

TISP4xxxJ3BJ Overvoltage Protector Series

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

Rating	Symbol	Value	Unit
Repetitive peak off-state voltage	'4070J3BJ	± 58	V
	'4080J3BJ	± 65	
	'4095J3BJ	± 75	
	'4115J3BJ	± 90	
	'4125J3BJ	± 100	
	'4145J3BJ	± 120	
	'4165J3BJ	± 135	
	'4180J3BJ	± 145	
	'4200J3BJ	± 155	
	'4219J3BJ	± 180	
	'4250J3BJ	± 190	
	'4290J3BJ	± 220	
	'4350J3BJ	± 275	
	'4395J3BJ	± 320	
Non-repetitive peak impulse current (see Notes 1 and 2)	I_{PPSM}	± 1000	A
2/10 μs (GR-1089-CORE, 2/10 μs voltage wave shape)		± 800	
8/20 μs (IEC 61000-4-5, combination wave generator, 1.2/50 μs voltage wave shape)		± 400	
10/160 μs (TIA-968-A, 10/160 μs voltage wave shape)		± 370	
4/250 μs (ITU-T K.20/21, 10/700 μs voltage waveshape, simultaneous)		± 350	
5/310 μs (ITU-T K.20/21, 10/700 μs voltage wave shape, single)		± 350	
5/320 μs (TIA-968-A, 9/720 μs voltage waveshape, single)		± 250	
10/560 μs (TIA-968-A, 10/560 μs voltage wave shape)		± 200	
10/1000 μs (GR-1089-CORE, 10/1000 μs voltage wave shape)			
Non-repetitive peak on-state current (see Notes 1 and 2)	I_{TSM}	50	A
20 ms, 50 Hz (full sine wave)			
Initial rate of rise of on-state current. Linear current ramp. Maximum ramp value < 50 A	di_T/dt	800	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 $T_J = 25^\circ\text{C}$.

2. These non-repetitive rated currents are peak values of either polarity. The surge may be repeated after the device returns to its initial conditions.

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

Parameter	Test Conditions	Min	Typ	Max	Unit
I_{DRM} Repetitive peak off-state current	$V_D = V_{DRM}$			± 5	μA
	$T_A = 25^\circ\text{C}$ $T_A = 85^\circ\text{C}$			± 10	
$V_{(BO)}$ AC Breakover voltage	$dv/dt = \pm 250 \text{ V/ms}$, $R_{SOURCE} = 300 \Omega$			± 70	V
				± 80	
				± 95	
				± 115	
				± 125	
				± 145	
				± 165	
				± 180	
				± 200	
				± 219	
				± 250	
				± 290	
				± 350	
				± 395	

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Users should verify actual device performance in their specific applications.

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

Parameter	Test Conditions	Min	Typ	Max	Unit
$V_{(BO)}$ Ramp breakover voltage	$dv/dt \leq \pm 1000 \text{ V}/\mu\text{s}$, Linear voltage ramp, Maximum ramp value = $\pm 500 \text{ V}$ $di/dt = \pm 20 \text{ A}/\mu\text{s}$, Linear current ramp, Maximum ramp value = $\pm 10 \text{ A}$			± 77 ± 88 ± 104 ± 125 ± 135 ± 156 ± 177 ± 192 ± 212 ± 231 ± 263 ± 303 ± 364 ± 409	V
$I_{(BO)}$ Breakover current	$dv/dt = \pm 250 \text{ V}/\text{ms}$, $R_{\text{SOURCE}} = 300 \Omega$			± 900 ± 800 ± 600	mA
I_H Holding current	$I_T = \pm 5 \text{ A}$, $di/dt = \pm 30 \text{ mA}/\text{ms}$	± 150		± 600	mA
dv/dt Critical rate of rise of off-state voltage	Linear voltage ramp Maximum ramp value $< 0.85V_{\text{DRM}}$	± 5			kV/ μs
I_D Off-state current	$V_D = \pm 50 \text{ V}$ $T_A = 85^\circ\text{C}$			± 10	μA
C_O Off-state capacitance	$f = 1 \text{ MHz}$, $V_d = 1 \text{ V rms}$, $V_D = 0$		195	235	pF
			120	145	
			105	125	
	$f = 1 \text{ MHz}$, $V_d = 1 \text{ V rms}$, $V_D = -1 \text{ V}$		180	215	
			110	132	
			95	115	
	$f = 1 \text{ MHz}$, $V_d = 1 \text{ V rms}$, $V_D = -2 \text{ V}$		165	200	
			100	120	
			90	105	
	$f = 1 \text{ MHz}$, $V_d = 1 \text{ V rms}$, $V_D = -50 \text{ V}$		85	100	
			50	60	
			42	50	
	$f = 1 \text{ MHz}$, $V_d = 1 \text{ V rms}$, $V_D = -100 \text{ V}$ (see Note 3)		40	50	
			35	40	

NOTE: 3. To avoid possible clipping, the TISP4125J3BJ is tested with $V_D = -98 \text{ V}$.

Thermal Characteristics

Parameter	Test Conditions	Min	Typ	Max	Unit
$R_{\theta JA}$ Junction to ambient thermal resistance	EIA/JESD51-3 PCB, $I_T = I_{\text{TSM}(1000)}$ (see Note 4)			90	$^\circ\text{C}/\text{W}$

NOTE: 4. EIA/JESD51-2 environment and PCB has standard footprint dimensions connected with 5 A rated printed wiring track widths.

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Parameter Measurement Information

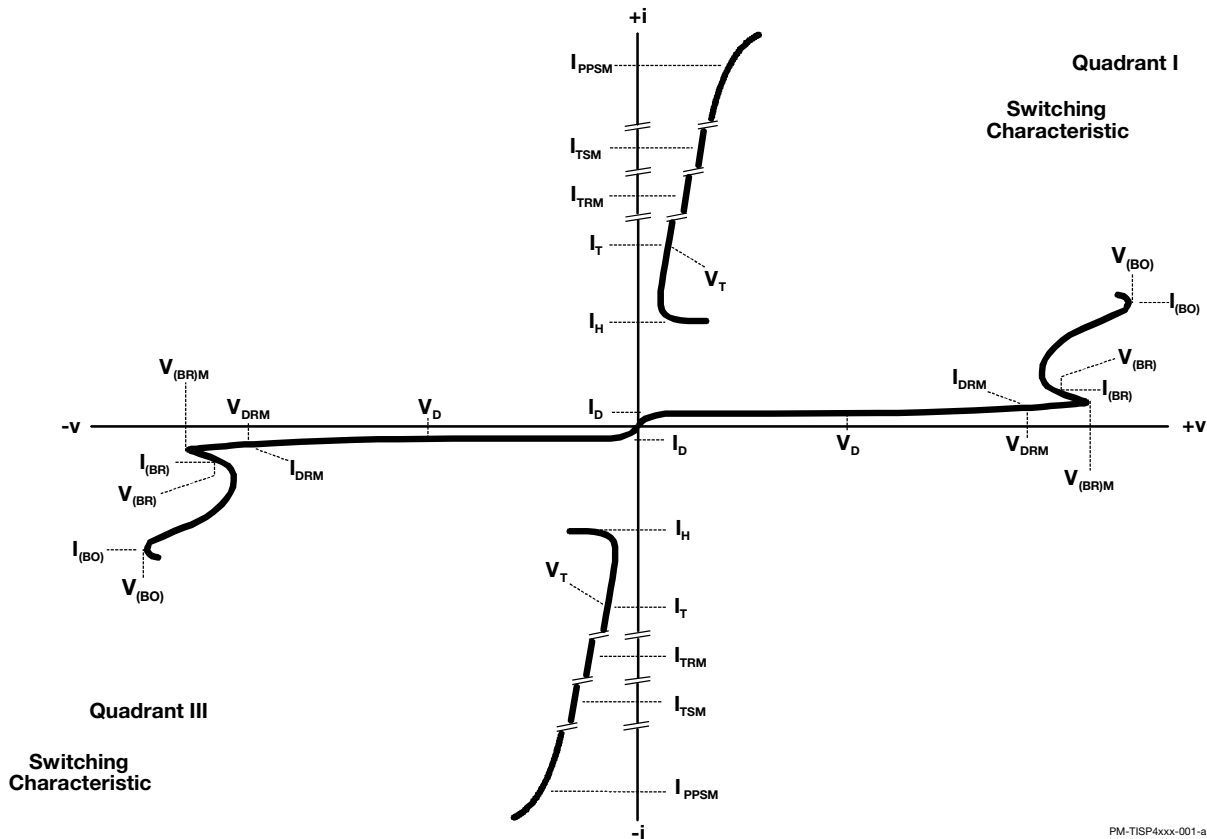


Figure 1. Voltage-Current Characteristic for T and R Terminals
All Measurements are Referenced to the R Terminal

PM-TISP4xxx-001-a

Typical Characteristics

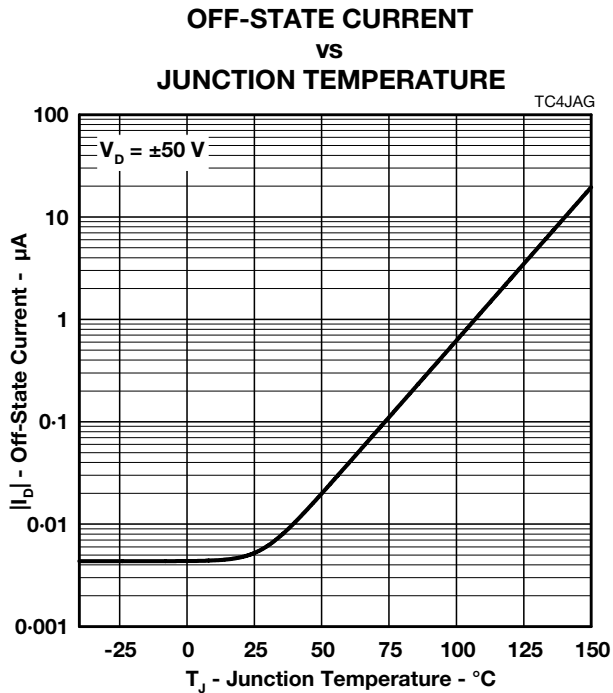


Figure 2.

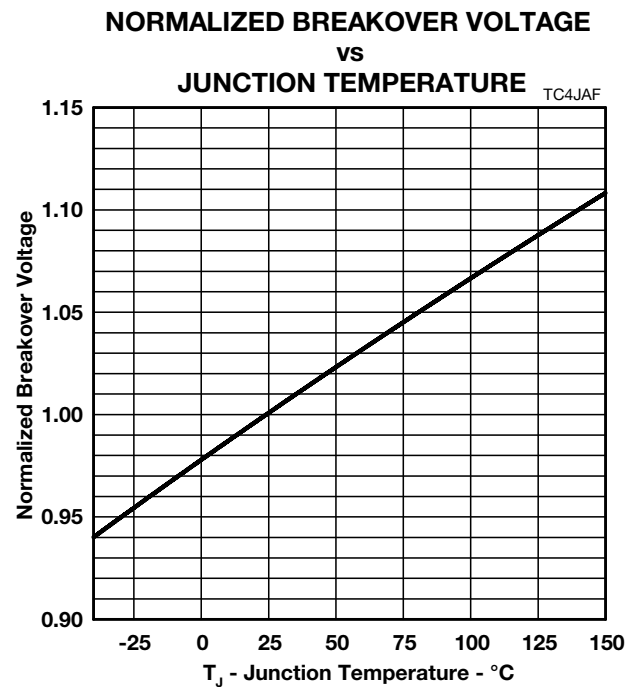


Figure 3.

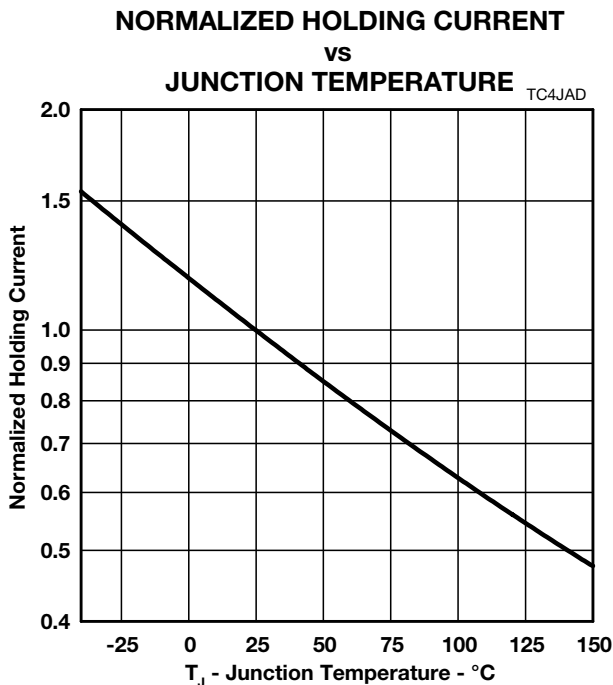


Figure 4.

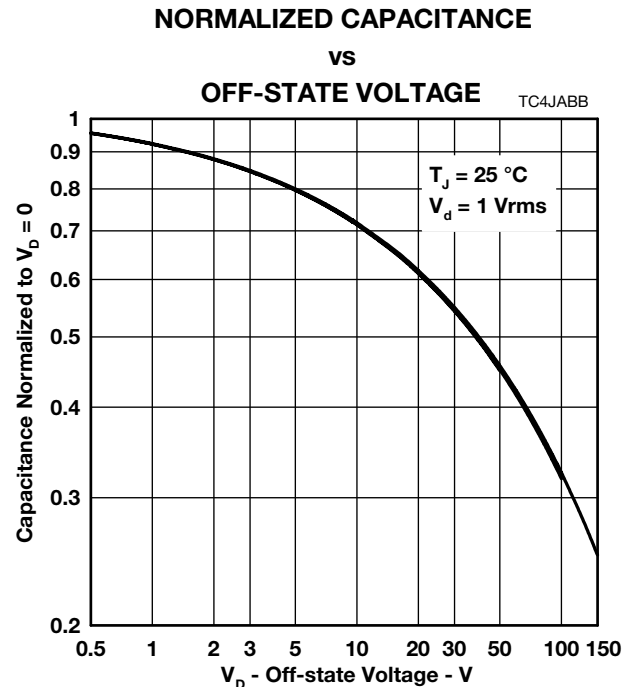


Figure 5.

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Rating and Thermal Characteristics

NON-REPETITIVE PEAK ON-STATE CURRENT VS CURRENT DURATION

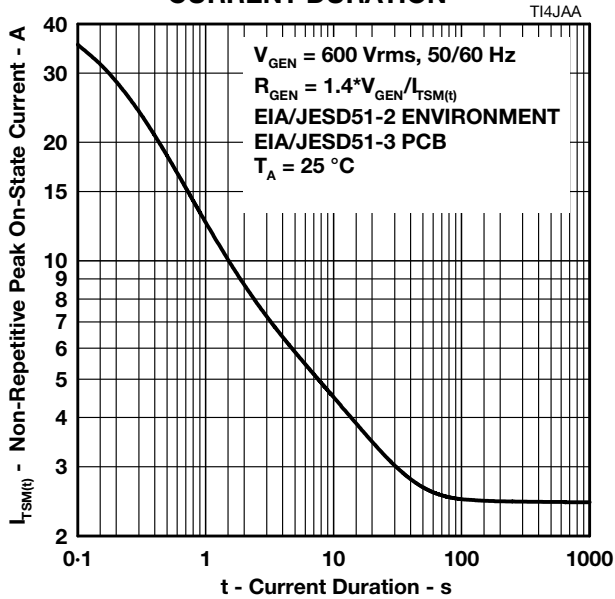


Figure 6.

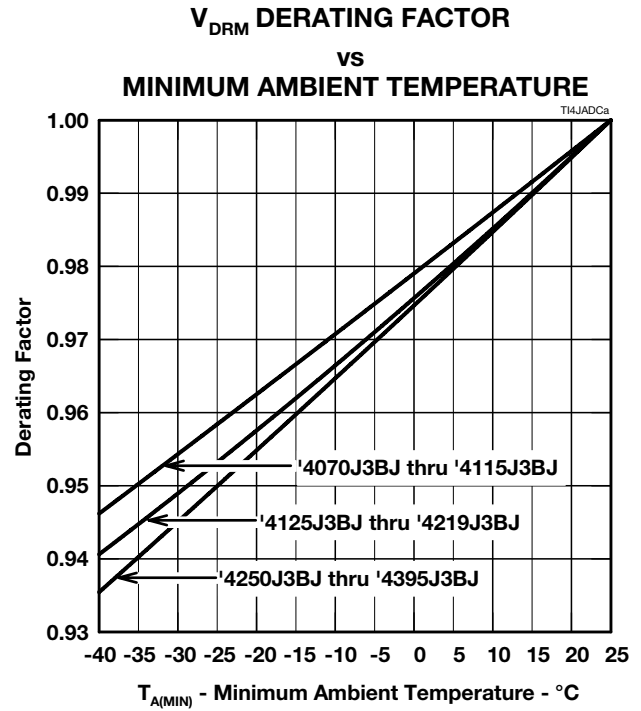


Figure 7.

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Applications Information

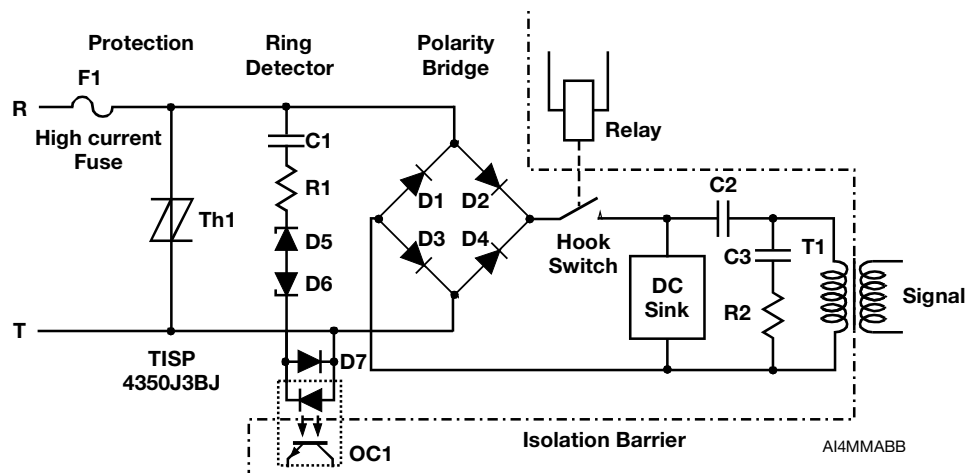


Figure 8. Typical Application Circuit

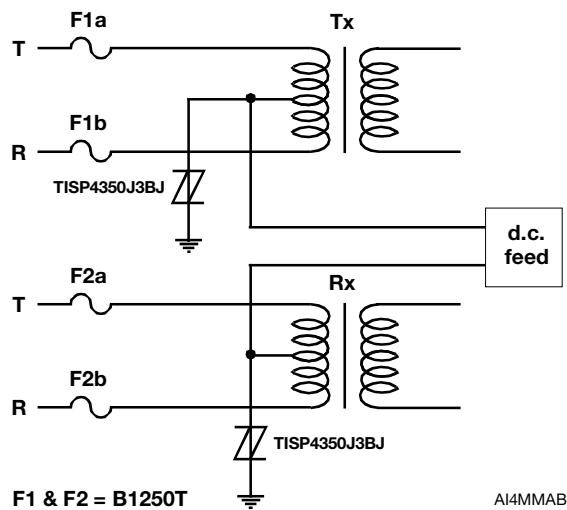


Figure 9. Typical Application Circuit

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