

FCC - TEST REPORT

Report Number : **60.960.15.139.01R01** Date of Issue : October 28, 2015

Model : **HSTNW-D02W**

Product Type : **BLE SMART WATCH**

Trade Name : **Titan JUXT**

Applicant : DAYTON INDUSTRIAL CO., LTD

Address : 2-12 Kwai Fat Road, 11-A Kwai Chung, New Territories, Hong Kong

Production Facility : KENDY Enterprise Ltd

Address : 2-12 Kwai Fat Road, 11-A Kwai Chung, New Territories, Hong Kong

Test Result : ☒ **Positive** ☐ **Negative**

Total pages including Appendices : 50

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2 Description of Equipment Under Test

Description of the Equipment Under Test

Product:	BLE SMART WATCH
Model no.:	HSTNW-D02W
FCC ID:	O4GTITAN
Rating:	1) For Bluetooth module: 3.6VDC (1 x 3.6VDC rechargeable button cell battery, Model: LIR2025) 2) For watch: 1.5VDC (1 x 1.5VDC button cell battery, Model:364)
Frequency:	2402MHz-2480MHz
Antenna gain:	0 dBi
Number of operated channel:	40
Modulation:	GFSK

3 Summary of Test Standards

Test Standards
FCC Part 15 Subpart C 10-1-13 Edition Federal Communications Commission, PART 15 — Radio Frequency Devices, Subpart C — Unintentional Radiators

4 Details about the Test Laboratory

Site 1

Company name: TÜV SÜD Hong Kong Ltd.
3/F, West Wing, Lakeside 2,
10 Science Park West Avenue,
Science Park, Shatin, Hong Kong

Site 2

Company name: TÜV SÜD China Ltd.
Building 12&13 Zhiheng Wisdomland Business Park,
Nantou Checkpoint Road 2,
Shenzhen 518052, P.R.China
FCC Registration Number: 502708

Emission Tests	
Test Item	Test Site
FCC Part 15 Subpart C	
FCC Title 47 Part 15.205, 15.209 & 15.247(d) Spurious Radiated Emission	Site 2
FCC Title 47 Part 15.207 Conduct Emission	NIL
FCC Title 47 Part 15.247(a)(2) 6dB & 99% Bandwidth	Site 2
FCC Title 47 Part 15.247(b) Peak Output Power	Site 2
FCC Title 47 Part 2.1051 & 15.247(d) Spurious Emissions at Antenna Terminals	Site 2
FCC Title 47 Part 15.247(d) 100kHz Bandwidth of band edges	Site 2
FCC Title 47 Part 15.247(e) Power Spectral Density	Site 2
FCC Title 47 Part 15.203 & 15.247(b) Antenna Requirement	Site 2

4.1 Test Equipment Site List

Radiated emission Test – Site 2

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESR 26	101269	17-Aug-16
Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9163	707	17-Aug-17
Horn Antenna	Rohde & Schwarz	HF907	102294	17-Aug-17
Pre-amplifier	Rohde & Schwarz	SCU 18	102230	17-Aug-16
3m Semi-anechoic chamber	TDK	9X6X6	----	29-May-19

6dB & 99% Bandwidth, Peak Output Power, Spurious Emissions at Antenna Terminals, 100kHz Bandwidth of band edges, Power Spectral Density – Site 2

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
Signal Generator	Rohde & Schwarz	SMB100A	108272	17-Aug-16
Signal Analyzer	Rohde & Schwarz	FSV40	101030	17-Aug-16
Vector Signal Generator	Rohde & Schwarz	SMU 200A	105324	17-Aug-16
RF Switch Module	Rohde & Schwarz	OSP120/OSP-B157	101226/100851	17-Aug-16

4.2 Measurement System Uncertainty

Measurement System Uncertainty Emissions

System Measurement Uncertainty	
Items	Extended Uncertainty
Uncertainty for Radiated Emission in 3m chamber 9kHz-30MHz	4.54dB
Uncertainty for Radiated Emission in 3m chamber 30MHz-1000MHz	Horizontal: 4.83dB; Vertical: 4.91dB;
Uncertainty for Radiated Emission in 3m chamber 1000MHz-25000MHz	Horizontal: 4.89dB; Vertical: 4.88dB;
Uncertainty for Conducted RF test	2.04dB

5 Summary of Test Results

Emission Tests				
FCC Part 15 Subpart C				
Test Condition	Pages	Test Result		
		Pass	Fail	N/A
FCC Title 47 Part 15.205, 15.209 & 15.247(d) Spurious Radiated Emission	10-15	☒	☐	☐
FCC Title 47 Part 15.207 Conduct Emission	NIL	☐	☐	☒
FCC Title 47 Part 15.247(a)(2) 6dB & 99% Bandwidth	16-21	☒	☐	☐
FCC Title 47 Part 15.247(b) Peak Output Power	22-24	☒	☐	☐
FCC Title 47 Part 2.1051 & 15.247(d) Spurious Emissions at Antenna Terminals	25-27	☒	☐	☐
FCC Title 47 Part 15.247(d) 100kHz Bandwidth of band edges	28-31	☒	☐	☐
FCC Title 47 Part 15.247(e) Power Spectral Density	32-34	☒	☐	☐
FCC Title 47 Part 15.203 & 15.247(b) Antenna Requirement	35	☒	☐	☐

6 General Remarks

Remarks

NIL

SUMMARY:

- All tests according to the regulations cited on page 5 were

■ - Performed

□ - **Not** Performed

- The Equipment Under Test

■ - **Fulfills** the general approval requirements.

□ - **Does not** fulfill the general approval requirements.

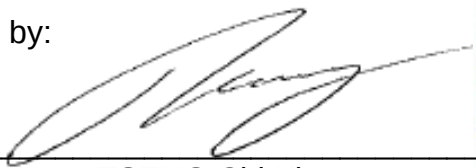
Sample Received Date: September 28, 2015

Testing Start Date: September 28, 2015

Testing End Date: October 9, 2015

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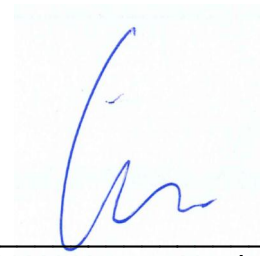
Reviewed by:



TSENG Chi Kit
EMC Project Engineer



Prepared by:



CHAN Kwong Ngai
EMC Test Engineer

7 Emission Test Results

7.1 Spurious Radiated Emission

EUT: HSTNW-D02W
 Op Condition: Operated, TX Mode (2402MHz)
 Test Specification: FCC15.205, 15.209 & 15.247(d) Antenna: Horizontal
 Comment: 3.6VDC
 Remark: 9kHz to 25GHz

Test Result	
☒	Passed
☐	Not Passed

Frequency MHz	Result dBμV/m	Limit dBμV/m	Margin dB	Detector
121.763	20.01	43.5	-23.49	Quasi Peak
139.852	18.45	43.5	-25.05	Quasi Peak
171.163	19.34	43.5	-24.16	Quasi Peak
400.586	22.00	46	-24.00	Quasi Peak
1580.000	30.37	74	-43.63	Peak
1580.000	28.15	54	-25.85	Average
4804.000	60.78	74	-13.22	Peak
4804.000	35.12	54	-18.88	Average
7205.250	56.43	74	-17.57	Peak
7205.250	38.88	54	-15.12	Average
9608.125	56.12	74	-17.88	Peak
9608.125	40.01	54	-13.99	Average

Spurious Radiated Emission

EUT: HSTNW-D02W
 Op Condition: Operated, TX Mode (2402MHz)
 Test Specification: FCC15.205, 15.209 & 15.247(d) Antenna: Vertical
 Comment: 3.6VDC
 Remark: 9kHz to 25GHz

Test Result	
☒	Passed
☐	Not Passed

Frequency MHz	Result dBμV/m	Limit dBμV/m	Margin dB	Detector
120.985	20.13	43.5	-23.37	Quasi Peak
140.643	19.82	43.5	-23.68	Quasi Peak
404.568	21.98	46	-24.02	Quasi Peak
1580.125	29.86	74	-44.14	Peak
1580.125	28.02	54	-25.98	Average
1635.500	30.97	74	-43.03	Peak
4804.000	59.98	74	-14.02	Peak
4804.000	31.43	54	-22.57	Average
7205.250	53.35	74	-20.65	Peak
7205.250	36.29	54	-17.71	Average
9608.125	52.76	74	-21.24	Peak
9608.125	38.77	54	-15.23	Average

Spurious Radiated Emission

EUT: HSTNW-D02W
 Op Condition: Operated, TX Mode (2440MHz)
 Test Specification: FCC15.205, 15.209 & 15.247(d) Antenna: Horizontal
 Comment: 3.6VDC
 Remark: 9kHz to 25GHz

Test Result

☒ Passed

☐ Not Passed

Frequency MHz	Result dBμV/m	Limit dBμV/m	Margin dB	Detector
121.763	20.01	43.5	-23.49	Quasi Peak
139.852	18.45	43.5	-25.05	Quasi Peak
171.163	19.34	43.5	-24.16	Quasi Peak
400.586	22.00	46	-24.00	Quasi Peak
1580.000	30.87	74	-43.13	Peak
1580.000	28.12	54	-25.88	Average
4880.500	60.66	74	-13.34	Peak
4880.500	34.97	54	-19.03	Average
7320.125	51.43	74	-22.57	Peak
7320.125	37.68	54	-16.32	Average
9760.000	50.23	74	-23.77	Peak
9760.000	39.12	54	-14.88	Average

Spurious Radiated Emission

EUT: HSTNW-D02W
 Op Condition: Operated, TX Mode (2440MHz)
 Test Specification: FCC15.205, 15.209 & 15.247(d) Antenna: Vertical
 Comment: 3.6VDC
 Remark: 9kHz to 25GHz

Test Result

☒ Passed
☐ Not Passed

Frequency MHz	Result dBμV/m	Limit dBμV/m	Margin dB	Detector
120.985	20.13	43.5	-23.37	Quasi Peak
140.643	19.82	43.5	-23.68	Quasi Peak
404.568	21.98	46	-24.02	Quasi Peak
1580.125	30.75	74	-43.25	Peak
1580.125	29.03	54	-24.97	Average
1635.500	31.22	74	-42.78	Peak
4880.500	59.98	74	-14.02	Peak
4880.500	33.56	54	-20.44	Average
7320.125	49.23	74	-24.77	Peak
7320.125	35.75	54	-18.25	Average
9760.000	47.12	74	-26.88	Peak
9760.000	37.55	54	-16.45	Average

Spurious Radiated Emission

EUT: HSTNW-D02W
 Op Condition: Operated, TX Mode (2480MHz)
 Test Specification: FCC15.205, 15.209 & 15.247(d) Antenna: Horizontal
 Comment: 3.6VDC
 Remark: 9kHz to 25GHz

Test Result

☒ Passed
☐ Not Passed

Frequency MHz	Result dBμV/m	Limit dBμV/m	Margin dB	Detector
121.763	20.01	43.5	-23.49	Quasi Peak
139.852	18.45	43.5	-25.05	Quasi Peak
171.163	19.34	43.5	-24.16	Quasi Peak
400.586	22.00	46	-24.00	Quasi Peak
1580.000	30.01	74	-13.99	Peak
1580.000	27.23	54	-16.77	Average
4960.500	59.65	74	-14.35	Peak
4960.500	34.32	54	-19.68	Average
7440.000	46.68	74	-27.32	Peak
7440.000	35.99	54	-18.01	Average
9920.120	46.03	74	-27.97	Peak
9920.120	39.08	54	-14.92	Average

Spurious Radiated Emission

EUT: HSTNW-D02W
 Op Condition: Operated, TX Mode (2480MHz)
 Test Specification: FCC15.205, 15.209 & 15.247(d) Antenna: Vertical
 Comment: 3.6VDC
 Remark: 9kHz to 25GHz

Test Result

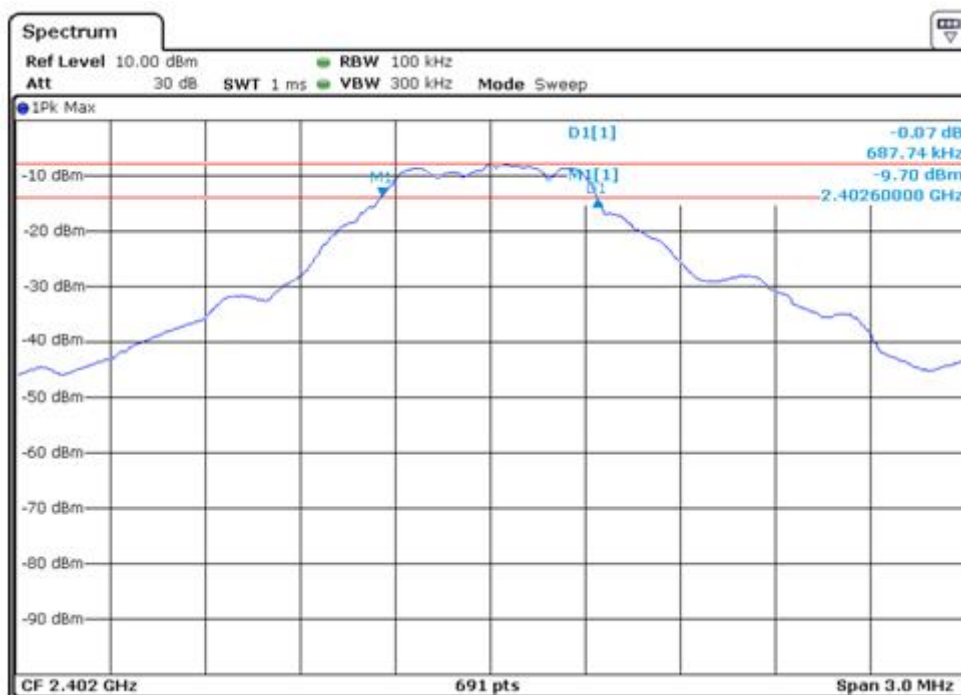
☒ Passed
☐ Not Passed

Frequency MHz	Result dBμV/m	Limit dBμV/m	Margin dB	Detector
120.985	20.13	43.5	-23.37	Quasi Peak
140.643	19.82	43.5	-23.68	Quasi Peak
404.568	21.98	46	-24.02	Quasi Peak
1580.125	29.88	74	-44.12	Peak
1580.125	27.56	54	-16.44	Average
1635.500	30.78	74	-43.22	Peak
4960.500	59.32	74	-14.68	Peak
4960.500	33.98	54	-20.02	Average
7440.000	47.66	74	-26.34	Peak
7440.000	36.85	54	-17.15	Average
9920.120	46.88	74	-27.12	Peak
9920.120	38.55	54	-15.45	Average

7.2 6dB & 99% Bandwidth

EUT: HSTNW-D02W
 Op Condition: Operated, TX Mode (2402MHz)
 Test Specification: FCC15.247(a)(2), 6dB Bandwidth
 Comment: 3.6VDC

Test Result

☒ Passed☐ Not Passed

6dB bandwidth	Limit
687.74 kHz	> 500 kHz

6dB & 99% Bandwidth

EUT: HSTNW-D02W
Op Condition: Operated, TX Mode (2402MHz)
Test Specification: FCC15.247(a)(2), 99% Bandwidth
Comment: 3.6VDC

Test Result

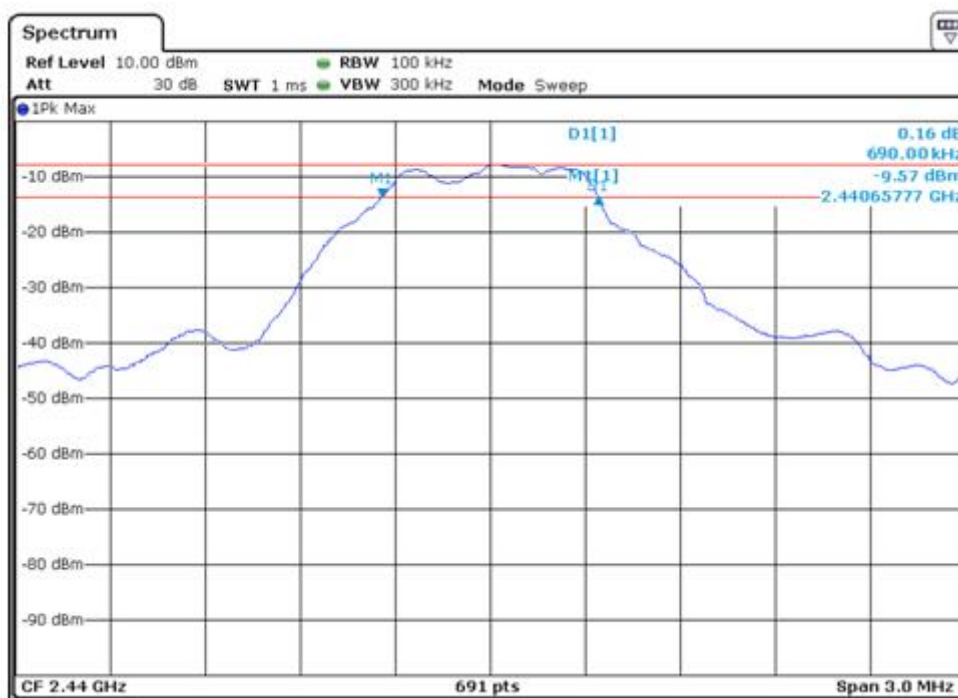
☒ Passed☐ Not Passed**99% bandwidth**

1013.889 kHz

6dB & 99% Bandwidth

EUT: HSTNW-D02W
 Op Condition: Operated, TX Mode (2440MHz)
 Test Specification: FCC15.247(a)(2), 6dB Bandwidth
 Comment: 3.6VDC

Test Result

☒ Passed☐ Not Passed

6dB bandwidth	Limit
690.00 kHz	> 500 kHz

6dB & 99% Bandwidth

EUT: HSTNW-D02W
Op Condition: Operated, TX Mode (2440MHz)
Test Specification: FCC15.247(a)(2), 99% Bandwidth
Comment: 3.6VDC

Test Result

☒ Passed☐ Not Passed**99% bandwidth**

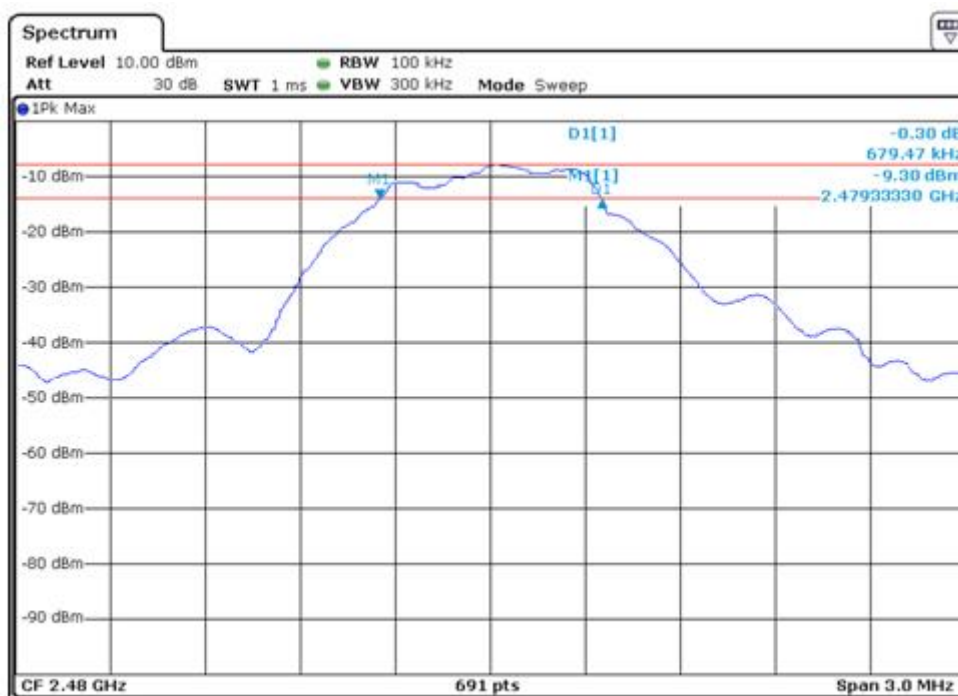
1014.434 kHz

6dB & 99% Bandwidth

EUT: HSTNW-D02W
 Op Condition: Operated, TX Mode (2480MHz)
 Test Specification: FCC15.247(a)(2), 6dB Bandwidth
 Comment: 3.6VDC

Test Result

☒ Passed
☐ Not Passed

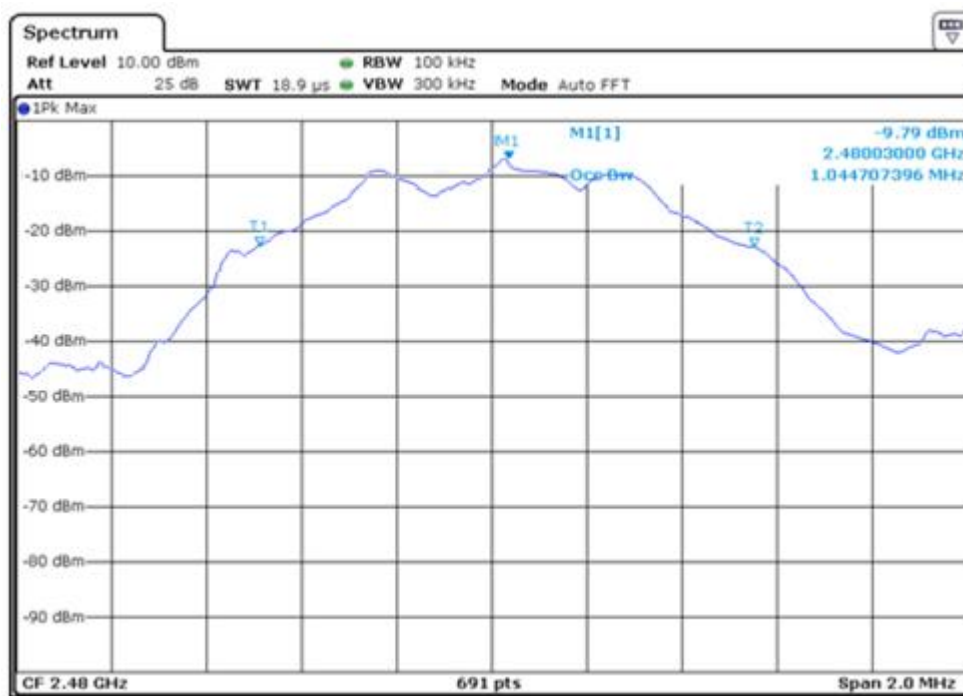


6dB bandwidth	Limit
679.47 kHz	> 500 kHz

6dB & 99% Bandwidth

EUT: HSTNW-D02W
Op Condition: Operated, TX Mode (2480MHz)
Test Specification: FCC15.247(a)(2), 99% Bandwidth
Comment: 3.6VDC

Test Result

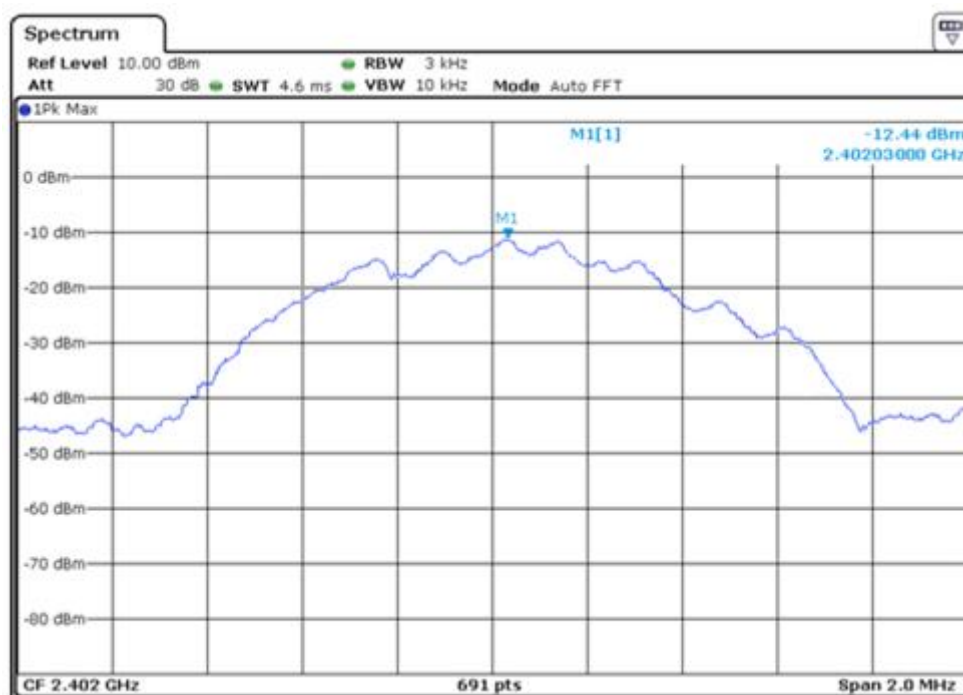
☒ Passed☐ Not Passed**99% bandwidth**

1044.707 kHz

7.3 Peak Output Power

EUT: HSTNW-D02W
 Op Condition: Operated, TX Mode (2402MHz)
 Test Specification: FCC15.247(b)
 Comment: 3.6VDC

Test Result

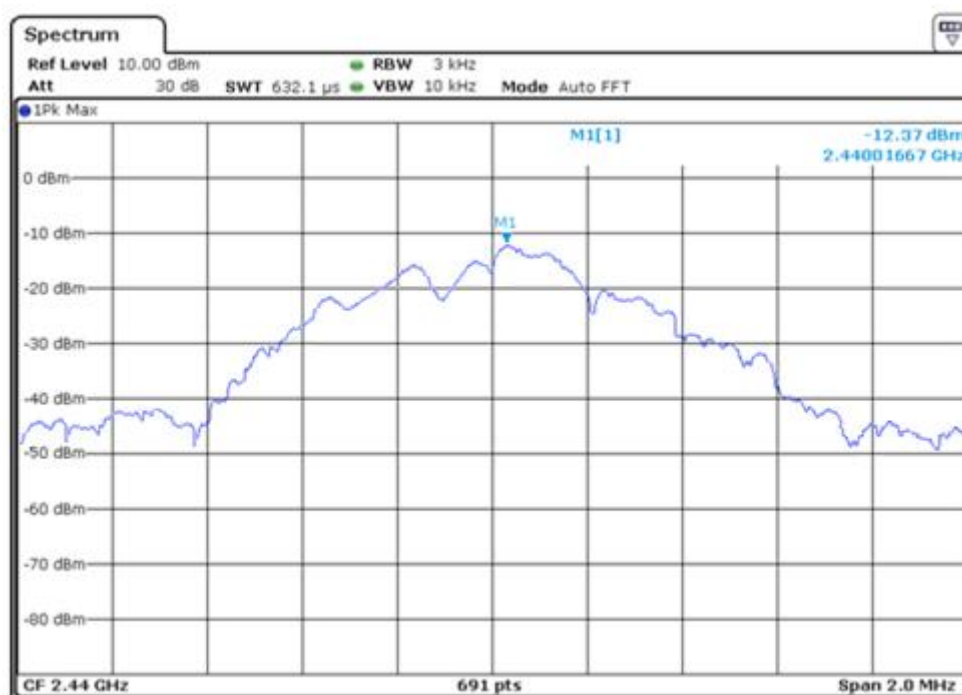
☒ Passed☐ Not Passed

Conducted Output Power	Limit
-12.44 dBm	< 30dBm

Peak Output Power

EUT: HSTNW-D02W
 Op Condition: Operated, TX Mode (2440MHz)
 Test Specification: FCC15.247(b)
 Comment: 3.6VDC

Test Result

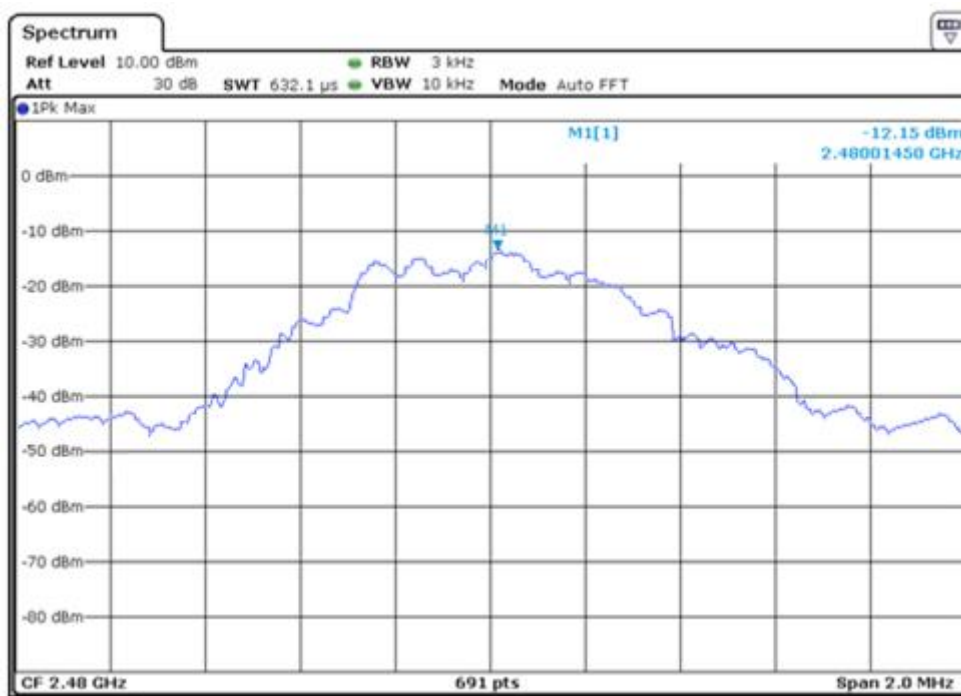
☒ Passed☐ Not Passed

Conducted Output Power	Limit
-12.37 dBm	< 30dBm

Peak Output Power

EUT: HSTNW-D02W
Op Condition: Operated, TX Mode (2480MHz)
Test Specification: FCC15.247(b)
Comment: 3.6VDC

Test Result

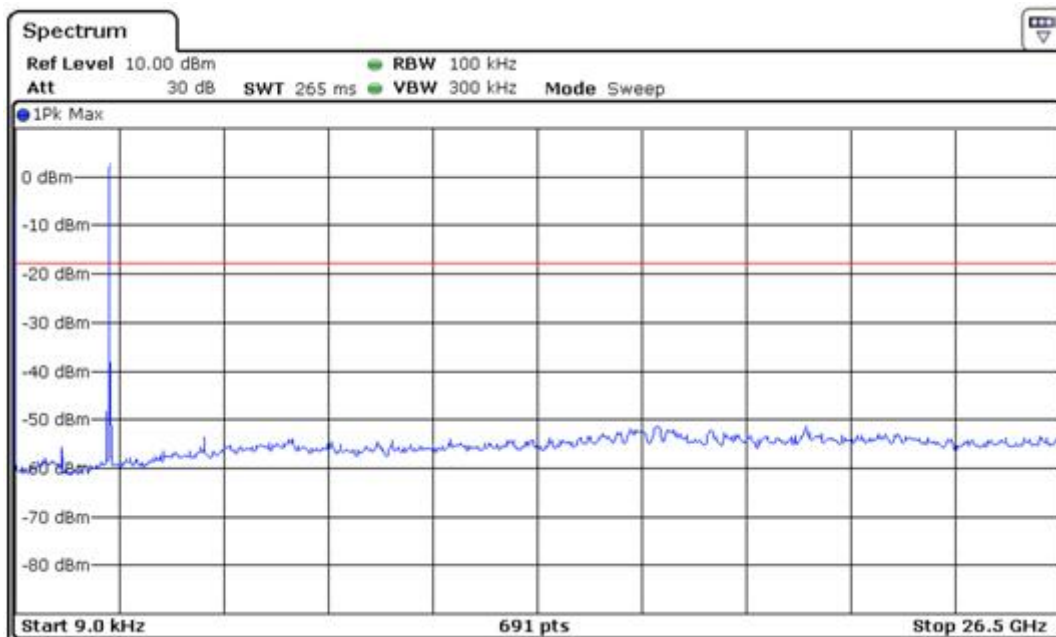
☒ Passed☐ Not Passed

Conducted Output Power	Limit
-12.15 dBm	< 30dBm

7.4 Spurious Emissions at Antenna Terminals

EUT: HSTNW-D02W
Op Condition: Operated, TX Mode (2402MHz)
Test Specification: FCC2.1051 & 15.247(d)
Comment: 3.6VDC
Remark: 9kHz to 26.5GHz

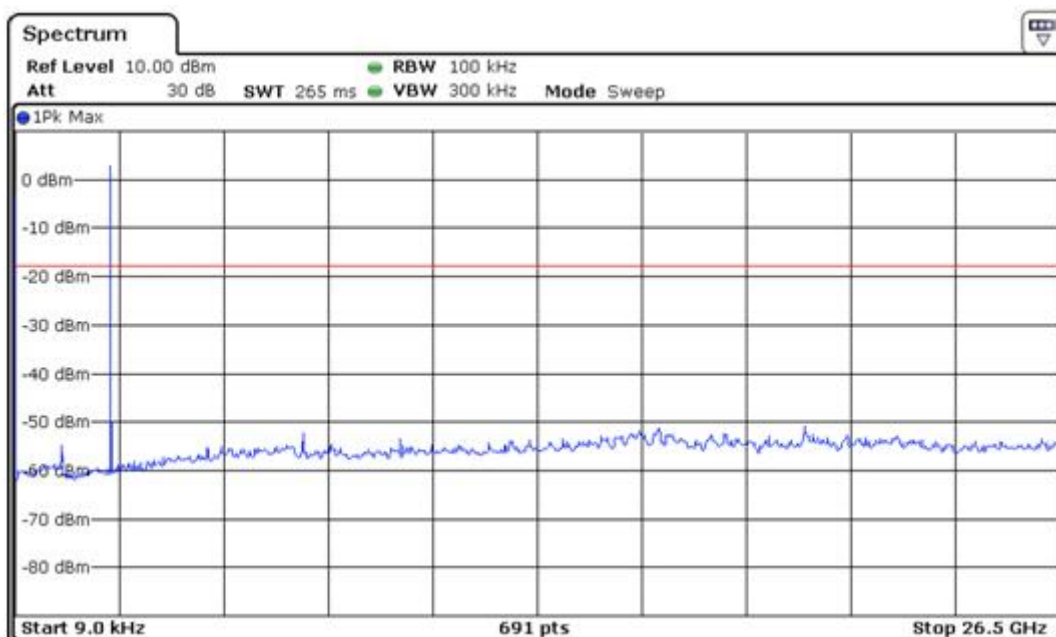
Test Result

☒ Passed☐ Not Passed

Spurious Emissions at Antenna Terminals

EUT: HSTNW-D02W
Op Condition: Operated, TX Mode (2440MHz)
Test Specification: FCC2.1051 & 15.247(d)
Comment: 3.6VDC
Remark: 9kHz to 26.5GHz

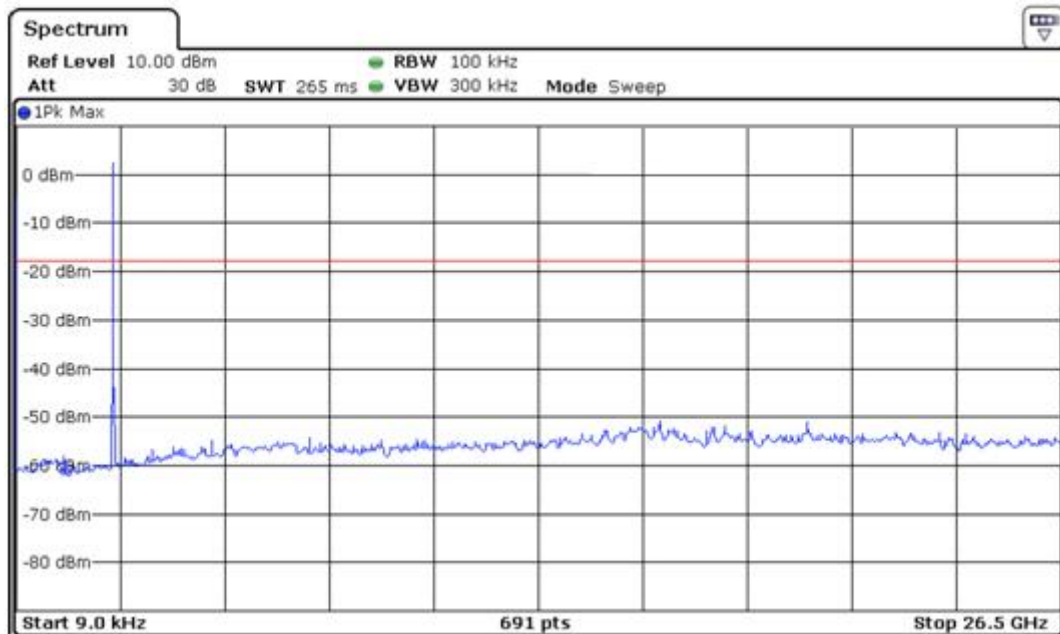
Test Result

☒ Passed☐ Not Passed

Spurious Emissions at Antenna Terminals

EUT: HSTNW-D02W
Op Condition: Operated, TX Mode (2480MHz)
Test Specification: FCC2.1051 & 15.247(d)
Comment: 3.6VDC
Remark: 9kHz to 26.5GHz

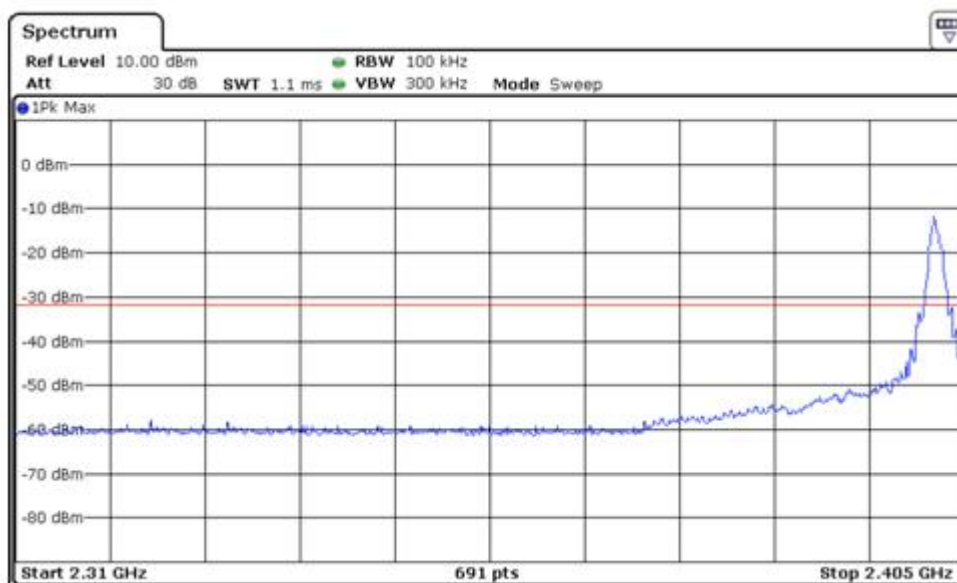
Test Result

☒ Passed☐ Not Passed

7.5 100kHz Bandwidth of band edges

EUT: HSTNW-D02W
 Op Condition: Operated, TX Mode (2402MHz)
 Test Specification: FCC15.247(d), Conducted
 Comment: 3.6VDC

Test Result

☒ Passed☐ Not Passed

Frequency	Result
2.402 GHz	-12.53 dBm
2.390 GHz	-51.32 dBm

Band edges	Limit
38.79 dB	> 20dB

100kHz Bandwidth of band edges

EUT: HSTNW-D02W
Op Condition: Operated, TX Mode (2402MHz)
Test Specification: FCC15.247(d), Radiated
Comment: 3.6VDC

Test Result☒ Passed☐ Not Passed

Frequency MHz	Result dB μ V/m	Limit dB μ V/m	Margin dB	Detector
2439.000	34.98	74	-39.02	Peak
2439.000	30.88	54	-23.12	Average

100kHz Bandwidth of band edges

EUT: HSTNW-D02W
 Op Condition: Operated, TX Mode (2480MHz)
 Test Specification: FCC15.247(d), Conducted
 Comment: 3.6VDC

Test Result

☒ Passed☐ Not Passed

Frequency	Result
2.480 GHz	-12.55 dBm
2.4835 GHz	-51.37 dBm

Band edges	Limit
38.82 dB	> 20dB

100kHz Bandwidth of band edges

EUT: HSTNW-D02W
Op Condition: Operated, TX Mode (2480MHz)
Test Specification: FCC15.247(d), Radiated
Comment: 3.6VDC

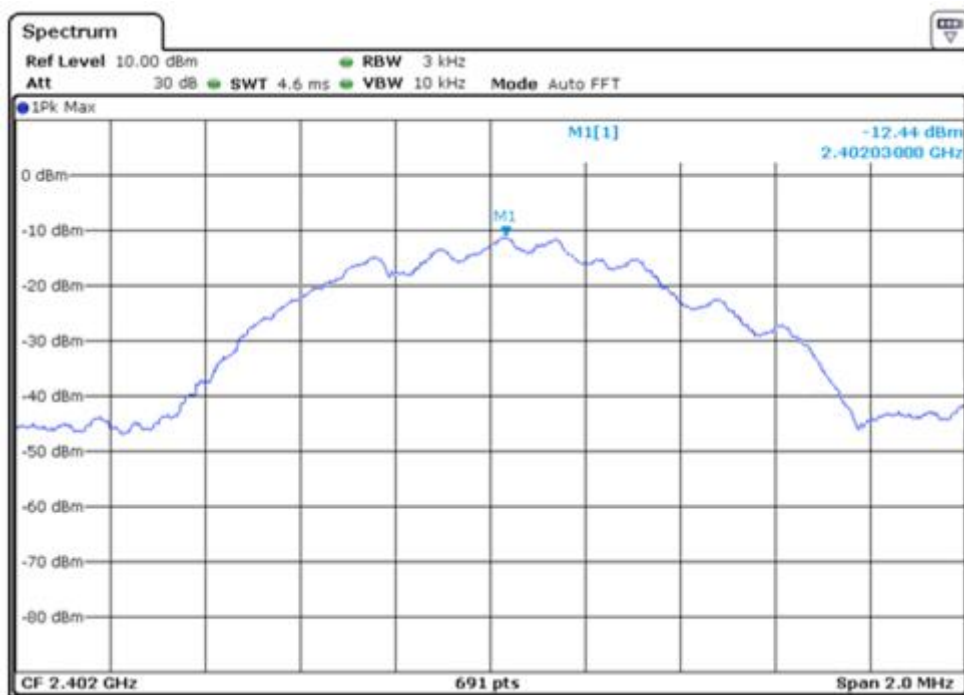
Test Result☒ Passed☐ Not Passed

Frequency MHz	Result dB μ V/m	Limit dB μ V/m	Margin dB	Detector
2483.500	36.04	74	-37.96	Peak
2483.500	31.56	54	-22.44	Average

7.6 Power Spectral Density

EUT: HSTNW-D02W
 Op Condition: Operated, TX Mode (2402MHz)
 Test Specification: FCC15.247(e)
 Comment: 3.6VDC

Test Result

☒ Passed☐ Not Passed

Frequency	PSD	Result
2.402GHz	-12.44 dBm / 3kHz	< 8 dBm / 3 kHz

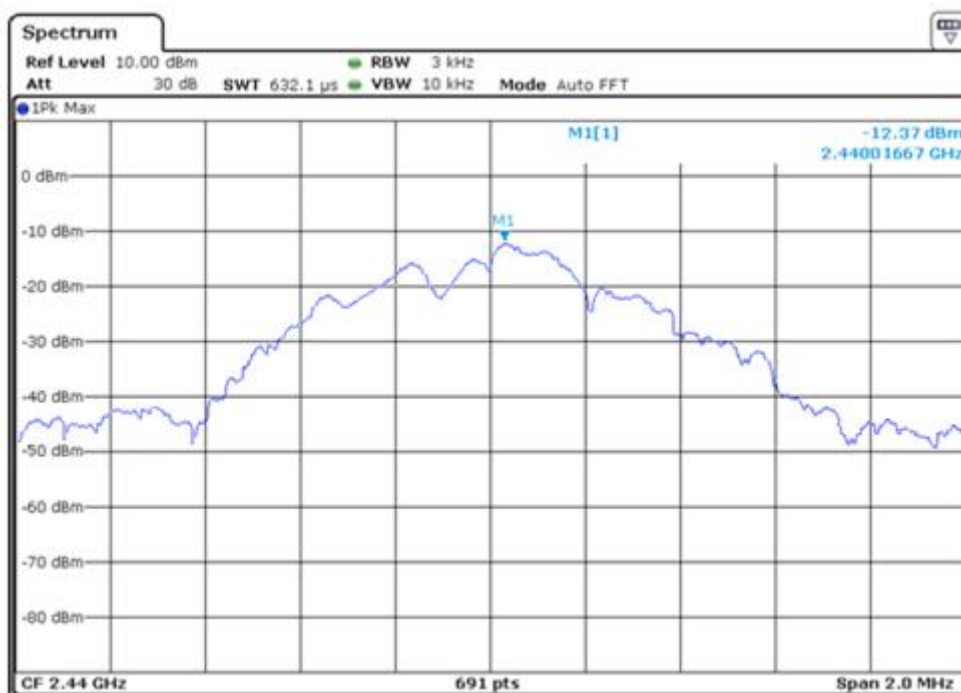
Power Spectral Density

EUT: HSTNW-D02W
 Op Condition: Operated, TX Mode (2440MHz)
 Test Specification: FCC15.247(e)
 Comment: 3.6VDC

Test Result

☒ Passed

☐ Not Passed



Frequency	PSD	Result
2.440GHz	-12.37 dBm / 3kHz	< 8 dBm / 3 kHz

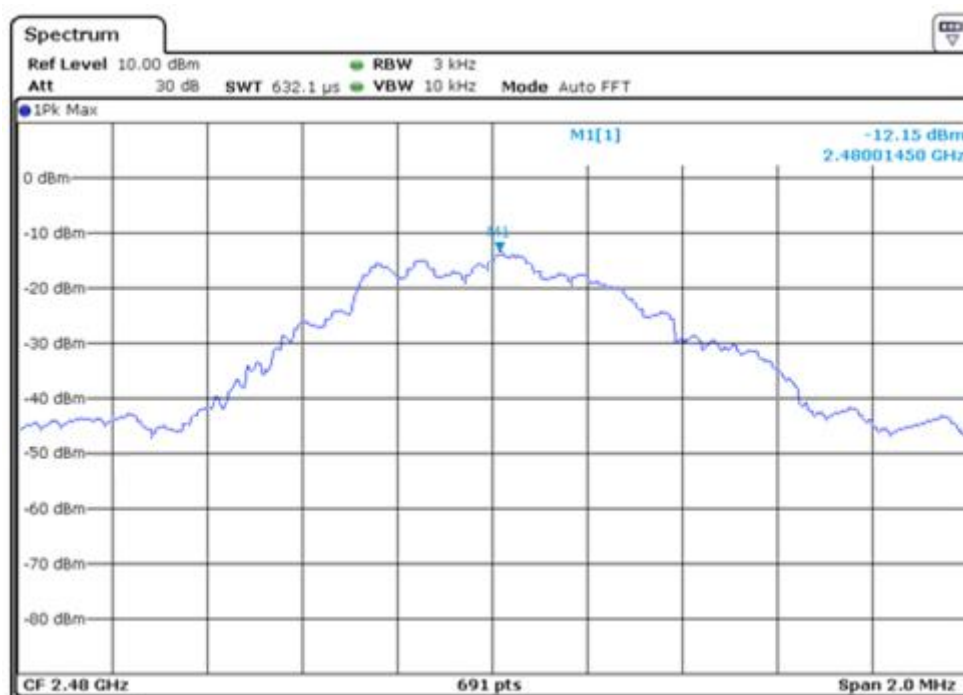
Power Spectral Density

EUT: HSTNW-D02W
 Op Condition: Operated, TX Mode (2480MHz)
 Test Specification: FCC15.247(e)
 Comment: 3.6VDC

Test Result

☒ Passed

☐ Not Passed



Frequency	PSD	Result
2.480GHz	-12.15 dBm / 3kHz	< 8 dBm / 3 kHz

7.7 Antenna Requirement

EUT: HSTNW-D02W
Op Condition: Operated, TX Mode
Test Specification: FCC15.203 & 15.247(b)
Comment: 3.6VDC

Test Result☒ Passed☐ Not Passed

Limit

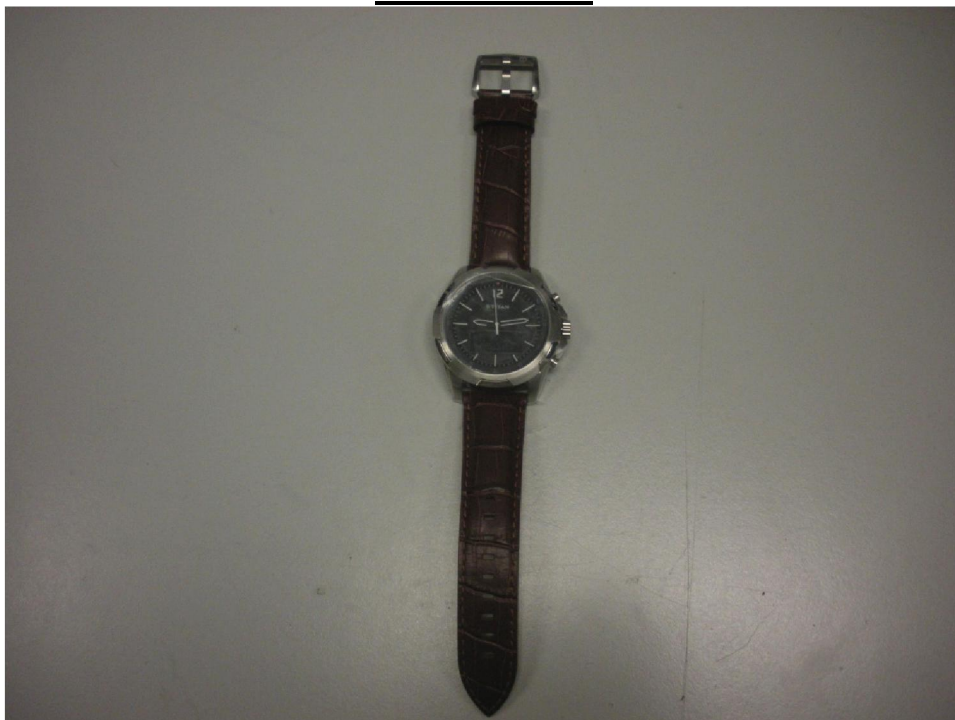
For intentional device, according to FCC Title 47 Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC Title 47 Part 15.247(b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The antenna used in this product is PCB antenna, and the maximum gain of this antenna is 0.0 dBi.

8 Appendix A - Photographs of EUT

HSTNW-D02W



Appendix A



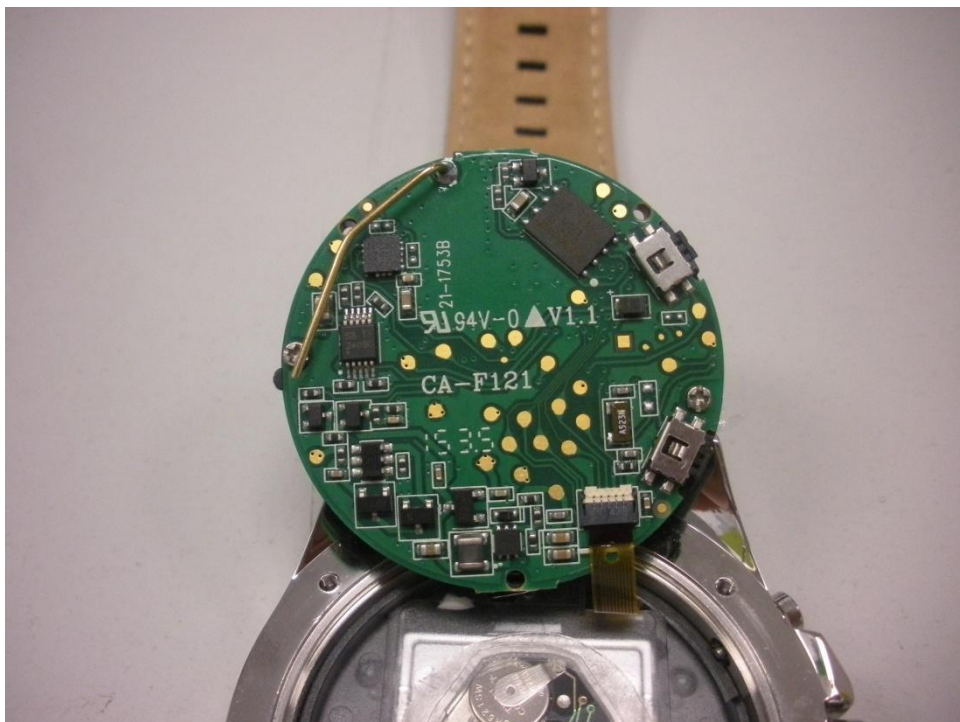
Appendix A



Appendix A



Appendix A



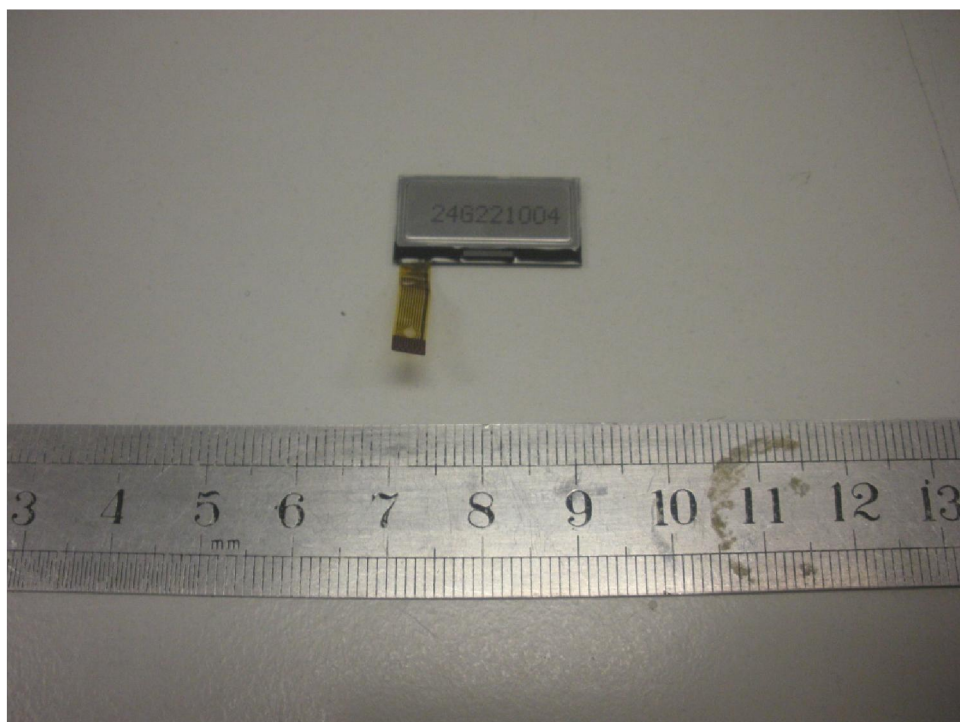
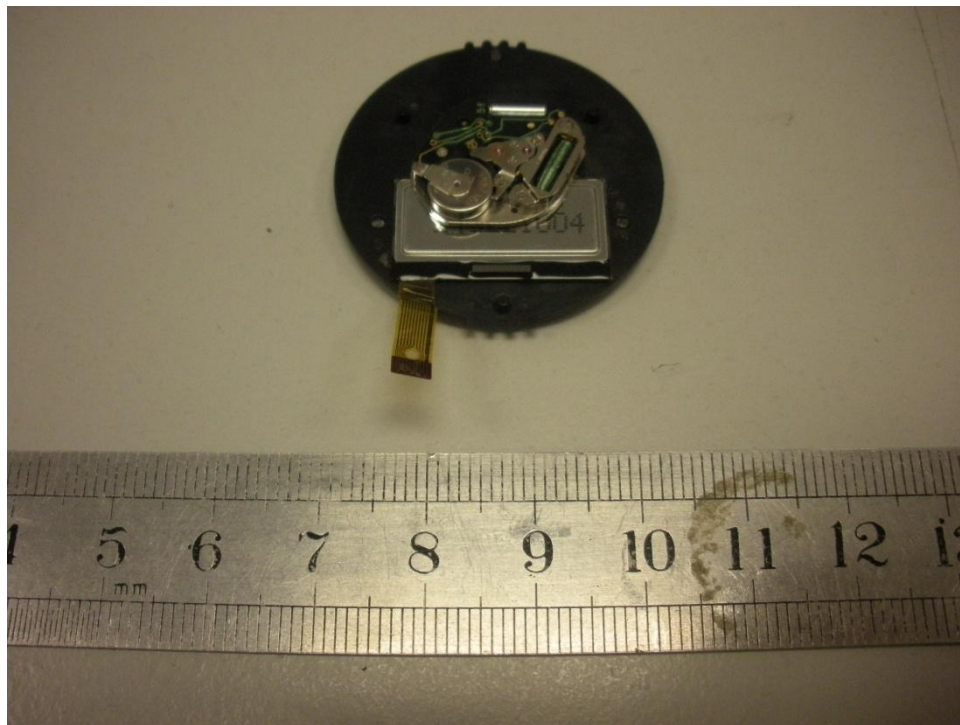
Appendix A



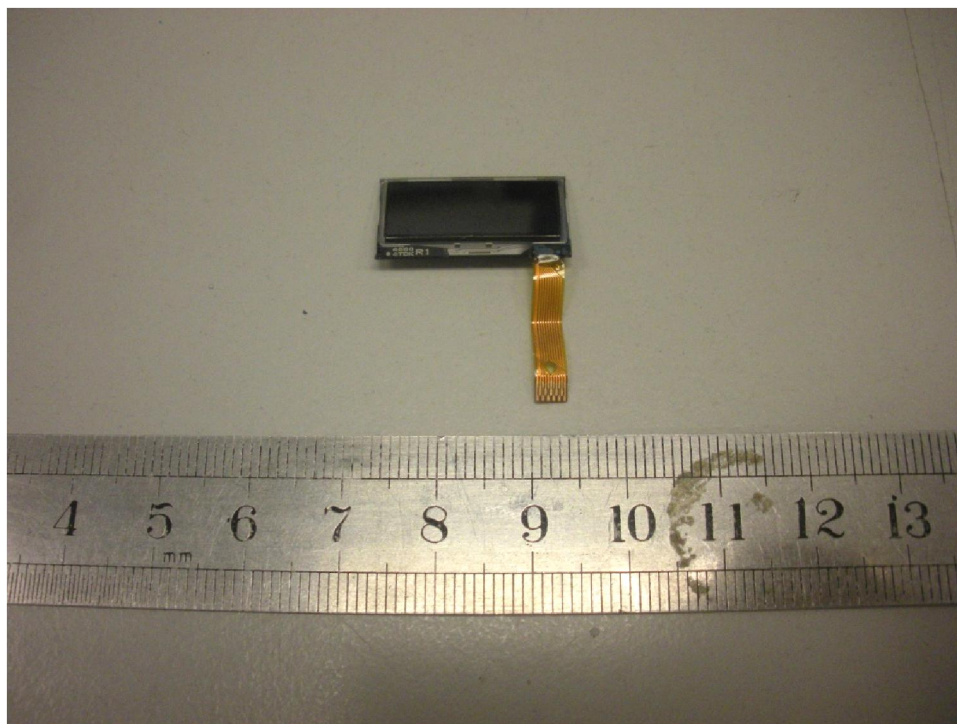
Appendix A



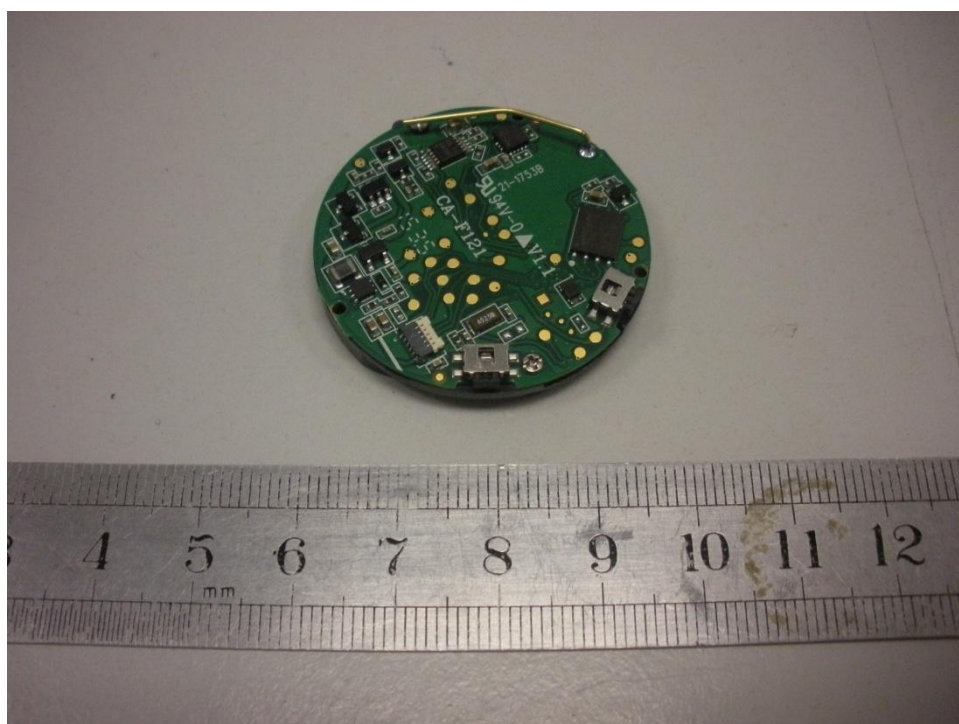
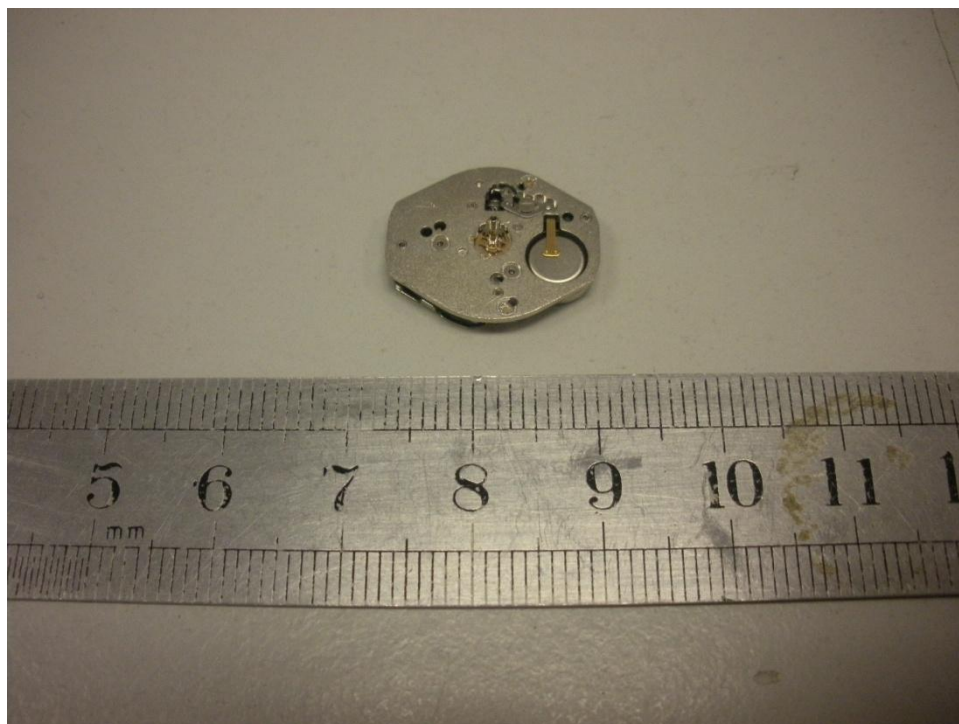
Appendix A



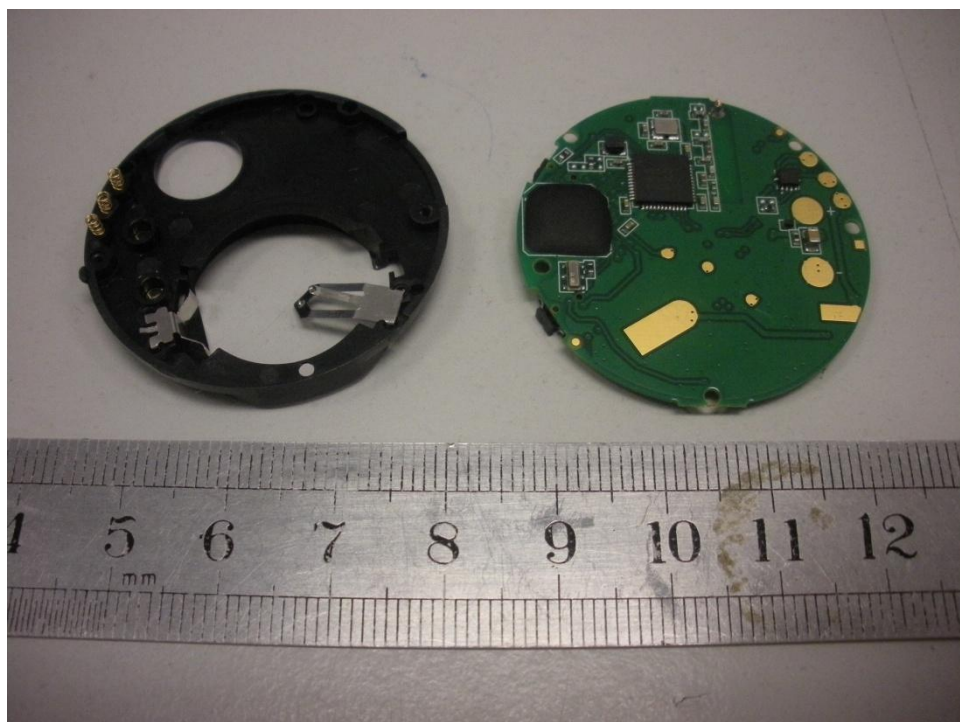
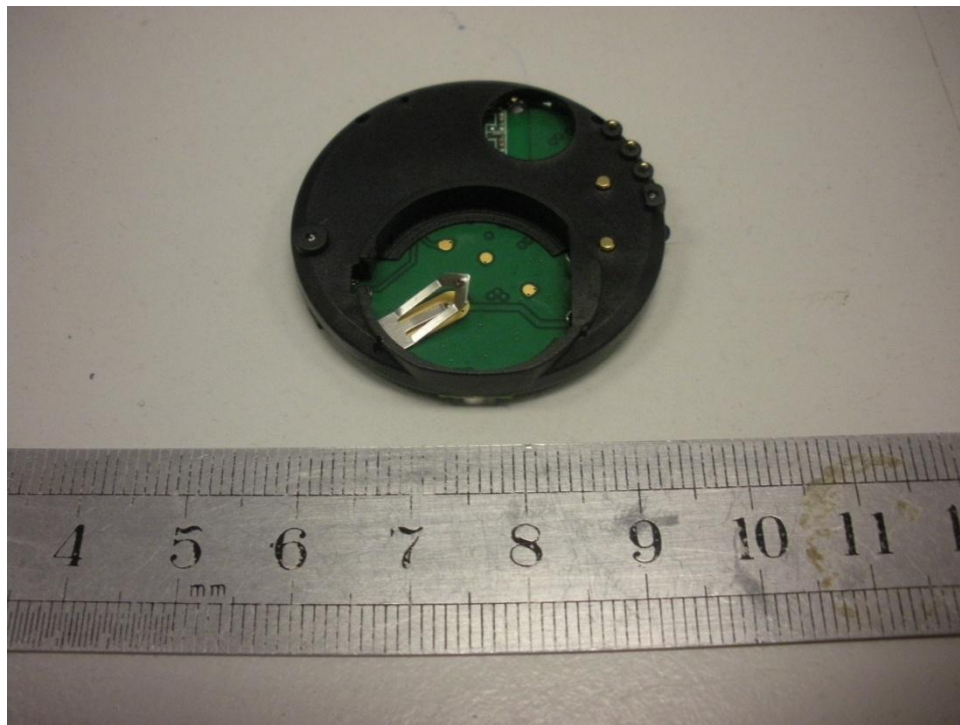
Appendix A



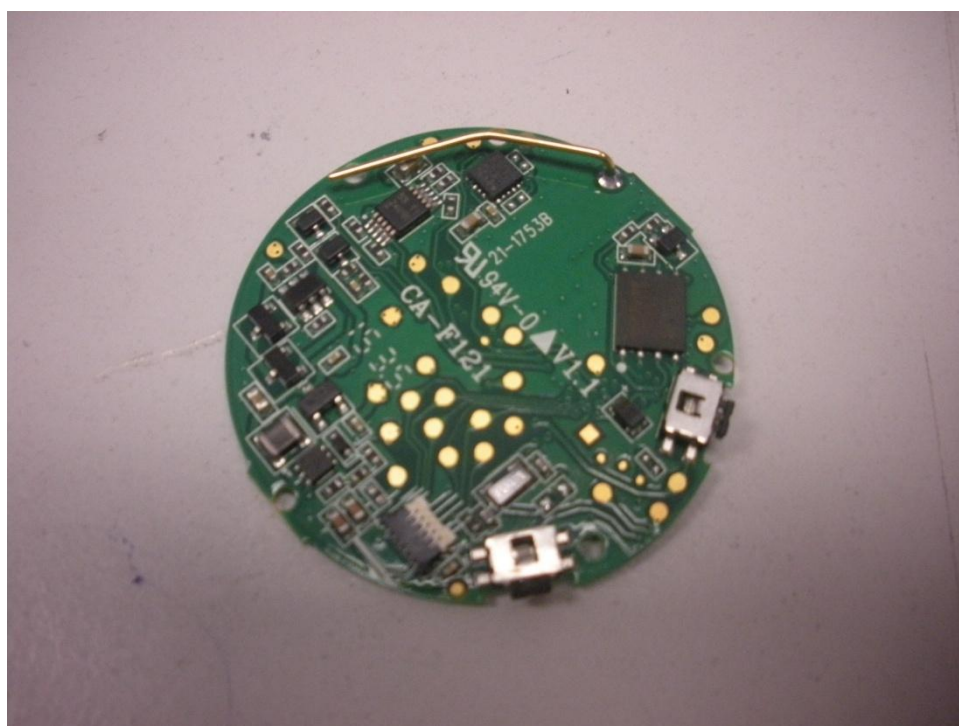
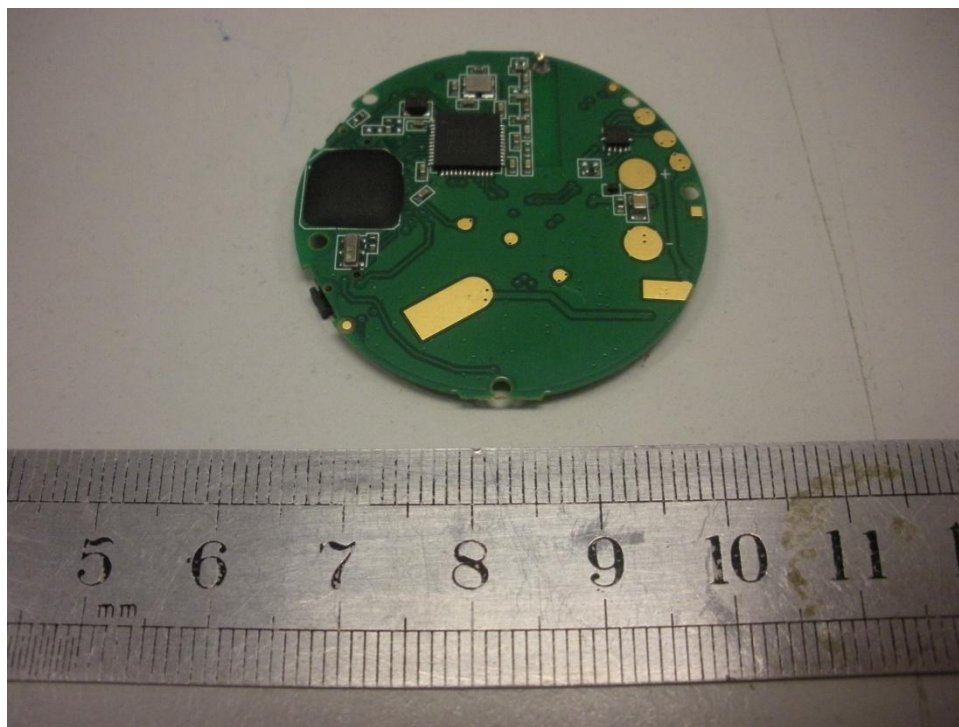
Appendix A



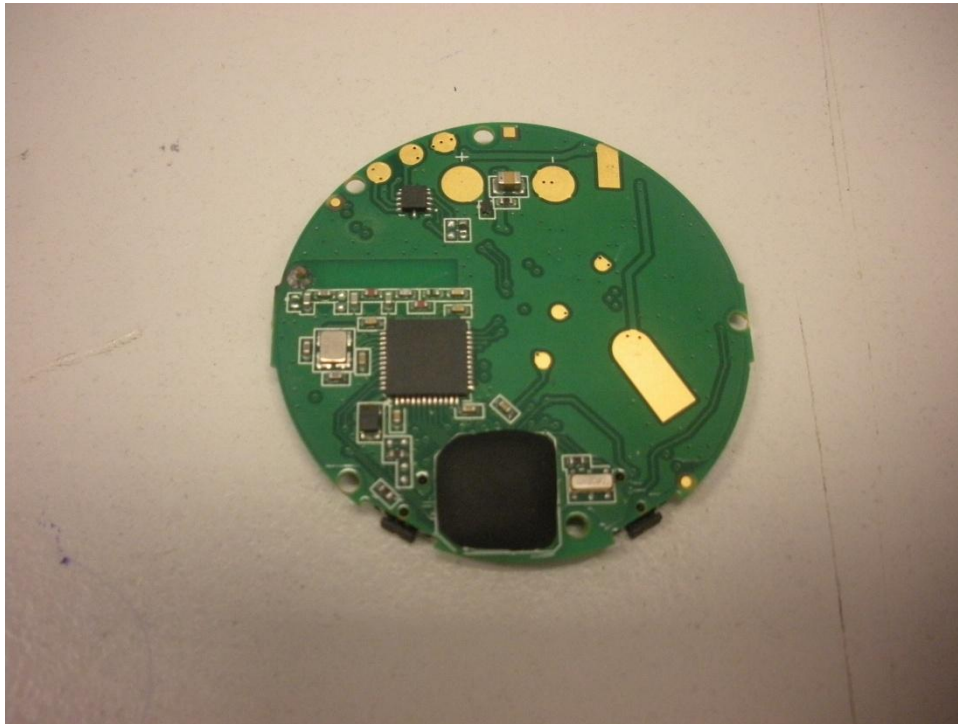
Appendix A



Appendix A



Appendix A



9 Appendix B - Setup Photographs of EUT

Spurious Radiated Emission



6dB & 99% Bandwidth, Peak Output Power, Spurious Emissions at Antenna Terminals, 100kHz Bandwidth of band edges, Power Spectral Density



10 Appendix C - General Product Information

Radiofrequency radiation exposure evaluation

According to KDB 447498 D01v05r02 section 4.3.1,

>> The 1-g SAR test exclusion thresholds, for 100MHz to 6GHz, at test separation distances ≤ 50 mm are determined by:

Power at 2402GHz = 0.0570 mW EIRP

Power at 2440GHz = 0.0579 mW EIRP

Power at 2480GHz = 0.0609 mW EIRP

$[(0.0570 \text{ mW}) / (50 \text{ mm})] \cdot [\text{sqrt}(2402 \text{ GHz})] = 0.0558$ which is ≤ 3.0 for 1-g SAR.

$[(0.0579 \text{ mW}) / (50 \text{ mm})] \cdot [\text{sqrt}(2440 \text{ GHz})] = 0.0572$ which is ≤ 3.0 for 1-g SAR.

$[(0.0609 \text{ mW}) / (50 \text{ mm})] \cdot [\text{sqrt}(2480 \text{ GHz})] = 0.0606$ which is ≤ 3.0 for 1-g SAR.

Therefore the device is exempt from stand-alone SAR test requirements.

>> The fundamental frequency of the EUT is 2402MHz-2480MHz, the test separation distance is $< 50\text{mm}$.

>> The power of EUT measured is:

- For 2402MHz: $0.0570\text{mW} = 10 \log(0.0570) \text{ dBm} \sim -12.44\text{dBm}$
- For 2440MHz: $0.0579\text{mW} = 10 \log(0.0579) \text{ dBm} \sim -12.37\text{dBm}$
- For 2480MHz: $0.0609\text{mW} = 10 \log(0.0609) \text{ dBm} \sim -12.15\text{dBm}$