FCC Test Report

Report No.: AGC07516190301FE03

FCC ID	:	2ASL7TWEEDZLLC
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	tweedz braided headphonesc
BRAND NAME	:	tweedz
MODEL NAME	:	TWEEDZ-BTIE
CLIENT	:	TWEEDZ LLC
DATE OF ISSUE	:	Mar. 13, 2019
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	/	Mar. 13, 2019	Valid	Initial release

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TABLE OF CONTENTS

1. VERIFICATION OF CONFORMITY 5

2. GENERAL INFORMATION 6

2.1. PRODUCT DESCRIPTION 6

2.2. TABLE OF CARRIER FREQUENCYS 6

3. MEASUREMENT UNCERTAINTY 7

4. DESCRIPTION OF TEST MODES 8

5. SYSTEM TEST CONFIGURATION 9

5.1. CONFIGURATION OF EUT SYSTEM 9

5.2. EQUIPMENT USED IN EUT SYSTEM 9

5.3. SUMMARY OF TEST RESULTS 10

6. TEST FACILITY 11

7. TEST EQUIPMENT LIST 12

8. RADIATED EMISSION 13

8.1TEST LIMIT 13

8.2. MEASUREMENT PROCEDURE 14

8.3. TEST SETUP 16

8.4. TEST RESULT 18

9. BAND EDGE EMISSION 26

9.1. MEASUREMENT PROCEDURE 26

9.2 TEST SETUP 26

9.3 RADIATED TEST RESULT 27

10. 20DB BANDWIDTH 31

10.1. MEASUREMENT PROCEDURE 31

10.2. TEST SET-UP 31

10.3. LIMITS AND MEASUREMENT RESULTS 31

11. FCC LINE CONDUCTED EMISSION TEST 38

11.1. LIMITS OF LINE CONDUCTED EMISSION TEST 38

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11.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST 38
11.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST 39
11.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST 39
11.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST 39

APPENDIX A: PHOTOGRAPHS OF TEST SETUP 40

APPENDIX B: PHOTOGRAPHS OF EUT 42

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1. VERIFICATION OF CONFORMITY

Applicant	TWEEDZ LLC
Address	4310 Buena Vista St, Suite 9 Dallas, Texas 75205 USA
Manufacturer	Dongguan YueMai Acoustic Technology Co., Ltd
Address	XinLong 1st Road, MiaoBianWang Village, Shipai Town, Dongguan City, Guangdong, China
Factory	Dongguan YueMai Acoustic Technology Co., Ltd
Address	XinLong 1st Road, MiaoBianWang Village, Shipai Town, Dongguan City, Guangdong, China
Product Designation	tweedz braided headphones
Brand Name	tweedz
Test Model	TWEEDZ-BTIE
Date of test	Feb. 28, 2019 to Mar. 26, 2019
Deviation	None
Condition of Test Sample	Normal
Test Result	Pass
Report Template	AGCRT-US-BR/RF

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 Erik Yang

Erik Yang(Yang Jianmin) Mar. 26, 2019

Reviewed By Bart Xie

Bart Xie(Xie Xiaobin) Mar. 26, 2019

Approved By Forrest Lei

Forrest Lei(Lei Yonggang)
Authorized Officer
Mar. 26, 2019

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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
Bluetooth Version	V4.2
Maximum field strength	96.60dBuV/m(peak)@3m
Modulation	BR ☒GFSK, EDR ☒π /4-DQPSK, ☒8DPSK BLE ☐GFSK
Number of channels	79 for BR/EDR
Hardware Version	91D6100 V2.0
Software Version	691x 202
Antenna Designation	PCB Antenna
Antenna Gain	3.3dBi
Power Supply	DC 3.7V by battery
Note: The USB port only used for charging and can't be used to transfer data with PC.	

2.2. TABLE OF CARRIER FREQUENCYS

BR/EDR channel List

Frequency Band	Channel Number	Frequency
2400~2483.5MHz	00	2402MHz
	01	2403MHz
	:	:
	38	2440 MHz
	39	2441 MHz
	40	2442 MHz
	:	:
	77	2479 MHz
	78	2480 MHz

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3. MEASUREMENT UNCERTAINTY

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

- 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

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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

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.
4. For Conducted Test method, a temporary antenna connector is provided by the manufacture.

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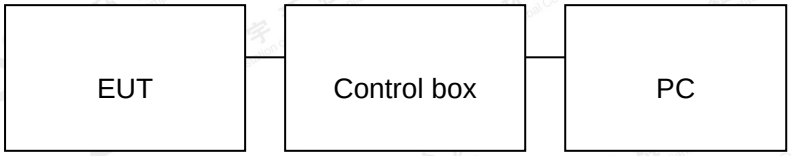
5. SYSTEM TEST CONFIGURATION

5.1. CONFIGURATION OF EUT SYSTEM

Configure 1: (Normal hopping)

Configure 2: (Control continuous TX)



5.2. EQUIPMENT USED IN EUT SYSTEM

Item	Equipment	Mfr/Brand	Model/Type No.	Remark
1	tweedz braided	tweedz	TWEEDZ-BTIE	EUT
2	Battery	SW	601220	Accessory
3	Ipod	APPLE	A1367	A.E
4	Control box	DOFLY	LY-USB-TIL V2.2	A.E
5	USB Cable	N/A	1m unshielded	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	N/A
§15.215	Band Width	Compliant

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6. TEST FACILITY

Test Site	Attestation of Global Compliance (Shenzhen) Co., Ltd
Location	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Designation Number	CN1259
FCC Test Firm Registration Number	975832
A2LA Cert. No.	5054.02
Description	Attestation of Global Compliance(Shenzhen) Co., Ltd is accredited by A2LA

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7. TEST EQUIPMENT LIST

TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	Jun. 12, 2018	Jun. 11, 2019
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Dec. 20, 2018	Dec. 19, 2019
2.4GHz Fliter	Micro-tronics	087	N/A	Jun. 12, 2018	Jun. 11, 2019
Attenuator	Weinachel Corp	58-30-33	N/A	Jun. 12, 2018	Jun. 11, 2019
Horn antenna	SCHWARZBECK	BBHA 9170	#768	Sep. 21, 2017	Sep. 20, 2020
Active loop antenna (9K-30MHz)	ZHINAN	ZN30900C	18051	Jun. 14, 2018	Jun. 13, 2020
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	May. 26, 2018	May. 25, 2020
Broadband Preamplifier	ETS LINDGREN	3117PA	00225134	Oct. 25, 2018	Oct. 24, 2019
ANTENNA	SCHWARZBECK	VULB9168	D69250	Sep. 28, 2017	Sep. 27, 2019

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8. RADIATED EMISSION

8.1TEST LIMIT

Standard FCC15.249

Fundamental Frequency	Field Strength of Fundamental (millivolts/meter)	Field Strength of Harmonics (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 (MHz)	Distance Meters	Field Strengths Limit	
		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 (Peak) 54.0 dB(μV)/m (Average)	

Remark: (1) Emission level dB μ V = 20 log Emission level μ 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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8.2. MEASUREMENT PROCEDURE

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

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

Spectrum Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP
Start ~Stop Frequency	Fundamental: 2.4~2.483GHz RBW 2MHz/ VBW 6MHz for Peak, RBW 2MHz/ VBW 10Hz for Average Harmonics: 1GHz~25GHz RBW 1MHz/ VBW 3MHz for Peak, RBW 1MHz/ VBW 10Hz for Average
Receiver Parameter	**Setting**
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP

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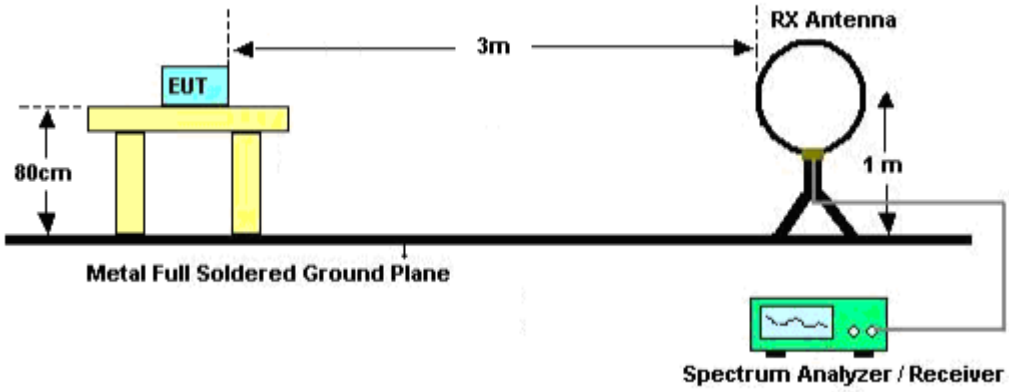
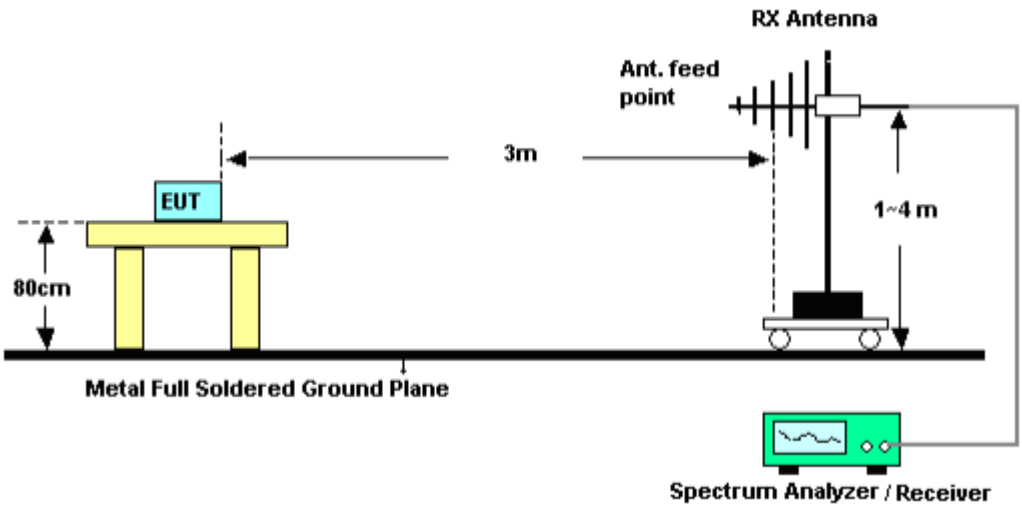
8.3. TEST SETUP

Radiated Emission Test-Setup Frequency Below 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



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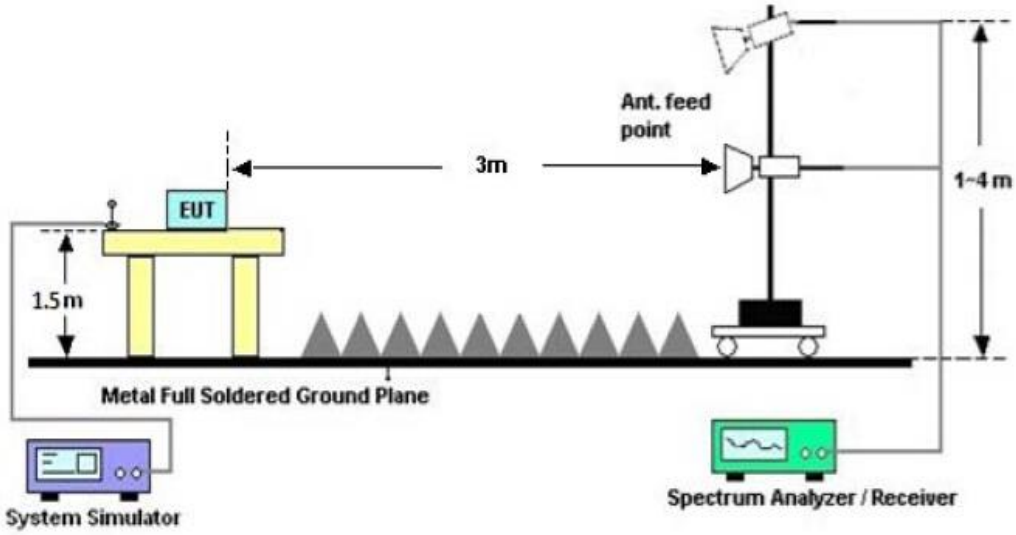
RADIATED EMISSION TEST SETUP ABOVE 1000MHz



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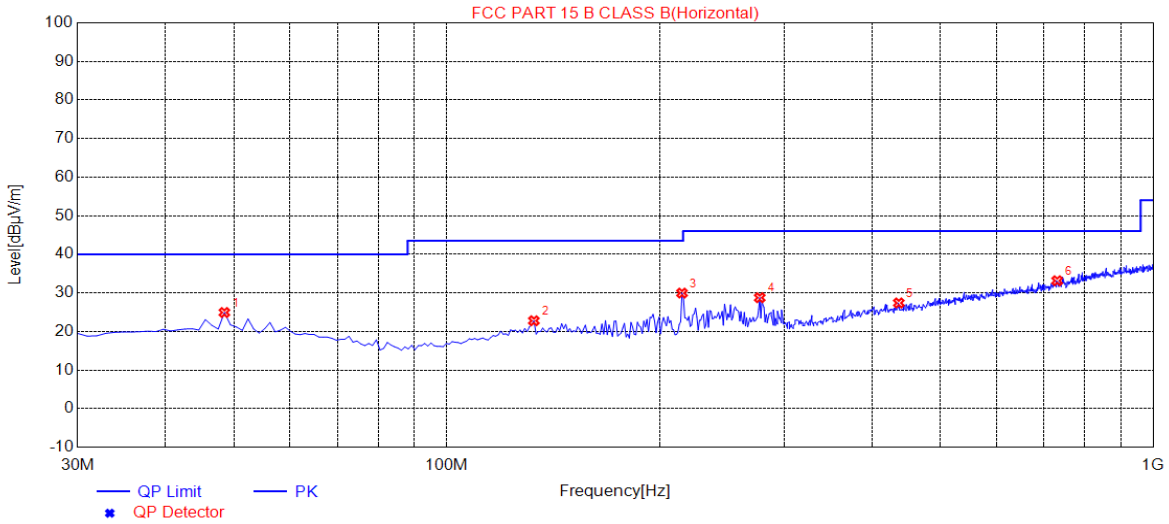
8.4. TEST RESULT

RADIATED EMISSION BELOW 30MHz

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

RADIATED EMISSION 30MHz- 1GHZ FOR BR/EDR

EUT：	tweedz braided headphones	Model Name. ：	TWEEDZ-BTIE
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	Mode 10	Polarization :	Horizontal



Suspected Data List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	48.4300	24.91	14.71	40.00	15.09	150	241	Horizontal
2	132.820	22.77	14.35	43.50	20.73	200	107	Horizontal
3	215.270	29.94	12.98	43.50	13.56	100	274	Horizontal
4	277.350	28.74	16.05	46.00	17.26	100	79	Horizontal
5	436.430	27.38	20.67	46.00	18.62	200	29	Horizontal
6	731.310	33.15	26.75	46.00	12.85	200	0	Horizontal

RESULT: PASS

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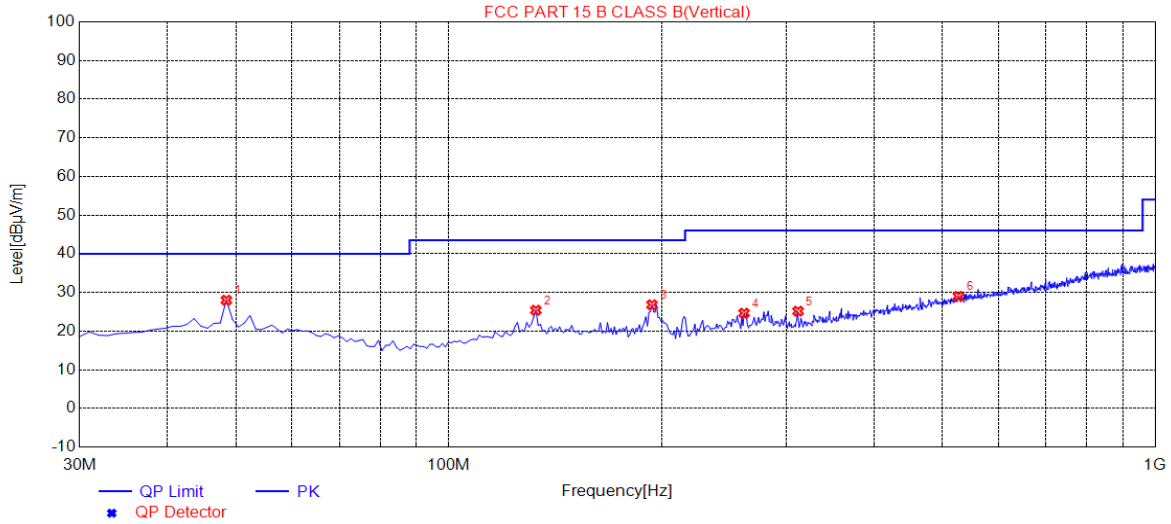
EUT：	tweedz braided headphones	Model Name. ：	TWEEDZ-BTIE
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	Mode 10	Polarization :	Vertical



Suspected Data List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	48.4300	27.99	14.71	40.00	12.01	100	166	Vertical
2	132.820	25.39	14.35	43.50	18.11	100	113	Vertical
3	193.930	26.81	12.34	43.50	16.69	100	141	Vertical
4	261.830	24.64	14.71	46.00	21.36	200	4	Vertical
5	312.270	25.15	16.37	46.00	20.85	200	9	Vertical
6	526.640	28.98	22.77	46.00	17.02	150	329	Vertical

RESULT: PASS

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

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

3. The mode 10 is the worst case, and only the data of the worst case recorded in this test report.

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FIELD STRENGTH OF FUNDAMENTAL FOR BR/EDR

EUT：	tweedz braided headphones	Model Name. ：	TWEEDZ-BTIE
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Modulation ：	GFSK	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
2402.021	83.06	13.46	96.52	114.00	-17.48	peak
2402.021	75.14	13.46	88.60	94.00	-5.40	AVG
2441.021	82.61	13.88	96.49	114.00	-17.51	peak
2441.021	74.70	13.88	88.58	94.00	-5.42	AVG
2480.021	82.49	14.11	96.60	114.00	-17.40	peak
2480.021	74.50	14.11	88.61	94.00	-5.39	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT：	tweedz braided headphones	Model Name. ：	TWEEDZ-BTIE
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Modulation ：	GFSK	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
2402.021	82.65	13.46	96.11	114.00	-17.89	peak
2402.021	74.58	13.46	88.04	94.00	-5.96	AVG
2441.021	82.14	13.88	96.02	114.00	-17.98	peak
2441.021	74.21	13.88	88.09	94.00	-5.91	AVG
2480.021	82.02	14.11	96.13	114.00	-17.87	peak
2480.021	74.07	14.11	88.18	94.00	-5.82	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

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EUT：	tweedz braided headphones	Model Name. ：	TWEEDZ-BTIE
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Modulation ：	π /4-DQPSK	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
2402.021	82.08	13.46	95.54	114.00	-18.46	peak
2402.021	74.07	13.46	87.53	94.00	-6.47	AVG
2441.021	81.64	13.88	95.52	114.00	-18.48	peak
2441.021	73.63	13.88	87.51	94.00	-6.49	AVG
2480.021	81.52	14.11	95.63	114.00	-18.37	peak
2480.021	73.56	14.11	87.67	94.00	-6.33	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT：	tweedz braided headphones	Model Name. ：	TWEEDZ-BTIE
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Modulation ：	π /4-DQPSK	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
2402.021	81.64	13.46	95.10	114.00	-18.90	peak
2402.021	73.62	13.46	87.08	94.00	-6.92	AVG
2441.021	81.18	13.88	95.06	114.00	-18.94	peak
2441.021	73.15	13.88	87.03	94.00	-6.97	AVG
2480.021	81.06	14.11	95.17	114.00	-18.83	peak
2480.021	73.04	14.11	87.15	94.00	-6.85	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

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EUT：	tweedz braided headphones	Model Name. ：	TWEEDZ-BTIE
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Modulation ：	8DPSK	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
2402.021	81.09	13.46	94.55	114.00	-19.45	peak
2402.021	73.07	13.46	86.53	94.00	-7.47	AVG
2441.021	80.68	13.88	94.56	114.00	-19.44	peak
2441.021	72.70	13.88	86.58	94.00	-7.42	AVG
2480.021	80.54	14.11	94.65	114.00	-19.35	peak
2480.021	72.54	14.11	86.65	94.00	-7.35	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT：	tweedz braided headphones	Model Name. ：	TWEEDZ-BTIE
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Modulation ：	8DPSK	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
2402.021	80.58	13.46	94.04	114.00	-19.96	peak
2402.021	72.57	13.46	86.03	94.00	-7.97	AVG
2441.021	80.15	13.88	94.03	114.00	-19.97	peak
2441.021	72.20	13.88	86.08	94.00	-7.92	AVG
2480.021	80.03	14.11	94.14	114.00	-19.86	peak
2480.021	72.00	14.11	86.11	94.00	-7.89	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

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RADIATED EMISSION ABOVE 1GHZ FOR BR/EDR

EUT：	tweedz braided headphones	Model Name. ：	TWEEDZ-BTIE
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	Mode 1	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4804.026	42.75	7.12	49.87	74	-24.13	peak
4804.026	39.56	7.12	46.68	54	-7.32	AVG
7206.039	37.23	9.84	47.07	74	-26.93	peak
7206.039	35.52	9.84	45.36	54	-8.64	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT：	tweedz braided headphones	Model Name. ：	TWEEDZ-BTIE
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	Mode 1	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4804.026	43.26	7.12	50.38	74	-23.62	peak
4804.026	40.32	7.12	47.44	54	-6.56	AVG
7206.039	36.53	9.84	46.37	74	-27.63	peak
7206.039	34.35	9.84	44.19	54	-9.81	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

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EUT：	tweedz braided headphones	Model Name. ：	TWEEDZ-BTIE
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	Mode 2	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4882.032	43.26	7.12	50.38	74	-23.62	peak
4882.032	40.32	7.12	47.44	54	-6.56	AVG
7323.048	36.53	9.84	46.37	74	-27.63	peak
7323.048	34.35	9.84	44.19	54	-9.81	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT：	tweedz braided headphones	Model Name. ：	TWEEDZ-BTIE
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	Mode 2	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4882.032	43.37	7.12	50.49	74	-23.51	peak
4882.032	41.28	7.12	48.4	54	-5.6	AVG
7323.048	35.52	9.84	45.36	74	-28.64	peak
7323.048	34.26	9.84	44.1	54	-9.9	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

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EUT：	tweedz braided headphones	Model Name. ：	TWEEDZ-BTIE
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	Mode 3	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4960.042	40.26	7.12	47.38	74	-26.62	peak
4960.042	38.42	7.12	45.54	54	-8.46	AVG
7440.063	35.59	9.84	45.43	74	-28.57	peak
7440.063	33.79	9.84	43.63	54	-10.37	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT：	tweedz braided headphones	Model Name. ：	TWEEDZ-BTIE
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	Mode 3	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4960.042	40.68	7.12	47.8	74	-26.2	peak
4960.042	38.48	7.12	45.6	54	-8.4	AVG
7440.063	37.23	9.84	47.07	74	-26.93	peak
7440.063	35.15	9.84	44.99	54	-9.01	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Note: Other emissions from 8G to 25 GHz are considered as ambient noise. 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.
The GFSK modulation was the worst case and only the data of worst recorded in this report.

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9. BAND EDGE EMISSION

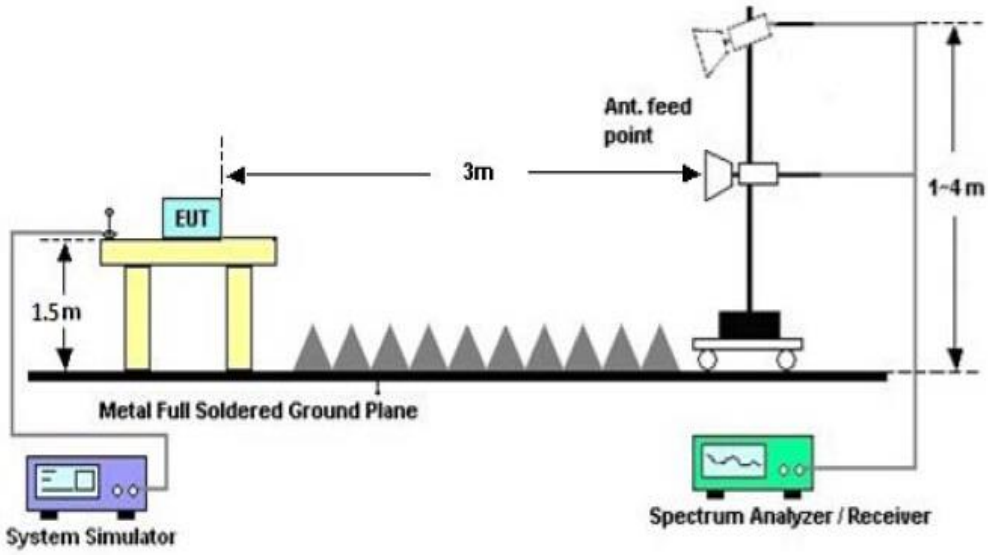
9.1. MEASUREMENT PROCEDURE

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

9.2 TEST SETUP

RADIATED EMISSION TEST SETUP



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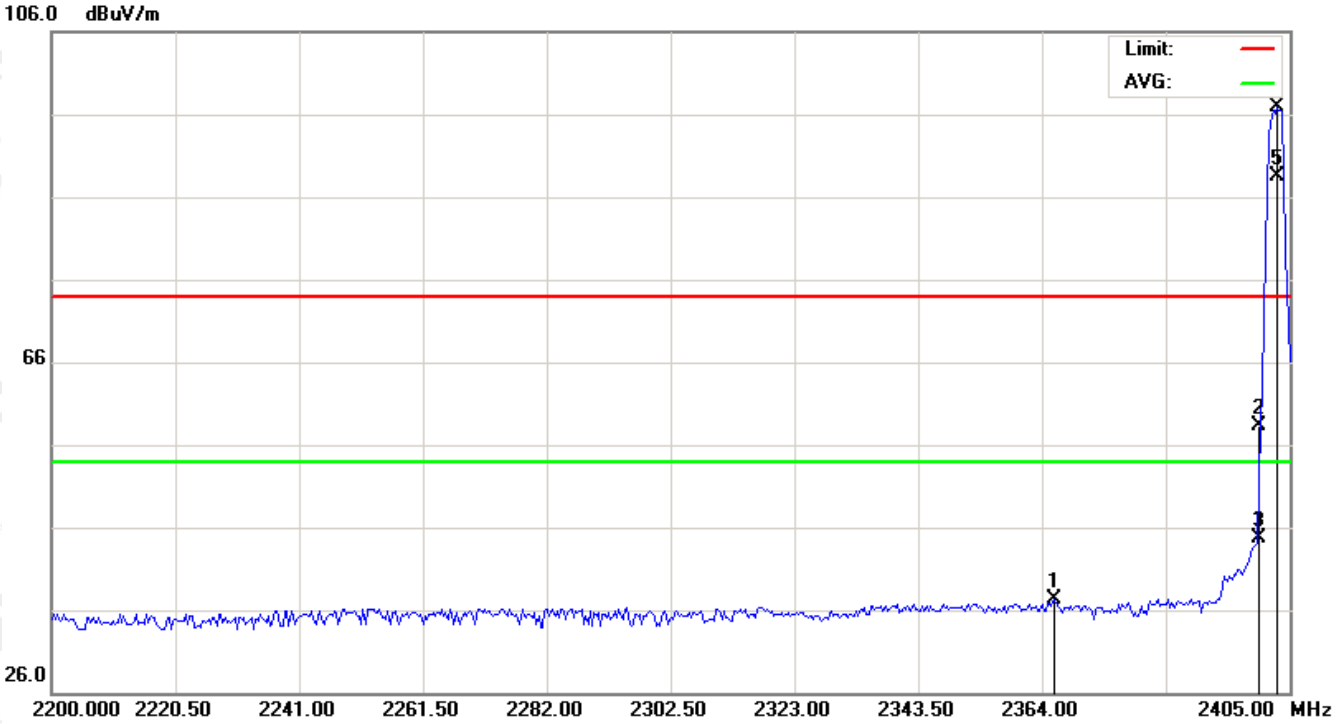
9.3 RADIATED TEST RESULT

FOR BR/EDR

(Worst modulation: GFSK)

TEST PLOT OF BAND EDGE FOR LOW CHANNEL-Horizontal



No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		2366.050	23.83	13.46	37.29	74.00	-36.71	peak			
2		2400.000	44.94	13.46	58.40	74.00	-15.60	peak			
3		2400.000	31.32	13.46	44.78	54.00	-9.22	AVG	150	125	
4	X	2402.950	83.44	13.46	96.90	74.00	22.90	peak			
5	*	2402.950	75.13	13.46	88.59	54.00	34.59	AVG	100	258	

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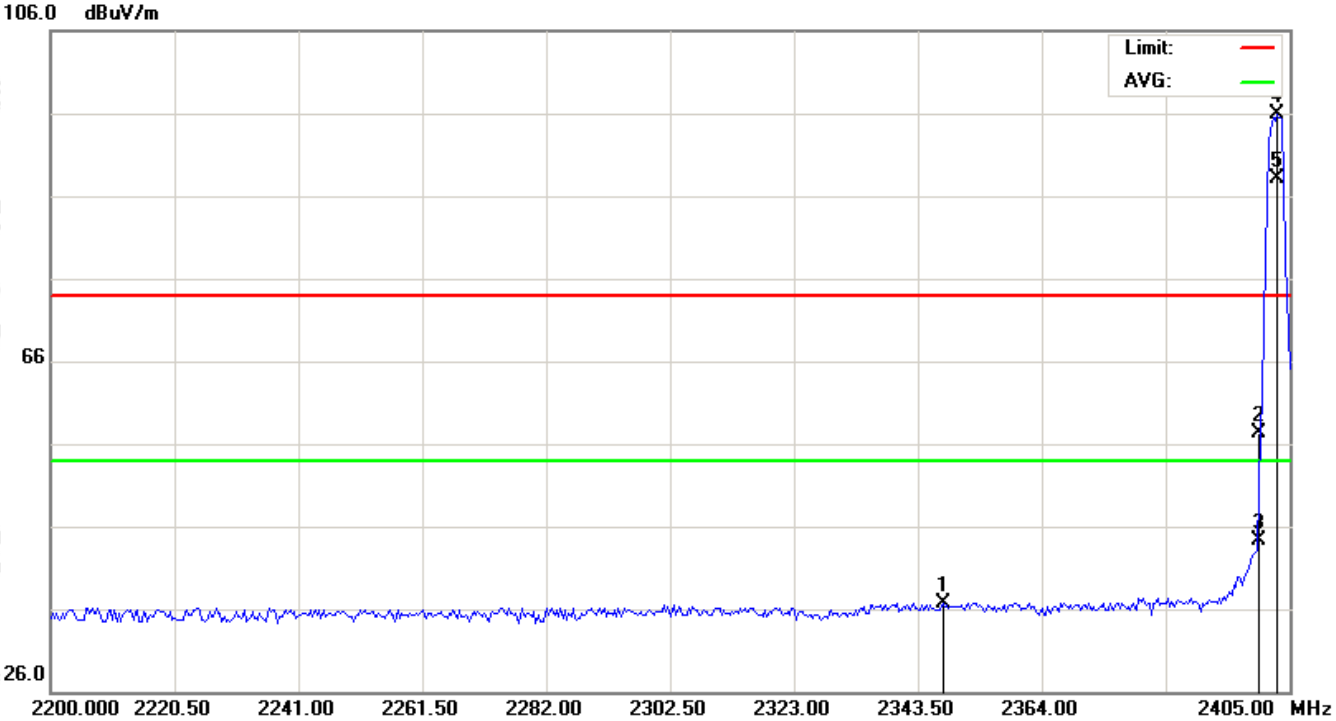
TEST PLOT OF BAND EDGE FOR LOW CHANNEL -Vertical



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	.	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		2347.600	23.29	13.46	36.75	74.00	-37.25	peak			
2		2400.000	43.94	13.46	57.40	74.00	-16.60	peak			
3		2400.000	30.89	13.46	44.35	54.00	-9.65	AVG	100	169	
4	X	2402.950	82.44	13.46	95.90	74.00	21.90	peak			
5	*	2402.950	74.55	13.46	88.01	54.00	34.01	AVG	100	125	

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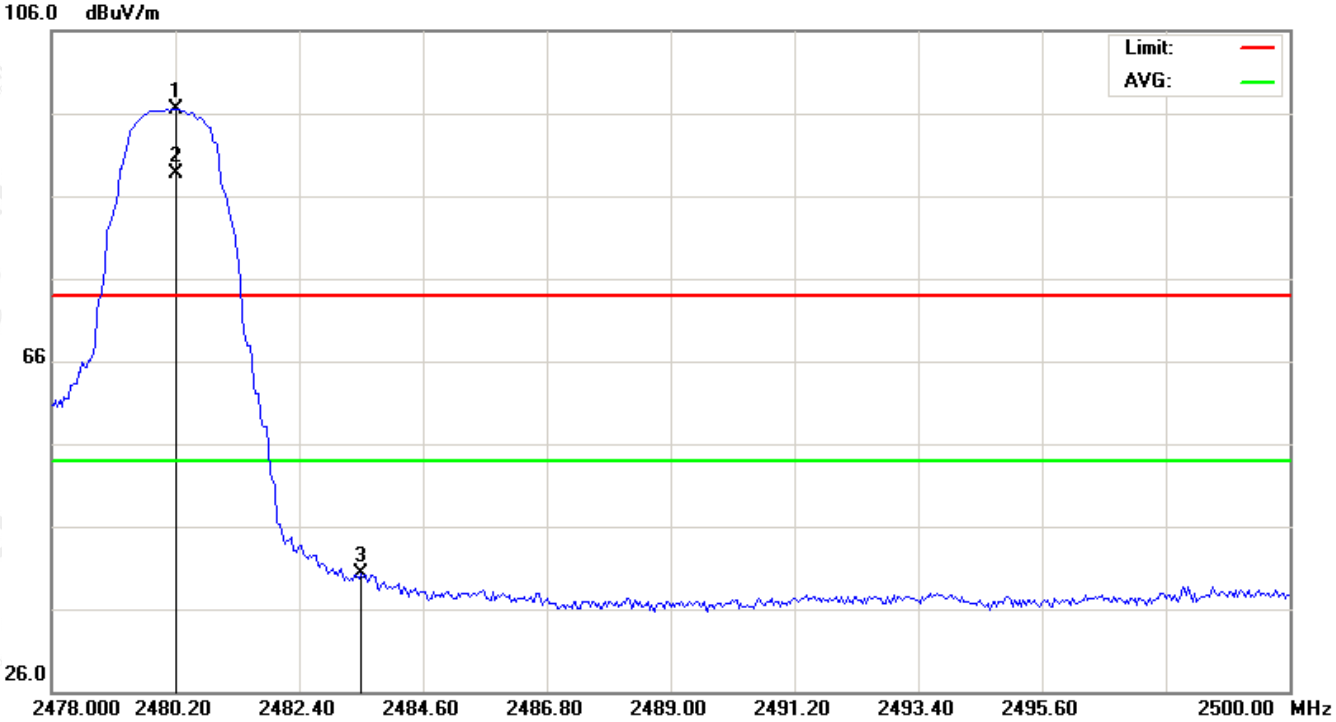
TEST PLOT OF BAND EDGE FOR HIGH CHANNEL -Horizontal



No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	X	2480.200	82.33	14.11	96.44	74.00	22.44	peak			
2	*	2480.200	74.59	14.11	88.70	54.00	34.70	AVG	150	213	
3		2483.500	26.16	14.13	40.29	74.00	-33.71	peak			

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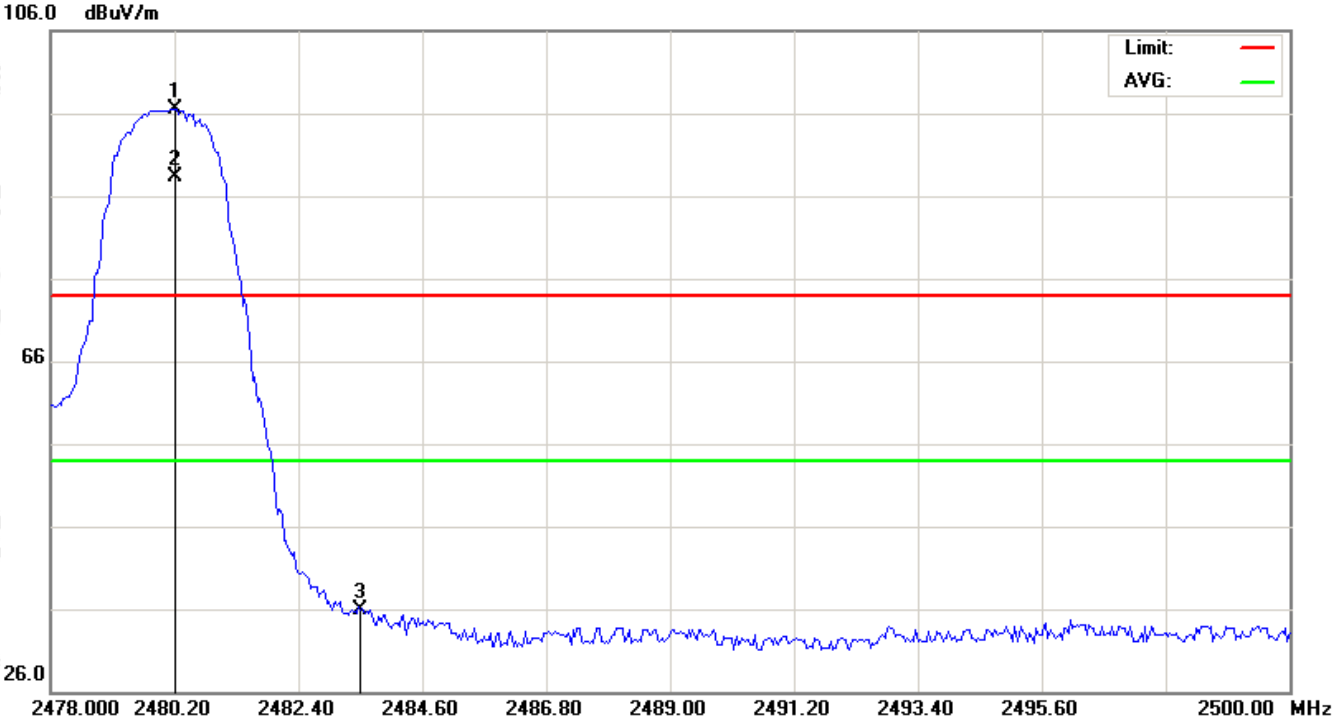
TEST PLOT OF BAND EDGE FOR HIGH CHANNEL-Vertical



No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	X	2480.200	82.33	14.11	96.44	74.00	22.44	peak			
2	*	2480.200	74.13	14.11	88.24	54.00	34.24	AVG	100	168	
3		2483.500	21.72	14.13	35.85	74.00	-38.15	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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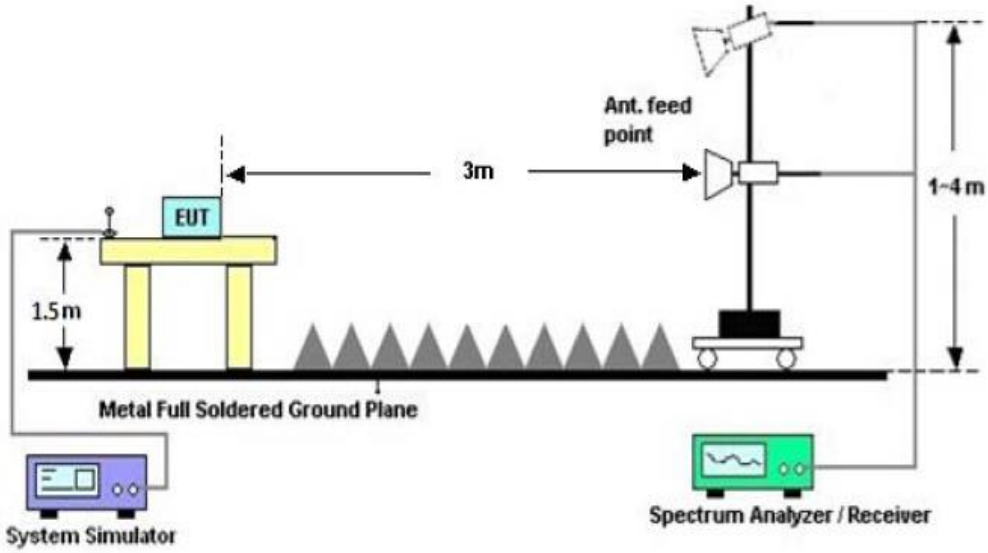
10. 20DB BANDWIDTH

10.1. 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.

10.2. TEST SET-UP



10.3. LIMITS AND MEASUREMENT RESULTS

TEST ITEM	20DB BANDWIDTH
TEST MODULATION	GFSK for BR/EDR

Test Data (MHz)		Criteria
Low Channel	0.842	PASS
Middle Channel	0.829	PASS
High Channel	0.827	PASS

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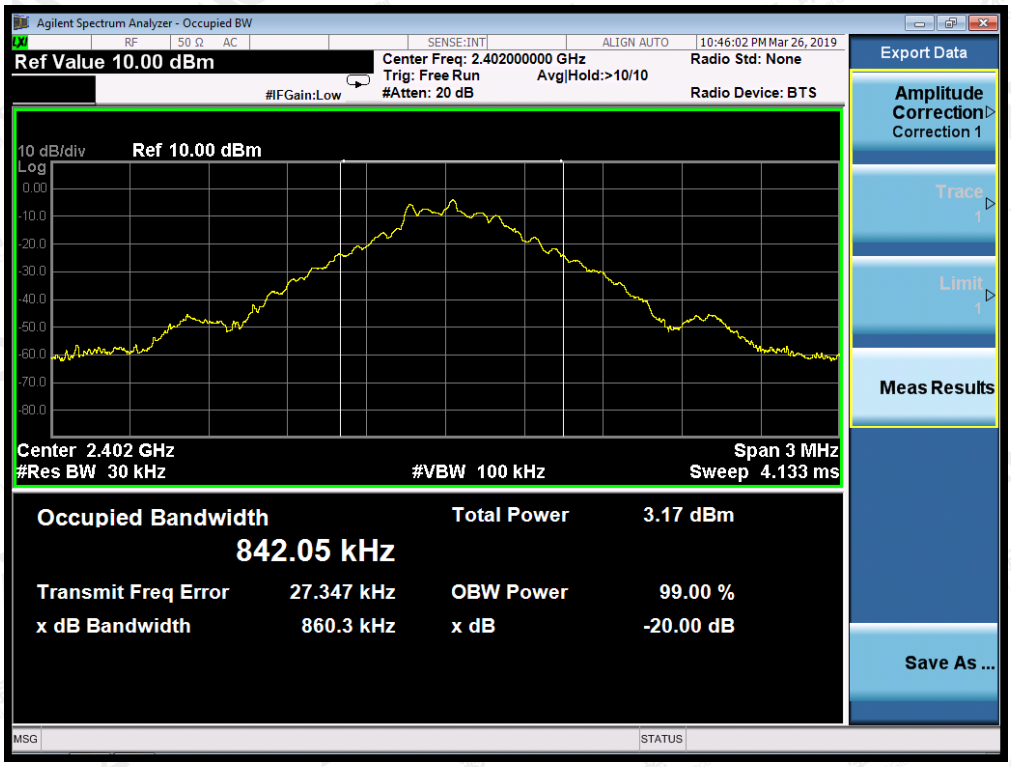
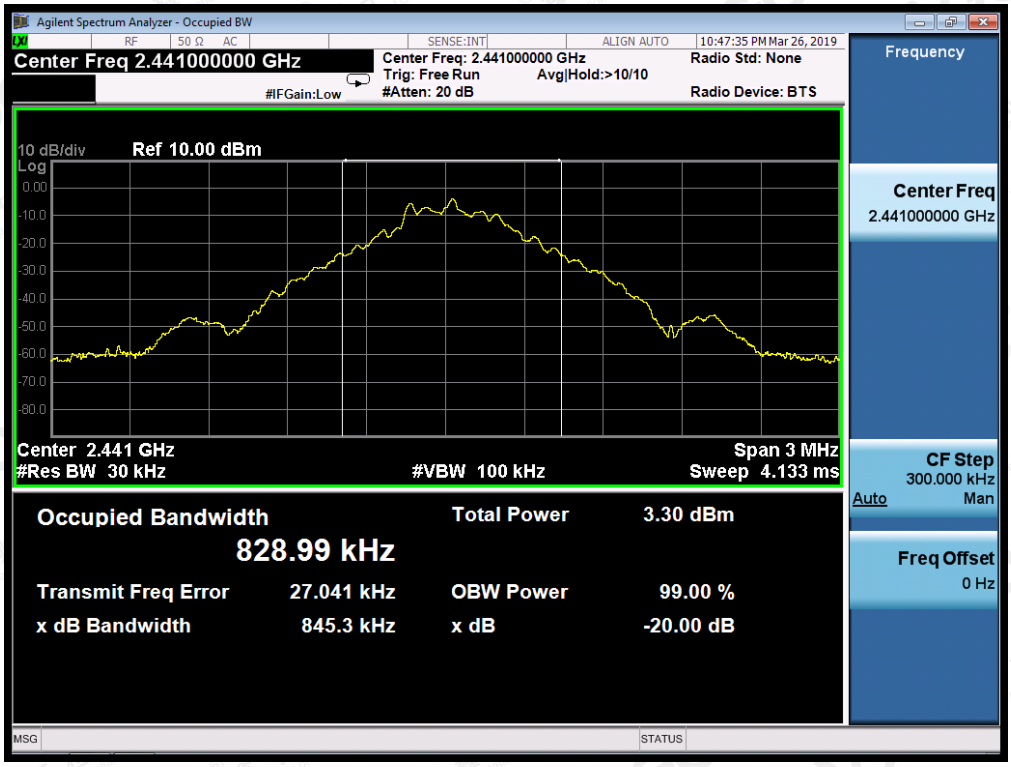
TEST PLOT OF BANDWIDTH FOR LOW CHANNEL



TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



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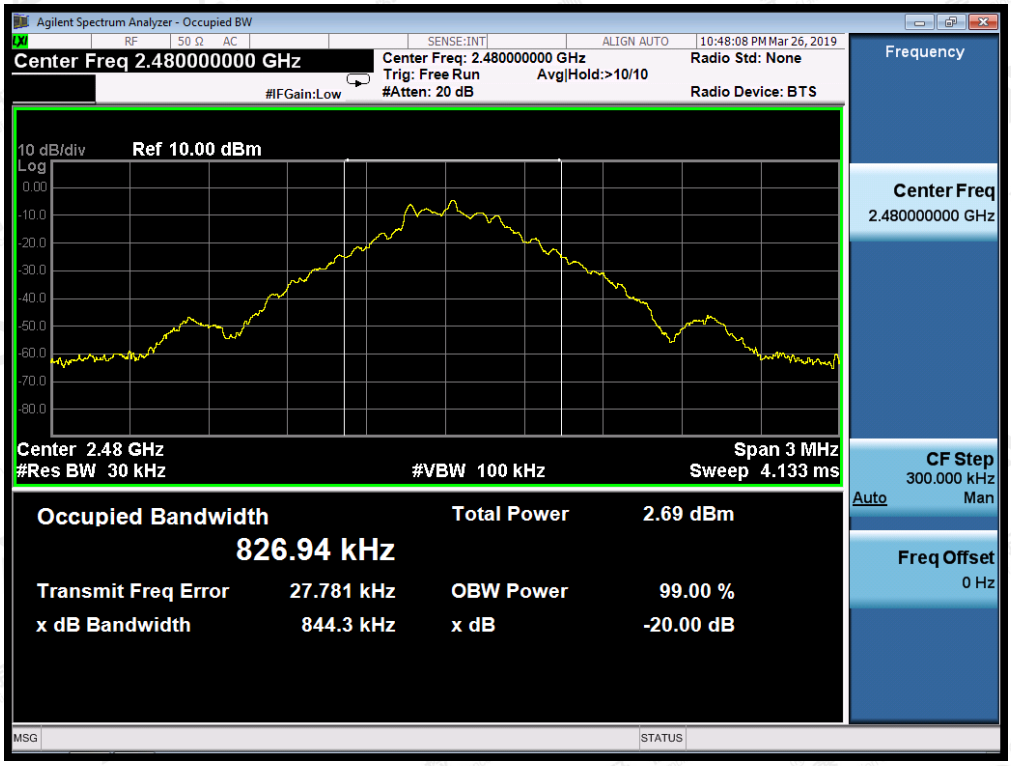
TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



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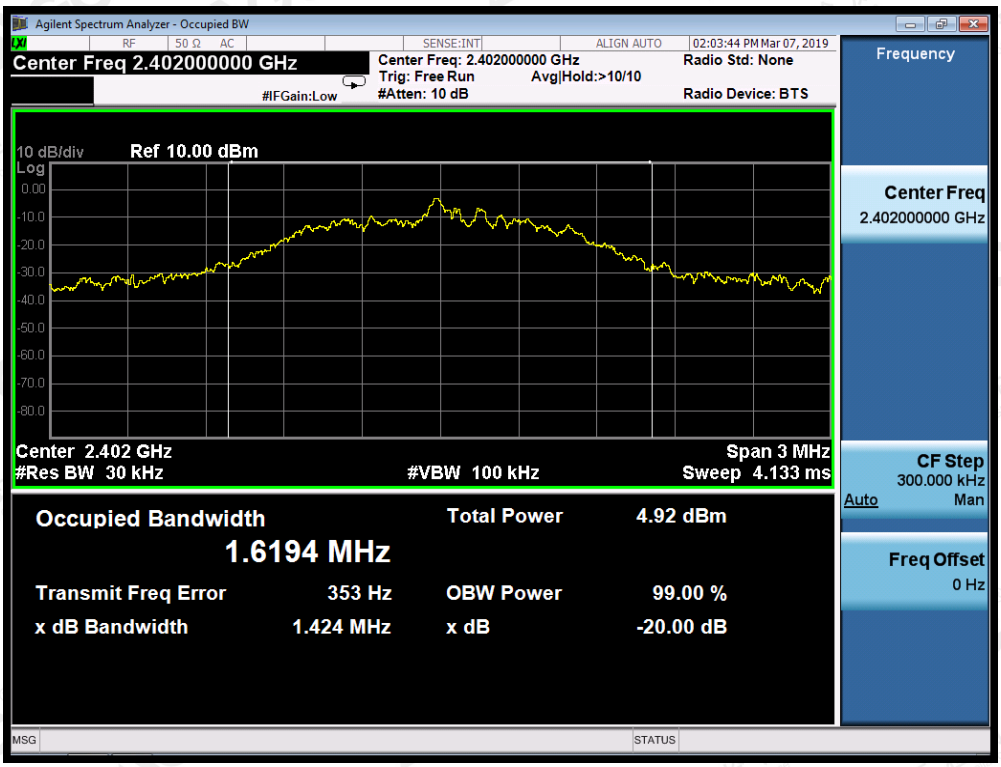
TEST ITEM	20DB BANDWIDTH
TEST MODULATION	π /4-DQPSK for BR/EDR

Test Data (MHz)		Criteria
Low Channel	1.424	PASS
Middle Channel	1.408	PASS
High Channel	1.396	PASS

TEST PLOT OF BANDWIDTH FOR LOW CHANNEL



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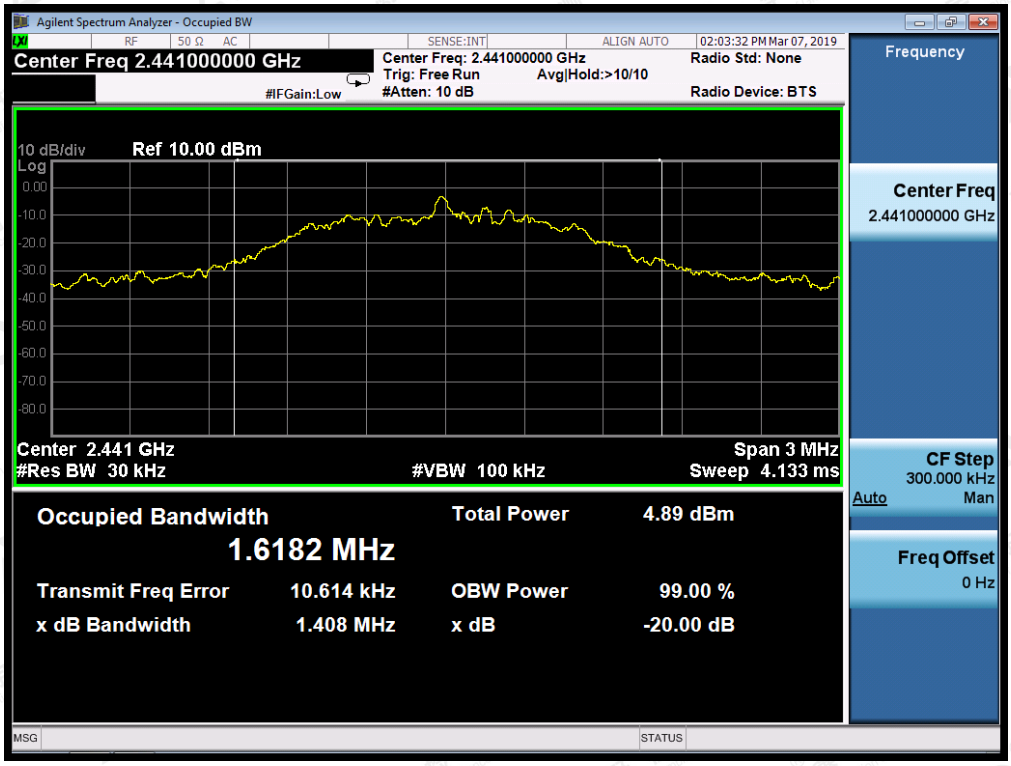
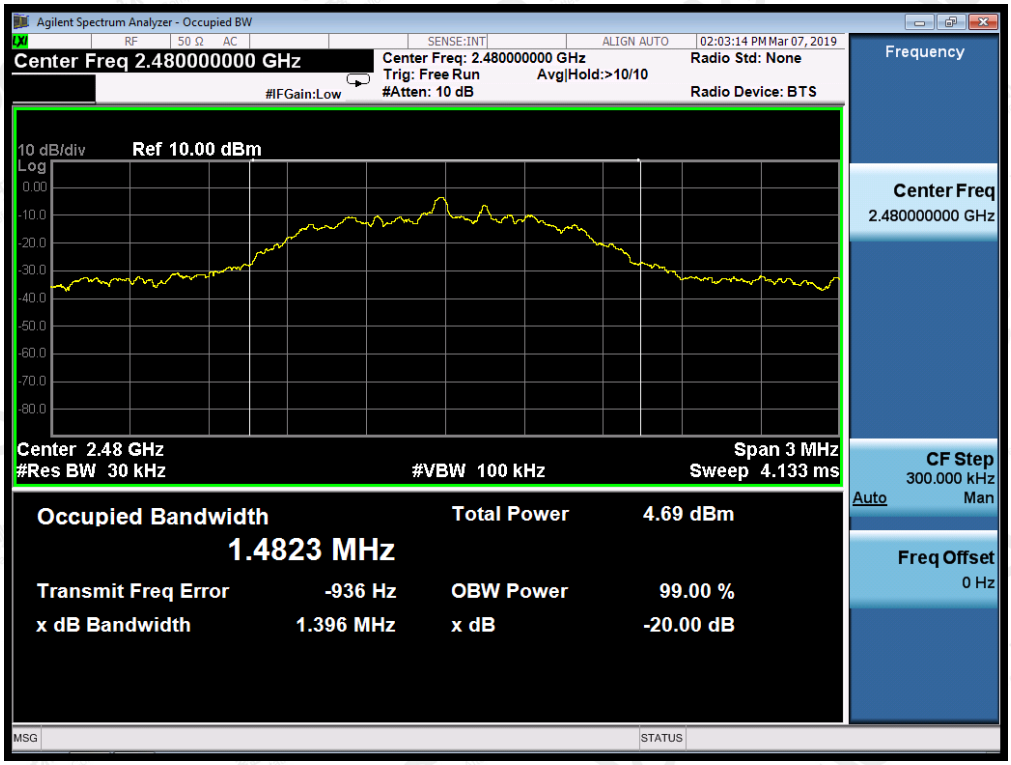
TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



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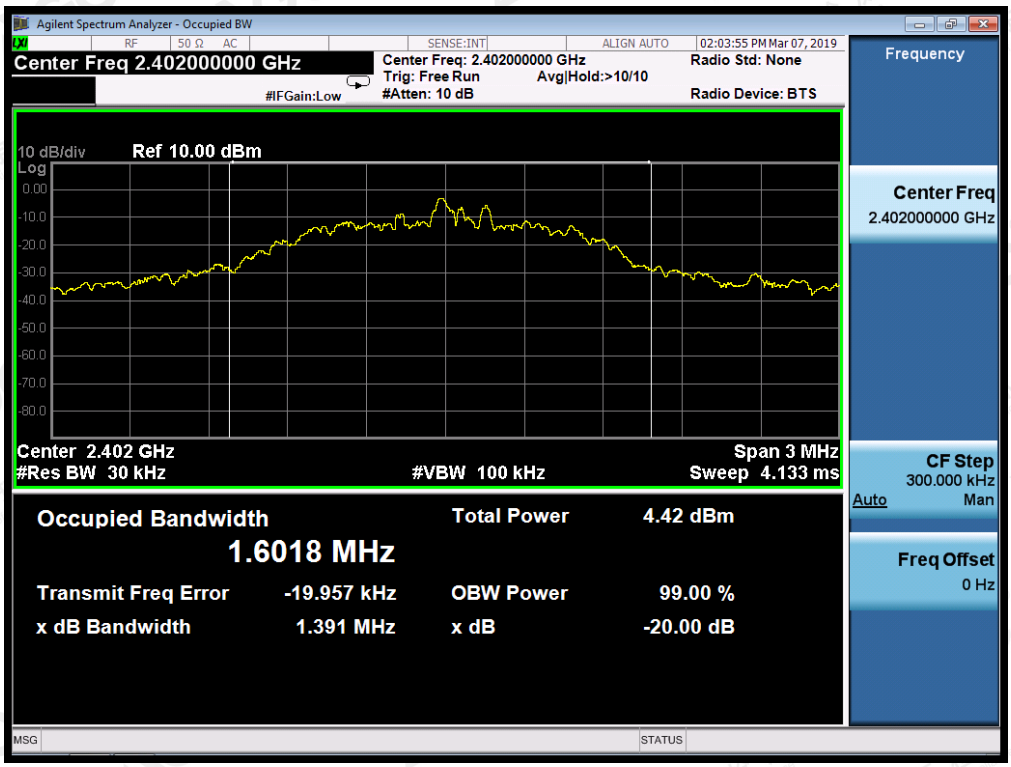
TEST ITEM	20DB BANDWIDTH
TEST MODULATION	8DPSK for BR/EDR

Test Data (MHz)		Criteria
Low Channel	1.391	PASS
Middle Channel	1.400	PASS
High Channel	1.311	PASS

TEST PLOT OF BANDWIDTH FOR LOW CHANNEL



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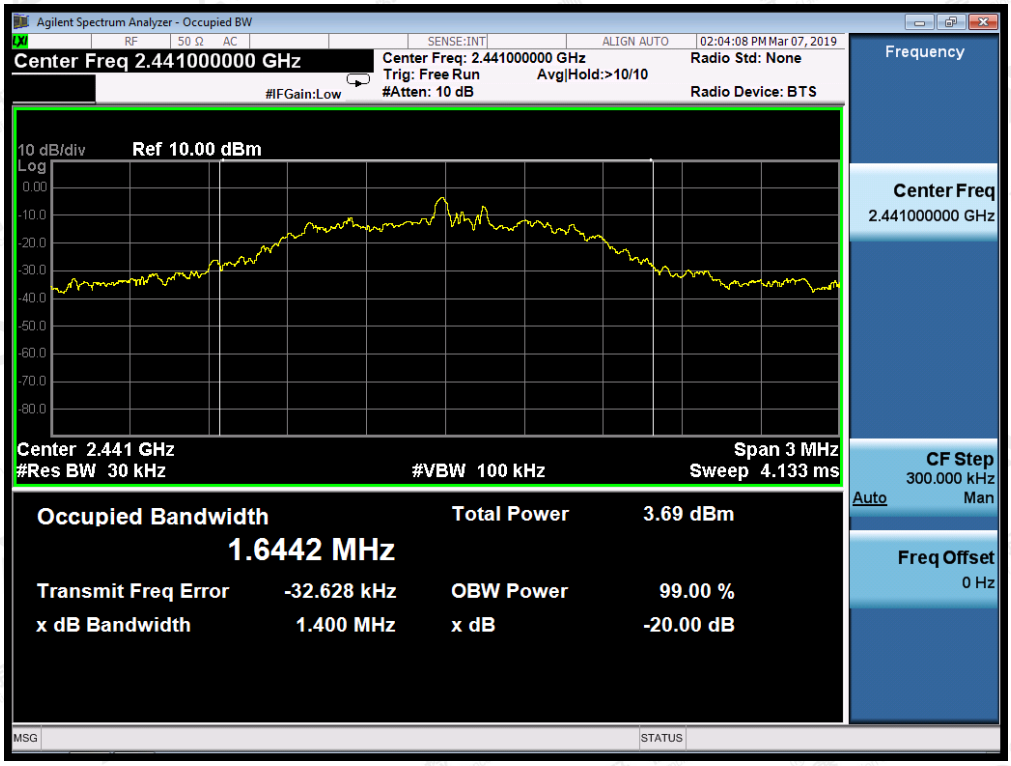
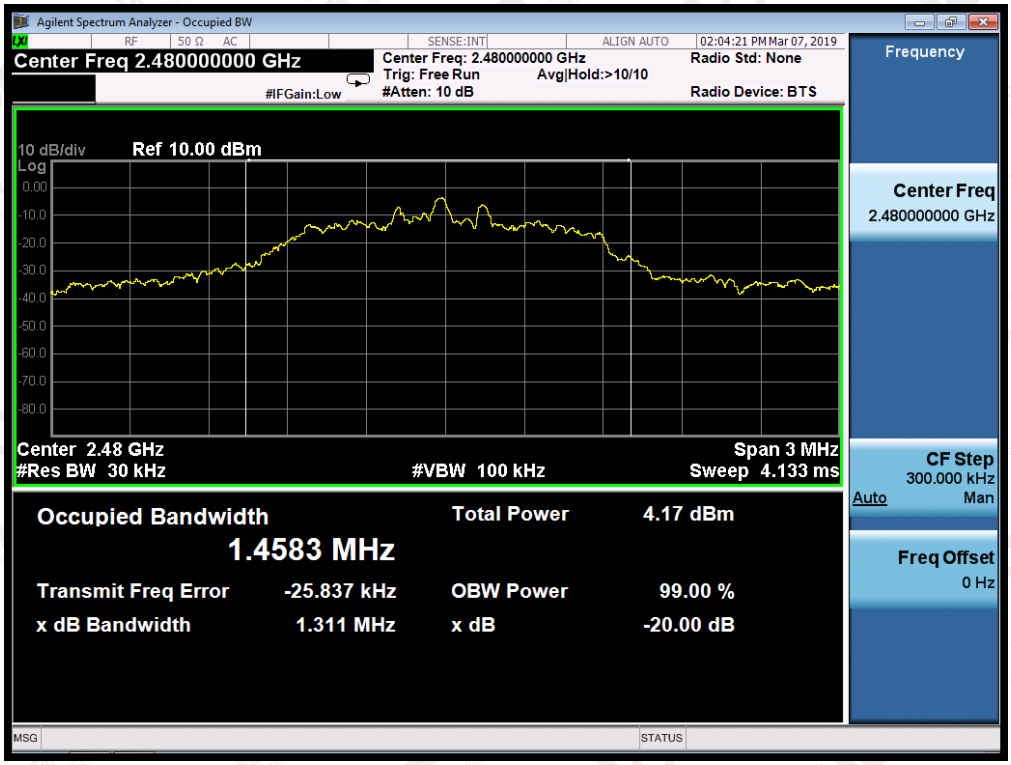
TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



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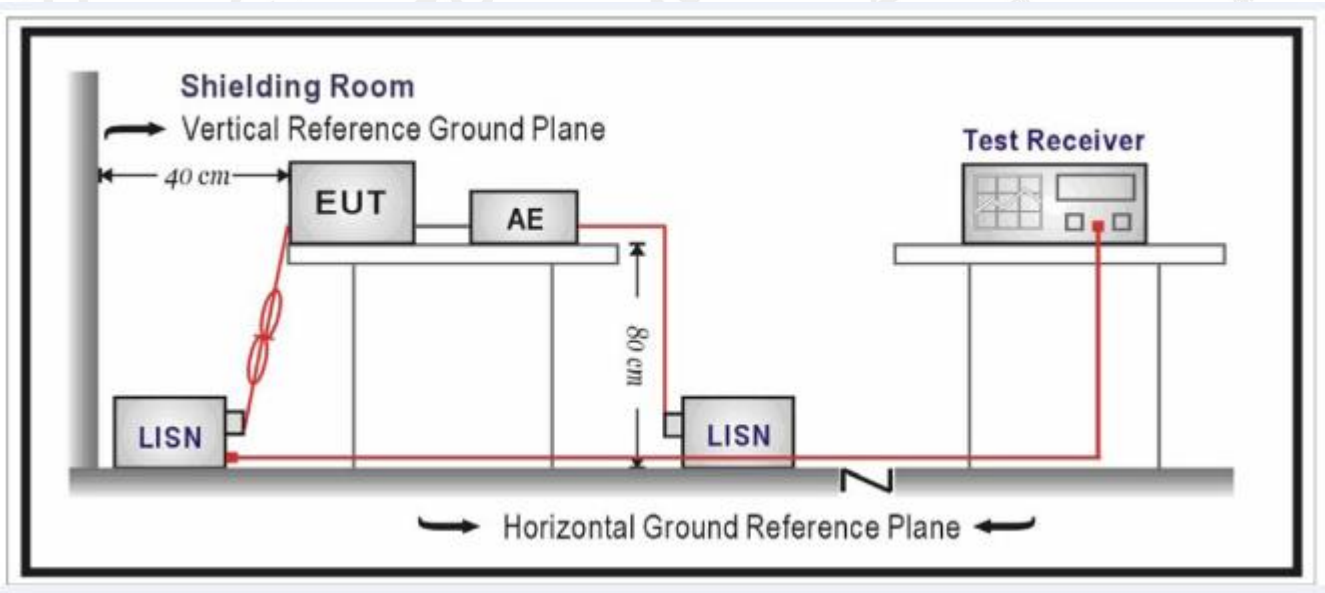
11. FCC LINE CONDUCTED EMISSION TEST

11.1. LIMITS OF LINE CONDUCTED EMISSION TEST

Frequency	Maximum RF Line Voltage	
	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



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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 C63.10-2013 (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 C63.10-2013.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10-2013.
4. All support equipments received AC120V/60Hz power from a LISN, if any.
5. The EUT received DC 5V power by adapter which received AC120V/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.
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.

11.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

N/A

Note: The BT function of EUT doesn't work when charging.

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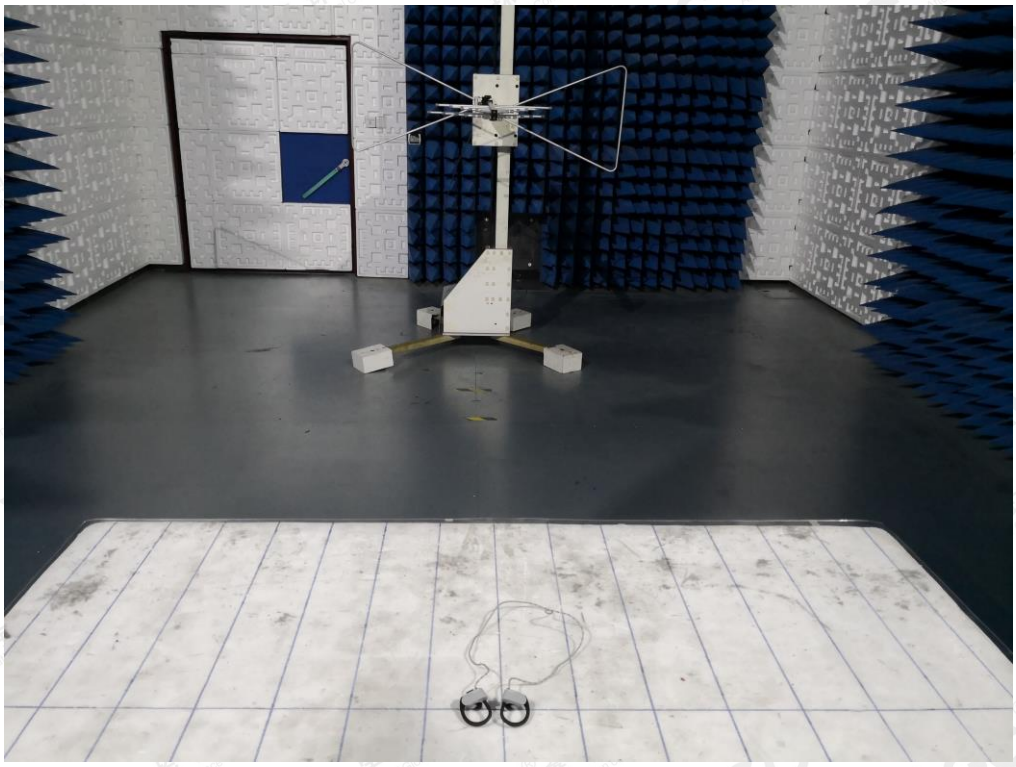
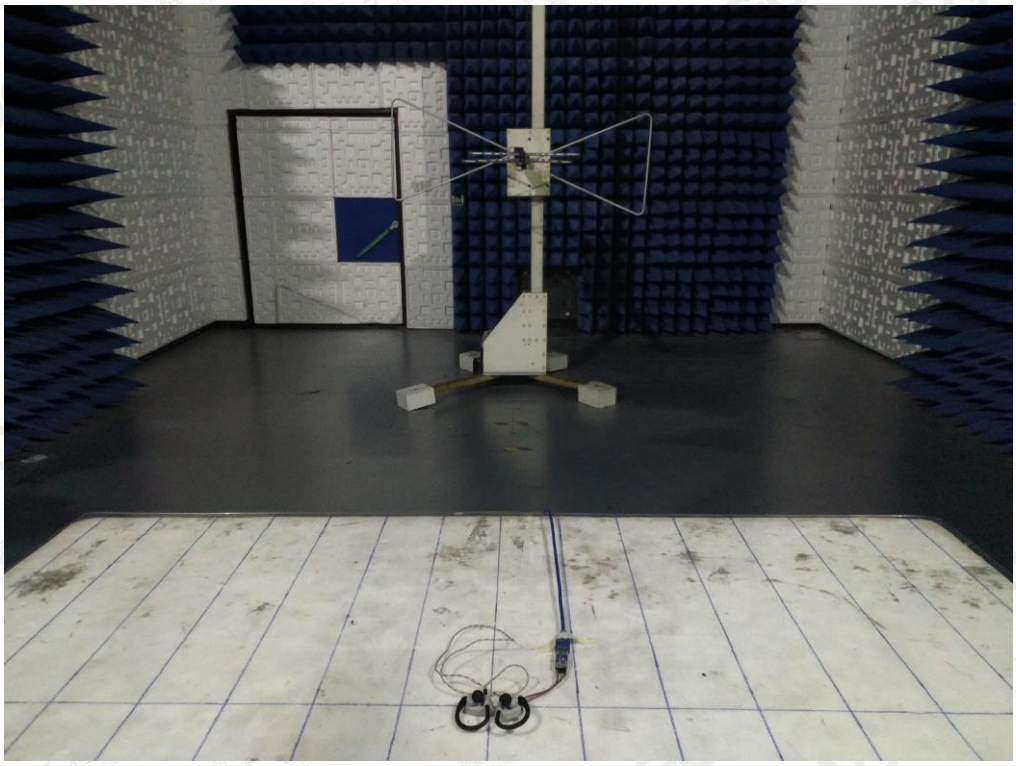
APPENDIX A: PHOTOGRAPHS OF TEST SETUP

FCC RADIATED EMISSION TEST SETUP





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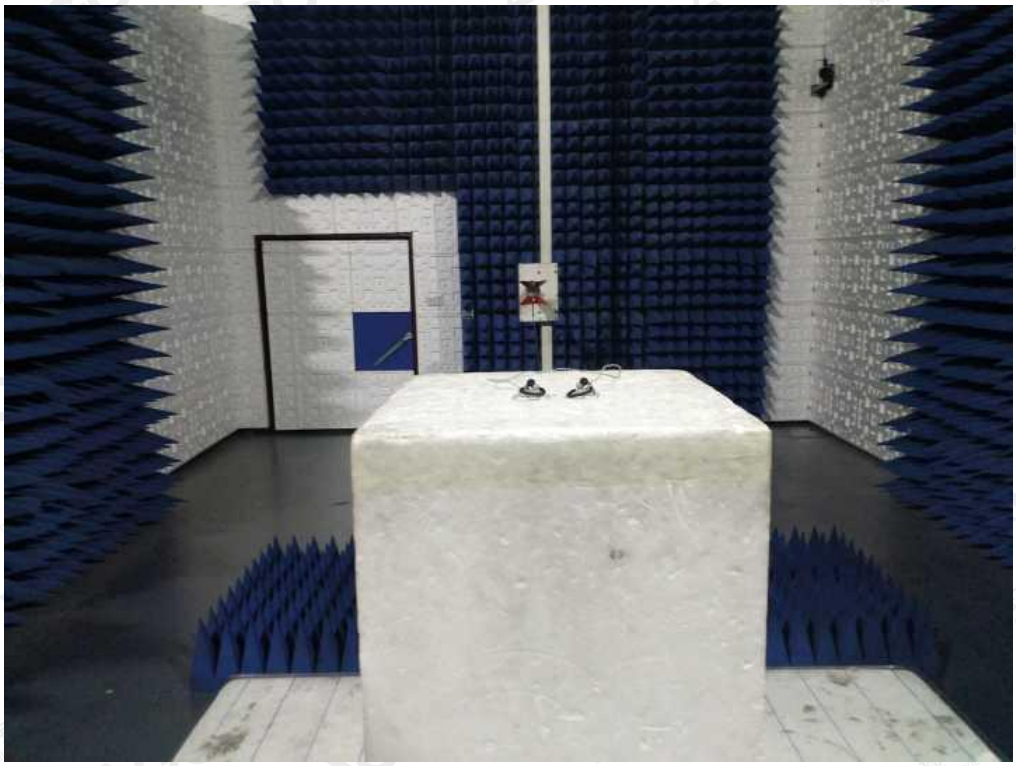

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APPENDIX B: PHOTOGRAPHS OF EUT

ALL VIEW OF EUT

TOTAL VIEW OF EUT

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TOP VIEW OF EUT

BOTTOM VIEW OF EUT

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FRONT VIEW OF EUT

BACK VIEW OF EUT

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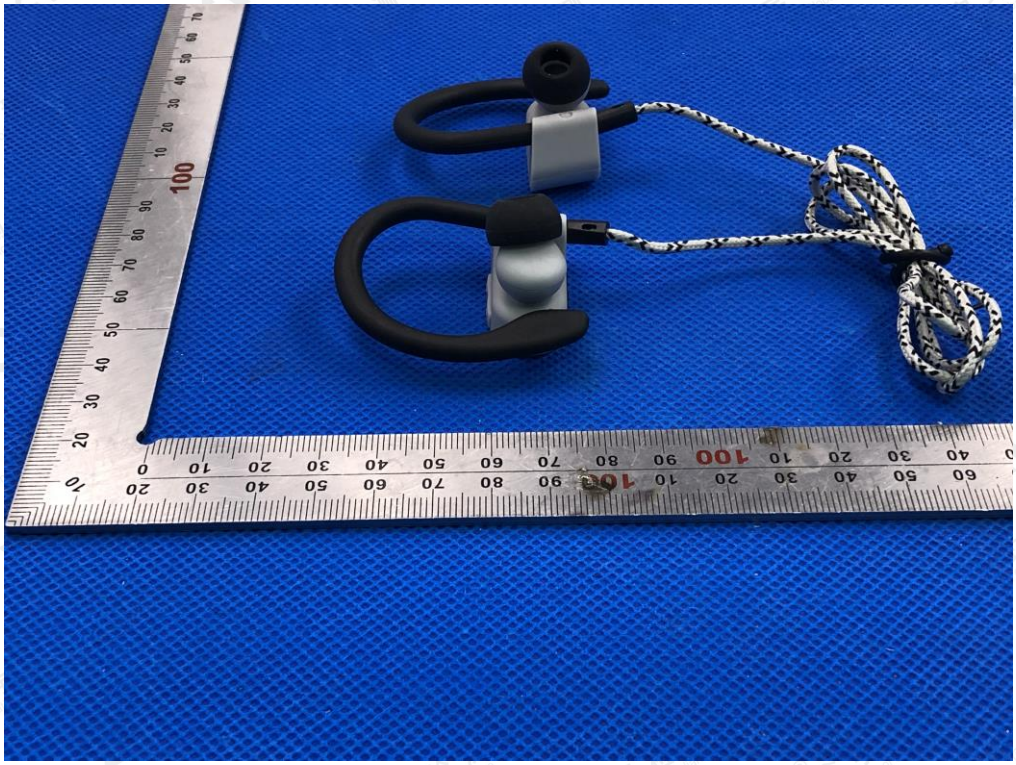
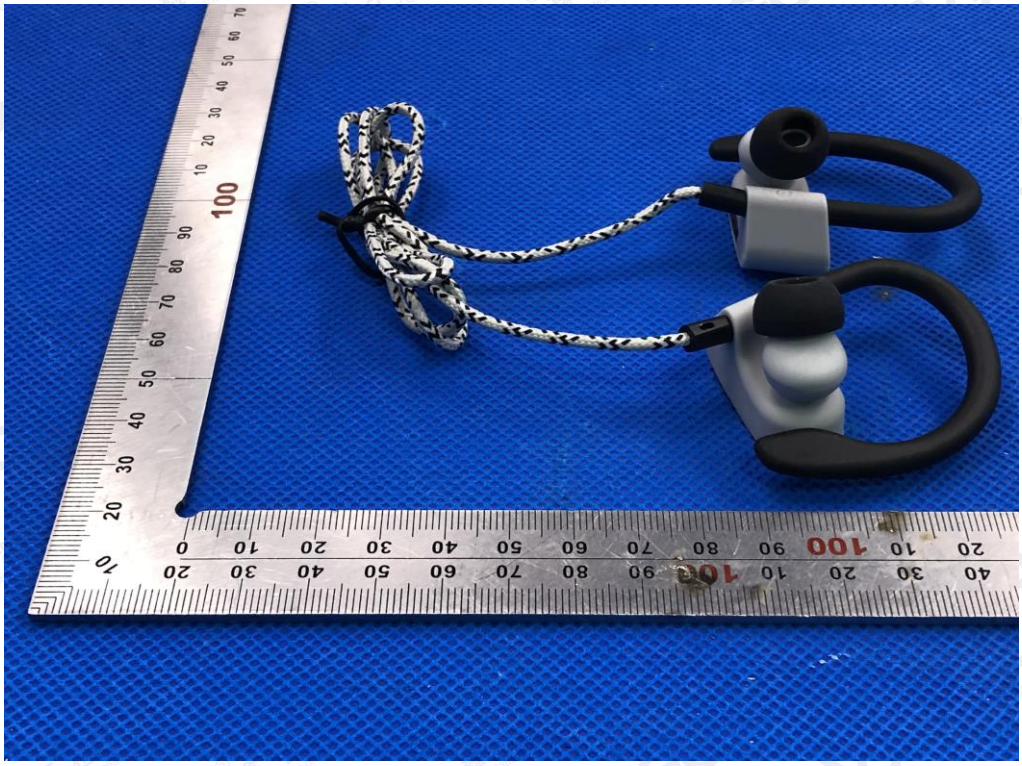
LEFT VIEW OF EUT



RIGHT VIEW OF EUT



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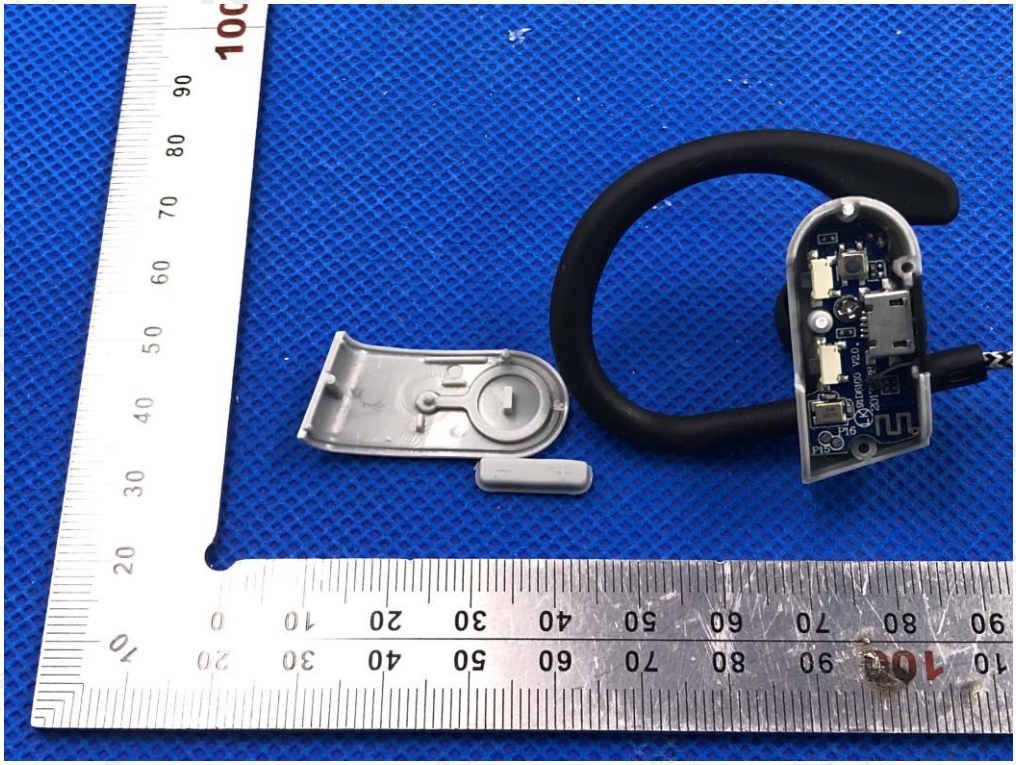
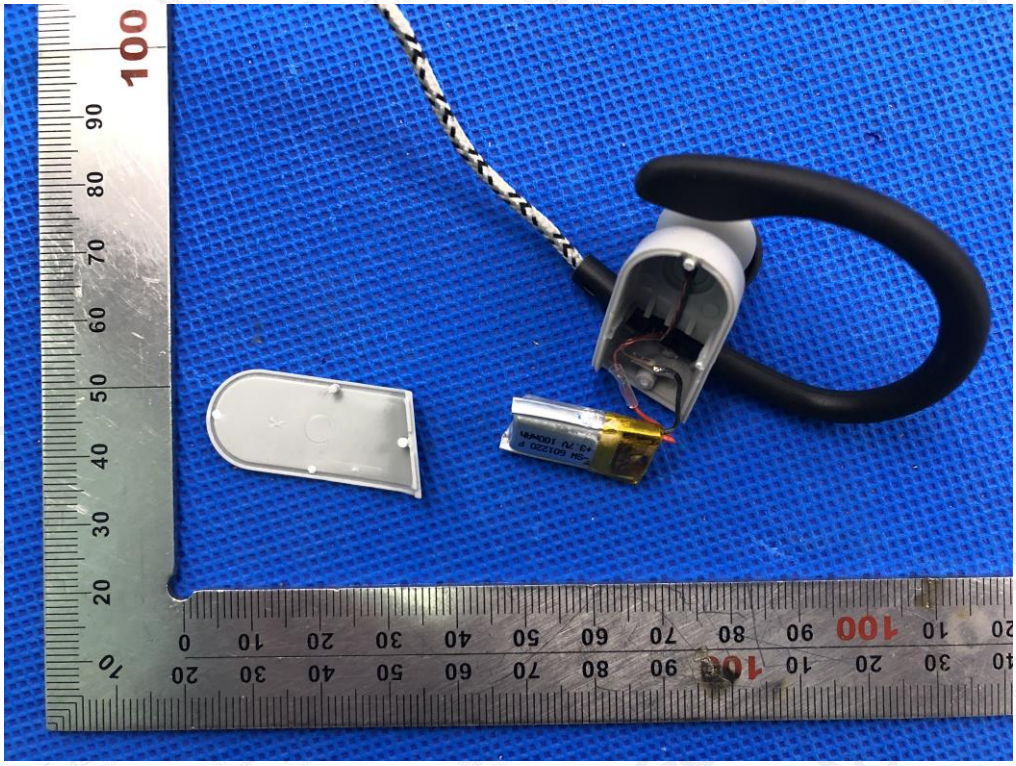
OPEN VIEW OF EUT-1



OPEN VIEW OF EUT-2



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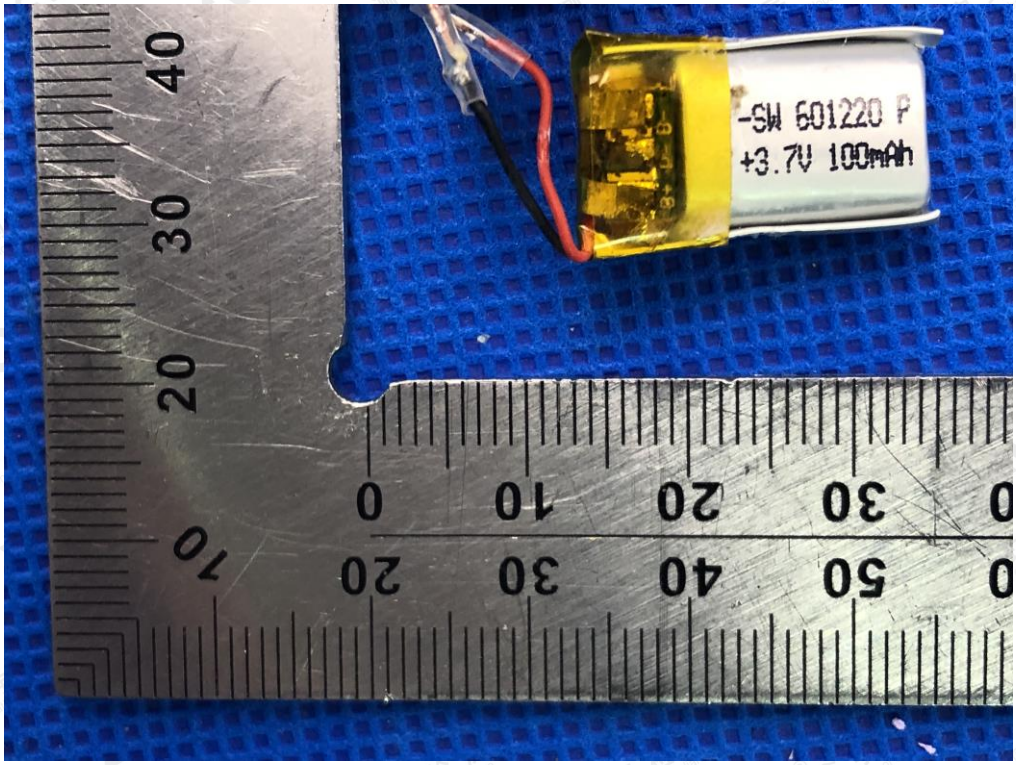
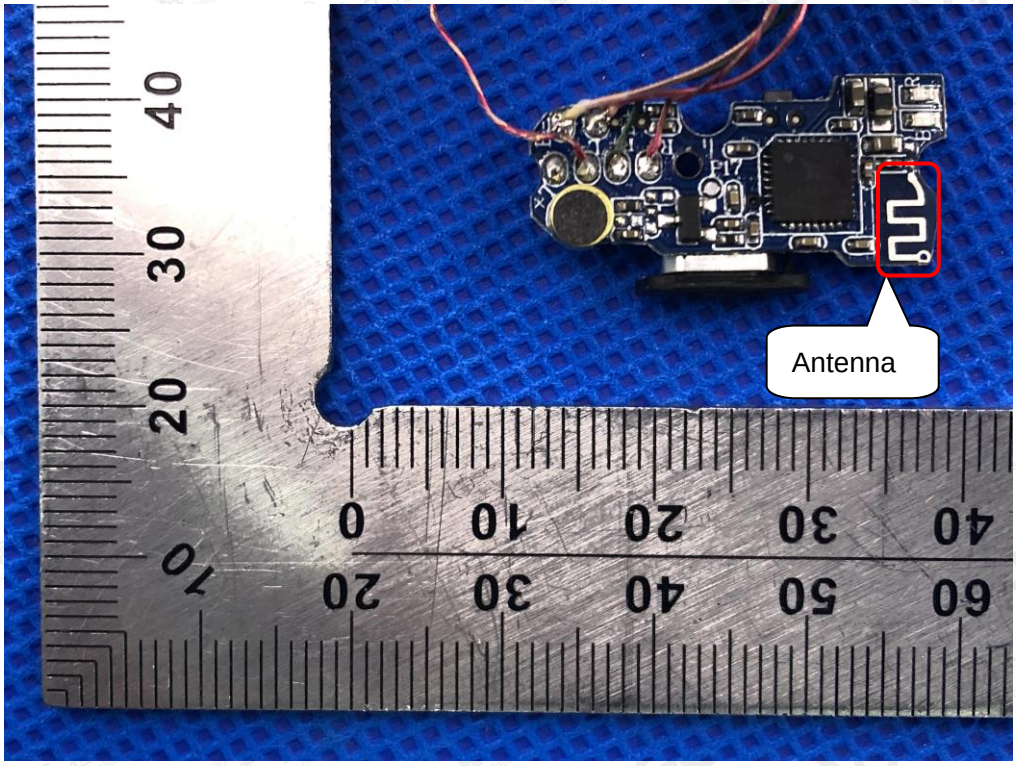
VIEW OF BATTERY



INTERNAL VIEW OF EUT-1



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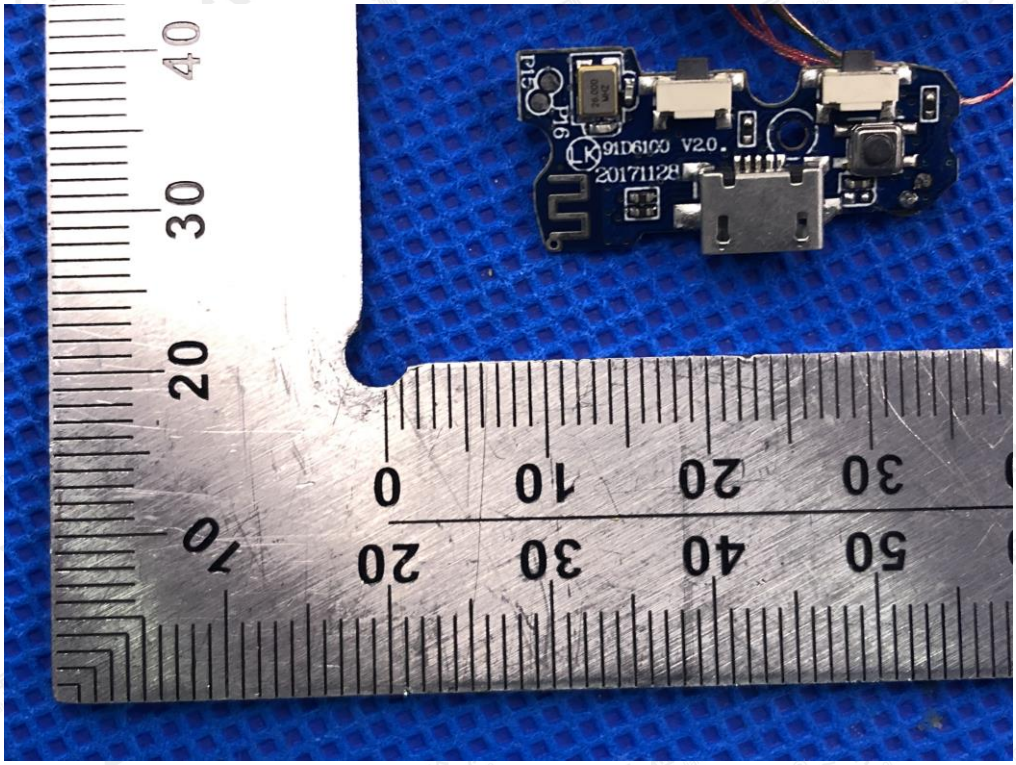
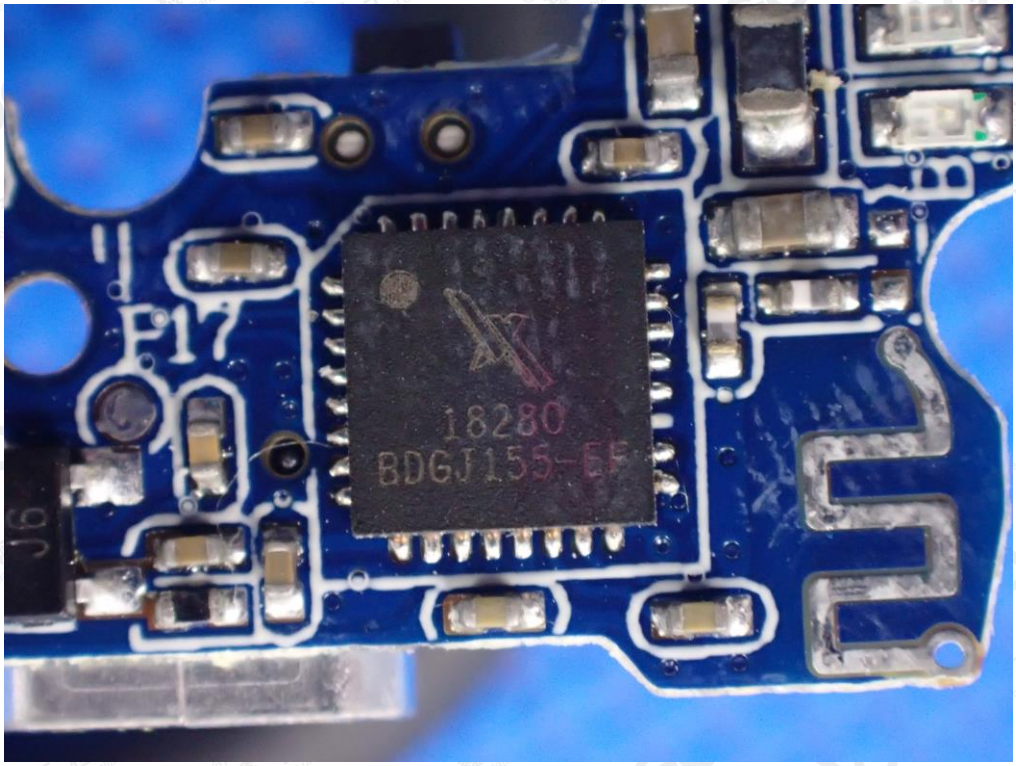
INTERNAL VIEW OF EUT-2



INTERNAL VIEW OF EUT-3



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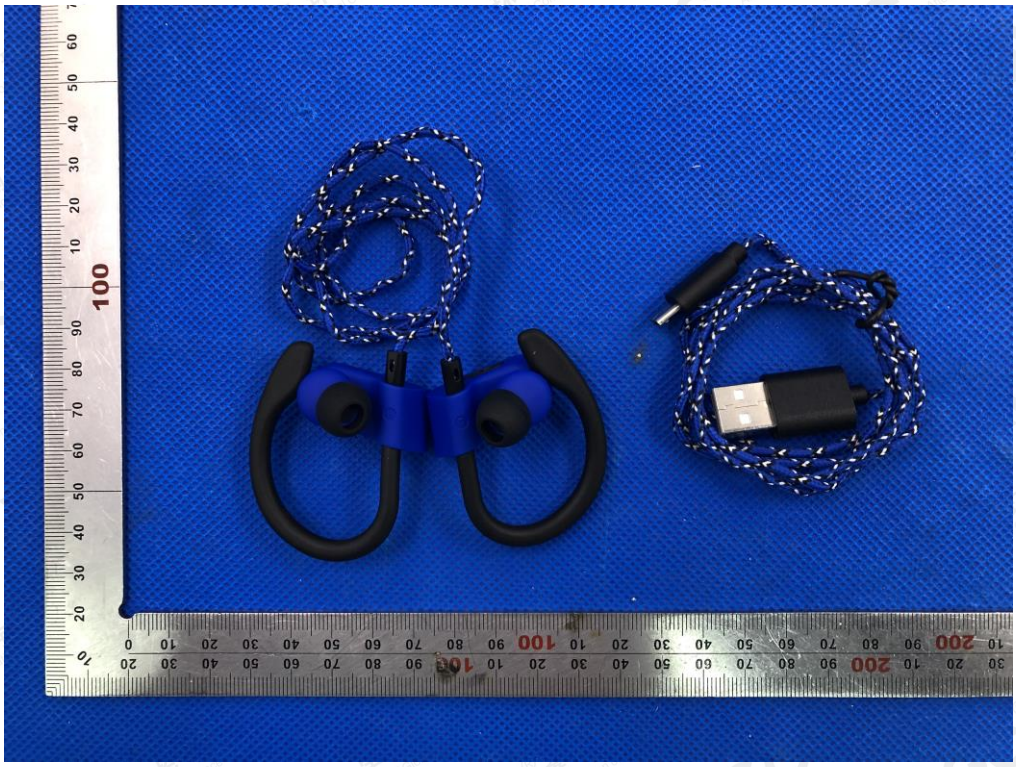
Other color samples

TOTAL VIEW OF EUT



----END OF REPORT----

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