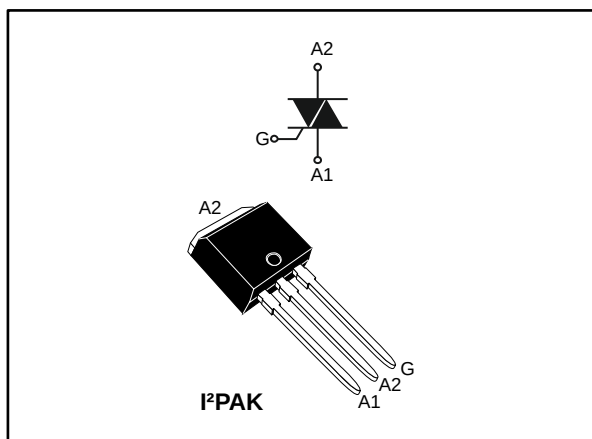


12 A Snubberless™ Triac

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 °C	12	A
I _{TSM}	Non repetitive surge peak on-state current (full cycle, T _j initial = 25 °C)		t _p = 20 ms	90	A
			t _p = 16.7 ms	95	
I ² t	I ² t value for fusing		t _p = 10 ms	66	A ² s
di/dt	Critical rate of rise of on-state current I _G = 2 x I _{GT} , tr ≤ 100 ns		f = 100 Hz	100	A/μs
V _{DRM} / V _{RRM}	Repetitive peak off-state voltage		T _j = 125 °C	800	V
			T _j = 150 °C	600	
V _{DSM} / V _{RSM}	Non repetitive surge peak off-state voltage		t _p = 10 ms	900	
I _{GM}	Peak forward gate current	t _p = 20 μs	T _j = 150 °C	4	A
P _{G(AV)}	Average gate power dissipation		T _j = 150 °C	1	W
T _{stg}	Storage junction temperature range			-40 to +150	°C
T _j	Operating junction temperature range			-40 to +150	°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/ μ 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 1: Maximum power dissipation versus on-state RMS current (full cycle)

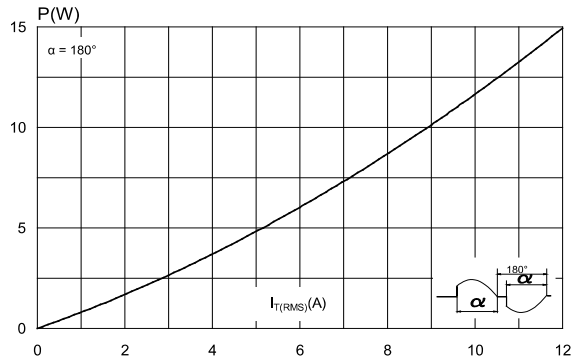


Figure 2: On-state RMS current versus case temperature (full cycle)

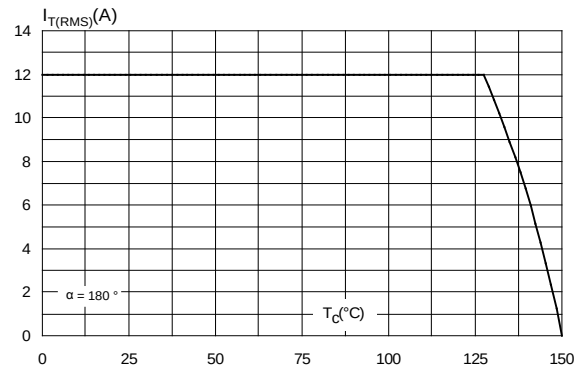


Figure 3: On-state RMS current versus ambient temperature (free air convection)

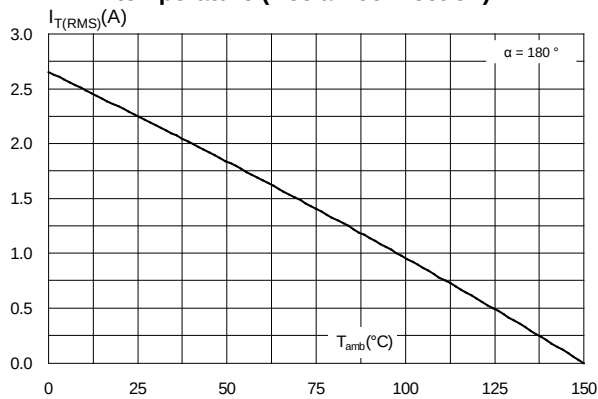


Figure 4: Variation of thermal impedance versus pulse duration

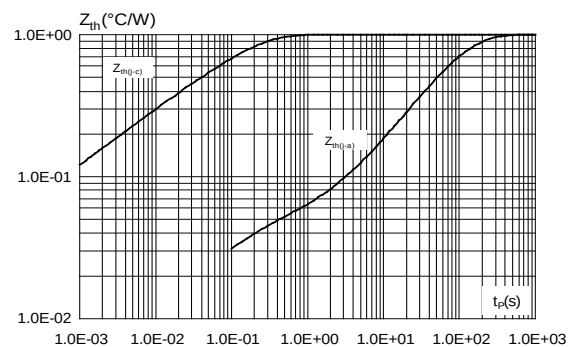


Figure 5: On-state characteristics (maximum values)

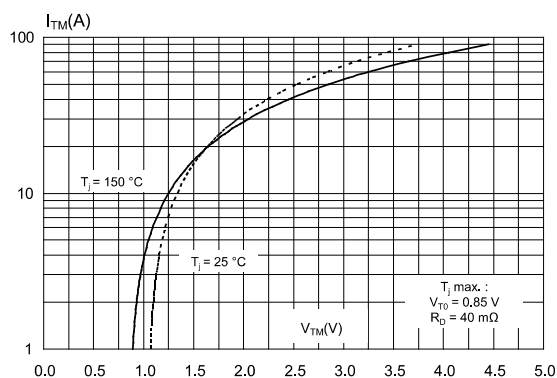


Figure 6: Surge peak on-state current versus number of cycles

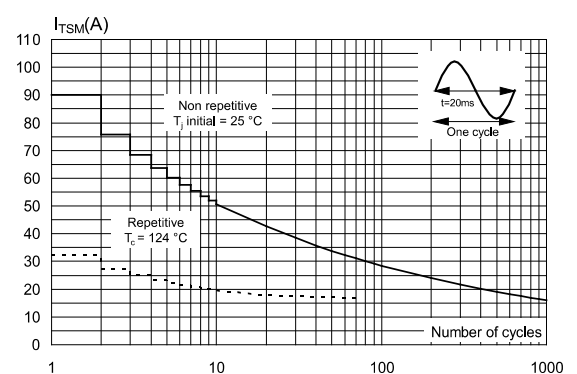


Figure 7: Non repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 10$ ms

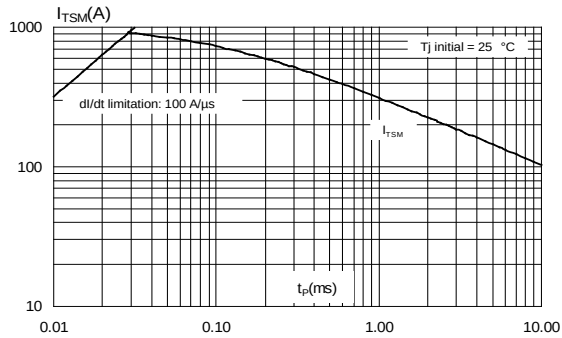


Figure 8: Relative variation of gate current, holding current and latching current versus junction temperature (typical values)

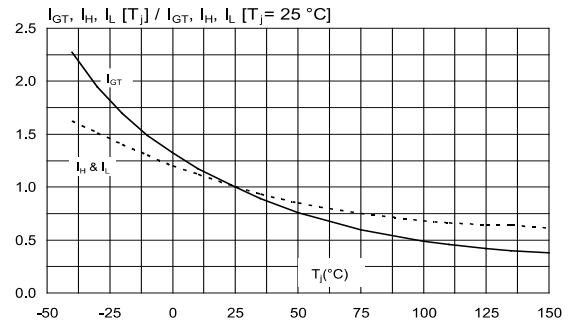


Figure 9: Relative variation of critical rate of decrease of main current versus reapplied dV/dt (typical values)

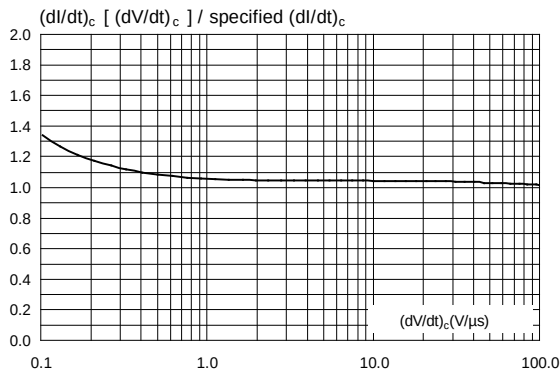


Figure 10: Relative variation of critical rate of decrease of main current versus junction temperature

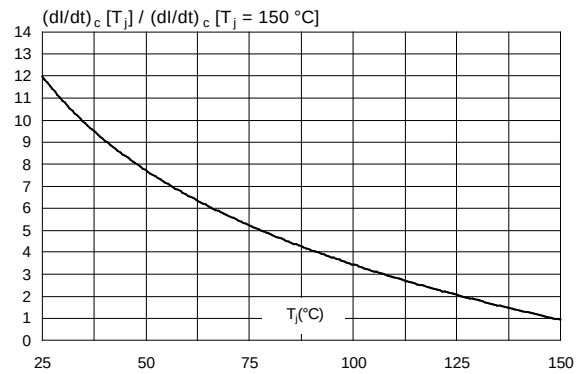


Figure 11: Relative variation of static dV/dt immunity versus junction temperature

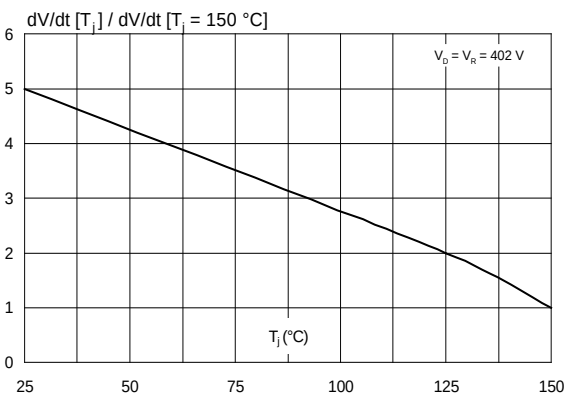
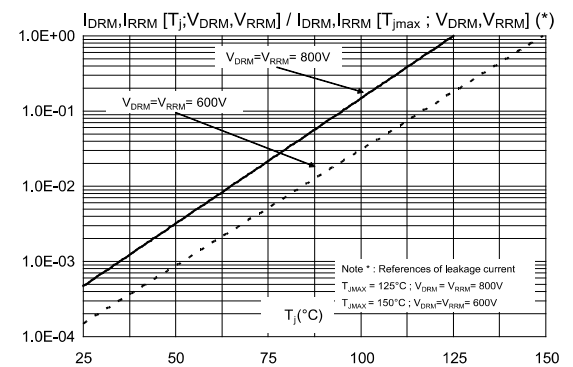


Figure 12: Relative variation of leakage current versus junction temperature for different blocking voltages (typical values)



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

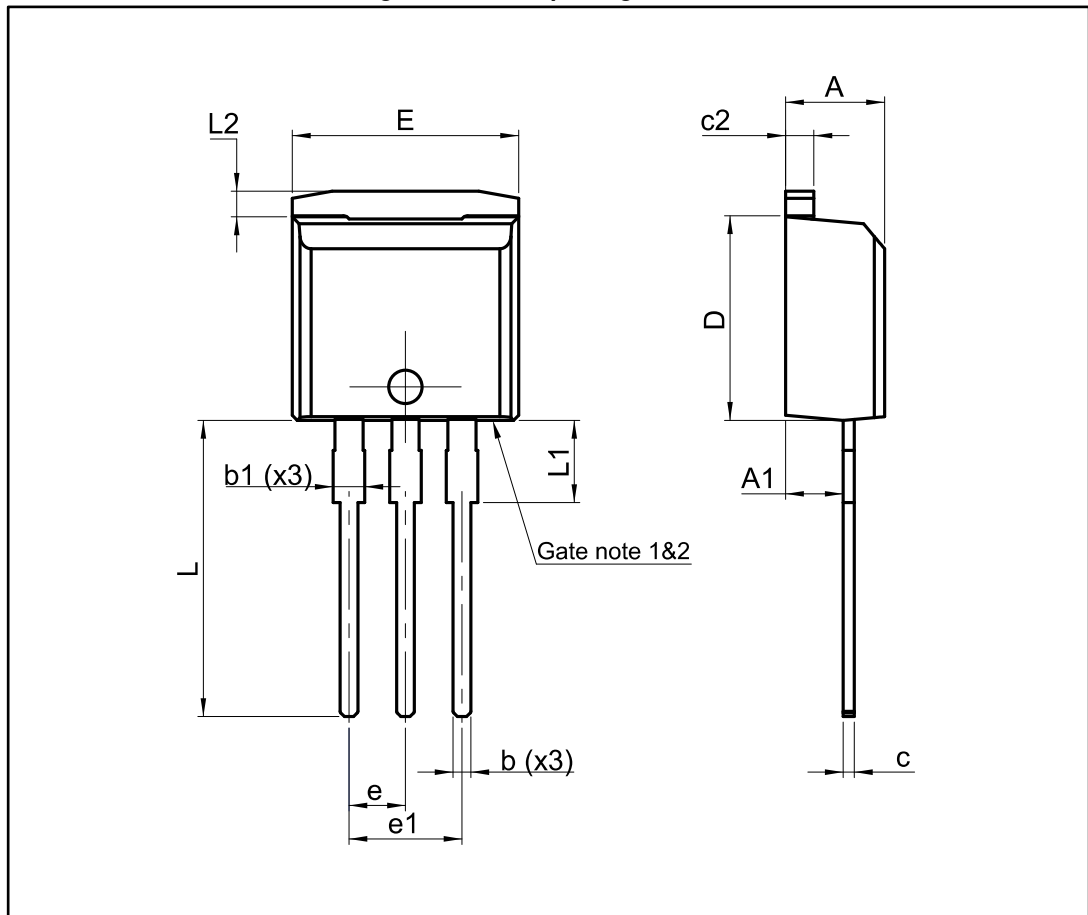


Table 6: I²PAK package mechanical data

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

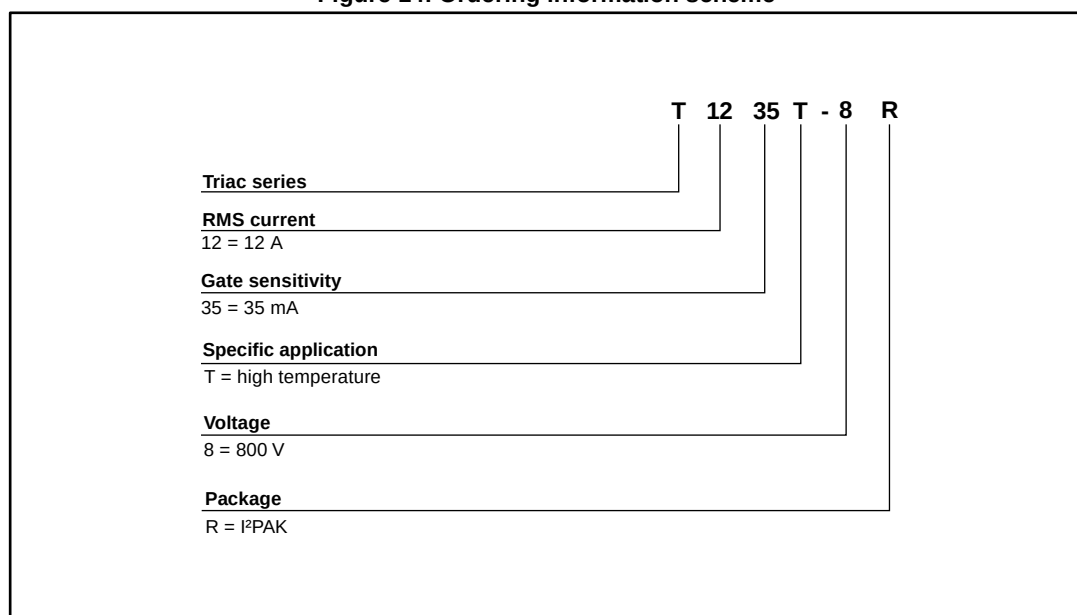


Table 7: Ordering information

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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