



FCC Part 15, Subpart B, Class B

Powerstick.com Inc.

PowerClean

Test Model: PowerClean

Prepared for : Powerstick.com Inc.
Address : 39 Camelot Drive, Ottawa, Ontario, Canada, K2W 5G6

Prepared by : Shenzhen LCS Compliance Testing Laboratory Ltd.
Address : 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park
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Date of receipt of test sample : October 25, 2024
Number of tested samples : 2
Sample No. : A241024004-1, A241024004-2
Serial number : Prototype
Date of Test : October 25, 2024 ~ November 07, 2024
Date of Report : November 08, 2024



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FCC Part 15, Subpart B, Class B
FCC 47 CFR Part 15 Subpart B, Class B, ANSI C63.4 -2014

Report Reference No. : **LCSA10244159EA**

Date Of Issue..... : November 08, 2024

Testing Laboratory Name..... : **Shenzhen LCS Compliance Testing Laboratory Ltd.**
Address..... : 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park
Yabianxueziwei, Shajing Street, Baoan District, Shenzhen,
518000, China
Testing Location/ Procedure.... : Full application of Harmonised standards ■
Partial application of Harmonised standards □
Other standard testing method □

Applicant's Name..... : **Powerstick.com Inc.**
Address..... : 39 Camelot Drive, Ottawa, Ontario, Canada, K2W 5G6

Test Specification

Standard..... : FCC 47 CFR Part 15 Subpart B, Class B, ANSI C63.4
-2014
Test Report Form No..... : TRF-4-E-010 A/0
TRF Originator..... : Shenzhen LCS Compliance Testing Laboratory Ltd.
Master TRF..... : Dated 2011-03

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Test Item Description..... : **PowerClean**
Test Model : PowerClean
Trade Mark..... : Powerstick
Ratings..... : Input: DC 5V, 300mA
Battery: 3.7V, 450mAh
Result : **Positive**

Compiled by:

Ling Zhu

Ling Zhu/Administrator

Supervised by:

Cary Luo

Cary Luo/ Technique principal

Approved by:

Gavin Liang

Gavin Liang/ Manager



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FCC -- TEST REPORT

Test Report No. : LCSA10244159EA

November 08, 2024

Date of issue

Test Model : PowerClean

EUT..... : PowerClean

Applicant..... : Powerstick.com Inc.

Address..... : 39 Camelot Drive, Ottawa, Ontario, Canada, K2W 5G6

Telephone..... : /

Fax..... : /

Manufacturer..... : Powerstick.com Inc.

Address..... : 39 Camelot Drive, Ottawa, Ontario, Canada, K2W 5G6

Telephone..... : /

Fax..... : /

Factory : Powerstick.com Inc.

Address..... : 39 Camelot Drive, Ottawa, Ontario, Canada, K2W 5G6

Telephone..... : /

Fax..... : /

Test Result according to the standards on page 6: **Positive**

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.



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Revision History

Report Version	Issue Date	Revision Content	Revised By
000	November 08, 2024	Initial Issue	---





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1. SUMMARY OF STANDARDS AND RESULTS

1.1. Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below.

EMISSION			
Description of Test Item	Standard	Limits	Results
Conducted disturbance at mains terminals	FCC 47 CFR Part 15 Subpart B, Class B, ANSI C63.4 -2014	Class B	PASS
Radiated disturbance	FCC 47 CFR Part 15 Subpart B, Class B, ANSI C63.4 -2014	Class B	PASS
N/A is an abbreviation for Not Applicable.			

Test mode:		
Mode 1	Charging+Working	Record



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2. GENERAL INFORMATION

2.1. Description of Device (EUT)

EUT : PowerClean

Trade Mark : Powerstick

Test Model : PowerClean

Power Supply : Input: DC 5V, 300mA
Battery: 3.7V, 450mAh

Highest internal frequency (Fx) : $F_x \leq 108 \text{ MHz}$

Highest internal frequency (Fx)	Highest measured frequency
$F_x \leq 108 \text{ MHz}$	1 GHz
$108 \text{ MHz} < F_x \leq 500 \text{ MHz}$	2 GHz
$500 \text{ MHz} < F_x \leq 1 \text{ GHz}$	5 GHz
$F_x > 1 \text{ GHz}$	$5 \times F_x$ up to a maximum of 6 GHz

NOTE 1 For FM and TV broadcast receivers, F_x is determined from the highest frequency generated or used excluding the local oscillator and tuned frequencies.
Where F_x is unknown, the radiated emission measurements shall be performed up to 6 GHz.

2.2. Support Equipment List

Manufacturer	Description	Model	Serial Number	Certificate
---	---	---	---	---

2.3 External I/O Cable

I/O Port Description	Quantity	Cable
---	---	---





2.4. Description of Test Facility

Site Description

EMC Lab.

: NVLAP Accreditation Code is 600167-0.
FCC Designation Number is CN5024.
CAB identifier is CN0071.
CNAS Registration Number is L4595.
FCC Test Firm Registration Number: 254912.

2.5. Statement of the 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 CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the LCS quality 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.

2.6. Measurement Uncertainty

Test	Parameters	Expanded Uncertainty (U _{lab})	Expanded Uncertainty (U _{cispr})
Conducted Emission	Level accuracy (9kHz to 150kHz) (150kHz to 30MHz)	± 2.63 dB ± 2.35 dB	± 3.8 dB ± 3.4 dB
Radiated Emission	Level accuracy (30MHz to 1000MHz)	± 3.48 dB	± 5.3 dB
Radiated Emission	Level accuracy (above 1000MHz)	± 3.90 dB	± 5.2 dB

(1) Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus.

(2) The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor of $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.



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3. TEST RESULTS

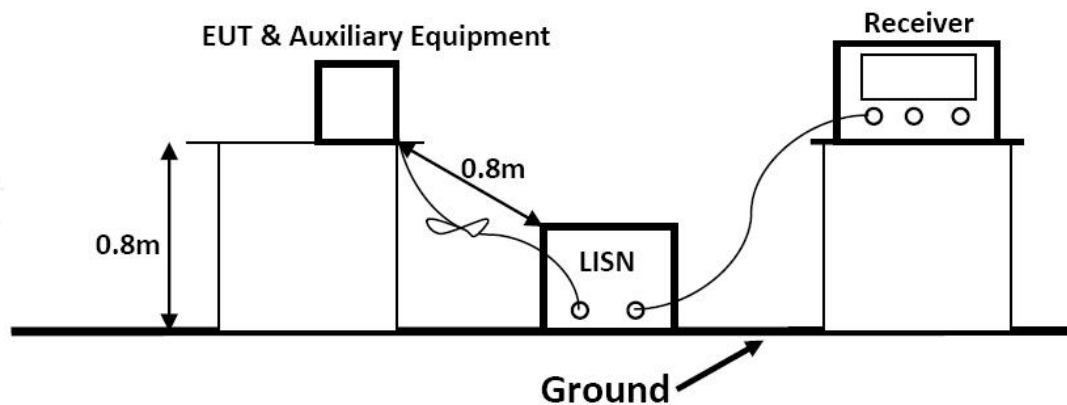
3.1. POWER LINE CONDUCTED EMISSION MEASUREMENT

3.1.1. Test Equipment

The following test equipments are used during the power line conducted measurement:

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	EMI Test Software	Farad	EZ	/	N/A	N/A
2	EMI Test Receiver	R&S	ESR3	102312	2024-03-02	2025-03-01
3	Artificial Mains	R&S	ENV216	101288	2024-06-06	2025-06-05
4	Pulse Limiter	R&S	ESH3-Z2	102750-NB	2024-06-06	2025-06-05
5	Impedance Stabilization Network	TESEQ	ISN T800	45130	2024-10-11	2025-10-10

3.1.2. Block Diagram of Test Setup



3.1.3. Test Standard

Power Line Conducted Emission Limits (Class B)

Frequency (MHz)			Limit (dB μ V)	
			Quasi-peak Level	Average Level
0.15	~	0.50	66.0 ~ 56.0 *	56.0 ~ 46.0 *
0.50	~	5.00	56.0	46.0
5.00	~	30.00	60.0	50.0

NOTE1-The lower limit shall apply at the transition frequencies.

NOTE2-The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.



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3.1.4.EUT Configuration on Test

The following equipments are installed on Power Line Conducted Emission Measurement to meet the commission requirement and operating regulations in a manner, which tends to maximize its emission characteristics in a normal application.

3.1.5.Operating Condition of EUT

3.1.5.1.Setup the EUT as shown on Section 3.1.2

3.1.5.2.Turn on the power of all equipments.

3.1.5.3.Let the EUT work in measuring Lighting and measure it.

3.1.6.Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC/ANSI C63.4-2014 on Conducted Emission Measurement.

The bandwidth of the test receiver is set at 9kHz.

The frequency range from 150kHz to 30MHz is investigated

3.1.7.Test Results

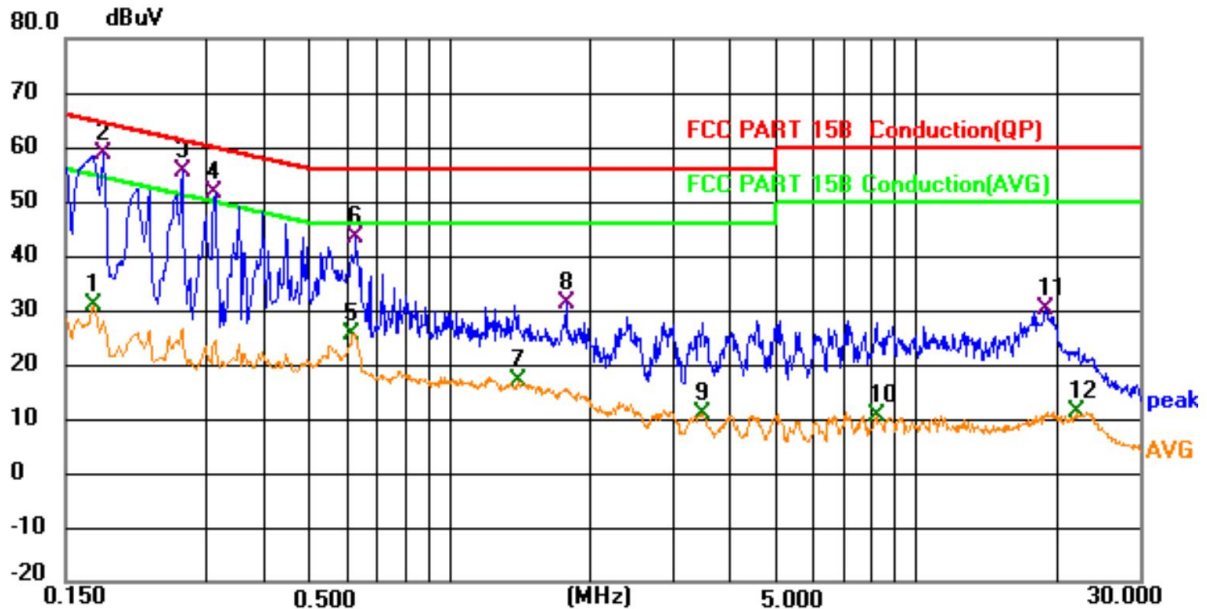
PASS.

The test result please refer to the next page.





Test Model	PowerClean	Test Mode	Working
Environmental Conditions	22.5°C, 53.7% RH	Test Engineer	Can Kun
Pol	Line	Test Voltage	AC 120V/60Hz



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.172	11.24	19.79	31.03	54.86	-23.83	AVG	
2	*	0.181	38.96	19.74	58.70	64.44	-5.74	QP	
3		0.267	35.68	19.76	55.44	61.21	-5.77	QP	
4		0.312	31.70	19.83	51.53	59.92	-8.39	QP	
5		0.618	5.95	19.47	25.42	46.00	-20.58	AVG	
6		0.627	23.82	19.45	43.27	56.00	-12.73	QP	
7		1.401	-2.27	19.07	16.80	46.00	-29.20	AVG	
8		1.774	12.26	18.99	31.25	56.00	-24.75	QP	
9		3.485	-8.23	19.20	10.97	46.00	-35.03	AVG	
10		8.196	-9.03	19.70	10.67	50.00	-39.33	AVG	
11		18.910	10.81	19.25	30.06	60.00	-29.94	QP	
12		22.123	-7.66	18.91	11.25	50.00	-38.75	AVG	

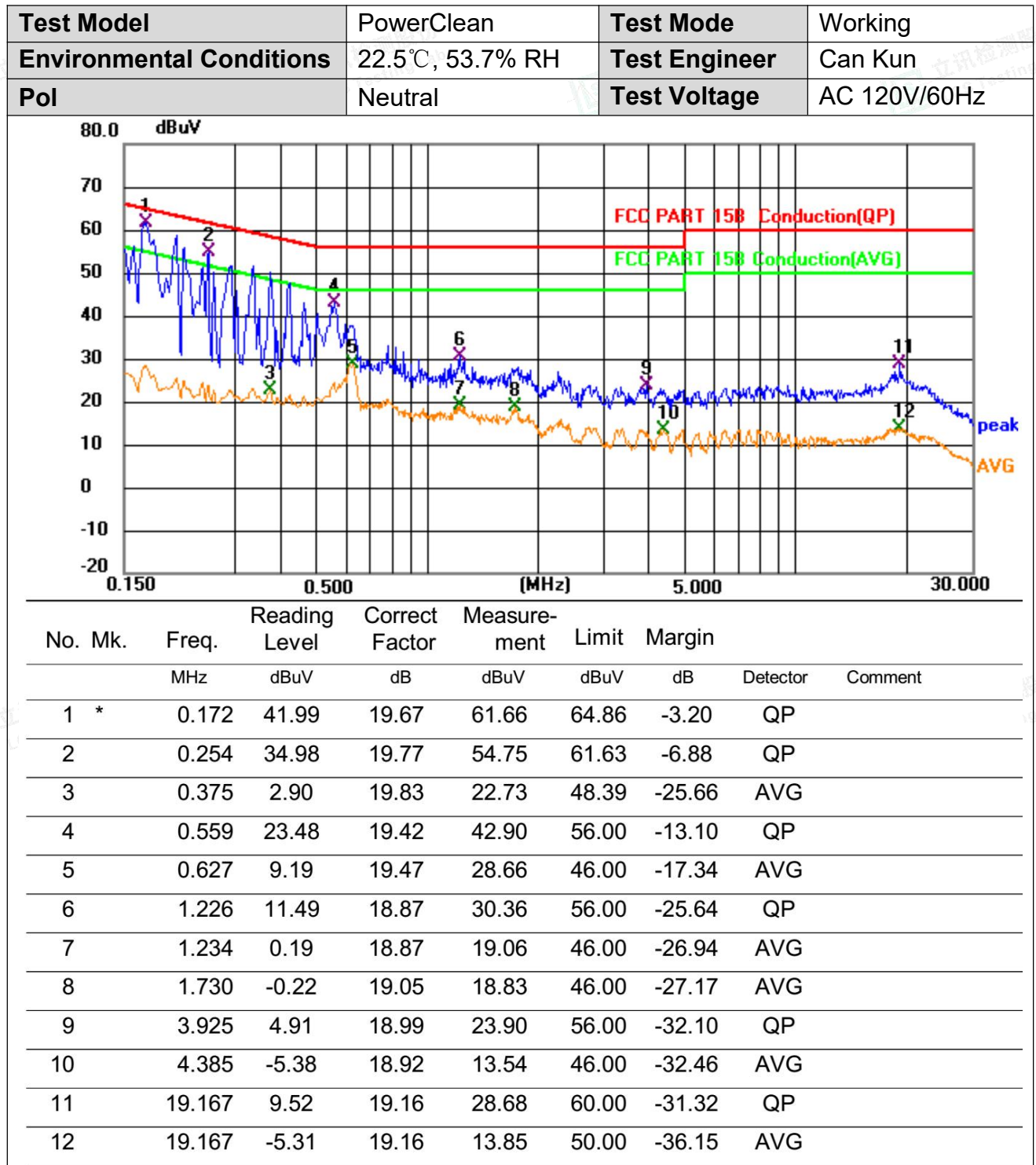


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***Note: 1) Pre-scan all modes and recorded the worst case results in this report.

2) Margin= Reading level + Correct factor – Limit

Correct Factor= Liss Factor+Cable Factor+Insertion loss of Pulse Limiter



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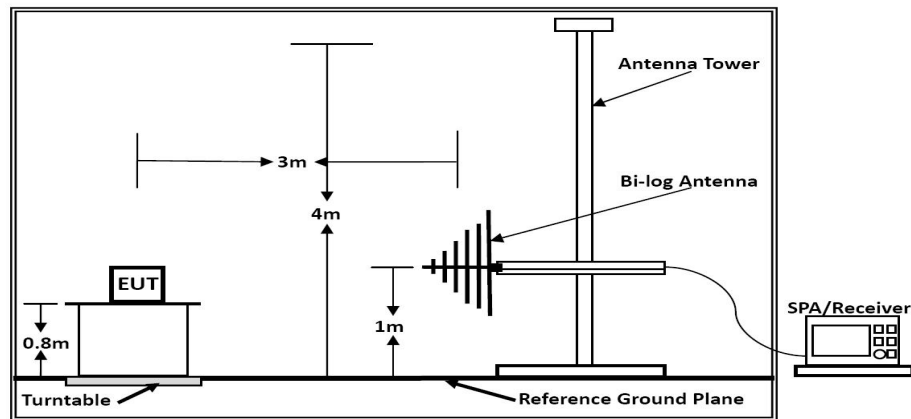
3.2. Radiated emission Measurement

3.2.1. Test Equipment

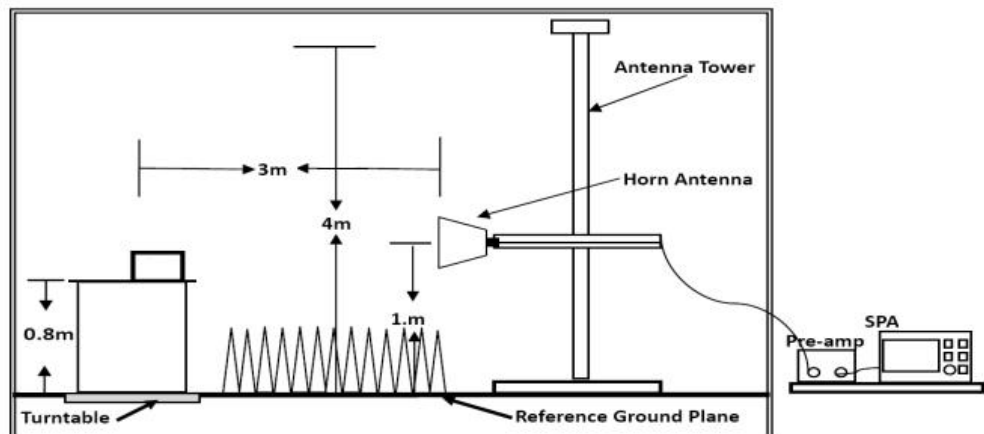
The following test equipments are used during the radiated emission measurement:

Item	Test equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	EMI Test Software	AUDIX	E3	/	N/A	N/A
2	By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2024-08-03	2027-08-02
3	Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1925	2024-07-13	2027-07-12
4	EMI Test Receiver	R&S	ESPI	101940	2024-06-06	2025-06-05
5	Low-frequency amplifier	SchwarzZBECK	BBV9745	00253	2024-10-08	2025-10-07
6	High-frequency amplifier	JS Denki Pte	PA0118-43	JSPA21009	2024-10-08	2025-10-07
7	EMI Test Software	Farad	EZ	/	N/A	N/A
8	MXA Signal Analyzer	Agilent	N9020A	MY50510140	2024-10-08	2025-10-07

3.2.2. Block Diagram of Test Setup



Below 1GHz



Above 1GHz





3.2.3. Radiated Emission Limit (Class B)

Limits for Radiated Disturbance Below 1GHz

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		$\mu\text{V/m}$	$\text{dB}(\mu\text{V})/\text{m}$
30 ~ 88	3	100	40
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46
960 ~ 1000	3	500	54

Remark: (1) Emission level $(\text{dB})\mu\text{V} = 20 \log \text{Emission level } \mu\text{V/m}$
(2) The smaller limit shall apply at the cross point between two frequency bands.
(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

Limits for Radiated Emission Above 1GHz

Frequency (MHz)	Distance (Meters)	Peak Limit ($\text{dB}\mu\text{V/m}$)	Average Limit ($\text{dB}\mu\text{V/m}$)
Above 1000	3	74	54

***Note: The lower limit applies at the transition frequency.

3.2.4. EUT Configuration on Measurement

The following equipment are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

3.2.5. Operating Condition of EUT

3.2.5.1. Setup the EUT as shown in Section 3.2.2.

3.2.5.2. Let the EUT work in test Lighting and measure it.

3.2.6. Test Procedure

EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated by-log antenna) is used as receiving antenna. Both horizontal and vertical polarization of the antenna is set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.4-2014 on radiated emission measurement.

The bandwidth of the EMI test receiver is set at 120kHz, 300kHz.

The frequency range from 30MHz to 1000MHz is checked.

3.2.7. Radiated Emission Noise Measurement Result

PASS.

The scanning waveforms please refer to the next page.



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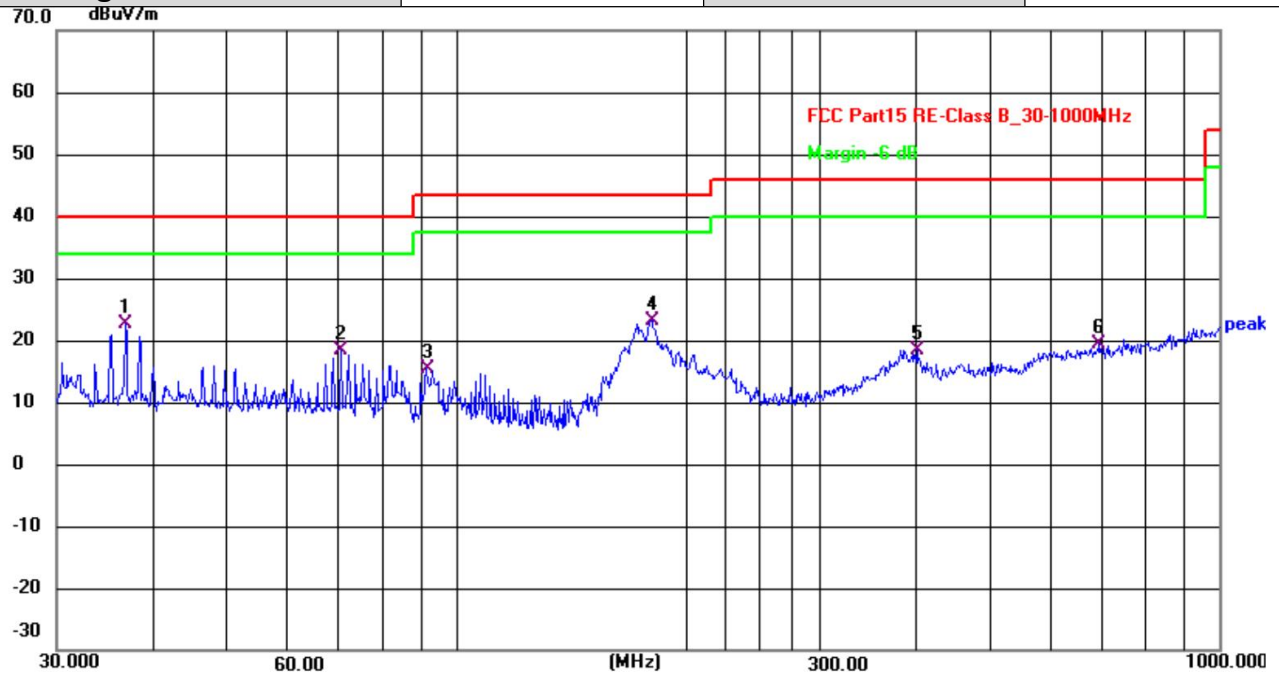
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Test Model	PowerClean	Test Mode	Working
Environmental Conditions	23.8°C, 52.3% RH	Detector Function	Quasi-peak
Pol	Vertical	Distance	3m
Test Engineer	Can Kun	Test Voltage	AC 120V/60Hz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	36.8953	40.39	-17.69	22.70	40.00	-17.30	QP
2	70.5836	37.85	-19.49	18.36	40.00	-21.64	QP
3	91.4949	34.20	-18.78	15.42	43.50	-28.08	QP
4	180.6488	41.91	-18.66	23.25	43.50	-20.25	QP
5	401.8385	32.80	-14.42	18.38	46.00	-27.62	QP
6	696.8567	30.21	-10.94	19.27	46.00	-26.73	QP



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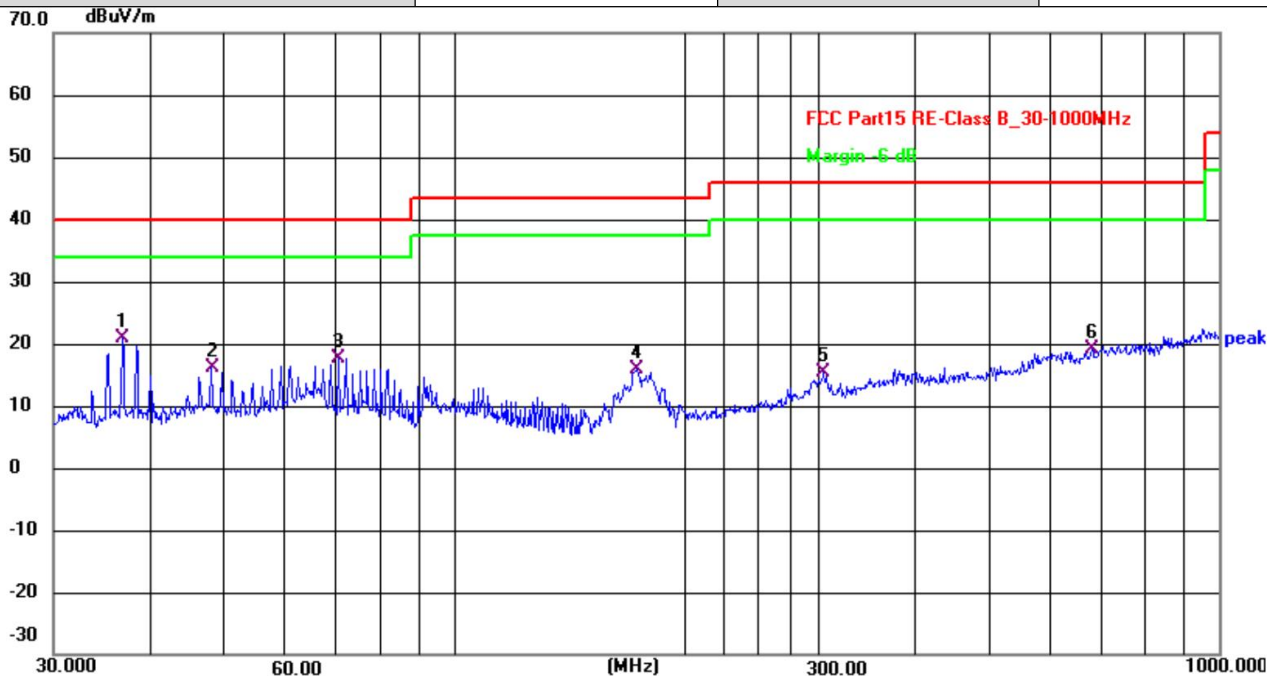
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Test Model	PowerClean	Test Mode	Working
Environmental Conditions	23.8°C, 52.3% RH	Detector Function	Quasi-peak
Pol	Horizontal	Distance	3m
Test Engineer	Can Kun	Test Voltage	AC 120V/60Hz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	36.8953	38.36	-17.43	20.93	40.00	-19.07	QP
2	48.1626	32.39	-16.23	16.16	40.00	-23.84	QP
3	70.5836	36.77	-19.12	17.65	40.00	-22.35	QP
4	173.8135	35.98	-20.12	15.86	43.50	-27.64	QP
5	304.6099	30.85	-15.56	15.29	46.00	-30.71	QP
6	682.3484	28.89	-9.81	19.08	46.00	-26.92	QP

Note: 1). Pre-Scan all mode, Thus record worse case mode result in this report.

2) Margin = Reading level + Correct factor - Limit

Correct Factor = Antenna Factor + Cable Factor - Pre-amplifier Factor



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4. TEST SETUP PHOTOGRAPHS OF EUT

Please refer to separated files for Test Setup Photos of the EUT.

5. EXTERIOR PHOTOGRAPHS OF THE EUT

Please refer to separated files for External Photos of the EUT.

6. INTERIOR PHOTOGRAPHS OF THE EUT

Please refer to separated files for Internal Photos of the EUT.

-----THE END OF TEST REPORT-----

