

TEST REPORT

Product : Biometric Monitor
Trade mark : BodyPlus
Model/Type reference : Aero S02
Serial Number : N/A
Report Number : EED32J00172101
FCC ID : 2ANCC-BE1602SZ
Date of Issue : Aug. 16, 2017
Test Standards : 47 CFR Part 15Subpart C
Test result : PASS

Prepared for:

BodyPlus Technology Co.,Ltd
1st Floor, No.5 Wing Building, Maximilian Hotel,
Beiyuan East Road, Chaoyang District, Beijing

Prepared by:

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Date:

Aug. 16, 2017

Check No.: 3096399066



2 Version

Version No.	Date	Description
00	Aug. 16, 2017	Original

3 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15Subpart C Section 15.203/15.247 (c)	ANSI C63.10-2013	PASS
AC Power Line Conducted Emission	47 CFR Part 15Subpart C Section 15.207	ANSI C63.10-2013	PASS
Conducted Peak Output Power	47 CFR Part 15Subpart C Section 15.247 (b)(3)	ANSI C63.10-2013/ KDB 558074 D01v04	PASS
6dB Occupied Bandwidth	47 CFR Part 15Subpart C Section 15.247 (a)(2)	ANSI C63.10-2013/ KDB 558074 D01v04	PASS
Power Spectral Density	47 CFR Part 15Subpart C Section 15.247 (e)	ANSI C63.10-2013/ KDB 558074 D01v04	PASS
Band-edge for RF Conducted Emissions	47 CFR Part 15Subpart C Section 15.247(d)	ANSI C63.10-2013/ KDB 558074 D01v04	PASS
RF Conducted Spurious Emissions	47 CFR Part 15Subpart C Section 15.247(d)	ANSI C63.10-2013/ KDB 558074 D01v04	PASS
Radiated Spurious Emissions	47 CFR Part 15Subpart C Section 15.205/15.209	ANSI C63.10-2013	PASS
Restricted bands around fundamental frequency (Radiated Emission)	47 CFR Part 15Subpart C Section 15.205/15.209	ANSI C63.10-2013	PASS

Remark:

1. Test according to ANSI C63.4-2014 & ANSI C63.10-2013.
2. The tests include Aero S02 female sportswear and Aero S02 male sportswear which are supplied by client.

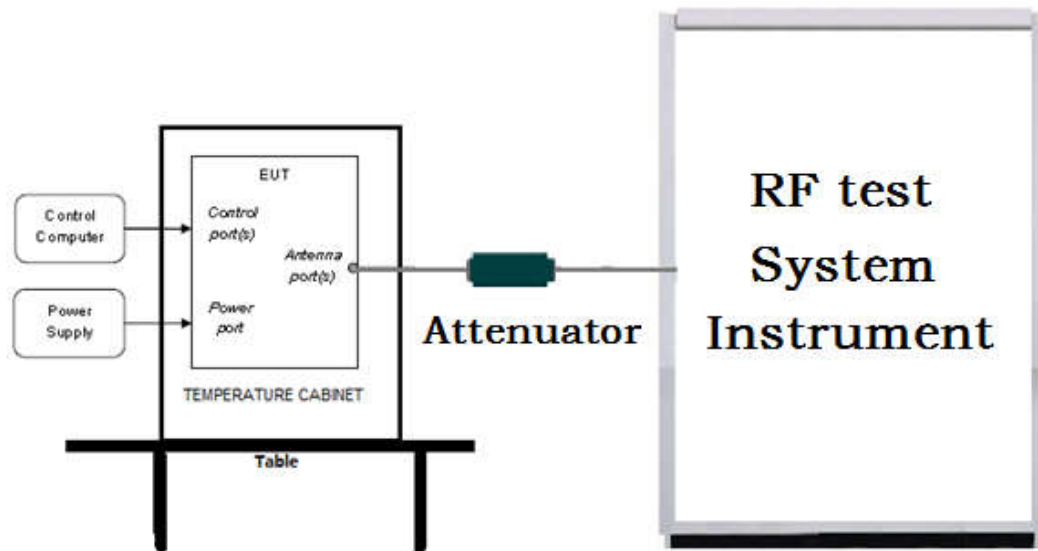
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5 Test Requirement

5.1 Test setup

5.1.1 For Conducted test setup



5.1.2 For Radiated Emissions test setup

Radiated Emissions setup:

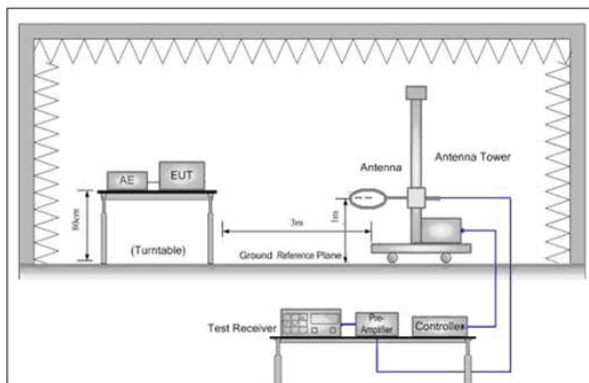


Figure 1. Below 30MHz

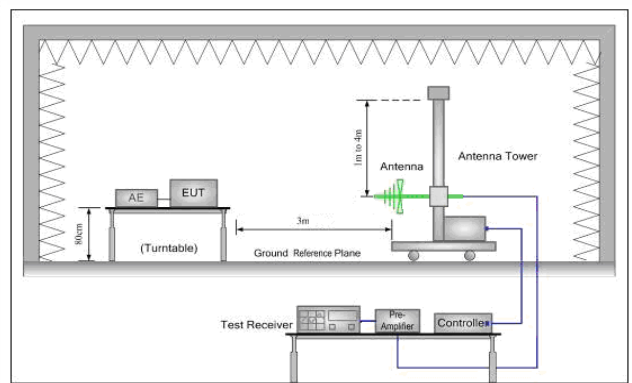


Figure 2. 30MHz to 1GHz

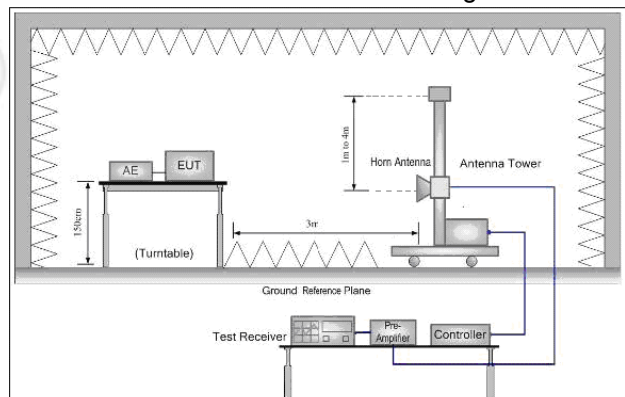
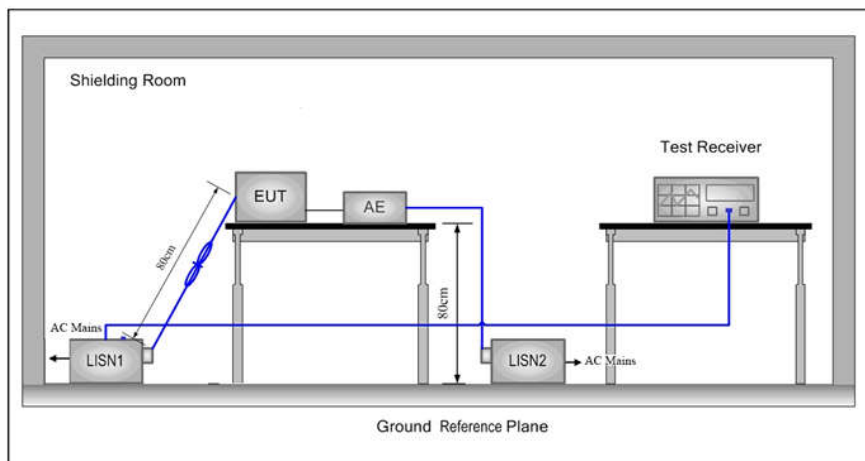


Figure 3. Above 1GHz

5.1.3 For Conducted Emissions test setup

Conducted Emissions setup



5.2 Test Environment

Operating Environment:	
Temperature:	26.2 °C
Humidity:	58 % RH
Atmospheric Pressure:	1010mbar

5.3 Test Condition

Test channel:

Test Mode	Tx/Rx	RF Channel		
		Low(L)	Middle(M)	High(H)
GFSK	2402MHz ~2480 MHz	Channel 1	Channel 20	Channel 40
		2402MHz	2440MHz	2480MHz
Transmitting mode:	The EUT transmitted the continuous signal at the specific channel(s).			

6 General Information

6.1 Client Information

Applicant:	BodyPlus Technology Co.,Ltd
Address of Applicant:	1st Floor, No.5 Wing Building, Maximilian Hotel, Beiyuan East Road, Chaoyang District, Beijing
Manufacturer:	BodyPlus Technology Co.,Ltd
Address of Manufacturer:	1st Floor, No.5 Wing Building, Maximilian Hotel, Beiyuan East Road, Chaoyang District, Beijing
Factory:	Shenzhen Q&D Circuits Co., Ltd
Address of Factory:	Block A1, Fufa Industrial Park, Fuyong, Baoan, Shenzhen, China

6.2 General Description of EUT

Product Name:	Biometric Monitor
Model No.(EUT):	Aero S02
Trade mark:	BodyPlus
EUT Supports Radios application:	BT4.0 Single Mode, 2402MHz-2480MHz
Power Supply:	Battery: 3.7V/70mAh Supply by DC 5V
Sample Received Date:	Aug. 8, 2017
Sample tested Date:	Aug. 8, 2017 to Aug. 16, 2017

6.3 Product Specification subjective to this standard

Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	4.0
Modulation Technique:	DSSS
Modulation Type:	GFSK
Number of Channel:	40
Test Power Grade:	2 (manufacturer declare)
Test Software of EUT:	nRF Studio V1.20.0.2 (manufacturer declare)
Hardware Version	0.6 (manufacturer declare)
Software Version	0.24 (manufacturer declare)
Antenna Type and Gain:	PCB Antenna and 3.3 dBi
Test Voltage:	AC 120V, 60Hz

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2402MHz	11	2422MHz	21	2442MHz	31	2462MHz
2	2404MHz	12	2424MHz	22	2444MHz	32	2464MHz
3	2406MHz	13	2426MHz	23	2446MHz	33	2466MHz
4	2408MHz	14	2428MHz	24	2448MHz	34	2468MHz
5	2410MHz	15	2430MHz	25	2450MHz	35	2470MHz
6	2412MHz	16	2432MHz	26	2452MHz	36	2472MHz
7	2414MHz	17	2434MHz	27	2454MHz	37	2474MHz
8	2416MHz	18	2436MHz	28	2456MHz	38	2476MHz
9	2418MHz	19	2438MHz	29	2458MHz	39	2478MHz
10	2420MHz	20	2440MHz	30	2460MHz	40	2480MHz

6.4 Description of Support Units

The EUT has been tested with associated equipment below.

Associated equipment name		Manufacture	model	S/N serial number	Supplied by
AE1	AC Adapter	AK	AK12WG-0500200UU	N/A	CTI

6.5 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd.

Hongwei Industrial Zone, Bao'an 70 District, Shenzhen, Guangdong, China 518101

Telephone: +86 (0) 755 33683668 Fax: +86 (0) 755 33683385

No tests were sub-contracted.

6.6 Deviation from Standards

None.

6.7 Abnormalities from Standard Conditions

None.

6.8 Other Information Requested by the Customer

None.

6.9 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.9×10^{-8}
2	RF power, conducted	0.31dB (30MHz-1GHz)
		0.57dB (1GHz-18GHz)
3	Radiated Spurious emission test	4.5dB (30MHz-1GHz)
		4.8dB (1GHz-12.75GHz)
4	Conduction emission	3.6dB (9kHz to 150kHz)
		3.2dB (150kHz to 30MHz)
5	Temperature test	0.64°C
6	Humidity test	2.8%
7	DC power voltages	0.025%

7 Equipment List

RF test system					
Equipment	Manufacturer	Model No.	Serial Number	Cal. Date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
Signal Generator	Keysight	E8257D	MY53401106	03-14-2017	03-13-2018
Communication test set test set	Agilent	N4010A	MY51400230	03-14-2017	03-13-2018
Spectrum Analyzer	Keysight	N9010A	MY54510339	03-14-2017	03-13-2018
Signal Generator	Keysight	N5182B	MY53051549	03-14-2017	03-13-2018
High-pass filter(3-18GHz)	Sinoscite	FL3CX03WG18 NM12-0398-002	---	01-11-2017	01-10-2018
High-pass filter(6-18GHz)	MICRO-TRONICS	SPA-F-63029-4	---	01-11-2017	01-10-2018
band rejection filter (GSM900)	Sinoscite	FL5CX01CA09C L12-0395-001	---	01-11-2017	01-10-2018
band rejection filter (GSM850)	Sinoscite	FL5CX01CA08C L12-0393-001	---	01-11-2017	01-10-2018
band rejection filter (GSM1800)	Sinoscite	FL5CX02CA04C L12-0396-002	---	01-11-2017	01-10-2018
band rejection filter (GSM1900)	Sinoscite	FL5CX02CA03C L12-0394-001	---	01-11-2017	01-10-2018
DC Power	Keysight	E3642A	MY54436035	03-14-2017	03-13-2018
PC-1	Lenovo	R4960d	---	04-01-2017	03-31-2018
BT&WI-FI Automatic control	R&S	OSP120	101374	03-14-2017	03-13-2018
RF control unit	JS Tonscend	JS0806-2	158060006	03-14-2017	03-13-2018
BT&WI-FI Automatic test software	JS Tonscend	JS1120-2	---	03-14-2017	03-13-2018

3M Semi/full-anechoic Chamber					
Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
3M Chamber & Accessory Equipment	TDK	SAC-3	---	06-05-2016	06-05-2019
TRILOG Broadband Antenna	SCHWARZBEC K	VULB9163	9163-484	05-23-2017	05-22-2018
Microwave Preamplifier	Agilent	8449B	3008A02425	02-16-2017	02-15-2018
Horn Antenna	ETS-LINDGREN	3117	00057407	07-20-2015	07-18-2018
Loop Antenna	ETS	6502	00071730	07-30-2016	07-28-2018
Microwave Preamplifier	A.H.SYSTEMS	PAP-1840-60	6041.6042	06-30-2015	06-28-2018
Horn Antenna	A.H.SYSTEMS	SAS-574 374	---	06-30-2015	06-28-2018
Spectrum Analyzer	R&S	FSP40	100416	06-13-2017	06-12-2018
Receiver	R&S	ESCI	100435	06-14-2017	06-13-2018
Multi device Controller	maturo	NCD/070/10711 112	---	01-11-2017	01-10-2018
LISN	schwarzbeck	NNBM8125	81251547	06-13-2017	06-12-2018
LISN	schwarzbeck	NNBM8125	81251548	06-13-2017	06-12-2018
Signal Generator	Agilent	E4438C	MY45095744	03-14-2017	03-13-2018
Signal Generator	Keysight	E8257D	MY53401106	03-14-2017	03-13-2018
Temperature/ Humidity Indicator	TAYLOR	1451	1905	05-08-2017	05-07-2018
Communication test set	Agilent	E5515C	GB47050534	03-14-2017	03-13-2018
Cable line	Fulai(7M)	SF106	5219/6A	01-11-2017	01-10-2018
Cable line	Fulai(6M)	SF106	5220/6A	01-11-2017	01-10-2018
Cable line	Fulai(3M)	SF106	5216/6A	01-11-2017	01-10-2018
Cable line	Fulai(3M)	SF106	5217/6A	01-11-2017	01-10-2018
Communication test set	R&S	CMW500	152394	03-14-2017	03-13-2018
High-pass filter(3-18GHz)	Sinoscite	FL3CX03WG18 NM12-0398-002	---	01-11-2017	01-10-2018
High-pass filter(6-18GHz)	MICRO-TRONICS	SPA-F-63029-4	---	01-11-2017	01-10-2018
band rejection filter	Sinoscite	FL5CX01CA09 CL12-0395-001	---	01-11-2017	01-10-2018
band rejection filter	Sinoscite	FL5CX01CA08 CL12-0393-001	---	01-11-2017	01-10-2018
band rejection filter	Sinoscite	FL5CX02CA04 CL12-0396-002	---	01-11-2017	01-10-2018
band rejection filter	Sinoscite	FL5CX02CA03 CL12-0394-001	---	01-11-2017	01-10-2018

Conducted disturbance Test					
Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
Receiver	R&S	ESCI	100009	06-14-2017	06-13-2018
Temperature/ Humidity Indicator	TAYLOR	1451	1905	05-08-2017	05-07-2018
Communication test set	Agilent	E5515C	GB47050534	03-14-2017	03-13-2018
Communication test set	R&S	CMW500	152394	03-14-2017	03-13-2018
LISN	R&S	ENV216	100098	06-13-2017	06-12-2018
LISN	schwarzbeck	NNLK8121	8121-529	06-13-2017	06-12-2018
Voltage Probe	R&S	ESH2-Z3	--	06-13-2017	06-11-2020
Current Probe	R&S	EZ17	100106	06-13-2017	06-12-2018
ISN	TESEQ GmbH	ISN T800	30297	02-23-2017	02-22-2018

8 Radio Technical Requirements Specification

Reference documents for testing:

No.	Identity	Document Title
1	FCC Part15C	Subpart C-Intentional Radiators
2	ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices

Test Results List:

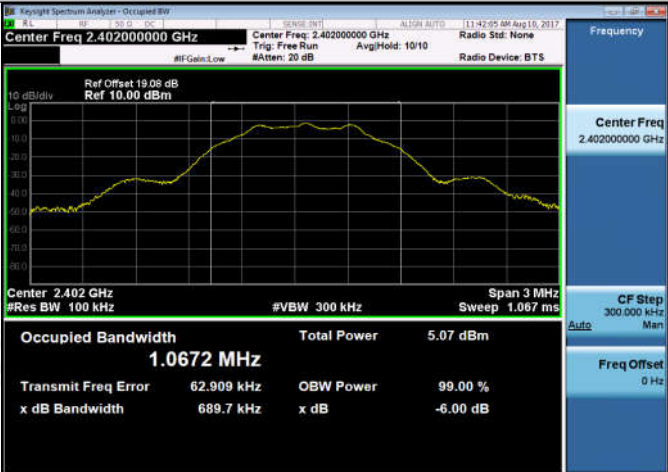
Test Requirement	Test method	Test item	Verdict	Note
Part15C Section 15.247 (a)(2)	ANSI C63.10	6dB Occupied Bandwidth	PASS	Appendix A)
Part15C Section 15.247 (b)(3)	ANSI C63.10	Conducted Peak Output Power	PASS	Appendix B)
Part15C Section 15.247(d)	ANSI C63.10	Band-edge for RF Conducted Emissions	PASS	Appendix C)
Part15C Section 15.247(d)	ANSI C63.10	RF Conducted Spurious Emissions	PASS	Appendix D)
Part15C Section 15.247 (e)	ANSI C63.10	Power Spectral Density	PASS	Appendix E)
Part15C Section 15.203/15.247 (c)	ANSI C63.10	Antenna Requirement	PASS	Appendix F)
Part15C Section 15.207	ANSI C63.10	AC Power Line Conducted Emission	PASS	Appendix G)
Part15C Section 15.205/15.209	ANSI C63.10	Restricted bands around fundamental frequency (Radiated Emission)	PASS	Appendix H)
Part15C Section 15.205/15.209	K ANSI C63.10	Radiated Spurious Emissions	PASS	Appendix I)

Appendix A): 6dB Occupied Bandwidth

Test Result

Mode	Channel	6dB Bandwidth [MHz]	99% OBW[MHz]	Verdict
BLE	LCH	0.6897	1.0672	PASS
BLE	MCH	0.6905	1.0738	PASS
BLE	HCH	0.6998	1.0760	PASS

Test Graphs

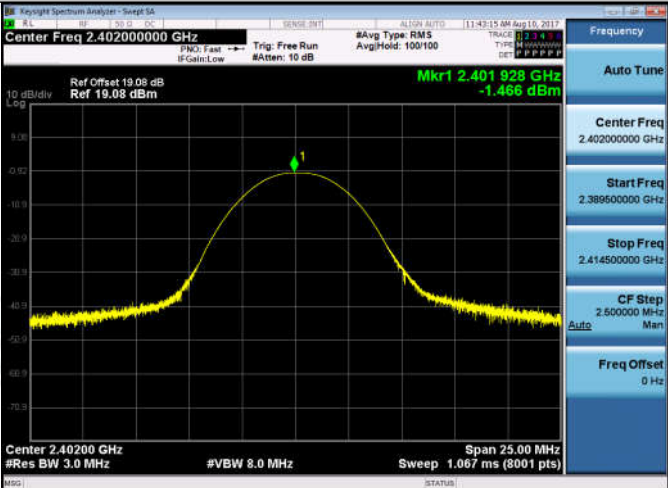
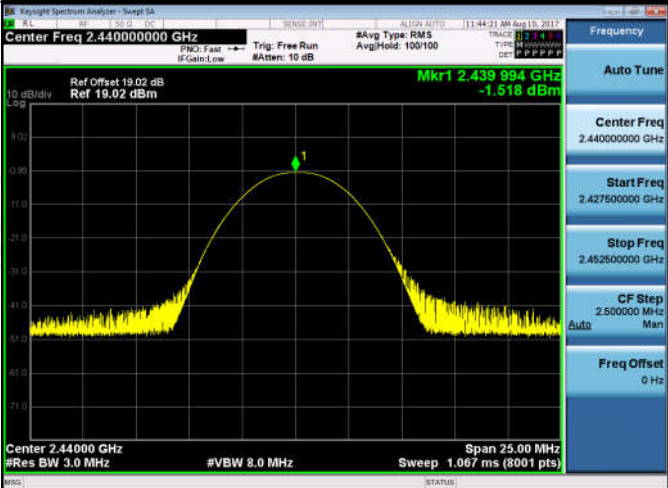
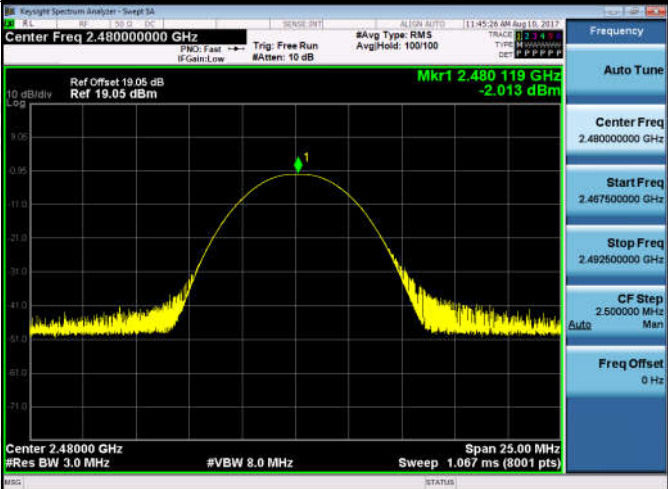
Graphs	
LCH	 Keygraph Spectrum Analyzer - Occupied BW Center Freq 2.402000000 GHz Ref Offset 19.08 dB Ref 10.00 dBm Center 2.402 GHz #Res BW 100 kHz Span 3 MHz #VBW 300 kHz Sweep 1.067 ms Occupied Bandwidth 1.0672 MHz Total Power 5.07 dBm Transmit Freq Error 62.909 kHz OBW Power 99.00 % x dB Bandwidth 689.7 kHz x dB -6.00 dB
MCH	 Keygraph Spectrum Analyzer - Occupied BW Center Freq 2.440000000 GHz Ref Offset 19.02 dB Ref 29.02 dBm Center 2.44 GHz #Res BW 100 kHz Span 3 MHz #VBW 300 kHz Sweep 1.067 ms Occupied Bandwidth 1.0738 MHz Total Power 4.99 dBm Transmit Freq Error 63.950 kHz OBW Power 99.00 % x dB Bandwidth 690.5 kHz x dB -6.00 dB
HCH	 Keygraph Spectrum Analyzer - Occupied BW Center Freq 2.480000000 GHz Ref Offset 19.05 dB Ref 29.05 dBm Center 2.48 GHz #Res BW 100 kHz Span 3 MHz #VBW 300 kHz Sweep 1.067 ms Occupied Bandwidth 1.0760 MHz Total Power 4.51 dBm Transmit Freq Error 65.439 kHz OBW Power 99.00 % x dB Bandwidth 699.8 kHz x dB -6.00 dB

Appendix B): Conducted Peak Output Power

Test Result

Mode	Channel	Conduct Peak Power[dBm]	Verdict	Remark
BLE	LCH	-1.466	PASS	RMS detector
BLE	MCH	-1.518	PASS	
BLE	HCH	-2.013	PASS	

Test Graphs

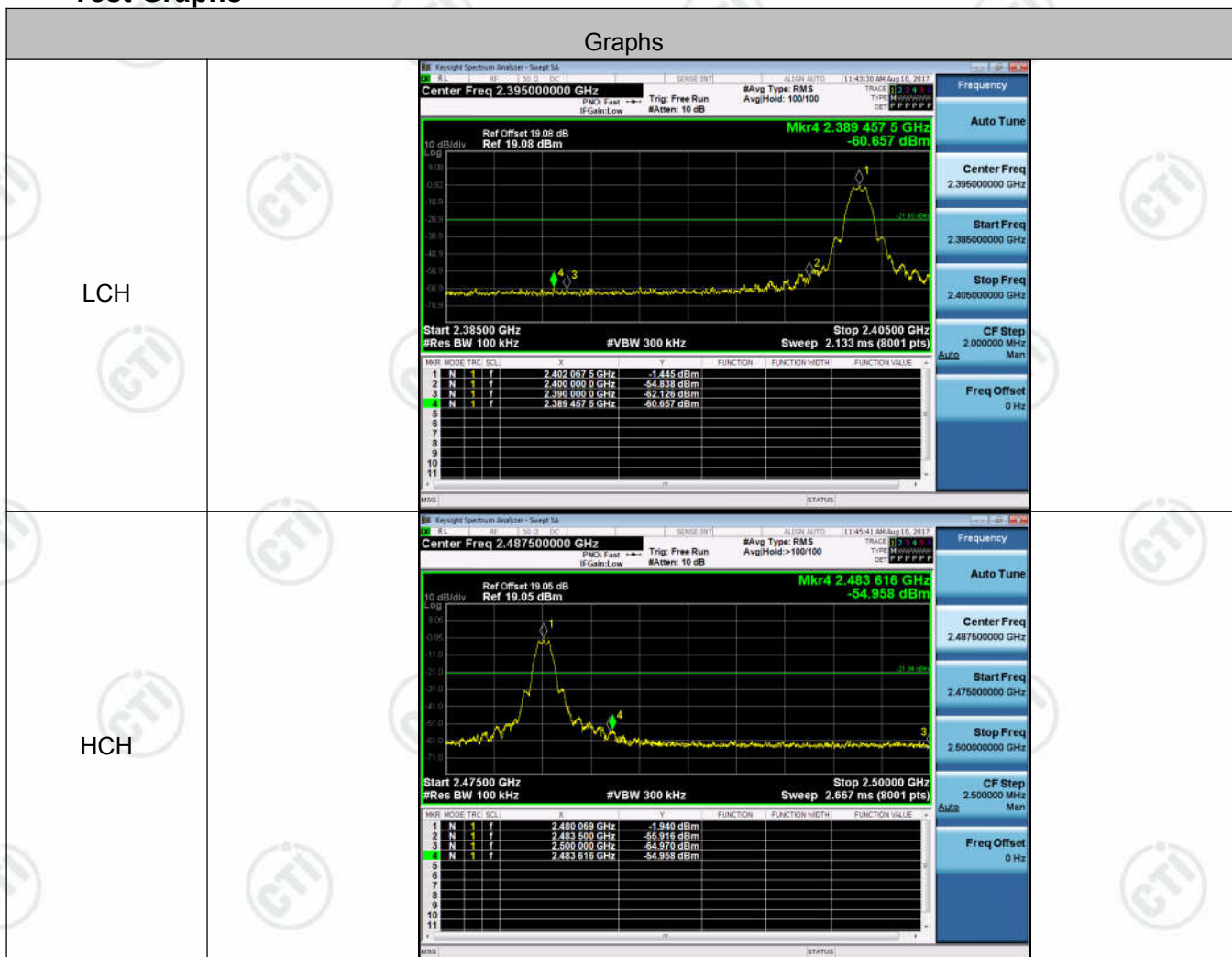
Graphs	
LCH	 Keygraph Spectrum Analyzer - Sweep SA Center Freq 2.402000000 GHz Ref Offset 19.08 dB Ref 19.08 dBm Mkr1 2.401 928 GHz -1.466 dBm Center 2.40200 GHz #Res BW 3.0 MHz #VBW 8.0 MHz Sweep 1.067 ms (8001 pts) Span 25.00 MHz
MCH	 Keygraph Spectrum Analyzer - Sweep SA Center Freq 2.440000000 GHz Ref Offset 19.02 dB Ref 19.02 dBm Mkr1 2.439 994 GHz -1.518 dBm Center 2.44000 GHz #Res BW 3.0 MHz #VBW 8.0 MHz Sweep 1.067 ms (8001 pts) Span 25.00 MHz
HCH	 Keygraph Spectrum Analyzer - Sweep SA Center Freq 2.480000000 GHz Ref Offset 19.05 dB Ref 19.05 dBm Mkr1 2.480 119 GHz -2.013 dBm Center 2.48000 GHz #Res BW 3.0 MHz #VBW 8.0 MHz Sweep 1.067 ms (8001 pts) Span 25.00 MHz

Appendix C): Band-edge for RF Conducted Emissions

Result Table

Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
BLE	LCH	-1.445	-60.657	-21.45	PASS
BLE	HCH	-1.940	-54.958	-21.94	PASS

Test Graphs

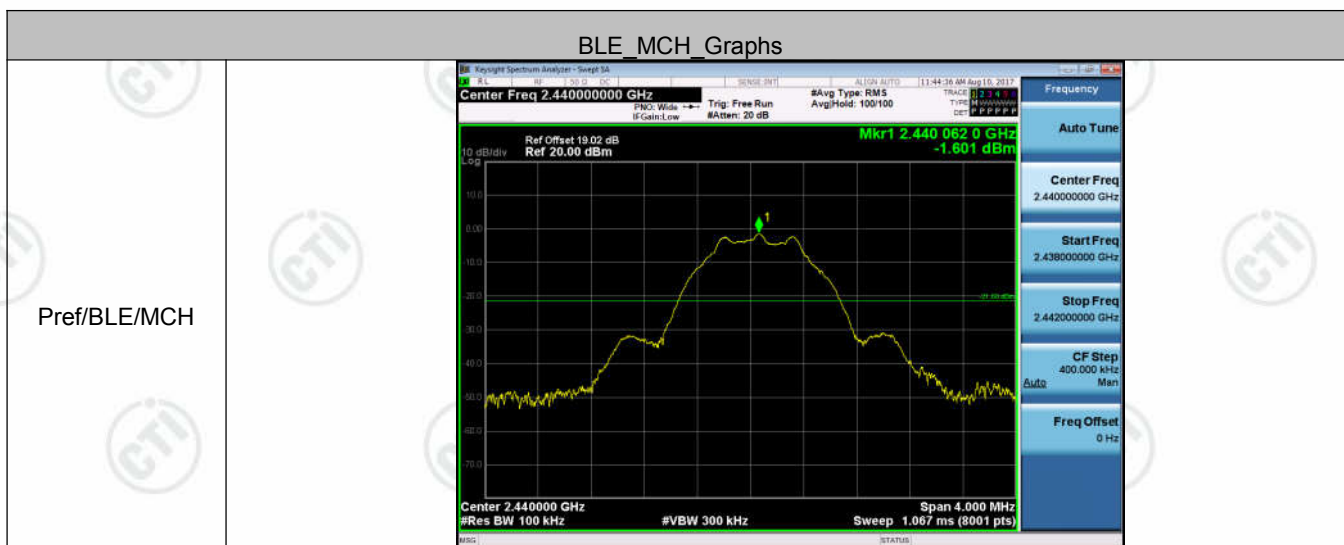
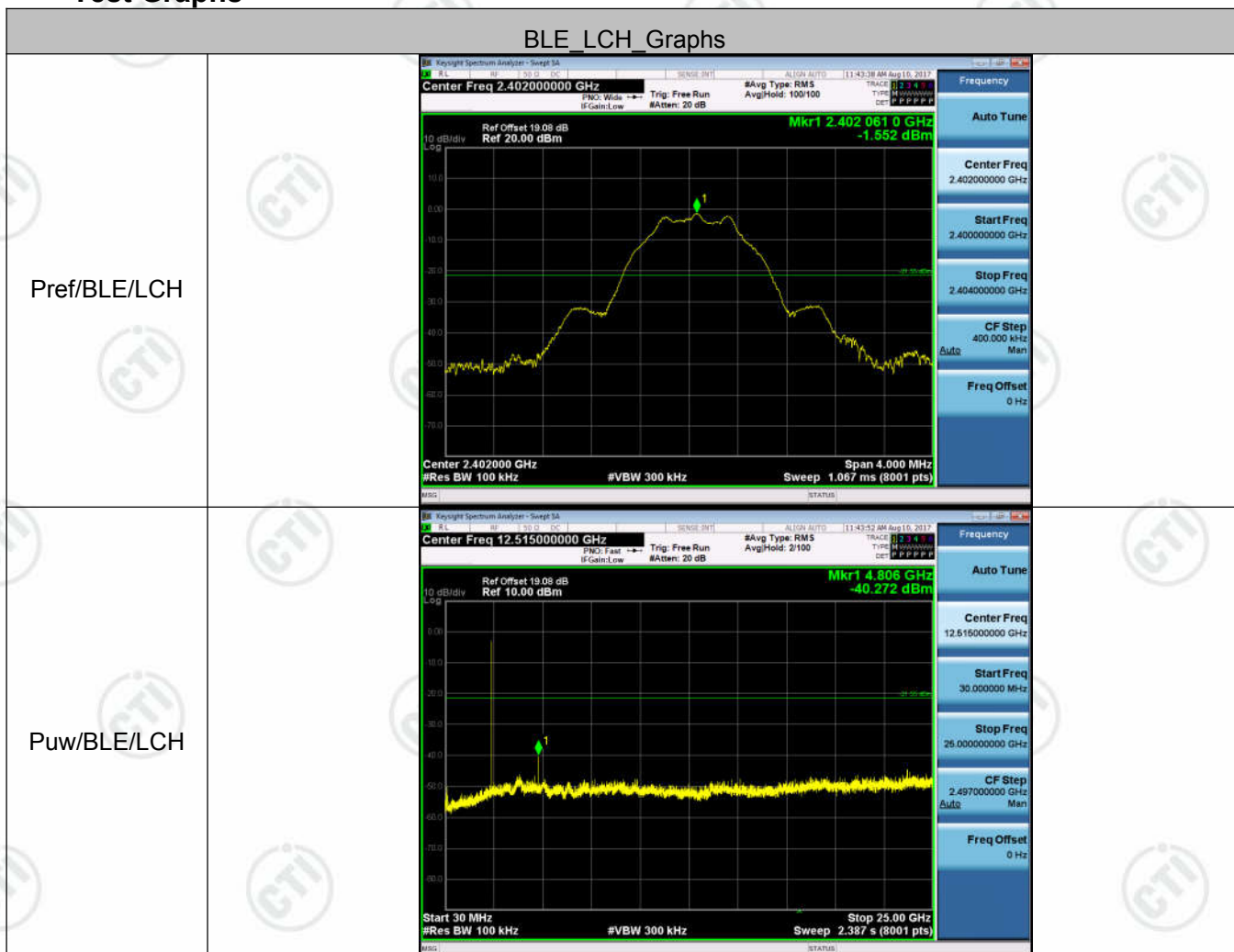


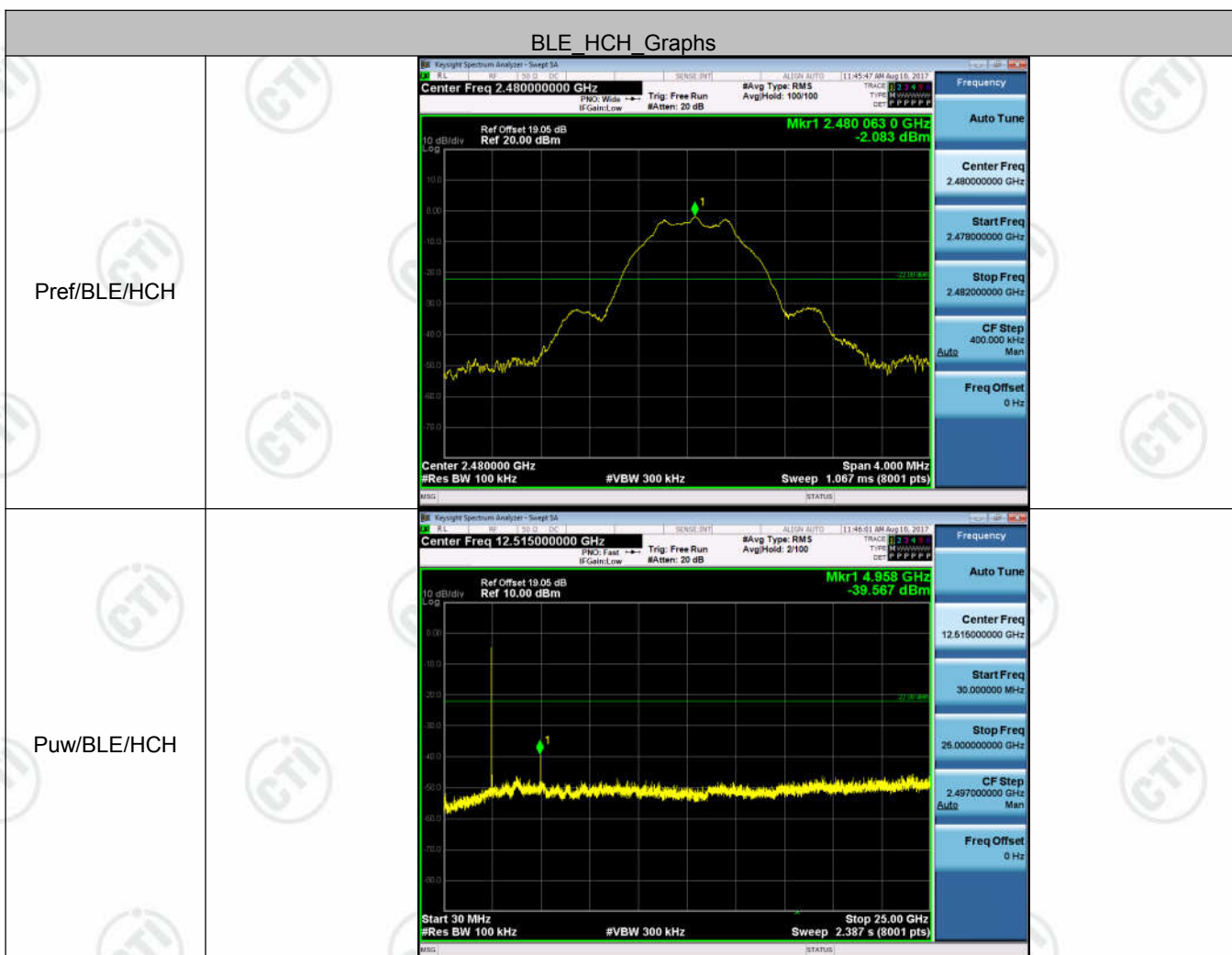
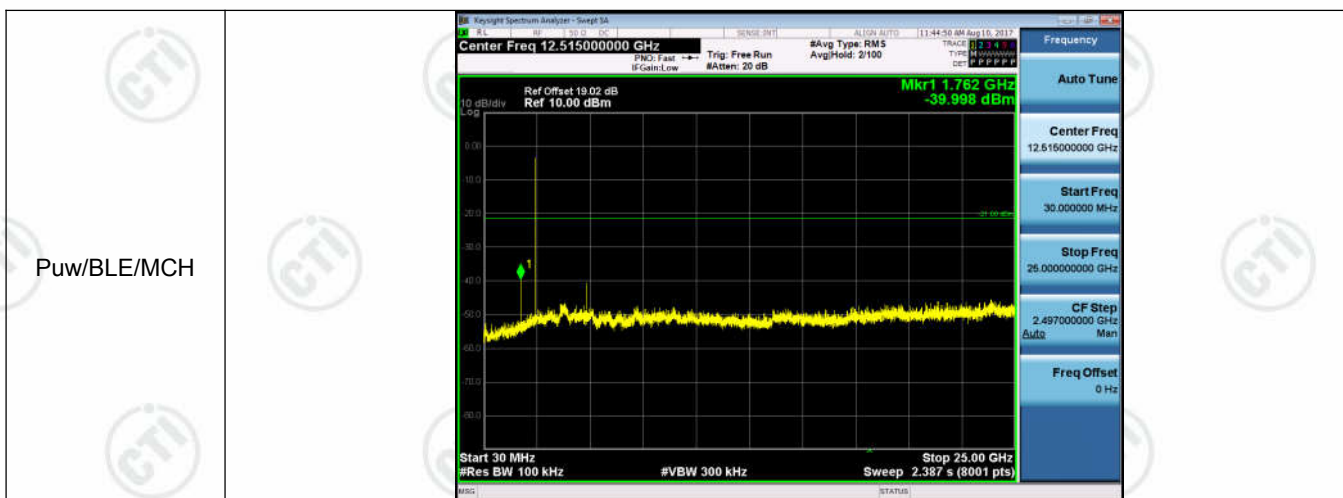
Appendix D): RF Conducted Spurious Emissions

Result Table

Mode	Channel	Pref [dBm]	Puw[dBm]	Verdict
BLE	LCH	-1.552	<Limit	PASS
BLE	MCH	-1.601	<Limit	PASS
BLE	HCH	-2.083	<Limit	PASS

Test Graphs



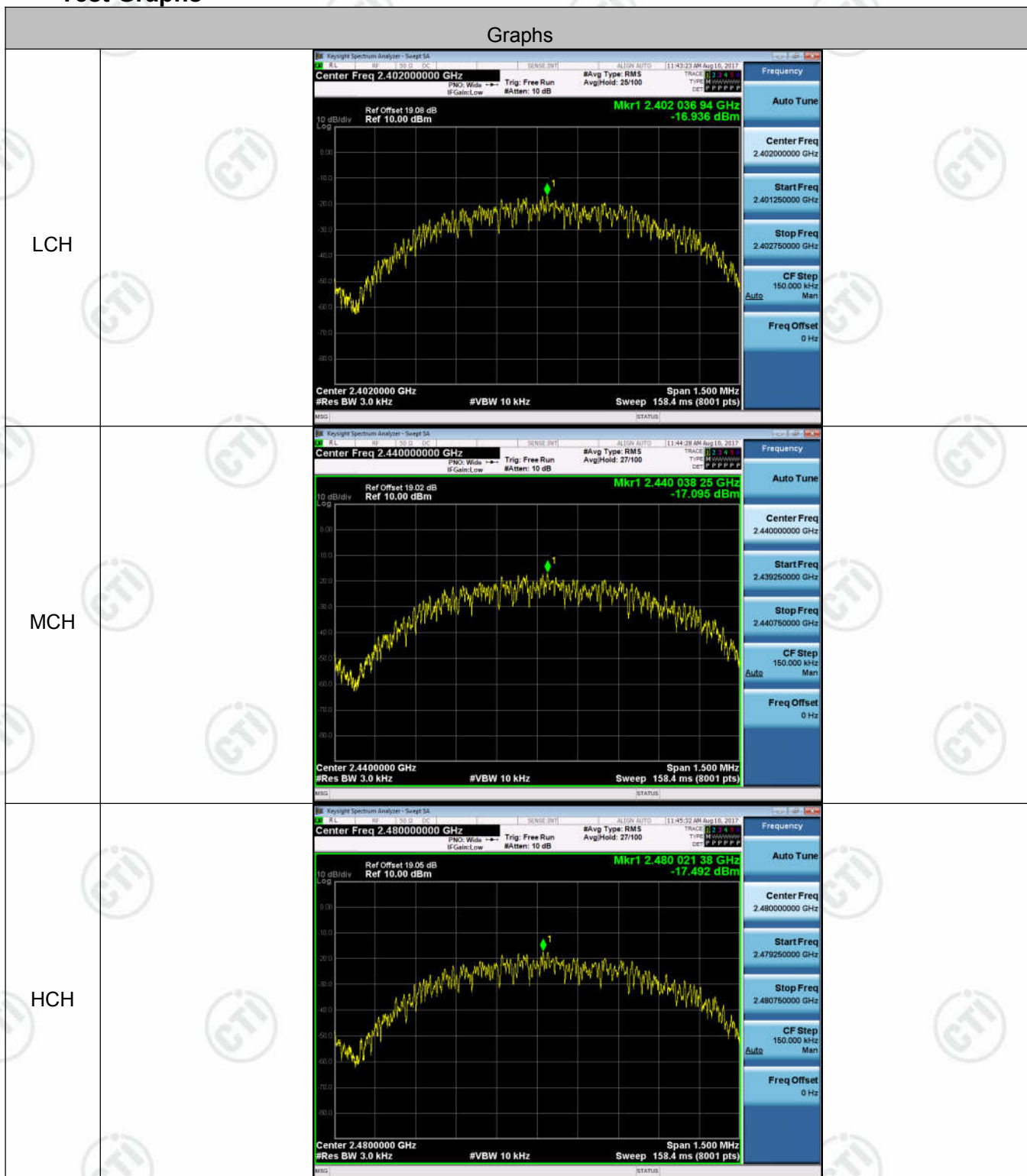


Appendix E): Power Spectral Density

Result Table

Mode	Channel	PSD [dBm/3kHz]	Limit [dBm/3kHz]	Verdict
BLE	LCH	-16.936	8	PASS
BLE	MCH	-17.095	8	PASS
BLE	HCH	-17.492	8	PASS

Test Graphs



Appendix F): Antenna Requirement

15.203 requirement:

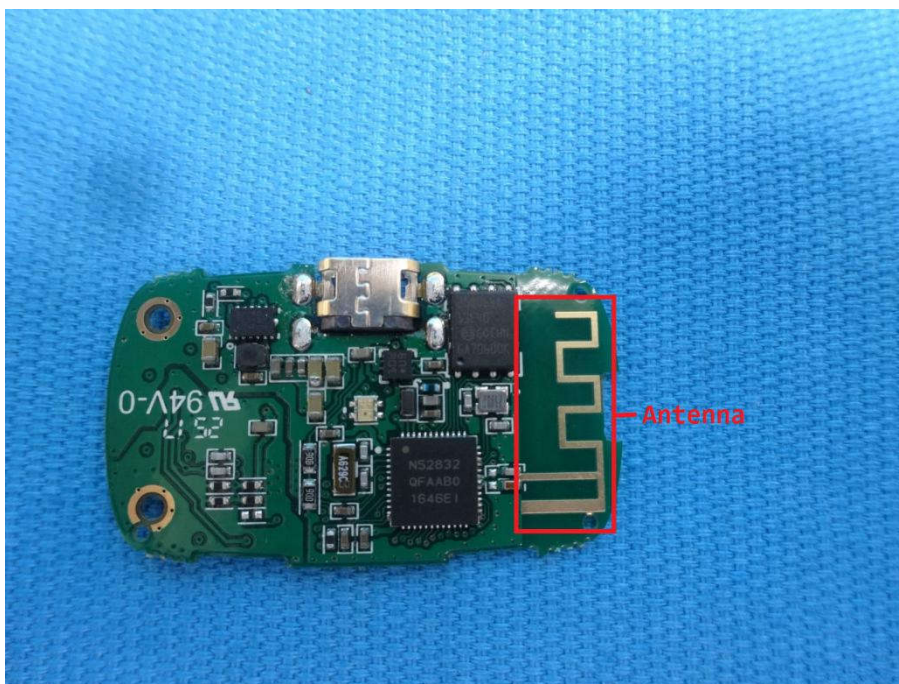
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

15.247(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

EUT Antenna:

The antenna is PCB antenna and no consideration of replacement. The best case gain of the antenna is 3.3dBi.



Appendix G): AC Power Line Conducted Emission

Test Procedure:	Test frequency range :150KHz-30MHz 1)The mains terminal disturbance voltage test was conducted in a shielded room. 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded. 3)The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2. 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.														
Limit:	<table><tr><th rowspan="2">Frequency range (MHz)</th><th colspan="2">Limit (dBμV)</th></tr><tr><th>Quasi-peak</th><th>Average</th></tr><tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr><tr><td>0.5-5</td><td>56</td><td>46</td></tr><tr><td>5-30</td><td>60</td><td>50</td></tr></table> * The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz. NOTE : The lower limit is applicable at the transition frequency	Frequency range (MHz)	Limit (dBμV)		Quasi-peak	Average	0.15-0.5	66 to 56*	56 to 46*	0.5-5	56	46	5-30	60	50
Frequency range (MHz)	Limit (dBμV)														
	Quasi-peak	Average													
0.15-0.5	66 to 56*	56 to 46*													
0.5-5	56	46													
5-30	60	50													

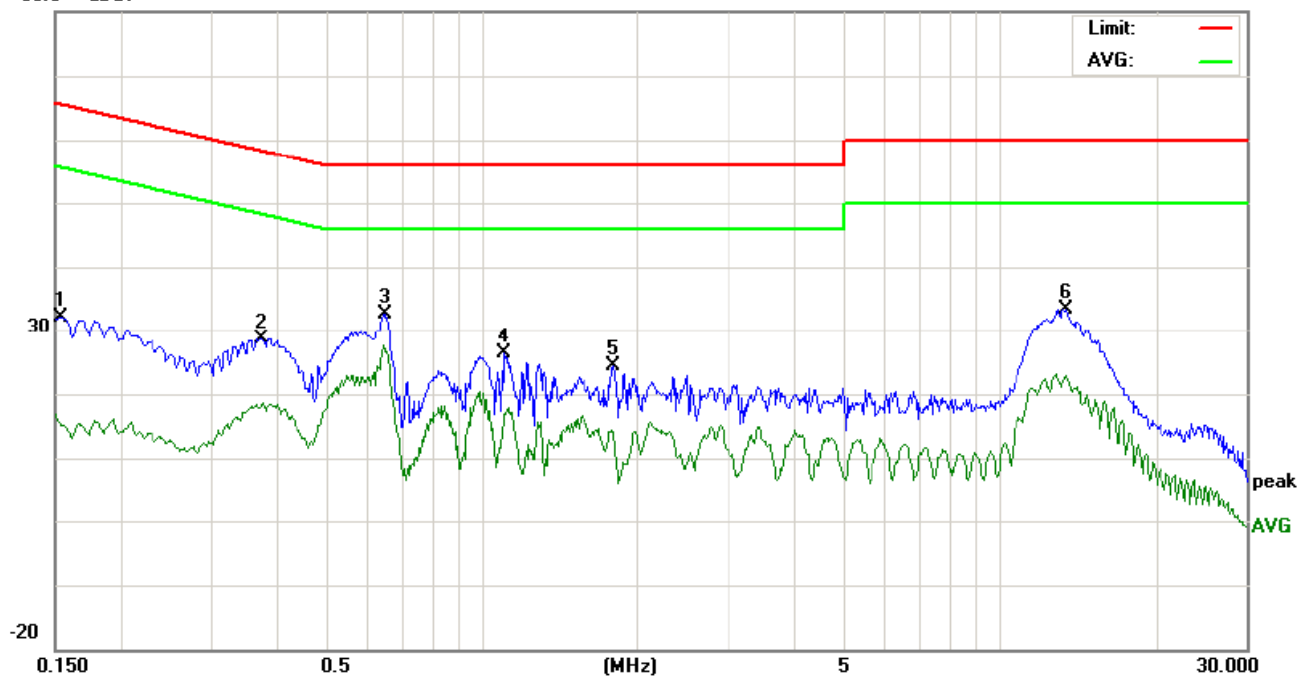
Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

Live line:

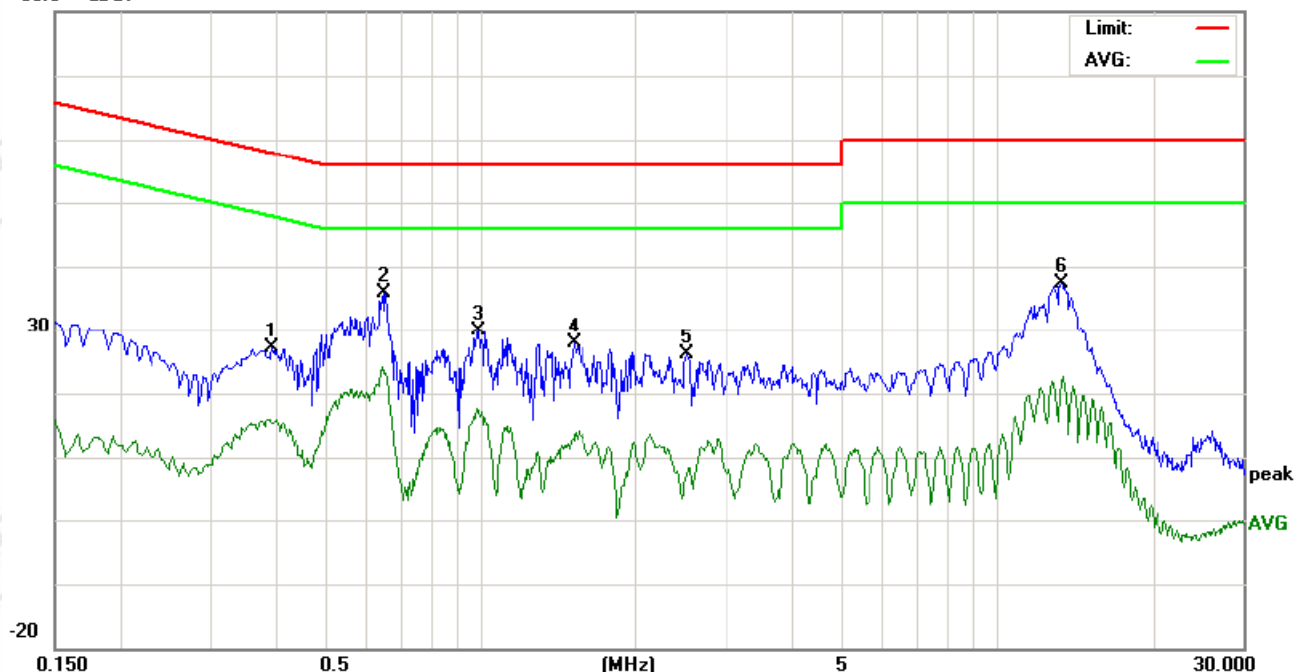
80.0 dBuV



No.	Freq. MHz	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1539	22.38	18.05	4.12	9.76	32.14	27.81	13.88	65.78	55.78	-37.97	-41.90	P	
2	0.3740	18.98	15.09	8.09	9.76	28.74	24.85	17.85	58.41	48.41	-33.56	-30.56	P	
3	0.6500	22.96	20.97	17.51	9.75	32.71	30.72	27.26	56.00	46.00	-25.28	-18.74	P	
4	1.1060	16.64	9.59	6.53	9.63	26.27	19.22	16.16	56.00	46.00	-36.78	-29.84	P	
5	1.8020	14.62	8.30	2.87	9.70	24.32	18.00	12.57	56.00	46.00	-38.00	-33.43	P	
6	13.4740	23.49	19.61	11.09	9.97	33.46	29.58	21.06	60.00	50.00	-30.42	-28.94	P	

Neutral line:

80.0 dBuV



No.	Freq. MHz	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		peak	QP	AVG	QP	AVG	QP	AVG		
1	0.3940	17.31	12.16	5.54	9.75	27.06	21.91	15.29	57.98	47.98	-36.07	-32.69	P	
2	0.6540	26.04	18.65	13.32	9.75	35.79	28.40	23.07	56.00	46.00	-27.60	-22.93	P	
3	0.9980	20.36	12.57	7.05	9.62	29.98	22.19	16.67	56.00	46.00	-33.81	-29.33	P	
4	1.5220	18.23	9.24	2.85	9.67	27.90	18.91	12.52	56.00	46.00	-37.09	-33.48	P	
5	2.5020	16.55	6.74	-3.87	9.70	26.25	16.44	5.83	56.00	46.00	-39.56	-40.17	P	
6	13.3380	27.32	22.32	8.61	9.97	37.29	32.29	18.58	60.00	50.00	-27.71	-31.42	P	

Notes:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.

Remark:

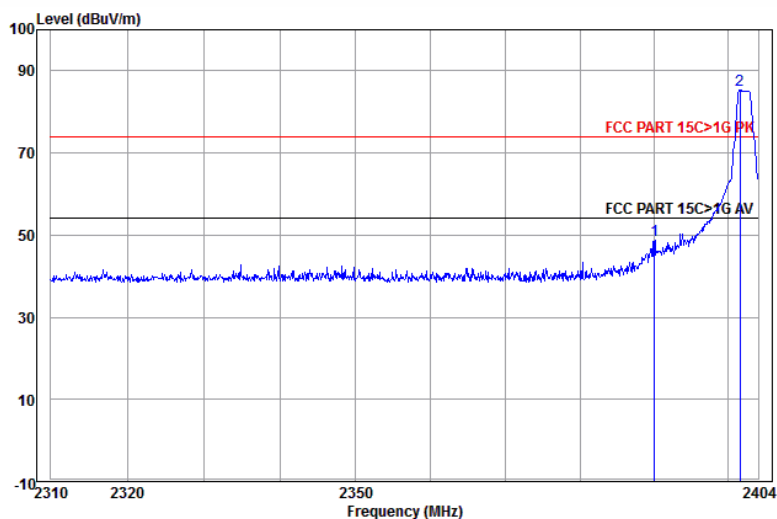
The Aero S02 female sportswear and Aero S02 male sportswear were tested and found the Aero S02 female sportswear was the worst case, only the worst data are reported.

Appendix H): Restricted bands around fundamental frequency (Radiated)

Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Peak	1MHz	10Hz	Average
Test Procedure:	Below 1GHz test procedure as below: - The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. - The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. - The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. - For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable was turned from 0 degrees to 360 degrees to find the maximum reading. - The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. - Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel Above 1GHz test procedure as below: - Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber change form table 0.8 meter to 1.5 meter(Above 18GHz the distance is 1 meter and table is 1.5 meter). . Test the EUT in the lowest channel , the Highest channel - The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is worse case. - Repeat above procedures until all frequencies measured was complete.				
Limit:	Frequency	Limit (dBμV/m @3m)		Remark	
	30MHz-88MHz	40.0		Quasi-peak Value	
	88MHz-216MHz	43.5		Quasi-peak Value	
	216MHz-960MHz	46.0		Quasi-peak Value	
	960MHz-1GHz	54.0		Quasi-peak Value	
	Above 1GHz	54.0		Average Value	
		74.0		Peak Value	

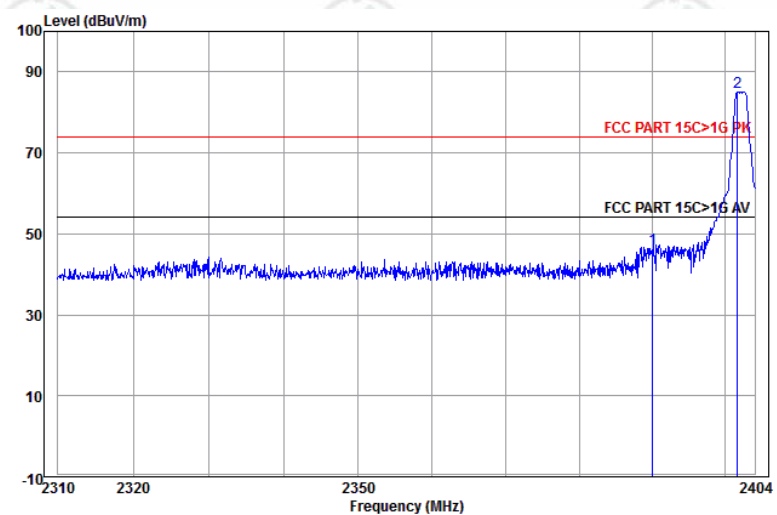
Test plot as follows:

Worse case mode:	GFSK		
Frequency: 2390.0MHz	Test channel: Lowest	Polarization: Horizontal	Remark: Peak



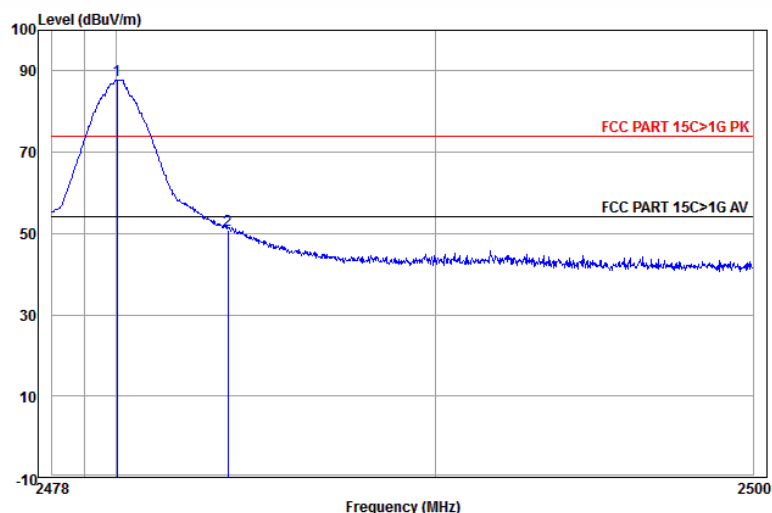
	Ant Freq	Cable Factor	Preamp Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2390.000	32.53	3.07	44.03	57.04	48.61	74.00	-25.39	Horizontal Peak
2 pp	2401.508	32.56	3.07	44.04	93.81	85.40	74.00	11.40	Horizontal Peak

Worse case mode:	GFSK		
Frequency: 2390.0MHz	Test channel: Lowest	Polarization: Vertical	Remark: Peak



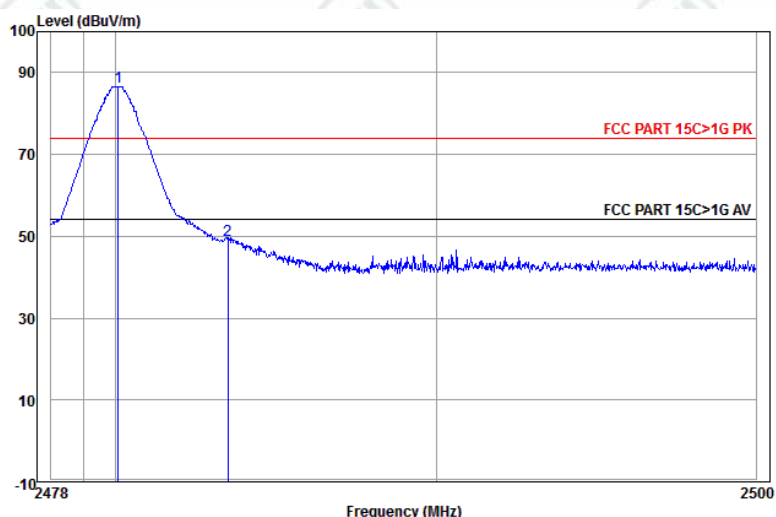
	Ant Freq	Cable Factor	Preamp Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2390.000	32.53	3.07	44.03	54.72	46.29	74.00	-27.71	Vertical Peak
2 pp	2401.604	32.56	3.07	44.04	93.50	85.09	74.00	11.09	Vertical Peak

Worse case mode:	GFSK		
Frequency: 2483.5MHz	Test channel: Highest	Polarization: Horizontal	Remark: Peak



	Ant Freq	Cable Factor	Preamp Loss	Read Level	Read Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	2480.038	32.71	3.12	44.14	96.15	87.84	74.00	13.84	Horizontal Peak
2	2483.500	32.71	3.12	44.14	59.24	50.93	74.00	-23.07	Horizontal Peak

Worse case mode:	GFSK		
Frequency: 2483.5MHz	Test channel: Highest	Polarization: Vertical	Remark: Peak



	Ant Freq	Cable Factor	Preamp Loss	Read Level	Read Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	2480.082	32.71	3.12	44.14	94.92	86.61	74.00	12.61	Vertical Peak
2	2483.500	32.71	3.12	44.14	57.45	49.14	74.00	-24.86	Vertical Peak

Note:

1) Through Pre-scan Non-hopping transmitting mode and charge+transmitter mode with all kind of data type, find the DH5 of data type is the worse case of GFSK modulation type in charge + transmitter mode.

2) *The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:*

Final Test Level = Receiver Reading - Correct Factor

Correct Factor = Preamplifier Factor - Antenna Factor - Cable Factor

Remark:

The Aero S02 female sportswear and Aero S02 male sportswear were tested and found the Aero S02 female sportswear was the worst case, only the worst data are reported.

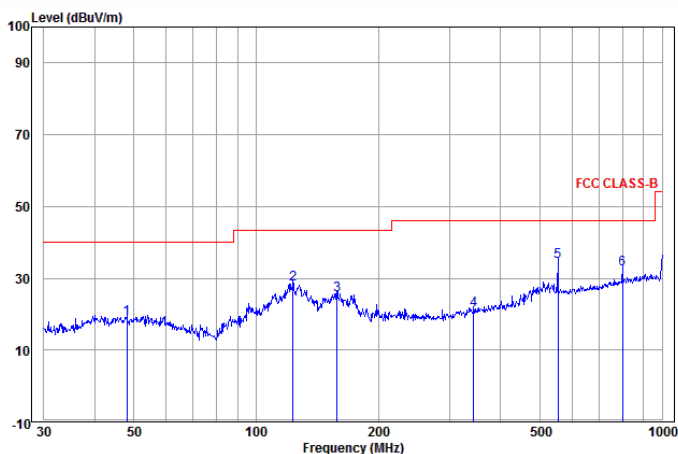
Appendix I) Radiated Spurious Emissions

Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak
	0.009MHz-0.090MHz	Average	10kHz	30kHz	Average
	0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak
	0.110MHz-0.490MHz	Average	10kHz	30kHz	Average
	0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
Peak		1MHz	10Hz	Average	
Test Procedure:					
Below 1GHz test procedure as below:					
a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.					
Above 1GHz test procedure as below:					
g. Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 meter to 1.5 meter(Above 18GHz the distance is 1 meter and table is 1.5 meter). h. Test the EUT in the lowest channel ,the middle channel ,the Highest channel i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is worse case. j. Repeat above procedures until all frequencies measured was complete.					
Limit:	Frequency	Field strength (microvolt/meter)	Limit (dBμV/m)	Remark	Measurement distance (m)
	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz-88MHz	100	40.0	Quasi-peak	3
	88MHz-216MHz	150	43.5	Quasi-peak	3
	216MHz-960MHz	200	46.0	Quasi-peak	3
	960MHz-1GHz	500	54.0	Quasi-peak	3
	Above 1GHz	500	54.0	Average	3
Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.					

Radiated Spurious Emissions test Data: Radiated Emission below 1GHz

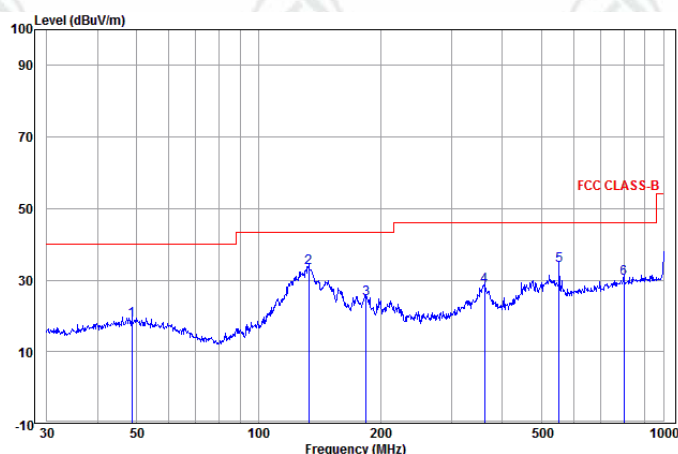
30MHz~1GHz (QP)

Test mode:	Transmitting	Vertical
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	Ant Freq	Cable Factor	Read Level	Read Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dB		
1	47.994	14.93	0.10	3.62	18.65	40.00	-21.35	Vertical QP
2	123.266	11.39	0.60	16.49	28.48	43.50	-15.02	Vertical QP
3	158.112	10.05	0.70	14.62	25.37	43.50	-18.13	Vertical QP
4	343.180	14.63	1.29	5.18	21.10	46.00	-24.90	Vertical QP
5 pp	554.825	18.62	1.57	14.48	34.67	46.00	-11.33	Vertical QP
6	798.980	21.59	2.46	8.48	32.53	46.00	-13.47	Vertical QP

Test mode:	Transmitting	Horizontal
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	Ant Freq	Cable Loss	Read Level	Read Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dB		
1	48.672	14.99	0.10	3.62	18.71	40.00	-21.29	Horizontal QP
2 pp	133.151	10.73	0.60	22.00	33.33	43.50	-10.17	Horizontal QP
3	184.490	11.07	0.96	12.83	24.86	43.50	-18.64	Horizontal QP
4	361.714	15.17	1.32	11.85	28.34	46.00	-17.66	Horizontal QP
5	552.883	18.61	1.56	14.02	34.19	46.00	-11.81	Horizontal QP
6	798.980	21.59	2.46	6.50	30.55	46.00	-15.45	Horizontal QP

Transmitter Emission above 1GHz

Worse case mode:		GFSK(1-DH5)		Test channel:		Lowest	Remark: Peak		
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1336.682	30.54	2.07	44.20	46.05	34.46	74.00	-39.54	Pass	H
1518.111	30.90	2.31	43.98	45.73	34.96	74.00	-39.04	Pass	H
4804.000	34.69	5.98	44.60	42.54	38.61	74.00	-35.39	Pass	H
6187.929	36.00	7.39	44.52	44.87	43.74	74.00	-30.26	Pass	H
7206.000	36.42	6.97	44.77	43.33	41.95	74.00	-32.05	Pass	H
9608.000	37.88	6.98	45.58	42.37	41.65	74.00	-32.35	Pass	H
1336.682	30.54	2.07	44.20	47.20	35.61	74.00	-38.39	Pass	V
1626.120	31.10	2.44	43.86	47.74	37.42	74.00	-36.58	Pass	V
4804.000	34.69	5.98	44.60	44.93	41.00	74.00	-33.00	Pass	V
6412.427	36.12	7.33	44.54	46.70	45.61	74.00	-28.39	Pass	V
7206.000	36.42	6.97	44.77	43.86	42.48	74.00	-31.52	Pass	V
9608.000	37.88	6.98	45.58	43.61	42.89	74.00	-31.11	Pass	V

Worse case mode:		GFSK(1-DH5)		Test channel:		Middle	Remark: Peak		
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1251.079	30.35	1.94	44.31	47.44	35.42	74.00	-38.58	Pass	H
1706.700	31.24	2.54	43.77	47.38	37.39	74.00	-36.61	Pass	H
4880.000	34.85	6.13	44.60	44.69	41.07	74.00	-32.93	Pass	H
6172.197	35.99	7.39	44.52	46.16	45.02	74.00	-28.98	Pass	H
7320.000	36.43	6.85	44.87	44.93	43.34	74.00	-30.66	Pass	H
9760.000	38.05	7.12	45.55	43.35	42.97	74.00	-31.03	Pass	H
1276.818	30.41	1.98	44.28	47.55	35.66	74.00	-38.34	Pass	V
1557.252	30.98	2.36	43.93	47.08	36.49	74.00	-37.51	Pass	V
4880.000	34.85	6.13	44.60	44.29	40.67	74.00	-33.33	Pass	V
6001.768	35.90	7.44	44.50	46.29	45.13	74.00	-28.87	Pass	V
7320.000	36.43	6.85	44.87	45.75	44.16	74.00	-29.84	Pass	V
9760.000	38.05	7.12	45.55	44.06	43.68	74.00	-30.32	Pass	V

Worse case mode:		GFSK(1-DH5)		Test channel:		Highest	Remark: Peak		
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Gain (dB)	Read Level (dBμV)	Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1257.465	30.36	1.95	44.30	47.99	36.00	74.00	-38.00	Pass	H
1601.472	31.06	2.41	43.88	46.59	36.18	74.00	-37.82	Pass	H
4960.000	35.02	6.29	44.60	42.97	39.68	74.00	-34.32	Pass	H
6412.427	36.12	7.33	44.54	45.86	44.77	74.00	-29.23	Pass	H
7440.000	36.45	6.73	44.97	43.92	42.13	74.00	-31.87	Pass	H
9920.000	38.22	7.26	45.52	43.53	43.49	74.00	-30.51	Pass	H
1273.572	30.40	1.97	44.28	48.31	36.40	74.00	-37.60	Pass	V
4960.000	35.02	6.29	44.60	43.00	39.71	74.00	-34.29	Pass	V
5836.044	35.78	7.28	44.52	46.79	45.33	74.00	-28.67	Pass	V
7440.000	36.45	6.73	44.97	44.67	42.88	74.00	-31.12	Pass	V
9157.857	37.38	6.55	45.67	45.49	43.75	74.00	-30.25	Pass	V
9920.000	38.22	7.26	45.52	42.94	42.90	74.00	-31.10	Pass	V

Note:

1) Through Pre-scan Non-hopping transmitting mode and charge+transmitter mode with all kind of data type, find the DH5 of data type is the worse case of GFSK modulation type in charge + transmitter mode.

2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading - Correct Factor

Correct Factor = Preamplifier Factor - Antenna Factor - Cable Factor

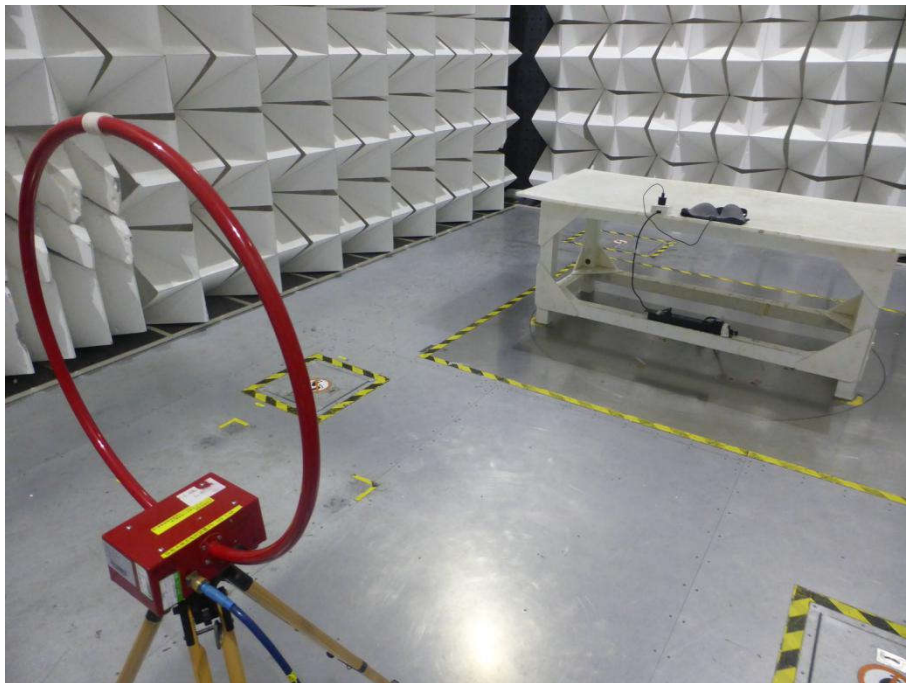
3) Scan from 9kHz to 25GHz, the disturbance above 13GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

Remark:

The Aero S02 female sportswear and Aero S02 male sportswear were tested and found the Aero S02 female sportswear was the worst case, only the worst data are reported.

PHOTOGRAPHS OF TEST SETUP

Test model No.:Aero S02



Radiated spurious emission Test Setup-1(9KHz-30MHz) (female sportswear)



Radiated spurious emission Test Setup-2(Below 1GHz) (female sportswear)



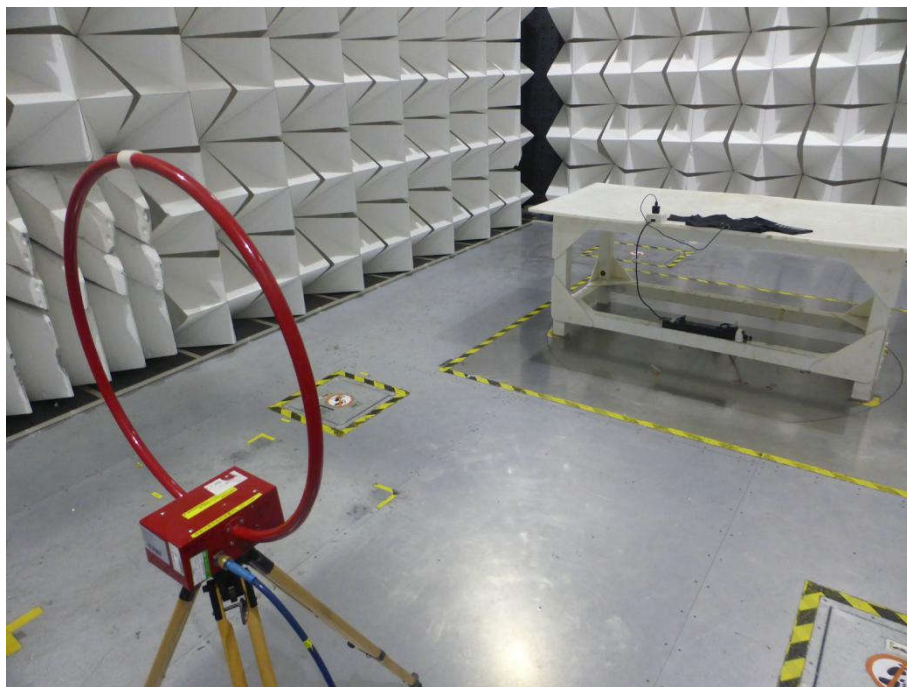
Radiated spurious emission Test Setup-3(Above 1GHz) (female sportswear)



Conducted Emissions Test Setup (female sportswear)



Close-up (female sportswear)



Radiated spurious emission Test Setup-1(9KHz-30MHz) (male sportswear)



Radiated spurious emission Test Setup-2(Below 1GHz) (male sportswear)



Radiated spurious emission Test Setup-3(Above 1GHz) (male sportswear)



Conducted Emissions Test Setup (male sportswear)



Close-up (male sportswear)

PHOTOGRAPHS OF EUT Constructional Details

Test model No.: Aero S02



View of Product-1



View of Product-2



View of Product-3



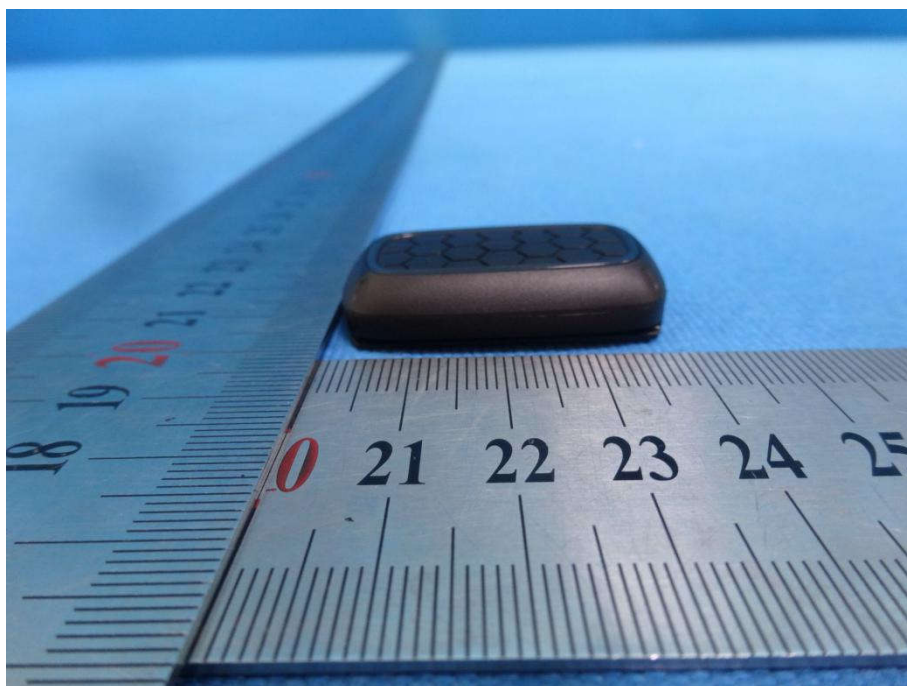
View of Product-4



View of Product-5



View of Product-6



View of Product-7



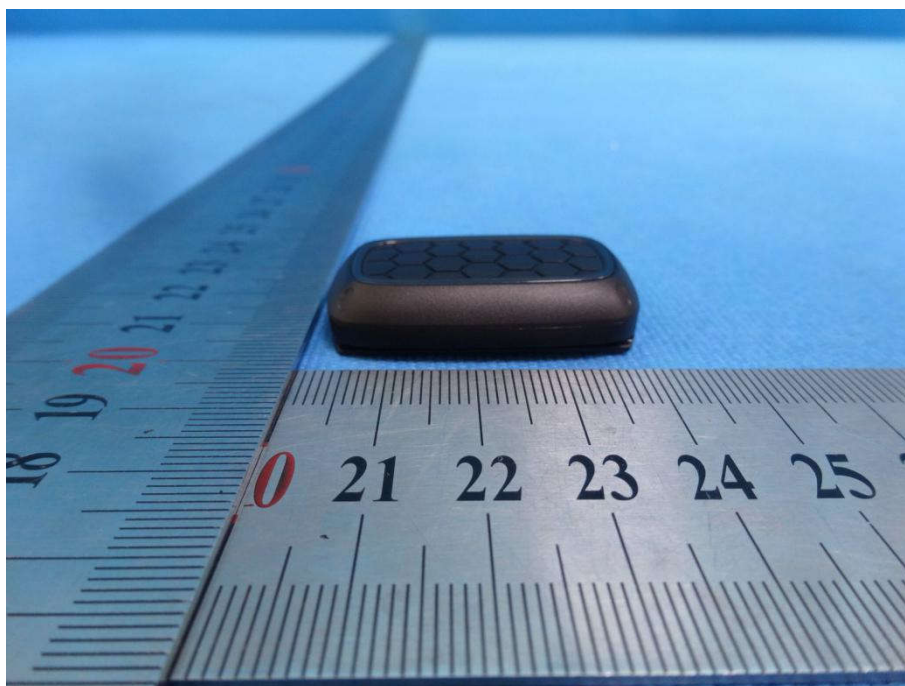
View of Product-8



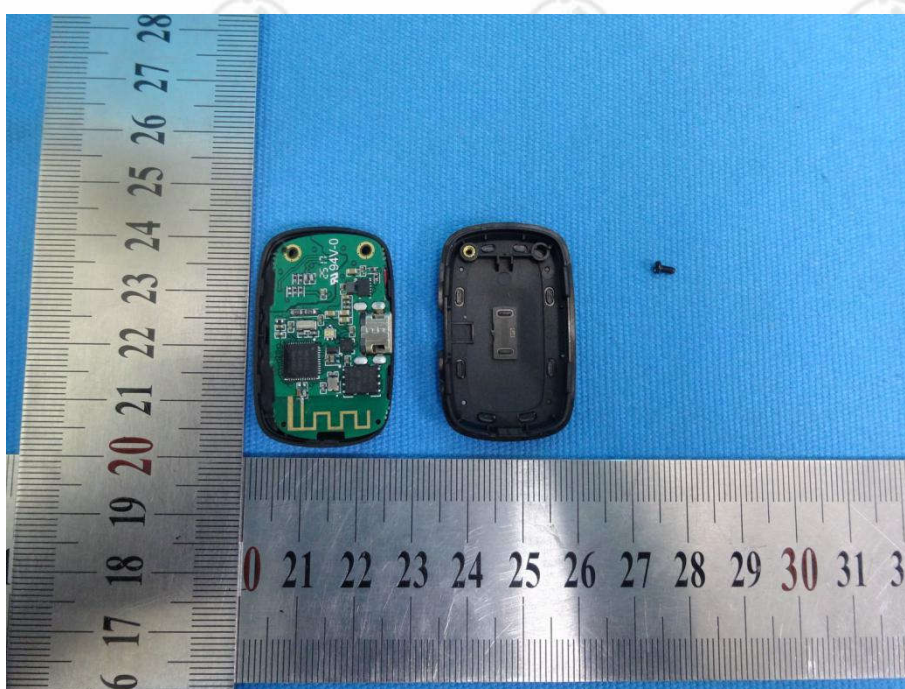
View of Product-9



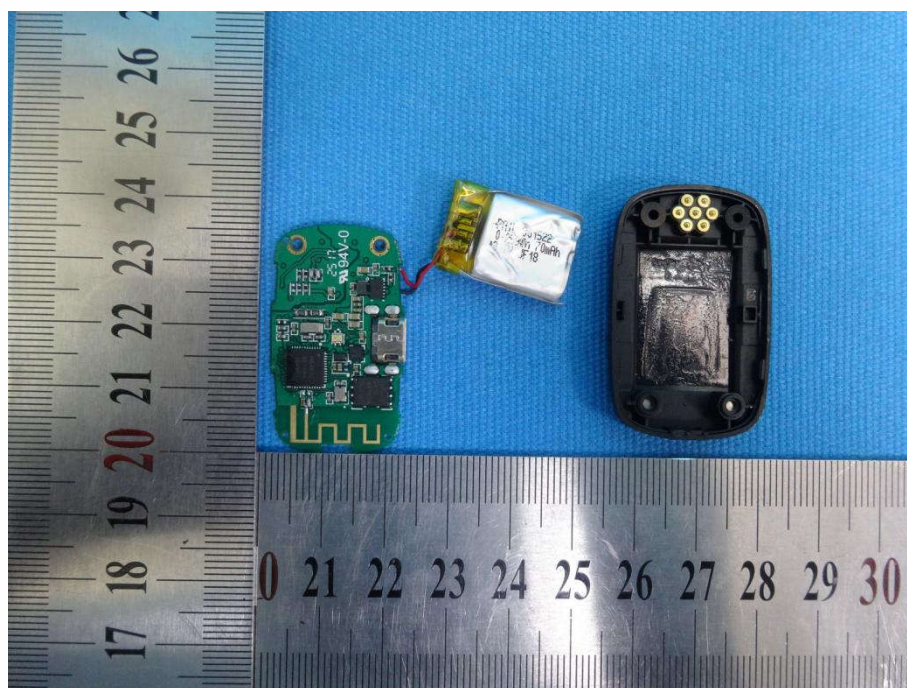
View of Product-10



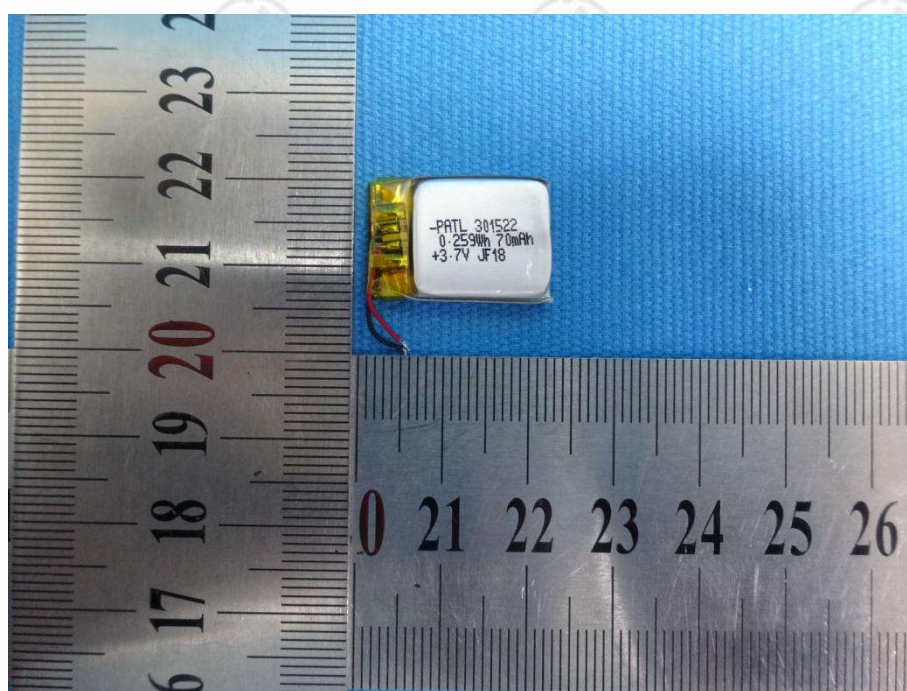
View of Product-11



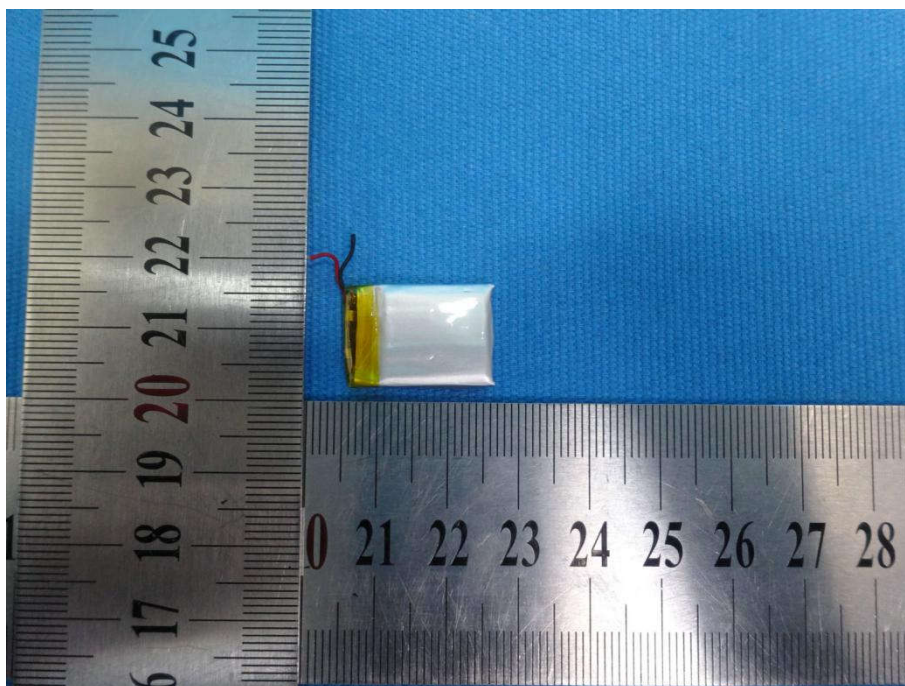
View of Product-12



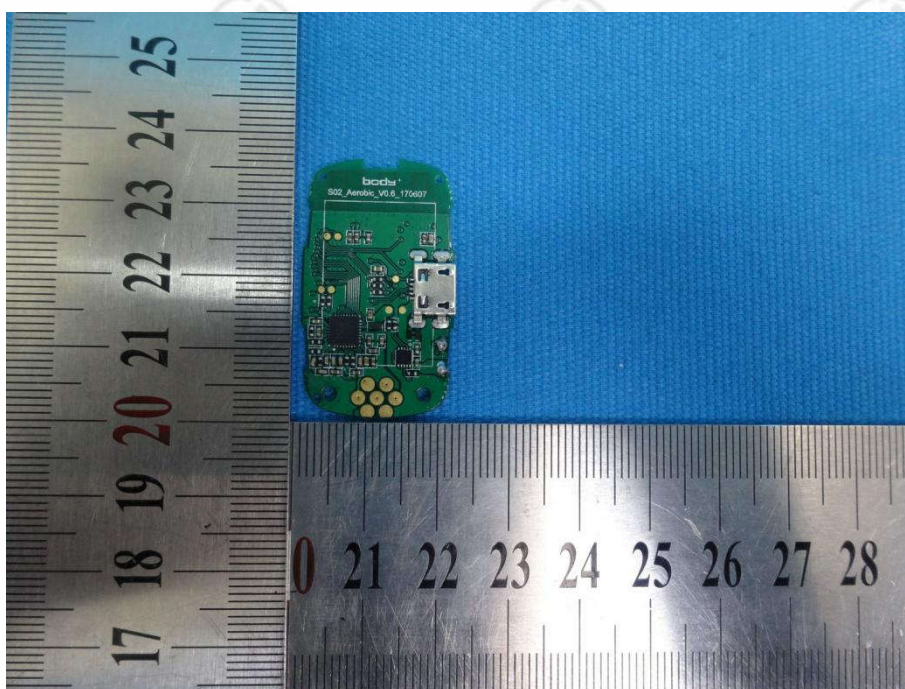
View of Product-13



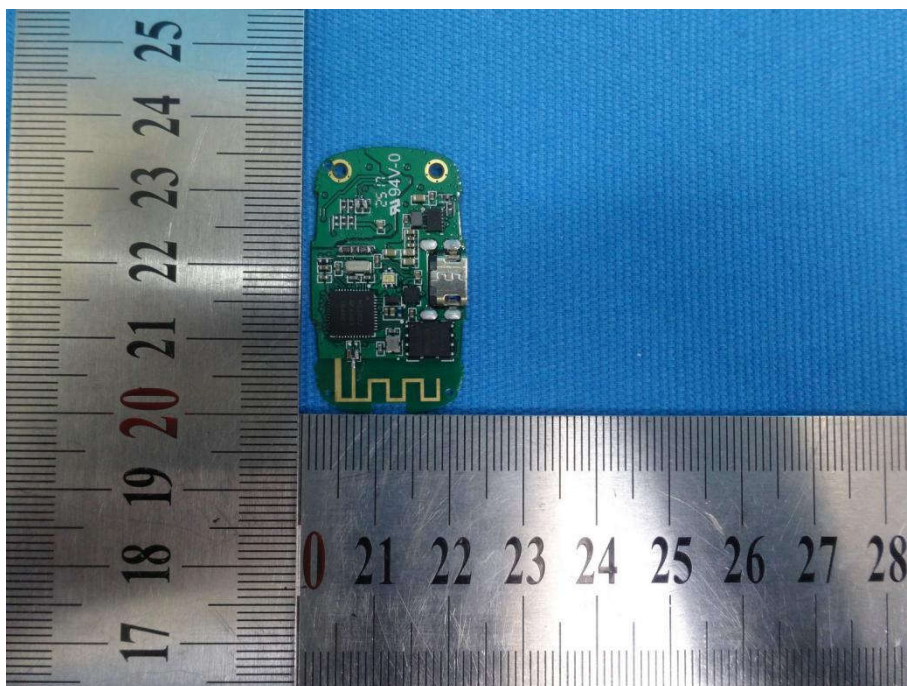
View of Product-14



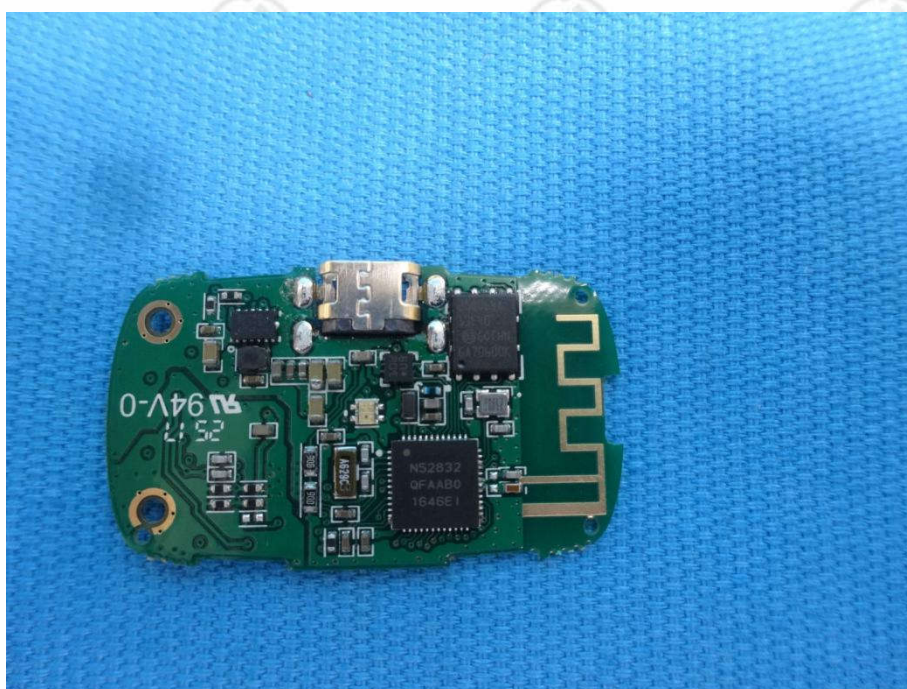
View of Product-15



View of Product-16



View of Product-17



View of Product-18

*** End of Report ***

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