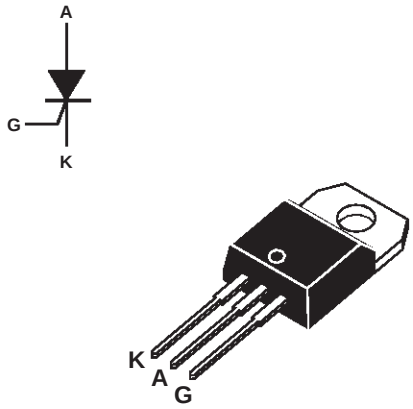
TYP512
TYP1012

SCR FOR OVERVOLTAGE PROTECTION



TO-220AB

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)	Tc = 110°C	12	A
$I_{T(AV)}$	Average on-state current (180° conduction angle, single phase circuit)	Tc = 110°C	8	A
I_{TSM}	Non repetitive surge peak on-state current (Tj initial = 25°C)	tp = 8.3ms	315	A
		tp = 10ms	300	
I^2t	I^2t value	tp = 10ms	450	A^2s
I_{TM}	Non repetitive surge peak on-state current (Tj initial = 25°C) Exponential pulse wave form	tp = 1ms	750	A
dI/dt	Critical rate of rise of on-state current Gate supply: I_G = 100mA dI_G/dt = 1A/µs		100	A/µs
Tstg Tj	Storage and operating junction temperature range		-40 to +150 -40 to +125	°C
Tl	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 Tj = 125°C	50	100	V

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 (tp = 20µs) I_{FGM} = 4A (tp = 20µs) V_{RGM} = 5V

ELECTRICAL CHARACTERISTICS

Symbol	Test conditions			Value	Unit
I_{GT}	V_D = 12V (DC) R_L = 33Ω	Tj = 25°C	MAX.	30	mA
V_{GT}	V_D = 12V (DC) R_L = 33Ω	Tj = 25°C	MAX.	1.5	V
V_{GD}	$V_D = V_{DRM}$ R_L = 3.3kΩ	Tj =125°C	MIN.	0.2	V
tgt	$V_D = V_{DRM}$ I_G = 200mA dI_G/dt = 1.5A/µs	Tj = 25°C	TYP.	1	µs
I_L	$I_G = 1.2I_{GT}$	Tj = 25°C	TYP.	60	mA
I_H	I_T = 500mA Gate open	Tj = 25°C	MAX.	50	mA
V_{TM}	I_{TM} = 50A tp = 380µs	Tj = 25°C	MAX.	1.5	V
I_{DRM} I_{RRM}	V_{DRM} rated V_{RRM} rated	Tj = 25°C	MAX.	0.01	mA
		Tj = 125°C	MAX.	2	
dV/dt	Linear slope up to V_D = 67% V_{DRM} gate open	Tj = 125°C	MIN.	200	V/µs
tq	V_D=67%V_{DRM} I_{TM}= 50A V_R= 25V dI_{TM}/dt=30 A/µs dV_D/dt= 50V/µs	Tj = 125°C	TYP.	100	µs

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

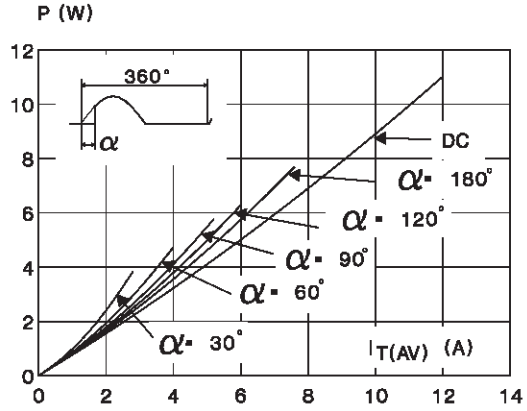


Fig. 2: Correlation between maximum average power dissipation and maximum allowable temperatures (Tamb and Tcase) for different thermal resistances heatsink + contact.

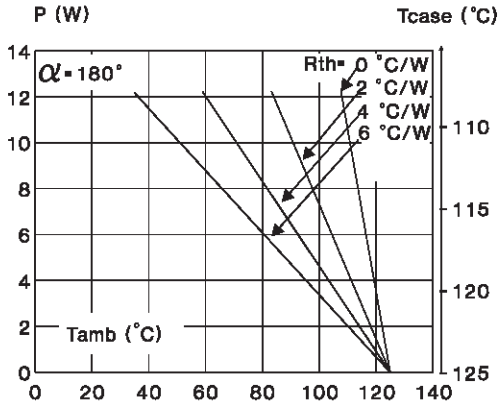


Fig. 3: Average on-state current versus case temperature.

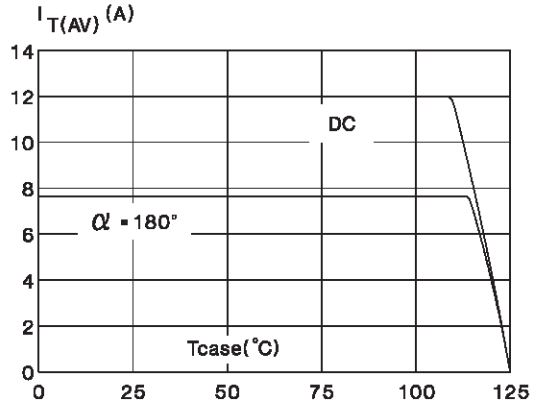


Fig. 4: Relative variation of thermal impedance versus pulse duration.

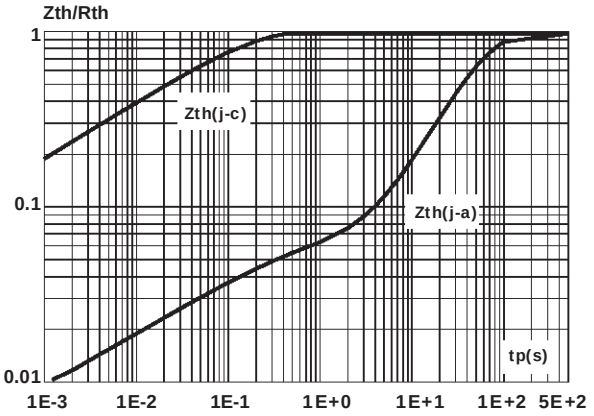


Fig. 5: Relative variation of gate trigger current versus junction temperature.

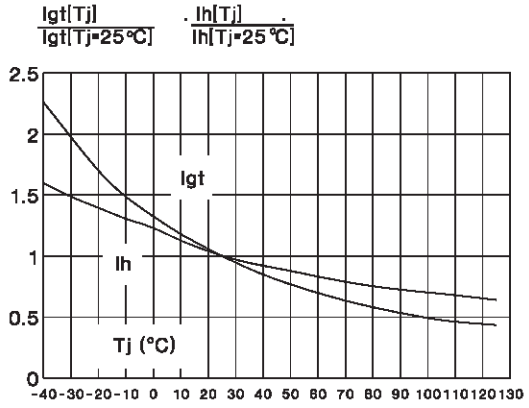


Fig. 6: Non repetitive surge peak on-state current versus number of cycles.

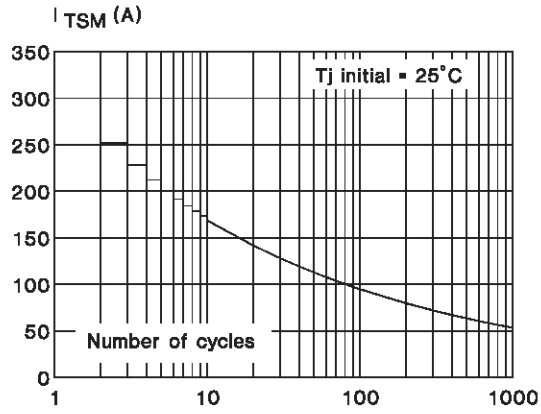


Fig. 7: Non repetitive surge peak on-state current for a sinusoidal pulse with width: t ≤ 10ms, and corresponding value of I^2t.

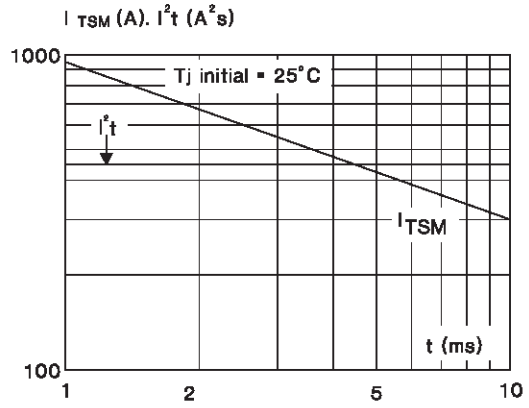


Fig. 8: On-state characteristics (maximum values).

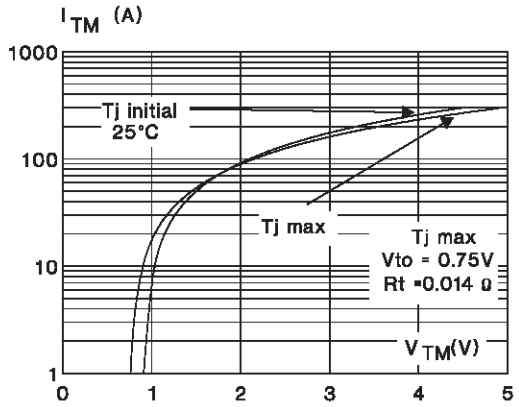


Fig. 9: Peak capacitor discharge current versus pulse width.

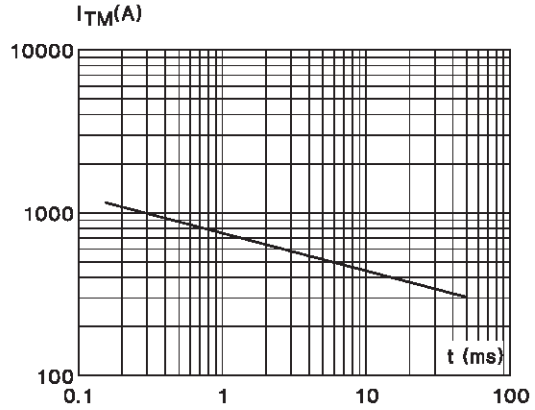
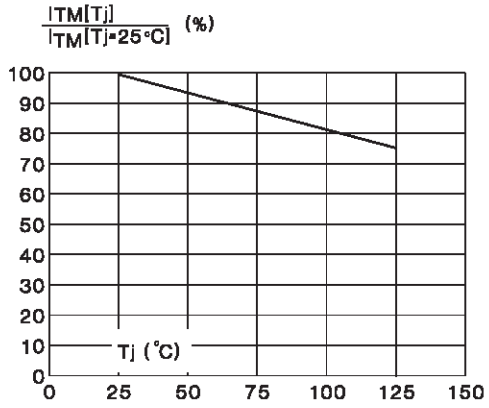
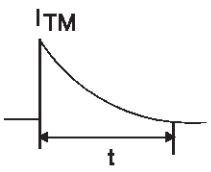


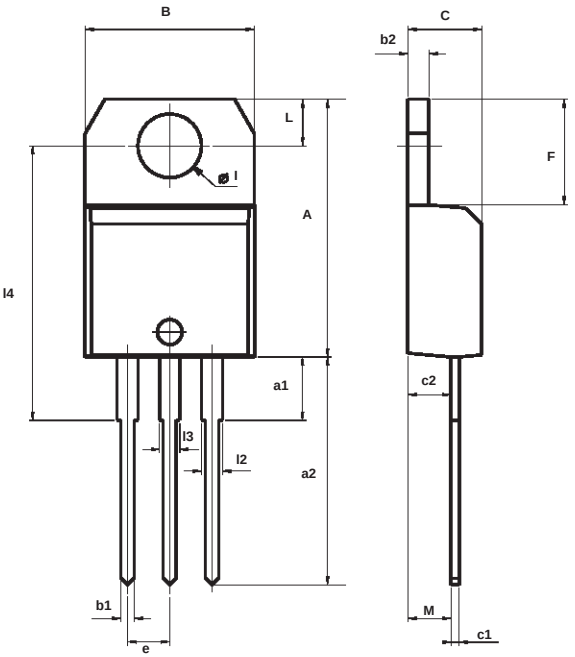
Fig. 10: Allowable peak capacitor discharge current versus initial junction temperature.





PACKAGE MECHANICAL DATA

TO-220AB (Plastic)



REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	15.20		15.90	0.598		0.625
a1		3.75			0.147	
a2	13.00		14.00	0.511		0.551
B	10.00		10.40	0.393		0.409
b1	0.61		0.88	0.024		0.034
b2	1.23		1.32	0.048		0.051
C	4.40		4.60	0.173		0.181
c1	0.49		0.70	0.019		0.027
c2	2.40		2.72	0.094		0.107
e	2.40		2.70	0.094		0.106
F	6.20		6.60	0.244		0.259
I	3.75		3.85	0.147		0.151
l4	15.80	16.40	16.80	0.622	0.646	0.661
L	2.65		2.95	0.104		0.116
l2	1.14		1.70	0.044		0.066
l3	1.14		1.70	0.044		0.066
M		2.60			0.102	

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.