BORN SEMICONDUCTOR

BTISP61089BDR-S

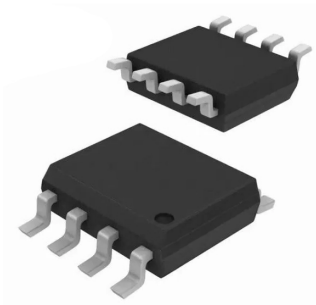
Thyristor Surge Suppressor

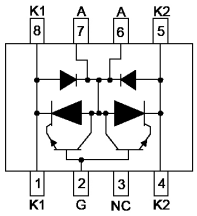
Features

- Dual programmable transient suppressor.
- Wide negative firing voltage range:V_{GKRM}=-167V max.
- Low dynamic switching voltage:V_{FRM} andV_{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

Package

SOP-8





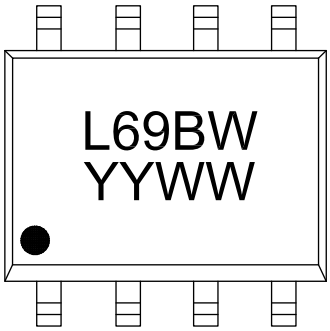
Mechanical Characteristics

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

Applications

- SLIC
- VoIP

Making Information &Pin Configuration



Summary of Packing Options

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

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Thyristor Surge Suppressor

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

Absolute Maximum Rating

Rating	Symber	Conditions	Value	Units
Peak Pulse Voltage	V_{PP}	10/700μs	1600	V
Non-repetitive peak on-state pulse current	I_{PP}	10/1000μs	30	A
		5/310μs	40	
		1.2/50μs	100	
		2/10μs	120	
Non repetitive surge peak on-state current (sinusoidal) 60Hz	I_{TSM}	0.5s	6.5	A
		1s	4.5	
		5s	2.3	
		30s	1.3	
		900s	0.72	
Maximum voltage LINE/GROUND	V_{DRM}	–	-170	V
Maximum voltage GATE/LINE	V_{GKRM}	–	-167	
Operating free-air temperature range	T_A	–	-40 to +85	°C
Lead Soldering Temperature	T_L	–	260(10S)	
Junction Temperature	T_J	–	-40 to + 150	
Storage Temperature	T_{stg}	–	-40 to + 150	
Junction to ambient	$R_{\theta JA}$	–	120	°C/W

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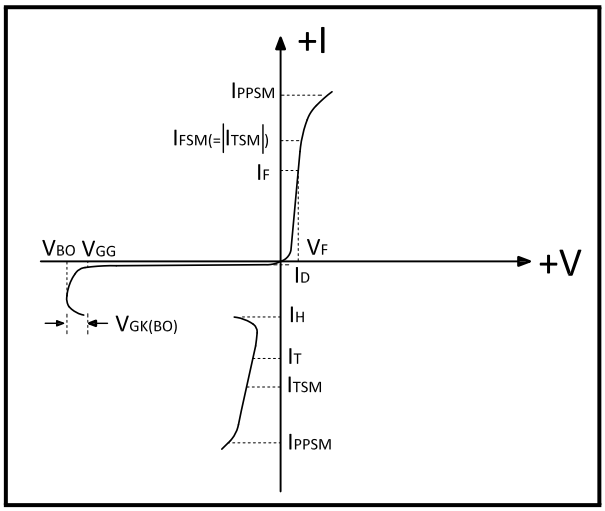
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Thyristor Surge Suppressor

Electrical Parameters (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_{FWM}	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_{GK}	Cathode-anode off-state capacitance



Note:8/20us pulse Waveform.

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

Parameter	Symber	Conditions	Min	Typical	Max	Units
forward voltage	V_F	I_F=5A, t_w=200μs	–	–	3	V
peak forward recovery voltage	V_{FRM}	2/10μs, I_F=5A,R_S=50Ω, V_{GG}=-100V, C_G=220nF	–	–	10	V

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

Parameter	Symber	Conditions	Min	Typical	Max	Units
off-state current	I_D	V_D=-170V, V_{GK}=0,T_J=25°C	–	–	-5	uA
		V_D=-170V, V_{GK}=0,T_J=85°C	–	–	-50	uA
breakover voltage	V_{BO}	2/10μs, I_T=-100A, R_S=50Ω, V_{GG}=-100V, C_G=220nF	–	–	-112	V
gate trigger voltage	V_{GT}	I_T=3A, tp(g)≥20μs,V_{GG}=-100V	–	–	2.5	V
Holding Current	I_H	I_T=-1A, di/dt=1A/ms, V_{GG}=-100V	-150	–	–	mA
gate reverse Current	I_{GKS}	V_{GG}=V_{GK}=-100V, V_{KA}=0 ,T_J=25°C	–	–	-5	uA
		V_{GG}=V_{GK}=-100V, V_{KA}=0,T_J=85°C	–	–	-50	uA
gate trigger Current	I_{GT}	I_T=3A, tp(g)≥20μs, V_{GG}=-100V	–	–	5	mA
gate switching charge	Q_{GS}	1.2/50μs, I_T=-53A, R_S=47Ω, V_{GG}=-100V,C_G=220nF	–	0.1	–	uC
cathode-anode offstate capacitance	C_{KA}	f=1MHz,V_d=1V,I_G=0,V_D=-3V	–	–	100	pF
		f=1MHz,V_d=1V,I_G=0,V_D=-48V	–	–	50	pF

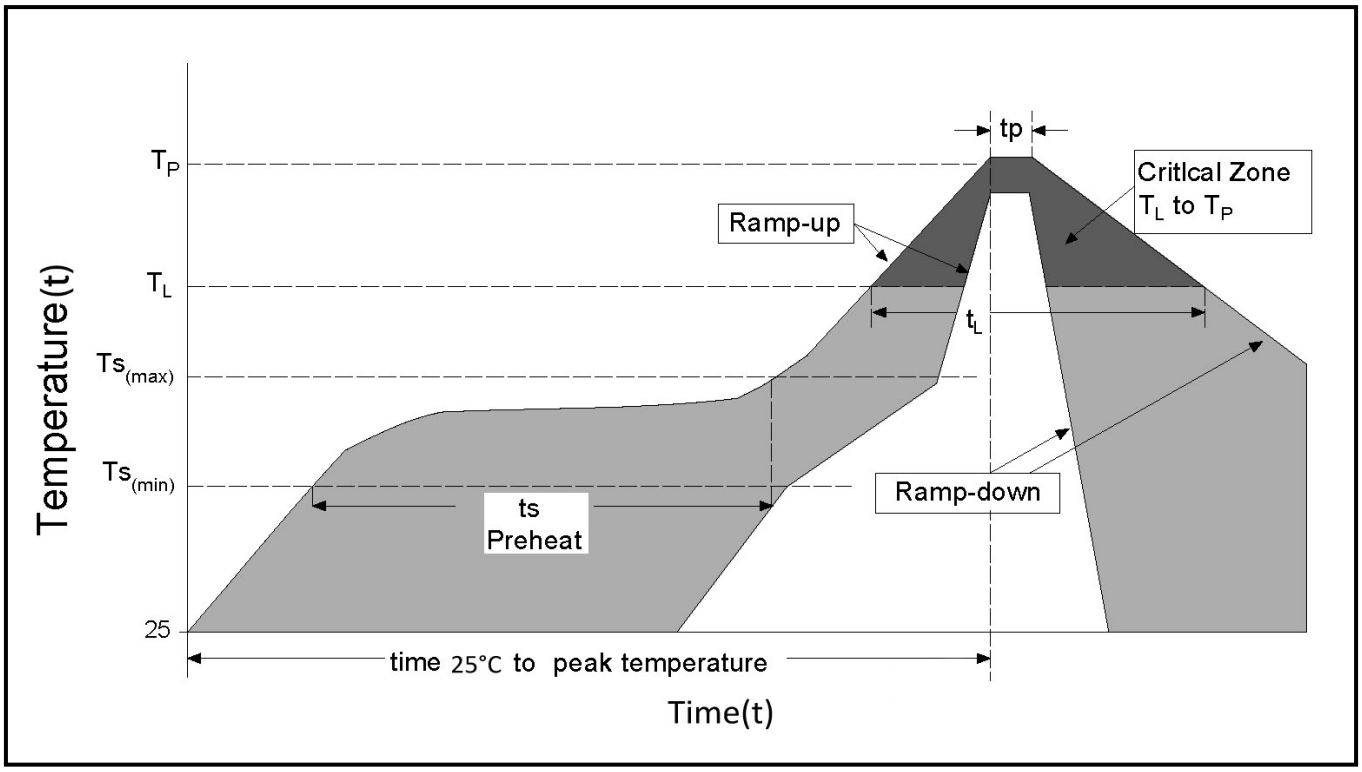
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Thyristor Surge Suppressor

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 T_L - 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

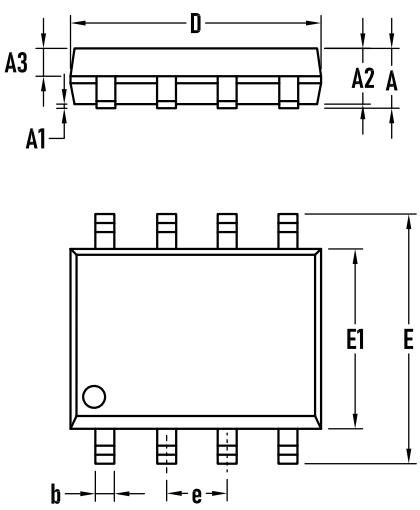
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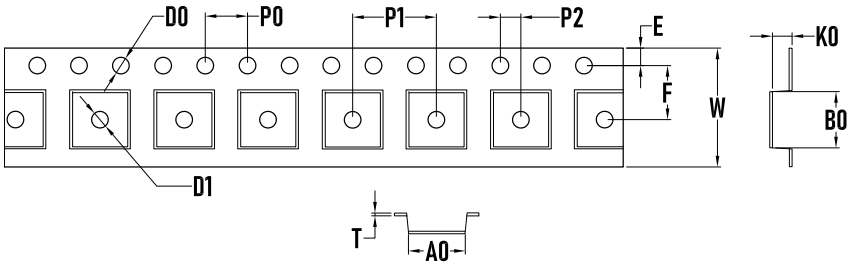
Thyristor Surge Suppressor

Outline Drawing-SOP8



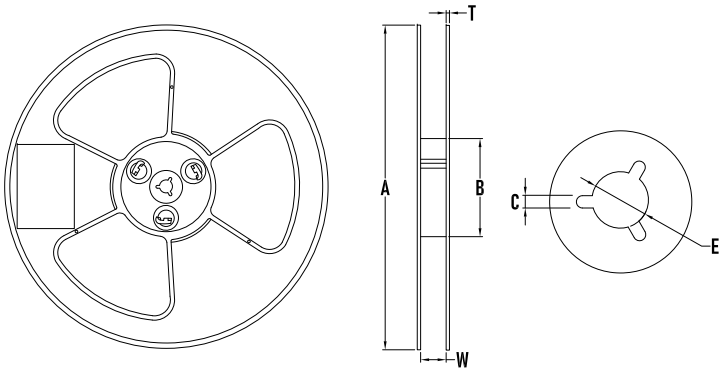
SYMBOL	mm.		
	MIN.	TYP.	MAX.
A	1.50	1.65	1.80
A1	0.01	0.15	0.20
A2	1.35	1.45	1.55
A3	0.60	0.70	0.80
b	0.30	0.40	0.50
c	0.15	0.20	0.25
D	4.70	4.90	5.10
E	5.70	6.00	6.30
E1	3.80	3.90	4.00
e	1.27BSC		
h	0.25	–	0.50
L	0.40	0.65	0.85
L1	0.80	1.05	1.20
θ	0 °	4°	8 °

Packaging Tape - SOP8



SYMBOL	MILLIMETER
A0	6.50±0.10
B0	5.35±0.10
D0	1.60±0.10
D1	1.60±0.10
E	1.75±0.10
F	5.50±0.10
K0	2.10±0.10
P0	4.00±0.10
P1	8.00±0.10
P2	2.00±0.10
W	12.00±0.10
T	0.20±0.02

Packaging Reel



SYMBOL	MILLIMETER
A	330±1
B	100±0.5
C	2.7±0.2
T	2.0±0.2
E	13.60
W	12.4±0.2
Quantity	3000PCS

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