# **FCC Test Report**

Report No.: AGC00019161101FE03

FCC ID : XELTWSB1

**APPLICATION PURPOSE** : Original Equipment

**PRODUCT DESIGNATION**: Bluetooth Headset

**BRAND NAME** : ORICORE

**MODEL NAME** : TWS B1

CLIENT Shenzhen Hongnanke Communication Equipment Co.,

Ltd.

**DATE OF ISSUE** : Nov.24, 2016

STANDARD(S)

TEST PROCEDURE(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	/	Nov.24, 2016	Valid	Original Report

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## 1. VERIFICATION OF CONFORMITY

Applicant Shenzhen Hongnanke Communication Equipment Co., Ltd.			
Address	No. 16, the Second Industry Park Xiakeng, Tongle, Longgang District, Shenzhen, Guangdong, China		
Manufacturer	Shenzhen Hongnanke Communication Equipment Co., Ltd.		
Address  No. 16, the Second Industry Park Xiakeng, Tongle, Longgang D Shenzhen, Guangdong, China			
Product Designation	Bluetooth Headset		
Brand Name	ORICORE		
Test Model	TWS B1		
Date of test	Nov.19, 2016 Nov,22, 2016		
Deviation	None		
Condition of Test Sample	Normal		
Report Template	AGCRT-US-BR/RF		

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 15.249.

Tested By	Strive Lung		
,	Strive Liang(Liang Faqiang)	Nov.22, 2016	
Reviewed By	Lowery ce		
	Forrest Lei(Lei Yonggang)	Nov.24, 2016	
Approved By	Solya shong		
	Solger Zhang(Zhang Hongyi) Authorized Officer	Nov.24, 2016	

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#### 2. GENERAL INFORMATION

## 2.1. PRODUCT DESCRIPTION

A major technical description of EUT is described as following

2.402 GHz to 2.480GHz		
3.04dBm(Max EIRP Power=Max radiation field-95.2)		
V 4.1		
GFSK ,π /4-DQPSK, 8DPSK		
79 for BR/EDR		
LB300-20161115		
LB300_B1_0.5-J13Patch-300sEQ2-ENCH.airoha		
Ceramic Antenna		
0dBi		
DC 3.7V		

Note: 1. The BT function of EUT didn't work when charging.

2. The EUT didn't support BLE.

3. The EUT comprises left and right channel headphones, both are the same. Only the right headphones test data recorded in the report.

# 2.2. TABLE OF CARRIER FREQUENCYS

BR/EDR channel List

Frequency Band	Channel Number	Frequency
	0	2402MHZ
	1	2403MHZ
	:	:
	38	2440 MHZ
2400~2483.5MHZ	39	2441 MHZ
	40	2442 MHZ
	•	:
	77	2479 MHZ
	78	2480 MHZ

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## 3. MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement y  $\pm U$ , where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %  $\circ$ 

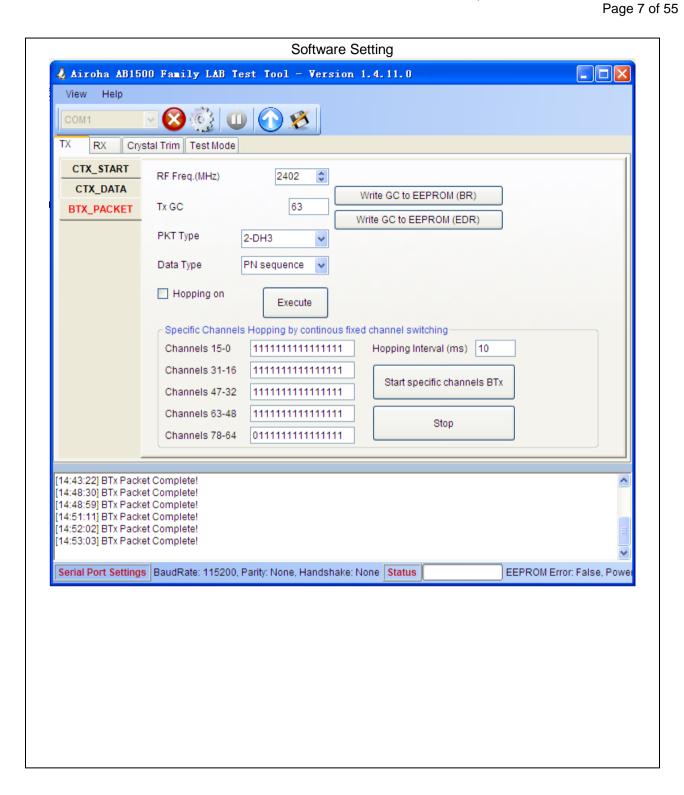
No.	Item	Uncertainty
1	Conducted Emission Test	±3.18dB
2	All emissions,radiated	±3.91dB
3	Temperature	±0.5°C
4	Humidity	±2%

## 4. DESCRIPTION OF TEST MODES

NO.	TEST MODE DESCRIPTION		
1	Low channel GFSK		
2	Middle channel GFSK		
3	High channel GFSK		
4	Low channel π /4-DQPSK		
5	Middle channel π /4-DQPSK		
6	High channel π /4-DQPSK		
7	Low channel 8DPSK		
8	Middle channel 8DPSK		
9	High channel 8DPSK		
10	BT Link		

#### Note:

- 1. All the test modes can be supply by battery, only the result of the worst case was recorded in the report, if no other cases.
- 2. For Radiated Emission, 3axis were chosen for testing for each applicable mode.
- 3. The EUT used fully-charged battery when tested.



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# 5. SYSTEM TEST CONFIGURATION

## **5.1. CONFIGURATION OF EUT SYSTEM**

Configure 1: (Normal hopping)



Configure 2: (Control continuous TX)



## **5.2. EQUIPMENT USED IN EUT SYSTEM**

Item	Equipment	Mfr/Brand	Model/Type No.	Remark
1	Bluetooth Headset	ORICORE	TWS B1	EUT
2	Battery	AUN	401215Y	Accessory
3	PC	Sony	E1412AYCW	A.E
4	Control box	AIROHA	N/A	A.E

# **5.3. SUMMARY OF TEST RESULTS**

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.249	Radiated Emission	Compliant
§15.249	Band Edges	Compliant
§15.207	Conduction Emission	N/A
§15.215	Bandwidth	Compliant

Note: N/A means it's not applicable to this item.

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# **6. TEST FACILITY**

Site Dongguan Precise Testing Service Co., Ltd.	
Location  Building D,Baoding Technology Park,Guangming Road2,Dongcheng District Dongguan, Guangdong, China,	
FCC Registration No.	371540
Description	The test site is constructed and calibrated to meet the FCC requirements in documents ANSI C63.4:2014.

# **TEST METHODOLOGY**

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

## 7. 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, 2016	July 3, 2017	
Trilog Broadband Antenna (25M-1GHz)	SCHWARZBECK	VULB9160	9160-3355	July 4, 2016	July 3, 2017	
Signal Amplifier	SCHWARZBECK	BBV 9475	9745-0013	July 4, 2016	July 3, 2017	
RF Cable	SCHWARZBECK	AK9515E	96221	July 4, 2016	July 3, 2017	
3m Anechoic Chamber	CHENGYU	966	PTS-001	June 6, 2016	June 5, 2017	
MULTI-DEVICE Positioning Controller	Max-Full	MF-7802	MF780208339	N/A	N/A	
Active loop antenna (9K-30MHz)	Schwarzbeck	FMZB1519	1519-038	June 6, 2016	June 5, 2017	
Spectrum analyzer	Agilent	E4407B	MY46185649	June 6, 2016	June 5, 2017	
Radiation Cable 1	MXT	RS1	R005	June 6, 2016	June 5, 2017	
Radiation Cable 2	MXT	RS1	R006	June 6, 2016	June 5, 2017	

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# FOR RADIATED EMISSION TEST (1GHZ ABOVE)

TON NADIATED EMISS	ion real (Tone ABC	, · - /			
	Radia	ted Emission Tes	st Site		
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
EMI Test Receiver	Rohde & Schwarz	ESCI	101417	July 4, 2016	July 3, 2017
Horn Antenna (1G-18GHz)	SCHWARZBECK	BBHA9120D	9120D-1246	July 11, 2016	July 10, 2017
Spectrum Analyzer	Agilent	E4411B	MY4511453	July 4, 2016	July 3, 2017
Signal Amplifier	SCHWARZBECK	BBV 9718	9718-269	July 7, 2016	July 6, 2017
RF Cable	SCHWARZBECK	AK9515H	96220	July 8, 2016	July 7, 2017
3m Anechoic Chamber	CHENGYU	966	PTS-001	June 6, 2016	June 5, 2017
MULTI-DEVICE Positioning Controller	Max-Full	MF-7802	MF780208339	N/A	N/A
Horn Ant (18G-40GHz)	Schwarzbeck	BBHA 9170	9170-181	June 6, 2016	June 5, 2017
Radiation Cable 1	MXT	RS1	R005	June 6, 2016	June 5, 2017
Radiation Cable 2	MXT	RS1	R006	June 6, 2016	June 5, 2017

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## 8. RADIATED EMISSION

## 8.1TEST LIMIT

#### Standard FCC15.249

Fundamental Frequency	Field Strength of Fundamental	Field Strength of Harmonics			
	(millivolts/meter)	(microvolts/meter)			
900-928MHz	50	500			
2400-2483.5MHz	50	500			
5725-5875MHz	50	500			
24.0-24.25GHz	250	2500			

#### Standard FCC 15.209

Frequency	Distance	Field Strengths Limit				
(MHz)	(MHz) Meters		dB(μV)/m			
0.009 ~ 0.490	300	2400/F(kHz)				
0.490 ~ 1.705	30	24000/F(kHz)				
1.705 ~ 30	30	30				
30 ~ 88	3	100	40.0			
88 ~ 216	3	150	43.5			
216 ~ 960	3	200	46.0			
960 ~ 1000	3	500	54.0			
Above 1000	3	Other:74.0 dB(µV)/m (Peal	k) 54.0 dB(μV)/m (Average)			

Remark:

- (1) Emission level dB $\mu$  V = 20 log Emission level  $\mu$  V/m
- (2) The smaller limit shall apply at the cross point between two frequency bands.
- (3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

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#### **8.2. 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)

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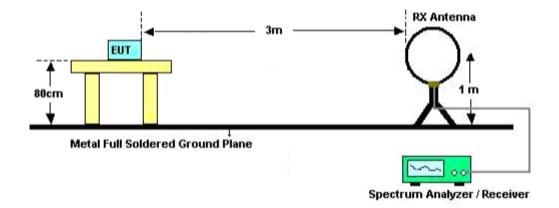
The following table is the setting of spectrum analyzer and receiver.

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

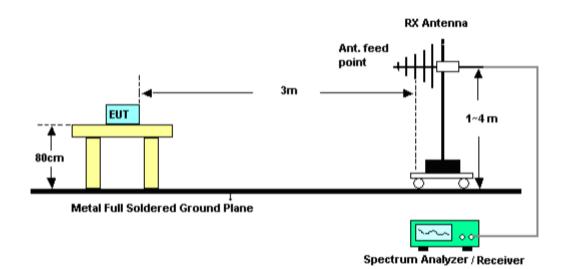
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#### 8.3. TEST SETUP

# Radiated Emission Test-Setup Frequency Below 30MHz

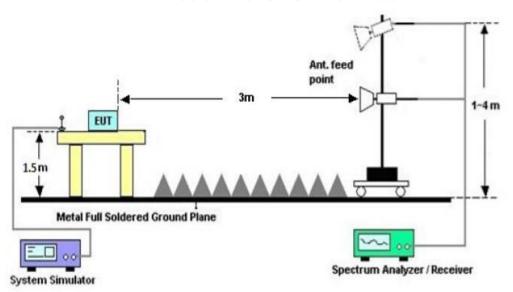


## RADIATED EMISSION TEST SETUP 30MHz-1000MHz



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# RADIATED EMISSION TEST SETUP ABOVE 1000MHz



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#### 8.4. TEST RESULT

(Worst modulation:GFSK)

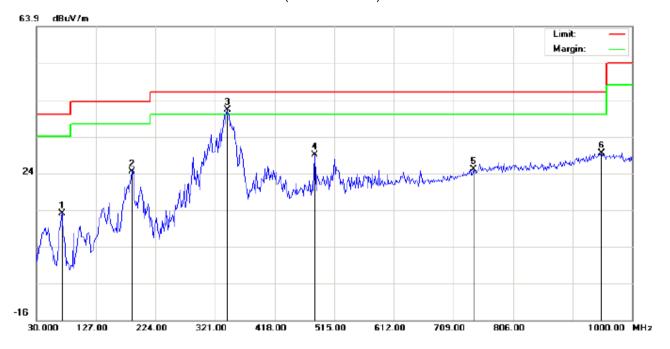
#### FOR BR/EDR

#### **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

Limit: FCC Class B 3M Radiation

EUT:Bluetooth Headset

M/N:TWS B1

Mode:Low Channel TX

Note:

Polarization:	Horizontal	Temperature: 23	.9
Power:		Humidity: 54.2 %	6

Distance:

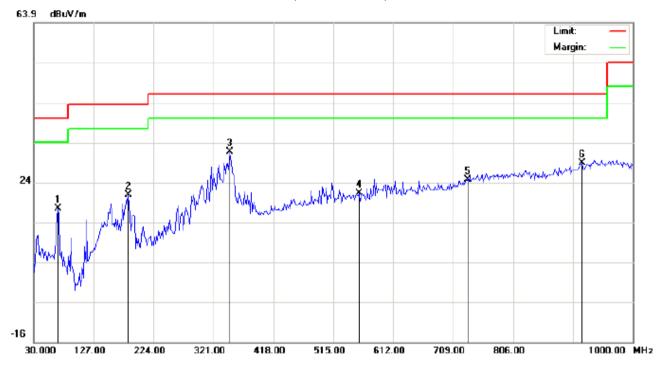
No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	-	MHz	dBu∀	dB/m	dBu∀/m	dBu∀/m	dB		cm	degree	
1		72.0333	4.67	8.28	12.95	40.00	-27.05	peak			
2		185.2000	13.16	11.31	24.47	43.50	-19.03	peak			
3	*	340.4000	23.18	18.10	41.28	46.00	-4.72	peak			
4		482.6667	8.01	20.94	28.95	46.00	-17.05	peak			
5		741.3333	-1.38	26.38	25.00	46.00	-21.00	peak		·	
6		949.8833	-0.53	30.00	29.47	46.00	-16.53	peak		·	

Temperature: 23.9

Humidity: 54.2 %

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



Polarization:

Power:

Distance:

Vertical

Site: site #1 Limit: FCC Class B 3M Radiation

EUT:Bluetooth Headset

M/N:TWS B1

Mode:Low Channel TX

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBu∀	dB/m	dBu\//m	dBu∀/m	dB		cm	degree	
1		68.8000	12.59	4.73	17.32	40.00	-22.68	peak	·	·	
2		183.5833	7.59	13.16	20.75	43.50	-22.75	peak			
3	*	346.8667	13.03	18.53	31.56	46.00	-14.44	peak			
4		557.0333	-1.38	22.52	21.14	46.00	-24.86	peak			
5		733.2500	-1.56	26.15	24.59	46.00	-21.41	peak	·	·	
6		917.5500	-0.28	29.10	28.82	46.00	-17.18	peak			

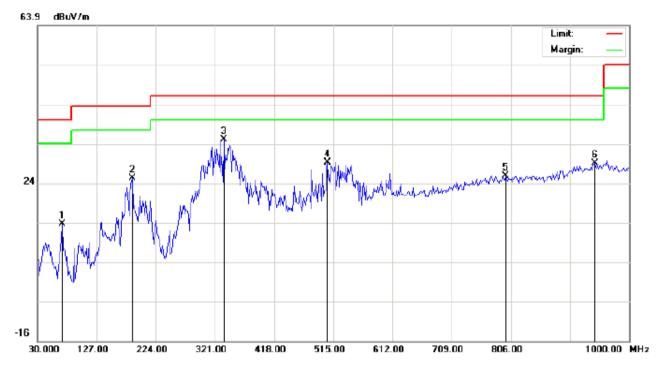
## **RESULT: PASS**

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

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

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



Site: site #1 Limit: FCC Class B 3M Radiation

EUT:Bluetooth Headset

M/N:TWS B1

Mode:Middle Channel TX

Note:

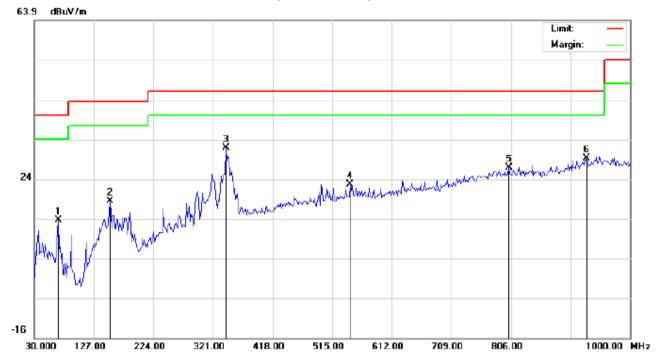
Polarization:	Horizontal	Temperature: 23.9
Power:		Humidity: 54.2 %

Distance:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height		Comment
	-	MHz	dBu∀	dB/m	dBu∀/m	dBu∀/m	dB		cm	degree	
1		70.4167	3.73	9.85	13.58	40.00	-26.42	peak			
2		185.2000	13.94	11.31	25.25	43.50	-18.25	peak			
3	*	335.5500	17.28	17.78	35.06	46.00	-10.94	peak			
4		505.3000	7.90	21.27	29.17	46.00	-16.83	peak			
5		797.9167	-1.46	27.29	25.83	46.00	-20.17	peak			
6		943.4167	-0.91	29.82	28.91	46.00	-17.09	peak			

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



Site: site #1 Limit: FCC Class B 3M Radiation

EUT:Bluetooth Headset

M/N:TWS B1

Mode:Middle Channel TX

Note:

Polarization:	Vertical	Temperatu	ıre: 23.9
Power:		Humidity:	54.2 %

Distance:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	-	MHz	dBu∀	dB/m	dBu∀/m	dBu∀/m	dB		cm	degree	
1		68.8000	8.95	4.73	13.68	40.00	-26.32	peak			
2		152.8667	3.04	15.28	18.32	43.50	-25.18	peak			
3	*	342.0167	13.68	18.21	31.89	46.00	-14.11	peak			
4		544.1000	0.37	22.32	22.69	46.00	-23.31	peak			
5		802.7667	-0.43	27.32	26.89	46.00	-19.11	peak			
6		928.8667	-0.30	29.41	29.11	46.00	-16.89	peak			

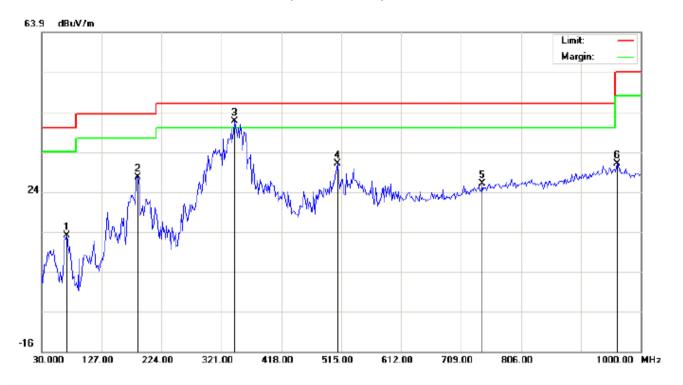
## **RESULT: PASS**

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

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

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



Site: site #1

Limit: FCC Class B 3M Radiation

EUT:Bluetooth Headset

M/N:TWS B1

Mode:High Channel TX

Note:

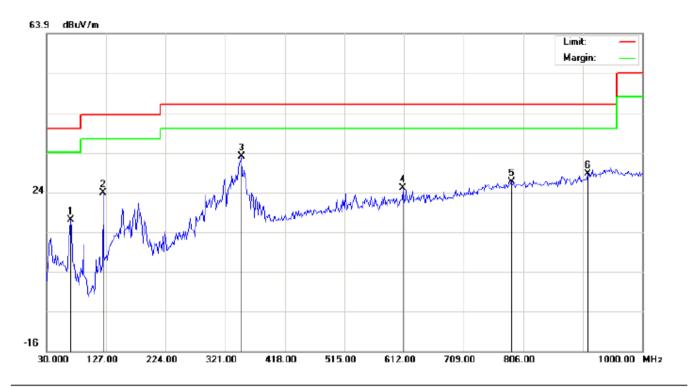
Polarization: *Horizontal* Temperature: 23.9 Power: Humidity: 54.2 %

Distance:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height		Comment
	-	MHz	dBu∀	dB/m	dBu∀/m	dBu∀/m	dB		cm	degree	
1		70.4167	3.20	9.85	13.05	40.00	-26.95	peak			
2		185.2000	16.31	11.31	27.62	43.50	-15.88	peak			
3	*	342.0167	23.37	18.21	41.58	46.00	-4.42	peak			
4		508.5333	9.58	21.36	30.94	46.00	-15.06	peak			
5		742.9500	-0.37	26.43	26.06	46.00	-19.94	peak			
6		961.2000	1.19	29.89	31.08	54.00	-22.92	peak			

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



Site: site #1

Limit: FCC Class B 3M Radiation

EUT:Bluetooth Headset

M/N:TWS B1

Mode:High Channel TX

Note:

Polarization:	Vertical	Temperature: 23.9
Power:		Humidity: 54.2 %

Distance:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	-	MHz	dBu∀	dB/m	dBu∀/m	dBu∀/m	dB		cm	degree	
1		68.8000	12.22	4.73	16.95	40.00	-23.05	peak			
2		122.1500	16.13	7.76	23.89	43.50	-19.61	peak			
3	*	346.8667	14.42	18.53	32.95	46.00	-13.05	peak			
4		610.3833	2.04	22.96	25.00	46.00	-21.00	peak			
5		786.6000	-0.50	27.14	26.64	46.00	-19.36	peak			
6		911.0833	-0.36	28.92	28.56	46.00	-17.44	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.

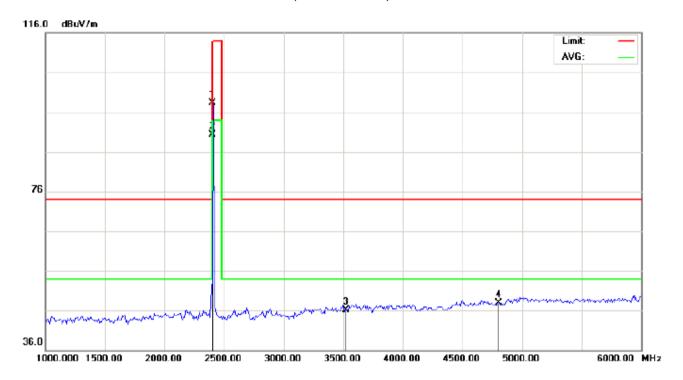
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#### **RADIATED EMISSION ABOVE 1GHZ**

(Worst modulation: GFSK)

#### FOR BR/EDR

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



Site: site #1 Polarization: Horizontal Temperature: 22.7 Humidity: 53.6 %

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

EUT:Bluetooth Headset

M/N:TWS B1

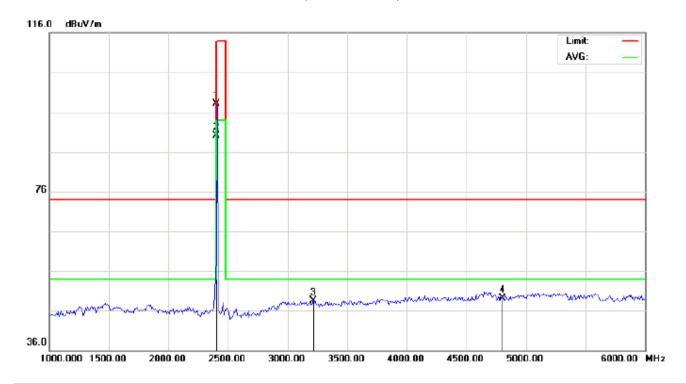
Mode: Low Channel TX

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	-	MHz	dBu∀	dB/m	dBu∀/m	dBu∀/m	dB		cm	degree	
1		2402.000	87.92	10.32	98.24	114.00	-15.76	peak			
2	*	2402.000	79.89	10.32	90.21	94.00	-3.79	AVG	100	84	
3		3524.000	33.82	12.26	46.08	74.00	-27.92	peak			
4		4804.000	40.24	7.69	47.93	74.00	-26.07	peak			

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



Site: site #1 Polarization: Vertical Temperature: 22.7

Distance:

Limit: FCC Class B 3M Radiation above 1GHZ(PK)- Power: Humidity: 53.6 %

M/N:TWS B1

Mode: Low Channel TX

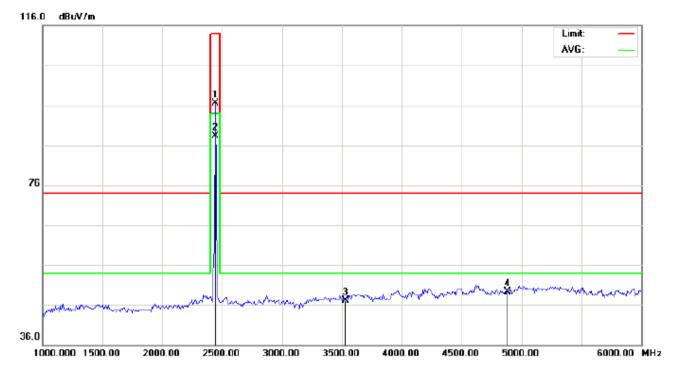
EUT:Bluetooth Headset

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	-	MHz	dBu∀	dB/m	dBu∀/m	dBu∀/m	dB		cm	degree	
1		2402.000	87.82	10.32	98.14	114.00	-15.86	peak			
2	*	2402.000	79.75	10.32	90.07	94.00	-3.93	AVG	100	79	
3		3215.000	36.57	11.84	48.41	74.00	-25.59	peak			
4		4804.000	41.38	7.69	49.07	74.00	-24.93	peak			

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



Site: site #1 Polarization: Horizontal Temperature: 22.7
Limit: FCC Class B 3M Radiation above 1GHZ(PK)- Power: Humidity: 53.6 %

EUT:Bluetooth Headset Distance:

M/N:TWS B1

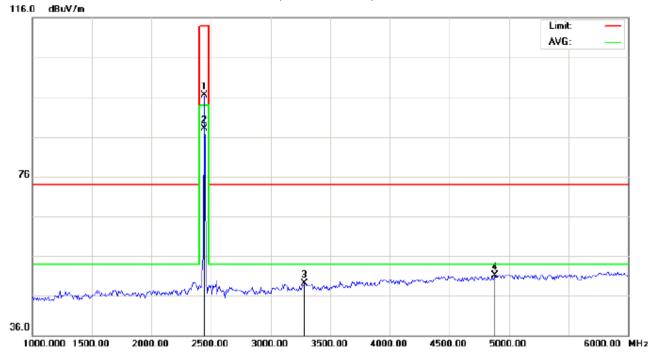
Mode: Middle Channel TX

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	-	MHz	dBu∀	dB/m	dBu\//m	dBu∀/m	dB		cm	degree	
1		2441.000	86.24	10.36	96.60	114.00	-17.40	peak			
2	*	2441.000	77.96	10.36	88.32	94.00	-5.68	AVG	100	67	
3		3527.000	34.74	12.28	47.02	74.00	-26.98	peak			
4		4882.000	41.38	7.89	49.27	74.00	-24.73	peak			

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



Site: site #1 Polarization: Vertical Temperature: 22.7
Limit: FCC Class B 3M Radiation above 1GHZ(PK)- Power: Humidity: 53.6 %

EUT:Bluetooth Headset Distance:

M/N:TWS B1

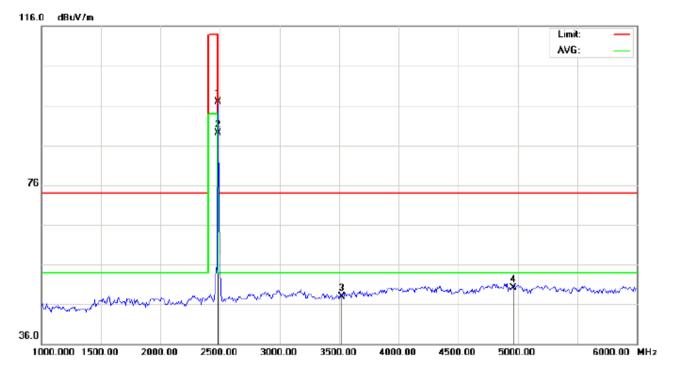
Mode: Middle Channel TX

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height		Comment
	-	MHz	dBu∀	dB/m	dBu∀/m	dBu∀/m	dB		cm	degree	
1		2441.000	86.05	10.36	96.41	114.00	-17.59	peak			
2	*	2441.000	77.76	10.36	88.12	94.00	-5.88	AVG	100	83	
3		3286.000	37.21	11.91	49.12	74.00	-24.88	peak			
4		4882.000	43.31	7.89	51.20	74.00	-22.80	peak			

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



Site: site #1 Polarization: Horizontal Temperature: 22.7
Limit: FCC Class B 3M Radiation above 1GHZ(PK)- Power: Humidity: 53.6 %

EUT:Bluetooth Headset Distance:

M/N:TWS B1

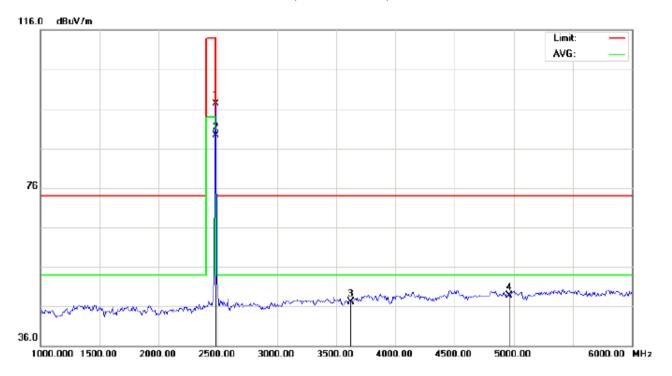
Mode: High Channel TX

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	-	MHz	dBu∀	dB/m	dBu∀/m	dBu∀/m	dB		cm	degree	
1		2480.000	86.57	10.41	96.98	114.00	-17.02	peak			
2	*	2480.000	78.70	10.41	89.11	94.00	-4.89	AVG	100	86	
3		3521.000	35.67	12.24	47.91	74.00	-26.09	peak			
4		4960.000	42.01	8.09	50.10	74.00	-23.90	peak			

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



Site: site #1 Polarization: Vertical Temperature: 22.7
Limit: FCC Class B 3M Radiation above 1GHZ(PK)- Power: Humidity: 53.6 %

EUT:Bluetooth Headset Distance:

M/N:TWS B1

Mode: High Channel TX

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	-	MHz	dBu∀	dB/m	dBu\//m	dBu∀/m	dB		cm	degree	
1		2480.000	86.91	10.41	97.32	114.00	-16.68	peak			
2	*	2480.000	78.83	10.41	89.24	94.00	-4.76	AVG	100	85	
3		3625.000	34.20	12.88	47.08	74.00	-26.92	peak			
4		4960.000	40.66	8.09	48.75	74.00	-25.25	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.

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# Field strength of the fundamental signal

# 1Mbps Result:

# Peak value

Frequency	Reading Level	Factor	Measurement	Limit	Over	Antenna
(MHz)	(dBuv)	(dB/m)	(dBuv/m)	(dBuv/m)	(dB)	Polarization
2402	87.92	10.32	98.24	114	-15.76	Horizontal
2402	87.82	10.32	98.14	114	-15.86	Vertical
2441	86.24	10.36	96.60	114	-17.40	Horizontal
2441	86.05	10.36	96.41	114	-17.59	Vertical
2480	86.57	10.41	96.98	114	-17.02	Horizontal
2480	86.91	10.41	97.32	114	-16.68	Vertical

# Average value

Frequency	Reading Level	Factor	Measurement	Limit	Over	Antenna
(MHz)	(dBuv)	(dB/m)	(dBuv/m)	(dBuv/m)	(dB)	Polarization
2402	79.89	10.32	90.21	94	-3.79	Horizontal
2402	79.75	10.32	90.07	94	-3.93	Vertical
2441	77.96	10.36	88.32	94	-5.68	Horizontal
2441	77.76	10.36	88.12	94	-5.88	Vertical
2480	78.70	10.41	89.11	94	-4.89	Horizontal
2480	78.83	10.41	89.24	94	-4.76	Vertical

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# 2Mbps Result:

# Peak value

Frequency	Reading Level	Factor	Measurement	Limit	Over	Antenna
(MHz)	(dBuv)	(dB/m)	(dBuv/m)	(dBuv/m)	(dB)	Polarization
2402	87.80	10.32	98.12	114	-15.88	Horizontal
2402	87.63	10.32	97.95	114	-16.05	Vertical
2441	85.89	10.36	96.25	114	-17.75	Horizontal
2441	85.85	10.36	96.21	114	-17.79	Vertical
2480	86.35	10.41	96.76	114	-17.24	Horizontal
2480	86.45	10.41	96.86	114	-17.14	Vertical

# Average value

Frequency	Reading Level	Factor	Measurement	Limit	Over	Antenna
(MHz)	(dBuv)	(dB/m)	(dBuv/m)	(dBuv/m)	(dB)	Polarization
2402	79.53	10.32	89.85	94	-4.15	Horizontal
2402	79.33	10.32	89.65	94	-4.35	Vertical
2441	77.85	10.36	88.21	94	-5.79	Horizontal
2441	77.47	10.36	87.83	94	-6.17	Vertical
2480	78.21	10.41	88.62	94	-5.38	Horizontal
2480	78.70	10.41	89.11	94	-4.89	Vertical

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# 3Mbps Result:

# Peak value

Frequency	Reading Level	Factor	Measurement	Limit	Over	Antenna
(MHz)	(dBuv)	(dB/m)	(dBuv/m)	(dBuv/m)	(dB)	Polarization
2402	87.82	10.32	98.14	114	-15.86	Horizontal
2402	87.73	10.32	98.05	114	-15.95	Vertical
2441	85.96	10.36	96.32	114	-17.68	Horizontal
2441	85.85	10.36	96.21	114	-17.79	Vertical
2480	86.44	10.41	96.85	114	-17.15	Horizontal
2480	86.80	10.41	97.21	114	-16.79	Vertical

# Average value

Frequency	Reading Level	Factor	Measurement	Limit	Over	Antenna
(MHz)	(dBuv)	(dB/m)	(dBuv/m)	(dBuv/m)	(dB)	Polarization
2402	79.45	10.32	89.77	94	-4.23	Horizontal
2402	79.30	10.32	89.62	94	-4.38	Vertical
2441	77.76	10.36	88.12	94	-5.88	Horizontal
2441	77.69	10.36	88.05	94	-5.95	Vertical
2480	78.63	10.41	89.04	94	-4.96	Horizontal
2480	78.71	10.41	89.12	94	-4.88	Vertical

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## 9. BAND EDGE EMISSION

# 9.1. MEASUREMENT PROCEDURE

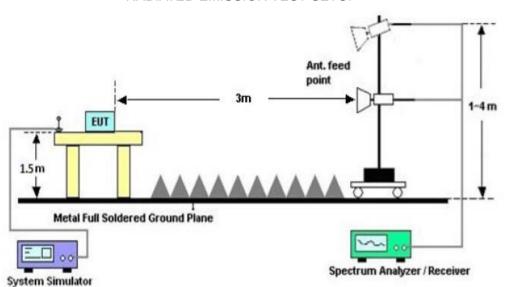
1The EUT operates at hopping-off test mode. The lowest or highest channels are tested to verify the largest transmission and spurious emissions power at the continuous transmission mode.

2Max hold the trace of the setup 1,and the EUT operates at hopping-on test mode to verify the largest spurious emissions power.

3Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission

#### 9.2 TEST SETUP

#### RADIATED EMISSION TEST SETUP



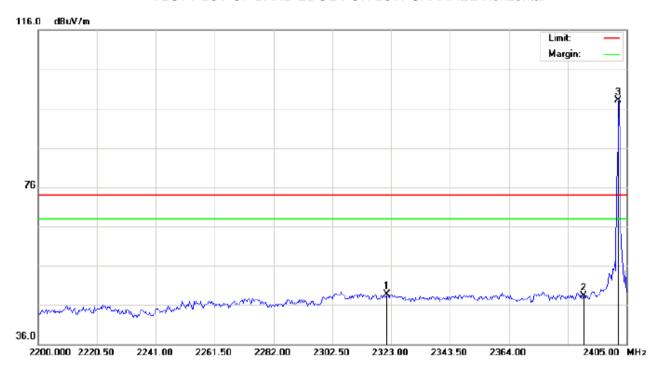
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# 9.3 RADIATED TEST RESULT

(Worst modulation: GFSK)

FOR BR/EDR

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



Site: site #1 Polarization: Horizontal Temperature: 26
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %

EUT:Bluetooth Headset

M/N:TWS B1

Mode: Low Channel TX

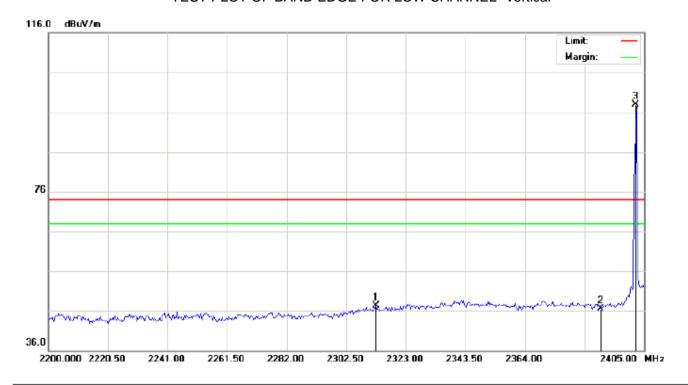
Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBu∀	dB/m	dBu\//m	dBu∀/m	dB		cm	degree	
1		2321.633	38.44	10.23	48.67	74.00	-25.33	peak			
2		2390.000	38.00	10.31	48.31	74.00	-25.69	peak			
3	*	2402.000	87.72	10.32	98.04	74.00	24.04	peak			

Distance:

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



Site: site #1 Polarization: Vertical Temperature: 26
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %

EUT:Bluetooth Headset Distance:

M/N:TWS B1

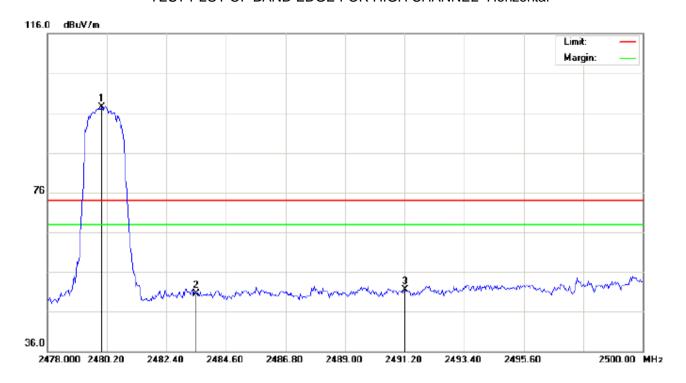
Mode: Low Channel TX

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	-	MHz	dBu∀	dB/m	dBu\//m	dBu∀/m	dB		cm	degree	
1		2312.750	37.13	10.22	47.35	74.00	-26.65	peak			
2		2390.000	36.21	10.31	46.52	74.00	-27.48	peak			
3	*	2402.000	87.63	10.32	97.95	74.00	23.95	peak			

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



Site: site #1 Polarization: Horizontal Temperature: 26
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %

EUT:Bluetooth Headset

M/N:TWS B1

Mode: High Channel TX

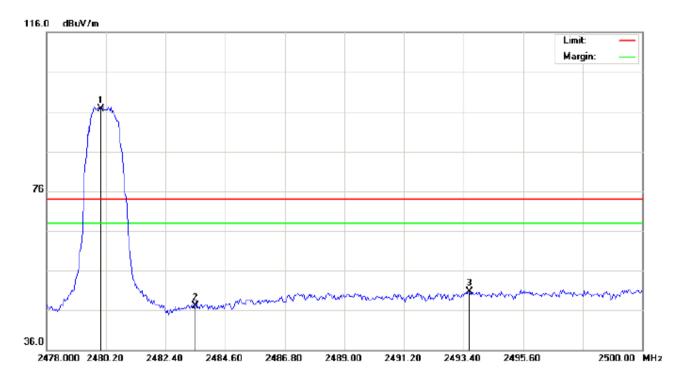
Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	-	MHz	dBu∀	dB/m	dBu\//m	dBu∀/m	dB		cm	degree	
1	*	2480.000	87.05	10.41	97.46	74.00	23.46	peak			
2		2483.500	40.19	10.41	50.60	74.00	-23.40	peak			
3		2491.200	41.11	10.42	51.53	74.00	-22.47	peak			

Distance:

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



Site: site #1

Polarization: Vertical

Temperature: 26

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

Power: Humidity: 60 %

EUT:Bluetooth Headset

Distance:

M/N:TWS B1

Mode: High Channel TX

Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	-	MHz	dBu∀	dB/m	dBu∀/m	dBu∀/m	dB		cm	degree	
1	*	2480.000	86.32	10.41	96.73	74.00	22.73	peak			
2		2483.500	36.76	10.41	47.17	74.00	-26.83	peak			
3		2493.620	40.23	10.42	50.65	74.00	-23.35	peak			

#### **RESULT: PASS**

Note: The other modes radiation emission have enough 20dB margin.

Factor=Antenna Factor + Cable loss - Amplifier gain, Over=Measure-Limit.

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

Hopping on mode and Hopping off mode have been tested, but only worst case reported.

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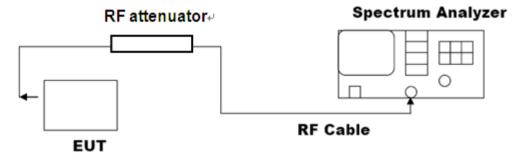
# 10. 20DB BANDWIDTH

#### 10.1. 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 Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hoping channel RBW  $\geq$  1% of the 20 dB bandwidth, VBW  $\geq$  RBW; Sweep = auto; Detector function = peak
- 4. Set SPA Trace 1 Max hold, then View.

#### 10.2. TEST SET-UP

# (BLOCK DIAGRAM OF CONFIGURATION)



Note: The EUT has been used temporary antenna connector for testing.

#### 10.3. LIMITS AND MEASUREMENT RESULTS

#### FOR BR/EDR

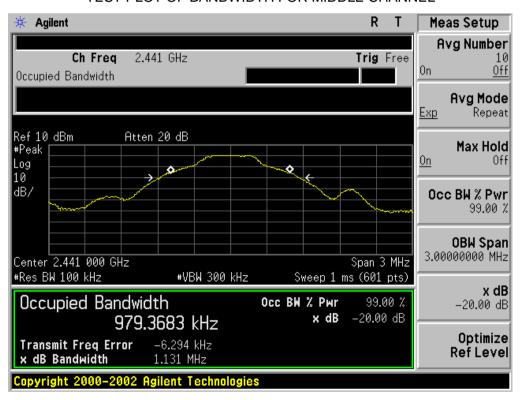
BLUETOOTH 1MBPS LIMITS AND MEASUREMENT RESULT									
	Measurement Result								
Applicable Limits		Dogulf							
		99%OBW (MHz)	-20dB BW(MHz)	Result					
	Low Channel	0.976	1.128	PASS					
N/A	Middle Channel	0.979	1.131	PASS					
	High Channel	0.979	1.127	PASS					

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#### TEST PLOT OF BANDWIDTH FOR LOW CHANNEL

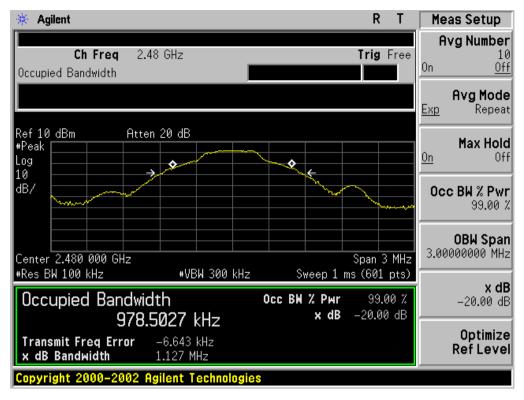


#### TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



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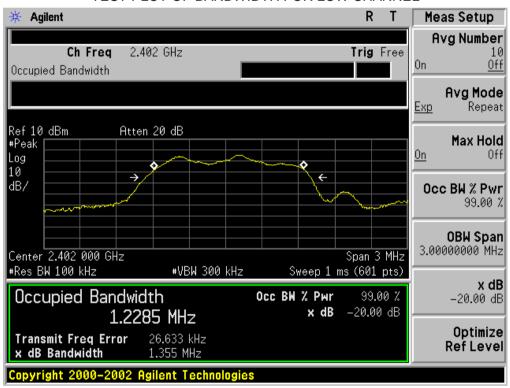
### TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



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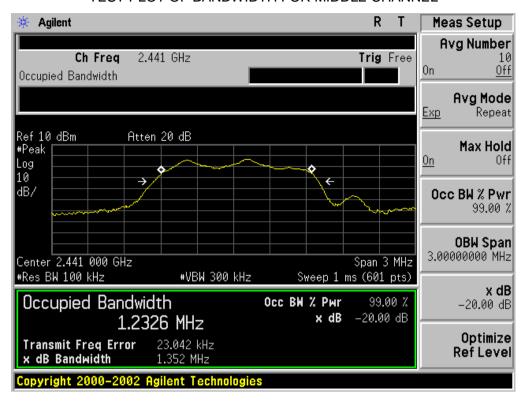
BLUETOOTH 2MBPS LIMITS AND MEASUREMENT RESULT						
	Measurement Result					
Applicable Limits	Test Data (MHz)			Docult		
		99%OBW (MHz)	-20dB BW(MHz)	Result		
N/A	Low Channel	1.229	1.355	PASS		
	Middle Channel	1.233	1.352	PASS		
	High Channel	1.230	1.354	PASS		

# TEST PLOT OF BANDWIDTH FOR LOW CHANNEL

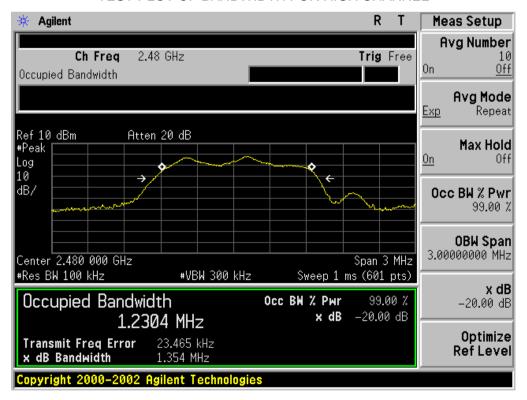


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#### TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



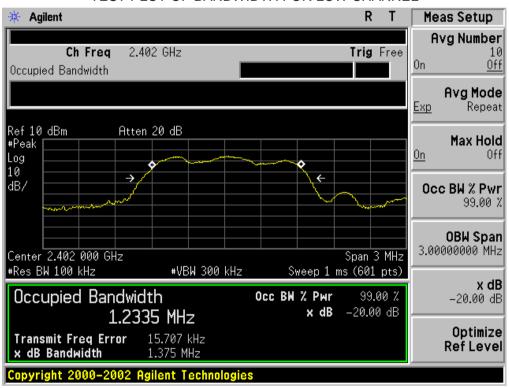
TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



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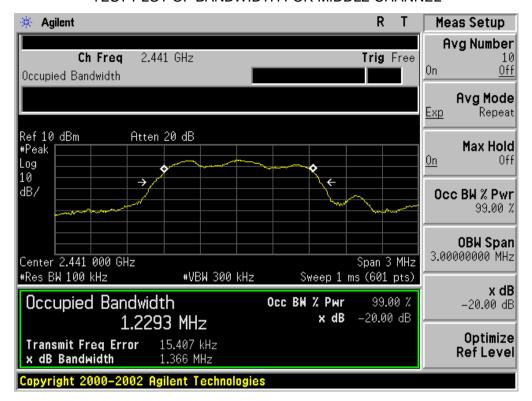
BLUETOOTH 3MBPS LIMITS AND MEASUREMENT RESULT						
	Measurement Result					
Applicable Limits	Test Data (MHz)			Docult		
		99%OBW (MHz)	-20dB BW(MHz)	Result		
N/A	Low Channel	1.234	1.375	PASS		
	Middle Channel	1.229	1.366	PASS		
	High Channel	1.234	1.374	PASS		

# TEST PLOT OF BANDWIDTH FOR LOW CHANNEL

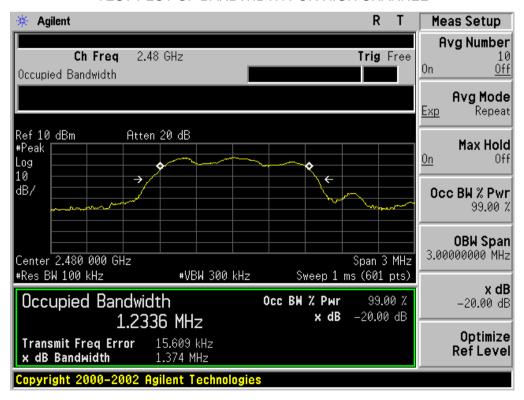


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#### TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



#### TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



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# 11. FCC LINE CONDUCTED EMISSION TEST

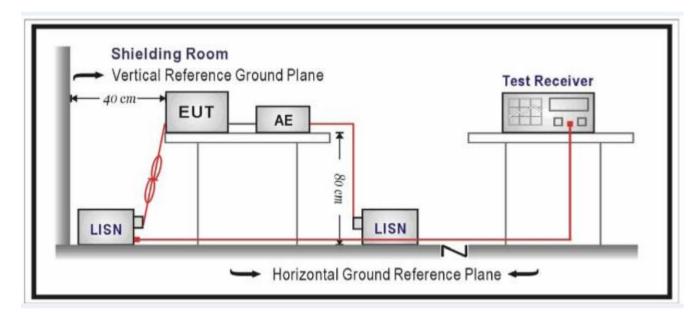
# 11.1. LIMITS OF LINE CONDUCTED EMISSION TEST

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.

# 11.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



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#### 11.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST

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 adapter or PC which received 120V/60Hzpower 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 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.

#### 11.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

- 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.

#### 11.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

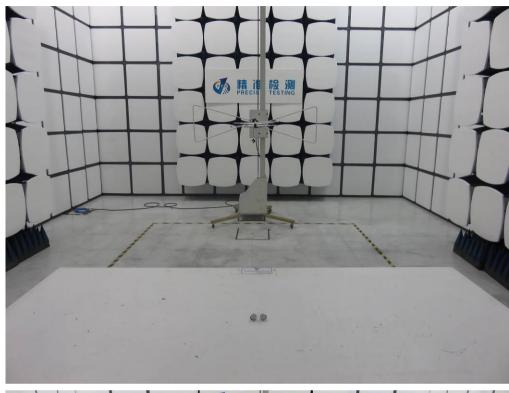
N/A

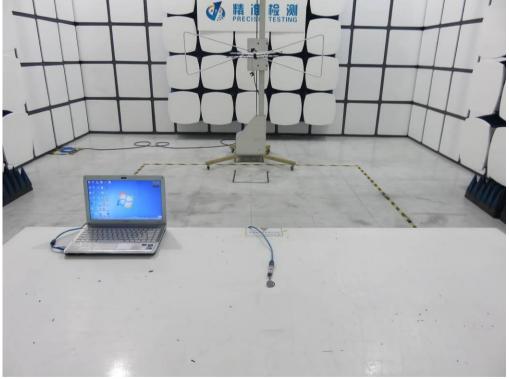
Note: The BT function of EUT didn't work when charging.

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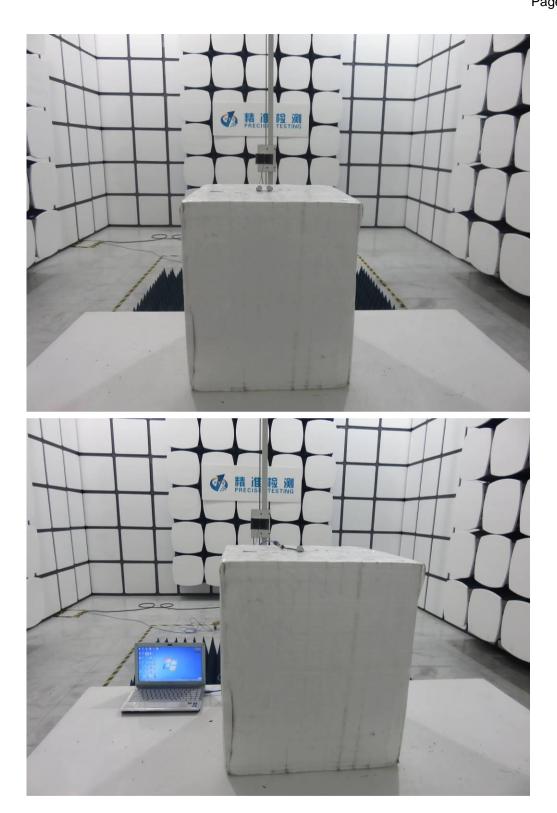
# **APPENDIX A: PHOTOGRAPHS OF TEST SETUP**

FCC RADIATED EMISSION TEST SETUP





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# APPENDIX B: PHOTOGRAPHS OF EUT

WHOLE VIEW OF EUT



TOP VIEW OF EUT(Right)

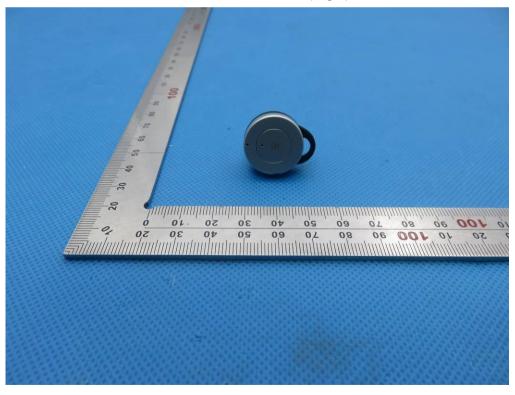


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BOTTOM VIEW OF EUT(Right)



FRONT VIEW OF EUT(Right)



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BACK VIEW OF EUT(Right)



LEFT VIEW OF EUT(Right)



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RIGHT VIEW OF EUT(Right)

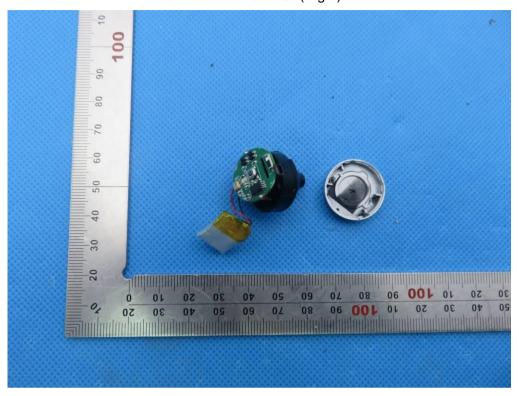


VIEW OF EUT (PORT) (Right)

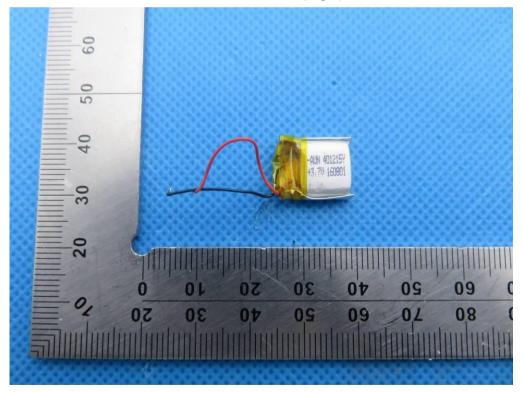


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OPEN VIEW OF EUT(Right)-1

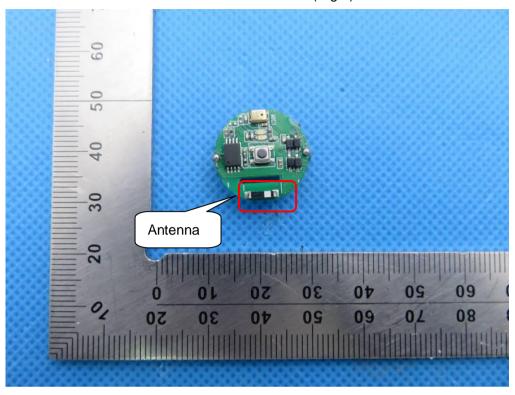


OPEN VIEW OF EUT(Right)-2

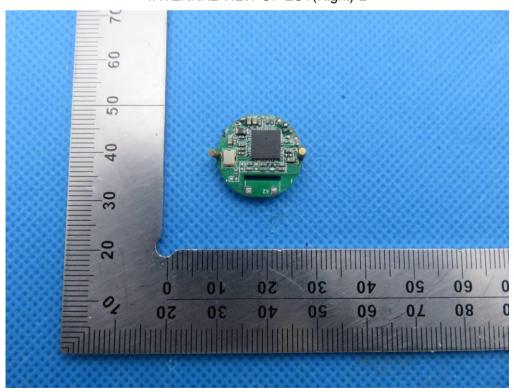


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INTERNAL VIEW OF EUT(Right)-1

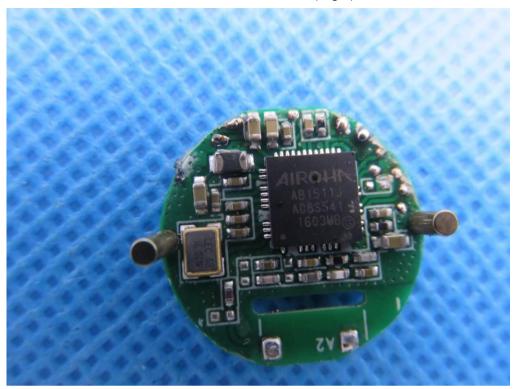


INTERNAL VIEW OF EUT(Right)-2

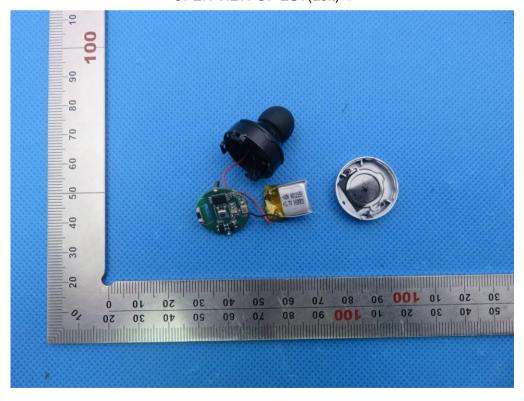


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INTERNAL VIEW OF EUT(Right)-3

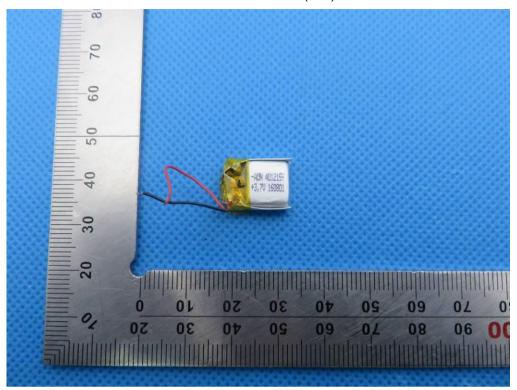


OPEN VIEW OF EUT(Left)-1

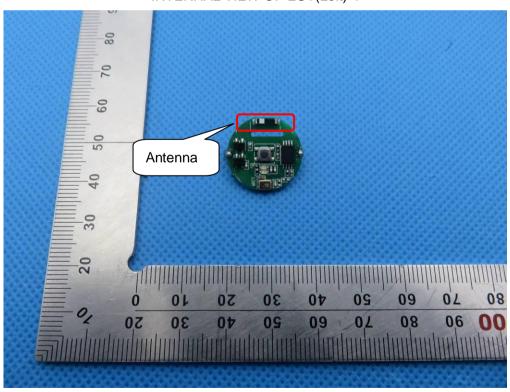


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OPEN VIEW OF EUT(Left)-2

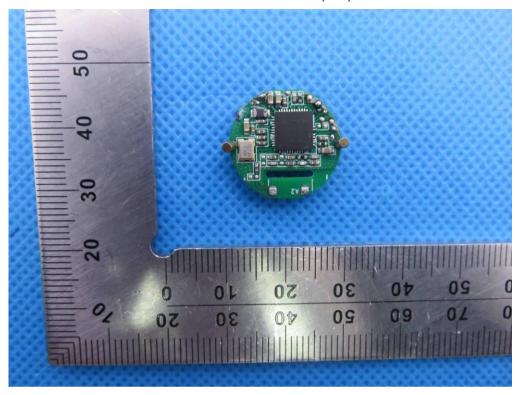


INTERNAL VIEW OF EUT(Left)-1

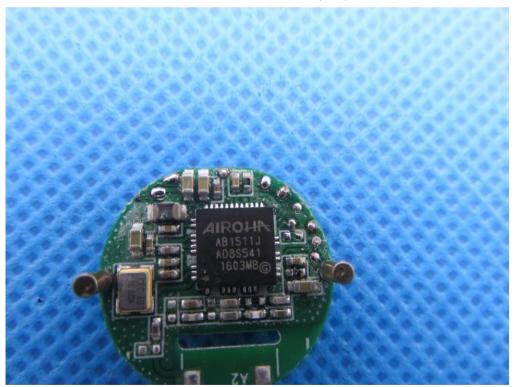


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# INTERNAL VIEW OF EUT(Left)-2



INTERNAL VIEW OF EUT(Left)-3



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