

FCC TEST REPORT
for
Shenzhen Jietong Technology Co., Ltd.

UHF RFID Reader
Model No.: JT-8280B, JT-8280A, JT-8280C, JT-8280W, JT-8288A, JT-8288B,
JT-8288W, JT-8290A, JT-8290B, JT-8290W

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Report Number : R011607937I
Date of Test : Aug. 01~ Sept. 26, 2016
Date of Report : Sept. 27, 2016

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TEST REPORT

Applicant : Shenzhen Jietong Technology Co., Ltd.
Manufacturer : Shenzhen Jietong Technology Co., Ltd.
EUT : UHF RFID Reader
Model No. : JT-8280B, JT-8280A, JT-8280C, JT-8280W, JT-8288A, JT-8288B,
JT-8288W, JT-8290A, JT-8290B, JT-8290W
Serial No. : N.A.
Trade Mark : N.A.
Rating : DC 12V, 3A

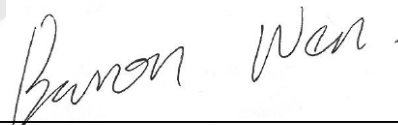
Measurement Procedure Used:

FCC Part15 Subpart C 2015, Paragraph 15.207, 15.247 & 15.209

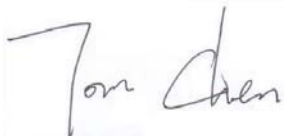
The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen 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 : Aug. 01~ Sept. 26, 2016

Prepared by : 
(Tested Engineer / Baron Wen)

Reviewer : 
(Project Manager / Amy Ding)

Approved & Authorized Signer : 
(Manager / Tom Chen)

1. GENERAL INFORMATION

1.1 Description of Device (EUT)

EUT	: UHF RFID Reader
Model Number	: JT-8280B, JT-8280A, JT-8280C, JT-8280W, JT-8288A, JT-8288B, JT-8288W, JT-8290A, JT-8290B, JT-8290W (Note: All samples are the same except the model number and colour, so we prepare “JT-8280B” for test only.)
Test Power Supply	: AC 120V, 60Hz for adapter/ AC 240V, 60Hz for adapter
Adapter	: Model No.: GM50-120300-F Input: AC 100-240V, 50/60Hz, 1.5A Output: DC 12V, 3.0A
Frequency	: 902.5~927.0MHz
Antenna Specification	: Integrated Antenna: 8dBi
Modulation	: ASK
Applicant Address	: Shenzhen Jietong Technology Co., Ltd. : A-3F, Baiwang Building, Shahe West Rd 5288, Nanshan District, Shenzhen, China
Manufacturer Address	: Shenzhen Jietong Technology Co., Ltd. : A-3F, Baiwang Building, Shahe West Rd 5288, Nanshan District, Shenzhen, China
Factory Address	: Shenzhen Jietong Technology Co., Ltd. : A-3F, Baiwang Building, Shahe West Rd 5288, Nanshan District, Shenzhen, China
Date of receipt	: Aug. 01, 2016
Date of Test	: Aug. 01~ Sept. 26, 2016

1.2 Auxiliary Equipment Used during Test

PC	: Manufacturer: DELL M/N: OPTIPLEX 380 S/N: 1J63X2X CE , FCC: DOC
MONITOR	: Manufacturer: DELL M/N: E170Sc S/N: CN-00V539-64180-055-0UPS CE , FCC: DOC
KEYBOARD	: Manufacturer: DELL M/N: SK-8115 S/N: CN-0DJ313-71616-06C-02XN CE , FCC: DOC Cable: 1m, unshielded
MOUSE	: Manufacturer: DELL M/N: M-UARDEL7 S/N: N/A CE , FCC: DOC Cable: 1m, unshielded
Printer	: Manufacturer: Brother M/N: MFC-3360C S/N: N/A CE, FCC: DOC
Power Line	: Non-Shielded, 1.5m
VGA Cable	: Non-Shielded, 1.5m

1.3 Description of Test Facility

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

FCC-Registration No.: 752021

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 752021, July 06, 2016.

IC-Registration No.: 8058A-1

Shenzhen Anbotek Compliance Laboratory Limited., EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration 8058A, Jun. 13, 2016.

Test Location

All Emissions tests were performed at
Shenzhen Anbotek Compliance Laboratory Limited. at 1/F., Building 1, SEC
Industrial Park, No.0409 Qianhai Road, Nanshan District, Shenzhen, Guangdong,
China

1.4 Measurement Uncertainty

Radiation Uncertainty : Ur = 4.1 dB (Horizontal)
Ur = 4.3 dB (Vertical)

Conduction Uncertainty : Uc = 3.4dB

2. Test Procedure

The tests documented in this report were performed in accordance with ANSI C63.10: 2013 and FCC Part 15, Paragraph 15.207, 15.247 & 15.209.

2.1 Summary of Test Results

The EUT has been tested according to the following specifications:

Standard Section	Test Item	Judgment
15.203/15.247(c)	Antenna Requirement	PASS
15.207	Conducted Emission	PASS
15.247(b)(1)	Conducted Peak Output Power	PASS
15.247(a)(1)	20dB Occupied Bandwidth	PASS
15.247(a)(1)	Carrier Frequencies Separation	PASS
15.247(a)(1)	Hopping Channel Number	PASS
15.247(a)(1)	Dwell Time	PASS
15.205/15.209	Spurious Emission	PASS
15.247(d)	Band Edge	PASS
Remark: "N/A" is an abbreviation for Not Applicable.		

N/A means Not Applicable.

2.1 ResultsDescription of Test Modes

The EUT has been tested under operating condition.

Software used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

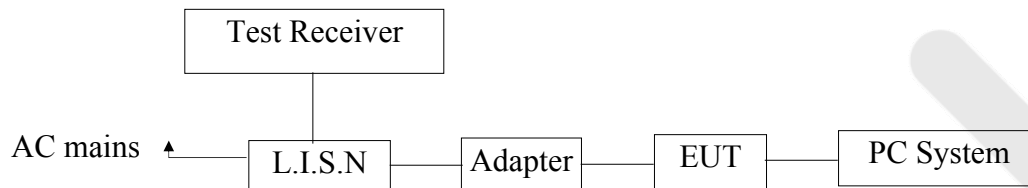
The test channel

Test model	Low Channel	Mid Channel	High Channel
Continuous TX	902.5MHz	914.5MHz	927.0MHz

3. Conducted Emission

3.1 Block Diagram of Test Setup

3.1.1. Block diagram of connection between the EUT and simulators



3.2 Power Line Conducted Emission Measurement Limits (15.207)

Frequency MHz	Limits dB(μV)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66 ~ 56*	56 ~ 46*
0.50 ~ 5.00	56	46
5.00 ~ 30.00	60	50

Notes: 1. *Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

3.3 Configuration of EUT on Measurement

The following equipments are installed on Power Line Conducted Emission Measurement to meet the commission requirement and operating regulations in a manner which tends to maximize its emission characteristics in a normal application.

3.4 Operating Condition of EUT

- 3.4.1. Setup the EUT and simulator as shown as Section 3.1.
- 3.4.2. Turn on the power of all equipment.
- 3.4.3. Let the EUT work in test mode (On) and measure it.

3.5 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.

The test results are reported on Section 3.6.

Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Two-Line V-network	Rohde & Schwarz	ENV216	100055	Apr. 16, 2016	1 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Apr. 16, 2016	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Apr. 16, 2016	1 Year

3.6 Power Line Conducted Emission Measurement Results

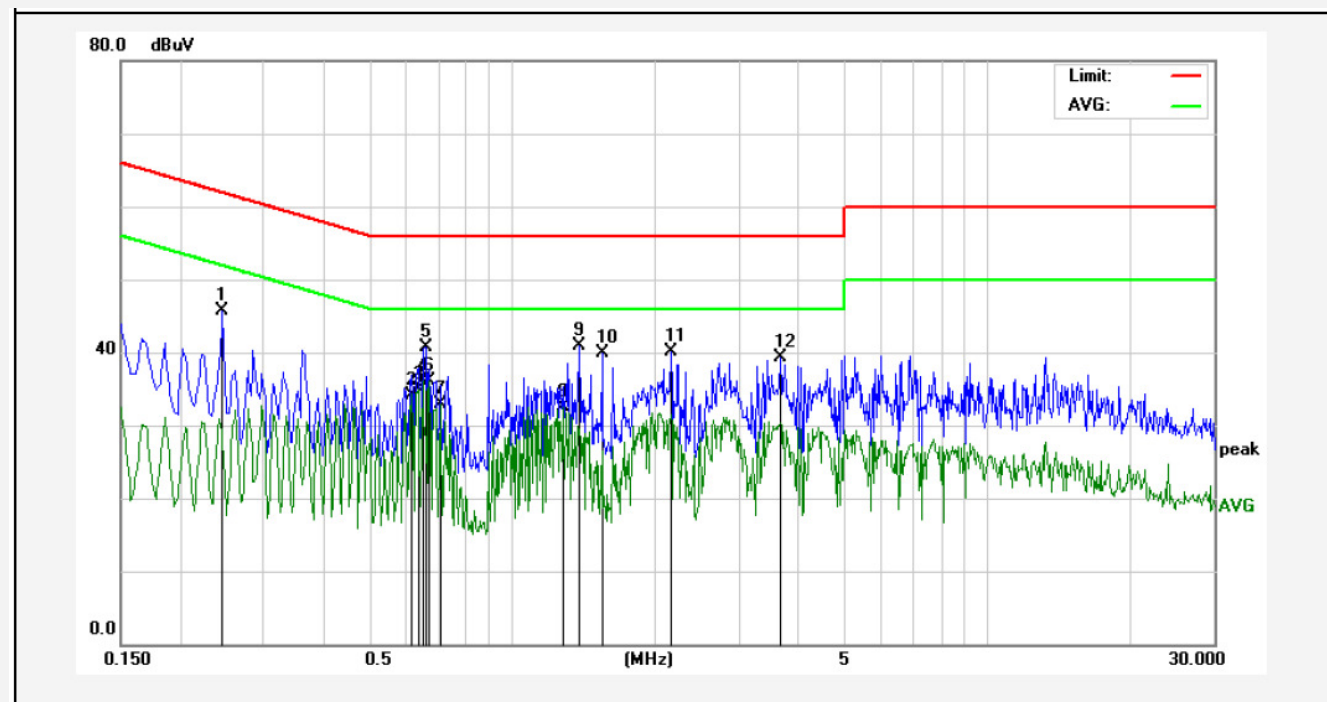
PASS.

The frequency range from 150KHz to 30 MHz is investigated.

Please refer the following pages.

CONDUCTED EMISSION TEST DATA

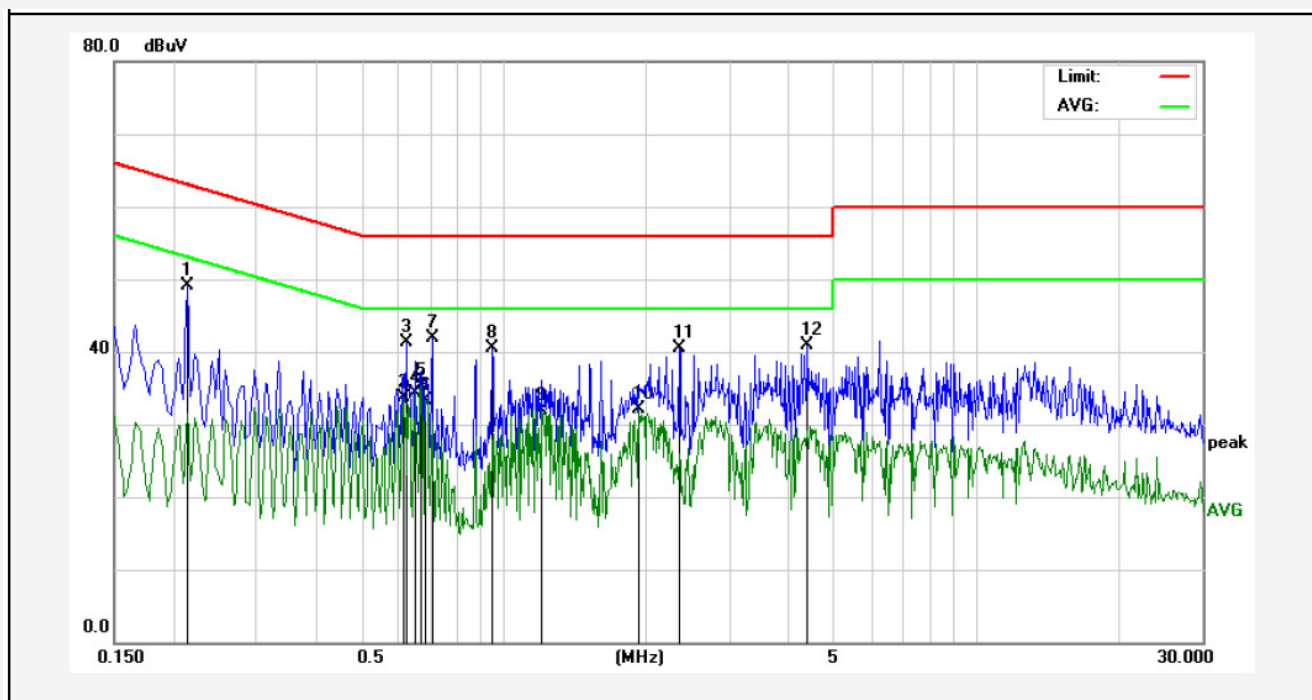
Test Site: 1# Shielded Room
Operating Condition: On
Test Specification: AC 120V, 60Hz for adapter
Comment: Live Line
Tem.:25℃ Hum.:50%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Over Limit (dB)	Detector	Remark
1	0.2460	25.71	20.10	45.81	61.89	-16.08	QP	
2	0.6140	14.20	20.15	34.35	46.00	-11.65	AVG	
3	0.6340	14.88	20.15	35.03	46.00	-10.97	AVG	
4	0.6500	16.02	20.15	36.17	46.00	-9.83	AVG	
5	0.6580	20.71	20.15	40.86	56.00	-15.14	QP	
6	0.6700	16.11	20.15	36.26	46.00	-9.74	AVG	
7	0.7060	12.82	20.16	32.98	46.00	-13.02	AVG	
8	1.2820	12.56	20.20	32.76	46.00	-13.24	AVG	
9	1.3820	20.97	20.20	41.17	56.00	-14.83	QP	
10	1.5460	19.96	20.20	40.16	56.00	-15.84	QP	
11	2.1619	20.02	20.25	40.27	56.00	-15.73	QP	
12	3.6620	19.32	20.25	39.57	56.00	-16.43	QP	

CONDUCTED EMISSION TEST DATA

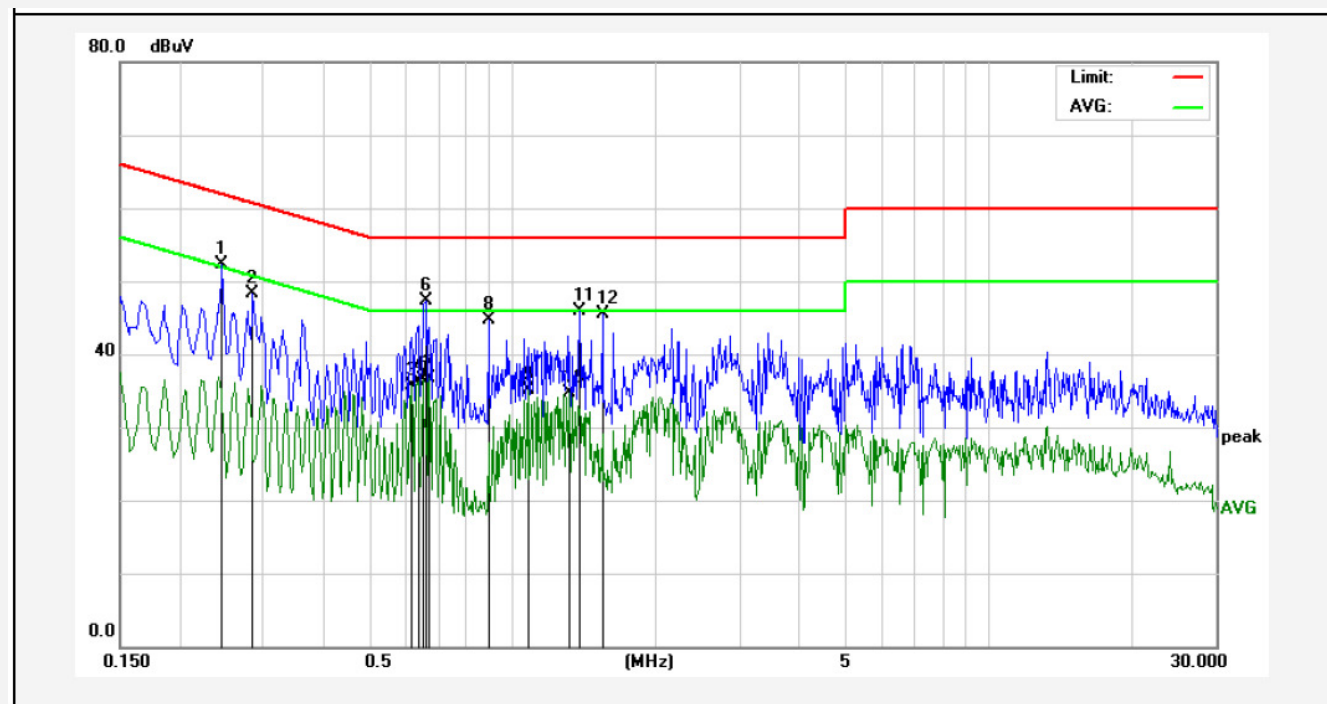
Test Site: 1# Shielded Room
Operating Condition: On
Test Specification: AC 120V, 60Hz for adapter
Comment: Neutral Line
Tem.:25°C Hum.:50%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Over Limit (dB)	Detector	Remark
1	0.2140	29.03	20.10	49.13	63.04	-13.91	QP	
2	0.6140	13.75	20.15	33.90	46.00	-12.10	AVG	
3	0.6220	21.34	20.15	41.49	56.00	-14.51	QP	
4	0.6500	14.29	20.15	34.44	46.00	-11.56	AVG	
5	0.6700	15.31	20.15	35.46	46.00	-10.54	AVG	
6	0.6860	13.32	20.16	33.48	46.00	-12.52	AVG	
7	0.7060	21.99	20.16	42.15	56.00	-13.85	QP	
8	0.9460	20.55	20.17	40.72	56.00	-15.28	QP	
9	1.2059	11.98	20.20	32.18	46.00	-13.82	AVG	
10	1.9340	12.02	20.20	32.22	46.00	-13.78	AVG	
11	2.3580	20.53	20.25	40.78	56.00	-15.22	QP	
12	4.3859	20.89	20.30	41.19	56.00	-14.81	QP	

CONDUCTED EMISSION TEST DATA

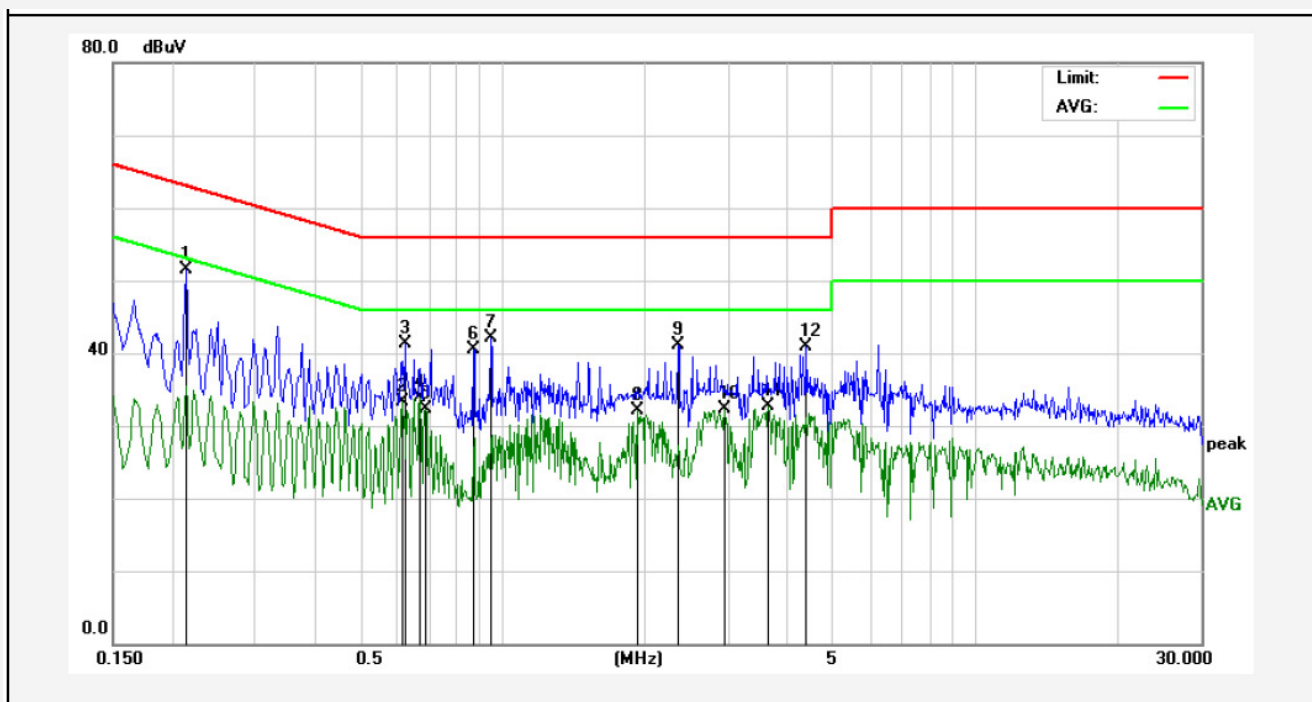
Test Site: 1# Shielded Room
Operating Condition: On
Test Specification: AC 240V, 60Hz for adapter
Comment: Live Line
Tem.:25°C Hum.:50%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Over Limit (dB)	Detector	Remark
1	0.2459	32.21	20.10	52.31	61.89	-9.58	QP	
2	0.2857	28.24	20.10	48.34	60.65	-12.31	QP	
3	0.6139	15.70	20.15	35.85	46.00	-10.15	AVG	
4	0.6340	16.38	20.15	36.53	46.00	-9.47	AVG	
5	0.6500	16.52	20.15	36.67	46.00	-9.33	AVG	
6	0.6580	27.21	20.15	47.36	56.00	-8.64	QP	
7	0.6700	16.61	20.15	36.76	46.00	-9.24	AVG	
8	0.8940	24.76	20.16	44.92	56.00	-11.08	QP	
9	1.0780	15.01	20.20	35.21	46.00	-10.79	AVG	
10	1.3180	14.64	20.20	34.84	46.00	-11.16	AVG	
11	1.3810	25.97	20.20	46.17	56.00	-8.83	QP	
12	1.5460	25.46	20.20	45.66	56.00	-10.34	QP	

CONDUCTED EMISSION TEST DATA

Test Site: 1# Shielded Room
Operating Condition: On
Test Specification: AC 240V, 60Hz for adapter
Comment: Neutral Line
Tem.:25°C Hum.:50%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Over Limit (dB)	Detector	Remark
1	0.2139	31.53	20.10	51.63	63.05	-11.42	QP	
2	0.6139	13.25	20.15	33.40	46.00	-12.60	AVG	
3	0.6219	21.34	20.15	41.49	56.00	-14.51	QP	
4	0.6700	13.81	20.15	33.96	46.00	-12.04	AVG	
5	0.6863	12.24	20.15	32.39	46.00	-13.61	AVG	
6	0.8699	20.45	20.17	40.62	56.00	-15.38	QP	
7	0.9455	22.05	20.17	42.22	56.00	-13.78	QP	
8	1.9334	12.02	20.20	32.22	46.00	-13.78	AVG	
9	2.3580	21.03	20.20	41.23	56.00	-14.77	QP	
10	2.9539	12.28	20.20	32.48	46.00	-13.52	AVG	
11	3.6419	12.67	20.25	32.92	46.00	-13.08	AVG	
12	4.3859	20.89	20.30	41.19	56.00	-14.81	QP	

4. Radiation Interference

4.1 Requirements (15.247, 15.209):

4.1.1. Test Limits (< 30 MHz)

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meter)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30

4.1.2. Test Limits (≥ 30 MHz)

FIELD STRENGTH of Fundamental: @3M	FIELD STRENGTH of Harmonics	S15.209 30 - 88 MHz	40 dBuV/m
902-928 MHz		88 - 216 MHz	43.5
2.4-2.4835 GHz		216 - 960 MHz	46
94 dBuV/m @3m	54 dBuV/m @3m	ABOVE 960 MHz	54dBuV/m

For range 9KHz~30MHz, The measured value is really too low to be recorded.

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in 15.209, whichever is the lesser attenuation.

4.2 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 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 =3MHz,
Detector= Peak
Trace mode= Max hold.
Sweep- auto couple.

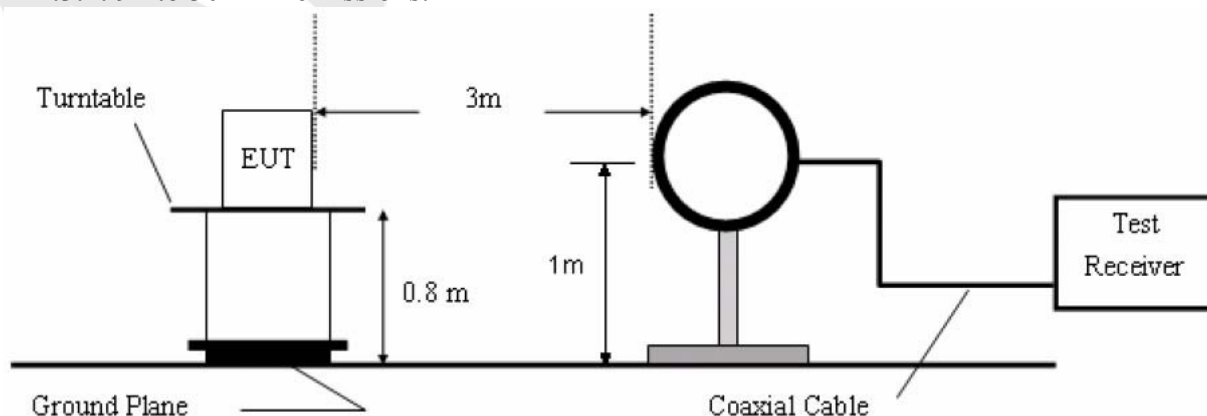
Set the spectrum analyzer as:
RBW =1MHz, VBW =10Hz
Detector= Average
Trace mode= Max hold.
Sweep- auto couple.

Test Equipment

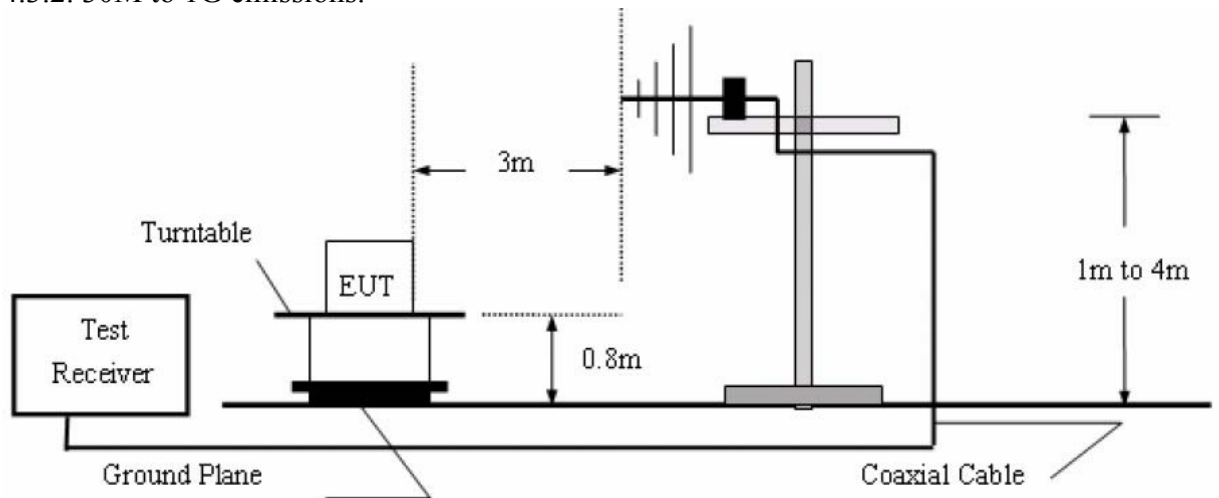
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analysis	Agilent	E4407B	US39390582	Apr. 16, 2016	1 Year
2.	Preamplifier	Instruments corporation	EMC011830	980100	Apr. 16, 2016	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESPI	101604	Apr. 16, 2016	1 Year
4.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Apr. 19, 2016	1 Year
5.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Apr. 19, 2016	1 Year
6.	Pre-amplifier	SONOMA	310N	186860	Apr. 16, 2016	1 Year
7.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A
8	Power Sensor	DAER	RPR3006W	15I00041SN046	Jun 30, 2016	1 Year
9	MXA Spectrum Analysis	Agilent	N9020A	MY51170037	Jun 30, 2016	1 Year
10	MXG RF Vector Signal Generator	Agilent	N5182A	MY48180656	Jun 30, 2016	1 Year
11	Signal Generator	Agilent	E4421B	MY41000743	Jun 30, 2016	1 Year
12	DC Power supply	IV	IV-8080	YQSB0096	Jun 30, 2016	1 Year
13	TEMP&HUMI PROGRAMMABLE CHAMBER	Bell Group	BE-THK-150M8	SE-0137	Mar. 16, 2016	1 Year

4.3 Test Configuration

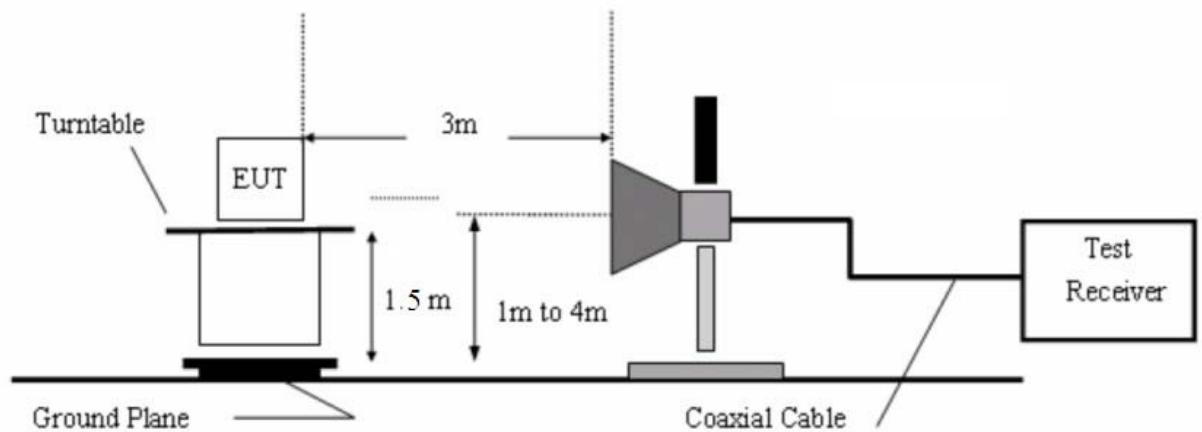
4.3.1. 9k to 30MHz emissions:



4.3.2. 30M to 1G emissions:



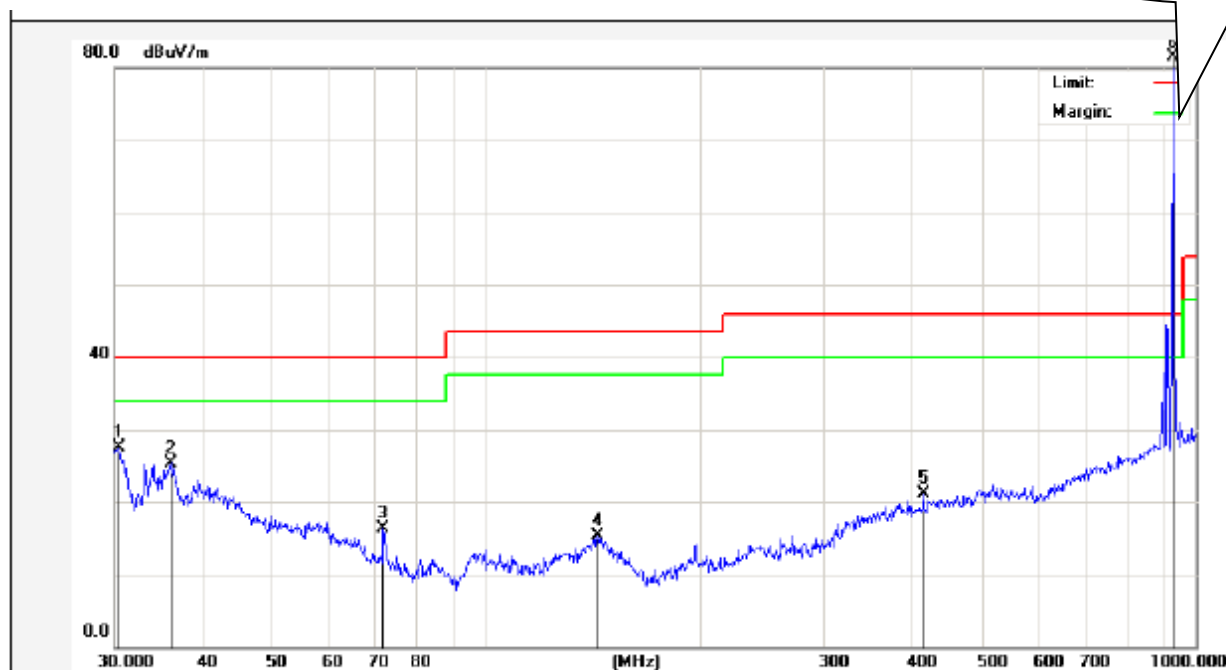
4.3.3. 1G to 40G emissions:



4.4 Test Results

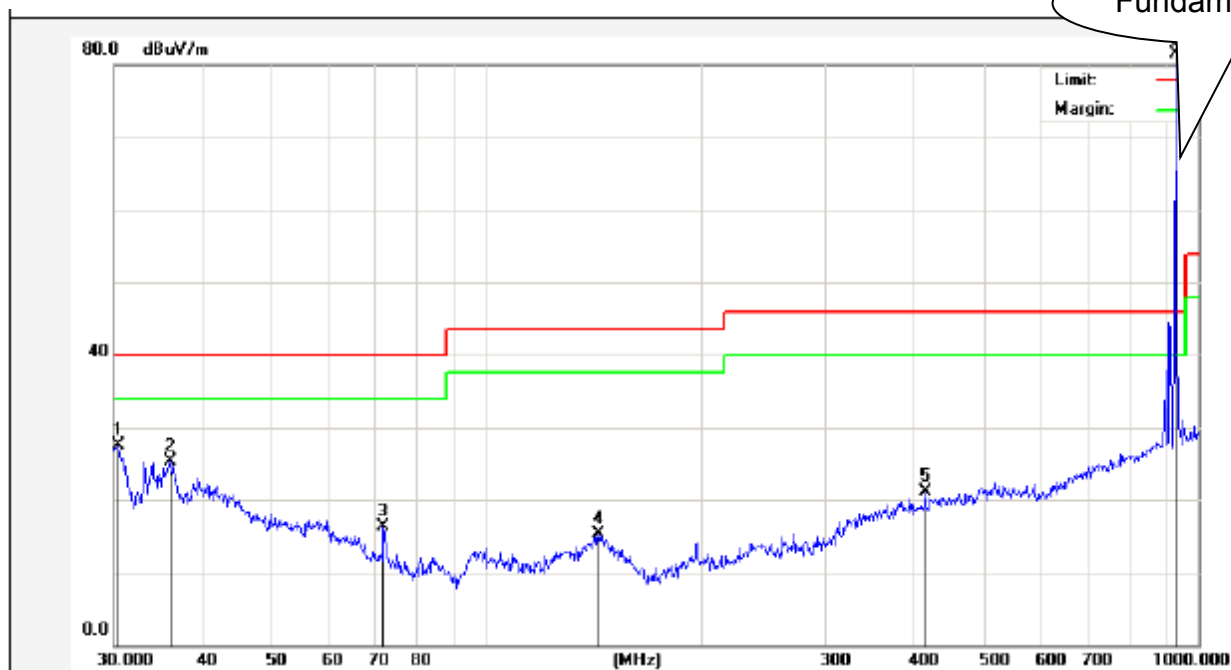
PASS.

Job No.:	011607937I	Plarization:	Horizontal
Standard:	(RE)FCC PART 15C _3m	Power Source:	AC 120V, 60Hz for adapter
Test item:	Radiation Test (30~1000MHz)	Temp.(C)/Hum.(%RH):	24.3(°C)/55%RH
Test Mode:	On	Distance:	3m



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	30.5304	44.18	-16.66	27.52	40.00	-12.48	peak			
2	36.0007	38.90	-13.50	25.40	40.00	-14.60	peak			
3	71.8319	36.25	-19.98	16.27	40.00	-23.73	peak			
4	143.8292	33.71	-18.43	15.28	43.50	-28.22	peak			
5	413.2706	32.53	-11.48	21.05	46.00	-24.95	peak			
6	929.0082	84.85	-3.30	81.55	46.00	35.55	peak			

Job No.:	011607937I	Plarization:	Vertical
Standard:	(RE)FCC PART 15C _3m	Power Source:	AC 120V, 60Hz for adapter
Test item:	Radiation Test (30~1000MHz)	Temp.(C)/Hum.(%RH):	24.3(°C)/55%RH
Test Mode:	On	Distance:	3m



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	30.5304	44.18	-16.66	27.52	40.00	-12.48	peak			
2	36.0007	38.90	-13.50	25.40	40.00	-14.60	peak			
3	71.8319	36.25	-19.98	16.27	40.00	-23.73	peak			
4	143.8292	33.71	-18.43	15.28	43.50	-28.22	peak			
5	413.2706	32.53	-11.48	21.05	46.00	-24.95	peak			
6	929.0082	84.85	-3.30	81.55	46.00	35.55	peak			

Data: (Frequency=902.5MHz)
Horizontal

Frequency	Cable Loss	Ant Factor	Pream pFactor	Read Level	Level	Limit	Over Limit	Remark
MHz	dB	dB/m	dB	dBμV	dBμV/m	dBμV/m	dB	
1805.00	1.82	28.02	39.21	75.32	65.95	74.00	-8.05	Peak
1805.00	1.82	28.02	39.21	60.42	51.05	54.00	-2.95	AV
2707.50	2.28	33.16	35.16	58.63	58.91	74.00	-15.09	Peak
2707.50	2.28	33.16	35.16	49.35	49.63	54.00	-4.37	AV
3610.00	2.50	33.31	35.02	57.63	58.42	74.00	-15.58	Peak
3610.00	2.50	33.31	35.02	47.19	47.98	54.00	-6.02	AV
4512.50	---	---	---	---	---	---	---	---
4512.50	---	---	---	---	---	---	---	---
5415.00	---	---	---	---	---	---	---	---
5415.00	---	---	---	---	---	---	---	---

Vertical

Frequency	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
MHz	dB	dB/m	dB	dBμV	dBμV/m	dBμV/m	dB	
1805.00	1.82	28.02	39.21	70.14	60.77	74.00	-13.23	Peak
1805.00	1.82	28.02	39.21	54.18	44.81	54.00	-9.19	AV
2707.50	2.28	33.16	35.16	53.25	53.53	74.00	-20.47	Peak
2707.50	2.28	33.16	35.16	43.67	43.95	54.00	-10.05	AV
3610.00	2.50	33.31	35.02	51.42	52.21	74.00	-21.79	Peak
3610.00	2.50	33.31	35.02	40.23	41.02	54.00	-12.98	AV
4512.50	---	---	---	---	---	---	---	---
4512.50	---	---	---	---	---	---	---	---
5415.00	---	---	---	---	---	---	---	---
5415.00	---	---	---	---	---	---	---	---

NOTE: “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

Data: (Frequency=914.5MHz)

Horizontal

Frequency	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
MHz	dB	dB/m	dB	dBμV	dBμV/m	dBμV/m	dB	
1829.00	1.82	28.02	39.21	74.33	64.96	74.00	-9.04	Peak
1829.00	1.82	28.02	39.21	59.92	50.55	54.00	-3.45	AV
2743.50	2.28	33.16	35.16	67.12	67.40	74.00	-6.60	Peak
2743.50	2.28	33.16	35.16	59.34	49.62	54.00	-4.38	AV
3658.00	2.5	33.31	35.02	68.39	69.18	74.00	-4.82	Peak
3658.00	2.5	33.31	35.02	58.94	49.73	54.00	-4.27	AV
4572.50	---	---	---	---	---	---	---	---
4572.50	---	---	---	---	---	---	---	---
5487.00	---	---	---	---	---	---	---	---
5487.00	---	---	---	---	---	---	---	---

Vertical

Frequency	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
MHz	dB	dB/m	dB	dBμV	dBμV/m	dBμV/m	dB	
1829.00	1.82	28.02	39.21	69.25	59.88	74.00	-14.12	Peak
1829.00	1.82	28.02	39.21	53.17	43.80	54.00	-10.20	AV
2743.50	2.28	33.16	35.16	63.35	63.63	74.00	-10.37	Peak
2743.50	2.28	33.16	35.16	50.07	50.35	54.00	-3.65	AV
3658.00	2.5	33.31	35.02	62.28	63.07	74.00	-10.93	Peak
3658.00	2.5	33.31	35.02	48.23	49.02	54.00	-4.98	AV
4572.50	---	---	---	---	---	---	---	---
4572.50	---	---	---	---	---	---	---	---
5487.00	---	---	---	---	---	---	---	---
5487.00	---	---	---	---	---	---	---	---

NOTE: “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

Data: (Frequency=927MHz)

Horizontal

Frequency	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
MHz	dB	dB/m	dB	dBμV	dBμV/m	dBμV/m	dB	
1854.00	1.82	28.02	39.21	72.17	62.80	74.00	-11.20	Peak
1854.00	1.82	28.02	39.21	59.29	49.92	54.00	-4.08	AV
2781.00	2.28	33.16	35.16	65.14	65.42	74.00	-8.58	Peak
2781.00	2.28	33.16	35.16	45.27	45.55	54.00	-8.45	AV
3708.00	2.5	33.31	35.02	54.18	54.97	74.00	-19.03	Peak
3708.00	2.5	33.31	35.02	40.39	41.18	54.00	-12.82	AV
4635.00	---	---	---	---	---	---	---	---
4635.00	---	---	---	---	---	---	---	---
5562.00	---	---	---	---	---	---	---	---
5562.00	---	---	---	---	---	---	---	---

Vertical

Frequency	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over Limit	Remark
MHz	dB	dB/m	dB	dBμV	dBμV/m	dBμV/m	dB	
1854.00	1.82	28.02	39.21	68.23	58.86	74.00	-15.14	Peak
1854.00	1.82	28.02	39.21	54.11	44.74	54.00	-9.26	AV
2781.00	2.28	33.16	35.16	58.45	58.73	74.00	-15.27	Peak
2781.00	2.28	33.16	35.16	42.46	42.74	54.00	-11.26	AV
3708.00	2.5	33.31	35.02	55.22	56.01	74.00	-17.99	Peak
3708.00	2.5	33.31	35.02	40.14	40.93	54.00	-13.07	AV
4635.00	---	---	---	---	---	---	---	---
4635.00	---	---	---	---	---	---	---	---
5562.00	---	---	---	---	---	---	---	---
5562.00	---	---	---	---	---	---	---	---

NOTE: “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

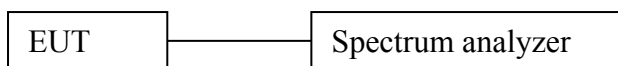
5. CHANNEL SEPARATION TEST

5.1 Measurement Procedure

The EUT must have its hopping function enabled. Using the following spectrum analyzer settings:

1. Span= Wide enough to capture the peaks of two adjacent channels
2. Set the RBW = 100kHz.
3. Set the VBW = 100.kHz.
4. Sweep time = auto couple.
5. Detector function = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.

5.2 Test SET-UP



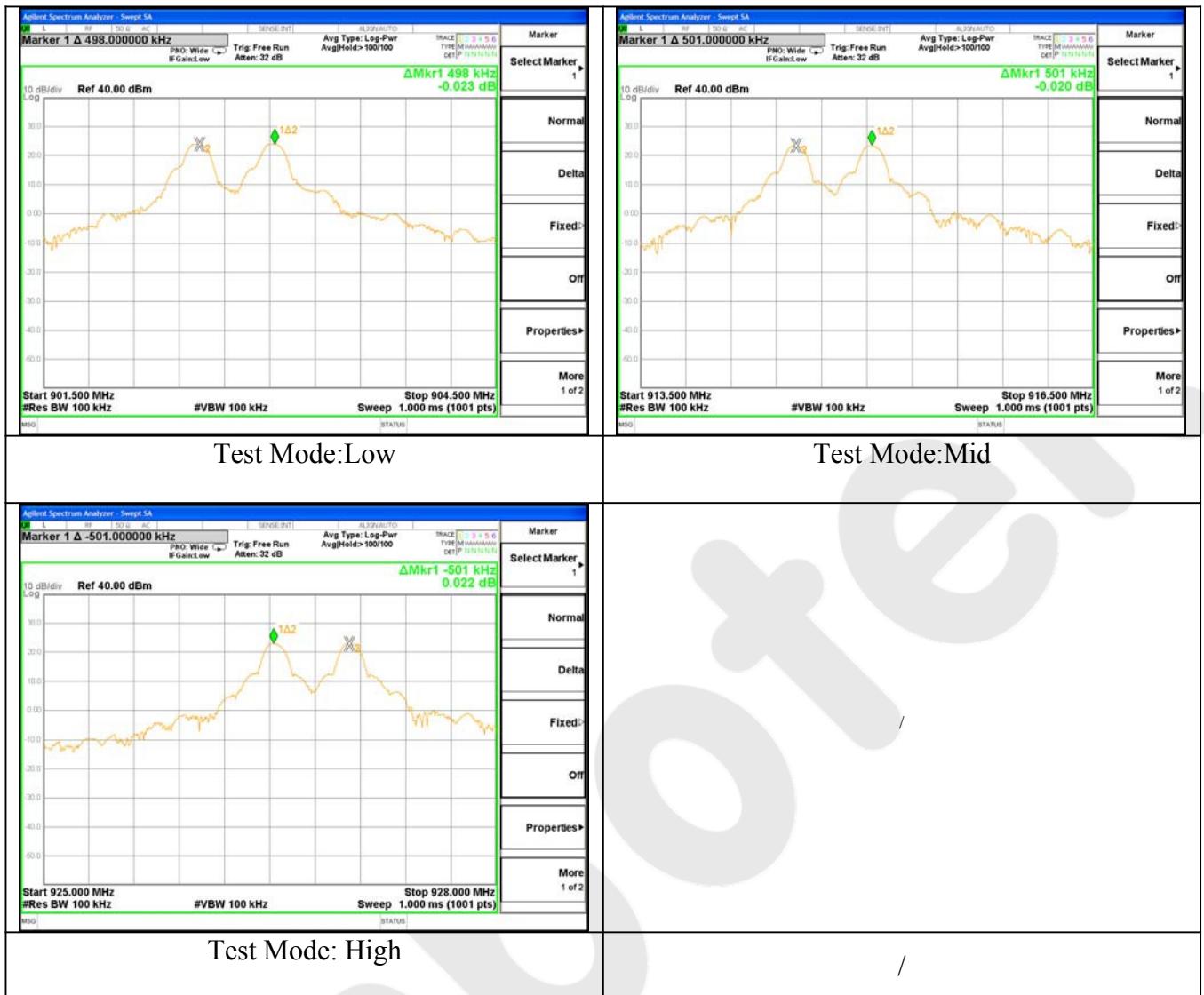
5.3 Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analysis	Agilent	E4407B	US39390582	Apr. 16, 2016	1 Year
2.	Preamplifier	Instruments corporation	EMC011830	980100	Apr. 16, 2016	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESPI	101604	Apr. 16, 2016	1 Year
4.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Apr. 19, 2016	1 Year
5.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Apr. 19, 2016	1 Year
6.	Pre-amplifier	SONOMA	310N	186860	Apr. 16, 2016	1 Year
7.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A
8	Power Sensor	DAER	RPR3006W	15I00041SN046	Jun 30, 2016	1 Year
9	MXA Spectrum Analysis	Agilent	N9020A	MY51170037	Jun 30, 2016	1 Year
10	MXG RF Vector Signal Generator	Agilent	N5182A	MY48180656	Jun 30, 2016	1 Year
11	Signal Generator	Agilent	E4421B	MY41000743	Jun 30, 2016	1 Year
12	DC Power supply	IV	IV-8080	YQSB0096	Jun 30, 2016	1 Year
13	TEMP&HUMI PROGRAMMABLE CHAMBER	Bell Group	BE-THK-150M8	SE-0137	Mar. 16, 2016	1 Year

5.4 Test Results

Test Item : Frequency Separation Test Mode : CH Low ~ CH High
Test Voltage : AC 120V, 60Hz for adapter Temperature : 24°C
Test Result : PASS Humidity : 55%RH

Channel	Frequency (MHz)	Separation Read Value (kHz)	Limit (<kHz)
Low	902.5	498	51.33
Mid	914.5	501	40.75
High	927.0	501	40.25



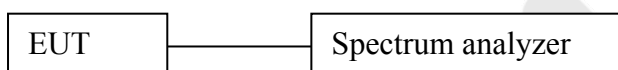
6. 20DB BANDWIDTH TEST

6.1 Measurement Procedure

Using the following spectrum analyzer settings:

1. Span= approximately 2 to 3 times the 20dB bandwidth, centered on a hopping channel.
2. Set the RBW = 1 kHz.
3. Set the VBW = 3 kHz.
4. Sweep time = auto couple.
5. Detector function = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.

6.2 Test SET-UP



6.3 Test Equipment

Same as the equipment listed in 5.3.

6.4 Test Results

Test Item	: 20dB BW	Test Mode	: CH Low ~ CH High
Test Voltage	: AC 120V, 60Hz for adapter	Temperature	: 24°C
Test Result	: PASS	Humidity	: 55%RH

Channel	Frequency (MHz)	20dB Down BW(kHz)	Test Result
Low	902.5	51.33	PASS
Mid	914.5	40.75	PASS
High	927.0	40.25	PASS



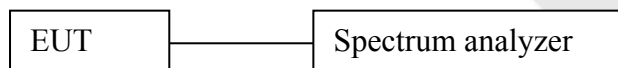
7. QUANTITY OF HOPPING CHANNEL TEST

7.1 Measurement Procedure

The EUT must have its hopping function enabled. Using the following spectrum analyzer setting:

1. Span= the frequency band of operation
2. Set the RBW = 100 kHz.
3. Set the VBW $\geq 3 \times$ RBW.
4. Sweep time = auto couple.
5. Detector function = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.

7.2 Test SET-UP



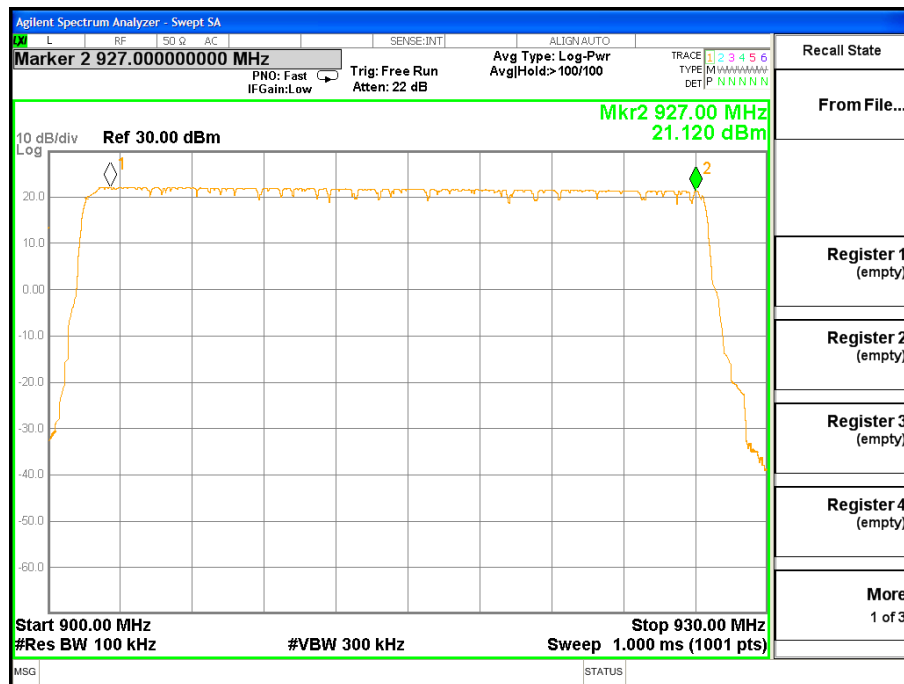
7.3 Test Equipment

Same as the equipment listed in 5.3.

7.4 Test Results

Test Item	: Number of Hopping Frequency	Test Mode	: CH Low ~ CH High
Test Voltage	: AC 120V, 60Hz for adapter	Temperature	: 24°C
Test Result	: PASS	Humidity	: 55%RH

Hopping Channel Frequency Range	Quantity of Hopping Channel	Quantity of Hopping Channel
902.5MHz-927MHz	50	≥ 50



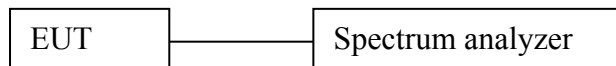
8. DWELL TIME TEST

8.1 Measurement Procedure

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

1. Span= zero span, centered on a hopping channel
2. Set the RBW = 1 MHz.
3. Set the VBW = 3 MHz.
4. Sweep time = as necessary to capture the entire dwell time per hopping channel.
5. Detector function = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.

8.2 Test SET-UP



8.3 Test Equipment

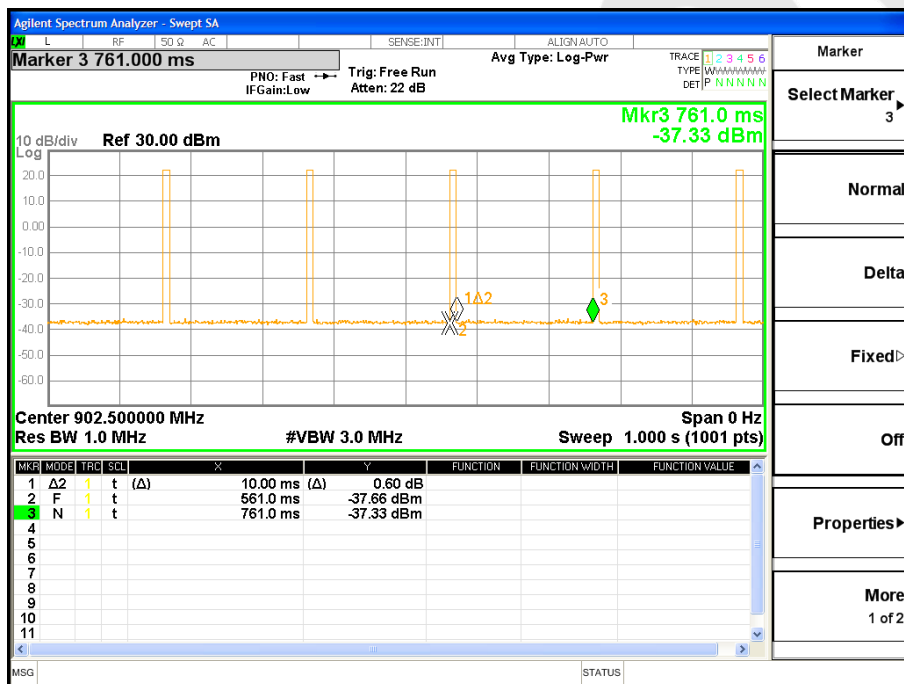
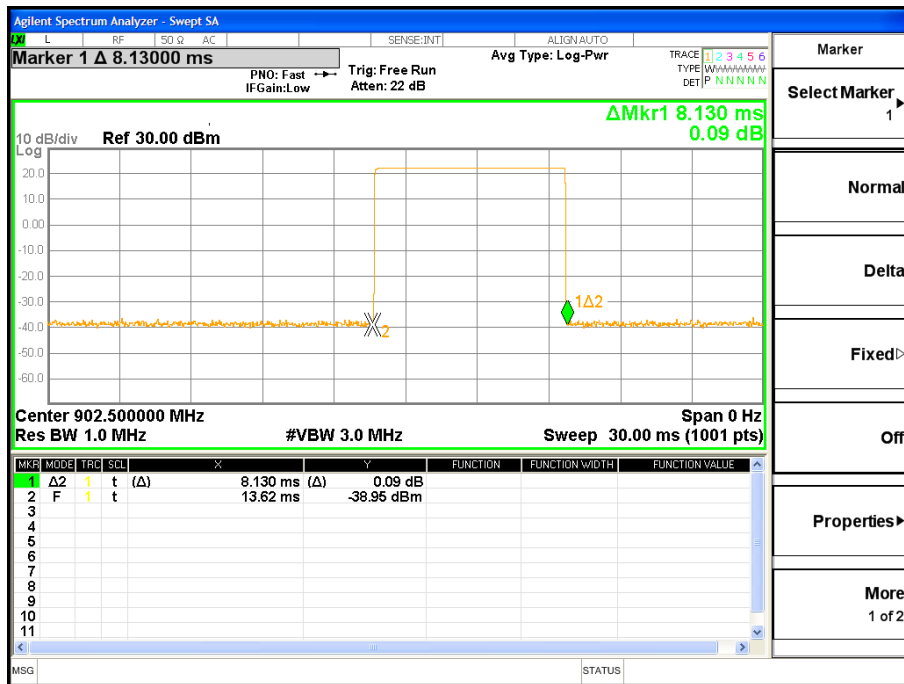
Same as the equipment listed in 5.3.

8.4 Test Results

Test Item	: Time of Occupancy	Test Mode	: CH Low ~ CH High
Test Voltage	: AC 120V, 60Hz for adapter	Temperature	: 24℃
Test Result	: PASS	Humidity	: 55%RH

Frequency (MHz)	Pulse width (ms)	Time slot length(ms)	Dwell time (ms)	Limit (ms)
902.5	13.62	Pulse width*5	68.1	400

Five Ton at one second.Each on time is 13.62ms



9. MAXIMUM PEAK OUTPUT POWER TEST

9.1 Measurement Procedure

- a. Check the calibration of the measuring instrument(SA) using either an internal calibrator or a known signal from an external generator.
- b. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
- c. The center frequency of the spectrum analyzer is set to the fundamental frequency and using proper RBW and VBW setting.
- d. Measure the captured power within the band and recording the plot.
- e. Repeat above procedures until all frequencies required were complete.

Using the following spectrum analyzer settings:

1. Span= approximately 5 times the 20dB bandwidth, centered on a hopping channel
2. Set the RBW = 100kHz.
3. Set the VBW = 300kHz.
4. Sweep time = auto couple.
5. Detector function = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.

9.2 Test SET-UP



9.3 Test Equipment

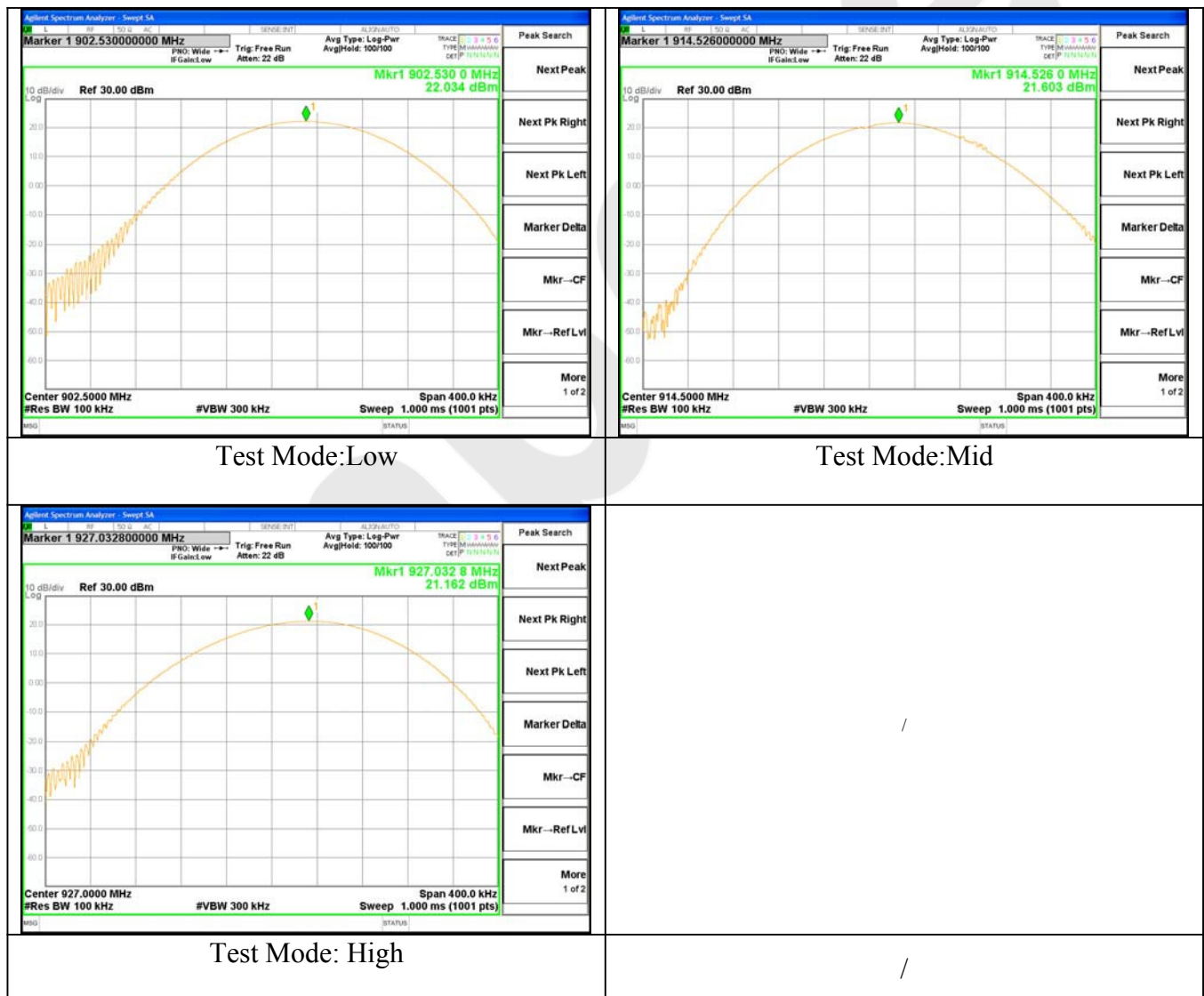
Same as the equipment listed in 5.3.

9.4 Test Results

Test Item	: Max. peak output power	Test Mode	: CH Low ~ CH High
Test Voltage	: AC 120V, 60Hz for adapter	Temperature	: 24°C
Test Result	: PASS	Humidity	: 55%RH

Channel Frequency (MHz)	Peak Power output(mW)	Peak Power output(dBm)	Peak Power Limit(mW)	Results
902.5	159.73	22.034	28	PASS
914.5	144.64	21.603	28	PASS
927.0	130.68	21.162	28	PASS

Note:The antenna gain is 8dBi;Limit=30dBm-(8-6)dB=28dBm



10. BAND EDGE TEST

10.1 Measurement Procedure

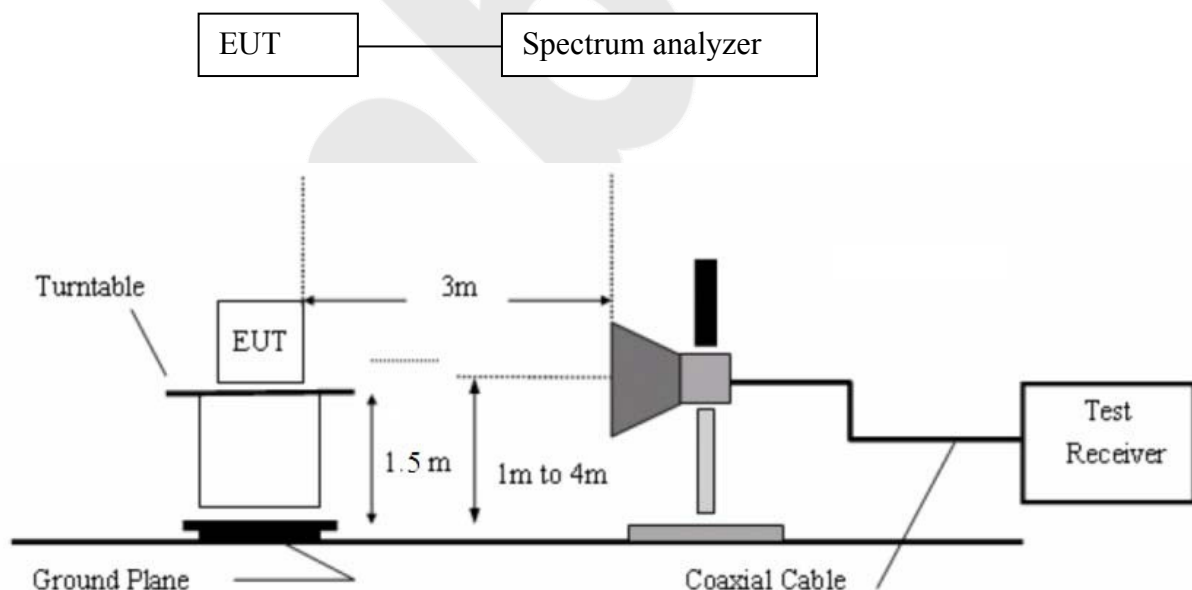
A) Conducted Emission method:

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Put it on the Rotated table and turn on the EUT and make it operate in transmitting mode. Then set it to low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range.
3. Set both RBW and VBW of spectrum analyzer to 100kHz with a convenient frequency span including 100kHz bandwidth from band edge,
4. Measurement the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Report above procedures until all measured frequencies were complete.

B) Radiated Emission method:

The EUT is placed on a turn table which is 1.5 meter high above the ground. 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. for Radiated emissions restricted band RBW= 1 MHz, VBW= 3 MHz.

10.2 Test SET-UP



10.3 Test Equipment

Same as the equipment listed in 5.3.

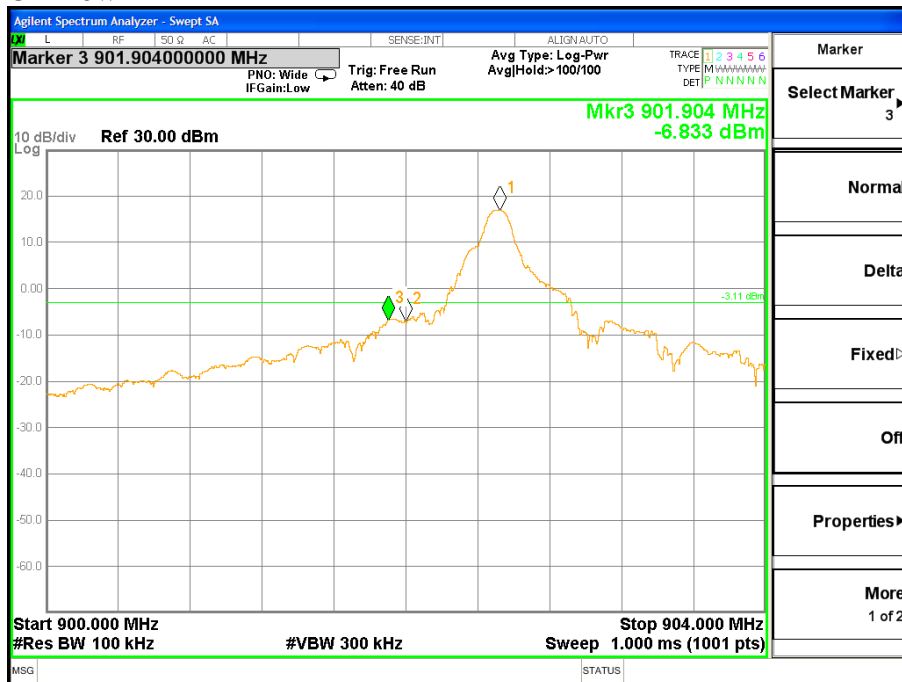
10.4 Test Results

Pass.

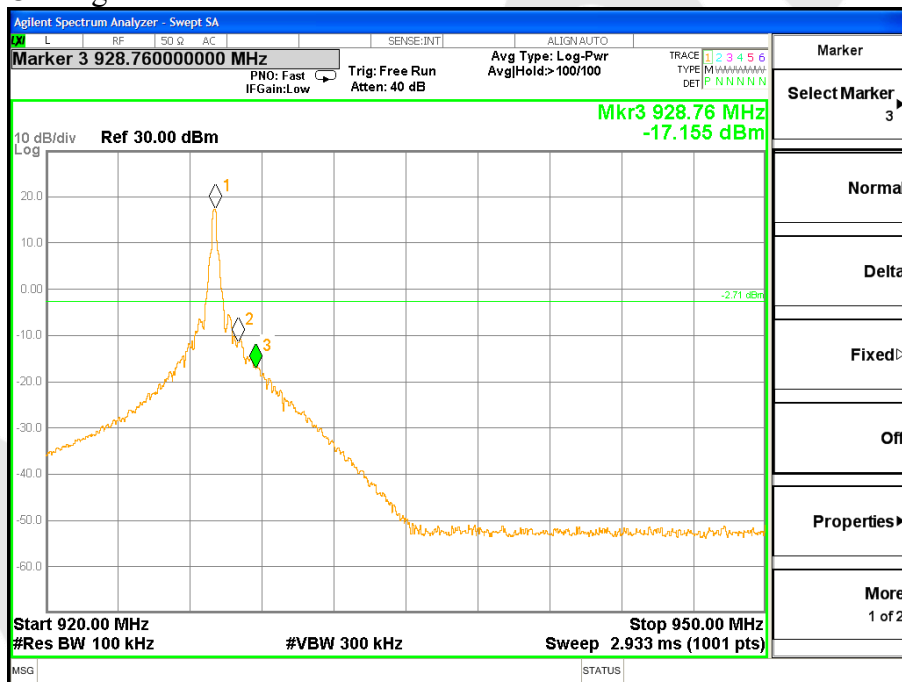
Please refer the following data.

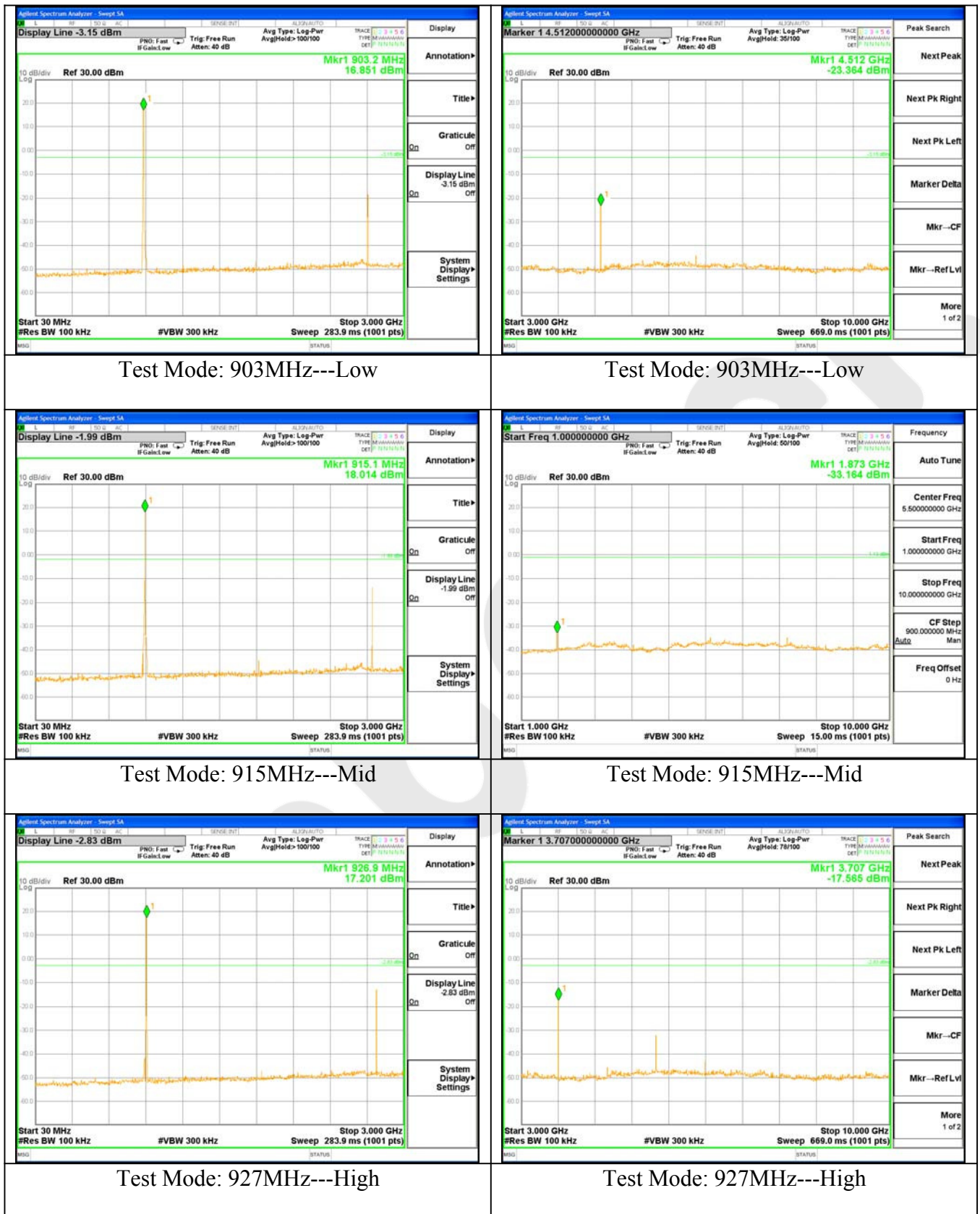
Test Item	: Band eadge	Test Mode	: CH Low ~ CH High
Test Voltage	: AC 120V, 60Hz for adapter	Temperature	: 24℃
Test Result	: PASS	Humidity	: 55%RH

CH Low



CH High





11. ANTENNA APPLICATION

11.1 Antenna requirement

The EUT'S antenna is met the requirement of FCC part 15C section 15.203 and 15.247.

FCC part 15C section 15.247 requirements:

Systems operating in the 2402-2480MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum peak output power of the intentional radiator is reduced by 1dB for every 3dBi that the directional gain of the antenna exceeds 6dBi.

11.2 Result

The EUT's antenna used a Plate Antenna, The antenna's gain is 8dBi and meets the requirement.

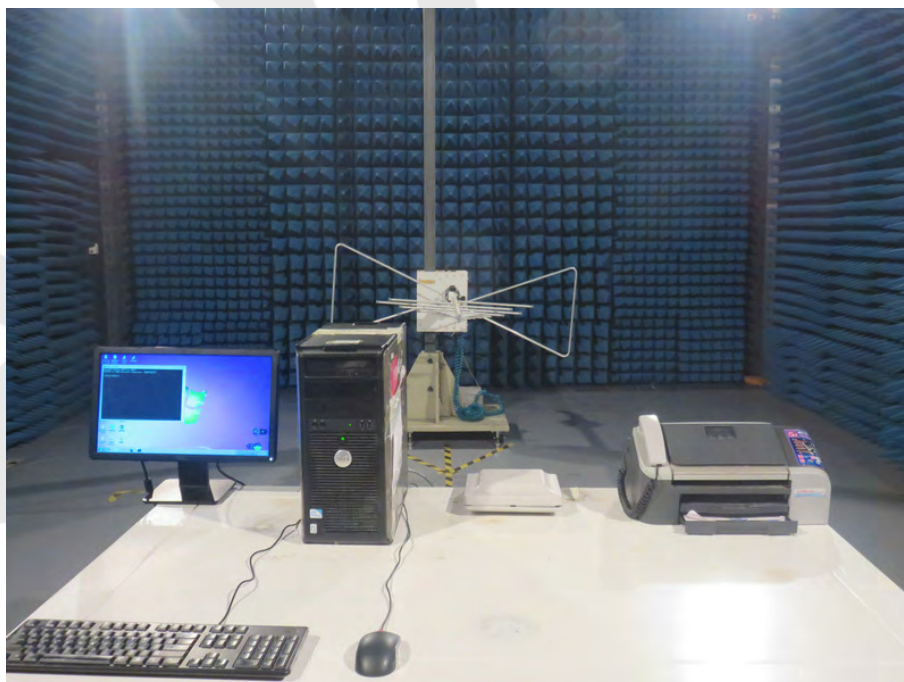


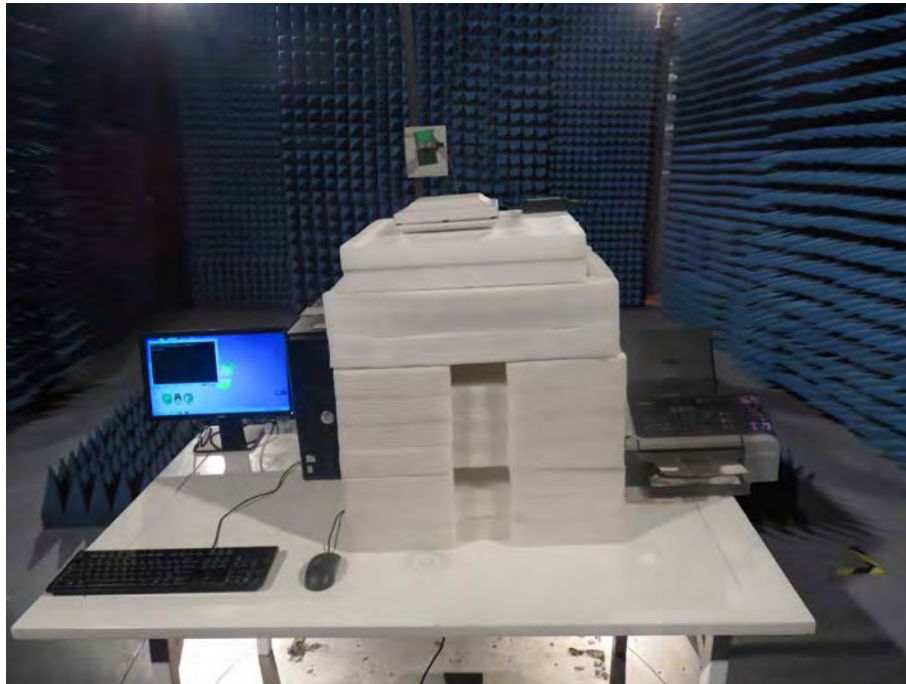
12. PHOTOGRAPH

12.1 Photo of Power Line Conducted Emission Measurement



12.2 Photo of Radiation Emission Test





APPENDIX I (EXTERNAL PHOTOS)

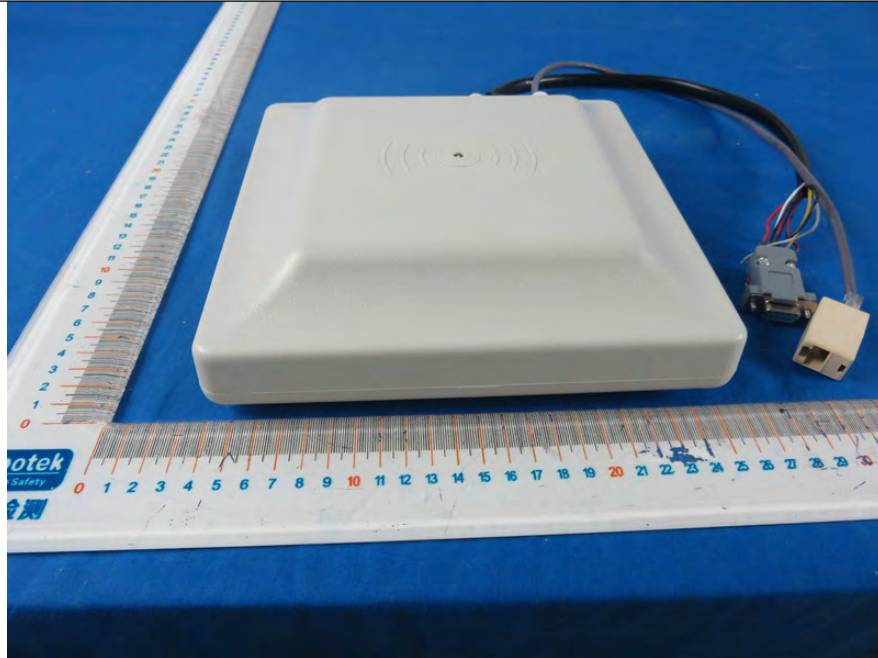
1. Figure
The EUT-Top View



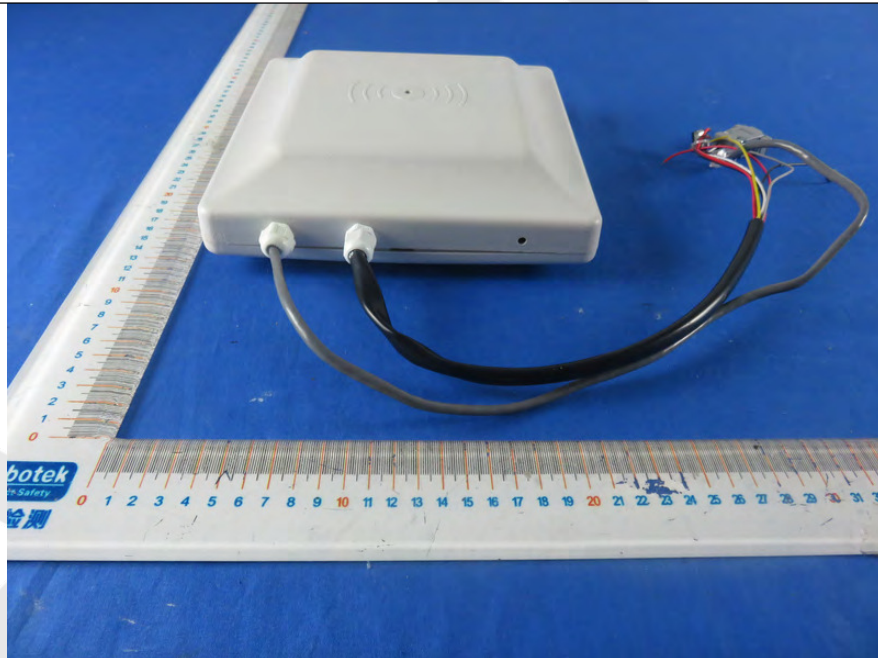
2. Figure
The EUT-Bottom View



3. Figure
The EUT-Front View



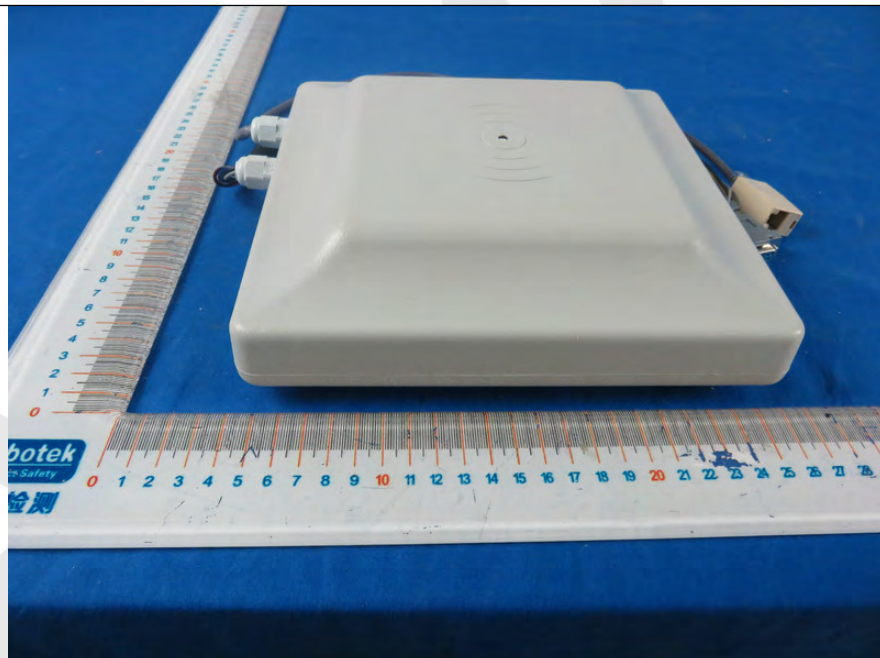
4. Figure
The EUT-Back View



5. Figure
The EUT- Right View

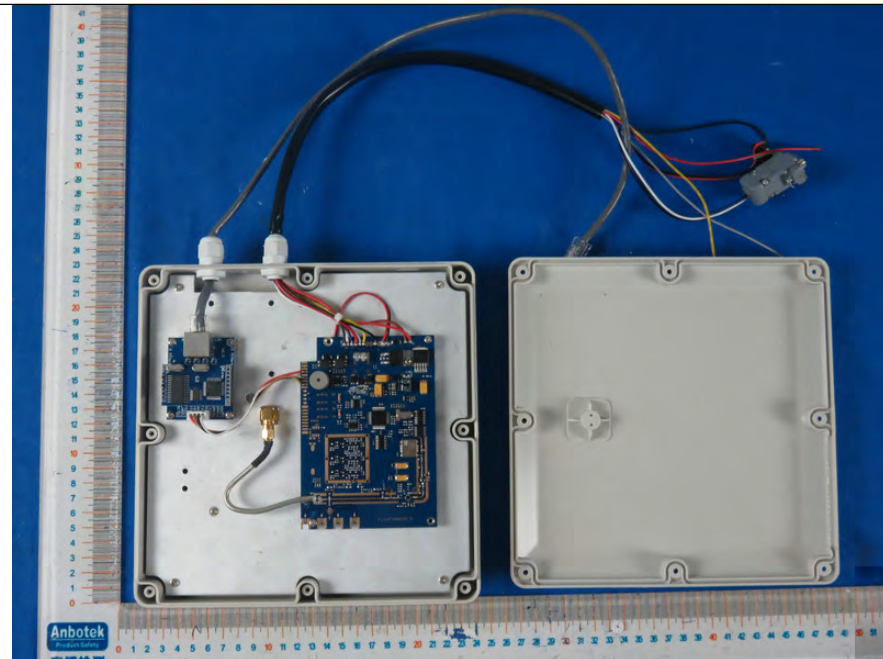


6. Figure
The EUT- Left View

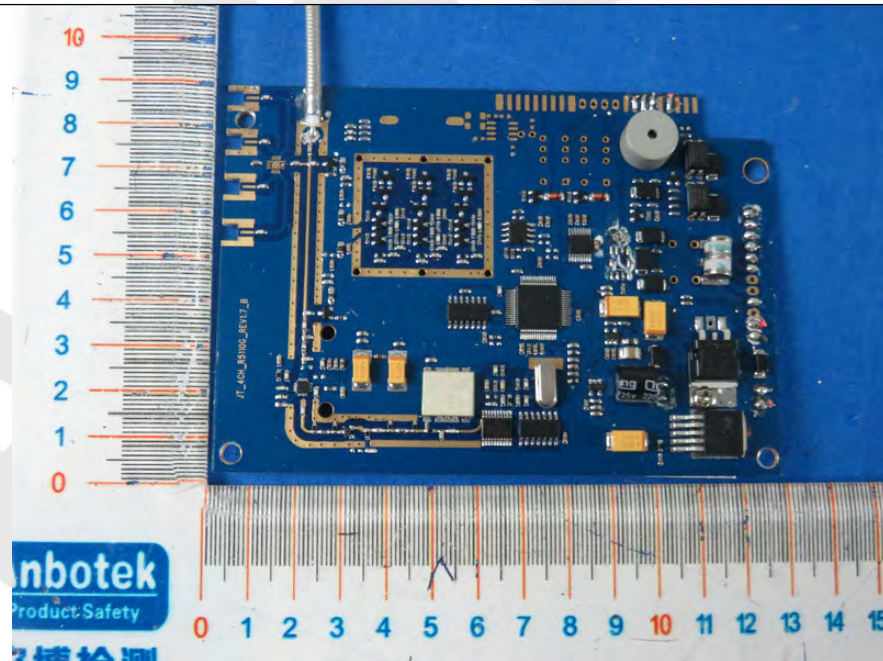


APPENDIX II (INTERNAL PHOTOS)

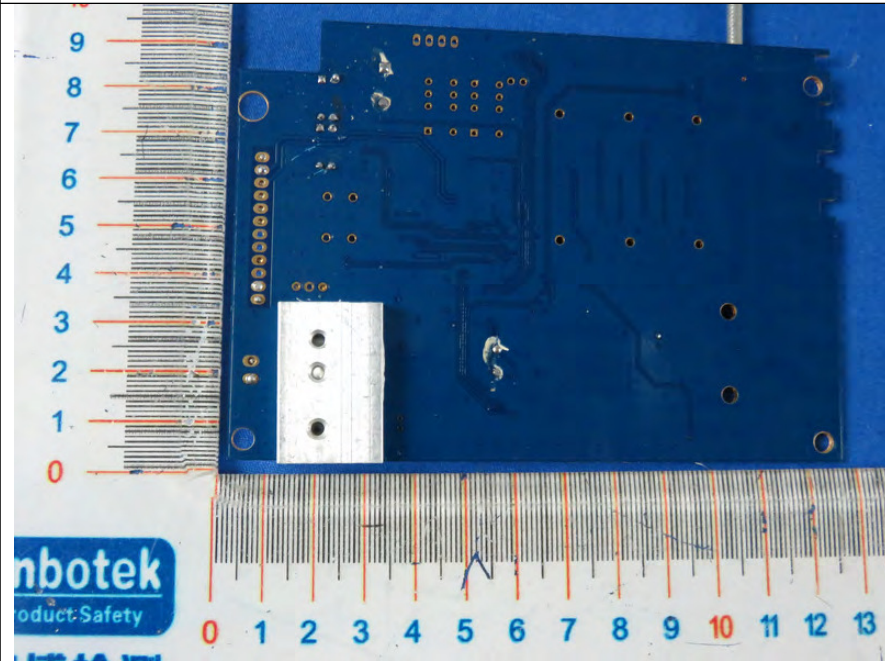
1. Figure
The EUT-Inside View



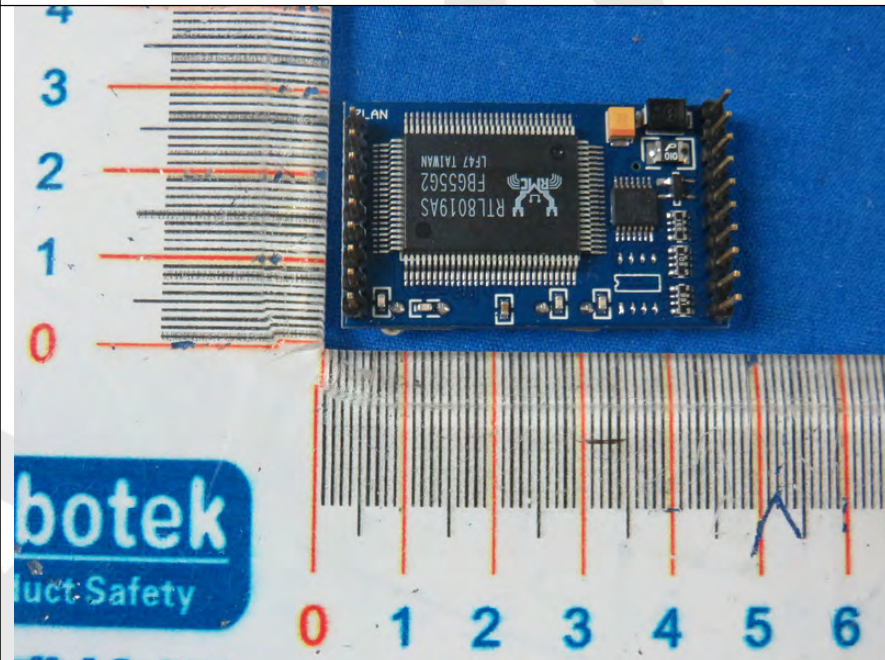
2. Figure
PCB of the EUT-Front View



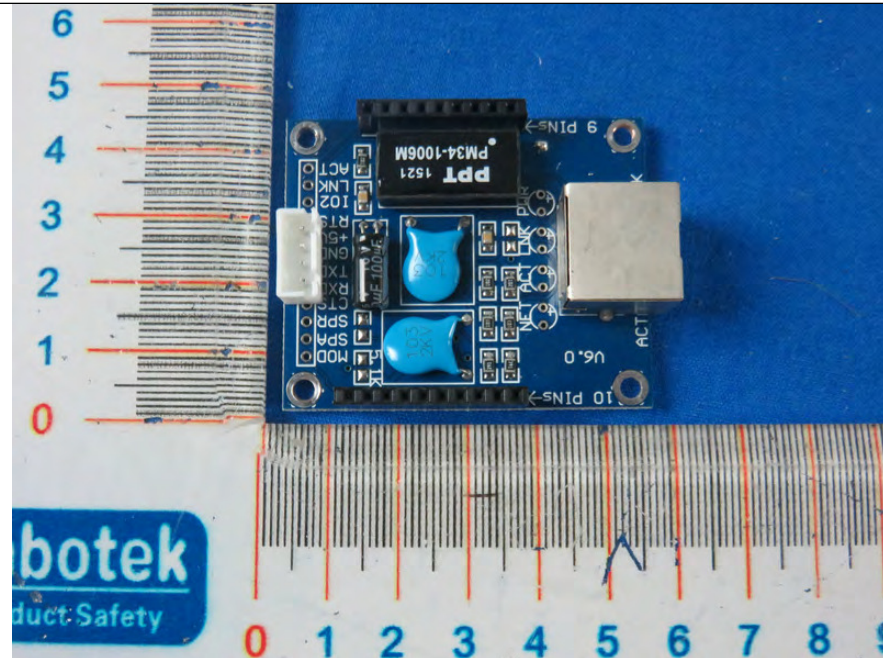
3. Figure
PCB of the EUT-Back View



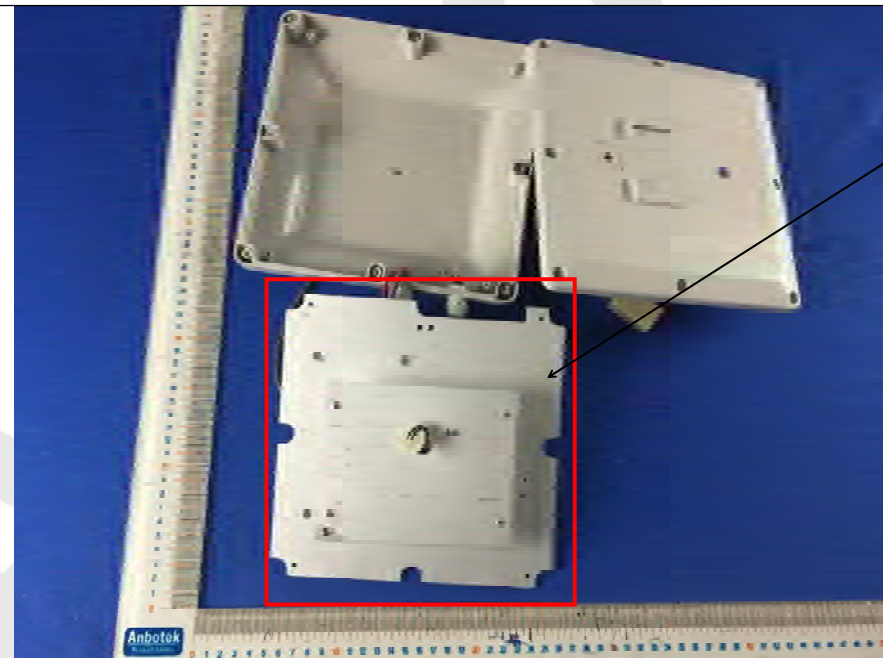
4. Figure
PCB of the EUT-Front View



5. Figure
PCB of the EUT-Back View



6. Figure
The EUT-Antenna View



Antenna