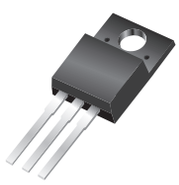
HP8Q80MC

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
	 TO-220F

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 800 V
- On-state RMS current to 8 A

SYMBOL	PARAMETER	Value	Unit
V_{DRM}	Repetitive peak off-state voltages	800	V
$I_{T(RMS)}$	RMS on-state current （full sine wave）	8	A
I_{TSM}	Non-repetitive peak on-state current (full cycle,Tj initial=25℃)	71	A

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
Rth j-mb	Junction to mounting case	full cycle half cycle	–	–	2.0 2.4	K/W
Rth(j-a)	Junction to ambient	in free air	–	60	–	K/W

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

SYMBOL	PARAMETER	CONDITIONS	MIN	Value	UNIT
V_{DRM}/V_{RRM}	Repetitive peak off-state Voltages		-	800	V
$I_{T(RMS)}$	RMS on-state current	Full sine wave;Tmb<=102℃	-	8	A
I_{TSM}	Non repetitive surge peak on-state current	Full sine wave;Tj=25℃ prior to surge t=20ms	-	65	A
		t=16.7ms	-	71	A
I^2t	I^2t value for fusing	tp=10ms	-	21	A^2S
dI_T/dt	Repetitive rate of rise of on-state current after triggering	I_{TM}=12A, I_G=0.2A; dI_G/dt=0.2 A/μs	-	100	A/μs
I_{GM}	Peak gate current		-	2	A
V_{GM}	Peak gate voltage		-	5	V
P_{GM}	Peak gate power		-	5	W
$P_{G(AV)}$	Average gate power	Over any 20 ms period	-	0.5	W
T_{stg}	Storage temperature		-40	150	℃
T_j	Operating junction temperature range		-40	125	℃

T_J=25℃ unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS		MIN	TYP	MAX	UNIT
Static characteristics							
I_{GT}	Gate trigger current[2]	V_D=12V; I_T=0.1 A	T2+ G+	2	-	35	mA
			T2+ G-	2	-	35	mA
			T2- G-	2	-	35	mA
I_L	Latching current	V_D=12V; I_{GT}=0.1 A	T2+ G+	-	31	60	mA
			T2+ G-	-	34	90	mA
			T2- G-	-	30	60	mA
I_H	Holding current	V_D=12V; I_{GT}=0.1 A		-	31	60	mA
V_T	On-state voltage	I_T=10 A		-	1.3	1.65	V
V_{GT}	Gate trigger voltage	V_D=12 V; I_T=0.1 A		-	0.7	1.5	V
		V_D=400V; I_T=0.1A; Tj=125℃		0.25	0.4	-	
I_D	Off-state leakage current	V_D=$V_{DRM(max)}$; Tj=125℃		-	0.1	0.5	mA

Dynamic Characteristics

dV_D/dt	Critical rate of rise of off-state voltage	V_D=67%V_{DRM} gate open;Tj=125℃ exponential waveform;gate open circuit	1000	4000	-	V/μs
dI_{com}/dt	Critical rate of change of commutating current	V_{DM}=400V;Tj=125℃; $I_{T(RMS)}$=8 A without snubber;gate open circuit	-	14	-	A/ms
t_{gt}	Gate controlled turn-on time	I_{TM}=12A;V_D=$V_{DRM(max)}$;IG=0.1A;d_{iG}/dt=5A/us	-	2	-	μs

Note1:minimum I_{GT} is guaranted at 5% of I_{GT} max.

Note2: for both polarities of A2 referenced to A1.

Description

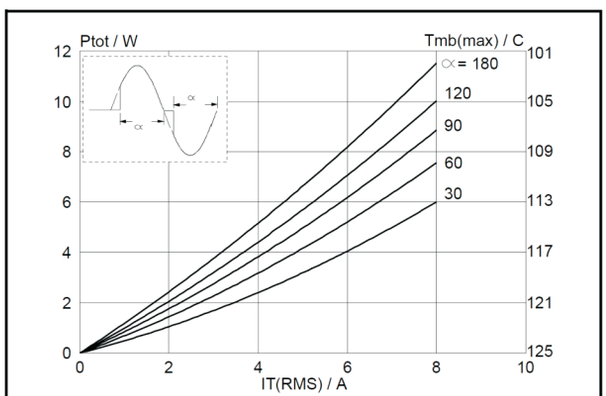


Fig.1. Maximum on-state dissipation, P_{tot}, versus rms on-state current, $I_{T(RMS)}$, where α = conduction angle.

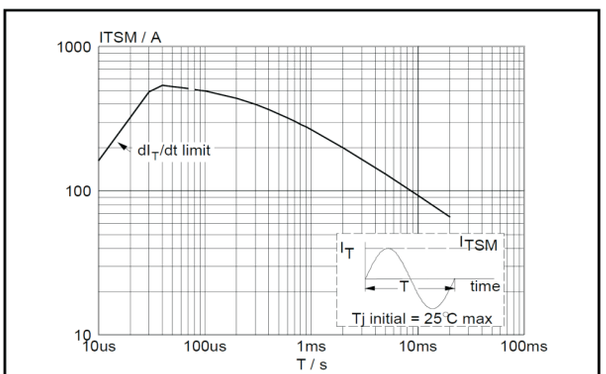


Fig.2. Maximum permissible non-repetitive peak on-state current I_{TSM}, versus pulse width t_p, for sinusoidal currents, $t_p \leq 20ms$.

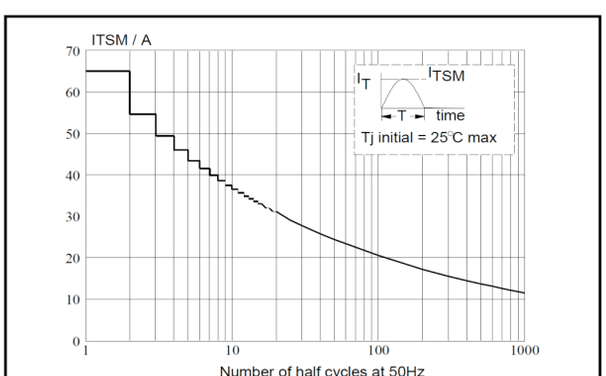


Fig.3. Maximum permissible non-repetitive peak on-state current I_{TSM}, versus number of cycles, for sinusoidal currents, f = 50 Hz.

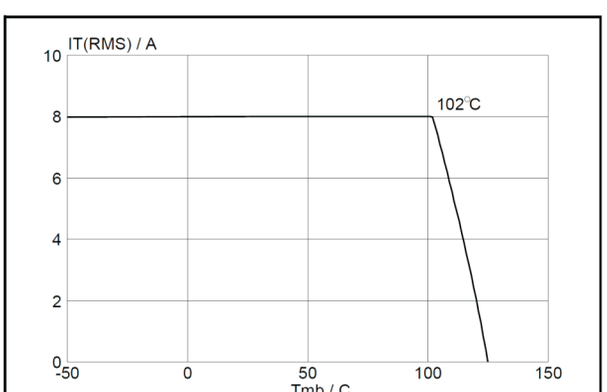


Fig.4. Maximum permissible rms current $I_{T(RMS)}$, versus mounting base temperature T_{mb}.

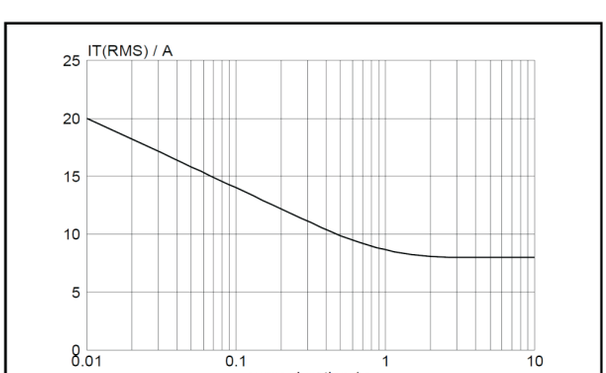


Fig.5. Maximum permissible repetitive rms on-state current $I_{T(RMS)}$, versus surge duration, for sinusoidal currents, f = 50 Hz; $T_{mb} \leq 102°C$.

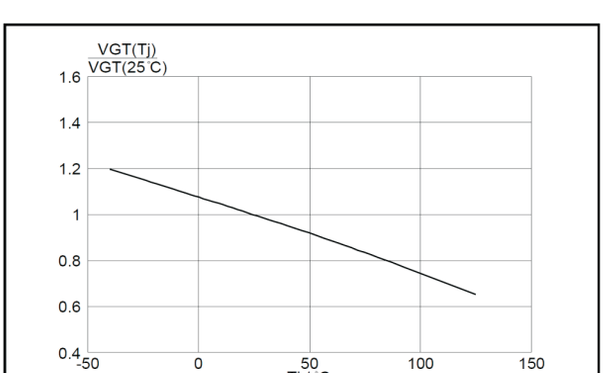


Fig.6. Normalised gate trigger voltage $V_{GT}(T_j)/ V_{GT}(25°C)$, versus junction temperature T_j.

Description

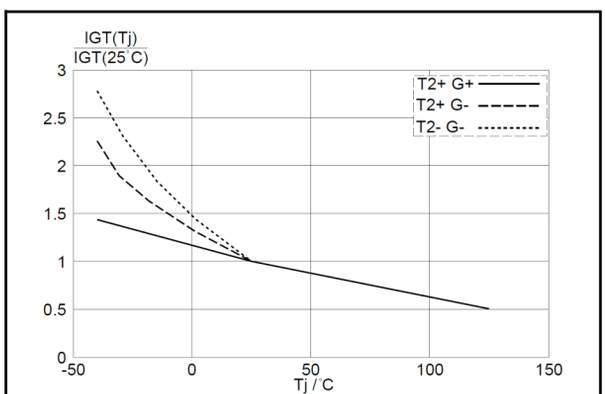


Fig.7. Normalised gate trigger current $I_{GT}(T_j)/ I_{GT}(25^{\circ}C)$, versus junction temperature T_j.

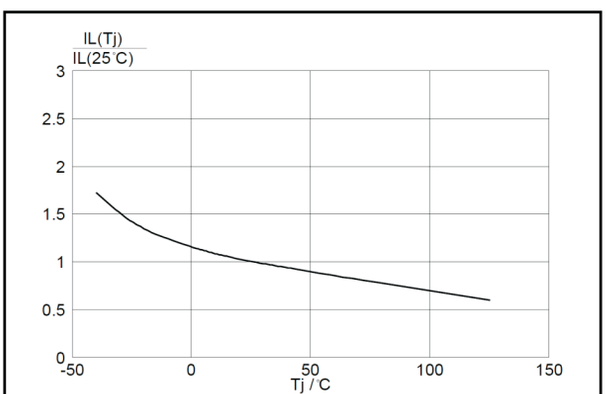


Fig.8. Normalised latching current $I_L(T_j)/ I_L(25^{\circ}C)$, versus junction temperature T_j.

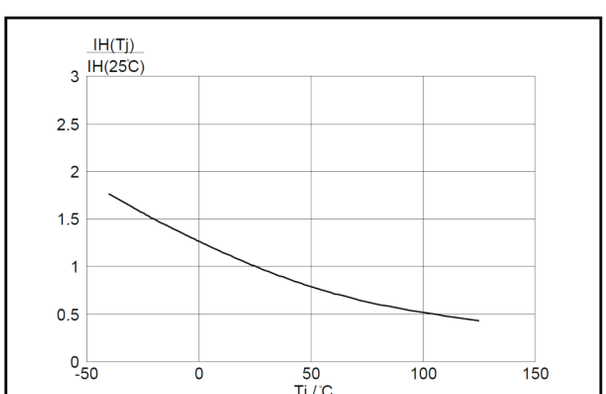


Fig.9. Normalised holding current $I_H(T_j)/ I_H(25^{\circ}C)$, versus junction temperature T_j.

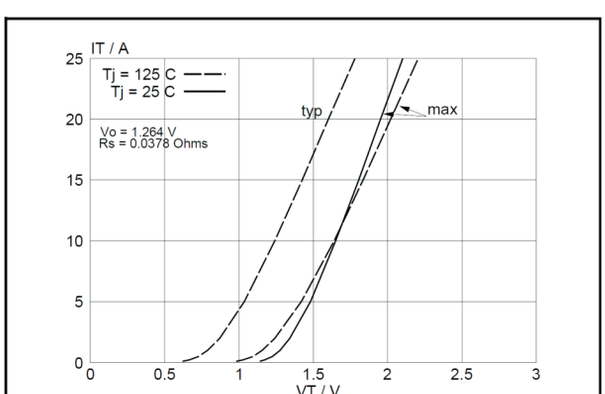


Fig.10. Typical and maximum on-state characteristic.

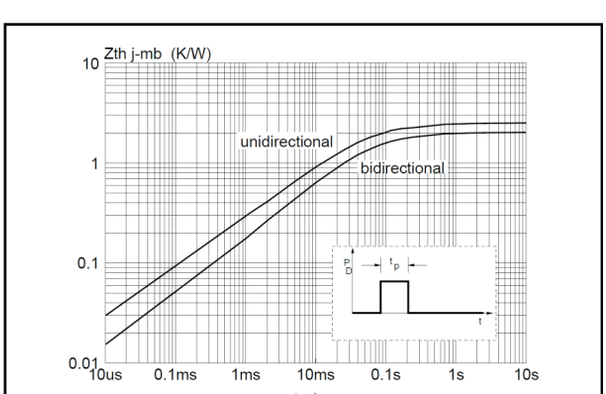


Fig.11. Transient thermal impedance $Z_{th\ j\text{-}mb}$, versus pulse width t_p.

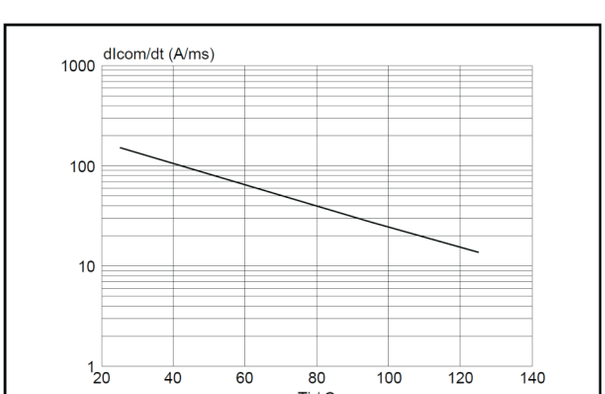
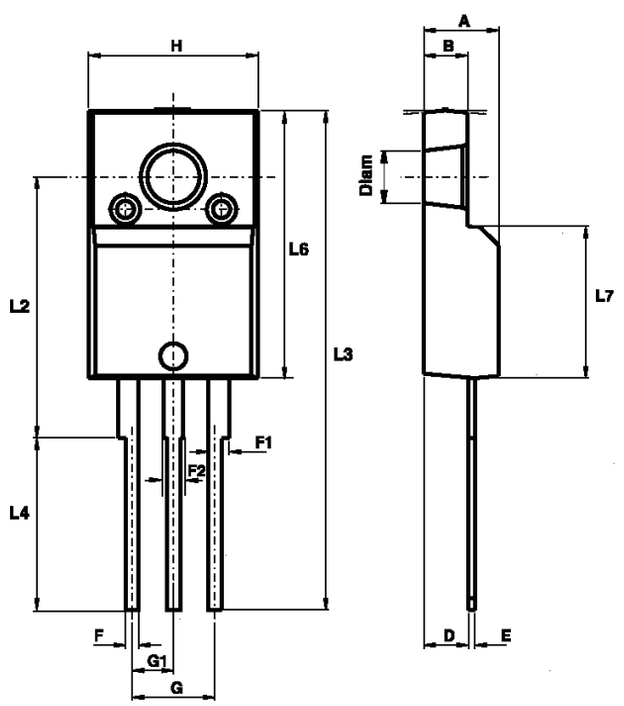


Fig.12. Typical, critical rate of change of commutating current, dI_{com}/dt versus junction temperature.

MECHANICAL DATA

Dimensions in mm
Net Mass: 2 g
TO-220F



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
B	2.50	2.70	0.098	0.106
D	2.50	2.75	0.098	0.108
E	0.40	0.70	0.016	0.028
F	0.75	1.00	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	2.40	2.70	0.094	0.106
H	10.00	10.40	0.394	0.409
L2	16.00 typ.		0.630 typ.	
L3	28.60	30.60	1.125	1.205
L4	9.80	10.60	0.386	0.417
L6	15.90	16.40	0.626	0.646
L7	9.00	9.30	0.354	0.366
Diam	3.00	3.20	0.118	0.126