FCC 47 CFR PART 15 SUBPART B

TEST REPORT

For

Applicant :	**GTSYS Limited**
Address :	**23/F, Heng Shan Centre, 145 Queen's Road East, Wan Chai, Hong Kong**
Product Name :	**GTSYS - RFID UHF Desktop**
Model Name :	**DR-U-USB, DRUUSB-R1-D001, DRUUSB-R1-D002, DRUUSB-R1-D003, DRUUSB-R1-D004, DRUUSB-R1-D004**
Brand Name :	GTSYS
FCC ID :	**A2BDRUUSB-R1-22DB**
Report No. :	**STS111123F1**
Date of Issue :	**November. 24, 2011**

Issued by :	**Shenzhen Super Test Service Technology Co., Ltd.**
Address :	**No.5, Langshan 2nd Rd., North Hi-Tech Industrial Park, Nanshan Shenzhen, China**
Tel :	**86-755-2795 8522**
Fax :	**86-755-2795 8022**

TABLE OF CONTENTS

1. VERIFICATION OF CONFORMITY

Equipment Under Test:	GTSYS - RFID UHF Desktop
Brand Name:	GTSYS
Model Number:	DR-U-USB
Series Model Name:	DR-U-USB, DRUUSB-R1-D001, DRUUSB-R1-D002, DRUUSB-R1-D003, DRUUSB-R1-D004, DRUUSB-R1-D004
Difference description:	Only the appearance and model name are different.
FCC ID:	A2BDRUUSB-R1-22DB
Applicant:	GTSYS Limited 23/F, Heng Shan Centre, 145 Queen's Road East, Wan Chai, Hong Kong
Manufacturer:	CWLinux Unit 138, 13/F Weswick Cermercial Bld. 147-151 Queen's Road East , Wan Chai, Hong Kong
Technical Standards:	FCC Part 15 B
File Number:	STS11123F1
Date of test:	November 09, 2011 ~ November 24, 2011
Deviation:	None
Condition of Test Sample:	Normal
Test Result:	PASS

The above equipment was tested by STS for compliance with the requirements set forth in FCC Part 15 and the Technical Standards mentioned above. This said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment and the level of the immunity endurance of the equipment are within the compliance requirements.

The test results of this report relate only to the tested sample identified in this report.

Tested by (+ signature): Zhang Ling

Zhang Ling November. 24, 2011

Review by (+ signature): July Wen

July Wen November. 24, 2011

Approved by (+ signature): Terry Yang

Terry Yang November. 24, 2011

2. GENERAL INFORMATION

2.1 PRODUCT INFORMATION

EUT Description	
Description:	GTSYS - RFID UHF Desktop
Brand Name:	GTSYS
Model Name:	DR-U-USB
Series Number:	DR-U-USB, DRUUSB-R1-D001, DRUUSB-R1-D002, DRUUSB-R1-D003, DRUUSB-R1-D004, DRUUSB-R1-D004
Model Difference description:	Only the appearance and model name are different.
Power Supply:	This deceive is powered by USB port.
Frequency Range:	902.75MHz-927.25MHz(Low:902.75MHz,Middle:914.75MHz, High:927.25MHz)
Number of Channels:	50
Transmit Power	22dBm
Modulation Technique:	DSB-ASK
Antenna Type:	Internal
Antenna Gain:	2 dBi
Temperature Range:	-20°C ~ +55°C

NOTE:

1. Please refer to Appendix 2 for the photographs of the EUT. For a more detailed features description about the EUT, please refer to User's Manual.

2.2 OBJECTIVE

Perform FCC Part 15 Subpart B tests for FCC Marking.

2.3 TEST STANDARDS AND RESULTS

Test items and the results are as bellow:

EMISSION				
Standard	**Item**		**Result**	**Remarks**
FCC 47 CFR Part 15 Subpart B (10-1-05 Edition)	§15.107	Conducted Emission	PASS	Meet Class B limit
	§15.109	Radiated Emission	PASS	Meet Class B limit

Note:

1. The test result judgment is decided by the limit of measurement standard
2. The information of measurement uncertainty is available upon the customer's request.

2.4 ENVIRONMENTAL CONDITIONS

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

- Temperature: 15-35ºC
- Humidity: 30-60 %
- Atmospheric pressure: 86-106 kPa

3. TEST FACILITY

Test Site: Compliance Certification Services Inc. (Kun shan) Laboratory

Location: No.10 Weiye Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China

Description: There is one 3m semi-anechoic an area test sites and two line conducted labs for final test. The Open Area Test Sites and the Line Conducted labs are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4:2009 and CISPR 16 requirements.

The FCC Registration Number is **424105**.

Site Filing: The site description is on file with the Federal Communications Commission, 7435 Oakland Mills Road, Columbia, MD 21046.

Instrument Tolerance: All measuring equipment is in accord with ANSI C63.4:2009 and CISPR 16 requirements that meet industry regulatory agency and accreditation agency requirement.

Ground Plane: Two conductive reference ground planes were used during the Line Conducted Emission, one in vertical and the other in horizontal. The dimensions of these ground planes are as below. The vertical ground plane was placed distancing 40 cm to the rear of the wooden test table on where the EUT and the support equipment were placed during test. The horizontal ground plane projected 50 cm beyond the footprint of the EUT system and distanced 80 cm to the wooden test table. For Radiated Emission Test, one horizontal conductive ground plane extended at least 1m beyond the periphery of the EUT and the largest measuring antenna, and covered the entire area between the EUT and the antenna. It has no holes or gaps having longitudinal dimensions larger than one-tenth of a wavelength at the highest frequency of measurement up to 1GHz.

4. SETUP OF EQUIPMENT UNDER TEST

4.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

4.2 SUPPORT EQUIPMENT

Device Type	Brand	Model	FCC ID	Series No.	Data Cable	Power Cord
Notebook	lenovo	8890	N/A	L3-A19107/08	N/A	N/A

Remark:
All the equipment/cables were placed in the worst-case [-configuration to maximize the emission during the test.
Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

4.3 TEST EQUIPMENT LIST

Instrumentation: The following list contains equipment used at MOST for testing. The equipment conforms to the CISPR 16-1 / ANSI C63.2 Specifications for Electromagnetic Interference and Field Strength Instrumentation from 10 kHz to 1.0 GHz or above.

No.	Equipment	Manufacturer	Model No.	S/N	Calibration date	Calibration due date
1	Test Receiver	Rohde & Schwarz	ESCI	100492	2011/03/14	2012/03/14
2	L.I.S.N.	Rohde & Schwarz	ENV216	100093	2011/03/14	2012/03/14
3	Coaxial Switch	Anritsu Corp	MP59B	6200283933	2011/03/14	2012/03/14
4	Terminator	Hubersuhner	50Ω	No.1	2011/03/14	2012/03/14
5	RF Cable	SchwarzBeck	N/A	No.1	2011/03/14	2012/03/14
6	Test Receiver	Rohde & Schwarz	ESPI	101202	2011/03/14	2012/03/14
7	Bilog Antenna	Sunol	JB3	A121206	2011/03/14	2012/03/14
8	Test Antenna - Horn	Schwarzbeck	BBHA 9120C	--	2011/03/14	2012/03/14
9	Test Antenna - Bi-Log	Schwarzbeck	VULB 9163	--	2011/03/14	2012/03/14
10	Cable	Resenberger	N/A	NO.1	2011/03/14	2012/03/14
11	Cable	SchwarzBeck	N/A	NO.2	2011/03/14	2012/03/14
12	Cable	SchwarzBeck	N/A	NO.3	2011/03/14	2012/03/14
13	DC Power Filter	DuoJi	DL2×30B	N/A	2011/03/14	2012/03/14
14	Single Phase Power Line Filter	DuoJi	FNF 202B30	N/A	2011/03/14	2012/03/14
15	3 Phase Power Line Filter	DuoJi	FNF 402B30	N/A	2011/03/14	2012/03/14
16	Test Receiver	Rohde & Schwarz	ESCI	100492	2011/03/14	2012/03/14
17	Absorbing Clamp	Luthi	MDS21	3635	2011/03/14	2012/03/14
18	Coaxial Switch	Anritsu Corp	MP59B	6200283933	2011/03/14	2012/03/14
19	AC Power Source	Kikusui	AC40MA	LM003232	2011/03/14	2012/03/14
20	Test Analyzer	Kikusui	KHA1000	LM003720	2011/03/14	2012/03/14
21	Line Impendence Network	Kikusui	LIN40MA-PCR-L	LM002352	2011/03/14	2012/03/14
22	ESD Tester	Kikusui	KES4021	LM003537	2011/03/14	2012/03/14
23	EMCPRO System	EM Test	UCS-500-M4	V0648102026	2011/03/14	2012/03/14
24	Signal Generator	IFR	2032	203002/100	2011/03/14	2012/03/14
25	Amplifier	A&R	150W1000	301584	2011/03/14	2012/03/14
26	CDN	FCC	FCC-801-M2-25	47	2011/03/14	2012/03/14
27	CDN	FCC	FCC-801-M3-25	107	2011/03/14	2012/03/14
28	EM Injection Clamp	FCC	F-203I-23mm	403	2011/03/14	2012/03/14
29	RF Cable	MIYAZAKI	N/A	No.1/No.2	2011/03/14	2012/03/14
30	Universal Radio Communication Tester	ROHDE&SCHWARZ	CMU200	0304789	2011/03/14	2012/03/14
31	Telecommunication Antenna	European Antennas	PSA 75301R/170	0304213	2011/03/14	2012/03/14

NOTE: *Equipments listed above have been calibrated and are in the period of validation.*

5. 47 CFR PART 15B REQUIREMENTS

5.1 GENERAL INFORMATION

EUT Function and Test Mode

Mode 1: Idle Mode

During the test, the EUT connected the Notebook via USB cable and was on idle mode.

The EUT configuration of the emission test was **EUT + Notebook.**

Mode 2 Transmitter Mode

During the test, the EUT was connected with the Notebook via USB cable and was on transmitter mode.

The EUT configuration of the emission test was **EUT + Notebook.**

NOTE:

All test modes are performed, only the worse cases are recorded in this report.

6. LINE CONDUCTED EMISSION TEST

6.1. LIMITS OF LINE CONDUCTED EMISSION TEST

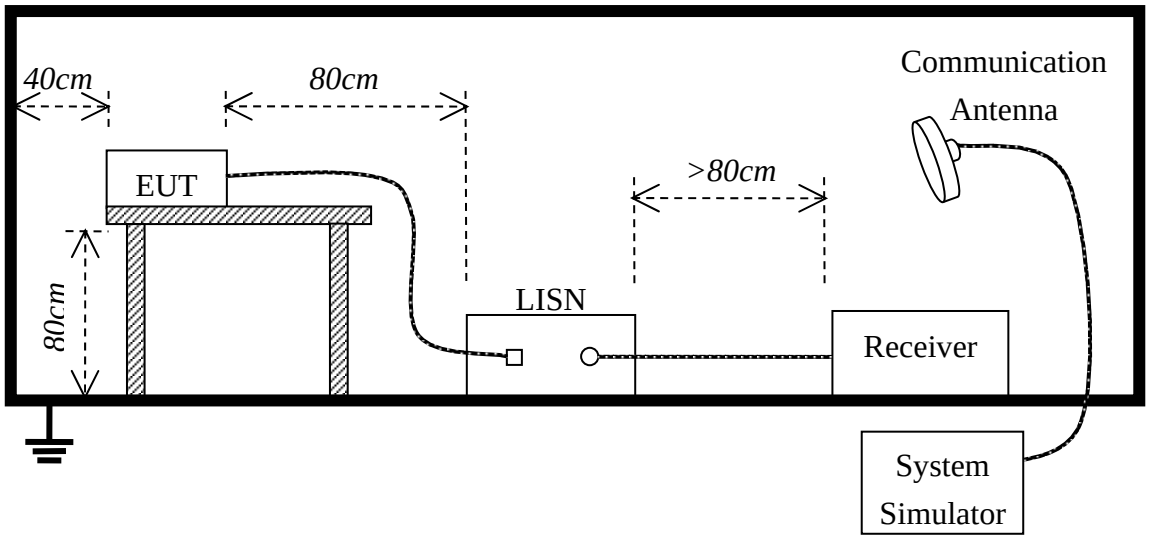
According to FCC §15.107, for equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN).

Frequency	Maximum RF Line Voltage	
	Q.P.(dBuV)	Average(dBuV)
150kHz-500kHz	66-56	56-46
500kHz-5MHz	56	46
5MHz-30MHz	60	50

NOTE:

1. *The lower limit shall apply at the transition frequency.*
2. *The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz*

6.2. BLOCK DIAGRAM OF TEST SETUP



6.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST

1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When 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 FCC Part 15 (see Test Facility for the dimensions of the ground plane used). When the EUT is floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
2) Support equipment, if needed, was placed as per FCC Part 15.
3) All I/O cables were positioned to simulate typical actual usage as per FCC Part 15.
4) The EUT received DC 5V power by USB port of PC. The AC/DC adapter of PC which through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5) All support equipments received power from a second LISN supplying power of AC 120V/60Hz, 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 30 MHz for emissions in each of the test modes.
8) During the above scans, the emissions were maximized by cable manipulation.
9) The following test mode(s) were scanned during the preliminary test:

Preliminary Conducted Emission Test				
Frequency Range Investigated		150KHz to 30 MHz		
Mode of operation	Date	Report No.	Data#	Worst Mode
Idle Mode	2011-11-15	STS111123F1	DR-U-USB _0_(L, N)	☐
Transmitter Mode	2011-11-15	STS111123F1	DR-U-USB _2_(L, N)	☒

Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

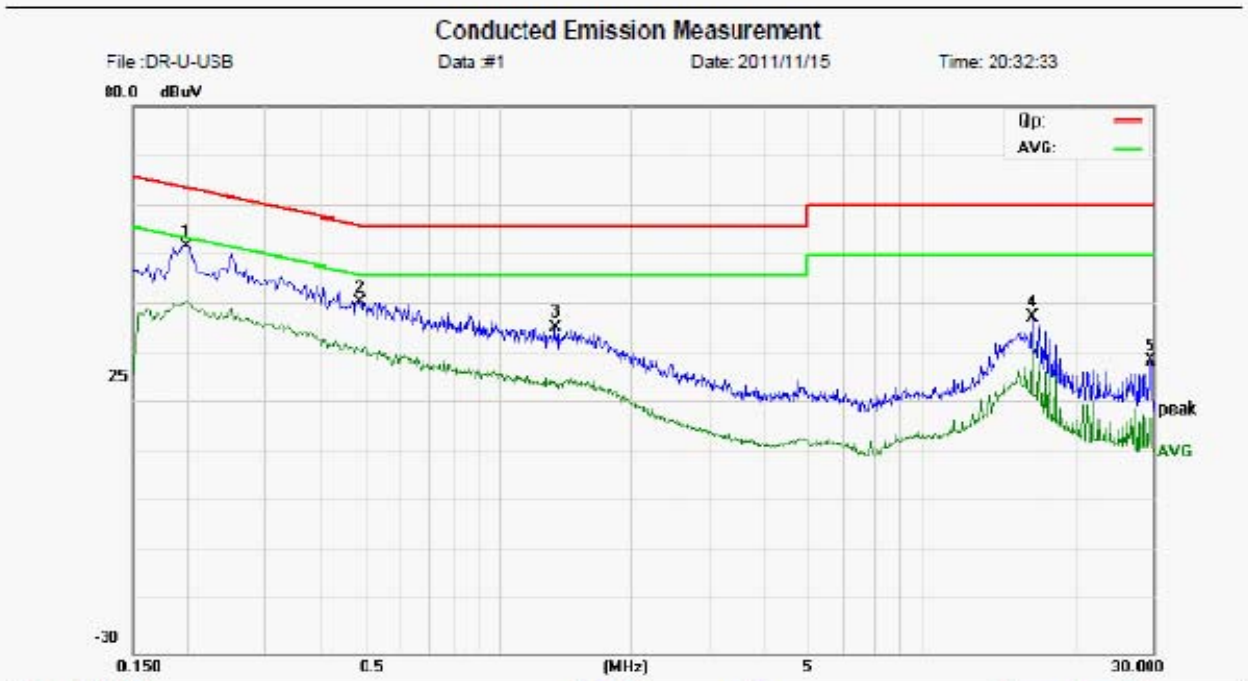
6.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

EUT and support equipment was set up on the test bench as per step 9 of the preliminary test.

A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less –2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.

The test data of the worst case condition(s) was reported on the Summary Data page.

6.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

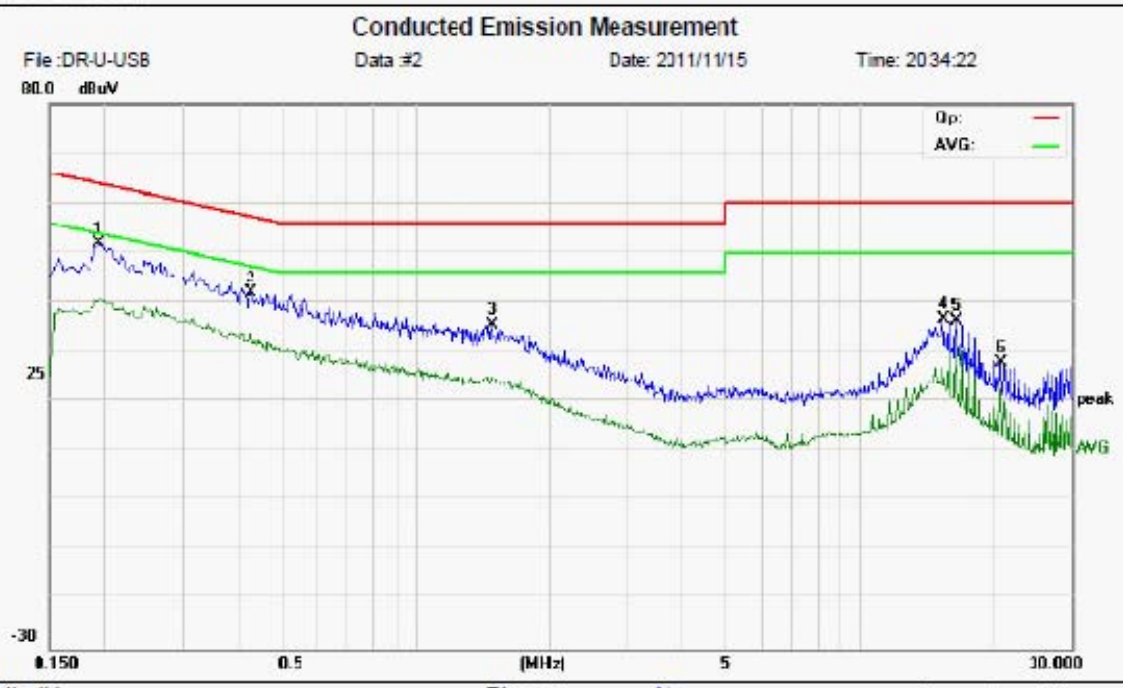


Site site #1
Limit: FCC Part15 B Class B QP
EUT: GTSYS-RFID UHF Desktop
M/N: DR-U-USB
Mode: NORMAL WORKING
Note:

Phase: L1
Power: DC 5V From PC Input
Ac120V/60Hz

Temperature: 26
Humidity: 60 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	cBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1980	40.03	11.88	51.91	63.69	-11.78	peak	
2		0.4860	30.53	10.09	40.62	56.24	-15.62	peak	
3		1.3420	25.87	9.66	35.53	56.00	-20.47	peak	
4		15.9380	28.58	9.00	37.58	60.00	-22.42	peak	
5		29.2500	19.68	9.00	28.68	60.00	-31.32	peak	



Site site #1
Phase: N
Temperature: 20
Limit: FCC Part15 B Class B QP
Power: DC 5V From PC Input
Humidity: 60 %
EUT: GTSYS-RFID UHF Desktop
M/N: DR-U-USB
Mode: NORMAL WORKING
Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1940	40.26	11.64	51.90	63.86	-11.96	peak	
2		0.4260	31.56	10.49	42.05	57.33	-15.28	peak	
3		1.4740	26.15	9.53	35.68	56.00	-20.32	peak	
4		15.4100	27.72	9.00	36.72	60.00	-23.28	peak	
5		16.4740	27.55	9.00	36.55	60.00	-23.45	peak	
6		20.7180	19.00	9.00	28.00	60.00	-32.00	peak	

7. RADIATED EMISSION TEST

7.1. LIMITS OF RADIATED DISTURBANCES AT 3M DISTANCES FOR CLASS B

According to FCC §15.109, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

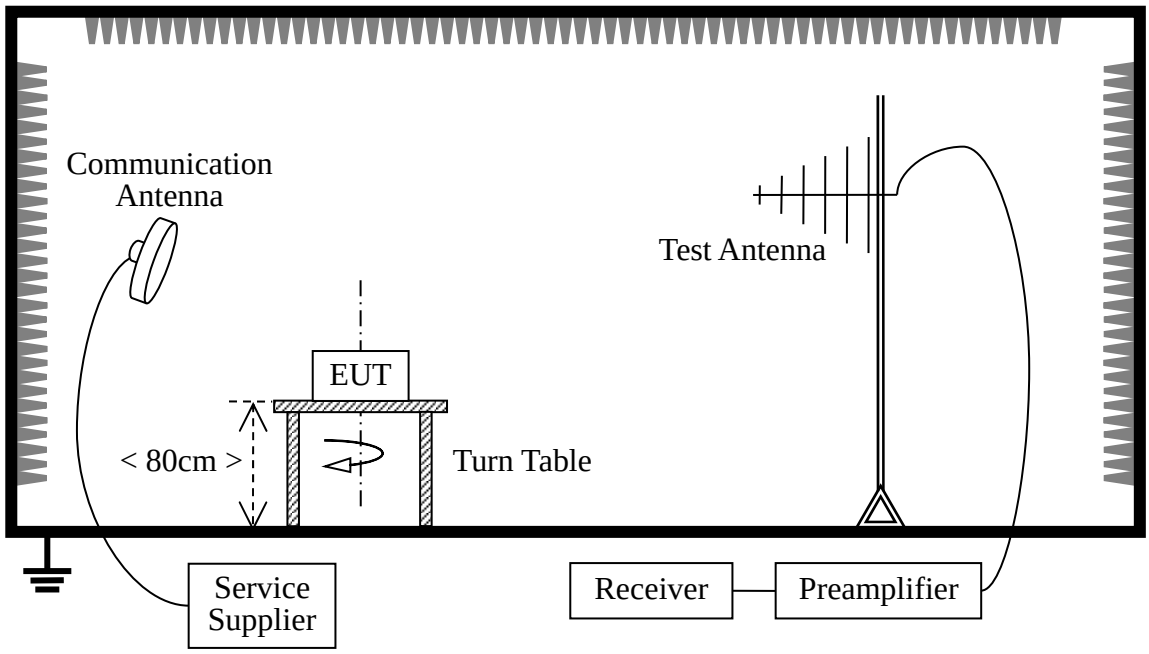
Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

NOTE:

1. Field Strength (dBμV/m) = 20*log[Field Strength (μV/m)].
2. In the emission tables above, the tighter limit applies at the band edges.

7.2 TEST DESCRIPTION

Test Setup:



The EUT is powered by USB port of PC. The Module is located in a 3m Semi-Anechoic Chamber; the antenna factors, cable loss and so on of the site as factors are calculated to correct the reading. During the measurement, the EUT is activated and transmitting with the other Bluetooth device (Supply by the Applicant) during the test.

For the Test Antenna:

(a) In the frequency range of 9 kHz to 30MHz, magnetic field is measured with Loop Test Antenna. The Test Antenna is positioned with its plane vertical at 1m distance from the EUT. The center of the Loop Test Antenna is 1m above the ground. During the measurement the Loop Test Antenna rotates about its vertical axis for maximum response at each azimuth about the EUT.

(b) In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) is used. Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength. The emission levels at both horizontal and vertical polarizations should be tested.

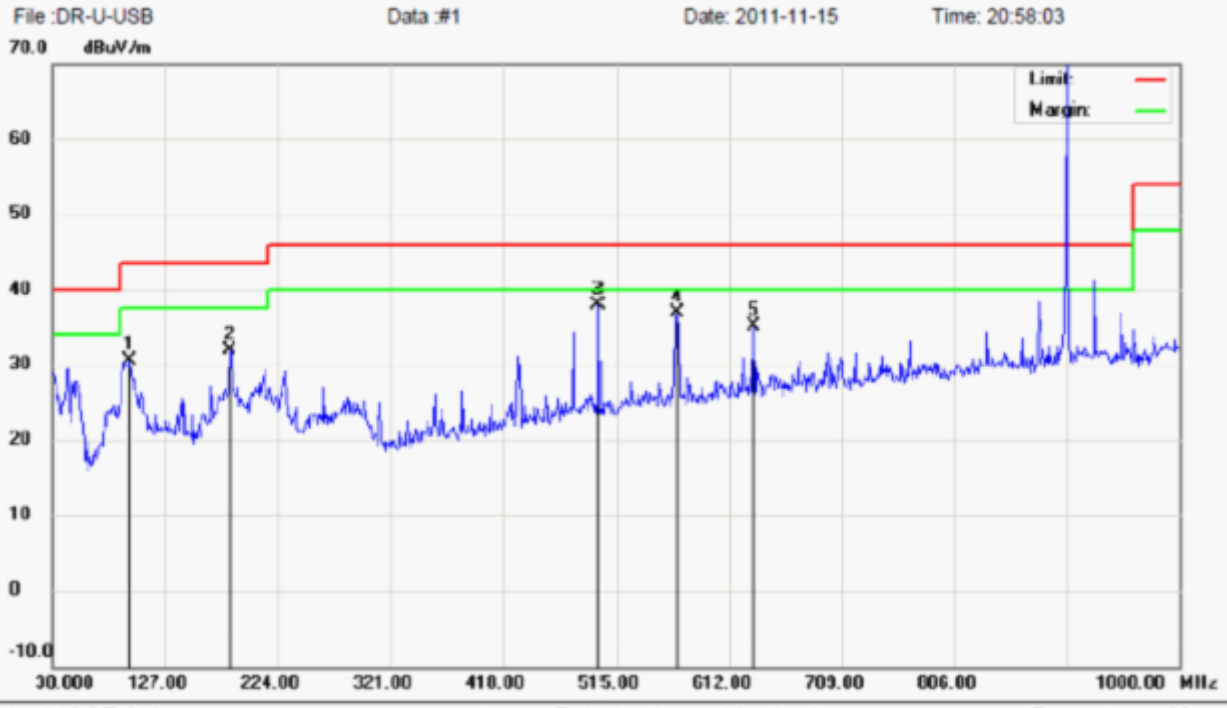
Preliminary Radiated Emission Test				
Frequency Range Investigated			**30 MHz to 1000 MHz**	
Mode of operation	**Date**	**Report No.**	**Data#**	**Worst Mode**
Idle Mode	2011-11-15	STS111123F1	DR-U-USB _0_(H, V)	☐
Transmitter Mode	2011-11-15	STS111123F1	DR-U-USB _1_(H, V)	☒

7.3 TEST RESULT

Form 9KHz to 30MHz:

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	AV Margin (dB)
					Peak (dBuV/m)	AV (dBuV/m)			
N/A	H								>20
N/A	V								>20

-No detected in below 30MHz.

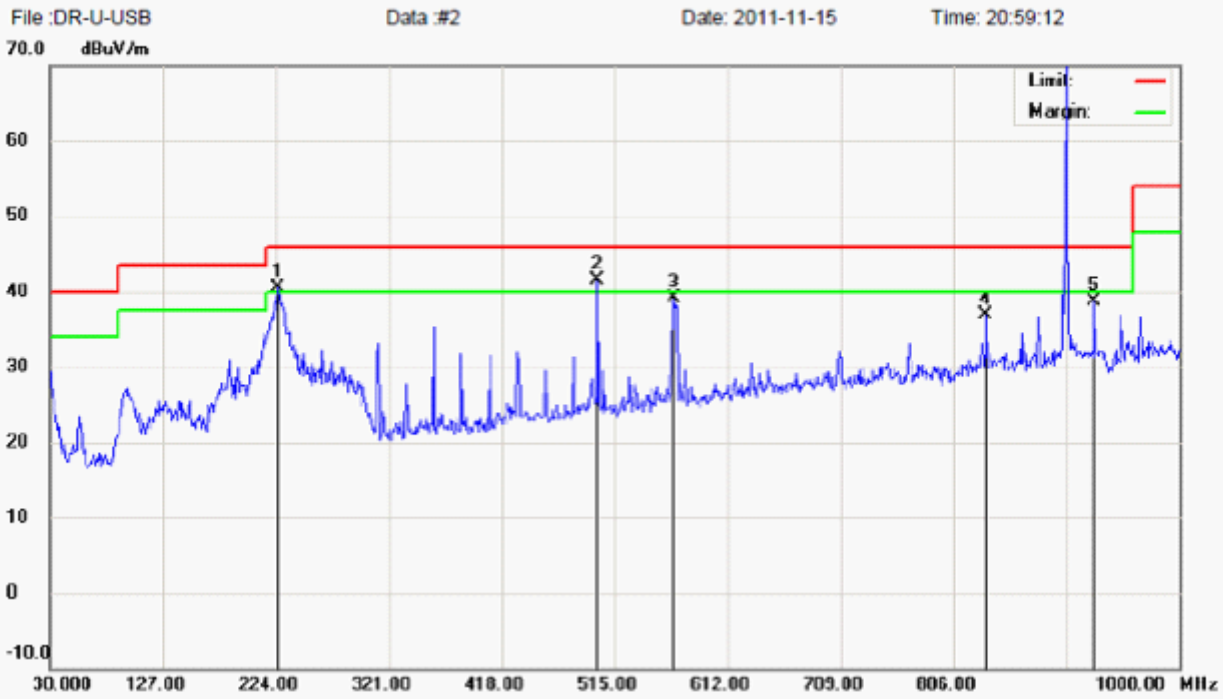


Site site MOST 3M
Limit: FCC Part15 B 3M Radiation
EUT: GTSYS-RFID UHF Desktop
M/N: DR-U-USB
Mode: NORMAL WORKING
Note:

Polarization: *Vertical*
Power: DC 5V From PC Input Ac120V/60H
Distance:

Temperature: 26
Humidity: 61 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		95.9600	18.22	12.27	30.49	43.50	-13.01	peak			
2		183.2600	15.19	16.63	31.82	43.50	-11.68	peak			
3	*	500.4500	16.58	21.40	37.98	46.00	-8.02	peak			
4		567.3800	14.16	22.82	36.98	46.00	-9.02	peak			
5		633.3400	11.32	23.80	35.12	46.00	-10.88	peak			



Site site MOST 3M
Limit: FCC Part15 B 3M Radiation
EUT: GTSYS-RFID UHF Desktop
M/N: DR-U-USB
Mode: NORMAL WORKING
Note:

Polarization: *Horizontal*
Power: DC 5V From PC Input Ac120V/60H
Distance:

Temperature: 26
Humidity: 61 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	!	225.9400	24.08	16.42	40.50	46.00	-5.50	peak			
2	*	500.4500	20.14	21.40	41.54	46.00	-4.46	peak			
3		566.4100	16.30	22.79	39.09	46.00	-6.91	peak			
4		834.1300	9.76	27.08	36.84	46.00	-9.16	peak			
5		927.2500	11.22	27.43	38.65	46.00	-7.35	peak			

Above 1 GHz:

Operation Mode:	Transmitter Mode	**Test Date:**	2011-11-15
Temperature:	24°C	**Tested by:**	Habby Guo
Humidity:	70 % RH	**Polarity:**	Ver. / Hor.

Freq.	Ant. Pol	Peak	AV	Ant. / CL	Actual Fs		Peak	AV	AV
(MHz)	H/V	Reading	Reading	CF			Limit	Limit	Margin
		(dBuV)	(dBuV)	(dB)	Peak	AV	(dBuV/m)	(dBuV/m)	(dB)
					(dBuV/m)	(dBuV/m)			
1828.50	H	51.42	32.29	15.54	66.96	47.83	74.00	54.00	-4.45
2742.75	H	49.17	25.24	20.32	69.49	45.56	74.00	54.00	-6.86
N/A	H								
1828.50	V	53.13	34.08	15.54	68.67	49.62	74.00	54.00	-4.38
2742.75	V	44.87	26.39	20.32	65.19	46.71	74.00	54.00	-7.29
N/A	V								

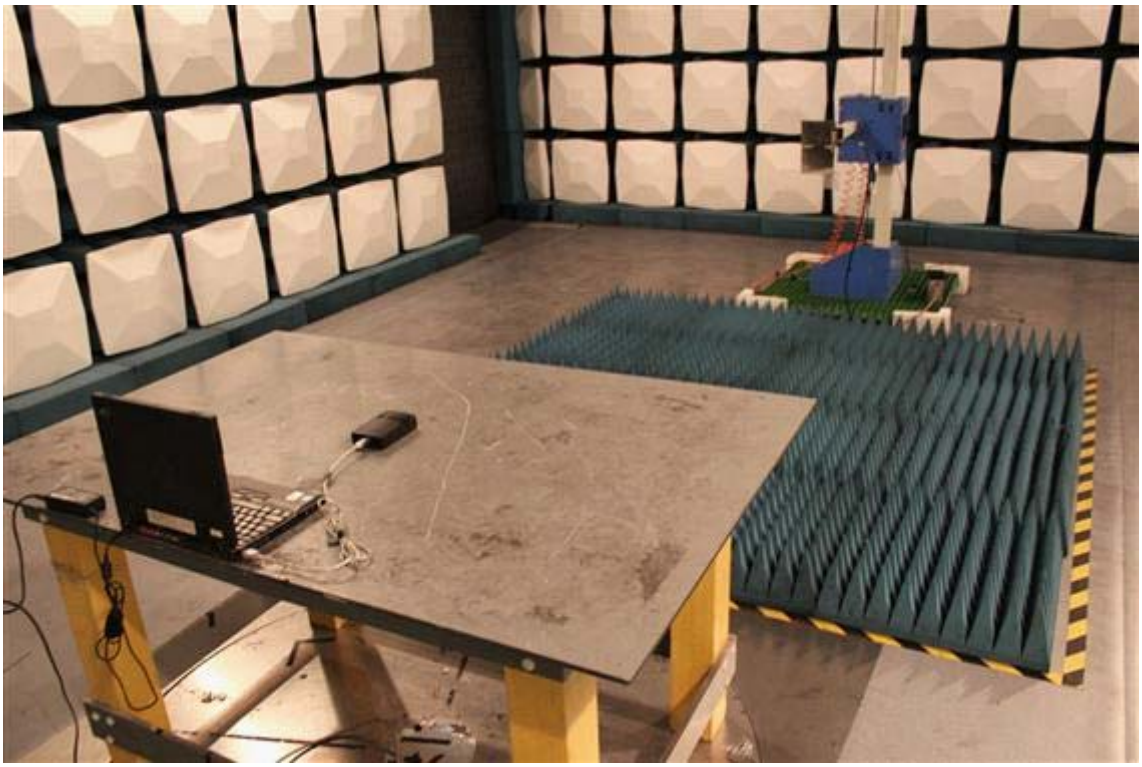
Notes:

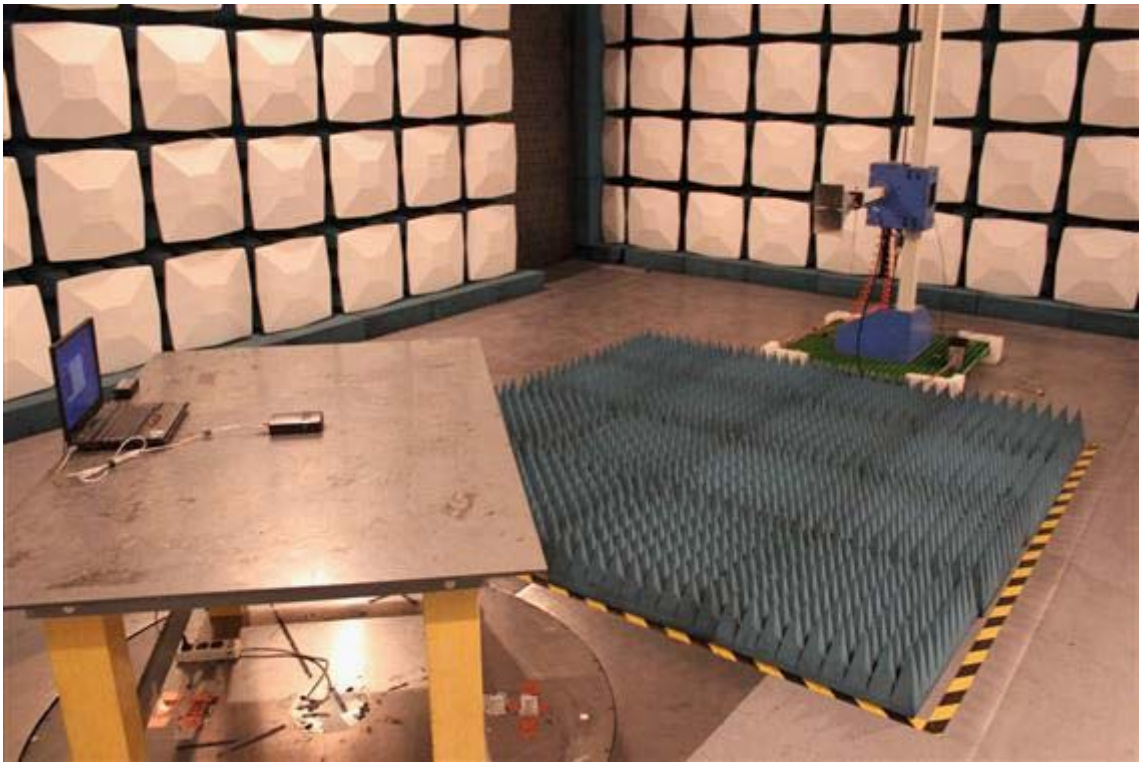
1. *.Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
3. *The frequency that above 1GHz, the emission measurements of basic frequency and harmonic frequency is not suitable, and is mainly from the environment noise.*

APPENDIX 1
PHOTOGRAPHS OF TEST SETUP

CE TEST SETUP

RE TEST SETUP



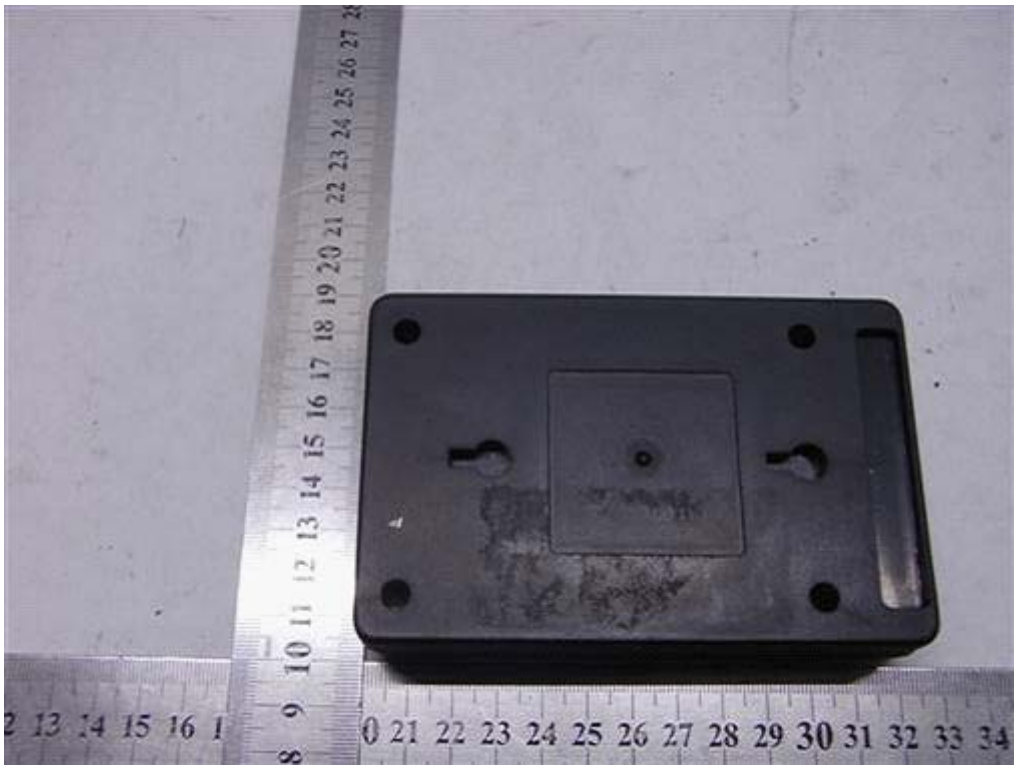


CONDUCTED SPURIOUS EMISSION TEST SETUP

APPENDIX 2
PHOTOGRAPHS OF EUT

FRONT VIEW OF SAMPLE

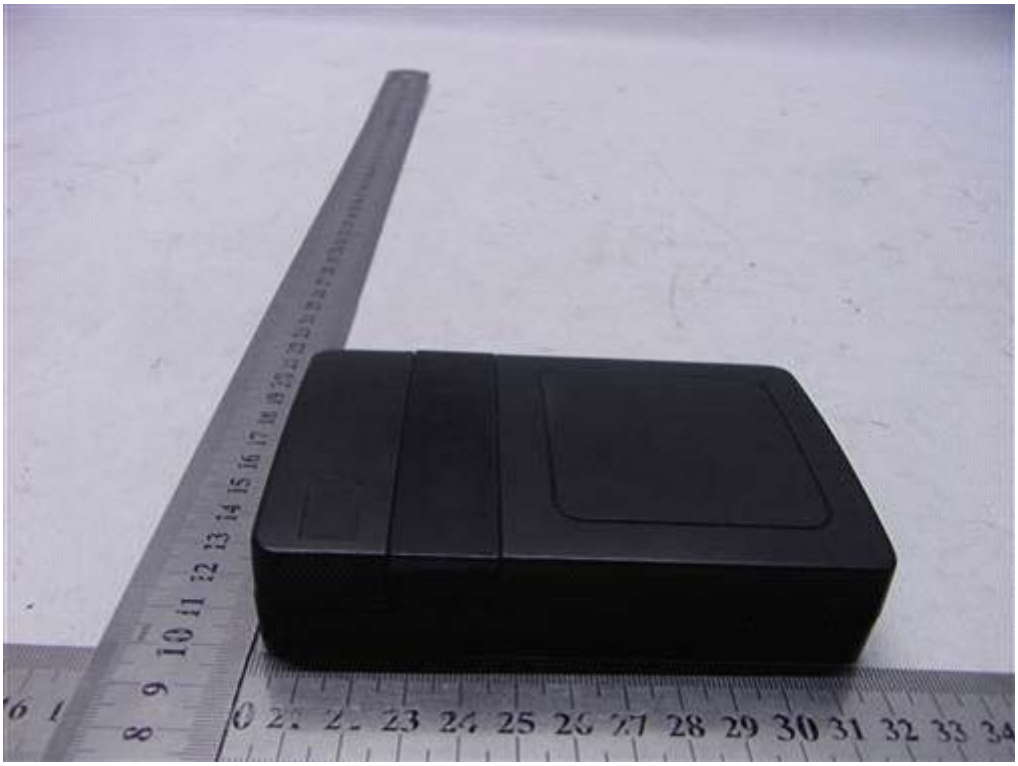
BACK VIEW OF SAMPLE



LEFT VIEW OF SAMPLE

RIGHT VIEW OF SAMPLE

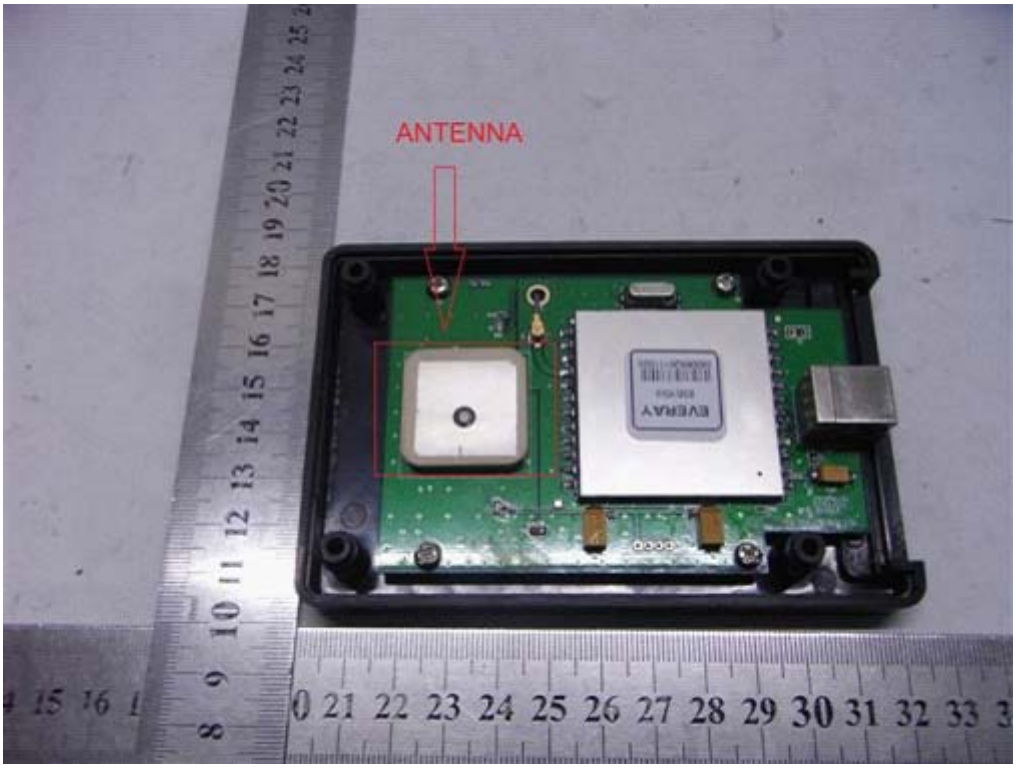
TOP VIEW OF SAMPLE



BOTTOM VIEW OF SAMPLE

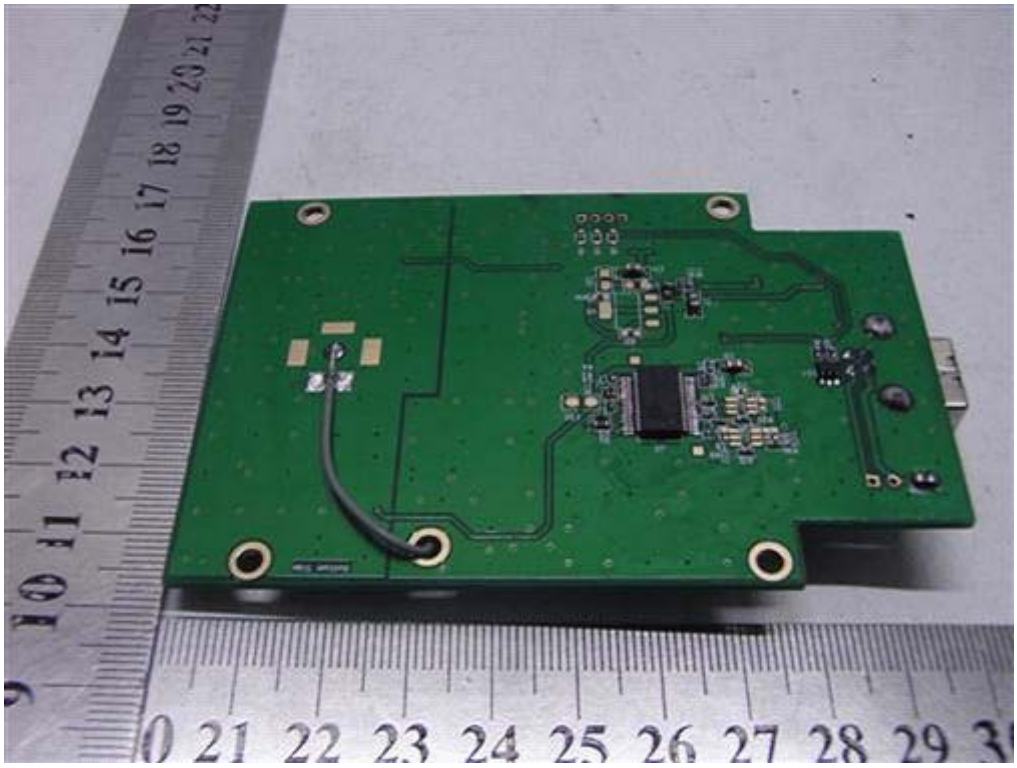
PHOTO OF THE ENTIRE SAMPLE

INTERNAL PHOTO OF SAMPLE – 1

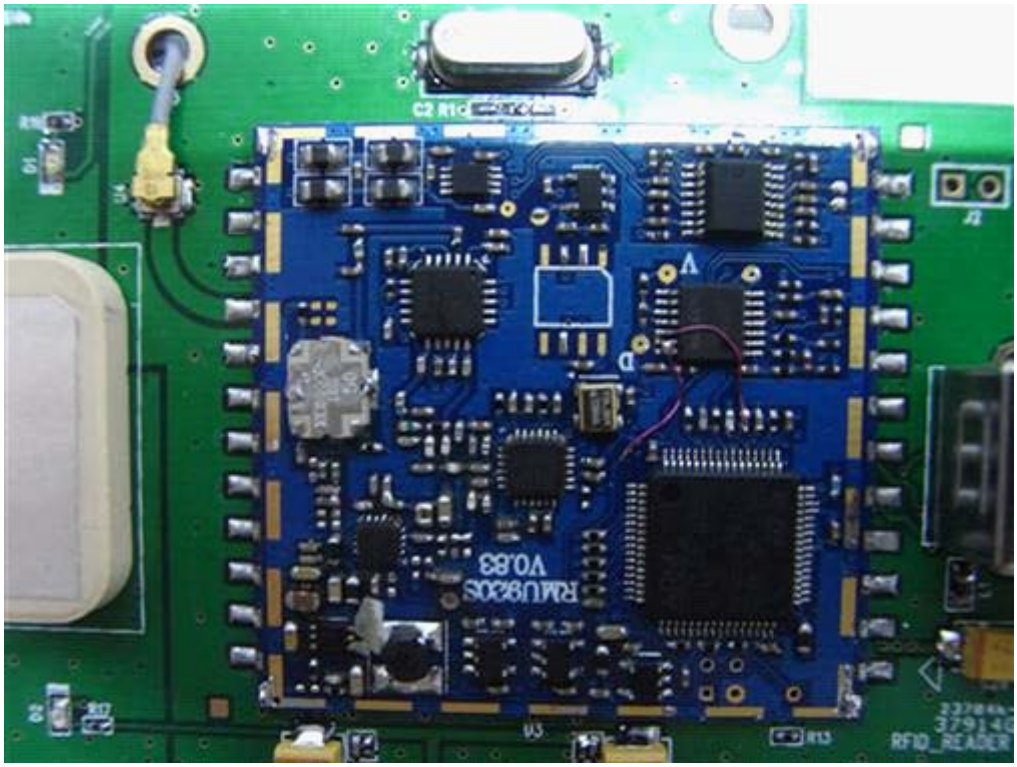


INTERNAL PHOTO OF SAMPLE – 2

INTERNAL PHOTO OF SAMPLE –3



INTERNAL PHOTO OF SAMPLE –4



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