

**S61089**

Revision:B

**Dual Programmable Transient Voltage Suppressor**

**General Description**

This device has been especially designed to protect 2 new high voltage, as well as classical SLICs, against transient overvoltages.

Positive overvoltages are clamped by 2 diodes. Negative surges are suppressed by 2 thyristors, their breakdown voltage being referenced to -VBAT through the gate.

This component presents a very low gate triggering current (IGT) in order to reduce the current consumption on printed circuit board during the firing phase.

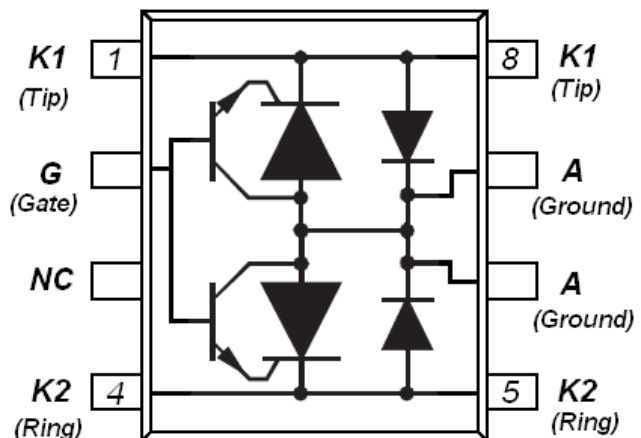
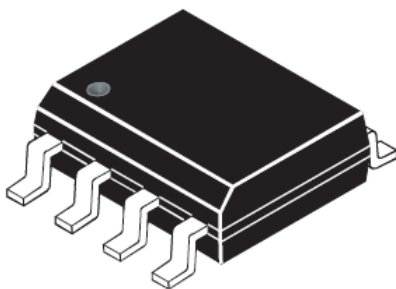
**Benefits**

This devices are not subject to ageing and provide a fail safe mode in short circuit for a better protection. Trisils are used to help equipment to meet various standards such as UL1950, IEC950 / CSA C22.2, UL1459 and FCC part68.

**Features**

- Dual line programmable transient voltage suppressor
- Wide negative firing voltage range:  
 VMGL = -75V (S61089)  
 VMGL = -100V (S61089A)  
 VMGL = -155V (S61089B)
- Low dynamic switching voltages: VFP and VDGL
- Low gate triggering current: IGT = 5 mA max
- Peak pulse current: IPP = 30 A (10/1000 s)
- Holding current: IH > 150 mA

**SOP-8**

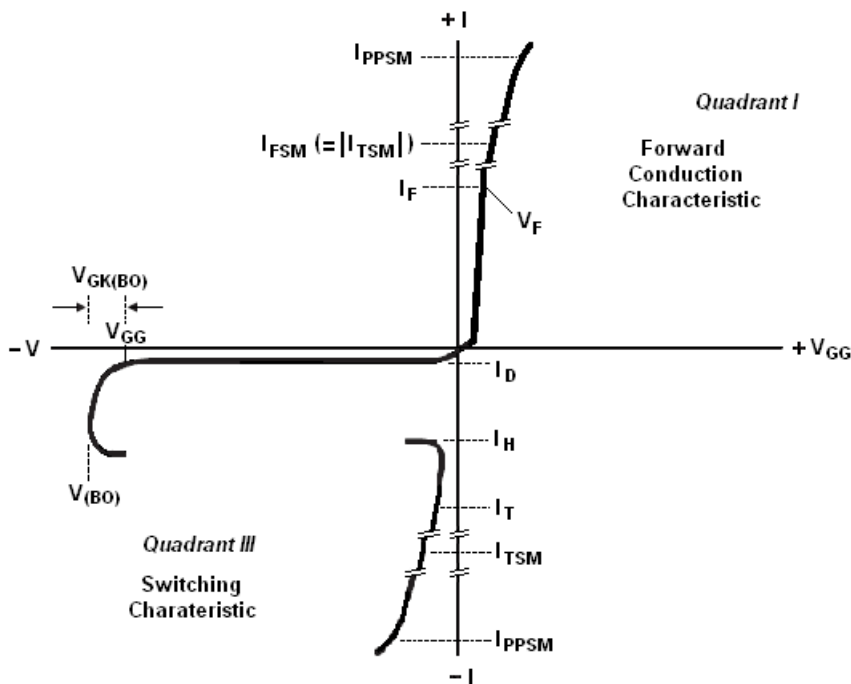


<b>Absolute Maximum Ratings</b>				
Parameter	Symbol	Value	Units	
Repetitive peak off-state votage, $V_{GK}=0$	S61089 S61089A S61089B	$V_{DRM}$	-90 -120 -170	V
Repetitive peak gate-cathode voltage, $V_{KA}=0$	S61089 S61089A S61089B	$V_{GKRM}$	-85 -120 -170	V
Non-repetitive peak on-state current 10/1000 us (Telcordia(Bellcore)Gr-1089-CORE.Issue 2.February 1999,Section4) 5/320 us (ITU-T K.20, K.21& K.45, K.44 open-circuit voltage wave shape 10/700us) 1.2/50 us (Telcordia(Bellcore)Gr-1089-CORE.Issue 2.February 1999,Section4) 2/10 us (Telcordia(Bellcore)Gr-1089-CORE.Issue 2.February 1999,Section4)	$I_{PPSM}$		30 40 100 120	A
Non-repetitive peak on-state current. $V_{GG}=-75V$ 50Hz to 60Hz 0.1 s 1 s 5 s 300 s 900 s	$I_{TSM}$		11 4.8 2.7 0.95 0.93	A
Operating free-air temperature range	$T_A$		-40 to +85	°C
Operating Junction Temperature Range	$T_J$		-40 to +150	°C
Storage Temperature Range	$T_{STG}$		-40 to +150	°C

**Themal Characteristics**

Junction To ambient	$R_{\theta JA}$	170	°C/W
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**Parameter Measurement Information**



**Figure 1. Voltage-Current Charateristic**

**Unless Otherwise Noted, All Voltages are Referenced to the Anode**

## Electrical Parameter

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
$V_{GK(BO)}$	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

## Electrical Characteristics

Ratings at 25°C ambient temperature unless otherwise specified.

Parameter		Test Conditions	Min	Typ	Max	Unit	
$I_D$	Off-state current	$V_D = V_{DRM}, V_{GK} = 0$			$T_J = 25\text{ }^\circ\text{C}$	-5	$\mu\text{A}$
					$T_J = 85\text{ }^\circ\text{C}$	-50	$\mu\text{A}$
$V_{(BO)}$	Breakover voltage	2/10us, $I_{PP} = -56\text{A}, R_S = 45\Omega, V_{GG} = -48\text{V}, C_G = 220\text{nF}$ 2/10us, $I_{PP} = -100\text{A}, R_S = 50\Omega, V_{GG} = -48\text{V}, C_G = 220\text{nF}$ 1.2/50us, $I_{PP} = -53\text{A}, R_S = 47\Omega, V_{GG} = -48\text{V}, C_G = 220\text{nF}$ 1.2/50us, $I_{PP} = -96\text{A}, R_S = 52\Omega, V_{GG} = -48\text{V}, C_G = 220\text{nF}$			-57	V	
					-60		
					-60		
					-64		
$V_{GK(BO)}$	Gate-cathode impulse Breakover voltage	2/10us, $I_{PP} = -56\text{A}, R_S = 45\Omega, V_{GG} = -48\text{V}, C_G = 220\text{nF}$ 2/10us, $I_{PP} = -100\text{A}, R_S = 50\Omega, V_{GG} = -48\text{V}, C_G = 220\text{nF}$ 1.2/50us, $I_{PP} = -53\text{A}, R_S = 47\Omega, V_{GG} = -48\text{V}, C_G = 220\text{nF}$ 1.2/50us, $I_{PP} = -96\text{A}, R_S = 52\Omega, V_{GG} = -48\text{V}, C_G = 220\text{nF}$			9	V	
					12		
					12		
					16		
$V_F$	Forward voltage	$I_F = 5\text{ A}, T_W = 200\text{ us}$			3	V	
$V_{FRM}$	Peak forward recovery voltage	2/10us, $I_{PP} = -56\text{A}, R_S = 45\Omega, V_{GG} = -48\text{V}, C_G = 220\text{nF}$ 2/10us, $I_{PP} = -100\text{A}, R_S = 50\Omega, V_{GG} = -48\text{V}, C_G = 220\text{nF}$ 1.2/50us, $I_{PP} = -53\text{A}, R_S = 47\Omega, V_{GG} = -48\text{V}, C_G = 220\text{nF}$ 1.2/50us, $I_{PP} = -96\text{A}, R_S = 52\Omega, V_{GG} = -48\text{V}, C_G = 220\text{nF}$			6	V	
					8		
					8		
					12		
$I_H$	Holding current	$I_T = -1\text{ A}, di/dt = 1\text{A/ms}, V_{GG} = -48\text{ V}$	-150			mA	
$I_{GKS}$	Gate reverse current	$V_{GG} = V_{GK} = V_{GKRM}, V_{KA} = 0$			$T_J = 25\text{ }^\circ\text{C}$	-5	$\mu\text{A}$
					$T_J = 85\text{ }^\circ\text{C}$	-50	$\mu\text{A}$
$I_{GT}$	Gate trigger current	$I_T = -3\text{ A}, t_{p(g)} \geq 20\text{ us}, V_{GG} = -48\text{V}$			5	mA	
$V_{GT}$	Gate-cathode trigger voltage	$I_T = -3\text{ A}, t_{p(g)} \geq 20\text{ us}, V_{GG} = -48\text{V}$			2.5	V	
$Q_{GS}$	Gate switching charge	1.2/50us, $I_{PP} = -53\text{A}, R_S = 47\Omega, V_{GG} = -48\text{V}, C_G = 220\text{nF}$		0.1		$\mu\text{C}$	
$C_{KA}$	Cathode-anode off-State capacitance	$F = 1\text{ MHz}, V_d = 1\text{V}, I_G = 0$			$V_D = -3\text{ V}$	100	pF
					$V_D = -48\text{ V}$	50	pF

Typical Characteristics

Peak Non-Recurring AC vs. Current Duration

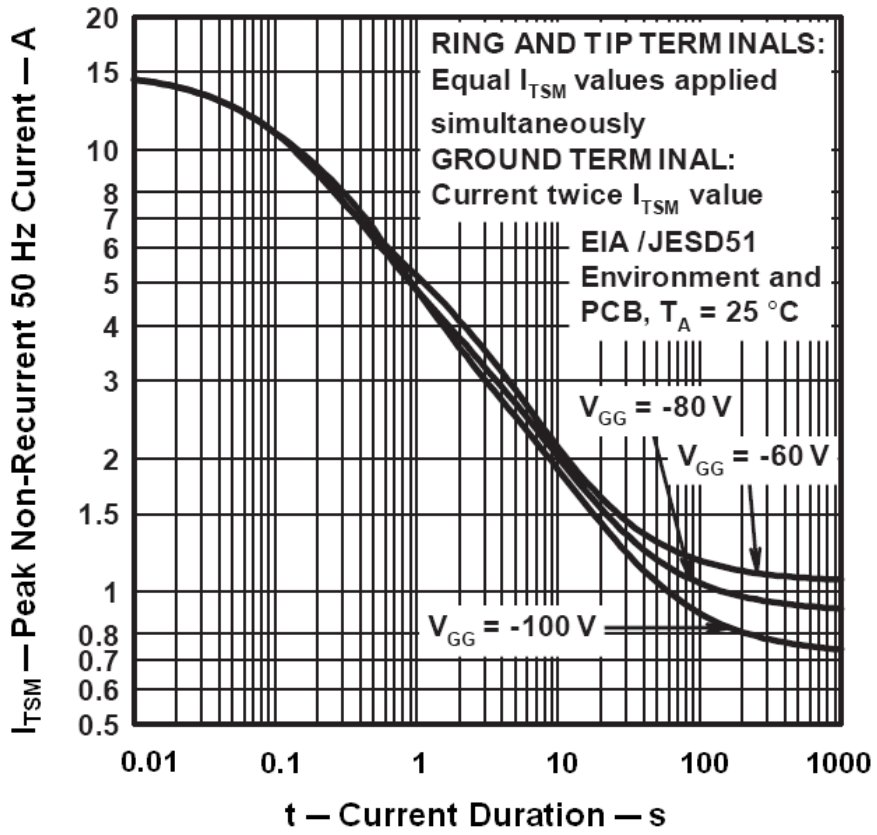


Fig2. Non-repetitive Peak On-State Current against Duration

Typical Characteristics

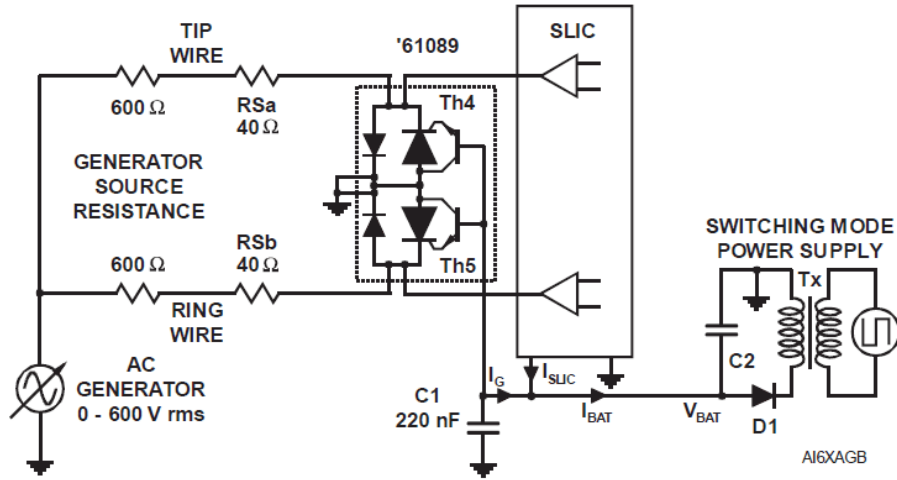
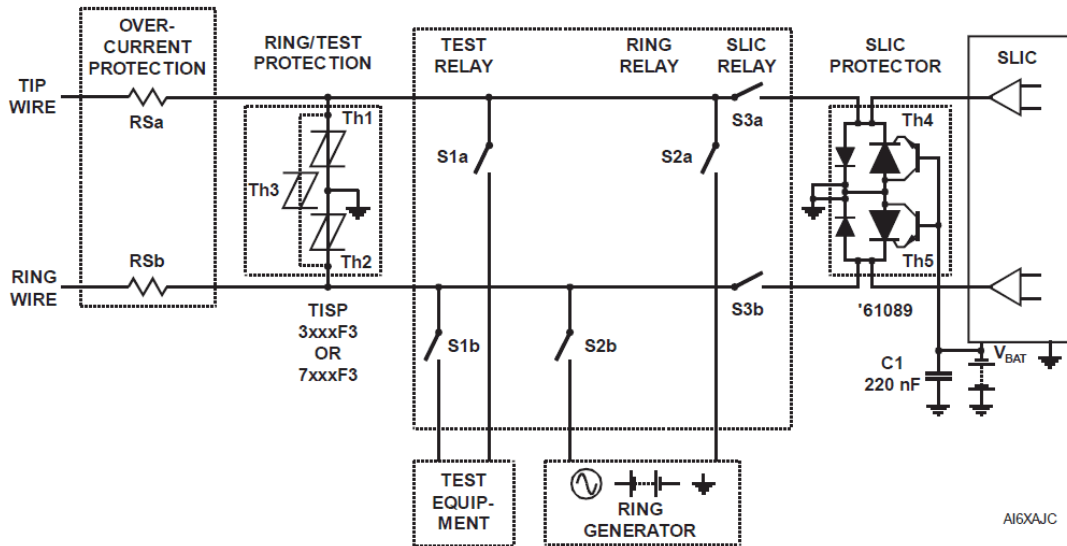
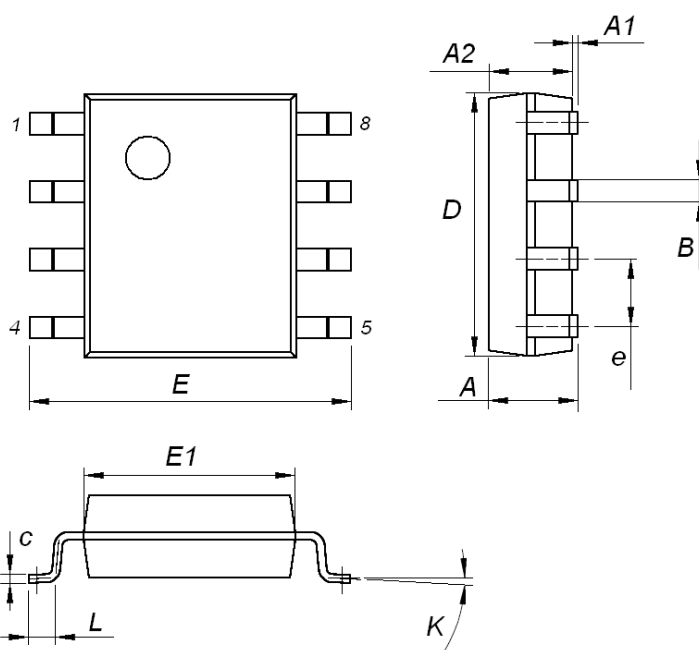


Figure 3. '61089 Buffered Gate Protector



## SOP-8 MECHANICAL DATA

DIM	Millimeters		
	MIN	TYP	MAX
A			1.75
A1	0.10		0.25
A2	1.35	1.55	1.75
B	0.35	0.42	0.49
C	0.19		0.25
D	4.80	4.90	5.00
E	5.80	6.00	6.20
E1	3.80	3.95	4.00
e		1.27	
L	0.40		0.90
K	0°		8°



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