



# TYNx10 Series

STANDARD

10A SCR

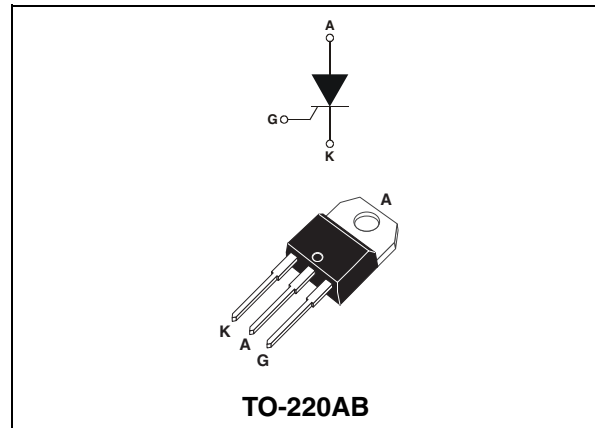
**Table 1: Main Features**

Symbol	Value	Unit
$I_{T(RMS)}$	10	A
$V_{DRM}/V_{RRM}$	400, 600 and 800	V
$I_{GT}$	15	mA

**DESCRIPTION**

The **TYNx10** Silicon Controlled Rectifiers is a high performance glass passivated technology.

This general purpose Silicon Controlled Rectifiers is designed for power supply up to 400Hz on resistive or inductive load.



**Table 2: Order Codes**

Part Numbers	Marking
TYN410RG	TYN410
TYN610RG	TYN610
TYN810RG	TYN810

**Table 3: Absolute Ratings** (limiting values)

Symbol	Parameter		Value	Unit	
$I_{T(RMS)}$	RMS on-state current (180° conduction angle)		$T_c = 100^\circ C$ 10	A	
$I_{T(AV)}$	Average on-state current (180° conduction angle)		$T_c = 100^\circ C$ 6.4	A	
$I_{TSM}$	Non repetitive surge peak on-state current	$t_p = 8.3 \text{ ms}$	$T_j = 25^\circ C$	105	A
		$t_p = 10 \text{ ms}$		100	
$I^2t$	$I^2t$ Value for fusing	$t_p = 10 \text{ ms}$	$T_j = 25^\circ C$	50	A <sup>2</sup> s
dl/dt	Critical rate of rise of on-state current $I_G = 100 \text{ mA}$ , $dI_G/dt = 0.1 \text{ A}/\mu\text{s}$		$T_j = 125^\circ C$	50	A/ $\mu\text{s}$
$I_{GM}$	Peak gate current	$t_p = 20 \mu\text{s}$	$T_j = 125^\circ C$	4	A
$P_{G(AV)}$	Average gate power dissipation		$T_j = 125^\circ C$	1	W
$P_{GM}$	Maximum gate power	$t_p = 20 \mu\text{s}$	$T_j = 125^\circ C$	10	W
$V_{DRM}$ $V_{RRM}$	Repetitive peak off-state voltage	<b>TYN410</b>	$T_j = 125^\circ C$	400	V
		<b>TYN610</b>		600	
		<b>TYN810</b>		800	
$T_{stg}$ $T_j$	Storage junction temperature range Operating junction temperature range			- 40 to + 150 - 40 to + 125	$^\circ C$
$T_L$	Maximum lead temperature for soldering during 10s at 2mm from case			260	$^\circ C$

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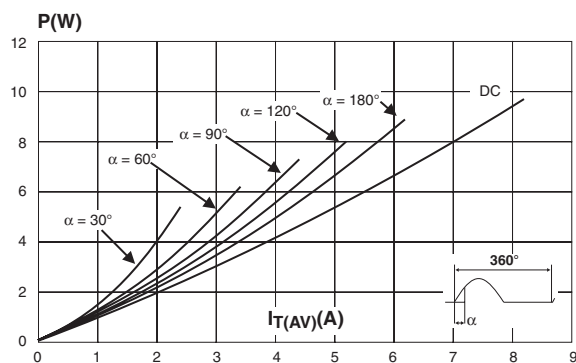
**Tables 4: Electrical Characteristics** ( $T_j = 25^\circ\text{C}$ , unless otherwise specified)

Symbol	Test Conditions		Value	Unit	
$I_{GT}$	$V_D = 12\text{ V (D.C.)}$ $R_L = 33\ \Omega$		MAX.	15	mA
$V_{GT}$			MAX.	1.5	V
$V_{GD}$	$V_D = V_{DRM}$ $R_L = 3.3\ \text{k}\Omega$	$T_j = 110^\circ\text{C}$	MIN.	0.2	V
$t_{gt}$	$V_D = V_{DRM}$ $I_G = 40\ \text{mA}$ $di_G/dt = 0.5\ \text{A}/\mu\text{s}$		TYP.	2	$\mu\text{s}$
$I_H$	$I_T = 100\ \text{mA}$ Gate open		MAX.	30	mA
$I_L$	$I_G = 1.2 \times I_{GT}$		TYP.	50	mA
$dV/dt$	Linear slope up to: $V_D = 67\% V_{DRM}$ Gate open	$T_j = 110^\circ\text{C}$	MIN.	200	$\text{V}/\mu\text{s}$
$V_{TM}$	$I_{TM} = 20\ \text{A}$ $t_p = 380\ \mu\text{s}$		MAX.	1.6	V
$I_{DRM}$ $I_{RRM}$	$V_{DRM} = V_{RRM}$	$T_j = 25^\circ\text{C}$	MAX.	10	$\mu\text{A}$
		$T_j = 110^\circ\text{C}$		2	mA
$t_q$	$V_D = 67\% V_{DRM}$ $I_{TM} = 20\ \text{A}$ $V_R = 25\ \text{V}$ $di_{TM}/dt = 30\ \text{A}/\mu\text{s}$ $dV_D/dt = 50\ \text{V}/\mu\text{s}$	$T_j = 110^\circ\text{C}$	TYP.	70	$\mu\text{s}$

**Table 5: Thermal Resistance**

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction to case (D.C.)	2.5	$^\circ\text{C}/\text{W}$
$R_{th(j-a)}$	Junction to ambient	60	$^\circ\text{C}/\text{W}$

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



**Figure 2: Correlation between maximum average power dissipation and maximum allowable temperature ( $T_{amb}$  and  $T_{lead}$ )**

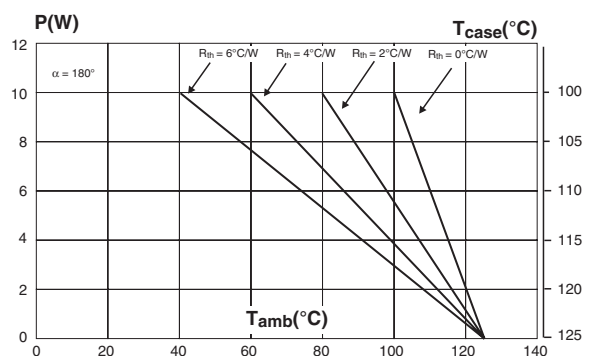


Figure 3: Average on-state current versus case temperature

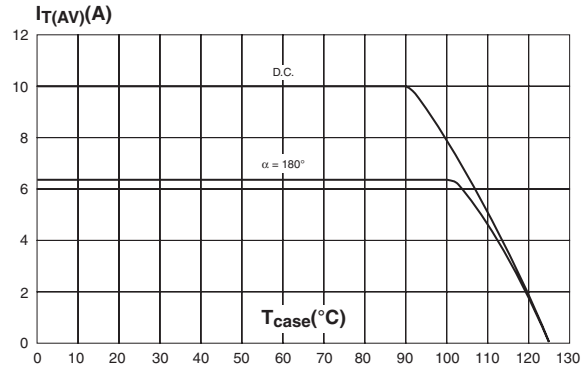


Figure 4: Relative variation of thermal impedance versus pulse duration

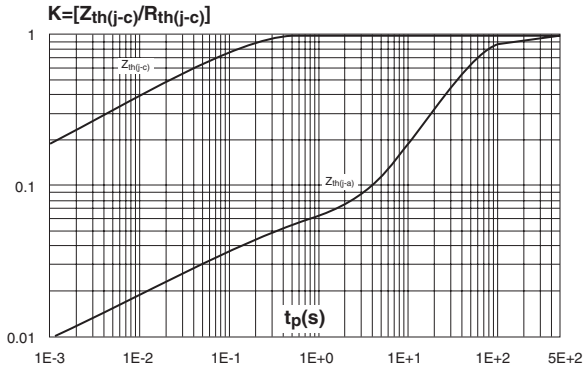


Figure 5: Relative variation of gate trigger current versus junction temperature

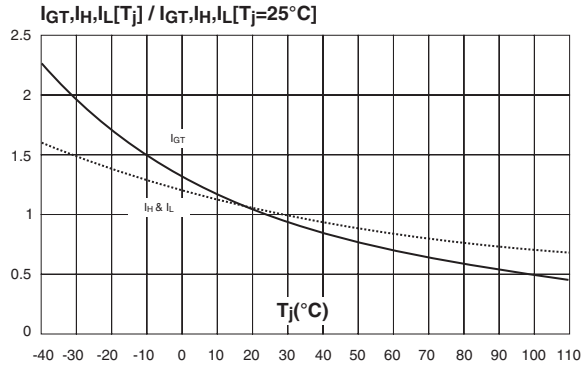


Figure 6: Surge peak on-state current versus number of cycles

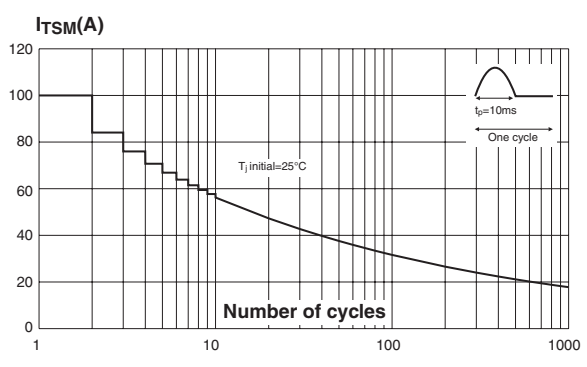


Figure 7: Non-repetitive surge peak on-state current for a sinusoidal pulse with width t\_p < 10 ms, and corresponding values of I^2t

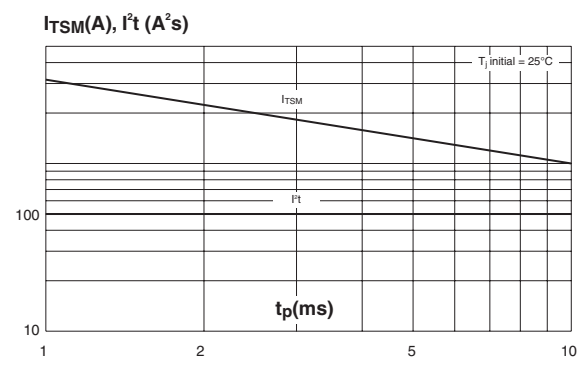
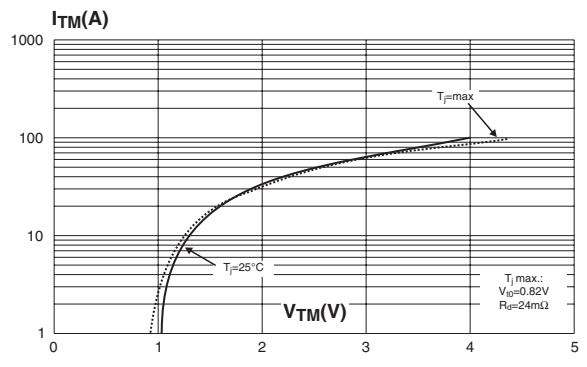


Figure 8: On-state characteristics (maximum values)



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Figure 9: Ordering Information Scheme

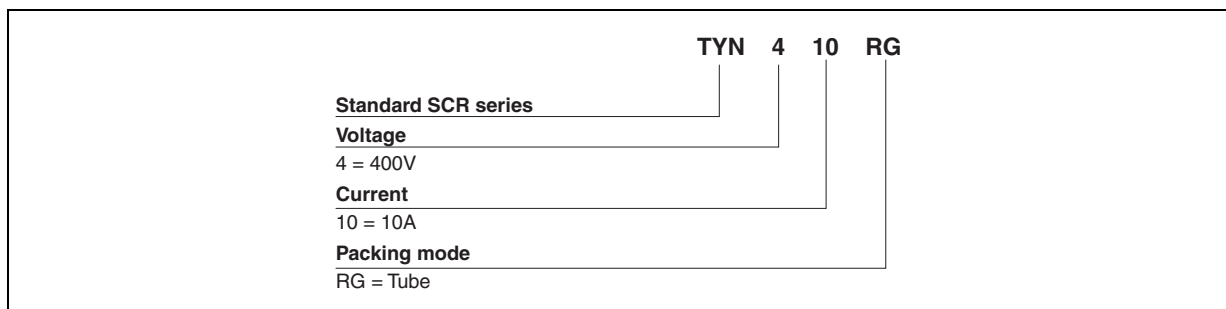
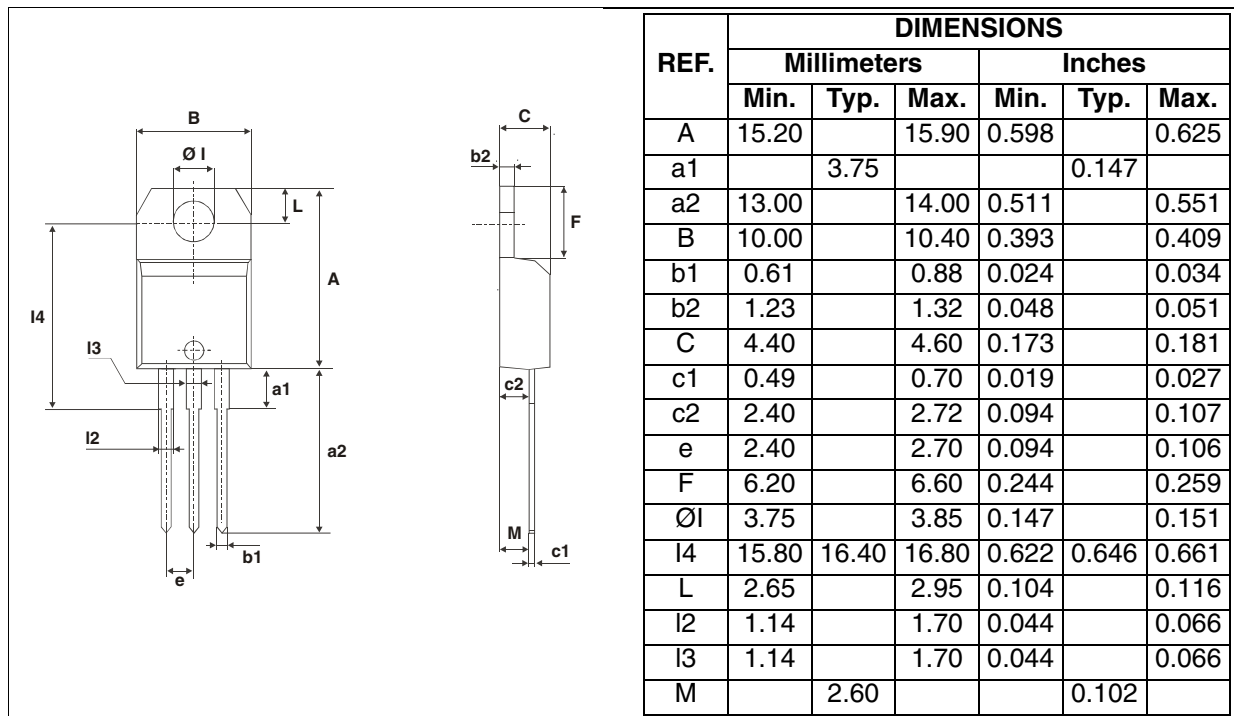


Table 6: Product Selector

Part Numbers	Voltage (xxx)			Sensitivity	Package
	400 V	600 V	800V		
TYN410RG	X			15 mA	TO-220AB
TYN610RG		X			
TYN810RG			X		

Figure 10: TO-220AB Package Mechanical Data



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](http://www.st.com).

Table 7: Ordering Information

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
TYN410RG	TYN410	TO-220AB	2.3 g	50	Tube
TYN610RG	TYN610				
TYN810RG	TYN810				

Table 8: Revision History

Date	Revision	Description of Changes
Sep-2001	1A	First issue.
13-Feb-2006	2	TO-220AB delivery mode changed from bulk to tube. ECOPACK statement added.

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