

FMBCRPAT08-80

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FMBCRPAT08-80

8.0A 800V Triode AC Semiconductor Switch

Features

- $V_D / V_R : 800V, I_{T(RMS)} : 8A, I_{GT} : 5mA$.
- Glass passivated junctions.
- High voltage and surge capability.
- Low thermal resistance and durability.
- Triggering in all four quadrants.
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen-free part, ex.FMBCRPAT08-80-H.

Applications

- Static relays.
- Heating regulation.
- In-duction motor starting circuits.
- Phase control operation in light dimmers.
- Motor speed controllers.

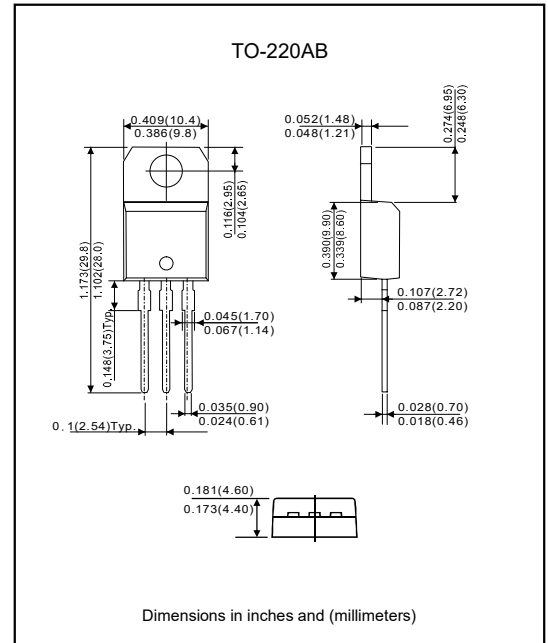
Mechanical data

- Epoxy:UL94-V0 rated flame retardant.
- Case : Molded plastic, TO-220AB.
- Terminals : Solder plated, solder able per MIL-STD-750, Method 2026.
- Mounting Position : Any.

Maximum ratings (At $T_c=25^\circ C$ unless otherwise specified)

Parameter	Symbol	Ratings	Unit
Repetitive peak off-state voltage (T=25°C)	V_{DRM}	800	V
Repetitive peak reverse voltage (T=25°C)	V_{RRM}	800	V
RMS on-state current (T _c =100°C)	$I_{T(RMS)}$	8	A
Non repetitive surge peak on-state current (full cycle, f=50Hz)	I_{TSM}	80	A
I ² t value for fusing (t _p =10ms)	I ² t	32	A ² S
Critical rate of rise of on-state current (I=2×I _{GT})	di/dt	50	A/μS
Peak gate current	I _{GM}	4	A
Peak gate power dissipation	P _{GM}	5	W
Average gate power dissipation	P _{G(AV)}	1	W
Thermal resistance, junction to case (DC)	R _{θJC}	2.7	°C/W
Operating junction temperature	T _J	+125	°C
Storage junction temperature range	T _{STG}	-40 to +150	°C

Package outline



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Electrical characteristics ($T_c=25^\circ\text{C}$ unless otherwise specified)

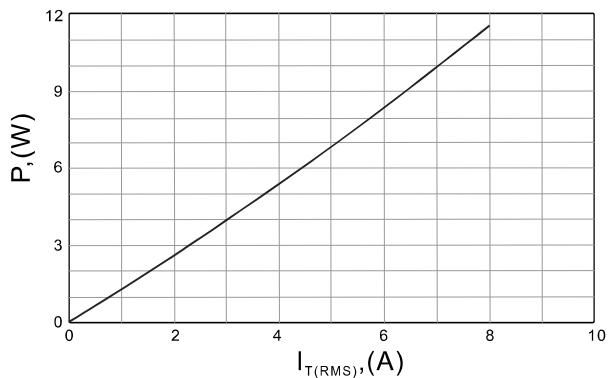
Parameter	Symbol	Conditions	Quadrant	Min.	Typ.	Max.	Unit
Gate trigger current	I_{GT}	$V_D=12\text{V}$, $I_T=0.1\text{A}$, $T_J=25^\circ\text{C}$	I II III			5	mA
Gate trigger voltage	V_{GT}		I II III			1.5	V
Gate Non-trigger voltage	V_{GD}	$V_D=V_{DRM}$, $T_J=125^\circ\text{C}$	I II III	0.2			V
Latching current	I_L	$I_G=1.2I_{GT}$	I-III			20	mA
			II			25	
Holding current	I_H	$I_T=100\text{mA}$				15	mA
Critical rate of rise of off-state voltage	dv/dt	$V_D=2/3V_{DRM}$ gate open, $T_J=125^\circ\text{C}$		50			V/ μs

Static characteristics

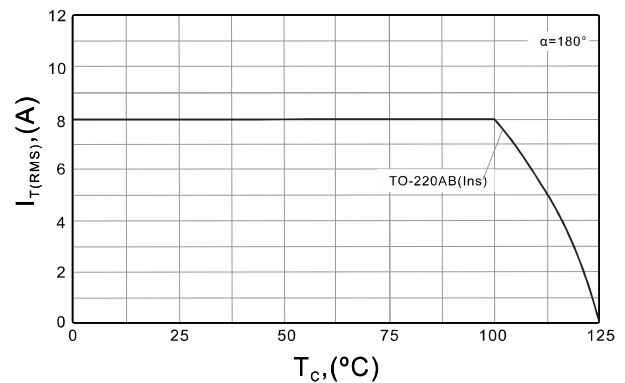
Peak on-state voltage	V_{TM}	$I_{TM}=11\text{A}$, $t_p=380\mu\text{s}$	($T_J=25^\circ\text{C}$)			1.55	V
Repetitive peak off-state current	I_{DRM}	$V_D=V_{DRM}$, $V_R=V_{RRM}$	($T_J=25^\circ\text{C}$)			5	μA
Repetitive peak reverse current	I_{RRM}		($T_J=125^\circ\text{C}$)			1	mA

Rating and characteristic curves

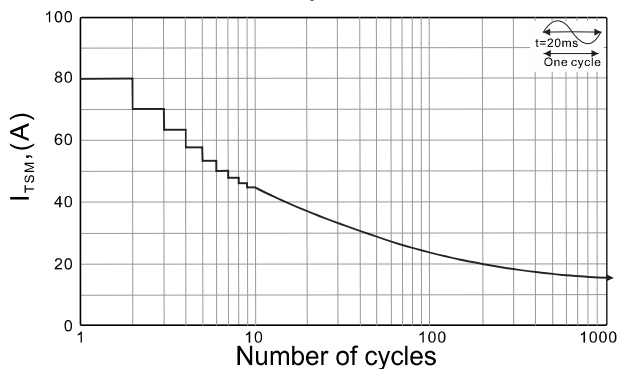
Maximum power dissipation vs. On-state current



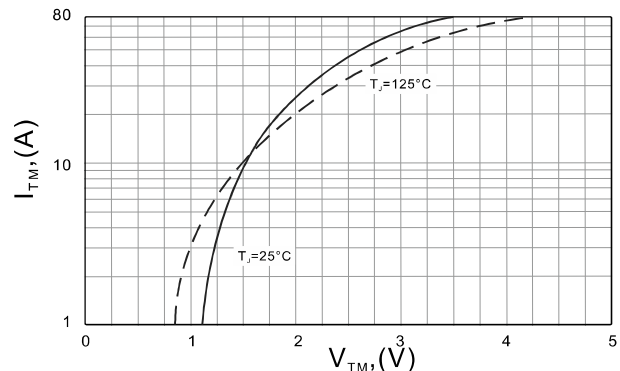
On-state current vs. Case temperature



Surge peak on-state current vs. Number of cycles



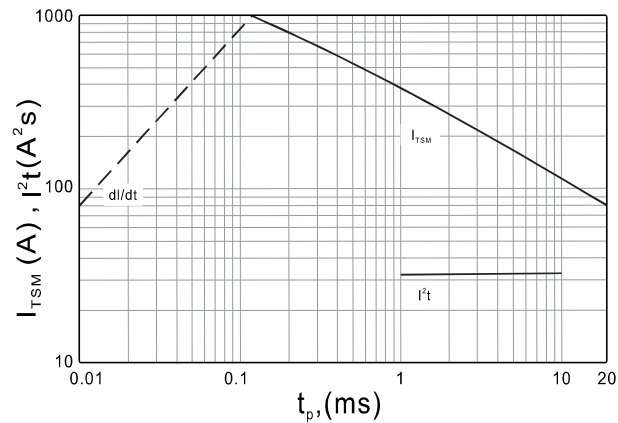
On-state characteristics (maximum values)



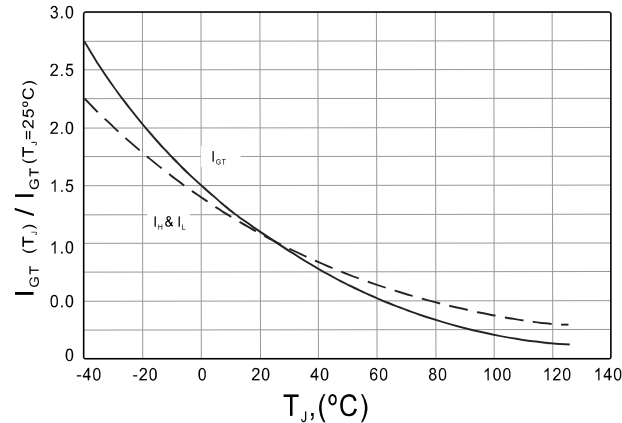
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Rating and characteristic curves

Non - repetitive surge peak on-state current
(for a sinusoidal pulse with width $t_p < 10\text{ms}$,
and corresponding value of I^2t ($dI/dt < 50\text{A}/\mu\text{s}$))



Relative variations of gate trigger current
holding current and latching current vs.
junction temperature



Pinning information

Pin	Simplified outline	Symbol
Pin1 T1 (Main Terminal-1) Pin2 T2 (Main Terminal-2) Pin3 Gate		

Marking

Type number	Marking code
FMBCRPAT08-80	BCRPAT08-80

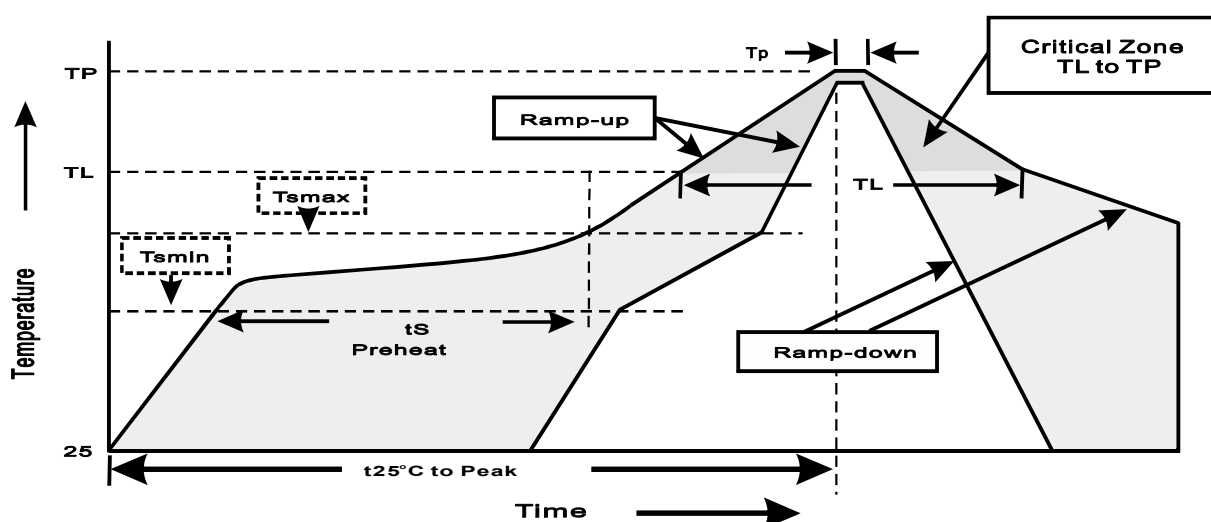
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Packing Information

Device	Outline	Device Package	Tube (pcs)	Inner Box (pcs)	Per Carton (pcs)
FMBCRPAT08-80	Tube	TO-220AB	50	1,000	8,000

Suggested thermal profiles for soldering processes

- 1.Storage environment: Temperature=5°C~40°C Humidity=55%±25%
- 2.Reflow soldering of surface-mount devices



3.Reflow soldering

Profile Feature	Soldering Condition
Average ramp-up rate(T_L to T_P)	$<3^{\circ}\text{C}/\text{sec}$
Preheat -Temperature Min(T_{smin}) -Temperature Max(T_{smax}) -Time(min to max)(t_s)	150°C 200°C 60~120sec
T_{smax} to T_L -Ramp-upRate	$<3^{\circ}\text{C}/\text{sec}$
Time maintained above: -Temperature(T_L) -Time(t_L)	217°C 60~260sec
Peak Temperature(T_P)	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(t_P)	10~30sec
Ramp-down Rate	$<3^{\circ}\text{C}/\text{sec}$
Time 25°C to Peak Temperature	<6minutes