TEST REPORT

Product Name : DC/DC Converter
Model Number : GTD93035L6013.2-F, GTD93035H6013.2-F

Prepared for	:	GlobTek, Inc.
Address	:	186 VETERANS DRIVE NORTHVALE NJ 07647 United States of America
Prepared by	:	EMTEK (SHENZHEN) CO., LTD.
Address	:	Building 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China Tel: (0755) 26954280 Fax: (0755) 26954282
Report Number	:	ENS2302150071E00401R
Date(s) of Tests	:	June 05, 2023 to July 03, 2023
Date of issue	:	July 04, 2023

TABLE OF CONTENT

Description Page

1. DESCRIPTION OF STANDARDS AND RESULTS (EUT) 6
2. GENERAL INFORMATION 7
2.1. Description of Device (EUT) 7
2.2. Independent Operation Modes 7
2.3. Test Manner 8
2.4. Description of Support Device 8
2.5. Description of Test Facility 8
2.6. Measurement Uncertainty 9
3. MEASURING DEVICE AND TEST EQUIPMENT 10
3.1. For Radiated Emission Measurement (3m) 10
3.2. For Electrostatic Discharge Immunity Test 10
3.3. For Continuous RF Electromagnetic Field Disturbances Immunity 10
3.4. For Electrical Fast Transient / Burst Immunity Test 10
3.5. For Surge Immunity Test 11
3.6. For Continuous Induced RF Disturbances Immunity Test 11
3.7. For Power Frequency Magnetic Field Immunity Test 11
4. RADIATED EMISSION MEASUREMENT (UP TO 1GHZ) 12
4.1. Block Diagram of Test Setup 12
4.2. Measuring Standard 12
4.3. Test Procedure 13
4.4. Measuring Results 13
5. IMMUNITY PERFORMANCE CRITERIA DESCRIPTION 18
6. ELECTROSTATIC DISCHARGE 19
6.1. Test Specification 19
6.2. Block Diagram of Test Setup 19
6.3. Test Procedure 19
6.4. Test Results 20
7. CONTINUOUS RF ELECTROMAGNETIC FIELD DISTURBANCES 21
7.1. Test Specification 21
7.2. Block Diagram of Test Setup 21
7.3. Test procedure 21
7.4. Test results 22
8. ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST 23
8.1. Test Specification 23
8.2. Block Diagram of Test Setup 23
8.3. Test Procedure 24
8.4. Test Results 24
9. SURGE IMMUNITY TEST 25
9.1. Test Specification 25
9.2. Block Diagram of Test Setup 25
9.3. Test Procedure 25
9.4. Test results 26
10. CONTINUOUS INDUCED RF DISTURBANCES 27
10.1. Test Specification 27
10.2. Block Diagram of Test Setup 27
10.3. Test Procedure 27
10.4. Test results 28
11. POWER FREQUENCY MAGNETIC FIELD 29

11.1. Test Specification 29
11.2. Block Diagram of Test Setup 29
11.3. Test Procedure 29
11.4. Test Results 30
12. PHOTOGRAPHS 31
12.1. Photos of Radiation Emission Measurement 31
12.2. Photo of Electrostatic Discharge Test 32
12.3. Photo of Continuous RF Electromagnetic Field Disturbances 32
12.4. Photos of Electrical Fast Transient / Burst Test 33
12.5. Photos of Surge Test 33
12.6. Photos of Continuous Induced RF Disturbances Test 34
12.7. Photo of Power Frequency Magnetic Field Test 34

APPENDIX A: Photos of EUT (6 Pages)
APPENDIX B: Critical Component List(4 Pages)

TEST REPORT DESCRIPTION

Applicant	:	GlobTek, Inc.
Manufacturer	:	GlobTek, Inc.
Trade Mark	:	G GlobTek, Inc.
EUT	:	DC/DC Converter
Model Number	:	GTD93035L6013.2-F, GTD93035H6013.2-F
Unique Number	:	003996
Rating	:	GTD93035L6013.2-F Input: 9-60V⎓ 9.0A Output: 13.2V⎓ 4.54A GTD93035H6013.2-F Input: 55-150V⎓ 2A Output: 13.2V⎓ 4.54A

Measurement Procedure Used:

SANS 2332:2017/CISPR 32:2015
SANS 61000-3-2:2009/IEC 61000-3-2:2014, SANS 61000-3-3:2009/IEC 61000-3-3:2013
SANS 2335:2018/CISPR35:2016
(SANS 61000-4-2:2009/IEC 61000-4-2:2008,
SANS 61000-4-3:2008/IEC 61000-4-3:2006+A1:2007+A2:2010,
SANS 61000-4-4:2011/IEC 61000-4-4:2012, SANS 61000-4-5: 2006/IEC 61000-4-5:2014+A1:2017,
SANS 61000-4-6:2017/IEC 61000-4-6:2013, SANS 61000-4-8: 2009/IEC 61000-4-8:2009,
SANS 61000-4-11:2005/IEC 61000-4-11:2004+A1:2017)

The device described above is tested by 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 (SHENZHEN) CO., LTD. is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the SANS 2332/CISPR 32, SANS 61000-3-2/IEC 61000-3-2, SANS 61000-3-3/IEC 61000-3-3 and SANS 2335/CISPR 35 requirements.

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

Date of Test	:	June 05, 2023 to July 03, 2023
Prepared by	:	Jessie Hu/Editor
Reviewer	:	Kaimin Guo/Supervisor
Approved & Authorized Signer	:	Lisa Wang/Manager

EMTEK (SHENZHEN) CO., LTD. TESTING

Modified Information

Version	Report No.	Revision Date	Summary
Ver.1.0	ENS2302150071E00401R	/	Original Report

1. DESCRIPTION OF STANDARDS AND RESULTS (EUT)

EMISSION			
Description of Test Item	Standard	Limits	Results
Conducted Emissions From the AC Mains Power Ports	**SANS 2332:2017/CISPR 32:2015**	Class B	N/A
Asymmetric mode conducted emissions at Wired network ports	**SANS 2332:2017/CISPR 32:2015**	Class B	N/A
Radiated emissions at frequencies up to 1 GHz	**SANS 2332:2017/CISPR 32:2015**	Class B	Pass
Radiated emissions at frequencies above 1 GHz	**SANS 2332:2017/CISPR 32:2015**	Class B	N/A
Harmonic Current Emissions	**SANS 61000-3-2:2009/IEC 61000-3-2:2014**	Class A	N/A
Voltage Fluctuation and Flicker	**SANS 61000-3-3:2009/IEC 61000-3-3:2013**	Section 5	N/A

IMMUNITY				
Description of Test Item		Basic Standard	Performance Criteria	Results
Electrostatic Discharge	Enclosure ports	**SANS 61000-4-2:2009/IEC 61000-4-2:2008**	B	Pass
Continuous RF electromagnetic field disturbances	Enclosure ports	**SANS 61000-4-3:2008/IEC 61000-4-3:2006+A1:2007+A2:2010**	A	Pass
Electrical fast transients/burst	AC mains power ports	**SANS 61000-4-4:2011/IEC 61000-4-4:2012**	N/A	N/A
	Analogue/digital data ports		N/A	N/A
	DC network power ports		B	Pass
Surges	AC mains power ports	**SANS 61000-4-5:2006/IEC 61000-4-5:2014+A1:2017**	N/A	N/A
	Analogue/digital data ports		N/A	N/A
	DC network power ports		B	Pass
Continuous induced RF disturbances	AC mains power ports	**SANS 61000-4-6:2017/IEC 61000-4-6:2013**	N/A	N/A
	Analogue/digital data ports		N/A	N/A
	DC network power ports		A	Pass
Power frequency magnetic field	Enclosure ports	**SANS 61000-4-8:2009/IEC 61000-4-8:2009**	A	Pass
Voltage dips and interruptions	AC mains power ports	**SANS 61000-4-11:2005/IEC 61000-4-11:2004+A1:2017**	B,C	N/A
Note: N/A is an abbreviation for Not Applicable.				

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

EUT	:	DC/DC Converter
Model Number	:	GTD93035L6013.2-F, GTD93035H6013.2-F (Note: Models GTD93035L6013.2-F and GTD93035H6013.2-F are identical in appearance and also share most of the critical components. Both two models were evaluated in the report.)
Applicant	:	GlobTek, Inc.
Address	:	186 VETERANS DRIVE NORTHVALE NJ 07647 United States of America
Manufacturer	:	GlobTek, Inc.
Address	:	186 VETERANS DRIVE NORTHVALE NJ 07647 United States of America
Factory	:	GlobTek (Suzhou) Co., Ltd.
Address	:	Building 4, No. 76 JinLing East Road, Suzhou Industrial Park, Suzhou, JiangSu, 215021, China
Date of Received	:	June 05, 2023
Date of Test	:	June 05, 2023 to July 03, 2023

2.2. Independent Operation Modes

A. ON
1. Full Load

2.3. Test Manner

Details of EUT Test Modes:

Test Items	Test Voltage	Function Type	Worst case
Radiated emissions at frequencies up to 1 GHz	DC 9V, DC 60V DC 55V, DC 150V	Mode A	Mode A.1
Electrostatic Discharge	DC 9V, DC 60V DC 55V, DC 150V	Mode A	\
Continuous RF electromagnetic field disturbances	DC 9V, DC 60V DC 55V, DC 150V	Mode A	\
Electrical fast transients/burst	DC 9V, DC 60V DC 55V, DC 150V	Mode A	\
Surges	DC 9V, DC 60V DC 55V, DC 150V	Mode A	\
Continuous induced RF disturbances	DC 9V, DC 60V DC 55V, DC 150V	Mode A	\
Power frequency magnetic field	DC 9V, DC 60V DC 55V, DC 150V	Mode A	\

2.4. Description of Support Device

N/A

2.5. Description of Test Facility

Site Description

EMC Lab. : **Accredited by CNAS**
The Certificate Registration Number is L2291.
The Laboratory has been assessed and proved to be in compliance with CNAS-CL01 (identical to ISO/IEC 17025:2017)

Accredited by FCC
Designation Number: CN1204
Test Firm Registration Number: 882943

Accredited by A2LA
The Certificate Number is 4321.01.

Accredited by Industry Canada
The Conformity Assessment Body Identifier is CN0008

Name of Firm : EMTEK (SHENZHEN) CO., LTD.

Site Location : Building 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China

2.6. Measurement Uncertainty

Test Item		Uncertainty
Radiated Emission Uncertainty (3m 3# Chamber)	:	±3.88dB (30M~1GHz Polarize: H) ±4.52dB (30M~1GHz Polarize: V)
Uncertainty for C/S Test	:	0.94dB(Using CDN Test) 2.37dB(Using EM Clamp Test)
Uncertainty for R/S Test	:	1.53dB(80MHz-3000MHz)
Uncertainty for ESD Test	:	6%
Uncertainty for test site temperature and humidity	:	0.6℃ 4%

3. MEASURING DEVICE AND TEST EQUIPMENT

3.1. For Radiated Emission Measurement (3m)

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑	EMI Test Receiver	Rohde & Schwarz	ESU 26	100154	May 13, 2023	1 Year
☑	Pre-Amplifie	Lunar EM	LNA30M3G-25	J101000000070	May 13, 2023	1 Year
☑	Bilog Antenna	Schwarzbeck	VULB9163	659	Aug. 22, 2021	2 Year

3.2. For Electrostatic Discharge Immunity Test

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑	ESD Tester	EMTEST	Dito	CR46527B	Nov. 01, 2022	1 Year

3.3. For Continuous RF Electromagnetic Field Disturbances Immunity

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑	Power Amplifier	MILMEGA	AS0102-55	1018770	May 13, 2023	1 Year
☑	RF Power Meter. Dual Channel	BOONTON	4232A	10539	May 13, 2023	1 Year
☑	Log.-Per. Antenna	SCHWARZBECK	STLP 9129-7/16	3050	N/A	N/A
☑	Signal Generator	Agilent	N5181A	MY50145187	May 13, 2023	1 Year
☑	50ohm Diode Power Sensor	BOONTON	51011EMC	36164	May 13, 2023	1 Year
☑	Field Strength Meter	DARE	RSS1006A	10I00037SNO22	May 19, 2023	1 Year
☑	Multi-function interface system	DARE	CTR1009B	12I00250SNO72	N/A	N/A
☑	Automatic switch group	DARE	RSW1004A	N/A	N/A	N/A
☑	Power Amplifier	MILMEGA	AS1860-50	1059346	May 13, 2023	1 Year
☑	Power Amplifier	Vectawave	VBA 1000-600C	133627	Oct. 31, 2022	1 Year

3.4. For Electrical Fast Transient / Burst Immunity Test

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑	Burst Tester	Partner	IMU-MGS	109938-1635	Nov. 01, 2022	1 Year
☐	Coupling Clamp	HAEFELY	IP-4A	147147	May 11, 2023	1 Year

3.5. For Surge Immunity Test

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑	Controller	HAEFELY	Psurge 8000	174031	May 10, 2023	1 Year
☑	Impulse Module	HAEFELY	PIM 100	174124	May 10, 2023	1 Year
☑	Coupling Decoupling	HAEFELY	PCD 130	172181	May 10, 2023	1 Year
☐	Coupling Module	HAEFELY	PCD122	174354	May 10, 2023	1 Year
☐	Impulse Module	HAEFELY	PIM 120	174435	May 10, 2023	1 Year
☐	Coupling Module	HAEFELY	PCD 126A	174387	May 10, 2023	1 Year
☐	Impulse Module	HAEFELY	PIM 110	174391	May 10, 2023	1 Year
☐	Impulse Module	HAEFELY	PIM 150	178707	May 15, 2023	1 Year
☐	Impulse Module	PMI	PCDN8	190422	May 10, 2023	1 Year

3.6. For Continuous Induced RF Disturbances Immunity Test

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑	Continuous Wave Simulator	EMTEST	CWS500C	0900-12	May 11, 2023	1 Year
☐	CDN	EMTEST	CDN-M2	510010010010	May 10, 2023	1 Year
☑	CDN	EMTEST	CDN-M3	0900-11	May 10, 2023	1 Year
☐	EM Injection Clamp	EMTEST	F-2031-23MM	368	May 10, 2023	1 Year
☑	Attenuator	EMTEST	100W 6dB DC-3G	/	May 11, 2023	1 Year
☐	Signal Generator	R&S	SMB100A	103041	May 11, 2023	1 Year
☑	CDN	LUTHI	CDN L-801 M2/M3	2606	May 10, 2023	1 Year

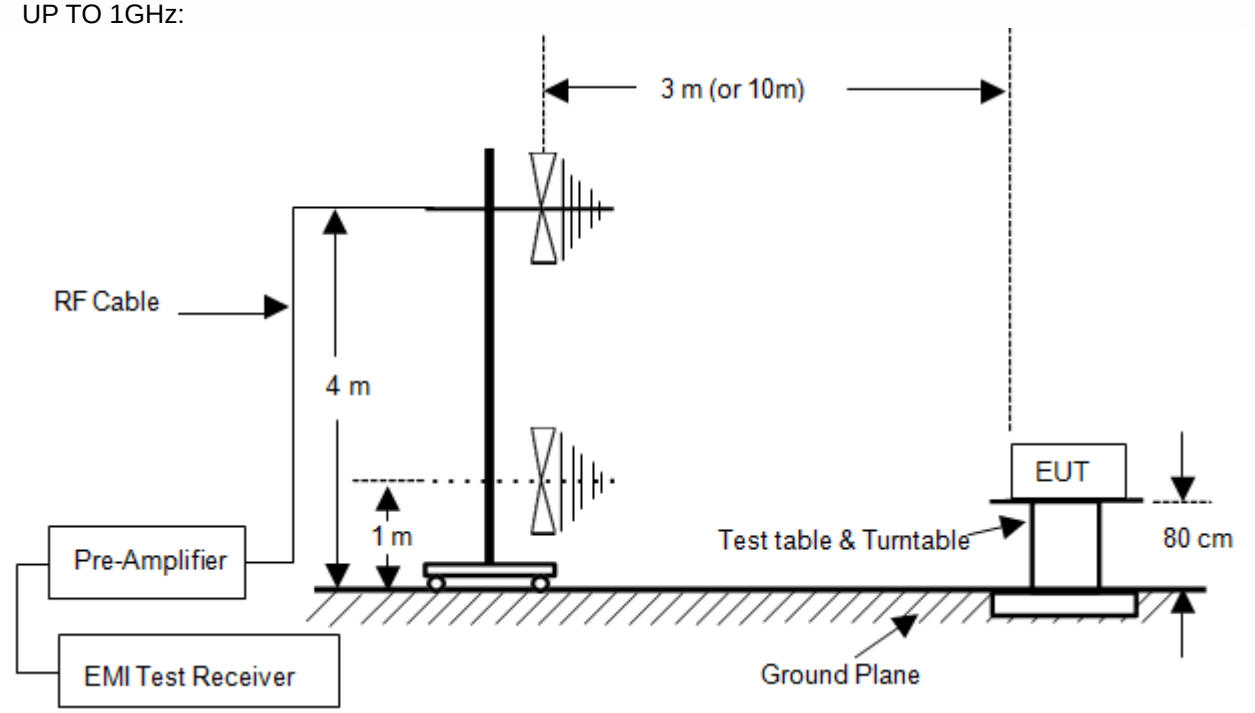
3.7. For Power Frequency Magnetic Field Immunity Test

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑	Magnetic Field Tester	HAEFELY	MAG100	250040.1	May 10, 2023	1 Year

4. RADIATED EMISSION MEASUREMENT (UP TO 1GHz)

4.1. Block Diagram of Test Setup

UP TO 1GHz:



4.2. Measuring Standard

SANS 2332/CISPR 32

Frequency range MHz	Measurement			Class B limits dB(μV/m)
	Facility	Distance (m)	Detector type / bandwidth	
30 to 230	OATS/SAC	10	Quasi Peak / 120 kHz	30
230 to 1 000				37
30 to 230	OATS/SAC	3		40
230 to 1 000				47

4.3. Test Procedure

The EUT was placed on a non-conductive table whose total height equaled 80cm. All units of equipment forming the system under test (includes the EUT as well as connected peripherals and associated equipment or devices) shall be arranged such that a nominal 0.1 m separation is achieved between the neighboring units. Where the mains cable supplied by the manufacturer is longer than 1 m, the excess should be folded at the centre into a bundle no longer than 0.4 m, so that its length is shortened to 1 m.

The EUT was set 3 meters (or 10 meters) away from the receiving antenna that was mounted on a non-conductive mast. The antenna can move up and down between 1 to 4 meters to find out the maximum emission level.

The turntable can rotate 360 degree to determine the position of the maximum emission level.

The initial testing identified the frequency that has the highest disturbance relative to the limit while operating the EUT in typical modes of operation and cable positions in a test setup representative of typical system configuration.

The identification of the frequency of highest emission with respect to the limit was found by investigating emissions at a number of significant frequencies. The probable frequency of maximum emission had been found and that the associated cable and EUT configuration and mode of operation had been identified.

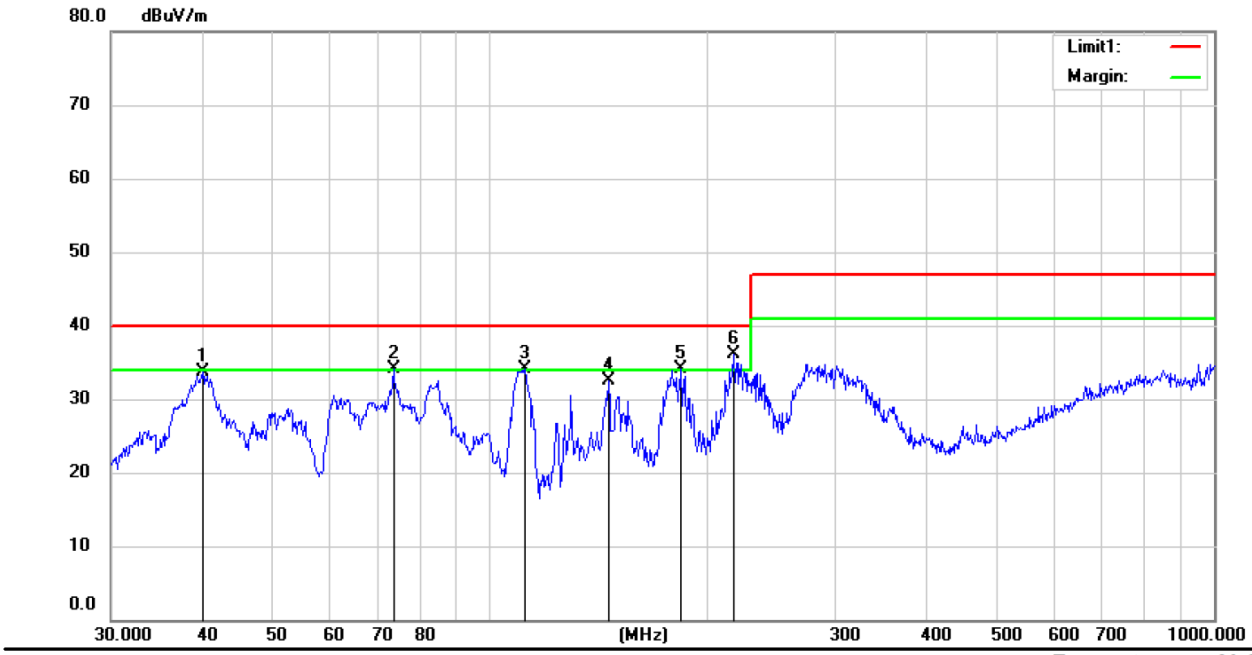
The bandwidth of the Receiver is set at 120 kHz.

Test results were obtained from the following equation:
Emission level (dBμV/m) = Antenna Factor -Amp Factor +Cable Loss + Reading
Margin (dB) = Emission Level (dBμV/m) - Limit (dBμV/m)

4.4. Measuring Results

PASS.

All the modes were tested and the data of the worst modes are attached the following pages.



Site 3m Chamber #3
Limit: CISPR 32 class B
M/N: GTD93035L6013.2-F
Mode: Full load
Note:

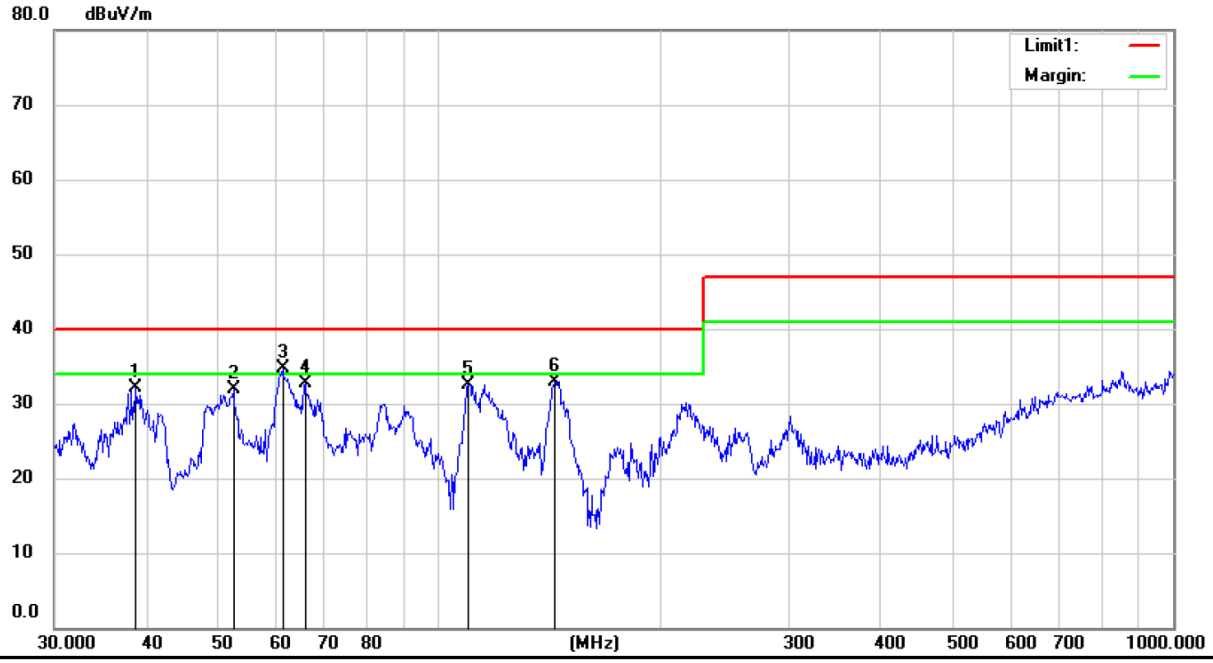
Polarization: *Horizontal*
Power: DC 60V/9A

Temperature: 26 C
Humidity: 60 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		40.1347	42.08	-8.43	33.65	40.00	-6.35	QP			
2	!	73.6170	43.91	-9.75	34.16	40.00	-5.84	QP			
3	!	111.7380	44.82	-10.67	34.15	40.00	-5.85	QP			
4		145.8610	42.90	-10.45	32.45	40.00	-7.55	QP			
5	!	183.8440	44.53	-10.39	34.14	40.00	-5.86	QP			
6	*	216.7828	46.08	-9.97	36.11	40.00	-3.89	QP			

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

Operator: SLM



Site 3m Chamber #3
Limit: CISPR 32 class B
M/N: GTD93035L6013.2-F
Mode: Full load
Note:

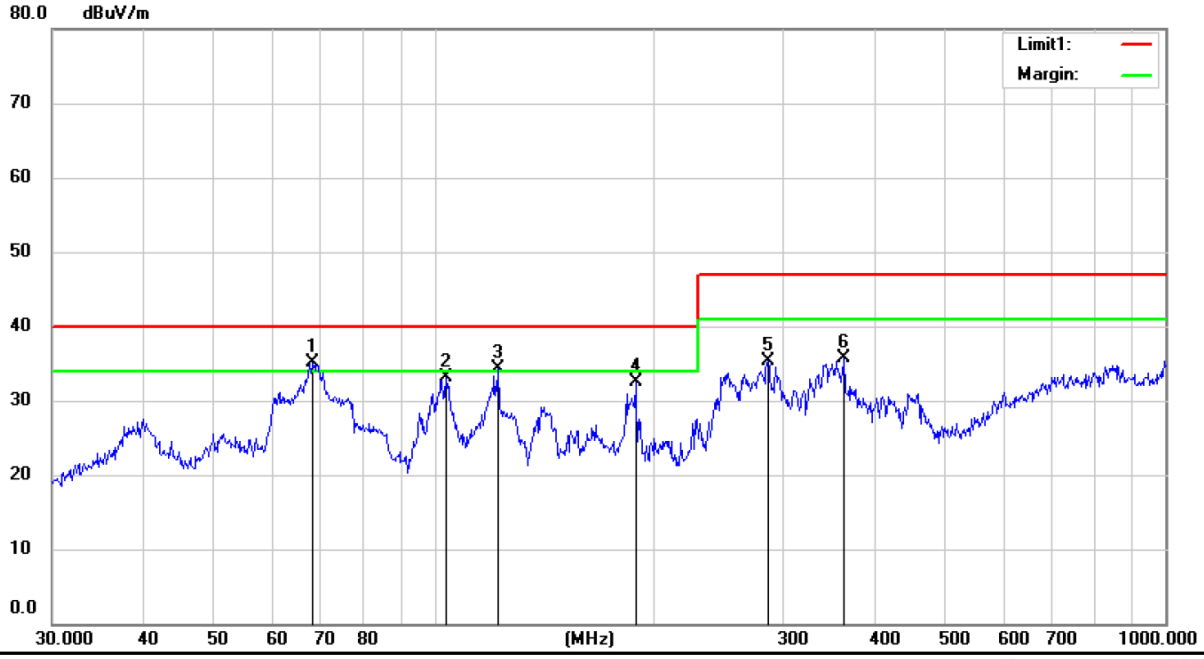
Polarization: *Vertical*
Power: DC 60V/9A

Temperature: 26 C
Humidity: 60 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		38.7516	40.89	-8.74	32.15	40.00	-7.85	QP			
2		52.5752	39.59	-7.77	31.82	40.00	-8.18	QP			
3	*	61.3462	42.40	-7.69	34.71	40.00	-5.29	QP			
4		65.8030	41.18	-8.51	32.67	40.00	-7.33	QP			
5		109.7960	43.27	-10.79	32.48	40.00	-7.52	QP			
6		143.8291	43.55	-10.60	32.95	40.00	-7.05	QP			

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

Operator: SLM



Site 3m Chamber #3
Limit: CISPR 32 class B
M/N: GTD93035H6013.2-F
Mode: Full load
Note:

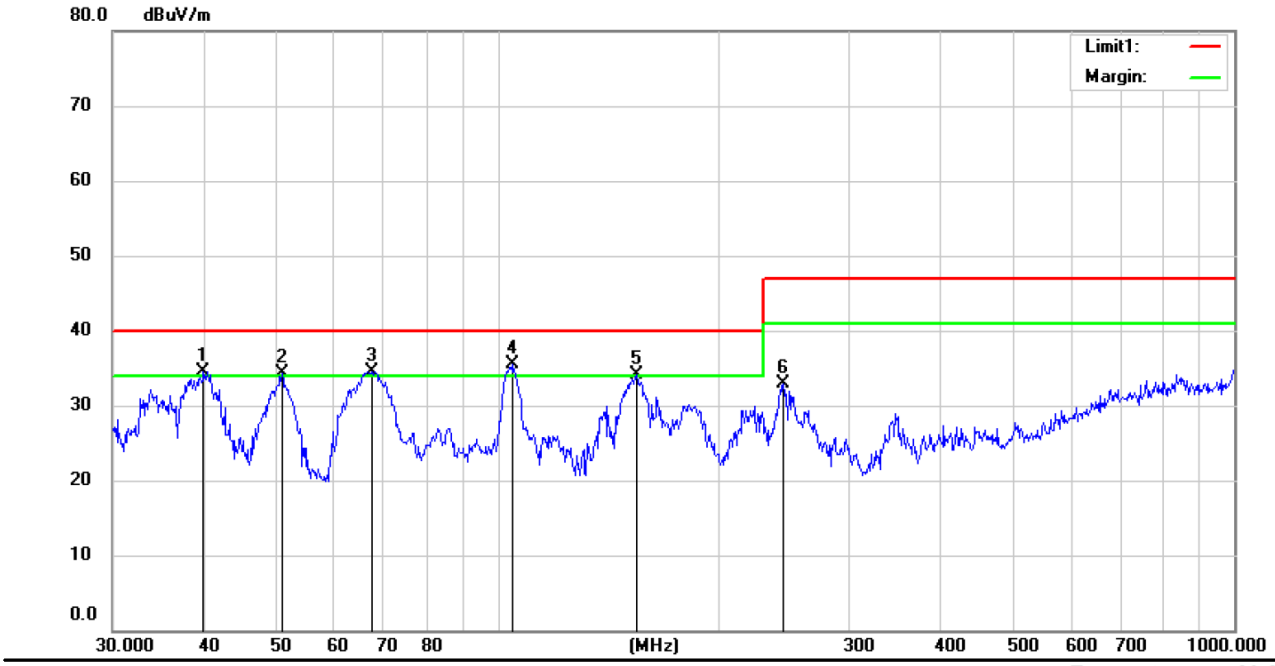
Polarization: *Horizontal*
Power: DC 150V/2A

Temperature: 26 C
Humidity: 60 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	68.1512	44.05	-8.86	35.19	40.00	-4.81	QP			
2		103.8054	43.72	-10.55	33.17	40.00	-6.83	QP			
3	!	122.4040	44.85	-10.60	34.25	40.00	-5.75	QP			
4		188.4122	42.92	-10.41	32.51	40.00	-7.49	QP			
5		285.9777	42.18	-6.88	35.30	47.00	-11.70	QP			
6		362.9843	41.02	-5.26	35.76	47.00	-11.24	QP			

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

Operator: SLM



Site 3m Chamber #3
Limit: CISPR 32 class B
M/N: GTD93035H6013.2-F
Mode: Full load
Note:

Polarization: *Vertical*
Power: DC 150V/2A

Temperature: 26 C
Humidity: 60 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	!	39.8541	42.97	-8.46	34.51	40.00	-5.49	QP			
2	!	50.9420	42.19	-7.82	34.37	40.00	-5.63	QP			
3	!	67.4381	43.36	-8.77	34.59	40.00	-5.41	QP			
4	*	104.5360	46.03	-10.48	35.55	40.00	-4.45	QP			
5	!	154.2785	44.37	-10.24	34.13	40.00	-5.87	QP			
6		244.2321	41.78	-8.90	32.88	47.00	-14.12	QP			

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

Operator: SLM

5. IMMUNITY PERFORMANCE CRITERIA DESCRIPTION

Performance Level

The test results shall be classified in terms of the loss of function or degradation of performance of the equipment under test, relative to a performance level by its manufacturer or the requestor of the test, or the agreed between the manufacturer and the purchaser of the product.

Definition related to the performance level:
1. Based on the used product standard
2. Based on the declaration of the manufacturer, requestor or purchaser

SANS 2335/CISPR 35:

Performance criterion A
The equipment shall continue to operate as intended without operator intervention. No degradation of performance, loss of function or change of operating state is allowed below a performance level specified by the manufacturer when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

Performance criterion B
During the application of the disturbance, degradation of performance is allowed. However, no unintended change of actual operating state or stored data is allowed to persist after the test.
After the test, the equipment shall continue to operate as intended without operator intervention; no degradation of performance or loss of function is allowed, below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance.
If the minimum performance level (or the permissible performance loss), or recovery time, is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

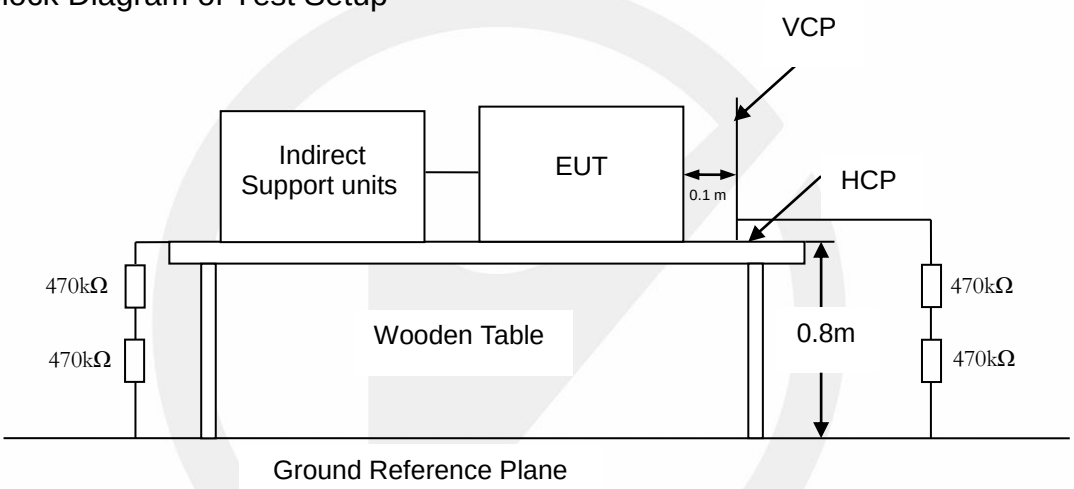
Performance criterion C
Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer’s instructions. A reboot or re-start operation is allowed. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

6. ELECTROSTATIC DISCHARGE

6.1. Test Specification

Test Standard	:	SANS 2335/CISPR 35
Basic Standard	:	IEC 61000-4-2
Performance criterion	:	B
Test level	:	±8.0kV (Air discharge) ±4.0kV (Contact discharge)

6.2. Block Diagram of Test Setup



6.3. Test Procedure

a. In the case of air discharge testing, the climatic conditions shall be within the following ranges:
- ambient temperature: 15°C to 35°C;
- relative humidity : 30% to 60%;
- atmospheric pressure : 86 kPa (860 mbar) to 106 kPa (1060 mbar)

b. Test programs and software shall be chosen so as to exercise all normal modes of operation of the EUT. The use of special exercising software is encouraged, but permitted only where it can be shown that the EUT is being comprehensively exercised.

c. In the case of contact discharges, the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

d. In the case of painted surface covering a conducting substrate, the following procedure shall be adopted : - If the coating is not declared to be an insulating coating by the equipment manufacturer, then the pointed tip of the generator shall penetrate the coating so as to make contact with the conducting substrate. - Coating declared as insulating by the manufacturer shall only be submitted to the air discharge. - The contact discharge test shall not be applied to such surfaces.

e. In the case of air discharges, the round discharge tip of the discharge electrode shall be approached as fast as possible (without causing mechanical damage) to touch the EUT. After each discharge, the ESD generator (discharge electrode) shall be removed from the EUT. The generator is then retriggered for a new single discharge. This procedure shall be repeated until the discharges are completed. In the case of an air discharge test, the discharge switch, which is used for contact discharge, shall be closed.

f. The test voltage shall be increased from the minimum to the selected test severity level, in order to determine any threshold of failure. The final test level should not exceed the product specification value in order to avoid damage to the equipment.
g. The test shall be performed with both air discharge and contact discharge. The test shall be performed with single discharges. On each pre-selected point at least 10 single discharges (in the most sensitive polarity) shall be applied. For the time interval between successive single discharges an initial value of 1 s is recommended. Longer intervals may be necessary to determine whether a system failure has occurred.
h. Ensure that the applied charge on the EUT has been dis-charged before next ESD pulse.

6.4. Test Results

PASS

Temperature	:	22.8°C
Humidity	:	47%
Atmospheric Pressure	:	101kpa
Test Engineer	:	LHT
Test Date	:	2023-06-08

Air Discharge:

Test Voltage	Location	Actual criterion	Required performance criterion	Result (Pass/Fail)
±2; 4; 8 kV	SLOT	A	B	Pass

Contact Discharge

Test Voltage	Location	Actual criterion	Required performance criterion	Result (Pass/Fail)
±2; 4kV	METAL	A	B	Pass

Indirect Discharge

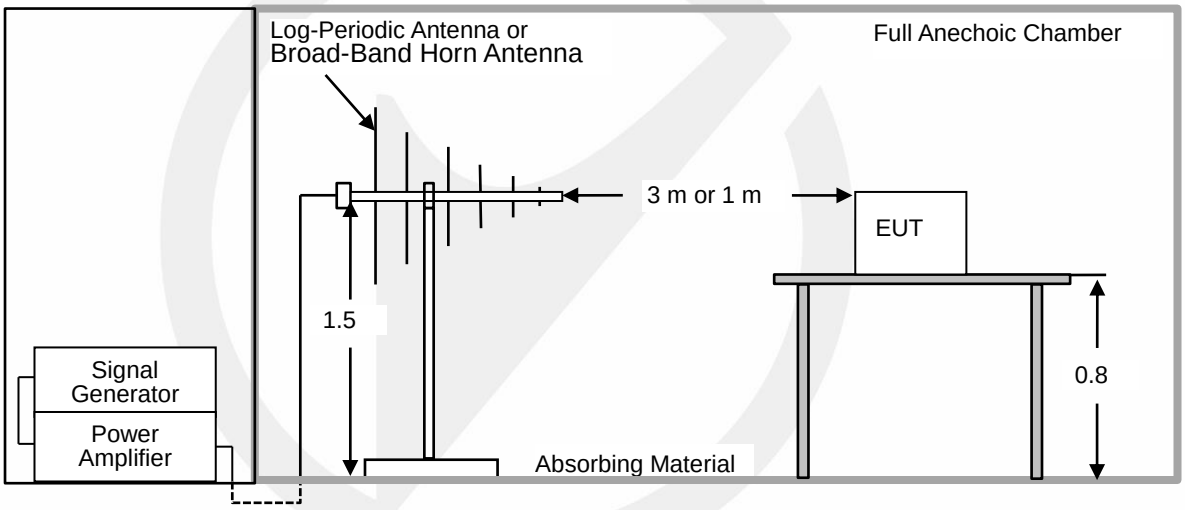
Test Voltage	Location	Actual criterion	Required performance criterion	Result (Pass/Fail)
±2; 4 kV	HCP	A	B	Pass
±2; 4kV	VCP	A	B	Pass

7. CONTINUOUS RF ELECTROMAGNETIC FIELD DISTURBANCES

7.1. Test Specification

Test standard	:	SANS 2335/CISPR 35	
Basic standard	:	IEC 61000-4-3	
Performance criterion	:	A	
Frequency range & Test level	:	☒80M-1000MHz	3V/m
		☒Spot frequency	3V/m
		☐Additional spot frequency	3V/m
Modulation	:	AM, 80%, 1kHz sine-wave	

7.2. Block Diagram of Test Setup



7.3. Test procedure

The procedure defined in this part requires the generation of electromagnetic fields within which the test sample is placed and its operation observed. To generate fields that are useful for simulation of actual (field) conditions may require significant antenna drive power and the resultant high field strength levels. To comply with local regulations and to prevent biological hazards to the testing personnel, it is recommended that these tests be carried out in a shielded enclosure or semi-anechoic chamber.

a. The antenna which is enabling the complete frequency range of 80-1000 MHz is placed 3m (or 1m) away from the equipment. The required field strength is determined by placing the field strength meter(s) on top of or directly alongside the equipment under test and monitoring the field strength meter via a remote field strength indicator outside the enclosure while adjusting the continuous-wave to the antenna.
b. The test is performed with the antenna facing the front and back sides of the EUT with. Both vertical and horizontal polarizations from antenna are tested.

7.4. Test results

PASS

Temperature	:	21.3°C
Humidity	:	48%
Atmospheric Pressure	:	101kpa
Test Engineer	:	LHT
Test Date	:	2023-06-08

☒ 80M-1000MHz:

Freq. Range (MHz)	Field	Modulation	Polarity	Position (°)	Actual criterion	Required performance criterion	Result
80-1000	3V/m	AM, 80%	H / V	0, 90,180, 270	A	A	Pass

☒ Spot frequency:

Freq (MHz)	Field	Modulation	Polarity	Position (°)	Actual criterion	Required performance criterion	Result
1800, 2600, 3500, 5000	3V/m	AM, 80%	H / V	0, 90,180, 270	A	A	Pass

☐ Additional spot frequency:

Freq (MHz)	Field	Modulation	Polarity	Position (°)	Actual criterion	Required performance criterion	Result
80, 120, 160, 230, 434, 460, 600, 863, 900	3V/m	AM, 80%	H / V	0, 90,180, 270	N/A	N/A	N/A

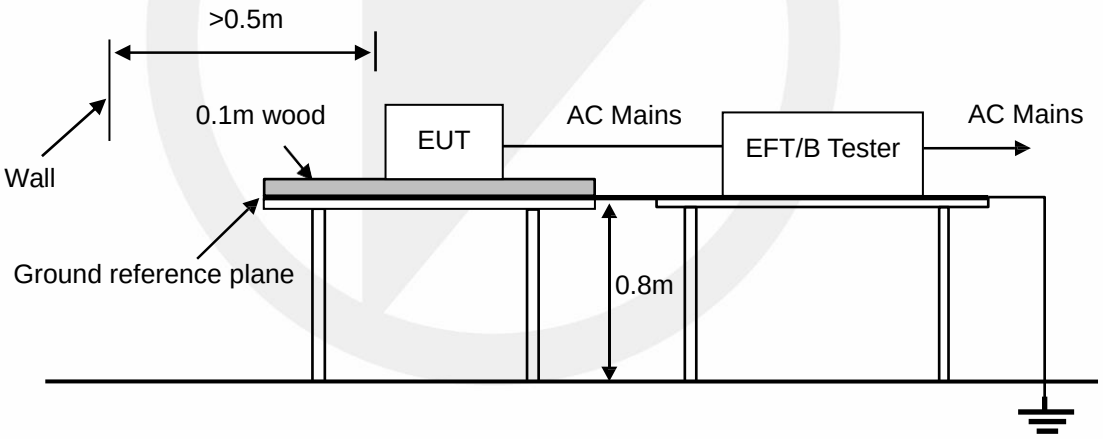
8. ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

8.1. Test Specification

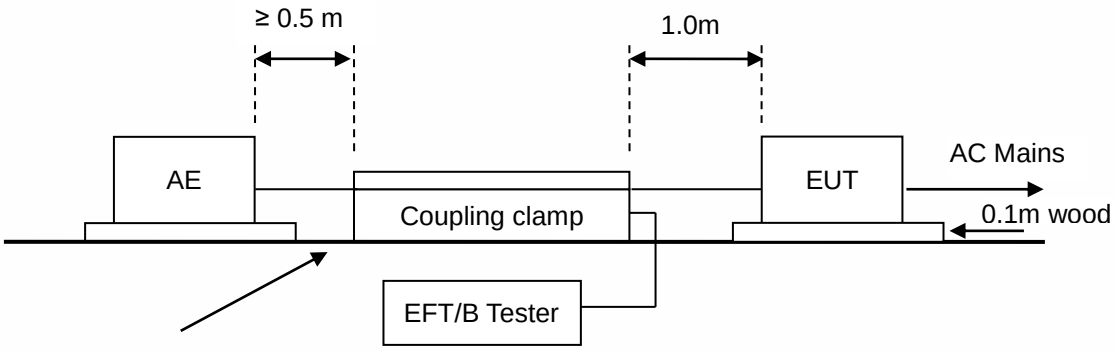
Test standard	:	SANS 2335/CISPR 35
Basic standard	:	IEC 61000-4-4
Performance criterion	:	B
Test level	:	☐1kV, AC mains power ports
		☒0.5kV, DC network power ports
		☐0.5kV, Analogue/digital data ports
Repetition frequency	:	☒5kHz, ☐100kHz(Only xDSL ports)
Tr/Th:	:	5/50ns
Burst period	:	300ms
Test time :	:	120s

8.2. Block Diagram of Test Setup

AC Lines:



Signal lines:



8.3. Test Procedure

The EUT is put on the table that 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.

8.4. Test Results

PASS

Temperature	:	22.9°C
Humidity	:	49%
Atmospheric Pressure	:	101kpa
Test Engineer	:	LHT
Test Date	:	2023-06-08

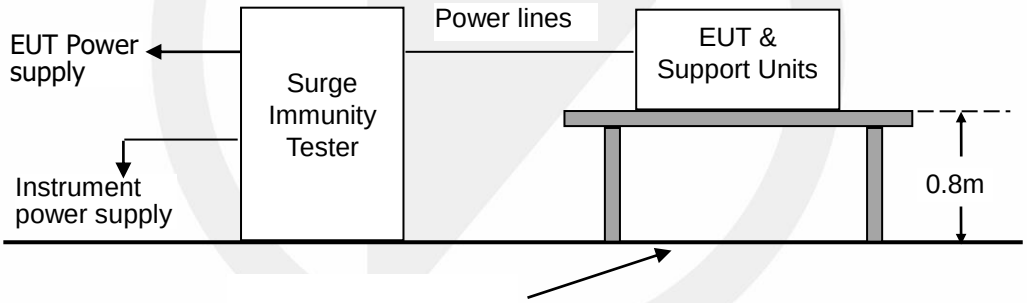
Injection Line	Voltage (kV)	Injected Method	Actual criterion	Required performance criterion	Result (Pass/Fail)
☐ AC mains power ports	± 1	☒ CDN ☐ Direct injection ☐ Capacitive coupling clamp	N/A	N/A	N/A
☒ DC network power ports	± 0.5	☒ CDN ☐ Direct injection ☐ Capacitive coupling clamp	A	B	Pass
☐ Analogue/digital data ports (Wired network port)	± 0.5	☐ CDN ☐ Direct injection ☒ Capacitive coupling clamp	N/A	N/A	N/A
☐ Analogue/digital data ports (Broadcast receiver tuner port)	± 0.5	☐ CDN ☐ Direct injection ☒ Capacitive coupling clamp	N/A	N/A	N/A

9. SURGE IMMUNITY TEST

9.1. Test Specification

Test standard	:	SANS 2335/CISPR 35
Basic standard	:	IEC 61000-4-5
Test level	:	☐1kV, Line to Line, AC mains power ports, Criterion B
		☐2kV, Line to Earth, AC mains power ports, Criterion B
		☒0.5kV, Line to Reference ground, DC network power ports, Criterion B
		☐1.0kV, Lines to Ground, Unshielded symmetrical, Criterion C
		☐4.0kV, Lines to Ground, Unshielded symmetrical, Criterion C
		☐0.5kV, Shield to ground, Coaxial or shielded port, Criterion B
Number of surges	:	5 (for each combination of parameters)
Repetition rate	:	1 minute / time
Polarity:	:	Positive / Negative
Phase angle:	:	90º, 270º (Only AC mains power ports)

9.2. Block Diagram of Test Setup



9.3. Test Procedure

This test simulates a lightning event by inducing transients onto the AC/DC power supply lines in common mode (Line to Ground) and differential mode (Line to Line). Each device was tested in a total of two surge configurations: Line to Ground (L-G): Combination Wave, Line to Protective Earth with 9uF and 10Ohm and Neutral to Protective Earth with 9uF and 10Ohm, common mode, generator earthed.
Line to Line (L-L): Combination Wave,
Line to Neutral with 18uF, differential mode, generator floated.
2 ohm : the source impedance of the low-voltage power supply network.
12 ohm : the source impedance of the low-voltage power supply network and ground.

a. If not otherwise specified the surges have to be applied synchronized to the voltage phase at the zero-crossing and the peak value of the a.c. voltage wave (positive and negative).
b. The surges have to be applied line to line and line to earth. When testing line to earth, the test voltage has to be applied successively between each of the lines and earth, if there is no other specification.
c. The test procedure shall also consider the non-linear current-voltage characteristics of the equipment under test. Therefore the test voltage has to be increased by steps up to the test level specified in the product standard or test plan. All lower levels including the selected test level shall be satisfied.
d. For testing the secondary protection, the output voltage of the generator shall be increased up to the worst-case voltage breakdown level (let-through level) of the primary protection.

e. Testing shall be performed according to a Test Plan, which shall be included in the test report.
f. To find all critical points of the duty cycle of the equipment, a sufficient number of positive and negative test pulses shall be applied.

9.4. Test results

PASS

Temperature	:	22.9°C
Humidity	:	49%
Atmospheric Pressure	:	101kpa
Test Engineer	:	LHT
Test Date	:	2023-06-08

☐ AC mains power ports:

Coupling Line	Voltage (kV)	Waveform (μs)	Polarity	Actual criterion	Required performance criterion	Result (Pass/Fail)
☐ Line to line	0.5, 1	1.2/50 (8/20)	Pos./ Neg.	N/A	B	N/A
☐ Line to earth	0.5, 1, 2	1.2/50 (8/20)	Pos./ Neg.	N/A	B	N/A

☒ DC network power ports:

Coupling Line	Voltage (kV)	Waveform (μs)	Polarity	Actual criterion	Required performance criterion	Result (Pass/Fail)
Line to Reference ground	0.5	1.2/50 (8/20)	Pos./ Neg.	A	B	Pass

☐ Analogue/digital data ports:

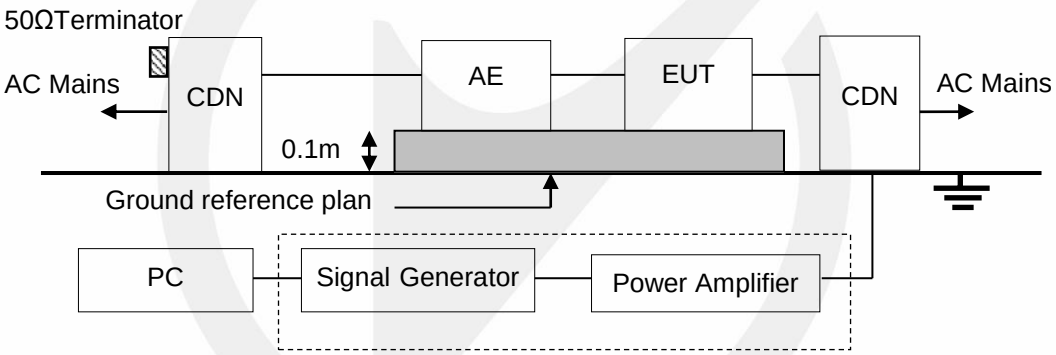
Port type	Coupling Line	Voltage (kV)	Waveform (μs)	Polarity	Actual criterion	Required performance criterion	Result (Pass/Fail)
☐ Unshielded symmetrical (Wired network port)	Lines to ground	0.5, 1	10/700 (5/320)	Pos./ Neg.	N/A	C	N/A
☐ Unshielded symmetrical (.....)	Lines to ground	0.5, 1	10/700 (5/320)	Pos./ Neg.	N/A	C	N/A
☐ Unshielded symmetrical	Lines to ground	0.5, 1, 2, 4	10/700 (5/320)	Pos./ Neg.	N/A	C	N/A
☐ Coaxial or shielded (Broadcast receiver tuner port)	Shield to ground	0.5	1.2/50 (8/20)	Pos./ Neg.	N/A	C	N/A
☐ Coaxial or shielded (.....)	Shield to ground	0.5	1.2/50 (8/20)	Pos./ Neg.	N/A	C	N/A

10. CONTINUOUS INDUCED RF DISTURBANCES

10.1. Test Specification

Test standard	:	SANS 2335/CISPR 35
Basic standard	:	IEC 61000-4-6
Performance criterion	:	A
Frequency range & Test level	:	0.15M to 10MHz, 3V 10M to 30MHz, 3V to 1V 30M to 80MHz, 1V
Modulation	:	AM 80%, 1kHz sine-wave
Frequency Step	:	1% of fundamental

10.2. Block Diagram of Test Setup



10.3. Test Procedure

a. The EUT shall be operated within its intended climatic conditions. The temperature and relative humidity should be recorded.
b. The EUT is placed on a 0.1m high test table, and a well grounded cable is connected to metallic plane above the test table.
c. All cables/wires must be laid out on test plate (3cm in thickness),and the EUT is set up on test plate (10 cm in thickness) as shown in test setup photo, and the cables/wires must not be in mid-air, they should be touching the surface of test plate. Ensure that the EUT is properly connected to the accessory equipment.
d. The test shall be performed with the test generator connected to each of the coupling and decoupling devices in turn while the other non-excited RF-input ports of the coupling devices are terminated by a 50 ohm load resistor.
e. The frequency range is swept from 150 kHz to 80 MHz, using the signal levels established during the setting process, and with the disturbance signal 80% amplitude modulated with a 1 kHz sine wave, pausing to adjust the RF-signal level or to switch coupling devices as necessary. The rate of sweep shall no exceed 1.5 x 10-3 decades/s. Where the frequency is swept incrementally, the step size shall no exceed 1% of the start and thereafter 1% of the preceding frequency value.
f. The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised, and able to respond. Sensitive frequencies e.g. clock frequency (ies) and harmonics or frequencies of dominant interest shall be analyzed separately.

g. Attempts should be made to fully exercise the EUT during testing, and to fully interrogate all exercise modes selected for susceptibility
h. Testing shall be performed according to a Test Plan, which shall be included in the test report.

10.4. Test results

PASS

Temperature	:	22.9°C
Humidity	:	49%
Atmospheric Pressure	:	101kpa
Test Engineer	:	LHT
Test Date	:	2023-06-08

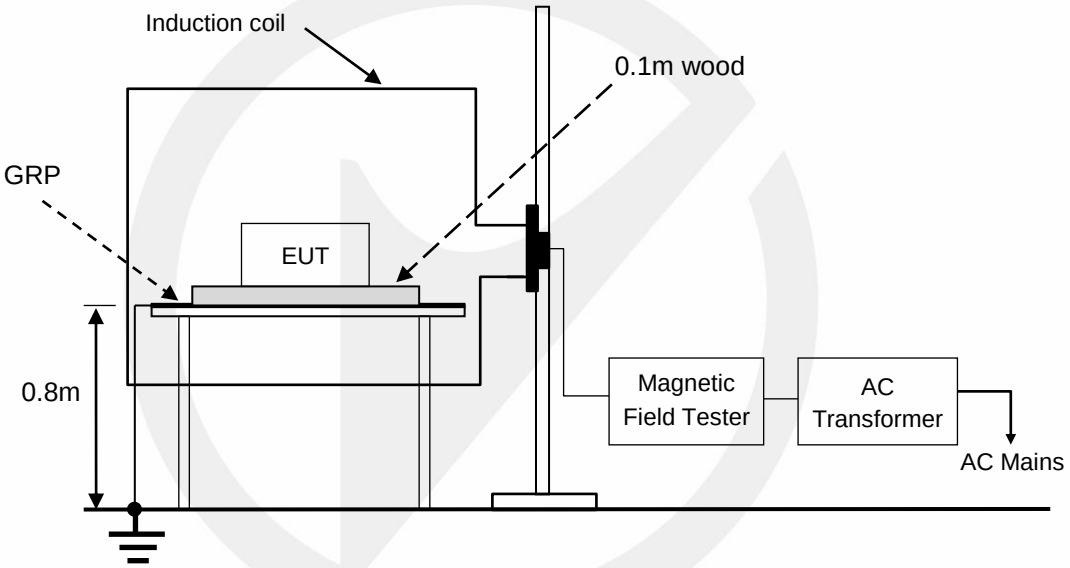
Range (MHz)	Levers (V)	Injection port	Coupling type	Actual criterion	Required performance criterion	Result (Pass/Fail)
0.15-10	3	☐AC mains power ports	☒CDN ☐EM Clamp ☐Current Clamp ☐Direct injection	N/A	N/A	N/A
10-30	3-1					
30-80	1					
0.15-10	3	☒DC network power ports	☒CDN ☐EM Clamp ☐Current Clamp ☐Direct injection	A	A	Pass
10-30	3-1					
30-80	1					
0.15-10	3	☐Analogue/digital data ports (Wired network port)	☐CDN ☒EM Clamp ☐Current Clamp ☐Direct injection	N/A	N/A	N/A
10-30	3-1					
30-80	1					
0.15-10	3	☐Analogue/digital data ports (Broadcast receiver tuner port)	☐CDN ☐EM Clamp ☒Current Clamp ☐Direct injection	N/A	N/A	N/A
10-30	3-1					
30-80	1					
0.15-10	3	☐Analogue/digital data ports (.....)	☐CDN ☐EM Clamp ☒Current Clamp ☐Direct injection	N/A	N/A	N/A
10-30	3-1					
30-80	1					

11. POWER FREQUENCY MAGNETIC FIELD

11.1. Test Specification

Test Standard	:	SANS 2335/CISPR 35
Basic Standard	:	IEC 61000-4-8
Performance criterion	:	A
Test level	:	1A/m

11.2. Block Diagram of Test Setup



GRP: Ground reference plane
EUT: Equipment under test

11.3. Test Procedure

The EUT is placed in the middle of a induction coil (1*1m), under which is a 1*1*0.1m (high) table, this small table is also placed on a larger table, 0.8 m above the ground. Both horizontal and vertical polarization of the induction coil is set on test, so that each side of the EUT is affected by the magnetic field. Also can reach the same aim by change the position of the EUT.

11.4. Test Results

PASS

Temperature	:	22.9°C
Humidity	:	49%
Atmospheric Pressure	:	101kpa
Test Engineer	:	LHT
Test Date	:	2023-06-08

Test Level (A/m)	Frequency	Testing Duration	Coil Orientation	Actual criterion	Required performance criterion	Result (Pass/Fail)
1	☒ 50Hz ☒ 60Hz	5 mins	☒ x-axis ☒ y-axis ☒ z-axis	A	A	Pass

12. PHOTOGRAPHS

12.1. Photos of Radiation Emission Measurement





12.2.Photo of Electrostatic Discharge Test



12.3.Photo of Continuous RF Electromagnetic Field Disturbances



12.4.Photos of Electrical Fast Transient / Burst Test



12.5.Photos of Surge Test



12.6.Photos of Continuous Induced RF Disturbances Test

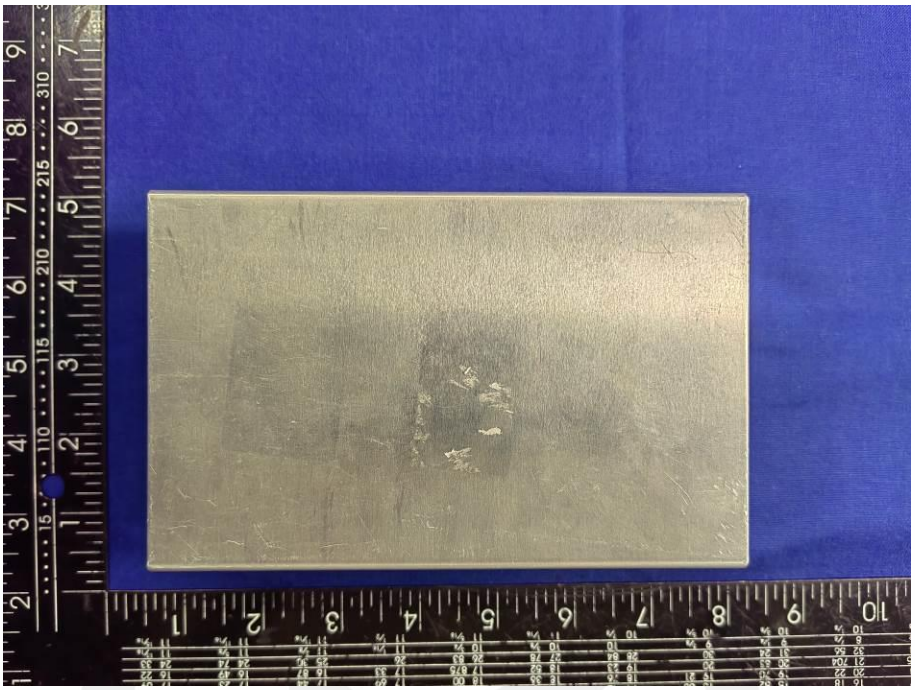


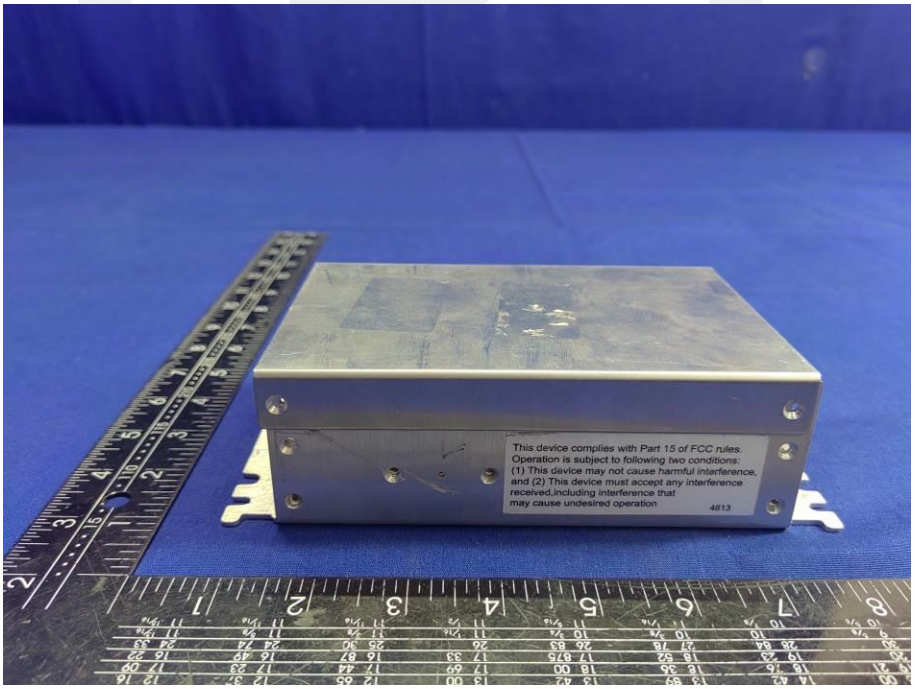
12.7.Photo of Power Frequency Magnetic Field Test

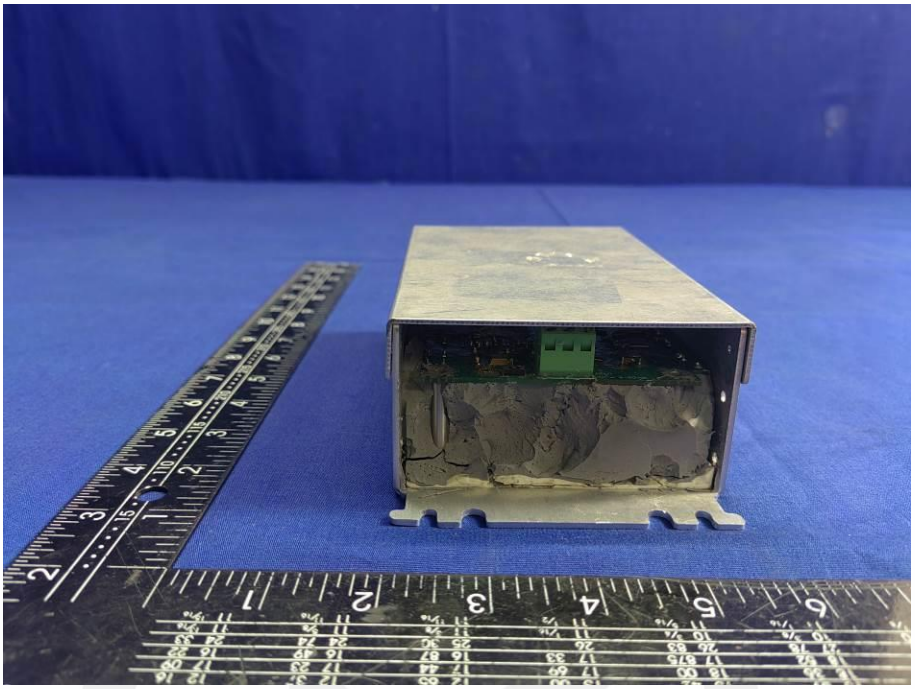


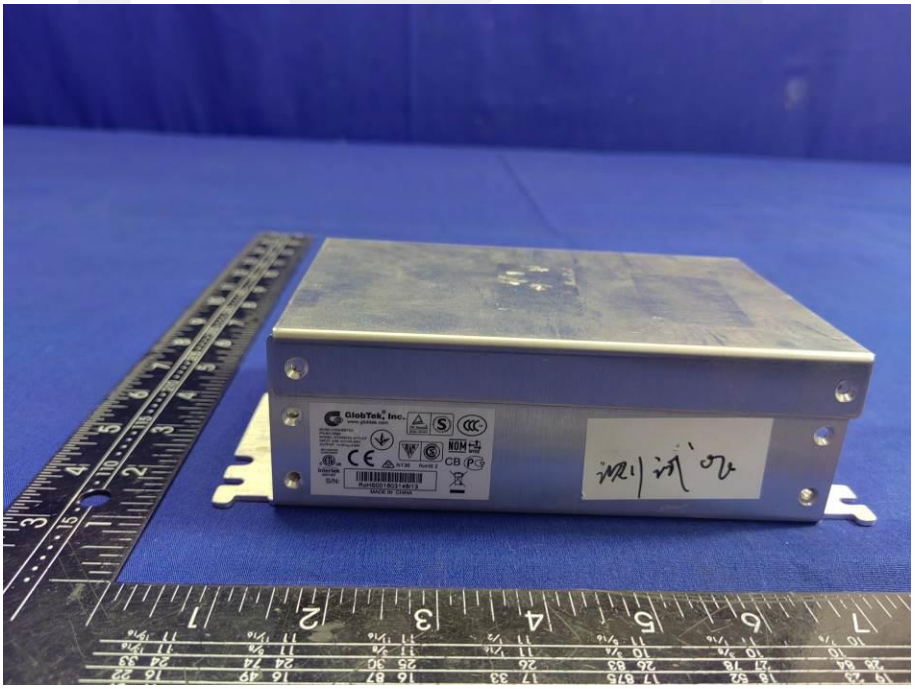
APPENDIX A: Photos of EUT

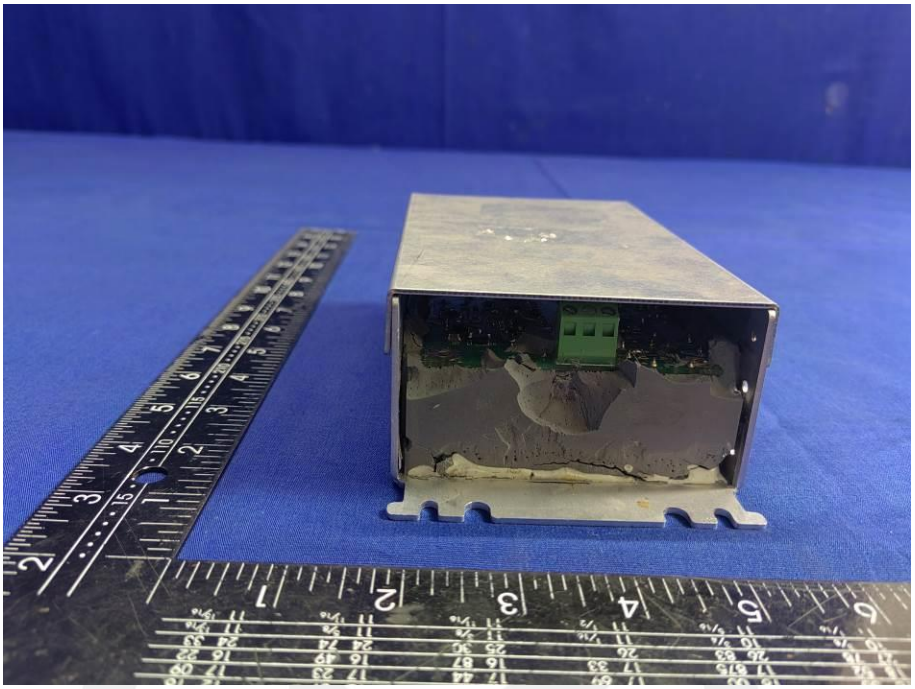
GTD93035L6013.2-F

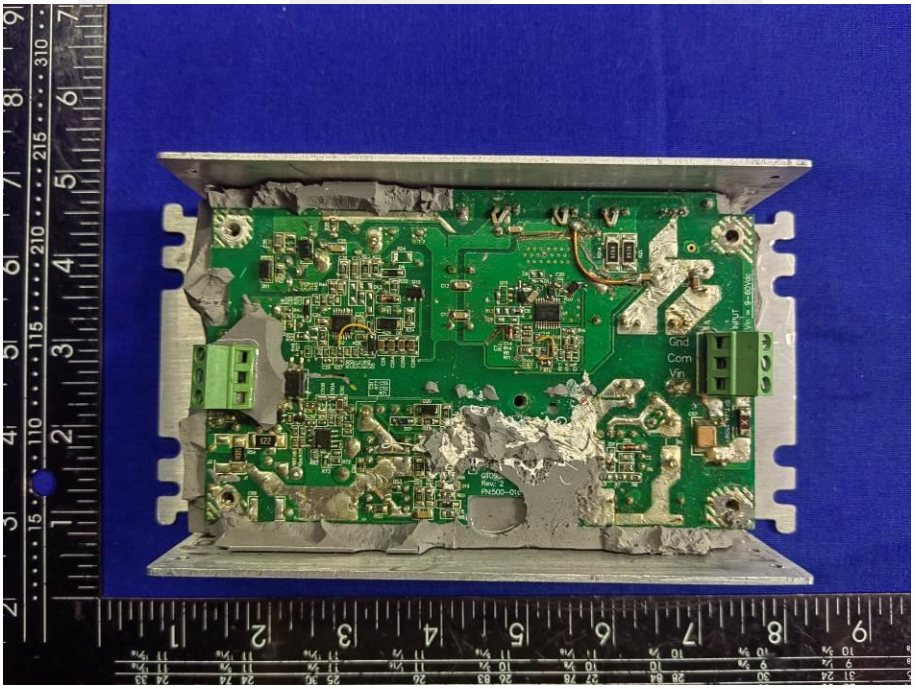




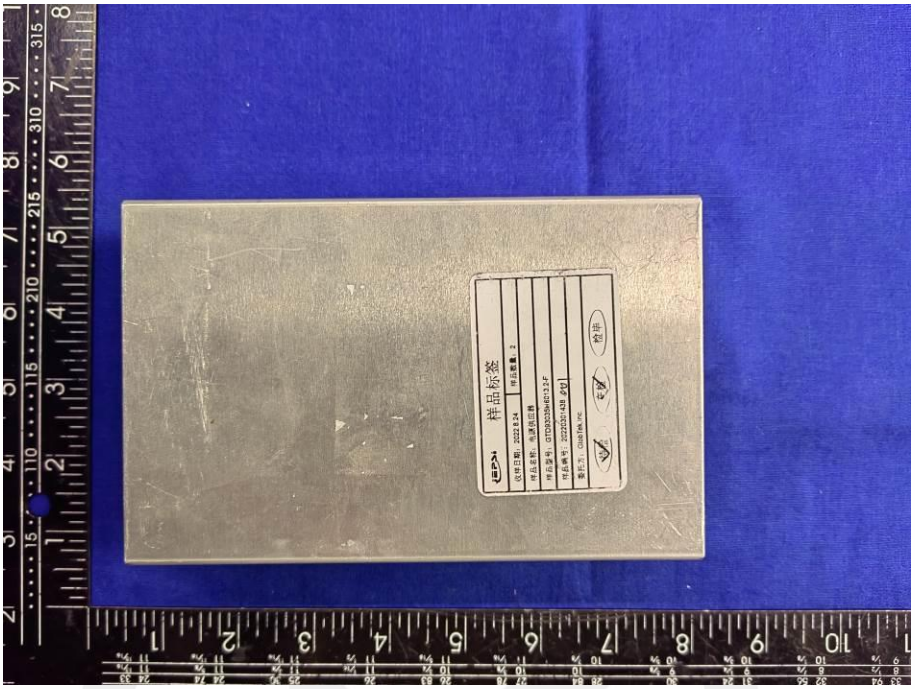


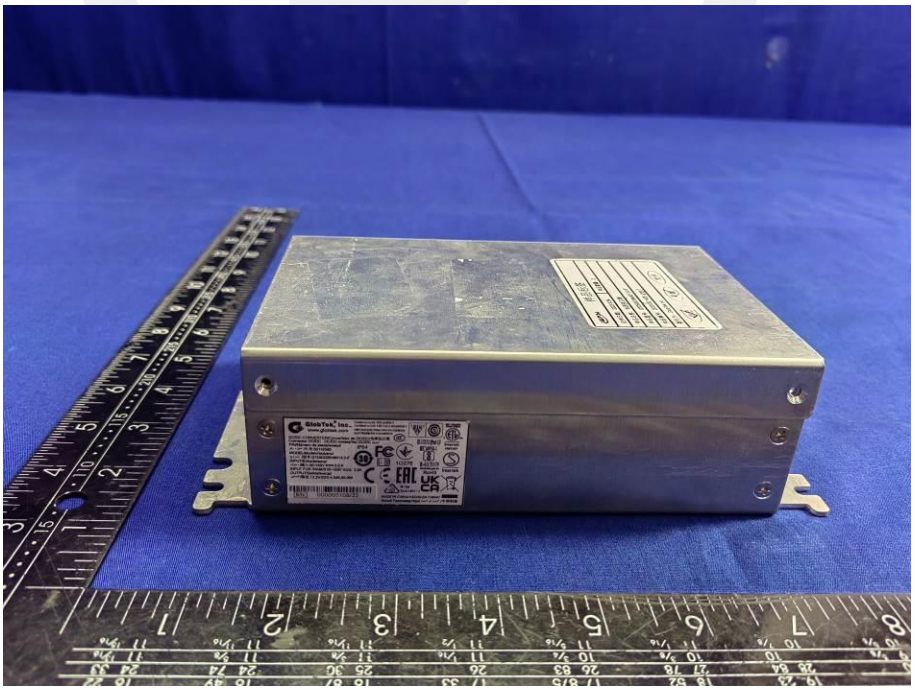


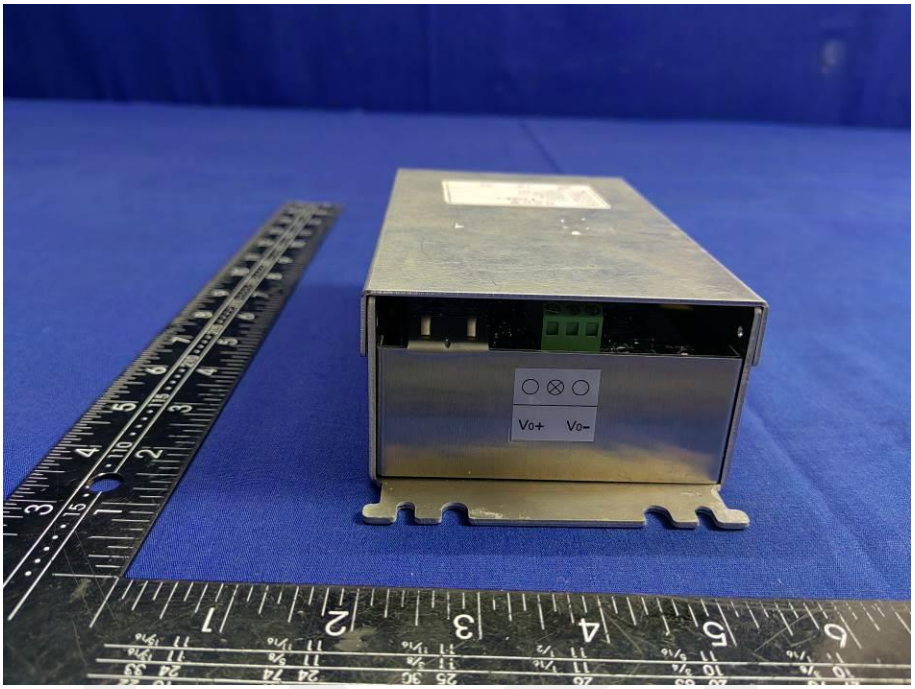


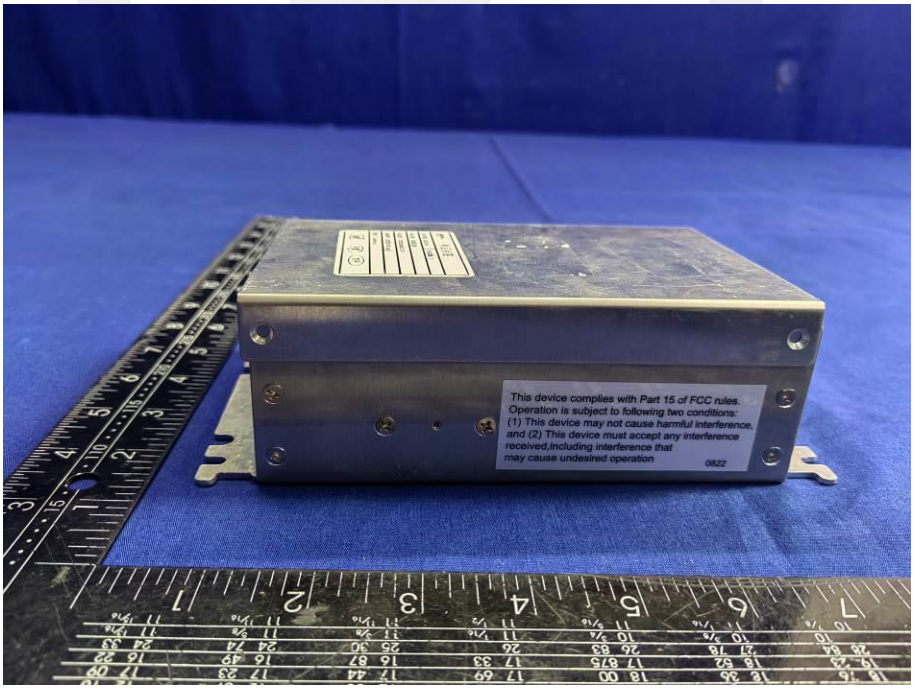

Gnd
Com
Vin

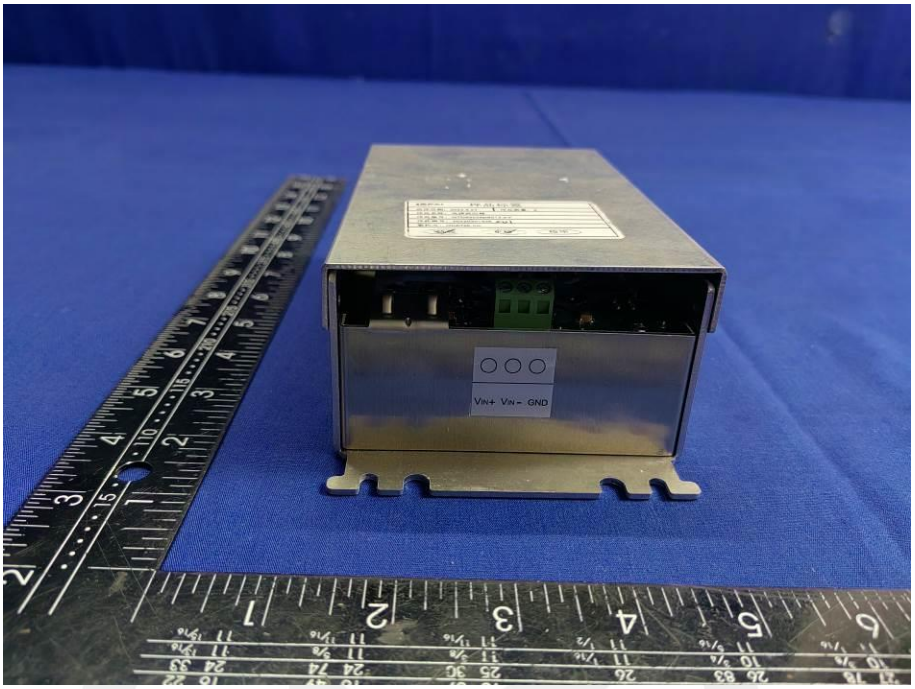
GTD93035H6013.2-F

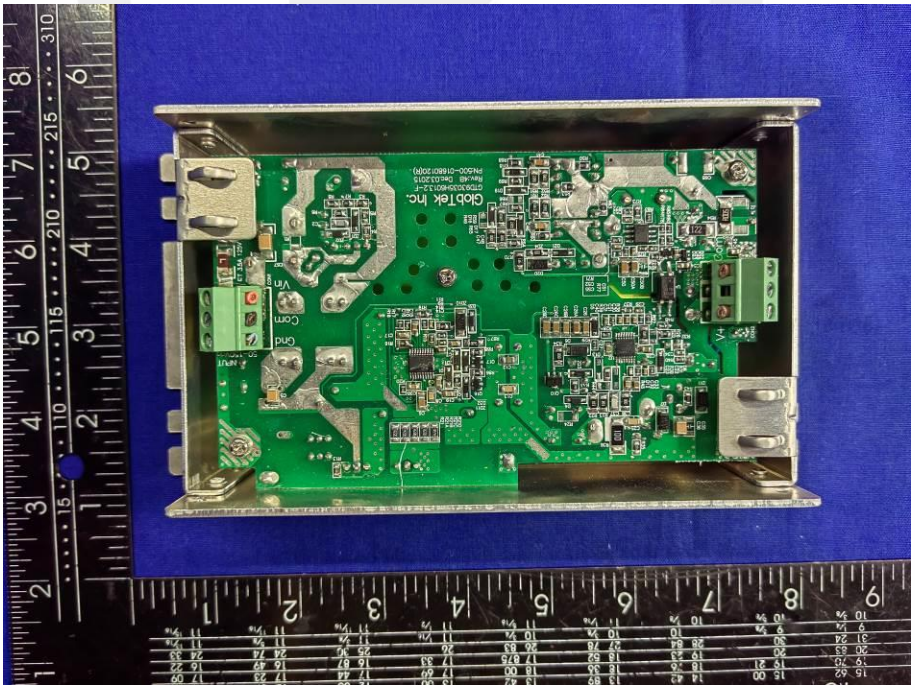





Vo+
Vo-


This device complies with Part 15 of FCC rules.
Operation is subject to following two conditions:
(1) This device may not cause harmful interference,
and (2) This device must accept any interference
received,including interference that
may cause undesired operation
0822


VIN+ VIN- GND


GlobTek Inc.
Vin
Com
Gnd

APPENDIX B: Critical Component List

No.	Object/part No.	Manufacturer/ trademark	Type/model	Technical data	Standard (Edition / year)	Mark(s) of conformity1)
1.	PCB	SHENZHEN TONGCHUANGX IN ELECTRONICS CO LTD	TCX	Min. V-0, min 1.6 mm thickness, 130°C	UL 796 IEC/EN 62368-1	UL E250336 & Test with equipment
2.	Alternative	SHUANG MING INDUSTRY CO LTD	T005V0	Min. V-0, min 1.6 mm thickness, 130°C	UL 796 IEC/EN 62368-1	UL E78017 & Test with equipment
3.	Alternative	SHANGHAI H-FAST ELECTRONICS CO LTD	211001	Min. V-0, min1.6 mm thickness, 130°C	UL 796 IEC/EN 62368-1	UL E337862 & Test with equipment
4.	Alternative	GUANGDE BOYA XINXING ELECTRONIC TECHNOLOGY CO LTD	BY- 1	Min. V-0, min1.6 mm thickness, 130°C	UL 796 IEC/EN 62368-1	UL E475783 & Test with equipment
5.	Alternative	SHENZHEN GOLDEN BOARD CIRCUIT CO LTD	JYH-2	Min. V-0, min1.6 mm thickness, 130°C	UL 796 IEC/EN 62368-1	UL E489124 & Test with equipment
6.	Alternative	ZHEJIANG WANZHENG ELECTRONICS SCIENCE & TECHNOLOGY CO.,LTD.	JWZ-2	Min. V-0, min1.6 mm thickness, 130°C	UL 796 IEC/EN 62368-1	UL E302598 & Test with equipment
7.	Alternative	JIANGXI ZHONG XIN HUA ELECTRONICS INDUSTRY CO LTD	ZXH-2	Min. V-0, min 1.6 mm thickness, 130°C	UL 796 IEC/EN 62368-1	UL E331298 & Test with equipment
8.	Alternative	Interchangeable	Interchange ab le	Min. V-0, min 1.6 mm thickness, 130°C	UL 796: 2016 IEC60707: 1999	S, ETL, UL & other EU certification marks
9.	SMT fuse (F1) for 55-150Vdc model	AEM COMPONENTS (SUZHOU) CO LTD	AF2	3.50A, 125V, Rated breaking capacity 50A.	IEC/EN 62368-1	UL E232989 & Test with equipment
10.	SMT fuse (F1) for 9-60Vdc model	AEM COMPONENTS (SUZHOU) CO LTD	AF2	12A, 65V, Rated breaking capacity 50A.	IEC/EN 62368-1	UL E232989 & Test with equipment
11.	Y-Capacitor (CY6) (optional)	TDK CORPORATION	CD	Y1, min. 250VAC, 125°C, max. 1000pF	IEC/EN 60384-14 UL 60384-14 UL 1414	VDE 40029780 UL E37861
12.	Alternative	Success Electronics Co., Ltd.	SE	Y1, min. 250VAC, 125°C, max. 1000pF	IEC/EN 60384-14 UL 60384-14 UL 1414	VDE40037211 VDE40020002 UL E114280
13.	Alternative	Success Electronics Co., Ltd.	SB	Y1, min. 250VAC,125°C, max. 1000pF	IEC/EN 60384-14 UL 60384- 14 UL 1414	VDE40037221 VDE40020001 UL E1 14280

No.	Object/part No.	Manufacturer/ trademark	Type/model	Technical data	Standard (Edition / year)	Mark(s) of conformity1)
14.	Alternative	Murata Mfg. Co., Ltd.	KX	Y1, min. 250VAC, 125°C, max. 1000pF	IEC/EN 60384-14 UL 60384- 14 UL 1414	VDE 40002831 UL E37921
15.	Alternative	Walsin Technology Corp.	AH	Y1, min. 250VAC, 125°C, max. 1000pF	IEC/EN 60384-14 UL 60384- 14 UL 1414	VDE 40001804 UL E146544
16.	Alternative	JYA-NAY Co., Ltd.	JN	Y1, min. 250VAC, 125°C, max. 1000pF	IEC/EN 60384-14 UL 60384- 14 UL 1414	TUV 69242987 UL E201384
17.	Alternative	Haohua Electronic Co.	CT7	Y1, min. 250VAC, 125°C, max. 1000pF	IEC/EN 60384-14 UL 60384- 14 UL 1414	VDE 40003902 UL E233106
18.	Optocoupler (U3, U4)	Lite-On Technology Corporation	LTV-817	Dti=0.8mm Int. , EXT.dcr=7.8mm, thermal cycling test,110°C	IEC/EN 60747-5-2 UL 1577	VDE 40015248 UL E113898
19.	Alternative	Everlight Electronics Co., Ltd.	EL817	Dti=0.5mm Int. , dcr=6.0mm EXT.dcr=7.7mm, thermal cycling test,110°C	IEC/EN 60747-5-2 UL 1577	VDE 132249 UL E214129
20.	Alternative	Fairchild Semiconductor Pte Ltd.	H11A817B, FOD817B	Insulation voltage: 850V; Transient overvoltage: 6000V; CTI175; Int. Cr/ Ext. Cr: ≥7,0/ 7,0 mm; 30/110/21	IEC/EN 60747-5-2	VDE 40026857
21.	Alternative	Sharp Corporation Electronic Components and Devices Group	PC817	Insulation voltage: 890V; Transient overvoltage: 9000V Int. Cr/ Ext. Cr: 7.62/ 7.62 mm; 30/100/21	IEC/EN 60747-5-2	VDE 40008087
22.	Alternative	Bright Led Electronics Corp.	BPC-817 (A; B; C; D; L), BPC-817 M, BPC-817 S	Dti=0.4mm EXT.dcr=7.0mm, thermal cycling test,110°C	IEC/EN 60747-5-2	VDE 40007240
23.	Alternative	COSMO Electronics Corporation	K1010, KP1010	Dti=0.6mm Int. , dcr=4.0mm EXT.dcr=5.0mm, thermal cycling test,115°C	IEC/EN 60747-5-2	VDE 101347

No.	Object/part No.	Manufacturer/ trademark	Type/model	Technical data	Standard (Edition / year)	Mark(s) of conformity1)
24.	Line filter (LF1) (Optional)	GlobTek/ HAOPUWEI /BOAM/ENG	LF011	130°C	IEC/EN 62368-1	Test with equipment
25.	Line filter (LF2) (Optional)	GlobTek/ HAOPUWEI /BOAM/ENG	LF012	130°C	IEC/EN 62368-1	Test with equipment
26.	Boost inductor (L1) (Optional)	GlobTek/ HAOPUWEI /BOAM/ENG	LF013 for 55- 150Vdc; LF014 for 9-60Vdc.	130°C	IEC/EN 62368-1	Test with equipment
27.	Current transducer(T2)	GlobTek/ HAOPUWEI /BOAM/ENG	LF009	130°C	IEC/EN 62368-1	Test with equipment
28.	Transformer (T1)	GlobTek/ HAOPUWEI /BOAM/ENG	TF017	Class B, with insulation system	IEC/EN 62368-1	Test with equipment
29.	-Insulation System	GLOBTEK INC	GTX-130-TM	Class B	IEC/EN 62368-1 UL 1446	UL E243347 & Test with equipment
30.	Alternative	WUXI HAOPUWEI ELECTRONICS CO LTD	ZT- 130	Class B	IEC/EN 62368-1 UL 1446	UL E315275 & Test with equipment
31.	Alternative	SHAN DONG BOAM ELECTRIC CO LTD	BOAM-01,B 1	Class B	IEC/EN 62368-1 UL 1446	UL E252329 & Test with equipment
32.	Alternative	ENG ELECTRIC CO LTD	ENG130-1	Class B	IEC/EN 62368-1 UL 1446	UL E308897 & Test with equipment
33.	Metal enclosure	Interchangeable	Interchange ab le	Metal, Min. thickness:1.5mm	IEC/EN 62368-1	Test with equipment
34.	DC Connector	Cixi Kaifeng electronic co., ltd	KF103	Min.250V, min. 10A, Max. 105°C	UL 486	UL E305844
35.	Varistor ZNR1 for GTD93035H6013.2-F (Optional)	Success Electronics Co., Ltd.	SVR10D241K	Max continue Voltage 200Vdc, Min V-1 coating, 85°C	IEC 61051-1 IEC 61051-2 IEC 61051-2-2	VDE 123677
36.	Alternative	Brightking (Shenzhen) Co., Ltd.	241KD10	Max continue Voltage 200Vdc, Min V- 1 coating, 105°C	IEC 61051-1 IEC 61051-2 IEC 61051-2-2	VDE 40027827
37.	Alternative	Centra Science Corp.	CNR10D241K	Max continue Voltage 200Vdc, Min V-1 coating, 105°C	IEC 61051-1 IEC 61051-2 IEC 61051-2-2 DIN EN 61051-1:2009	VDE 40008220
38.	Varistor ZNR1 for GTD93035L6013.2-F (Optional)	SUCCESS ELECTRONICS CO LTD	SVR14D101K	Min. 60Vac(rms), Max.125°C	IEC 61051-1 IEC 61051-2 IEC 61051-2-2	VDE 123677

No.	Object/part No.	Manufacturer/ trademark	Type/model	Technical data	Standard (Edition / year)	Mark(s) of conformity1)
39.	/	Brightking	101KD14	Min. 60Vac(rms), Max.125°C	IEC 61051-1 IEC 61051-2 IEC 61051-2-2	VDE 40027827
40.	/	Centra Science Corp.	CNR14D101K	Min. 60Vac(rms), Max.125°C	IEC 61051-1 IEC 61051-2 IEC 61051-2-2	VDE 40008220
41.	Y capacitor (CY1, CY2) (Optional)	Success Electronics Co., Ltd.	SF	Y2 type, min. 250VAC, 125°C, max. 4700pF	IEC/EN 60384-14	UL E114280 VDE 40016665
42.	Alternative	TDK CORPORATION	CY	Y2 type, min. 250VAC, 125°C, max. 4700pF	IEC/EN 60384-14	UL E37861 VDE138759
43.	Alternative	SHANTOU HIGH-NEW TECHNOLOGY DEVELOPMNT ZONE SONGTIAN ENTERPRISE CO LTD	CE	Y2 type, min. 250VAC, 125°C, max. 4700pF	IEC/EN 60384-14	UL E208107 VDE 40025748

End of Report

Statement

1． This report is invalid without the signature of the authorized approver and "special seal for testing".

2． This report shall not be copied partly without authorization.

3． The test results or observations are applicable only to tested sample. Client shall be responsible for representativeness of the sample and authenticity of the material.

4． The observations or tests with special mark fall outside the scope of accreditation, and are only used for purpose of commission, research, training, internal quality control etc.

5． The test results or observations are provided in accordance with measured value, without taking risks caused by uncertainty into account. Without explicit stipulation in special agreements, standards or regulations, EMTEK shall not assume any responsibility.

6． Objections shall be raised within 20 days from the date receiving the report.