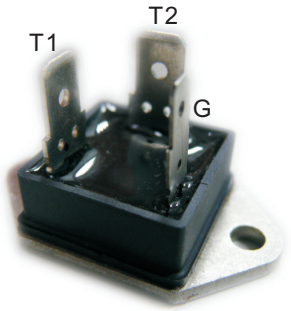
TRIACs, 40A
Sunbberless

FEATURES

- High current triac
- Low thermal resistance with clip bonding
- Low thermal resistance insulation ceramic for insulated TO-3 package
- High commutation capability
- Packages are RoHS compliant



APPLICATIONS

The snubberless concept offer suppression of RC network and it is suitable for applications such as on/off function in static relays, heating regulation, induction motor starting circuits, phase control operation in light dimmers, motor speed controllers, and silmilar.

Due to their clip assembly techinque, they provide a superior performance in surge current handling capabilities.

By using an internal ceramic pad, the M40T series provides voltage insulated tab (rated at 2500V_{RMS}) complying with UL standards.

MAIN FEATURES

SYMBOL	VALUE	UNIT
$I_{T(RMS)}$	40	A
V_{DRM}/V_{RRM}	600 to 1200	V
$I_{GT(Q1)}$	10 to 50	mA

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS		VALUE	UNIT
RMS on-state current (full sine wave)	$I_{T(RMS)}$	TO-3	T_c = 90ºC	40	A
Non repetitive surge peak on-state current (full cycle, T_j initial = 25°C)	I_{TSM}	F =50 Hz	t = 20 ms	400	A
		F =60 Hz	t = 16.7 ms	420	
I^2t Value for fusing	I^2t	t_p = 10 ms		800	A^2s
Critical rate of rise of on-state current $I_G = 2xI_{GT}$, $t_r \leq 100ns$	dI/dt	F =100 Hz	T_j =125ºC	50	A/µs
Peak gate current	I_{GM}	T_p =20 µs	T_j =125ºC	4	A
Peak gate power dissipation (tp = 20µs)	P_{GM}	T_j =125ºC		10	W
Average gate power dissipation	$P_{G(AV)}$	T_j =125ºC		1	
Storage temperature range	T_{stg}			- 40 to + 150	ºC
Operating junction temperature range	T_j			- 40 to + 125	

◎ ELECTRICAL CHARACTERISTICS (T_J= 25 ºC unless otherwise specified)

SNUBBERLESS and Logic level (3 quadrants)					
SYMBOL	TEST CONDITIONS	QUADRANT		Limits BW	Unit
I_{GT}(1)	V_D = 12 V, R_L = 33Ω	I - II - III	MAX.	50	mA
V_{GT}		I - II - III		1.3	V
V_{GD}	$V_D = V_{DRM}$, R_L = 3.3KΩ T_j = 125°C	I - II - III	MIN.	0.2	V
I_H(2)	I_T = 500 mA		MAX.	60	mA
I_L	I_G = 1.2 I_{GT}	I - III	MAX.	80	mA
		II		100	
dV/dt(2)	V_D = 67% V_{DRM}, gate open ,T_j = 125°C		MIN.	1000	V/µs
(dI/dt)c(2)	Without snubber, T_j = 125°C			20	A/ms

STATIC CHARACTERISTICS					
SYMBOL	TEST CONDITIONS			VALUE	UNIT
V_{TM}(2)	I_{TM} = 60 A, t_P = 380 µs	T_j = 25°C	MAX.	1.55	V
V_{t0}(2)	Threshold voltage	T_j = 125°C	MAX.	0.85	V
R_d(2)	Dynamic resistance	T_j = 125°C	MAX.	10	mΩ
I_{DRM} I_{RRM}	$V_D = V_{DRM}$ $V_R = V_{RRM}$	T_j = 25°C	MAX.	10	µA
		T_j = 125°C		5	mA

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

THERMAL RESISTANCE			
SYMBOL		VALUE	UNIT
$R_{th(j-c)}$	Junction to case (AC)	0.8	°C/W
$R_{th(j-a)}$	Junction to ambient	50	

S = Copper surface under tab.

PRODUCT SELECTOR							
PART NUMBER	VOLTAGE (xx)				SENSITIVITY	TYPE	PACKAGE
	600 V	800 V	1000 V	1200 V			
M40TxxA	V	V	V	V	50 mA	Snubberless	TO-3

ORDERING INFORMATION					
ORDERING TYPE	MARKING	PACKAGE	WEIGHT	BASE Q'TY	DELIVERY MODE
M40TxxA	M40TxxA	TO-3	23g	50	BOX

ORDERING INFORMATION SCHEME

M 40 T 60 A

Module type
M = TO-3 Fast-on packege

Current
40 = 40A

Triac series

Voltage
60 = 600V
80 = 800V
100 = 1000V
120 = 1200V

Package type
A = Soldering Assembly

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

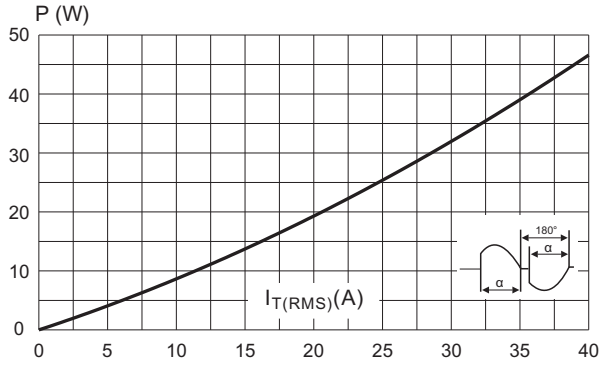


Fig.2 On-state rms current versus case temperature (full cycle)

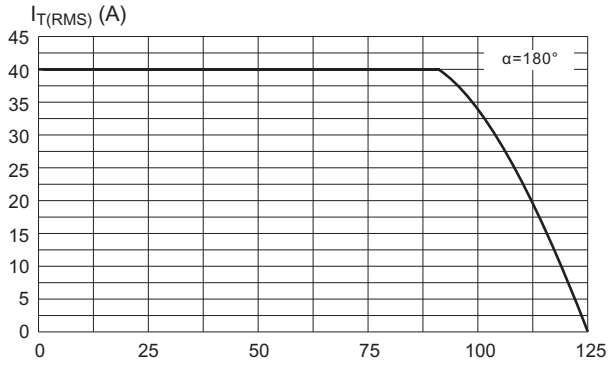


Fig.3 Relative variation of thermal impedance versus pulse duration.

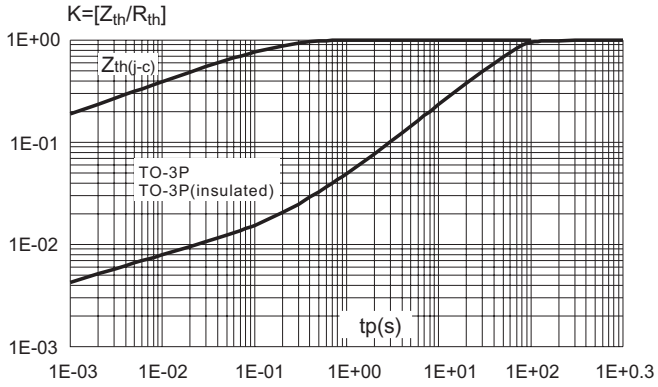


Fig.4 On-state characteristics (maximum values).

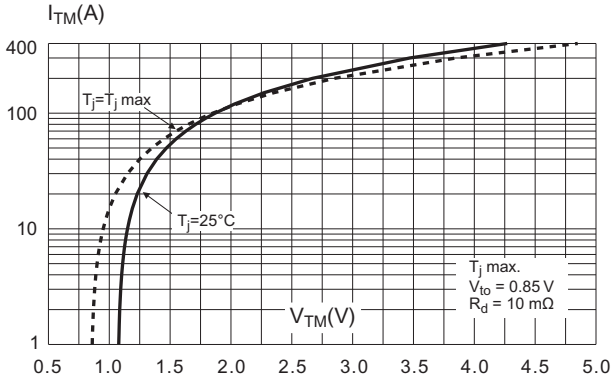


Fig.5 Surge peak on-state current versus number of cycles.

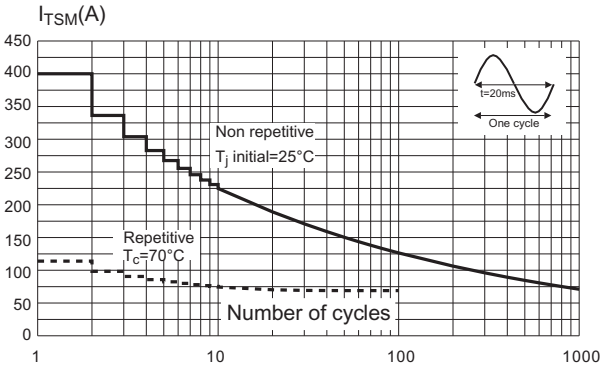


Fig.6 Non-repetitive surge peak on-state current for a sinusoidal pulse and corresponding value of I^2t.

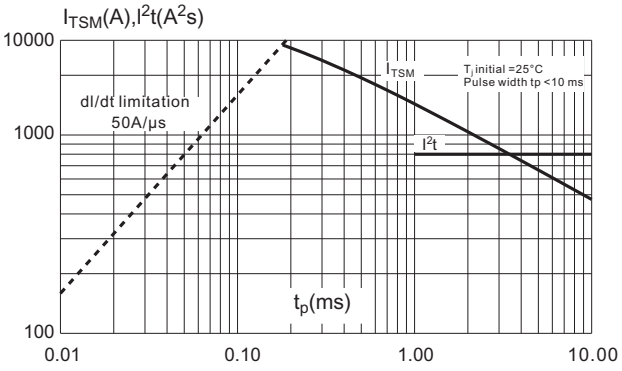


Fig.7 Relative variation of gate trigger, holding and latching current versus junction temperature.

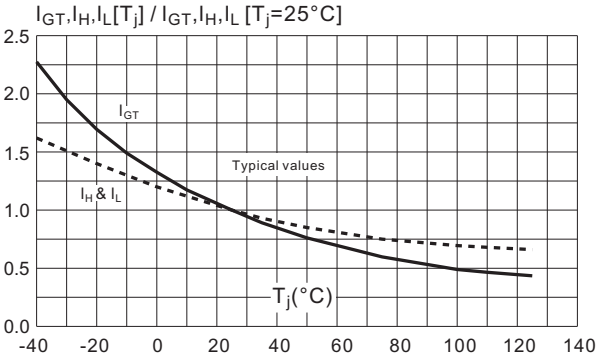


Fig.8 Relative variation of critical rate of decrease of main current versus (dV/dt)c (typical values).

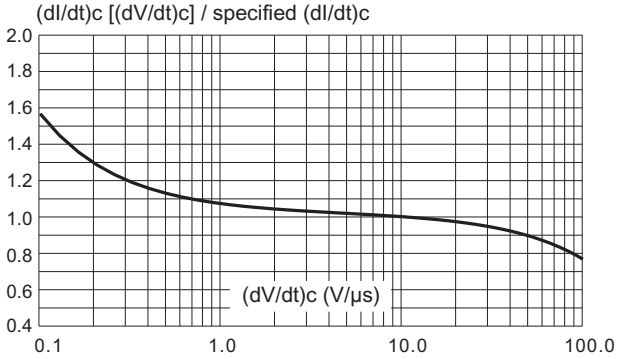
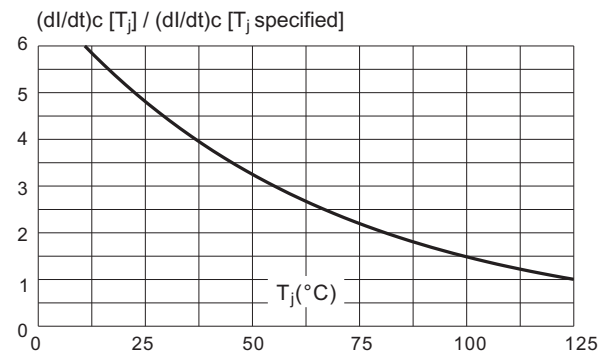
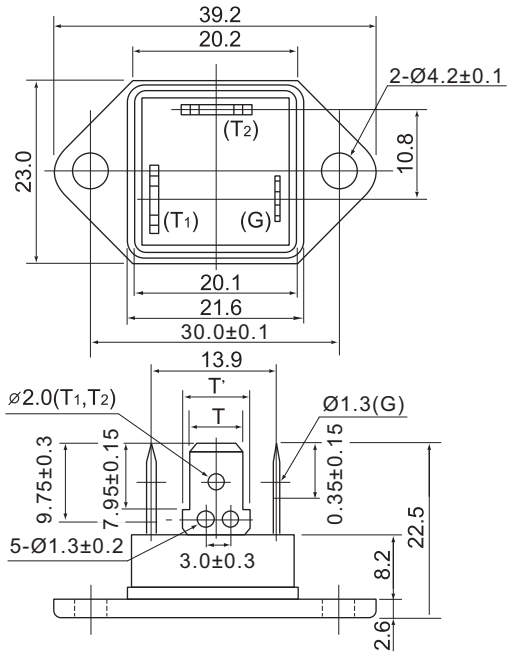


Fig.9 Relative variation of critical rate of decrease of main current versus (dV/dt)c.





T_1:TAB250(T=6.35, T'=8.25, t=0.8)
T_2:TAB250(T=6.35, T'=8.25, t=0.8)
G:TAB187(T=4.75, T'=5.7, t=0.5)

All dimensions in millimeters