Shenzhen Huatongwei International Inspection Co., Ltd.
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FCC TEST REPORT

47 CFR FCC Part 15 Subpart C & 15.231

FCC ID .....:	**TWNZF01-D**
Report Reference No.....:	**WE10090038**
Compiled by (position+printed name+signature)..:	File administrators Wenliang Li
Supervised by (position+printed name+signature)..:	Test Engineer Xiankun Ding
Approved by (position+printed name+signature)..:	Manager Jimmy Li
Date of issue.....:	Nov 03, 2010
Testing Laboratory Name.....:	**Shenzhen Huatongwei International Inspection Co., Ltd**
Address .....:	Keji Nan No.12 Road, Hi-tech Park, Shenzhen, China
Applicant's name.....:	**Pro-Lite, Inc.**
Address .....:	3505 Cadillac Ave. Building D
Manufacturer's name .....:	**NINGBO YOUWON TECHNOLOGY ELECTRONICS CO., LTD**
Address .....:	#928, XUEYUAN ROAD, LUGANG VILLAGE, GAOQIAO TOWN, NINGBO
Test specification:	
Standard .....:	**47 CFR FCC Part 15 Subpart C & 15.231**
	ANSI C63.4: 2009
TRF Originator.....:	Shenzhen Huatongwei International Inspection CO., Ltd
Master TRF.....:	Dated 2006-06

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Equipment Under Test .....:	**Wireless Module**
Trade Mark .....:	/
Model/Type reference.....:	ZF01-D
Listed Models .....:	/
Result.....:	**Complied**

T E S T R E P O R T

Test Report No. :	WE10090038	Nov 03, 2010 Date of issue

Equipment under Test	:	Wireless Module
Model /Type	:	ZF01-D
Listed Models	:	/
Applicant	:	**Pro-Lite, Inc.**
Address	:	3505 Cadillac Ave. Building D
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Address	:	#928, XUEYUAN ROAD, LUGANG VILLAGE, GAOQIAO TOWN, NINGBO

SUMMARY OF STANDARDS AND RUSELT

No.	Test Item	Test Standards and Procedure	Result
1	AC Conducted Emission	FCC Subpart 15C § 15.207	Complied
2	Radiated Emission	FCC Subpart 15C § 15.209 FCC Subpart 15C § 15.231(e)	Complied
3	Deactivation Time	FCC Subpart 15C § 15.231(e)	Complied
4	20dB Bandwidth	FCC Subpart 15C § 15.231(c)	Complied
5	Antenna Requirement	FCC Subpart 15C § 15.203	Complied

NOTE: 1) The detailed test rusult please see section 4.
2) The test report merely corresponds to the test sample.
3) It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

Contents

1. TEST STANDARDS

The tests were performed according to following standards:

47 CFR FCC Part 15 Subpart C & 15.231 – Intentional Radiators & Periodic operation in the band 40.66–40.70 MHz and above 70 MHz

ANSI C63.4: 2009 – American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40GHz

ANSI C63.10: 2009 – American National Standard for Teating Unlicensed Wireless Devices

2 . SUMMARY

2.1. General Remarks

Date of receipt of test sample : Sep 20, 2010

Testing commenced on : Sep 20, 2010

Testing concluded on : Oct 14, 2010

2.2. Equipment Under Test Power Supply

Power supply voltage : ○ 120V / 60 Hz ○ 115V / 60Hz
○ 12 V DC ○ 24 V DC
● Other (specified in blank below)

DC 5V from PC

2.3. S Short description of the Equipment under Test (EUT)

Product Name : Wireless Module

Model Number : ZF01-D

Operation Frequency : 433.05MHz,432.70MHz,433.31MHz
433.54MHz,434.05MHz,434.31MHz
434.61MHz,434.91MHz

Modulation Technology : GFSK

Transmitter Type : Periodic Transmitter

Sample Type : Prototype

I/O Port : USB, RS232, RS422, TTL

For more details, refer to the user's manual of the EUT.

Remark: The EUT has been tested with 4 different ports, and the worst case is EUT with USB port.
And the data recorded in this report is the worst case test data.

2.4. EUT operation mode

The EUT has been tested under typical operating condition.

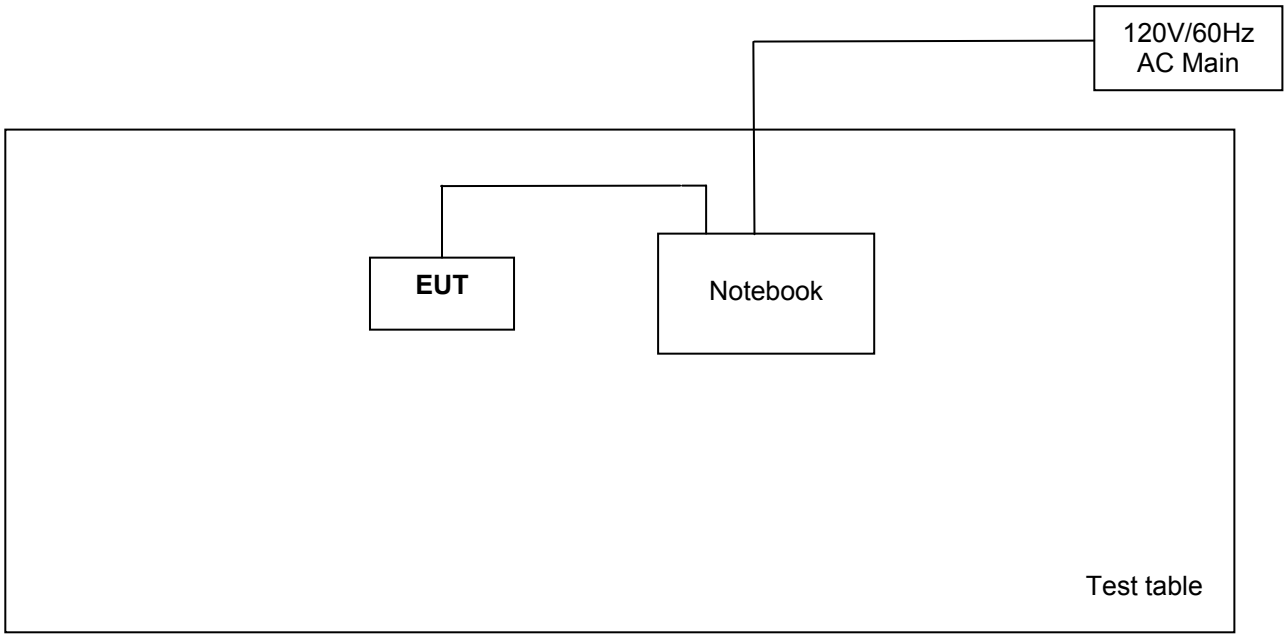
2.5. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: **TWNZF01-D** filing to comply with the FCC Part 15, Subpart C Rules.

2.6. Modifications

No modifications were implemented to meet testing criteria.

2.7. Configuration of Tested System



Equipment Used in Tested System

No.	Equipment	Manufacturer	Model No.	Serial No.
1	Notebook	DELL	PP01L	2F485A00

Note: For actual sample please see test setup photos and EUT external photos.

3. TEST ENVIRONMENT

3.1. Address of the test laboratory

Shenzhen Huatongwei International Inspection Co., Ltd
Keji Nan No.12 Road, Hi-tech Park, Shenzhen, China
Phone: 86-755-26715686 Fax: 86-755-26748089

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 (2003) and CISPR Publication 22.

3.2. Test Facility

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

CNAS-Lab Code: L1225

Shenzhen Huatongwei International Inspection Co., Ltd has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories, Date of Registration: Mar 30, 2009. Valid time is until Mar 29, 2012.

A2LA-Lab Cert. No. 2243.01

Shenzhen Huatongwei International Inspection Co., Ltd, EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing. Valid time is until Sept 30, 2011.

FCC-Registration No.: 662850

Shenzhen Huatongwei International Inspection Co., Ltd, 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 662850, Renewal date Jun 01, 2009.

IC-Registration No.: 5377

The 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 5377 on November Feb 13, 2009. Valid time is until Feb 13, 2011.

ACA

Shenzhen Huatongwei International Inspection Co., Ltd, EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our A2LA accreditation.

NEMKO-Aut. No.: ELA125

Shenzhen Huatongwei International Inspection Co., Ltd has been assessed the quality assurance system, the testing facilities, qualifications and testing practices of the relevant parts of the organization. The quality assurance system of the Laboratory has been validated against ISO/IEC 17025:2005 or equivalent. The laboratory also fulfils the conditions described in Nemko Document NLA-10, the Authorization is valid through July 07, 2011.

VCCI

The 3m Semi-anechoic chamber (12.2m×7.95m×6.7m) and Shielded Room (8m×4m×3m) of Shenzhen Huatongwei International Inspection Co., Ltd has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2484. Date of Registration: December 20, 2006. Valid time is until December 20, 2012.

Main Ports Conducted Interference Measurement of Shenzhen Huatongwei International Inspection Co., Ltd has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: C-2726. Date of Registration: December 20, 2006. Valid time is until December 19, 2012.

DNV

Shenzhen Huatongwei International Inspection Co Ltd has been found to comply with the requirements of DNV towards subcontractor of EMC and safety testing services in conjunction with the EMC and Low voltage Directives and in the voluntary field. The acceptance is based on a formal quality Audit and follow-ups according to relevant parts of ISO/IEC Guide 17025(2005), in accordance with the requirements of the DNV Laboratory Quality Manual towards subcontractors. Valid time is until Aug 24, 2013.

3.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	22 ° C
Humidity:	65 %
Atmospheric pressure:	950-1050mbar

3.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen Huatongwei International Inspection Co., Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen Huatongwei laboratory is reported:

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.22dB	(1)
Radiated Emission	1~12.75GHz	4.35dB	(1)
20dB Bandwidth	/	0.25dB	(1)
Deactivation Time	/	0.5ms	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3.5. Equipments Used during the Test

Conducted Emisssions					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	100106	2009/11
2	Artificial Mains	ROHDE & SCHWARZ	ESH2-Z5	100028	2009/11
3	Pulse Limiter	ROHDE & SCHWARZ	ESHSZ2	100044	2009/11
4	EMI Test Software	ROHDE & SCHWARZ	ESK1	N/A	2009/11

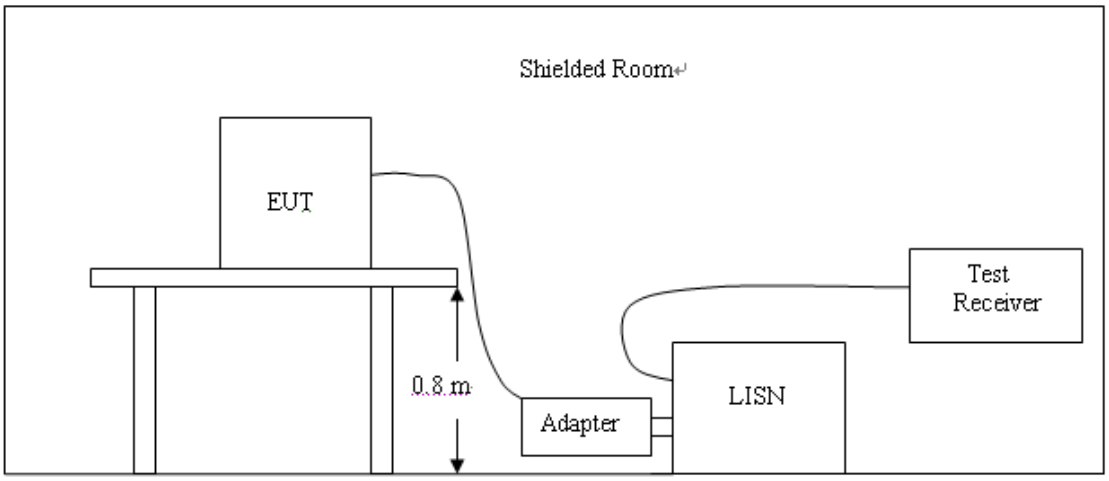
Radiated Emissions					
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	ULTRA-BROADBAND ANTENNA	ROHDE & SCHWARZ	HL562	100015	2010/05
2	Amplifier	Sonoma	310 N	291722	2009-11
3	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESI 26	100009	2009/11
4	RF TEST PANEL	ROHDE & SCHWARZ	TS / RSP	335015/ 0017	2009/11
5	TURNTABLE	ETS	2088	2149	2009/11
6	ANTENNA MAST	ETS	2075	2346	2009/11
7	EMI TEST SOFTWARE	ROHDE & SCHWARZ	ESK1	N/A	2009/11
8	Double-Ridged-Waveguide Horn Antenna	ROHDE & SCHWARZ	HF906	100039	2009/11
9	Amplifier	ROHDE & SCHWARZ	HF906 (1-18)GMZ	00101800-28-5A	2009/11

20dB Bandwidth & Deactivation Time & Duty Cycle					
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESCI	100106	2009/11

4. TEST CONDITIONS AND RESULTS

4.1. AC Conducted Emission

TEST CONFIGURATION



TEST PROCEDURE

1 The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system; a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4.
2 Support equipment, if needed, was placed as per ANSI C63.4.
3 All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
4 The EUT received DC 5V from PC input 120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5 All support equipments received AC power from a second LISN, if any.
6 The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7 Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
8 During the above scans, the emissions were maximized by cable manipulation.

CONDUCTED LIMIT

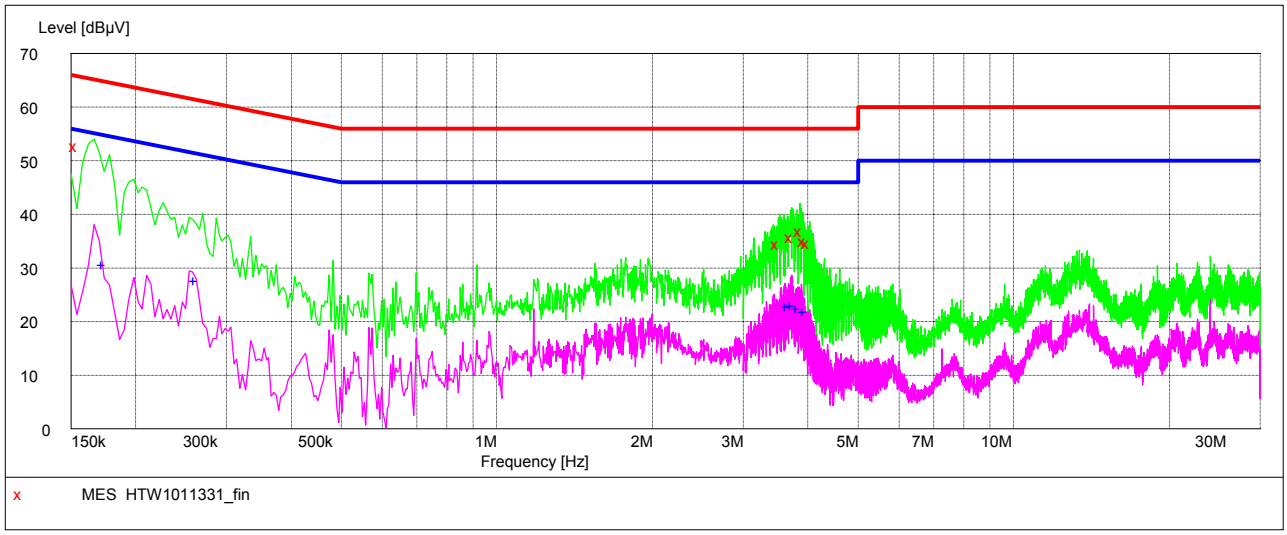
According to FCC Subpart 15 B § 15.207 AC Conducted Emission Limits is as following：

Frequency fange (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.1~ 0.5	66 to 56*	56 to 46*
0.5 ~ 5	56	46
5 ~ 30	60	50
* Decreasing linearly with the logarithm of the frequency		

TEST RESULTS

SCAN TABLE: "Voltage (9K-30M)FIN"

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "HTW1011331_fin"

10/11/2010 8:46PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.154000	52.90	10.5	66	12.9	QP	N	GND
3.510000	34.70	10.5	56	21.3	QP	N	GND
3.738000	36.00	10.5	56	20.0	QP	N	GND
3.890000	37.00	10.5	56	19.0	QP	N	GND
3.946000	35.20	10.5	56	20.8	QP	N	GND
4.014000	34.90	10.5	56	21.1	QP	N	GND

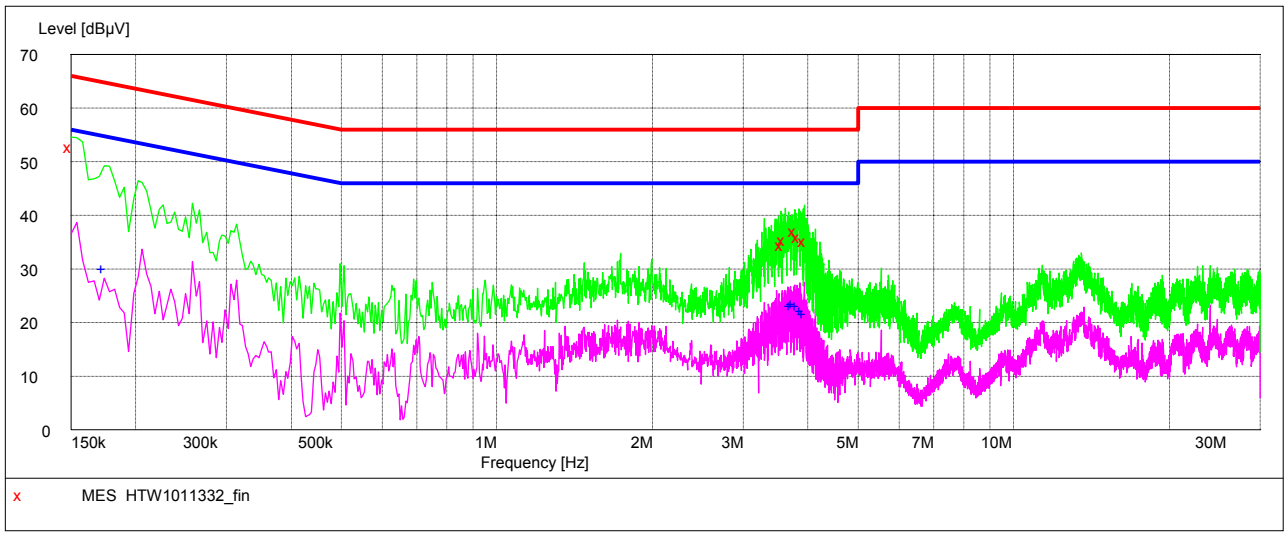
MEASUREMENT RESULT: "HTW1011331_fin2"

10/11/2010 8:46PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.174000	30.70	10.5	55	24.1	AV	N	GND
0.262000	27.70	10.5	51	23.7	AV	N	GND
3.654000	22.80	10.5	46	23.2	AV	N	GND
3.746000	23.10	10.5	46	22.9	AV	N	GND
3.846000	22.60	10.5	46	23.4	AV	N	GND
3.954000	21.90	10.5	46	24.1	AV	N	GND

SCAN TABLE: "Voltage (9K-30M)FIN"

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "HTW1011332_fin"

10/11/2010 8:49PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	53.00	10.5	66	13.0	QP	L1	GND
3.574000	34.70	10.5	56	21.3	QP	L1	GND
3.610000	35.60	10.5	56	20.4	QP	L1	GND
3.790000	37.20	10.5	56	18.8	QP	L1	GND
3.854000	36.10	10.5	56	19.9	QP	L1	GND
3.950000	35.40	10.5	56	20.6	QP	L1	GND

MEASUREMENT RESULT: "HTW1011332_fin2"

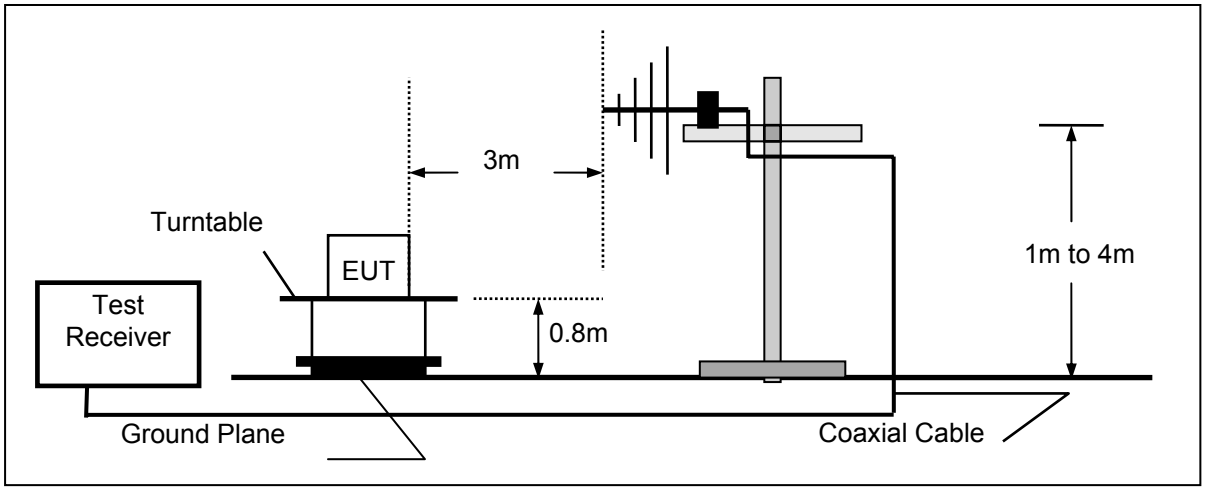
10/11/2010 8:49PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.174000	30.10	10.5	55	24.7	AV	L1	GND
3.722000	23.20	10.5	46	22.8	AV	L1	GND
3.750000	23.70	10.5	46	22.3	AV	L1	GND
3.814000	23.30	10.5	46	22.7	AV	L1	GND
3.902000	22.30	10.5	46	23.7	AV	L1	GND
3.938000	21.80	10.5	46	24.2	AV	L1	GND

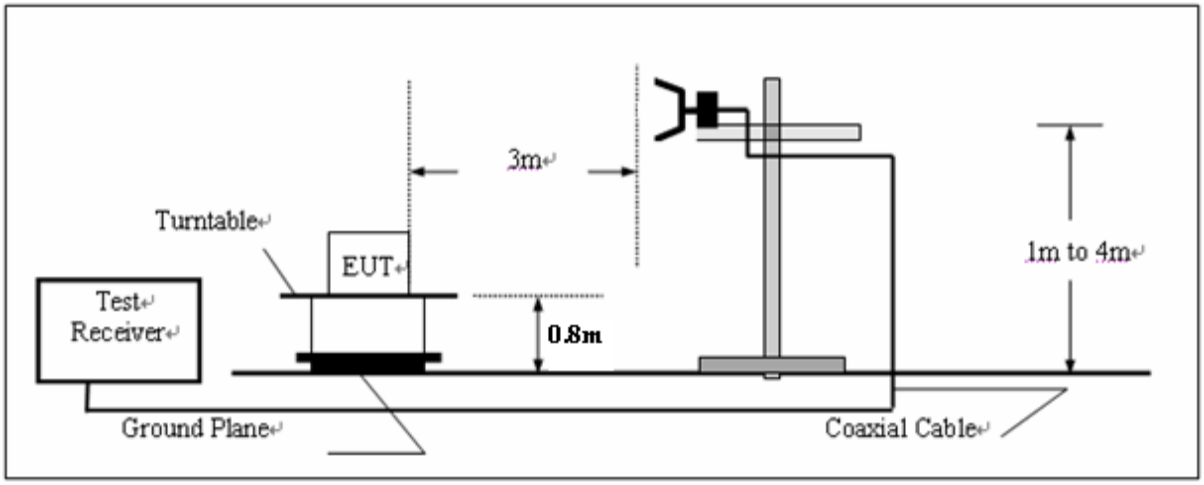
4.2. Radiated Emission

TEST CONFIGURATION

Radiated Emission Test Set-Up, Frequency range 30 - 1000MHz



Radiated Emission Test Set-Up, Frequency range 1GHz – 6GHz



TEST PROCEDURE

1, The EUT was placed on a turn table which is 0.8m above ground plane.
2, Connect the EUT to Notebook PC, and EUT will transmit automatic at 433.05MHz.
3, Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0 ° to 360 ° to acquire the highest emissions from EUT.
4, And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
5, Repeat above procedures until all frequency measurements have been completed.

RADIATION LIMIT

For periodic transmitter, according to § 15.231(e), the field strength of fundamental from device at a distance of 3 meters shall not exceed the following values：

Fundamental frequency (MHz)	Distance (Meters)	Field strength of fundamental	
		(μV/m)	(dBμV/m)
40.66-40.70	3	1000	60
70-130	3	500	54
130-174	3	500 to 1500	54 to 63.5
174-260	3	1500	63.5
260-470	3	1500 to 5000	63.5 to 74
Above 470	3	5000	74

For periodic transmitter, according to § 15.231(e), the field strength radiated emissions from device at a distance of 3 meters shall not exceed the following values：

Fundamental frequency (MHz)	Distance (Meters)	Field strength of spurious emission	
		(μV/m)	(dBμV/m)
40.66-40.70	3	100	40
70-130	3	50	34
130-174	3	50 to 150	34 to 43.5
174-260	3	150	43.5
260-470	3	150 to 500	43.5 to 54
Above 470	3	500	54
Note: 1, For other bands limit pls refer 15.209 2, The limit beolw 1GHz based CISPR quasi-peak detector, the limit above 1GHz based average detector and peak limit is 74dBuV/m.			

FCC Part 15B § 15.209, all spurious emissions shall comply with the limits of table as follow:

Frequency (MHz)	Distance (Meters)	Radiated (μV/m)	Radiated (dBμV/m)
30-88	3	100	40.0
88-216	3	150	43.5
216-960	3	200	46.0
Above 960	3	500	54.0

Note: The sprious emissions shall be bttenuated to the average limits shown in above table or to the general limits shown in section 15.209, which limit permits a higher field strength.

TEST RESULTS

The emissions from 1GHz to 6GHz are peak measured peak and average level, below 1GHz measured QPlevel, detailed test data please see the following pages.

Field Strength Calculation

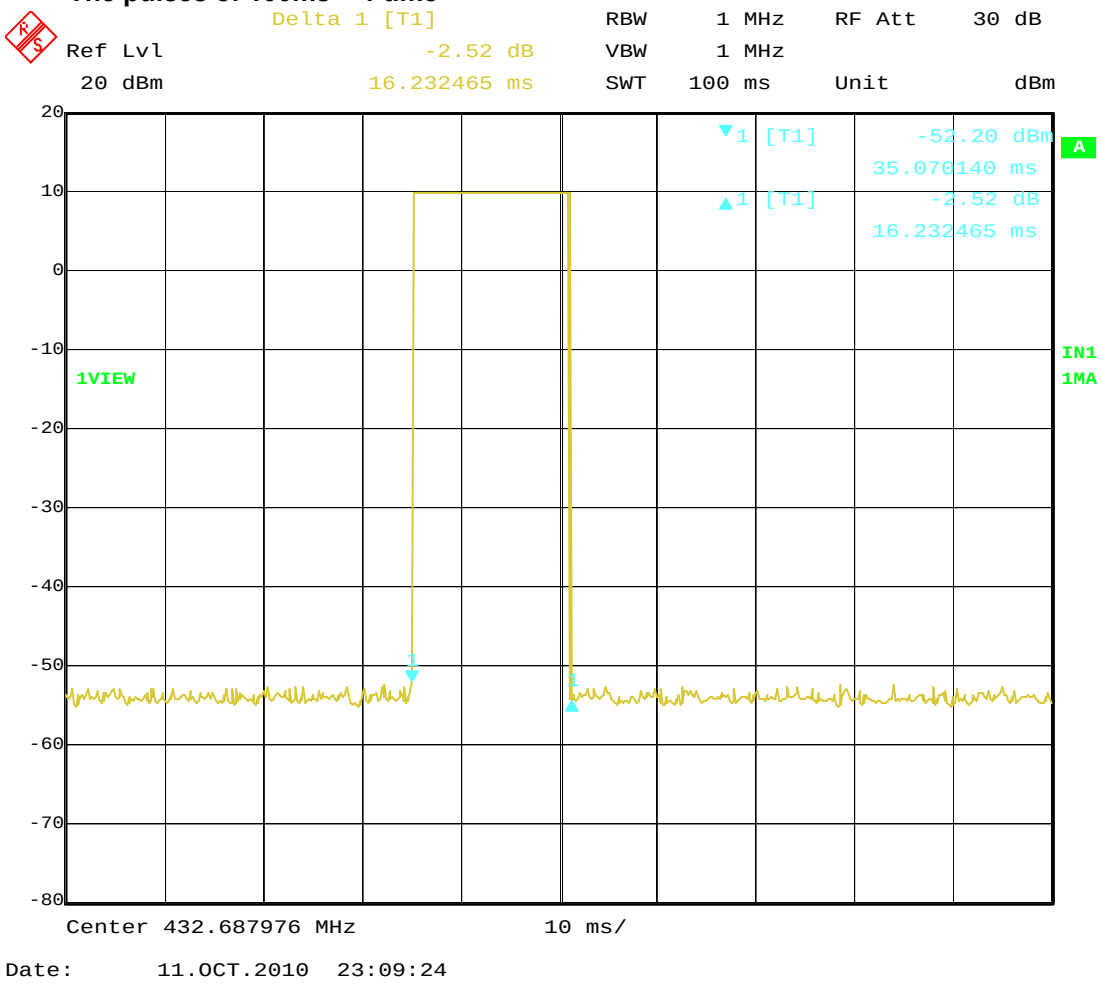
The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows: **FS = RA + AF + CL - AG**	
Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

Duty Cycle Correction Factor

Duty Cycle = TX on/100ms X 100% = 16.23 ms/100ms X 100% =16.23%

Duty Cycle Correction Factor = 20log (Duty Cycle) = -15.79

The pulses of 100ms = 1 time



Time of a pulse = 16.23ms

Radiated emission of fundamental emission

Frequency (MHz)	Field Strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Antenna Factor (dB/m)	Cable Loss (dB)	Amplifier Gain (dB)	Reading Amplitude (dBμV)	Polarization
432.70	85.80	92.83	7.03	PK	14.50	8.70	31.90	94.50	Horizontal
432.70	70.01	72.83	2.82	AV	14.50	8.70	31.90	78.71	Horizontal
433.54	87.15	92.85	5.70	PK	14.50	8.70	31.90	95.85	Horizontal
433.54	71.36	72.85	1.49	AV	14.50	8.70	31.90	80.06	Horizontal
434.91	86.63	92.90	6.27	PK	14.50	8.70	31.90	95.33	Horizontal
434.91	70.84	72.90	2.06	AV	14.50	8.70	31.90	79.54	Horizontal

Frequency (MHz)	Field Strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Antenna Factor (dB/m)	Cable Loss (dB)	Amplifier Gain (dB)	Reading Amplitude (dBμV)	Polarization
432.68	83.20	92.83	9.63	PK	14.50	8.70	31.90	91.90	Vertical
432.68	67.41	72.83	5.42	AV	14.50	8.70	31.90	76.11	Vertical
433.56	85.94	92.85	6.91	PK	14.50	8.70	31.90	94.64	Vertical
433.56	70.15	72.85	2.70	AV	14.50	8.70	31.90	78.85	Vertical
434.90	85.70	92.90	7.20	PK	14.50	8.70	31.90	94.40	Vertical
434.90	69.91	72.90	2.99	AV	14.50	8.70	31.90	78.61	Vertical

Note: According to section 15.35(b), when average radiated emission measurements are specified, including emission measurement below 1000MHz, there also is limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit for the frequency being investigated.

Spurious radiated emission

Bottom channel

Frequency (MHz)	Field Strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Antenna Factor (dB/m)	Cable Loss (dB)	Amplifier Gain (dB)	Reading Amplitude (dBμV)	Polarization
220.50	40.10	46.00	5.90	QP	10.00	7.80	31.90	54.20	Horizontal
352.69	35.40	46.00	10.60	QP	13.40	8.50	31.90	45.40	Horizontal
376.01	37.60	46.00	8.40	QP	14.20	8.50	31.90	46.80	Horizontal
865.41	66.50	72.83	5.33	PK	20.20	9.34	31.50	69.46	Horizontal
865.41	50.71	52.83	2.12	AV	20.20	9.34	31.50	52.67	Horizontal
1298.21	58.80	72.83	14.03	PK	25.60	3.40	32.20	62.00	Horizontal
1298.21	43.01	52.83	9.82	AV	25.60	3.40	32.20	46.21	Horizontal
2163.47	43.00	72.83	29.83	PK	27.40	4.30	32.30	43.60	Horizontal
2163.47	27.21	52.83	25.62	AV	27.40	4.30	32.30	27.81	Horizontal
3028.30	55.10	72.83	17.73	PK	29.80	5.30	32.50	52.50	Horizontal
3028.30	39.31	52.83	13.52	AV	29.80	5.30	32.50	36.71	Horizontal
3461.69	48.10	72.83	24.73	PK	30.90	5.90	32.60	43.90	Horizontal
3461.69	32.31	52.83	20.52	AV	30.90	5.90	32.60	28.11	Horizontal
4326.76	46.30	74.00	27.20	PK	11.30	6.10	32.60	61.50	Horizontal
4326.76	30.51	54.00	23.49	AV	11.30	6.10	32.60	45.71	Horizontal

Frequency (MHz)	Field Strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Antenna Factor (dB/m)	Cable Loss (dB)	Amplifier Gain (dB)	Reading Amplitude (dBμV)	Polarization
31.94	30.50	40.00	9.50	QP	20.20	6.36	31.80	35.74	Vertical
43.61	34.90	40.00	5.10	QP	13.80	6.48	31.80	46.42	Vertical
834.77	40.70	46.00	5.30	QP	20.70	9.21	31.50	42.29	Vertical
865.41	65.40	72.83	4.43	PK	20.20	9.34	31.50	69.36	Vertical
865.41	49.61	52.83	3.22	AV	20.20	9.34	31.50	51.57	Vertical
1298.08	50.90	72.83	21.93	PK	25.60	3.40	32.20	54.10	Vertical
1298.08	35.11	52.83	17.72	AV	25.60	3.40	32.20	38.31	Vertical
2163.40	42.50	72.83	30.33	PK	27.40	4.30	32.30	43.10	Vertical
2163.40	25.71	52.83	27.12	AV	27.40	4.30	32.30	26.31	Vertical
3028.68	58.00	72.83	14.83	PK	29.80	5.30	32.50	55.40	Vertical
3028.68	42.21	52.83	10.62	AV	29.80	5.30	32.50	39.61	Vertical
3461.51	49.00	72.83	23.83	PK	30.90	5.90	32.60	44.80	Vertical
3461.51	33.21	52.83	19.62	AV	30.90	5.90	32.60	29.01	Vertical
4326.87	50.00	74.00	24.00	PK	11.30	6.10	32.60	65.20	Vertical
4326.87	34.21	54.00	19.79	AV	11.30	6.10	32.60	49.41	Vertical

Note: Within the frequency range 30-4500MHz, other than harmonics, there are no other spurious emissions found in the measurement.

Middle channel

Frequency (MHz)	Field Strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Antenna Factor (dB/m)	Cable Loss (dB)	Amplifier Gain (dB)	Reading Amplitude (dBμV)	Polarization
221.41	41.30	46.00	4.70	QP	10.00	7.80	31.90	55.40	Horizontal
350.89	33.20	46.00	12.80	QP	13.40	8.50	31.90	43.20	Horizontal
377.62	39.90	46.00	6.10	QP	14.20	8.50	31.90	49.10	Horizontal
867.07	65.31	72.85	7.54	PK	20.20	9.34	31.50	67.27	Horizontal
867.07	49.52	52.85	3.33	AV	20.20	9.34	31.50	51.48	Horizontal
1300.84	56.10	72.85	16.75	PK	25.60	3.40	32.20	59.30	Horizontal
1300.84	40.31	52.85	12.54	AV	25.60	3.40	32.20	43.51	Horizontal
2167.69	53.00	72.85	19.85	PK	27.40	4.30	32.30	53.60	Horizontal
2167.69	37.21	52.85	15.64	AV	27.40	4.30	32.30	37.81	Horizontal
3034.57	49.10	72.85	23.75	PK	29.80	5.30	32.50	46.50	Horizontal
3034.57	33.31	52.85	19.54	AV	29.80	5.30	32.50	30.71	Horizontal
3468.50	51.80	72.85	21.05	PK	30.90	5.90	32.60	47.60	Horizontal
3468.50	36.01	52.85	16.84	AV	30.90	5.90	32.60	31.81	Horizontal
4335.38	43.20	74.00	30.80	PK	11.30	6.10	32.60	58.40	Horizontal
4335.38	27.41	54.00	26.59	AV	11.30	6.10	32.60	42.61	Horizontal

Frequency (MHz)	Field Strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Antenna Factor (dB/m)	Cable Loss (dB)	Amplifier Gain (dB)	Reading Amplitude (dBμV)	Polarization
30.87	28.70	40.00	11.30	QP	20.20	6.36	31.80	33.94	Vertical
46.36	36.50	40.00	3.50	QP	13.80	6.48	31.80	48.02	Vertical
835.89	42.70	46.00	3.30	QP	20.70	9.21	31.50	44.29	Vertical
867.39	66.10	72.85	6.75	PK	20.20	9.34	31.50	68.06	Vertical
867.39	50.31	52.85	2.54	AV	20.20	9.34	31.50	52.27	Vertical
1300.43	51.70	72.85	21.15	PK	25.60	3.40	32.20	54.90	Vertical
1300.43	35.91	52.85	16.94	AV	25.60	3.40	32.20	39.11	Vertical
2167.06	52.60	72.85	20.25	PK	27.40	4.30	32.30	53.20	Vertical
2167.06	36.81	52.85	16.04	AV	27.40	4.30	32.30	37.41	Vertical
3034.74	48.30	72.85	24.55	PK	29.80	5.30	32.50	45.70	Vertical
3034.74	32.51	52.85	20.34	AV	29.80	5.30	32.50	29.91	Vertical
3468.60	49.90	72.85	22.95	PK	30.90	5.90	32.60	45.70	Vertical
3468.60	34.11	52.85	18.74	AV	30.90	5.90	32.60	29.91	Vertical
4335.54	44.10	74.00	29.90	PK	11.30	6.10	32.60	59.30	Vertical
4335.54	28.31	54.00	25.69	AV	11.30	6.10	32.60	43.51	Vertical

Note: Within the frequency range 30-4500MHz, other than harmonics, there are no other spurious emissions found in the measurement.

Top channel

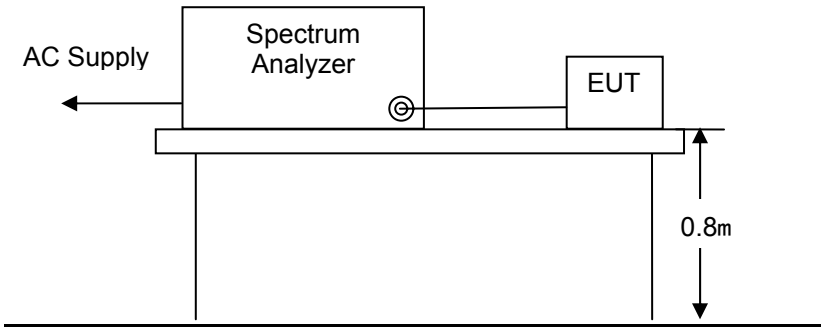
Frequency (MHz)	Field Strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Antenna Factor (dB/m)	Cable Loss (dB)	Amplifier Gain (dB)	Reading Amplitude (dBμV)	Polarization
221.80	41.30	46.00	4.70	QP	10.00	7.80	31.90	55.40	Horizontal
347.21	33.20	46.00	12.80	QP	13.40	8.50	31.90	43.20	Horizontal
375.30	39.90	46.00	6.10	QP	14.20	8.50	31.90	49.10	Horizontal
869.88	66.10	72.90	5.80	PK	20.20	9.34	31.50	69.06	Horizontal
869.88	50.31	52.90	2.59	AV	20.20	9.34	31.50	52.27	Horizontal
1304.81	55.90	72.90	17.00	PK	25.60	3.40	32.20	59.10	Horizontal
1304.81	40.11	52.90	12.79	AV	25.60	3.40	32.20	43.31	Horizontal
2169.63	49.60	72.90	23.30	PK	27.40	4.30	32.30	50.20	Horizontal
2169.63	33.81	52.90	19.09	AV	27.40	4.30	32.30	34.41	Horizontal
3044.57	53.60	72.90	19.30	PK	29.80	5.30	32.50	51.00	Horizontal
3044.57	37.81	52.90	15.09	AV	29.80	5.30	32.50	35.21	Horizontal
3479.50	48.40	72.90	24.50	PK	30.90	5.90	32.60	44.20	Horizontal
3479.50	32.61	52.90	20.29	AV	30.90	5.90	32.60	28.41	Horizontal
4349.38	46.10	74.00	27.90	PK	11.30	6.10	32.60	61.30	Horizontal
4349.38	30.31	54.00	23.69	AV	11.30	6.10	32.60	45.51	Horizontal

Frequency (MHz)	Field Strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Antenna Factor (dB/m)	Cable Loss (dB)	Amplifier Gain (dB)	Reading Amplitude (dBμV)	Polarization
31.60	31.50	40.00	8.50	QP	20.20	6.36	31.80	36.74	Vertical
47.49	34.90	40.00	5.10	QP	13.80	6.48	31.80	46.42	Vertical
836.35	41.70	46.00	4.30	QP	20.70	9.21	31.50	43.29	Vertical
869.61	65.90	72.90	5.00	PK	20.20	9.34	31.50	68.86	Vertical
869.61	50.11	52.90	2.79	AV	20.20	9.34	31.50	52.07	Vertical
1304.75	55.30	72.90	17.6	PK	25.60	3.40	32.20	58.50	Vertical
1304.75	39.51	52.90	13.39	AV	25.60	3.40	32.20	42.71	Vertical
2169.90	50.30	72.90	22.60	PK	27.40	4.30	32.30	50.90	Vertical
2169.90	34.51	52.90	18.39	AV	27.40	4.30	32.30	35.11	Vertical
3044.39	51.20	72.90	21.70	PK	29.80	5.30	32.50	48.60	Vertical
3044.39	35.41	52.90	17.49	AV	29.80	5.30	32.50	32.81	Vertical
3479.20	53.60	72.90	19.30	PK	30.90	5.90	32.60	49.40	Vertical
3479.20	37.81	52.90	15.09	AV	30.90	5.90	32.60	33.61	Vertical
4349.16	45.40	74.00	28.60	PK	11.30	6.10	32.60	60.60	Vertical
4349.16	29.61	54.00	24.39	AV	11.30	6.10	32.60	44.81	Vertical

Note: Within the frequency range 30-4500MHz, other than harmonics, there are no other spurious emissions found in the measurement.

4.3. Deactivation Time

TEST CONFIGURATION



TEST PROCEDURE

1 The EUT was placed on a wooded table which is 0.8m height and close to receiver antenna of spectrum analyzer.
2 The spectrum analyzer resolution bandwidth was set to 1 MHz and video bandwidht was set to 1 MHz to encompass all significant spectral components during the test. The spectrum analyzer was operated in linear scale and zero span mode after tuning to the transmitter carrier frequency.

Limit

For periodic transmitter, according to FCC Part 15C § 15.231(e)

Item	Limit (second)
One transmission time	not greater than 1 second
Transmission period	at least 30 times the duration of the transmssion but in no case less than 10 second

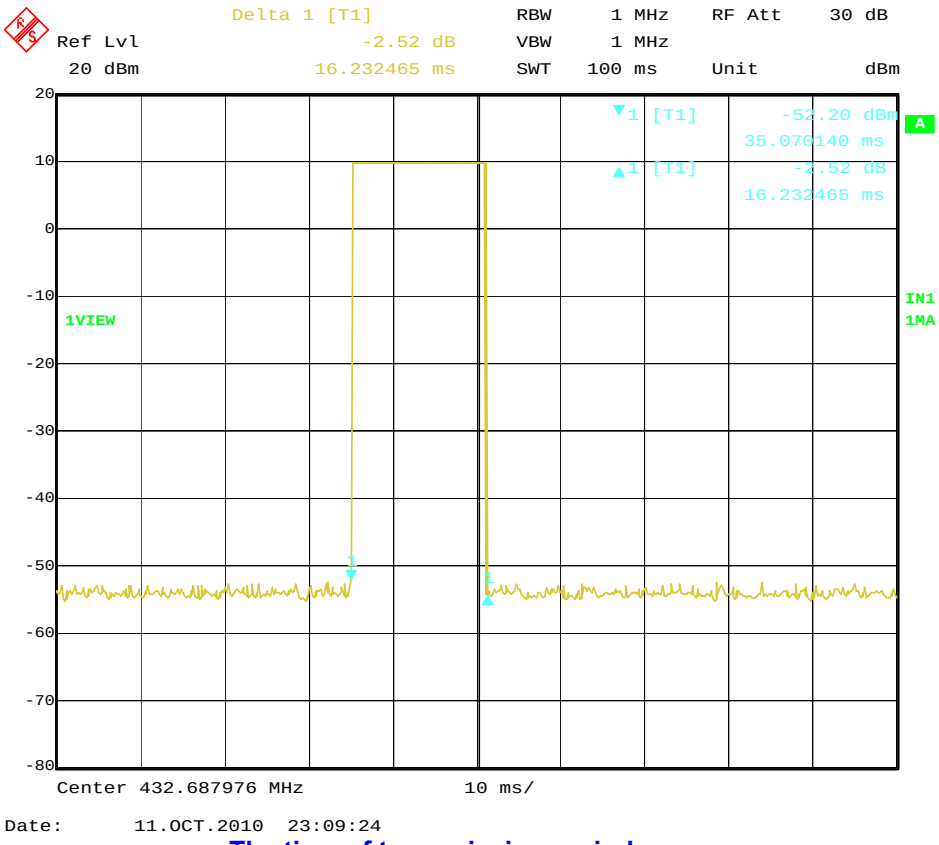
TEST RESULTS

EUT statement: The transmitter was automatically activated, and the carrier frequency 433.05MHz:

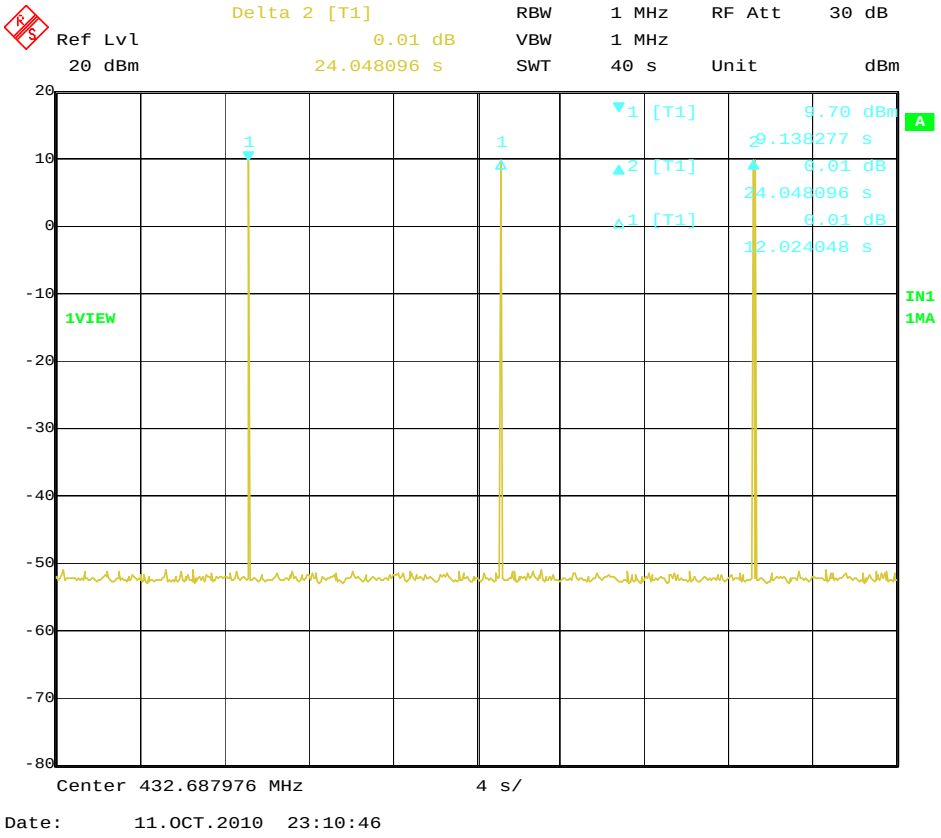
Frequency (MHz)	One transmission time (second)	Transmission period (second)	Result
432.70	0.01623	12.02	Pass
433.54	0.01623	12.02	Pass
434.91	0.01623	12.02	Pass

Bottom channel

The time of one transmission

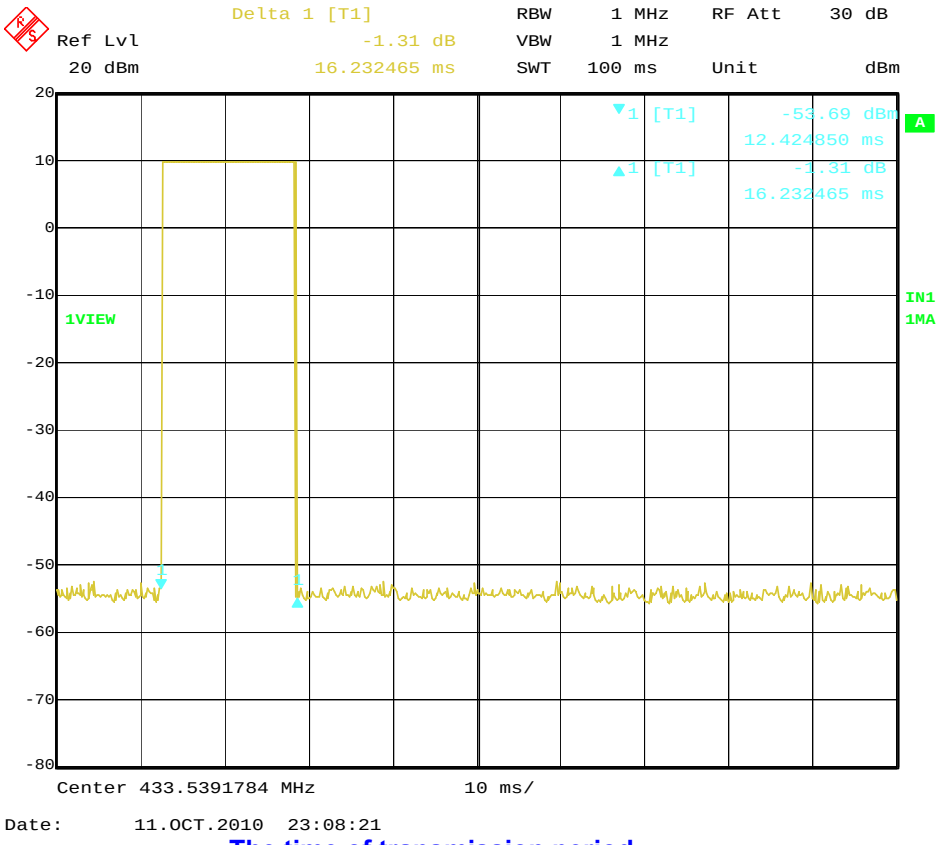


The time of transmission period

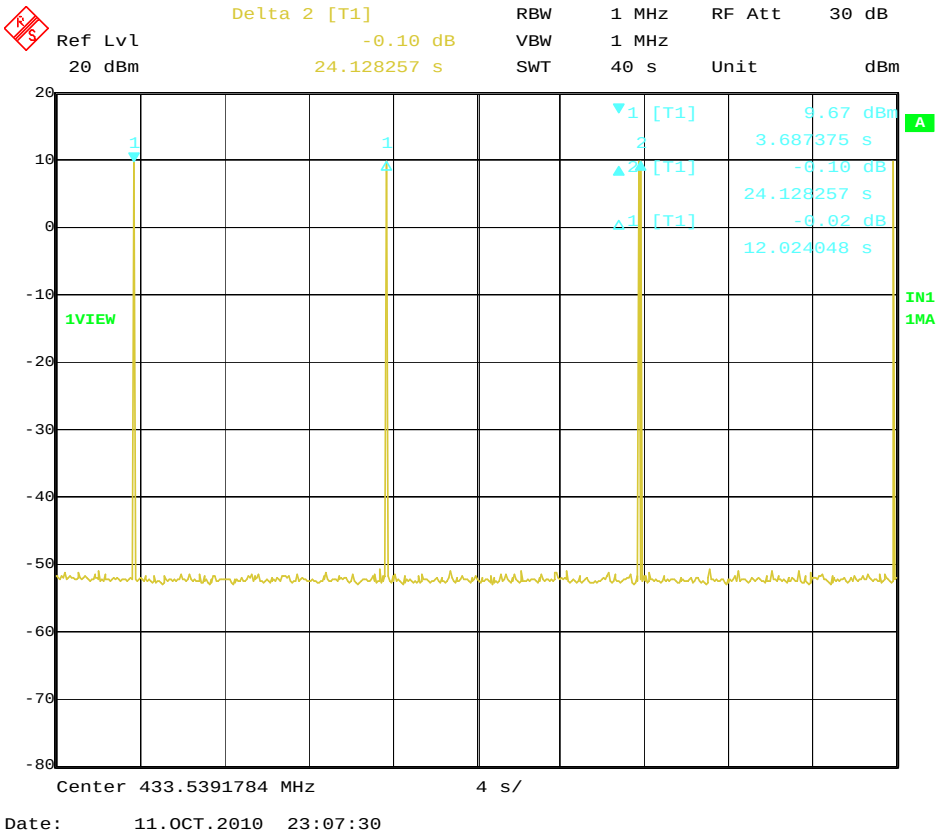


Middle channel

[The time of one transmission]

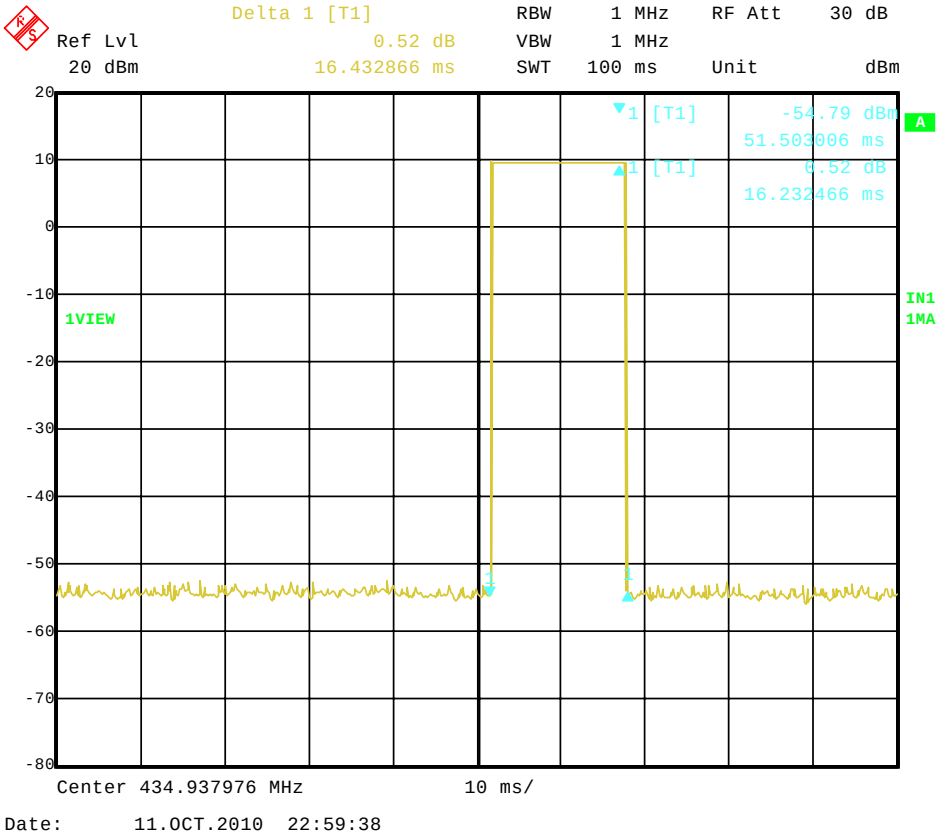


[The time of transmission period]

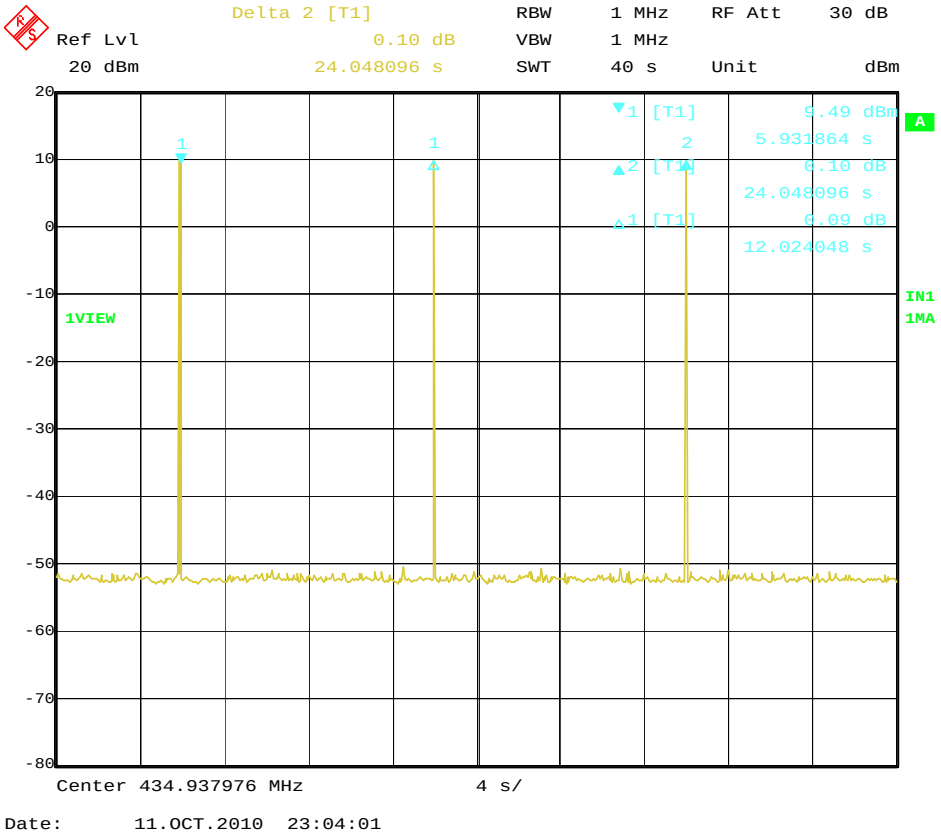


Top channel

The time of one transmission

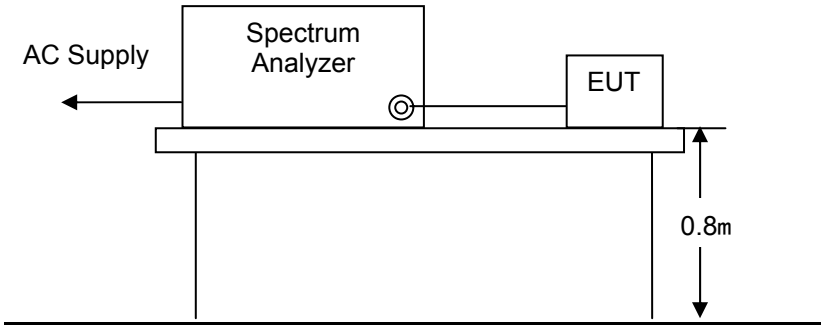


The time of transmission period



4.4. 20dB Bandwidth

TEST CONFIGURATION



TEST PROCEDURE

1 The EUT was placed on a wooded table which is 0.8m height and close to receiver antenna of spectrum analyzer.
2 The spectrum analyzer resolution bandwidth was set to 10 kHz and video bandwidht was set to 30 kHz to encompass all significant spectral components during the test. The detector was set to peak and hold mode to clearly observe the components.

Limit

According to FCC Part 15C § 15.231(c)

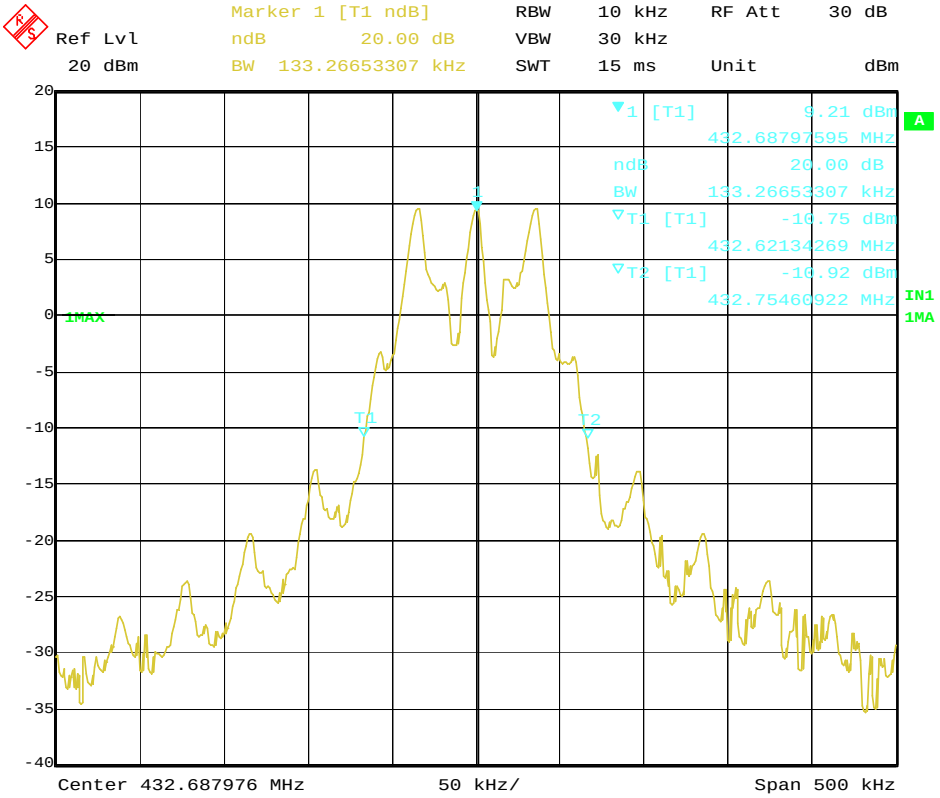
The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70MHz and below 900MHz.

TEST RESULTS

Frequency (MHz)	20dB Bandwidth Measurement Bandwidth (KHz)	Limit (kHz)	Result
432.70	133.27	1081.75	Pass
433.54	133.27	1083.85	Pass
434.91	133.27	1087.28	Pass

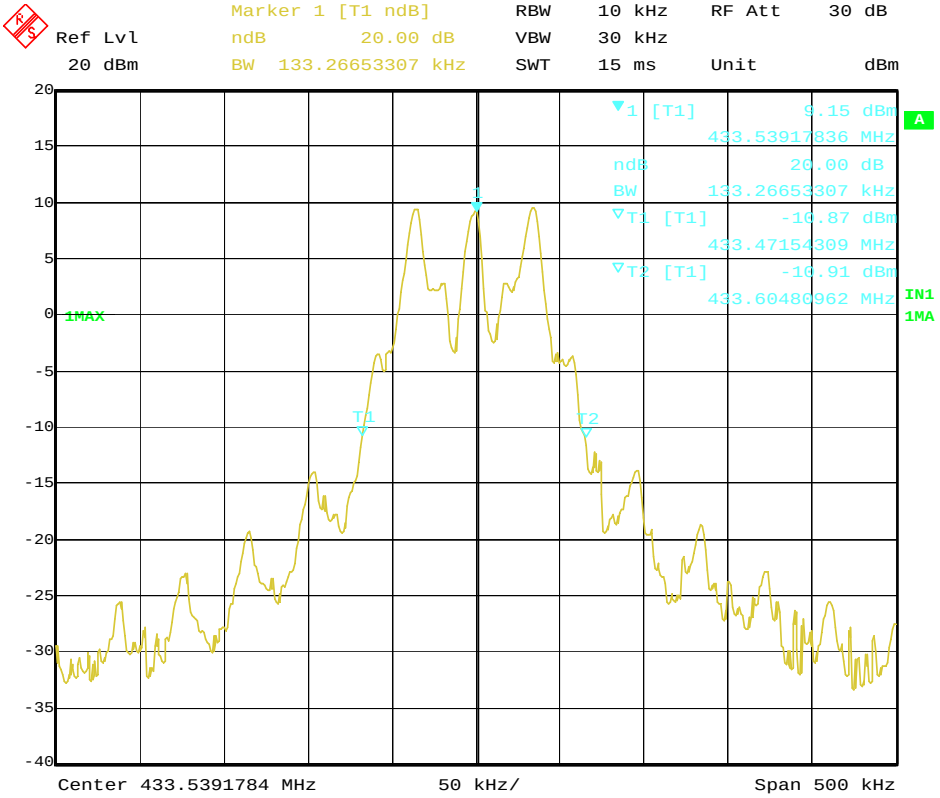
20dB Bandwidth

Bottom channel



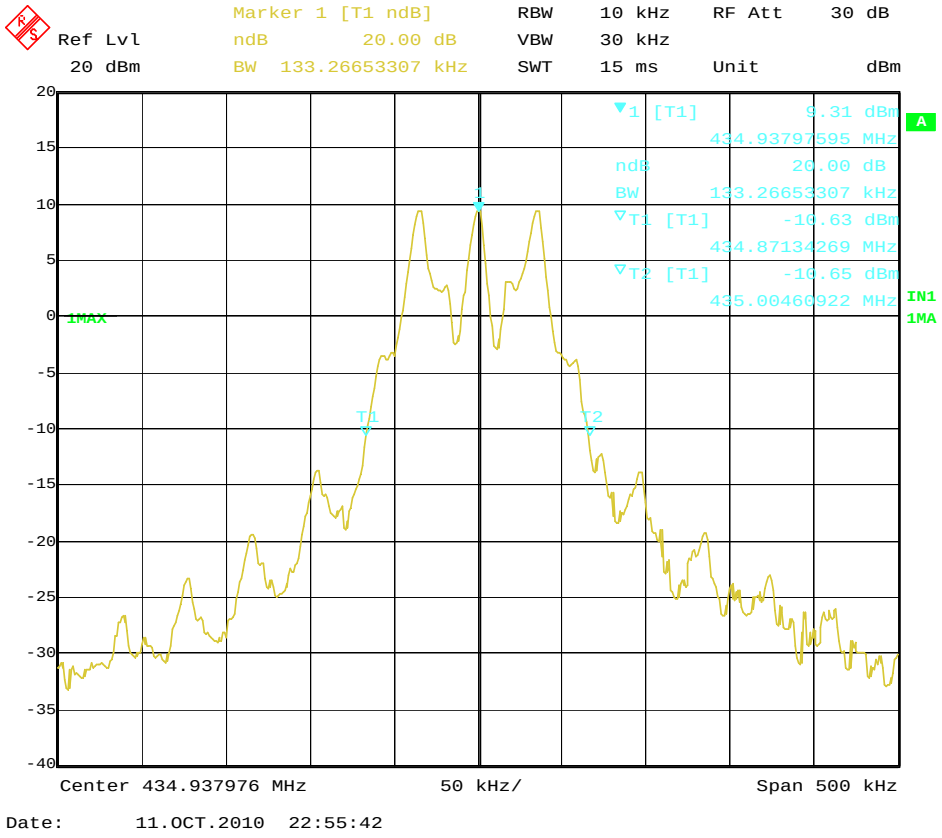
Date: 11.OCT.2010 22:52:01

Middle channel



Date: 11.OCT.2010 22:53:42

Top channel

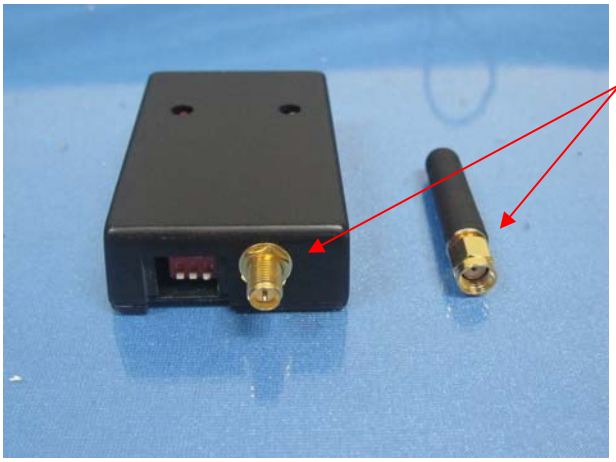

Marker 1 [T1 ndB]
RBW 10 kHz
RF Att 30 dB
Ref Lvl
ndB 20.00 dB
VBW 30 kHz
20 dBm
BW 133.26653307 kHz
SWT 15 ms
Unit dBm
1 [T1] 9.31 dBm
434.93797595 MHz
ndB 20.00 dB
BW 133.26653307 kHz
T1 [T1] -10.63 dBm
434.87134269 MHz
T2 [T1] -10.65 dBm
435.00460922 MHz
A
IN1
1MA
1MAX
T1
T2
20
15
10
5
0
-5
-10
-15
-20
-25
-30
-35
-40
Center 434.937976 MHz
50 kHz/
Span 500 kHz
Date: 11.OCT.2010 22:55:42

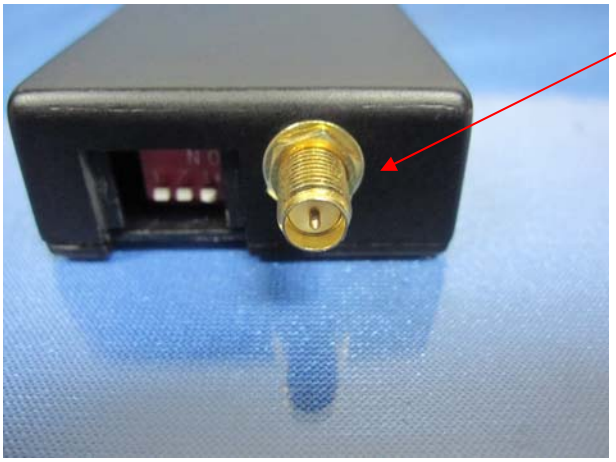
4.5. Antenna Requirement

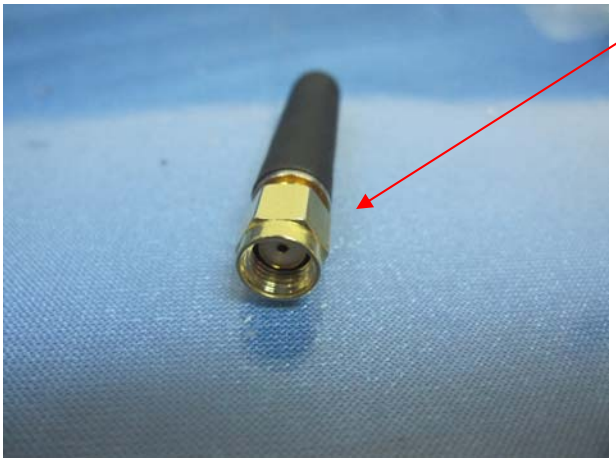
According to FCC Part 15C § 15.203,

a), An intentional radiator shall be de-signed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.
b), 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.

The EUT use of a nonstandard antenna connector (Reverse SMA), so the EUT meets the requirements of antenna.
Detial please see the photos as following:



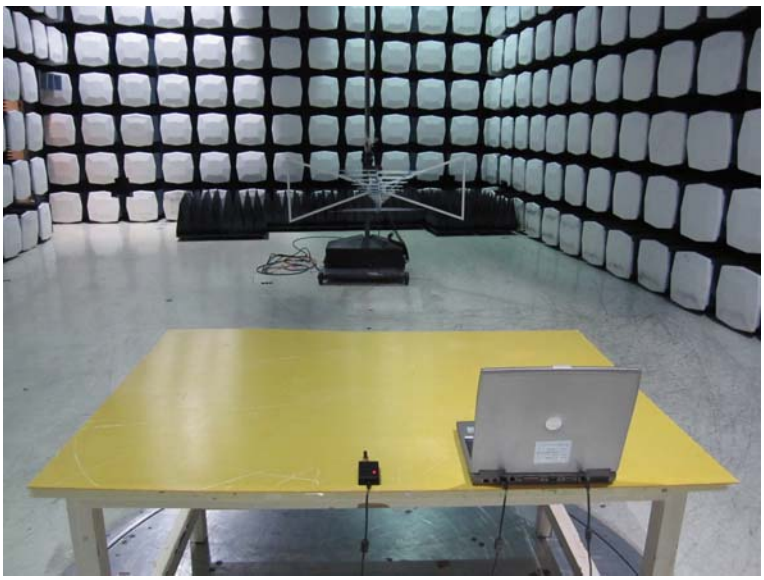




5. Test Setup Photos of the EUT

AC conducted emission test photo

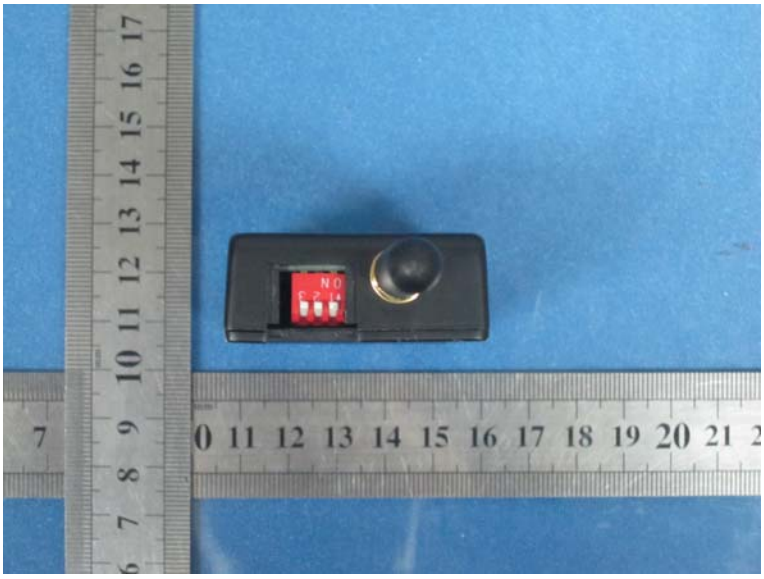
Radiated emission test photo



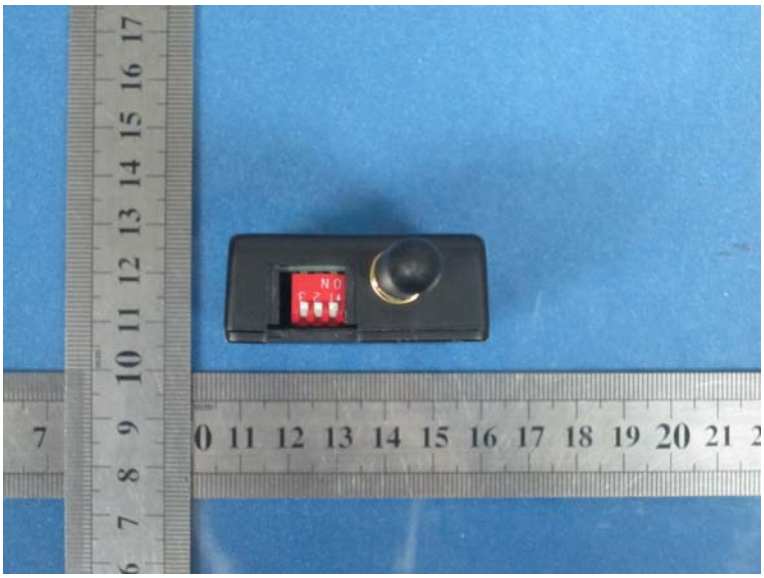
6. External and Internal Photos of the EUT

External Photos

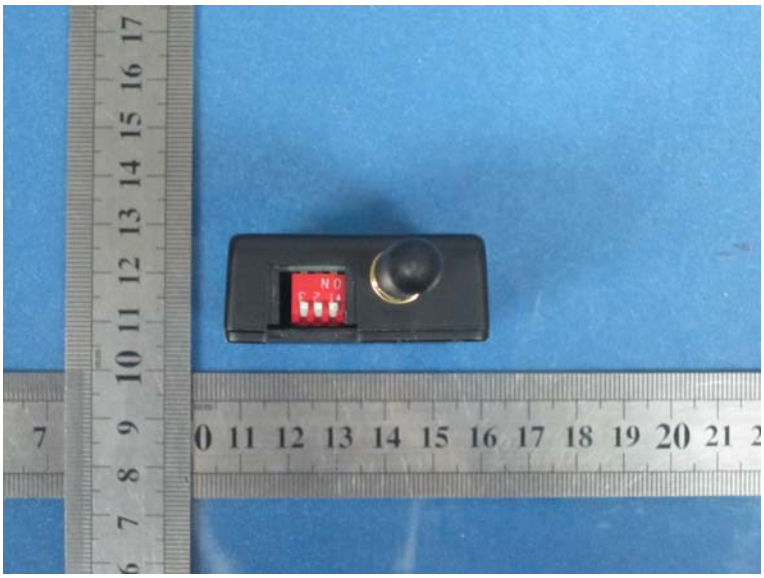
TTL and RS232 I/O port



RS422 I/O port

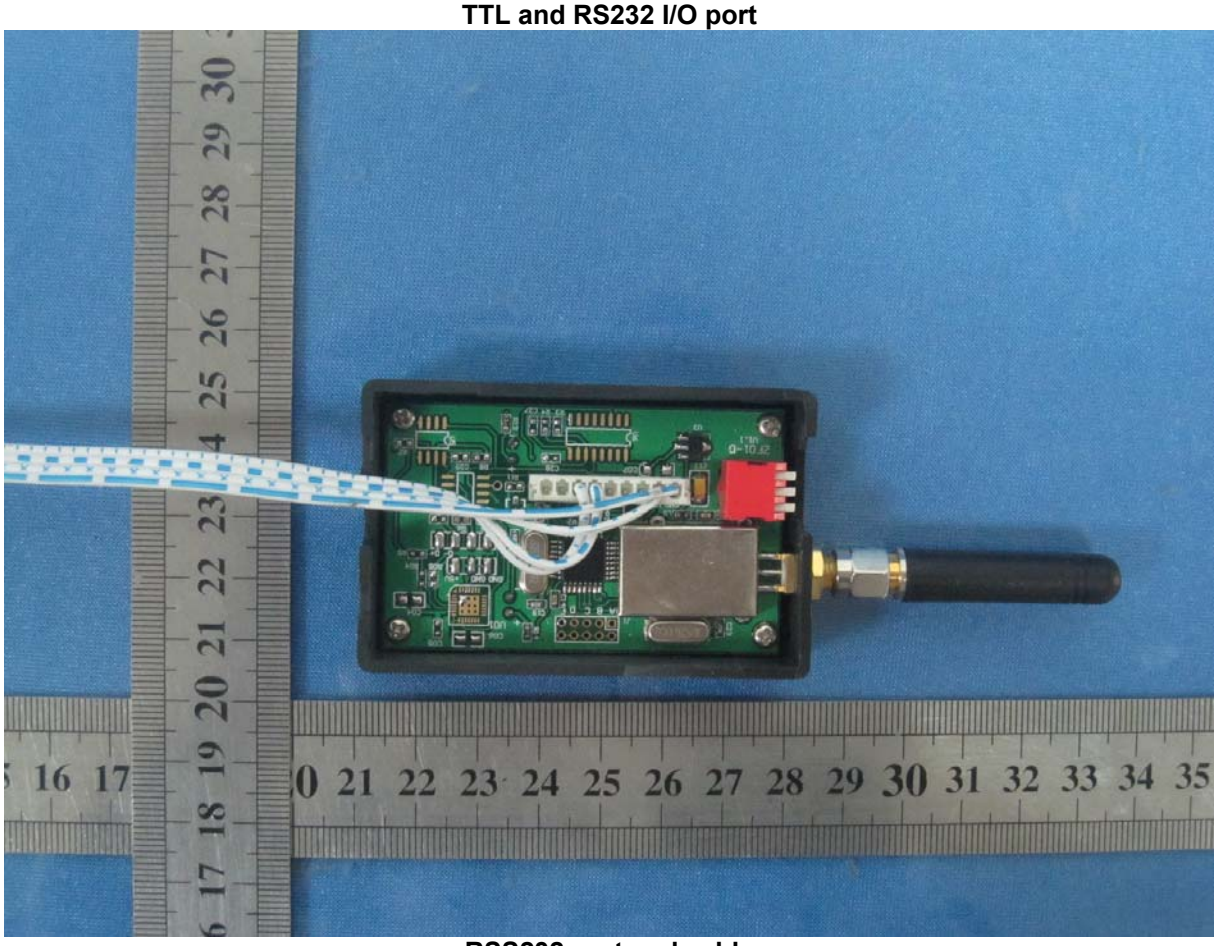


USB I/O port

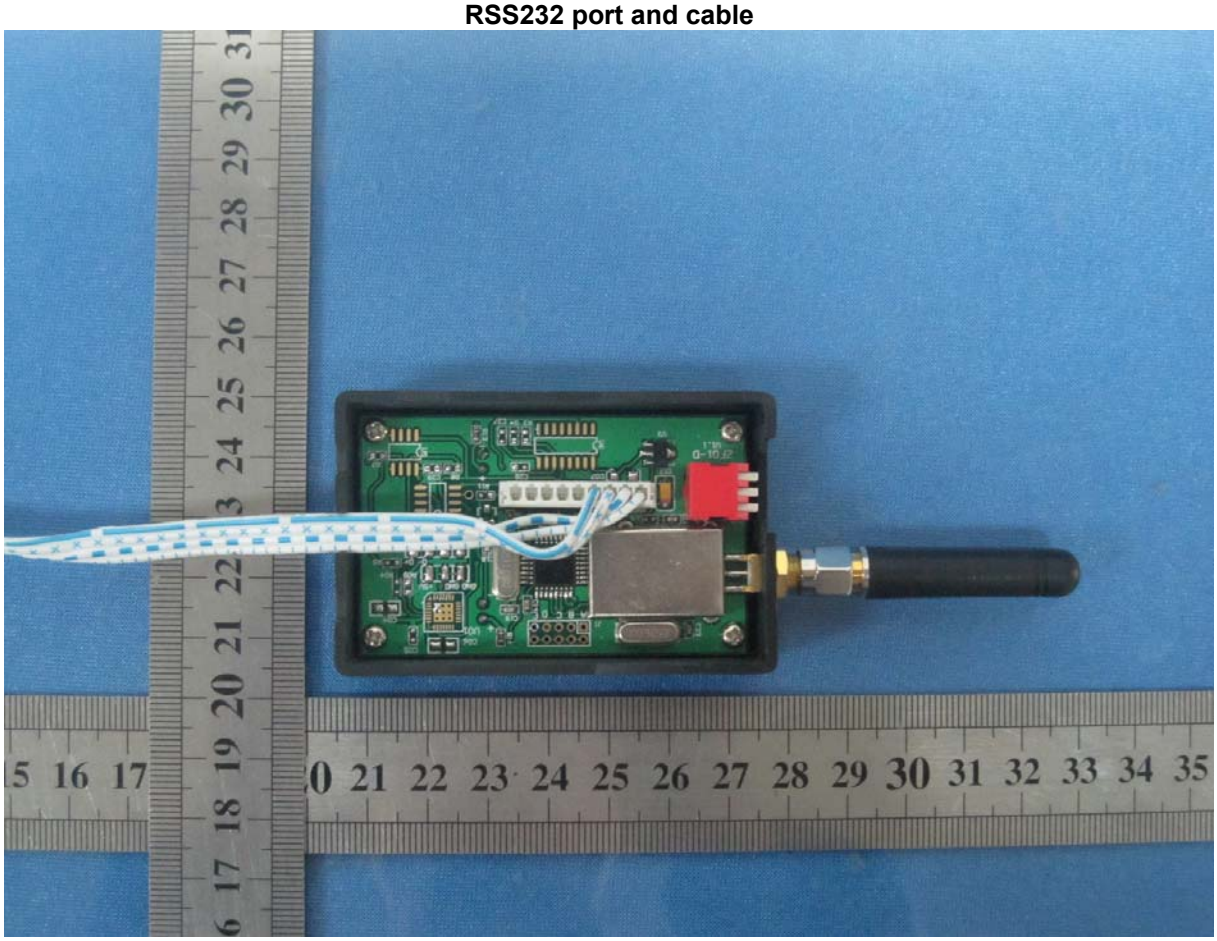


Internal Photos

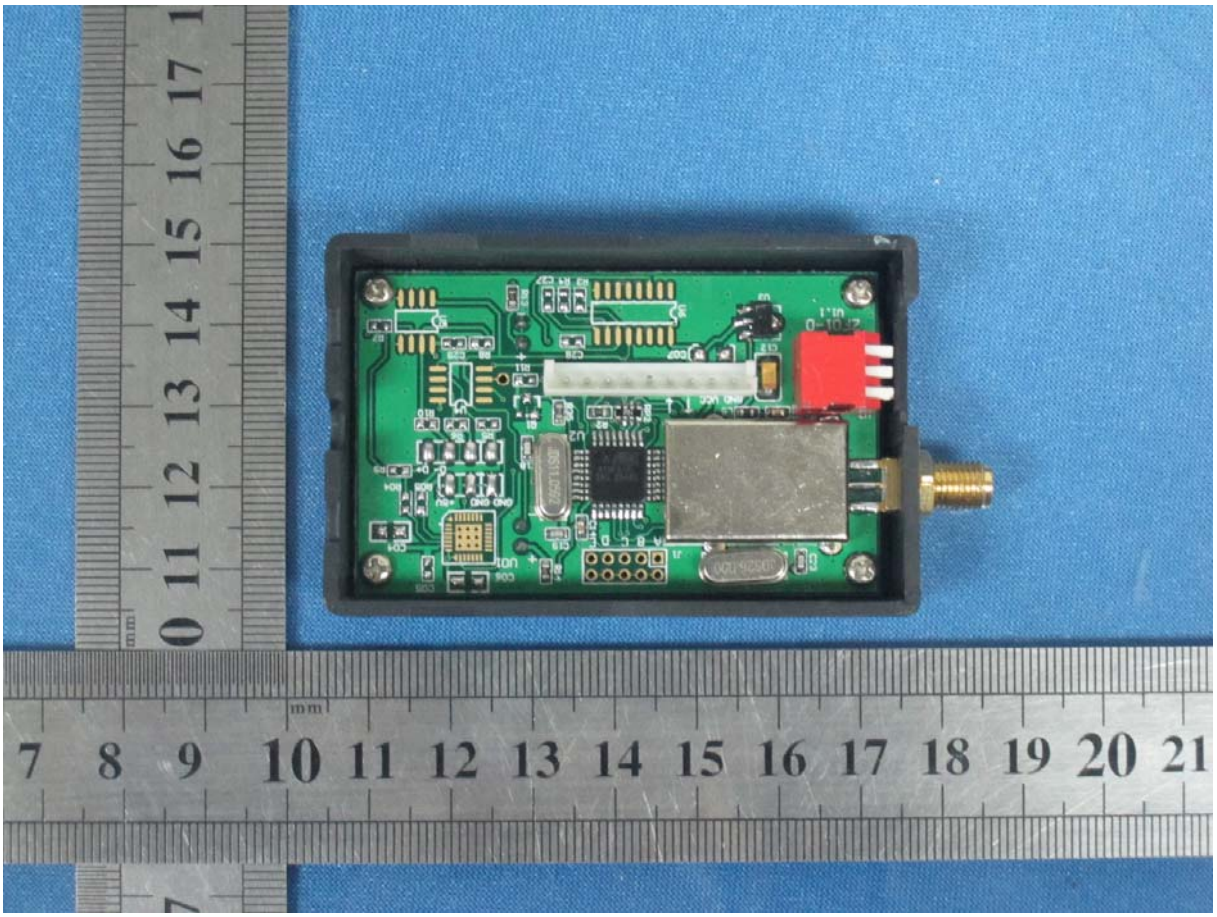
TTL and RS232 I/O port

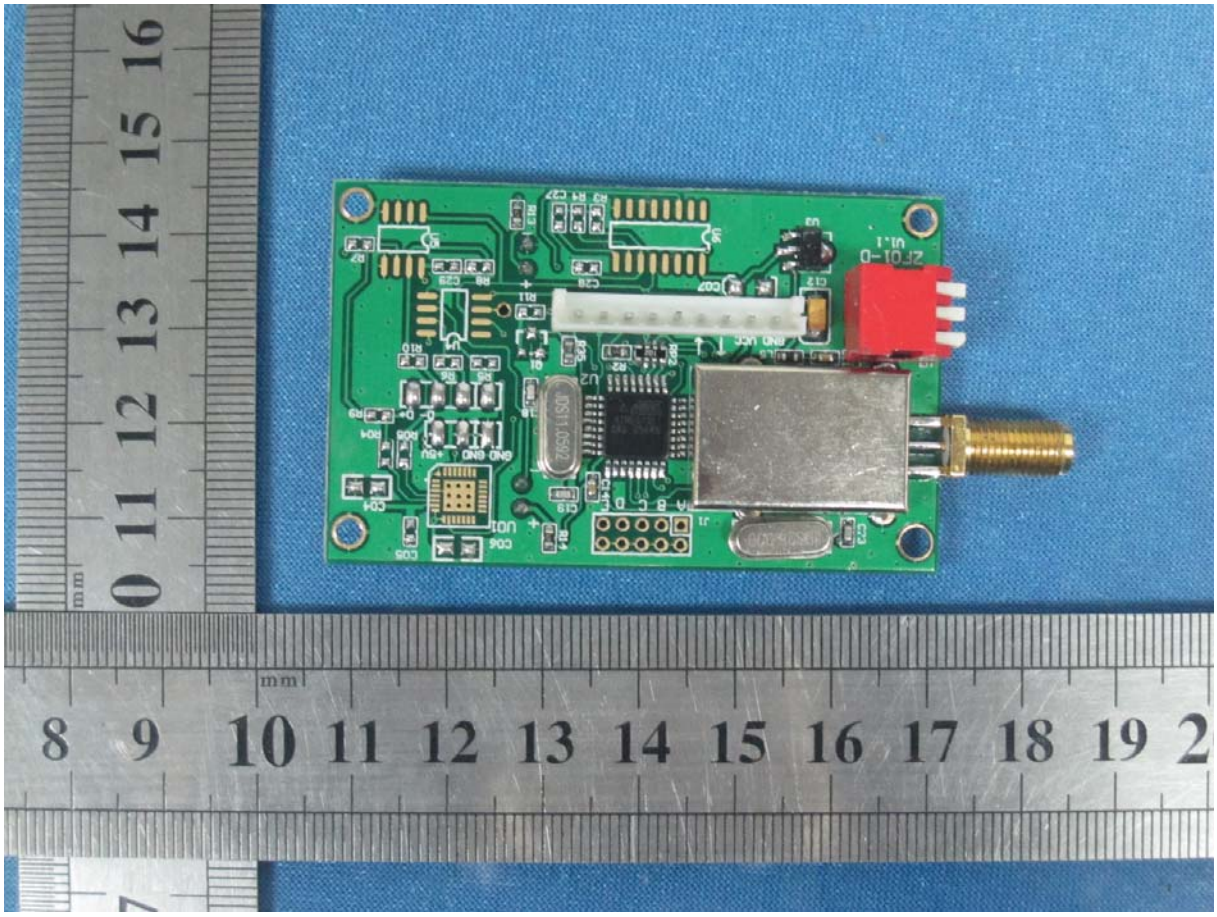


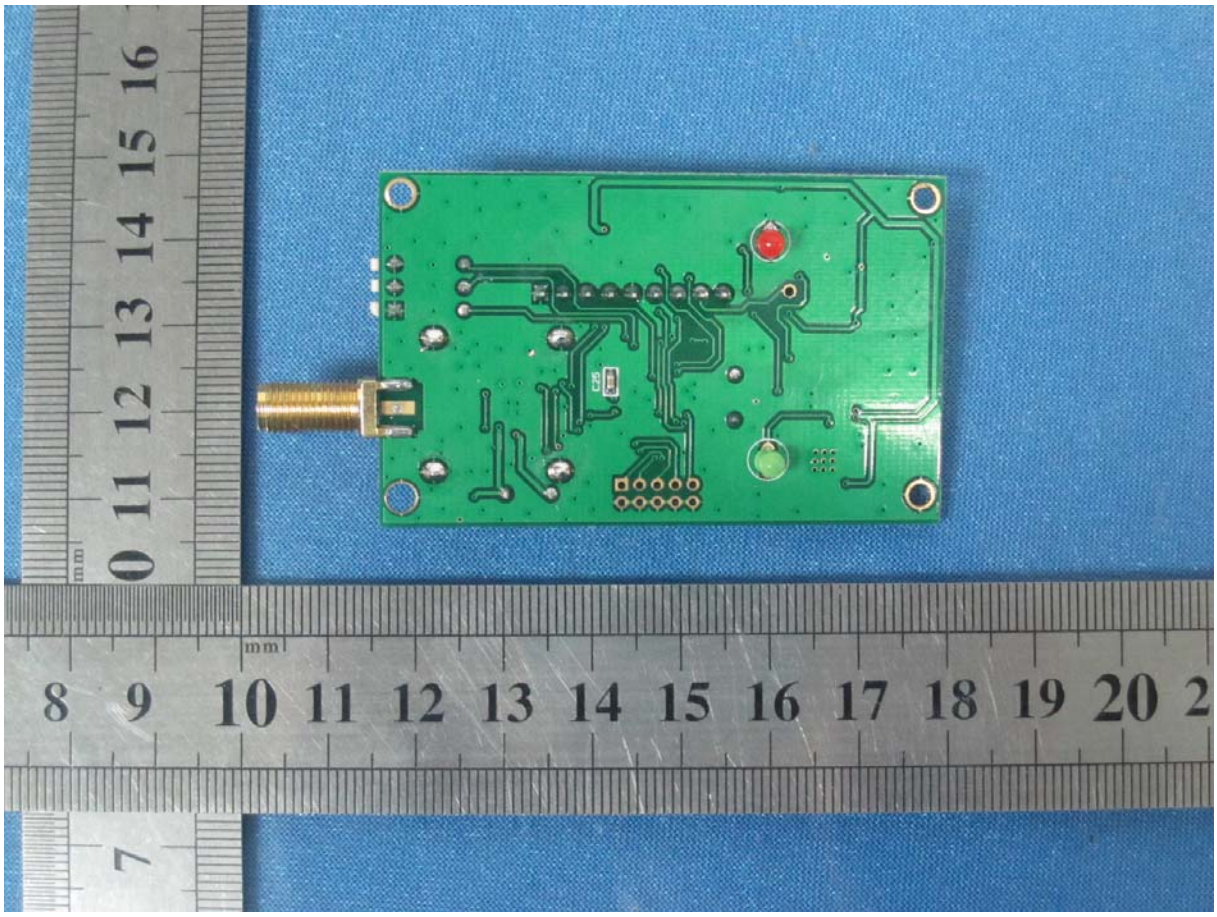
RSS232 port and cable

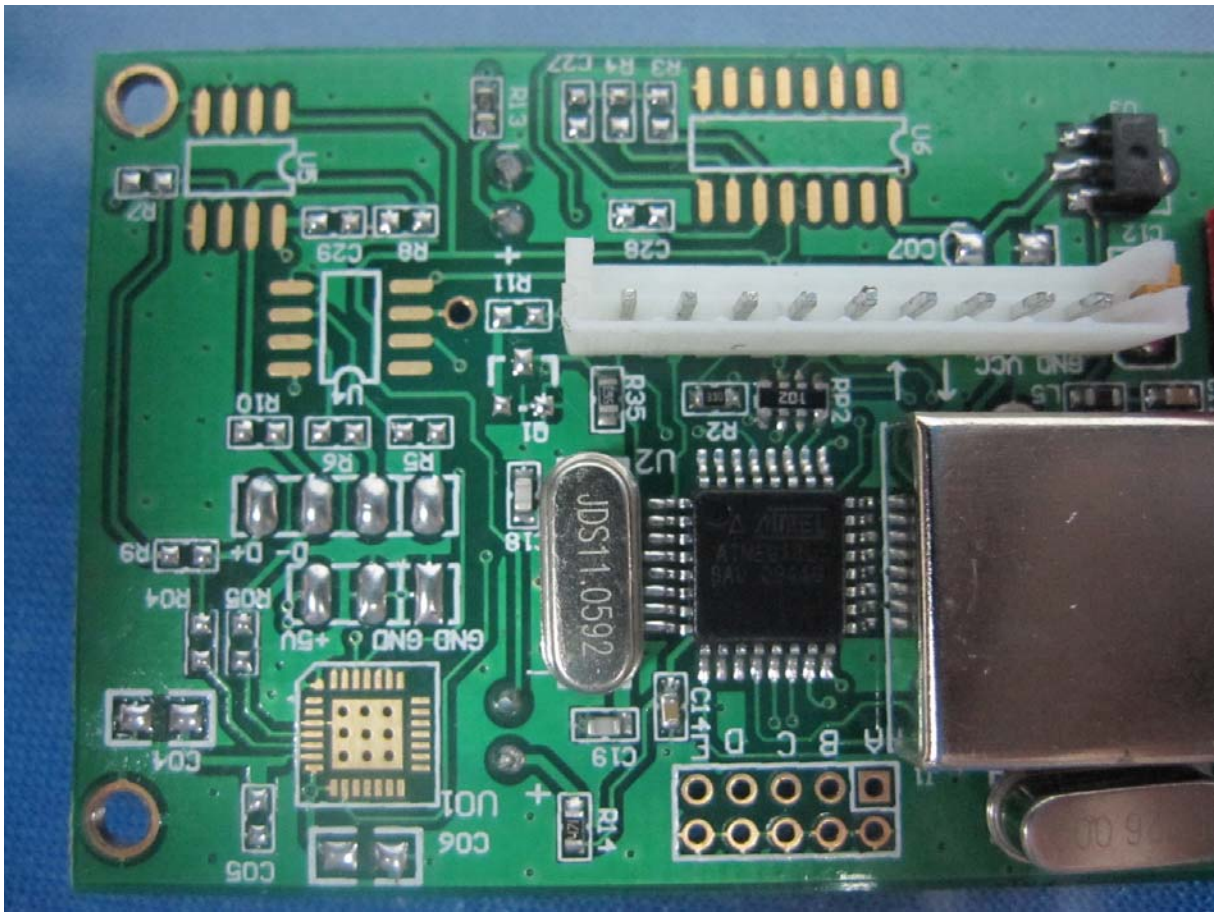


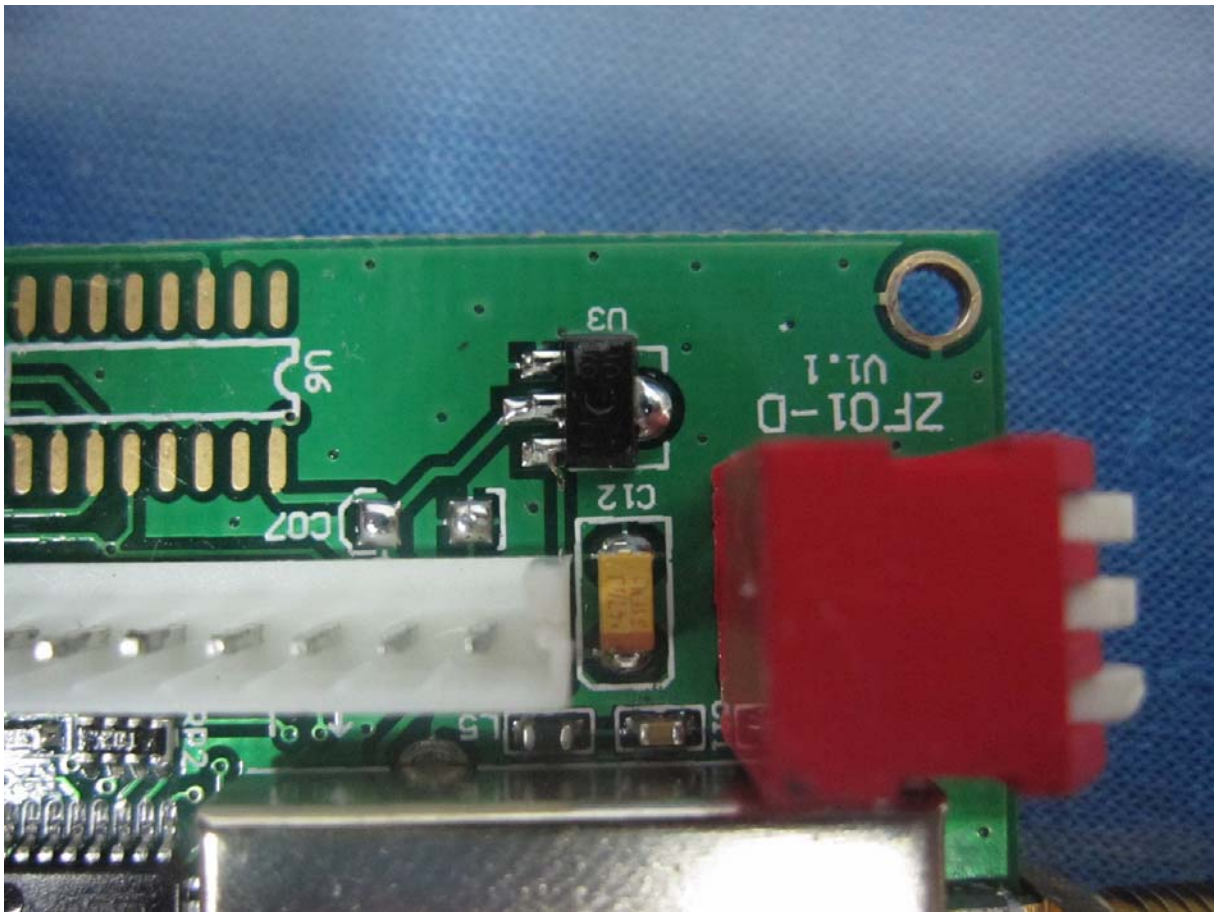
TTL port and cable

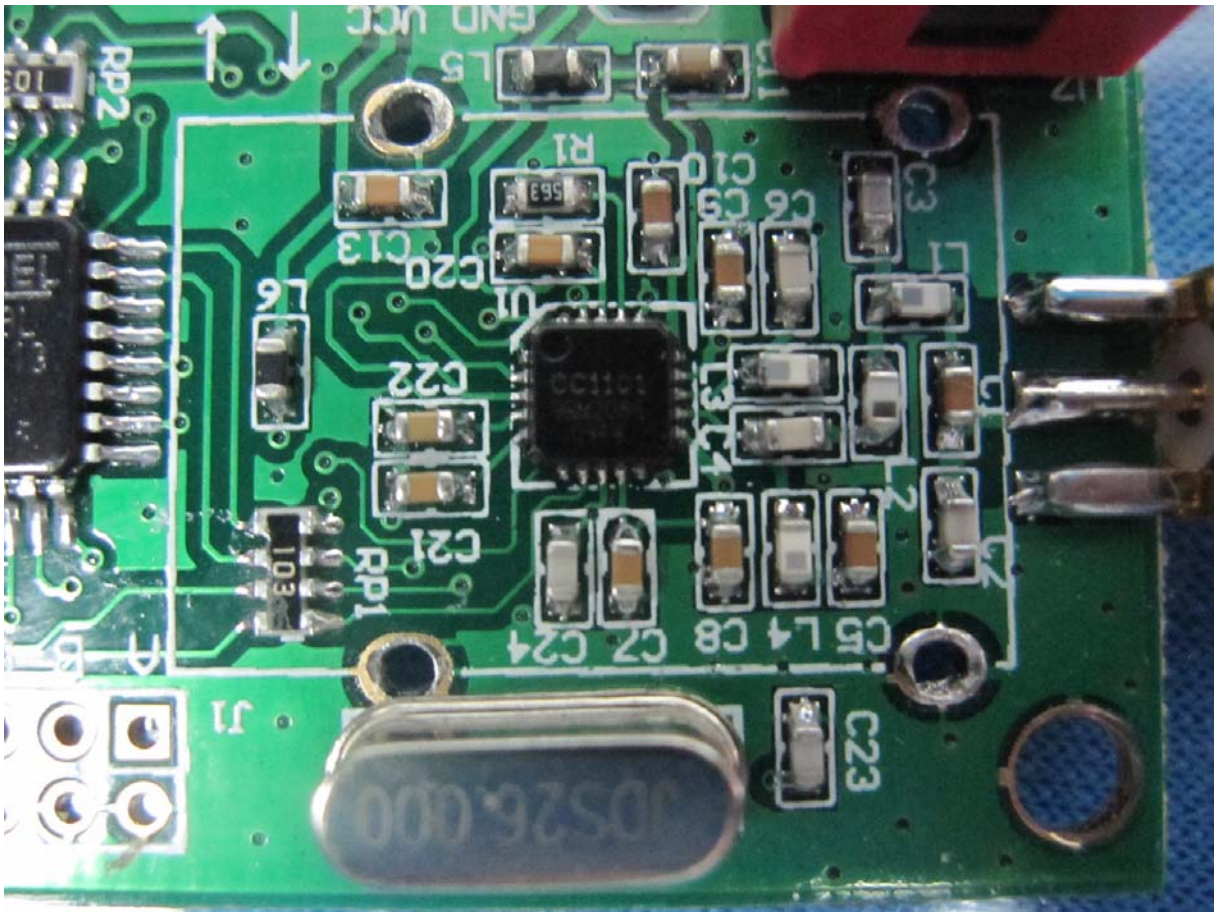




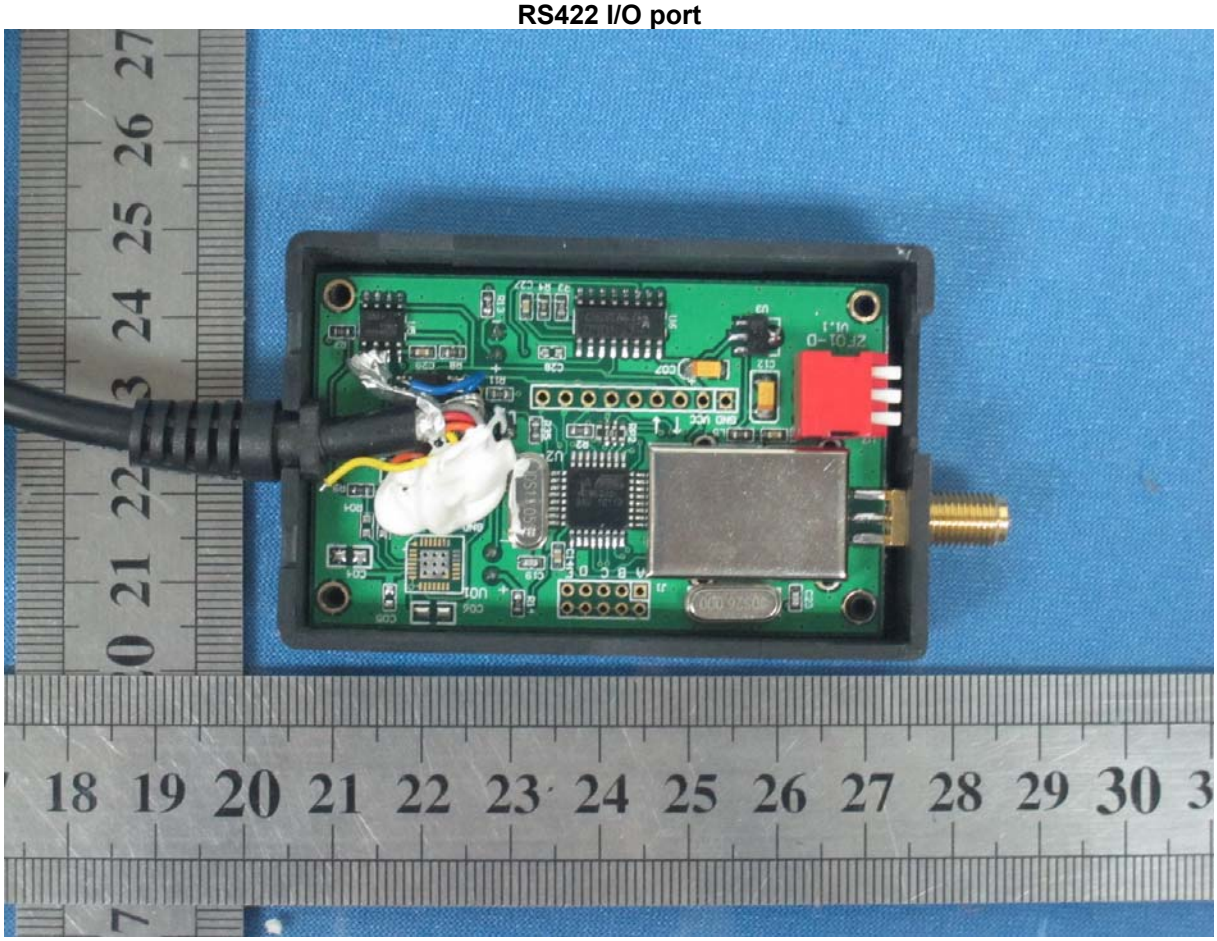


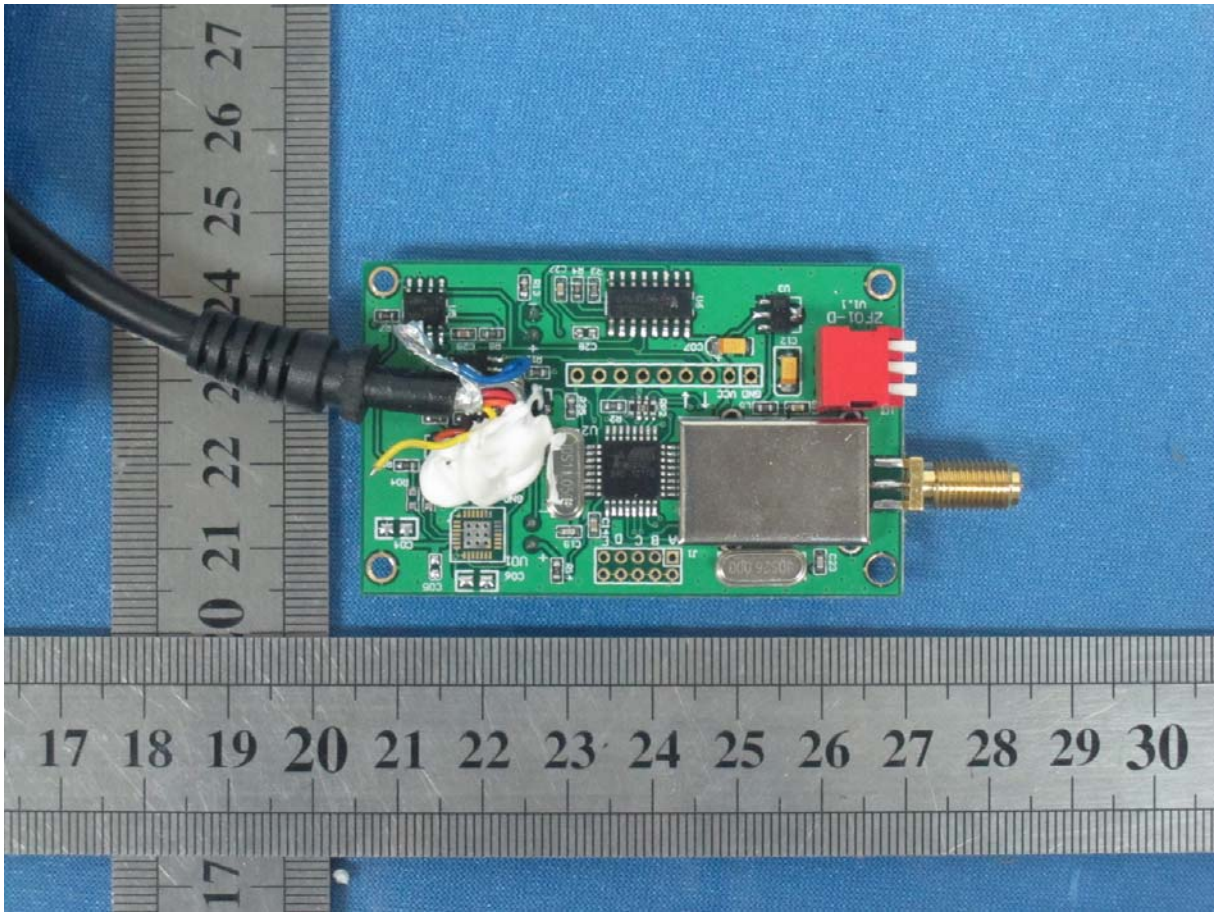

JDS11.0592

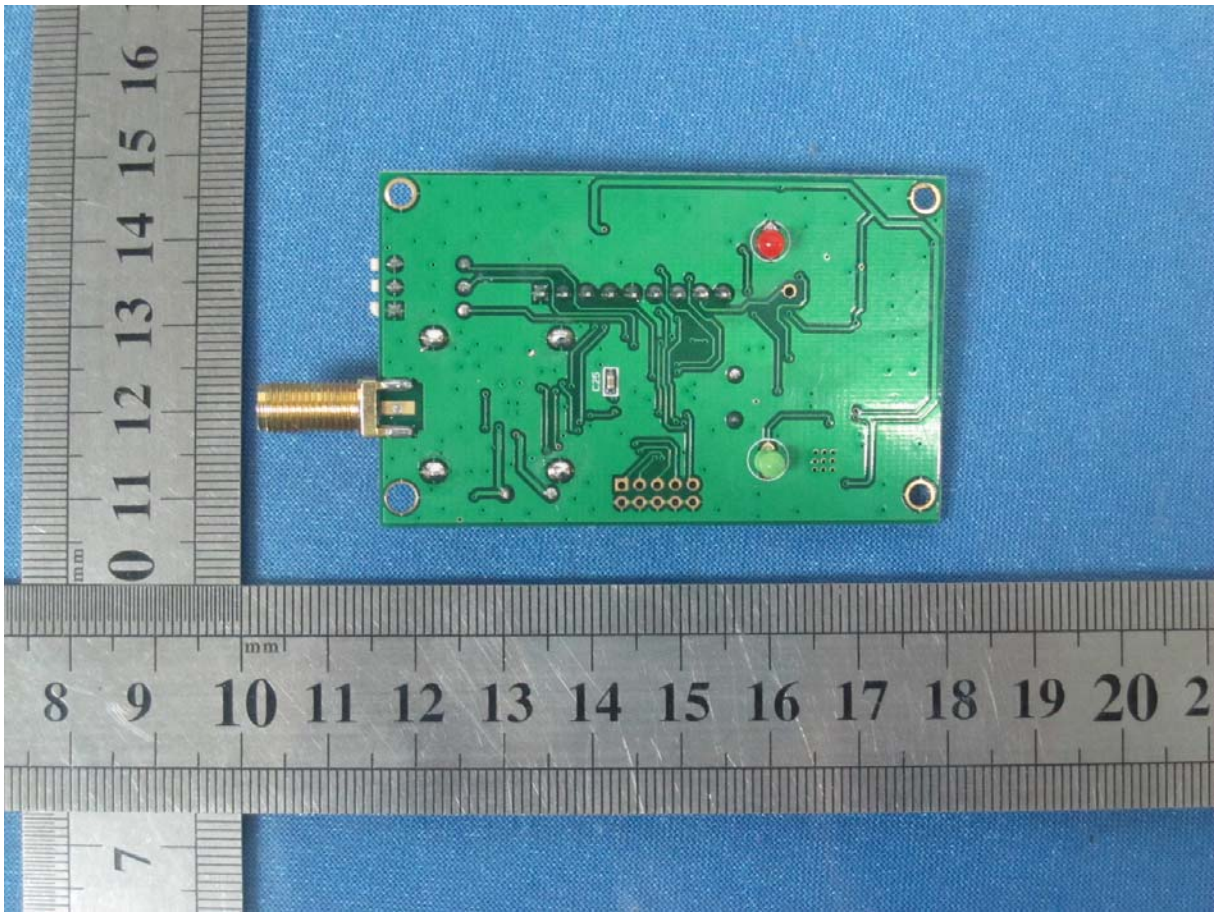

U3
U6
ZF01-D
V1.1
C12
C07

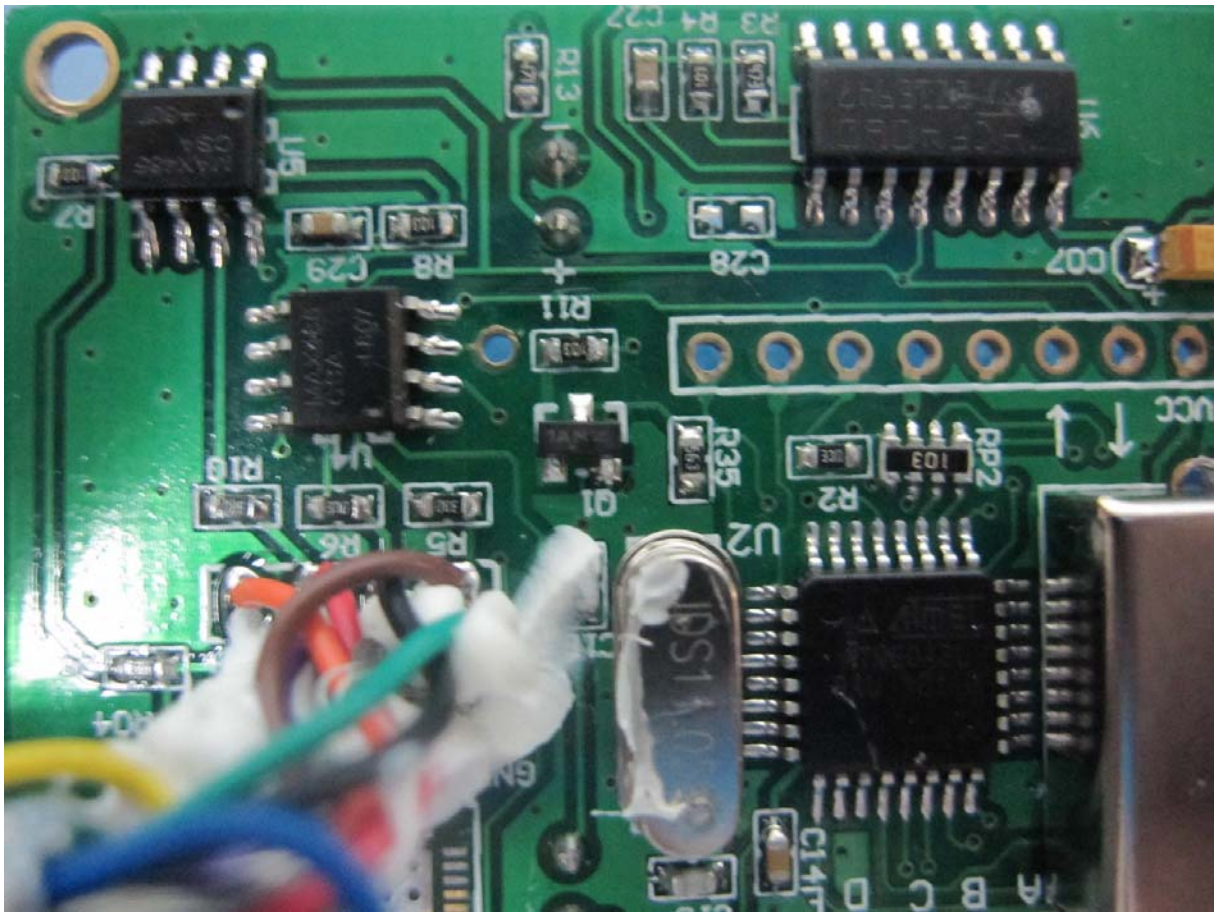

RP2
R1
C13
C20
C22
C21
RP1
C23
J1

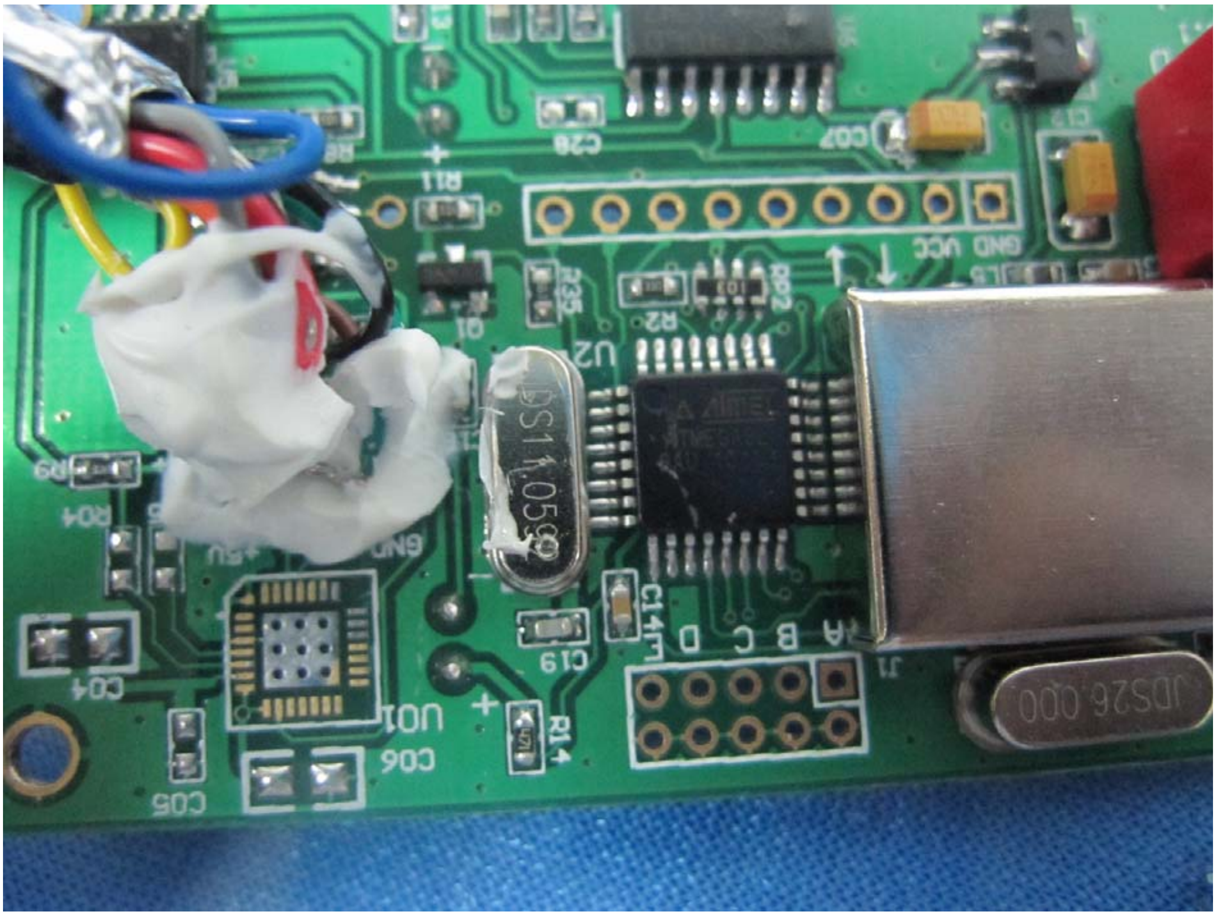
RS422 I/O port

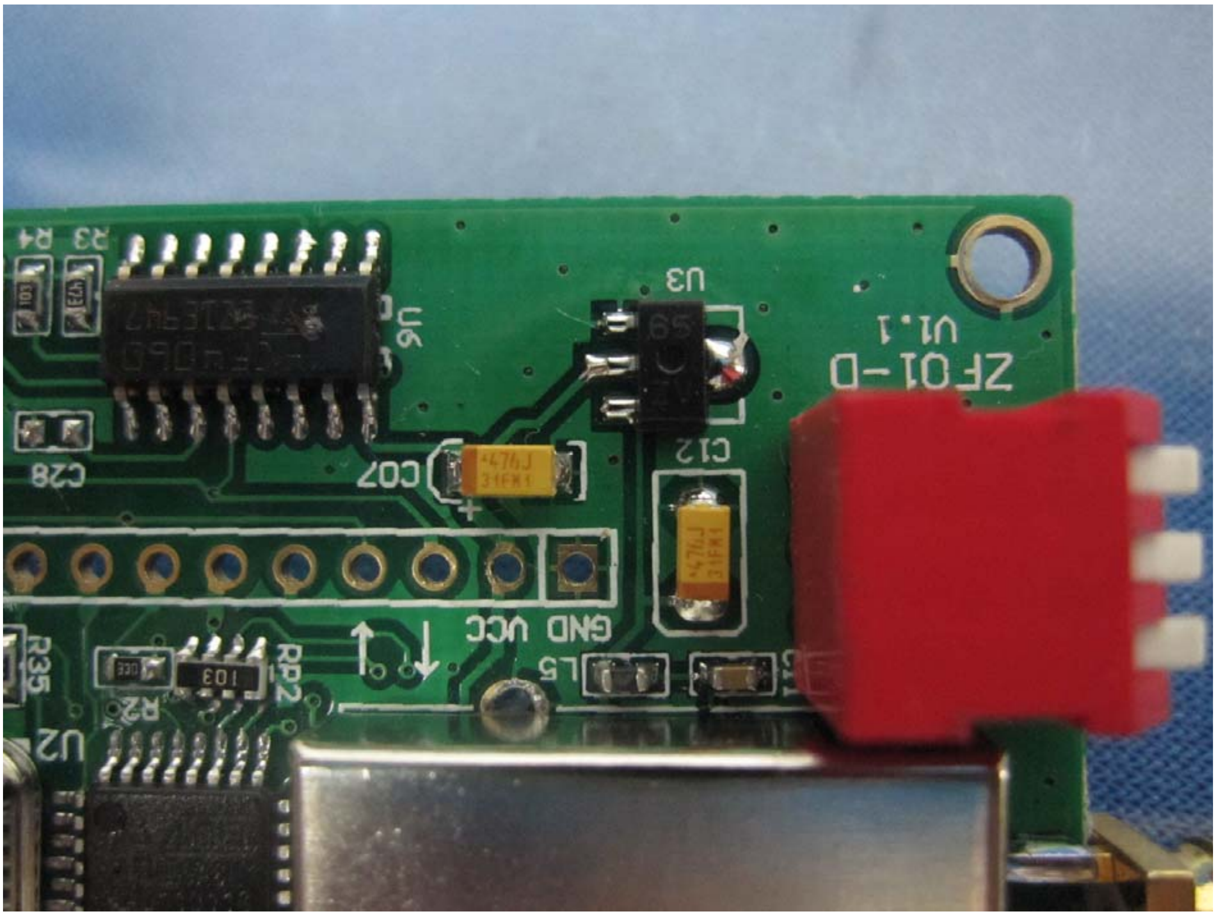


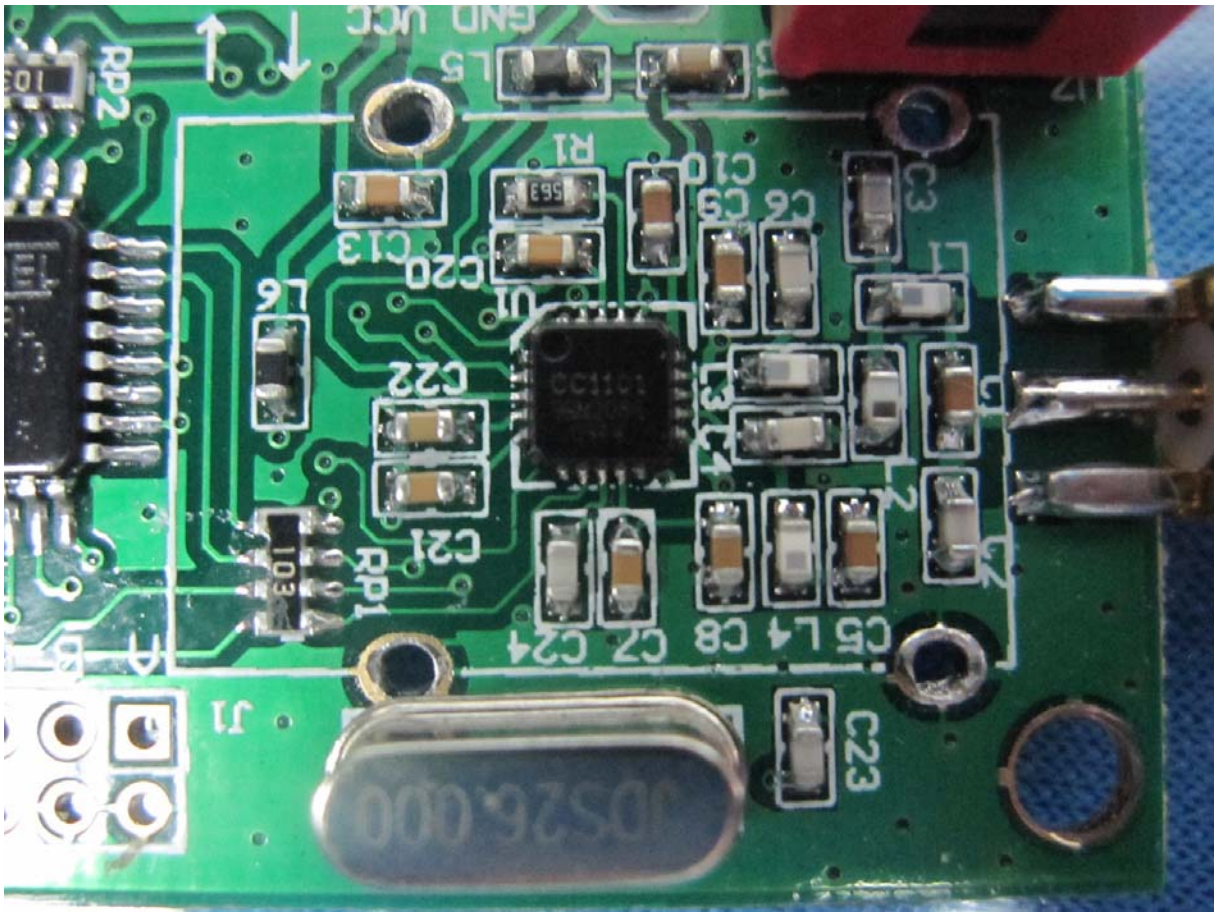




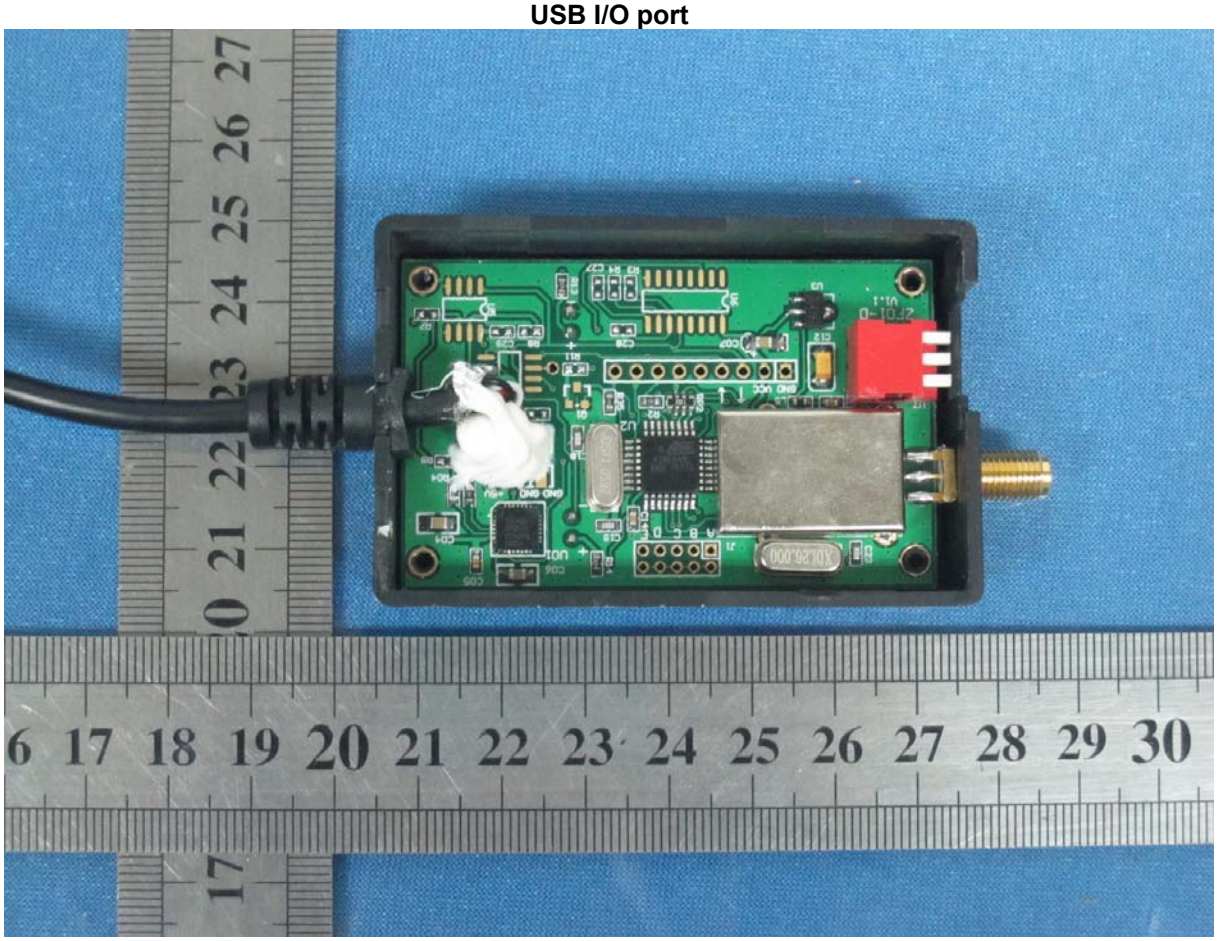


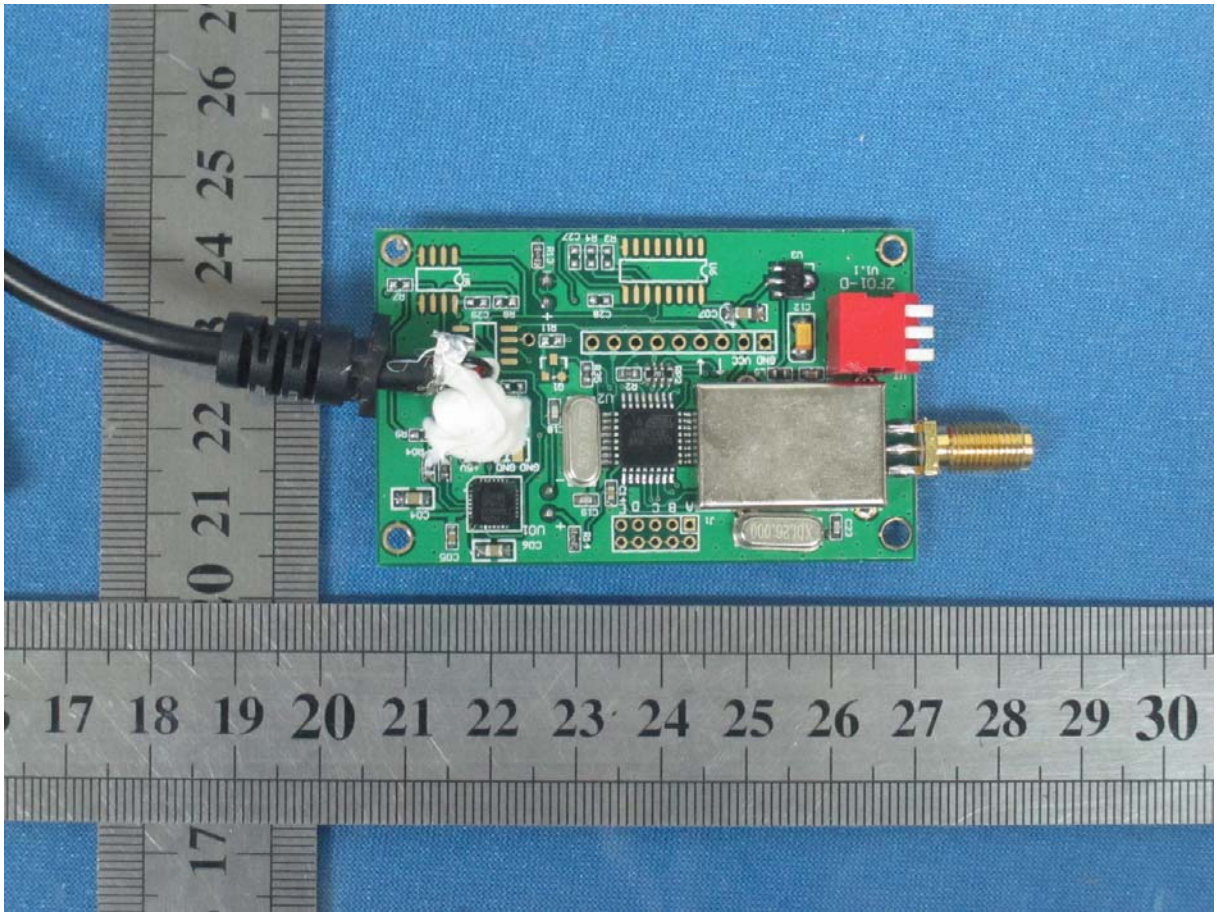


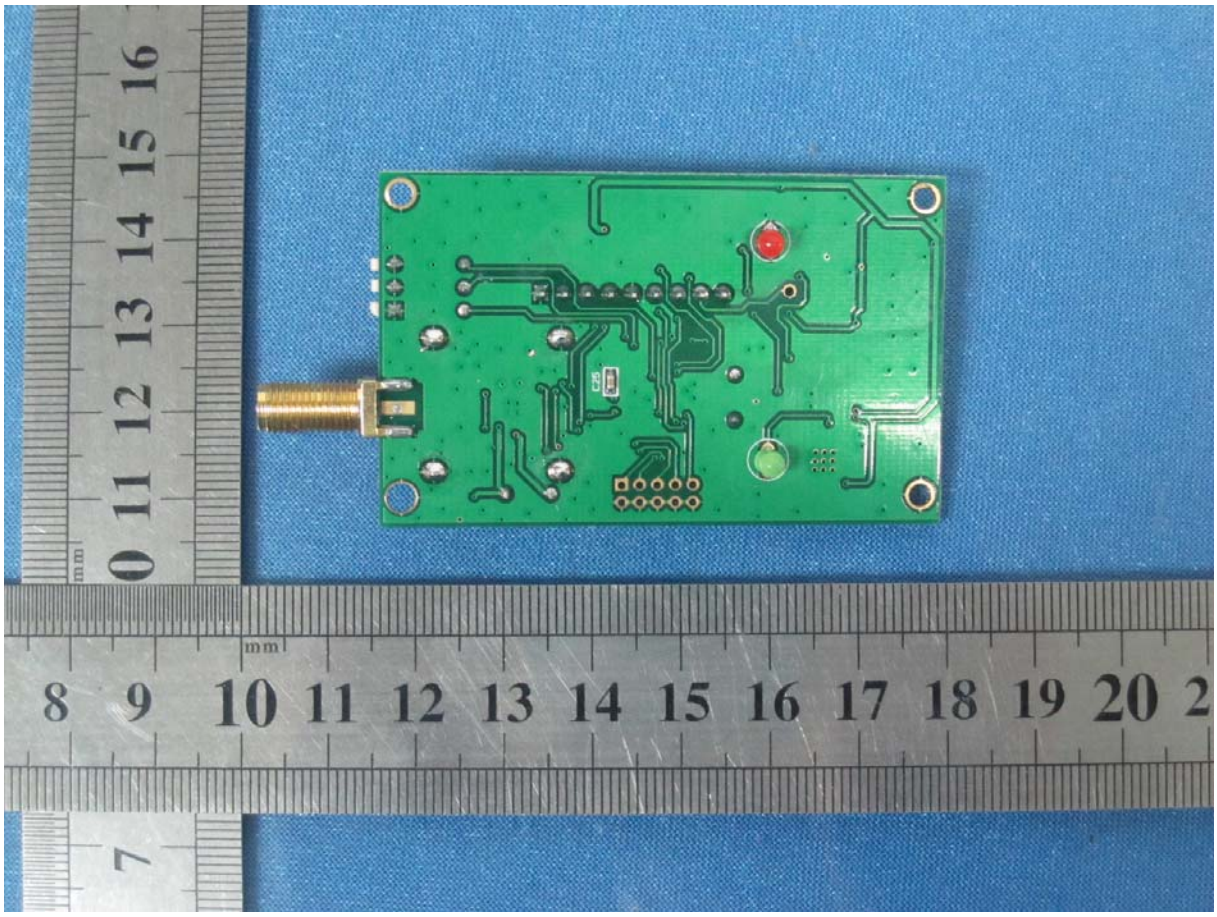


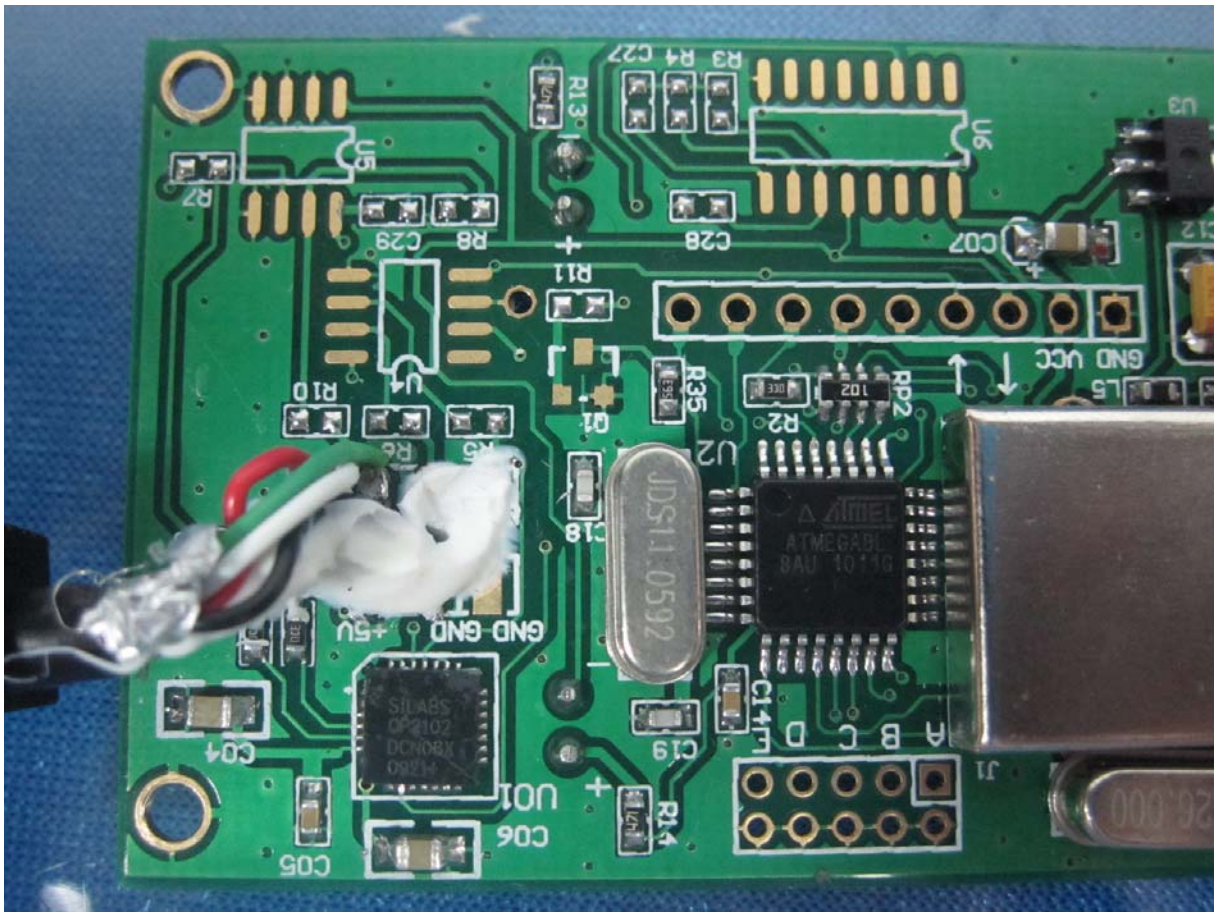

GND VCC
RP2
L5
R1
C1
C3
C9
C6
C13
C20
L6
U1
C22
L3
C4
L1
L2
C21
RP1
C5
L4
C8
C2
C24
J1
C23

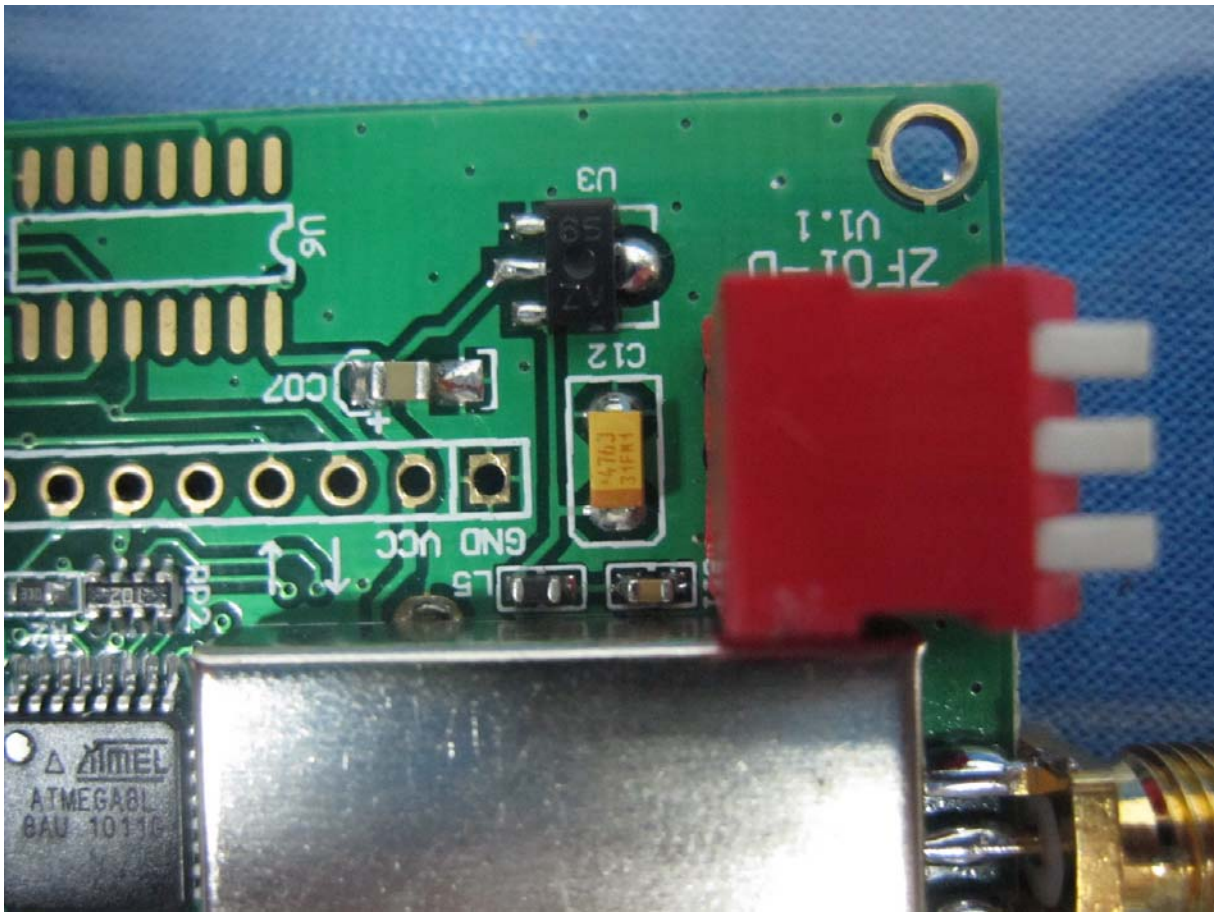
USB I/O port

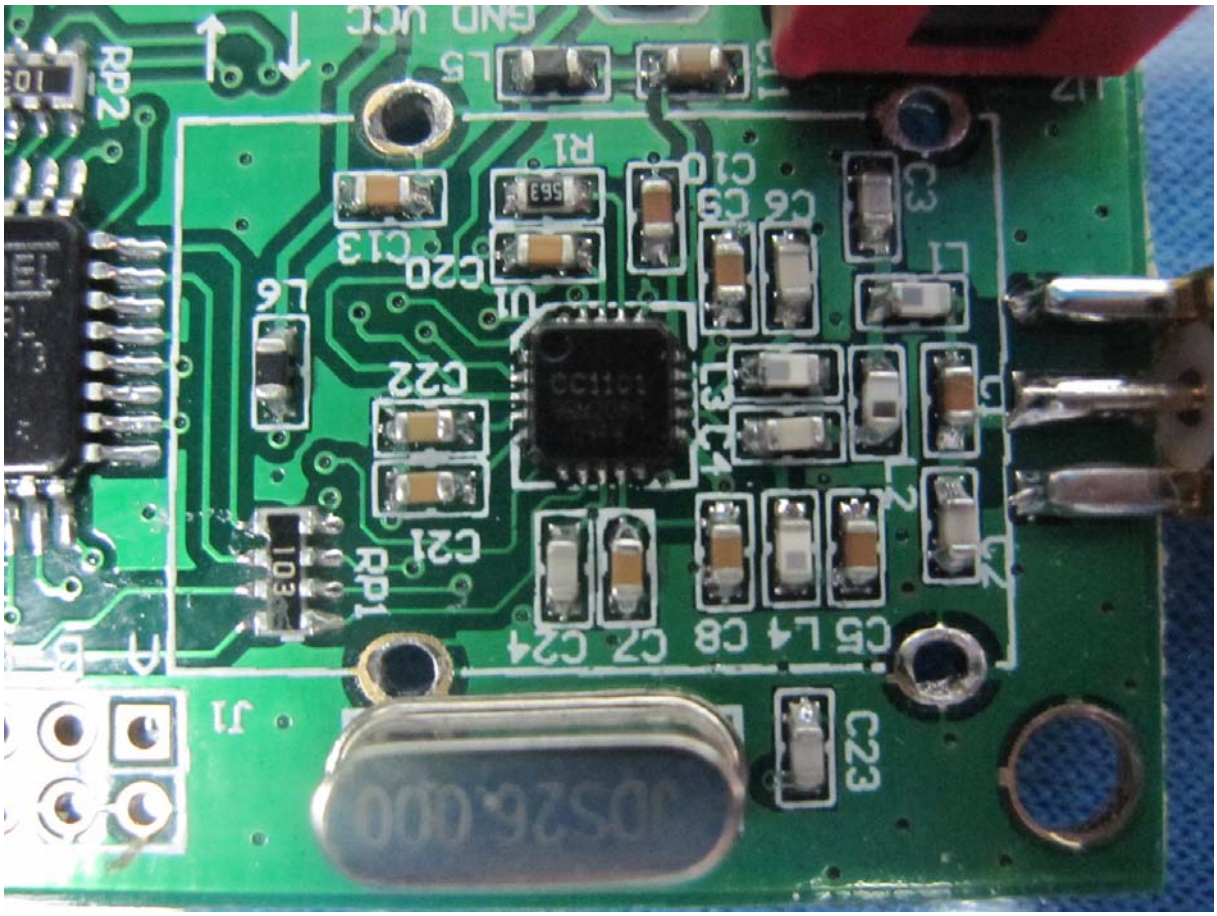












.....End of Report.....