FCC Test Report

Report No.: AGC04303160601FE03

FCC ID	: 2ACP4-BT250
APPLICATION PURPOSE	: Original Equipment
PRODUCT DESIGNATION	: Bluetooth Headset
BRAND NAME	: SENTRY
MODEL NAME	: BT250
CLIENT	: Sentry Industries limited
DATE OF ISSUE	: Jun.16, 2016
STANDARD(S) TEST PROCEDURE(S)	: FCC Part 15 Rules
REPORT VERSION	: V1.0



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Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Jun.16, 2016	Valid	Original Report

Report Revise Record

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Applicant	Sentry Industries limited	
Address	507 Houston Centre, 63 Mody Road,TST, HongKong	
Manufacturer	Guangdong SAIYO Electronics Industry Co., Ltd.	
Address	Xibian Industry Zone, Tongyu Town, Chaoyang District, Shantou City, Guangdong Province, China	
Product Designation	Bluetooth Headset	
Brand Name	SENTRY	
Test Model	BT250	
Date of test	May 30, 2016 to Jun.01, 2016	
Deviation	None	
Condition of Test Sample	Normal	
Report Template	AGCRT-US-BR/RF	

1. VERIFICATION OF CONFORMITY

We hereby certify that:

The above equipment was tested by Dongguan Precise Testing Service Co., Ltd. The test data, the energy emitted by the sample tested as described in this report is in compliance with the requirements of FCC Rules Part 15.249.

Trime Unang Tested By Jun.16, 2016 Time Huang(Huang Nanhui) most in **Reviewed By** Forrest Lei(Lei Yonggang) Jun.16, 2016 Saya 2 Approved By Solger Zhang(Zhang Hongyi) Jun.16, 2016 Authorized Officer

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	0.53dBm(Max EIRP Power=Max radiation field-95.2)	
Bluetooth Version	V3.0	
Modulation	GFSK ,π /4-DQPSK, 8DPSK	
Number of channels	79 for BR/EDR	
Hardware Version	V1.1	
Software Version	V1.1	
Antenna Designation	PCB Antenna (Met 15.203 Antenna requirement)	
Antenna Gain	0dBi	
Power Supply	DC 3.7V	
Note: 1. The USB port only used for charging and can't be used to transfer data with PC.		
2. The EUT is not active when charging.		

2.2. TABLE OF CARRIER FREQUENCYS

BR/EDR channel List

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

3. MEASUREMENT UNCERTAINTY

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

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

4. DESCRIPTION OF TEST MODES

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

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.

Softwa	re Setting
💑 AppoTech RF Control Kit V4.0	
IC Model CW66xx COM Port Info Port: COM1 Rate: 921600	Specification FIX RX mode (1)check FIX_RX_24xx (2)check channel to set channel number FIX IX mode (1)uncheck FIX_RX_24xx (2)check channel to set channel number (3)check power to set IX signal amplitude (4)Modulation Enable OFF
DUT MODE FCC Mode RF Trim Fix_RX_24xx SingleTone Hopping: OFF Channel 41 (2-30) Tx Modulation: ON	TX (1)uncheck FIX_RX_24xx Modulation (2)check channel to set channel number (3)check power to set TX signal amplitud (4)Modulation Enable ON (5)select Packet Type
✓ Channel 41 (2-80) Tx Modulation: ON ▼ ✓ Power 6 (0-7) Packet Type: 3DH5 ▼ Test scenario 3 Transmitter test - 1010 pattern ▼ RF R12 ▼ 60BD Write Read	Hopping (1) uncheck FIX_RX_24xx (2) uncheck channel to enable Hopping ON and TX Modulation OFF (3) check power (4) select Packet Type Address 0206 Val 04 Write_xSFR Read_xSFR
01 19 FC 40 FC 40 B2 41 04 06 A0 40 00 81 00 00 80 0 04 0E 04 01 19 FC 00 01 08 FC 00 01 08 FC 03 04 02 03 00 00 80 0 04 0E 04 01 19 FC 00 00 00 00 80 0 04 0E 04 01 08 FC 00	Image: Enable Patch 1 Image: Enable Patch 2 0000845 000000F 048280 0482AE 048040 048073
04 0E 07 01 09 FC 00 0C BD 60	S
Show HCI Clear Save Read MROM	Ser

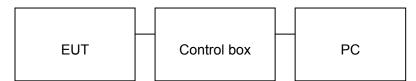
5. SYSTEM TEST CONFIGURATION

5.1. CONFIGURATION OF EUT SYSTEM

Configure 1: (Normal hopping)

EUT

Configure 2: (Control continuous TX)



5.2. EQUIPMENT USED IN EUT SYSTEM

Item	Equipment	Mfr/Brand	Model/Type No.	Remark
1	Bluetooth Headset	SENTRY	BT250	EUT
2	Battery	XKD	350926	Accessory
3	PC	Sony	E1412AYCW	A.E
4	Control box	JR	N/A	A.E

5.3. SUMMARY OF TEST RESULTS

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

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

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 C63.10:2013.

TEST METHODOLOGY

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

7. ALL TEST EQUIPMENT LIST

FOR RADIATED EMISSION TEST (BELOW 1GHZ)

	Radiat	ted Emission Tes	st Site		
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
EMI Test Receiver	Rohde & Schwarz ESCI 1		101417	July 4, 2015	July 3, 2016
Trilog Broadband Antenna (25M-1GHz)	SCHWARZBECK	VULB9160	9160-3355	July 4, 2015	July 3, 2016
Signal Amplifier	SCHWARZBECK	BBV 9475	9745-0013	July 4, 2015	July 3, 2016
RF Cable	SCHWARZBECK	AK9515E	96221	July 4, 2015	July 3, 2016
3m Anechoic Chamber	CHENGYU	966	PTS-001	June 6, 2015	June 5, 2016
MULTI-DEVICE Positioning Controller	Max-Full	MF-7802	MF780208339	N/A	N/A
Active loop antenna (9K-30MHz)	Schwarzbeck	FMZB1519	1519-038	June 6, 2015	June 5, 2016
Spectrum analyzer	Agilent	E4407B	MY46185649	June 6, 2015	June 5, 2016
Radiation Cable 1	MXT	RS1	R005	June 6, 2015	June 5, 2016
Radiation Cable 2	MXT	RS1	R006	June 6, 2015	June 5, 2016
temporary antenna connector	N/A	S100		June 4, 2015	June 3, 2016

	, , , , , , , , , , , , , , , , , , ,	ted Emission Tes	st Site		
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration
EMI Test Receiver	Rohde & Schwarz	ESCI	101417	July 4, 2015	July 3, 2016
Horn Antenna (1G-18GHz)	SCHWARZBECK	BBHA9120D	9120D-1246	July 11, 2015	July 10, 2016
Spectrum Analyzer	Agilent	E4411B	MY4511453	July 4, 2015	July 3, 2016
Signal Amplifier	SCHWARZBECK	BBV 9718	9718-269	July 7, 2015	July 6, 2016
RF Cable	SCHWARZBECK	AK9515H	96220	July 8, 2015	July 7, 2016
3m Anechoic Chamber	CHENGYU	966	PTS-001	June 6, 2015	June 5, 2016
MULTI-DEVICE Positioning Controller	Max-Full	MF-7802	MF780208339	N/A	N/A
Horn Ant (18G-40GHz)	Schwarzbeck	BBHA 9170	9170-181	June 6, 2015	June 5, 2016
Radiation Cable 1	MXT	RS1	R005	June 6, 2015	June 5, 2016
Radiation Cable 2	MXT	RS1	R006	June 6, 2015	June 5, 2016

FOR RADIATED EMISSION TEST (1GHZ ABOVE)

8. RADIATED EMISSION

8.1TEST LIMIT

Standard FCC15.249

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

Standard FCC 15.209

Frequency	Distance	Field Stren	ngths Limit					
(MHz)	Meters	μ V/m	dB(µV)/m					
0.009 ~ 0.490	300	2400/F(kHz)						
0.490 ~ 1.705	30	24000/F(kHz)						
1.705 ~ 30	30	30						
30 ~ 88	3	100	40.0					
88 ~ 216	3	150	43.5					
216 ~ 960	3	200	46.0					
960 ~ 1000	3	500	54.0					
Above 1000	3	Other:74.0 dB(µV)/m (Peal	<) 54.0 dB(μV)/m (Average)					
Remark: (1) Emission le	evel dB μ V = 20 log Emissio	n level µV/m						
(2) The smalle	er limit shall apply at the cros	s point between two frequen	cy bands.					
(3) Distance is the distance in meters between the measuring instrument, antenna and the clos								

point of any part of the device or system.

8.2. MEASUREMENT PROCEDURE

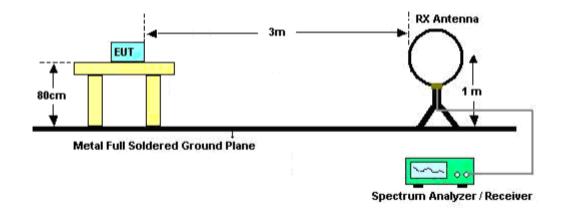
- The measuring distance of 3m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation(below 1GHz)
- 2. The measuring distance 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)

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

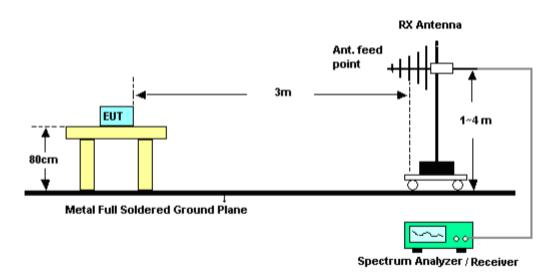
The following table is the setting of spectrum analyzer and receiver.

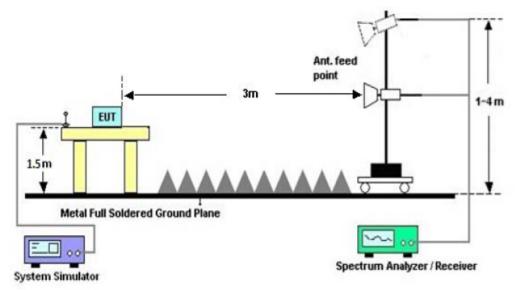
8.3. TEST SETUP

Radiated Emission Test-Setup Frequency Below 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz





RADIATED EMISSION TEST SETUP ABOVE 1000MHz

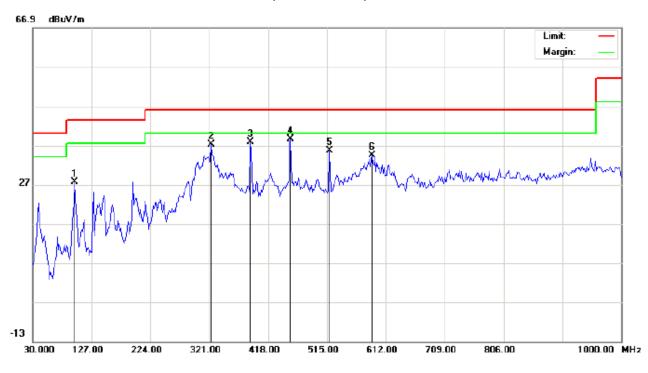
8.4. TEST RESULT (Worst modulation: GFSK) FOR BR/EDR

RADIATED EMISSION BELOW 30MHZ

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

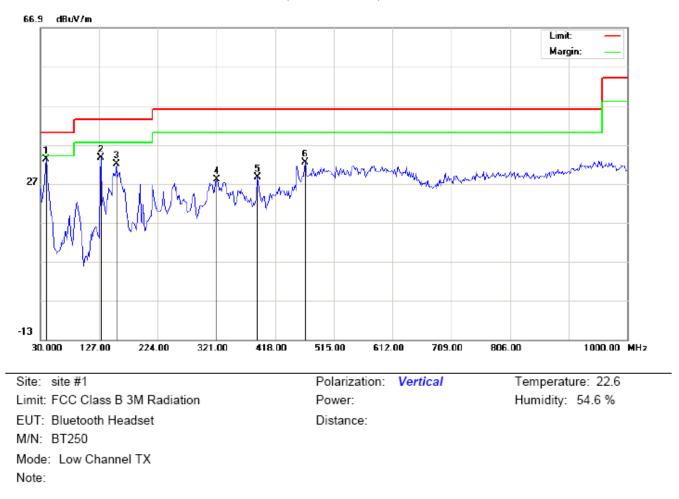
RADIATED EMISSION BELOW 1GHZ

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



Site: site #1Polarization: HorizontalTemperature: 22.6Limit: FCC Class B 3M RadiationPower:Humidity: 54.6 %EUT: Bluetooth HeadsetDistance:M/N: BT250Mode: Low Channel TXNote:Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	-	MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		99.5167	17.67	10.00	27.67	43.50	-15.83	peak			
2		324.2333	20.19	17.02	37.21	46.00	-8.79	peak			
3		388.9000	18.86	19.00	37.86	46.00	-8.14	peak			
4	*	455.1833	17.91	20.65	38.56	46.00	-7.44	peak			
5		519.8500	13.88	21.67	35.55	46.00	-10.45	peak			
6		589.3667	10.89	23.46	34.35	46.00	-11.65	peak			



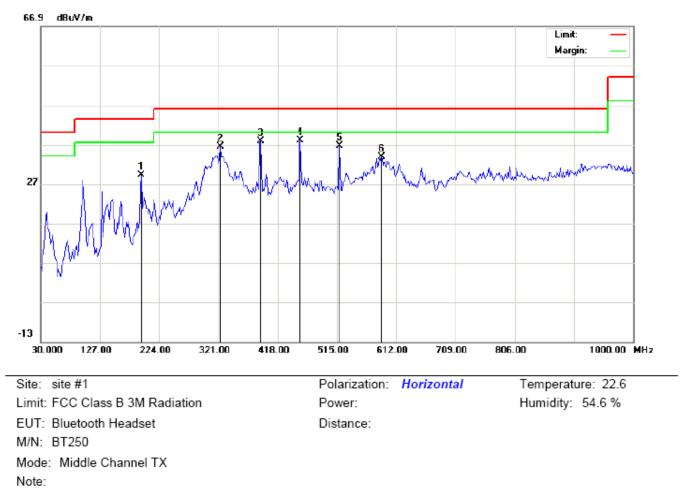
RADIATED EMISSION TEST- (30MHZ-1GHZ)-LOW CHANNEL -VERTICAL

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	•	MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	39.7000	24.79	8.51	33.30	40.00	-6.70	peak			
2		130.2332	22.41	11.13	33.54	43.50	-9.96	peak			
3		156.1000	16.78	15.30	32.08	43.50	-11.42	peak			
4		321.0000	11.29	16.81	28.10	46.00	-17.90	peak			
5		388.9000	9.57	19.00	28.57	46.00	-17.43	peak			
6		468.1167	11.58	20.79	32.37	46.00	-13.63	peak			

RESULT: PASS

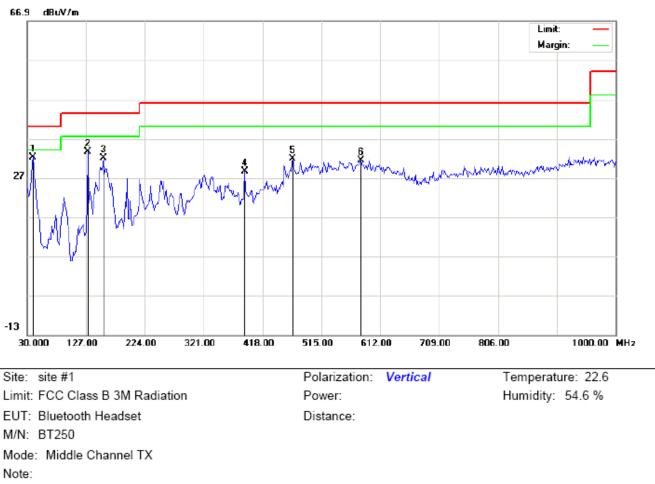
Note: 1. Factor=Antenna Factor + Cable loss, Margin=Measurement-Limit.

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



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	dBuV/m	dBuV/m	dB		cm	degree	
1		194.9000	17.49	11.76	29.25	43.50	-14.25	peak			
2		324.2333	19.37	17.02	36.39	46.00	-9.61	peak			
3		390.5167	18.73	19.01	37.74	46.00	-8.26	peak			
4	*	455.1833	17.37	20.65	38.02	46.00	-7.98	peak			
5		519.8500	15.02	21.67	36.69	46.00	-9.31	peak			
6		587.7500	10.44	23.42	33.86	46.00	-12.14	peak			

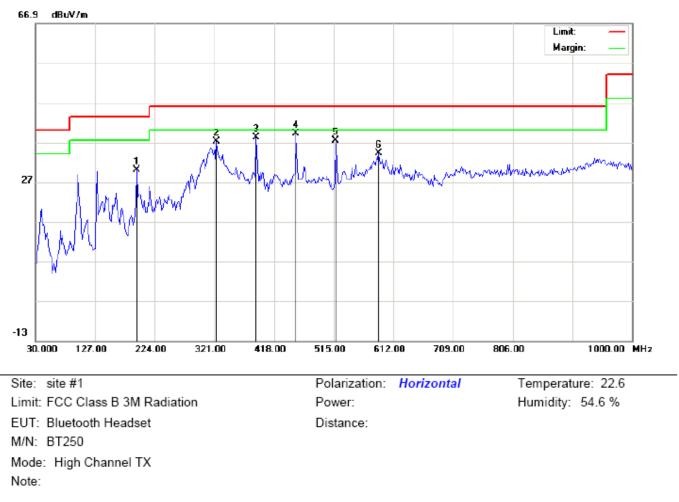


No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	•	MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	39.7000	23.70	8.51	32.21	40.00	-7.79	peak			
2		130.2332	22.41	11.13	33.54	43.50	-9.96	peak			
3		156.1000	16.78	15.30	32.08	43.50	-11.42	peak			
4		388.9000	9.57	19.00	28.57	46.00	-17.43	peak			
5		468.1167	11.03	20.79	31.82	46.00	-14.18	peak			
6		579.6667	8.74	22.63	31.37	46.00	-14.63	peak			

RESULT: PASS

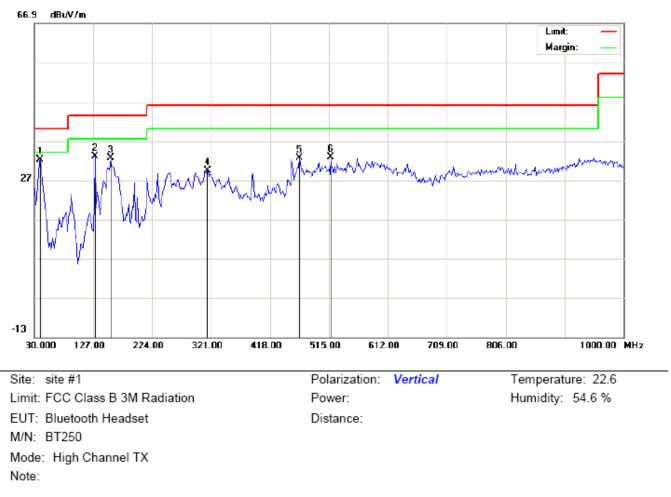
Note: 1. Factor=Antenna Factor + Cable loss, Margin=Measurement-Limit.

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



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	dBuV/m	dB		cm	degree	
1		194.9000	18.34	11.76	30.10	43.50	-13.40	peak			
2		324.2333	20.19	17.02	37.21	46.00	-8.79	peak			
3		388.9000	19.11	19.00	38.11	46.00	-7.89	peak			
4	*	453.5667	18.53	20.63	39.16	46.00	-6.84	peak			
5		518.2333	15.71	21.62	37.33	46.00	-8.67	peak			
6		587.7500	10.76	23.42	34.18	46.00	-11.82	peak			



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	dBuV/m	dB		cm	degree	
1	*	39.7000	23.79	8.51	32.30	40.00	-7.70	peak			
2		130.2332	21.94	11.13	33.07	43.50	-10.43	peak			
3		156.1000	17.34	15.30	32.64	43.50	-10.86	peak			
4		314.5333	13.02	16.38	29.40	46.00	-16.60	peak			
5		466.5000	11.92	20.77	32.69	46.00	-13.31	peak			
6		518.2333	11.13	21.62	32.75	46.00	-13.25	peak			

RESULT: PASS

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

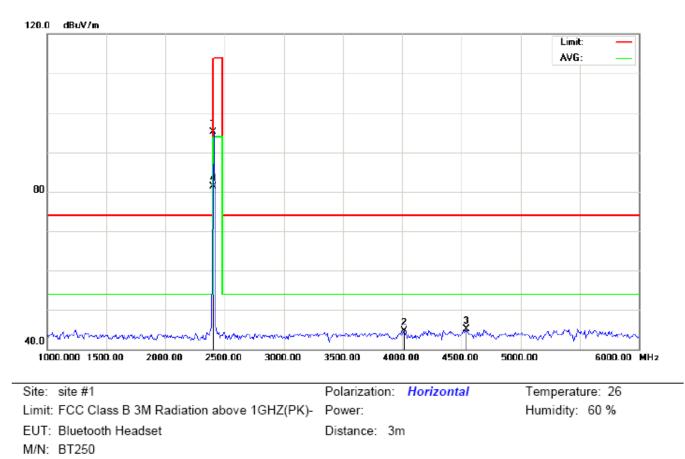
2. The "Factor" value can be calculated automatically by software of measurement system.

RADIATED EMISSION ABOVE 1GHZ

(Worst modulation: GFSK)

FOR BR/EDR

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

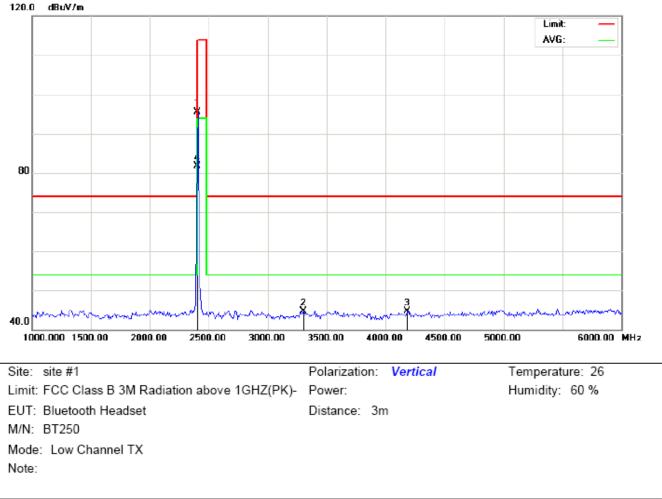


No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	-	MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		2402.000	104.77	-9.68	95.09	114.00	-18.91	peak			
2		4016.667	49.53	-4.75	44.78	74.00	-29.22	peak			
3		4541.667	48.10	-3.00	45.10	74.00	-28.90	peak			
4	*	2402.000	91.05	-9.68	81.37	94.00	-12.63	AVG	100	114	

RESULT: PASS

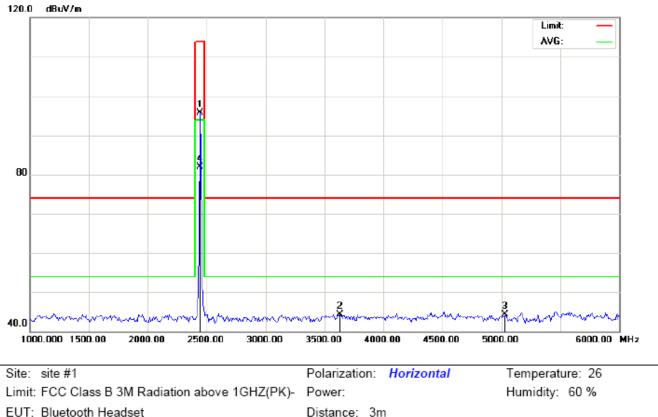
Note:

Mode: Low Channel TX



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 dB	dBuV/m	dBuV/m	dB		cm	degree	
1		2402.000	105.20	-9.68	95.52	114.00	-18.48	peak			
2		3300.000	52.85	-8.08	44.77	74.00	-29.23	peak			
3		4183.333	48.85	-4.19	44.66	74.00	-29.34	peak			
4	*	2402.000	91.33	-9.68	81.65	94.00	-12.35	AVG	100	330	

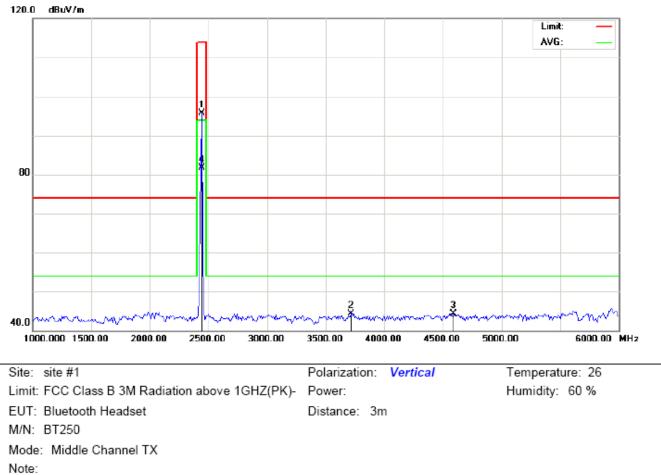


RADIATED EMISSION TEST- (ABOVE 1GHZ)-MIDDLE CHANNEL-HORIZONTAL

M/N: BT250 Mode: Middle Channel TX Note:

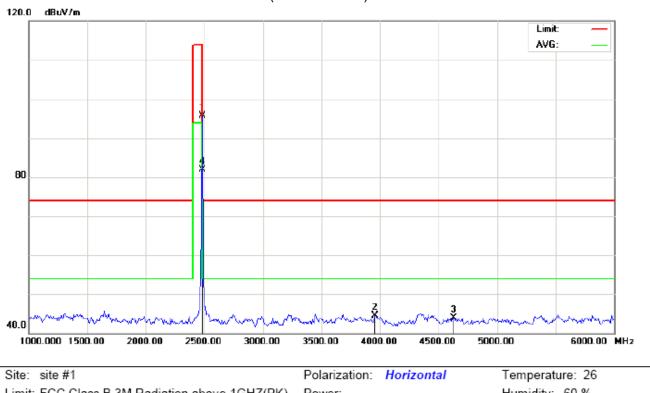
Distance: 3m

Antenna Table Reading Measurement Limit Freq. Factor Over Mk Height Degree Detector No. Comment dBu∨ dBu\//m MHz dB/m dBuV/m dB cm degree 2441.000 105.30 95.67 114.00 -18.33 1 -9.63 peak peak 2 3633.333 51.28 -7.07 44.21 74.00 -29.79 3 5033.333 46.09 -1.80 44.29 74.00 -29.71 peak -9.63 AVG 100 4 2441.000 91.47 81.84 94.00 -12.16 117



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	dBuV/m	dB		cm	degree	
1		2441.000	105.24	-9.63	95.61	114.00	-18.39	peak			
2		3716.667	50.96	-6.56	44.40	74.00	-29.60	peak			
3		4591.667	47.17	-2.87	44.30	74.00	-29.70	peak			
4	*	2441.000	91.42	-9.63	81.79	94.00	-12.21	AVG	100	327	



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

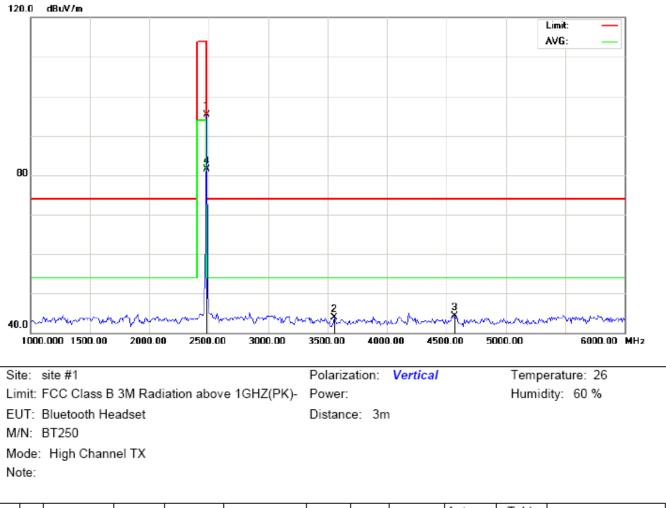
 Site:
 site #1
 Polarization:
 Horizontal
 Temperature:
 26

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

 EUT:
 Bluetooth Headset
 Distance:
 3m

 M/N:
 BT250
 High Channel TX
 Vote:

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		2480.000	105.32	-9.59	95.73	114.00	-18.27	peak			
2		3958.333	49.49	-5.07	44.42	74.00	-29.58	peak			
3		4633.333	46.73	-2.76	43.97	74.00	-30.03	peak			
4	*	2480.000	91.51	-9.59	81.92	94.00	-12.08	AVG	100	112	



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

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height		Comment
	-	MHz	dBu∨	dB/m	dBu\//m	dBuV/m	dB		cm	degree	
1		2480.000	104.92	-9.59	95.33	114.00	-18.67	peak			
2		3558.333	51.43	-7.53	43.90	74.00	-30.10	peak			
3		4566.667	47.28	-2.94	44.34	74.00	-29.66	peak			
4	*	2480.000	91.11	-9.59	81.52	94.00	-12.48	AVG	100	331	

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.

Field strength of the fundamental signal

1Mbps Result:

Peak value

Frequency	Reading Level	Factor	Measurement	Limit	Over	Antenna
(MHz)	(dBuv)	(dB/m)	(dBuv/m)	(dBuv/m)	(dB)	Polarization
2402	104.77	-9.68	95.09	114.00	-18.91	Horizontal
2402	105.20	-9.68	95.52	114.00	-18.48	Vertical
2441	105.30	-9.63	95.67	114.00	-18.33	Horizontal
2441	105.24	-9.63	95.61	114.00	-18.39	Vertical
2480	105.32	-9.59	95.73	114.00	-18.27	Horizontal
2480	104.92	-9.59	95.33	114.00	-18.67	Vertical

Average value

Frequency	Reading Level	Factor	Measurement	Limit	Over	Antenna	
(MHz)	(MHz) (dBuv) (dB/m)		(dBuv/m)	(dBuv/m)	(dB)	Polarization	
2402	91.05	-9.68	81.37	94.00	-12.63	Horizontal	
2402	91.33	-9.68	81.65	94.00	-12.35	Vertical	
2441	91.47	-9.63	81.84	94.00	-12.16	Horizontal	
2441	91.42	-9.63	81.79	94.00	-12.21	Vertical	
2480	91.51	-9.59	81.92	94.00	-12.08	Horizontal	
2480	2480 91.11 -9.59		81.52	94.00	-12.48	Vertical	

2Mbps Result:

Peak value

Frequency	requency Reading Factor Measurement		Limit	Over	Antenna	
(MHz)	(dBuv)	dBuv) (dB/m) (dl		(dBuv/m)	(dB)	Polarization
2402	104.81	-9.68	95.13	114.00	-18.87	Horizontal
2402	104.7	-9.68	95.02	114.00	-18.98	Vertical
2441	104.95	-9.68	95.27	114.00	-18.73	Horizontal
2441	104.83	-9.68	95.15	114.00	-18.85	Vertical
2480	105.11	-9.63	95.48	114.00	-18.52	Horizontal
2480	105.00	-9.63	95.37	114.00	-18.63	Vertical

Average value

Frequency	Reading Level	Factor Measuren		Limit	Over	Antenna	
(MHz)	z) (dBuv) (dB/m)		(dBuv/m)	(dBuv/m)	(dB)	Polarization	
2402	90.87	-9.63	81.24	94.00	-12.76	Horizontal	
2402	90.77	-9.63	81.14	94.00	-12.86	Vertical	
2441	91.12	-9.59	81.53	94.00	-12.47	Horizontal	
2441	90.94	-9.59	81.35	94.00	-12.65	Vertical	
2480	91.26	-9.59	81.67	94.00	-12.33	Horizontal	
2480	91.02	-9.59	81.43	94.00	-12.57	Vertical	

3Mbps Result:

Peak value

Frequency	Reading Level	Factor Measurement		Limit	Over	Antenna
(MHz)) (dBuv) (dB/m) (dBuv/m)		(dBuv/m)	(dB)	Polarization	
2402	104.44	-9.68	94.76	114.00	-19.24	Horizontal
2402	104.21	-9.68	94.53	114.00	-19.47	Vertical
2441	104.55	-9.68	94.87	114.00	-19.13	Horizontal
2441	104.39	-9.68	94.71	114.00	-19.29	Vertical
2480	104.66	-9.63	95.03	114.00	-18.97	Horizontal
2480	104.52	-9.63	94.89	114.00	-19.11	Vertical

Average value

Frequency	Reading Level			Limit	Over	Antenna	
(MHz)	(MHz) (dBuv) (dB/m)		(dBuv/m)	(dBuv/m)	(dB)	Polarization	
2402	90.37	-9.63	80.74	94.00	-13.26	Horizontal	
2402	90.14	-9.63	80.51	94.00	-13.49	Vertical	
2441	90.57	-9.59	80.98	94.00	-13.02	Horizontal	
2441	90.38	-9.59	80.79	94.00	-13.21	Vertical	
2480	90.69	-9.59	81.10	94.00	-12.90	Horizontal	
2480	480 90.45 -9.59		80.86	94.00	-13.14	Vertical	

9. BAND EDGE EMISSION

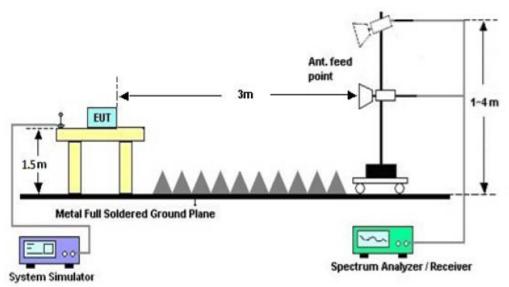
9.1. MEASUREMENT PROCEDURE

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

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

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

9.2 TEST SETUP



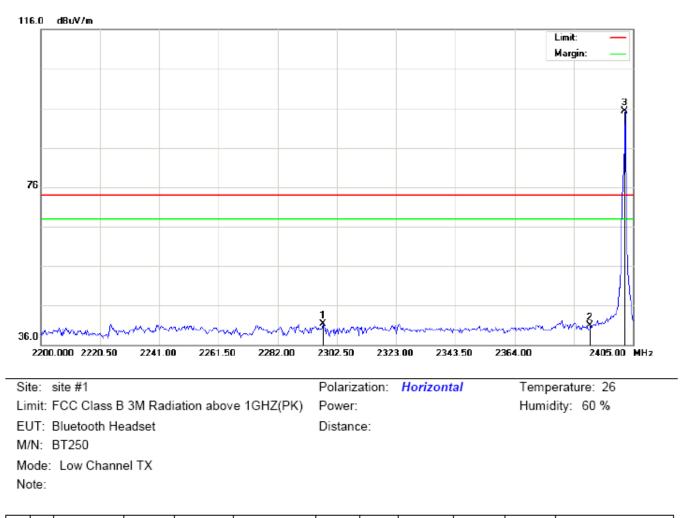
RADIATED EMISSION TEST SETUP

9.3 RADIATED TEST RESULT

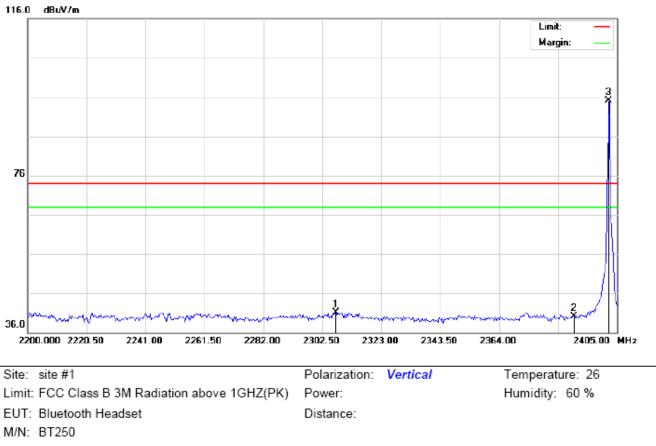
(Worst modulation: GFSK)

FOR BR/EDR

TEST PLOT OF BAND EDGE FOR LOW CHANNEL-Horizontal



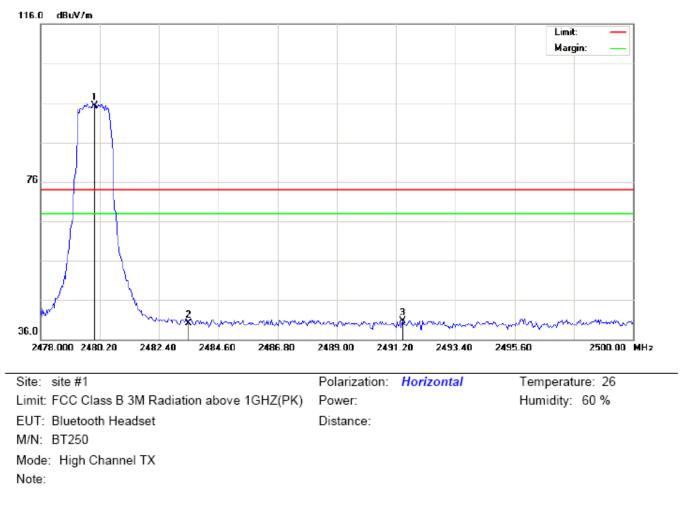
	No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	I I
		-	MHz	dBu∀	dB/m	dBuV/m	dBu∨/m	dB		cm	degree	
ſ	1		2297.717	31.02	10.21	41.23	74.00	-32.77	peak			
	2		2390.000	30.62	10.31	40.93	74.00	-33.07	peak			
	3	*	2402.000	84.91	10.32	95.23	74.00	21.23	peak			



TEST PLOT OF BAND EDGE FOR LOW CHANNEL -Vertical

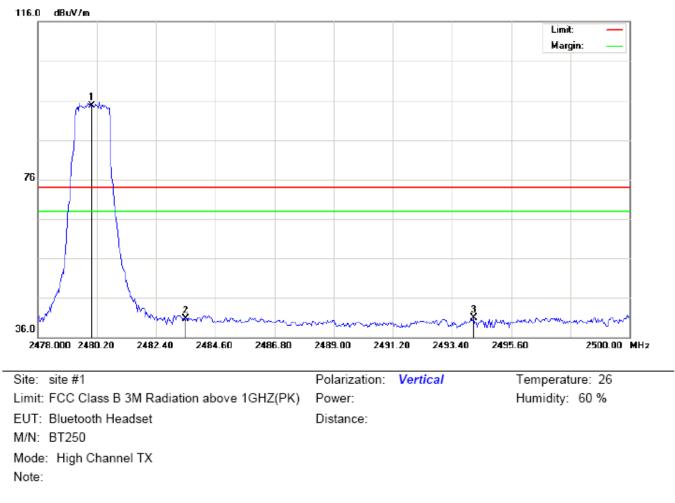
Mode: Low Channel TX Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		2307.283	30.87	10.22	41.09	74.00	-32.91	peak			
2		2390.000	29.85	10.31	40.16	74.00	-33.84	peak			
3	*	2402.000	84.76	10.32	95.08	74.00	21.08	peak			



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	dBuV/m	dBuV/m	dB		cm	degree	
1	*	2480.000	84.96	10.41	95.37	74.00	21.37	peak			
2		2483.500	29.75	10.41	40.16	74.00	-33.84	peak			
3		2491.457	30.28	10.42	40.70	74.00	-33.30	peak			



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	dBuV/m	dBuV/m	dB		cm	degree	
1	*	2480.000	84.35	10.41	94.76	74.00	20.76	peak			
2		2483.500	30.37	10.41	40.78	74.00	-33.22	peak			
3		2494.207	30.55	10.42	40.97	74.00	-33.03	peak			

RESULT: PASS

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

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

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

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

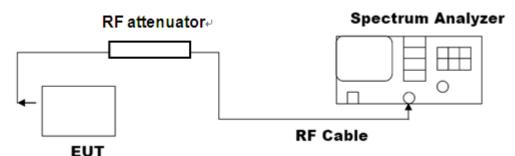
10. 20DB BANDWIDTH

10.1. MEASUREMENT PROCEDURE

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

10.2. TEST SET-UP

(BLOCK DIAGRAM OF CONFIGURATION)

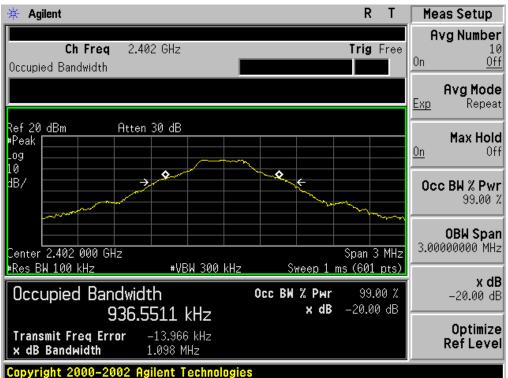


Note: The EUT has been used temporary antenna connector for testing.

10.3. LIMITS AND MEASUREMENT RESULTS

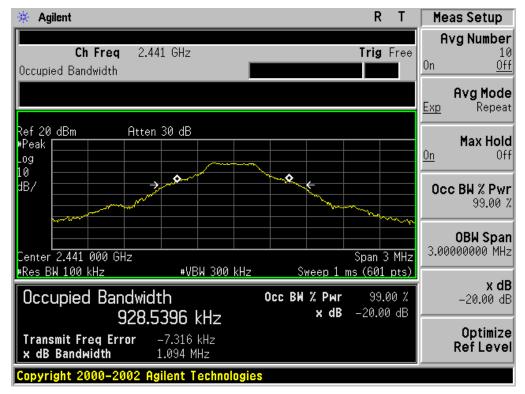
FOR BR/EDR

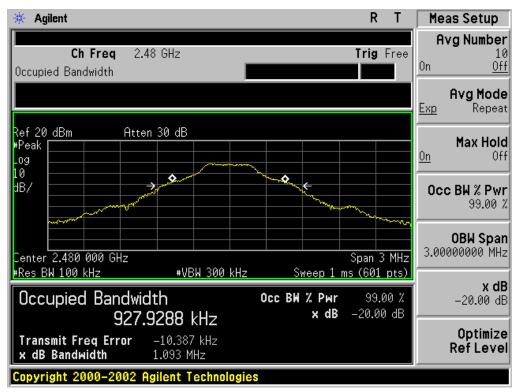
BLUETOOTH 1MBPS LIMITS AND MEASUREMENT RESULT										
	Measurement Result									
Applicable Limits		Desult								
		99%OBW (MHz)	-20dB BW(MHz)	Result						
	Low Channel	0.937	1.098	PASS						
N/A	Middle Channel	0.929	1.094	PASS						
	High Channel	0.928	1.093	PASS						



TEST PLOT OF BANDWIDTH FOR LOW CHANNEL

TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL

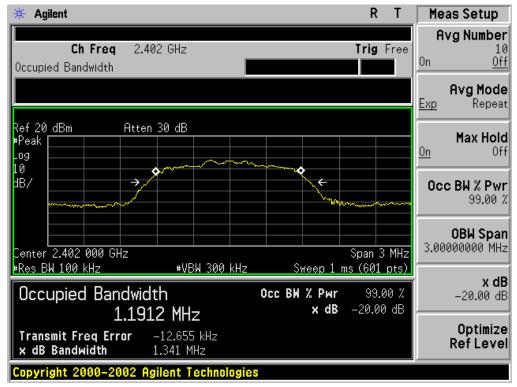


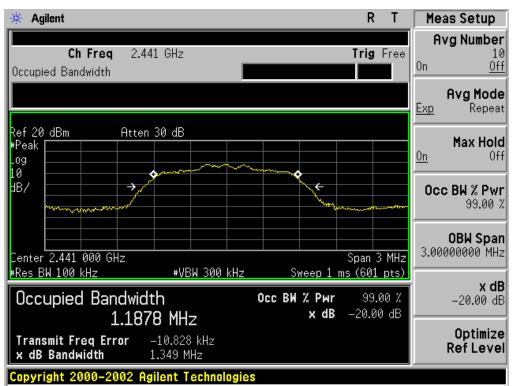


TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL

BLUETOOTH 2MBPS LIMITS AND MEASUREMENT RESULT						
	Measurement Result					
Applicable Limits	Test Data (MHz)			Decult		
		99%OBW (MHz)	-20dB BW(MHz)	Result		
N/A	Low Channel	1.191	1.341	PASS		
	Middle Channel	1.188	1.349	PASS		
	High Channel	1.181	1.353	PASS		

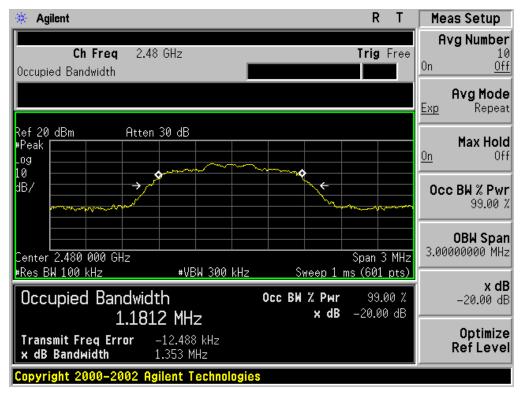
TEST PLOT OF BANDWIDTH FOR LOW CHANNEL





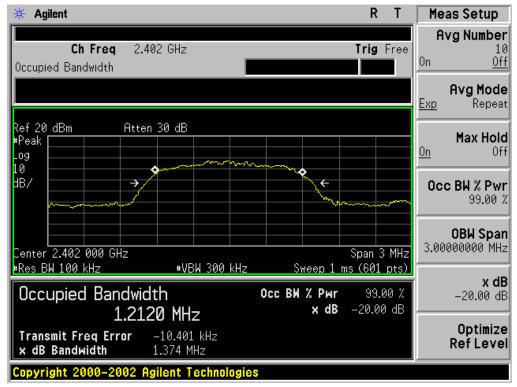
TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL

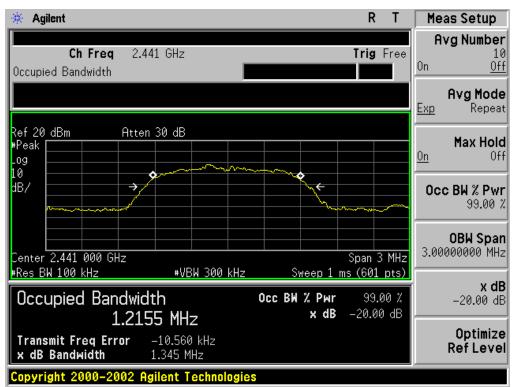
TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



BLUETOOTH 3MBPS LIMITS AND MEASUREMENT RESULT						
	Measurement Result					
Applicable Limits	Test Data (MHz)			Decult		
		99%OBW (MHz)	-20dB BW(MHz)	Result		
N/A	Low Channel	1.212	1.374	PASS		
	Middle Channel	1.216	1.345	PASS		
	High Channel	1.224	1.372	PASS		

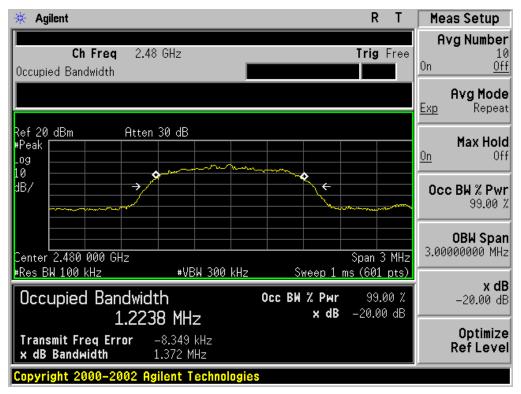
TEST PLOT OF BANDWIDTH FOR LOW CHANNEL





TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL

TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



11. FCC LINE CONDUCTED EMISSION TEST

11.1. LIMITS OF LINE CONDUCTED EMISSION TEST

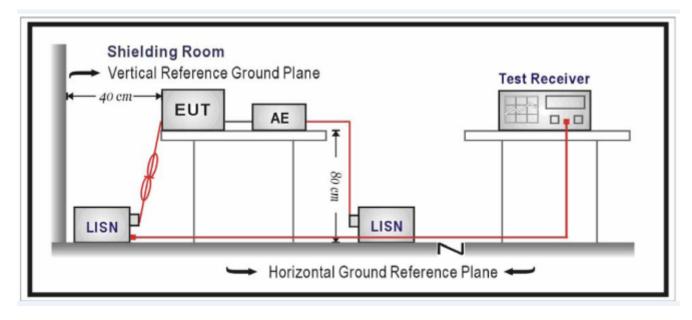
Energy and and	Maximum RF Line Voltage			
Frequency	Q.P.(dBuV)	Average(dBuV)		
150kHz~500kHz	66-56	56-46		
500kHz~5MHz	56	46		
5MHz~30MHz	60	50		

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.

11.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



11.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST

- 1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- 2. Support equipment, if needed, was placed as per ANSI C63.10.
- 3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
- 4. All support equipments received AC120V/60Hz power from a LISN, if any.
- 5. The EUT received DC charging voltage by adapter or PC which received 120V/60Hzpower by a LISN.
- 6. The test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7. Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
- 8. During the above scans, the emissions were maximized by cable manipulation.
- 9. The test mode(s) were scanned during the preliminary test.

Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

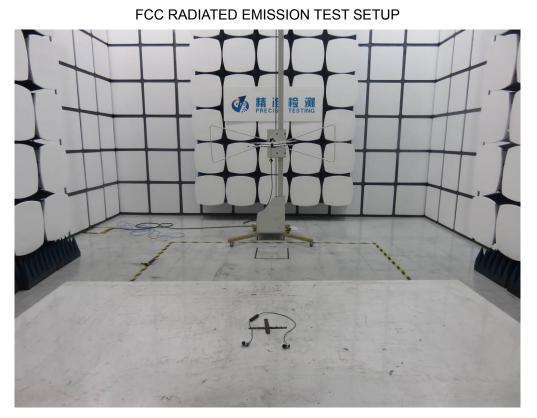
11.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

- 1. EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
- A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less –2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
- 3. The test data of the worst case condition(s) was reported on the Summary Data page.

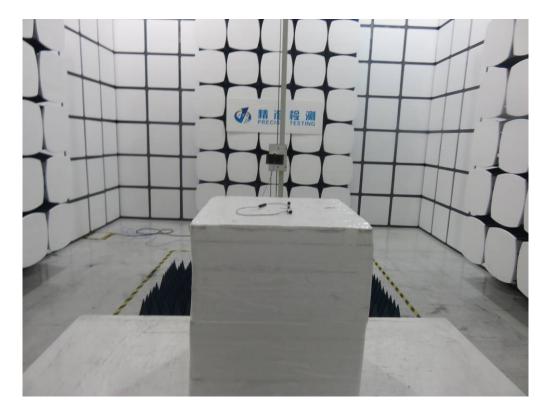
11.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

N/A

Note: Owing to the EUT is not active when charging, So the test item is not applicable.









APPENDIX B: PHOTOGRAPHS OF EUT

TOP VIEW OF EUT

BOTTOM VIEW OF EUT





FRONT VIEW OF EUT

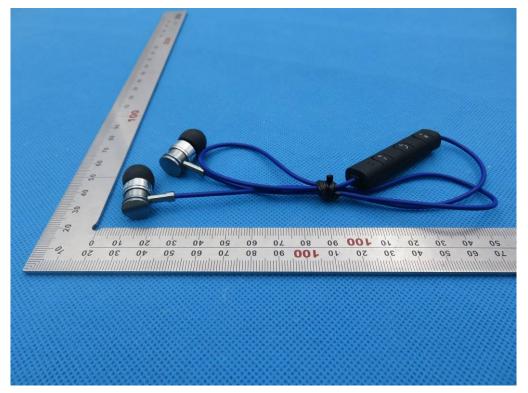
BACK VIEW OF EUT





LEFT VIEW OF EUT

RIGHT VIEW OF EUT





VIEW OF EUT (LOCAL)-1

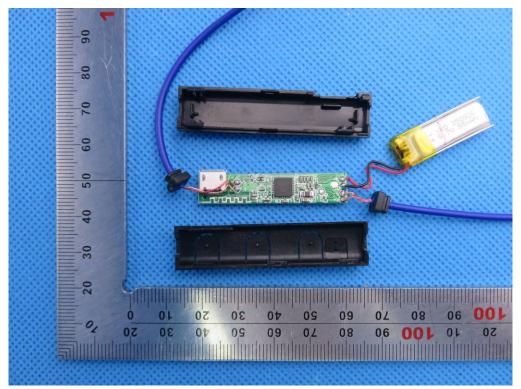
VIEW OF EUT (LOCAL)-2

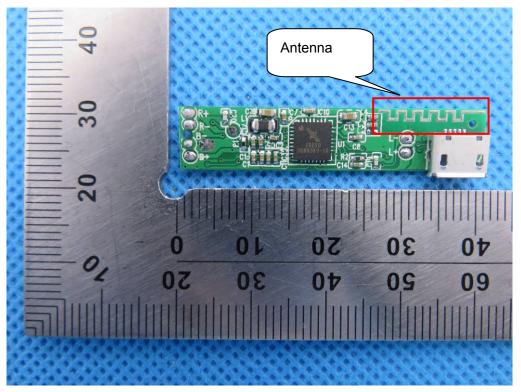




VIEW OF EUT (PORT)

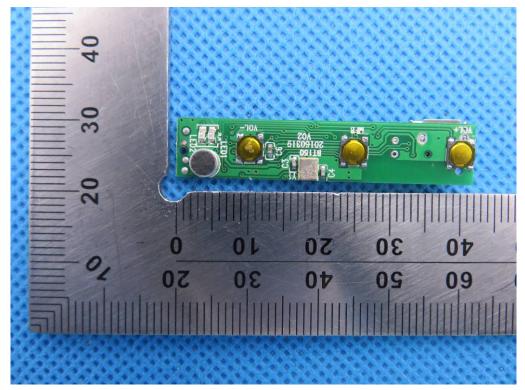
OPEN VIEW OF EUT



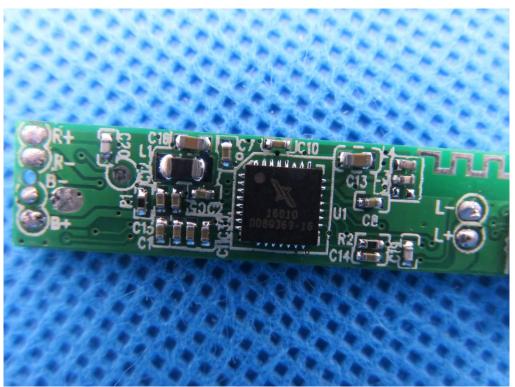


INTERNAL VIEW OF EUT-1

INTERNAL VIEW OF EUT-2



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INTERNAL VIEW OF EUT-3

----END OF REPORT----