

High temperature 8 A sensitive TRIACs

Features

- Medium current TRIAC
- Logic level sensitive TRIAC
- 150 °C max. T_i turn-off commutation
- Clip bounding
- RoHS (2002/95/EC) compliant packages

Applications

- The T810H is designed for the control of AC actuators in appliances and industrial systems.
- The multi-port drive of the microcontroller can control the multiple loads of such appliances and systems through these sensitive gate TRIACs.

Description

Specifically designed to operate at 150 °C, the new 8 A T810H TRIACs provide an enhanced performance in terms of power loss and thermal dissipation. This allows the optimization of the heatsink size, leading to space and cost effectiveness when compared to electromechanical solutions.

Based on ST logic level technology, they offer an I_{GT} lower than 10 mA and specified minimal commutation and high noise immunity levels valid up to the T_i max.

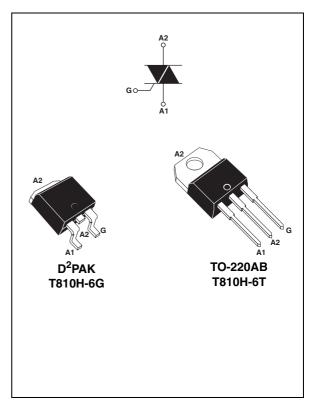


Table 1. Device summary

Symbol	Value	Unit
I _{T(RMS)}	8	Α
V_{DRM}/V_{RRM}	600	V
I _{GT MAX}	10	mA

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Table 2. Absolute maximum ratings

Symbol	Param	Value	Unit			
I _{T(RMS)}	On-state rms current (full sine wave)	D ² PAK, TO-220AB	T _c = 135 °C	8	Α	
1.	Non repetitive surge peak on-state	F = 60 Hz	t = 16.7 ms	84	^	
I _{TSM}	current (full cycle, T _j initial = 25 °C)	F = 50 Hz	t = 20 ms	80	Α	
l ² t	I^2 t Value for fusing $t_p = 10 \text{ ms}$			42	A ² s	
dI/dt	Critical rate of rise of on-state current $I_G = 2 \times I_{GT}$, $t_r \le 100 \text{ ns}$	F = 120 Hz	T _j = 150 °C	50	A/μs	
V _{DSM} /V _{RSM}	Non repetitive surge peak off-state voltage	t _p = 10 ms	T _j = 25 °C	V _{DRM} /V _{RRM} + 100	V	
I _{GM}	Peak gate current $t_p = 20 \mu s$ $T_j = 150 ^{\circ}C$		4	Α		
P _{G(AV)}	Average gate power dissipation $T_j = 150 ^{\circ}\text{C}$			1	W	
T _{stg} T _j	Storage junction temperature range Operating junction temperature range			- 40 to + 150 - 40 to + 150	°C	

Table 3. Electrical characteristics ($T_i = 25$ °C, unless otherwise specified)

Symbol	Test conditions Quadrant		Min	Max.	Unit
I _{GT}	V - 12 V P - 22 O	1 - 11 - 111	1	10	mA
V _{GT}	$V_D = 12 \text{ V} R_L = 33 \Omega$	1 - 11 - 111		1.0	V
V_{GD}	$V_D = V_{DRM}$, $R_L = 3.3 \text{ k}\Omega$	1 - 11 - 111	0.15		V
I _H ⁽¹⁾	I _T = 100 mA			25	mA
	1 101	I - III		30	mA
ΙL	$I_G = 1.2 I_{GT}$	II		35	IIIA
dV/dt (1)	$V_D = 67\% V_{DRM,}$ gate open, $T_j = 150 ^{\circ}\text{C}$	75		V/µs	
(dl/dt)c ⁽¹⁾	Logic level, 0.1 V/μs, T _j = 150 °C		11.4		A/ms
(ui/ut)C · /	Logic level, 15 V/µs, T _j = 150 °C		3.0		AVIIIS

^{1.} For both polarities of A2 referenced to A1.

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Table 4. Static characteristics

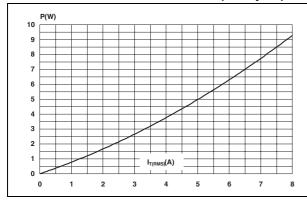
Symbol	Test cond	Value	Unit		
V _T ⁽¹⁾	$I_{TM} = 11.3 \text{ A}, t_p = 380 \mu\text{s}$	T _j = 25 °C	MAX.	1.5	V
V _{t0} (1)	Threshold voltage	T _j = 150 °C	MAX.	0.80	V
R _d ⁽¹⁾	Dynamic resistance	T _j = 150 °C	MAX.	55.0	mΩ
	V _{DRM} = V _{RRM}	T _j = 25 °C	MAX.	5	μΑ
I _{DRM}		T _j = 150 °C	MAX.	3.1	
I _{RRM}	V _D /V _R = 400 V (at peak mains voltage)	T _j = 150 °C	MAX.	2.5	mA
	V _D /V _R = 200 V (at peak mains voltage)	T _j = 150 °C	MAX.	2.0	

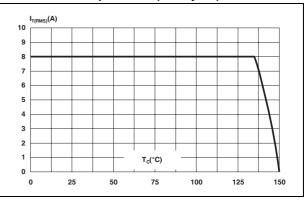
^{1.} for both polarities of A2 referenced to A1.

Table 5. Thermal resistance

Symbol	Parameter			Value	Unit
R _{th(j-c)}	Junction to case (AC)		D ² PAK / TO-220AB	1.60	
D	R _{th/(i-2)} Junction to ambient		D ² PAK	45	°C/W
R _{th(j-a)}	Junction to ambient		TO-220AB	60	

Figure 1. Maximum power dissipation versus Figure 2. On-state rms current versus case on-state rms current (full cycle) temperature (full cycle)

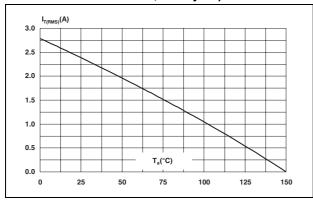




Characteristics T810H

Figure 3. On-state rms current versus ambient temperature (free air convection, full cycle)

Figure 4. Relative variation of thermal impedance, versus pulse duration



1.E-02

1.E-03

1.E-03

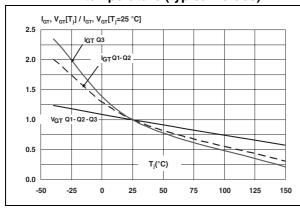
1.E-03

1.E-02

1.E-03

Figure 5. Relative variation of gate trigger current and voltage versus junction temperature (typical values)

Figure 6. Relative variation of holding and latching current versus junction temperature (typical values)



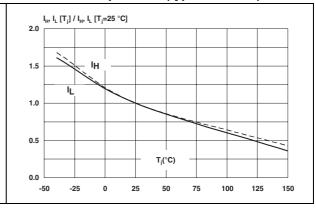
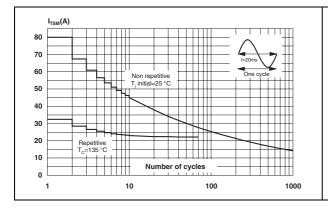
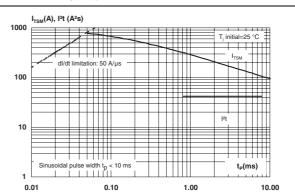


Figure 7. Surge peak on-state current versus number of cycles

Figure 8. Non-repetitive surge peak on-state current and corresponding value of I²t

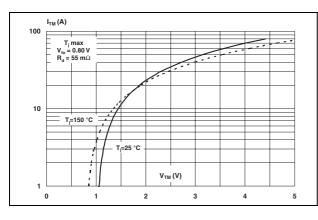


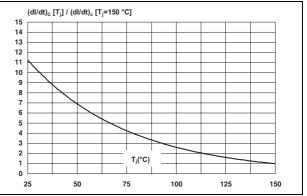


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Figure 9. On-state characteristics (maximum Figure 10. values)

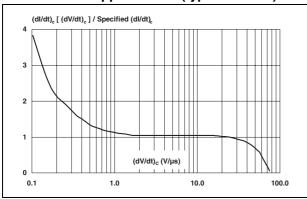
Relative variation of critical rate of decrease of main current versus junction temperature





Relative variation of critical rate of Figure 12. Figure 11. decrease of main current versus reapplied dV/dt (typical values)

Relative variation of static dV/dt immunity versus junction temperature



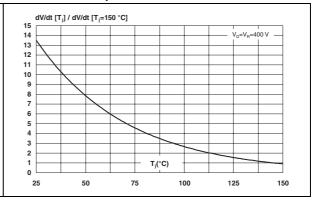
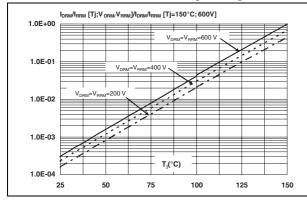
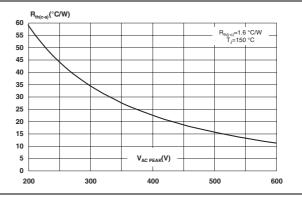


Figure 13. Variation of leakage current versus Figure 14. Acceptable case to ambient thermal junction temperature for different values of blocking voltage

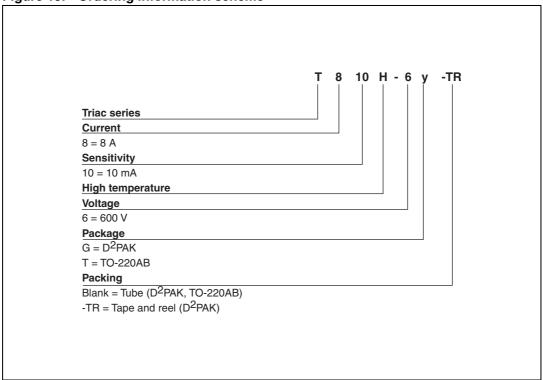
resistance versus repetitive peak off-state voltage





2 Ordering information scheme

Figure 15. Ordering information scheme



T810H Package information

3 Package information

- Epoxy meets UL94, V0
- Recommended torque 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.

Table 6. D²PAK dimensions

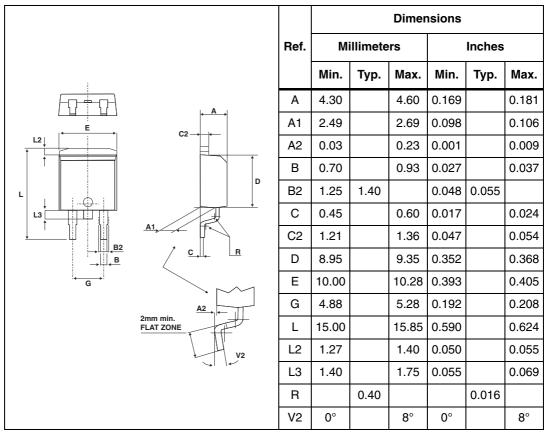
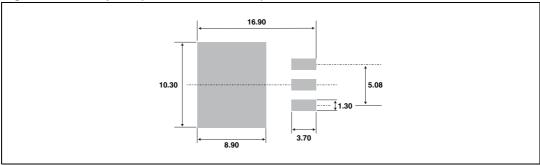
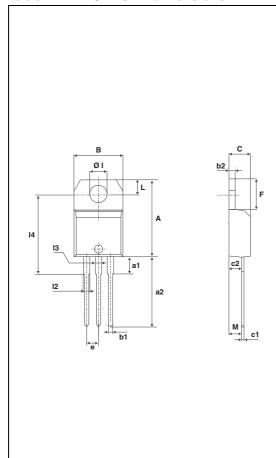


Figure 16. Footprint (dimensions in mm)



Package information T810H

Table 7. TO-220AB dimensions



	Dimensions					
Ref.	Mi	Ilimete	rs	Inches		
	Min.	Тур.	Max.	Min.	Тур.	Max.
Α	15.20		15.90	0.598		0.625
a1		3.75			0.147	
a2	13.00		14.00	0.511		0.551
В	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
С	4.40		4.60	0.173		0.181
с1	0.49		0.70	0.019		0.027
c2	2.40		2.72	0.094		0.107
е	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
14	15.80	16.40	16.80	0.622	0.646	0.661
L	2.65		2.95	0.104		0.116
12	1.14		1.70	0.044		0.066
l3	1.14		1.70	0.044		0.066
М		2.60			0.102	

4 Ordering information

Table 8. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
T810H-6G	T810H 6G	D ² PAK	1.5 g	50	Tube
T810H-6G-TR	T810H 6G	D ² PAK	1.5 g	1000	Tape and reel
T810H-6T	T810H 6T	TO-220AB	2.3 g	50	Tube

5 Revision history

Table 9. Document revision history

Date	Revision	Changes
15-May-2009	1	First issue.

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