

FMBCRB25-60

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25.0A 600V Triode AC Semiconductor Switch

Features

- V_D / V_R : 600V, $I_{T(RMS)}$: 25A, I_{GT} : 35mA.
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen-free part, ex.FMBCRB25-60-H.

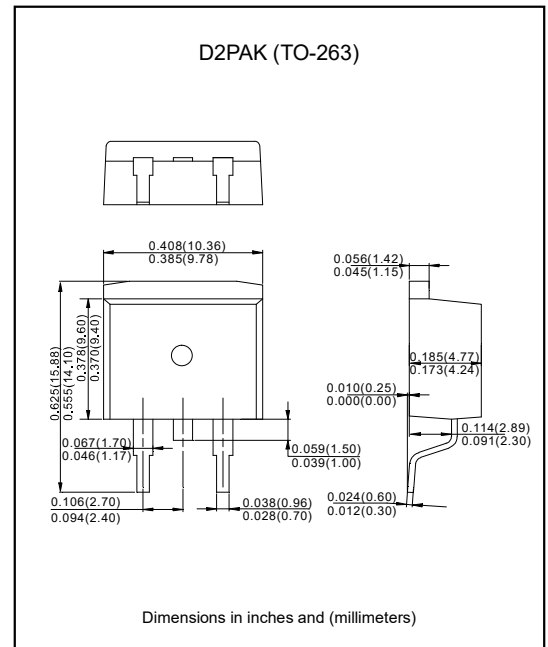
Applications

- General purpose AC switching.
- Heating regulation ON/OFF function, etc.

Mechanical data

- Epoxy:UL94-V0 rated flame retardant.
- Case : Molded plastic, D2PAK (TO-263).
- Terminals : Solder plated, solder able per MIL-STD-750, Method 2026.
- Mounting Position : Any.

Package outline



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

Parameter	Symbol	Ratings	Unit
Repetitive peak off-state voltage ($T_J=25^\circ\text{C}$)	V_{DRM}	600	V
Repetitive peak reverse voltage ($T_J=25^\circ\text{C}$)	V_{RRM}	600	V
RMS on-state current ($T_c \leq 97^\circ\text{C}$)	$I_{T(RMS)}$	25	A
Non repetitive surge peak on-state current (full cycle, $t_p=20\text{ms}$, $T_J=25^\circ\text{C}$)	I_{TSM}	250	A
Non repetitive surge peak on-state current (full cycle, $t_p=16.6\text{ms}$, $T_J=25^\circ\text{C}$)		275	
I^2t value for fusing ($t_p=10\text{ms}$, $T_J=25^\circ\text{C}$)	I^2t	340	A^2S
Critical rate of rise of on-state current ($I=2 \times I_{GT}$, $f=100\text{Hz}$, $T_J=125^\circ\text{C}$)	di/dt	100	$\text{A}/\mu\text{S}$
Peak gate current ($t_p=20\mu\text{s}$, $T_J=125^\circ\text{C}$)	I_{GM}	4	A
Average gate power dissipation ($T_J=125^\circ\text{C}$)	$P_{G(AV)}$	0.5	W
Peak gate power	P_{GM}	10	W
Peak pulse voltage ($T_J=25^\circ\text{C}$, non-repetitive, off-state)	V_{PP}	2.5	kV
Operating junction temperature	T_J	+125	$^\circ\text{C}$
Storage junction temperature range	T_{STG}	-40 to +150	$^\circ\text{C}$
Thermal resistance, junction to ambient (AC, in free air, $S=2\text{cm}^2$)	$R_{\theta JA}$	45	$^\circ\text{C}/\text{W}$
Thermal resistance, junction to case (AC)	$R_{\theta JC}$	0.8	$^\circ\text{C}/\text{W}$

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

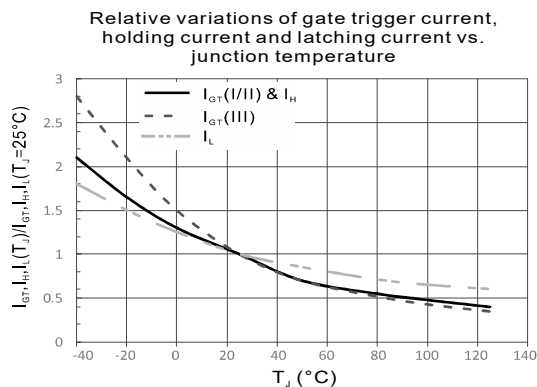
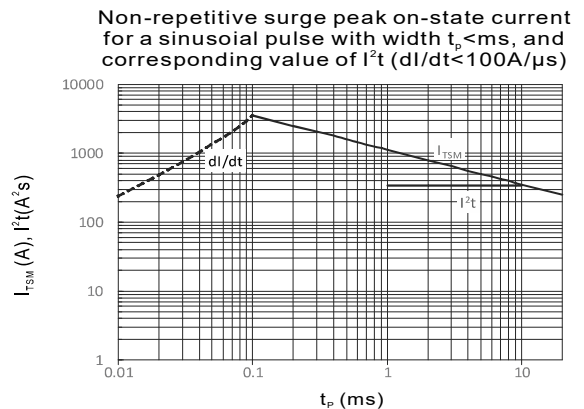
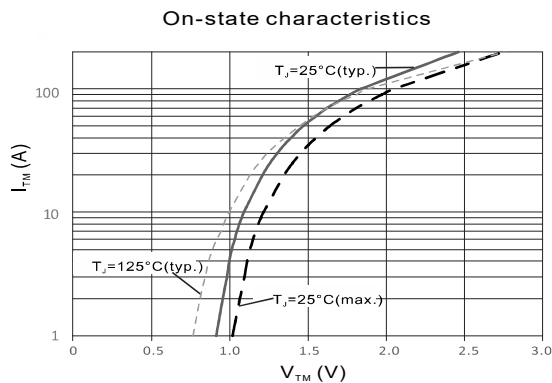
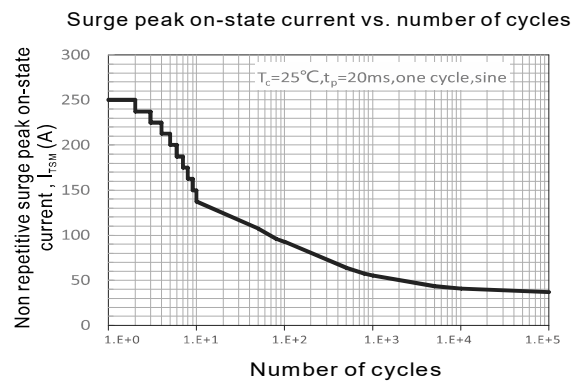
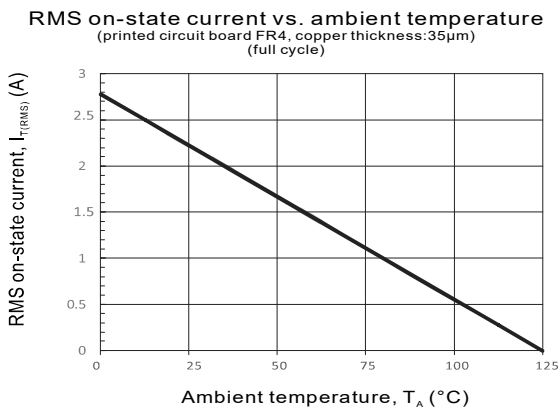
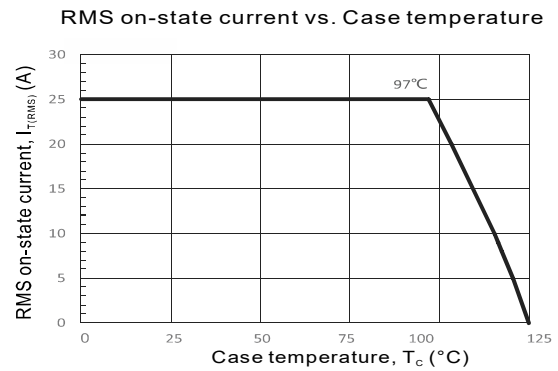
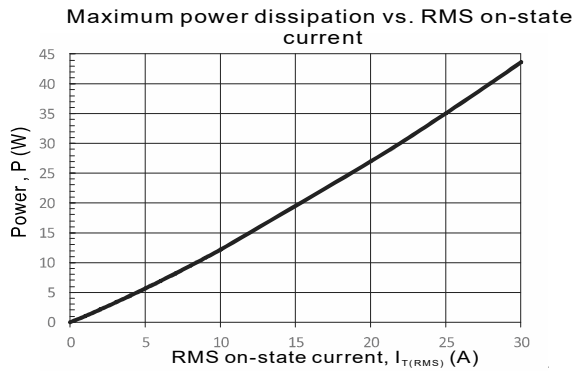
Parameter	Symbol	Conditions	Quadrant	Min.	Typ.	Max.	Unit
Gate trigger current	I_{GT}	$V_D=12\text{V}, R_L=33\Omega$	I-II-III			35	mA
Gate trigger voltage	V_{GT}		I-II-III			1	V
Gate Non-trigger voltage	V_{GD}	$V_D=V_{DRM}, R_L=3.3\text{k}\Omega$ ($T_J=125^\circ\text{C}$)	ALL	0.2			V
Latching current	I_L	$I_G=1.2I_{GT}$	I-III			70	mA
			II			80	
Holding current	I_H	$I_T=500\text{mA}$				50	mA
Critical rate of rise off-state voltage	dv/dt	$V_D=400\text{V}$ gate open ($T_J=125^\circ\text{C}$)		1500			V/ μs
Critical rate of decrease of commutating on- state current	$(di/dt)_c$	$(dv/dt)_c=20\text{V}/\mu\text{s}$ ($T_J=125^\circ\text{C}$)		15			A/ms
Turn-on time	t_{on}	$I_G=40\text{mA}, I_A=200\text{mA}, I_R=20\text{mA}$ ($T_J=25^\circ\text{C}$)			7		μs
Turn-off time	t_{off}				50		

Static characteristics

Peak on-state voltage	V_{TM}	$I_{TM}=35\text{A}, t_p=380\mu\text{s}$ ($T_J=25^\circ\text{C}$)				1.5	V
Threshold voltage	V_{TO}					0.75	V
Dynamic resistance	R_D					18	m Ω
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}		$(T_J=125^\circ\text{C})$			1.5	mA

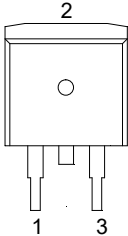
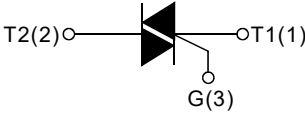
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Rating and characteristic curves

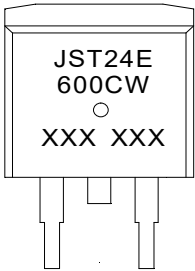


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Pinning information

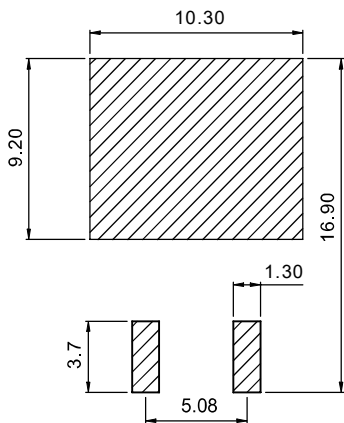
Pin	Simplified outline	Symbol
Pin1 T1 (Main Terminal-1) Pin2 T2 (Main Terminal-2) Pin3 Gate		

Marking

Type number	Marking code
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* YWW: Wafer lot code
Y: Year
WW: Week
XX: Assy. code
K: Lot run traceability code

Suggested solder pad layout



Note:
1. Controlling dimension: in millimeters.
2. General tolerance: ± 0.1 mm.
3. The pad layout is for reference purposes only.

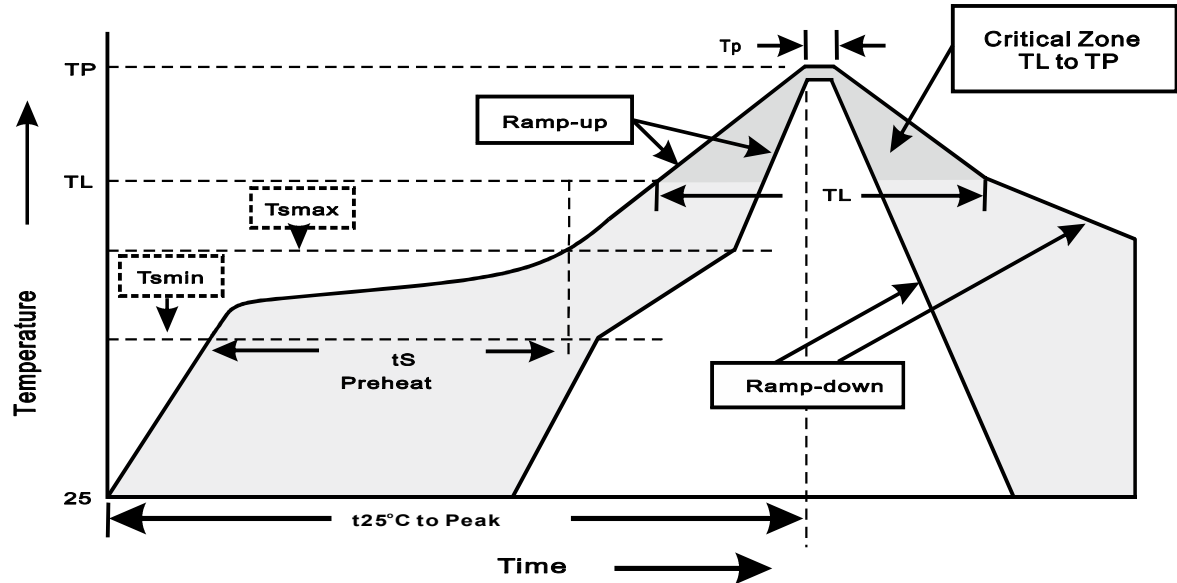
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Packing Information

Device	Outline	Device Package	Tube (pcs)
FMBCRB25-60	Tube	D2PAK (TO-263)	50
	Tape & Reel		800

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