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

Rating		Symbol	Value	Unit
Repetitive peak off-state voltage, I_G = 0	-40 °C ≤ T_J ≤ 85 °C	V_{DRM}	-170	V
Repetitive peak gate-cathode voltage, V_{KA} = 0	-40 °C ≤ T_J ≤ 85 °C	V_{GKRM}	-167	
Non-repetitive peak on-state pulse current (see Notes 1 and 2) 10/1000 µs (Bellcore GR-1089-CORE, Issue 1, November 1994, Section 4) 5/320 (ITU-T K.20/21/45, YD/T-950, open circuit voltage waveshape 10/700) 2/10 (Bellcore GR-1089-CORE, Issue 1, November 1994, Section 4)		I_{TSP}	 30 40 120	A
Non-repetitive peak on-state current, 60 Hz (see Notes 1, 2 and 3) 900 s		I_{TSM}	 0.5	A
Non-repetitive peak gate current, 2/10 µs pulse, cathodes commoned (see Notes 1 and 2)		I_{GSM}	40	A
Junction temperature		T_J	-40 to +150	°C
Storage temperature range		T_{stg}	-40 to +150	°C

NOTES: 1. Initially the protector must be in thermal equilibrium with T_J = 25 °C. The surge may be repeated after the device returns to its initial conditions.
2. These non-repetitive rated currents are peak values for either polarity. The rated current values may be applied to any cathode-anode terminal pair. Additionally, all cathode-anode terminal pairs may have their rated current values applied simultaneously (in this case the anode terminal current will be four times the rated current value of an individual terminal pair).
3. EIA/JESD51-2 environment and EIA/JESD51-7 high effective thermal conductivity test board (multi-layer) connected with 0.6 mm printed wiring track widths.

Recommended Operating Conditions

		Min	Typ	Max	Unit
C_G	Gate decoupling capacitor		100		nF
R_S	TISP61089Q series resistor for first-level and second-level surge survival TISP61089Q series resistor for first-level surge survival	40 25			Ω

Electrical Characteristics, T_J = 25 °C (Unless Otherwise Noted)

Parameter		Test Conditions		Min	Typ	Max	Unit
I_D	Off-state current	V_D = V_{DRM}, V_{GK} = 0				-5	µA
$V_{(BO)}$	Breakover voltage	10/700 µs, I_T = -40 A, R_S = 55 Ω, V_{GG} = -48 V, C_G = 100nF				-64	V
V_F	Forward voltage	I_F = 5 A, t_w = 200 µs				3	V
V_{FRM}	Peak forward recovery voltage	10/700 µs, I_F = 40 A, R_S = 55 Ω, V_{GG} = -48 V, C_G = 100nF			12		V
I_H	Holding current	I_T = -1 A, di/dt = 1 A/ms, V_{GG} = -100 V		-150			mA
I_{GAS}	Gate reverse current	V_{GG} = V_{GK} = V_{GKRM}, V_{KA} = 0				-5	µA
I_{GT}	Gate trigger current	I_T = 3 A, $t_{p(g)}$ ≥ 20 µs, V_{GG} = -100 V				5	mA
V_{GT}	Gate trigger voltage	I_T = 3 A, $t_{p(g)}$ ≥ 20 µs, V_{GG} = -100 V				2.5	V
C_{AK}	Anode-cathode off-state capacitance	f = 1 MHz, V_d = 1 V I_G = 0, (see Note 4)	V_D = -3V			100	pF
			V_D = -48V			50	

Thermal Characteristics

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

Parameter Measurement Information

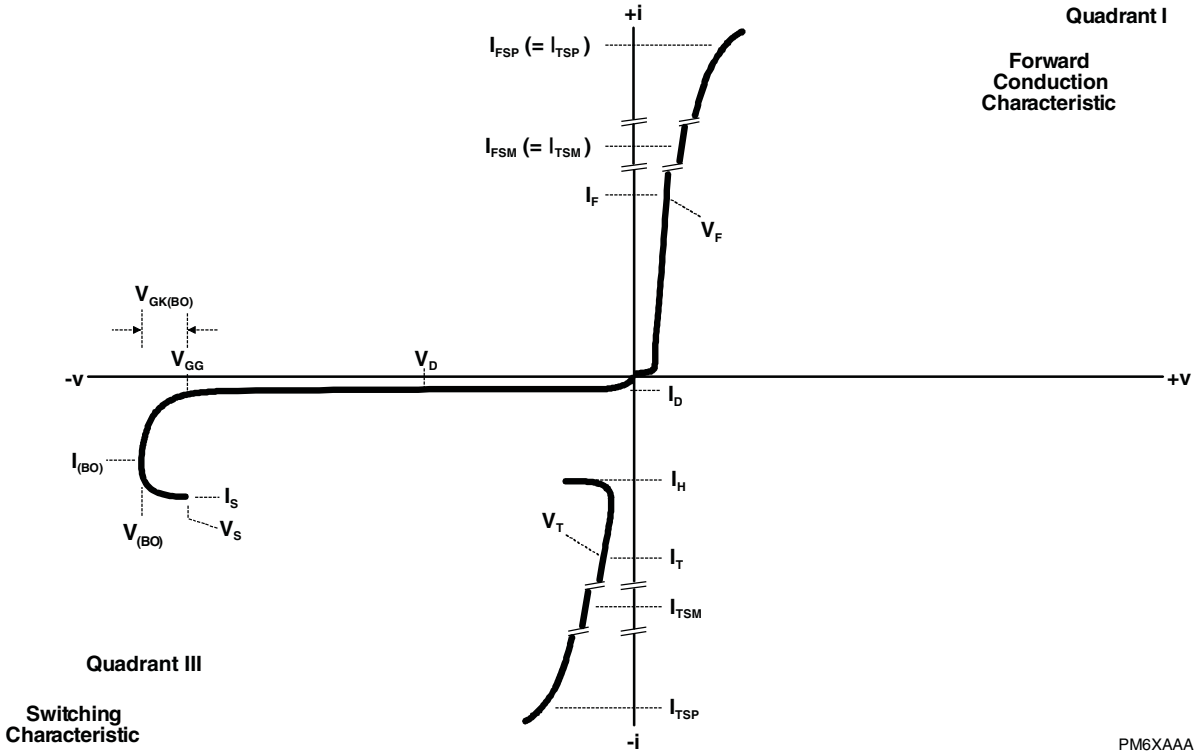

Figure 1. Voltage-Current Characteristic

Applications Information

Typical Applications Circuit

Figure 2 shows a typical TISP61089Q SLIC card protection circuit. The incoming line conductors, Ring (R) and Tip (T), connect to the relay matrix via the series overcurrent protection. Positive temperature coefficient (PTC) resistors can be used for overcurrent protection. Resistors will reduce the prospective current from the surge generator for both the TISP61089Q and the ring/test protector.

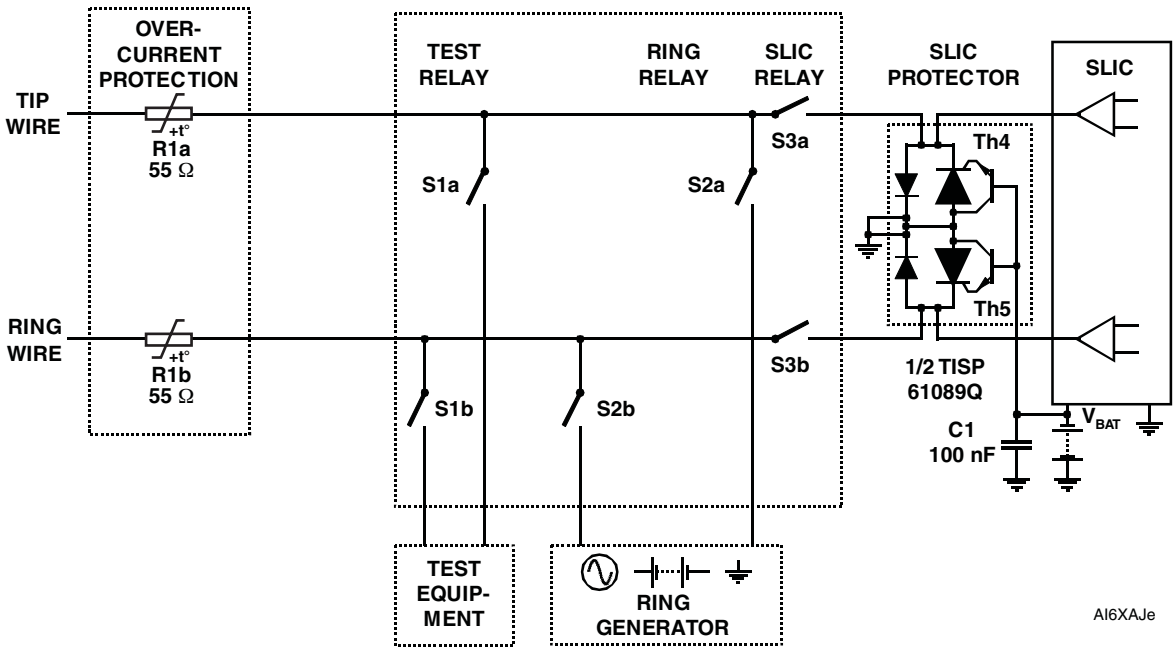

Figure 2. Typical Application Circuit

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