

FCC BLE TEST REPORT

No. 150106-BLE

For

Bullitt Group

Product Name: Mobile Phone

Model Name: IM 5

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.

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

Test Laboratory:

GCCT, Guangdong Telecommunications Terminal Products Quality Supervision and Testing Center

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Tel:+86(0)762-3607181, Fax:+86(0)762-3603336 Email: ncctmail@126.com. www.ncct.org.cn

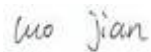
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GENERAL SUMMARY

Product Name	Mobile Phone
Model Name	IM 5
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 15C:“Radio Frequency Devices Sub-Part C: intentional Radiators”
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:

Luo Jian
Manager

Reviewed by:

Wen Xiaoyong
Deputy Manager

Tested by:

Gao Xiaoqing
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	+86-762-3607221
Fax	+86-762-3603336

1.2 Testing Environment

Environment Data	Temperature(°C)	Humidity(%)
Maximum Ambient	25.4	49
Minimum Ambient	18.3	44

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	IM 5
FCC ID	ZL5IM5
Tx Frequency	GSM850:824.2~848.8 MHz UMTS Band V : 826.4~846.6MHz PCS1900 TX: 1850.2~1909.8MHz UMTS Band II : 1852.4~1907.6MHz Bluetooth/BLE: 2402 ~ 2480 MHz WIFI(802.11b/g/n-20): 2412 ~ 2462 MHz WIFI(n-40): 2422 ~ 2452 MHz
Rx Frequency	GSM850: 869.2~893.8 MHz UMTS Band V : 871.4~891.6 MHz PCS1900 TX: 1930.2~1989.8 MHz UMTS Band II TX: 1932.4~1987.6 MHz Bluetooth/BLE: 2402 ~ 2480 MHz WIFI(802.11b/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(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/BLE/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

3.2 Internal Identification of EUT

EUT ID *	IMEI	HW Version	SW Version
150106-M03	1:355616029939703 2:355616029941154	XL-V2.0	XL01D-S13A_BULLITT_L7EN_202_141230
150106-M04	1:355616029939216 2:355616029940669	XL-V2.0	XL01D-S13A_BULLITT_L7EN_202_141230

*EUT ID: is used to identify the test sample in the lab internally. 150106-M03 and 150106-M04 are the same mobile phone.

3.3 Internal Identification of AE

AE ID *	Description	Type	SN
150106-B03	Battery	CA366069HV	/
150106-C03	Adapter	A8-501000	/
150106-B04	Battery	CA366069HV	/
150106-C04	Adapter	A8-501000	/

*AE ID: is used to identify the test sample in the lab internally. 150106-B03 and 150106-B04 are the same accessories, 150106-C03 and 150106-C04 are the same accessories.

4. Test Results

4.1 Summary of Test Results

No	Test cases	Sample	Verdict
1	Maximum transmit power	M03	Pass
2	Maximum Power Spectral Density	M03	Pass
3	6dB Occupied Bandwidth	M03	Pass
4	Band Edge Compliance	M03	Pass
5	Conducted Transmitter emissions	M03	Pass
6	Radiated Transmitter emissions	M04	Pass
7	AC Conducted Emission	M04	Pass
8	Antenna Requirements	M03	Pass

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

EUT was tested with Channel 0, 19,39.

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 Equipment Utilized

Table 1. Measurement Equipment

Hardware						
No.	Name	Model	SN	Manufacture	Cal. Date	Cal. Due Date
1	Spectrum Analyzer	N9020A	MY52091261	Agilent	2014.08.15	2015.08.15
2	Switch Unit	/	E0112	/	2014.08.15	2015.08.15
Software						
Tech BT			v1.0.3			

Table 2. Radiated emission test system

No.	Name	Model	SN	Manufacture	Cal. date	Cal. Due Date
1	Spectrum Analyzer	E4440A	MY48250641	Agilent	2014.08.15	2015.08.15
2	BiCoNilog Antenna	3142E	00142015	ETS-Lindgren	2014.08.15	2015.08.15
3	Horn Antenna	3117	129169	ETS-Lindgren	2014.08.15	2015.08.15
4	Signal Generator	N5183A-532	MY49060563	Agilent	2014.08.15	2015.08.15
5	Universal Radio Communication Tester	E5515C	MY48367105	Agilent	2014.08.15	2015.08.15
6	RF Preselector	N9039A	MY48260024	Agilent	/	/
7	Loop Antenna	HFH2	860015/00	R&S	2014.08.15	2015.08.15

ANNEX A: EUT Photograph

EUT Front View



EUT behind View



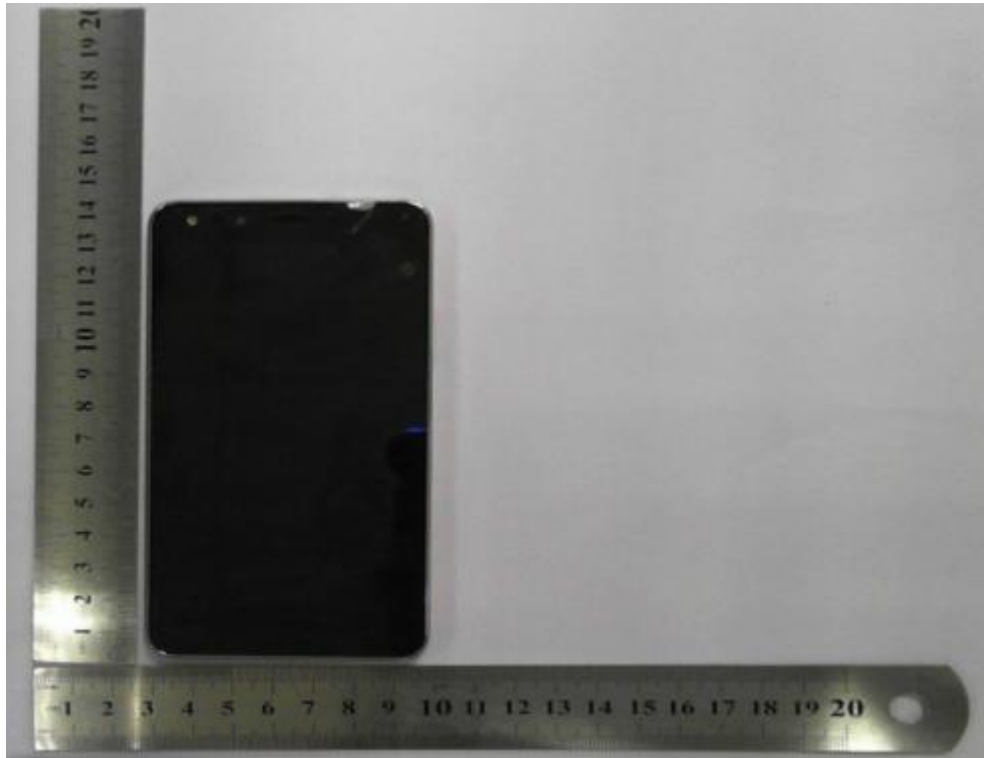
EUT Left View



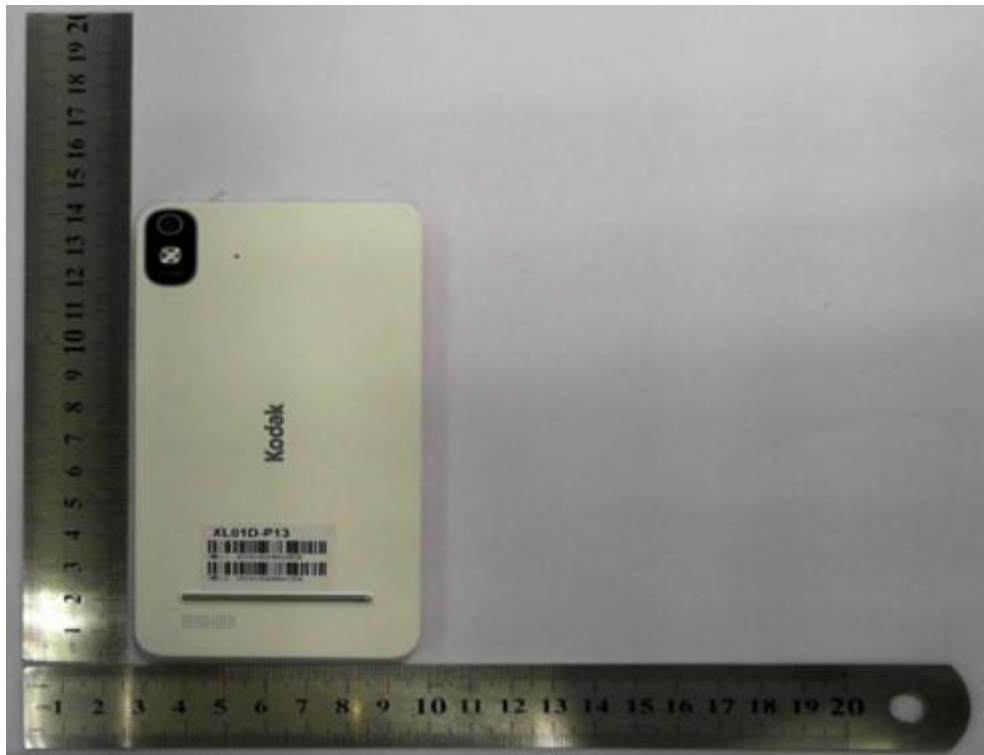
EUT Right View



EUT Top View



EUT Rear View



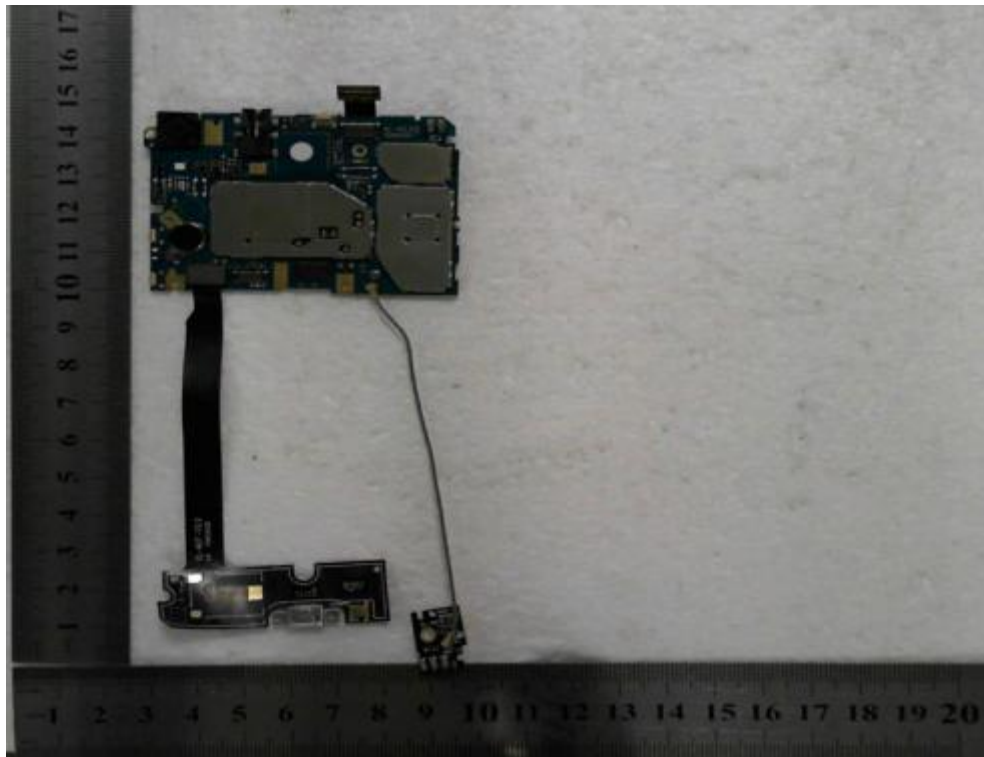
All



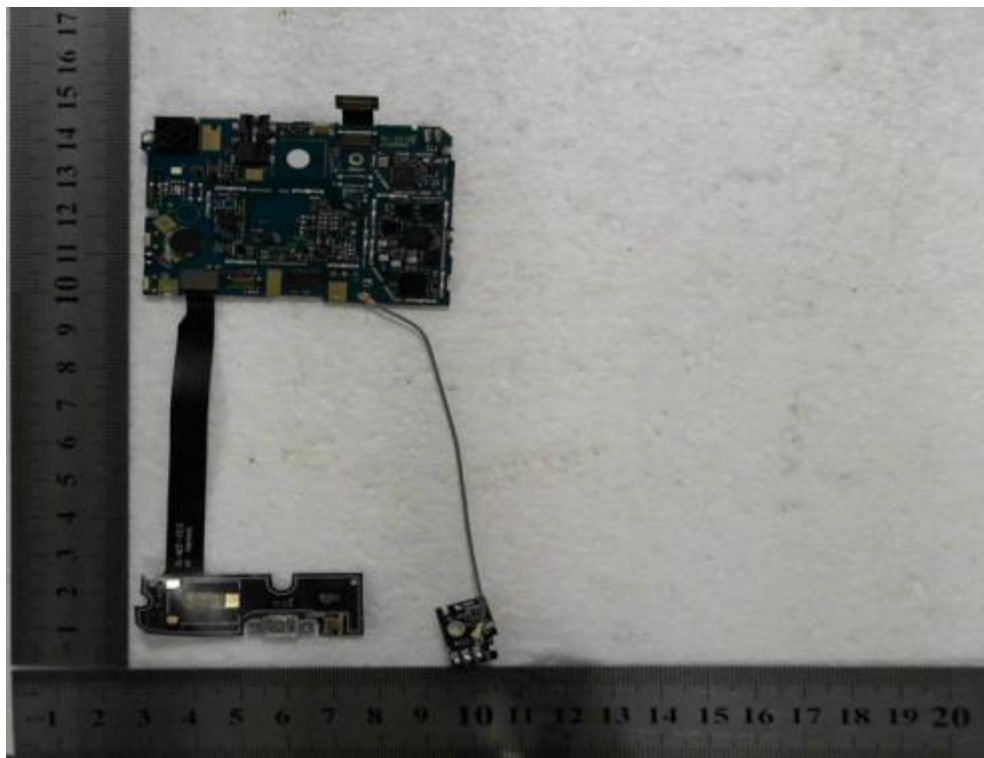
cover off



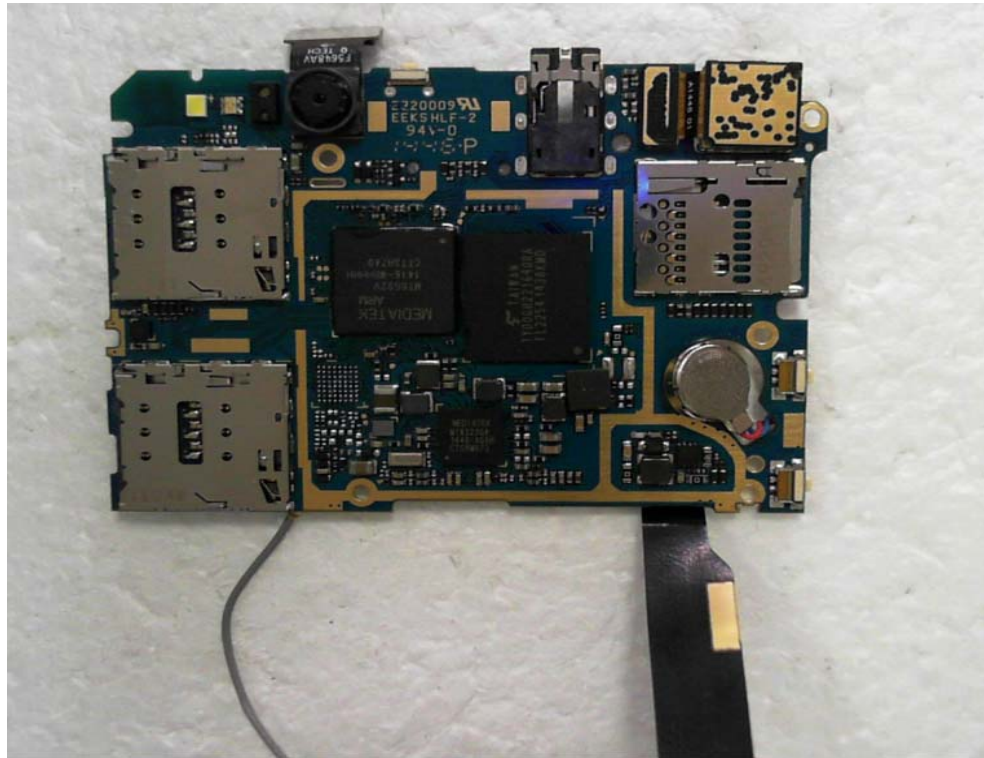
Mainboard With shielding Front View



Mainboard Without shielding Front View



Mainboard Rear



Battery



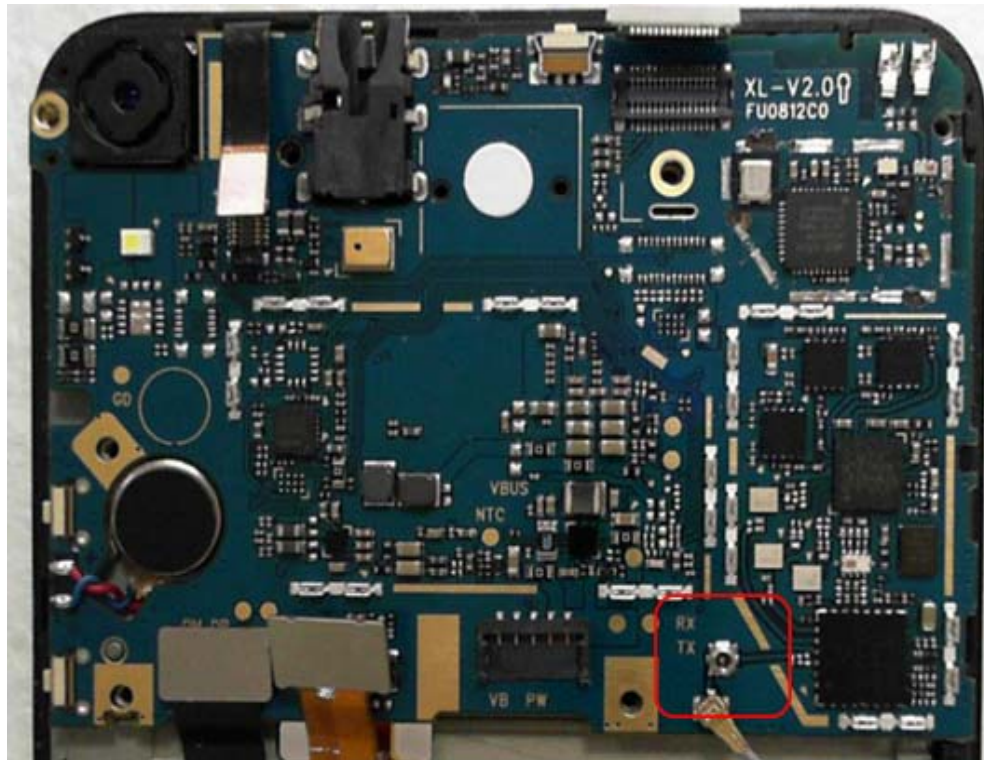
USB Cable



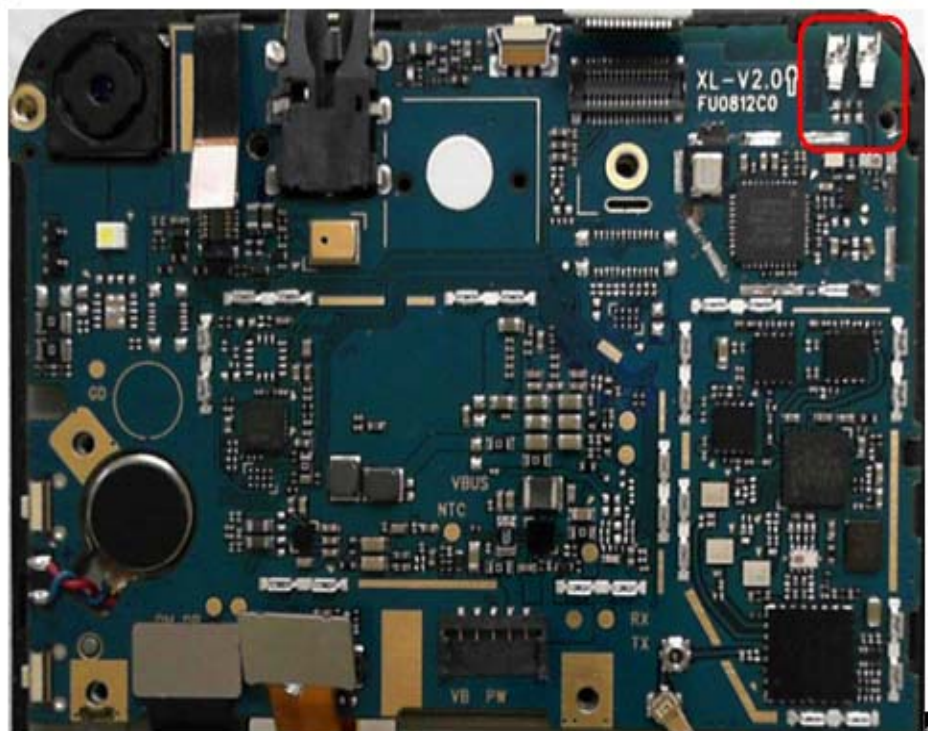
Headset



GSM/DCS/UMTS Antenna View



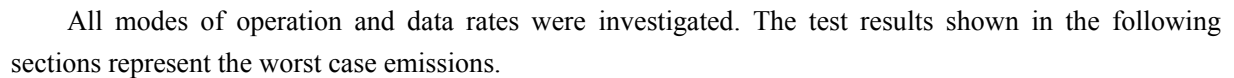
BT/WIFI Antenna View



Adapter



The radiated test setup is shown in each radiated test case section. The conducted test setup is shown as following:



B.1.1 Description

B.1.2 Test Results

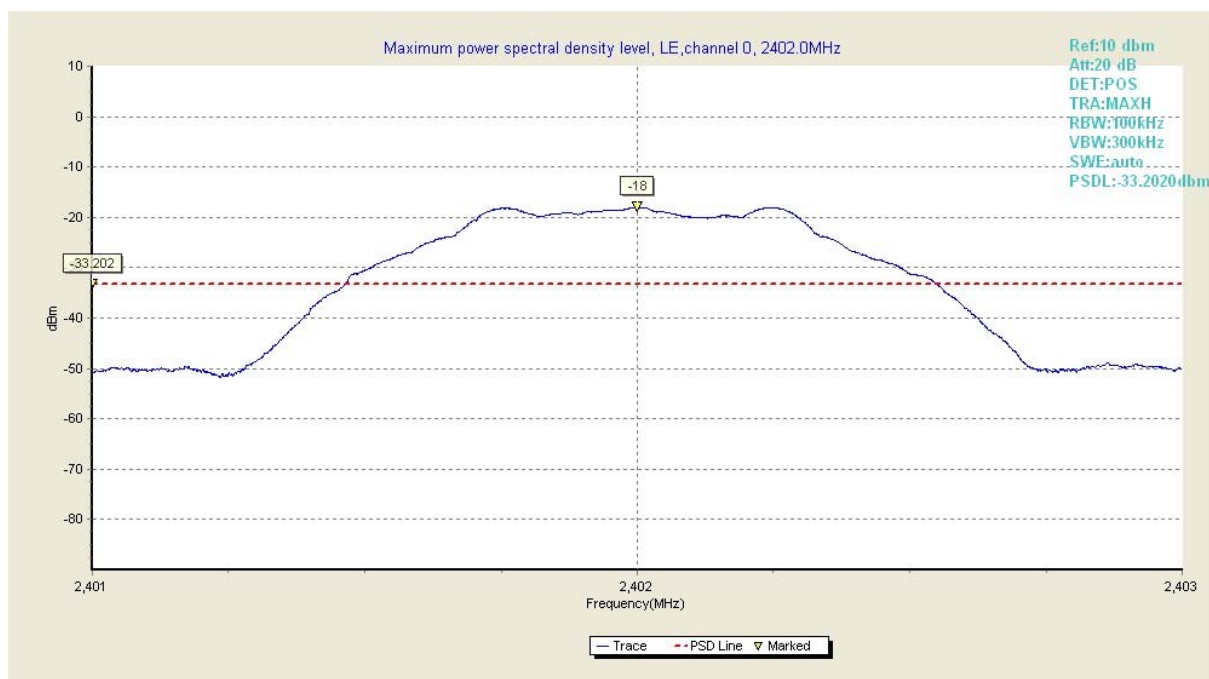
B.2 Maximum Power Spectral Density

The maximum spectral density shall be equal to or less than 8 dBm per 3kHz.

Test equipment parameter:

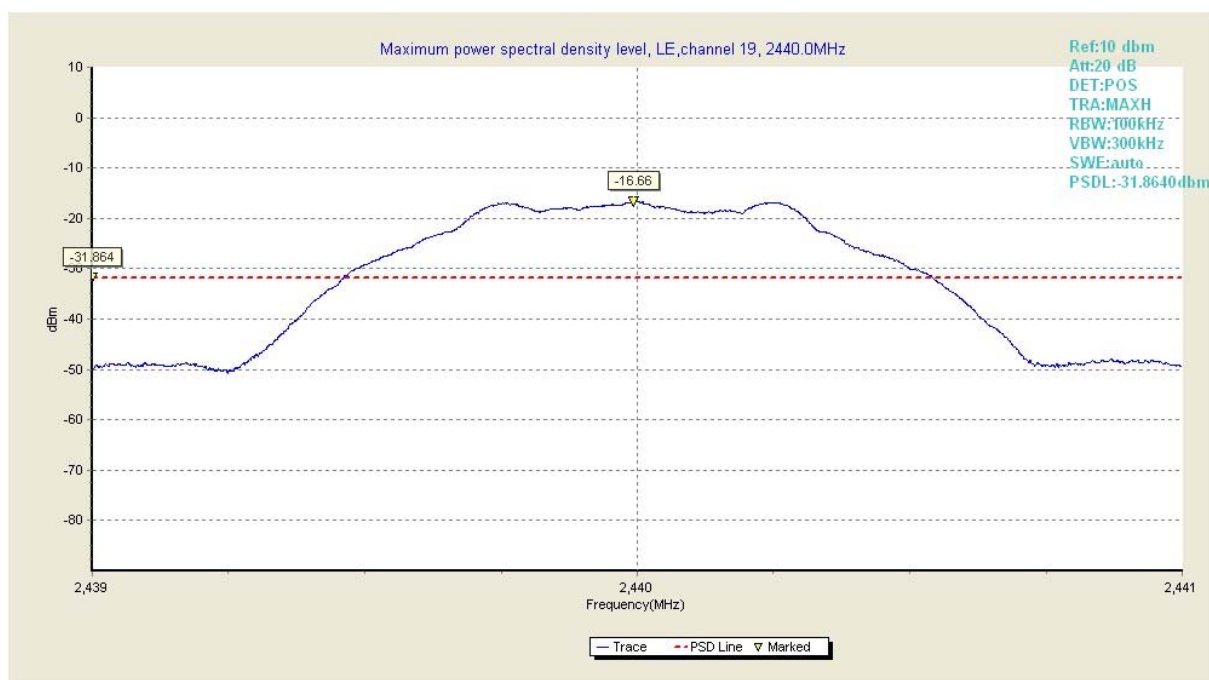
TRA: Max Hold RBW: 100kHz VBW: 300kHz Sweep time: AUTO

Limit (PSD dBm/3kHz)	PSD(dBm/3kHz)						Verdict
	2402MHz		2440 MHz		2480 MHz		
≤8	-33.202	Fig.1	-31.864	Fig.2	-31.698	Fig.3	Pass
Antenna Maximum Gain: -2dBi							



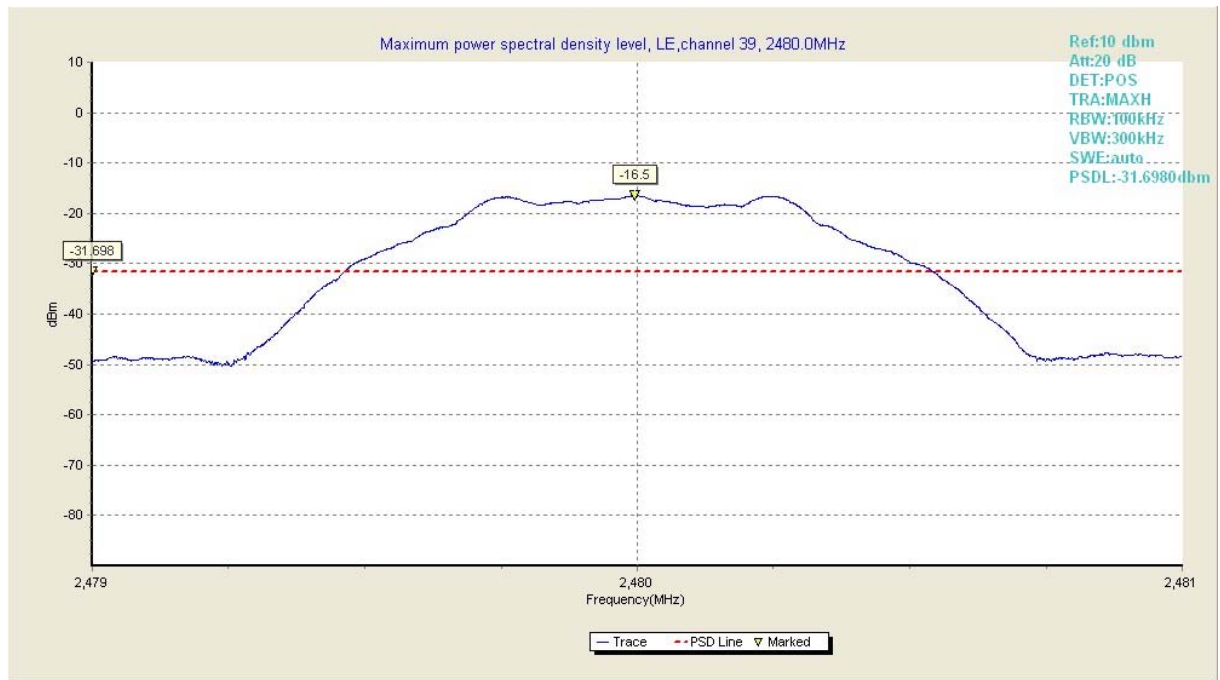
Test Plot 1	2401.502 MHz	-33.202 dBm
Test Plot 2	2402.611 MHz	-33.202 dBm

Fig.1 Maximum power spectral density of BLE in channel 0



Test Plot 1	2439.517 MHz	-31.864 dBm
Test Plot 2	2440.584 MHz	-31.864 dBm

Fig.2 Maximum power spectral density of BLE in channel 19



Test Plot 1	2479.504 MHz	-31.698 dBm
Test Plot 2	2480.623 MHz	-31.698 dBm

Fig.3 Maximum power spectral density of BLE in channel 39

B.3 6dB Occupied Bandwidth

B.3.1 Description

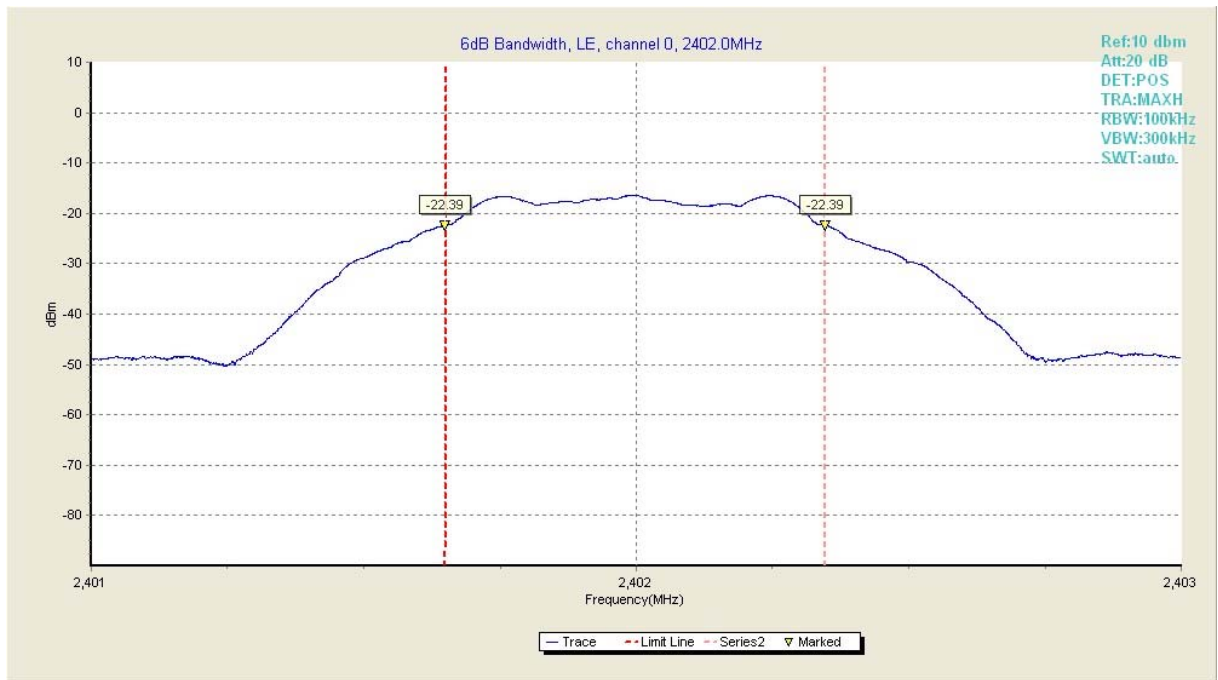
The Occupied 6dB Bandwidth shall be equal to or more than 500 kHz.

B.3.2 Test Results

Test equipment parameter:

TRA: Max Hold RBW: 100kHz VBW: 300kHz Sweep time: AUTO

Channel	Frequency (MHz)	Limit (MHz)	Occupied Bandwidth (MHz)	Test Results	Verdict
0	2402	>0.5	0.6960	Fig.4	Pass
19	2440		0.6980	Fig.5	Pass
39	2480		0.7006	Fig.6	Pass



Test plot 1	2401.649 MHz	-22.389 dBm
Test plot 2	2402.345 MHz	-22.389 dBm

Fig.4 6dB Bandwidth of BLE in channel 0,2402MHz



Test plot 1	2439.647 MHz	-21.840 dBm
Test plot 2	2440.345 MHz	-21.840 dBm

Fig.5 6dB Bandwidth of BLE in channel 19,2440MHz



Test plot 1	2479.647 MHz	-21.830 dBm
Test plot 2	2480.347 MHz	-21.820 dBm

Fig.6 6dB Bandwidth of BLE in channel 39,2480MHz

B.4 Band Edge Compliance

B.4.1 Description

The Band Edges Compliance shall be equal to or less than -20 dBc.

B.4.2 Test Results

Test equipment parameter:

TRA: Max Hold RBW: 100kHz VBW: 300kHz Sweep time: AUTO

Channel	Frequency(MHz)	Limit (dB)	Test Result(MHz)		Verdict
0	2402	≤ -20	-53.32	Fig.7	Pass
39	2480		-53.32	Fig.8	Pass

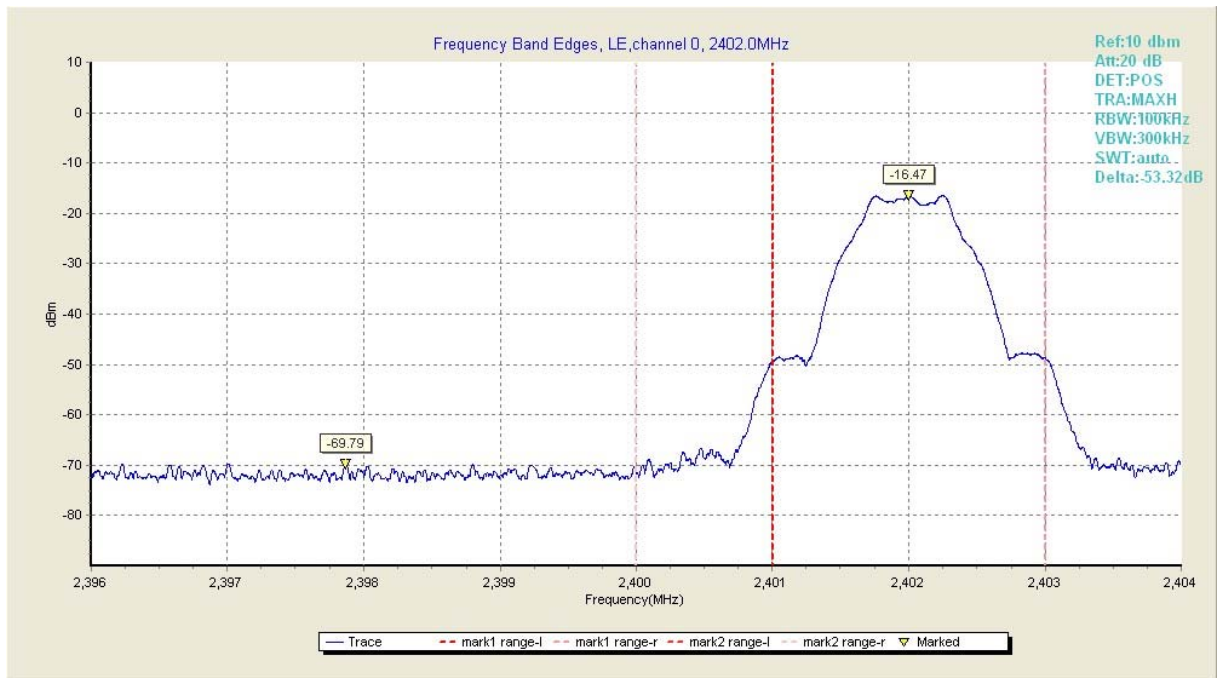


Fig7. Frequency Band Edges in channel 0,2402MHz

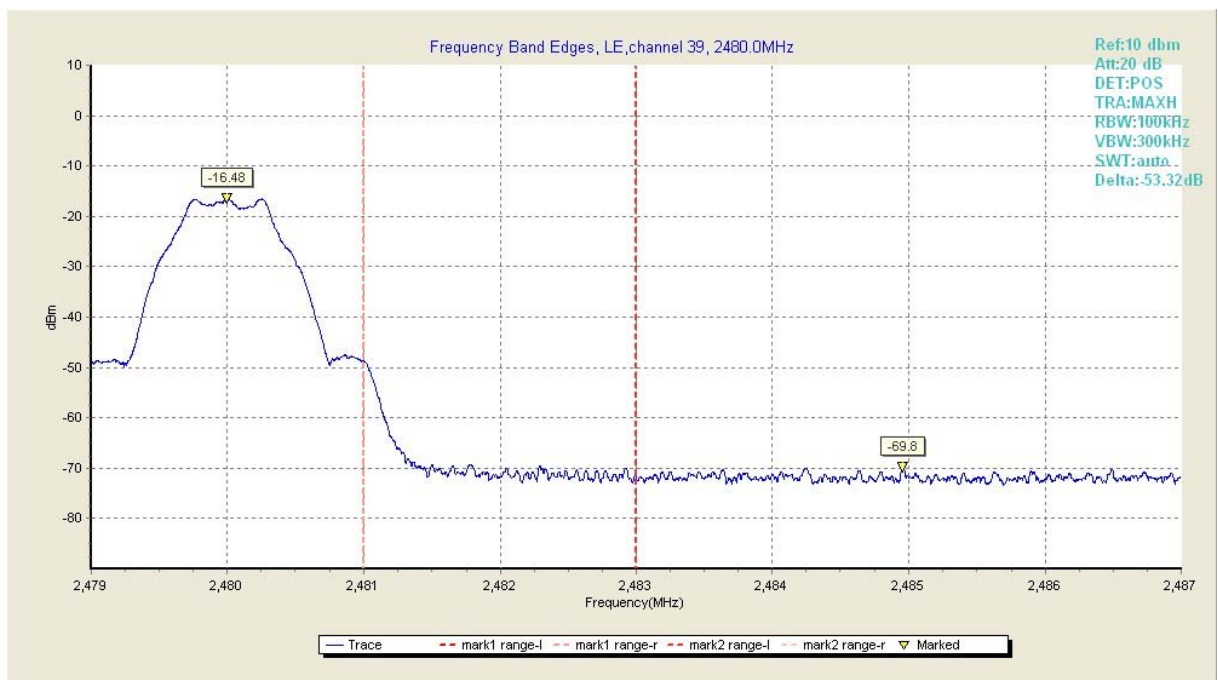


Fig8. Frequency Band Edges in channel 39,2480MHz

B.5 Conducted Spurious Emissions

B.5.1 Description

All harmonics/spurious must be at least 20 dB down from the highest emission level within the authorized band.

B.5.2 Test Results

Test equipment parameter:

TRA: Max Hold

RBW: 100kHz

VBW: 300kHz

Sweep time: AUTO

Channel	Frequency Range	Test Results	Verdict
0	30MHz ~ 1GHz	Fig.9	Pass
	1GHz ~ 3GHz	Fig.10	Pass
	3GHz ~ 10GHz	Fig.11	Pass
	10GHz ~ 26GHz	Fig.12	Pass
19	30MHz ~ 1GHz	Fig.13	Pass
	1GHz ~ 3GHz	Fig.14	Pass
	3GHz ~ 10GHz	Fig.15	Pass
	10GHz ~ 26GHz	Fig.16	Pass
39	30MHz ~ 1GHz	Fig.17	Pass
	1GHz ~ 3GHz	Fig.18	Pass
	3GHz ~ 10GHz	Fig.19	Pass
	10GHz ~ 26GHz	Fig.20	Pass

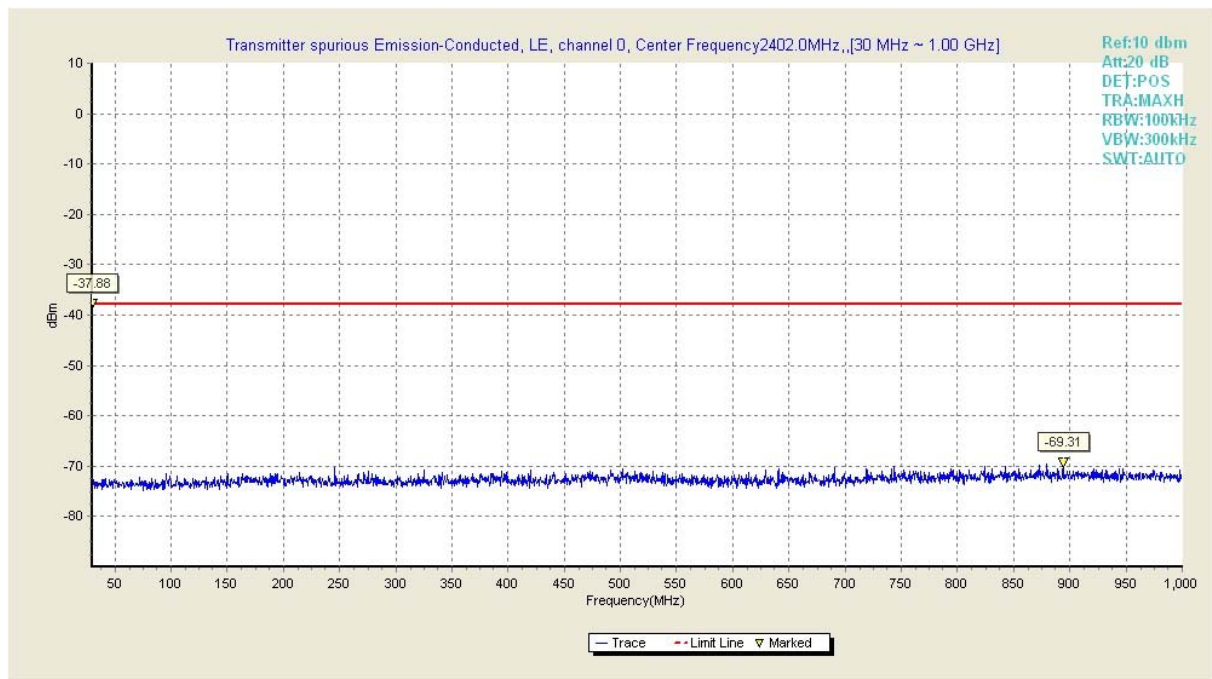


Fig.9 Transmitter spurious emission-Conducted of BLE in channel 0,(30MHz~1GHz)

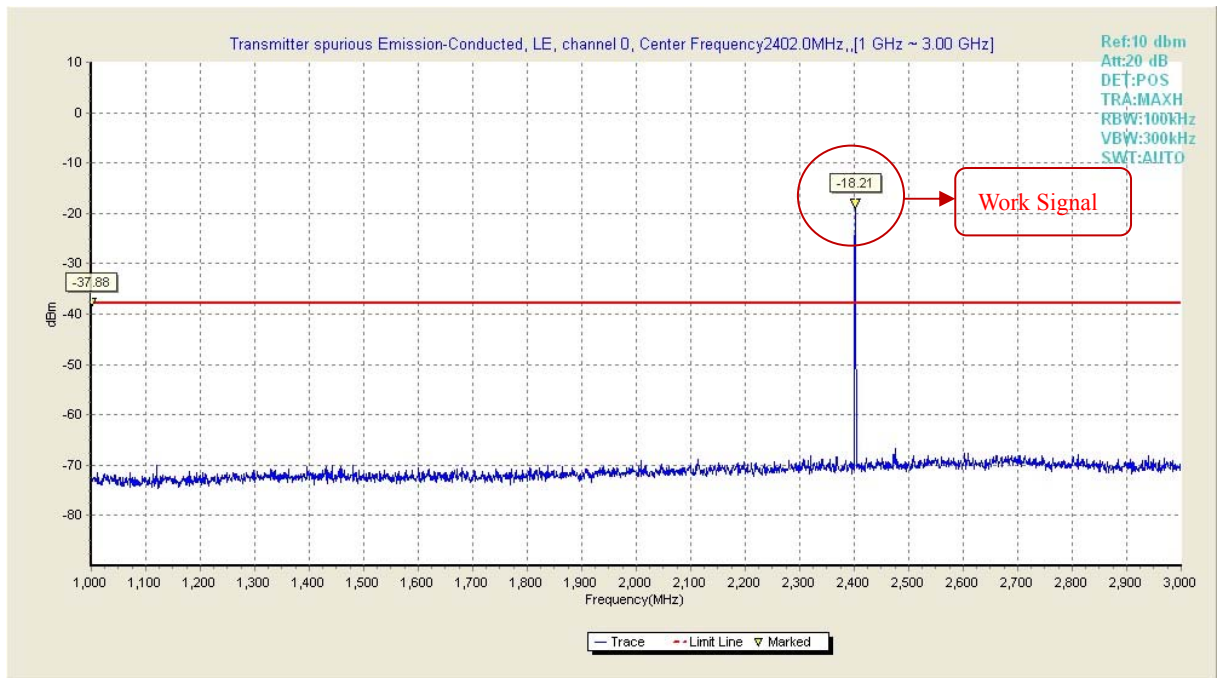


Fig.10 Transmitter spurious emission-Conducted of BLE in channel 0,(1GHz ~3GHz)

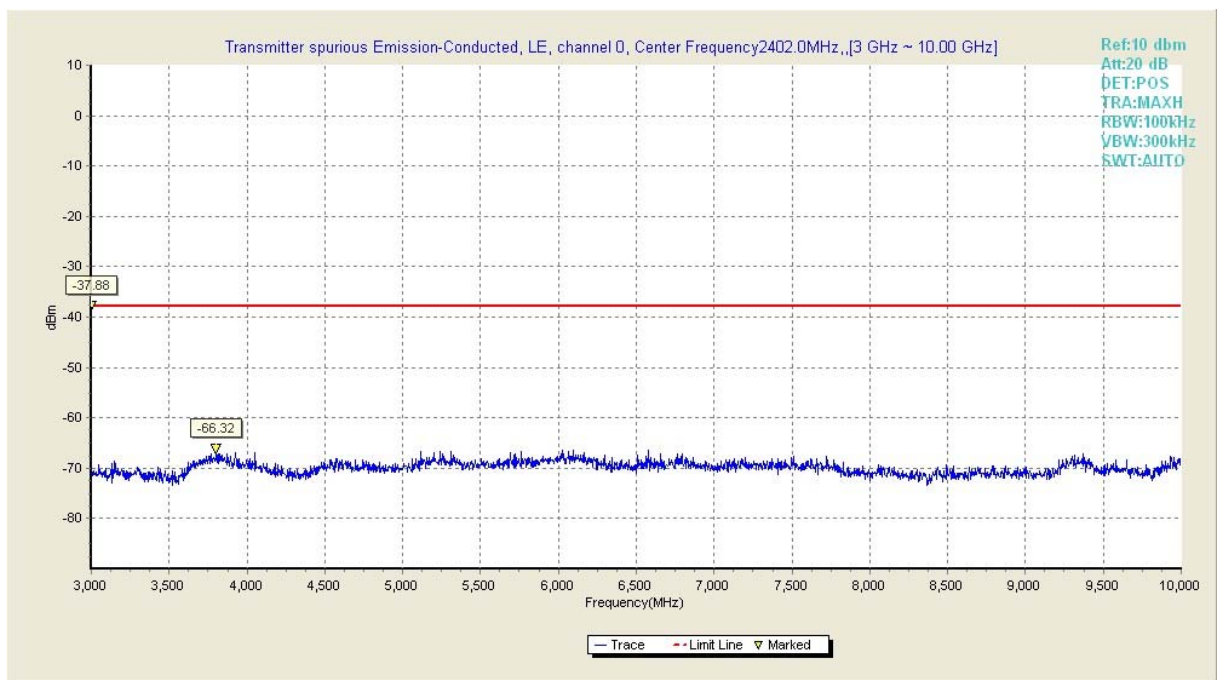


Fig.11 Transmitter spurious emission-Conducted of BLE in channel 0,(3GHz ~10GHz)

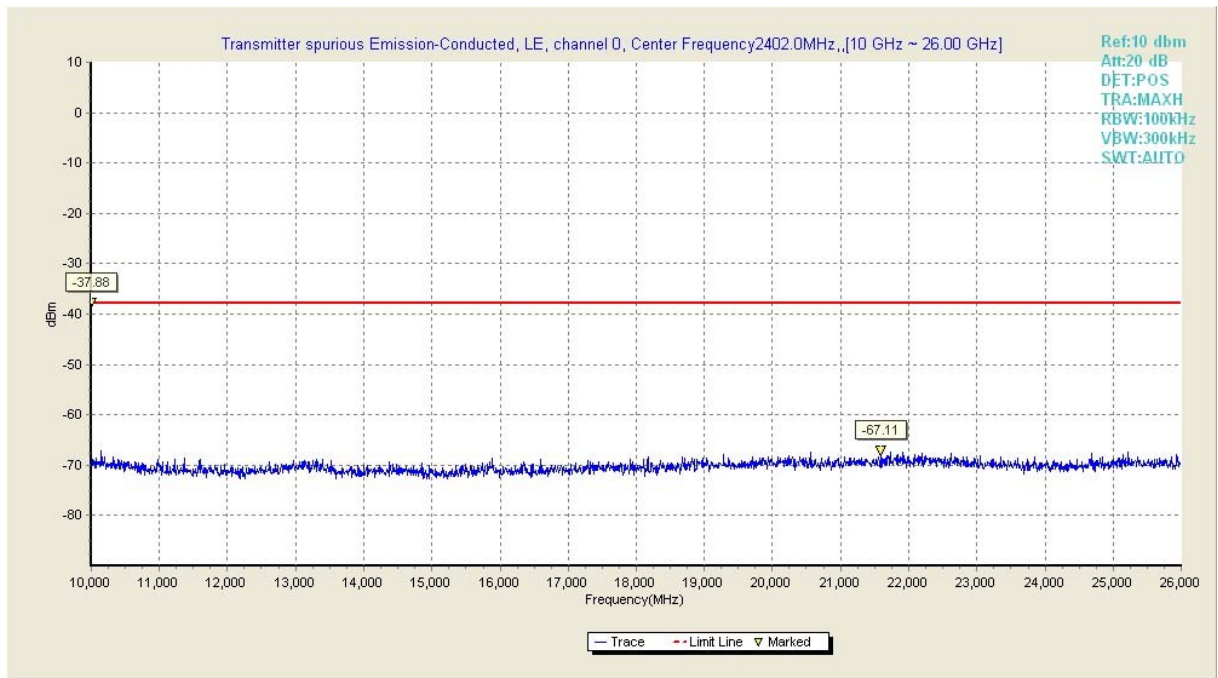


Fig.12 Transmitter spurious emission-Conducted of BLE in channel 0,(10GHz ~26GHz)

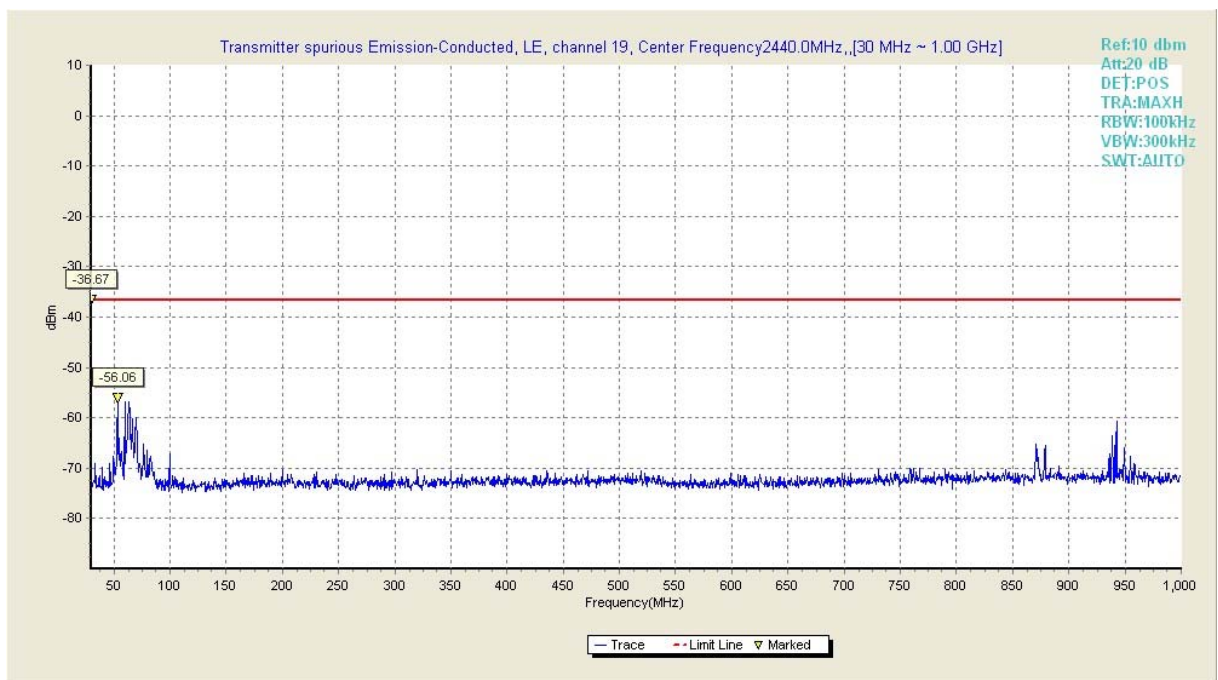


Fig.13 Transmitter spurious emission-Conducted of BLE in channel 19,(30MHz ~1GHz)

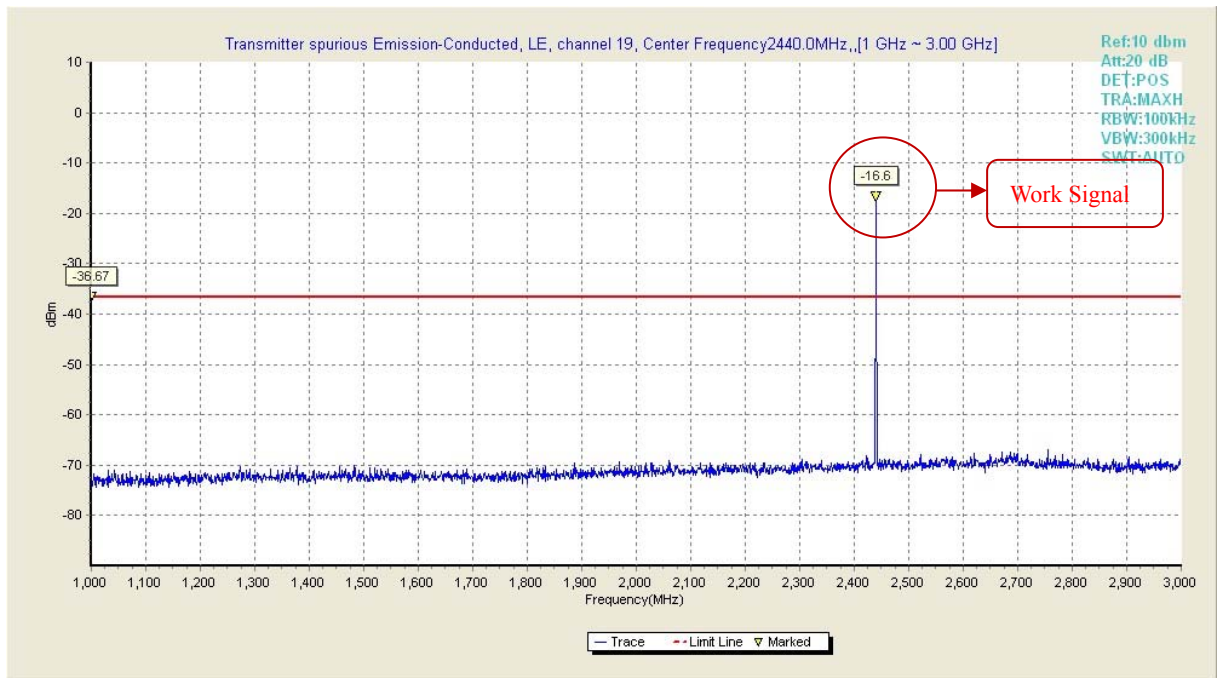


Fig.14 Transmitter spurious emission-Conducted of BLE in channel 19,(1GHz ~3GHz)

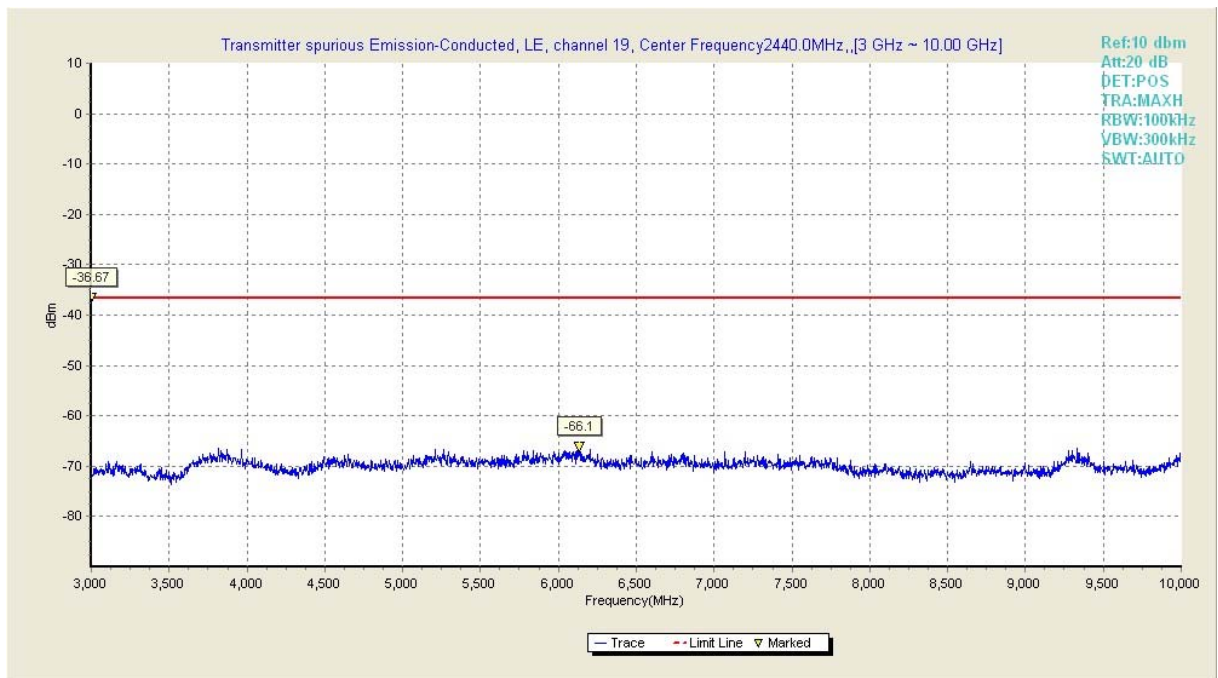


Fig.15 Transmitter spurious emission-Conducted of BLE in channel 19,(3GHz ~10GHz)

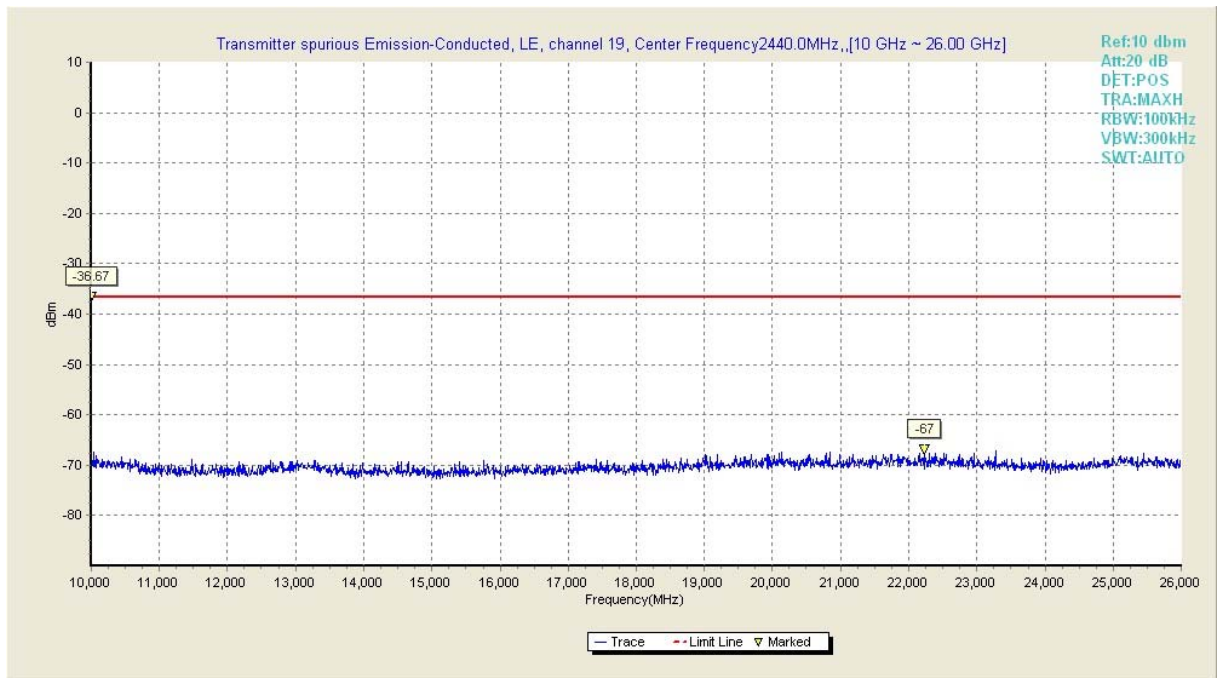


Fig.16 Transmitter spurious emission-Conducted of BLE in channel 19,(10GHz ~26GHz)

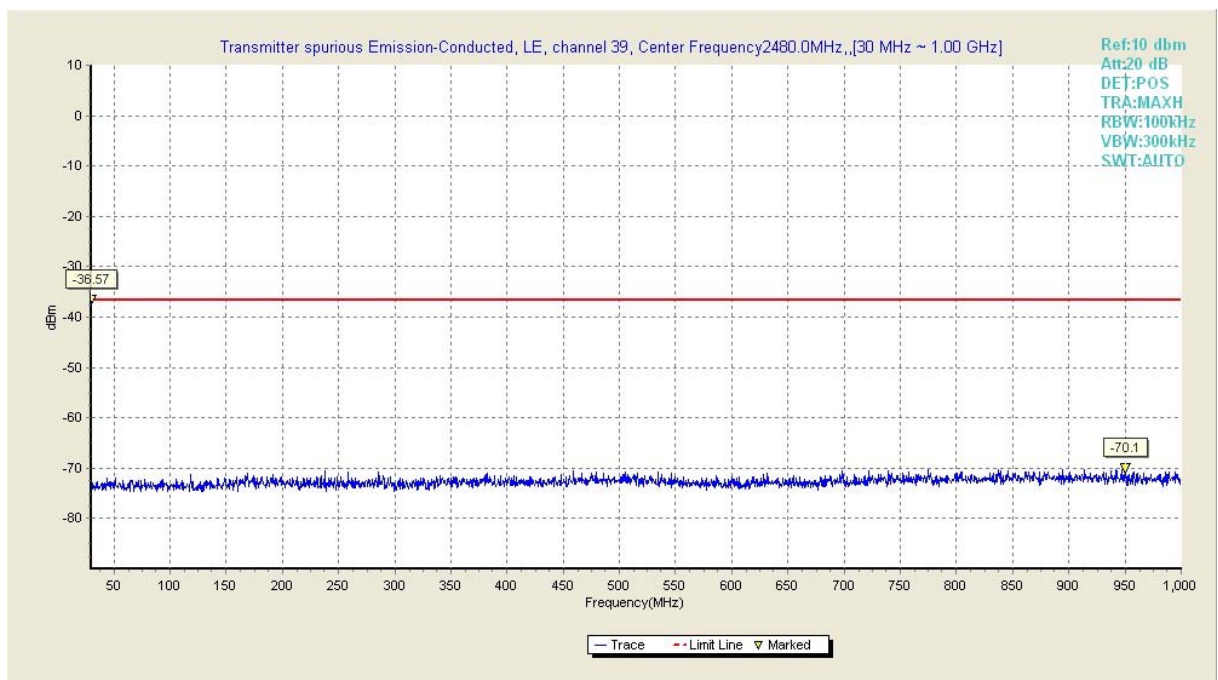


Fig.17 Transmitter spurious emission-Conducted of BLE in channel 39,(30MHz ~1GHz)

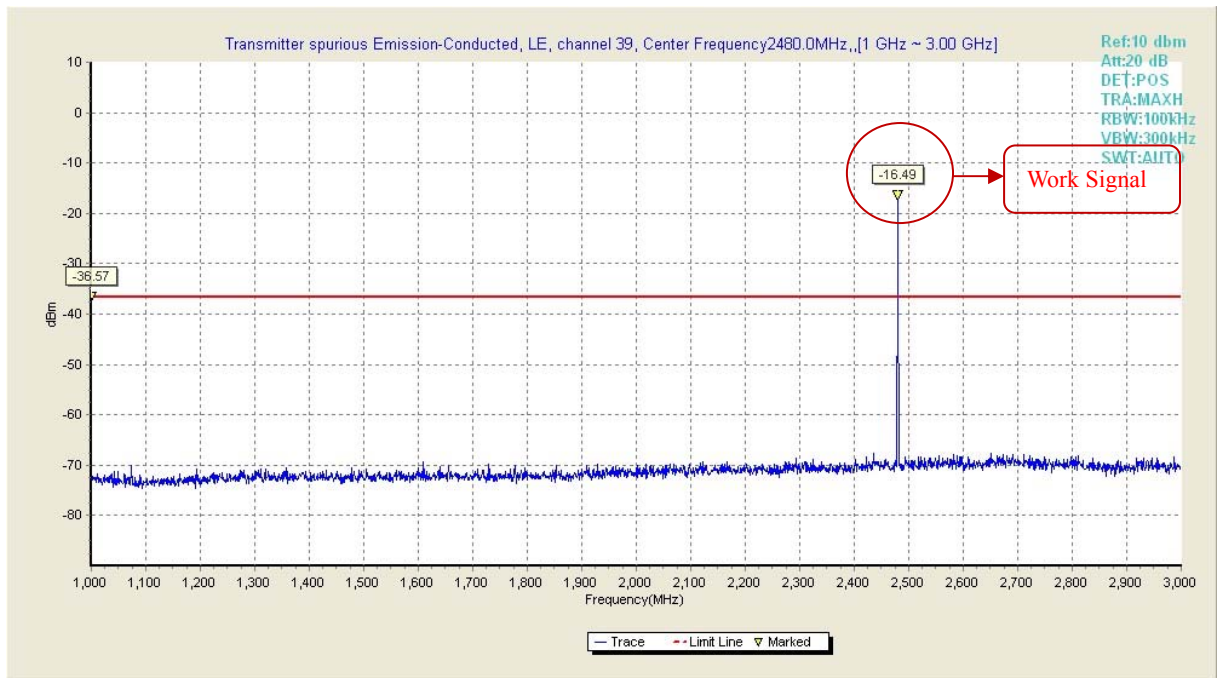


Fig.18 Transmitter spurious emission-Conducted of BLE in channel 39,(1GHz ~3GHz)

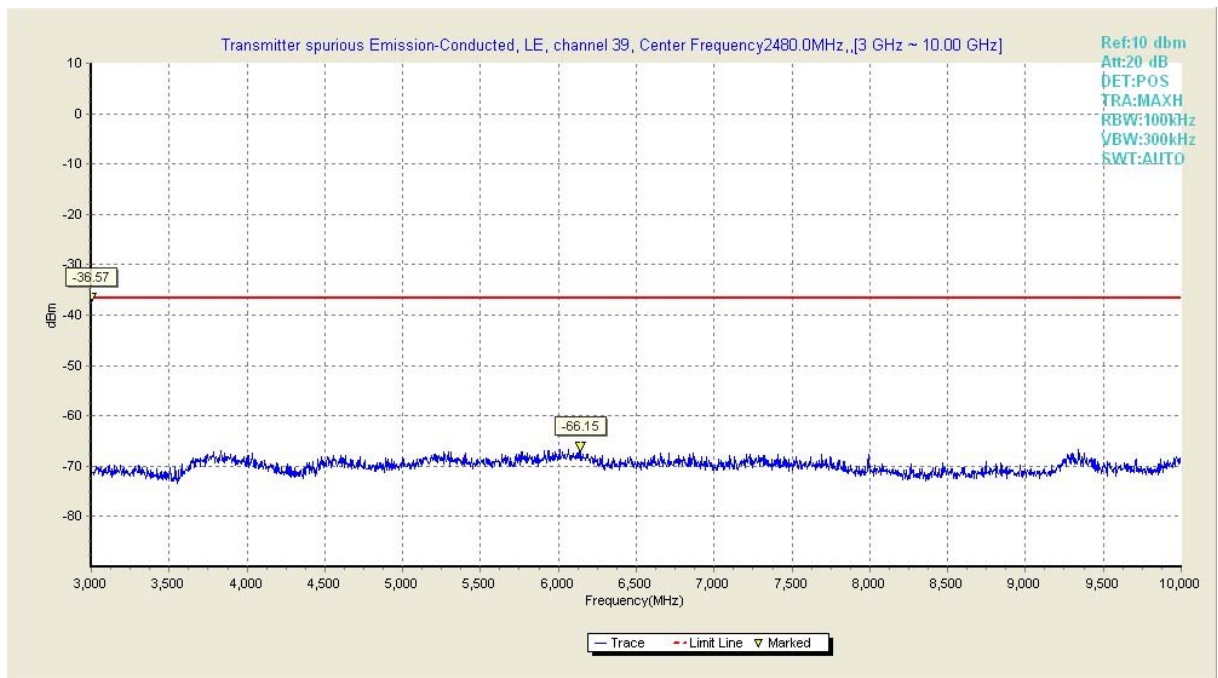


Fig.19 Transmitter spurious emission-Conducted of BLE in channel 39,(3GHz ~10GHz)

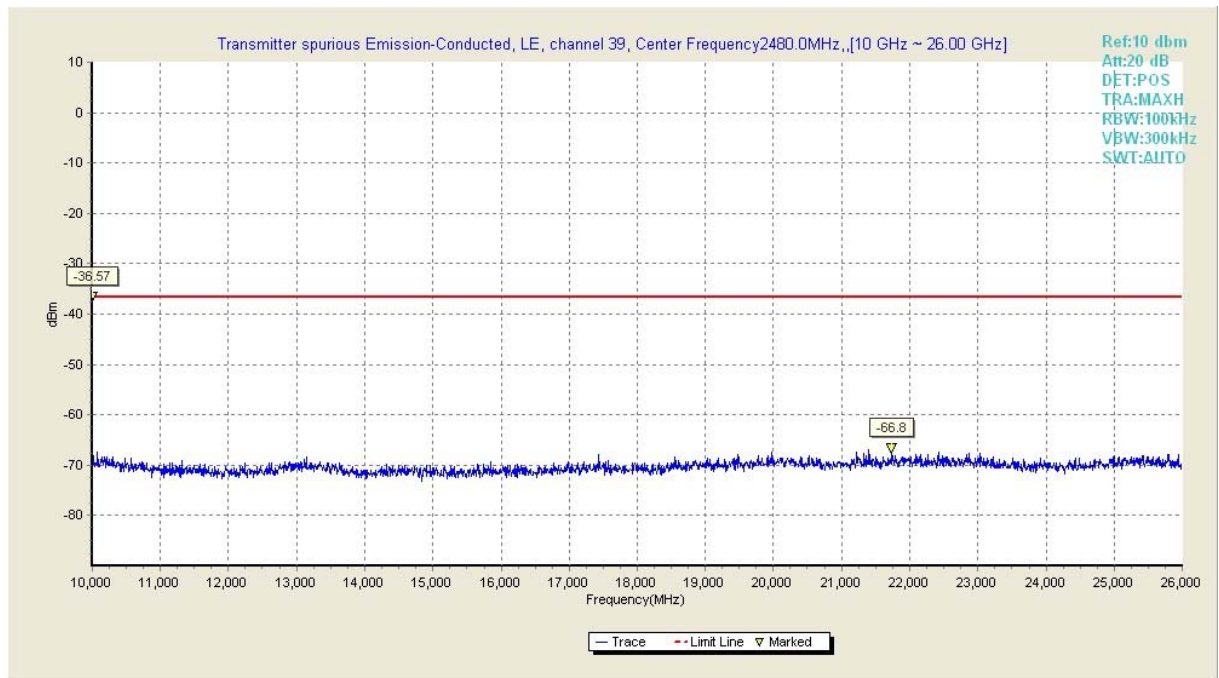


Fig.20 Transmitter spurious emission-Conducted of BLE in channel 39,(10GHz ~26GHz)

B.6 Radiated Emissions

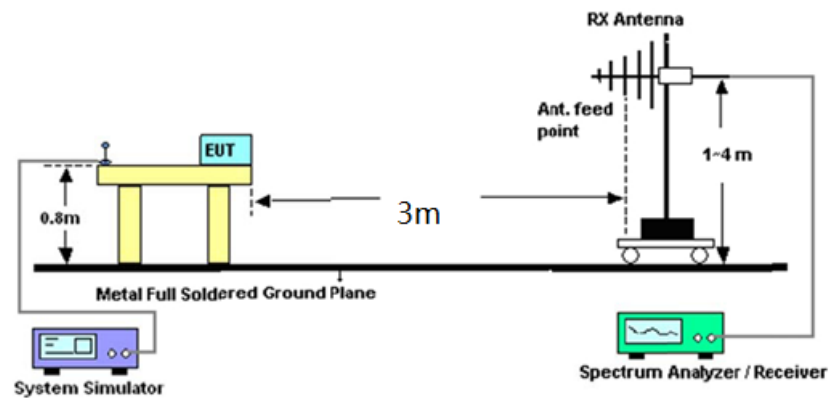
B.6.1 Limit of Radiated Emission

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20dB below the highest emission level within the authorized band. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below

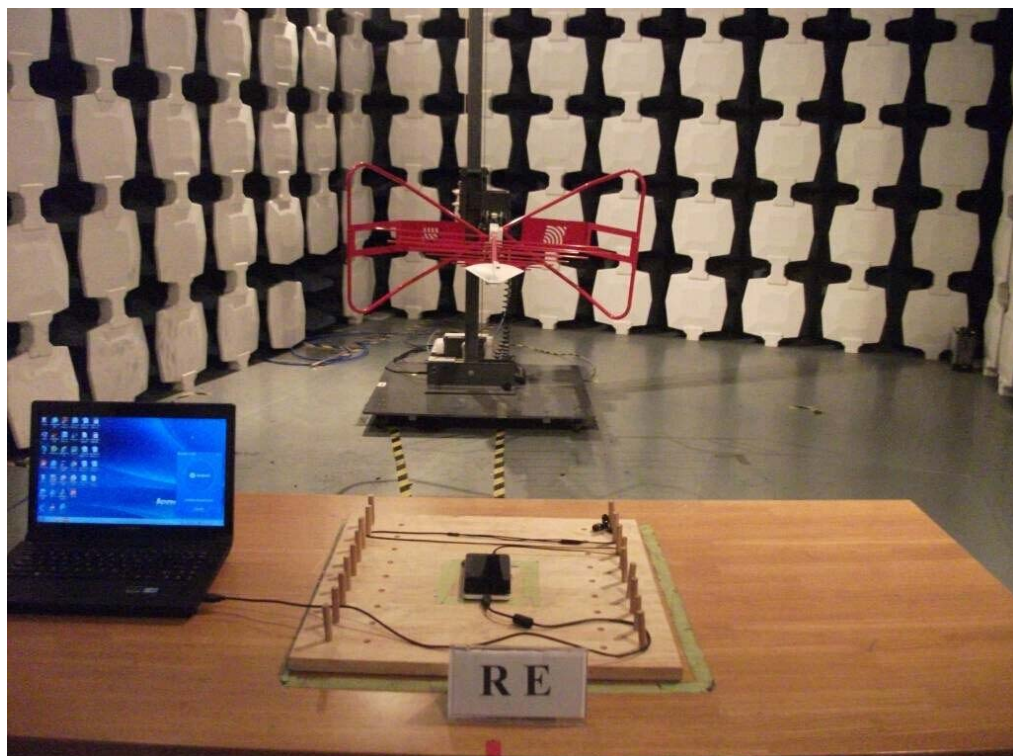
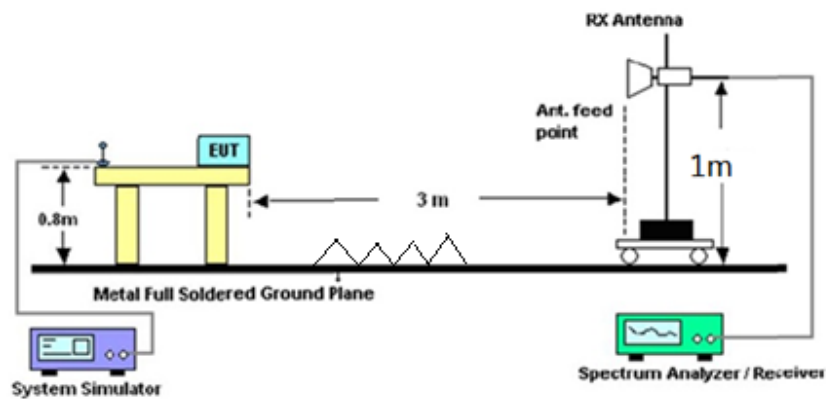
Frequency(MHz)	Field Strength(microvolts/meters)	Measurement Distance(Meters)
0.009-0.490	2400/F(kHz)	3000
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
above 960	500	3

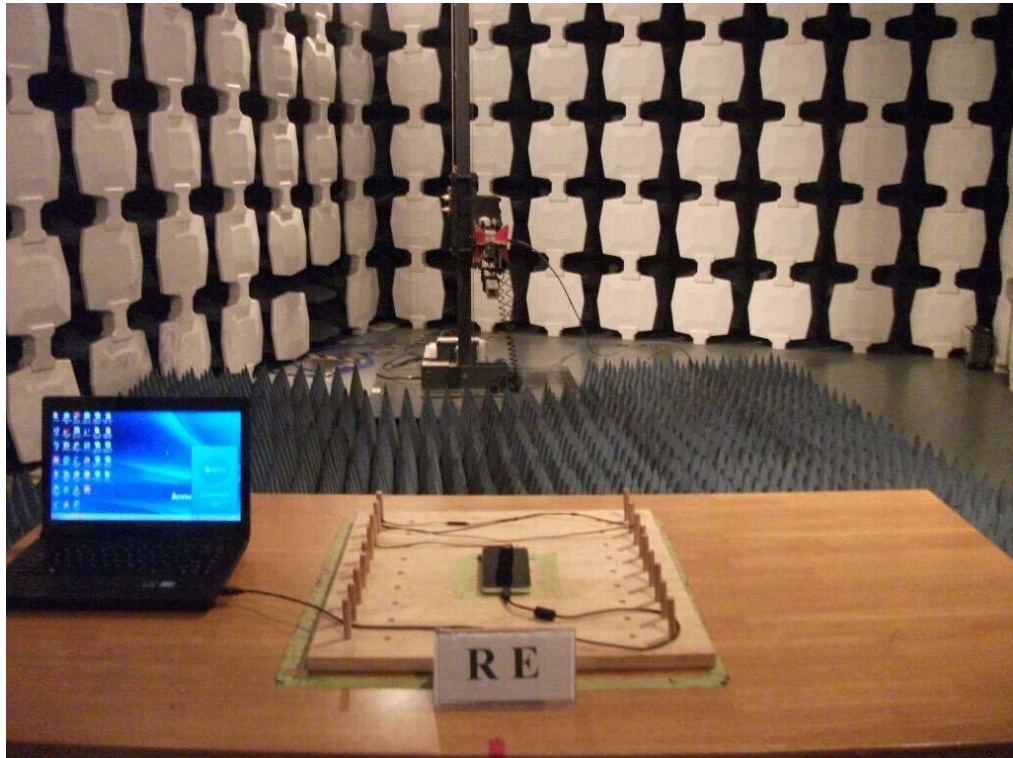
B.6.2 Test Setup

Radiated Emissions Frequency: Below 1GHz



Radiated Emissions Frequency: above 1GHz





B.6.3 Test Results

The low frequency, which started from 9kHz to 30MHz and the high frequency, which above 6GHz to 10th harmonic, were pre-scanned and which was 20dB lower than limit line per 15.31(0) were not reported.

Test Mode: Traffic

Verdict: Pass

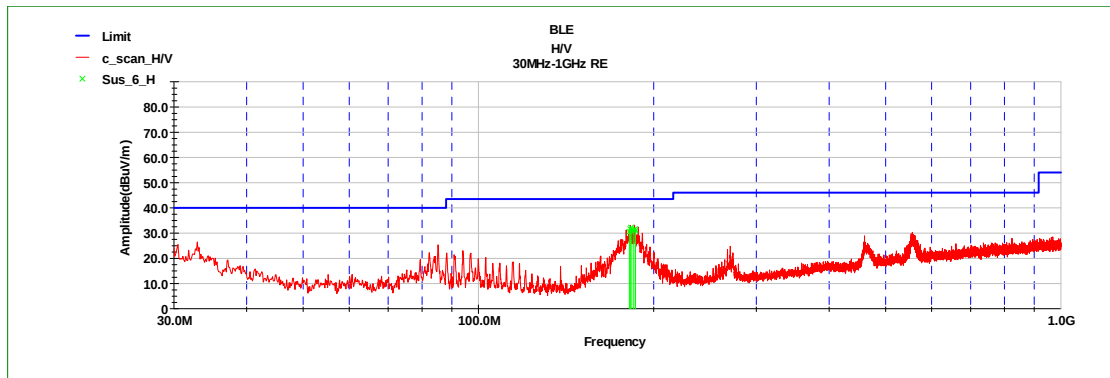


Fig.21 Radiated Emission of channel 0 in 30MHz-1GHz

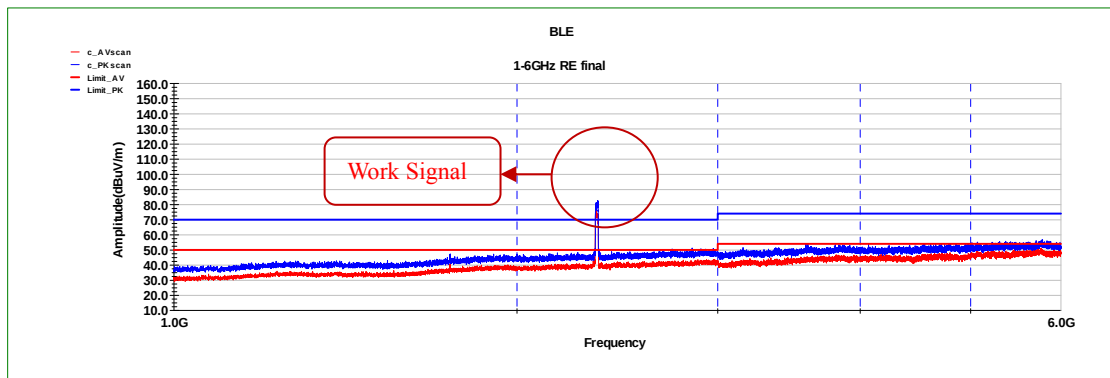


Fig.22 Radiated Emission of channel 0 in 1GHz-6GHz

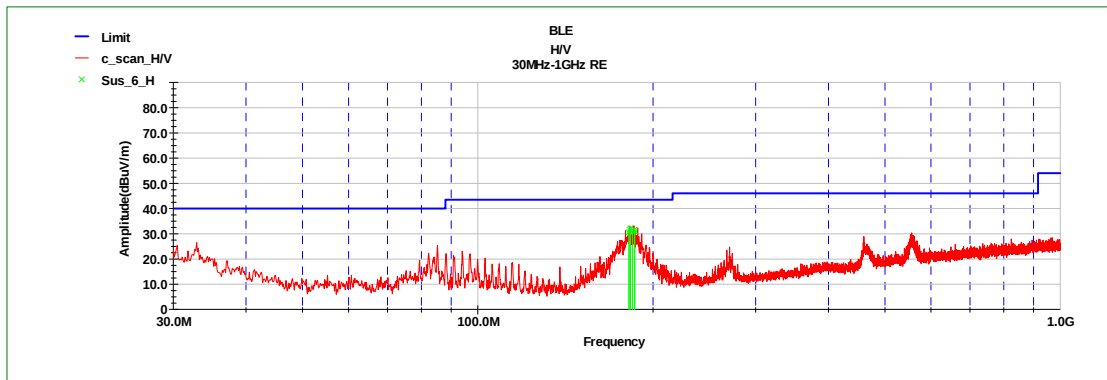


Fig.23 Radiated Emission of channel 19 in 30MHz-1GHz

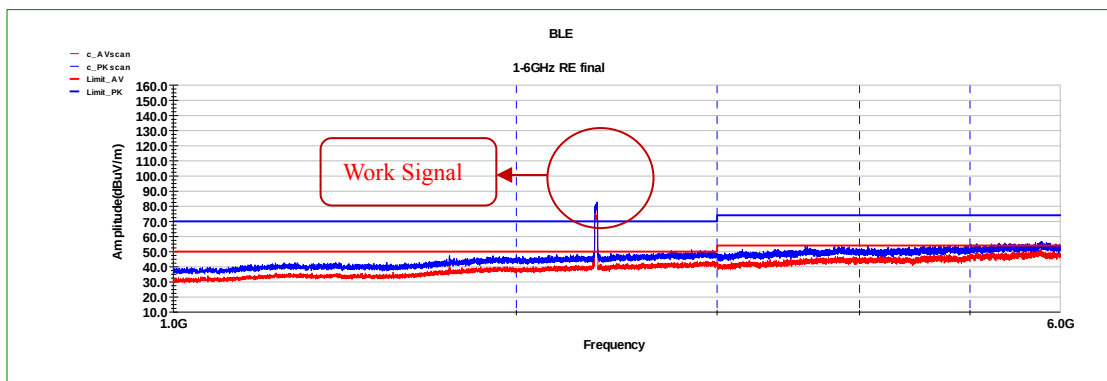


Fig.24 Radiated Emission of channel 19 in 1GHz-6GHz

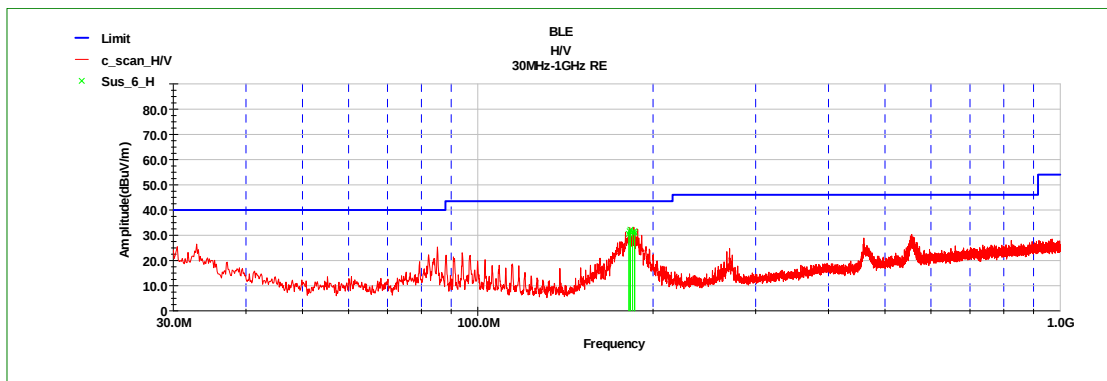


Fig.25 Radiated Emission of channel 39 in 30MHz-1GHz

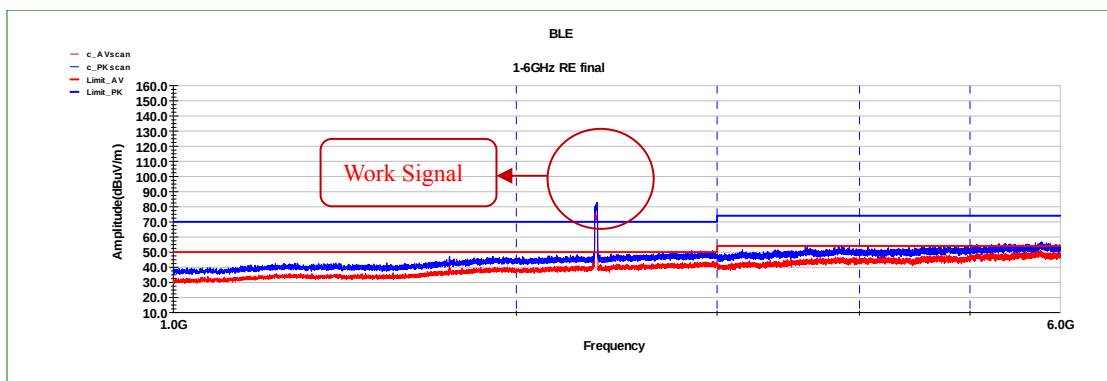


Fig.26 Radiated Emission of channel 39 in 1GHz-6GHz

B.7 AC Conducted Emission

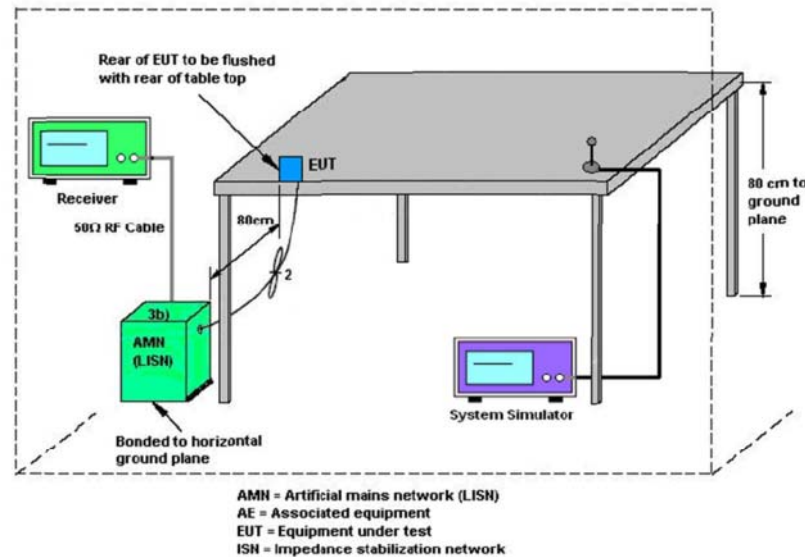
B.7.1 Description

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits

B.7.2 Test Procedure

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

B.7.4 Test Setup





B.7.5 Test Results

Limit

Frequency of Emission(MHz)	Conducted Limit(dB μ V)	
	Quasi –Peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50
*Decreases with logarithm of the frequency		

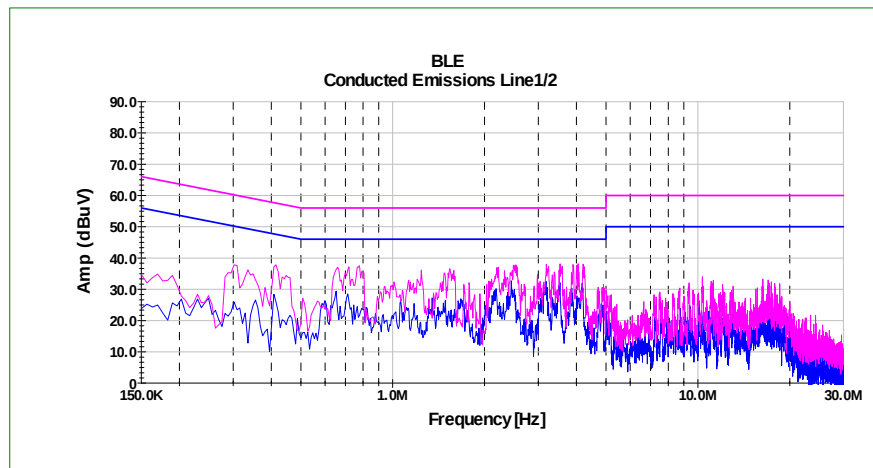


Fig.27 AC conducted emission of BLE in 150kHz~30MHz

B.8Antenna Requirements

B.8.1 Standard Applicable

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the FCC rule.

B.8.2 Antenna Connected construction

The Antenna type used in this product is PIFA Antenna without connector and it is considered to meet antenna requirement.

B.8.3 Antenna Gain

The antenna peak gain of EUT is less than 6dBi, Therefore, it is not necessary to reduced maximum peak output power limit.

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