

## New Dual and Triple 2 x 100 A 10/1000 Overvoltage Protectors in TO-220 Pin Compatible Single In Line Package

### Features

- 2 x 100 A 10/1000 surge
  - Provides high level of protection
  - Rated current may be applied simultaneously to T & R terminals
- Low-height TO-220 pin compatible package
- Single chip construction gives close voltage matching
- Extensive voltage selections available to meet application requirements
  - TISP3xxxH3SL 70 V to 350 V
  - TISP7xxxH3SL 70 V to 400 V
- Functional replacements for Pxx02Ax, Pxx03Ax and TLPxxxG-1 parts (see table)

The dual-bidirectional TISP3xxxH3SL and triple element bidirectional TISP7xxxH3SL are 2 x 100A 10/1000 rated overvoltage protectors. They are intended to protect exposed telecom applications where a fuse is fitted but little or no additional series resistance can be used, and requirements such as FCC Part 68 or GR-1089-CORE must be met. Supplied in the TO-220 pin compatible low-height 3-pin single in line (SL) package, these devices offer a full range of protection voltages, and are 2 x 100A 10/1000 versions of our popular 35A 10/1000 TISP3xxxF3SL and TISP7xxxF3SL.

The TISP3xxxH3SL dual bidirectional configuration means that the protection voltage from Tip to Ring will be twice the Tip or Ring to Ground voltage. The TISP7xxxH3SL triple bidirectional design means the protection voltage between each terminal pair is the same. Both designs allow the simultaneous conduction of lightning or power line surges from the Tip and Ring terminals to Ground, as required by ITU-T K.20/21 and GR-1089-CORE.

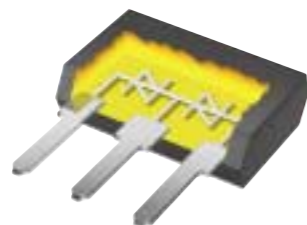
We invite you to request your free datasheet and sample with the pre-paid card enclosed.

### TISP3xxxH3SL and TISP7xxxH3SL Product Ranges

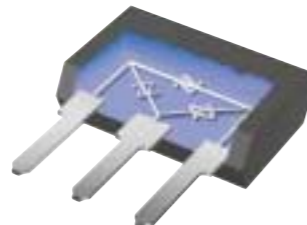
Device Number	Stand-Off Voltage $V_{DRM}$	Protection Voltage $V_{(BO)}$	$I_{TSP}$ Ratings for Lightning Surge Standards		Functional Replacement for
Number			2/10 $\mu$ s	10/1000 $\mu$ s	
TISP3070H3SL	58	70	500	100	P1402AB, P1402AC
TISP3080H3SL	65	80	500	100	P1602AB, P1602AC
TISP3095H3SL	75	95	500	100	*
TISP3115H3SL	90	115	500	100	P2202AB, P2202AC
TISP3125H3SL	100	125	500	100	P2202AB, P2202AC
TISP3135H3SL	110	135	500	100	*
TISP3145H3SL	120	145	500	100	P2702AB, P2702AC
TISP3180H3SL	145	180	500	100	P3002AB, P3002AC
TISP3210H3SL	160	210	500	100	P3602AB, P3602AC
TISP3250H3SL	190	250	500	100	P4202AB, P4202AC
TISP3290H3SL	220	290	500	100	P4802AB, P4802AC
TISP3350H3SL	275	350	500	100	P6002AB, P6002AC
TISP7070H3SL	58	70	500	100	*
TISP7080H3SL	65	80	500	100	*
TISP7095H3SL	75	95	500	100	*
TISP7125H3SL	100	125	500	100	*
TISP7135H3SL	110	135	500	100	*
TISP7145H3SL	120	145	500	100	*
TISP7165H3SL	130	165	500	100	P1553AB, P1553AC
TISP7180H3SL	145	180	500	100	P1553Ax, TLP140G-1
TISP7200H3SL	150	200	500	100	P1803AB, P1803AC
TISP7210H3SL	160	210	500	100	P1803Ax
TISP7220H3SL	170	220	500	100	P2103AB, P2103AC
TISP7250H3SL	200	250	500	100	P2103Ax, P2353Ax, TLP200G-1
TISP7290H3SL	230	290	500	100	P2703Ax, TLP200G-1
TISP7350H3SL	275	350	500	100	P3203Ax
TISP7400H3SL	300	400	500	100	P3403Ax, TLP270G-1

\* Only Bourns offers these voltage variants.

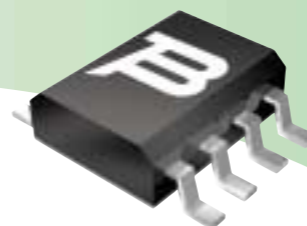
TISP3xxxH3SL



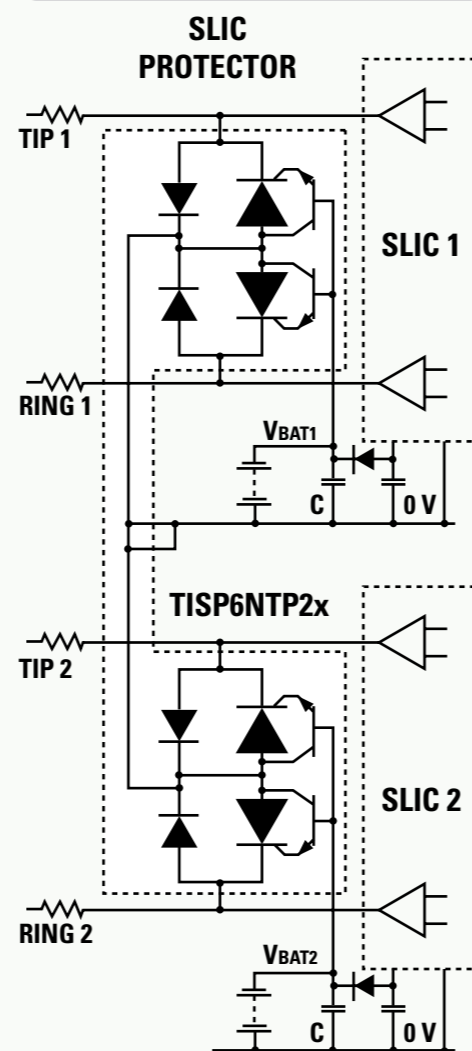
TISP7xxxH3SL



## The new TISP6NTP2x is the most cost effective single device to protect two short loop telephone lines.



### TISP6NTP2x Protecting 2 SLICs



With the increase of cable modems and Pairgain systems regenerating two or more POTS (Plain Old Telephone Service) lines for use within a building, we have released a single device which can protect two telephone lines with different battery voltages.

The TISP6NTP2x has four thyristor, diode and transistor structures to provide independent four wire protection. This level of integration allows the saving of PCB real estate with only one protector required between lines. This becomes a real benefit with say, 8 or 16 lines when you are saving up to eight devices per system or board.

This type of protector is essential when protecting modern SLICs which specify overvoltages in relation to the battery voltage ( $V_{BAT}$ ). Only a programmable protector reference to the battery supply can limit the negative voltages to within a few volts of  $V_{BAT}$ .

We invite you to request your free datasheet and sample with the pre-paid card enclosed.

Device	Voltage Rating
TISP6NTP2A	-90V
TISP6NTP2B	-120V

### Features

- TISP6NTP2 protects two SLICs with one device
- Voltage Range:
  - TISP6NTP2A: 0 to -90V
  - TISP6NTP2B: 0 to -120V
- 20A 10/1000 Surge performance over full operating temperature range
- Ensures standards compliance
- Applications include PABX, Wireless in the local loop, Fiber in the loop, Pairgain, Routers and many more applications where short loop POTS lines are exposed

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**Single Bidirectional & Single Unidirectional** Overvoltage protectors in 2-pin surface mount SMB (DO-214AA) package

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**TISP4xxxL3BJ**  
Cost effective Modem protectors rated for FCC Part 68 surges and UL1950 / UL60950 power cross  
**TISP4360H3BJ**  
Dedicated ADSL Modem and ADSL Splitter protection, rated to comply with FCC Part 68

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**Single Bidirectional** Overvoltage protectors in through-hole DO-92 (modified TO-92) package

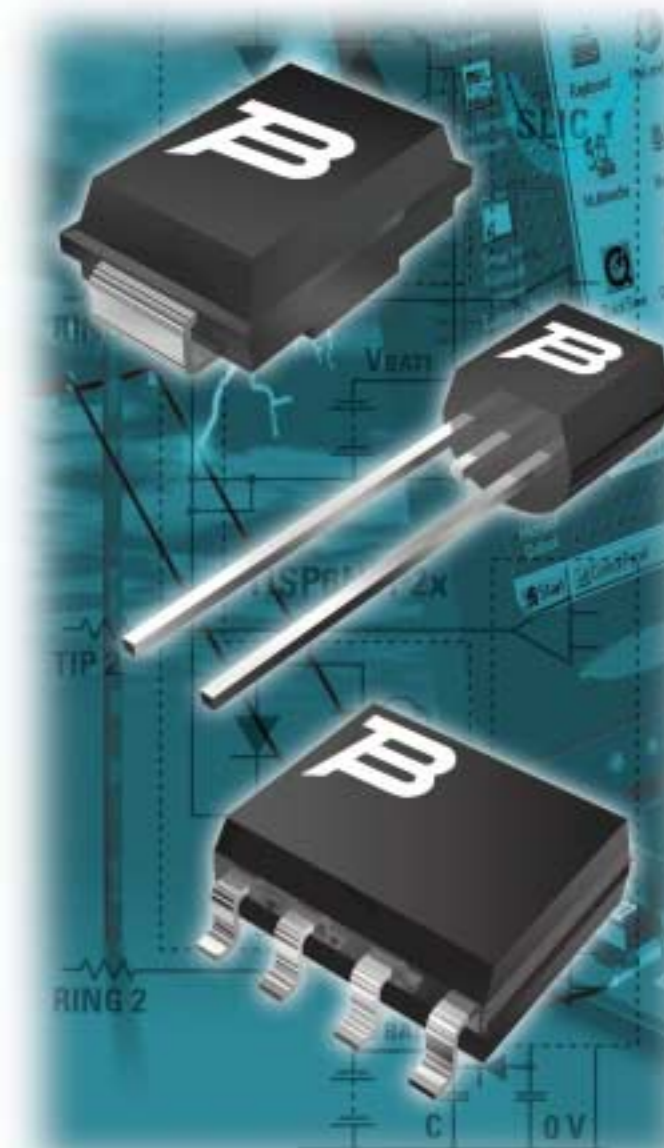
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**TISP3xxxH3SL & TISP7xxxH3SL**  
Dual and triple 2 x 100A 10/1000 overvoltage protectors in TO-220 compatible Single In Line package

6

**TISP6NTP2**  
Quad-programmable overvoltage protection for 2 SLICs with battery voltages down to -105 V

## NEW TISP® Telecom Overvoltage Protection Products Extend Circuit Protection Range

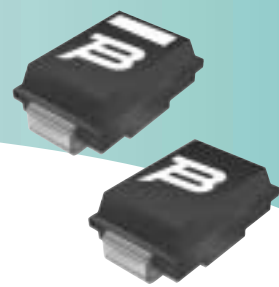


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# Overvoltage Protectors in Surface Mount SMB (DO-214AA) Packages



These surface mount TISP® (Thyristor Integrated Surge Protector) devices protect telecom equipment from transients introduced to the line by lightning and power line induction. Each device is specified and characterized to enable equipment to meet and exceed equipment standards and recommendations, including ITU-T K.20/21/45, FCC Part 68, UL1950 / UL60950 and Telcordia (Bellcore) GR-1089-CORE. The small size of the SMB (DO-214AA) package minimizes PCB footprint and provides an economical protection solution.

## TISP4xxxxBJ - Single Bidirectional

The single bidirectional TISP4xxxxBJ family provides one of the most flexible protection solutions. The device can be used singly for applications where there is no ground connection, in pairs to provide ground reference protection, or three can be connected in delta or star configuration to provide three way protection for critical applications. This flexibility allows the device to protect a wide range of applications from modem, fax and telephone subscriber equipment to ISDN, NT and analog and digital line cards.

The range is available with two lightning surge ratings 50A 10/1000 (100A 9/720) and 100A 10/1000 (200A 9/720), 18 protection voltage options from 70V to 400V and two holding current options to ensure an accurate match with the application requirements.

## TISP5xxxH3BJ - Single Unidirectional

The single unidirectional TISP5xxxH3BJ consists of a voltage triggered unidirectional thyristor with an anti-parallel diode. The thyristor section operates by initially clipping the overvoltage by breakdown clamping until the current rises to the breakover level causing the device to crowbar into a low impedance on-state. The device will automatically reset to the high impedance off-state as the transient subsides. The diode section limits overvoltages to one diode drop under impulse and a.c. conditions.

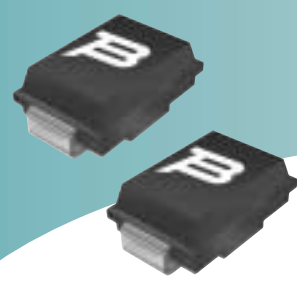
The TISP5xxxH3BJ is available in four voltage variants, ideal for SLIC linecard and xDSL applications.

Both the diode and crowbar sections are rated for 100A 10/1000, and 200A 9/720. Nine international surge waveforms are guaranteed over an extended temperature range. Under a.c. conditions, 60A is guaranteed for 16.7 ms, allowing the reduction of series resistance required.

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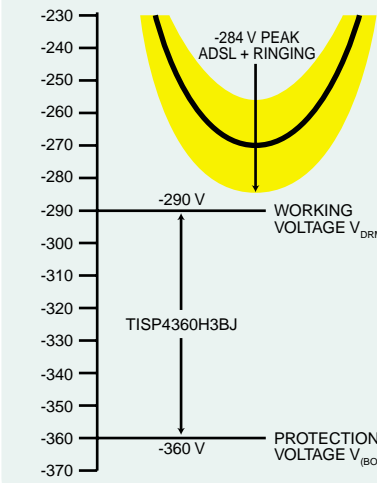
Device	Protection Voltage	10/1000 $\mu$ s Surge Rating	Holding Current	Characteristics
TISP4xxxM3BJ	70V to 400V with 18 variants	50A	150mA	
TISP4xxxH3BJ	70V to 400V with 18 variants	100A	150mA	
TISP4xxxH4BJ	165V to 360V with 6 variants	100A	225mA	
TISP5xxxH3BJ	-70V to -150V with 4 variants	100A	150mA	

# TISP4360H3BJ - Dedicated Overvoltage Protection for ADSL Modems & Splitters



## Normal System Voltage Levels

$\pm 15V$  ADSL signal shown as yellow band



The TISP4360H3BJ is designed to protect ADSL modems and ADSL splitters from transients induced by lightning and power lines, while minimizing disruption to normal system operation.

A conventional analog modem protector would have a 275V working voltage to ensure that it would not clip the 269V peak ringing voltage (FCC Part 68 - Clause b. 312). ADSL modem and ADSL splitter applications have a  $\pm 15V$  ADSL signal superimposed on the analog ringing signal. This -284V peak would be clipped by a conventional analog modem protector, disrupting normal system operation. The TISP4360H3BJ's 290V working voltage is designed to comfortably exceed the permitted 284V, allowing the system to operate normally.

We invite you to request your free datasheet and sample with the pre-paid card enclosed.

# Cost-Effective Modem Protection Specified for FCC Part 68 Surges and UL/CSA Power Cross

The TISP4350L3BJ and TISP4070L3BJ are designed to protect equipment such as modems against FCC Part 68 Type A and B surges and UL1950 / UL60950 Clause 6 power cross. The 350V protection voltage of the TISP4350L3BJ allows it to protect a modem hook switch and comply with the FCC Part 68 Type B ringer voltage. The TISP4070L3BJ's 58V working voltage provides additional protection for the modem electronics.



These devices feature a 40A 9/720 surge rating, requiring no additional series resistance to comply with the 37.5A 9/720 lightning surge requirements of FCC Part 68. Hence the TISP4xxxL3BJ can provide optimum protection for cost-sensitive customer premise equipment. In addition, the inherent low capacitance of these devices (39 pF @ 5V bias for the TISP4070L3BJ and 25 pF for the TISP4350L3BJ) make them ideal for high data rate digital applications.

## Features

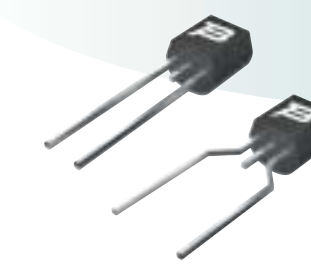
### TISP4360H3BJ

- Matched to POTS + ADSL Voltages
- Specified to allow compliance with UL1950 / UL60950 - Detailed power line cross specification
- High Surge Current ratings for ITU-T K.20/K.21/K.45, FCC Part 68, UL1950 / UL60950 and GR1089

## Features

### TISP4350L3BJ and TISP4070L3BJ

- Ideal for modem hook switch and electronics protection
- Optimized for cost-sensitive applications
- Protects against FCC Part 68 Type A and B surges and UL / CSA power cross
- Inherent low capacitance for high data rate digital applications
- Extensive applications information for UL / CSA compliance included in the datasheet



# TISP4xxx3LM Single Bidirectional Through-Hole Surge Protectors

## Features

- Available in 50A, 100A, 200A 9/720 surge ratings
- Rated for all ITU-T K.20, K.21 and K.45 surges and a.c. requirements
- Specified for FCC Part 68, UL1950 / UL60950
- Applications include Modems, ADSL Modems, Fax Machines, Telephones, Surge Bars

Supplied in the space saving through-hole DO-92 (modified TO-92) packages, our latest range of overvoltage protectors are designed for use in 2-wire telecom applications.

The TISP4xxx3LM devices feature 50A, 100A and 200A 9/720 surge ratings with up to 17 different operating voltages from 58V to 300V. This provides a flexible protection solution for 2-wire telecom equipment such as telephones, fax machines and modems.

The devices are comprehensively specified for a full range of international requirements including ITU-T K.20, K.21, K.45 and FCC Part 68, UL1950 / UL60950. In addition, the devices are guaranteed for real world conditions with protection voltages guaranteed under lightning surge conditions. Both the TISP4xxxM3LM and TISP4xxxH3LM have surge ratings ( $I_{TSP}$ ) guaranteed over an ambient temperature range of -40°C to 85°C.

The TISP4xxx3LM series provides a through-hole compliment to our existing range of single bidirectional surface-mount overvoltage protectors in SMB (DO-214AA) packages, ensuring that we have the protection solution to meet your requirement.

We invite you to request your free datasheet and sample with the pre-paid card enclosed.

9/720 $\mu$ s Surge Rating	Through-Hole Packages	Surface-Mount Packages Also Available
50A		
100A		
200A		