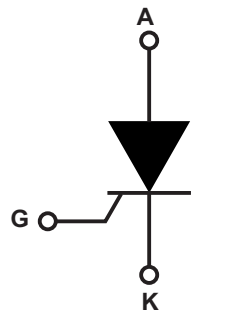
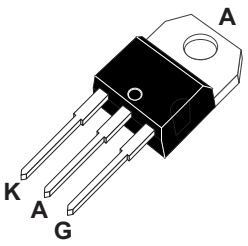
TYN640, TYN840

40 A standard SCRs

Datasheet - production data





TO-220AB

Description

These standard SCRs are 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 1. Device summary

Order code	Voltage	Sensitivity
TYN640RG	600 V	35 mA
TYN840RG	800 V	35 mA

Features

- On-state rms current, $I_{T(RMS)}$: 40 A
- Repetitive peak off-stat voltage, V_{DRM}, V_{RRM}:
  - 600 V
  - 800 V
- Triggering gate current, I_{GT}: 35 mA

1 Characteristics

Table 2. Absolute ratings (limiting values)

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

Table 3. Electrical Characteristics (T_j = 25 °C, unless otherwise specified)

Symbol	Test Conditions			Value	Unit
I_{GT}	V_D = 12 V R_L = 33 Ω		MIN.	3.5	mA
			MAX.	35	
V_{GT}			MAX.	1.3	V
V_{GD}	V_D = V_{DRM} R_L = 3.3 kΩ	T_j = 125 °C	MIN.	0.2	V
I_H	I_T = 500 mA Gate open		MAX.	75	mA
I_L	I_G = 1.2 x I_{GT}		MAX.	150	mA
dV/dt	V_D = 67% V_{DRM} Gate open	T_j = 125 °C	MIN.	1000	V/µs
V_{TM}	I_{TM} = 80 A t_p = 380 µs	T_j = 25 °C	MAX.	1.6	V
V_{t0}	Threshold voltage	T_j = 125 °C	MAX.	0.85	V
R_d	Dynamic resistance	T_j = 125 °C	MAX.	10	mΩ
I_{DRM} I_{RRM}	V_{DRM} = V_{RRM}	T_j = 25 °C	MAX.	5	µA
		T_j = 125 °C		4	mA

Table 4. Thermal resistance

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

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

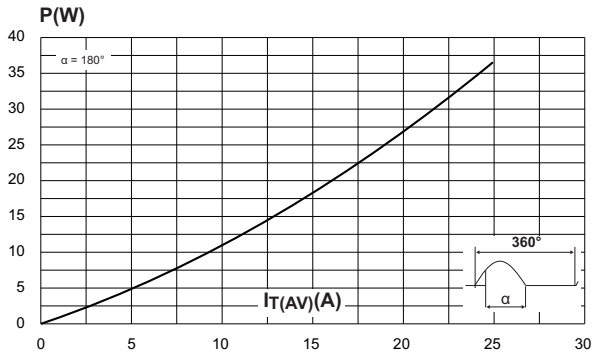


Figure 2. Average and DC on-state current versus case temperature

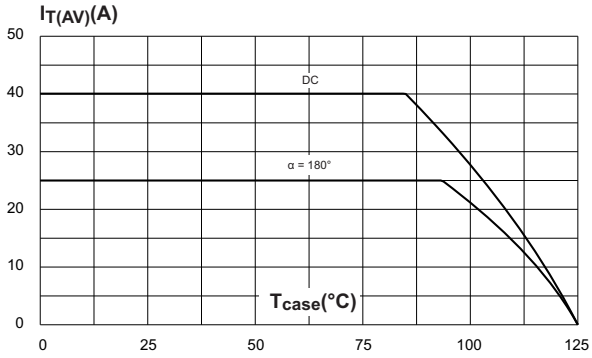


Figure 3. Relative variation of thermal impedance versus pulse duration

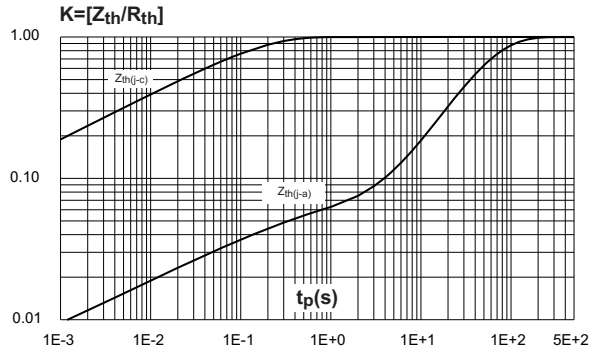


Figure 4. Relative variation of gate trigger current, holding current and latching current versus junction temperature

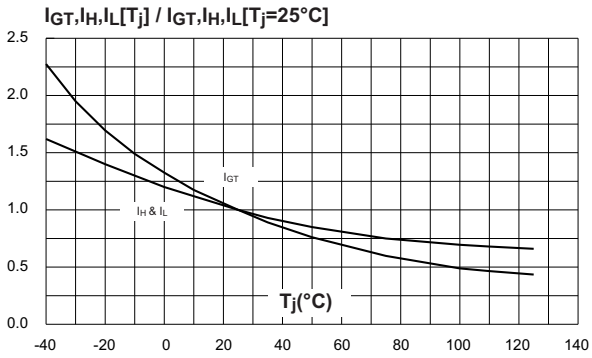


Figure 5. Surge peak on-state current versus number of cycles

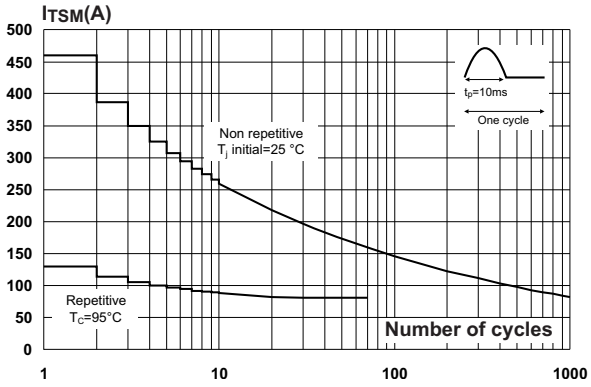


Figure 6. Non-repetitive surge peak on-state current for a sinusoidal pulse with width t_p < 10 ms, and corresponding values of I^2t

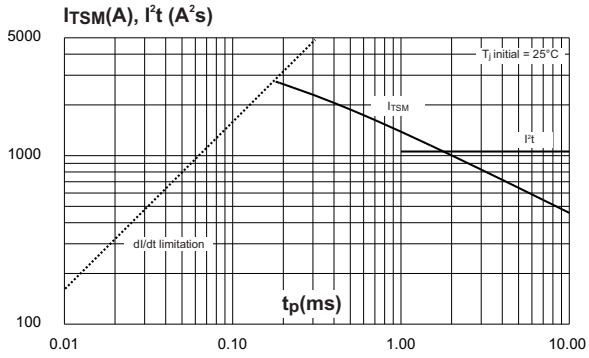
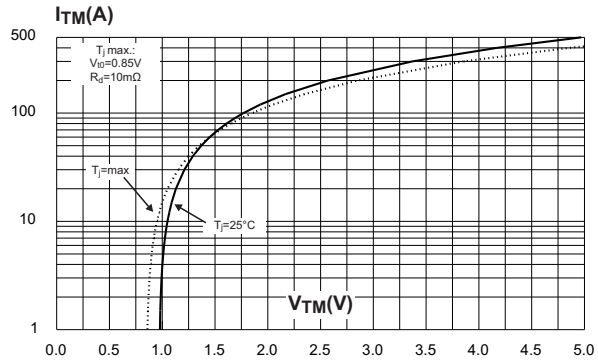


Figure 7. On-state characteristics (maximum values)



2 Package information

- Epoxy meets UL94, V0
- Lead-free package

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Figure 8. TO-220AB dimension definitions

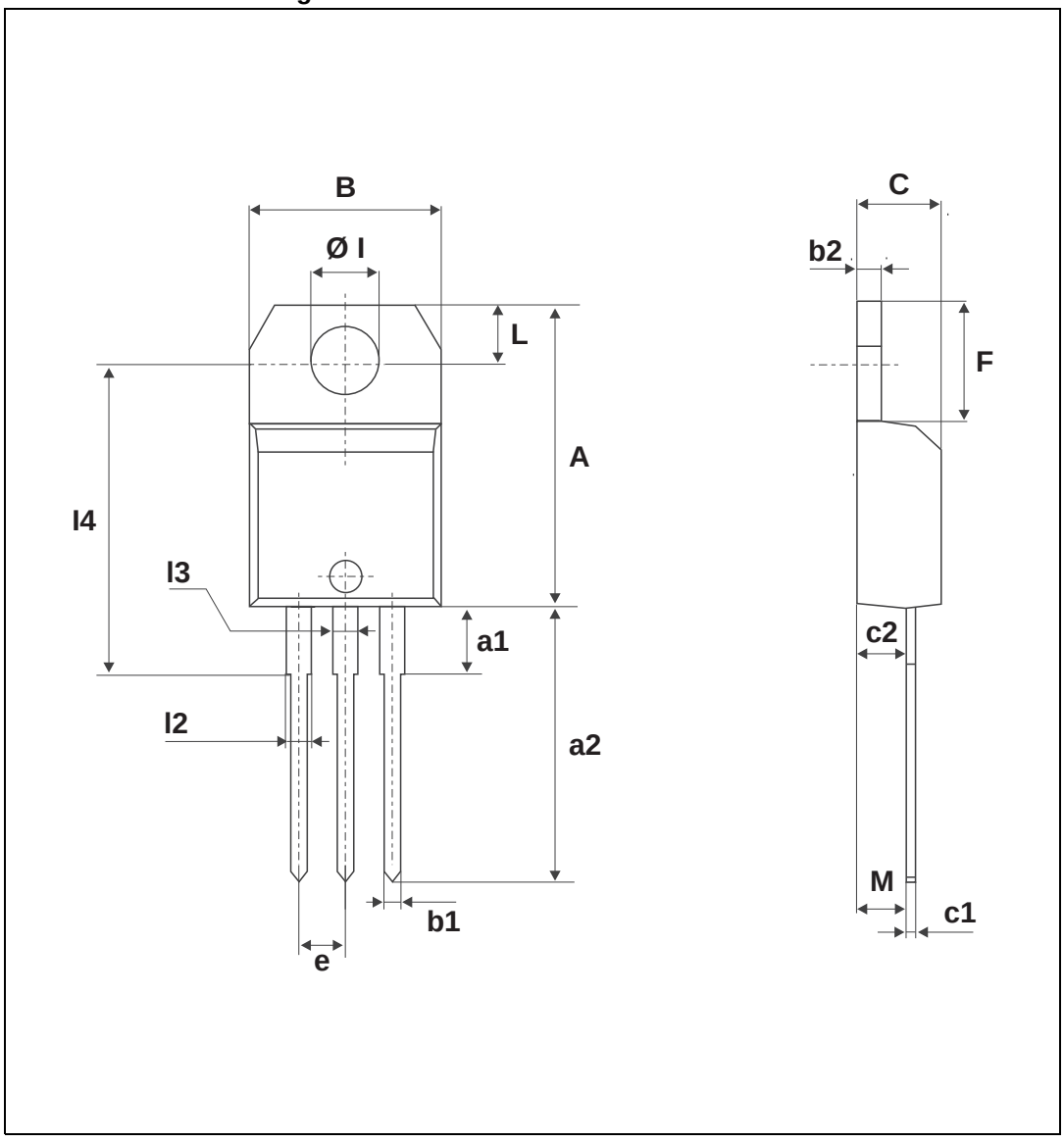

Table 5. TO-220AB dimension values

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
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	

3 Ordering information

Figure 9. Ordering Information Scheme

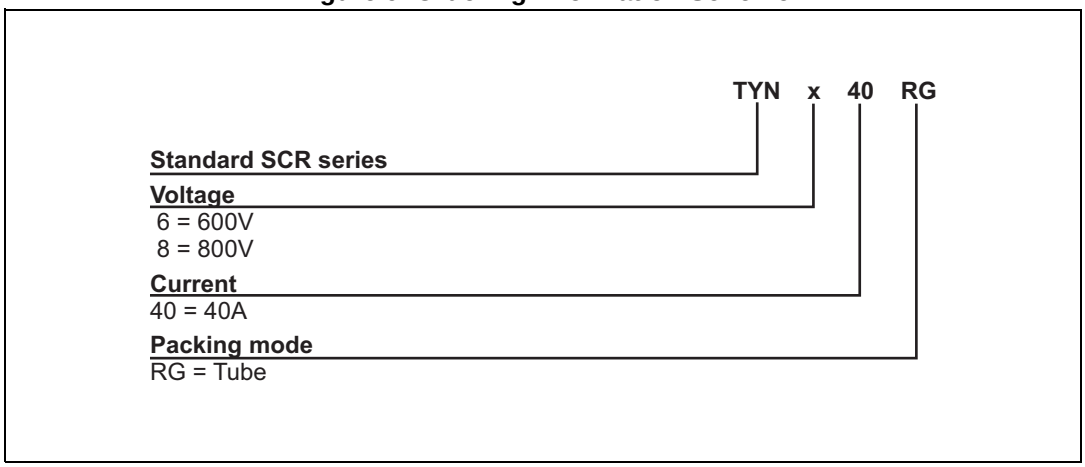

Table 6. Ordering Information

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

4 Revision history

Table 7. Document revision history

Date	Revision	Changes
Apr-2002	4A	Last update.
13-Feb-2006	5	TO-220AB delivery mode changed from bulk to tube. ECOPACK statement added.
05-Nov-2013	6	Updated *Figure 5*.

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