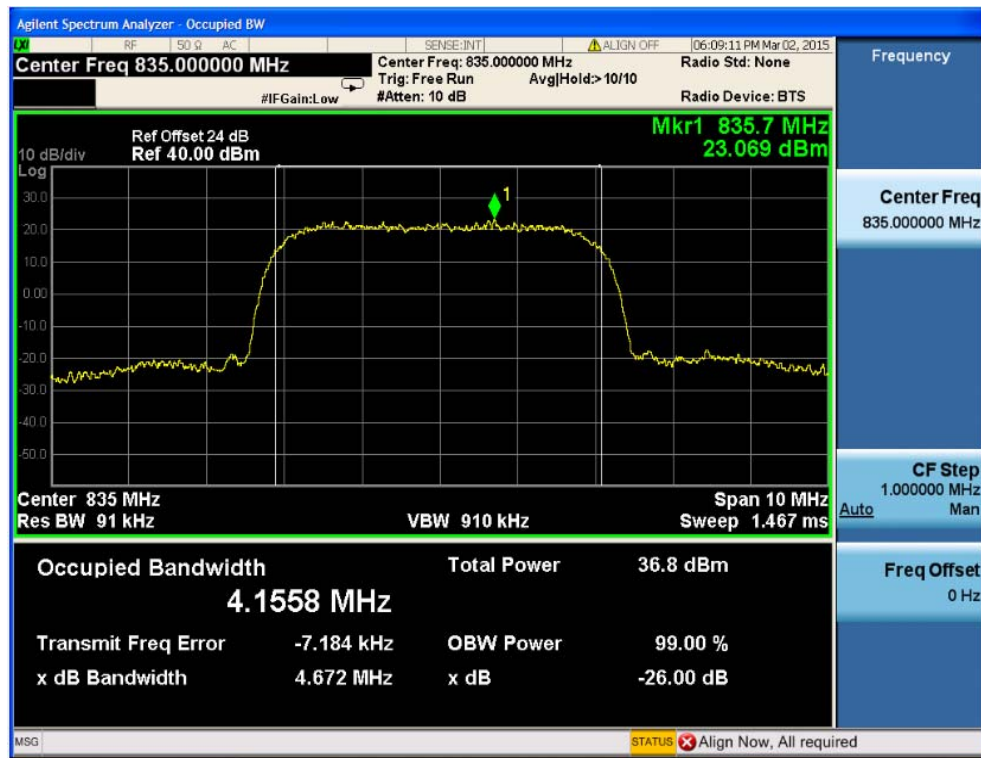


Fig.15 WCDMA Band V-CH4233 Occupied Bandwidth(HSUPA Subtes5)

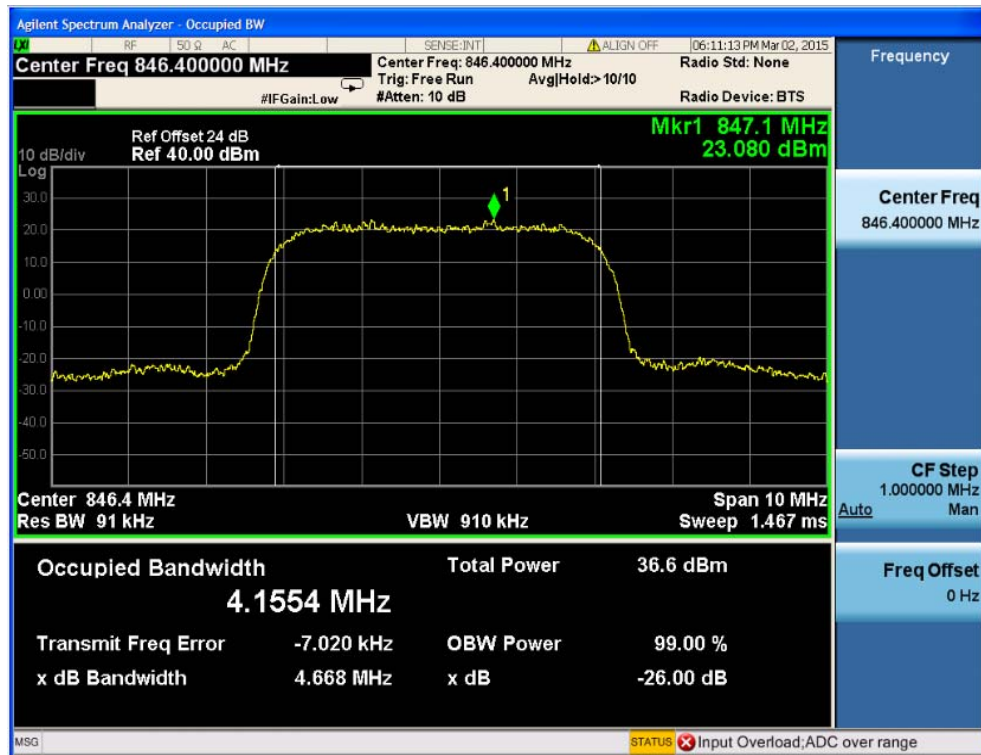


Fig.16 WCDMA Band II-CH4132 Occupied Bandwidth

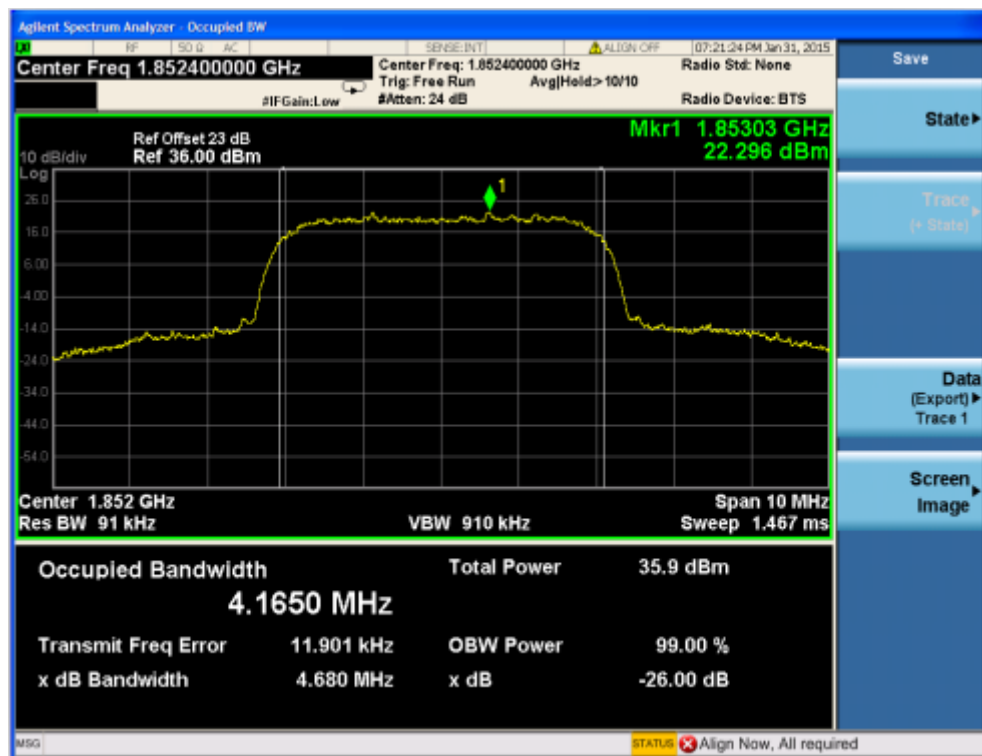


Fig.17 WCDMA Band II-CH4182 Occupied Bandwidth

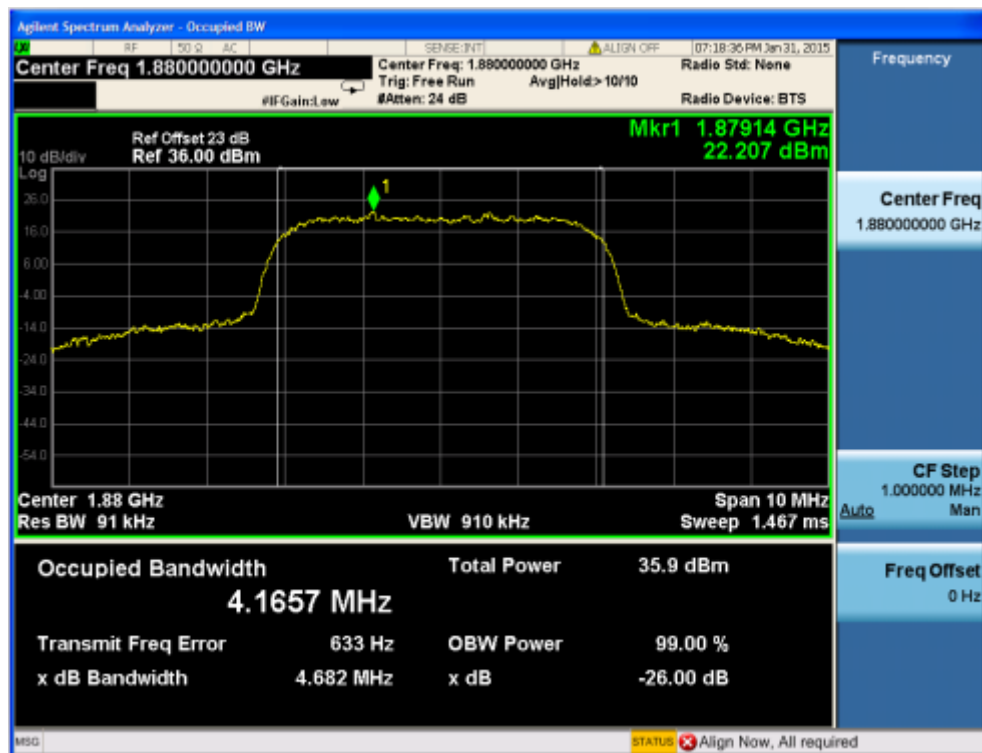


Fig.18 WCDMA Band II-CH4233 Occupied Bandwidth

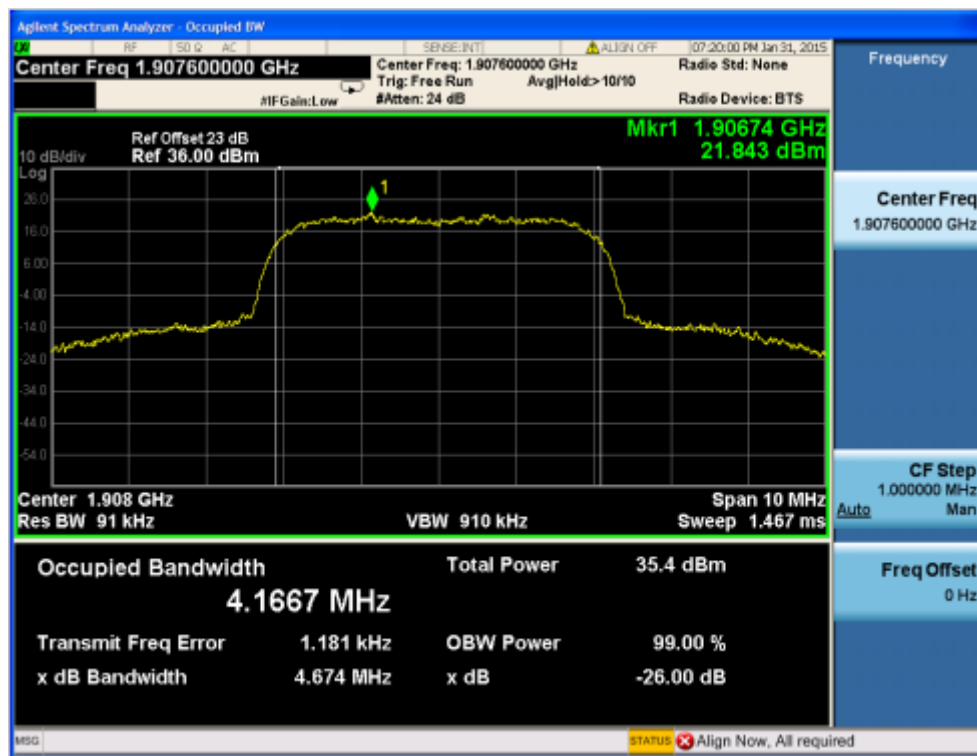


Fig.19 WCDMA Band II-CH9263 Occupied Bandwidth(HSDPA Subtes1)

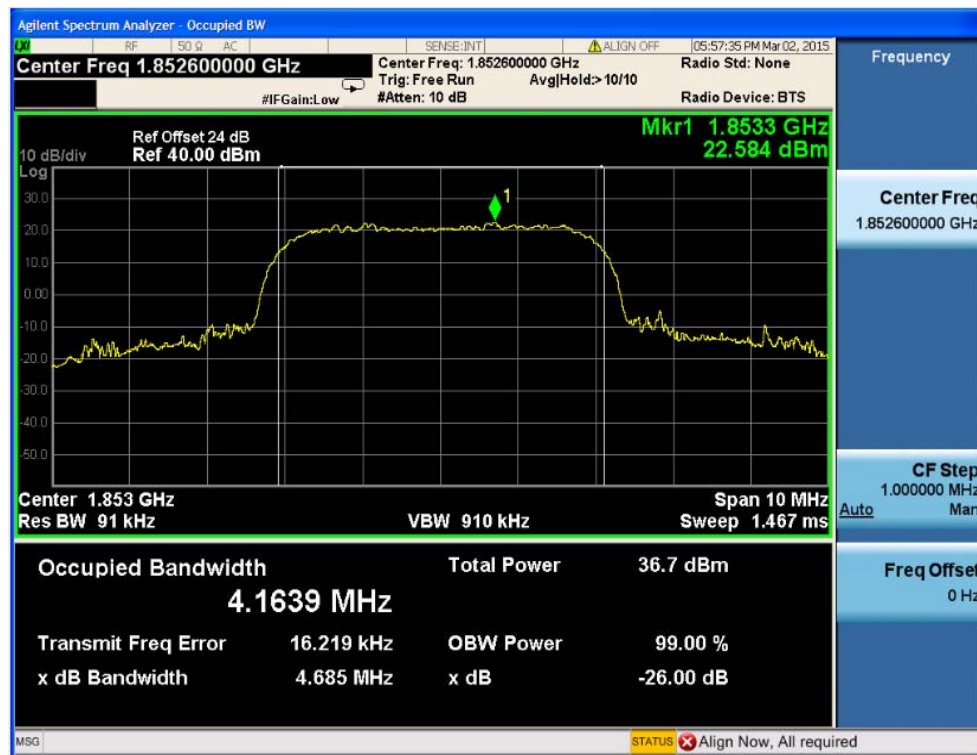


Fig.20 WCDMA Band II-CH9400 Occupied Bandwidth(HSDPA Subtes1)

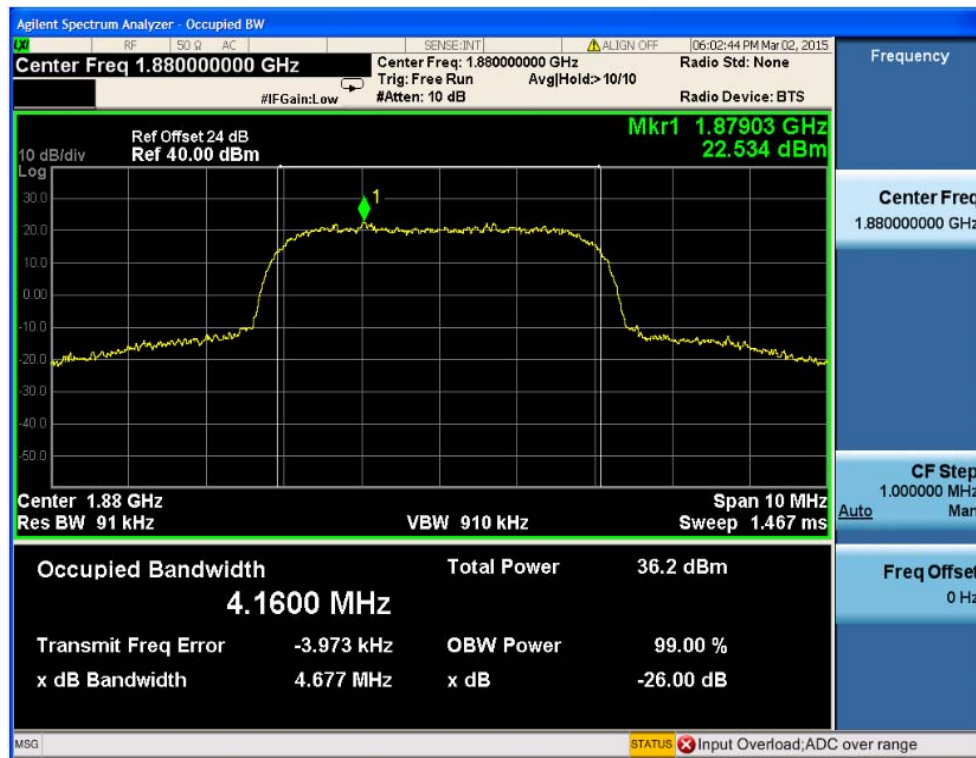


Fig.21 WCDMA Band II-CH9538 Occupied Bandwidth(HSDPA Subtes1)

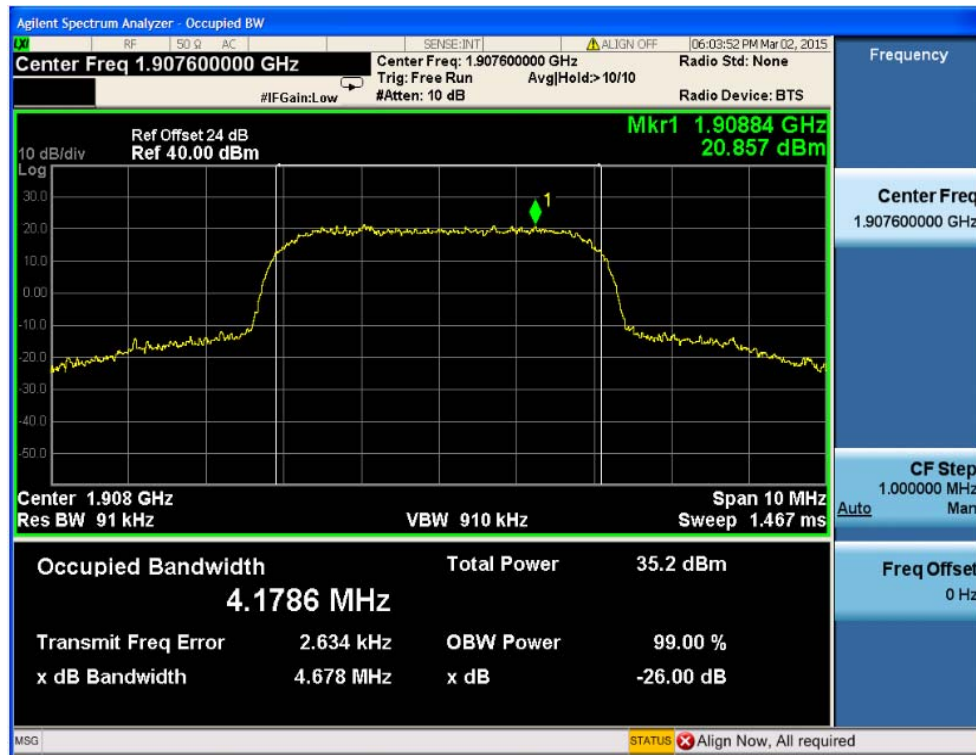


Fig.22 WCDMA Band II-CH9263 Occupied Bandwidth(HSUPA Subtes5)

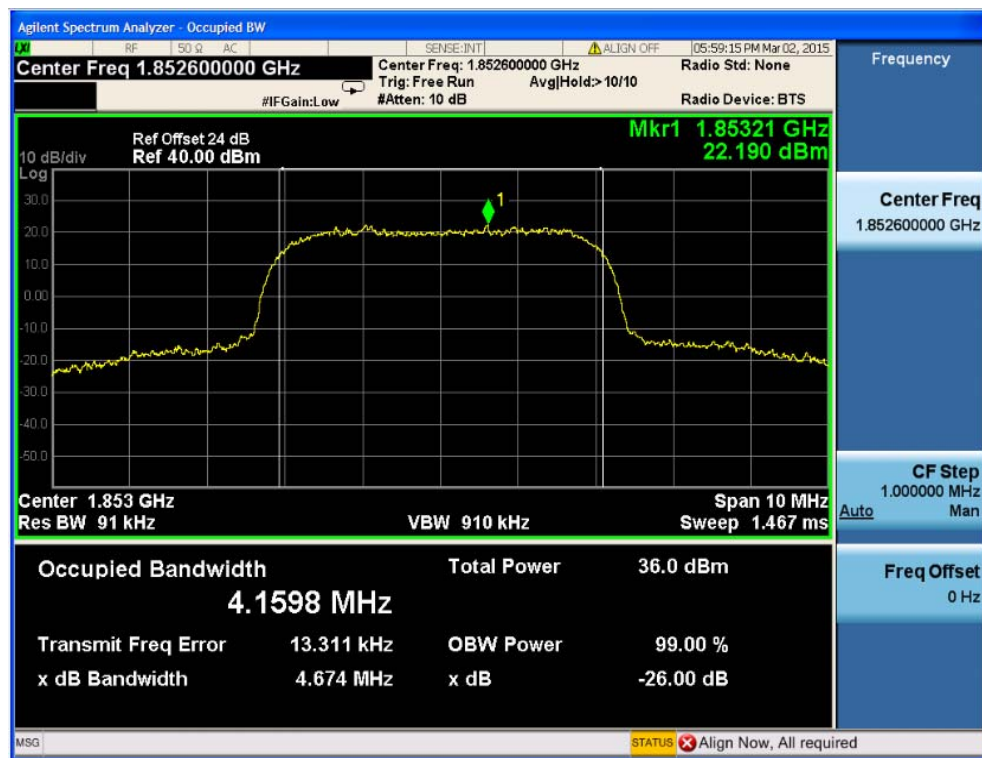


Fig.23 WCDMA Band II-CH9400 Occupied Bandwidth(HSUPA Subtes5)

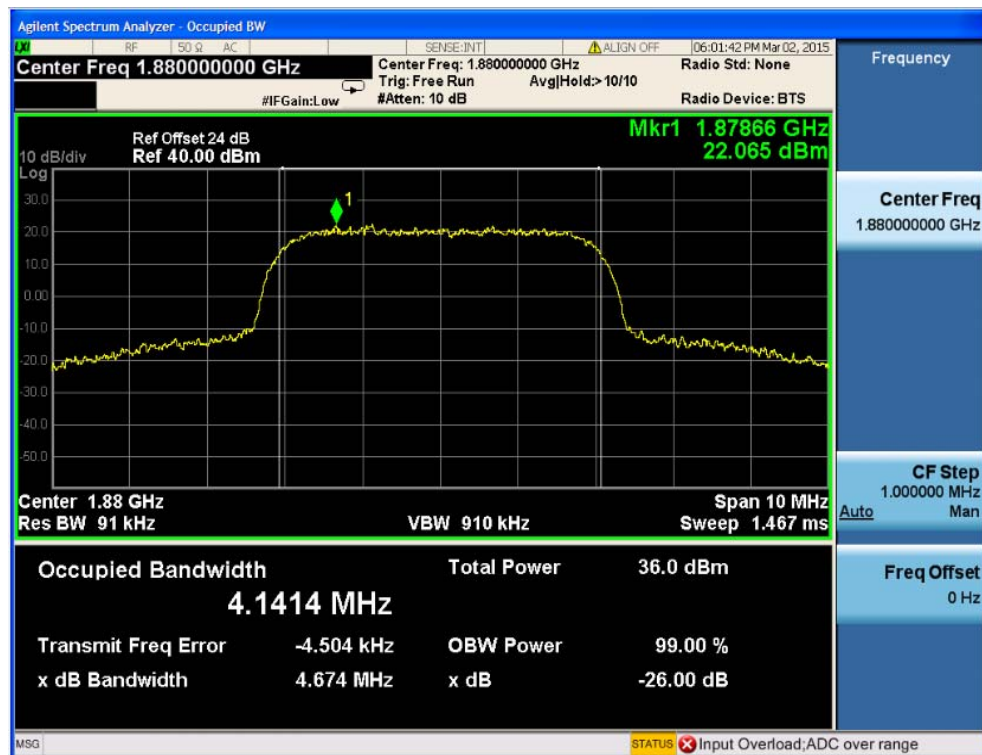
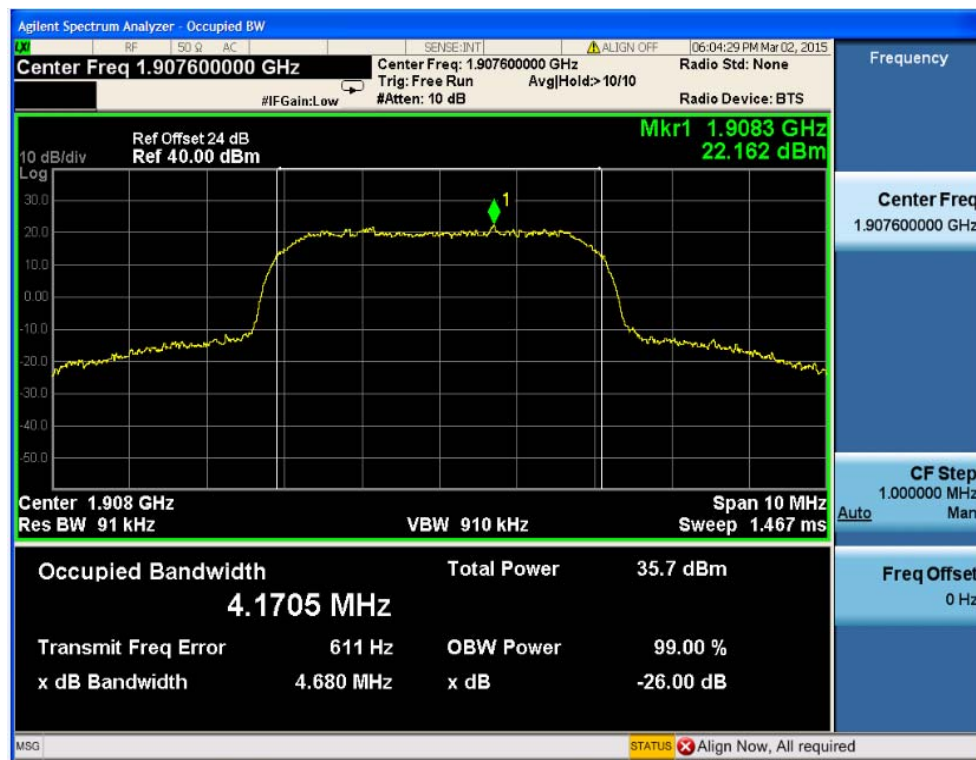


Fig.24 WCDMA Band II-CH9538 Occupied Bandwidth(HSUPA Subtes5)



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

B.4.1 Description

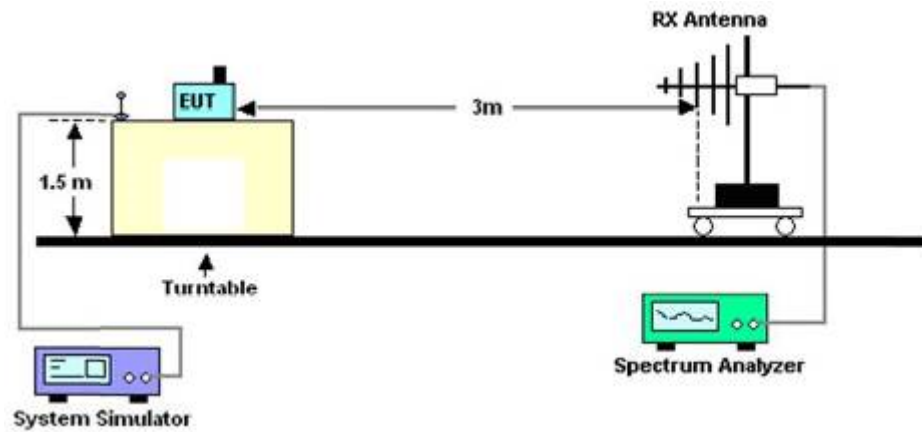
The radiated spurious emission was measured by substitution method according to TIA-603C-2004. The power of any emission outside of the authorized operating frequency ranges must be lower than transmitter power by a factor of at least $43 + 10 \log(P)$ dB. The spectrum is scanned from 30 MHz up to a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

B.4.2 Test Procedure

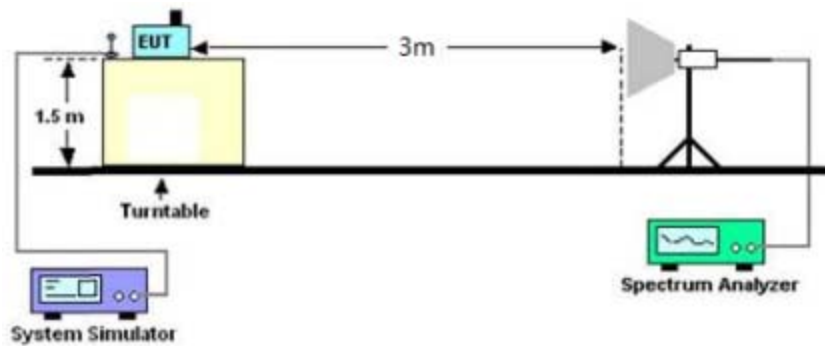
1. The EUT was placed on a 0.8 meter high rotatable wooden table.
2. The EUT was set 3 meters test distance from the receive antenna.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and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

B.4.3 Test Setup

<Below 1GHz>



<Above 1GHz>



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

Band	CH	Frequency(MHz)	Result	Verdict
GSM850	189	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 189 30MHz~3GHz

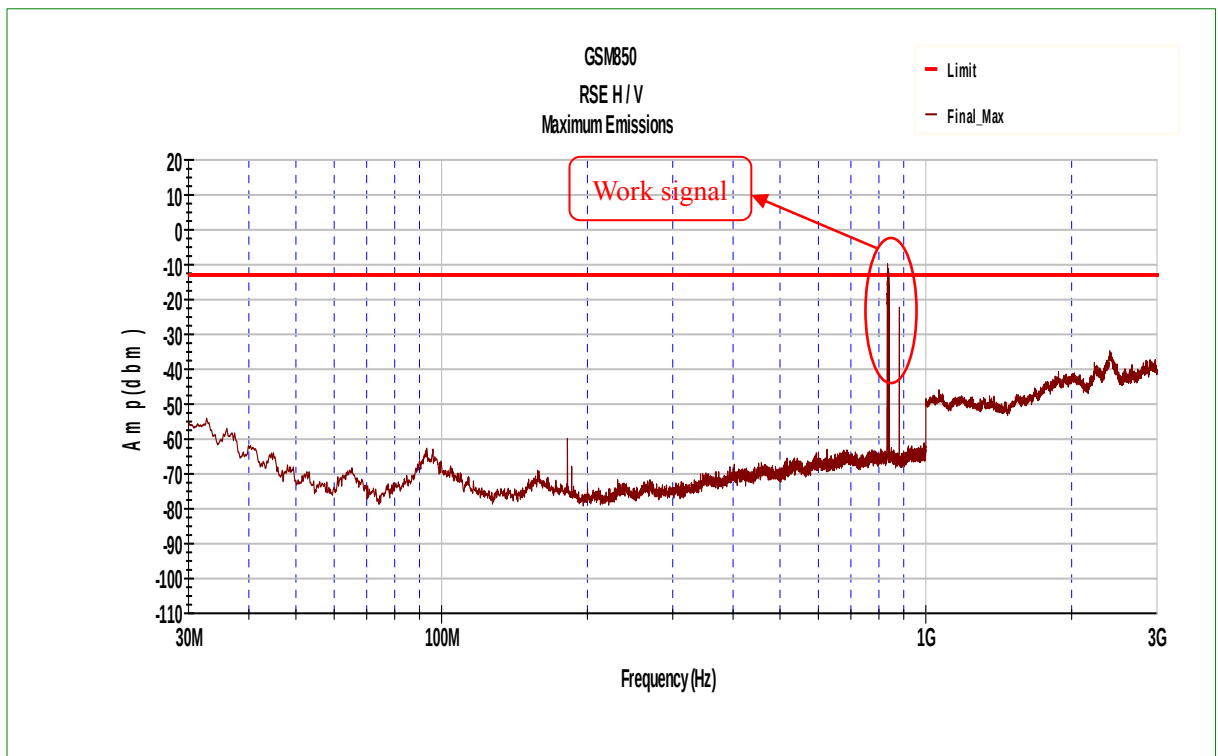


Fig.26 GSM850 on Channel 189 3GHz~9GHz

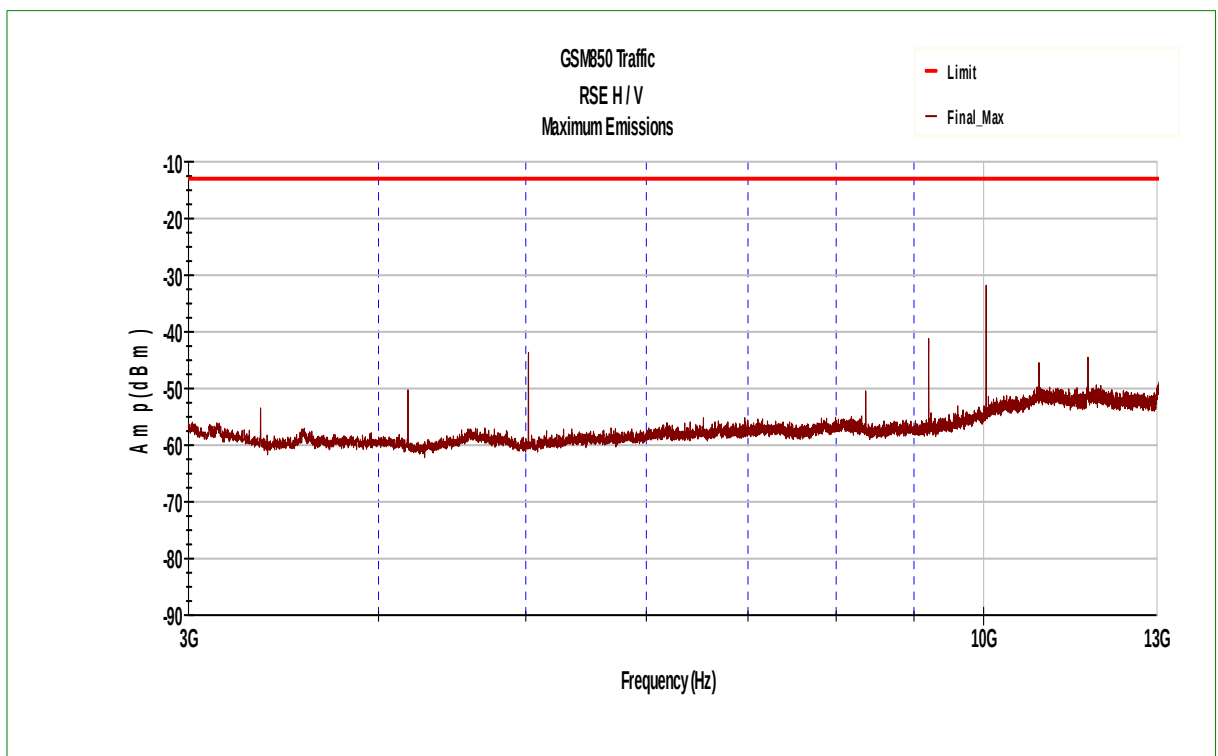


Fig.27 GSM1900 on Channel 661 30MHz~3GHz

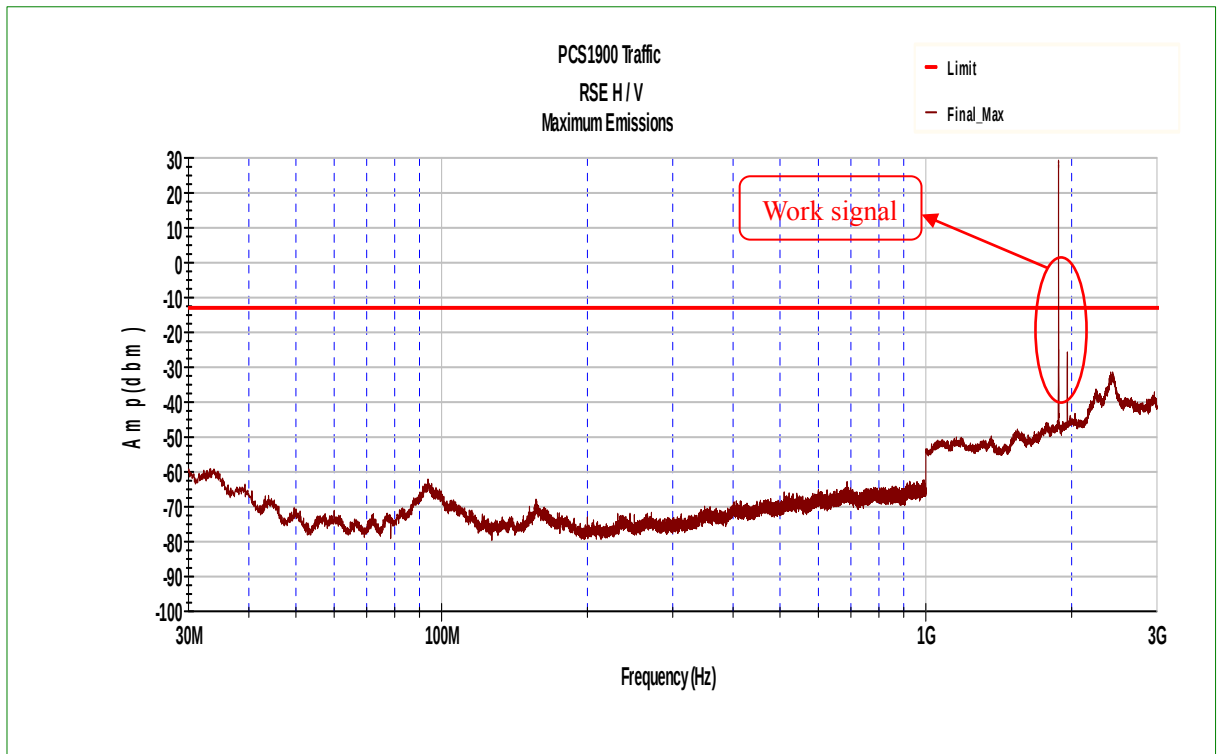


Fig.28 GSM1900 on Channel 661 3GHz~19.1GHz

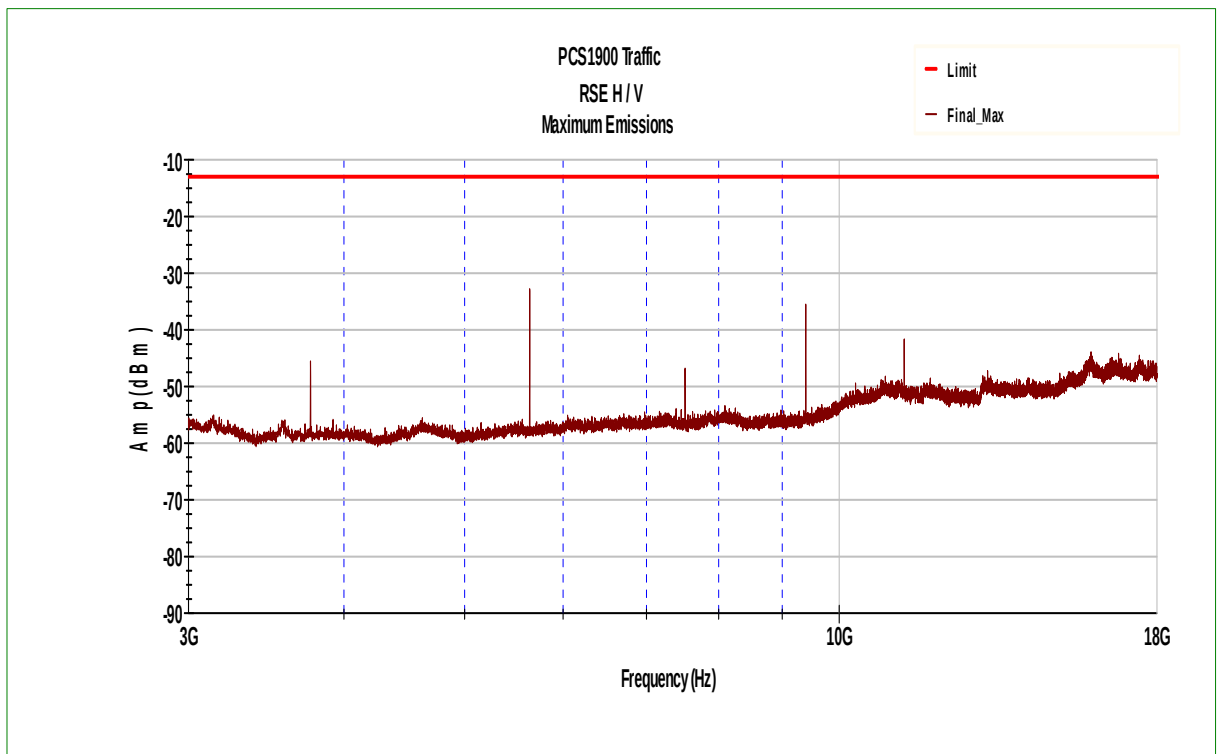


Fig.29 WCDMA Band V on Channel 4175 30MHz~3GHz

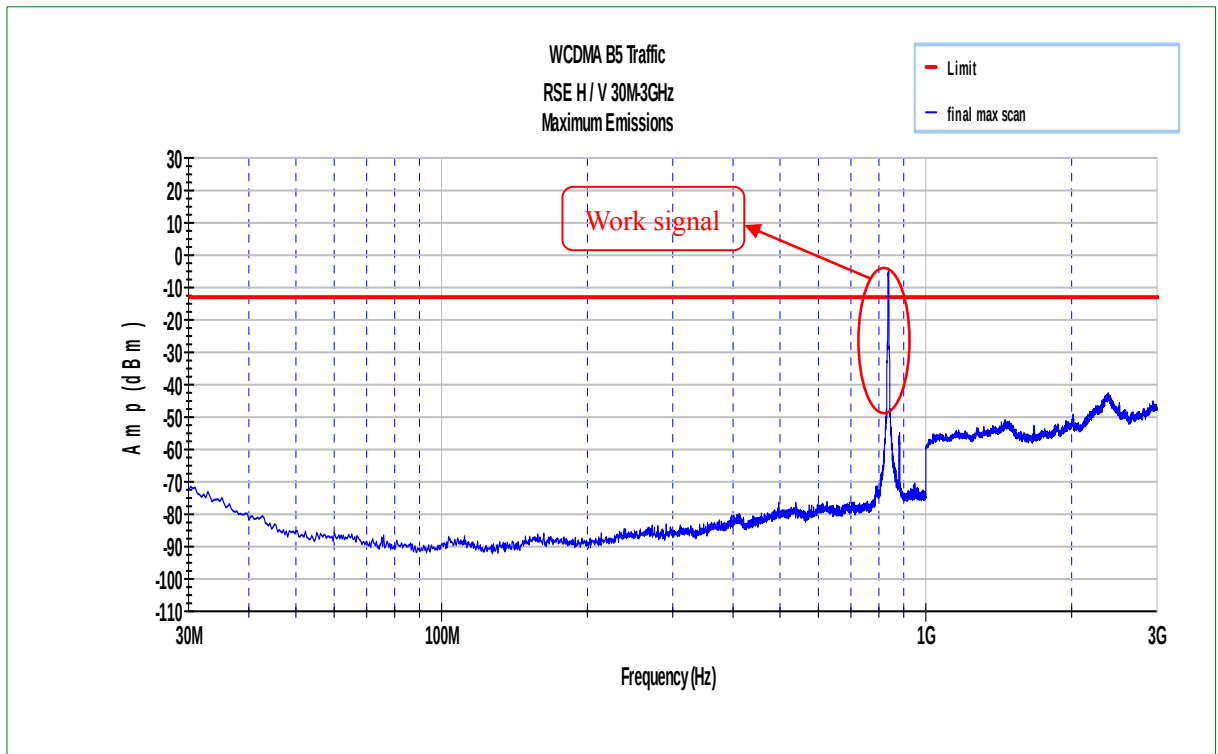


Fig.30 WCDMA Band V on Channel 4175 3GHz~9GHz

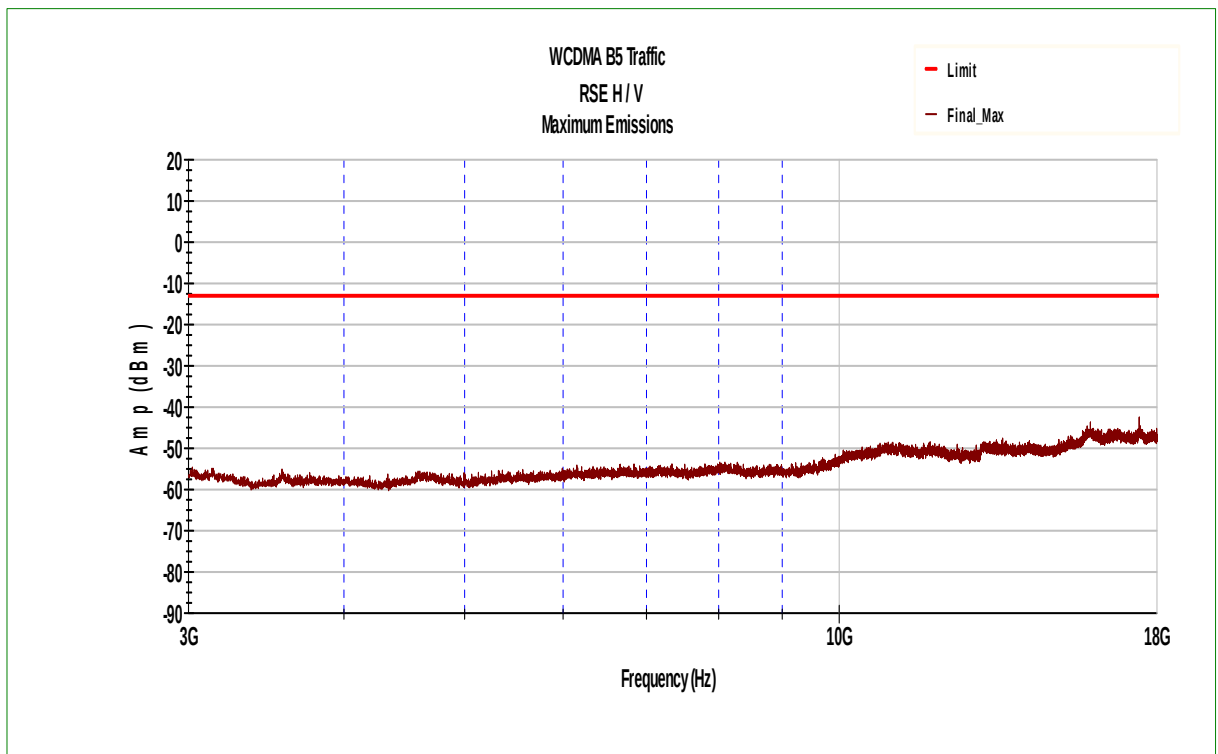


Fig.31 WCDMA Band II Channel 9400 30MHz~3GHz

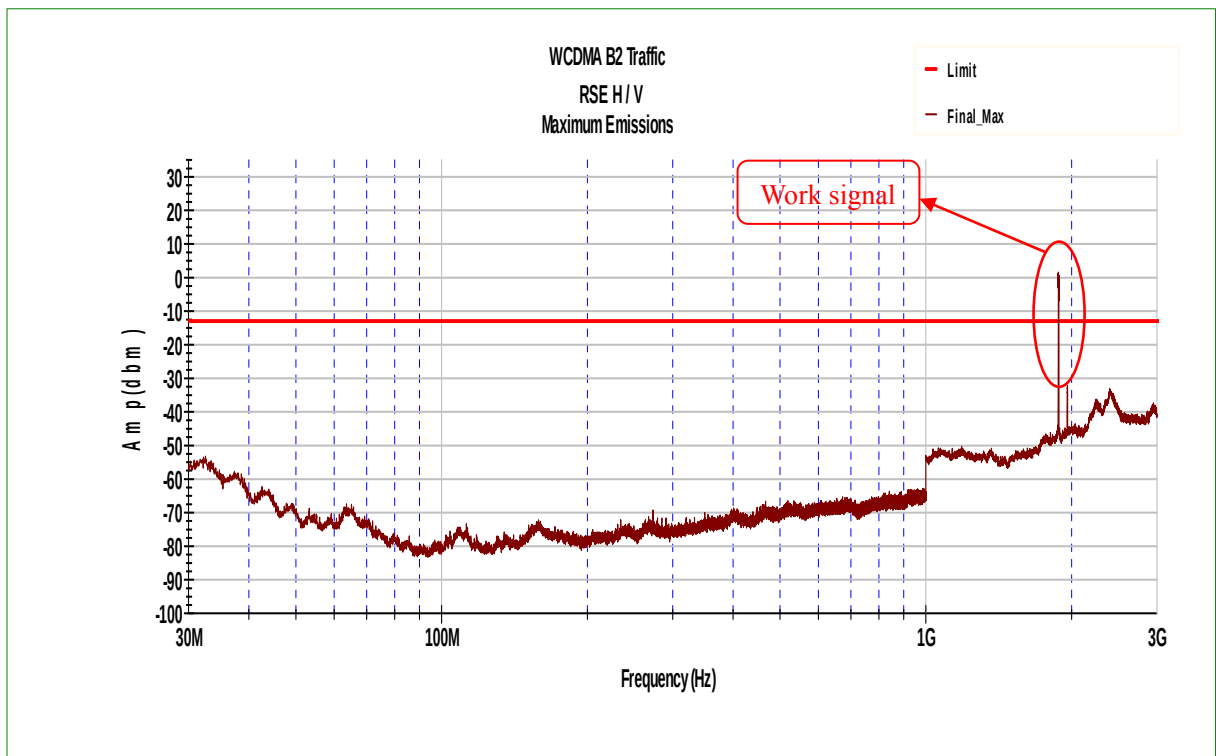
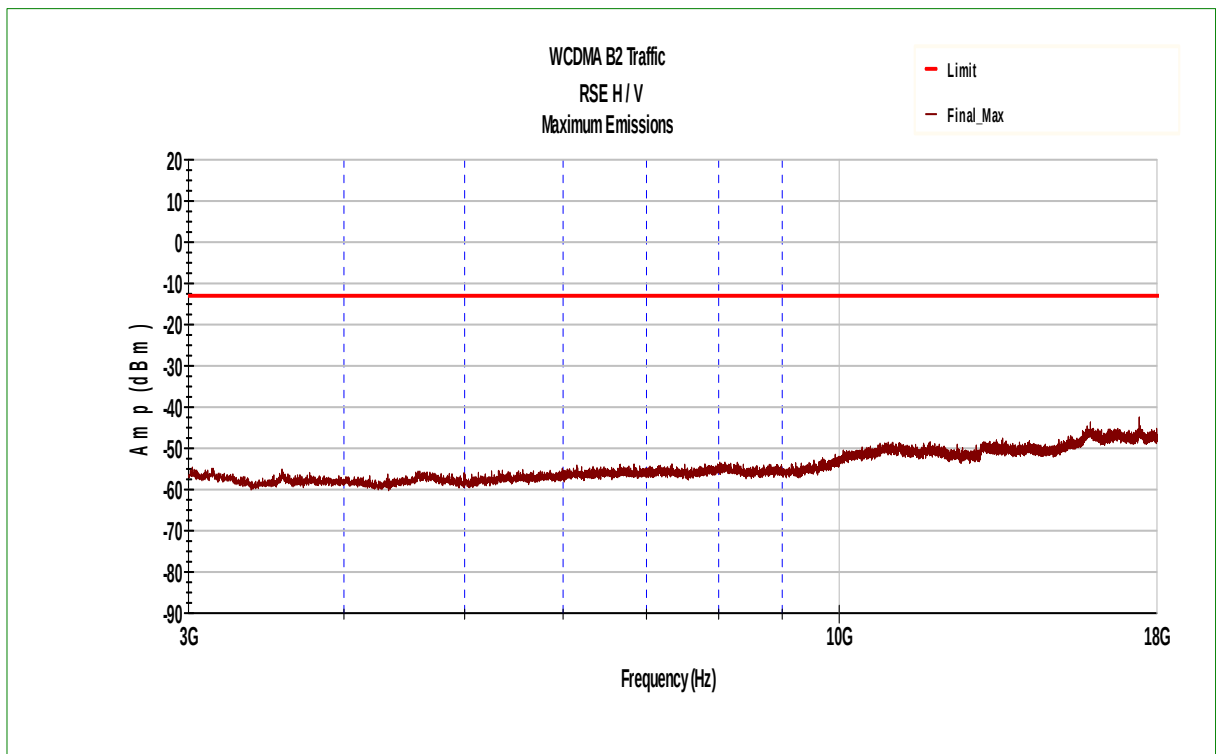


Fig.32 WCDMA Band II Channel 9400 3GHz~19.1GHz

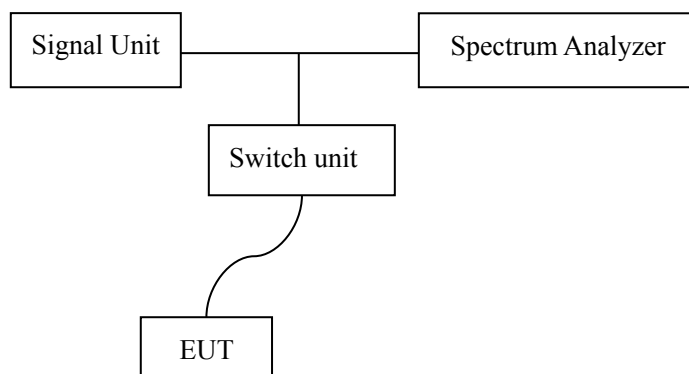


B.5 Band Edge Compliance (22.917(b)/ 24.238)**B.5.1 Description**

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	4132	824.2	Fig.37	Pass
	4233	848.8	Fig.38	Pass
WCDMA Band VHSDPA Subtest 1	4132	824.2	Fig.39	Pass
	4233	848.8	Fig.40	Pass
WCDMA Band VHSUPA Subtest 5	4132	824.2	Fig.41	Pass
	4233	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

Fig.33 GSM850-CH128 Band Edge Compliance

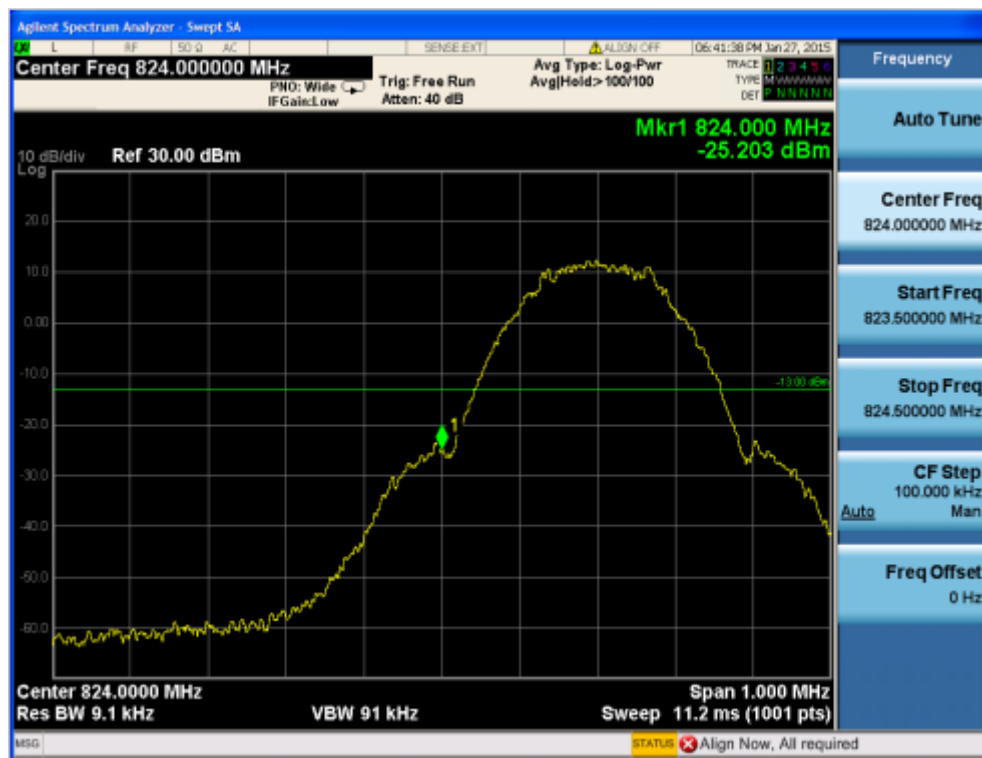


Fig.34 GSM850-CH251 Band Edge Compliance

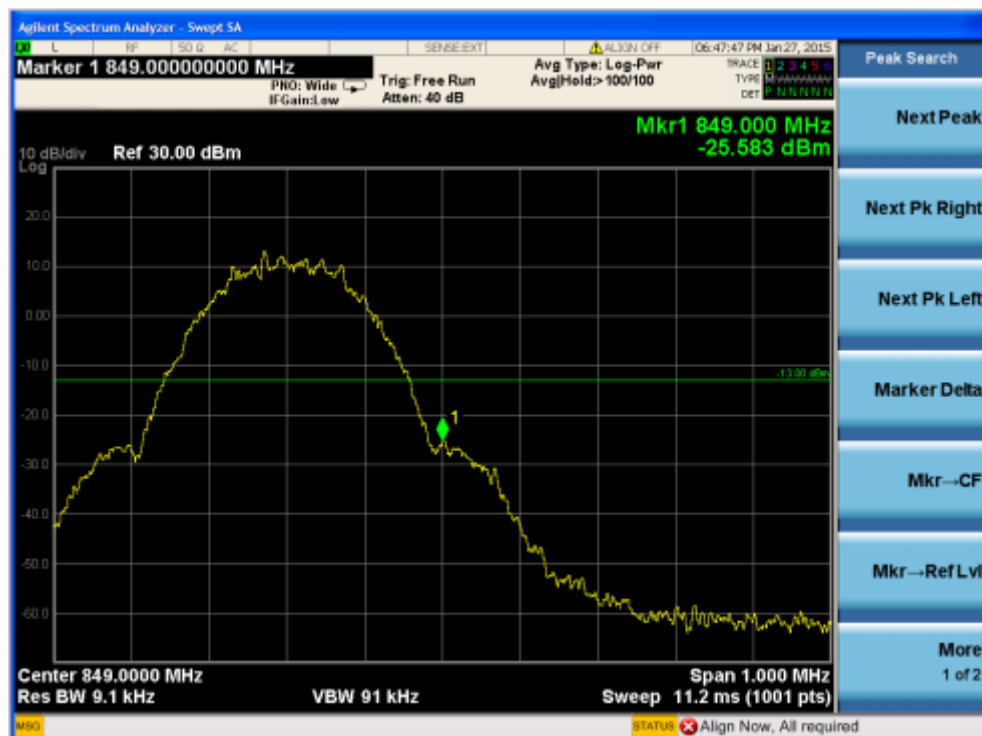


Fig.35 GSM1900-CH512 Band Edge Compliance

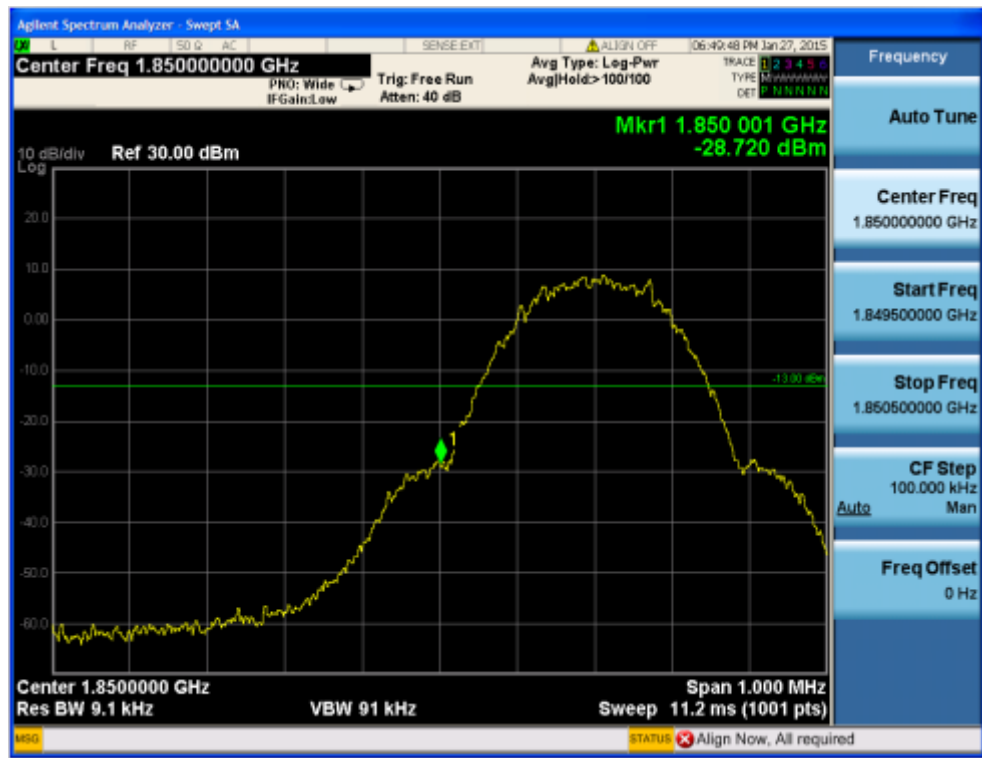


Fig.36 GSM1900-CH810 Band Edge Compliance

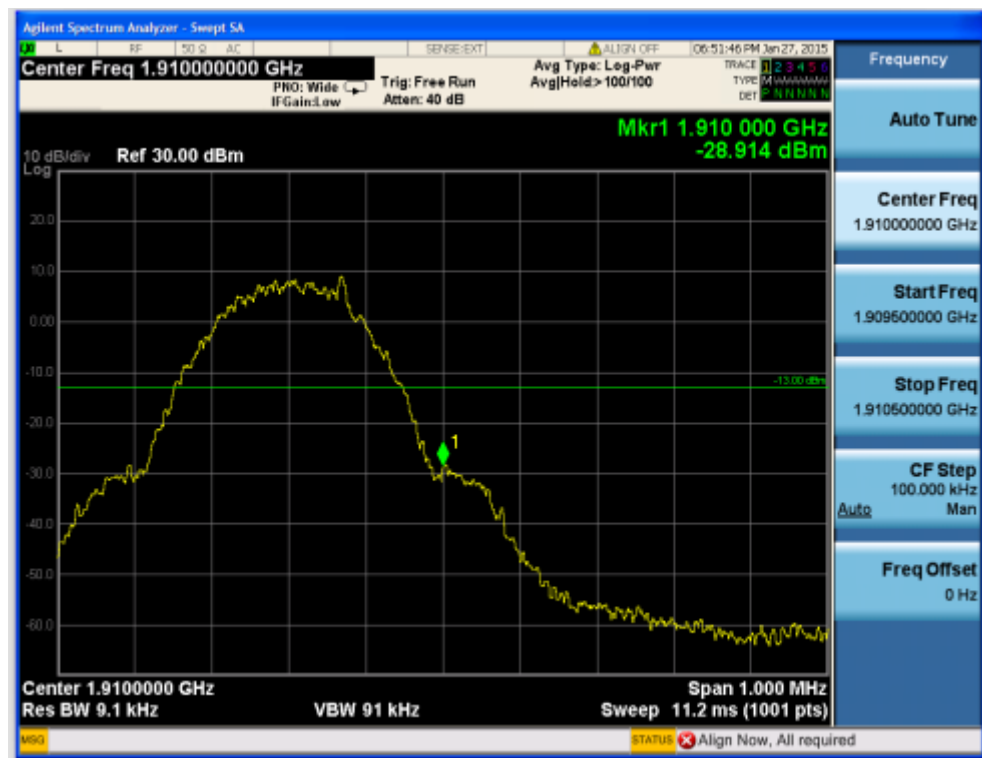


Fig.37 WCDMA Band V-CH4132Band Edge Compliance



Fig.38 WCDMA Band V-CH4232Band Edge Compliance

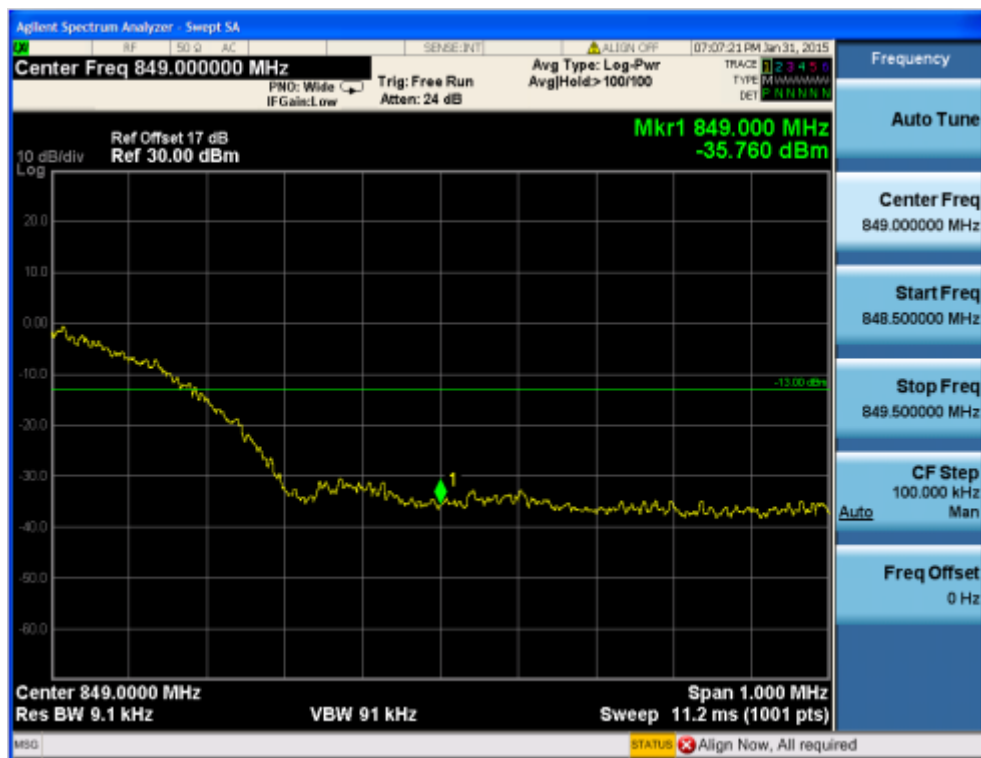


Fig.39 WCDMA Band V-CH4132Band Edge Compliance(HSDPA Subtest1)



Fig.40 WCDMA Band V-CH4232Band Edge Compliance(HSDPA Subtest1)

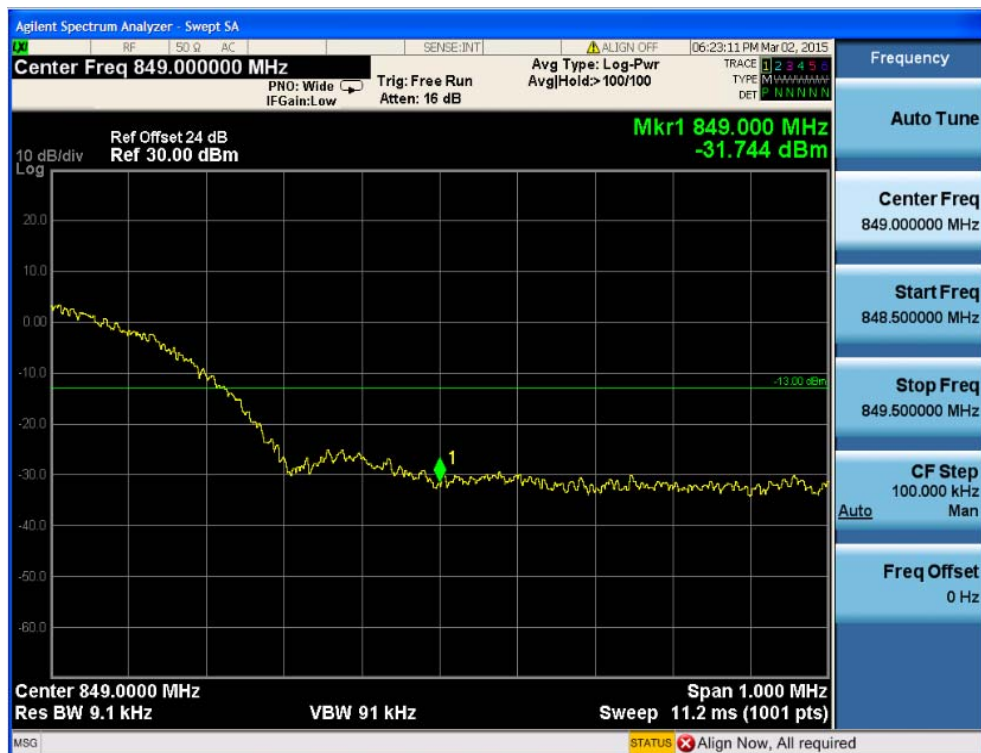


Fig.41 WCDMA Band V-CH4232Band Edge Compliance(HSUPA Subtest5)



Fig.42 WCDMA Band V-CH4232Band Edge Compliance(HSUPA Subtest5)



Fig.43 WCDMA Band II-CH9263Band Edge Compliance

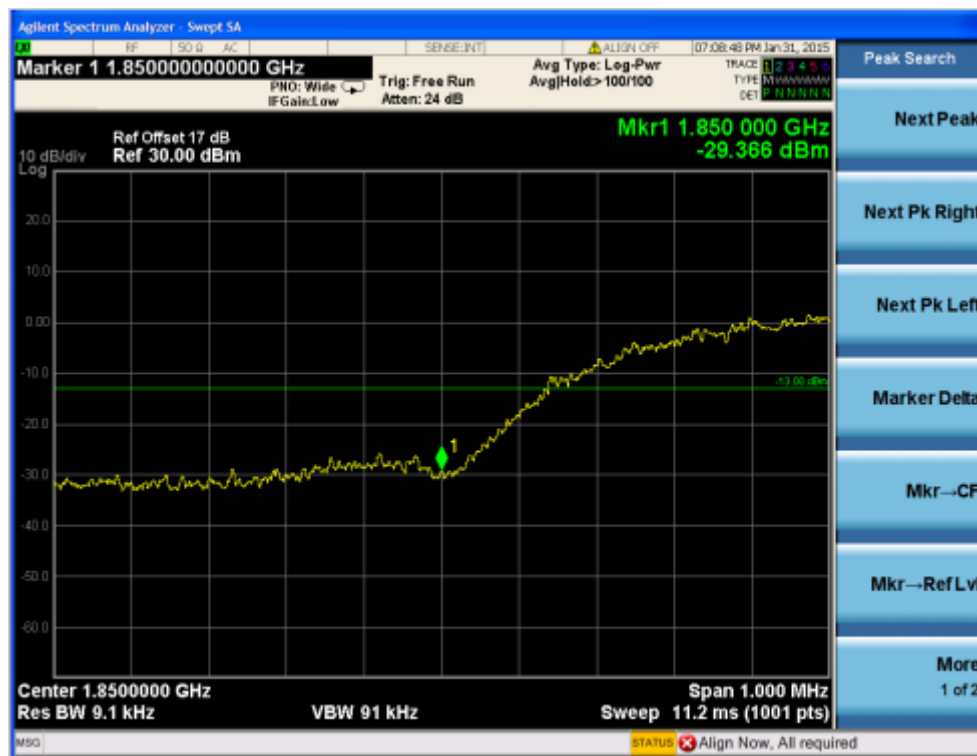


Fig.44 WCDMA Band II-CH9538 Band Edge Compliance



Fig.45 WCDMA Band II-CH9263 Band Edge Compliance(HSDPA Subtest1)



Fig.46 WCDMA Band II-CH9538 Band Edge Compliance(HSDPA Subtest1)



Fig.47 WCDMA Band II-CH9263 Band Edge Compliance(HSUPA Subtest5)



Fig.48 WCDMA Band II-CH9538 Band Edge Compliance(HSUPA Subtest5)



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

B.6.1 Description

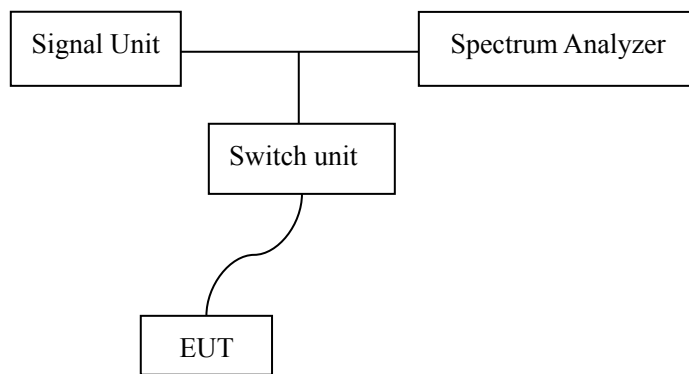
The power of any emission outside of the authorized operating frequency ranges must be lower than transmitter power by a factor of at least $43+10\log(P)$ dB. For all power levels +30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm. It is measured by means of spectrum analyzer and scanned from 30MHz up to a frequency including its 10th 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	189	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 189 30MHz~3GHz

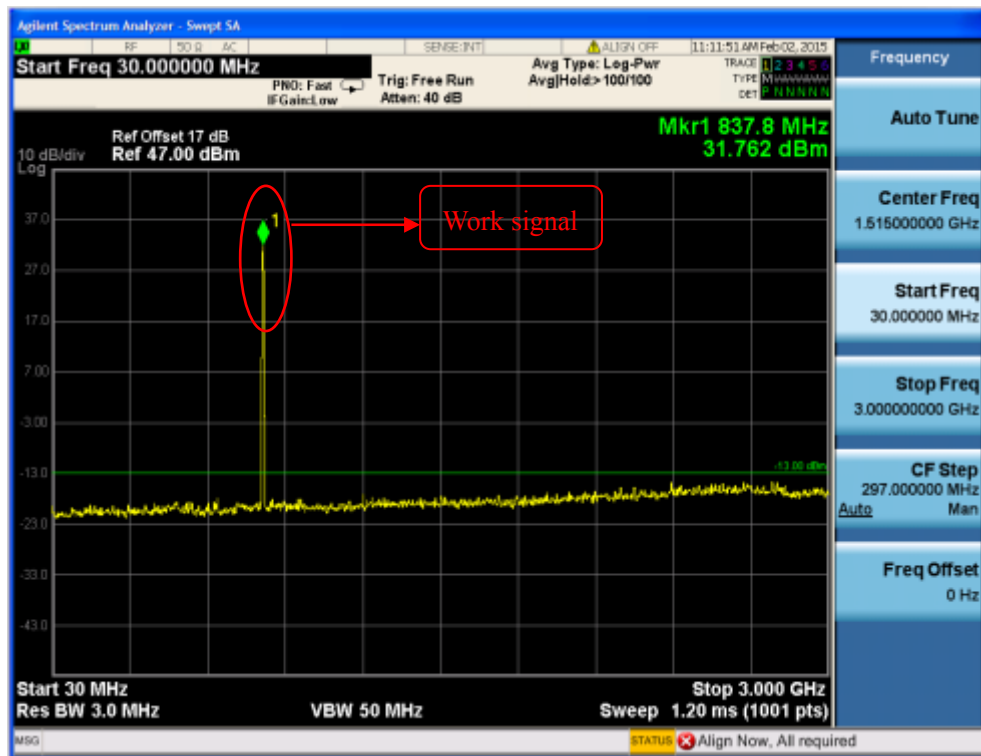


Fig.50 GSM850 on Channel 189 3GHz~9GHz



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

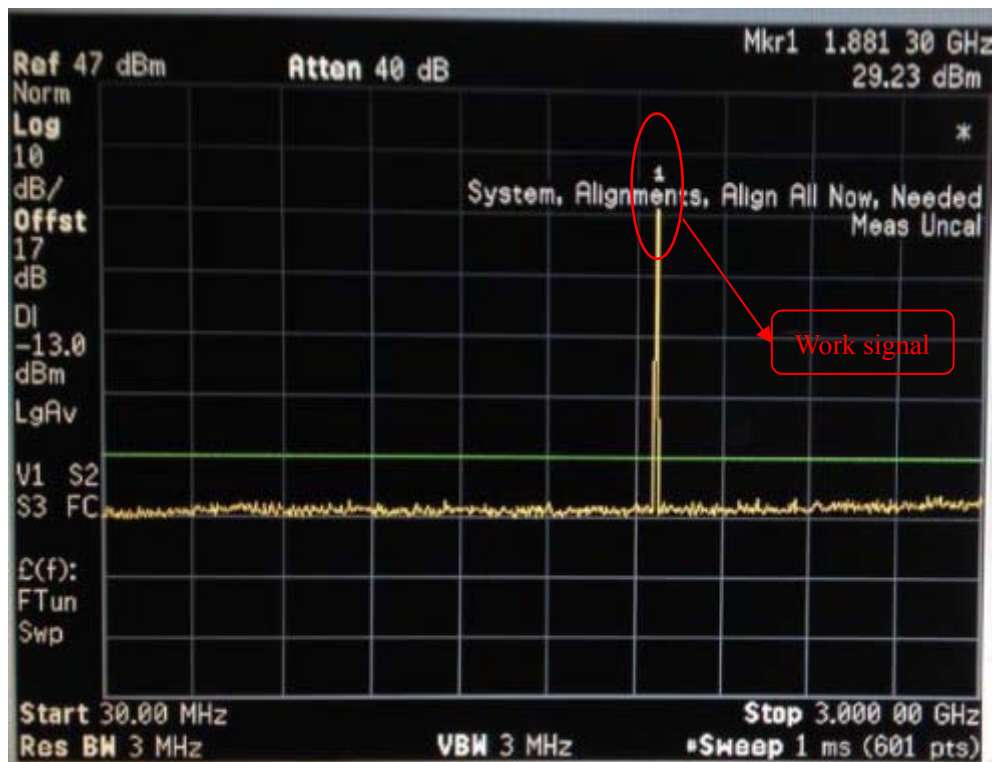


Fig.52 GSM1900 on Channel 661 3GHz~19.1GHz

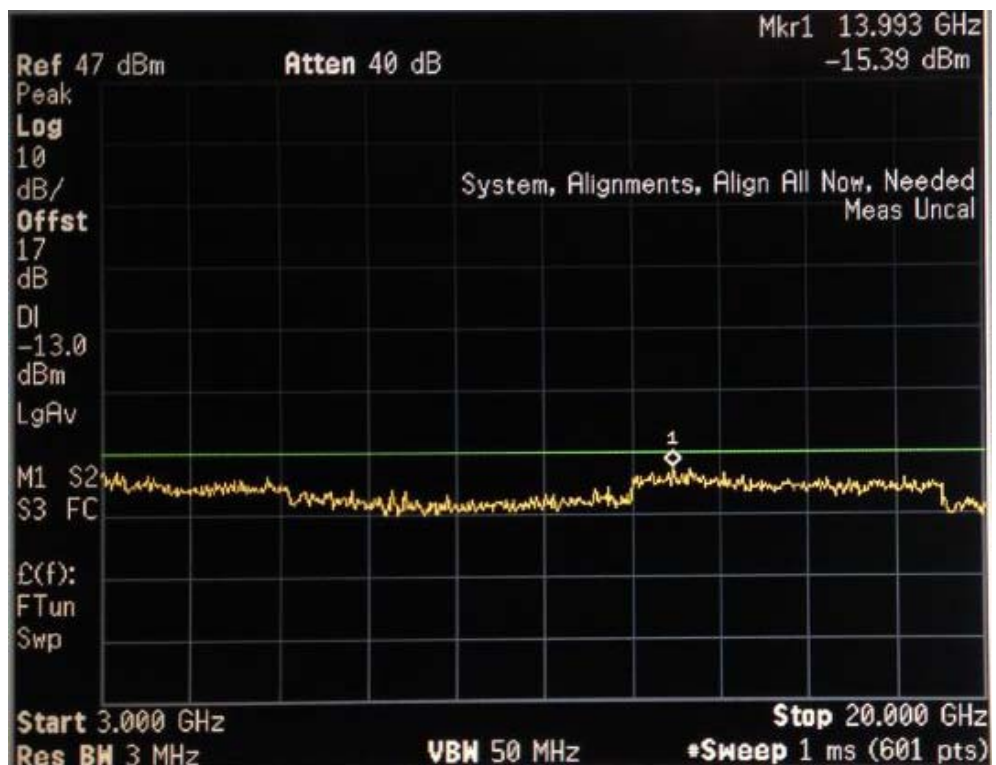


Fig.53 WCDMA Band V on Channel 4175 30MHz~3GHz

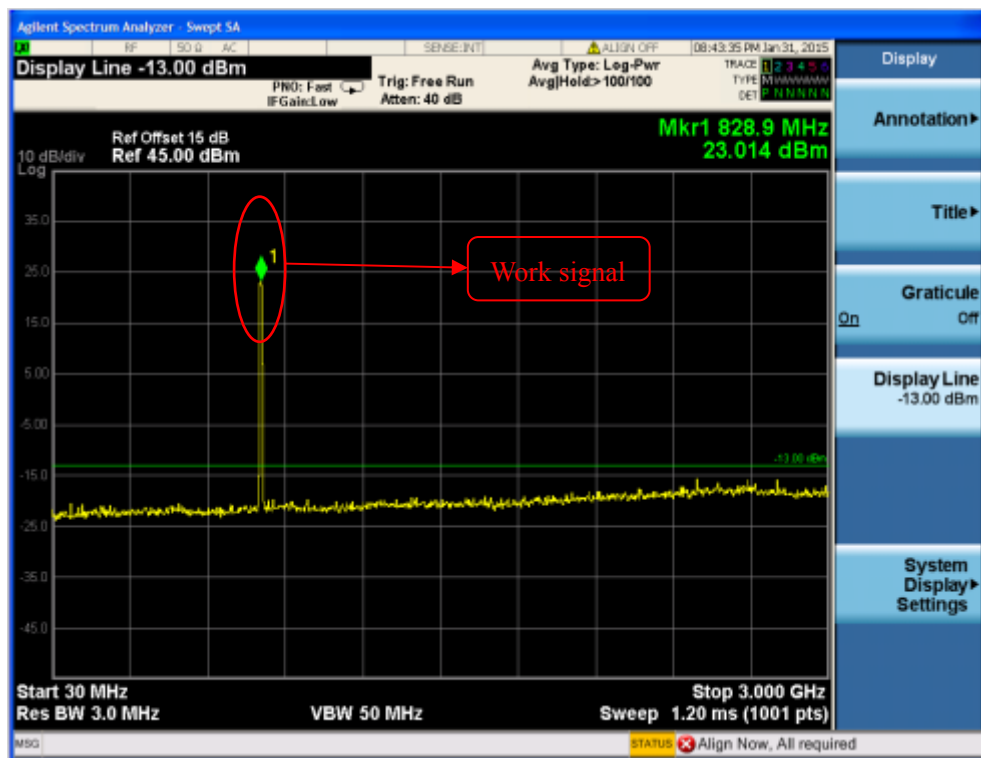


Fig.54 WCDMA Band V on Channel 4175 3GHz~9GHz

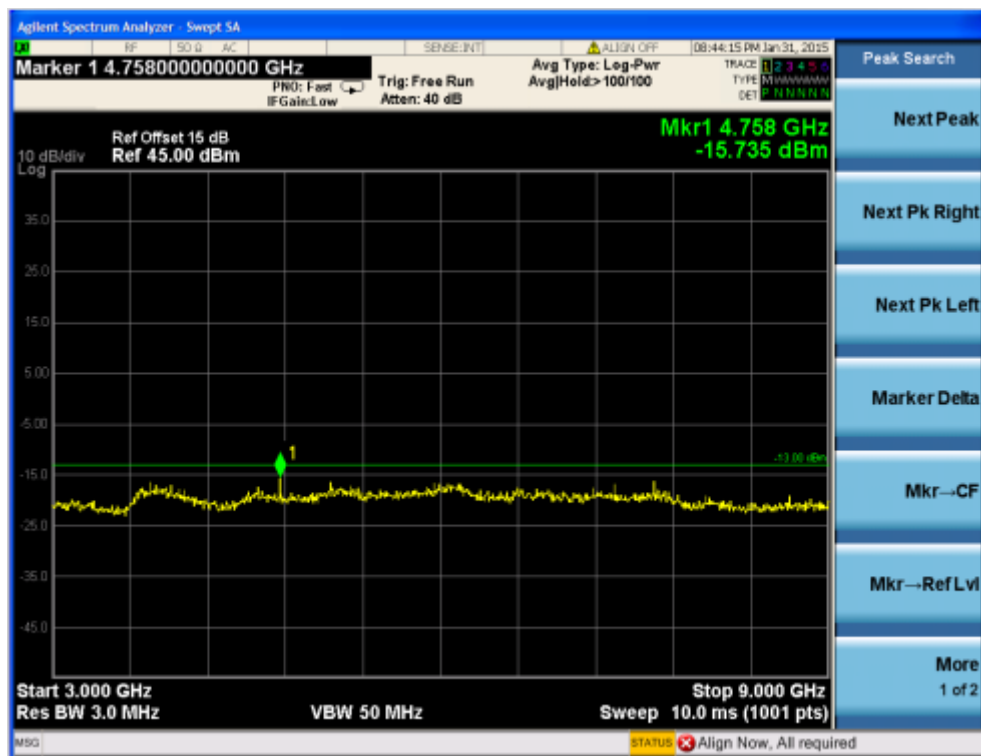


Fig.55 WCDMA Band II Channel 9400 30MHz~3GHz

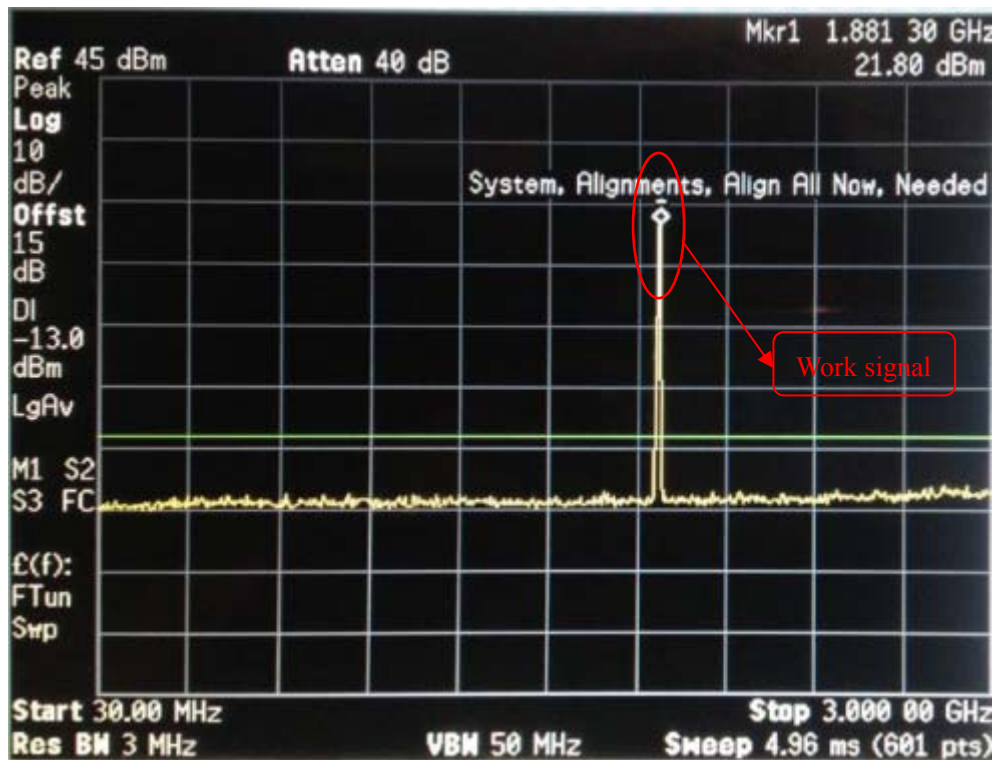
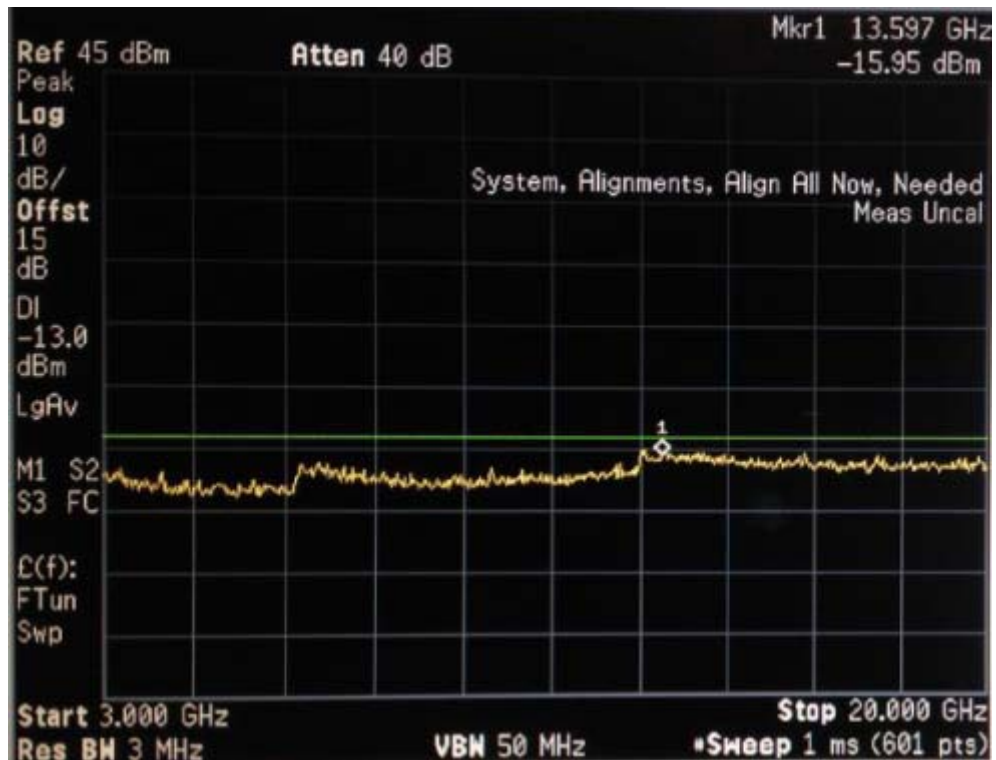


Fig.56 WCDMA Band II on Channel 9400 3GHz~19.1GHz

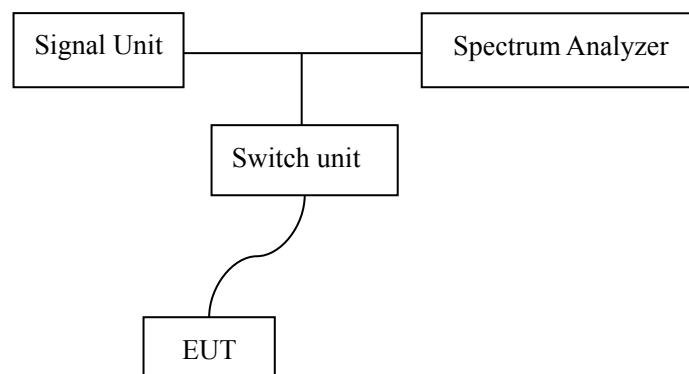


B.7 Peak-to-average ratio 24.232(d)**B.7.1 Description**

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.7.2 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.7.3 Test Setup**B.7.4 Test Results****Limit**

Peak-to-average ratio

$\leq 13\text{dBm}$

Band		CH	Frequency(MHz)	Result(dBm)	Verdict
GSM850	GSM	128	824.2	0.11	Pass
		189	836.6	0.09	Pass
		251	848.8	0.08	Pass
	GPRS	128	824.2	0.12	Pass
		189	836.6	0.11	Pass
		251	848.8	0.13	Pass
GSM1900	GSM	512	1850.2	0.12	Pass
		661	1880.0	0.09	Pass
		810	1909.8	0.08	Pass
	GPRS	512	1850.2	0.07	Pass
		661	1880.0	0.10	Pass
		810	1909.8	0.11	Pass
WCDMA Band V		4132	824.2	0.10	Pass
		4175	835	0.10	Pass
		4233	848.8	0.11	Pass

WCDMA Band V HSDPA Subtest 1	4132	824.2	0.12	Pass
	4175	835	0.09	Pass
	4233	848.8	0.11	Pass
WCDMA Band V HSUPA Subtest 5	4132	824.2	0.12	Pass
	4175	835	0.10	Pass
	4233	848.8	0.09	Pass
WCDMA Band II	9263	1850.2	0.10	Pass
	9400	1880.0	0.12	Pass
	9538	1909.8	0.11	Pass
WCDMA Band II HSDPA Subtest 1	9263	1850.2	0.10	Pass
	9400	1880.0	0.09	Pass
	9538	1909.8	0.10	Pass
WCDMA Band II HSUPA Subtest 5	9263	1850.2	0.11	Pass
	9400	1880.0	0.10	Pass
	9538	1909.8	0.12	Pass

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