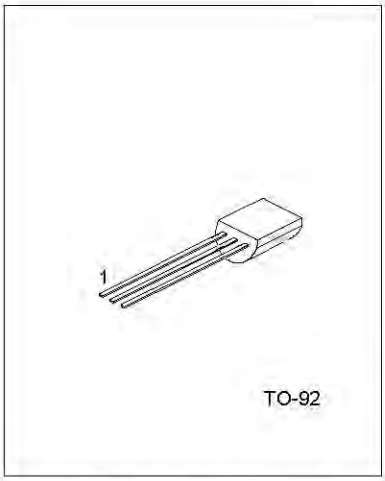
DESCRIPTION

The UTC 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.



1:CATHODE 2:GATE 3:ANODE

QUICK REFERENCE DATA

PARAMETER	SYMBOL	MAX(B)	MAX(D)	MAX(E)	MAX(G)	UNIT
Repetitive peak off-state voltages	V_{DRM}, V_{RRM}	200	400	500	600	V
Average on-state current	$I_{T(AV)}$	0.5	0.5	0.5	0.5	A
RMS on-state current	$I_{T(RMS)}$	0.8	0.8	0.8	0.8	A
Non-repetitive peak on-state current	I_{TSM}	8	8	8	8	A

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	CONDITIONS	MIN	MAX	UNIT
Repetitive peak off-state voltages :	V_{DRM},V_{RRM}			B:200 D:400 E:500 G:600	V
Average on-state current	$I_{T(AV)}$	Half sine wave; Tlead<=83°C		0.5	A
RMS on-state current	$I_{T(RMS)}$	All conduction angles		0.8	A
Non-repetitive peak on-state current	I_{TSM}	t=10ms t=8.3ms half sine wave; Tj=25°C prior to surge		8 9	A
I^2t 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}=2A;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

PARAMETER	SYMBOL	CONDITIONS	MIN	MAX	UNIT
Peak gate power	P_{GM}			2	W
Average gate power	$P_{G(AV)}$	Over any 20 ms period		0.1	W
Storage temperature	Tstg		-40	150	°C
Operating junction temperature	Tj			125	°C

THERMAL RESISTANCES

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Thermal resistance junction to lead	Rth j-lead				60	K/W
Thermal resistance junction to ambient	Rth j-a	pcb mounted; lead length=4mm		150		K/W

ELECTRICAL CHARACTERISTICS (Tj=25°C unless otherwise stated)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
STATIC						
Gate trigger current	I_{GT}	V_D=12V;IT=10mA;gate open circuit		50	200	μA
Latching current	I_L	V_D=12V;I_{GT}=0.5mA; R_{GK}=1kΩ		2	6	mA
Holding current	I_H	V_D=12V;I_{GT}=0.5mA; R_{GK}=1kΩ		2	5	mA
On-state voltage	V_T	I_T=1A		1.2	1.35	V
Gate trigger voltage	V_{GT}	V_D=12V;I_T=10mA; gate open circuit V_D=$V_{DRM(max)}$;$I_{T=10mA}$; Tj=125°C; gate open circuit	 0.2	0.5 0.3	0.8	V
Off-state leakage current	I_D,I_R	V_D=$V_{DRM(max)}$;V_R=$V_{RRM(max)}$;Tj=125°C;R_{GK}=1kΩ		0.05	0.1	mA
DYNAMIC						
Ciritical rate of rise of off-state voltage	dV_D/dt	V_{DM}=67% $V_{DRM(max)}$; Tj=125°C; 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=0.1A/μs		2		μs
Circuit commutated turn-off time	tq	V_D=67% $V_{DRM(max)}$; Tj=125°C;I_{TM}=1.6A;V_R=35V ;dI_{TM}/dt=30A/μs; V_D/dt=2V/μs;R_{GK}=1kΩ		100		μs

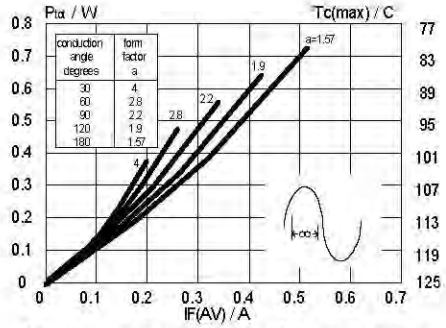


FIG.1 Maximum on-state dissipation, P tot, versus average on-state current, I T(AV), where a=form factor=I T(RMS) / IT(AV)

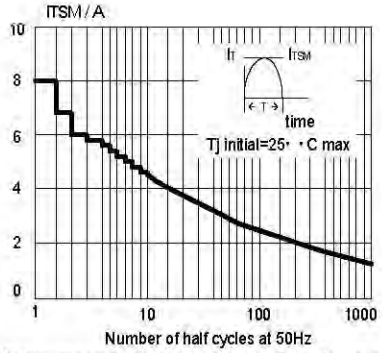


FIG.4 Maximnum permissible non-repetitive peak on-state current ITSM, versus number of cycles, for sinusoidal currents, f = 50Hz.

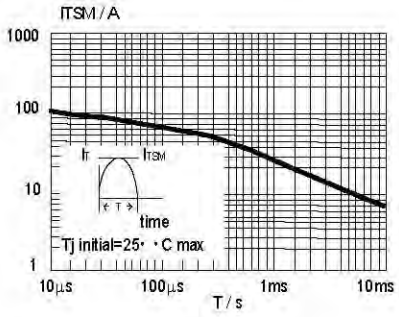


FIG.2 Maximum permissible non-repetitive peak on-state current ITSM, versus pulse width tp, for sinusoidal currents, t p<=10ms.

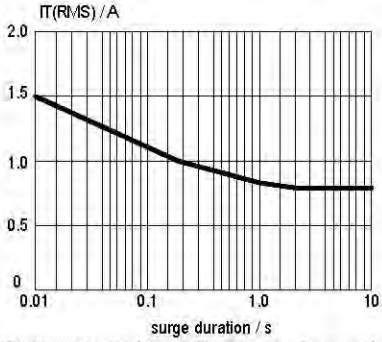


FIG.5 Maximum permissible repetitive rms on-state current I T(RMS), versus surge duration, for sinusoidal currents, f= 50Hz; Tlead<=83• •C

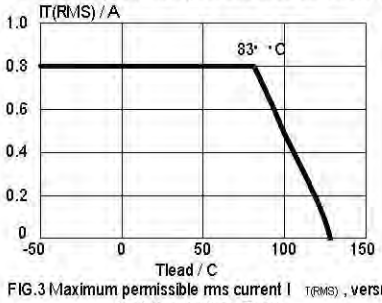


FIG.3 Maximum permissible rms current I T(RMS), versus lead temperature, Tlead

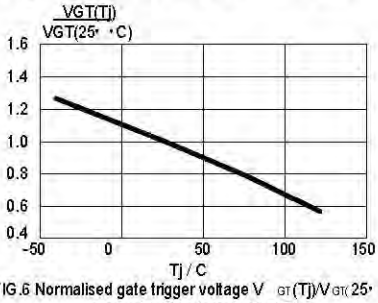


FIG.6 Normalised gate trigger voltage V GT(Tj)/V GT(25• •C), versus junction temperature Tj

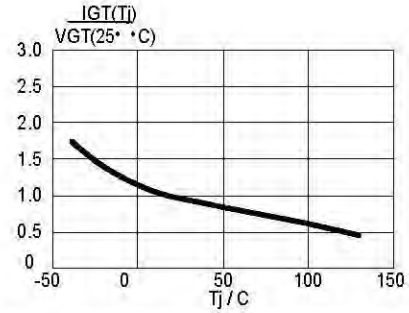


FIG.7 Normalised gate trigger current $I_{GT}(Tj)/I_{GT}(25^{\bullet}C)$, versus junction temperature Tj

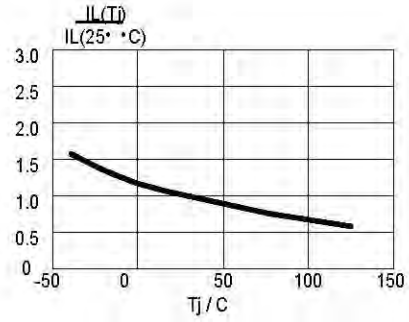


FIG.8 Normalised latching current $I_L(Tj)/I_L(25^{\bullet}C)$, versus junction temperature Tj, R_{GK}= 1KΩ

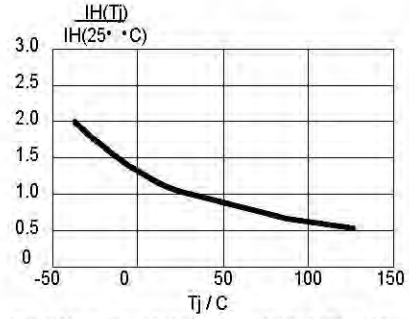


FIG.9 Normalised holding current $I_H(Tj)/I_H(25^{\bullet}C)$, versus junction temperature Tj, R_{GK}=1KΩ

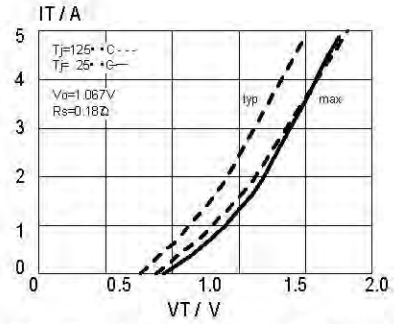


FIG.10 Typical and maximum on-state characteristic.

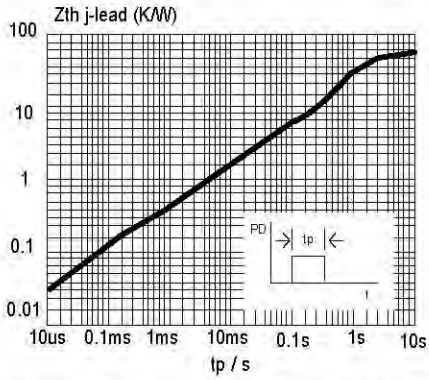


FIG.11 Transient thermal impedance Zth j-lead, versus pulse width tp.

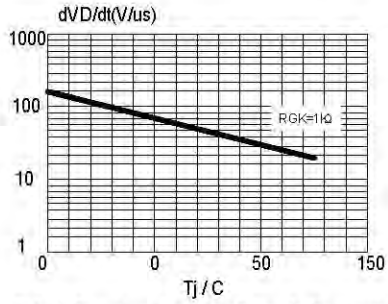


FIG.12 Typical, critical rate of rise of off-state voltage, dV_D/dt versus junction temperature Tj.