

**TEST REPORT**  
**[Amendment No.1 (See Remarks)]**

ULR No.	TC64511910000884F	Page 1 of 7	
Test Report No.:	TR120190605001A1	Issue Date:	01/07/19
Discipline:	Electrical Testing	Group:	EMI/EMC Test Facility
Issued to:	SPECTRUM TECHVISION PRIVATE LIMITED #96, PETECHENNAPPA INDUSTRIAL ESTATE, KAMAKSHIPAIYA, MAGADI MAIN ROAD, BANGALORE-79, INDIA		
Test item:	Spectrum 10KV External Surge Protection Device, Brand: Spectrum.		
Identification:	Model No/ Product code:-	STV18SPD10KV	Serial No.:
			10KVSPD-0519-217-200
Job Order No.:	<b>BTH-R1/EE/190527/1</b>		Date of receipt:
			27/05/19
Date(s) of performance of tests:	Date of Starting:	01/06/19	Date of Completion:
			01/06/19
Testing laboratory and its address:	<b>BHARAT TEST HOUSE PVT. LTD.</b> 1474, HSIIDC Indl. Estate, Rai, Distt. Sonapat-131001 Haryana.		
Test specification:	<b>IEC 61643-11: 2011, Test Protocol followed as per IEC 61000-4-5: 2014</b>		
Test Result:	The test item passed the test specification(s).		
Abbreviations:	OATS: Open Area Test Site, FCC: Federal Communications Commission, IC: Industry Canada, IEC: International Electrotechnical Commission, GRP: Ground Reference Plane, EUT: Equipment Under Test, AE: Auxiliary Equipment, CDN: Coupling Decoupling Network, SPD: Surge Protection Device		
Remarks:	- The report is amended with reference to our earlier Test Report No. TR120190605001 dated 05/06/19. This test report relates to the test sample submitted		
<b>Tested by</b>	<b>Authorized Signatory</b>		
			
<b>Testing Engineer</b>	<b>T.M./Q.M./Dy. Q.M./Auth Sig.</b>		
Date:	01/07/19	Date:	01/07/19

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**BHARAT TEST HOUSE PVT. LTD.**

1474, HSIIDC Industrial Estate, Rai, Distt-Sonepat, Haryana-131001  
 Tel: 0130-2367673, 2974474 | email: bthrai@bharatstesthouse.com

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**ISO 9001:2008, ISO 14001:2004 & OHSAS 18001 CERTIFIED LAB**

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**LAB LOCATION AND FACILITY**

- Bharat Test House (P) Ltd is a NABL Accredited Laboratory situated at Plot no. 1474, HSIIDC Industrial Estate, Rai, Distt. Sonapat, Haryana – 131001.
- EMI/EMC Testing Laboratory of BTHPL is also recognized by FCC; Registration Number: 186338 under FCC part 15 & 18 and IC; Authorisation Number: 010273048-001.
- EMI/EMC Testing Laboratory of BTHPL has various tests facilities for Emission measurements and Compliance tests. Provision of Pre-compliance R&D facility is also been facilitated.
- EMI/EMC Testing Laboratory of BTHPL has a 10 Meter Radiated Emission OATS facility recognized by both FCC and IC.
- EMI/EMC Testing Laboratory of BTHPL has Lightning Surge Generator having a capability upto 20kV/10kA.

**LIST OF INSTRUMENTS USED IN TESTING**

Sr. No.	Instrument Name	Make	Range & L.C
1.	Surge Generator (20kV)	PRIMA	±0.20kV to ±20kV 0 to ±10kA L.C. = 0.01
2.	Thermometer (Wet & Dry)	ZEAL	(-)10°C to 50°C L.C = 1°C



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**1. SUMMARY OF TEST RESULTS**

S. No.	TEST DESCRIPTION	RESULTS	PERFORMANCE CRITERIA
1.	SURGE IMMUNITY TEST	Pass	B

**1.1 PERFORMANCE CRITERIA DURING IMMUNITY TEST:**

- Performance Criterion 'A':** The equipment shall continue to operate as intended during and after the test. 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.
- Performance Criterion 'B':** During the test, degradation of performance is allowed. However, no change of 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. The performance level may be replaced by a permissible loss of performance.
- Performance Criterion 'C':** Temporary 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. Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.
- Performance Criterion 'D':** Loss of function or degradation of performance which is not recoverable, owing to damage to hardware or software, or loss of data.

**2. LAB INITIAL CONDITIONS**
**2.1 EUT MOUNTING, BONDING AND GROUNDING:**

- The EUT was mounted on a standard reference table having a dimension of 1.6m \* 0.8m length and 0.8m of height specified as per relevant standard requirement. A wooden sheet of 0.1m width was used as a base of the EUT mounting on the standard reference table.
- A GRP was laid above & below the standard reference table as per relevant standard requirement. The EUT was provided with proper body ground; wherever needed as per customer's instruction manual to the GRP via a metallic earth strip connected directly to the laboratory earth pit. All the test equipments and generators used during the tests were body grounded as per relevant standard requirement.

**2.2 FACILITY ENVIRONMENTAL CONDITIONS:**

The test site was observed at the following ambient environmental conditions during the test:

**Ambient Temperature:** 26°C  
**Relative Humidity:** 55%RH  
**Barometric Pressure:** 100.2kPa



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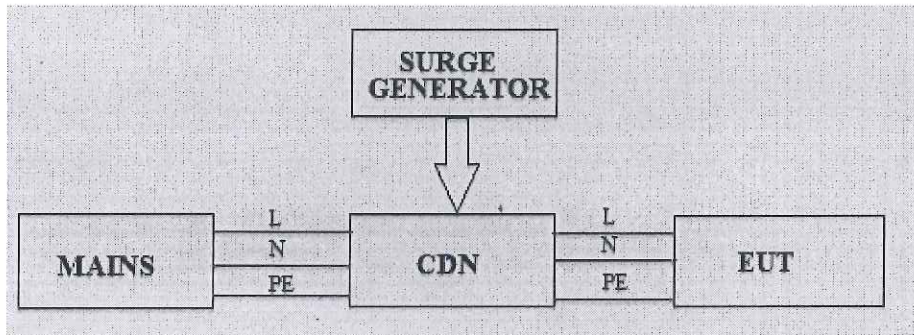
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**3. TEST RESULTS & DESCRIPTION**

**3.1 SURGE IMMUNITY TEST:**

**3.1.1 Block Diagram of Test Setup:**



**3.1.2 Test Standard:** IEC 61643-11: 2011

**3.1.3 Test Protocol Followed:** IEC 61000-4-5: 2014

**3.1.4 Test Specifications:**

No. of Pulses (As per customer's requirement): 2 at each angle and each polarity.

Repetition Rate: 1 per 60sec at 10KV.

Phase shift: In a range between 0° to 360° relative to the phase angle of ac line voltage to the EUT with ±10° tolerance

Output impedance: 12Ω ± 10% for Line-Earth & Neutral-Earth (Common Mode) and 2Ω ± 10% for Line to Neutral (Differential mode).

Open circuit voltage wave shape: 1.2/50μs

Closed circuit current wave shape: 8/20μs

**3.1.5 Test Parameters:**

Co-ordination of SPD and Load (40W LED Street Light):-

Test Level	Open circuit peak Voltage Level (kV)	Short circuit peak Current Level (kA)	Polarity	Phase angles	No. of Pulses	Mode
Customer's requirement	10	5	+/-	0°, 90°, 180°, 270°	Total: 16	Differential (L-N)
	10	0.833	+/-	0°, 90°, 180°, 270°	Total: 16	Common (L-E)
	10	0.833	+/-	0°, 90°, 180°, 270°	Total: 16	Common (N-E)

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**3.1.6 Observations:**

Co-ordination of SPD and Load (40W LED Street Light):-

The configurations of the above test level were observed to be as follows:-

Test Level	Open circuit peak Voltage Level (kV)	Short circuit peak Current Level (kA)	Polarity	Phase angles	Mode	Performance Criteria
Customer's requirement	10	5	+/-	0°, 90°, 180°, 270°	Differential (L-N)	B
	10	0.833	+/-	0°, 90°, 180°, 270°	Common (L-E)	B
	10	0.833	+/-	0°, 90°, 180°, 270°	Common (N-E)	B

**Performance Criterion 'B':** During the test, degradation of performance is allowed. However, no change of 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. The performance level may be replaced by a permissible loss of performance.

**3.1.7 Result:**

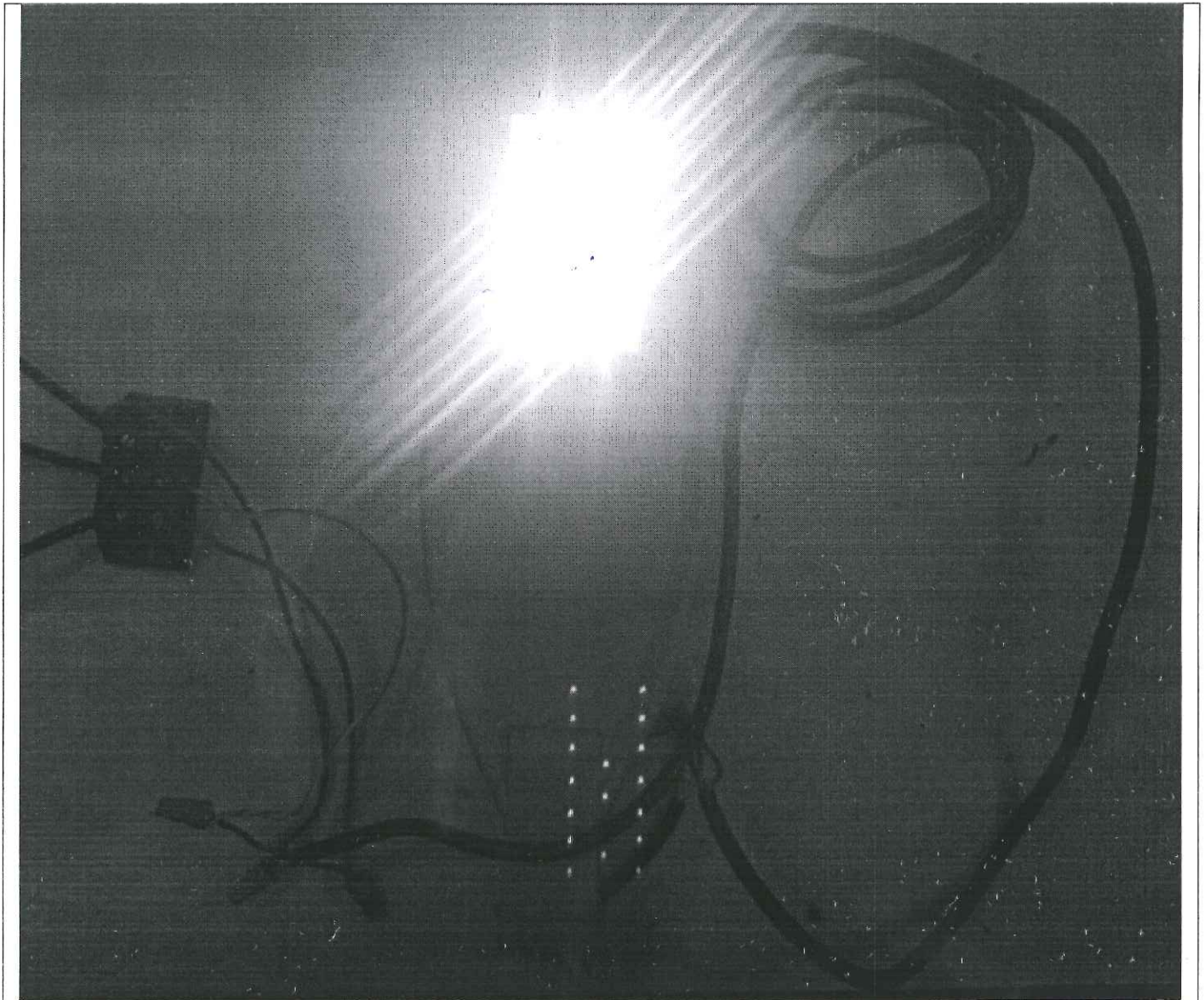
Pass



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Annexure 'A'

EUT PHOTOGRAPHS



EUT connections with Load

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