

FMBCRS01-80

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FMBCRS01-80

1.0A 800V Triode AC Semiconductor Switch

Features

- $V_D / V_R : 800V$, $I_{T(RMS)} : 1A$, $I_{GT} : 3mA$.
- 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.FMBCRS01-80-H.

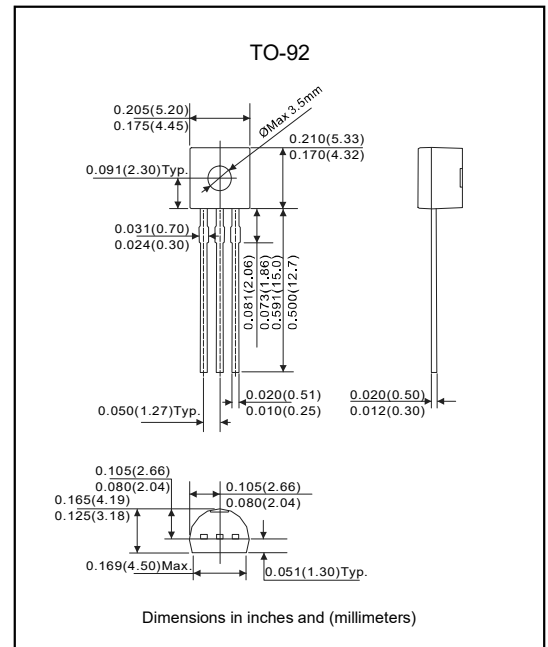
Applications

- 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-92.
- Terminals : Solder plated, solder able per MIL-STD-750, Method 2026.
- Mounting Position : Any.

Package outline



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

Parameter	Symbol	Ratings	Unit
Repetitive peak off-state voltage ($T=25^\circ C$)	V_{DRM}	800	V
Repetitive peak reverse voltage ($T=25^\circ C$)	V_{RRM}	800	V
Non-repetitive surge peak off-state voltage	V_{DSM}	$V_{DRM}+100$	V
Non-repetitive peak reverse voltage	V_{RSM}	$V_{RRM}+100$	V
RMS on-state current ($T_c=51^\circ C$)	$I_{T(RMS)}$	1	A
Non repetitive surge peak on-state current (180° conduction angle, $f=50Hz$)	I_{TSM}	12	A
I^2t value for fusing ($t_p=10ms$)	I^2t	0.72	A^2S
Critical rate of rise of on-state current ($I=2 \times I_{GT}$, $t_r \leq 100ns$)	di/dt	20	$A/\mu S$
Peak gate current	I_{GM}	1	A
Average gate power dissipation	$P_{G(AV)}$	0.5	W
Thermal resistance, junction to case (AC)	$R_{\theta JC}$	60	$^\circ C/W$
Operating junction temperature	T_J	+125	$^\circ C$
Storage junction temperature range	T_{STG}	-40 to +150	$^\circ C$

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

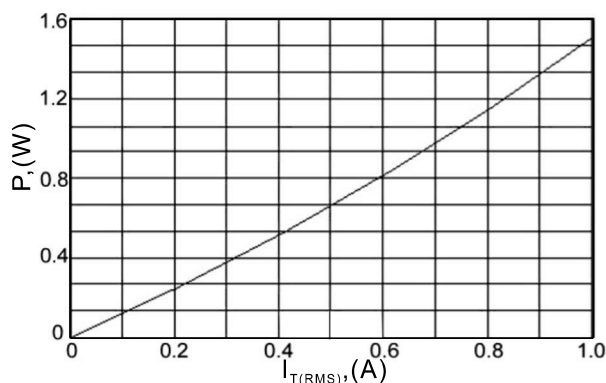
Parameter	Symbol	Conditions	Quadrant	Min.	Typ.	Max.	Unit
Gate trigger current	I_{GT}	$V_D=12\text{V}$	I-II-III			3	mA
			IV			7	
Gate trigger voltage	V_{GT}		ALL			1.3	V
Gate Non-trigger voltage	V_{GD}	$V_D=V_{DRM}, T_J=125^\circ\text{C}$	ALL	0.2			V
Latching current	I_L	$I_G=1.2I_{GT}$	I-III			5	mA
			II-IV			15	
Holding current	I_H	$I_T=200\text{mA}$				5	mA
Critical rate of rise of off-state voltage	dv/dt	$V_D=2/3V_{DRM}$ gate open, $T_J=125^\circ\text{C}$		20			V/ μs

Static characteristics

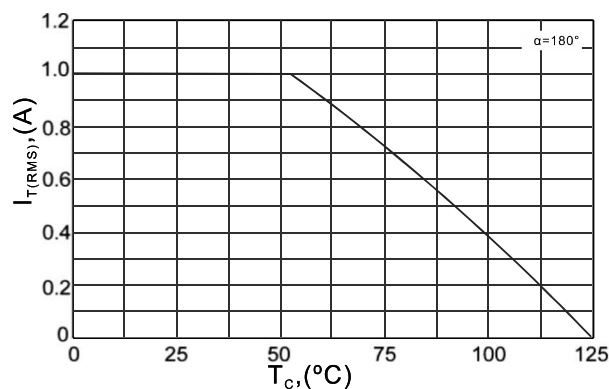
Peak on-state voltage	V_{TM}	$I_{TM}=1.4\text{A}, t_p=380\mu\text{s}$	$(T_J=25^\circ\text{C})$			1.5	V
Repetitive peak off-state current	I_{DRM}	$V_D=V_{DRM}, V_R=V_{RRM}$	$(T_J=25^\circ\text{C})$			5	μA
Repetitive peak reverse current	I_{RRM}		$(T_J=125^\circ\text{C})$			5	mA

Rating and characteristic curves

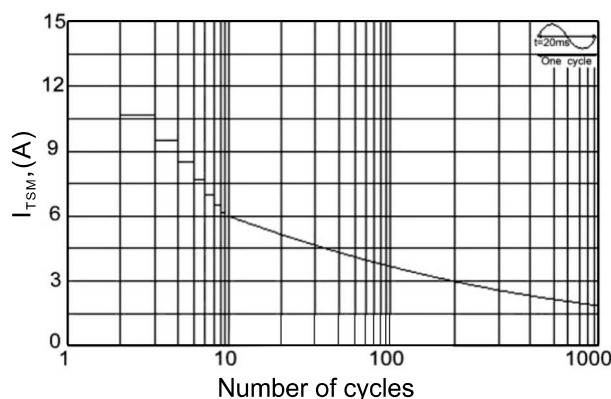
Maximum power dissipation vs. On-state current



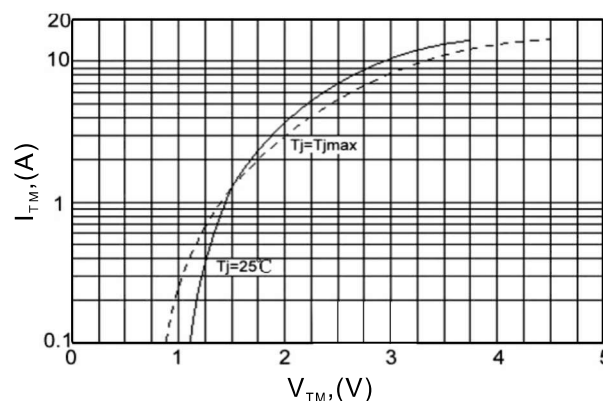
On-state current vs. Case temperature



Surge peak on-state current vs. Number of cycles



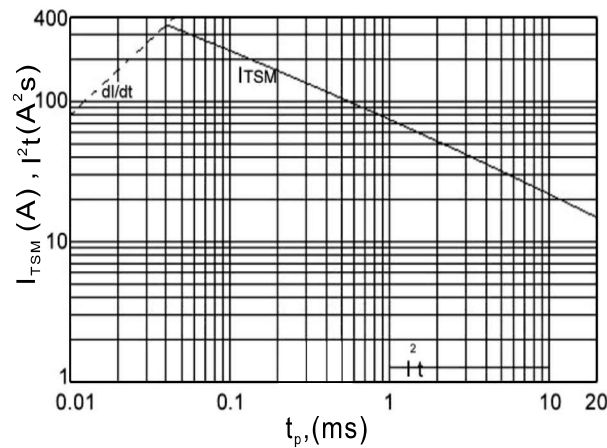
On-state characteristics (maximum values)



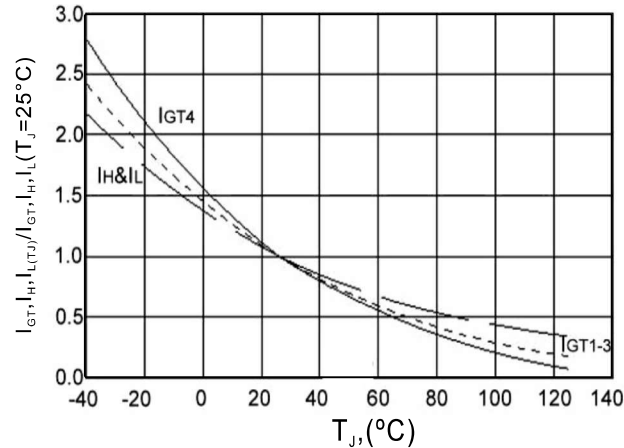
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Rating and characteristic curves

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		

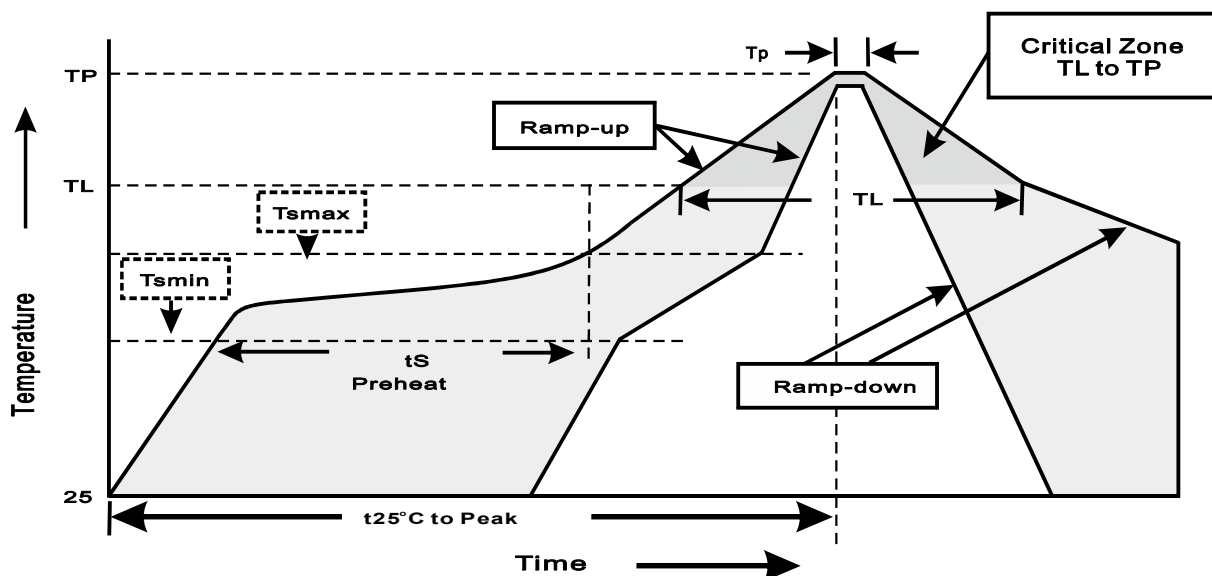
Marking

Type number	Marking code
FMBCRS01-80	BCRS01-80

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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°C/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°C/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°C/sec
Time 25°C to Peak Temperature	<6minutes