

Issued Date: 2016-06-05

# **FCC Test Report**

### Part 15 subpart C

Client Information:

Applicant: PC PARTNER LTD

Applicant add.: UNIT 1901-1908, 19TH FL, SHATIN GALLERIA, 18-24 SHAN MEI ST FO

TAN, Shatin, N.T., HongKong.

**Product Information:** 

Product Name: CoZee SENSOR

Model No.: ZIOT-JN5168-BS

Derivative model No.: N/A

Brand Name: ZOTAC

FCC ID: NPFZIOT-JN5168

Standards: CFR 47 FCC PART 15 SUBPART C:2016 section 15.247

Prepared By:

**UL-CCIC Company Limited** 

Add.: Electronic Building, Parage Electronic Industrial Park, No. 8 Nanyun Er Road,

Guangzhou Science Park, Guangzhou, 510663 China

Date of Receipt: May 23, 2016 Date of Test: May 23~ Jun. 02, 2016

Date of Issue: Jun. 05, 2016 Test Result: Pass

This device described above has been tested by Dongguan Yaxu (AiT) Technology Limited, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

\*This test report must not be used by the client to claim product endorsement by any agency of the U.S. government.

Approved by:



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# 2 Version

Revision Record							
Version	Chapter	Date	Modifier	Remark			
00		Jun. 05, 2016					





## 3 Test Summary

### 3.1 Compliance with FCC Part 15 subpart C

TEST	TEST REQUIREMENT	TEST METHOD	RESULT
Antenna Requirement	FCC PART 15 C section 15.247 (c) and Section 15.203	FCC PART 15 C section 15.247 (c) and Section 15.203	PASS
Conducted Emissions at Mains Terminals	FCC PART 15 C section 15.207	ANSI C63.10: Clause 6.2	N/A
Radiated Spurious Emission 30 MHz to 25 GHz)	FCC PART 15 C section 15.209 &15.247(d)	ANSI C63.10: Clause 6.4, 6.5 and 6.6	PASS
6 dB Bandwidth	FCC PART 15 C section 15.247 (a)(2)	ANSI C63.10: Clause 6.9.1	PASS
Maximum Peak Output Power	FCC PART 15 C section 15.247(b)(3)	FCC/KDB-558074 D01 v03r05 Clause 9.1.2	PASS
Peak Power Spectral Density	FCC PART 15 C section 15.247(e)	ANSI C63.10: Clause 6.11.2.3	PASS
Band Edges Measurement	FCC PART 15 C section 15.247 (d) &15.205	FCC/KDB-558074 D01 v03r05 Clause 13.3.1	PASS
Conducted Spurious Emission (30MHz to 25GHz)	FCC PART 15 C section 15.209 &15.247(d)	ANSI C63.10: Clause 6.7	PASS

### Remark:

N/A: not applicable. Refer to the relative section for the details. EUT: In this whole report EUT means Equipment Under Test.

Tx: In this whole report Tx (or tx) means Transmitter.
Rx: In this whole report Rx (or rx) means Receiver.
RF: In this whole report RF means Radio Frequency.

ANSI C63.10: the detail version is ANSI C63.10:2013 in the whole report.



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### 3.2 Measurement Uncertainty

All measurements involve certain levels of uncertainties, the following measurements uncertainty Levels have estimated based on standards, the maximum value of the uncertainty as below:

No. Item		Uncertainty
1	Conducted Emission Test	1.20dB
2	Radiated Emission Test	3.30dB

### 3.3 Test Location

All tests were performed at:

Dongguan Yaxu (AiT) Technology Limited No.22, Jinqianling Third Street, Jitigang, Huangjiang, Dongguan, Guangdong, China Tel.: +86.769.82020499 Fax.: +86.769.82020495



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### 4 Test Facility

The test facility is recognized, certified or accredited by the following organizations:

### .CNAS- Registration No: L6177

Dongguan Yaxu (AiT) technology Limited is accredited to ISO/IEC 17025:2005 general Requirements for the competence of testing and calibration laboratories (CNAS-CL01 Accreditation Criteria for the competence of testing and calibration laboratories) on Apr. 18, 2013

### .FCC- Registration No: 248337

The 3m Semi-Anechoic Chamber, 3m/10m Open Area Test Site and Shielding Room of Dongguan Yaxu (AiT) Technology Limited have been registered by Federal Communications Commission (FCC) on Aug.29, 2014.

### .Industry Canada(IC)-Registration No: IC6819A

The 3m Semi-Anechoic Chamber and 3m/10m Open Area Test Site of Dongguan Yaxu (AiT) Technology Limited have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing on Oct. 01, 2014.

#### .VCCI- Registration No: 2705

The 3m/10m Open Area Test Site, Shielding Room and 3m Chamber of Dngguan Yaxu (AiT) technology Limited have been registered by Voluntary Control Council for Interference on Nov. 21, 2012. The Telecommunication Ports Conducted Disturbance Measurement of Asia Institute Technology (Dongguan) Limited have been registered by Voluntary Control Council for Interference on May. 13, 2013.

### 4.1 Deviation from standard

None

### 4.2 Abnormalities from standard conditions

None



# **5** General Information

# **5.1 General Description of EUT**

Manufacturer:	PC PARTNER LTD		
Manufacturer Address:	UNIT 1901-1908, 19TH FL, SHATIN GALLERIA, 18-24 SHAN MEI ST FO TAN, Shatin, N.T., HongKong.		
EUT Name:	CoZee SENSOR		
Model No:	ZIOT-JN5168-BS		
Brand Name:	ZOTAC		
Derivative model No.:	N/A		
Operation frequency:	2405 MHz to 2480 MHz		
Number of Channels:	16 Channels		
Modulation Technology:	OQPSK(DSSS technique)		
Transmit Data Rate:	250kbps		
Channel Separation:	5 MHz		
Antenna Type:	FPCB antenna with the ipex connector		
Antenna Gain:	maximum 2.9 dBi		
H/W No.:	03		
S/W No.:	1.0.4		
Power Supply Range:	DC 3.0V from battery		
Power Cord:	N/A		
Note:			
1.	For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.		





### **EUT channels and frequencies list:**

1. Test frequencies are lowest channel: 2405 MHz, middle channel: 2445 MHz and highest channel: 2480 MHz

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2405	9	2445
2	2410	10	2450
3	2415	11	2455
4	2420	12	2460
5	2425	13	2465
6	2430	14	2470
7	2435	15	2475
8	2440	16	2480



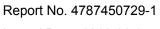


## **5.2 EUT Peripheral List**

No	Equipment	Manufacturer	Model No.	Serial No.	Power cord	signal cable
1	N/A	N/A	N/A	N/A	N/A	N/A

# 5.3 Test Peripheral List

No.	Equipment	Manufacturer	Model No.	Serial No.	Power cord	signal cable
1	Notebook	ASUS	N/A	X401A	X16-96072	N/A
2	USB line	N/A	N/A	N/A	N/A	0.3m/unshielded /detachable
3	Transform board	N/A	N/A	N/A	N/A	N/A





# 6 Equipments List for All Test Items

No	Test Equipment	Manufacturer	Model No	Serial No	Cal. Date	Cal. Due Date
1	SIGNAL Analyzer	R&S	FSV40	101470	2015.06.29	2016.06.28
2	EMI Measuring Receiver	R&S	ESR	101660	2015.06.29	2016.06.28
3	Low Noise Pre Amplifier	Tsj	MLA-10K01-B01-2 7	1205323	2015.06.29	2016.06.28
4	Low Noise Pre Amplifier	Tsj	MLA-0120-A02-34	2648A04738	2015.06.29	2016.06.28
5	TRILOG Super Broadband test Antenna	SCHWARZBECK	VULB9160	9160-3206	2015.06.29	2016.06.28
6	Broadband Horn Antenna	SCHWARZBECK	BBHA9120D	452	2015.06.29	2016.06.28
7	SHF-EHF Horn	SCHWARZBECK	BBHA9170	BBHA917036 7	2015.06.29	2016.06.28
8	50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2015.06.29	2016.06.28
9	Loop Antenna	ETS	6512	00165355	2015.06.29	2016.06.28
10	Radiated Cable 1# (30MHz-1GHz)	FUJIKURA	5D-2W	01	2015.12.25	2016.12.24
11	Radiated Cable 2# (1GHz -25GHz)	FUJIKURA	10D2W	02	2015.12.25	2016.12.24
12	Conducted Cable 1#(9KHz-30MHz)	FUJIKURA	1D-2W	01	2015.12.25	2016.12.24

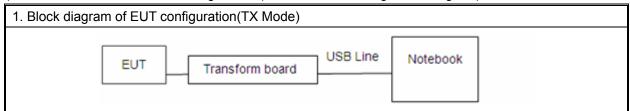


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### 7 Test Result

### 7.1 Description of Test conditions

(1) EUT was tested in normal configuration (Please See following Block diagram)



- Note: 1. The EUT was programmed to be in continuously transmitting mode with new battery and the transmit duty cycle is not less than 98%.
  - 2. Using the notebook and the transform board to control the fixed transmitting frequency and other test mode. After finishing the test setting, the notebook and the transform board will be removed during measurements.

### (2) E.U.T. test conditions:

15.31(e): For intentional radiators, measurements of the variation of the input power or the adiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.

15.32: Power supplies and CPU boards used with personal computers and for which separate authorizations are required to be obtained shall be tested as follows: Testing shall be in accordance with the procedures specified in Section 15.31 of this part.

### (3) Test frequencies:

According to the 15.31(m) Measurements on intentional radiators or receivers, other than TV broadcast receivers, shall be performed and. If required reported for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table:

Frequency range over	Number of	Location in
which device operates	frequencies	the range of operation
1 MHz or less	1	Middle
1 to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top, 1 near middle and
Wore than 10 MHZ	J	1 near bottom

#### (4) Frequency range of radiated measurements:

According to the 15.33, the test range will be up to the tenth harmonic of the highest fundamental frequency.

(5) Pre-test the EUT in all transmitting mode at the lowest, middle and highest channel with different data rate and conducted to determine the worst-case mode, only the worst-case results are recorded in this report.



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### 7.2 Antenna Requirement

### 7.2.1 Standard requirement

15.203 requirement: For intentional device, according to 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.

15.247(c) (1)(i) requirement: (i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

#### 7.2.2 EUT Antenna

The antenna is FPCB antenna with the ipex connector and no consideration of replacement. Antenna gain is maximum 2.9 dBi from 2.4GHz to 2.5GHz.



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### 7.3 Conduction Emissions Measurement

Test Requirement: FCC Part 15 C section 15.207

Test Method: ANSI C63.10: Clause 6.2

Frequency Range: 150 kHz to 30 MHz

**Detector:** Peak for pre-scan (9kHz Resolution Bandwidth)

**Test Limit** 

### Limits for conducted disturbance at the mains ports of class B

Frequency Range	Class B Limit (dBuV)		
(MHz)	Quasi-peak	Average	
0.15 to 0.50	66 to 56	56 to 46	
0.50 to 5	56	46	
5 to 30	60	50	

NOTE 1 The limit decreases linearly with the logarithm of the frequency in the range 0,15 MHz to 0,50 MHz.

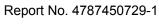
### **EUT Operation:**

Test in normal operating mode. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage.

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

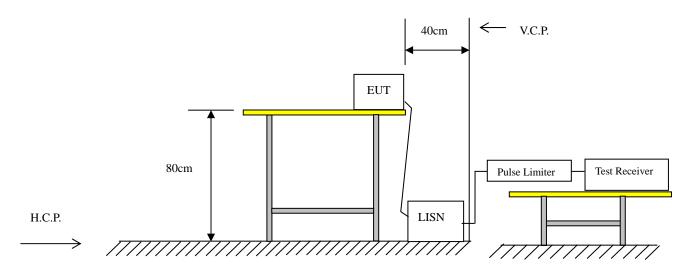
### **Test procedure**

- 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  $50\Omega/50\mu H + 5\Omega$  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, but separated from metallic contact with the ground reference plane by 0.1m of insulation.
- 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.





### Test setup





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### 7.3.1 Test results

Remark: Because the EUT employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines. Measurements to demonstrate compliance with the conducted limits are not required for devices.



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### 7.4 Radiated Emissions Measurement

Test Requirement: FCC Part 15 C section 15.247

(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating. The radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that Contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, and provided the transmitter demonstrates compliance with the peak conducted power limits.

Test Method: ANSI C63.10: Clause 6.4, 6.5 and 6.6

Test Status: Pre-Scan has been conducted to determine the worst-case mode from all

possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.

Detector: For PK value:

RBW = 1 MHz for  $f \ge 1$  GHz, 100 kHz for f < 1 GHz

 $VBW \geq RBW$ 

Sweep = auto

Detector function = peak

Trace = max hold

For AV value:

RBW = 1 MHz for  $f \ge 1$  GHz, 100 kHz for f < 1 GHz

VBW =10Hz

Sweep = auto

Detector function = peak

Trace = max hold

15.209 Limit:  $40.0 \text{ dB}_{\mu}\text{V/m}$  between 30MHz & 88MHz

43.5 dB $\mu$ V/m between 88MHz & 216MHz 46.0 dB $\mu$ V/m between 216MHz & 960MHz

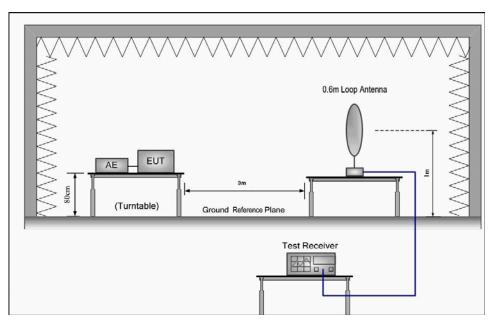
54.0 dBµV/m above 960MHz



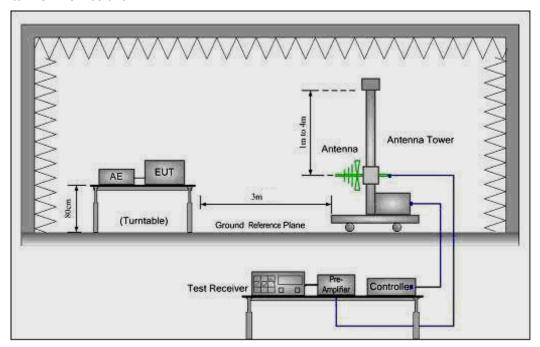


### **Test Configuration:**

1) 9 kHz to 30 MHz emissions:

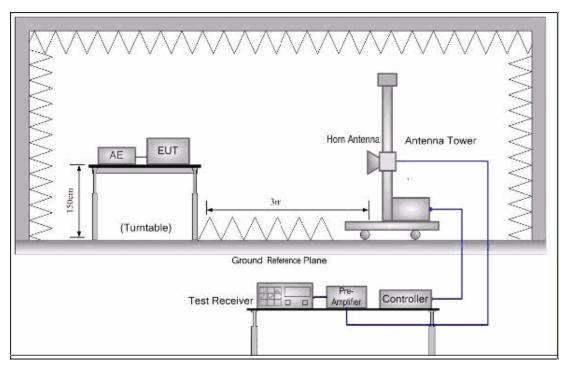


2) 30 MHz to 1 GHz emissions:





### 3) 1 GHz to 40 GHz emissions:





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#### Test procedure:

Test site with RF absorbing material covering the ground plane that met the site validation criterion called out in CISPR 16-1-4:2007 was used to perform radiated emission test above 1 GHz.

The receiver was scanned from 30MHz to 25GHz. When an emission was found, the table was rotated to produce the maximum signal strength. An initial pre-scan was performed for in peak detection mode using the receiver. The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. The worst case emissions were reported.

From 30MHz to 1GHz, read the Quasi-Peak field strength of the emissions with receiver QP detector RBW=120KHz.

Above 1GHz, read the Peak field strength and Average field strength.

Read the Peak field strength through RBW=1MHz,VBW=3MHz in spectrum analyzer setting;

Read the Average field strength through RBW=1MHz,VBW=10Hz in spectrum analyzer setting;

For measurement at frequency above 1GHz

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

While maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit specified in Section 15.209. If the dwell time per channel of the hopping signal is less than 100 ms, then the average field strength reading obtained with the 10 Hz VBW may be further adjusted by a "duty cycle correction factor", derived from 20log(dwell time/100 ms), in an effort to demonstrate compliance with the 15.209 limit.



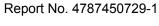
Issued Date: 2016-06-05

### 7.4.1 Test Result

### 7.4.1.1 Radiated Emissions Test Data Below 30MHz

EUT:	CoZee SENSOR	Model Name:	ZIOT-JN5168-BS
Temperature:	25 ℃	Test Data	2016-05-26
Pressure:	1005 hPa	Relative Humidity:	60%
Test Mode:	TX	Test Voltage :	DC 3.0V from battery
Measurement Distance	3 m	Frenqucy Range	9KHz to 30MHz
RBW/VBW	/VBW 9KHz~150KHz/RB 200Hz for QP, 150KHz~30MHz/RB 9KHz for QP		

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





### 7.4.1.2 Radiated Emissions Test Data 30MHz-1000MHz

EUT:	CoZee SENSOR	Model Name:	ZIOT-JN5168-BS		
Temperature:	25 ℃	Test Data	2016-05-26		
Pressure:	1010 hPa	Relative Humidity:	60%		
Test Mode :	TX: 2.405 GHz	Test Voltage:	DC 3.0V from battery		
Measurement Distance	3 m	Frenqucy Range	30MHz to 1GHz		
RBW/VBW	100KHz / 300KHz for spectrum, RBW=120KHz for receiver.				

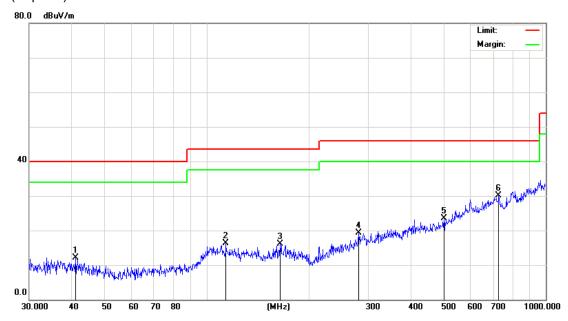
Test at Channel 1 (2.405 GHz) in transmitting status

30 MHz~1 GHz Spurious Emissions .Quasi-Peak Measurement

### Vertical:

Peak scan

Level (dBµV/m)



Quasi-peak measurement

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBu∀/m	dB	Detector
1		41.1319	28.94	-16.86	12.08	40.00	-27.92	QP
2		114.1137	30.24	-14.02	16.22	43.50	-27.28	QP
3		164.9074	30.84	-14.76	16.08	43.50	-27.42	QP
4	2	281.0074	30.41	-11.18	19.23	46.00	-26.77	QP
5	į	501.1789	29.03	-5.61	23.42	46.00	-22.58	QP
6	*	726.8052	30.63	-0.51	30.12	46.00	-15.88	QP

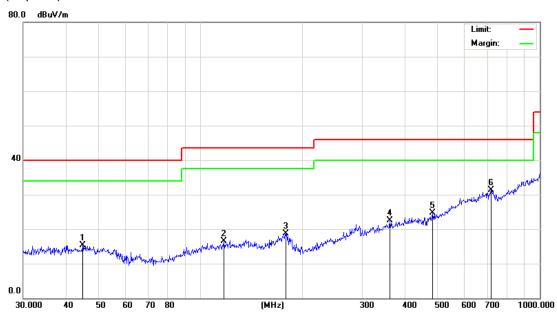




### Horizontal:

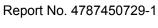
Peak scan

Level (dBµV/m)



Quasi-peak measurement

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBu∀/m	dB	Detector
1		44.9004	29.83	-14.51	15.32	40.00	-24.68	QP
2	1	17.3602	31.50	-15.03	16.47	43.50	-27.03	QP
3	1	78.7583	31.16	-12.47	18.69	43.50	-24.81	QP
4	3	61.7139	30.00	-7.58	22.42	46.00	-23.58	QP
5	4	83.9094	30.54	-5.78	24.76	46.00	-21.24	QP
6	* 7	19.1994	31.62	-0.39	31.23	46.00	-14.77	QP





EUT:	CoZee SENSOR	Model Name:	ZIOT-JN5168-BS		
Temperature:	25 ℃	Test Data	2016-05-26		
Pressure:	1010 hPa	Relative Humidity:	60%		
Test Mode :	TX: 2.445 GHz	Test Voltage :	DC 3.0V from battery		
Measurement Distance	3 m	Frenqucy Range	30MHz to 1GHz		
RBW/VBW	100KHz / 300KHz for spectrum, RBW=120KHz for receiver.				

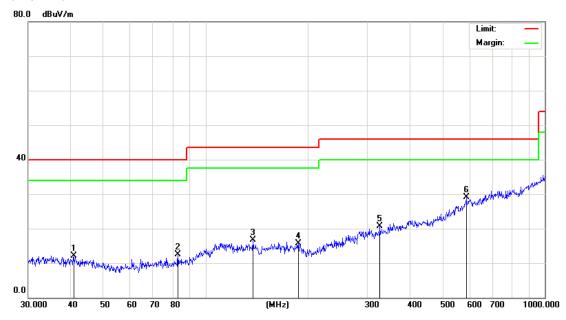
Test at Channel 9 (2.45 GHz) in transmitting status

30 MHz~1 GHz Spurious Emissions .Quasi-Peak Measurement

### Vertical:

Peak scan

Level (dBµV/m)



### Quasi-peak measurement

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		40.8445	28.94	-16.81	12.13	40.00	-27.87	QP
2		82.9385	31.29	-18.81	12.48	40.00	-27.52	QP
3		137.9028	31.47	-14.83	16.64	43.50	-26.86	QP
4		187.7529	31.53	-15.79	15.74	43.50	-27.76	QP
5	,	326.7395	29.36	-8.74	20.62	46.00	-25.38	QP
6	*	586.8437	31.40	-2.35	29.05	46.00	-16.95	QP

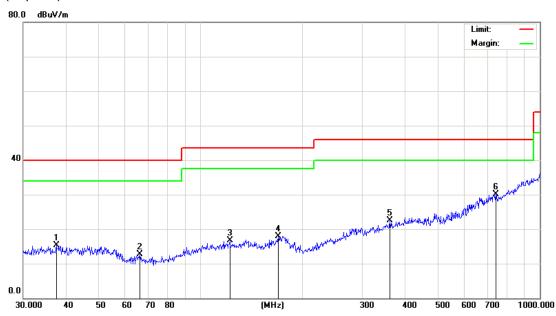




### Horizontal:

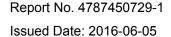
Peak scan

Level (dBµV/m)



Quasi-peak measurement

No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		37.5478	29.93	-14.54	15.39	40.00	-24.61	QP
2		66.2661	30.57	-17.80	12.77	40.00	-27.23	QP
3		121.9754	31.71	-15.00	16.71	43.50	-26.79	QP
4		169.5989	31.46	-13.49	17.97	43.50	-25.53	QP
5		361.7139	30.00	-7.58	22.42	46.00	-23.58	QP
6	*	742.2586	30.98	-0.82	30.16	46.00	-15.84	QP





RBW/VBW

ZIOT-JN5168-BS EUT: CoZee SENSOR Model Name: Temperature: 25 ℃ Test Data 2016-05-26 Pressure: 1010 hPa Relative Humidity: 60% TX: 2.48 GHz Test Mode: DC 3.0V from battery Test Voltage: Measurement Distance 3 m Frenqucy Range 30MHz to 1GHz

100KHz / 300KHz for spectrum, RBW=120KHz for receiver.

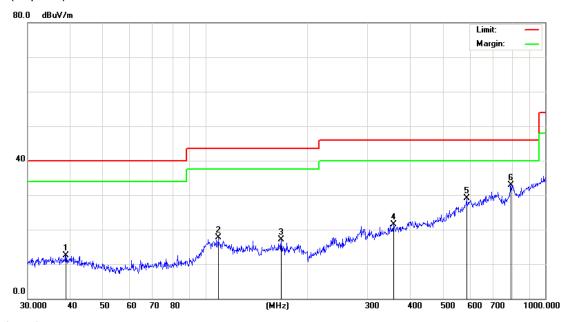
Test at Channel 16 (2.48 GHz) in transmitting status

30 MHz~1 GHz Spurious Emissions .Quasi-Peak Measurement

### Vertical:

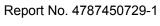
Peak scan

Level (dBµV/m)



#### Quasi-peak measurement

No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBu∀/m	dB	Detector
1		38.8878	29.11	-16.64	12.47	40.00	-27.53	QP
2		109.0286	31.19	-13.42	17.77	43.50	-25.73	QP
3		167.2368	32.19	-15.04	17.15	43.50	-26.35	QP
4		357.9287	29.16	-7.67	21.49	46.00	-24.51	QP
5		586.8437	31.40	-2.35	29.05	46.00	-16.95	QP
6	*	793.3960	30.26	2.57	32.83	46.00	-13.17	QP

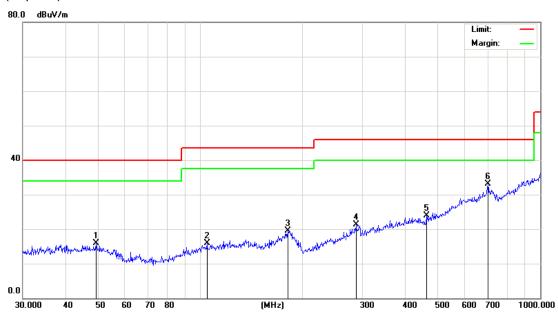




### Horizontal:

Peak scan

Level (dBµV/m)



Quasi-peak measurement

No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBu∀/m	dB	Detector
1		49.3594	30.20	-14.21	15.99	40.00	-24.01	QP
2		104.5361	31.53	-15.59	15.94	43.50	-27.56	QP
3		180.6488	31.53	-12.00	19.53	43.50	-23.97	QP
4		286.9823	31.95	-10.60	21.35	46.00	-24.65	QP
5		462.3455	30.67	-6.75	23.92	46.00	-22.08	QP
6	*	701.7610	32.81	0.32	33.13	46.00	-12.87	QP



Issued Date: 2016-06-05

### 7.4.1.3 Radiated Emissions Test Data above 1GHz

EUT:	CoZee SENSOR	Model Name:	ZIOT-JN5168-BS		
Temperature:	25 ℃	Test Data	2016-05-26		
Pressure:	1010 hPa	Relative Humidity:	60%		
Test Mode :	TX: 2.405 GHz	Test Voltage:	DC 3.0V from battery		
Measurement Distance	3 m	Frenqucy Range	1GHz to 25GHz		
RBW/VBW	Spurious emission: 1MHz/3MHz for Peak, 1MHz/10Hz for Average.				
	non-restricted band: 100KHz/300KHz for Peak.				

### 1~25 GHz Harmonics & Spurious Emissions. Peak & Average Measurement

### (a) Antenna polarization: Horizontal

()										
Frequency	Reading	Correct	Measure	Limit	Margin	Detector				
(MHz)	Level	Factor	Level	(dBuV/m)	(dB)	Туре				
	(dBuV)	(dB)	(dBuV/m)							
4810.000	54.93	5.07	60.00	74.00	-14.00	PEAK				
4810.000	42.31	5.07	47.38	54.00	-6.62	AVERAGE				
7215.000	46.68	7.07	53.75	74.00	-20.25	PEAK				
7215.000	36.29	7.07	43.36	54.00	-10.64	AVERAGE				

### (b) Antenna polarization: Vertical

	2), and ma polarization. Voluda.								
Frequency	Reading	Correct	Measure	Limit	Margin	Detector			
(MHz)	Level	Factor	Level	(dBuV/m)	(dB)	Туре			
	(dBuV)	(dB)	(dBuV/m)						
4810.000	56.40	5.07	61.47	74.00	-12.53	PEAK			
4810.000	45.73	5.07	50.80	54.00	-3.20	AVERAGE			
7215.000	47.45	7.07	54.52	74.00	-19.48	PEAK			
7215.000	35.28	7.07	42.35	54.00	-11.65	AVERAGE			



Issued Date: 2016-06-05

EUT:	CoZee SENSOR	Model Name:	ZIOT-JN5168-BS		
Temperature:	25 ℃	Test Data	2016-05-26		
Pressure:	1010 hPa	Relative Humidity:	60%		
Test Mode :	TX: 2.445 GHz	Test Voltage :	DC 3.0V from battery		
Measurement Distance	3 m	Frenqucy Range	1GHz to 25GHz		
RBW/VBW	Spurious emission: 1MHz/3MHz for Peak, 1MHz/10Hz for Average.				
NDVV/ V DVV	non-restricted band: 100KHz/300KHz for Peak.				

### 1~25 GHz Harmonics & Spurious Emissions. Peak & Average Measurement

### (a) Antenna polarization: Horizontal

Frequency	Reading	Correct	Measure	Limit	Margin	Detector
(MHz)	Level	Factor	Level	Level (dBuV/m)		Туре
	(dBuV)	(dB)	(dBuV/m)			
4890.000	53.29	5.15	58.44	74.00	-15.56	PEAK
4890.000	42.83	5.15	47.98	54.00	-6.02	AVERAGE
7335.000	43.74	7.59	51.33	74.00	-22.67	PEAK
7335.000	32.54	7.59	40.13	54.00	-13.87	AVERAGE

### (b) Antenna polarization: Vertical

-,									
Frequency	Reading	Correct	Measure	Limit	Margin	Detector			
(MHz)	Level	Factor	Level	(dBuV/m)	(dB)	Туре			
	(dBuV)	(dB)	(dBuV/m)						
4890.000	54.36	5.15	59.51	74.00	-14.49	PEAK			
4890.000	43.55	5.15	48.70	54.00	-5.30	AVERAGE			
7335.000	46.24	7.59	53.83	74.00	-20.17	PEAK			
7335.000	35.58	7.59	43.17	54.00	-10.83	AVERAGE			



Issued Date: 2016-06-05

EUT:	CoZee SENSOR	Model Name:	ZIOT-JN5168-BS				
Temperature:	<b>25</b> ℃	Test Data	2016-05-26				
Pressure:	1010 hPa	Relative Humidity:	60%				
Test Mode :	TX:2.48 GHz	Test Voltage:	DC 3.0V from battery				
Measurement Distance	3 m	Frenqucy Range	1GHz to 25GHz				
RBW/VBW	Spurious emission: 1MHz/3MHz for Peak, 1MHz/10Hz for Average.						
NDVV/ V DVV	non-restricted band: 100KHz/300KHz for Peak.						

### 1~25 GHz Harmonics & Spurious Emissions. Peak & Average Measurement

#### (a) Antenna polarization: Horizontal

Frequency	Reading	Correct	Measure	Limit	Margin	Detector
(MHz)	Level	Factor	Level	(dBuV/m)	(dB)	Туре
	(dBuV)	(dB)	(dBuV/m)			
4960.000	54.72	5.22	59.94	74.00	-14.06	PEAK
4960.000	43.35	5.22	48.57	54.00	-5.43	AVERAGE
7440.000	42.73	8.06	50.79	74.00	-23.21	PEAK
7440.000	31.60	8.06	39.66	54.00	-14.34	AVERAGE

#### (b) Antenna polarization: Vertical

Frequency	Reading	Correct	Measure	Limit	Margin	Detector
(MHz)	Level	Factor	Level	Level (dBuV/m)		Туре
	(dBuV)	(dB)	(dBuV/m)			
4960.000	55.67	5.22	60.89	74.00	-13.11	PEAK
4960.000	43.50	5.22	48.72	54.00	-5.28	AVERAGE
7440.000	45.28	8.06	53.34	74.00	-20.66	PEAK
7440.000	33.95	8.06	42.01	54.00	-11.99	AVERAGE

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 + Antenna Factor + Cable Loss –Preamplifier Factor.

As shown in Section, for frequencies above 1000 MHz. the above field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

No any other emissions level which are attenuated less than 20dB below the limit.

According to 15.31(o), The amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this Part.

Hence there no other emissions have been reported.



Issued Date: 2016-06-05

#### Remark:

- 1) .For this intentional radiator operates below 25 GHz. The spectrum shall be investigated to the tenth harmonics of the highest fundamental frequency. And above the second harmonic of this intentional radiator, the disturbance is very low. So the test result only displays to 2<sup>nd</sup> harmonic.
- 2). As shown in Section, for frequencies above 1000 MHz. the above field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.
- 3). The test only perform the EUT in transmitting status since the test frequencies were over 1GHz only required transmitting status.

Test result: The unit does meet the FCC requirements.



Issued Date: 2016-06-05

#### 7.4.2 Radiated Emissions which fall in the restricted bands

Test Requirement: FCC Part 15 C section 15.247

(d) In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission

limits specified in Section 15.209(a) (see Section 15.205(c)).

Test Method: ANSI C63.10: Clause 6.4, 6.5 and 6.6

Test Status: Pre-Scan has been conducted to determine the worst-case mode from all

possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.

Test site: Measurement Distance: 3m (Semi-Anechoic Chamber)

Limit:  $40.0 \text{ dB}_{\mu}\text{V/m}$  between 30MHz & 88MHz;

 $43.5 \text{ dB}\mu\text{V/m}$  between 88MHz & 216MHz;

 $46.0 \text{ dB}\mu\text{V/m}$  between 216MHz & 960MHz;

 $54.0 \text{ dB}_{\mu}\text{V/m}$  above 960MHz.

Detector: For PK value:

RBW = 1 MHz for  $f \ge 1$  GHz, 100 kHz for f < 1 GHz

 $VBW \geq RBW$ 

Sweep = auto

Detector function = peak

Trace = max hold

For AV value:

RBW = 1 MHz for  $f \ge 1$  GHz, 100 kHz for f < 1 GHz

VBW =10Hz

Sweep = auto

Detector function = peak

Trace = max hold



Issued Date: 2016-06-05

Section 15.205 Restricted bands of operation.

(a) Except as shown in paragraph (d) of this section. only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
<sup>1</sup> 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	
13.36 - 13.41	322 - 335.4		





### **Test Result:**

# 7.4.2.1 Test at Channel 1 (2.405 GHz) in transmitting status Peak Measurement:

Frequency (MHz)	Reading Level (dB <sub>µ</sub> V)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Emission Level (dB <sub>µ</sub> V/m)	Limit (dB <sub>µ</sub> V/m)	Antenna polarization
2310.000	53.27	27.93	4.74	35.09	50.85	74.00	Vertical
2390.000	54.96	27.63	4.96	35.05	52.50	74.00	V
2483.500	54.38	27.55	4.9	34.99	51.84	74.00	V
2500.000	53.62	27.55	5.00	34.98	51.19	74.00	V
2310.000	54.59	27.93	4.74	35.09	52.17	74.00	Horizontal
2390.000	53.81	27.63	4.96	35.05	51.35	74.00	Н
2483.500	53.52	27.55	4.9	34.99	50.98	74.00	Н
2500.000	54.60	27.55	5.00	34.98	52.17	74.00	Н

### **Average Measurement:**

Frequency	Reading Level	Antenna factors	Cable	Preamp factor	Emission Level	Limit	Antenna
(MHz)	Levei (dBμV)	(dB/m)	loss (dB)	(dB)	Levei (dB <sub>μ</sub> V/m)	(dBμV/m)	polarization
2310.000	42.68	27.93	4.74	35.09	40.26	54.00	Vertical
2390.000	43.99	27.63	4.96	35.05	41.53	54.00	V
2483.500	44.52	27.55	4.9	34.99	41.98	54.00	V
2500.000	43.69	27.55	5.00	34.98	41.26	54.00	V
2310.000	44.20	27.93	4.74	35.09	41.78	54.00	Horizontal
2390.000	44.87	27.63	4.96	35.05	42.41	54.00	Н
2483.500	43.66	27.55	4.9	34.99	41.12	54.00	Н
2500.000	43.96	27.55	5.00	34.98	41.53	54.00	Н





### 7.4.2.2 Test at Channel 9 (2.445 GHz) in transmitting status

### **Peak Measurement:**

Frequency	Reading	Antenna	Cable	Preamp	Emission	Limit	Antenna
(MHz)	Level	factors	loss	factor	Level		polarization
(IVITIZ)	(dBμV)	(dB/m)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	polarization
2310.000	52.87	27.93	4.74	35.09	50.45	74.00	Vertical
2390.000	53.60	27.63	4.96	35.05	51.14	74.00	V
2483.500	52.43	27.55	4.90	34.99	49.89	74.00	V
2500.000	51.45	27.55	5.00	34.98	49.02	74.00	V
2310.000	52.53	27.93	4.74	35.09	50.11	74.00	Horizontal
2390.000	51.85	27.63	4.96	35.05	49.39	74.00	Н
2483.500	52.76	27.55	4.90	34.99	50.22	74.00	Н
2500.000	51.93	27.55	5.00	34.98	49.50	74.00	Н

### **Average Measurement:**

Frequency (MHz)	Reading Level (dB <sub>µ</sub> V)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
2310.000	42.84	27.93	4.74	35.09	40.42	54.00	Vertical
2390.000	40.23	27.63	4.96	35.05	37.77	54.00	V
2483.500	42.73	27.55	4.90	34.99	40.19	54.00	V
2500.000	41.50	27.55	5.00	34.98	39.07	54.00	V
2310.000	41.33	27.93	4.74	35.09	38.91	54.00	Horizontal
2390.000	40.24	27.63	4.96	35.05	37.78	54.00	Н
2483.500	41.76	27.55	4.90	34.99	39.22	54.00	Н
2500.000	40.58	27.55	5.00	34.98	38.15	54.00	Н





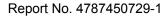
### 7.4.2.3 Test at Channel 16 (2.480 GHz) in transmitting status

### **Peak Measurement:**

Frequency (MHz)	Reading Level (dBµV)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Emission Level (dBµV/m)	Limit (dBµV/m)	Antenna polarization
2310.000	55.30	27.93	4.74	35.09	52.88	74.00	Vertical
2390.000	54.76	27.63	4.96	35.05	52.30	74.00	V
2483.500	56.35	27.55	4.90	34.99	53.81	74.00	V
2500.000	54.83	27.55	5.00	34.98	52.40	74.00	V
2310.000	56.70	27.93	4.74	35.09	54.28	74.00	Horizontal
2390.000	54.29	27.63	4.96	35.05	51.83	74.00	Н
2483.500	55.10	27.55	4.90	34.99	52.56	74.00	Н
2500.000	55.36	27.55	5.00	34.98	52.93	74.00	Н

### **Average Measurement:**

Frequency (MHz)	Reading Level (dB <sub>µ</sub> V)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Emission Level (dBµV/m)	Limit (dBµV/m)	Antenna polarization
2310.000	44.62	27.93	4.74	35.09	42.20	54.00	Vertical
2390.000	43.83	27.63	4.96	35.05	41.37	54.00	V
2483.500	45.30	27.55	4.90	34.99	42.76	54.00	V
2500.000	46.27	27.55	5.00	34.98	43.84	54.00	V
2310.000	43.59	27.93	4.74	35.09	41.17	54.00	Horizontal
2390.000	44.64	27.63	4.96	35.05	42.18	54.00	Н
2483.500	45.31	27.55	4.90	34.99	42.77	54.00	Н
2500.000	44.65	27.55	5.00	34.98	42.22	54.00	Н





### 7.5 6 dB Bandwidth

### 7.6 6 dB Bandwidth

Test Requirement: FCC Part 15 C section 15.247

(a)(2)Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5MHz, and 5725-5850 MHz bands. The

minimum 6 dB bandwidth shall be at least 500 kHz.

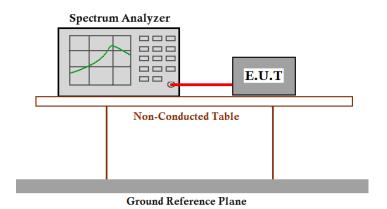
Test Method: ANSI C63.10: Clause 6.9.1

Test Status: Pre-Scan has been conducted to determine the worst-case mode from

all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed

below.

#### **Test Configuration:**



### Test Procedure:

- 1. Remove the antenna from the EUT and then connect a low attention attenuation RF cable (cable loss =1.5dB) from the antenna port to the spectrum.
- 2. Set the spectrum analyzer: Sweep = auto; Detector Function = Peak; ace = Max Hold

RBW: 1%~5% OBW; VBW: ≥3\*RBW

Span: two times and five times the OBW.

- 3. Mark the peak power frequency and -6dB (upper and lower) power frequency.
- 4. Repeat until all the test status is investigated.
- 5. Report the worse case.



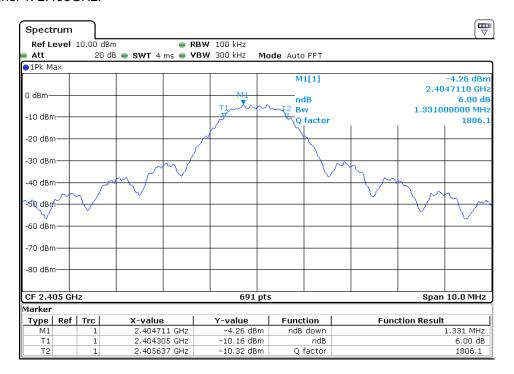


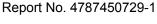
Channel No.	Frequency (MHz)	Mode	Data Rate	Measured 6dB bandwidth (MHz)	Limit	Result
1	2405		250 kbps	1.331		Pass
9	2445	TX	250 kbps	1.404	≥500KHz	Pass
16	2480		250 kbps	1.563		Pass

Test result: The unit does meet the FCC requirements.

### Result plot as follows:

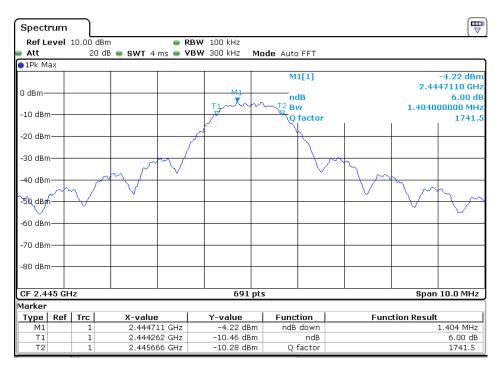
#### Channel 1: 2.405GHz:



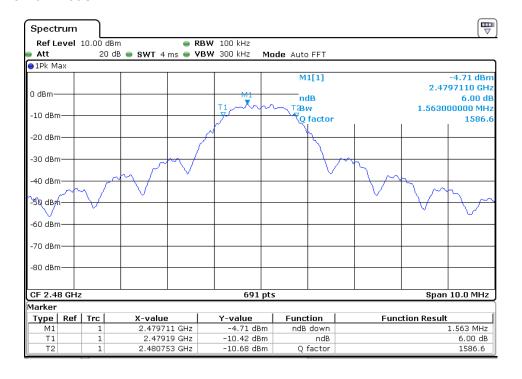




#### Channel 9: 2.445GHz:



#### Channel 16: 2.480GHz:





# 7.7 Maximum Peak Output Power

Test Requirement: FCC Part 15 C section 15.247

(b)(3) For systems using digital modulation in the 902-928 MHz,

2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt.

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.

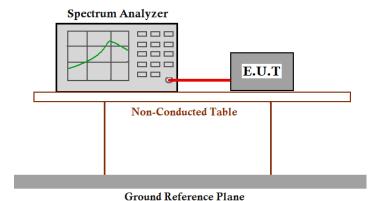
Test Method: FCC/KDB-558074 D01 v03r05 9.1.1 RBW ≥ DTS bandwidth

Test Status: Pre-Scan has been conducted to determine the worst-case mode from

all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed

below.

Test Configuration:





Issued Date: 2016-06-05

#### Test Procedure:

1. Remove the antenna from the EUT and then connect a low attention attenuation RF cable

(Cable loss =1.0dB) from the antenna port to the spectrum.

- 2. Set the RBW ≥ DTS bandwidth
- 3. Set the VBW ≥ 3 x RBW
- 4. Set the span  $\geq$  3 x RBW.
- 5. Detector = peak.
- 6. Sweep time = auto couple.
- 7. Trace mode = max hold.
- 8. Use peak marker function to determine the peak amplitude level.
- 9. Report the worse case.

#### Test result:

Channel	Frequency	Mode	Data Rate	Measured Channel Power	Limit	Result
No.	(MHz)			(dBm)		
1	2405	тх	250 kbps	-2.21	1W(30dBm)	Pass
9	2445		250 kbps	-2.12		Pass
16	2480		250 kbps	-2.35		Pass

Remark: Level = Read Level + Cable Loss.

The unit does meet the FCC requirements.



Issued Date: 2016-06-05

# 7.8 Peak Power Spectral Density

Test Requirement: FCC Part 15 C section 15.247

(e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the

power spectral density.

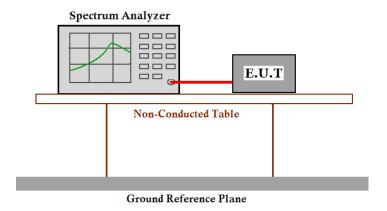
Test Method: ANSI C63.10: Clause 6.11.2.3

Test Status: Pre-Scan has been conducted to determine the worst-case mode from

all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed

below.

#### Test Configuration:





Issued Date: 2016-06-05

#### Test Procedure:

- 1. Remove the antenna from the EUT and then connect a low attention attenuation RF cable (cable loss =1.0 dB) from the antenna port to the spectrum analyzer or power meter.
- 2. Set the spectrum analyzer:
  - a) Set CENTER FREQUENCY = Frequency from Power Spectral Density Test Matrix (see 6.10.2)
  - b) Set SPAN = 20 MHz (For devices with a nominal 40 MHz BW, 50 MHz span will be needed)
  - c) Set REFERENCE LEVEL = 20 dBm
  - d) Set ATTENUATION = 0 dB (add internal attenuation, if necessary)
  - e) Set SWEEP TIME = Coupled
  - f) Set RBW = 3 kHz
  - g) Set VBW = 10 kHz
  - h) Set DETECTOR = Peak
  - i) Set MKR = Center Frequency
  - j) Set TRACE = CLEAR WRITE

Place the radio in continuous transmit mode. Set the TRACE to MAX HOLD, and after the trace stabilizes, the TRACE to VIEW. Set the marker on the peak of the signal and then adjust the center frequency of the spectrum analyzer to the marker frequency.

After viewing the EUT waveform on the spectrum analyzer, perform the following spectrum analyzer functions to capture the trace:

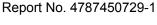
Set SPAN = 300 kHz

Set SWEEP TIME = 100 s

Set TRACE = MAX HOLD

Set MKR = PEAK SEARCH

- 3. Measure the Power Spectral Density of the test frequency with special test status.
- 4. Repeat until all the test status is investigated.
- 5. Report the worse case.





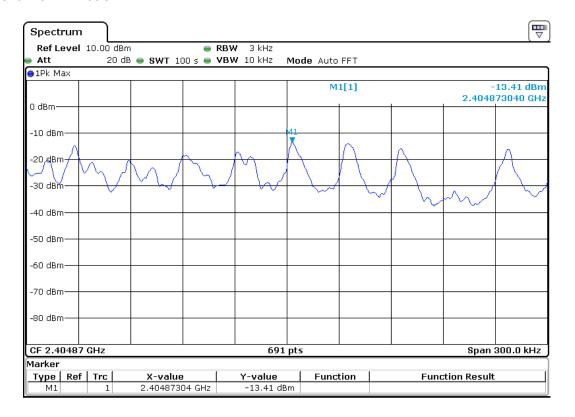
Channel No.	Frequency (MHz)	Mode	Data Rate	Measured Peak Power Spectral Density (dBm/3KHz)	Limit	Result
1	2405		250 kbps	-13.41		Pass
9	2445	TX	250 kbps	-13.44	8dBm/3KHz	Pass
16	2480		250 kbps	-14.12		Pass

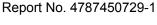
Test result: Level = Read Level + Cable Loss.

The unit does meet the FCC requirements.

# Result plot as follows:

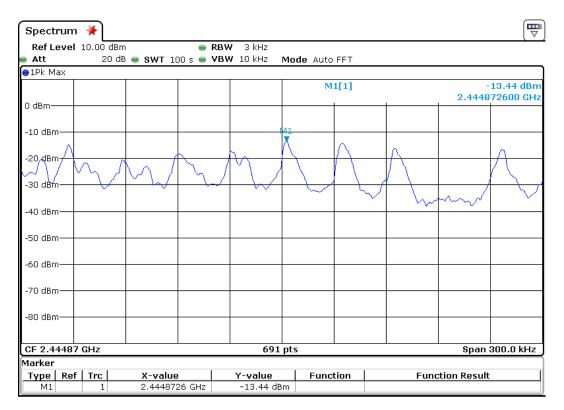
#### Channel 1: 2.405GHz:



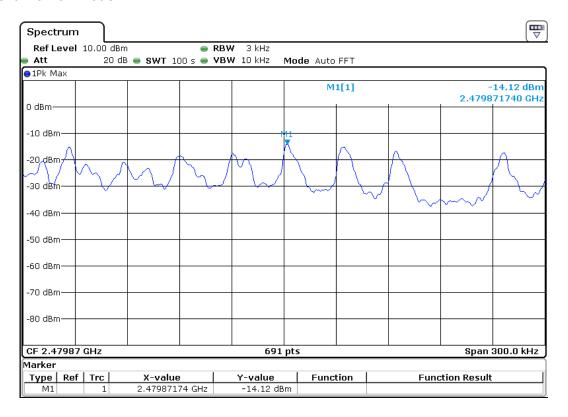




#### Channel 9: 2.445GHz:



# Channel 16: 2.480GHz:





Issued Date: 2016-06-05

# 7.9 Band Edges Requirement

Test Requirement: FCC Part 15 C section 15.247

(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating. The radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power. Based on either an RF conducted or a radiated measurement. Provided the transmitter demonstrates compliance with the peak conducted power limits.

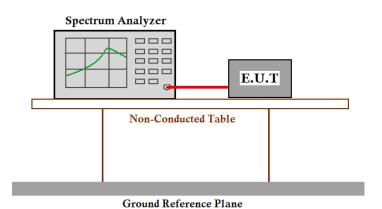
Frequency Band: 2400 MHz to 2483.5 MHz

Test Method: FCC/KDB-558074 D01 v03r05 Clause 13.3.1

Test Status: Pre-Scan has been conducted to determine the worst-case mode from all

possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.

#### **Test Configuration:**



#### Test Procedure:

- 1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum analyzer or power meter.
- 2. Set instrument center frequency to the frequency of the emission to be measured(must be within 2MHz of the authorized band edge).
- 3. Set span to 2MHz,
- 4. RBW=100kHz,
- 5. VBW≥3×RBW
- 6. Detector=peak
- 7. Sweep time =auto,
- 8. Trace mode=max hold.



Issued Date: 2016-06-05

9. Allow sweep to continue until the trace stabilizes(required measurement time may increase for low duty cycle applications)

10. Compute the power by integrating the spectrum over 1MHz using the analyzer's band power measurement function with band limits set equal to the emission frequency( $f_{\rm emission}$ ) $\pm$ 0.5MHz.If the instrument does not have a band power function,the sum the amplitude levels(in power units) at 100kHz intervals extending across the 1MHz spectrum defined by femission $\pm$ 0.5MHz.

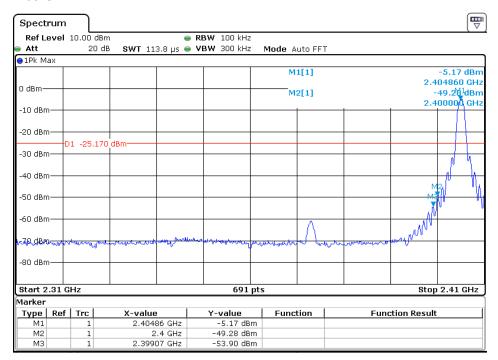


#### Test result with plots as follows:

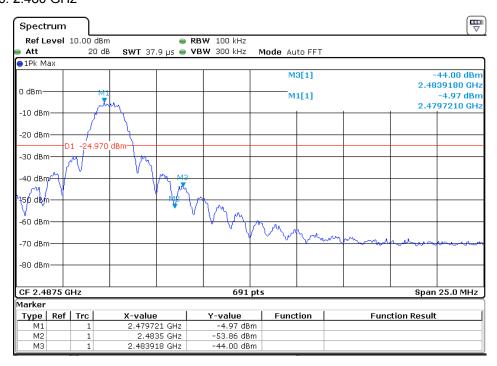
Compare with the output power of the lowest frequency, the Lower Edges attenuated more than 20dB.

Compare with the output power of the highest frequency, the Upper Edges attenuated more than 20dB.

Channel1: 2.405 GHz



#### Channel16: 2.480 GHz





# 7.10 Conducted Spurious Emissions

Test Requirement: FCC Part 15 C section 15.247

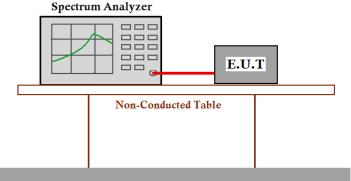
(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating. the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power. Based on either an RF conducted or a radiated measurement. Provided the transmitter demonstrates compliance with the peak conducted power limits.

Test Method: ANSI C63.10: Clause 6.7

Test Status: Pre-Scan has been conducted to determine the worst-case mode from all

possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.

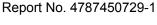
### **Test Configuration:**



Ground Reference Plane

#### Test Procedure:

- 1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum analyzer or power meter.
- 2. Set the spectrum analyzer: RBW=100 KHz, VBW = 300KHz. Sweep = auto; Detector Function = Peak. Trace = Max Hold, Scan up through 10th harmonic.
- 3. Measure the Conducted Spurious Emissions of the test frequency with special test status.
- 4. Repeat until all the test status is investigated.
- 5. Report the worse case.

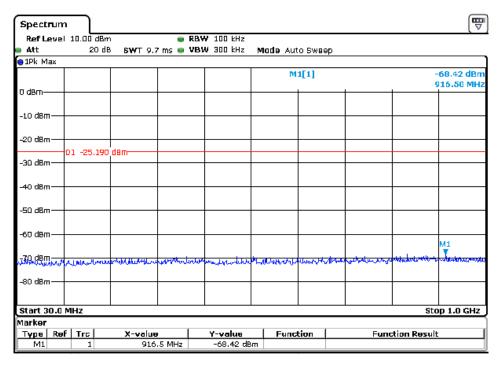




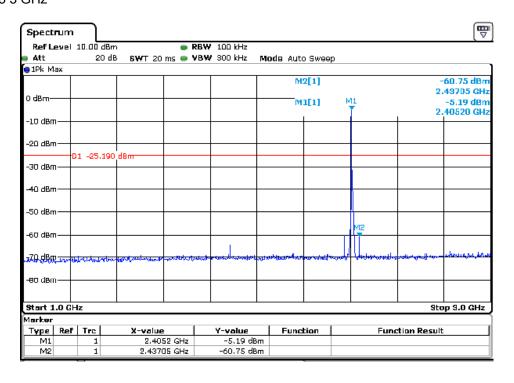
### Result plot as follows:

Channel 1: 2.405GHz:

30 MHz to 1 GHz

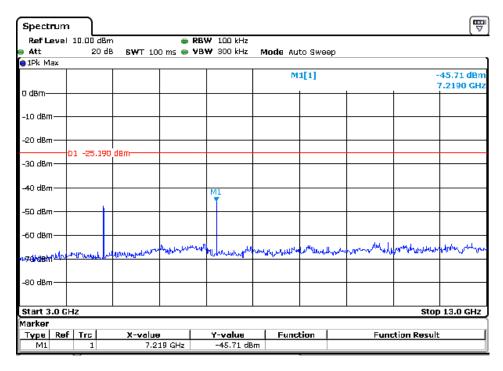


### 1 G to 3 GHz

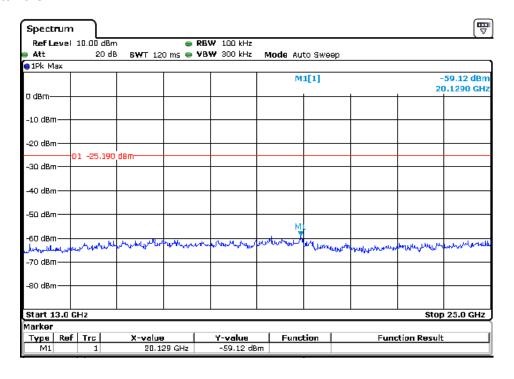


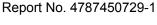


#### 3 G to 13 GHz



#### 13 G to 25 GHz

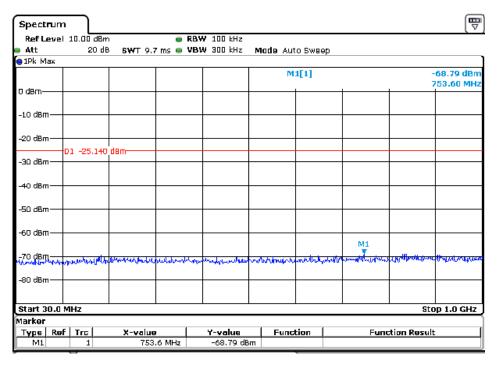




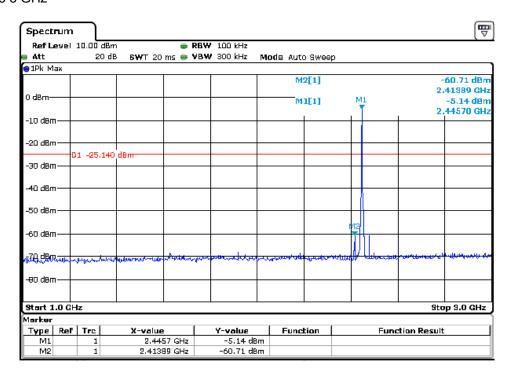


#### Channel 9: 2.445GHz:

#### 30 MHz to 1 GHz

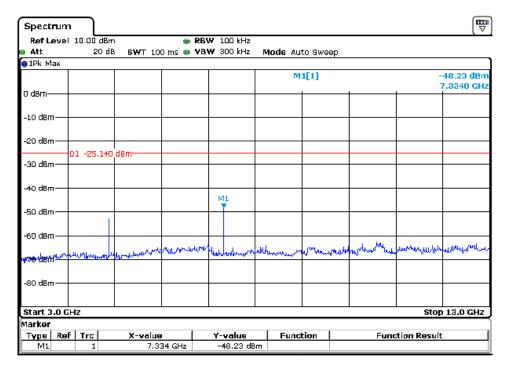


# 1 G to 3 GHz

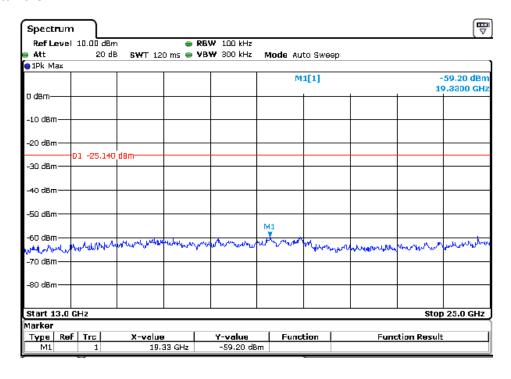




#### 3 G to 13 GHz



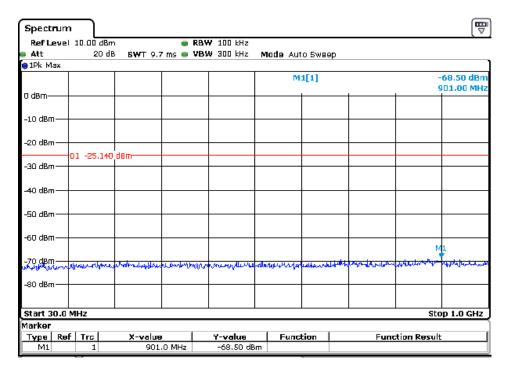
#### 13 G to 25 GHz



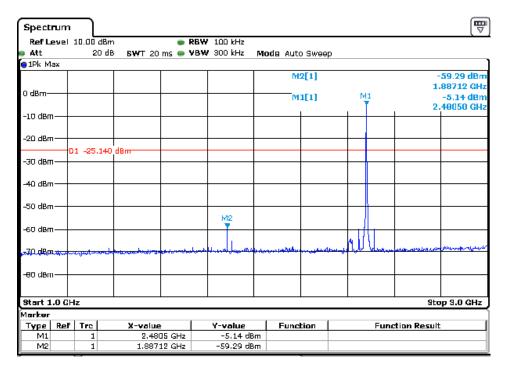


#### Channel 16:2.480 GHz

#### 30 MHz to 1 GHz



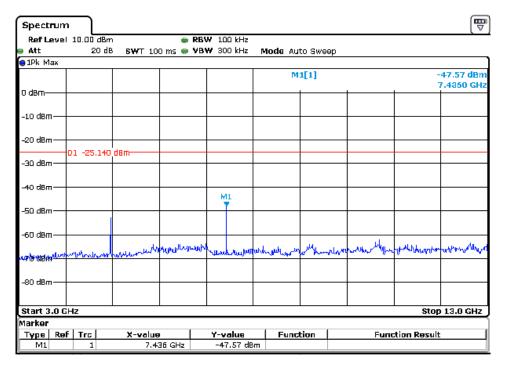
#### 1 G to 3 GHz



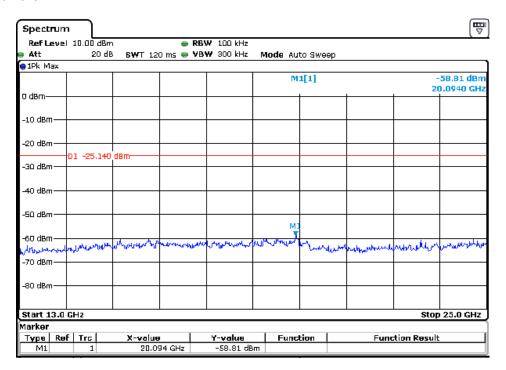




#### 3 G to 13 GHz



#### 13 G to 25 GHz

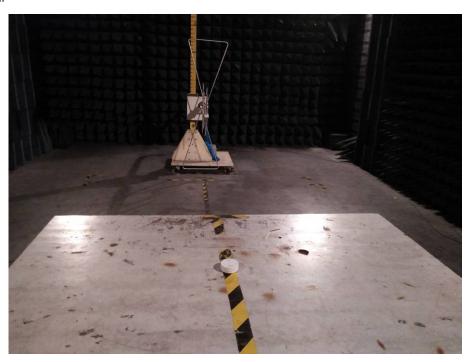




# 8 Photographs

# 8.1 Radiated Spurious Emission Test Setup

Below 1GHz:



Above 1GHz:

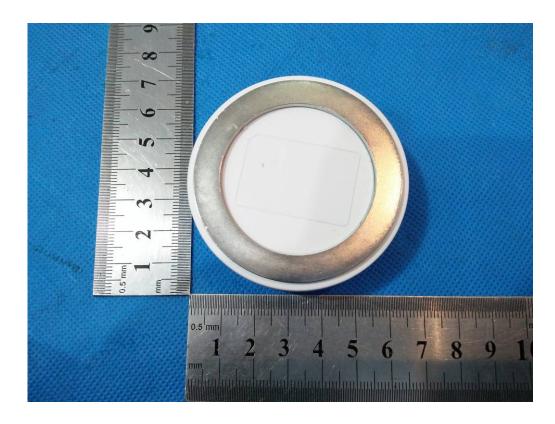


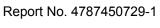




# 9 APPENDIX-Photographs of EUT Constructional Details



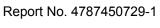














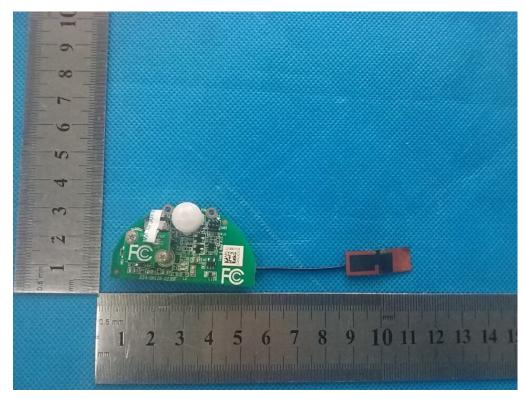
















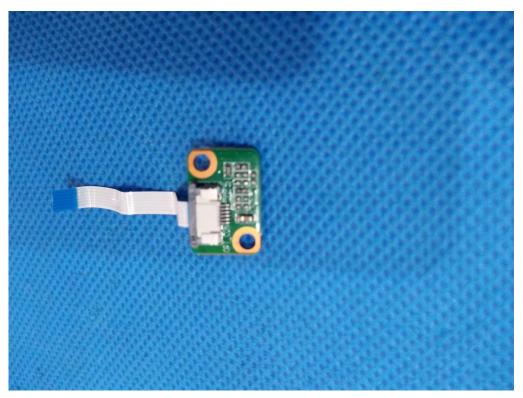


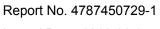




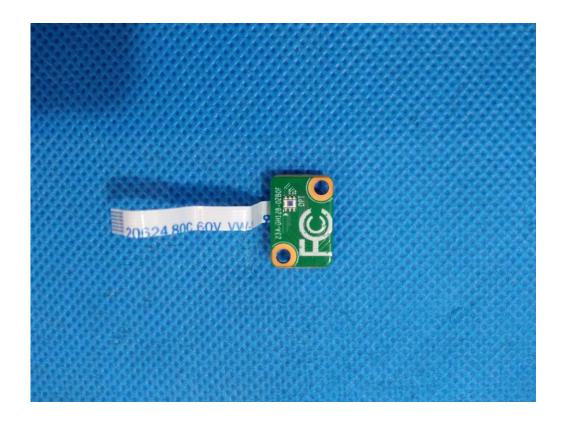










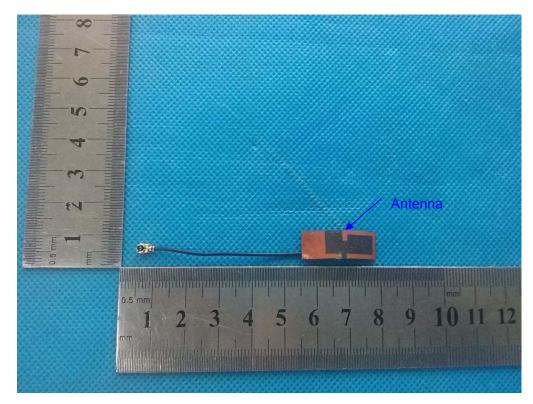












\*\*End of report\*\*