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Report No.: SHEM120300025404
Page: 1 of 22

TEST REPORT

Application No.: SHEM120300025404

Applicant: ICP Electronics Inc.

Equipment Under Test (EUT):

NOTE: The following sample(s) submitted was/were identified on behalf of the client as

Trade Mark: 

Name: WIRELESS LAN MODULE

Model No.: WIFI-RT3593-DB

Standards: FCC Part15 :2011 Subpart B

Date of Receipt: Mar. 12, 2012

Date of Test: Mar. 14, 2012 to Apr. 1, 2012

Date of Issue: June. 8, 2012

Test Result :	PASS*
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* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Jim Xu
E&E Section Head
SGS-CSTC(Shanghai) Co., Ltd.



Neil Zhang
E&E Project Engineer
SGS-CSTC(Shanghai) Co., Ltd.

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2 Test Summary

Test	Test Requirement	Test Method	Class / Severity	Result
Radiated Emission*	FCC Part15:2011	ANSI C63.4: 2009	Class B	PASS
Conducted Emission 150KHz-30MHz	FCC Part15:2011	ANSI C63.4: 2009	Class B	PASS

* If the highest frequency of the internal sources of the EUT is less than 108MHz, the measurement shall only be made up to 1GHz.



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4 General Information

4.1 Client Information

Applicant : ICP Electronics Inc.
 Applicant Address: 3F., No.22, Zhongxing Rd., Xizhi Dist., New Taipei City 221, Taiwan, R.O.C
 Manufacturer: Armorlink SH Corp.
 Address of Manufacturer: 515.Shenfu Rd,Xinzhuang Industrial Development Zone,Minhang District,Shanghai,P.R.China

4.2 General Description of E.U.T.

Trade Mark: 
 Name: WIRELESS LAN MODULE
 Model No.: WIFI-RT3593-DB

4.3 Details of E.U.T.

Power Supply: 3.3V
 Hardware Version: N/A
 Software Version: N/A

4.4 Description of Support Units

Support equipments / Associated Equipments:

- The EUT has been tested independently. and or
 The EUT has been tested with support equipments as below.

Description	Manufacturer	Model No.	Serial No.	Supplied by Client or SGS?
MOUSE	Lenovo	M-UAE119	23-284953	SGS
17" LCD	Lenovo	9227-AE1	VENCW23	SGS
Main-board	N/A	945GSE	N/A	Client
Adapter for Main-board	ICP Electronics Inc.	ACE-916A	S701140033 9	Client
Hard Disk (HD)	Seagate	ST9160310AS	5SV50RR5	Client

Support Software:

Description	Manufacturer	Software name	Supplied by Client or SGS?
WiFi Test Tool	N/A	Ralink RT3593 QA Tool	Client

4.5 Standards Applicable for Testing

The standards used was FCC Part15:2011.

Table 1 : Tests Carried Out Under FCC Part 15: 2011

Standard	Status
FCC Part 15 B: 2011 Radiated Emission	√
FCC Part 15 B: 2011 Conducted Emission	√

× Indicates that the test is not applicable
√ Indicates that the test is applicable

4.6 Abnormalities from Standard Conditions

None.

4.7 Test Location

All tests were performed at:
SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.
No.588 West Jindu Road, Songjiang District, Shanghai, China. 201612.
Tel: +86 21 6191 5666 Fax: +86 21 6191 5678

4.8 Test Facility

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

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. 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) for the competence in the field of testing. Date of expiry: 2014-07-26.

- **FCC – Registration No.: 402683**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered and fully described in a report filed with the Federal Communications Commission (FCC). The acceptance letter from the FCC is maintained in our files. Registration No.: 402683, Expiry Date: 2015-02-22.

- **Industry Canada (IC) – IC Assigned Code: 8617A**

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A. Expiry Date: 2014-09-20.

5 Equipment Used during Test

Radiated Emission

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due date
1	EMI test receiver	Rohde & Schwarz	ESU40	100109	2012-06-03	2013-06-01
2	Antenna	SCHWARZBECK	VULB9168	9168-313	2011-10-28	2012-10-26
3	CONTROLLER	INNCO	CO200	474	/	/
4	Antenna	SCHWARZBECK	BBHA9120D	9120D-679	2011-10-28	2012-10-26
5	Antenna	SCHWARZBECK	BBHA9170	9170-373	2011-10-28	2012-10-26

Conducted Emission

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due date
1	EMI test receiver	Rohde & Schwarz	ESCS30	100086	2012-06-03	2013-06-01
2	Line impedance stabilization network	SCHWARZBECK	NSLK8127	8127-490	2012-05-07	2013-05-05

General Equipment

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due date
1	Digital pressure meter	YONGZHI	DYM3-01	101012	2011-11-18	2012-11-17
2	Digital Multimeter	FLUKE	17B	10560713	2011-08-24	2012-08-22
3	Temperature & humidity recorder	ShangHai weather meter work	ZJ 1-2B	0805126	2011-07-25	2012-07-23

6 Emission Test Results

6.1 Radiated Emissions, 30MHz to 1GHz

Test Requirement:	FCC Part15: 2011
Test Method:	ANSI C63.4: 2009
Test Date:	March 21, 2012
Frequency Range:	30MHz to 1GHz
Measurement Distance:	3m
Class:	Class B
Detector:	Peak for pre-scan (120kHz resolution bandwidth)
Result:	PASS

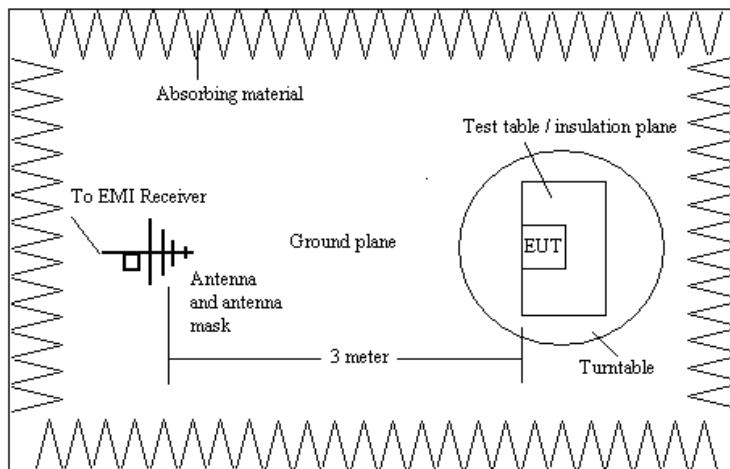
6.1.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1006 mbar

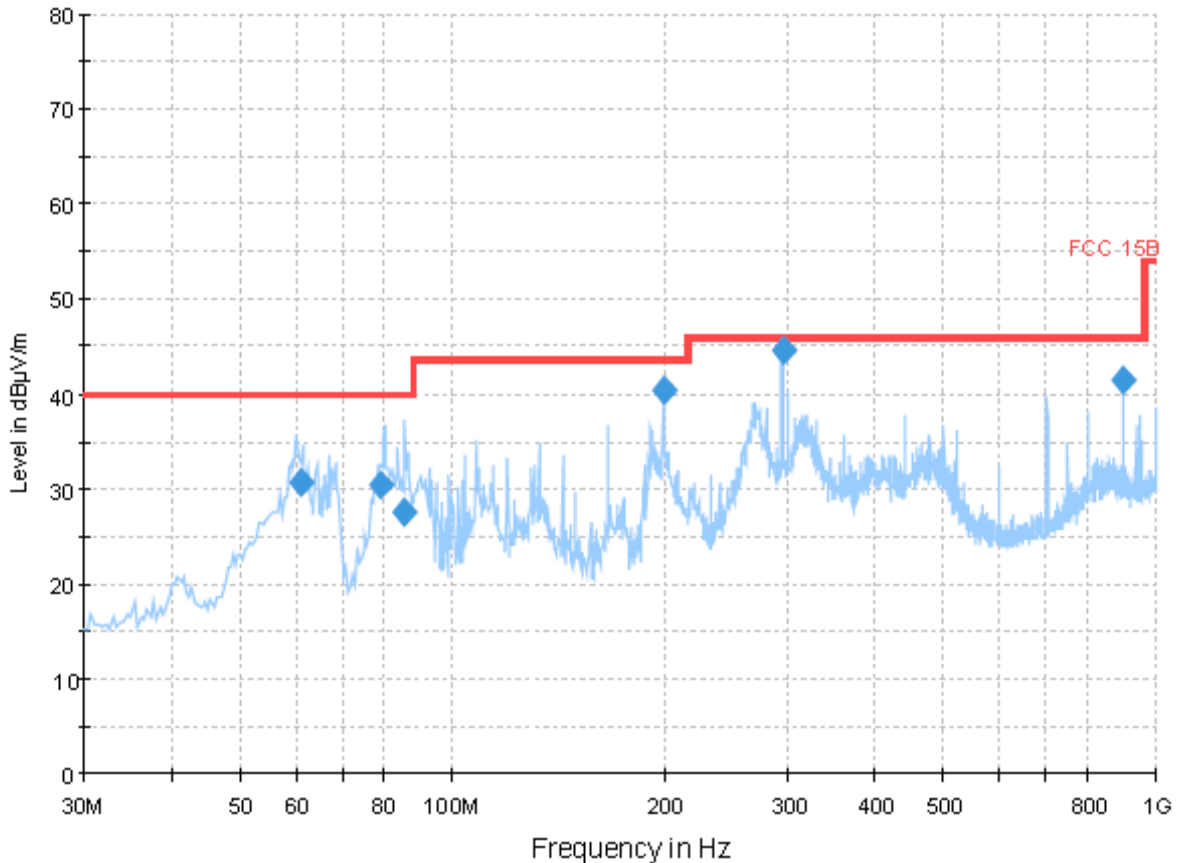
EUT Operation: The EUT is configured to create an operating communication link via test software "Ralink RT3593 QA Tool" that the client supplied.

6.1.2 Test setup



6.1.3 Measurement Data

Horizontal:

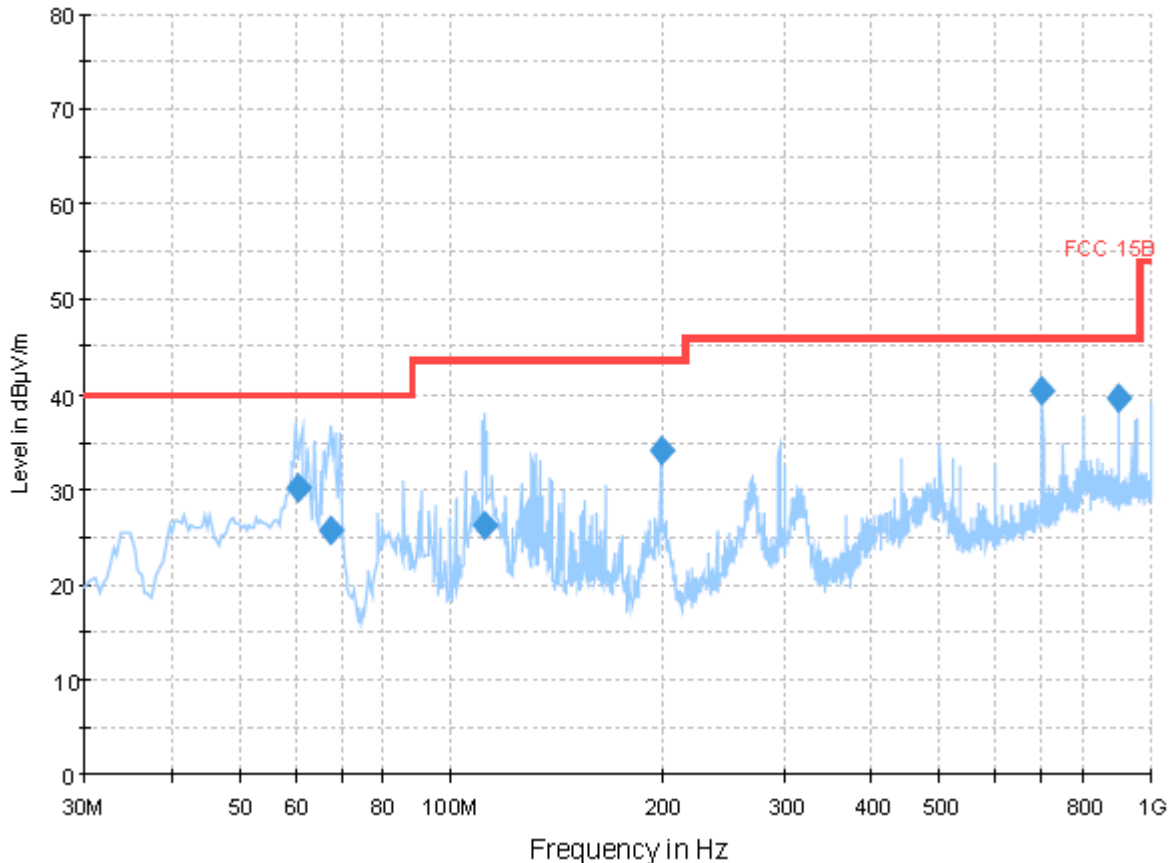


Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)
60.998400	30.6	1000.000	120.000	250.0	H	19.0	-10.2	9.4
79.619200	30.4	1000.000	120.000	250.0	H	272.0	-13.2	9.6
85.540800	27.5	1000.000	120.000	235.0	H	298.0	-13.2	12.5
200.014080	40.4	1000.000	120.000	165.0	H	188.0	-12.0	3.1
294.918560	44.7	1000.000	120.000	100.0	H	47.0	-8.8	1.3
899.986400	41.4	1000.000	120.000	100.0	H	58.0	2.5	4.6

(continuation of the "Final Result 1" table from column 9 ...)

Frequency (MHz)	Limit (dBµV/m)	Comment
60.998400	40.0	
79.619200	40.0	
85.540800	40.0	
200.014080	43.5	
294.918560	46.0	
899.986400	46.0	

Vertical:



Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)
60.696960	30.1	1000.000	120.000	100.0	V	116.0	-10.2	9.9
67.609120	25.8	1000.000	120.000	100.0	V	53.0	-11.4	14.2
112.084000	26.2	1000.000	120.000	100.0	V	299.0	-11.1	17.3
200.016000	34.2	1000.000	120.000	100.0	V	108.0	-12.0	9.3
700.034720	40.3	1000.000	120.000	109.0	V	187.0	-0.2	5.7
900.019040	39.6	1000.000	120.000	100.0	V	234.0	2.5	6.4

(continuation of the "Final Result 1" table from column 9 ..)

Frequency (MHz)	Limit (dBµV/m)	Comment
60.696960	40.0	
67.609120	40.0	
112.084000	43.5	
200.016000	43.5	
700.034720	46.0	
900.019040	46.0	



6.2 Conducted Emissions, 150kHz to 30MHz

Test Requirement:	FCC Part15:2011
Test Method:	ANSI C63.4: 2009
Test Date:	March 24, 2012
Frequency Range:	150kHz to 30MHz
Class:	Class B
Limit:	66 dB μ V - 56 dB μ V between 150kHz & 500kHz Quasi-peak 56 dB μ V between 0.5MHz & 5MHz Quasi-peak 60 dB μ V between 5MHz & 30MHz Quasi-peak
Result:	PASS

6.2.1 E.U.T. Operation

Operating Environment:

Temperature: 23.0°C Humidity: 57% RH Atmospheric Pressure: 1012 mbar

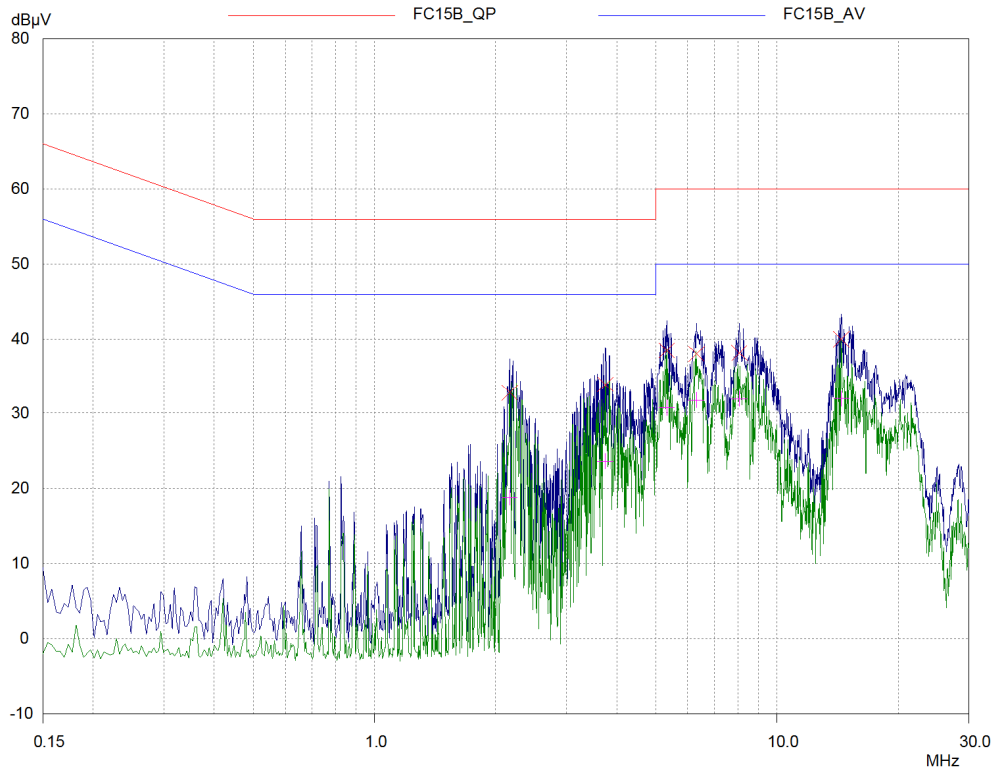
EUT Operation: The EUT is configured to create an operating communication link via test software "Ralink RT3593 QA Tool" that the client supplied.

6.2.2 Test Result and Partial Measurement Data

Pass.

An initial pre-scan was performed in the Shielding room using the receiver in peak detection mode. The EUT was measured for 2 Lines and peak emissions from the EUT were detected within 6dB of the class B limit line.

L Line:



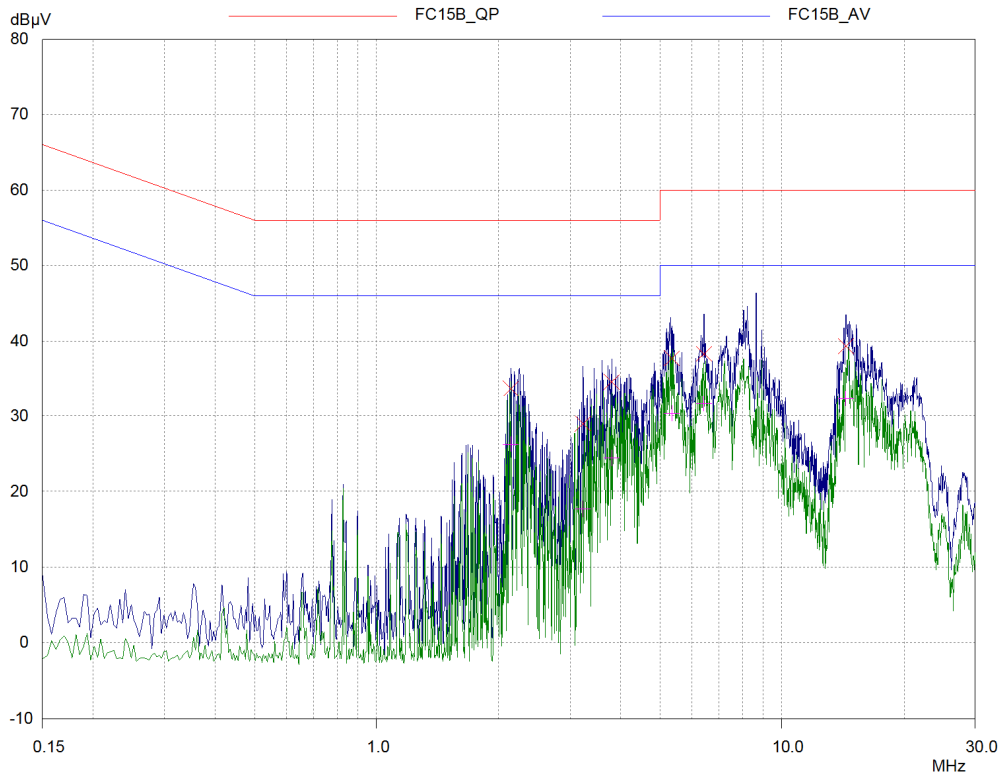
Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB
2.16562	32.80	56.00	23.20
3.74765	33.93	56.00	22.07
5.31796	38.51	60.00	21.49
6.30625	38.01	60.00	21.99
8.06795	38.20	60.00	21.80
14.45078	39.99	60.00	20.01

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB
2.16562	18.71	46.00	27.29
3.74765	23.60	46.00	22.40
5.31796	30.76	50.00	19.24
6.30625	31.74	50.00	18.26
8.06795	31.91	50.00	18.09
14.45078	31.97	50.00	18.03

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N Line:



Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB
2.14218	33.68	56.00	22.32
3.22812	28.93	56.00	27.07
3.79843	34.59	56.00	21.41
5.34531	37.71	60.00	22.29
6.41171	38.31	60.00	21.69
14.38437	39.33	60.00	20.67

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB
2.14218	26.20	46.00	19.80
3.22812	17.68	46.00	28.32
3.79843	24.39	46.00	21.61
5.34531	30.30	50.00	19.70
6.41171	31.58	50.00	18.42
14.38437	32.31	50.00	17.69

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7 EQUIPMENT UNDER TEST PICTURES

7.1 Radiated Emission Test Setup



7.2 Conducted Emission Test Setup



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8 Appendix B: EUT Construction Photographs

EUT Front View



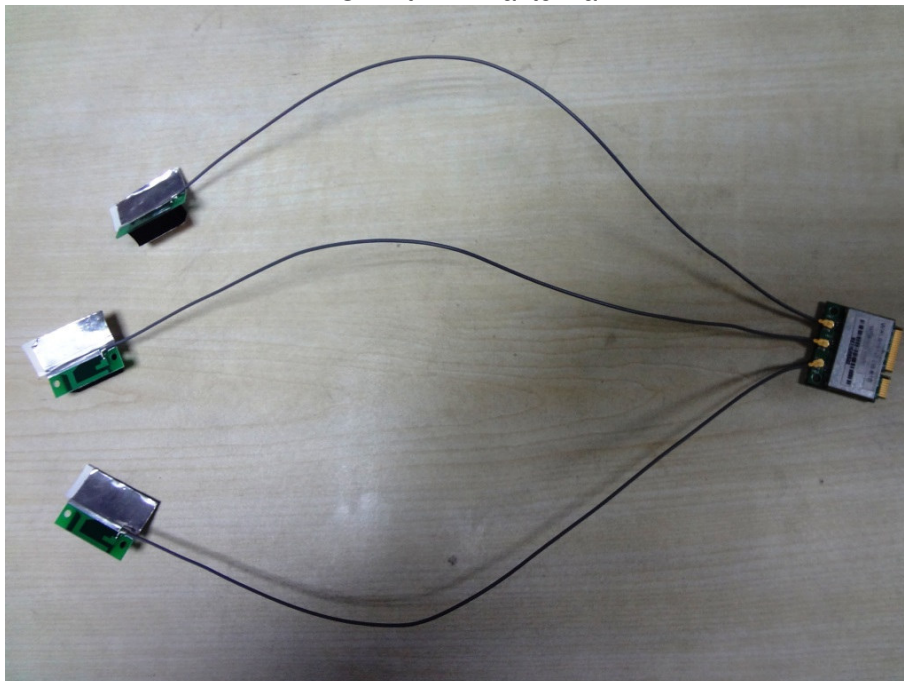
EUT Bottom View



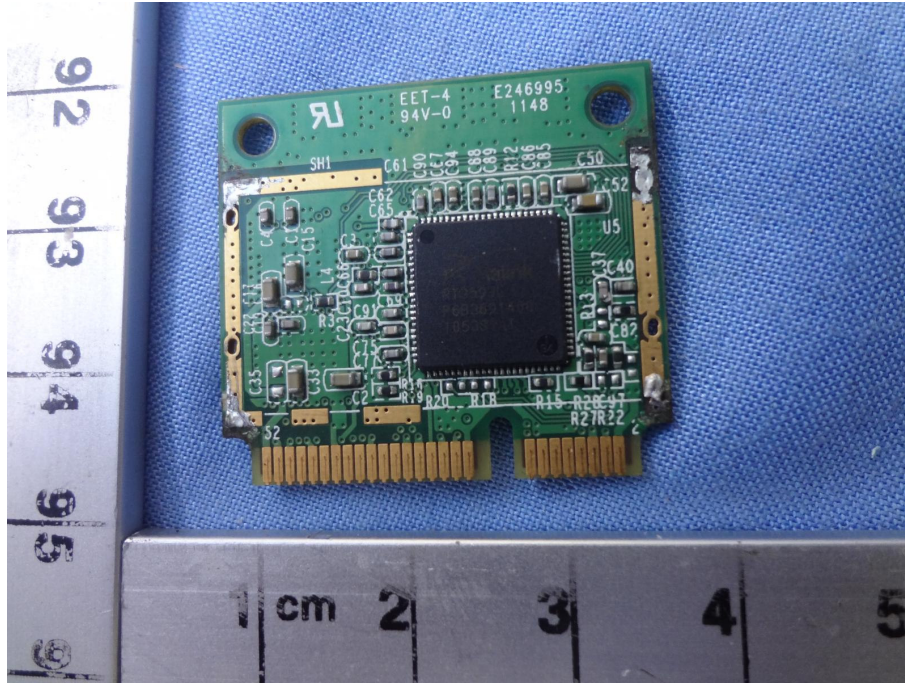
EUT with Dipole antenna



EUT with PIFA antenna



Internal of PCB Front View



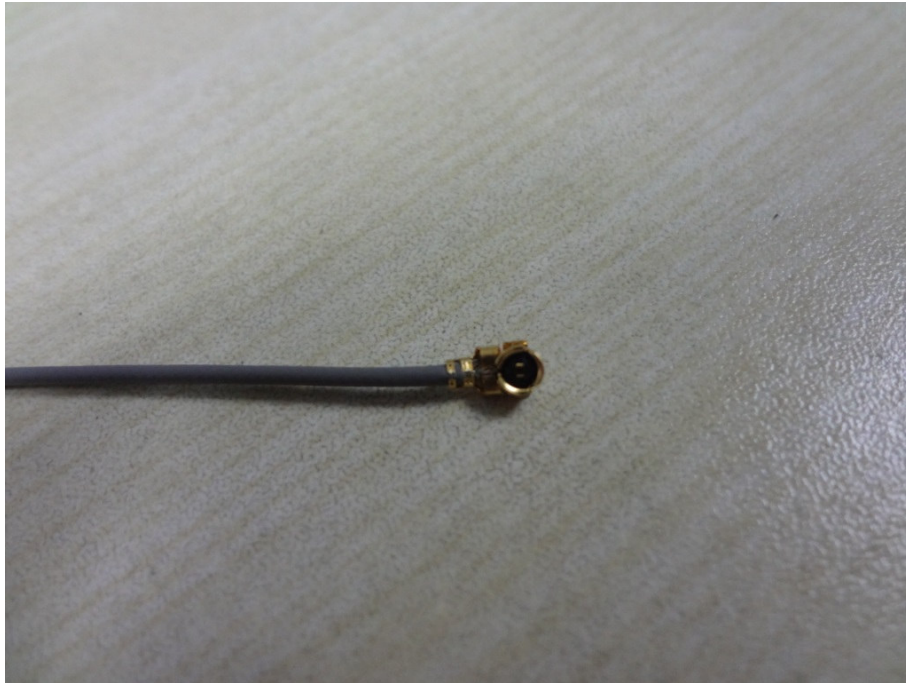
Internal of PCB Back View



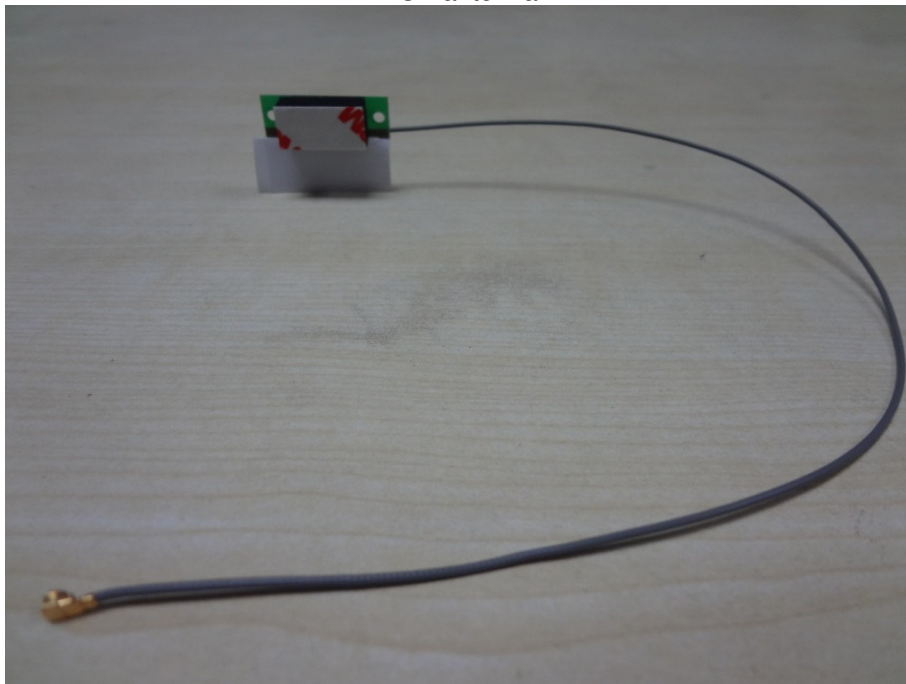
Dipole antenna

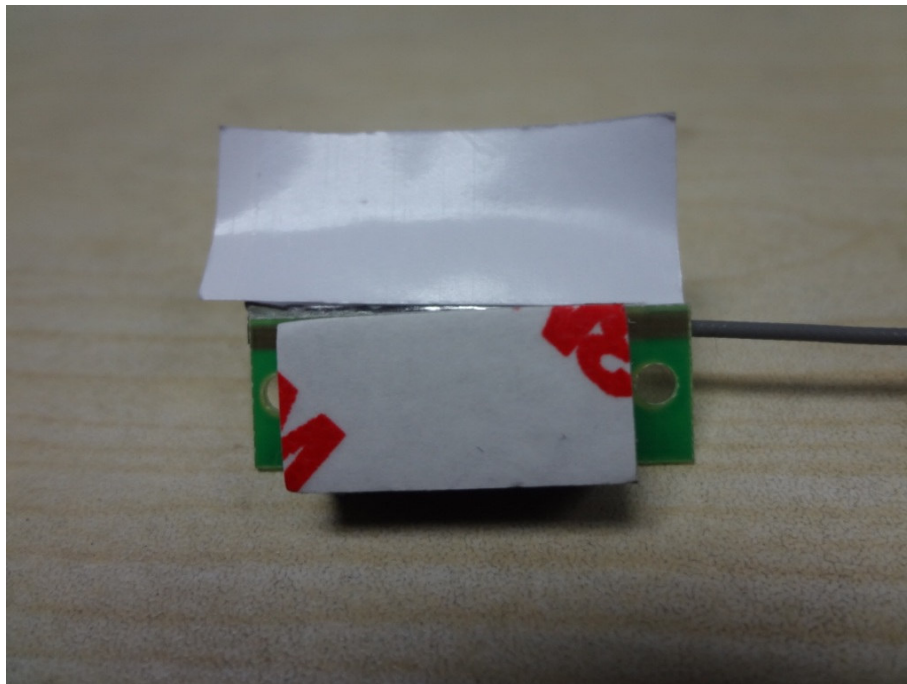
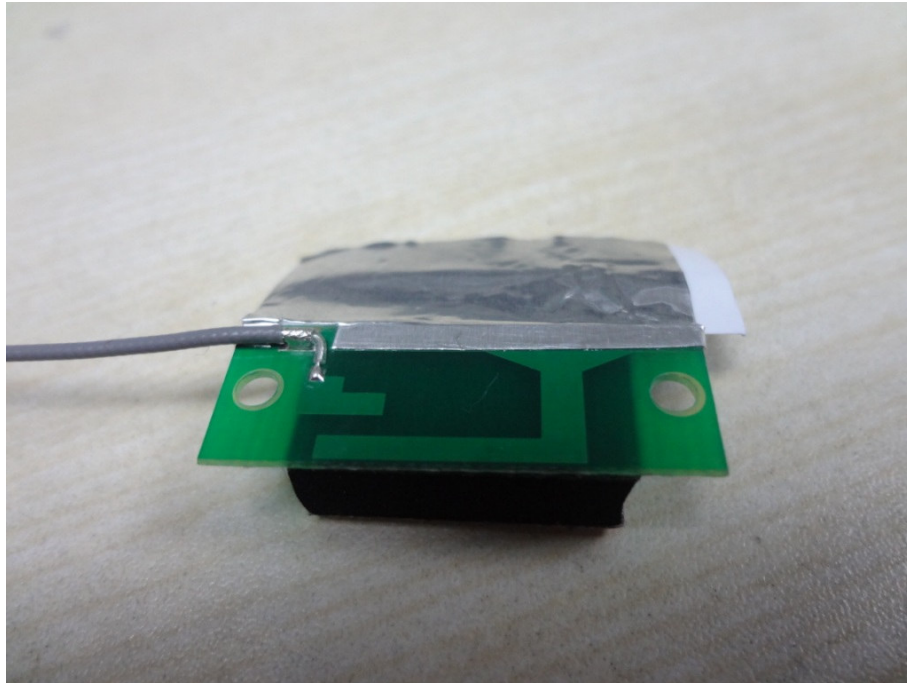




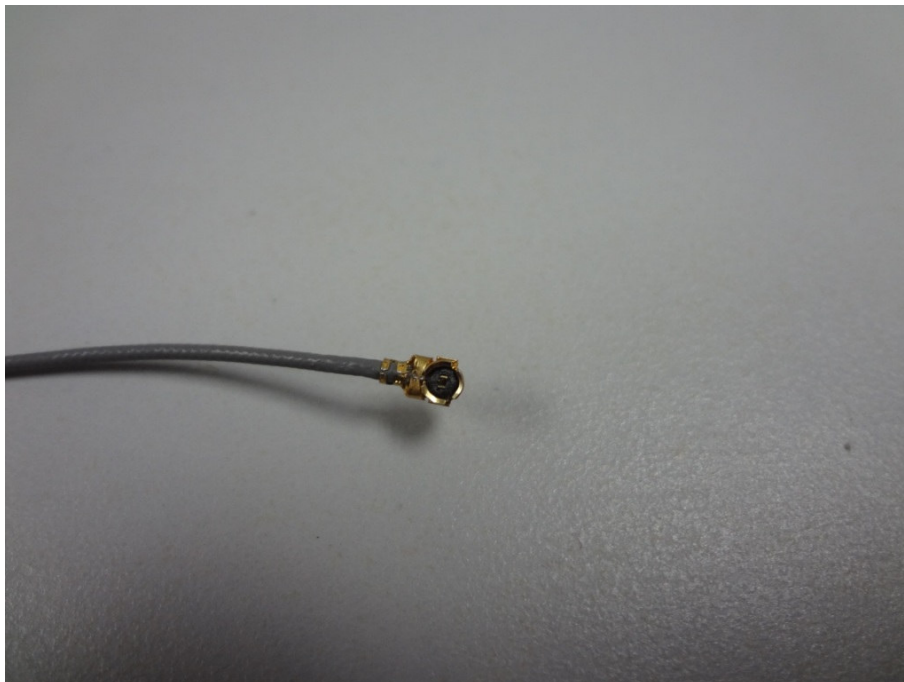
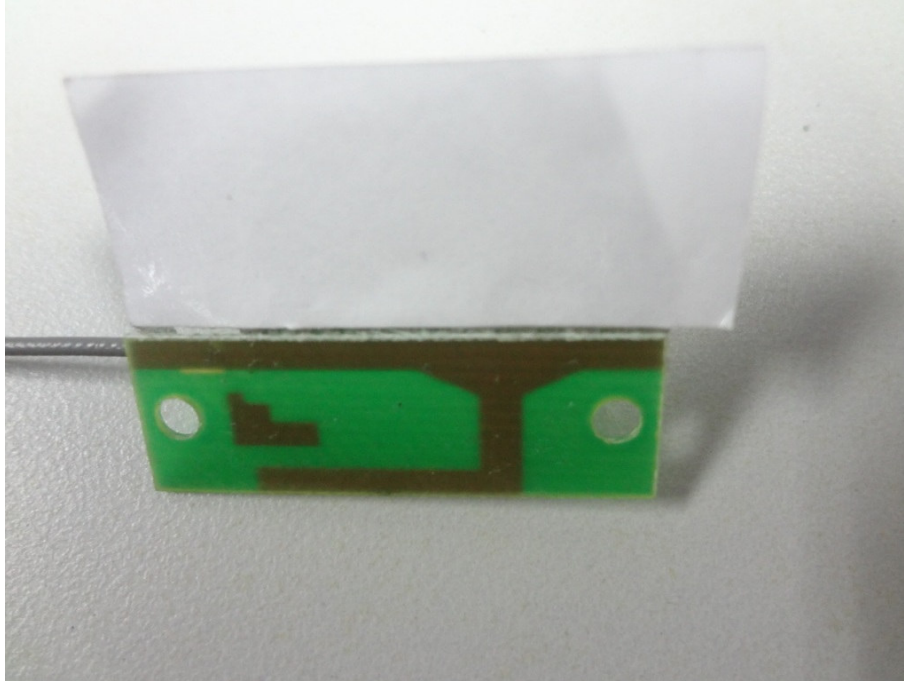


PCB antenna





Remove Mylar

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