

15 A standard SCR

Table 1. Main features

Symbol	Value	Unit
I _{T(RMS)}	15	Α
V _{DRM} /V _{RRM}	600	V
I _{GT (Q1)}	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

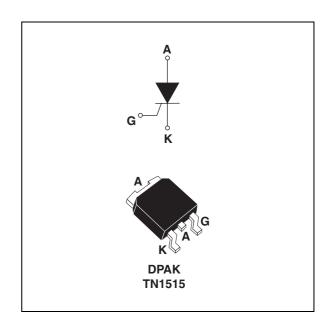


Table 3. Absolute maximum ratings

Symbol	Parameter	Value	Unit		
I _{T(RMS)}	RMS on-state current (180° conduction angle) $T_c = 109^{\circ} C$		15	Α	
I _{T(AV)}	Average on-state current (180° conduction	angle)	T _c = 109° C	9.5	Α
I	Non repetitive surge neak on-state current	$t_p = 8.3 \text{ ms}$	T _i = 25° C	165	Α
TSM	I _{TSM} Non repetitive surge peak on-state current		1 - 25 0	150	^
l ² t	I ² t Value for fusing	$t_p = 10 \text{ ms}$	T _j = 25° C	113	A ² s
dI/dt	Critical rate of rise of on-state current $I_G = 2 \times I_{GT}$, $t_r \le 100 \text{ ns}$	F = 120 Hz	T _j = 125° C	50	A/µs
I _{GM}	Peak gate current $t_p = 20 \mu s$		T _j = 125° C	4	Α
P _{G(AV)}	Average gate power dissipation $T_j = 125^{\circ} C$			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

Characteristics TN1515-600B

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

Symbol	Test conditions		Values		Unit
1.	V 40 V D 22 O	T _j = 25° C	MIN.	2	- mA
I _{GT}	$V_{out} = 12 \text{ V}, R_L = 33 \Omega$		MAX.	15	IIIA
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° C	MIN.	0.2	V
I _H	I _T = 500 mA		MAX.	40	mA
ΙL	I _G = 1.2 I _{GT}		MAX.	60	mA
dV/dt	V _D = 67% V _{DRM,} gate open	T _j = 125° C	MIN.	200	V/µs
V_{TM}	$I_{TM} = 30 \text{ A}, t_p = 380 \mu\text{s}$	T _j = 25° C	MAX.	1.6	V
V _{TO}	Threshold voltage	T _j = 125° C	MAX.	0.85	V
R_D	Dynamic resistance	T _j = 125° C	MAX.	25	mΩ
I _{DRM}	V _{DRM} = V _{BRM}	T _j = 25° C	MAX.	5	μA
I _{RRM}	VDRM - VRRM	T _j = 125° C	IVIAA.	2	mA

Table 5. Thermal resistance

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

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

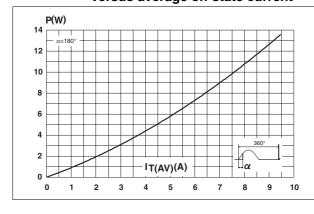
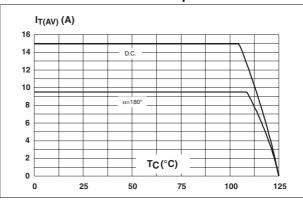


Figure 2. Average and DC on-state current versus case temperature



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TN1515-600B Characteristics

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

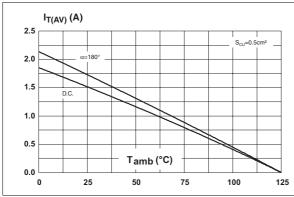
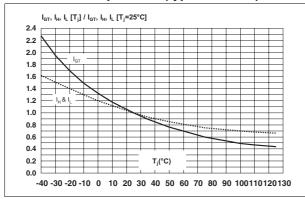


Figure 5. Relative variation of gate trigger current, holding current and latching current versus junction temperature (typical values)

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



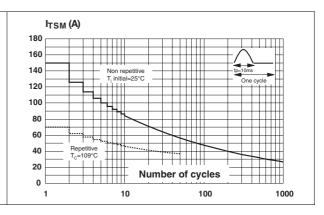
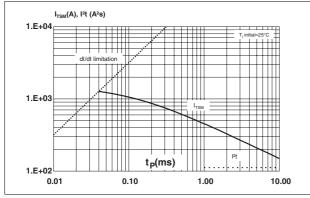


Figure 7. Non-repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 10$ ms and corresponding value of l^2t

Figure 8. On-state characteristics (maximum values)



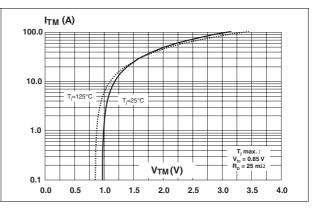
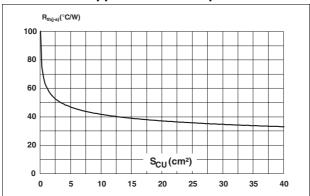
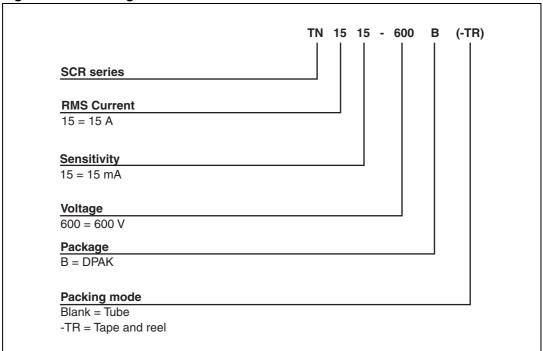


Figure 9. Junction to ambient thermal resistance versus copper surface under tab, PCB FR4, copper thickness 35µm



2 Ordering information scheme

Figure 10. Ordering information scheme

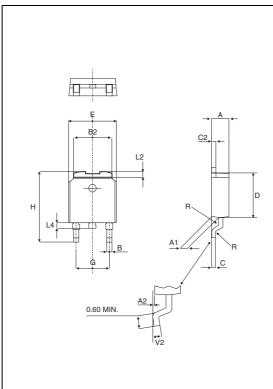


TN1515-600B Package information

3 Package information

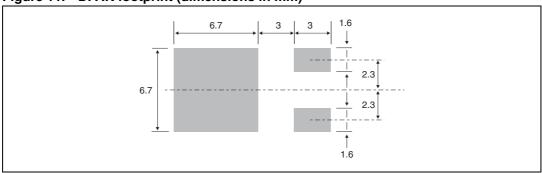
Epoxy meets UL94, V0

Table 6. DPAK dimensions



	DIMENSIONS				
REF.	Millimeters		Inches		
	Min.	Min. Max		Max.	
Α	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	
В	0.64	0.90	0.025	0.035	
B2	5.20	5.40	0.204	0.212	
С	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	
Е	6.40	6.60	0.251	0.259	
G	4.40	4.60	0.173	0.181	
Н	9.35	10.10	0.368	0.397	
L2	0.80 typ.		0.03	1 typ.	
L4	0.60	1.00	0.023	0.039	
V2	0°	8°	0°	8°	

Figure 11. DPAK footprint (dimensions in mm)



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.

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Ordering information TN1515-600B

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 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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