

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

TEST REPORT

Shenzhen Sunricher Technology Limited

LED Controllers

Test Model: SR-1009PD

Additional Model No.: Please refer to page 7

Prepared for : Shenzhen Sunricher Technology Limited

Address : 3rd Floor,B building,Jia'an Industrial Building, Liu Xian Third road,No.72 area, Xin'an Street, Baoan District, Shenzhen, China

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Date of receipt of test sample : April 01, 2019
 Number of tested samples : 1
 Serial number : Prototype
 Date of Test : April 01, 2019 ~ April 09, 2019
 Date of Report : April 15, 2019



FCC TEST REPORT

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

Report Reference No. : LCS190322040AEA
Date Of Issue : April 15, 2019
Testing Laboratory Name..... : Shenzhen LCS Compliance Testing Laboratory Ltd.
**Address : 1/F., 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..... : Shenzhen Sunricher Technology Limited
**Address : 3rd Floor,B building,Jia'an Industrial Building, Liu Xian Third
road,No.72 area, Xin'an Street, Baoan District, Shenzhen, China**
Test Specification
Standard : FCC Part 15, Subpart 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. : LED Controllers
Test Model..... : SR-1009PD
Trade Mark :

Ratings :

 Input: DC 12-36V
 Output: DC 12-36V

Result : Positive
Compiled by:
Supervised by:
Approved by:

Ryan Hu / File administrators

Calvin Weng / Technique Principal

Gavin Liang/ Manager

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FCC -- TEST REPORT

Test Report No. : LCS190322040AEA
April 15, 2019

Date of issue

Test Model : SR-1009PD

EUT..... : LED Controllers

Applicant..... : Shenzhen Sunricher Technology Limited

Address..... : 3rd Floor,B building,Jia'an Industrial Building, Liu Xian Third road,No.72 area, Xin'an Street, Baoan District, Shenzhen, China

Telephone..... : /

Fax..... : /

Manufacturer..... : Shenzhen Sunricher Technology Limited

Address..... : 3rd Floor,B building,Jia'an Industrial Building, Liu Xian Third road,No.72 area, Xin'an Street, Baoan District, Shenzhen, China

Telephone..... : /

Fax..... : /

Factory..... : Shenzhen Sunricher Technology Limited

Address..... : 3rd Floor,B building,Jia'an Industrial Building, Liu Xian Third road,No.72 area, Xin'an Street, Baoan 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	April 15, 2019	Initial Issue	Gavin Liang

TABLE OF CONTENTS

Test Report Description	Page
1. SUMMARY OF STANDARDS AND RESULTS	6
1.1. Description of Standards and Results.....	6
2. GENERAL INFORMATION	7
2.1. Description of Device (EUT)	7
2.2. Support Equipment List.....	7
2.3. Description of Test Facility	7
2.4. Statement of the Measurement Uncertainty	8
2.5. Measurement Uncertainty	8
3. POWER LINE CONDUCTED EMISSION MEASUREMENT	9
3.1. Test Equipment.....	9
3.2. Block Diagram of Test Setup	9
3.3. Test Standard	9
3.4. EUT Configuration on Test	9
3.5. Operating Condition of EUT	10
3.6. Test Procedure	10
3.7. Test Results	10
4. RADIATED EMISSION MEASUREMENT	12
4.1. Test Equipment.....	12
4.3. Radiated Emission Limit (Class B)	13
4.4. EUT Configuration on Measurement	13
4.5. Operating Condition of EUT	13
4.6. Test Procedure	13
4.7. Radiated Emission Noise Measurement Result.....	14
5. TEST SETUP PHOTOGRAPHS OF EUT.....	16
6. EXTERIOR PHOTOGRAPHS OF THE EUT.....	17
7. INTERIOR PHOTOGRAPHS OF THE EUT	18

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

Test mode:		
Mode 1	Control LED light	Record

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

EUT : LED Controllers

Trade Mark :



Test Model : SR-1009PD

Additional Model No : SR-1009CS, SR-1009FA, SR-1009LC-RGB, SR-1009EA, SR-1009EAWI, SR-1009MS-RGBW-Receiver, SR-1009EA-PD, SR-1029-Master, SR-1009NPD, SR-2501NS, SR-2501N, SR-2501SAC-HP, SR-1009NP7, SR-1Channel TPF, SR-1009NP, SR-1009NP3, SR-1009SAC-HP, SR-1009SAC-SWITCH

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

Ratings : Input: DC 12-36V
Output: DC 12-36V

EUT Clock Frequency : $\leq 108\text{MHz}$

869.5MHz RX

Frequency Range : 869.5MHz

Channel Number : 1 Channels

Modulation Type : FSK

Antenna Description : Internal Antenna

2.2. Support Equipment List

Name	Manufacturers	M/N	S/N	Certificate
--	--	--	--	--

2.3. Description of Test Facility

Site Description

EMC Lab. : FCC Registration Number is 254912.
Industry Canada Registration Number is 9642A-1.
EMSD 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 Accreditation Code is 600167-0.
FCC Designation Number is CN5024.

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%.

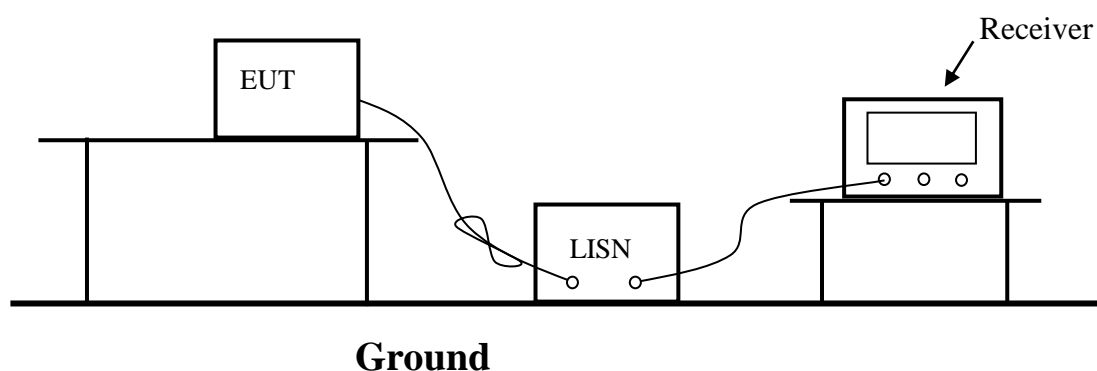
3. POWER LINE CONDUCTED EMISSION MEASUREMENT

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 Software	AUDIX	E3	/	2018-06-16
2	EMI Test Receiver	R&S	ESPI	101840	2018-06-16
3	Artificial Mains	R&S	ENV216	101288	2018-06-16
4	10dB Attenuator	SCHWARZBECK	MTS-IMP-136	261115-001-0032	2018-06-16

3.2. Block Diagram of Test Setup



3.3. 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.

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 (Mode 1) 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	SR-1009PD	Test Mode	Mode 1
Environmental Conditions	24.5°C, 53.8% RH	Test Engineer	Diamond Lu
Pol	Line	Test Voltage	AC 120V/60Hz

Trace: 2
Env. Ins: 24.5*/53.8%
Pol: LINE

	Freq	Reading	LISNFac	CabLos	Aux2Fac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.17	28.92	9.60	0.02	10.00	48.54	64.94	-16.40	QP
2	0.17	7.27	9.60	0.02	10.00	26.89	54.94	-28.05	Average
3	0.29	24.22	9.63	0.03	10.00	43.88	60.41	-16.53	QP
4	0.29	6.22	9.63	0.03	10.00	25.88	50.41	-24.53	Average
5	0.62	21.23	9.63	0.04	10.00	40.90	56.00	-15.10	QP
6	0.62	9.25	9.63	0.04	10.00	28.92	46.00	-17.08	Average
7	1.92	18.08	9.64	0.05	10.00	37.77	56.00	-18.23	QP
8	1.92	6.56	9.64	0.05	10.00	26.25	46.00	-19.75	Average
9	9.71	22.67	9.69	0.08	10.00	42.44	60.00	-17.56	QP
10	9.71	-2.89	9.69	0.08	10.00	16.88	50.00	-33.12	Average
11	10.96	17.51	9.70	0.09	10.00	37.30	60.00	-22.70	QP
12	10.96	-2.13	9.70	0.09	10.00	17.66	50.00	-32.34	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	SR-1009PD	Test Mode	Mode 1
Environmental Conditions	24.5°C, 53.8% RH	Test Engineer	Diamond Lu
Pol	Neutral	Test Voltage	AC 120V/60Hz

Trace: 4
Env. Ins: 24.5*/53.8%
Pol: NEUTRAL

	Freq	Reading	LISNFac	CabLos	Aux2Fac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.16	25.38	9.67	0.02	10.00	45.07	65.34	-20.27	QP
2	0.16	6.73	9.67	0.02	10.00	26.42	55.33	-28.91	Average
3	0.21	24.35	9.59	0.03	10.00	43.97	63.36	-19.39	QP
4	0.21	1.61	9.59	0.03	10.00	21.23	53.36	-32.13	Average
5	0.65	22.35	9.63	0.04	10.00	42.02	56.00	-13.98	QP
6	0.65	5.94	9.63	0.04	10.00	25.61	46.00	-20.39	Average
7	1.17	18.75	9.63	0.05	10.00	38.43	56.00	-17.57	QP
8	1.17	1.17	9.63	0.05	10.00	20.85	46.00	-25.15	Average
9	3.21	17.65	9.65	0.06	10.00	37.36	56.00	-18.64	QP
10	3.21	1.01	9.65	0.06	10.00	20.72	46.00	-25.28	Average
11	4.18	17.49	9.65	0.06	10.00	37.20	56.00	-18.80	QP
12	4.18	0.82	9.65	0.06	10.00	20.53	46.00	-25.47	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.

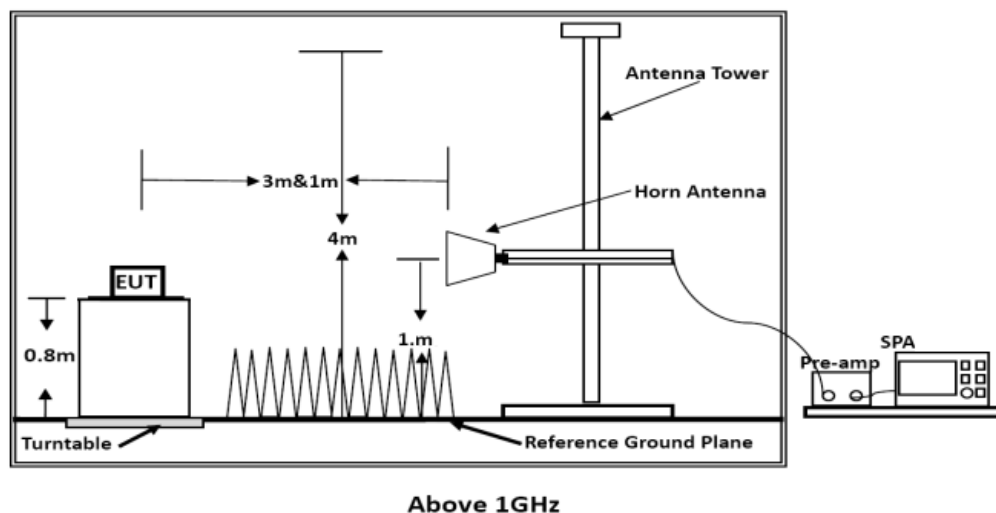
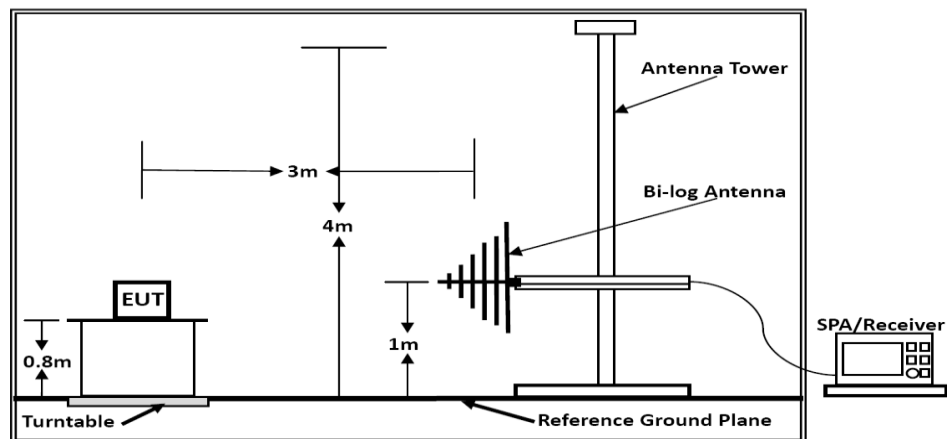
4. RADIATED EMISSION MEASUREMENT

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	EMI Test Software	AUDIX	E3	/	2018-06-16
2	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	2018-06-16
3	Positioning Controller	MF	MF-7082	/	2018-06-16
4	By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2018-07-26
5	Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1925	2018-07-02
6	EMI Test Receiver	R&S	ESR 7	101181	2018-06-16
7	RS SPECTRUM ANALYZER	R&S	FSP40	100503	2018-11-15
8	AMPLIFIER	QuieTek	QTK	CHM/0809065	2018-11-15
9	RF Cable-R03m	Jye Bao	RG142	CB021	2018-06-16
10	RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	2018-06-16

4.2. Block Diagram of Test Setup



4.3. 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 Disturbance Above 1GHz

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

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 (Mode 1) 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.

The bandwidth of the Spectrum analyzer is set at RBW/VBW=1MHz/3MHz.

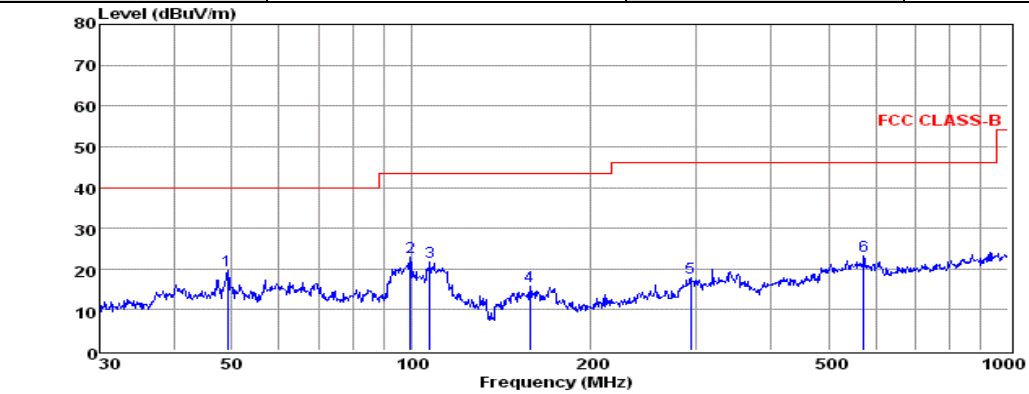
The frequency range from 1GHz to the frequency which about 5th carrier harmonic or 6GHz is checked.

4.7. Radiated Emission Noise Measurement Result

PASS.

The scanning waveforms please refer to the next page.

Test Model	SR-1009PD	Test Mode	Mode 1
Environmental Conditions	23.8°C, 52.8% RH	Detector Function	Quasi-peak
Pol	Vertical	Distance	3m
Test Engineer	Diamond Lu	Test Voltage	AC 120V/60Hz



Env./Ins:
pol:

23.8°C/52.8%
VERTICAL

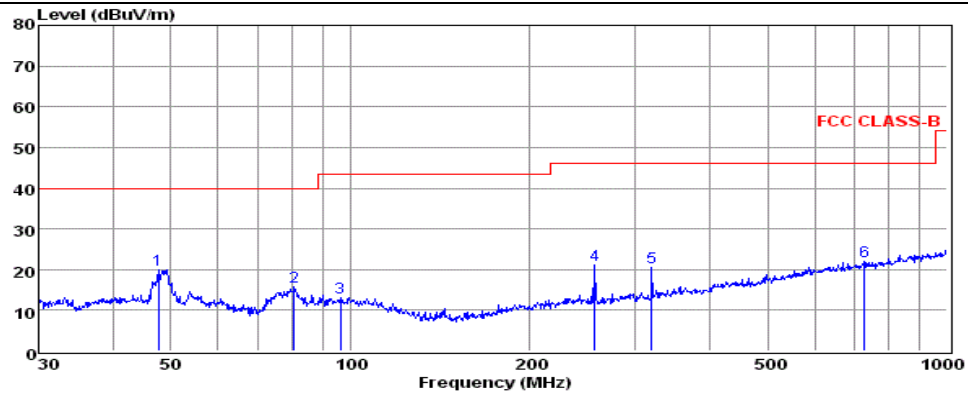
	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	49.19	5.90	0.35	13.30	19.55	40.00	-20.45	QP
2	99.53	9.07	0.61	13.13	22.81	43.50	-20.69	QP
3	107.51	8.50	0.68	12.48	21.66	43.50	-21.84	QP
4	158.11	6.31	0.83	8.59	15.73	43.50	-27.77	QP
5	294.11	3.71	1.08	12.95	17.74	46.00	-28.26	QP
6	572.61	3.89	1.49	17.94	23.32	46.00	-22.68	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	SR-1009PD	Test Mode	Mode 1
Environmental Conditions	23.8°C, 52.8% RH	Detector Function	Quasi-peak
Pol	Horizontal	Distance	3m
Test Engineer	Diamond Lu	Test Voltage	AC 120V/60Hz



Env./Ins: 23.8°C/52.8%
 pol: HORIZONTAL

	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	47.66	6.29	0.35	13.39	20.03	40.00	-19.97	QP
2	80.36	6.34	0.65	8.67	15.66	40.00	-24.34	QP
3	96.10	-0.27	0.58	12.91	13.22	43.50	-30.28	QP
4	256.52	8.11	1.02	12.06	21.19	46.00	-24.81	QP
5	319.94	6.18	1.16	13.33	20.67	46.00	-25.33	QP
6	726.81	1.15	1.70	19.15	22.00	46.00	-24.00	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.

5. TEST SETUP PHOTOGRAPHS OF EUT

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

6. EXTERIOR PHOTOGRAPHS OF THE EUT

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

7. INTERIOR PHOTOGRAPHS OF THE EUT

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

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