



TEST REPORT

FCC TEST REPORT Under FCC 15 Subpart B

Report Reference No.....: EA1410010F 01001

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Date of issue.....: Oct. 23, 2014

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Dongguan City, Guangdong Pr., China.

Applicant's name: Luen Ming Electric Works CO., Ltd.

Address.....: Flat G, 2F. & 10F., Wah Hing Industrial Mansions, 36 Tai Yau
Street, San Po Kong, Kowloon, Hong Kong

Manufacturer.....: Shen Zhen Luen Ming Hing Plastic & Electric Technology
Co.,Ltd.

Address.....: No. 103, Ao Yi Road, Heng Gang, Long Gang Town, Shen Zhen
City, Guang Dong, China

Test specification:

Test item description.....: WIRELESS REMTOTE BATTERY PACKS

Trade Mark.....: N/A

Model/Type reference: RF001

Ratings.....: DC 3V 20mA

Table of Contents	Page
1 GENERAL INFORMATION	4
1.1 CERTIFICATE	4
1.2 GENERAL PRODUCT INFORMATION	5
1.3. NORMATIVE REFERENCES	5
2. SUMMARY OF TEST RESULTS	6
2.1 MEASUREMENT UNCERTAINTY	6
2.2 DESCRIPTION OF TEST MODES	7
2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED	7
2.4 DESCRIPTION OF SUPPORT UNITS	7
2.5 EUT SYSTEM OPERATION	7
3. EMISSION TEST	8
3.1 CONDUCTED EMISSION MEASUREMENT	8
3.1.1 LIMITS OF CONDUCTED EMISSION (MAINS PORT)	8
3.1.2 MEASUREMENT INSTRUMENTS LIST	8
3.1.4 DEVIATION FROM TEST STANDARD	9
3.1.5 TEST SETUP	9
3.1.6 EUT OPERATING CONDITIONS	9
3.1.7 TEST RESULTS	9
3.2 RADIATED EMISSION MEASUREMENT	10
3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT	10
3.2.2 MEASUREMENT INSTRUMENTS LIST	11
3.2.3 TEST PROCEDURE	11
3.2.4 DEVIATION FROM TEST STANDARD	11
3.2.5 TEST SETUP	12
3.2.6 EUT OPERATING CONDITIONS	12
3.2.7 TEST RESULTS	13
3.3 20dB OCCUPIED BANDWIDTH MEASUREMENT	14
3.3.1 LIMITS	14
3.3.2 MEASUREMENT INSTRUMENTS LIST	14
3.3.3 TEST PROCEDURE	14
3.3.4 DEVIATION FROM TEST STANDARD	14
3.3.5 TEST SETUP	14
3.3.6 EUT OPERATING CONDITIONS	14
3.3.7 TEST RESULTS	15



Table of Contents

Page

3.4 DWELL TIME MEASUREMENT	16
3.4.1 LIMITS	16
3.4.2 MEASUREMENT INSTRUMENTS LIST	16
3.4.3 TEST PROCEDURE	16
3.4.4 DEVIATION FROM TEST STANDARD	16
3.4.5 TEST SETUP	16
3.4.6 EUT OPERATING CONDITIONS	16
3.4.7 TEST RESULTS	17



1 GENERAL INFORMATION
1.1 CERTIFICATE

Testing Laboratory : Dong Guan Anci Electronic Technology Co., Ltd.
 Address..... : No. A222, Building A, Shifu Hardware Plaza, Changan Town, Dongguan City, Guangdong Pr., China.

Applicant's name..... : Luen Ming Electric Works CO., Ltd.
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Manufacturer..... : Shen Zhen Luen Ming Hing Plastic & Electric Technology Co.,Ltd.
 Address..... : No. 103, Ao Yi Road, Heng Gang, Long Gang Town, Shen Zhen City, Guang Dong, China

Factory..... : Shen Zhen Luen Ming Hing Plastic & Electric Technology Co.,Ltd.
 Address..... : No. 103, Ao Yi Road, Heng Gang, Long Gang Town, Shen Zhen City, Guang Dong, China

Test specification:

Test item description : WIRELESS REMTOTE BATTERY PACKS
 Trade Mark..... : N/A
 Model/Type reference : RF001
 Test Sample: RF001
 Ratings..... : DC 3V 20mA

Standards : 47 CFR FCC Part 15 Subpart C: 2014
 ANSI C63.4: 2009

The device described above was tested by Dong Guan Anci Electronic Technology Co., Ltd. to determine the maximum emission levels emanated from the device and severity levels of the device endure and its performance criterion. The measurement results are contained in this test report and Dong Guan Anci Electronic Technology Co., Ltd. assumes full responsibility for the accuracy and completeness of these measurements. This report shows the EUT is technically compliance with the above official standards.

This report applies to the above sample only and shall not be reproduced in part without written approval of Dong Guan Anci Electronic Technology Co., Ltd.



1.2 GENERAL PRODUCT INFORMATION

Product	WIRELESS REMTOTE BATTERY PACKS
Brand Name	N/A
Model No.	RF001
Working Voltage	DC 3V
Frequency Range	315 MHz
Channel Number	1
Channel Separation	N/A
Type of Modulation	FSK
Antenna Type	Spring Antenna
Equipment type	Transmitter

1.3. NORMATIVE REFERENCES

- [1] **ANSI C63.4:2009** American National Standard for Methods of Measuring of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.
- [2] **FCC 47 CFR Part 2** General Rules and Regulations
- [3] **FCC 47 CFR Part 15** Radio Frequency Devices

2. SUMMARY OF TEST RESULTS

Standard	Test Item	Judgment	Remark
FCC Part 15C 15.231	Conducted Emission	N/A	
	Radiated Emission	PASS	
	20dB Occupied Bandwidth	PASS	
	Dwell Time	PASS	

2.1 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

A. Conducted Measurement :

Test Site	Method	Measurement Frequency Range	U, (dB)	NOTE
C01	ANSI	150 KHz ~ 30MHz	2.54	

B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U, (dB)	NOTE
OS02	ANSI	30MHz ~ 200MHz	V	3.0	
		30MHz ~ 200MHz	H	3.0	
		200MHz ~ 1,000MHz	V	3.0	
		200MHz ~ 1,000MHz	H	3.0	

2.2 DESCRIPTION OF TEST MODES

The EUT was tested together with the below additional components, and configuration, which produced the worst emission levels, was selected and recorded in this report.

The measurement was performed at 3 axis for lie orientation, side orientation and stand orientation. The lie orientation is the worst mode, so only the worst mode test data was reported.

the following test mode was recorder in this report.

Test Item	Test mode
Conduct Emission	N/A
Radiation Emission	Continuously TX mode
Bandwidth Test	Normal operation
Dwell time Test	Normal operation

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



2.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Equipment	Model No.	Serial No.	FCC ID	Trade Name	Data Cable	Power Cord
1.	N/A						

Note:

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

2.5 EUT SYSTEM OPERATION

1. Set up EUT with the relative support equipments.
2. Make sure the EUT worked normally during the test.

3. EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 LIMITS OF CONDUCTED EMISSION (MAINS PORT) (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *
0.50 -5.0	73.00	60.00	56.00	46.00
5.0 -30.0	73.00	60.00	60.00	50.00

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

3.1.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	LISN	SCHWARZBECK MESS-ELEKTRONIK	NSLK 8127	8127-669	2015-06-27
2	Pulse Limiter	ROHDE&SCHWARZ	ESH3-Z2	101661	2015-06-27
3	Test Cable	N/A	C01	N/A	2015-06-27
4	EMI Test Receiver	ROHDE&SCHWARZ	ESCI	101358	2015-06-27

Remark: " N/A" denotes No Model No. , Serial No. or No Calibration specified.

3.1.3 TEST PROCEDURE

The EUT is put on the table that is 0.8m high above the ground and at least away from other Metallic surface 0.4m. The EUT is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohms coupling impedance for the testing equipment; and the peripheral equipment powers form other L.I.S.N. Please refer to the block diagram of the test setup and photographs. Both sides of AC line (Line & Neutral) are checked for maximum conducted interference. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables must be changed according to FCC part 15 B.

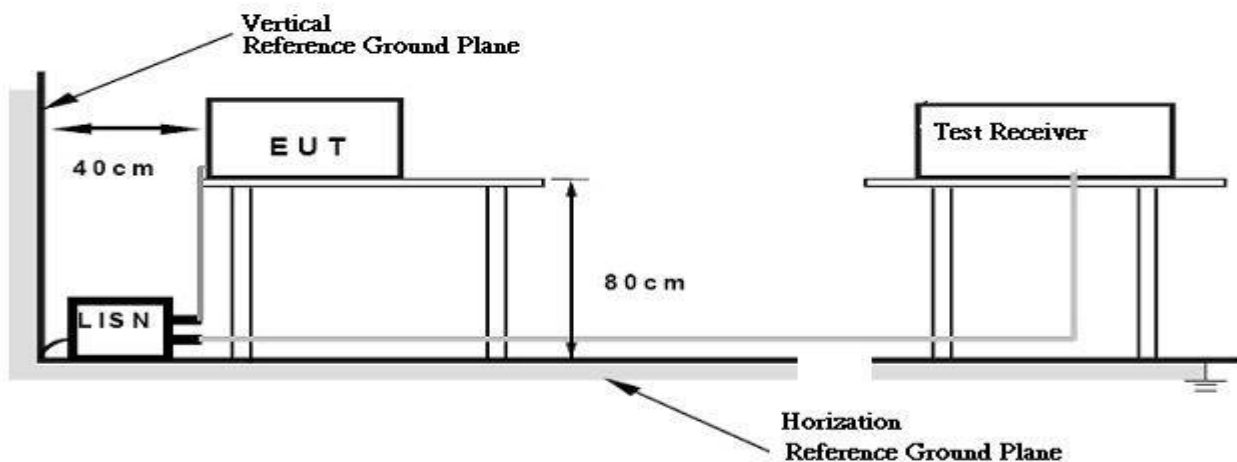
The bandwidth of the field strength meter (R&S Test Receiver ESCI) is set at 120 KHz.

The frequency range from 150KHz to 30MHz is checked. The details of test modes are listed as follows, and the test data has been listed in section 3.1.7

3.1.4 DEVIATION FROM TEST STANDARD

No deviation

3.1.5 TEST SETUP



3.1.6 EUT OPERATING CONDITIONS

The EUT exercise program used during radiated and/or conducted emission measurement was designed to exercise the various system components in a manner similar to a typical use.

3.1.7 TEST RESULTS

No applicable to battery product.

3.2 RADIATED EMISSION MEASUREMENT

3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

FCC Part 15 C (Section:15.205; Section:15.209; Section:15.231(e))

According to 15.231 the field strength of emissions from intentional radiators operated under these frequencies bands shall not exceed the following:

Fundamental Frequency(MHz)	Field Strength of Fundamental		Field Strength of Spurious	
	uV/meter	dBuV/meter	uV/meter	dBuV/meter
40.66 - 40.70	1000	60	100	50
70 -130	500	53.98	50	43.98
130 - 174	500 to1500**	53.98 to 63.52	50 to150**	43.98 to 53.52
174 - 260	1500	63.52	150	53.52
260 - 470	1500 to 5000**	63.52 to 73.98	150 to 500**	53.52 to 63.98
Above 470	5000	73.98	500	63.98

Note: (1) Where F is the frequency in MHz,the formulas for calculating the maximum permitted fundamental field strengths are as follows: for the band 130-174MHz,uV/m at 3 meters = $22.72727(F) - 2454.545$; for the band 260-470MHz,uV/m at 3 meters = $16.6667(F) - 2833.3333$.The maximum permitted unwanted emission level is 20dB below the maximum permitted fundamental level.

(2) The above field strength limits are specified at a distance of 3 meters. The tighter limits apply at the band edges. Emissions radiated outside of the specified bands,shall be according to the general radiated limits in 15.209 as following:

Frequencies (MHz)	Field strength uV/meter	Measurement distance (meters)
0.009-0.490	$2400/F(\text{kHz})$	300
0.490-1.705	$24000/F(\text{kHz})$	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

As shown in 15.35(b), for frequencies above 1000MHz,the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition fo modulation.



3.2.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Log-Bicon Antenna	SCHWARZBECK MESS	VULB 9163	9163-588	2015-06-28
2	Test Cable	N/A	10M_OS01	N/A	2015-07-01
3	Test Cable	N/A	C01-1/-2	N/A	2015-07-01
4	Pre-Amplifier	HP	8447D	N/A	2015-07-01
5	Spectrum Analyzer	Agilent	E4407B	N/A	2015-06-28
6	Test Receiver	ROHDE&SCHWARZ	ESVD	832497/002	2015-06-27
7	Antenna Mast	N/A	N/A	N/A	N/A
8	Turn Table	N/A	N/A	N/A	N/A
9	Positioning Controller	Max-Full Antenna Corp.	MF7802	N/A	N/A

Remark: " N/A" denotes No Model No. / Serial No. and No Calibration specified.

3.2.3 TEST PROCEDURE

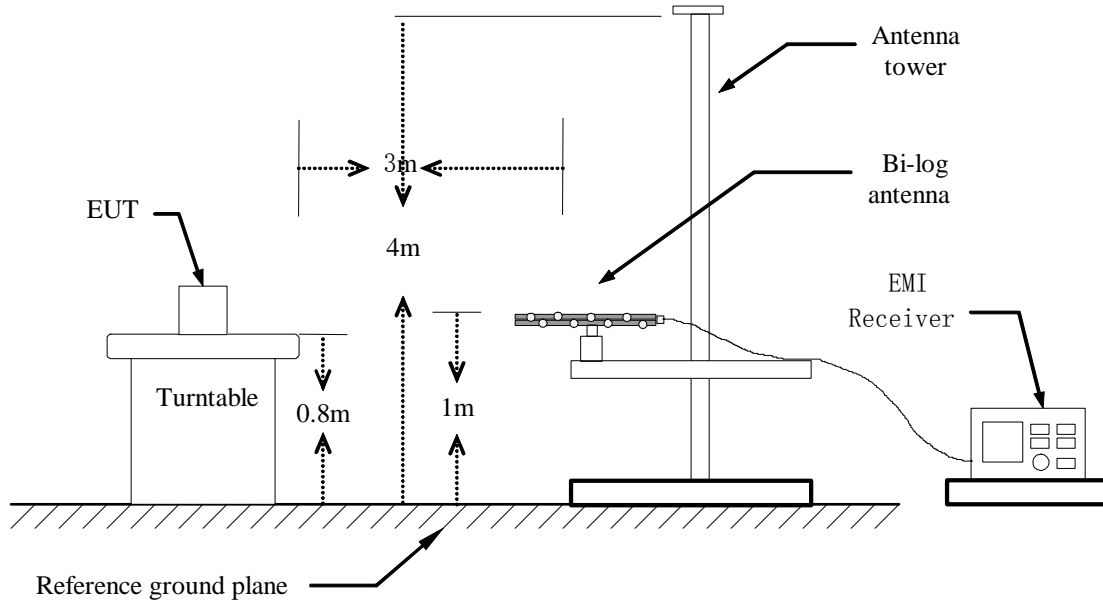
- The EUT was placed on a turn table which was 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna which was mounted on a antenna tower. At the frequency of 30 MHz~1000MHz ,the measuring antenna moved up and down to find out the maximum emission level. It moved from 1 to 4 m for horizontal and vertical polarizations. The broadband antenna was used as a receiving antenna. At the frequency of 1 GHz -5GHz ,the measuring antenna stands 1 m for horizontal and vertical polarizations. The horn antenna was used as a receiving antenna.
- The bandwidth setting on the test receiver was 120 KHz(30 MHz~1000MHz).
- The bandwidth setting on the test receiver was 1MHz(1 GHz~5GHz).
- The test data of the worst-case condition(s) was recorded.

3.2.4 DEVIATION FROM TEST STANDARD

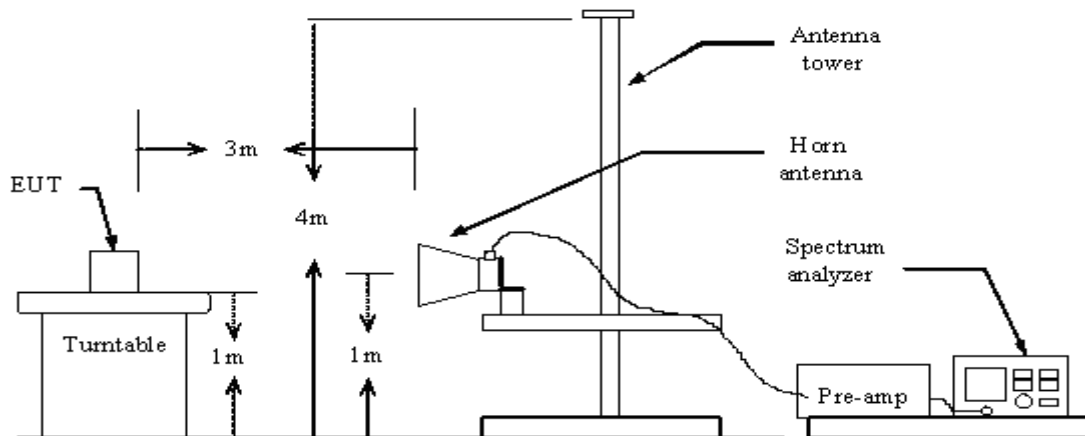
No deviation

3.2.5 TEST SETUP

Below 1GHz



Above 1GHz



3.2.6 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 3.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.



3.2.7 TEST RESULTS

EUT:	WIRELESS REMTOTE BATTERY PACKS	Model No. :	RF001
Temperature:	21°C	Relative Humidity:	50 %
Pressure:	1008 hPa	Test Power :	DC 3V
Test Mode :	Continuously TX mode		

Frequency (MHz)	Ant. Pol.	Corr. Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin	Note	Result
315.00	H	-8.7	79.01	87.66	-8.65	Peak	Pass
315.00	H	-8.7	64.51	67.66	-3.15	AV	Pass
630.00	H	-1.29	52.67	67.66	-14.99	Peak	Pass
630.00	H	-1.29	38.17	47.66	-9.49	AV	Pass
945.00	H	3.49	53.46	67.66	-14.20	Peak	Pass
945.00	H	3.49	38.96	47.66	-8.70	AV	Pass
387.99	H	-6.66	26.41	40.00	-13.59	QP	Pass
1235.00	H	9.78	58.00	74.00	-16.00	Peak	Pass
1238.00	H	9.78	43.50	54.00	-10.50	AV	Pass
315.00	V	-8.7	70.89	87.66	-16.77	Peak	Pass
315.00	V	-8.7	56.39	67.66	-11.27	AV	Pass
630.00	V	-1.29	38.37	67.66	-29.29	Peak	Pass
630.00	V	-1.29	23.87	47.66	-23.79	AV	Pass
945.00	V	3.49	46.47	67.66	-21.19	Peak	Pass
945.00	V	3.49	31.97	47.66	-15.69	AV	Pass
1208.00	V	9.56	58.88	74.00	-15.12	Peak	Pass
1208.00	V	9.56	50.07	54.00	-3.93	AV	Pass
1754.00	V	10.22	55.17	74.00	-18.83	Peak	Pass
1754.00	V	10.22	46.47	54.00	-7.53	AV	Pass

- Note: 1. Level = Antenna Factor + Cable Loss + Meter Reading-Preamp factor
 2. AV level =PK level-|20logdutycycle|
 3. 20logdutycycle=20log(14*1.178 ms+ 4*0.594ms)/100ms= -14.5
 4. – means to the measure is no necessary, due to the PK value comply with AV limits.

3.3 20dB OCCUPIED BANDWIDTH MEASUREMENT

3.3.1 LIMITS

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

3.3.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Log-Bicon Antenna	SCHWARZBECK MESS	VULB 9163	9163-588	2015-06-28
4	Pre-Amplifier	HP	8447D	N/A	2015-07-01
5	Spectrum Analyzer	Agilent	E4407B	N/A	2015-06-28
6	Test Receiver	ROHDE&SCHWARZ	ESVD	832497/002	2015-06-27

Remark: " N/A" denotes No Model No. / Serial No. and No Calibration specified.

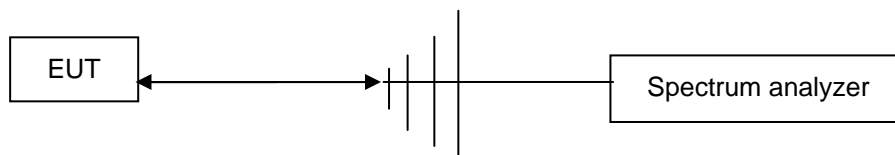
3.3.3 TEST PROCEDURE

- a. The EUT was placed on a turn table was 0.8meter above ground.
- b. The signal was coupled to the spectrum analyzer through an antenna.
- c. Set SPA RBW:30KHz,VBW:100KHz sweep time :auto
- d. Set SPA trace max hold, then view.

3.3.4 DEVIATION FROM TEST STANDARD

No deviation

3.3.5 TEST SETUP



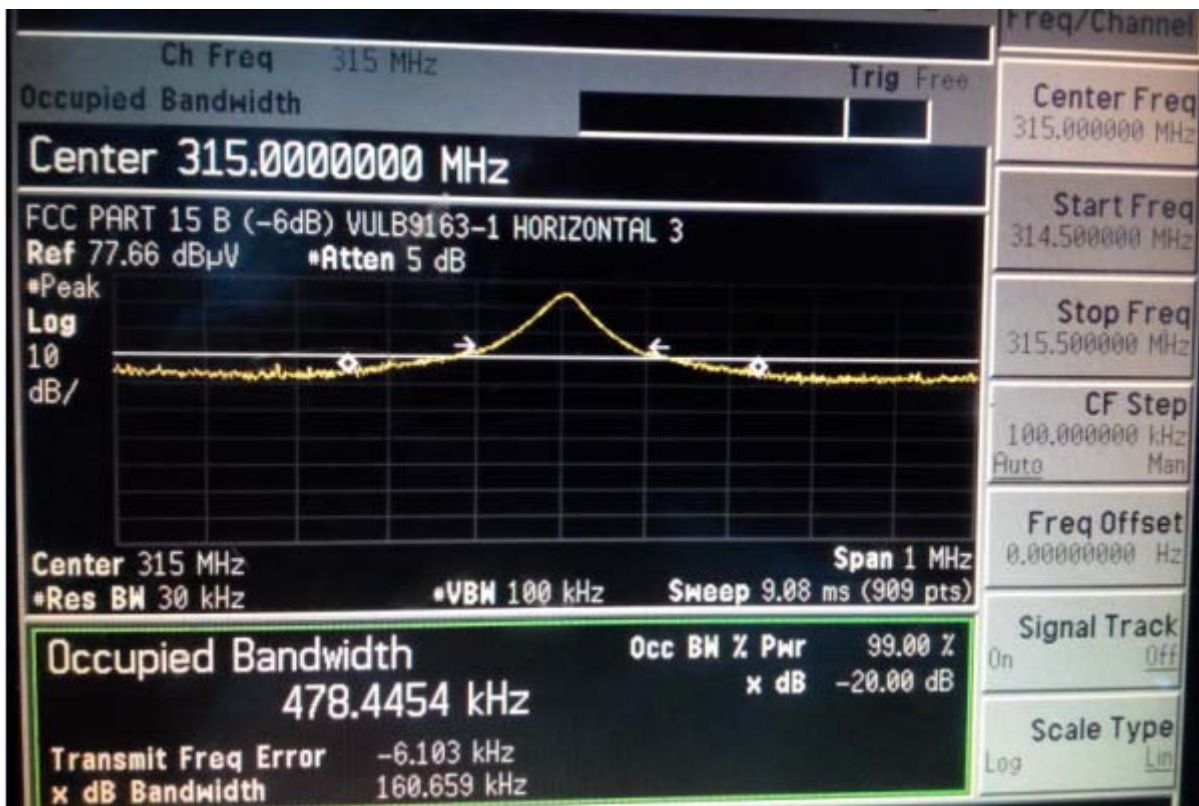
3.3.6 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 3.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

3.3.7 TEST RESULTS

Frequency (MHz)	20dB bandwidth (KHz)	Maximum Limit (KHz)	Result
315	160.7	787.5	Pass

Details please see the following test plots



3.4 DWELL TIME MEASUREMENT

3.4.1 LIMITS

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

3.4.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Log-Bicon Antenna	SCHWARZBECK MESS	VULB 9163	9163-588	2015-06-28
4	Pre-Amplifier	HP	8447D	N/A	2015-07-01
5	Spectrum Analyzer	Agilent	E4407B	N/A	2015-06-28
6	Test Receiver	ROHDE&SCHWARZ	ESVD	832497/002	2015-06-27

Remark: " N/A" denotes No Model No. / Serial No. and No Calibration specified.

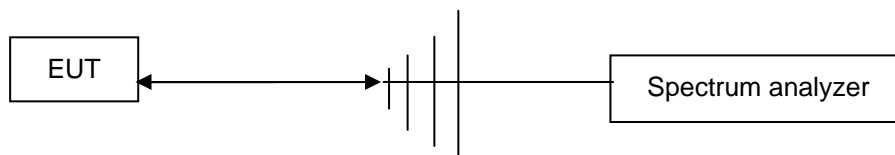
3.4.3 TEST PROCEDURE

- a. The EUT was placed on a turn table was 0.8meter above ground.
- b. The signal was coupled to the spectrum analyzer through an antenna.
- c. Set SPA RBW:30KHz,VBW:100KHz Span:0Hz
- d. Set SPA trace max hold, then view.

3.4.4 DEVIATION FROM TEST STANDARD

No deviation

3.4.5 TEST SETUP



3.4.6 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 3.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

3.4.7 TEST RESULTS

Ton(s)	Ton limits(s)	Result
0.168	<5s	Pass

Details please see the following test plots

