

STANDARD

40A SCRs

Table 1: Main Features

Symbol	Value	Unit
$I_{T(RMS)}$	40	A
V_{DRM}/V_{RRM}	600 to 1000	V
I_{GT}	35	mA

DESCRIPTION

The TYNx40 series is suitable for applications where in-rush current conditions are critical, such as overvoltage crowbar protection circuits in power supplies, in-rush current limiting circuits, solid state relays (in back to back configuration), welding equipment, high power motor control circuits.

Using clip assembly technology, they provide a superior performance in high surge current capabilities.

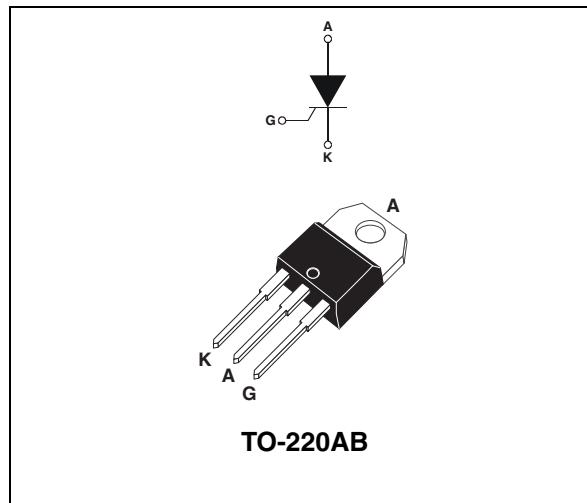


Table 2: Order Codes

Part Numbers	Marking
TYN640RG	TYN640
TYN840RG	TYN840
TYN1040RG	TYN1040

Table 3: Absolute Ratings (limiting values)

Symbol	Parameter		Value	Unit
$I_{T(RMS)}$	RMS on-state current (180° conduction angle)	$T_c = 95^\circ\text{C}$	40	A
$I_{T(AV)}$	Average on-state current (180° conduction angle)	$T_c = 95^\circ\text{C}$	25	A
I_{TSM}	Non repetitive surge peak on-state current	$t_p = 8.3 \text{ ms}$	480	A
		$t_p = 10 \text{ ms}$	460	
I^2t	I^2t Value for fusing	$t_p = 10 \text{ ms}$	$T_j = 25^\circ\text{C}$	$1060 \text{ A}^2\text{s}$
dl/dt	Critical rate of rise of on-state current $I_G = 2 \times I_{GT}$, $t_r \leq 100 \text{ ns}$	$F = 60 \text{ Hz}$	$T_j = 125^\circ\text{C}$	$50 \text{ A}/\mu\text{s}$
I_{GM}	Peak gate current	$t_p = 20 \mu\text{s}$	$T_j = 125^\circ\text{C}$	4 A
$P_{G(AV)}$	Average gate power dissipation		$T_j = 125^\circ\text{C}$	1 W
T_{stg} T_j	Storage junction temperature range Operating junction temperature range		- 40 to + 150 - 40 to + 125	$^\circ\text{C}$
V_{RGM}	Maximum peak reverse gate voltage		5	V

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Tables 4: Electrical Characteristics ($T_j = 25^\circ\text{C}$, unless otherwise specified)

Symbol	Test Conditions			Value	Unit
I_{GT}	$V_D = 12 \text{ V}$ $R_L = 33 \Omega$		MIN.	3.5	mA
			MAX.	35	
			MAX.	1.3	V
V_{GD}	$V_D = V_{DRM}$ $R_L = 3.3 \text{ k}\Omega$	$T_j = 125^\circ\text{C}$	MIN.	0.2	V
I_H	$I_T = 500 \text{ mA}$ Gate open		MAX.	75	mA
I_L	$I_G = 1.2 \times I_{GT}$		MAX.	150	mA
dV/dt	$V_D = 67 \% V_{DRM}$ Gate open	$T_j = 125^\circ\text{C}$	MIN.	1000	V/ μ s
V_{TM}	$I_{TM} = 80 \text{ A}$ $t_p = 380 \mu\text{s}$	$T_j = 25^\circ\text{C}$	MAX.	1.6	V
V_{t0}	Threshold voltage	$T_j = 125^\circ\text{C}$	MAX.	0.85	V
R_d	Dynamic resistance	$T_j = 125^\circ\text{C}$	MAX.	10	m Ω
I_{DRM} I_{RRM}	$V_{DRM} = V_{RRM}$	$T_j = 25^\circ\text{C}$	MAX.	5	μ A
		$T_j = 125^\circ\text{C}$		4	mA

Table 5: Thermal resistance

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction to case (DC)	0.8	$^\circ\text{C/W}$
$R_{th(j-a)}$	Junction to ambient (DC)	60	$^\circ\text{C/W}$

Figure 1: Maximum average power dissipation versus average on-state current

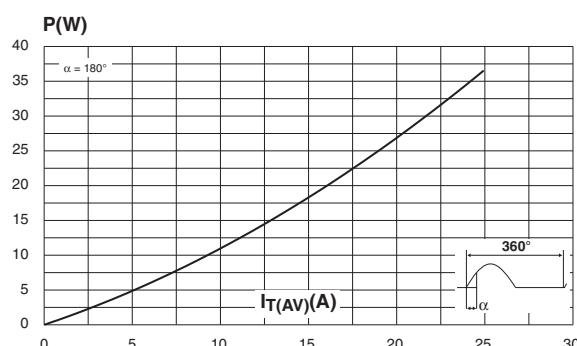


Figure 2: Average and D.C. on-state current versus case temperature

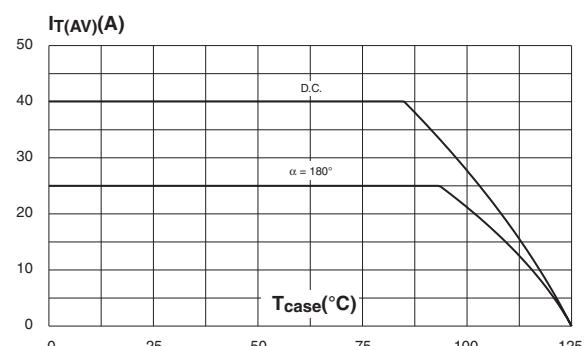


Figure 3: Relative variation of thermal impedance versus pulse duration

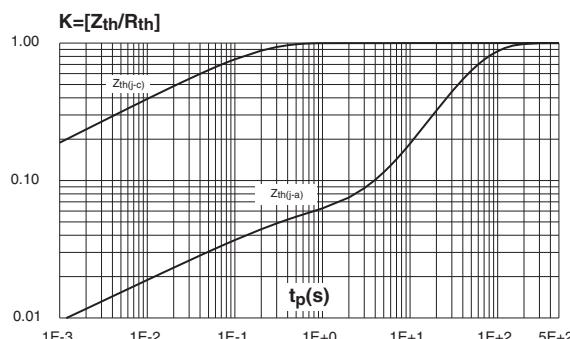


Figure 5: Surge peak on-state current versus number of cycles

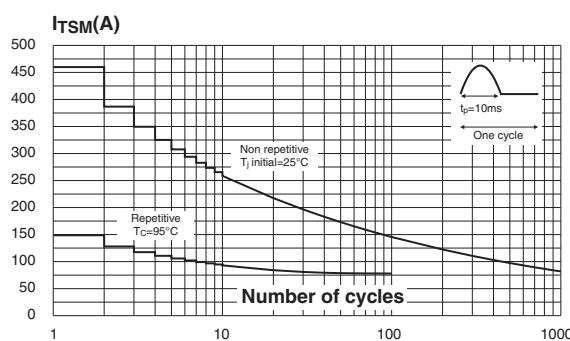


Figure 7: On-state characteristics (maximum values)

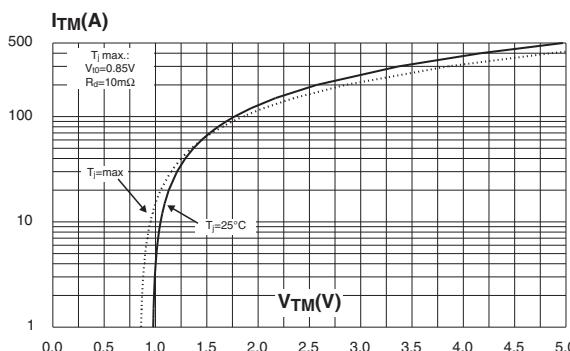


Figure 4: Relative variation of gate trigger current, holding current and latching current versus junction temperature

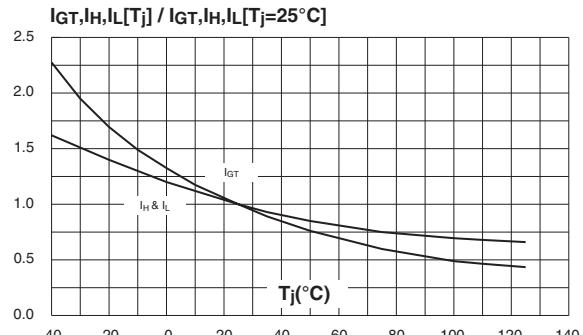
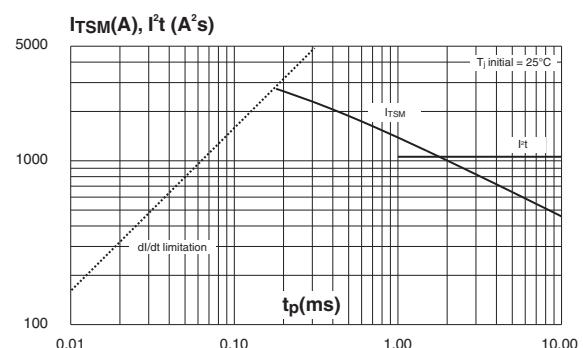


Figure 6: Non-repetitive surge peak on-state current for a sinusoidal pulse with width tp < 10 ms, and corresponding values of I²t



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Figure 8: Ordering Information Scheme

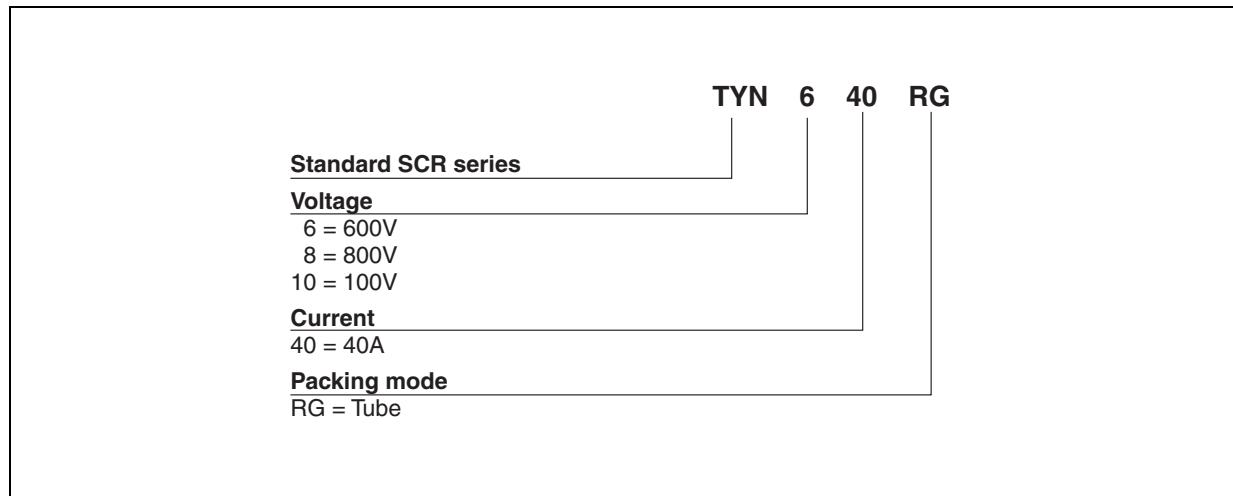
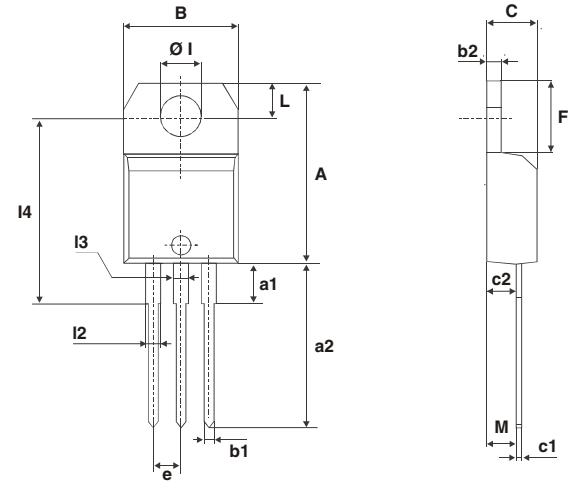


Table 6: Product Selector

Part Numbers	Voltage (xxx)			Sensitivity	Package
	600 V	800 V	1000 V		
TYNx40	X	X	X	35 mA	TO-220AB

Figure 9: TO-220AB Package Mechanical Data



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
ØI	3.75		3.85	0.147		0.151
I4	15.80	16.40	16.80	0.622	0.646	0.661
L	2.65		2.95	0.104		0.116
I2	1.14		1.70	0.044		0.066
I3	1.14		1.70	0.044		0.066
M		2.60			0.102	

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect . The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com.

Table 7: Ordering Information

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
TYN640RG	TYN640	TO-220AB	2.3 g	50	Tube
TYN840RG	TYN840				
TYN1040RG	TYN1040				

Table 8: Revision History

Date	Revision	Description of Changes
Apr-2002	4A	Last update.
13-Feb-2006	5	TO-220AB delivery mode changed from bulk to tube. ECOPACK statement added.

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