



# TYNx40 Series

STANDARD

40A SCRs

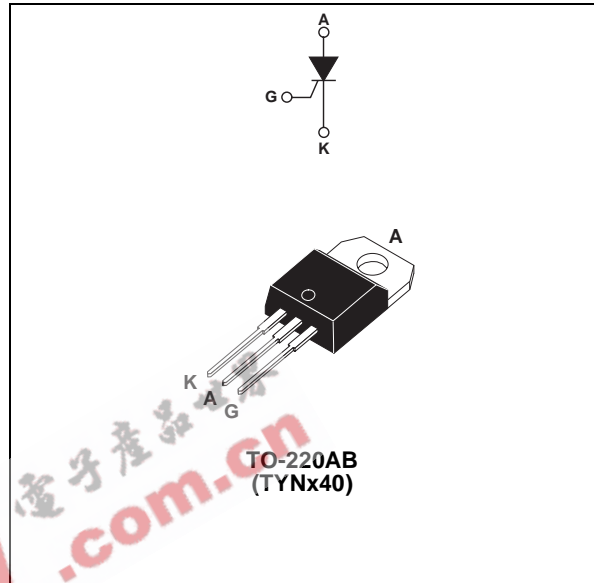
## MAIN FEATURES:

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.



## 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	$t_p = 8.3 \text{ ms}$	$T_j = 25^\circ\text{C}$ 480	A
		$t_p = 10 \text{ ms}$		
$I^2t$	$I^2t$ Value for fusing		$T_j = 25^\circ\text{C}$ 1060	$\text{A}^2\text{s}$
$di/dt$	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

## TYNx40 Series

### ELECTRICAL CHARACTERISTICS (T<sub>j</sub> = 25°C, unless otherwise specified)

Symbol	Test Conditions		Value	Unit	
I <sub>GT</sub>	V <sub>D</sub> = 12 V    R <sub>L</sub> = 33 Ω	MIN.	3.5	mA	
		MAX.	35		
V <sub>GT</sub>		MAX.	1.3	V	
V <sub>GD</sub>	V <sub>D</sub> = V <sub>DRM</sub> R <sub>L</sub> = 3.3 kΩ	T <sub>j</sub> = 125°C	MIN.	0.2	V
I <sub>H</sub>	I <sub>T</sub> = 500 mA    Gate open		MAX.	75	mA
I <sub>L</sub>	I <sub>G</sub> = 1.2 I <sub>GT</sub>		MAX.	150	mA
dV/dt	V <sub>D</sub> = 67 % V <sub>DRM</sub> Gate open	T <sub>j</sub> = 125°C	MIN.	1000	V/μs
V <sub>TM</sub>	I <sub>TM</sub> = 80 A    tp = 380 μs	T <sub>j</sub> = 25°C	MAX.	1.6	V
V <sub>t0</sub>	Threshold voltage	T <sub>j</sub> = 125°C	MAX.	0.85	V
R <sub>d</sub>	Dynamic resistance	T <sub>j</sub> = 125°C	MAX.	10	mΩ
I <sub>DRM</sub> I <sub>RRM</sub>	V <sub>DRM</sub> = V <sub>RRM</sub>	T <sub>j</sub> = 25°C	MAX.	5	μA
		T <sub>j</sub> = 125°C		4	mA

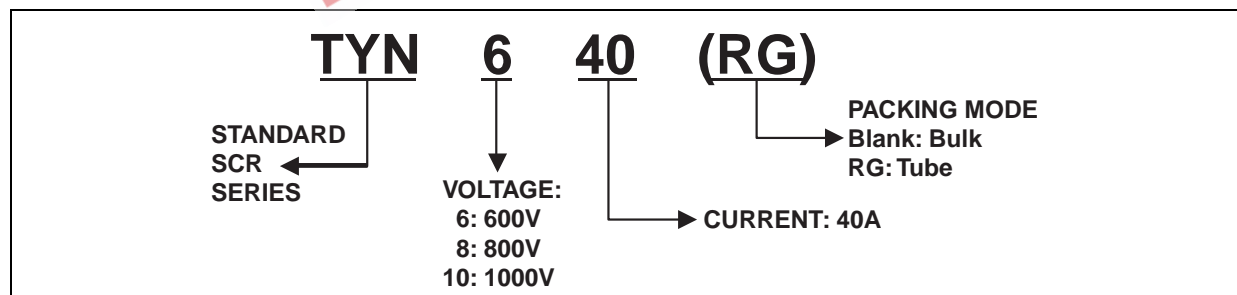
### THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
R <sub>th(j-c)</sub>	Junction to case (DC)	0.8	°C/W
R <sub>th(j-a)</sub>	Junction to ambient (DC)	60	°C/W

### PRODUCT SELECTOR

Part Number	Voltage			Sensitivity	Package
	600 V	800 V	1000 V		
TYNx40	X	X	X	35 mA	TO-220AB

### ORDERING INFORMATION

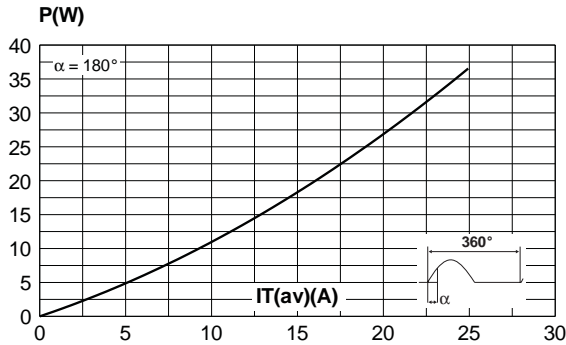


### OTHER INFORMATION

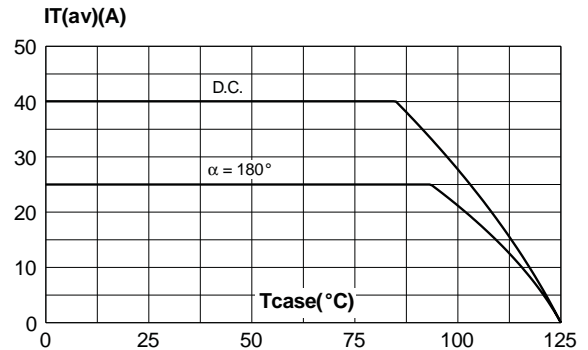
Part Number	Marking	Weight	Base Quantity	Packing mode
TYNx40	TYNx40	2.3 g	250	Bulk
TYNx40RG	TYNx40	2.3 g	50	Tube

Note: x = voltage

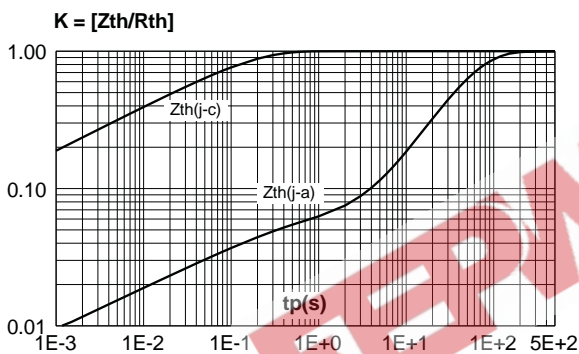
**Fig. 1:** Maximum average power dissipation versus average on-state current.



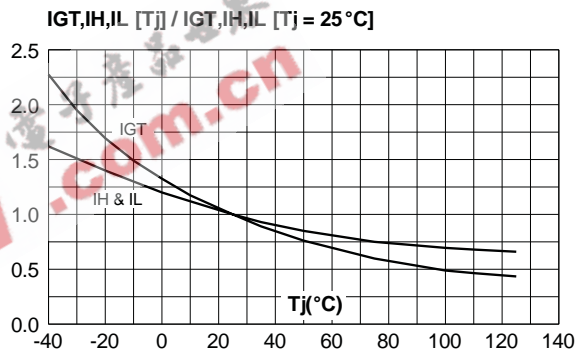
**Fig. 2:** Average and DC on-state current versus case temperature.



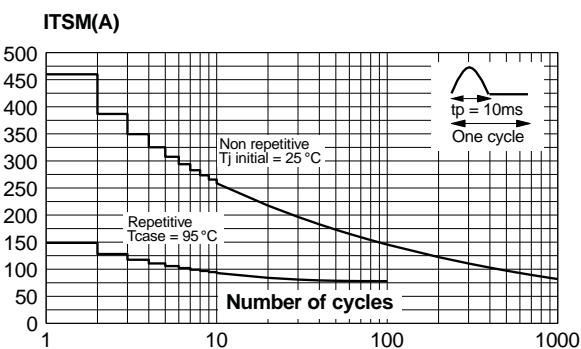
**Fig. 3:** Relative variation of thermal impedance versus pulse duration.



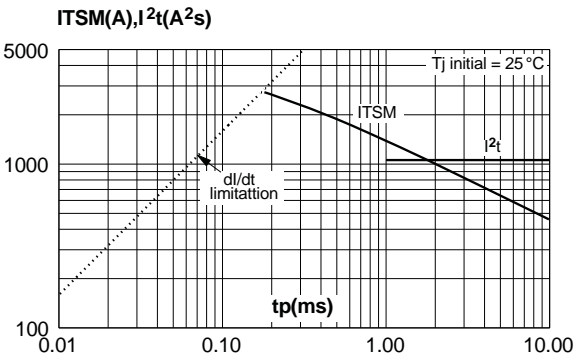
**Fig. 4:** Relative variation of gate trigger current, holding current and latching current versus junction temperature.



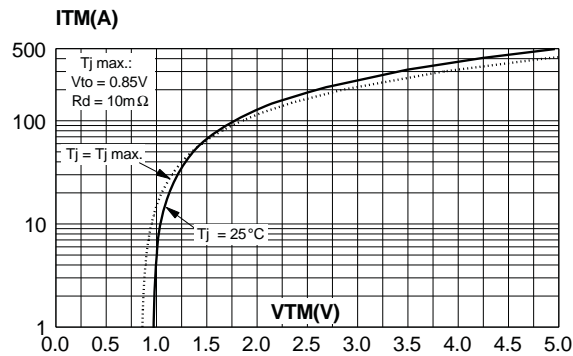
**Fig. 5:** Surge peak on-state current versus number of cycles.



**Fig. 6:** Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 10$  ms, and corresponding value of  $I^2t$ .

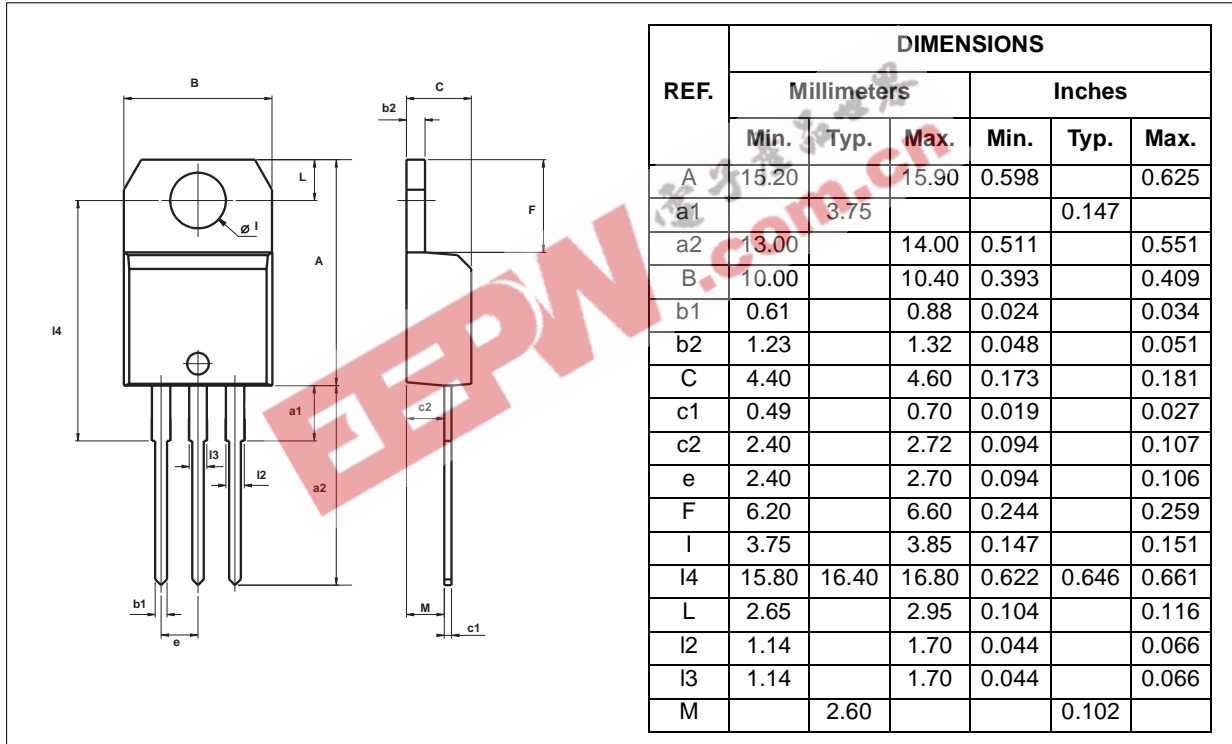


**Fig. 7: On-state characteristics (maximum values).**



**PACKAGE MECHANICAL DATA**

TO-220AB (Plastic)



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