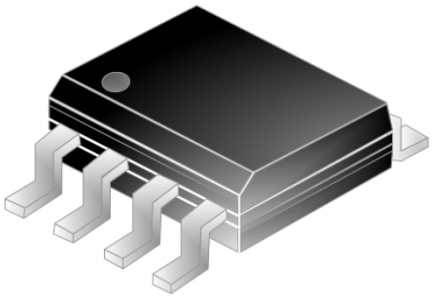
BTISP61089BDR-S

Thyristor Programmable Overvoltage Protector

»Features

- Dual programmable transient suppressor.
- Wide negative firing voltage range:
  V_{GKRM}=-167V max.
- Low dynamic switching voltage:
  V_{FRM} and V_{GK}(BD)
- Low gate triggering current:
  I_{GT}=5mA max
- Peak pulse current:
  I_{PP}=30A for 10/1000us surge
- Holding current:
  I_H=150mA min.
- Complies with The Following Standards:
  YD/T 950-1998
  ITU-T K.20
  FCC part 68
  GR-1089-CORE



SOP-8 (SO-8)

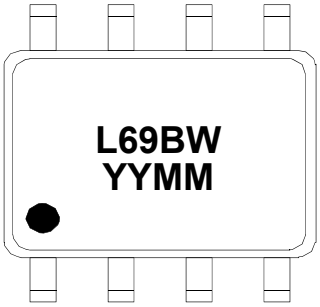
»Mechanical Characteristics

- SOP-8(SO-8) package
- Molding compound flammability rating: UL 94V-0
- Packaging: Tape and Reel
- RoHS/WEEE Compliant

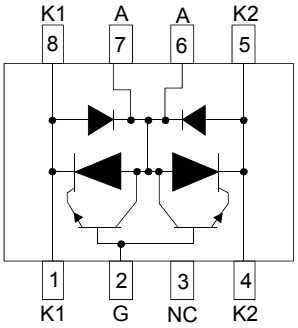
»Applications

- SLIC
- VoIP

»Marking Information



»Pin Configuration



»Summary of Packing Options

Package	Packing Description	Packing Quantity	Industry Standard
SOP-8	Tape/Reel,13" reel	2500	EIA-481-1

»Absolute ratings (T_A = 25 °C, unless otherwise specified)

Voltage waveform (μs)	Current waveform (μs)	Required peak current (A)
2/10μs	2/10μs	120
10/700μs	5/310μs	40
10/1000μs	10/1000μs	30

'1089 TEST CLAUSE AND TEST #	60 Hz power fault time	Required peak current (A)
4.5.13 Second-Level 2	500ms	6.5
4.5.13 Second-Level 2	1s	4.6
4.5.13 Second-Level 2	5s	2.3
4.5.13 Second-Level 1	30s	1.3
4.5.13 Second-Level 1	900s	0.73

Symbol	Parameter	Value	Unit
I_{PP}	Non-repetitive peak on-state pulse current		A
	10/1000μs	30	
	5/310μs	40	
	1.2/50μs	100	
	2/10μs	120	
V_{PP}	10/700μs	1600	V
I_{TSM}	Non repetitive surge peak on-state current (sinusoidal) 60Hz		A
	0.5s	6.5	
	1s	4.5	
	5s	2.3	
	30s	1.3	
	900s	0.72	
V_{DRM}	Maximum voltage LINE/GROUND	-170	V
V_{GKRM}	Maximum voltage GATE/LINE	-167	
T_A	Operating free-air temperature range	-40~85	℃
T_{STG}	Storage temperature range	-40~150	
T_J	Junction temperature	-40~150	
T_L	Maximum lead temperature for soldering during 10S	260	
$R_{\theta JA}$	Junction to ambient	120	℃/W

»Electrical Characteristics (T_A=25°C unless otherwise noted)

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

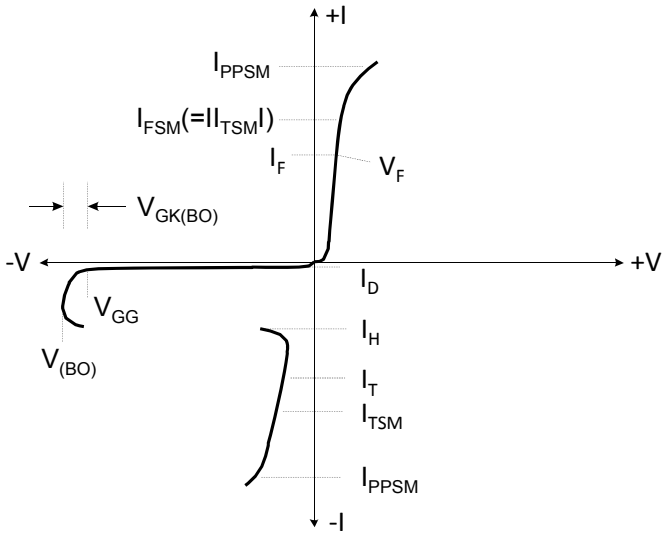


Figure 1. Voltage-Current Characteristic

Unless Otherwise Noted, All Voltages are Referenced to the Anode

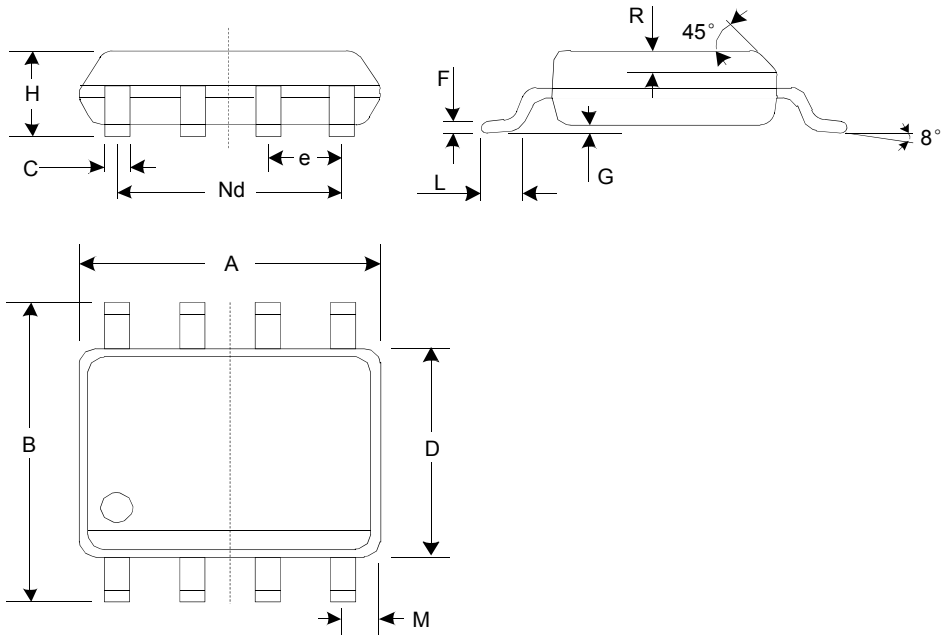
»Parameters Related to The Diode (T_A=25℃)

Parameter	Test conditions	Min.	Typ.	Max.	Unit
V_F forward voltage	I_F=5A, t_w=200μs			3	V
V_{FRM} peak forward recovery voltage	2/10μs, I_F=100A, Rs=50Ω, V_{GG}=-100V, C_G=220nF			10	V

»Parameters Related to The Protection Thyristor (T_A=25℃)

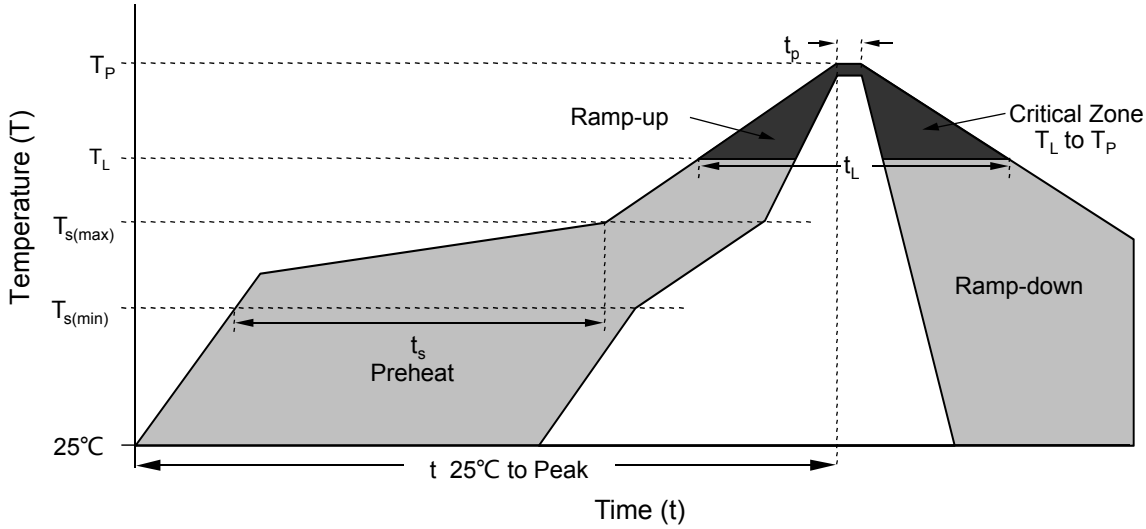
Parameter	Test conditions		Min.	Typ.	Max.	Unit
I_D off-state current	V_D=-170V, V_{GK}=0	T_J=25℃			-5	μA
		T_J=85℃			-50	μA
V_{BO} breakover voltage	2/10μs, I_T=-100A, Rs=50Ω, V_{GG}=-100V, C_G=220nF				-112	V
I_H holding current	I_T=-1A, di/dt=1A/ms, V_{GG}=-100V		-150			mA
I_{GKS} gate reverse current	V_{GG}=V_{GK}=-100V, 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}=-100V				5	mA
V_{GT} gate trigger voltage	I_T=3A, tp(g)≥20μs,V_{GG}=-100V				2.5	V
Q_{GS} gate switching charge	1.2/50μs, I_T=-53A, Rs=47Ω, V_{GG}=-100V,C_G=220nF			0.1		μC
C_{KA} cathode-anode off-state capacitance	f=1MHz,Vd=1V,I_G=0	V_D=-3V			100	pF
		V_D=-48V			50	pF

»Package Dimensions



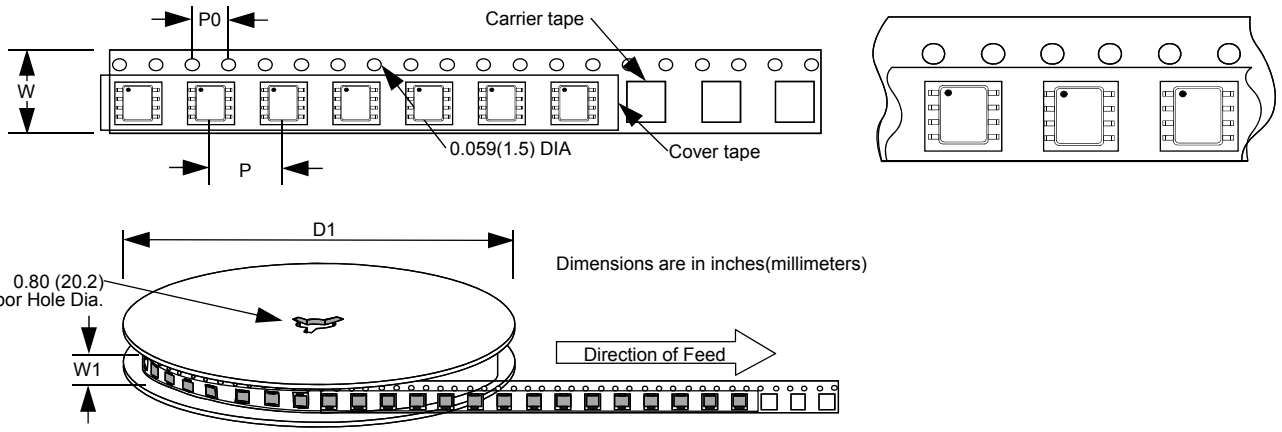
SOP-8						
Dimension	Inches			Millimeters		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.189		0.197	4.8		5
B	0.228		0.244	5.8		6.2
C	0.014		0.019	0.35		0.48
D	0.15		0.157	3.8		4
F	0.007		0.01	0.19		0.25
G	0.004		0.01	0.1		0.25
H			0.069			1.75
L	0.019	0.033	0.05	0.48	0.85	1.27
M			0.024			0.6
R		0.02			0.5	
e		0.05			1.27	
Nd		0.15			3.81	

»Soldering Parameters



Reflow Condition		Lead-free assembly
Pre Heat	- Temperature Min ($T_{s(min)}$)	150°C
	- Temperature Max ($T_{s(max)}$)	200°C
	- Time (min to max) (t_s)	60 – 180 secs
Average ramp up rate (Liquidus Temp (T_L) to peak)		3°C/second max
$T_{S(max)}$ to TL - Ramp-up Rate		3°C/second max
Reflow	- Temperature (T_L) (Liquidus)	217°C
	- Time (t_L)	60 – 150 secs
Peak Temperature (T_P)		$260^{+0/-5\ °C}$
Time within 5°C of actual peak Temperature (t_p)		20 – 40 secs
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (t)		8 minutes Max.
Do not exceed		260°C

»Tape and Reel Specification



Dimension	Inches			Millimeters		
	MIN	NOM	MAX	MIN	NOM	MAX
P		0.315			8	
P0		0.157			4	
W		0.472			12	
W1		0.492			12.5	
D2		13			330	