

FCC PART 15B

TEST REPORT

For

IDEAL TECHNOLOGY COMPANY LIMITED

NO.12 Xiangrong Road, Song mu Shan Dalang Town,Dongguan City, Guangdong, China.

FCC ID: 2AUUE-3000

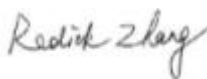
Report Type: Original Report	Product Type: Smart LED Light Bulb
Report Number:	RDG200324006-00
Report Date:	2020-04-28
Reviewed By:	Redick Zhang EMC Engineer 
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TABLE OF CONTENTS

General Information	3
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT).....	3
OBJECTIVE	3
TEST METHODOLOGY	3
MEASUREMENT UNCERTAINTY	4
TEST FACILITY	4
DECLARATIONS	4
System Test Configuration	5
DESCRIPTION OF TEST CONFIGURATION	5
EQUIPMENT MODIFICATIONS	5
EUT EXERCISE SOFTWARE	5
BLOCK DIAGRAM OF TEST SETUP	5
TEST EQUIPMENT LIST	6
ENVIRONMENTAL CONDITIONS	7
Summary of Test Results	8
1 – Conducted emissions	9
EUT SETUP	9
EMI TEST RECEIVER SETUP	9
TEST PROCEDURE	10
CORRECTED AMPLITUDE & MARGIN CALCULATION	10
TEST DATA	11
2 – Radiated emissions	13
EUT SETUP	13
EMI TEST RECEIVER SETUP	13
TEST PROCEDURE	13
CORRECTED AMPLITUDE & MARGIN CALCULATION	14
TEST DATA	15

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

EUT Name:	Smart LED Light Bulb
EUT Model:	N7
Multiple Models:	N/A
Rated Input Voltage:	100-250Vac 50/60Hz
The Highest Operating Frequency:	2480MHz
I/O Ports:	N/A
EUT Function:	Light Bulb
Serial Number:	200324006
EUT Received Date:	2020.03.25
EUT Received Status:	Good

Objective

This report is prepared on behalf of *IDEAL TECHNOLOGY COMPANY LIMITED* in accordance with Part 2, Part J, and Part 15, Subpart A and B of the Federal Communications Commission's rules..

The objective is to determine the compliance of EUT with:
FCC Part 15B.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2014 American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

Measurement Uncertainty

Parameter	Measurement Uncertainty
Unwanted Emissions, radiated	30M~200MHz: 4.55 dB, 200M~1GHz: 5.92 dB, 1G~6GHz: 4.98 dB, 6G~18GHz: 5.89 dB, 18G~26.5G: 5.47 dB, 26.5G~40G: 5.63 dB
Temperature	±1℃
Humidity	±5%
AC Power Lines Conducted Emission	3.12 dB (150 kHz to 30 MHz)

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China.

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 897218, the FCC Designation No. : CN1220.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier : CN0022.

Declarations

BACL is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with a triangle symbol “△”. Customer model name, addresses, names, trademarks etc. are not considered data.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

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SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in a typical fashion (as normally used by a typical user).

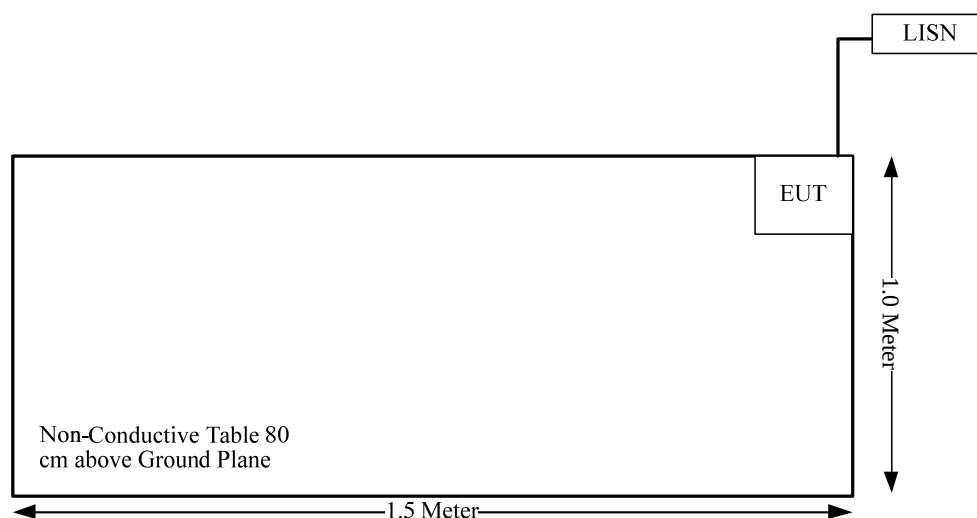
Equipment Modifications

No modification was made to the EUT.

EUT Exercise Software

No EUT software was used for testing.

Block Diagram of Test Setup



Test Equipment List

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted emission					
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-01	2019-09-05	2020-09-05
R&S	Test Software	EMC32	Version8.53.0	N/A	N/A
R&S	LISN	ENV 216	101614	2019-09-12	2020-09-12
R&S	EMI Test Receiver	ESCI	101121	2019-05-09	2020-05-09
Radiated emissions below 1GHz					
R&S	EMI Test Receiver	ESCI	100224	2019-09-12	2020-09-12
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
Sunol Sciences	Antenna	JB3	A060611-2	2017-08-25	2020-08-25
Unknown	Coaxial Cable	C-NJNJ-50	C-1000-01	2019-09-05	2020-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-02	2019-09-05	2020-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0530-01	2019-09-24	2020-09-24
Sonoma	Amplifier	310N	185914	2019-10-13	2020-10-13
Radiated emissions above 1GHz					
Agilent	Spectrum Analyzer	E4440A	SG43360054	2019-05-09	2020-05-09
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
ETS-Lindgren	Horn Antenna	3115	000 527 35	2018-10-12	2021-10-12
Unknown	Coaxial Cable	C-SJSJ-50	C-0800-01	2019-09-05	2020-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-02	2019-09-05	2020-09-05
Mini-Circuit	Amplifier	ZVA-213-S+	54201245	2019-09-05	2020-09-05
Agilent	Signal Generator	E8247C	MY43321350	2018-12-10	2019-12-10

* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Environmental Conditions

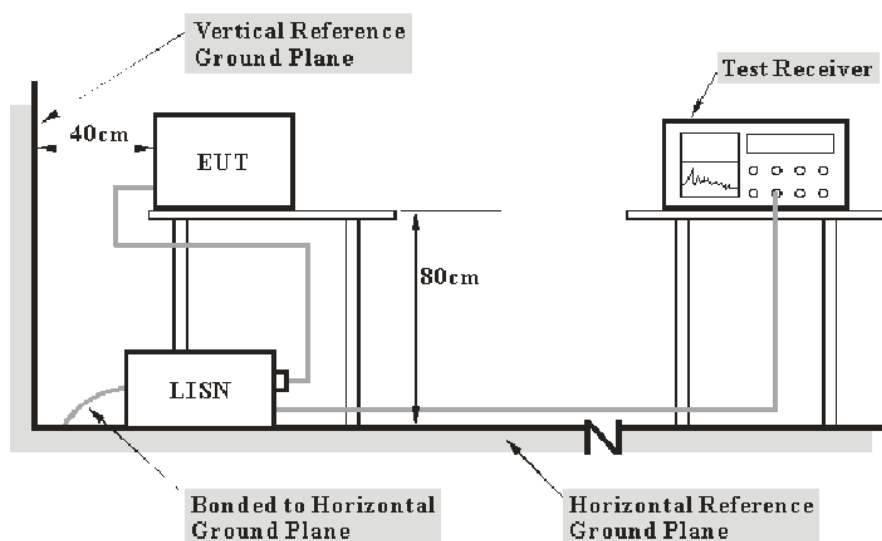
Temperature:	22.3~25.6 °C
Relative Humidity:	45~57%
ATM Pressure:	101.1~ 101.7kPa
Tester:	Ase Chen, Sem Xiang
Test Date:	2020.03.30~2020.04.27

SUMMARY OF TEST RESULTS

SN	Rule and Clause	Description of Test	Test Result
1	FCC §15.107	Conducted emissions	Compliance
2	FCC §15.109	Radiated emissions	Compliance

1 - CONDUCTED EMISSIONS

EUT 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.

The setup of EUT is according with per ANSI C63.4-2014 measurement procedure. The specification used was with the FCC Part 15 B Class B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Procedure

During the conducted emission test, the EUT was connected to the outlet of the first LISN and the other support equipments were connected to the outlet of the second LISN.

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

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

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Result (QuasiPeak or Average) = Meter Reading + Corr.

Note:

Corr. = Cable loss + Factor of coupling device

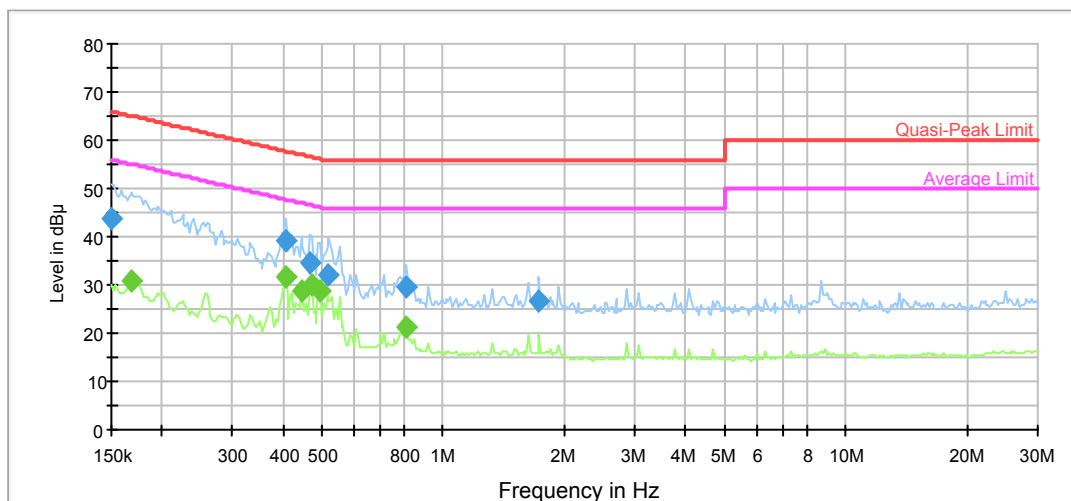
The “**Margin**” column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of 7dB means the emission is 7dB below the maximum limit. The equation for margin calculation is as follows:

Margin = Limit – Result

Test Data

Please refer to following table and plots:

Model Number: N7
 Port: L
 Test Mode: On
 Power Source: AC 120V/60Hz
 Note:



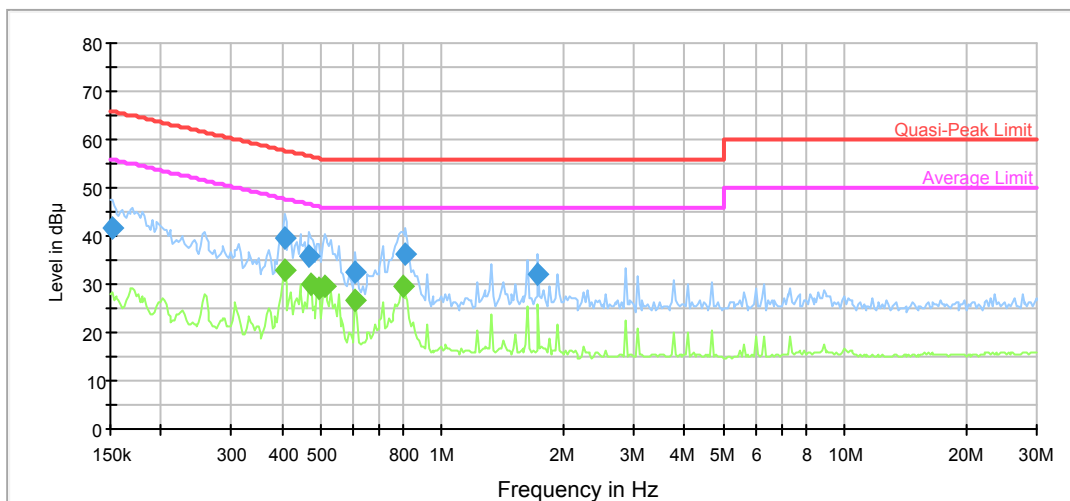
Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.150000	43.8	9.000	L1	9.7	22.2	66.0
0.405722	39.1	9.000	L1	9.7	18.6	57.7
0.466367	34.7	9.000	L1	9.7	21.9	56.6
0.520311	32.0	9.000	L1	9.7	24.0	56.0
0.814189	29.5	9.000	L1	9.7	26.5	56.0
1.734401	26.5	9.000	L1	9.8	29.5	56.0

Final Result 2

Frequency (MHz)	Average (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.169024	30.8	9.000	L1	9.7	24.2	55.0
0.405722	31.8	9.000	L1	9.7	15.9	47.7
0.443733	28.7	9.000	L1	9.7	18.3	47.0
0.471031	29.8	9.000	L1	9.7	16.6	46.5
0.495058	28.7	9.000	L1	9.7	17.4	46.1
0.814189	21.1	9.000	L1	9.7	24.9	46.0

Model Number: N7
 Port: N
 Test Mode: On
 Power Source: AC 120V/60Hz
 Note:



Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.151500	41.5	9.000	N	9.7	24.4	65.9
0.405722	39.7	9.000	N	9.6	18.0	57.7
0.466367	35.7	9.000	N	9.6	20.9	56.6
0.610106	32.5	9.000	N	9.6	23.5	56.0
0.814189	36.3	9.000	N	9.6	19.7	56.0
1.734401	32.0	9.000	N	9.6	24.0	56.0

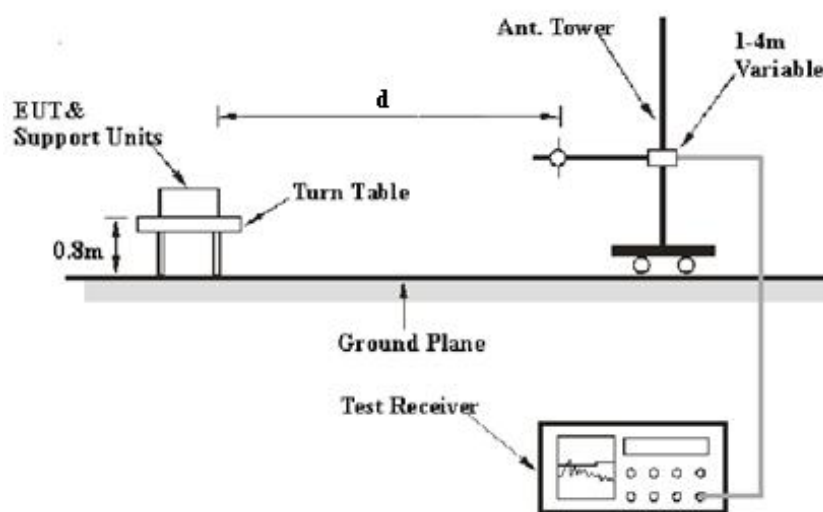
Final Result 2

Frequency (MHz)	Average (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.405722	33.1	9.000	N	9.6	14.7	47.7
0.471031	30.1	9.000	N	9.6	16.4	46.5
0.495058	29.1	9.000	N	9.6	17.0	46.1
0.510059	29.7	9.000	N	9.6	16.3	46.0
0.610106	26.6	9.000	N	9.6	19.4	46.0
0.798146	29.5	9.000	N	9.6	16.5	46.0

2 - RADIATED EMISSIONS

EUT Setup

Below 1GHz:



The radiated emission tests were performed at the 3 meters distance, above 1GHz were performed at the 3 meters, using the setup accordance with the ANSI C63.4-2014. The specification used was the FCC Part 15.109 Class B limits.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 13GHz.

During the radiated emission test, the EMI test receiver was set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	/	Peak
	1 MHz	Reduced video bandwidth	/	AVG

Test Procedure

During the radiated emissions, the EUT of laptop was connected to the first AC floor outlet and the other support equipments were connected to the second AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

The data was recorded in the Quasi-peak detection mode for below 1 GHz, peak and average detection mode above 1 GHz.

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$$\text{Result} = \text{Meter Reading} + \text{Corrected}$$

Note:

$$\text{Corrected} = \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

or

$$\text{Corrected} = \text{Antenna Factor} + \text{Cable Loss} + \text{Insertion loss of attenuator} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7 dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

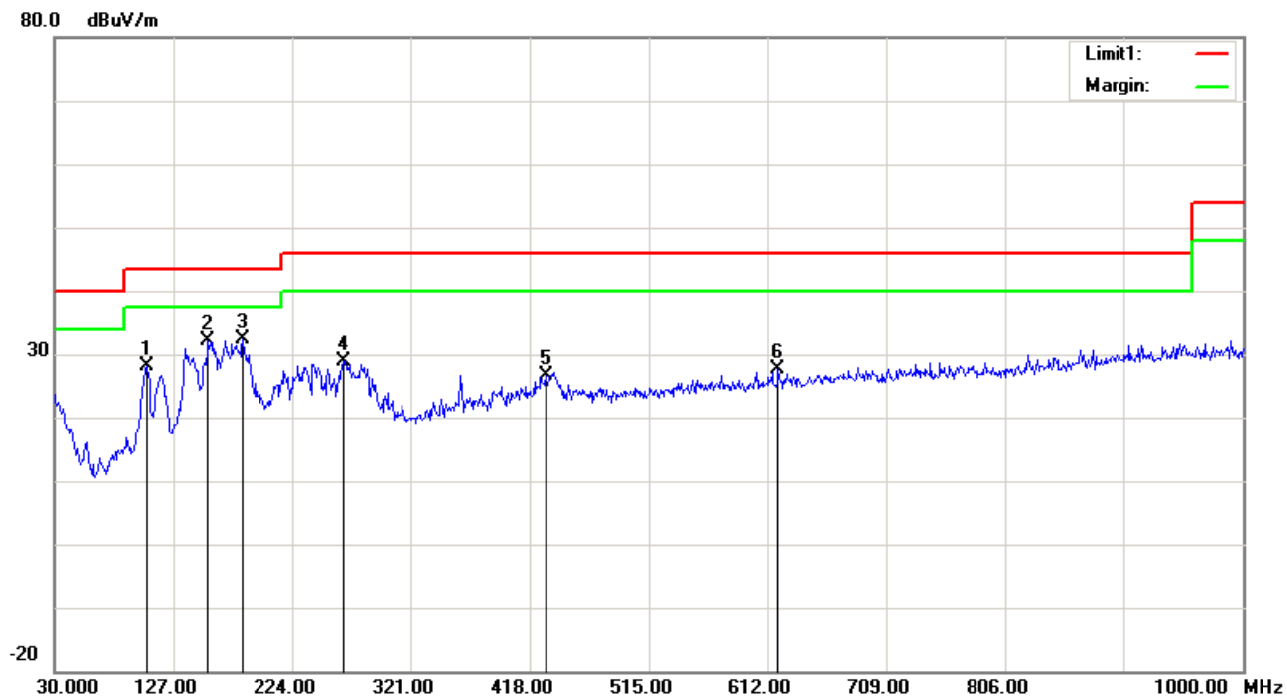
$$\text{Margin} = \text{Limit} - \text{Result}$$

Test Data

Please refer to following table and plots:

Condition: FCC Part 15B Class B
EUT: Smart LED Light Bulb
Model: N7
Test Mode: On
Note:

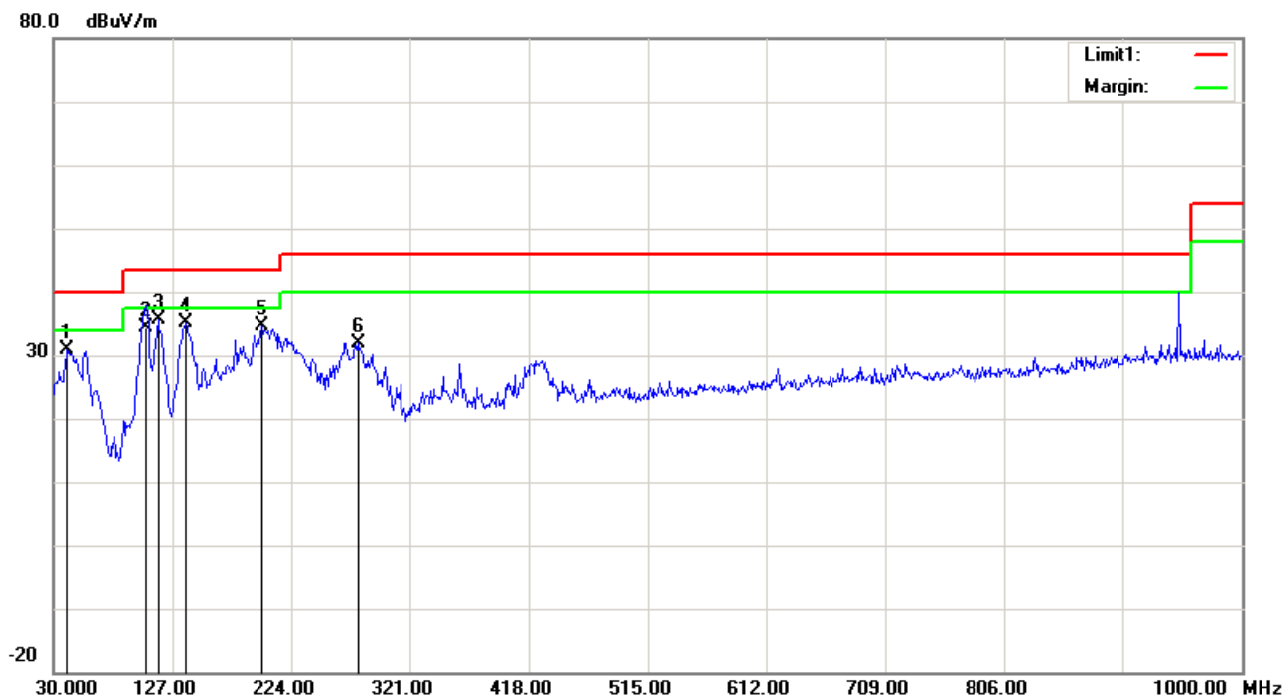
Polarization: Horizontal
Power: AC 120V/60Hz
Distance: 3m



No.	Frequency (MHz)	Reading (dBμV)	Detector	Corrected (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1	105.6600	41.87	peak	-13.64	28.23	43.50	15.27
2	155.1300	41.72	peak	-9.53	32.19	43.50	11.31
3	183.2600	42.56	peak	-10.10	32.46	43.50	11.04
4	265.7100	37.80	peak	-9.00	28.80	46.00	17.20
5	431.5800	31.33	peak	-4.63	26.70	46.00	19.30
6	620.7300	28.25	peak	-0.53	27.72	46.00	18.28

Condition: FCC Part 15B Class B
EUT: Smart LED Light Bulb
Model: N7
Test Mode: On
Note:

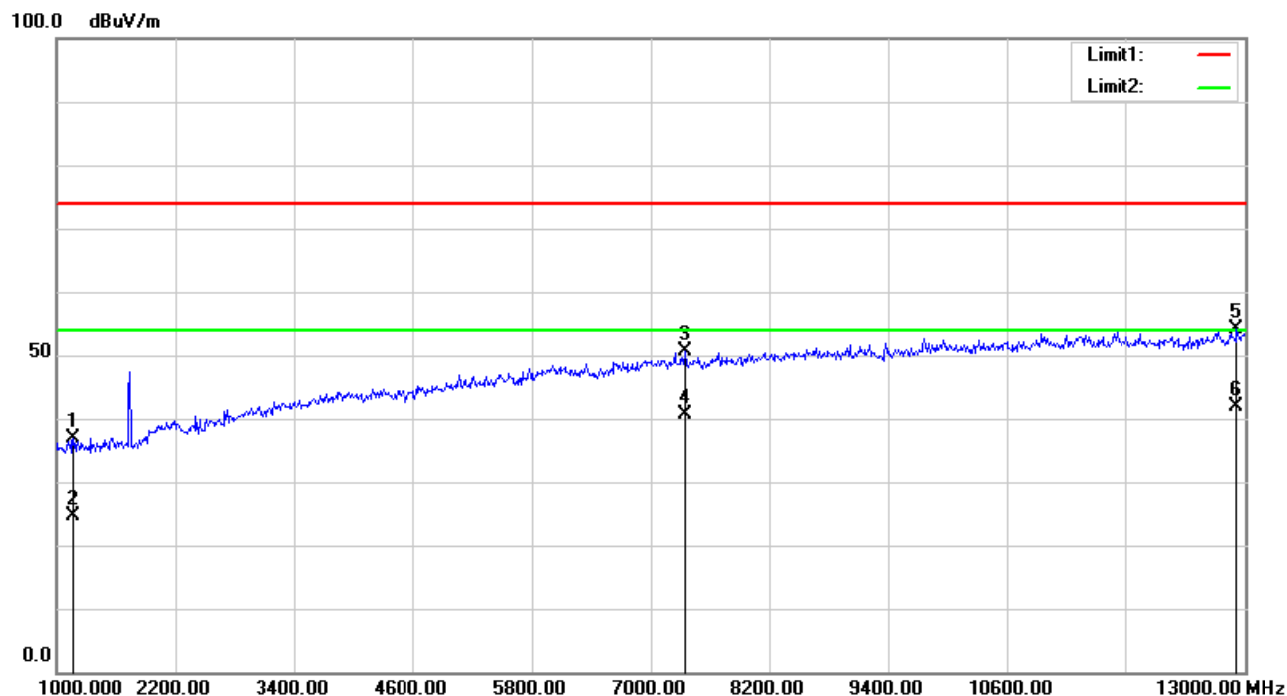
Polarization: Vertical
Power: AC 120V/60Hz
Distance: 3m



No.	Frequency (MHz)	Reading (dB μ V)	Detector	Corrected (dB/m)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
1	40.6700	40.72	peak	-9.87	30.85	40.00	9.15
2	105.6600	48.14	QP	-13.64	34.50	43.50	9.00
3	115.3600	48.65	peak	-12.92	35.73	43.50	7.77
4	137.6700	44.60	peak	-9.38	35.22	43.50	8.28
5	199.7500	43.95	peak	-9.39	34.56	43.50	8.94
6	278.3200	40.55	peak	-8.60	31.95	46.00	14.05

Condition: FCC Part 15B Class B
EUT: Smart LED Light Bulb
Model: N7
Test Mode: On
Note:

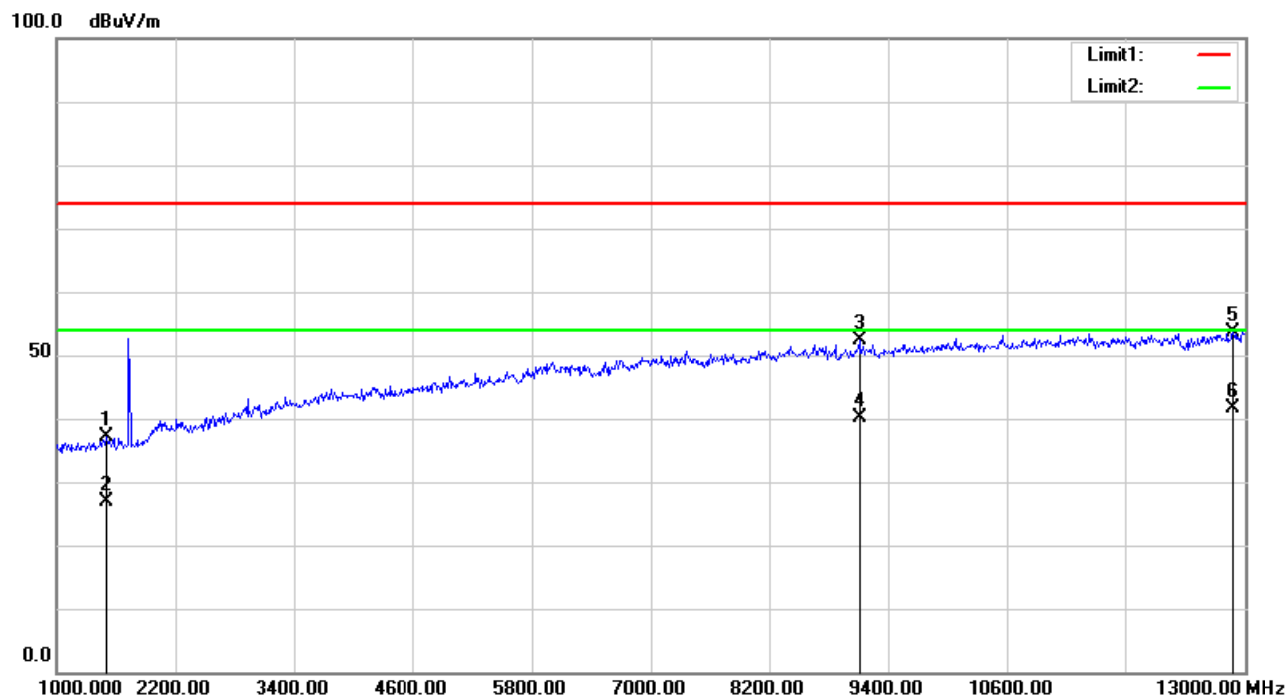
Polarization: Horizontal
Power: AC 120V/60Hz
Distance: 3m



No.	Frequency (MHz)	Reading (dB μ V)	Detector	Corrected (dB/m)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
1	1168.000	37.29	peak	-0.43	36.86	74.00	37.14
2	1168.000	25.16	AVG	-0.43	24.73	54.00	29.27
3	7348.000	35.71	peak	14.92	50.63	74.00	23.37
4	7348.000	25.59	AVG	14.92	40.51	54.00	13.49
5	12922.000	32.46	peak	21.61	54.07	74.00	19.93
6	12922.000	20.23	AVG	21.61	41.84	54.00	12.16

Condition: FCC Part 15B Class B
EUT: Smart LED Light Bulb
Model: N7
Test Mode: On
Note:

Polarization: Vertical
Power: AC 120V/60Hz
Distance: 3m



No.	Frequency (MHz)	Reading (dB μ V)	Detector	Corrected (dB/m)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
1	1510.000	35.87	peak	1.25	37.12	74.00	36.88
2	1510.000	25.73	AVG	1.25	26.98	54.00	27.02
3	9112.000	34.72	peak	17.55	52.27	74.00	21.73
4	9112.000	22.65	AVG	17.55	40.20	54.00	13.80
5	12886.000	32.22	peak	21.50	53.72	74.00	20.28
6	12886.000	20.11	AVG	21.50	41.61	54.00	12.39

*****END OF REPORT*****