

FCC

EMC

TEST REPORT

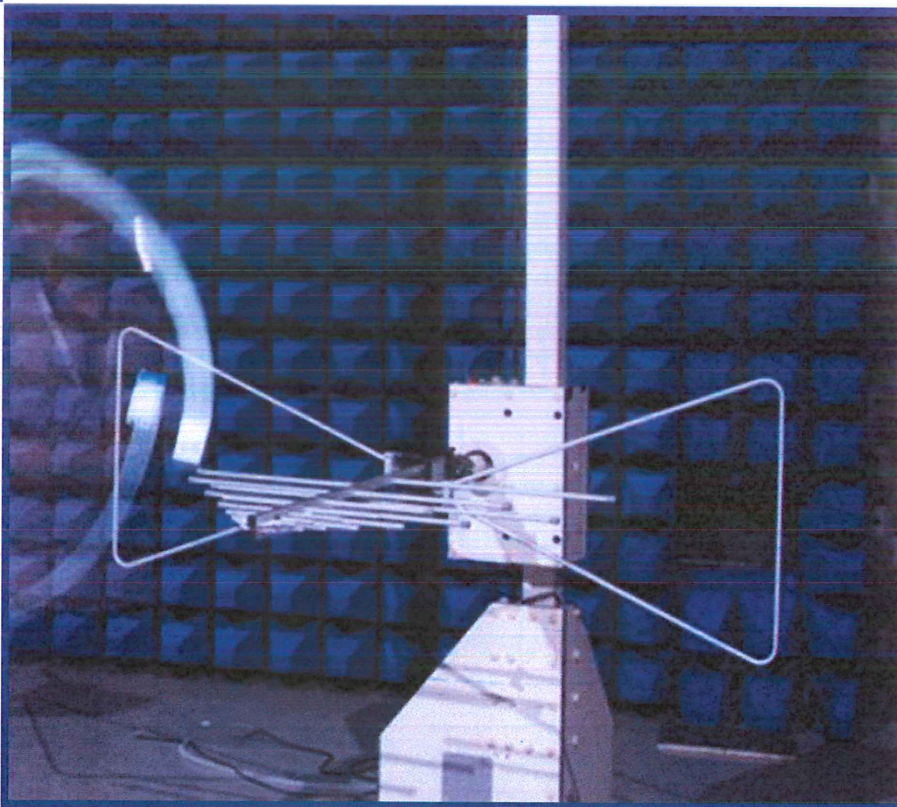
ISSUED BY
Shenzhen BALUN Technology Co., Ltd.



FOR
EdgeCam 2

ISSUED TO
Shenzhen Jimi IOT Co., Ltd

4/F, Building C, Gaoxinqi Industrial Park, Liuxian 1st Road, No.67
Xin'an Street, Bao'an District, Shenzhen, China



Tested by: Xiong Chong
Xiong Chong

Date: Aug. 21, 2020

Approved by: [Signature]
Wei Yanduan
(Chief Engineer)

Date: Aug. 21, 2020

Report No.: BL-SZ2060878-401

EUT Name: EdgeCam 2

Model Name: JC400 (refer section 2.4)

Brand Name: JIMI

Test Standard: 47 CFR Part 15 Subpart B

FCC ID: 2AMLF-JC400

Test Conclusion: Pass

Test Date: Jun. 28, 2020 ~ Jul. 07, 2020

Date of Issue: Aug. 21, 2020

NOTE: This test report of test results only related to testing samples, which can be duplicated completely for the legal use with the approval of the applicant; it shall not be reproduced except in full, without the written approval of Shenzhen BALUN Technology Co., Ltd. Any objections should be raised within thirty days from the date of issue. To validate the report, please contact us.

Revision History

Version	Issue Date	Revisions Content
<u>Rev. 01</u>	<u>Aug. 21, 2020</u>	<u>Initial Issue</u>

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1 GENERAL INFORMATION

1.1 Identification of the Testing Laboratory

Company Name	Shenzhen BALUN Technology Co.,Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Phone Number	+86 755 6685 0100
Fax Number	+86 755 6182 4271

1.2 Identification of the Responsible Testing Location

Test Location	Shenzhen BALUN Technology Co.,Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Accreditation Certificate	The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 11524A-1. The laboratory is a testing organization accredited by FCC as a accredited testing laboratory. The designation number is CN1196. The laboratory is a testing organization accredited by American Association for Laboratory Accreditation(A2LA) according to ISO/IEC 17025.The accreditation certificate is 4344.01. The laboratory is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L6791.
Description	All measurement facilities used to collect the measurement data are located at Block B, FL 1, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China 518055

1.3 Laboratory Condition

Ambient Temperature	20°C to 25°C
Ambient Relative Humidity	45% to 55%
Ambient Pressure	100 kPa to 102 kPa

1.4 Announce

- (1) The test report refer to the BALUN report mode v6.8.
- (2) The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.
- (3) The test report is invalid if there is any evidence and/or falsification.
- (4) The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein.
- (5) This document may not be altered or revised in any way unless done so by BALUN and all revisions are duly noted in the revisions section.
- (6) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.
- (7) The laboratory is only responsible for the data released by the laboratory, except for the part provided by the applicant.

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	Shenzhen Jimi IOT Co., Ltd
Address	4/F, Building C, Gaoxinqi Industrial Park, Liuxian 1st Road, No.67 Xin'an Street, Bao'an District, Shenzhen, China

2.2 Manufacturer Information

Manufacturer	Shenzhen Jimi IOT Co., Ltd
Address	4/F, Building C, Gaoxinqi Industrial Park, Liuxian 1st Road, No.67 Xin'an Street, Bao'an District, Shenzhen, China

2.3 Factory Information

Factory	Huizhou City Jimi Zhizao Technology Co., Ltd.
Address	2Floor, No.12 Factory, Songyang Road, Zhongkai Hi-tech Zone, Huizhou City, Guangdong Province, China

2.4 General Description for Equipment under Test (EUT)

EUT Name		EdgeCam 2
Model Name Under Test		JC400
Series Model Name		JC400D, JC400P, JC400S, JC400U, JC400M, JC400B, JC400N, JC400E, JC400F, JC400H, JC400G, JC400X, JC400Y, JC400Z , JM400
Description of Model name differentiation		The difference of different models of JC400 series lies in the subcamera, wherein the subcamera for JC400, JC400U, JC400M, JC400B, JC400N, JC400E, JC400F, is a remote AHD camera; for JC400D, JC400U, JC400H, JC400G, JM400 is a DMS camera; for JC400P, JC400X, JC400Y, JC400Z and JC400S is built-in. The PCB and the material used are the same.
Hardware Version		KM854101_MAIN_V4.1
Software Version	Version A	KMC28_JC400_V1.0_191104_EN_CE
	Version B	KMC28B_JC400_V1.0_191104_EN_CE
Dimensions (Approx.)		N/A
Weight (Approx.)		N/A
Note: Based on client request, all model were tested, but report contains only the worst test data. JC400 is the worst.		

2.5 Ancillary Equipment

Ancillary Equipment 1	Antenna
Ancillary Equipment 2	Power Line
Ancillary Equipment 3	Power Bank
Ancillary Equipment 4	Power Cable
Ancillary Equipment 5	4-Pin Relay
Ancillary Equipment 6	Accessory Camera

2.6 Technical Information

Network and Wireless connectivity	2G Network GSM/GPRS/EGPRS 850/1900 MHz 3G Network WCDMA/HSDPA/HSUPA Band 2/4/5 4G Network FDD LTE Band 2/4/5/7/12/17 TDD LTE Band 38/41 Bluetooth, WIFI, GPS
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The requirement for the following technical information of the EUT was tested in this report:

The Highest Speed of Processor	1.4 GHz
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3 SUMMARY OF TEST RESULTS

3.1 Test Standards

No.	Identity	Document Title
1	FCC 47 CFR Part 15 Subpart B (10-1-18 Edition)	Unintentional Radiators
2	ANSI C63.4-2014	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low- Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

3.2 Verdict

No.	Description	FCC Rule	Test Verdict	Result
1	Radiated Emission	15.109	Pass	Annex A .1
2	Conducted Emission, AC Ports	15.107	N/A	Annex A .2
Note: The EUT is used in Vehicle environment.				

3.3 Test Uncertainty

The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Measurement	Value
Conducted emissions (9 kHz-30 MHz)	2.96 dB
Radiated emissions (30 MHz-1 GHz)	3.66 dB
Radiated emissions (1 GHz-18 GHz)	5.57 dB
Radiated emissions (18 GHz-40 GHz)	6.12 dB

4 GENERAL TEST CONFIGURATIONS

4.1 Test Environments

Environment Parameter	Selected Values During Tests			
	Temperature	Voltage	Relative Humidity	Ambient Pressure
Normal Temperature, Normal Voltage (NTNV)	23°C to 25°C	DC 12 V from Vehicle Battery	50% to 55%	100 kPa to 102 kPa

4.2 Test Equipment List

Radiated Emission Test For Frequency Below 1 GHz (10 m)						
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due	Use
EMI Receiver	ROHDE&SCHWARZ	ESRP	101036	2020.06.09	2021.06.08	☐
Test Antenna-Bi-Log	SCHWARZBECK	VULB 9168	9168-0883	2020.05.11	2022.05.10	☐
Anechoic Chamber	EMC Electronic Co., Ltd	20.10*11.60*7.35m	N/A	2018.08.08	2021.08.07	☐
Test Software	BALUN	BL410_E	V19.918	--	--	☐

Radiated Emission Test For Frequency Below 1 GHz (3 m)						
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due	Use
EMI Receiver	KEYSIGHT	N9038A	MY53220118	2019.10.29	2020.10.28	☒
Test Antenna-Bi-Log	SCHWARZBECK	VULB 9163	9163-624	2018.08.22	2020.08.21	☒
Test Antenna-Horn	SCHWARZBECK	BBHA 9120D	9120D-1600	2018.07.12	2020.07.11	☐
Anechoic Chamber	YIHENG	9m*6m*6m	N/A	2018.07.18	2021.07.27	☒
Test Software	BALUN	BL410_E	V19.918	--	--	☒

Radiated Emission Test For Frequency Above 1 GHz						
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due	Use
EMI Receiver	KEYSIGHT	N9038A	MY53220118	2019.10.29	2020.10.28	☒
Spectrum Analyzer	ROHDE&SCHWARZ	FSV-40	101544	2020.02.19	2021.02.18	☒
Test Antenna-Horn	SCHWARZBECK	BBHA 9120D	9120D-1148	2018.07.12	2020.07.11	☒
Test Antenna-Horn	A-INFO	BBHA 9120D	LB-180400KF	2019.01.06	2021.01.05	☒
Anechoic Chamber	YIHENG	9m*6m*6m	N/A	2018.07.18	2021.07.17	☒
Test Software	BALUN	BL410_E	V19.918	--	--	☒

Conducted disturbance Test						
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due	Use
EMI Receiver	KEYSIGHT	N9010B	MY5711030 9	2020.06.09	2021.06.08	☐
LISN	SCHWARZBECK	NSLK 8127	8127-687	2020.06.09	2021.06.08	☐
Shielded Enclosure	YiHeng Electronic Co., Ltd	3.4m*3.1m*2 .8m	N/A	2018.08.16	2021.08.15	☐
Test Software	BALUN	BL410_E	V19.918	--	--	☐

4.3 Test Enclosure list

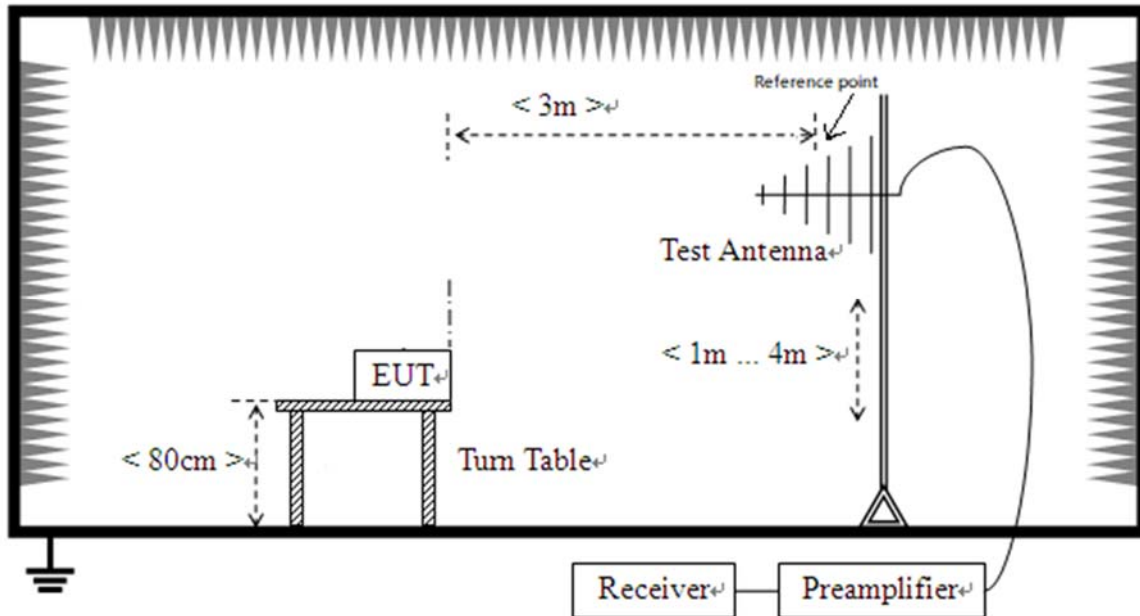
Description	Manufacturer	Model	Serial No.	Length	Description	Use
Vehicle Battery	N/A	N/A	N/A	N/A	DC12V	☒

4.4 Test Configurations

Test Configurations (TC) No.	Description
TC01	<u>The Working Test Mode</u> EUT + Power Line + Power Bank + Antenna + Accessory Camera + Vehicle Battery

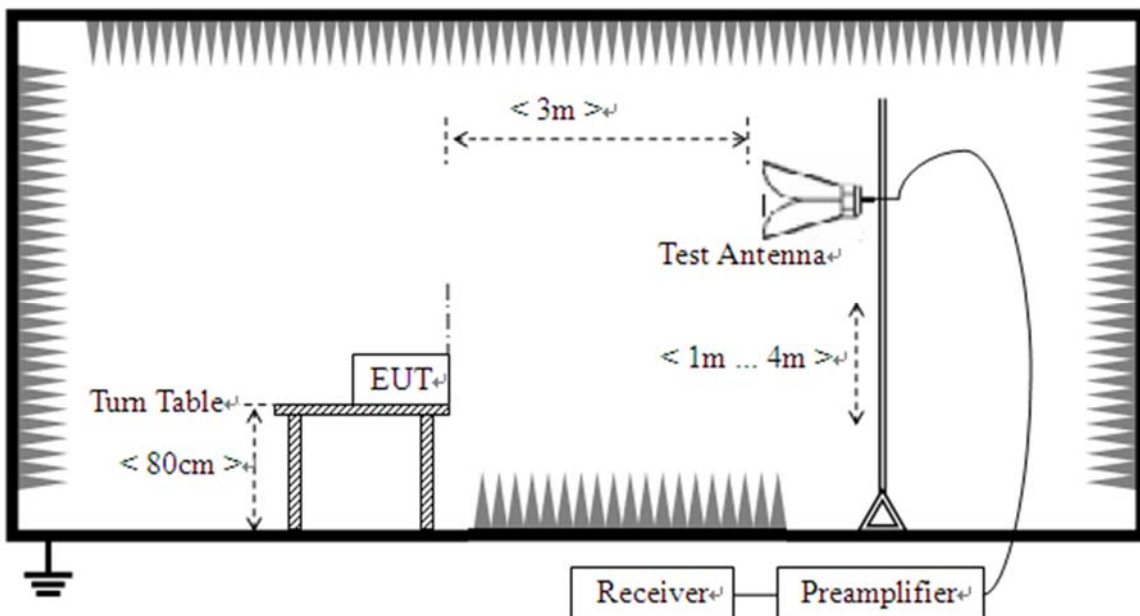
4.5 Test Setups

Test Setup 1



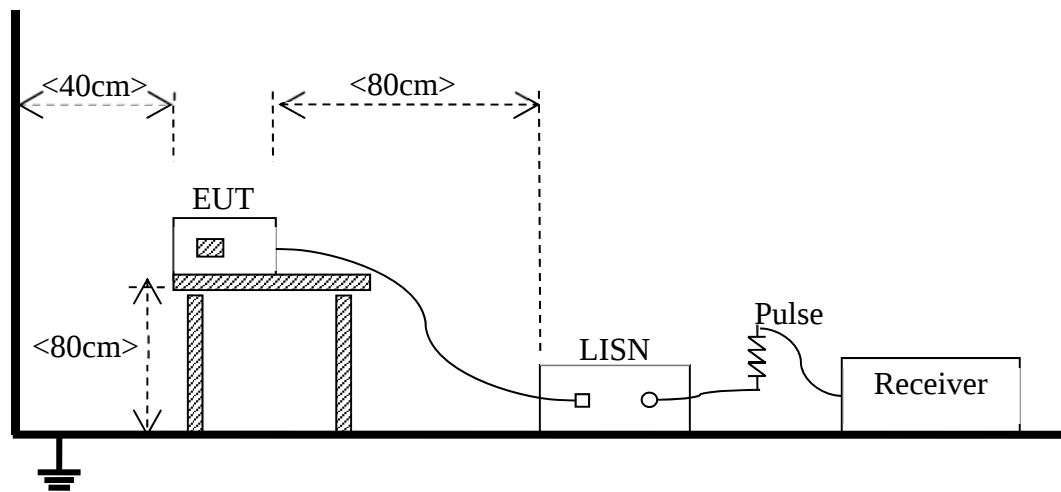
(For Radiated Emission Test (30 MHz-1 GHz))

Test Setup 2



(For Radiated Emission Test (above 1 GHz))

Test Setup 3



(For Conducted Emission, AC Ports Test)

4.6 Test Conditions

Test Case	Test Conditions	
Radiated Emission	Test Env.	NTNV
	Test Setup	Test Setup 1&2
	Test Configuration	TC01 Note
Note: Based on client request, all normal using modes of the normal function were tested but only the worst test data of the worst mode is reported by this report. The Working Test Mode is the worst mode in this report.		

5 TEST ITEMS

5.1 Emission Tests

5.1.1 Radiated Emission

5.1.1.1 Limit

Frequency range (MHz)	Class B (at 3 m)		Class B (at 10 m)	Class A (at 10 m)	
	Field Strength ($\mu\text{V/m}$)	Field Strength (dB $\mu\text{V/m}$)	Field Strength (dB $\mu\text{V/m}$)	Field Strength ($\mu\text{V/m}$)	Field Strength (dB $\mu\text{V/m}$)
30 - 88	100	40	30	90	39
88 - 216	150	43.5	33.5	150	43.5
216 - 960	200	46	36	210	46.4
Above 960	500	54	44	300	49.5

NOTE:

- 1) Field Strength (dB $\mu\text{V/m}$) = $20 \times \log [\text{Field Strength } (\mu\text{V/m})]$.
- 2) In the emission tables above, the tighter limit applies at the band edges.

5.1.1.2 Test Setup

Refer to 4.5 section (test setup 1 to test setup 2) for radiated emission test, the photo of test setup please refer to ANNEX B.

5.1.1.3 Test Procedure

All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

An initial pre-scan was performed in the chamber using the EMI Receiver in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by Bi-Log antenna with 2 orthogonal polarities.

5.1.1.4 Test Result

Please refer to ANNEX A.1.

NOTE:

1. Results (dB $\mu\text{V/m}$) = Reading (dB μV) + Factor (dB/m)

The reading level is calculated by software which is not shown in the sheet

2. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Amplifier Gain (dB)

3. Over limit = Results – Limit.

5.1.2 Conducted Emission

5.1.2.1 Test Limit

Frequency range (MHz)	Class A	
	Quasi-peak (dBμV)	Average (dBμV)
0.15 - 0.50	79	66
0.50 - 30	73	60

Frequency range (MHz)	Class B	
	Quasi-peak (dBμV)	Average (dBμV)
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50

NOTE:

- 1) The lower limit shall apply at the band edges.
- 2) The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50 MHz.

5.1.2.2 Test Setup

Refer to 4.5 section test (test setup 3) for conducted emission, the photo of test setup please refer to ANNEX B.

5.1.2.3 Test Procedure

The EUT is connected to the power mains through a LISN which provides 50 Ω/50 μH of coupling impedance for the measuring instrument. The test frequency range is from 150 kHz to 30 MHz. The maximum conducted interference is searched using Peak (PK), Quasi-peak (QP) and Average (AV) detectors; the emission levels that are more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed.

Devices subject to Part 15 must be tested for all available U.S. voltages and frequencies (such as a nominal 120 VAC, 50/60 Hz and 240 VAC, 50/60 Hz) for which the device is capable of operation. A device rated for 50/60 Hz operation need not be tested at both frequencies provided the radiated and line conducted emissions are the same at both frequencies.

5.1.2.4 Test Result

Please refer to ANNEX A.2.

NOTE:

1. Results (dBuV/m) = Reading (dBuV) + Factor (dB/m)

The reading level is calculated by software which is not shown in the sheet

2. Factor = Insertion loss + Cable loss

3. Over limit = Results – Limit.

ANNEX A TEST RESULTS

A.1 Radiated Emission

Note 1: The symbol of “--” in the table which means not application.

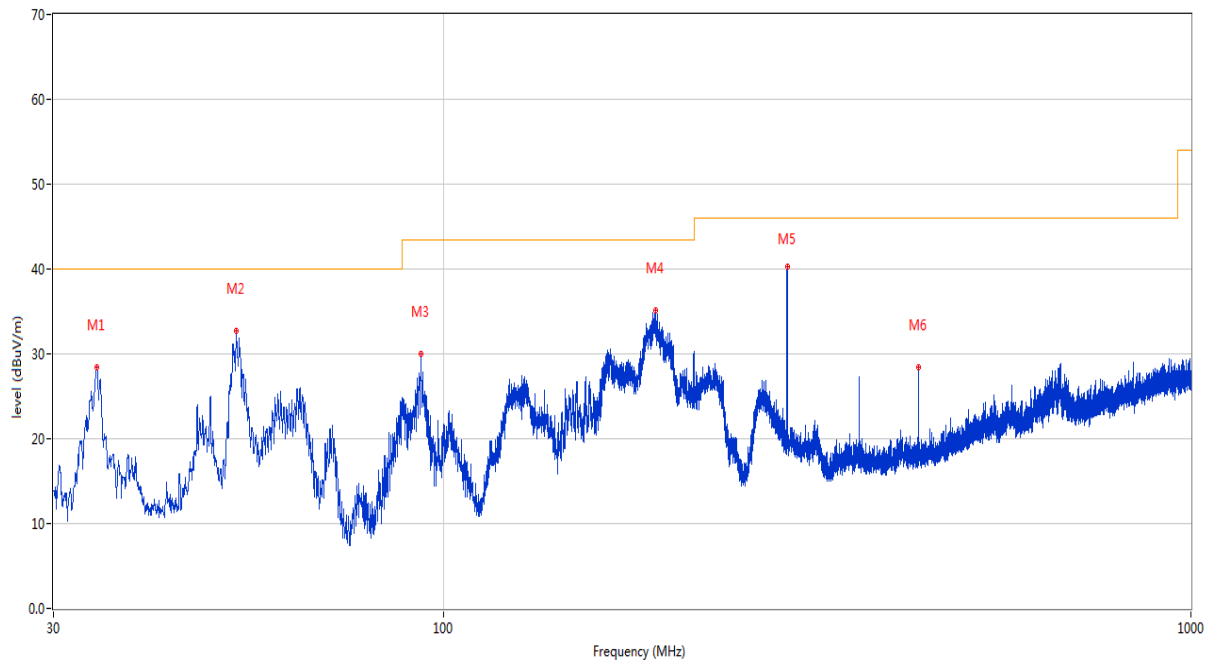
Note 2: For the test data above 1 GHz, according the ANSI C63.4-2014, where limits are specified for both average and peak (or quasi-peak) detector functions, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement.

Note 3: The Radiated Emission from 18G-40G is noise only, do not show on the report.

Test Data and Plots

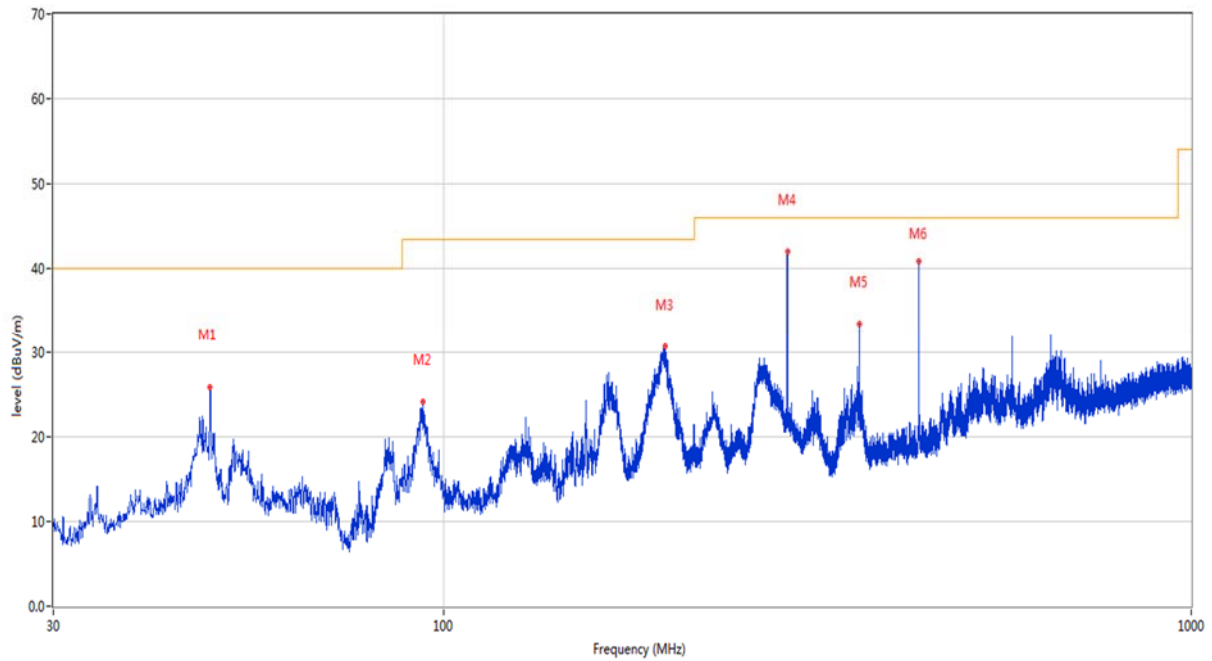
The Working Test Mode

A.1.1 Test Antenna Vertical, 30 MHz – 1 GHz



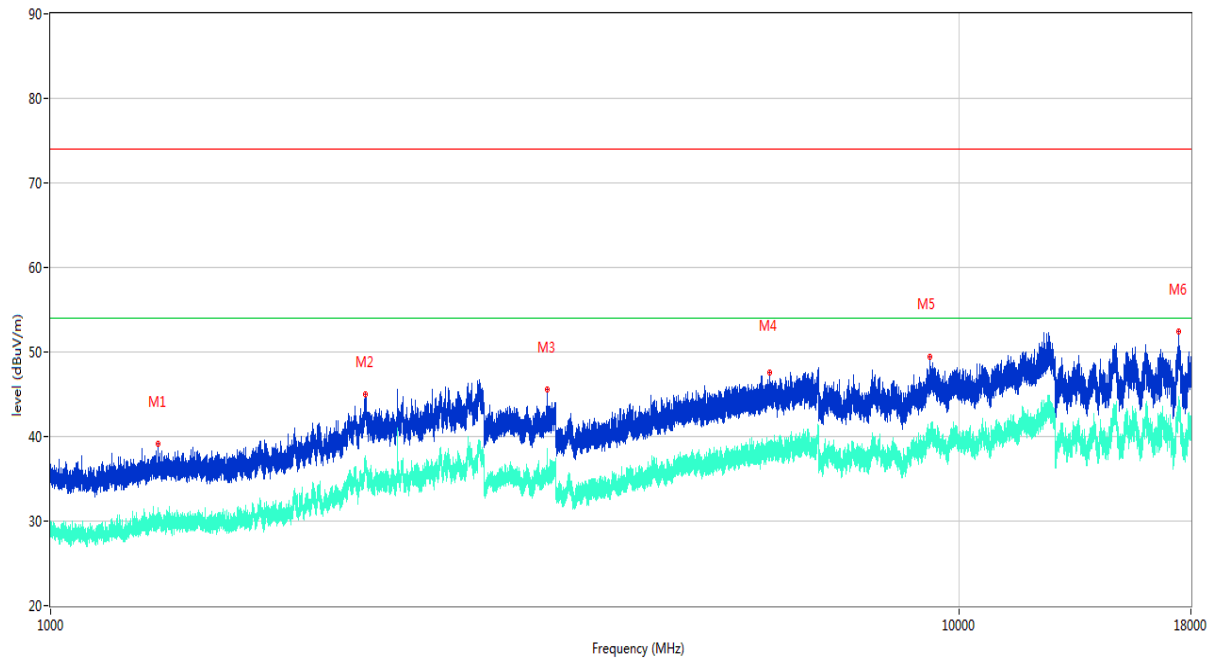
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	34.268	28.43	-25.88	40.0	-11.57	Peak	111.50	100	Vertical	Pass
2	52.698	32.74	-23.05	40.0	-7.26	Peak	344.20	100	Vertical	Pass
3	93.147	29.96	-25.47	43.5	-13.54	Peak	124.30	100	Vertical	Pass
4	191.844	35.18	-25.10	43.5	-8.32	Peak	119.90	100	Vertical	Pass
5	288.020	40.27	-21.98	46.0	-5.73	Peak	268.30	100	Vertical	Pass
6	432.017	28.40	-18.27	46.0	-17.60	Peak	228.50	200	Vertical	Pass

A.1.2 Test Antenna Horizontal, 30 MHz – 1 GHz



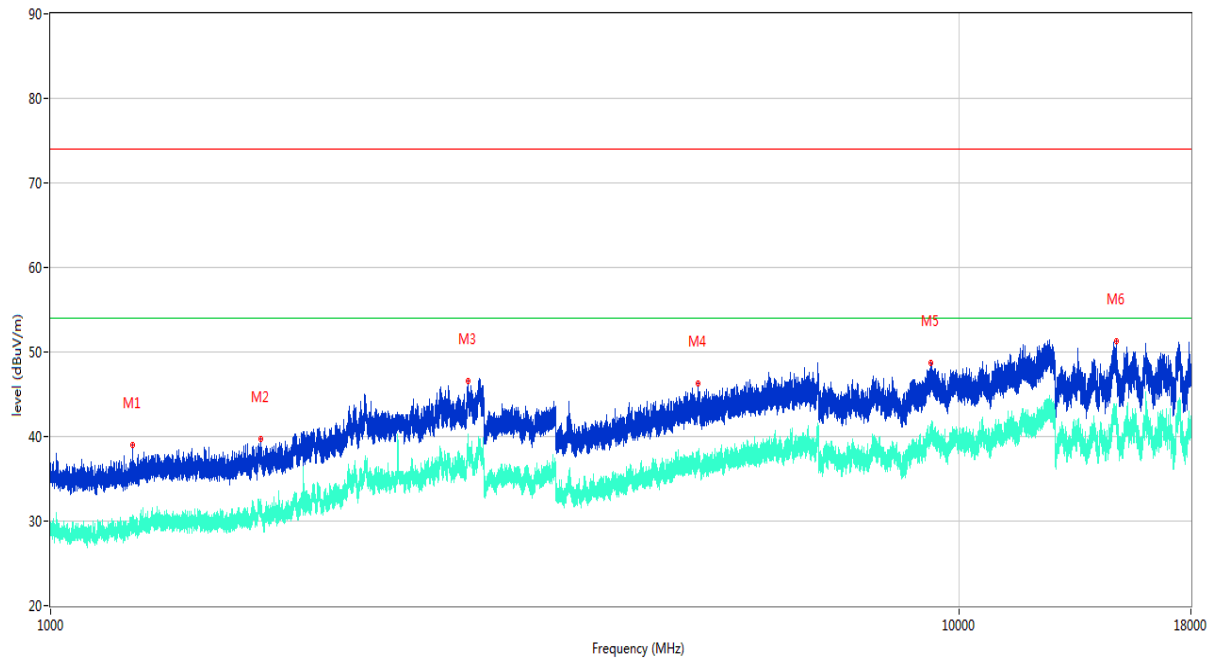
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	48.624	25.92	-22.51	40.0	-14.08	Peak	360.00	200	Horizontal	Pass
2	93.632	24.14	-25.41	43.5	-19.36	Peak	360.00	200	Horizontal	Pass
3	197.956	30.69	-24.19	43.5	-12.81	Peak	360.00	200	Horizontal	Pass
4	288.020	43.19	-21.98	46.0	-3.21	Peak	216.20	100	Horizontal	Pass
5	359.994	33.49	-19.85	46.0	-12.51	Peak	27.30	100	Horizontal	Pass
6	432.017	40.79	-18.27	46.0	-5.21	Peak	165.20	100	Horizontal	Pass

A.1.3 Test Antenna Vertical, 1 GHz – 18 GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1312.000	39.21	-14.93	74.0	-34.79	Peak	356.90	100	Vertical	Pass
1**	1312.000	29.73	-14.93	54.0	-24.27	AV	356.90	100	Vertical	Pass
2	2222.800	45.02	-8.43	74.0	-28.98	Peak	303.10	100	Vertical	Pass
2**	2222.800	37.37	-8.43	54.0	-16.63	AV	303.10	100	Vertical	Pass
3	3519.600	45.57	-6.98	74.0	-28.43	Peak	159.50	100	Vertical	Pass
3**	3519.600	37.12	-6.98	54.0	-16.88	AV	159.50	100	Vertical	Pass
4	6184.000	47.52	-2.30	74.0	-26.48	Peak	0.00	100	Vertical	Pass
4**	6184.000	39.35	-2.30	54.0	-14.65	AV	0.00	100	Vertical	Pass
5	9293.100	49.42	19.89	74.0	-24.58	Peak	124.70	100	Vertical	Pass
5**	9293.100	39.61	19.89	54.0	-14.39	AV	124.70	100	Vertical	Pass
6	17454.262	52.40	26.35	74.0	-21.60	Peak	89.50	100	Vertical	Pass
6**	17454.262	43.41	26.35	54.0	-10.59	AV	89.50	100	Vertical	Pass

A.1.4 Test Antenna Horizontal, 1 GHz – 18 GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1231.700	39.01	-15.58	74.0	-34.99	Peak	134.60	100	Horizontal	Pass
1**	1231.700	29.86	-15.58	54.0	-24.14	AV	134.60	100	Horizontal	Pass
2	1705.000	39.67	-14.18	74.0	-34.33	Peak	337.70	100	Horizontal	Pass
2**	1705.000	31.65	-14.18	54.0	-22.35	AV	337.70	100	Horizontal	Pass
3	2883.400	46.60	-6.16	74.0	-27.40	Peak	41.60	100	Horizontal	Pass
3**	2883.400	38.44	-6.16	54.0	-15.56	AV	41.60	100	Horizontal	Pass
4	5164.400	46.22	-2.73	74.0	-27.78	Peak	314.60	100	Horizontal	Pass
4**	5164.400	37.01	-2.73	54.0	-16.99	AV	314.60	100	Horizontal	Pass
5	9311.787	48.77	20.17	74.0	-25.23	Peak	302.40	100	Horizontal	Pass
5**	9311.787	39.56	20.17	54.0	-14.44	AV	302.40	100	Horizontal	Pass
6	14887.537	51.22	24.97	74.0	-22.78	Peak	165.30	100	Horizontal	Pass
6**	14887.537	42.95	24.97	54.0	-11.05	AV	165.30	100	Horizontal	Pass

A.2 Conducted Emission

Note: Not applicable.

ANNEX B TEST SETUP PHOTOS

Please refer the document “BL-SZ2060878-AE.PDF”.

ANNEX C EUT EXTERNAL PHOTOS

Please refer the document “BL-SZ2060878-AW.PDF”.

ANNEX D EUT INTERNAL PHOTOS

Please refer the document “BL-SZ2060878-AI.PDF”.

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