

FCC Part 15, Subpart B, Class B

ShenZhen Reliance Technology Co.,Limited

TON168 FILM Scanner

Test Model: TON168

Additional Model No.: TON169, TON170, TON171

Prepared for : ShenZhen Reliance Technology Co.,Limited
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Science Park, Bantian Street, Longgang District,
Shenzhen, China

Prepared by : Shenzhen LCS Compliance Testing Laboratory Ltd.
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Date of receipt of test sample : November 30, 2020
Number of tested samples : 1
Serial number : Prototype
Date of Test : November 30, 2020 ~ December 18, 2020
Date of Report : December 22, 2020



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

Report Reference No. : LCS201126020AE

Date Of Issue..... : December 22, 2020

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

Address..... : Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing 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..... : ShenZhen Reliance Technology Co.,Limited

Address..... : 502, 5th Floor, No.1 Building, West District, Shangxue Science Park, Bantian Street, Longgang District, Shenzhen, China

Test Specification

Standard..... : FCC 47 CFR Part 15 Subpart B, Class B, 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..... : TON168 FILM Scanner

Test Model : TON168

Trade Mark..... : Tonivent

Ratings..... : Input: AC100-240V, 50/60Hz, 0.2A
Output: DC 5V, 1A

Result : Positive

Compiled by:

Jack Liu

Jack Liu/ File administrators

Supervised by:

Jin Wang

Jin Wang/ Technique principal

Approved by:



Gavin Liang/ Manager

FCC -- TEST REPORT

Test Report No. : LCS201126020AE

December 22, 2020

Date of issue

Test Model : TON168

EUT..... : TON168 FILM Scanner

Applicant..... : ShenZhen Reliance Technology Co.,LimitedAddress..... : 502, 5th Floor, No.1 Building, West District, Shangxue
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Science Park, Bantian Street, Longgang District,
Shenzhen, China

Telephone..... : /

Fax..... : /

Factory..... : /

Address..... : /

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	December 22, 2020	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. TEST RESULTS.....	9
3.1. POWER LINE CONDUCTED EMISSION MEASUREMENT.....	9
3.2. Radiated emission Measurement.....	13
4. PHOTOGRAPH.....	17
5. EXTERNAL AND INTERNAL PHOTOS 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 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	USB	Record
Mode 2	TV	Pre-scan

***Note: All test modes were tested, but we only recorded the worst case in this report.

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

EUT	: TON168 FILM Scanner
Trade Mark	: Tonivent
Test Model	: TON168
Additional Model	: TON169, TON170, TON171
Model Declaration	: PCB board, structure and internal of these model(s) are the same, So no additional models were tested
Power Supply	: Input: AC100-240V, 50/60Hz, 0.2A Output: DC 5V, 1A

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

Name	Manufacturers	M/N	S/N
PC	Lenovo	WB0202140H	WB05067151

2.3. 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.

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
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

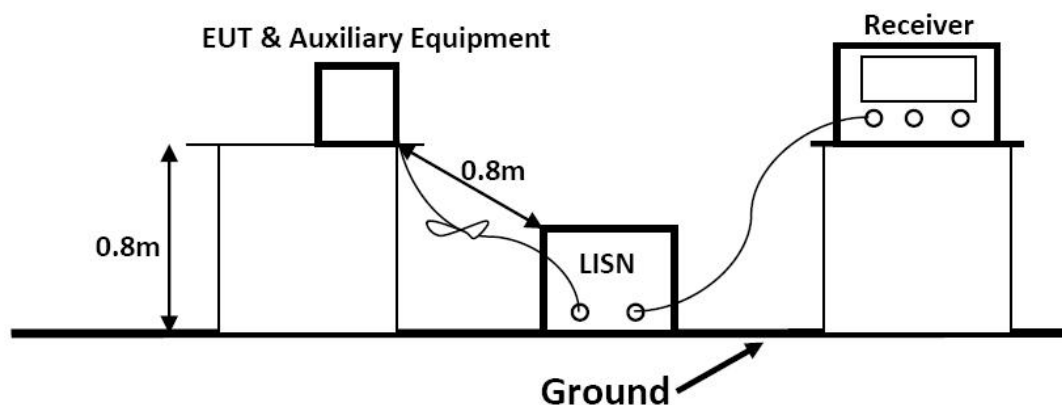
3.1. POWER LINE CONDUCTED EMISSION MEASUREMENT

3.1.1. Test Equipment

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

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	EMI Test Software	EZ	EZ-EMC	/	N/A	N/A
2	EMI Test Receiver	R&S	ESPI	101840	2020-06-22	2021-06-21
3	Artificial Mains	R&S	ENV216	101288	2020-06-22	2021-06-21
4	10dB Attenuator	SCHWARZBECK	MTS-IMP-136	261115-001-0032	2020-06-22	2021-06-21
5	Impedance Stabilization Network	TESEQ	ISN T800	45130	2020-10-20	2021-10-19

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.

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.

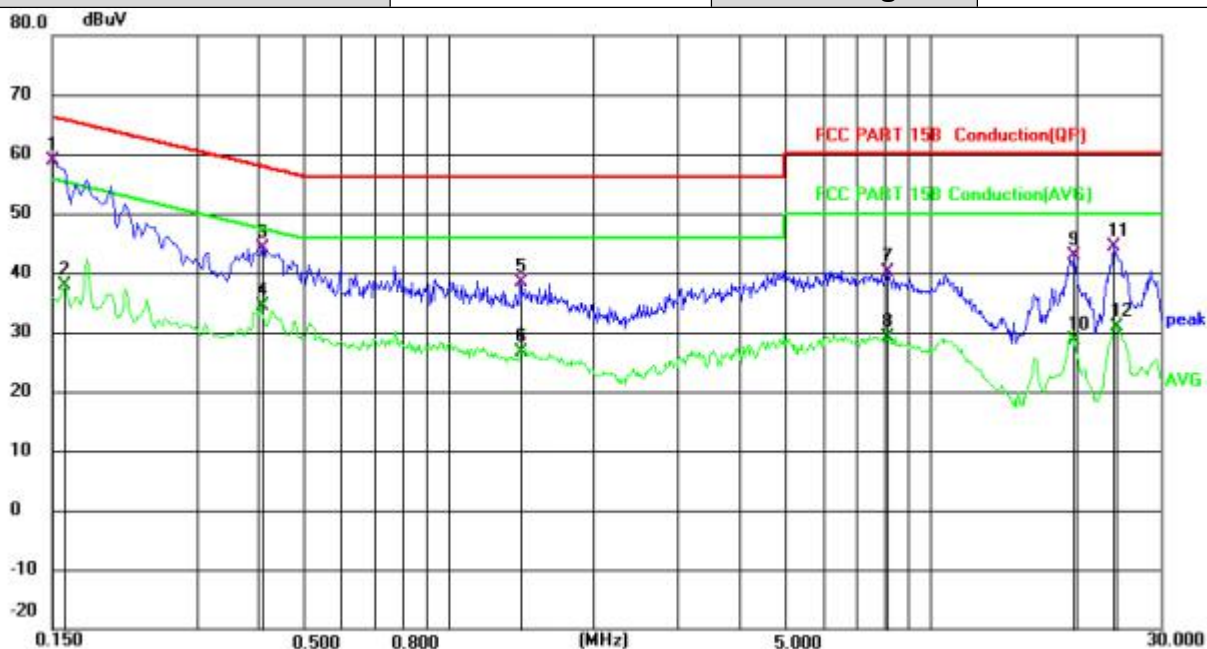
The frequency range from 150kHz to 30MHz is investigated

3.1.7. Test Results

PASS.

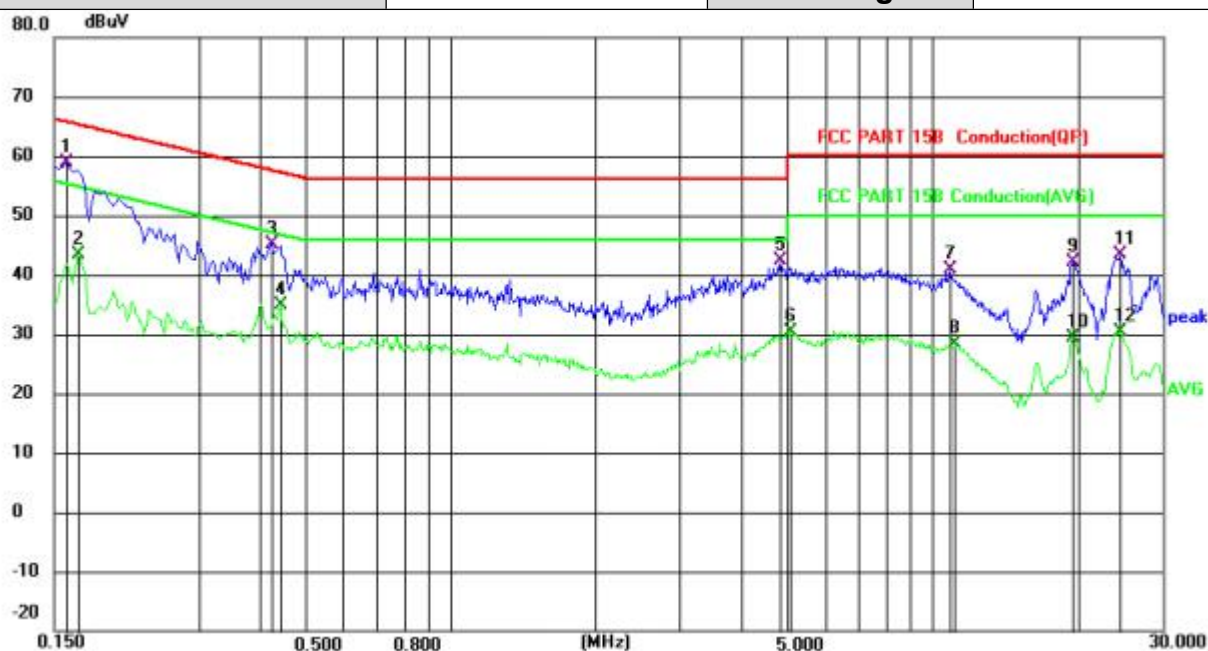
The test result please refer to the next page.

Test Model	TON168	Test Mode	Mode 1
Environmental Conditions	23.3°C, 53.7% RH	Test Engineer	Kay Hu
Pol	Line	Test Voltage	AC 120V/60Hz



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1	*	0.1500	39.82	19.14	58.96	66.00	-7.04	QP	
2		0.1590	18.63	19.15	37.78	55.52	-17.74	AVG	
3		0.4111	24.82	19.32	44.14	57.63	-13.49	QP	
4		0.4111	15.08	19.32	34.40	47.63	-13.23	AVG	
5		1.4101	19.02	19.33	38.35	56.00	-17.65	QP	
6		1.4101	7.34	19.33	26.67	46.00	-19.33	AVG	
7		8.1511	20.60	19.64	40.24	60.00	-19.76	QP	
8		8.1511	9.39	19.64	29.03	50.00	-20.97	AVG	
9		19.8466	22.49	20.30	42.79	60.00	-17.21	QP	
10		19.8466	8.43	20.30	28.73	50.00	-21.27	AVG	
11		24.0856	24.10	20.24	44.34	60.00	-15.66	QP	
12		24.4771	10.70	20.23	30.93	50.00	-19.07	AVG	

Test Model	TON168	Test Mode	Mode 1
Environmental Conditions	23.3°C, 53.7% RH	Test Engineer	Kay Hu
Pol	Neutral	Test Voltage	AC 120V/60Hz



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin		
		MHz	Level	Factor	ment			Detector	Comment
			dBuV	dB	dBuV	dBuV	dB		
1	*	0.1590	39.83	19.15	58.98	65.52	-6.54	QP	
2		0.1681	24.25	19.16	43.41	55.05	-11.64	AVG	
3		0.4246	25.93	19.32	45.25	57.36	-12.11	QP	
4		0.4426	15.55	19.32	34.87	47.01	-12.14	AVG	
5		4.8346	22.91	19.49	42.40	56.00	-13.60	QP	
6		5.0596	10.83	19.49	30.32	50.00	-19.68	AVG	
7		10.9006	21.09	19.77	40.86	60.00	-19.14	QP	
8		11.1975	8.59	19.80	28.39	50.00	-21.61	AVG	
9		19.5586	21.94	20.07	42.01	60.00	-17.99	QP	
10		19.5586	9.42	20.07	29.49	50.00	-20.51	AVG	
11		24.6121	23.25	20.12	43.37	60.00	-16.63	QP	
12		24.6121	10.32	20.12	30.44	50.00	-19.56	AVG	

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

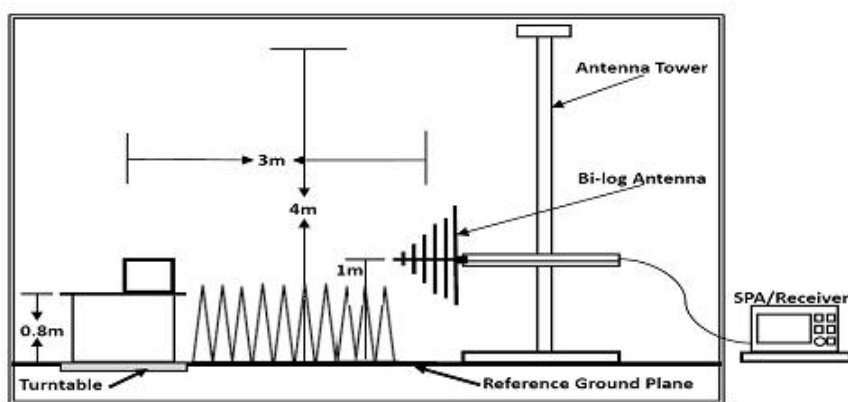
3.2. Radiated emission Measurement

3.2.1. Test Equipment

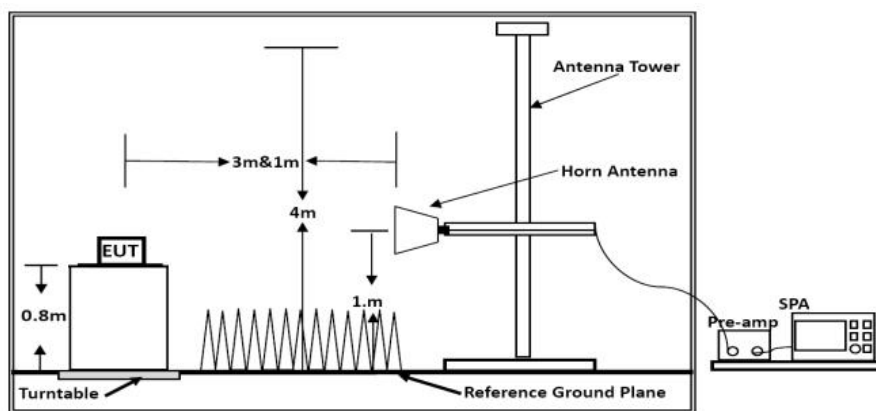
The following test equipments are used during the radiated emission measurement:

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	EMI Test Software	EZ	EZ-EMC	/	N/A	N/A
2	By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2018-07-26	2021-07-25
3	Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1925	2018-07-02	2021-07-01
4	EMI Test Receiver	R&S	ESR 7	101181	2020-06-22	2021-06-21
5	Broadband Preamplifier	/	BP-01M18G	P190501	2020-06-22	2021-06-21

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 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.

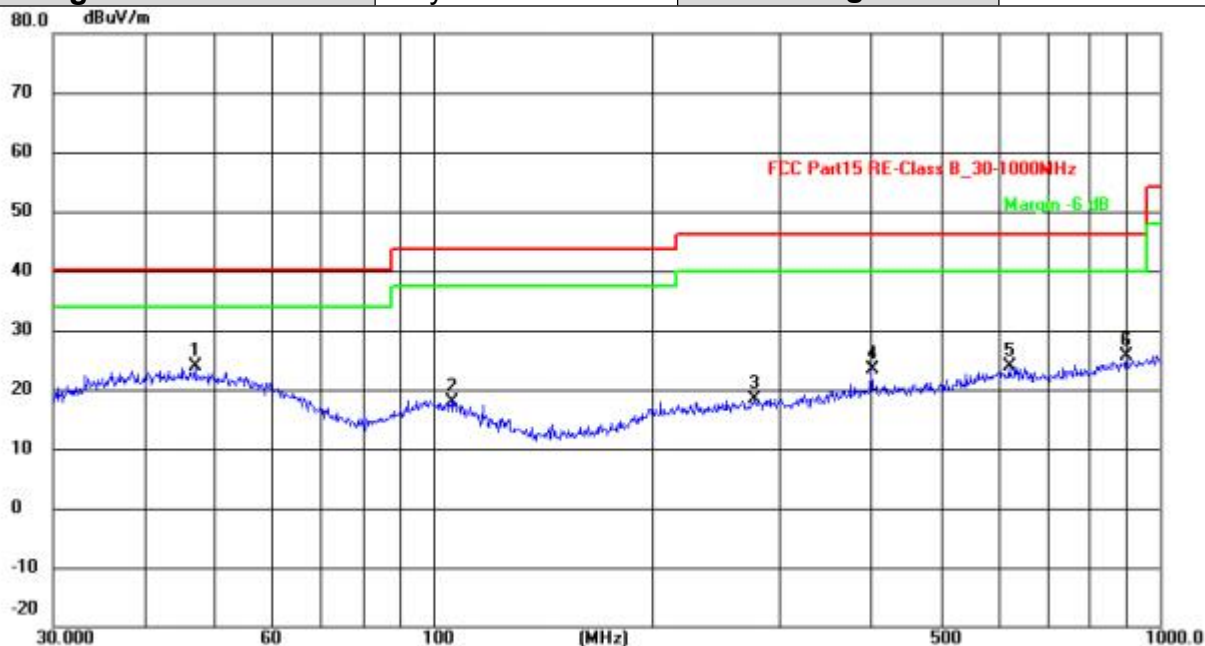
The bandwidth of the EMI test receiver is set at 120kHz, 300kHz.
The frequency range from 30MHz to 1000MHz is checked.

3.2.7. Radiated Emission Noise Measurement Result

PASS.

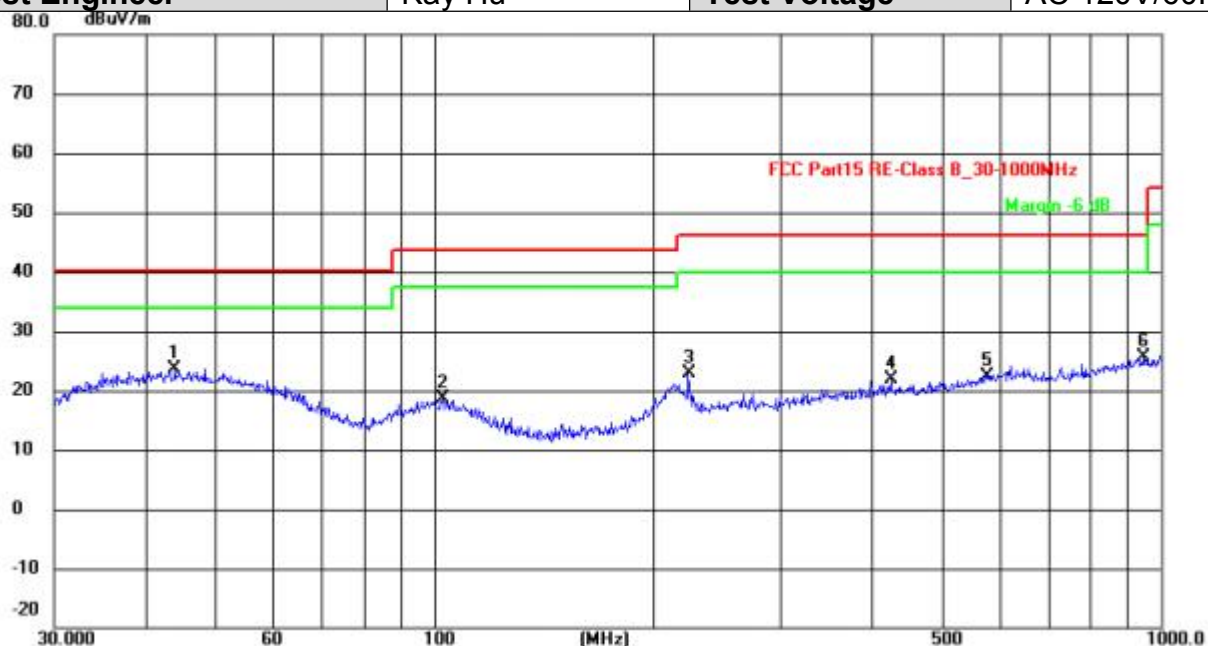
The scanning waveforms please refer to the next page.

Test Model	TON168	Test Mode	Mode 1
Environmental Conditions	24.6°C, 54.1% RH	Detector Function	Quasi-peak
Pol	Vertical	Distance	3m
Test Engineer	Kay Hu	Test Voltage	AC 120V/60Hz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	46.9948	52.13	-28.19	23.94	40.00	-16.06	QP
2	106.0126	48.33	-30.39	17.94	43.50	-25.56	QP
3	277.0935	46.31	-27.82	18.49	46.00	-27.51	QP
4	400.4319	48.29	-24.91	23.38	46.00	-22.62	QP
5	620.7096	44.96	-21.05	23.91	46.00	-22.09	QP
6	900.1474	44.51	-18.79	25.72	46.00	-20.28	QP

Test Model	TON168	Test Mode	Mode 1
Environmental Conditions	24.6°C, 54.1% RH	Detector Function	Quasi-peak
Pol	Horizontal	Distance	3m
Test Engineer	Kay Hu	Test Voltage	AC 120V/60Hz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	43.9658	52.09	-28.35	23.74	40.00	-16.26	QP
2	102.7192	48.89	-30.23	18.66	43.50	-24.84	QP
3	223.7334	52.00	-29.21	22.79	46.00	-23.21	QP
4	425.0280	46.43	-24.62	21.81	46.00	-24.19	QP
5	576.6443	44.13	-21.63	22.50	46.00	-23.50	QP
6	945.4399	44.24	-18.54	25.70	46.00	-20.30	QP

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

5. EXTERNAL AND INTERNAL PHOTOS OF THE EUT

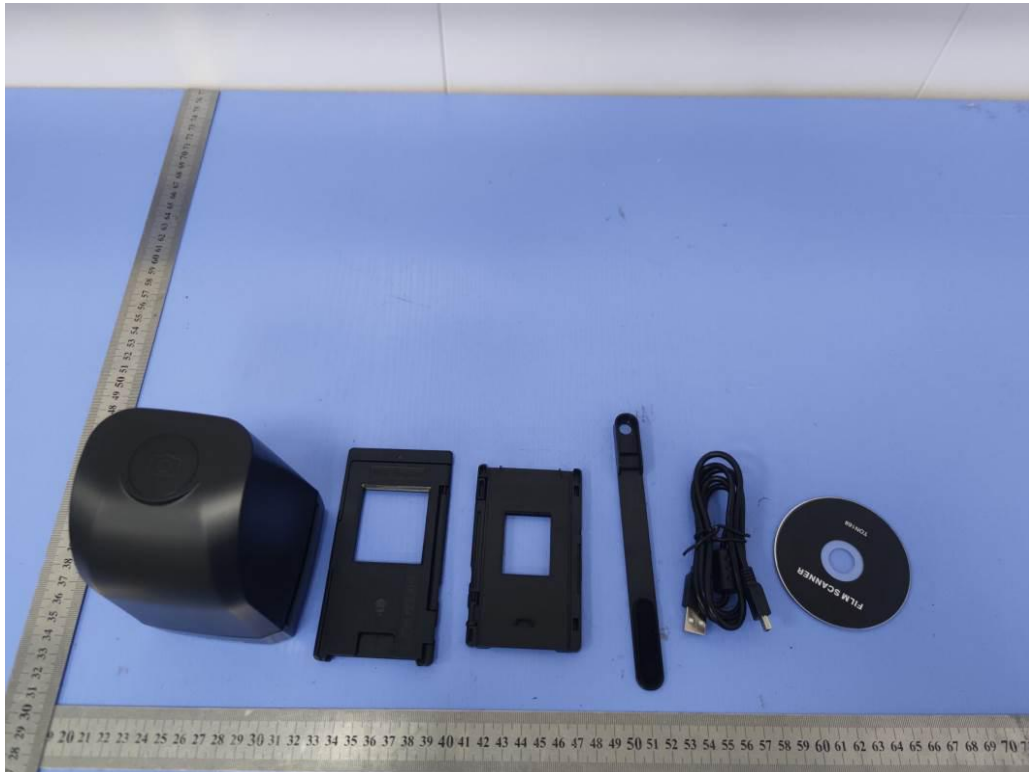


Fig. 1



Fig. 2



Fig. 5



Fig. 6



Fig. 7

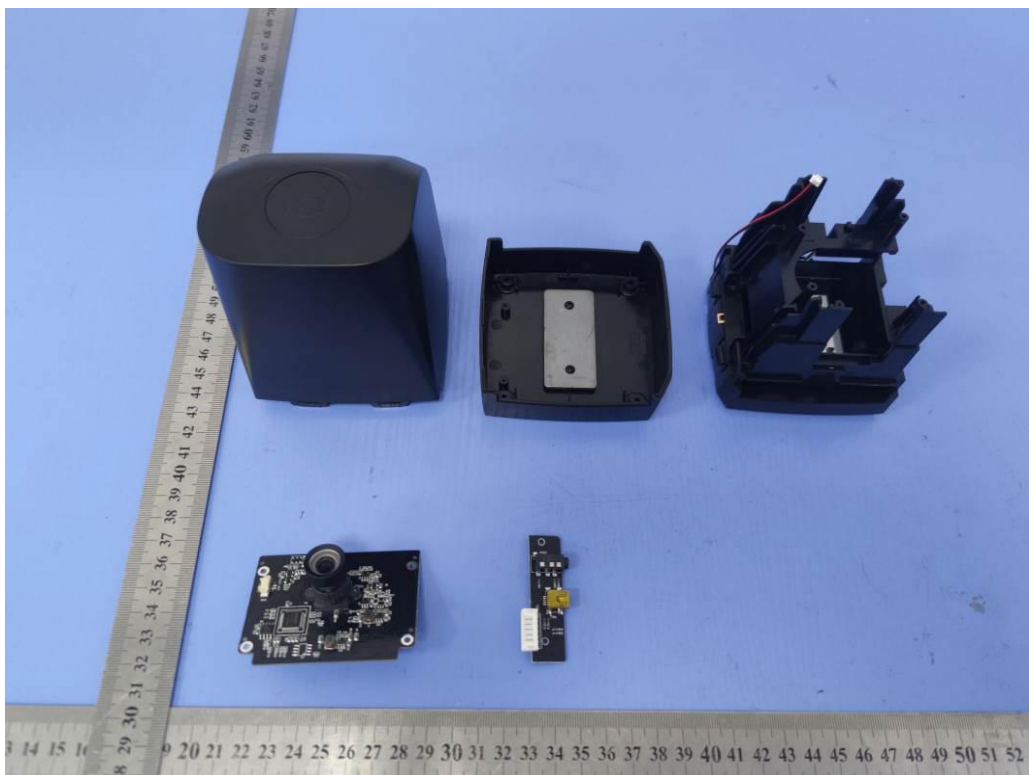


Fig. 8

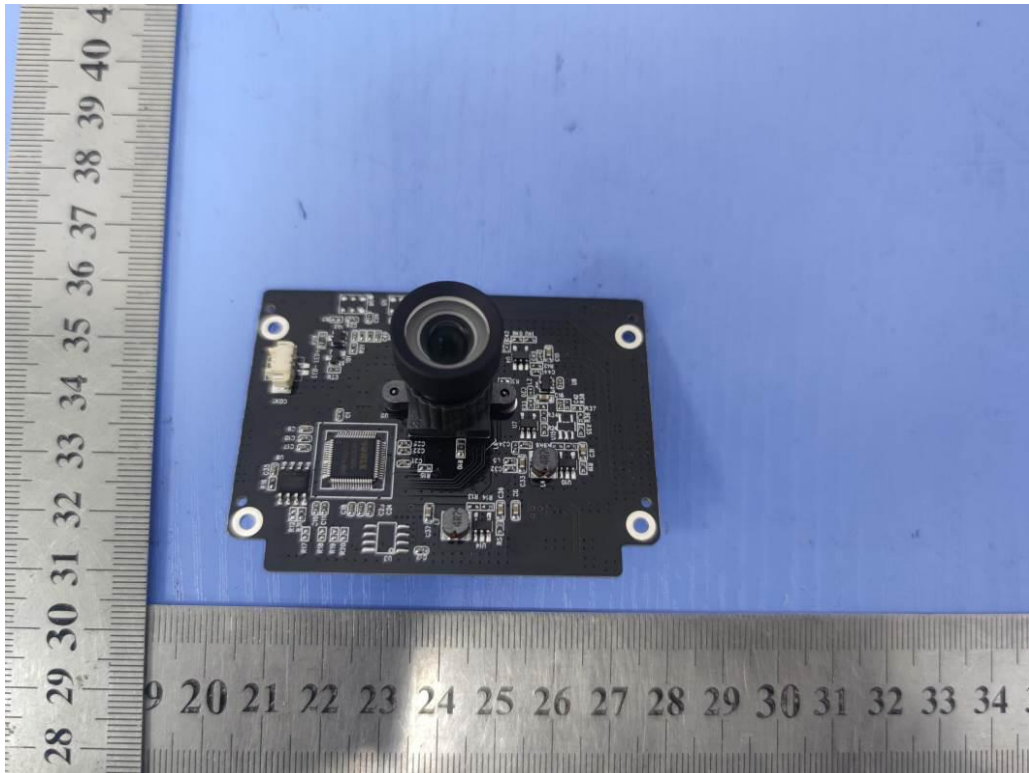


Fig. 9

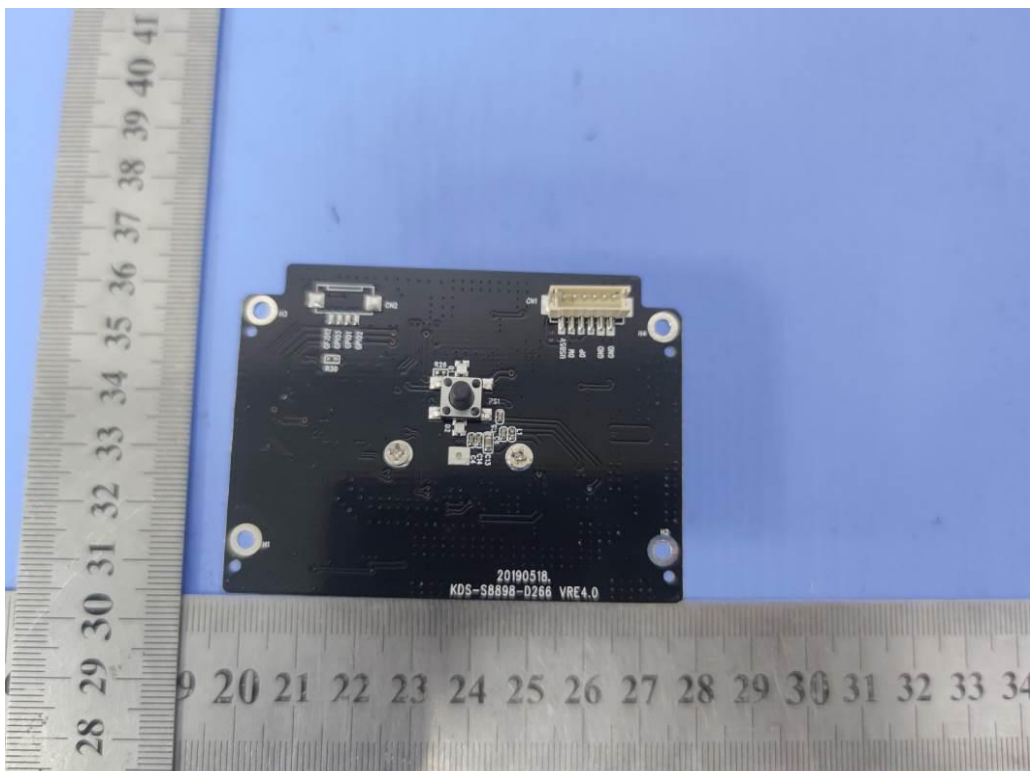


Fig. 10

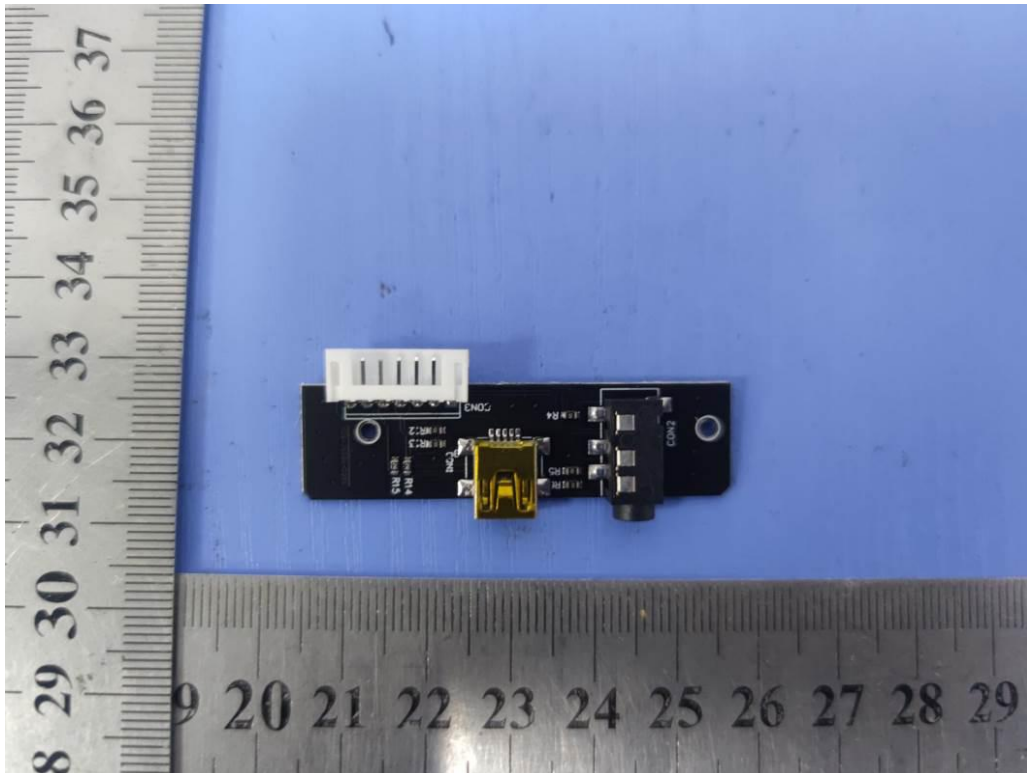


Fig. 11

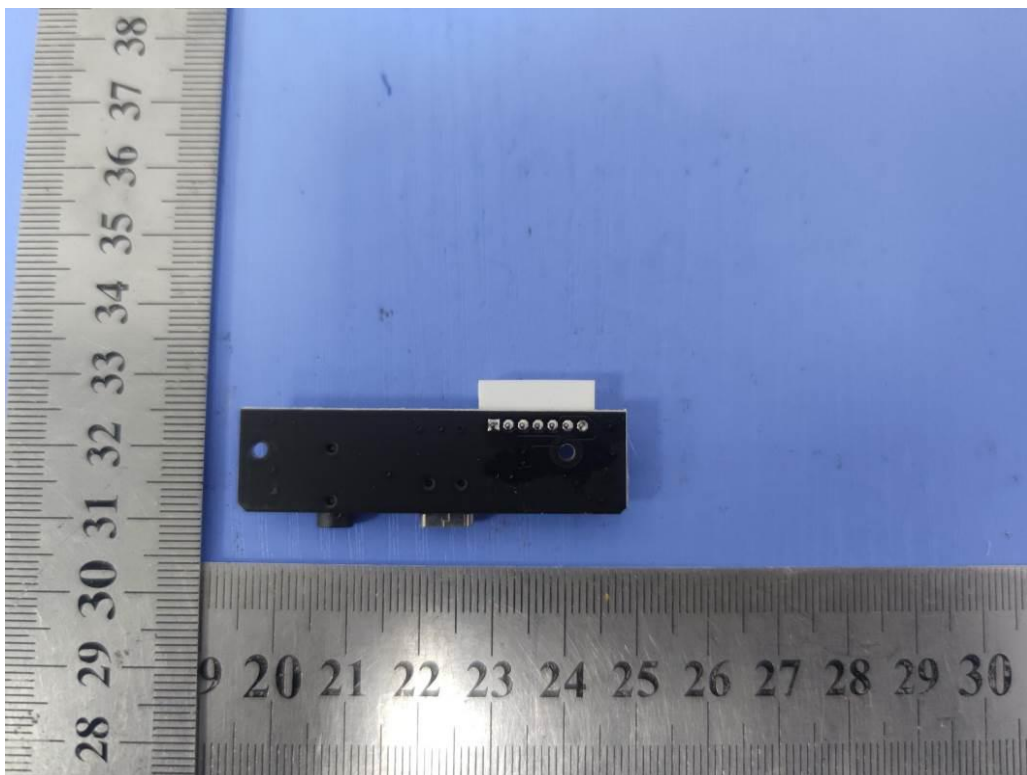


Fig. 12

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