HP25QseriesRC

Three quadrant triacs

HAOPIN MICROELECTRONICS CO.,LTD.

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 commutate the full rated ms current at the maximum rated junction temperature without the aid of a snubber.

Symbol	Simplified outline
	

Pin	Description
1	Main terminal 1 (T1)
2	Main terminal 2 (T2)
3	gate (G)
TAB	Main terminal 2 (T2)

Applications:

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

Features

- Blocking voltage to 600-1000 V
- On-state RMS current to 25 A

SYMBOL	PARAMETER	Value	Unit
V_{DRM}	Repetitive peak off-state voltages HP25Q60RC HP25Q80RC HP25QK0RC	600 800 1000	V
$I_{T(RMS)}$	RMS on-state current （full sine wave）	25	A
I_{TSM}	Non-repetitive peak on-state current (full cycle,Tj initial=25℃)	260	A

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
$R_{th(j-c)}$	Junction to case(AC)		–	0.8	–	℃/W
$R_{th(j-a)}$	Junction to ambient		–	60	–	℃/W

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

SYMBOL	PARAMETER	CONDITIONS			MIN	Value	UNIT
V_{DRM}	Repetitive peak off-state Voltages				-	V_{DRM}/V_{RRM} +100	V
$I_{T(RMS)}$	RMS on-state current	T_c=100℃			-	25	A
I_{TSM}	Non repetitive surge peak on-state current	Tj initial =25℃	F=50H_Z	t=20ms	-	250	A
			F=60H_Z	t=16.7ms	-	260	A
I^2t	I^2t value for fusing	T_p=10ms			-	340	A^2S
dI/dt	Critical rate of rise of on-state current	I_G=2×I_{GT} , tr≥100ns	F=100H_Z	Tj=125℃	-	50	A/μs
I_{GM}	Peak gate current	tp=20us		Tj=125℃	-	4	A
I_{DRM}	V_{DRM}=V_{RRM}			Tj=25℃	-	5	μA
I_{RRM}	V_{DRM}=V_{RRM}			Tj=125℃	-	3	mA
$P_{G(AV)}$	Average gate power			Tj=125℃	-	1	W
T_{stg}	Storag e temperature range				-40	150	℃
T_j	Operating junction Temperature range				-40	125	℃

T_J=25°C unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS		MIN	TYP	MAX	UNIT
Static characteristics							
I_{GT}		V_D=12V; R_L=30Ω	I-II-III	-	-	35	mA
I_L		I_G=1.2 I_{GT}	I-III II	- -	- -	70 80	mA mA
I_H		I_T=500mA		-	-	50	mA
V_{GT}		V_D=12V; R_L=30Ω		-	-	1.3	V
V_{GD}		V_D=V_{DRM} R_L=3.3KΩ Tj=125℃	I-II-III	0.2	-	-	V
dV/dt		V_D=67%V_{DRM} gate open;T_J=125℃		500	-	-	V/μs
(dV/dt)c		T_J=125℃		13	-	-	A/ms

Dynamic Characteristics

V_{TM}	I_{TM}=35A tp=380us	T_J=25℃	-	-	1.55	V
V_{to}	Threshold voltage	T_J=125℃	-	-	0.85	V
R_d	Dynamic resistance	T_J=125℃	-	-	16	mΩ

Description

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

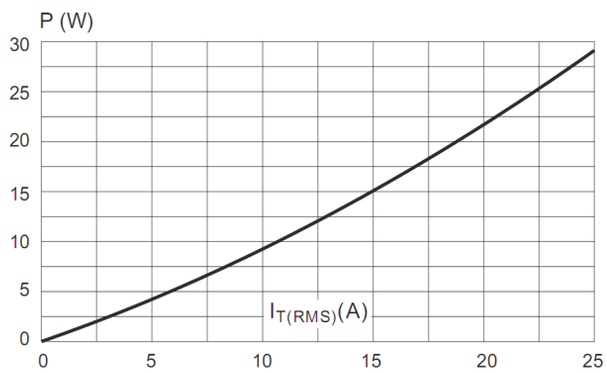


Fig.2 RMS on-state current versus case temperature (full cycle)

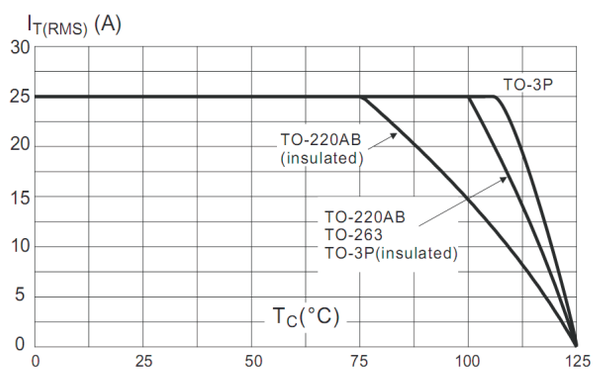


Fig.3 D^2PAK RMS on-state current versus ambient temperature (printed circuit board FR4, copper thickness: 35µm)(full cycle)

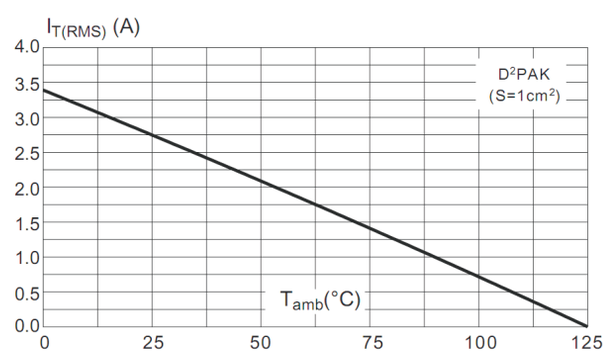


Fig.4 Relative variation of thermal impedance versus pulse duration.

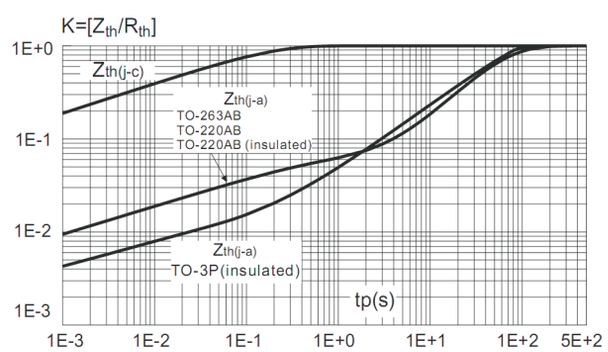


Fig.5 On-state characteristics (maximum values).

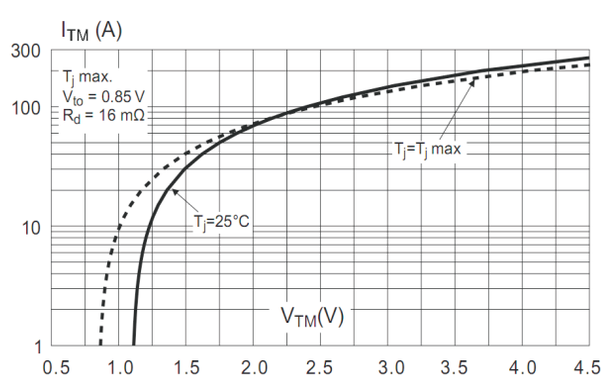
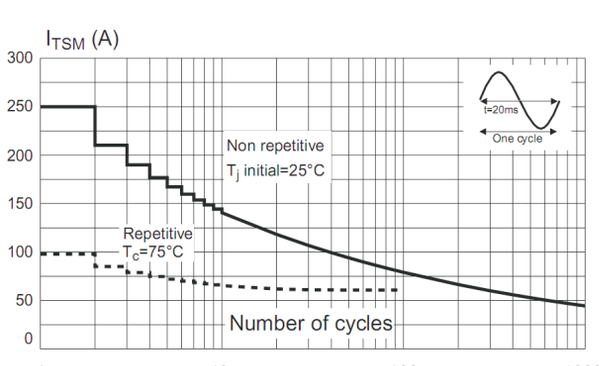


Fig.6 Surge peak on-state current versus number of cycles.



Description

Fig.7 Non-repetitive surge peak on-state current for a sinusoidal pulse with width tp < 10ms. and corresponding value of I^2t.

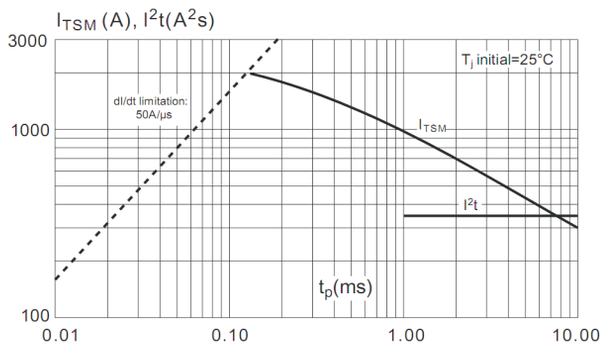


Fig.8 Relative variation of gate trigger current,holding current and latching current versus junction temperature (typical values).

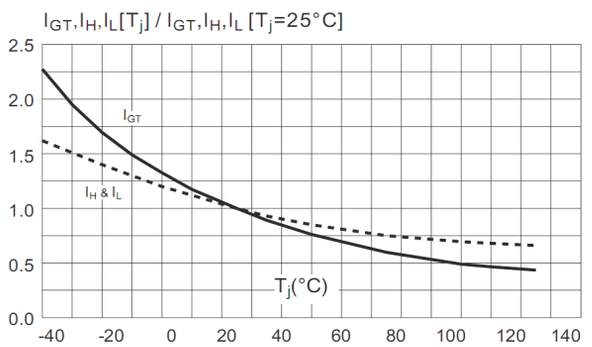


Fig.9 Relative variation of critical rate of decrease of main current versus (dV/dt)c (typical values).

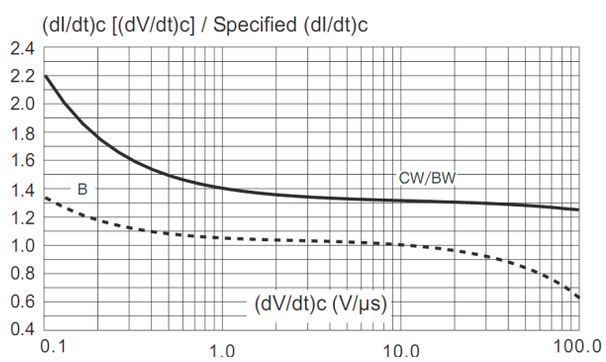
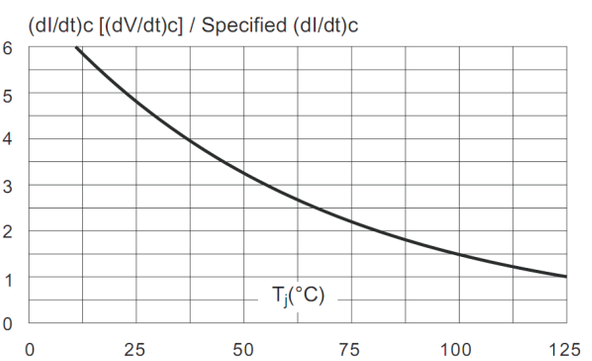


Fig.10 Relative variation of critical rate of decrease of main current versus T_j

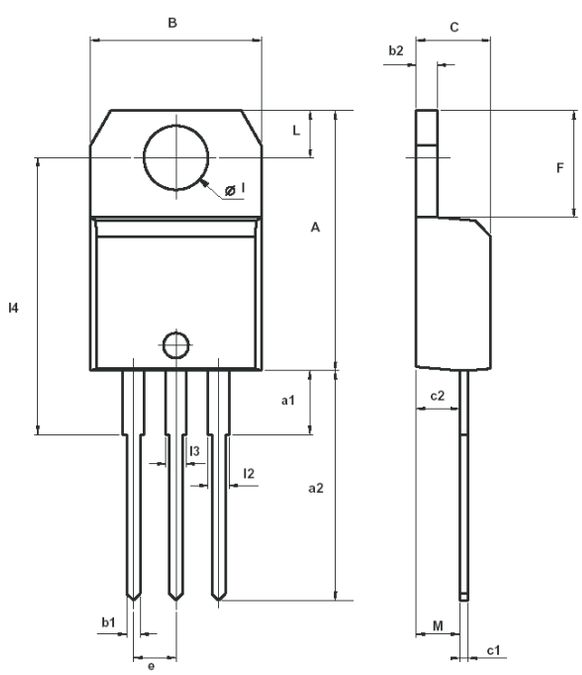


MECHANICAL DATA

Dimensions in mm

Net Mass: 2g

TO-220AB



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
I	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	