

TEST REPORT

Report No...... : **ATA2603298E**

FCC ID..... : **2BVOG-LST2AB**

Applicant..... : Luminous Star Technology LTD.

Address..... : N0.31, Ln. 167, Guosheng St., Yongkang Dist., Tainan City 710.
Taiwan (R.O.C.)

Manufacturer..... : Luminous Star Technology LTD.

Address..... : N0.31, Ln. 167, Guosheng St., Yongkang Dist., Tainan City 710.
Taiwan (R.O.C.)

Product Name..... : **Metal Chili Access Control Remote Control**

Trade Mark..... : N/A

Model/Type reference..... : 2 Buttons AB

Listed Model(s)..... : /

Standard..... : **FCC CFR Title 47 Part 15 Subpart C Section 15.231**

Date of Receipt..... : Mar. 31, 2026

Date of Test Date..... : Mar. 31, 2026-Apr. 13, 2026

Date of issue..... : Apr. 13, 2026

Test result..... : **Pass**

Compiled by:

(Printed name+signature) Lily Zheng

Supervised by:

(Printed name+signature) Travis Young

Approved by:

(Printed name+signature) Jason Chen

Testing Laboratory Name..... : SHENZHEN ATA TESTING LAB. INC.

Address..... : 4th Floor, Building 10, No. 60 Nanchang Road,
Nanchang Community, Xixiang Street, Bao'an District,
Shenzhen City, Guangdong, People's Republic of China

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1. TEST SUMMARY

1.1. Test Standards

The tests were performed according to following standards:

FCC Rules Part 15.231: Periodic operation in the band 40.66–40.70 MHz and above 70 MHz.

ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.

1.2. Report version

Revised No.	Date of issue	Description
01	Apr. 13, 2026	Original

1.3. Test Description

FCC Rules Part 15.231			
Test Item	Standard Section	Result	Test Engineer
	FCC		
Antenna requirement	15.203	Pass	Lily Zheng
Conducted Emissions	15.207	N/A	N/A
Radiated Spurious Emissions	15.205/15.209(a)/15.231(b)/15.35(c)	Pass	Lily Zheng
Deactivation Time	15.231(a)(1)	Pass	Lily Zheng
Duty Cycle	15.231	Pass	Lily Zheng
Occupied Bandwidth	15.231(c)	Pass	Lily Zheng

Note: 1. The measurement uncertainty is not included in the test result.

2.N/A: means this test item is not applicable

1.4. Test Facility

Test Site	Shenzhen ATA Testing Lab Inc.
Test Site Location	4th Floor, Building 10, No. 60 Nanchang Road, Nanchang Community, Xixiang Street, Bao'an District, Shenzhen City, Guangdong, People' s Republic of China
Telephone:	+86 0755-82828582
Fax:	+86 0755-82828582

The test facility is recognized, certified, or accredited by these organizations:	A2LA Accreditation Lab Certificate Number: 7693.02
	FCC Accredited Lab Designation Number: CN1455

1.5. Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 2 " and is documented in the Shenzhen ATA Testing Lab. Inc. system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device. Below is the best measurement capability for Shenzhen ATA Testing Lab. Inc.

Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	± 0.58 dB	(1)
Conducted spurious emissions	± 1.60 dB	(1)
Conducted Emissions 9kHz~30MHz	± 2.70 dB	(1)
Radiated Emissions 30~1000MHz	± 5.432 dB	(1)
Radiated Emissions 1~18GHz	± 3.88 dB	(1)
Radiated Emissions 18~40GHz	± 5.32 dB	(1)
Occupied Bandwidth	$\pm 0.463\%$	(1)
Humidity	$\pm 2.0\%$ RH	(1)
Temperature	$\pm 0.6^{\circ}\text{C}$	(1)
Barometric pressure	0.5hPa	(1)

Note (1): This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=1.96$.

1.6. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15~35°C
Relative Humidity:	30~60 %
Air Pressure:	950~1050mba

2. GENERAL INFORMATION

2.1. General Description of EUT

Product Name:	Metal Chili Access Control Remote Control
Model/Type reference:	2 Buttons AB
Trademark:	N/A
Series Model::	/
Model Difference:	/
Power supply:	N/A
Power supply(Battery):	DC 3 V(Super battery)
Hardware version:	V1.0
Software version:	V1.0
RF Specification	
Operation frequency:	434.1MHz
Modulation Type:	ASK
Channel number:	1
Antenna type:	PCB antenna
Antenna gain:	-2.07dBi
Note:(1)All antenna information is provided by the manufacturer, test laboratory will not be responsible if any error. (2) The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity. "N/A" Indicates inapplicability	

2.2. Test Mode

The EUT was operated at continuous transmitting mode that was for the purpose of the measurements. All testing shall be performed under maximum output power condition, and to measure its highest possible emissions level, more detailed description as follows:

Test Mode	Description	Remark
1	TX	DC 3V

2.3. Measurement Instruments List

RF Test system					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Until
1	Spectrum Analyzer	Keysight	N9020A	MY50530404	2026.05.07
2	Vector Signal Generator	Agilent	N5182A	MY47420598	2026.05.07
3	Wideband Radio Communication Tester	R&S	CMW500	161163	2026.05.07
4	RF Control Unit	MWRFTest	MW100-RF CB	MW250428ATA-55	2026.05.07

Transmitter spurious emissions & Receiver spurious emissions					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	EMI Test Receiver	R&S	ESPI7	100092	2026.05.07
2	High Pass Filter	Chengdu E-Microwave	OHF-3-18-S	0E01901038	2026.05.07
3	High Pass Filter	Chengdu E-Microwave	OHF-6.5-18-S	0E01901039	2026.05.07
4	Spectrum Analyzer	HP	8593E	3831U02087	2026.05.07
5	Ultra-Broadband logarithmic period Antenna	Schwarzbeck	VULB9168	FARAD-3A1.1 +	2026.05.07
6	Loop Antenna	Beijin ZHINAN	ZN30900C	2.0.0.0	2026.05.07
7	Spectrum Analyzer	R&S	FSV40-N	101798	2026.05.07
8	Horn Antenna	Schwarzbeck	BBHA 9120 D	03169	2026.05.07
9	Pre-Amplifier	Schwarzbeck	BBV 9745	9745#129	2026.05.07
10	Pre-Amplifier	EMCI	EMC051835SE	980662	2026.05.07

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Until
1	LISN	Schwarzbeck	NSLK 8127	01169	2026.05.07
2	EMI Test Receiver	R&S	ESCI3	100930	2026.05.07

Note:

1)The Cal. Interval was one year.

2)The cable loss has calculated in test result which connection between each test instruments.

2.5. Test Software

Software name	Model	Version
Conducted emission Measurement Software	EZ-EMC	FARAD-3A1.1+
Radiated emission Measurement Software	EZ-EMC	FARAD-3A1.1+
Bluetooth and WIFI Test System	MWRF8310	2.0.0.0

3. TEST ITEM AND RESULTS

3.1. Antenna requirement

Requirement

FCC CFR Title 47 Part 15 Subpart C 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. 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.

Test Result

The EUT antenna is permanent attached Internal antenna(Gain: 0dBi). It comply with the standard requirement.

3.2. Conducted Emission

Limit

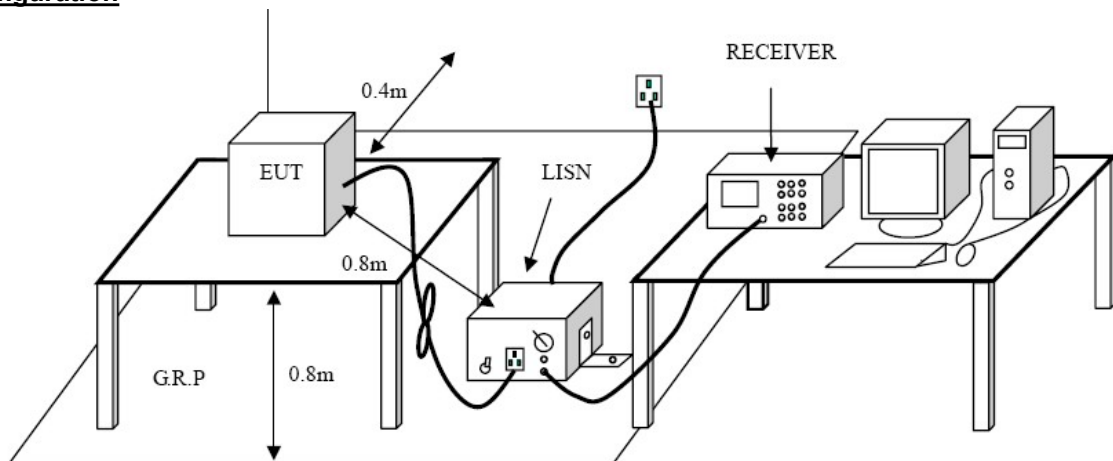
Conducted Emission Test Limit

Frequency	Maximum RF Line Voltage (dB μ V)	
	Quasi-peak Level	Average Level
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
500kHz~5MHz	56	46
5MHz~30MHz	60	50

Notes:

- (1) *Decreasing linearly with logarithm of the frequency.
- (2) The lower limit shall apply at the transition frequencies.
- (3) The limit decrease in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

Test Configuration



Test Procedure

1. The EUT was setup according to ANSI C63.10:2013 requirements.
2. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface.
3. The EUT and simulators are connected to the main power through a line impedances stabilization network (LISN). The LISN provides a 50ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)
4. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.
5. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
6. Conducted Emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.
7. During the above scans, the emissions were maximized by cable manipulation.

Test Mode:

Please refer to the clause 2.3.

Test Results

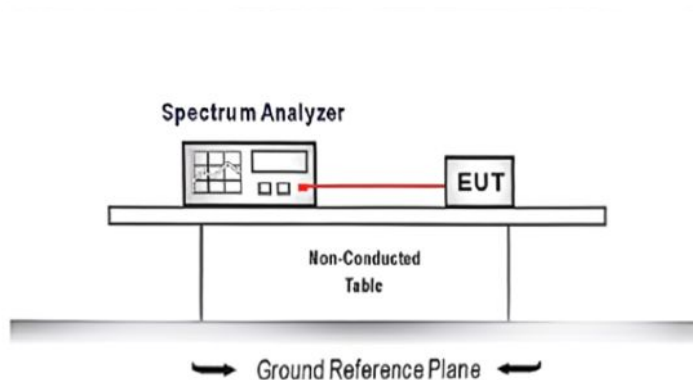
☐ Passed ☒ Not Applicable

3.3. Occupied Bandwidth

Limit

The bandwidth of the emission shall be no wider than 0.25% of the center frequency

Test Configuration



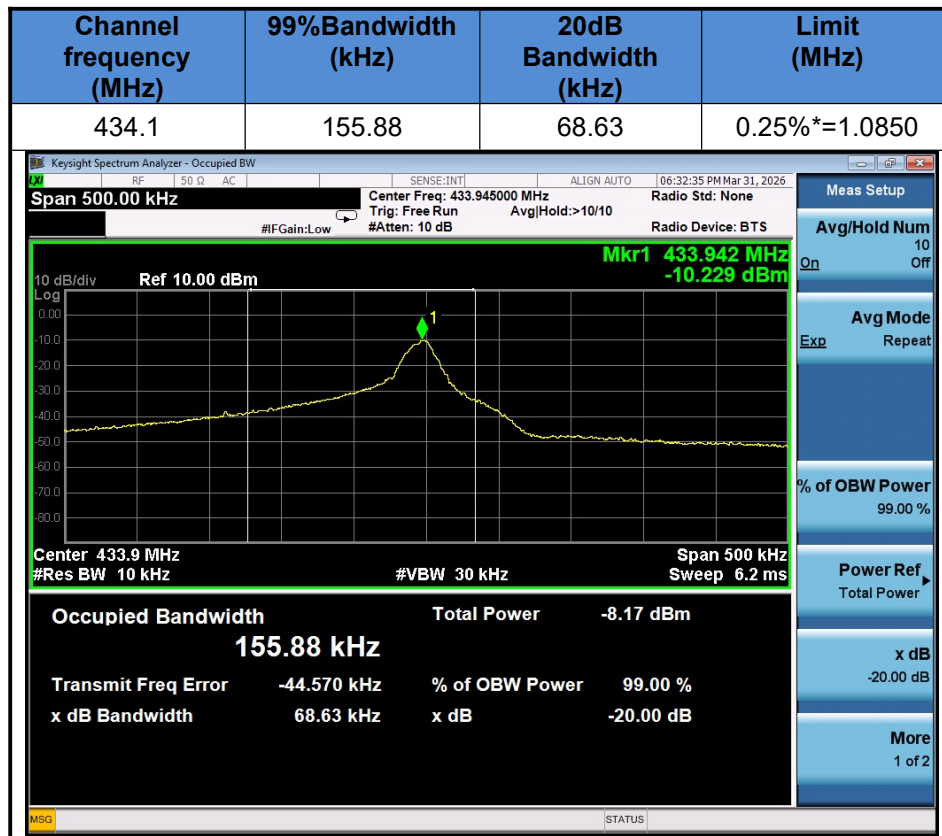
Test Procedure

1. The transmitter output was connected to the spectrum analyzer through an attenuator, the path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT transmit continuously
3. Use the following spectrum analyzer settings:
Span = approximately 2 to 3 times the 99% bandwidth, centered on a operation channel
RBW $\geq$ 1% of the 20 dB bandwidth, VBW $\geq$ RBW
Sweep = auto, Detector function = peak, Trace = max hold
4. Measure and record the results in the test report.

Test Mode

Please refer to the clause 2.3.

Test Results

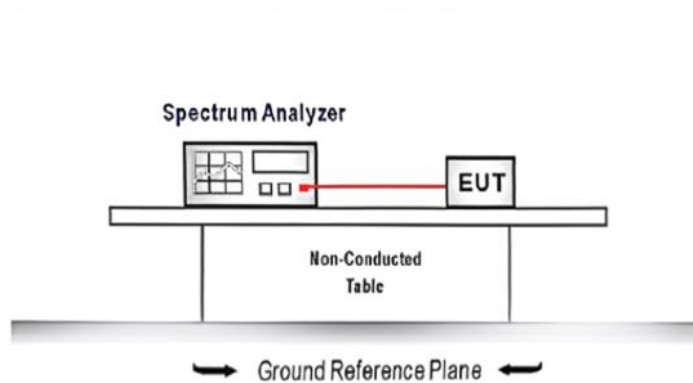


3.4. Deactivation Time

Limit

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

Test Configuration



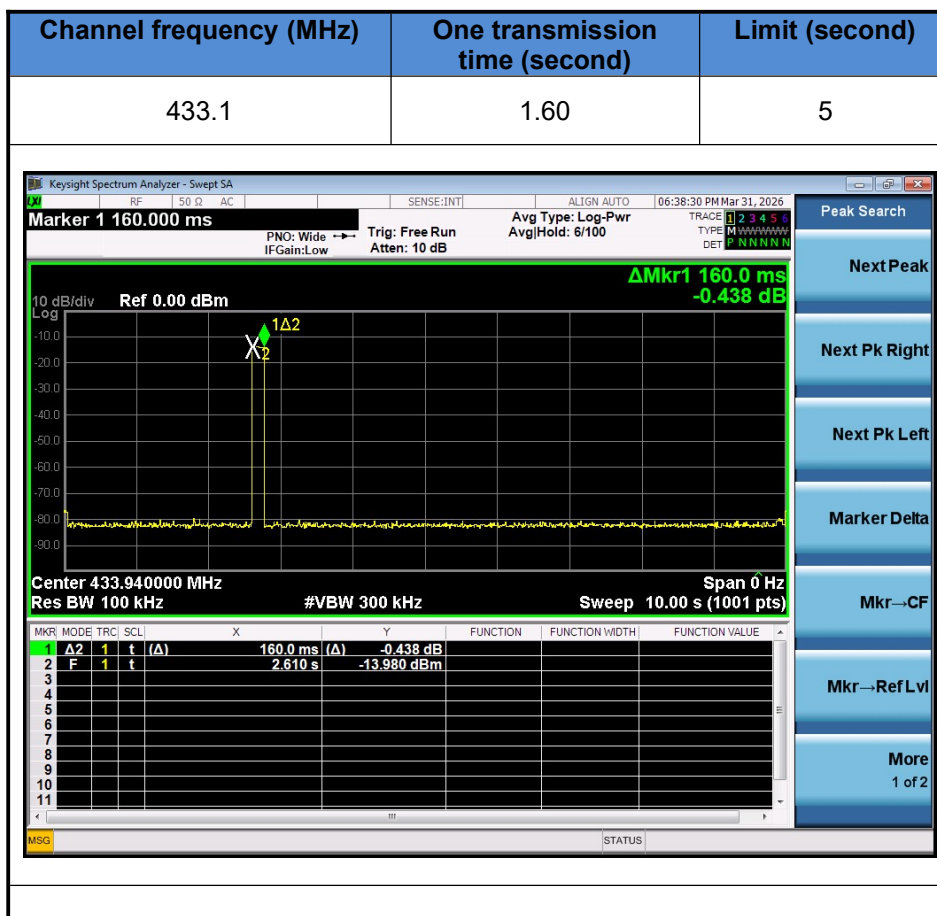
Test Procedure

1. The transmitter output was connected to the spectrum analyzer through an attenuator, the path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT transmit continuously
3. Use the following spectrum analyzer settings:
Frequency=Center carrier frequency
RBW=100KHz, VBW=300KHz, Span= 0,
Sweep time= 5 second, Detector function = peak, Trace = single
4. Measure and record the results in the test report.

Test Mode

Please refer to the clause 2.3.

Test Results



3.5. Spurious Emission (radiated)

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.209

Radiated Emission Limits (9 kHz~1000 MHz)

Frequency (MHz)	Field Strength (microvolt/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

The field strength of emissions from intentional radiators operated **average value** under this section shall not exceed the following

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
260 - 470 MHz	3,750 to 12,500 **	375 to 1,250 **

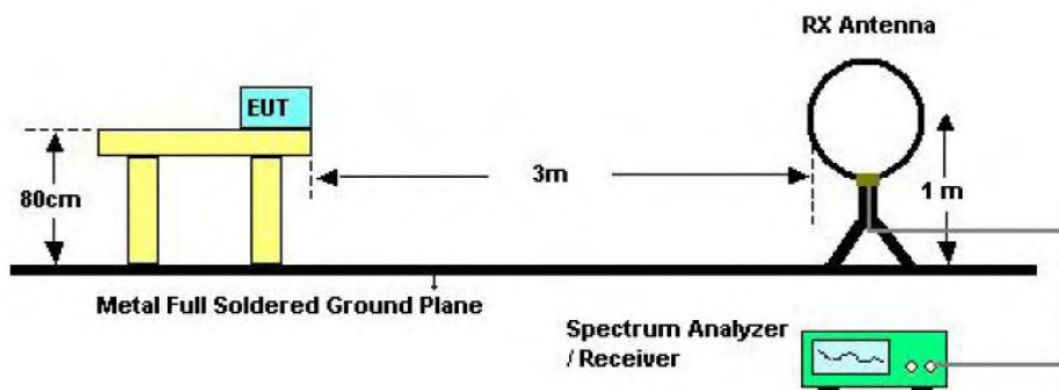
** linear interpolations

F is 434.1MHz

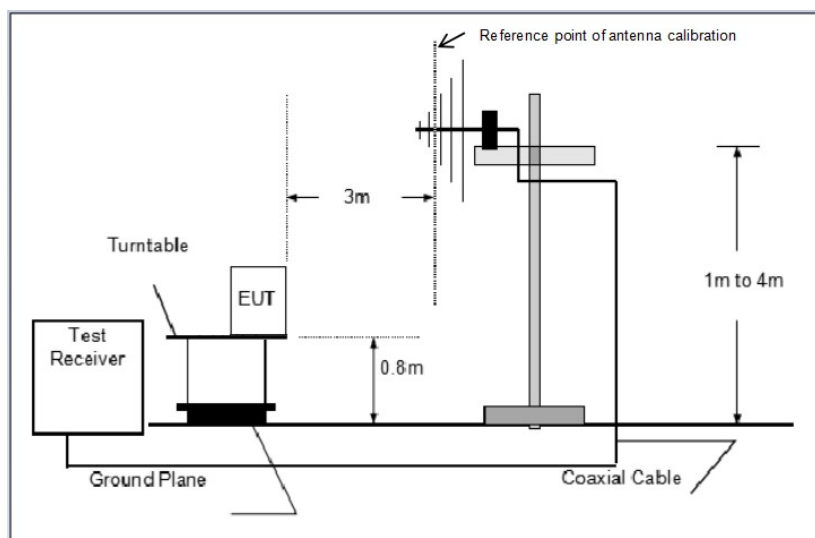
Field strength of fundamental: $\mu\text{V/m}$ at 3 meters = $41.6667(F) - 7083.3420$

Field strength of harmonics: $\mu\text{V/m}$ at 3 meters = $4.16667(F) - 708.3342$

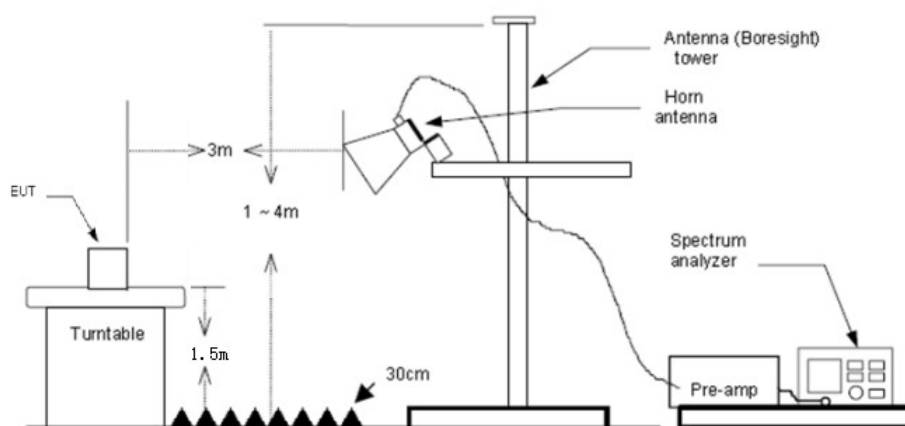
Test Configuration



Below 30MHz Test Setup



Below 1000MHz Test Setup



Above 1GHz Test Setup

Test Procedure

1. The EUT was setup and tested according to ANSI C63.10:2013
2. The EUT is placed on a turn table which is 0.8 meter above ground for below 1 GHz, and 1.5 m for above 1 GHz. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT was set 3 meters from the receiving antenna, which was mounted on the top of a variable height antenna tower.
4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
5. Set to the maximum power setting and enable the EUT transmit continuously.
6. Use the following spectrum analyzer settings
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Below 1 GHz:
RBW=120 kHz, VBW=300 kHz, Sweep=auto, Detector function=peak, Trace=max hold;
If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
 - (3) From 1 GHz to 10th harmonic:
RBW=1MHz, VBW=3MHz Peak detector for Peak value.
RBW=1MHz, VBW=10Hz RMS detector for Average value.

Test Mode

Please refer to the clause 2.3.

Test Result

The value is less than the limit value 20dB.

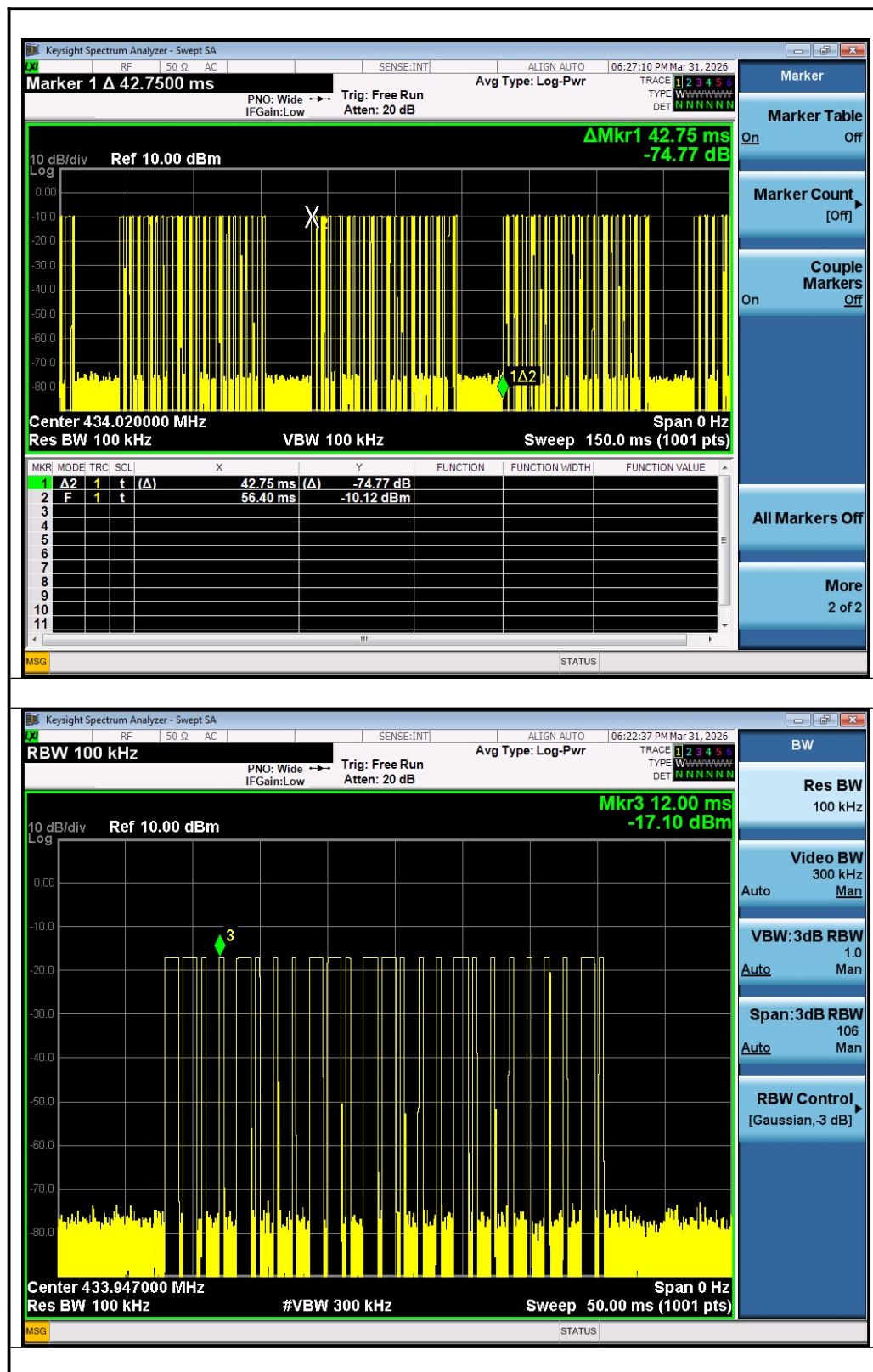
9 KHz~30 MHz , 30MHz~1GHz and 1GHz~6GHz

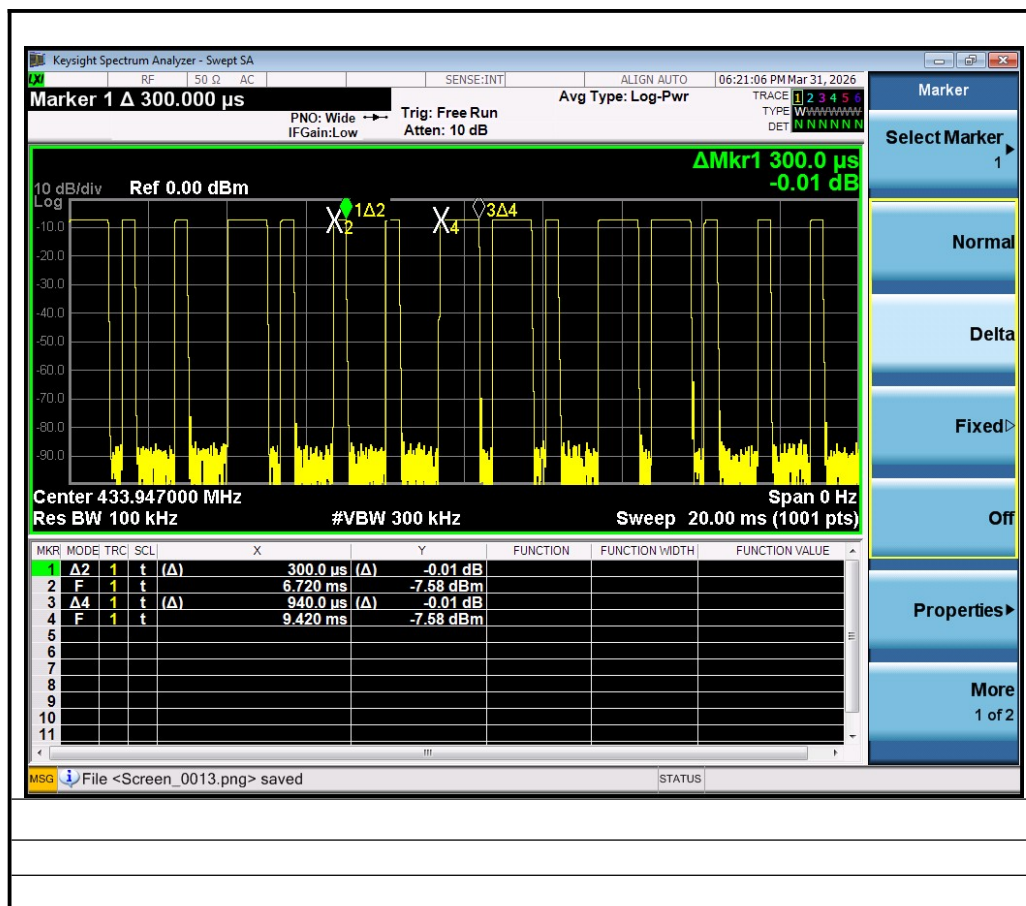
From 9 KHz~30 MHz, 30MHz-1GHz and 1GHz~6GHz: Conclusion: PASS

Note:

- 1) Final level = Reading level + Correct Factor
Correct Factor=Antenna Factor + Cable Loss -Preamplifier Factor
- 2) The emission levels of other frequencies are very lower than the limit and not show in test report.
- 3) The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

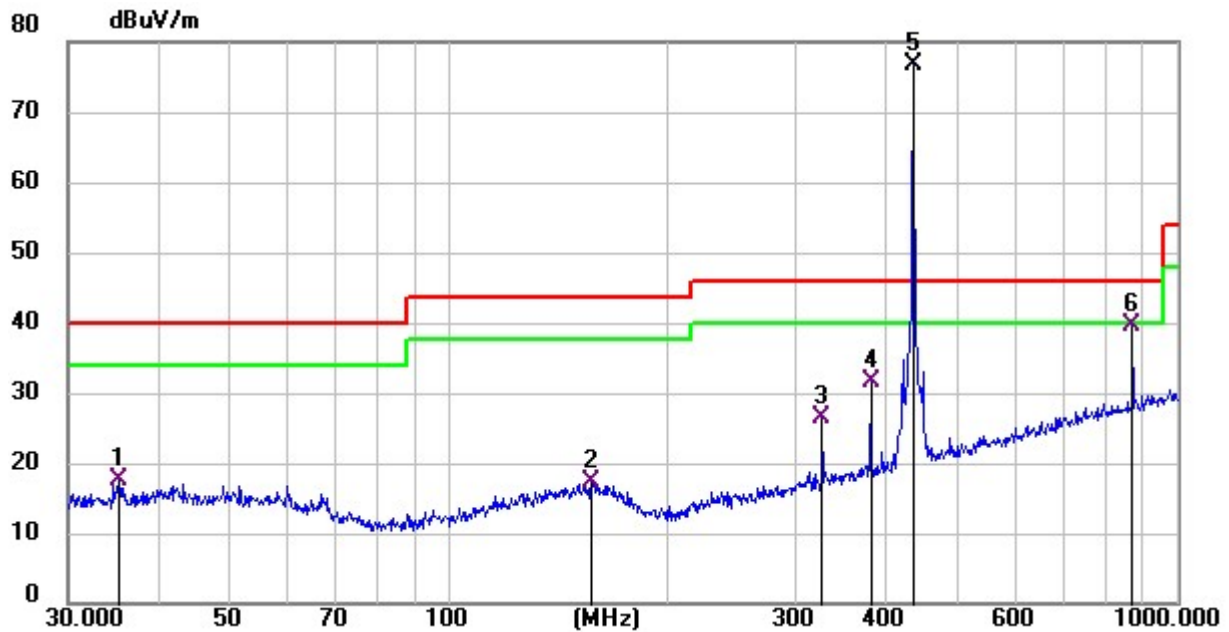
T_{on} (ms)	$T_{on}+T_{off}$ (ms)
$9*0.94+16*0.3 =13.26$	42.75
Duty Cycle= $T_{on}/(T_{on}+T_{off})= 13.26ms/42.75ms =0.310175=31.02\%$	
Duty cycle factor (dB)= $20\log (T_{on} / (T_{on} + T_{off}))$ (dB) = -10.17(dB)	





■ Results of Radiated Emissions (30MHz~ 1000MHz)

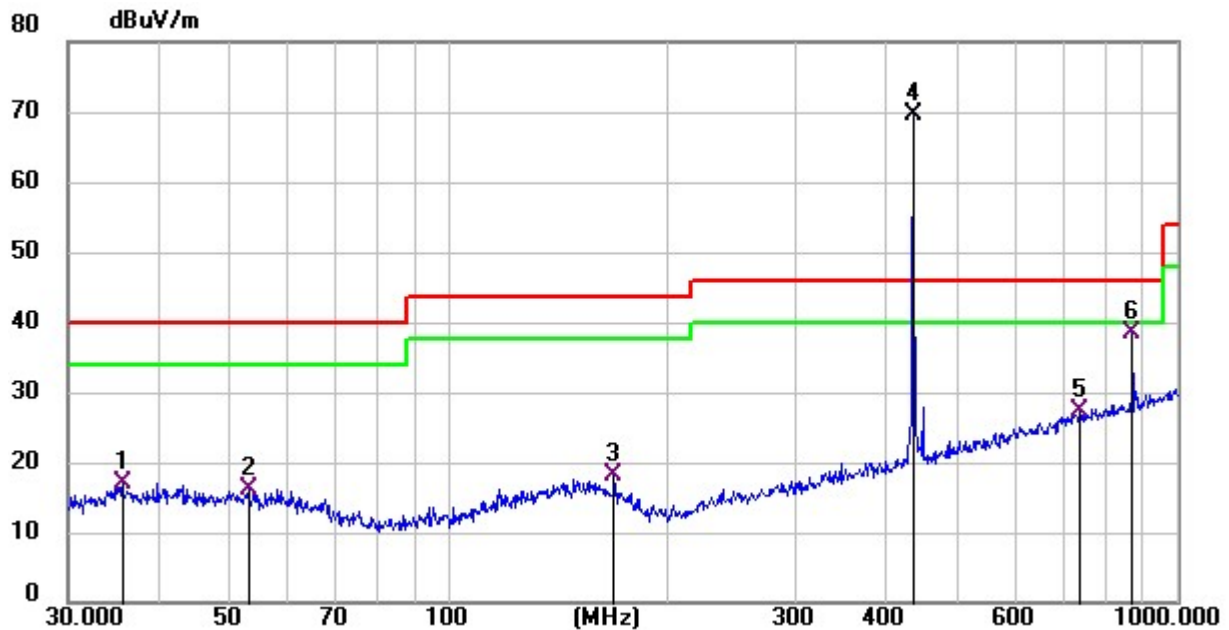
EUT:	Metal Chili Access Control Remote Control	Model Name:	2 Buttons AB
Pressure:	1010 hPa	Phase:	Horizontal
Temperature	24.8℃	Humidity	52.1%
Test Mode:	TX	Test Voltage:	DC 3V from the battery



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	35.2511	30.70	-13.25	17.45	40.00	-22.55	QP
2	157.0073	28.89	-11.49	17.40	43.50	-26.10	QP
3	325.5958	37.33	-10.80	26.53	46.00	-19.47	QP
4	379.9141	40.96	-9.53	31.43	46.00	-14.57	QP
5	434.0650	84.98	-10.17	74.81	105.29	-30.48	peak
6*	869.1302	40.09	-10.17	29.92	85.29	-55.37	peak

Note:Duty cycle factor = $20\log(\text{Duty cycle})$, Duty cycle = $T_{\text{on}} / (T_{\text{on}} + T_{\text{off}})$

EUT:	Metal Chili Access Control Remote Control	Model Name:	2 Buttons AB
Pressure:	1010 hPa	Phase:	Vertical
Temperature	24.8°C	Humidity	52.1%
Test Mode:	TX	Test Voltage:	DC 3V from the battery



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	35.6240	30.35	-13.22	17.13	40.00	-22.87	QP
2	53.1313	29.47	-13.22	16.25	40.00	-23.75	QP
3	168.4137	30.46	-12.24	18.22	43.50	-25.28	QP
4	434.0650	77.65	-10.17	67.48	105.29	-37.81	peak
5	734.4913	29.51	-2.15	27.36	46.00	-18.64	QP
6*	869.1302	38.83	-10.17	28.66	85.29	-56.63	peak

■ Results of Radiated Emissions (Above 1GHz)

Test Channel				433.1MHz			
Frequency (MHz)	Reading Level (dBuV)	Correct Factor (dB/m)	Final level (dBuV/m)	Limit Line (dBuV/m)	Margin Limit (dB)	Polarization	Test value
1299.600	57.69	-11.97	45.72	74.00	-28.28	Vertical	Peak
1732.400	47.18	-11.35	35.83	74.00	-38.17	Vertical	
2598.600	53.31	-10.83	42.48	74.00	-31.52	Vertical	
3031.700	57.47	-10.52	46.95	74.00	-27.05	Vertical	
3464.800	51.13	-9.73	41.40	74.00	-32.60	Vertical	
3897.900	44.74	-6.25	38.49	74.00	-35.51	Vertical	
1299.600	64.92	-11.97	52.95	74.00	-21.05	Horizontal	
1732.400	52.15	-11.35	40.80	74.00	-33.20	Horizontal	
2598.600	48.83	-10.99	37.84	74.00	-36.16	Horizontal	
3031.700	56.53	-10.82	45.71	74.00	-28.29	Horizontal	
3464.800	62.98	-10.52	52.46	74.00	-21.54	Horizontal	
3897.900	58.27	-9.73	48.54	74.00	-25.46	Horizontal	

Frequency (MHz)	Peak Level (dBuV/m)	Duty cycle factor	AV Level (dBuV/m)	FCC Limit (dBuV/m)	Margin (dB)	Polarization
1302.300	54.62	-10.17	44.45	65.29	-20.84	Vertical
1736.400	48.26	-10.17	38.09	65.29	-27.2	Vertical
2170.500	50.14	-10.17	39.97	65.29	-25.32	Vertical
2604.600	54.18	-10.17	44.01	65.29	-21.28	Vertical
3038.700	44.12	-10.17	33.95	65.29	-31.34	Vertical
3472.800	40.23	-10.17	30.06	65.29	-35.23	Vertical
1302.300	51.69	-10.17	41.52	65.29	-23.77	Horizontal
1736.400	41.28	-10.17	31.11	65.29	-34.18	Horizontal
2170.500	38.36	-10.17	28.19	65.29	-37.1	Horizontal
2604.600	46.51	-10.17	36.34	65.29	-28.95	Horizontal
3038.700	51.52	-10.17	41.35	65.29	-23.94	Horizontal
3472.800	47.92	-10.17	37.75	65.29	-27.54	Horizontal

Note:Duty cycle factor = $20\log(\text{Duty cycle})$, Duty cycle = $T_{on} / (T_{on} + T_{off})$

4. EUT TEST PHOTOS

Note: Refer to the attached test photos

5.PHOTOGRAPHS OF EUT CONSTRUCTIONAL

Note: Refer to the attached exterior and interior photos

*****THE END*****