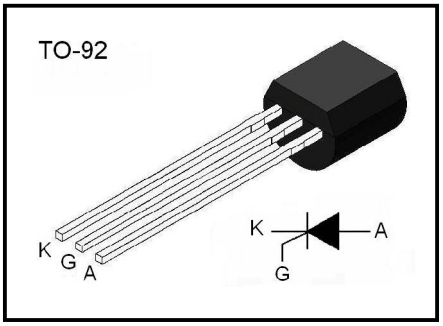
BT169 TO-92 Plastic-Encapsulate Thyristors

Description

The BT169 is 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.



Absolute Maximum Ratings (Ta=25℃)

Parameter	Symbol	Conditions	Value				Unit
			B	D	E	G	
Repetitive peak off-state voltages	V_{DRM}, V_{RRM}		200	400	500	600	V
Average on-state current	$I_{T(AV)}$	half sine wave	0.5				A
RMS on-state current	$I_{T(RMS)}$	all conduction angles	0.8				A
Peak forward surge current	I_{TSM}	t=10ms, half sine wave	8				A
I^2t t for fusing	I^2t	t=10ms	0.32				A^2s
Repetitive rate of rise of on-state current after triggering	dI_T/dt	I_{TM} = 1A, I_G = 10mA dI_G/dt = 100mA/μs	50				A/μs
Peak gate current	I_{GM}		1				A
Peak gate voltage	V_{GM}		5				V
Peak reverse gate voltage	V_{RGM}		5				V
Peak gate power	P_{GM}		2				W
Gate dissipation	$P_{G(AV)}$	over any 20 ms period	0.1				W
Operating junction temperature	T_j		125				℃
Storage temperature range	T_{stg}		-40～+50				℃

Thermal Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Thermal resistance junction-lead	$R_{\theta j\text{-}lead}$				60	°C/W
Thermal resistance junction-ambient	$R_{\theta j\text{-}a}$	pcb mounted; lead length = 4mm		150		°C/W

Electrical Characteristics (T_j=25℃ unless otherwise stated)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Gate trigger current	I_{GT}	V_D=12 V; I_T=10mA; gate open circuit			200	μA
Latching current	I_L	V_D=12V, I_{GT}=0.5mA，R_{AG} =1kΩ			6	mA
Holding current	I_H	V_D=12V, I_{GT}=0.5mA，R_{AG} =1kΩ			5	mA
On state voltage	V_T	I_T =1A			1.35	V
Gate trigger voltage	V_{GT}	V_D=12 V; I_T=10mA; gate open circuit			0.8	V
Gate non trigger voltage	V_{GD}	V_D=$V_{DRM(Max)}$, I_T =10mA, T_j =125℃ gate open circuit	0.2			V
Off-state leakage current	I_D，I_R	V_D=$V_{DRM(max)}$, V_R=$V_{RRM(max)}$ T_j=125℃, R_{AG} =1kΩ			0.1	mA
Critical rate of rise of off-state voltage	dV_D/dt	V_{DM}=67% $V_{DRM(max)}$; T_j =125℃ exponential waveform; R_{GK}=1kΩ		25		V/μs
Gate controlled turn-on time	t_{gt}	I_{TM} =2A; V_D=$V_{DRM(max)}$, I_G=10mA dI_G/dt = 100mA/μs		2		μs
Circuit commutated turn-off time	t_q	V_{DM}=67% $V_{DRM(max)}$; T_j =125℃ I_{TM} =2A; V_R= 35V; dI_{TM}/dt = 30A/μs dV_D/dt=2V/μs; R_{GK}=1kΩ		100		μs

Typical Characteristics

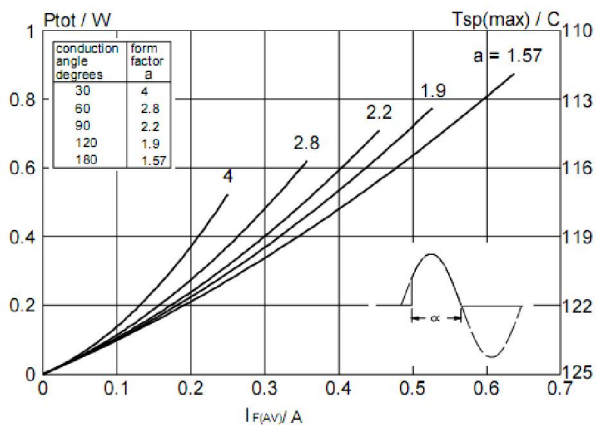


Fig.1.Maximum on-state dissipation, Ptot, vs average on-state current, $I_{T(AV)}$, where a = form factor = $I_{T(RMS)}$ / $I_{T(AV)}$.

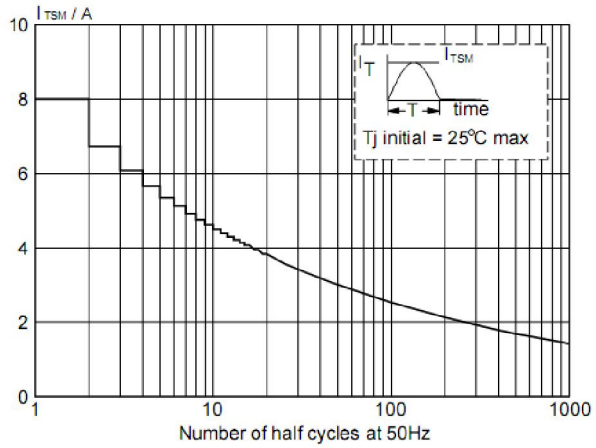


Fig.2. Maximum permissible non-repetitive peak on-state current I_{TSM}, vs. number of cycles, for sinusoidal currents, f = 50 Hz.

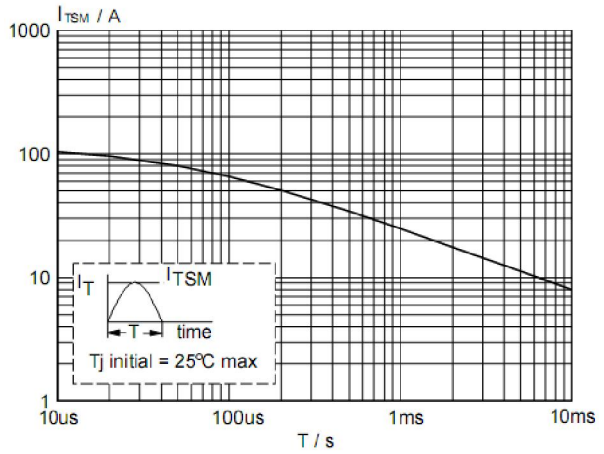


Fig.3. Maximum permissible non-repetitive peak on-state current I_{TSM}, vs pulse width tp, for sinusoidal currents, tp ≤ 10ms.

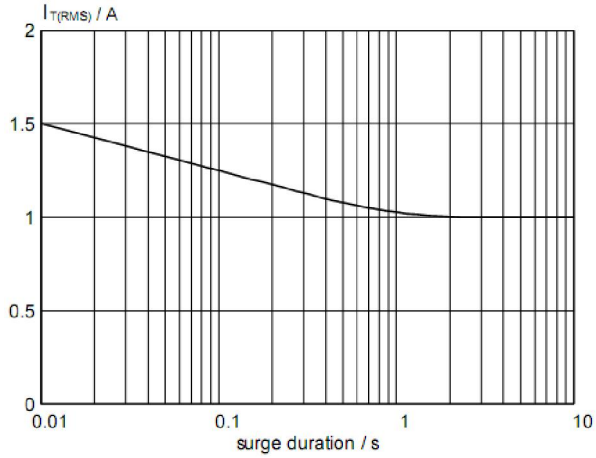


Fig.4. Maximum permissible repetitive rms on-state current IT(RMS), vs surge duration, for sinusoidal currents, f = 50 Hz; Tsp ≤ 112˚C.

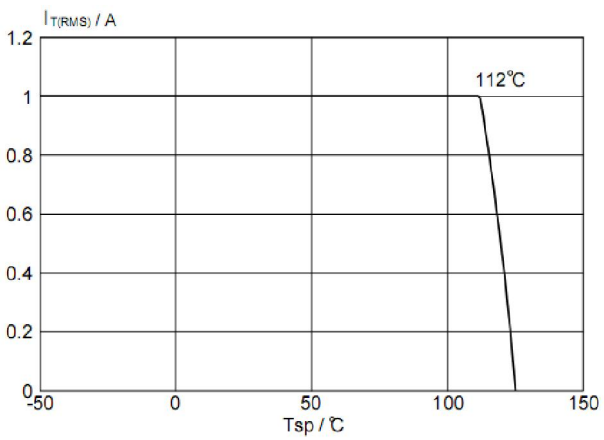


Fig.5. Maximum permissible rms current $I_{T(RMS)}$, vs solder point temperature Tsp.

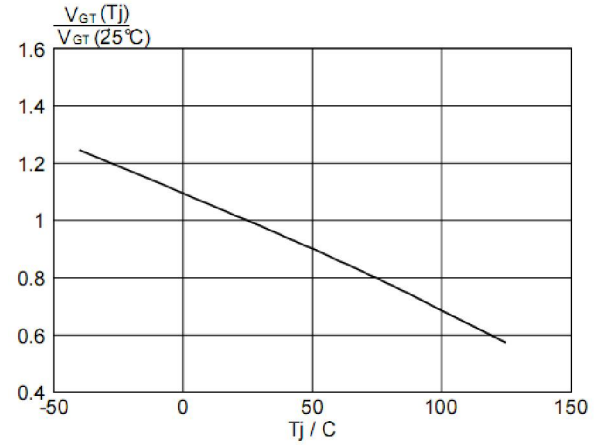


Fig.6. Normalised gate trigger voltage $V_{GT}(T_j)$/ V_{GT}(25˚C), vs junction temperature T_j .

Typical Characteristics

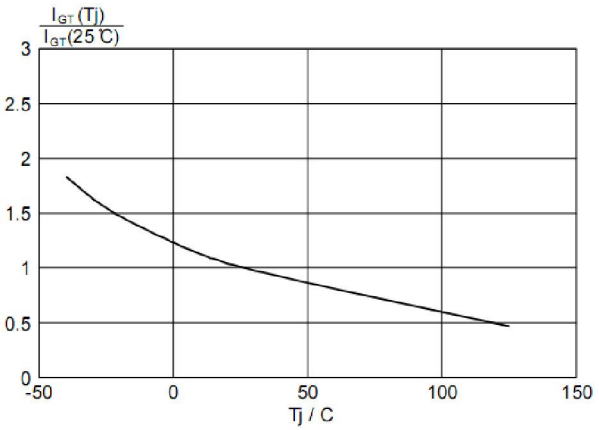


Fig.7. Normalised gate trigger current $I_{GT}(T_j)$/ $I_{GT}(25^{\circ}C)$, vs junction temperature T_j.

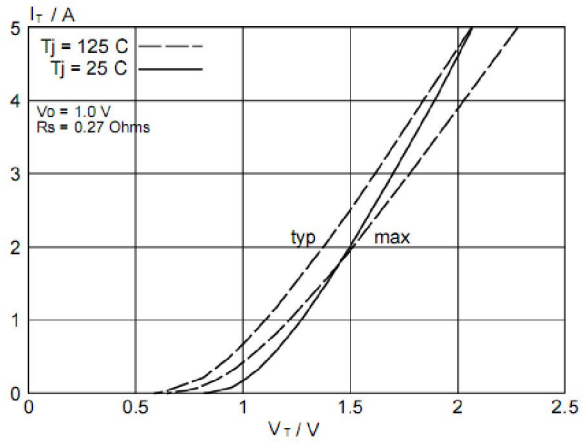


Fig.8. Typical and maximum on-state characteristic.

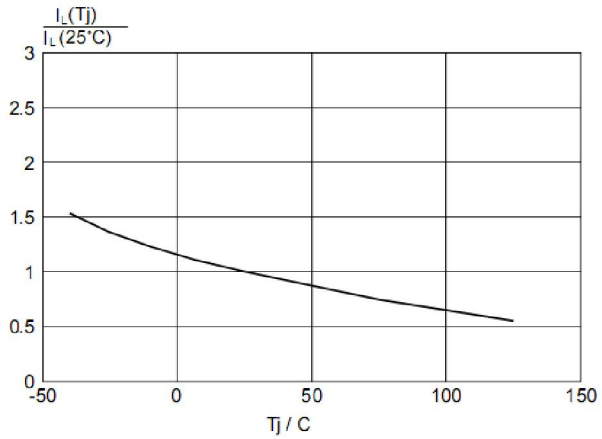


Fig.9. Normalised latching current $I_L(T_j)$/ $I_L(25^{\circ}C)$, vs T_j , R_{GK} = 1 kΩ.

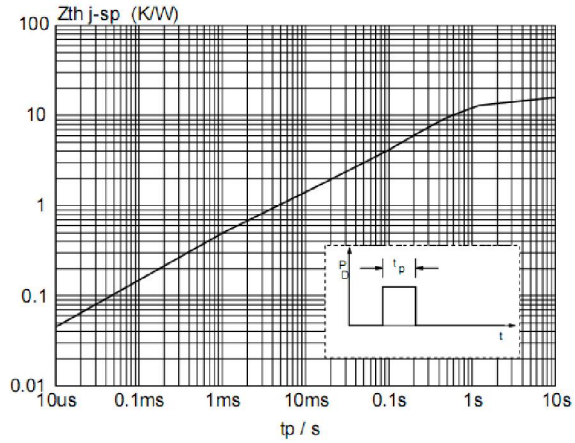


Fig.10. Transient thermal impedance Zth j-sp, vs pulse width tp.

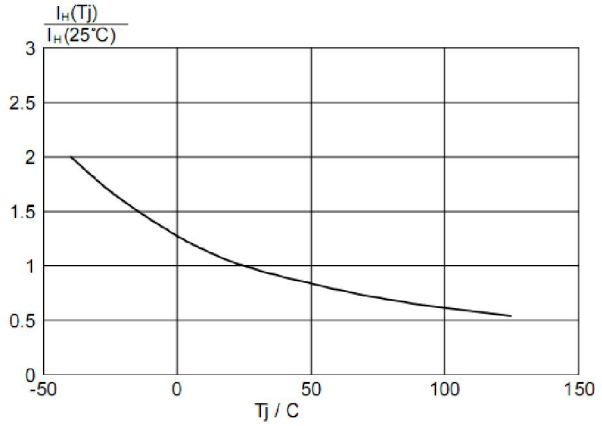


Fig.11. Normalised holding current $I_H(T_j)$/ $I_H(25^{\circ}C)$, vs T_j , R_{GK} = 1 kΩ.

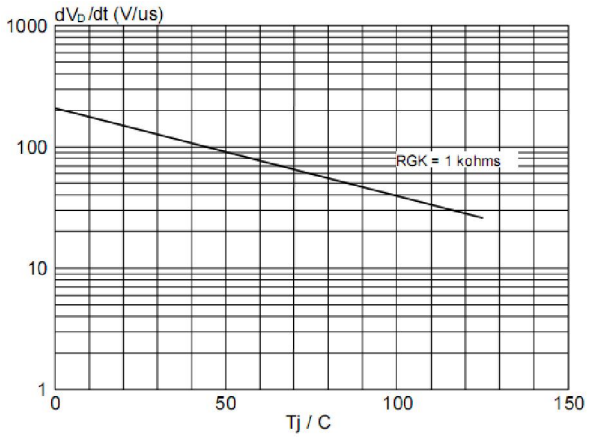
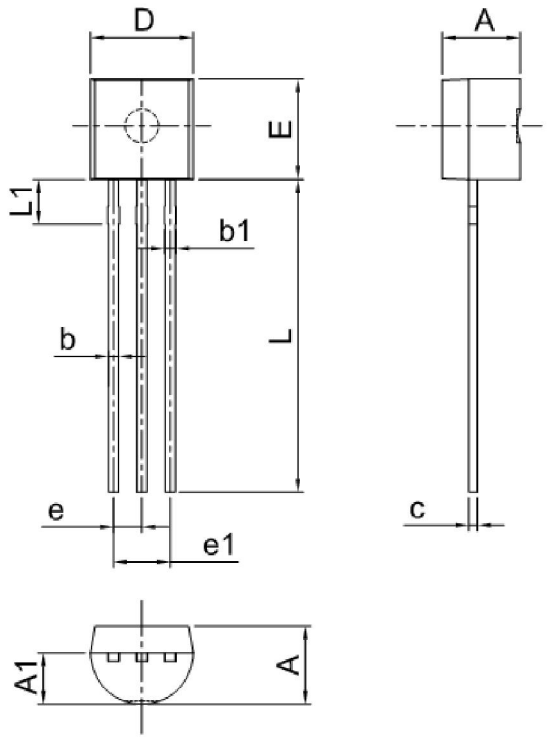


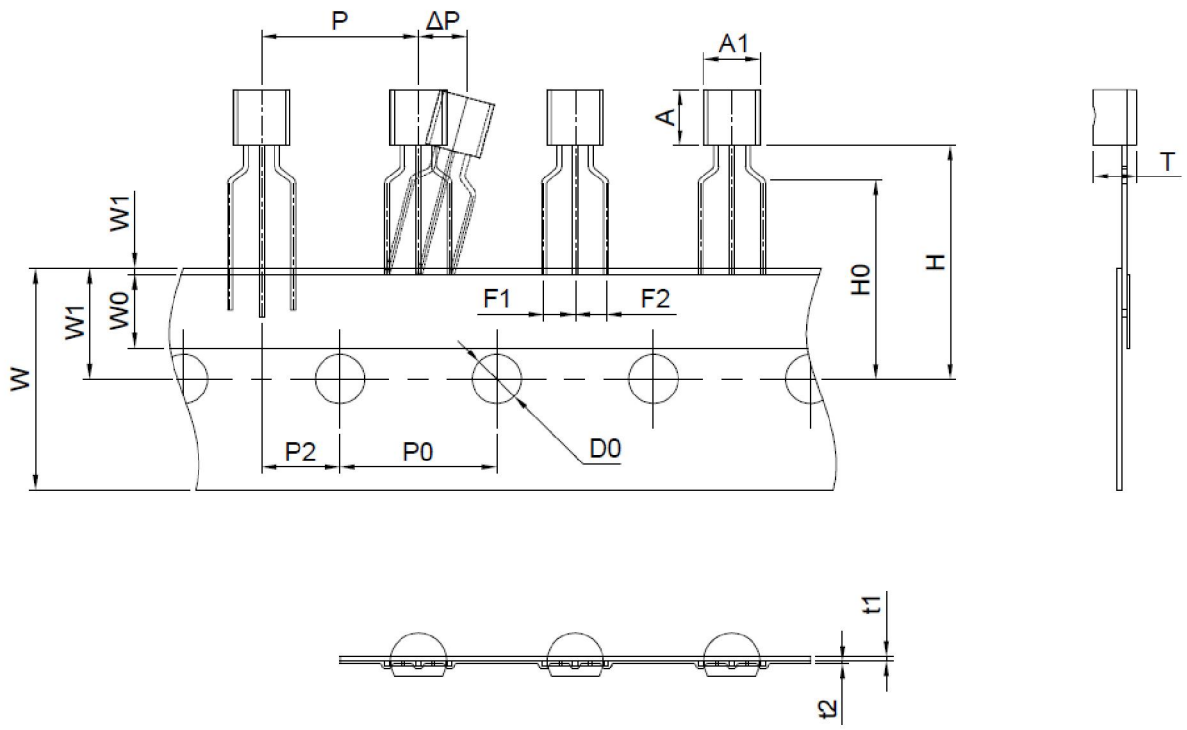
Fig.12. Typical, critical rate of rise of off-state voltage, dV_D/dt vs Tj

Package Dimensions

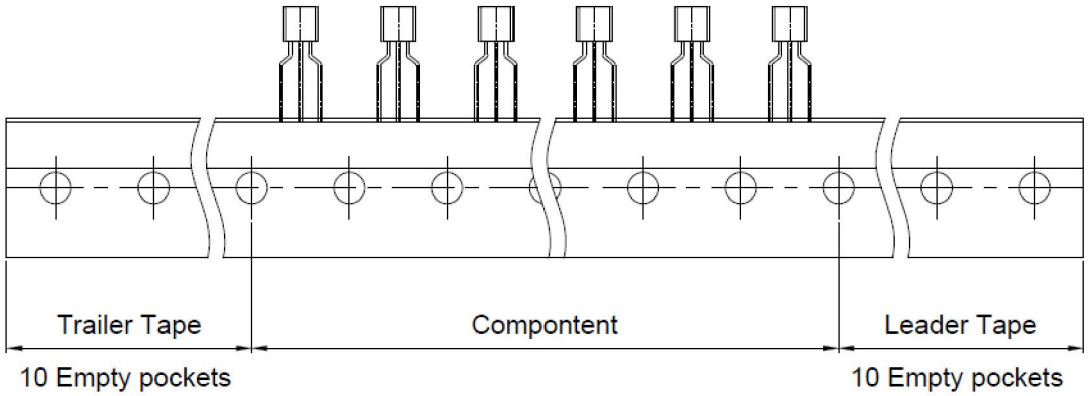


Dim	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	3.30	3.70	0.130	0.146
A1	2.30	2.70	0.091	0.106
b	0.40	0.50	0.016	0.020
b1	0.50	0.70	0.020	0.028
c	0.35	0.45	0.014	0.018
D	4.45	4.70	0.175	0.185
E	4.40	4.65	0.173	0.183
e	1.17	1.37	0.046	0.054
e1	2.34	2.64	0.092	0.104
L	13.50	14.50	0.531	0.571
L1	1.80	2.20	0.071	0.087

Taping Dimensions



Dimiensions are in millimeter								
A	**A1**	**T**	**P**	**P0**	**P2**	**F1**	**F2**	**W**
4.6	**4.6**	**3.5**	**12.7**	**12.7**	**6.35**	**2.54**	**2.54**	**18.0**
W0	**W1**	**W2**	**H**	**H0**	**D0**	**t1**	**T2**	**ΔP**
6.0	**9.0**	**1.0Max**	**19.0**	**18.0**	**4.0**	**0.4**	**0.2**	**0**



Package	Box	Box Size(mm)	Carton	Carton Size(mm)
TO-92	**2000pcs**	**330×145×45**	**20,000pcs**	**360×330×240**