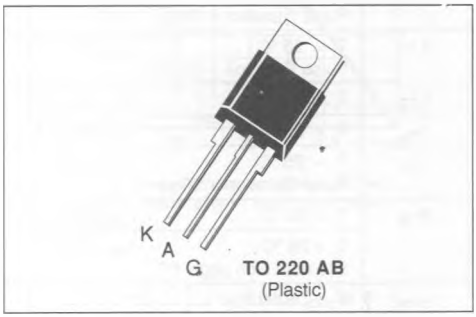
SGS-THOMSON MICROELECTRONICS

TYP 212 → 2012

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.

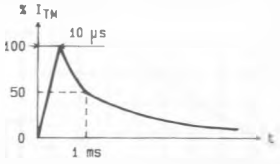
ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit
$I_{T(RMS)}$	RMS on-state Current (1)	T_c = 75 °C	12	A
$I_{T(AV)}$	Mean on-state Current (1)	T_c = 75 °C	8	A
I_{TSM}	Non Repetitive Surge Peak on-state Current (T_j initial = 25 °C) (2)	t = 8.3 ms	315	A
		t = 10 ms	300	
I^2t	I^2t Value for Fusing	t = 10 ms	450	A^2s
I_{TM}	Non Repetitive Surge Peak on-state Current (T_j initial = 25 °C) (5)	t = 1 ms	750	A
di/dt	Critical Rate of Rise of on-state Current (3)		100	A/µs
T_{stg} T_j	Storage and Operating Junction Temperature Range		– 40 to 125 – 40 to 125	°C °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 mA di_G/dt = 1 A/µs.
(4) T_j = 125 °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	°C/W
$R_{th\ (j-a)}$	Junction-ambient	60	°C/W

GATE CHARACTERISTICS (maximum values)

P_{GM} = 20 W (t_p = 20 µs) I_{FGM} = 2 A (t_p = 20 µs) V_{RGM} = 5 V

$P_{G(AV)}$ = 0.5 W V_{FGM} = 10 V (t_p = 20 µs)

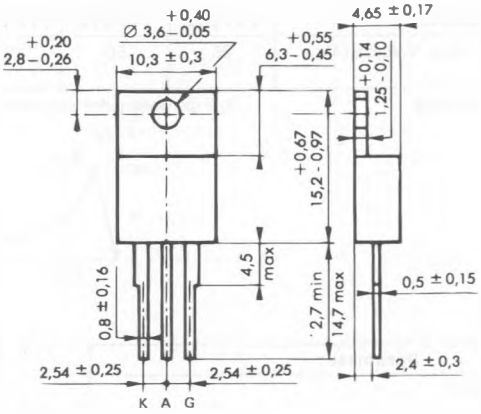
ELECTRICAL CHARACTERISTICS

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

* For higher guaranteed values, please consult us.

PACKAGE MECHANICAL DATA

TO 220 AB Plastic



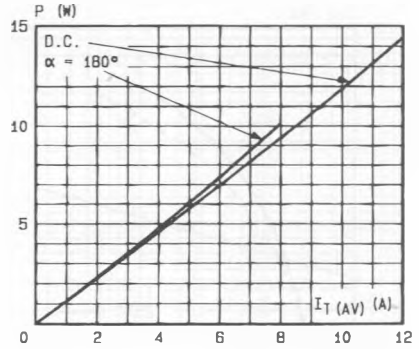


Fig.1 - Maximum average power dissipation versus average on-state current (half sine wave 50 Hz and D.C).

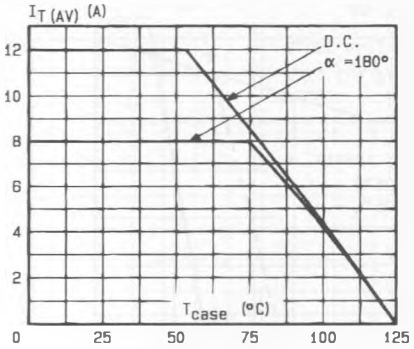


Fig.2 - Maximum average on-state current versus case temperature (half sine wave 50 Hz and D.C).

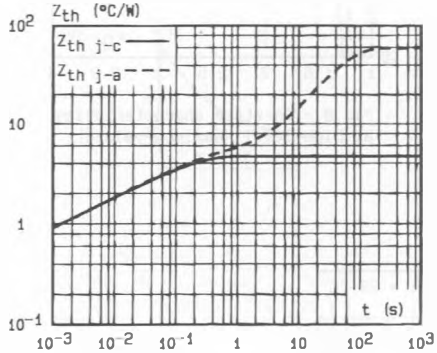


Fig.3 - Thermal transient impedance junction to case and junction to ambient. versus pulse duration.

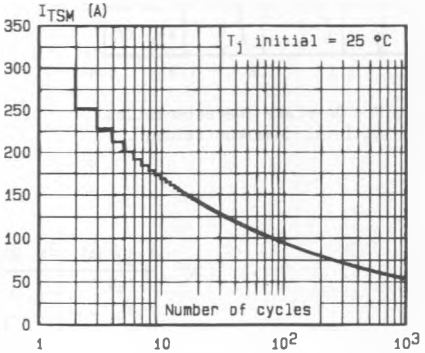


Fig.4 - Non repetitive surge peak on-state current versus number of cycles.

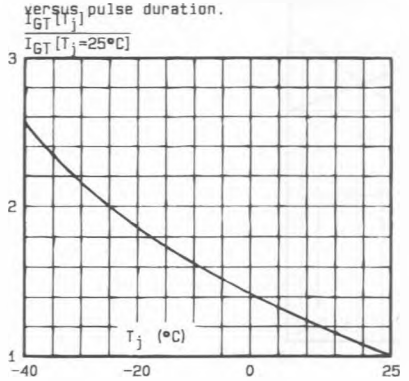


Fig.5 - Relative variation of gate trigger current versus junction temperature.

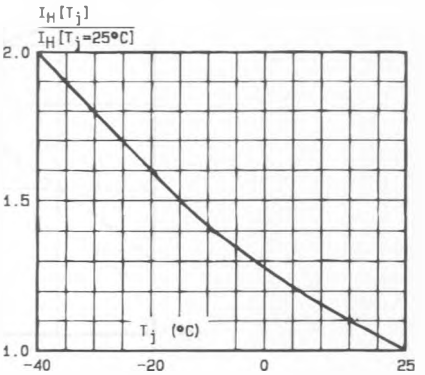


Fig.6 - Relative variation of holding current versus junction temperature.

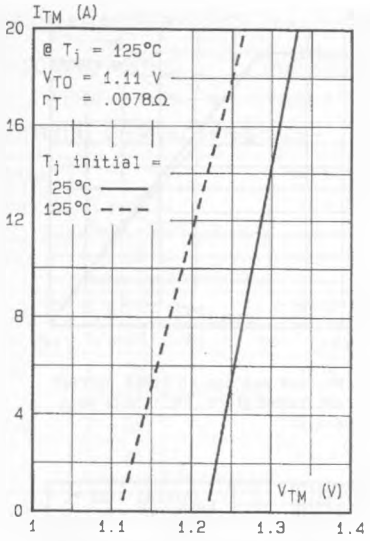


Fig.7 - On-state characteristics at low level (maximum values).

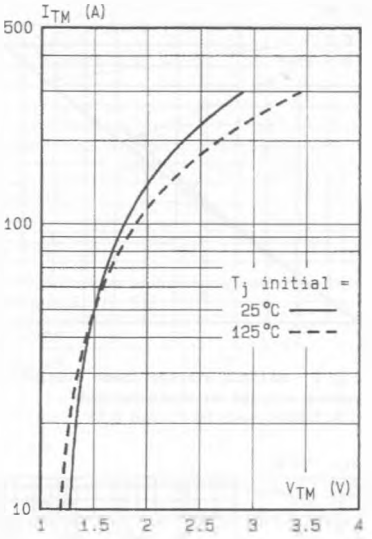


Fig.8 - On-state characteristics at high level (maximum values).

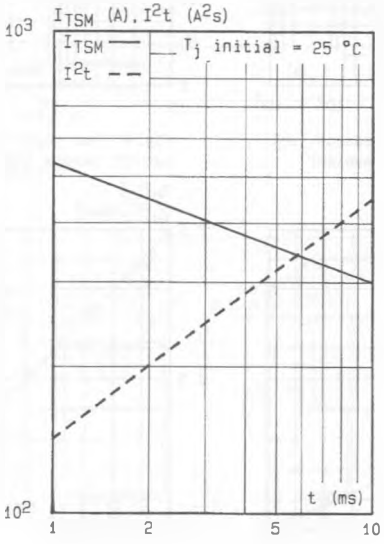


Fig.9 - Non repetitive surge peak on-state current for a sinusoidal pulse with width : t ≤ 10 ms, and corresponding value of I^2t.

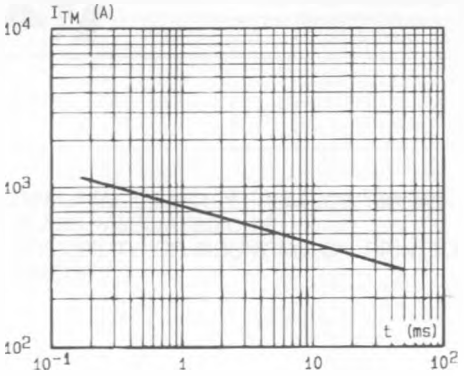


Fig.10 - Peak capacitor discharge current versus pulse width.

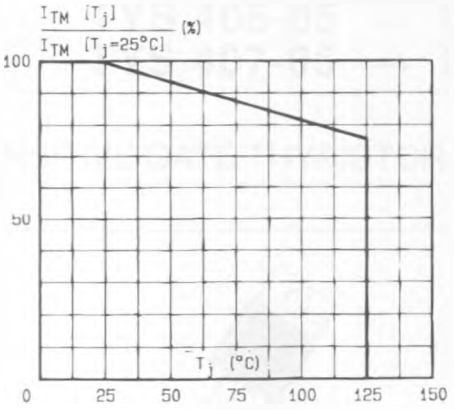


Fig.11 - Allowable peak capacitor discharge current versus initial junction temperature.