China

FCC - TEST REPORT

Report Number	:	60.790.16.083.01R01	Date of Issue	: August 16, 2016
Model	:	Pinout-A, Pinout-B		
Trade Mark	:	Zesty Accessory		
Product Type	:	Pinout		
Applicant	:	Zesty Systems Inc.		
Address	:	4F, Annex, Sumitomo Ryogoku bldg 2-10-6 Ryogoku, Sumida Tokyo, Japan		
Production Facility	:	SHENZHEN JIAYZ PHOTO INDUSTRIAL CO.,LTD		
Address	:	2th Floor, Building A16, Silicon Valley Power Intelligent Terminal Industrial Park , No.20, KuKeng Dafu Industry Zone, Guanlan Aobei Community, Longhua New District, Shenzhen, Guangdong, P.R.China.		
Test Result	:	■Positive ☐Negative		
Total pages including Appendices	:	47		

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1 Table of Contents

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2 Description of Equipment Under Test

Description of the Equipment Under Test

Product:	Pinout
Model no.:	Pinout-A, Pinout-B
FCC ID:	2AIZ7PINOUT01
Rating:	5.0VDC
Frequency:	2402MHz-2480MHz
Antenna gain:	1.0dBi
Number of operated channel:	40
Modulation:	GFSK

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3 Summary of Test Standards

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

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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: BTL Inc.
No.3, jinshagang 1st Road,
Shixia, Dalang Twon, Dongguan City,
Guangdong, P.R.China 523792
FCC Registration Number: 319330

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

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4.1 Test Equipment Site List

Site 2

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Antenna	Schwarbeck	VULB9160	9160-3232	03/28/2016	(1)
Amplifier	HP	8447D	2944A09673	03/28/2016	(1)
Test Receiver	R&S	ESCI	100382	03/28/2016	(1)
Test Cable	N/A	C-01_CB03	N/A	06/30/2016	(1)
Antenna	ETS	3115	00075789	03/28/2016	(1)
Amplifier	Agilent	8449B	3008A02274	03/28/2016	(1)
Spectrum	Agilent	E4408B	US39240143	11/08/2015	(1)
Test Cable	HUBER+SUHNER	C-45	N/A	01/13/2016	(1)
Controller	CT	SC100	N/A	N.C.R	(4)
Active Loop Antenna	R&S	HFH2-Z2	830749/020	03/28/2016	(3)
Spectrum Analyzer	R&S	FSU26	100036	05/26/2016	(1)
RF cable	WOKEN	--	S02-140428-041	07/14/2015	(1)

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 years.
(4) N.C.R. = No Calibration Request

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4.2 Measurement System Uncertainty

Measurement System Uncertainty Emissions

Test Item	Frequency Range		Uncertainty (dB)
Conducted Emission	9kHz ~ 30MHz		± 2.02
Radiated Emission	30MHz ~ 1000MHz	Horizontal	± 3.98
		Vertical	± 3.62
	1000MHz ~ 18000MHz	Horizontal	± 3.11
		Vertical	± 3.07
	18000MHz ~ 40000MHz	Horizontal	± 3.66
		Vertical	± 3.54

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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	16-18	☒	☐	☐
FCC Title 47 Part 15.247(b) Peak Output Power	19	☒	☐	☐
FCC Title 47 Part 2.1051 & 15.247(d) Spurious Emissions at Antenna Terminals	20-28	☒	☐	☐
FCC Title 47 Part 15.247(d) 100kHz Bandwidth of band edges	29-33	☒	☐	☐
FCC Title 47 Part 15.247(e) Power Spectral Density	34-35	☒	☐	☐
FCC Title 47 Part 15.203 & 15.247(b) Antenna Requirement	36	☒	☐	☐

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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: July 3, 2016

Testing Start Date: July 4, 2016

Testing End Date: July 26, 2016

- TÜV SÜD HONG KONG LTD. -

Reviewed by: Prepared by:

TSENG Chi Kit	CHAN Kwong Ngai
EMC Project Engineer	EMC Test Engineer

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7 Emission Test Results

7.1 Spurious Radiated Emission

EUT: Pinout-A
Op Condition: Operated, TX Mode (2402MHz)
Test Specification: FCC15.205, 15.209 & 15.247(d) Antenna: Horizontal
Comment: 5.0VDC
Remark: 9kHz to 25GHz

Test Result
☒ Passed
☐ Not Passed

Frequency MHz	Result dBµV/m	Limit dBµV/m	Margin dB	Detector
48.430	22.82	40	-17.18	Quasi Peak
144.460	22.26	43.5	-21.24	Quasi Peak
232.730	29.85	46	-16.15	Quasi Peak
298.690	31.35	46	-14.65	Quasi Peak
384.050	28.87	46	-17.13	Quasi Peak
799.210	36.26	46	-9.74	Quasi Peak
4806.210	44.40	74	-29.60	Peak
4806.100	35.35	54	-18.65	Average

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Spurious Radiated Emission

EUT:	Pinout-A
Op Condition:	Operated, TX Mode (2402MHz)
Test Specification:	FCC15.205, 15.209 & 15.247(d) Antenna: Vertical
Comment:	5.0VDC
Remark:	9kHz to 25GHz

Test Result
☒ Passed
☐ Not Passed

Frequency MHz	Result dBµV/m	Limit dBµV/m	Margin dB	Detector
48.430	25.35	40	-14.65	Quasi Peak
121.180	20.46	43.5	-23.04	Quasi Peak
232.730	22.07	46	-23.93	Quasi Peak
314.210	24.13	46	-21.87	Quasi Peak
549.920	25.06	46	-20.94	Quasi Peak
771.080	29.95	46	-16.05	Quasi Peak
4806.050	47.23	74	-26.77	Peak
4806.070	40.27	54	-13.73	Average

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Spurious Radiated Emission

EUT:	Pinout-A
Op Condition:	Operated, TX Mode (2440MHz)
Test Specification:	FCC15.205, 15.209 & 15.247(d) Antenna: Horizontal
Comment:	5.0VDC
Remark:	9kHz to 25GHz

Test Result
☒ Passed
☐ Not Passed

Frequency MHz	Result dBµV/m	Limit dBµV/m	Margin dB	Detector
48.430	22.91	40	-17.09	Quasi Peak
167.740	23.72	43.5	-19.78	Quasi Peak
233.700	30.38	46	-15.62	Quasi Peak
299.660	29.97	46	-16.03	Quasi Peak
431.580	27.21	46	-18.79	Quasi Peak
798.240	34.31	46	-11.69	Quasi Peak
4881.080	42.22	74	-31.78	Peak
4882.070	34.81	54	-19.19	Average

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Spurious Radiated Emission

EUT:	Pinout-A
Op Condition:	Operated, TX Mode (2440MHz)
Test Specification:	FCC15.205, 15.209 & 15.247(d) Antenna: Vertical
Comment:	5.0VDC
Remark:	9kHz to 25GHz

Test Result
☒ Passed
☐ Not Passed

Frequency MHz	Result dBµV/m	Limit dBµV/m	Margin dB	Detector
48.430	25.59	40	-14.41	Quasi Peak
83.350	20.86	40	-19.14	Quasi Peak
232.730	20.87	46	-25.13	Quasi Peak
299.660	20.27	46	-25.73	Quasi Peak
551.860	25.63	46	-20.37	Quasi Peak
807.940	30.78	46	-15.22	Quasi Peak
4882.140	46.36	74	-27.64	Peak
4882.080	39.01	54	-14.99	Average

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Spurious Radiated Emission

EUT:	Pinout-A
Op Condition:	Operated, TX Mode (2480MHz)
Test Specification:	FCC15.205, 15.209 & 15.247(d) Antenna: Horizontal
Comment:	5.0VDC
Remark:	9kHz to 25GHz

Test Result
☒ Passed
☐ Not Passed

Frequency MHz	Result dBµV/m	Limit dBµV/m	Margin dB	Detector
144.460	22.96	43.5	-20.54	Quasi Peak
232.730	30.23	46	-15.77	Quasi Peak
298.690	29.30	46	-16.70	Quasi Peak
384.050	29.34	46	-16.66	Quasi Peak
548.950	25.58	46	-20.42	Quasi Peak
797.270	32.37	46	-13.63	Quasi Peak
4958.210	45.86	74	-28.14	Peak
4958.060	35.59	54	-18.41	Average

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Spurious Radiated Emission

EUT:	Pinout-A
Op Condition:	Operated, TX Mode (2480MHz)
Test Specification:	FCC15.205, 15.209 & 15.247(d) Antenna: Vertical
Comment:	5.0VDC
Remark:	9kHz to 25GHz

Test Result
☒ Passed
☐ Not Passed

Frequency MHz	Result dBµV/m	Limit dBµV/m	Margin dB	Detector
48.430	25.70	40	-14.30	Quasi Peak
64.920	22.31	40	-17.69	Quasi Peak
232.730	20.67	46	-25.33	Quasi Peak
299.660	21.50	46	-24.50	Quasi Peak
540.220	25.20	46	-20.80	Quasi Peak
731.310	28.92	46	-17.08	Quasi Peak
4958.060	46.58	74	-27.42	Peak
4958.060	39.97	54	-14.03	Average

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7.2 6dB & 99% Bandwidth

EUT: Pinout-A
Op Condition: Operated, TX Mode
Test Specification: FCC15.247(a)(2)
Comment: 5.0VDC

Test Result
☒ Passed
☐ Not Passed

Frequency (MHz)	6dB RF Bandwidth (MHz)	99 % Occupied Bandwidth (MHz)	6dB RF Bandwidth Limit (MHz)
2402	0.690	1.071	> 0.500
2440	0.687	1.071	> 0.500
2480	0.690	1.071	> 0.500

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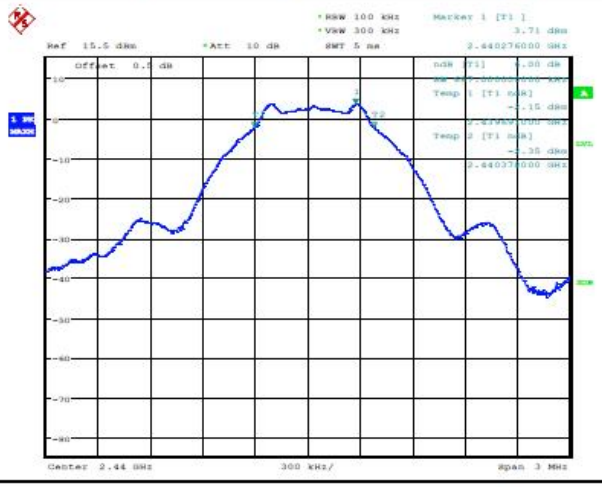
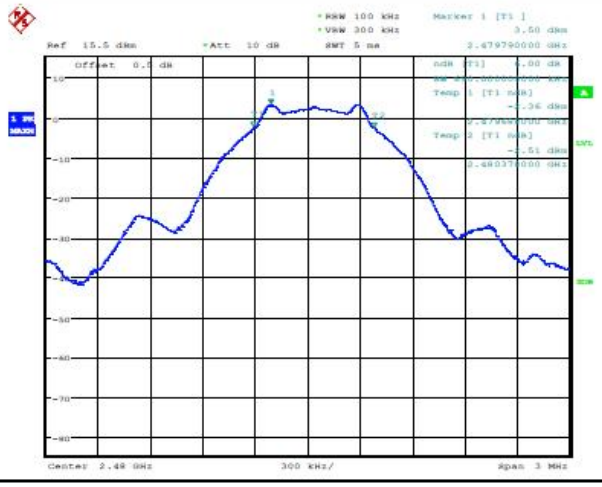
6dB & 99% Bandwidth

EUT:	Pinout-A
Op Condition:	Operated, TX Mode
Test Specification:	FCC15.247(a)(2), 6dB Bandwidth
Comment:	5.0VDC

Test Result
☒ Passed
☐ Not Passed

Mode 1	
2402	
2440	
2480	

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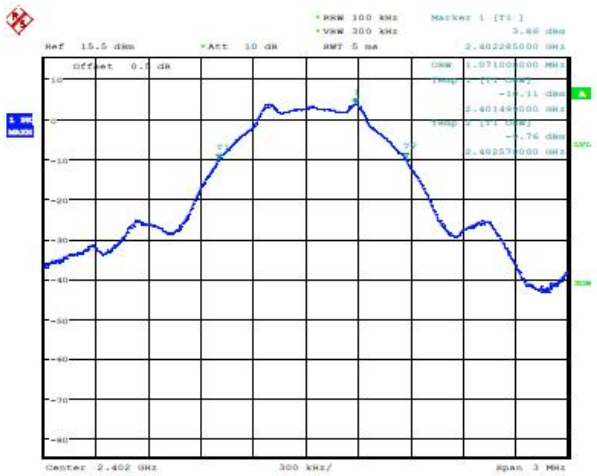
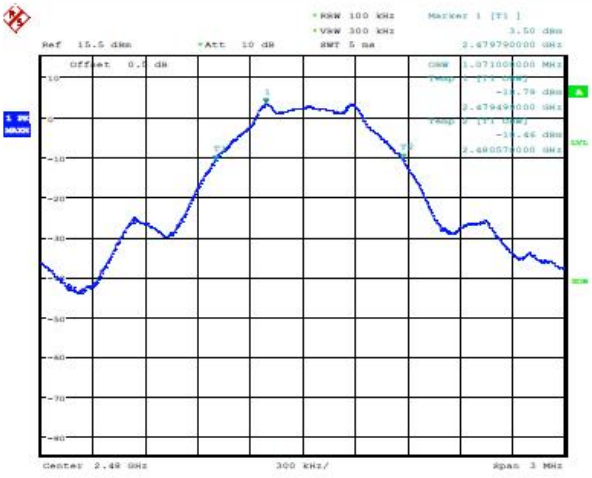
6dB & 99% Bandwidth

EUT:	Pinout-A
Op Condition:	Operated, TX Mode
Test Specification:	FCC15.247(a)(2), 99% Bandwidth
Comment:	5.0VDC

Test Result
☒ Passed
☐ Not Passed

Mode 1	
2402	
2440	
2480	

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7.3 Peak Output Power

EUT: Pinout-A
Op Condition: Operated, TX Mode
Test Specification: FCC15.247(b)
Comment: 5.0VDC

Test Result
☒ Passed
☐ Not Passed

Frequency (MHz)	Peak Power (dBm)	Limit (dBm)
2402	4.21	< 30
2440	4.02	< 30
2480	3.76	< 30

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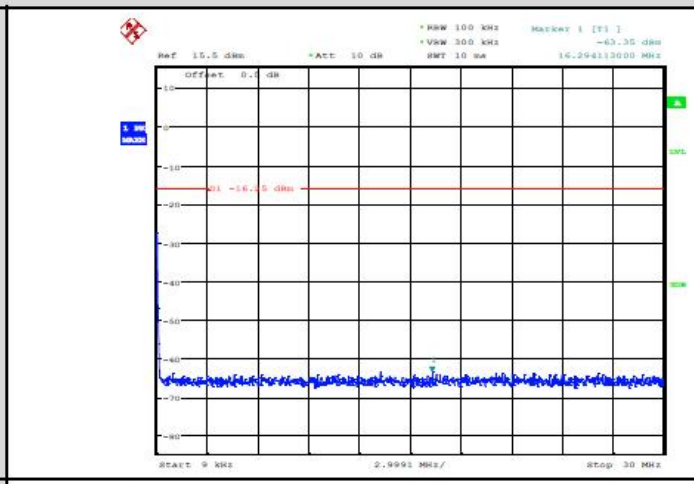
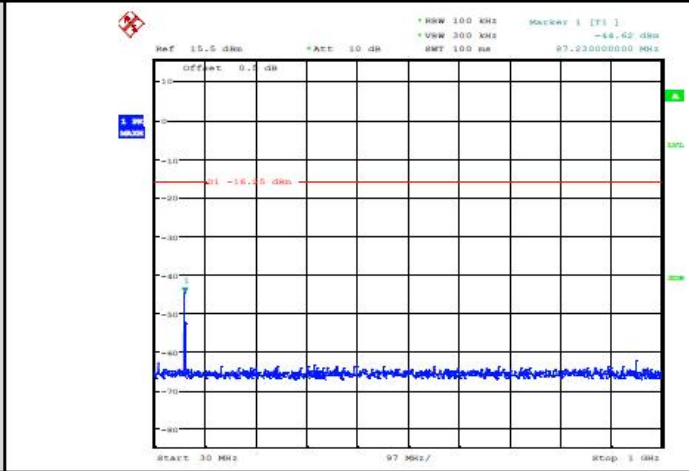
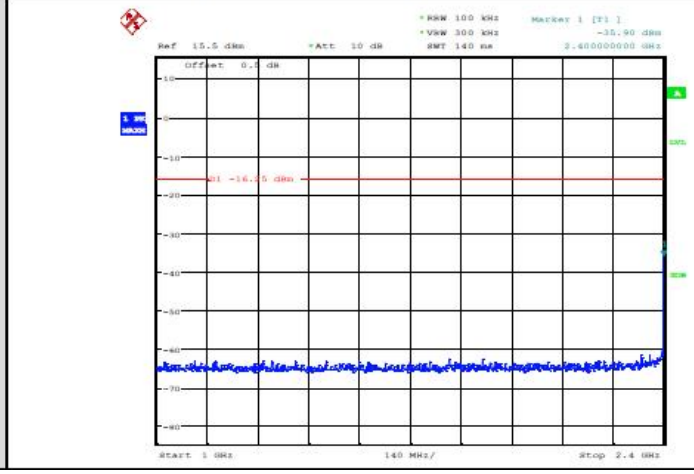
7.4 Spurious Emissions at Antenna Terminals

EUT:	Pinout-A
Op Condition:	Operated, TX Mode (2402MHz)
Test Specification:	FCC2.1051 & 15.247(d)
Comment:	5.0VDC

Test Result
☒ Passed
☐ Not Passed

Mode 1-2402	
9kHz-30MHz	
30MHz-1GHz	
1GHz-2.4GHz	

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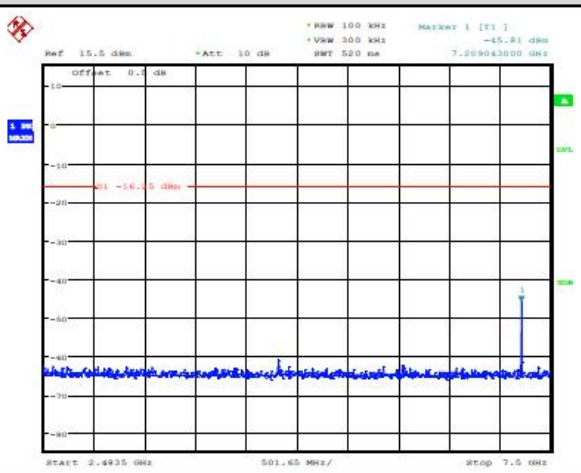
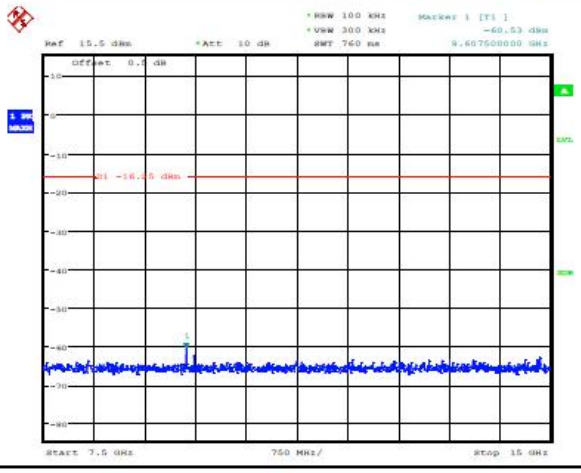
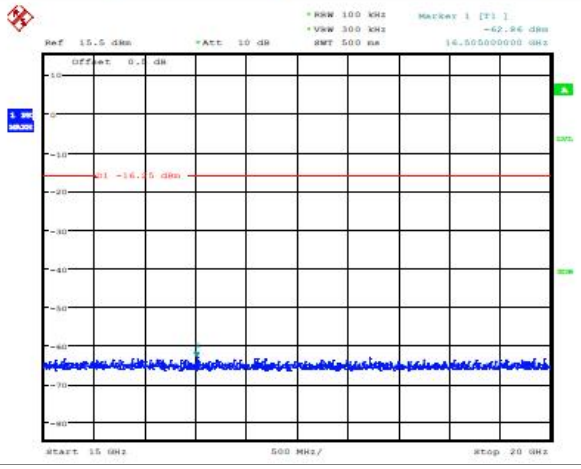
Spurious Emissions at Antenna Terminals

EUT:	Pinout-A
Op Condition:	Operated, TX Mode (2402MHz)
Test Specification:	FCC2.1051 & 15.247(d)
Comment:	5.0VDC

Test Result
☒ Passed
☐ Not Passed

Mode 1-2402	
2.4835GHz-7.5GHz	
7.5GHz-15GHz	
15GHz-20GHz	

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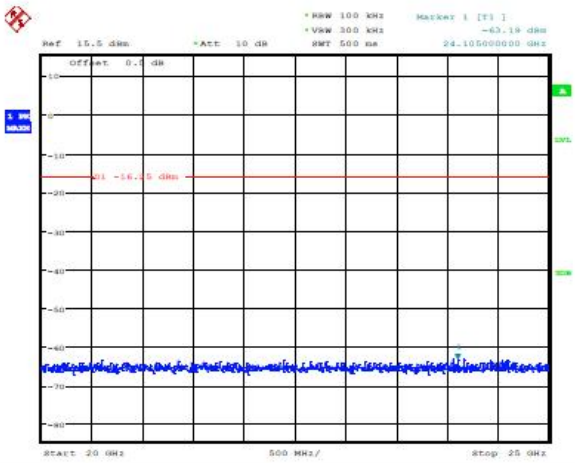
Spurious Emissions at Antenna Terminals

EUT:	Pinout-A
Op Condition:	Operated, TX Mode (2402MHz)
Test Specification:	FCC2.1051 & 15.247(d)
Comment:	5.0VDC

Test Result
☒ Passed
☐ Not Passed

Mode 1-2402	
20GHz-25GHz	

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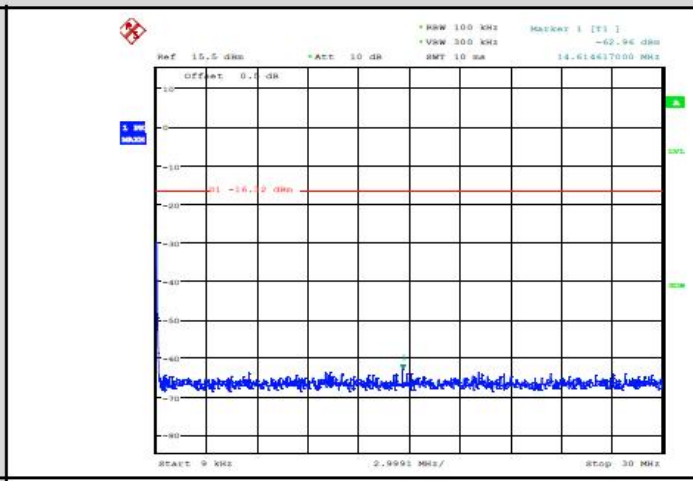
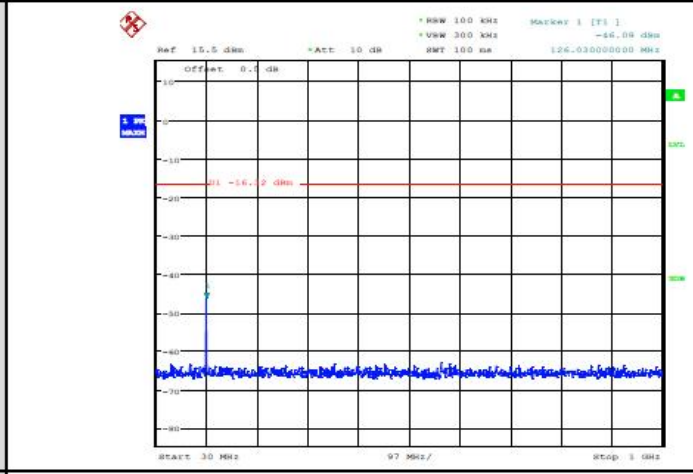
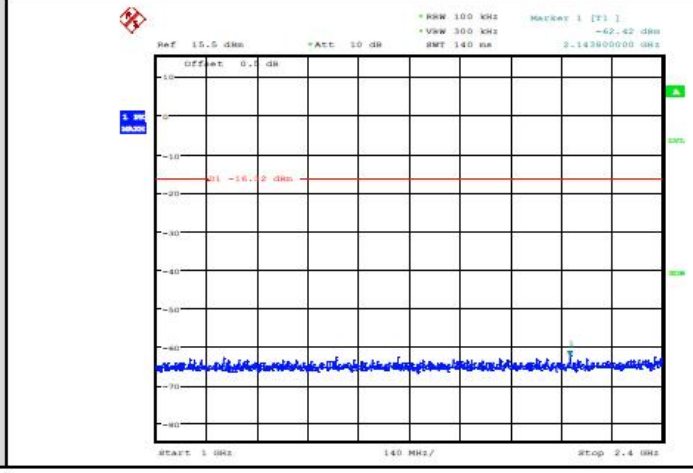
Spurious Emissions at Antenna Terminals

EUT:	Pinout-A
Op Condition:	Operated, TX Mode (2440MHz)
Test Specification:	FCC2.1051 & 15.247(d)
Comment:	5.0VDC

Test Result
☒ Passed
☐ Not Passed

Mode 1-2440	
9kHz-30MHz	
30MHz-1GHz	
1GHz-2.4GHz	

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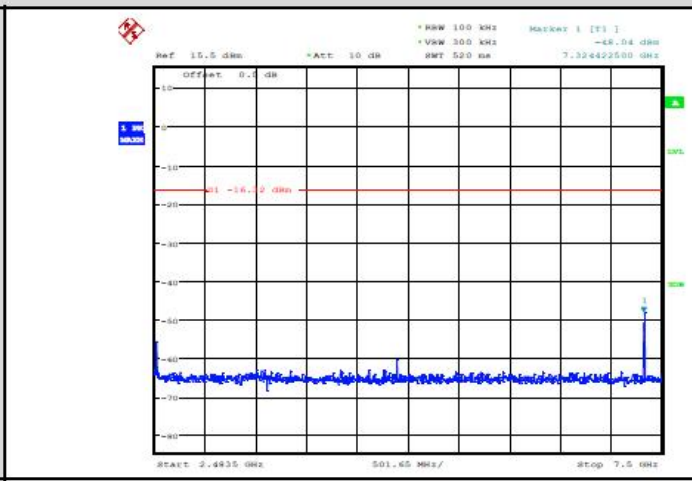
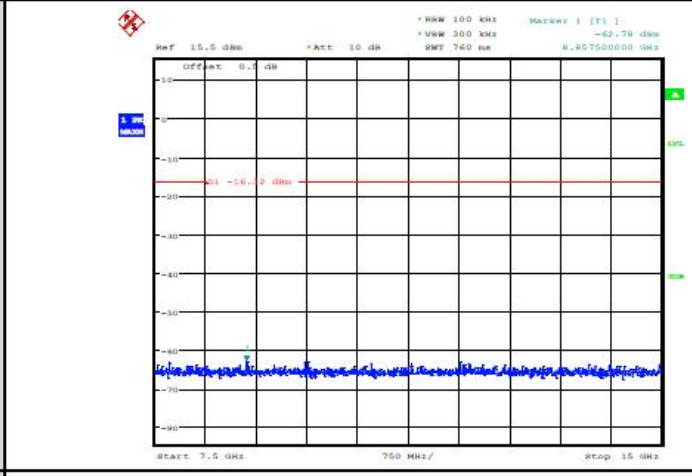
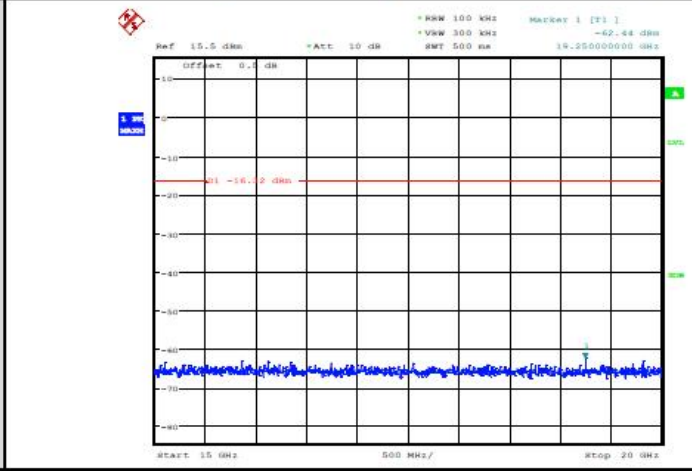
Spurious Emissions at Antenna Terminals

EUT:	Pinout-A
Op Condition:	Operated, TX Mode (2440MHz)
Test Specification:	FCC2.1051 & 15.247(d)
Comment:	5.0VDC

Test Result
☒ Passed
☐ Not Passed

Mode 1-2440	
2.4835GHz-7.5GHz	
7.5GHz-15GHz	
15GHz-20GHz	

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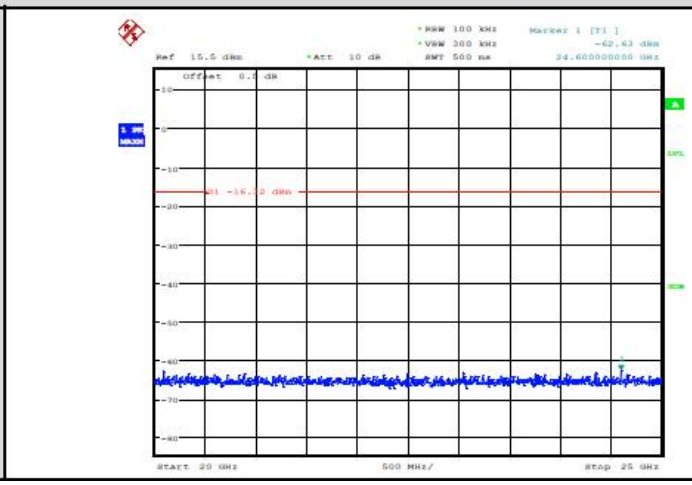
Spurious Emissions at Antenna Terminals

EUT:	Pinout-A
Op Condition:	Operated, TX Mode (2440MHz)
Test Specification:	FCC2.1051 & 15.247(d)
Comment:	5.0VDC

Test Result
☒ Passed
☐ Not Passed

Mode 1-2440	
20GHz-25GHz	

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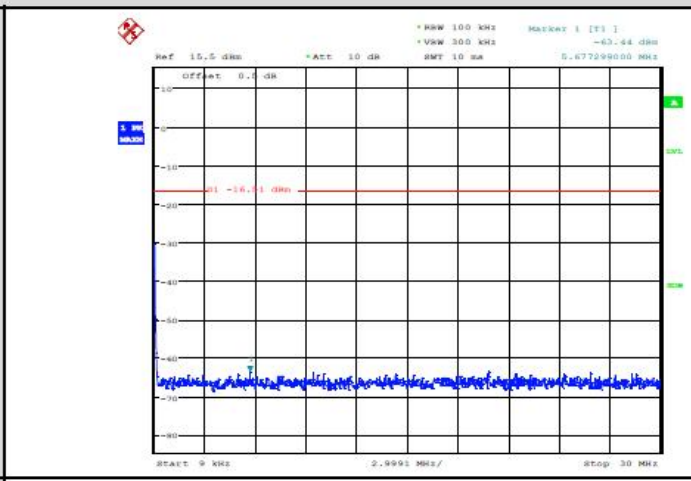
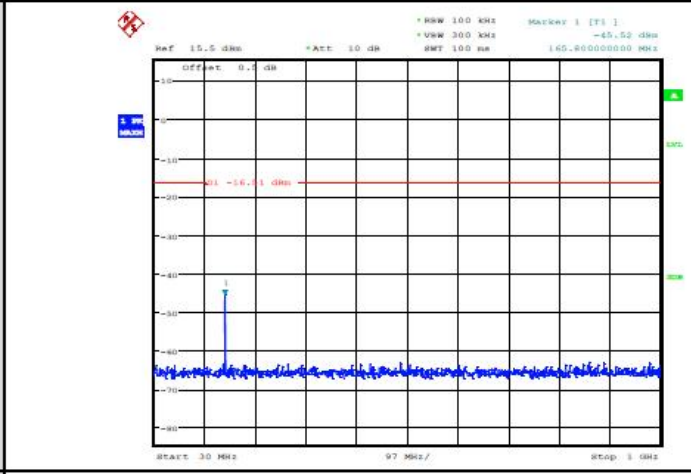
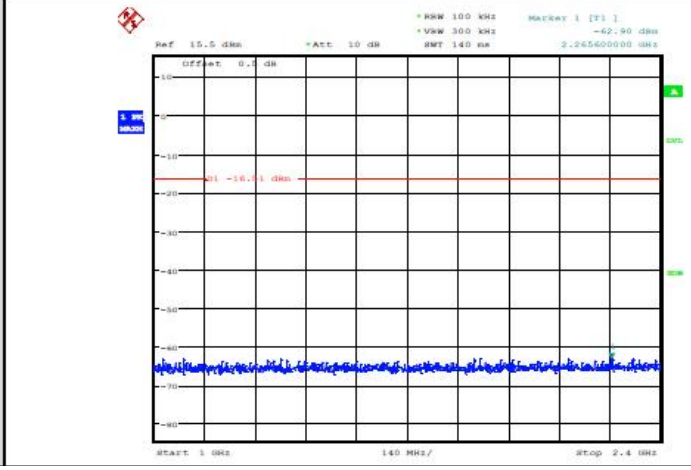
Spurious Emissions at Antenna Terminals

EUT:	Pinout-A
Op Condition:	Operated, TX Mode (2480MHz)
Test Specification:	FCC2.1051 & 15.247(d)
Comment:	5.0VDC

Test Result
☒ Passed
☐ Not Passed

Mode 1-2480	
9KHz-30MHz	
30MHz-1GHz	
1GHz-2.4GHz	

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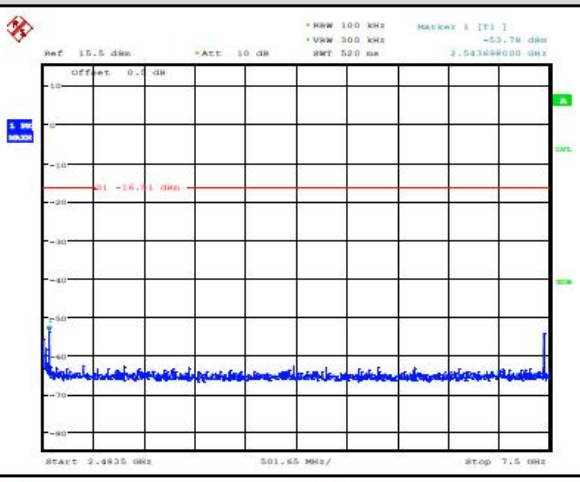
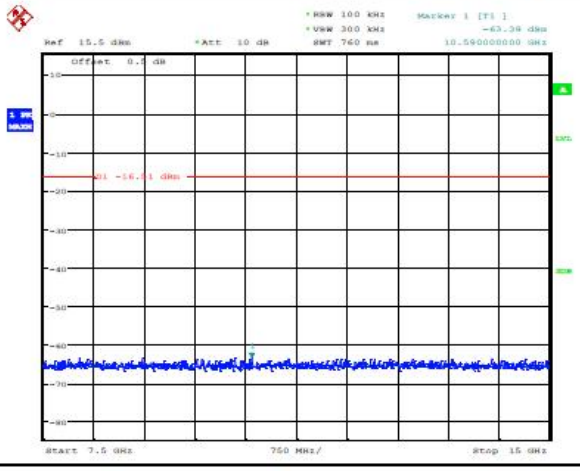
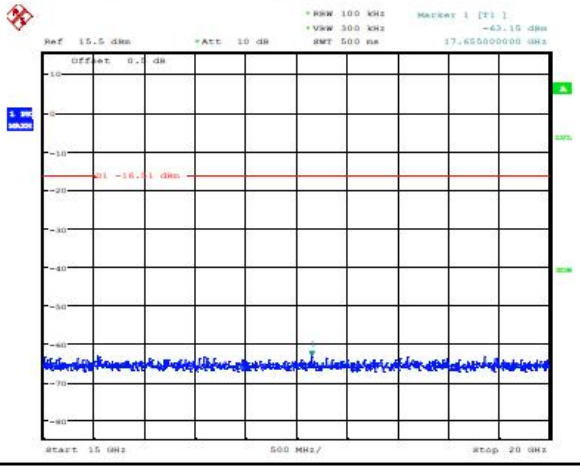
Spurious Emissions at Antenna Terminals

EUT: Pinout-A
Op Condition: Operated, TX Mode (2480MHz)
Test Specification: FCC2.1051 & 15.247(d)
Comment: 5.0VDC

Test Result
☒ Passed
☐ Not Passed

Mode 1-2480	
2.4835GHz-7.5GHz	
7.5GHz-15GHz	
15GHz-20GHz	

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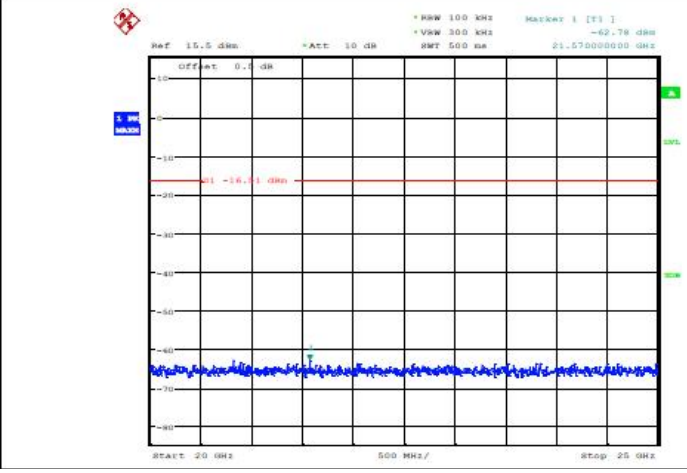
Spurious Emissions at Antenna Terminals

EUT:	Pinout-A
Op Condition:	Operated, TX Mode (2480MHz)
Test Specification:	FCC2.1051 & 15.247(d)
Comment:	5.0VDC

Test Result
☒ Passed
☐ Not Passed

Mode 1-2480	
20GHz-25GHz	

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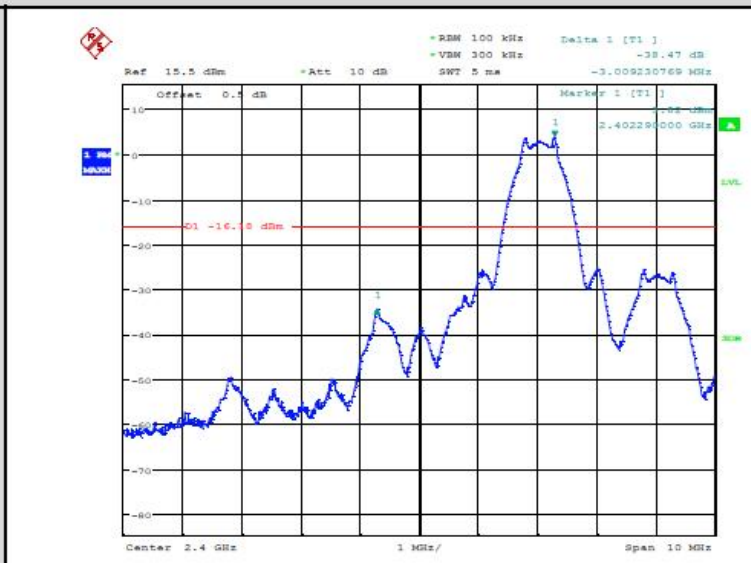
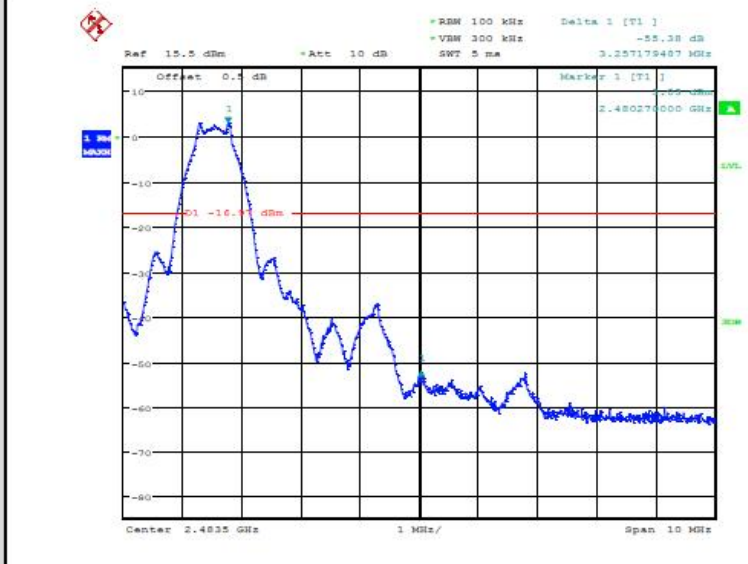
7.5 100kHz Bandwidth of band edges

EUT:	Pinout-A
Op Condition:	Operated, TX Mode (2402/2480MHz)
Test Specification:	FCC15.247(d), Conducted
Comment:	5.0VDC

Test Result
☒ Passed
☐ Not Passed

Mode 1	
2402	
2480	

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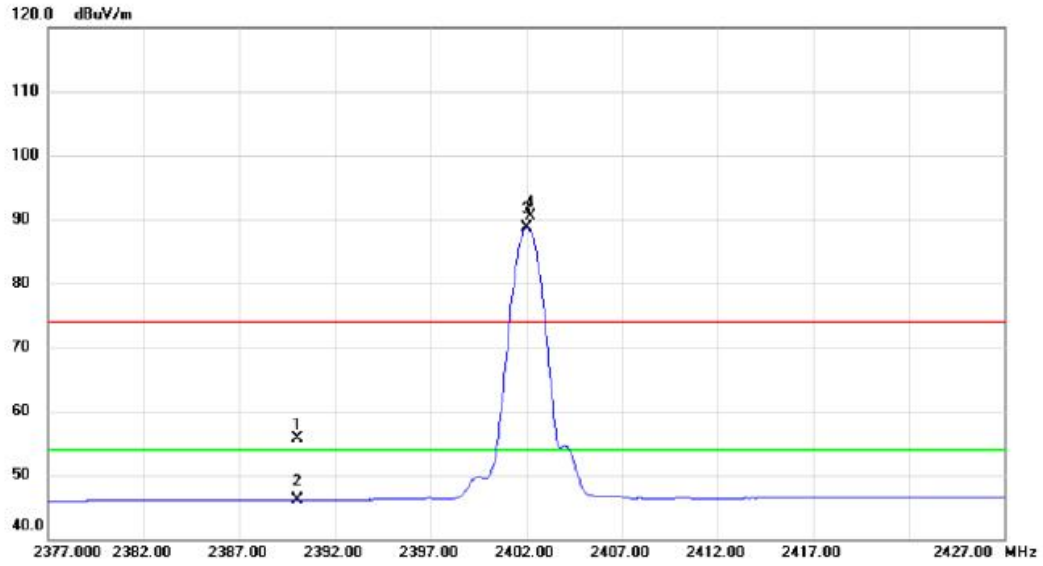
100kHz Bandwidth of band edges

EUT:	Pinout-A
Op Condition:	Operated, TX Mode (2402MHz)
Test Specification:	FCC15.247(d), Radiated, Antenna: Horizontal
Comment:	5.0VDC

Test Result
☒ Passed
☐ Not Passed



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	22.72	33.01	55.73	74.00	-18.27	peak	
2		2390.000	13.12	33.01	46.13	54.00	-7.87	AVG	
3		2402.050	55.73	33.06	88.79	54.00	34.79	AVG	No Limit
4		2402.250	57.34	33.06	90.40	74.00	16.40	peak	No Limit

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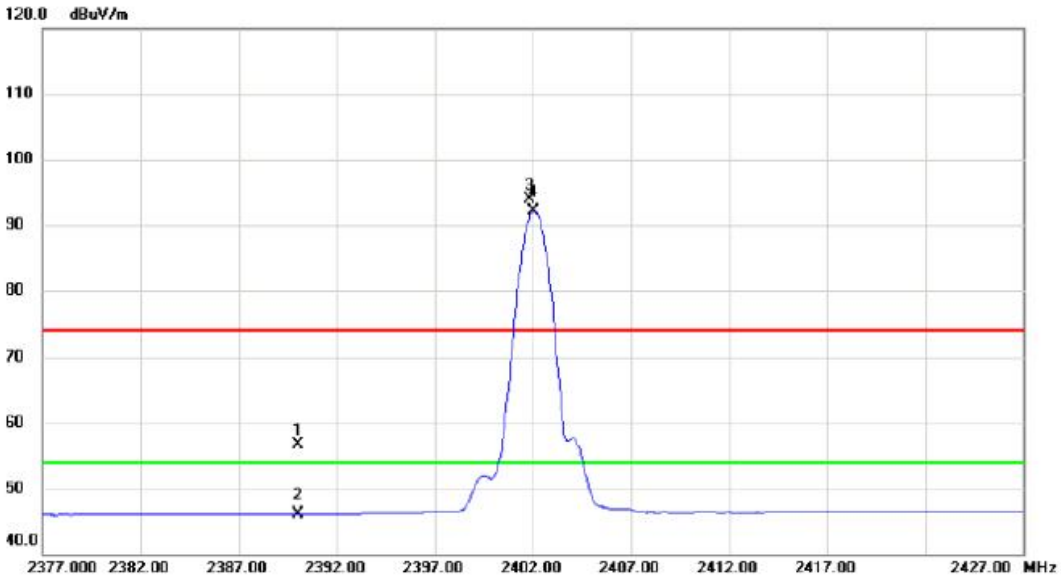
100kHz Bandwidth of band edges

EUT:	Pinout-A
Op Condition:	Operated, TX Mode (2402MHz)
Test Specification:	FCC15.247(d), Radiated, Antenna: Vertical
Comment:	5.0VDC

Test Result
☒ Passed
☐ Not Passed



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	23.66	33.01	56.67	74.00	-17.33	peak	
2		2390.000	13.13	33.01	46.14	54.00	-7.86	AVG	
3		2401.800	60.75	33.06	93.81	74.00	19.81	peak	No Limit
4		2402.050	59.10	33.06	92.16	54.00	38.16	AVG	No Limit

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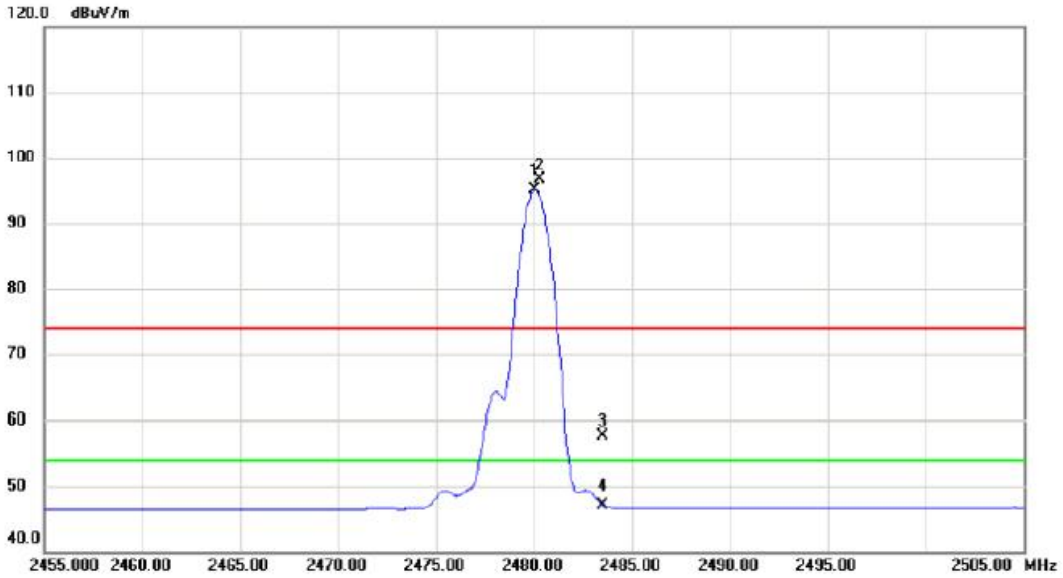
100kHz Bandwidth of band edges

EUT:	Pinout-A
Op Condition:	Operated, TX Mode (2480MHz)
Test Specification:	FCC15.247(d), Radiated, Antenna: Horizontal
Comment:	5.0VDC

Test Result
☒ Passed
☐ Not Passed



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2480.050	61.66	33.39	95.05	54.00	41.05	AVG	No Limit
2		2480.300	63.22	33.39	96.61	74.00	22.61	peak	No Limit
3		2483.500	24.28	33.40	57.68	74.00	-16.32	peak	
4		2483.500	13.74	33.40	47.14	54.00	-6.86	AVG	

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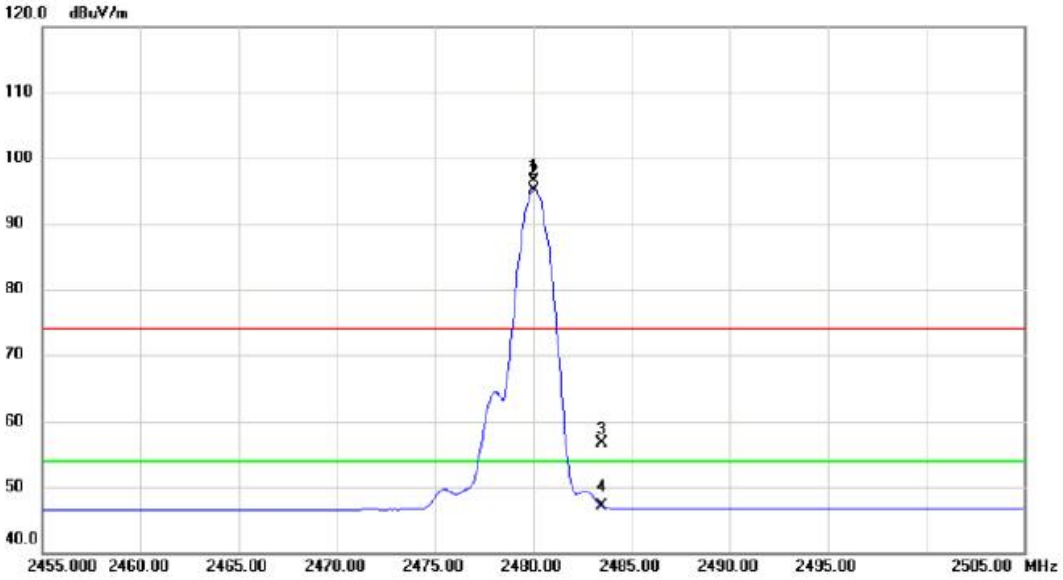
100kHz Bandwidth of band edges

EUT:	Pinout-A
Op Condition:	Operated, TX Mode (2480MHz)
Test Specification:	FCC15.247(d), Radiated, Antenna: Vertical
Comment:	5.0VDC

Test Result
☒ Passed
☐ Not Passed



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2480.050	63.02	33.39	96.41	74.00	22.41	peak	No Limit
2		2480.050	61.69	33.39	95.08	54.00	41.08	AVG	No Limit
3		2483.500	23.33	33.40	56.73	74.00	-17.27	peak	
4		2483.500	13.72	33.40	47.12	54.00	-6.88	AVG	

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7.6 Power Spectral Density

EUT: Pinout-A
Op Condition: Operated, TX Mode
Test Specification: FCC15.247(b)
Comment: 5.0VDC

Test Result
☒ Passed
☐ Not Passed

Frequency(MHz)	Reading (dBm/100kHz)	Limit(dBm/3kHz)
2402	3.94	< 8
2440	3.71	< 8
2480	3.45	< 8

Note: 100 kHz RBW is used during test, if the result compliance with 8dBm/3kHz, it must also compliance with 8dBm/3kHz when a 3kHz RBW is used.

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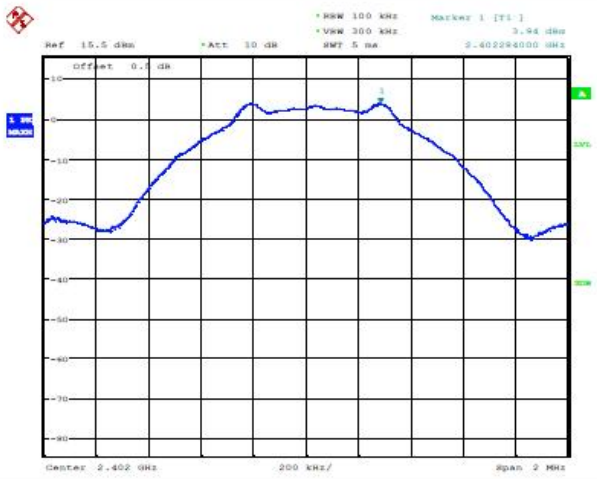
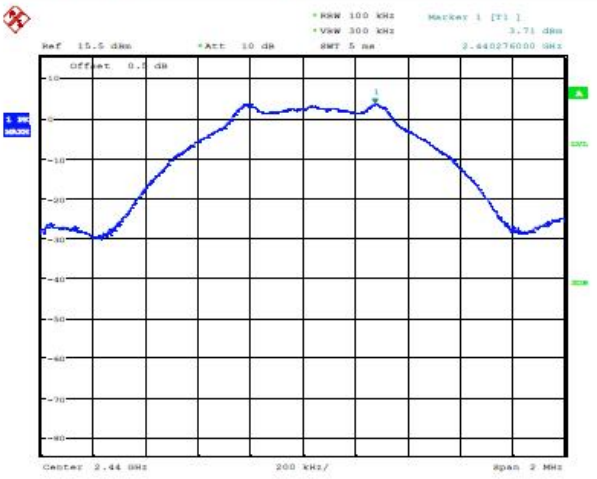
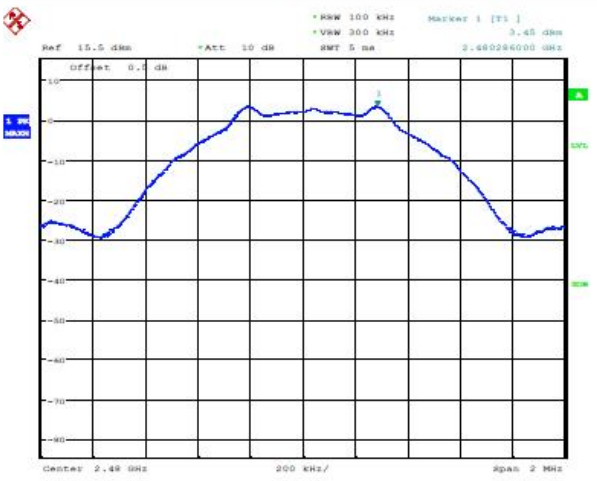
Power Spectral Density

EUT: Pinout-A
Op Condition: Operated, TX Mode
Test Specification: FCC15.247(b)
Comment: 5.0VDC

Test Result
☒ Passed
☐ Not Passed

Mode 1	
2402	
2440	
2480	

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7.7 Antenna Requirement

EUT:	Pinout-A
Op Condition:	Operated, TX Mode
Test Specification:	FCC15.203 & 15.247(b)
Comment:	5.0VDC

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 1.0 dBi.

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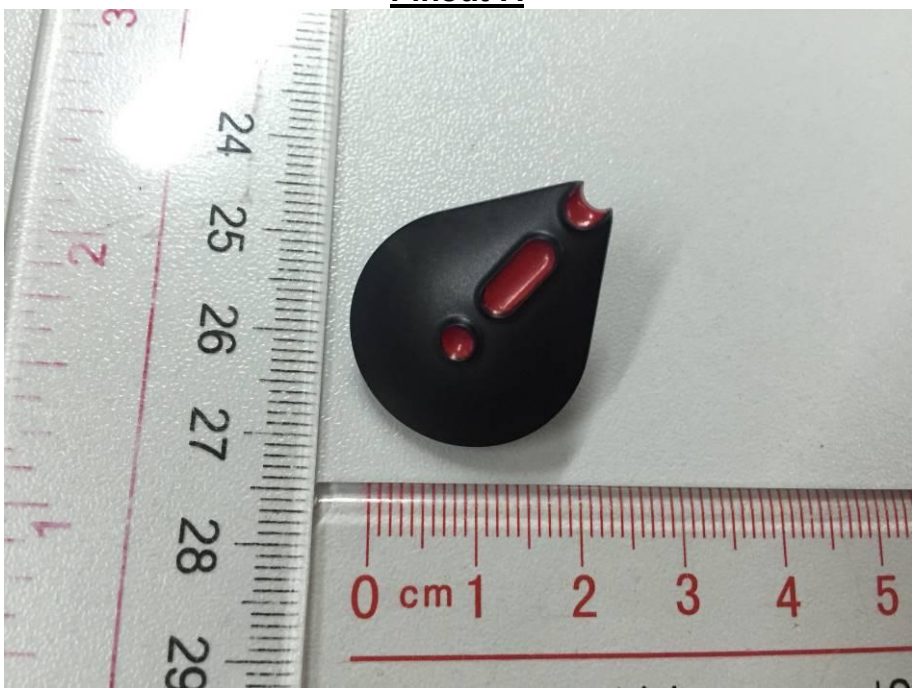
8 Appendix A - Photographs of EUT

Pinout-A



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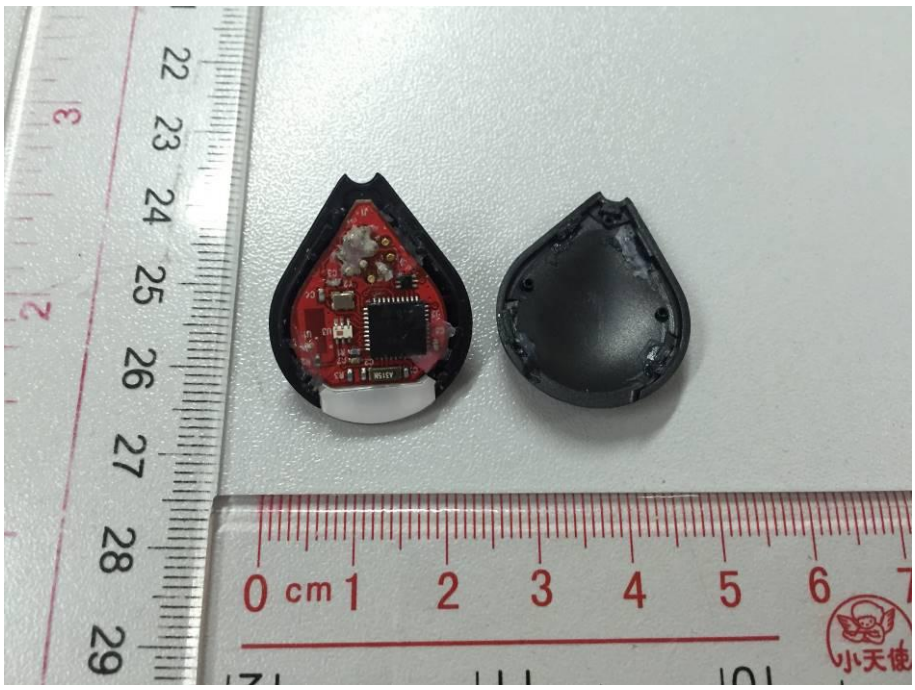
Appendix A



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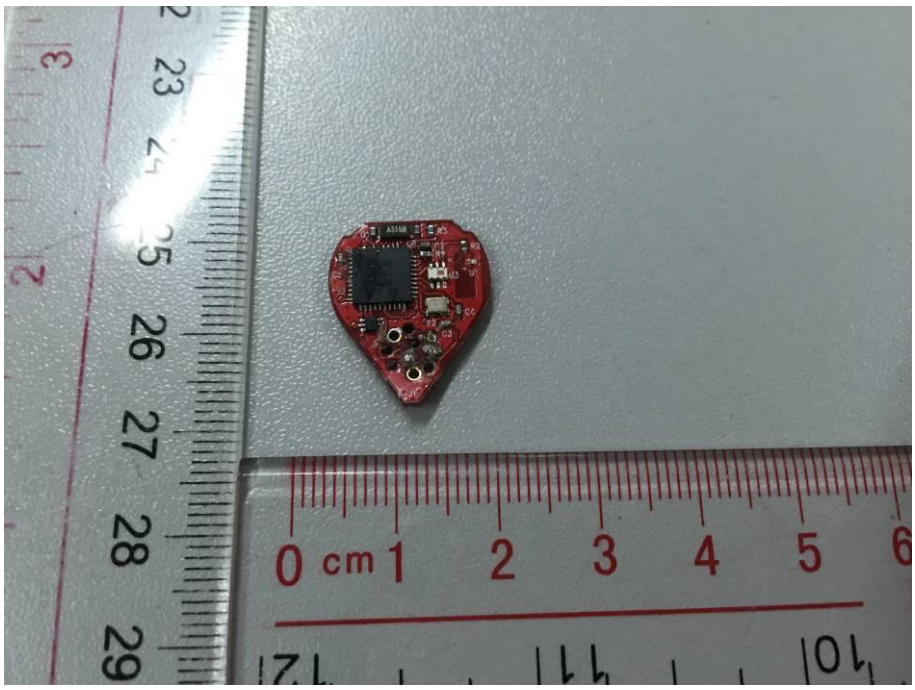
Appendix A



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Appendix A

Pinout-B

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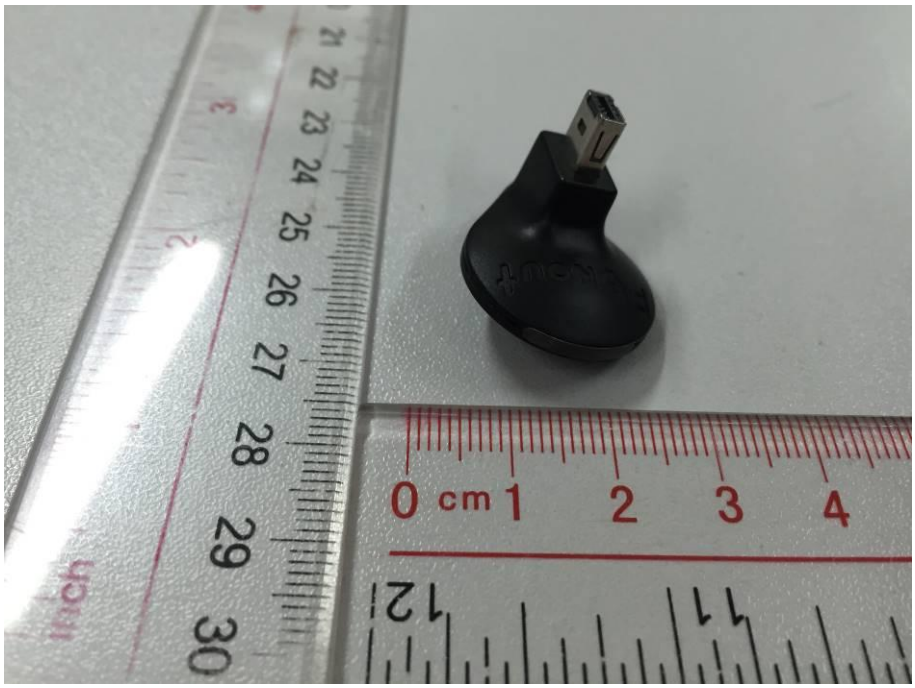
Appendix A



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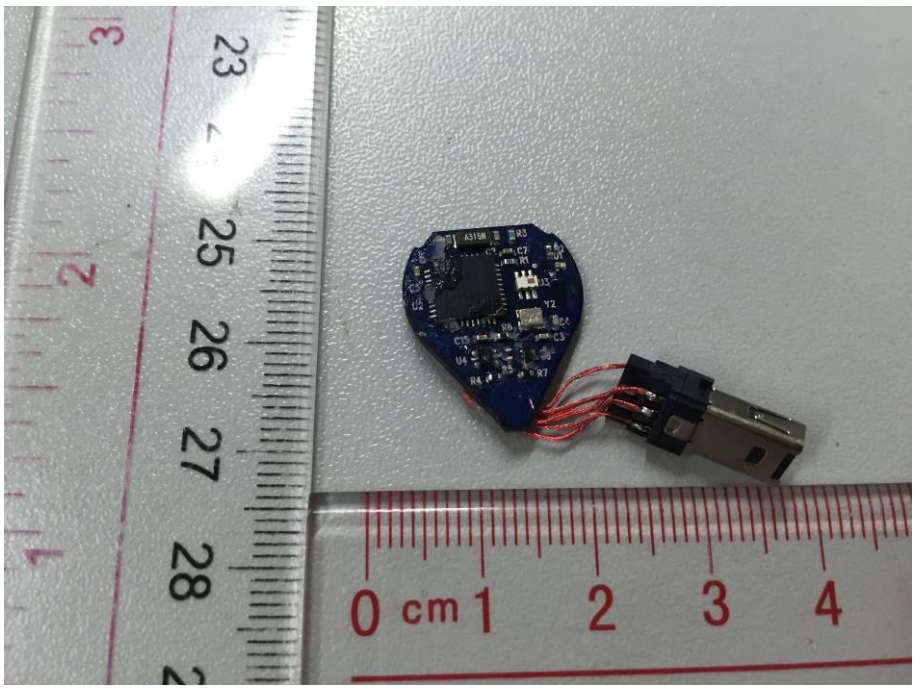
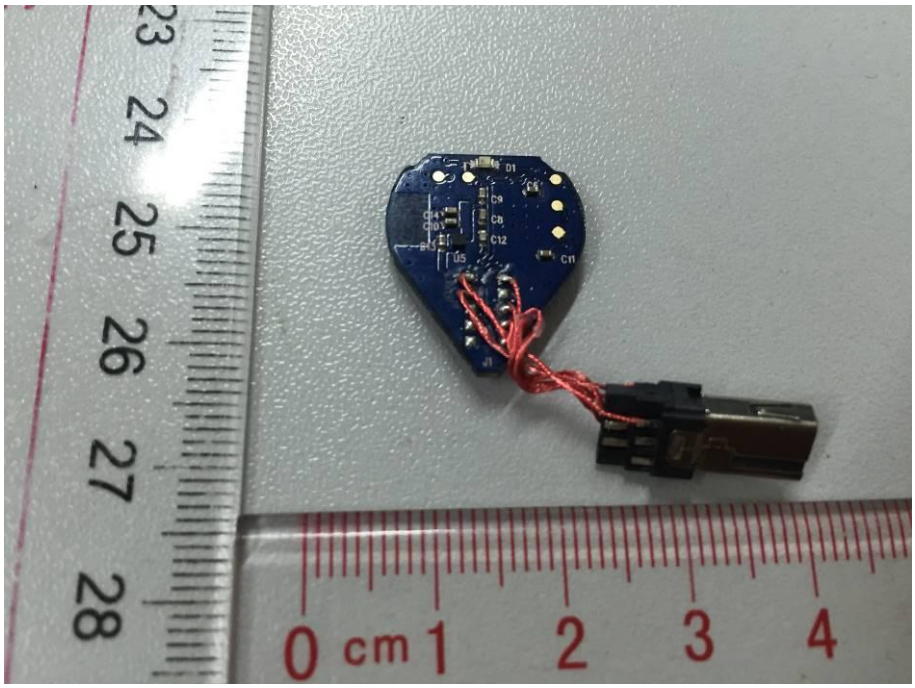
Appendix A



China

Appendix A



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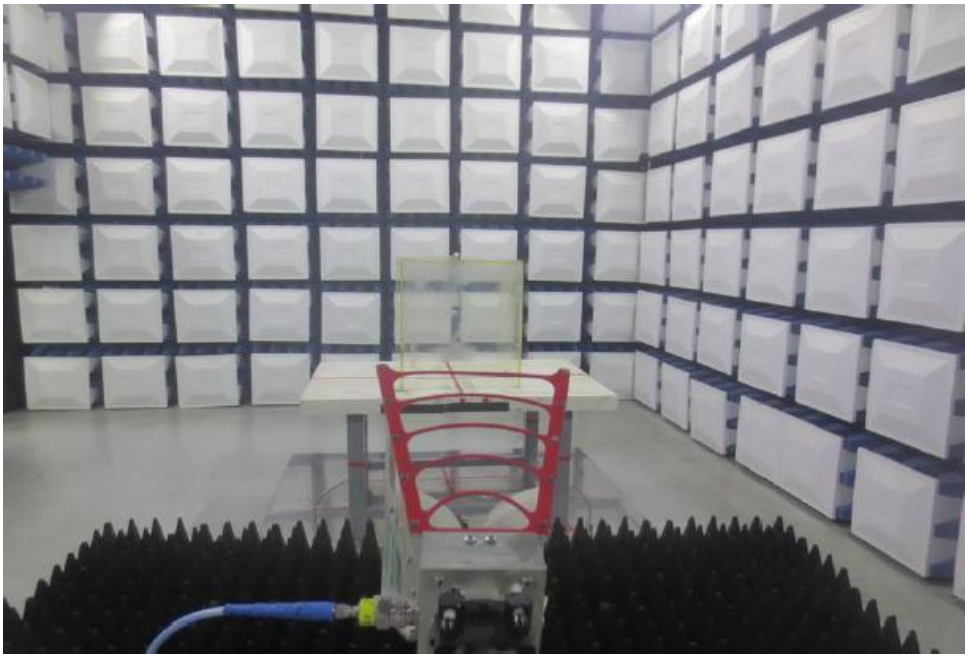
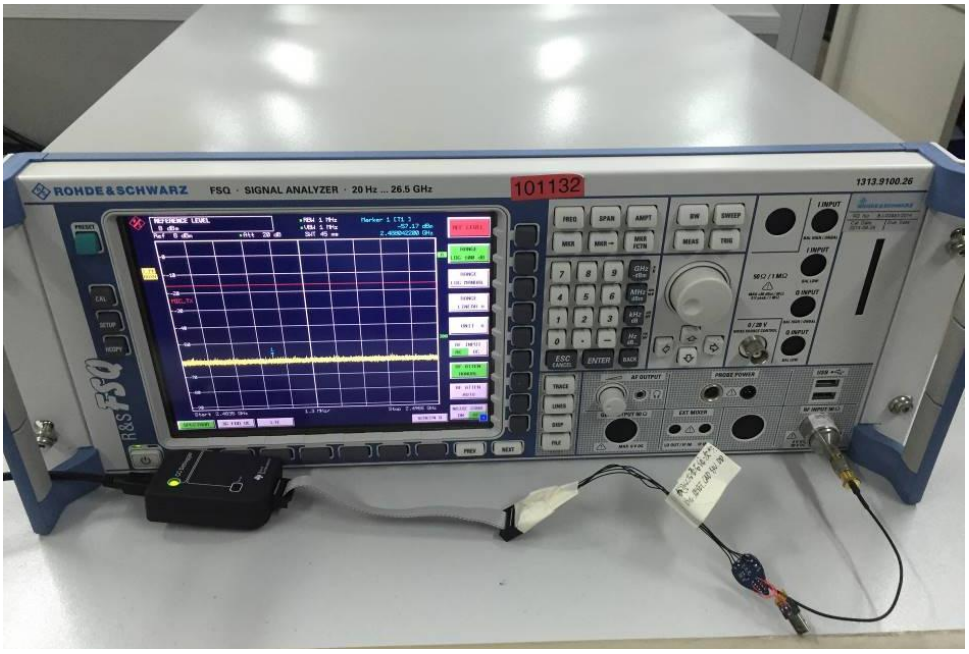
9 Appendix B - Setup Photographs of EUT



Appendix B



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10 Appendix C - General Product Information

Radiofrequency radiation exposure evaluation

According to KDB 447498 D01v06 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 2.402GHz = 2.4774 mW EIRP
Power at 2.440GHz = 2.3496 mW EIRP
Power at 2.480GHz = 2.2130 mW EIRP

[(2.4774 mW) / (5 mm)] · [sqrt (2.402 GHz)] = 0.7679 which is ≤ 3.0 for 1-g SAR.
[(2.3496 mW) / (5 mm)] · [sqrt (2.440 GHz)] = 0.7340 which is ≤ 3.0 for 1-g SAR.
[(2.2130 mW) / (5 mm)] · [sqrt (2.480 GHz)] = 0.6970 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 < 50mm. (Manufacturer specified the separation distance is: 20mm)

>> The power of EUT measured is:

- For 2402MHz: 2.4774mW = 10 log (2.4774) dBm ~ 3.94dBm
- For 2440MHz: 2.3496mW = 10 log (2.3496) dBm ~ 3.71dBm
- For 2480MHz: 2.2130mW = 10 log (2.2130) dBm ~ 3.45dBm

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Appendix C

Zesty Systems Inc.

We:

Zesty Systems Inc.
4F, Annex, Sumitomo Ryogoku bldg 2-10-6
Ryogoku, Sumida Tokyo
Japan 130-0026

The <<PINOUT-A, PINOUT-B>> have the same technical construction including circuit diagram, components and component layout, all electrical construction and mechanical construction, with <<PINOUT-A >>, <<PINOUT-B >. The difference lies only in the connector type that connects to remote control terminal of the different models.

<<Model A>>: PINOUT-A

<<Model B>>: PINOUT-B

Applicant: Zesty Systems Inc.

07/05/2016
(Date)

Sun Xueming
(Applicant's authorized signature and company Chop)