BOURNS®

TISP7015 (VLV) Overvoltage Protector

Three Terminal Very Low Voltage (VLV) Protection

**Ion-Implanted Breakdown Region
- Precise and Stable Voltage**

DEVICE	V_{DRM} V	$V_{(BO)}$ V
'7015	8	15

Protection for Signal, Data and Control Lines
- ISDN
- T1/E1
- RS232 & RS485

Low Capacitance .... **40 pF max.**

Rated for International Surge Wave Shapes

Voltage Waveshape	Standard	I_{PPSM} A
8/20	IEC 61000-4-5	150
10/700	ITU-T K.20/45/21	40
10/1000	GR-1089-CORE	30

🄄 .... **UL Recognized Components**

D Package (Top View)

T1 — 1
NC — 2
NC — 3
T2 — 4
NC — 8
NC — 7
G — 6
NC — 5

MD7XAJA

NC - No internal connection

Device Symbol

T1   T2

G

SD7XAD
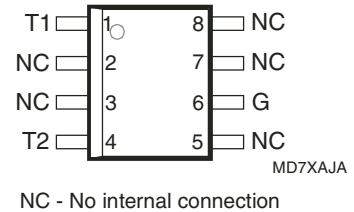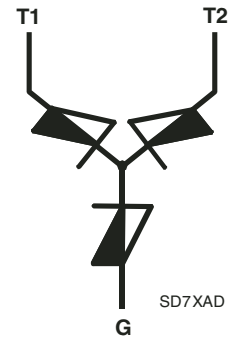
Description

The TISP7015 is a 3-point overvoltage protector designed for protecting against metallic (differential mode) and simultaneous longitudinal (common mode) impulses.

These devices are designed to limit overvoltages between signal, data and control port conductors, connected to terminals T1 and T2, and a protective ground, G. Each terminal pair has a symmetrical voltage-triggered bidirectional thyristor characteristic (Figure 1). 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. 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.

Terminals marked NC do not have any internal connections and may be left floating or tied to some circuit point.

How To Order

Device	Package	Carrier	For Standard Termination Finish Order As	For Lead Free Termination Finish Order As
TISP7015	D, Small-outline	Embossed Tape Reeled	TISP7015DR	TISP7015DR-S
		Tube	TISP7015D	TISP7015D-S

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Absolute Maximum Ratings, T_J = 25 °C (Unless Otherwise Noted)

Rating	Symbol	Value	Unit
Repetitive peak off-state voltage	V_{DRM}	± 8	V

Non-repetitive peak on-state pulse current (see Notes 1 and 2)
          8/20 (IEC 61000-4-5, clause 7.2, R = 0, combination wave generator)
          5/310 (ITU-T recommendation K.44, 10/700 generator used for K.20/45/21)
          10/1000 (Telcordia GR-1089-CORE, 10/1000 voltage wave shape)
	I_{PPSM}	150
		40
		30
			A

Non-repetitive peak on-state current (see Notes 1, 2 and 3) 50/60 Hz, 1 s	I_{TSM}	4	A
Junction temperature	T_J	-40 to +150	°C
Storage temperature range	T_{stg}	-65 to +150	°C

NOTES: 1. Initially, the TISP7015 must be in thermal equilibrium at the specified T_A. The surge may be repeated after the TISP7015 returns to its initial conditions.

2. These non-repetitive rated currents are peak values of either polarity.

3. Total return current, I_G, value.

Electrical Characteristics, T_J = 25 °C (Unless Otherwise Noted)
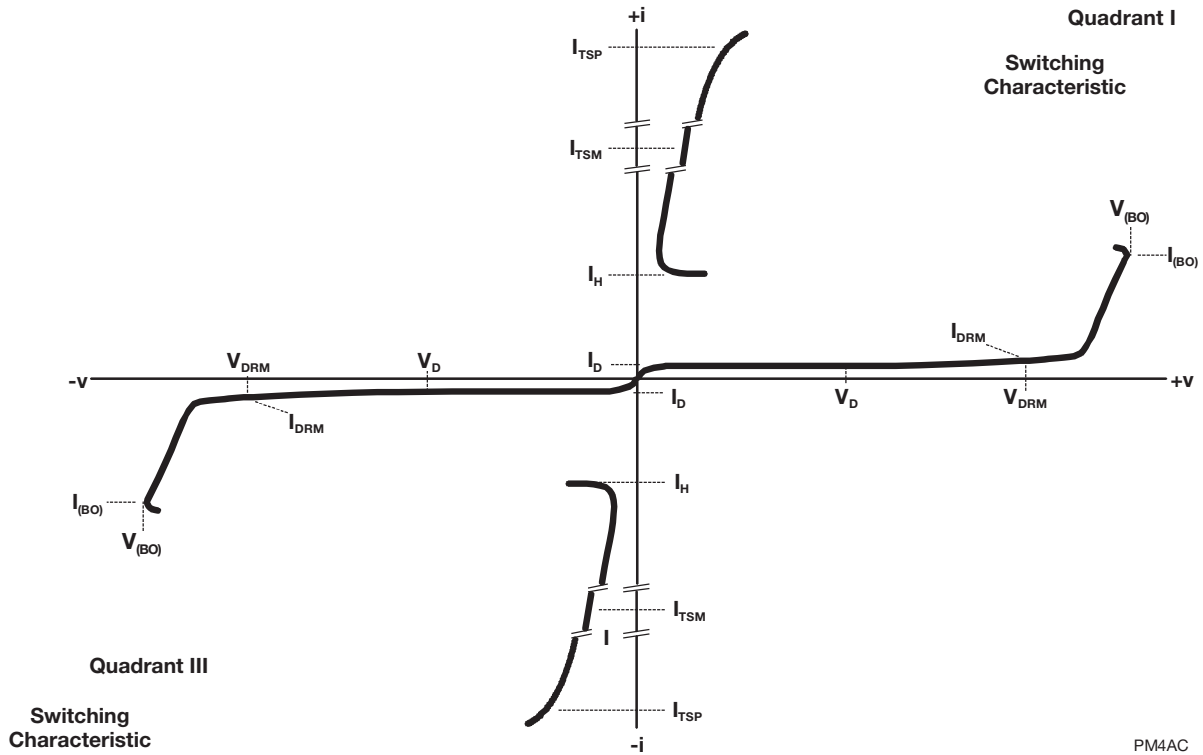
	Parameter	Test Conditions	Min	Typ	Max	Unit
I_{DRM}	Repetitive peak off-state current	$V_D = \pm V_{DRM}$			±4	µA
$V_{(BO)}$	Breakover voltage	dv/dt = ±250 V/ms, R_{SOURCE} = 300 Ω			±15	V
$I_{(BO)}$	Breakover current	dv/dt = ±250 V/ms, R_{SOURCE} = 300 Ω			±100	mA
V_T	On-state voltage	$I_T = \pm 5$ A, $t_W = 100$ µs			±4	V
I_H	Holding current	$I_T = \pm 5$ A, di/dt = +/-30 mA/ms	±30			mA
I_D	Off-state current	$V_D = \pm 0.85 V_{DRM}$, T_A = 85 °C			±10	µA
C_{KA}	Off-state capacitance	f = 1 MHz, V_d = 30 mV rms, V_D = 0 (see Note 4)		32	40	pF

NOTE 4: Three-terminal guarded measurement, unmeasured terminal voltage bias is zero.

Thermal Characteristics

	Parameter	Test Conditions	Min	Typ	Max	Unit
$R_{\theta JA}$	Junction to free air thermal resistance	P_{tot} = 0.8 Ω, T_A = 25 °C, 5 cm^2, FR4 PCB			160	°C/W

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Parameter Measurement Information

Figure 1. Voltage-Current Characteristic for any Terminal Pair

JULY 2000 - REVISED FEBRUARY 2005
Specifications are subject to change without notice.
Customers should verify actual device performance in their specific applications.

MECHANICAL DATA

Device Symbolization Code

Devices will be coded as below.

Device	Symbolization Code
TISP7015	7015

MECHANICAL DATA

D008 Plastic Small-outline Package

This small-outline package consists of a circuit mounted on a lead frame and encapsulated within a plastic compound. The compound will withstand soldering temperature with no deformation, and circuit performance characteristics will remain stable when operated in high humidity conditions. Leads require no additional cleaning or processing when used in soldered assembly.

D008

8-pin Small Outline Microelectronic Standard Package MS-012, JEDEC Publication 95

4.80 - 5.00
(0.189 - 0.197)

8 7 6 5

5.80 - 6.20
(0.228 - 0.244)

INDEX

3.81 - 4.00
(0.150 - 0.157)

1 2 3 4

1.35 - 1.75
(0.053 - 0.069)

7 ° NOM
3 Places

0.25 - 0.50
(0.010 - 0.020) x 45 ° NOM

4.60 - 5.21
(0.181 - 0.205)

0.102 - 0.203
(0.004 - 0.008)

0.36 - 0.51
(0.014 - 0.020)
8 Places

7 ° NOM
4 Places

4 ° ± 4 °

0.28 - 0.79
(0.011 - 0.031)

Pin Spacing
1.27
(0.050)
(see Note A)
6 places

0.190 - 0.229
(0.0075 - 0.0090)

0.51 - 1.12
(0.020 - 0.044)

DIMENSIONS ARE: $\frac{MM}{(INCHES)}$

MDXXAAE

NOTES: A. Leads are within 0.25 (0.010) radius of true position at maximum material condition.
   B. Body dimensions do not include mold flash or protrusion.
   C. Mold flash or protrusion shall not exceed 0.15 (0.006).
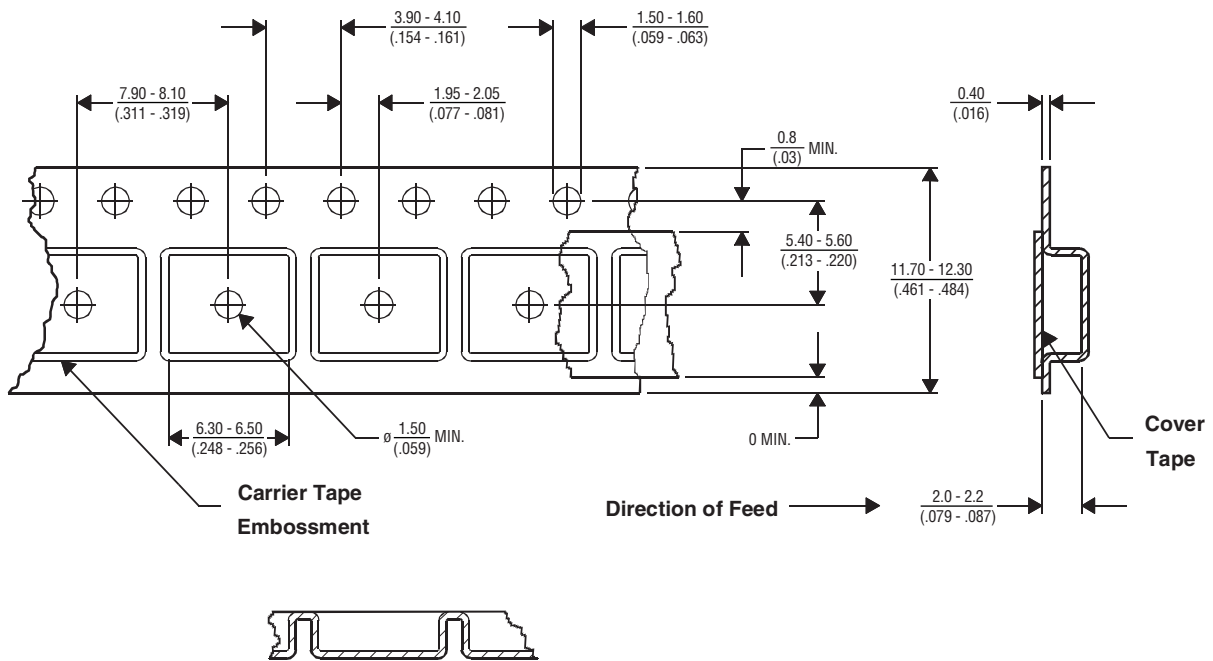   D. Lead tips to be planar within ±0.051 (0.002).

MECHANICAL DATA

D008 Tape DImensions

D008 Package (8-pin Small Outline) Single-Sprocket Tape

DIMENSIONS ARE: $\frac{MM}{(INCHES)}$

MDXXATC

NOTES: A. Taped devices are supplied on a reel of the following dimensions:-

Reel diameter: $\frac{330 +0.0/-4.0}{(12.99 +0.0/-.157)}$

Reel hub diameter: $\frac{100 \pm 2.0}{(3.937 \pm .079)}$

Reel axial hole: $\frac{13.0 \pm 0.2}{(.512 \pm .008)}$

B. 2500 devices are on a reel.