

**ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT  
INTENTIONAL RADIATOR CERTIFICATION TO  
FCC PART 15 SUBPART C REQUIREMENT**

*OF*

**Convertible Reader with Ultra-Slim Piezo Keyboard**

**Model No.: AYC-E55, AYC-E65BB, AYC-E65BG, AYC-E65BW,  
AYC-E60N, AYC-E60B**

**FCC ID: GCD-AYCEX5**

**Trademark: Rosslare**

**Report No.: ES181221001E**

**Issue Date: January 03, 2019**

*Prepared for*  
**Rosslare Enterprises Limited**  
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*Prepared by*  
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**VERIFICATION OF COMPLIANCE**


Applicant:	Rosslare Enterprises Limited Room 905, 12 Wang Tai Road , Kowloon Bay, Kowloon, Hong Kong
Manufacturer:	Rosslare Electronics (Shenzhen) Ltd. Block 2, No. A-1 Baiwangxin Industrial Park, XiLi Town, Shenzhen, China
Product Description:	Convertible Reader with Ultra-Slim Piezo Keyboard
Model Number:	AYC-E55, AYC-E65BB, AYC-E65BG, AYC-E65BW, AYC-E60N, AYC-E60B
Trademark:	Rosslare


**We hereby certify that:**


The above equipment was tested by EMTEK (SHENZHEN) CO., LTD. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10-2013 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.209(2015).

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

Date of Test : December 21, 2018 to January 02, 2019

Prepared by :   
Yaping Shen/Editor

Reviewer :   
Joe Xia/Supervisor

Approved & Authorized Signer :   
Lisa Wang/Manager

### Modified Information

Version	Summary	Revision Date	Report No.
Ver.1.0	Original Report	/	ES181221001E

## Table of Contents

<b>1. GENERAL INFORMATION .....</b>	<b>5</b>
1.1 PRODUCT DESCRIPTION .....	5
1.2 TEST SYSTEM UNCERTAINTY .....	5
1.3 TEST FACILITY .....	6
<b>2. SYSTEM TEST CONFIGURATION.....</b>	<b>7</b>
2.1 EUT CONFIGURATION .....	7
2.2 EUT EXERCISE .....	7
2.3 TEST PROCEDURE .....	7
2.4 CONFIGURATION OF TESTED SYSTEM.....	8
<b>3. SUMMARY OF TEST RESULTS.....</b>	<b>9</b>
<b>4. CONDUCTED EMISSIONS TEST .....</b>	<b>10</b>
4.1 MEASUREMENT PROCEDURE .....	10
4.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION) .....	10
4.3 MEASUREMENT EQUIPMENT USED.....	10
4.4 CONDUCTED EMISSION LIMIT .....	10
4.5 MEASUREMENT RESULT .....	10
4.6 CONDUCTED MEASUREMENT PHOTOS .....	13
<b>5. RADIATED EMISSION TEST .....</b>	<b>14</b>
5.1 MEASUREMENT PROCEDURE .....	14
5.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION) .....	14
5.3 MEASUREMENT EQUIPMENT USED.....	15
5.4 RADIATED EMISSION LIMIT .....	15
5.5 MEASUREMENT RESULT .....	17
5.6 RADIATED MEASUREMENT PHOTOS:.....	20
<b>6. ANTENNA REQUIREMENT .....</b>	<b>21</b>
6.1 RESULT .....	21

APPENDIX (Photos of EUT) (4 pages)

## 1. General Information

### 1.1 Product Description

Characteristics	Description
Product Name	Convertible Reader with Ultra-Slim Piezo Keyboard
Model number	AYC-E55, AYC-E65BB, AYC-E65BG, AYC-E65BW, AYC-E60N, AYC-E60B (Note: These models are the same except for the model name and firmware. So we selected AYC-E65BG for test.)
Power Supply for Test	AC 120V/60Hz
Modulation	ASK
Operating Frequency Range	125kHz
Number of Channels	1 channel
Antenna Type	Internal antenna

Note: for a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

### 1.2 TEST SYSTEM UNCERTAINTY

The following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Parameter	Uncertainty
Radio Frequency	$\pm 1 \times 10^{-5}$
Maximum Peak Output Power Test	$\pm 1.0\text{dB}$
Conducted Emissions Test	$\pm 2.0\text{dB}$
Radiated Emission Test	$\pm 2.0\text{dB}$
Power Density	$\pm 2.0\text{dB}$
Occupied Bandwidth Test	$\pm 1.0\text{dB}$
Band Edge Test	$\pm 3\text{dB}$
All emission, radiated	$\pm 3\text{dB}$
Antenna Port Emission	$\pm 3\text{dB}$
Temperature	$\pm 0.5^\circ\text{C}$
Humidity	$\pm 3\%$

Measurement Uncertainty for a level of Confidence of 95%

### 1.3 Test Facility

Site Description  
EMC Lab.

: Accredited by CNAS, 2016.10.24  
The certificate is valid until 2022.10.28  
The Laboratory has been assessed and proved to be in compliance with CNAS-CL01:2006 (identical to ISO/IEC 17025:2005)  
The Certificate Registration Number is L2291.

Accredited by TUV Rheinland Shenzhen 2016.5.19  
The Laboratory has been assessed according to the requirements ISO/IEC 17025.

Accredited by FCC, August 03, 2017  
Designation Number: CN1204  
Test Firm Registration Number: 882943

Wireless Device Testing laboratories recognized by Innovation, Science and Economic Development Canada, 2018.09.12  
The CAB identifier is CN0008.

Accredited by A2LA, July 31, 2017  
The Certificate Number is 4321.01.

Name of Firm  
Site Location

: EMTEK (SHENZHEN) CO., LTD.  
: Bldg 69, Majialong Industry Zone,  
Nanshan District, Shenzhen, Guangdong, China

## **2. System Test Configuration**

### **2.1 EUT Configuration**

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

### **2.2 EUT Exercise**

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

### **2.3 Test Procedure**

#### **2.3.1 Conducted Emissions**

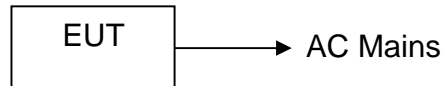
The EUT is placed on a turn table which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.

#### **2.3.2 Radiated Emissions**

The EUT is placed on a turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this transmitter(EUT) was rotated through three orthogonal axes according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013.

## 2.4 Configuration of Tested System

**Fig. 2-1 Configuration of Tested System**



**Table 2-1 Equipment Used in Tested System**

Item	Equipment	Brand	Model No.	FCC ID	Series No.	Note
1	Convertible Reader with Ultra-Slim Piezo Keyboard	Rosslare	AYC-E65BG	GCD-AYCEX5	N/A	<b>EUT</b>
2	Switching Adapter	DVE	DSA-42PFB-12 1 120350	N/A	N/A	<b>Support EUT</b>

**Note:**

- (1) Unless otherwise denoted as EUT in 『Remark』 column, device(s) used in tested system is a support equipment.
- (2) Three orthogonal panels X, Y, Z of EUT are tested. And the test results of the worst test panel(Y) were recorded.



### 3. Summary of Test Results

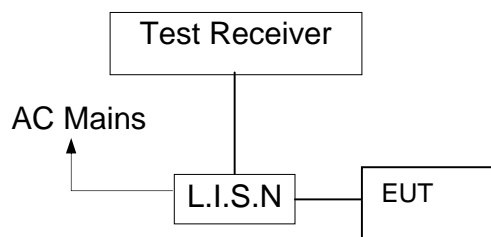
<b>FCC Rules</b>	<b>Description Of Test</b>	<b>Result</b>
§15.207	AC Power Conducted Emission	Compliant
§15.209	Radiated Emission	Compliant
§15.203	Antenna Application	Compliant

## 4. Conducted Emissions Test

### 4.1 Measurement Procedure

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured was complete.

### 4.2 Test SET-UP (Block Diagram of Configuration)



### 4.3 Measurement Equipment Used

Conducted Emission Test Site						
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	Characteristics	Last Cal.	Due date
Test Receiver	Rohde & Schwarz	ESCS30	828985/018	9kHz~3GHz	05/16/2018	05/15/2019
Artificial Network	Schwarzbeck	8126D	8126D-211	9KHz-300MHz	05/16/2018	05/15/2019
RF Switching Unit	CDS	RSU-M2	38401	9KHz-300MHz	05/16/2018	05/15/2019
Coaxial Cable	CDS	79254	46107086	9kHz~3GHz	05/16/2018	05/15/2019

### 4.4 Conducted Emission Limit

#### Conducted Emission

#### Frequency(MHz)

0.15-0.5

0.5-5.0

5.0-30.0

#### Quasi-peak

66-56

56

60

#### Average

56-46

46

50

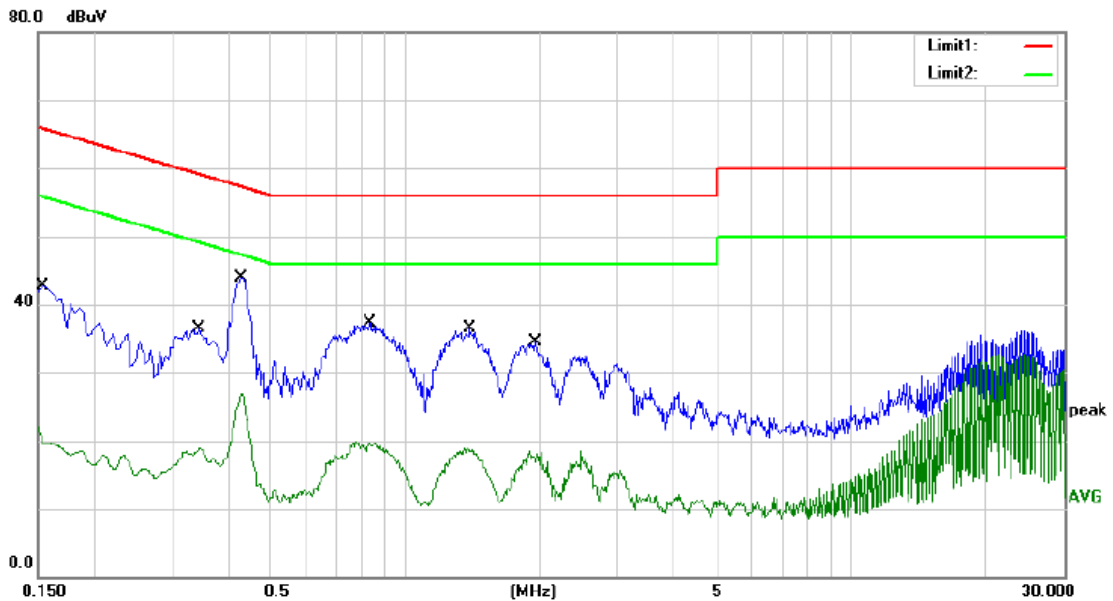
**Note:** 1. The lower limit shall apply at the transition frequencies

2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

### 4.5 Measurement Result

Pass.

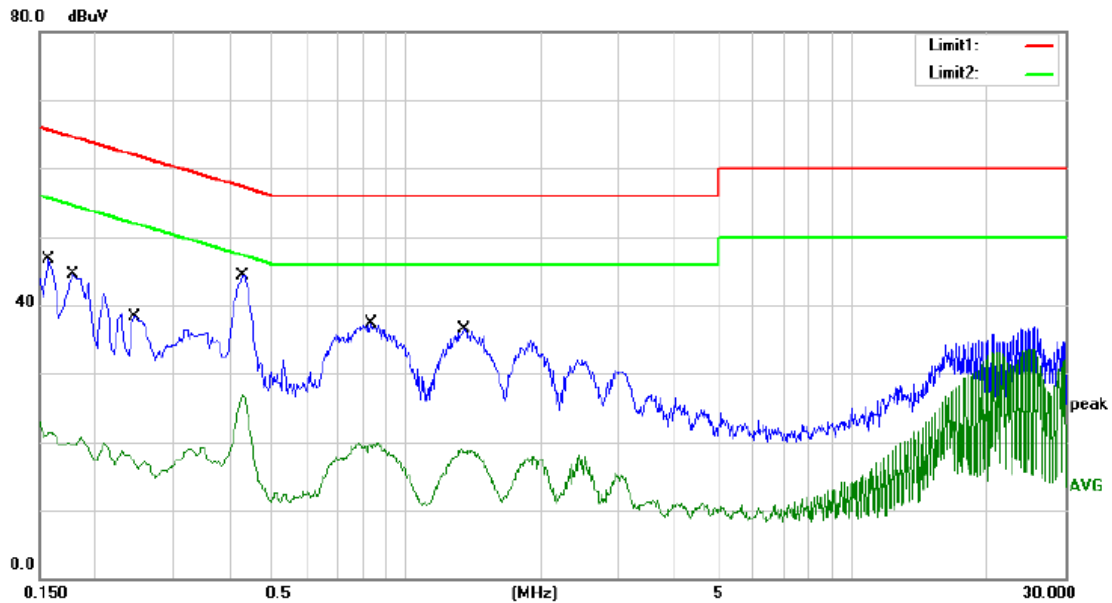
Please refer to the following.



Site site #1 Phase: **L1** Temperature: 25  
 Limit: (CE)FCC PART 15 C\_QP Power: AC 120V/60Hz Humidity: 55 %  
 Mode: TX  
 Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.1540	29.98	9.78	39.76	65.78	-26.02	QP	
2		0.1540	12.29	9.78	22.07	55.78	-33.71	AVG	
3		0.3460	23.67	9.81	33.48	59.06	-25.58	QP	
4		0.3460	9.01	9.81	18.82	49.06	-30.24	AVG	
5	*	0.4300	31.15	9.83	40.98	57.25	-16.27	QP	
6		0.4300	17.15	9.83	26.98	47.25	-20.27	AVG	
7		0.8340	24.56	9.84	34.40	56.00	-21.60	QP	
8		0.8340	10.03	9.84	19.87	46.00	-26.13	AVG	
9		1.3980	23.72	9.84	33.56	56.00	-22.44	QP	
10		1.3980	9.06	9.84	18.90	46.00	-27.10	AVG	
11		1.9580	21.57	9.84	31.41	56.00	-24.59	QP	
12		1.9580	8.60	9.84	18.44	46.00	-27.56	AVG	

\*:Maximum data    x:Over limit    !:over margin    Comment: Factor build in receiver.    Operator: Yaping Shen



Site site #1 Phase: **N** Temperature: 25  
 Limit: (CE)FCC PART 15 C\_QP Power: AC 120V/60Hz Humidity: 55 %  
 Mode: TX  
 Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1580	33.88	9.78	43.66	65.57	-21.91	QP	
2		0.1580	13.08	9.78	22.86	55.57	-32.71	AVG	
3		0.1780	31.79	9.78	41.57	64.58	-23.01	QP	
4		0.1780	11.01	9.78	20.79	54.58	-33.79	AVG	
5		0.2460	25.60	9.80	35.40	61.89	-26.49	QP	
6		0.2460	8.88	9.80	18.68	51.89	-33.21	AVG	
7	*	0.4300	31.81	9.83	41.64	57.25	-15.61	QP	
8		0.4300	17.01	9.83	26.84	47.25	-20.41	AVG	
9		0.8340	24.39	9.84	34.23	56.00	-21.77	QP	
10		0.8340	10.08	9.84	19.92	46.00	-26.08	AVG	
11		1.3500	23.68	9.84	33.52	56.00	-22.48	QP	
12		1.3500	9.03	9.84	18.87	46.00	-27.13	AVG	

\*:Maximum data    x:Over limit    !:over margin    Comment: Factor build in receiver.    Operator: Yaping Shen

#### 4.6 Conducted Measurement Photos



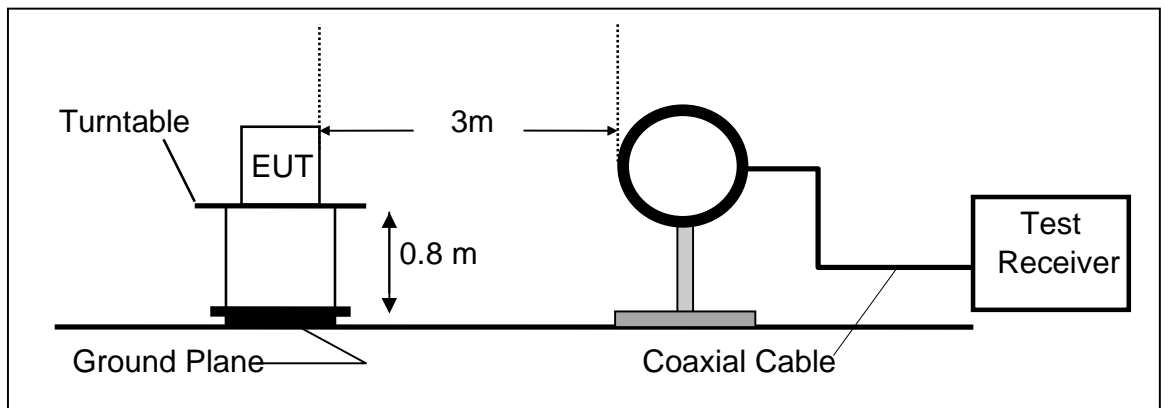
## 5. Radiated Emission Test

### 5.1 Measurement Procedure

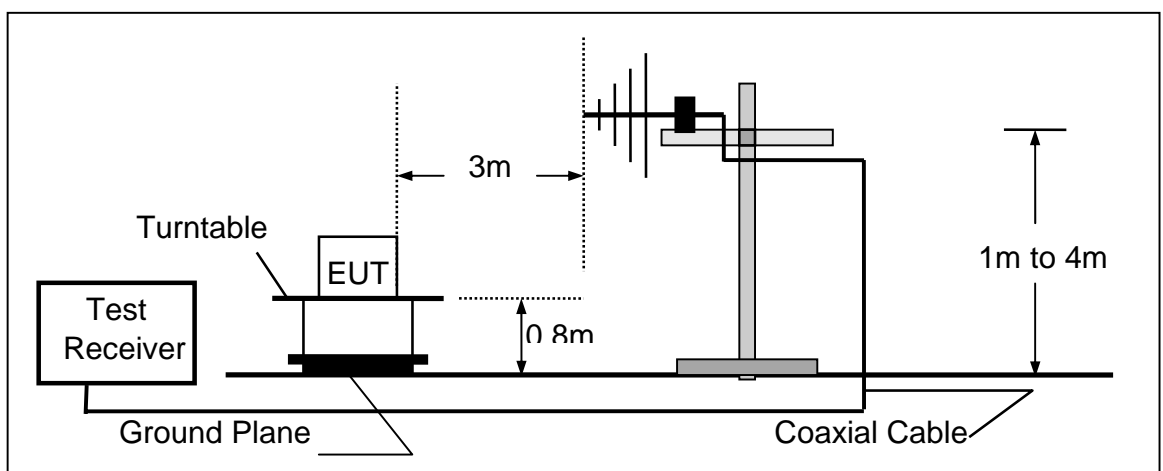
1. The EUT was placed on a turntable which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measured were complete.

### 5.2 Test SET-UP (Block Diagram of Configuration)

(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency Below 1000MHz



### 5.3 Measurement Equipment Used

Equipment	Serial No.	Manufacturer	Model No.	Cal. Date	Due Date
EMI Test Receiver	Rohde & Schwarz	ESU	1302.6005.26	05/16/2018	05/15/2019
Pre-Amplifier	HP	8447D	2944A07999	05/16/2018	05/15/2019
Bilog Antenna	Schwarzbeck	VULB9163	142	05/16/2018	05/15/2019
Loop Antenna	Schwarzbeck	FMZB 1519	012	05/16/2018	05/15/2019
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170399	05/16/2018	05/15/2019
Horn Antenna	Schwarzbeck	BBHA9120D	D143	05/16/2018	05/15/2019
Cable	Schwarzbeck	AK9513	ACRX1	05/16/2018	05/15/2019
Cable	Rosenberger	N/A	FP2RX2	05/16/2018	05/15/2019
Cable	Schwarzbeck	AK9513	CRPX1	05/16/2018	05/15/2019
Cable	Schwarzbeck	AK9513	CRRX2	05/16/2018	05/15/2019
Pre-Amplifier	A.H.	PAM-0126	1415261	05/16/2018	05/15/2019

### 5.4 Radiated Emission Limit

The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table 15.209(a):

FCC Part 15.209				
Frequency (MHz)	Field Strength Limitation		Field Strength Limitation Frequency at 3m Measurement Distance	
	(uV/m)	Dist	(uV/m)	(dBuV/m)
0.009 – 0.490	2400 / F(KHz)	300m	10000 * 2400/F(KHz)	20log 2400/F(KHz) + 80
0.490 – 1.705	24000 / F(KHz)	30m	100 * 24000/F(KHz)	20log 24000/F(KHz) + 40
1.705 – 30.00	30	30m	100* 30	20log 30 + 40
30.0 – 88.0	100	3m	100	20log 100
88.0 – 216.0	150	3m	150	20log 150
216.0 – 960.0	200	3m	200	20log 200
Above 960.0	500	3m	500	20log 500

15.205 Restricted bands of operation

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
<sup>1</sup> 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	( <sup>2</sup> )

- Remark 1. Emission level in dBuV/m=20 log (uV/m)  
 : 2. Measurement was performed at an antenna to the closed point of EUT distance of meters.  
 3. Only spurious frequency is permitted to locate within the Restricted Bands specified in provision of § 15.205, and the emissions located in restricted bands also comply with 15.209 limit.



## 5.5 Measurement Result

### Radiated Emission (Below 30MHz):

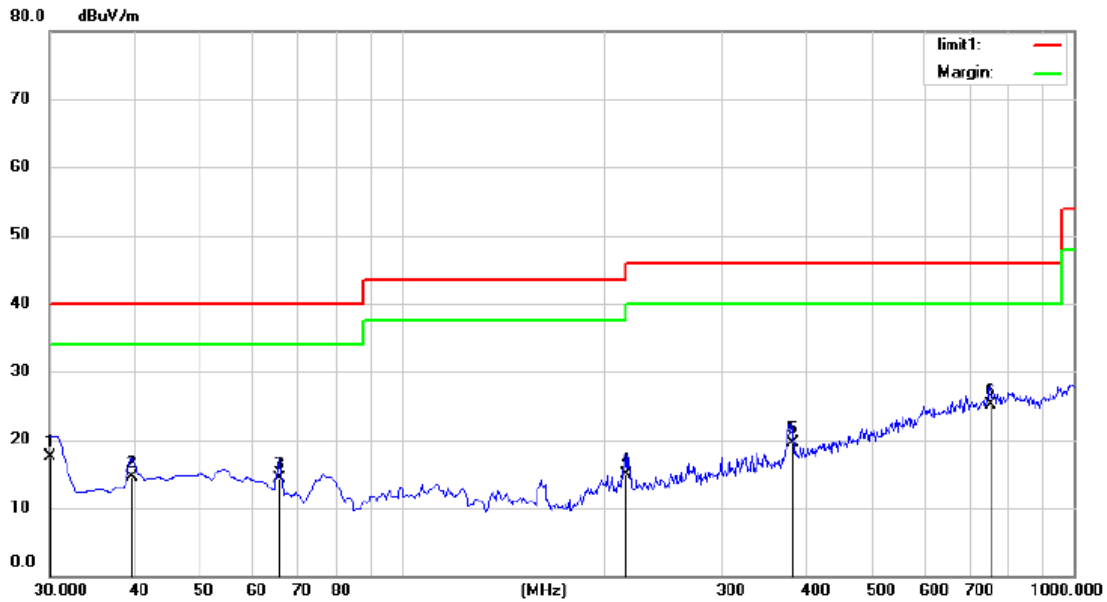
Fundamental

Frequency (MHz)	Ant.Pol (H/V)	Reading@3m (dBuV/m)		Limit@3m (dBuV/m)		Margin (dB)	
		Peak	Average	Peak	Average	Peak	Average
0.125	V	70.16	64.52	125.7	105.7	-55.54	-41.18

Other Emissions:

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)	Limit 3m (dBuV/m)	Over (dB)	Note
8.78	V	37.59	69.54	-31.95	QP
12.56	V	36.82	69.54	-32.72	QP
14.32	V	34.65	69.54	-34.89	QP
17.54	V	33.23	69.54	-36.31	QP
21.67	V	32.47	69.54	-37.07	QP
28.19	V	32.06	69.54	-37.48	QP
6.17	H	38.02	69.54	-31.52	QP
11.78	H	37.68	69.54	-31.86	QP
15.22	H	35.71	69.54	-33.83	QP
20.66	H	34.56	69.54	-34.98	QP
25.34	H	33.63	69.54	-35.91	QP
27.21	H	33.25	69.54	-36.29	QP

## Radiated Emission (30MHz-1GHz):

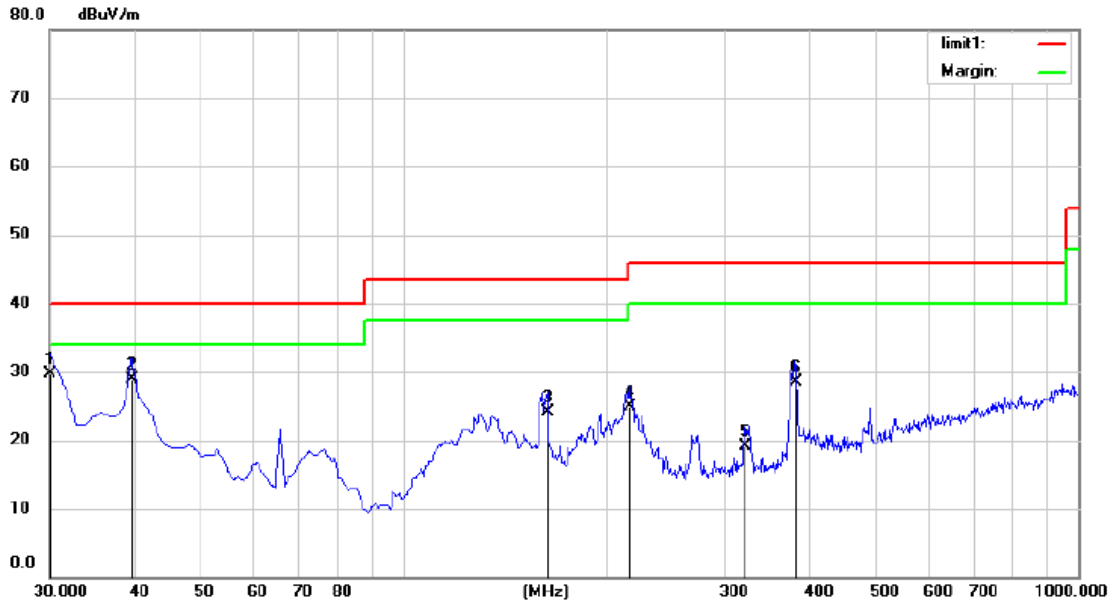


Site Chamber #1 Polarization: **Horizontal** Temperature: 26  
 Limit: (RE)FCC PART 15 C 3m Power: AC 120V/60Hz Humidity: 55 %  
 Mode: TX  
 Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		30.0000	36.26	-18.76	17.50	40.00	-22.50	QP		
2		39.7146	31.43	-16.99	14.44	40.00	-25.56	QP		
3		65.8900	32.37	-18.09	14.28	40.00	-25.72	QP		
4		215.2700	32.07	-17.17	14.90	43.50	-28.60	QP		
5		382.1100	30.73	-11.30	19.43	46.00	-26.57	QP		
6	*	751.6800	28.63	-3.53	25.10	46.00	-20.90	QP		

\*:Maximum data    x:Over limit    !:over margin

Operator: Yaping Shen



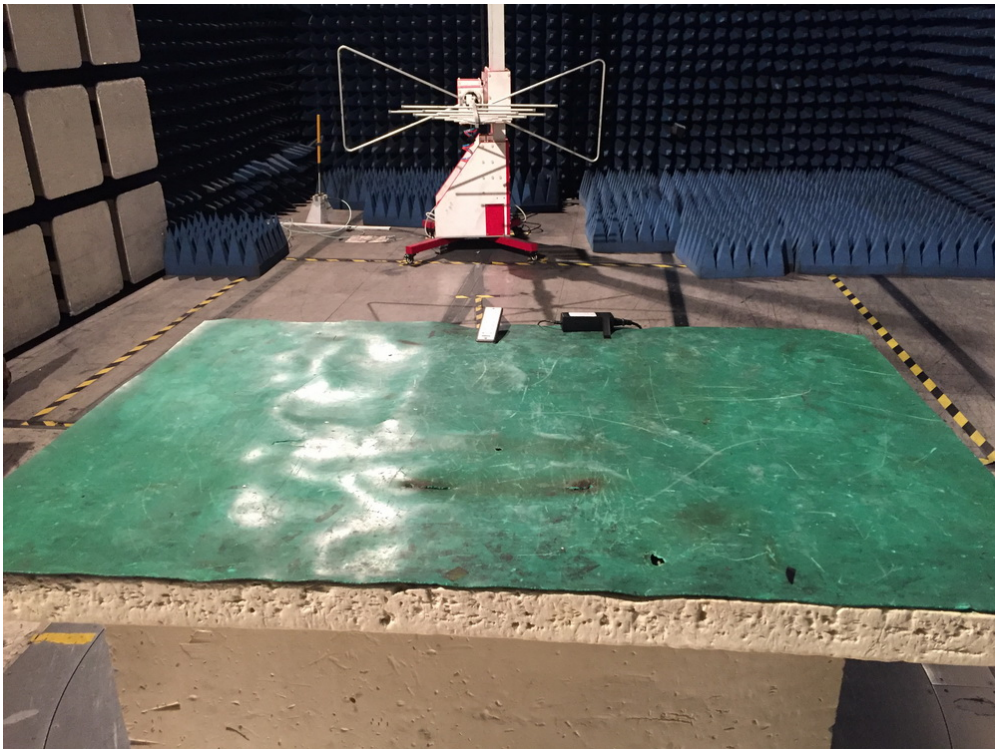
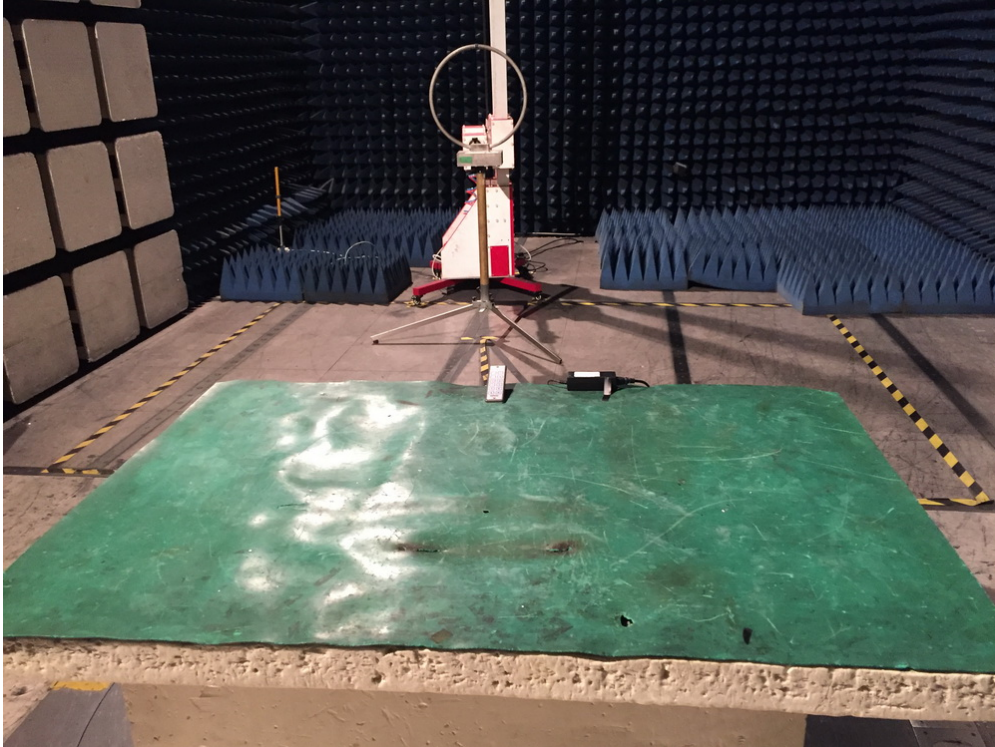
Site Chamber #1      Polarization: **Vertical**      Temperature: 26  
 Limit: (RE)FCC PART 15 C 3m      Power: AC 120V/60Hz      Humidity: 55 %  
 Mode: TX  
 Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Detector	Comment
1	*	30.0000	48.39	-18.76	29.63	40.00	-10.37			QP	
2		39.7000	45.84	-16.86	28.98	40.00	-11.02			QP	
3		163.8600	44.52	-20.42	24.10	43.50	-19.40			QP	
4		217.2100	41.89	-17.00	24.89	46.00	-21.11			QP	
5		321.0000	32.80	-13.62	19.18	46.00	-26.82			QP	
6		382.1100	40.71	-12.12	28.59	46.00	-17.41			QP	

\*:Maximum data    x:Over limit    !:over margin

Operator: Yaping Shen

**5.6 Radiated Measurement Photos:**



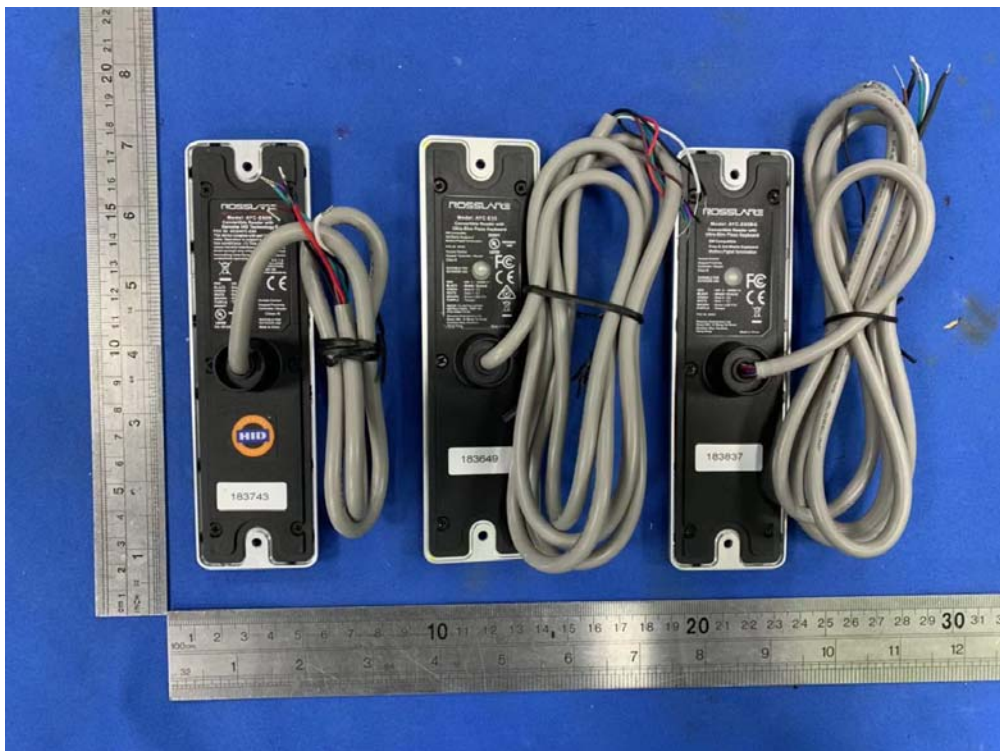
## **6. ANTENNA REQUIREMENT**

For intentional device, according to FCC 47 CFR Section 15.203, 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.

### **6.1 Result**

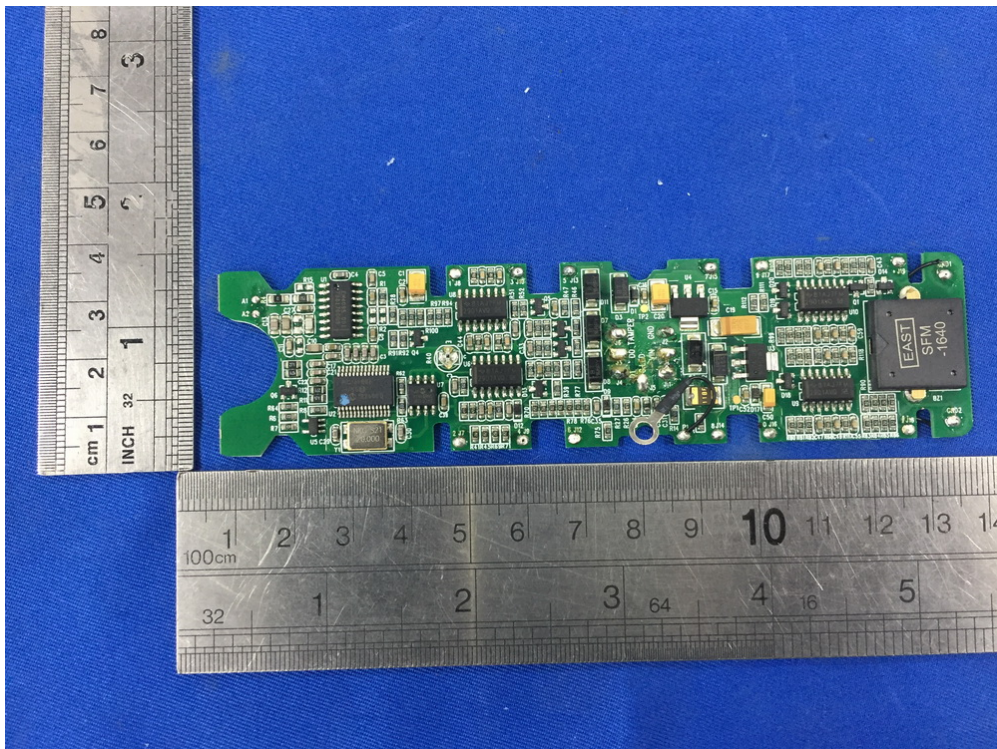
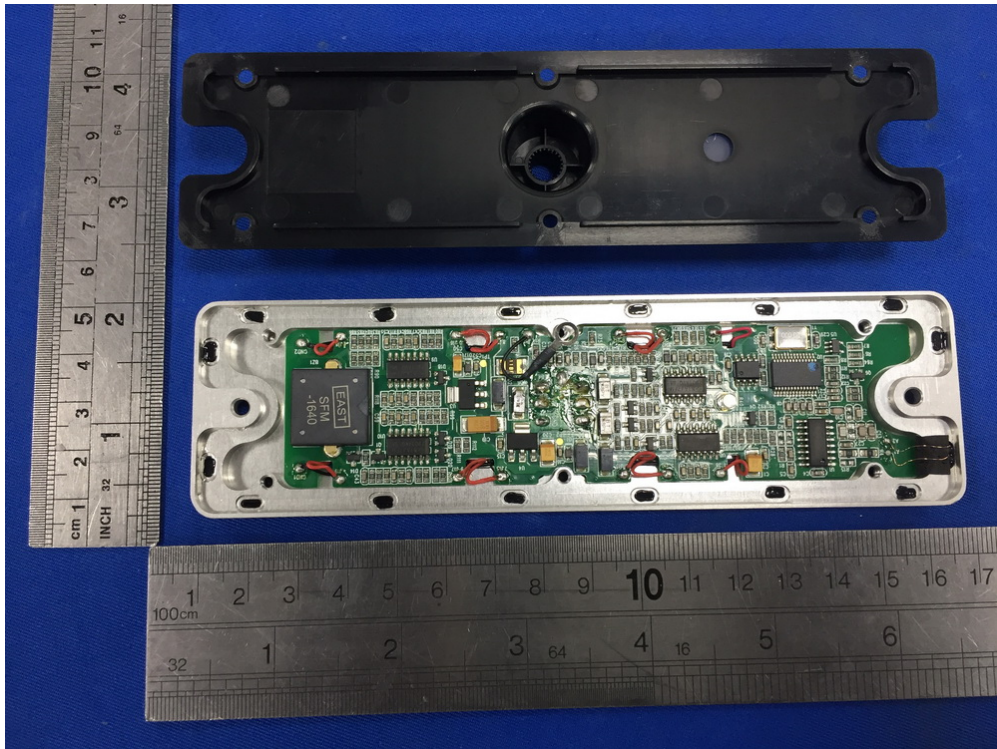
The antenna is permanently attached on PCB, no consideration of replacement. Please refer to internal Photos for details.

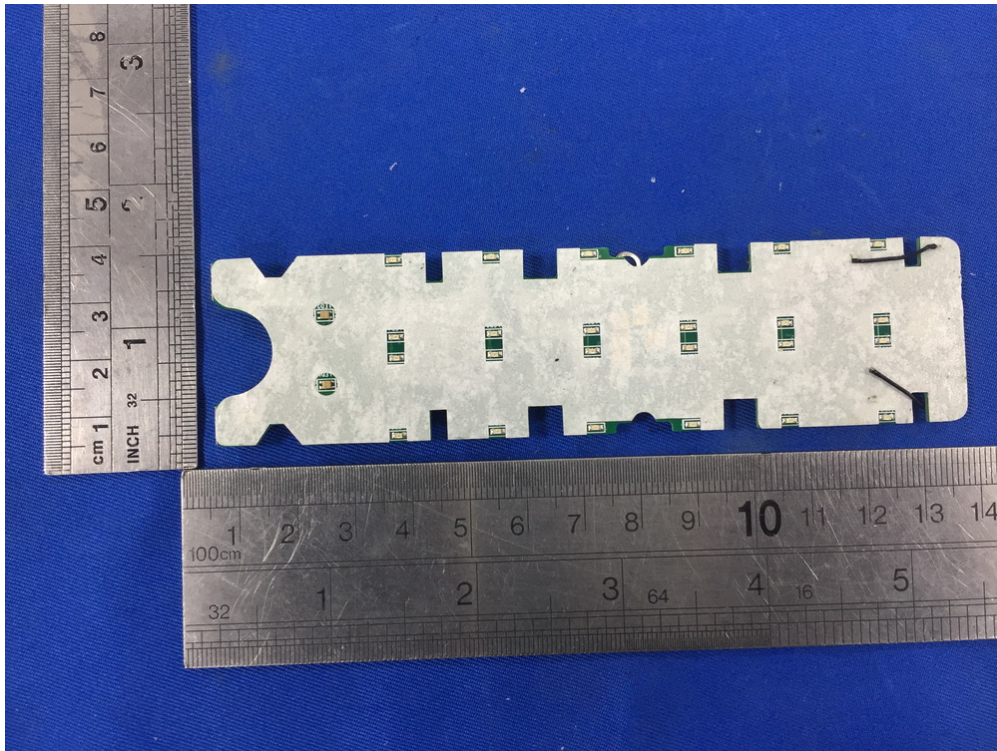
# APPENDIX I (Photos of EUT)











-----The end-----