

TEST REPORT

Product Name : AC-DC Converter
Model Number : PM30X15-Sxx, PM30X20-Sxx,
PM30X20-Sxx-W, PM30X20-Sxx-H2,
PM30X20-Sxx-H4 (Variable xx can be 03,
05, 09, 12, 15 and 24, indicate output
voltage, eg:03=3.3Vdc, 24=24.0Vdc.)

Prepared for : Favotek Limited
Address : Rooms 05-15, 13A/F., South Tower, World Finance Center,
Harbour City, 17 Canton Road, Tsim Sha Tsui, Kowloon,
Hong Kong.

Prepared by : EMTEK(DONGGUAN) CO., LTD.
Address : -1&2/F., Building 2, Zone A, Zhongda Marine Biotechnology
Research and Development Base, N.9, Xincheng
Avenue, Songshanhu High-technology Industrial
Development Zone, Dongguan, Guangdong, China

Tel : +86-769-22807078
Fax: +86-769-22807079

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Appendix I (Photos of EUT) (2 pages)



TEST REPORT DESCRIPTION

Applicant : Favotek Limited
Manufacturer : Favotek Limited
Factory : Favotek Limited
EUT : AC-DC Converter
Model No. : PM30X15-Sxx, PM30X20-Sxx, PM30X20-Sxx-W, PM30X20-Sxx-H2,
PM30X20-Sxx-H4
(Variable xx can be 03, 05, 09, 12, 15 and 24, indicate output voltage,
eg:03=3.3Vdc, 24=24.0Vdc.)
Rating : See the page 10-11 model list for detail
Measurement Procedure Used:

EN 55032: 2015+AC: 2016

EN 55035: 2017

EN 61000-3-2: 2014, EN 61000-3-3: 2013

(IEC 61000-4-2: 2008, IEC61000-4-3: 2006+A1:2007+A2: 2010, IEC 61000-4-4: 2012,
IEC 61000-4-5: 2014, IEC 61000-4-6: 2013, IEC 61000-4-11: 2004)

The device described above is tested by EMTEK(DONGGUAN) CO., LTD. and EMTEK (SHENZHEN) CO., LTD. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and EMTEK(DONGGUAN) CO., LTD. is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the EN 55032, EN 61000-3-2, EN 61000-3-3 and EN 55035 requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of EMTEK(DONGGUAN) CO., LTD.

Date of Test :

May 11, 2020 to May 18, 2020

Bill Zhong

Prepared by :

Bill Zhong / Editor

Galen Xiao

Reviewer :

Galen Xiao / Supervisor

Approved & Authorized Signer :

Sam Lv / Manager

Modified Information

Version	Summary	Revision Date	Report No.
Ver.1.0	Original Report	/	ED201111023E




1. DESCRIPTION OF STANDARDS AND RESULTS

EMISSION			
Description of Test Item	Standard	Limits	Results
Conducted Disturbance at Mains Terminals	EN 55032: 2015+AC: 2016	Table A.10	Pass
Radiated Disturbance	EN 55032: 2015+AC: 2016	Table A.4	Pass
Harmonic Current Emissions	EN 61000-3-2: 2014	Class A	N/A
Voltage Fluctuation and Flicker	EN 61000-3-3: 2013	Clause 5	Pass
IMMUNITY			
Description of Test Item	Basic Standard	Performance Criteria	Results
Electrostatic Discharge (ESD)	IEC 61000-4-2: 2008	B	Pass
Radio-Frequency, Continuous Radiated Disturbance	IEC 61000-4-3: 2006 +A1: 2007+A2: 2010	A	Pass
EFT/B Immunity	IEC 61000-4-4: 2012	B	Pass
Surge Immunity	IEC 61000-4-5: 2014	B	Pass
Conducted RF Immunity	IEC 61000-4-6: 2013	A	Pass
Power Frequency Magnetic Field	IEC 61000-4-8: 2009	A	N/A
Voltage Dips, >95% Reduction	IEC 61000-4-11: 2004	B	Pass
Voltage Dips, 30% Reduction		B	Pass
Voltage Interruptions		B	Pass
Note: N/A is an abbreviation for Not Applicable.			

2. GENERAL INFORMATION

2.1 Description of Device (EUT)

EUT	: AC-DC Converter
Model Number	: PM30X15-Sxx, PM30X20-Sxx, PM30X20-Sxx-W, PM30X20-Sxx-H2, PM30X20-Sxx-H4 (Variable xx can be 03, 05, 09, 12, 15 and 24, indicate output voltage, eg:03=3.3Vdc, 24=24.0Vdc.) (Note: The model difference see model list ,Here PM30X20-S03, PM30X20-S24 was selected for full testing)
Power Supply for Test	: AC 230V 50Hz, AC 120V 60Hz
Operate Mode	: Full load, half load, empty load
Trade Mark	: 
Applicant	: Favotek Limited
Address	: Rooms 05-15, 13A/F., South Tower, World Finance Center, Harbour City, 17 Canton Road, Tsim Sha Tsui, Kowloon, Hong Kong.
Manufacturer	: Favotek Limited
Address	: Rooms 05-15, 13A/F., South Tower, World Finance Center, Harbour City, 17 Canton Road, Tsim Sha Tsui, Kowloon, Hong Kong.
Factory	: Favotek Limited
Address	: Rooms 05-15, 13A/F., South Tower, World Finance Center, Harbour City, 17 Canton Road, Tsim Sha Tsui, Kowloon, Hong Kong.
Date of sample received	: May 11, 2020
Date of Test	: May 11, 2020 to May 18, 2020

2.2 Description of Test Facility

Site Description

EMC Lab : Accredited by CNAS, 2020.08.27
The certificate is valid until 2024.07.05
The Laboratory has been assessed and proved to be in compliance with CNAS/CL01:2018
The Certificate Registration Number is L3150

Name of Firm : EMTEK(DONGGUAN) CO., LTD.
Site Location : -1&2/F., Building 2, Zone A, Zhongda Marine Biotechnology Research and Development Base, No.9, Xincheng Avenue, Songshanhu High-technology Industrial Development Zone, Dongguan, Guangdong, China

2.3 Measurement Uncertainty

Test Item	Uncertainty
Conducted Emission Uncertainty	: 2.42dB
Radiated Emission Uncertainty (3m Chamber)	: 3.2dB (30M~1GHz Polarize: H) 3.3dB (30M~1GHz Polarize: V)
Uncertainty for Flicker test	: 0.07%
Uncertainty for Harmonic test	: 1.8%
Uncertainty for C/S Test	: 1.45(Using CDN Test) 2.37(Using EM Clamp Test)
Uncertainty for R/S Test	: 2.10dB(80MHz-1000MHz) 1.76dB(1000MHz-6000MHz)
Uncertainty for test site temperature and humidity	: 0.6℃ 4%

2.4 Description of Support Device

N/A

2.5 Model list

Product Differentiation

- 1) PM30X15-Sxx Serial's all models are identical in electrical, mechanical, physical construction except for transformer, model name, the voltage and current of output rating.
(PM30X15-Sxx Serial's all models are based on PM30X20-Sxx, Only the name are different.)
- 2) PM30X20-Sxx Serial's all models are identical in electrical, mechanical, physical construction except for transformer, model name, the voltage and current of output rating.
 - Different model have different components of both primary circuit and secondary circuit.
 - The secondary winding of the transformer may be different in each model.
 - All models have the same primary winding turnings.
- 3) PM30X20-Sxx series use two PCB plates, but the material, copper thickness and plate thickness are the same.
 - The PCB wiring used by PM30X20-S03 and PM30X20-S05 is the same, but different from that used by other models in the series.
- 4) PM30X20-Sxx-H2 Serial's all models are based on PM30X20-Sxx, But the PM30X20-Sxx-H2 have one more terminal strip, plastic base, PCB than PM30X20-Sxx.
- 5) PM30X20-Sxx-H4 Serial's all models are based on PM30X20-Sxx-H2, But the PM30X20-Sxx-H4 have one more metal base than PM30X20-Sxx-H2.
- 6) PM30X20-Sxx-W Serial's all models are based on PM30X20-Sxx, But the PM30X20-Sxx-W use leads instead of terminals.

For models PM30X15-Sxx, PM30X20-Sxx, PM30X20-Sxx-W, PM30X20-Sxx-H2, PM30X20-Sxx-H4

Part number	Input voltage	Output voltage	Output current	Output power	Transformer type
PM30X15-S03 PM30X20-S03 PM30X20-S03-W PM30X20-S03-H2 PM30X20-S03-H4	100-277Vac 0.5A 50-60Hz	3.3V	4.5A	14.85W	51500773 (A/0~A/5)
PM30X15-S05 PM30X20-S05 PM30X20-S05-W PM30X20-S05-H2 PM30X20-S05-H4		5V	4A	20W	
PM30X15-S09 PM30X20-S09 PM30X20-S09-W PM30X20-S09-H2 PM30X20-S09-H4		9V	2.2A	19.8W	51500774 (A/0~A/5)
PM30X15-S12 PM30X20-S12 PM30X20-S12-W PM30X20-S12-H2 PM30X20-S12-H4		12V	1.67A	20.04W	51500702 (A/0~A/5)

PM30X15-S15 PM30X20-S15 PM30X20-S15-W PM30X20-S15-H2 PM30X20-S15-H4		15V	1.33A	19.95W	
PM30X15-S24 PM30X20-S24 PM30X20-S24-W PM30X20-S24-H2 PM30X20-S24-H4		24V	0.83A	19.92W	51500775 (A/0~A/5)



3. MEASURING DEVICES AND TEST EQUIPMENT

3.1 For Power Line Conducted Emission

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde&Schwarz	ESCI	100137	May 23, 2019	1 Year
2.	L.I.S.N.	Rohde&Schwarz	ENV216	101209	May 23, 2019	1 Year
3.	RF Switching Unit	CDS	RSU-M2	38401	May 23, 2019	1 Year
4	Artificial Mains Network	Schwarzbeck	NNLK-8121-641	8121-641	May 23, 2019	1 Year

3.2 For Radiated Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Test Receiver	Rohde & Schwarz	ESCI	101415	May 23, 2019	1 Year
2.	Bilog Antenna	Schwarzbeck	VULB9163	9163-143	May 23, 2019	1 Year
3.	Power Amplifier	HP	8447F	EED184	May 23, 2019	1 Year
4.	Cable	N/A	CBL-26	N/A	May 23, 2019	1 Year
5.	Cable	N/A	CBL-26	N/A	May 23, 2019	1 Year
6.	Cable	N/A	CBL-26	N/A	May 23, 2019	1 Year
7.	Signal Analyzer	R&S	FSV30	103040	May 23, 2019	1 Year
8.	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1272	May 23, 2019	1 Year
9.	Power Amplifier	LUNAR EM	LNA1G18-40	J10100000081	May 23, 2019	1 Year
10.	Cable	H+S	RG 233/U	525178	May 23, 2019	1 Year
11.	Cable	H+S	RG 233/U	528948 WP	May 23, 2019	1 Year
12.	Cable	H+S	RG 233/U	525179	May 23, 2019	1 Year

3.3 For Harmonic / Flicker Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Power Frequency Test System	TESEQ	5001IX-CTS-400-SCH	1805A03008	May 23, 2019	1 Year
2.	AC Frequency Conversion Power	TESEQ	100-CTS-230-TSQ	1804A03259	May 23, 2019	1 Year
3.	PC	LENOVO	T2900D	SS12485803	May 23, 2019	1 Year

3.4 For Electrostatic Discharge Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ESD Tester	TESEQ	NSG437	409	May 23, 2019	1 Year

3.5 For RF Strength Susceptibility Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Signal Generator	Agilent	N5181A	MY50145187	May 23, 2019	1 Year
2	RF Power Meter.	BOONTON	4232A	10539	May 23, 2019	1 Year
3	50ohm Diode Power Sensor	BOONTON	51011EMC	34236/34238	May 23, 2019	1 Year
4	Field Strength Meter	DARE	RSS1006A	10I00037SO22	May 23, 2019	1 Year
5	50ohm Diode Power Sensor	BOONTON	51011EMC	36164	May 23, 2019	1 Year
6	Power Amplifier	MILMEGA	80RF1000-175	1059345	May 23, 2019	1 Year
7	Power Amplifier	MILMEGA	AS0102-55	1018770	May 23, 2019	1 Year
8	Power Amplifier	MILMEGA	AS1860-50	1059346	May 23, 2019	1 Year
9	Log.-Per. Antenna	Schwarzbeck	VULP 9118E	811	May 23, 2019	1 Year
10	Broad-Band Horn Antenna	Schwarzbeck	STLP 9149	9149-227	May 23, 2019	1 Year
11	Multi-function interface system	DARE	CTR1009B	12I00250SNO72	N/A	N/A
12	Automatic switch group	DARE	RSW1004A	N/A	N/A	N/A

3.6 For Electrical Fast Transient/Burst Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Three-in-one tester	HTEC	HCOMPACT1	190305	May 23, 2019	1 Year
2	Coupling Clamp	EM TEST	HFK	0605-10	May 23, 2019	1 Year

3.7 For Surge Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Three-in-one tester	HTEC	HCOMPACT1	190305	May 23, 2019	1 Year

3.8 For Injected Currents Susceptibility Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Simulator	EM TEST	CWS500C	0900-12	May 23, 2019	1 Year
2.	CDN	EM TEST	CDN-M2	5100100100	May 23, 2019	1 Year
3.	CDN	EM TEST	CDN-M3	0900-11	May 23, 2019	1 Year
4.	Injection Clamp	EM TEST	F-2031-23MM	368	May 23, 2019	1 Year
5.	Attenuator	EM TEST	ATT6	0010222A	May 23, 2019	1 Year

3.9 For Voltage Dips and Interruptions Test

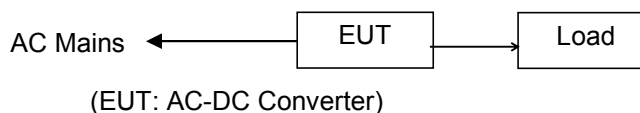
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Three-in-one tester	HTEC	HCOMPACT1	190305	May 23, 2019	1 Year



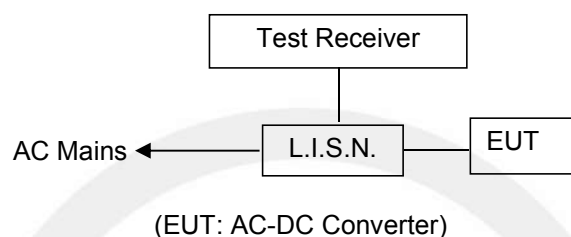
4. POWER LINE CONDUCTED MEASUREMENT

4.1 Block Diagram of Test Setup

4.1.1 Block diagram of connection between the EUT and simulators



4.1.2 Block diagram of test setup



4.2 Conducted Power Line Emission Measurement Standard and Limits

4.2.1 Standard:

EN 55032: 2015+AC: 2016

4.2.2 Limits

Frequency	At mains terminals (dBmV)	
	Quasi-peak Level	Average Level
150KHz ~ 0.5MHz	66 ~ 56*	56 ~ 46*
0.5MHz ~ 5MHz	56	46
5.0MHz ~ 30MHz	60	50

1. At the transition frequency the lower limit applies.
2. * decreasing linearly with logarithm of the frequency.

4.3 EUT Configuration on Measurement

The configuration of the EUT is same as Section 4.1.

4.4 Operating Condition of EUT

Step 1: Setup the EUT as shown in Section 4.1.

Step 2: Turn on the power of all equipments.

Step 3: Let the EUT work in measuring mode (Full load, half load, empty load) and measure it.

4.5 Test Procedure

The EUT is put on the table which is 0.8 meter high above the ground and connected to the AC mains through a Line Impedance Stabilization Network (L.I.S.N.). This provided a 50ohm coupling impedance for the tested equipments. Both sides of AC line are checked to find out the maximum conducted emission according to the EN 55032 regulations during conducted emission measurement. And the voltage probe had been used for the load terminals measurement according to the EN 55032 standard.

The bandwidth of the test receiver (ESCI) is set at 200Hz in 9K~150KHz range and 9KHz in 150K~30MHz range.

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

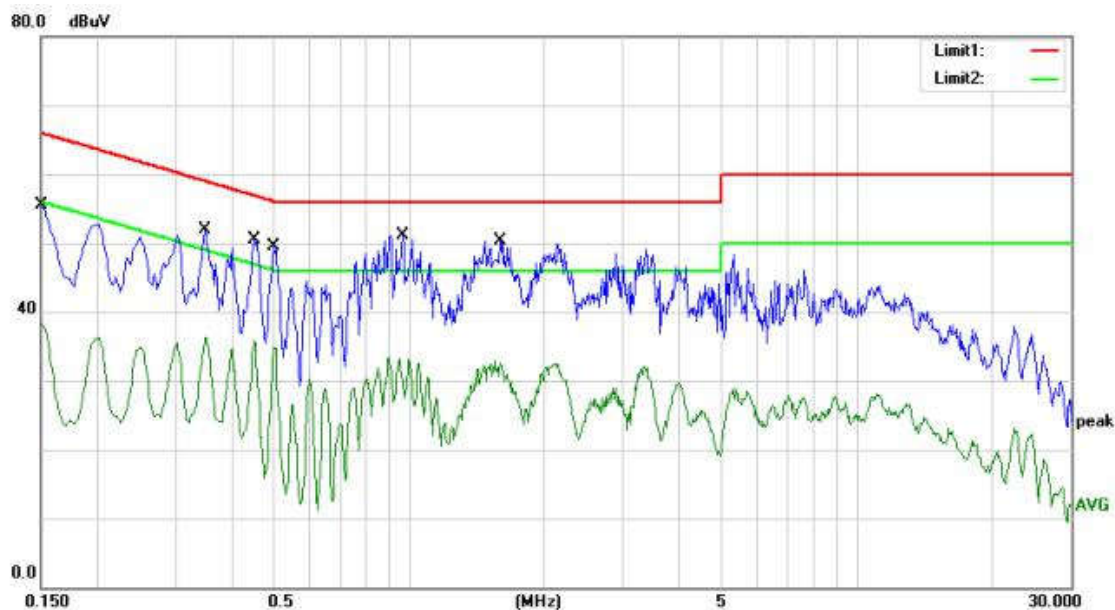
4.6 Measurement Results

PASS.

The frequency range from 150KHz to 30MHz is investigated.

We test at AC 230V 50Hz, AC 120V 60 Hz, and the worst test data on mode(Full load) at AC 230V 50Hz are attach in follow page.

PM30X20-S03



Site site #1

Phase: **L1**

Temperature: 25

Limit: EN55032 class B_QP (CE)

Power: AC 230V/50Hz

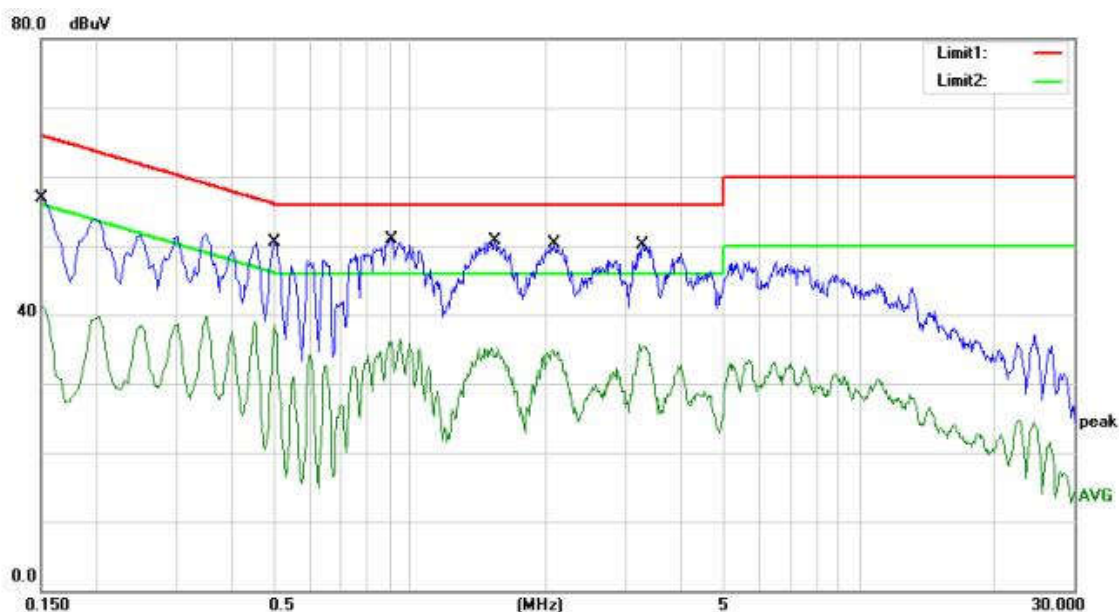
Humidity: 55 %

Mode: Full Load

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1500	45.47	10.01	55.48	66.00	-10.52	QP	
2		0.1500	28.60	10.01	38.61	56.00	-17.39	AVG	
3		0.3500	41.84	10.11	51.95	58.96	-7.01	QP	
4		0.3500	26.29	10.11	36.40	48.96	-12.56	AVG	
5		0.4500	40.43	10.16	50.59	56.88	-6.29	QP	
6		0.4500	25.78	10.16	35.94	46.88	-10.94	AVG	
7		0.4980	39.28	10.18	49.46	56.03	-6.57	QP	
8		0.4980	24.76	10.18	34.94	46.03	-11.09	AVG	
9	*	0.9660	40.94	10.18	51.12	56.00	-4.88	QP	
10		0.9660	23.03	10.18	33.21	46.00	-12.79	AVG	
11		1.5980	40.11	10.18	50.29	56.00	-5.71	QP	
12		1.5980	22.71	10.18	32.89	46.00	-13.11	AVG	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: Jason

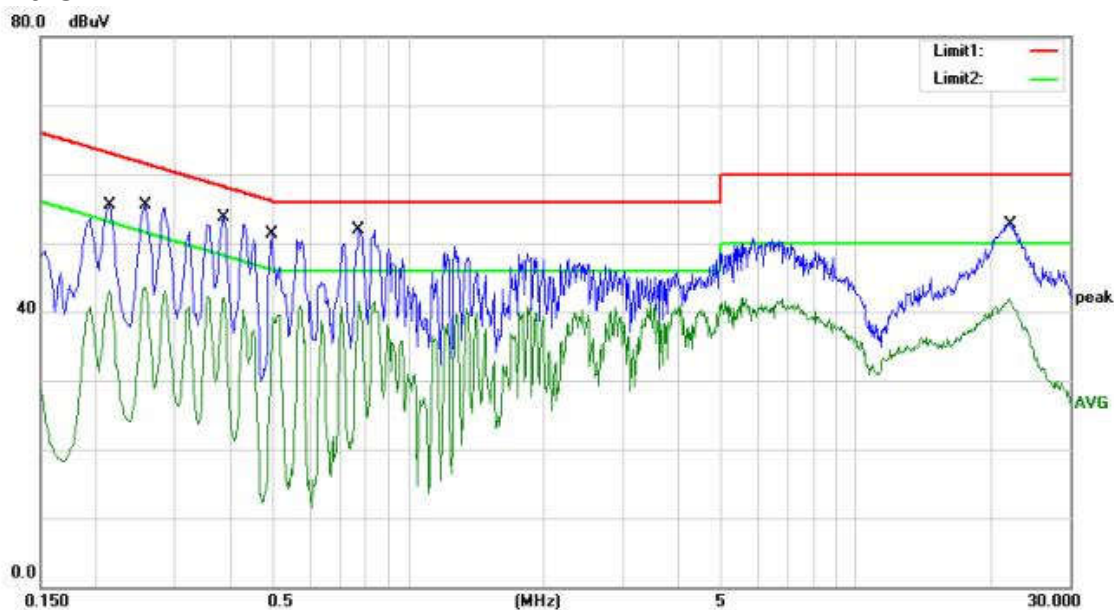


Site site #1 Phase: **N** Temperature: 25
 Limit: EN55032 class B_QP (CE) Power: AC 230V/50Hz Humidity: 55 %
 Mode: Full Load
 Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1500	46.80	10.01	56.81	66.00	-9.19	QP	
2		0.1500	31.47	10.01	41.48	56.00	-14.52	AVG	
3		0.4980	40.29	10.18	50.47	56.03	-5.56	QP	
4		0.4980	28.23	10.18	38.41	46.03	-7.62	AVG	
5	*	0.9060	40.73	10.18	50.91	56.00	-5.09	QP	
6		0.9060	26.41	10.18	36.59	46.00	-9.41	AVG	
7		1.5380	40.58	10.18	50.76	56.00	-5.24	QP	
8		1.5380	24.95	10.18	35.13	46.00	-10.87	AVG	
9		2.0940	40.04	10.18	50.22	56.00	-5.78	QP	
10		2.0940	24.68	10.18	34.86	46.00	-11.14	AVG	
11		3.2780	40.00	10.18	50.18	56.00	-5.82	QP	
12		3.2780	25.56	10.18	35.74	46.00	-10.26	AVG	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: Jason

PM30X20-S24



Site site #1

Phase: **L1**

Temperature: 25

Limit: EN55032 class B_QP (CE)

Power: AC 230V/50Hz

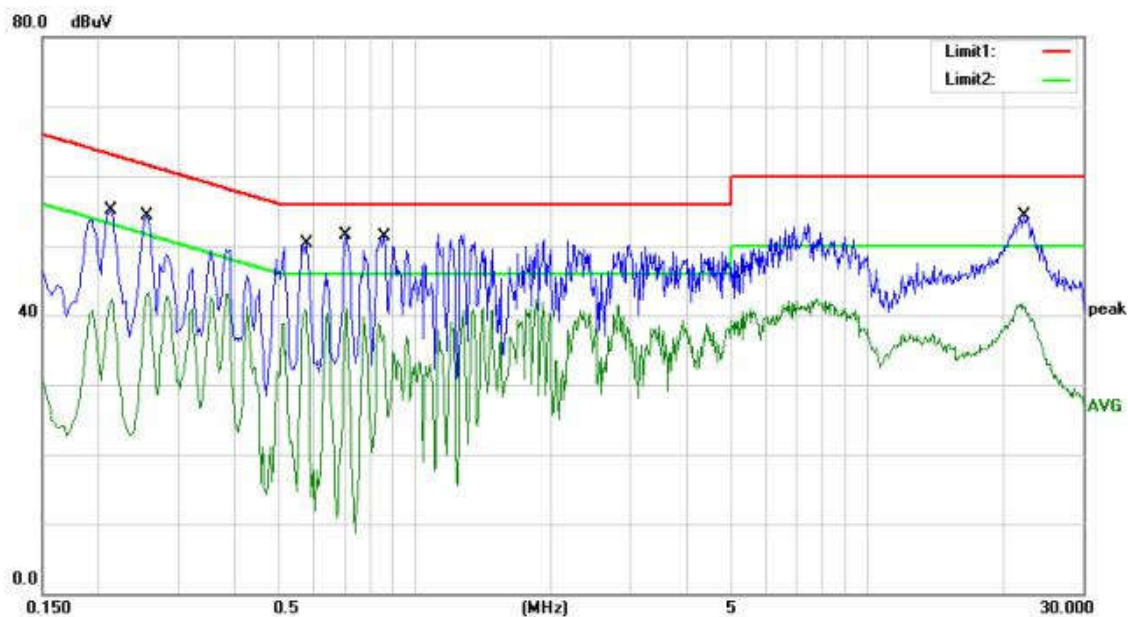
Humidity: 55 %

Mode: Full Load

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.2140	45.52	10.04	55.56	63.05	-7.49	QP	
2		0.2140	33.14	10.04	43.18	53.05	-9.87	AVG	
3		0.2580	45.42	10.06	55.48	61.50	-6.02	QP	
4		0.2580	33.48	10.06	43.54	51.50	-7.96	AVG	
5		0.3860	43.52	10.12	53.64	58.15	-4.51	QP	
6		0.3860	32.05	10.12	42.17	48.15	-5.98	AVG	
7		0.4940	41.09	10.18	51.27	56.10	-4.83	QP	
8		0.4940	29.38	10.18	39.56	46.10	-6.54	AVG	
9	*	0.7740	41.72	10.18	51.90	56.00	-4.10	QP	
10		0.7740	31.37	10.18	41.55	46.00	-4.45	AVG	
11		22.0780	42.41	10.29	52.70	60.00	-7.30	QP	
12		22.0780	31.65	10.29	41.94	50.00	-8.06	AVG	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: Jason



Site site #1 Phase: **N** Temperature: 25
 Limit: EN55032 class B_QP (CE) Power: AC 230V/50Hz Humidity: 55 %
 Mode: Full Load
 Note:

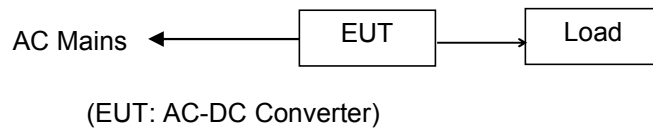
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.2127	45.09	10.04	55.13	63.10	-7.97	QP	
2		0.2127	32.32	10.04	42.36	53.10	-10.74	AVG	
3		0.2560	44.28	10.06	54.34	61.56	-7.22	QP	
4		0.2560	33.15	10.06	43.21	51.56	-8.35	AVG	
5		0.5780	40.20	10.18	50.38	56.00	-5.62	QP	
6		0.5780	30.80	10.18	40.98	46.00	-5.02	AVG	
7	*	0.7020	41.24	10.18	51.42	56.00	-4.58	QP	
8		0.7020	30.64	10.18	40.82	46.00	-5.18	AVG	
9		0.8580	41.16	10.18	51.34	56.00	-4.66	QP	
10		0.8580	28.80	10.18	38.98	46.00	-7.02	AVG	
11		22.1860	44.01	10.29	54.30	60.00	-5.70	QP	
12		22.1860	31.12	10.29	41.41	50.00	-8.59	AVG	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: Jason

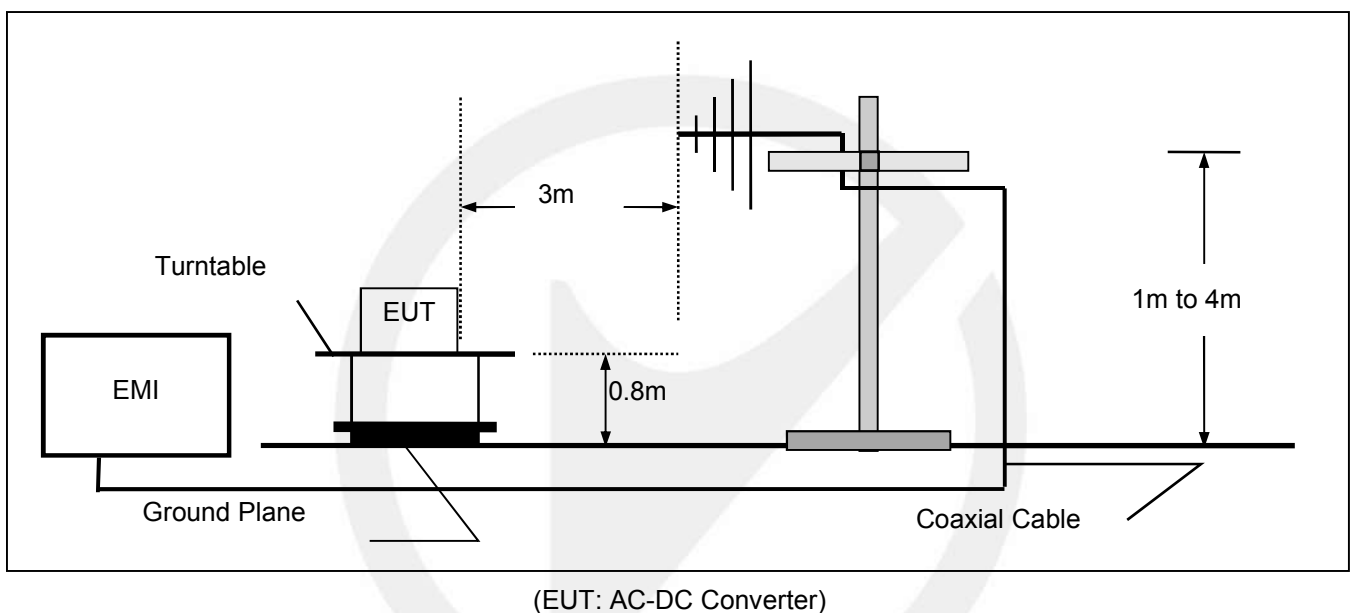
5. RADIATED EMISSION MEASUREMENT

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)



5.2 Measuring Standard

EN 55032: 2015+AC: 2016

5.3 Radiated Emission Limits

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

Limits below 1GHz

FREQUENCY (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMIT (dBmV/m)
30 ~ 230	3	40
230 ~ 1000	3	47

Note: (1) The smaller limit shall apply at the combination point between two frequency bands.
(2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the EUT.

5.4 EUT Configuration on Test

The EN 55032 regulations test method must be used to find the maximum emission during radiated emission measurement.

EUT : AC-DC Converter
Model Number : PM30X20-S03, PM30X20-S24

5.5 Operating Condition of EUT

Step 1: Turn on the power.

Step 2: Let the EUT work in test mode (Full load, half load, empty load) and measure it.

5.6 Test Procedure

The EUT is placed on a turn table which is 0.8 meter high above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meter to find out the maximum emission level. Bilog antenna (calibrated by Dipole Antenna) is used as a receiving antenna. Both horizontal and vertical polarizations of the antenna are set on test.

The bandwidth of the Receiver (ESCI) is set at 120kHz.

5.7 Test Results

PASS.

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

We test at AC 230V 50Hz and AC 120V 60 Hz, and the worst test data on mode(Full load) at AC 230V 50Hz are attach in follow page.

PM30X20-S03



Site Chamber #1

Polarization: **Horizontal**

Temperature: 26

Limit: (RE)EN55032_class B_3m

Power: AC 230V/50Hz

Humidity: 55 %

Mode: Full Load

Note:

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
		MHz	Level	Factor	ment			Height	Degree	
			dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		35.2511	45.36	-18.48	26.88	40.00	-13.12	QP		
2	*	112.9196	54.80	-18.83	35.97	40.00	-4.03	QP		
3	!	124.5690	56.80	-21.00	35.80	40.00	-4.20	QP		
4		187.0956	39.65	-18.64	21.01	40.00	-18.99	QP		
5		233.3487	39.74	-16.18	23.56	47.00	-23.44	QP		
6		336.0351	34.80	-12.51	22.29	47.00	-24.71	QP		

*:Maximum data x:Over limit !:over margin

Operator: Lian



Site Chamber #1

Polarization: **Vertical**

Temperature: 26

Limit: (RE)EN55032_class B_3m

Power: AC 230V/50Hz

Humidity: 55 %

Mode: Full Load

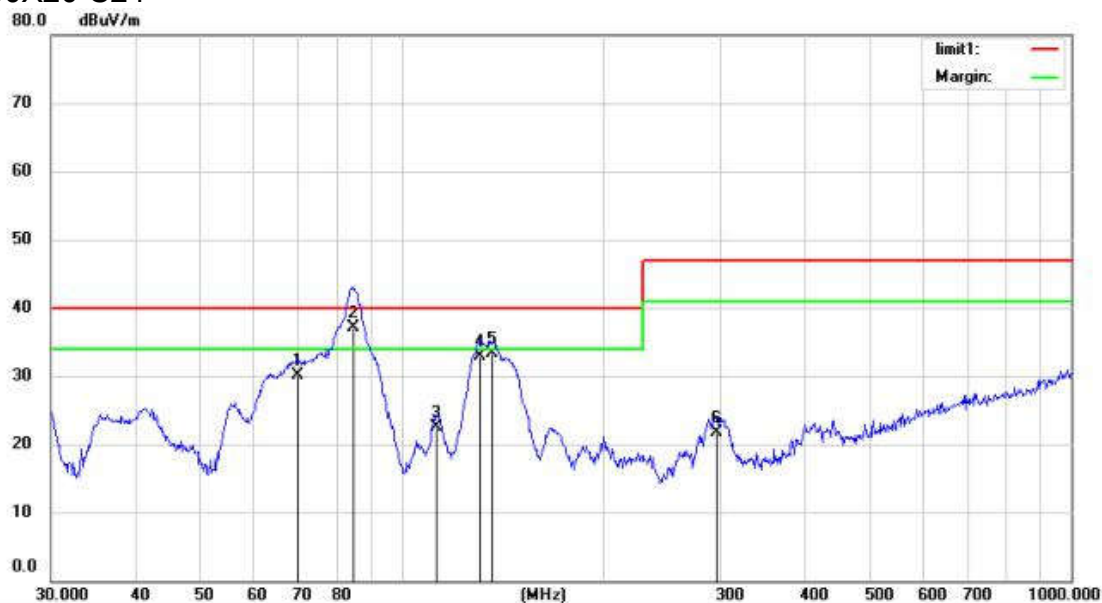
Note:

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table
		MHz	Level	Factor	ment			Height	Degree
			dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree
1	*	32.7486	54.87	-18.98	35.89	40.00	-4.11	QP	
2		34.8821	51.36	-18.62	32.74	40.00	-7.26	QP	
3		75.7114	51.84	-21.43	30.41	40.00	-9.59	QP	
4	!	126.7723	56.35	-21.17	35.18	40.00	-4.82	QP	
5	!	131.2965	56.80	-21.38	35.42	40.00	-4.58	QP	
6		219.0753	41.74	-16.82	24.92	40.00	-15.08	QP	

*:Maximum data x:Over limit !:over margin

Operator: Lian

PM30X20-S24



Site Chamber #1

Polarization: **Horizontal**

Temperature: 26

Limit: (RE)EN55032_class B_3m

Power: AC 230V/50Hz

Humidity: 55 %

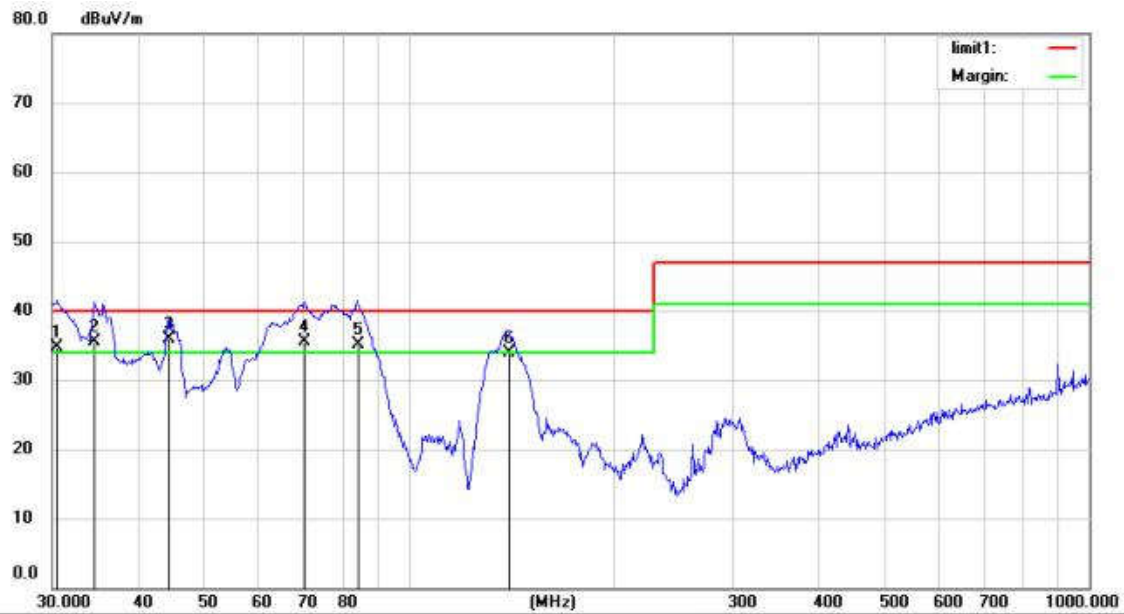
Mode: Full Load

Note:

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table
		MHz	Level	Factor	ment			Height	Degree
			dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree
1		69.8450	49.58	-19.57	30.01	40.00	-9.99	QP	
2	*	84.7020	58.50	-21.35	37.15	40.00	-2.85	QP	
3		112.5244	41.36	-18.77	22.59	40.00	-17.41	QP	
4		131.2965	54.35	-21.38	32.97	40.00	-7.03	QP	
5		135.9822	54.80	-21.54	33.26	40.00	-6.74	QP	
6		295.1470	35.49	-13.79	21.70	47.00	-25.30	QP	

*:Maximum data x:Over limit !:over margin

Operator: Lian



Site Chamber #1

Polarization: **Vertical**

Temperature: 26

Limit: (RE)EN55032_class B_3m

Power: AC 230V/50Hz

Humidity: 55 %

Mode: Full Load

Note:

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
		MHz	Level	Factor	ment			Height	Degree	
			dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1	!	30.5306	53.60	-18.82	34.78	40.00	-5.22	QP		
2	!	34.5173	54.30	-18.75	35.55	40.00	-4.45	QP		
3	*	44.4308	51.85	-15.93	35.92	40.00	-4.08	QP		
4	!	70.3365	55.30	-19.76	35.54	40.00	-4.46	QP		
5	!	84.1100	56.40	-21.38	35.02	40.00	-4.98	QP		
6		140.3421	55.49	-21.50	33.99	40.00	-6.01	QP		

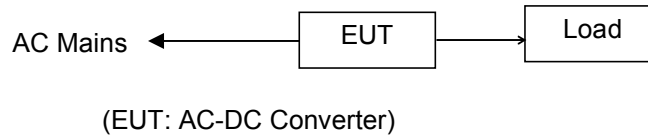
*:Maximum data x:Over limit !:over margin

Operator: Lian

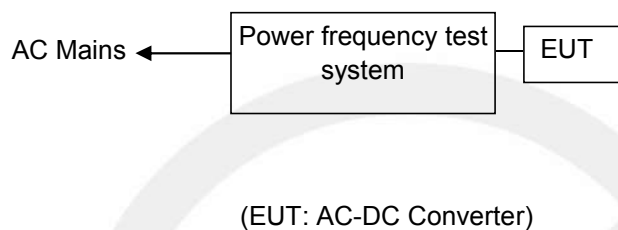
6. HARMONIC CURRENT MEASUREMENT

6.1 Block Diagram of Test Setup

6.1.1 Block diagram of connection between the EUT and simulators



6.1.2 Block Diagram of Harmonic Test Setup



6.2 Measuring Standard

EN 61000-3-2: 2014 Class A Power<75W

6.3 Operating Condition of EUT

Same as Section 4.4 except that the test setup replaced by Section 6.1.

6.4 Test Results

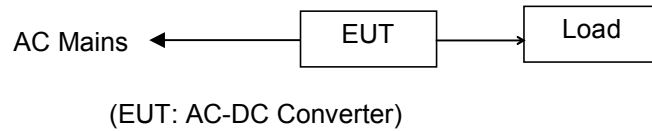
Not Applicable.

Because power of EUT is less than 75W, according to standard EN61000-3-2, Harmonics Current is not required.

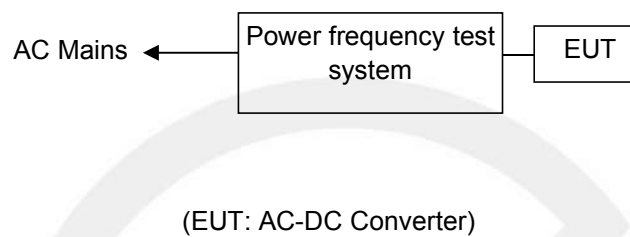
7. VOLTAGE FLUCTUATIONS & FLICKER MEASUREMENT

7.1 Block Diagram of Test Setup

7.1.1 Block diagram of connection between the EUT and simulators



7.1.2 Block Diagram of Flicker Test Setup



7.2 Measuring Standard

EN 61000-3-3: 2013

7.3 Operating Condition of EUT

Same as Section 4.4 except that the test setup replaced by Section 7.1.

7.4 Test Results

PASS.

Please refer to the following pages.

Flicker Test Summary per EN/IEC61000-3-3 Ed. 3.0 (2013) (Run time)

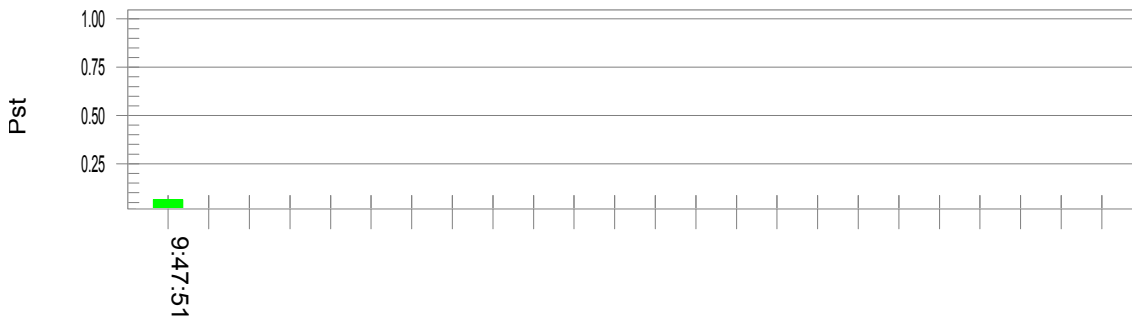
EUT: PM30X20-S24
Test category: dt,dmax,dc and Pst (European limits)
Test date: 2020-5-14 Start time: 9:37:30 End time: 9:47:57
Test duration (min): 10 Data file name: F-000521.cts_data
Comment: Full load
Customer: Customer information

Test Result: Pass

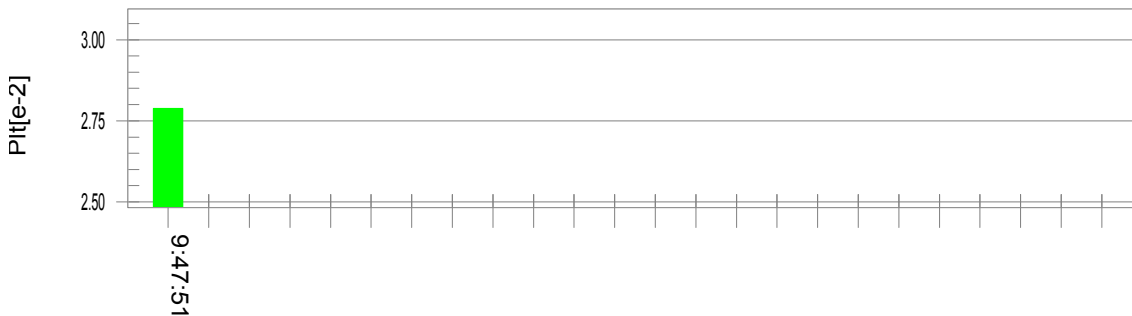
Status: Test Completed

Pst_i and limit line

European Limits



Plt and limit line



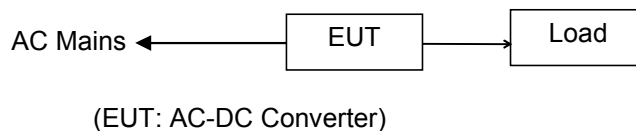
Parameter values recorded during the test:

Vrms at the end of test (Volt):	229.76		
T-max (mS):	0	Test limit (mS):	500.0 Pass
Highest dc (%):	0.00	Test limit (%):	3.30 Pass
Highest dmax (%):	0.00	Test limit (%):	4.00 Pass
Highest Pst (10 min. period):	0.064	Test limit:	1.000 Pass

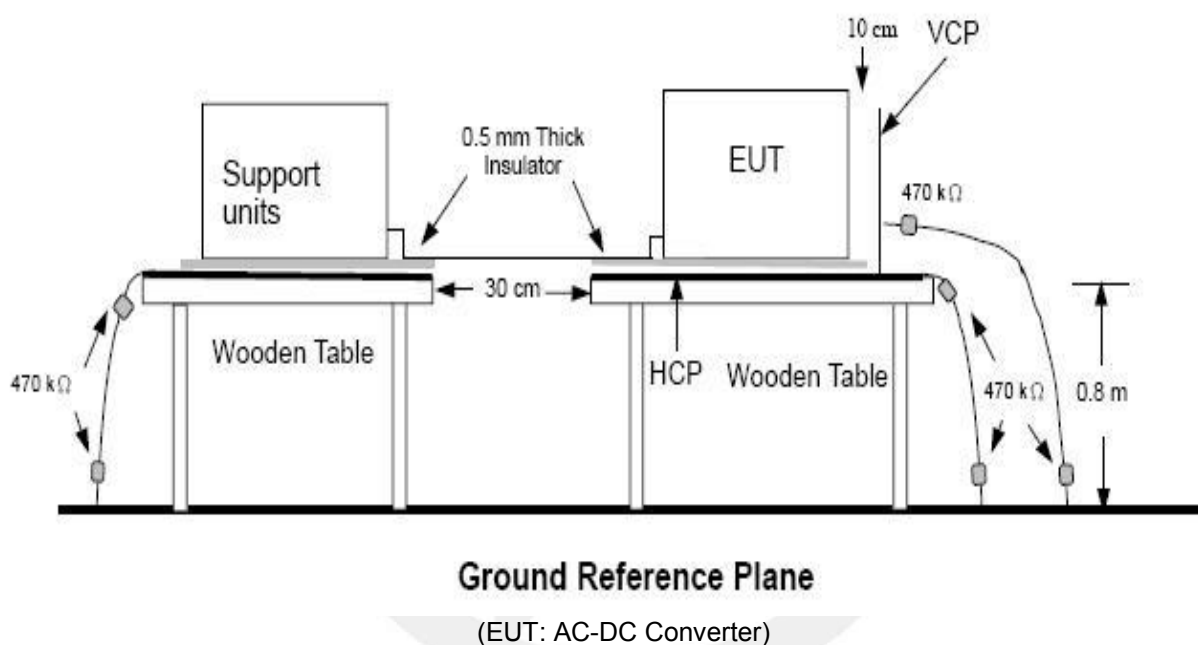
8. ELECTROSTATIC DISCHARGE TEST

8.1 Block Diagram of Test Setup

8.1.1 Block diagram of connection between the EUT and simulators



8.1.2 Block Diagram of ESD Test Setup



8.2 Test Standard

EN 55035: 2017

(IEC 61000-4-2: 2008 (Severity Level: 3 /Contact Discharge: $\pm 6\text{KV}$; Severity Level: 3 / Air Discharge: $\pm 8\text{KV}$))

8.3 Severity Levels and Performance Criterion

8.3.1 Severity level

Level	Test Voltage Contact Discharge (KV)	Test Voltage Air Discharge (KV)
1.	± 2	± 2
2.	± 4	± 4
3.	± 6	± 8
4.	± 8	± 15
X	Special	Special

Performance criterion: B

8.4 EUT Configuration

The configuration of EUT is listed in Section 8.1.

8.5 Operating Condition of EUT

Step 1: Setup the EUT as shown in Section 8.1.

Step 2: Turn on the power of all equipments.

Step 3: Let the EUT work in test mode (Full load, half load, empty load) and measure it.

8.6 Test Procedure

8.6.1 Air Discharge

This test is done on a non-conductive surface. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 25 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

8.6.2 Contact Discharge

All the procedure shall be same as Section 8.6.1. except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

8.6.3 Indirect discharge for horizontal coupling plane

At least 20 single discharges shall be applied to the horizontal coupling plane, at points on each side of the EUT. The discharge electrode positions vertically at a distance of 0.1m from the EUT and with the discharge electrode touching the coupling plane.

8.6.4 Indirect discharge for vertical coupling plane

At least 20 single discharge shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

8.7 Test Results

PASS.

Please refer to the following page.

Electrostatic Discharge Test Results

EMTEK(DONGGUAN) CO., LTD.

Applicant : Favotek Limited	Test Date : May 14, 2020
EUT : AC-DC Converter	Temperature : 23°C
M/N for test : PM30X20-S03, PM30X20-S24	Humidity : 55%
Power Supply : AC 230V/50Hz	Test Engineer: Huang
Test Mode : Full load, half load, empty load	Criterion : B

Contact Discharge:±6KV Air Discharge:±8KV # For each point positive 25 times and negative 25 times

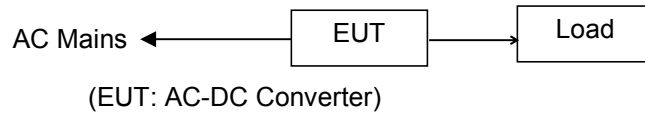
Location	Kind A-Air Discharge C-Contact Discharge	Result
HCP	C	PASS
VCP	C	PASS
Enclosure	A	PASS
Remark:	Test Equipment : ESD Tester (TESEQ, 409)	

Discharge should be considered on Contact and Air and Horizontal Coupling Plane (HCP) and Vertical Coupling Plane (VCP).

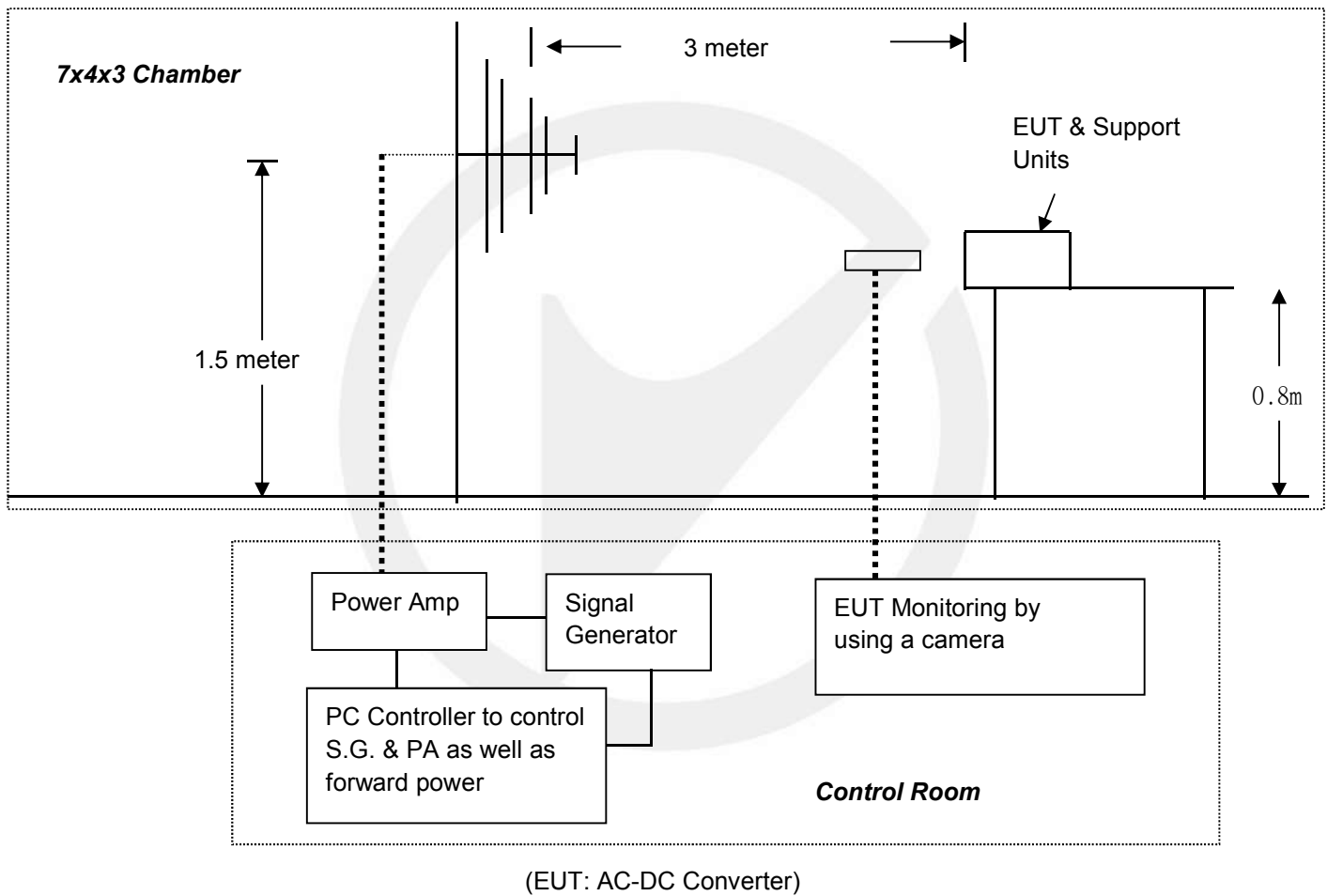
9. RF FIELD STRENGTH SUSCEPTIBILITY TEST

9.1 Block Diagram of Test Setup

9.1.1 Block diagram of connection between the EUT and simulators



9.1.2 Block diagram of R/S test set up



9.2 Test Standard

EN 55035: 2017

(IEC 61000-4-3: 2006+A1: 2007+A2: 2010 (Severity Level 3, 10V / m))

9.3 Severity Levels and Performance Criterion

9.3.1 Severity level

Level	Field Strength V/m
1.	1
2.	3
3.	10
X	Special

Performance criterion: A

9.4 EUT Configuration

The configurations of EUT are listed in Section 9.1.

9.5 Operating Condition of EUT

Step 1: Setup the EUT as shown in Section 9.1.

Step 2: Turn on the power of all equipments.

Step 3: Let the EUT work in test mode (Full load, half load, empty load) and measure it.

9.6 Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. EUT is set 3 meter away from the transmitting antenna which is mounted on an antenna tower. Both horizontal and vertical polarizations of the antenna are set on test. Each of the four sides of EUT must be faced this transmitting antenna and measured individually. In order to judge the EUT performance, a CCD camera is used to monitor EUT screen. All the scanning conditions are as follows:

Condition of Test	Remarks
1. Fielded Strength	10 V/m (Severity Level 3)
2. Radiated Signal	Unmodulated
Scanning Frequency	80 - 6000 MHz
3. Dwell time of radiated	0.0015 decade/s
4. Waiting Time	1 Sec.

9.7 Test Results

PASS.

These test result outsourced to EMTEK (SHENZHEN) CO., LTD.

Please refer to the following page.

RF Field Strength Susceptibility Test Results

EMTEK(SHENZHEN) CO., LTD.

Applicant: Favotek Limited Test Date : May 14, 2020

EUT : AC-DC Converter

Temperature : 23℃

M/N : PM30X20-S03, PM30X20-S24

Humidity : 55%

Field Strength: 10 V/m

Criterion : A

Power Supply: AC 230V/50Hz

Frequency Range: 80 - 6000MHz

Test Engineer: Tom

Modulation: ☒ AM ☐ Pulse ☐ none 1 KHz 80%

Test Mode : Full load, half load, empty load

Frequency Range : 80 - 6000MHz

Steps

1 %

Horizontal

Vertical

Front

PASS

PASS

Right

PASS

PASS

Rear

PASS

PASS

Left

PASS

PASS

Test Equipment :

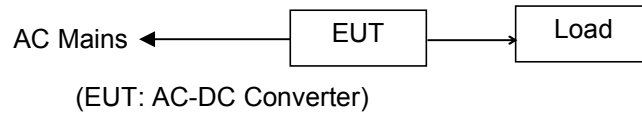
1. Signal Generator : N5181A (Agilent)
2. Power Amplifier : 80RF1000-175 (MILMEGA)& AS0102-55 (MILMEGA)& AS1860-50 (MILMEGA)
3. Log.-Per. Antenna: VULP 9118E(SCHWARZBECK)
4. Broad-Band Horn Antenna: STLP 9149 (SCHWARZBECK)
5. RF Power Meter. Dual Channel : 4232A (BOONTON)
6. Field Strength Meter: RSS1006A (DARE)

Note: EUT was tested under Field Strength: 10 V/m.

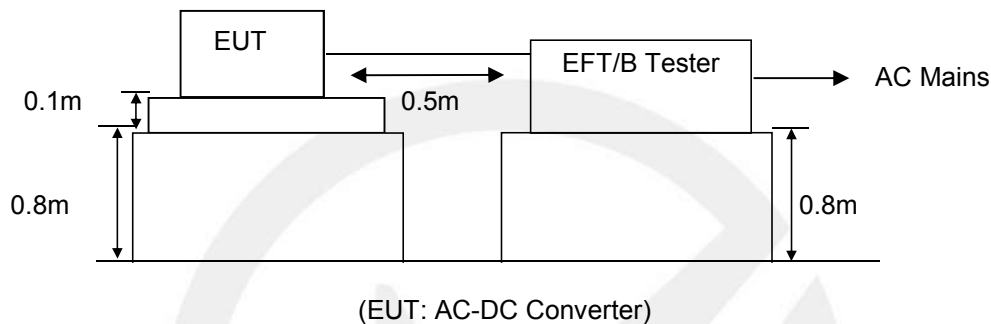
10. ELECTRICAL FAST TRANSIENT/BURST TEST

10.1 Block Diagram of Test Setup

10.1.1 Block Diagram of connection between the EUT and simulators



10.1.2 Block Diagram of EFT Test Setup



10.2 Test Standard

EN 55035: 2017
(IEC 61000-4-4: 2012, Severity Level, Line to Line: Level 3: ±2KV)

10.3 Severity Levels and Performance Criterion

10.3.1 Severity level

Open circuit output test voltage and repetition rate of the impulses				
Level	On power port, PE		On I/O (Input/Output) Signal data and control ports	
	Voltage peak KV	Repetition rate KHz	Voltage peak KV	Repetition rate KHz
1.	0.5 KV	5 or 100	0.25 KV	5 or 100
2.	1 KV	5 or 100	0.5 KV	5 or 100
3.	2 KV	5 or 100	1 KV	5 or 100
4.	4 KV	5 or 100	2 KV	5 or 100
X	Special	Special	Special	Special
NOTE 1 Use of 5 KHz repetition rates is traditional; however, 100 KHz is closer to reality. Product committees should determine which frequencies are relevant for specific products or product types.				
NOTE 2 With some products, there may be no clear distinction, between power ports and I/O ports, in which case it is up to product committees to make this determination for test purposes.				
"X" is an open level. The level has to be specified in the dedicated equipment specification.				

Performance criterion: B

10.4 EUT Configuration

The configurations of EUT are listed in Section 10.1.

10.5 Operating Condition of EUT

Step 1: Setup the EUT as shown in Section 10.1.

Step 2: Turn on the power of all equipments.

Step 3: Let the EUT work in test mode (Full load, half load, empty load) and measure it.

10.6 Test Procedure

The EUT is put on the table which is 0.8 meter high above the ground. This reference ground plane shall project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5m.

For input and output AC power ports:

The EUT is connected to the power mains by using a coupling device which couples the EFT interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 2 mins.

For signal lines and control lines ports:

No I/O ports. It's unnecessary to test.

10.7 Test Results

PASS.

Please refer to the following page.

Electrical Fast Transient/Burst Test Results

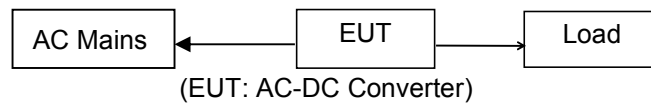
EMTEK(DONGGUAN) CO., LTD.

Standard :	<input checked="" type="checkbox"/> IEC 61000-4-4 <input type="checkbox"/> EN 61000-4-4	Result : <input checked="" type="checkbox"/> PASS / <input type="checkbox"/> FAIL
Applicant : Favotek Limited EUT : AC-DC Converter M/N : PM30X20-S03, PM30X20-S24 Power Supply: AC 230V/50Hz Criterion : B Ambient Condition : 23 °C 55% RH		
Operation Mode : Full load, half load, empty load		
Line : <input checked="" type="checkbox"/> AC Mains	Line : <input type="checkbox"/> Signal <input type="checkbox"/> I/O Cable	
Coupling : <input checked="" type="checkbox"/> Direct	Coupling : <input type="checkbox"/> Capacitive	
Test Time : 120s		
Line	Test Voltage	Result (+) Result (-)
L	2KV	PASS PASS
N	2KV	PASS PASS
PE		
L、N	2KV	PASS PASS
L、PE		
N、PE		
L、N、PE		
Signal Line		
DC Line		
Note:		
Test Equipment	Burst Tester Model : UCS500M6B	

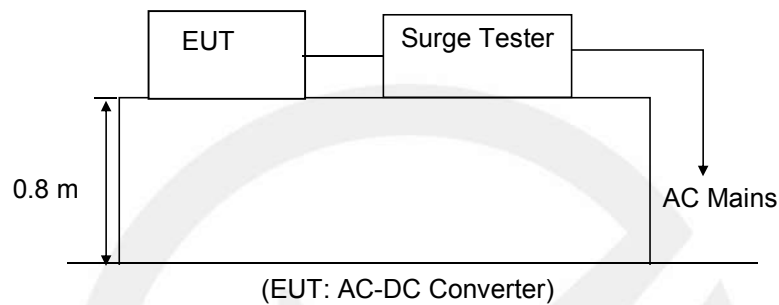
11. SURGE IMMUNITY TEST

11.1 Block Diagram of Test Setup

11.1.1 Block Diagram of the EUT



11.1.2 Surge Test Setup



11.2 Test Standard

EN 55035: 2017
(IEC 61000-4-5: 2014, Severity Level: Line to Line: Level 1, 1.0KV)

11.3 Severity Levels and Performance Criterion

11.3.1 Severity level

Severity Level	Open-Circuit Test Voltage KV
1	0.5
2	1.0
3	2.0
4	4.0
*	Special

Performance criterion: B

11.4 EUT Configuration

The configurations of EUT are listed in Section 11.1.

11.5 Operating Condition of EUT

Step 1: Setup the EUT as shown in Section 11.1.

Step 2: Turn on the power of all equipments.

Step 3: Let the EUT work in test mode (Full load, half load, empty load) and measure it.

11.6 Test Procedure

- 1) Set up the EUT and test generator as shown on Section 11.1.2.
- 2) For line to line coupling mode, provide a 1.0KV , 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points.
- 3) At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.
- 4) Different phase angles are done individually.
- 5) Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

11.7 Test Results

PASS.

Please refer to the following page.

Surge Immunity Test Results

EMTEK(DONGGUAN) CO., LTD.

Applicant : <u>Favotek Limited</u>				Test Date : <u>May 14, 2020</u>	
EUT : <u>AC-DC Converter</u>				Temperature : <u>23℃</u>	
M/N : <u>PM30X20-S03, PM30X20-S24</u>				Humidity : <u>55%</u>	
Power Supply : <u>AC 230V/50Hz</u>				Test Engineer : <u>Huang</u>	
Test Mode : <u>Full load, half load, empty load</u>				Criterion : <u>B</u>	

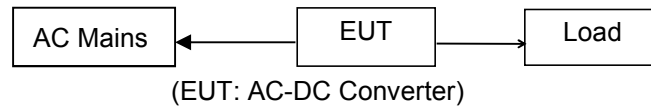
Location	Polarity	Phase Angle	No of Pulse	Pulse Voltage (KV)	Result
L-N	±	0°	5	1.0	PASS
	±	90°	5	1.0	PASS
	±	180°	5	1.0	PASS
	±	270°	5	1.0	PASS
L-PE					
N-PE					

Remark:	Test Equipment : Surge Generator VCS 500M6T
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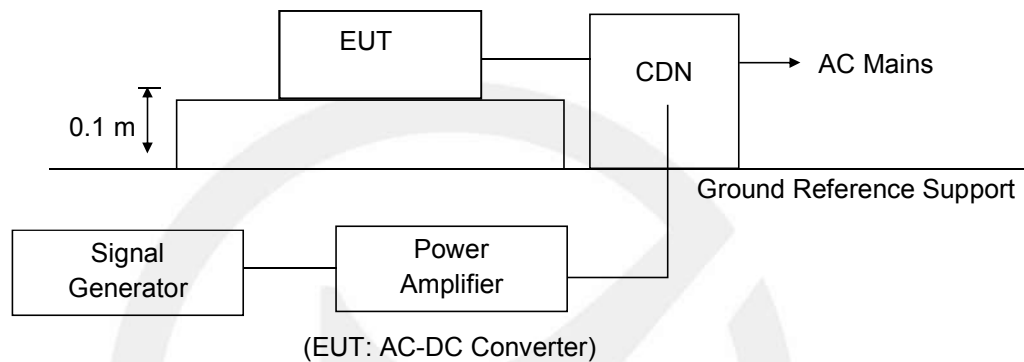
12. INJECTED CURRENTS SUSCEPTIBILITY TEST

12.1 Block Diagram of Test Setup

12.1.1 Block Diagram of the EUT



12.1.2 Block Diagram of Test Setup



12.2 Test Standard

EN 55035: 2017
(IEC 61000-4-6: 2013, Severity Level 3: 10V (rms))

12.3 Severity Levels and Performance Criterion

12.3.1 Severity level

Level	Field Strength V
1.	1
2.	3
3.	10
X	Special

Performance criterion: A

12.4 EUT Configuration

The configurations of EUT are listed in Section 12.1.

12.5 Operating Condition of EUT

Step 1: Setup the EUT as shown in Section 12.1.

Step 2: Turn on the power of all equipments.

Step 3: Let the EUT work in test mode (Full load, half load, empty load) and measure it.

12.6 Test Procedure

- 1) Set up the EUT, CDN and test generators as shown on Section 12.1.2.
- 2) Let the EUT work in test mode and measure it.
- 3) The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
- 4) The disturbance signal described below is injected to EUT through CDN.
- 5) The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- 6) The frequency range is swept from 150KHz to 80MHz using 10V signal level, and with the disturbance signal 80% amplitude modulated with a 1KHz sine wave.
- 7) The rate of sweep shall not exceed 1.5×10^{-3} decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.
- 8) Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

12.7 Test Results

PASS.

These test result outsourced to EMTEK(SHENZHEN) CO., LTD.

Please refer to the following page.

Injected Currents Susceptibility Test Results

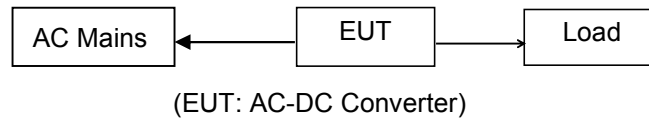
EMTEK(SHENZHEN) CO., LTD.

Applicant : Favotek Limited		Test Date : May 14, 2020		
EUT : AC-DC Converter		Temperature : 23℃		
M/N : PM30X20-S03, PM30X20-S24		Humidity : 55%		
Power Supply : AC 230V/50Hz		Test Engineer : Tom		
Test Mode : Full load, half load, empty load				
Frequency Range (MHz)	Injected Position	Strength	Criterion	Result
0.15-80 MHz	AC Mains	10V(rms)	A	PASS
Test Mode :				
Frequency Range (MHz)	Injected Position	Strength	Criterion	Result
Remark : 1. Modulation Signal:1KHz 80% AM Measurement Equipment : Simulator: CWS500C (SWITZERLAND EMTEST) CDN : <input checked="" type="checkbox"/> CDN-M2 (SWITZERLAND EMTEST) <input type="checkbox"/> CDN-M3 (SWITZERLAND EMTEST)		Note:		

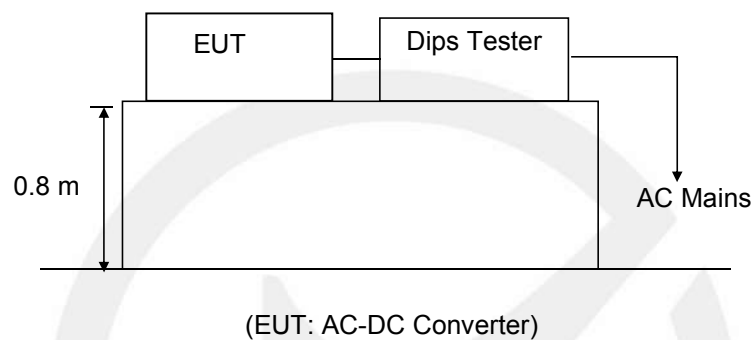
13. VOLTAGE DIPS AND INTERRUPTIONS TEST

13.1 Block Diagram of Test Setup

13.1.1 Block Diagram of the EUT



13.1.2 Dips Test Setup



13.2 Test Standard

EN 55035: 2017
(IEC 61000-4-11: 2004)

13.3 Severity Levels and Performance Criterion

13.3.1 Severity level

Test Level %UT	Voltage dip and short interruptions %UT	Duration (in period)
0	100	0.5
0	100	1
0	100	5
0	100	10
0	100	25
70	30	50
70	30	*

Performance criterion: B

13.4 EUT Configuration

The configurations of EUT are listed in Section 13.1.

13.5 Operating Condition of EUT

Step 1: Setup the EUT as shown in Section 13.1.

Step 2: Turn on the power of all equipments.

Step 3: Let the EUT work in test mode (Full load, half load, empty load) and measure it.

13.6 Test Procedure

1) Set up the EUT and test generator as shown on Section 13.1.2.

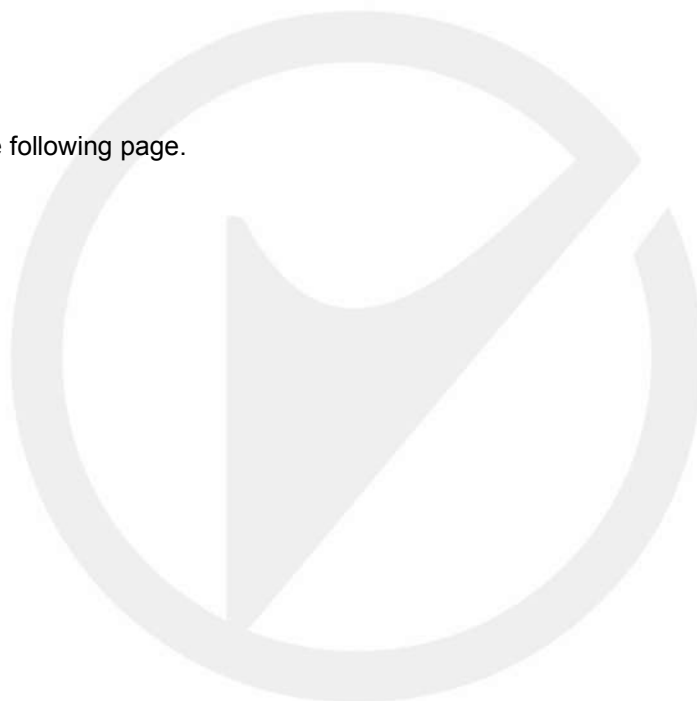
2) The interruption is introduced at selected phase angles with specified duration.

3) Record any degradation of performance.

13.7 Test Results

PASS.

Please refer to the following page.



Voltage Dips And Interruptions Test Results

EMTEK(DONGGUAN) CO., LTD.

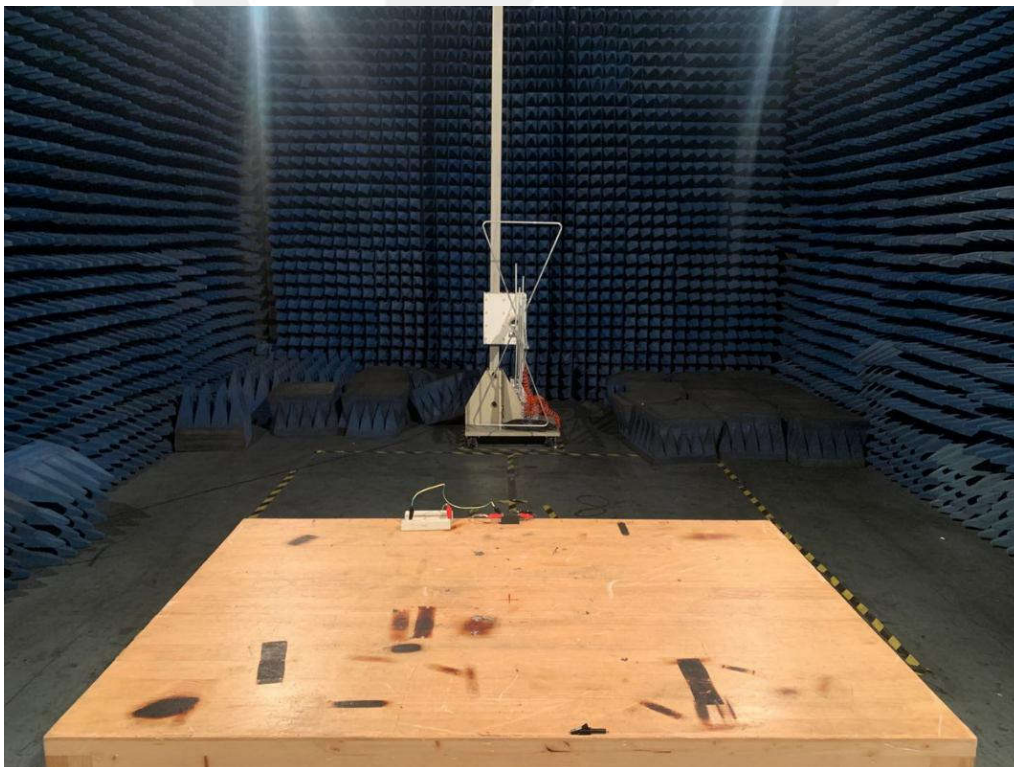
Applicant : Favotek Limited EUT : AC-DC Converter M/N : PM30X20-S03, PM30X20-S24 Power Supply : AC 230V/50Hz			Test Date : May 14, 2020 Temperature : 23°C Humidity : 55% Test Engineer : Huang	
Test Model : Full load (50Hz)				
Test Level % U _T	Voltage Dips & Short Interruptions % U _T	Duration (in period)	Criterion <input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D	Result
0	100	0.5P	B	PASS
0	100	250P	B	PASS
70	30	25P	B	PASS
Test Model : Full load (60Hz)				
Test Level % U _T	Voltage Dips & Short Interruptions % U _T	Duration (in period)	Criterion <input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D	Result
0	100	0.5P	B	PASS
0	100	300	B	PASS
70	30	30P	B	PASS
Remark: 1.U _T is the rated voltage for the equipment.			Test Equipment : Dips Tester Pline 1610	

14. PHOTOGRAPH

14.1 Photo of Conducted Emission Measurement



14.2 Photo of Radiation Emission Measurement



14.3 Photo of Harmonic/Flicker Measurement



14.4 Photo of Electrostatic Discharge Test



14.5 Photo of Electrical Fast Transient /Burst Test



14.6 Photo of Surge Test



14.7 Photo of Voltage Dips and Interruption Immunity Test



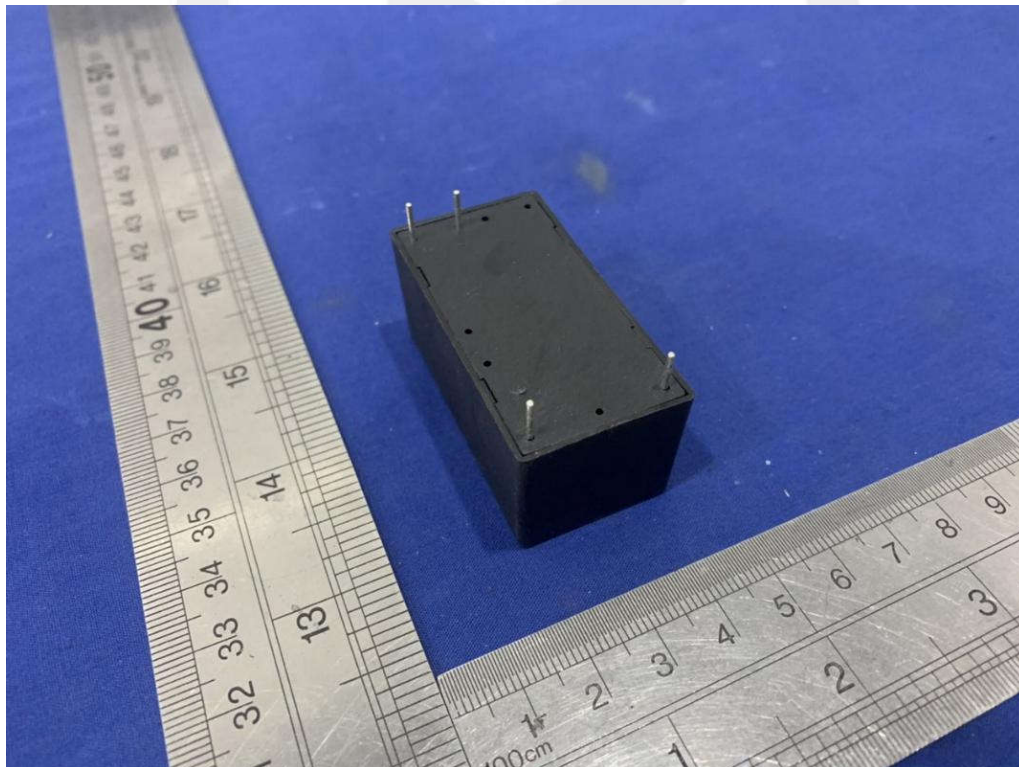
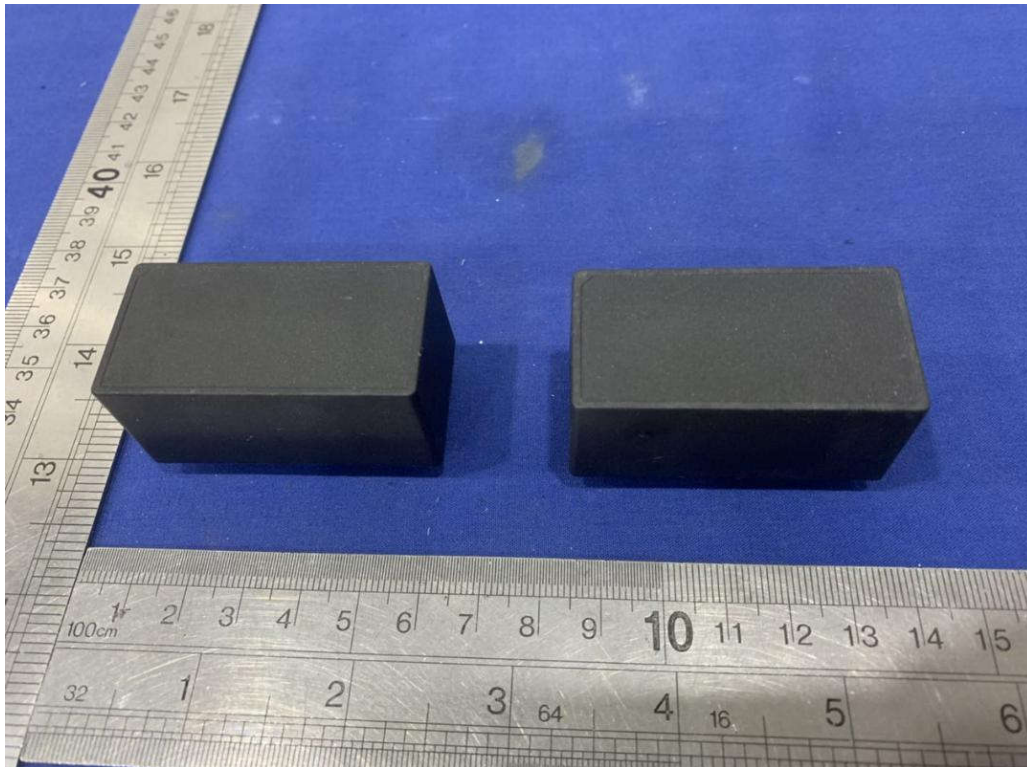
14.8 Photo of RF Field Strength susceptibility Test

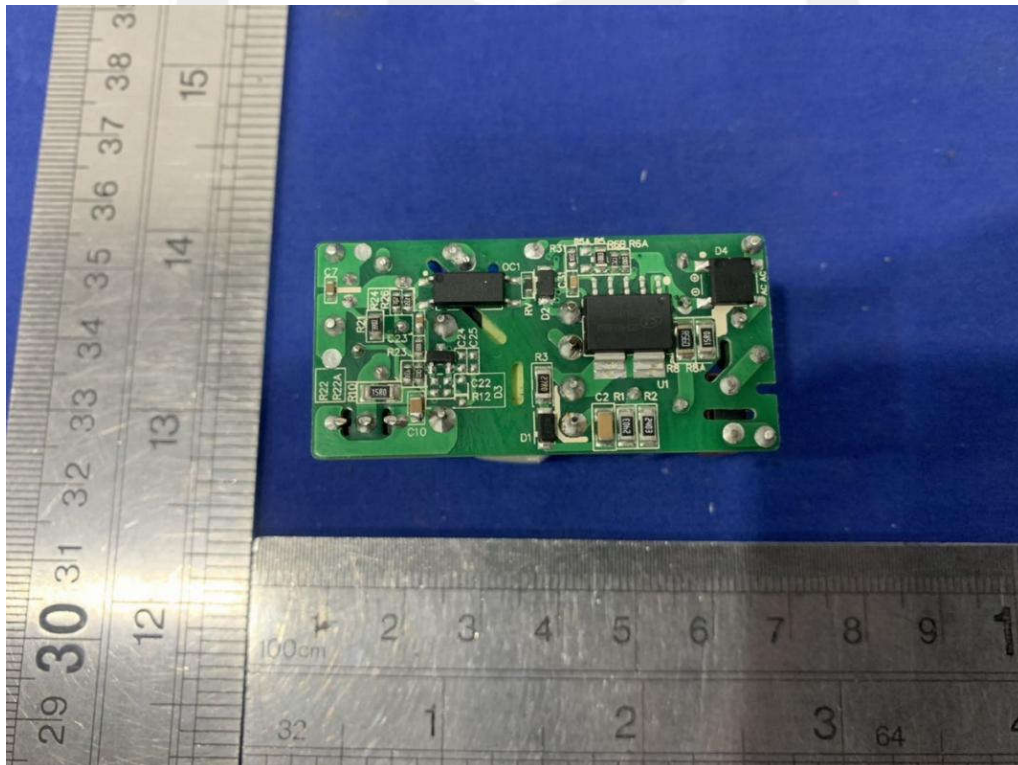
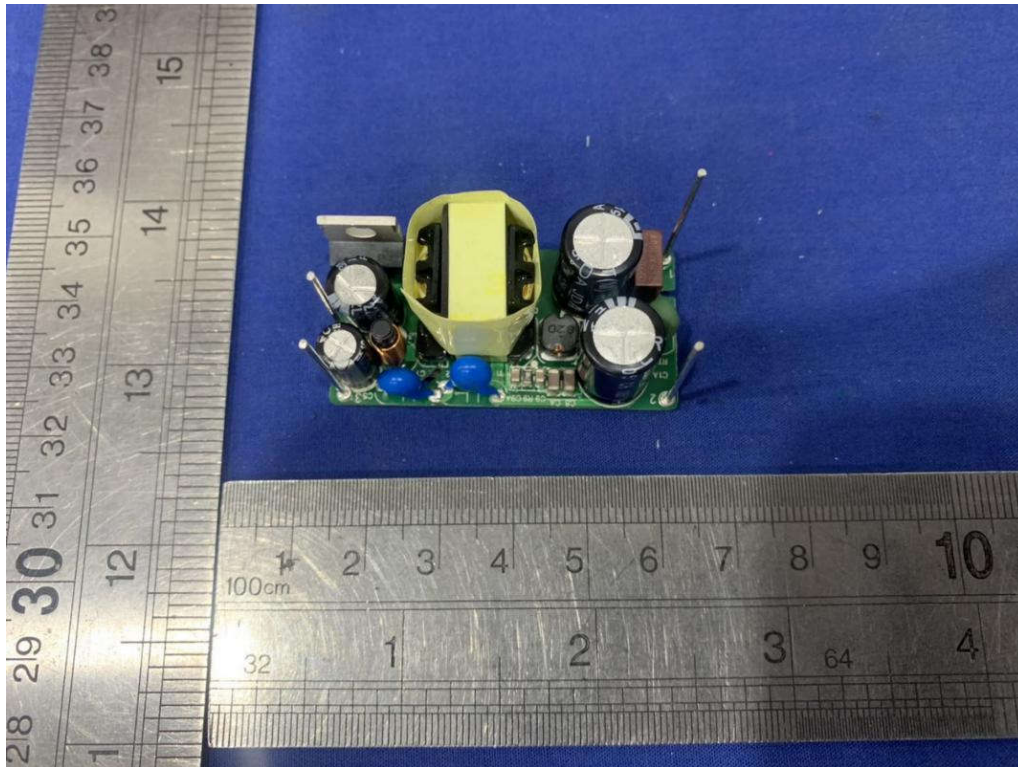


14.9 Photo of Injected Currents Susceptibility Test



APPENDIX I (Photos of EUT)





-----The end-----

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