

#### Report No.: AGC02182190602FE03 Page 45 of 64

EUT	BLUETOOTH HEADPHONES	Model Name	IBT-3
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4960.022	49.06	0.22	49.28	74.00	-24.72	peak
4960.022	45.82	0.22	46.04	54.00	-7.96	AVG
7440.033	45.73	2.64	48.37	74.00	-25.63	peak
7440.033	42.37	2.64	45.01	54.00	-8.99	AVG
<u> </u>						
Remark:	- Ci	0		- C	- 6	
actor = Ante	enna Factor + Ca	ble Loss –	Pre-amplifier		S ( )	- 61

EUT	UT BLUETOOTH HEADPHONES Model Name		IBT-3
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4960.022	47.40	0.22	47.62	74.00	-26.38	peak
4960.022	45.72	0.22	45.94	54.00	-8.06	AVG
7440.033	46.47	2.64	49.11	74.00	-24.89	peak
7440.033	42.30	2.64	44.94	54.00	-9.06	AVG
	0	0.0	©			6
emark:		CC-		0		

# **RESULT: PASS**

#### Note:

Other emissions from 1G to 25 GHz are considered as ambient noise. No recording in the test report. Factor = Antenna Factor + Cable loss - Amplifier gain, Over=Measure-Limit.

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

All test modes had been tested. The GFSK modulation is the worst case and recorded in the report.





#### **TEST RESULT FOR RESTRICTED BANDS REQUIREMENTS**

EUT	BLUETOOTH HEADPHONES	Model Name	IBT-3
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Horizontal

ΡK

Spectrum					
Ref Level 113.0		😑 RBW 1 MHz			
Att	20 dB SWT 5.7	µs 🖷 VBW 3 MHz	Mode Auto FFT		
TDF 1Pk Max					
110 dBµV/m			M1[1]		97.57 dBµV/
110 00,01,0					2.4018710 G
100 dBµV/m			M2[1]		_44.3 <sup>1</sup> 1dBμV/
					2.3900800 G
90 dBµV/m					-/
			1		
80 dBµV/m					+++
D	2 74.000 dBµV/m				+++
70 dBµV/m					
					f = 1
60 dBµV/m					
50 dBµV/m	.000 dBµV/m				
зо аврулі			M2		, I
40 dBµV/m			$\sim \sim$		
io appr,iii					
30 dBµV/m					
20 dBµV/m					
Start 2.37 GHz		1001 pt			Stop 2.405 GH
Aarker		1001 pt	5		Stop 2.403 GH
Type   Ref   Trc	X-value	Y-value	Function	Function F	Result
M1 1				. unocion i	
M2 1					

Date: 18.JUN.2019 05:56:33



Ref Level Att TDF	113.00 d		<ul> <li>RBW 1 MHz</li> <li>VBW 3 MHz</li> </ul>	Mode Auto FFT		
1Rm AvgPw	r					
10 dBµV/m-				M1[1]		97.06 dBµV∕n
				100111		2.4020450 GH
.00 dBµV/m-				M2[1]		35.10 HBµV/n 2.3980000 GH
				1	1	2.0500000 011
10 dBµV/m+						
0 dBµV/m		4.000 dBµV/m				
0 000000						
0 dBµV/m						
	1 54.000	dBu//m				
0 dBµV/m	1 01.000	, app v/m				
0 dBµV/m				M2		
			1	- the	+	
0 dBµV/m						
0 dBµV/m+						
tart 2.37 G	Hz		1001 pt	s		Stop 2.405 GHz
arker						
Type   Ref	Trc	X-value	Y-value	Function	Functio	n Result
M1	1	2.402045 GHz	97.06 dBµV/m			
M2	1	2.39 GHz	35.10 dBµV/m			

Date: 18.JUN.2019 05:56:58

**RESULT: PASS** 

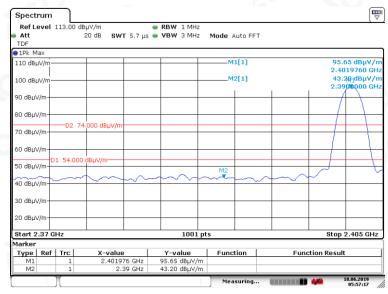




#### Report No.: AGC02182190602FE03 Page 47 of 64

EUT	BLUETOOTH HEADPHONES Model Name		IBT-3
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 1	Antenna	Vertical

PK



Date: 18.JUN.2019 05:57:18



Ref Level 113.0 Att TDF		■ RBW 1 MHz µs ■ VBW 3 MHz	Mode Auto Fi	FT		
●1Rm AvgPwr						
110 dBµV/m			M1[1]		94.94 dB 2.401941	
100 dBµV/m			M2[1]		36.581dB 2.390200	
90 dBµV/m						
80 dBµV/m					+ $/+$	
70 dBµV/m	2 74.000 dBµV/m					$\vdash$
60 dBµV/m						
50 dBµV/m	000 dBµV/m					
40 dBµV/m			M2	_		l
30 dBµV/m		$\neg \neg$				
20 dBµV/m						
Start 2.37 GHz		1001 j	ots		Stop 2.405	GHz
Marker	1	1	1			
Type   Ref   Trc	X-value 2.401941 GH;	Y-value 2 94.94 dBµV/m	Function	Fur	nction Result	

Date: 18.JUN.2019 05:57:09

**RESULT: PASS** 





#### Report No.: AGC02182190602FE03 Page 48 of 64

EUTBLUETOOTH HEADPHONESModel Name		Model Name	IBT-3
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	Mode 3	Antenna	Horizontal

ΡK Spectrum Ref Level 113.00 Att TDF dBμV/m ● RBW 1 MHz 20 dB SWT 3.8 μs ● VBW 3 MHz Mode Auto FFT 1Pk Max 110 dBµ\ 96.85 dBµV, 2.4800990 G 46.24 dBµV, 2.4835000 G 42[1] 100 dBµV 30 dBuV/r 0 dBµV/ 🖞 dBµV/r 1 54.0 50 dBµV/i i0 dBµ 20 dBuV/ Stop 2.5 GHz 1001 pts Start 2.478 GH 
 Y-value
 Function

 96.85 dBμV/m
 46.24 dBμV/m
 Type | Ref | Trc | X-value Function Re 480099 GHz 2.4835 GHz M1 M2

	vel 1:	13.00 dE		🔵 RBW 1 MHz			,
Att TDF			20 dB <b>SWT</b> 3.8 μ	s 👄 VBW 3 MHz	Mode Auto FF1		
1Rm Av	gPwr						
110 dBµ	//m				M1[1]		95.55 dBµV/n
					100511		2.4800550 GH: 46.15 dBµV/n
100 dBµʻ	//tú				M2[1]		46.15 dBµV/h 2.4835000 GH
90 dB	(m						
	I )	\					
80 <mark>0</mark> 8µV;	/m	$\rightarrow$				_	
- (		-D2 74	.000 dBµV/m				
70 dBµV,	′m+						
60 dBuV	100						
po uppv,		54 000	dBµV/m				
50 dBµV;	/m	34.000					
40 dBµV;	/m						
30 dBµV;	100						
30 ubµv;							
20 dBµV;	/m						
Start 2.	478 G	Hz		1001 p	ts		Stop 2.5 GHz
1arker Type	Dof 1	Trc	X-value	Y-value	Function	F	nction Result
M1	Ref	1	2.480055 GHz	95.55 dBuV/m	Function	Fui	ICTION RESult
M2		1	2.4835 GHz	46.15 dBµV/m			

AV

Date: 18.JUN.2019 05:58:19

Date: 18.JUN.2019

05:58:28

**RESULT: PASS** 





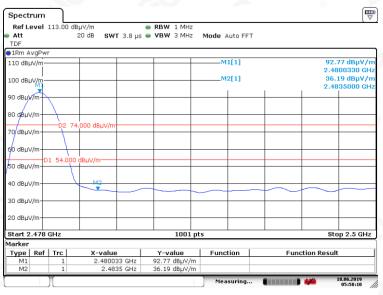
#### Report No.: AGC02182190602FE03 Page 49 of 64

BLUETOOTH HEADPHONES	Model Name	IBT-3	
25°C	Relative Humidity	55.4%	
960hPa	Test Voltage	Normal Voltage	
Mode 3	Antenna	Vertical	
	25°C 960hPa	25°C     Relative Humidity       960hPa     Test Voltage	

PK

Spectrum Ref Level 113.00 Att Mode Auto FFT TDE ●1Pk Ma 110 dBu 94.51 dBµV, 2.4800330 G 2 480 44.92 dBμV/ 2.4835000 G 2[1] 100 dBµV 30 <mark>(</mark>BuV/r 0 dBuV i dBµV/r 1 54.0 50 dBµV/i 20 dBuV/i Start 2.478 GH 1001 pts Stop 2.5 GH Type | Ref | Trc | **Y-value** 94.51 dBµV/m 44.92 dBµV/m Function X-value Function Res 30033 .4835 GHz GHz M2





Date: 18.JUN.2019 05:58:11

Date: 18.JUN.2019

05:57:56

#### **RESULT: PASS**

**Note**: The factor had been edited in the "Input Correction" of the Spectrum Analyzer. So the Amplitude of test plots is equal to Reading level plus the Factor in dB. Use the A dB( $\mu$ V) to represent the Amplitude. Use the F dB( $\mu$ V/m) to represent the Field Strength. So A=F. All test modes had been pre-tested. The GFSK modulation is the worst case and recorded in the report.



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Add: 2/F., Building 2, No.1–4, Chaxi Sanwei Technial Industrial Park, Gushu, Xixiang, Bao'an District, Shenzhen, Guangdong, China Tel: +86-755 2523 4088 E-mail: agc@agc-cert.com Service Hotline:400 089 2118



# **11. NUMBER OF HOPPING FREQUENCY**

## **11.1. MEASUREMENT PROCEDURE**

The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings:

1. Span: The frequency band of operation. Depending on the number of channels the device supports, it may be necessary to divide the frequency range of operation across multiple spans, to allow the individual channels to be clearly seen.

2. RBW: To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.

3. VBW ≥ RBW. Sweep: Auto. Detector function: Peak. Trace: Max hold.

4. Allow the trace to stabilize.

### 11.2. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)

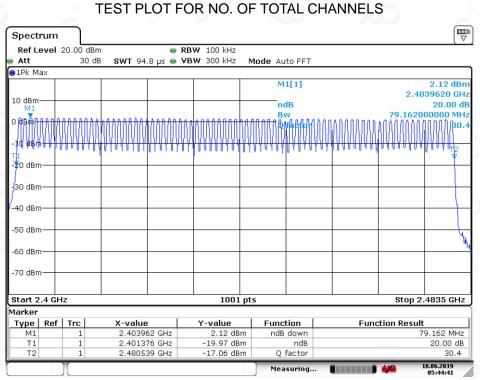
Same as described in section 8.2

# **11.3. MEASUREMENT EQUIPMENT USED**

The same as described in section 6

# **11.4. LIMITS AND MEASUREMENT RESULT**

TOTAL NO. OF HOPPING CHANNEL	LIMIT (NO. OF CH)	MEASUREMENT (NO. OF CH)	RESULT
	>=15	79	PASS



Date: 18.JUN.2019 05:44:42

Note: The GFSK modulation is the worst case and recorded in the report.





# 12. TIME OF OCCUPANCY (DWELL TIME)

# **12.1. MEASUREMENT PROCEDURE**

The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings:

1. Span: Zero span, centered on a hopping channel.

2. RBW shall be  $\leq$  channel spacing and where possible RBW should be set >> 1 / T, where T is the expected dwell time per channel.

3. Sweep: As necessary to capture the entire dwell time per hopping channel; where possible use a video trigger and trigger delay so that the transmitted signal starts a little to the right of the start of the plot. The trigger level might need slight adjustment to prevent triggering when the system hops on an adjacent channel; a second plot might be needed with a longer sweep time to show two successive hops on a channel.

4. Detector function: Peak. Trace: Max hold.

5. Use the marker-delta function to determine the transmit time per hop.

6. Repeat the measurement using a longer sweep time to determine the number of hops over the period specified in the requirements. The sweep time shall be equal to, or less than, the period specified in the requirements. Determine the number of hops over the sweep time and calculate the total number of hops in the period specified in the requirements, using the following equation:

(Number of hops in the period specified in the requirements) = (number of hops on spectrum analyzer)  $\times$  (period specified in the requirements / analyzer sweep time)

7. The average time of occupancy is calculated from the transmit time per hop multiplied by the number of hops in the period specified in the requirements.

# 12.2. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)

Same as described in section 8.2

# 12.3. MEASUREMENT EQUIPMENT USED

The same as described in section 6

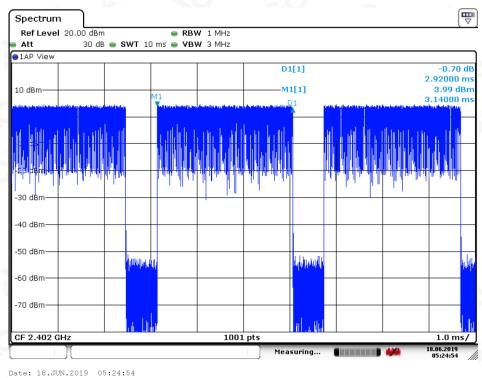
# 12.4. LIMITS AND MEASUREMENT RESULT

Channel	Time of Pulse for DH5 (ms)	Number of hops in the period specified in the requirements	Sweep Time (ms)	Limit (ms)
Low	2.920	27*4	315.360	400
Middle	2.920	27*4	315.360	400
High	2.920	27*4	315.360	400

Note: The 8-DPSK modulation is the worst case and recorded in the report.

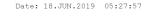






#### TEST PLOT OF LOW CHANNEL

P Spectrum Ref Level 20.00 dBm 🔵 RBW 1 MHz Att 30 dB 👄 SWT 7.9 s 👄 VBW 3 MHz SGL ⊖1AP Clrw 10 dBm· 0 dBm 1 de dE CF 2.402 GHz 1001 pts 790.0 ms/ Read

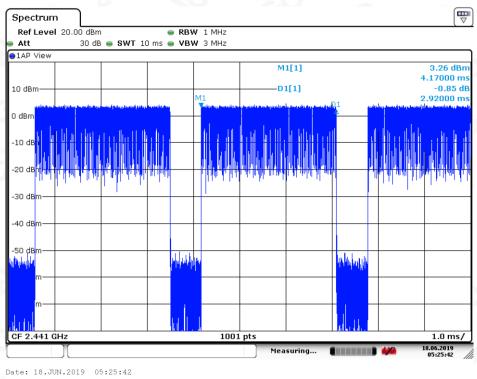




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TEST PLOT OF MIDDLE CHANNEL

 Spectrum
 RBW 1 MHz

 30 dB
 SWT 7.9 s
 VBW 3 MHz

 SG
 14P Clrw
 10 dBm
 10 dBm

 10 dBm
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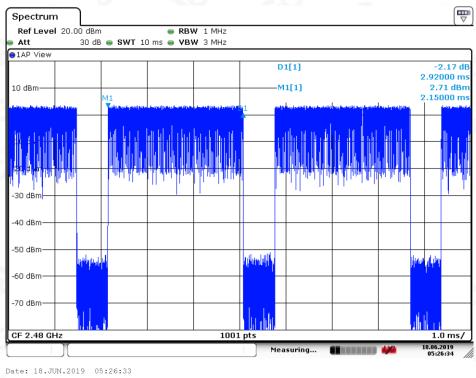
Date: 18.JUN.2019 05:27:40



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TEST PLOT OF HIGH CHANNEL

P Spectrum Ref Level 20.00 dBm 🔵 RBW 1 MHz Att 30 dB 👄 SWT 7.9 s 👄 VBW 3 MHz SGL ⊖1AP Clrw 10 dBm· 0 dBm 1 de з<mark>bi</mark>dв CF 2.402 GHz 1001 pts 790.0 ms/ Read

Date: 18.JUN.2019 05:27:57



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# **13. FREQUENCY SEPARATION**

### **13.1. MEASUREMENT PROCEDURE**

The EUT shall have its hopping function enabled. Use the following spectrum analyzer settings:

1. Span: Wide enough to capture the peaks of two adjacent channels.

2. RBW: Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel.

3. Video (or average) bandwidth (VBW)  $\geq$  RBW.

4. Sweep: Auto. e) Detector function: Peak. f) Trace: Max hold. g) Allow the trace to stabilize.

Use the marker-delta function to determine the separation between the peaks of the adjacent channels.

#### **13.2. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)**

Same as described in section 6.2

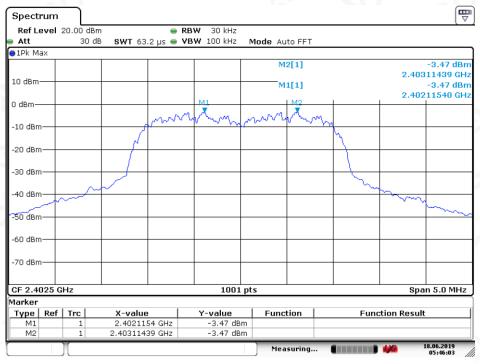
#### **13.3. MEASUREMENT EQUIPMENT USED**

The same as described in section 6.3

#### 13.4. LIMITS AND MEASUREMENT RESULT

CHANNEL	CHANNEL SEPARATION	LIMIT	RESULT
	KHz	KHz	Pass
CH01-CH02	998.99	>=25 KHz or 2/3 20 dB BW	

#### TEST PLOT FOR FREQUENCY SEPARATION



Date: 18.JUN.2019 05:46:04

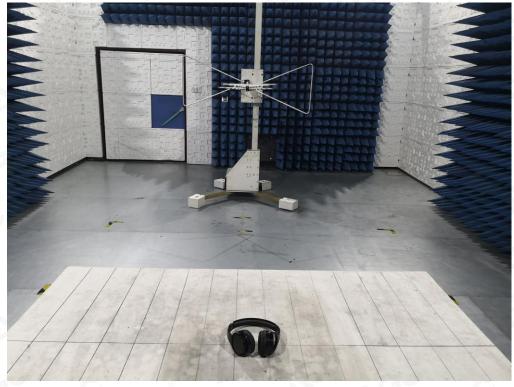
Note: The 8-DPSK modulation is the worst case and recorded in the report.





Report No.: AGC02182190602FE03 Page 56 of 64

# APPENDIX A: PHOTOGRAPHS OF TEST SETUP RADIATED EMISSION TEST SETUP BELOW 1GHZ



RADIATED EMISSION TEST SETUP ABOVE 1GHZ





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Report No.: AGC02182190602FE03 Page 57 of 64



# APPENDIX B: PHOTOGRAPHS OF EUT AII VIEW OF EUT

TOP VIEW OF EUT





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Report No.: AGC02182190602FE03 Page 58 of 64

# BOTTOM VIEW OF EUT



## FRONT VIEW OF EUT







Report No.: AGC02182190602FE03 Page 59 of 64

# BACK VIEW OF EUT



## LEFT VIEW OF EUT







Report No.: AGC02182190602FE03 Page 60 of 64

# **RIGHT VIEW OF EUT**



## **OPEN VIEW OF EUT-1**







Report No.: AGC02182190602FE03 Page 61 of 64

### **OPEN VIEW OF EUT-2**



### **OPEN VIEW OF EUT-3**

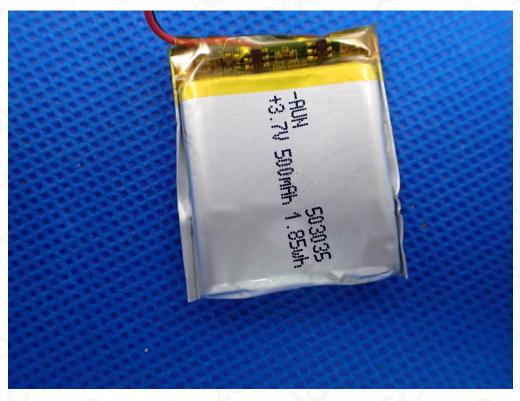




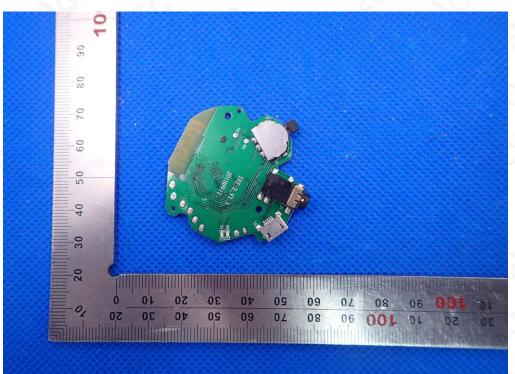


Report No.: AGC02182190602FE03 Page 62 of 64

# BATTERY VIEW OF EUT



## **INTERNAL VIEW OF EUT-1**

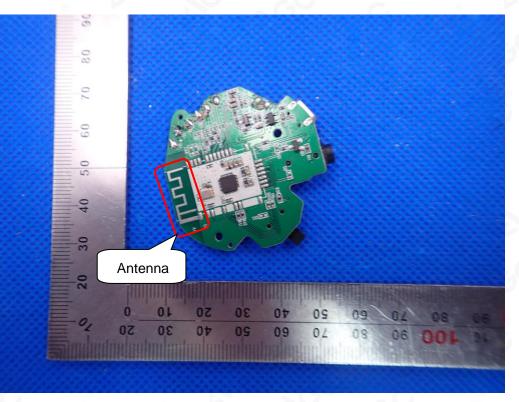




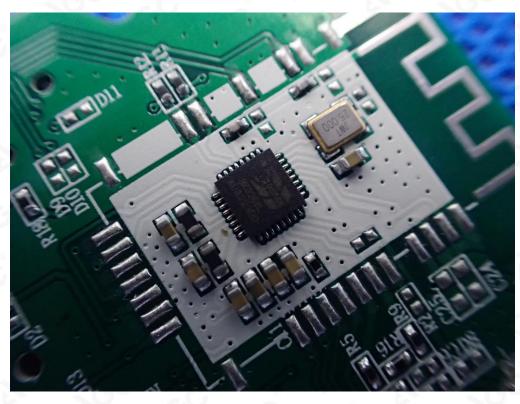


Report No.: AGC02182190602FE03 Page 63 of 64

### **INTERNAL VIEW OF EUT-2**



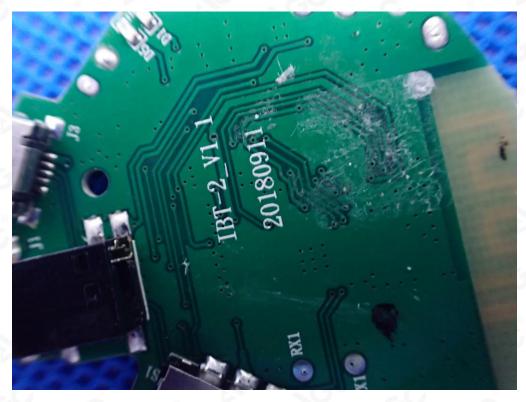
### **INTERNAL VIEW OF EUT-3**







Report No.: AGC02182190602FE03 Page 64 of 64



# **INTERNAL VIEW OF EUT-4**

----END OF REPORT----

