TCT 通测检测 TESTING CENTRE TECHNOLOGY

TEST REPORT

FCC ID: 2ANST-L1

Product: Low-Power video doorbell

Model No.: L1

Additional Model: L2, L3, L4, L5, L6, L7, L8, L9, L10, L11, L12, L13, L14, L15, L16, L17, L18, L19, L20, L21, L22, L23, L24, L25, L26, L27, L28, L29, L30

Trade Mark: N/A

Report No.: TCT171019E001

Issued Date: Oct. 23, 2017

Issued for:

Shenzhen EEP Industrial Co., Ltd.

No.11 Xinan Street,Wuhe Middle Road, Bantian Village, Buji Town, Shenzhen, China

Issued By:

Shenzhen Tongce Testing Lab.

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1. Test Certification

Product:	Low-Power video doorbell
Model No.:	L1
Additional Model:	L2, L3, L4, L5, L6, L7, L8, L9, L10, L11, L12, L13, L14, L15, L16, L17, L18, L19, L20, L21, L22, L23, L24, L25, L26, L27, L28, L29, L30
Trade Mark:	**N/A**
Applicant:	Shenzhen EEP Industrial Co., Ltd.
Address:	No.11 Xinan Street, Wuhe Middle Road, Bantian Village, Buji Town, Shenzhen, China
Manufacturer:	Shenzhen EEP Industrial Co., Ltd.
Address:	No.11 Xinan Street, Wuhe Middle Road, Bantian Village, Buji Town, Shenzhen, China
Date of Test:	Oct. 10 - 12, 2017
Applicable Standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.231

The above equipment has been tested by Shenzhen Tongce Testing Lab. and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Tested By: Garen **Date:** ***Oct. 12, 2016***

Reviewed By: **Date:** ***Oct. 23, 2016***

Approved By: Tomsin **Date:** ***Oct. 23, 2016***

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2. Test Result Summary

Requirement	CFR 47 Section	Result
Conduction Emission, 0.15MHz to 30MHz	§15.207	PASS
Manually Activated Transmitter	§15.231(a)	PASS
Radiation Emission	§15.231(b), §15.205, §15.209, §15.35	PASS
Occupied Bandwidth	§15.231(c)	PASS

Note:

1. PASS: Test item meets the requirement.

2. Fail: Test item does not meet the requirement.

3. N/A: Test case does not apply to the test object.

4. The test result judgment is decided by the limit of test standard.

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3. EUT Description

Product Name:	Low-Power video doorbell
Model :	L1
Additional Model:	L2, L3, L4, L5, L6, L7, L8, L9, L10, L11, L12, L13, L14, L15, L16, L17, L18, L19, L20, L21, L22, L23, L24, L25, L26, L27, L28, L29, L30
Trade Mark:	**N/A**
Operation Frequency:	433.94MHz
Modulation Technology:	ASK
Antenna Type:	Integrated Antenna
Antenna Gain:	3.0dBi (declare by Manufacturer)
Power Supply:	AC 100-240V, 50/60Hz Or DC 3.7V 2*3.7V 18650 battery in parallel
Remark:	All above models are identical in the same PCB layout, interior structure and electrical circuits. The only difference is the model name for commercial purpose.

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4. Genera Information

4.1. Test Environment and Mode

Operating Environment:	
Temperature:	24.0 °C
Humidity:	54 % RH
Atmospheric Pressure:	1010 mbar
Test Mode:	
Operation mode:	Keep the EUT in continuous transmitting with modulation
The sample was placed (0.8m below 1GHz, 1.5m above 1GHz) above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.	

Per-test mode.

We have verified the construction and function in typical operation, The EUT was placed on three different polar directions; i.e. X axis, Y axis, Z axis. which was shown in this test report and defined as follows:

Axis	X	Y	Z
Field Strength(dBuV/m)	62.47	65.62	62.59

Final Test Mode:

According to ANSI C63.10 standards, the test results are both the “worst case” and “worst setup”:
Y axis (see the test setup photo)

4.2. Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Equipment	Model No.	Serial No.	FCC ID	Trade Name
/	/	/	/	/

Note:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.

2. Grounding was established in accordance with the manufacturer’s requirements and conditions for the intended use.

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5. Facilities and Accreditations

5.1. Facilities

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

- FCC - Registration No.: 645098

  Shenzhen Tongce Testing Lab

  The 3m Semi-anechoic chamber has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

- IC - Registration No.: 10668A-1

  The 3m Semi-anechoic chamber of Shenzhen TCT Testing Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing

5.2. Location

Shenzhen Tongce Testing Lab

Address: 1B/F., Building 1, Yibaolai Industrial Park, Qiaotou, Fuyong, Baoan District, Shenzhen, Guangdong, China

Tel: 86-755-27673339

5.3. Measurement Uncertainty

The reported uncertainty of measurement y ± U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

No.	Item	MU
1	Conducted Emission	±2.56dB
2	RF power, conducted	±0.12dB
3	Spurious emissions, conducted	±0.11dB
4	All emissions, radiated(<1G)	±3.92dB
5	All emissions, radiated(>1G)	±4.28dB
6	Temperature	±0.1°C
7	Humidity	±1.0%

6. Test Results and Measurement Data

6.1. Antenna Requirement

Standard requirement:	FCC Part15 C Section 15.203 /247(c)
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. 15.247(c) (1)(i) requirement: (i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.	
E.U.T Antenna:	
The antenna is integrated antenna which permanently attached, and the best case gain of the antenna is 3.0dBi.	

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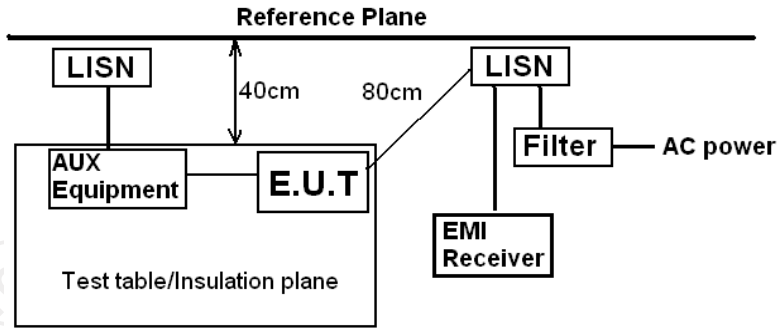
6.2. Conducted Emission

6.2.1. Test Specification

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.207</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.4:2014</td></tr>
<tr><td>Frequency Range:</td><td>150 kHz to 30 MHz</td></tr>
<tr><td>Receiver setup:</td><td>RBW=9 kHz, VBW=30 kHz, Sweep time=auto</td></tr>
<tr><td>Limits:</td><td>
<table>
<tr><td rowspan="2">Frequency range (MHz)</td><td colspan="2">Limit (dBuV)</td></tr>
<tr><td>Quasi-peak</td><td>Average</td></tr>
<tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr>
<tr><td>0.5-5</td><td>56</td><td>46</td></tr>
<tr><td>5-30</td><td>60</td><td>50</td></tr>
</table>
</td></tr>
<tr><td>Test Setup:</td><td> 

Remark:
E.U.T: Equipment Under Test
LISN: Line Impedence Stabilization Network
Test table height=0.8m</td></tr>
<tr><td>Test Mode:</td><td>Transmitting Mode</td></tr>
<tr><td>Test Procedure:</td><td>1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.
2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).
3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement.</td></tr>
<tr><td>Test Result:</td><td>PASS</td></tr>
</table>

6.2.1. Test Instruments

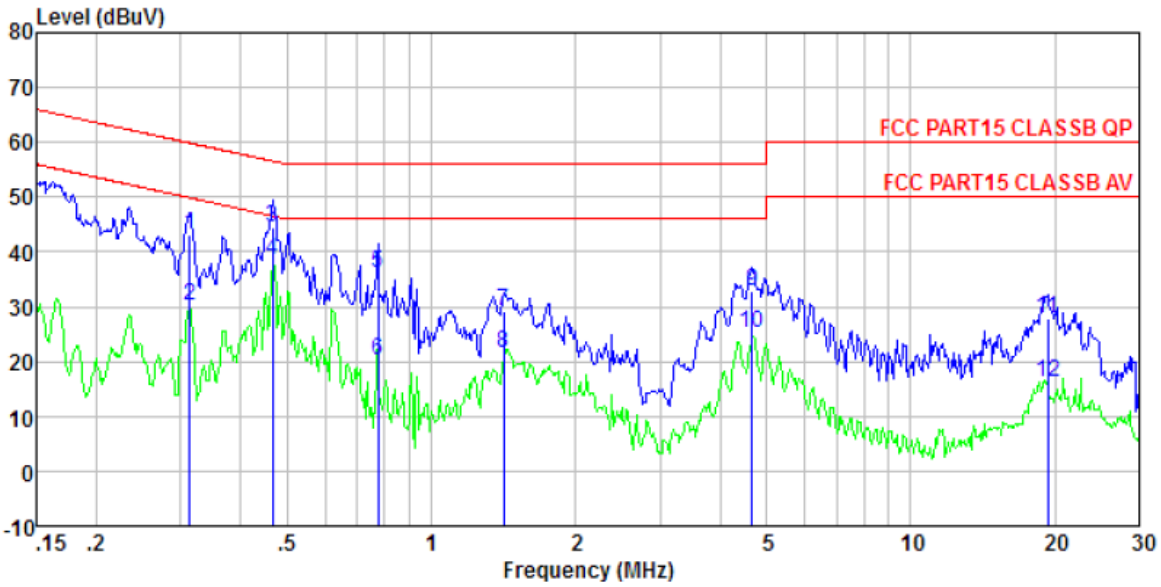
Conducted Emission Shielding Room Test Site (843)				
Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Test Receiver	R&S	ESPI	101401	Jun. 12, 2018
LISN	Schwarzbeck	NSLK 8126	8126453	Sep. 27, 2018
Coax cable (9KHz-30MHz)	TCT	CE-05	N/A	Sep. 27, 2018
EMI Test Software	Shurple Technology	EZ-EMC	N/A	N/A

Note: *The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).*

6.2.2. Test data

Please refer to following diagram for individual

Conducted Emission on Line Terminal of the power line (150 kHz to 30MHz)

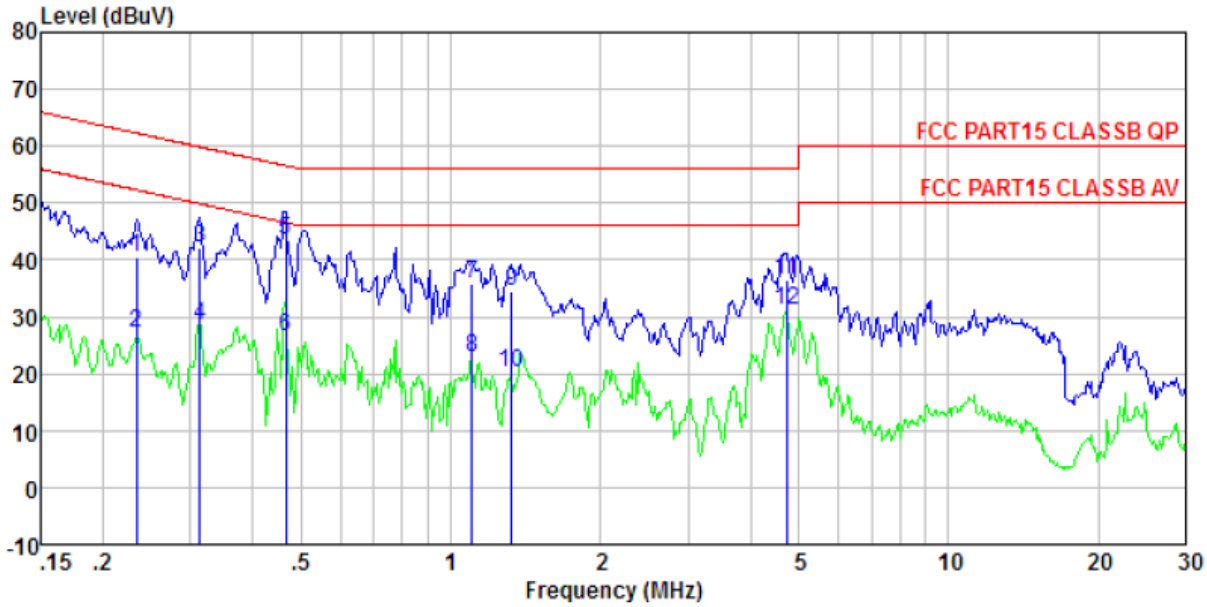


Freq MHz	Reading level dBuV	lISN/ISN factor dB	Cable loss dB	level dBuV	Limit level dBuV	Over limit dB	Remark
0.313	42.51	0.44	0.10	43.05	59.88	-16.83	QP
0.313	29.71	0.44	0.10	30.25	49.88	-19.63	Average
0.466	44.05	0.39	0.11	44.55	56.58	-12.03	QP
0.466	38.07	0.39	0.11	38.57	46.58	-8.01	Average
0.775	35.65	0.27	0.13	36.05	56.00	-19.95	QP
0.775	19.93	0.27	0.13	20.33	46.00	-25.67	Average
1.418	28.73	0.22	0.13	29.08	56.00	-26.92	QP
1.418	21.32	0.22	0.13	21.67	46.00	-24.33	Average
4.672	32.45	0.21	0.15	32.81	56.00	-23.19	QP
4.672	24.75	0.21	0.15	25.11	46.00	-20.89	Average
19.326	27.48	0.29	0.22	27.99	60.00	-32.01	QP
19.326	15.67	0.29	0.22	16.18	50.00	-33.82	Average

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level =Receiver Read level + LISN Factor + Cable Loss
4. *If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.*

Conducted Emission on Neutral Terminal of the power line (150 kHz to 30MHz)



Freq MHz	Reading level dBuV	lISN/ISN factor dB	Cable loss dB	level dBuV	Limit level dBuV	Over limit dB	Remark
0.234	40.03	0.42	0.12	40.57	62.30	-21.73	QP
0.234	26.62	0.42	0.12	27.16	52.30	-25.14	Average
0.313	41.53	0.42	0.10	42.05	59.88	-17.83	QP
0.313	27.95	0.42	0.10	28.47	49.88	-21.41	Average
0.466	43.06	0.37	0.11	43.54	56.58	-13.04	QP
0.466	26.02	0.37	0.11	26.50	46.58	-20.08	Average
1.106	35.44	0.21	0.13	35.78	56.00	-20.22	QP
1.106	22.48	0.21	0.13	22.82	46.00	-23.18	Average
1.324	34.21	0.21	0.13	34.55	56.00	-21.45	QP
1.324	19.94	0.21	0.13	20.28	46.00	-25.72	Average
4.721	36.05	0.21	0.15	36.41	56.00	-19.59	QP
4.721	30.68	0.21	0.15	31.04	46.00	-14.96	Average

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level =Receiver Read level + LISN Factor + Cable Loss
4. *If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.*

6.3. Radiated Emission Measurement

6.3.1. Test Specification

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.231(a) and 15.209</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.4: 2014 and ANSI C63.10:2013</td></tr>
<tr><td>Frequency Range:</td><td>9 kHz to 5 GHz</td></tr>
<tr><td>Measurement Distance:</td><td>3 m</td></tr>
<tr><td>Antenna Polarization:</td><td>Horizontal & Vertical</td></tr>
<tr><td>Receiver Setup:</td><td>
<table>
<tr><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></tr>
<tr><td>9kHz- 150kHz</td><td>Quasi-peak</td><td>200Hz</td><td>1kHz</td><td>Quasi-peak Value</td></tr>
<tr><td>150kHz-30MHz</td><td>Quasi-peak</td><td>9kHz</td><td>30kHz</td><td>Quasi-peak Value</td></tr>
<tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>100KHz</td><td>300KHz</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr>
<tr><td>Peak</td><td>1MHz</td><td>10Hz</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td></td><td>1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber in below 1GHz, 1.5m above the ground in above 1GHz. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. 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.
4. 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 and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. 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.</td></tr>
</table>

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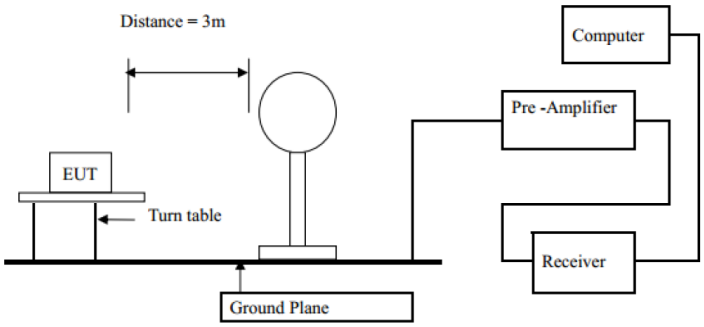
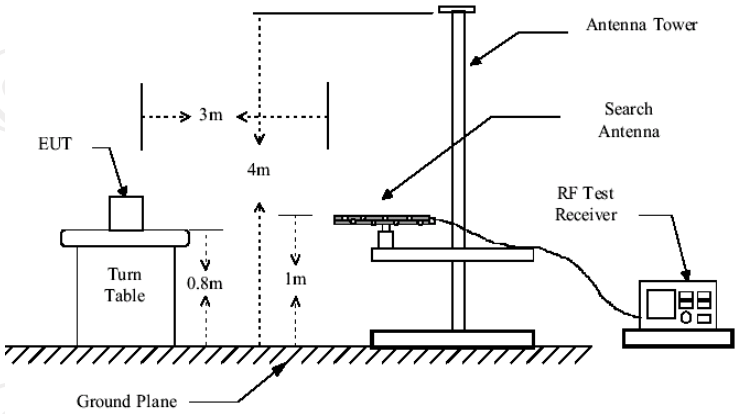
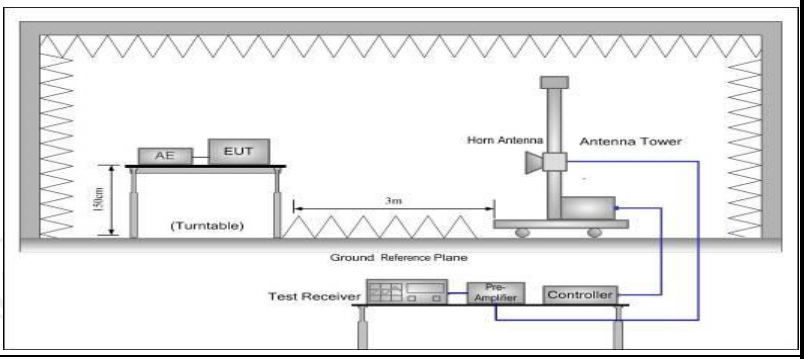
Test setup:	For radiated emissions below 30MHz  30MHz to 1GHz  Above 1GHz 
Test Mode:	Transmitting Mode
Test results:	PASS

6.3.2. Limit

Fundamental Frequency (MHz)	Filed Strength of Fundamental (microvolts/meter)	Filed Strength of Spurious Emission (microvolts/meter)
40.66-40.70	2250	225
70-130	1250	125
130-174	1250 to 3750*	125 to 375*
174-260	3750	375
260-470	3750 to 12500*	375 to 1250*
Above 470	12500	1250
Horn Antenna	Schwarzbeck	BBHA 9120D
*Linear interpolations		
[Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follows: For the band 130-174 MHz, μV/m at 3 meters = 56.81818(F) - 6136.3636; for the band 260-470 MHz, μV/m at 3 meters = 41.6667(F) - 7083.3333. The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.]		

For EUT

Fundamental Frequency (MHz)	Filed Strength of Fundamental (microvolts/meter)	Filed Strength of Spurious Emission(dBμV/m)
433.94	80.82	60.82

Note:

1. *Intentional radiators operating under the provisions of this Section shall demonstrate compliance with the limits on the field strength of emissions, as shown in the above table, based on the average value of the measured emissions.*
2. *According to 15.35, on any frequency or frequencies below or equal to 1000 MHz, the limits Shown are based on measuring equipment employing a CISPR quasi-peak detector function and related measurement bandwidths, 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.*
3. *According to 15.231(b), The limits on the field strength of the spurious emissions in the above table is based on the fundamental frequency of the intentional radiator. Spurious emissions shall be attenuated to the average (or, alternatively, CISPR quasi-peak) limits shown in this table or to the general limits shown in Section 15.209, whichever limit permits one higher field strength.*

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Frequencies in restricted band are complied to limit on Paragraph 15.209

Frequency Range (MHz)	Distance (m)	Field strength (dB μ V/m)
0.009-0.490	3	20log 2400/F (kHz) + 80
0.490-1.705	3	20log 24000/F (kHz) + 40
1.705-30	3	20log 30 + 40
30-88	3	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

Note:

1. *RF Voltage (dBuV) = 20 log RF Voltage (uV)*
2. *In the Above Table, the tighter limit applies at the band edges.*
3. *Distance refers to the distance in meters between the measuring instrument antenna and the EUT*
4. *The radiated emissions should be tested under 3-axes position (Lying, Side, and Stand), After pre-test. It was found that the worse radiated emission was get at the lying position.*
5. *If measurement is made at 3m distance, then F.S Limitation at 3m distance is adjusted by using the formula Ld1 = Ld2 * (d2/d1)*

6.3.3. Test Instruments

Radiated Emission Test Site (966)				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
ESPI Test Receiver	ROHDE&SCHWARZ	ESVD	100008	Sep. 27, 2018
Spectrum Analyzer	ROHDE&SCHWARZ	FSEM	848597/001	Sep. 27, 2018
Pre-amplifier	EM Electronics Corporation CO.,LTD	EM30265	07032613	Sep. 27, 2018
Pre-amplifier	HP	8447D	2727A05017	Sep. 27, 2018
Loop antenna	ZHINAN	ZN30900A	12024	Sep. 27, 2018
Broadband Antenna	Schwarzbeck	VULB9163	340	Sep. 27, 2018
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Sep. 27, 2018
Coax cable	TCT	N/A	N/A	Sep. 27, 2018
Coax cable	TCT	N/A	N/A	Sep. 27, 2018
Coax cable	TCT	N/A	N/A	Sep. 27, 2018
Coax cable	TCT	N/A	N/A	Sep. 27, 2018
EMI Test Software	Shurple Technology	EZ-EMC	N/A	N/A

Note: *The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).*

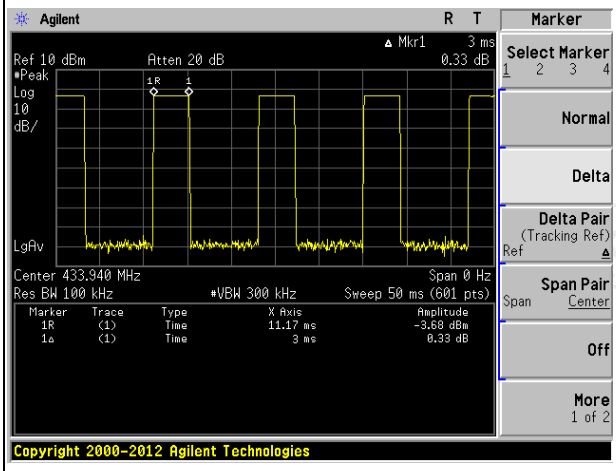
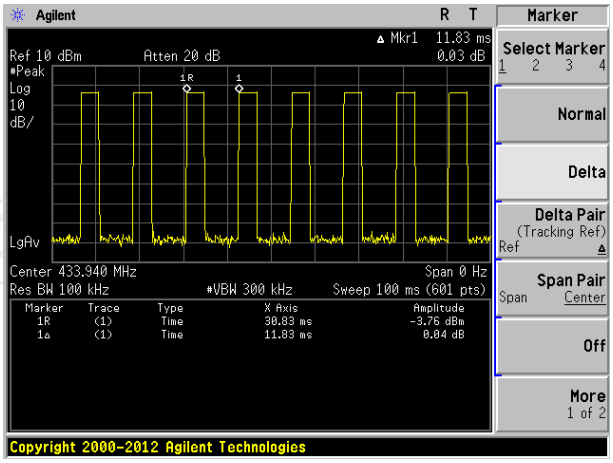
6.3.4. Test Data

Duty Cycle Test Data:

Total time one cycle(ms)	Effective time one cycle(ms)	Duty Cycle	AV Factor(dB)
11.83	3	0.25	-11.92

Note:

Duty Cycle= Effective time one cycle/ Total time one cycle= 0.25
AV Factor = 20 log(Duty Cycle)

Ton time	T period
	

Field Strength of Fundamental

Frequency (MHz)	Emission PK (dBuV/m)	Horizontal /Vertical	Limits PK (dBuV/m)	Margin (dB)
433.94	65.62	H	100.82	-35.20
433.94	62.90	V	100.82	-37.92

Frequency (MHz)	Emission PK (dBuV/m)	AV Factor(dB)	Horizontal /Vertical	Emission AVG (dBuV/m)	Limits AV (dBuV/m)	Margin (dB)
433.94	65.62	-11.92	H	53.7	80.82	-27.12
433.94	62.90	-11.92	V	50.98	80.82	-29.84

Harmonics and Spurious Emissions

Frequency Range (9 kHz-30MHz)

Frequency (MHz)	Level@3m (dBμV/m)	Limit@3m (dBμV/m)
--	--	--
--	--	--
--	--	--
--	--	--

Note: *1. Emission Level=Reading+ Cable loss-Antenna factor-Amp factor*

2. The emission levels are 20 dB below the limit value, which are not reported. It is deemed to comply with the requirement

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Below 1GHz

Quasi-peak Value Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
34.16	45.64	11.25	0.60	30.08	27.41	40.00	-12.59	Vertical
54.07	39.13	11.93	0.81	29.97	21.90	40.00	-18.10	Vertical
88.03	40.48	10.60	1.09	29.76	22.41	43.50	-21.09	Vertical
142.32	40.63	7.37	1.52	29.44	20.08	43.50	-23.42	Vertical
327.89	32.66	14.03	2.51	29.84	19.36	46.00	-26.64	Vertical
537.59	36.17	18.19	3.47	29.30	28.53	46.00	-17.47	Vertical
32.29	30.00	11.25	0.58	30.09	11.74	40.00	-28.26	Horizontal
75.98	42.46	7.35	0.99	29.82	20.98	40.00	-19.02	Horizontal
91.82	41.30	10.98	1.12	29.74	23.66	43.50	-19.84	Horizontal
157.56	47.48	8.02	1.62	29.37	27.75	43.50	-15.75	Horizontal
283.98	36.87	13.01	2.29	29.90	22.27	46.00	-23.73	Horizontal
362.99	44.64	14.74	2.68	29.67	32.39	46.00	-13.61	Horizontal

Above 1GHz

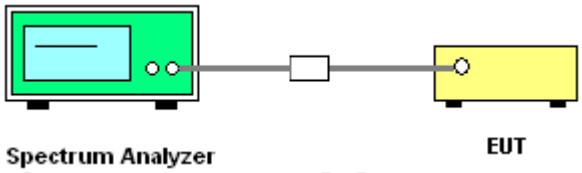
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	PK Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
1370.00	37.88	25.66	4.59	33.39	34.74	74.00	-39.26	Vertical
2355.00	37.19	27.69	5.34	34.05	36.17	74.00	-37.83	Vertical
3415.00	37.44	28.67	6.80	32.85	40.06	74.00	-33.94	Vertical
4150.00	33.67	30.06	8.01	32.01	39.73	74.00	-34.27	Vertical
4695.00	33.19	31.65	8.51	32.03	41.32	74.00	-32.68	Vertical
5645.00	30.52	32.36	9.72	32.35	40.25	74.00	-33.75	Vertical
1430.00	36.62	25.42	4.64	33.47	33.21	74.00	-40.79	Horizontal
2410.00	36.12	27.57	5.40	33.99	35.10	74.00	-38.90	Horizontal
3395.00	37.11	28.60	6.76	32.87	39.60	74.00	-34.40	Horizontal
4115.00	30.98	29.95	7.97	32.05	36.85	74.00	-37.15	Horizontal
4635.00	31.41	31.57	8.46	32.01	39.43	74.00	-34.57	Horizontal
5590.00	28.25	32.22	9.63	32.38	37.72	74.00	-36.28	Horizontal

Note:

1. *Emission Level=Peak Reading + Correction Factor; Correction Factor= Antenna Factor + Cable loss – Pre-amplifier*
2. *Margin (dB) = Emission Level (dBμV/m)- limit (dBμV/m)*
3. *The emission levels of other frequencies are very lower than the limit and not show in test report.*
4. *Measurements were conducted from 1 GHz to the 10th harmonic of highest fundamental frequency.*
5. *Data of measurement shown " * "in the above table mean that the reading of emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.*

6.4. Manually Activated Transmitter

6.4.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.231(a1)
Test Method:	ANSI C63.10: 2013
Limit:	According to 15.231(a), A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.
	1. According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT. 2. Set to the maximum power setting and enable the EUT transmit continuously. 3. Use the following spectrum analyzer settings. VBW = 1MHz, VBW≥RBW; Span = 0; Sweep Time = 5s; Detector function = peak; 4. Measure and record the results in the test report.
Test setup:	
Test Mode:	Transmitting Mode
Test results:	PASS

6.4.2. Test Instruments

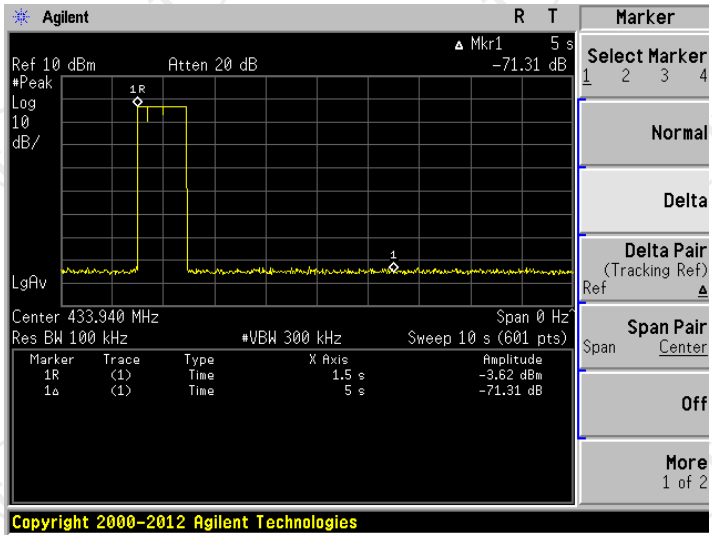
RF Test Room				
Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum Analyzer	Agilent	N9020A	MY49100060	Sep. 27, 2018

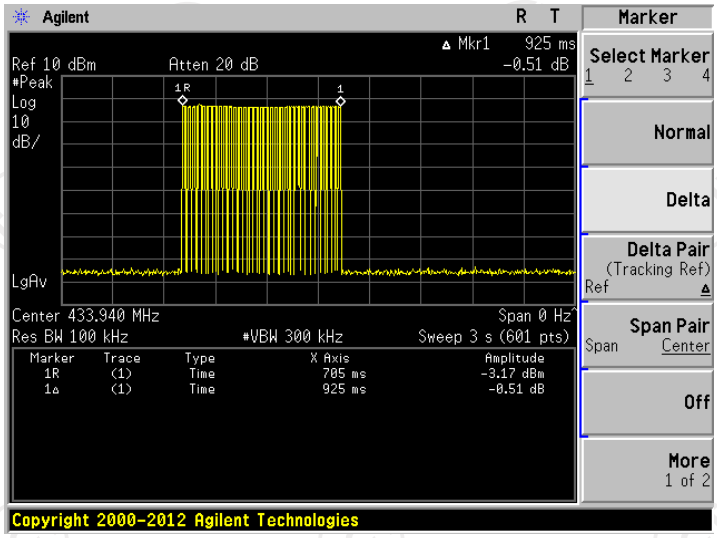
Note: *The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).*

6.4.3. Test data

Test Channel (MHz)	Manually Activated Transmitter (s)	Limit (s)	Conclusion
433.94	0.925	5	PASS

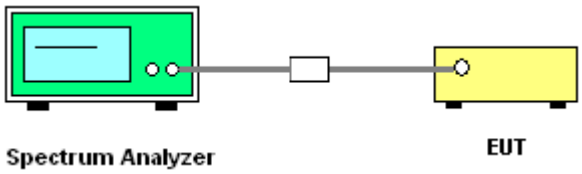
Test plots as follows:





6.5. Occupied Bandwidth

6.5.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.215(c)
Test Method:	ANSI C63.10: 2013
Limit:	According to 15.231(c), The bandwidth of the emission shall be no wider than 0.25% of the centre 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 centre frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.
	1. According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT. 2. Set to the maximum power setting and enable the EUT transmit continuously. 3. Use the following spectrum analyzer settings for 20dB Bandwidth measurement. Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel; RBW≥ 1% of the 20 dB bandwidth; VBW≥RBW; Sweep = auto; Detector function = peak; Trace = max hold. 4. Measure and record the results in the test report.
Test setup:	
Test Mode:	Transmitting Mode
Test results:	PASS

6.5.2. Test Instruments

RF Test Room				
Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum Analyzer	Agilent	N9020A	MY49100060	Sep. 27, 2018

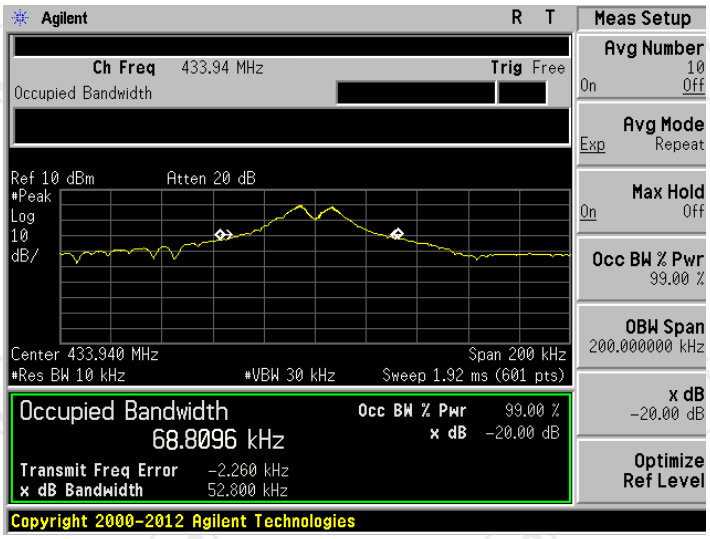
Note: *The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).*

6.5.3. Test data

Test Channel (MHz)	20dB Occupy Bandwidth (kHz)	Limit (kHz)	Conclusion
433.94	52.8	1084.8	PASS

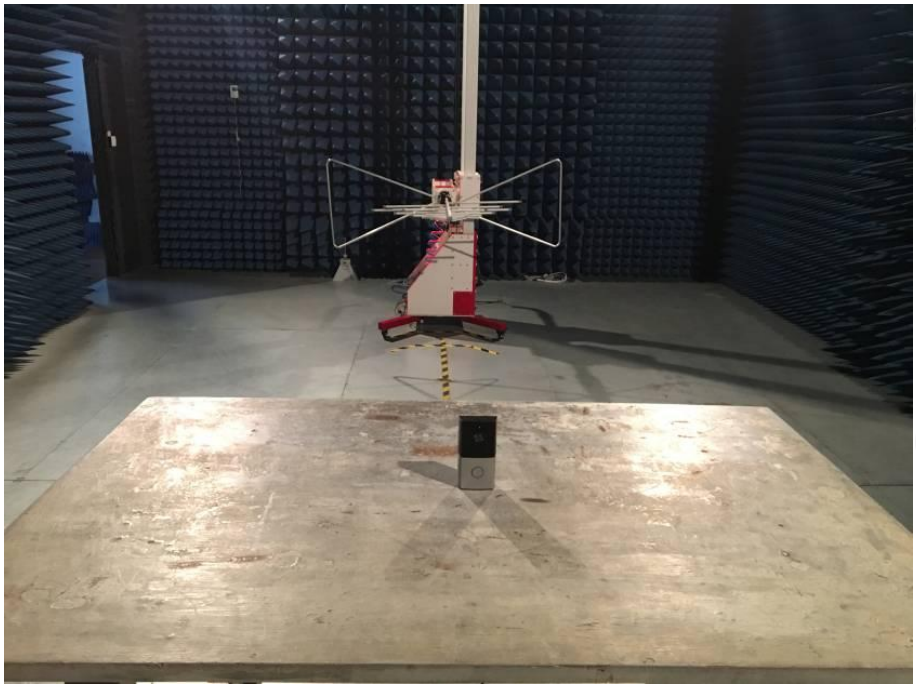
Note: *Limit = 433.92MHz *0.25% = 1084.8 kHz*

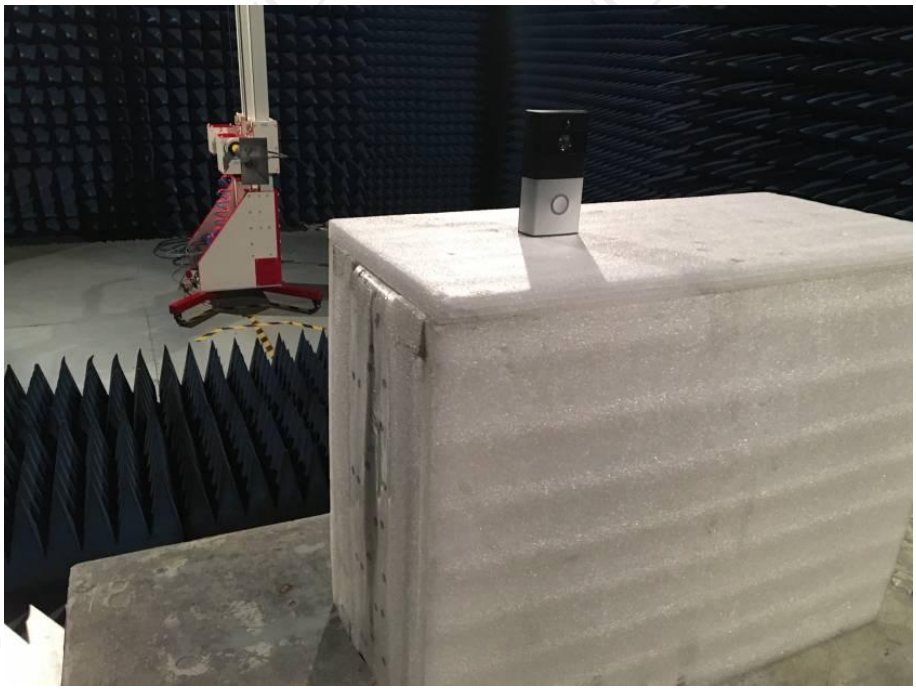
Test plots as follows:



Appendix A: Photographs of Test Setup

Radiated Emission





CE

Appendix B: Photographs of EUT
Model: L1
External Photos

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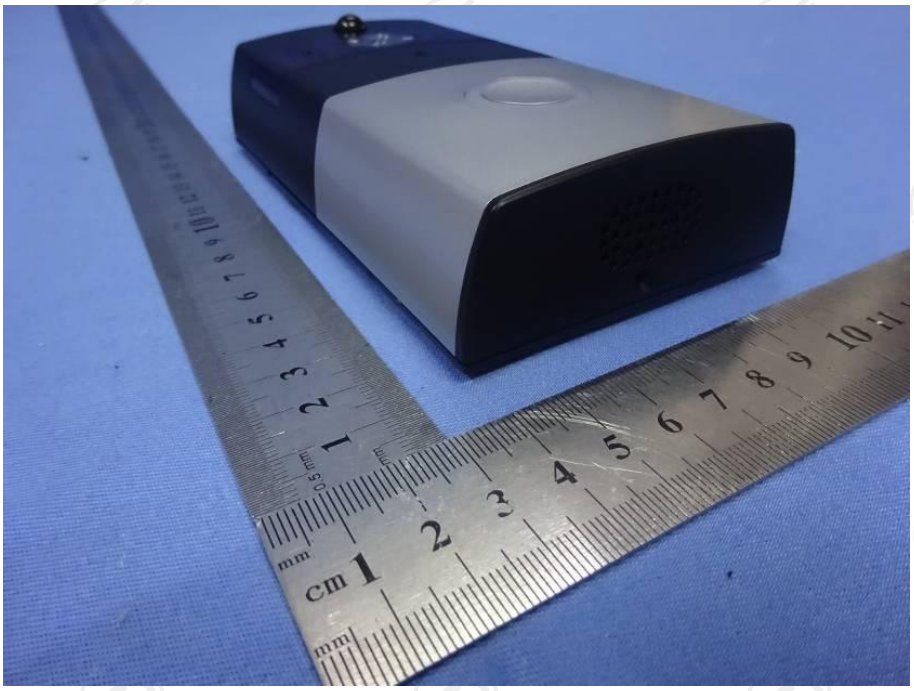
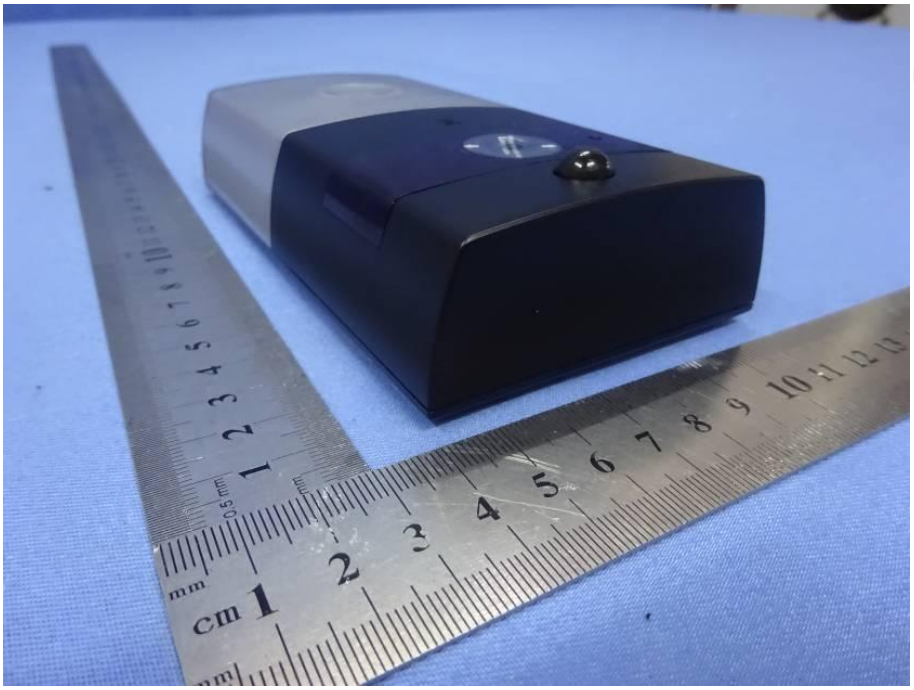
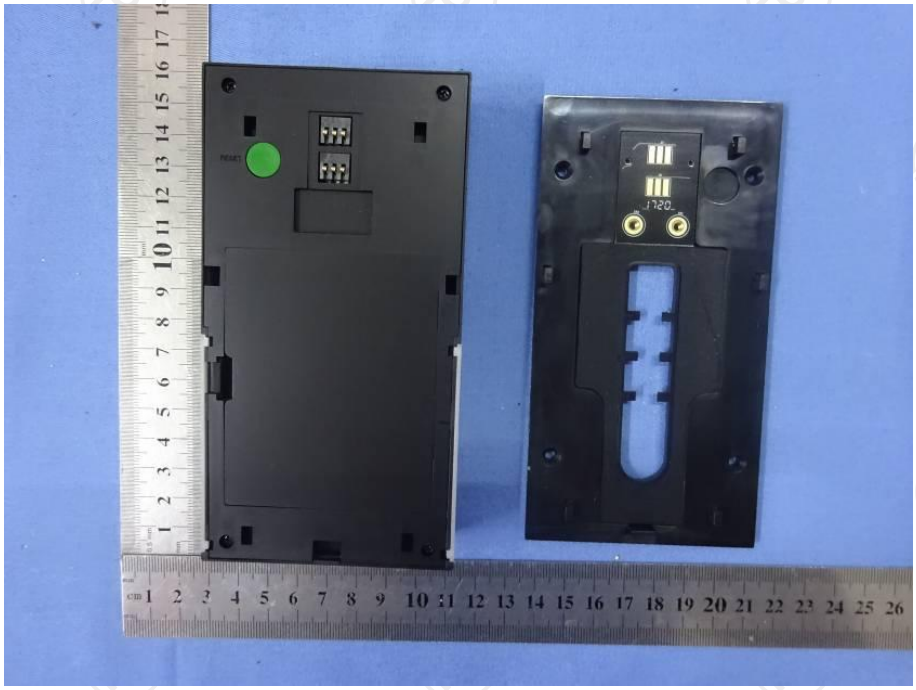
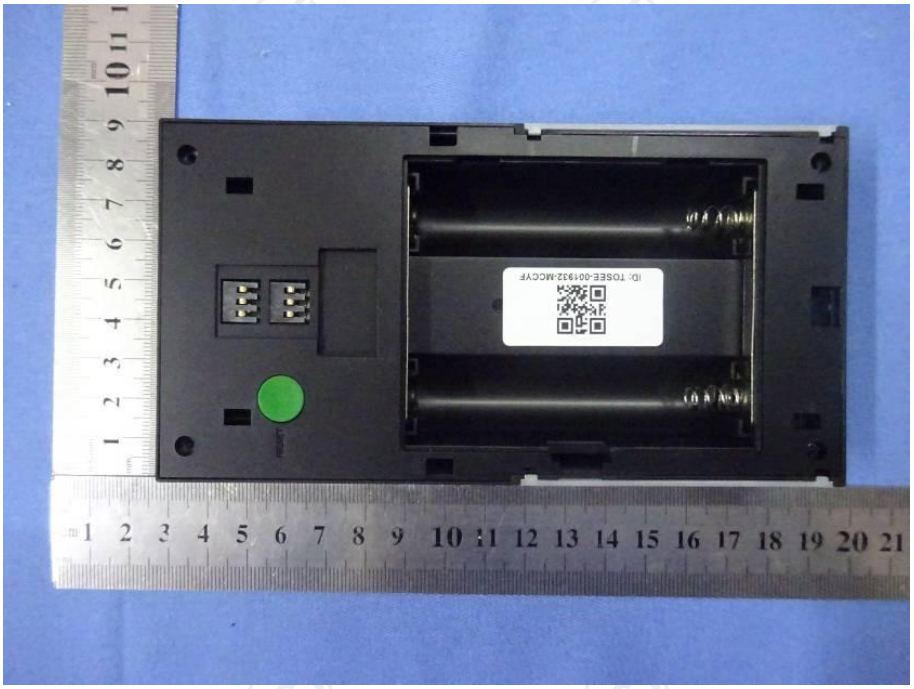




Model: L1
Internal Photos





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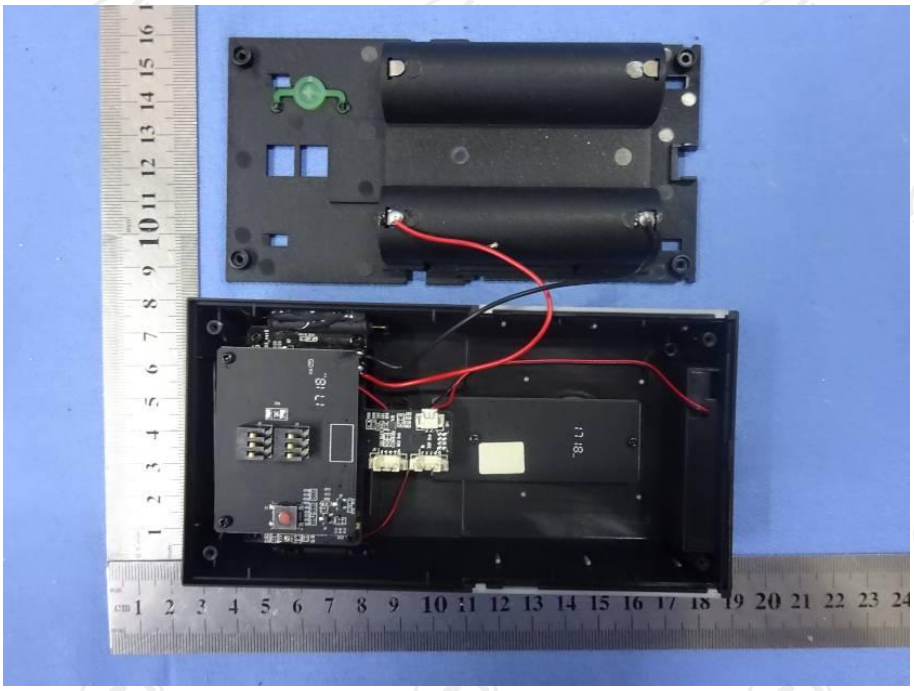
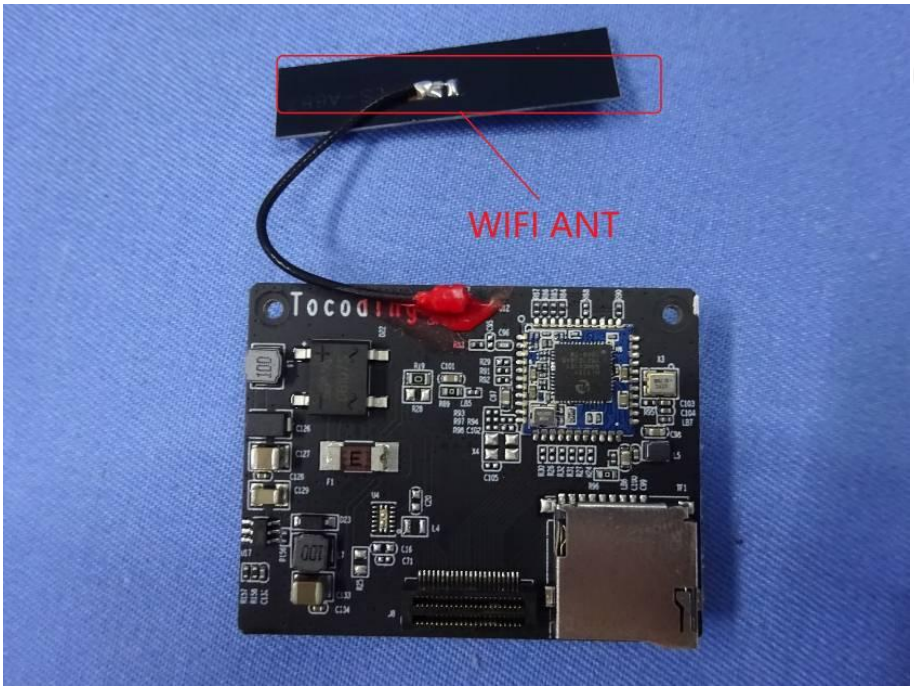
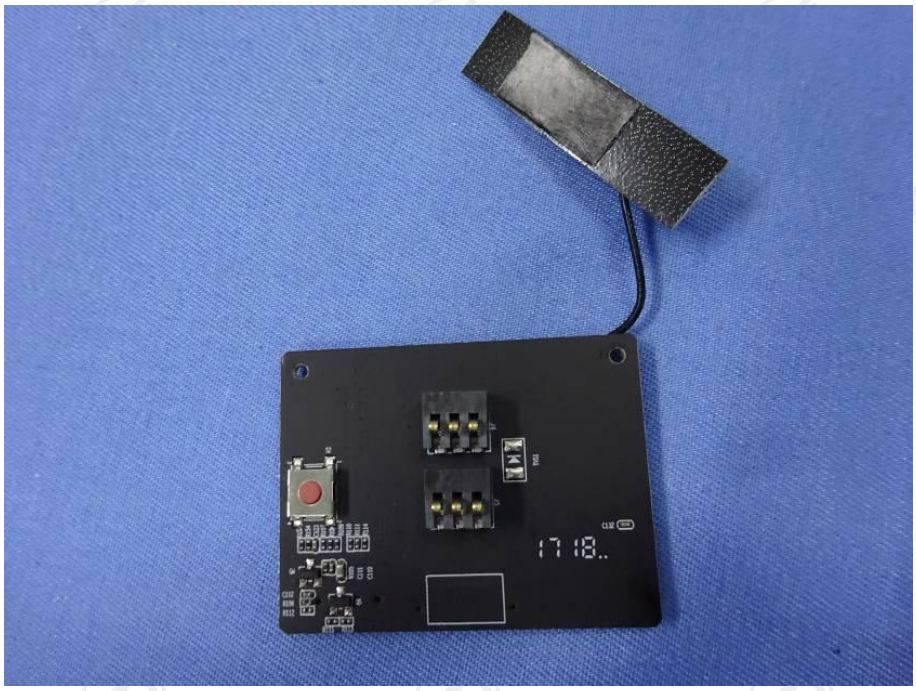
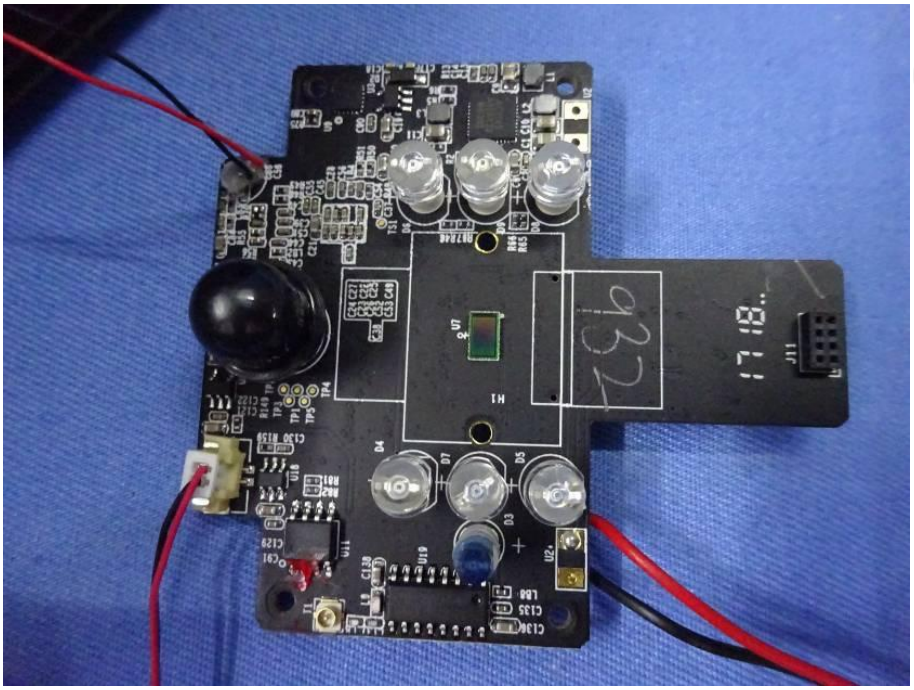



WIFI ANT





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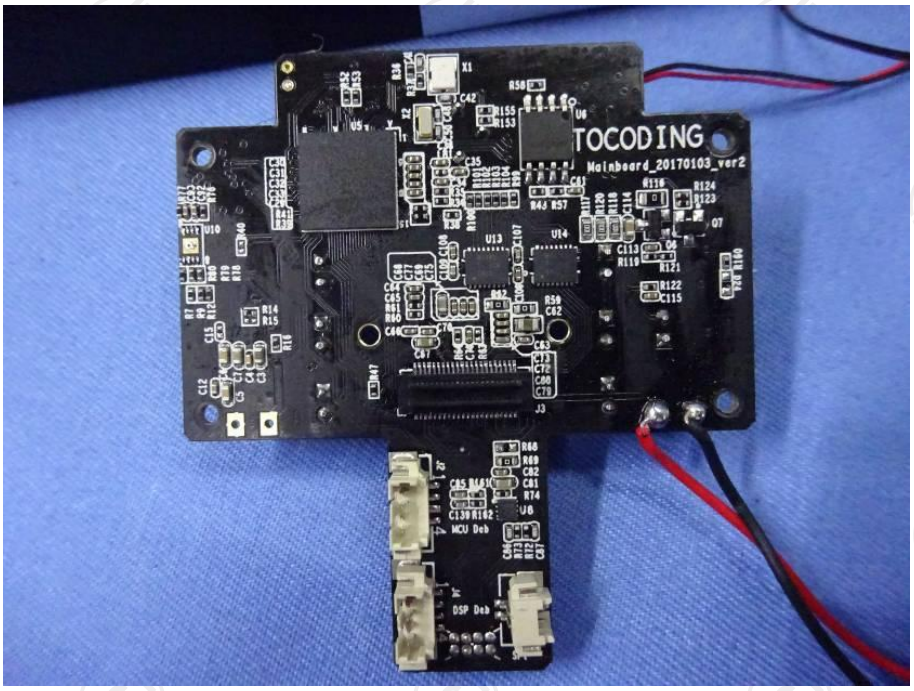
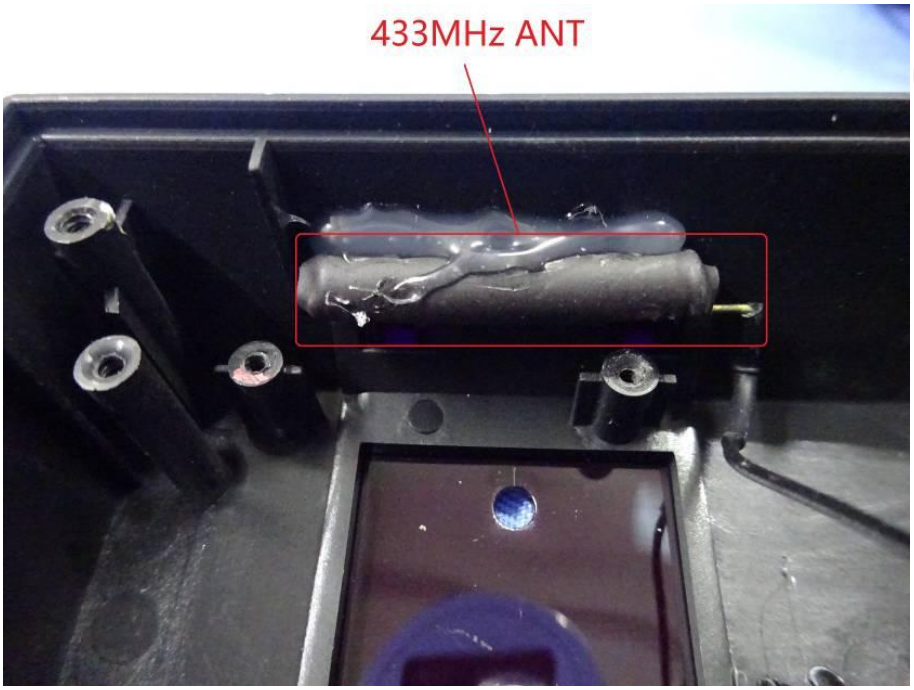
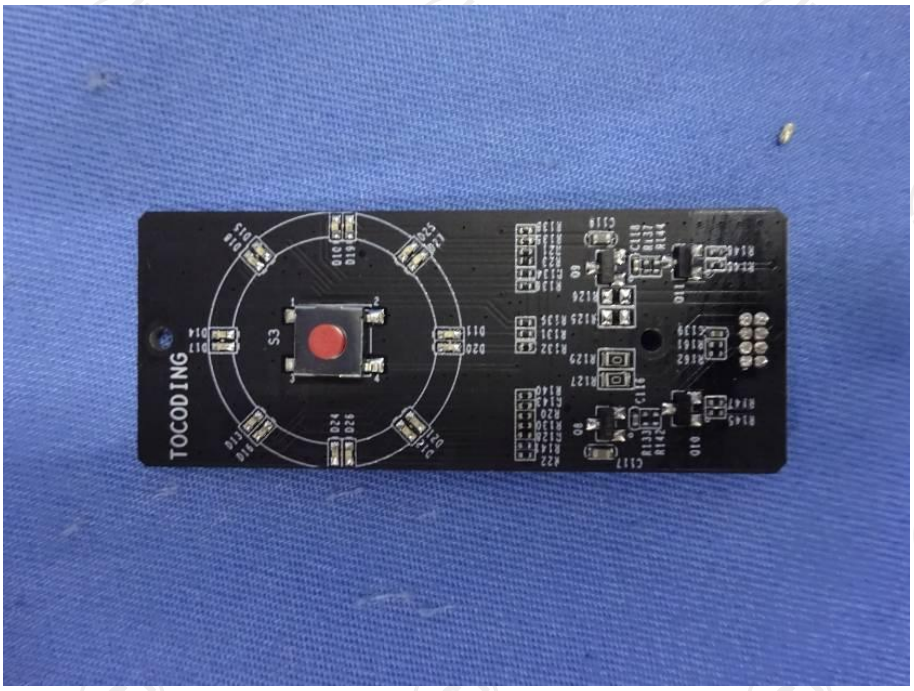
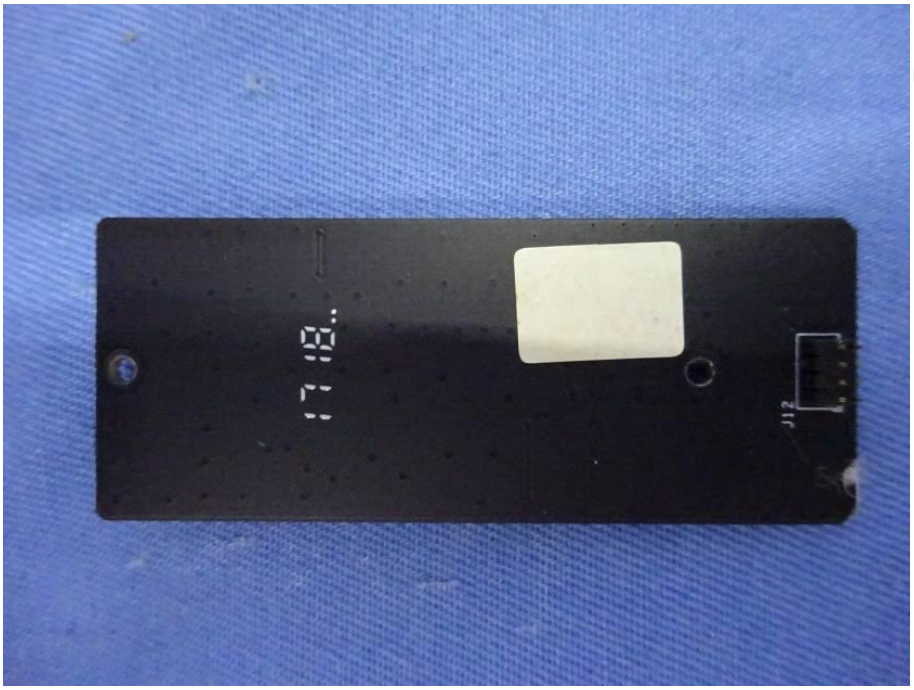

TOCODING
Mainboard_20170103_ver2


433MHz ANT





********END OF REPORT********