

Description

Passivated high commutation triacs in a plastic envelope intended for use in circuits where high static and dynamic dV/dt and high dI/dt can occur. These devices will commute the full rated ms current at the maximum rated junction temperature without the aid of a snubber.

Symbol 		Simplified outline  TO-252	
Pin	Description		
1	Main terminal 1 (T1)		
2	Main terminal 2 (T2)		
3	gate (G)		
TAB	Main teminal 2(T2)		

Applications:

- ◆ Motor control
- ◆ Industrial and domestic lighting
- ◆ Heating
- ◆ Static switching

Features

- ◆ Blocking voltage to 600 V
- ◆ On-state RMS current to 4 A

SYMBOL	PARAMETER	Value	Unit
V_{DRM}	Repetitive peak off-state voltages	600	V
$I_T (RMS)$	RMS on-state current (full sine wave)	4	A
I_{TSM}	Non-repetitive peak on-state current (full cycle, T_j initial=25°C)	30	A

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
$R_{th(j-c)}$	Junction to case(AC)		-	2.6	-	°C/W
$R_{th(j-a)}$	Junction to ambient	$s=0.5\text{ cm}^2$	-	70	-	°C/W

Limiting values in accordance with the Maximum system(IEC 134)

SYMBOL	PARAMETER	CONDITIONS	MIN	MAX	UNIT
V_{DRM}	Repetitive peak off-state Voltages		-	600	V
$I_{T(RMS)}$	RMS on-state current Full sine wave	$T_c=110^{\circ}\text{C}$	-	4	A
I^2t	I^2t value for fusing	$T_p=10\text{ms}$	-	5.1	A^2s
DI/dt	Critical rate of rise of on-state current $I_G=2 \times I_{GT}$, $t_r \leq 100 \text{ ns}$	$F=120\text{Hz}$ $T_j=125^{\circ}\text{C}$	-	50	$\text{A}/\mu\text{S}$
I_{GM}	Peak gate current	$T_p=20 \mu\text{s}$ $T_j=125^{\circ}\text{C}$	-	4	A
V_{GD}		$V_D=V_{DRM}$; $R_L=33\text{k}\Omega$ $T_j=125^{\circ}\text{C}$	0.2	-	V
V_{GT}		$V_D=12\text{V}$; $R_L=30\Omega$	-	1.3	V
$P_{G(AV)}$	Average gate power	$T_j=125^{\circ}\text{C}$	-	1	W
T_{stg}	Storage temperature		-40	150	$^{\circ}\text{C}$
T_j	Operating junction Temperature range		-40	125	$^{\circ}\text{C}$

$T_j=25^{\circ}\text{C}$ unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
Static characteristics						
I_{GT}	Gate trigger current	$V_D=12\text{V}$; $R_L=30\Omega$ I-II-III	-	-	10	mA
I_L	Latching current	$I_G=1.2I_{GT}$ I-III II	-	-	25 30	mA
I_{DRM} I_{RRM}	$V_{DRM}=V_{RRM}$	$T_j=25^{\circ}\text{C}$ $T_j=125^{\circ}\text{C}$	-	-	5 1	μA mA
I_H	Holding current	$I_T=100\text{mA}$	-	-	15	mA
V_{TM}	$I_{TM}=5.5\text{A}$ $t_p=380 \mu\text{s}$	$T_j=25^{\circ}\text{C}$	-	-	1.6	V
V_{TO}	Threshold voltage	$T_j=125^{\circ}\text{C}$	-	-	0.9	V
R_D	Dynamic resistance	$T_j=125^{\circ}\text{C}$	-	-	120	$\text{M}\Omega$

Dynamic Characteristics

D_v/dt	Critical rate of rise of Off-state voltage	$V_D=67\% V_{DRM}$ gate open; $T_j=125^{\circ}\text{C}$;	40	-	-	$\text{V}/\mu\text{s}$
$(di/dt)_c$		$(dV/dt)_c=0.1\text{V}/\mu\text{s}$ $T_j=125^{\circ}\text{C}$ $(dv/dt)_c=10\text{V}/\mu\text{s}$ $T_j=125^{\circ}\text{C}$	2.7 2.0	-	-	A/ms

Description

Fig. 1: Maximum power dissipation versus RMS on-state current (full cycle).

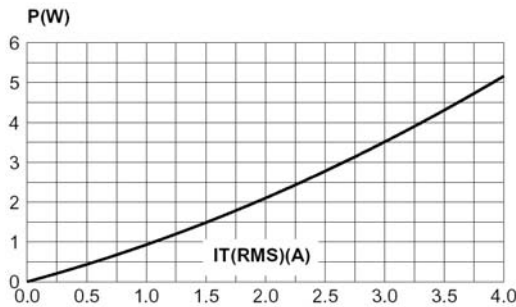


Fig. 2-1: RMS on-state current case versus temperature (full cycle).

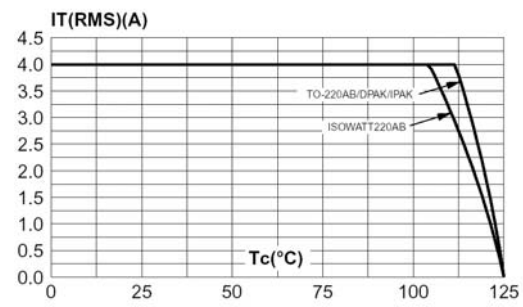


Fig. 2-2: RMS on-state current versus ambient temperature (printed circuit FR4, copper thickness: 35μm), full cycle.

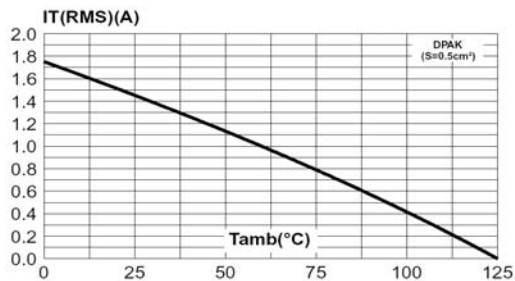


Fig. 3: Relative variation of thermal impedance versus pulse duration.

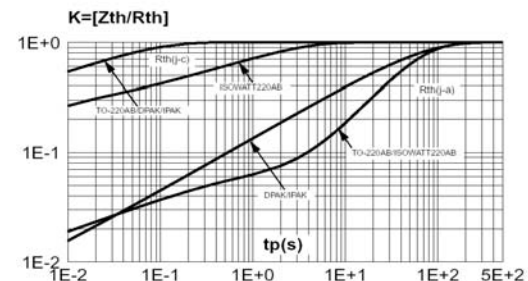


Fig. 4: Relative variation of gate trigger current, holding current and latching current versus junction temperature (typical values).

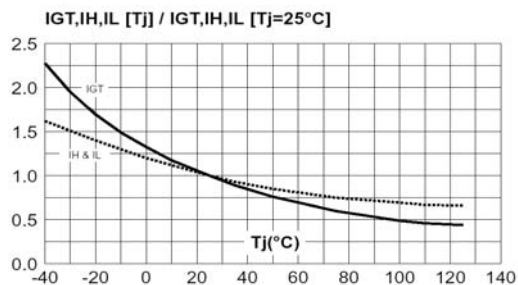
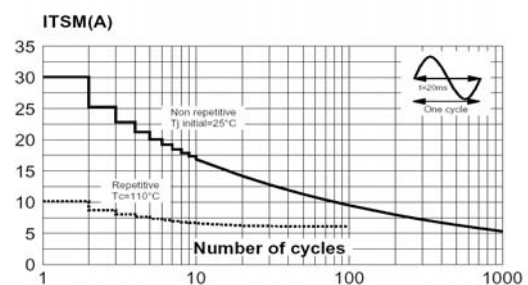


Fig. 5: Surge peak on-state current versus number of cycles.



Description

Fig. 6: Non-repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 10\text{ms}$, and corresponding value of I^2t .

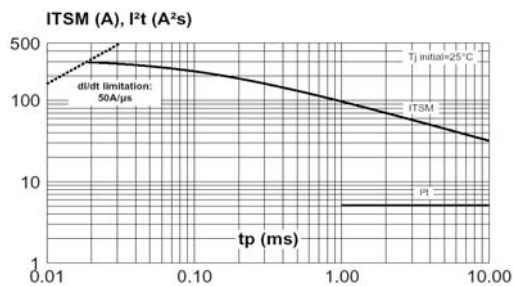


Fig. 7: On-state characteristics (maximum values).

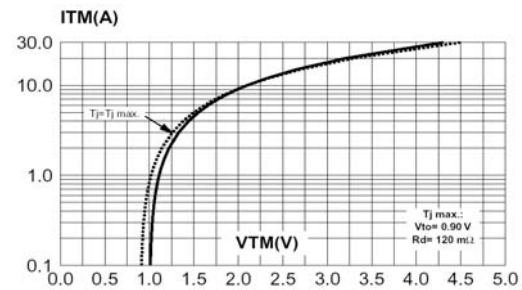


Fig. 8: Relative variation of critical rate of decrease of main current versus $(dV/dt)_c$ (typical values).

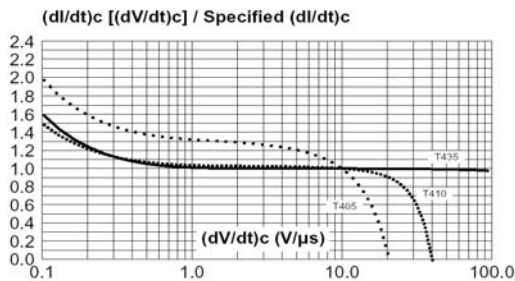


Fig. 9: Relative variation of critical rate of decrease of main current versus junction temperature.

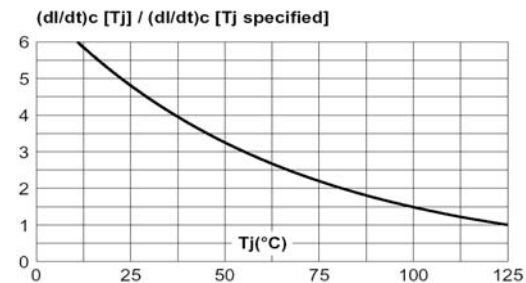
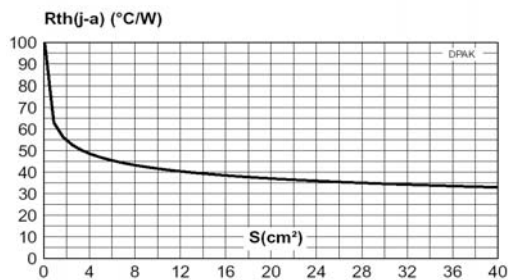
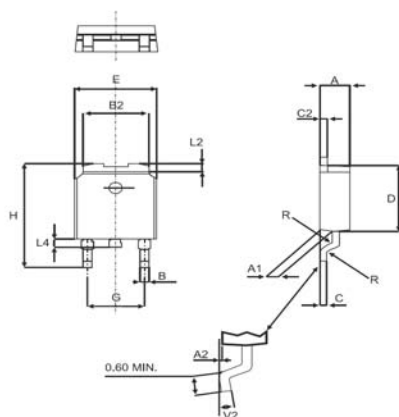


Fig. 10: DPAK thermal resistance junction to ambient versus copper surface under tab (printed circuit board FR4, copper thickness: $35\mu\text{m}$).



MECHANICAL DATA

Dimensions in mm
Net Mass: 0.3 g
TO-252



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max	Min.	Max.
A	2.20	2.40	0.086	0.094
A1	0.90	1.10	0.035	0.043
A2	0.03	0.23	0.001	0.009
B	0.64	0.90	0.025	0.035
B2	5.20	5.40	0.204	0.212
C	0.45	0.60	0.017	0.023
C2	0.48	0.60	0.018	0.023
D	6.00	6.20	0.236	0.244
E	6.40	6.60	0.251	0.259
G	4.40	4.60	0.173	0.181
H	9.35	10.10	0.368	0.397
L2	0.80 typ.		0.031 typ.	
L4	0.60	1.00	0.023	0.039
R	0.2 typ.		0.007 typ.	
V2	0°	8°	0°	8°