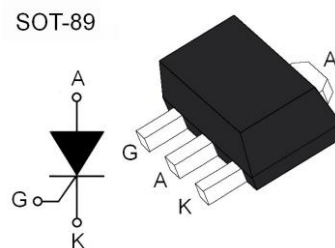


Description

Glass passivated, sensitive gate thyristors in a plastic envelope, intended for use in general purpose switching and phase control applications. These devices are intended to be interfaced directly to microcontrollers, logic integrated circuits and other low power gate trigger circuits.



Features

- Sensitive Gate Trigger Current - 200 μ A Max
- Low Reverse and forward Blocking Current -100 μ A Max, $T_c=125^{\circ}\text{C}$
- Low Holding Current -5mA Max

Marking: BT169

Absolute Maximum Ratings ($T_a=25^{\circ}\text{C}$)

Parameter	Symbol	Conditions	Value			Unit
			D	E	G	
Peak Repetitive Forward Voltage	V_{DRM}		400	500	600	V
Reverse Blocking Voltage	V_{RRM}		400	500	600	V
Average on-state current	$I_{\text{T(AV)}}$	half sine wave	0.5			A
RMS On-State Current	$I_{\text{T(RMS)}}$	all conduction angles	0.8			A
Peak Forward Surge Current	I_{TSM}	$t = 10\text{ms}$, half sine wave; $T_j = 25^{\circ}\text{C}$ prior to surge	8			A
I^2t for fusing	I^2t	$t = 10\text{ ms}$	0.32			A
Repetitive rate of rise of on-state current after triggering	dI_{T}/dt	$dI_{\text{G}}/dt=100\text{mA}/\mu\text{s}$	50			A/ μs
Peak gate voltage	V_{RM}		5			V
Peak Reverse Gate Voltage	V_{GRM}		5			V
Peak Gate Current	I_{GM}		0.1			A
Peak gate power	P_{GM}		2			W
Average gate power	$P_{\text{G(AV)}}$	over any 20 ms period	0.1			W
Operating junction temperature	T_j		125			$^{\circ}\text{C}$
Storage temperature	T_{stg}		$-40 \sim +125$			


Thermal Characteristics

Parameter	Symbol	Typ	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	75	$^{\circ}\text{C}/\text{W}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	200	$^{\circ}\text{C}/\text{W}$
Maximum Lead Temperature for Soldering Purposes for 10 Seconds	T_L	260	$^{\circ}\text{C}$

Electrical Characteristics ($T_a=25^{\circ}\text{C}$)

Parameter	Symbol	Conditions	Value		Unit
			Min	Max	
Peak Forward and Reverse Blocking Current	I_{DRM}, I_{RRM}	$V_D = V_{DRM(max)}, V_R = V_{RRM(max)}$ $R_{GK} = 1k\Omega, T_j = 125^{\circ}\text{C}$		100	μA
On state voltage	V_{TM}	$I_{TM} = 1\text{A}$		1.35	V
Gate trigger voltage	V_{GT}	$V_D = 12\text{V}, I_T = 10\text{mA}$		0.8	V
		$V_D = V_{DRM(max)}, I_T = 10\text{mA}$	0.2		
Gate trigger current	I_{GT}	$V_D = 12\text{V}, I_T = 10\text{mA}$		20	μA
Holding current	I_H	$V_D = 12\text{V}, I_{GT} = 0.5\text{mA}, R_{GK} = 1K\Omega$		5	mA
Latching current	I_L	$V_D = 12\text{V}, I_{GT} = 0.5\text{mA}, R_{GK} = 1K\Omega$		6	mA

Dynamic Characteristics

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Critical Rate of Rise of off-State Voltage	dV_D/dt	$V_D = 67\% V_{DRM(max)}, T_j = 125^{\circ}\text{C}$ Exponential Waveform, $R_K = 1K\Omega$		25		V/ μs
Gate controlled turn-on time	t_{gt}	$V_D = 67\% V_{DRM(max)}, T_j = 125^{\circ}\text{C}$ $dI_G/dt = 100\text{mA}/\mu\text{s}$		2		μs
Circuit commutated turn-off time	t_q	$I_{TM} = 1.6\text{A}, V_R = 35\text{V}, dI_{TM}/dt = 30\text{A}/\mu\text{s}$ $dI_D/dt = 2\text{V}/\mu\text{s}, R_{GK} = 1K\Omega$		100		μs

Typical Characteristics

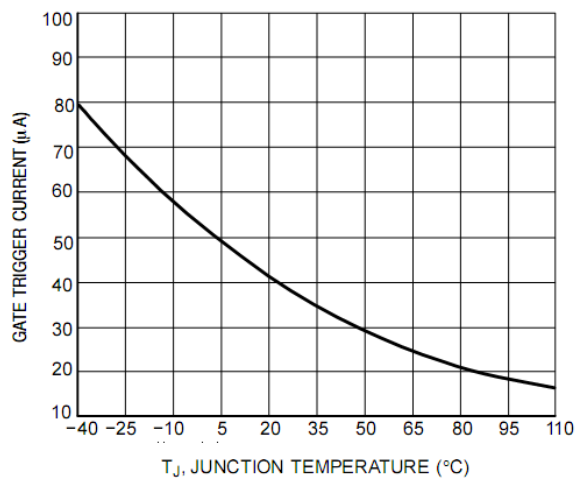


Figure 1. Typical Gate Trigger Current vs Junction Temperature

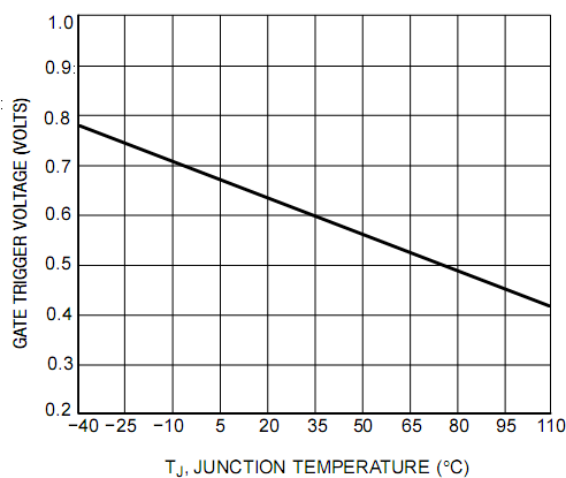


Figure 2. Typical Gate Trigger Voltage vs Junction Temperature

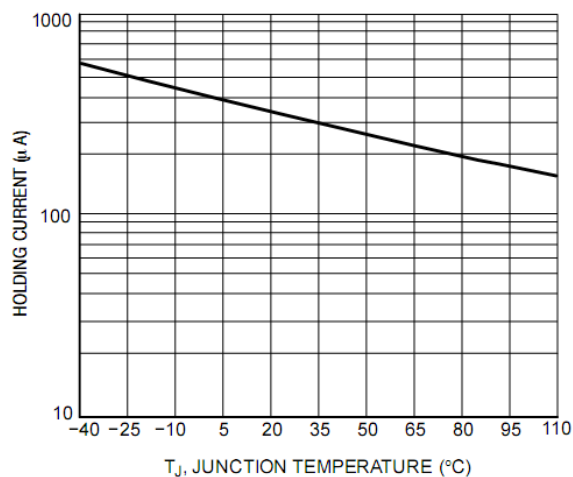


Figure 3. Typical Holding Current vs Junction Temperature

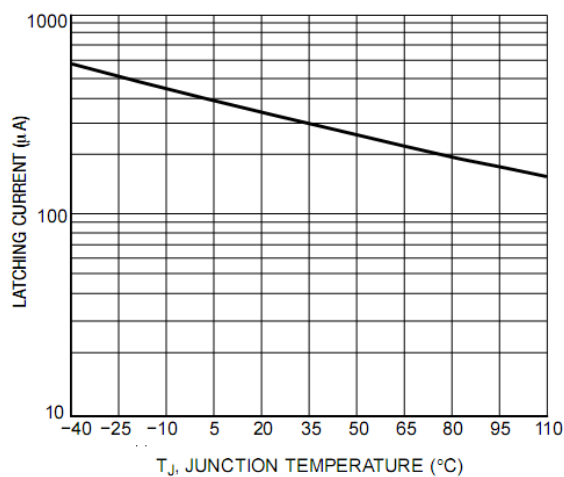


Figure 4. Typical Latching Current vs Junction Temperature

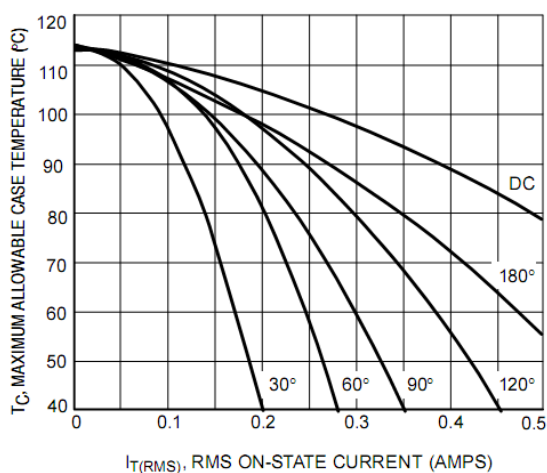


Figure 5. Typical RMS Current Derating

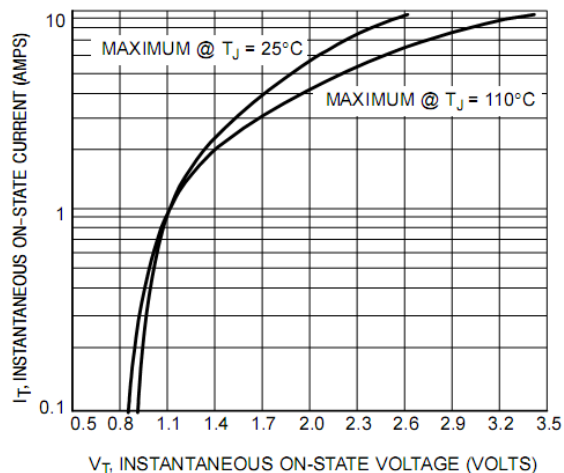
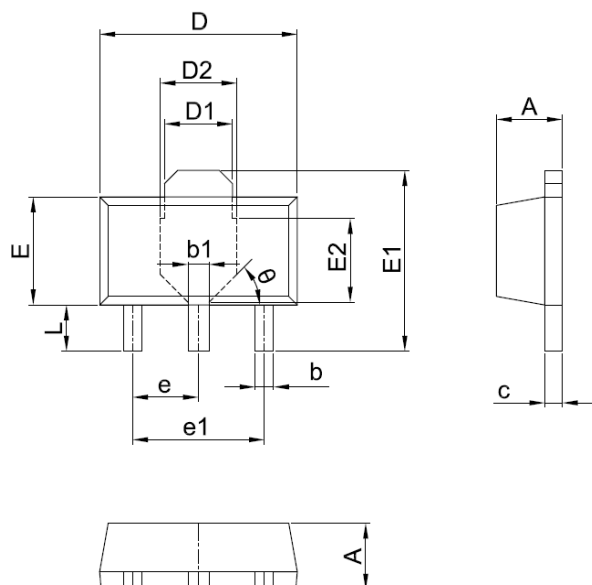


Figure 6. Typical On-State Characteristics

Package Dimensions



Dim	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	1.40	1.60	0.055	0.063
b	0.32	0.52	0.013	0.020
b1	0.38	0.58	0.015	0.023
c	0.35	0.45	0.014	0.018
D	4.40	4.60	0.173	0.181
D1	1.45	1.65	0.057	0.065
D2	1.70	1.80	0.067	0.071
E	2.30	2.60	0.091	0.102
E1	3.95	4.25	0.156	0.167
E2	1.80	2.00	0.071	0.079
e	1.40	1.60	0.055	0.063
e1	2.80	3.20	0.110	0.126
L	0.90	1.20	0.035	0.047