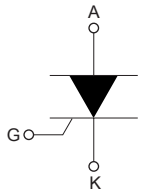
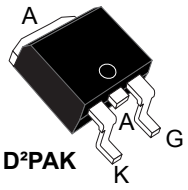
TN2540-12G

Datasheet

Standard SCR, D²PAK, 25 A, 1200 V





Features

- Max. blocking voltage = V_{DRM}, V_{RRM} = 1200 V
- I_{GT} maximum = 40 mA
- High static and dynamic commutation at T_j = 125 °C
  - dI/dt = 50 A/µs
  - dV/dt = 1500 V/µs
- ECOPACK®2 compliant (RoHS and HF compliance)

Applications

- Solar
- Wind renewable energy inverters
- Solid State Relay (SSR)
- Uninterruptible Power Supply (UPS)
- AC DC Inrush Current Limiter (ICL)
- Battery charger
- AC DC voltage controlled rectifier
- Industrial welding systems
- Off board automotive battery charger
- Soft starter
- General purpose motor control

Product status link
TN2540-12G

Product summary	
$I_{T(RMS)}$	25 A
V_{DRM}, V_{RRM}	1200 V
I_{GT}	40 mA
T_j	125 °C

Description

Available in SMD D²PAK with anode in backside.

The TN2540-12G SCR is suitable in industrial applications where high immunity is required with a lower gate current.

1 Characteristics

Table 1. Absolute maximum ratings (limiting values), T_j = 25 °C unless otherwise specified

Symbol	Parameter			Value	Unit
V_{DRM}/V_{RRM}	Repetitive peak off-state voltage (50-60 Hz)		T_j = 125 °C	1200	V
$I_{T(RMS)}$	On-state RMS current (180° conduction angle)		T_c = 102 °C	25	A
$I_{T(AV)}$	Average on-state current (180° conduction angle)			16	
I_{TSM}	Non repetitive surge peak on-state current		t_p = 8.3 ms	314	A
			t_p = 10 ms	300	
I^2t	I^2t value for fusing		t_p = 10 ms	450	A^2s
dI/dt	I_G = 2 x I_{GT}, tr ≤ 100 ns Critical rate of rise of on-state current		f = 60 Hz	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}	Storage junction temperature range			-40 to +150	°C
T_j	Operating junction temperature range			-40 to +125	°C

Table 2. 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.	4	mA
			Max.	40	
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.	80	mA
I_L	I_G = 1.2 x I_{GT}		Max.	90	mA
dV/dt	V_D = 67 % V_{DRM}, gate open	T_j = 125 °C	Min.	1500	V/µs

Table 3. Static electrical characteristics

Symbol	Test conditions			Value	Unit
V_{TM}	I_{TM} = 50 A, t_p = 380 µs	T_j = 25 °C	Max.	1.60	V
V_{TO}	Threshold voltage	T_j = 125 °C	Max.	0.85	
R_D	Dynamic resistance	T_j = 125 °C	Max.	14	mΩ
I_{DRM}, I_{RRM}	V_{OUT} = 1200 V	T_j = 25 °C	Max.	10	µA
		T_j = 125 °C		6	mA

Table 4. Thermal resistance parameter

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Thermal resistance Junction to case (DC)	Max.	1.0	°C/W

1.1 Characteristics (curves)

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

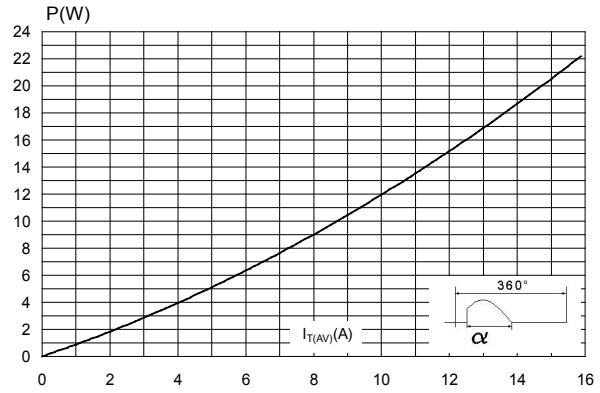


Figure 2. Average and DC on-state current versus case temperature

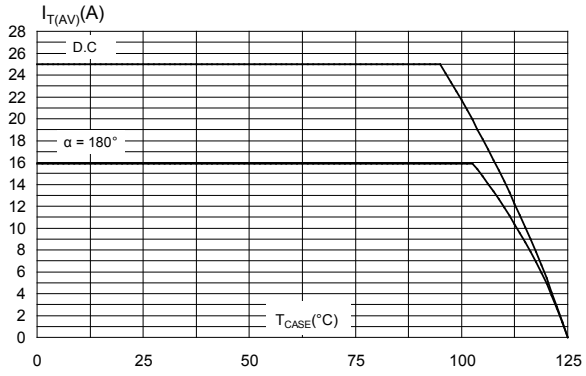


Figure 3. Average and D.C. on state current versus ambient temperature

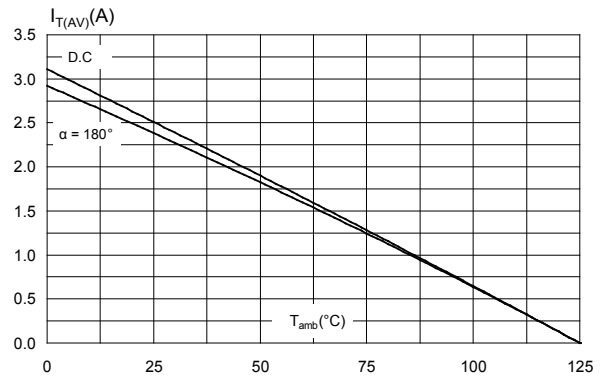


Figure 4. Relative variation of thermal impedance junction to case

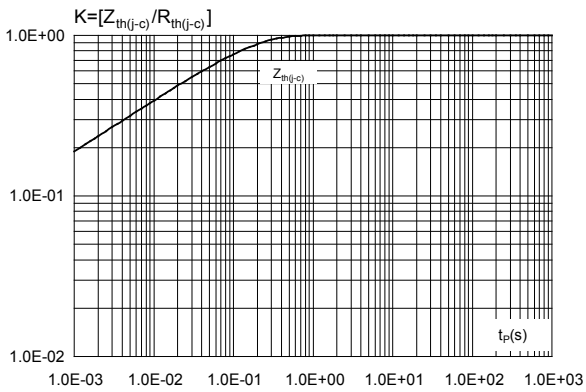


Figure 5. Relative variation of gate trigger and holding current versus junction temperature

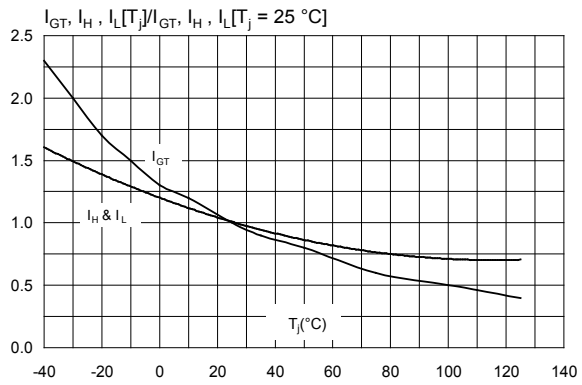


Figure 6. Surge peak on-state current versus number of cycles

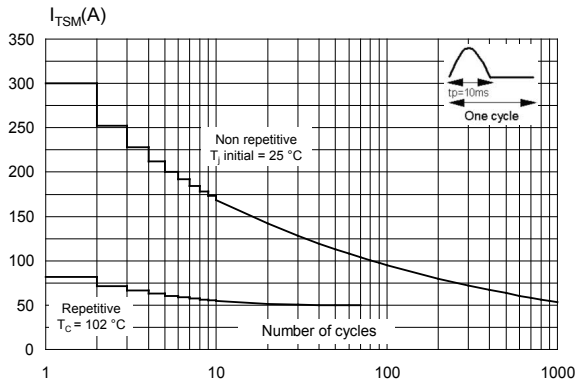


Figure 7. Non repetitive surge peak on-state current for a sinusoidal pulse with width t_p < 10 ms

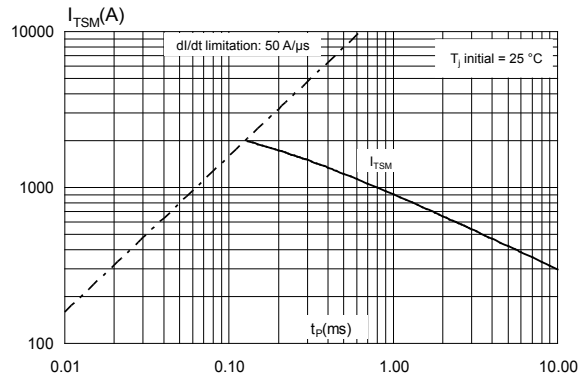
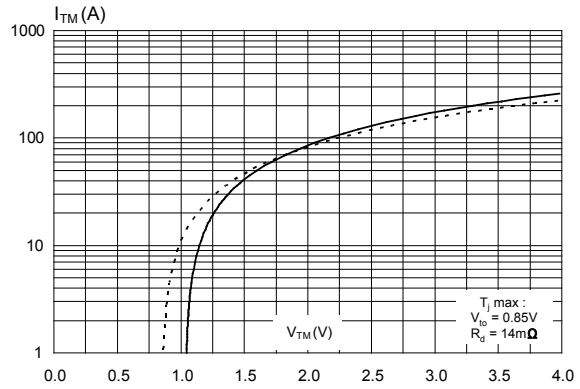


Figure 8. On-state characteristics (maximum values)



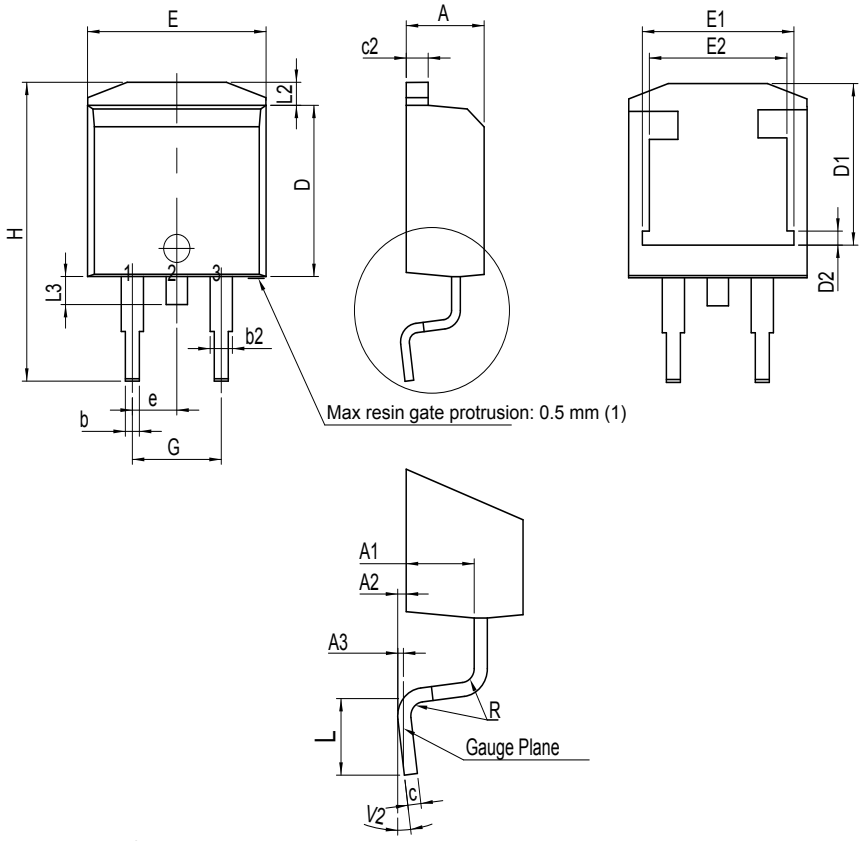
2 Package information

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: www.st.com. ECOPACK® is an ST trademark.

2.1 D²PAK package information

- ECOPACK®2 compliant
- Lead-free package leads finishing
- Molding compound resin is halogen-free and meets UL standard level V0

Figure 9. D²PAK package outline



(1) Resin gate is accepted in each of position shown on the drawing, or their symmetrical.

Table 5. D²PAK package mechanical data

Ref.	Dimensions					
	Millimeters			Inches[1]		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.30		4.60	0.1693		0.1811
A1	2.49		2.69	0.0980		0.1059
A2	0.03		0.23	0.0012		0.0091
A3		0.25			0.0098	
b	0.70		0.93	0.0276		0.0366
b2	1.25		1.7	0.0492		0.0669
c	0.45		0.60	0.0177		0.0236
c2	1.21		1.36	0.0476		0.0535
D	8.95		9.35	0.3524		0.3681
D1	7.50		8.00	0.2953		0.3150
D2	1.30		1.70	0.0512		0.0669
e	2.54			0.10000		
E	10.00		10.28	0.3937		0.4047
E1	8.30		8.70	0.3268		0.3425
E2	6.85		7.25	0.2697		0.2854
G	4.88		5.28	0.1921		0.2079
H	15		15.85	0.5906		0.6240
L	1.78		2.28	0.0701		0.0898
L2	1.27		1.40	0.0500		0.0551
L3	1.40		1.75	0.0551		0.0689
R		0.40			0.0157	
V2[2]	0°		8°	0°		8°

1. *Dimensions in inches are given for reference only*
2. *Degrees*

Figure 10. D²PAK recommended footprint (dimensions are in mm)

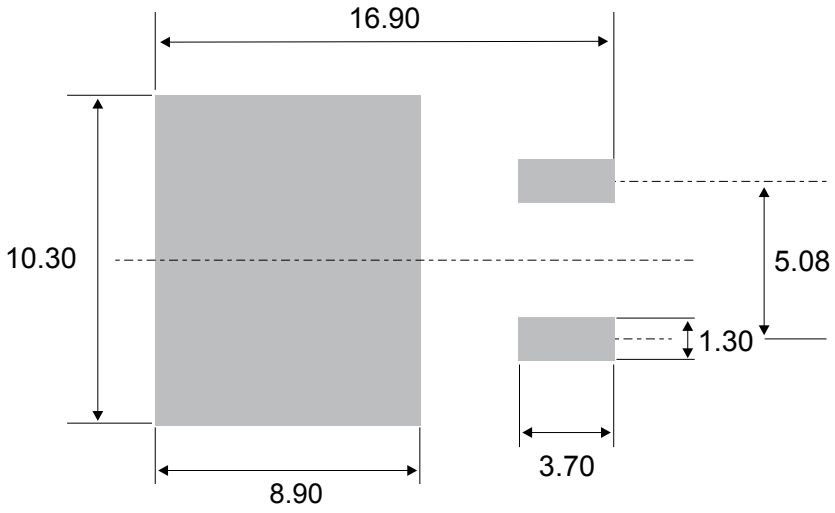
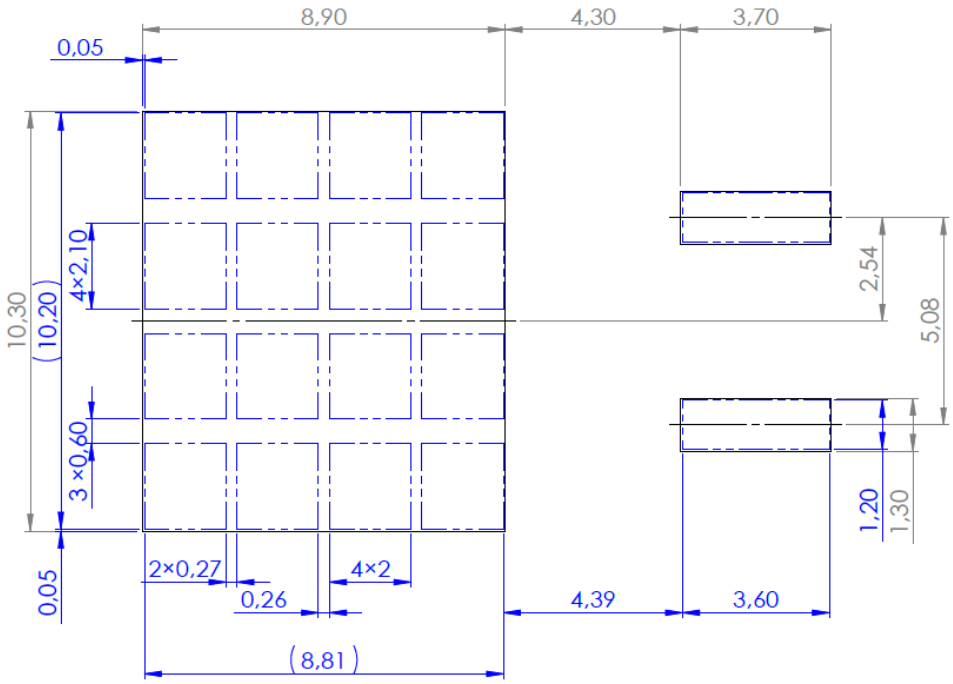


Figure 11. D²PAK stencil definitions(dimensions are in mm)



3 Ordering information

Figure 12. **Ordering information scheme**

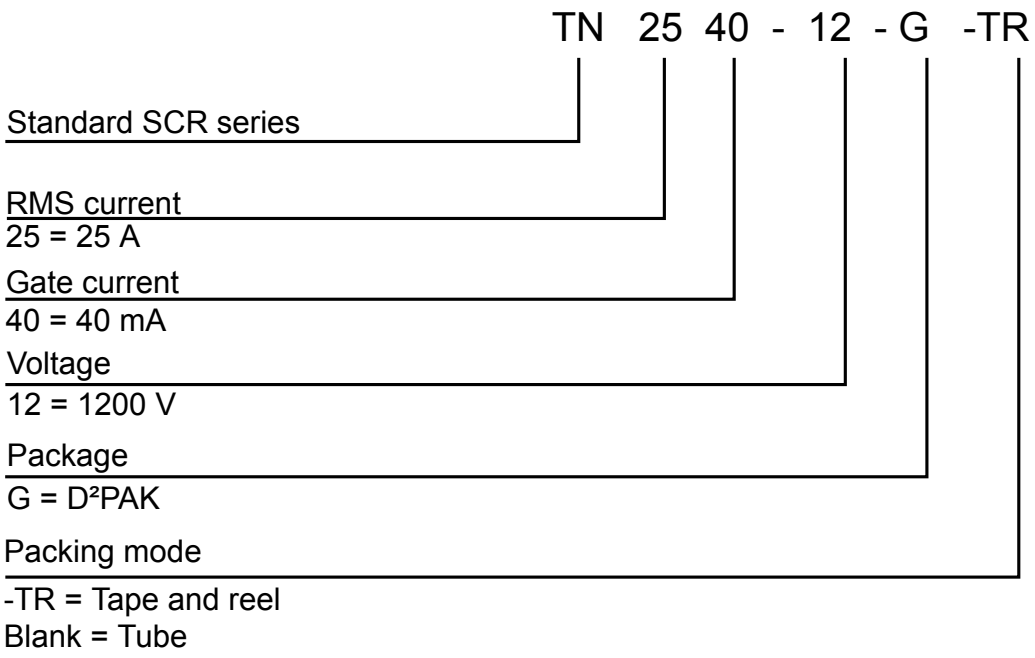


Table 6. **Ordering information**

Order code	Marking	Package	Weight	Base qty.	Delivery mode
TN2540-12G-TR	TN2540-12G	D²PAK	1.6 g	1000	Tape and Reel
TN2540-12G				50	Tube

Revision history

Table 7. **Document revision history**

Date	Version	Changes
18-Oct-2018	1	Initial release.