

FCC Part 15, Subpart B, Class A(sDoC)

TEST REPORT

BORN ELECTRONICS LIMITED

POE switch

Test Model: BI808PE1G2F

Additional Model No.: BI804PG1G2F, BI808PGM2F, BI808GM2F,
BI916PGM2F, BI916GM2F, BI808PGM 4F, BI604PE1E2F, BI808G8F,
BI808PG2F, BI804PGM2F, BI604PE2F, BI804PG1D2F, BI912PGM4F,
BI824GM8FC4F, BI924GM8FC4T

Prepared for : BORN ELECTRONICS LIMITED
Address : 157 SIXTH AVENUE LONDON E12 5PT

Prepared by : Shenzhen LCS Compliance Testing Laboratory Ltd.
Address : 101, 601, Xingyuan Industrial Park, Gushu Community,
Xixiang Street, Bao'an District, Shenzhen, Guangdong,
China

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Date of receipt of test sample : August 28, 2019
Number of tested samples : 1
Serial number : Prototype
Date of Test : August 28, 2019 ~ September 03, 2019
Date of Report : April 08, 2021



**FCC TEST REPORT
FCC Part 15, Subpart B, Class A(sDoC)**

Report Reference No. : **LCS190812262AE200**

Date Of Issue..... : April 08, 2021

Testing Laboratory Name..... : **Shenzhen LCS Compliance Testing Laboratory Ltd.**

Address..... : 101, 601, Xingyuan Industrial Park, Gushu Community,
Xixiang Street, Bao'an District, Shenzhen, Guangdong,
China

Testing Location/ Procedure.... : Full application of Harmonised standards
Partial application of Harmonised standards
Other standard testing method

Applicant's Name..... : **BORN ELECTRONICS LIMITED**

Address..... : 157 SIXTH AVENUE LONDON E12 5PT

Test Specification

Standard..... : FCC Part 15, Subpart B, Class A(sDoC), ANSI C63.4 -2014

Test Report Form No..... : LCSEMC-1.0

TRF Originator..... : Shenzhen LCS Compliance Testing Laboratory Ltd.

Master TRF..... : Dated 2011-03

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Test Item Description..... : **POE switch**

Test Model : BI808PE1G2F

Trade Mark..... : N/A

Ratings..... : Input: DC 48-57V

Result : **Positive**

Compiled by:

Lucky.xie

Lucky Xie/ File administrators

Supervised by:

Tom Wang

Tom Wang/ Technique principal

Approved by:



Gavin Liang/ Manager

FCC -- TEST REPORT**Test Report No. : LCS190812262AE200**April 08, 2021

Date of issue

Test Model : BI808PE1G2F

EUT..... : POE switch

Applicant..... : BORN ELECTRONICS LIMITED

Address..... : 157 SIXTH AVENUE LONDON E12 5PT

Telephone..... : /

Fax..... : /

Manufacturer..... : BORN ELECTRONICS LIMITED

Address..... : 157 SIXTH AVENUE LONDON E12 5PT

Telephone..... : /

Fax..... : /

Factory..... : BORN ELECTRONICS LIMITED

Address..... : 157 SIXTH AVENUE LONDON E12 5PT

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.

Revision History

Revision	Issue Date	Revisions	Revised By
000	September 05, 2019	Initial Issue	Gavin Liang
200	April 08, 2021	Revised	Gavin Liang

lish“Remark : This report is based on the report No. LCS190812255AE. This report is invalid without the original report.

for changing the following information:

- 1.Changed applicant and Manufacturer and Factory to Born Electronics limited
- 2.Changed applicant address to 157 SIXTH AVENUE LONDON E12 5PT
- 3.Product model changed to BI808PE1G2F
- 4.Change trade Test Additional Model No to BI804PG1G2F, BI808PGM2F, BI808GM2F, BI916PGM2F, BI916GM2F, BI808PGM 4F, BI604PE1E2F, BI808G8F, BI808PG2F, BI804PGM2F, BI604PE2F, BI804PG1D2F, BI912PGM4F, BI824GM8FC4F, BI924GM8FC4T
- 5.Changed External and internal photos of the EUT

Other contents still remain the same with the previous one.

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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 Part 15, Subpart B, Class A(sDoC), ANSI C63.4 -2014	Class A	PASS
Radiated disturbance	FCC Part 15, Subpart B, Class A(sDoC), ANSI C63.4 -2014	Class A	PASS

N/A is an abbreviation for Not Applicable.

Test Mode:

Mode 1	LAN Mode	Record
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2. GENERAL INFORMATION

2.1. Description of Device (EUT)

EUT : POE switch

Trade Mark : N/A

Test Model : BI808PE1G2F

Additional Model : BI804PG1G2F, BI808PE1G2F, BI808PGM2F, BI808GM2F, BI916PGM2F, BI916GM2F, BI808PGM 4F, BI604PE1E2F, BI808G8F, BI808PG2F, BI804PGM2F, BI604PE2F, BI804PG1D2F, BI912PGM4F, BI824GM8FC4F, BI924GM8FC4T

Model Declaration : PCB board, structure and internal of these model(s) are the same, So no additional models were tested

Power Supply : Input: DC 48-57V

Highest internal frequency (Fx)	Highest measured frequency
Fx ≤ 108 MHz	1 GHz
108 MHz < Fx ≤ 500 MHz	2 GHz
500 MHz < Fx ≤ 1 GHz	5 GHz
Fx > 1 GHz	5 × Fx up to a maximum of 6 GHz

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

2.2. Support Equipment List

Description	Manufacturer	Model	Serial Number
PC	DELL	vostro15-7570	---

2.3. Description of Test Facility

Site Description

EMC Lab. : FCC Registration Number is 254912.

Industry Canada Registration Number is 9642A-1.

ESMD Registration Number is ARCB0108.

UL Registration Number is 100571-492.

TUV SUD Registration Number is SCN1081.

TUV RH Registration Number is UA 50296516-001.

NVLAP Registration Code is 600167-0.

2.4. 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.

2.5. Measurement Uncertainty

Test	Parameters	Expanded Uncertainty (Ulab)	Expanded Uncertainty (Ucispr)
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%.

3. TEST RESULTS

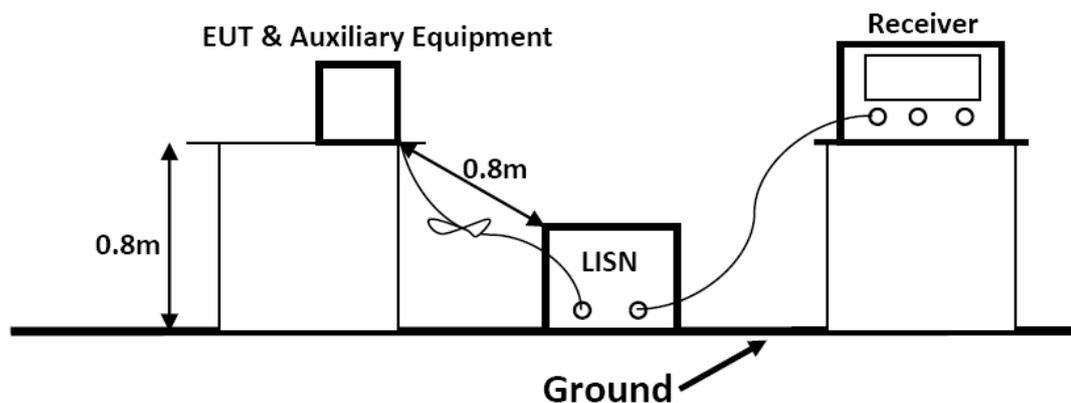
3.1. POWER LINE CONDUCTED EMISSION MEASUREMENT

3.1.1. Test Equipment

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

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Software	AUDIX	E3	/	N/A
2	EMI Test Receiver	R&S	ESPI	101840	2019-06-11
3	Artificial Mains	R&S	ENV216	101288	2019-06-12
4	10dB Attenuator	SCHWARZBECK	MTS-IMP-136	261115-001-0032	2019-06-11
5	Impedance Stabilization Network	TESEQ	ISN T800	45130	2018-11-15

3.1.2. Block Diagram of Test Setup



3.1.3. Test Standard

Power Line Conducted Emission Limits (Class A)

Frequency (MHz)			Limit (dB μ V)	
			Quasi-peak Level	Average Level
0.15	~	0.50	79	66
0.50	~	30.00	73	60

NOTE1- Decreasing linearly with logarithm of frequency.

NOTE2- The lower limit shall apply at the transition frequencies.

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 Mode 1 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.

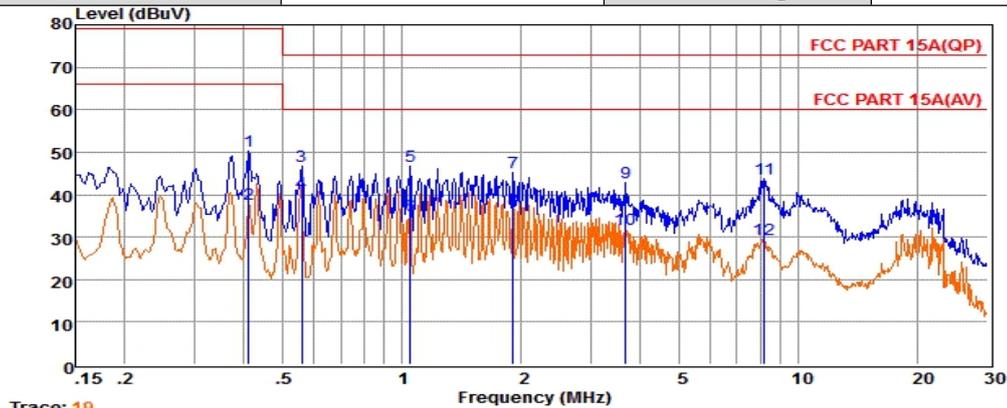
The frequency range from 150kHz to 30MHz is investigated

3.1.7. Test Results

PASS.

The test result please refer to the next page.

Test Model	BI808PE1G2F	Test Mode	Mode 1
Environmental Conditions	23.6°C, 54.2% RH	Test Engineer	Jay Li
Pol	Line	Test Voltage	AC 120V/60Hz

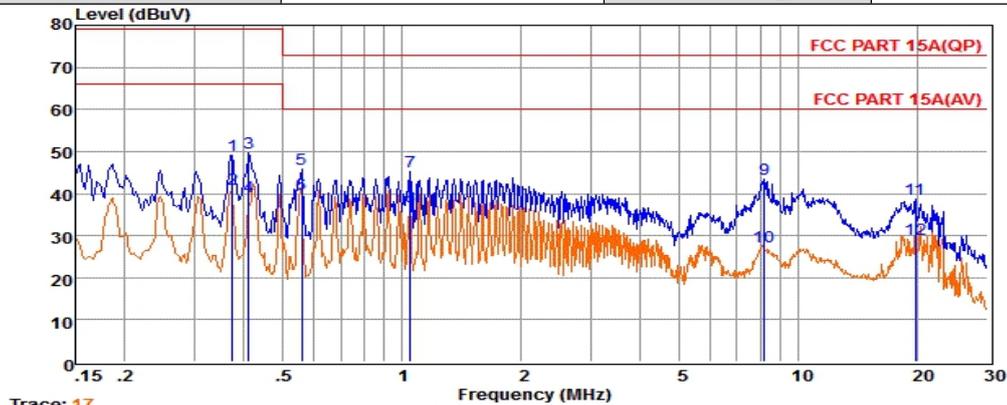


Trace: 19

	Freq	Reading	LISNFac	CabLos	Aux2Fac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.41	30.60	9.62	0.04	10.00	50.26	79.00	-28.74	QP
2	0.41	18.12	9.62	0.04	10.00	37.78	66.00	-28.22	Average
3	0.56	27.07	9.63	0.04	10.00	46.74	73.00	-26.26	QP
4	0.56	20.79	9.63	0.04	10.00	40.46	60.00	-19.54	Average
5	1.05	26.91	9.63	0.05	10.00	46.59	73.00	-26.41	QP
6	1.05	15.39	9.63	0.05	10.00	35.07	60.00	-24.93	Average
7	1.91	25.53	9.64	0.05	10.00	45.22	73.00	-27.78	QP
8	1.91	16.80	9.64	0.05	10.00	36.49	60.00	-23.51	Average
9	3.66	23.00	9.65	0.06	10.00	42.71	73.00	-30.29	QP
10	3.66	12.00	9.65	0.06	10.00	31.71	60.00	-28.29	Average
11	8.19	24.00	9.68	0.07	10.00	43.75	73.00	-29.25	QP
12	8.19	9.79	9.68	0.07	10.00	29.54	60.00	-30.46	Average

Remarks: 1. Measured = Reading + LISNFac + Cable Loss + Aux2 Fac.
 2. The emission levels that are 20dB below the official limit are not reported.

Test Model	BI808PE1G2F	Test Mode	Mode 1
Environmental Conditions	23.6°C, 54.2% RH	Test Engineer	Jay Li
Pol	Neutral	Test Voltage	AC 120V/60Hz



Trace: 17

	Freq	Reading	LISNFac	CabLos	Aux2Fac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.37	29.56	9.61	0.04	10.00	49.21	79.00	-29.79	QP
2	0.37	21.27	9.61	0.04	10.00	40.92	66.00	-25.08	Average
3	0.41	30.05	9.61	0.04	10.00	49.70	79.00	-29.30	QP
4	0.41	19.67	9.61	0.04	10.00	39.32	66.00	-26.68	Average
5	0.56	26.28	9.62	0.04	10.00	45.94	73.00	-27.06	QP
6	0.56	20.23	9.62	0.04	10.00	39.89	60.00	-20.11	Average
7	1.05	25.47	9.63	0.05	10.00	45.15	73.00	-27.85	QP
8	1.05	17.19	9.63	0.05	10.00	36.87	60.00	-23.13	Average
9	8.19	23.77	9.70	0.07	10.00	43.54	73.00	-29.46	QP
10	8.19	7.53	9.70	0.07	10.00	27.30	60.00	-32.70	Average
11	19.74	18.66	9.88	0.12	10.00	38.66	73.00	-34.34	QP
12	19.74	9.23	9.88	0.12	10.00	29.23	60.00	-30.77	Average

Remarks: 1. Measured = Reading + LISNFac + Cable Loss + Aux2 Fac.
 2. The emission levels that are 20dB below the official limit are not reported.

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

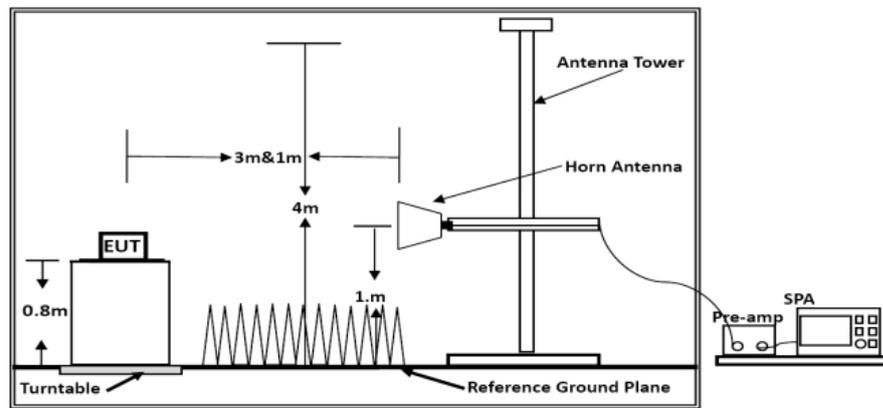
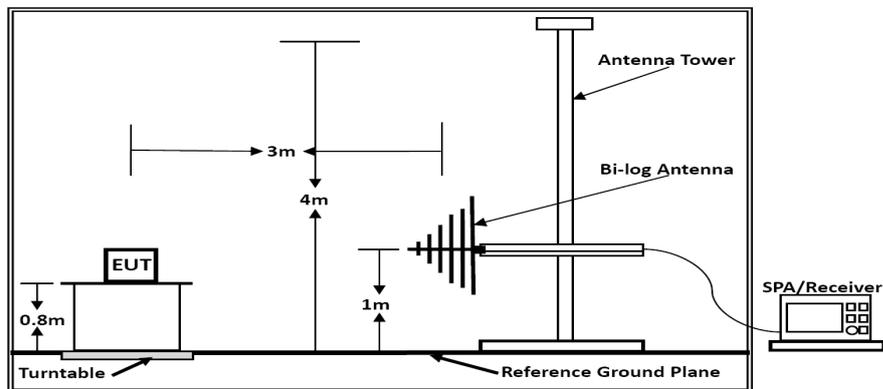
3.2. Radiated emission Measurement

3.2.1. Test Equipment

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

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Software	AUDIX	E3	/	N/A
2	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	2019-06-12
3	Positioning Controller	MF	MF-7082	/	2019-06-12
4	By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2019-07-25
5	Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-192 5	2019-07-01
6	EMI Test Receiver	R&S	ESR 7	101181	2019-06-12
7	RS SPECTRUM ANALYZER	R&S	FSP40	100503	2018-11-15
8	Broadband Preamplifier	/	BP-01M18G	P190501	2019-07-01
9	RF Cable-R03m	Jye Bao	RG142	CB021	2019-06-12
10	RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	2019-06-12

3.2.2. Block Diagram of Test Setup



3.2.3. Radiated Emission Limit (Class A)

Limits for Radiated Disturbance Below 1GHz

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		$\mu\text{V}/\text{m}$	$\text{dB}(\mu\text{V})/\text{m}$
30 ~ 88	3	90	50
88 ~ 216	3	150	53.5
216 ~ 960	3	200	56
960 ~ 1000	3	500	64

Remark: (1) Emission level $(\text{dB})\mu\text{V} = 20 \log$ Emission level $\mu\text{V}/\text{m}$
 (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 ($\text{dB}\mu\text{V}/\text{m}$)	Average Limit ($\text{dB}\mu\text{V}/\text{m}$)
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 Mode 1 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, 1000kHz.

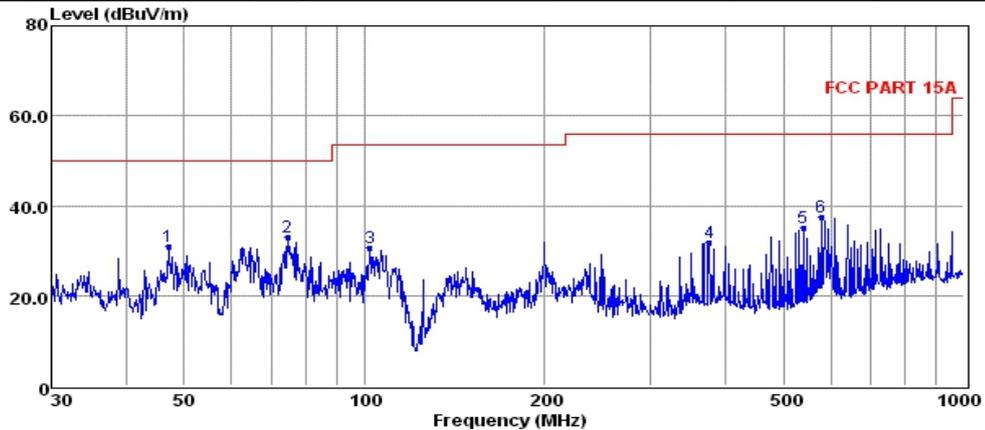
The frequency range from 30MHz to 1000MHz is checked.

3.2.7. Radiated Emission Noise Measurement Result

PASS.

The scanning waveforms please refer to the next page.

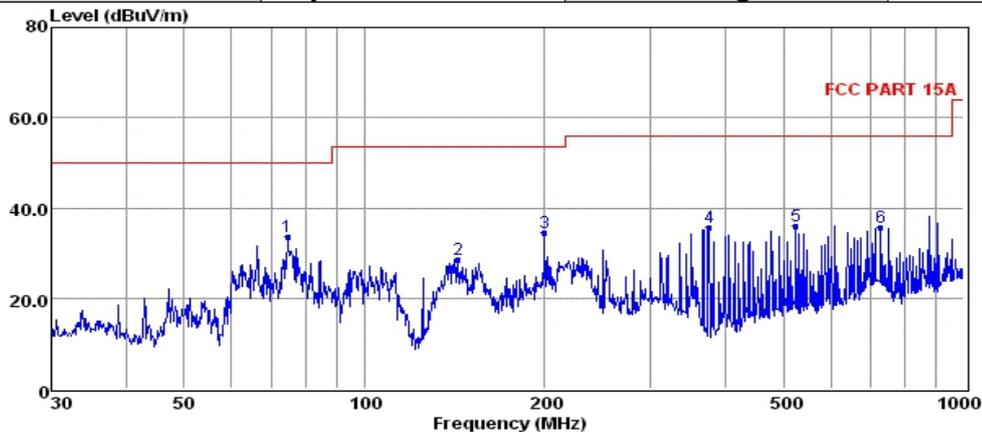
Test Model	BI808PE1G2F	Test Mode	Mode 1
Environmental Conditions	23.8°C, 54.3% RH	Detector Function	Quasi-peak
Pol	Vertical	Distance	3m
Test Engineer	Jay Li	Test Voltage	AC 120V/60Hz



	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	46.99	17.03	0.35	13.43	30.81	50.00	-19.19	QP
2	74.40	24.71	0.54	7.90	33.15	50.00	-16.85	QP
3	102.00	17.19	0.60	12.98	30.77	53.50	-22.73	QP
4	375.94	16.29	1.10	14.56	31.95	56.00	-24.05	QP
5	539.48	16.50	1.34	17.32	35.16	56.00	-20.84	QP
6	578.67	17.90	1.44	18.05	37.39	56.00	-18.61	QP

Note: 1. All readings are Quasi-peak values.
 2. Measured= Reading + Antenna Factor + Cable Loss
 3. The emission that are 20db below the official limit are not reported

Test Model	BI808PE1G2F	Test Mode	Mode 1
Environmental Conditions	23.8°C, 54.3% RH	Detector Function	Quasi-peak
Pol	Horizontal	Distance	3m
Test Engineer	Jay Li	Test Voltage	AC 120V/60Hz



	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	74.40	25.16	0.54	7.90	33.60	50.00	-16.40	QP
2	143.33	19.69	0.71	8.21	28.61	53.50	-24.89	QP
3	199.99	22.99	0.84	10.57	34.40	53.50	-19.10	QP
4	375.94	20.12	1.10	14.56	35.78	56.00	-20.22	QP
5	524.55	17.53	1.45	17.04	36.02	56.00	-19.98	QP
6	726.81	14.78	1.70	19.15	35.63	56.00	-20.37	QP

Note: 1. All readings are Quasi-peak values.
 2. Measured= Reading + Antenna Factor + Cable Loss
 3. The emission that are 20db below the official limit are not reported

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

4. PHOTOGRAPH



Photo of Power Line Conducted Measurement

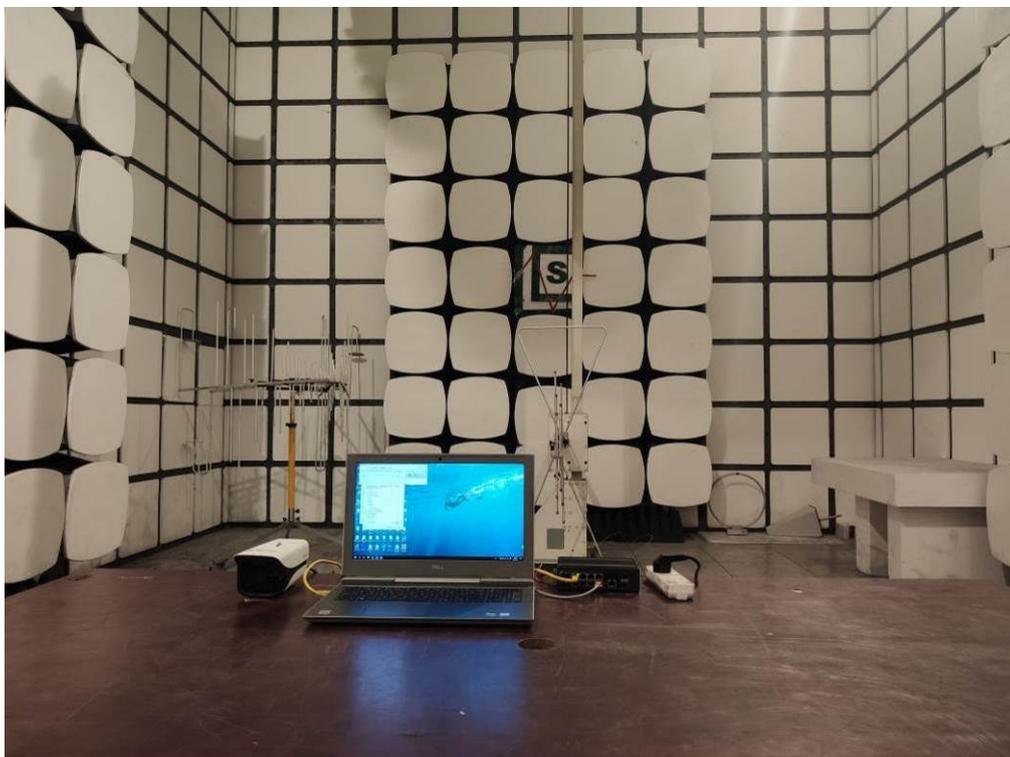


Photo of Radiated Measurement (Below 1GHz)

5. EXTERNAL AND INTERNAL PHOTOS OF THE EUT



Fig. 1

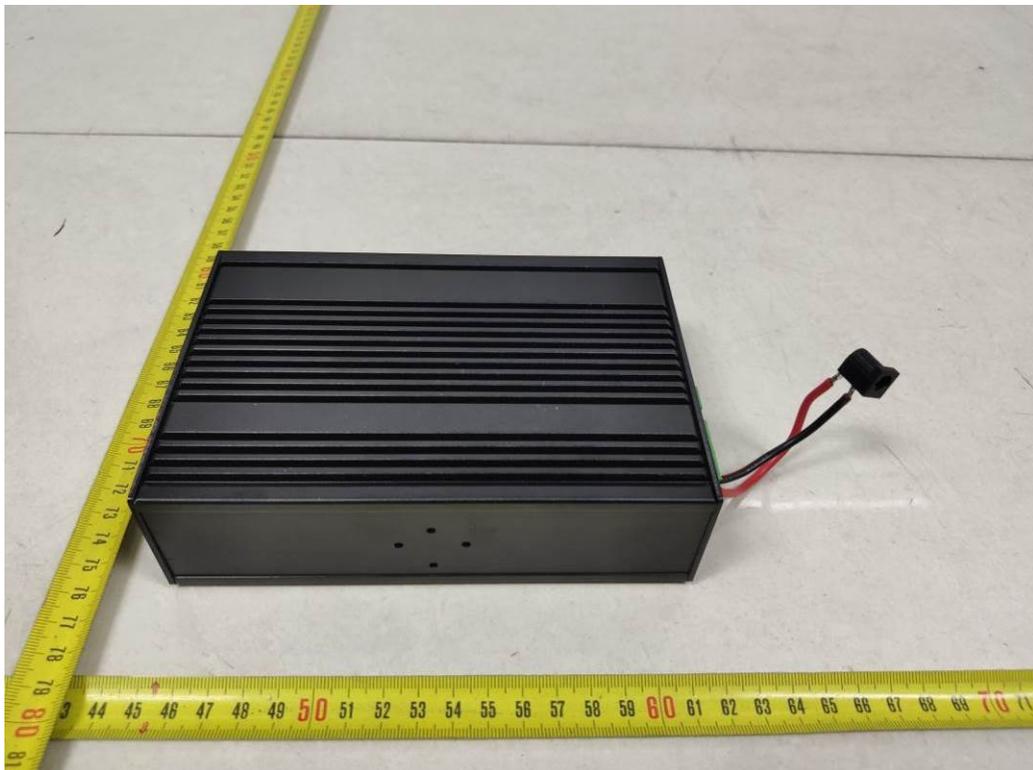


Fig. 2



Fig. 3

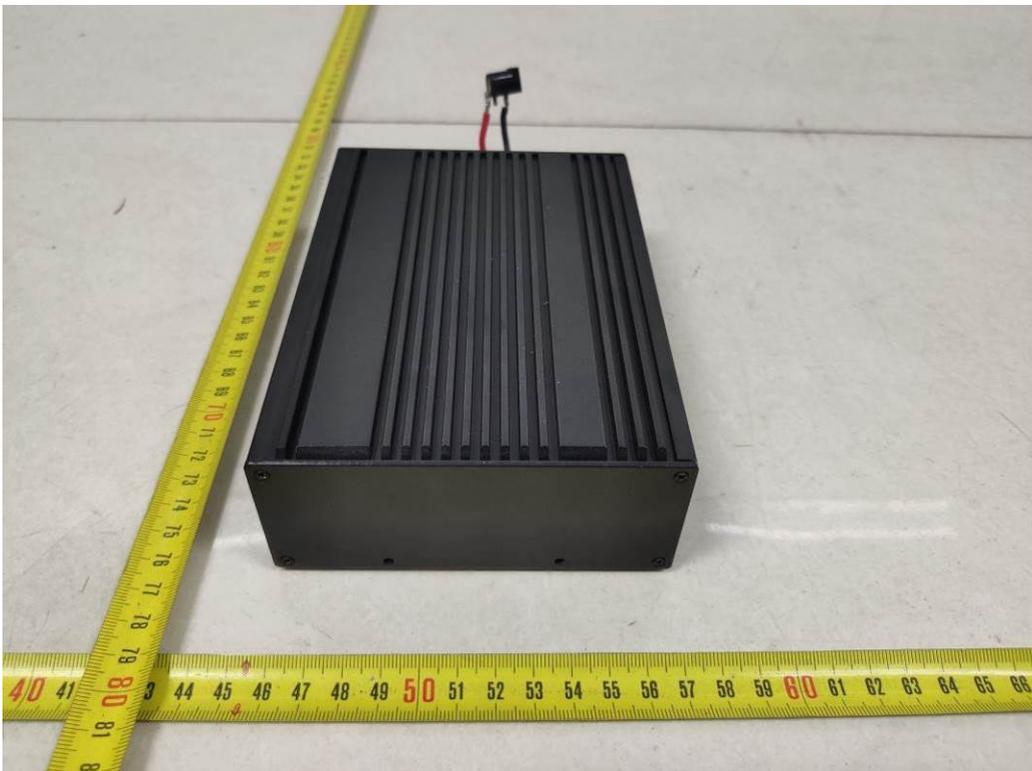


Fig. 4



Fig. 5

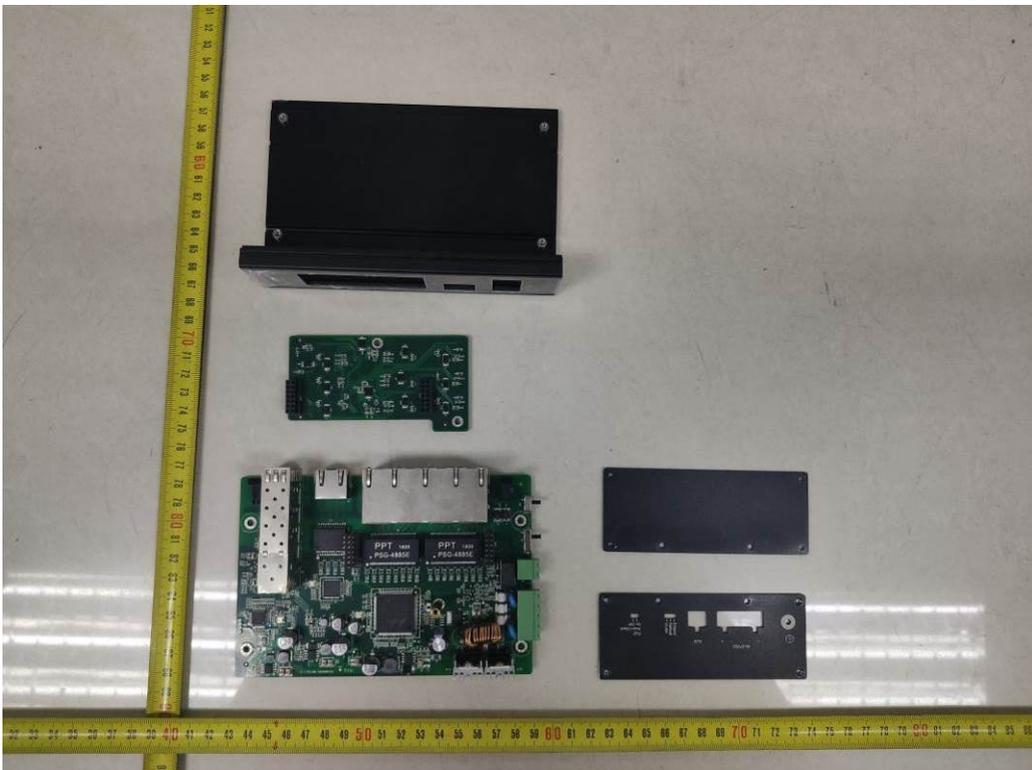


Fig. 6

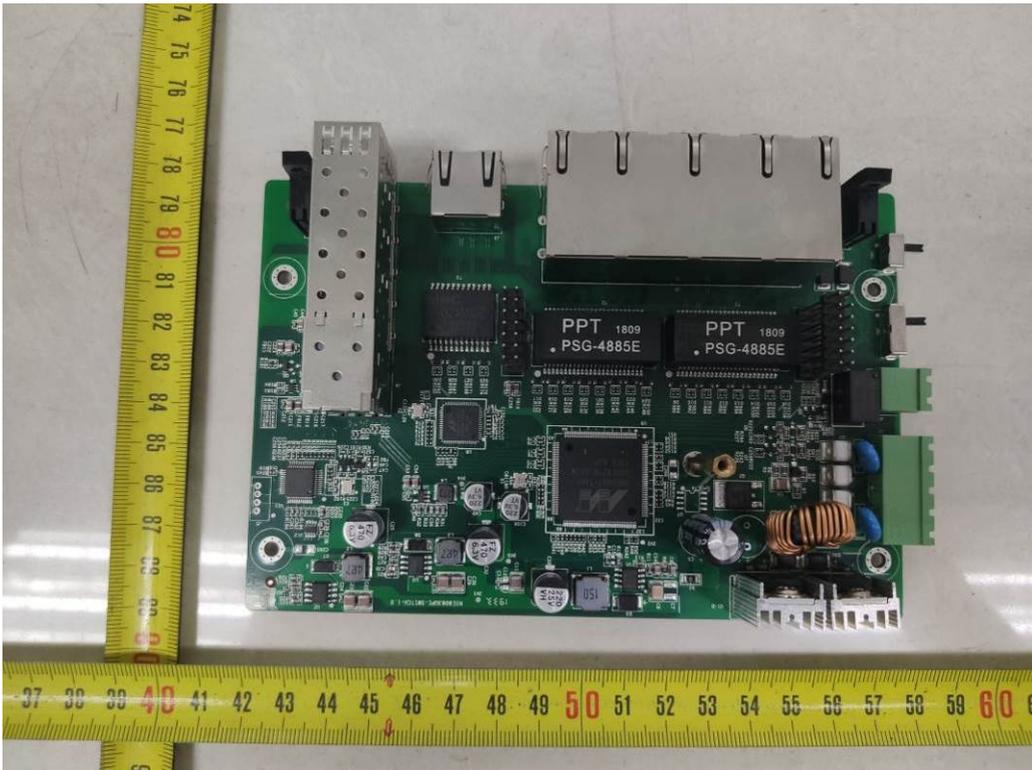


Fig. 7

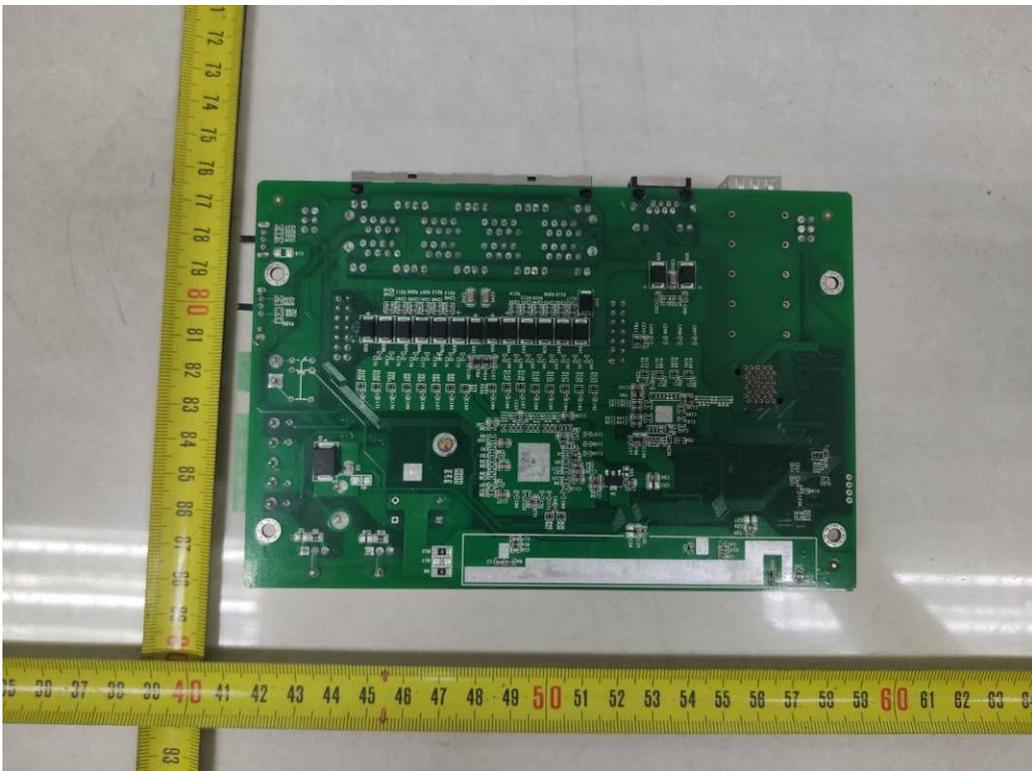


Fig. 8

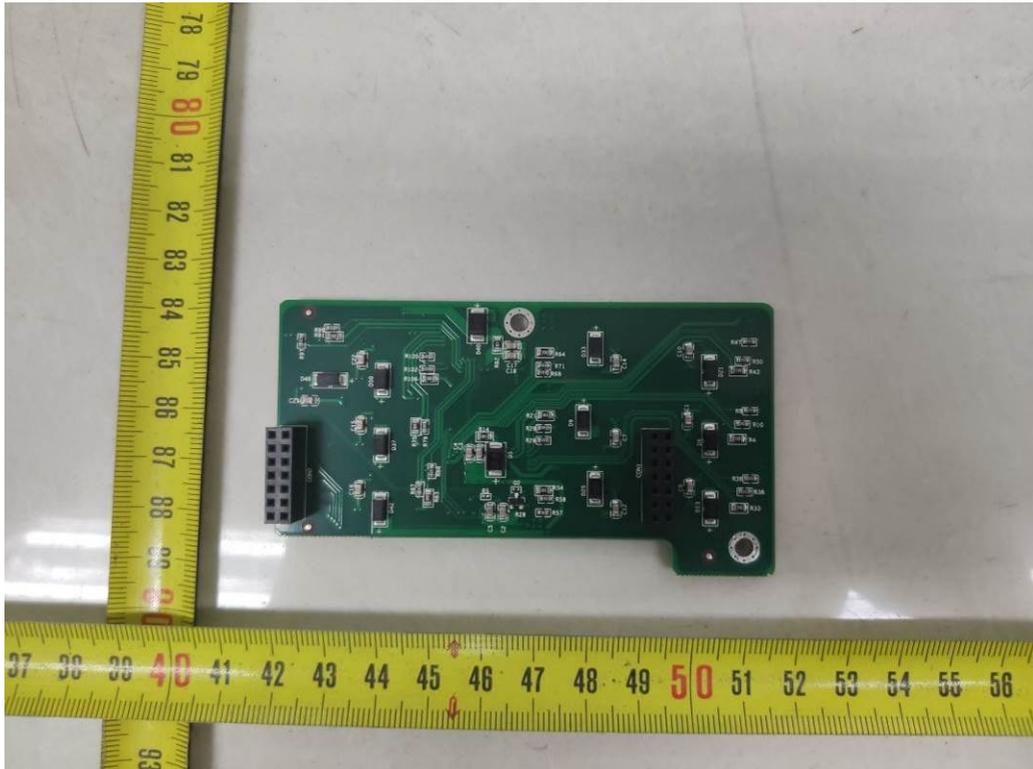


Fig. 9

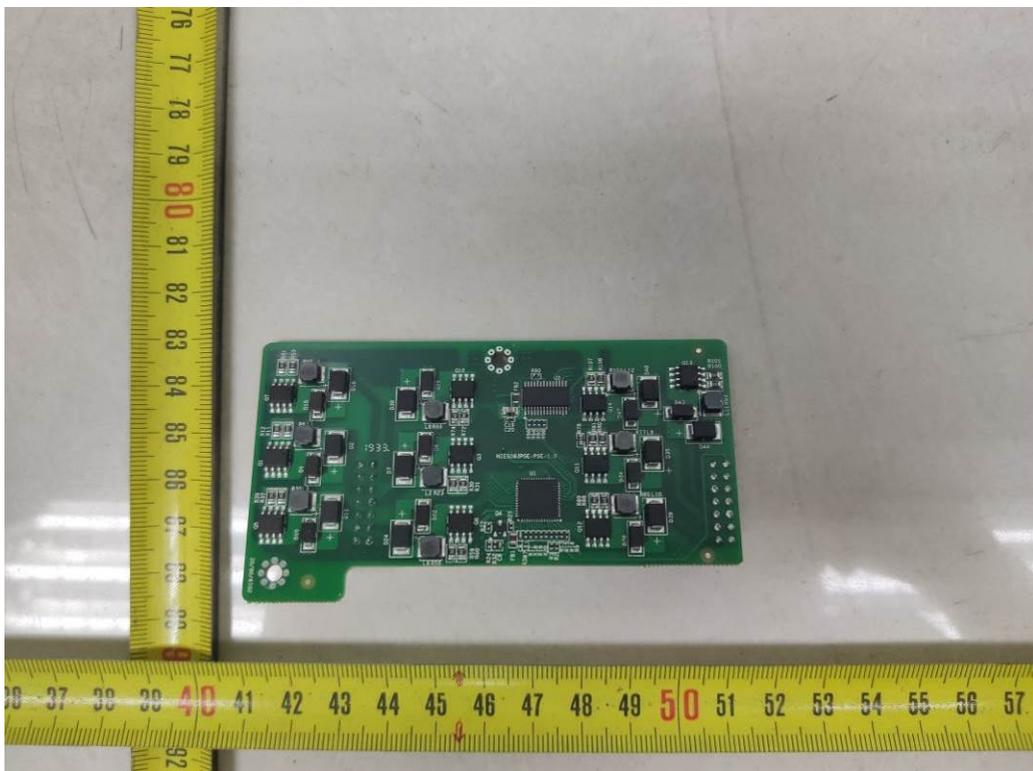


Fig. 10

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