

SCR FOR OVERVOLTAGE PROTECTION

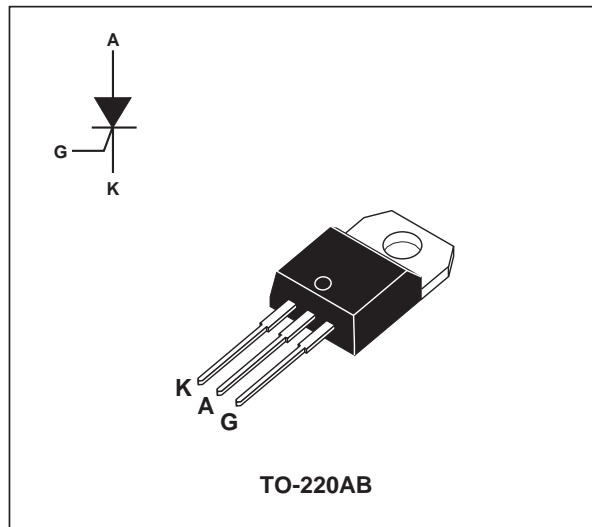
FEATURES

- High surge current capability
- High di/dt rating
- High stability and reliability

DESCRIPTION

The TYN512 and TYN1012 Family of Silicon Controlled Rectifiers uses a high performance glass passivated technology.

This general purpose Family of Silicon Controlled Rectifiers is designed for overvoltage protection in crowbar circuits application.



ABSOLUTE RATINGS (limiting values)

Symbol	Parameter	Value	Unit	
$I_{T(RMS)}$	RMS on-state current (180° conduction angle, single phase circuit)	$T_c = 110^\circ\text{C}$ 12	A	
$I_{T(AV)}$	Average on-state current (180° conduction angle, single phase circuit)	$T_c = 110^\circ\text{C}$ 8	A	
I_{TSM}	Non repetitive surge peak on-state current (T_j initial = 25°C)	$t_p = 8.3\text{ms}$	315	A
		$t_p = 10\text{ms}$	300	
I^2t	I^2t value	$t_p = 10\text{ms}$	450	A ² s
I_{TM}	Non repetitive surge peak on-state current (T_j initial = 25°C) Exponential pulse wave form	$t_p = 1\text{ms}$	750	A
di/dt	Critical rate of rise of on-state current Gate supply: $I_G = 100\text{mA}$ $di_G/dt = 1\text{A}/\mu\text{s}$		100	A/ μs
T_{stg} T_j	Storage and operating junction temperature range		-40 to +150 -40 to +125	°C
T_l	Maximum lead soldering temperature during 10s at 4.5mm from case		260	°C

Symbol	Parameter	TYP		Unit
		512	1012	
V_{DRM} V_{RRM}	Repetitive peak off-state voltage $T_j = 125^\circ\text{C}$	50	100	V

TYP512 TYP1012

THERMAL RESISTANCE

Symbol	Parameter	Value	Unit
Rth (j-a)	Junction to ambient	60	°C/W
Rth (j-c) DC	Junction to case for DC	1.3	°C/W

GATE CHARACTERISTICS (maximum values)

$P_{G(AV)} = 1W$ $P_{GM} = 10W$ ($t_p = 20\mu s$) $I_{FGM} = 4A$ ($t_p = 20\mu s$) $V_{RGM} = 5V$

ELECTRICAL CHARACTERISTICS

Symbol	Test conditions	Value	Unit
I_{GT}	$V_D = 12V$ (DC) $R_L = 33\Omega$	$T_j = 25^\circ C$ MAX.	30 mA
V_{GT}	$V_D = 12V$ (DC) $R_L = 33\Omega$	$T_j = 25^\circ C$ MAX.	1.5 V
V_{GD}	$V_D = V_{DRM}$ $R_L = 3.3k\Omega$	$T_j = 125^\circ C$ MIN.	0.2 V
tgt	$V_D = V_{DRM}$ $I_G = 200mA$ $di_G/dt = 1.5A/\mu s$	$T_j = 25^\circ C$ TYP.	1 μs
I_L	$I_G = 1.2I_{GT}$	$T_j = 25^\circ C$ TYP.	60 mA
I_H	$I_T = 500mA$ Gate open	$T_j = 25^\circ C$ MAX.	50 mA
V_{TM}	$I_{TM} = 50A$ $t_p = 380\mu s$	$T_j = 25^\circ C$ MAX.	1.5 V
I_{DRM} I_{RRM}	V_{DRM} rated V_{RRM} rated	$T_j = 25^\circ C$ MAX. $T_j = 125^\circ C$ MAX.	0.01 2 mA
dV/dt	Linear slope up to $V_D = 67\% V_{DRM}$ gate open	$T_j = 125^\circ C$ MIN.	200 V/ μs
tq	$V_D = 67\% V_{DRM}$ $I_{TM} = 50A$ $V_R = 25V$ $di_{TM}/dt = 30 A/\mu s$ $dV_D/dt = 50V/\mu s$	$T_j = 125^\circ C$ TYP.	100 μs

Fig. 1: Maximum average power dissipation versus average on-state current.

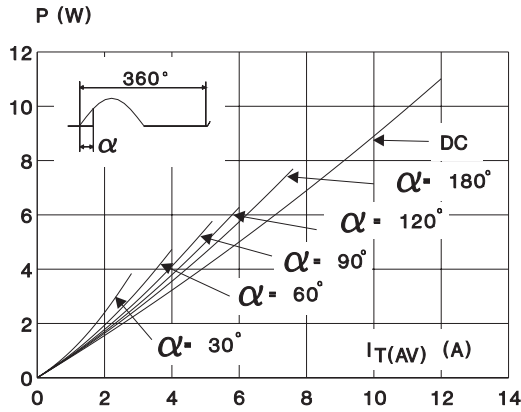


Fig. 2: Correlation between maximum average power dissipation and maximum allowable temperatures (Tamb and Tcase) for different thermal resistances (Rth).

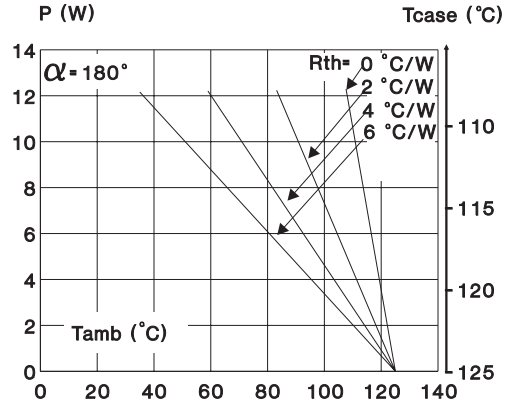


Fig. 3: Average on-state current versus case temperature.

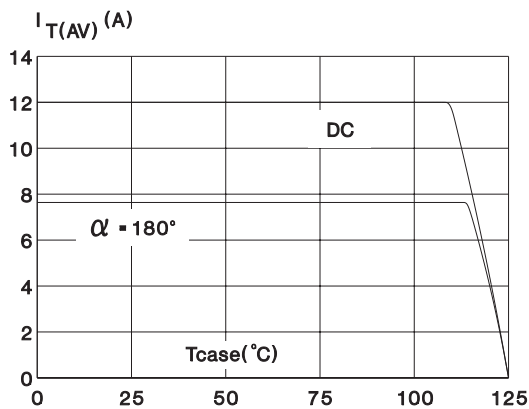


Fig. 4: Relative variation of thermal impedance versus pulse duration.

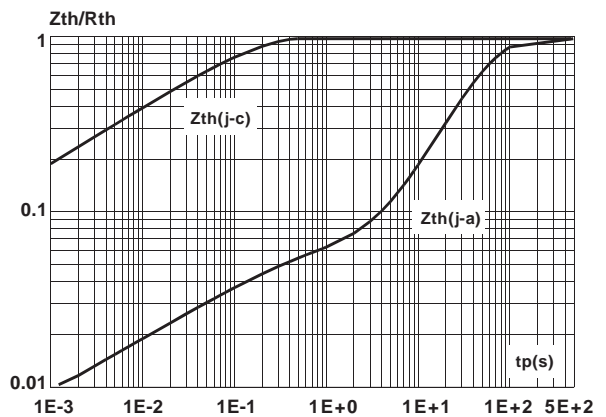


Fig. 5: Relative variation of gate trigger current versus junction temperature.

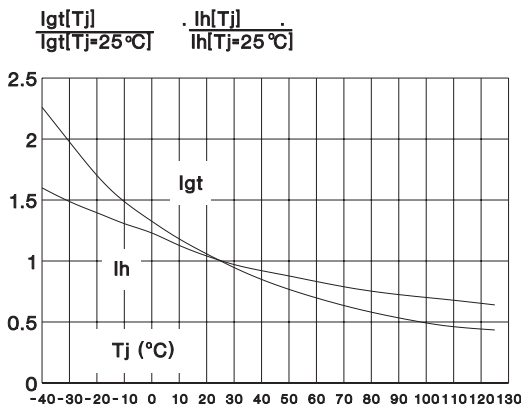


Fig. 6: Non repetitive surge peak on-state current versus number of cycles.

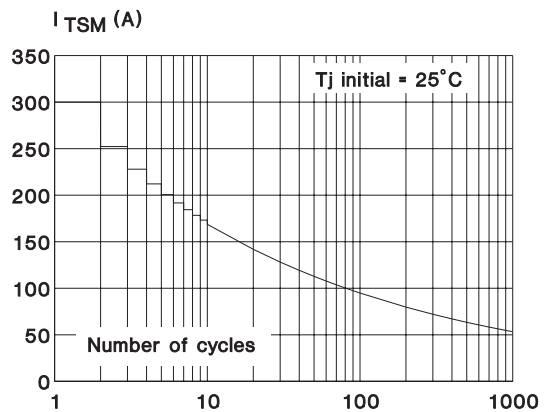


Fig. 7: Non repetitive surge peak on-state current for a sinusoidal pulse with width: $t \leq 10\text{ms}$, and corresponding value of I^2t .

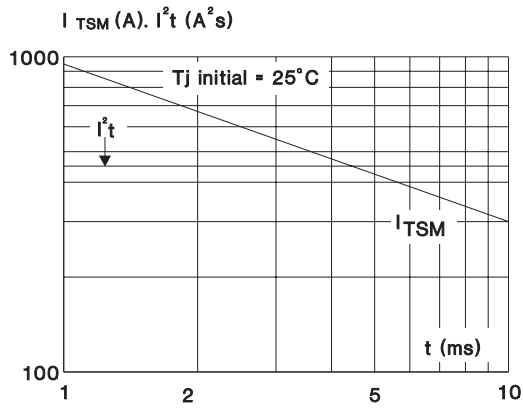


Fig. 8: On-state characteristics (maximum values).

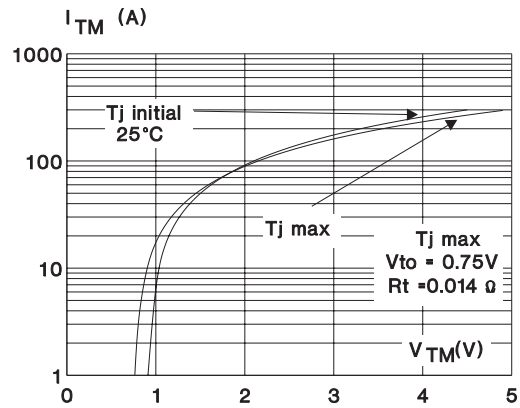


Fig. 9: Peak capacitor discharge current versus pulse width.

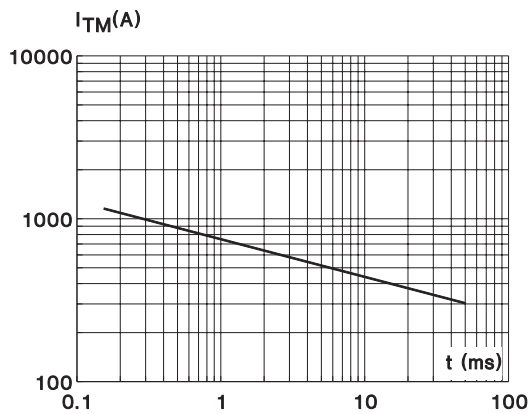
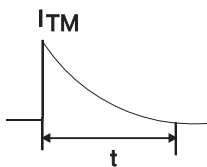
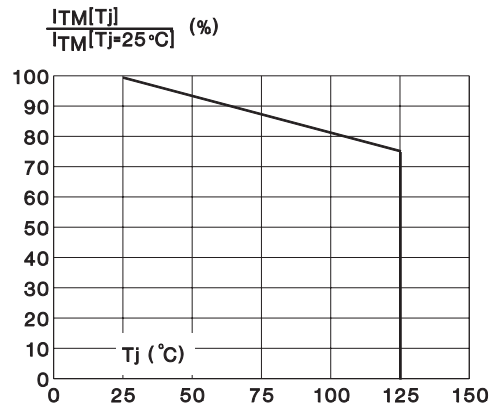
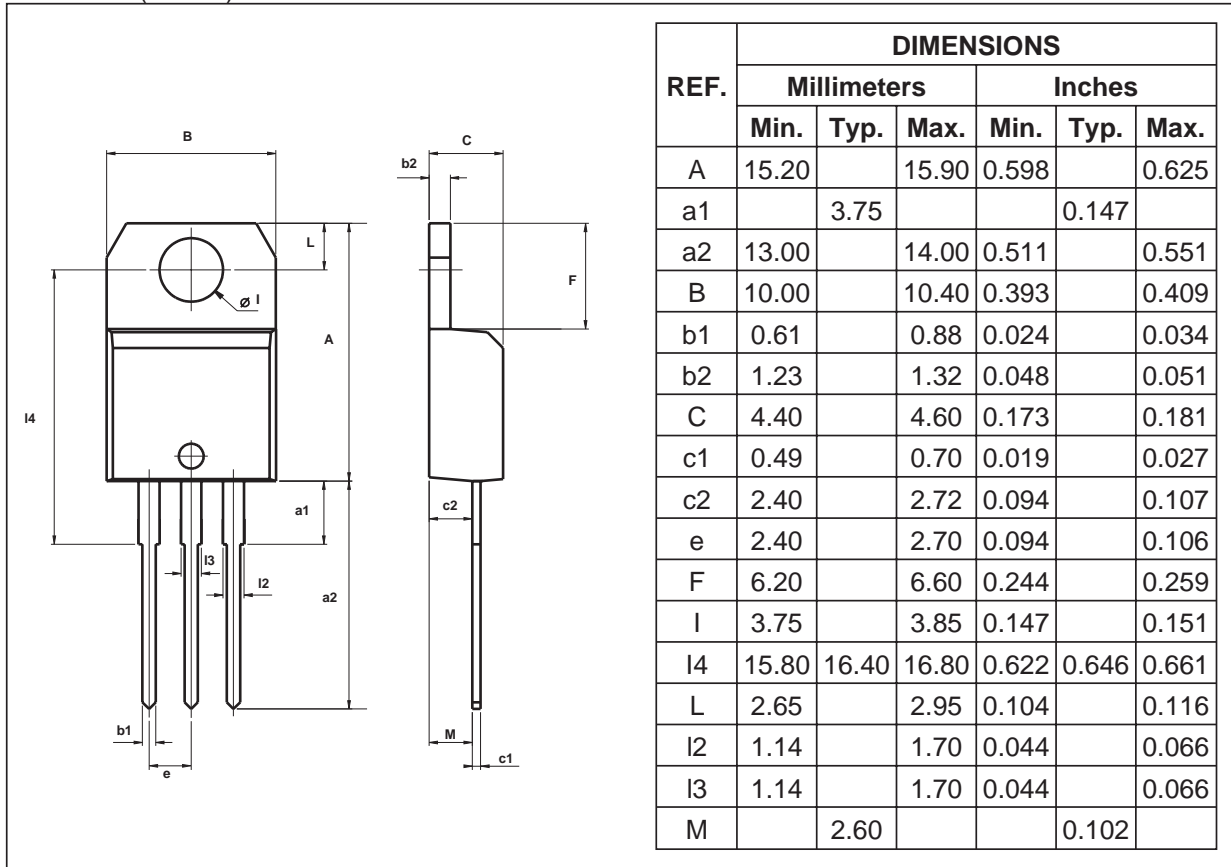


Fig. 10: Allowable peak capacitor discharge current versus initial junction temperature.



PACKAGE MECHANICAL DATA
TO-220AB (Plastic)



OTHER INFORMATION

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
TYPx12	TYPx12	TO-220AB	2.3 g	250	Bulk

- Epoxy meets UL94,V0
- Cooling method: C
- Recommended torque value: 0.8 m.N.
- Maximum torque value: 1 m.N.

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