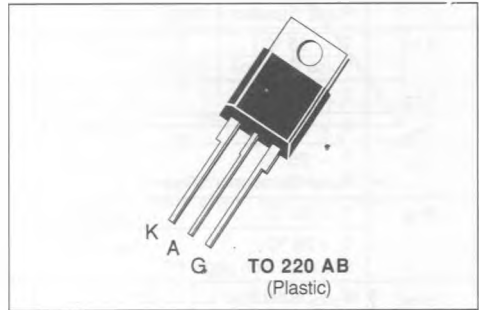


THYRISTORS FOR OVERVOLTAGE PROTECTION

- GLASS PASSIVATED CHIP
- HIGH STABILITY AND RELIABILITY
- HIGH SURGE CAPABILITY
- HIGH di/dt RATING



**DESCRIPTION**

SCR designed for overvoltage protection in crowbar circuits.

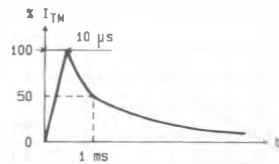
**ABSOLUTE RATINGS** (limiting values)

Symbol	Parameter	Value	Unit
$I_{T(RMS)}$	RMS on-state Current (1)	$T_c = 75\text{ }^\circ\text{C}$ 12	A
$I_{T(AV)}$	Mean on-state Current (1)	$T_c = 75\text{ }^\circ\text{C}$ 8	A
$I_{TSM}$	Non Repetitive Surge Peak on-state Current ( $T_j$ initial = 25 °C) (2)	$t = 8.3\text{ ms}$	315
		$t = 10\text{ ms}$	300
$I^2t$	$I^2t$ Value for Fusing	$t = 10\text{ ms}$	450
$I_{TM}$	Non Repetitive Surge Peak on-state Current ( $T_j$ initial = 25 °C) (5)	$t = 1\text{ ms}$	750
di/dt	Critical Rate of Rise of on-state Current (3)	100	A/ $\mu$ s
$T_{stg}$ $T_j$	Storage and Operating Junction Temperature Range	- 40 to 125	$^\circ\text{C}$
		- 40 to 125	$^\circ\text{C}$

Symbol	Parameter	TYP212	TYP512	TYP1012	TYP2012	Unit
$V_{DRM}$ $V_{RRM}$	Repetitive Peak off-state Voltage (4)	25	50	100	200	V

- (1) Single phase circuit, 180° conduction angle  
 (2) Half sine wave  
 (3)  $I_G = 300\text{ mA}$   $di_c/dt = 1\text{ A}/\mu\text{s}$   
 (4)  $T_j = 125\text{ }^\circ\text{C}$

(5) Exponential pulse wave form 10/1000



DBBTHYPROTEC1

**THERMAL RESISTANCES**

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction-case for D.C.	4.74	$^\circ\text{C}/\text{W}$
$R_{th(j-a)}$	Junction-ambient	60	$^\circ\text{C}/\text{W}$

**GATE CHARACTERISTICS** (maximum values)

$P_{GM} = 20 \text{ W}$  ( $t_p = 20 \mu\text{s}$ )

$I_{FGM} = 2 \text{ A}$  ( $t_p = 20 \mu\text{s}$ )

$V_{RGM} = 5 \text{ V}$

$P_{G(AV)} = 0.5 \text{ W}$

$V_{FGM} = 10 \text{ V}$  ( $t_p = 20 \mu\text{s}$ )

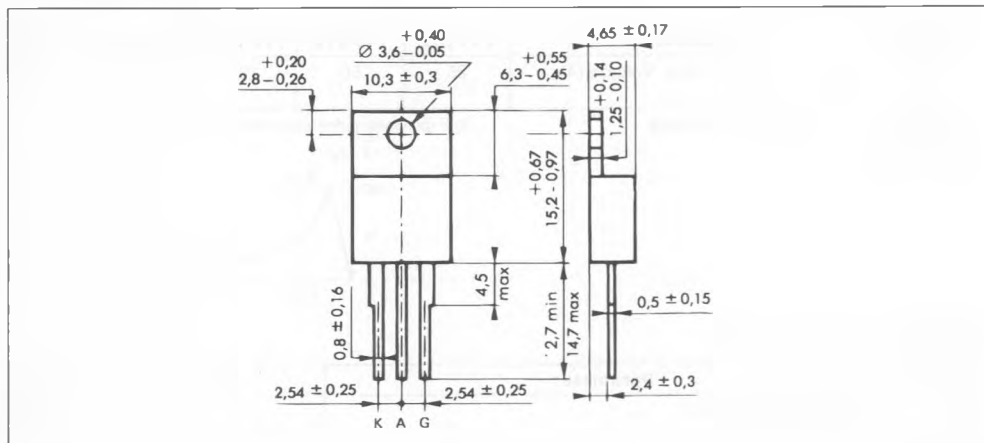
**ELECTRICAL CHARACTERISTICS**

Symbol	Test Conditions			Min.	Typ.	Max.	Unit
$I_{GT}$	$T_j = 25 \text{ }^\circ\text{C}$ Pulse Duration > 20 $\mu\text{s}$	$V_D = 12 \text{ V}$	$R_L = 33 \text{ } \Omega$			30	mA
$V_{GT}$	$T_j = 25 \text{ }^\circ\text{C}$ Pulse Duration > 20 $\mu\text{s}$	$V_D = 12 \text{ V}$	$R_L = 33 \text{ } \Omega$			1.5	V
$V_{GD}$	$T_j = 125 \text{ }^\circ\text{C}$	$V_D = V_{DRM}$	$R_L = 3.3 \text{ k}\Omega$	0.2			V
$I_H$	$T_j = 25 \text{ }^\circ\text{C}$	$I_T = 100 \text{ mA}$	Gate Open			50	mA
$I_L$	$T_j = 25 \text{ }^\circ\text{C}$ Pulse Duration > 20 $\mu\text{s}$	$V_D = 12 \text{ V}$	$I_G = 60 \text{ mA}$		60		mA
$V_{TM}$	$T_j = 25 \text{ }^\circ\text{C}$	$I_{TM} = 50 \text{ A}$	$t_p = 10 \text{ ms}$			1.5	V
	$T_j = 25 \text{ }^\circ\text{C}$ See note 5 on page 1/5.	$I_{TM} = 750 \text{ A}$	$t = 10 \text{ ms}$		6		
$I_{DRM}$	$V_{DRM}$ Specified			$T_j = 25 \text{ }^\circ\text{C}$		0.01	mA
				$T_j = 125 \text{ }^\circ\text{C}$		2	
$I_{RRM}$	$V_{RRM}$ Specified			$T_j = 25 \text{ }^\circ\text{C}$		0.01	mA
				$T_j = 125 \text{ }^\circ\text{C}$		2	
$t_{g1}$	$T_j = 25 \text{ }^\circ\text{C}$ $I_G = 200 \text{ mA}$	$V_D = V_{DRM}$ $di_G/dt = 1.5 \text{ A}/\mu\text{s}$	$I_T = 50 \text{ A}$		1		$\mu\text{s}$
$t_q$	$T_j = 125 \text{ }^\circ\text{C}$ $V_D = 67 \% V_{DRM}$ Gate Open	$I_T = 50 \text{ A}$ $di/dt = 30 \text{ A}/\mu\text{s}$	$V_R = 25 \text{ V}$ $dv/dt = 50 \text{ V}/\mu\text{s}$		100		$\mu\text{s}$
$dv/dt^*$	$T_j = 125 \text{ }^\circ\text{C}$ Linear Slope up to $V_D = 67 \% V_{DRM}$	Gate Open		200			V/ $\mu\text{s}$

\* For higher guaranteed values, please consult us.

**PACKAGE MECHANICAL DATA**

TO 220 AB Plastic



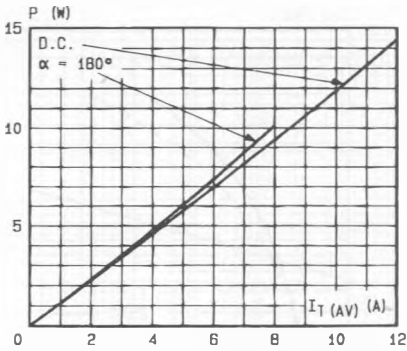


Fig.1 - Maximum average power dissipation versus average on-state current (half sine wave 50 Hz and D.C).

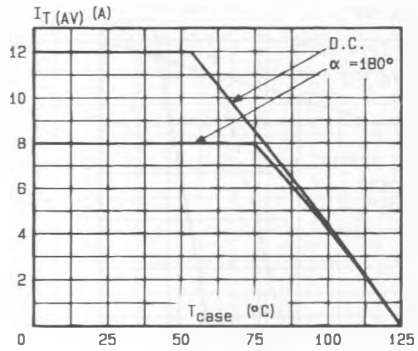


Fig.2 - Maximum average on-state current versus case temperature (half sine wave 50 Hz and D.C).

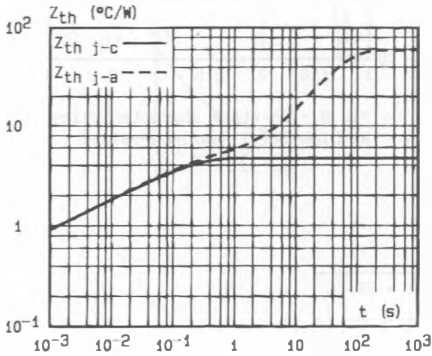


Fig.3 - Thermal transient impedance junction to case and junction to ambient, versus pulse duration.

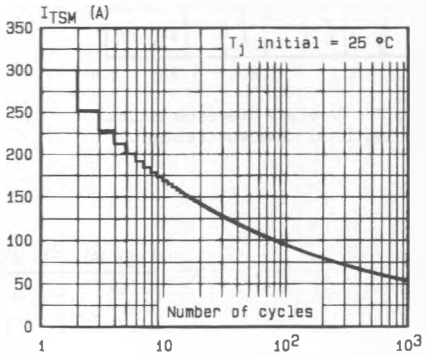


Fig.4 - Non repetitive surge peak on-state current versus number of cycles.

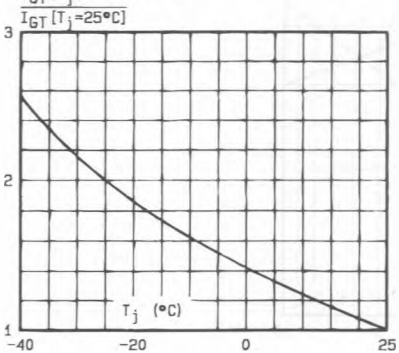


Fig.5 - Relative variation of gate trigger current versus junction temperature.

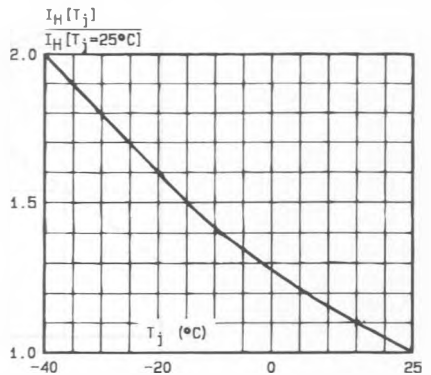


Fig.6 - Relative variation of holding current versus junction temperature.

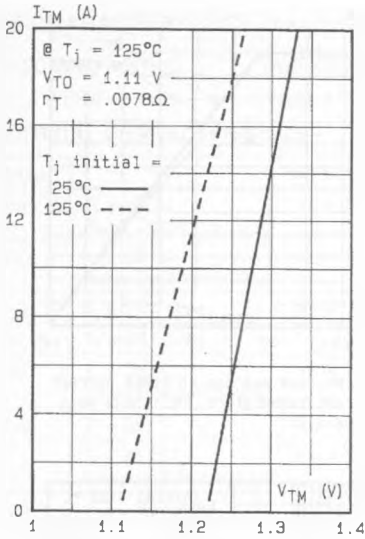


Fig.7 - On-state characteristics at low level (maximum values).

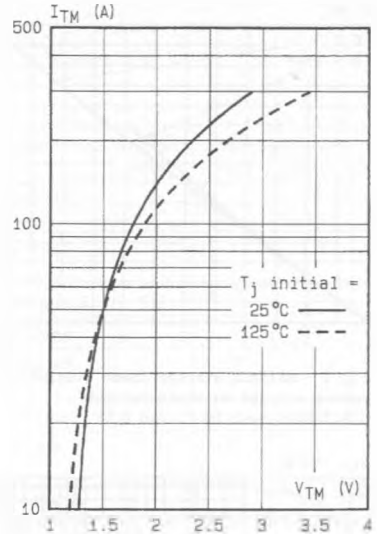


Fig.8 - On-state characteristics at high level (maximum values).

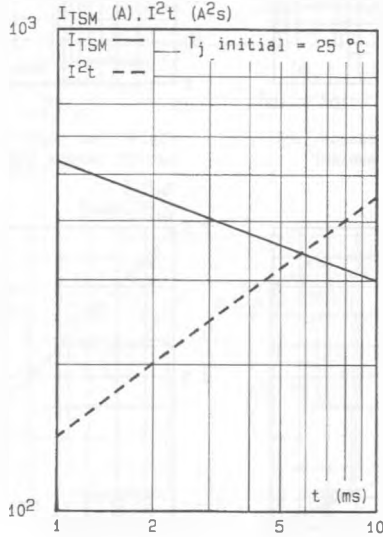


Fig.9 - Non repetitive surge peak on-state current for a sinusoidal pulse with width :  $t \leq 10\text{ ms}$ , and corresponding value of  $I^2t$ .

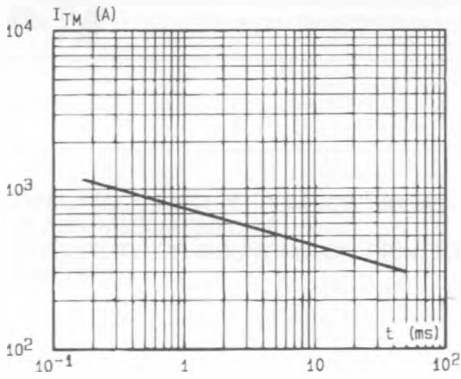


Fig.10 - Peak capacitor discharge current versus pulse width.

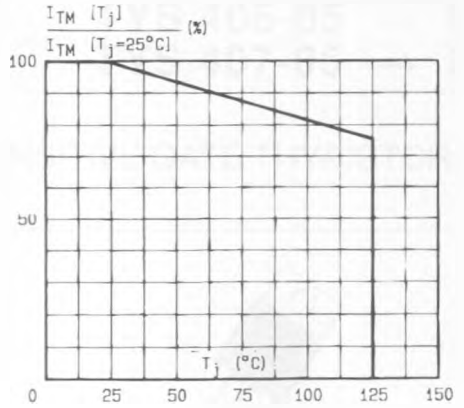


Fig.11 - Allowable peak capacitor discharge current versus initial junction temperature.

