FMCRP16-60

List

FMCRP16-60

16.0A 600V Sensitive Gate Silicon Controlled Rectifiers Blocking Voltage

Features

- V_D / V_R= 600V, $I_{T(RMS)}$=16A, $I_{GT(Max)}$=15mA .
- High thermal cycling performance.
- Very high current surge capacity.
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen free parts, ex. FMCRP16-60-H.

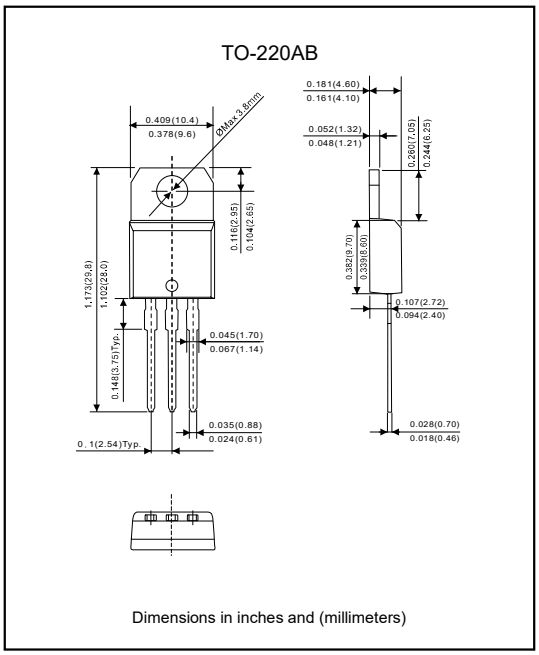
Applications

- Line rectifying 50/60 Hz.
- Soft start AC motor control.
- DC motor control.
- Power converter.
- AC power control.
- Lighting and temperature control.

Mechanical data

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

Package outline



Maximum ratings (T_A=25ºC, Unless otherwise noted)

Parameter		Symbol	Ratings	Unit
Repetitive peak off-state voltage		V_{DRM}	600	V
Repetitive peak reverse voltage		V_{RRM}	600	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=110°C)	$I_{T(RMS)}$	16	A
Non-repetitive surge peak on-state current	(180° conduction angle, F=50Hz)	I_{TSM}	190	A
Average on-state current	(180° conduction angle)	$I_{T(AV)}$	10	A
Circuit fusing considerations	I^2t value for fusing (t_p=10ms)	I^2t	180	A^2s
Peak gate current		I_{GM}	4	A
Average gate power dissipation		$P_{G(AV)}$	1	W
Critical rate of rise of on-state current	(I= 2x I_{GT}x t_r≤ 100ns)	dI/dt	50	A/µs
Thermal resistance, junction to case	(DC)	$R_{\theta JC}$	1.1	°C/W
Operating Junction temperature range		T_J	+125	°C
Storage temperature range		T_{STG}	-40 to +150	°C

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Electrical characteristics (At T=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On characteristics						
Gate Trigger Current	I_{GT}	V=12V, R=140Ω			15	mA
Holding Current	I_H	I_T=50mA			50	mA
Latch Current	I_L	I_G=1.2 I_{GT}			60	mA
Gate trigger voltage	V_{GT}	V=12V, R=140Ω			1.3	V
Non-triggering gate voltage	V_{GD}	V_D=V_{DRM}, T_J=125°C	0.2			V
Static characteristics						
Peak forward on-state voltage	V_{TM}	I_{TM}=32A, t_p=380μs, T_J=25°C			1.6	V
Forward and reverse leakage current	I_{DRM}	V_D=V_{DRM}, V_R=V_{RRM}, T_J=25°C			5	μA
Leakage current for diodes	I_{RRM}	V_D=V_{DRM}, V_R=V_{RRM}, T_J=125°C			2	mA
Dynamic parameters						
Critical rate of rise of off-state voltage	dV/dt	V_D=2/3 V_{DRM}, gate open T_J=125°C	500			V/μs

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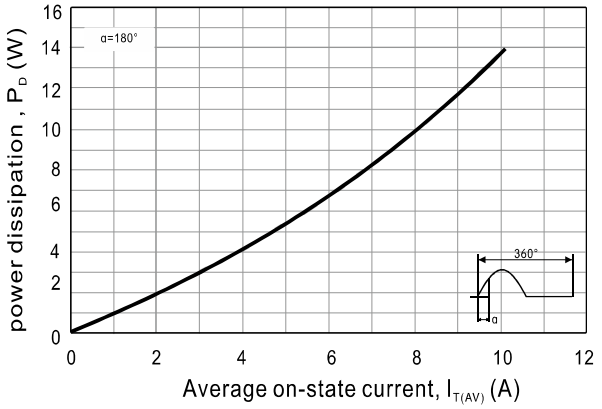
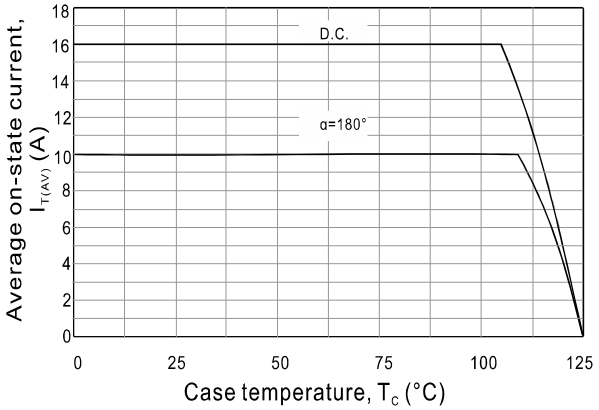
Rating and characteristic curves

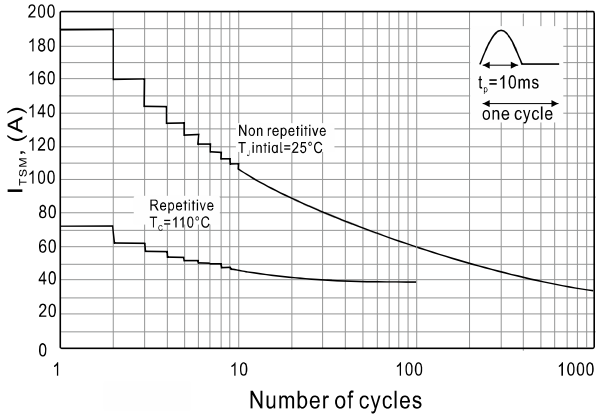
Maximum power dissipation vs. average on-state current



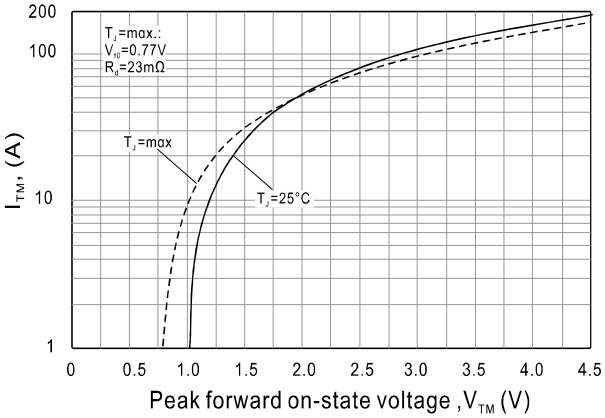
On-state current vs. Case temperature



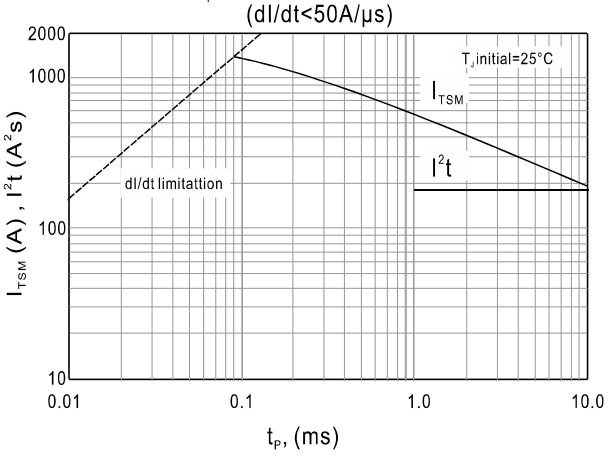
Surge peak on-state current vs. Number of cycles



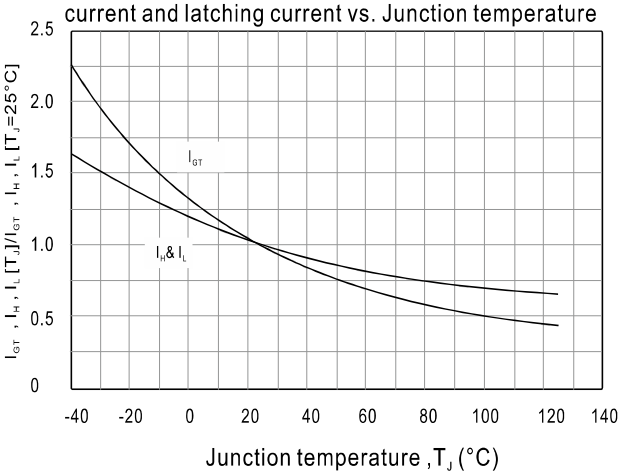
On-state characteristics (maximum values)



Non-repetitive surge peak on-state current for a sinusoidal pulse with width t_p<10ms, and corresponding value of 12t (dI/dt<50A/μs)



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



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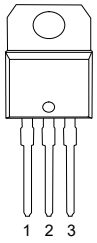
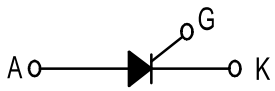
Pinning information

Pin	Simplified outline	Symbol
Pin 1 K: Cathode Pin 2 G: Gate Pin 3 A: Anode		

Marking

Type number	Marking code
FMCRP16-60	S1615-6B

Packing Information

Device	Outline	Device Package	Tube (pcs)
FMCRP16-60	Tube	TO-220AB	50

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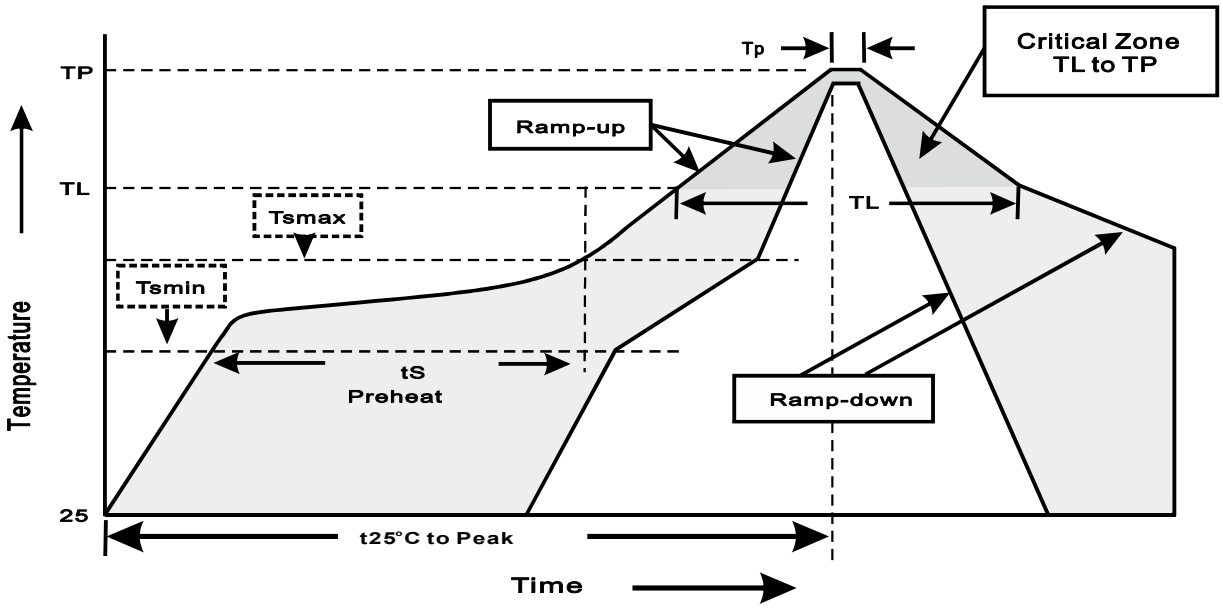
Suggested thermal profiles for soldering processes

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(Tsmin) -Temperature Max(Tsmax) -Time(min to max)(t_s)	 150°C 200°C 60~120sec
Tsmax 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