FCC RADIO TEST REPORT

No. 150504-RF

for

Logic Mark LLC

3G mobile phone only call 911

Model: 30711

Trade Name: Guardian Alert 911 PLUS

Issued Date: 2015-07-28

Test Laboratory:

GCCT, *Guangdong Telecommunications Terminal Products Quality Supervision and Testing Center*

Technology Road, High-tech Zone, He Yuan, Guang Dong, PR China 517001

Tel:+86(0)762-3607221, Fax:+86(0)762-3603336 Email: ncctmail@126.com. www.ncct.org.cn

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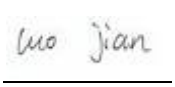
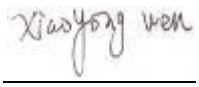
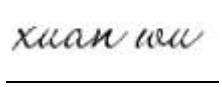
GENERAL SUMMARY

Product Name	3G mobile phone only call 911
Model Name	30711
Applicant	LogicMark LLC
Manufacturer	APEX Global Electronics CO. 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" ANSI-TIA-603-C-2004 "Land Mobile FM or PM Communications Equipment Measurement and Performance Standards"
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:2015.07.28
Comment	The test results in this report apply only to the tested sample of the stated device/equipment.

Approved by:	*Reviewed by:*	*Tested by:*
		
LuoJian	Wen Xiaoyong	Wu Xuan
Manager	Deputy Manager	Test Engineer

1.Test Laboratory

1.1 Testing Location

Company Name:	GCCT, Guangdong Telecommunications Terminal Products Quality Supervision and Testing Center
FCC Registration No.	303878
CNAS Registration No.	L4992
Address:	Technology Road, High-tech Zone, Heyuan, Guangdong Province, PR.China
Postal Code:	517001
Telephone:	+86-762-3607221
Fax:	+86-762-3603336

1.2Testing Environment

Environment Data	Temperature(℃)	Humidity(%)
Maximum Ambient	26.8	45
Minimum Ambient	20.1	28

EUT is under testing environment.

1.3.Project Data

Project Leader:	Wen Xiaoyong
Testing Start Date:	2015-05-25
Testing End Date:	2015-07-20

2.Client Information

2.1Applicant Information

Company Name:	Logic Mark LLC
Address:	10106 Bluegrass Pkwy, Louisville KY, 40299
City:	KY
Postal Code:	40299
Country:	United States
Telephone:	703-934-7934
Fax:	703-934-7934

2.2Manufacturer Information

Company Name:	APEX Global Electronics CO. Limited
Address:	Unit M,17/F,Block 2,Kin Ho Industrial Building,14-24 Au Pui Wan Street,Fo Tan,N.T.Hong Kong
City:	Hong Kong
Postal Code:	/
Country:	China
Telephone:	(852) 23344535
Fax:	(852) 23344535

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

3.1About EUT

Model Name	30711
FCC ID	TYD-GA30711
Tx Frequency	WCDMA Band V : 826~846 MHz WCDMA Band II : 1852~1907 MHz
Rx Frequency	WCDMA Band V : 871~891 MHz WCDMA Band II : 1932~1987 MHz
Number of Channels	WCDMA Band V:25 WCDMA Band II: 60
Modulation	WCDMA:BPSK/QPSK
Emission Designator	WCDMA Band V:4M16F9W WCDMA Band II: 4M18F9W
Antenna Type	PIFA(GSM/DCS/WCDMA)
Normal Voltage	3.7V
Extreme Low Voltage	3.5V
Extreme High Voltage	4.2V
Extreme Low Temperature	-10℃
Extreme High Temperature	55℃

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

3.2Internal Identification of EUT

EUT ID*	IMEI	HW Version	SW Version
150540-M01	/	M8_V1.0	M8_V1.0
150540-M02	/	M8_V1.0	M8_V1.0

*EUT ID: is used to identify the test sample in the lab internally.150540-M01and 1502540-M02 are the same mobile phones.

3.3Internal Identification of AE

AE ID*	Description	Type	SN

150540-B01	Battery	/	/
150540-C02	Charger	/	/
150540-B02	Battery	/	/

*AE ID: is used to identify the test sample in the lab internally. 150540-B01 and 150540-B02 are the same accessories, 150540-C01 and 150540-C02 are the same accessories.

4.Test Results

4.1Summary 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.

4.2Statements

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

5.1List 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. Radiated Power 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	/

5.2Climate Chamber

No.	Name	Type	SN	Manufacturer	Cal Date	Cal Due Date
1	Climate Chamber	MW3030	09114081	ESPEC	2014.08.13	2015.08.13

ANNEX A: EUT Photograph

Adapter Front View

Adapter Back View

EUT Top View

EUT Rear View

ANNEX B: Detailed Test Results

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

B.1.1 Conducted Output Power Measurement

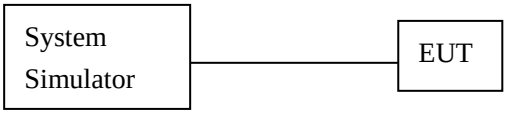
B.1.1.1 Description

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

WCDMA Band V and Band II

Band II

Band/Time slot configuration	Frequency(MHz)	Channel	Power Class	Peak output power(dBm)	Verdict
RMC （12.2kbps）	1852.6	9263	3	22.94	Pass
	1880.0	9400		22.86	
	1907.6	9538		22.81	

Band V

Band/Time slot configuration	Frequency(MHz)	Channel	Power Class	Peak output power(dBm)	Verdict
RMC （12.2kbps）	826.6	4133	3	23.01	Pass
	835.0	4175		23.02	
	846.4	4232		23.09	

B.1.2 Radiated Power

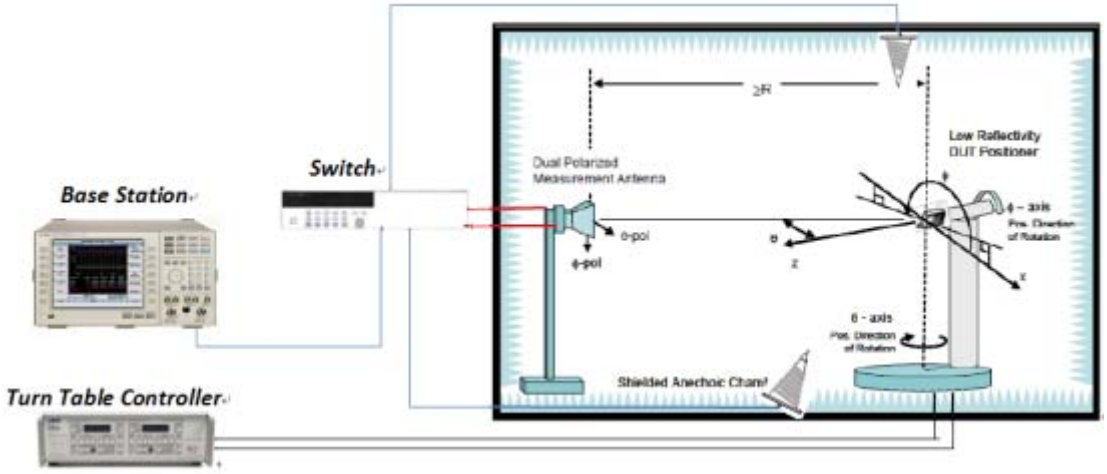
B.1.2.1 Description

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 (Pin) is applied to the input of the dipole, and the power received (Pr) at the chamber's probe antenna is recorded.
2. A "reference path loss" is established as Pin + 2.15 - Pr.
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 (Pin).
8. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15dBi.

B.1.2.3 Test Setup



B.1.2.4 Test Result of ERP

WCDMA Band V

Frequency(MHz)	Channel No.	Power Step	ERP(dBm)	Verdict
826.6	4133	3	21.32	Pass
835	4175	3	21.11	Pass
846.4	4232	3	21.34	Pass

WCDMA Band II

Frequency(MHz)	Channel	Power Class	EIRP(dBm)	Verdict
1852.6	9263	3	23.23	Pass
1880.0	9400	3	23.12	Pass

1907.6	9538	3	23.05	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 ±0.00023% (±2.5ppm) of the center frequency.

B.2.2 Test Procedure for Temperature Variation

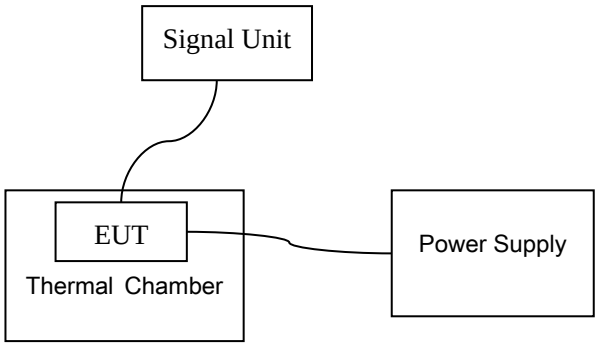
1. The EUT was set up in the thermal chamber and connected with the base station.

2. With power OFF, the temperature was decreased to -20℃ 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℃ step to 50℃. 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℃, the testing lowest temperature will be raised in 10℃ step until the EUT can be turned on.

B.2.2.1 Test Setup



B.2.2.2 Test Results

WCDMA Band II

Temperature (℃)	Frequency Error（Hz）	ppm	Limit	Verdict
-20	/	/	≤±2.5ppm	/
-10	3.15	0.0018		Pass
0	5.13	0.0029		Pass
10	-0.46	-0.0003		Pass
20	-1.18	-0.0007		Pass
30	6.14	0.0034		Pass
40	0.33	0.0002		Pass
50	1.69	0.0009		Pass
55	2.37	0.0013		Pass

WCDMA Band V

Temperature (℃)	Frequency Error（Hz）	ppm	Limit	Verdict

-20	/	/		/
-10	2.33	0.0027		Pass
0	-3.86	-0.0045		Pass
10	1.34	0.0016		Pass
20	-0.85	-0.0010	≤±2.5ppm	Pass
30	1.24	0.0015		Pass
40	1.99	0.0023		Pass
50	-3.57	-0.0042		Pass
55	5.66	0.0067		Pass

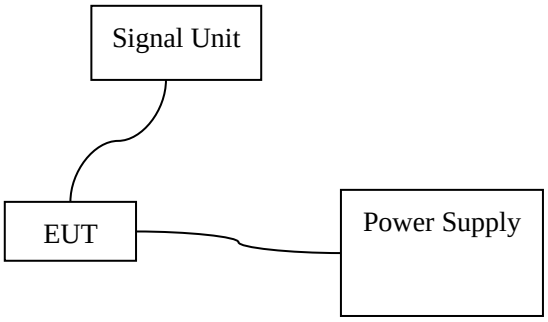
B.2.3 Test Procedure for Voltage Variation

1. The EUT was placed in a temperature chamber at 25±5℃ 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:

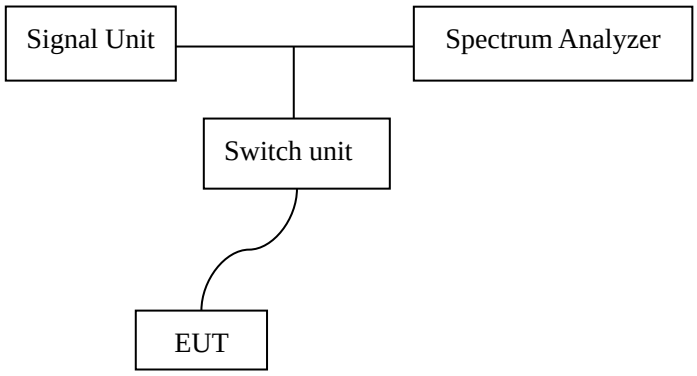
Band	Voltage (V)	Freq.Dev.(Hz)	Dev.(ppm)	Limit(ppm)	Verdict
WCDMA Band II	3.5	3.18	0.0017	≤±2.5ppm	Pass
	3.7	2.54	0.0013		Pass
	4.2	-3.34	-0.0018		Pass
WCDMA Band V	3.5	-4.25	-0.050		Pass
	3.7	4.14	0.0049		Pass
	4.2	5.16	0.0061		Pass

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
WCDMA Band V	4133	826.6	Fig.1	Pass
	4175	835	Fig.2	Pass
	4233	846.4	Fig.3	Pass
WCDMA Band II	9263	1852.6	Fig.4	Pass
	9400	1880.0	Fig.5	Pass
	9538	1907.6	Fig.6	Pass

Fig.1 WCDMA Band V-CH4133 Occupied Bandwidth

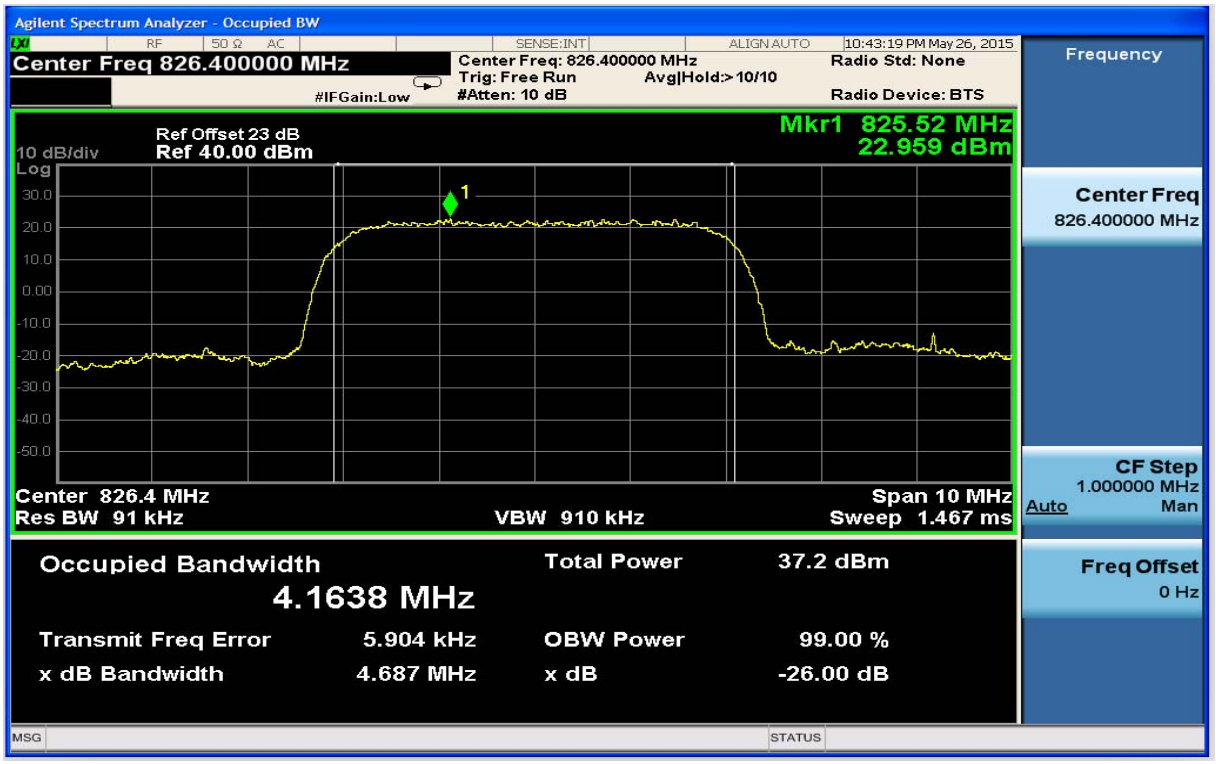


Fig.2 WCDMA Band V-CH4175 Occupied Bandwidth

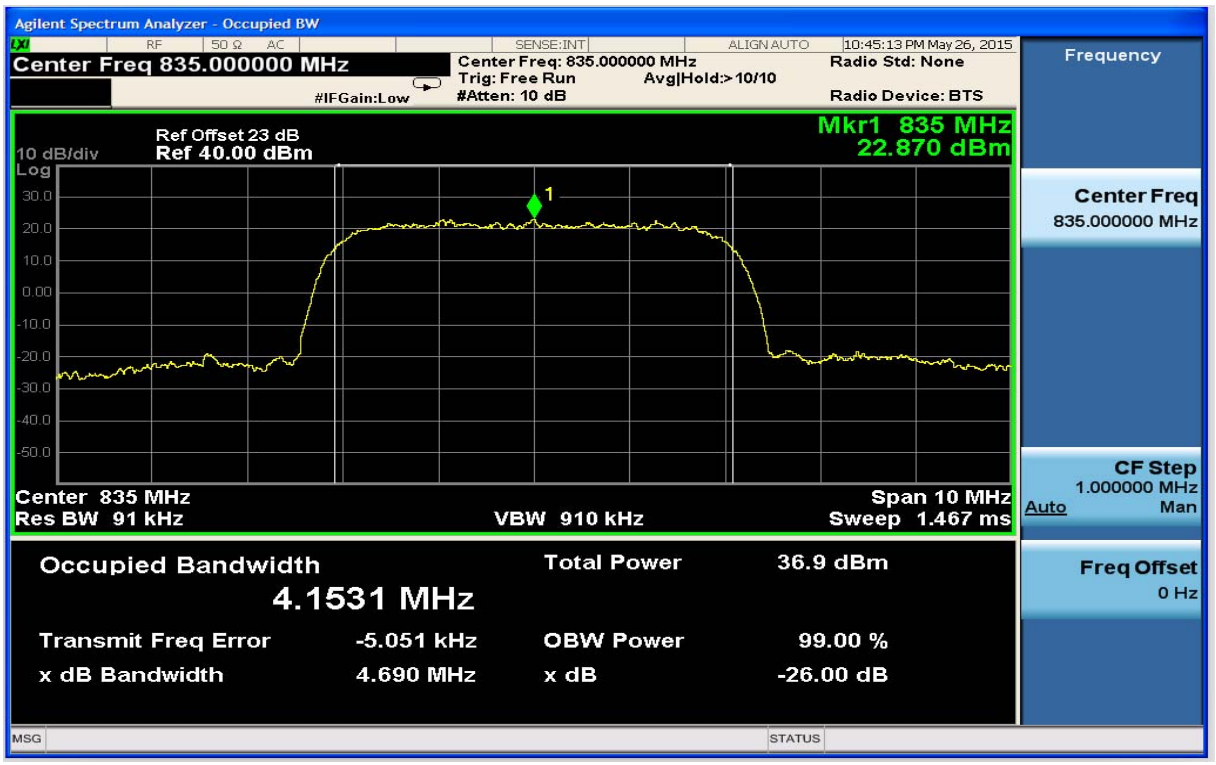


Fig.3 WCDMA Band V-CH4232 Occupied Bandwidth

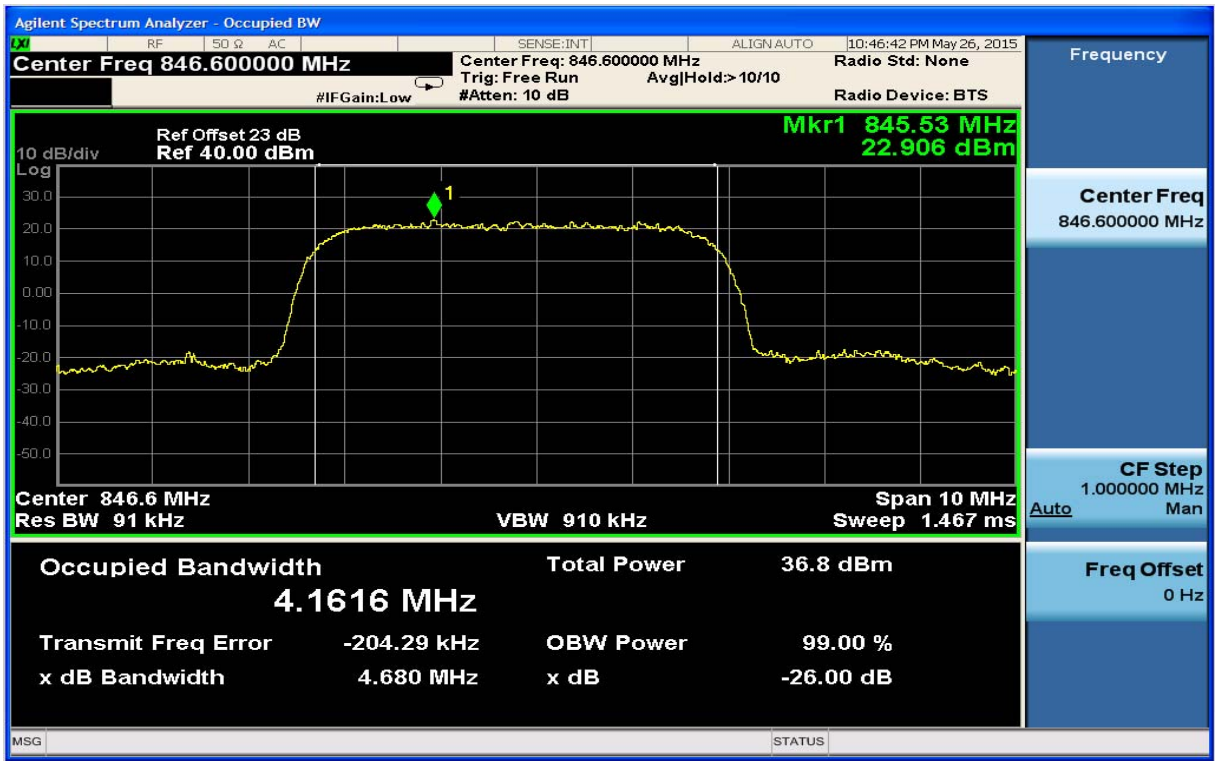


Fig.4 WCDMA Band II-CH9263 Occupied Bandwidth

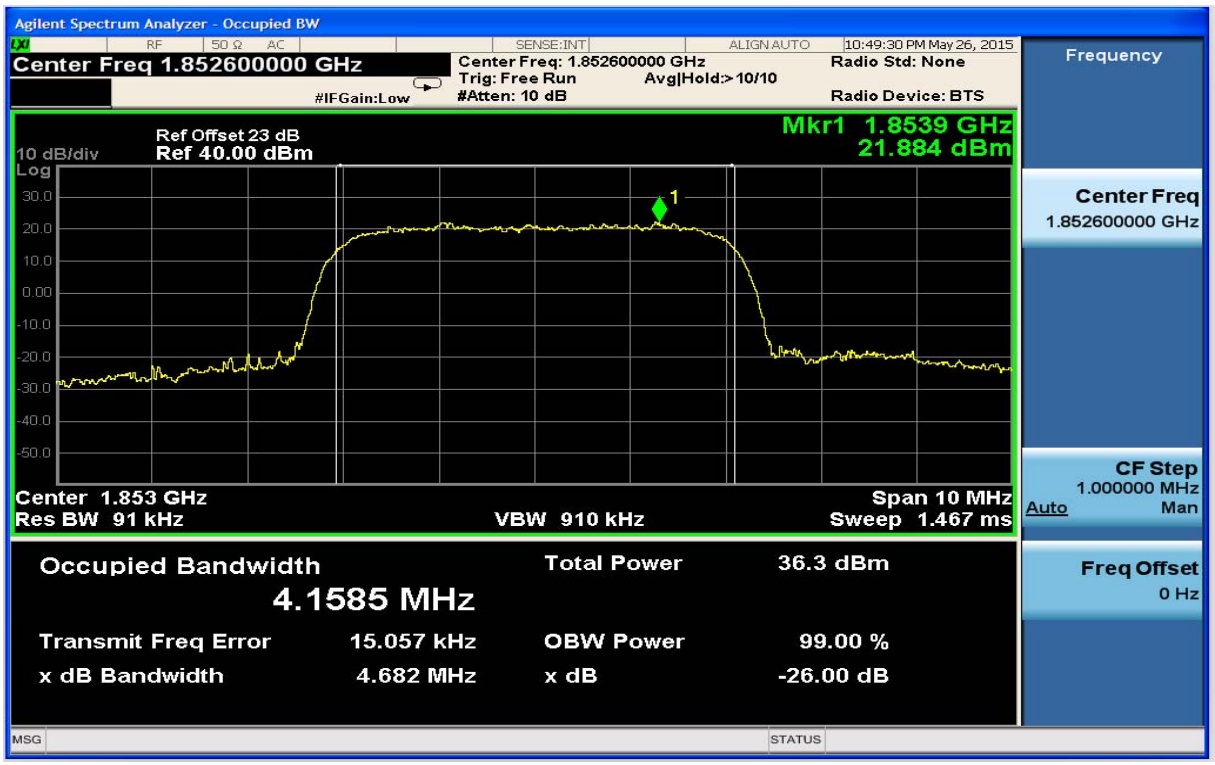


Fig.5 WCDMA Band II-CH9400 Occupied Bandwidth

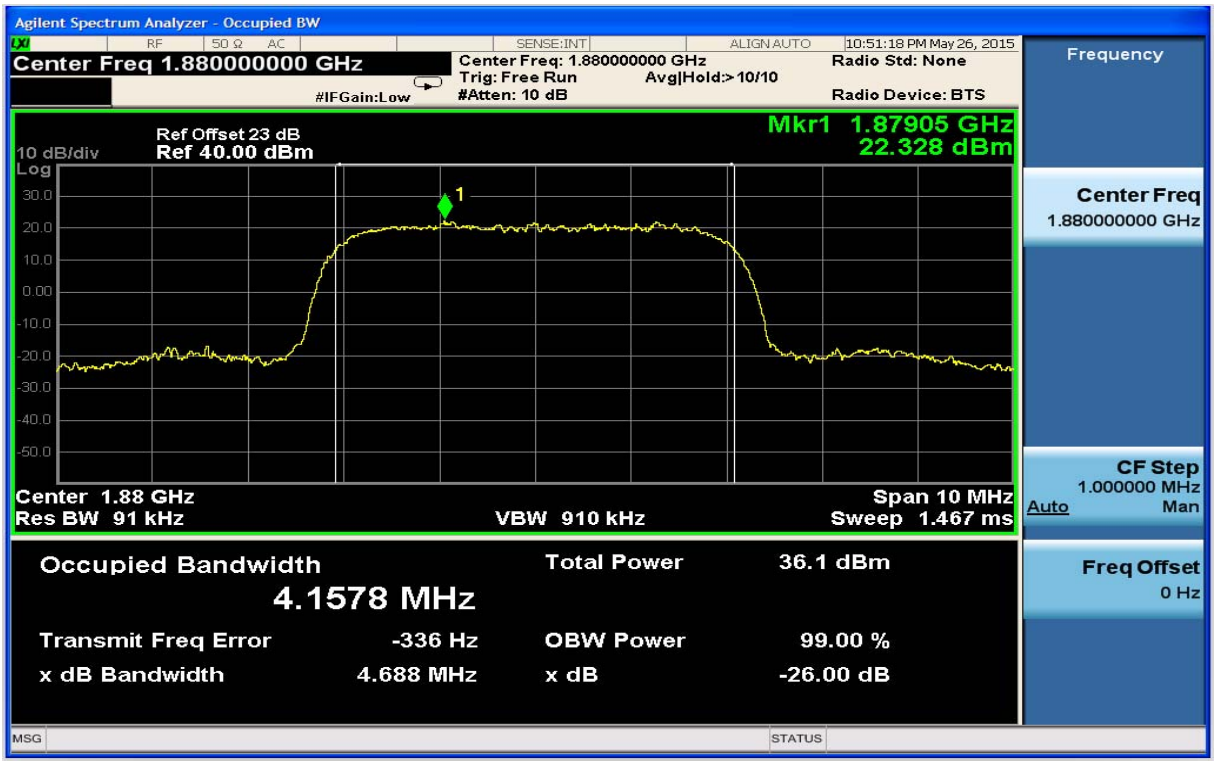
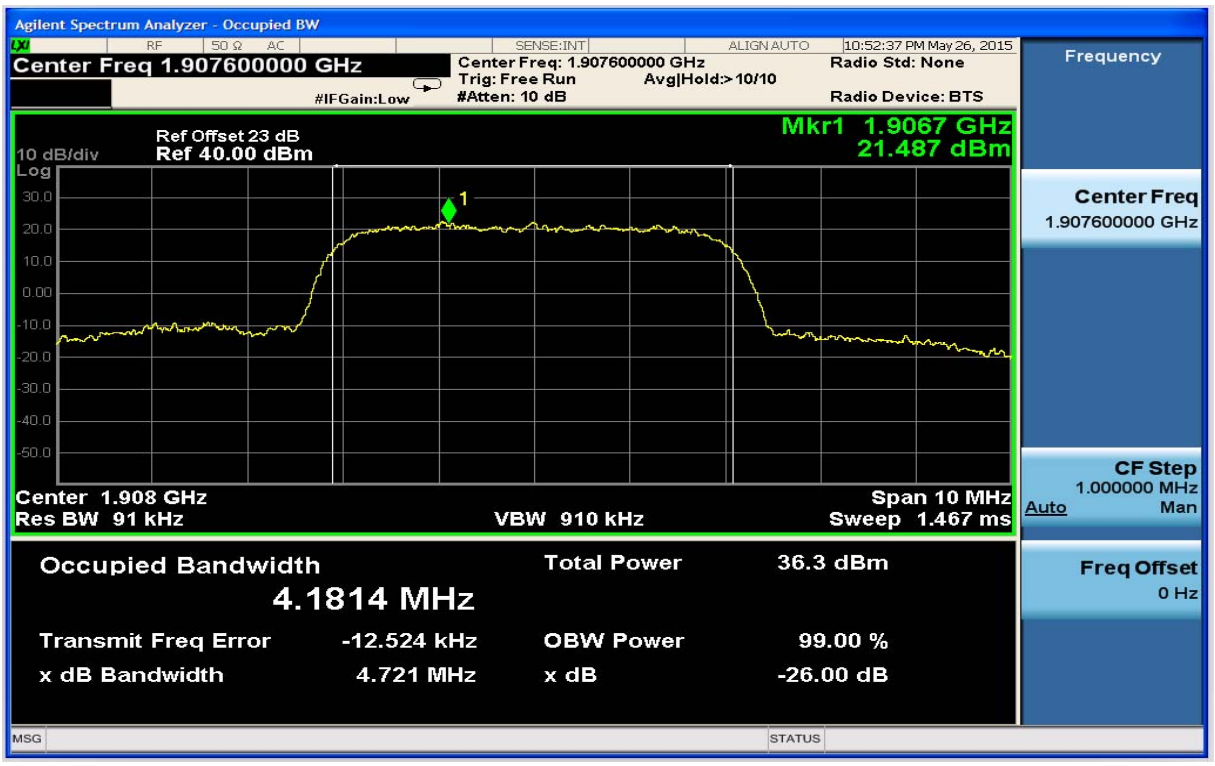


Fig.6 WCDMA Band II-CH9538 Occupied Bandwidth



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.This method does not require calibration of all measuring components. Instead, the spurious output power is recorded from measuring device. Then this power level is matched by a signal from a calibrated signal generator which is substituted for the EUT. The power supplied by the generator is then equal to the power of the spurious domain emission. 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+10log(P) dB. The spectrum is scanned from 30MHz up to a frequency including its 10th harmonic...

B.4.2Test Procedure

1.All possible modes of operation were investigated. Only the 6 worst case emissions measured using the correct CISPR detectors, are reported. All other emission were relatively insignificant.

2.A"-ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.

3.Radiated Emissions Measurement Uncertainty

All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95%(in the case where distributions are normal),with a coverage factor of 2,in the range 1GHz-40GH is ±6.0dB(for EUTs<0.5m X 0.5m X 0.5m)

4.The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.

5.The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

6.Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution.

7.Sample Calculation:

EUT Field Strength(dBm)=Reading(Signal generator)+Antenna Gain(substitution antenna)-Cable loss(From Signal Generator to substitution antenna)

8.The limit is derived from 43+10log(p)dB below transmitter power P(Watts)

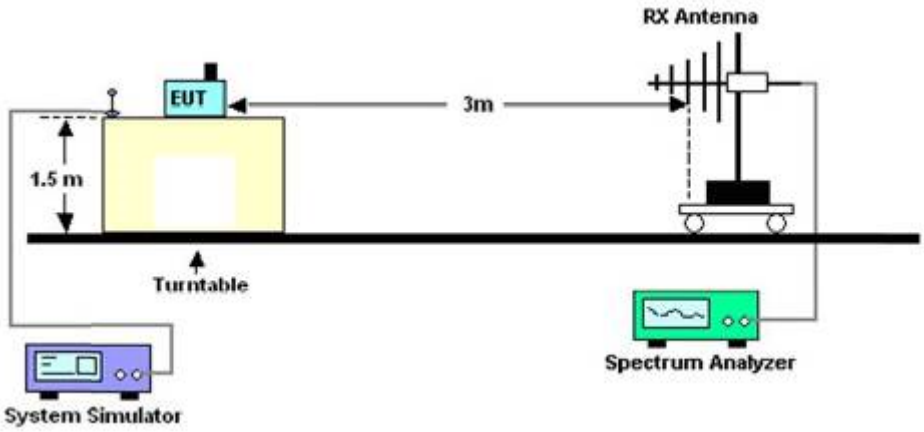
=p(w)-[43+10log(p)](dB)

=[30+10 log(p)] (dBm)- [43+10 log(p)] (dB)

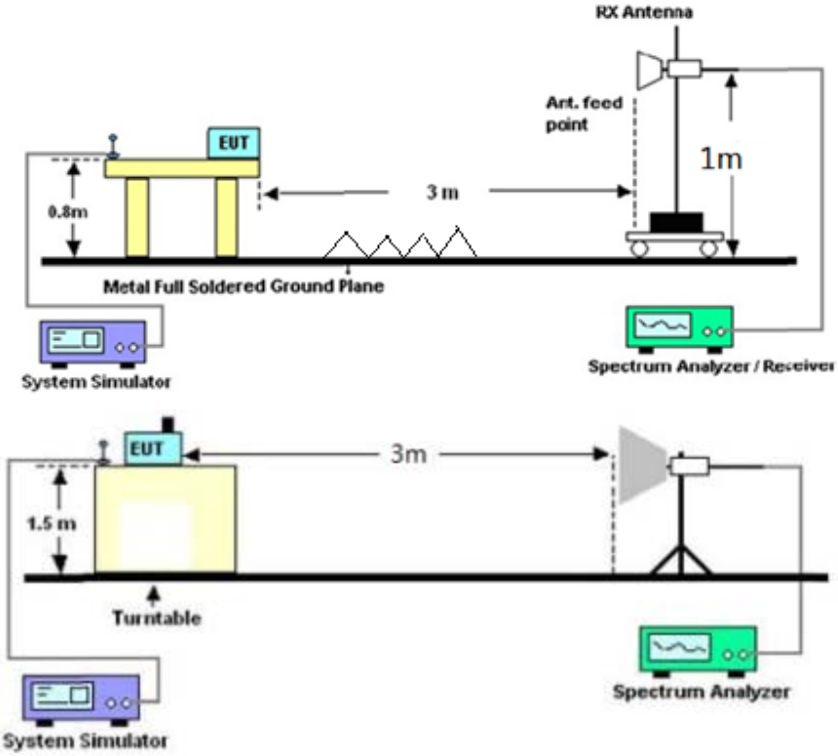
=-13dBm

B.4.3 Test Setup

<Below 1GHz>


RX Antenna
EUT
3m
1.5 m
Turntable
Spectrum Analyzer
System Simulator

<Above 1GHz>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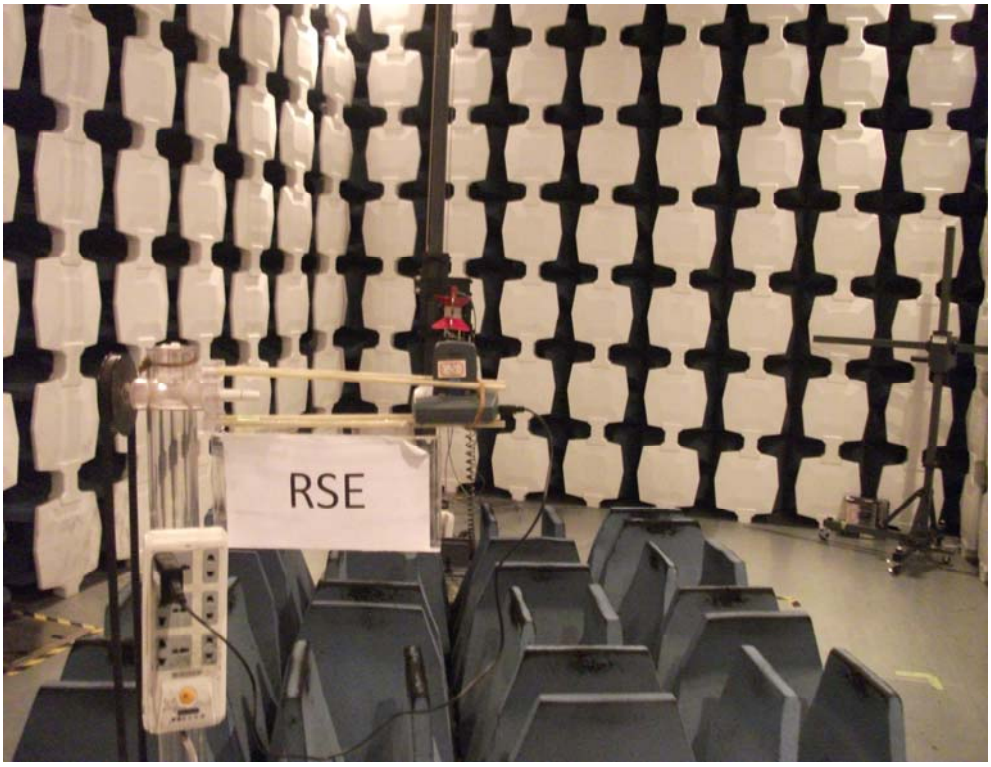
1m
EUT
3 m
0.8m
Metal Full Soldered Ground Plane
System Simulator
Spectrum Analyzer / Receiver
EUT
3m
1.5 m
Turntable
Spectrum Analyzer
System Simulator



B.4.4Test Results

WCDMA Band V								
CH	**Frequency (MHz)**	**Substituted Level(dBm)**	**Polarity (H/V)**	**Antenna Gain(dBi)**	**Cable Loss(dB)**	**Limit dBm**	**Result**	**Verdict**

L	1652.8	-56.87	V	7.56	0.71	-13	-48.6	Pass
	1652.8	-57.15	H	7.56	0.71		-48.88	Pass
	146.2	-43.12	V	2.61	0.14		-40.37	Pass
	203.6	-45.86	H	4.13	0.14		-41.59	Pass
M	1670	-57.12	V	7.56	0.71		-48.85	Pass
	1670	-57.42	H	7.56	0.71		-49.15	Pass
	145.7	-43.19	V	2.61	0.14		-40.44	Pass
	202.8	-46.28	H	4.13	0.14		-42.01	Pass
H	1693.2	-56.79	V	7.56	0.71		-48.52	Pass
	1693.2	-57.16	H	7.56	0.71		-48.89	Pass
	143.7	-43.21	V	2.61	0.14		-40.46	Pass
	202.8	-46.23	H	4.13	0.14		-41.96	Pass

WCDMA Band II								
CH	**Frequency (MHz)**	**Substituted Level(dBm)**	**Polarity (H/V)**	**Antenna Gain(dBi)**	**Cable Loss(dB)**	**Limit dBm**	**Result**	**Verdict**
L	3704.8	-50.88	V	10.11	2.35	-13	-42.61	Pass
	3704.8	-52.21	H	10.11	2.35		-43.94	Pass
	144.3	-45.13	V	2.61	0.14		-42.38	Pass
	203.7	-44.19	H	4.13	0.14		-39.92	Pass
M	3760	-51.15	V	10.11	2.35		-42.88	Pass
	3760	-52.11	H	10.11	2.35		-43.84	Pass
	144.6	-45.17	V	2.61	0.14		-42.42	Pass
	202.3	-44.49	H	4.13	0.14		-40.22	Pass
H	3815.2	-50.91	V	10.11	2.35		-42.64	Pass
	3815.2	-52.21	H	10.11	2.35		-43.94	Pass
	146.2	-45.13	V	2.61	0.14		-42.38	Pass
	203.7	-44.51	H	4.13	0.14		-40.24	Pass

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

B.5.1 Description

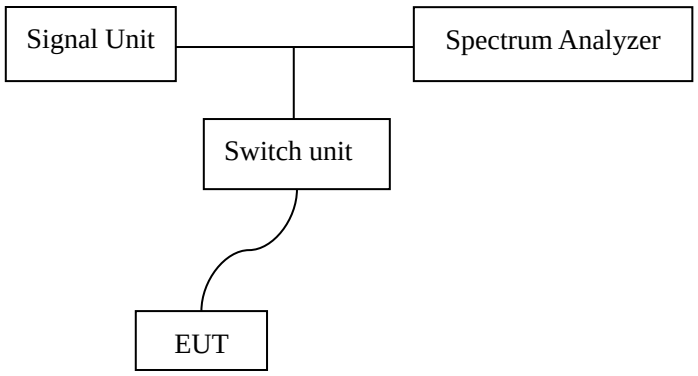
The power of any emission outside of the authorized operating frequency ranges must be lower than transmitter power by a factor of at least 43+10log(P) dB.

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
WCDMA Band V	4133	824.2	Fig.7	Pass
	4232	848.8	Fig.8	Pass
WCDMA Band II	9263	1850.2	Fig.9	Pass
	9538	1909.8	Fig.10	Pass

Fig.7 WCDMA Band V-CH4133 Band Edge Compliance

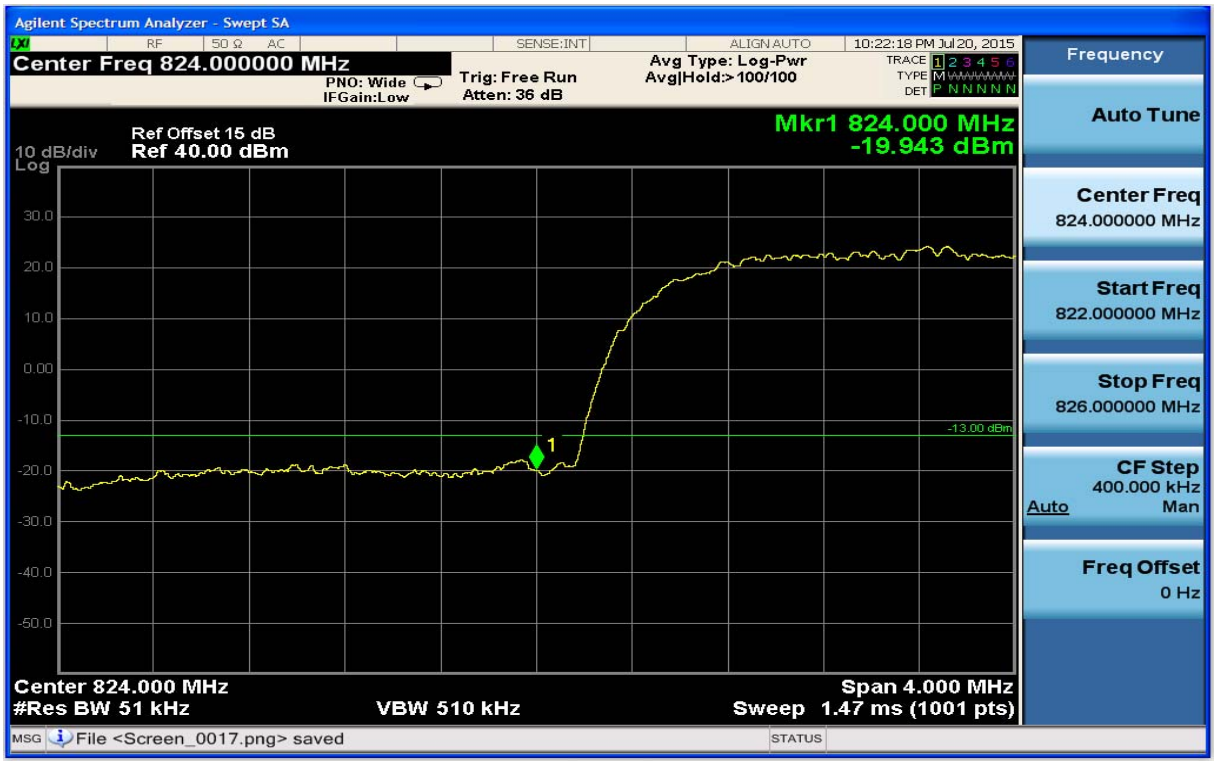


Fig.8 WCDMA Band V-CH4232Band Edge Compliance

Fig.9 WCDMA Band II-CH9263Band Edge Compliance

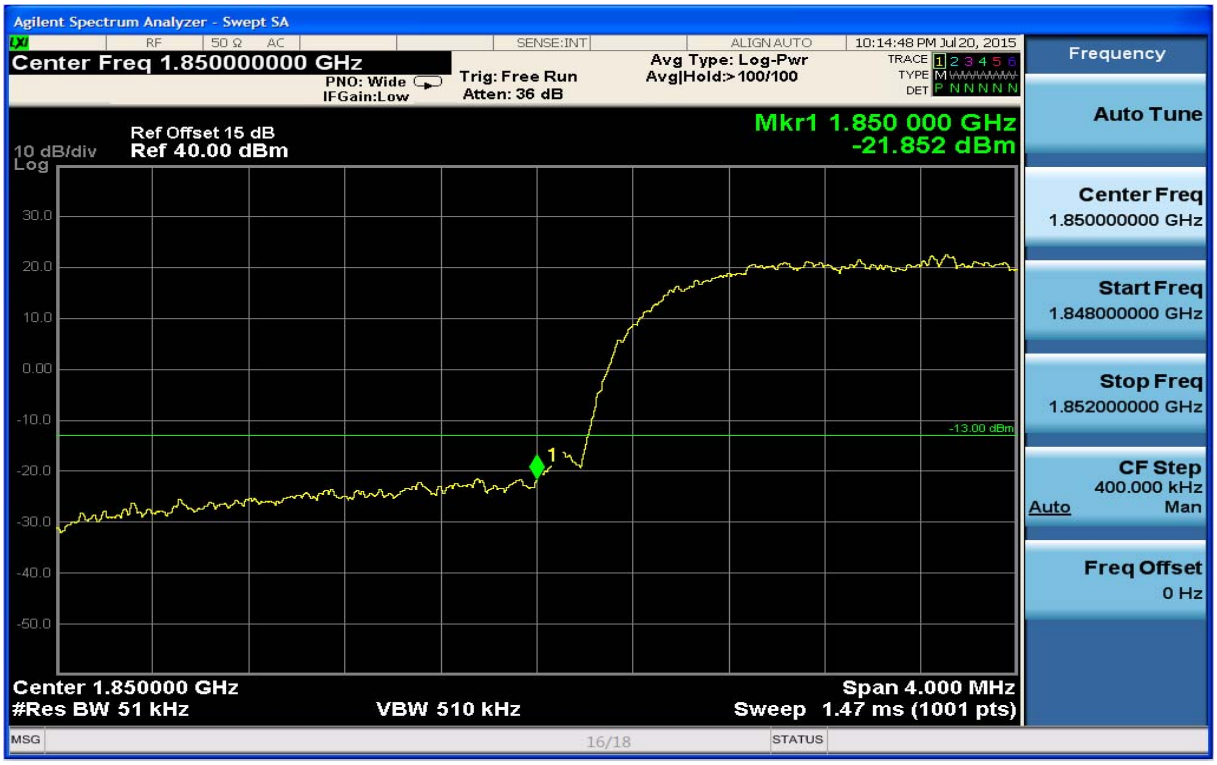


Fig.10 WCDMA Band II-CH9538Band Edge Compliance

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

B.6.1 Description

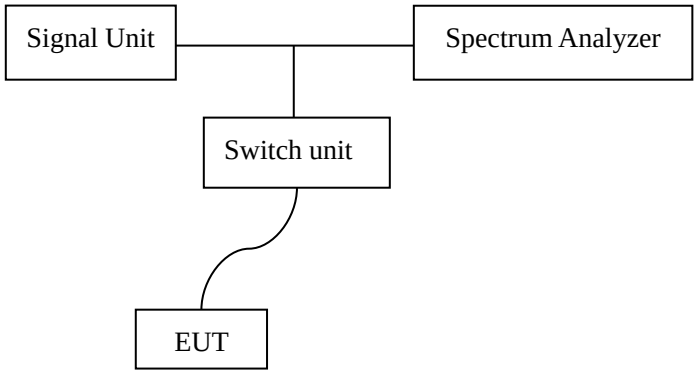
The power of any emission outside of the authorized operating frequency ranges must be lower than transmitter power by a factor of at least 43+10log(P) dB. For all power levels +30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm. It is measured by means of spectrum analyzer and scanned from 30MHz up to a frequency including its 10^{th} 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
WCDMA Band V	4175	835	Fig.11	Pass
			Fig.12	Pass
WCDMA Band II	9400	1880.0	Fig.13	Pass
			Fig.14	Pass

Fig.11 WCDMA Band V on Channel 4175 30MHz~3GHz

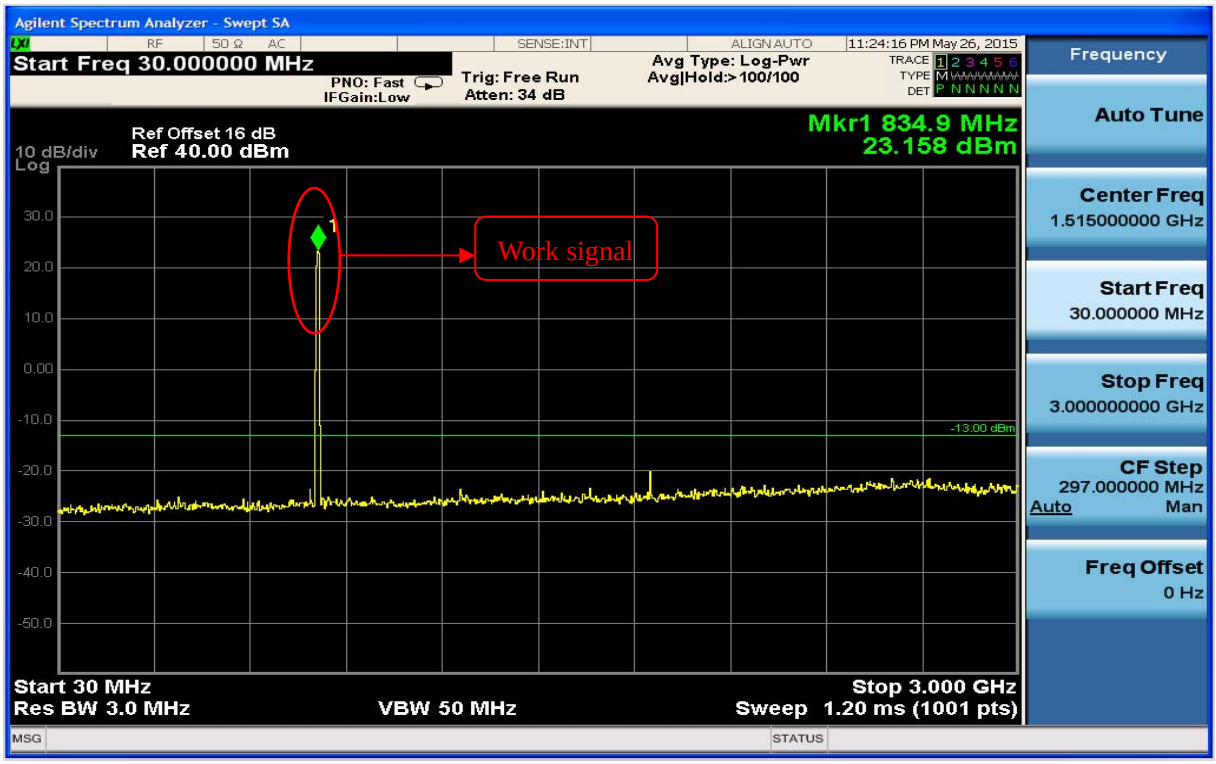


Fig.12 WCDMA Band V on Channel 4175 3GHz~9GHz

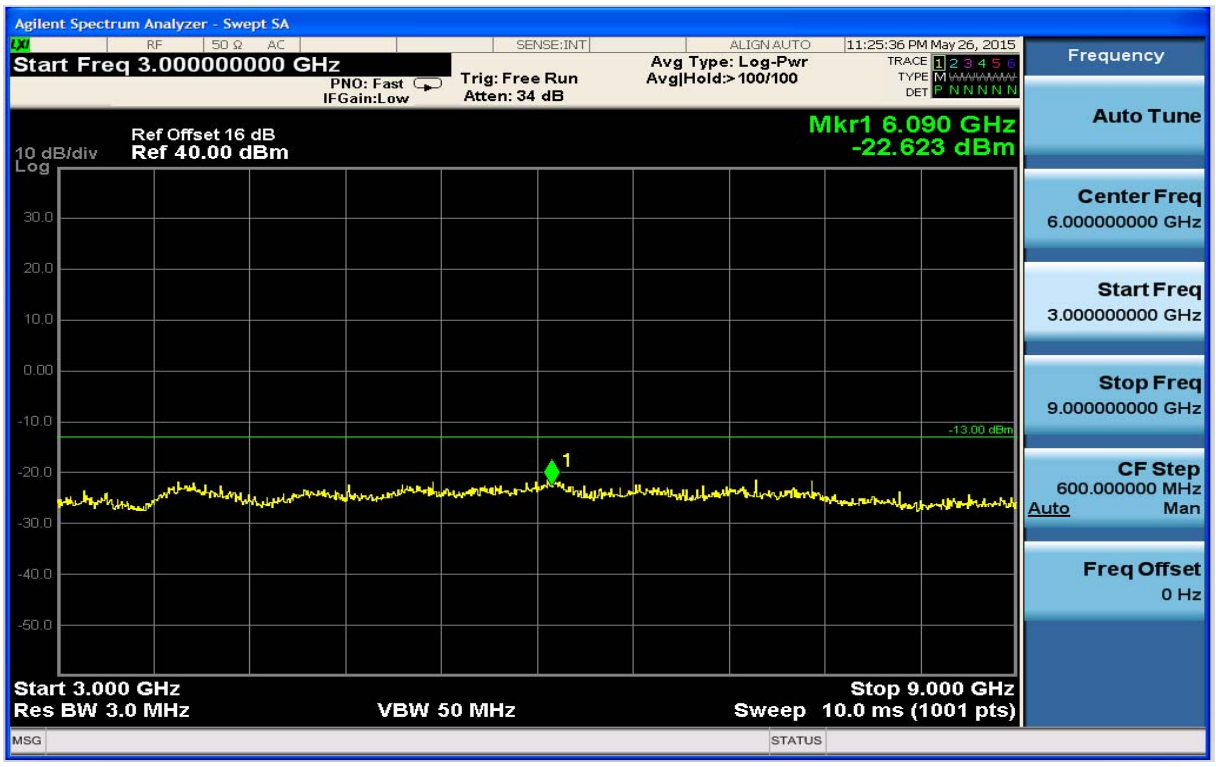


Fig.13 WCDMA Band II Channel 9400 30MHz~3GHz

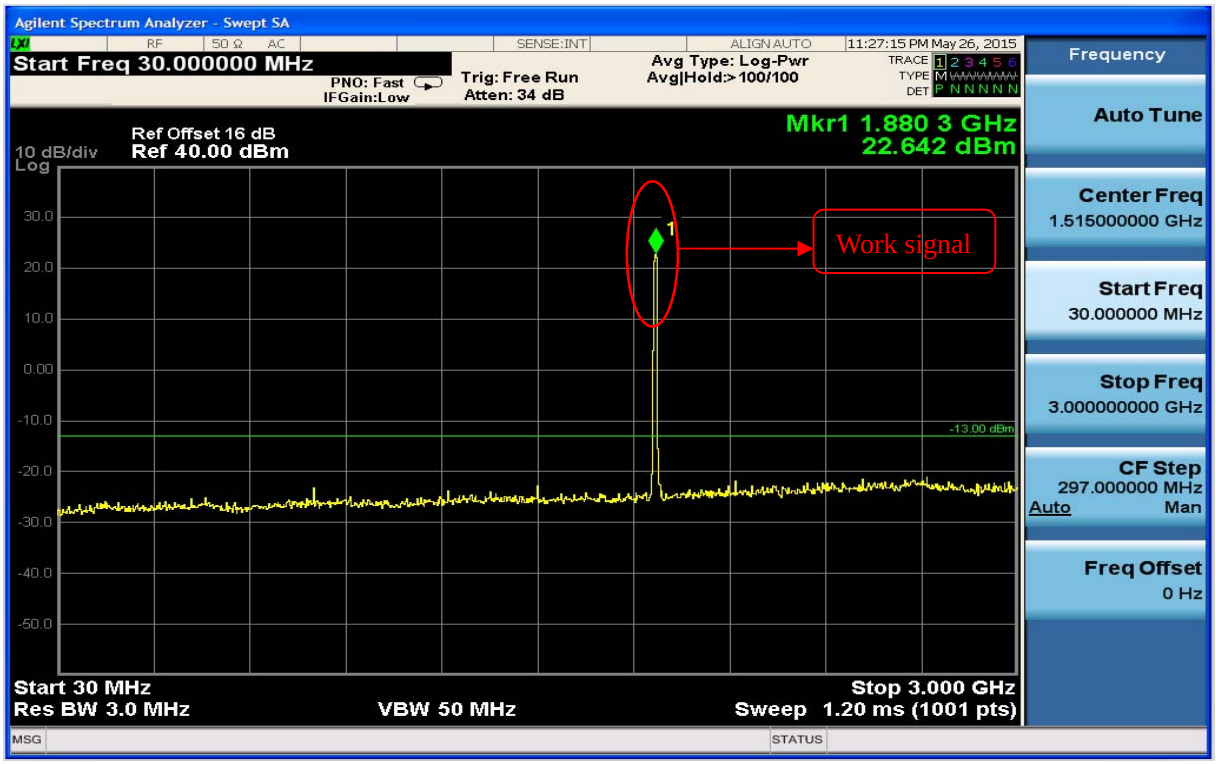
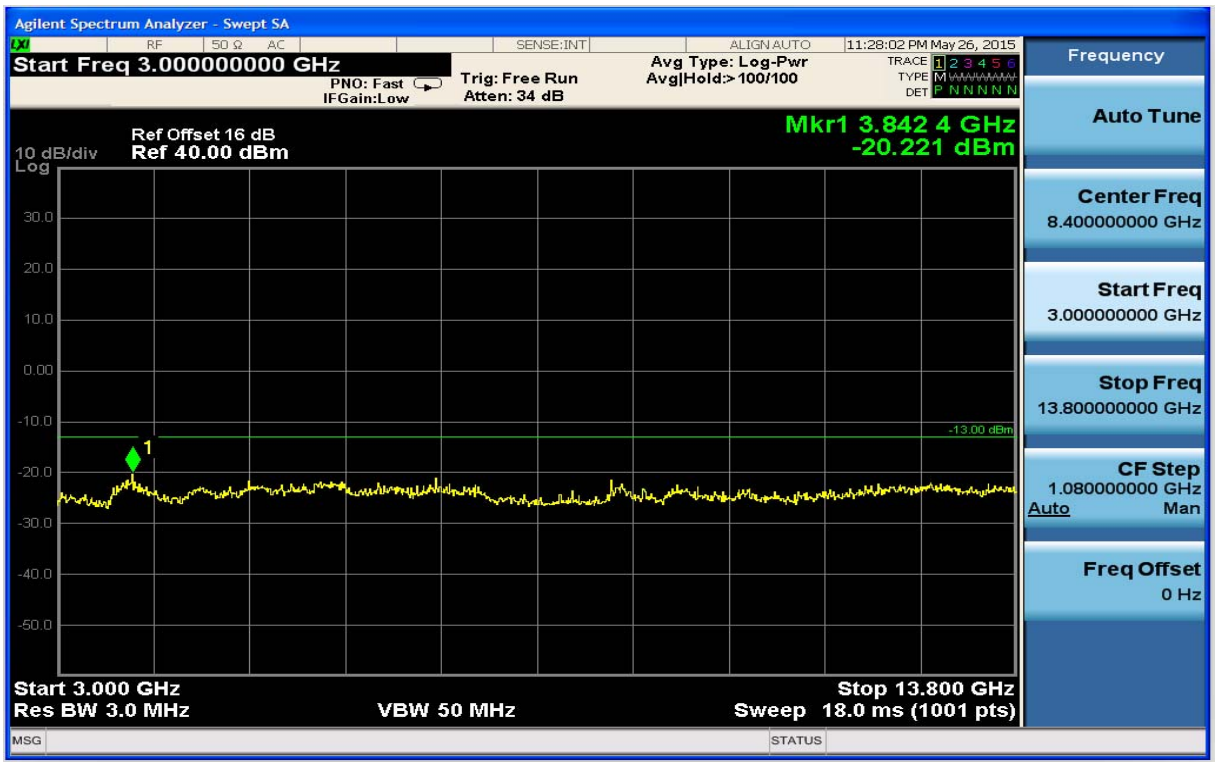


Fig.14 WCDMA Band II on Channel 9400 3GHz~19.1GHz



The Conducted Spurious Emissions was checked. No emissions were found and only noise floor in13.8GHz~19.1GHz

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

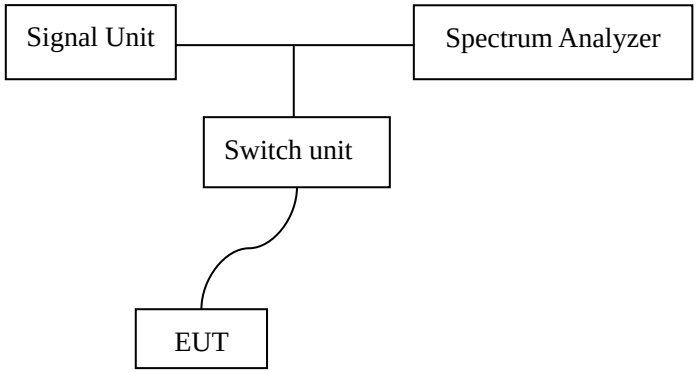
B.8.1 Description

Power Complementary Cumulative Distribution Function (CCDF) curves provide a means for characterizing the power peaks f a digitally modulated signal on a statistical basic. 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
WCDMA Band V	4132	824.2	0.02	Pass
	4175	835	0.03	Pass
	4233	848.8	0.04	Pass
WCDMA Band II	9263	1850.2	0.06	Pass
	9400	1880.0	0.05	Pass
	9538	1909.8	0.07	Pass

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