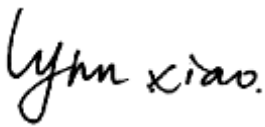
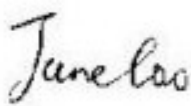
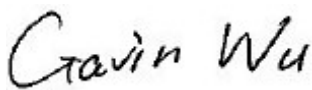


TEST REPORT

Report No.:	EM201300847	Application No.:	ZJ00035069
Client:	Shanghai Sunray Technology Co., Ltd.		
Address:	8F, Bei Da 2, NO.560 Sheng Xia Rd, Pudong Zhangjiang, Shanghai, China		
Sample Description:	Micro Power Wireless Data Module		
Model:	SRWF-1022		
Adding model:	/		
FCC ID:	RBC-1022		
Test Specification:	FCC Part 15.231,Subpart C:2012		
Test Date:	2013-10-18 to 2014-05-06		
Issue Date:	2014-05-06		
Test Result:	Pass.		
Prepared By:	Reviewed By:	Approved By:	
Test Engineer	Technical Manager	Manager	
			
Date:2014-05-06	Date:2014-05-06	Date:2014-05-06	
Other Aspects:			
/			
Abbreviations: ok / P = passed; fail / F = failed; n.a. / N = not applicable			
The test result in this test report refers exclusively to the presented test sample. This report shall not be reproduced except in full, without the written approval of GRGT.			

DIRECTIONS OF TEST

1. This station carries out test task according to the national regulation of verifications which can be traced to National Primary Standards and BIPM.
2. The test report merely corresponds to the test sample. It is not permitted to copy extracts of these test result without the written permission of the test laboratory.
3. If there is any objection concerning the test, the client should inform the laboratory within 15 days from the date of receiving the test report.

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1. TEST RESULT SUMMARY

Section C of FCC Part 15.231:2012			
Standard	Item	Limit / Severity	Result
FCC Part 15,Subpart C (15.231)	Antenna Requirement	Section 15.203	PASS
	Cease transmission time after activation	Section 15.231(a)(2)	PASS
	Field strength of fundamental	Section 15.231(b)	PASS
	Radiated Spurious Emission	Section 15.209 &15.231(b)	PASS
	Occupied Bandwidth	Section 15.231 (c)	PASS

2. GENERAL DESCRIPTION OF EUT

2.1 APPLICANT

Name: Shanghai Sunray Technology Co., Ltd.
Address: 8F, Bei Da 2, NO.560 Sheng Xia Rd, Pudong Zhangjiang, Shanghai, China

2.2 MANUFACTURER

Name: Shanghai Sunray Technology Co., Ltd.
Address: 8F, Bei Da 2, NO.560 Sheng Xia Rd, Pudong Zhangjiang, Shanghai, China

2.3 BASIC DESCRIPTION OF EQUIPMENT UNDER TEST

Equipment: Micro Power Wireless Data Module
Model No.: SRWF-1022
Trade Name: Sunray
Power Supply: Input:AC 100-240V 50Hz/60Hz
Output:3.6V 1A
Frequency 470.5~479.5MHz
Type of Modulation GFSK
Antenna Type exposed antenna

3. LABORATORY AND ACCREDITATIONS

3.1 LABORATORY

The tests and measurements refer to this report were performed by Guangzhou GRG Metrology and Test CO., LTD.

Add. : 163 Pingyun Rd, West of Huangpu Ave, Guangzhou, 510656, P. R. China

Telephone: +86-20-38699959, 38699960, 38699961

Fax : +86-20-38695185

3.2 ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

USA	FCC Listed Lab (No. 688188)
China	CNAS (No.L0446)
China	DILAC (No.DL175)
Canada	Registration No.:8355A-1

3.3 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement		Frequency	Uncertainty
Radiated Emission	Horizontal	30MHz～1000MHz	4.2dB
		1GHz～26.5GHz	4.2dB
	Vertical	30MHz～1000MHz	4.4dB
		1GHz～26.5GHz	4.4dB
Conducted Emission		9kHz～30MHz	3.1 dB

This uncertainty represents an expanded uncertainty factor of $k=2$.

3.4 LIST OF USED TEST EQUIPMENT AT GRGT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Transmitter Time/Occupied bandwidth				
Receiver	R&S	ESU40	100106	2015-01-26
Radiated Emissions				
Biconical Log-periodic Antenna	ETS.LINDGREN	3142C	00075971	2014-05-25
Pre-amplifier	Compliance Direction Systems Inc.	PAP-0203	22003	2014-12-08
Receiver	R&S	ESU40	100106	2015-01-26
Horn antenna	SCHWARZBECK	BBHA9120D	D752	2015-08-02
Cable	GRGT	GRGT2	GRGT2	2014-07-11

NOTE: The calibration interval of the above test instruments is 12 months.

4. TEST RESULTS

4.1 E.U.T. TEST CONDITIONS

Type of antenna: exposed antenna

Temperature: 21.0 °C

Humidity: 51 % RH

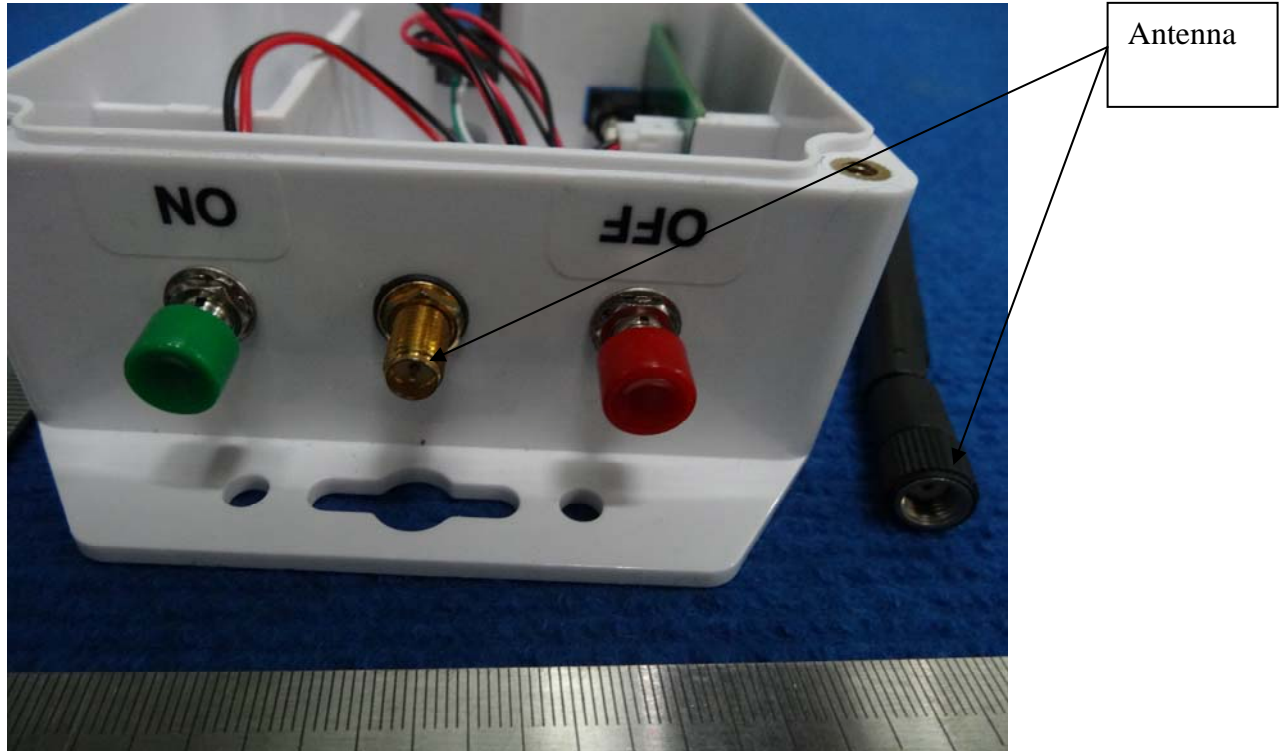
Atmospheric Pressure: 1011 mbar

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

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

4.2 ANTENNA REQUIREMENT

The EUT antenna is exposed antenna. Antenna gain is -1dBi .which accordance 15.203.is considered sufficient to comply with the provisions of this section



4.3 OCCUPIED BANDWIDTH

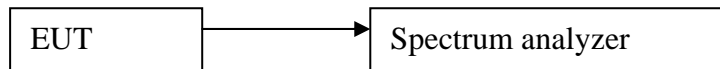
4.3.1 LIMITS

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

4.3.2 TEST PROCEDURES

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: Span = approximately 2 to 3 times the 20dB bandwidth, centred on a hopping channel;
3. Set the spectrum analyzer: RBW \geq 1% of the 20dB bandwidth (set 1 kHz). VBW \geq RBW. Sweep = auto; Detector Function = Peak. Trace = Max Hold.
4. Mark the peak frequency and -20dB points or 99% bandwidth.
5. Bandwidth value is OBW value.

4.3.3 TEST SETUP



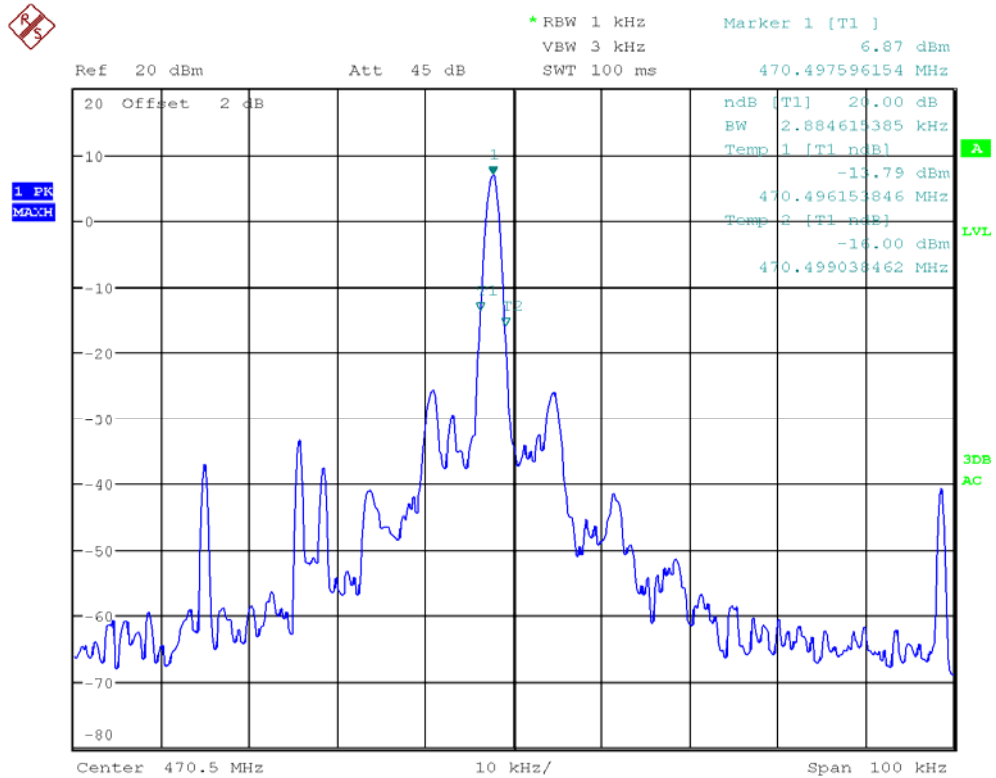
4.3.4 TEST RESULTS

Frequency (MHz)	20dB Bandwidth Emission (kHz)	Limit (MHz)	Limit (MHz)
470.5	2.884	1.176	Pass
479.5	2.884	1.199	Pass

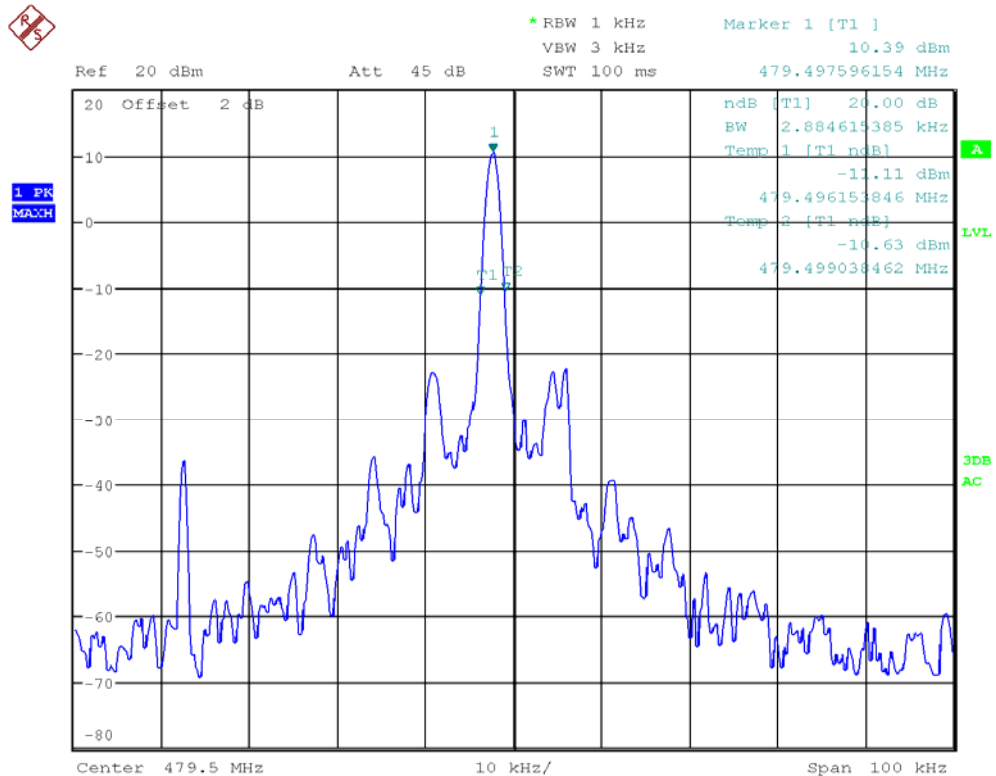
Limit=Frequency x 0.25%=470.005 x 0.25%=1.175MHz

Refer to attached plots:

Channel 470.5 MHz



Channel 479.5 MHz



4.4 CEASE TRANSMISSION TIME AFTER ACTIVATION

4.4.1 LIMITS

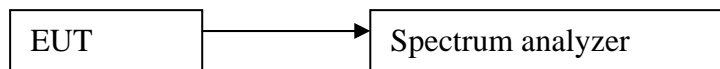
15.231 (a) (1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

(2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.

4.4.2 TEST PROCEDURES

1. Set spectrum analyzer span = 0. centered on a hopping channel;
2. Set RBW = 30 KHz and VBW = 100KHz. Sweep = as necessary to capture the entire dwell time per hopping channel. Detector Function = Peak. Trace = Max hold;
3. Use the marker-delta function to determine the dwell time.

4.4.3 TEST SETUP

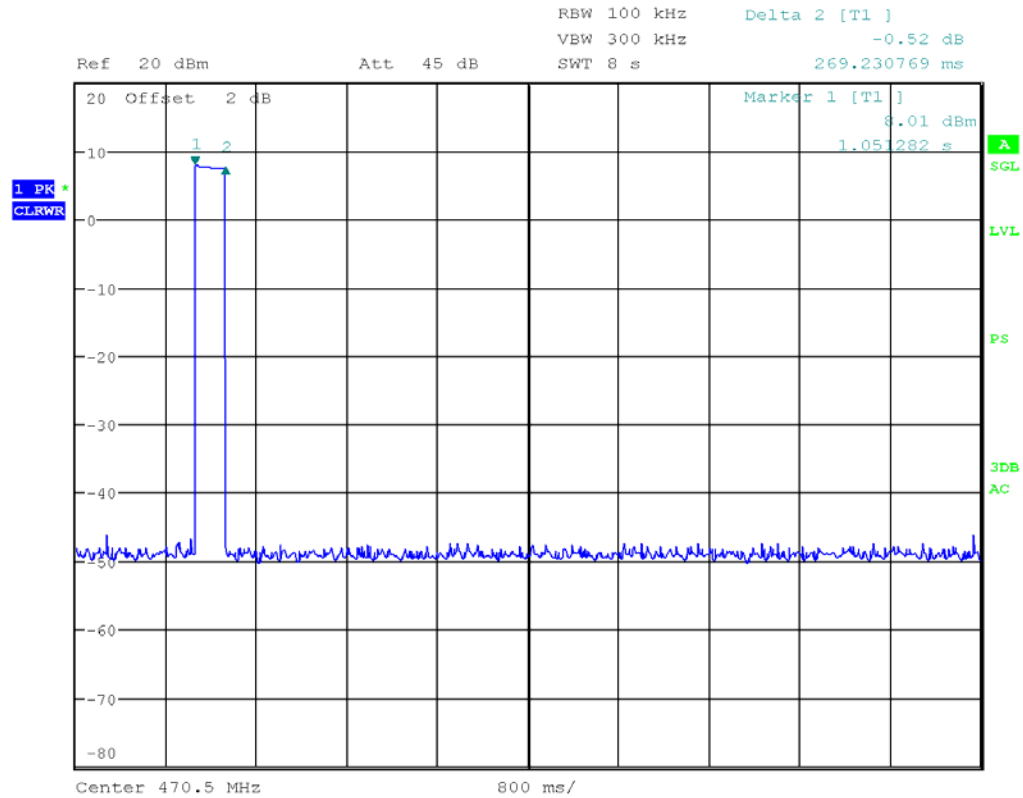


4.4.4 TEST RESULTS

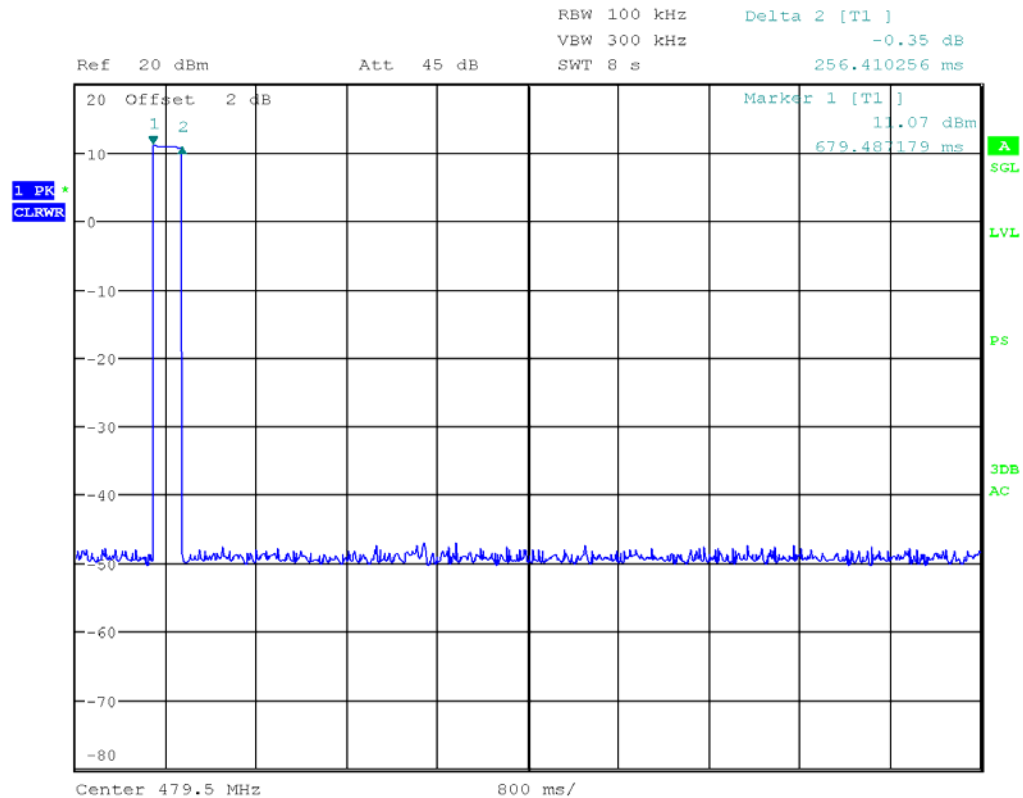
A manually operated transmitter can cease transmission within 5 seconds after activation.

Please refer the graph as below:

Channel 470. 5MHz



Channel 479. 5MHz



4.5 FIELD STRENGTH OF FUNDAMENTAL

4.5.1 LIMITS

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

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 range 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

(a) On any frequency or frequencies below or equal to 1000 MHz, the limits shown are based on measuring equipment employing a CISPR quasi-peak detector function and related measurement bandwidths, unless otherwise specified. The specifications for the measuring instrument using the CISPR quasi-peak detector can be found in Publication 16 of the International Special Committee on Radio Interference (CISPR) of the International Electro technical Commission. As an alternative to CISPR quasi-peak measurements, the responsible party, at its option, may demonstrate compliance with the emission limits using measuring equipment employing a peak detector function, properly adjusted for such factors as pulse desensitization, as long as the same bandwidths as indicated for CISPR quasi-peak measurements are employed.

Note: For pulse modulated devices with a pulse-repetition frequency of 20 Hz or less and for which CISPR quasi-peak measurements are specified, compliance with the regulations shall be demonstrated using measuring equipment employing a peak detector function, properly adjusted for such factors as pulse desensitization, using the same measurement bandwidths that are indicated for CISPR quasi-peak measurements.

(b) Unless otherwise specified, on any frequency or frequencies above 1000 MHz, the radiated emission limits are based on the use of measurement instrumentation employing an average detector function . Unless otherwise specified, measurements above 1000 MHz shall be performed using a minimum resolution bandwidth of 1 MHz. When average radiated emission measurements are specified in this part,

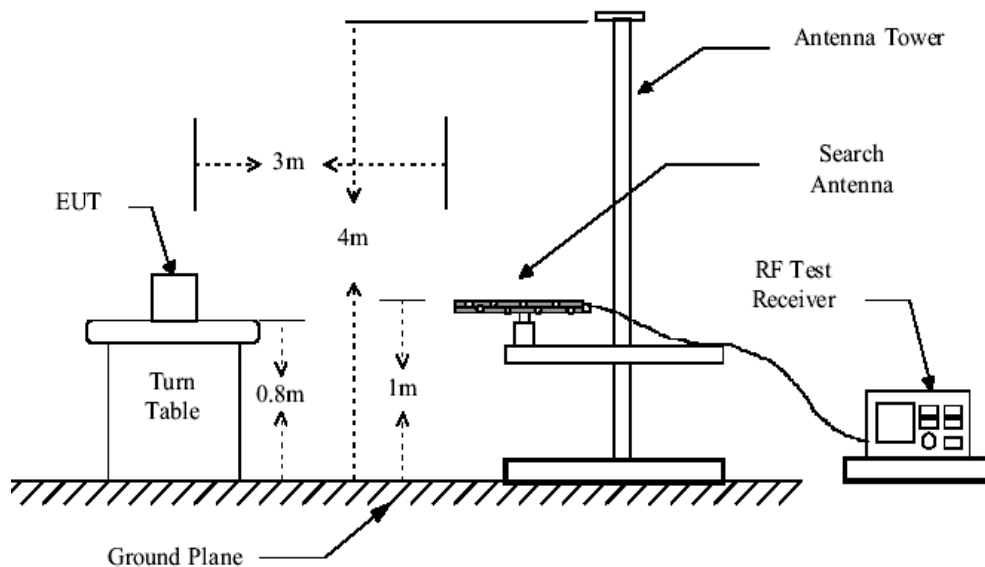
including average emission measurements below 1000 MHz, there also is a limit on the peak level of the radio frequency emissions. Unless otherwise specified, *e.g.*, see §§ 15.250, 15.252, 15.255, and 15.509-15.519 of this part, the limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device, *e.g.*, the total peak power level. Note that the use of a pulse desensitization correction factor may be needed to determine the total peak emission level. The instruction manual or application note for the measurement instrument should be consulted for determining pulse desensitization factors, as necessary.

4.5.2 TEST PROCEDURES

Spectrum analyzer set up:

Below 1GHz Set the spectrum analyzer: RBW =100 KHz VBW \geq RBW, Span = enough to catch the trace. Sweep = auto; Detector Function = Peak and Avg. Trace = Max,hold.

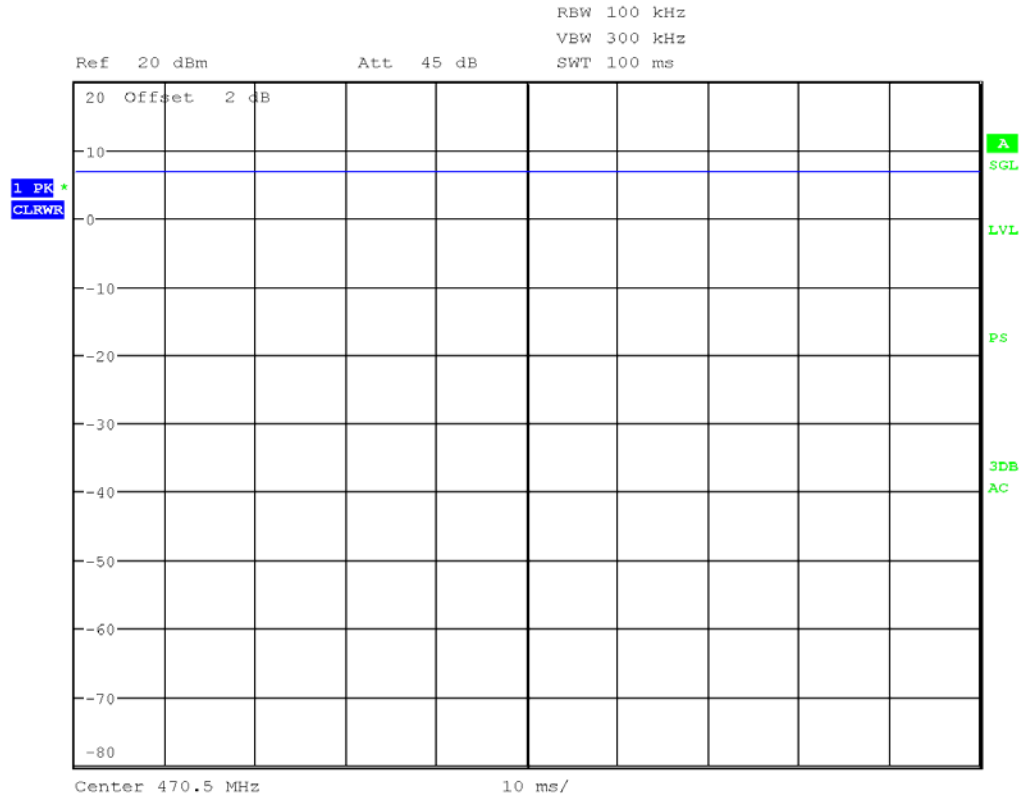
4.5.3 TEST SETUP



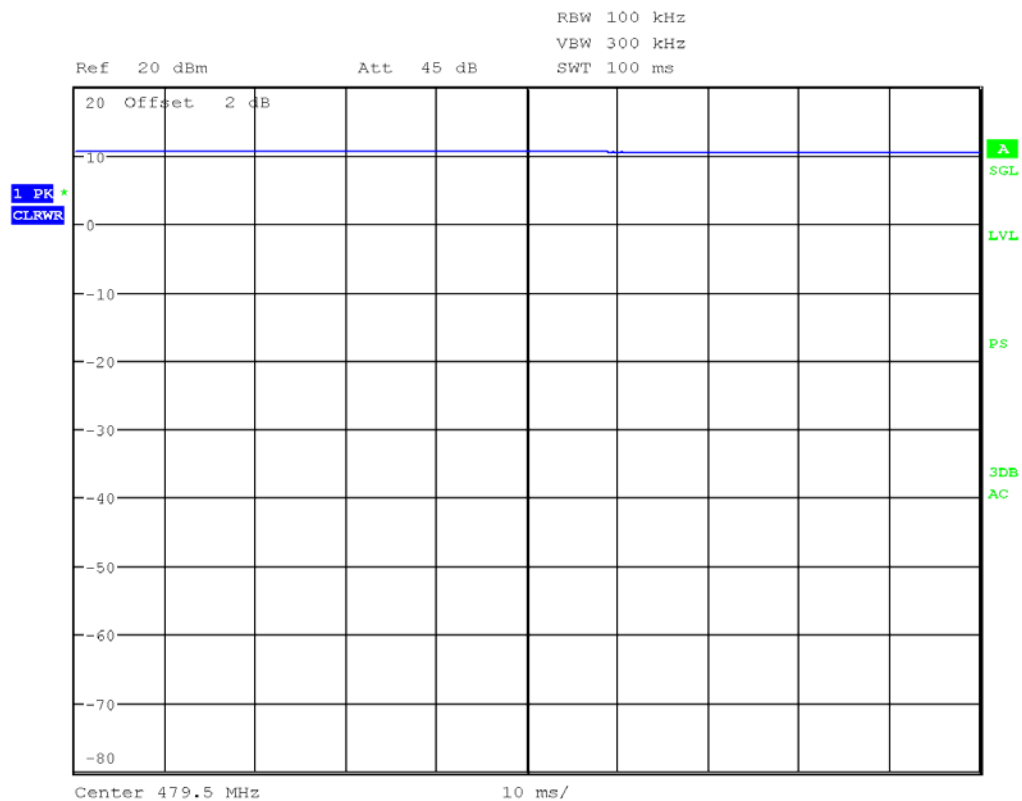
4.5.3 TEST RESULTS

Duty cycle: 100%

Channel 470.5MHz:



Channel 479.5MHz:



Channel 470.5MHz:

No	Frequency MHz	Reading dBuV/m	Correct Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol V/H
1	470.4968	53.21	19.85	73.06	101.94	-28.88	Peak	VERTICAL
2	470.4968	52.45	19.85	72.30	101.94	-29.64	Peak	HORIZONTAL

No	Frequency MHz	Reading dBuV/m	Correct Factor dB/m	Avg dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol V/H
1	470.4968	51.25	19.85	71.10	81.94	-10.84	Avg	VERTICAL
2	470.4968	51.05	19.85	70.90	81.94	-11.04	Avg	HORIZONTAL

Channel 479.5MHz:

No	Frequency MHz	Reading dBuV/m	Correct Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol V/H
1	479.4968	54.34	20.01	74.35	101.94	-27.59	Peak	VERTICAL
2	479.4968	53.92	20.01	73.93	101.94	-28.01	Peak	HORIZONTAL

No	Frequency MHz	Reading dBuV/m	Correct Factor dB/m	Avg dBuV/m	Limit dBuV/m	Margin dB	Remark	Pol V/H
1	479.4968	51.79	20.01	70.80	81.94	-11.14	Avg	VERTICAL
2	479.4968	51.59	20.01	70.60	81.94	-11.34	Avg	HORIZONTAL

Note: Duty Cycle: 100%

4.6 RADIATED SPURIOUS EMISSIONS

4.6.1 LIMITS

Frequency (MHz)	Quasi-peak(dBμV/m)
30 ~ 88	40
88~216	43.5
216 ~ 960	46
Above 960	54

NOTE: (1) The lower limit shall apply at the transition frequencies.

Frequency (GHz)	Quasi-peak(dBμV/m)
1 ~ 5	74
1~ 5	54

4.6.2 TEST PROCEDURES

Procedure of Preliminary Test

Radiated emission tests shall be made with the receive or transmit antenna located at a horizontal distance of 3 m plus half of the maximum width of the EUT being tested, measured from the centre of the EUT. The tests shall be performed with the equipment configured as closely as possible to its typical, practical operation. Unless stated otherwise, cables and wiring shall be as specified by the manufacturer and the equipment shall be in its housing (or cabinet) with all covers and access panels in place. Any deviation from normal EUT operating conditions shall be included in the test report.

The EUT (on a non-conductive support structure, where applicable) shall be placed on a remotely operated turntable, to allow the EUT to be rotated. The height of the EUT above the ground plane shall be according to the following requirements.

- Table-top equipment is placed on a non-conductive set-up table with height $0,8\text{ m} \pm 0,01\text{ m}$, ANSI C63.4 specifies the method to determine the impact of the non-conductive set-up table on test results.
- Floor-standing equipment is placed on a non-conductive support, as specified in the applicable product standard. If there are no EUT height placement requirements in the product standard, the EUT shall be placed on a non-conductive support at a height of 5 cm to 15 cm above the ground plane.

Interface cables, loads, and devices should be connected to at least one of each type of the interface ports of the EUT and, where practical, each cable shall be terminated in a device typical for its actual use. Where there are multiple interface ports of the same type, a typical number of these devices shall be connected to devices or loads. It is sufficient to connect only one of the loads, provided that it can be shown, for example by preliminary testing, that the connection of further ports would not significantly increase the level of disturbance (that is, more than 2 dB) or significantly degrade the immunity level.

The test mode(s) described in Item 2.4 were scanned during the preliminary test. After the preliminary scan, we found the test mode described in Item 2.4 producing the highest emission level. The EUT and cable configuration, antenna position, polarization and turntable position of the above highest emission level were recorded for the final test.

Procedure of Final Test

EUT and support equipment were set up on the turntable as per the configuration with highest

emission level in the preliminary test. The Analyzer / Receiver scanned from 30MHz to 1000MHz. Emissions were scanned and measured rotating the EUT to 360 degrees, varying cable placement and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level. Record at least six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and only QP reading is presented. The test data of the worst-case condition(s) was recorded.

Procedure of Final Test

EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test. A scan was taken on both power lines, 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. The test data of the worst-case condition(s) was recorded.

Below 1GHz Set the spectrum analyzer: RBW = 100KHz VBW \geq RBW, Span = enough to catch the trace. Sweep = auto; Detector Function = Peak. Trace = Max,hold.

Above 1GHz Set the spectrum analyzer: RBW = 1MHz VBW \geq RBW, Span = enough to catch the trace. Sweep = auto; Detector Function = Peak. Trace = Max,hold.

4.6.3 TEST SETUP

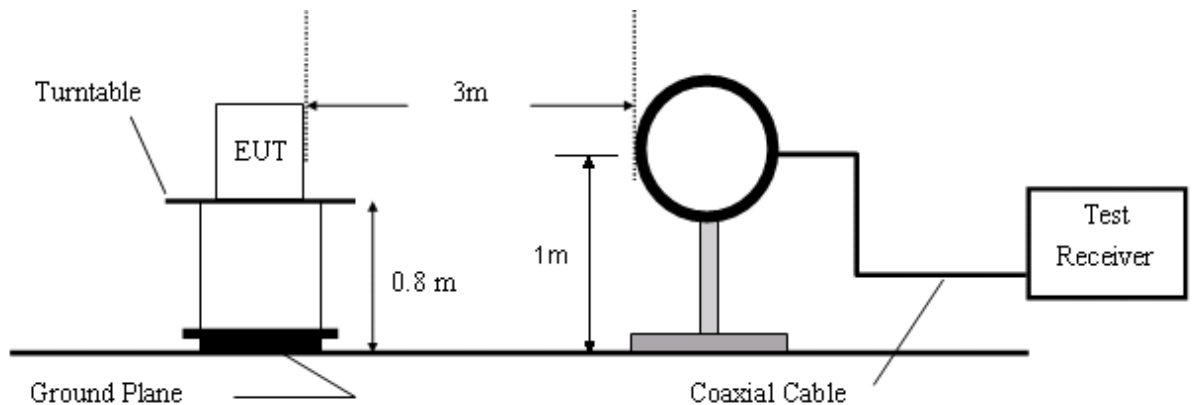


Figure 1. 9KHz to 30MHz radiated emissions test configuration

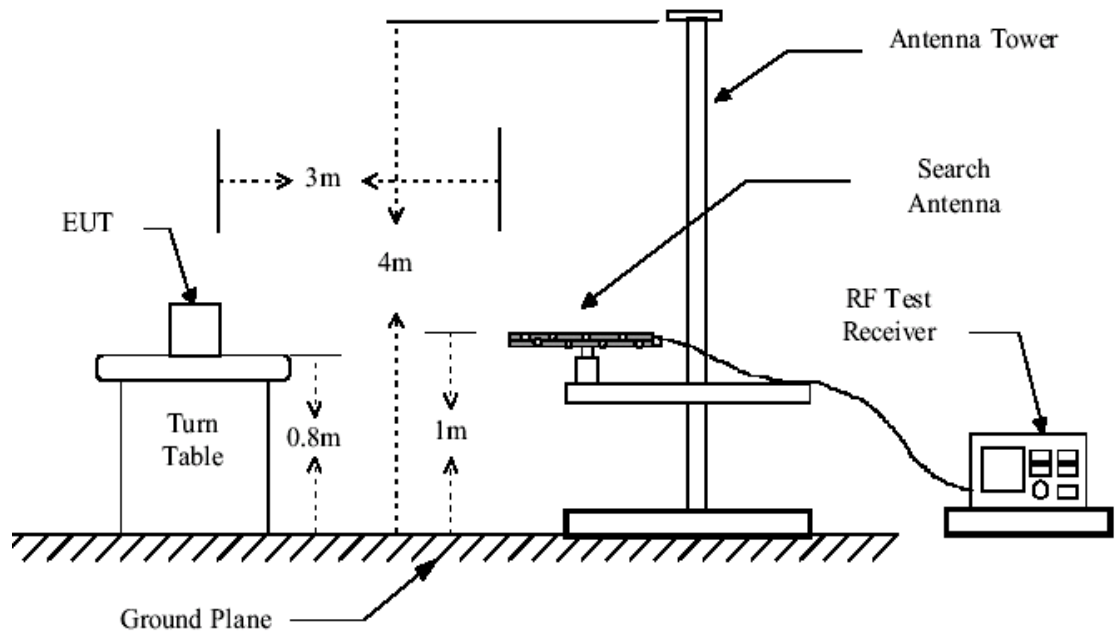


Figure 2. 30MHz to 1GHz radiated emissions test configuration

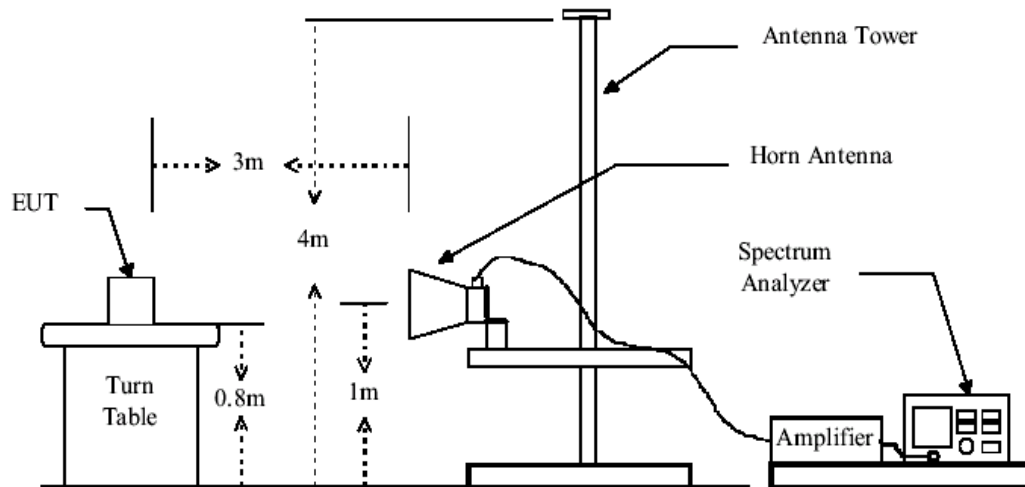


Figure 3. Above 1GHz radiated emissions test configuration

4.6.4 TEST RESULTS

Channel 470.5MHz:

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

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Antenna polarization
1	55.3525	8.88	8.82	17.70	40.00	-22.30	Vertical
2	84.3675	12.37	9.03	21.40	40.00	-18.60	Vertical
3	98.1904	12.65	9.95	22.60	43.50	-20.90	Vertical
4	242.6561	8.22	13.38	21.60	46.00	-24.40	Vertical
5	526.9650	7.38	20.72	28.10	46.00	-17.90	Vertical
6	945.3549	7.77	26.23	34.00	46.00	-12.00	Vertical
7	31.3795	1.63	18.57	20.20	40.00	-19.80	Horizontal
8	36.3160	0.54	15.56	16.10	40.00	-23.90	Horizontal
9	43.7154	1.98	12.02	14.00	40.00	-26.00	Horizontal
10	47.2935	2.59	10.71	13.30	40.00	-26.70	Horizontal
11	99.8598	3.70	10.00	13.70	43.50	-29.80	Horizontal
12	134.5047	3.59	8.91	12.50	43.50	-31.00	Horizontal

1~5 GHz Harmonics & Spurious Emissions. Peak & Average Measurement

Peak Measurement:

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Antenna polarization
1	1828.579	27.59	3.79	31.38	74.00	-42.62	Vertical
2	2270.941	27.65	4.83	32.48	74.00	-41.52	Vertical
3	3023.722	28.69	11.66	40.35	74.00	-33.65	Vertical
4	3784.377	27.91	12.72	40.63	74.00	-33.37	Vertical
5	3974.451	26.42	13.24	39.66	74.00	-34.34	Vertical
6	4651.639	28.50	15.57	44.07	74.00	-29.93	Vertical
7	1960.458	27.55	3.84	31.39	74.00	-42.61	Horizontal
8	2403.527	27.45	5.30	32.75	74.00	-41.25	Horizontal
9	2842.225	27.73	9.72	37.45	74.00	-36.55	Horizontal
10	3062.969	28.60	11.69	40.29	74.00	-33.71	Horizontal
11	3520.711	27.58	12.01	39.59	74.00	-34.41	Horizontal
12	4651.639	28.69	15.57	44.26	74.00	-29.74	Horizontal

AV Measurement:

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Antenna polarization
1	1828.579	14.11	3.79	17.90	54.00	-36.10	Vertical
2	2270.941	14.57	4.83	19.40	54.00	-34.60	Vertical
3	3023.722	15.14	11.66	26.80	54.00	-27.20	Vertical
4	3784.377	15.38	12.72	28.10	54.00	-25.90	Vertical
5	3974.451	15.36	13.24	28.60	54.00	-25.40	Vertical
6	4651.639	18.13	15.57	33.70	54.00	-20.30	Vertical
7	1960.458	15.26	3.84	19.10	54.00	-34.90	Horizontal
8	2403.527	14.20	5.30	19.50	54.00	-34.50	Horizontal
9	2842.225	15.18	9.72	24.90	54.00	-29.10	Horizontal
10	3062.969	16.51	11.69	28.20	54.00	-25.80	Horizontal
11	3520.711	14.39	12.01	26.40	54.00	-27.60	Horizontal
12	4651.639	17.53	15.57	33.10	54.00	-20.90	Horizontal

The field strength is calculated by adding the Antenna Factor. Correct Factor.

The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Correct Factor

Channel 479.5MHz:

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

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Antenna polarization
1	46.7651	10.31	10.89	21.20	40.00	-18.80	Vertical
2	49.1911	7.87	10.03	17.90	40.00	-22.10	Vertical
3	75.8238	10.31	8.19	18.50	40.00	-21.50	Vertical
4	79.7572	13.66	8.54	22.20	40.00	-17.80	Vertical
5	99.3002	11.42	9.98	21.40	43.50	-22.10	Vertical
6	164.6630	6.99	10.61	17.60	43.50	-25.90	Vertical
7	34.9152	1.96	16.44	18.40	40.00	-21.60	Horizontal
8	46.7651	3.21	10.89	14.10	40.00	-25.90	Horizontal
9	47.8282	3.18	10.52	13.70	40.00	-26.30	Horizontal
10	100.4225	4.42	9.98	14.40	43.50	-29.10	Horizontal
11	844.8599	4.61	25.19	29.80	46.00	-16.20	Horizontal
12	961.4272	9.77	26.43	36.20	54.00	-17.80	Horizontal

1~5 GHz Harmonics & Spurious Emissions. Peak & Average Measurement

Peak Measurement:

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Antenna polarization
1	2074.917	28.04	4.12	32.16	74.00	-41.84	Vertical
2	2543.854	28.73	6.07	34.80	74.00	-39.20	Vertical
3	2813.052	28.07	9.37	37.44	74.00	-36.56	Vertical
4	3126.826	29.17	11.73	40.90	74.00	-33.10	Vertical
5	4556.641	29.86	15.24	45.10	74.00	-28.90	Vertical
6	4923.219	28.41	16.51	44.92	74.00	-29.08	Vertical
7	2156.766	27.82	4.42	32.24	74.00	-41.76	Horizontal
8	2511.259	28.44	5.77	34.21	74.00	-39.79	Horizontal
9	3070.879	28.21	11.69	39.90	74.00	-34.10	Horizontal
10	3266.978	27.07	11.81	38.88	74.00	-35.12	Horizontal
11	4361.163	27.39	14.56	41.95	74.00	-32.05	Horizontal
12	4603.895	29.20	15.41	44.61	74.00	-29.39	Horizontal

AV Measurement:

No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Antenna polarization
1	2074.917	14.08	4.12	18.20	54.00	-35.80	Vertical
2	2543.854	15.03	6.07	21.10	54.00	-32.90	Vertical
3	2813.052	15.23	9.37	24.60	54.00	-29.40	Vertical
4	3126.826	16.27	11.73	28.00	54.00	-26.00	Vertical
5	4556.641	17.06	15.24	32.30	54.00	-21.70	Vertical
6	4923.219	15.39	16.51	31.90	54.00	-22.10	Vertical
7	2156.766	13.88	4.42	18.30	54.00	-35.70	Horizontal
8	2511.259	15.83	5.77	21.60	54.00	-32.40	Horizontal
9	3070.879	15.01	11.69	26.70	54.00	-27.30	Horizontal
10	3266.978	14.59	11.81	26.40	54.00	-27.60	Horizontal
11	4361.163	15.54	14.56	30.10	54.00	-23.90	Horizontal
12	4603.895	17.09	15.41	32.50	54.00	-21.50	Horizontal

The field strength is calculated by adding the Antenna Factor. Correct Factor.

The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Correct Factor

4.7 CONDUCTED EMISSION MEASUREMENT

4.7.1 LIMITS

Frequency range	Limits (dB μ V)	
	Quasi-peak	Average
150kHz \sim 0.5MHz	66 \sim 56	56 \sim 46
0.5 MHz \sim 5 MHz	56	46
5 MHz \sim 30 MHz	60	50

4.7.2 TEST PROCEDURES

Procedure of Preliminary Test

For measurement of the disturbance voltage the equipment under test (EUT) is connected to the power supply mains and any other extended network via one or more artificial network(s). An EUT, whether intended to be grounded or not, and which is to be used on a table is configured as follows:

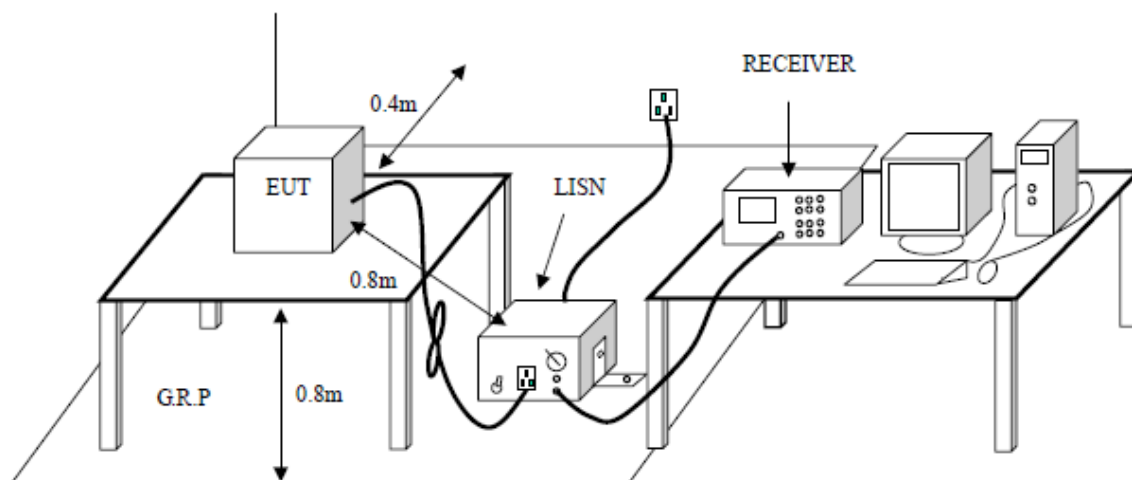
- Either the bottom or the rear of the EUT shall be at a controlled distance of 40 cm from a reference ground plane. This ground plane is normally the wall or floor of a shielded room. It may also be a grounded metal plane of at least 2 m by 2 m. This is physically accomplished as follows:
 - 1) Place the EUT on a table of non-conducting material which is at least 80 cm high. Place the EUT so that it is 40 cm from the wall of the shielded room, or
 - 2) place the EUT on a table of non-conducting material which is 40 cm high so that the bottom of the EUT is 40 cm above the ground plane;
- All other conductive surfaces of the EUT shall be at least 80 cm from the reference ground plane;
- The EUT are placed on the floor that one side of the housings is 40 cm from the vertical reference ground plane and other metallic parts;
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth forming a bundle 30 cm to 40 cm long, hanging approximately in the middle between the ground plane and the table.
- I/O cables that are connected to a peripheral shall be bundled in the centre. The end of the cable may be terminated if required using correct terminating impedance. The total length shall not exceed 1 m.

The test mode(s) described in Item 2.4 were scanned during the preliminary test. After the preliminary scan, we found the test mode described in Item 2.4 producing the highest emission level. The EUT configuration and cable configuration of the above highest emission levels were recorded for reference of the final test.

Procedure of Final Test

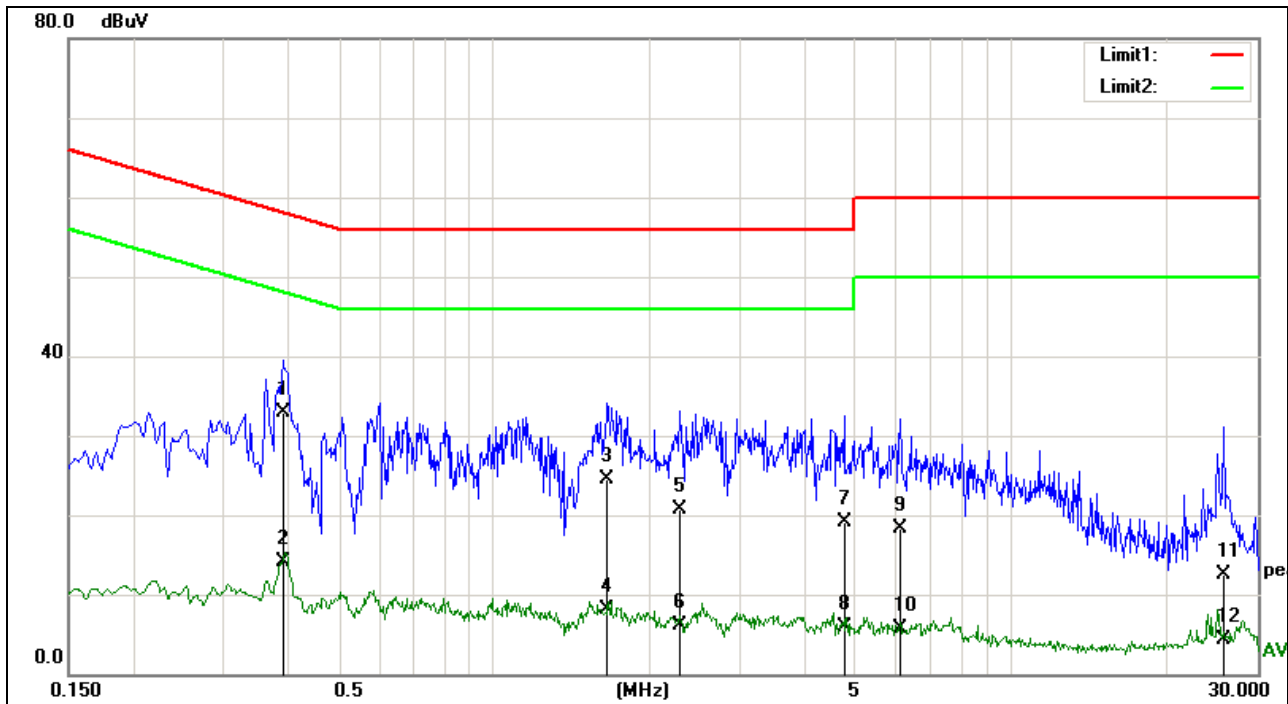
EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test. A scan was taken on both power lines, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. The test data of the worst-case condition(s) was recorded.

4.7.3 TEST SETUP



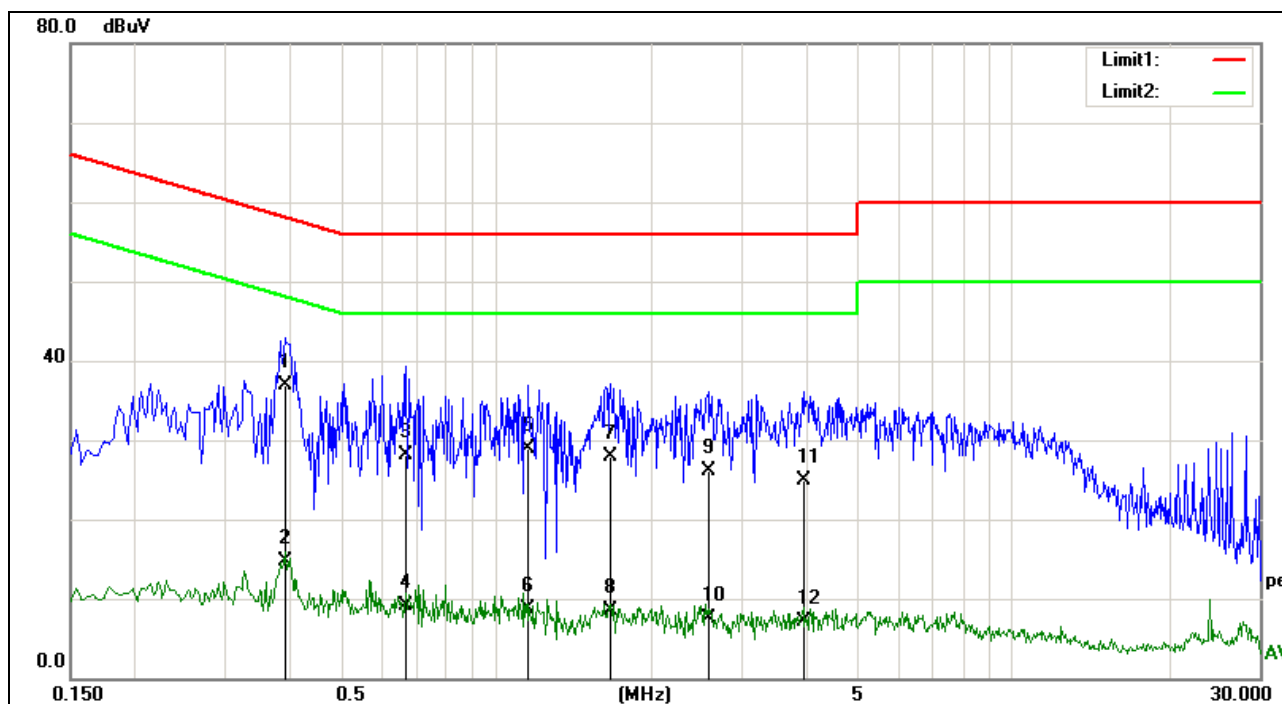
4.7.4 TEST RESULTS

Project No.:	ZJ00035069	Probe:	N
Standard:	(CE)FCC PART 15 class B_QP	Power Source:	AC 230V/50Hz
Test item:	Conduction Test	Date:	2014-4-16
Temp./Hum.(%RH):	23/57%RH	Time:	11:42:52
EUT:	Micro Power Wireless Data Module	Test Result:	Pass
Model:	SRWF-1022		
Note:	Normal		



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.3899	26.49	6.51	33.00	58.06	-25.06	QP
2	0.3899	7.59	6.51	14.10	48.06	-33.96	AVG
3	1.6620	18.02	6.58	24.60	56.00	-31.40	QP
4	1.6620	1.62	6.58	8.20	46.00	-37.80	AVG
5	2.2860	14.11	6.59	20.70	56.00	-35.30	QP
6	2.2860	-0.39	6.59	6.20	46.00	-39.80	AVG
7	4.7580	12.39	6.71	19.10	56.00	-36.90	QP
8	4.7580	-0.81	6.71	5.90	46.00	-40.10	AVG
9	6.1020	11.66	6.74	18.40	60.00	-41.60	QP
10	6.1020	-1.04	6.74	5.70	50.00	-44.30	AVG
11	25.7340	5.42	7.08	12.50	60.00	-47.50	QP
12	25.7340	-2.78	7.08	4.30	50.00	-45.70	AVG

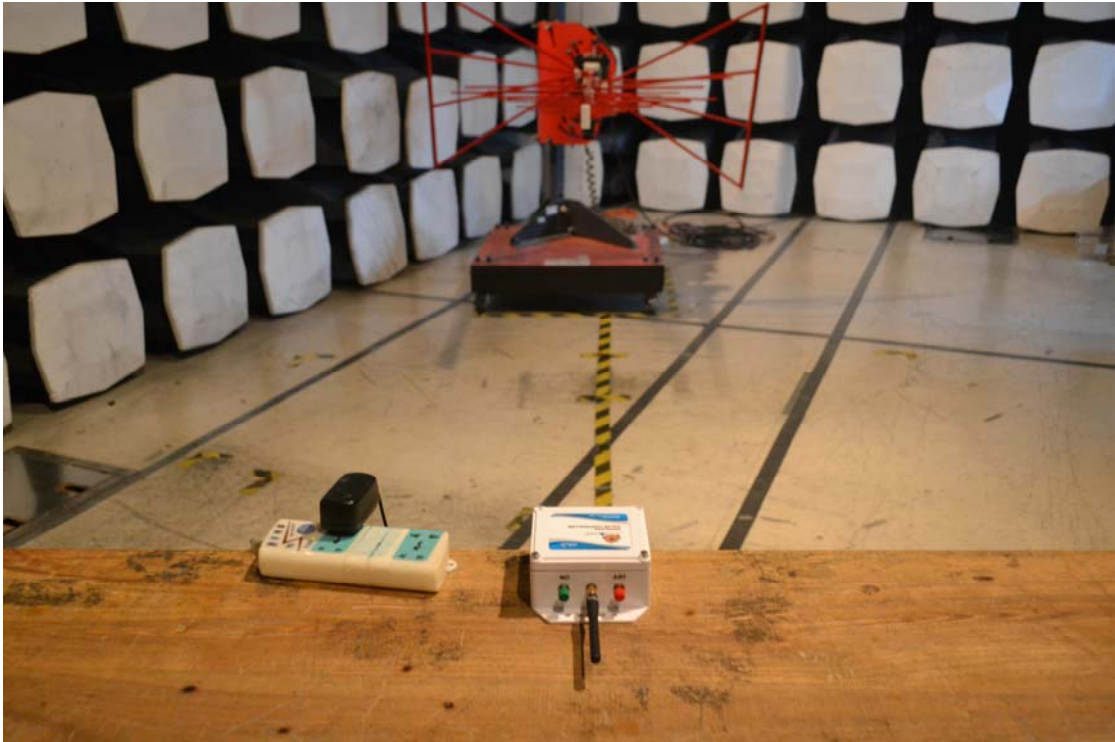
Project No.:	ZJ00035069	Probe:	L1
Standard:	(CE)FCC PART 15 class B_QP	Power Source:	AC 230V/50Hz
Test item:	Conduction Test	Date:	2014-4-16
Temp./Hum.(%RH):	23/57%RH	Time:	11:47:11
EUT:	Micro Power Wireless Data Module	Test Result:	Pass
Model:	SRWF-1022		
Note:	Normal		



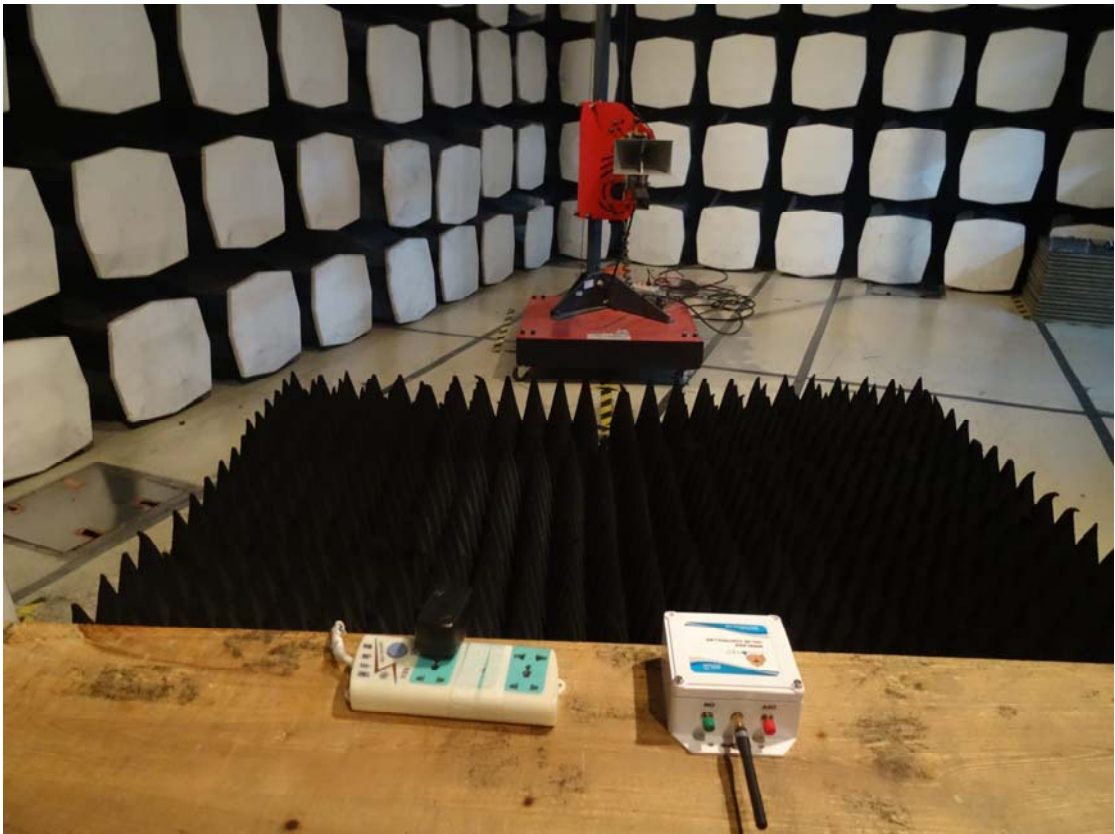
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.3899	30.39	6.51	36.90	58.06	-21.16	QP
2	0.3899	8.19	6.51	14.70	48.06	-33.36	AVG
3	0.6700	21.62	6.48	28.10	56.00	-27.90	QP
4	0.6700	2.62	6.48	9.10	46.00	-36.90	AVG
5	1.1539	22.35	6.55	28.90	56.00	-27.10	QP
6	1.1539	2.15	6.55	8.70	46.00	-37.30	AVG
7	1.6660	21.42	6.58	28.00	56.00	-28.00	QP
8	1.6660	1.92	6.58	8.50	46.00	-37.50	AVG
9	2.5780	19.41	6.69	26.10	56.00	-29.90	QP
10	2.5780	0.81	6.69	7.50	46.00	-38.50	AVG
11	3.9300	18.28	6.62	24.90	56.00	-31.10	QP
12	3.9300	0.48	6.62	7.10	46.00	-38.90	AVG

APPENDIX A: PHOTOGRAPH OF THE TEST ARRANGEMENT

RADIATED SPURIOUS EMISSION TEST (Below 1GHz)



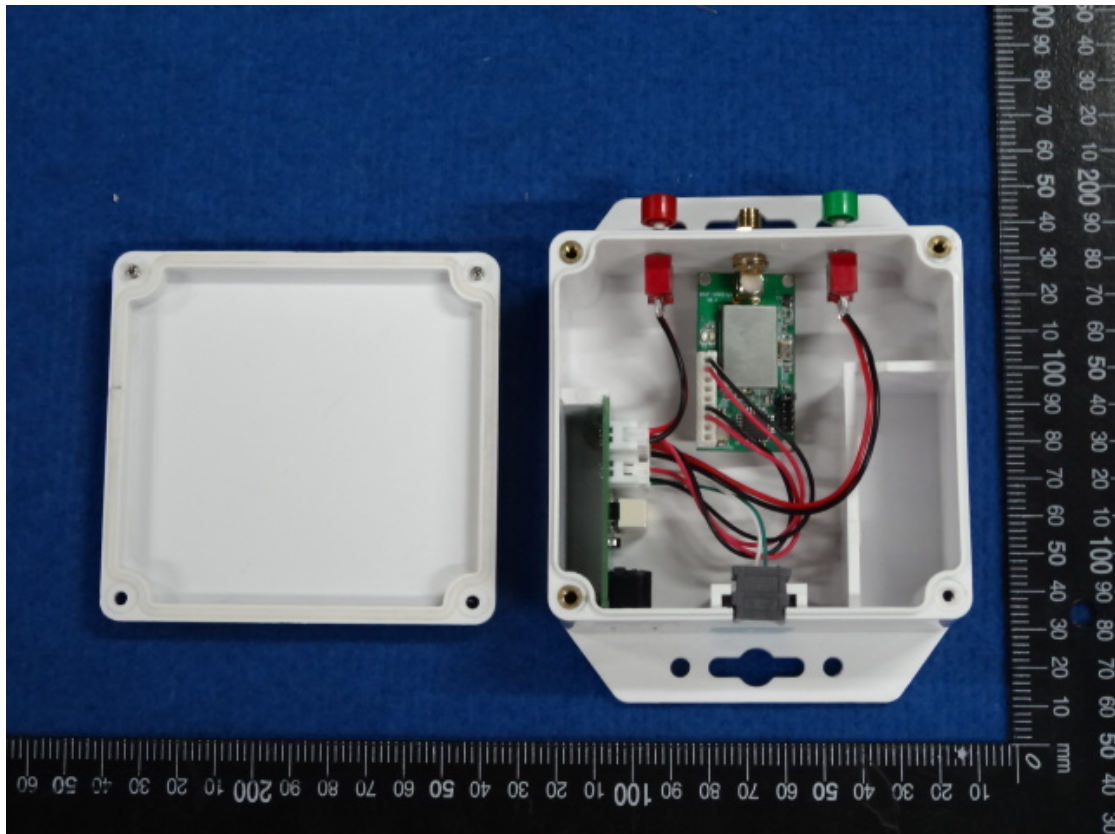
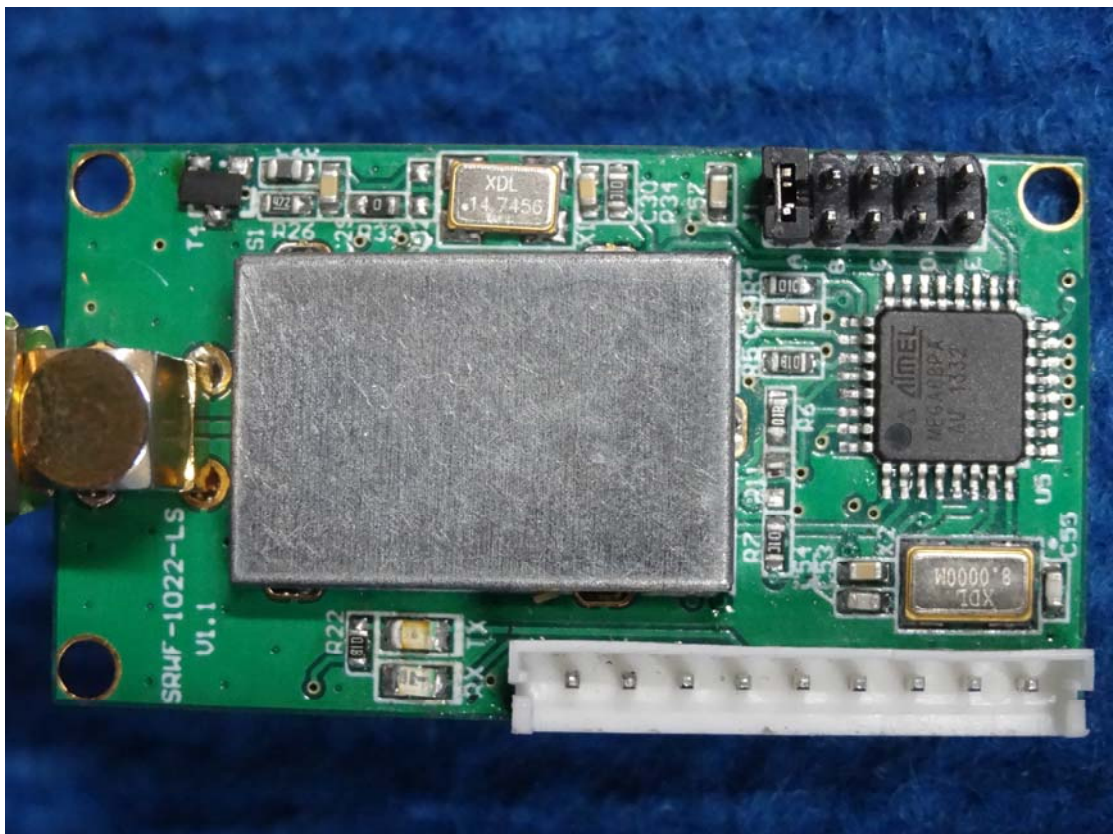
RADIATED SPURIOUS EMISSION TEST (Above 1GHz)

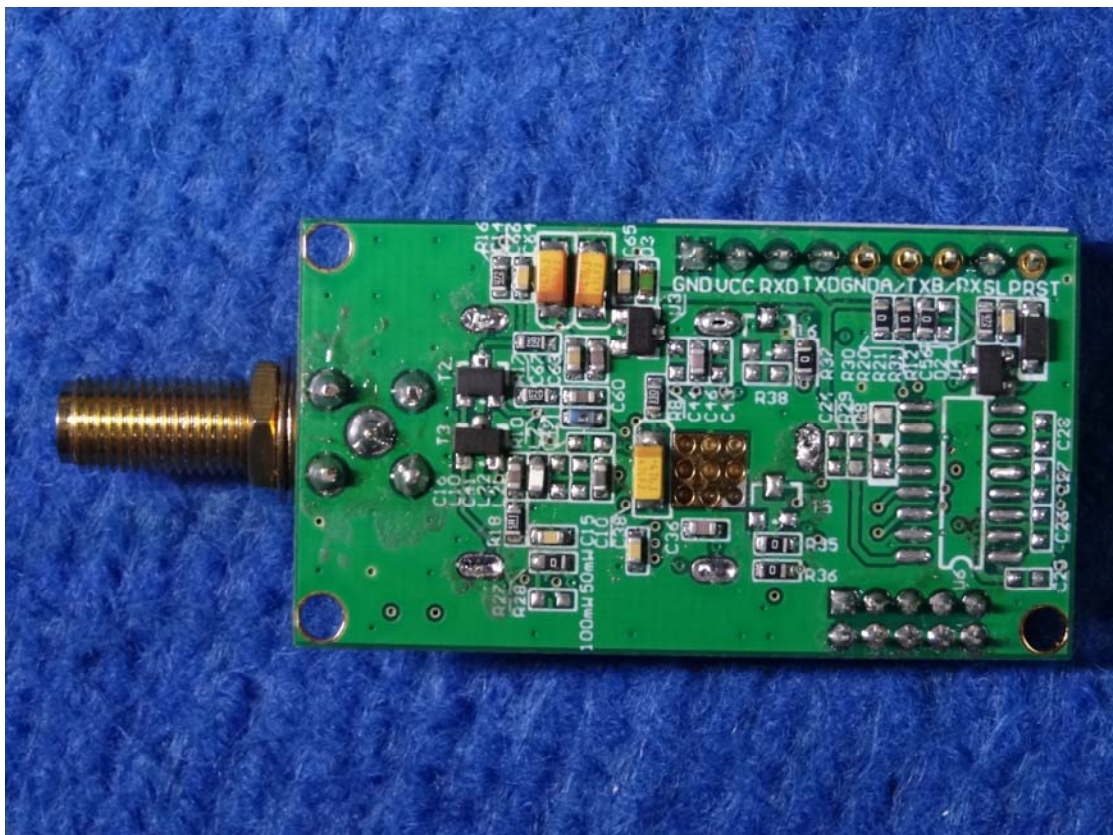
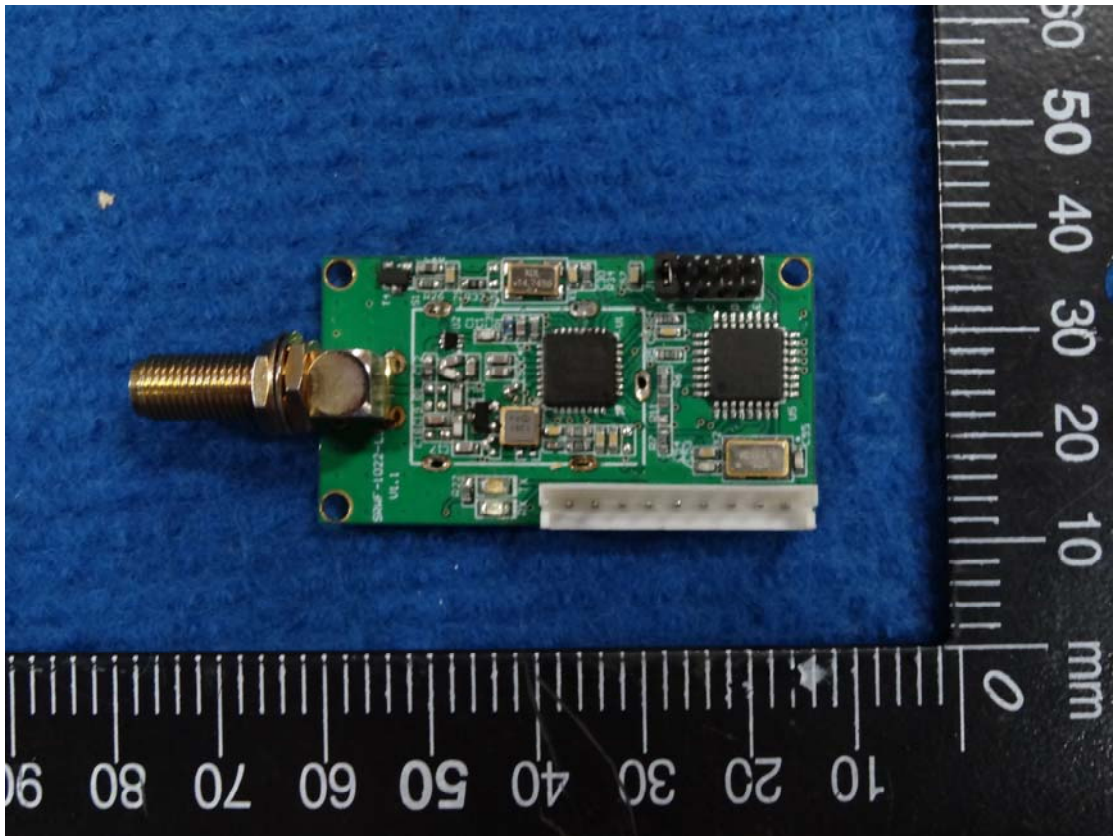


APPENDIX B: PHOTOGRAPH OF THE EUT

Host:



**Modular:**



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