

EMC TEST REPORT

Applicant : Shanghai ZoomSmart Technology Co.,Ltd.
Address of Applicant : Room 802 Hengxi Road No.809 Pujiang Town
Minhang district, Shanghai, China
Product Name : Rugged Phone
Model No. : LT600
Standards : 47 CFR Part 15 Subpart B
ANSI C63.4-2014
Date of Receipt : 2019-09-16
Date of Test : 2019-09-23~2019-12-12
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REMARK:

This report details the results of the testing carried out on one sample, the results contained in this report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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1. GENERAL INFORMATION

1.1 Testing Laboratory

Company Name	ICAS Testing Technology Services (Shanghai) Co., Ltd.
Address	1298 Pingan Rd, Minhang District, Shanghai, China
Telephone	0086 21-51682999
Fax	0086 21-54711112
Homepage	www.icasiso.com

1.2 Product Description for Equipment under Test (EUT)

Product Name	Rugged Phone
Brand Name	ZOOMSMART
Model No.	LT600
FCC ID	2AUFL-LT600
Working Voltage	DC 3.85V
Hardware version	A6001_V1.00_PCB
Software version	A6001_V1_00
FCC ID	2AUFL-LT600

2. SUMMARY OF TEST RESULTS

2.1 Test Standards

47 CFR Part 15 Subpart B ICES-003(Issue6,January 2016)		
Rule	Description	Results
§ FCC Part 15.107 § ICES-003 6.1	Conducted Emission	Compliance
§ FCC Part 15.109 § ICES-003 6.1	Radiated Emission	Compliance

No.	Identity	Document Title
1	47 CFR Part 15 Subpart B (10-1-16 Edition)	PART 15—RADIO FREQUENCY DEVICES --Unintentional Radiators
2	ICES-003(Issue6,January 2016)	Information Technology Equipment(Including Digital Apparatus)—Limits and Methods of Measurement
3	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 9kHz to 40GHz

2.2 Test Uncertainty

Measurement	U cispr
Conducted disturbance at mains port (9 kHz to 30 MHz)	1.9 dB
Conducted disturbance at telecommunication port (150 kHz to 30 MHz)	1.9 dB
Radiated disturbance (30 MHz to 1000 MHz)	3.2 dB
Radiated disturbance (1 GHz to 18 GHz)	3.2 dB

Note :
All test items were verified and recorded according to the standards and without any addition/
deviation/exclusion during the test

3. SYSTEM TEST CONFIGURATION

3.1 EUT Test Mode

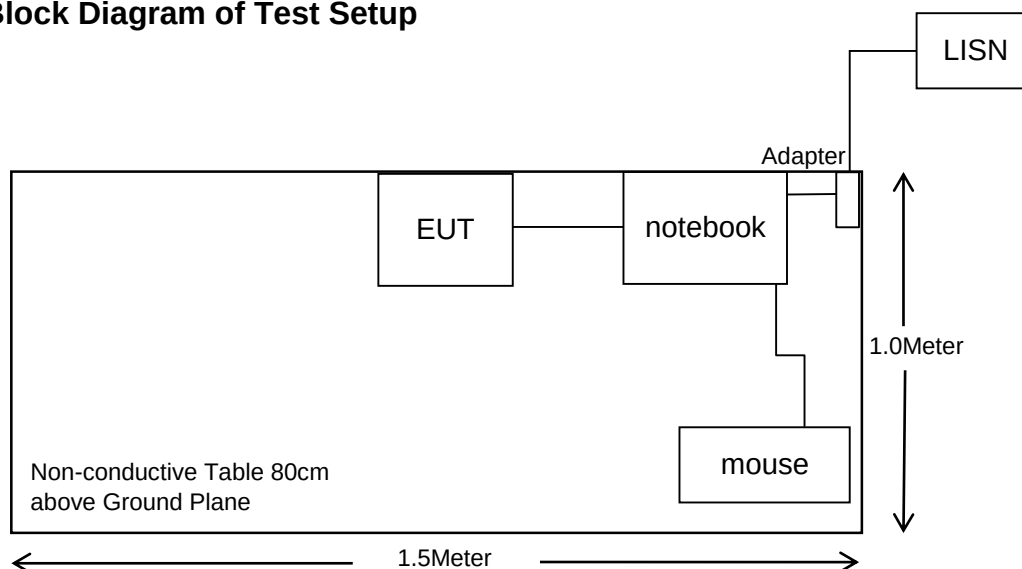
The system was configured for testing in a typical Mode(as normally used by a typical user).

3.2 Support Equipment List and Details of test Equipment

Manufacturer	Description	Model	Serial Number
Dell	Mouse	MS116P	N/A
Laptop	Lenovo	TP00083A	N/A
Manufacturer	Description	Length(m)	I/O Port
N/A	N/A	N/A	N/A

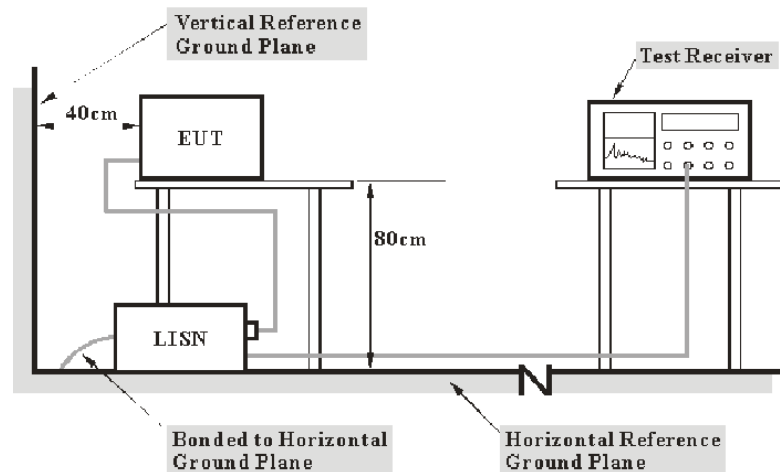
Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESPI3	100173	2019/6/19	2020/6/19
SCHWARZBECK	V-network	NSLK 8127	8127-902	2019/2/20	2020/2/20
R&S	EMI Test Receiver	ESR7	101911	2019/6/19	2020/6/19
Schwarzbeck	Antenna	VULB9163	9163-1037	2019/1/27	2020/1/27
Schwarzbeck	Horn Antenna	BBHA9120D	9120D-1775	2019/7/26	2020/7/26

3.3 Block Diagram of Test Setup



4. 47 CFR Part 15B & ICES-003 § CONDUCTED EMISSION (ANSI C63.4)

4.1 Test System Diagram



Note: 1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

4.2 EMI Test Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz. During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

4.3 Test Equipment List

Manufacturer	Description	Model	Serial Number	Test use
R&S	EMI Test Receiver	ESPI3	100173	☒
TESQ	V-network	NSLK 8127	8127-902	☒

4.4 Test Limit

Frequency Range	Limit	
	Quasi-peak (dB μ V)	Average (dB μ V)
0.15MHz – 0.50MHz	66-56	56-46
0.50MHz – 5MHz	56	46
5MHz – 30MHz	60	50

4.5 Test Procedure

EUT was connected to the outlet of the LISN.
The LISN was bounded to ground.

Measurement was carried out in a stable mode of operation, which means with a stable light output.

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance using all installation combination.

All data was recorded in the Quasi-peak and average detection mode.

Factor & Margin Calculation

The factor is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

Factor = LISN VDF + Cable Loss + Transient Limiter Attenuation

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 3dB means the emission is 3 dB below the limit. The equation for margin calculation is as follows:

Q-peak Level / Average Level = Reading + Factor

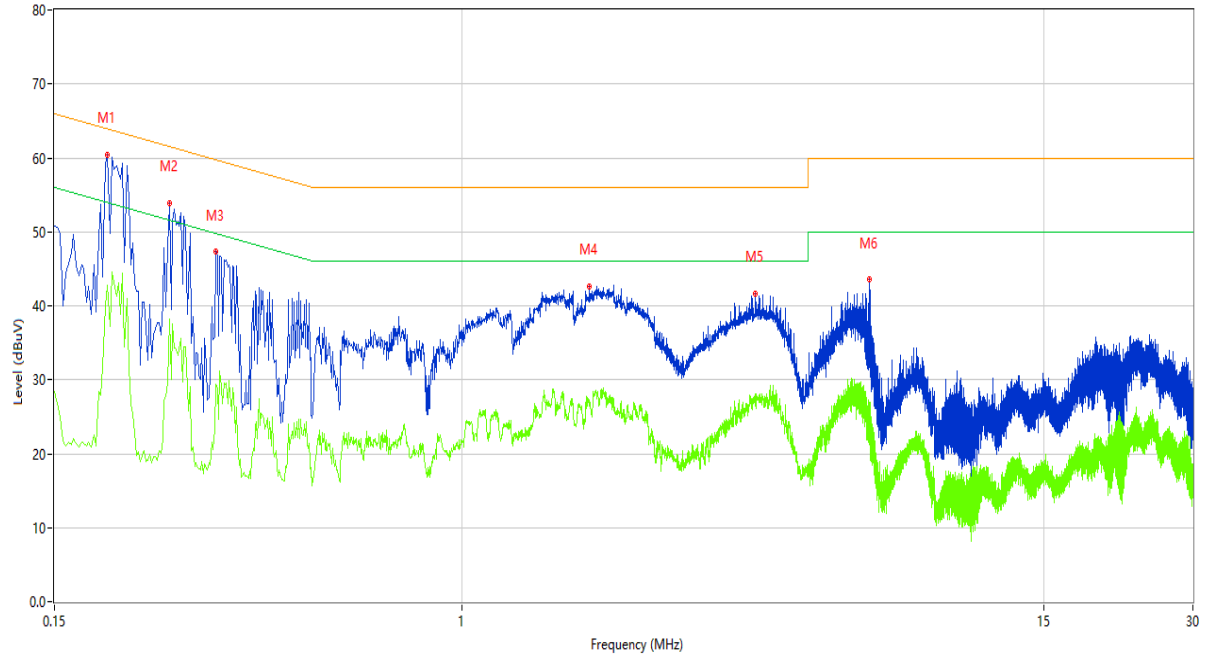
Margin = QP Limit – Q-peak Level or Margin = AV Limit – Average Level

Note : Margin just showing the least value of QP and AV

Frequency (MHz)	Peak Level (dBuV)	Q-peak Level (dBuV)	Average Level (dBuV)	Factor (dB)	QP Limit (dBuV)	AV Limit (dBuV)	Margin (dB)	Line	Verdict
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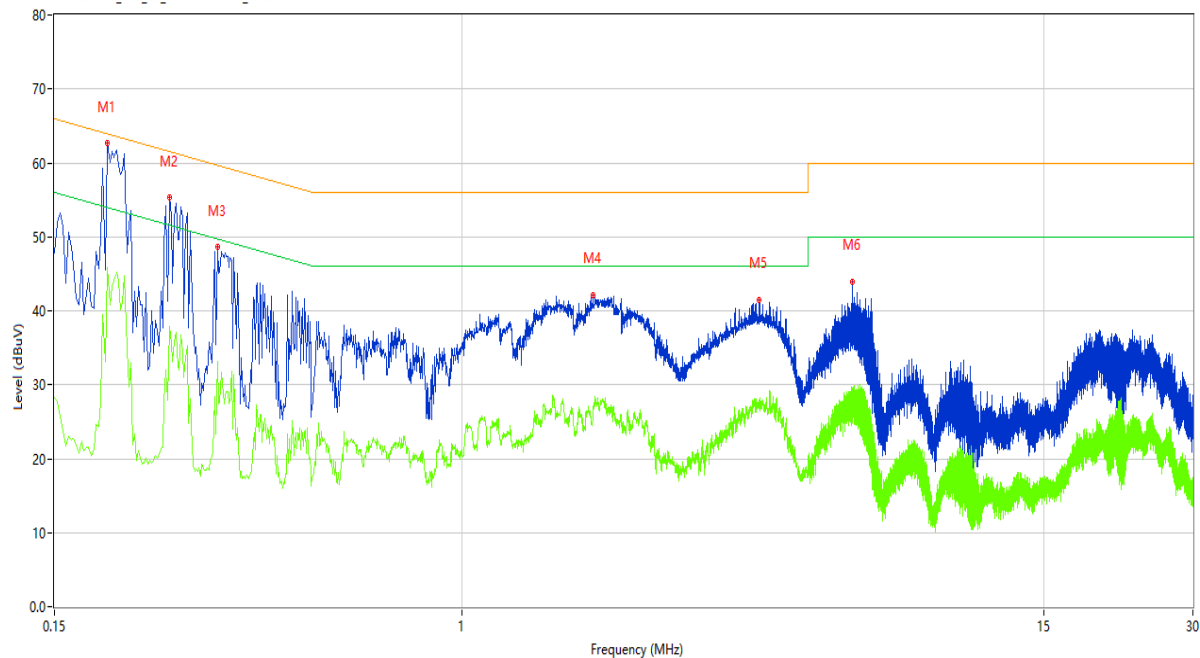
4.6 Test Record

CEmission Test case_FCC_CE_FCC PART 15B_Class B



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Over Limit (dB)	Detector	Line	Verdict
1	0.192	60.63	10.15	63.95	-3.32	Peak	L	Pass
1*	0.192	57.54	10.15	63.95	-6.41	QP	L	Pass
1**	0.192	42.78	10.15	53.95	-11.17	AV	L	Pass
2	0.256	53.62	10.14	61.56	-7.94	Peak	L	Pass
2*	0.256	50.01	10.14	61.56	-11.55	QP	L	Pass
2**	0.256	38.13	10.14	51.56	-13.43	AV	L	Pass
3	0.318	47.46	10.14	59.76	-12.30	Peak	L	Pass
3*	0.318	43.81	10.14	59.76	-15.95	QP	L	Pass
3**	0.318	29.42	10.14	49.76	-20.34	AV	L	Pass
4	1.810	42.93	10.17	56.00	-13.07	Peak	L	Pass
4*	1.810	38.75	10.17	56.00	-17.25	QP	L	Pass
4**	1.810	27.30	10.17	46.00	-18.70	AV	L	Pass
5	3.910	42.20	10.24	56.00	-13.80	Peak	L	Pass
5*	3.910	37.90	10.24	56.00	-18.10	QP	L	Pass
5**	3.910	28.01	10.24	46.00	-17.99	AV	L	Pass
6	6.670	44.90	10.30	60.00	-15.10	Peak	L	Pass
6*	6.670	35.99	10.30	60.00	-24.01	QP	L	Pass
6**	6.670	24.52	10.30	50.00	-25.48	AV	L	Pass

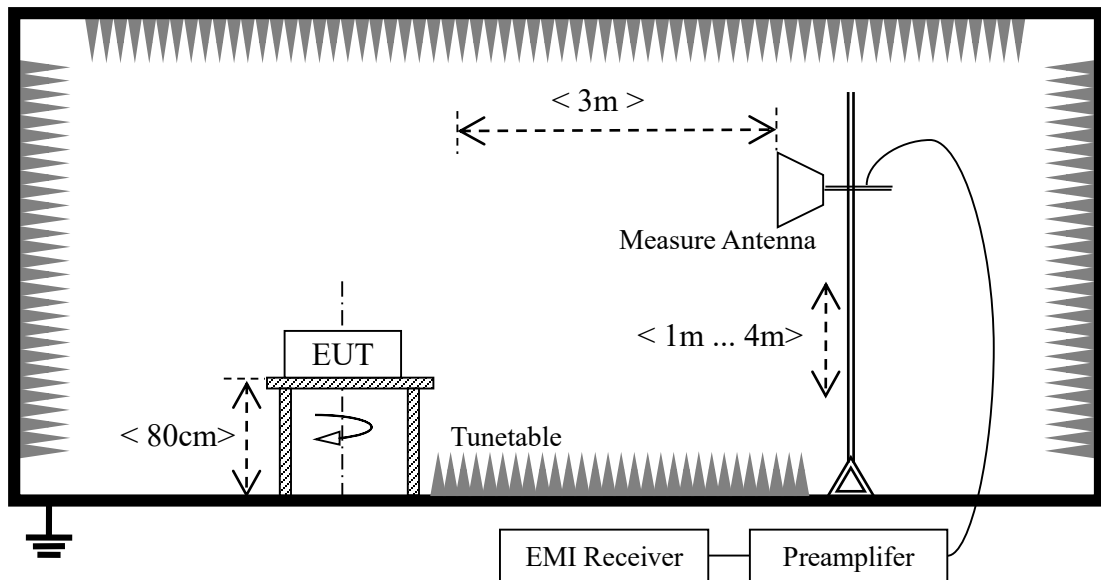
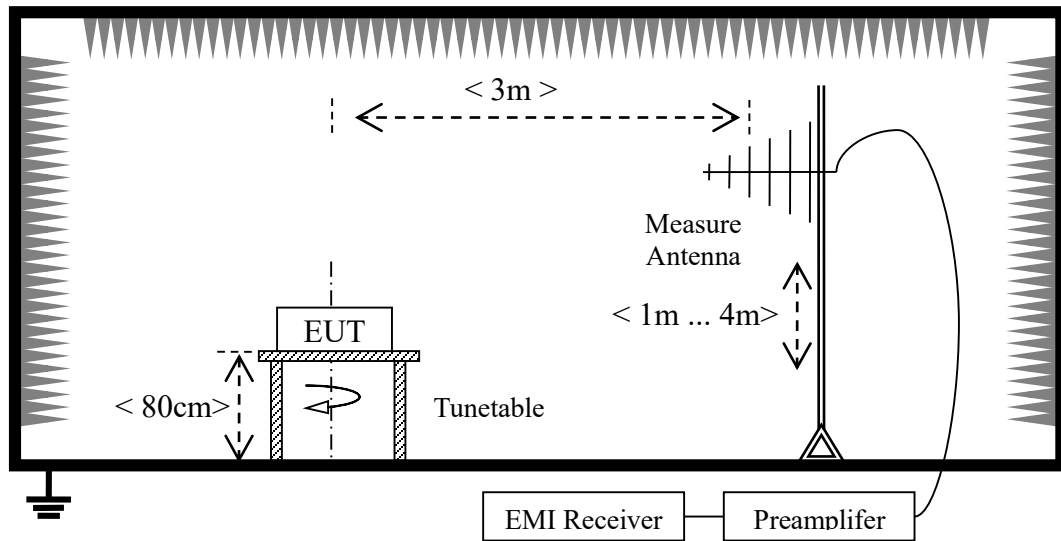
CEmission Test case_FCC_CE_FCC PART 15B_Class B



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Over Limit (dB)	Detector	Line	Verdict
1	0.192	62.10	10.15	63.95	-1.85	Peak	N	Pass
1*	0.192	58.77	10.15	63.95	-5.18	QP	N	Pass
1**	0.192	45.87	10.15	53.95	-8.08	AV	N	Pass
2	0.256	54.80	10.14	61.56	-6.76	Peak	N	Pass
2*	0.256	51.37	10.14	61.56	-10.19	QP	N	Pass
2**	0.256	37.88	10.14	51.56	-13.68	AV	N	Pass
3	0.320	48.51	10.14	59.71	-11.20	Peak	N	Pass
3*	0.320	45.25	10.14	59.71	-14.46	QP	N	Pass
3**	0.320	33.08	10.14	49.71	-16.63	AV	N	Pass
4	1.840	42.76	10.17	56.00	-13.24	Peak	N	Pass
4*	1.840	39.65	10.17	56.00	-16.35	QP	N	Pass
4**	1.840	27.17	10.17	46.00	-18.83	AV	N	Pass
5	3.982	42.09	10.25	56.00	-13.91	Peak	N	Pass
5*	3.982	37.49	10.25	56.00	-18.51	QP	N	Pass
5**	3.982	27.60	10.25	46.00	-18.40	AV	N	Pass
6	6.144	44.14	10.28	60.00	-15.86	Peak	N	Pass
6*	6.144	36.13	10.28	60.00	-23.87	QP	N	Pass
6**	6.144	28.76	10.28	50.00	-21.24	AV	N	Pass

5. 47 CFR Part 15B & ICES-003 § RADIATED EMISSION(ANSI C63.4)

5.1 Test System Diagram



5.2 EMI Test Setup

The system was investigated from 30 MHz to 6000 MHz.

During the radiated emission test, the EMI test receiver was set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30MHz – 1000 MHz	120 kHz	300 kHz	120kHz	QP
1000MHz-6000MHz	1MHz	3MHz/10Hz	/	PK/AV

5.3 Test Equipment List

Manufacturer	Description	Model	Serial Number	Test use
R&S	EMI Test Receiver	ESR7	101911	☒
Schwarzbeck	Antenna	VULB9163	9163-1037	☒
Schwarzbeck	Horn Antenna	BBHA9120D	9120D-1775	☒

5.4 Test Limit

Frequency Range	Limit(3m distance)
	Quasi-peak
30MHz – 88MHz	40 dB μ V/m
88MHz – 216MHz	43.5 dB μ V/m
216 MHz -960 MHz	46 dB μ V/m
Above 960MHz	54 dB μ V/m

5.5 Test Procedure

For the radiated emissions test, the adapter was connected to the AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the Quasi-peak detection mode.

Factor & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Reading. The basic equation is as follows:

Peak Level / Q-peak Level /Average Level = Reading + Antenna Factor + Cable Loss - Amplifier Gain

Factor = Antenna Factor + Cable Loss - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 3 dB means the emission is 3 dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{QP Limit} - \text{Q-peak Level} \text{ or } \text{Margin} = \text{AV Limit} - \text{Average Level}$$

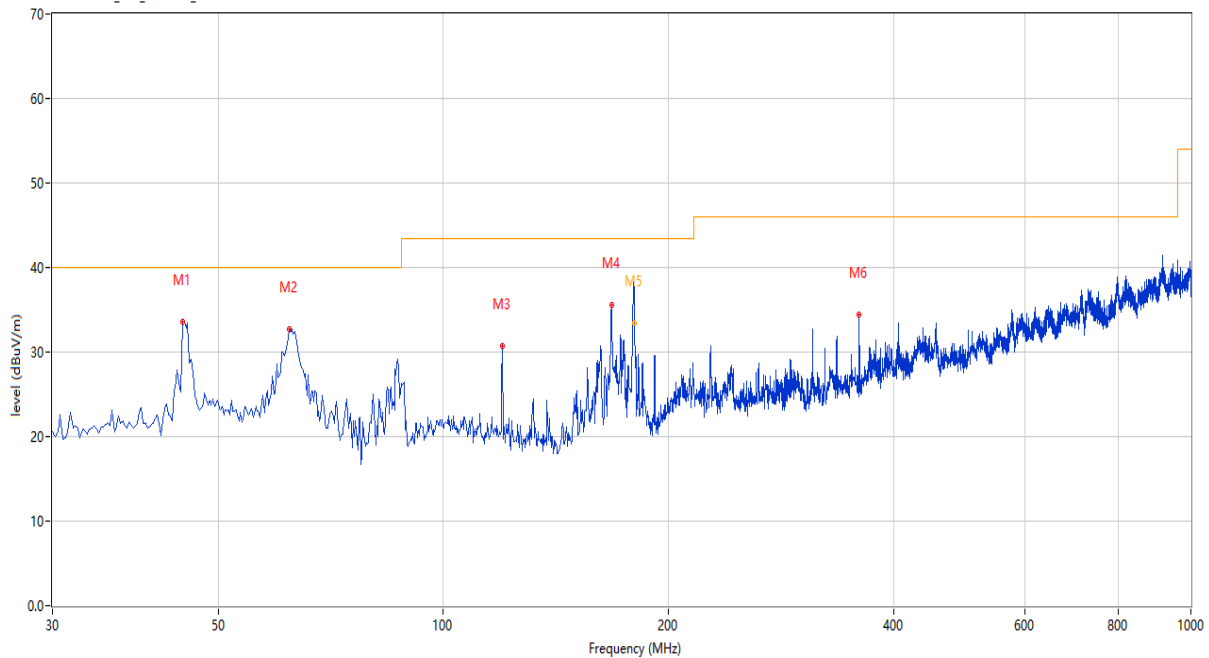
Note : Margin just showing the least value of QP and AV

Frequency (MHz)	Peak Level (dBuV/m)	Q-peak Level (dBuV/m)	Average Level (dBuV/m)	Factor (dB)	PK Limit (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Table (o)	Height (cm)	ANT	Verdict
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5.6 Test Record

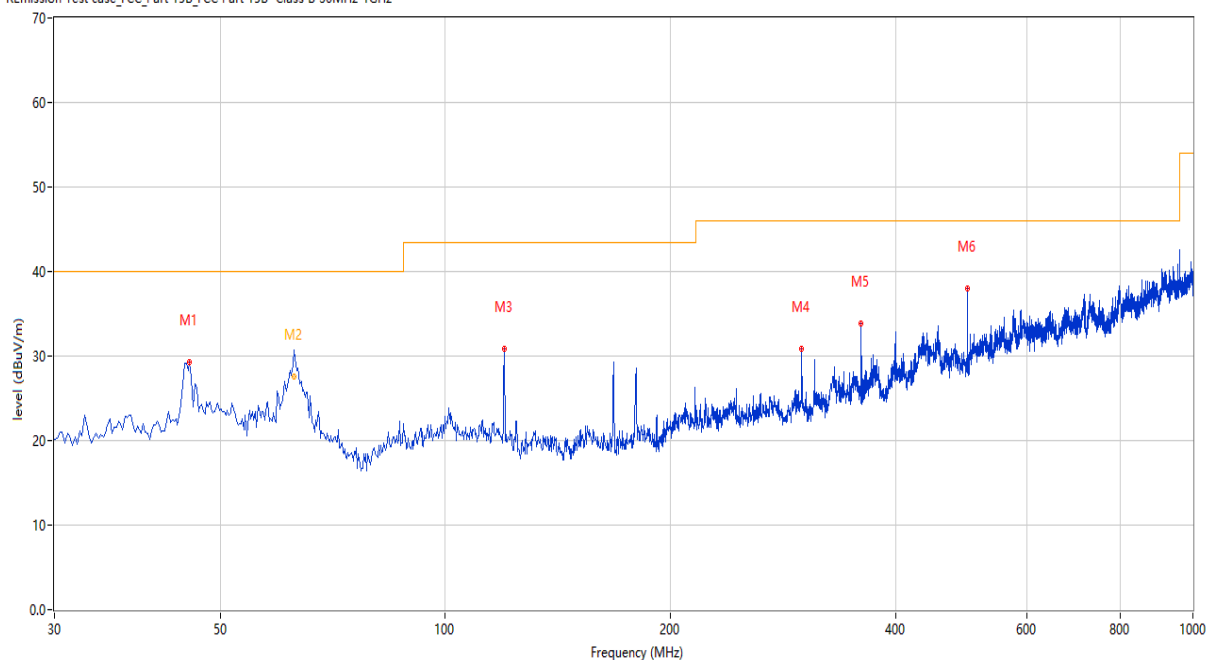
30M-1GHz

REmission Test case_FCC_Part 15B_FCC Part 15B Class B 30MHz-1GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	44.789	33.52	-25.06	40.0	-6.48	Peak	243.40	200	Horizontal	Pass
2	62.244	32.65	-25.80	40.0	-7.35	Peak	160.80	200	Horizontal	Pass
3	119.945	30.73	-27.10	43.5	-12.77	Peak	4.10	200	Horizontal	Pass
4	167.948	35.53	-29.04	43.5	-7.97	Peak	0.00	200	Horizontal	Pass
5	180.022	40.48	-28.12	43.5	-3.02	Peak	0.00	172	Horizontal	Pass
5*	180.022	33.38	-28.12	43.5	-10.12	QP	0.00	172	Horizontal	Pass
6	359.960	34.37	-23.76	46.0	-11.63	Peak	337.60	100	Horizontal	Pass

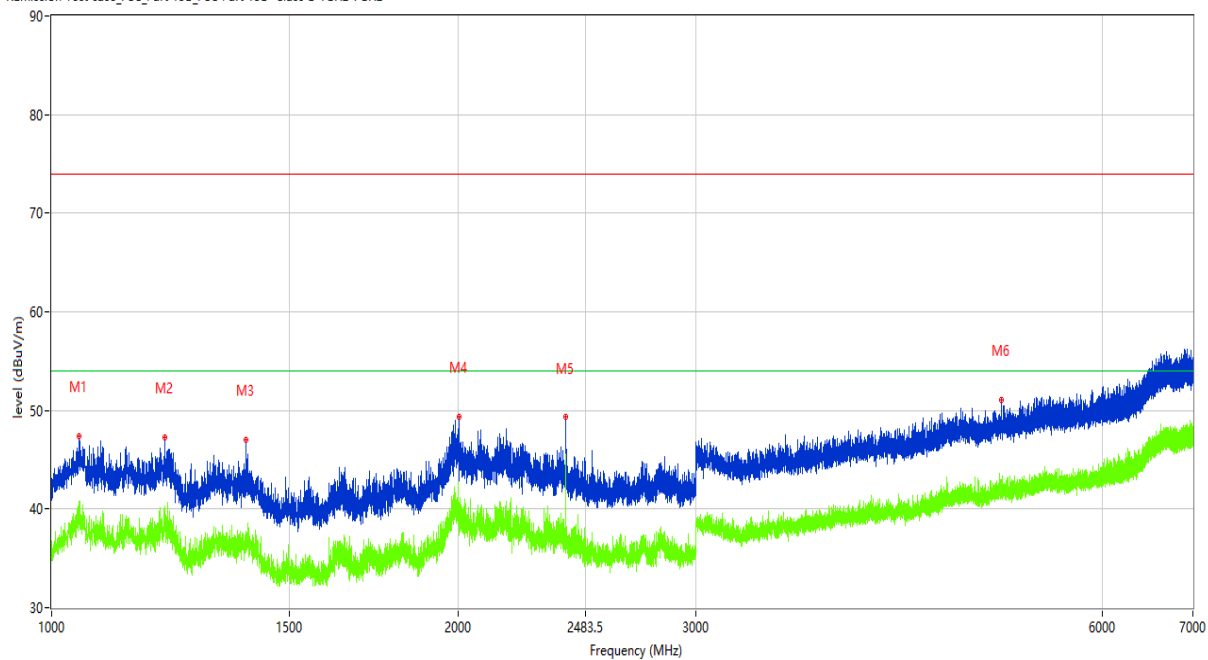
REmission Test case_FCC_Part 15B_FCC Part 15B Class B 30MHz-1GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	45.516	29.32	-24.72	40.0	-10.68	Peak	160.20	100	Vertical	Pass
2	62.729	30.78	-25.81	40.0	-9.22	Peak	0.00	200	Vertical	Pass
2*	62.729	27.59	-25.81	40.0	-12.41	QP	0.00	200	Vertical	Pass
3	119.945	30.92	-27.10	43.5	-12.58	Peak	169.50	100	Vertical	Pass
4	299.835	30.91	-24.07	46.0	-15.09	Peak	330.70	100	Vertical	Pass
5	359.960	33.80	-23.76	46.0	-12.20	Peak	60.50	100	Vertical	Pass
6	499.848	37.99	-20.12	46.0	-8.01	Peak	330.70	100	Vertical	Pass

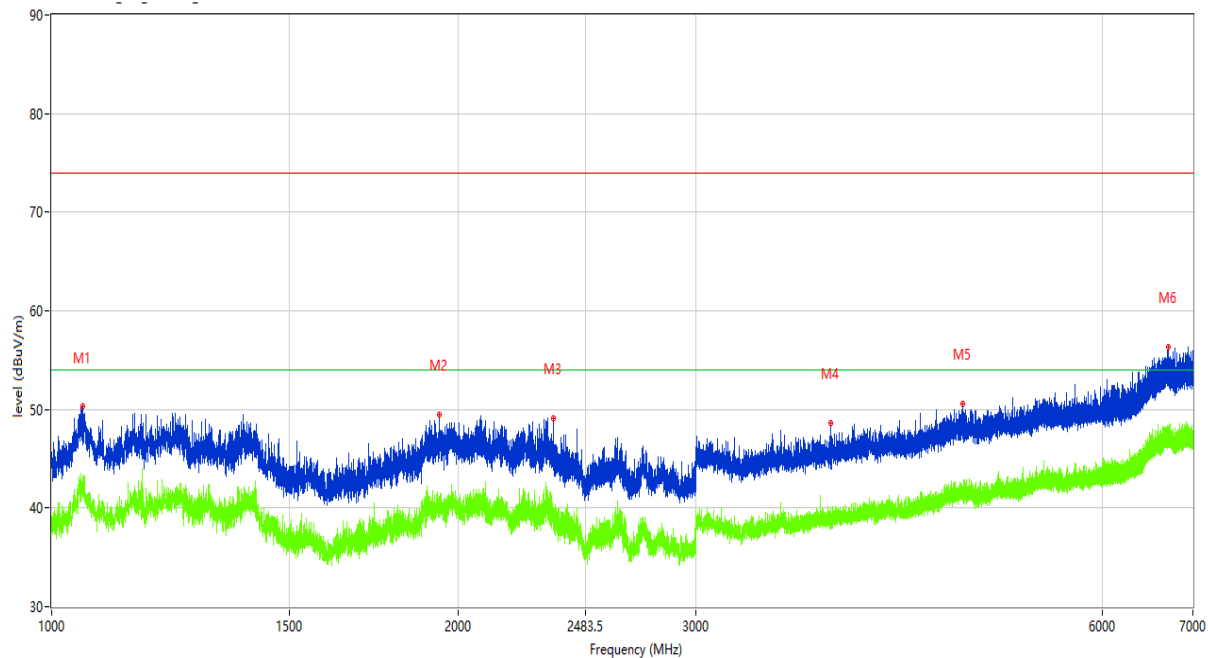
1G-7GHz

REmission Test case_FCC_Part 15B_FCC Part 15B Class B 1GHz-7GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1048.244	47.36	-7.19	74.0	-26.64	Peak	195.50	100	Horizontal	Pass
1**	1048.244	39.68	-7.19	54.0	-14.32	AV	195.50	100	Horizontal	Pass
2	1212.473	47.30	-7.24	74.0	-26.70	Peak	69.00	100	Horizontal	Pass
2**	1212.473	40.26	-7.24	54.0	-13.74	AV	69.00	100	Horizontal	Pass
3	1392.201	47.04	-8.21	74.0	-26.96	Peak	69.00	100	Horizontal	Pass
3**	1392.201	37.70	-8.21	54.0	-16.30	AV	69.00	100	Horizontal	Pass
4	2004.374	49.40	-6.13	74.0	-24.60	Peak	132.60	100	Horizontal	Pass
4**	2004.374	40.62	-6.13	54.0	-13.38	AV	132.60	100	Horizontal	Pass
5	2401.575	49.36	-4.18	74.0	-24.64	Peak	114.40	100	Horizontal	Pass
5**	2401.575	43.48	-4.18	54.0	-10.52	AV	114.40	100	Horizontal	Pass
6	5051.744	51.03	1.71	74.0	-22.97	Peak	355.40	100	Horizontal	Pass
6**	5051.744	42.82	1.71	54.0	-11.18	AV	355.40	100	Horizontal	Pass

REmission Test case_FCC_Part 15B_FCC Part 15B Class B 1GHz-7GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1054.993	50.27	-7.16	74.0	-23.73	Peak	244.90	100	Vertical	Pass
1**	1054.993	41.93	-7.16	54.0	-12.07	AV	244.90	100	Vertical	Pass
2	1935.883	49.45	-6.82	74.0	-24.55	Peak	92.30	100	Vertical	Pass
2**	1935.883	41.20	-6.82	54.0	-12.80	AV	92.30	100	Vertical	Pass
3	2351.081	49.15	-4.14	74.0	-24.85	Peak	195.70	100	Vertical	Pass
3**	2351.081	40.02	-4.14	54.0	-13.98	AV	195.70	100	Vertical	Pass
4	3776.528	48.61	-0.74	74.0	-25.39	Peak	30.40	100	Vertical	Pass
4**	3776.528	39.86	-0.74	54.0	-14.14	AV	30.40	100	Vertical	Pass
5	4724.409	50.56	0.98	74.0	-23.44	Peak	48.70	100	Vertical	Pass
5**	4724.409	41.02	0.98	54.0	-12.98	AV	48.70	100	Vertical	Pass
6	6709.661	56.32	5.91	74.0	-17.68	Peak	98.40	100	Vertical	Pass
6**	6709.661	48.06	5.91	54.0	-5.94	AV	98.40	100	Vertical	Pass

EXHIBIT A - EUT PHOTOGRAPHS

Front Side

EUT – All View



TEST SETUP – PHOTO

CE TEST



RE TEST Below 1GHz



RE TEST Above 1GHz



END OF REPORT