

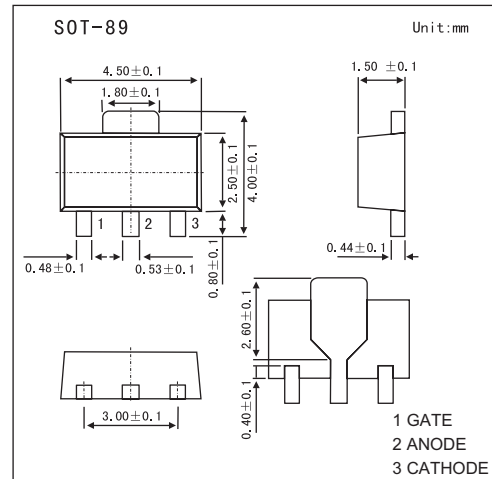
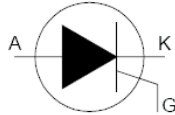
## Silicon Controlled Rectifiers

### HBT169M

#### ■ Features

- Repetitive peak off-state voltages :400V
- Average on-state current :0.5A
- RMS on-state current :0.8A
- Non-repetitive peak on-state current :8A

Symbol



#### ■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

Parameter	Symbol	Rating	Unit
Peak Repetitive Forward and Reverse Blocking Voltage*	$V_{DRM}$ and $V_{RRM}$	400	V
Forward Current RMS	$I_{T(RMS)}$	0.8	A
Non-repetitive peak on-state current (t=10ms)	$I_{TSM}$	8	A
Non-repetitive peak on-state current (t=8.3ms)		9	A
Circuit Fusing Considerations (t = 10ms)	$I^2t$	0.32	$A^2s$
Repetitive rate of rise of on-state current after triggering *1	$di_T/dt$	50	A/us
Peak gate current	$I_{GM}$	1	A
Peak Gate Power — Forward, $T_A = 25^\circ\text{C}$	$P_{GM}$	2	W
Average Gate Power — Forward, $T_A = 25^\circ\text{C}$	$P_{GF(AV)}$	0.1	W
Peak Gate Current — Forward, $T_A = 25^\circ\text{C}$	$I_{GFM}$	1	A
Peak gate voltage	$V_{GM}$	5	V
Peak Gate Voltage — Reverse	$V_{GRM}$	5	V
Thermal resistance junction to lead *2	$R_{th\ j-lead}$	60	K/W
Thermal resistance junction to ambient *2	$R_{th\ j-a}$	150	K/W
Storage temperature	$T_{stg}$	150	$^\circ\text{C}$
Operating junction temperature	$T_J$	125	$^\circ\text{C}$

\*1  $I_{TM}=2A$ ;  $I_G=10mA$ ;  $di_G/dt=100mA/us$

\*2 pcb mounted; lead length=4mm

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## ■ Electrical Characteristics (Ta = 25°C, unless otherwise noted.)

Parameter	Symbol	Testconditions	Min	Typ.	Max	Unit
On-state Voltage	V <sub>T</sub>	I <sub>T</sub> =1A		1.2	1.35	V
Gate Trigger Current (Continuous dc)*2 T <sub>c</sub> = 25°C	I <sub>GT</sub>	V <sub>D</sub> =12V, I <sub>T</sub> =10mA, Gate open circuit		50	200	μ A
Latching Current	I <sub>L</sub>	V <sub>D</sub> =12V, I <sub>GT</sub> =0.5mA; R <sub>GK</sub> =1k Ω		2	6	mA
Holding Current	I <sub>H</sub>	V <sub>D</sub> =12V, I <sub>GT</sub> =0.5mA; R <sub>GK</sub> =1k Ω		2	5	mA
Gate Trigger Voltage	V <sub>GT</sub>	V <sub>D</sub> =12V, I <sub>T</sub> =10mA, Gate open circuit		0.5	0.8	V
		V <sub>D</sub> = V <sub>DRM</sub> (max), I <sub>T</sub> =10mA; T <sub>j</sub> =125 °C, Gate open circuit	0.2	0.2		
Off-state Leakage Current	I <sub>D</sub> , I <sub>R</sub>	V <sub>D</sub> =V <sub>DRM</sub> (max); V <sub>R</sub> = V <sub>RRM</sub> (max); T <sub>j</sub> =125 °C; R <sub>GK</sub> =1k Ω		0.05	0.1	mA
Critical rate of rise of off-state voltage	dV <sub>D</sub> /dt	V <sub>DM</sub> =67% V <sub>DRM</sub> (max); T <sub>j</sub> =125 °C, exponential waveform; R <sub>GK</sub> =1k Ω	500	800		V/us
Gate controlled turn-on time	t <sub>gt</sub>	I <sub>TM</sub> =2A; V <sub>D</sub> =V <sub>DRM</sub> (max), G=10mA; di <sub>G</sub> /dt=0.1A/us		2		us
Circuit commutated turn-off time	t <sub>q</sub>	V <sub>D</sub> =67% V <sub>DRM</sub> (max); T <sub>j</sub> =125 °C, T <sub>M</sub> =1.6A; V <sub>R</sub> =35V; di <sub>TM</sub> /dt=30A/us, dv <sub>D</sub> /dt=2V/us; R <sub>GK</sub> =1k Ω		100		us

\*1. Forward current applied for 1 ms maximum duration, duty cycle ≤ 1%.

\*2. R<sub>GK</sub> current is not included in measurement.

## ■ Marking

Marking	169
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