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# FCC Test Report

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Report No.: AGC03925160501FE08

**FCC ID** : ZAY-Z-BT1000

**APPLICATION PURPOSE** : Original Equipment

**PRODUCT DESIGNATION** : Bluetooth headset

**BRAND NAME** : ZONOKI

**MODEL NAME** : Z-BT1000, Z-BF1000

**CLIENT** : SHENZHEN ZONOKI DIGITAL TECHNOLOGY CO., LTD.

**DATE OF ISSUE** : June 12, 2016

**STANDARD(S)** : FCC Part 15 Rules

**REPORT VERSION** : V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd



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### Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	June 12, 2016	Valid	Original Report

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## 1. VERIFICATION OF COMPLIANCE

<b>Applicant</b>	SHENZHEN ZONOKI DIGITAL TECHNOLOGY CO., LTD.
<b>Address</b>	1-3 Floor, Building B, NO.49, ShangXia Road, Henggang Street, Longgang District, Shenzhen, China, 518115
<b>Manufacturer</b>	SHENZHEN ZONOKI DIGITAL TECHNOLOGY CO., LTD.
<b>Address</b>	1-3 Floor, Building B, NO.49, ShangXia Road, Henggang Street, Longgang District, Shenzhen, China, 518115
<b>Product Designation</b>	Bluetooth Headset
<b>Brand Name</b>	ZONOKI
<b>Test Model</b>	Z-BT1000
<b>Series Model</b>	Z-BF1000
<b>Difference description</b>	All the same except for the model name.
<b>Date of test</b>	May 30, 2016 to June 01, 2016
<b>Deviation</b>	None
<b>Condition of Test Sample</b>	Normal
<b>Report Template</b>	AGCRT-US-BLE/RF (2013-03-01)

We hereby certify that:

The above equipment was tested by Dongguan Precise Testing Service Co., Ltd. The test data, the energy emitted by the sample tested as described in this report is in compliance with the requirements of FCC Rules Part 15.247.

Tested By Strive Liang  
Strive Liang(Liang faqiang) June 12, 2016

Reviewed By Forrest Lei  
Forrest Lei(Lei Yonggang) June 12, 2016

Approved By Solger Zhang  
Solger Zhang(Zhang Hongyi) June 12, 2016  
Authorized Officer

## 2.GENERAL INFORMATION

### 2.1PRODUCT DESCRIPTION

The EUT is designed as a “Bluetooth headset”. It is designed by way of utilizing the FHSS technology to achieve the system operation.

A major technical description of EUT is described as following

<b>Operation Frequency</b>	2.402 GHz to 2.480GHz
<b>Bluetooth Version</b>	V4.1
<b>Modulation</b>	GFSK
<b>Number of channels</b>	40 Channel(37 Hopping Channel,3 advertising Channel)
<b>Antenna Designation</b>	PCB Antenna
<b>Antenna Gain</b>	0dBi
<b>Hardware Version</b>	Z-BF1000-V2
<b>Software Version</b>	V4.1
<b>Power Supply</b>	DC 3.7 V
Note: The USB Port can not be used for communication with PC. It's only for charging.	

### 2.2 RELATED SUBMITTAL(S)/GRANT(S)

This submittal(s) (test report) is intended for **FCC ID: ZAY-Z-BT1000** filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.

### 2.3TEST METHODOLOGY

All measurements contained in this report were conducted with ANSI C63.10-2013.

### 2.4 TEST FACILITY

All measurement facilities used to collect the measurement data are located at Dongguan Precise Testing Service Co., Ltd.

Building D,Baoding Technology Park,Guangming Road2,Dongcheng District, Dongguan, Guangdong, China,

### 2.5 SPECIAL ACCESSORIES

Refer to section 3.2.

### 2.6 EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

### 2.7 MEASUREMENT UNCERTAINTY

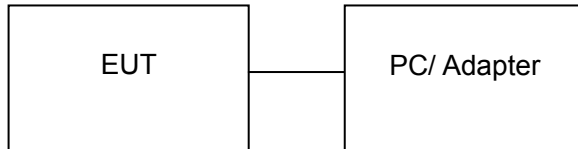
Radiation Emission: +/-3.2

Conduction Emission: +/-2.5

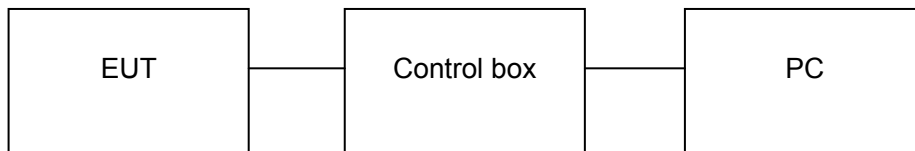
### 3. SYSTEM TEST CONFIGURATION

#### 3.1 CONFIGURATION OF TESTED SYSTEM

Configure 1: (Normal hopping)



**Configuration:** Continuous TX



#### 3.2 EQUIPMENT USED IN TESTED SYSTEM

ITEM	EQUIPMENT	MFR/BRAND	MODEL/TYPE NO.	REMARK
1	Bluetooth headset	ZONOKI	Z-BT1000	EUT
2	Battery	N/A	XK602030	Accessory
3	PC	Sony	E1412AYCW	A.E
4	Control box	CSR	N/A	A.E
5	Adapter	SURPER-EAGEL	CH06-050100-US	A.E

### 3.3. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§ 15.203	Antenna Requirement	Compliant
§15.209 §15.247(d)	Radiated Emission	Compliant
§15.247(d)	Band Edges	Compliant
§15.247	6 dB Bandwidth	Compliant
§15.247(b)	Conducted Power	Compliant
§15.247(e)	Maximum Conducted Output Power SPECTRAL Density	Compliant
§15.207	Line Conduction Emission	Compliant



#### 4. DESCRIPTION OF TEST MODES

The EUT has been operated in one modulation: GFSK .

NO.	TEST MODE DESCRIPTION
1	Low channel GFSK
2	Middle channel GFSK
3	High channel GFSK
4	BT Link with charging
5	BT Link

Note:

1. Only the result of the worst case was recorded in the report if no any records.
2. For Radiated Emission, 3axis were chosen for testing for each applicable mode.
3. Transmitting duty cycle >98%, The average correction factor is about -0.18
- 4.The EUT used fully-charged battery when tested.

## **5. ANTENNA REQUIREMENT**

### **5.1. STANDARD APPLICABLE**

According to FCC 15.203, An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. 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 provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

### **5.2. TEST RESULT**

This product has a PCB antenna, fulfill the requirement of this section.

## 6. TEST FACILITY

<b>Site</b>	Dongguan Precise Testing Service Co., Ltd.
<b>Location</b>	Building D,Baoding Technology Park,Guangming Road2,Dongcheng District, Dongguan, Guangdong, China,
<b>FCC Registration No.</b>	371540
<b>Description</b>	The test site is constructed and calibrated to meet the FCC requirements in documents ANSI C63.10:2013.

### ALL TEST EQUIPMENT LIST

#### FOR RADIATED EMISSION TEST (BELOW 1GHZ)

Radiated Emission Test Site					
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
EMI Test Receiver	Rohde & Schwarz	ESCI	101417	July 4, 2015	July 3, 2016
Trilog Broadband Antenna (25M-1GHz)	SCHWARZBECK	VULB9160	9160-3355	July 4, 2015	July 3, 2016
Signal Amplifier	SCHWARZBECK	BBV 9475	9745-0013	July 4, 2015	July 3, 2016
RF Cable	SCHWARZBECK	AK9515E	96221	July 4, 2015	July 3, 2016
3m Anechoic Chamber	CHENGYU	966	PTS-001	June 6, 2015	June 5, 2016
MULTI-DEVICE Positioning Controller	Max-Full	MF-7802	MF780208339	N/A	N/A
Active loop antenna (9K-30MHz)	Schwarzbeck	FMZB1519	1519-038	June 6, 2015	June 5, 2016
Spectrum analyzer	Agilent	E4407B	MY46185649	June 6, 2015	June 5, 2016

#### FOR RADIATED EMISSION TEST (1GHZ ABOVE)

Radiated Emission Test Site					
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
EMI Test Receiver	Rohde & Schwarz	ESCI	101417	July 4, 2015	July 3, 2016
Trilog Broadband Antenna (25M-1GHz)	SCHWARZBECK	VULB9160	9160-3355	July 4, 2015	July 3, 2016
Signal Amplifier	SCHWARZBECK	BBV 9475	9745-0013	July 4, 2015	July 3, 2016
RF Cable	SCHWARZBECK	AK9515E	96221	July 4, 2015	July 3, 2016
3m Anechoic Chamber	CHENGYU	966	PTS-001	June 6, 2015	June 5, 2016
MULTI-DEVICE Positioning Controller	Max-Full	MF-7802	MF780208339	N/A	N/A
Active loop antenna (9K-30MHz)	Schwarzbeck	FMZB1519	1519-038	June 6, 2015	June 5, 2016
Spectrum analyzer	Agilent	E4407B	MY46185649	June 6, 2015	June 5, 2016

Conducted Emission Test Site					
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
EMI Test Receiver	Rohde & Schwarz	ESCI	101417	July 4, 2015	July 3, 2016
Artificial Mains Network	Narda	L2-16B	000WX31025	July 8, 2015	July 7, 2016
Artificial Mains Network (AUX)	Narda	L2-16B	000WX31026	July 8, 2015	July 7, 2016
RF Cable	SCHWARZBECK	AK9515E	96222	July 4, 2015	July 3, 2016
Shielded Room	CHENGYU	843	PTS-002	June 6, 2015	June 5, 2016
Conduction Cable	MXT	SE1	S003	June 6, 2015	June 5, 2016

## **7. RADIATED EMISSION**

### **7.1 MEASUREMENT PROCEDURE**

1. The measuring distance of 3m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation(Below 1GHz)
2. The measuring distance of 3m shall used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation(Above 1GHz)
3. The height of the test antenna shall vary between 1m to 4m.Both horizontal and vertical polarization Of the antenna are set to make the measurement.
4. The initial step in collecting radiated emission data is a receive peak detector mode. Pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
5. All readings are peak unless otherwise stated QP in column of Note. Peak denoted that the Peak reading compliance with the QP limits and then QP Mode measurement didn't perform(Below 1GHz)
6. All readings are Peak mode value unless otherwise stated AVG in column of Note. If the Peak mode measured value compliance with the Peak limits and lower than AVG Limits, the EUT shall be deemed to meet Peak&AVG limits and then only Peak mode was measured, but AVG mode didn't perform.(Above 1GHz)

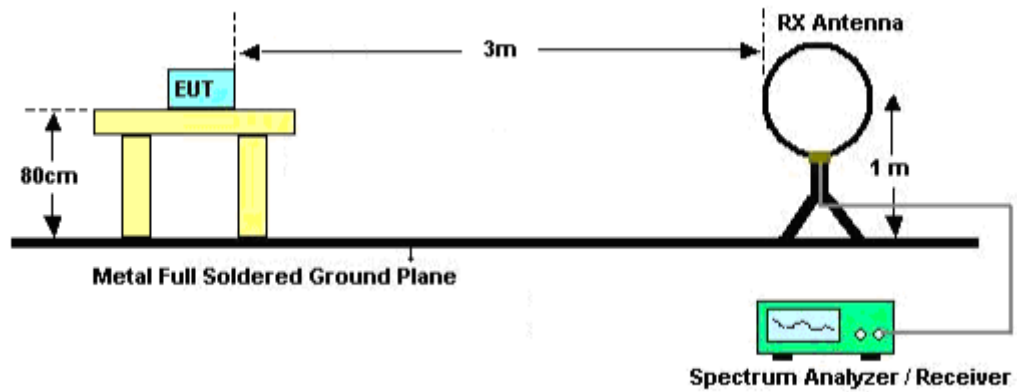
The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP
Start ~Stop Frequency	1GHz~26.5GHz 1MHz/3MHz for Peak, 1MHz/10Hz for Average

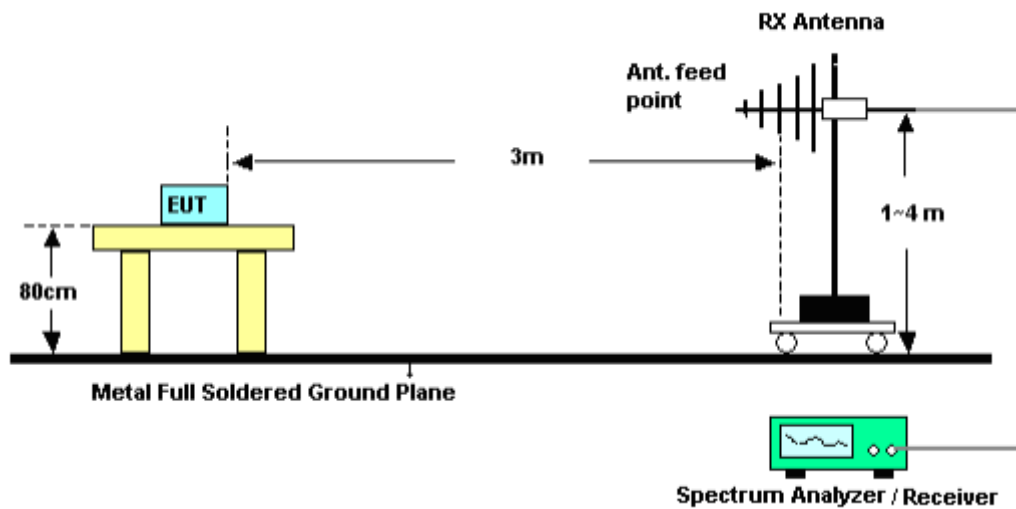
Receiver Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP

## 7.2 TEST SETUP

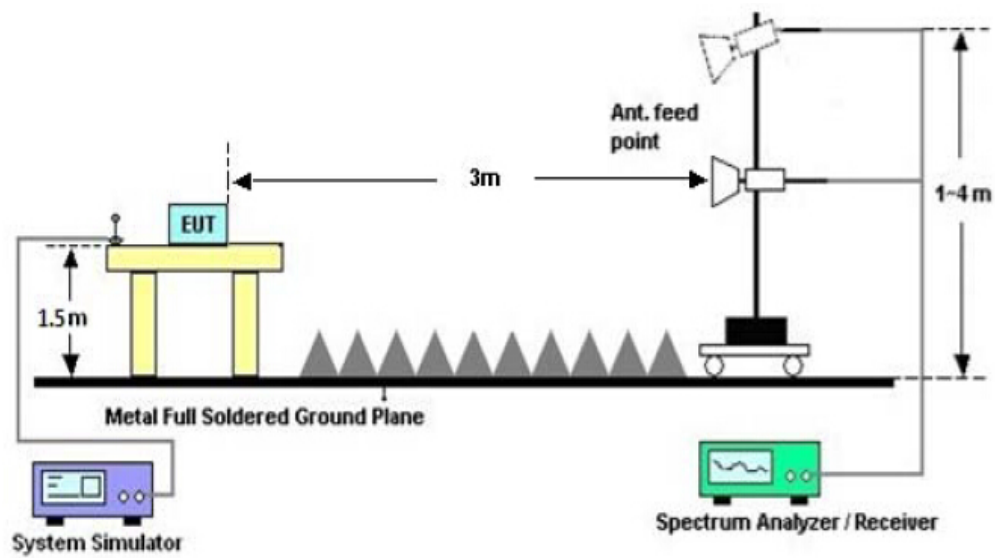
### Radiated Emission Test-Setup Frequency Below 30MHz



### RADIATED EMISSION TEST SETUP 30MHz-1000MHz



## RADIATED EMISSION TEST SETUP ABOVE 1000MHz





### 7.3 LIMITS AND MEASUREMENT RESULT

15.209 Limit in the below table has to be followed

Frequencies (MHz)	Field Strength (microvolt/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
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

Note: All modes were tested For restricted band radiated emission,  
the test records reported below are the worst result compared to other modes.

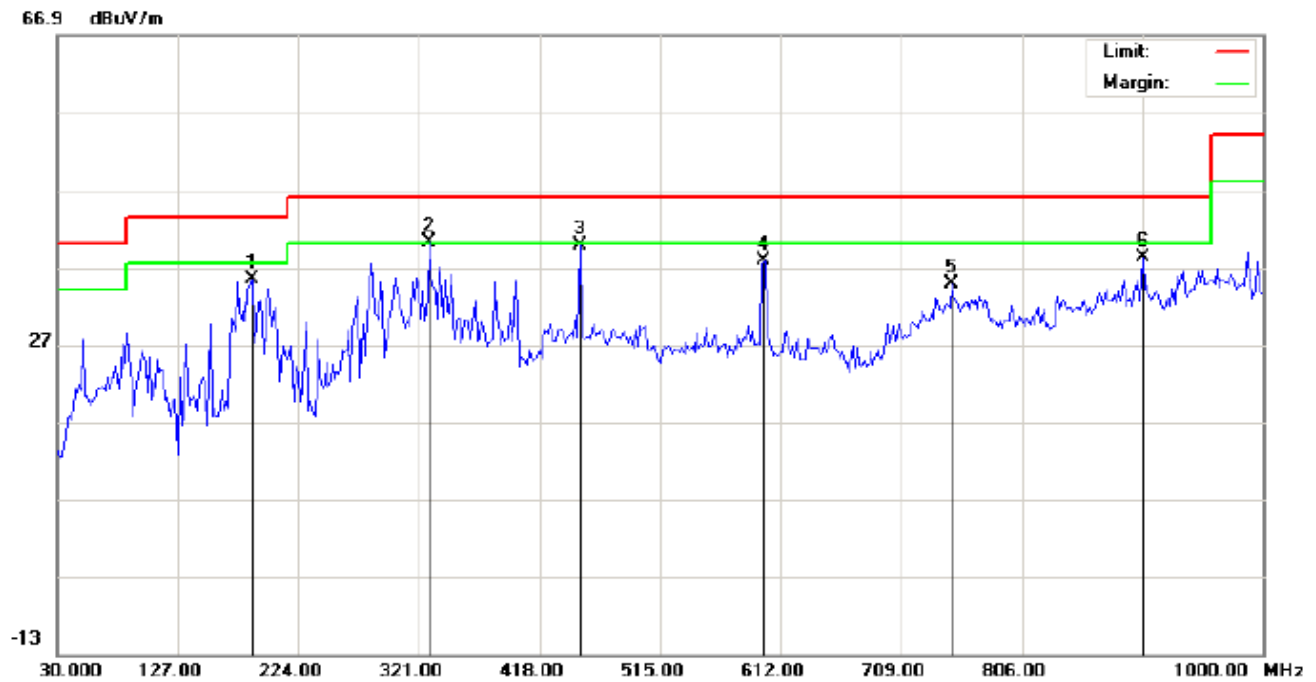
#### 7.4 TEST RESULT (Worst Modulation: GFSK)

##### RADIATED EMISSION BELOW 30MHZ

No emission found between lowest internal used/generated frequencies to 30MHz.

##### RADIATED EMISSION BELOW 1GHZ

RADIATED EMISSION TEST- (30MHZ-1GHZ)-LOW CHANNEL-HORIZONTAL

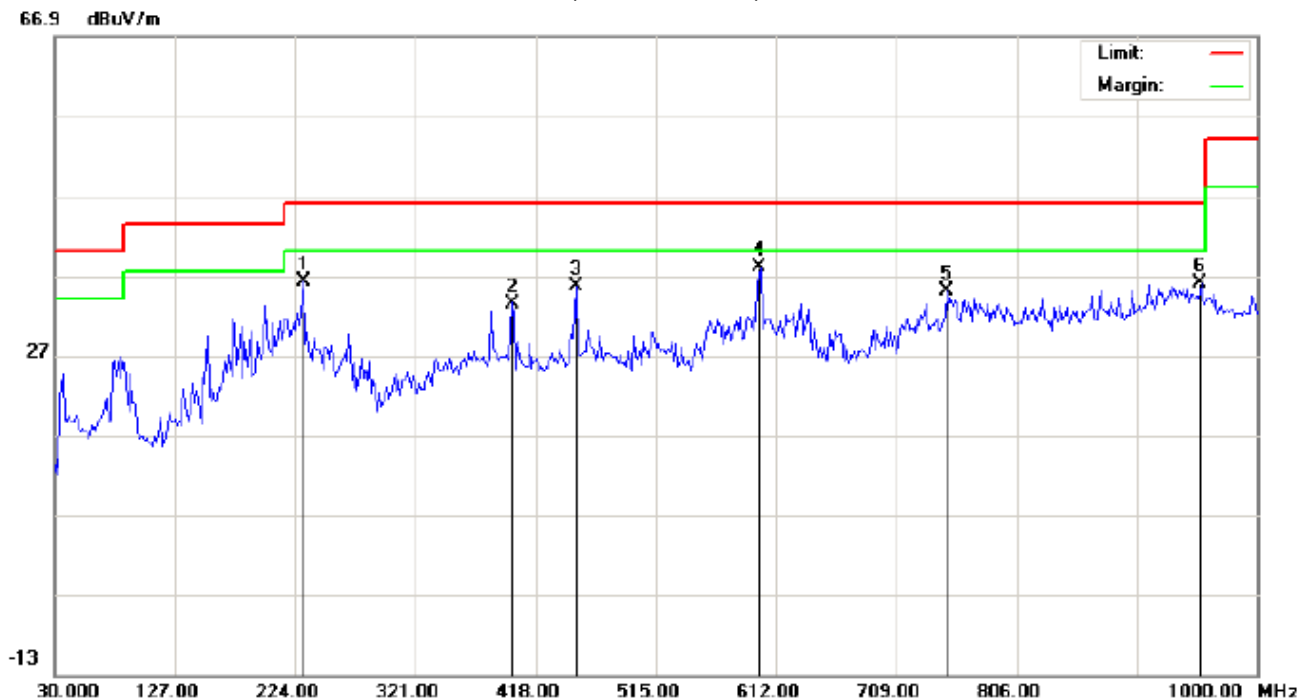


Site: site #1	Polarization: <b>Horizontal</b>	Temperature: 22.6
Limit: FCC Class B 3M Radiation	Power:	Humidity: 54.6 %
EUT:Bluetooth Headset	Distance:	
M/N: Z-BT1000		
Mode:Low Channel TX		
Note:		

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		186.8166	24.01	11.39	35.40	43.50	-8.10	peak			
2	*	329.0833	22.90	17.35	40.25	46.00	-5.75	peak			
3		450.3333	19.14	20.59	39.73	46.00	-6.27	peak			
4		599.0666	14.16	23.71	37.87	46.00	-8.13	peak			
5		749.4166	8.10	26.61	34.71	46.00	-11.29	peak			
6		903.0000	9.51	28.69	38.20	46.00	-7.80	peak			

**RESULT: PASS**

## RADIATED EMISSION TEST- (30MHZ-1GHZ)-LOW CHANNEL -VERTICAL



Site: site #1

Limit: FCC Class B 3M Radiation

EUT:Bluetooth Headset

M/N: Z-BT1000

Mode:Low Channel TX

Note:

Polarization: **Vertical**

Power:

Distance:

Temperature: 22.6

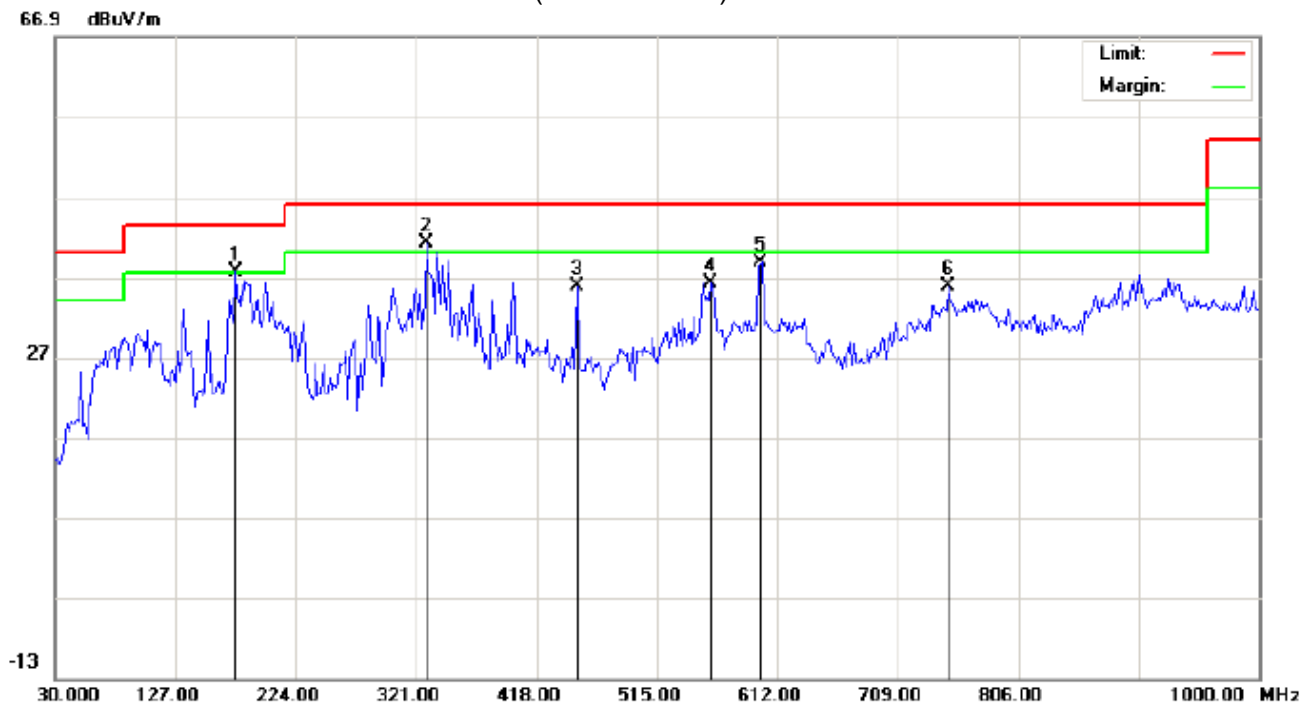
Humidity: 54.6 %

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		230.4667	24.23	11.99	36.22	46.00	-9.78	peak			
2		398.6000	14.44	19.06	33.50	46.00	-12.50	peak			
3		450.3333	14.93	20.59	35.52	46.00	-10.48	peak			
4	*	599.0666	15.27	22.73	38.00	46.00	-8.00	peak			
5		749.4166	8.37	26.61	34.98	46.00	-11.02	peak			
6		954.7332	5.98	29.95	35.93	46.00	-10.07	peak			

**RESULT: PASS****Note:** 1. Factor=Antenna Factor + Cable loss, Margin=Measurement-Limit.

2. The "Factor" value can be calculated automatically by software of measurement system.

## RADIATED EMISSION TEST- (30MHZ-1GHZ)-MIDDLE CHANNEL-HORIZONTAL



Site: site #1

Limit: FCC Class B 3M Radiation

EUT: Bluetooth Headset

M/N: Z-BT1000

Mode: Middle Channel TX

Note:

Polarization: *Horizontal*

Power:

Distance:

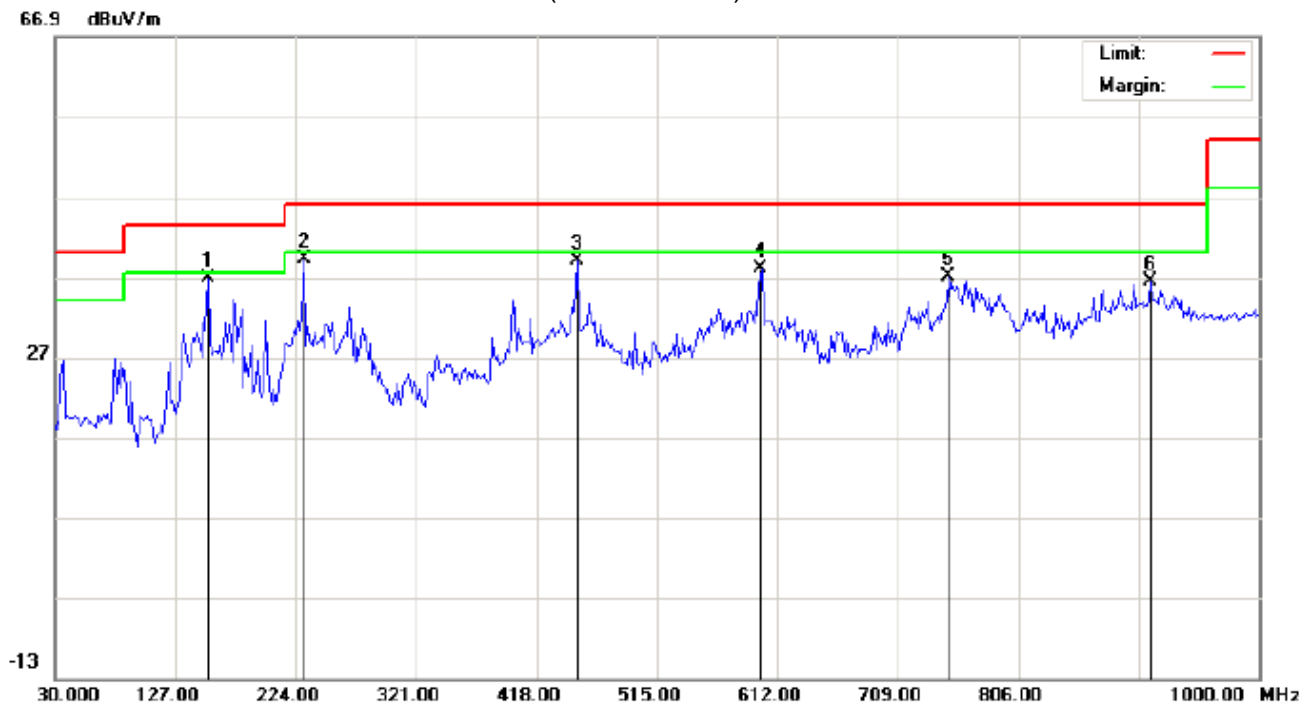
Temperature: 22.6

Humidity: 54.6 %

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	!	175.5000	26.64	10.90	37.54	43.50	-5.96	peak			
2	*	329.0833	23.90	17.35	41.25	46.00	-4.75	peak			
3		450.3333	15.14	20.59	35.73	46.00	-10.27	peak			
4		558.6499	13.54	22.70	36.24	46.00	-9.76	peak			
5		599.0666	15.16	23.71	38.87	46.00	-7.13	peak			
6		749.4166	9.10	26.61	35.71	46.00	-10.29	peak			

**RESULT: PASS**

## RADIATED EMISSION TEST- (30MHZ-1GHZ)- MIDDLE CHANNEL -VERTICAL



Site: site #1

Limit: FCC Class B 3M Radiation

EUT:Bluetooth Headset

M/N: Z-BT1000

Mode:Middle Channel TX

Note:

Polarization: **Vertical**

Power:

Distance:

Temperature: 22.6

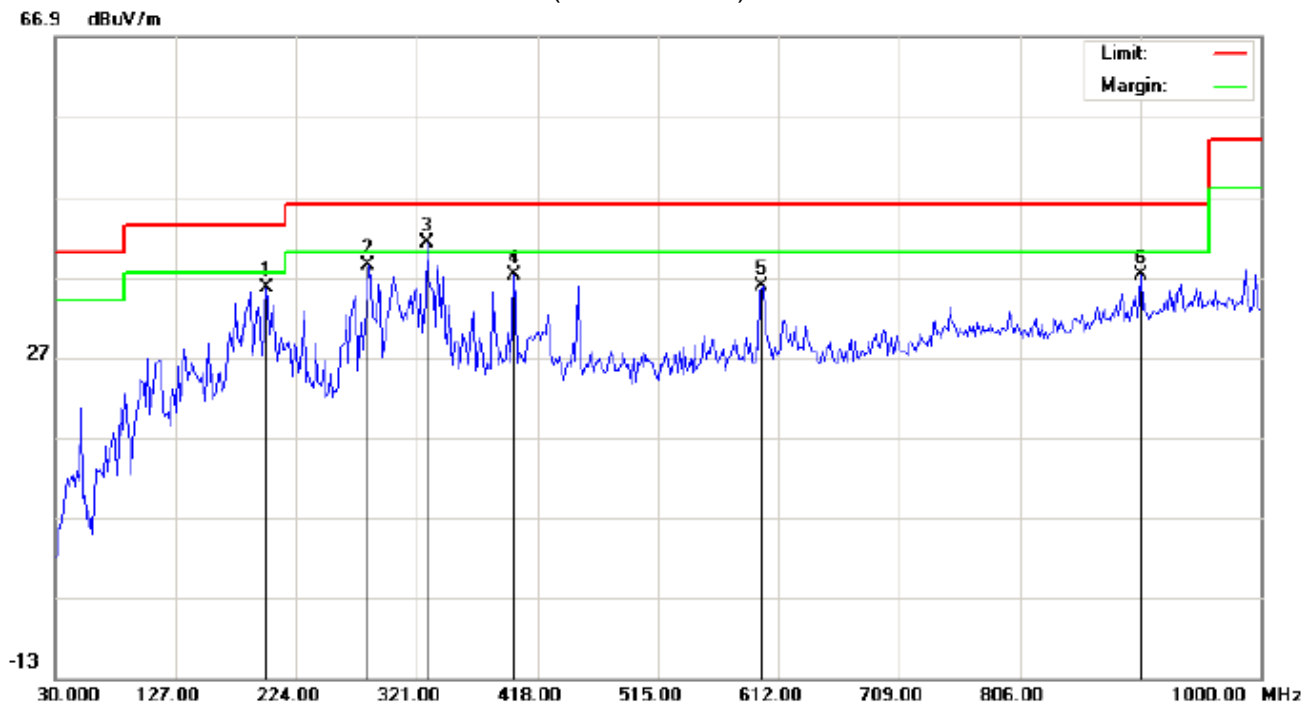
Humidity: 54.6 %

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	152.8667	21.58	15.28	36.86	43.50	-6.64	peak			
2		230.4667	27.23	11.99	39.22	46.00	-6.78	peak			
3		450.3333	18.43	20.59	39.02	46.00	-6.98	peak			
4		599.0666	15.27	22.73	38.00	46.00	-8.00	peak			
5		749.4166	10.37	26.61	36.98	46.00	-9.02	peak			
6		912.7000	7.42	28.96	36.38	46.00	-9.62	peak			

**RESULT: PASS****Note:** 1. Factor=Antenna Factor + Cable loss, Margin=Measurement-Limit.

2. The "Factor" value can be calculated automatically by software of measurement system.

## RADIATED EMISSION TEST- (30MHZ-1GHZ)-HIGH CHANNEL-HORIZONTAL



Site: site #1  
 Limit: FCC Class B 3M Radiation  
 EUT: Bluetooth Headset  
 M/N: Z-BT1000  
 Mode: High Channel TX  
 Note:

Polarization: *Horizontal*

Temperature: 22.6

Power:

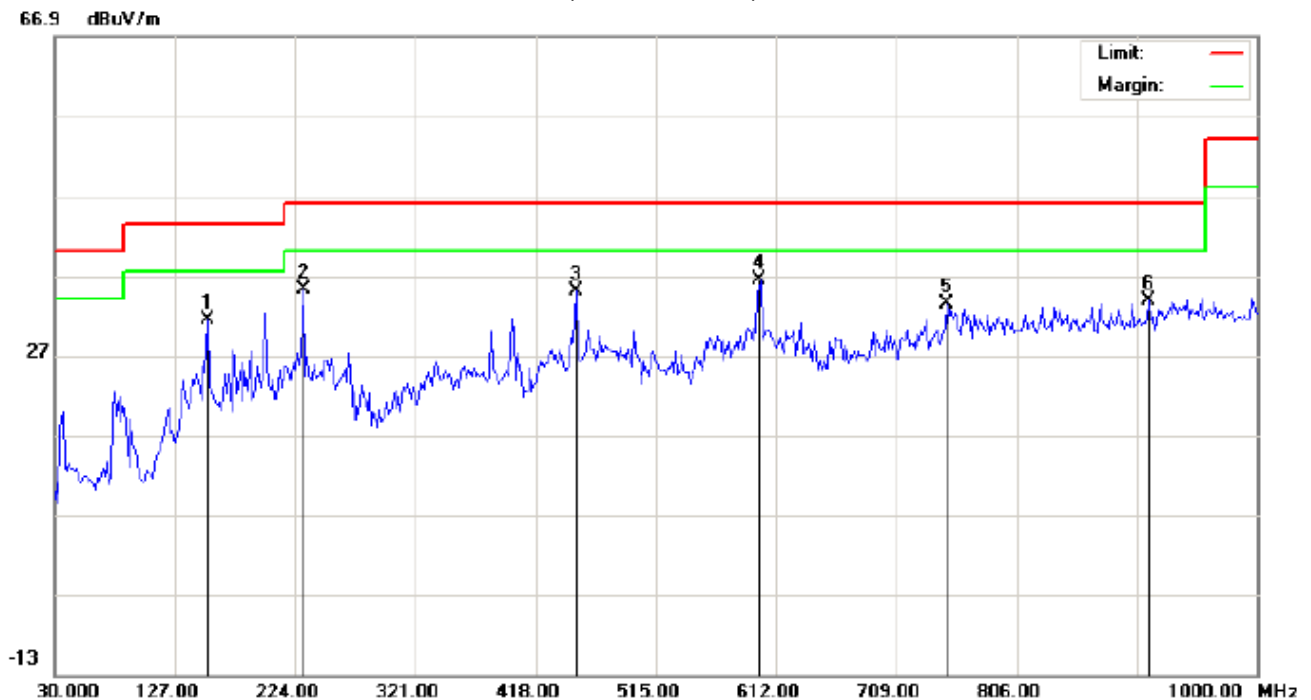
Humidity: 54.6 %

Distance:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		199.7500	23.71	11.99	35.70	43.50	-7.80	peak			
2		282.1999	26.09	12.38	38.47	46.00	-7.53	peak			
3	*	329.0833	23.90	17.35	41.25	46.00	-4.75	peak			
4		398.6000	18.19	19.06	37.25	46.00	-8.75	peak			
5		599.0666	12.16	23.71	35.87	46.00	-10.13	peak			
6		903.0000	8.51	28.69	37.20	46.00	-8.80	peak			

**RESULT: PASS**

## RADIATED EMISSION TEST- (30MHZ-1GHZ)-HIGH CHANNEL -VERTICAL



Site: site #1

Limit: FCC Class B 3M Radiation

EUT:Bluetooth Headset

M/N: Z-BT1000

Mode:High Channel TX

Note:

Polarization: **Vertical**

Power:

Distance:

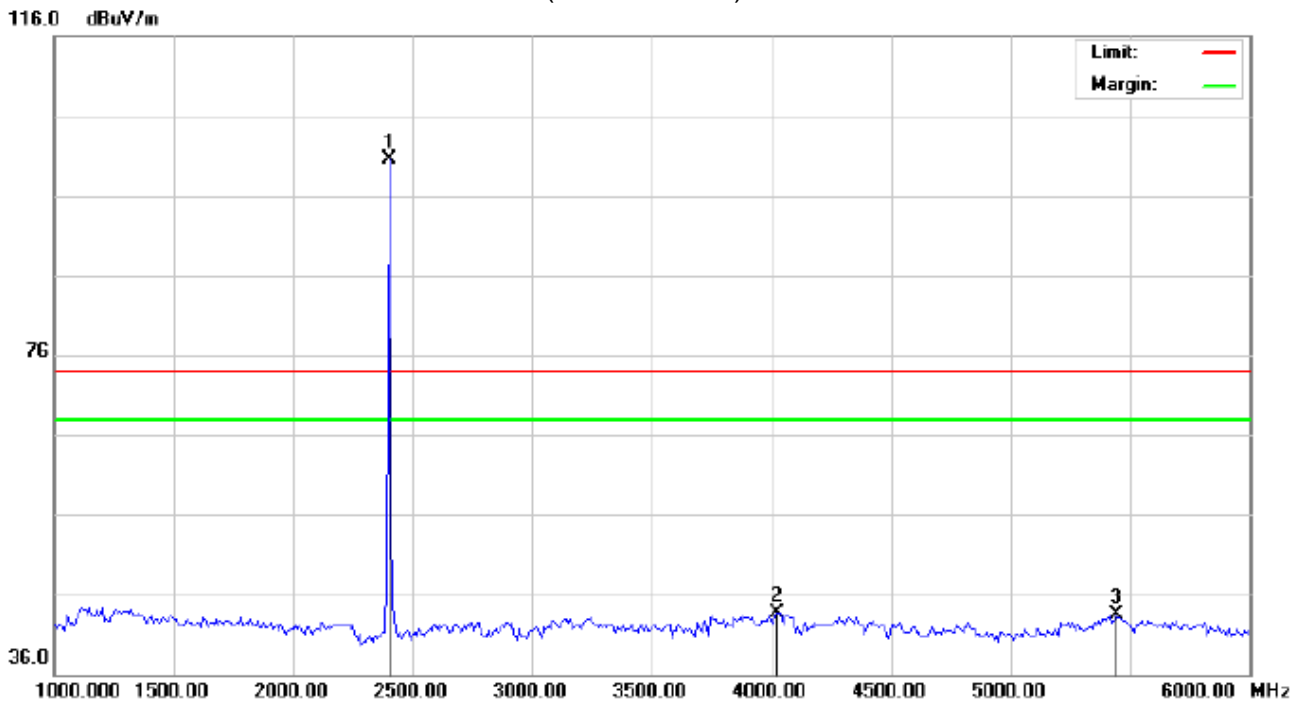
Temperature: 22.6

Humidity: 54.6 %

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		152.8667	16.08	15.28	31.36	43.50	-12.14	peak			
2		230.4667	23.23	11.99	35.22	46.00	-10.78	peak			
3		450.3333	14.43	20.59	35.02	46.00	-10.98	peak			
4	*	599.0666	13.77	22.73	36.50	46.00	-9.50	peak			
5		749.4166	6.87	26.61	33.48	46.00	-12.52	peak			
6		912.7000	4.92	28.96	33.88	46.00	-12.12	peak			

**RESULT: PASS****Note:** 1. Factor=Antenna Factor + Cable loss, Margin=Measurement-Limit.

2. The "Factor" value can be calculated automatically by software of measurement system.

**RADIATED EMISSION ABOVE 1GHZ****RADIATED EMISSION TEST- (ABOVE 1GHZ)-LOW CHANNEL-HORIZONTAL**

Site: Conduction

Polarization: *Horizontal*

Temperature: 26

Limit: FCC Class B 3M Radiation above 1GHZ(PK)

Power:

Humidity: 60 %

EUT:Bluetooth Headset

Distance:

M/N: Z-BT1000

Mode: Low Channel TX

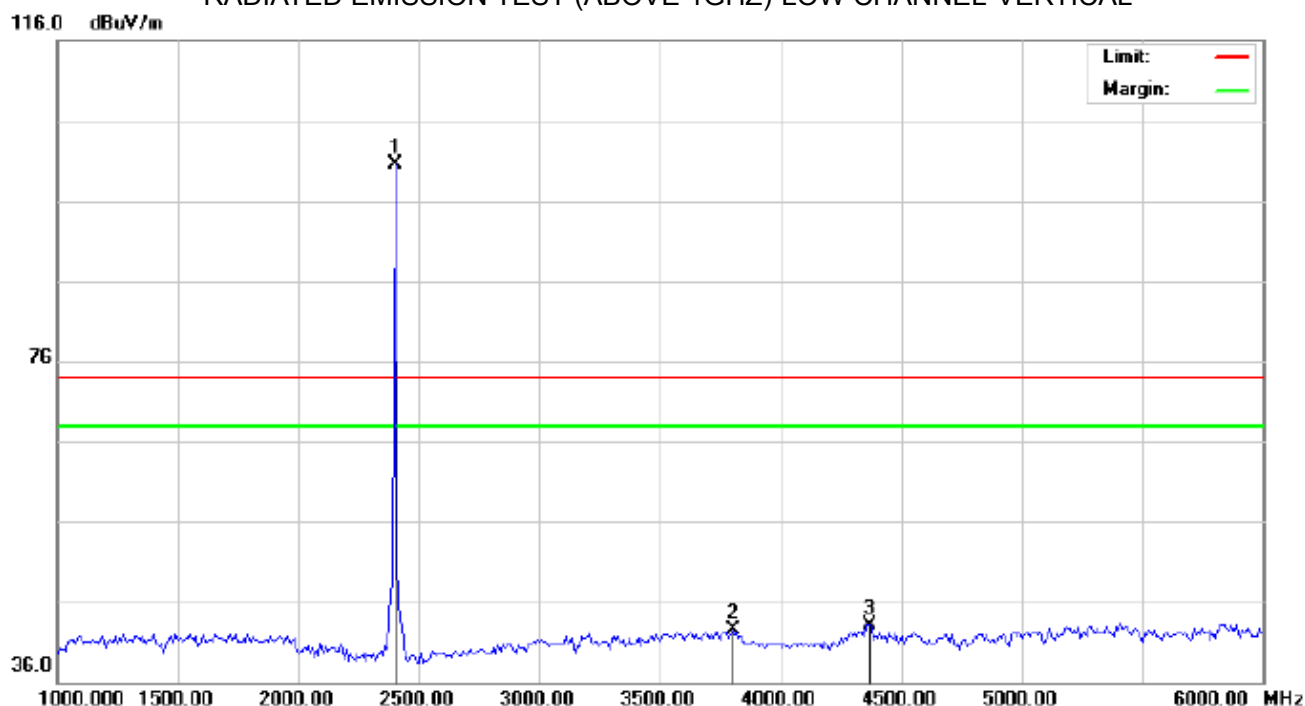
Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	2402.000	90.11	10.32	100.43	74.00	26.43	peak			
2		4025.000	28.88	14.77	43.65	74.00	-30.35	peak			
3		5441.667	44.08	-0.64	43.44	74.00	-30.56	peak			

**RESULT: PASS**



# RADIATED EMISSION TEST-(ABOVE 1GHZ)-LOW CHANNEL-VERTICAL



Site: Conduction  
Limit: FCC Class B 3M Radiation above 1GHZ(PK)  
EUT:Bluetooth Headset  
M/N: Z-BT1000  
Mode: Low Channel TX  
Note:

Polarization: **Vertical**  
Power:  
Distance:

Temperature: 26  
Humidity: 60 %

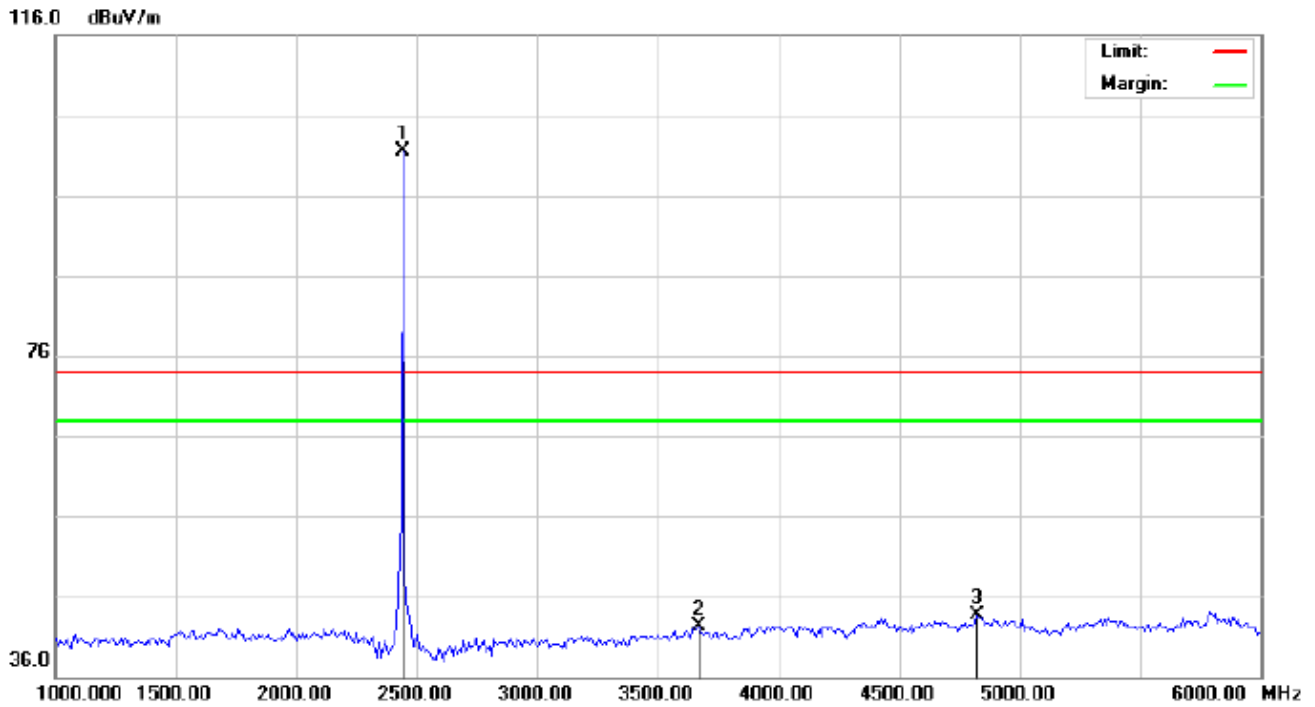
No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	2402.000	90.17	10.32	100.49	74.00	26.49	peak			
2		3800.000	28.52	13.96	42.48	74.00	-31.52	peak			
3		4366.667	34.08	9.10	43.18	74.00	-30.82	peak			

## RESULT: PASS

**Note:** 1. Factor=Antenna Factor + Cable loss, Margin=Measurement-Limit.

2. The "Factor" value can be calculated automatically by software of measurement system.

## RADIATED EMISSION TEST-(ABOVE 1GHZ)-MIDDLE CHANNEL-HORIZONTAL



Site: Conduction

Polarization: Horizontal

Temperature: 26

Limit: FCC Class B 3M Radiation above 1GHZ(PK)

Power:

Humidity: 60 %

EUT: Bluetooth Headset

Distance:

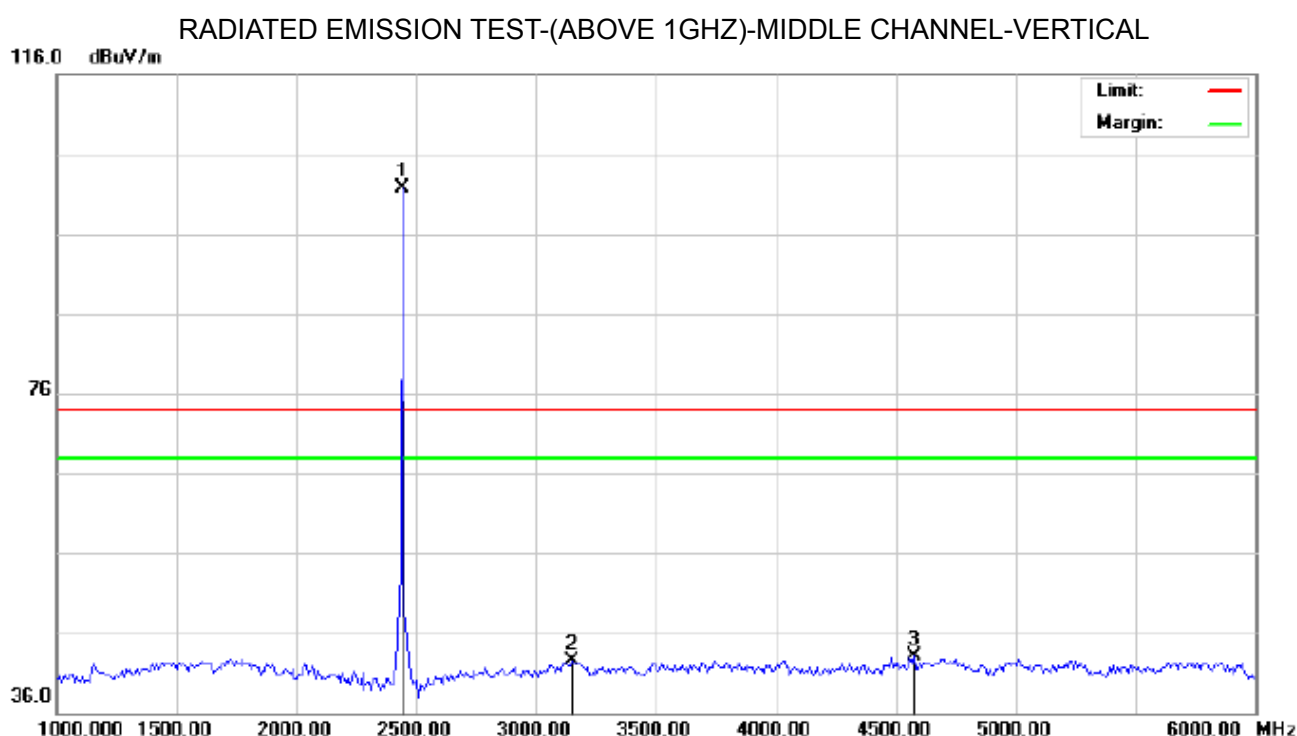
M/N: Z-BT1000

Mode: Middle Channel TX

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	2441.000	91.22	10.37	101.59	74.00	27.59	peak			
2		3666.667	29.12	13.14	42.26	74.00	-31.74	peak			
3		4825.000	35.94	7.74	43.68	74.00	-30.32	peak			

**RESULT: PASS**



Site: Conduction

Polarization: **Vertical**

Temperature: 26

Limit: FCC Class B 3M Radiation above 1GHZ(PK)

Power:

Humidity: 60 %

EUT: Bluetooth Headset

Distance:

M/N: Z-BT1000

Mode: Middle Channel TX

Note:

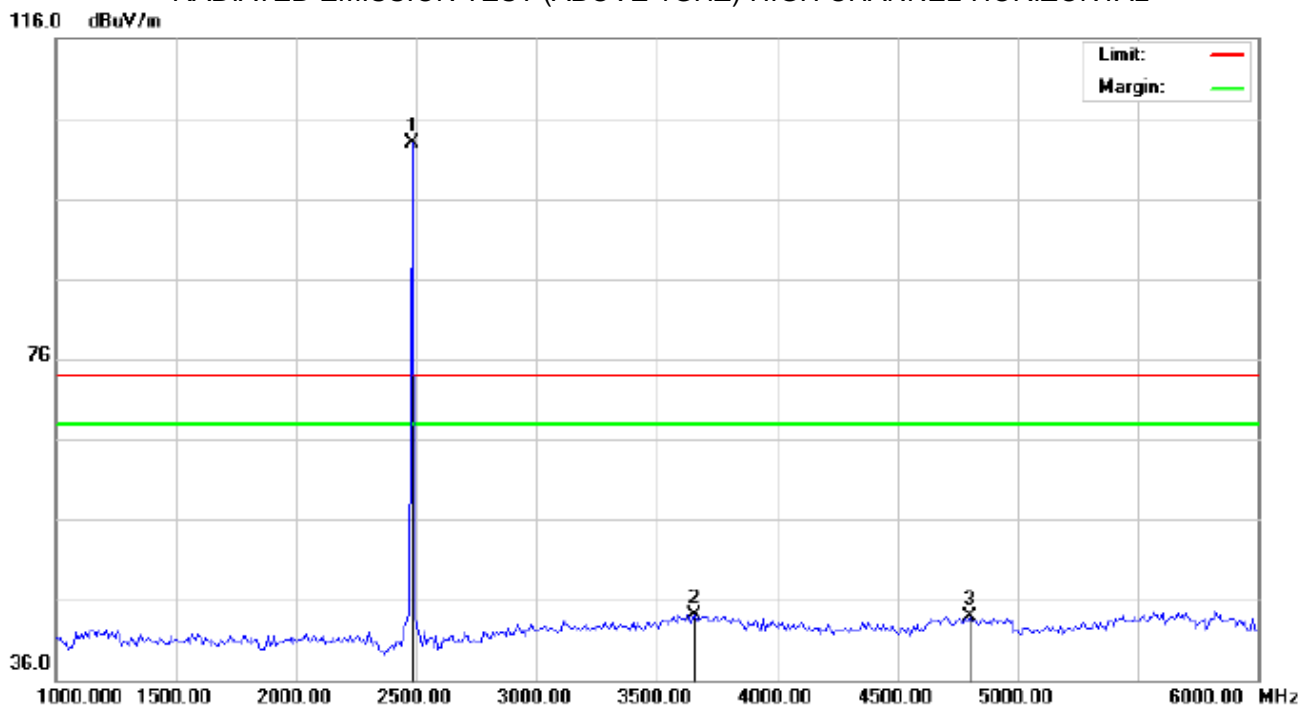
No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	2441.000	91.38	10.37	101.75	74.00	27.75	peak			
2		3150.000	30.80	11.78	42.58	74.00	-31.42	peak			
3		4575.000	35.92	7.09	43.01	74.00	-30.99	peak			

**RESULT: PASS**

**Note:** 1. Factor=Antenna Factor + Cable loss, Margin=Measurement-Limit.

2. The "Factor" value can be calculated automatically by software of measurement system.

# RADIATED EMISSION TEST-(ABOVE 1GHZ)-HIGH CHANNEL-HORIZONTAL



Site: Conduction  
Limit: FCC Class B 3M Radiation above 1GHZ(PK)  
EUT:Bluetooth Headset  
M/N: Z-BT1000  
Mode: High Channel TX  
Note:

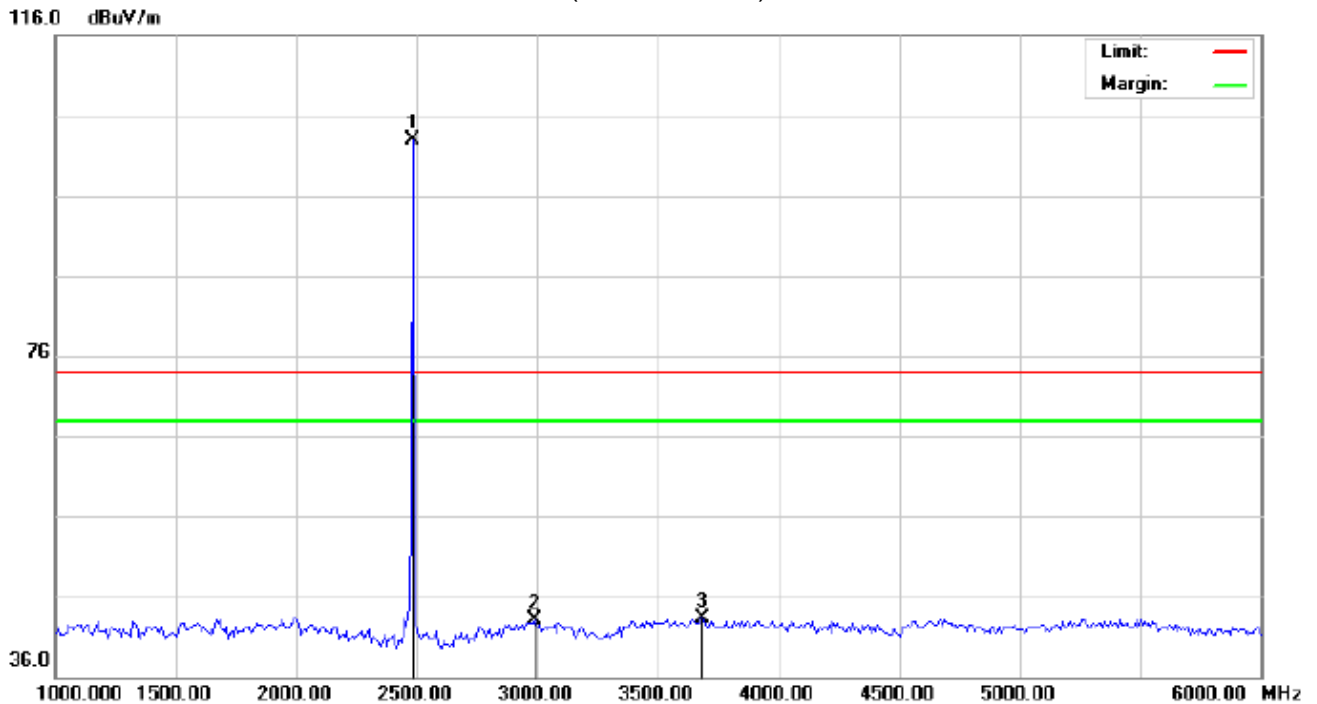
Polarization: *Horizontal*  
Power:  
Distance:

Temperature: 26  
Humidity: 60 %

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	2480.000	92.43	10.41	102.84	74.00	28.84	peak			
2		3658.333	30.97	13.09	44.06	74.00	-29.94	peak			
3		4800.000	36.13	7.68	43.81	74.00	-30.19	peak			

**RESULT: PASS**

## RADIATED EMISSION TEST-(ABOVE 1GHZ)-HIGH CHANNEL-VERTICAL



Site: Conduction

Polarization: Vertical

Temperature: 26

Limit: FCC Class B 3M Radiation above 1GHZ(PK)

Power:

Humidity: 60 %

EUT: Bluetooth Headset

Distance:

M/N: Z-BT1000

Mode: High Channel TX

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	2480.000	92.47	10.41	102.88	74.00	28.88	peak			
2		2991.667	31.48	11.62	43.10	74.00	-30.90	peak			
3		3683.333	30.09	13.24	43.33	74.00	-30.67	peak			

**RESULT: PASS****Note:** 6~25GHz at least have 20dB margin. No recording in the test report.

Factor=Antenna Factor+ Cable loss-Amplifier gain,

Margin=Measurement-Limit.

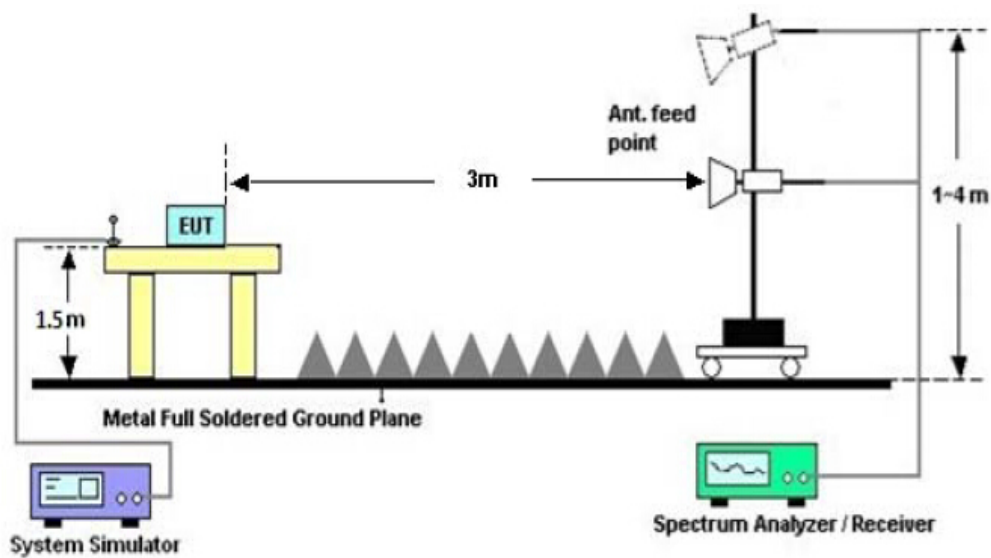
The "Factor" value can be calculated automatically by software of measurement system.

## 8. BAND EDGE EMISSION

### 8.1. MEASUREMENT PROCEDURE

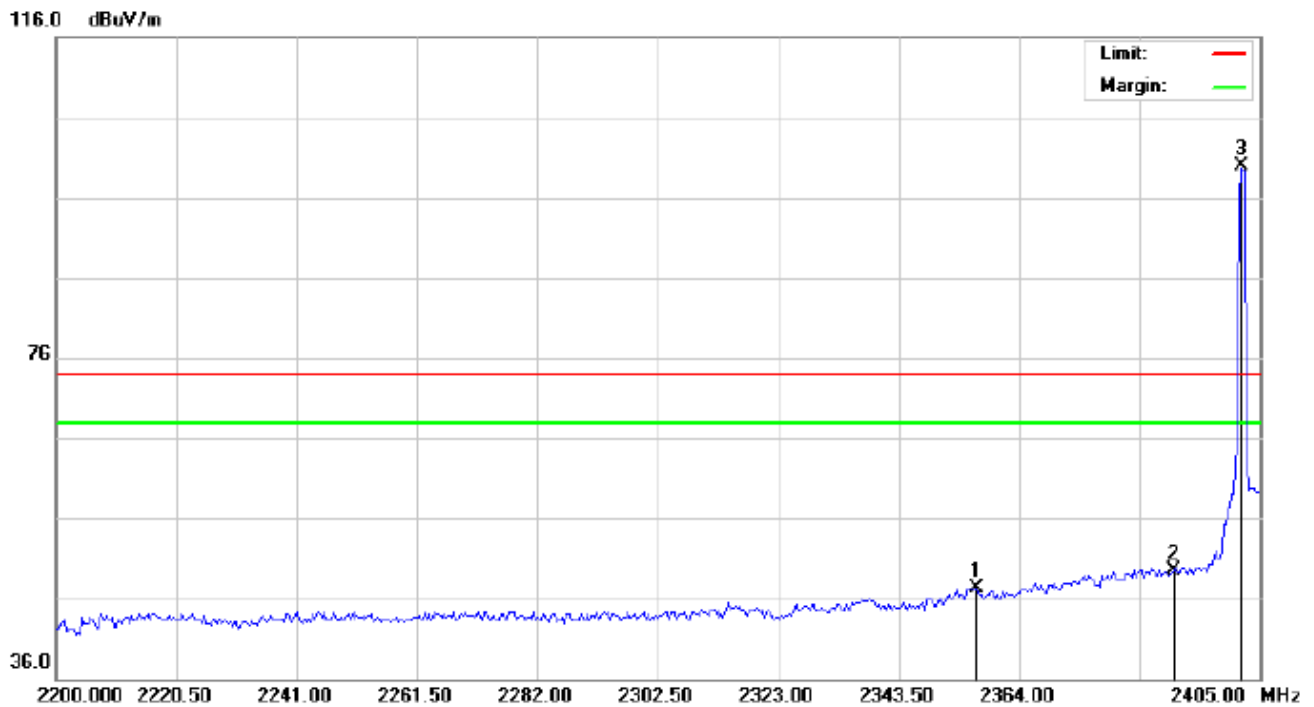
1. Set the EUT Work on the top, the bottom operation frequency individually.
2. Set SPA Start or Stop Frequency=Operation Frequency,  $RBW \geq 100\text{kHz}$ ,  $VBW \geq 3 \times RBW$ ,  
Center frequency =Operation frequency
3. The band edges was measured and recorded.

### 8.2. TEST SET-UP



## 8.3. TEST RESULT

## TEST PLOT OF BAND EDGE FOR LOW CHANNEL -Horizontal



Site: Conduction

Polarization: *Horizontal*

Temperature: 26

Limit: FCC Class B 3M Radiation above 1GHZ(PK)

Power:

Humidity: 60 %

EUT:Bluetooth Headset

Distance:

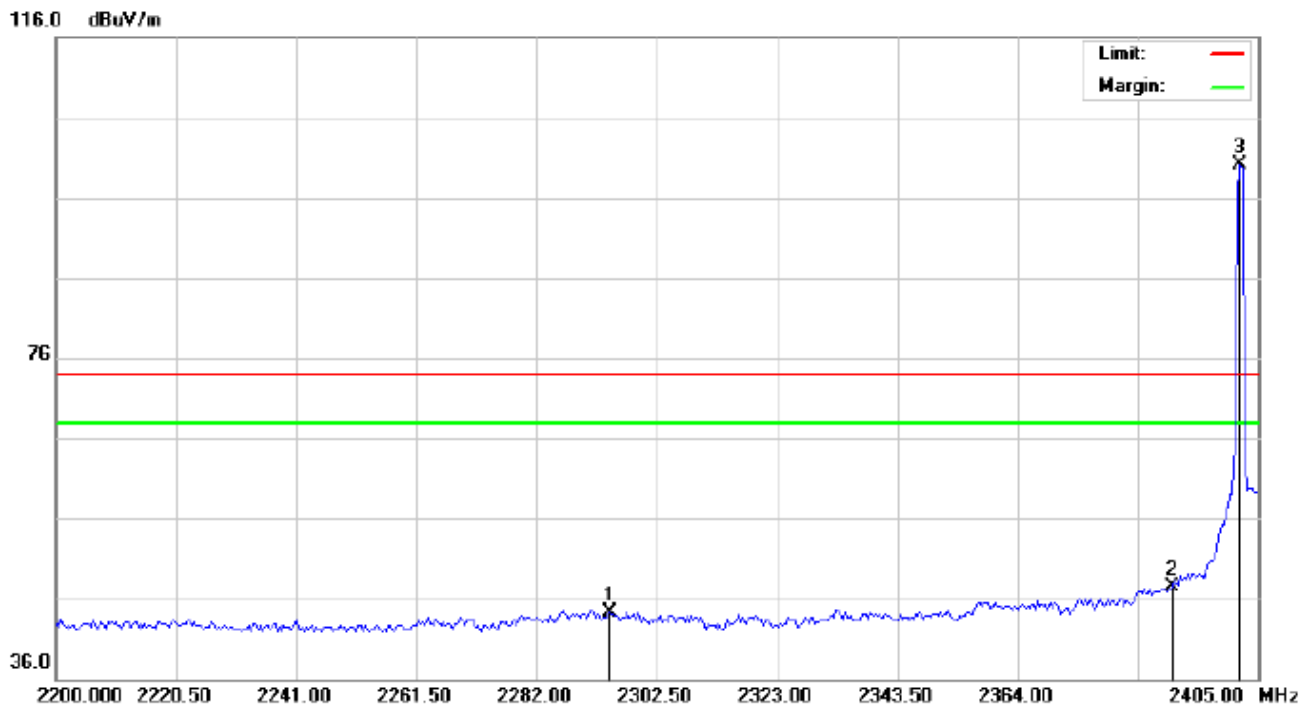
M/N: Z-BT1000

Mode: Low Channel TX

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB		cm	degree	
1		2356.825	37.09	10.27	47.36	74.00	-26.64	peak			
2		2390.000	39.12	10.31	49.43	74.00	-24.57	peak			
3	*	2402.000	89.61	10.32	99.93	74.00	25.93	peak			

## TEST PLOT OF BAND EDGE FOR LOW CHANNEL - Vertical



Site: Conduction

Polarization: *Vertical*

Temperature: 26

Limit: FCC Class B 3M Radiation above 1GHZ(PK)

Power:

Humidity: 60 %

EUT:Bluetooth Headset

Distance:

M/N: Z-BT1000

Mode: Low Channel TX

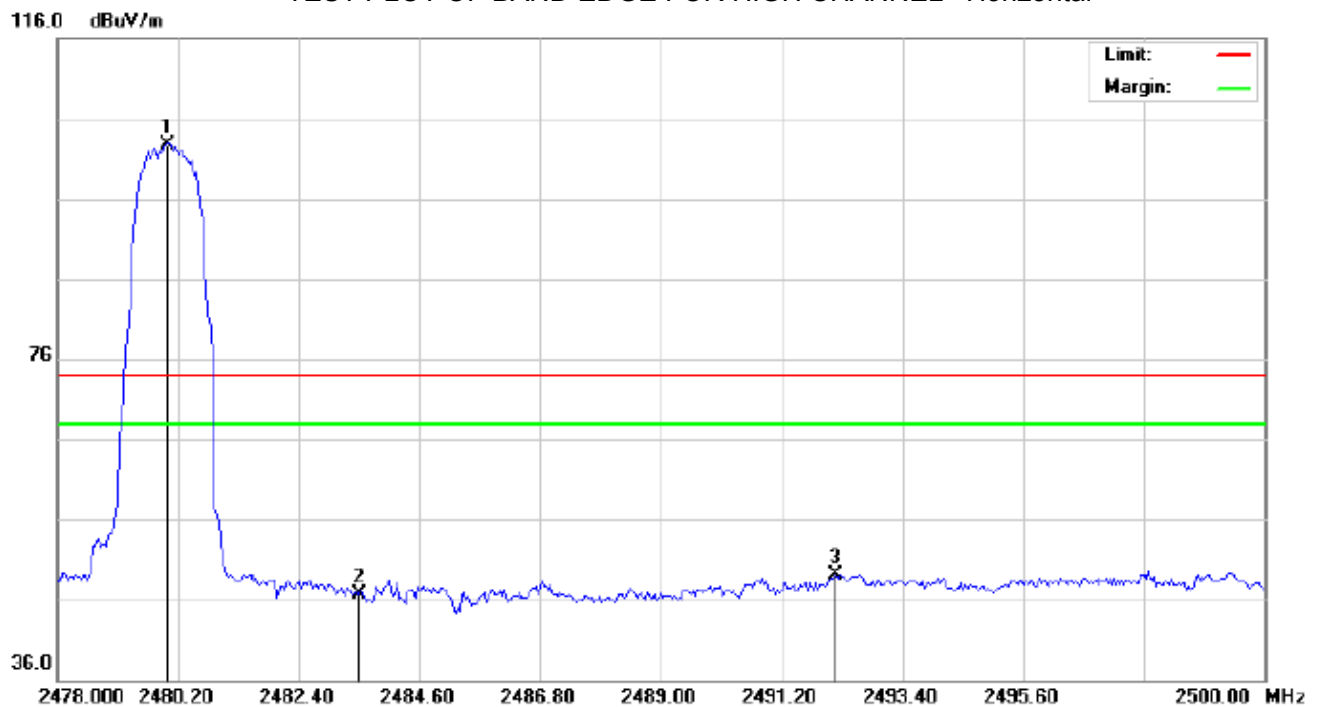
Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB		cm	degree	
1		2294.300	34.18	10.20	44.38	74.00	-29.62	peak			
2		2390.000	37.12	10.31	47.43	74.00	-26.57	peak			
3	*	2401.925	89.88	10.32	100.20	74.00	26.20	peak			

**RESULT: PASS**



## TEST PLOT OF BAND EDGE FOR HIGH CHANNEL –Horizontal



Site: Conduction

Polarization: *Horizontal*

Temperature: 26

Limit: FCC Class B 3M Radiation above 1GHZ(PK)

Power:

Humidity: 60 %

EUT: Bluetooth Headset

Distance:

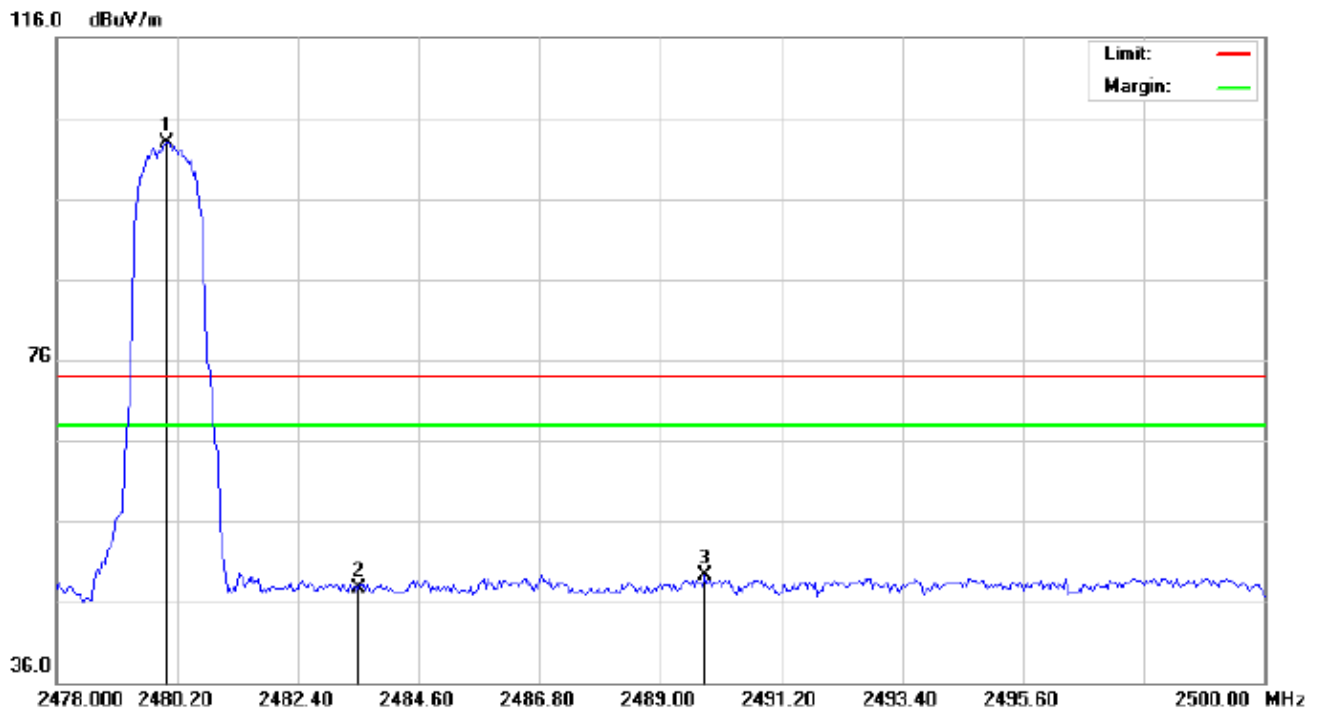
M/N: Z-BT1000

Mode: High Channel TX

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	2480.000	92.36	10.41	102.77	74.00	28.77	peak			
2		2483.500	36.25	10.41	46.66	74.00	-27.34	peak			
3		2492.190	38.74	10.42	49.16	74.00	-24.84	peak			

## TEST PLOT OF BAND EDGE FOR HIGH CHANNEL -Vertical



Site: Conduction

Polarization: **Vertical**

Temperature: 26

Limit: FCC Class B 3M Radiation above 1GHZ(PK)

Power:

Humidity: 60 %

EUT:Bluetooth Headset

Distance:

M/N: Z-BT1000

Mode: High Channel TX

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	2480.000	92.46	10.41	102.87	74.00	28.87	peak			
2		2483.500	37.25	10.41	47.66	74.00	-26.34	peak			
3		2489.807	38.78	10.42	49.20	74.00	-24.80	peak			

**RESULT: PASS**

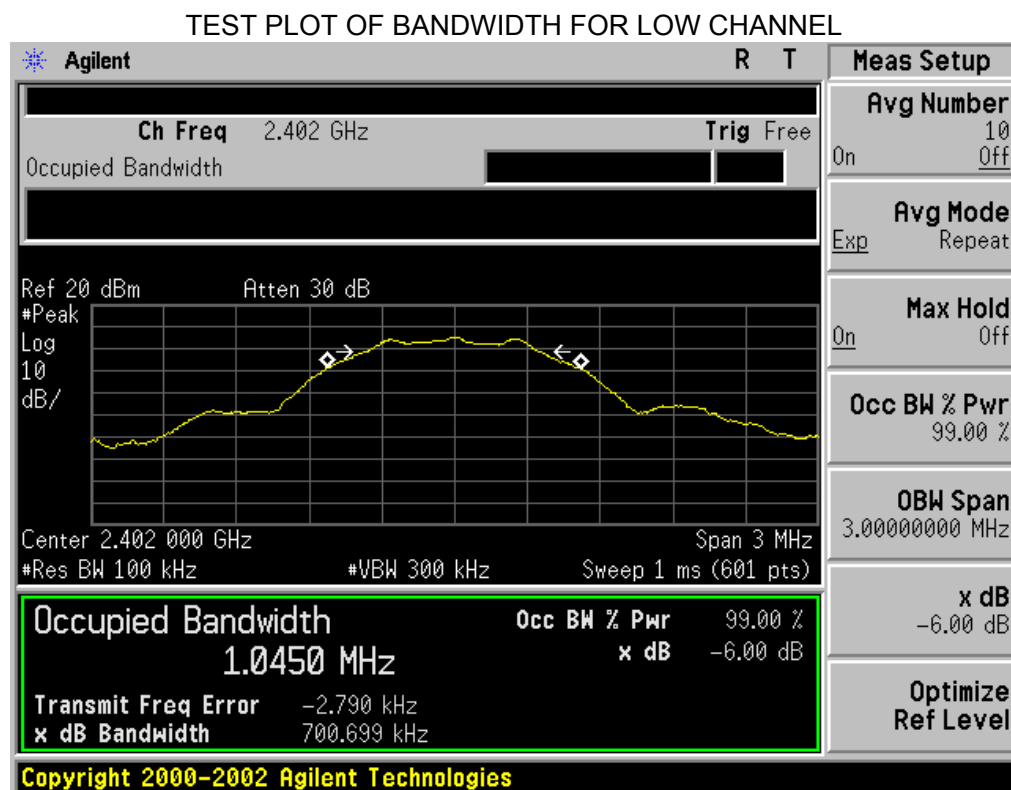
## 9. 6DB BANDWIDTH

### 9.1. TEST PROCEDURE

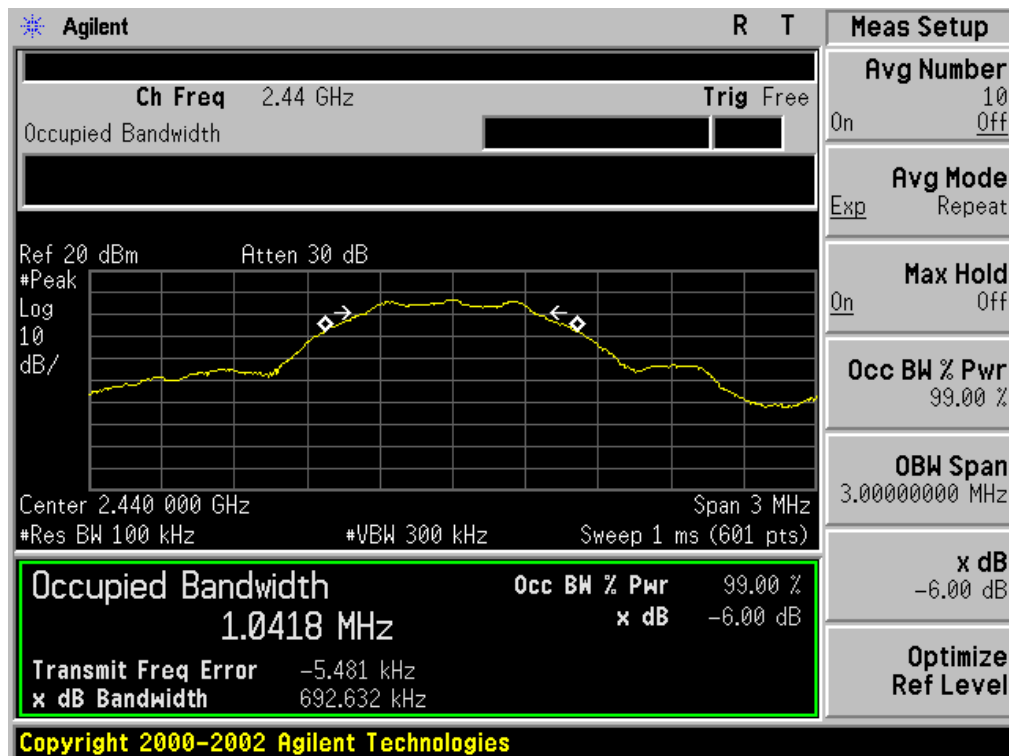
1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
3. Set SPA Centre Frequency = Operation Frequency, RBW= 100 KHz, VBW $\geq$ 3\*RBW.
4. Set SPA Trace 1 Max hold, then View.

### 9.2. SUMMARY OF TEST RESULTS/PLOTS

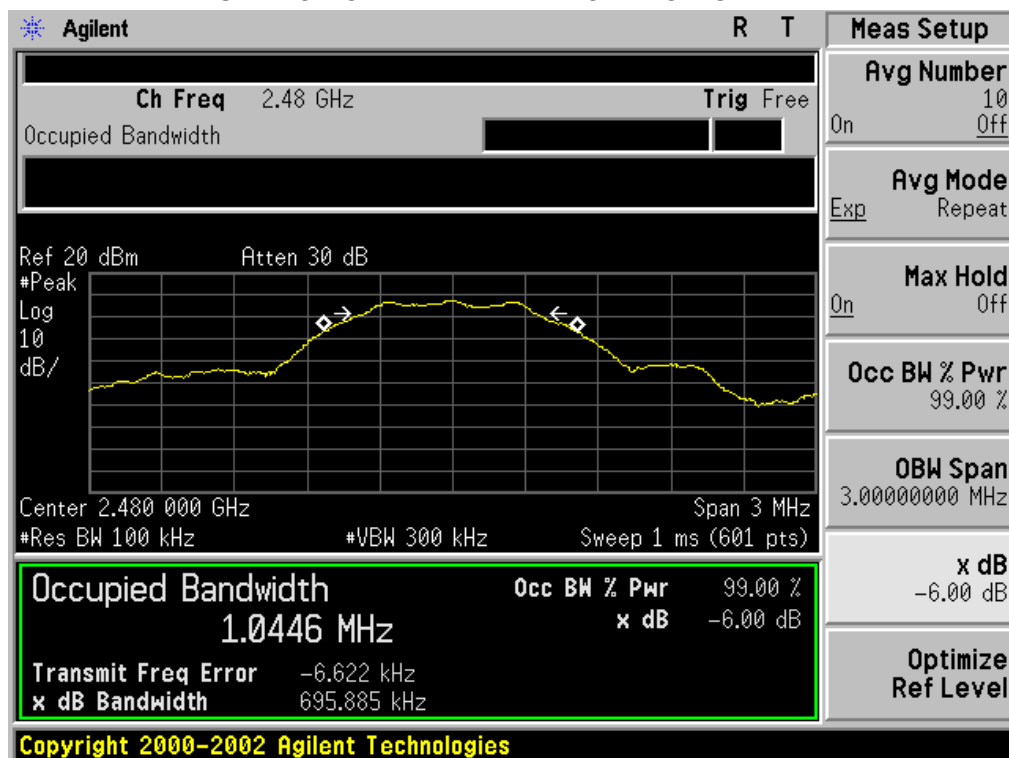
Channel	6dB Bandwidth (KHz)	Minimum Limit (KHz)	Pass/Fail
Low	0.701	500KHz	Pass
Middle	0.693		Pass
High	0.696		Pass



### TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



### TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



## 10. CONDUCTED OUTPUT POWER

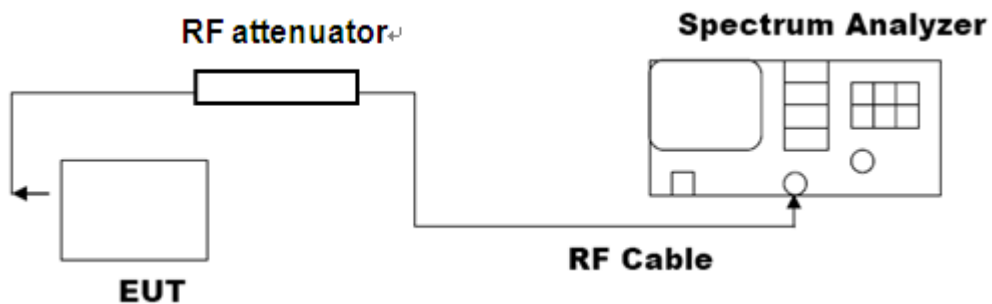
### 10.1. MEASUREMENT PROCEDURE

For peak power test:

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the top, middle and the bottom operation frequency individually.
3. Use the following spectrum analyzer settings:
  - a) Set the RBW  $\geq$  DTS bandwidth.
  - b) Set VBW  $\geq 3$  RBW.
  - c) Set span  $\geq 3 \times$  RBW
  - d) Sweep time = auto couple.
  - e) Detector = peak.
  - f) Trace mode = max hold.
  - g) Allow trace to fully stabilize.
  - h) Use peak marker function to determine the peak amplitude level.
4. Allow the trace to stabilize.
5. Record the result form the Spectrum Analyzer.

### 10.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

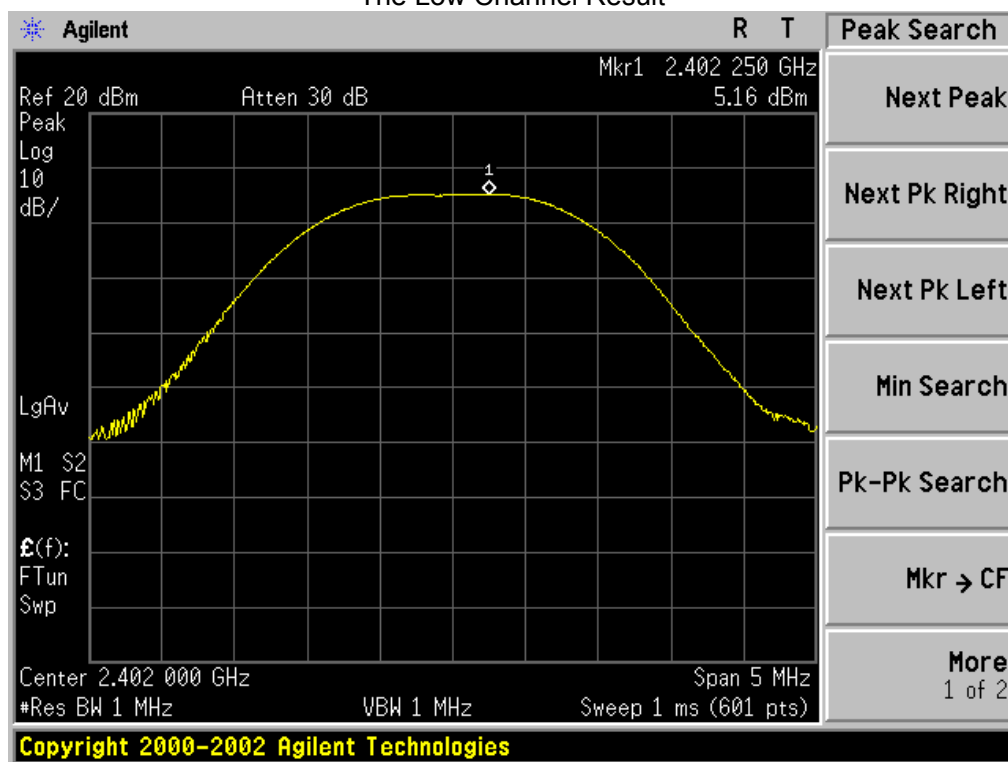
Setup Diagram for Peak Power



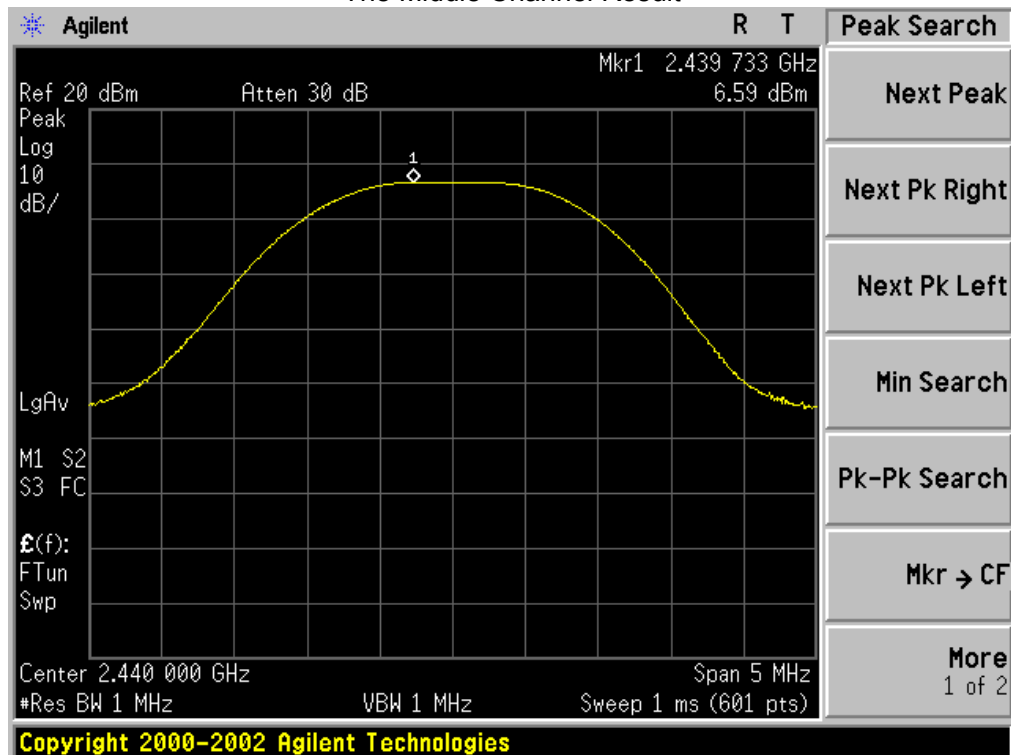
### 10.3. LIMITS AND MEASUREMENT RESULT

Channel	Peak Power (dBm)	Applicable Limits (dBm)	Pass/Fail
Low Channel	5.16	30	Pass
Middle Channel	6.59	30	Pass
High Channel	7.57	30	Pass

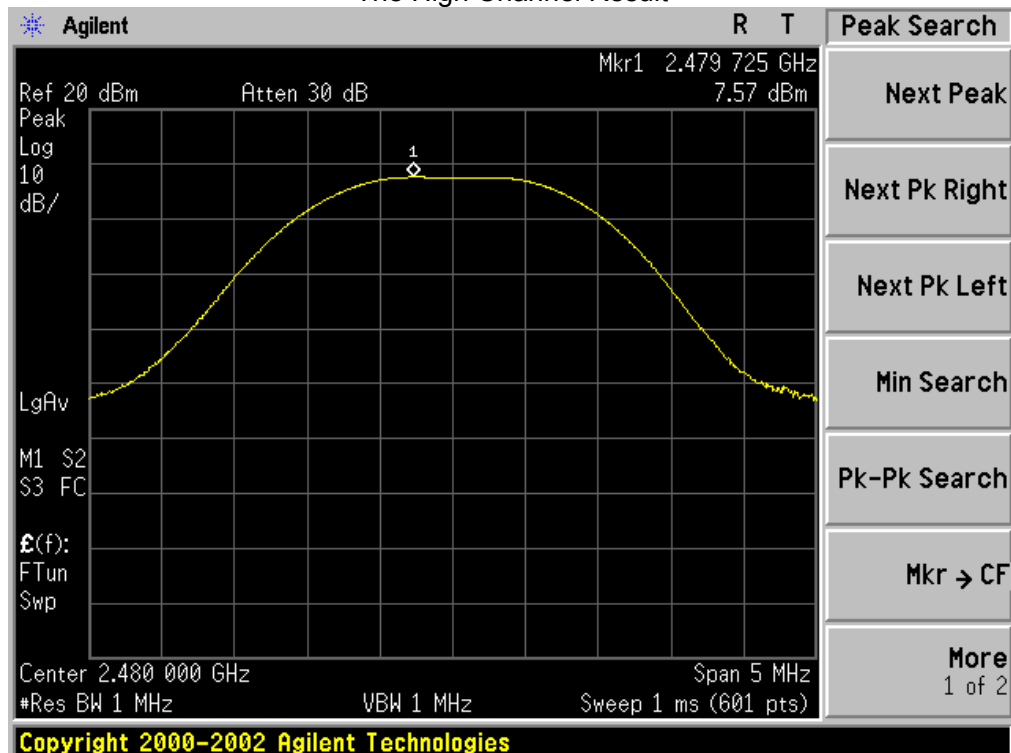
The Low Channel Result



The Middle Channel Result



The High Channel Result



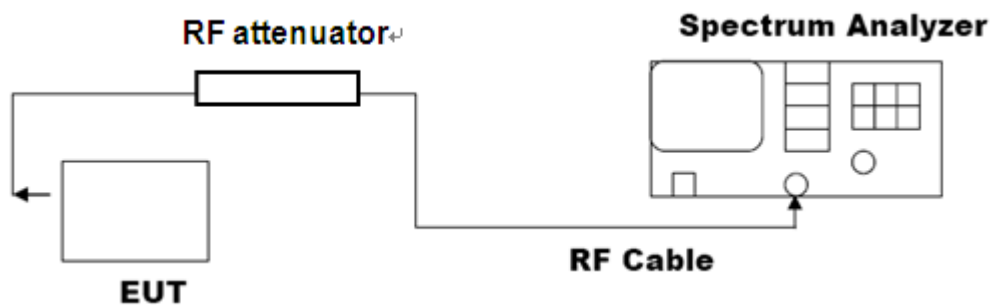
## 11. MAXIMUM CONDUCTED OUTPUT POWER SPECTRAL DENSITY

### 11.1 MEASUREMENT PROCEDURE

- (1). Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- (2). Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- (3). Set the span to 1.5times the DTS bandwidth, RBW:  $3\text{kHz} \leq \text{RBW} \leq 100\text{kHz}$ , VBW  $\geq 3 \times \text{RBW}$
- (4). Set SPA Trace 1 Max hold, then View.

Note: The EUT was tested according to KDB 558074 for compliance to FCC 47CFR 15.247 requirements.

### 11.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

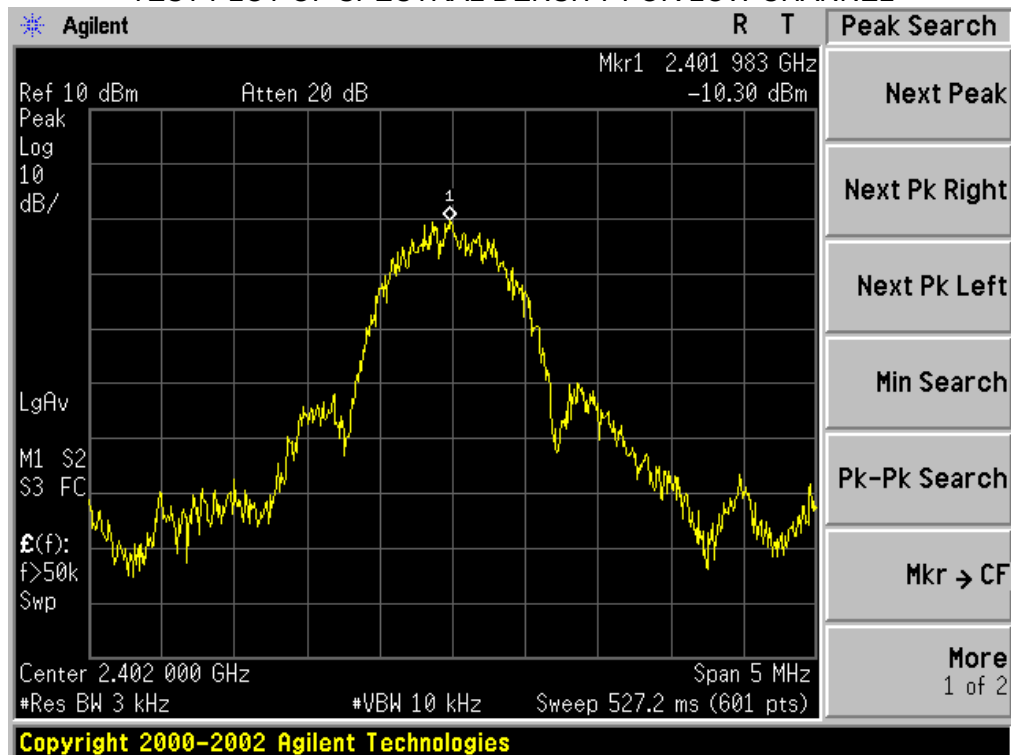


### 11.3 LIMITS AND MEASUREMENT RESULT

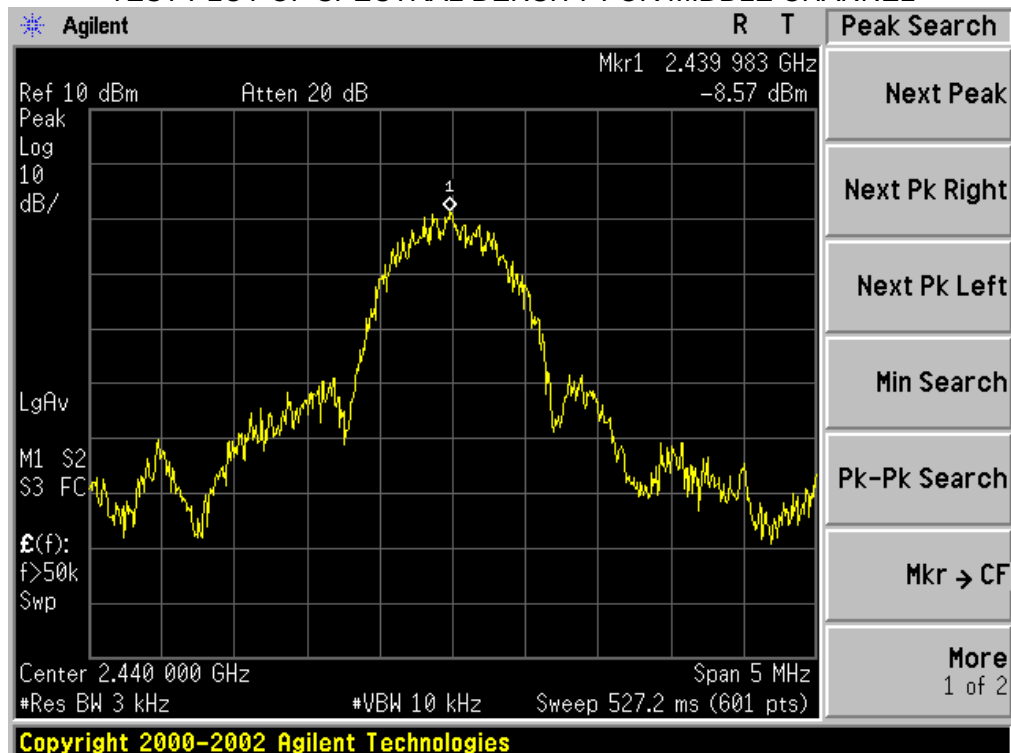
Channel No.	PSD (dBm/3KHz)	Limit (dBm/3KHz)	Result
Low Channel	-10.30	8	Pass
Middle Channel	-8.57	8	Pass
High Channel	-8.30	8	Pass



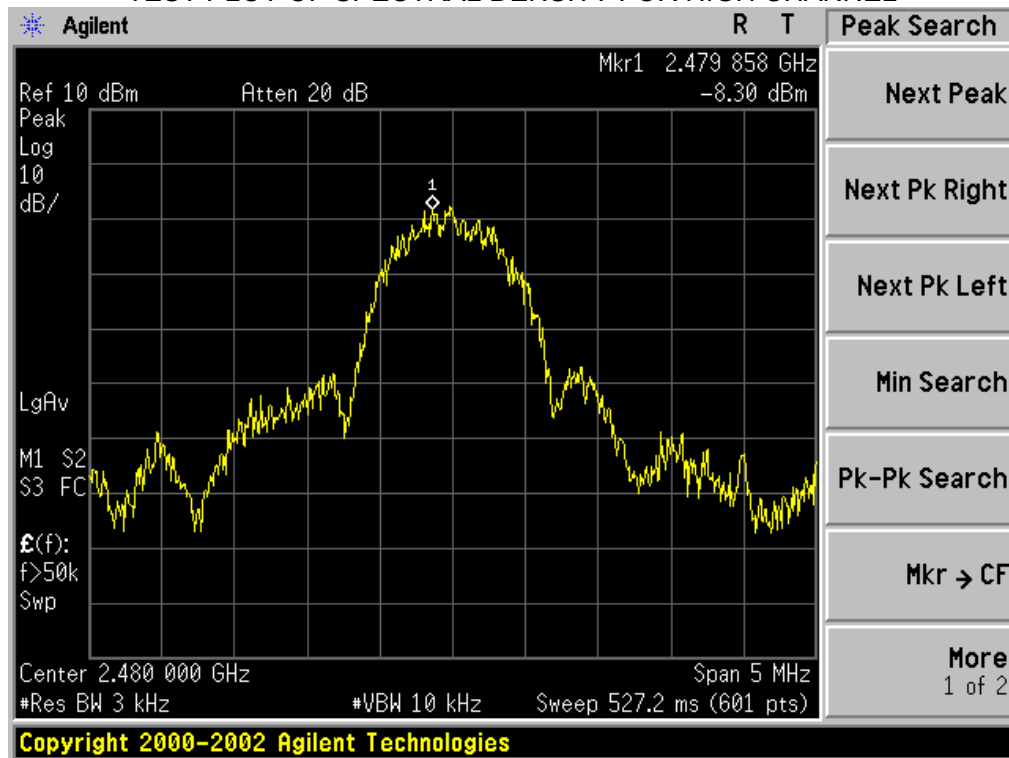
TEST PLOT OF SPECTRAL DENSITY FOR LOW CHANNEL



TEST PLOT OF SPECTRAL DENSITY FOR MIDDLE CHANNEL



TEST PLOT OF SPECTRAL DENSITY FOR HIGH CHANNEL



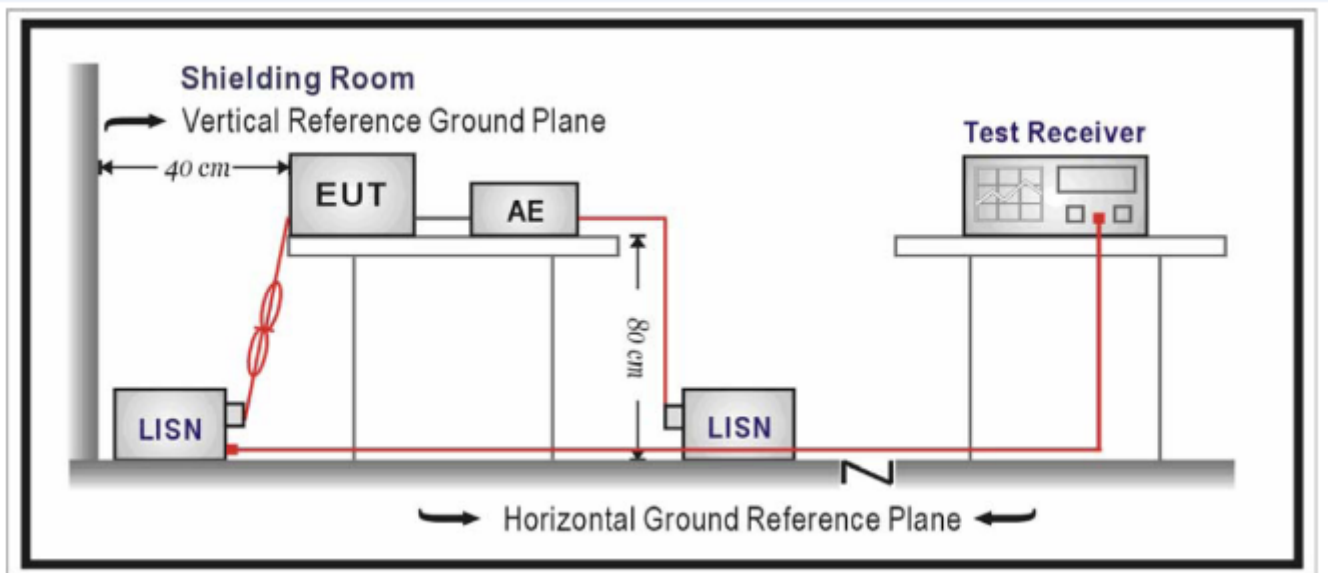
## 12. FCC LINE CONDUCTED EMISSION TEST

### 12.1 LIMITS

Frequency	Maximum RF Line Voltage	
	Q.P.( dBuV)	Average( dBuV)
150kHz~500kHz	66-56	56-46
500kHz~5MHz	56	46
5MHz~30MHz	60	50

**\*\*Note:** 1. The lower limit shall apply at the transition frequency.  
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz

### 12.2 TEST SETUP



### 12.3 PRELIMINARY PROCEDURE

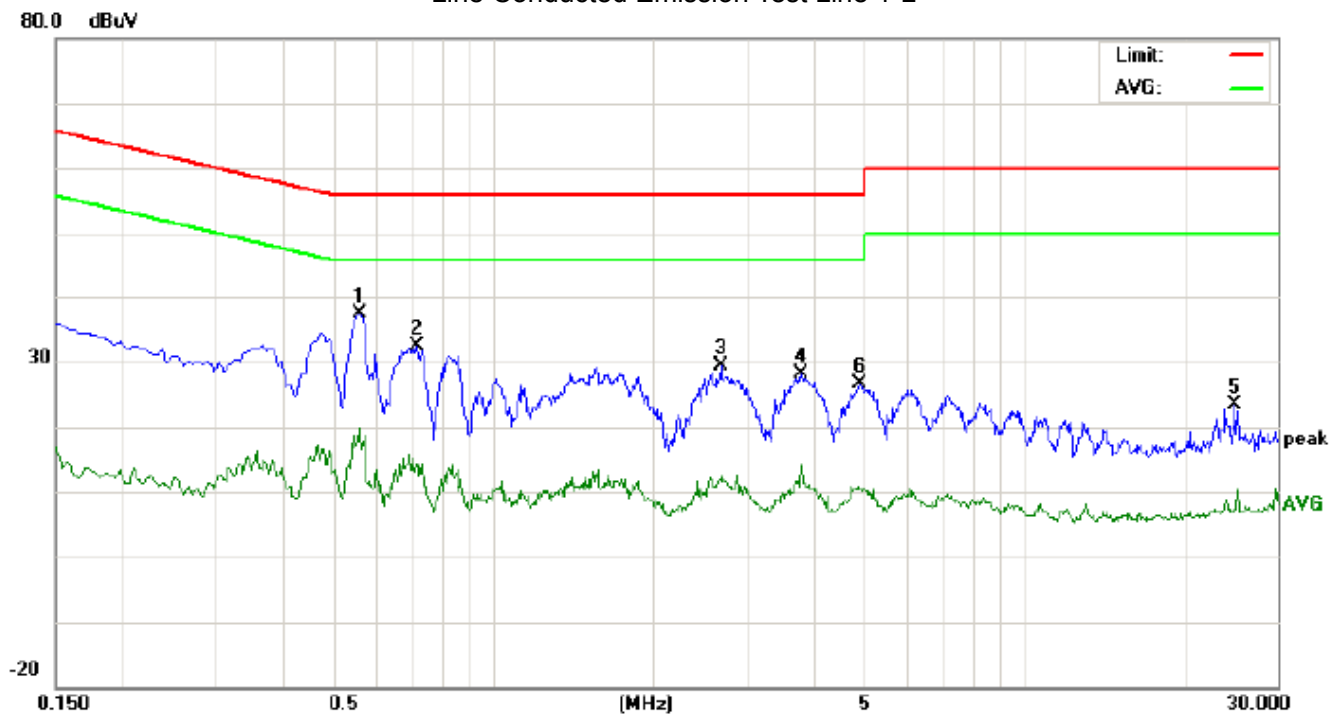
- 1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- 2) Support equipment, if needed, was placed as per ANSI C63.10.
- 3) All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
- 4) All support equipments received AC120V/60Hz power from a LISN, if any.
- 5) The EUT received DC charging voltage by PC or by adapter which received 120V/60Hz power by a LISN.
- 6) The test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7) Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
- 8) During the above scans, the emissions were maximized by cable manipulation.
- 9) The following test mode(s) were scanned during the preliminary test.  
Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

### 12.4 FINAL TEST PROCEDURE

- 1) EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
- 2) A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less -2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
- 3) The test data of the worst case condition(s) was reported on the Summary Data page.

## 12.5 TEST RESULT OF POWER LINE Worst Case (By Adapter)

### Line Conducted Emission Test Line 1-L



Site: Conduction

Phase: L1

Temperature: 24.1

Limit: FCC Class B Conduction(QP)

Power:

Humidity: 53.5 %

EUT: Bluetooth Headset

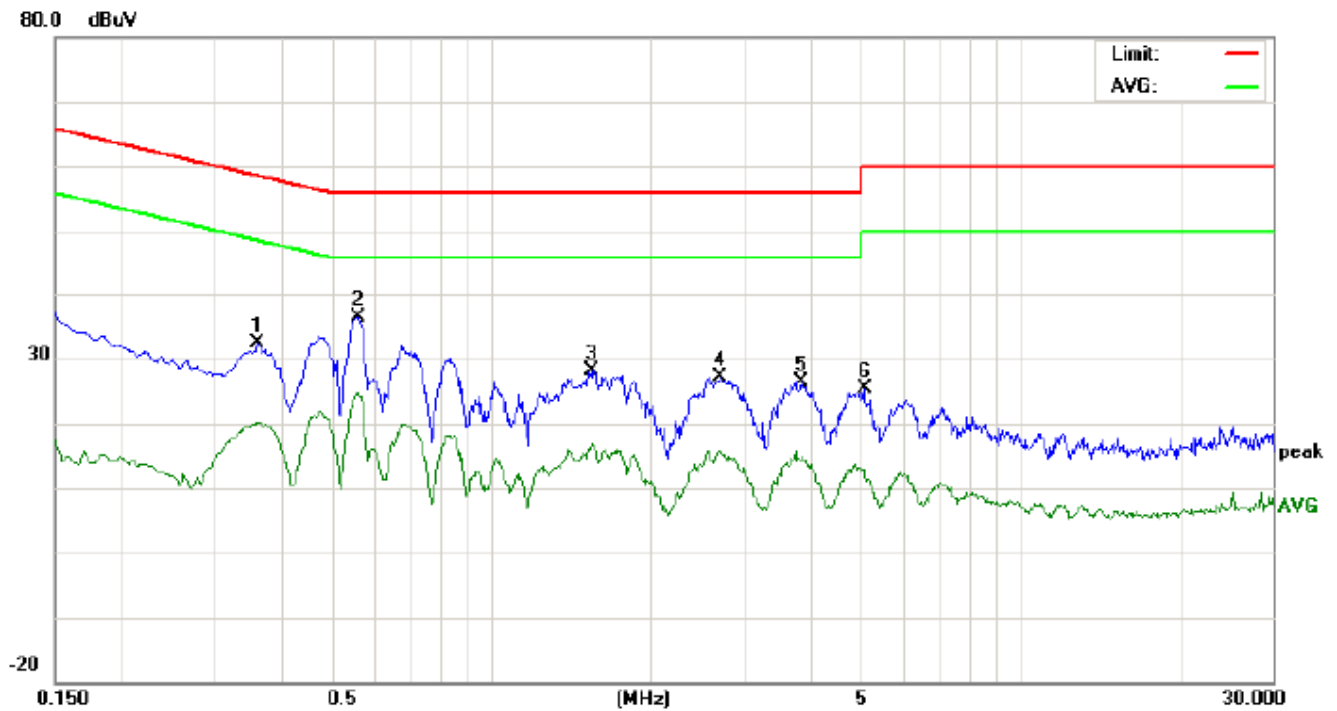
M/N: Z-BT1000

Mode: BT Link with charging

Note:

No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor (dB)	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.5580	27.10		9.53	10.35	37.45		19.88	56.00	46.00	-18.55	-26.12	P	
2	0.7180	21.95		3.97	10.34	32.29		14.31	56.00	46.00	-23.71	-31.69	P	
3	2.6820	19.03		1.04	10.47	29.50		11.51	56.00	46.00	-26.50	-34.49	P	
4	3.8060	17.74		3.57	10.46	28.20		14.03	56.00	46.00	-27.80	-31.97	P	
5	24.9540	13.14		-2.87	10.12	23.26		7.25	60.00	50.00	-36.74	-42.75	P	
6	4.9100	16.31		0.09	10.23	26.54		10.32	56.00	46.00	-29.46	-35.68	P	

Line Conducted Emission Test Line 2-N

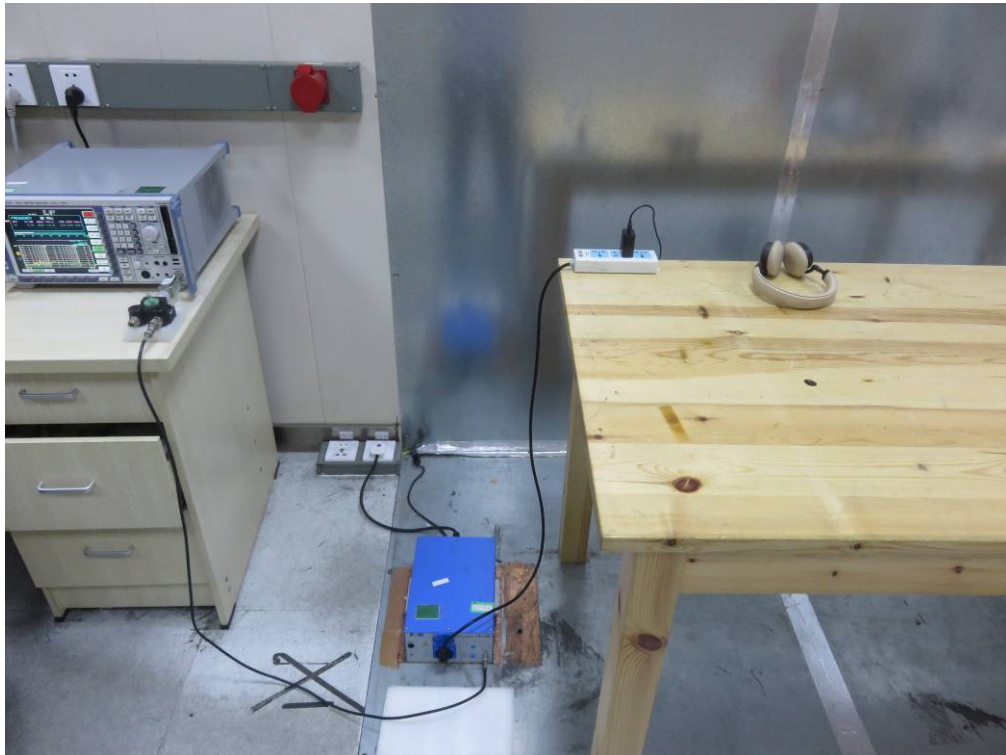


Site: Conduction Phase: **N** Temperature: 24.1  
Limit: FCC Class B Conduction(QP) Power: Humidity: 53.5 %  
EUT:Bluetooth Headse  
M/N: Z-BT1000  
Mode: BT Link with charging  
Note:

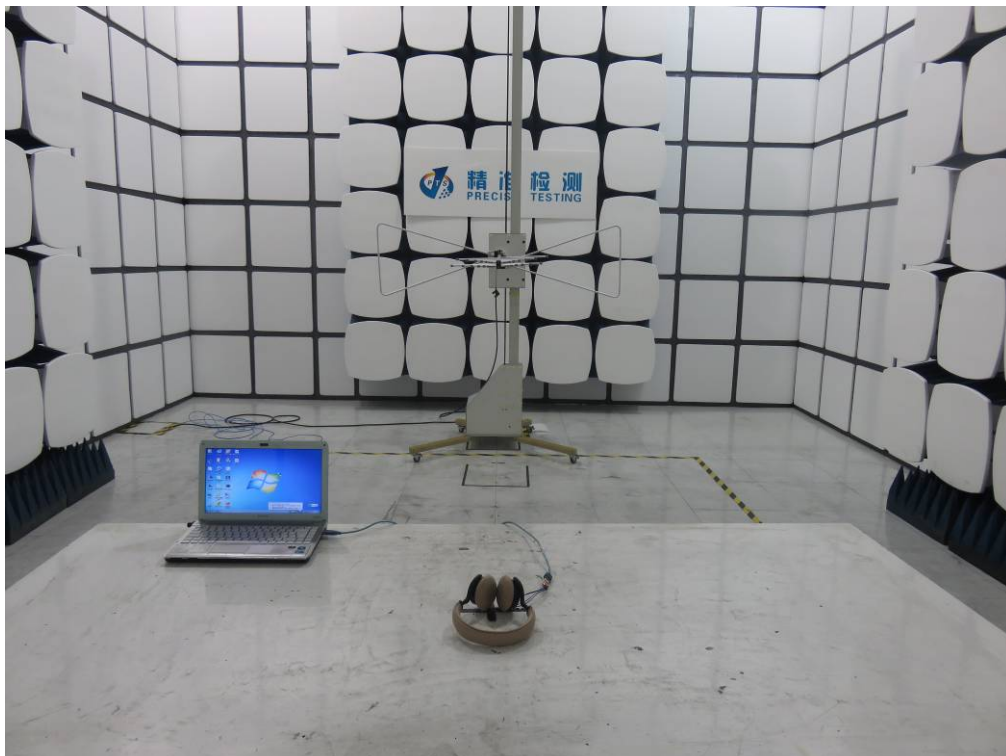
No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.3621	21.94		9.82	10.31	32.25		20.13	58.68	48.68	-26.43	-28.55	P	
2	0.5581	26.12		14.62	10.35	36.47		24.97	56.00	46.00	-19.53	-21.03	P	
3	1.5501	17.77		6.61	10.36	28.13		16.97	56.00	46.00	-27.87	-29.03	P	
4	2.7061	16.68		4.77	10.48	27.16		15.25	56.00	46.00	-28.84	-30.75	P	
5	3.8501	15.92		4.12	10.45	26.37		14.57	56.00	46.00	-29.63	-31.43	P	
6	5.0620	15.03		2.62	10.24	25.27		12.86	60.00	50.00	-34.73	-37.14	P	

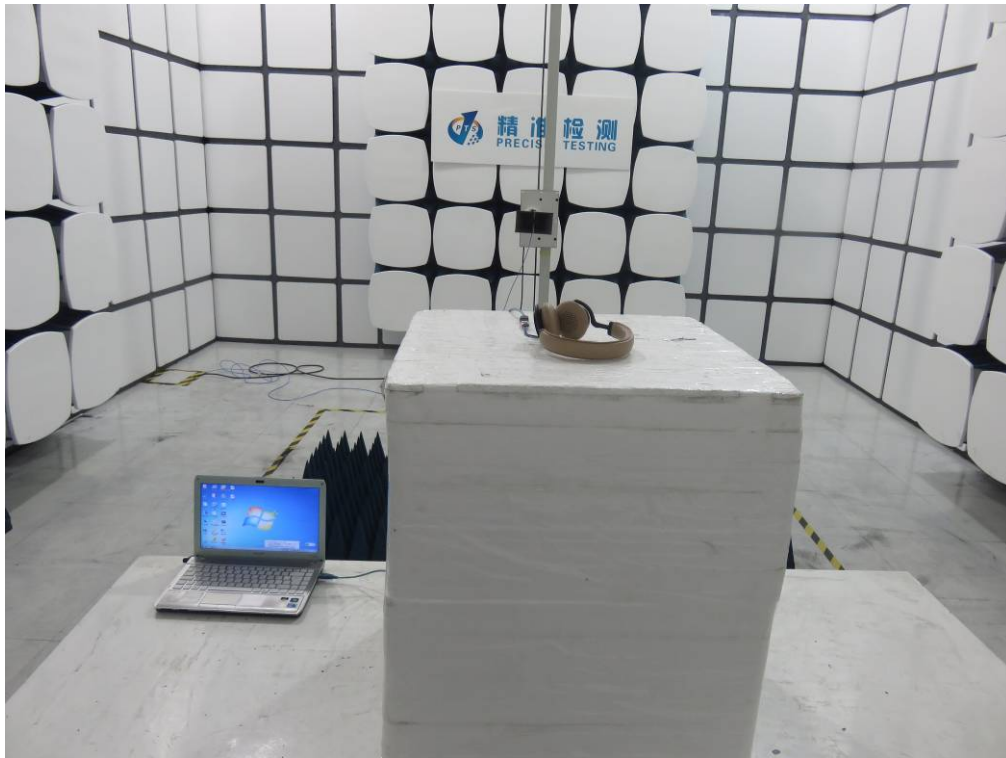
## APPENDIX A: PHOTOGRAPHS OF TEST SETUP

### FCC LINE CONDUCTED EMISSION TEST SETUP



FCC RADIATED EMISSION TEST SETUP







## APPENDIX B: PHOTOGRAPHS OF EUT

### TOTAL VIEW OF EUT



TOP VIEW OF EUT



BOTTOM VIEW OF EUT

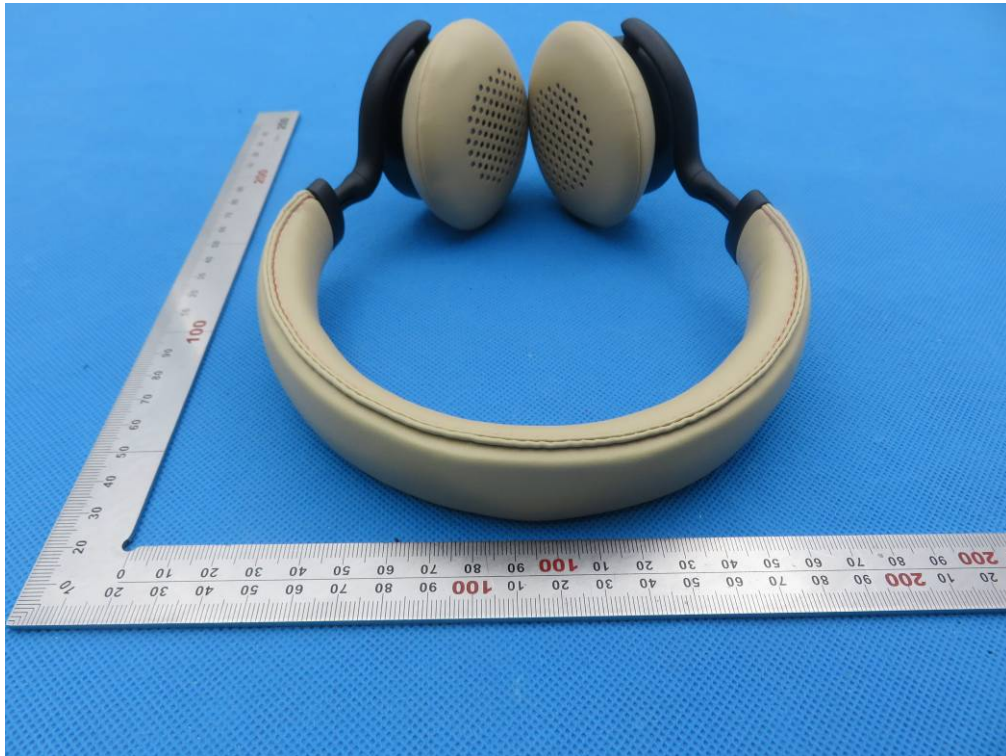


FRONT VIEW OF EUT





BACK VIEW OF EUT



LEFT VIEW OF EUT



RIGHT VIEW OF EUT



VIEW OF EUT (PORT)

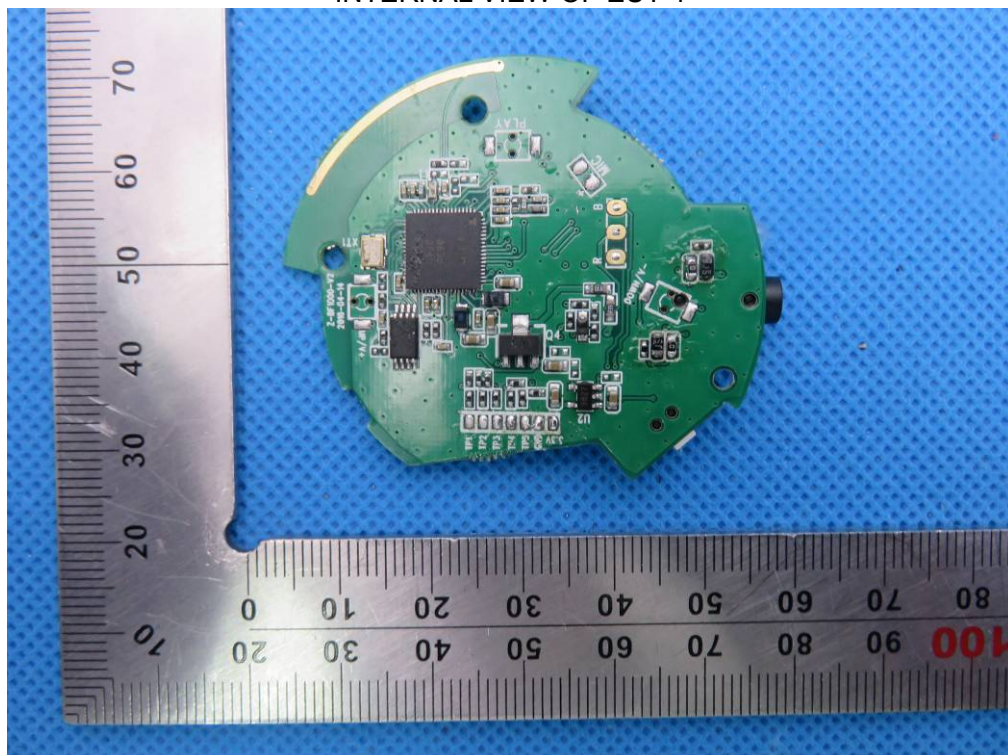




VIEW OF EUT (OPEN)

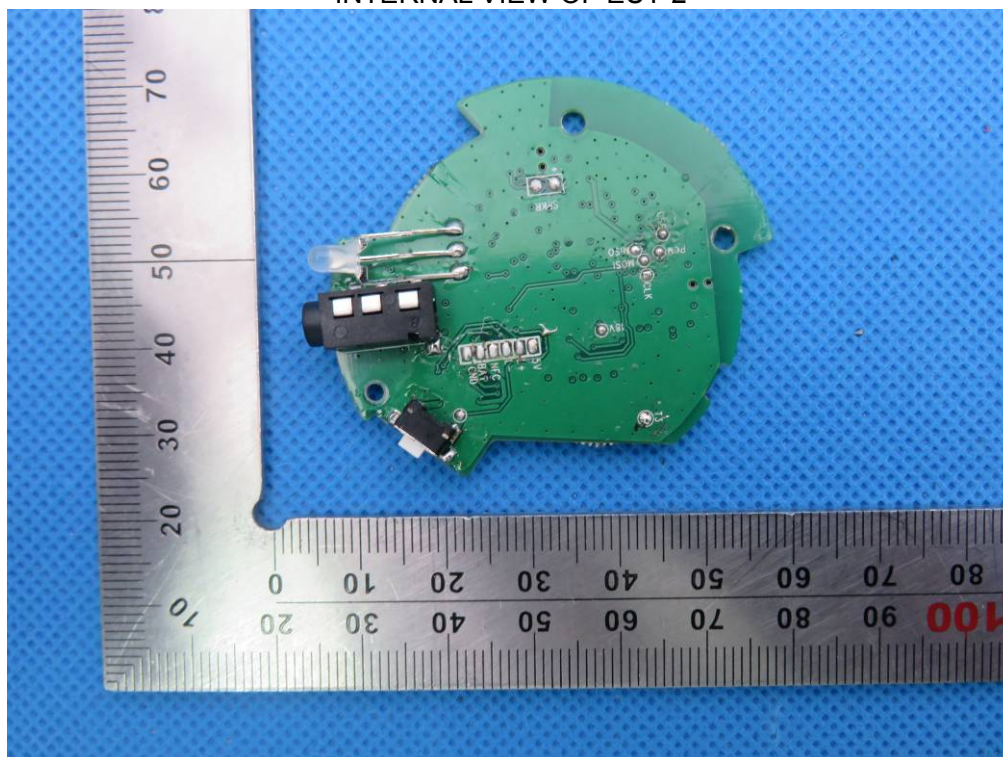


INTERNAL VIEW OF EUT-1

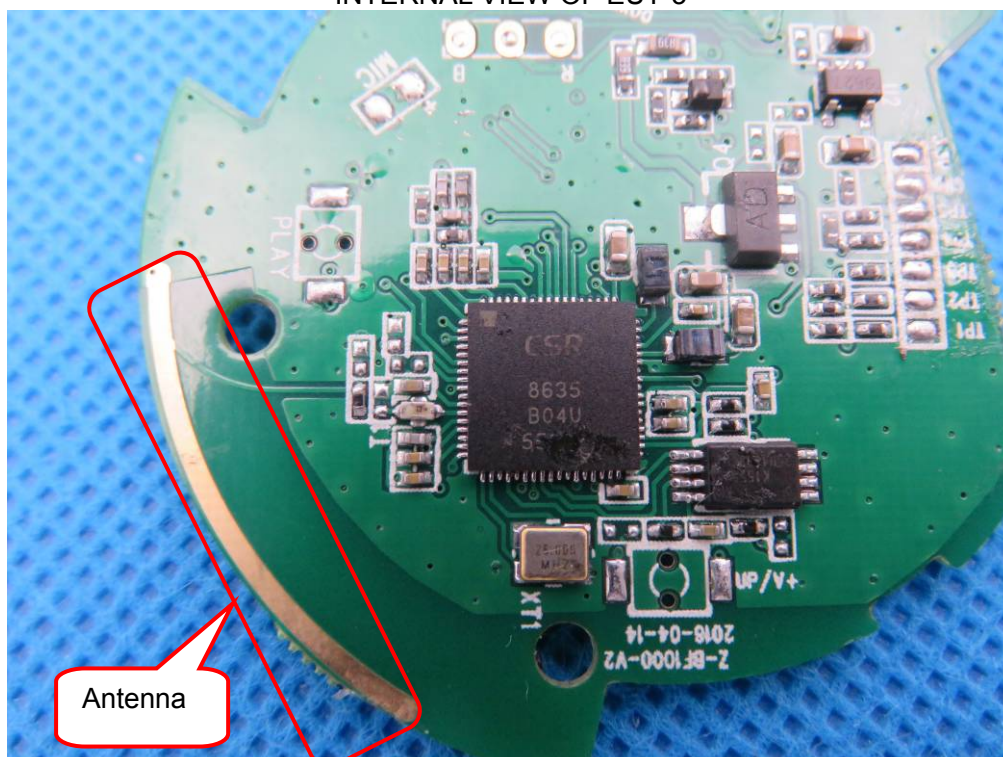




INTERNAL VIEW OF EUT-2

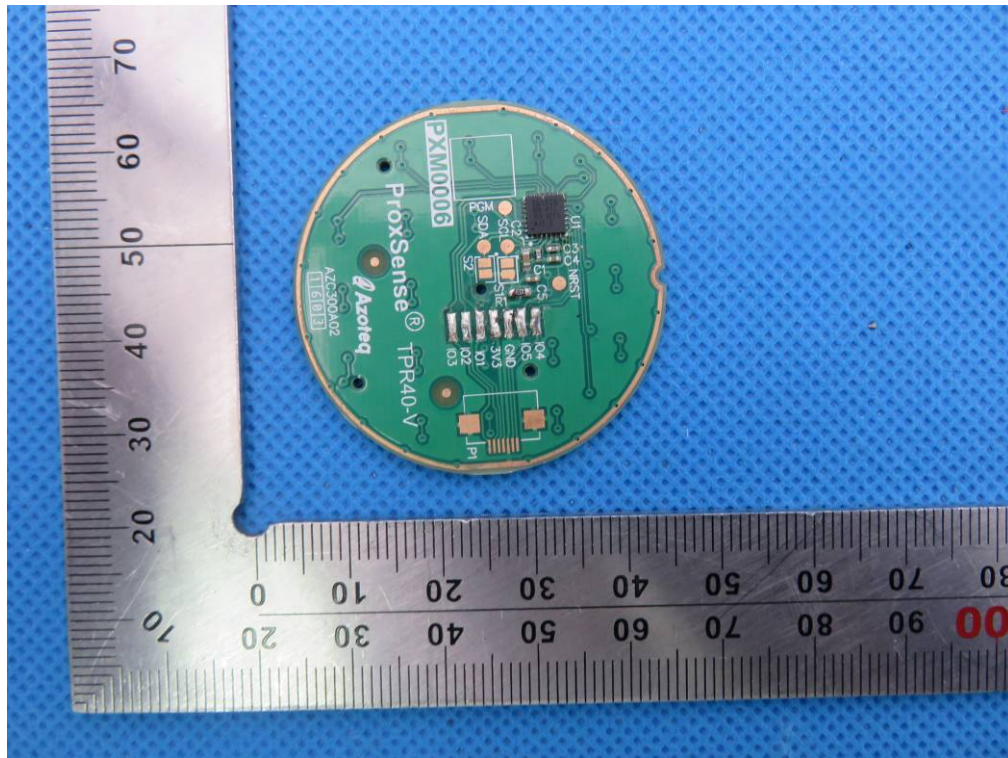


INTERNAL VIEW OF EUT-3

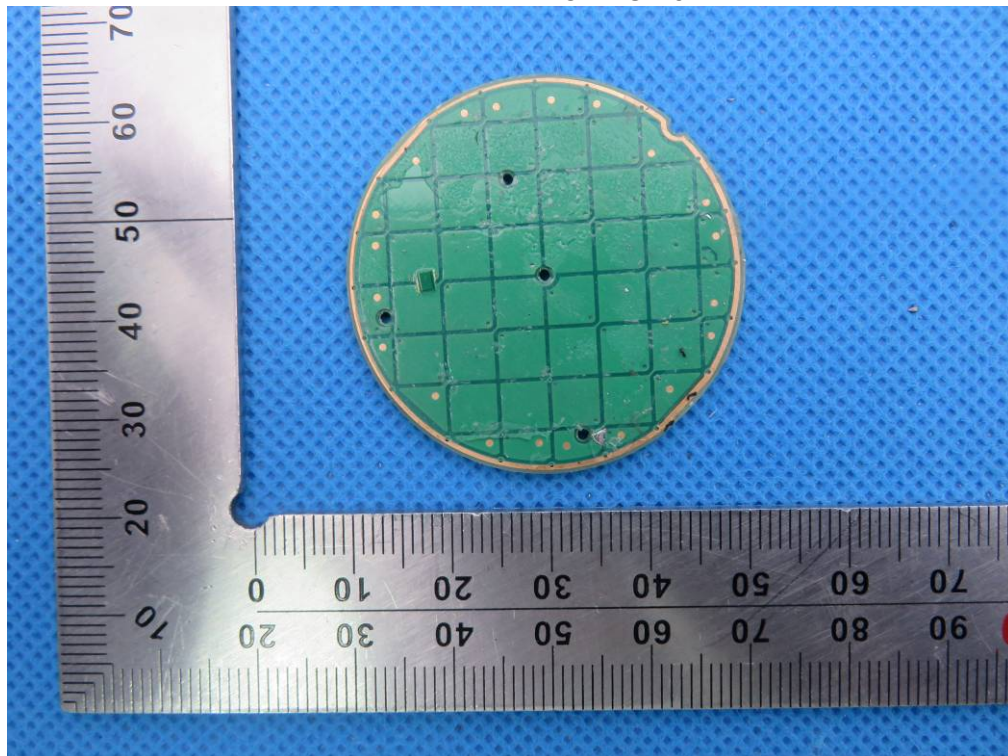




INTERNAL VIEW OF EUT-4

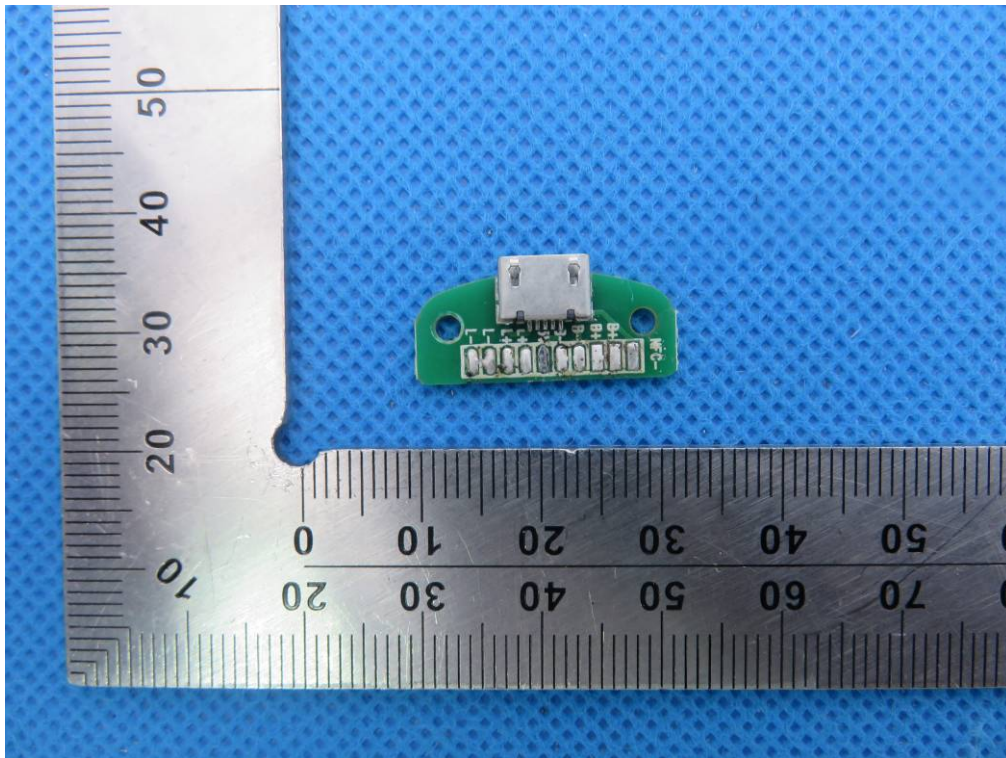


INTERNAL VIEW OF EUT-5

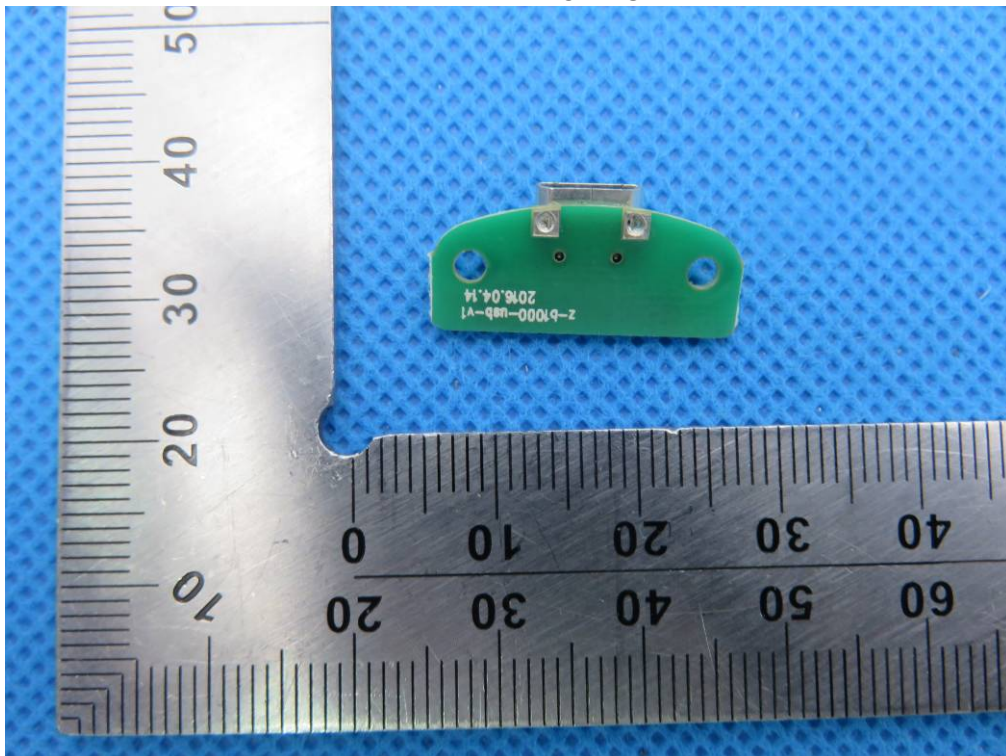




INTERNAL VIEW OF EUT-6



INTERNAL VIEW OF EUT-7



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