

# **FCC Test Report**

Report No.: AGC00194180104FE03

FCC ID : 2ABFFSH62

**APPLICATION PURPOSE**: Original Equipment

**PRODUCT DESIGNATION**: Bluetooth Receiver

**BRAND NAME** : N/A

**MODEL NAME** : SH62, SH62A, SH62B, SH62C, SH62D, SH62E, SH62F

CLIENT SHENZHEN SURE THING INDUSTRY AND COMMERCE

DEVELOPMENT CO.,LTD

**DATE OF ISSUE** : Jan. 23, 2018

STANDARD(S)

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

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	Jumes 1 8 Filter	Jan. 23, 2018	Valid	Initial release

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# 1. VERIFICATION OF CONFORMITY

1. VERIFICATION OF CO	SINI OKIVITI				
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 Receiver				
Brand Name	N/A				
Test Model	SH62				
Series Model	SH62A, SH62B, SH62C, SH62D, SH62E, SH62F				
Difference description	All the same except for the model name.				
Date of test	Jan. 12, 2018 to Jan. 23, 2018				
Deviation	None None				
Condition of Test Sample	Normal				
Report Template	AGCRT-US-BR/RF				
XX					

We hereby certify that:

The above equipment was tested by Attestation of Global Compliance (Shenzhen) 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. The test results of this report relate only to the tested sample identified in this report.

Tested By	Jorden Wand	
The State of the S	Jonhen Wang(Wang Yonghuan)	Jan.23, 2018
G Mandalina C	Foresto ei	
Reviewed By	Forrest Lei(Lei Yonggang)	Jan. 23, 2018

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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	3.33dBm(Max EIRP Power=Max radiation field-95.2)
Bluetooth Version	V4.1 • A TANK OF THE PARTY OF T
Modulation	BR ⊠GFSK, EDR ⊠π /4-DQPSK, ⊠8DPSK BLE □GFSK
Number of channels	79 for BR/EDR
Hardware Version	V1.0
Software Version	v2xxx
Antenna Designation	Ceramic Antenna
Antenna Gain	2.5dBi
Power Supply	DC 3.7V by battery

### 2.2. TABLE OF CARRIER FREQUENCYS

BR/EDR channel List

Frequency Band	<b>Channel Number</b>	Frequency
Miller July od Clock	0	2402MHz
, Go	1 Expansion	2403MHz
The Manual Control of the Control of	The accompanies of the state of	
8 Manual of Country Co	38	2440 MHz
2400~2483.5MHz	39	2441 MHz
	40	2442 MHz
TA PORTOR OF THE STATE OF THE S	CG Francisco	CO DO DO
or Girmin C	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%.

- Uncertainty of Conducted Emission, Uc = ±3.2 dB
- Uncertainty of Radiated Emission below 1GHz, Uc = ±3.9 dB
- Uncertainty of Radiated Emission above 1GHz, Uc = ±4.8 dB

### 4. DESCRIPTION OF TEST MODES

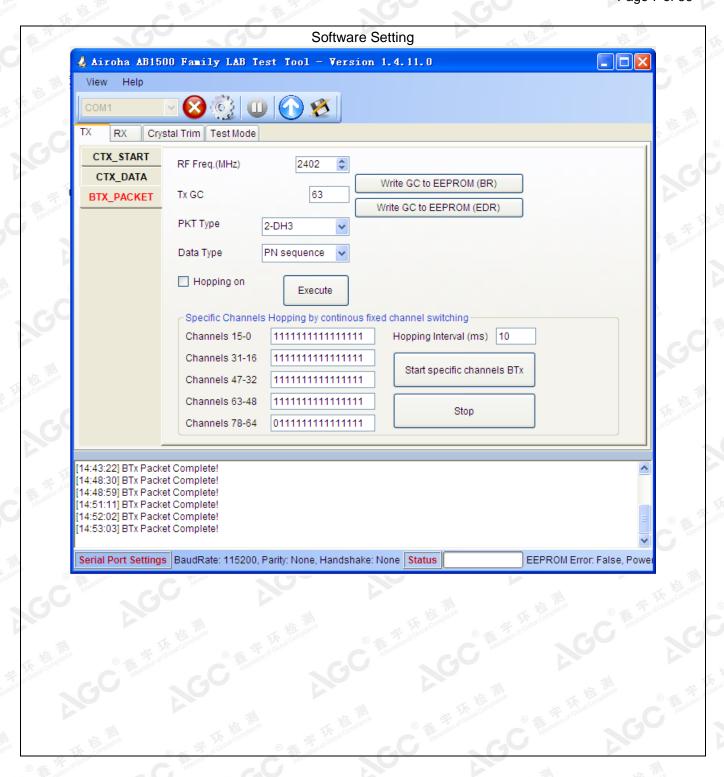
NO.	TEST MODE DESCRIPTION
8 # Took Cool	Low channel GFSK
2 30	Middle channel GFSK
3	High channel GFSK
4 4 4 1	Low channel π /4-DQPSK
® 5 nnd Globs	Middle channel π /4-DQPSK
6	High channel π /4-DQPSK
7	Low channel 8DPSK
A Calculation 8 ® A Antonia	Middle channel 8DPSK
90	High channel 8DPSK
10	BT Link with charging
11th harmonian	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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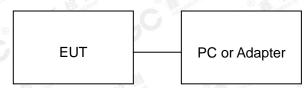


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# 5. SYSTEM TEST CONFIGURATION

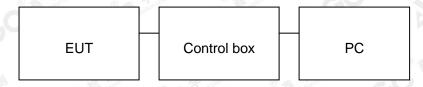
### 5.1. CONFIGURATION OF EUT SYSTEM

Configure 1: (Normal hopping)



Note: Owing to the EUT has own battery, testing may be performed while PC or adapter removed.

Configure 2: (Control continuous TX)



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

Item Equipment		Mfr/Brand	Model/Type No.	Remark	
1 ,	Bluetooth Receiver	SURE THING	SH62	EUT	
2	Battery	YJ POWER GROUP LIMITED	502025	Accessory	
3	PC	APPLE	A1465	A.E	
4	Control box	AIROHA	N/A	A.E	
5 9	Adapter	IPRO	NTR-S01	A.E	
6	USB Cable	N/A	1m unshielded	A.E	
7	Speaker	SANWA	GSP069BK	A.E	

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#### **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

Test Site	Attestation of Global Compliance (Shenzhen) Co., Ltd			
Location	1-2F., Bldg.2, No.1-4, Chaxi Sanwei Technical Industrial Park, Gushu, Xixiang, Bao'an District B112-B113, Bldg.12, Baoan Bldg Materials Center, No.1 of Xixiang Inner Ring Road, Baoan District, Shenzhen 518012			
NVLAP Lab Code	600153-0			
Designation Number	CN5028			
FCC Test Firm Registration Number	682566			
Description	Attestation of Global Compliance(Shenzhen) Co., Ltd is accredited by National Voluntary Laboratory Accreditation program, NVLAP Code 600153-0			

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# 7. TEST METHOD

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

# 8. TEST EQUIPMENT LIST

# **TEST EQUIPMENT OF CONDUCTED EMISSION TEST**

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESPI	101206	Jun.20, 2017	Jun.19, 2018
LISN	R&S	ESH2-Z5	100086	Aug.21, 2017	Aug.20, 2018

# **TEST EQUIPMENT OF RADIATED EMISSION TEST**

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	Jun.20, 2017	Jun.19, 2018
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Dec.08, 2017	Dec.07, 2018
Horn antenna	SCHWARZBECK	BBHA 9170	#768	Sep.20, 2017	Sep.19, 2018
preamplifier	ChengYi	EMC184045SE	980508	Sep.15, 2017	Sep.14, 2018
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	May 18, 2017	May 17, 2019
Broadband Preamplifier	SCHWARZBECK	BBV 9718	9718-205	Jun.20, 2017	Jun.19, 2018
ANTENNA	SCHWARZBECK	VULB9168	D69250	Sep.28, 2017	Sep.27, 2018
Loop Antenna	A.H.Systems,Inc	SAS-562B	,	Mar. 01, 2016	Feb. 28, 2018

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# 9. RADIATED EMISSION

### 9.1TEST LIMIT

### Standard FCC15.249

Fundamental	Field Strength of Fundamental	Field Strength of Harmonics
Frequency	(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 Str	engths Limit
(MHz)	Meters	μ V/m	dB(μV)/m
0.009 ~ 0.490	300	2400/F(kHz)	9
0.490 ~ 1.705	30	24000/F(kHz)	技訓
1.705 ~ 30	30	30 (1)	E Cobaco (Color of Color of Co
30 ~ 88	3 F 1000	100	40.0
88 ~ 216	3 - 6	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3. I	Other:74.0 dB(μV)/m (Average)	(Peak) 54.0 dB(μV)/m

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)
- 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.
- 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.

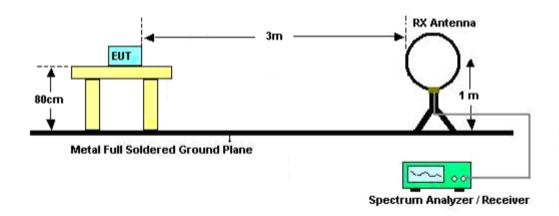
	Spectrum Parameter	Setting
bal comp	Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
	Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
, <sub>1</sub>	Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP
Miles allon of Colone Co	Start ~Stop Frequency	1GHz~26.5GHz RBW 2MHz/ VBW 6MHz for Peak, RBW 1.5MHz/ VBW 10Hz for Average
	Receiver Parameter	Setting
® #5c	Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
CO I	Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
	Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP

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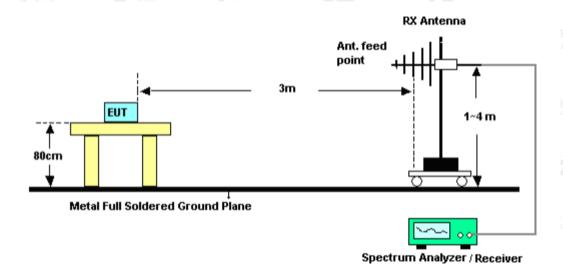


### 9.3. TEST SETUP

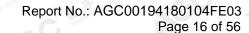
### Radiated Emission Test-Setup Frequency Below 30MHz



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

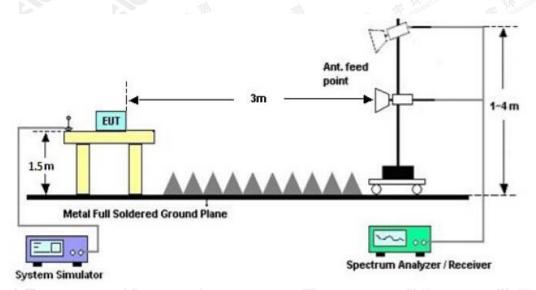


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# RADIATED EMISSION TEST SETUP ABOVE 1000MHz



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# 9.4. TEST RESULT

(Worst modulation: GFSK)

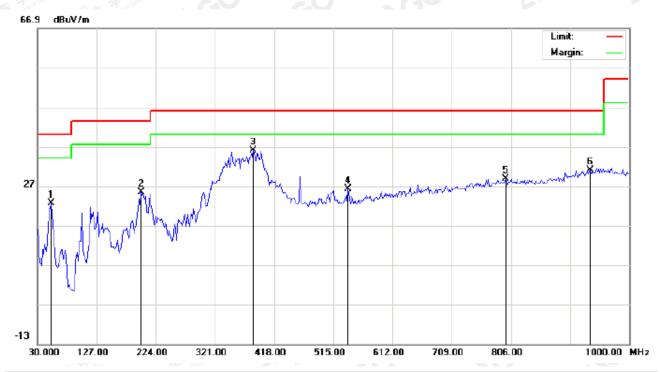
FOR BR/EDR

### **RADIATED EMISSION BELOW 30MHz**

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

### **RADIATED EMISSION BELOW 1GHz**

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



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		52.6333	14.24	8.41	22.65	40.00	-17.35	peak			
2		199.7500	13.32	11.99	25.31	43.50	-18.19	peak			
3	*	384.0500	17.13	18.96	36.09	46.00	-9.91	peak			
4		539.2500	3.93	22.19	26.12	46.00	-19.88	peak			
5		797.9167	1.51	27.29	28.80	46.00	-17.20	peak		·	
6		935.3333	1.45	29.59	31.04	46.00	-14.96	peak		·	

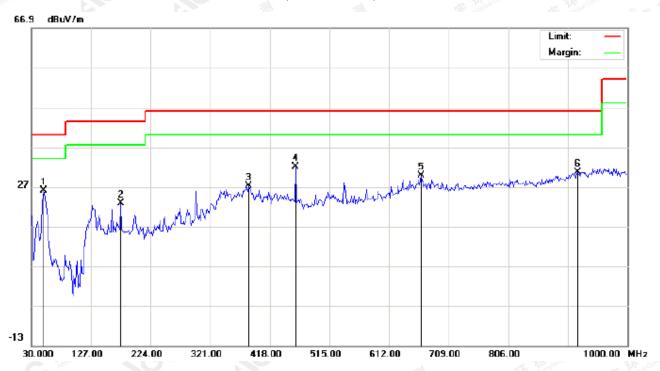
**RESULT: PASS** 

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



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	*	49.4000	17.75	8.28	26.03	40.00	-13.97	peak			
2		175.5000	8.38	14.35	22.73	43.50	-20.77	peak			
3		384.0500	8.21	18.96	27.17	46.00	-18.83	peak			
4		460.0333	11.25	20.70	31.95	46.00	-14.05	peak			
5		663.7333	5.67	24.22	29.89	46.00	-16.11	peak			
6		919.1667	1.48	29.14	30.62	46.00	-15.38	peak			

#### **RESULT: PASS**

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

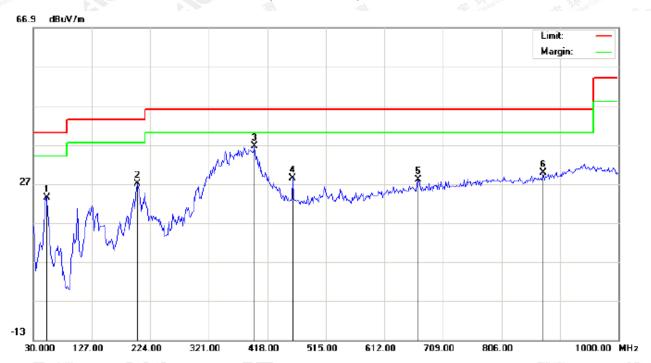
2. The "Factor" value can be calculated automatically by software of measurement system.

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



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		52.6333	15.03	8.41	23.44	40.00	-16.56	peak			
2		202.9832	15.36	11.70	27.06	43.50	-16.44	peak			
3	*	396.9833	17.60	19.05	36.65	46.00	-9.35	peak			
4		460.0333	7.63	20.70	28.33	46.00	-17.67	peak			
5		668.5833	3.66	24.36	28.02	46.00	-17.98	peak			
6		875.5167	1.82	27.97	29.79	46.00	-16.21	peak			

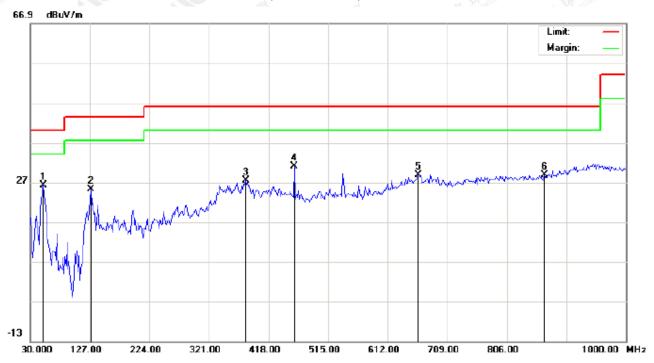
**RESULT: PASS** 

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



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	*	51.0167	18.07	8.23	26.30	40.00	-13.70	peak			
2		128.6167	14.72	10.45	25.17	43.50	-18.33	peak			
3		380.8167	8.42	18.94	27.36	46.00	-18.64	peak			
4		460.0333	10.26	20.70	30.96	46.00	-15.04	peak			
5		662.1167	4.55	24.17	28.72	46.00	-17.28	peak			
6		867.4333	0.97	27.76	28.73	46.00	-17.27	peak			

### **RESULT: PASS**

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

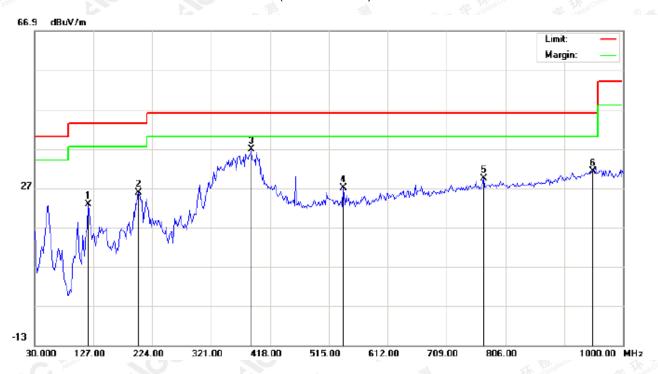
2. The "Factor" value can be calculated automatically by software of measurement system.

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



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		118.9167	16.61	6.11	22.72	43.50	-20.78	peak			
2		201.3667	13.99	11.86	25.85	43.50	-17.65	peak			
3	*	387.2833	17.78	18.99	36.77	46.00	-9.23	peak			
4		539.2500	4.90	22.19	27.09	46.00	-18.91	peak			
5		770.4333	2.44	26.91	29.35	46.00	-16.65	peak			
6		949.8833	1.27	30.00	31.27	46.00	-14.73	peak			

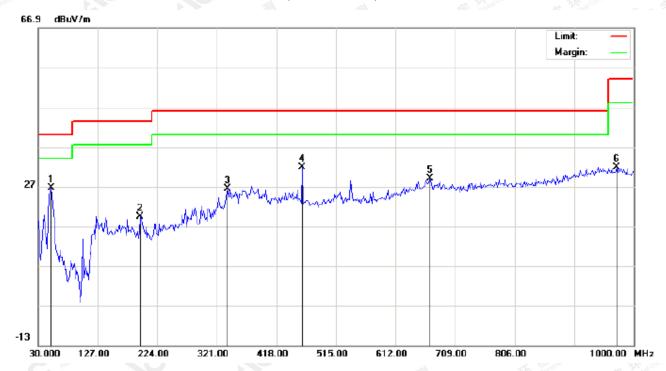
**RESULT: PASS** 

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



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	*	51.0167	18.47	8.23	26.70	40.00	-13.30	peak			
2		196.5167	9.52	9.88	19.40	43.50	-24.10	peak			
3		338.7833	8.41	17.99	26.40	46.00	-19.60	peak			
4		460.0333	11.04	20.70	31.74	46.00	-14.26	peak			
5		668.5833	4.58	24.35	28.93	46.00	-17.07	peak	·		-
6		972.5167	2.08	29.78	31.86	54.00	-22.14	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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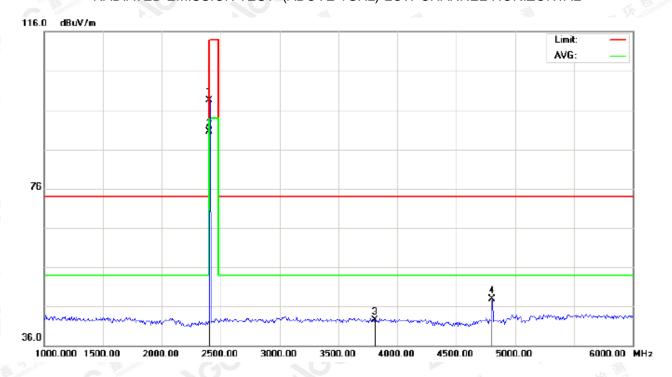
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# **RADIATED EMISSION ABOVE 1GHz**

(Worst modulation: GFSK)

# FOR BR/EDR

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



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height		Comment
	-	MHz	dBu∀	dB/m	dBu\//m	dBu√/m	dB		cm	degree	
1		2402.000	88.21	10.32	98.53	114.00	-15.47	peak			
2	*	2402.000	80.10	10.32	90.42	94.00	-3.58	AVG	100	281	
3		3808.333	28.42	14.01	42.43	74.00	-31.57	peak			
4		4804.000	40.24	7.69	47.93	74.00	-26.07	peak			

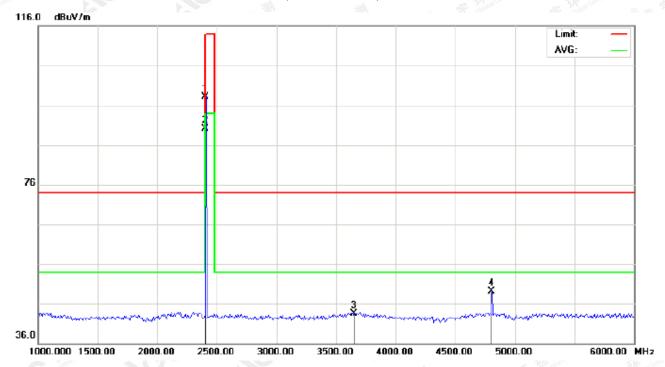
RESULT. PASS

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



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	98.41	114.00	-15.86	peak			
2	*	2402.000	79.80	10.32	90.12	94.00	-3.88	AVG	100	24	
3		3650.000	30.42	13.03	43.45	74.00	-30.55	peak			
4		4804.000	41.38	7.69	49.07	74.00	-24.93	peak			

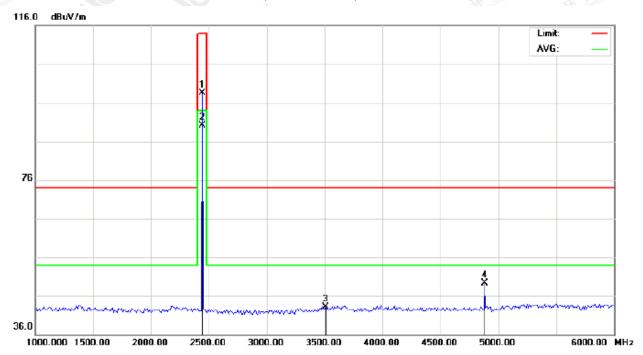
**RESULT: PASS** 

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



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	88.24	10.36	98.49	114.00	-15.40	peak			
2	*	2441.000	79.83	10.36	90.19	94.00	-3.81	AVG	100	291	
3		3508.333	31.00	12.16	43.16	74.00	-30.84	peak			
4		4883.000	41.38	7.89	49.27	74.00	-24.73	peak			

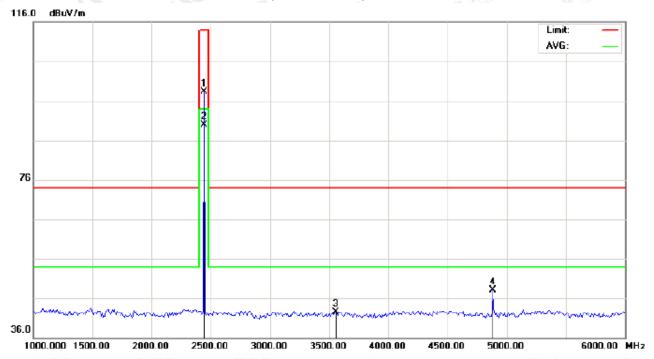
RESULT. PASS

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



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	87.99	10.36	98.35	114.00	-15.65	peak			
2	*	2441.000	79.49	10.36	89.85	94.00	-4.15	AVG	100	26	
3		3558.333	30.07	12.47	42.54	74.00	-31.46	peak			
4		4882.000	40.31	7.89	48.20	74.00	-25.80	peak			

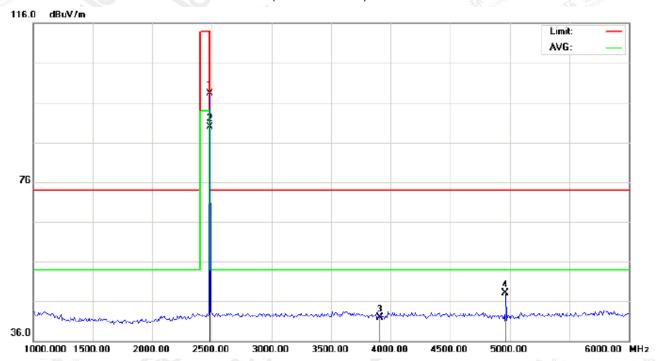
**RESULT: PASS** 

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



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	87.97	10.41	98.38	114.00	-15.62	peak			
2	*	2480.000	79.46	10.41	89.87	94.00	-4.13	AVG	100	285	
3		3908.333	27.35	14.63	41.98	74.00	-32.02	peak			
4		4960.000	40.01	8.09	48.10	74.00	-25.90	peak			

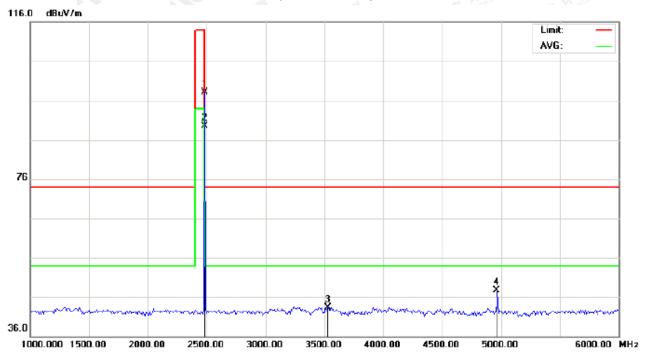
RESULT. PASS

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



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	87.69	10.41	98.12	114.00	-15.90	peak			
2	*	2480.000	79.10	10.41	89.51	94.00	-4.49	AVG	100	29	
3		3533.333	31.00	12.32	43.32	74.00	-30.68	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 Polarization	
(MHz)	(dBuv)	(dB/m)	(dBuv/m)	(dBuv/m)	(dB)		
2402	88.21	10.32	98.53	114	-15.47	Horizontal	
2402	87.82	10.32	98.41	114	-15.86	Vertical	
2441	88.24	10.36	98.49	114	-15.40	Horizontal	
2441	87.99	10.36	98.35	114	-15.65	Vertical	
2480	87.97 10.41		98.38	114	-15.62	Horizontal	
2480	87.69	10.41	98.12	114	-15.90	Vertical	

# Average value

Frequency	Reading Level	Factor	Measurement	Limit	Over	Antenna Polarization	
(MHz)	(dBuv)	(dB/m)	(dBuv/m)	(dBuv/m)	(dB)		
2402	80.10	10.32	90.42	94	-3.58	Horizontal	
2402	79.80	10.32	90.12	94	-3.88	Vertical	
2441	79.83	10.36	90.19	94	-3.81	Horizontal	
2441	79.49	10.36	89.85	94	-4.15	Vertical	
2480	79.46	10.41	89.87	94	-4.13	Horizontal	
2480	79.10	10.41	89.51	94	-4.49	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	87.69	10.32	98.01	114	-15.99	Horizontal	
2402	87.58	10.32	97.90	114	-16.10	Vertical	
2441	87.57	10.36	97.93	114	-16.07	Horizontal	
2441	87.46	10.36	97.82	114	-16.18	Vertical	
2480	87.46	10.41	97.87	114	-16.13	Horizontal	
2480	87.15	10.41	97.56	114	-16.44	Vertical	

### Average value

Frequency	Reading Level	Factor	Measurement	Limit	Over	Antenna	
(MHz)	(dBuv)	(dB/m)	(dBuv/m)	(dBuv/m)	(dB)	Polarization	
2402	79.55	10.32	89.87	94	-4.13	Horizontal	
2402	79.26	10.32	89.58	94	-4.42	Vertical	
2441	79.29	10.36	89.65	94	-4.35	Horizontal	
2441	78.94	10.36	89.30	94	-4.70	Vertical	
2480	78.93	10.41	89.34	94	-4.66	Horizontal	
2480	78.58	10.41	88.99	94	-5.01	Vertical	

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# 3Mbps Result:

#### Peak value

Frequency	Reading Level	e lactor i idea		Limit	Over	Antenna	
(MHz)	(dBuv)	(dB/m)	(dBuv/m)	(dBuv/m)	(dB)	Polarization	
2402	87.21	10.32	97.53	114	-16.47	Horizontal	
2402	87.11	10.32	97.43	114	-16.57	Vertical	
2441	87.08	10.36	97.44	114	-16.56	Horizontal	
2441	87.00	10.36	97.36	114	-16.64	Vertical	
2480	87.01	10.41	97.42	114	-16.58	Horizontal	
2480	86.67	10.41	97.08	114	-16.92	Vertical	

### Average value

Frequency	Reading Level	Factor	Factor Measurement		Over	Antenna	
(MHz)	(dBuv)	(dB/m)	(dBuv/m)	(dBuv/m)	(dB)	Polarization	
2402	79.08	10.32	89.40	94	-4.60	Horizontal	
2402	78.77	10.32	89.09	94	-4.91	Vertical	
2441	78.80	10.36	89.16	94	-4.84	Horizontal	
2441	78.46	10.36	88.82	94	-5.18	Vertical	
2480	78.46	10.41	88.87	94	-5.13	Horizontal	
2480	78.11	10.41	88.52	94	-5.48	Vertical	

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### 10. BAND EDGE EMISSION

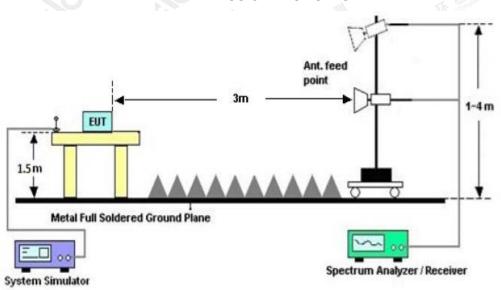
### 10.1. MEASUREMENT PROCEDURE

- 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 setup 1, 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



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		2353.750	31.76	10.27	42.03	74.00	-31.97	peak			
2		2390.000	33.00	10.31	43.31	74.00	-30.69	peak			
3		2400.000	42.47	10.32	52.79	74.00	-21.21	peak			
4	*	2402.000	88.22	10.32	98.54	74.00	24.54	peak			
5	Х	2402.000	80.02	10.32	90.34	74.00	16.34	AVG	100	287	

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# TEST PLOT OF BAND EDGE FOR LOW CHANNEL -Vertical



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height		Comment
	-	MHz	dBu∀	dB/m	dBu\//m	dBu∀/m	dB		cm	degree	
1		2372.542	31.28	10.29	41.57	74.00	-32.43	peak			
2		2390.000	31.71	10.31	42.02	74.00	-31.98	peak			
3		2400.000	36.06	10.32	46.38	74.00	-27.62	peak			
4	*	2402.000	88.09	10.32	98.41	74.00	24.41	peak			
5	Х	2402.000	79.72	10.32	90.04	74.00	16.04	AVG	100	31	

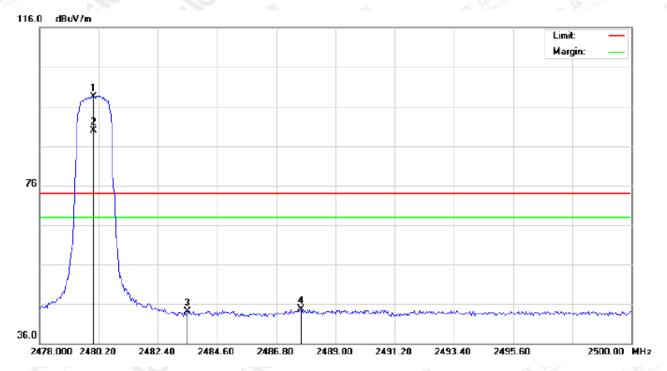
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# TEST PLOT OF BAND EDGE FOR HIGH CHANNEL -Horizontal



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	88.05	10.41	98.46	74.00	24.46	peak			
2	Х	2480.000	79.43	10.41	89.84	74.00	15.84	AVG	100	283	
3		2483.500	33.69	10.41	44.10	74.00	-29.90	peak			
4		2487.716	34.18	10.42	44.60	74.00	-29.40	peak			

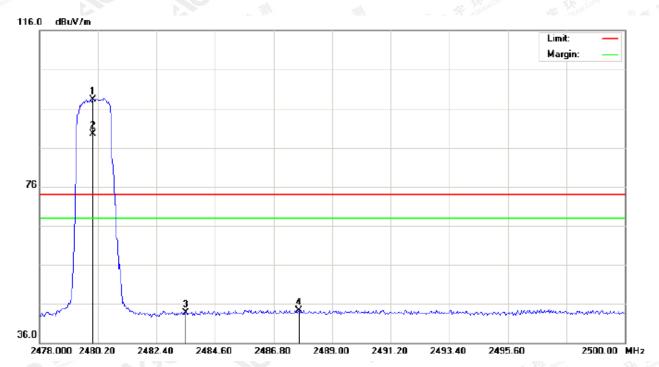
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# TEST PLOT OF BAND EDGE FOR HIGH CHANNEL-Vertical



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	87.82	10.41	98.23	74.00	24.23	peak			
2	Х	2480.000	79.06	10.41	89.47	74.00	15.47	AVG	100	27	
3		2483.500	33.26	10.41	43.67	74.00	-30.33	peak			
4		2487.753	33.95	10.42	44.37	74.00	-29.63	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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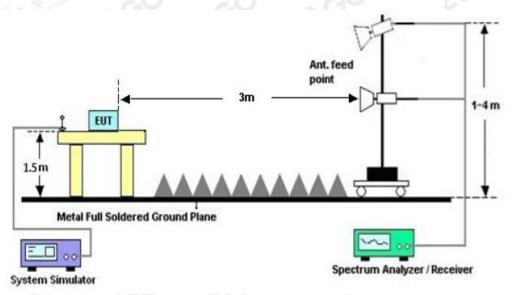
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## 11. 20DB BANDWIDTH

### 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 ≥ 3RBW; 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

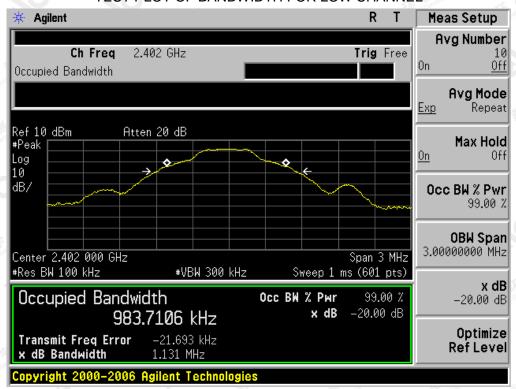
#### FOR BR/EDR

BLUETOOTH 1MBPS LIMITS AND MEASUREMENT RESULT										
		Measure	ement Result							
Applicable Limits		Danill								
		99%OBW (MHz)	-20dB BW(MHz)	Result						
Social Committee (8) September 10	Low Channel	0.984	1.131	PASS						
N/A	Middle Channel	0.978	1.134	PASS						
- FIN	High Channel	0.980	1.128	PASS						

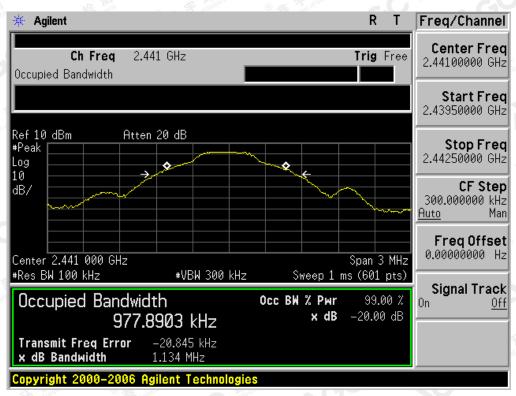
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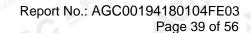
#### TEST PLOT OF BANDWIDTH FOR LOW CHANNEL



#### TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL

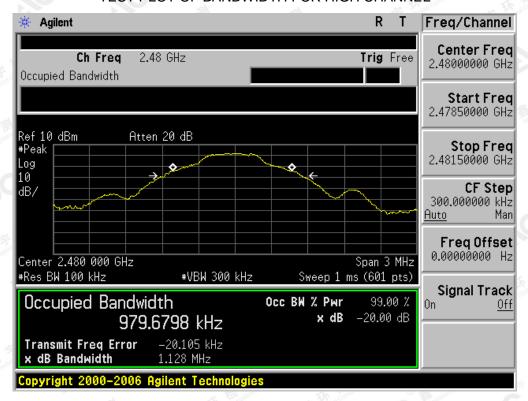


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#### TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



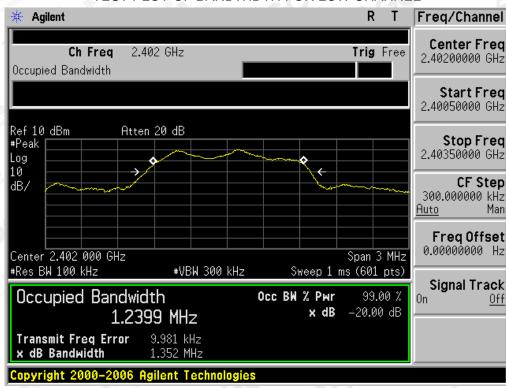
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BLUETO	OOTH 2MBPS LIN	MITS AND MEASU	REMENI RESULI							
Measurement Result										
Applicable Limits		Doords								
		99%OBW (MHz)	-20dB BW(MHz)	Result						
The figures The figures	Low Channel	1.240	1.352	PASS						
N/A	Middle Channel	1.242	1.361	PASS						
	High Channel	1.246	1.364	PASS						

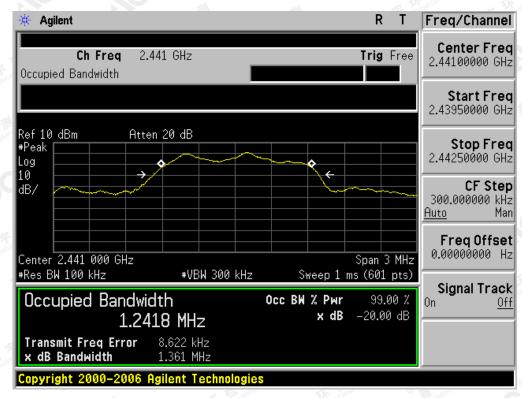
### TEST PLOT OF BANDWIDTH FOR LOW CHANNEL



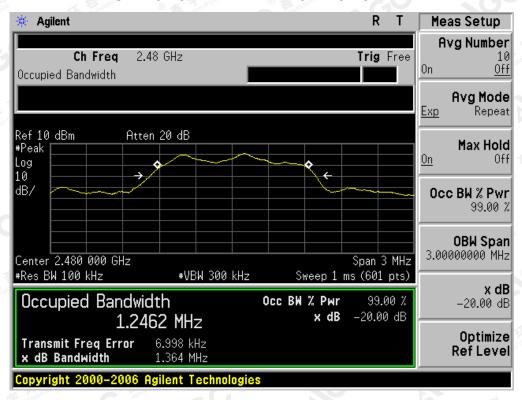
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#### TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



#### TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



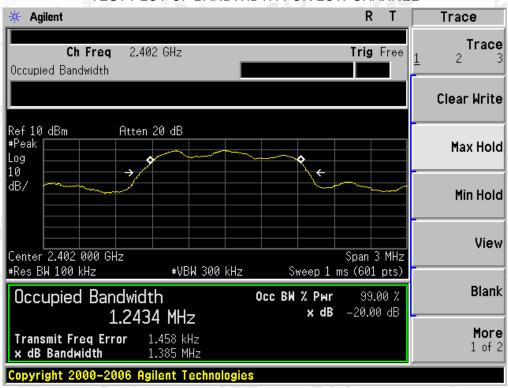
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BLUET	OOTH 3MBPS LIN	MITS AND MEASU	REMENT RESULT						
	Measurement Result								
Applicable Limits		Danill							
		99%OBW (MHz)	-20dB BW(MHz)	Result					
TO THE WORLD	Low Channel	1.243	1.385	PASS					
N/A	Middle Channel	1.241	1.373	PASS					
	High Channel	1.243	1.386	PASS					

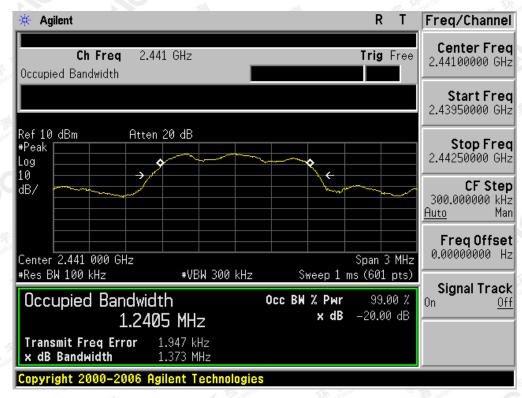
### TEST PLOT OF BANDWIDTH FOR LOW CHANNEL



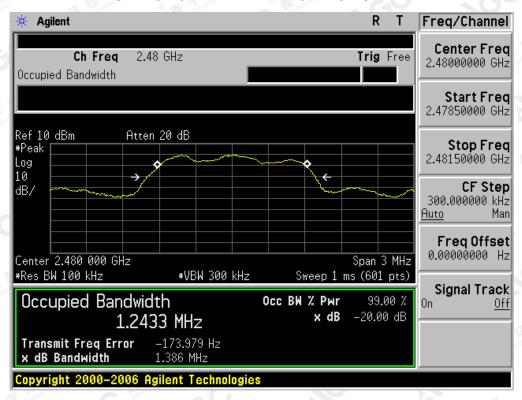
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#### TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



#### TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



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# 12. FCC LINE CONDUCTED EMISSION TEST

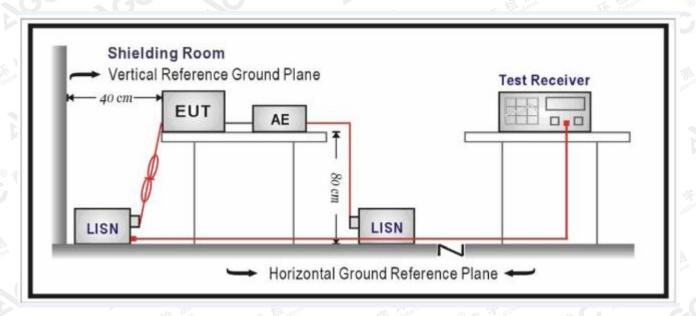
## 12.1. LIMITS OF LINE CONDUCTED EMISSION TEST

F	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

- 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.

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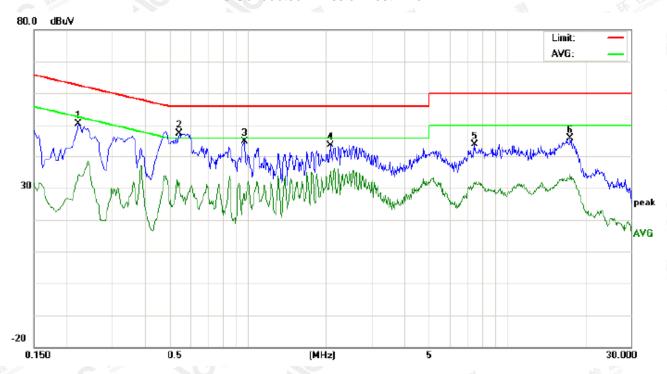
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## 12.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

By adapter(worst case)

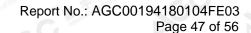
#### FOR BR/EDR

### Line Conducted Emission Test Line 1-L



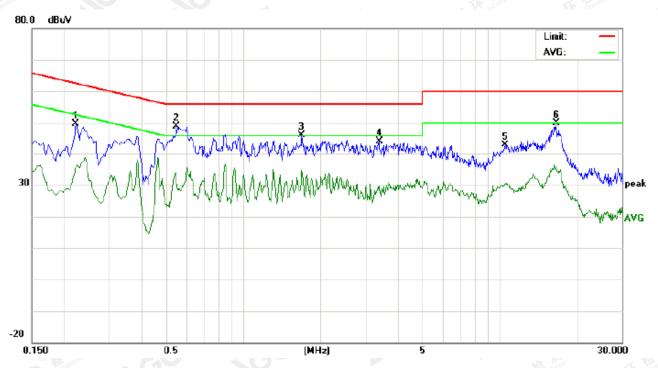
	No. Freq.		Reading_Level (dBuV)		Correct Measurement Factor (dBuV)				rgin IB)	P/F	Comment				
Ĺ		(MHz)	Peak	QP	AVG	dB	Peak	QP	AVG	QP	AVG	QP	AVG		
	1	0.2220	40.17		24.05	10.24	50.41		34.29	62.74	52.74	-12.33	-18.45	Р	
	2	0.5460	37.08		21.20	10.36	47.44		31.56	56.00	46.00	-8.56	-14.44	Р	
	3	0.9700	34.56		17.85	10.38	44.94		28.23	56.00	46.00	-11.06	-17.77	Р	
Г	4	2.0860	33.45		24.93	10.26	43.71		35.19	56.00	46.00	-12.29	-10.81	Р	
ş	5	7.4980	33.46		21.19	10.33	43.79		31.52	60.00	50.00	-16.21	-18.48	Р	
St.	6	17.5020	35.88		24.15	10.12	46.00		34.27	60.00	50.00	-14.00	-15.73	Р	

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## Line Conducted Emission Test Line 2-N



No.	Freq.	Rea	ding_L (dBuV)		Correct Factor	1	asuren (dBuV)		1	nit uV)	1	rgin IB)	P/F	Comment
	(MHz)	Peak	QP	AVG	dB	Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.2220	39.29		25.50	10.24	49.53		35.74	62.74	52.74	-13.21	-17.00	Р	
2	0.5500	38.53		21.40	10.35	48.88		31.75	56.00	46.00	-7.12	-14.25	Р	
3	1.6980	35.72		24.30	10.32	46.04		34.62	56.00	46.00	-9.96	-11.38	Р	
4	3.3860	33.66		19.16	10.52	44.18		29.68	56.00	46.00	-11.82	-16.32	Р	
5	10.5380	32.69		20.39	10.10	42.79		30.49	60.00	50.00	-17.21	-19.51	Р	
6	16.6460	39.87		25.50	10.12	49.99		35.62	60.00	50.00	-10.01	-14.38	Р	

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## APPENDIX A: PHOTOGRAPHS OF TEST SETUP

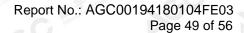
FCC LINE CONDUCTED EMISSION TEST SETUP



FCC RADIATED EMISSION TEST SETUP

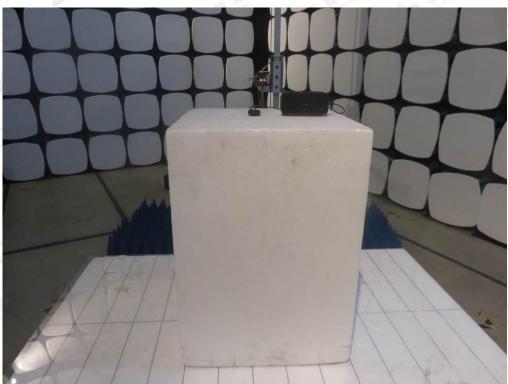


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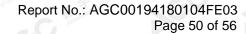








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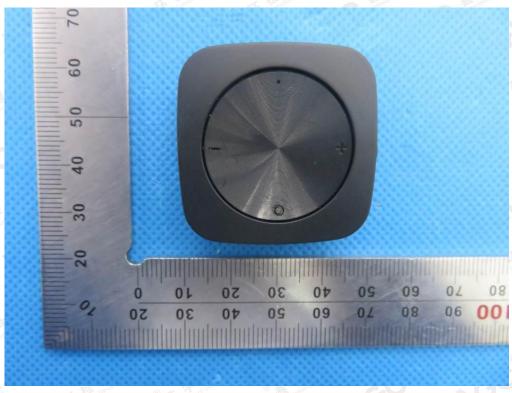


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## **APPENDIX B: PHOTOGRAPHS OF EUT**

TOP VIEW OF EUT



**BOTTOM VIEW OF EUT** 



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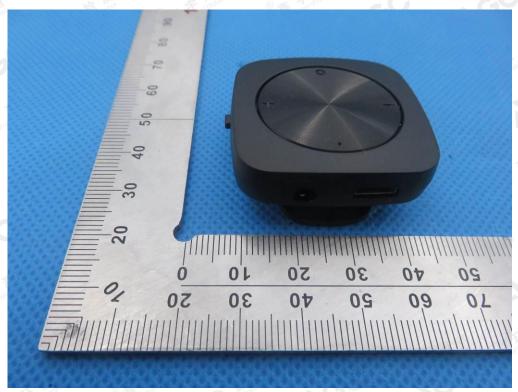
Tel: +86-755 2908 1955 Fax: +86-755 2600 8484 E-mail: agc@agc-cert.com @ 400 089 2118 Add: 2/F., Building 2, No.1-4, Chaxi Sanwei Technical Industrial Park, Gushu, Xixiang, Baoan District, Shenzhen, Guangdong China



## FRONT VIEW OF EUT



**BACK VIEW OF EUT** 



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# LEFT VIEW OF EUT



RIGHT VIEW OF EUT



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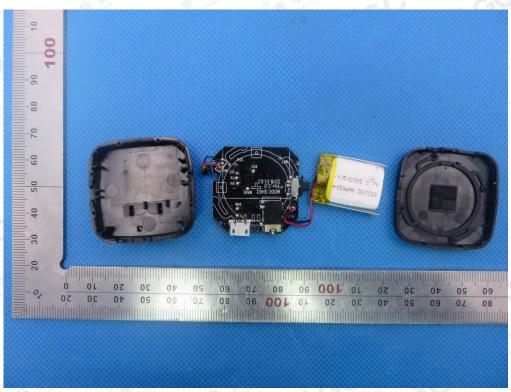
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# VIEW OF EUT (PORT)



**OPEN VIEW OF EUT** 



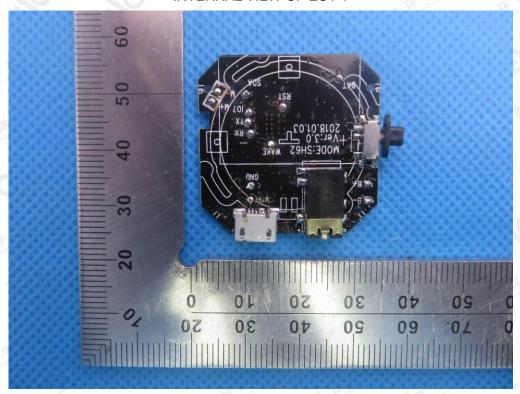
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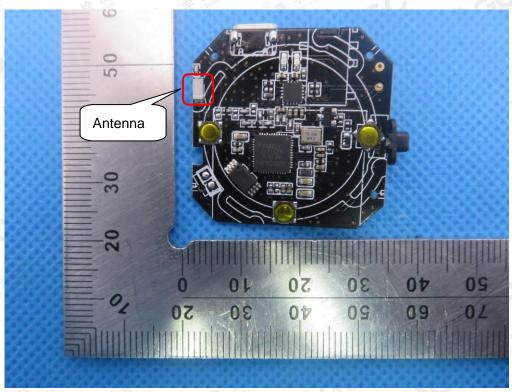
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# **INTERNAL VIEW OF EUT-1**



**INTERNAL VIEW OF EUT-2** 



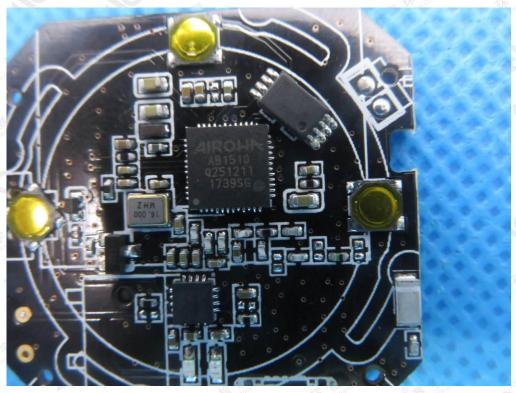
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# **INTERNAL VIEW OF EUT-3**



VIEW OF ADAPTER(AE)



The adapter was supplied by AGC

## ----END OF REPORT----

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