Brückewell

TS61089
Dual Programmable Transient Voltage Suppressor

Revision:B

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.

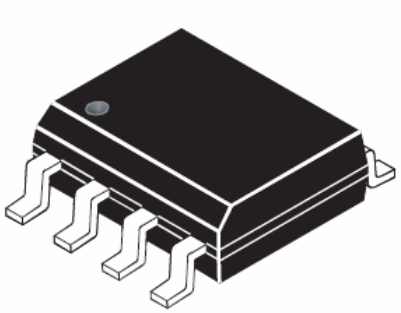
Features

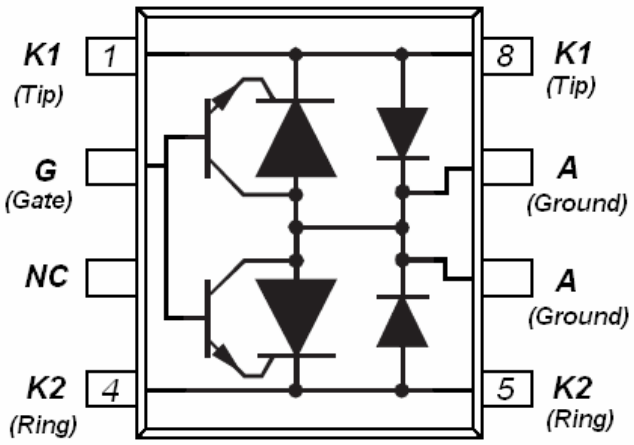
- Dual line programmable transient voltage suppressor
- Wide negative firing voltage range:
  VMGL = -75V (S61089)
  VMGL = -100V (S61089A)
  VMGL = -155V (S61089B)
- Low dynamic switching voltages: VFP and VDGL
- Low gate triggering current: IGT = 5 mA max
- Peak pulse current: IPP = 30 A (10/1000 s)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

Marking

TYPE	MARKING
TS61089	SE69
TS61089A	SE69A
TS61089B	SE69B

SOP-8





Absolute Maximum Ratings

Parameter		Symbol	Value	Units
Repetitive peak off-state votage, V_{GK}=0	TS61089	V_{DRM}	-90	V
	TS61089A		-120	
	TS61089B		-170	
Repetitive peak gate-cathode voltage, V_{KA}=0	TS61089	V_{GKRM}	-85	V
	TS61089A		-120	
	TS61089B		-170	
Non-repetitive peak on-state current		I_{PPSM}		A
10/1000 us (Telcordia(Bellcore)Gr-1089-CORE.Issue 2.February 1999,Section4)			30	
5/320 us (ITU-T K.20, K.21& K.45, K.44 open-circuit voltage wave shape 10/700us)			40	
1.2/50 us (Telcordia(Bellcore)Gr-1089-CORE.Issue 2.February 1999,Section4)			100	
2/10 us (Telcordia(Bellcore)Gr-1089-CORE.Issue 2.February 1999,Section4)			120	
Non-repetitive peak on-state current. VGG=-75V 50Hz to 60Hz		I_{TSM}		A
0.1 s			11	
1 s			4.8	
5 s			2.7	
300 s			0.95	
900 s			0.93	
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

Parameter Measurement Information

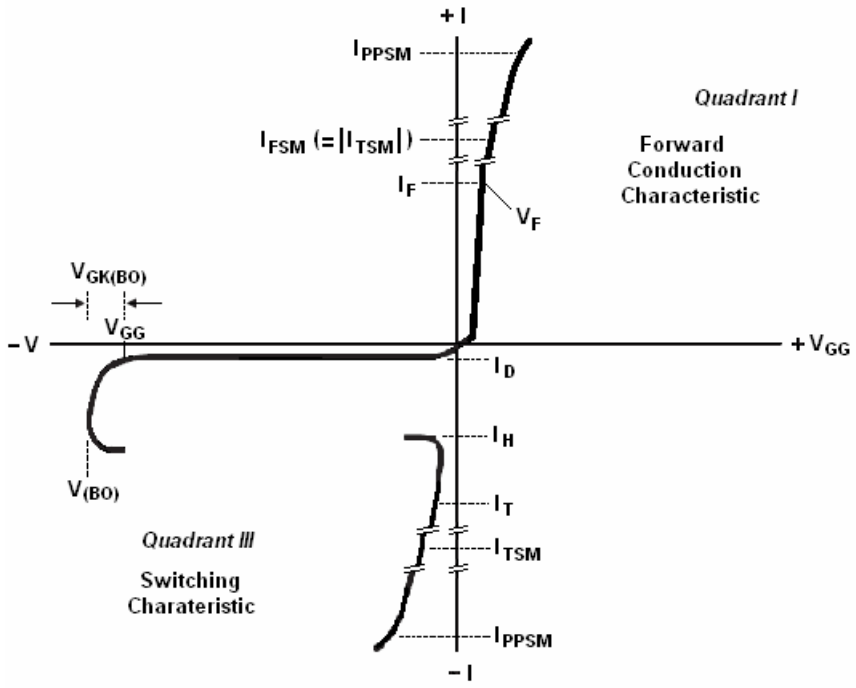


Figure 1. Voltage-Current Charateristic

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

Typical Characteristics

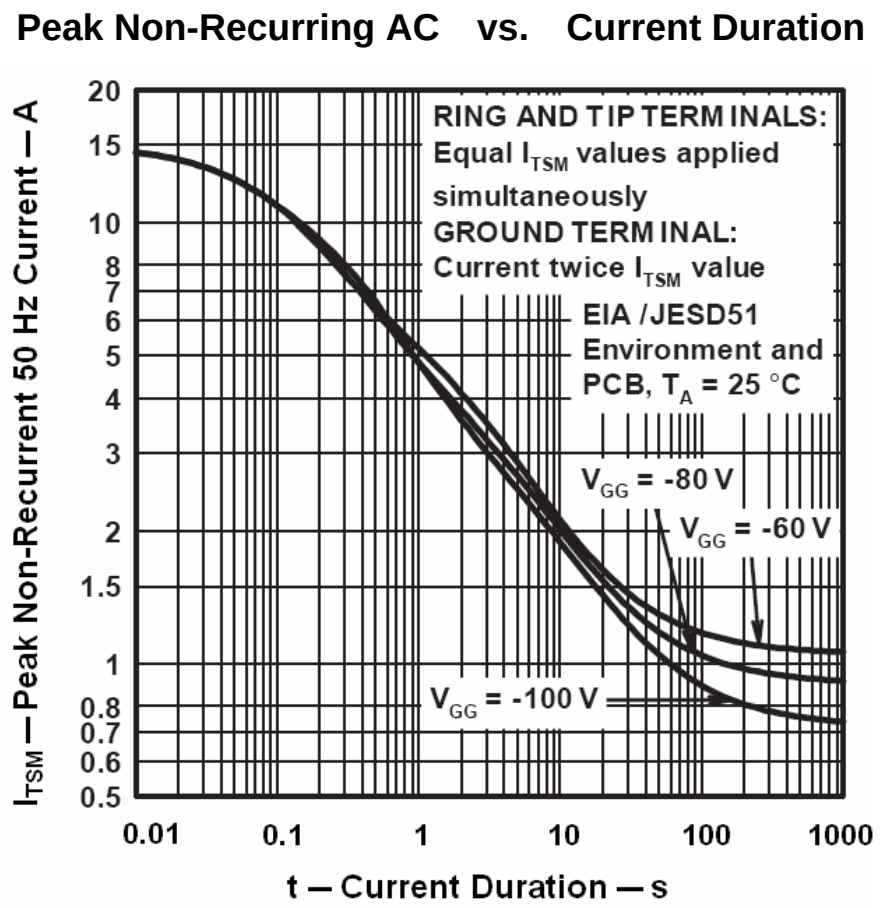


Fig2. Non-repetitive Peak On-State Current against Duration

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°