1 Characteristics

Table 2. Absolute maximum ratings

Symbol	Parameter			Value	Unit
$I_{T(RMS)}$	On-state rms current (full sine wave)	D^2PAK, TO-220AB	T_c = 135 °C	8	A
I_{TSM}	Non repetitive surge peak on-state current (full cycle, T_j initial = 25 °C)	F = 60 Hz	t = 16.7 ms	84	A
		F = 50 Hz	t = 20 ms	80	
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 = 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 µs	T_j = 150 °C	4	A
$P_{G(AV)}$	Average gate power dissipation		T_j = 150 °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_j = 25 °C, unless otherwise specified)

Symbol	Test conditions	Quadrant	Min	Max.	Unit
I_{GT}	V_D = 12 V R_L = 33 Ω	I - II - III	1	10	mA
V_{GT}		I - II - III		1.0	V
V_{GD}	$V_D = V_{DRM}$, R_L = 3.3 kΩ	I - II - III	0.15		V
I_H (1)	I_T = 100 mA			25	mA
I_L	$I_G = 1.2\ I_{GT}$	I - III		30	mA
		II		35	
dV/dt (1)	V_D = 67% $V_{DRM,}$ gate open, T_j = 150 °C		75		V/µs
(dI/dt)c (1)	Logic level, 0.1 V/µs, T_j = 150 °C		11.4		A/ms
	Logic level, 15 V/µs, T_j = 150 °C		3.0		

1. For both polarities of A2 referenced to A1.

Table 4. Static characteristics

Symbol	Test conditions			Value	Unit
V_T (1)	I_{TM} = 11.3 A, t_p = 380 µs	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
I_{DRM} I_{RRM}	V_{DRM} = V_{RRM}	T_j = 25 °C	MAX.	5	µA
		T_j = 150 °C	MAX.	3.1	mA
	V_D/V_R = 400 V (at peak mains voltage)	T_j = 150 °C	MAX.	2.5	
	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^2PAK / TO-220AB	1.60	°C/W
$R_{th(j-a)}$	Junction to ambient	S = 1 cm^2	D^2PAK	45	
			TO-220AB	60	

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

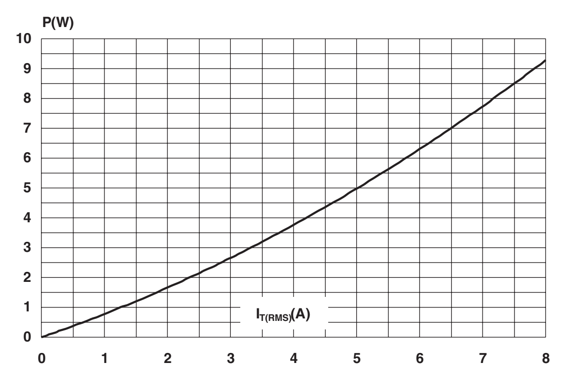


Figure 2. On-state rms current versus case temperature (full cycle)

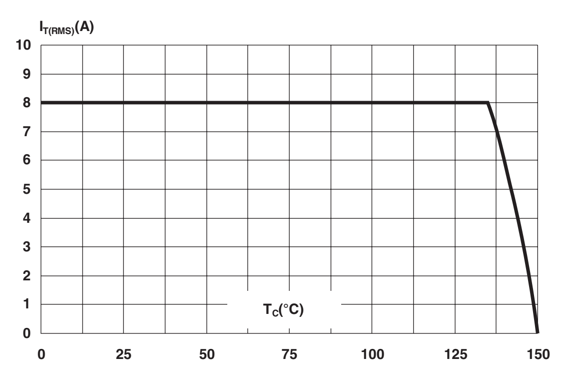


Figure 3. On-state rms current versus ambient temperature (free air convection, full cycle)

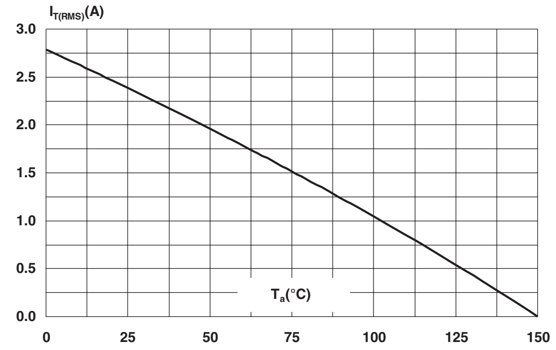


Figure 4. Relative variation of thermal impedance, versus pulse duration

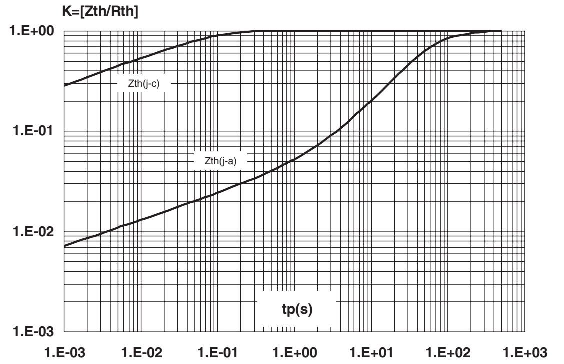


Figure 5. Relative variation of gate trigger current and voltage versus junction temperature (typical values)

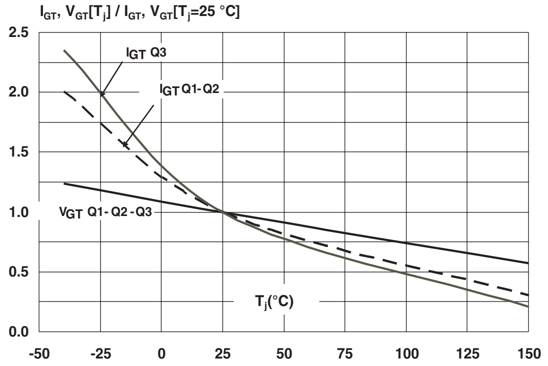


Figure 6. Relative variation of holding and latching current versus junction temperature (typical values)

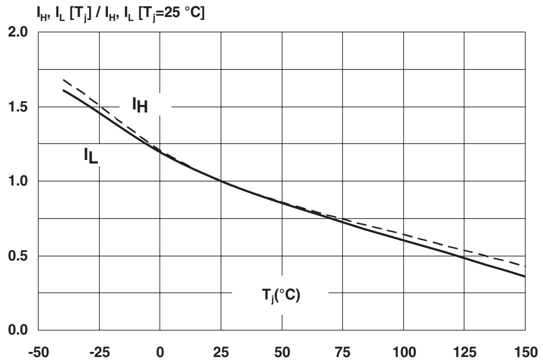


Figure 7. Surge peak on-state current versus number of cycles

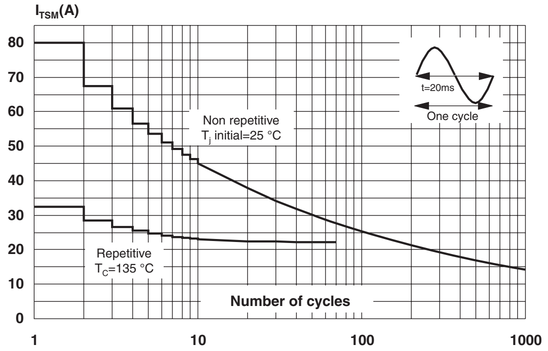


Figure 8. Non-repetitive surge peak on-state current and corresponding value of I^2t

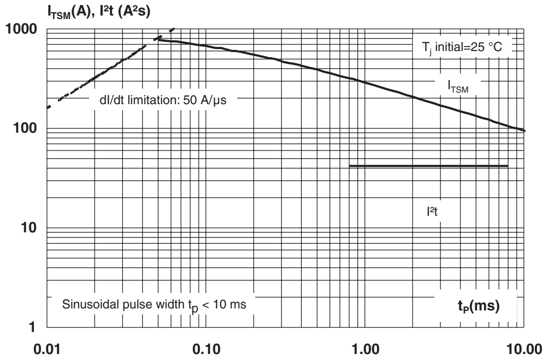


Figure 9. On-state characteristics (maximum values)

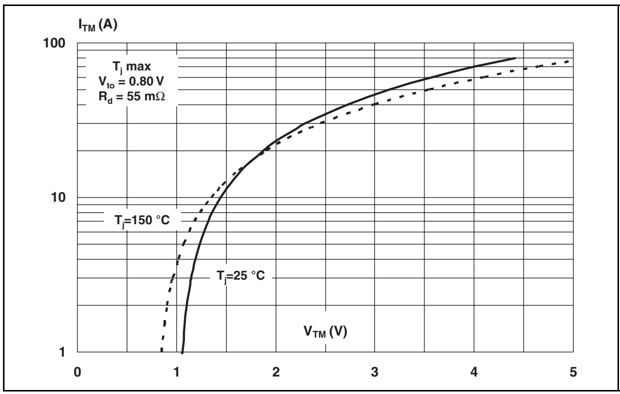


Figure 10. Relative variation of critical rate of decrease of main current versus junction temperature

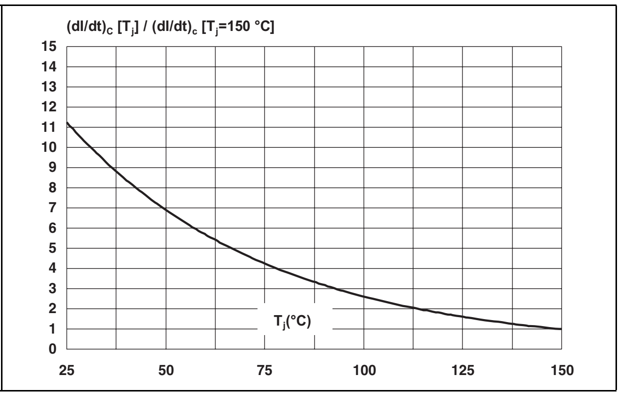


Figure 11. Relative variation of critical rate of decrease of main current versus reapplied dV/dt (typical values)

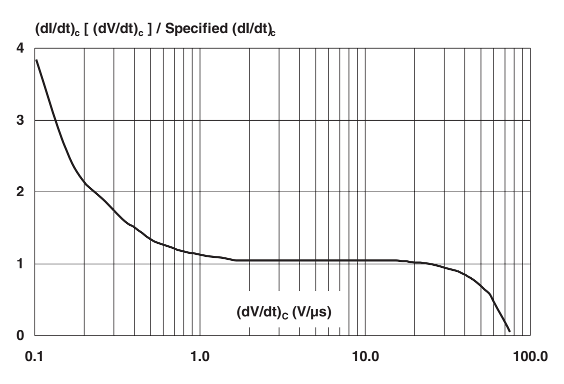


Figure 12. Relative variation of static dV/dt immunity versus junction temperature

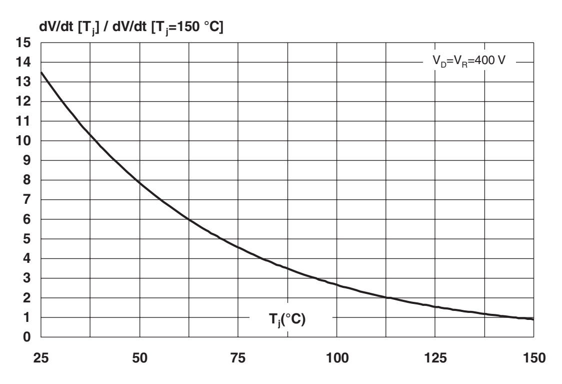


Figure 13. Variation of leakage current versus junction temperature for different values of blocking voltage

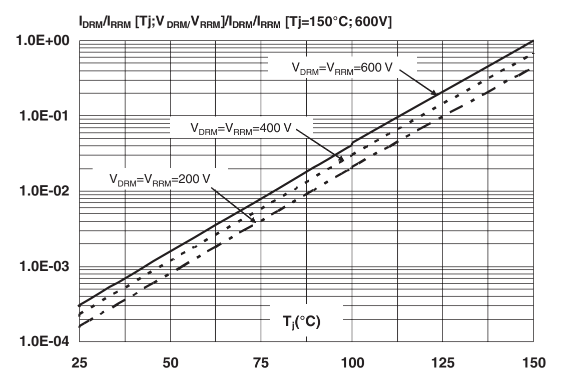
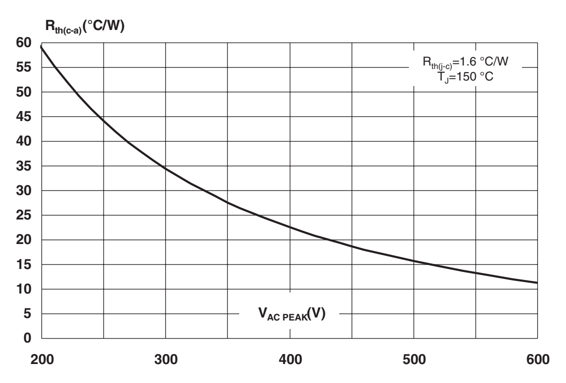
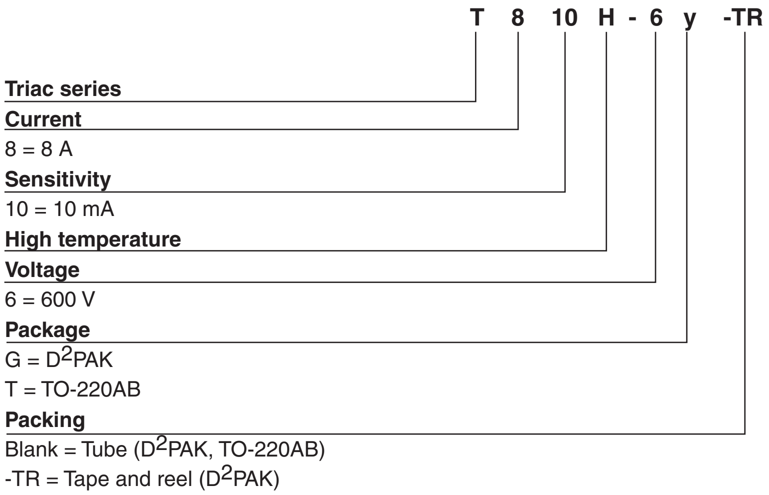


Figure 14. Acceptable case to ambient thermal resistance versus repetitive peak off-state voltage



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

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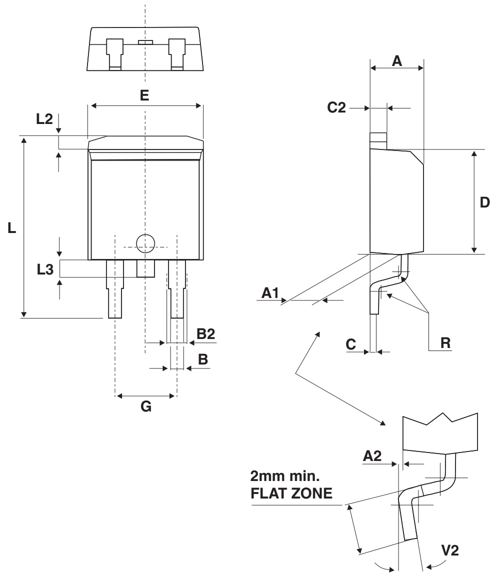
Table 6. D^2PAK dimensions



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.30		4.60	0.169		0.181
A1	2.49		2.69	0.098		0.106
A2	0.03		0.23	0.001		0.009
B	0.70		0.93	0.027		0.037
B2	1.25	1.40		0.048	0.055	
C	0.45		0.60	0.017		0.024
C2	1.21		1.36	0.047		0.054
D	8.95		9.35	0.352		0.368
E	10.00		10.28	0.393		0.405
G	4.88		5.28	0.192		0.208
L	15.00		15.85	0.590		0.624
L2	1.27		1.40	0.050		0.055
L3	1.40		1.75	0.055		0.069
R		0.40			0.016	
V2	0°		8°	0°		8°

Figure 16. Footprint (dimensions in mm)

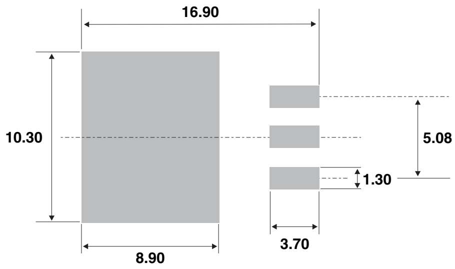
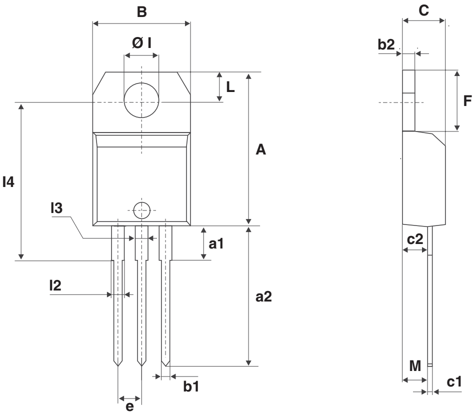


Table 7. TO-220AB dimensions

	Ref.	Dimensions					
		Millimeters			Inches		
		Min.	Typ.	Max.	Min.	Typ.	Max.
	A	15.20		15.90	0.598		0.625
	a1		3.75			0.147	
	a2	13.00		14.00	0.511		0.551
	B	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
	C	4.40		4.60	0.173		0.181
	c1	0.49		0.70	0.019		0.027
	c2	2.40		2.72	0.094		0.107
	e	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
	I4	15.80	16.40	16.80	0.622	0.646	0.661
	L	2.65		2.95	0.104		0.116
	I2	1.14		1.70	0.044		0.066
	I3	1.14		1.70	0.044		0.066
	M		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^2PAK	1.5 g	50	Tube
T810H-6G-TR	T810H 6G	D^2PAK	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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