

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

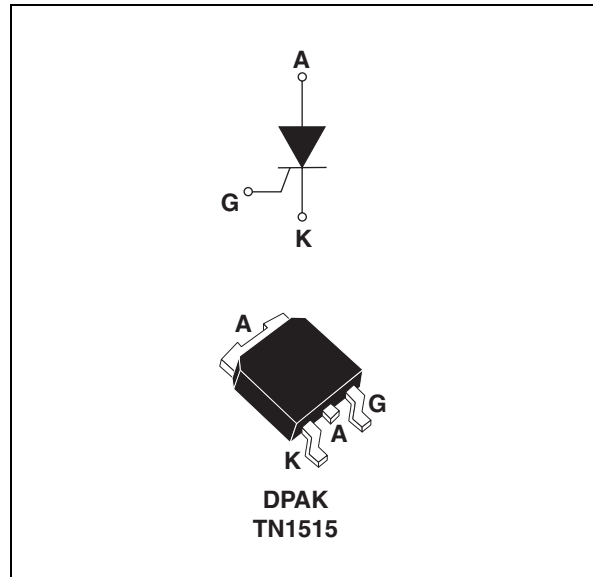


Table 3. Absolute maximum ratings

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	A^2s
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/ μs
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 Ω
I_{DRM}	$V_{DRM} = V_{RRM}$	$T_j = 25^\circ\text{C}$	MAX.	5	μA
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

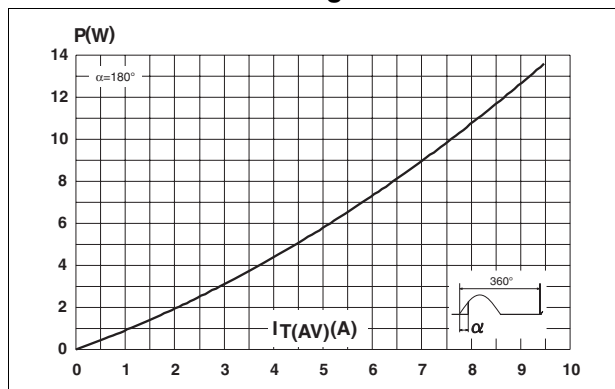


Figure 2. Average and DC on-state current versus case temperature

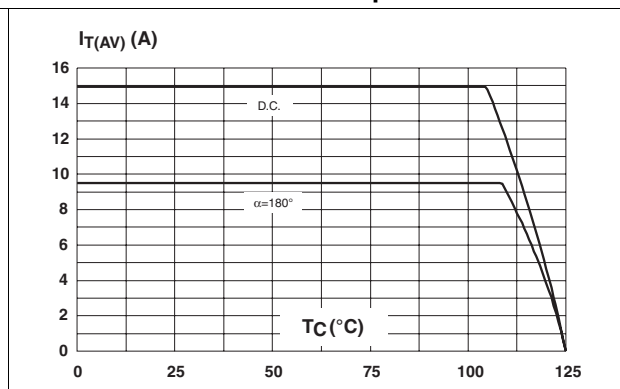


Figure 3. Average and DC on-state current versus ambient temperature, PCB FR4, copper thickness 35 μm

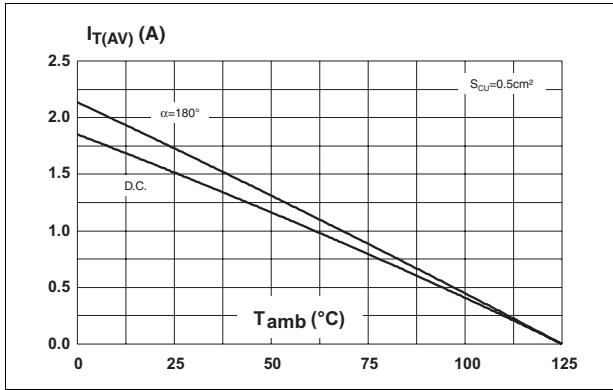


Figure 4. Thermal impedance, junction to ambient, versus pulse duration, PCB FR4, copper thickness 35 μm

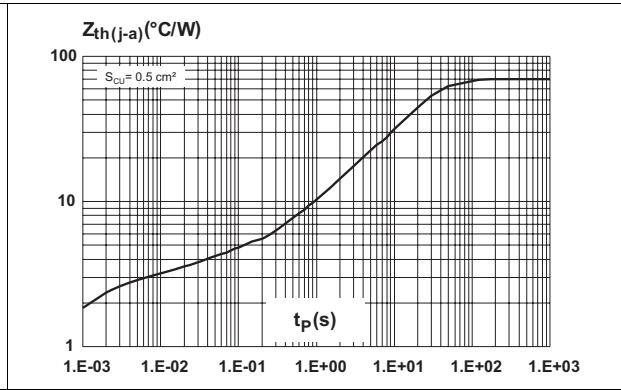


Figure 5. Relative variation of gate trigger current, holding current and latching current versus junction temperature (typical values)

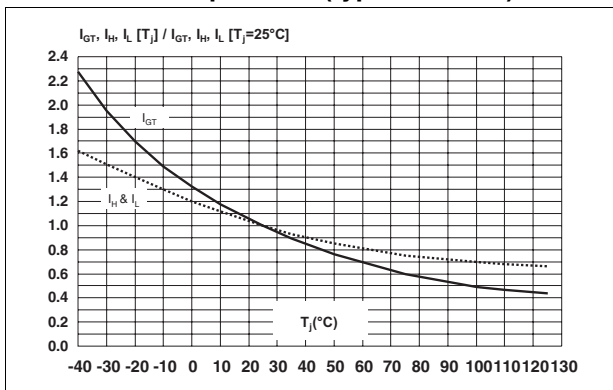


Figure 6. Surge peak on-state current versus number of cycles

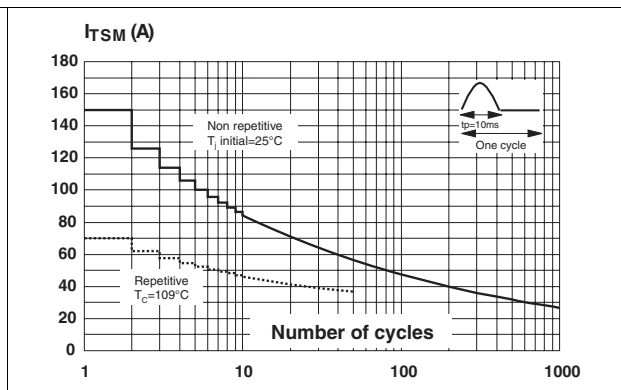


Figure 7. Non-repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 10$ ms and corresponding value of I^2t

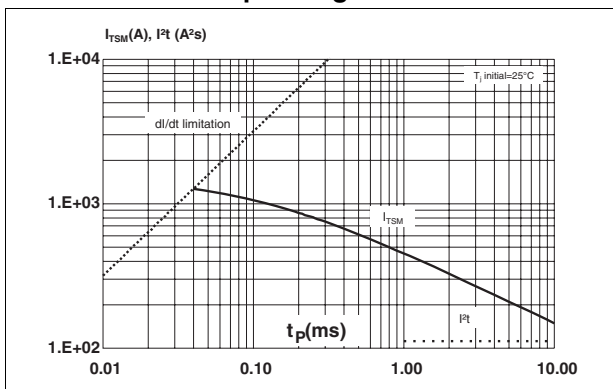


Figure 8. On-state characteristics (maximum values)

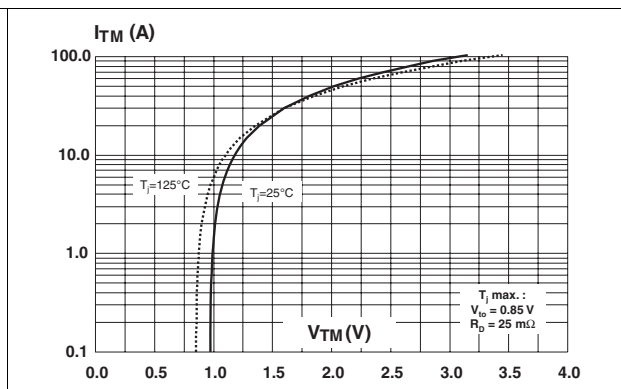
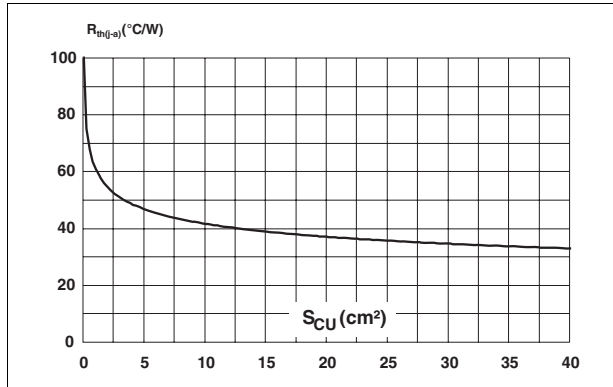
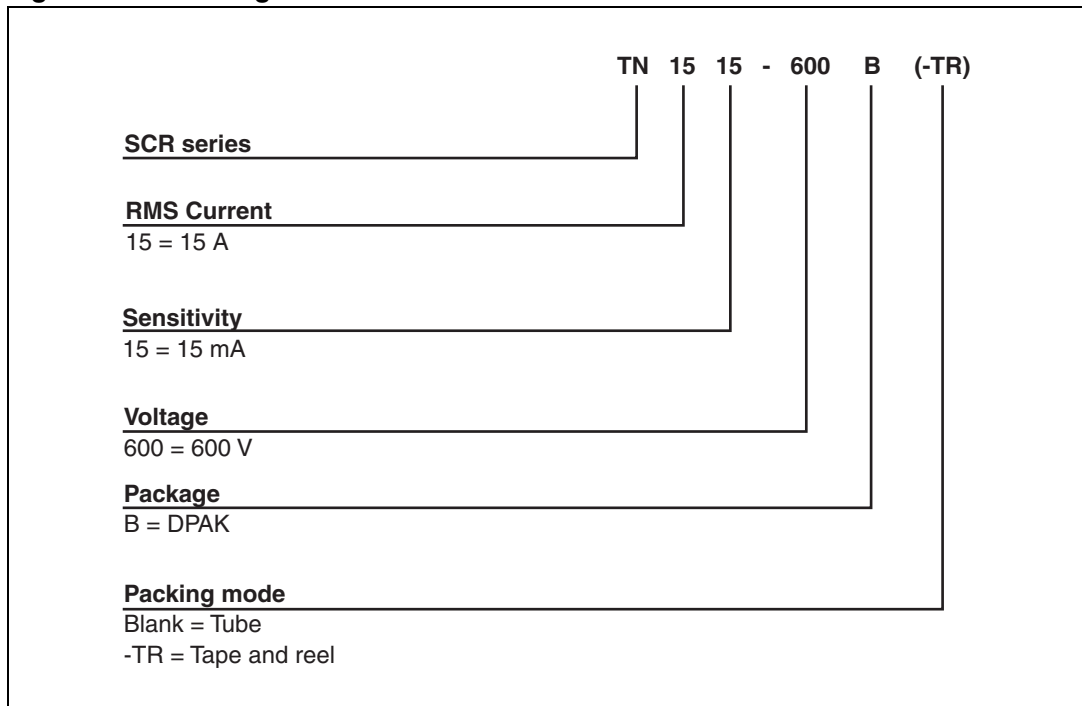


Figure 9. Junction to ambient thermal resistance versus copper surface under tab, PCB FR4, copper thickness 35µm



2 Ordering information scheme

Figure 10. Ordering information scheme



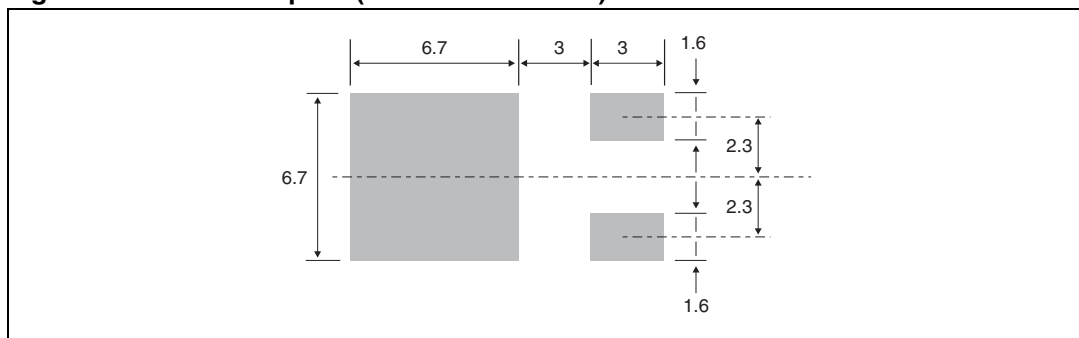
3 Package information

- 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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