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检测
TESTING
CNAS L6478



TEST REPORT

Reference No. : WTZ20F08056717X1E
 Applicant : EMPIRE OF LIGHT PTY. LTD
 Address : 8 ROWANY CLOSE, BONNYRIGG, NSW, 2177, AUSTRALIA
 Manufacturer : The same as above
 Address : The same as above
 Product Name : LED Frameless Panellight
 Model No. : Refer to section 3.2
 Standards : AS CISPR 15:2017
 Date of Receipt sample : 2020-08-28
 Date of Test : 2020-09-01 to 2020-09-08
 Date of Issue : 2020-09-28
 Test Report Form No. : WEL-CISPR15A-01B
 Test Result : **Pass**

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

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1 Test Summary

EMISSION			
Test Item	Test Standard	Class / Severity	Result
Mains Terminal Disturbance Voltage, 9kHz to 30MHz	AS CISPR 15:2017	Clause 4.3.1	Pass
Radiated Electromagnetic Disturbance, 9kHz to 30MHz	AS CISPR 15:2017	Clause 4.4.1	Pass
Radiated Emission, 30MHz to 300MHz	AS CISPR 15:2017	Clause 4.4.2	Pass

Remark:

Pass

Test item meets the requirement

Fail

Test item does not meet the requirement

N/A

Test case does not apply to the test object



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3 General Information

3.1 General Description of E.U.T.

Product Name : LED Frameless Panellight

Model No. : Refer to section 3.2

Remark..... : All models have the same LED driver and lamp beads, only difference in power and appearance. Therefore the EMC tests were performed on model EOL.CE.FR20-36 which has the biggest power.

3.2 Details of E.U.T.

Technical Data..... :

Item	Model	Rated Input	Rated Power
1	EOL.CE.FR20-36	200-265VAC, 50-60Hz	36W
2	EOL.CE.FR20-9	200-265VAC, 50-60Hz	9W
3	EOL.CE.FR20-12	200-265VAC, 50-60Hz	12W
4	EOL.CE.FR20-18	200-265VAC, 50-60Hz	18W
5	EOL.CE.FR20-24	200-265VAC, 50-60Hz	24W
6	EOL.CE.FS20-36	200-265VAC, 50-60Hz	36W
7	EOL.CE.FS20-9	200-265VAC, 50-60Hz	9W
8	EOL.CE.FS20-12	200-265VAC, 50-60Hz	12W
9	EOL.CE.FS20-18	200-265VAC, 50-60Hz	18W
10	EOL.CE.FS20-24	200-265VAC, 50-60Hz	24W

3.3 Description of Support Units

The EUT has been tested as an independent unit. EOL.CE.FR20-36 is the test sample. The DV&RE tests were performed in the condition of AC 240V/50Hz input.

3.4 Standards Applicable for Testing

The tests were performed according to following standards:

AS CISPR 15:2017

Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment



3.5 Test Facility

The test facility has a test site registered with the following organizations:

- **ISED – Registration No.: 21895**

Waltek Testing Group (Foshan) Co., Ltd. has been registered and fully described in a report filed with the Innovation, Science and Economic Development Canada (ISED). The acceptance letter from the ISED is maintained in our files. Registration ISED number: 21895, March 12, 2019

- **FCC – Registration No.: 820106**

Waltek Testing Group (Foshan) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 820106, August 16, 2018

- **NVLAP – Lab Code: 600191-0**

Waltek Testing Group (Foshan) Co., Ltd. EMC Laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 600191-0.

This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

3.6 Subcontracted

Whether parts of tests for the product have been subcontracted to other labs:

Yes No

If Yes, list the related test items and lab information:

Test items: ---

Lab information: ---

3.7 Abnormalities from Standard Conditions

None.

3.8 Other

This report is based on Project No. WTZ20F08056717E for adding CNAS which do not affect the EMC test items. Therefore there was no further test has been performed. Original report No. WTZ20F08056717E is no longer valid.



4 Equipment Used during Test

Mains Terminal Disturbance Voltage 1#(Conducted Emission)					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	EMI Test Receiver	R&S	ESR3	102423	Valid
2.	LISN	R&S	ENV216	101343	Valid
3.	Cable	HUBER+SUHNER	CBL2-NN-6M	223NN624	Valid
4.	Switch	CD	RSU-A4 18G	RSUA4008	Valid
Mains Terminal Disturbance Voltage 2#(Conducted Emission)					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	EMI Test Receiver	R&S	ESCI	101178	Valid
2.	LISN	R&S	ENV216	101215	Valid
3.	Cable	HUBER+SUHNER	CBL2-NN-6M	6102701	Valid
4.	Switch	ESE	RSU/M2	---	Valid
Radiated Electromagnetic Disturbance(9kHz to 30MHz)					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	EMI Test Receiver	R&S	ESCI	101178	Valid
2	Three Loops Antenna	SCHWARZBECK	HXYZ9170	213	Valid
Radiated Emission					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	EMI Test Receiver	R&S	ESR7	101566	Valid
2.	Active Loop Antenna	SCHWARZBECK	FMZB1519B	00004	Valid
3.	Trilog Broadband Antenna	SCHWARZBECK	VULB 9162	9162-117	Valid
4.	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	01561	Valid
5.	Preamplifier	Lunar E M	LNA1G18-40	20160501002	Valid

4.1 Software List

Description	Manufacturer	Model	Version
EMI Test Software (Conducted Emission1#)	FARATRONIC	EZ-EMC	EMEC-3A1
EMI Test Software (Conducted Emission2#)	FARATRONIC	EZ-EMC	CON-03A1
EMI Test Software (LOOP)	FARATRONIC	EZ-EMC	CON-03A1
EMI Test Software (Radiated Emission)	FARATRONIC	EZ-EMC	RA-03A1-1



4.2 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Conducted Emission	150kHz~30MHz	±2.7dB	(1)
Radiated Electromagnetic Disturbance	9kHz~30MHz	±3.0dB	(1)
Radiated Emission	30MHz~1GHz	±4.1dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

4.3 Special Accessories and Auxiliary Equipment

Item	Equipment	Technical Data	Manufacturer	Model No.	Serial No.
1.	/	/	/	/	/

4.4 Decision Rule

Compliance or non-compliance with a disturbance limit shall be determined in the following manner.

If U_{LAB} is less than or equal to U_{cispr} , then

-Compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;

-Non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

If U_{LAB} is greater than U_{cispr} , then

-Compliance is deemed to occur if no measured disturbance level, increased by $(U_{LAB} - U_{cispr})$, exceeds the disturbance limit;

-Non-compliance is deemed to occur if any measured disturbance level, increased by $(U_{LAB} - U_{cispr})$, exceeds the disturbance limit.



5 Emission Test Results

5.1 Mains Terminals Disturbance Voltage, 9kHz to 30MHz

Test Requirement.....	: AS CISPR 15
Test Method.....	: AS CISPR 15
Test Result.....	: Pass
Frequency Range.....	: 9kHz to 30MHz
Class/Severity.....	: Table 2a of AS CISPR 15

5.1.1 E.U.T. Operation

Operating Environment:

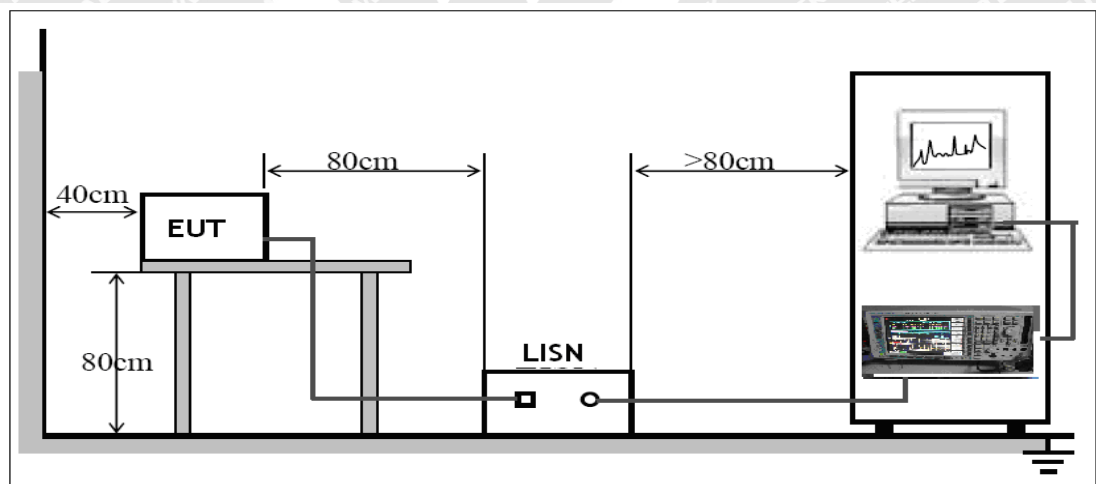
Temperature	: 25.0°C
Humidity.....	: 60.0%RH
Atmospheric Pressure.....	: 101.2kPa

EUT Operation:

Input Voltage	: AC 240V/50Hz
Operating Mode.....	: Lighting mode

5.1.2 Block Diagram of Test Setup

The Mains Terminals Disturbance Voltage tests were performed in accordance with the AS CISPR 15.



5.1.3 Measurement Data

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.



5.1.4 Corrected Amplitude & Margin Calculation

The Corrected factor is calculated by adding LISN VDF(Voltage Division Facotr), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

$$\text{Measurement} = \text{Reading Level} + \text{Correct Factor}$$

$$\text{Correct Facotor} = \text{LISN VDF} + \text{Cable Loss}$$

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. The equation for margin calculation is as follows:

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

5.1.5 Mains Terminals Disturbance Voltage Test Data

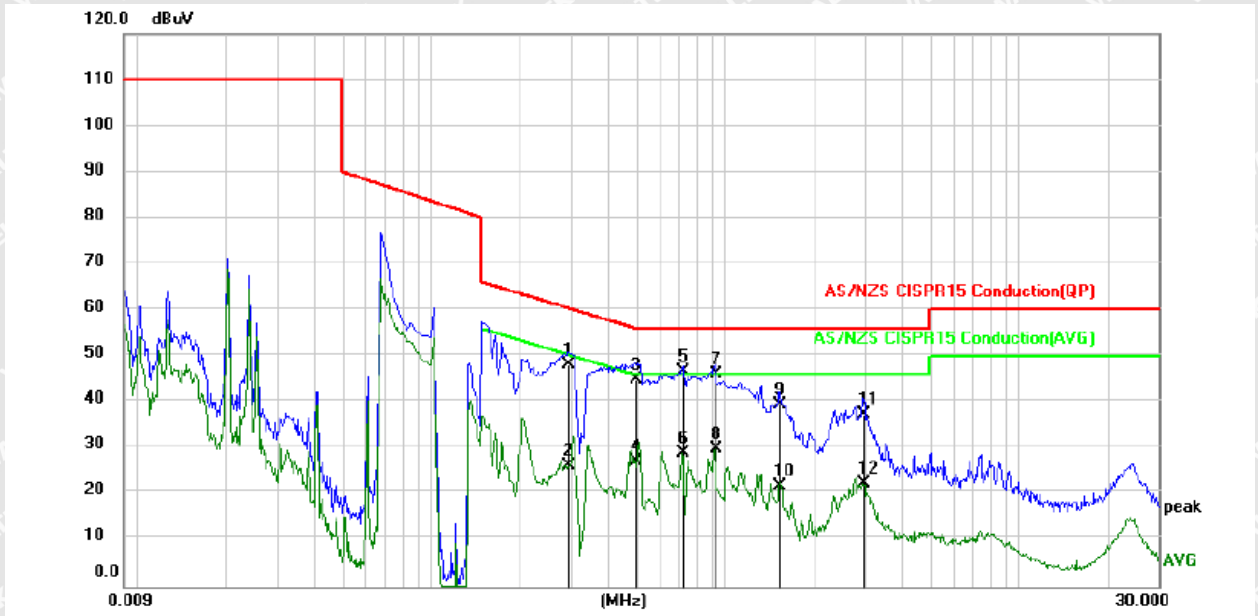
Live Line



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.2060	43.75	9.63	53.38	63.37	-9.99	QP	
2		0.2060	31.83	9.63	41.46	53.37	-11.91	AVG	
3		0.4940	35.27	9.63	44.90	56.10	-11.20	QP	
4		0.4940	18.10	9.63	27.73	46.10	-18.37	AVG	
5	*	0.7140	37.01	9.63	46.64	56.00	-9.36	QP	
6		0.7140	19.19	9.63	28.82	46.00	-17.18	AVG	
7		0.9180	36.88	9.64	46.52	56.00	-9.48	QP	
8		0.9180	19.60	9.64	29.24	46.00	-16.76	AVG	
9		1.3300	31.90	9.64	41.54	56.00	-14.46	QP	
10		1.3300	15.27	9.64	24.91	46.00	-21.09	AVG	
11		2.9500	22.96	9.66	32.62	56.00	-23.38	QP	
12		2.9500	10.46	9.66	20.12	46.00	-25.88	AVG	



Neutral Line



No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measurement dBuV	Limit dBuV	Over dB	Detector	Comment
1	0.2940	38.44	9.60	48.04	60.41	-12.37	QP	
2	0.2940	16.56	9.60	26.16	50.41	-24.25	AVG	
3	0.4980	35.28	9.61	44.89	56.03	-11.14	QP	
4	0.4980	17.55	9.61	27.16	46.03	-18.87	AVG	
5 *	0.7220	36.91	9.61	46.52	56.00	-9.48	QP	
6	0.7220	19.46	9.61	29.07	46.00	-16.93	AVG	
7	0.9260	36.57	9.61	46.18	56.00	-9.82	QP	
8	0.9260	20.29	9.61	29.90	46.00	-16.10	AVG	
9	1.5380	29.98	9.62	39.60	56.00	-16.40	QP	
10	1.5380	12.06	9.62	21.68	46.00	-24.32	AVG	
11	2.9660	27.56	9.64	37.20	56.00	-18.80	QP	
12	2.9660	12.64	9.64	22.28	46.00	-23.72	AVG	



5.2 Radiated Electromagnetic Disturbance, 9kHz to 30MHz

Test Requirement.....	: AS CISPR 15
Test Method.....	: AS CISPR 15
Test Result.....	: Pass
Frequency Range.....	: 9kHz to 30MHz
Class/Severity.....	: Table 3a of AS CISPR 15

5.2.1 E.U.T. Operation

Operating Environment:

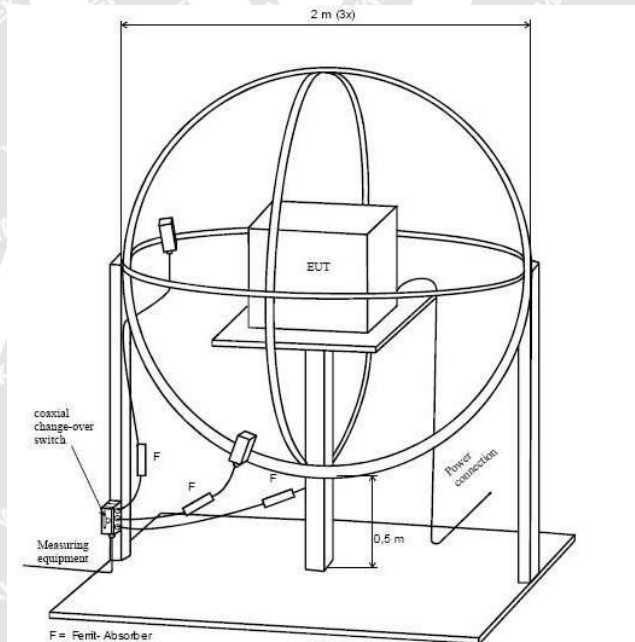
Temperature.....	: 24.8°C
Humidity.....	: 49.3%RH
Barometric Pressure.....	: 101.2kPa

EUT Operation:

Input Voltage.....	: AC 240V/50Hz
Operating Mode.....	: Lighting mode

5.2.2 Block Diagram of Test Setup

The Radiated Electromagnetic Disturbance (9kHz to 30MHz) test was performed in accordance with the AS CISPR 15.



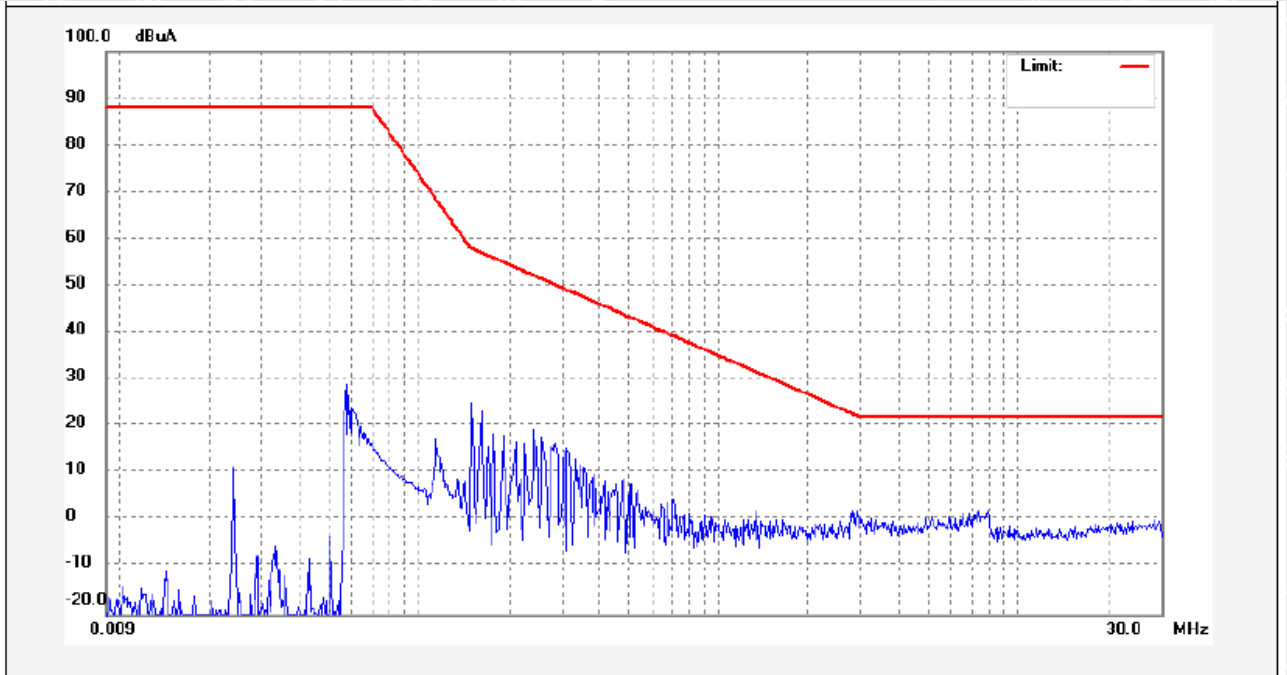
5.2.3 Measurement Data

According to the data in section 5.2.4, the EUT complied with the AS CISPR 15 standards.



5.2.4 Radiated Electromagnetic Disturbance Test Data, 9kHz to 30MHz

Loop X

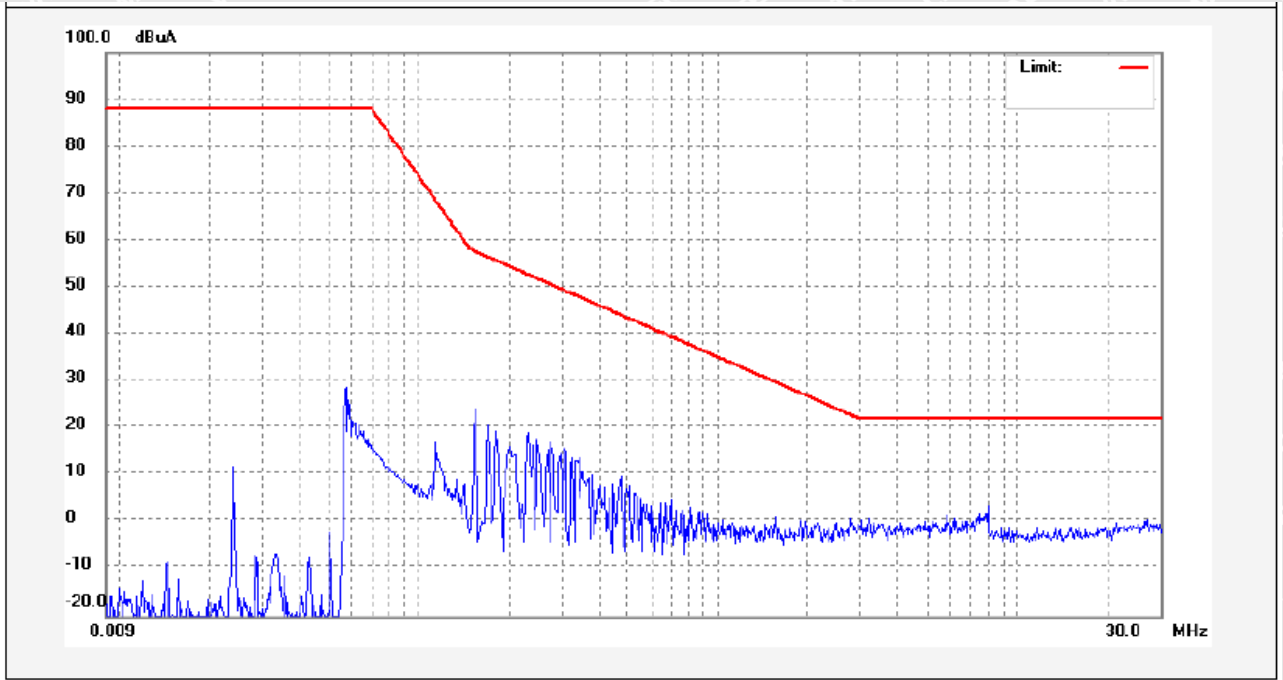


No.	Freq. (MHz)	Reading (dBuA)	Factor (())	Result (dBuA)	Limit (dBuA)	Margin (dB)	Detector	Remark
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Loop Y

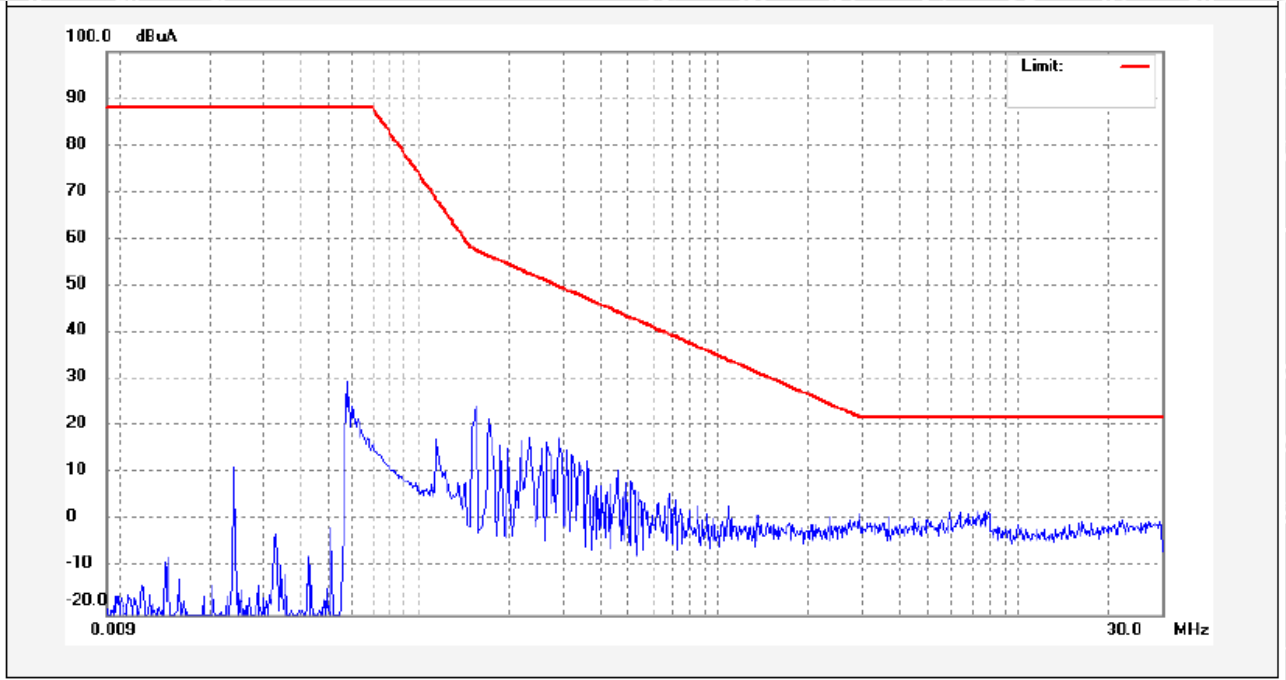


No.	Freq. (MHz)	Reading (dBuA)	Factor (())	Result (dBuA)	Limit (dBuA)	Margin (dB)	Detector	Remark
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Loop Z



No.	Freq. (MHz)	Reading (dBuA)	Factor (())	Result (dBuA)	Limit (dBuA)	Margin (dB)	Detector	Remark
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5.3 Radiated Emission, 30MHz to 300MHz

Test Requirement.....	: AS CISPR 15
Test Method.....	: AS CISPR 15
Test Result.....	: Pass
Frequency Range.....	: 30MHz to 300MHz
Class/Severity.....	: Table 3b of AS CISPR 15

5.3.1 E.U.T. Operation

Operating Environment:

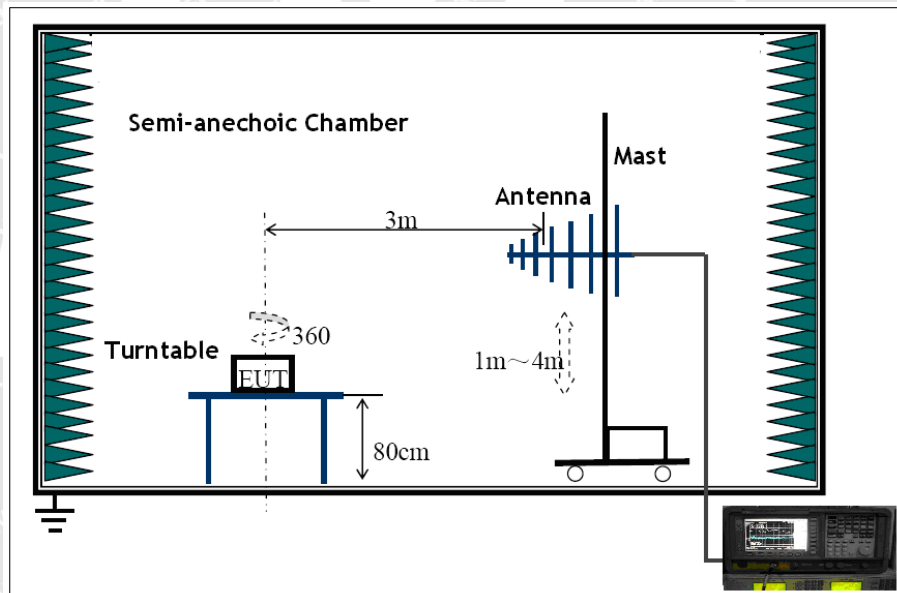
Temperature.....	: 24.2°C
Humidity.....	: 50.3%RH
Atmospheric Pressure.....	: 101.2kPa

EUT Operation:

Input Voltage.....	: AC 240V/50Hz
Operating Mode.....	: Lighting mode

5.3.2 Block Diagram of Test Setup

The Radiated Emission test was performed in the 3m Semi- Anechoic Chamber test site and accordance with CISPR16-2-3.



5.3.3 Measurement Data

The maximised peak emissions from the EUT was scanned and measured for Horizontal & Vertical polarisation. Quasi-peak measurements were performed if peak emissions were within 6dB of the limit line.



5.3.4 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Corr. Factor}$$

$$\text{Corr. Factor} = \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

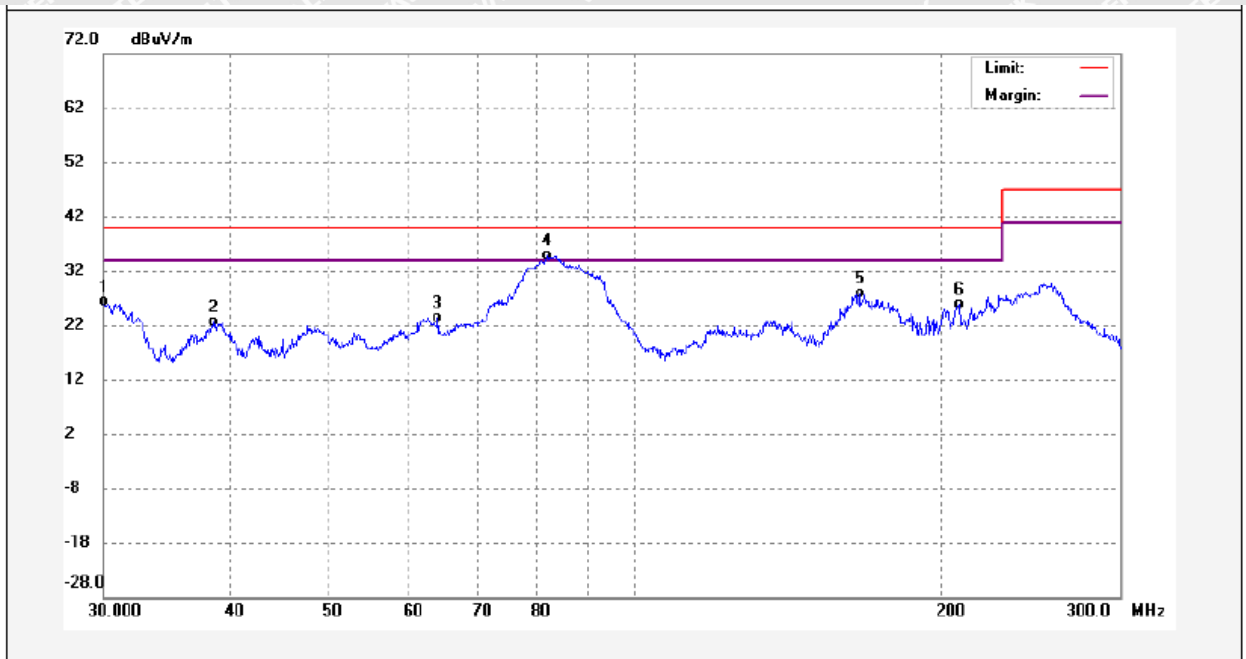
The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the maximum limit.

The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{Limit}$$

5.3.5 Radiated Emission Test Data

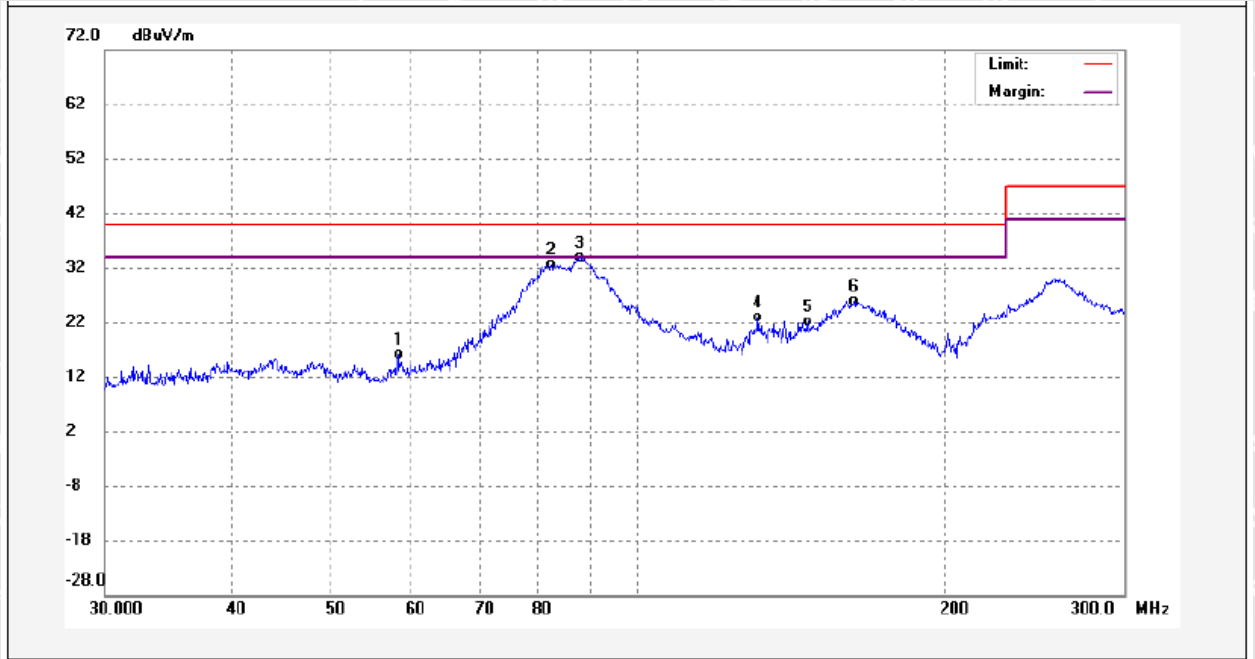
Vertical Polarization



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	30.0000	15.41	11.09	26.50	40.00	-13.50	QP	
2	38.5852	9.99	12.66	22.65	40.00	-17.35	QP	
3	64.0356	11.42	11.96	23.38	40.00	-16.62	QP	
4	82.1526	24.34	10.46	34.80	40.00	-5.20	QP	
5	166.3877	14.89	12.95	27.84	40.00	-12.16	QP	
6	208.5553	11.61	14.34	25.95	40.00	-14.05	QP	



Horizontal Polarization



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	58.2266	3.20	13.02	16.22	40.00	-23.78	QP	
2	82.3230	22.40	10.32	32.72	40.00	-7.28	QP	
3	87.8459	22.77	11.07	33.84	40.00	-6.16	QP	
4	131.2566	12.64	10.24	22.88	40.00	-17.12	QP	
5	146.9675	12.34	9.91	22.25	40.00	-17.75	QP	
6	163.0126	15.21	10.62	25.83	40.00	-14.17	QP	





6 Photographs – Test Setup

6.1 Photograph – Mains Terminal Disturbance Voltage Test Setup



6.2 Photograph – Radiated Electromagnetic Disturbance Test Setup





6.3 Photograph – Radiated Emission Test Setup, 30MHz to 300MHz

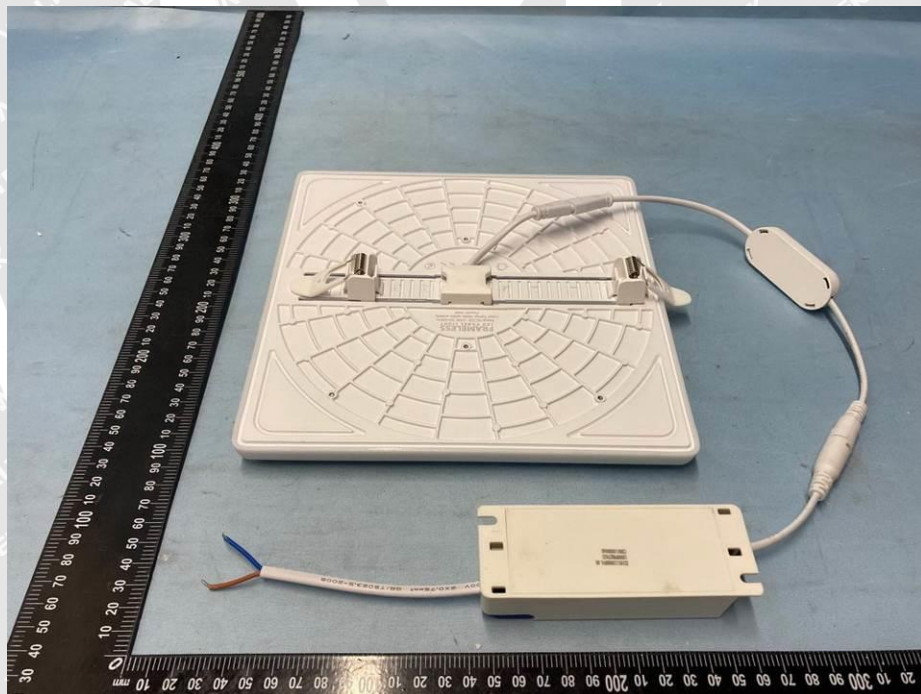


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7 Photographs – Constructional Details

7.1 EUT – External View





==== End of Report ====

