TN1205T-600

12 A SCR

Features

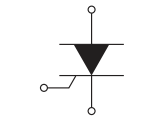
- High current density per square mm

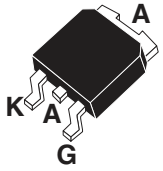
Applications

- Overvoltage crowbar protection
- Motor control circuits in power tools and kitchen aids
- Inrush current limiting circuits

Description

This device is mounted in DPAK and intended for use in applications such as voltage regulators circuits for motorbikes, overvoltage crowbar protection, motor control circuits in power tools and capacitive discharge ignition.





DPAK
TN1205T-600B

Table 1. Device summary

$I_{T(rms)}$	12 A
V_{DRM}/V_{RRM}	600 V
I_{GT}	2 to 5 mA

1 Characteristics

Table 2. Absolute ratings(1)

Symbol	Parameter			Value	Unit
$I_{T(RMS)}$	On-state rms current (180 °C conduction angle)		T_c = 103 °C	12	A
$I_{T(AV)}$	Average on-state current(180 °C conduction angle)		T_c = 103 °C	8	A
I_{TSM}	Non repetitive surge peak on-state current		t_p = 8.3 ms t_p = 10 ms	120 115	A
I^2T	I^2T value for fusing		t_p = 10 ms	66	A^2s
di/dt	Critical rate of rise of on-state current I_G = 2 x I_{GT}, tr ≤ 100 ns	F = 60 Hz	T_j = 125 °C	50	A/µs
I_{GM}	Peak gate current	t_p = 20 µs	T_c = 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	

1. T_j = 25 °C, unless otherwise specified

Table 3. Electrical characteristics(1)

Symbol	Test conditions		Min.	Typ.	Max.	Unit
I_{GT}	V_D = 12 V, R_L = 33 Ω		2		5	mA
V_{GT}	V_D = 12 V, R_L = 33 Ω				1.3	V
V_{GD}	V_D = V_{DRM}, R_L = 3.3 kΩ	T_j = 125 °C	0.2			V
I_H	I_T = 500 mA gate open				15	mA
I_L	I_G = 1.2 I_{GT}				30	mA
dV/dt	V_D = 67% V_{DRM} gate open	T_j = 125 °C	100			V/µs
t_{GT}	Gate controlled turn on time I_{TM} = 40 A, V_D = $V_{DRM(MAX)}$, I_{GT} = 100 mA dI_G/dt = 5 A/µs, R_G = 68 Ω			1.2		µs
t_q	Circuit commutated turn off time V_D = 67% $V_{DRM(MAX)}$, T_j = 125 °C, I_{TM} = 20 A, V_R = 25 V dI_T/dt = 30 A/µS, dV_D/dt = 50 V/µs, R_{GK} = 100 Ω			55		µs
V_{TM}	I_{TM} = 24 A, T_p = 380 µs				1.6	V
V_{T0}	Threshold voltage	T_j = 125 °C			0.85	V
R_d	Dynamyc restistance	T_j = 125 °C			30	mΩ
I_{DRM} I_{RRM}	V_{DRM} = V_{RRM}	T_j = 25 °C			5	µA
		T_j = 125 °C			2	mA

1. T_j = 25 °C, unless otherwise specified

Table 4. Thermal resistance

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case (DC)		1.8	°C/W
$R_{th(j-a)}$	Junction to ambient (DC)	$S^{(1)}$ = 0.5 cm^2	70	°C/W

1. S = Copper surface under tab.

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

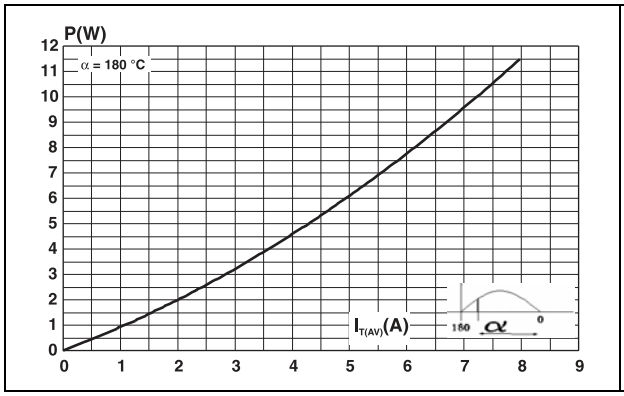


Figure 2. Average and DC on-state current versus case temperature

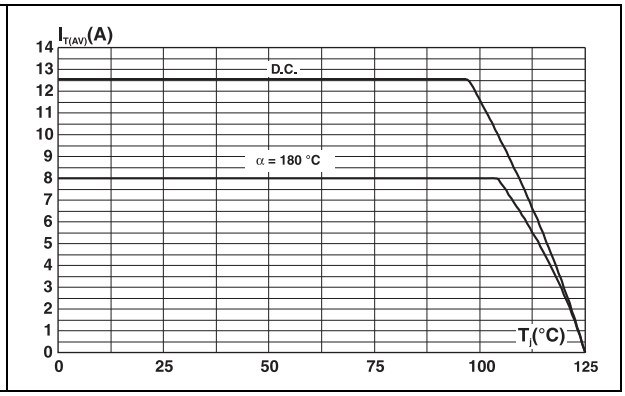


Figure 3. Average DC on-state current versus ambient temperature

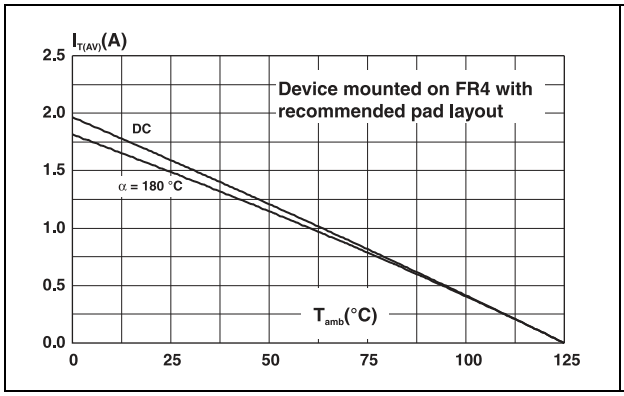


Figure 4. Relative variation of thermal impedance junction to case versus pulse duration

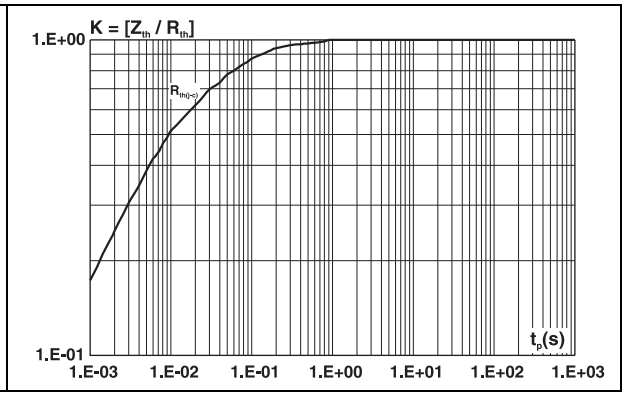


Figure 5. Relative variation of thermal impedance junction to ambient versus pulse duration

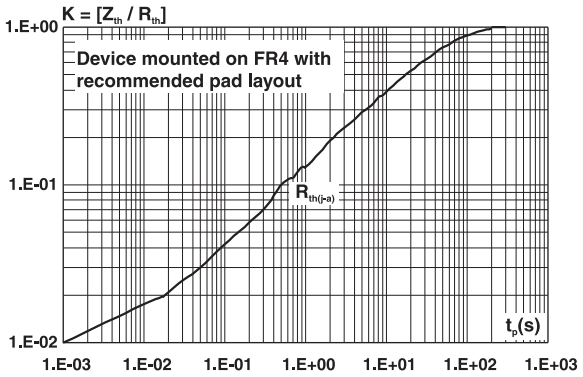


Figure 6. Relative variation of gate trigger current and voltage, holding and latching current versus T_j

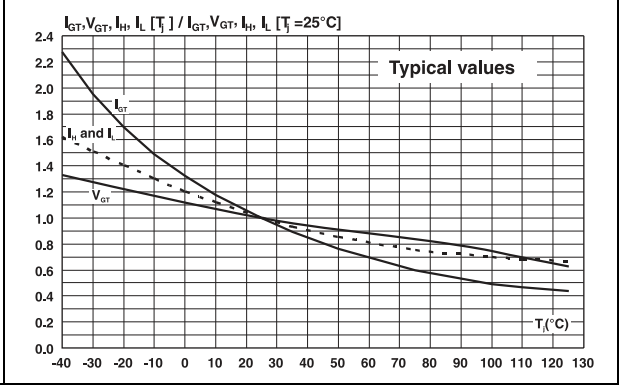


Figure 7. Surge peak on-state current versus number of cycles

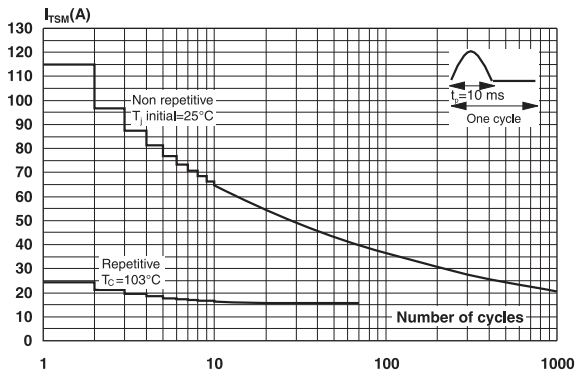


Figure 8. Non-repetitive surge peak on-state current for a sinusoidal pulse, and corresponding values of I^2t

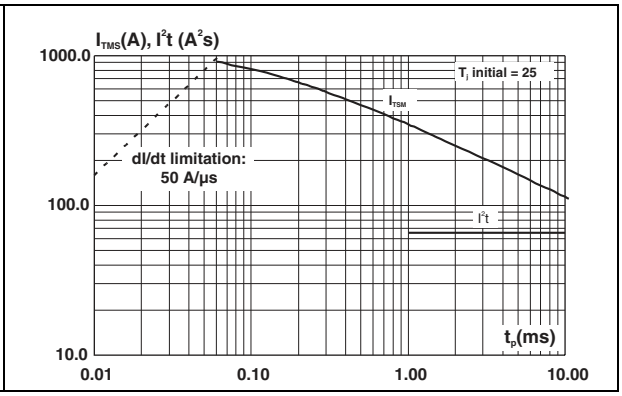


Figure 9. On-state characteristics (maximum values)

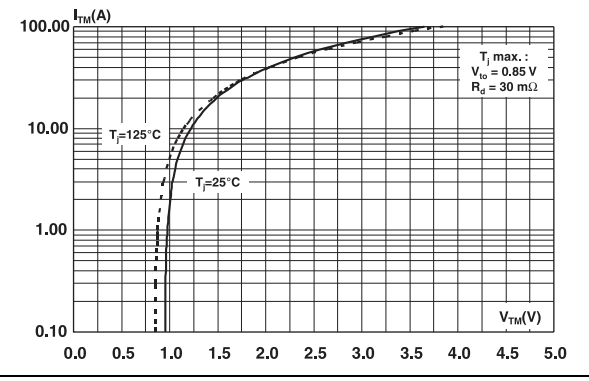
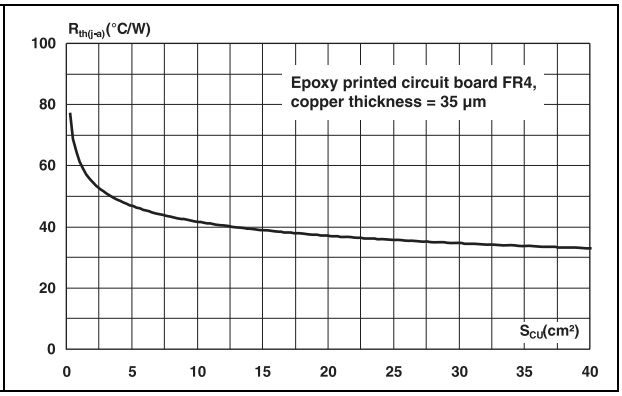
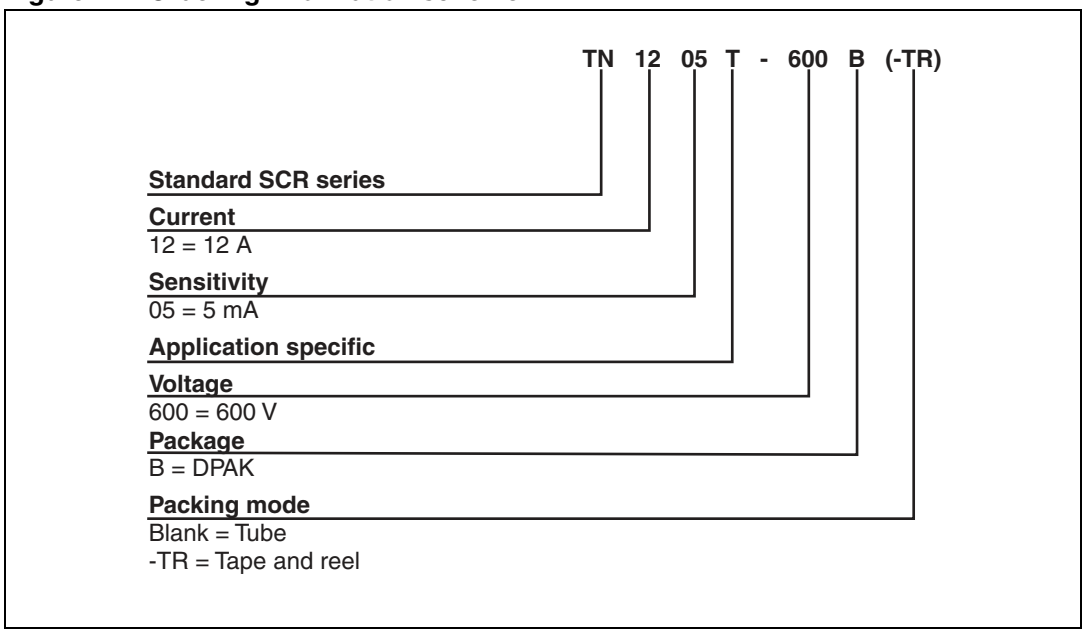


Figure 10. Thermal resistance junction to ambient versus copper surface under tab



2 Ordering information scheme

Figure 11. Ordering information scheme

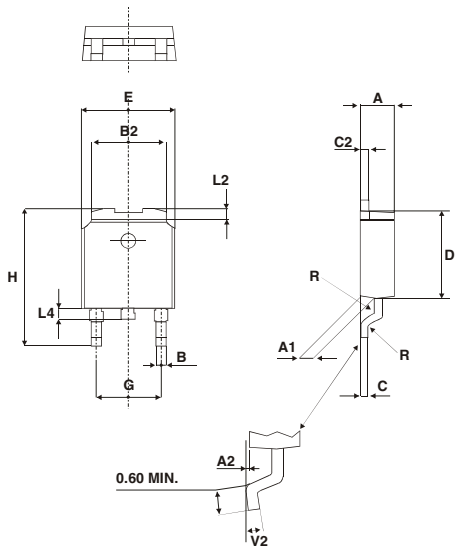


3 Package information

- Epoxy meets UL94, V0
- Lead-free package

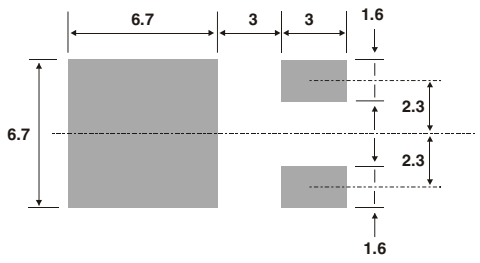
In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: www.st.com. ECOPACK® is an ST trademark.

Table 5. 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 12. Footprint (dimensions in mm)



4 Ordering information

Table 6. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
TN1205T-600B	TN12 05T6	DPAK	0.3g	75	Tube
TN1205T-600B-TR	TN12 05T6			2500	Tape and reel

5 Revision history

Table 7. Document revision history

Date	Revision	Changes
01-Oct-2009	1	Initial release.