



# TN25 and TYNx25 Series

STANDARD

25A SCRs

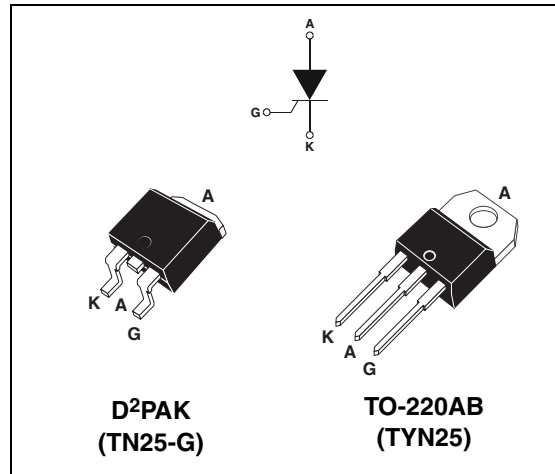
**Table 1: Main Features**

Symbol	Value	Unit
$I_{T(RMS)}$	25	A
$V_{DRM}/V_{RRM}$	600 to 1000	V
$I_{GT}$	40	mA

**DESCRIPTION**

The standard **TN25 / TYNx25** 25A SCR series is suitable for general purpose applications.

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



**Table 2: Order Codes**

Part Numbers	Marking
TN2540-x00G	TN2540x00G
TN2540-x00G-TR	TN2540x00G
TYNx25RG	TYNx25

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

Symbol	Parameter		Value	Unit
$I_{T(RMS)}$	RMS on-state current (180° conduction angle)		$T_c = 100^\circ\text{C}$ 25	A
$I_{T(AV)}$	Average on-state current (180° conduction angle)		$T_c = 100^\circ\text{C}$ 16	A
$I_{TSM}$	Non repetitive surge peak on-state current	$t_p = 8.3 \text{ ms}$	$T_j = 25^\circ\text{C}$ 314	A
		$t_p = 10 \text{ ms}$		
$I^2t$	$I^2t$ Value for fusing	$t_p = 10 \text{ ms}$	$T_j = 25^\circ\text{C}$ 450	$\text{A}^2\text{s}$
$di/dt$	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

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

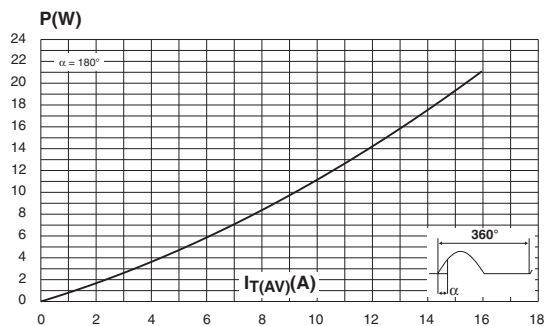
Symbol	Test Conditions		Value	Unit		
$I_{GT}$	$V_D = 12\text{ V}$	$R_L = 33\ \Omega$	MIN.	4	mA	
			MAX.	40		
$V_{GT}$			MAX.	1.3	V	
$V_{GD}$	$V_D = V_{DRM}$	$R_L = 3.3\ \text{k}\Omega$	$T_j = 125^\circ\text{C}$	MIN.	0.2	V
$I_H$	$I_T = 500\ \text{mA}$ Gate open			MAX.	50	mA
$I_L$	$I_G = 1.2 \times I_{GT}$			MAX.	90	mA
dV/dt	$V_D = 67\% V_{DRM}$ Gate open		$T_j = 125^\circ\text{C}$	MIN.	1000	V/ $\mu\text{s}$
$V_{TM}$	$I_{TM} = 50\ \text{A}$ $t_p = 380\ \mu\text{s}$		$T_j = 25^\circ\text{C}$	MAX.	1.6	V
$V_{t0}$	Threshold voltage		$T_j = 125^\circ\text{C}$	MAX.	0.77	V
$R_d$	Dynamic resistance		$T_j = 125^\circ\text{C}$	MAX.	14	m $\Omega$
$I_{DRM}$ $I_{RRM}$	$V_{DRM} = V_{RRM}$		$T_j = 25^\circ\text{C}$	MAX.	5	$\mu\text{A}$
			$T_j = 125^\circ\text{C}$		4	mA

**Table 5: Thermal resistance**

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case (DC)		1.0	$^\circ\text{C}/\text{W}$
$R_{th(j-a)}$	Junction to ambient (DC)	$S = 01\ \text{cm}^2$ D <sup>2</sup> PAK	45	$^\circ\text{C}/\text{W}$
		TO-220AB	60	

S = Copper surface under tab.

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



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

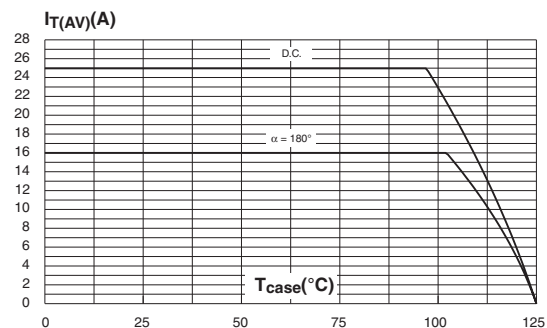


Figure 3: Average and D.C. on-state current versus ambient temperature (copper surface under tab: S=1cm<sup>2</sup>) (D<sup>2</sup>PAK)

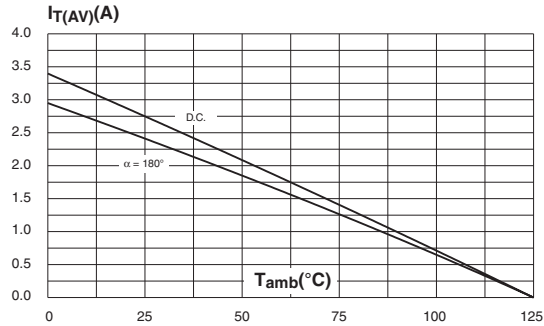


Figure 4: Relative variation of thermal impedance versus pulse duration

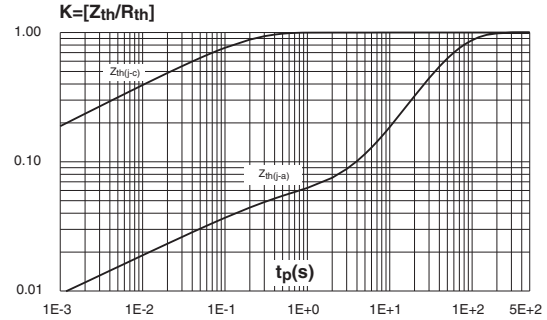


Figure 5: Relative variation of gate trigger current, holding current and latching current versus junction temperature

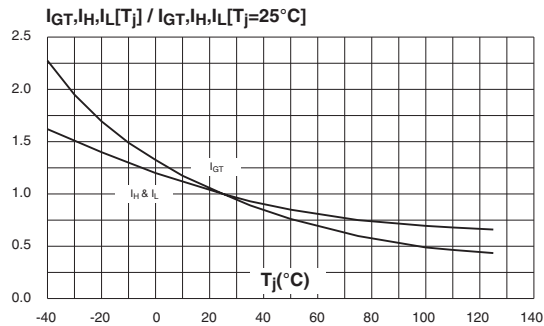


Figure 6: Surge peak on-state current versus number of cycles

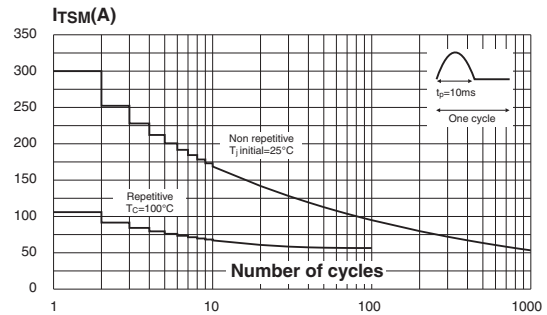


Figure 7: Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 10$  ms, and corresponding values of  $I^2t$

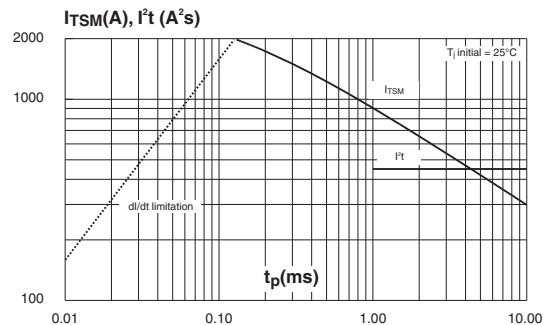
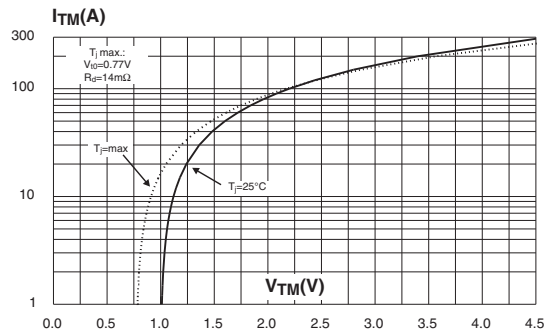
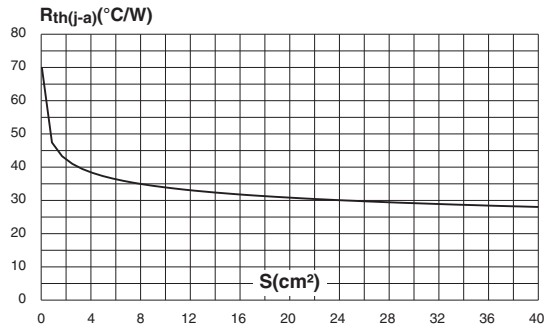


Figure 8: On-state characteristics (maximum values)

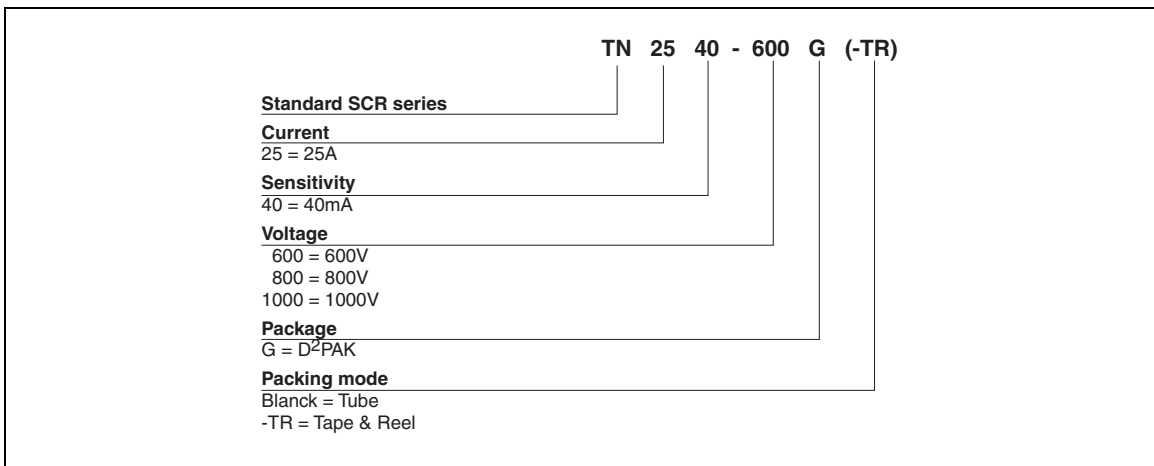


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**Figure 9: Thermal resistance junction to ambient versus copper surface under tab (epoxy printed circuit board FR4, copper thickness: 35µm) (D<sup>2</sup>PAK)**



**Figure 10: Ordering Information Scheme (TN25 series)**



**Figure 11: Ordering Information Scheme (TYN25 series)**

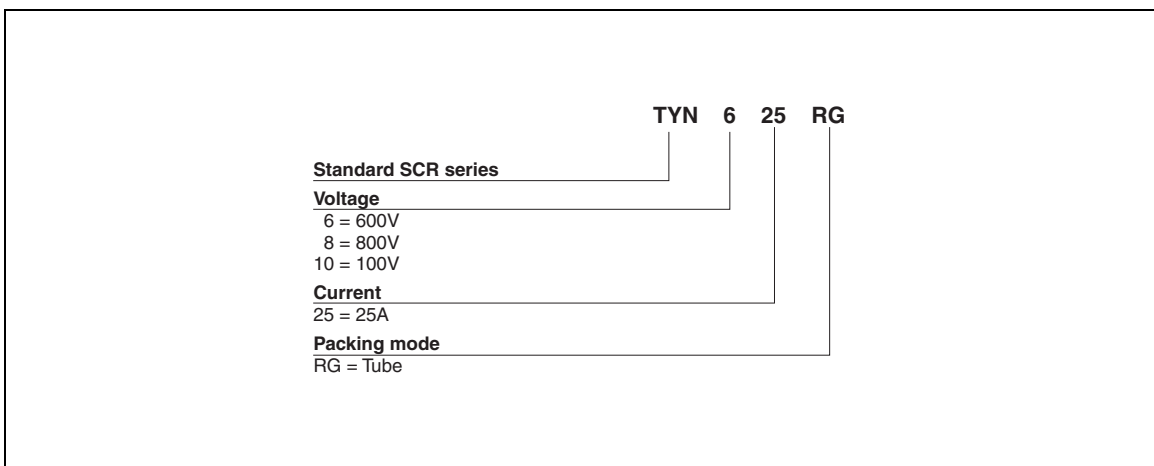


Table 6: Product Selector

Part Numbers	Voltage (xxx)			Sensitivity	Package
	600 V	800 V	1000 V		
TN2540-xxxG	X	X	X	40 mA	D <sup>2</sup> PAK
TYNx25	X	X	X	40 mA	TO-220AB

Figure 12: D<sup>2</sup>PAK Package Mechanical Data

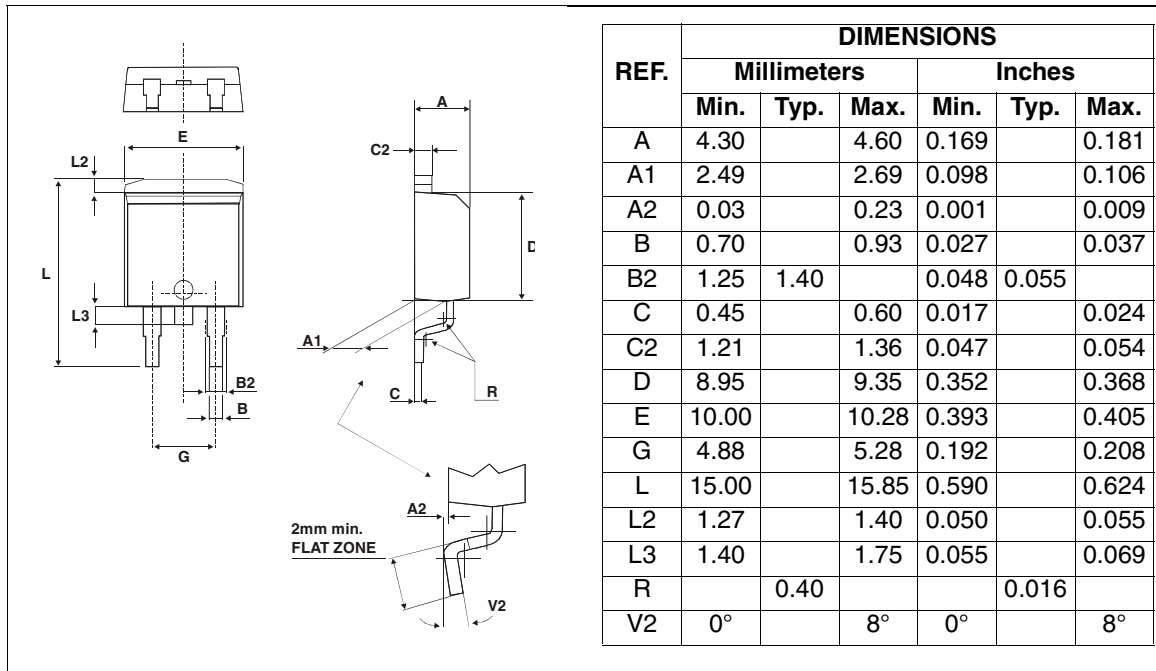
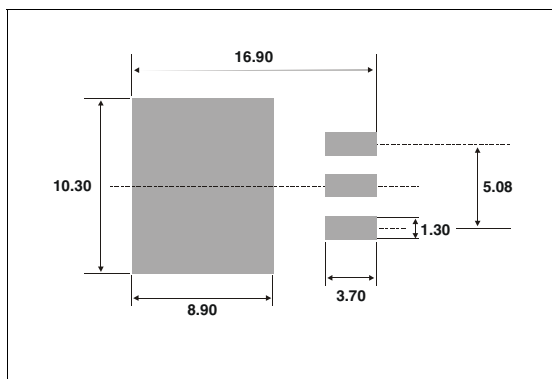
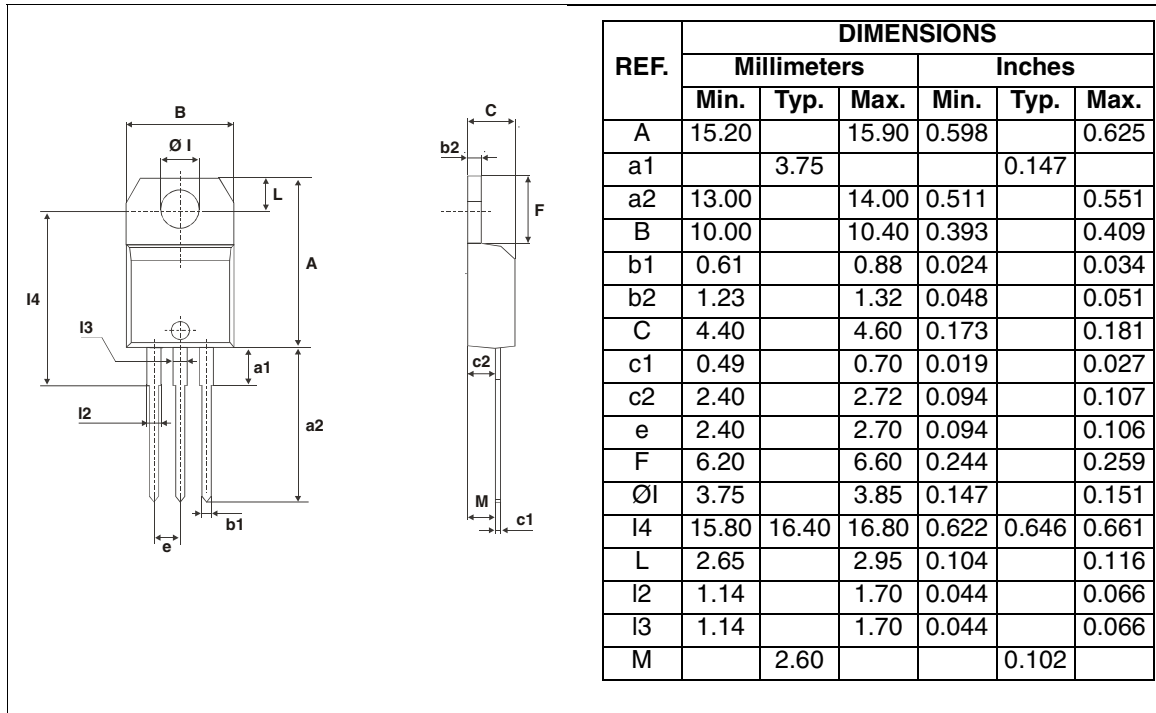


Figure 13: D<sup>2</sup>PAK Foot Print Dimensions (in millimeters)



## TN25 and TYNx25 Series

Figure 14: 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
TN2540-x00G	TN2540x00G	D <sup>2</sup> PAK	1.5 g	50	Tube
TN2540-x00G-TR	TN2540x00G	D <sup>2</sup> PAK	1.5 g	1000	Tape & reel
TYNx25RG	TYNx25	TO-220AB	2.3 g	50	Tube

Note: x = voltage

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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