TN1625
TYN616, TYN816

16 A standard SCRs

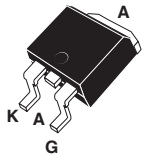
Features

- $I_{T(RMS)}$ =16 A
- V_{DRM}/V_{RRM} = 600 to 1000 V
- I_{GT} = 25 mA

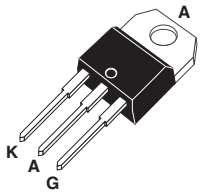
Description

The standard TN16 / TYNx16 16 A SCRs series is suitable for general purpose applications.

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



D²PAK
(TN1625-x00G)



TO-220AB
(TYNx16RG)

Table 1. Device summary

Parameter	TN1625-600G TYN616RG	TYN816RG	TN1625-1000G	Unit
V_{DRM}/V_{RRM}	600	800	1000	V
Sensitivity	25	25	25	mA

1 Characteristics

Table 2. Absolute ratings (limiting values)

Symbol	Parameter			Value	Unit
$I_{T(RMS)}$	RMS on-state current (180 °Conduction angle)		T_c = 110 °C	16	A
$I_{T(AV)}$	Average on-state current (180 °Conduction angle)		T_c = 110 °C	10	A
I_{TSM}	Non repetitive surge peak on-state current	t_p = 8.3 ms	T_j = 25 °C	200	A
		t_p = 10 ms		190	
I^2t	I^2t Value for fusing	t_p = 10 ms	T_j = 25 °C	180	A^2s
dI/dt	Critical rate of rise of on-state current I_G = 2 x I_{GT} , $t_r \leq$ 100 ns	F = 60 Hz	T_j = 125 °C	50	A/µs
I_{GM}	Peak gate current	t_p = 20 µs	T_j = 125 °C	4	A
$P_{G(AV)}$	Average gate power dissipation		T_j = 125 °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

Table 3. Electrical characteristics (T_j = 25 °C, unless otherwise specified)

Symbol	Test Conditions			Value	Unit
I_{GT}	V_D = 12 V R_L = 33 Ω		MIN.	2	mA
			MAX.	25	
V_{GT}			MAX.	1.3	V
V_{GD}	V_D = V_{DRM} R_L = 3.3 kΩ	T_j = 125 °C	MIN.	0.2	V
I_H	I_T = 500 mA Gate open		MAX.	40	mA
I_L	I_G = 1.2 x I_{GT}		MAX.	60	mA
dV/dt	V_D = 67 % V_{DRM} Gate open	T_j = 125 °C	MIN.	500	V/µs
V_{TM}	I_{TM} = 32 A t_p = 380 µs	T_j = 25 °C	MAX.	1.6	V
V_{t0}	Threshold voltage	T_j = 125 °C	MAX.	0.77	V
R_d	Dynamic resistance	T_j = 125 °C	MAX.	23	mΩ
I_{DRM} I_{RRM}	V_{DRM} = V_{RRM}	T_j = 25 °C	MAX.	5	µA
		T_j = 125 °C		2	mA

Table 4. Thermal resistance

Symbol	Parameter			Value	Unit
$R_{th(j-c)}$	Junction to case (DC)			1.1	°C/W
$R_{th(j-a)}$	Junction to ambient (DC)	S = 01 cm^2	D^2PAK	45	°C/W
			TO-220AB	60	

S = copper surface under tab

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

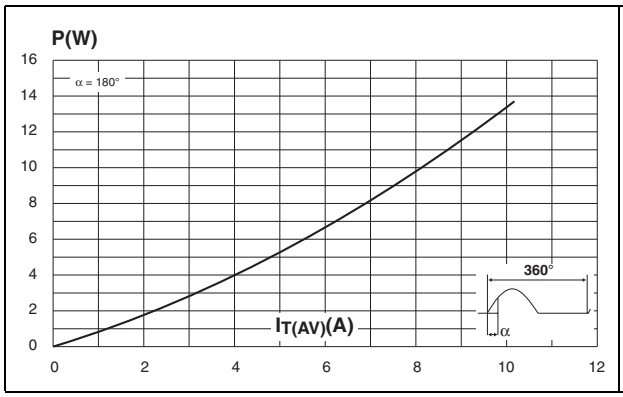


Figure 2. Average and D.C. on-state current versus case temperature

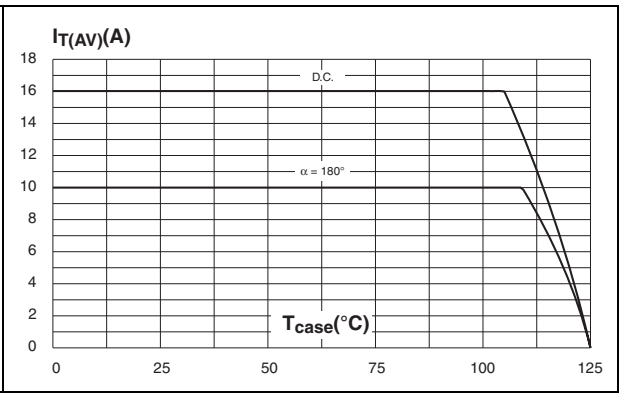


Figure 3. Average and D.C. on-state current versus ambient temperature (copper surface under tab: S=1cm^2) (D^{2}PAK)

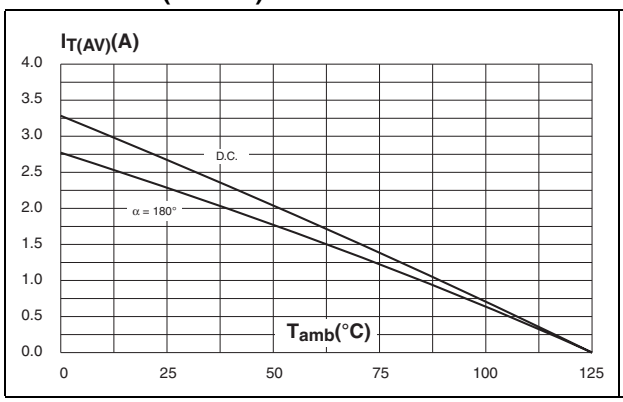


Figure 4. Relative variation of thermal impedance versus pulse duration

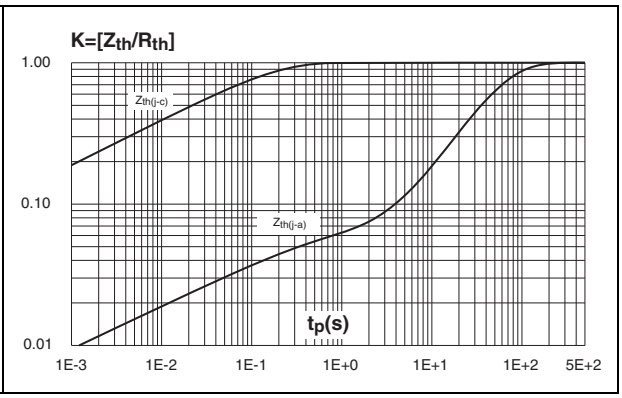


Figure 5. Relative variation of gate trigger current, holding current and latching current versus junction temperature

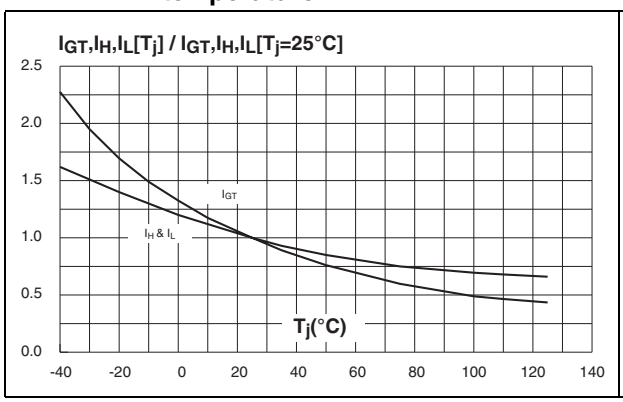


Figure 6. Surge peak on-state current versus number of cycles

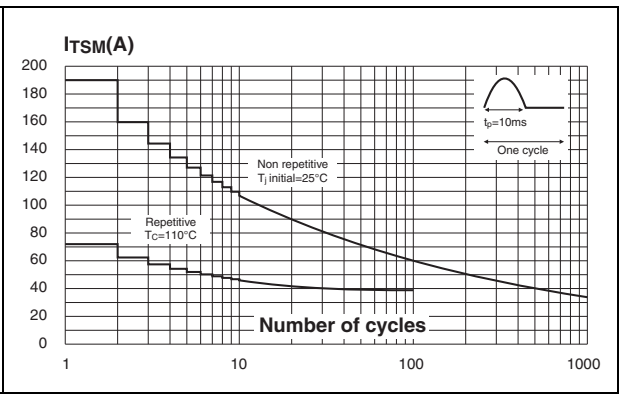


Figure 7. Non-repetitive surge peak on-state current for a sinusoidal pulse with width t_p < 10 ms, and corresponding values of I^2t

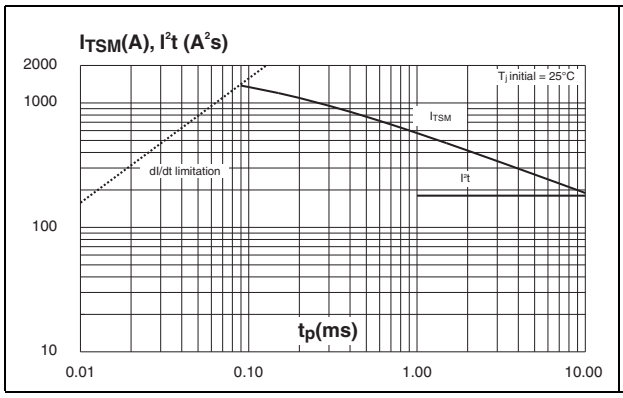


Figure 8. On-state characteristics (maximum values)

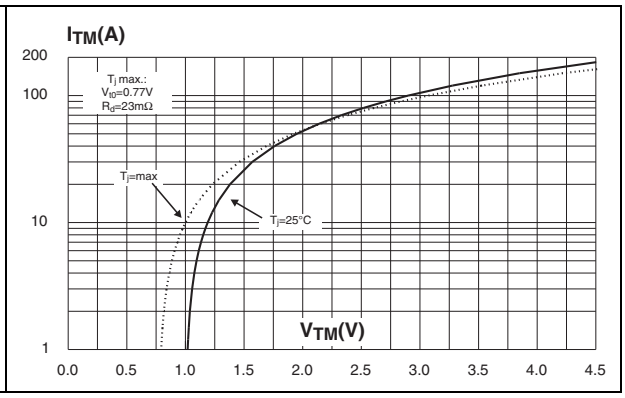
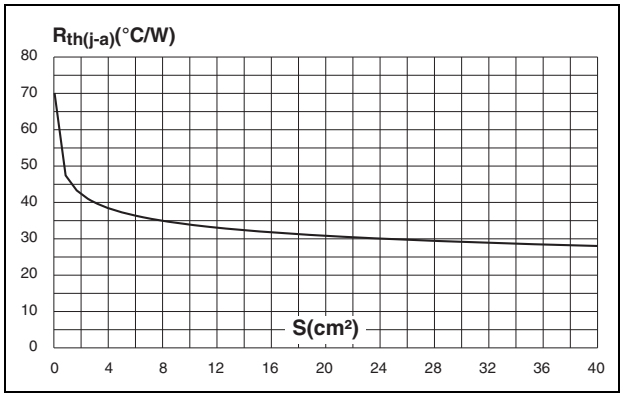


Figure 9. Thermal resistance junction to ambient versus copper surface under tab (epoxy printed circuit board FR4, copper thickness: 35 µm) (D^2PAK)



2 Ordering information scheme

Figure 10. TN1625

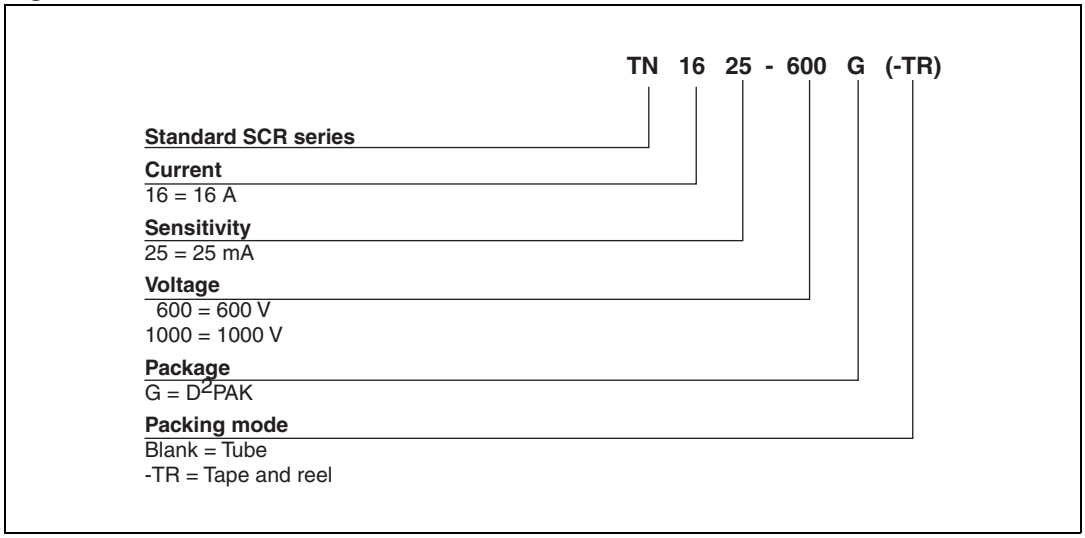
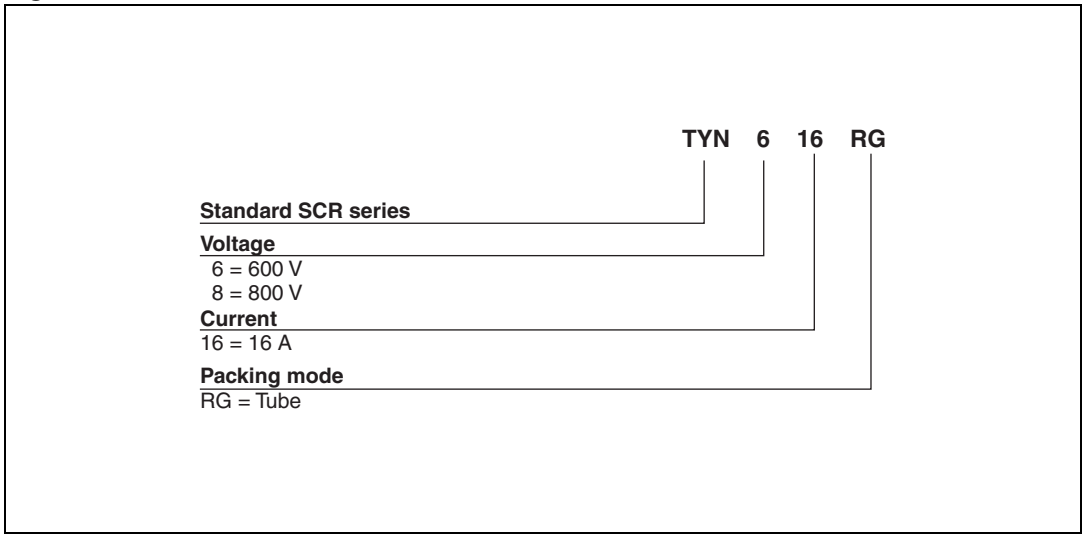


Figure 11. TYNx16

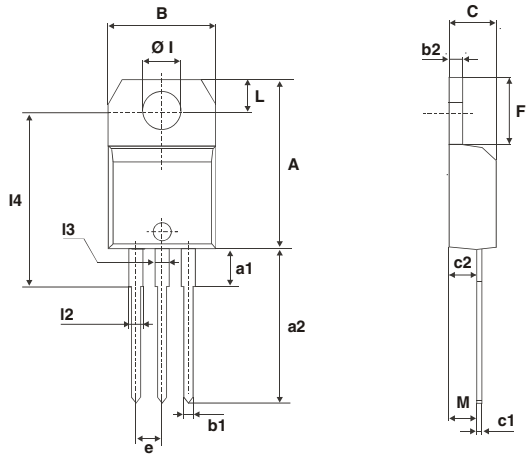


3 Package information

- Epoxy meets UL94,V0
- Cooling method: C
- Recommended torque value: 0.4 - 0.6 N·m

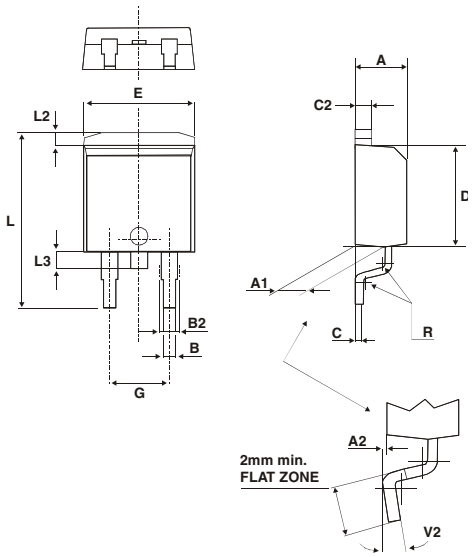
In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a lead-free second level interconnect. The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings 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.

Table 5. TO-220AB dimensions



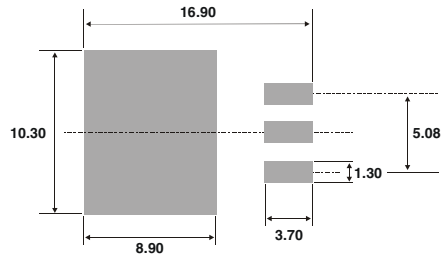
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	15.20		15.90	0.598		0.625
a1		3.75			0.147	
a2	13.00		14.00	0.511		0.551
B	10.00		10.40	0.393		0.409
b1	0.61		0.88	0.024		0.034
b2	1.23		1.32	0.048		0.051
C	4.40		4.60	0.173		0.181
c1	0.49		0.70	0.019		0.027
c2	2.40		2.72	0.094		0.107
e	2.40		2.70	0.094		0.106
F	6.20		6.60	0.244		0.259
ØI	3.75		3.85	0.147		0.151
l4	15.80	16.40	16.80	0.622	0.646	0.661
L	2.65		2.95	0.104		0.116
l2	1.14		1.70	0.044		0.066
l3	1.14		1.70	0.044		0.066
M		2.60			0.102	

Table 6. D²PAK dimensions



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.30		4.60	0.169		0.181
A1	2.49		2.69	0.098		0.106
A2	0.03		0.23	0.001		0.009
B	0.70		0.93	0.027		0.037
B2	1.25	1.40		0.048	0.055	
C	0.45		0.60	0.017		0.024
C2	1.21		1.36	0.047		0.054
D	8.95		9.35	0.352		0.368
E	10.00		10.28	0.393		0.405
G	4.88		5.28	0.192		0.208
L	15.00		15.85	0.590		0.624
L2	1.27		1.40	0.050		0.055
L3	1.40		1.75	0.055		0.069
R	0.40			0.016		
V2	0°		8°	0°		8°

Figure 12. Footprint (dimensions in mm)



4 Ordering information

Table 7. Ordering information

Order code[1]	Marking[1]	Package	Weight	Base qty	Delivery mode
TN1625-x00G	TN1625x00G	D^2PAK	1.5 g	50	Tube
TN1625-x00G-TR	TN1625x00G	D^2PAK	1.5 g	1000	Tape and reel
TYNx16RG	TYNx16	TO-220AB	2.3 g	50	Tube

1. x indicates votage, 6, 8 or 10 for 600, 800 and 1000 V respectively

5 Revision history

Table 8. Document revision history

Date	Revision	Changes
Apr-2002	4A	Last update.
13-Feb-2006	5	TO-220AB delivery mode changed from bulk to tube. ECOPACK statement added.
07-Nov-2007	6	Reformatted to current standards. *Table 2.*: $I_{T(RMS)}$ value corrected from 12 A to 16 A

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