FCC TEST REPORT

For

Low Power Radio Solutions Ltd

EASY RADIO

Model No.: ERIC LORA

Prepared For	:	Low Power Radio Solutions Ltd
Address	:	Two Rivers Ind Est, Station Lane, Witney, United Kingdom OX28 4BH

Prepared By	:	Shenzhen Anbotek Compliance Laboratory Limited
Address	:	1/F, Building D, Sogood Science and Technology Park, Sanwei community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.518102 Tel: (86) 755-26066440 Fax: (86) 755-26014772

Report Number	:	SZAWW180925011-01
Date of Receipt	:	Sept. 25, 2018
Date of Test	:	Sept. 25~Oct. 31, 2018
Date of Report	:	Oct. 31, 2018

Contents

1. General Information....5
1.1. Client Information....5
1.2. Description of Device (EUT)....5
1.3. Auxiliary Equipment Used During Test....5
1.4. Description of Test Modes....6
1.5. List of Channels....6
1.7. Test Equipment List....8
1.8. Description of Test Facility....9
2. Summary of Test Results....10
3. Conducted Emission Test....11
3.1. Test Standard and Limit....11
3.2. Test Setup....11
3.3. Test Procedure....11
3.4. Test Data....11
4. Radiation Spurious Emission and Band Edge....18
4.1. Test Standard and Limit....18
4.2. Test Setup....18
4.3. Test Procedure....19
4.4. Test Data....20
5. Maximum Peak Output Power Test....29
5.1. Test Standard and Limit....29
5.2. Test Setup....29
5.3. Test Procedure....29
5.4. Test Data....29
6. 6DB Occupy Bandwidth Test....32
6.1. Test Standard and Limit....32
6.2. Test Setup....32
6.3. Test Procedure....32
6.4. Test Data....32
7. Power Spectral Density Test....35
7.1. Test Standard and Limit....35
7.2. Test Setup....35
7.3. Test Procedure....35
7.4. Test Data....35
8. 100kHz Bandwidth of Frequency Band Edge Requirement....38
8.1. Test Standard and Limit....38
8.2. Test Setup....38
8.3. Test Procedure....38
8.4. Test Data....38
9. Antenna Requirement....40
9.1. Test Standard and Requirement....40
9.2. Antenna Connected Construction....40

APPENDIX I -- TEST SETUP PHOTOGRAPH.....41
APPENDIX II -- EXTERNAL PHOTOGRAPH.....43
APPENDIX III -- INTERNAL PHOTOGRAPH.....45

TEST REPORT

Applicant	:	Low Power Radio Solutions Ltd
Manufacturer	:	Low Power Radio Solutions Ltd
Product Name	:	EASY RADIO
Model No.	:	ERIC LORA
Trade Mark	:	N.A.
Rating(s)	:	Input: DC 5V via USB Port
Test Standard(s)	**:**	**FCC Part15 Subpart C 2018, Section 15.247**
Test Method(s)	**:**	**ANSI C63.10: 2013, KDB558074 D01 DTS Meas Guidance v05**

The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen Anbotek Compliance Laboratory Limited is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the FCC Part 15 Subpart C requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited.

Date of Test: Sept. 25~Oct. 31, 2018

Prepared by: (Engineer / OliayYang)

Reviewer: (Supervisor / Snowy Meng)

Approved & Authorized Signer: (Manager / Sally Zhang)

1. General Information

1.1. Client Information

Applicant	:	Low Power Radio Solutions Ltd
Address	:	Two Rivers Ind Est, Station Lane, Witney, United Kingdom OX28 4BH
Manufacturer	:	Low Power Radio Solutions Ltd
Address	:	Two Rivers Ind Est, Station Lane, Witney, United Kingdom OX28 4BH
Factory	:	Low Power Radio Solutions Ltd
Address	:	Two Rivers Ind Est, Station Lane, Witney, United Kingdom OX28 4BH

1.2. Description of Device (EUT)

Product Name	:	EASY RADIO	
Model No.	:	ERIC LORA	
Trade Mark	:	N.A.	
Test Power Supply	:	DC 5V via USB Port	
Product Description	:	Operation Frequency:	903-927MHz
		Number of Channel:	49 Channels
		Modulation Type:	CSS
		Antenna Type:	Columnar Antenna
		Antenna Gain(Peak):	0 dBi
Remark: 1)For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.			

1.3. Auxiliary Equipment Used During Test

Notebook	:	Manufacturer: FUJITSU LIMITED M/N: LH531 S/N: 518127-01R2300775 DC Rating: DC 19V, 4.22A CE , FCC DOC, CCC
		Adapter: M/N: ADP-602HA Input: 100V-240V~ 50/60Hz, 1.5A Output: DC 19V, 3.16A

1.4. Description of Test Modes

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	CH01
Mode 2	CH25
Mode 3	CH49
Mode 4	Keeping TX Mode

For Conducted Emission	
Final Test Mode	Description
Mode 4	Keeping TX Mode

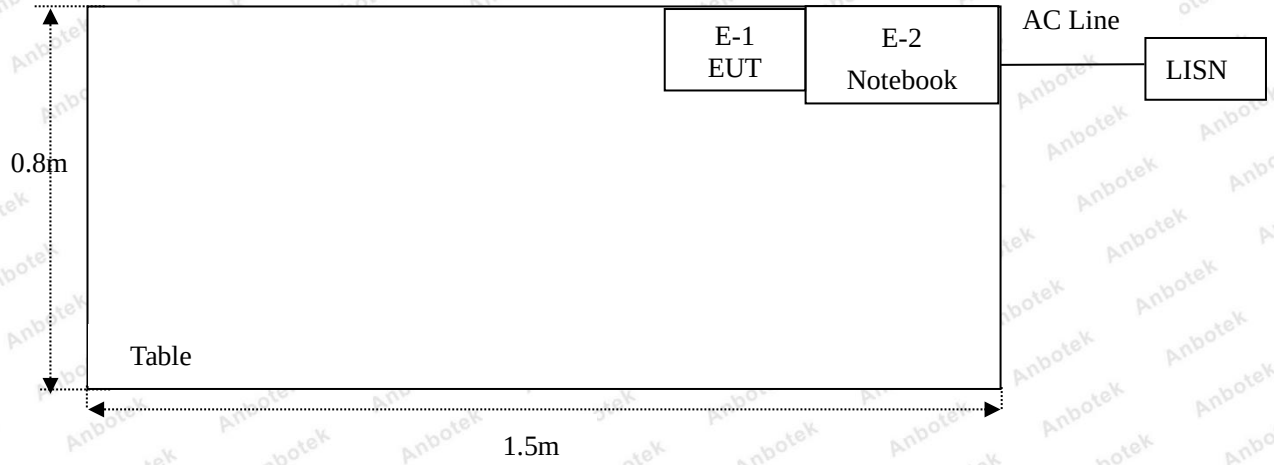
For Radiated Emission	
Final Test Mode	Description
Mode 1	CH01
Mode 2	CH25
Mode 3	CH49
Mode 4	Keeping TX Mode

1.5. List of Channels

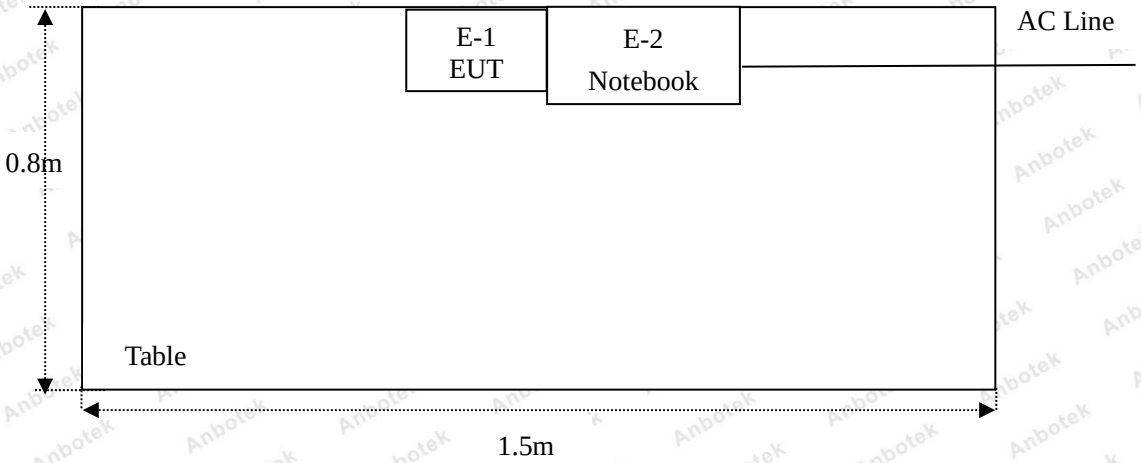
Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
01	903.0	11	908.0	21	913.0	31	918.0	41	923.0
02	903.5	12	908.5	22	913.5	32	918.5	42	923.5
03	904.0	13	909.0	23	914.0	33	919.0	43	924.0
04	904.5	14	909.5	24	914.5	34	919.5	44	924.5
05	905.0	15	910.0	25	915.0	35	920.0	45	925.0
06	905.5	16	910.5	26	915.5	36	920.5	46	925.5
07	906.0	17	911.0	27	916.0	37	921.0	47	926.0
08	906.5	18	911.5	28	916.5	38	921.5	48	926.5
09	907.0	19	912.0	29	917.0	39	922.0	49	927.0
10	907.5	20	912.5	30	917.5	40	922.5		

1.6. Description Of Test Setup

CE



RE



1.7. Test Equipment List

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	L.I.S.N. Artificial Mains Network	Rohde & Schwarz	ENV216	100055	Nov. 17, 2017	1 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Nov. 17, 2017	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Nov. 17, 2017	1 Year
4.	Spectrum Analysis	Agilent	E4407B	US39390582	Nov. 17, 2017	1 Year
5.	MAX Spectrum Analysis	Agilent	N9020A	MY51170037	Nov. 18, 2017	1 Year
6.	Preamplifier	SKET Electronic	BK1G18G30D	KD17503	Nov. 17, 2017	1 Year
7.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Nov. 20, 2017	1 Year
8.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Nov. 20, 2017	1 Year
9.	Loop Antenna	Schwarzbeck	HFH2-Z2	100047	Nov. 17, 2017	1 Year
10.	Horn Antenna	Schewarzbeck	BBHA9170	9170-375	Nov. 17, 2017	1 Year
11.	Pre-amplifier	SONOMA	310N	186860	Nov. 17, 2017	1 Year
12.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A
13.	RF Test Control System	YIHENG	YH3000	2017430	Nov. 18, 2017	1 Year
14.	Power Sensor	DAER	RPR3006W	15I00041SN045	Nov. 17, 2017	1 Year
15.	Power Sensor	DAER	RPR3006W	15I00041SN046	Nov. 17, 2017	1 Year
16.	MXA Spectrum Analysis	Agilent	N9020A	MY51170037	Nov. 18, 2017	1 Year
17.	MXG RF Vector Signal Generator	Agilent	N5182A	MY48180656	Nov. 18, 2017	1 Year
18.	Signal Generator	Agilent	E4421B	MY41000743	Nov. 18, 2017	1 Year
19.	DC Power Supply	LW	TPR-6410D	349315	Nov. 01, 2017	1 Year
20.	Constant Temperature Humidity Chamber	Sertep	ZJ-HWHS80B	ZJ-17042804	Nov. 01, 2017	1 Year

1.8. Description of Test Facility

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

FCC-Registration No.: 184111

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registed and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No. 184111, July 31, 2017.

ISED-Registration No.: 8058A-1

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (ISED) Innovation, Science and Economic Development Canada. The acceptance letter from the ISED is maintained in our files. Registration 8058A-1, June 13, 2016.

Test Location

Shenzhen Anbotek Compliance Laboratory Limited.
1/F, Building D, Sogood Science and Technology Park, Sanwei community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.518102

2. Summary of Test Results

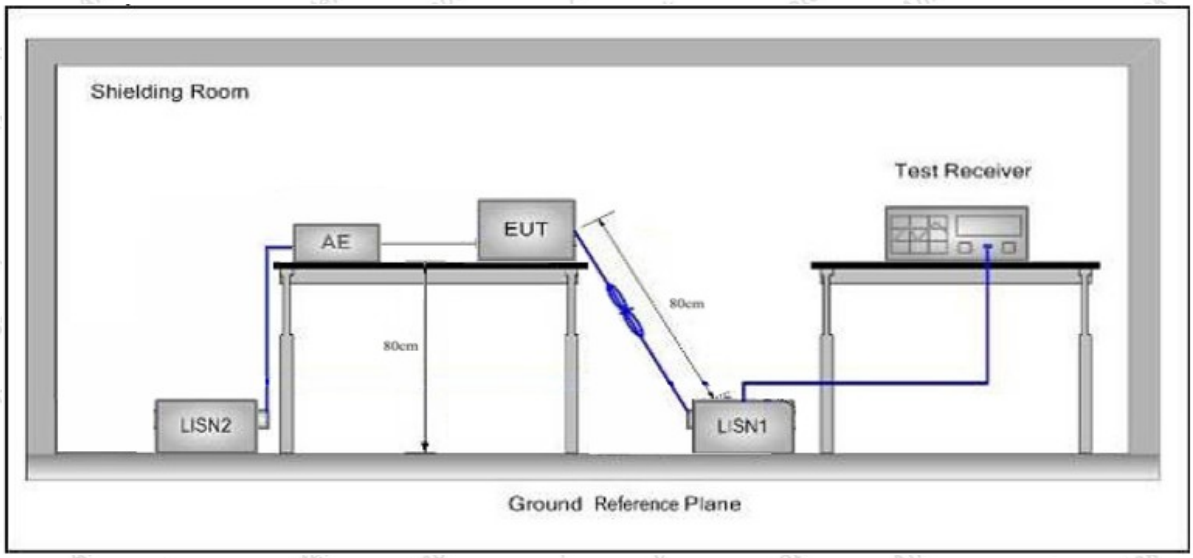
Standard Section	Test Item	Result
15.203/15.247(c)	Antenna Requirement	PASS
15.207	Conducted Emission	PASS
15.205/15.209	Spurious Emission	PASS
15.247(b)(3)	Conducted Peak Output Power	PASS
15.247(a)(2)	6dB Occupied Bandwidth	PASS
15.247(e)	Power Spectral Density	PASS
15.247(d)	Band Edge	PASS
Remark: "N/A" is an abbreviation for Not Applicable.		

3. Conducted Emission Test

3.1. Test Standard and Limit

Test Standard	FCC Part15 Section 15.207		
Test Limit	Frequency	Maximum RF Line Voltage (dBuV)	
		Quasi-peak Level	Average Level
	150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
	500kHz~5MHz	56	46
	5MHz~30MHz	60	50
Remark: (1) *Decreasing linearly with logarithm of the frequency. (2) The lower limit shall apply at the transition frequency.			

3.2. Test Setup



3.3. Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC ANSI C63.10-2013 on Conducted Emission Measurement.

The bandwidth of test receiver (ESCI) set at 9kHz.

The frequency range from 150kHz to 30MHz is checked.

3.4. Test Data

Please to see the following pages.

Conducted Emission Test Data

Test Site: 1# Shielded Room

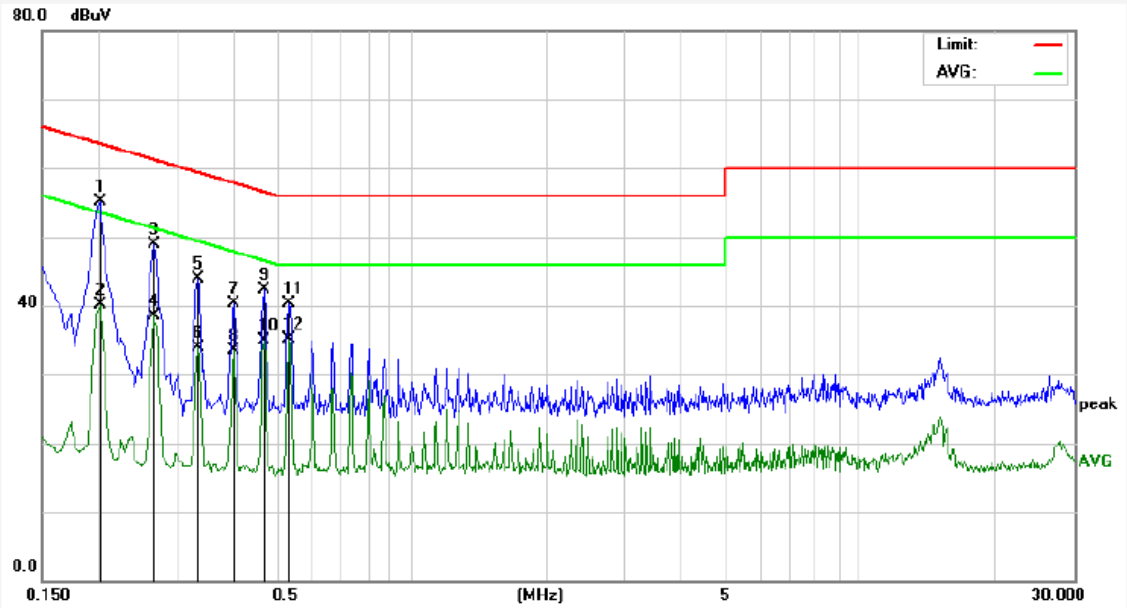
Operating Condition: Keeping TX Mode

Test Mode: CH01 (Low channel)

Test Specification: DC 5V via USB Port

Comment: Live Line

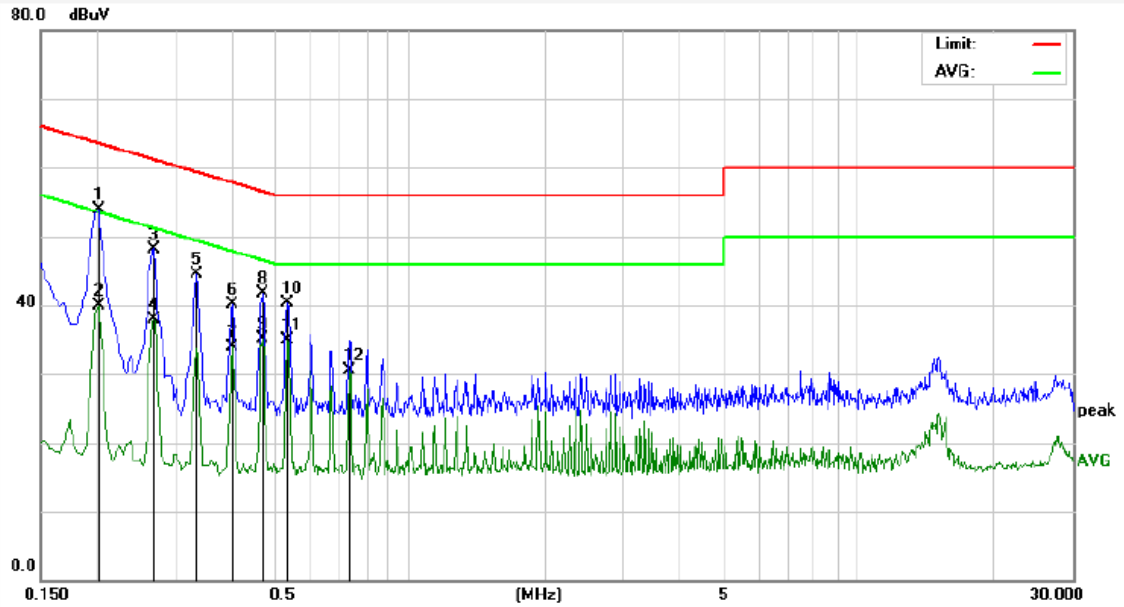
Tem.: 22.7℃ Hum.: 54%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Over Limit (dB)	Detector	Remark
1	0.2020	55.13	19.90	55.13	63.52	-8.39	QP	
2	0.2020	40.05	19.90	40.05	53.52	-13.47	AVG	
3	0.2660	48.86	19.90	48.86	61.24	-12.38	QP	
4	0.2660	38.57	19.89	38.57	51.24	-12.67	AVG	
5	0.3339	43.85	19.89	43.85	59.35	-15.50	QP	
6	0.3339	33.92	19.90	33.92	49.35	-15.43	AVG	
7	0.4020	40.25	19.90	40.25	57.81	-17.56	QP	
8	0.4020	33.54	19.93	33.54	47.81	-14.27	AVG	
9	0.4700	42.31	19.96	42.31	56.51	-14.20	QP	
10	0.4700	34.91	19.96	34.91	46.51	-11.60	AVG	
11	0.5340	40.29	20.01	40.29	56.00	-15.71	QP	
12	0.5340	35.05	20.01	35.05	46.00	-10.95	AVG	

Conducted Emission Test Data

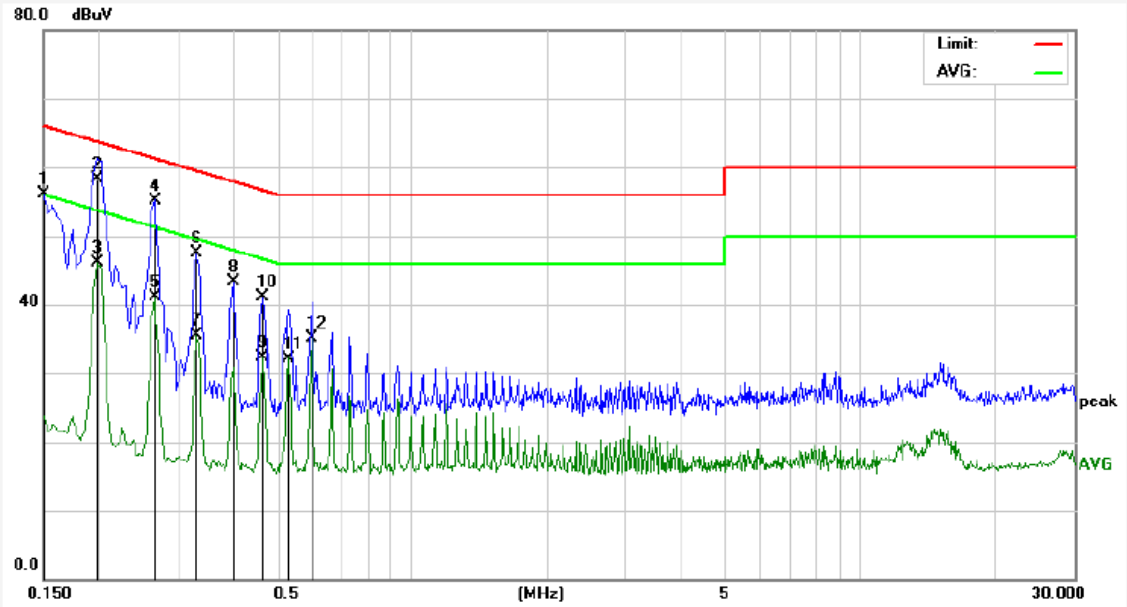
Test Site:	1# Shielded Room
Operating Condition:	Keeping TX Mode
Test Mode:	CH01 (Low channel)
Test Specification:	DC 5V via USB Port
Comment:	Neutral Line
	Tem.: 22.7℃ Hum.: 54%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Over Limit (dB)	Detector	Remark
1	0.2020	53.94	19.90	53.94	63.52	-9.58	QP	
2	0.2020	39.91	19.90	39.91	53.52	-13.61	AVG	
3	0.2700	48.20	19.90	48.20	61.12	-12.92	QP	
4	0.2700	37.93	19.89	37.93	51.12	-13.19	AVG	
5	0.3339	44.41	19.89	44.41	59.35	-14.94	QP	
6	0.4020	40.16	19.90	40.16	57.81	-17.65	QP	
7	0.4020	33.82	19.90	33.82	47.81	-13.99	AVG	
8	0.4700	41.63	19.93	41.63	56.51	-14.88	QP	
9	0.4700	35.18	19.96	35.18	46.51	-11.33	AVG	
10	0.5340	40.28	19.99	40.28	56.00	-15.72	QP	
11	0.5340	34.91	20.01	34.91	46.00	-11.09	AVG	
12	0.7340	30.48	20.03	30.48	46.00	-15.52	AVG	

Conducted Emission Test Data

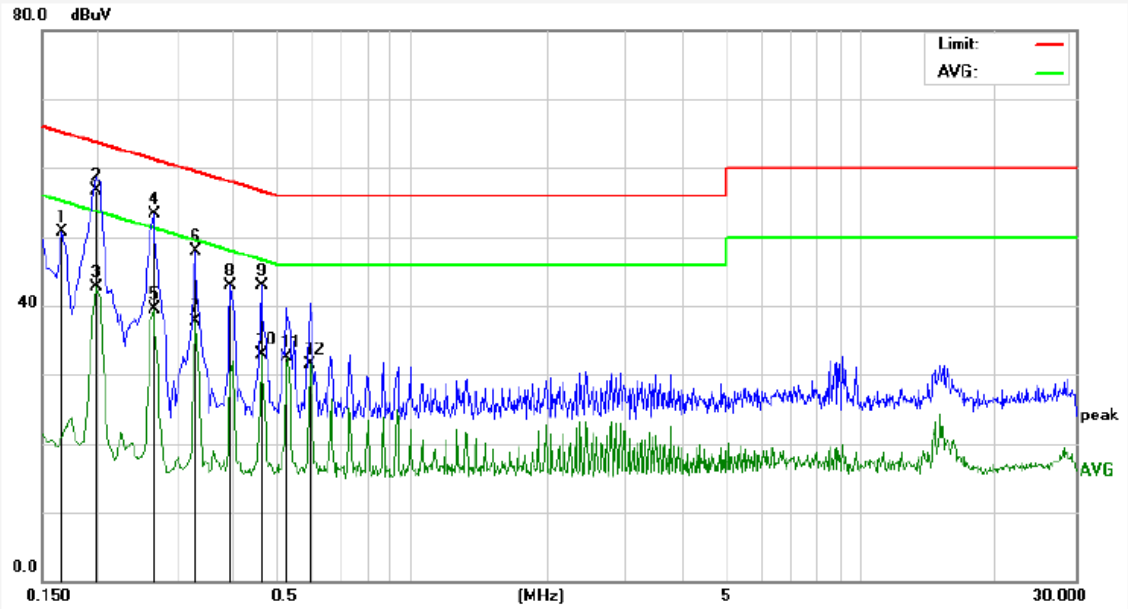
Test Site:	1# Shielded Room
Operating Condition:	Keeping TX Mode
Test Mode:	CH25 (Middle channel)
Test Specification:	DC 5V via USB Port
Comment:	Live Line
	Tem.: 22.7℃ Hum.: 54%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Over Limit (dB)	Detector	Remark
1	0.1499	36.13	19.90	56.03	66.00	-9.97	QP	
2	0.1980	38.34	19.90	58.24	63.69	-5.45	QP	
3	0.1980	26.22	19.90	46.12	53.69	-7.57	AVG	
4	0.2660	35.31	19.89	55.20	61.24	-6.04	QP	
5	0.2660	21.16	19.89	41.05	51.24	-10.19	AVG	
6	0.3300	27.62	19.90	47.52	59.45	-11.93	QP	
7	0.3300	15.63	19.90	35.53	49.45	-13.92	AVG	
8	0.3980	23.40	19.93	43.33	57.89	-14.56	QP	
9	0.4620	12.26	19.96	32.22	46.66	-14.44	AVG	
10	0.4660	21.19	19.96	41.15	56.58	-15.43	QP	
11	0.5299	12.21	19.99	32.20	46.00	-13.80	AVG	
12	0.5980	15.13	20.01	35.14	46.00	-10.86	AVG	

Conducted Emission Test Data

Test Site:	1# Shielded Room
Operating Condition:	Keeping TX Mode
Test Mode:	CH25 (Middle channel)
Test Specification:	DC 5V via USB Port
Comment:	Neutral Line
	Tem.: 22.7℃ Hum.: 54%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Over Limit (dB)	Detector	Remark
1	0.1660	30.75	19.90	50.65	65.15	-14.50	QP	
2	0.1980	36.77	19.90	56.67	63.69	-7.02	QP	
3	0.1980	22.89	19.90	42.79	53.69	-10.90	AVG	
4	0.2660	33.42	19.89	53.31	61.24	-7.93	QP	
5	0.2660	19.56	19.89	39.45	51.24	-11.79	AVG	
6	0.3300	28.02	19.90	47.92	59.45	-11.53	QP	
7	0.3300	17.76	19.90	37.66	49.45	-11.79	AVG	
8	0.3940	23.01	19.93	42.94	57.98	-15.04	QP	
9	0.4620	22.97	19.96	42.93	56.66	-13.73	QP	
10	0.4620	12.99	19.96	32.95	46.66	-13.71	AVG	
11	0.5299	12.46	19.99	32.45	46.00	-13.55	AVG	
12	0.5940	11.55	20.01	31.56	46.00	-14.44	AVG	

Conducted Emission Test Data

Test Site: 1# Shielded Room

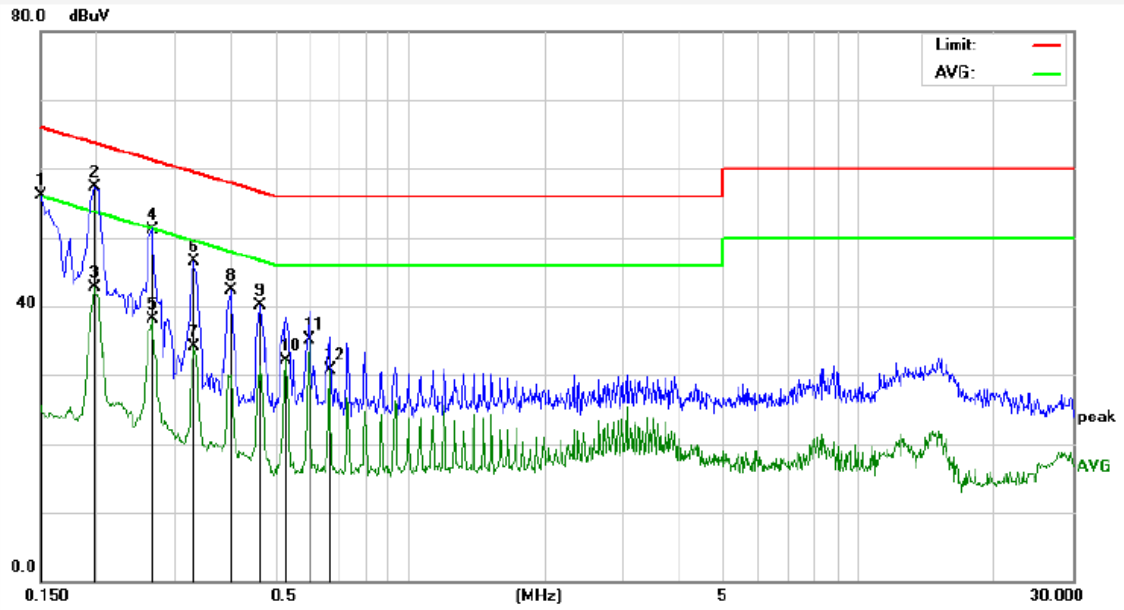
Operating Condition: Keeping TX Mode

Test Mode: CH49 (High channel)

Test Specification: DC 5V via USB Port

Comment: Live Line

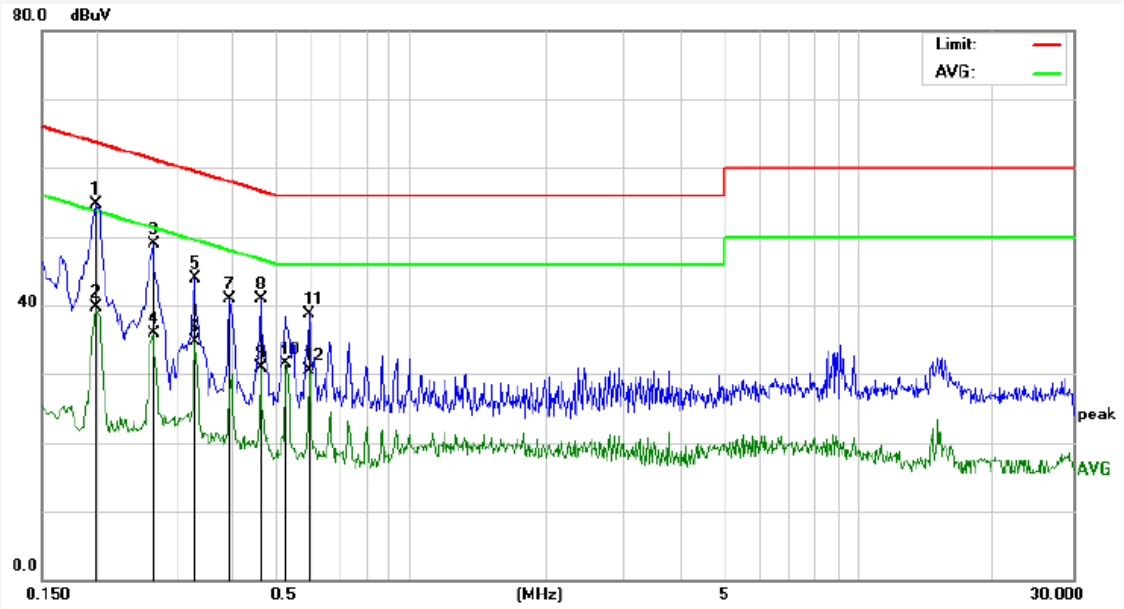
Tem.: 22.7℃ Hum.: 54%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Over Limit (dB)	Detector	Remark
1	0.1499	36.13	19.90	56.03	66.00	-9.97	QP	
2	0.1980	37.37	19.90	57.27	63.69	-6.42	QP	
3	0.1980	22.72	19.90	42.62	53.69	-11.07	AVG	
4	0.2660	31.31	19.89	51.20	61.24	-10.04	QP	
5	0.2660	18.16	19.89	38.05	51.24	-13.19	AVG	
6	0.3300	26.62	19.90	46.52	59.45	-12.93	QP	
7	0.3300	14.13	19.90	34.03	49.45	-15.42	AVG	
8	0.3980	22.40	19.93	42.33	57.89	-15.56	QP	
9	0.4660	20.19	19.96	40.15	56.58	-16.43	QP	
10	0.5299	12.21	19.99	32.20	46.00	-13.80	AVG	
11	0.5978	15.13	20.01	35.14	46.00	-10.86	AVG	
12	0.6620	10.61	20.03	30.64	46.00	-15.36	AVG	

Conducted Emission Test Data

Test Site:	1# Shielded Room
Operating Condition:	Keeping TX Mode
Test Mode:	CH49 (High channel)
Test Specification:	DC 5V via USB Port
Comment:	Neutral Line
	Tem.: 22.7℃ Hum.: 54%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Over Limit (dB)	Detector	Remark
1	0.1980	34.79	19.90	54.69	63.69	-9.00	QP	
2	0.1980	19.89	19.90	39.79	53.69	-13.90	AVG	
3	0.2660	28.92	19.89	48.81	61.24	-12.43	QP	
4	0.2660	16.06	19.89	35.95	51.24	-15.29	AVG	
5	0.3300	24.02	19.90	43.92	59.45	-15.53	QP	
6	0.3300	14.76	19.90	34.66	49.45	-14.79	AVG	
7	0.3940	21.01	19.93	40.94	57.98	-17.04	QP	
8	0.4620	20.97	19.96	40.93	56.66	-15.73	QP	
9	0.4620	10.99	19.96	30.95	46.66	-15.71	AVG	
10	0.5299	11.46	19.99	31.45	46.00	-14.55	AVG	
11	0.5938	18.70	20.01	38.71	56.00	-17.29	QP	
12	0.5938	10.55	20.01	30.56	46.00	-15.44	AVG	

4. Radiation Spurious Emission and Band Edge

4.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.209 and 15.205				
Test Limit	Frequency (MHz)	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz~0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz~88MHz	100	40.0	Quasi-peak	3
	88MHz~216MHz	150	43.5	Quasi-peak	3
	216MHz~960MHz	200	46.0	Quasi-peak	3
	960MHz~1000MHz	500	54.0	Quasi-peak	3
	Above 1000MHz	500	54.0	Average	3
		-	74.0	Peak	3

Remark:
(1)The lower limit shall apply at the transition frequency.
(2) 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB 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.

4.2. Test Setup

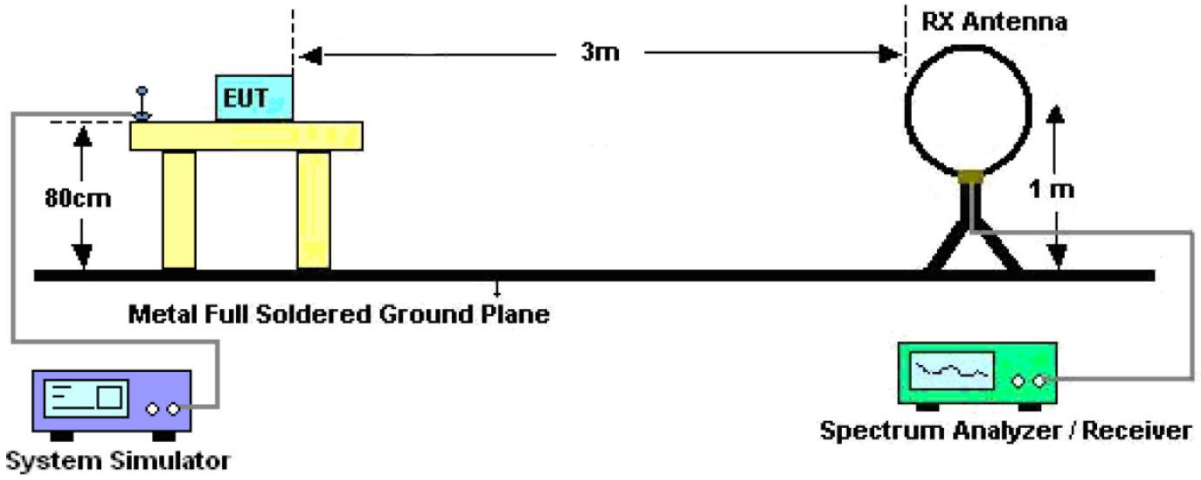


Figure 1. Below 30MHz

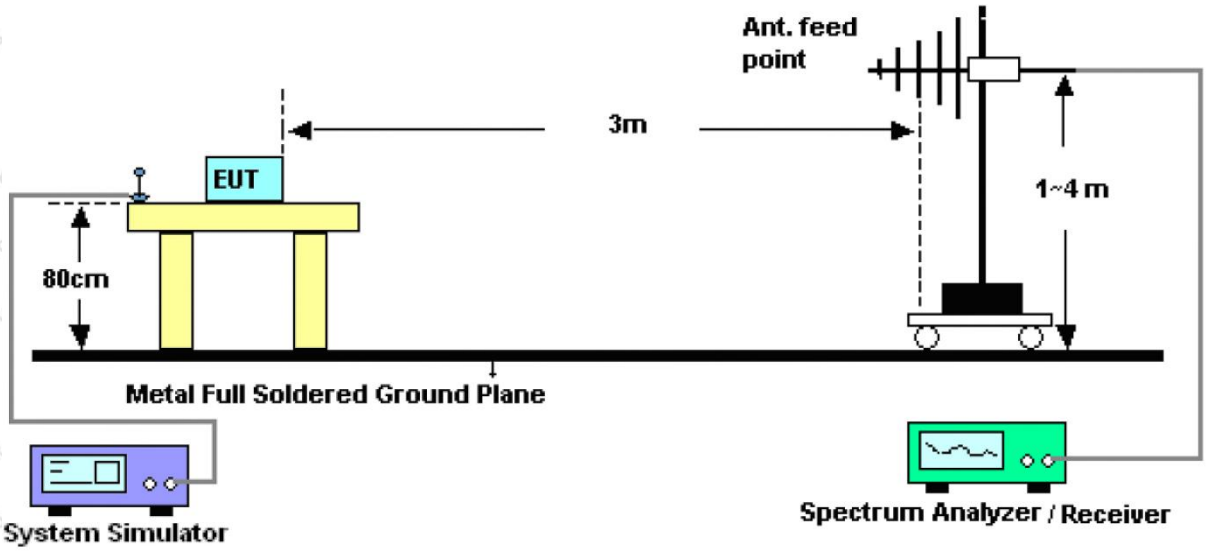


Figure 2. 30MHz to 1GHz

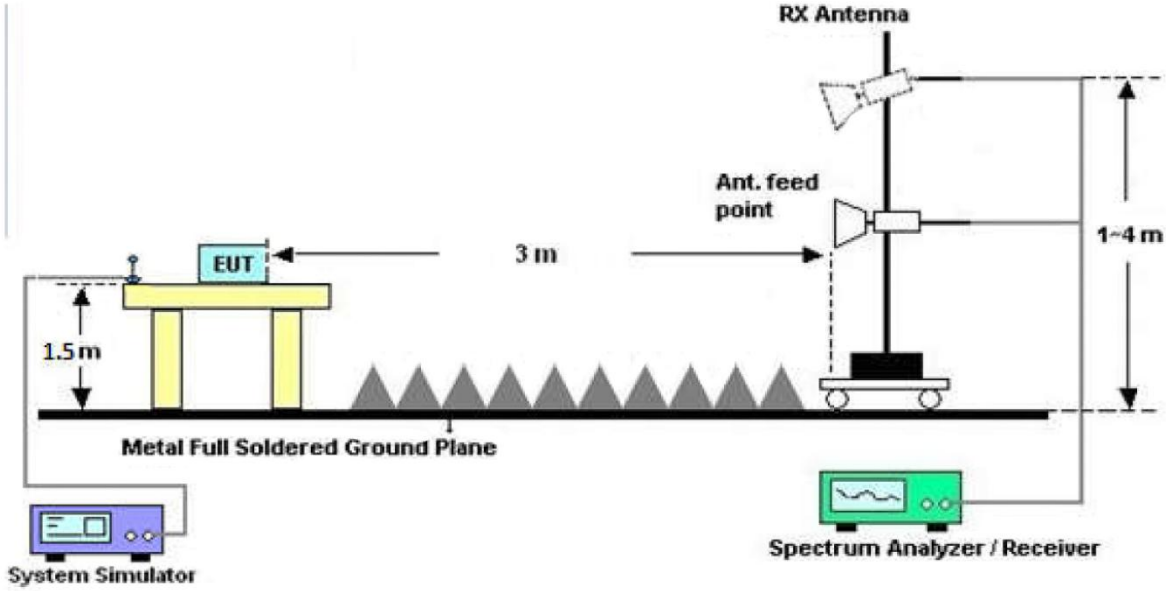


Figure 3. Above 1 GHz

4.3. Test Procedure

For below 1GHz: The EUT is placed on a turntable, which is 0.8m above the ground plane.
For above 1GHz: The EUT is placed on a turntable, which is 1.5m above the ground plane.
The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Rotated the EUT through three orthogonal axes to determine the maximum emissions, both horizontal and vertical polarization of the antenna are set on test. The EUT is tested in 9*6*6 Chamber. The device is evaluated in xyz orientation.
For the radiated emission test above 1GHz:
Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying

aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

For 9kHz to 150kHz, Set the spectrum analyzer as:
RBW = 200Hz, VBW =1kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For 150kHz to 30MHz, Set the spectrum analyzer as:
RBW = 9KHz, VBW =30kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For 30MHz to 1000MHz, Set the spectrum analyzer as:
RBW = 100kHz, VBW =300kHz,Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For above 1GHz,Set the spectrum analyzer as:
RBW =1MHz, VBW =1MHz, Detector= Peak, Trace mode= Max hold, Sweep- auto couple.
RBW =1MHz, VBW =10Hz, Detector= Average, Trace mode= Max hold, Sweep- auto couple.

4.4. Test Data

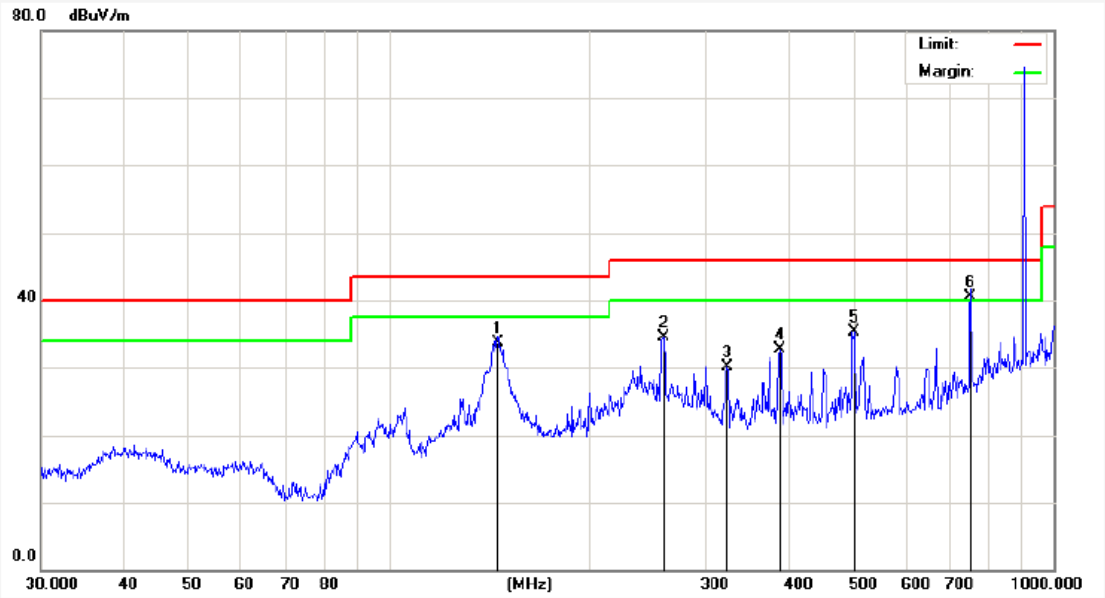
PASS

During the test, Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the X-axis is the worst case.

The test results of 9kHz-30MHz was attenuated more than 20dB below the permissible limits, so the results don't record in the report.

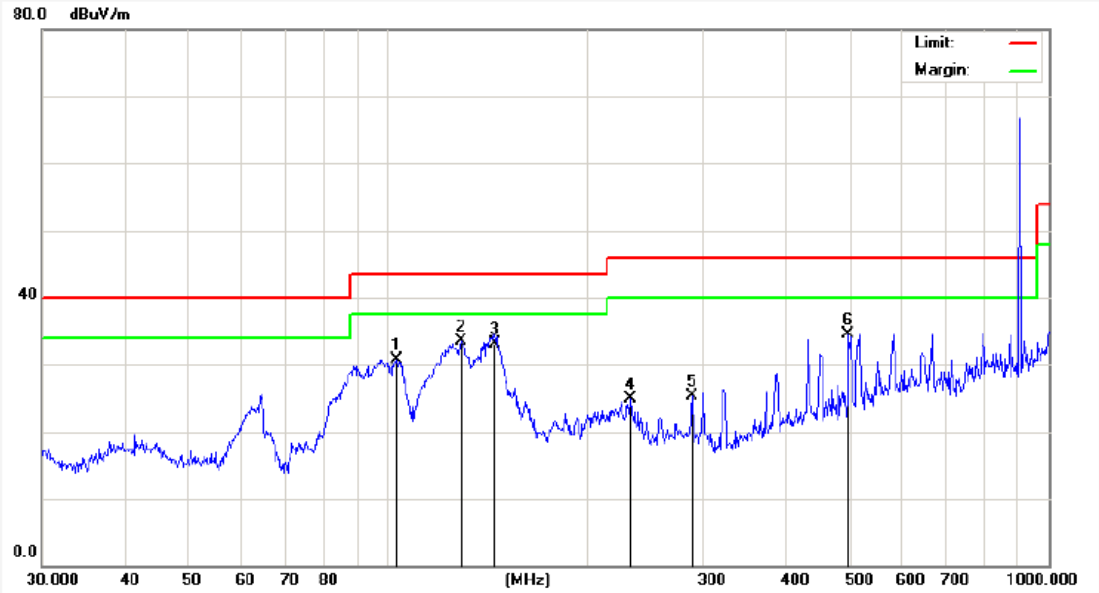
Test Results (30~1000MHz)

Job No.:	SZAWW180925011-01	Temp.(℃)/Hum.(%RH):	24.3℃/55%RH
Standard:	FCC PART 15C	Power Source:	DC 5V via USB Port
Test Mode:	Keeping TX Mode	Polarization:	Horizontal
Test Mode:	CH01 (Low channel)		



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	145.8611	56.19	-22.40	33.79	43.50	-9.71	QP	300	120	
2	259.2338	54.05	-19.55	34.50	46.00	-11.50	QP	300	196	
3	323.3204	45.93	-15.86	30.07	46.00	-15.93	QP	300	324	
4	387.9920	45.90	-13.23	32.67	46.00	-13.33	QP	300	240	
5	501.1790	46.23	-10.96	35.27	46.00	-10.73	QP	300	296	
6	750.1083	48.05	-7.49	40.56	46.00	-5.44	QP	300	360	

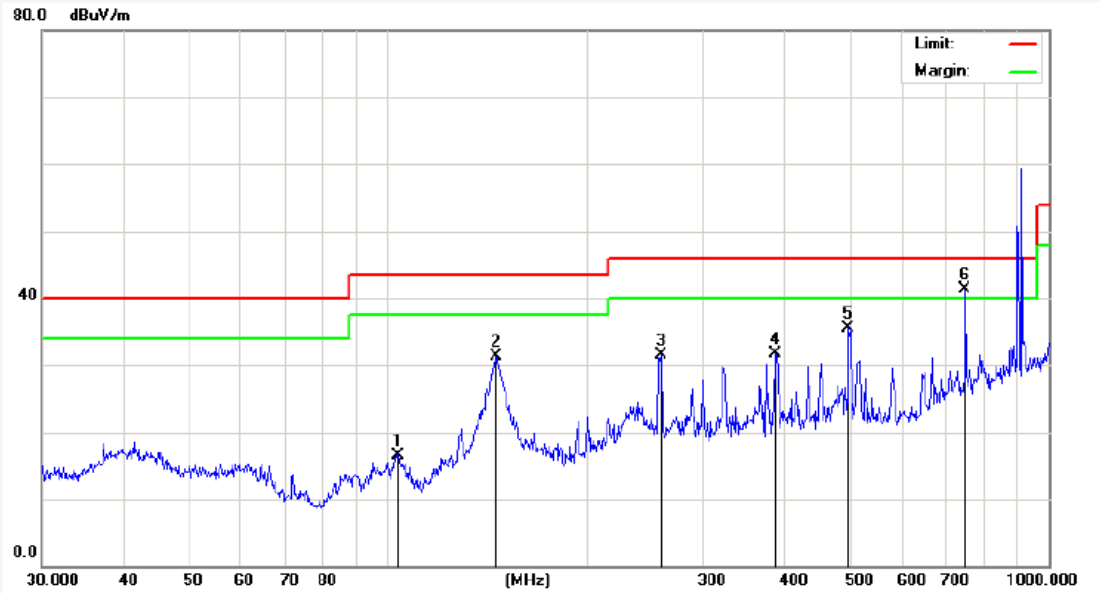
Job No.:	SZAWW180925011-01	Temp.(℃)/Hum.(%RH):	24.3℃/55%RH
Standard:	FCC PART 15C	Power Source:	DC 5V via USB Port
Test Mode:	Keeping TX Mode	Polarization:	Vertical
Test Mode:	CH01 (Low channel)		



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	103.4419	46.45	-15.71	30.74	43.50	-12.76	QP	300	71	
2	129.4677	51.30	-17.73	33.57	43.50	-9.93	QP	300	120	
3	145.3505	51.57	-18.41	33.16	43.50	-10.34	QP	300	210	
4	233.3487	39.70	-14.76	24.94	46.00	-21.06	QP	300	312	
5	289.0020	41.11	-15.87	25.24	46.00	-20.76	QP	300	274	
6	497.6764	45.44	-11.02	34.42	46.00	-11.58	QP	300	304	

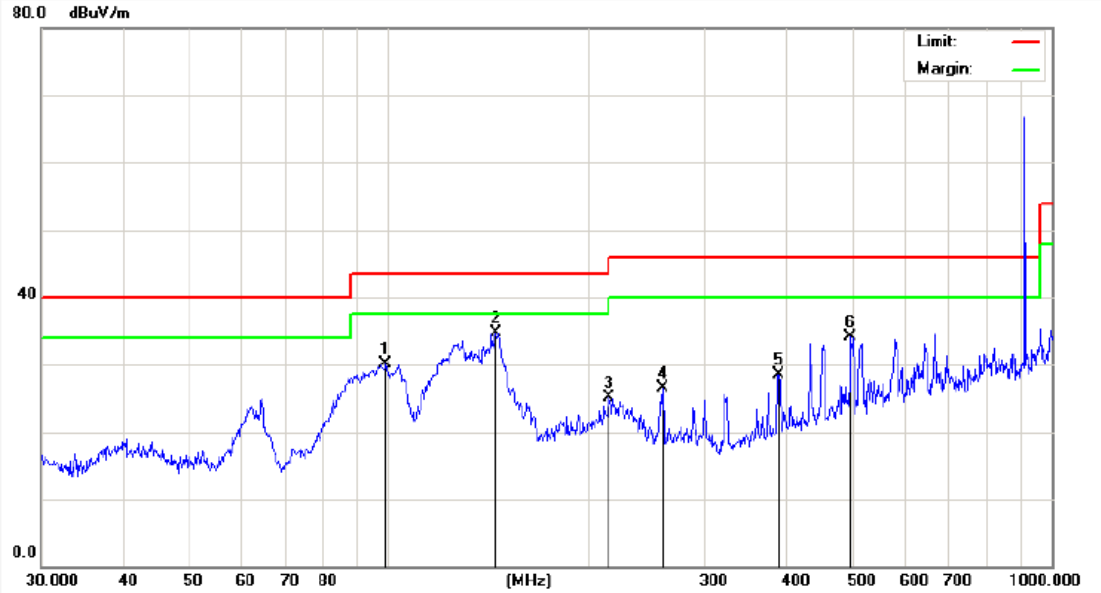
Test Results (30~1000MHz)

Job No.:	SZAWW180925011-01	Temp.(℃)/Hum.(%RH):	24.3℃/55%RH
Standard:	FCC PART 15C	Power Source:	DC 5V via USB Port
Test Mode:	Keeping TX Mode	Polarization:	Horizontal
Test Mode:	CH25 (Middle channel)		



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	103.8055	38.31	-21.71	16.60	43.50	-26.90	QP	300	79	
2	145.8611	53.76	-22.40	31.36	43.50	-12.14	QP	300	152	
3	259.2338	51.07	-19.55	31.52	46.00	-14.48	QP	300	199	
4	385.2805	45.10	-13.31	31.79	46.00	-14.21	QP	300	250	
5	497.6765	46.52	-11.02	35.50	46.00	-10.50	QP	300	43	
6	747.4825	48.78	-7.55	41.23	46.00	-4.77	QP	300	310	

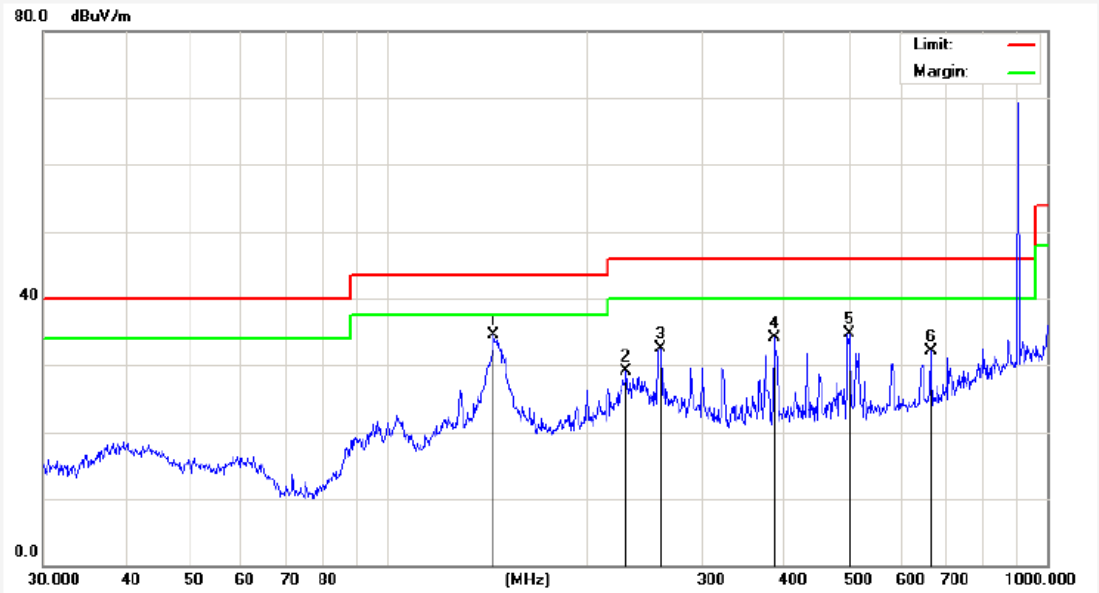
Job No.:	SZAWW180925011-01	Temp.(℃)/Hum.(%RH):	24.3℃/55%RH
Standard:	FCC PART 15C	Power Source:	DC 5V via USB Port
Test Mode:	Keeping TX Mode	Polarization:	Vertical
Test Mode:	CH25 (Middle channel)		



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	99.1797	46.00	-15.84	30.16	43.50	-13.34	QP	300	74	
2	145.3506	53.08	-18.41	34.67	43.50	-8.83	QP	300	125	
3	215.2678	40.62	-15.44	25.18	43.50	-18.32	QP	300	196	
4	259.2338	41.06	-14.59	26.47	46.00	-19.53	QP	300	220	
5	387.9920	40.74	-12.23	28.51	46.00	-17.49	QP	300	296	
6	497.6765	45.21	-11.02	34.19	46.00	-11.81	QP	300	321	

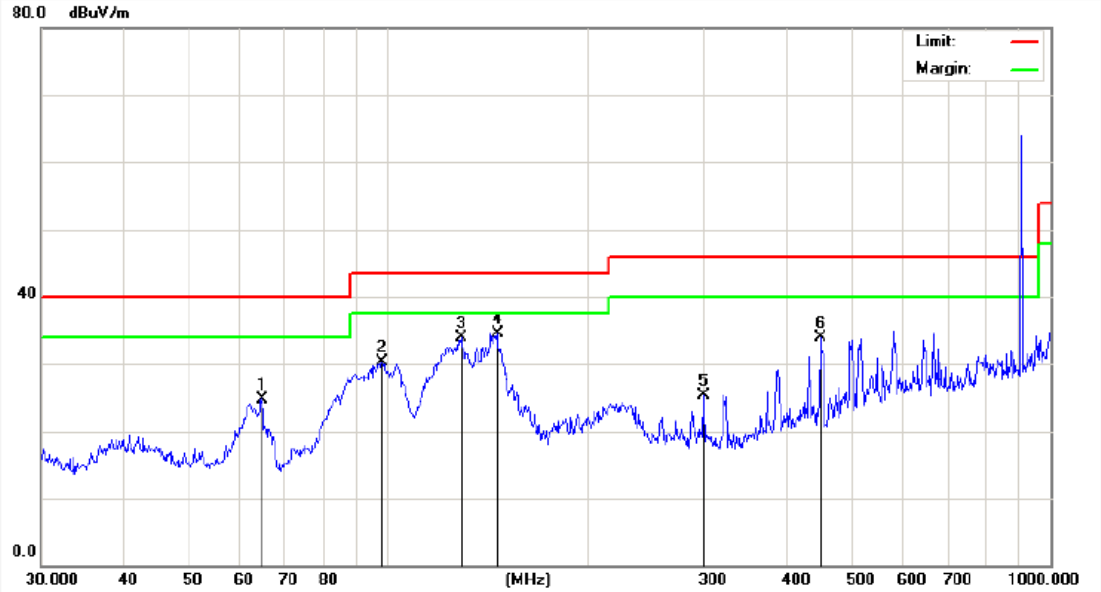
Test Results (30~1000MHz)

Job No.:	SZAWW180925011-01	Temp.(℃)/Hum.(%RH):	24.3℃/55%RH
Standard:	FCC PART 15C	Power Source:	DC 5V via USB Port
Test Mode:	Keeping TX Mode	Polarization:	Horizontal
Test Mode:	CH49 (High channel)		



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	144.8418	56.84	-22.42	34.42	43.50	-9.08	QP	300	45	
2	230.0985	48.49	-19.40	29.09	46.00	-16.91	QP	300	110	
3	259.2338	51.96	-19.55	32.41	46.00	-13.59	QP	300	165	
4	385.2805	47.42	-13.31	34.11	46.00	-11.89	QP	300	241	
5	501.1790	45.57	-10.96	34.61	46.00	-11.39	QP	300	293	
6	665.8035	41.59	-9.42	32.17	46.00	-13.83	QP	300	330	

Job No.:	SZAWW180925011-01	Temp.(℃)/Hum.(%RH):	24.3℃/55%RH
Standard:	FCC PART 15C	Power Source:	DC 5V via USB Port
Test Mode:	Keeping TX Mode	Polarization:	Vertical
Test Mode:	CH49 (High channel)		



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	64.6594	43.55	-18.75	24.80	40.00	-15.20	QP	300	120	
2	98.1419	46.21	-15.94	30.27	43.50	-13.23	QP	300	196	
3	129.0146	51.51	-17.67	33.84	43.50	-9.66	QP	300	241	
4	146.3735	52.90	-18.40	34.50	43.50	-9.00	QP	300	230	
5	299.3158	41.06	-15.69	25.37	46.00	-20.63	QP	300	320	
6	449.5558	45.46	-11.63	33.83	46.00	-12.17	QP	300	360	

Harmonics Emissions

Test Mode: CH01 (Low channel)

Frequency	Antenna	Reading	Cable Loss	Ant Factor	Amplifier	Level	Limits	Margin	Det.
(MHz)	Pol.	(dBuV/m)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	Mode
1806.0000	H	48.08	7.39	28.73	26.31	57.89	74	-16.11	PK
1806.0000	H	34.74	7.39	28.73	26.31	44.55	54	-9.45	AV
2709.0000	H	44.07	8.10	29.71	27.01	54.87	74	-19.13	PK
2709.0000	H	36.31	8.10	29.71	27.01	47.11	54	-6.89	AV
3612.0000	H	--	--	--	--	--	--	--	PK
3612.0000	H	--	--	--	--	--	--	--	AV
1806.0000	V	45.06	7.39	28.73	26.31	54.87	74	-19.13	PK
1806.0000	V	35.41	7.39	28.73	26.31	45.22	54	-8.78	AV
2709.0000	V	42.16	8.10	29.71	27.01	52.96	74	-21.04	PK
2709.0000	V	36.41	8.10	29.71	27.01	47.21	54	-6.79	AV
3612.0000	V	--	--	--	--	--	--	--	PK
3612.0000	V	--	--	--	--	--	--	--	AV

Test Mode: CH25 (Middle channel)

Frequency	Antenna	Reading	Cable Loss	Ant Factor	Amplifier	Level	Limits	Margin	Det.
(MHz)	Pol.	(dBuV/m)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	Mode
1830.0000	H	50.5	7.41	28.72	26.31	60.32	74	-13.68	PK
1830.0000	H	37.38	7.41	28.72	26.31	47.2	54	-6.8	AV
2745.0000	H	49.2	8.11	29.71	27.01	60.01	74	-13.99	PK
2745.0000	H	37.18	8.11	29.71	27.01	47.99	54	-6.01	AV
3660.0000	H	--	--	--	--	--	--	--	PK
3660.0000	H	--	--	--	--	--	--	--	AV
1830.0000	V	50.51	7.41	28.72	26.31	60.33	74	-13.67	PK
1830.0000	V	35.92	7.41	28.72	26.31	45.74	54	-8.26	AV
2745.0000	V	45.06	8.11	29.71	27.01	55.87	74	-18.13	PK
2745.0000	V	35.51	8.11	29.71	27.01	46.32	54	-7.68	AV
3660.0000	V	--	--	--	--	--	--	--	PK
3660.0000	V	--	--	--	--	--	--	--	AV

Test Mode: CH49 (High channel)

Frequency	Antenna	Reading	Cable Loss	Ant Factor	Amplifier	Level	Limits	Margin	Det.
(MHz)	Pol.	(dBuV/m)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	Mode
1854.0000	H	50.84	7.43	28.69	26.31	60.65	74	-13.35	PK
1854.0000	H	36.98	7.43	28.69	26.31	46.79	54	-7.21	AV
2781.0000	H	47	8.15	29.84	27.01	57.98	74	-16.02	PK
2781.0000	H	35.23	8.15	29.84	27.01	46.21	54	-7.79	AV
3708.0000	H	--	--	--	--	--	--	--	PK
3708.0000	H	--	--	--	--	--	--	--	AV
1854.0000	V	46.17	7.43	28.69	26.31	55.98	74	-18.02	PK
1854.0000	V	36.2	7.43	28.69	26.31	46.01	54	-7.99	AV
2781.0000	V	45.46	8.15	29.84	27.01	56.44	74	-17.56	PK
2781.0000	V	35.23	8.15	29.84	27.01	46.21	54	-7.79	AV
3708.0000	V	--	--	--	--	--	--	--	PK
3708.0000	V	--	--	--	--	--	--	--	AV

Remark:
1. Level = Reading + Cable Loss+Ant Factor-Amplifier
2. " -- " Mark indicated Background Noise Level

Radiated Band Edge:

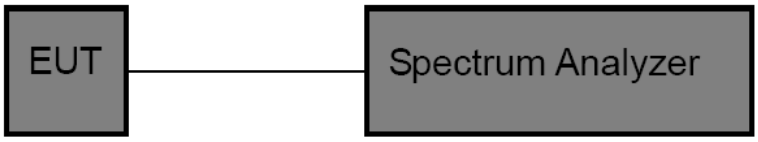
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.	Det.
902.0000	40.28	22.45	4.48	31.33	35.88	46.00	-10.12	H	QP
928.0000	41.43	22.59	4.54	31.35	37.21	46.00	-8.79	H	QP
902.0000	39.38	22.45	4.48	31.33	34.98	46.00	-11.02	V	QP
928.0000	40.23	22.59	4.54	31.35	36.01	46.00	-9.99	V	QP

5. Maximum Peak Output Power Test

5.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247 (b)(3)
Test Limit	30dBm

5.2. Test Setup



5.3. Test Procedure

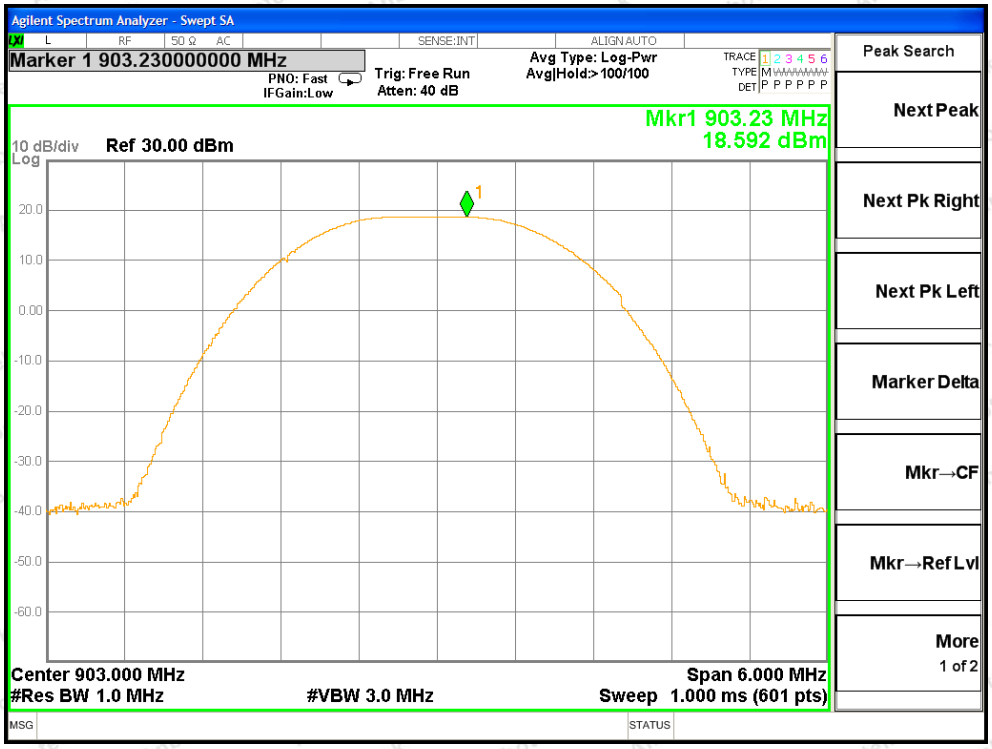
This procedure shall be used when the measurement instrument has available a resolution bandwidth that is greater than the DTS bandwidth.

1. Set the RBW ≥DTS bandwidth.
2. Set the VBW≥3*RBW.
3. Set the span≥ 3*RBW.
4. Detector = peak.
5. Sweep time = auto couple.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use peak marker function to determine the peak amplitude level.

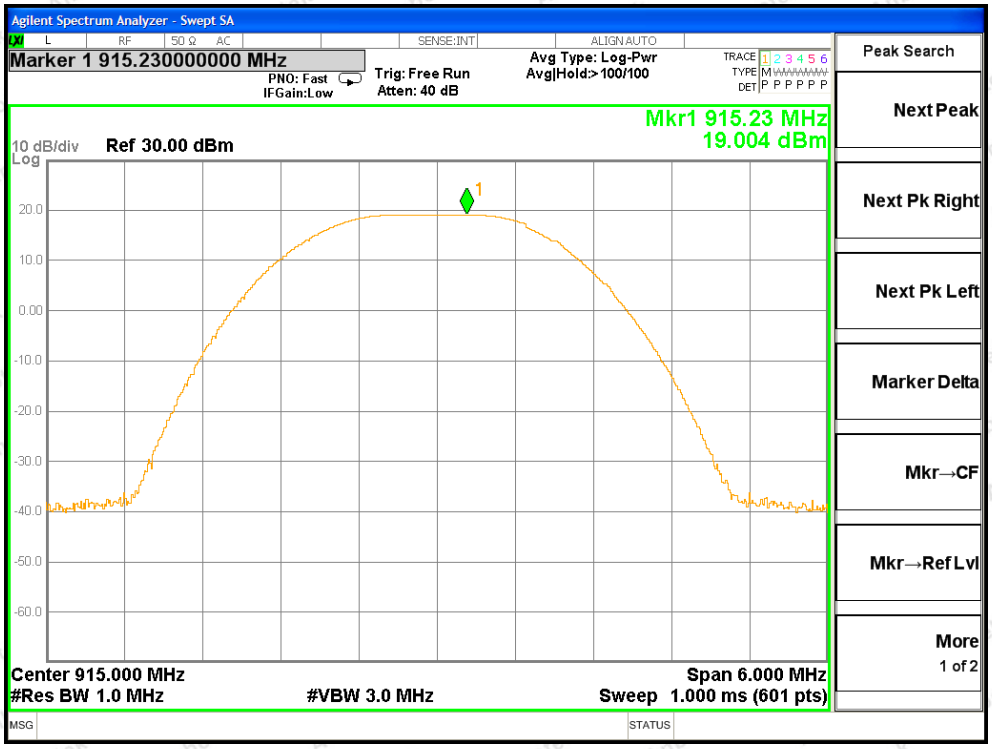
5.4. Test Data

Test Item	:	Max. peak output power	Test Mode	:	CH Low ~ CH High
Test Voltage	:	DC 5V via USB Port	Temperature	:	23.9℃
Test Result	:	PASS	Humidity	:	54%RH

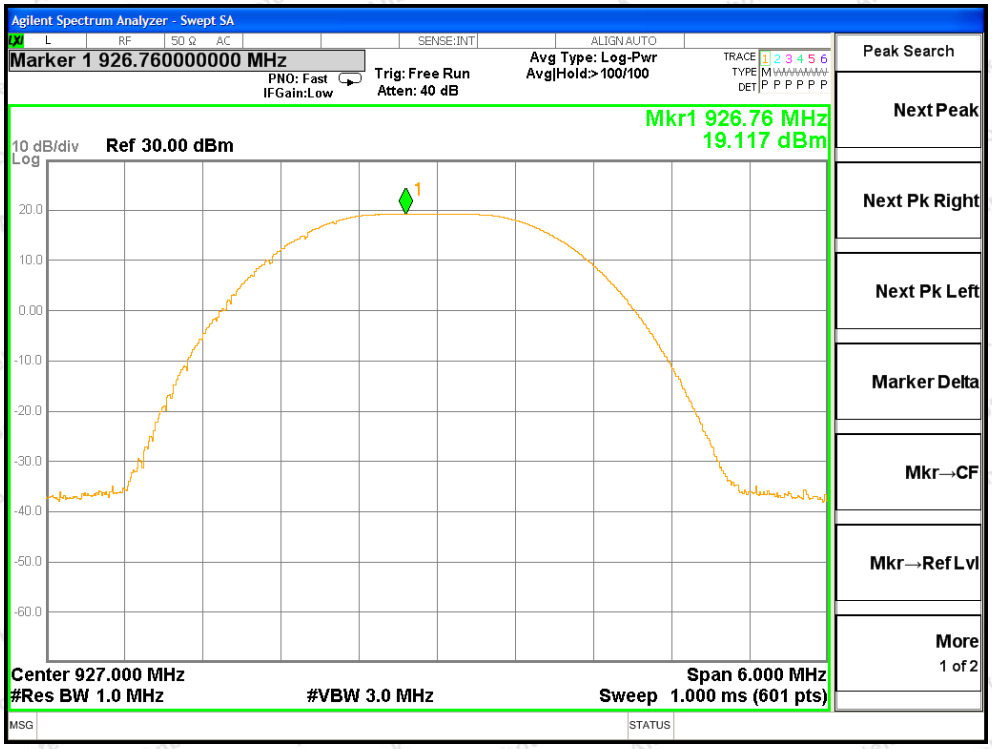
Channel Frequency (MHz)	Peak Power output (dBm)	Limit (dBm)	Results
903.0	18.592	30	PASS
915.0	19.004	30	PASS
927.0	**19.117**	30	PASS



CH: Low



CH: Middle


Agilent Spectrum Analyzer - Swept SA
Marker 1 926.760000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 40 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
Mkr1 926.76 MHz
19.117 dBm
10 dB/div
Log
Ref 30.00 dBm
Center 927.000 MHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Span 6.000 MHz
Sweep 1.000 ms (601 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

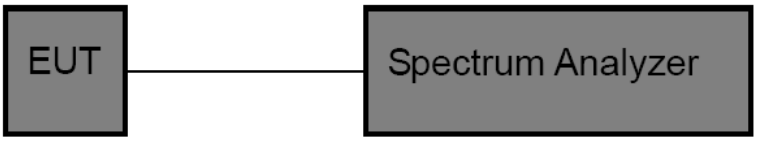
CH: High

6. 6DB Occupy Bandwidth Test

6.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247 (a)(2)
Test Limit	>500kHz

6.2. Test Setup



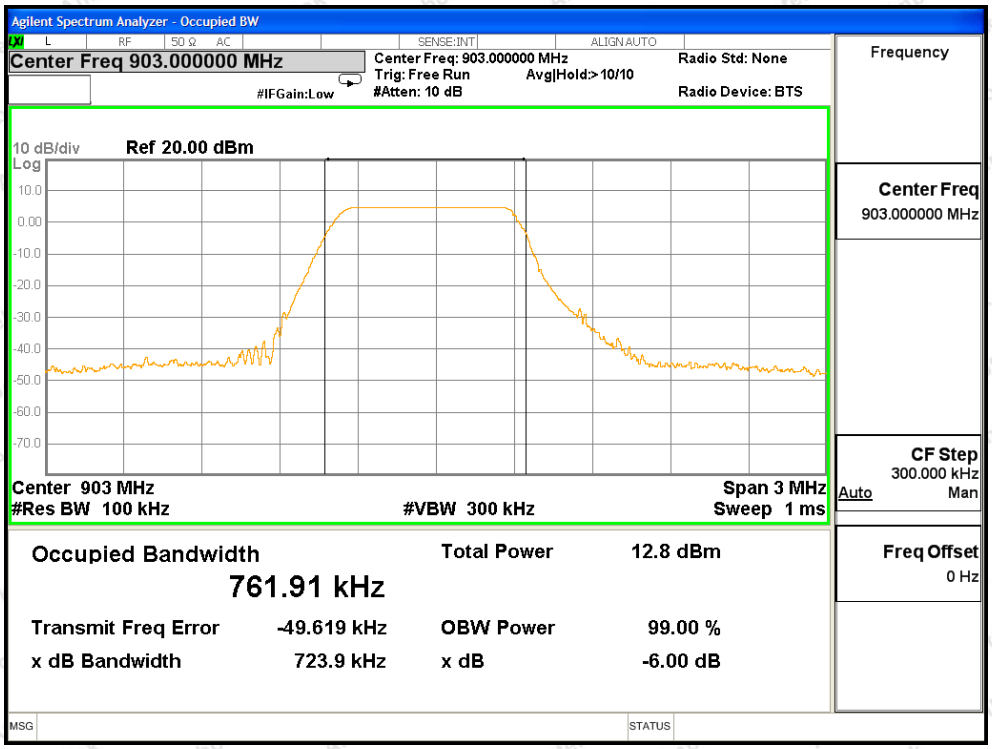
6.3. Test Procedure

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as:
RBW = 100kHz, VBW⩾3*RBW =300kHz,
Detector= Peak
Trace mode= Max hold.
Sweep- auto couple.
4. Mark the peak frequency and –6dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

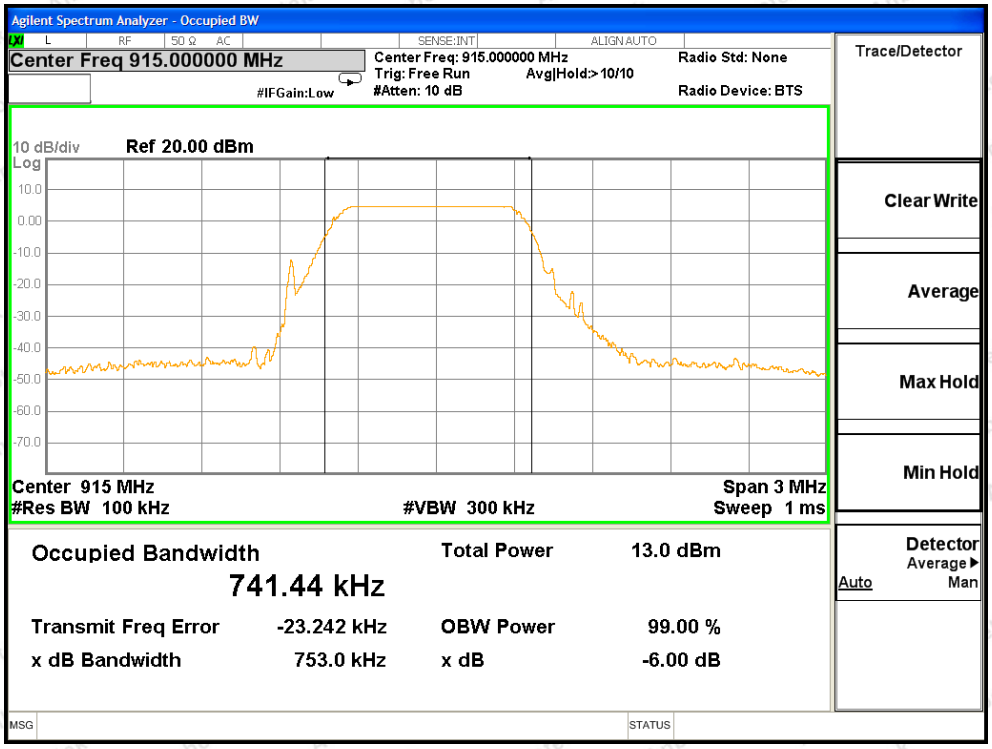
6.4. Test Data

Test Item	:	6dB Bandwidth	Test Mode	:	CH Low ~ CH High
Test Voltage	:	DC 5V via USB Port	Temperature	:	23.9℃
Test Result	:	PASS	Humidity	:	54%RH

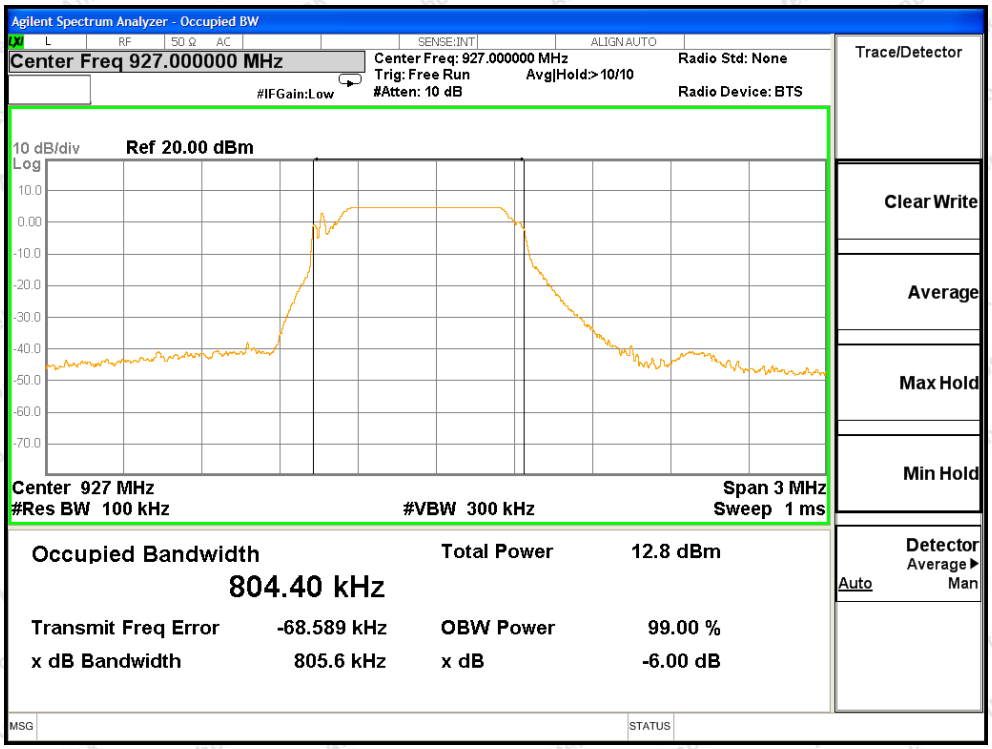
Channel	Frequency(MHz)	Bandwidth (kHz)	Limit (kHz)	Results
Low	903.0	723.9	>500	PASS
Middle	915.0	753.0		PASS
High	927.0	805.6		PASS



CH: Low



CH: Middle


Agilent Spectrum Analyzer - Occupied BW
Center Freq 927.000000 MHz
Center Freq: 927.000000 MHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 10 dB
Radio Std: None
Radio Device: BTS
#IFGain:Low
Trace/Detector
10 dB/div
Ref 20.00 dBm
Log
Clear Write
Average
Max Hold
Min Hold
Center 927 MHz
#Res BW 100 kHz
#VBW 300 kHz
Span 3 MHz
Sweep 1 ms
Occupied Bandwidth
804.40 kHz
Total Power 12.8 dBm
Transmit Freq Error -68.589 kHz
OBW Power 99.00 %
x dB Bandwidth 805.6 kHz
x dB -6.00 dB
Detector
Auto
Average
Man
MSG
STATUS

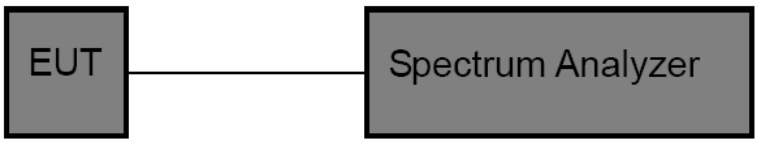
CH: High

7. Power Spectral Density Test

7.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247 (e)
Test Limit	8dBm

7.2. Test Setup



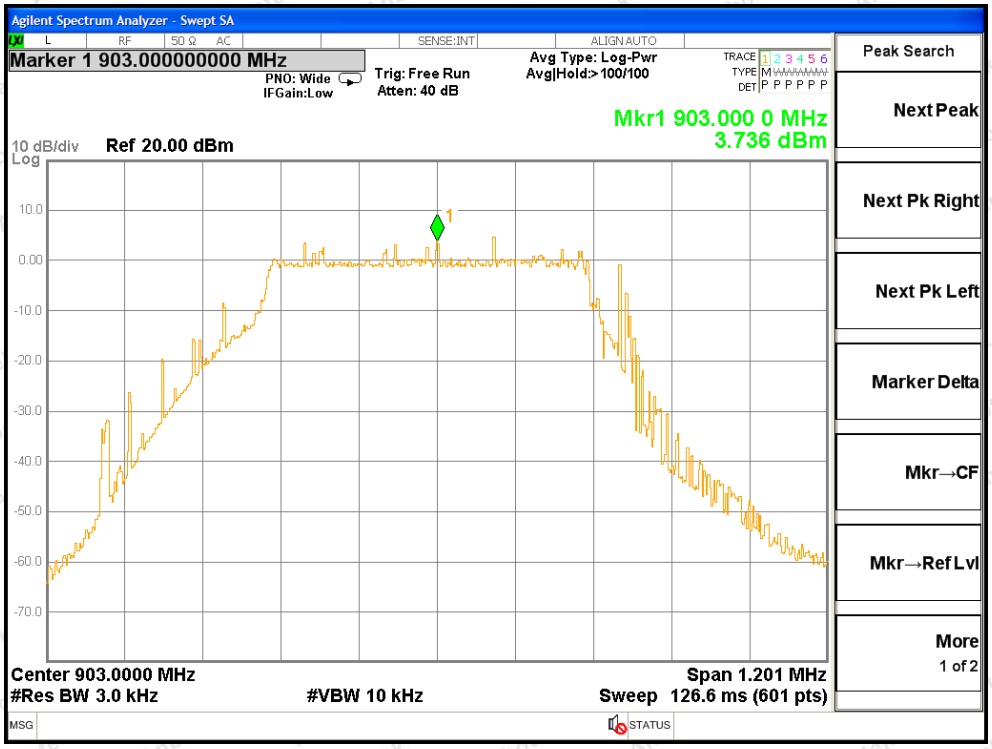
7.3. Test Procedure

1. Place the EUT on the table and set it in transmitting mode. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set the spectrum analyzer as RBW = 3kHz, VBW = 10kHz, Span = 1.5xDTS BW
3. Record the max. reading.
4. Repeat the above procedure until the measurements for all frequencies are completed.

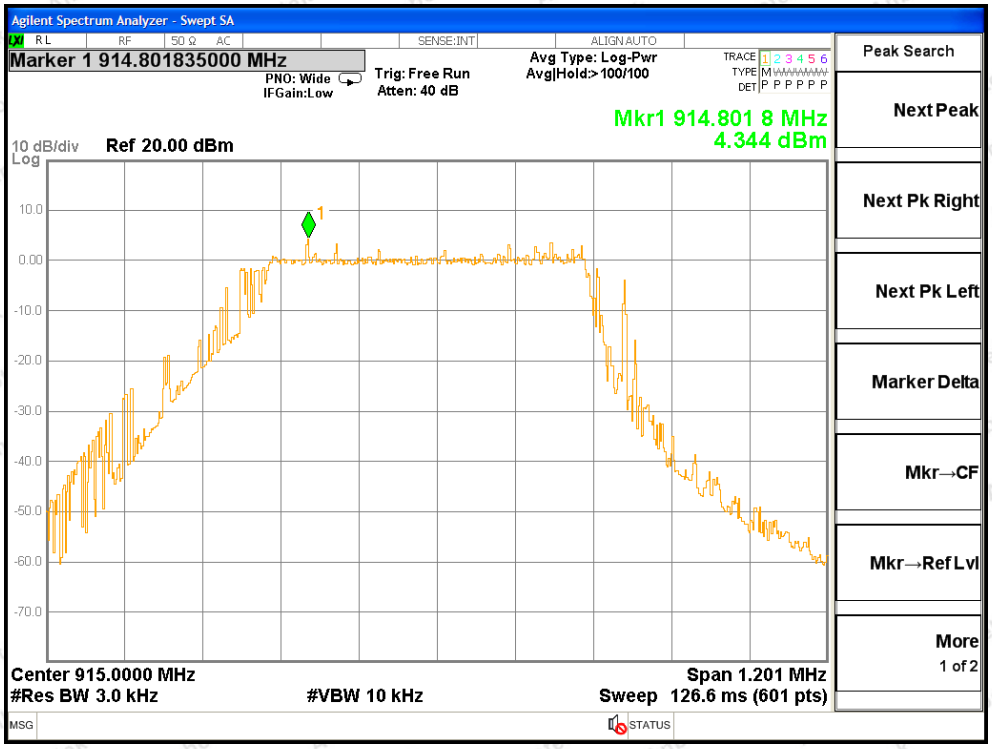
7.4. Test Data

Test Item	:	Power Spectral Density	Test Mode	:	CH Low ~ CH High
Test Voltage	:	DC 5V via USB Port	Temperature	:	23.9℃
Test Result	:	PASS	Humidity	:	54%RH

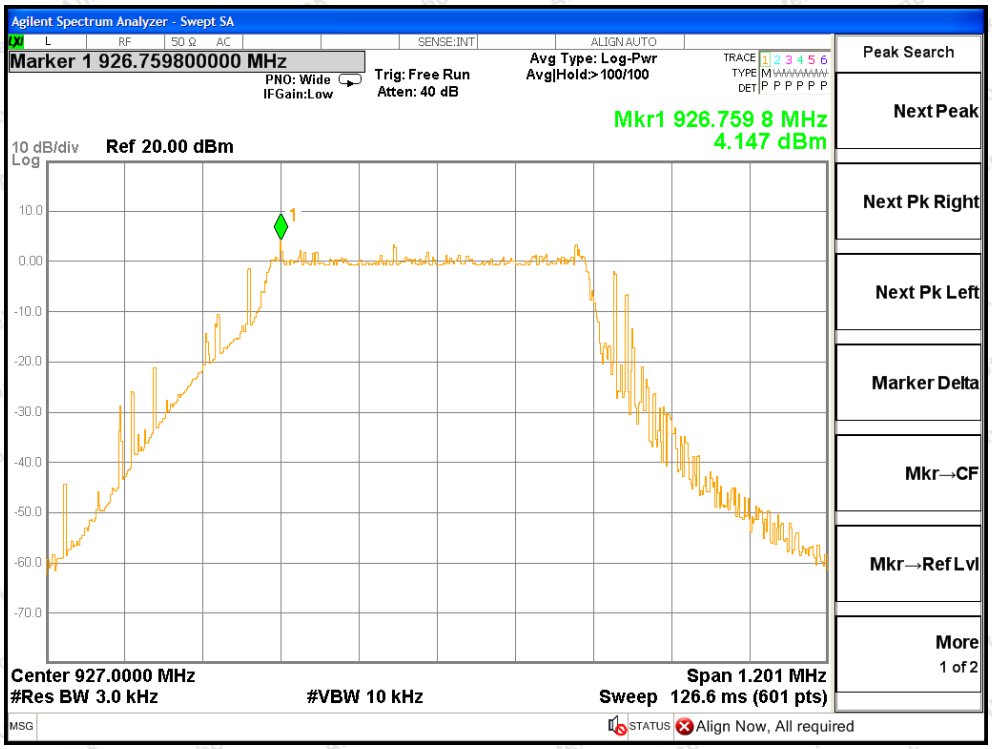
Channel	Frequency (MHz)	PPSD (dBm/KHz)	Limit (dBm/KHz)	Results
Low	903.0	3.736	8.00	PASS
Middle	915.0	4.344	8.00	PASS
High	927.0	4.147	8.00	PASS



CH: Low



CH: Middle


Agilent Spectrum Analyzer - Swept SA
Marker 1 926.759800000 MHz
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 40 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
Mkr1 926.759 8 MHz
4.147 dBm
10 dB/div
Log
Ref 20.00 dBm
Center 927.0000 MHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 1.201 MHz
Sweep 126.6 ms (601 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Align Now, All required

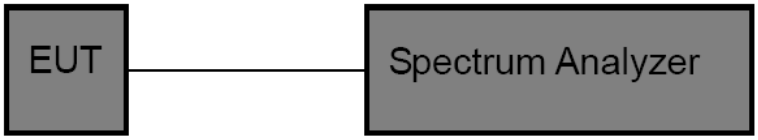
CH: High

8. 100kHz Bandwidth of Frequency Band Edge Requirement

8.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247 (d)
Test Limit	in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in15.209(a).

8.2. Test Setup



8.3. Test Procedure

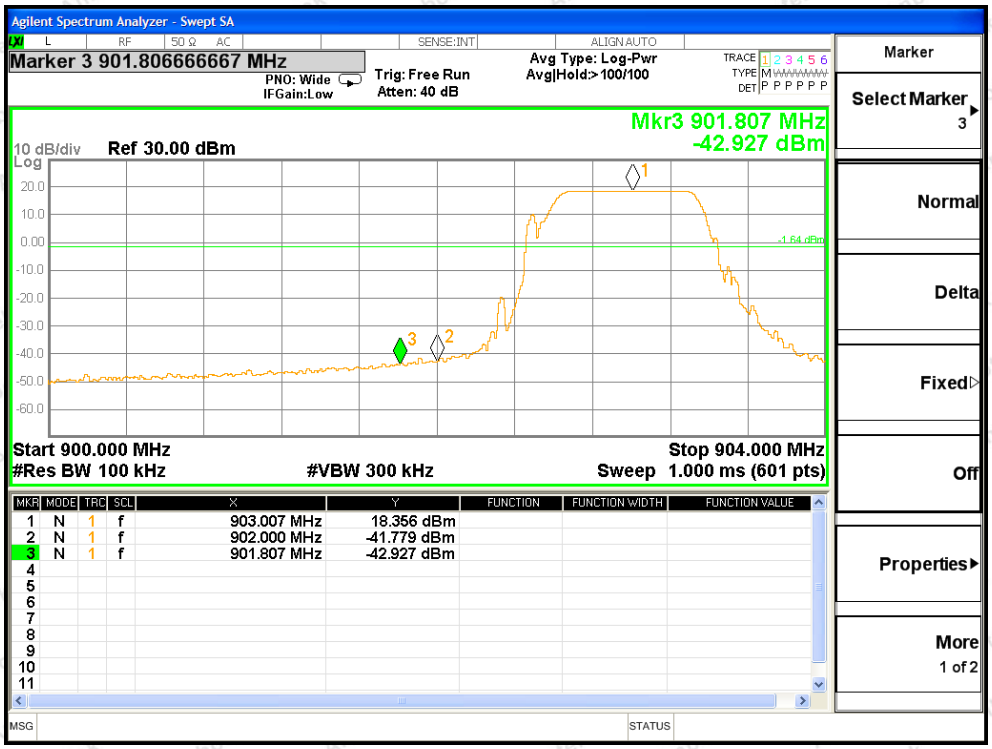
Using the following spectrum analyzer setting:

1. Set the RBW = 100KHz.
2. Set the VBW = 300KHz.
3. Sweep time = auto couple.
4. Detector function = peak.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.

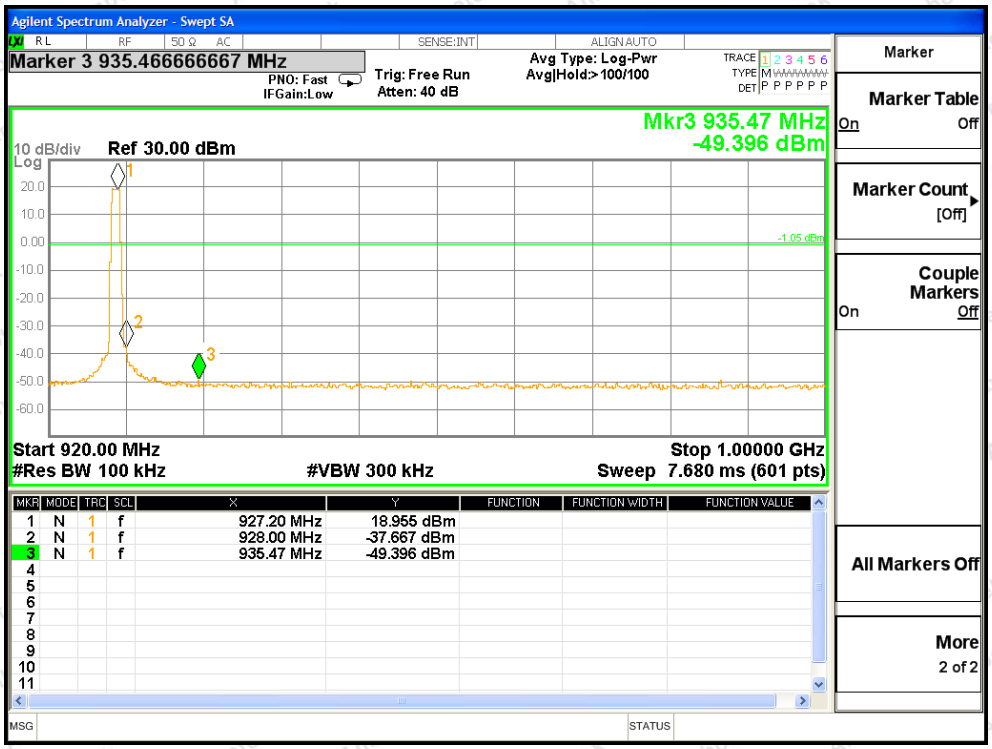
8.4. Test Data

Test Item	:	Band edge	Test Mode	:	CH Low ~ CH High
Test Voltage	:	DC 5V via USB Port	Temperature	:	23.9℃
Test Result	:	PASS	Humidity	:	54%RH

Frequency Band (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)	Results
902	60.135	>20	PASS
928	56.622	>20	PASS



CH: Low



CH: High

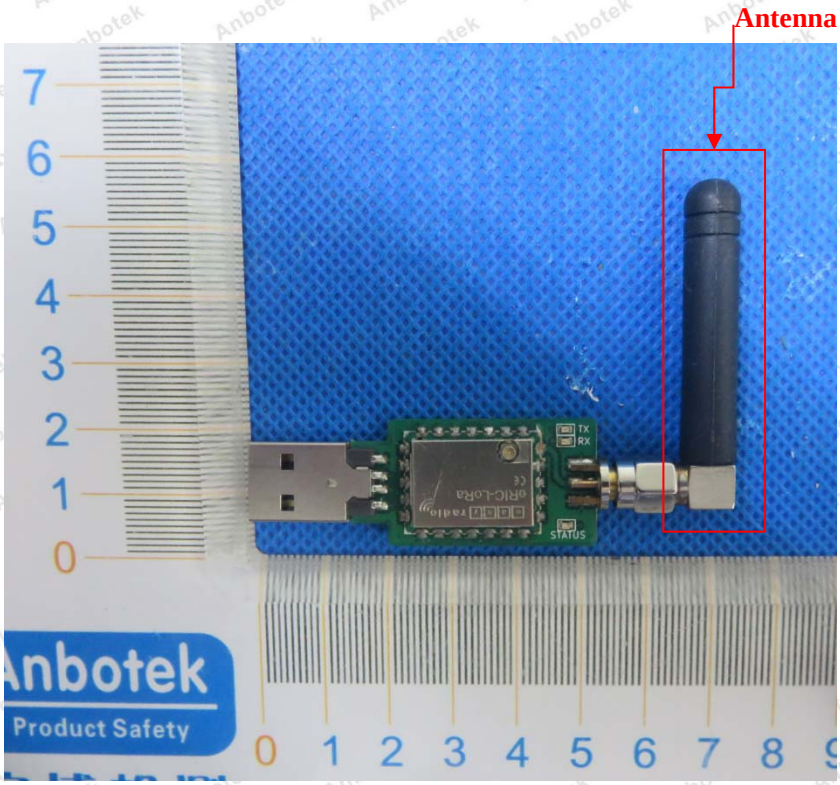
9. Antenna Requirement

9.1. Test Standard and Requirement

Test Standard	FCC Part15 Section 15.203 /247(c)
Requirement	1) 15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, 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. 2) 15.247(c) (1)(i) requirement: Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

9.2. Antenna Connected Construction

The antenna is a Monopole Antenna which permanently attached, and the best case gain of the antenna is 0 dBi. It complies with the standard requirement.



APPENDIX I -- TEST SETUP PHOTOGRAPH

Photo of Conducted Emission Test

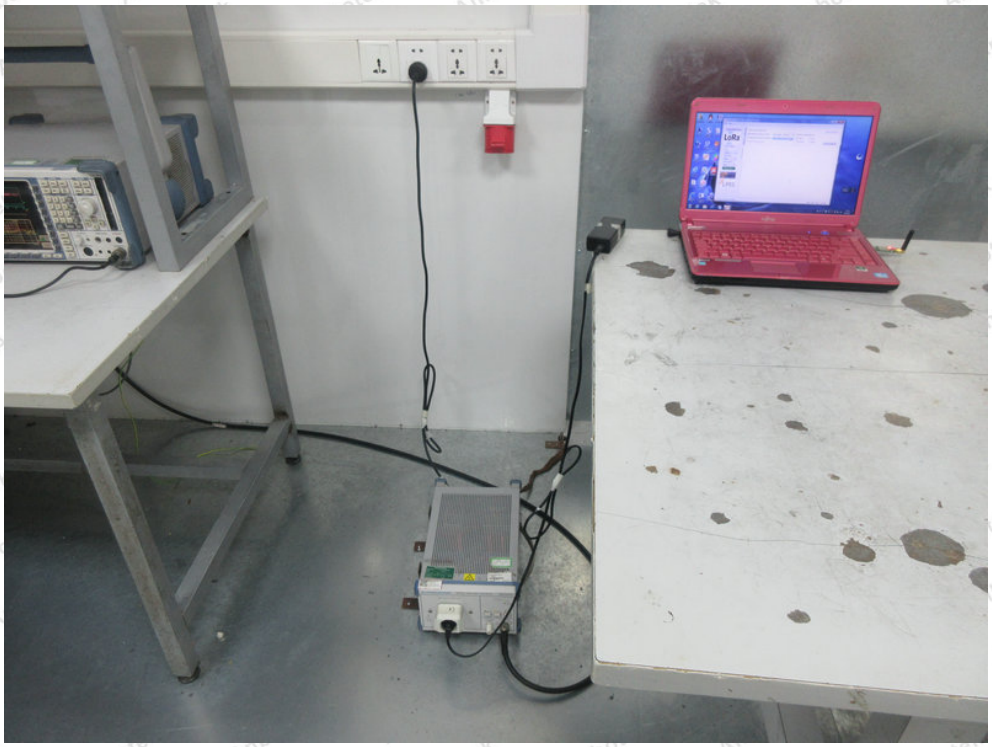
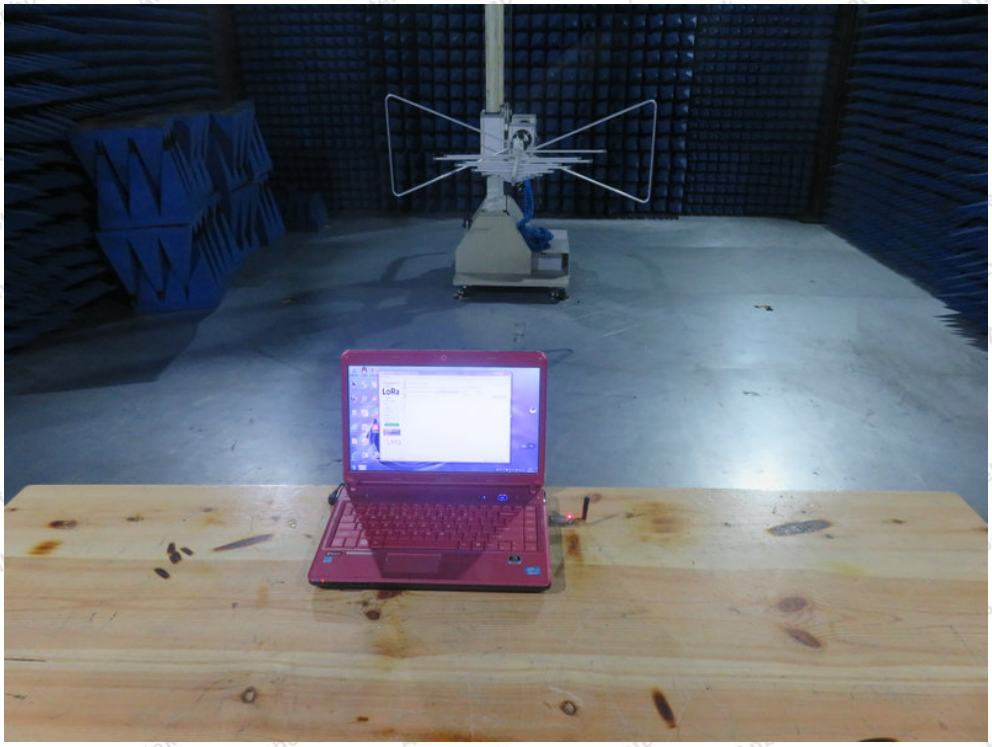
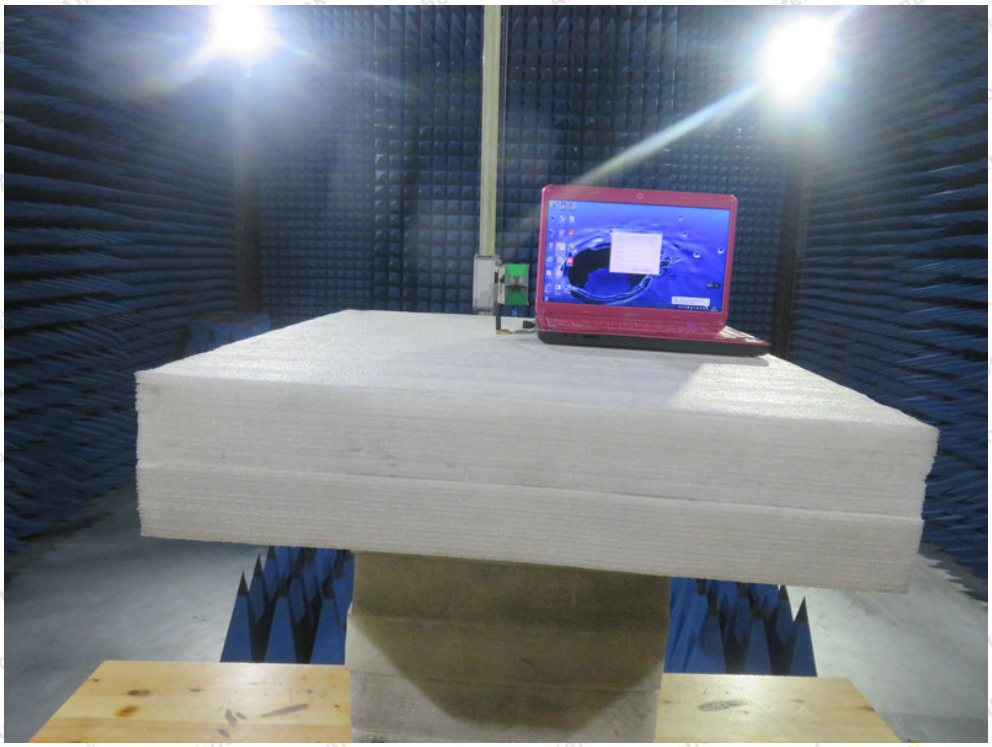


Photo of Radiation Emission Test

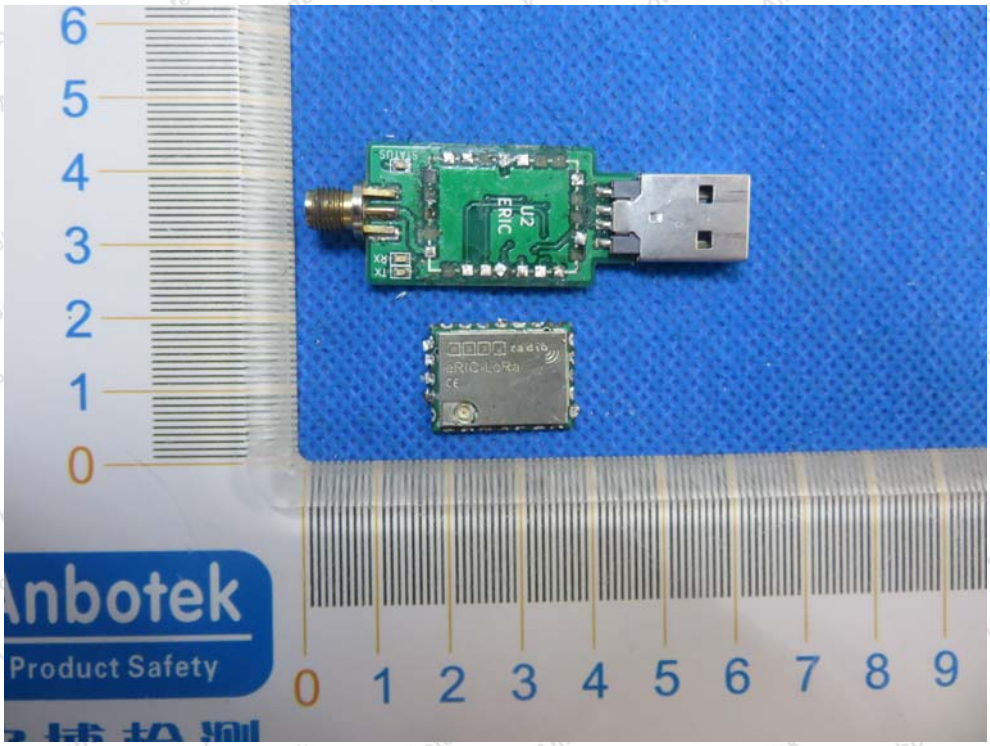


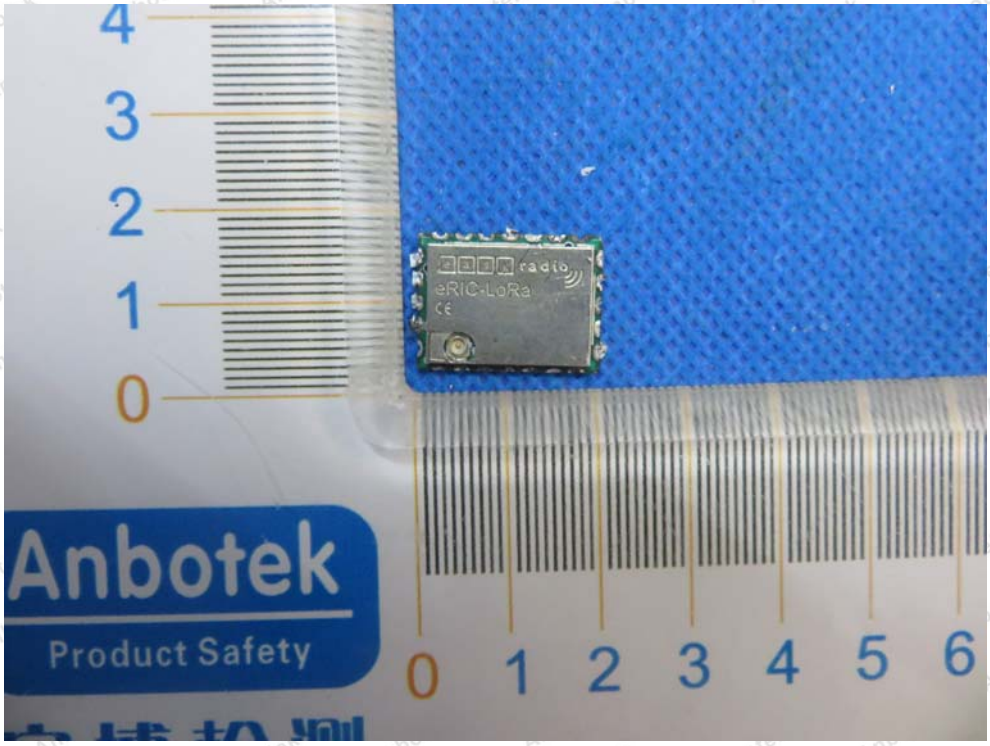


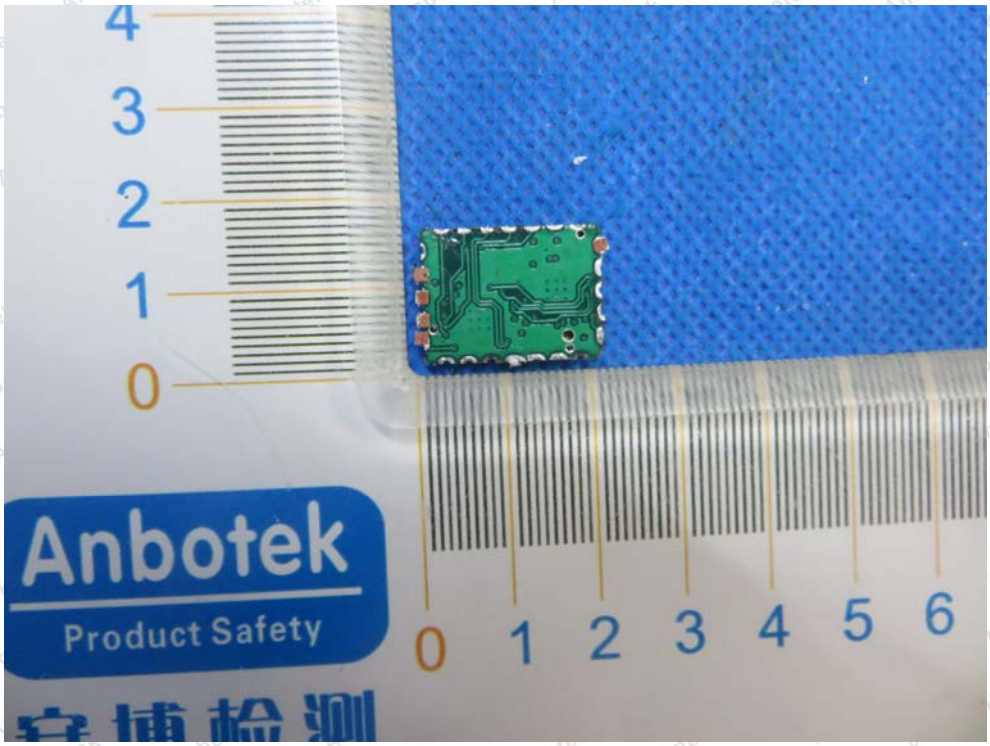
APPENDIX II -- EXTERNAL PHOTOGRAPH

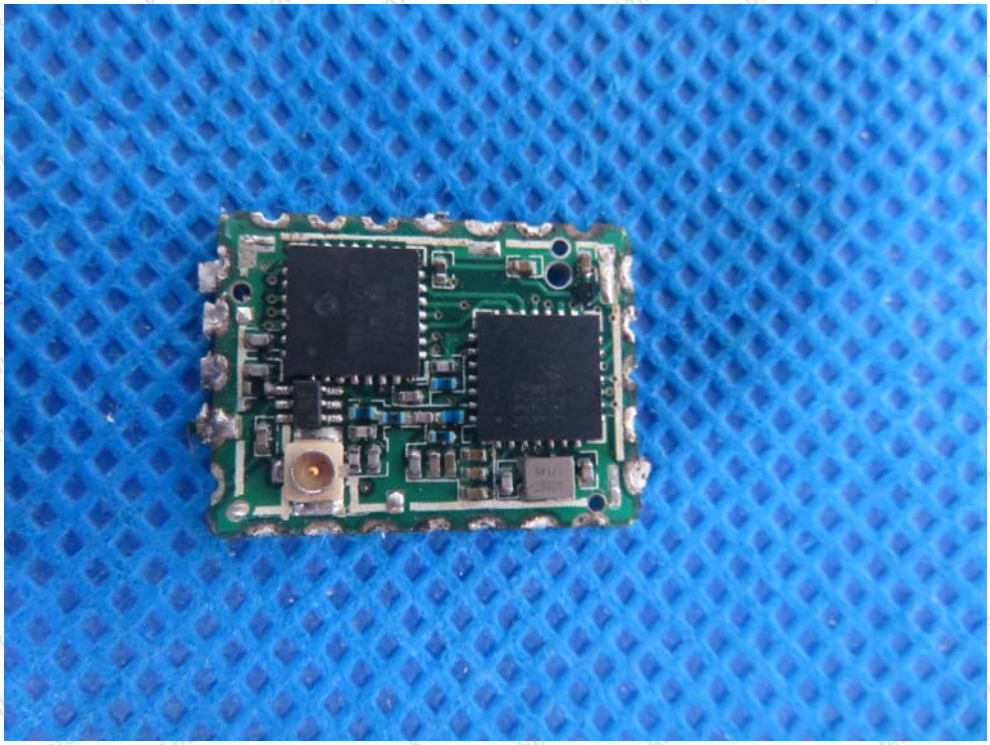
easy radio
eRIC-LoRa
RX
TX

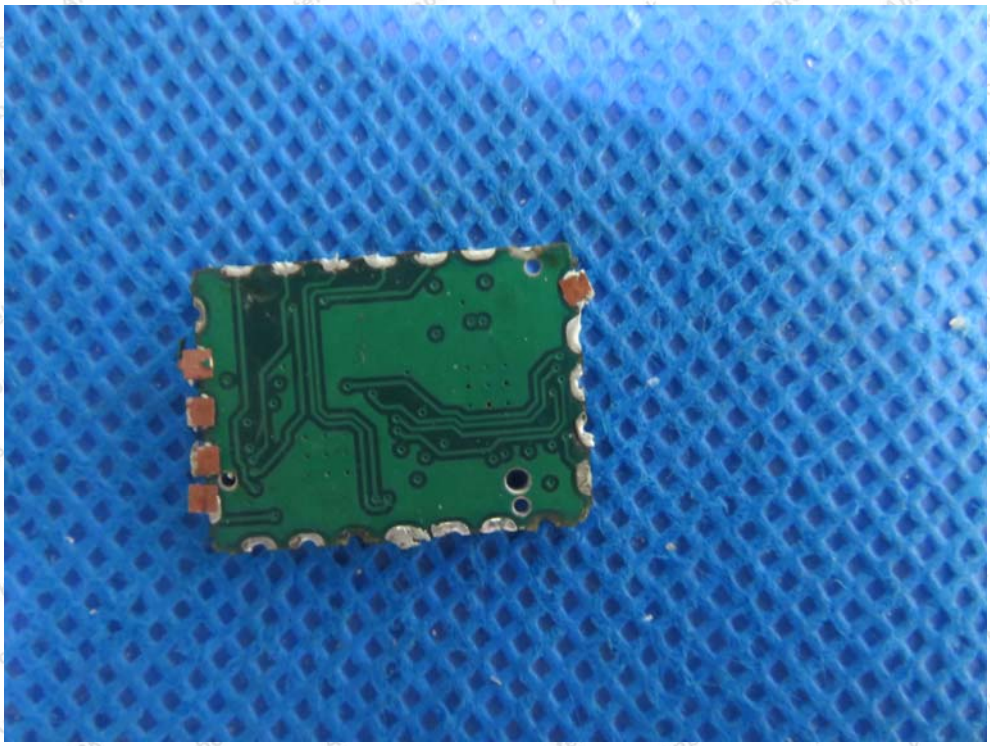
APPENDIX III -- INTERNAL PHOTOGRAPH






Anbotek
Product Safety





---------- End of Report ----------