



TISP4xxxHx - Single Bidirectional Thyristor Surge Protector

Device Number	TISP4015H1	TISP4030H1	TISP4040H1	TISP4C115H3	TISP4C125H3
Package Options	BJR	BJR	BJR	BJR	BJR
Standoff Voltage (V)	8	15	25	90	100
Protection Voltage (V)	15	30	40	115	125
Holding Current (mA)	50	50	50	150	150
Ratings for Lightning Surge Standards - GR-1089-CORE 2/10 us (A)	500	500	500	500	500
Ratings for Lightning Surge Standards - TIA/EIA-IS968 10/560 us (A)	125	125	125	100	100
Ratings for Lightning Surge Standards - ITU-T K.20/45/21 5/310 us (A)	150	150	150	150	150
Ratings for Lightning Surge Standards - GR-1089-CORE 10/1000 us (A)	100	100	100	100	100

Device Number	TISP4C145H3	TISP4C165H3	TISP4C180H3	TISP4C220H3	TISP4C250H3
Package Options	BJR	BJR	BJR	BJR	BJR
Standoff Voltage (V)	120	135	145	180	190
Protection Voltage (V)	145	165	180	220	250
Holding Current (mA)	150	150	150	150	150
Ratings for Lightning Surge Standards - GR-1089-CORE 2/10 us (A)	500	500	500	500	500
Ratings for Lightning Surge Standards - TIA/EIA-IS968 10/560 us (A)	100	100	100	100	100
Ratings for Lightning Surge Standards - ITU-T K.20/45/21 5/310 us (A)	150	150	150	150	150
Ratings for Lightning Surge					



TISP4015H1BJ, TISP4030H1BJ, TISP4040H1BJ

**VERY LOW VOLTAGE
BIDIRECTIONAL THYRISTOR OVERVOLTAGE PROTECTORS**

TISP40xxH1BJ VLV Overvoltage Protector Series

Low Capacitance

'4015	78 pF
'4030	62 pF
'4040	59 pF

Digital Line Signal Level Protection

-ISDN
-xDSL

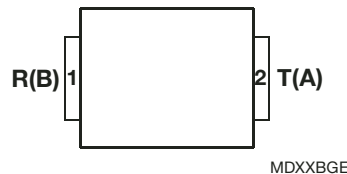
Safety Extra Low Voltage, SELV, values

Device	V _{DRM} V	V _(BO) V
'4015	± 8	± 15
'4030	± 15	± 30
'4040	± 25	± 40

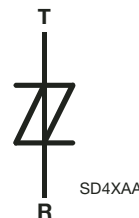
100 A "H" Series specified for:
ITU-T recommendations K.20, K.45, K.21
FCC Part 68 and GR-1089-CORE

Wave Shape	Standard	I _{TSP} A
2/10 μs	GR-1089-CORE	500
8/20 μs	IEC 61000-4-5	400
10/160 μs	FCC Part 68	200
10/700 μs	ITU-T K.20/45/21 FCC Part 68	150
10/560 μs	FCC Part 68	125
10/1000 μs	GR-1089-CORE	100

SMBJ Package (Top View)



Device Symbol



Terminals T and R correspond to the alternative line designators of A and B

..... **UL Recognized Components**

Description

These devices are designed to limit overvoltages on digital telecommunication lines. Overvoltages are normally caused by a.c. power system or lightning flash disturbances which are induced or conducted on to the telephone line. A single device provides 2-point protection and is typically used for the protection of transformer windings and low voltage electronics.

The protector consists of a symmetrical voltage-triggered bidirectional thyristor. Overvoltages are initially clipped by breakdown clamping until the voltage rises to the breakover level, which causes the device to crowbar into a low-voltage on-state condition. This low-voltage on state causes the current resulting from the overvoltage to be safely diverted through the device. The device switches off when the diverted current falls below the holding current value.

How to Order

Device	Package	Carrier	Order As	Marking Code	Std. Qty.
TISP40xxH1BJ	SMB (DO-214AA)	Embossed Tape Reeled	TISP40xxH1BJR-S	40xxH1	3000

Insert xx value corresponding to protection voltages of 15 V, 30 V and 40 V.

Specifications are subject to change without notice.
Customers should verify actual device performance in their specific applications.

TISP40xxH1BJ VLV Overvoltage Protector Series

BOURNS®

Absolute Maximum Ratings, $T_A = 25\text{ }^\circ\text{C}$ (Unless Otherwise Noted)

Rating	Symbol	Value	Unit
Repetitive peak off-state voltage	V_{DRM}	±8 ±15 ±25	V
Non-repetitive peak on-state pulse current (see Notes 1 and 2) 2/10 μs (Telcordia GR-1089-CORE, 2/10 μs voltage wave shape) 8/20 μs (IEC 61000-4-5, combination wave generator, 1.2/50 voltage, 8/20 current) 10/160 μs (FCC Part 68, 10/160 μs voltage wave shape) 5/310 μs (ITU-T K.20/45/21, 10/700 μs voltage wave shape) 5/320 μs (FCC Part 68, 9/720 μs voltage wave shape) 10/560 μs (FCC Part 68, 10/560 μs voltage wave shape) 10/1000 μs (Telcordia GR-1089-CORE, 10/1000 μs voltage wave shape)	I_{TSP}	±500 ±400 ±200 ±150 ±150 ±125 ±100	A
Non-repetitive peak on-state current (see Notes 1 and 2) 20 ms (50 Hz) full sine wave 16.7 ms (60 Hz) full sine wave 0.2 s 50 Hz/60 Hz a.c. 2 s 50 Hz/60 Hz a.c. 1000 s 50 Hz/60 Hz a.c.	I_{TSM}	45 50 21 7 2	A
Initial rate of rise of current (2/10 waveshape)	di/dt	450	A/ μs
Junction temperature	T_J	-40 to +150	$^\circ\text{C}$
Storage temperature range	T_{stg}	-65 to +150	$^\circ\text{C}$

- NOTES: 1. Initially the device must be in thermal equilibrium with $T_J = 25\text{ }^\circ\text{C}$.
2. The surge may be repeated after the device returns to its initial conditions.

Electrical Characteristics, $T_A = 25\text{ }^\circ\text{C}$ (Unless Otherwise Noted)

Parameter	Test Conditions	Min	Typ	Max	Unit
I_{DRM} Repetitive peak off-state current	$V_D = V_{DRM}$			±5	μA
$V_{(BO)}$ Breakover voltage	$di/dt = \pm 0.8\text{ A/ms}$	'4015 '4030 '4040		±15 ±30 ±40	V
$V_{(BO)}$ Impulse breakover voltage	$dv/dt \leq \pm 1000\text{ V}/\mu\text{s}$, Linear voltage ramp, Maximum ramp value = $\pm 500\text{ V}$ $di/dt = \pm 12\text{ A}/\mu\text{s}$, Linear current ramp, Maximum ramp value = $\pm 10\text{ A}$	'4015 '4030 '4040		±33 ±57 ±74	V
$I_{(BO)}$ Breakover current	$di/dt = \pm 0.8\text{ A/ms}$			±0.8	A
V_T On-state voltage	$I_T = \pm 5\text{ A}$, $t_w = 100\text{ }\mu\text{s}$			±3	V
I_D Off-state current	$V_D = \pm 6\text{ V}$ $V_D = \pm 13\text{ V}$ $V_D = \pm 22\text{ V}$	'4015 '4030 '4040		±2	μA
I_H Holding current	$I_T = \pm 5\text{ A}$, $di/dt = -/+30\text{ mA/ms}$	±50			m A

TISP40xxH1BJ VLV Overvoltage Protector Series



Electrical Characteristics, $T_A = 25\text{ }^\circ\text{C}$ (Unless Otherwise Noted) (Continued)

Parameter	Test Conditions	Min	Typ	Max	Unit
C_{off} Off-state capacitance	f = 1 MHz, $V_d = 1\text{ V rms}$, $V_D = 0$	'4015	78	100	pF
		'4030	62	81	
		'4040	59	77	
	f = 1 MHz, $V_d = 1\text{ V rms}$, $V_D = 1\text{ V}$	'4015	70	90	
		'4030	55	72	
		'4040	52	68	
	f = 1 MHz, $V_d = 1\text{ V rms}$, $V_D = 2\text{ V}$	'4015	65	85	
		'4030	50	65	
		'4040	47	61	

Thermal Characteristics

Parameter	Test Conditions	Min	Typ	Max	Unit
$R_{\theta JA}$ Junction to free air thermal resistance	EIA/JESD51-3 PCB, $I_T = I_{TSM(1000)}$, $T_A = 25\text{ }^\circ\text{C}$, (see Note 3)			115	$^\circ\text{C/W}$
	265 mm x 210 mm populated line card, 4-layer PCB, $I_T = I_{TSM(1000)}$, $T_A = 25\text{ }^\circ\text{C}$		52		

NOTE 3: EIA/JESD51-2 environment and PCB has standard footprint dimensions connected with 5 A rated printed wiring track widths.