

**Table 1. Main features**

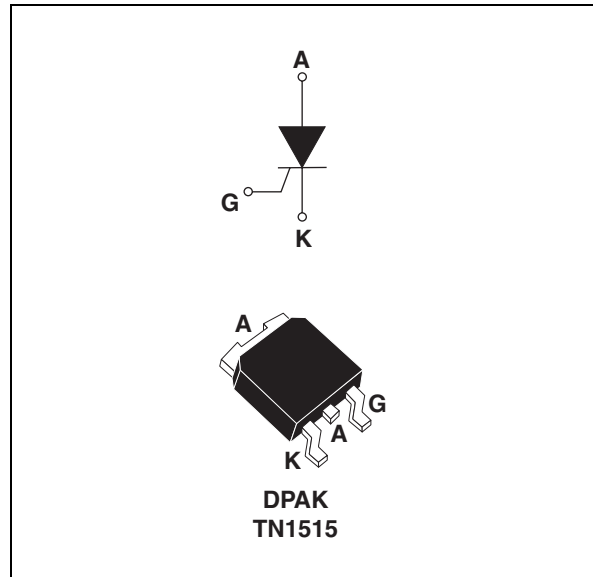
Symbol	Value	Unit
$I_{T(RMS)}$	15	A
$V_{DRM}/V_{RRM}$	600	V
$I_{GT(Q_1)}$	15	mA

### Description

Specifically designed to control motor in hand tools application, the TN15 SCR is available in DPAK package, providing a high robustness against stalled rotor operating conditions in a small SMD package

**Table 2. Order code**

Part number	Marking
TN1515-600B-TR	TN15 15600
TN1515-600B	TN15 15600



**Table 3. Absolute maximum ratings**

Symbol	Parameter		Value	Unit
$I_{T(RMS)}$	RMS on-state current (180° conduction angle)		$T_c = 109^\circ \text{C}$ 15	A
$I_{T(AV)}$	Average on-state current (180° conduction angle)		$T_c = 109^\circ \text{C}$ 9.5	A
$I_{TSM}$	Non repetitive surge peak on-state current	$t_p = 8.3 \text{ ms}$	$T_j = 25^\circ \text{C}$ 165	A
		$t_p = 10 \text{ ms}$		
$I^2t$	$I^2t$ Value for fusing	$t_p = 10 \text{ ms}$	$T_j = 25^\circ \text{C}$ 113	$\text{A}^2\text{s}$
$di/dt$	Critical rate of rise of on-state current $I_G = 2 \times I_{GT}$ , $t_r \leq 100 \text{ ns}$	$F = 120 \text{ Hz}$	$T_j = 125^\circ \text{C}$ 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

# 1 Characteristics

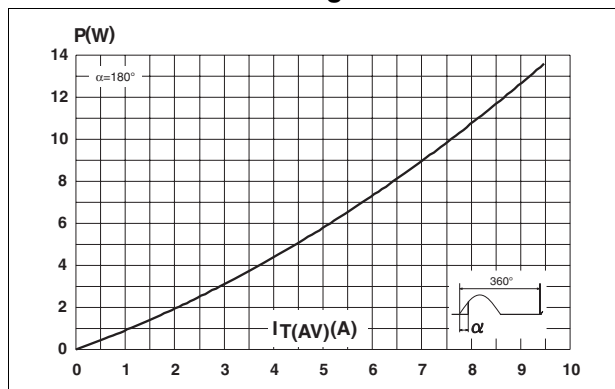
**Table 4. Electrical characteristics** ( $T_j = 25^\circ\text{C}$ , unless otherwise specified)

Symbol	Test conditions		Values		Unit
			MIN.	MAX.	
$I_{GT}$	$V_{out} = 12\text{ V}, R_L = 33\ \Omega$	$T_j = 25^\circ\text{C}$	MIN.	2	mA
			MAX.	15	
$V_{GT}$	$V_{out} = 12\text{ V}, R_L = 33\ \Omega$		MAX.	1.3	V
$V_{GD}$	$V_{out} = V_{DRM}, R_L = 33\ \Omega$	$T_j = 125^\circ\text{C}$	MIN.	0.2	V
$I_H$	$I_T = 500\text{ mA}$		MAX.	40	mA
$I_L$	$I_G = 1.2 I_{GT}$		MAX.	60	mA
dV/dt	$V_D = 67\% V_{DRM}$ , gate open	$T_j = 125^\circ\text{C}$	MIN.	200	V/ $\mu\text{s}$
$V_{TM}$	$I_{TM} = 30\text{ A}, t_p = 380\ \mu\text{s}$	$T_j = 25^\circ\text{C}$	MAX.	1.6	V
$V_{TO}$	Threshold voltage	$T_j = 125^\circ\text{C}$	MAX.	0.85	V
$R_D$	Dynamic resistance	$T_j = 125^\circ\text{C}$	MAX.	25	m $\Omega$
$I_{DRM}$	$V_{DRM} = V_{RRM}$	$T_j = 25^\circ\text{C}$	MAX.	5	$\mu\text{A}$
$I_{RRM}$		$T_j = 125^\circ\text{C}$		2	mA

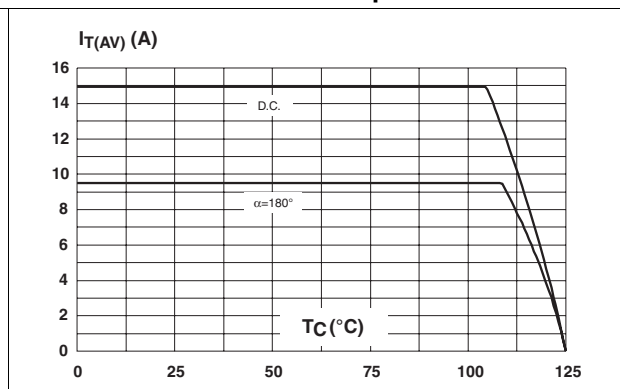
**Table 5. Thermal resistance**

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case (DC)		1.2	$^\circ\text{C/W}$
$R_{th(j-a)}$	Junction to ambient	$S = 0.5\text{ cm}^2$	70	$^\circ\text{C/W}$

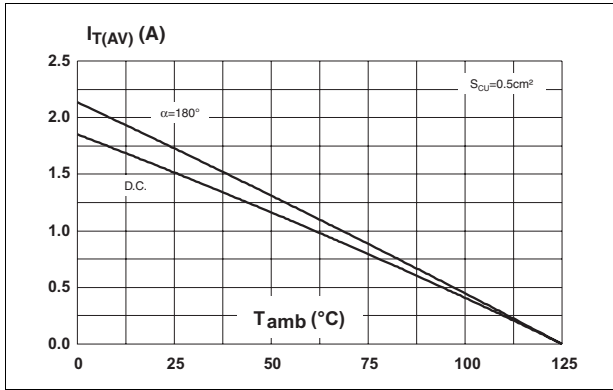
**Figure 1. Maximum power dissipation versus average on-state current**



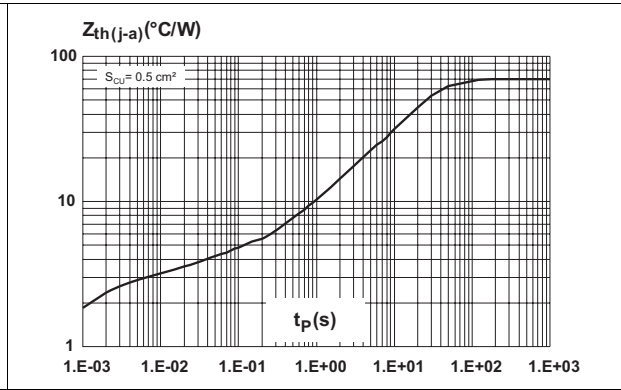
**Figure 2. Average and DC on-state current versus case temperature**



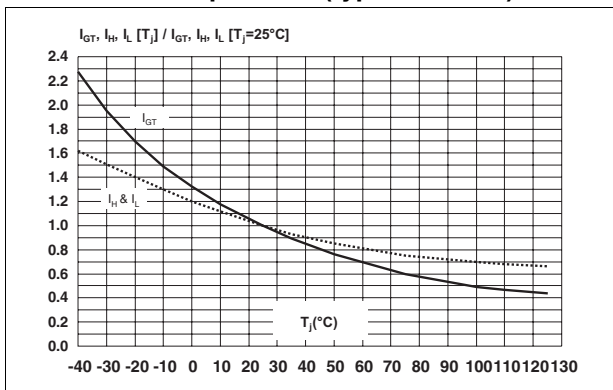
**Figure 3. Average and DC on-state current versus ambient temperature, PCB FR4, copper thickness 35  $\mu\text{m}$**



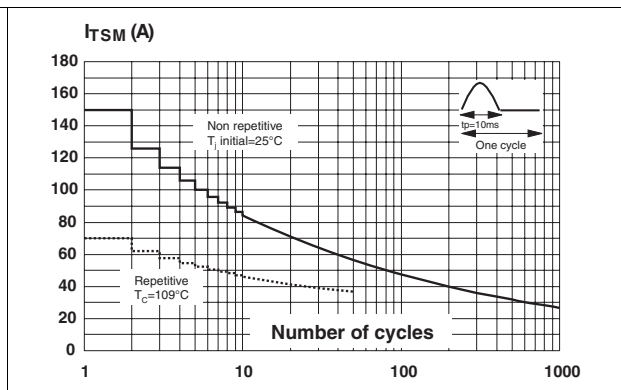
**Figure 4. Thermal impedance, junction to ambient, versus pulse duration, PCB FR4, copper thickness 35  $\mu\text{m}$**



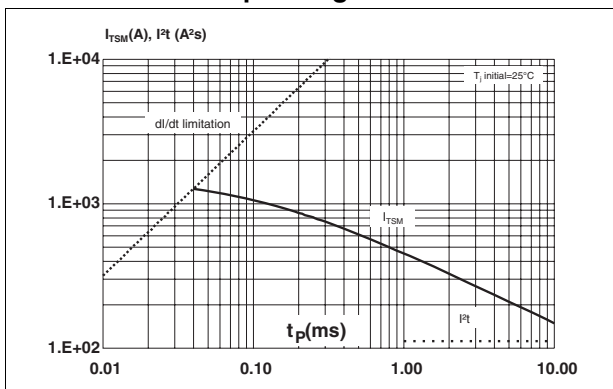
**Figure 5. Relative variation of gate trigger current, holding current and latching current versus junction temperature (typical values)**



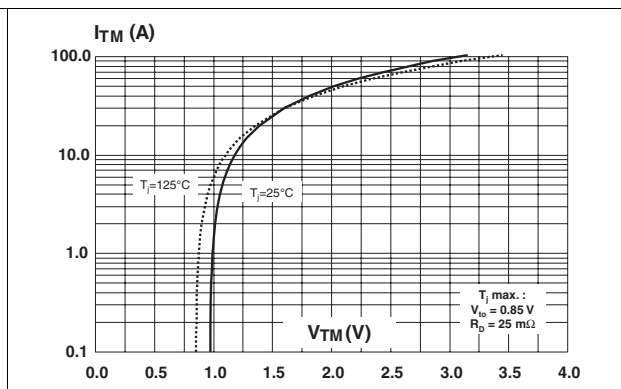
**Figure 6. Surge peak on-state current versus number of cycles**



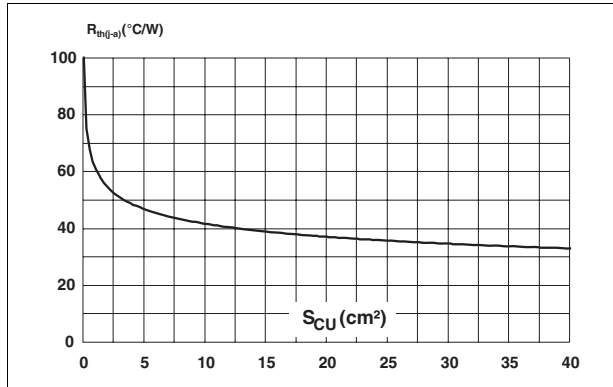
**Figure 7. Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 10$  ms and corresponding value of  $I^2t$**



**Figure 8. On-state characteristics (maximum values)**

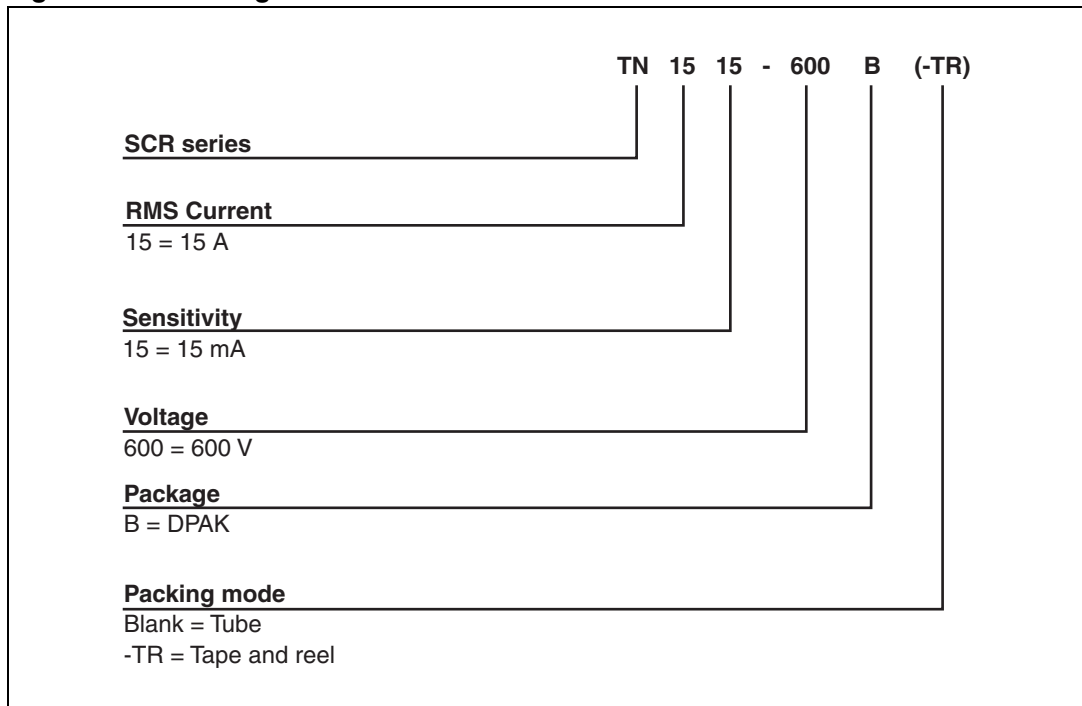


**Figure 9. Junction to ambient thermal resistance versus copper surface under tab, PCB FR4, copper thickness 35µm**



## 2 Ordering information scheme

**Figure 10. Ordering information scheme**



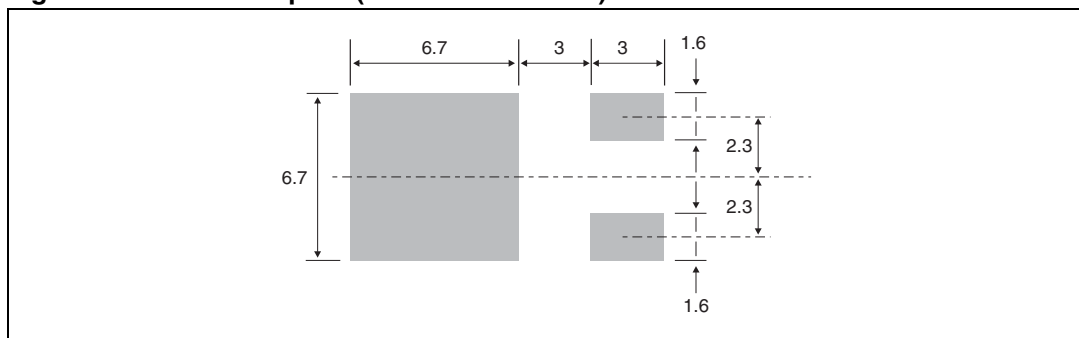
### 3 Package information

- Epoxy meets UL94, V0

**Table 6. DPAK dimensions**

REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max	Min.	Max.
A	2.20	2.40	0.086	0.094
A1	0.90	1.10	0.035	0.043
A2	0.03	0.23	0.001	0.009
B	0.64	0.90	0.025	0.035
B2	5.20	5.40	0.204	0.212
C	0.45	0.60	0.017	0.023
C2	0.48	0.60	0.018	0.023
D	6.00	6.20	0.236	0.244
E	6.40	6.60	0.251	0.259
G	4.40	4.60	0.173	0.181
H	9.35	10.10	0.368	0.397
L2	0.80 typ.		0.031 typ.	
L4	0.60	1.00	0.023	0.039
V2	0°	8°	0°	8°

**Figure 11. DPAK footprint (dimensions in mm)**



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## 4 Ordering information

Table 7. Ordering information

Part number	Marking	Package	Weight	Base qty	Delivery mode
TN1515-600B-TR	TN15 15600	DPAK	0.3 g	2500	Tape and reel
TN1515-600B	TN15 15600	DPAK	0.3 g	75	Tube

## 5 Revision history

Table 8. Revision history

Date	Revision	Changes
13-Mar-2006	1	Initial release.
11-Jul-2007	2	Added pin out labels to package illustration on cover page.

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