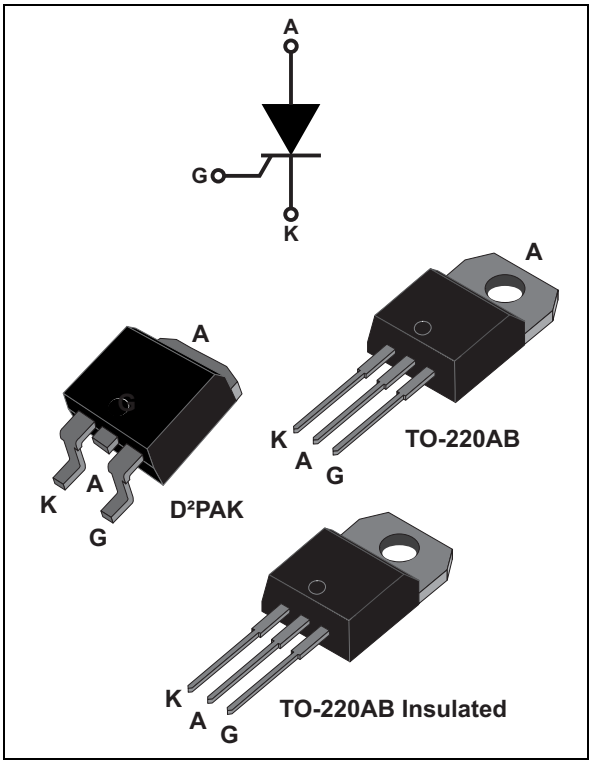
TN2540, TXN625, TYN625, TYN825, TYN1225

Standard 25 A SCRs

Datasheet - production data



Features

- On-state rms current, $I_{T(RMS)}$ 25 A
- Repetitive peak off-state voltage, V_{DRM}/V_{RRM} 600 to 1200 V
- Triggering gate current, I_{GT} 40 mA
- Insulated package TO-220AB ins
  - Insulating voltage 2500 V rms
  - UL1557 certified (file ref. E81734)

Description

These standard 25 A SCRs are suitable for general purpose applications.

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

TXN625RG is packaged in TO-220AB ins.

Table 1. Device summary

Order code	Voltage V_{DRM}/V_{RRM}			Sensitivity I_{GT}	Package
	600 V	800 V	1200 V		
TN2540-600G-TR	Y			40 mA	D^2PAK
TN2540-800G-TR		Y		40 mA	D^2PAK
TXN625RG	Y			40 mA	TO-220AB ins
TYN625RG	Y			40 mA	TO-220AB
TYN825RG		Y		40 mA	TO-220AB
TYN1225RG			Y	40 mA	TO-220AB

1 Characteristics

Table 2. Absolute ratings (limiting values)

Symbol	Parameter			Value	Unit
$I_{T(RMS)}$	On-state rms current (180 °Conduction angle)	TO-220AB, D^2PAK	T_c = 100 °C	25	A
		TO-220AB ins	T_c = 83 °C		
$I_{T(AV)}$	Average on-state current (180 °Conduction angle)		T_c = 100 °C	16	A
I_{TSM}	Non repetitive surge peak on-state current	t_p = 8.3 ms	T_j = 25 °C	314	A
		t_p = 10 ms		300	
I^2t	I^2t Value for fusing	t_p = 10 ms	T_j = 25 °C	450	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.	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.	50	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
V_{TM}	I_{TM} = 50 A tp = 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.	14	mΩ
I_{DRM} I_{RRM}	V_{DRM} = V_{RRM}	T_j = 25 °C	MAX.	5	µA
		T_j = 125 °C		4	mA

Table 4. Thermal resistances

Symbol	Parameter			Value	Unit
$R_{th(j-c)}$	Junction to case (DC)		D^2PAK, TO-220AB	1.0	°C/W
			TO-220AB ins	2.0	
$R_{th(j-a)}$	Junction to ambient (DC)	$S^{(1)}$ = 1 cm^2	D^2PAK	45	°C/W
			TO-220AB, TO-220AB ins	60	

1. S = Copper surface under tab.

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

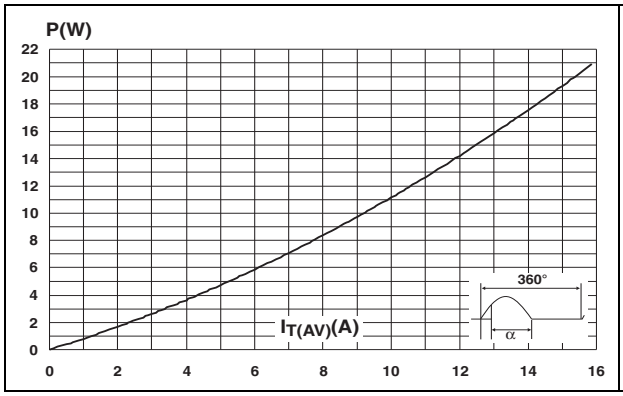


Figure 2. Average and DC on-state current versus case temperature

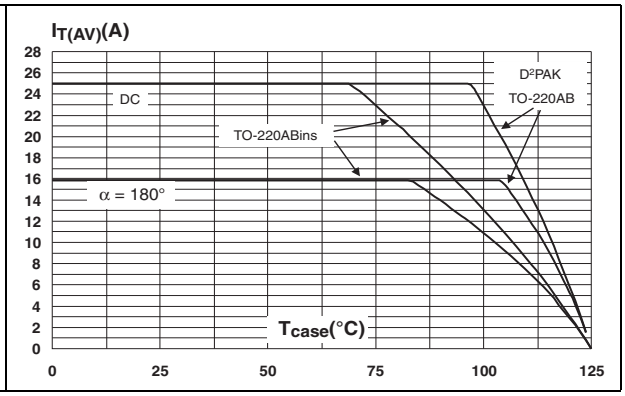


Figure 3. Average and DC on-state current versus ambient temperature

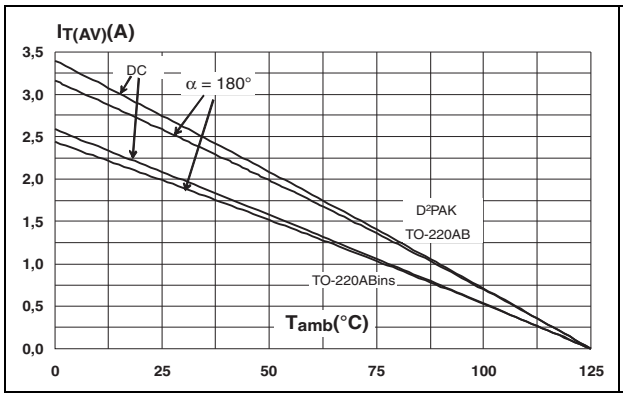


Figure 4. Relative variation of thermal impedance versus pulse duration (D^2PAK, and TO-220AB)

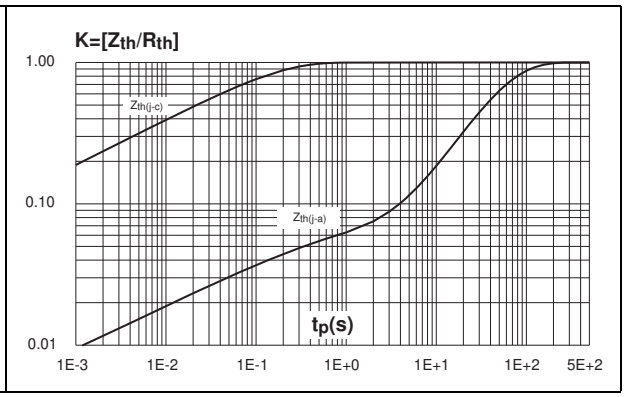


Figure 5. Relative variation of thermal impedance versus pulse duration (TO-220AB ins)

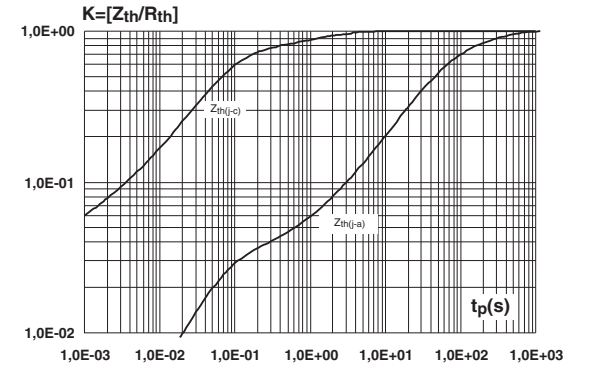


Figure 6. Relative variation of gate trigger, holding, and latching currents versus junction temperature

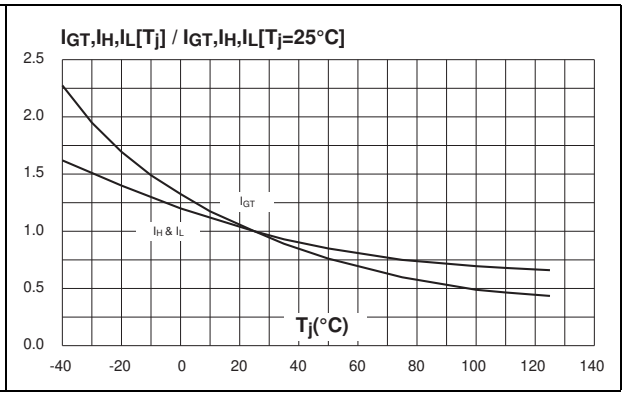


Figure 7. Surge peak on-state current versus number of cycles

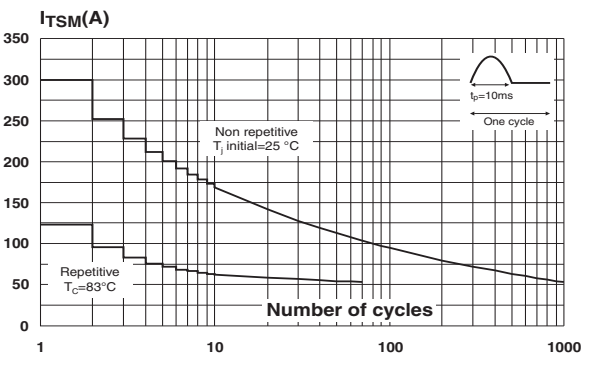


Figure 8. Non-repetitive surge peak on-state current, and corresponding values of I^2t

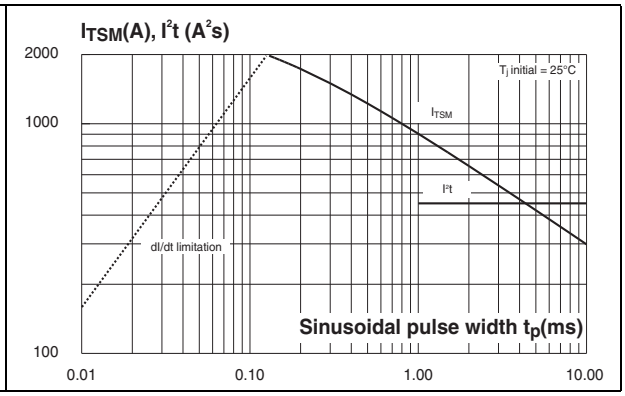


Figure 9. On-state characteristics (maximum values)

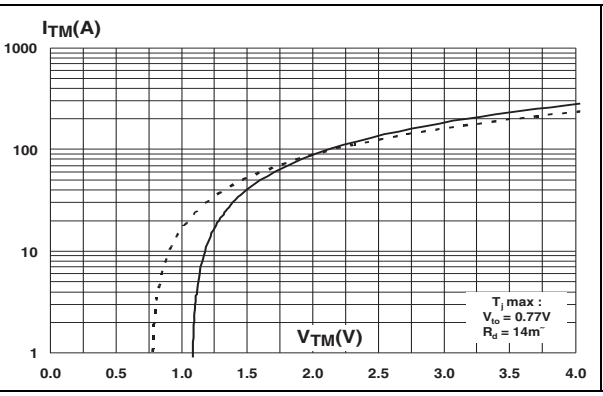
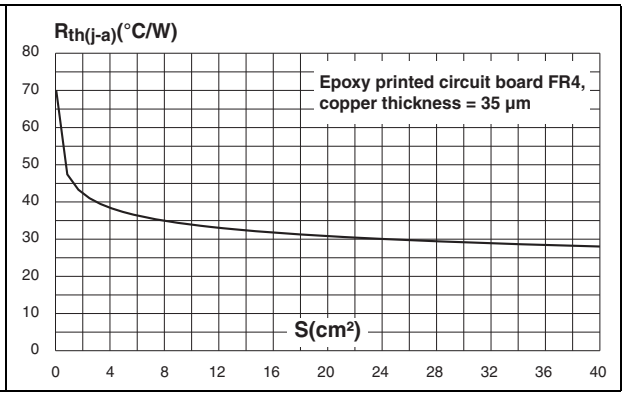


Figure 10. Thermal resistance junction to ambient versus copper surface under tab (D^2PAK)



2 Ordering information schemes

Figure 11. TN2540-x00G ordering information scheme

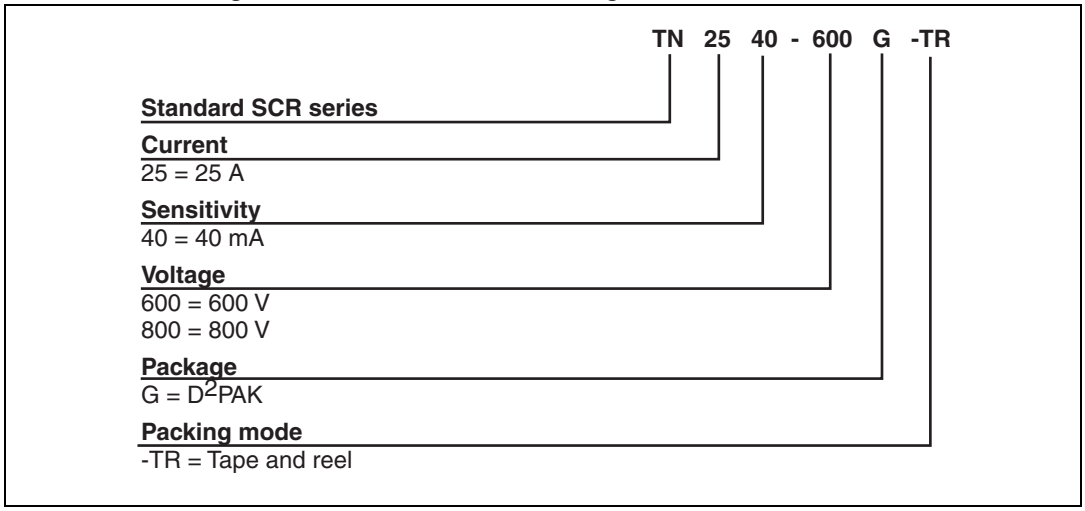


Figure 12. TXN625RG ordering information scheme

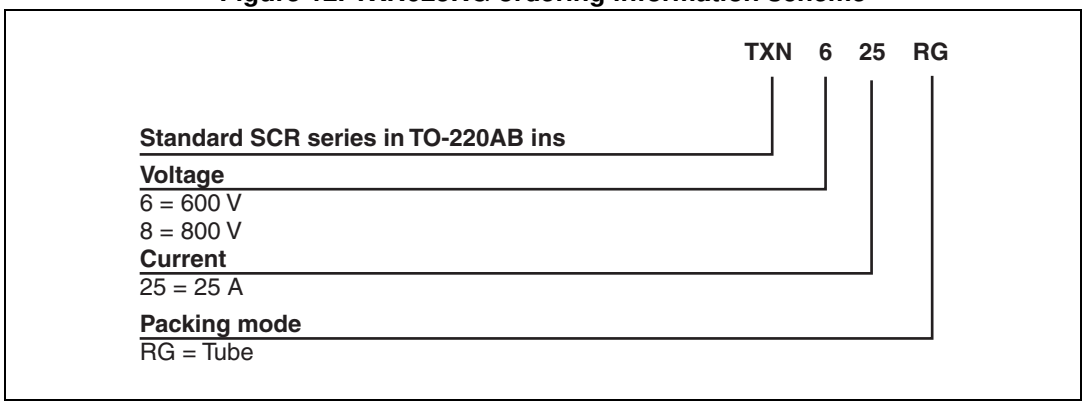
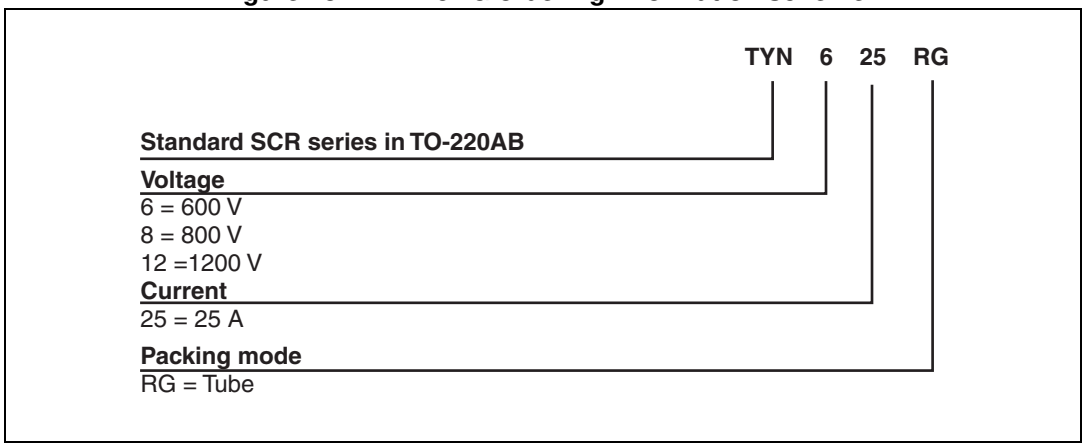


Figure 13. TYNx25RG ordering information scheme



3 Package information

- Epoxy meets UL94, V0
- Lead-free package
- Recommended torque values (TO-220AB, and TO220AB ins): 0.4 to 0.6 N·m

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.

Figure 14. TO-220AB (NIns. & Ins. 20-up) dimension definitions

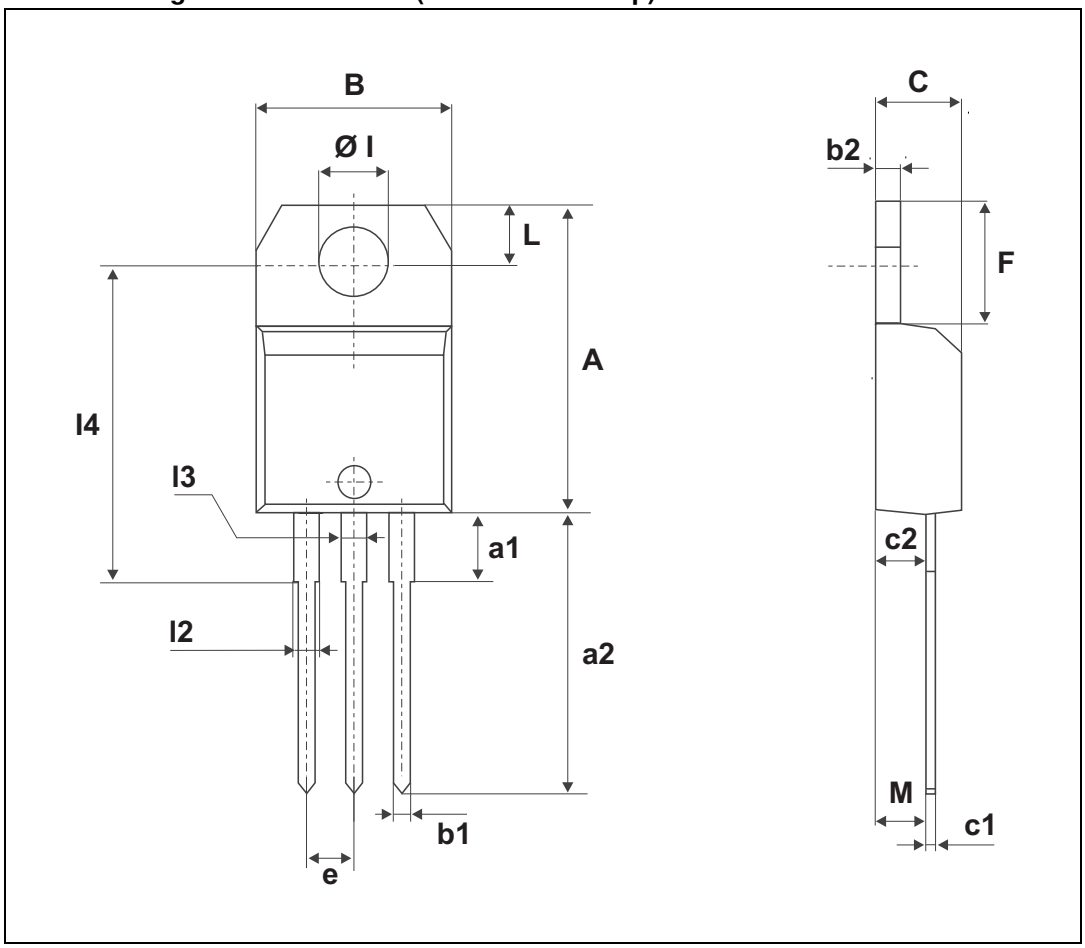


Table 5. TO-220AB (NIns. & Ins. 20-up) dimension values

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		2.70	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
I4	15.80	16.40	16.80	0.622	0.646	0.661
L	2.65		2.95	0.104		0.116
I2	1.14		1.70	0.044		0.066
I3	1.14		1.70	0.044		0.066
M		2.60			0.102	

Figure 15. D²PAK dimensions definitions

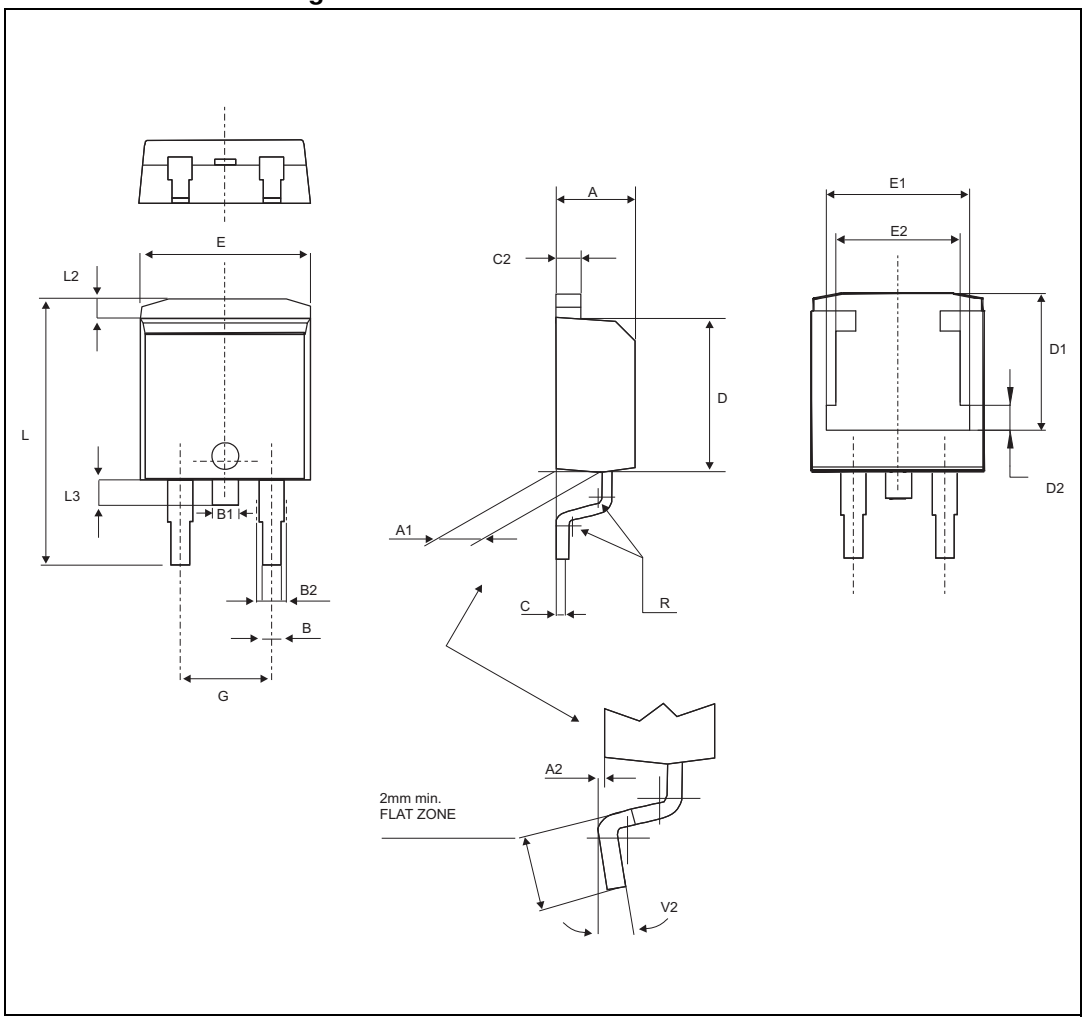
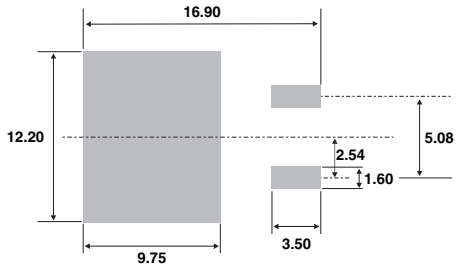


Table 6. D²PAK dimensions values

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
B1	1.20		1.38	0.047		0.054
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
D1	7.5		8.0	0.295		0.314
D2	1.3		1.7	0.051		0.067
E	10.00		10.28	0.393		0.405
E1	8.3		8.7	0.326		0.342
E2	6.85		7.25	0.269		0.285
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
R	0.40			0.016		
V2	0°		8°	0°		8°

Figure 16. D²PAK footprint (dimensions in mm)



4 Ordering information

Table 7. Ordering information

Order code	Voltage	Sensitivity	Marking	Package	Weight	Base qty	Delivery mode
TN2540-600G-TR	600 V	40 mA	TN2540600G	D^2PAK	1.5 g	1000	Tape & reel
TN2540-800G-TR	800 V	40 mA	TN2540800G	D^2PAK	1.5 g	1000	Tape & reel
TXN625RG	600 V	40 mA	TXN625	TO-220AB ins	2.3 g	50	Tube
TYN625RG	600 V	40 mA	TYN625	TO-220AB	2.3 g	50	Tube
TYN825RG	800 V	40 mA	TYN825	TO-220AB	2.3 g	50	Tube
TYN1225RG	1200 V	40 mA	TYN1225	TO-220AB	2.3 g	50	Tube

5 Revision history

Table 8. Document revision history

Date	Revision	Changes
Apr-2002	4A	Previous update
13-Feb-2006	5	TO-220AB delivery mode changed from bulk to tube. ECOPACK statement added.
17-Jun-2011	6	Added TXN625.
13-Sep-2011	7	Added UL certification in *Features*.
07-Feb-2012	8	Added TYN1225.
20-Aug-2014	9	Updated *Section 3: Package information*.