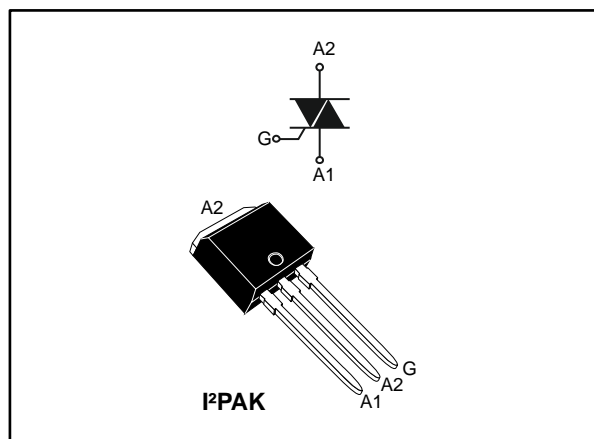


12 A Snubberless™ Triac

Datasheet - production data


Description

Housed in an I²PAK package this device is dedicated to low profile compact applications.

Its fully rated 150 °C junction temperature allows high AC commutation capability for on/off or phase control applications without snubber aid circuit.

Table 1: Device summary

Symbol	Value	Unit
V_{DRM}/V_{RRM}	800	V
I_{GT}	35	mA
T_j	150	°C

Features

- 12 A medium current Triac
- Three triggering quadrants device
- Very high noise immunity and dynamic commutation
- ECOPACK®2 compliant component

Applications

- General purpose AC line load control
- Motor control circuits
- Home, kitchen and tools appliances
- Lighting
- Inrush current limiting circuits

1 Characteristics

Table 2: Absolute ratings (limiting values), $T_j = 25\text{ °C}$, unless otherwise specified

Symbol	Parameter		Value	Unit	
$I_{T(RMS)}$	RMS on-state current (full sine wave)	$T_C = 128\text{ °C}$	12	A	
I_{TSM}	Non repetitive surge peak on-state current (full cycle, T_j initial = 25 °C)	$t_p = 20\text{ ms}$	90	A	
		$t_p = 16.7\text{ ms}$	95		
I^2t	I^2t value for fusing	$t_p = 10\text{ ms}$	66	A^2s	
di/dt	Critical rate of rise of on-state current $I_G = 2 \times I_{GT}$, $tr \leq 100\text{ ns}$	$f = 100\text{ Hz}$	100	$A/\mu s$	
V_{DRM} / V_{RRM}	Repetitive peak off-state voltage	$T_j = 125\text{ °C}$	800	V	
		$T_j = 150\text{ °C}$	600		
V_{DSM} / V_{RSM}	Non repetitive surge peak off-state voltage	$t_p = 10\text{ ms}$	900		
I_{GM}	Peak forward gate current	$t_p = 20\text{ }\mu s$	$T_j = 150\text{ °C}$	4	A
$P_{G(AV)}$	Average gate power dissipation	$T_j = 150\text{ °C}$	1	W	
T_{stg}	Storage junction temperature range		-40 to +150	$^{\circ}C$	
T_j	Operating junction temperature range		-40 to +150	$^{\circ}C$	

Table 3: Electrical characteristics ($T_j = 25\text{ °C}$ unless otherwise specified)

Symbol	Test conditions	Quadrant		Value	Unit
$I_{GT}^{(1)}$	$V_D = 12\text{ V}$, $R_L = 33\text{ }\Omega$	I - II - III	Max.	35	mA
V_{GT}			Max.	1	V
V_{GD}	$V_D = V_{DRM}$, $R_L = 3.3\text{ k}\Omega$, $T_j = 150\text{ °C}$	I - II - III	Min.	0.15	V
$I_H^{(1)}$	$I_T = 500\text{ mA}$, gate open		Max.	35	mA
I_L	$I_G = 1.2 \times I_{GT}$	I - III	Max.	50	mA
		II		80	
$dV/dt^{(2)}$	$V_D = 536\text{ V}$, gate open	$T_j = 125\text{ °C}$	Min.	2000	$V/\mu s$
	$V_D = 402\text{ V}$, gate open	$T_j = 150\text{ °C}$		1000	
$(di/dt)_c^{(2)}$	Without snubber	$T_j = 125\text{ °C}$	Min.	19.5	A/ms
		$T_j = 150\text{ °C}$		13	

Notes:

⁽¹⁾minimum I_{GT} is guaranteed at 5% of I_{GT} max.

⁽²⁾for both polarities of A2 referenced to A1.

Table 4: Static electrical characteristics

Symbol	Test conditions			Value	Unit
$V_{TM}^{(1)}$	$I_{TM} = 17 \text{ A}$, $t_p = 380 \text{ } \mu\text{s}$	$T_j = 25 \text{ } ^\circ\text{C}$	Max.	1.55	V
$V_{TO}^{(1)}$	Threshold voltage	$T_j = 150 \text{ } ^\circ\text{C}$	Max.	0.85	V
$R_D^{(1)}$	Dynamic resistance	$T_j = 150 \text{ } ^\circ\text{C}$	Max.	40	m Ω
I_{DRM} / I_{RRM}	$V_D = V_{DRM} = V_R = V_{RRM} = 600 \text{ V}$	$T_j = 25 \text{ } ^\circ\text{C}$	Max.	5	μA
		$T_j = 150 \text{ } ^\circ\text{C}$	Max.	3.6	mA
	$V_D = V_{DRM} = V_R = V_{RRM} = 800 \text{ V}$	$T_j = 125 \text{ } ^\circ\text{C}$	Max.	1.2	mA

Notes:

⁽¹⁾for both polarities of A2 referenced to A1

Table 5: Thermal parameters

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case (AC)	Max.	1.5	$^\circ\text{C/W}$
$R_{th(j-a)}$	Junction to ambient	Typ.	65	

1.1 Characteristics (curves)

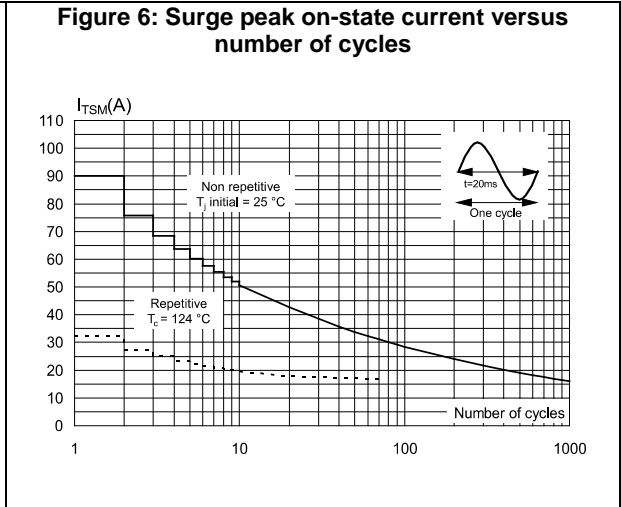
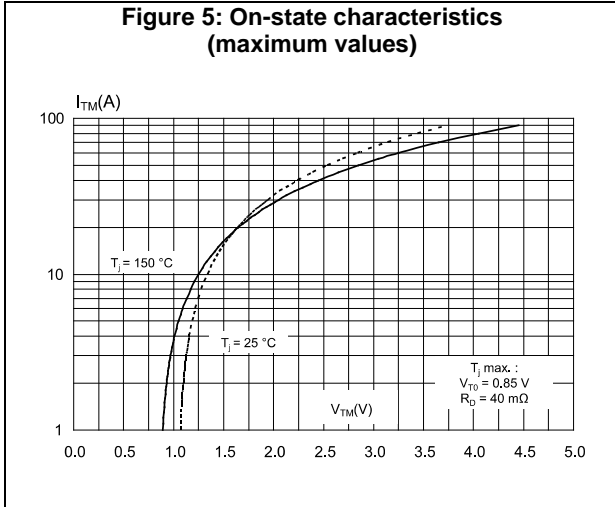
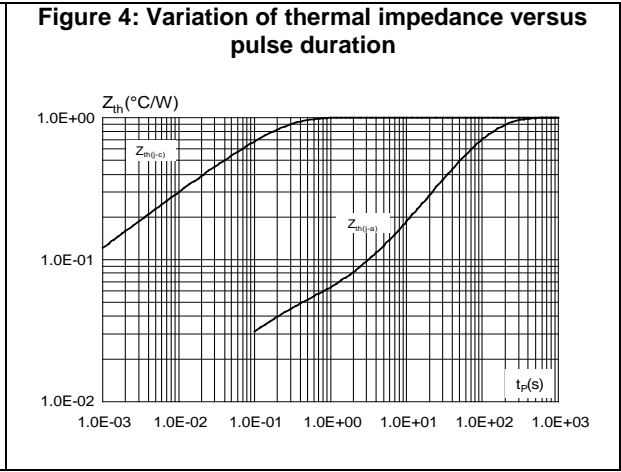
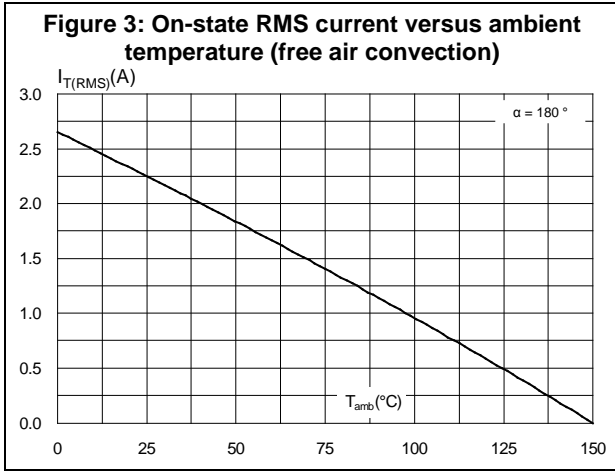
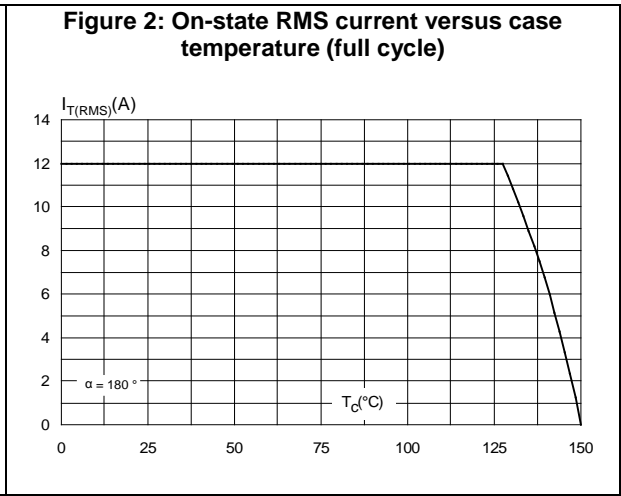
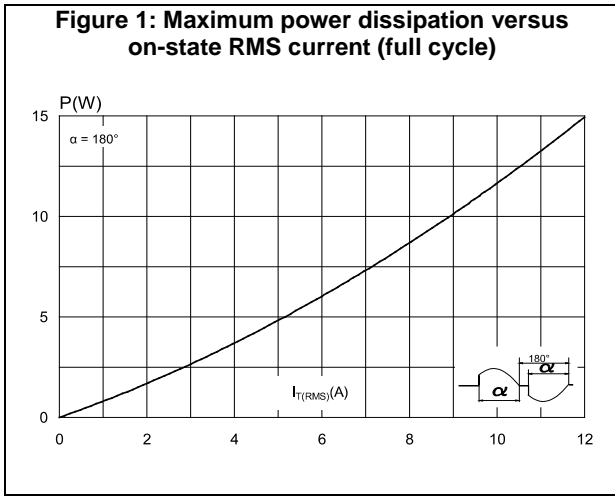


Figure 7: Non repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 10$ ms

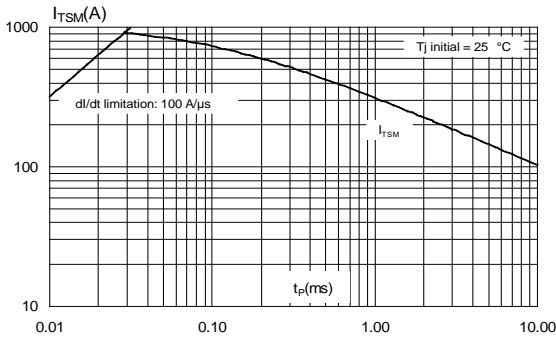


Figure 8: Relative variation of gate current, holding current and latching current versus junction temperature (typical values)

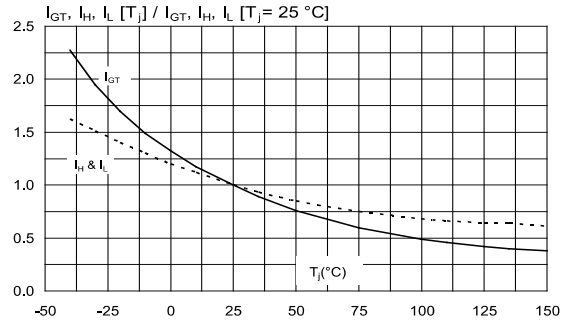


Figure 9: Relative variation of critical rate of decrease of main current versus reapplied dV/dt (typical values)

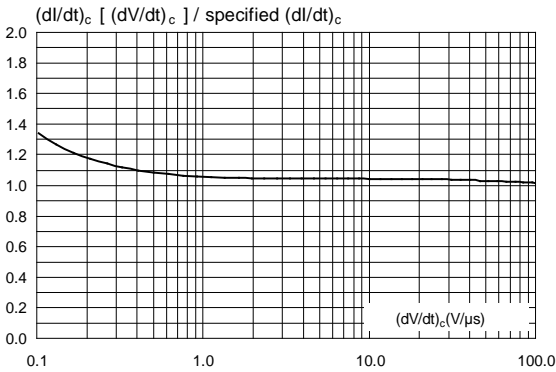


Figure 10: Relative variation of critical rate of decrease of main current versus junction temperature

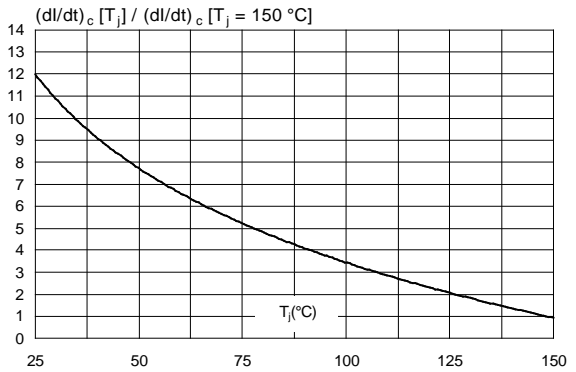


Figure 11: Relative variation of static dV/dt immunity versus junction temperature

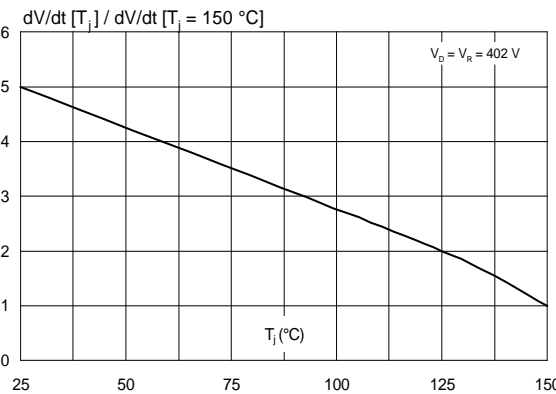
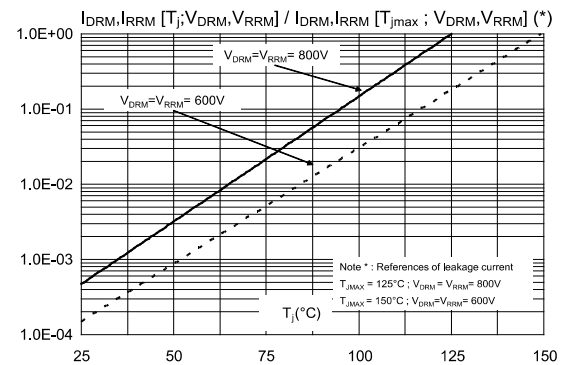


Figure 12: Relative variation of leakage current versus junction temperature for different blocking voltages (typical values)



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.

- ECOPACK®2 compliant
- Lead-free package leads finishing
- Molding compound resin is halogen-free and meets UL94 standard level V0

2.1 I²PAK package information

Figure 13: I²PAK package outline

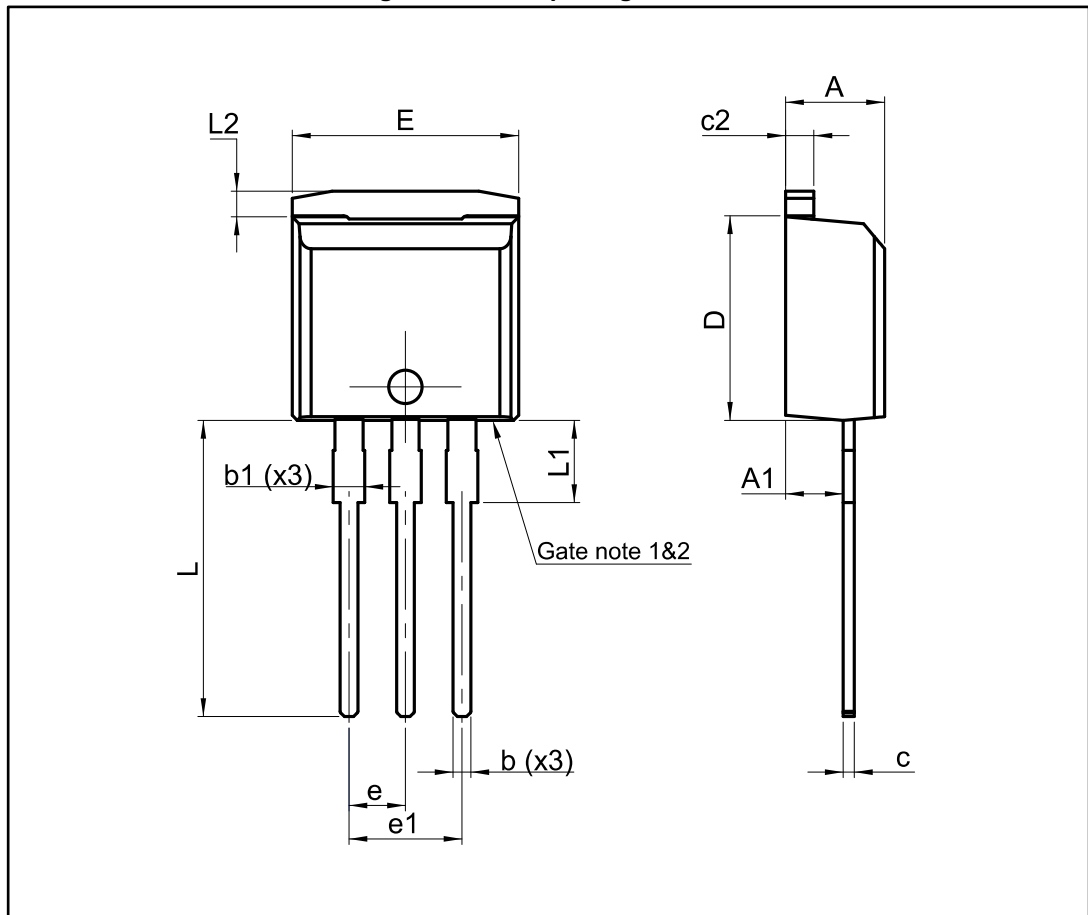


Table 6: PPAK package mechanical data

Ref.	Dimensions			
	Millimeters		Inches ⁽¹⁾	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.1732	0.1811
A1	2.40	2.72	0.0945	0.1071
b	0.61	0.88	0.0240	0.0346
b1	1.14	1.70	0.0449	0.0669
c	0.49	0.70	0.0193	0.0276
c2	1.23	1.32	0.0484	0.0520
D	8.95	9.35	0.3524	0.3681
e	2.40	2.70	0.0945	0.1063
e1	4.95	5.15	0.1949	0.2028
E	10.00	10.40	0.3937	0.4094
L	13.00	14.00	0.5118	0.5512
L1	3.50	3.93	0.1378	0.1547
L2	1.27	1.40	0.0500	0.0551

Notes:⁽¹⁾Inches dimensions given for reference only

3 Ordering information

Figure 14: Ordering information scheme

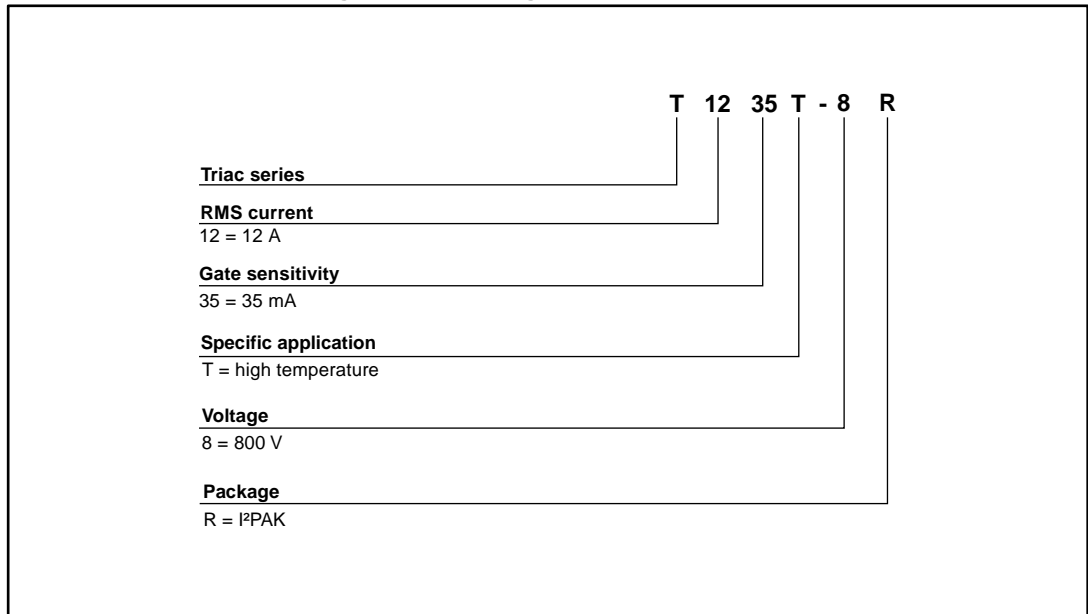


Table 7: Ordering information

Order code	Marking	Package	Weight	Base qty.	Delivery mode
T1235T-8R	T1235T-8R	I ² PAK	1.7 g	50	Tube

4 Revision history

Table 8: Document revision history

Date	Revision	Changes
14-Nov-2017	1	Initial release.

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