

FCC TEST REPORT
for
Neo-Neon (Viet Nam) Development Co., Ltd

LED Low Voltage Outfit

Model No. : LED(TT)-T-S14-10L-15Ft-29V-WW+MU-Z

FCC ID: 2AWEL-VN001

Prepared for : Neo-Neon (Viet Nam) Development Co., Ltd
Address : GIA LE INDUSTRIAL ZONE, DONG XUAN COMMUNAL,
DONG HUNG DISTRICT, THAI BINH PROVINCE,
VIETNAM

Prepared by : Shenzhen Accurate Technology Co., Ltd.
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Report No. : ATE20200505
Date of Test : May 16, 2020
Date of Report : May 22, 2020

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Test Report Certification

Applicant : Neo-Neon (Viet Nam) Development Co., Ltd
Address : GIA LE INDUSTRIAL ZONE, DONG XUAN COMMUNAL,
DONG HUNG DISTRICT, THAI BINH PROVINCE, VIETNAM
Manufacturer : Neo-Neon (Viet Nam) Development Co., Ltd
Address : GIA LE INDUSTRIAL ZONE, DONG XUAN COMMUNAL,
DONG HUNG DISTRICT, THAI BINH PROVINCE, VIETNAM
Product : LED Low Voltage Outfit
Model No. : LED(TT)-T-S14-10L-15Ft-29V-WW+MU-Z
Trade name : N/A

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart B Class B ANSI C63.4: 2014

The device described above is tested by Shenzhen Accurate Technology Co., Ltd. To determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart B Class B limits both radiated and conducted emissions. The measurement results are contained in this test report and Shenzhen Accurate Technology Co., Ltd. Is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Shenzhen Accurate Technology Co., Ltd.

Date of Test : May 16, 2020

Date of Report : May 22, 2020

Prepared by :


(Tina Zhang, Engineer)

Approve & Authorized Signer :


(Martin Lü, Manager)

1. TEST RESULTS SUMMARY

Test Items	Test Standard	Test Results
Power Line Conducted Emission	FCC Part 15 Subpart B	Pass
Radiated Emission	FCC Part 15 Subpart B	Pass

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

Product	: LED Low Voltage Outfit
Model No.	: LED(TT)-T-S14-10L-15Ft-29V-WW+MU-Z (Note: LED(TT)-T-S14-10L-15Ft-29V-WW+MU-Z is the main test model. Please refer to chapter 2.3 for the specific difference of the model.)
Rating	: AC 100-240V, 50/60Hz
Trade Mark	: n.a.
Remark(s)	: The EUT highest operating frequency provided by Manufacturer is less than 108MHz, the radiated emission measurement shall be made up to 1GHz.
Applicant Address	: Neo-Neon (Viet Nam) Development Co., Ltd GIA LE INDUSTRIAL ZONE, DONG XUAN COMMUNAL, DONG HUNG DISTRICT, THAI BINH PROVINCE, VIETNAM
Manufacturer Address	: Neo-Neon (Viet Nam) Development Co., Ltd GIA LE INDUSTRIAL ZONE, DONG XUAN COMMUNAL, DONG HUNG DISTRICT, THAI BINH PROVINCE, VIETNAM
Date of sample received	: May 12, 2020
Date of Test	: May 16, 2020
Sample Number	: 2000454

2.2. Accessory and Auxiliary Equipment

n.a.

2.3. Model difference declaration

LED(TT)-T-S14-10L-15Ft-29V-WW+MU-Z are identical in interior structure, electrical circuits and components, except for the model name and appearance.

Note: "Z" represents color of LED: -R, -Y, -A, -G, -B, -O, -PI, -PP, -W, -WW, CW, -GO, -M, or blank(Blank for conventional model). "W" for white, "WW" for warm white, "CW" for cold white, "GO" for golden, "G" for green, "B" for blue, "O" for orange, "R" for red, "Y" for yellow, "A" for amber, "PI" for pink, "PP" for purple, "M" for multi-color.

2.4. Description of Test Facility

EMC Lab : Recognition of accreditation by Federal Communications Commission (FCC)
The Designation Number is CN1189
The Registration Number is 708358

Listed by Innovation, Science and Economic Development Canada (ISED)
The Registration Number is 5077A-2

Accredited by China National Accreditation Service for Conformity Assessment (CNAS)
The Registration Number is CNAS L3193

Accredited by American Association for Laboratory Accreditation (A2LA)
The Certificate Number is 4297.01

Name of Firm : Shenzhen Accurate Technology Co., Ltd.

Site Location : 1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China

2.5. Measurement Uncertainty

Radiated emission expanded uncertainty (9kHz-30MHz) : U=2.66dB, k=2

Radiated emission expanded uncertainty (30MHz-1000MHz) : U=4.28dB, k=2

Radiated emission expanded uncertainty (1G-18GHz) : U=4.98dB, k=2

Radiated emission expanded uncertainty (18G-26.5GHz) : U=5.06dB, k=2

Conduction Emission Expanded Uncertainty (Mains ports, 9kHz-30MHz) : U=2.72dB, k=2

Conduction Emission Expanded Uncertainty (Telecommunication ports, 150kHz-30MHz) : U=2.94dB, k=2

3. MEASURING DEVICE AND TEST EQUIPMENT

3.1. The Equipment Used to Conducted Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESCS30	100307	Jan.4, 2020	1 Year
2.	Test Receiver	Rohde & Schwarz	ESPI	100396/003	Jan.4, 2020	1 Year
3.	Test Receiver	Rohde & Schwarz	ESPI	101526/003	Jan.4, 2020	1 Year
4.	Test Receiver	Rohde & Schwarz	ESR	101817	Jan.4, 2020	1 Year
5.	L.I.S.N.	Schwarzbeck	NLSK8126	8126431	Jan.4, 2020	1 Year
6.	L.I.S.N.	Rohde & Schwarz	ESH3-Z5	100305	Jan.4, 2020	1 Year
7.	L.I.S.N.	Rohde & Schwarz	ESH3-Z5	100310	Jan.4, 2020	1 Year
8.	L.I.S.N.	Rohde & Schwarz	ESH3-Z6	100132	Jan.4, 2020	1 Year
9.	L.I.S.N.	Rohde & Schwarz	ESH3-Z6	100979	Jan.4, 2020	1 Year
10.	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100305	Jan.4, 2020	1 Year
11.	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100312	Jan.4, 2020	1 Year
12.	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100815	Jan.4, 2020	1 Year
13.	50Ω Coaxial Switch	Anritsu Corp	MP59B	6200283936	Jan.4, 2020	1 Year
14.	50Ω Coaxial Switch	Anritsu Corp	MP59B	6200283933	Jan.4, 2020	1 Year
15.	50Ω Coaxial Switch	Anritsu Corp	MP59B	6200506474	Jan.4, 2020	1 Year
16.	VOLTAGE PROBE	Schwarzbeck	TK9416	N/A	Jan.4, 2020	1 Year
17.	RF CURRENT PROBE	Rohde & Schwarz	EZ-17	100048	Jan.4, 2020	1 Year
18.	8-Wire Impedance Stabilisation Network	Schwarzbeck	CAT5 8158	8158-0035	Jan.4, 2020	1 Year
19.	RF Coaxial Cable	SUHNER	N-2m	No.2	Jan.4, 2020	1 Year
20.	RF Coaxial Cable	SUHNER	N-2m	No.3	Jan.4, 2020	1 Year
21.	RF Coaxial Cable	SUHNER	N-2m	No.14	Jan.4, 2020	1 Year
Conducted Emission Test Software: ES-K1 V1.71						

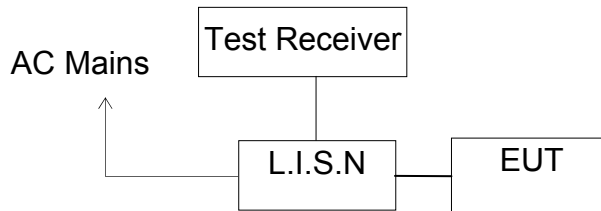
3.2. The Equipment Used to Radiated Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	Agilent	E7405A	MY45115511	Jan.4, 2020	1 Year
2.	Spectrum Analyzer	Rohde&Schwarz	FSV40	101495	Jan.4, 2020	1 Year
3.	Test Receiver	Rohde&Schwarz	ESCS30	100307	Jan.4, 2020	1 Year
4.	Test Receiver	Rohde& Schwarz	ESPI	100396/003	Jan.4, 2020	1 Year
5.	Test Receiver	Rohde& Schwarz	ESPI	101526/003	Jan.4, 2020	1 Year
6.	Test Receiver	Rohde& Schwarz	ESR	101817	Jan.4, 2020	1 Year
7.	Bilog Antenna	Schwarzbeck	VULB9163	9163-194	Jan.4, 2020	1 Year
8.	Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan.4, 2020	1 Year
9.	Log.-Per.Antenna	Schwarzbeck	VUSLP 9111B	9111B-074	Jan.4, 2020	1 Year
10.	Biconical Broad Band Antenna	Schwarzbeck	VHBB 9124+BBA 9106	9124-617	Jan.4, 2020	1 Year
11.	Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan.4, 2020	1 Year
12.	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan.4, 2020	1 Year
13.	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1067	Jan.4, 2020	1 Year
14.	Vertical Active Monopole Antenna	Schwarzbeck	VAMP 9243	9243-370	Jan.4, 2020	1 Year
15.	Pre-Amplifier	Compliance Direction	RSU-M2	38322	Jan.4, 2020	1 Year
16.	Pre-Amplifier	Agilent	8447D	294A10619	Jan.4, 2020	1 Year
17.	Pre-Amplifier	Rohde&Schwarz	CBLU11835 40-01	3791	Jan.4, 2020	1 Year
18.	Pre-Amplifier	A.H. System	PAM-0118	135	Jan.4, 2020	1 Year
19.	50 Coaxial Switch	Anritsu Corp	MP59B	6200237248	Jan.4, 2020	1 Year
20.	50 Coaxial Switch	Anritsu Corp	MP59B	6200506474	Jan.4, 2020	1 Year
21.	RF Coaxial Cable	Schwarzbeck	N-5m	No.1	Jan.4, 2020	1 Year
22.	RF Coaxial Cable	Schwarzbeck	N-1m	No.6	Jan.4, 2020	1 Year
23.	RF Coaxial Cable	Schwarzbeck	N-1m	No.7	Jan.4, 2020	1 Year
24.	RF Coaxial Cable	SUHNER	N-3m	No.8	Jan.4, 2020	1 Year
25.	RF Coaxial Cable	RESENBERGER	N-3.5m	No.9	Jan.4, 2020	1 Year
26.	RF Coaxial Cable	SUHNER	N-6m	No.10	Jan.4, 2020	1 Year
27.	RF Coaxial Cable	RESENBERGER	N-12m	No.11	Jan.4, 2020	1 Year
28.	RF Coaxial Cable	RESENBERGER	N-0.5m	No.12	Jan.4, 2020	1 Year
29.	RF Coaxial Cable	SUHNER	N-2m	No.13	Jan.4, 2020	1 Year
30.	RF Coaxial Cable	SUHNER	N-0.5m	No.15	Jan.4, 2020	1 Year
31.	RF Coaxial Cable	SUHNER	N-2m	No.16	Jan.4, 2020	1 Year
32.	RF Coaxial Cable	RESENBERGER	N-6m	No.17	Jan.4, 2020	1 Year
33.	Radiated Emission Test Software: EZ EMC V1.1.4.2					

4. AC POWER LINE CONDUCTED EMISSION MEASUREMENT

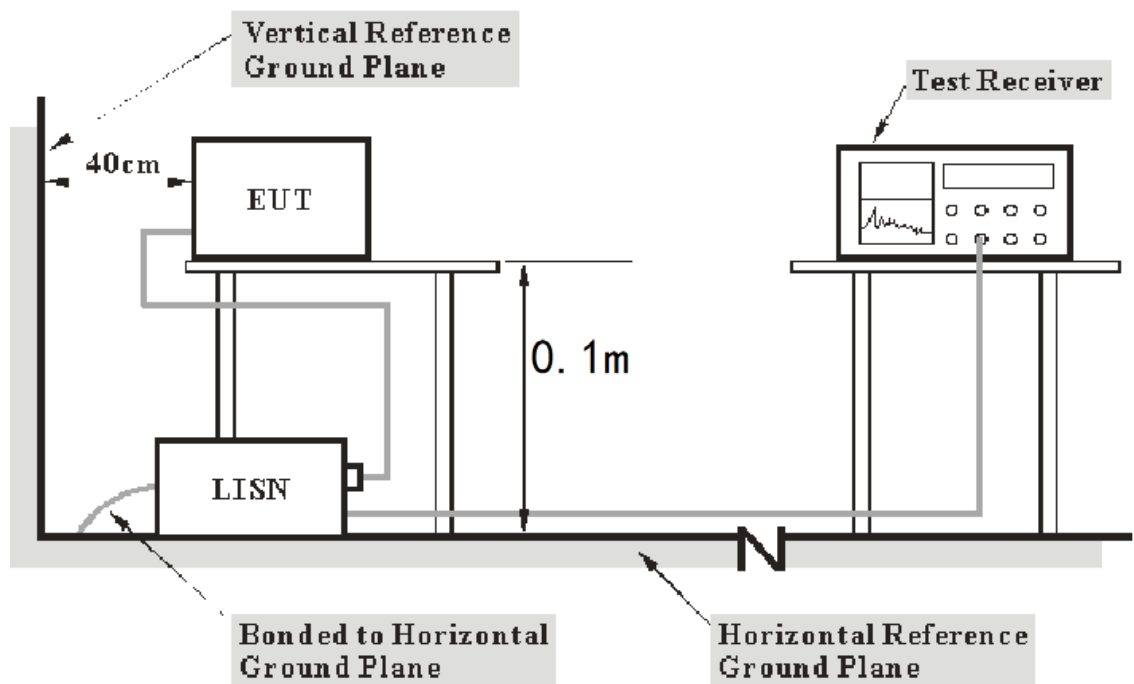
4.1. Block Diagram of Test Setup

4.1.1. Block diagram of connection between the EUT and simulators



(EUT: LED Low Voltage Outfit)

4.1.2. Test System Setup



- Note:**
1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

4.2.AC 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.		

4.3.Test mode description

Test mode: ON

4.4.Manufacturer

The 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

4.4.1.LED Low Voltage Outfit (EUT)

Model Number : LED(TT)-T-S14-10L-15Ft-29V-WW+MU-Z

Manufacturer : Neo-Neon (Viet Nam) Development Co., Ltd

4.5.Operating Condition of EUT

4.5.1.Setup the EUT and simulator as shown as Section 4.1.

4.5.2.Turn on the power of all equipment.

4.5.3.Let the EUT work in test mode and measure it.

4.6.Test Procedure

The EUT is put on the plane 0.1m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines 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 ANSI C63.4: 2014 on Conducted Emission Measurement.

The bandwidth of test receiver is set at 9kHz.

4.7.Data Sample

Frequency (MHz)	Transducer value (dB)	QuasiPeak Level (dB μ V)	Average Level (dB μ V)	QuasiPeak Limit (dB μ V)	Average Limit (dB μ V)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
X.XX	10.6	25.3	17.0	59.0	49.0	33.7	32.0	Pass

Frequency(MHz) = Emission frequency in MHz

Transducer value(dB) = Insertion loss of LISN + Cable Loss

Level(dB μ V) = Quasi-peak Reading/Average Reading + Transducer value

Limit (dB μ V) = Limit stated in standard

Calculation Formula:

Margin = Limit (dB μ V) - Level (dB μ V)

4.8.Measurement Results

Pass.

The frequency range from 150kHz to 30MHz is checked.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

Emissions attenuated more than 20 dB below the permissible value are not reported.

All data was recorded in the Quasi-peak and average detection mode.

The spectral diagrams are attached as below.

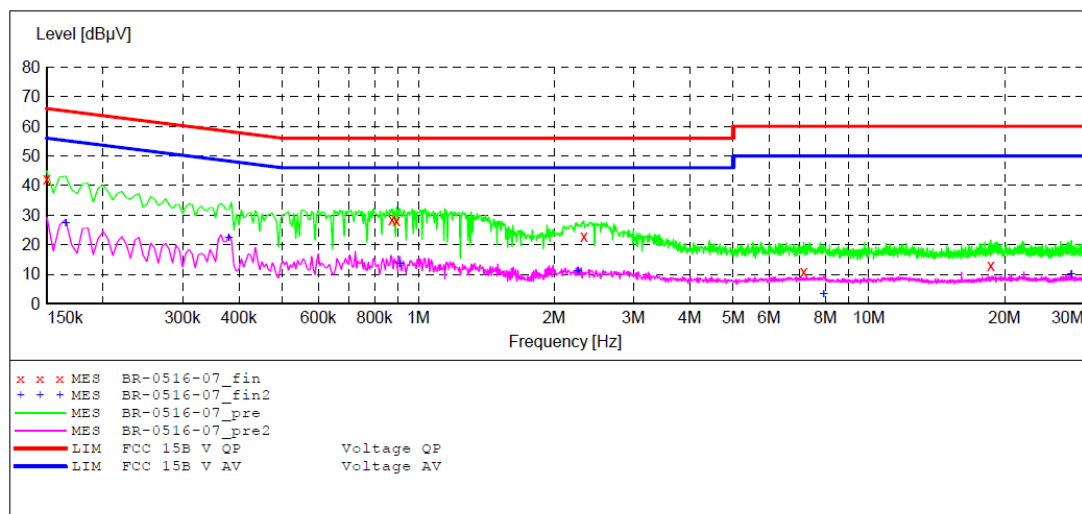
ACCURATE TECHNOLOGY CO., LTD

CONDUCTED EMISSION STANDARD FCC PART 15B

EUT: LED Low Voltage Outfit M/N:LED(TT)-T-S14-10L-15Ft-29V-WW+MU-Z
 Manufacturer: Neo-Neon (Viet Nam) Development Co., Ltd
 Operating Condition: ON
 Test Site: 1#Shielding Room
 Operator: Ben
 Test Specification: L 120V/60Hz
 Comment: Report No.:ATE20200505
 Start of Test: 5/16/2020 / 10:42:08AM

SCAN TABLE: "V 9K-30MHz fin"

Short Description: SUB STD VTERM2 1.70
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 9.0 kHz 150.0 kHz 100.0 Hz QuasiPeak 1.0 s 200 Hz NSLK8126 2008
 Average
 150.0 kHz 30.0 MHz 5.0 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008
 Average



MEASUREMENT RESULT: "BR-0516-07_fin"

5/16/2020 10:46AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.150000	42.10	10.5	66	23.9	QP	L1	GND
0.875000	28.50	10.8	56	27.5	QP	L1	GND
0.895000	28.00	10.8	56	28.0	QP	L1	GND
2.330000	22.70	11.0	56	33.3	QP	L1	GND
7.170000	10.70	11.2	60	49.3	QP	L1	GND
18.625000	13.00	11.4	60	47.0	QP	L1	GND

MEASUREMENT RESULT: "BR-0516-07_fin2"

5/16/2020 10:46AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.165000	27.50	10.5	55	27.7	AV	L1	GND
0.380000	22.40	10.7	48	25.9	AV	L1	GND
0.910000	13.50	10.8	46	32.5	AV	L1	GND
2.260000	11.10	11.0	46	34.9	AV	L1	GND
7.930000	3.50	11.2	50	46.5	AV	L1	GND
28.105000	10.00	11.5	50	40.0	AV	L1	GND

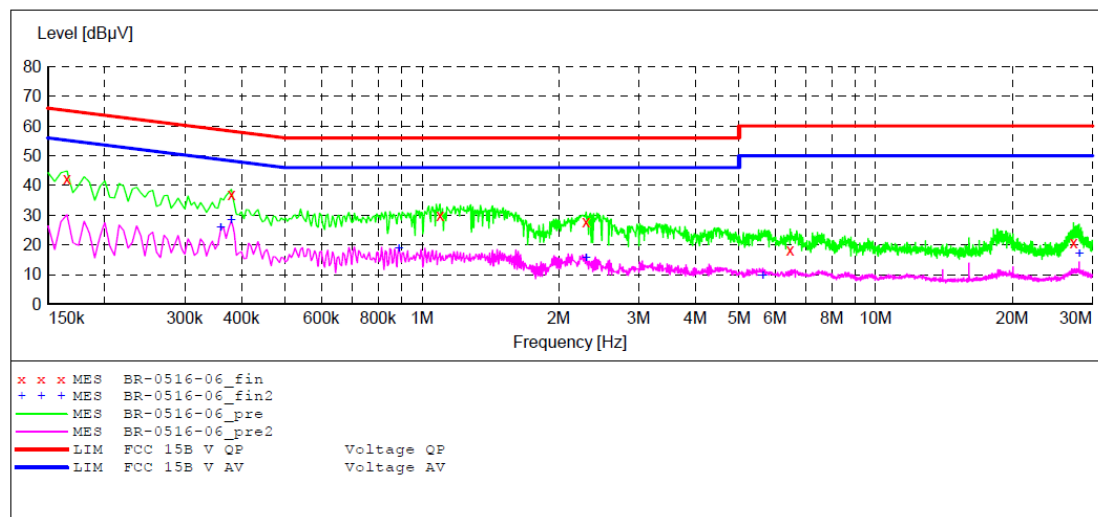
ACCURATE TECHNOLOGY CO., LTD

CONDUCTED EMISSION STANDARD FCC PART 15B

EUT: LED Low Voltage Outfit M/N:LED(TT)-T-S14-10L-15Ft-29V-WW+MU-Z
 Manufacturer: Neo-Neon (Viet Nam) Development Co., Ltd
 Operating Condition: ON
 Test Site: 1#Shielding Room
 Operator: Ben
 Test Specification: N 120V/60Hz
 Comment: Report No.:ATE20200505
 Start of Test: 5/16/2020 / 10:37:49AM

SCAN TABLE: "V 9K-30MHz fin"

Short Description: SUB STD VTERM2 1.70
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 9.0 kHz 150.0 kHz 100.0 Hz QuasiPeak 1.0 s 200 Hz NSLK8126 2008
 Average
 150.0 kHz 30.0 MHz 5.0 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008
 Average



MEASUREMENT RESULT: "BR-0516-06_fin"

5/16/2020 10:41AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.165000	42.20	10.5	65	23.0	QP	N	GND
0.380000	36.90	10.7	58	21.4	QP	N	GND
1.095000	30.00	10.9	56	26.0	QP	N	GND
2.300000	27.70	11.0	56	28.3	QP	N	GND
6.480000	18.40	11.2	60	41.6	QP	N	GND
27.310000	20.70	11.5	60	39.3	QP	N	GND

MEASUREMENT RESULT: "BR-0516-06_fin2"

5/16/2020 10:41AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.360000	25.90	10.6	49	22.8	AV	N	GND
0.380000	28.60	10.7	48	19.7	AV	N	GND
0.890000	19.00	10.8	46	27.0	AV	N	GND
2.300000	15.80	11.0	46	30.2	AV	N	GND
5.640000	9.70	11.2	50	40.3	AV	N	GND
28.105000	17.30	11.5	50	32.7	AV	N	GND

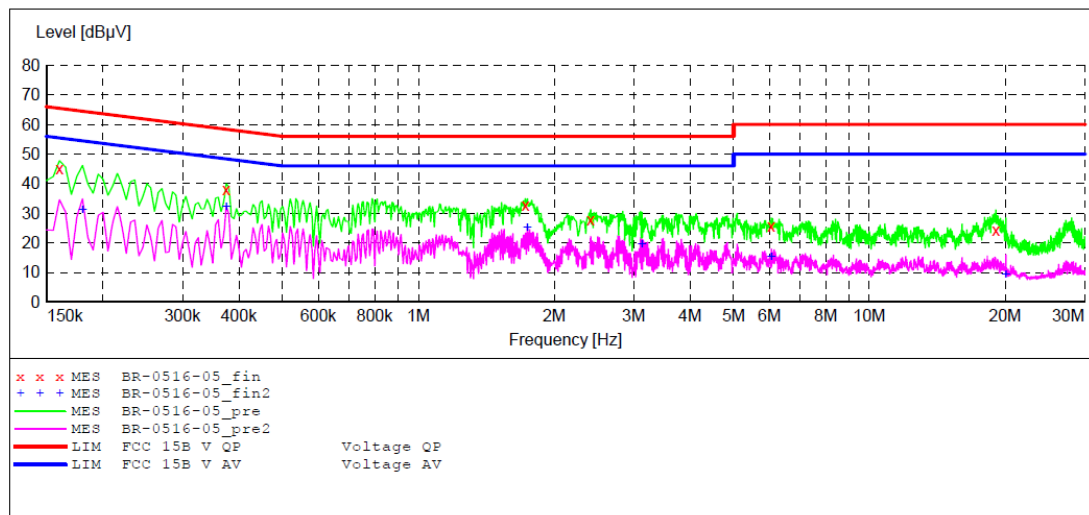
ACCURATE TECHNOLOGY CO., LTD

CONDUCTED EMISSION STANDARD FCC PART 15B

EUT: LED Low Voltage Outfit M/N:LED(TT)-T-S14-10L-15Ft-29V-WW+MU-Z
 Manufacturer: Neo-Neon (Viet Nam) Development Co., Ltd
 Operating Condition: ON
 Test Site: 1#Shielding Room
 Operator: Ben
 Test Specification: N 240V/60Hz
 Comment: Report No.:ATE20200505
 Start of Test: 5/16/2020 / 10:33:59AM

SCAN TABLE: "V 9K-30MHz fin"

Short Description: SUB STD VTERM2 1.70
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 9.0 kHz 150.0 kHz 100.0 Hz QuasiPeak 1.0 s 200 Hz NSLK8126 2008
 Average
 150.0 kHz 30.0 MHz 5.0 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008
 Average



MEASUREMENT RESULT: "BR-0516-05_fin"

5/16/2020 10:37AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.160000	45.10	10.5	66	20.4	QP	N	GND
0.375000	38.00	10.7	58	20.4	QP	N	GND
1.725000	32.60	10.9	56	23.4	QP	N	GND
2.410000	27.70	11.0	56	28.3	QP	N	GND
6.060000	25.50	11.2	60	34.5	QP	N	GND
19.075000	24.20	11.4	60	35.8	QP	N	GND

MEASUREMENT RESULT: "BR-0516-05_fin2"

5/16/2020 10:37AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.180000	31.40	10.5	55	23.1	AV	N	GND
0.375000	32.20	10.7	48	16.2	AV	N	GND
1.745000	25.30	11.0	46	20.7	AV	N	GND
3.130000	19.60	11.1	46	26.4	AV	N	GND
6.060000	15.50	11.2	50	34.5	AV	N	GND
20.080000	9.40	11.4	50	40.6	AV	N	GND

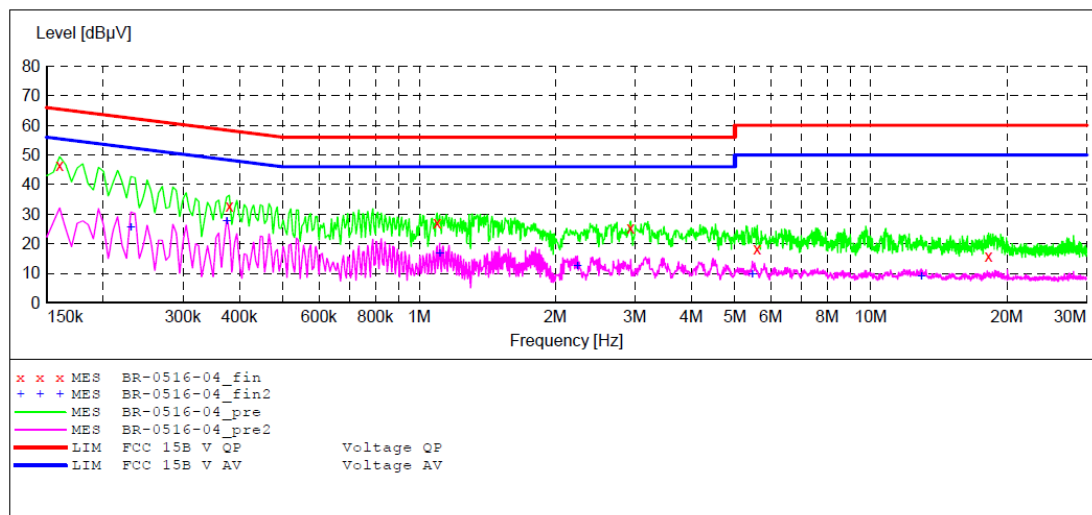
ACCURATE TECHNOLOGY CO., LTD

CONDUCTED EMISSION STANDARD FCC PART 15B

EUT: LED Low Voltage Outfit M/N:LED(TT)-T-S14-10L-15Ft-29V-WW+MU-Z
 Manufacturer: Neo-Neon (Viet Nam) Development Co., Ltd
 Operating Condition: ON
 Test Site: 1#Shielding Room
 Operator: Ben
 Test Specification: L 240V/60Hz
 Comment: Report No.:ATE20200505
 Start of Test: 5/16/2020 / 10:30:03AM

SCAN TABLE: "V 9K-30MHz fin"

Short Description: SUB STD VTERM2 1.70
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 9.0 kHz 150.0 kHz 100.0 Hz QuasiPeak 1.0 s 200 Hz NSLK8126 2008
 Average
 150.0 kHz 30.0 MHz 5.0 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008
 Average



MEASUREMENT RESULT: "BR-0516-04_fin"

5/16/2020 10:33AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.160000	46.50	10.5	66	19.0	QP	L1	GND
0.380000	32.70	10.7	58	25.6	QP	L1	GND
1.095000	27.10	10.9	56	28.9	QP	L1	GND
2.940000	25.30	11.1	56	30.7	QP	L1	GND
5.600000	18.10	11.2	60	41.9	QP	L1	GND
18.220000	15.80	11.4	60	44.2	QP	L1	GND

MEASUREMENT RESULT: "BR-0516-04_fin2"

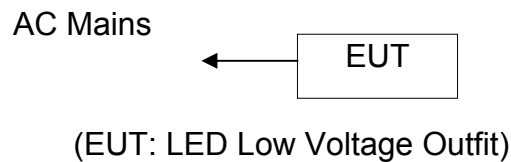
5/16/2020 10:33AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.230000	25.70	10.6	52	26.7	AV	L1	GND
0.375000	27.60	10.7	48	20.8	AV	L1	GND
1.110000	17.00	10.9	46	29.0	AV	L1	GND
2.240000	12.70	11.0	46	33.3	AV	L1	GND
5.470000	9.60	11.2	50	40.4	AV	L1	GND
12.925000	9.20	11.3	50	40.8	AV	L1	GND

5. RADIATED EMISSION MEASUREMENT

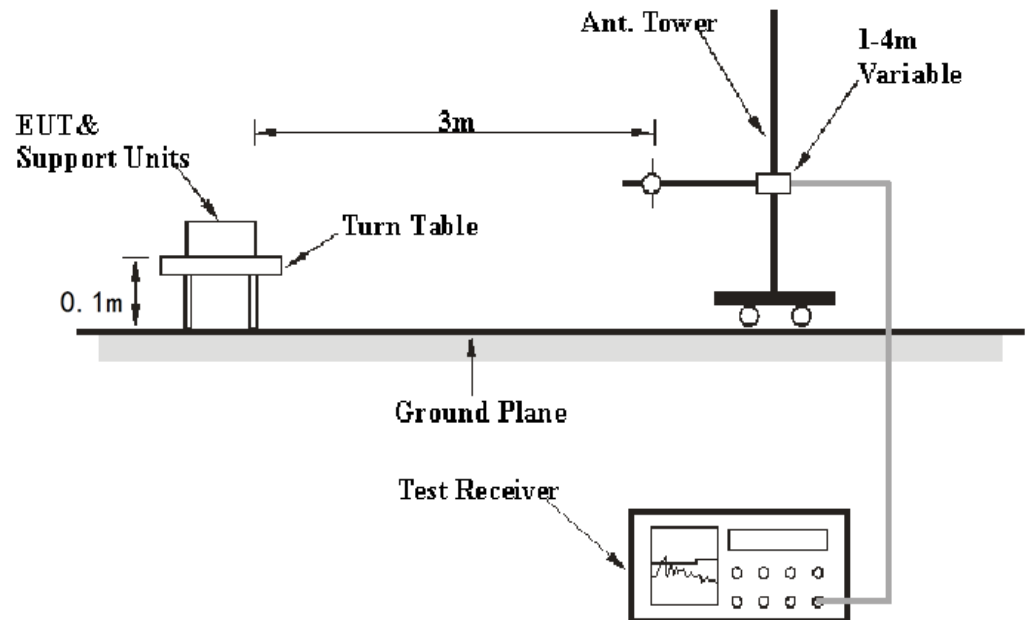
5.1. Block Diagram of Test

5.1.1. Block diagram of connection between the EUT and simulators



5.1.2. Block diagram of test setup (In chamber)

Radiated Emission Test Set-Up, Frequency 30MHz- 1GHz



5.2. Radiated Emission Limit (Class B)

All emanations from a class B device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below:

Frequency MHz	Distance Meters	Field Strengths Limit	
		$\mu\text{V/m}$	$\text{dB}(\mu\text{V/m})$
30-88	3	100	40.0
88-216	3	150	43.5
216-960	3	200	46.0
Above 960	3	500	54.0
Remark: (1) Emission level $\text{dB}(\mu\text{V}) = 20 \log$ 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.			

5.3. Test Mode Description

Test mode: ON

5.4. Manufacturer

The equipments 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.

5.4.1. LED Low Voltage Outfit (EUT)

Model Number : LED(TT)-T-S14-10L-15Ft-29V-WW+MU-Z

Manufacturer : Neo-Neon (Viet Nam) Development Co., Ltd

5.5. Operating Condition of EUT

5.5.1. Setup the EUT and simulator as shown as Section 5.1.

5.5.2. Turn on the power of all equipment.

5.5.3. Let the EUT work in test mode and measure it.

5.6. Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.1 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 an 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 bilog antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are 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.

During the radiated emission test, the spectrum analyzer was set with the following configurations:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for peak measurement with peak detector at frequency above 1GHz.

Note: The EUT highest operating frequency provided by Manufacturer than less 108MHz, the radiated emission measurement shall be made up to 1GHz.

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30.
1.705–108	1000.
108–500	2000.
500–1000	5000.
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower.

5.7.Data Sample

Frequency (MHz)	Reading (dB μ V)	Factor (dB/m)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Remark
X.XX	49.83	-22.03	27.80	43.50	-15.70	QP

Frequency(MHz) = Emission frequency in MHz

Reading(dB μ V) = Uncorrected Analyzer/Receiver reading

Factor (dB/m)= Antenna factor + Cable Loss – Amplifier gain

Result(dB μ V/m) = Reading + Factor

Limit (dB μ V/m)= Limit stated in standard

Margin (dB) = Result(dB μ V/m) - Limit (dB μ V/m)

Calculation Formula:

Margin(dB) = Result (dB μ V/m)–Limit(dB μ V/m)

Result(dB μ V/m)= Reading(dB μ V)+ Factor(dB/m)

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the limit.

5.8.Measurement Result

Pass.

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

Emissions attenuated more than 20 dB below the permissible value are not reported.

The spectral diagrams are attached as below.



ACCURATE TECHNOLOGY CO., LTD.

F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: JP2019 #86

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 23 C / 48 %

EUT: LED Low Voltage Outfit

Mode: ON

Model: LED(TT)-T-S14-10L-15Ft-29V-WW+MU-Z

Manufacturer: Neo-Neon (Viet Nam) Development Co., Ltd

Polarization: Horizontal

Power Source: AC 120V/60Hz

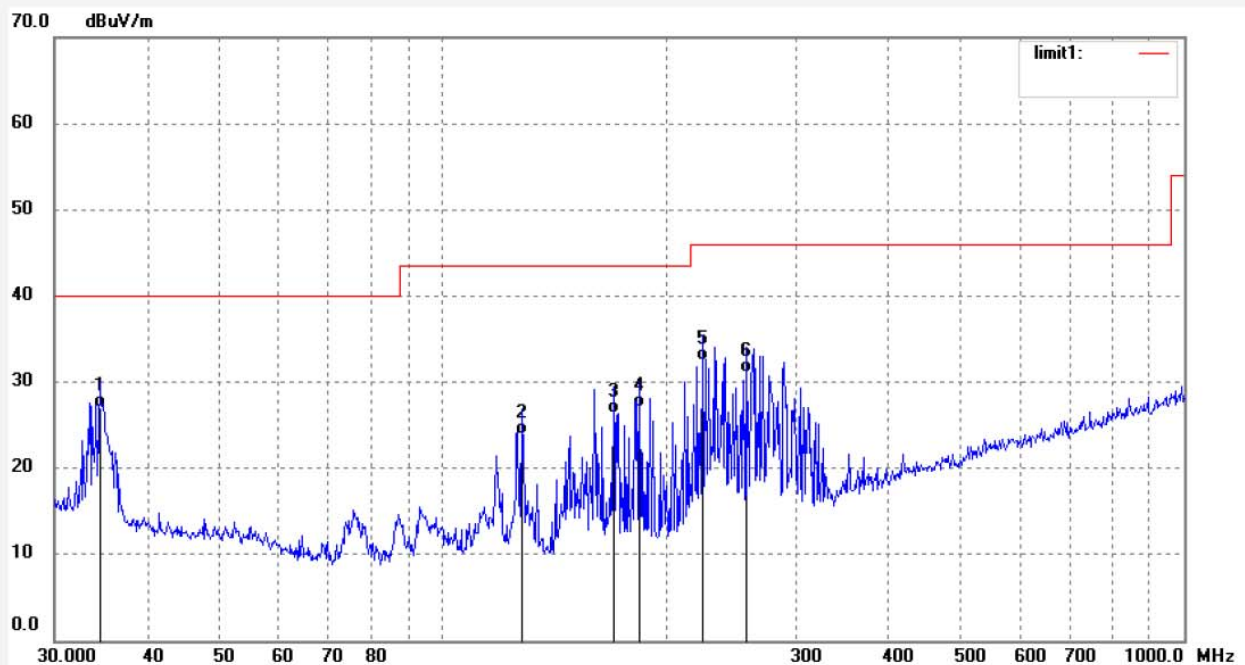
Date: 2020/05/16/

Time: 11/34/46

Engineer Signature: Ben

Distance: 3m

Note: Report NO.:ATE20200505



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	34.5173	38.39	-11.28	27.11	40.00	-12.89	QP	100	187	
2	128.1130	38.68	-14.81	23.87	43.50	-19.63	QP	100	301	
3	170.1948	41.08	-14.68	26.40	43.50	-17.10	QP	100	175	
4	184.4898	40.83	-13.79	27.04	43.50	-16.46	QP	100	325	
5	224.5193	44.86	-12.46	32.40	46.00	-13.60	QP	100	26	
6	256.5211	42.84	-11.74	31.10	46.00	-14.90	QP	100	132	



ACCURATE TECHNOLOGY CO., LTD.

F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber

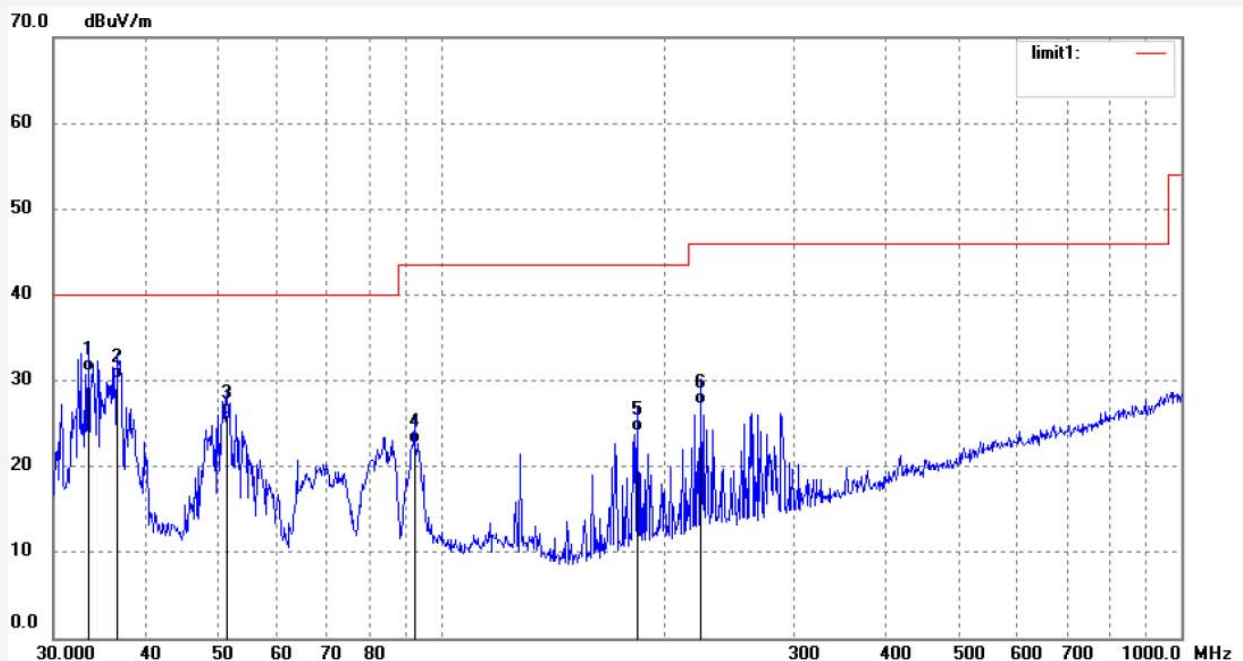
Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: JP2019 #85
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: LED Low Voltage Outfit
Mode: ON
Model: LED(TT)-T-S14-10L-15Ft-29V-WW+MU-Z
Manufacturer: Neo-Neon (Viet Nam) Development Co., Ltd

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 2020/05/16/
Time: 11/31/23
Engineer Signature: Ben
Distance: 3m

Note: Report NO.:ATE20200505



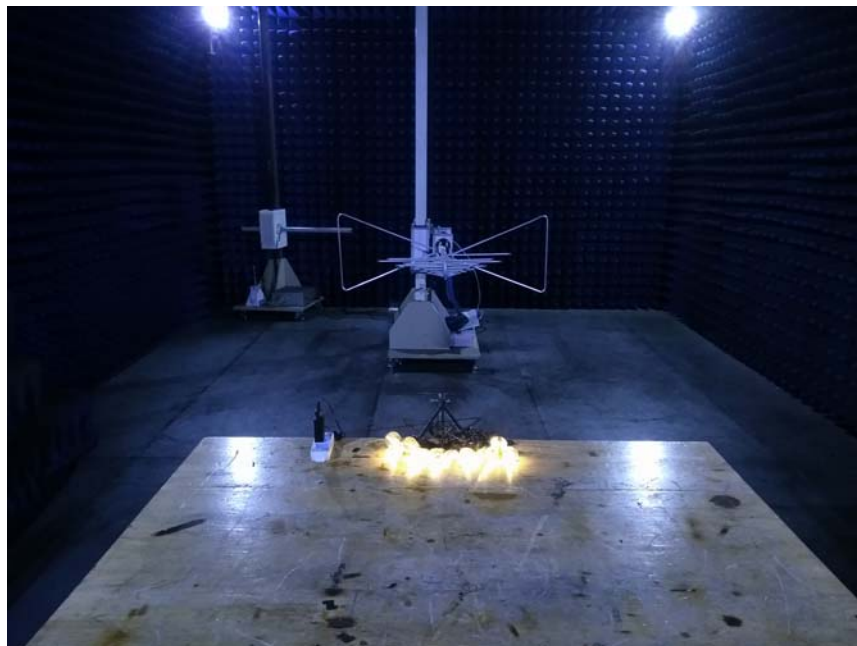
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	33.4449	42.09	-10.95	31.14	40.00	-8.86	QP	100	310	
2	36.5092	41.91	-11.75	30.16	40.00	-9.84	QP	100	128	
3	51.4807	39.67	-13.71	25.96	40.00	-14.04	QP	100	86	
4	92.1388	38.60	-15.96	22.64	43.50	-20.86	QP	100	169	
5	184.4898	37.91	-13.79	24.12	43.50	-19.38	QP	100	212	
6	224.5193	39.65	-12.46	27.19	46.00	-18.81	QP	100	35	

6. PHOTOGRAPHS

6.1.Photo of AC Power Line Conducted Emission Measurement



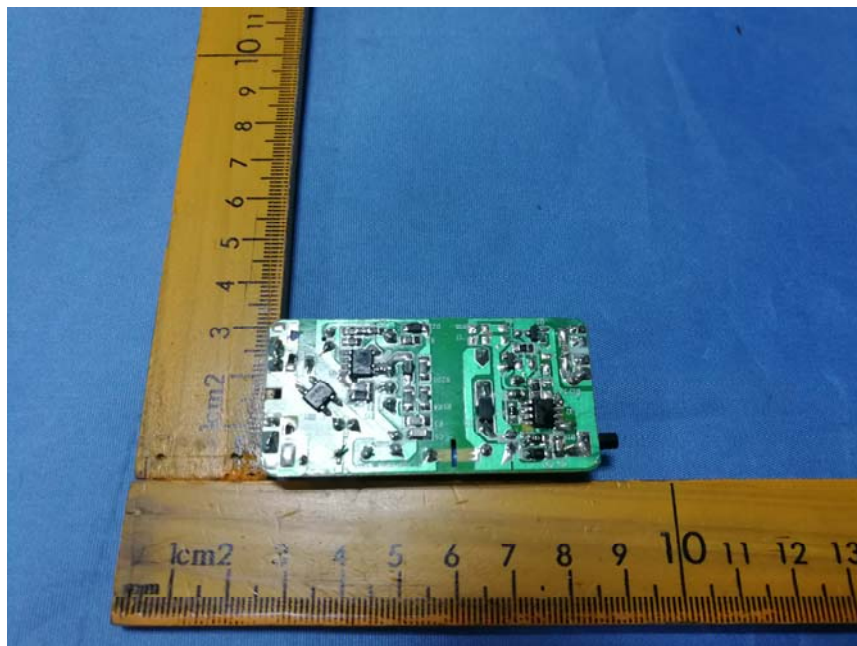
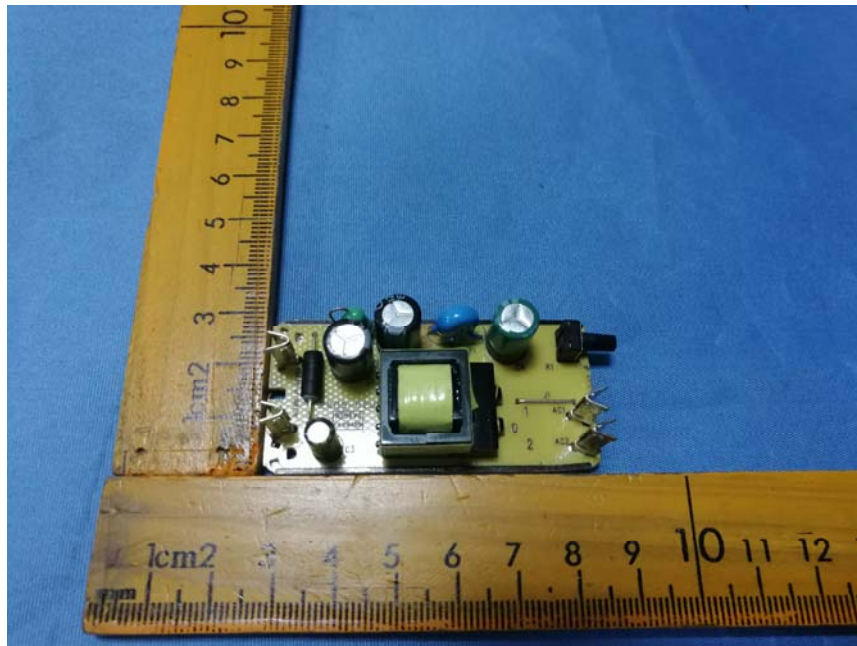
6.2.Photo of Radiation Emission Measurement



6.3.Photo of EUT







******* End of Test Report *******