



FCC PART 18 TEST REPORT

For

Fruto Industrial International Ltd.

Unit 1921,19/F,China Shine Plaze,3-15 Lin He Xi Road, Tian He, Guangzhou, China

FCC ID: ZBNC18-16

Report Type: Class II Permissive Change	Product Type: Induction Cooktop
Report Number: <u>SZ2210426-13782E-EM-00</u>	
Report Date: <u>2021-05-10</u>	
Reviewed By: <u>EMC Engineer</u>	<i>Joson Xiao</i>
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	Induction Cooktop
Tested Model	C18-16
Multiple Model	C18-23
Model Difference	Refer to the DoS
Voltage Range	AC 120V/60Hz
Highest operating frequency	28kHz
Date of Test	2021-05-06 to 2021-05-07
Sample serial number	RSZ2210426-13782E-EM-S1, RSZ2210426-13782E-EM-S2(Assigned by BACL, Shenzhen)
Received date	2021-04-26
Sample/EUT Status	Good condition

Objective

This report is in accordance with Part 2-Subpart J, and Part 18-Subparts A, B and C of the Federal Communication Commissions rules and regulations.

The objective of the manufacturer is to determine compliance with FCC Part 18 limits.

This is a CIIPC application of the device; the differences between the original device and the current one are changing the product name to “Induction Cooktop” and

Original	Object / part No.	Manufacturer/	Type / model	Technical data
C5 capacitor	HV Capacitor	Fengming electric Co.,Ltd	MKPH	1200 V, 0,27 μF, 40/105/21
	Alternative	Chuangge electric Co.,Ltd	MKPH	1200 V, 0,27 μF, 40/105/21
	IGBT	Infineon Technologies	H15R1203	1200V, 15A
Current				
C5 capacitor	HV Capacitor	Fengming electric Co.,Ltd	MKPH	1200 V, 0,3 μF, 40/105/21
	Alternative	Chuangge electric Co.,Ltd	MKPH	1200 V, 0,3 μF, 40/105/21
	IGBT	Leshan Hill Electronics Co., Ltd.	LSH20N135F1	1350V, 20A
New	HV Capacitor	Fengming electric Co.,Ltd	MKP-X2	275 V, 0.68μF, 40/085/21
New	Alternative	Chuangge electric Co.,Ltd	MKP-X2	275 V, 0.68μF, 40/085/21

Based on the above differences, it would affect the all test items,so we updated the test data for the all test items and photos. The other test data and photos please refer to the original report RSZ170926551-00.

Test Methodology

All measurements contained in this report were conducted with MP-5, FCC Methods of Measurements of Radio Noise Emissions from ISM Equipment, February 1986. All measurements were performed at Bay Area Compliance Laboratory Corporation. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Each test item follows test standards and with no deviation.

Measurement Uncertainty

Parameter		uncertainty
Conducted Emissions		±1.95dB
Radiated Emissions	Below 1GHz	±4.75dB
	Above 1GHz	±4.88dB

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 5F(B-West), 6F, 7F, the 3rd Phase of Wan Li Industrial Building D, Shihua Rd, FuTian Free Trade Zone, Shenzhen, China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No.: 342867, the FCC Designation No.: CN1221.

The test site has been registered with ISED Canada under ISED Canada Registration Number 3062B.

OPERATING CONDITION/TEST CONFIGURATION

Justification

The EUT was operated at maximum (continuous) RF output power. The loads consisted of water in a boiler in the amounts specified in the test procedure.

EUT Exercise Software

No exercise software was used.

Special Accessories

No special accessory was used.

Equipment Modifications

No modifications were made to the EUT tested.

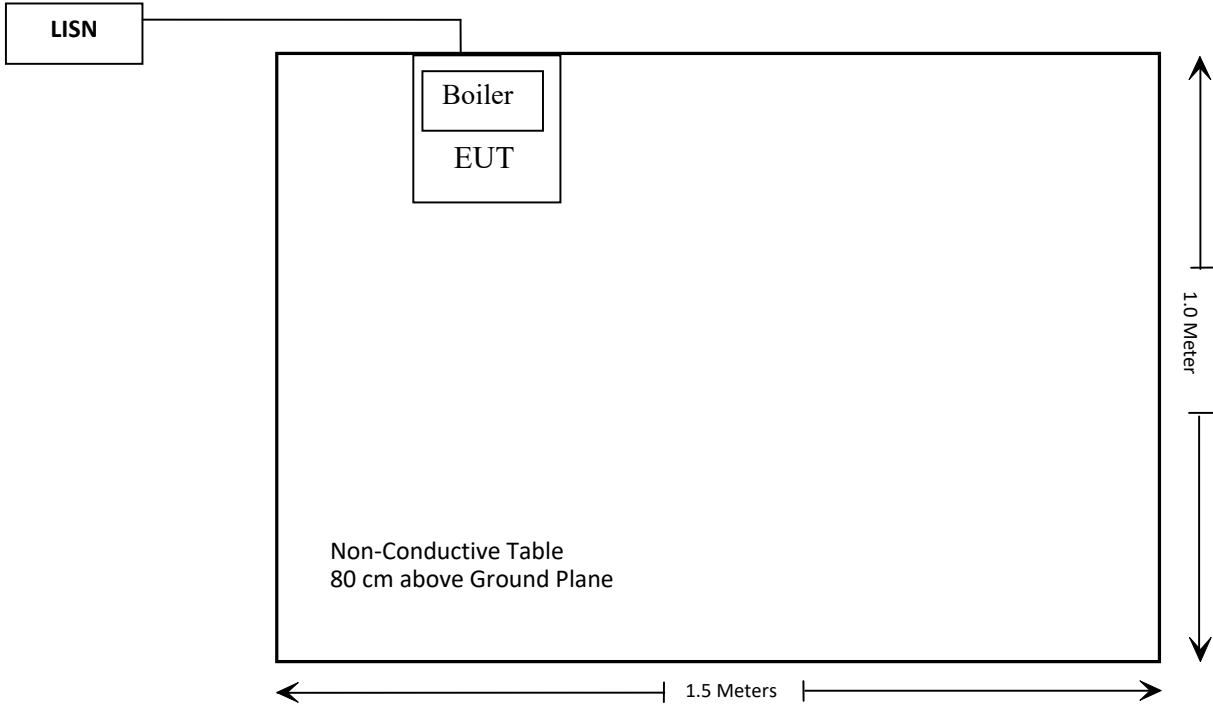
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
OUKE	Boiler	Unknown	Unknown

External Cable List and Details

Cable Description	Length (m)	From/Port	To
Unshielded Un-detachable AC cable	1.0	LISN	EUT

Block Diagram of Test Setup



SUMMARY OF TEST RESULT

FCC Rules	Description of Test	Results
§18.307	AC Line Conducted Emissions	Compliance
§18.305	Field Strength	Compliance

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
CONDUCTED EMISSIONS					
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2020/08/04	2021/08/03
Rohde & Schwarz	LISN	ENV216	101613	2020/08/04	2021/08/03
Rohde & Schwarz	Transient Limitor	ESH3Z2	DE25985	2020/11/29	2021/11/28
Unknown	CE Cable	CE Cable	UF A210B-1-0720-504504	2020/11/29	2021/11/28
Rohde & Schwarz	CE Test software	EMC 32	V8.53.0	NCR	NCR
FIELD STRENGTH					
R&S	EMI Test Receiver	ESR3	102455	2020/08/04	2021/08/03
Sonoma instrument	Pre-amplifier	310 N	186238	2020/08/04	2021/08/03
ETS	Passive Loop Antenna	6512	29604	2018/07/14	2021/07/13
Unknown	Cable 2	RF Cable 2	F-03-EM197	2020/11/29	2021/11/28
Unknown	Cable	Chamber Cable 4	EC-007	2020/11/29	2021/11/28
Rohde & Schwarz	Auto test software	EMC 32	V9.10	NCR	NCR

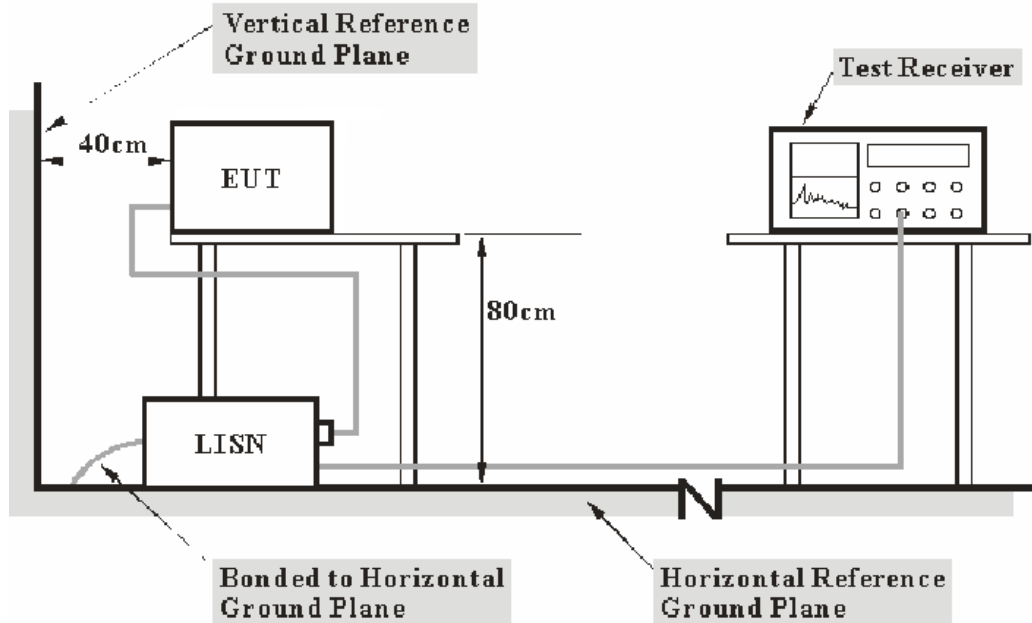
* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

CONDUCTED EMISSIONS

Applicable Standard

FCC §18.307

EUT Setup



- 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.

The setup of EUT is according with MP-5: 1986 measurement procedure. Specification used was with the FCC Part 18.

The socket was connected to a 120 VAC/ 60Hz power source.

EMI Test Receiver 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

Test Procedure

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

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

Test Data**Environmental Conditions**

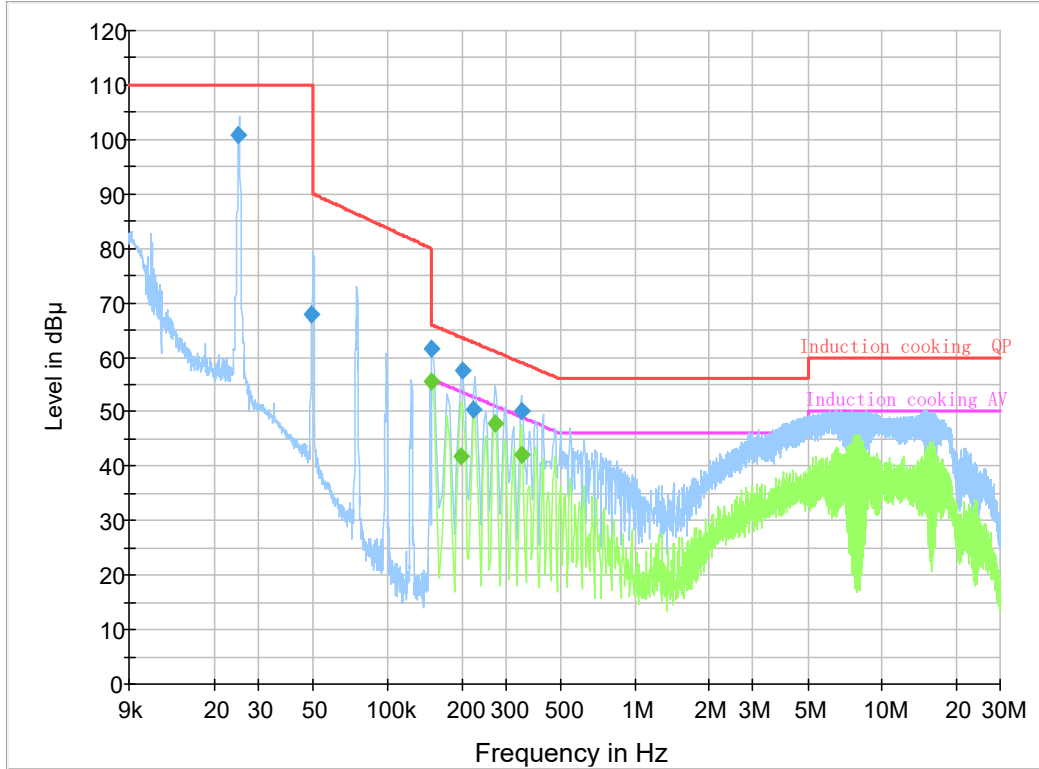
Temperature:	25 °C
Relative Humidity:	65 %
ATM Pressure:	101.0 kPa

The testing was performed by Haiguo Li on 2021-05-06.

Test mode: Cooking

Model: C18-16

AC 120V/60 Hz, Line



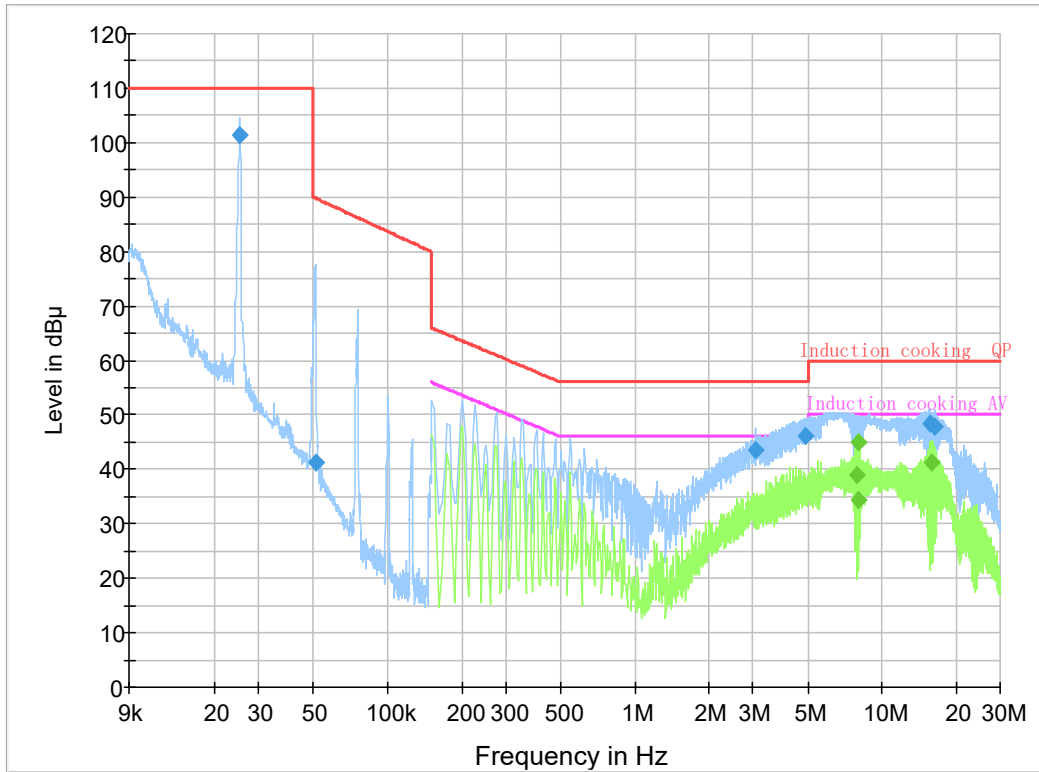
Final Result 1

Frequency (MHz)	QuasiPeak (dB µ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.024756	100.9	0.200	L1	20.3	9.1	110.0
0.049422	67.9	0.200	L1	19.9	42.1	110.0
0.150000	61.6	0.200	L1	19.8	4.4	66.0
0.201500	57.6	9.000	L1	19.8	5.9	63.5
0.221500	50.3	9.000	L1	19.8	12.5	62.8
0.348750	50.2	9.000	L1	19.9	8.8	59.0

Final Result 2

Frequency (MHz)	Average (dB µ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.150000	55.4	9.000	L1	19.8	0.6	56.0
0.198000	41.8	9.000	L1	19.8	11.9	53.7
0.274000	47.8	9.000	L1	19.8	3.2	51.0
0.350000	42.0	9.000	L1	19.9	7.0	49.0

AC 120V/60 Hz, Neutral



Final Result 1

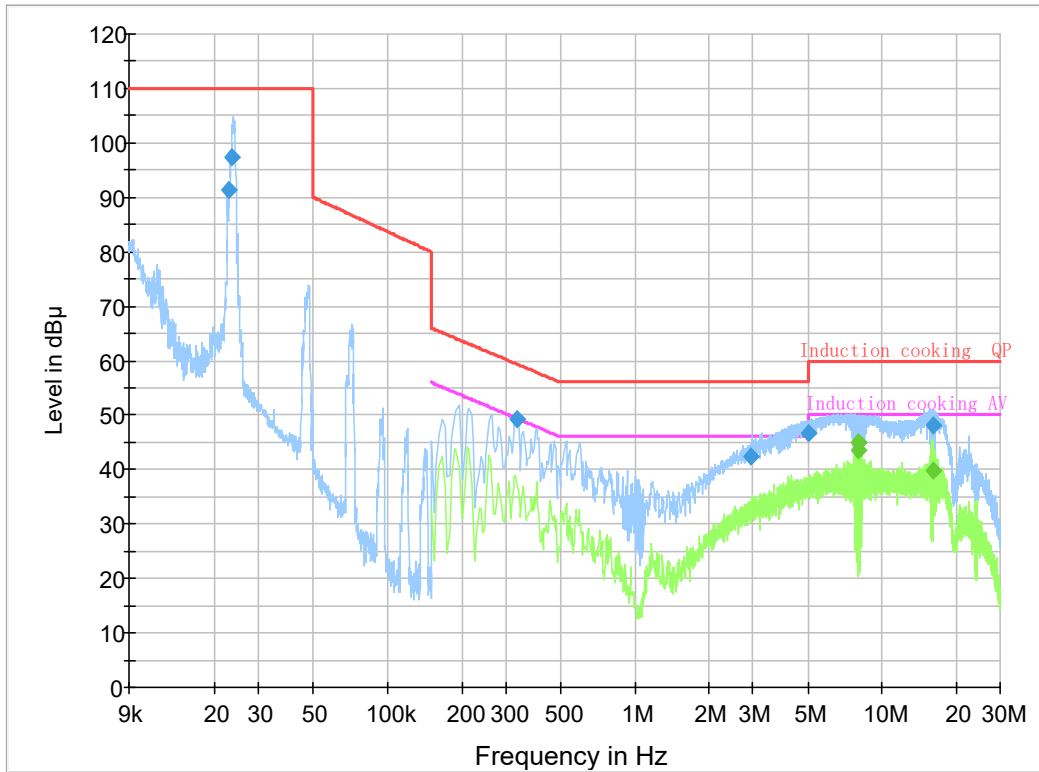
Frequency (MHz)	QuasiPeak (dB µ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.025234	101.4	0.200	N	20.5	8.6	110.0
0.050983	41.3	0.200	N	19.8	48.5	89.8
3.078000	43.6	9.000	N	19.9	12.4	56.0
4.882000	46.2	9.000	N	19.9	9.8	56.0
15.666000	48.4	9.000	N	20.0	11.6	60.0
16.222000	47.7	9.000	N	20.1	12.3	60.0

Final Result 2

Frequency (MHz)	Average (dB µ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
7.914000	38.9	9.000	N	19.9	11.1	50.0
7.958000	44.8	9.000	N	19.9	5.2	50.0
8.026000	34.4	9.000	N	19.9	15.6	50.0
15.818000	41.3	9.000	N	20.0	8.7	50.0

Model: C18-23

AC 120V/60 Hz, Line



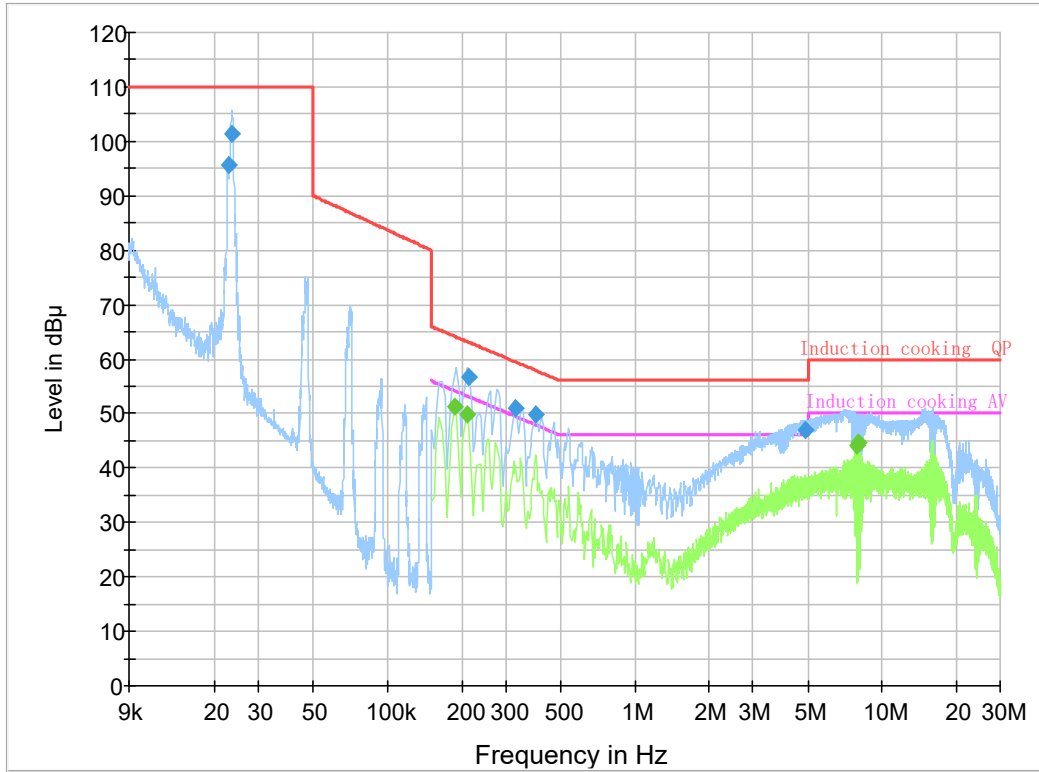
Final Result 1

Frequency (MHz)	QuasiPeak (dB µV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
0.022902	91.4	0.200	L1	20.4	18.6	110.0
0.023316	97.4	0.200	L1	20.4	12.6	110.0
0.332990	49.3	9.000	L1	19.8	10.1	59.4
2.929450	42.4	9.000	L1	19.9	13.6	56.0
5.007030	46.7	9.000	L1	19.9	13.3	60.0
16.005550	48.1	9.000	L1	20.1	11.9	60.0

Final Result 2

Frequency (MHz)	Average (dB µV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
7.978000	45.1	9.000	L1	19.9	4.9	50.0
8.002000	45.1	9.000	L1	19.9	4.9	50.0
8.050000	43.6	9.000	L1	19.9	6.4	50.0
15.962000	39.9	9.000	L1	20.1	10.1	50.0

AC 120V/60 Hz, Neutral



Final Result 1

Frequency (MHz)	QuasiPeak (dB µ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.022881	95.7	0.200	N	20.5	14.3	110.0
0.023389	101.3	0.200	N	20.5	8.7	110.0
0.214000	56.6	9.000	N	19.8	6.4	63.0
0.330000	50.9	9.000	N	19.8	8.6	59.5
0.398000	49.8	9.000	N	19.8	8.1	57.9
4.926000	46.9	9.000	N	19.9	9.1	56.0

Final Result 2

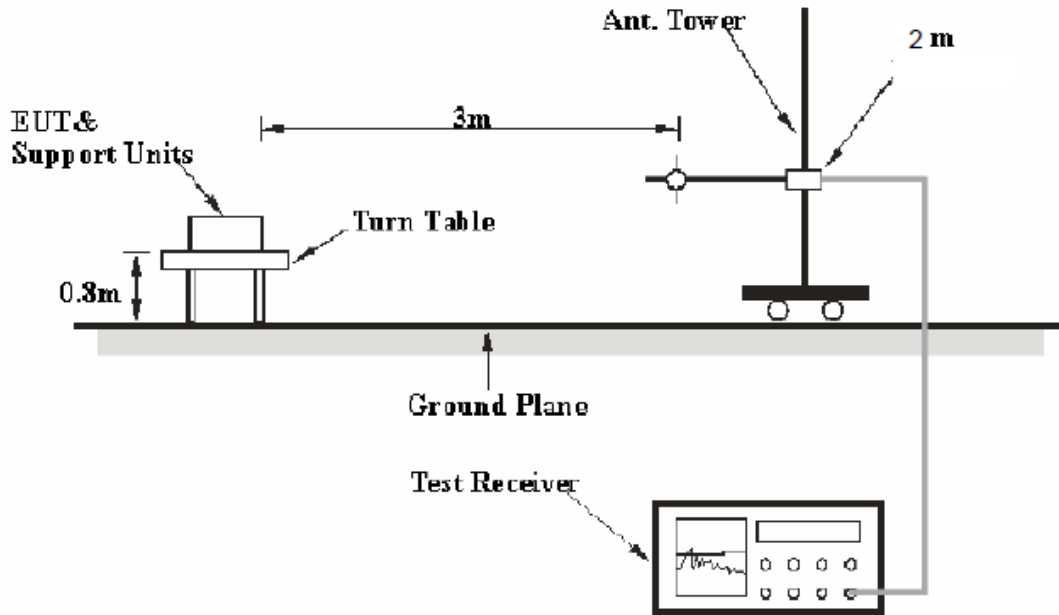
Frequency (MHz)	Average (dB µ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.186000	51.1	9.000	N	19.8	3.1	54.2
0.210000	49.8	9.000	N	19.8	3.4	53.2
7.906000	44.1	9.000	N	19.9	5.9	50.0
7.974000	44.6	9.000	N	19.9	5.4	50.0

FCC §18.305 – FIELD STRENGTH

Applicable Standard

FCC §18.305(b)

EUT Setup



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the FCC MP - 5.

The EUT was connected to 120 VAC/60 Hz power source.

EMI Test Receiver Setup and Spectrum Analyzer Setup

The system was investigated from 9 kHz to 30MHz.

During the radiated emission test, the EMI test receiver and Spectrum Analyzer were set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
9 kHz – 30 MHz	9 kHz	30 kHz	9 kHz	QP

Test Procedure

Maximizing procedure was performed on the six (6) highest emissions to ensure that the EUT complied with all installation combinations.

The EUT was in the normal (naïve) operating mode during the final qualification test to represent the worst results.

Corrected Amplitude & Margin Calculation

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

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Results Summary

According to the data in the following table, the EUT complied with the FCC Part 18,

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level complies with the limit if

$$L_m + U_{(Lm)} \leq L_{lim} + U_{cispr}$$

In BAACL., $U_{(Lm)}$ is less than U_{cispr} , if L_m is less than L_{lim} , it implies that the EUT complies with the limit.

Test Data and Plots

Environmental Conditions

Temperature:	26.2 °C
Relative Humidity:	54 %
ATM Pressure:	100.9 kPa

The testing was performed by Harris He on 2021-05-07

Test mode: Cooking

Model: C18-16

9 kHz –30 MHz

Frequency (MHz)	Corrected Amplitude (dBµV/m)	Detector (PK/QP)	Antenna height (m)	Turntable position (degree)	Correction Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
0.84	45.68	QP	2.0	226.0	48.0	103.52	57.84
1.21	47.62	QP	2.0	292.0	46.2	103.52	55.9
1.93	40.19	QP	2.0	171.0	46.2	103.52	63.33
2.18	45.32	QP	2.0	335.0	40.9	103.52	58.2
2.79	48.25	QP	2.0	293.0	40.9	103.52	55.27
4.09	40.17	QP	2.0	32.0	36.4	103.52	63.35

Model: C18-23

9 kHz –30 MHz

Frequency (MHz)	Corrected Amplitude (dBµV/m)	Detector (PK/QP)	Antenna height (m)	Turntable position (degree)	Correction Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
0.42	42.65	QP	2.0	7.0	55.6	103.52	60.87
1.02	47.91	QP	2.0	280.0	46.2	103.52	55.61
1.36	48.75	QP	2.0	33.0	46.2	103.52	54.77
2.18	46.21	QP	2.0	343.0	40.9	103.52	57.31
3.87	45.33	QP	2.0	191.0	40.9	103.52	58.19
5.64	43.16	QP	2.0	207.0	36.4	103.52	60.36

Note:

- 1) Corrected Amplitude = Meter Reading + Correction Factor
- 2) Correction Factor = Antenna Factor + Cable Loss - Amplifier Gain
- 3) Margin = Limit – Corrected Amplitude
- 4) The radiation limits (3m distance) = $20 \times \log 1500 + 40 \times \log (30/3) = 103.52(\text{dBuV/m})$

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