

FCC Part 15, Supart B, Class B(sDoC)

TEST REPORT

Haverford Systems, Inc., A Diversified Technology Company

ptz keyboard

Test Model: PT-JOY-G3

Additional Model No.: PT-JOY-G3, HC-JOY-G2, HC-JOY-G3

Prepared for	: Haverford Systems, Inc., A Diversified Technology Company
Address	: 152 Robbins Rd Downingtown, PA 19335
Prepared by	: Shenzhen LCS Compliance Testing Laboratory Ltd.
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Date of receipt of test sample	: October 09, 2018
Number of tested samples	: 1
Serial number	: Prototype
Date of Test	: October 09, 2018 ~ October 15, 2018
Date of Report	: November 16, 2018



FCC TEST REPORT

FCC Part 15, Supart B, Class B(sDoC)

Report Reference No. : LCS181009015AE

Date Of Issue : November 16, 2018

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

Address : Xingyuan Industrial Park, Tongda Road, Bao'an Avenue, 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..... : Haverford Systems, Inc., A Diversified Technology Company

Address : 152 Robbins Rd | Downingtown, PA 19335

Test Specification

Standard..... : FCC Part 15, Supart B, Class B(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. : ptz keyboard

Test Model..... : PT-JOY-G3

Trade Mark : PTZOPTICS, HuddleCamHD
 For SWITCHING ADAPTOR

Ratings..... : Input: 100-240V~, 50/60Hz, 0.6A Max
 Output: 12V---2000mA

Result : Positive

Compiled by:

Jessica Wu

Jessica Wu/ File administrators

Supervised by:

Davey Xu

Davey Xu/ Technique principal

Approved by:

Gavin Liang

Gavin Liang/ Manager

FCC -- TEST REPORT**Test Report No. : LCS181009015AE**November 16, 2018

Date of issue

Test Model : PT-JOY-G3

EUT..... : ptz keyboard

Applicant..... : Haverford Systems, Inc., A Diversified Technology Company

Address..... : 152 Robbins Rd | Downingtown, PA 19335

Telephone..... : /

Fax..... : /

Manufacturer..... : Shenzhen Mingyang Ages Electronics Co., LTDAddress..... : 1-2F, Building 7, Dongwu Industrial Zone, Donghuan 1st Rd,
Longhua District, Shenzhen, China

Telephone..... : /

Fax..... : /

Factory..... : Shenzhen Mingyang Ages Electronics Co., LTDAddress..... : 1-2F, Building 7, Dongwu Industrial Zone, Donghuan 1st Rd,
Longhua District, Shenzhen, China

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	November 16, 2018	Initial Issue	Gavin Liang

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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, Supart B, Class B(sDoC), ANSI C63.4 -2014	Class B	PASS
Radiated disturbance	FCC Part 15, Supart B, Class B(sDoC), ANSI C63.4 -2014	Class B	PASS
Conducted disturbance at Antenna terminals	FCC Part 15, Supart B, Class B(sDoC), ANSI C63.4 -2014	-----	N/A
N/A is an abbreviation for Not Applicable.			

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

EUT : ptz keyboard

Trade Mark : PTZOPTICS, HuddleCamHD

Test Model : PT-JOY-G3

Power Supply : For SWITCHING ADAPTOR
Input: 100-240V~, 50/60Hz, 0.6A Max
Output: 12V $\overline{\sim}$ 2000mA

EUT Clock Frequency : $\leq$ 108MHz

2.2. Description of Support Device

Description	Manufacturer	Model	Serial Number
PC	dell	Optiplex 380 MT	2YK643X

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 (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
Power disturbance	Level accuracy (30MHz to 300MHz)	± 2.90 dB	± 4.5 dB
Electromagnetic Radiated Emission (3-loop)	Level accuracy (9kHz to 30MHz)	± 3.60 dB	± 3.3 dB
Radiated Emission	Level accuracy (9kHz to 30MHz)	± 3.68 dB	N/A
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
Mains Harmonic	Voltage	$\pm 0.510\%$	N/A
Voltage Fluctuations & Flicker	Voltage	$\pm 0.510\%$	N/A
EMF		$\pm 21.59\%$	N/A

(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%.

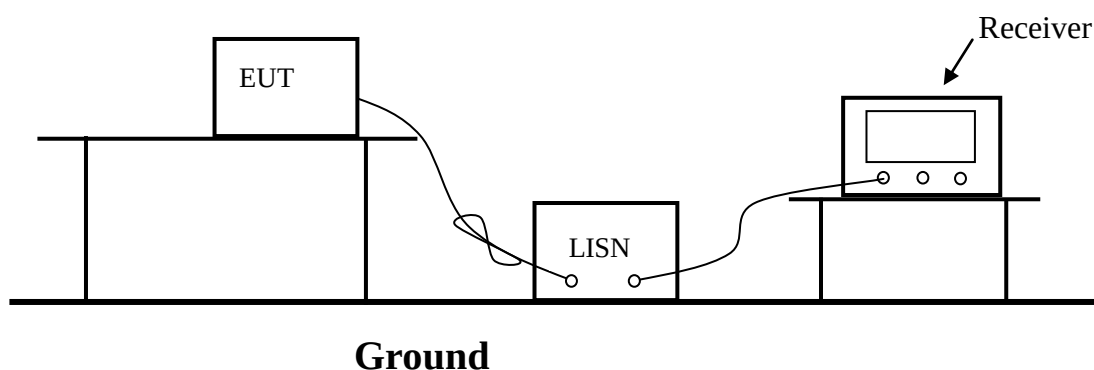
3. POWER LINE CONDUCTED EMISSION MEASUREMENT

3.1. 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 Receiver	ROHDE & SCHWARZ	ESCI	101142	2018-06-16
2	10dB Attenuator	SCHWARZBECK	MTS-IMP136	261115-001-0032	2018-06-16
3	Artificial Mains	ROHDE & SCHWARZ	ENV216	101288	2018-06-16
4	EMI Test Software	AUDIX	E3	N/A	N/A
5	ISN	SCHWARZBECK	NTFM 8158	NTFM 81580120	2017-11-17

3.2. Block Diagram of Test Setup



3.3. Test Standard

Power Line Conducted Emission Limits (Class B)

Frequency (MHz)			Limit (dBμV)	
			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.

3.4. 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.

3.5.Operating Condition of EUT

3.5.1.Setup the EUT as shown on Section 3.2

3.5.2.Turn on the power of all equipments.

3.5.3.Let the EUT work in measuring mode (Normal) and measure it.

3.6.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.

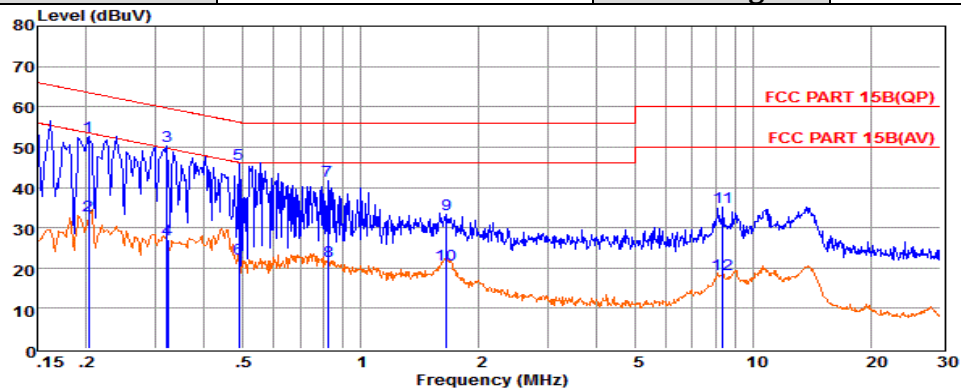
The frequency range from 150kHz to 30MHz is investigated

3.7.Test Results

PASS.

The test result please refer to the next page.

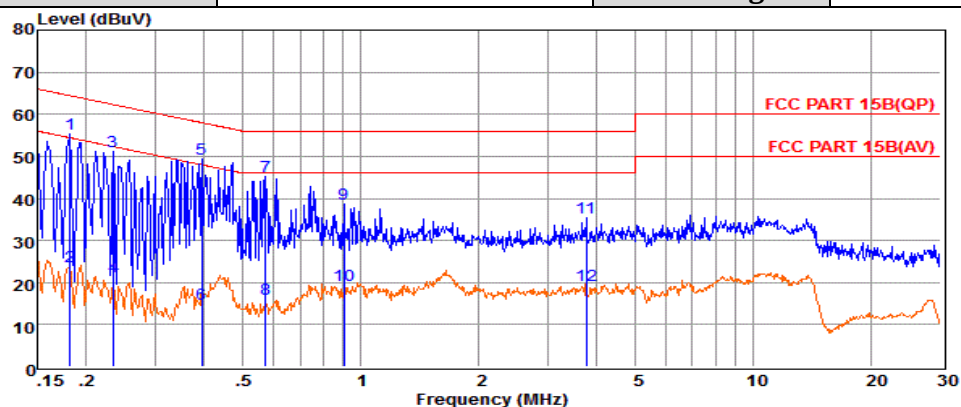
Test Model	PT-JOY-G3	Test Mode	Normal
Environmental Conditions	23.8°C, 53.2% RH	Test Engineer	Jay Li
Pol	Line	Test Voltage	AC 120V/60Hz



	Freq	Reading	LISNFac	CabLos	Aux2Fac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.20	32.85	9.63	0.03	10.00	52.51	63.49	-10.98	QP
2	0.20	13.50	9.63	0.03	10.00	33.16	53.49	-20.33	Average
3	0.32	30.61	9.62	0.03	10.00	50.26	59.66	-9.40	QP
4	0.32	7.40	9.62	0.03	10.00	27.05	49.66	-22.61	Average
5	0.49	26.01	9.62	0.04	10.00	45.67	56.19	-10.52	QP
6	0.49	2.78	9.62	0.04	10.00	22.44	46.18	-23.74	Average
7	0.83	21.88	9.64	0.04	10.00	41.56	56.00	-14.44	QP
8	0.83	1.89	9.64	0.04	10.00	21.57	46.00	-24.43	Average
9	1.65	13.57	9.64	0.05	10.00	33.26	56.00	-22.74	QP
10	1.65	1.14	9.64	0.05	10.00	20.83	46.00	-25.17	Average
11	8.37	15.28	9.69	0.07	10.00	35.04	60.00	-24.96	QP
12	8.37	-1.38	9.69	0.07	10.00	18.38	50.00	-31.62	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	PT-JOY-G3	Test Mode	Normal
Environmental Conditions	23.8°C, 53.2% RH	Test Engineer	Jay Li
Pol	Neutral	Test Voltage	AC 120V/60Hz



	Freq	Reading	LISNFac	CabLos	Aux2Fac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.18	35.69	9.63	0.02	10.00	55.34	64.42	-9.08	QP
2	0.18	4.10	9.63	0.02	10.00	23.75	54.41	-30.66	Average
3	0.23	31.51	9.60	0.03	10.00	51.14	62.30	-11.16	QP
4	0.23	1.66	9.60	0.03	10.00	21.29	52.30	-31.01	Average
5	0.39	29.61	9.61	0.04	10.00	49.26	57.99	-8.73	QP
6	0.39	-4.90	9.61	0.04	10.00	14.75	47.99	-33.24	Average
7	0.57	25.64	9.62	0.04	10.00	45.30	56.00	-10.70	QP
8	0.57	-3.73	9.62	0.04	10.00	15.93	46.00	-30.07	Average
9	0.90	19.09	9.63	0.05	10.00	38.77	56.00	-17.23	QP
10	0.90	-0.21	9.63	0.05	10.00	19.47	46.00	-26.53	Average
11	3.76	15.79	9.65	0.06	10.00	35.50	56.00	-20.50	QP
12	3.76	-0.25	9.65	0.06	10.00	19.46	46.00	-26.54	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.

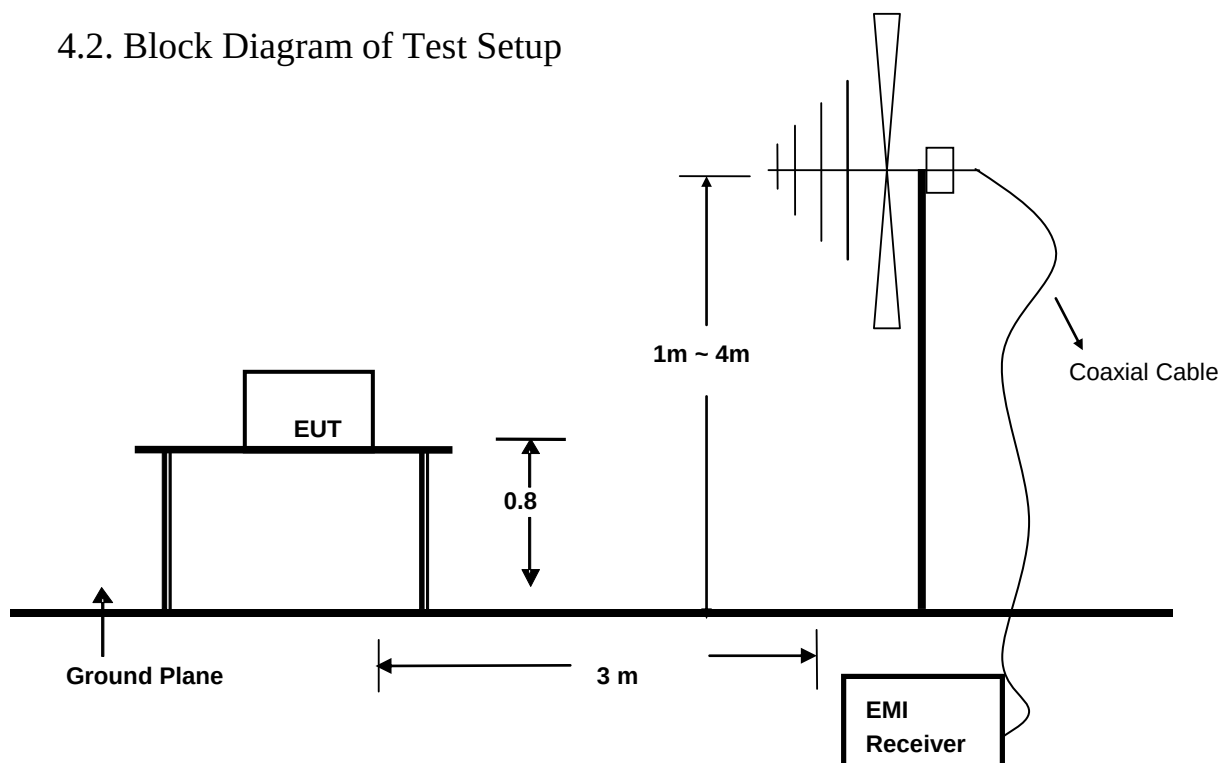
4. RADIATED EMISSION MEASUREMENT

4.1. Test Equipment

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

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	2018-06-16
2	EMI Test Receiver	ROHDE & SCHWARZ	ESR 7	101181	2018-06-16
3	By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2018-05-01
4	EMI Test Software	AUDIX	E3	N/A	2018-06-16
5	Positioning Controller	MF	MF-7082	/	2018-06-16

4.2. Block Diagram of Test Setup



4.3. Radiated Emission Limit (Class B)

Limits for radiated disturbance Blow 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.

4.4. 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.

4.5. Operating Condition of EUT

4.5.1. Setup the EUT as shown in Section 4.2.

4.5.2. Let the EUT work in test mode (Normal) and measure it.

4.6. 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.

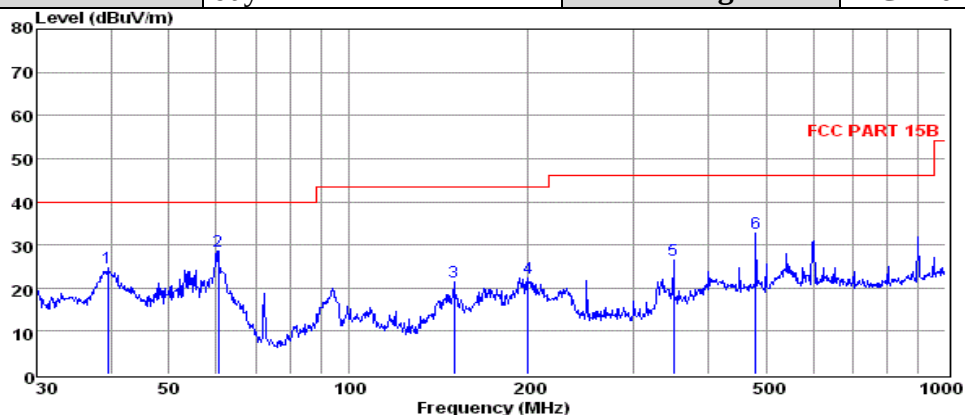
The frequency range from 30MHz to 1000MHz is checked.

4.7. Radiated Emission Noise Measurement Result

PASS.

The scanning waveforms please refer to the next page.

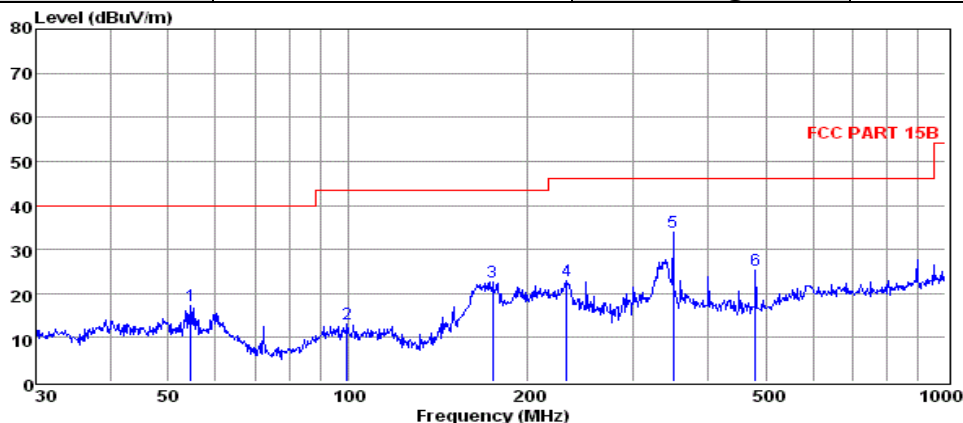
Test Model	PT-JOY-G3	Test Mode	Normal
Environmental Conditions	23.4℃, 53.6% RH	Detector Function	Quasi-peak
Pol	Vertical	Distance	3m
Test Engineer	Jay Li	Test Voltage	AC 120V/60Hz



	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	39.44	10.99	0.38	13.44	24.81	40.00	-15.19	QP
2	60.49	15.46	0.49	12.50	28.45	40.00	-11.55	QP
3	150.01	12.39	0.86	8.26	21.51	43.50	-21.99	QP
4	199.99	10.99	0.84	10.57	22.40	43.50	-21.10	QP
5	350.48	11.14	1.15	14.28	26.57	46.00	-19.43	QP
6	480.53	15.43	1.31	16.08	32.82	46.00	-13.18	QP

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

Test Model	PT-JOY-G3	Test Mode	Normal
Environmental Conditions	23.4℃, 53.6% 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	54.45	3.85	0.46	13.05	17.36	40.00	-22.64	QP
2	99.53	-0.55	0.61	13.13	13.19	43.50	-30.31	QP
3	174.42	12.73	0.73	9.28	22.74	43.50	-20.76	QP
4	232.53	10.26	0.98	11.76	23.00	46.00	-23.00	QP
5	350.48	18.43	1.15	14.28	33.86	46.00	-12.14	QP
6	480.53	8.02	1.31	16.08	25.41	46.00	-20.59	QP

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

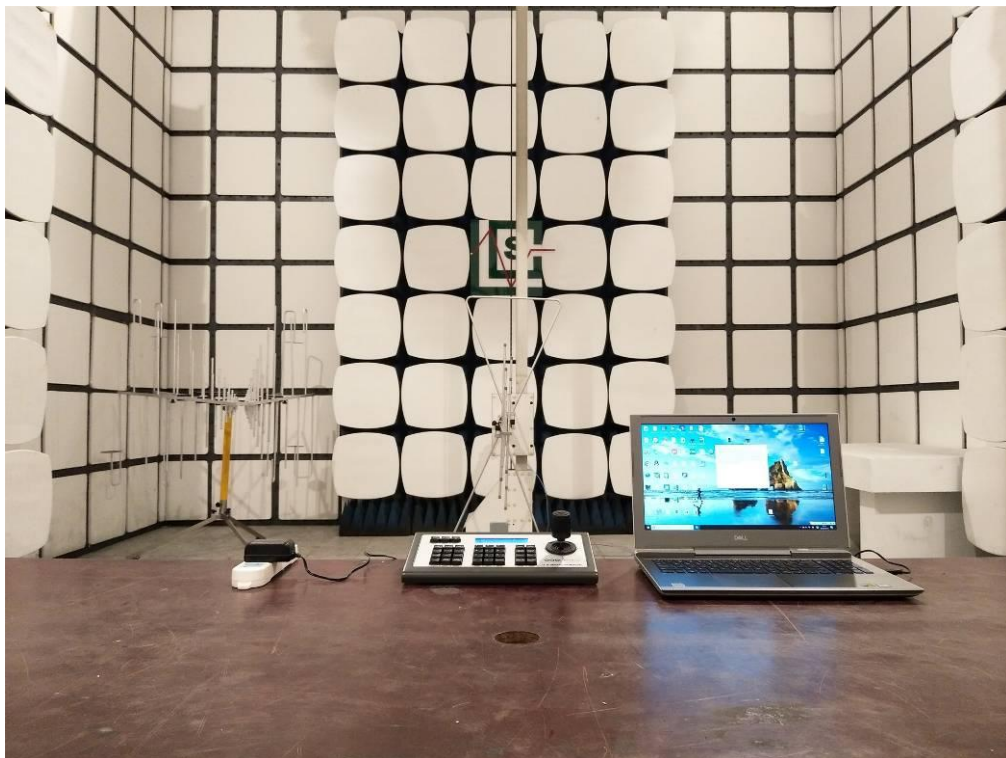
Note: Pre-Scan all mode, Thus record worse case mode result in this report.

5. PHOTOGRAPH

5.1.Photo of Power Line Conducted Measurement



5.2. Photo of Radiated Measurement



6. EXTERNAL AND INTERNAL PHOTOS OF THE EUT



Fig. 1



Fig. 2

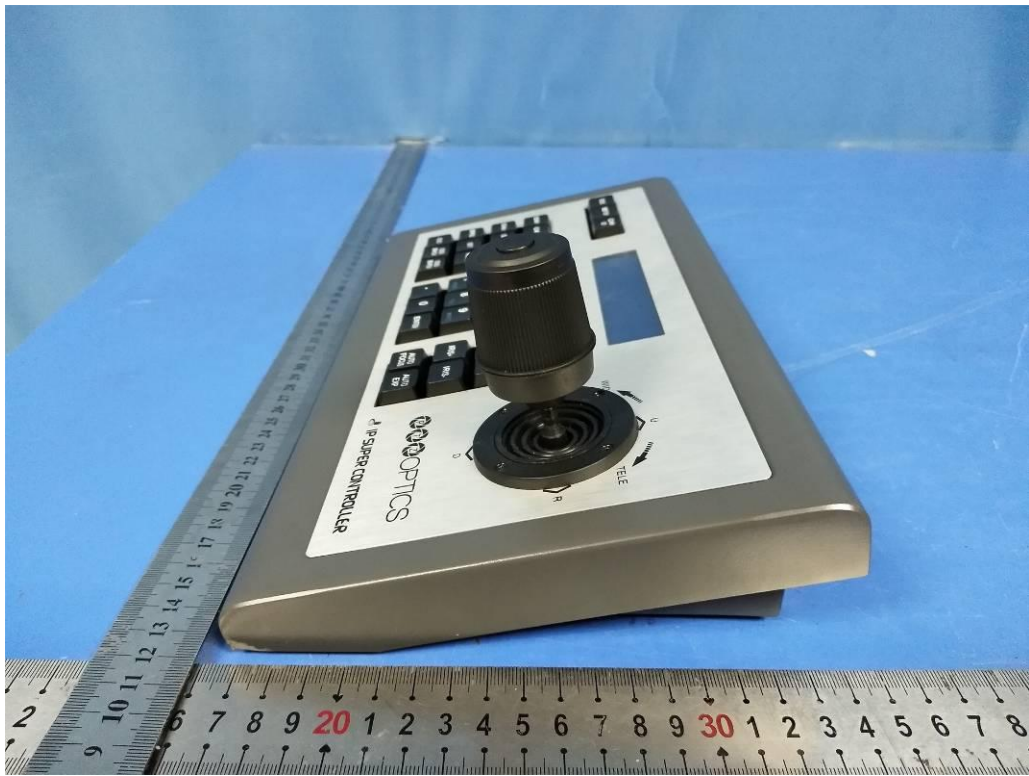


Fig. 3

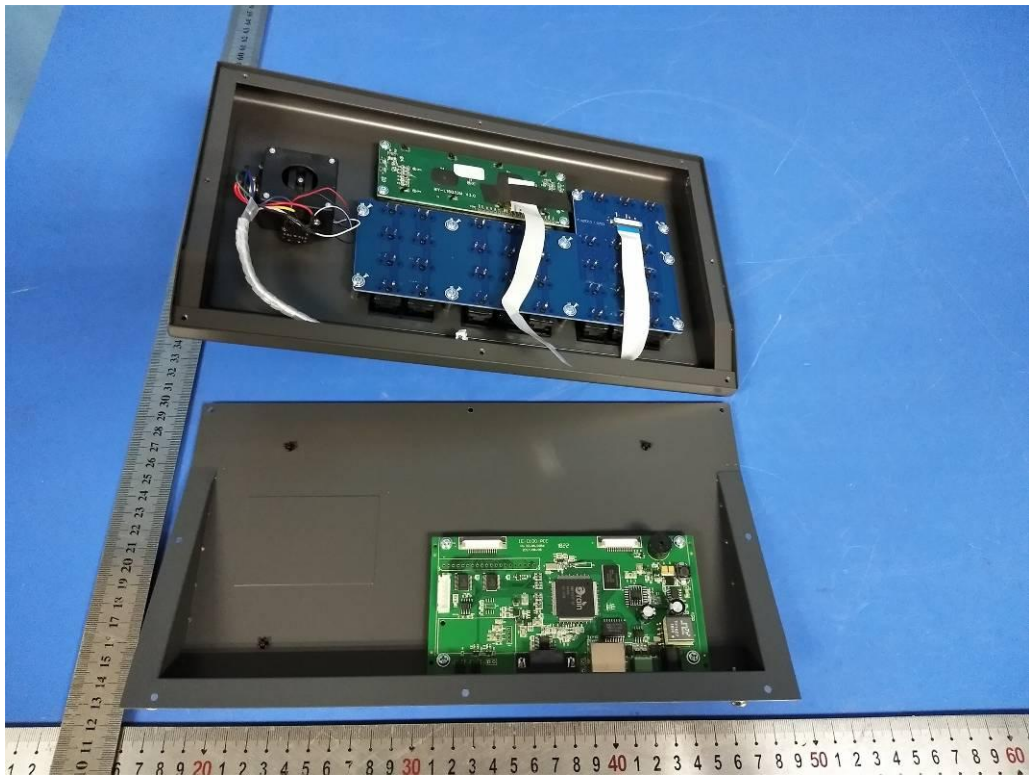


Fig. 4



Fig. 5

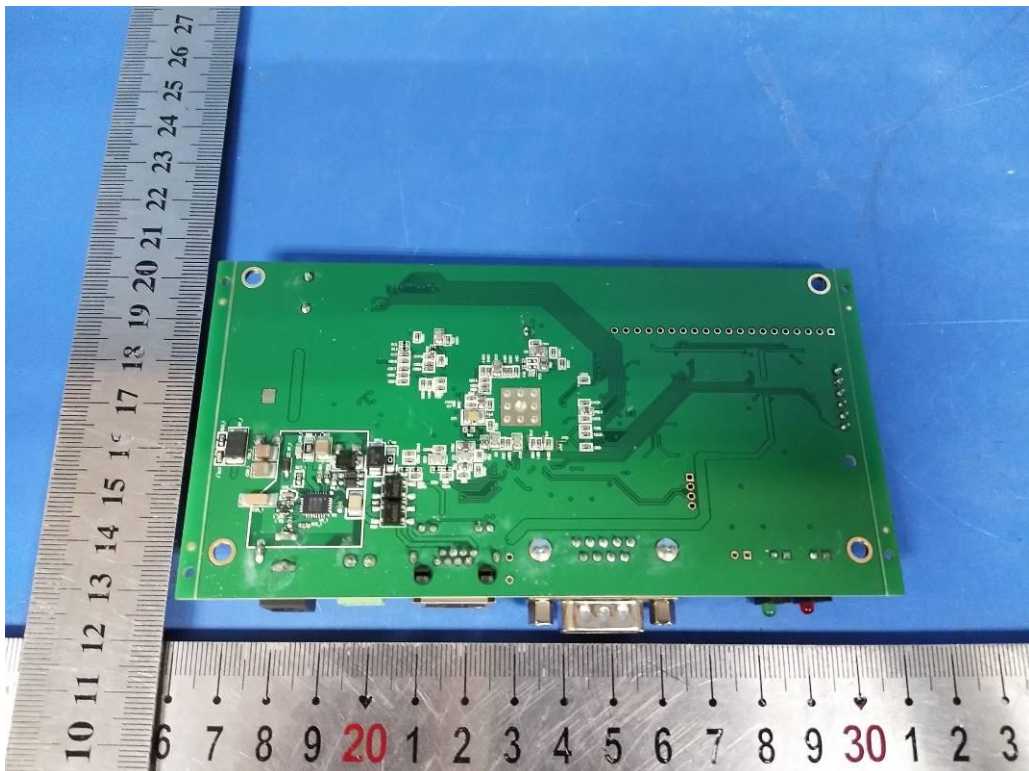


Fig. 6



Fig. 7

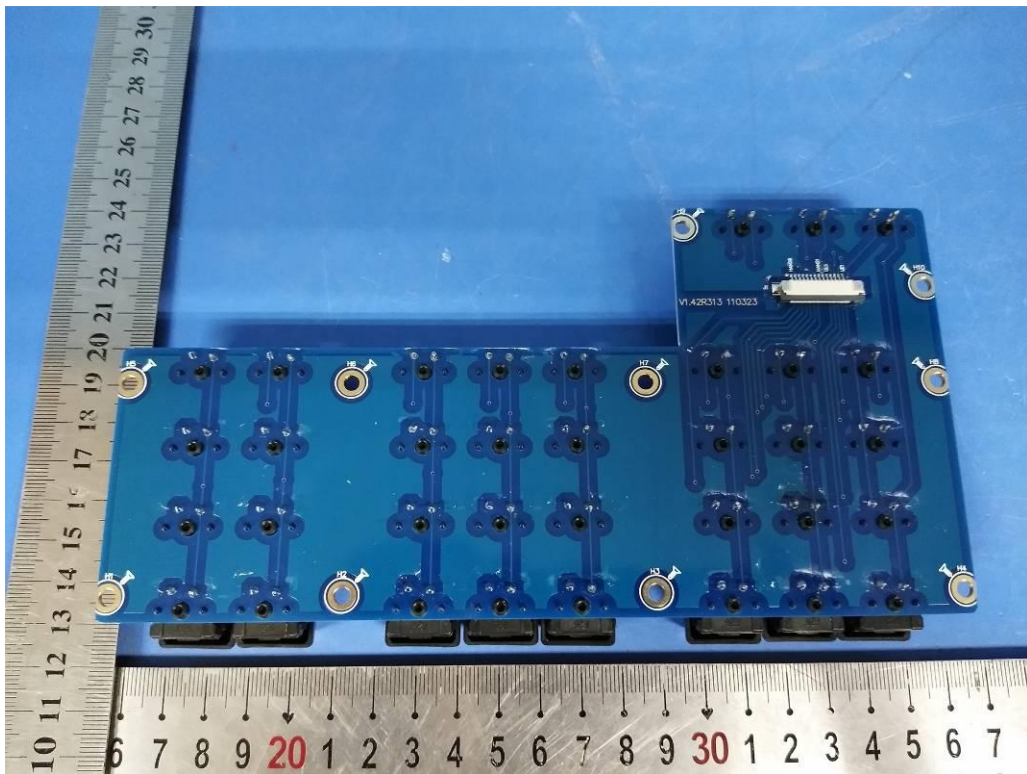


Fig. 8



Fig. 9



Fig. 10

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