



ISO/IEC17025 Accredited Lab.

Report No: 1504054-02

File reference No: 2015-06-19

Applicant: Bird Home Automation GmbH

Product: DoorBird

Model No: DoorBird 1.0

Trademark: DoorBird

Test Standards: FCC Part 15 Subpart C, Paragraph 15.231

Test result: It is herewith confirmed and found to comply with the requirements set up by ANSI C63.4&FCC Part 15 Subpart C, Paragraph 15.231 regulations for the evaluation of electromagnetic compatibility

Approved By

*Jack Chung*

Jack Chung  
Manager

Dated: June 19, 2015

**Results appearing herein relate only to the sample tested**

**The technical reports is issued errors and omissions exempt and is subject to withdrawal at**

**SHENZHEN TIMEWAY TESTING LABORATORIES**

Room 512-519, 5/F., East Tower, Building 4, Anhua Industrial Zone, Futian District, Shenzhen, Guangdong, China

Tel (755) 83448688, Fax (755) 83442996, E-Mail:info@timewaytech.com



### **Special Statement:**

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19.

The testing quality system of our laboratory meets with ISO/IEC-17025 requirements, which is approved by CNAS. This approval result is accepted by MRA of APLAC.

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

#### **CNAS-LAB Code: L2292**

The EMC Laboratory has been assessed and in compliance with CNAS-CL01 accreditation criteria for testing Laboratories (identical to ISO/IEC 17025:1999 General Requirements) for the Competence of testing Laboratories.

#### **FCC-Registration No.: 899988**

The EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications commission. The acceptance letter from the FCC is maintained in our files. Registration No.:899988.

#### **IC- Registration No.: IC5205A-02**

The EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration No.: IC 5205A-02.

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## Test Report Conclusion

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## 1.0 General Details

### 1.1 Test Lab Details

Name : SHENZHEN TIMEWAY TESTING LABORATORIES.  
Address: Room 512-519,5/F., East Tower,Building 4, Anhua Industrial Zone, Futian District,Shenzhen, Guangdong China  
Telephone: (755) 83448688  
Fax: (755) 83442996  
Site on File with the Federal Communications Commission – United States  
Registration Number: 899988  
For 3m & 10 m OATS  
Site Listed with Industry Canada of Ottawa, Canada  
Registration Number: IC: 5205A-02  
For 3m & 10 m OATS

### 1.2 Applicant Details

Applicant: Bird Home Automation GmbH  
Address: Joachimsthaler Strasse 12,10719,Berlin,Berlin,Germany  
Telephone: --  
Fax: --

### 1.3 Description of EUT

Product: DoorBird  
Manufacturer: Bird Home Automation GmbH  
Address: Joachimsthaler Strasse 12,10719,Berlin,Berlin,Germany  
Brand Name: DoorBird  
Model Number: DoorBird 1.0  
Additional Model Name N/A  
Additional Trade Name N/A  
Rating: DC 12V, 1A  
Operation Frequency: 433.92MHz  
Modulation Type: OOK  
Antenna Designation PIFA Antenna with Gain 2dBi

### 1.4 Submitted Sample

2 Samples

### 1.5 Test Duration

2015-04-10 to 2015-06-15

### 1.6 Test Uncertainty

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Conducted Emissions Uncertainty =3.6dB

Radiated Emissions Uncertainty =4.7dB

1.7 Test Engineer

*Terry Tang*

The sample tested by \_\_\_\_\_

Print Name: Terry Tang

2.0	Test Equipments				
Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
Ultra Broadband ANT	ROHDE&SCHWARZ	HL562	100157	2014-08-23	2015-08-22
System Controller	CT	SC100	-	--	--
Power Amplifier	AR	150W1000	300999	2014-08-23	2015-08-22
ESPI Test Receiver	ROHDE&SCHWARZ	ESI26	838786/013	2014-08-22	2015-08-21
3m OATS	--	--	N/A	2014-08-23	2015-08-22
Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-631	2014-08-23	2015-08-22

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### 3.0 Technical Details

#### 3.1 Summary of test results

The EUT has been tested according to the following specifications:			
Standard	Test Type	Result	Notes
FCC Part 15, Paragraph 15.203	Antenna requirements	PASS	Compliant
FCC Part 15, Paragraph 15.207	Conducted Emission Test	PASS	Compliant
FCC Part 15, Paragraph 15.209	General Requirement	PASS	Compliant
FCC Part 15, Paragraph 15.231 (a)	Radiated Emission Test	PASS	Compliant
FCC Part 15, Paragraph 15.231 (c)	20dB Bandwidth Testing	PASS	Compliant
FCC Part 15, Paragraph 15.231 (a) (1)	Deactivate Testing	PASS	Compliant

#### 3.2 Test Standards

**FCC Part 15 Subpart C, Paragraph 15.231, ANSI C63.4 :2009 and ANSI C63.4 :2009**

#### 4.0 EUT Modification

No modification by Shenzhen Timeway Technology Consulting Co.,Ltd

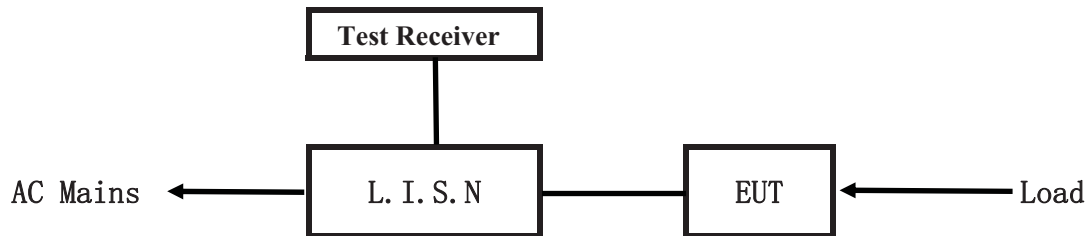
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## 5. Power Line Conducted Emission Test

### 5.1 Schematics of the test



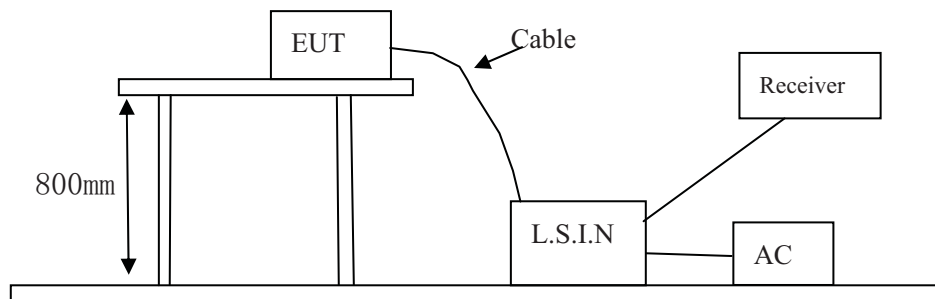
EUT: Equipment Under Test

### 5.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.4-2009. The Frequency spectrum From 0.15MHz to 30MHz was investigated. The LISN used was 50ohm/50uH as specified by section 5.1 of ANSI C63.4 –2009.

Test Voltage: 120V~, 60Hz

Block diagram of Test setup



### 5.3 Configuration of The EUT

The EUT was configured according to ANSI C63.4-2009. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

#### A. EUT

Device	Manufacturer	Model	FCC ID
DoorBird	Bird Home Automation GmbH	DoorBird 1.0	2AD99DBRDA

#### B. Internal Device

Device	Manufacturer	Model	FCC ID/DOC
N/A			

#### C. Peripherals

Device	Manufacturer	Model	Rating
Power Supply	LEADER	MU12-G1200100-C5	Input: 100-240V~, 50/60Hz, 0.5A; Output: DC12V, 1A

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#### 5.4 EUT Operating Condition

Operating condition is according to ANSI C63.4 -2009.

A Setup the EUT and simulators as shown on follow

B Enable AF signal and confirm EUT active to normal condition

#### 5.5 Power line conducted Emission Limit according to Paragraph 15.207

Frequency (MHz)	Class A Limits (dB $\mu$ V)		Class B Limits (dB $\mu$ V)	
	Quasi-peak Level	Average Level	Quasi-peak Level	Average Level
0.15 ~ 0.50	79.0	66.0	66.0~56.0*	56.0~46.0*
0.50 ~ 5.00	73.0	60.0	56.0	46.0
5.00 ~ 30.00	73.0	60.0	60.0	50.0

Notes: 1. \*Decreasing linearly with logarithm of frequency.  
2. The tighter limit shall apply at the transition frequencies

#### 5.6 Test Results

The frequency spectrum from 0.15MHz to 30MHz was investigated. All reading are quasi-peak values with a resolution bandwidth of 9kHz. (The average detector is necessary when the Quasi-peak emission level beyond the average Limit.)

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**A: Conducted Emission on Live Terminal (150kHz to 30MHz)**

**EUT Operating Environment**

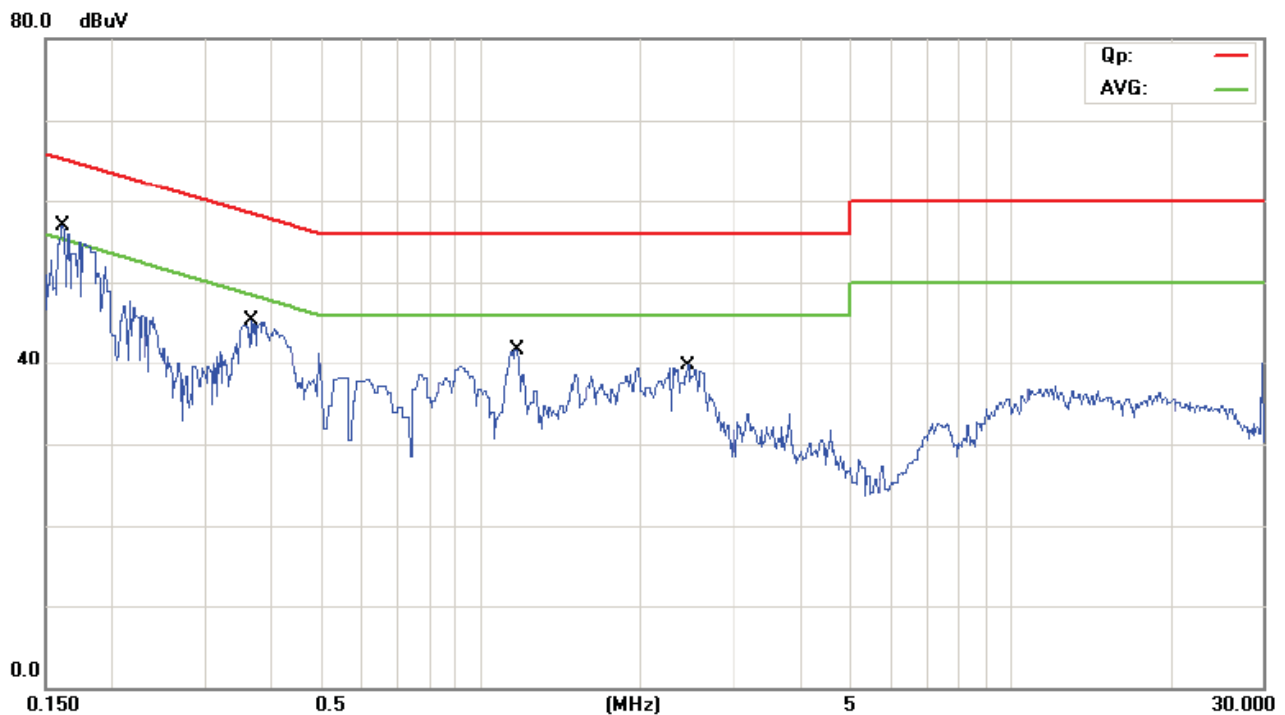
Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 KPa

**EUT set Condition: Keep RFID Transmitting**

**Equipment Level: Class B**

**Results: PASS**

Please refer to following diagram for individual



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1	*	0.1615	40.30	11.01	51.31	65.39	-14.08	QP
2		0.1615	5.10	11.01	16.11	55.39	-39.28	AVG
3		0.3645	29.30	11.23	40.53	58.63	-18.10	QP
4		0.3645	-1.10	11.23	10.13	48.63	-38.50	AVG
5		1.1637	22.90	11.97	34.87	56.00	-21.13	QP
6		1.1637	-1.90	11.97	10.07	46.00	-35.93	AVG
7		2.4551	20.50	12.48	32.98	56.00	-23.02	QP
8		2.4551	-6.20	12.48	6.28	46.00	-39.72	AVG

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**B: Conducted Emission on Neutral Terminal (150kHz to 30MHz)**

**EUT Operating Environment**

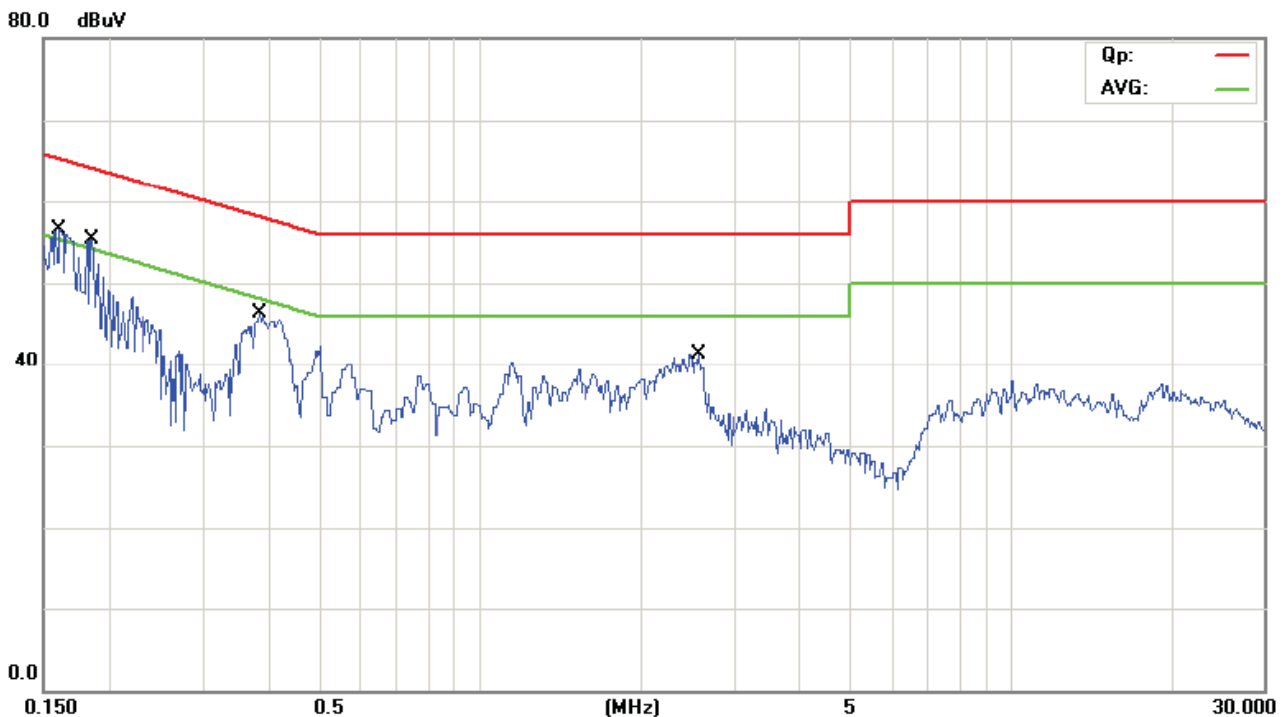
Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 KPa

**EUT set Condition: Keep RFID Transmitting**

**Equipment Level: Class B**

**Results: Pass**

Please refer to following diagram for individual



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1	*	0.1607	42.00	11.01	53.01	65.43	-12.42	QP
2		0.1607	4.00	11.01	15.01	55.43	-40.42	AVG
3		0.1844	40.00	11.04	51.04	64.29	-13.25	QP
4		0.1844	3.80	11.04	14.84	54.29	-39.45	AVG
5		0.3845	32.10	11.25	43.35	58.18	-14.83	QP
6		0.3845	4.50	11.25	15.75	48.18	-32.43	AVG
7		2.5678	21.10	12.53	33.63	56.00	-22.37	QP
8		2.5678	-4.20	12.53	8.33	46.00	-37.67	AVG

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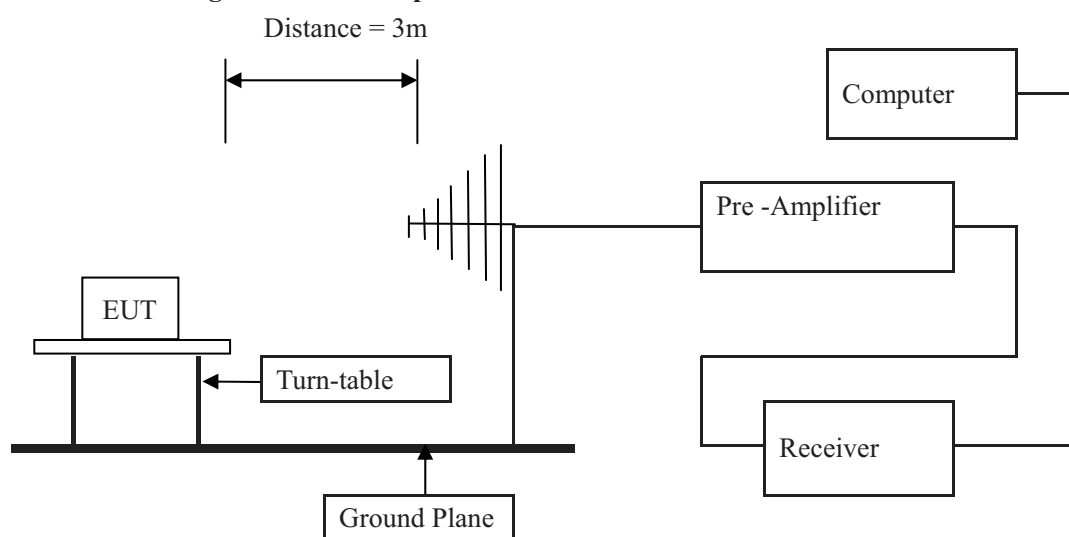
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## 6 Radiated Emission Test

### 6.1 Test Method and test Procedure:

- (1) The EUT was tested according to ANSI C63.4 –2009. The radiated test was performed at Timeway Laboratory. This site is on file with the FCC laboratory division, Registration No.899988
- (2) The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.4-2009.
- (3) The frequency spectrum from 30 MHz to 5 GHz was investigated. All readings from 30 MHz to 1 GHz are quasi-peak values with a resolution bandwidth of 120 kHz. All readings are above 1 GHz, peak values with a resolution bandwidth of 1 MHz . Measurements were made at 3 meters.
- (4) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.
- (5) Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations. All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dB of specification limit), and are distinguished with a "QP" in the data table.
- (6) The antenna polarization : Vertical polarization and Horizontal polarization.

#### Block diagram of Test setup



### 6.2 Configuration of The EUT

Same as section 5.3 of this report

### 6.3 EUT Operating Condition

Same as section 5.4 of this report.

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#### 6.4 Radiated Emission Limit

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below:

##### A FCC Part 15 Subpart C Paragraph 15.231(a) Limit

Fundamental Frequency (MHz)	Field Strength of Fundamental		Field Strength of Spurious Emission	
	uV/m	dBuV/m	uV/m	dBuV/m
40.66-40.70	2250	67.04	225	47.04
70-130	1250	61.94	125	41.94
130-174	1250-3750	61.94-71.48	125-375	41.94-51.48
174-260	3750	71.48	375	51.48
260-470	3750-12500	71.48-81.94	375-1250	51.48-61.94
Above 470	12500	81.94	1250	61.94

- Note:
1. RF Field Strength (dBuV) = 20 log RF Voltage (uV)
  2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
  3. The emission limit in this paragraph is based on measurement instrumentation employing an average detector.
  4. Linear interpolations for frequency ranges 130-174MHz and 260-470MHz
  5. the above field strength limits are specified at a distance of 3-meters and the tighter limits apply at the band edges

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**B. Frequencies in restricted band are complied to limit on Paragraph 15.209.**

Frequency Range (MHz)	Distance (m)	Field strength (dB $\mu$ V/m)
30-88	3	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

- Note:
1. RF Voltage (dBuV) = 20 log RF Voltage (uV)
  2. In the Above Table, the tighter limit applies at the band edges.
  3. Distance refers to the distance in meters between the measuring instrument antenna and the EUT
  4. All scanning using PK detector. And the final emission level was get using QP detector for frequency range from 30-1000MHz.As to 1G-5G, the final emission level got using PK detector. And Average = peak(dBuV/m) – duty cycle(dB)

**6.5 Test result**

**A Fundamental and Harmonics Radiated emission data**

Product:	DoorBird		Test Mode:	Keep Transmitting	
Test Item:	Fundamental Radiated Emission and Spurious Emission Data		Temperature:	25℃	
Test Voltage:	120V~		Humidity:	56%	
Test Result:	Pass				
Frequency (MHz)	Emission PK/AV (dBuV/m)	Horiz / Vert	Limits PK/AV (dBuV/m)	Margin (dB)	
433.92	77.73 (PK)	H	100.8/80.8	-3.07	
433.92	75.93 (PK)	V	100.8/80.8	-4.87	
867.84	46.29 (PK)	H	80.8/60.8	-14.51	
867.84	45.84 (PK)	V	80.8/60.8	-14.96	
1301.76	49.41(PK)	H	74/54	-4.59	
1301.76	46.41(PK)	V	74/54	-7.59	
1735.68	46.51(PK)	H	80.8/60.8	-14.29	
1735.68	43.73(PK)	V	80.8/60.8	-17.07	
2169.6	45.18(PK)	H	80.8/60.8	-15.62	
2169.6	41.91(PK)	V	80.8/60.8	-18.89	
2603.52	--	H/V	80.8/60.8	--	
3037.44	--	H/V	80.8/60.8	--	
3471.36	--	H/V	80.8/60.8	--	
3905.28	-	H/V	80.8/60.8	--	
4339.2	--	H/V	80.8/60.8	--	

Note: 1. Average = peak(dBuV/m) + duty cycle factor(dB), H=Horizontal, V=Vertical

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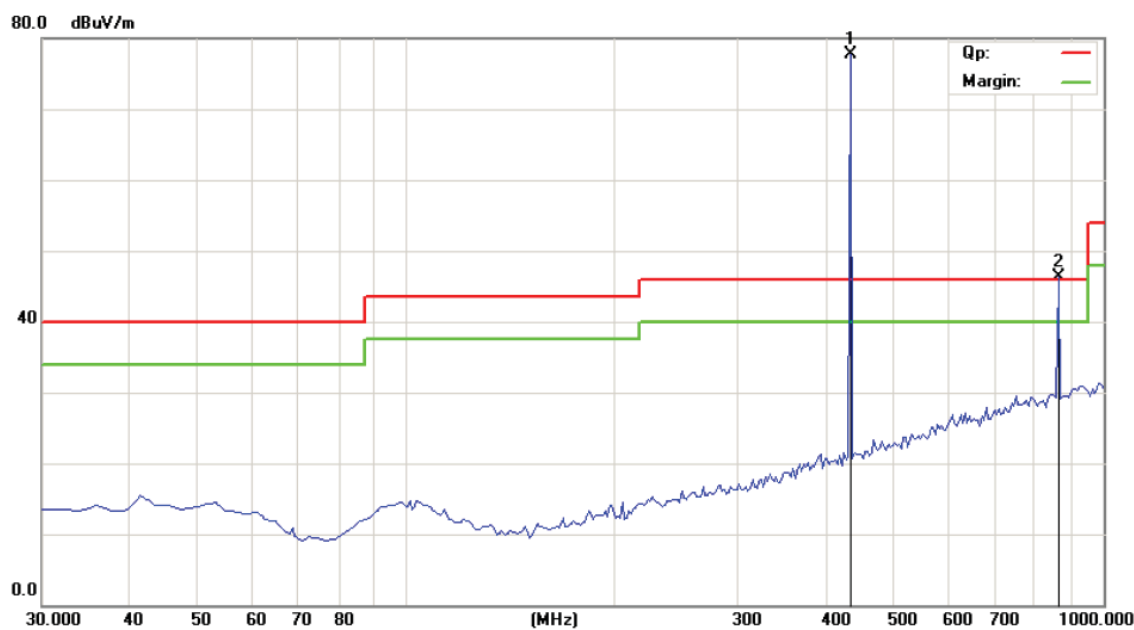


B. General Radiated Emission Data  
Radiated Emission In Horizontal (30MHz----1000MHz)

EUT set Condition: Keep Transmitting

Results: Pass

Please refer to following diagram for individual



Frequency (MHz)	Level@3m (dB $\mu$ V/m)	Antenna Polarity	Limit@3m (dB $\mu$ V/m)
--	--	H	--

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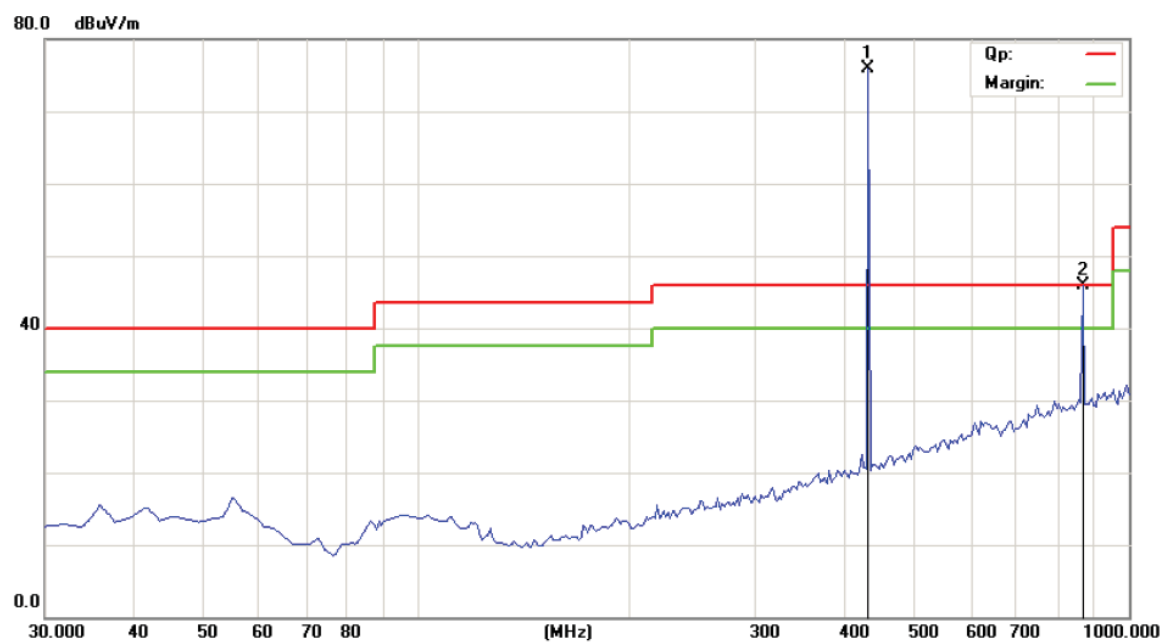
B. General Radiated Emission Data

Radiated Emission In Vertical (30MHz----1000MHz)

EUT set Condition: Keep Transmitting

Results: Pass

Please refer to following diagram for individual



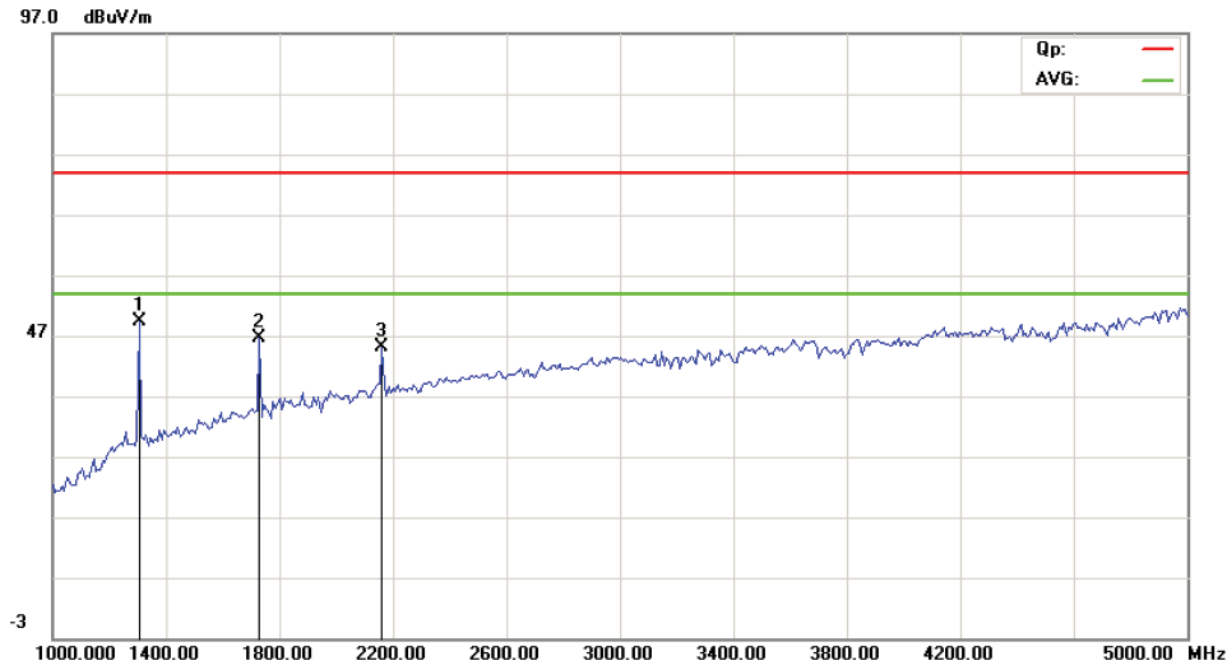
Frequency (MHz)	Level@3m (dB $\mu$ V/m)	Antenna Polarity	Limit@3m (dB $\mu$ V/m)
--	--	V	--

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Test Plot above 1G

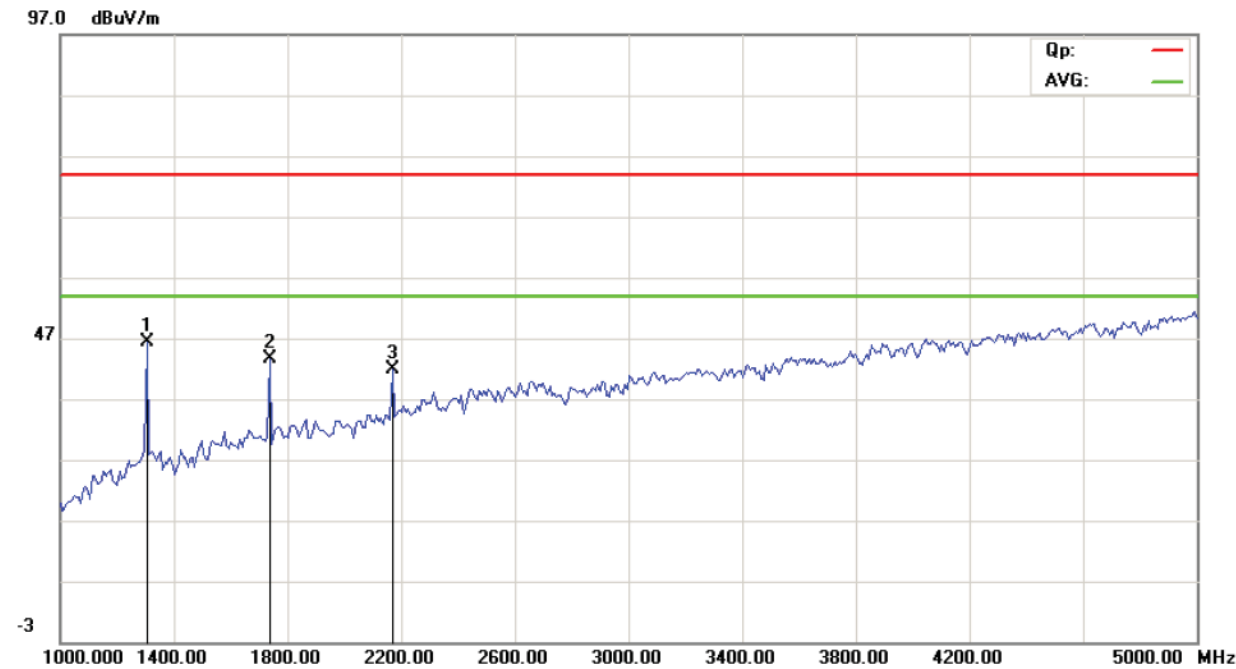
Horizontal



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Vertical



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## 7.0 20dB Bandwidth Testing

### 7.1 Requirement

Per 15.231(c), The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. Bandwidth is determined at the points 20 dB down from the modulated carrier.

### 7.2 Test Procedure

With the EUT's antenna attached, the EUT's 20dB Bandwidth power was received by the test antenna which was connected to the spectrum analyzer with the START and STOP frequencies set to the EUT's operation band.

### 7.3 Test Data

Frequency (MHz)	20dB Bandwidth Emission (kHz)	Limit (kHz)	Result
433.92	196	1084.80	Pass

Limit=Frequency x 0.25%=433.92x 0.25%=1084.80kHz

Refer to attached plots:

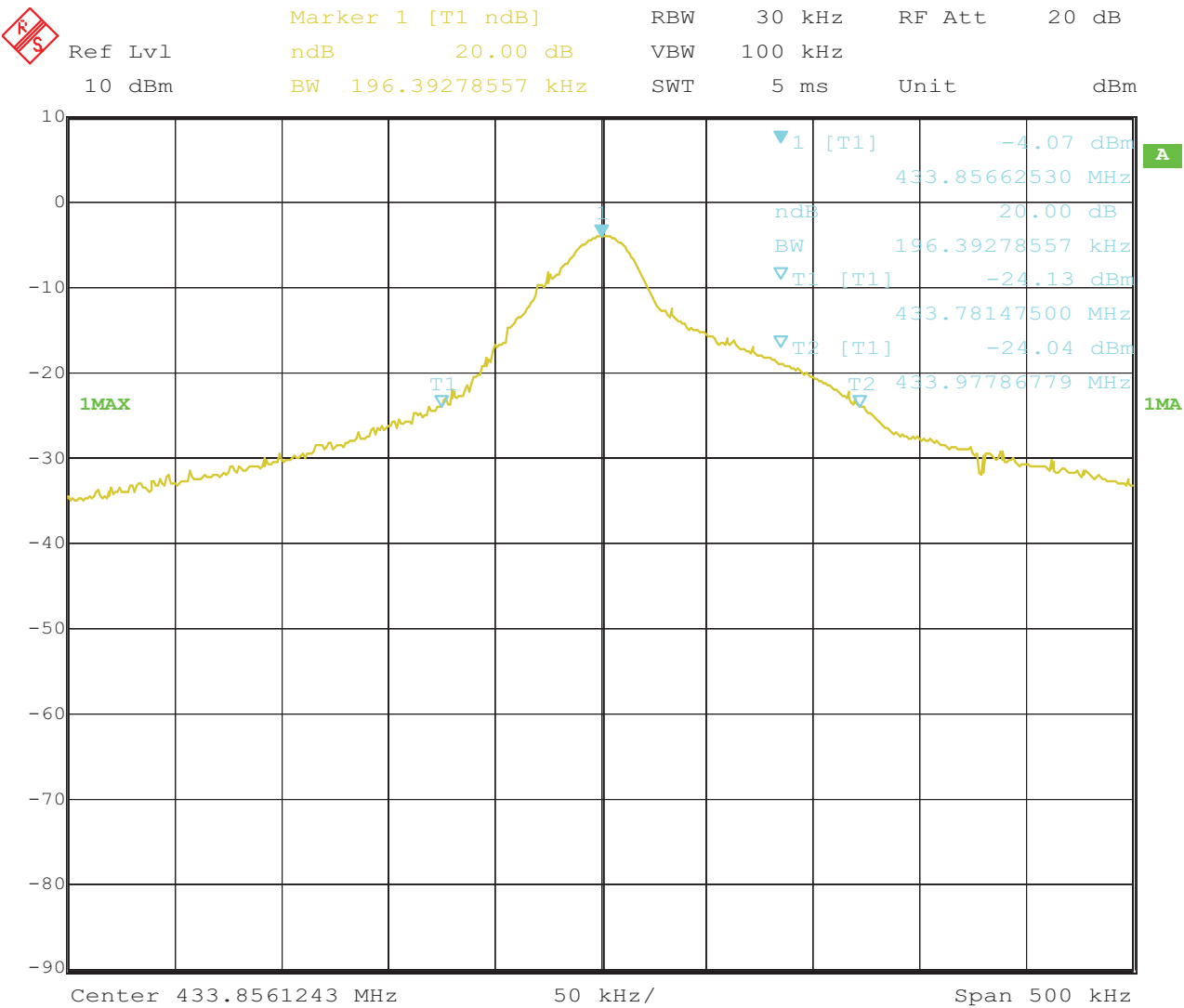
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20dB Bandwidth



Date: 12.JUN.2015 10:33:21

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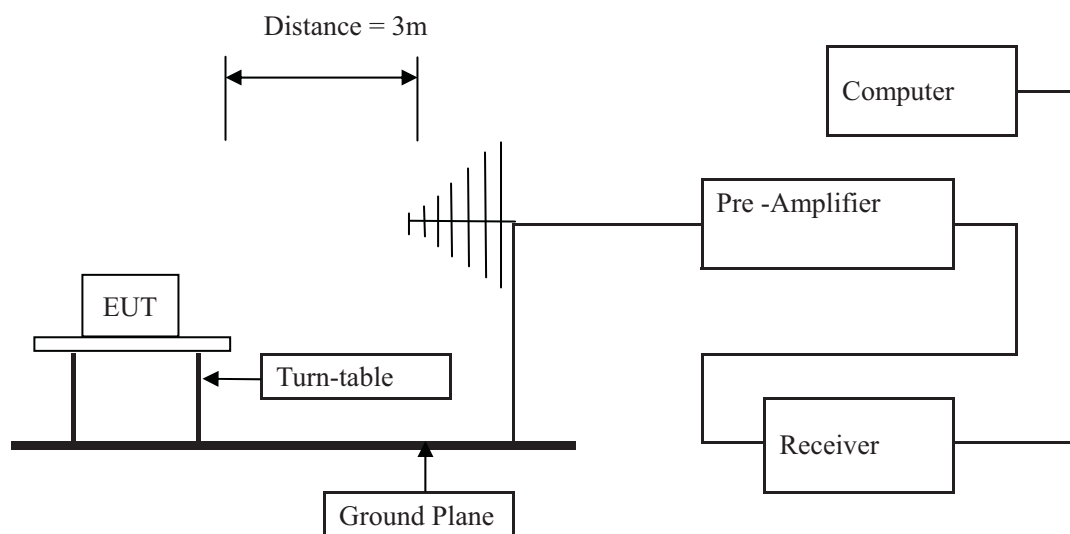
## 8.0 Deactivate Test

### 8.1 Requirement

Per 15.231(a) (1)

A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

### 8.2 Radiated Test Setup



For the actual test configuration , please refer to the related items – Photos of Testing

The deactivation test was performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.4 - 2009. The specification used was the FCC 15.231(e) limits.

### 8.3 Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

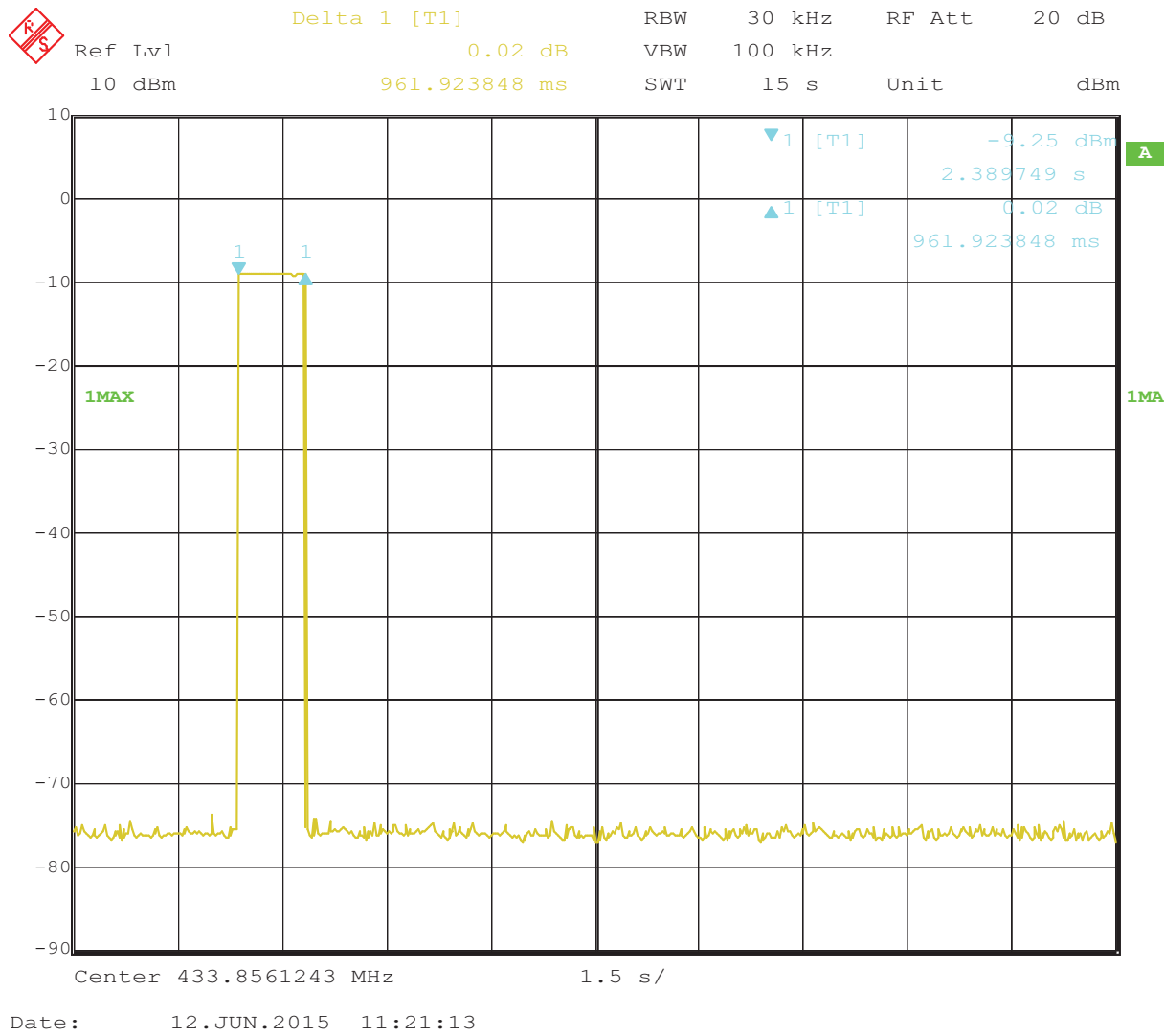
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8.4 Test Data  
Refer to attached plots:  
Periodic



8.5 Test result

Pass

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## 10.0 Antenna Requirement

### 10.1 Standard Applicable

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

### 10.2 Antenna Connected constructions

The antenna is PIFA antenna which is built-in. So it meets the requirement of 15.203

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## 11.0 FCC Label

**FCC ID: 2AD99DBRDA**

The label must not be a stick-on paper label. The label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

### Mark Location:



FCC Label Location

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## 12.0. Photo of testing

### 12.1 Conducted test View



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12.2 Radiated emission test view



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## Photographs – EUT

Outside view



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Outside view



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Inside view

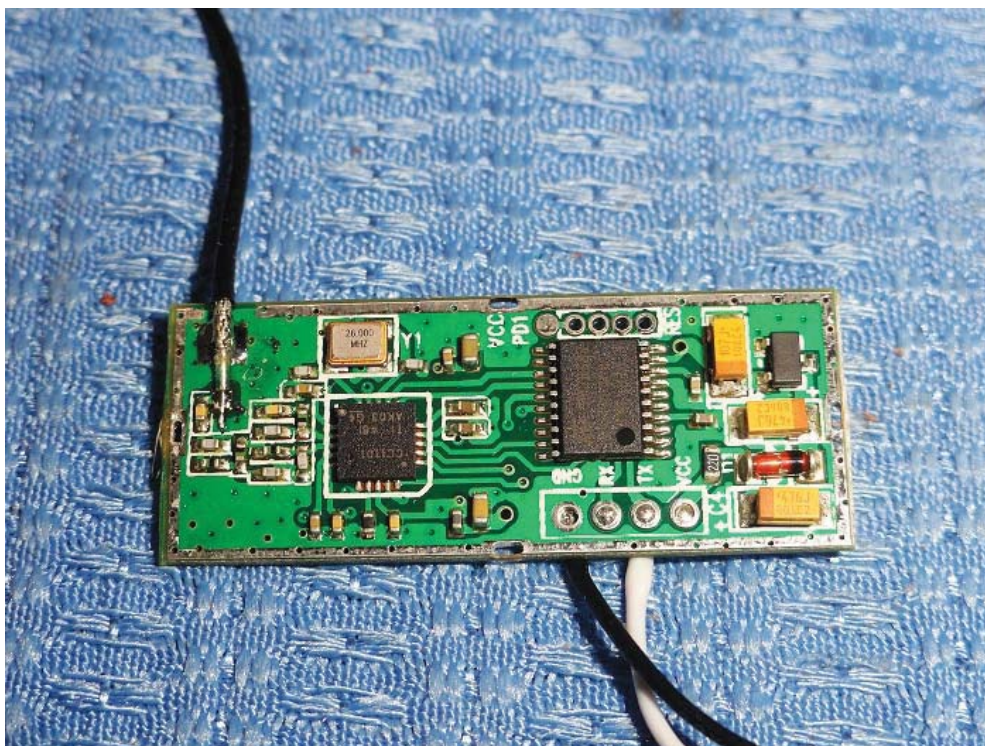
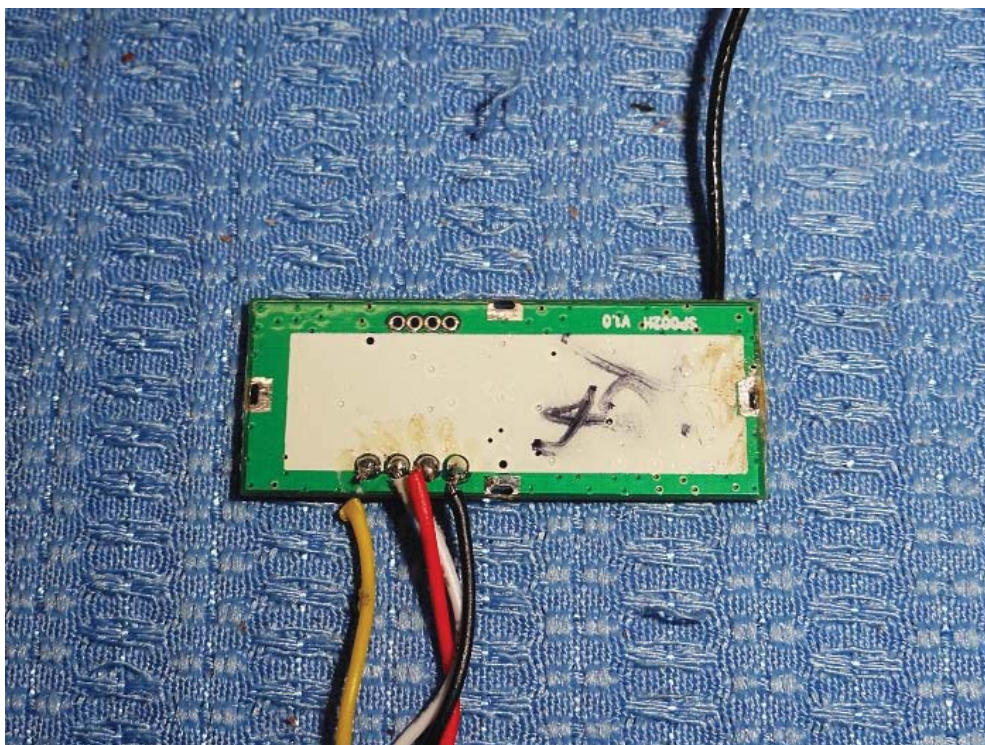


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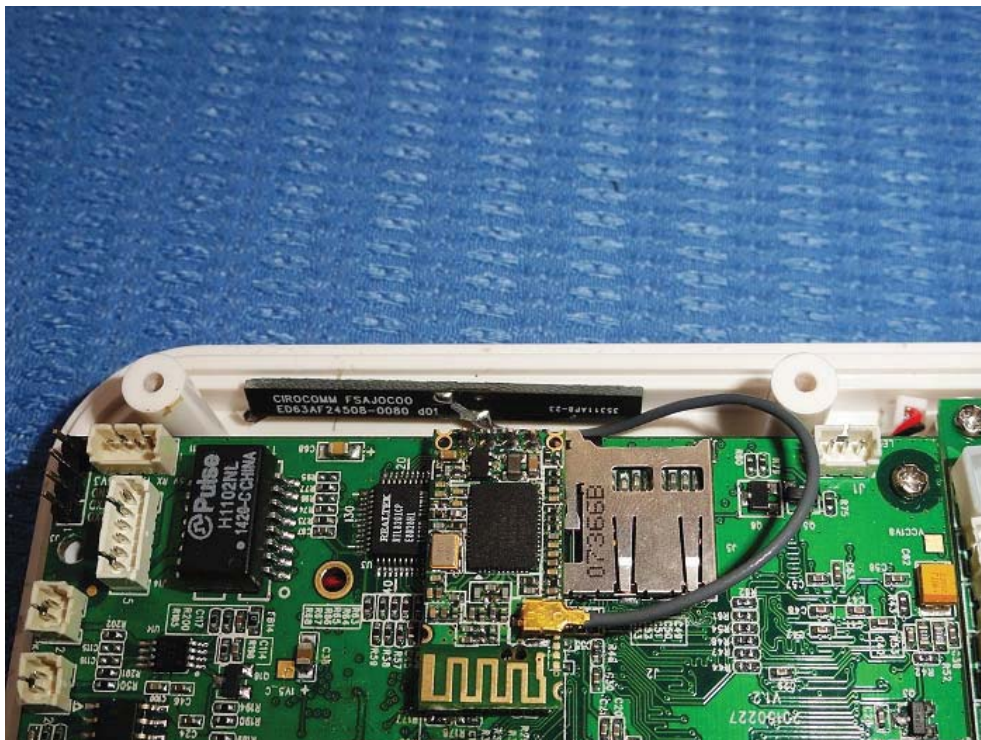
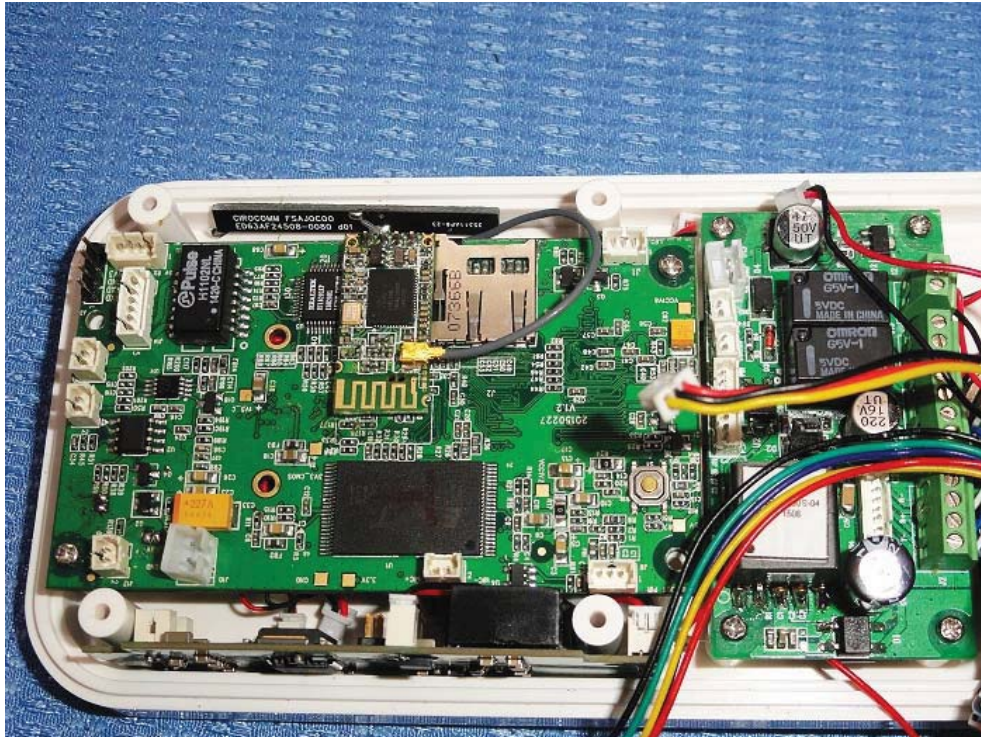


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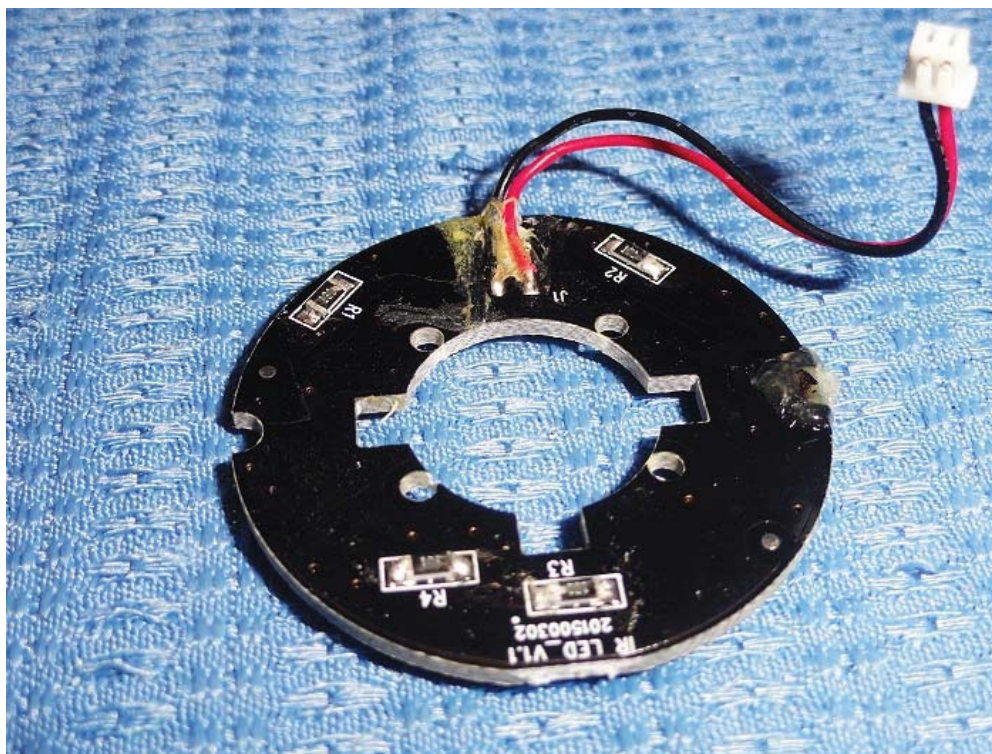
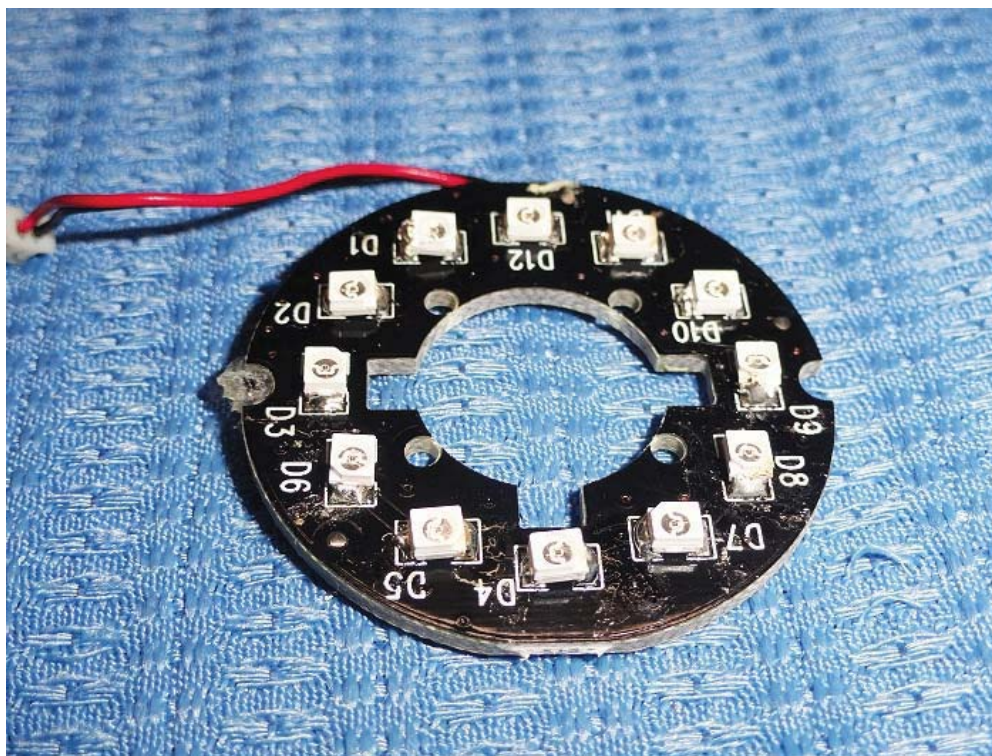


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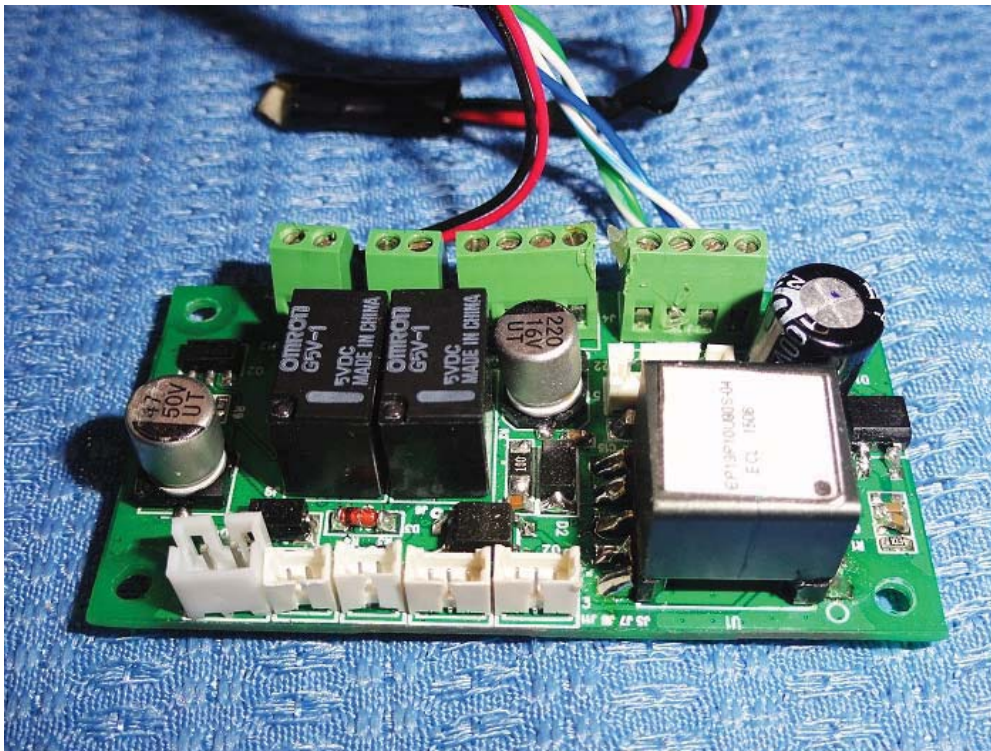


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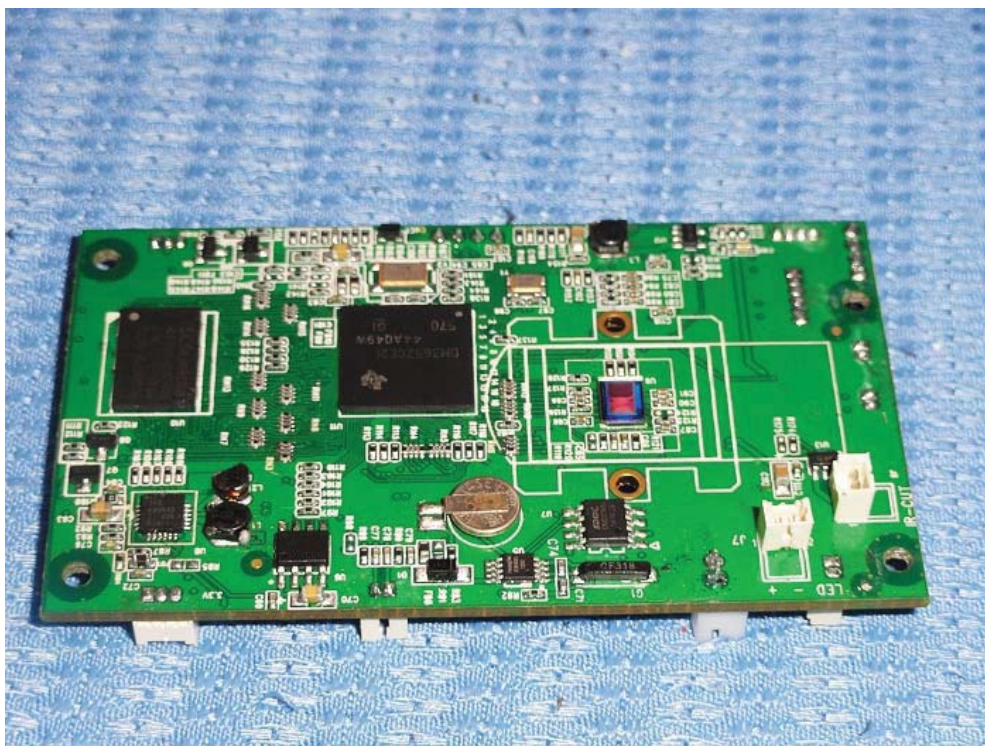


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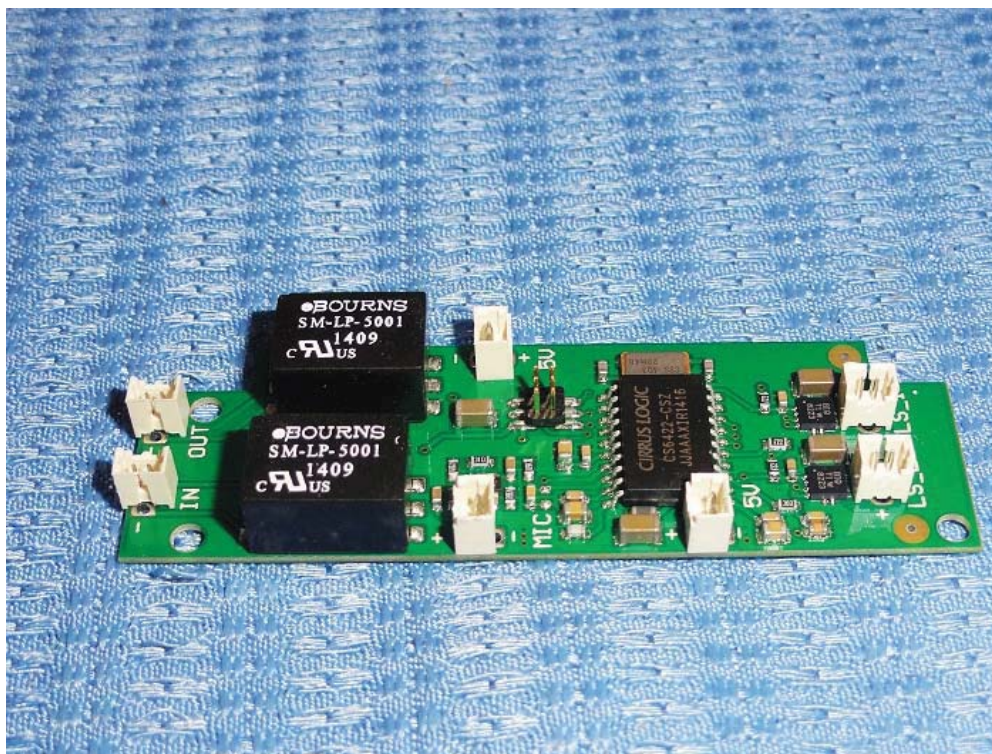
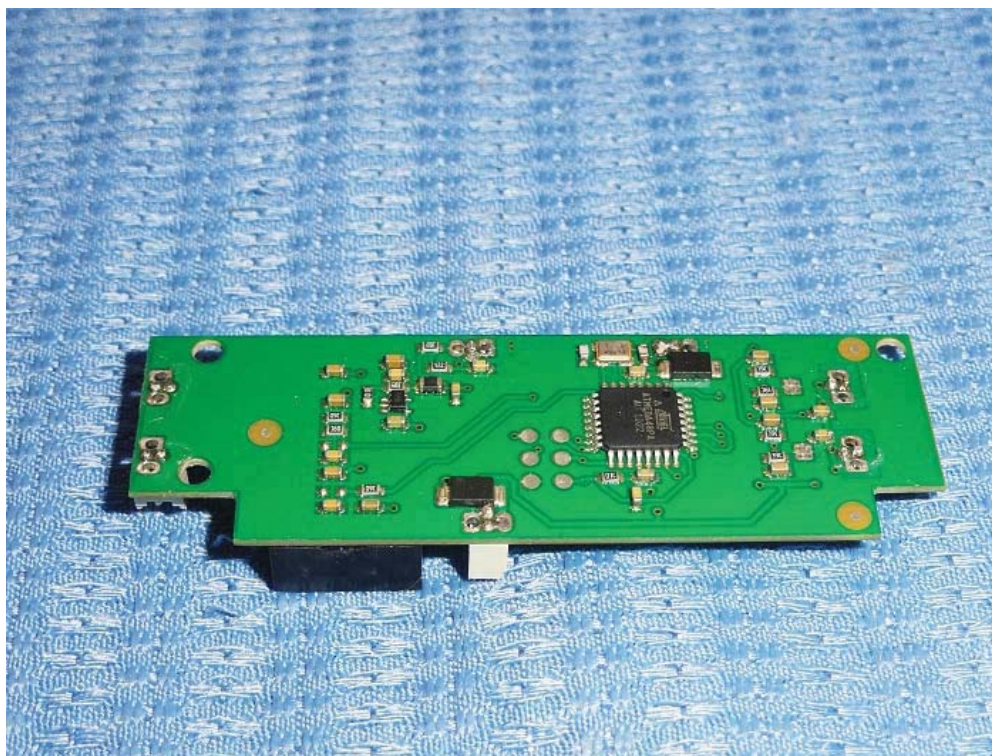


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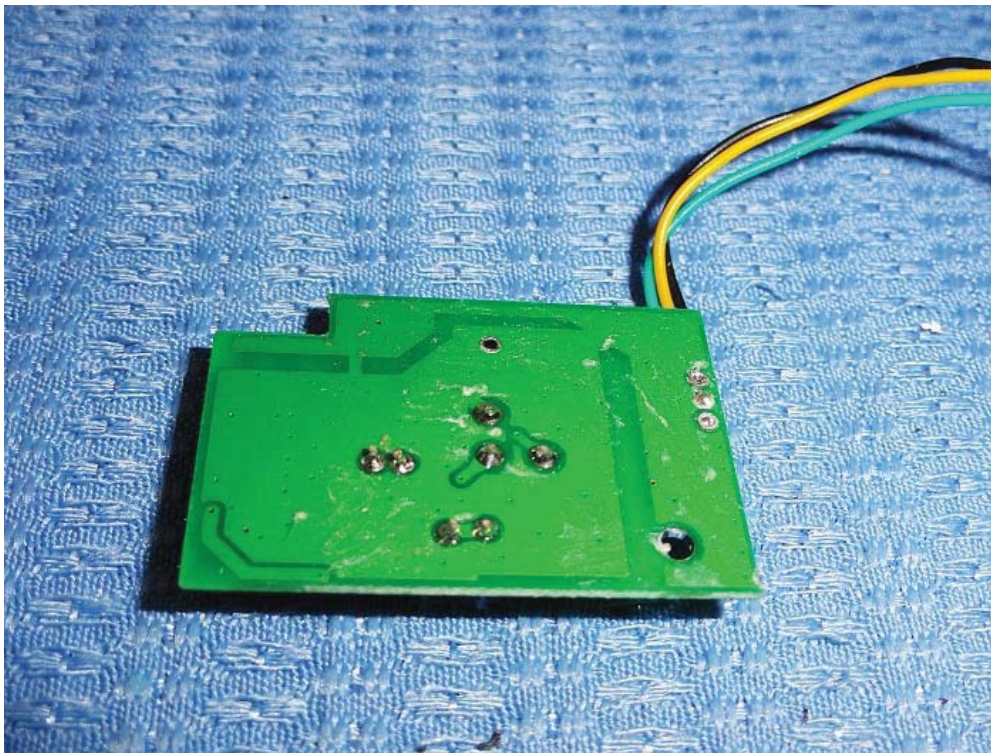


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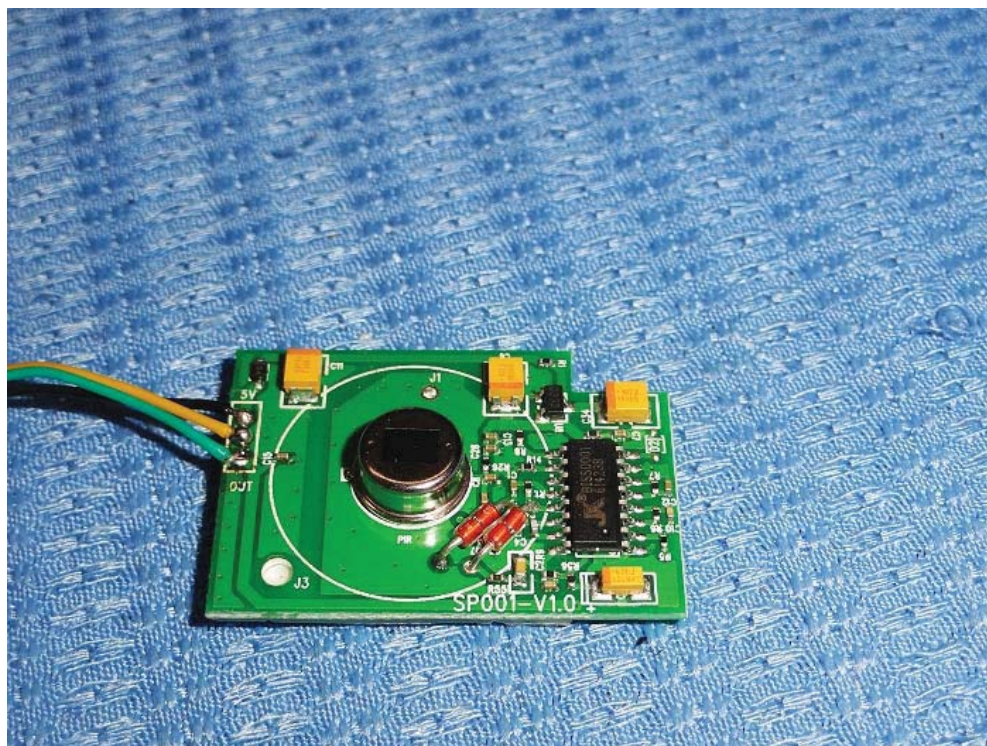


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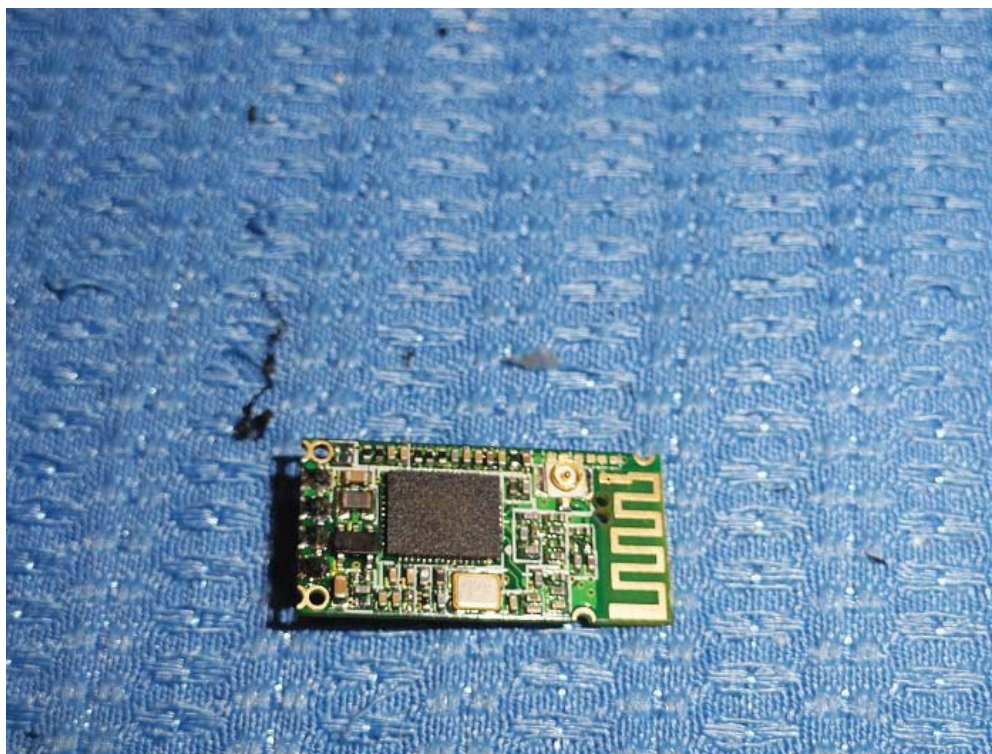
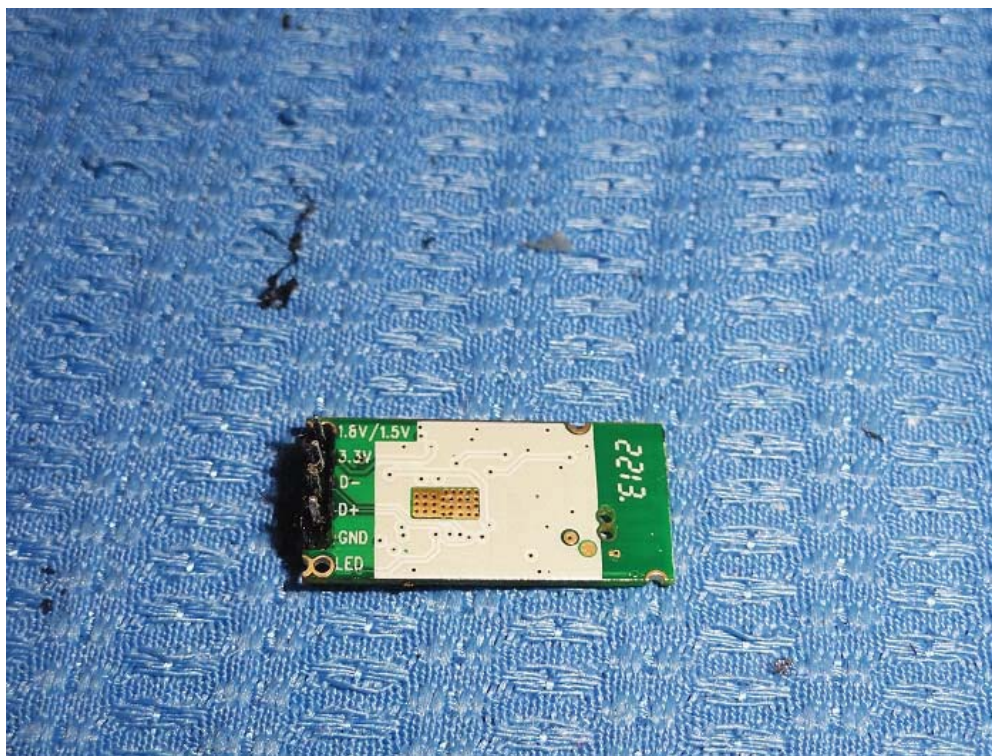


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WIFI Modular



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