FCC TEST REPORT

Product	:	Remote Transmitter
Trade mark	:	Skylink
Model/Type reference	:	MM-318
Serial Number	:	N/A
Report Number	:	EED32I000934
FCC ID	:	KUTMM318
Date of Issue	:	May 12, 2016
Test Standards	:	47 CFR Part 15 Subpart C (2015)
Test result	:	PASS

Prepared for:

Capital Prospect Limited
Rm 03, 13/F, Block B, Veristrong Ind. Bdg 34-36, Au Pui Wan Street, Fo Tan, N.T. Hong Kong

Prepared by:

Centre Testing International Group Co., Ltd.
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Compiled by: Reviewed by:

Approved by: Date: May 12, 2016

Sheek Luo

Lab supervisor

Check No.: 2384383415

2 Version

Version No.	Date	Description
00	May 12, 2016	Original

3 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15 Subpart C Section 15.203	ANSI C63.10-2013	PASS
AC Power Line Conducted Emission	47 CFR Part 15 Subpart C Section 15.207	ANSI C63.10-2013	N/A
Field Strength of the Fundamental Signal	47 CFR Part 15 Subpart C Section 15.231 (b)	ANSI C63.10-2013	PASS
Spurious Emissions	47 CFR Part 15 Subpart C Section 15.231 (b)/15.209	ANSI C63.10-2013	PASS
20dB Bandwidth	47 CFR Part 15 Subpart C Section 15.231 (c)	ANSI C63.10-2013	PASS
Deactivated Time	47 CFR Part 15 Subpart C Section 15.231 (a)	ANSI C63.10-2013	PASS

Remark:
The tested samples and the sample information are provided by the client.
N/A: Not applicable

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5 General Information

5.1 Client Information

Applicant:	Capital Prospect Limited
Address of Applicant:	Rm 03, 13/F, Block B, Veristrong Ind. Bdg 34-36, Au Pui Wan Street, Fo Tan, N.T. Hong Kong
Manufacturer:	Capital Prospect Limited
Address of Manufacturer:	Rm 03, 13/F, Block B, Veristrong Ind. Bdg 34-36, Au Pui Wan Street, Fo Tan, N.T. Hong Kong
Factory:	Dongguan Skylink Electronics Co., Ltd.
Address of Factory:	82 DALING RD GAO YING VILLAGE DALANG TOWN DONGGUAN GUANGDONG

5.2 General Description of EUT

Product Name:	Remote Transmitter
Mode No.(EUT):	MM-318
Trade Mark:	Skylink
EUT Primary Function:	The remote transmitter transmit a 318MHz ASK modulated signal to control the corresponding receiver
Power Supply:	3.0V DC (3.0V “CR2032” button battery)

5.3 Product Specification subjective to this standard

Frequency Range:	318MHz
Modulation Type:	ASK
Sample Type:	Portable production
Antenna Type:	Integral
Test voltage:	DC 3.0V
Test Sample:	One normal sample and One continuous transmission sample
Sample Received Date:	Apr. 20, 2016
Sample tested Date:	Apr. 20, 2016 to May 12, 2016

5.4 Test Environment and Mode

Operating Environment:	
Temperature:	24.0°C
Humidity:	52% RH
Atmospheric Pressure:	1010mbar
Test mode:	
Continuous Transmitting mode:	Continuous transmission with the continuous transmission samples
Normal transmission mode:	Transmission by the normal sample

5.5 Description of Support Units

The EUT has been tested independently.

5.6 Test Location

All tests were performed at:

Centre Testing International (Shenzhen) Corporation.
Hongwei Industrial Zone, Bao'an 70 District, Shenzhen, Guangdong, China 518101
Telephone: +86 (0) 755 3368 3668 Fax:+86 (0) 755 3368 3385
No tests were sub-contracted.

5.7 Test Facility

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

CNAS-Lab Code: L1910

Centre Testing International Group Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories..

A2LA-Lab Cert. No. 3061.01

Centre Testing International Group Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC-Registration No.: 886427

Centre Testing International (Shenzhen) Corporation. 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 886427.

IC-Registration No.: 7408A-2

The 3m Alternate Test Site of Centre Testing International (Shenzhen) Corporation. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 7408A-2 .

IC-Registration No.: 7408B-1

The 10m Alternate Test Site of Centre Testing International (Shenzhen) Corporation., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 7408B-1.

NEMKO-Aut. No.: ELA503

Centre Testing International Group Co., Ltd. has been assessed the quality assurance system, the testing facilities, qualifications and testing practices of the relevant parts of the organization. The quality assurance system of the Laboratory has been validated against ISO/IEC 17025 or equivalent. The laboratory also fulfils the conditions described in Nemko Document NLA-10.

VCCI

The Radiation 3 &10 meters site of Centre Testing International Group Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-4096.

Main Ports Conducted Interference Measurement of Centre Testing International Group Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: C-4563.

Telecommunication Ports Conducted Disturbance Measurement of Centre Testing International Group Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: T-2146.

The Radiation 3 meters site of Centre Testing International Group Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-758

5.8 Deviation from Standards

None.

5.9 Abnormalities from Standard Conditions

None.

5.10 Other Information Requested by the Customer

None.

5.11 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.9×10^{-8}
2	RF power, conducted	0.31dB (30MHz-1GHz)
		0.57dB (1GHz-18GHz)
3	Radiated Spurious emission test	4.5dB (30MHz-1GHz)
		4.8dB (1GHz-12.75GHz)
4	Conduction emission	3.6dB (9kHz to 150kHz)
		3.2dB (150kHz to 30MHz)
5	Temperature test	0.64°C
6	Humidity test	2.8%
7	DC power voltages	0.025%

6 Equipment List

3M Semi/full-anechoic Chamber					
Equipment	**Manufacturer**	**Mode No.**	**Serial Number**	**Cal. date (mm-dd-yyyy)**	**Cal. Due date (mm-dd-yyyy)**
3M Chamber & Accessory Equipment	TDK	SAC-3	---	06-02-2013	06-01-2016
TRILOG Broadband Antenna	SCHWARZBECK	VULB9163	9163-484	05-25-2015	05-23-2016
Microwave Preamplifier	Agilent	8449B	3008A02425	02-04-2016	02-03-2017
Horn Antenna	ETS-LINDGREN	3117	00057410	06-30-2015	06-28-2018
Loop Antenna	ETS	6502	00071730	07-30-2015	07-28-2017
Spectrum Analyzer	R&S	FSP40	100416	06-30-2015	06-28-2016
Receiver	R&S	ESCI	100435	06-30-2015	06-28-2016
Multi device Controller	maturo	NCD/070/10711 112	---	01-12-2016	01-11-2017
LISN	schwarzbeck	NNBM8125	81251547	06-30-2015	06-28-2016
LISN	schwarzbeck	NNBM8125	81251548	06-30-2015	06-28-2016
Signal Generator	Agilent	E4438C	MY45095744	04-01-2016	03-31-2017
Signal Generator	Keysight	E8257D	MY53401106	04-01-2016	03-31-2017
Temperature/ Humidity Indicator	TAYLOR	1451	1905	07- 08-2015	07-06-2016
Communication test set	Agilent	E5515C	GB47050534	04-01-2016	03-31-2017
Cable line	Fulai(7M)	SF106	5219/6A	01-12-2016	01-11-2017
Cable line	Fulai(6M)	SF106	5220/6A	01-12-2016	01-11-2017
Cable line	Fulai(3M)	SF106	5216/6A	01-12-2016	01-11-2017
Cable line	Fulai(3M)	SF106	5217/6A	01-12-2016	01-11-2017
Communication test set	R&S	CMW500	152394	04-01-2016	03-31-2017
High-pass filter(3-18GHz)	Sinoscite	FL3CX03WG18 NM12-0398-002	---	01-12-2016	01-11-2017
High-pass filter(6-18GHz)	MICRO-TRONICS	SPA-F-63029-4	---	01-12-2016	01-11-2017
band rejection filter	Sinoscite	FL5CX01CA09C L12-0395-001	---	01-12-2016	01-11-2017
band rejection filter	Sinoscite	FL5CX01CA08C L12-0393-001	---	01-12-2016	01-11-2017
band rejection filter	Sinoscite	FL5CX02CA04C L12-0396-002	---	01-12-2016	01-11-2017
band rejection filter	Sinoscite	FL5CX02CA03C L12-0394-001	---	01-12-2016	01-11-2017

RF Conducted test					
Equipment	**Manufacturer**	**Mode No.**	**Serial Number**	**Cal. date (mm-dd-yyyy)**	**Cal. Due date (mm-dd-yyyy)**
Spectrum Analyzer	R&S	FSP40	100416	06-30-2015	06-28-2016
Receiver	R&S	ESCI	100435	06-30-2015	06-28-2016
Signal Generator	Agilent	E4438C	MY45095744	04-01-2016	03-31-2017
Signal Generator	Keysight	E8257D	MY53401106	04-01-2016	03-31-2017
High-pass filter (3-18GHz)	Sinoscite	FL3CX03WG18 NM12-0398-002	---	01-12-2016	01-11-2017
High-pass filter (6-18GHz)	MICRO-TRONICS	SPA-F-63029-4	---	01-12-2016	01-11-2017
band rejection filter	Sinoscite	FL5CX01CA09C L12-0395-001	---	01-12-2016	01-11-2017
band rejection filter	Sinoscite	FL5CX01CA08C L12-0393-001	---	01-12-2016	01-11-2017
band rejection filter	Sinoscite	FL5CX02CA04C L12-0396-002	---	01-12-2016	01-11-2017

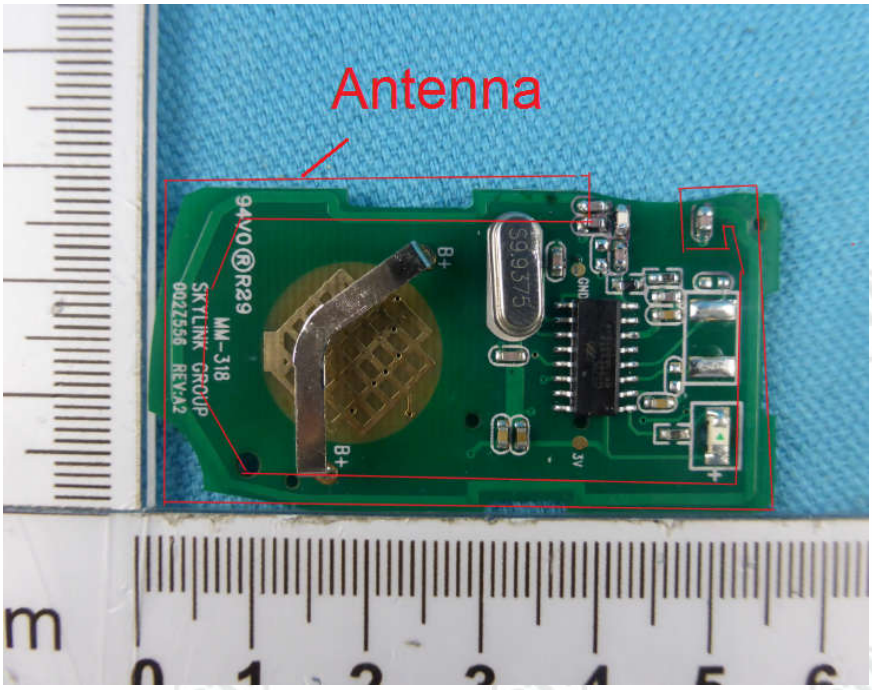
7 Test results and Measurement Data

7.1 Antenna Requirement

Standard requirement:	47 CFR Part 15C Section 15.203

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 be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.



Result: PCB antenna is used. It is permanently attached antenna and not be replaced by user.

7.2 Radiated Transmitter Emissions

7.2.1 Radiated Emissions

Test Requirement: 47 CFR Part 15C Section 15.231(b) and 15.209

Test Method: ANSI C63.10

Test Site: Measurement Distance: 3m (Semi-Anechoic Chamber)

Receiver Setup:

Frequency	Detector	RBW	VBW	Remark
0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak
0.009MHz-0.090MHz	Average	10kHz	30kHz	Average
0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak
0.110MHz-0.490MHz	Average	10kHz	30kHz	Average
0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
	Peak	1MHz	10Hz	Average

Test Setup:

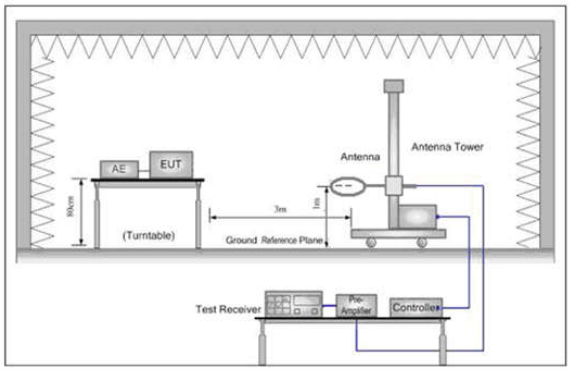


Figure 1. Below 30MHz

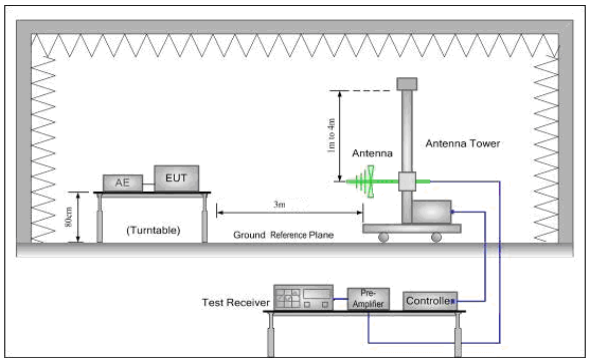


Figure 2. 30MHz to 1GHz

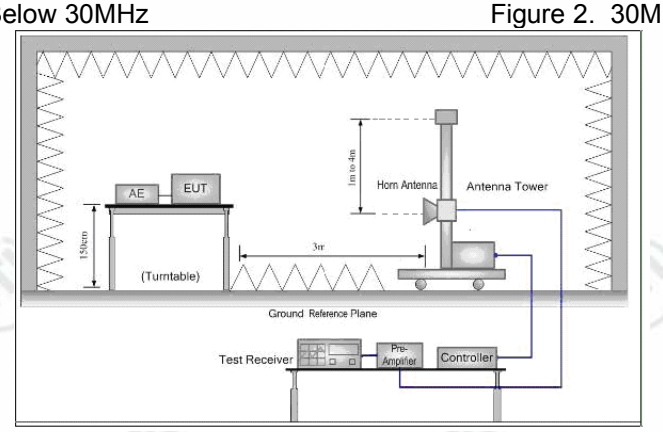


Figure 3. Above 1GHz

Test Procedure:

Below 1GHz test procedure as below:

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Above 1GHz test procedure as below:

g. Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 metre to 1.5 metre(Above 18GHz the distance is 1 meter and table is 1.5 metre).
h. Test the EUT in the lowest channel ,middle channel, the Highest channel
i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is worse case.
j. Repeat above procedures until all frequencies measured was complete.

Limit: (Spurious)

Frequency	Limit (dBμV/m @3m)	Detector
30MHz - 10th harmonics	55.8	Average
	75.8	Peak

Note: 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.

Limit: (Fundamental)

Frequency	Limit (dBμV/m @3m)	Detector
318MHz	75.8	Average
	95.8	Peak

Test Mode: Continuous transmitting mode
(All three button is tested and the worst case emission is for first “ • ” button)
New battery is used during all test

Instruments Used: Refer to section 6 for details

Test Results: **PASS**

Test data

Fundamental Emission

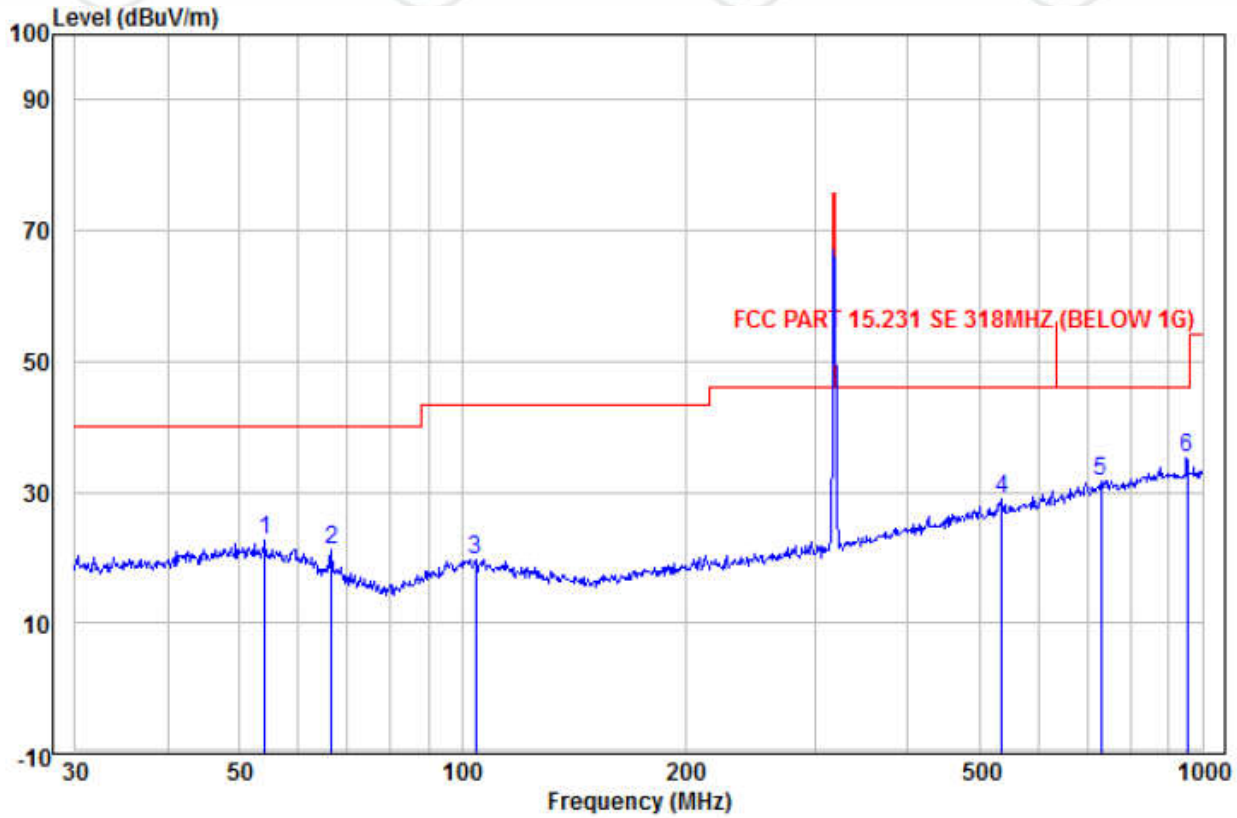
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Read Level (dBμV)	Peak Level (dBμV/m)	Average Limit (dBμV/m)	Over Limit (dB)	Polarization
318.00	13.98	2.50	50.67	67.15	75.80	-8.05	Horizontal
318.00	13.98	2.50	51.68	68.16	75.80	-7.64	Vertical

Remark: As shown in this section, for field strength of the fundamental signal measurements, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above. So, only the peak value is measured.

Spurious Emissions

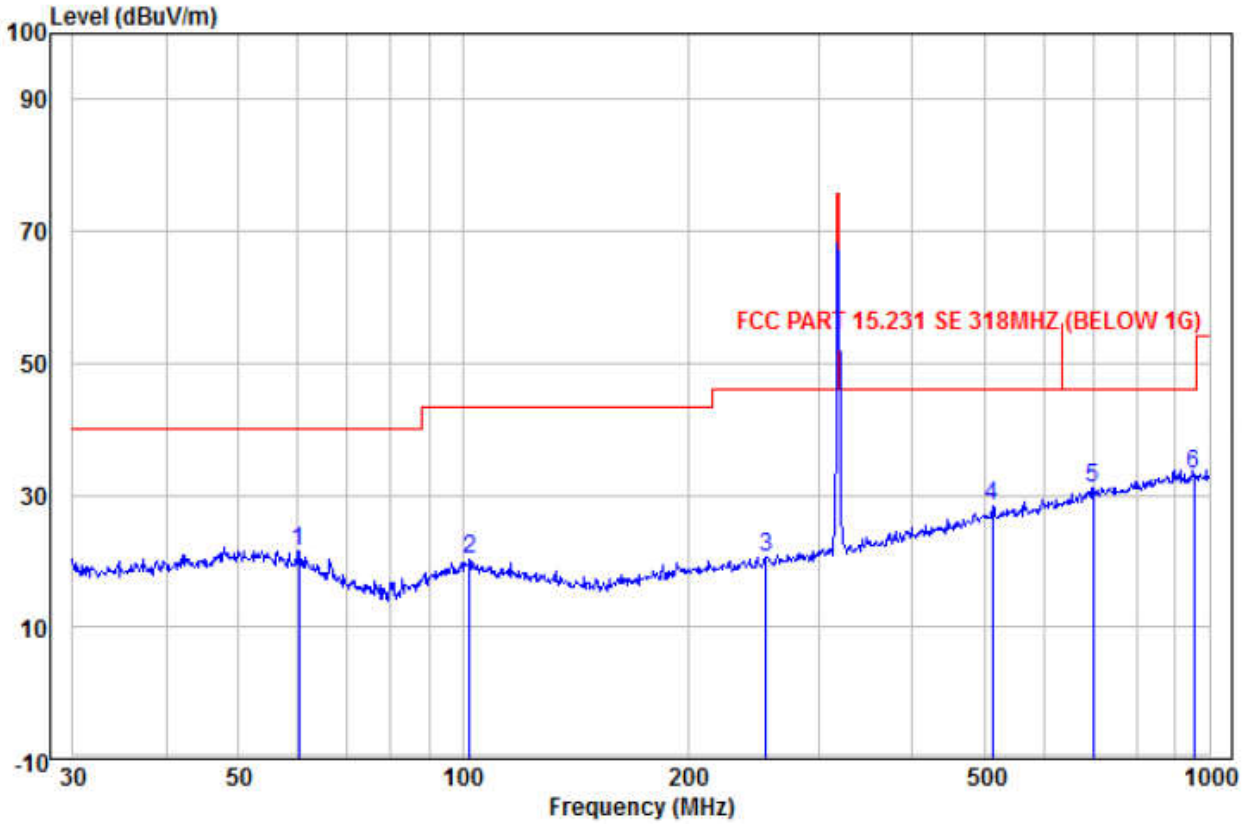
30MHz-1GHz

Peak Detector:



Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Read Level (dBuV)	Peak Level (dBuV/m)	Average Limit (dBuV/m)	Over Limit (dB)	polarization
54.071	14.54	1.41	6.69	22.64	55.80	-33.16	Horizontal
66.499	11.53	1.44	8.31	21.28	55.80	-34.52	Horizontal
104.170	12.85	1.57	5.40	19.82	55.80	-35.98	Horizontal
535.707	18.54	3.19	7.16	28.89	55.80	-26.91	Horizontal
729.358	20.88	3.96	6.94	31.78	55.80	-24.02	Horizontal
954.000	22.40	4.35	8.56	35.31	55.80	-20.49	Horizontal

Peak Detector:



Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Read Level (dBuV)	Peak Level (dBuV/m)	Average Limit (dBuV/m)	Over Limit (dB)	polarization
60.280	13.70	1.43	6.47	21.60	55.80	-34.20	Vertical
102.001	13.03	1.57	5.68	20.28	55.80	-35.52	Vertical
254.728*	12.51	2.35	5.71	20.57	46.00	-25.43	Vertical
511.835	18.45	3.15	6.78	28.38	55.80	-27.42	Vertical
699.305	20.69	3.89	6.52	31.10	55.80	-24.70	Vertical
954.000	22.40	4.35	6.29	33.04	55.80	-22.76	Vertical

Remark: "*" The emission is falling in FCC restricted band of section 15.205, the general limit of 15.209 shall be used instead of the limit of spurious emission under 15.231(b)

Above 1GHz

Peak value:

Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dBμV)	Peak Level (dBμV/m)	Average Limit (dBμV/m)	Over Limit (dB)	Polarization
1272.000	30.39	2.46	34.89	45.69	43.65	55.80	-12.24	Horizontal
1666.376*	31.17	2.70	34.54	47.39	46.72	54.00	-7.28	Horizontal
2552.543	32.84	3.26	34.42	45.83	47.51	55.80	-8.29	Horizontal
3303.900	33.33	4.54	34.53	45.54	48.88	55.80	-6.92	Horizontal
3639.545*	33.06	5.55	34.57	44.94	48.98	54.00	-5.02	Horizontal
1272.000	30.39	2.46	34.89	46.24	44.20	55.80	-11.60	Vertical
1669.365*	31.18	2.70	34.53	48.64	47.99	54.00	-6.01	Vertical
2227.582*	32.21	3.04	34.35	46.45	47.35	54.00	-6.65	Vertical
2862.693*	33.38	3.45	34.48	47.66	50.01	54.00	-3.99	Vertical
3758.839*	32.97	5.89	34.58	44.83	49.11	54.00	-4.89	Vertical

Remark:

1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

   Final Test Level =Receiver Reading - Correct Factor

   Correct Factor = Preamplifier Factor– Antenna Factor–Cable Factor

2) As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the peak values are measured.

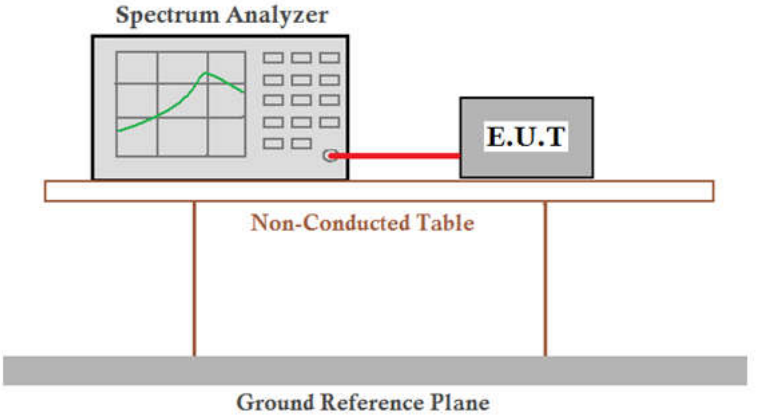
3) "*" The emission is falling in FCC restricted band of section 15.205, the general limit of 15.209 shall be used instead of the limit of spurious emission under 15.231(b)

7.3 20dB Bandwidth

Test Requirement: 47 CFR Part 15C Section 15.231 (c)

Test Method: ANSI C63.10

Test Setup:



Limit: The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

Test Mode: Transmitting mode

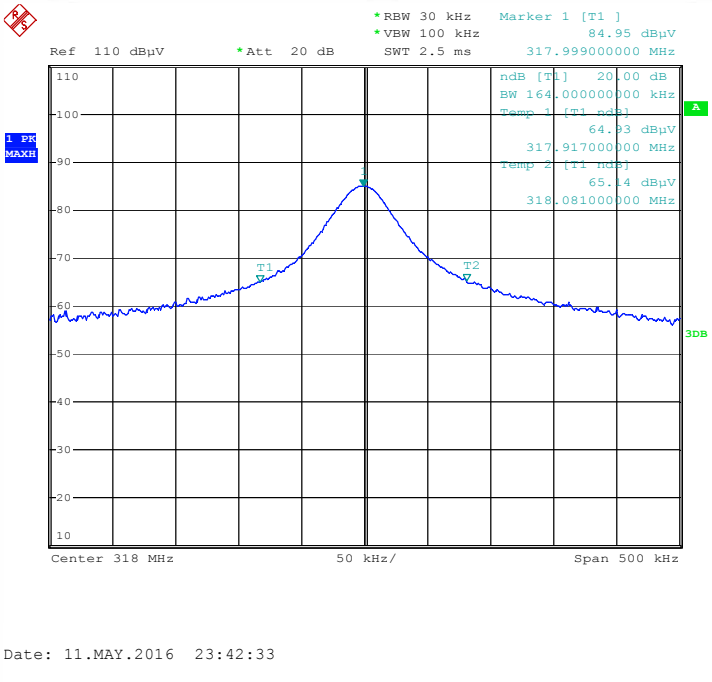
Instruments Used: Refer to section 6 for details

Test Results: Pass

Test data

20dB bandwidth (kHz)	Limit (kHz)	Results
164	795	Pass

Test plot as follows:

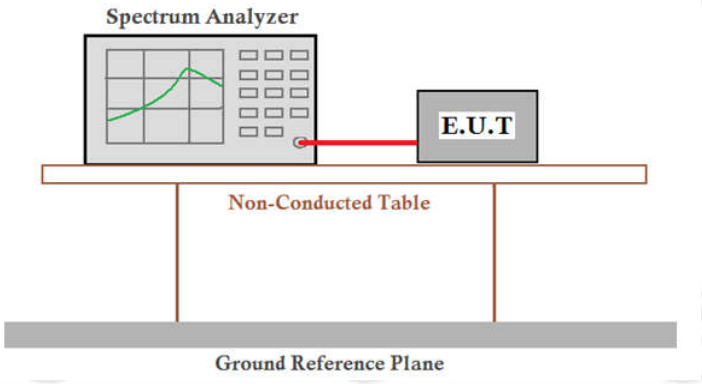


7.4 Deactivated Time

Test Requirement: 47 CFR Part 15C Section 15.231 (a)

Test Method: ANSI C63.10

Test Setup:



Limit: Automatically deactivate the transmitter within 5 seconds of being released

Test Mode: Press and release the button immediately with the normal sample
(All buttons are tested and found the worst case is first " • " button)

Instruments Used: Refer to section 6 for details

Test Results: **PASS**

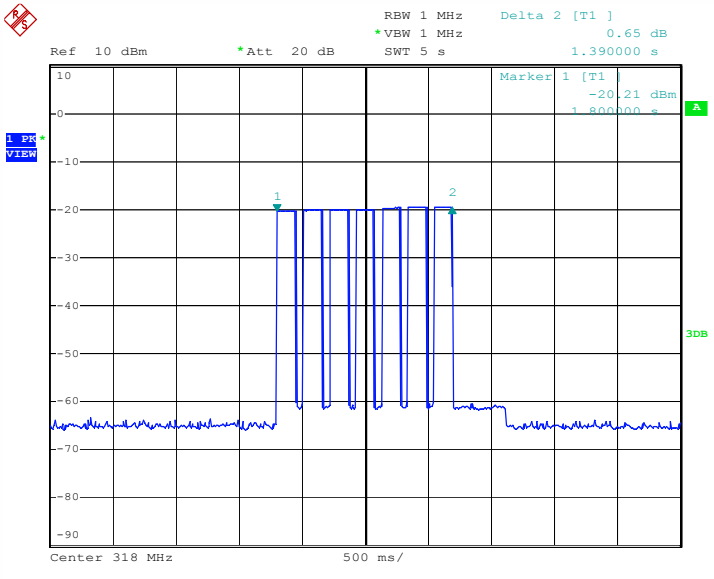
Remark:

1) Only manually switching and no automatic activation.
2) No Periodic transmission
3) No emergencies function.
4) No transmission of setup-information for security system exceed transmission during limit in (a)(1) and (a)(2).

Test data:

Test item	Test value	Limit (s)	Results
Manually press the first " • " button	1.39s	⩽5s	Pass

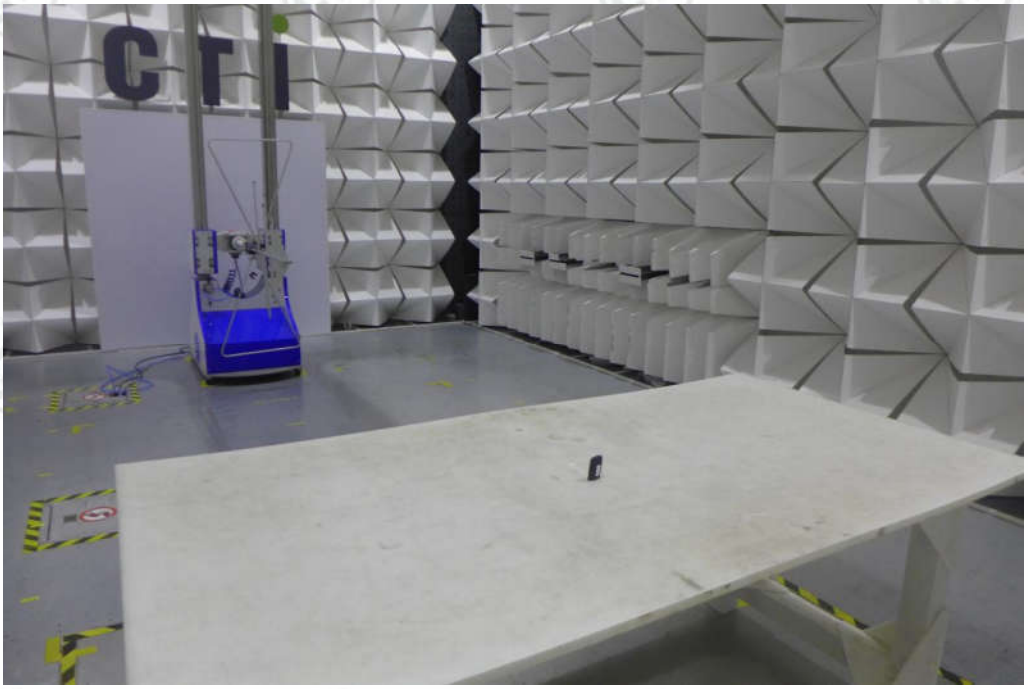
Test plot as follows:



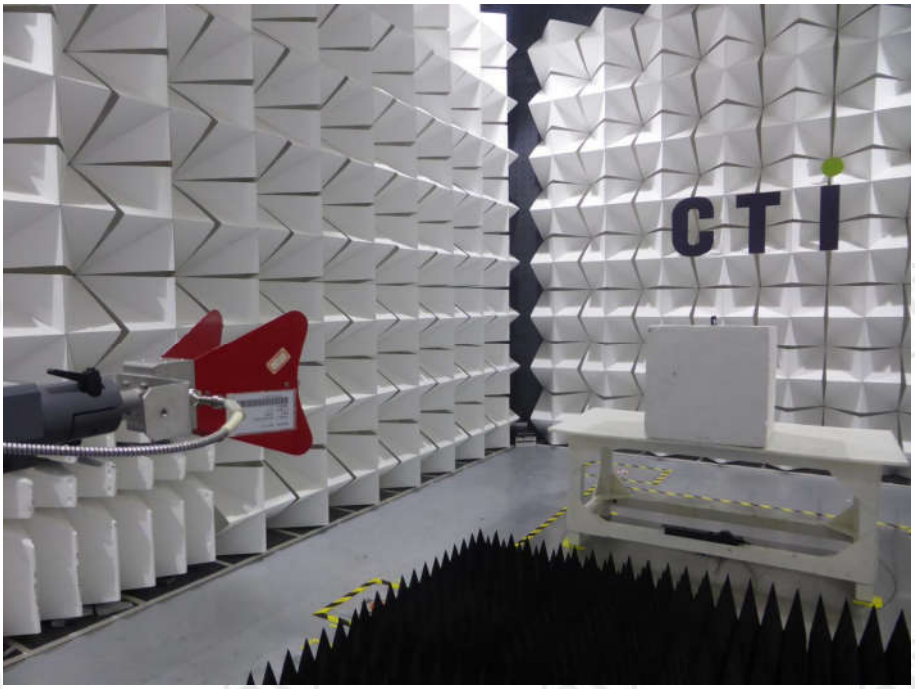
Date: 12.MAY.2016 05:37:23

APPENDIX 1 PHOTOGRAPHS OF TEST SETUP

Test Model No.: MM-318



Radiated emission Test Setup-1(30MHz～1GHz)



Radiated spurious emission Test Setup-2(Above 1GHz)

APPENDIX 2 PHOTOGRAPHS OF EUT

Test mode No.: MM-318

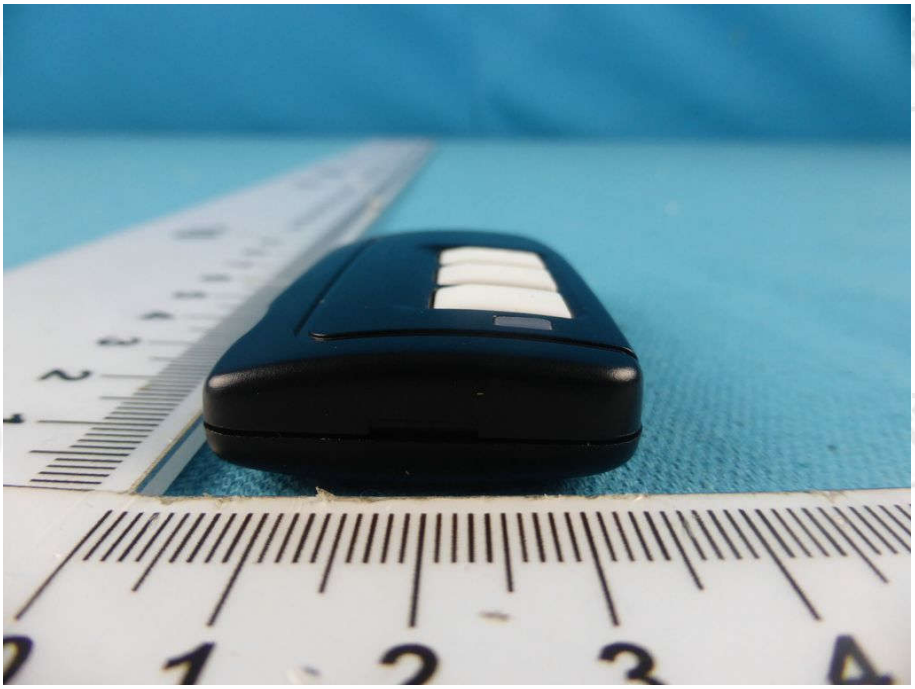
View of Product-1

View of Product-2

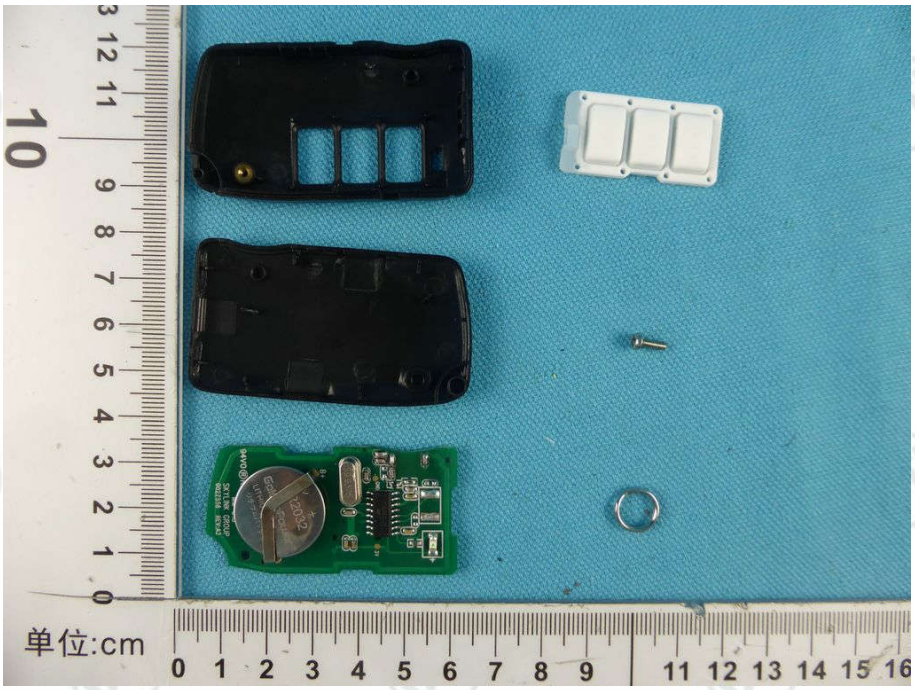
View of Product-3

View of Product-4

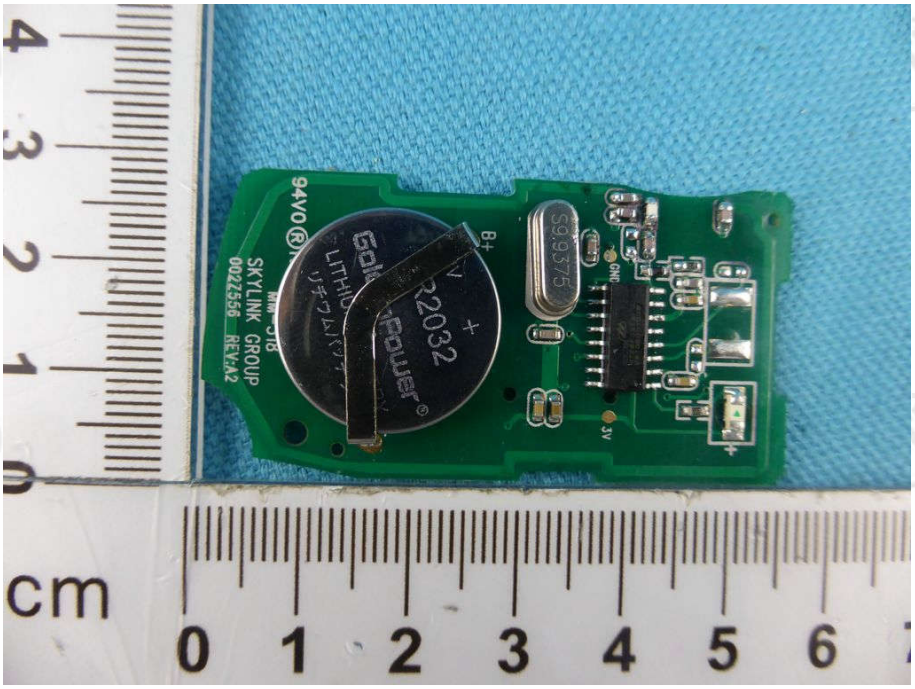
View of Product-5



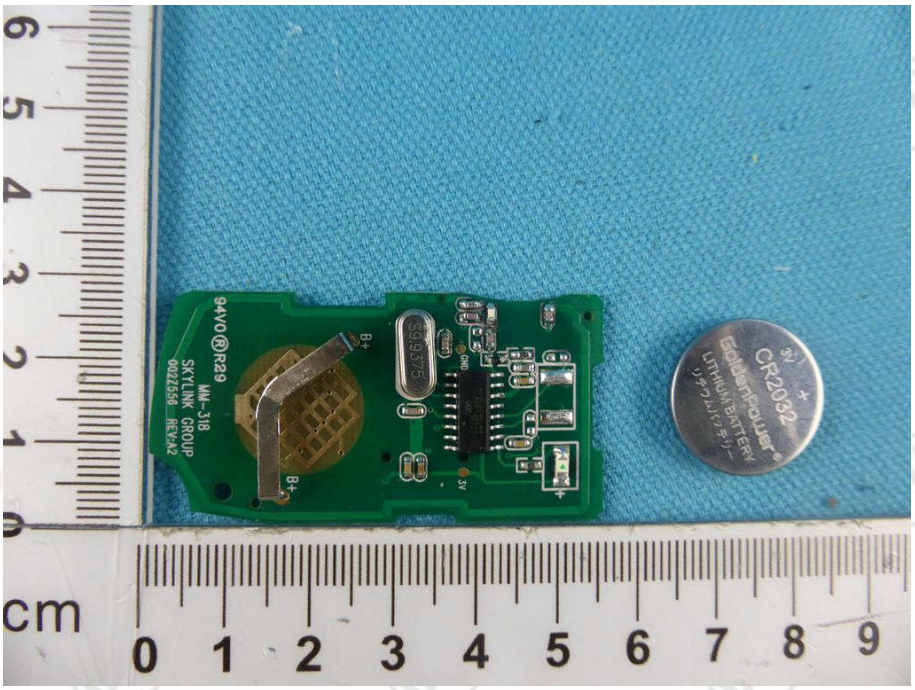
View of Product-6



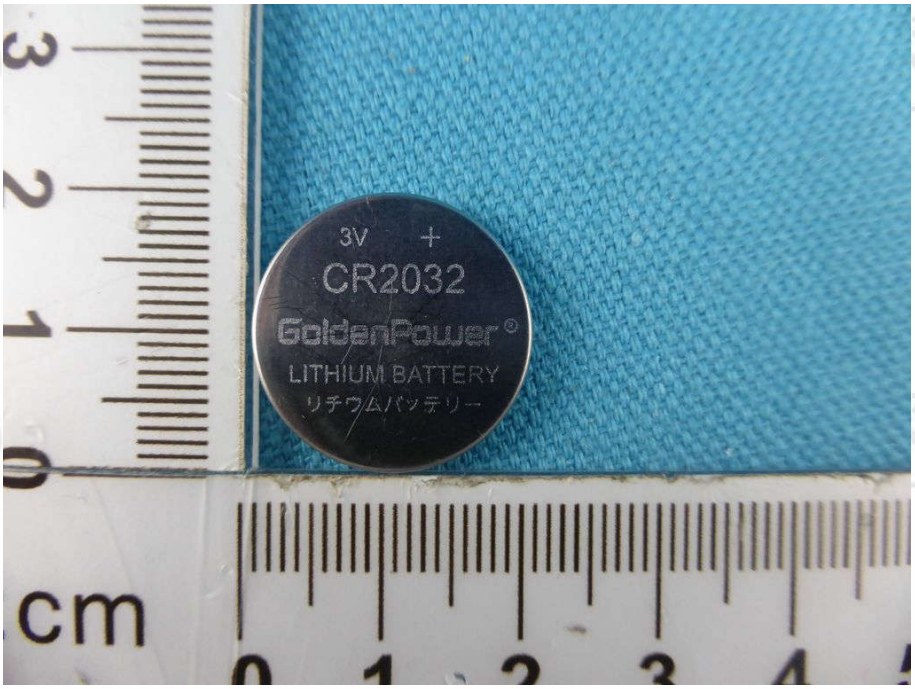
View of Product-7



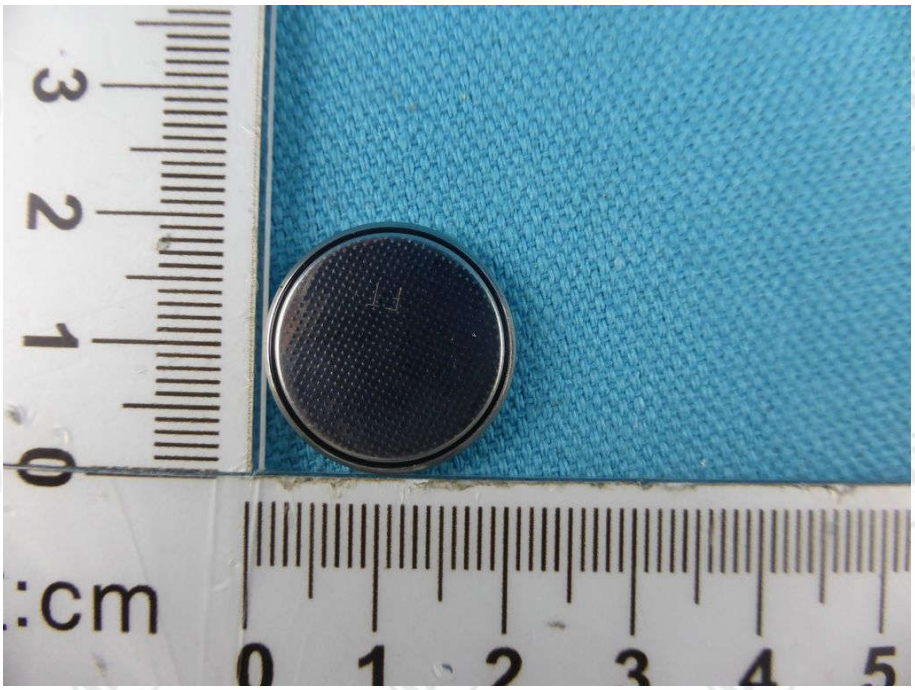
View of Product-8



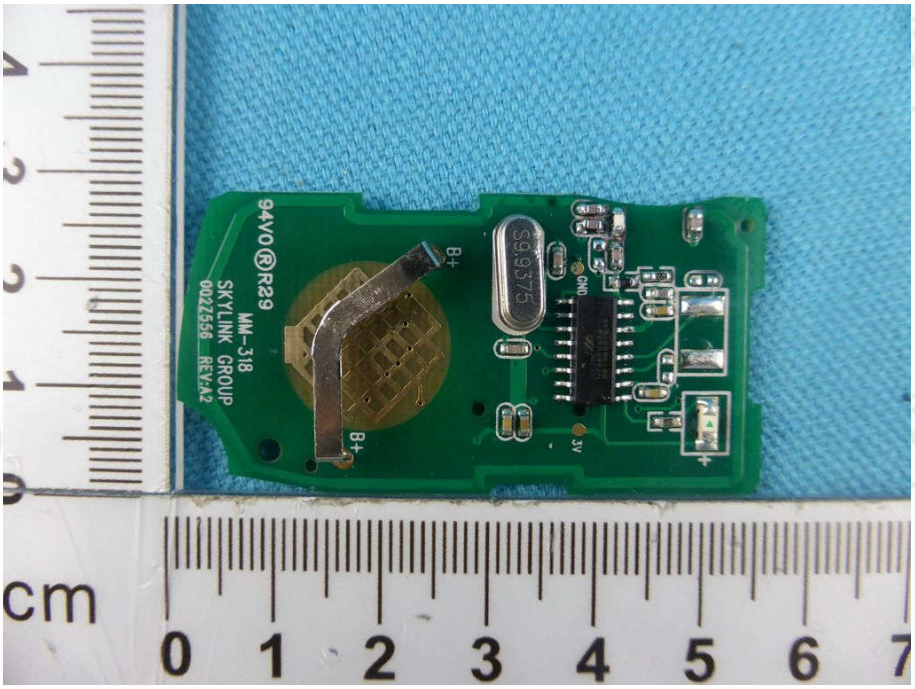
View of Product-9



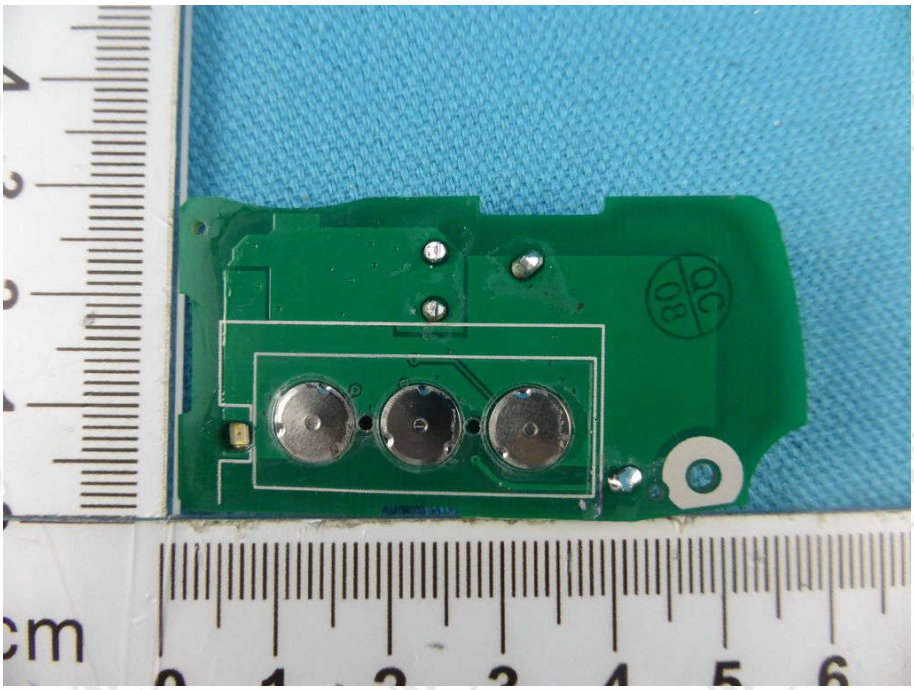
View of Product-10



View of Product-11



View of Product-12



View of Product-13

*** End of Report ***

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