8 A Snubberless™ Triac

Datasheet — production data

Features

- High static and dynamic commutation
- Package is RoHS (2002/95/EC) compliant
- High surge current
- ECOPACK®2 compliant component
- Complies with UL standards (File ref: E81734)

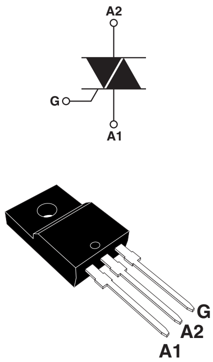
Applications

- General purpose AC switching
- Motor control circuits in power tools
- Home appliances
- Lighting

Description

The T830-8FP Triac can be used for the on/off function in general purpose AC switching where high commutation capability is required.

Provides insulation rated at 1500 V rms.



TO-220FPAB
(T830-8FP)

Table 1. Device summary

Symbol	Value	Unit
$I_{T(rms)}$	8	A
V_{DRM}, V_{RRM}	800	V
V_{DSM}, V_{RSM}	900	V
I_{GT}	30	mA

1 Characteristics

Table 2. Absolute ratings (limiting values)

Symbol	Parameter			Value	Unit
$I_{T(rms)}$	On-state rms current (full sine wave)		T_c = 95 °C	8	A
I_{TSM}	Non repetitive surge peak on-state current (full cycle, T_j initial = 25 °C)	F = 50 Hz	t = 20 ms	80	A
		F = 60 Hz	t = 16.7 ms	84	
I^2t	I^2t Value for fusing	t_p = 10 ms		42	A^2s
dI/dt	Critical rate of rise of on-state current $I_G = 2 \times I_{GT}$, $t_r \leq 100$ ns	F = 120 Hz	T_j = 125 °C	100	A/µs
V_{DSM}, V_{RSM}	Non repetitive surge peak on-state voltage	t_p = 10 ms	T_j = 25 °C	900	V
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
T_L	Lead temperature for soldering during 10 s (at 4 mm from case)			260	°C
V_{ins}	Insulation rms voltage, 1 minute			1500	V

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

Symbol	Test conditions	Quadrant		Value	Unit
I_{GT} (1)	V_D = 12 V, R_L = 30 Ω	I - II - III	Max.	30	mA
V_{GT}				1.3	V
V_{GD}	$V_D = V_{DRM}$, R_L = 3.3 kΩ, T_j = 125 °C	I - II - III	Min.	0.2	V
I_H (2)	I_T = 250 mA		Max.	50	mA
I_L	$I_G = 1.2\ I_{GT}$	I - II - III	Max.	60	mA
dV/dt	$V_D = 67\%V_{DRM}$, gate open	T_j = 125 °C	Min.	2500	V/µs
(dI/dt)c	Without snubber	T_j = 125 °C	Min.	10.0	A/ms

1. Minimum I_{GT} is guaranteed at 5% of I_{GT} max.
2. For both polarities of A2 referenced to A1.

Table 4. Static characteristics

Symbol	Test conditions			Value	Unit
V_T (1)	I_{TM} = 11 A, t_p = 380 µs	T_j = 25 °C	Max.	1.55	V
V_{t0} (1)	Threshold voltage	T_j = 125 °C	Max.	0.85	V
R_d (1)	Dynamic resistance	T_j = 125 °C	Max.	40	mΩ
I_{DRM} I_{RRM}	$V_{DRM} = V_{RRM}$	T_j = 25 °C	Max.	5	µA
		T_j = 125 °C		1	mA

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)	3.5	°C/W
$R_{th(j-a)}$	Junction to ambient	60	°C/W

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

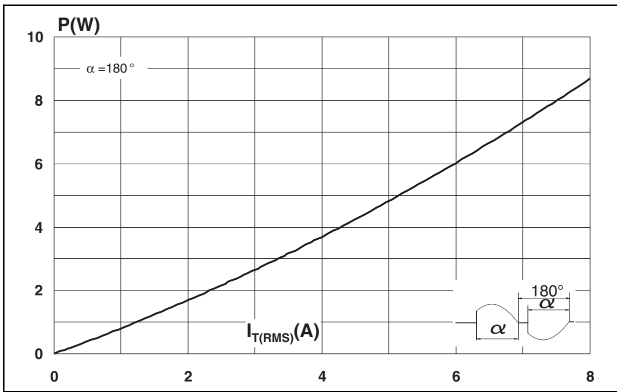


Figure 2. On-state rms current versus case temperature

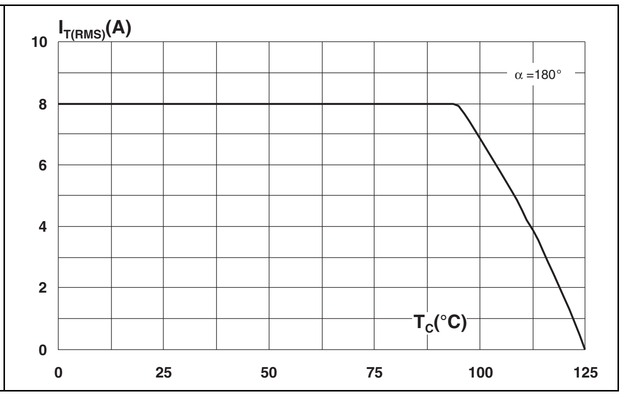


Figure 3. On-state rms current versus ambient temperature (free air convection)

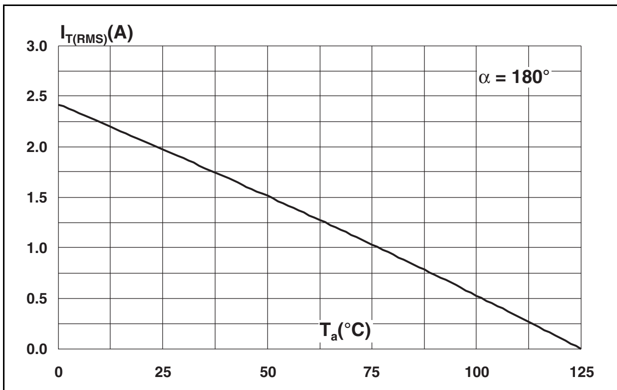


Figure 4. Relative variation of thermal impedance versus pulse duration

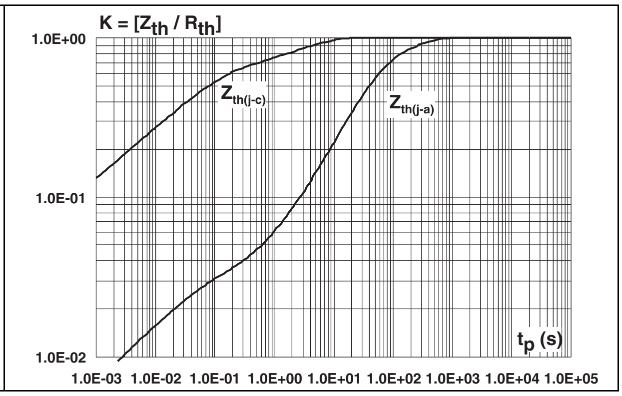


Figure 5. Relative variation of gate trigger current versus junction temperature (typical values)

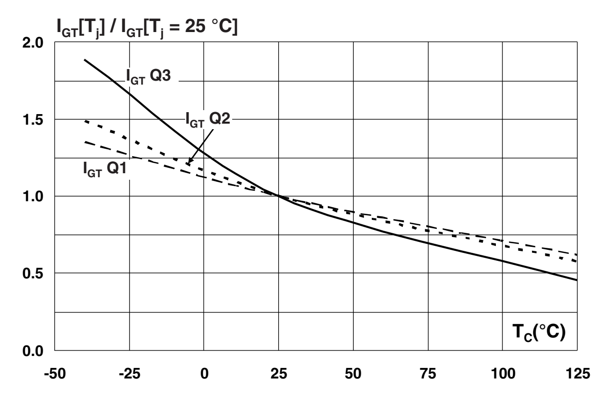


Figure 6. Relative variation of gate trigger voltage versus junction temperature (typical values)

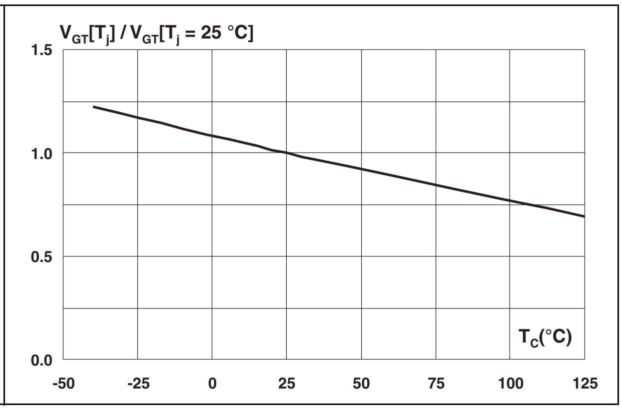


Figure 7. Relative variation of holding and latching current versus junction temperature (typical values)

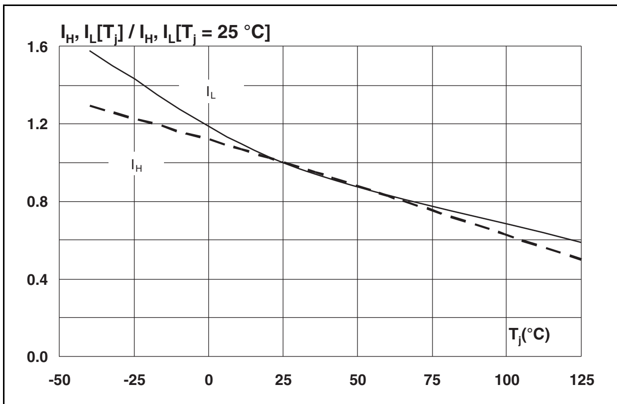


Figure 8. Surge peak on-state current versus number of cycles

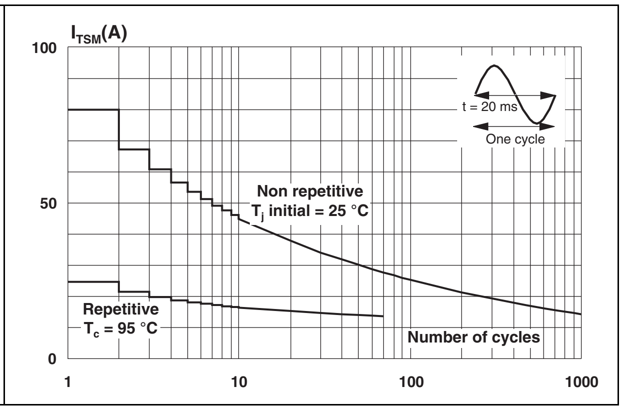


Figure 9. Non repetitive surge peak on-state current and corresponding value of I^2T

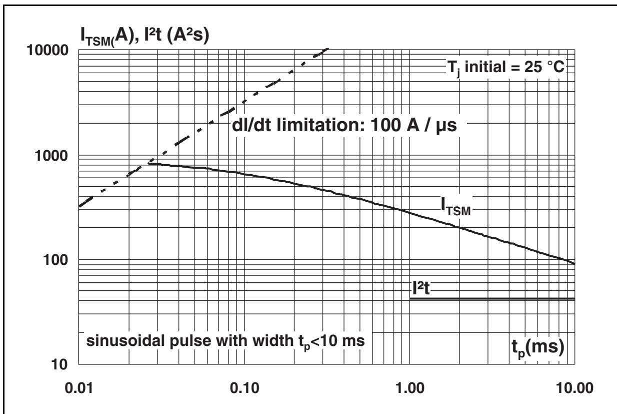


Figure 10. On-state characteristics (maximum values)

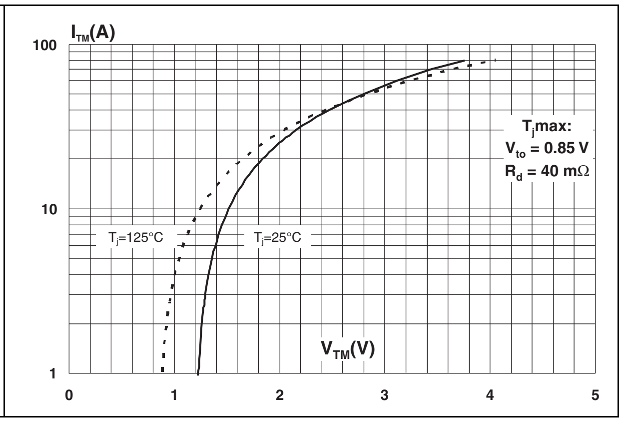


Figure 11. Relative variation of critical rate of decrease of main current versus junction temperature

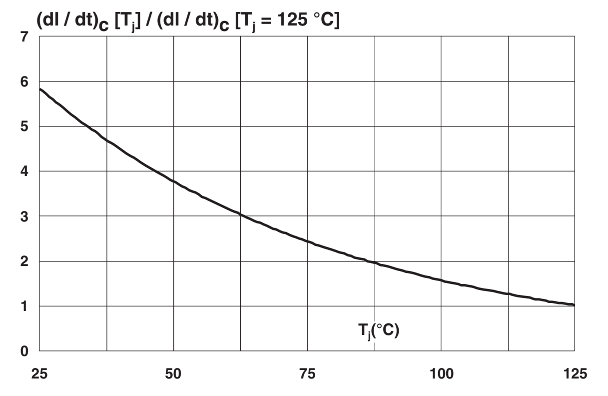


Figure 12. Relative variation of static dV/dt immunity versus junction temperature (typical values)

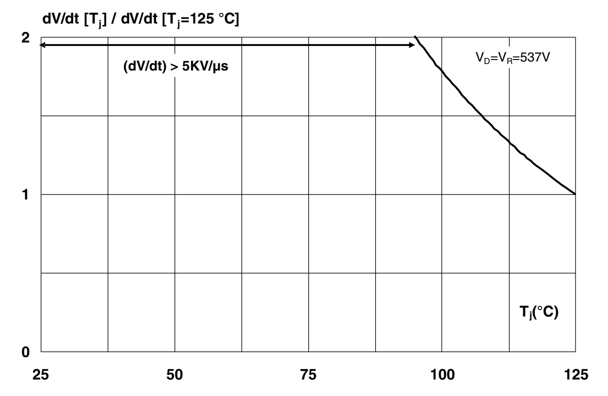


Figure 13. Relative variation of critical rate of decrease of main current versus reapplied dV/dt (typical values)

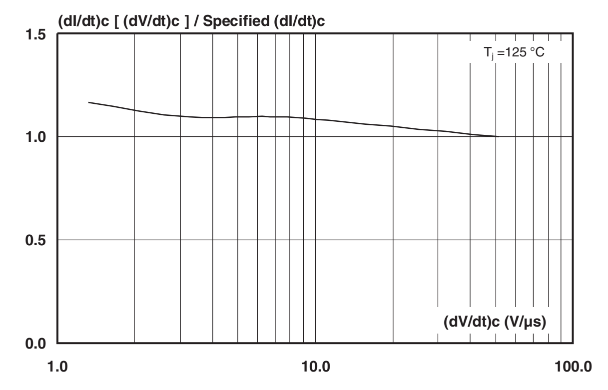
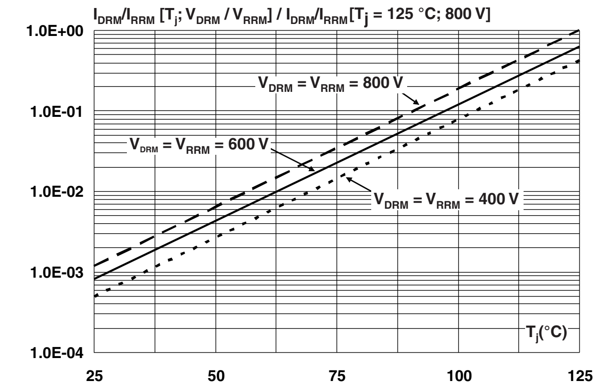
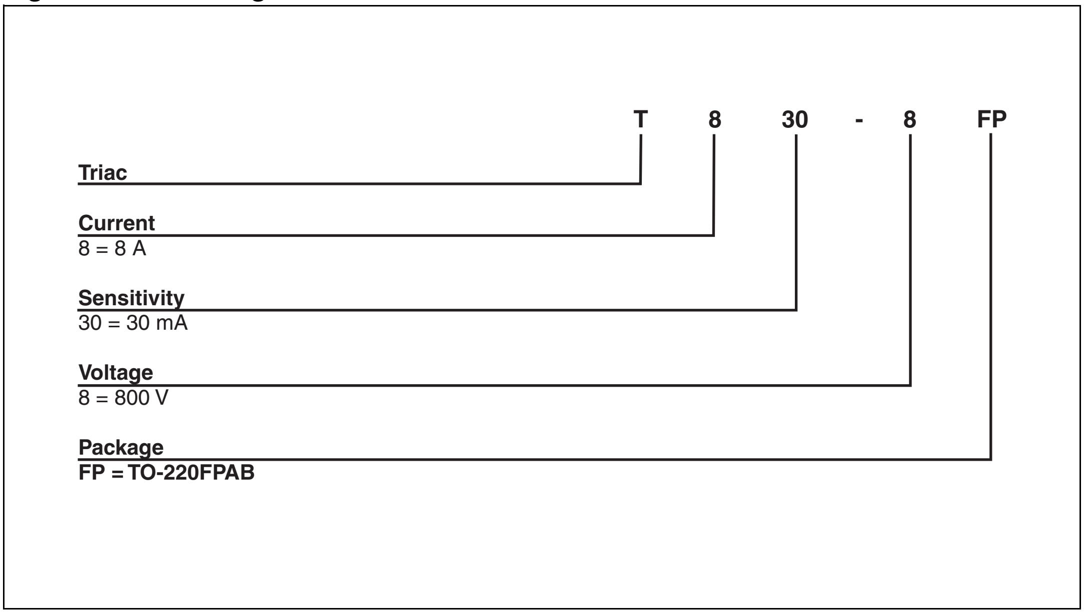


Figure 14. Relative variation of leakage current versus junction temperature



2 Ordering information scheme

Figure 15. Ordering information scheme

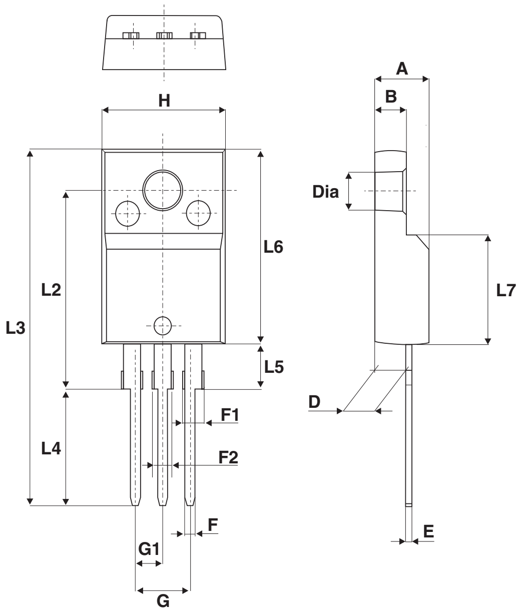


3 Package information

- 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. TO-220FPAB Dimensions



Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.4	4.6	0.173	0.181
B	2.5	2.7	0.098	0.106
D	2.5	2.75	0.098	0.108
E	0.45	0.70	0.018	0.027
F	0.75	1	0.030	0.039
F1	1.15	1.70	0.045	0.067
F2	1.15	1.70	0.045	0.067
G	4.95	5.20	0.195	0.205
G1	2.4	2.7	0.094	0.106
H	10	10.4	0.393	0.409
L2	16 Typ.		0.63 Typ.	
L3	28.6	30.6	1.126	1.205
L4	9.8	10.6	0.386	0.417
L5	2.9	3.6	0.114	0.142
L6	15.9	16.4	0.626	0.646
L7	9.00	9.30	0.354	0.366
Dia.	3.00	3.20	0.118	0.126

4 Ordering information

Table 7. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
T830-8FP	T830-8FP	TO-220FPAB	2.0 g	50	Tube

5 Revision history

Table 8. Document revision history

Date	Revision	Changes
24-Sep-2012	1	Initial release.