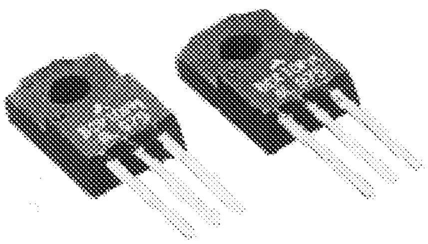
MITSUBISHI SEMICONDUCTOR ⟨TRIAC⟩

BCR10PM

MEDIUM POWER USE
INSULATED TYPE, PLANAR PASSIVATION TYPE

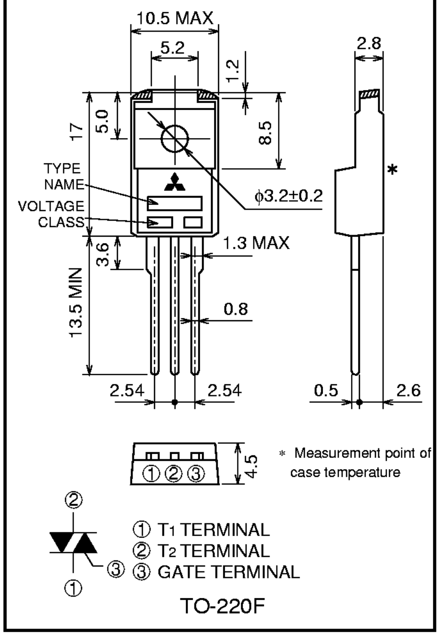
BCR10PM



- **$I_{T (RMS)}$ 10A**
- **V_{DRM} 400V/600V**
- **I_{FGT} Ⅰ, I_{RGT} Ⅰ, I_{RGT} Ⅲ 30mA (20mA) *5**
- **V_{iso} 1500V**
- **UL Recognized: File No. E80276**

OUTLINE DRAWING

Dimensions in mm



APPLICATION

Switching mode power supply, light dimmer, electric flasher unit, hair drier,
control of household equipment such as TV sets · stereo · refrigerator · washing machine · infrared kotatsu · carpet, small motor control,
copying machine, electric tool, solenoid drivers, other general purpose control applications

MAXIMUM RATINGS

Symbol	Parameter	Voltage class		Unit
		8	12	
V_{DRM}	Repetitive peak off-state voltage *1	400	600	V
V_{DSM}	Non-repetitive peak off-state voltage *1	500	720	V

Symbol	Parameter	Conditions	Ratings	Unit
$I_{T (RMS)}$	RMS on-state current	Commercial power frequency, sine full wave 360° conduction, T_c=85°C	10	A
I_{TSM}	Surge on-state current	60Hz sinewave 1 full cycle, peak value, non-repetitive	100	A
I^2t	I^2t for fusing	Value corresponding to 1 cycle of half wave 60Hz, surge on-state current	41.6	A^2s
P_{GM}	Peak gate power dissipation		5	W
$P_{G (AV)}$	Average gate power dissipation		0.5	W
V_{GM}	Peak gate voltage		10	V
I_{GM}	Peak gate current		2	A
T_j	Junction temperature		–40 ~ +125	°C
T_{stg}	Storage temperature		–40 ~ +125	°C
—	Weight	Typical value	2.0	g
V_{iso}	Isolation voltage	T_a=25°C, AC 1 minute, T_1 · T_2 · G terminal to case	1500	V

*1. Gate open.

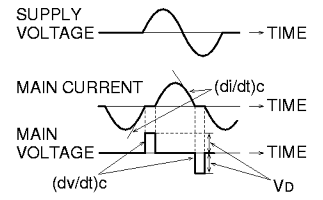
Feb.1999

MITSUBISHI ELECTRIC

ELECTRICAL CHARACTERISTICS

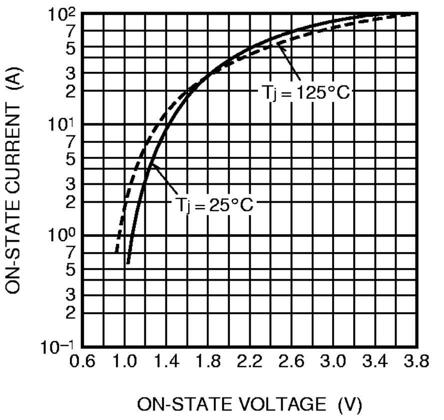
Symbol	Parameter		Test conditions	Limits			Unit
				Min.	Typ.	Max.	
I_{DRM}	Repetitive peak off-state current		T_j=125°C, V_{DRM} applied	—	—	2.0	mA
V_{TM}	On-state voltage		T_c=25°C, I_{TM}=15A, Instantaneous measurement	—	—	1.5	V
$V_{FGT\ I}$	Gate trigger voltage ✻2	I	T_j=25°C, V_D=6V, R_L=6Ω, R_G=330Ω	—	—	1.5	V
$V_{RGT\ I}$		II		—	—	1.5	V
$V_{RGT\ III}$		III		—	—	1.5	V
$I_{FGT\ I}$	Gate trigger current ✻2	I	T_j=25°C, V_D=6V, R_L=6Ω, R_G=330Ω	—	—	30✻5	mA
$I_{RGT\ I}$		II		—	—	30✻5	mA
$I_{RGT\ III}$		III		—	—	30✻5	mA
V_{GD}	Gate non-trigger voltage		T_j=125°C, V_D=1/2V_{DRM}	0.2	—	—	V
$R_{th\ (j\text{-}c)}$	Thermal resistance		Junction to case ✻4	—	—	3.5	°C/W
$(dv/dt)_c$	Critical-rate of rise of off-state commutating voltage			✻3	—	—	V/µs

✻2. Measurement using the gate trigger characteristics measurement circuit.
✻3. The critical-rate of rise of the off-state commutating voltage is shown in the table below.
✻4. The contact thermal resistance $R_{th\ (c\text{-}f)}$ in case of greasing is 0.5°C/W.
✻5. High sensitivity (I_{GT}≤20mA) is also available. (I_{GT} item ①)

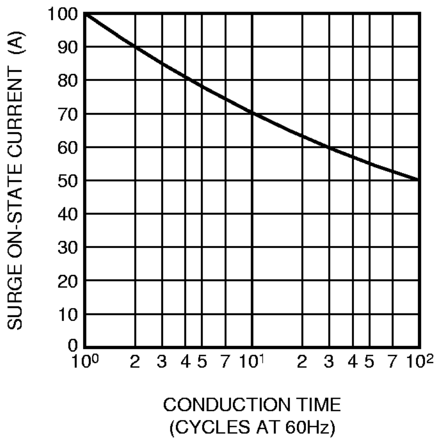
Voltage class	V_{DRM} (V)	$(dv/dt)_c$			Test conditions	Commutating voltage and current waveforms (inductive load)
		Symbol	Min.	Unit		
8	400	R	—	V/µs	1. Junction temperature T_j=125°C 2. Rate of decay of on-state commutating current $(di/dt)_c$=−5.0A/ms 3. Peak off-state voltage V_D=400V	
		L	10			
12	600	R	—			
		L	10			

PERFORMANCE CURVES

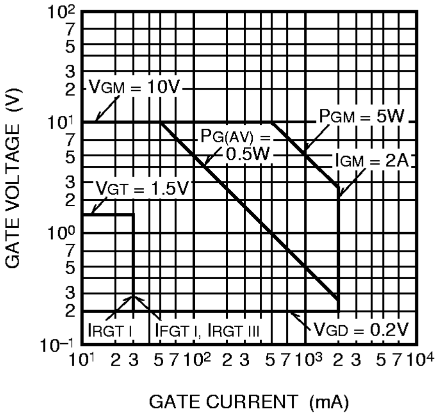
MAXIMUM ON-STATE CHARACTERISTICS



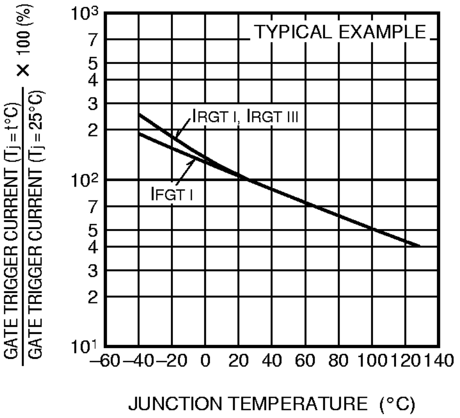
RATED SURGE ON-STATE CURRENT



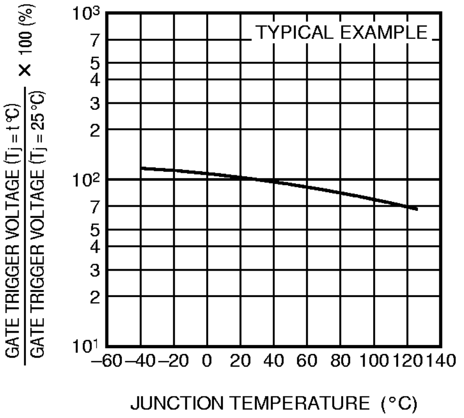
GATE CHARACTERISTICS



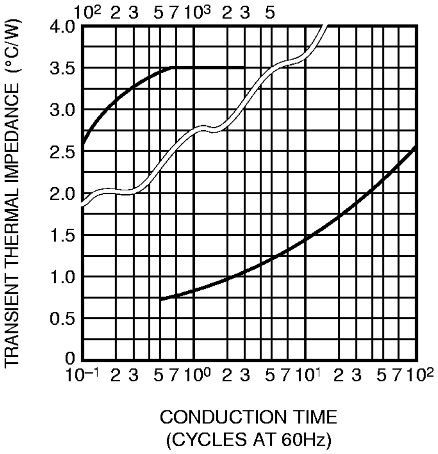
GATE TRIGGER CURRENT VS. JUNCTION TEMPERATURE



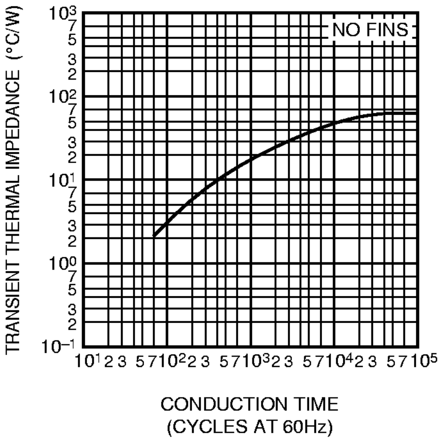
GATE TRIGGER VOLTAGE VS. JUNCTION TEMPERATURE



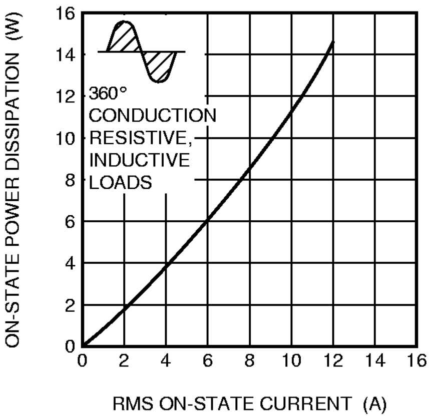
MAXIMUM TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO CASE)



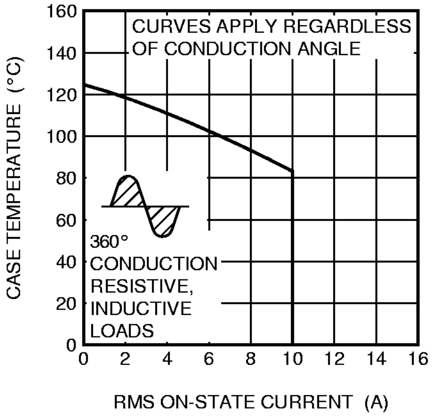
MAXIMUM TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO AMBIENT)



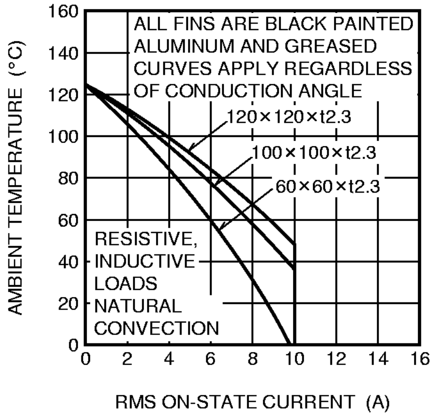
MAXIMUM ON-STATE POWER DISSIPATION



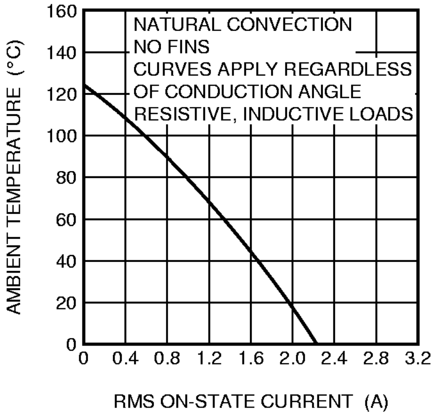
ALLOWABLE CASE TEMPERATURE VS. RMS ON-STATE CURRENT



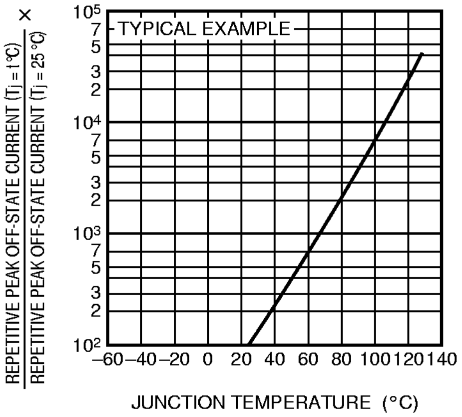
ALLOWABLE AMBIENT TEMPERATURE VS. RMS ON-STATE CURRENT



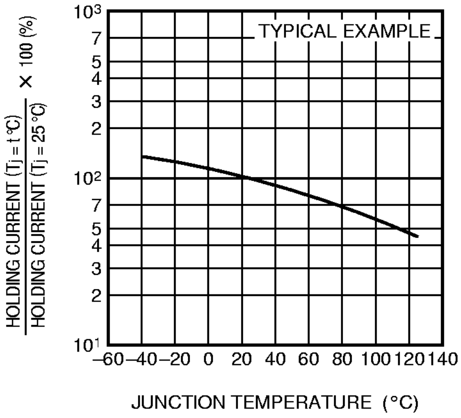
ALLOWABLE AMBIENT TEMPERATURE VS. RMS ON-STATE CURRENT



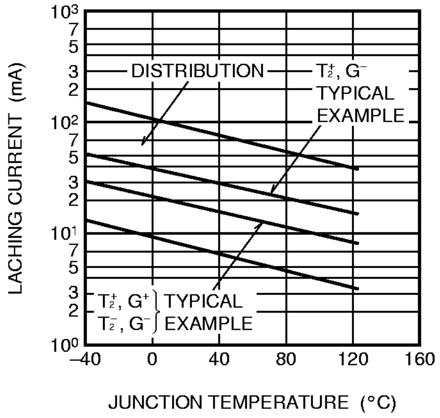
REPETITIVE PEAK OFF-STATE CURRENT VS. JUNCTION TEMPERATURE



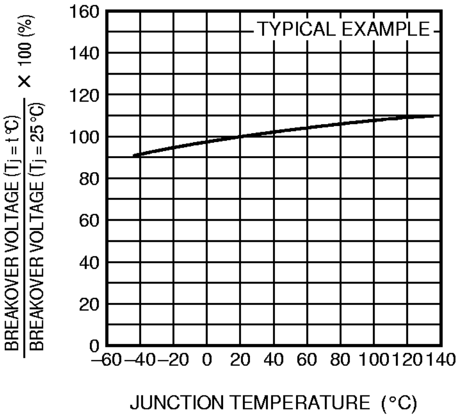
HOLDING CURRENT VS. JUNCTION TEMPERATURE



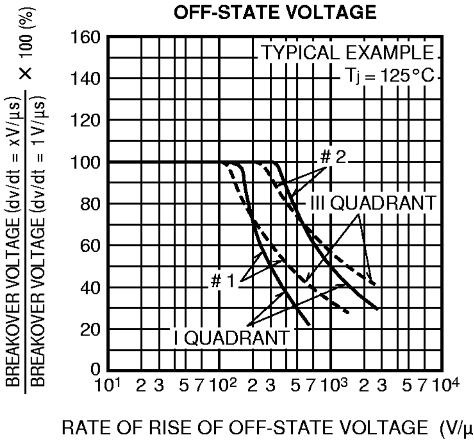
LACHING CURRENT VS. JUNCTION TEMPERATURE



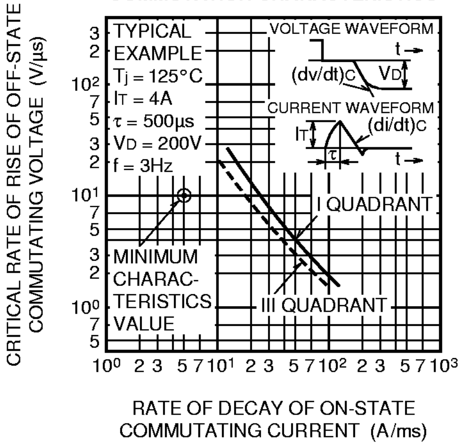
BREAKOVER VOLTAGE VS. JUNCTION TEMPERATURE



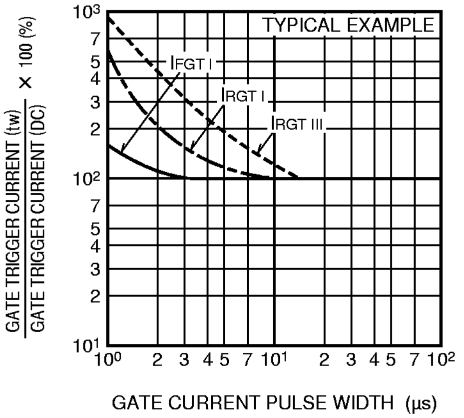
BREAKOVER VOLTAGE VS. RATE OF RISE OF OFF-STATE VOLTAGE



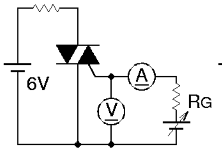
COMMUTATION CHARACTERISTICS



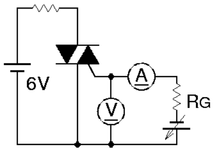
GATE TRIGGER CURRENT VS. GATE CURRENT PULSE WIDTH



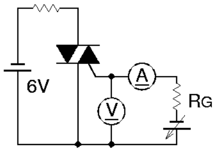
GATE TRIGGER CHARACTERISTICS TEST CIRCUITS



TEST PROCEDURE Ⅰ



TEST PROCEDURE Ⅱ



TEST PROCEDURE Ⅲ