# **FCC Test Report**

Report No.: AGC07627160801FE04

FCC ID : 2ADN5ETA1

**APPLICATION PURPOSE** : Original Equipment

**PRODUCT DESIGNATION**: Bluetooth headset

**BRAND NAME** : BLINC

**MODEL NAME** : ET-A1

CLIENT : Shanghai Blinc Electronic & Technology Co., Ltd.

**DATE OF ISSUE** : Nov.23, 2016

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

**REPORT VERSION** : V1.

Attestation of Global Compliance (Shenzhen) Co., Ltd

## **CAUTION:**

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Report No.: AGC07627160801FE04 Page 2 of 74

## **Report Revise Record**

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Nov.23, 2016	Valid	Original Report

## **TABLE OF CONTENTS**

1. VERIFICATION OF CONFORMITY	5
2. GENERAL INFORMATION	6
2.1. PRODUCT DESCRIPTION	6
2.2. TABLE OF CARRIER FREQUENCYS	6
2.3. RECEIVER INPUT BANDWIDTH	7
2.4. EXAMPLE OF A HOPPING SEQUENCY IN DATA MODE	7
2.5. EQUALLY AVERAGE USE OF FREQUENCIES AND BEHAVIOUR	
2.6. RELATED SUBMITTAL(S) / GRANT (S)	8
2.7. TEST METHODOLOGY	8
2.8. SPECIAL ACCESSORIES	8
2.9. EQUIPMENT MODIFICATIONS	
3. MEASUREMENT UNCERTAINTY	8
4. DESCRIPTION OF TEST MODES	9
5. SYSTEM TEST CONFIGURATION	11
5.1. CONFIGURATION OF EUT SYSTEM	
5.2. EQUIPMENT USED IN EUT SYSTEM	11
5.3. SUMMARY OF TEST RESULTS	12
7. PEAK OUTPUT POWER	15
7.1. MEASUREMENT PROCEDURE	15
7.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)	15
7.3. LIMITS AND MEASUREMENT RESULT	
8. BANDWIDTH	22
8.1. MEASUREMENT PROCEDURE	22
8.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)	22
8.3. LIMITS AND MEASUREMENT RESULTS	22
9. CONDUCTED SPURIOUS EMISSION	29
9.1. MEASUREMENT PROCEDURE	29
9.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)	29
9.3. MEASUREMENT EQUIPMENT USED	29
9.4. LIMITS AND MEASUREMENT RESULT	29
10. RADIATED EMISSION	33
10.1. MEASUREMENT PROCEDURE	33
10.2. TEST SETUP	35
10.3. TEST RESULT (Worst Modulation: GFSK)	37
11. BAND EDGE EMISSION	50

11.1. MEASUREMENT PROCEDURE	50
11.2. TEST SET-UP	50
11.3. TEST RESULT (Worst Modulation: GFSK)	51
12. NUMBER OF HOPPING FREQUENCY	55
12.1. MEASUREMENT PROCEDURE	55
12.2. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)	55
12.3. MEASUREMENT EQUIPMENT USED	55
12.4. LIMITS AND MEASUREMENT RESULT	55
13. TIME OF OCCUPANCY (DWELL TIME)	56
13.1. MEASUREMENT PROCEDURE	
13.2. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)	56
13.3. MEASUREMENT EQUIPMENT USED	56
13.4. LIMITS AND MEASUREMENT RESULT	56
14. FREQUENCY SEPARATION	59
14.1. MEASUREMENT PROCEDURE	59
14.2. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)	59
14.3. MEASUREMENT EQUIPMENT USED	59
14.4. LIMITS AND MEASUREMENT RESULT	
15. FCC LINE CONDUCTED EMISSION TEST	
15.1. LIMITS OF LINE CONDUCTED EMISSION TEST	
15.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST	
15.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST	
15.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST	
15.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST	63
APPENDIX A: PHOTOGRAPHS OF TEST SETUP	63
APPENDIX B: PHOTOGRAPHS OF EUT	6 E

Page 5 of 74

## 1. VERIFICATION OF CONFORMITY

Applicant	Shanghai Blinc Electronic & Technology Co., Ltd.
Address	Room 3099, 3rd Floor, No 1 Building, No.79 Aona Road, China (Shanghai)Pilot Free Trade Zone
Manufacturer	Shanghai Blinc Electronic & Technology Co., Ltd.
Address	Room 3099, 3rd Floor, No 1 Building, No.79 Aona Road, China (Shanghai)Pilot Free Trade Zone
Product Designation	Bluetooth Headset
Brand Name	BLINC
Test Model	ET-A1
Date of test	Aug.29, 2016 to Aug.31, 2016
Deviation	None
Condition of Test Sample	Normal
Report Template	AGCRT-US-BR/RF (2013-03-01)

We hereby certify that:

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

Tested By	Service Lung	
	Strive Liang(Liang Faqiang)	Aug.31, 2016
Reviewed By	forest ce	
	Forrest Lei(Lei Yonggang)	Nov.23, 2016
Approved By	Solya Hong	
	Solger Zhang(Zhang Hongyi)  Authorized Officer	Nov.23, 2016

Page 6 of 74

## 2. GENERAL INFORMATION

## 2.1. PRODUCT DESCRIPTION

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

A major technical description of EUT is described as following

Operation Frequency	2.402 GHz to 2.480GHz	
RF Output Power	19.23dBm(Max)	
Bluetooth Version	V3.0	
Modulation	GFSK, π /4-DQPSK, 8DPSK	
Number of channels	79	
Hardware Version	ET-01-V4	
Software Version	ET-01-REV01	
Antenna Designation	Fixed Antenna	
Antenna Gain	0dBi	
Power Supply	DC3.7V by Battery	
Note: The USB port only be used for charging and can't be used to transfer data with PC.		

## 2.2. TABLE OF CARRIER FREQUENCYS

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

Page 7 of 74

#### 2.3. RECEIVER INPUT BANDWIDTH

The input bandwidth of the receiver is 1.3MHZ,In every connection one Bluetooth device is the master and the other one is slave. The master determines the hopping sequence. The slave follows this sequence. Both devices shift between RX and TX time slot according to the clock of the master. Additionally the type of connection(e.g. single of multisport packet) is set up at the beginning of the connection. The master adapts its hopping frequency and its TX/RX timing according to the packet type of the connection. Also the slave of the connection will use these settings.

Repeating of a packet has no influence on the hopping sequence. The hopping sequence generated by the master of the connection will be followed in any case. That means, a repeated packet will not be send on the same frequency, it is send on the next frequency of the hopping sequence.

#### 2.4. EXAMPLE OF A HOPPING SEQUENCY IN DATA MODE

Example of a 79 hopping sequence in data mode: 40,21,44,23,42,53,46,55,48,33,52,35,50,65,54,67 56,37,60,39,58,69,62,71,64,25,68,27,66,57,70,59 72,29,76,31,74,61,78,63,01,41,05,43,03,73,07,75 09,45,13,47,11,77,15,00,64,49,66,53,68,02,70,06 01, 51, 03, 55, 05, 04

#### 2.5. EQUALLY AVERAGE USE OF FREQUENCIES AND BEHAVIOUR

The generation of the hopping sequence in connection mode depends essentially on two input values:

- 1. LAP/UAP of the master of the connection.
- 2. Internal master clock

The LAP(lower address part) are the 24 LSB's of the 48 BD\_ADDRESS. The BD\_ADDRESS is an unambiguous number of every Bluetooth unit. The UAP(upper address part) are the 24MSB's of the 48BD ADDRESS

The internal clock of a Bluetooth unit is derived from a free running clock which is never adjusted and is never turned off. For synchronization with other units only offset are used. It has no relation to the time of the day. Its resolution is at least half the RX/TX slot length of 312.5us. The clock has a cycle of about one day(23h30). In most case it is implemented as 28 bit counter. For the deriving of the hopping sequence the entire. LAP(24 bits),4LSB's(4bits)(Input 1) and the 27MSB's of the clock(Input 2) are used. With this input values different mathematical procedures(permutations, additions, XOR-operations) are performed to generate te Sequence. This will be done at the beginning of every new transmission.

Regarding short transmissions the Bluetooth system has the following behavior:

The first connection between the two devices is established, a hopping sequence was generated. For Transmitting the wanted data the complete hopping sequence was not used. The connection ended. The second connection will be established. A new hopping sequence is generated. Due to the fact the Bluetooth clock has a different value, because the period between the two transmission is longer(and it Cannot be shorter) than the minimum resolution of the clock(312.5us). The hopping sequence will always Differ from the first one.

Page 8 of 74

## 2.6. RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: 2ADN5ETA1** filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.

## 2.7. TEST METHODOLOGY

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

## 2.8. SPECIAL ACCESSORIES

Refer to section 5.2.

#### 2.9. EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

## 3. MEASUREMENT UNCERTAINTY

Conducted measurement: +/- 2.75dB Radiated measurement: +/- 3.2dB

Report No.: AGC07627160801FE04 Page 9 of 74

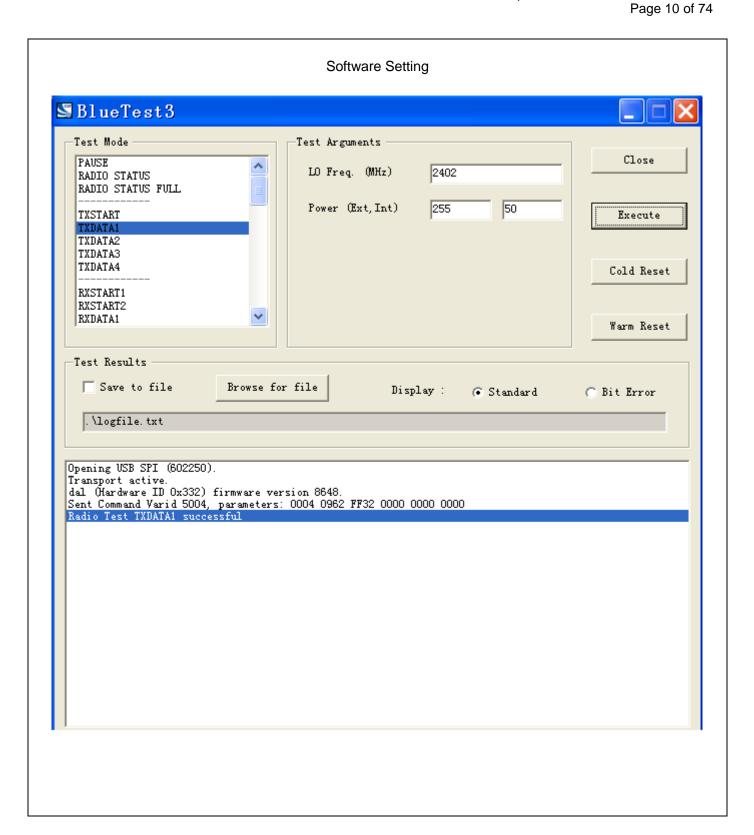
## 4. DESCRIPTION OF TEST MODES

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

## Note:

1. Only the result of the worst case was recorded in the report, if no other cases.

2.The EUT	used fully	/-charged	battery	when	tested.
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Page 11 of 74

## 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**

	0:::: 1 q 0 :: :::::::::::::::::::::::::				
Item	Equipment	Mfr/Brand	Model/Type No.	Remark	
1	Bluetooth Headset	BLINC	ET-A1	EUT	
	Battery	BLINC	453040PL	Accessory	
2	PC	Sony	E1412AYCW	A.E	
3	Control box	CSR	N/A	A.E	
	Adapter	IPRO	NTR-S01	A.E	
4	Temporary Antenna Connector	T10	N/A	A.E	

Report No.: AGC07627160801FE04 Page 12 of 74

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

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.247 b(1)	Peak Output Power	Compliant
§15.247 a(1)	20 dB Bandwidth	Compliant
§15.247 d	Spurious Emission	Compliant
§15.209	Radiated Emission	Compliant
§15.247 d	Band Edges	Compliant
§15.207	Conduction Emission	Compliant
§15.247 a(1)(iii)	Time of Occupancy	Compliant
§15.247 a(1)	Frequency Separation	Compliant

Page 13 of 74

## **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.

## **ALL TEST EQUIPMENT LIST**

FOR RADIATED EMISSION TEST (BELOW 1GHZ)

Radiated Emission Test Site					
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
EMI Test Receiver	ROHDE&SCHWARZ	ESCI	101417	July 4, 2016	July 3, 2017
Trilog Broadband Antenna (25M-1GHz)	SCHWARZBECK	VULB9160	9160-3355	July 4, 2016	July 3, 2017
Signal Amplifier	SCHWARZBECK	BBV 9475	9745-0013	July 4, 2016	July 3, 2017
RF Cable	SCHWARZBECK	AK9515E	96221	July 4, 2016	July 3, 2017
3m Anechoic Chamber	CHENGYU	966	PTS-001	June 6, 2016	June 5, 2017
MULTI-DEVICE Positioning Controller	MAX-FULL	MF-7802	MF780208339	N/A	N/A
Active loop antenna (9K-30MHz)	SCHWARZBECK	FMZB1519	1519-038	June 6, 2016	June 5, 2017
Spectrum analyzer	AGILENT	E4407B	MY46185649	June 6, 2016	June 5, 2017

## FOR RADIATED EMISSION TEST (1GHZ ABOVE)

Radiated Emission Test Site					
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
EMI Test Receiver	ROHDE&SCHWARZ	ESCI	101417	July 4, 2016	July 3, 2017
Horn Antenna (1G-18GHz)	SCHWARZBECK	BBHA9120D	9120D-1246	July 11, 2016	July 10, 2017
Spectrum Analyzer	AGILENT	E4411B	MY4511453	July 4, 2016	July 3, 2017
Signal Amplifier	SCHWARZBECK	BBV 9718	9718-269	July 7, 2016	July 6, 2017
RF Cable	SCHWARZBECK	AK9515H	96220	July 8, 2016	July 7, 2017
3m Anechoic Chamber	CHENGYU	966	PTS-001	June 6, 2016	June 5, 2017
MULTI-DEVICE Positioning Controller	MAX-FULL	MF-7802	MF780208339	N/A	N/A
Horn Ant (18G-40GHz)	SCHWARZBECK	BBHA 9170	9170-181	June 6, 2016	June 5, 2017

Page 14 of 74

Conducted Emission Test Site						
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration	
EMI Test Receiver	ROHDE&SCHWARZ	ESCI	101417	July 4, 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, 2016	June 5, 2017	
Conduction Cable	MXT	SE1	S003	June 6, 2016	June 5, 2017	

Page 15 of 74

## 7. PEAK OUTPUT POWER

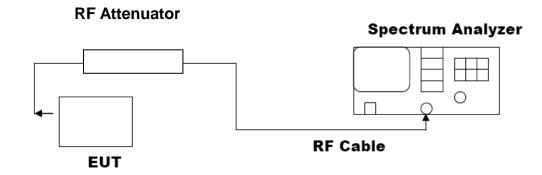
#### 7.1. MEASUREMENT PROCEDURE

For peak power test:

- 1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- 2. Set the EUT Work on the top, middle and the bottom operation frequency individually.
- 3. RBW > the 20 dB bandwidth of the emission being measured, VBW ≥ RBW.
- 4. Record the maximum power from the Spectrum Analyzer.

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

## **PEAK POWER TEST SETUP**

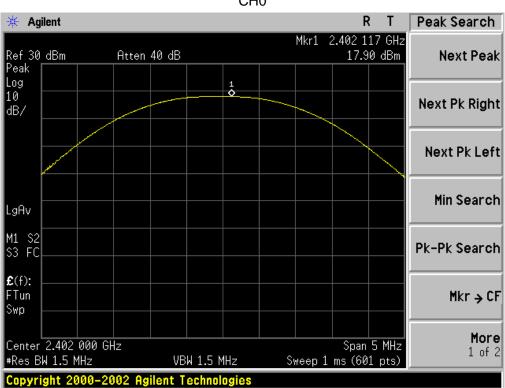


Page 16 of 74

## 7.3. LIMITS AND MEASUREMENT RESULT

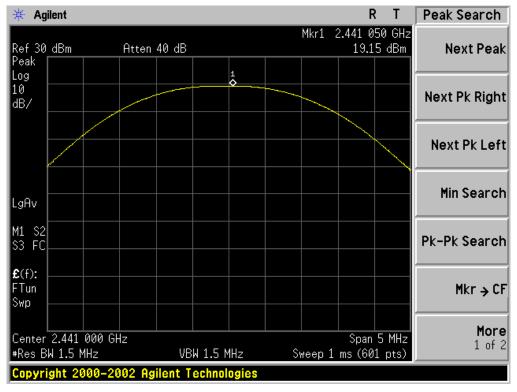
PEAK OUTPUT POWER MEASUREMENT RESULT FOR GFSK MOUDULATION				
Frequency Peak Power Applicable Limits (GHz) Pass or Fail				
2.402	17.90	21	Pass	
2.441	19.15	21	Pass	
2.480	19.23	21	Pass	

CH<sub>0</sub>

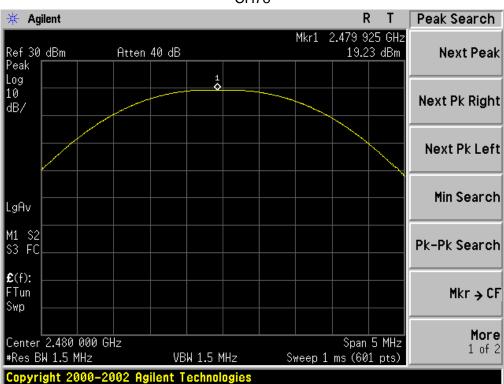


Page 17 of 74

**CH39** 



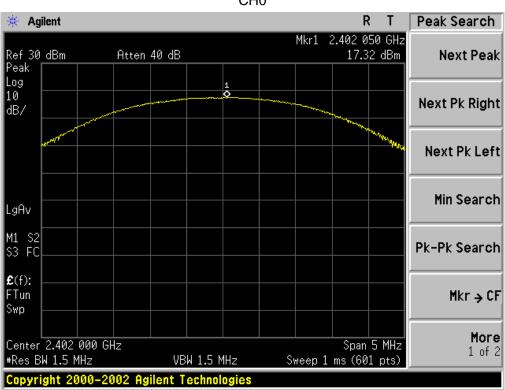
#### **CH78**



Report No.: AGC07627160801FE04 Page 18 of 74

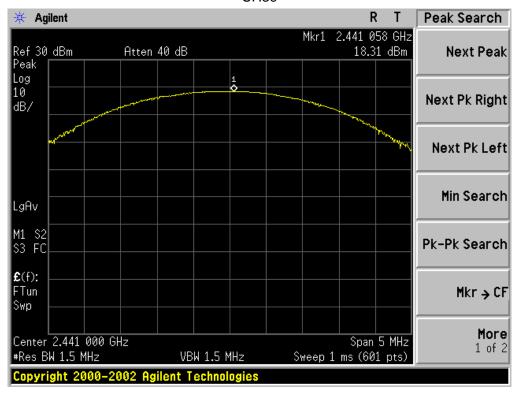
PEAK OUTPUT POWER MEASUREMENT RESULT FOR II /4-DQPSK MODULATION				
Frequency Peak Power Applicable Limits (GHz) (dBm) Pass or Fail				
2.402	17.32	21	Pass	
2.441	18.31	21	Pass	
2.480	18.86	21	Pass	

CH<sub>0</sub>

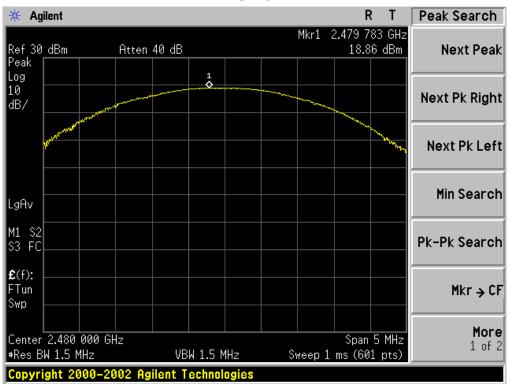


Report No.: AGC07627160801FE04 Page 19 of 74

**CH39** 



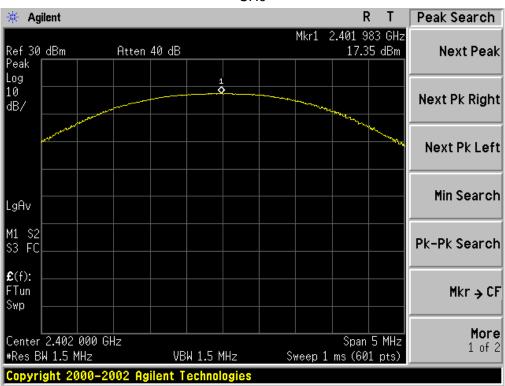
#### **CH78**



Report No.: AGC07627160801FE04 Page 20 of 74

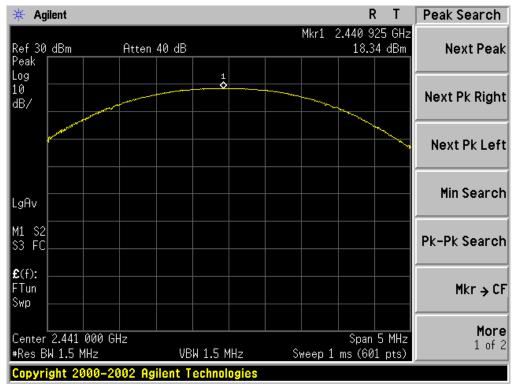
PEAK OUTPUT POWER MEASUREMENT RESULT FOR 8-DPSK MODULATION				
Frequency (GHz)	Peak Power (dBm)	Applicable Limits (dBm)	Pass or Fail	
2.402	17.35	21	Pass	
2.441	18.34	21	Pass	
2.480	18.98	21	Pass	

CH<sub>0</sub>

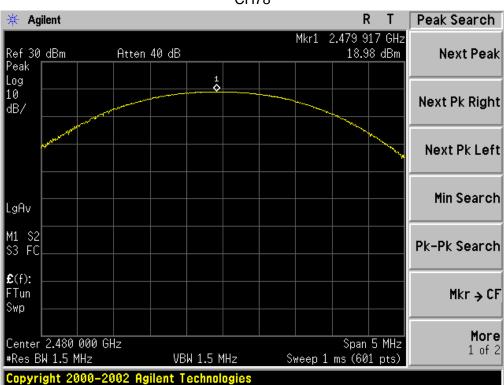


Page 21 of 74

CH39



#### **CH78**



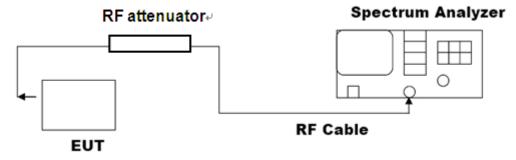
Page 22 of 74

## 8. BANDWIDTH

## **8.1. MEASUREMENT PROCEDURE**

- 1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- 2. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- 3. Set Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hoping channel RBW  $\geq$  1% of the 20 dB bandwidth, VBW  $\geq$  RBW; Sweep = auto; Detector function = peak
- 4. Set SPA Trace 1 Max hold, then View.

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



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

## 8.3. LIMITS AND MEASUREMENT RESULTS

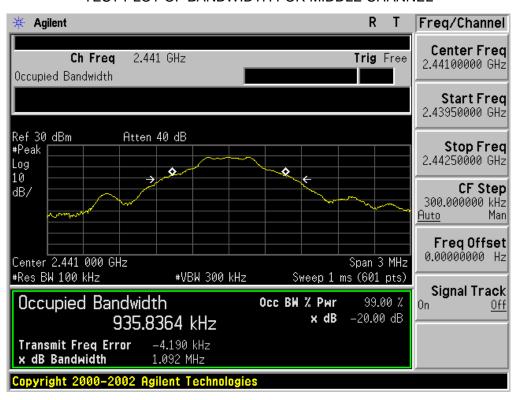
BLUETOOTH 1MBPS LIMITS AND MEASUREMENT RESULT				
	Measurement Result			
Applicable Limits		Test Data (MHz)		
		99%OBW (MHz)	-20dB BW(MHz)	Result
	Low Channel	0.937	1.104	PASS
N/A	Middle Channel	0.936	1.092	PASS
	High Channel	0.930	1.089	PASS

Page 23 of 74

#### TEST PLOT OF BANDWIDTH FOR LOW CHANNEL

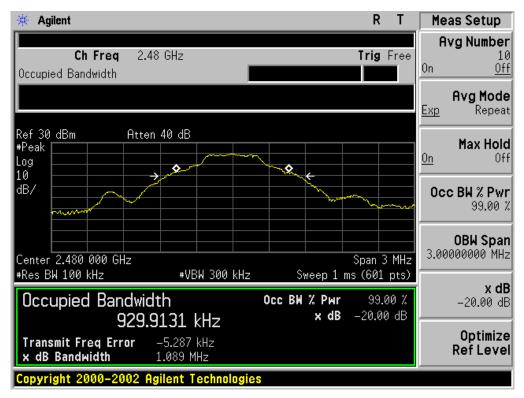


#### TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



Page 24 of 74

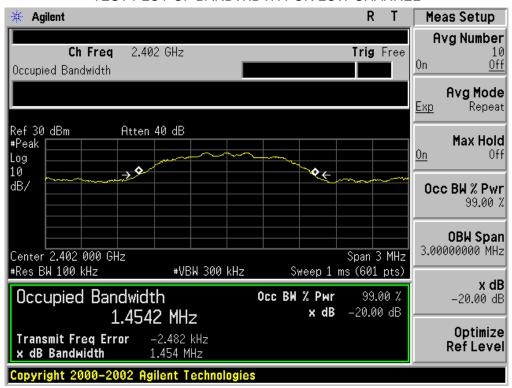
#### TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



Report No.: AGC07627160801FE04 Page 25 of 74

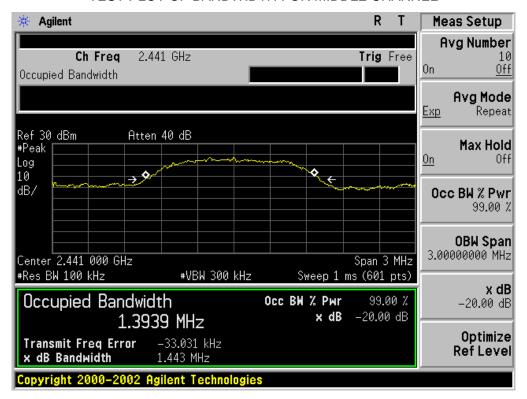
BLUETOOTH 2MBPS LIMITS AND MEASUREMENT RESULT				
	Measurement Result			
Applicable Limits		Test Data (MHz)		
		99%OBW (MHz)	-20dB BW(MHz)	Result
	Low Channel	1.454	1.454	PASS
N/A	Middle Channel	1.394	1.443	PASS
	High Channel	1.306	1.430	PASS

## TEST PLOT OF BANDWIDTH FOR LOW CHANNEL

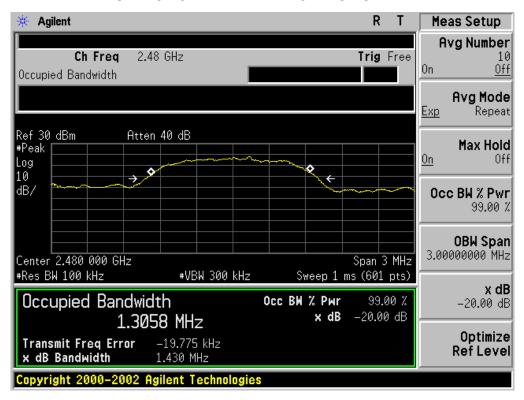


Page 26 of 74

#### TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



Report No.: AGC07627160801FE04 Page 27 of 74

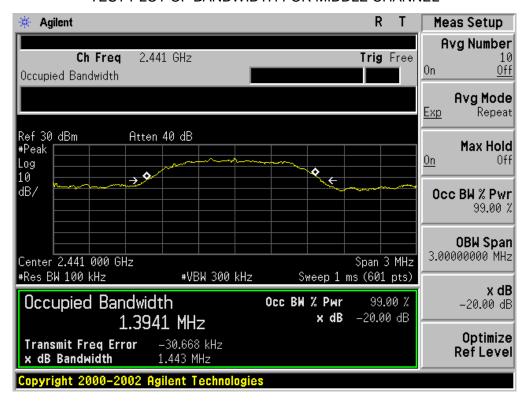
BLUETOOTH 3MBPS LIMITS AND MEASUREMENT RESULT					
	Measurement Result				
Applicable Limits		Test Data (MHz)			
	99%OBW (MHz) -20dB BW(MHz)				
	Low Channel	1.449	1.453	PASS	
N/A	Middle Channel	1.394	1.443	PASS	
	High Channel	1.297	1.428	PASS	

## TEST PLOT OF BANDWIDTH FOR LOW CHANNEL

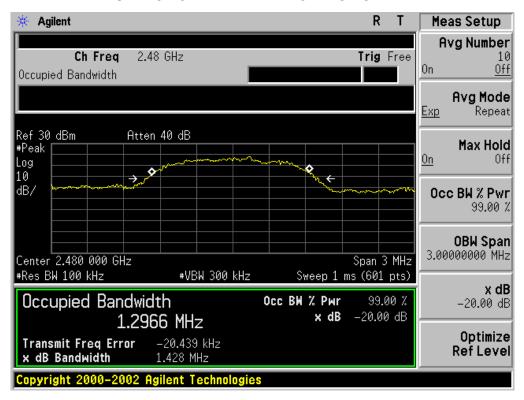


Report No.: AGC07627160801FE04 Page 28 of 74

#### TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



#### TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



Page 29 of 74

## 9. CONDUCTED SPURIOUS EMISSION

## 9.1. MEASUREMENT PROCEDURE

- 1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- 2. Set the EUT Work on the top, the Middle and the bottom operation frequency individually.
- 3. Set the Span = wide enough to capture the peak level of the in-band emission and all spurious emissions from the lowest frequency generated in the EUT up through the 10th harmonic.
  RBW = 100 kHz; VBW ≥ RBW; Sweep = auto; Detector function = peak.
- 4. Set SPA Trace 1 Max hold, then View.

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

The same as described in section 8.2

## 9.3. MEASUREMENT EQUIPMENT USED

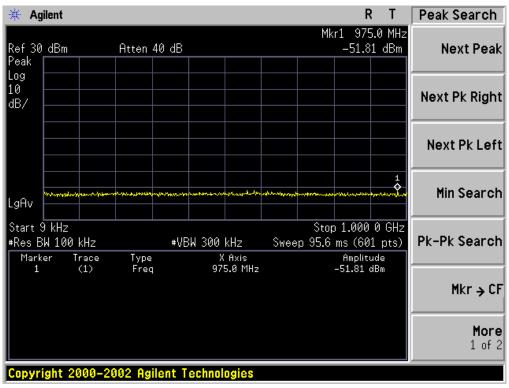
The same as described in section 6

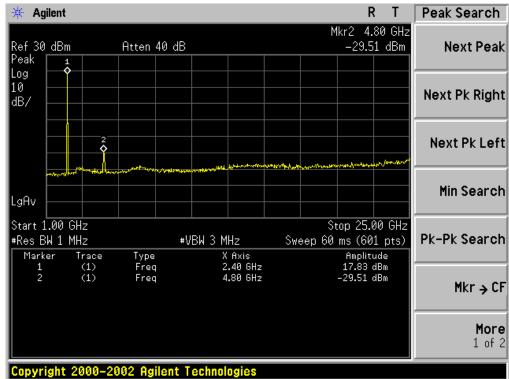
#### 9.4. LIMITS AND MEASUREMENT RESULT

LIMITS AND MEASUREMENT RESULT				
Applicable Limite	Measurement Result			
Applicable Limits	Test Data	Result		
In any 100 KHz Bandwidth Outside the	At least -20dBc than the limit			
frequency band in which the spread spectrum	Specified on the BOTTOM	PASS		
intentional radiator is operating, the radio frequency	Channel			
power that is produce by the intentional radiator				
shall be at least 20 dB below that in 100KHz				
bandwidth within the band that contains the highest				
level of the desired power.	At least -20dBc than the limit	PASS		
In addition, radiation emissions which fall in the	Specified on the TOP Channel	PASS		
restricted bands, as defined in §15.205(a), must also				
comply with the radiated emission limits specified				
in§15.209(a))				

Page 30 of 74

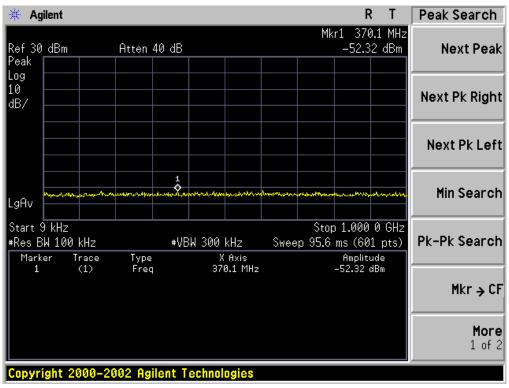
## TEST PLOT OF OUT OF BAND EMISSIONS WITH THE WORST CASE OF GFSK MODULATION IN LOW CHANNEL

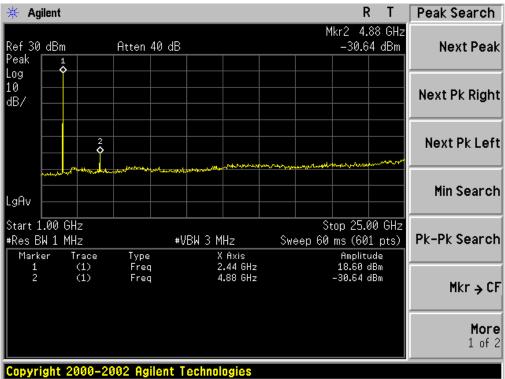




Page 31 of 74

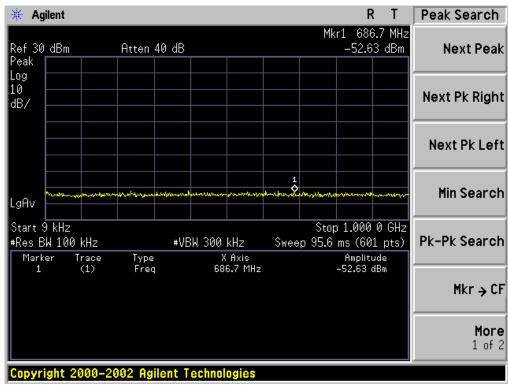
## TEST PLOT OF OUT OF BAND EMISSIONS OF GFSK MODULATION IN MIDDLE CHANNEL

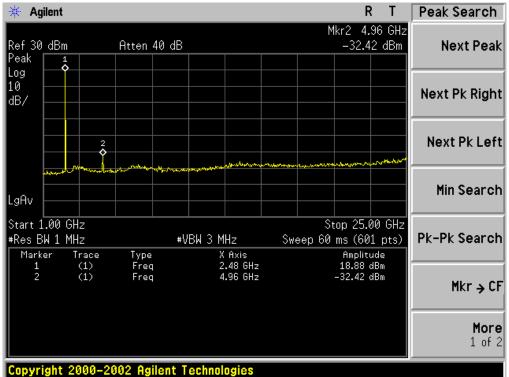




Page 32 of 74

## TEST PLOT OF OUT OF BAND EMISSIONS OF GFSK MODULATION IN HIGH CHANNEL





Page 33 of 74

#### 10. RADIATED EMISSION

#### 10.1. MEASUREMENT PROCEDURE

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

Report No.: AGC07627160801FE04 Page 34 of 74

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

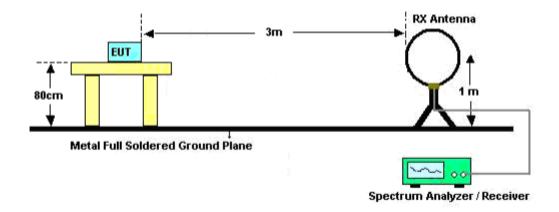
Spectrum Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP
Start ~Stop Frequency	1GHz~26.5GHz 1MHz/3MHz for Peak, 1MHz/10Hz for Average

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

Report No.: AGC07627160801FE04 Page 35 of 74

## 10.2. TEST SETUP

## Radiated Emission Test-Setup Frequency Below 30MHz

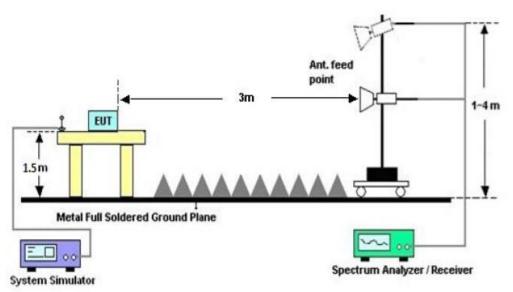


## RADIATED EMISSION TEST SETUP 30MHz-1000MHz



Page 36 of 74

## RADIATED EMISSION TEST SETUP ABOVE 1000MHz



Page 37 of 74

# 10.3. TEST RESULT (Worst Modulation: GFSK)

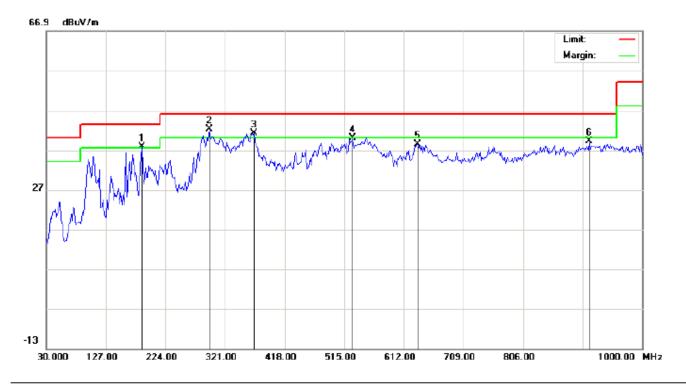
# **RADIATED EMISSION BELOW 30MHZ**

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

Page 38 of 74

## **RADIATED EMISSION BELOW 1GHZ**

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



Site: site #1

Limit: FCC Class B 3M Radiation

EUT:Bluetooth Headset

M/N:ET-A1

Mode:Low Channel TX

Note:

Polarization: *Horizontal* Temperature: 24.6 Power: Humidity: 54.3 %

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	. <u> </u>	185.2000	26.42	11.31	37.73	43.50	-5.77	peak			
2	*	295.1333	27.70	14.58	42.28	46.00	-3.72	peak			
3	İ	367.8833	22.30	18.86	41.16	46.00	-4.84	peak			
4	İ	527.9333	18.22	21.88	40.10	46.00	-5.90	peak			
5		634.6333	14.69	23.81	38.50	46.00	-7.50	peak		·	
6		914.3167	10.23	29.01	39.24	46.00	-6.76	peak			

Temperature: 24.6

Humidity: 54.3 %

Page 39 of 74

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



Site: site #1

Limit: FCC Class B 3M Radiation

EUT:Bluetooth Headset

M/N:ET-A1

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		117.3000	23.35	5.52	28.87	43.50	-14.63	peak			
2		167.4167	21.34	14.86	36.20	43.50	-7.30	peak			
3		312.9167	23.39	16.27	39.66	46.00	-6.34	peak			
4	*	540.8667	18.50	22.23	40.73	46.00	-5.27	peak			
5		720.3167	11.20	25.78	36.98	46.00	-9.02	peak			
6		903.0000	10.90	28.69	39.59	46.00	-6.41	peak			

Power:

Distance:

Polarization: Vertical

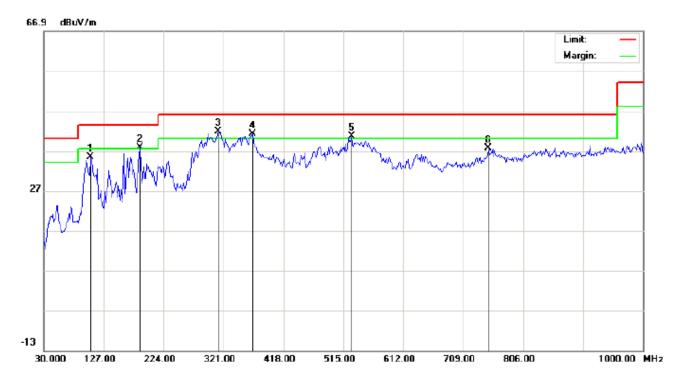
## **RESULT: PASS**

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

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

Page 40 of 74

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



Site: site #1

Limit: FCC Class B 3M Radiation

EUT:Bluetooth Headset

M/N:ET-A1

Mode:Middle Channel TX

Note:

Polarization: Horizontal Temperature: 24.6 Power: Humidity: 54.3 %

Distance:

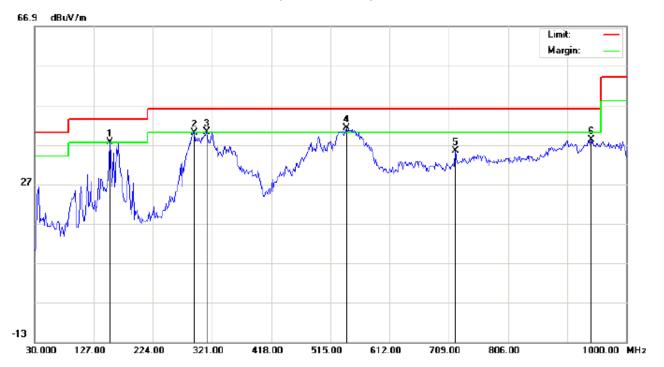
No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	-	MHz	dBu∀	dB/m	dBuV/m	dBu∀/m	dB		cm	degree	
1		105.9833	26.21	9.10	35.31	43.50	-8.19	peak			
2	ļ	185.2000	26.42	11.31	37.73	43.50	-5.77	peak			
3	*	312.9167	25.45	16.27	41.72	46.00	-4.28	peak			
4	ļ	367.8833	22.30	18.86	41.16	46.00	-4.84	peak			
5	İ	527.9333	18.72	21.88	40.60	46.00	-5.40	peak			
6		749.4167	11.06	26.61	37.67	46.00	-8.33	peak			

Temperature: 24.6

Humidity: 54.3 %

Page 41 of 74

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



Polarization: Vertical

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

EUT:Bluetooth Headset

M/N:ET-A1

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	ļ	152.8667	22.30	15.28	37.58	43.50	-5.92	peak			
2	ļ	291.9000	24.91	15.17	40.08	46.00	-5.92	peak			
3	ļ	312.9167	23.89	16.27	40.16	46.00	-5.84	peak			
4	*	540.8667	19.00	22.23	41.23	46.00	-4.77	peak			
5		720.3167	9.70	25.78	35.48	46.00	-10.52	peak			
6		9/1 8000	9.37	29.77	38 1/	46.00	7.86	noak			

Power:

Distance:

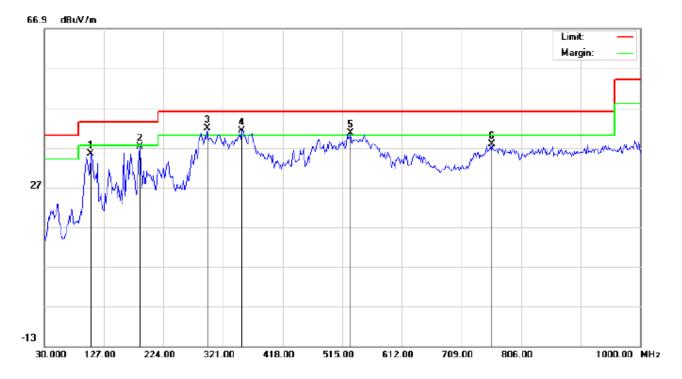
## **RESULT: PASS**

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

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

Page 42 of 74

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



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

EUT:Bluetooth Headset

M/N:ET-A1

Mode:High Channel TX

Note:

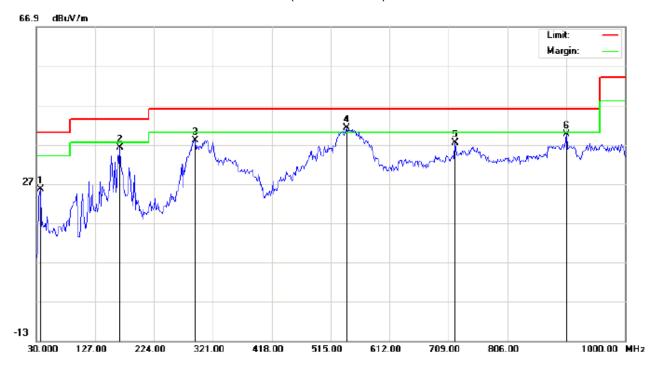
Polarization:	Horizontal	Temperature: 24.6
Power:		Humidity: 54.3 %

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		105.9833	26.21	9.10	35.31	43.50	-8.19	peak			
2		185.2000	25.92	11.31	37.23	43.50	-6.27	peak			
3	*	295.1333	27.20	14.58	41.78	46.00	-4.22	peak			
4	į	351.7167	22.38	18.75	41.13	46.00	-4.87	peak			
5	į	527.9333	18.72	21.88	40.60	46.00	-5.40	peak			
6		759.1167	11.14	26.76	37.90	46.00	-8.10	peak			

Page 43 of 74

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



Site: site #1

Limit: FCC Class B 3M Radiation

EUT:Bluetooth Headset

M/N:ET-A1

Mode:High Channel TX

Note:

Polarization:	verticai	i emperati	ure: 24.6
Power:		Humidity:	54.3 %
B: 4			

Distance:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height		Comment
	-	MHz	dBu∀	dB/m	dBuV/m	dBu∀/m	dB		cm	degree	
1		36.4667	21.36	4.27	25.63	40.00	-14.37	peak			
2		167.4167	21.34	14.86	36.20	43.50	-7.30	peak			
3		291.9000	22.91	15.17	38.08	46.00	-7.92	peak			
4	*	540.8667	19.00	22.23	41.23	46.00	-4.77	peak			
5		720.3167	11.70	25.78	37.48	46.00	-8.52	peak			
6		903.0000	10.90	28.69	39.59	46.00	-6.41	peak			

## **RESULT: PASS**

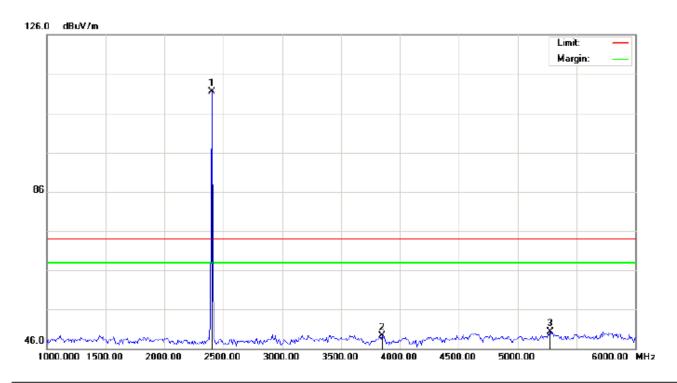
**Note:** 1. Factor=Antenna Factor + Cable loss, Margin=Measurement-Limit.

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

Page 44 of 74

## **RADIATED EMISSION ABOVE 1GHZ**

RADIATED EMISSION ABOVE 1GHZ (1-10<sup>th</sup> Harmonics)-LOW CHANNEL-HORIZONTAL



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

EUT:Bluetooth Headset Distance:

M/N:ET-A1

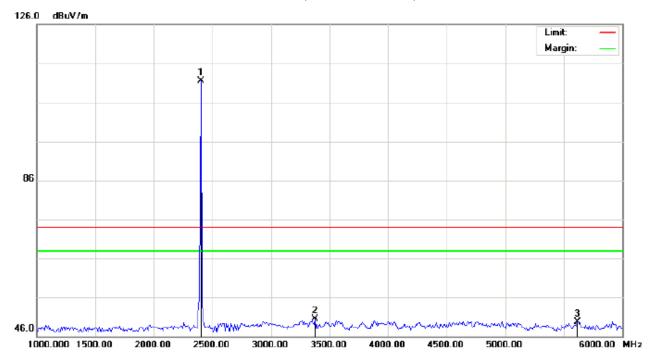
Mode: Low Channel TX

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	101.11	10.32	111.43	74.00	37.43	peak			
2		3850.000	35.11	14.27	49.38	74.00	-24.62	peak			
3		5275.000	47.66	2.69	50.35	74.00	-23.65	peak			

Page 45 of 74

# RADIATED EMISSION ABOVE 1GHZ (1-10<sup>th</sup> Harmonics)-LOW CHANNEL -VERTICAL



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

EUT:Bluetooth Headset Distance:

M/N:ET-A1

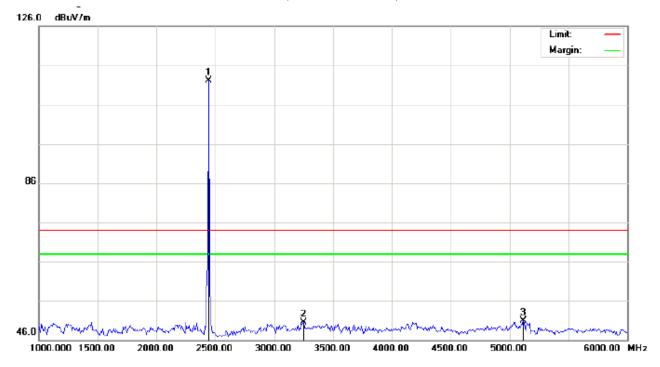
Mode: Low Channel TX

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	101.17	10.32	111.49	74.00	37.49	peak			
2		3375.000	38.51	11.99	50.50	74.00	-23.50	peak			
3		5616.667	51.56	-1.76	49.80	74.00	-24.20	peak			

Page 46 of 74

# RADIATED EMISSION ABOVE 1GHZ (1-10<sup>th</sup> Harmonics)-MIDDLE CHANNEL-HORIZONTAL



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

Distance:

EUT:Bluetooth Headset

M/N:ET-A1

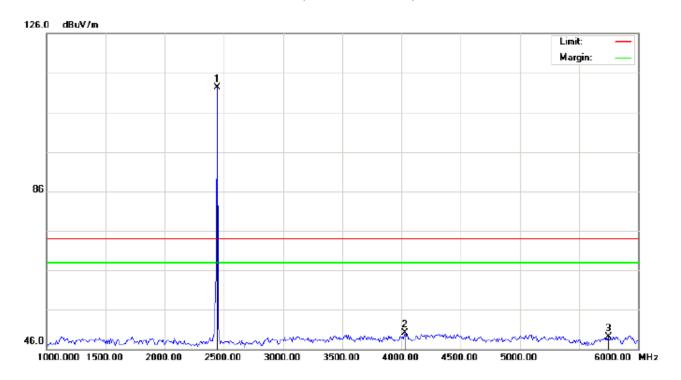
Mode: Middle Channel TX

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	101.73	10.36	112.09	74.00	38.09	peak			
2		3250.000	38.59	11.87	50.46	74.00	-23.54	peak			
3		5116.667	45.10	5.86	50.96	74.00	-23.04	peak			

Page 47 of 74

# RADIATED EMISSION ABOVE 1GHZ (1-10<sup>th</sup> Harmonics) - MIDDLE CHANNEL -VERTICAL



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

EUT:Bluetooth Headset Distance:

M/N:ET-A1

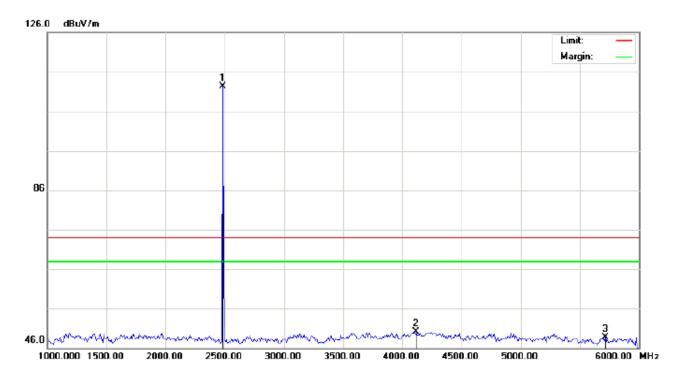
Mode: Middle Channel TX

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	101.89	10.36	112.25	74.00	38.25	peak			
2		4033.333	35.42	14.64	50.06	74.00	-23.94	peak			
3		5750.000	50.89	-1.70	49.19	74.00	-24.81	peak			

Page 48 of 74

# RADIATED EMISSION ABOVE 1GHZ (1-10<sup>th</sup> Harmonics)-HIGH CHANNEL-HORIZONTAL



Site: site #1 Polarization: Horizontal Temperature: 26

Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %

EUT:Bluetooth Headset Distance:

M/N:ET-A1

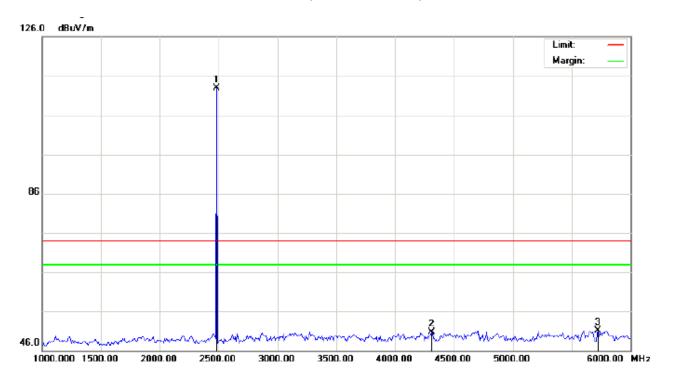
Mode:High Channel TX

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	101.93	10.41	112.34	74.00	38.34	peak			
2		4116.667	36.82	13.25	50.07	74.00	-23.93	peak			
3		5716.667	50.46	-1.71	48.75	74.00	-25.25	peak			

Page 49 of 74

# RADIATED EMISSION ABOVE 1GHZ (1-10<sup>th</sup> Harmonics)-HIGH CHANNEL -VERTICAL



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

EUT:Bluetooth Headset Distance:

M/N:ET-A1

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	102.47	10.41	112.88	74.00	38.88	peak			
2		4308.333	40.56	10.07	50.63	74.00	-23.37	peak			
3		5725.000	52.79	-1.71	51.08	74.00	-22.92	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.

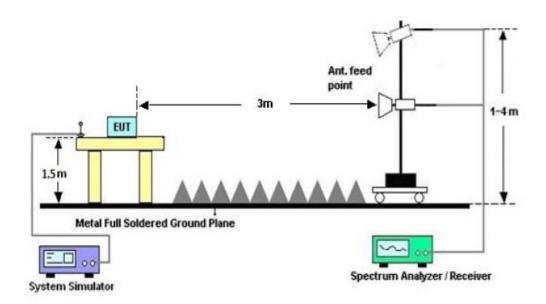
Page 50 of 74

## 11. BAND EDGE EMISSION

## 11.1. MEASUREMENT PROCEDURE

- 1. Set the EUT Work on the top, the bottom operation frequency individually.
- 2. Set SPA Start or Stop Frequency=Operation Frequency, RBW>=100kHz, VBW>=3\*RBW, Center frequency =Operation frequency
- 3. The band edges was measured and recorded.

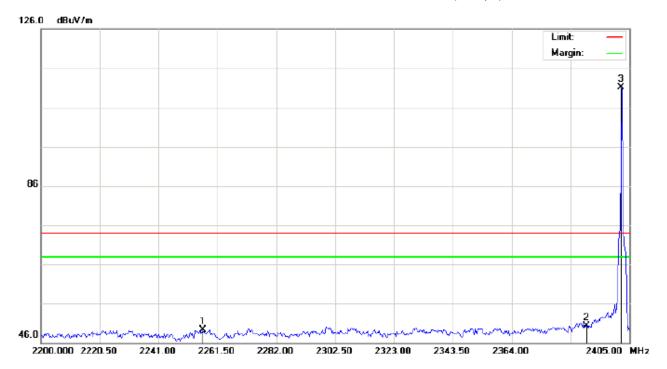
## 11.2. TEST SET-UP



Page 51 of 74

# 11.3. TEST RESULT (Worst Modulation: GFSK)

# TEST PLOT OF BAND EDGE FOR LOW CHANNEL (1Mbps)-Horizontal



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

EUT:Bluetooth Headset

M/N:ET-A1

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		2256.375	39.14	10.16	49.30	74.00	-24.70	peak			
2		2390.000	40.00	10.31	50.31	74.00	-23.69	peak			
3	*	2402.000	100.72	10.32	111.04	74.00	37.04	peak			

Distance:

Temperature: 26

Humidity: 60 %

Page 52 of 74

# TEST PLOT OF BAND EDGE FOR LOW CHANNEL (1Mbps)-Vertical



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

EUT:Bluetooth Headset Distance:

M/N:ET-A1

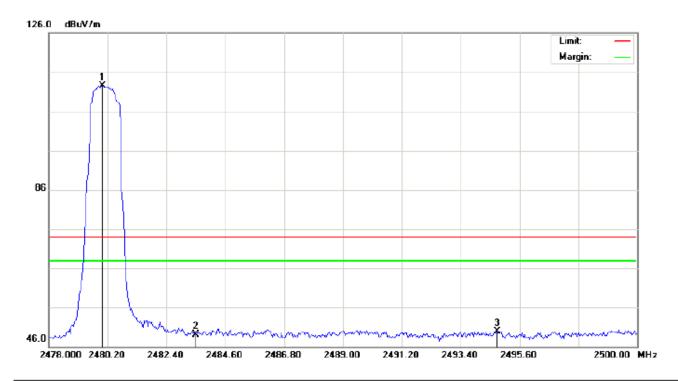
Mode: Low Channel TX

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		2258.083	39.20	10.16	49.36	74.00	-24.64	peak			
2		2390.000	38.71	10.31	49.02	74.00	-24.98	peak			
3	*	2402.000	101.09	10.32	111.41	74.00	37.41	peak			

Page 53 of 74

# TEST PLOT OF BAND EDGE FOR HIGH CHANNEL (1Mbps)-Horizontal



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

EUT:Bluetooth Headset Distance:

M/N:ET-A1

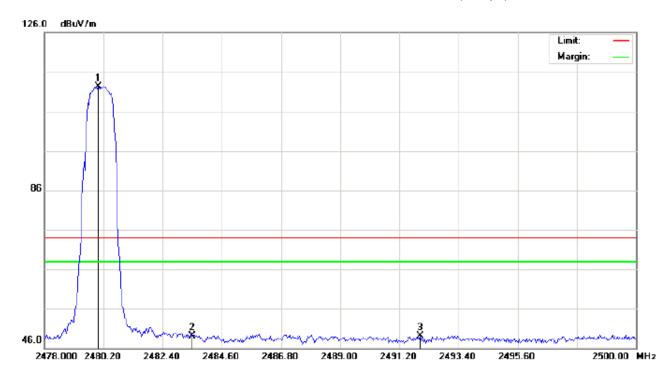
Mode: High Channel TX

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	102.05	10.41	112.46	74.00	38.46	peak			
2		2483.500	38.69	10.41	49.10	74.00	-24.90	peak			
3		2494.756	39.41	10.42	49.83	74.00	-24.17	peak			

Page 54 of 74

## TEST PLOT OF BAND EDGE FOR HIGH CHANNEL (1Mbps)-Vertical



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

EUT:Bluetooth Headset Distance:

M/N:ET-A1

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	101.82	10.41	112.23	74.00	38.23	peak			
2		2483.500	38.76	10.41	49.17	74.00	-24.83	peak			
3		2491.970	38.59	10.42	49.01	74.00	-24.99	peak			

## **RESULT: PASS**

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

- 2. The "Factor" value can be calculated automatically by software of measurement system.
- 3. Hopping off and Hopping on have been tested and only worst case recorded

Page 55 of 74

## 12. NUMBER OF HOPPING FREQUENCY

#### 12.1. MEASUREMENT PROCEDURE

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum analyzer.
- 3. Set the spectrum analyzer Start = 2.4GHz Stop = 2.4835GHz
- 4. Set the Spectrum Analyzer as RBW>=1%span, VBW>=RBW.

# 12.2. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)

Same as described in section 8.2

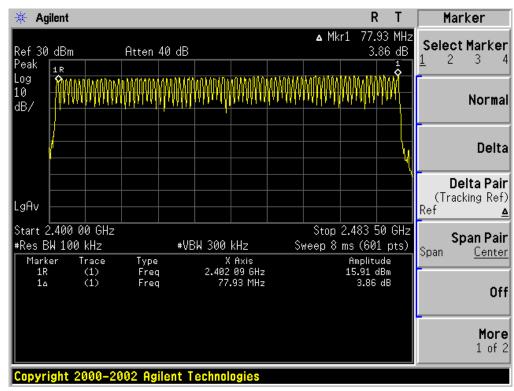
#### 12.3. MEASUREMENT EQUIPMENT USED

The same as described in section 6

#### 12.4. LIMITS AND MEASUREMENT RESULT

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

### TEST PLOT FOR NO. OF TOTAL CHANNELS



Page 56 of 74

# 13. TIME OF OCCUPANCY (DWELL TIME)

#### 13.1. MEASUREMENT PROCEDURE

- 1. Place the EUT on the table and set it in transmitting mode
- 2. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum analyzer.
- 3. Set Span = zero span, centered on a hoping channel
- 4. Set the spectrum analyzer as RBW=1MHz, VBW>=RBW, Span = 0 Hz

# 13.2. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)

Same as described in section 8.2

#### 13.3. MEASUREMENT EQUIPMENT USED

The same as described in section 6

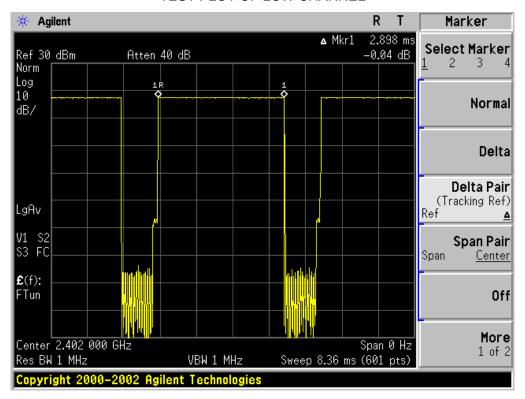
#### 13.4. LIMITS AND MEASUREMENT RESULT

## The Worst Case (3Mbps)

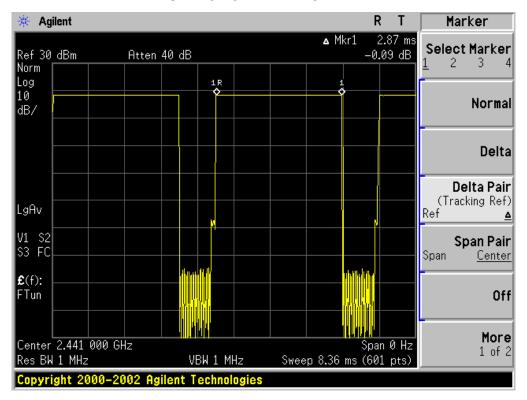
Channel	Time of Pulse for DH5 (ms)	Period Time (s)	Sweep Time (ms)	Limit (ms)
Low	2.898	31.6	309.12	400
Middle	2.870	31.6	306.13	400
High	2.898	31.6	309.12	400

Low Channel Time 2.898\*(1600/6)/79\*31.6=309.12ms Middle Channel Time 2.870\*(1600/6)/79\*31.6=306.13ms High Channel Time 2.898\*(1600/6)/79\*31.6=309.12ms

#### TEST PLOT OF LOW CHANNEL

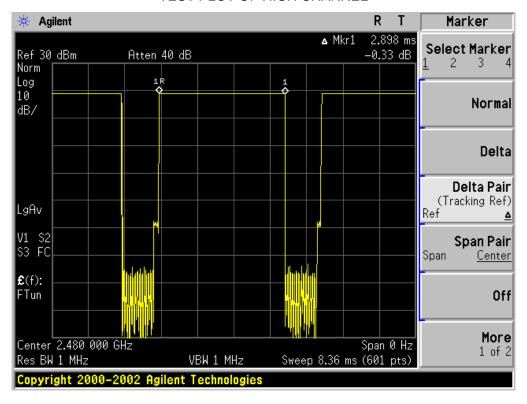


#### TEST PLOT OF MIDDLE CHANNEL



Page 58 of 74

#### TEST PLOT OF HIGH CHANNEL



Page 59 of 74

## 14. FREQUENCY SEPARATION

## 14.1. MEASUREMENT PROCEDURE

- 1. Place the EUT on the table and set it in transmitting mode
- 2. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum analyzer
- Set Span = wide enough to capture the peaks of two adjacent channels Resolution (or IF) Bandwidth
  (RBW) ≥ 1% of the span Video (or Average) Bandwidth (VBW) ≥ RBW; Sweep = auto; Detector function =
  peak; Trace = max hold

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

Same as described in section 6.2

## 14.3. MEASUREMENT EQUIPMENT USED

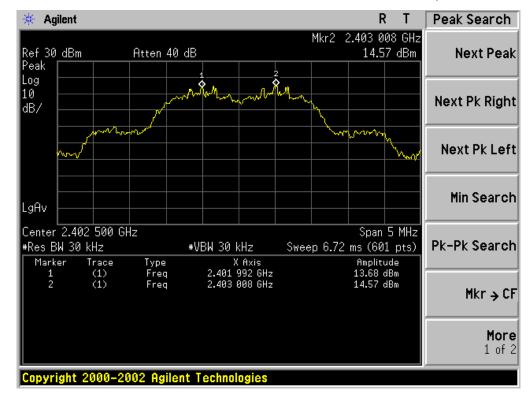
The same as described in section 6.3

## 14.4. LIMITS AND MEASUREMENT RESULT

CHANNEL	CHANNEL SEPARATION	LIMIT	RESULT
	KHz	KHz	Daga
CH00-CH01	1016	>=25 KHz or 2/3 20 dB BW	Pass

Page 60 of 74

## TEST PLOT FOR FREQUENCY SEPARATION (3Mbps)



Page 61 of 74

## 15. FCC LINE CONDUCTED EMISSION TEST

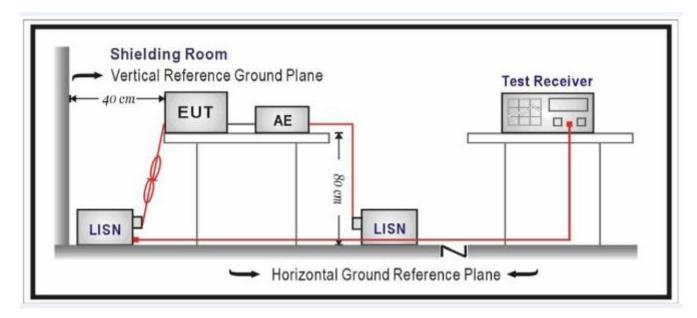
## 15.1. LIMITS OF LINE CONDUCTED EMISSION TEST

Framuenau	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.

## 15.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



Page 62 of 74

#### 15.3. 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 PC or by adapter 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.

## 15.4. 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: 53.7 %

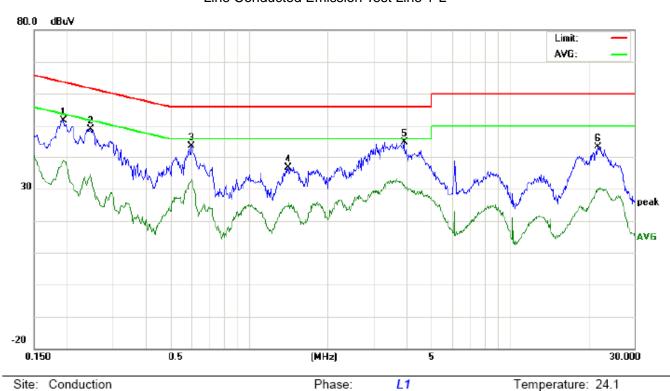
Page 63 of 74

## 15.5. 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 Headset

M/N:ET-A1

Mode:BT Link with charging

Note:

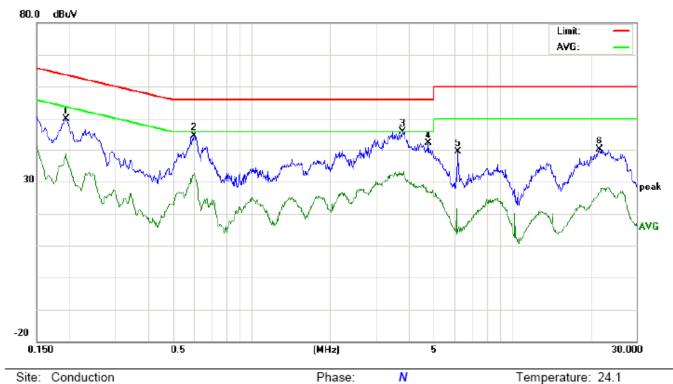
No.	Freq.		ding_L (dBuV)		Correct Factor		asuren (dBuV)		ı	nit uV)	Mai (d	rgin IB)	P/F	Comment
	(MHz)	Peak	QP	AVG	dB	Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1945	41.43		28.49	10.21	51.64		38.70	63.84	53.84	-12.20	-15.14	Р	
2	0.2467	38.59		23.70	10.27	48.86		33.97	61.86	51.86	-13.00	-17.89	Р	
3	0.6018	33.43		22.64	10.31	43.74		32.95	56.00	46.00	-12.26	-13.05	Р	
4	1.4135	26.24		14.37	10.38	36.62		24.75	56.00	46.00	-19.38	-21.25	Р	
5	3.9260	34.49		20.72	10.44	44.93		31.16	56.00	46.00	-11.07	-14.84	Р	
6	21.7540	33.16		20.01	10.12	43.28		30.13	60.00	50.00	-16.72	-19.87	Р	

Power:

Humidity: 53.7 %

Page 64 of 74

## Line Conducted Emission Test Line 2-N



Site: Conduction

Limit: FCC Class B Conduction(QP)

EUT:Bluetooth Headset

M/N:ET-A1

Mode:BT Link with charging

Note:

No.	Freq.	Rea	ding_L (dBuV)		Correct Factor	1	asuren (dBuV)			nit uV)	Mai (d	rgin IB)	P/F	Comment
	(MHz)	Peak	QP	AVG	dB	Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1940	39.56		28.36	10.21	49.77		38.57	63.86	53.86	-14.09	-15.29	Р	
2	0.6018	34.43		22.23	10.31	44.74		32.54	56.00	46.00	-11.26	-13.46	Р	
3	3.8100	35.35		21.61	10.46	45.81		32.07	56.00	46.00	-10.19	-13.93	Р	
4	4.7819	31.79		16.71	10.23	42.02		26.94	56.00	46.00	-13.98	-19.06	Р	
5	6.2019	29.09		4.10	10.29	39.38		14.39	60.00	50.00	-20.62	-35.61	Р	
6	21.6660	30.08		16.39	10.12	40.20		26.51	60.00	50.00	-19.80	-23.49	Р	

Power:

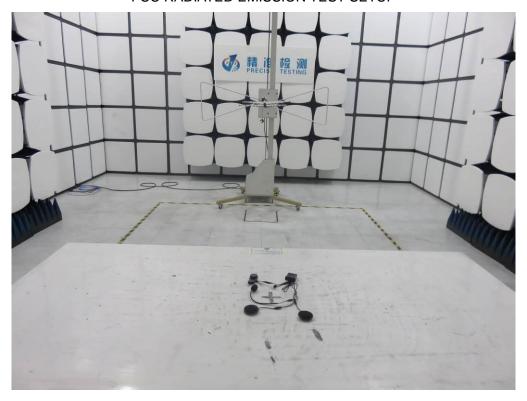
Page 65 of 74

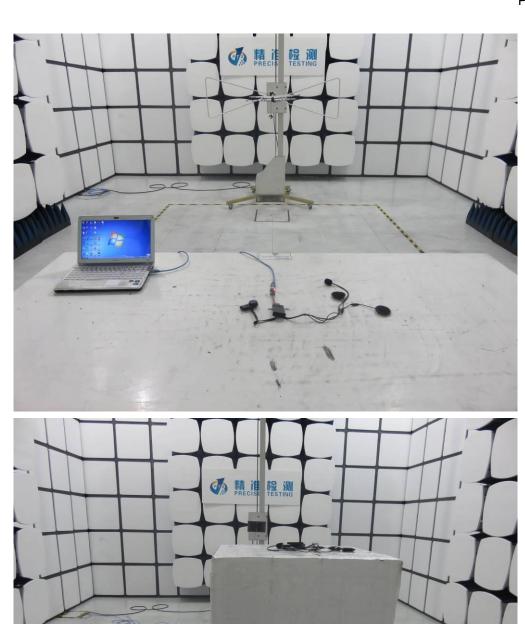
# **APPENDIX A: PHOTOGRAPHS OF TEST SETUP**

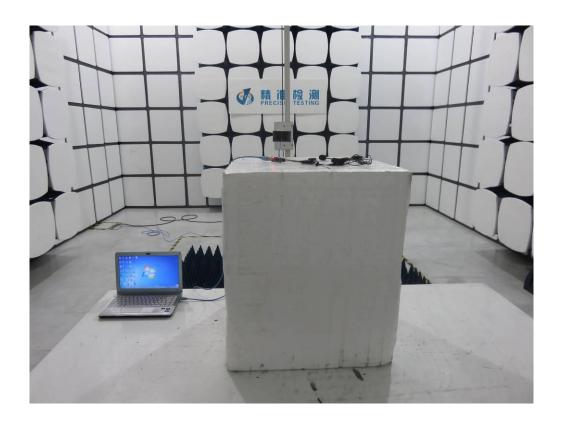
FCC LINE CONDUCTED EMISSION TEST SETUP



FCC RADIATED EMISSION TEST SETUP







Page 68 of 74

# **APPENDIX B: PHOTOGRAPHS OF EUT**

TOP VIEW OF EUT



**BOTTOM VIEW OF EUT** 



FRONT VIEW OF EUT



**BACK VIEW OF EUT** 



Report No.: AGC07627160801FE04 Page 70 of 74

# LEFT VIEW OF EUT



**RIGHT VIEW OF EUT** 

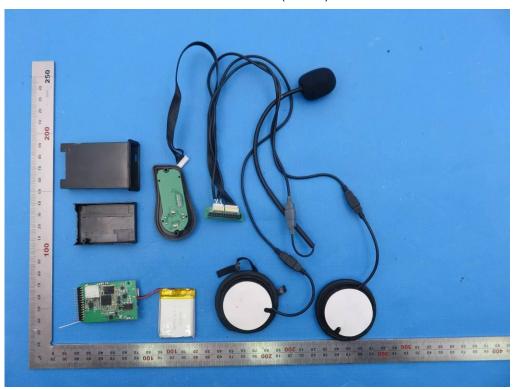


Report No.: AGC07627160801FE04 Page 71 of 74

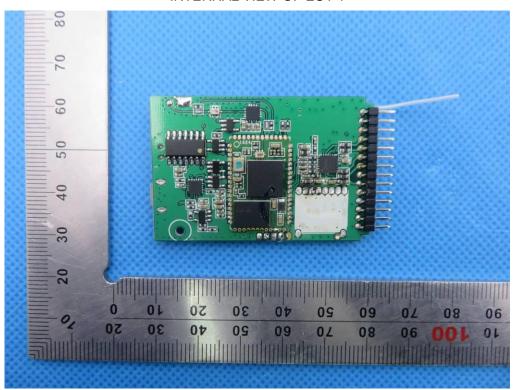
# VIEW OF EUT (PORT)



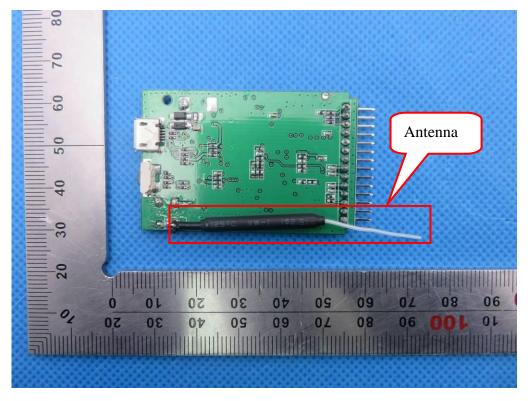
VIEW OF EUT (OPEN)



**INTERNAL VIEW OF EUT-1** 

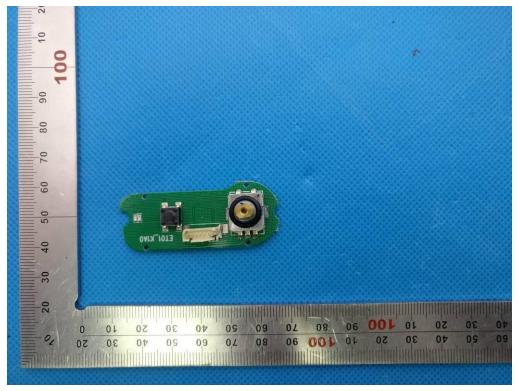


**INTERNAL VIEW OF EUT-2** 

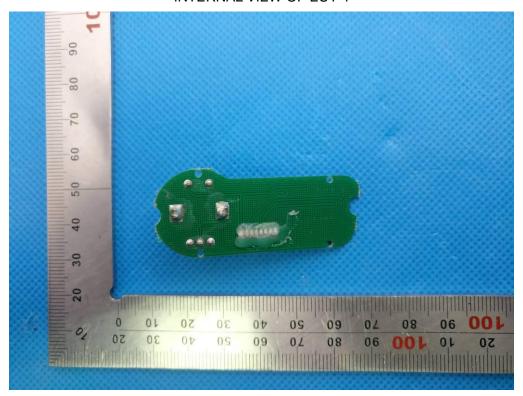


Report No.: AGC07627160801FE04 Page 73 of 74

**INTERNAL VIEW OF EUT-3** 



**INTERNAL VIEW OF EUT-4** 



# **INTERNAL VIEW OF EUT-5**



VIEW OF ADAPTER(AE)



The adapter was supplied by AGC

----END OF REPORT----