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

OF

Metallic, Anti-Vandal Stand-Alone Piezo PIN & PROX Controller

Model No.: AC-Q44

FCC ID: GCD-ACQ44

Trademark: Rosslare

Report No.:ES190618013E

Issue Date: June 27, 2019

Prepared for

Rosslare Enterprises Limited
Room 905, 12 Wang Tai Road , Kowloon Bay, Kowloon, Hong Kong

Prepared by

EMTEK（SHENZHEN) CO., LTD.

Bldg 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China.

TEL: 86-755-26954280
FAX: 86-755-26954282

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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 Indurstrial Park, XiLi Town, Shenzhen, China
Product Description:	Metallic, Anti-Vandal Stand-Alone Piezo PIN & PROX Controller
Model Number:	AC-Q44
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(2018).
The test results of this report relate only to the tested sample identified in this report.

Date of Test : June 18 2019 to June 27, 2019

Prepared by : _____
Jason Gao/Editor

Reviewer : _____
Galen Xiao/Supervisor

Approved & Authorized Signer : _____
Lisa Wang/Manager

Modified Information

Version	Summary	Revision Date	Report No.
Ver.1.0	Original Report	/	ES190618013E

Table of Contents

1. General Information

1.1 Product Description

Characteristics	Description
Product Name	Metallic, Anti-Vandal Stand-Alone Piezo PIN & PROX Controller
Model number	AC-Q44
Power Supply for Test	AC 16-24V,DC 12-24V form adapter
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	±1x10^-5
Maximum Peak Output Power Test	±1.0dB
Conducted Emissions Test	±2.0dB
Radiated Emission Test	±2.0dB
Power Density	±2.0dB
Occupied Bandwidth Test	±1.0dB
Band Edge Test	±3dB
All emission, radiated	±3dB
Antenna Port Emission	±3dB
Temperature	±0.5℃
Humidity	±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

Accredited by Industry Canada, November 24, 2015
The Certificate Registration Number is 4480A.

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

Name of Firm : EMTEK (SHENZHEN) CO., LTD.

Site Location : 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 a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 6.2 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 a placed on as 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 6.3 of ANSI C63.10-2013.

2.4 Configuration of Tested System

Fig. 2-1 Configuration of Tested System

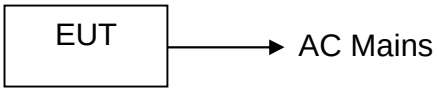


Table 2-1 Equipment Used in Tested System

Item	Equipment	Brand	Model No.	FCC ID	Series No.	Note
1	Metallic, Anti-Vandal Stand-Alone Piezo PIN & PROX Controller	Rosslare	AC-Q44	GCD-ACQ44	N/A	***EUT***
2	Switching Adapter	Lenove	PA-1650-56LC	N/A	N/A	***Support EUT***

Note:

(1) Unless otherwise denoted as EUT in 『Remark』 column, device(s) used in tested system is a support equipment.

3. Summary of Test Results

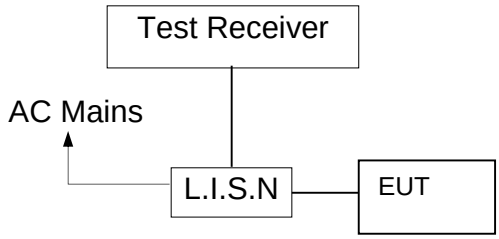
FCC Rules	Description Of Test	Result
§15.207	AC Power Conducted Emission	Compliant
§15.209	Radiated Emission	Compliant
§15.203	Antenna Application	Compliant

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	05/16/2019	05/15/2020
Artifical Network	Schwarzbeck	8126D	8126D-211	9KHz-300MHz	05/16/2019	05/15/2020
RF Switching Unit	CDS	RSU-M2	38401	9KHz-300MHz	05/16/2019	05/15/2020
Coaxial Cable	CDS	79254	46107086	9kHz~3GHz	05/16/2019	05/15/2020

4.4 Conducted Emission Limit

Conducted Emission

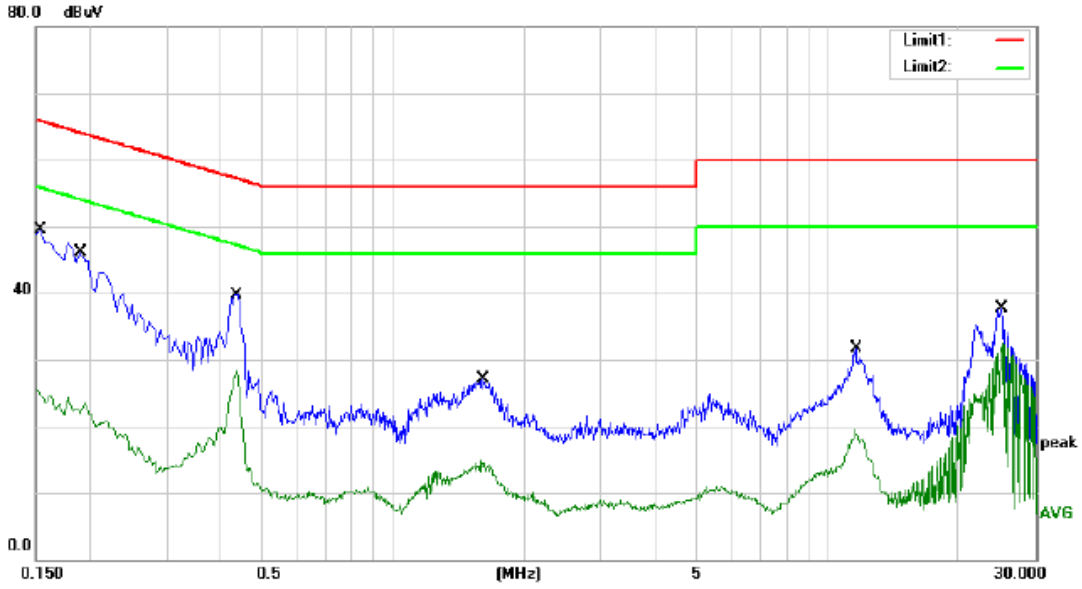
Frequency(MHz)	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50

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.

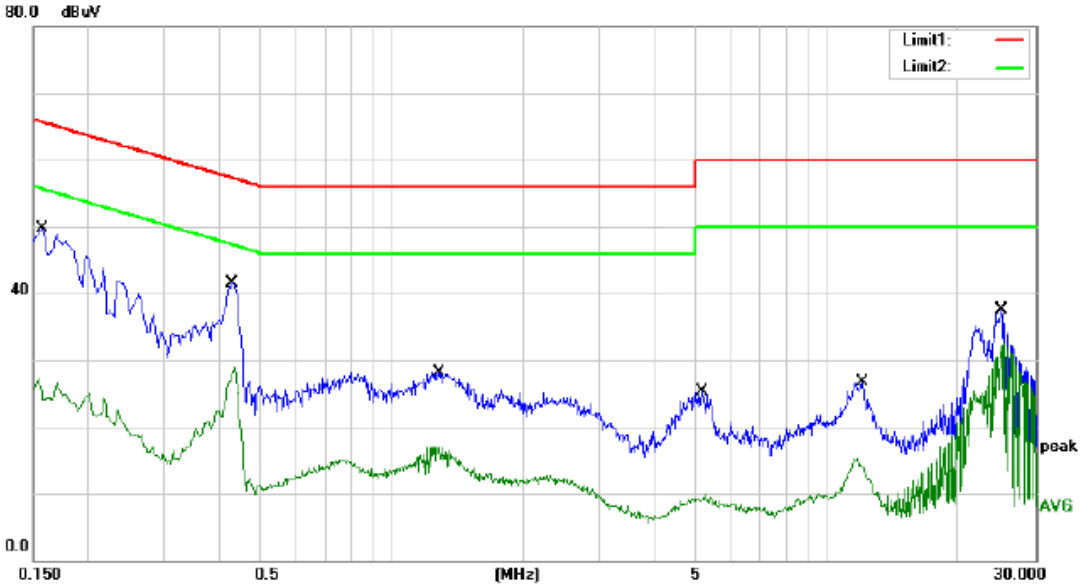
Please refer to the following.



Site site #1 Phase: N 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	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1540	39.40	10.01	49.41	65.78	-16.37	QP	
2		0.1540	15.75	10.01	25.76	55.78	-30.02	AVG	
3		0.1900	36.04	10.03	46.07	64.04	-17.97	QP	
4		0.1900	14.24	10.03	24.27	54.04	-29.77	AVG	
5		0.4340	29.64	10.15	39.79	57.18	-17.39	QP	
6		0.4340	18.20	10.15	28.35	47.18	-18.83	AVG	
7		1.6020	16.89	10.18	27.07	56.00	-28.93	QP	
8		1.6020	4.63	10.18	14.81	46.00	-31.19	AVG	
9		11.5660	21.44	10.22	31.66	60.00	-28.34	QP	
10		11.5660	9.35	10.22	19.57	50.00	-30.43	AVG	
11		25.0580	27.42	10.31	37.73	60.00	-22.27	QP	
12		25.0580	22.27	10.31	32.58	50.00	-17.42	AVG	

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



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	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1580	39.77	10.01	49.78	65.57	-15.79	QP	
2		0.1580	17.33	10.01	27.34	55.57	-28.23	AVG	
3	*	0.4300	31.44	10.15	41.59	57.25	-15.66	QP	
4		0.4300	18.81	10.15	28.96	47.25	-18.29	AVG	
5		1.2860	17.89	10.18	28.07	56.00	-27.93	QP	
6		1.2860	6.80	10.18	16.98	46.00	-29.02	AVG	
7		5.1500	15.05	10.18	25.23	60.00	-34.77	QP	
8		5.1500	-0.35	10.18	9.83	50.00	-40.17	AVG	
9		12.0140	16.49	10.22	26.71	60.00	-33.29	QP	
10		12.0140	5.11	10.22	15.33	50.00	-34.67	AVG	
11		25.0580	27.10	10.31	37.41	60.00	-22.59	QP	
12		25.0580	22.27	10.31	32.58	50.00	-17.42	AVG	

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

4.6 Conducted Measurement Photos

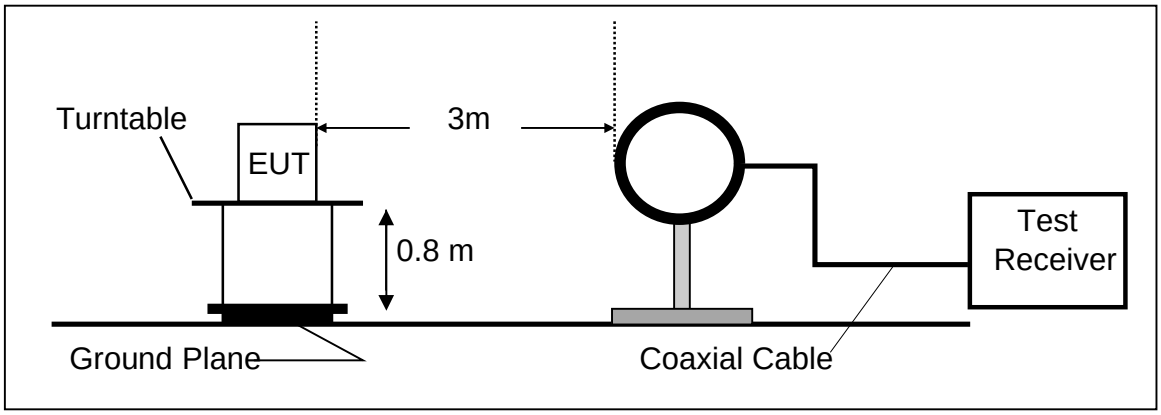
5. Radiated Emission Test

5.1 Measurement Procedure

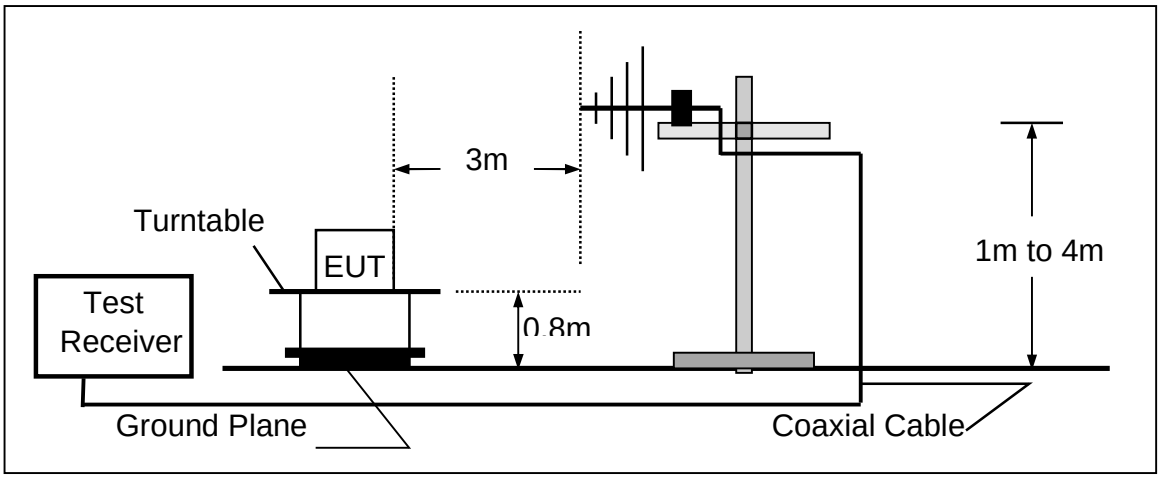
1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above 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	05/16/2019	05/15/2020
Pre-Amplifier	HP	8447D	2944A07999	05/16/2019	05/15/2020
Bilog Antenna	Schwarzbeck	VULB9163	142	05/16/2019	05/15/2020
Loop Antenna	Schwarzbeck	FMZB 1519	012	05/16/2019	05/15/2020
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170399	05/16/2019	05/15/2020
Horn Antenna	Schwarzbeck	BBHA9120D	D143	05/16/2019	05/15/2020
Cable	Schwarzbeck	AK9513	ACRX1	05/16/2019	05/15/2020
Cable	Rosenberger	N/A	FP2RX2	05/16/2019	05/15/2020
Cable	Schwarzbeck	AK9513	CRPX1	05/16/2019	05/15/2020
Cable	Schwarzbeck	AK9513	CRRX2	05/16/2019	05/15/2020
Pre-Amplifier	A.H.	PAM-0126	1415261	05/16/2019	05/15/2020

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
[1]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	([2])

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 x 15.205, and the emissions located in restricted bands also comply with 15.209 limit.

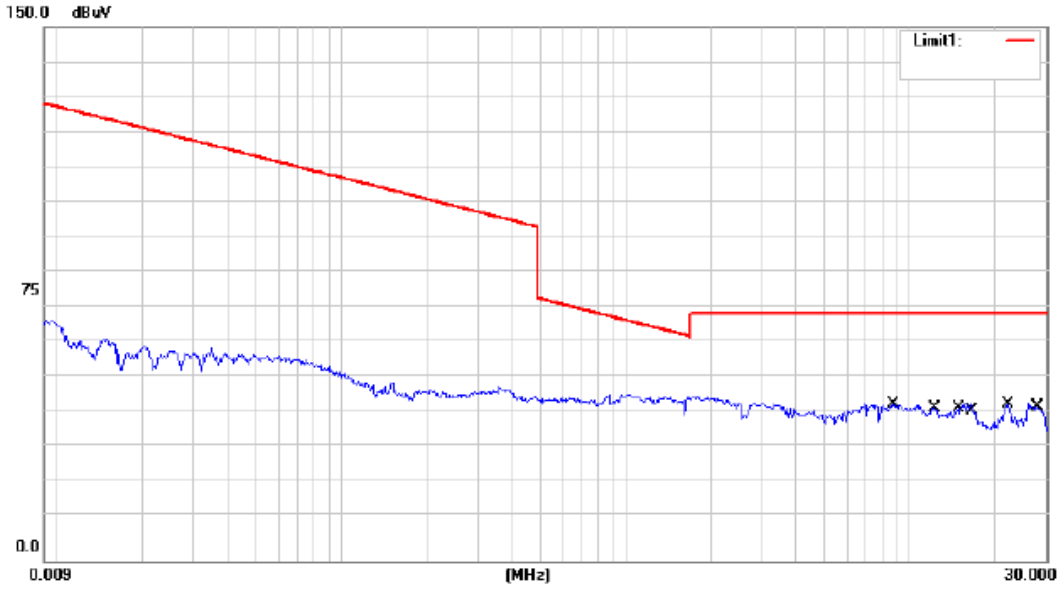
5.5 Measurement Result

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	67.53	62.82	125.7	105.7	-58.17	-42.88
0.125	H	70.14	65.36	125.7	105.7	-55.56	-40.34

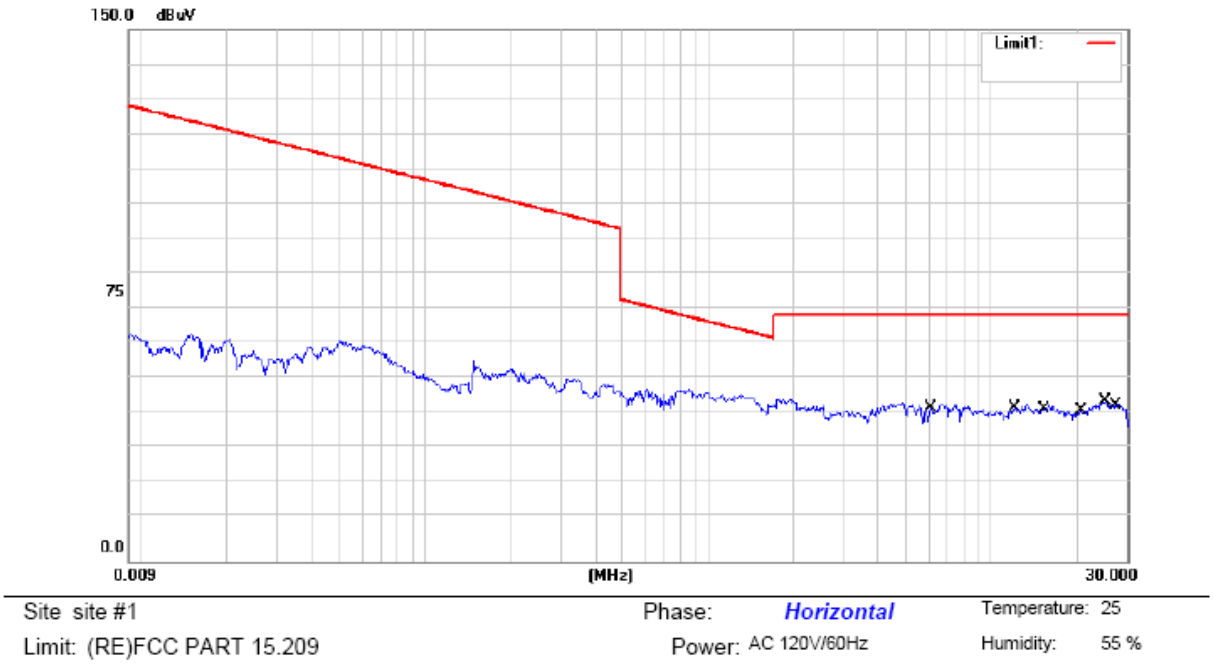
Other Emissions:



Site site #1 Phase: *Vertical* Temperature: 25

Limit: (RE)FCC PART 15.209 Power: AC 120V/60Hz Humidity: 55 %

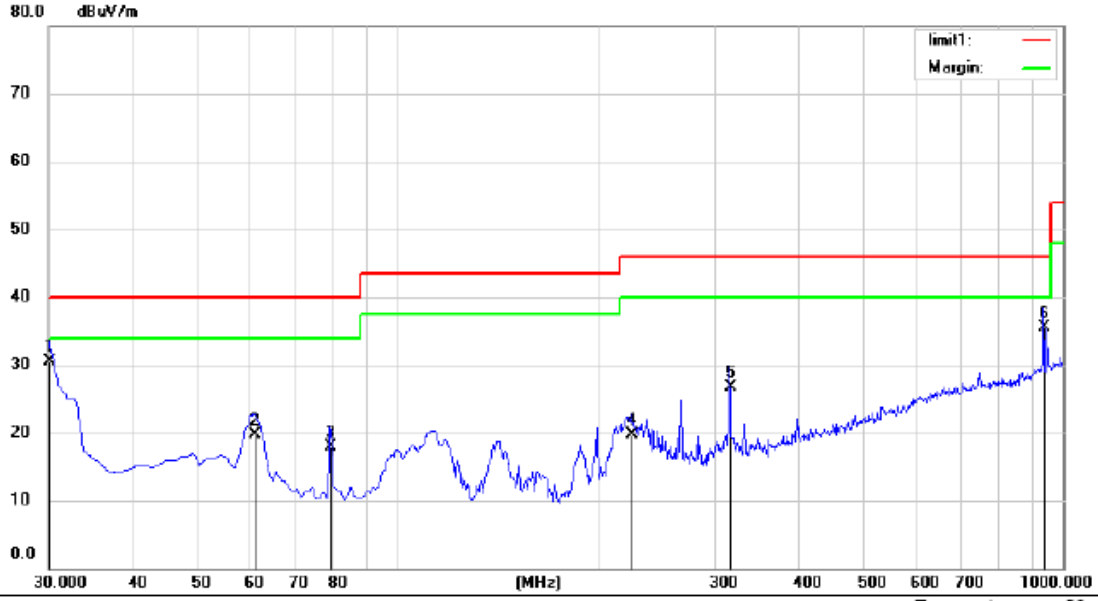
Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)	Limit 3m (dBuV/m)	Over (dB)	Note
8.53	V	33.15	69.54	-36.39	QP
12.32	V	31.24	69.54	-38.30	QP
14.56	V	35.45	69.54	-34.09	QP
17.12	V	34.19	69.54	-35.35	QP
21.78	V	36.93	69.54	-32.61	QP
28.44	V	37.43	69.54	-32.11	QP



Site site #1 Phase: *Horizontal* Temperature: 25
Limit: (RE)FCC PART 15.209 Power: AC 120V/60Hz Humidity: 55 %

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)	Limit 3m (dBuV/m)	Over (dB)	Note
6.17	H	31.52	69.54	-38.02	QP
11.78	H	32.63	69.54	-36.91	QP
15.22	H	36.71	69.54	-32.83	QP
20.66	H	37.86	69.54	-31.68	QP
25.34	H	34.14	69.54	-35.40	QP
27.21	H	36.27	69.54	-33.27	QP

Radiated Emission (30MHz-1GHz):



Site Chamber #1 Polarization: *Vertical* Temperature: 26

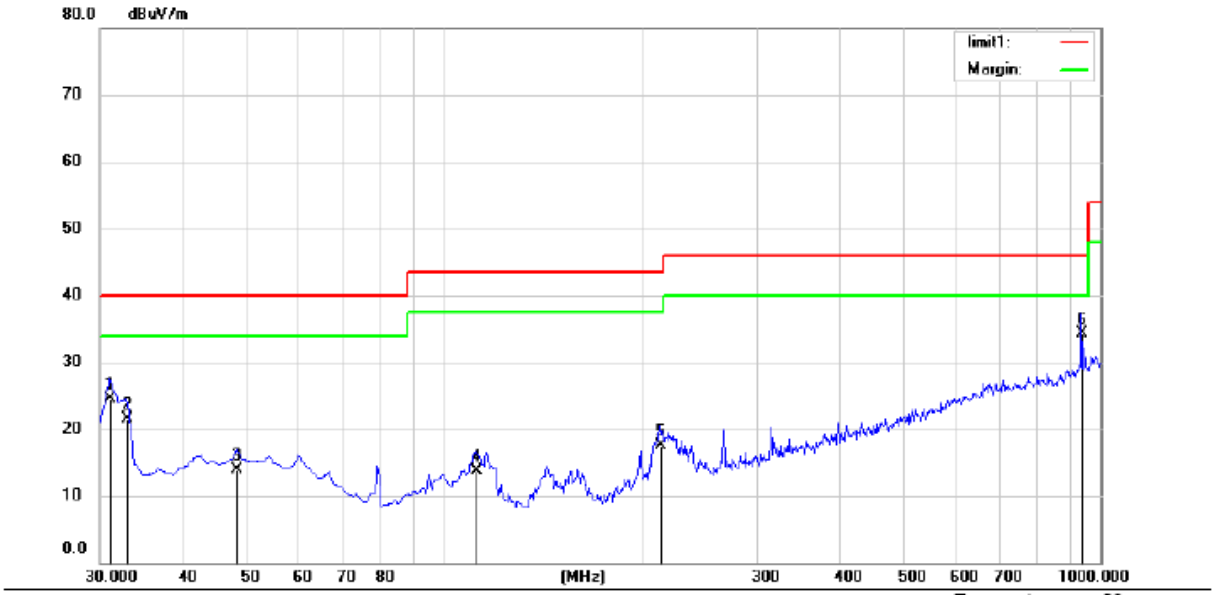
Limit: (RE)FCC PART 15 C 3m Power: AC 120V/60Hz Humidity: 55 %

Mode: TX

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	30.0000	49.30	-18.76	30.54	40.00	-9.46	QP			
2		61.0400	36.95	-17.22	19.73	40.00	-20.27	QP			
3		79.4700	39.51	-21.55	17.96	40.00	-22.04	QP			
4		224.9700	36.22	-16.60	19.62	46.00	-26.38	QP			
5		316.1500	40.18	-13.56	26.62	46.00	-19.38	QP			
6		937.9200	36.31	-0.82	35.49	46.00	-10.51	QP			

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



Site Chamber #1 Polarization: *Horizontal* Temperature: 26

Limit: (RE)FCC PART 15 C 3m Power: AC 120V/60Hz Humidity: 55 %

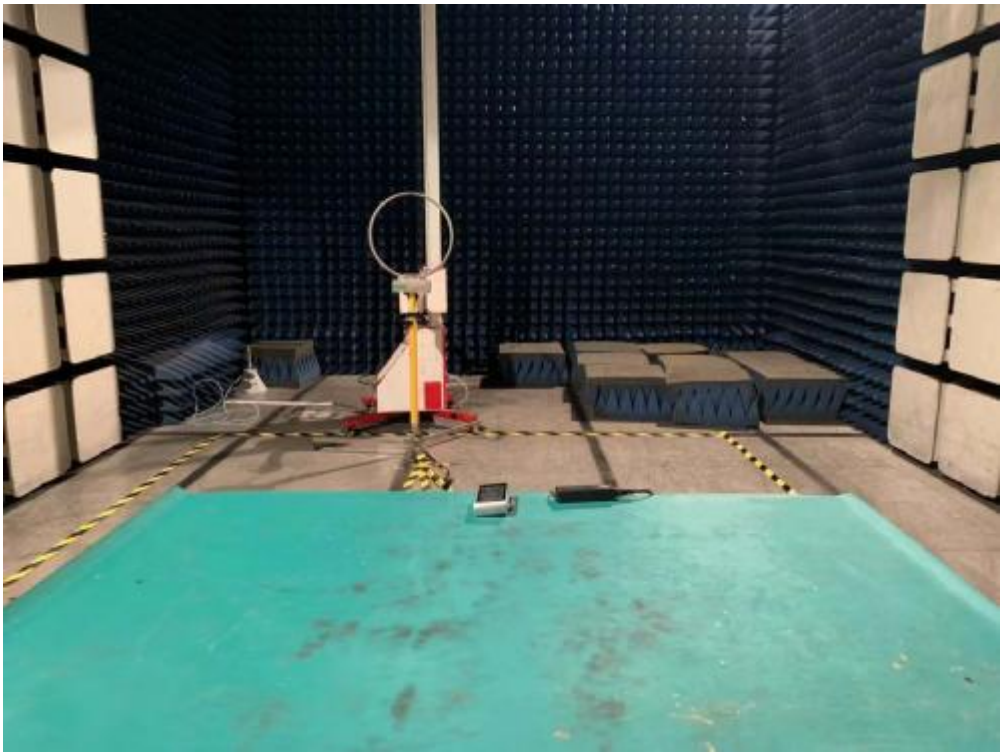
Mode: TX

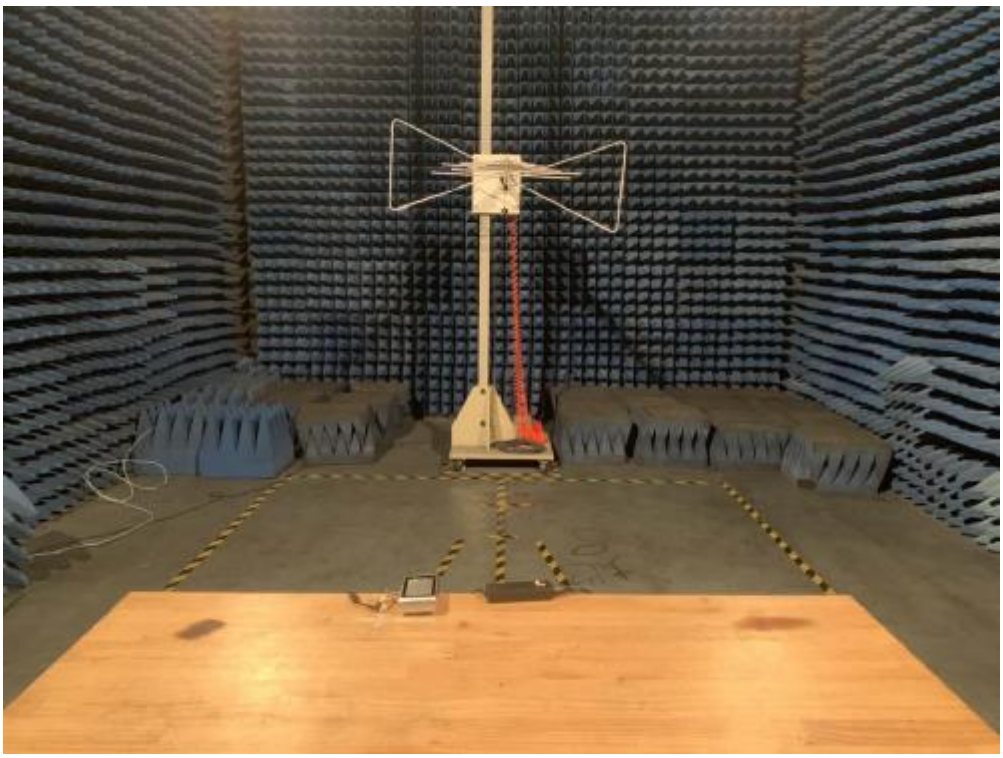
Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		30.9700	43.46	-18.88	24.58	40.00	-15.42	QP			
2		32.9100	40.56	-18.98	21.58	40.00	-18.42	QP			
3		48.4300	29.51	-15.67	13.84	40.00	-26.16	QP			
4		112.4500	32.40	-18.76	13.64	43.50	-29.86	QP			
5		213.3300	34.80	-17.29	17.51	43.50	-25.99	QP			
6	*	937.9200	35.22	-0.82	34.40	46.00	-11.60	QP			

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

5.6 Radiated Measurement Photos:





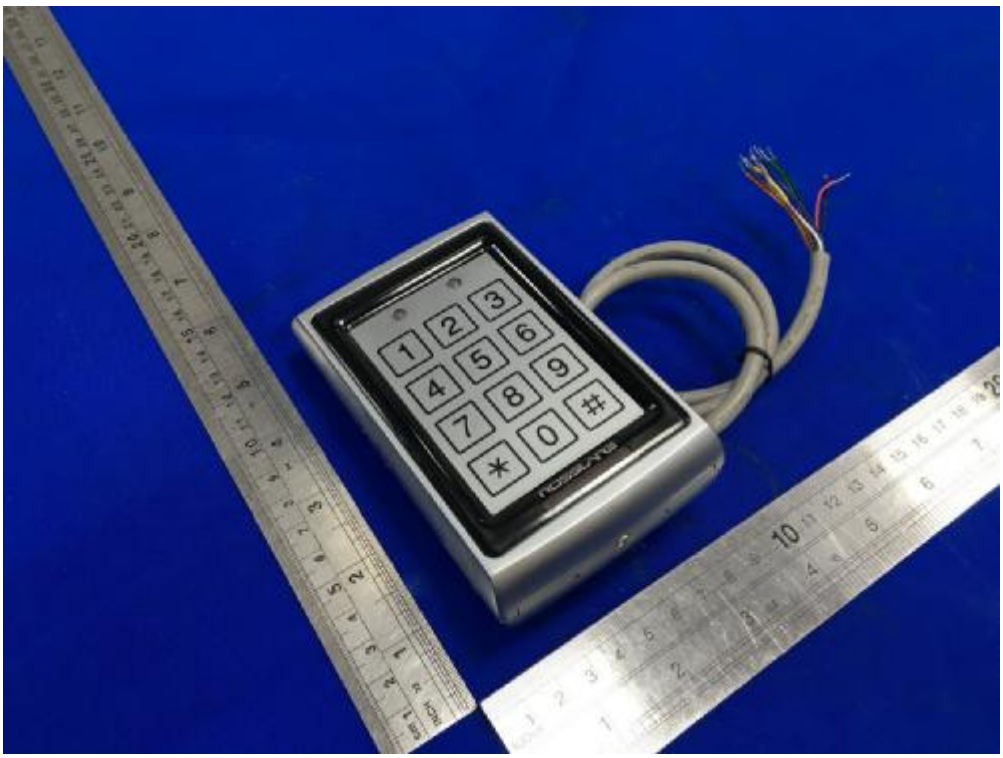
6. ANTENNA REQUIREMENT

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)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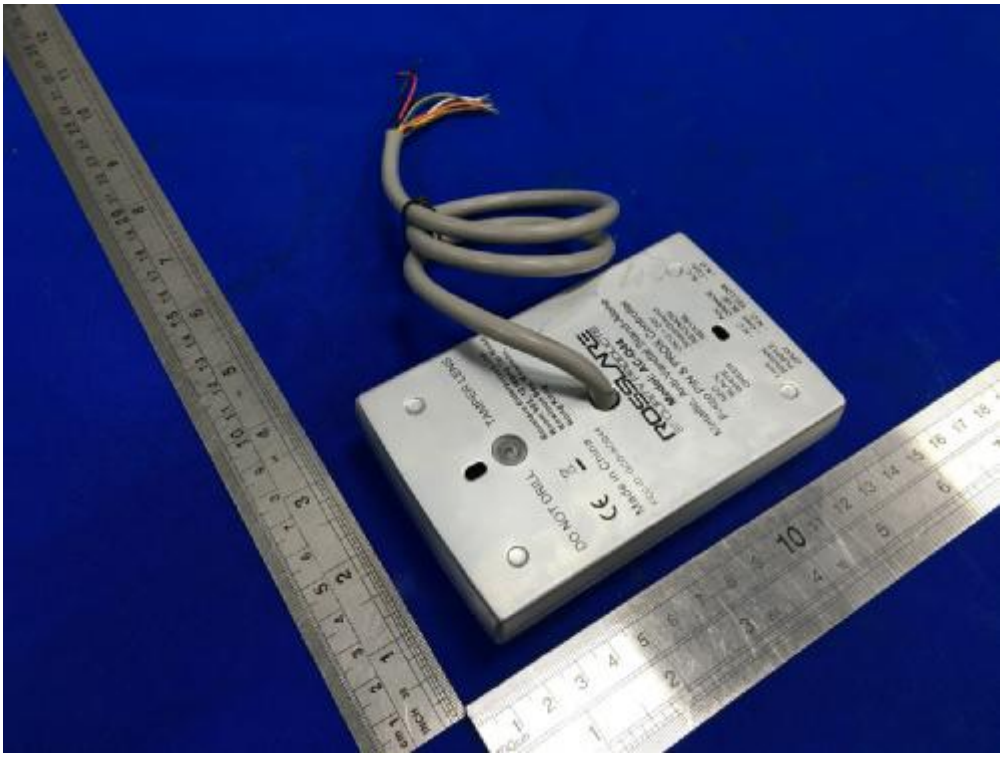
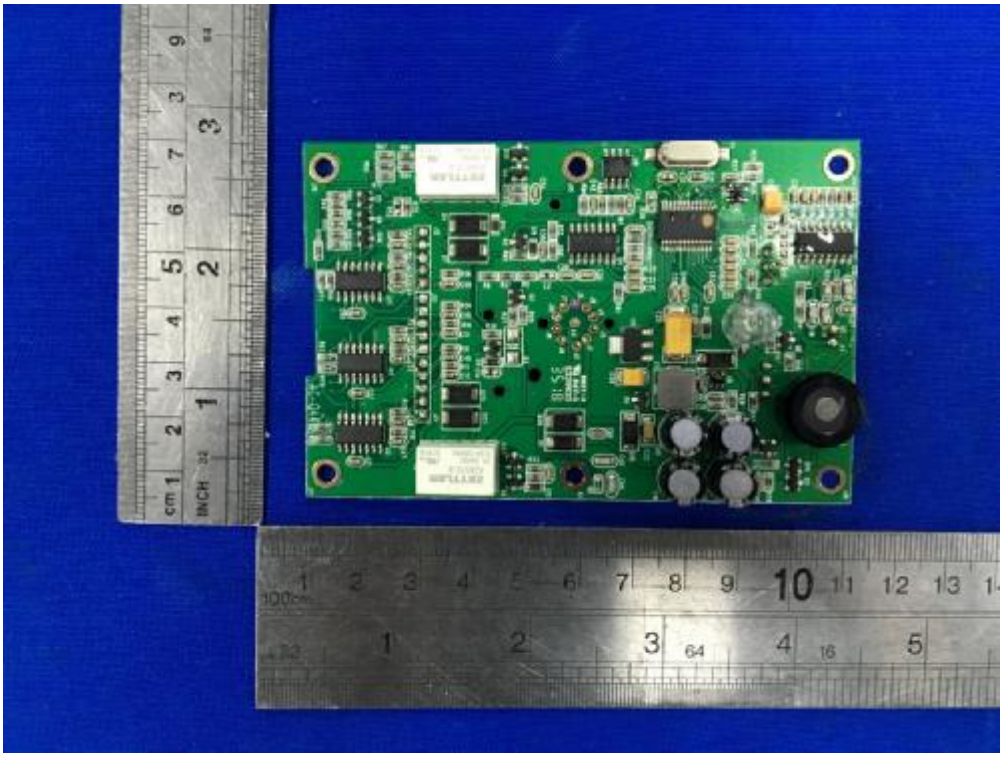
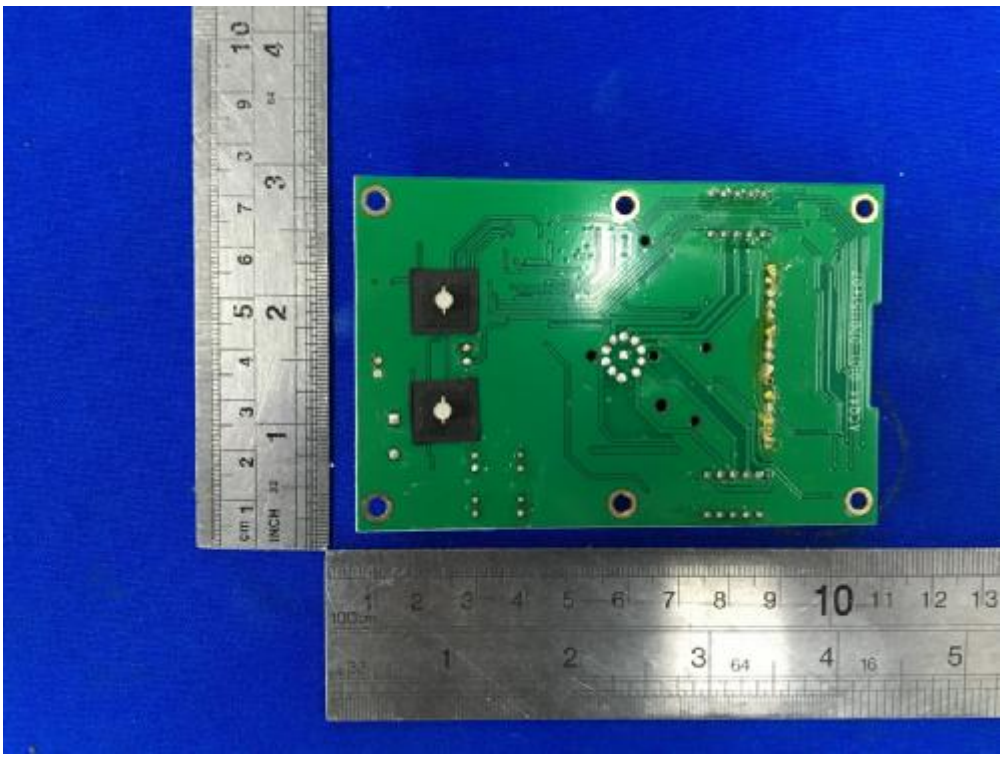
7 8 9
* 0 #







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