FCC TEST REPORT

Client Name	:	Superior Electronics Corporation
Address	:	No.10, Lane 31, Chongde St., Sinyi District, Taipei City 110, Taiwan
Product Name	:	Outdoor Mullion Stand-alone/Wiegand Proximity Reader
Date	:	Dec. 17, 2019

Shenzhen Anbotek Compliance Laboratory Limited

Contents

TEST REPORT

Applicant	:	Superior Electronics Corporation
Manufacturer	:	Superior Electronics Corporation
Product Name	:	Outdoor Mullion Stand-alone/Wiegand Proximity Reader
Model No.	:	SK-2612-SPQ, PR-3123-PQ, PR-3125-PQ, PR-2121-PQ, PR-2123-PQ, PR-2125-PQ, SK-2612-SDQ, SK-1612-SDQ
Trade Mark	:	ENFORCER
Rating(s)	:	Input: DC 12V, 0.5A

Test Standard(s)	**:**	**FCC Part15 Subpart C 2018, Paragraph 15.209**
Test Method(s)	**:**	**ANSI C63.10: 2013**

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 Receipt Nov. 06, 2019

Date of Test Nov. 06~Dec. 06, 2019

Prepared By

(Engineer / Dolly Mo)

Reviewer

(Supervisor / Bibo Zhang)

Approved & Authorized Signer

(Manager / Tom Chen)

1. General Information

1.1. Client Information

Applicant	:	Superior Electronics Corporation
Address	:	No.10, Lane 31, Chongde St., Sinyi District, Taipei City 110, Taiwan
Manufacturer	:	Superior Electronics Corporation
Address	:	No.10, Lane 31, Chongde St., Sinyi District, Taipei City 110, Taiwan
Factory	:	Superior Electronics Corporation
Address	:	No.10, Lane 31, Chongde St., Sinyi District, Taipei City 110, Taiwan

1.2. Description of Device (EUT)

Product Name	:	Outdoor Mullion Stand-alone/Wiegand Proximity Reader	
Model No.	:	SK-2612-SPQ, PR-3123-PQ, PR-3125-PQ, PR-2121-PQ, PR-2123-PQ, PR-2125-PQ, SK-2612-SDQ, SK-1612-SDQ (Note: All samples are the same except the model name, so we prepare "SK-2612-SPQ" for test only.)	
Trade Mark	:	ENFORCER	
Test Power Supply	:	DC 12V	
Test Sample No.	:	1-2-1(Normal Sample), 1-2-2(Engineering Sample)	
Product Description	:	Operation Frequency:	125KHz
		Modulation Type:	BPSK
		Antenna Type:	Loop 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.

N/A		

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	TX Mode

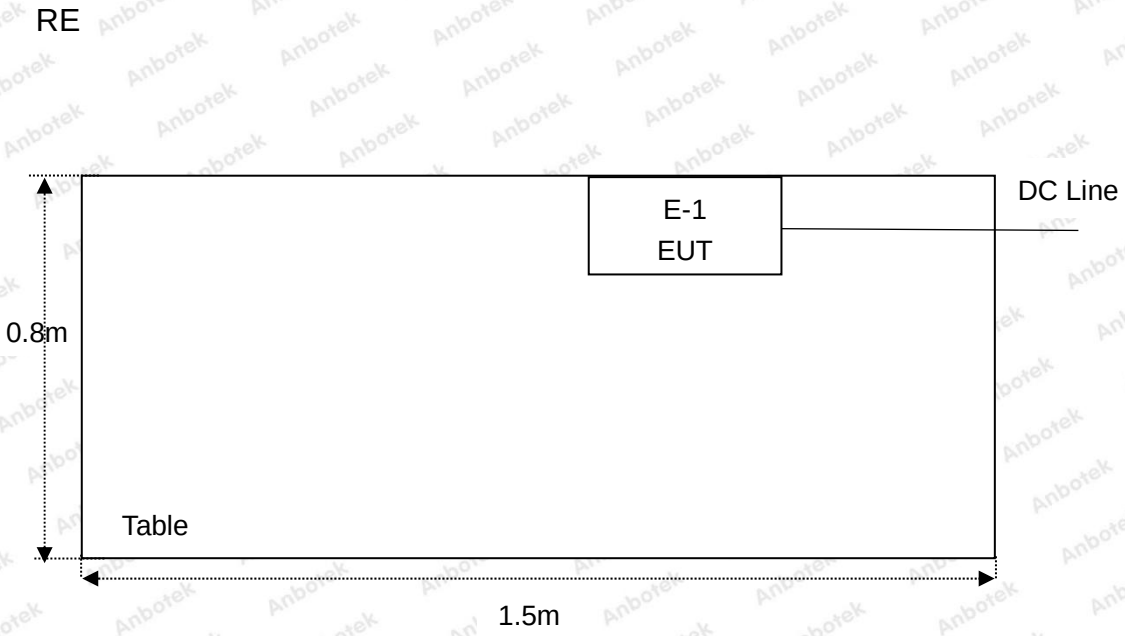
For Conducted Emission	
Final Test Mode	Description
Mode 1	TX Mode

For Radiated Emission	
Final Test Mode	Description
Mode 1	TX Mode

Note: (1)Test channel is 0.1250MHz.

(2)All the situation(full load, half load and empty load) has been tested,only the worst situation (full load) was recorded in the report.

1.5. Description Of Test Setup



1.6. 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. 04, 2019	1 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESPI3	101604	Nov. 04, 2019	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Nov. 04, 2019	1 Year
4.	MAX Spectrum Analysis	Agilent	N9020A	MY51170037	Nov. 04, 2019	1 Year
5.	Preamplifier	SKET Electronic	BK1G18G30D	KD17503	Nov. 04, 2019	1 Year
6.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Nov. 01, 2019	1 Year
7.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Nov. 01, 2019	1 Year
8.	Loop Antenna	Schwarzbeck	FMZB1519B	00053	Nov. 01, 2019	1 Year
9.	Horn Antenna	A-INFO	LB-180400-KF	J211060628	Nov. 01, 2019	1 Year
10.	Pre-amplifier	SONOMA	310N	186860	Nov. 04, 2019	1 Year
11.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A
12.	RF Test Control System	YIHENG	YH3000	2017430	Nov. 04, 2019	1 Year
13.	Power Sensor	DAER	RPR3006W	15I00041SN045	Nov. 04, 2019	1 Year
14.	Power Sensor	DAER	RPR3006W	15I00041SN046	Nov. 04, 2019	1 Year
15.	MXA Spectrum Analysis	Agilent	N9020A	MY51170037	Nov. 04, 2019	1 Year
16.	MXG RF Vector Signal Generator	Agilent	N5182A	MY48180656	Nov. 04, 2019	1 Year
17.	Signal Generator	Agilent	E4421B	MY41000743	Nov. 04, 2019	1 Year
18.	DC Power Supply	LW	TPR-6420D	374470	Nov. 04, 2019	1 Year
19.	Constant Temperature Humidity Chamber	ZHONGJIAN	ZJ-KHWS80B	N/A	Nov. 04, 2019	1 Year

1.7. 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, September 27, 2019.

ISED-Registration No.: 8058A

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, March 07, 2019.

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

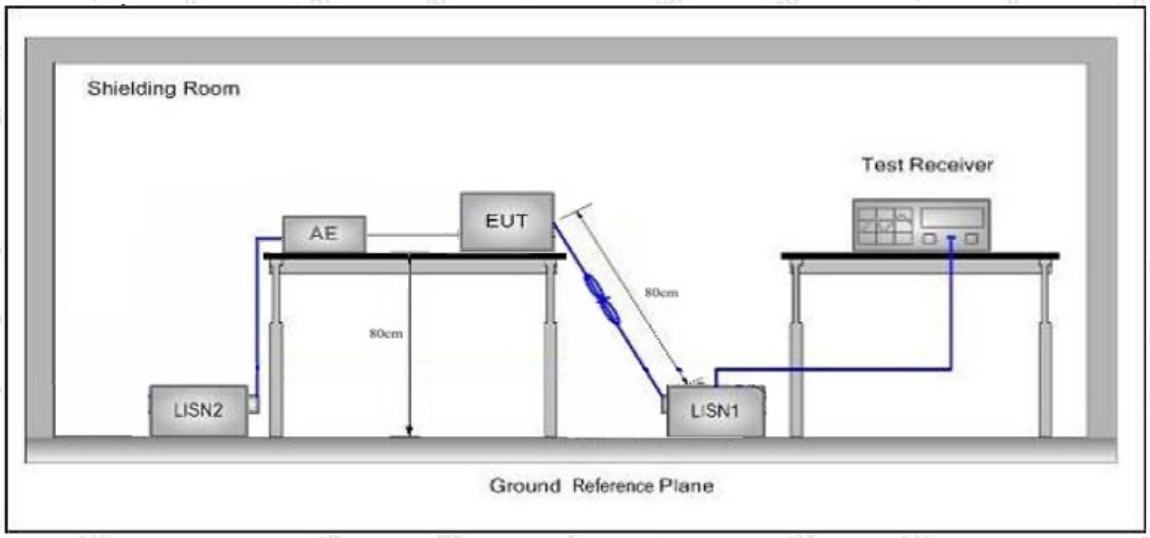
Standard Section	Test Item	Result
FCC Part 15, Paragraph 15.207	Conducted Emission Test	N/A
FCC Part 15, Paragraph 15.209(a)(f)	Spurious Emission	PASS
Part 15.203	Antenna Requirement	PASS
Remark: "N/A" is an abbreviation for Not Applicable.		

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

The EUT is powered by DC 12V battery inside, so there is no need to conduct this test.

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

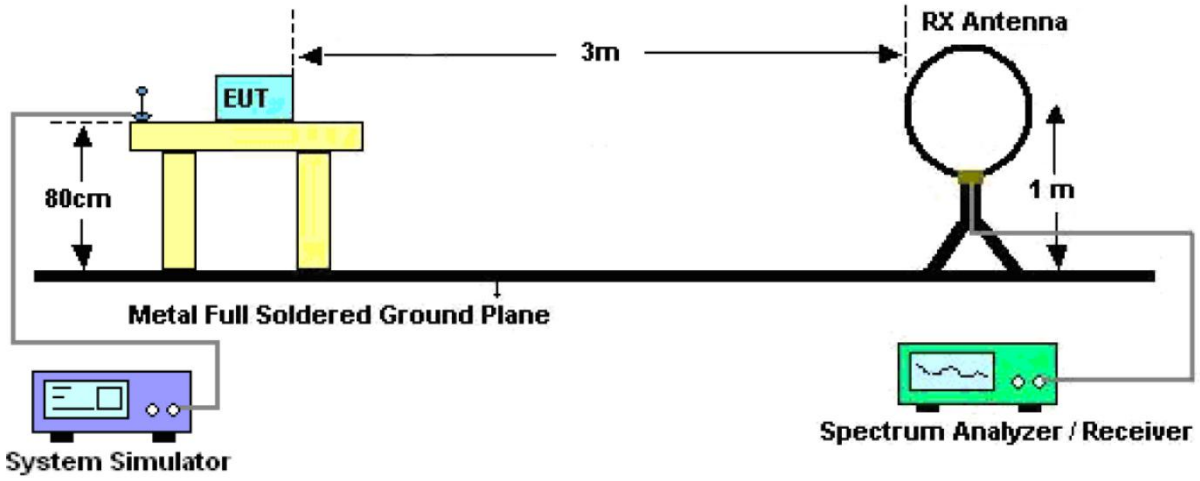


Figure 1. Below 30MHz

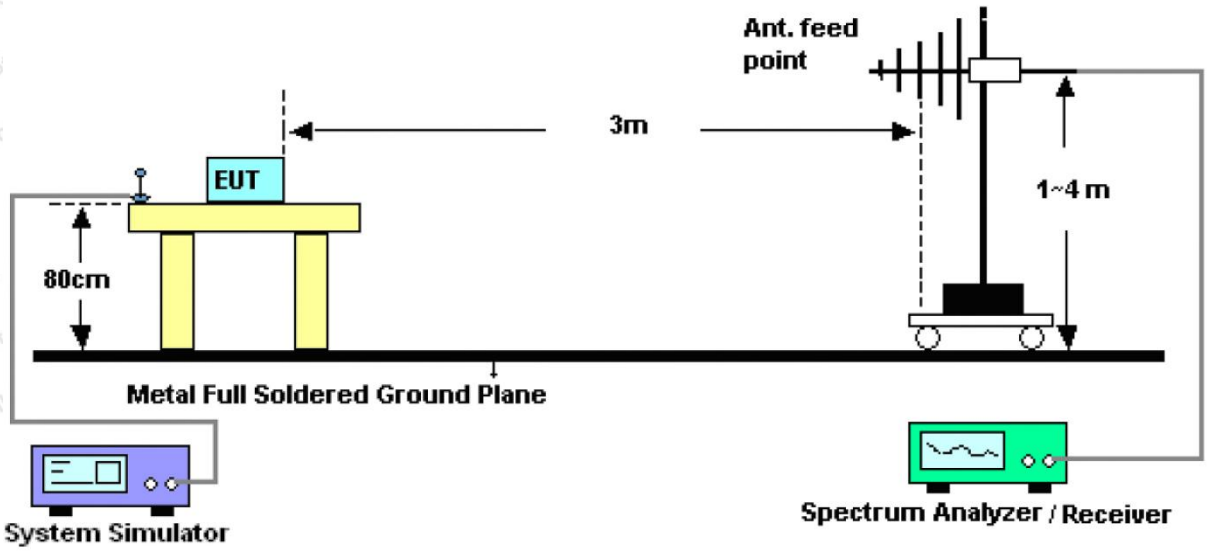


Figure 2. 30MHz to 1GHz

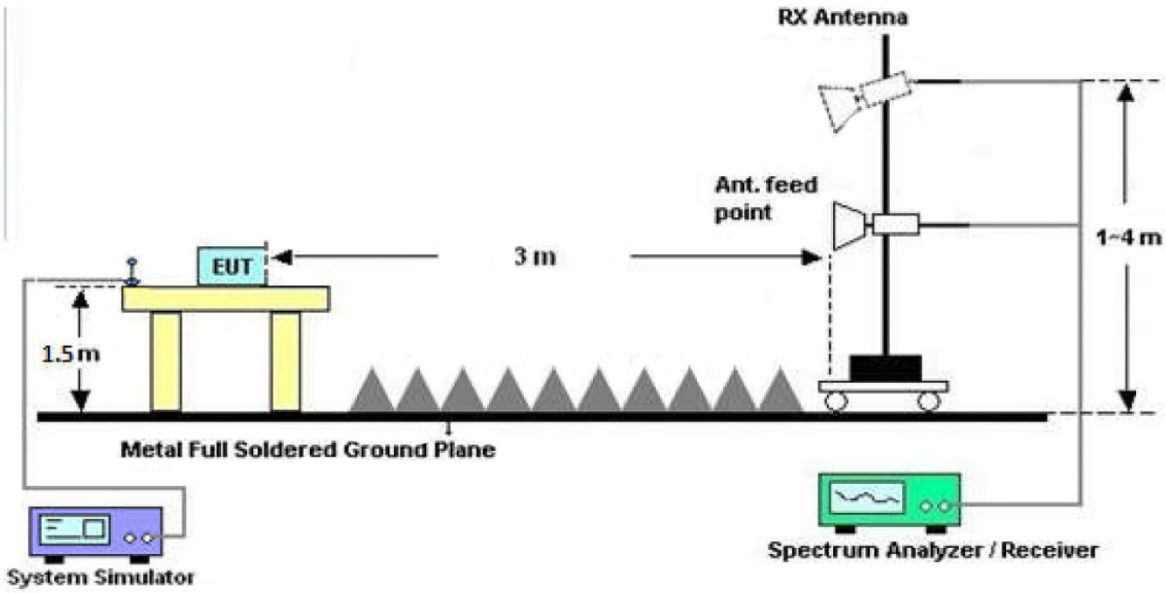


Figure 3. Above 1 GHz

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 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.

4.4. Test Data

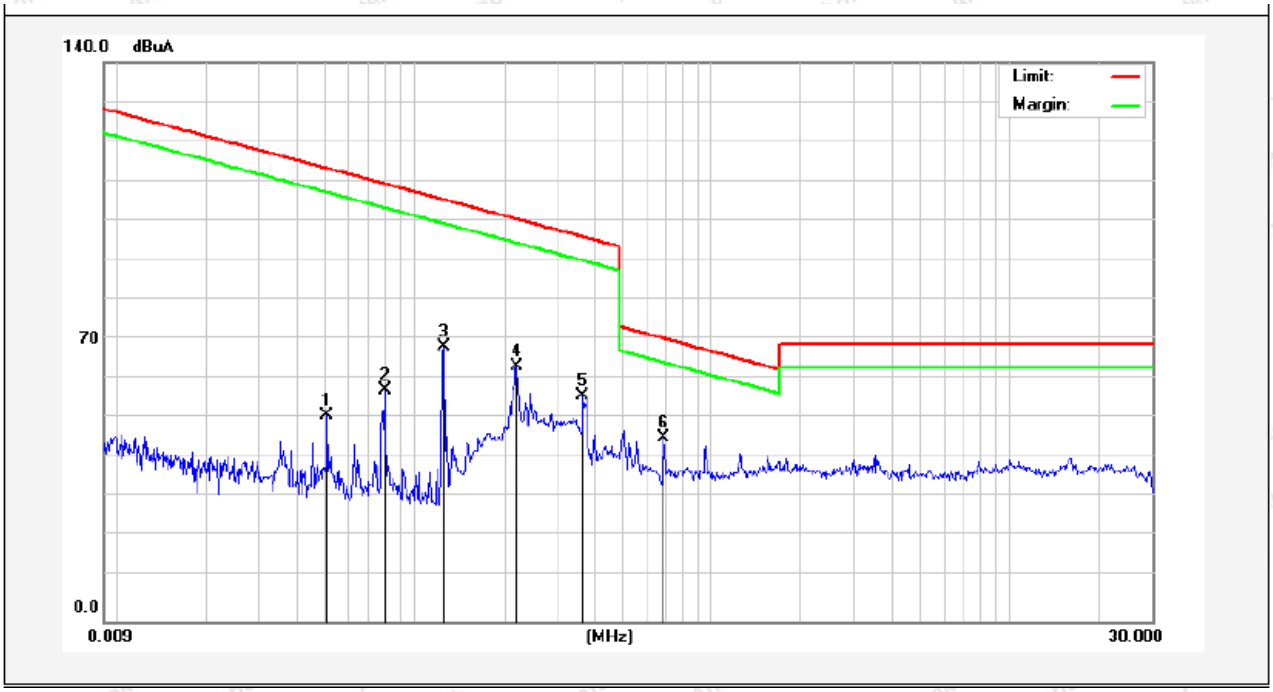
PASS

Note: The data is in TX mode, and this is the worst mode.

Test Results

(Between 9KHz – 30MHz)

Job No.:	**SZAWW191106006-01**		
Standard:	**FCC PART15 C _3m**	**Power Source:**	**DC 12V**
Test item:	**Radiation Test**	**Temp.(C)/Hum.(%RH):**	**24.3℃/54%RH**
Test Mode:	**Mode 1**	**Distance:**	**3m**

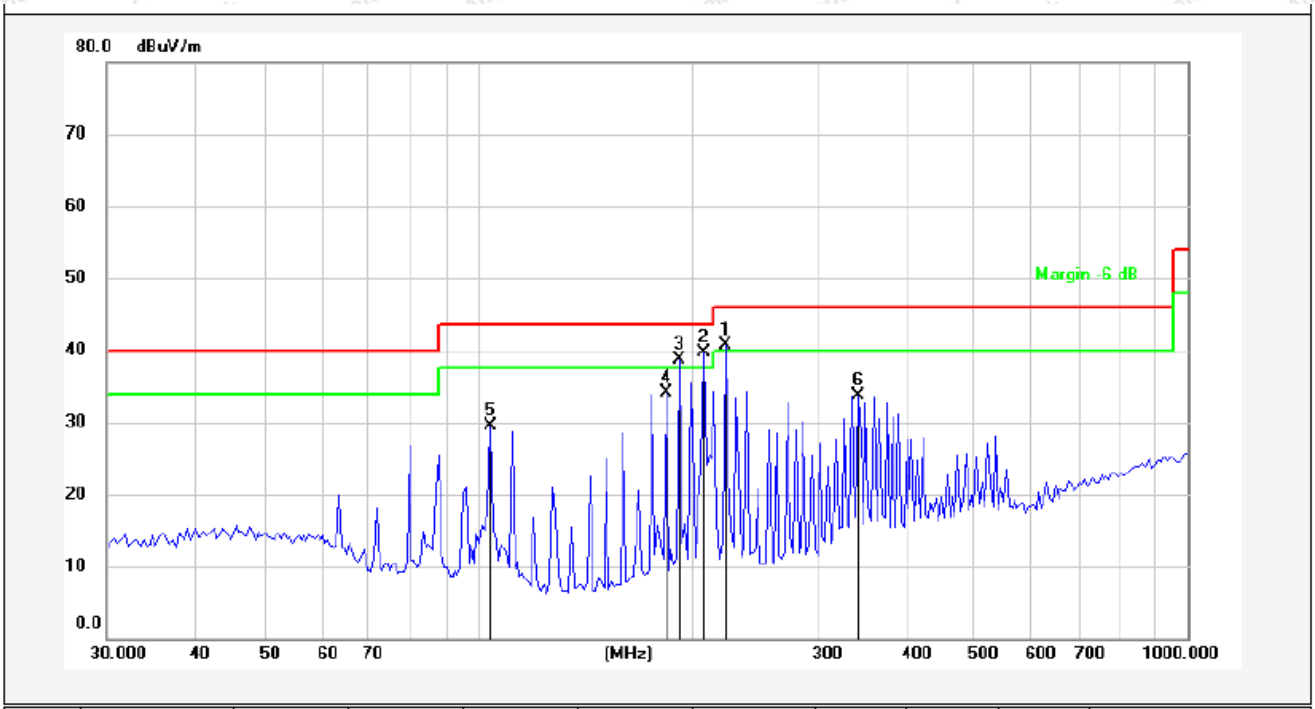


Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	degree (dge)
0.5090	40.21	19.53	2.59	0	62.33	133.36	-71.03	Peak	256
0.5090	29.60	19.53	2.59	0	51.72	113.36	-61.64	AV	256
0.0792	44.54	19.30	2.54	0	66.38	129.54	-63.16	Peak	147
0.0792	36.11	19.30	2.54	0	57.95	109.54	-51.59	AV	147
0.1250	57.71	19.30	2.54	0	79.55	125.54	-45.99	Peak	68
0.1250	46.77	19.30	2.54	0	68.61	105.54	-36.93	AV	68
0.2199	51.93	19.53	2.59	0	74.05	120.72	-46.67	Peak	349
0.2199	41.84	19.53	2.59	0	63.96	100.72	-36.76	AV	349
0.3664	43.75	19.53	2.59	0	65.87	116.31	-50.44	Peak	42
0.3664	34.29	19.53	2.59	0	56.41	96.31	-39.90	AV	42
0.6895	23.07	20.34	2.59	0	46.00	70.83	-24.83	QP	85

Remark: According to FCC PART 15.209 (d), the emission limits for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz, Radiated emission limits in these three bands are based on measurements employing an average detector.

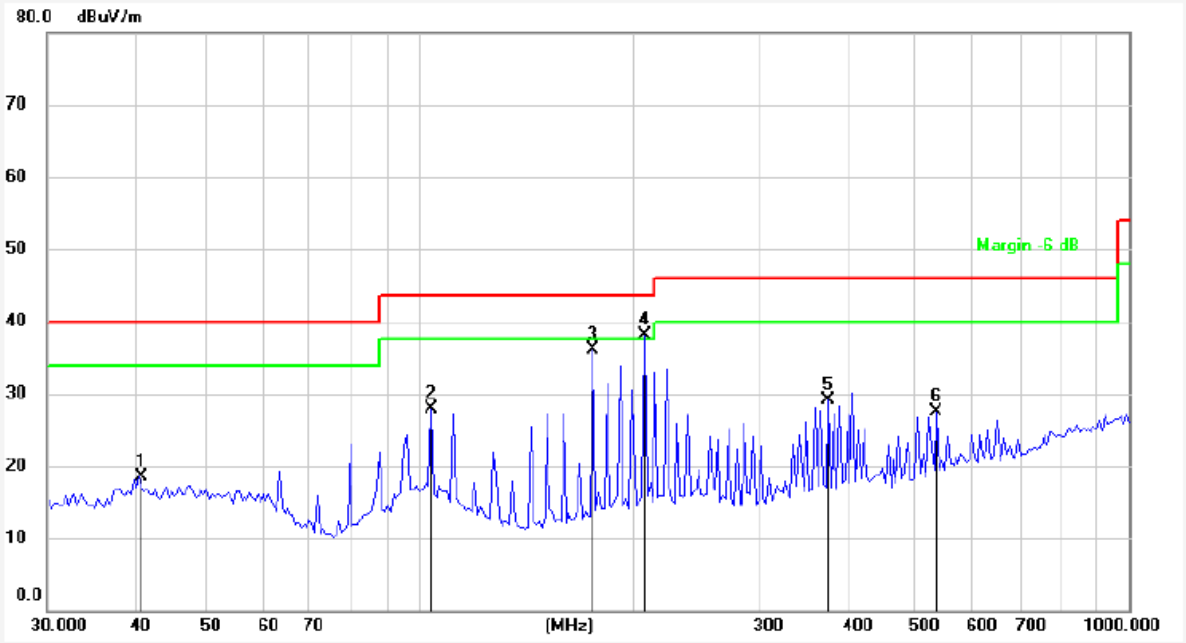
(Between 30MHz –1000 MHz)

Job No.:	**SZAWW191106006-01**	**Polarization:**	**Horizontal**
Standard:	**FCC PART15 C _3m**	**Power Source:**	**DC 12V**
Test item:	**Radiation Test**	**Temp.(C)/Hum.(%RH):**	**22.6℃/57%RH**
Test Mode:	**Mode 1**	**Distance:**	**3m**



No.	Freq. (MHz)	Reading (dBuV)	Factor ()	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	223.3413	62.60	-21.81	40.79	46.00	-5.21	QP	100	360	
2	208.2148	61.61	-21.94	39.67	43.50	-3.83	QP	100	254	
3	192.4183	61.32	-22.62	38.70	43.50	-4.80	QP	100	0	
4	184.1665	56.96	-22.82	34.14	43.50	-9.36	QP	100	154	
5	104.1701	51.59	-22.05	29.54	43.50	-13.96	QP	100	164	
6	343.1800	50.67	-16.90	33.77	46.00	-12.23	QP	100	133	

Job No.:	**SZAWW191106006-01**	**Polarization:**	**Vertical**
Standard:	**FCC PART15 C _3m**	**Power Source:**	**DC 12V**
Test item:	**Radiation Test**	**Temp.(C)/Hum.(%RH):**	**22.6℃/57%RH**
Test Mode:	**Mode 1**	**Distance:**	**3m**



No.	Freq. (MHz)	Reading (dBuV)	Factor ()	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	40.4172	34.05	-15.57	18.48	40.00	-21.52	QP	100	0	
2	104.1701	43.89	-16.05	27.84	43.50	-15.66	QP	100	360	
3	176.2686	55.19	-19.07	36.12	43.50	-7.38	QP	100	0	
4	208.2148	55.57	-17.53	38.04	43.50	-5.46	QP	100	360	
5	377.9211	44.37	-15.25	29.12	46.00	-16.88	QP	100	0	
6	536.6473	41.07	-13.48	27.59	46.00	-18.41	QP	100	360	

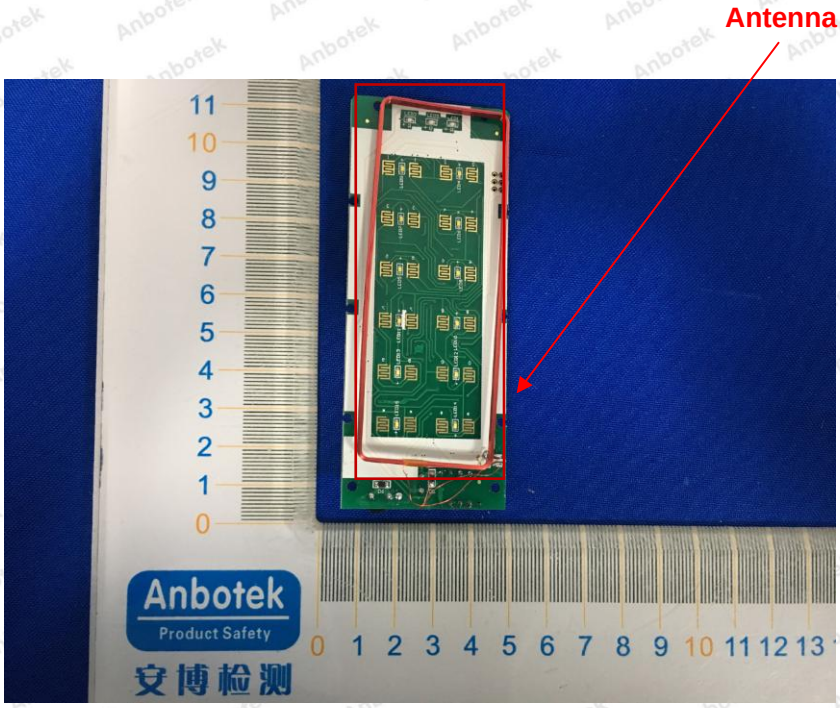
5. Antenna Requirement

5.1. Test Standard and Requirement

Test Standard	FCC Part15 Section 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

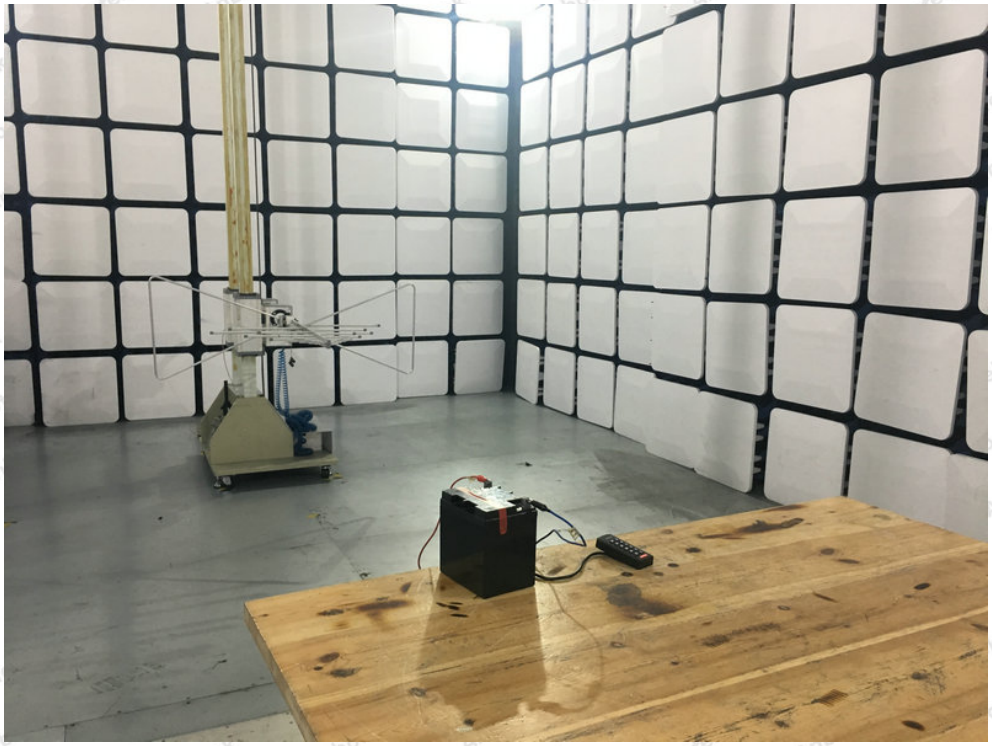
5.2. Antenna Connected Construction

The antenna is a Loop 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 Radiation Emission Test



APPENDIX II -- EXTERNAL PHOTOGRAPH


Access Control
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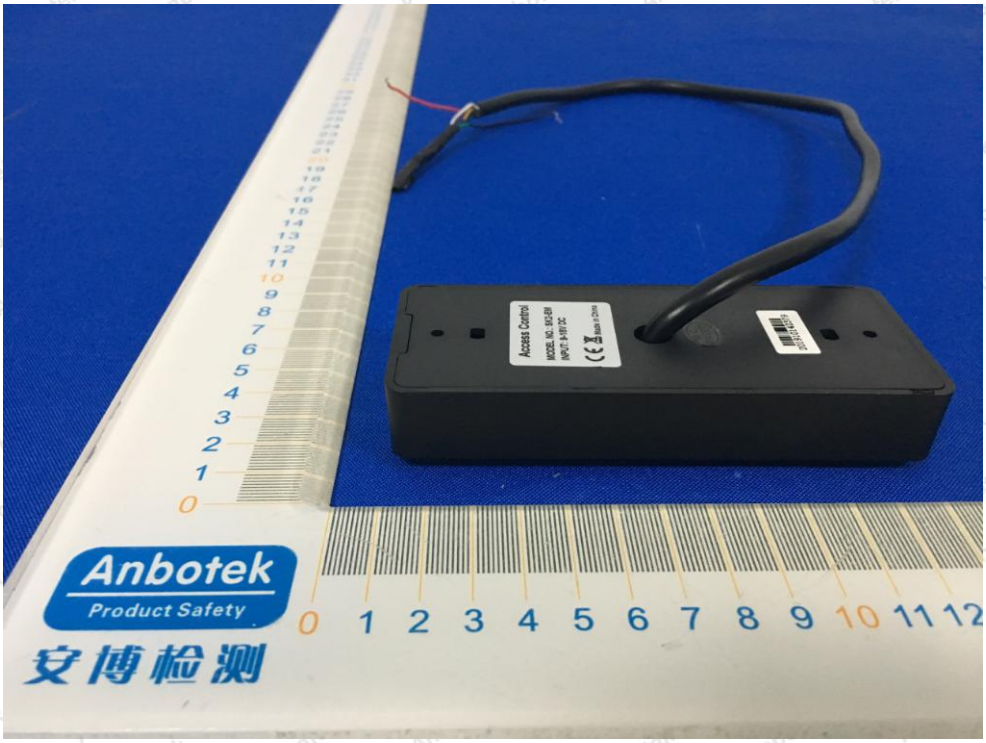
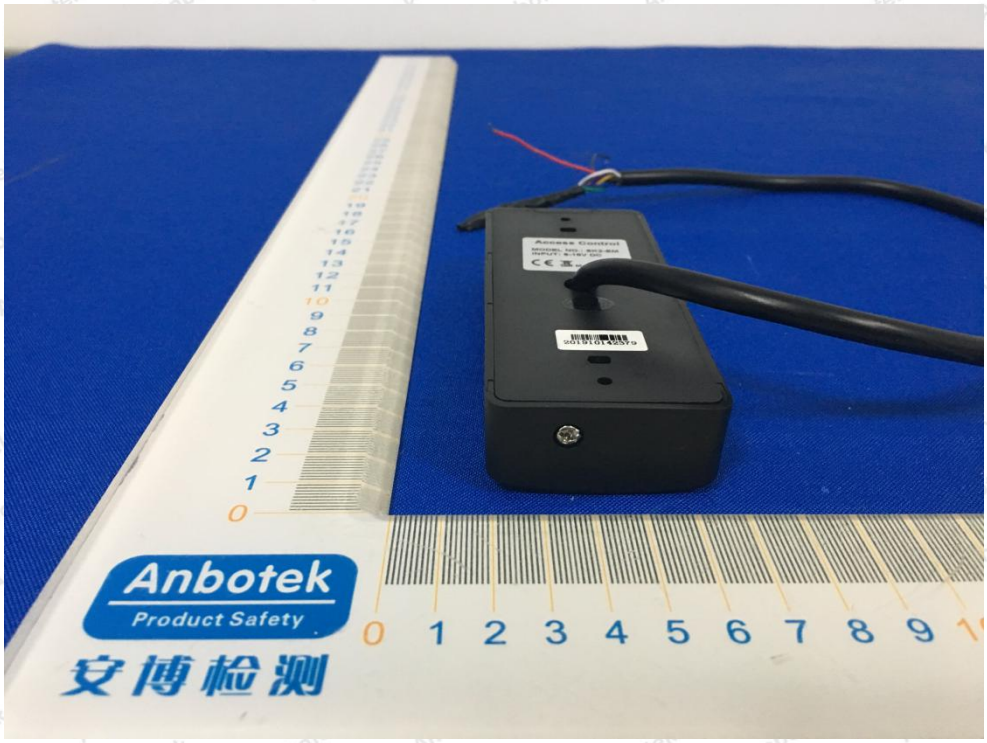
Product Safety
安博检测


Access Control
Anbotek
Product Safety
安博检测


Anbotek
Product Safety
安博检测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Product Safety
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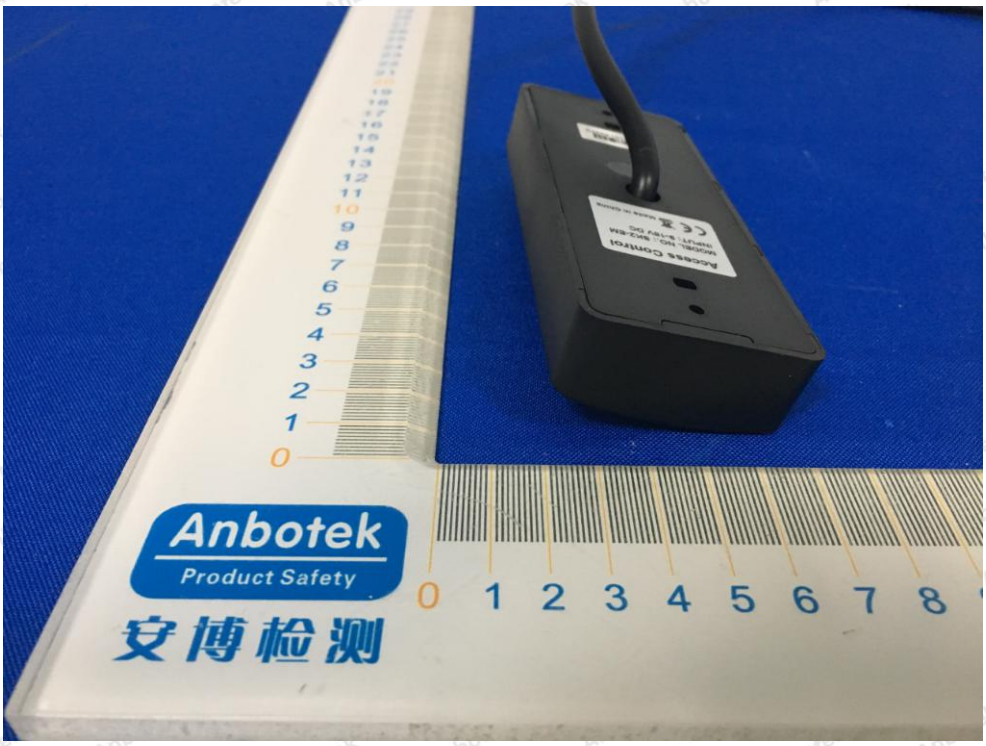
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Product Safety
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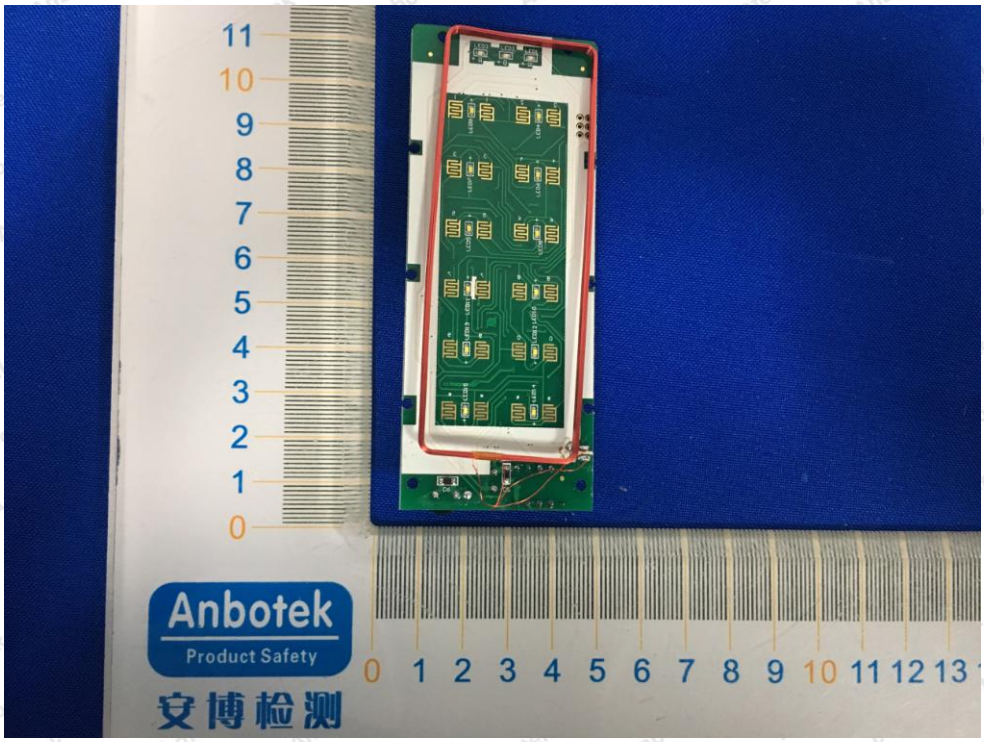
APPENDIX III -- INTERNAL PHOTOGRAPH

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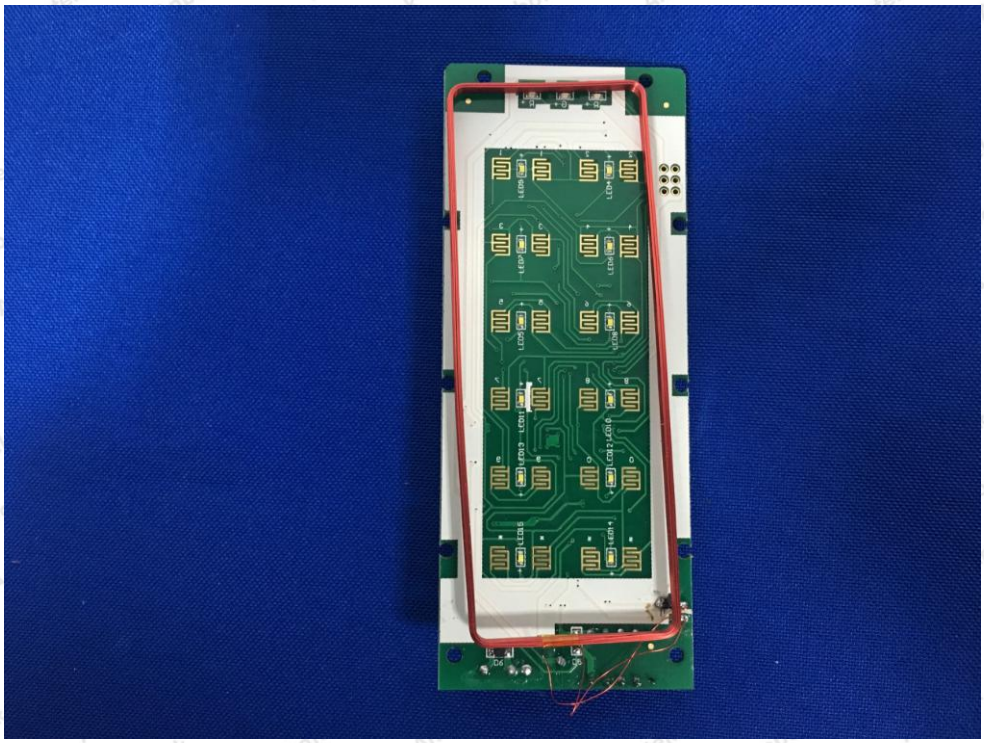

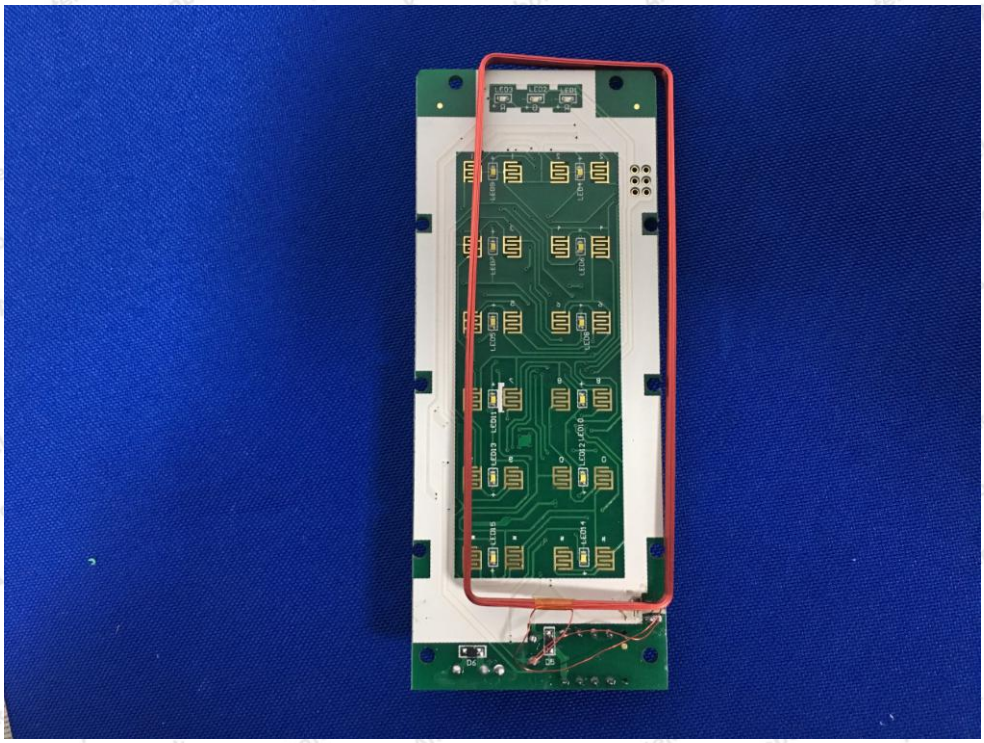

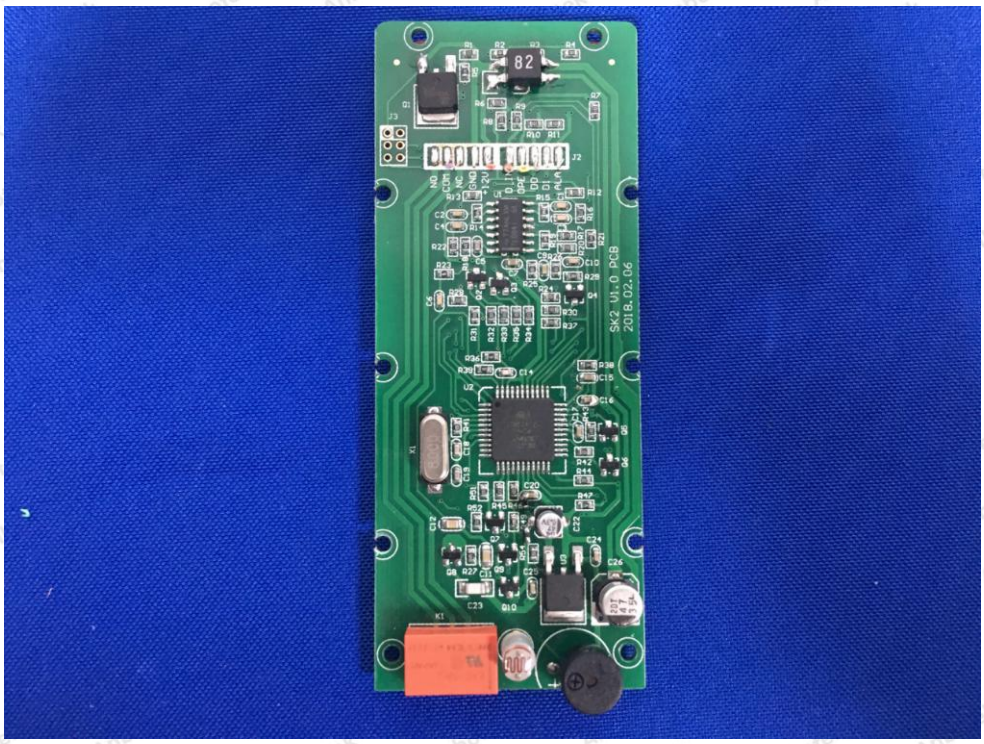

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