# **FCC Test Report**

Report No.: AGC01369170704FE03

**FCC ID** 2ABFFSH226A

**APPLICATION PURPOSE** Original Equipment

**PRODUCT DESIGNATION** Bluetooth Stereo headset

**BRAND NAME** : N/A

**MODEL NAME** : SH226A, SH226B, SH226C, SH226D, SH226E, SH226F

SHENZHEN SURE THING INDUSTRY AND COMMERCE **CLIENT** 

DEVELOPMENT CO.,LTD

**DATE OF ISSUE** Jul.03, 2017

STANDARD(S)

FCC Part 15 Subpart C Section 15.249 **TEST PROCEDURE(S)** 

REPORT VERSION : V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd

## **CAUTION:**

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# **Report Revise Record**

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Jul.03, 2017	Valid	Original Report

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## 1. VERIFICATION OF CONFORMITY

Applicant	SHENZHEN SURE THING INDUSTRY AND COMMERCE DEVELOPMENT CO.,LTD		
Address	2-3F, Building A, Fuxinlin Industrial Park, Hangcheng Industrial Area, Xixiang Town, Bao An District, Shenzhen, China		
Manufacturer	SHENZHEN SURE THING INDUSTRY AND COMMERCE DEVELOPMENT CO.,LTD		
Address	2-3F, Building A, Fuxinlin Industrial Park, Hangcheng Industrial Area, Xixiang Town, Bao An District, Shenzhen, China		
Product Designation	Bluetooth Stereo headset		
Brand Name	N/A		
Test Model	SH226A		
Series Model	SH226B, SH226C, SH226D, SH226E, SH226F		
Difference description	All the same except for the appearance color		
Date of test	Jun.28, 2017 to Jun.30, 2017		
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	Honry Zhang	
	Henry Zhang(Zhang Zhuorui)	Jun.30, 2017
Reviewed By	Forest ce	
	Forrest Lei(Lei Yonggang)	Jul.03, 2017
Approved By	Solya Hong	
	Solger Zhang(Zhang Hongyi)  Authorized Officer	Jul.03, 2017

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## 2. GENERAL INFORMATION

## 2.1. PRODUCT DESCRIPTION

A major technical description of EUT is described as following

Operation Frequency 2.402 GHz to 2.480GHz		
RF Output Power	3.23dBm(Max EIRP Power=Max radiation field-95.2)	
Bluetooth Version	V4.1	
Modulation	GFSK, π /4-DQPSK, 8DPSK	
Number of channels	79	
Hardware Version	V1.0	
Software Version	v2xxx	
Antenna Designation	PCB Antenna	
Antenna Gain	2dBi	
Power Supply	DC 3.7V by battery	

## Note:

The USB port only be used for charging and can't be used to transfer data with PC.
 The EUT didn't support BLE.

## 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

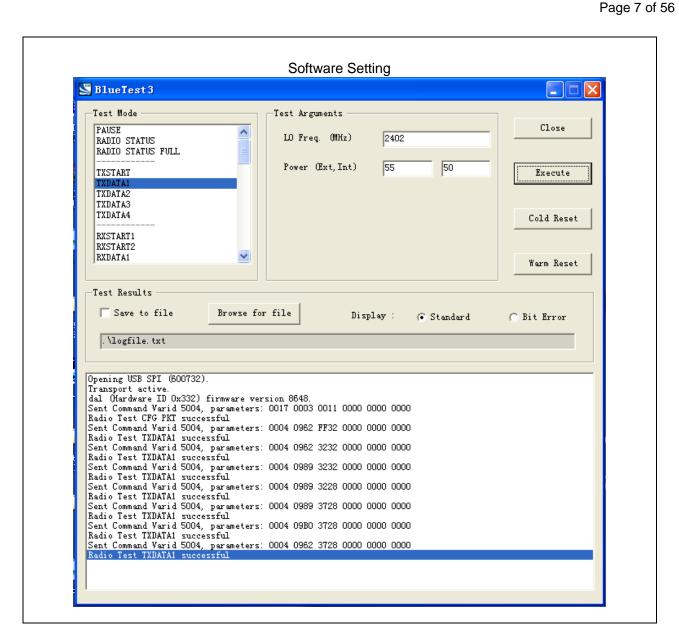
The reported uncertainty of measurement y ±U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

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 TX(GFSK)
2	Middle channel TX (GFSK)
3	High channel TX (GFSK)
4	Low channel TX(π/4-DQPSK)
5	Middle channel TX(π/4-DQPSK)
6	High channel TX (π/4-DQPSK)
7	Low channel TX(8DPSK)
8	Middle channel TX (8DPSK)
9	High channel TX (8DPSK)
10	BT Link with charging
11	BT Link

- 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.

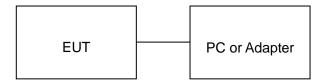


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## **5. SYSTEM TEST CONFIGURATION**

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

Configure 1: (Normal hopping)



Note: Owing to the EUT has own battery, Testing will be performed while PC or adapter remove.

Configure 2: (Control continuous TX)



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

ITEM	EQUIPMENT	MFR/BRAND	MODEL/TYPE NO.	REMARK
1	Bluetooth Stereo headset	SURE THING	SH226A	EUT
2	Battery	YJ	552535	Accessory
3	PC	Sony	E1412AYCW	A.E
4	PC Adapter	Sony	VGP-AC19V36	A.E
5	Control box	CSR	USB_SPI_TOOLS	A.E
6	Adapter	IPRO	NTR-S01	A.E
7	USB Cable	N/A	1.0m Unshielded	A.E

## **5.3. SUMMARY OF TEST RESULTS**

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.249(a) §15.209	Radiated Emission	Compliant
§15.249(d)	Band Edges	Compliant
§15.207	Conduction Emission	Compliant
§15.215	Bandwidth	Compliant

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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.

## 7. TEST METHOD

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

## 8. 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 & SCHWARZBECK	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		
MULTI-DEVICE Positioning Controller	MAX-FULL	MF-7802	MF780208339	N/A	N/A		
Active loop antenna (9K-30MHz)	SCHWARZBECK	FMZB1519	1519-038	June 6, 2017	June 5, 2018		
Spectrum analyzer	AGILENT	E4407B	MY46185649	June 6, 2017	June 5, 2018		
Radiation Cable 1	MXT	RS1	R005	June 6, 2017	June 5, 2018		
Radiation Cable 2	MXT	RS1	R006	June 6, 2017	June 5, 2018		
temporary antenna connector	N/A	S100		July 4, 2016	July 3, 2017		

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## FOR RADIATED EMISSION TEST (1GHz ABOVE)

TOTATION TITLE ENTINES	ON NADIATED ENGOION TEST (TOTIZABOVE)											
	Radiat	ted Emission Tes	st Site									
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration							
EMI Test Receiver	ROHDE & SCHWARZBECK	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							
MULTI-DEVICE Positioning Controller	MAX-FULL	MF-7802	MF780208339	N/A	N/A							
Horn Ant (18G-40GHz)	SCHWARZBECK	BBHA 9170	9170-181	June 6, 2017	June 5, 2018							
Radiation Cable 1	MXT	RS1	R005	June 6, 2017	June 5, 2018							
Radiation Cable 2	MXT	RS1	R006	June 6, 2017	June 5, 2018							

	Conducted Emission Test Site											
Name of Equipment Manufacturer Model Number Serial Number Calibration Calibration												
EMI Test Receiver	ROHDE & SCHWARZBECK	ESCI	101417	July 4, 2016	July 3, 2017							
Artificial Mains Network	NARDA	L2-16B	000WX31025	July 8, 2016	July 7, 2017							
Artificial Mains Network (AUX)	NARDA	L2-16B	000WX31026	July 8, 2016	July 7, 2017							
RF Cable	SCHWARZBECK	AK9515E	96222	July 4, 2016	July 3, 2017							
Shielded Room	CHENGYU	843	PTS-002	June 6, 2017	June 5, 2018							
Conduction Cable	MXT	SE1	S003	June 6, 2017	June 5, 2018							

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## 9. RADIATED EMISSION

## 9.1TEST 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 Strei	ngths Limit
(MHz)	Meters	μ V/m	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 (Ave	rage)

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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#### 9.2. 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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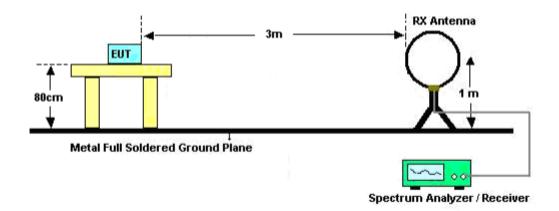
The following table is the setting of spectrum analyzer and receiver.

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 RBW 2MHz/VBW 6MHz for Peak, RBW 1.5MHz/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

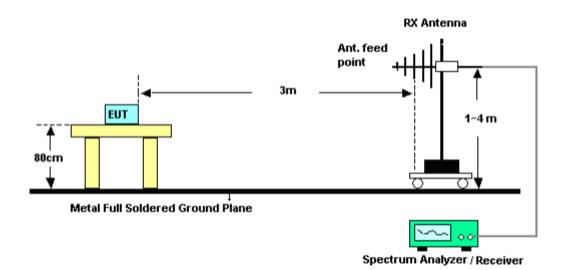
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## 9.3. TEST SETUP

## RADIATED EMISSION TEST SETUP BELOW 30MHz

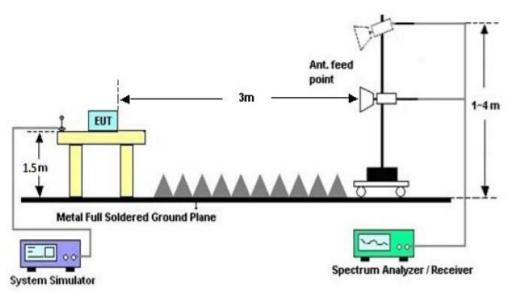


## RADIATED EMISSION TEST SETUP 30MHz-1000MHz



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# RADIATED EMISSION TEST SETUP ABOVE 1000MHz



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## 9.4. TEST RESULT

(Worst modulation:GFSK)

FOR BR/EDR

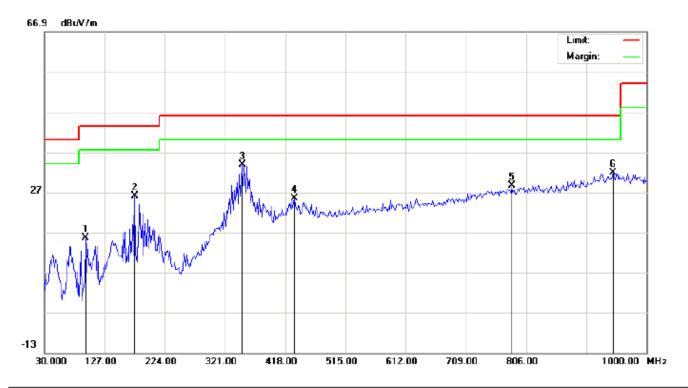
## **RADIATED EMISSION BELOW 30MHz**

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

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## **RADIATED EMISSION BELOW 1GHz**

## RADIATED EMISSION TEST- (30MHz-1GHz)-LOW CHANNEL-HORIZONTAL



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

EUT: Bluetooth Stereo headset

M/N: SH226A

Mode:Low Channel TX

Note:

Polarization: Horizontal Temperature: 22.4
Power: Humidity: 52.5 %

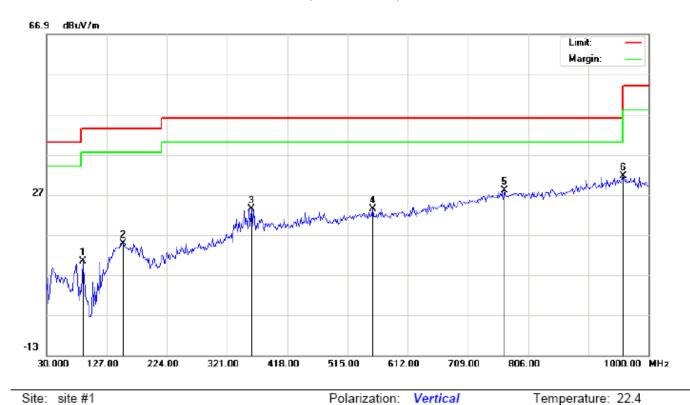
Distance:

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		96.2833	8.80	6.77	15.57	43.50	-27.93	peak			
2		175.5000	15.01	10.90	25.91	43.50	-17.59	peak			
3	*	348.4833	15.20	18.64	33.84	46.00	-12.16	peak			
4		432.5500	5.26	20.06	25.32	46.00	-20.68	peak			
5		783.3667	1.51	27.09	28.60	46.00	-17.40	peak			
6		946.6500	1.94	29.91	31.85	46.00	-14.15	peak			

Humidity: 52.5 %

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## RADIATED EMISSION TEST- (30MHz-1GHz)-LOW CHANNEL -VERTICAL



Site: site #1

Limit: FCC Class B 3M Radiation

EUT: Bluetooth Stereo headset

M/N: SH226A

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		88.2000	5.58	4.74	10.32	43.50	-33.18	peak			
2		152.8667	-0.54	15.28	14.74	43.50	-28.76	peak			
3		359.8000	4.60	18.80	23.40	46.00	-22.60	peak			
4		555.4167	0.90	22.51	23.41	46.00	-22.59	peak			
5		767.2000	1.11	26.87	27.98	46.00	-18.02	peak			

46.00

-14.48

peak

Power:

Distance:

Vertical

## **RESULT: PASS**

959.5833

1.61

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

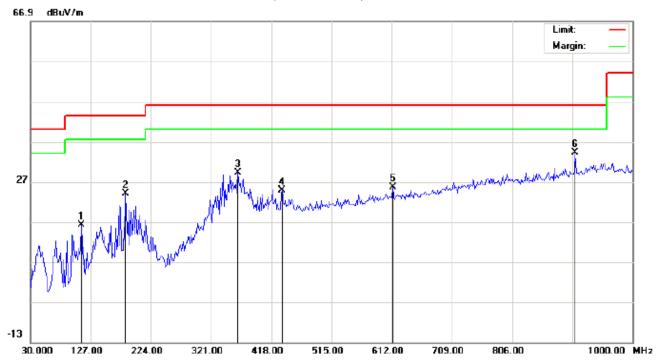
31.52

29.91

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 Stereo headset

M/N: SH226A

Mode:Middle Channel TX

Note:

Polarization:	Horizontal	Temperature: 22.4
Power:		Humidity: 52.5 %

Distance:

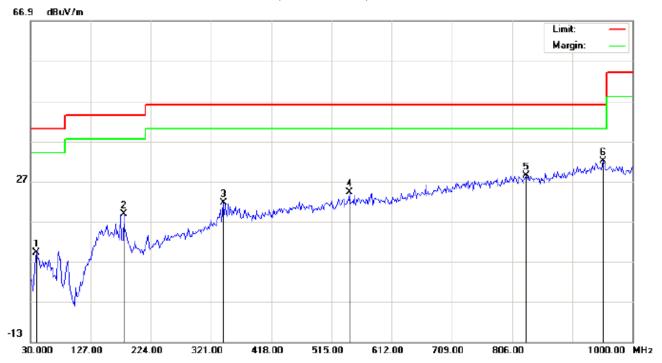
No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	-	MHz	dBu∀	dB/m	dBu∀/m	dBu∀/m	dB		cm	degree	
1		112.4500	8.53	7.60	16.13	43.50	-27.37	peak			
2		183.5833	12.80	11.24	24.04	43.50	-19.46	peak			
3		364.6500	10.30	18.84	29.14	46.00	-16.86	peak			
4		435.7833	4.67	20.16	24.83	46.00	-21.17	peak			
5		613.6167	1.84	23.76	25.60	46.00	-20.40	peak			
6	*	907.8500	5.35	28.83	34.18	46.00	-11.82	peak			

Temperature: 22.4

Humidity: 52.5 %

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## RADIATED EMISSION TEST- (30MHz-1GHz)- MIDDLE CHANNEL -VERTICAL



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

EUT: Bluetooth Stereo headset

M/N: SH226A

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		39.7000	0.70	8.51	9.21	40.00	-30.79	peak			
2		180.3500	4.86	13.98	18.84	43.50	-24.66	peak			
3		340.4000	3.44	18.10	21.54	46.00	-24.46	peak			
4		544.1000	1.98	22.32	24.30	46.00	-21.70	peak			
5		828.6333	1.03	27.31	28.34	46.00	-17.66	peak			
6	*	953.1167	2.02	29.97	31.99	46.00	-14.01	peak		·	

Polarization:

Power:

Distance:

Vertical

## **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 Stereo headset

M/N: SH226A

Mode:High Channel TX

Note:

Polarization: *Horizontal* Temperature: 22.4 Power: Humidity: 52.5 %

Distance:

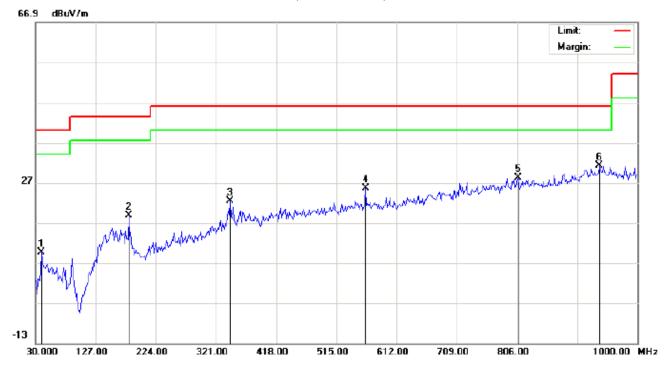
No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height		Comment
	-	MHz	dBu∀	dB/m	dBu∀/m	dBu∀/m	dB		cm	degree	
1		96.2833	7.73	6.77	14.50	43.50	-29.00	peak			
2		183.5833	13.65	11.24	24.89	43.50	-18.61	peak			
3		351.7167	11.81	18.75	30.56	46.00	-15.44	peak			
4		437.4000	5.64	20.21	25.85	46.00	-20.15	peak			
5		692.8333	0.10	25.00	25.10	46.00	-20.90	peak			
6	*	932.1000	2.24	29.50	31.74	46.00	-14.26	peak			

Temperature: 22.4

Humidity: 52.5 %

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## RADIATED EMISSION TEST- (30MHz-1GHz)-HIGH CHANNEL -VERTICAL



Polarization: Vertical

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

EUT:Bluetooth Stereo headset

M/N: SH226A

Mode:High 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		39.7000	1.15	8.51	9.66	40.00	-30.34	peak			
2		180.3500	4.81	13.98	18.79	43.50	-24.71	peak			
3		343.6333	4.04	18.32	22.36	46.00	-23.64	peak			
4		561.8833	3.05	22.54	25.59	46.00	-20.41	peak			
5		807.6167	0.91	27.32	28.23	46.00	-17.77	peak			
6	*	938.5667	1.48	29.68	31.16	46.00	-14.84	peak			

Power:

Distance:

## **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.

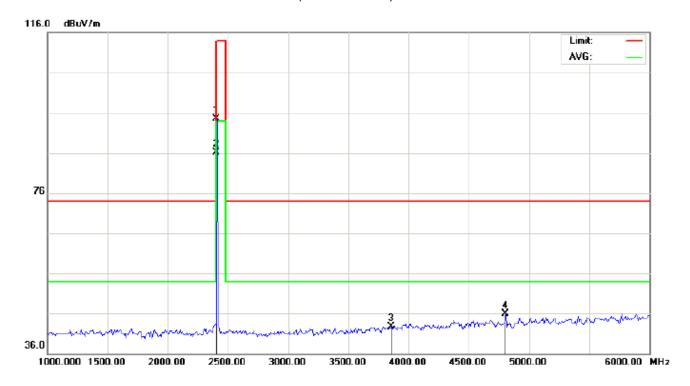
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## **RADIATED EMISSION ABOVE 1GHz**

(Worst modulation: GFSK)

## FOR BR/EDR

## RADIATED EMISSION TEST- (ABOVE 1GHz)-LOW CHANNEL-HORIZONTAL



Site: site #1 Polarization: Horizontal Temperature: 22.7

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

EUT: Bluetooth Stereo headset Distance:

M/N: SH226A

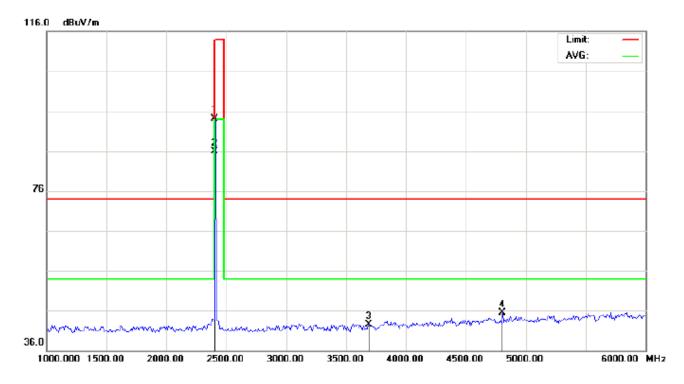
Mode: Low Channel TX

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	84.21	10.32	94.53	114.00	-19.47	peak			
2	*	2402.000	75.76	10.32	86.08	94.00	-7.92	AVG	100	65	
3		3858.333	28.46	14.32	42.78	74.00	-31.22	peak			
4		4804.000	38.24	7.69	45.93	74.00	-28.07	peak			

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## RADIATED EMISSION TEST- (ABOVE 1GHz)-LOW 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 Stereo headset Distance:

M/N: SH226A

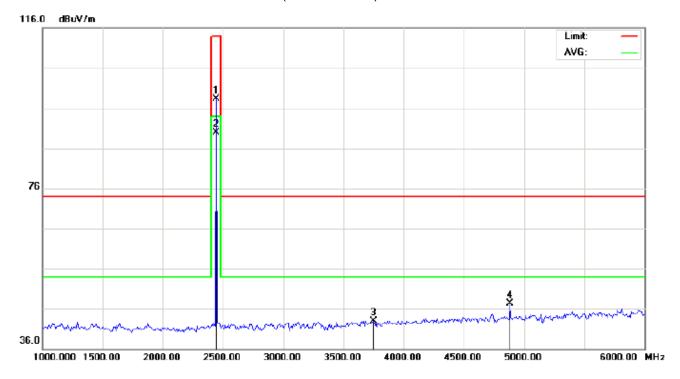
Mode: Low Channel TX

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	83.82	10.32	94.14	114.00	-19.86	peak			
2	*	2402.000	75.50	10.32	85.82	94.00	-8.18	AVG	100	56	
3		3691.667	29.20	13.29	42.49	74.00	-31.51	peak			
4		4804.000	37.88	7.69	45.57	74.00	-28.43	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 Stereo headset Distance:

M/N: SH226A

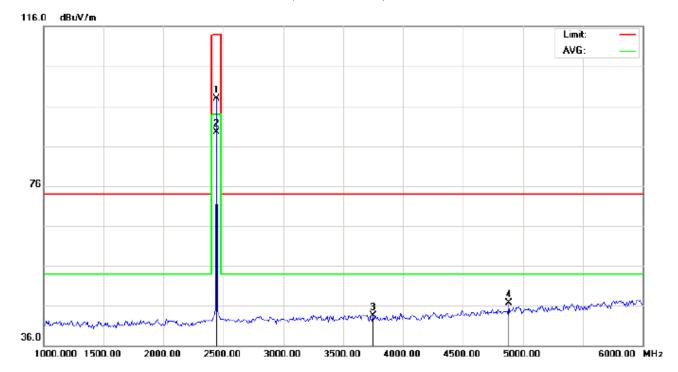
Mode: Middle Channel TX

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	88.04	10.36	98.40	114.00	-15.60	peak			
2	*	2441.000	79.52	10.36	89.88	94.00	-4.12	AVG	100	68	
3		3750.000	29.29	13.65	42.94	74.00	-31.06	peak			
4		4882.000	39.38	7.89	47.27	74.00	-26.73	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 Stereo headset Distance:

M/N: SH226A

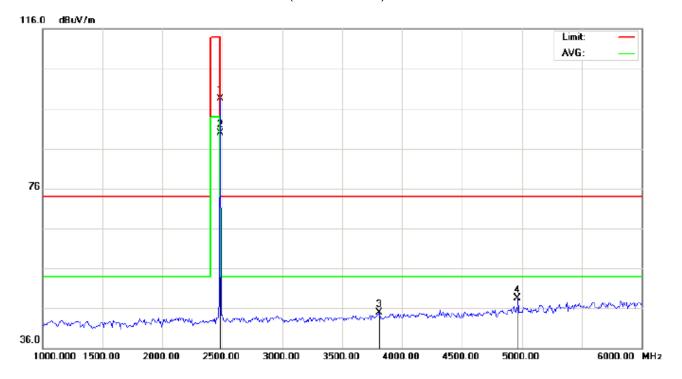
Mode: Middle Channel TX

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	87.49	10.36	97.85	114.00	-16.15	peak			
2	*	2441.000	79.06	10.36	89.42	94.00	-4.58	AVG	100	51	
3		3750.000	29.81	13.65	43.46	74.00	-30.54	peak			
4		4882.000	38.81	7.89	46.70	74.00	-27.30	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 Stereo headset Distance:

M/N: SH226A

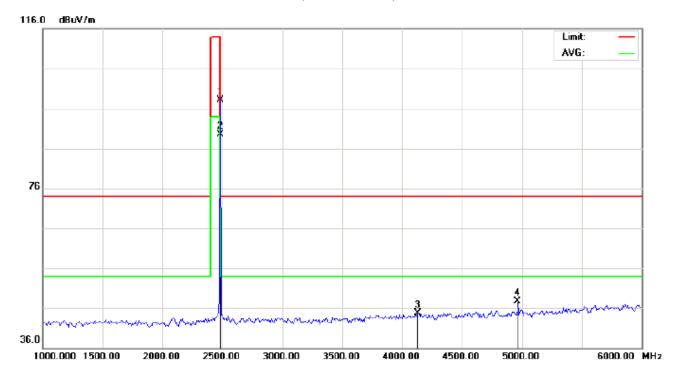
Mode: High Channel TX

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	88.02	10.41	98.43	114.00	-15.57	peak			
2	*	2480.000	79.54	10.41	89.95	94.00	-4.05	AVG	100	68	
3		3808.333	30.97	14.01	44.98	74.00	-29.02	peak			
4		4960.000	40.51	8.09	48.60	74.00	-25.40	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 Stereo headset Distance:

M/N: SH226A

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	87.64	10.41	98.05	114.00	-15.95	peak			
2	*	2480.000	79.07	10.41	89.48	94.00	-4.52	AVG	100	57	
3		4133.333	31.77	12.98	44.75	74.00	-29.25	peak			
4		4960.000	39.66	8.09	47.75	74.00	-26.25	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	84.21	10.32	94.53	114	-19.47	Horizontal
2402	83.82	10.32	94.14	114	-19.86	Vertical
2441	88.04	10.36	98.40	114	-15.60	Horizontal
2441	87.49	10.36	97.85	114	-16.15	Vertical
2480	88.02	10.41	98.43	114	-15.57	Horizontal
2480	87.64	10.41	98.05	114	-15.95	Vertical

# Average value

Frequency	Reading Level	Factor	Measurement	Limit	Over	Antenna
(MHz)	(dBuv)	(dB/m)	(dBuv/m)	(dBuv/m)	(dB)	Polarization
2402	75.76	10.32	86.08	94	-7.92	Horizontal
2402	75.50	10.32	85.82	94	-8.18	Vertical
2441	79.52	10.36	89.88	94	-4.12	Horizontal
2441	79.06	10.36	89.42	94	-4.58	Vertical
2480	79.54	10.41	89.95	94	-4.05	Horizontal
2480	78.07	10.41	89.48	94	-4.52	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	84.16	10.32	94.48	114	-19.52	Horizontal
2402	83.73	10.32	94.05	114	-19.95	Vertical
2441	87.96	10.36	98.32	114	-15.68	Horizontal
2441	87.42	10.36	97.78	114	-16.22	Vertical
2480	87.93	10.41	98.34	114	-15.66	Horizontal
2480	87.57	10.41	97.98	114	-16.02	Vertical

# Average value

Frequency	Reading Level	Factor	Measurement	Limit	Over	Antenna
(MHz)	(dBuv)	(dB/m)	(dBuv/m)	(dBuv/m)	(dB)	Polarization
2402	75.69	10.32	86.01	94	-7.99	Horizontal
2402	75.43	10.32	85.75	94	-8.25	Vertical
2441	79.43	10.36	89.79	94	-4.21	Horizontal
2441	79.00	10.36	89.36	94	-4.64	Vertical
2480	79.41	10.41	89.82	94	-4.18	Horizontal
2480	79.00	10.41	89.41	94	-4.59	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	84.10	10.32	94.42	114	-19.58	Horizontal
2402	83.64	10.32	93.96	114	-20.04	Vertical
2441	87.88	10.36	98.24	114	-15.76	Horizontal
2441	87.35	10.36	97.71	114	-16.29	Vertical
2480	87.88	10.41	98.29	114	-15.71	Horizontal
2480	87.51	10.41	97.92	114	-16.08	Vertical

# Average value

Frequency	Reading Level	Factor	Measurement	Limit	Over	Antenna
(MHz)	(dBuv)	(dB/m)	(dBuv/m)	(dBuv/m)	(dB)	Polarization
2402	75.60	10.32	85.92	94	-8.08	Horizontal
2402	75.36	10.32	85.68	94	-8.32	Vertical
2441	79.35	10.36	89.71	94	-4.29	Horizontal
2441	78.92	10.36	89.28	94	-4.72	Vertical
2480	79.34	10.41	89.75	94	-4.25	Horizontal
2480	78.94	10.41	89.35	94	-4.65	Vertical

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## 10. BAND EDGE EMISSION

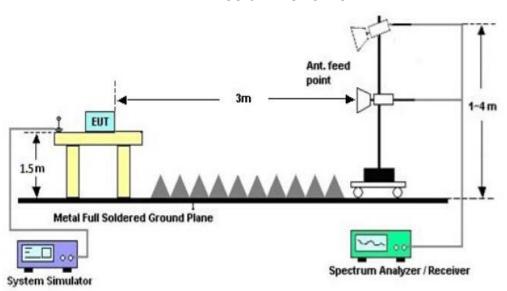
## **10.1. MEASUREMENT PROCEDURE**

- 1. The 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.
- 2. Max hold the trace of the setup1, and the EUT operates at hopping-on test mode to verify the largest spurious emissions power.
- 3. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission.

Start frequency(MHz)	Stop frequency(MHz)				
2200	2405				
2478	2500				

## **10.2 TEST SETUP**

## RADIATED EMISSION TEST SETUP



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## **10.3 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 Stereo headset

Distance:

M/N: SH226A

Mode: Low Channel TX

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	-	MHz	dBu∀	dB/m	dBuV/m	dBu∀/m	dB		cm	degree	
1		2309.333	31.06	10.22	41.28	74.00	-32.72	peak			
2		2390.000	29.50	10.31	39.81	74.00	-34.19	peak			
3		2400.000	42.97	10.32	53.29	74.00	-20.71	peak			
4	*	2402.000	84.22	10.32	94.54	74.00	20.54	peak			
5	Х	2402.000	75.69	10.32	86.01	74.00	12.01	AVG	100	69	

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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 Stereo headset Distance:

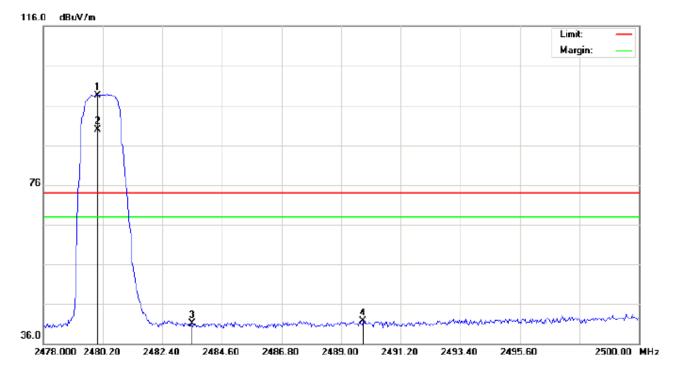
M/N: SH226A

Mode: Low Channel TX

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		2307.966	31.13	10.22	41.35	74.00	-32.65	peak			
2		2390.000	30.21	10.31	40.52	74.00	-33.48	peak			
3		2400.000	39.56	10.32	49.88	74.00	-24.12	peak			
4	*	2402.000	83.59	10.32	93.91	74.00	19.91	peak			
5	Х	2402.000	75.53	10.32	85.85	74.00	11.85	AVG	100	55	

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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 Stereo headset Distance:

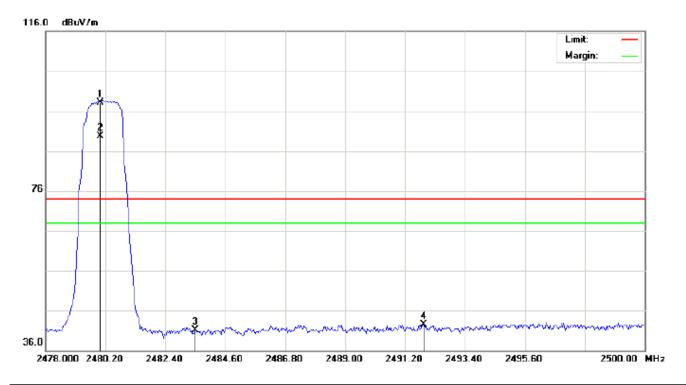
M/N: SH226A

Mode: High Channel TX

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height		Comment
		MHz	dBu∀	dB/m	dBu\//m	dBu√/m	dB		cm	degree	
1	*	2480.000	88.05	10.41	98.46	74.00	24.46	peak			
2	Х	2480.000	79.51	10.41	89.92	74.00	15.92	AVG	100	67	
3		2483.500	30.69	10.41	41.10	74.00	-32.90	peak			
4		2489.807	31.24	10.42	41.66	74.00	-32.34	peak			

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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 Stereo headset Distance:

M/N: SH226A

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	87.62	10.41	98.03	74.00	24.03	peak			
2	Х	2480.000	79.20	10.41	89.61	74.00	15.61	AVG	100	52	
3		2483.500	30.76	10.41	41.17	74.00	-32.83	peak			
4		2491.896	32.06	10.42	42.48	74.00	-31.52	peak			

## **RESULT: PASS**

Note: 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.

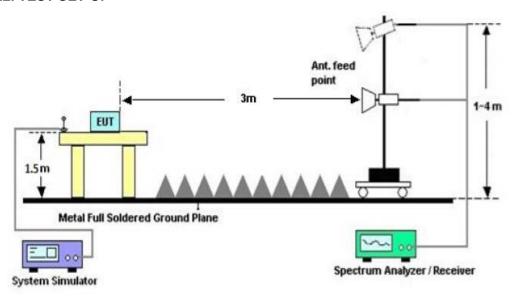
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## 11. 20DB BANDWIDTH

### 11.1. MEASUREMENT PROCEDURE

- 1. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- 2. Set Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hoping channel RBW ≥ 1% of the 20 dB bandwidth, VBW ≥ RBW; Sweep = auto; Detector function = peak
- 3. Set SPA Trace 1 Max hold, then View.

## 11.2. TEST SET-UP



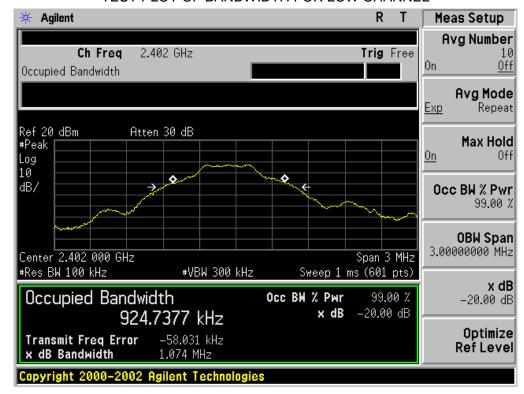
### 11.3. LIMITS AND MEASUREMENT RESULTS

### FOR BR/EDR

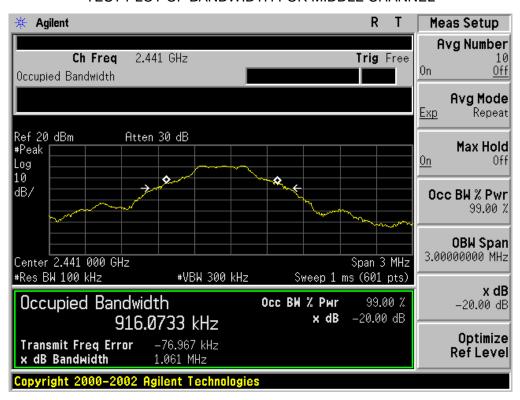
BLUETOOTH 1MBPS LIMITS AND MEASUREMENT RESULT										
	Measurement Result									
Applicable Limits		Decult								
		99%OBW (MHz)	-20dB BW(MHz)	Result						
	Low Channel	0.925	1.074	PASS						
N/A	Middle Channel	0.916	1.061	PASS						
	High Channel	0.907	1.080	PASS						

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#### TEST PLOT OF BANDWIDTH FOR LOW CHANNEL

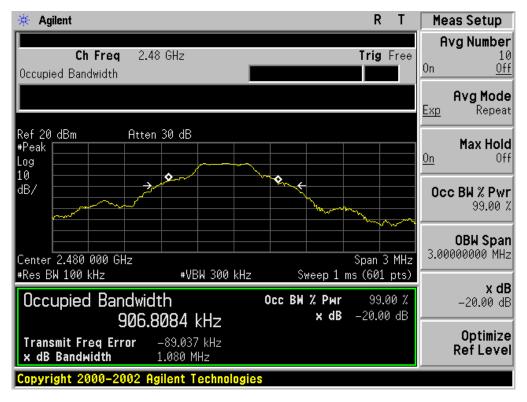


#### TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



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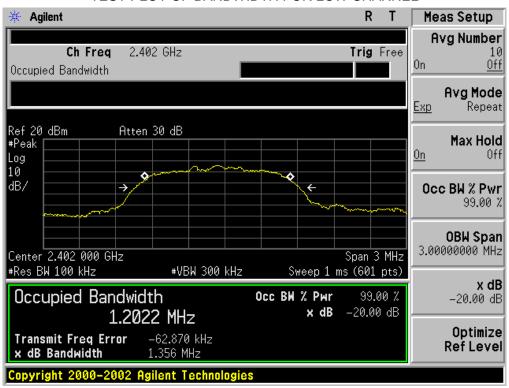
#### TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



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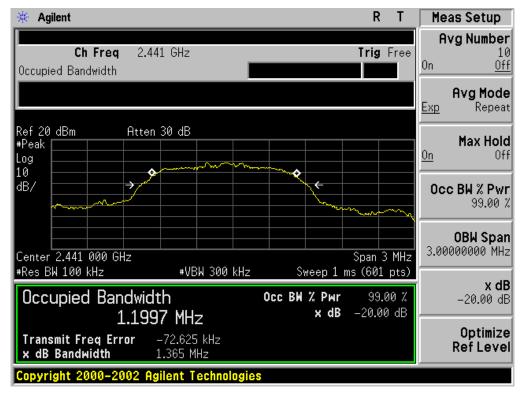
BLUETOOTH 2MBPS LIMITS AND MEASUREMENT RESULT										
Applicable Limits		Doorle								
		Result								
	Low Channel	1.202	1.356	PASS						
N/A	Middle Channel	1.200	1.365	PASS						
	High Channel	1.201	1.358	PASS						

## TEST PLOT OF BANDWIDTH FOR LOW CHANNEL

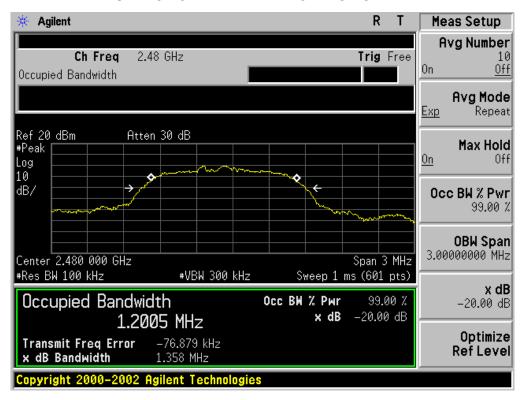


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#### TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



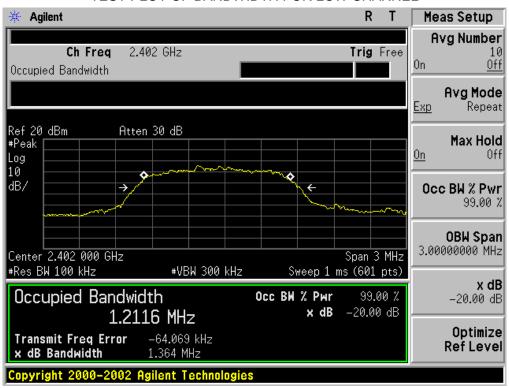
#### TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



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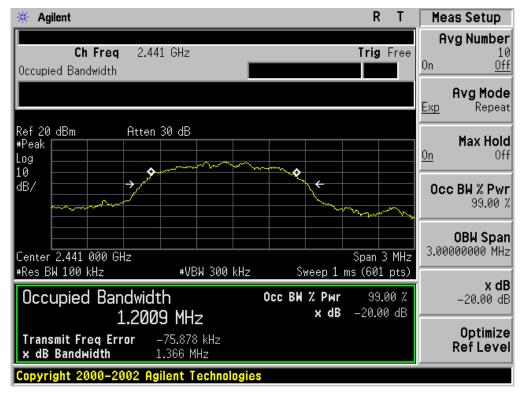
BLUETOOTH 3MBPS LIMITS AND MEASUREMENT RESULT									
	Measurement Result								
Applicable Limits		Doorle							
		Result							
	Low Channel	1.212	1.364	PASS					
N/A	Middle Channel	1.201	1.366	PASS					
	High Channel	1.212	1.356	PASS					

## TEST PLOT OF BANDWIDTH FOR LOW CHANNEL

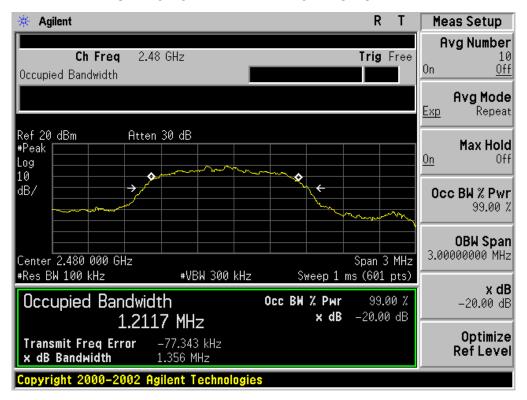


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#### TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



#### TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



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## 12. FCC LINE CONDUCTED EMISSION TEST

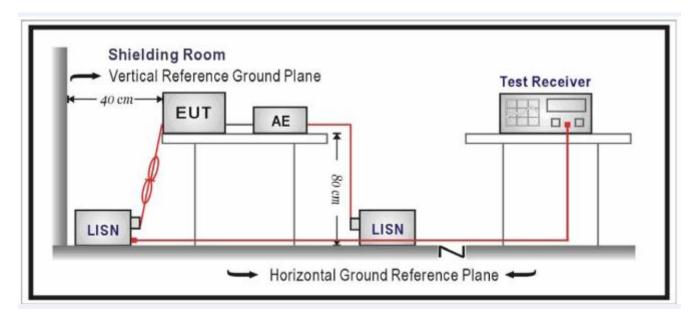
### 12.1. LIMITS OF LINE CONDUCTED EMISSION TEST

Frequency	Maximum RF Line Voltage							
Frequency	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. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



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#### 12.3. 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.

### 12.4. 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.

Humidity: 60 %

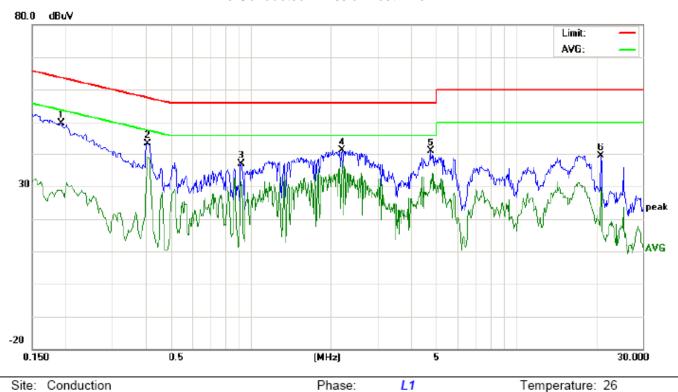
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## 12.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

# By adapter(worst case)

## FOR BR/EDR

## Line Conducted Emission Test Line 1-L



Site: Conduction

Limit: FCC Class B Conduction(QP)

EUT:Bluetooth Stereo headset

M/N:SH226A

Mode:BT Link with charging

Note:

No.	No. Freq.		Reading_Level (dBuV)		Correct Measurement Factor (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment	
	(MHz)	Peak	QP	AVG	dB	Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1923	39.48		18.62	10.21	49.69		28.83	63.93	53.93	-14.24	-25.10	Р	
2	0.4100	32.93		28.76	10.34	43.27		39.10	57.65	47.65	-14.38	-8.55	Р	
3	0.9220	26.38		21.05	10.40	36.78		31.45	56.00	46.00	-19.22	-14.55	Р	
4	2.2060	30.93		27.64	10.31	41.24		37.95	56.00	46.00	-14.76	-8.05	Р	
5	4.7699	30.76		19.56	10.23	40.99		29.79	56.00	46.00	-15.01	-16.21	Р	
6	20.9220	29.33		19.49	10.13	39.46		29.62	60.00	50.00	-20.54	-20.38	Р	

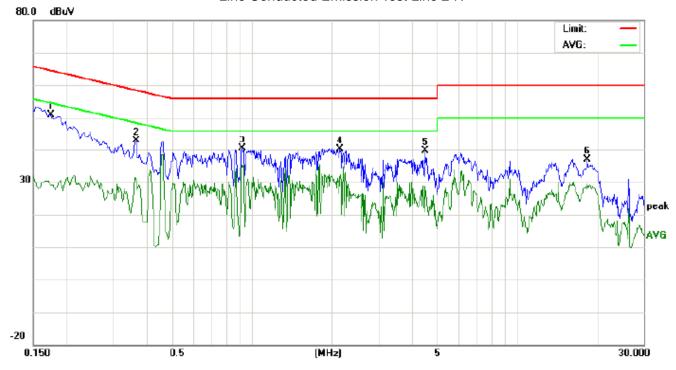
Power:

Temperature: 26

Humidity: 60 %

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## Line Conducted Emission Test Line 2-N



Phase:

Power:

Ν

Site: Conduction Limit: FCC Class B Conduction(QP)

EUT:Bluetooth Stereo headset

M/N:SH226A

Mode:BT Link with charging

Note:

No.	No. Freq.		Reading_Level (dBuV)		Correct Factor	•		Limit (dBuV)		Margin (dB)		P/F	Comment	
	(MHz)	Peak	QP	AVG	dB	Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1740	40.77		18.87	10.19	50.96		29.06	64.76	54.76	-13.80	-25.70	Р	
2	0.3660	32.44		20.36	10.32	42.76		30.68	58.59	48.59	-15.83	-17.91	Р	
3	0.9220	29.86		24.85	10.40	40.26		35.25	56.00	46.00	-15.74	-10.75	Р	
4	2.1540	29.91		20.52	10.28	40.19		30.80	56.00	46.00	-15.81	-15.20	Р	
5	4.5179	29.42		18.34	10.21	39.63		28.55	56.00	46.00	-16.37	-17.45	Р	
6	18.3419	26.82		19.25	10.12	36.94		29.37	60.00	50.00	-23.06	-20.63	Р	

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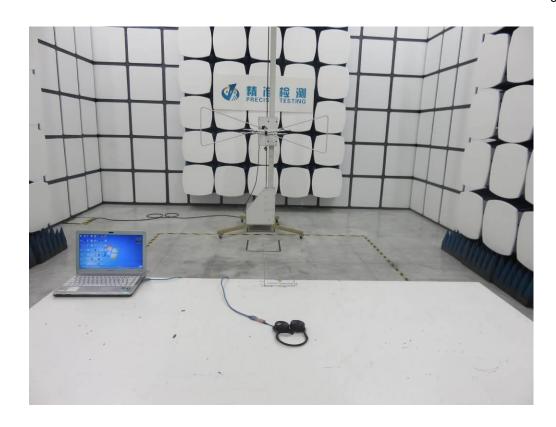
# **APPENDIX A: PHOTOGRAPHS OF TEST SETUP**

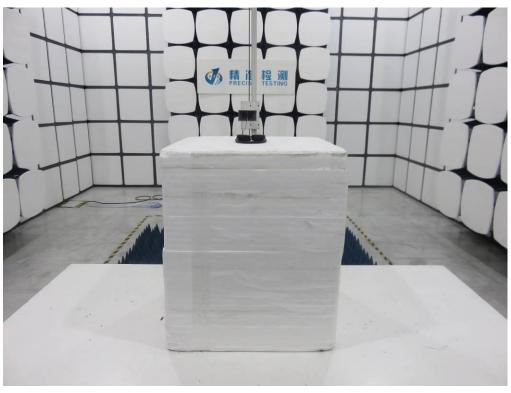
FCC LINE CONDUCTED EMISSION TEST SETUP

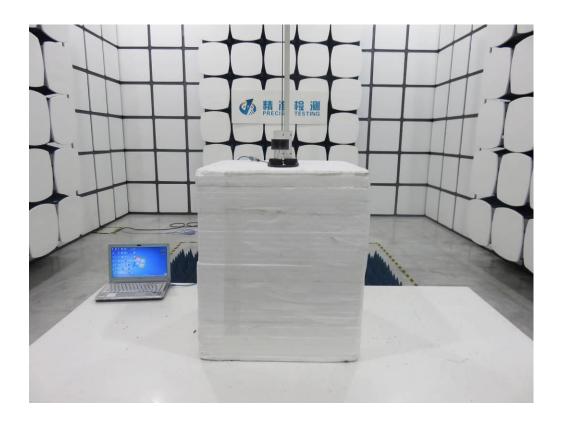


FCC RADIATED EMISSION TEST SETUP









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# **APPENDIX B: PHOTOGRAPHS 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



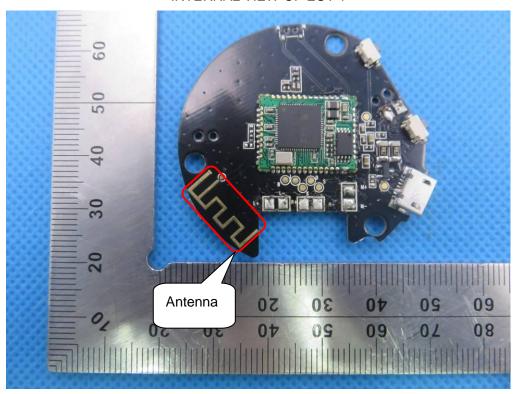
# VIEW OF EUT (PORT)



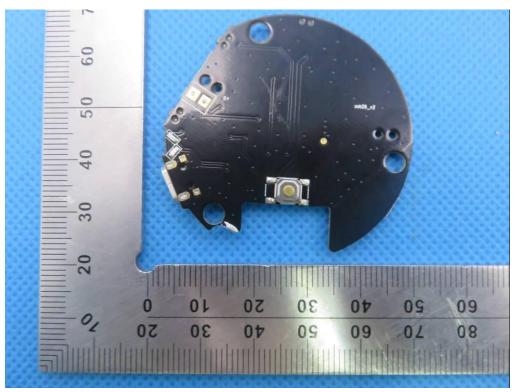
**OPEN VIEW OF EUT** 



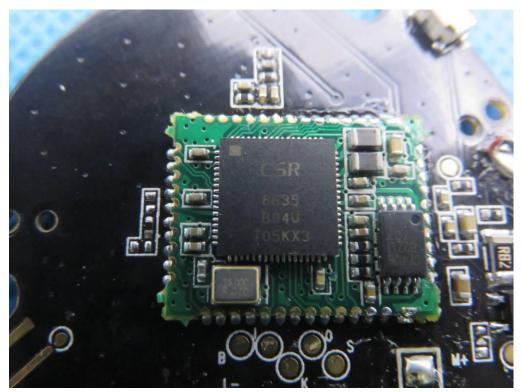
**INTERNAL VIEW OF EUT-1** 



**INTERNAL VIEW OF EUT-2** 



# **INTERNAL VIEW OF EUT-3**



VIEW OF ADAPTER (AE)



THE ADAPTER SUPPLIED BY AGC

----END OF REPORT----