TWEOS61089-12

TDA ELEKTRONIC TECHNOLOGY PTE LTD
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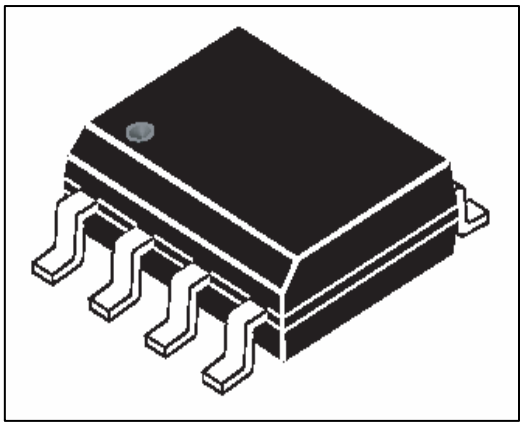
Features

- **Dual programmable transient suppressor.**
- **Wide negative firing voltage range:**
  V_{GKRM} = -120V max.
- **Low dynamic switching voltage:**
  V_{FRM} and $V_{GK(BD)}$
- **Low gate triggering current:**
  I_{GT} = 5ma max
- **Peak pulse current:**
  I_{PP} = 40A for 5/310µs surge
  I_{PP} = 30A for 10/1000us surge
- **Holding current:**
  I_H=150mA min.



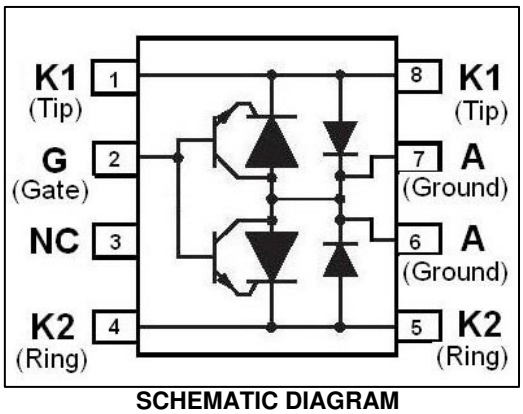
Description

This device has been especially designed to protect subscriber line card interfaces (SLIC) against transient overvoltages.

Positive overloads are clipped with 2 diodes. Negative surges are suppressed by 2 thyristors, their breakdown voltage being referenced to -V_{BAT} through the gate.

This component presents a very low gate trigge-ring current (I_{GT}) in order to reduce the current consumption on printed circuit board during the firing phase.

A particular attention has been given to the internal wire bonding. The “4-point” configuration ensures reliable protection, eliminating the overvoltage introduced by the parasitic inductances of the wiring (Ldi/dt), especially for very fast transients.



SCHEMATIC DIAGRAM

Bellcore

TR-NWT-001089

'1089 TEST CLAUSE AND TEST #	Voltage waveform (µs)	Required peak current (A)
4.5.8 Second-Level 1	2/10µs	120
4.5.7 first-Level 3	10/1000µs	30

'1089 TEST CLAUSE AND TEST #	60 Hz power fault time	Required peak current (A)
4.5.13 Second-Level 2	100ms	11
4.5.13 Second-Level 2	1s	4.5
4.5.13 Second-Level 2	5s	2.4
4.5.13 Second-Level 1	300s	0.95
4.5.13 Second-Level 1	900s	0.93

Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
I_{pp}	Non-repetitive peak on-state pulse current 10/1000µs 5/310µs 2/10µs	 30 40 120	A
I_{TSM}	Non repetitive surge peak on-state current (sinusoidal) 60Hz 0.1s 1s 5s 300s 900s	 11 4.5 2.4 0.95 0.93	A
V_{DRM}	Maximum voltage LINE/GROUND	-120	V
V_{GKRM}	Maximum voltage GATE/LINE	-120	
T_A	Operating free-air temperature range	-40 to +85	℃
T_{STG}	Storage temperature range	-40 to +150	
T_J	Junction temperature	-40 to +150	
T_L	Maximum lead temperature for soldering during 10S	260	

Thermal Resistance

Symbol	Parameter	Value	Unit
$R_{TH(j-a)}$	Junction to ambient	170	℃/W

Electrical Characteristics (T_{amb}=25℃)

Symbol	Parameter
I_D	Off-state current
I_H	Holding current
$V_{(BO)}$	Breakover voltage
V_F	Forward voltage
V_{FRM}	Peak forward recovery voltage
$V_{GK(BD)}$	Gate-cathode impulse breakover voltage
I_{GKS}	Gate reverse current
I_{GT}	Gate trigger current
V_{GT}	Gate-cathode trigger voltage
C_{KA}	Cathode-anode off-state capacitance

Measurement Figure

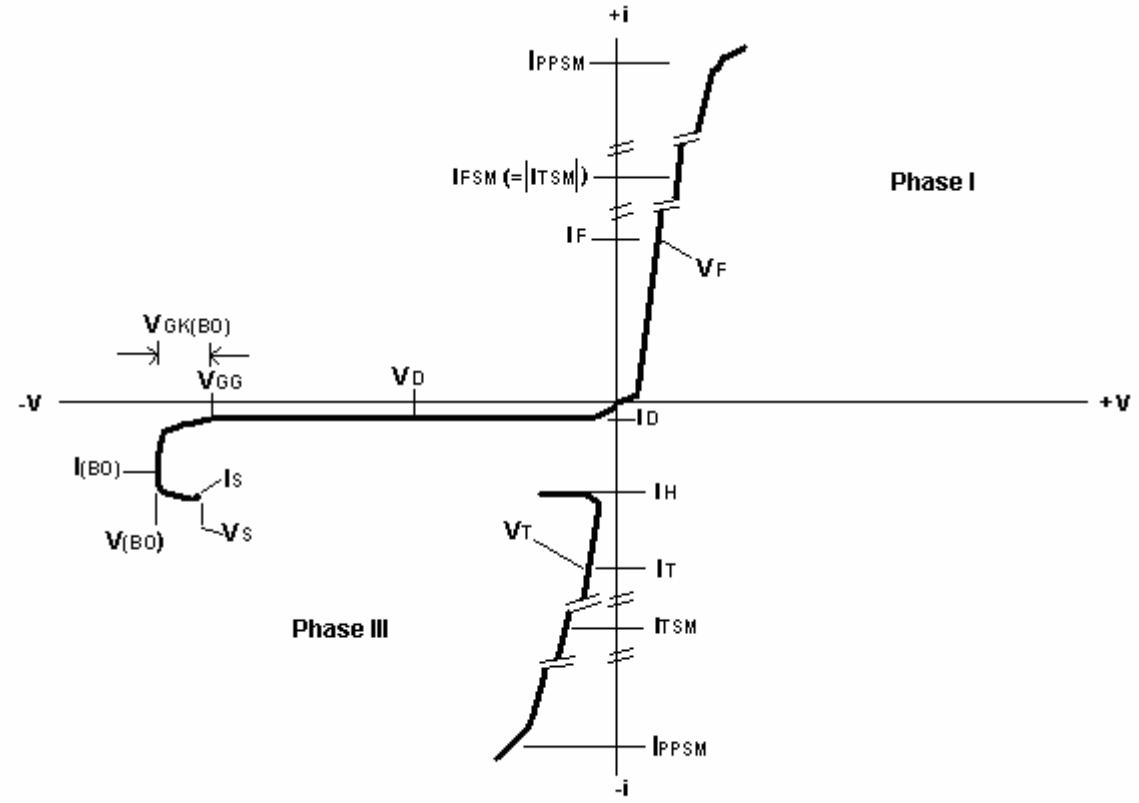


Figure 1. Voltage-Current (V-I) Characteristic

Parameters Related to The Diode (T_{amb}=25℃)

Parameter	Test conditions	Min.	Typ.	Max.	Unit.
V_F forward voltage	I_F=5A, tw=200μs			3	V
V_{FRM} peak forward recovery voltage	10/700 μs, 1.5kV, Rp=10Ω 2/10 μs, I_F=56A, Rs=45Ω, V_{GG}=-48V, C_G=220nF 2/10 μs, I_F=100A, Rs=50Ω, V_{GG}=-48V, C_G=220nF 1.2/50 μs, I_F=53A, Rs=47Ω, V_{GG}=-48V, C_G=220nF 1.2/10 μs, I_F=96A, Rs=52Ω, V_{GG}=-48V, C_G=220nF		6 8 8 12	5	V

Parameters Related to The Protection Thyristor (T_{amb}=25℃)

Parameter	Test conditions		Min.	Typ.	Max.	Unit.
I_D off-state current	V_D = -85V, V_{GK} = 0	T_J=25℃			-5	μA
		T_J=85℃			-50	μA
V_{BO} Breakover voltage	10/700 μs, 1.5kV, R_P=10Ω, I_{PP}= 30A 2/10 μs, I_T=-56A, Rs=45Ω, V_{GG}=-48V, C_G=220nF 2/10 μs, I_T=-100A, Rs=50Ω, V_{GG}=-48V, C_G=220nF 1.2/50 μs, I_T=-53A, Rs=47Ω, V_{GG}=-48V, C_G=220nF 1.2/10 μs, I_T=-96A, Rs=52Ω, V_{GG}=-48V, C_G=220nF			-57 -60 -60 -64	-58	V
I_H holding current	I_T = -1A, di/dt = 1A/ms, V_{GG} = -48V		-150			mA
I_{GKS} gate reverse current	V_{GG} = V_{GK} = -75V, V_{KA}=0	T_J=25℃			-5	μA
		T_J=85℃			-50	μA
I_{GT} gate trigger current	I_T = 3A, tp(g) ≥ 20μs, V_{GG} = -48V				5	mA
V_{GT} gate trigger voltage	I_T = 3A, tp(g) ≥20μs, V_{GG} = -48V				2.5	V
Q_{GS} gate switching charge	1.2/50 μs, I_T = -53A, Rs=47Ω, V_{GG}=-48V, C_G=220nF			0.1		
C_{KA} anode-cathode off-state capacitance	f = 1MHz, V_d = 1V, I_G = 0	V_D = -3V			110	pF
		V_D = -48V			55	pF

Electrical Parameters (Tamb=25℃)

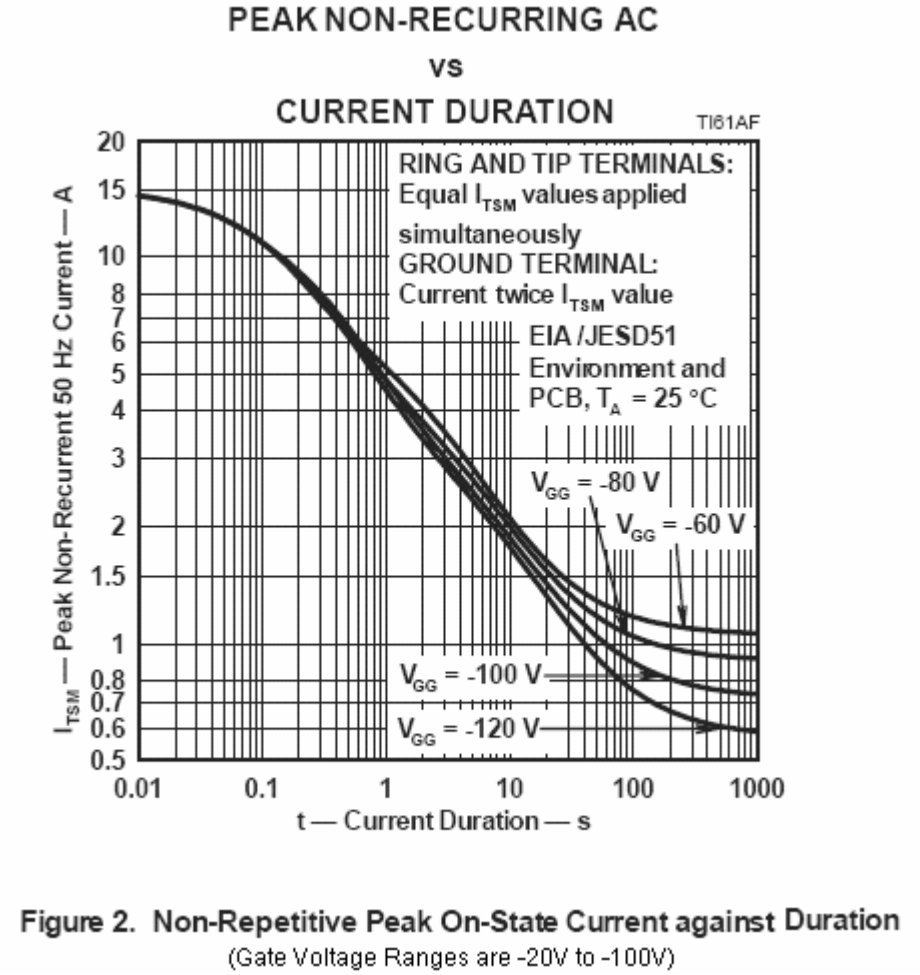
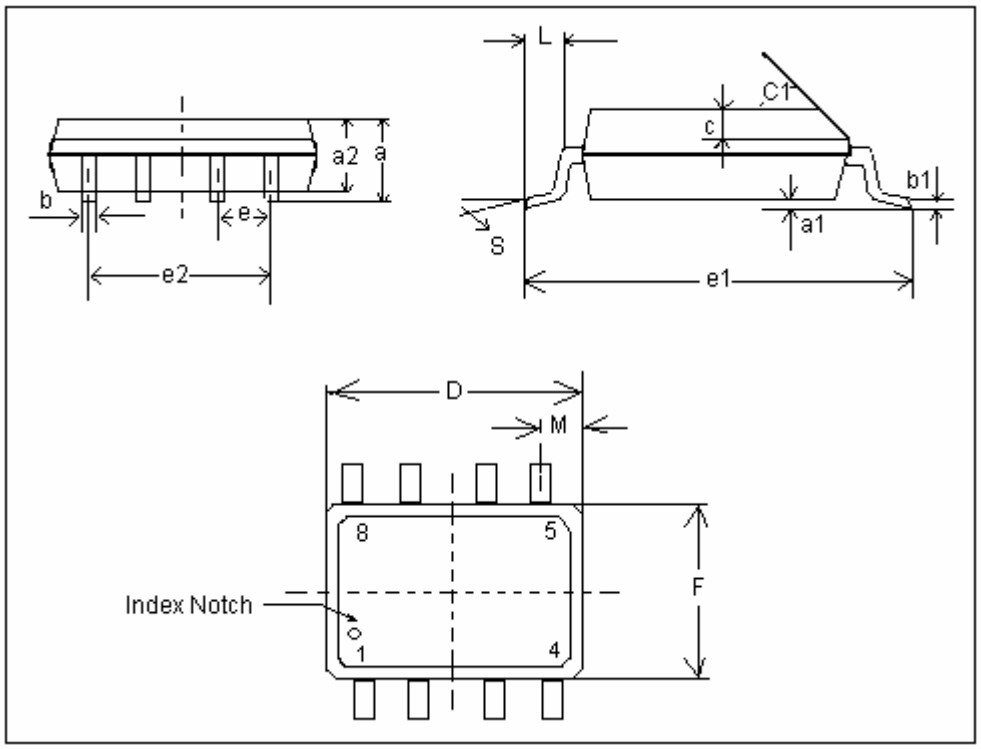


Figure 2. Non-Repetitive Peak On-State Current against Duration
(Gate Voltage Ranges are -20V to -100V)

Product Dimensions

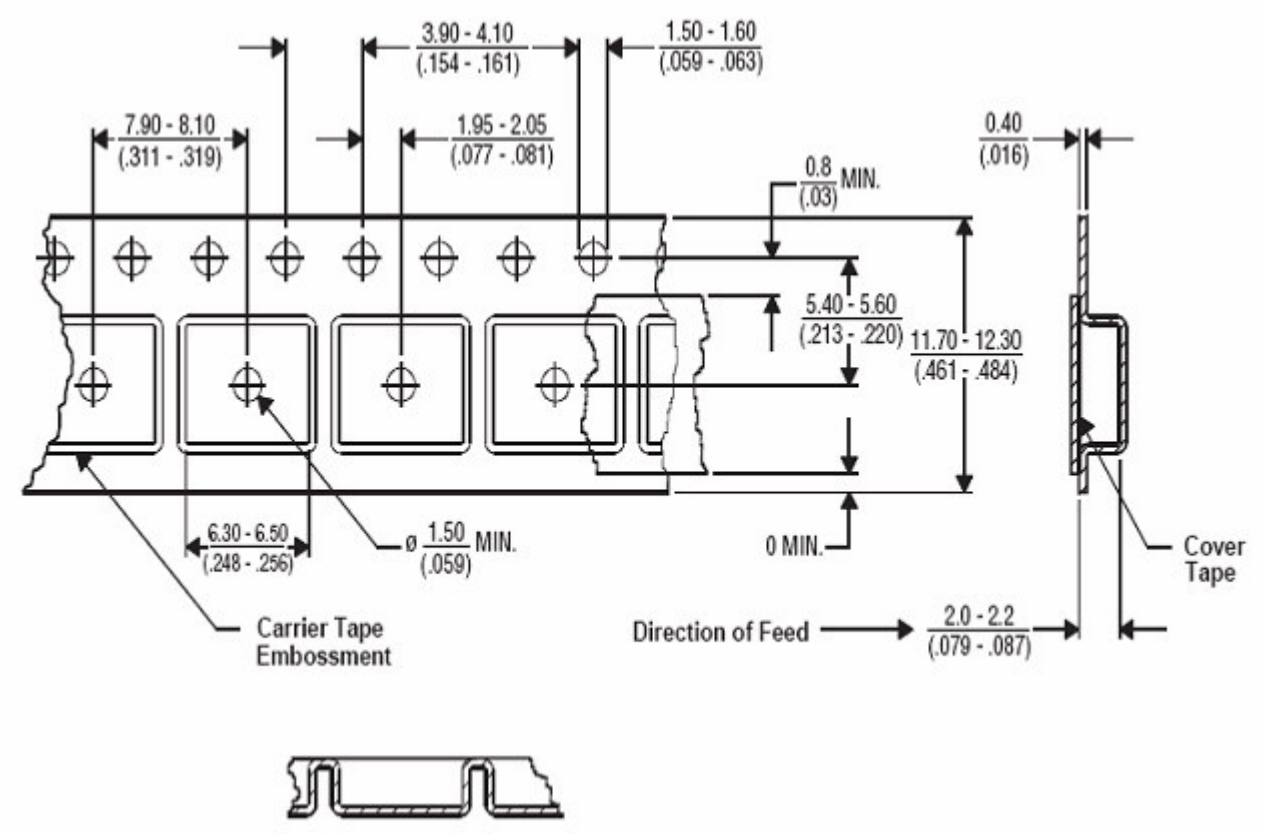


Parameter	DIMENSION					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
a			1.75			0.069
a1	0.1		0.25	0.004		0.010
a2			1.65			0.065
b	0.35		0.48	0.014		0.019
b1	0.19		0.25	0.007		0.010
c		0.50			0.020	
C1	45° (typ)					
D	4.8		5.0	0.189		0.197
e1	5.8		6.2	0.228		0.244
e		1.27			0.050	
e2		3.81			0.150	
F	3.8		4.0	0.15		0.157
L	0.4		1.27	0.016		0.050
M			0.6			0.024
S	8° (max)					

Package Information

Tape & Reel: 2500 pcs

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



DIMENSIONS= MILLMETERS / (INCHES)

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

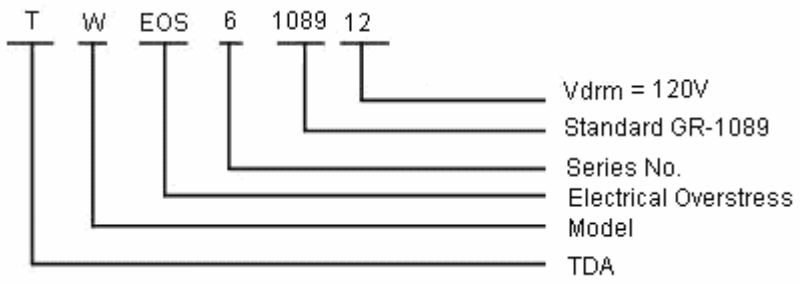
Reel Diameter= 330+0.0/-4.0 / (12.99+0.0/-.157)

Reel hub diameter = 100±2.0 / (3.937±.079)

Reel axial hole = 13.0±0.2 / (.512±.008)

B: 2500 devices are on a reel.

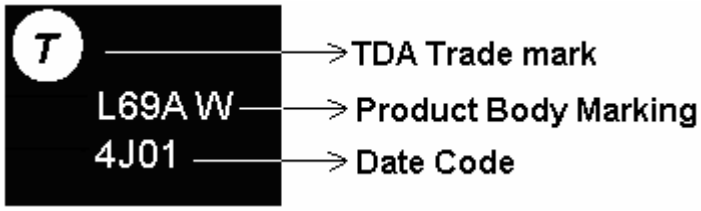
Marking system for Thyristor Surge Protector



Packaging and Marking Information

Order Code	Marking	Base qty	Delivery Mode
TWEOS61089	L69W	2500	Tape & Reel
TWEOS61089-12	L69AW	2500	Tape & Reel
TWEOS61089-17	L69BW	2500	Tape & Reel

Product Body Marking



Barcode Printing

T 06 A 1 0000 1 0N

T : Thyristor
06 : 2006, Year of Production
A : January, Month of production
1 : Production week of the month
0000 : Empty space
1: Product series (**0** for TWEOS4; **1** for TWEOS6)
0N: Package Type (**0N** for SMD; **1N** for Leaded type)

Production Month:

A- Jan, **B**- Feb, **C**-Mar, **D**-Apr, **E**-May, **F-**Jun, **G**-Jul, **H**- Aug, **J**-Sep, **K-**Oct, **L**-Nov, **M**-Dec