

Dual Programmable Transient Voltage Suppressor(TVS)

S61089, S61089A & S61089B

Description

This device has been especially designed to protect subscriber line card interfaces (SLIC) against transient over-voltages. 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 triggering 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 configuration ensures reliable protection, eliminating the overvoltage introduced by the parasitic inductances of the wiring (Ldi/dt), especially for very fast transients.

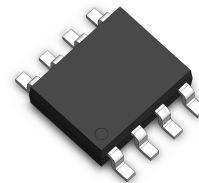
Feature

- u Dual line programmable transient voltage suppressor
- u Wide negative firing voltage range :
 - $V_{MGL} = -75V$ (S61089)
 - $V_{MGL} = -100V$ (S61089A)
 - $V_{MGL} = -155V$ (S61089B)
- u Low dynamic switching voltages V_{FP} and V_{DGL}
- u Low gate triggering current: $I_{GT} = 5mA$ max
- u Peak pulse current: $I_{PP} = 30A$ (10/1000 μs)
- u Holding current: $I_H > 150mA$

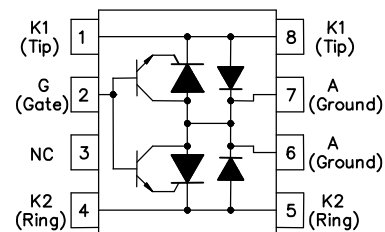
Benefits

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

SOP-8



Functional Diagram



Marking

Type	Marking
S61089	SE69
S61089A	SE69A
S61089B	SE69B

Absolute Maximum Ratings

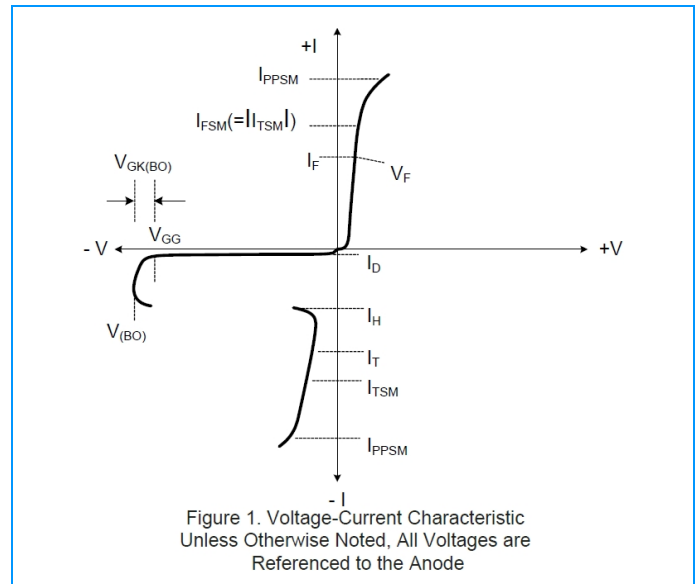
Parameter	Symbol	Value	Units
Repetitive Peak Off-state Voltage, $V_{GK}=0$	V_{DRM}	S61089	-90
		S61089A	-120
		S61089B	-170
Repetitive Peak Gate-cathode Voltage, $V_{KA}=0$	V_{GKRM}	S61089	-85
		S61089A	-120
		S61089B	-170
Non-repetitive Peak On-state Current 10/1000 μs (Telcordia (Bellcore) GR-1089-CORE, Issue 2, February 1999, Section 4) 5/320 μs (ITU-T K.20,K.218 & K.45,K.44 open-circuit voltage wave shape 10/7000 μ) 1.2/50 μs (Telcordia (Bellcore) GR-1089-CORE, Issue 2, February 1999, Section 4) 2/10 μs (Telcordia (Bellcore) GR-1089-CORE, Issue 2, February 1999, Section 4)	I_{PPSM}	30	A
		40	
		100	
		120	
Non-repetitive Peak On-state Current. $V_{GG}=-75V$ 50Hz to 60Hz	I_{TSM}	0.1s	11
		1s	4.8
		5s	2.7
		300s	0.95
		900s	0.93
Operating Free-air Temperature Range	T_A	-40 ~ +85	$^{\circ}C$
Operating Junction Temperature Range	T_J	-40 ~ +150	$^{\circ}C$
Storage Temperature Range	T_{STG}	-40 ~ +150	$^{\circ}C$

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Electrical Characteristics (T_A=25°C)

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



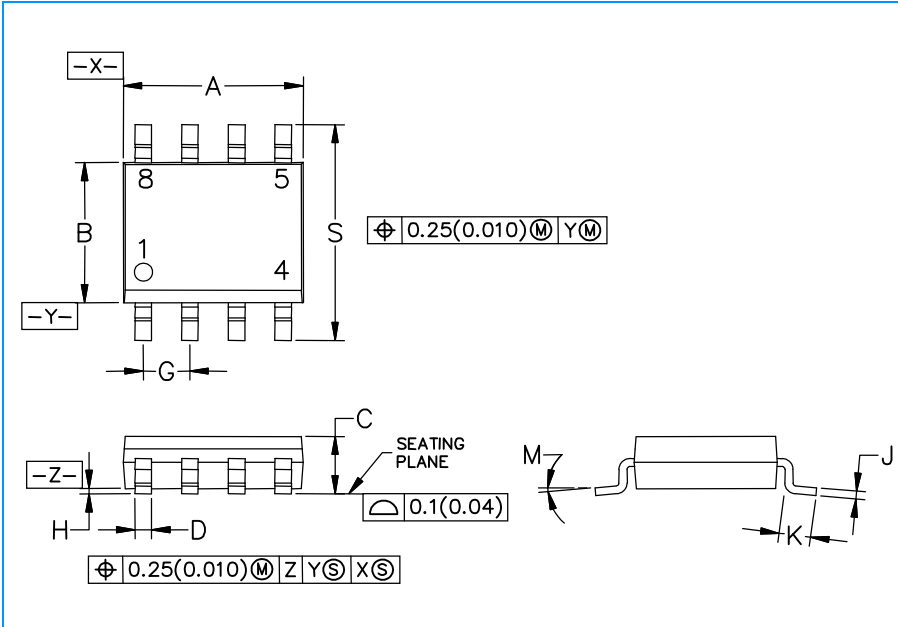
Parameters Related to The Diode (T_A=25°C)

Parameter		Test Conditions	Min.	Typ.	Max.	Unit
I _D	Off-State Current	V _D =V _{DRM} , V _{GK} =0	T _J =25°C		-5	μA
			T _J =85°C		-50	μA
V _(BO)	Breakover Voltage	2/10μs, I _{PP} = -56A, R _S =45Ω, V _{GG} = -48V, C _G =220nF		-57		V
		2/10μs, I _{PP} = -100A, R _S =50Ω, V _{GG} = -48V, C _G =220nF		-60		
		1.2/50μs, I _{PP} = -53A, R _S =47Ω, V _{GG} = -48V, C _G =220nF		-60		
		1.2/50μs, I _{PP} = -96A, R _S =52Ω, V _{GG} = -48V, C _G =220nF		-64		
V _{GK(BO)}	Gate-cathode Impulse Breakover Voltage	2/10μs, I _{PP} = -56A, R _S =45Ω, V _{GG} = -48V, C _G =220nF		9		V
		2/10μs, I _{PP} = -100A, R _S =50Ω, V _{GG} = -48V, C _G =220nF		12		
		1.2/50μs, I _{PP} = -53A, R _S =47Ω, V _{GG} = -48V, C _G =220nF		12		
		1.2/50μs, I _{PP} = -96A, R _S =52Ω, V _{GG} = -48V, C _G =220nF		16		
V _F	Forward Voltage	I _F =5A, T _W =200μs			3	V
V _{FRM}	Peak Forward Recovery Voltage	2/10μs, I _{PP} = -56A, R _S =45Ω, V _{GG} = -48V, C _G =220nF		6		V
		2/10μs, I _{PP} = -100A, R _S =50Ω, V _{GG} = -48V, C _G =220nF		8		
		1.2/50μs, I _{PP} = -53A, R _S =47Ω, V _{GG} = -48V, C _G =220nF		8		
		1.2/50μs, I _{PP} = -96A, R _S =52Ω, V _{GG} = -48V, C _G =220nF		12		
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} =V _{GKRM} , V _{KA} =0	T _J =25°C		-5	μA
			T _J =85°C		-50	μA
I _{GT}	Gate Trigger Current	I _T = -3A, t _{p(g)} ≥20μs, V _{GG} = -48V			5	mA
V _{GT}	Gate-cathode Trigger	I _T = -3A, t _{p(g)} ≥20μs, V _{GG} = -48V			2.5	V
Q _{GS}	Gate Switching	1.2/50μs, I _{PP} = -53A, R _S =47Ω, V _{GG} = -48V, C _G =220nF		0.1		μC
C _{KA}	Cathode-anode Off-State Capacitance	F=1MHz, V _d =1V, I _G =0	V _D = -3V		100	pF
			V _D = -48V		50	pF

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SOP-8 Package Outline & Dimensions



DIM	Millimeters		Inches	
	Min	Max	Min	Max
A	4.80	5.00	0.189	0.197
B	3.80	4.00	0.150	0.157
C	1.35	1.75	0.053	0.069
D	0.35	0.51	0.013	0.020
G	1.27BSC		0.050BSC	
H	0.10	0.25	0.004	0.010
J	0.19	0.25	0.007	0.010
K	0.40	1.27	0.016	0.050
M	0°	8°	0°	8°
S	5.80	6.20	0.228	0.244

Soldering Footprint

