THYRISTORS

Fully-diffused thyristors in TO–92 package, with low gate current requirement suitable for driving from IC outputs. Applications include relay and coil pulsing, control of small d.c. motors, small lamps, etc.
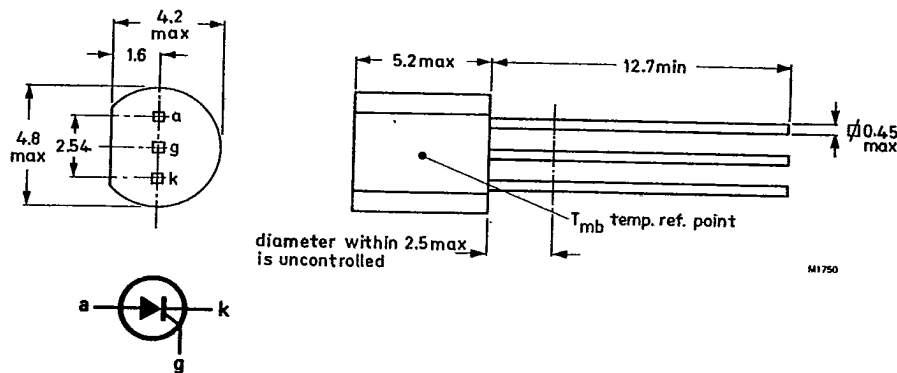
QUICK REFERENCE DATA

Repetitive peak voltages	V_{DRM}/V_{RRM}	max.	BT169-B	D	M	V
			200	400	600	
Average on-state current	$I_{T(AV)}$	max.		0.5		A
R.M.S. on-state current	$I_{T(RMS)}$	max.		0.8		A
Non-repetitive peak on-state current	I_{TSM}	max.		8		A

MECHANICAL DATA

Dimensions in mm

Fig.1 TO–92 variant

diameter within 2.5max is uncontrolled

T_{mb} temp. ref. point

M1750

RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC 134).

Anode to cathode			BT169-B	D	M	
Non-repetitive peak voltages (t ⩽ 10 ms)	V_{DSM}/V_{RSM}	max.	200	400	600	V*
Repetitive peak voltages (δ ⩽ 0.01)	V_{DRM}/V_{RRM}	max.	200	400	600	V

Average on-state current (averaged over any 20 ms period) up to T_{mb} = 55 °C	$I_{T(AV)}$	max.	0.5	A
R.M.S. on-state current	$I_{T(RMS)}$	max.	0.8	A
Repetitive peak on-state current	I_{TRM}	max.	8	A
Non-repetitive peak on-state current; t = 10 ms; half sine-wave; T_j = 125 °C prior to surge; with reapplied V_{RWMmax}	I_{TSM}	max.	8	A
I^2t for fusing (t = 10 ms)	I^2t	max.	0.32	A^2s
Rate of rise of on-state current after triggering with I_G = 1 mA to I_T = 1.8 A; dI_G/dt = 4 mA/μs	dI_T/dt	max.	30	A/μs

Gate to cathode

Peak reverse voltage	V_{RGM}	max.	8	V
Average power dissipation (averaged over any 20 ms period)	$P_{G(AV)}$	max.	0.1	W
Peak power dissipation	P_{GM}	max.	2	W

Temperatures

Storage temperature	T_{stg}		−40 to +150	°C
Operating junction temperature	T_j	max.	125	°C

THERMAL RESISTANCE

From junction to mounting base	$R_{th\ j-mb}$	=	100	K/W
From junction to ambient in free air, mounted on a p.c.b. with any lead length	$R_{th\ j-a}$	=	200	K/W

*R_{GK} = 1 kΩ.

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Thyristors

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CHARACTERISTICS

Anode to cathode

On-state voltage $I_T = 1$ A; $T_j = 25$ °C	V_T	<	1.35	V*
Rate of rise of off-state voltage that will not trigger any device; exponential method, $V_D = 2/3 V_{DRMmax}$; $R_{GK} = 1$ kΩ; $T_j = 125$ °C	dV_D/dt	<	100	V/μs
Reverse current $V_R = V_{RRMmax}$; $R_{GK} = 1$ kΩ; $T_j = 125$ °C	I_R	<	0.1	mA
Off-state current $V_D = V_{DRMmax}$; $R_{GK} = 1$ kΩ; $T_j = 125$ °C	I_D	<	0.1	mA
Latching current $V_D = 6$ V; $R_{GK} = 1$ kΩ; $T_j = 25$ °C	I_L	<	6	mA
Holding current $V_D = 6$ V; $R_{GK} = 1$ kΩ; $T_j = 25$ °C	I_H	<	5	mA

Gate to cathode

Voltage that will trigger all devices $V_D = 6$ V; $T_j = 25$ °C	V_{GT}	>	0.8	V
Current that will trigger all devices $V_D = 6$ V; $T_j = 25$ °C	I_{GT}	>	0.2	mA

Switching characteristics

Gate-controlled delay time when switched from $V_D = V_{DRMmax}$ to $I_T = 1.5$ A; $I_{GT} = 10$ mA; $dI_G/dt = 0.1$ A/μs; $T_j = 25$ °C	t_d	<	1.0	μs
Circuit-commutated turn-off time when switched from $I_T = 0.5$ A to $V_R > 35$ V with $-dI_T/dt = 110$ A/μs; $dV_D/dt = 50$ V/μs; $T_j = 125$ °C	t_q	<	100	μs

*Measured under pulse conditions to avoid excessive dissipation.

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