BCR3KM

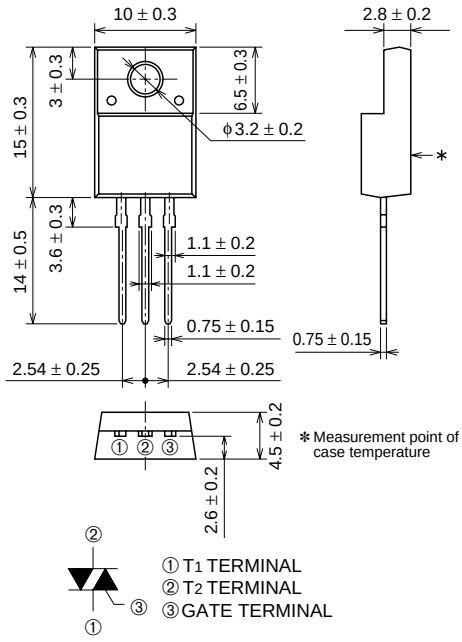
Refer to the page 6 as to the product guaranteed maximum junction temperature 150°C

LOW POWER USE
INSULATED TYPE, PLANAR PASSIVATION TYPE

BCR3KM

- $I_{T\ (RMS)}$ 3A
- V_{DRM} 600V
- $I_{FGT\ I}$, $I_{RGT\ I}$, $I_{RGT\ III}$ ..... 15mA (10mA) ✻3
- UL Recognized: Yellow Card No.E80276(N)
  File No. E80271

OUTLINE DRAWING **Dimensions in mm**



TO-220FN

APPLICATION

Control of heater such as electric rice cooker, electric pot

MAXIMUM RATINGS

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

Symbol	Parameter	Conditions	Ratings	Unit
$I_{T\ (RMS)}$	RMS on-state current	Commercial frequency, sine full wave 360° conduction, Tc=111°C	3	A
I_{TSM}	Surge on-state current	60Hz sinewave 1 full cycle, peak value, non-repetitive	30	A
I^2t	I^2t for fusing	Value corresponding to 1 cycle of half wave 60Hz, surge on-state current	3.7	A^2s
P_{GM}	Peak gate power dissipation		3	W
$P_{G\ (AV)}$	Average gate power dissipation		0.3	W
V_{GM}	Peak gate voltage		6	V
I_{GM}	Peak gate current		0.5	A
T_j	Junction temperature		–40 ~ +125	°C
T_{stg}	Storage temperature		–40 ~ +125	°C
—	Weight		2.0	g
V_{iso}	Isolation voltage	T_a=25°C, AC 1 minute, $T_1 \cdot T_2 \cdot G$ terminal to case	2000	V

✻1. Gate open.

MITSUBISHI ELECTRIC

BCR3KM

Refer to the page 6 as to the product guaranteed maximum junction temperature 150°C

LOW POWER USE
INSULATED TYPE, PLANAR PASSIVATION TYPE

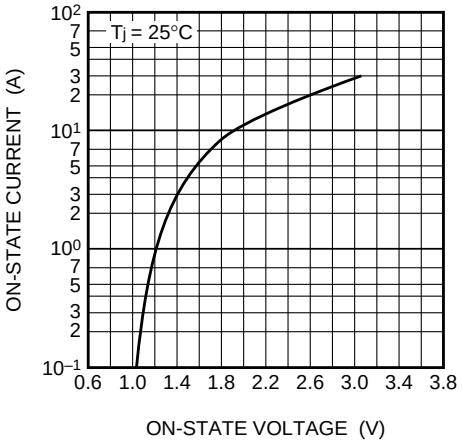
ELECTRICAL CHARACTERISTICS

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}=4.5A, 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	—	—	15*3	mA
$I_{RGT\ I}$		II		—	—	15*3	mA
$I_{RGT\ III}$		III		—	—	15*3	mA
V_{GD}	Gate non-trigger voltage		T_j=125°C, V_D=1/2V_{DRM}	0.2	—	—	V
$R_{th\ (j-c)}$	Thermal resistance		Junction to case *4	—	—	4.0	°C/W
$R_{th\ (j-a)}$	Thermal resistance		Junction to ambient	—	—	50	°C/W

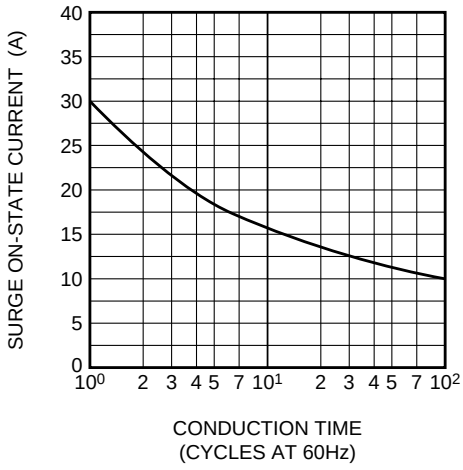
*2. Measurement using the gate trigger characteristics measurement circuit.
*3. High sensitivity (I_{GT}≤ 10mA) is also available. (I_{GT} item ①)
*4. The contact thermal resistance $R_{th\ (c-f)}$ in case of greasing is 0.5°C/W.

PERFORMANCE CURVES

MAXIMUM ON-STATE CHARACTERISTICS



RATED SURGE ON-STATE CURRENT



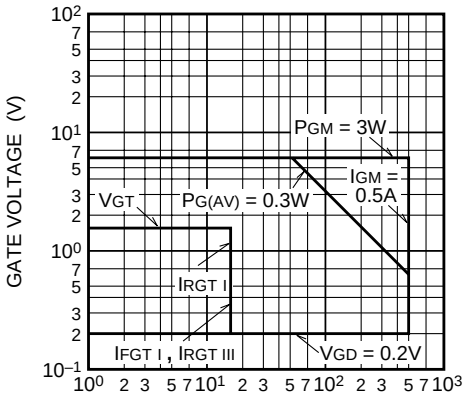
MITSUBISHI ELECTRIC

BCR3KM

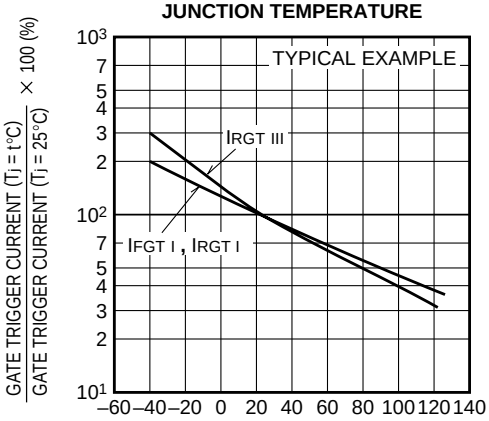
Refer to the page 6 as to the product guaranteed maximum junction temperature 150°C

LOW POWER USE
INSULATED TYPE, PLANAR PASSIVATION TYPE

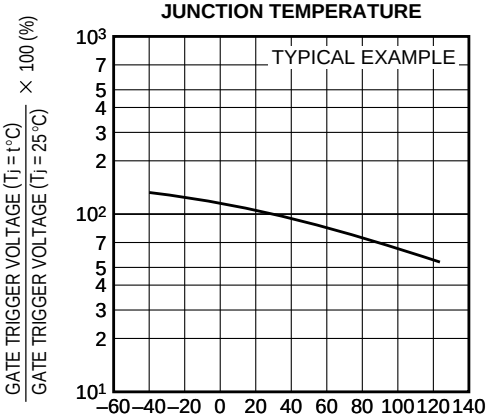
GATE CHARACTERISTICS (I, II AND III)



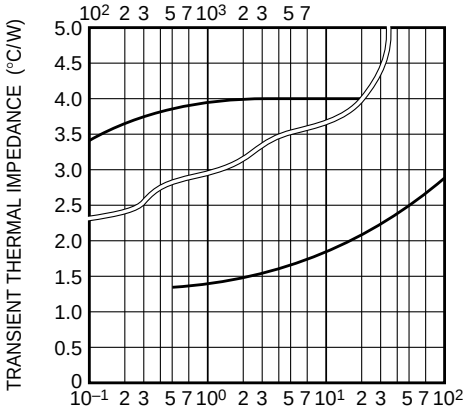
GATE TRIGGER CURRENT VS. JUNCTION TEMPERATURE



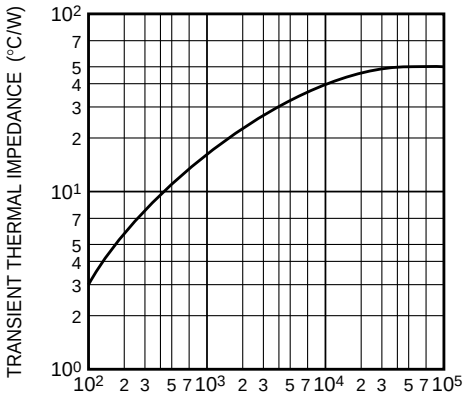
GATE TRIGGER VOLTAGE VS. JUNCTION TEMPERATURE



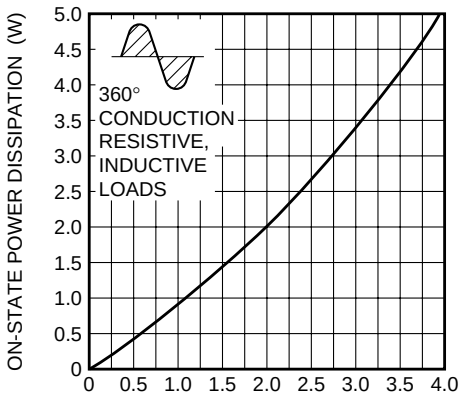
MAXIMUM TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO CASE)



MAXIMUM TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO AMBIENT)



MAXIMUM ON-STATE POWER DISSIPATION



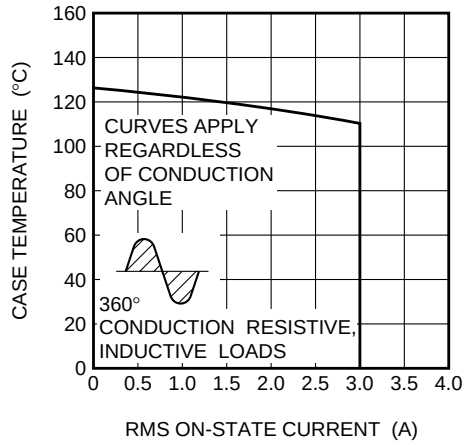
MITSUBISHI ELECTRIC

BCR3KM

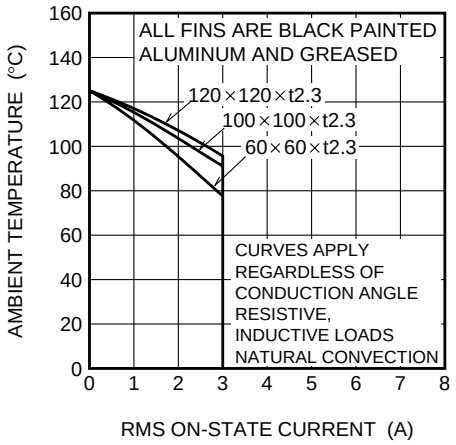
Refer to the page 6 as to the product guaranteed maximum junction temperature 150°C

LOW POWER USE
INSULATED TYPE, PLANAR PASSIVATION TYPE

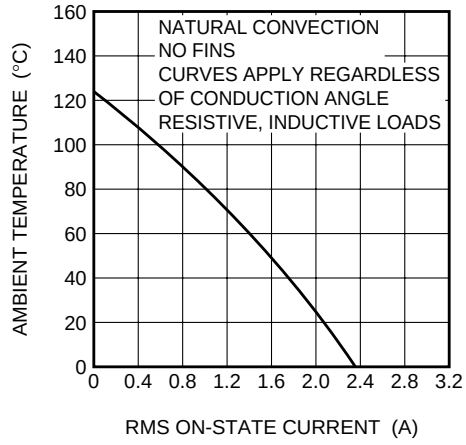
ALLOWABLE CASE TEMPERATURE VS. RMS ON-STATE CURRENT



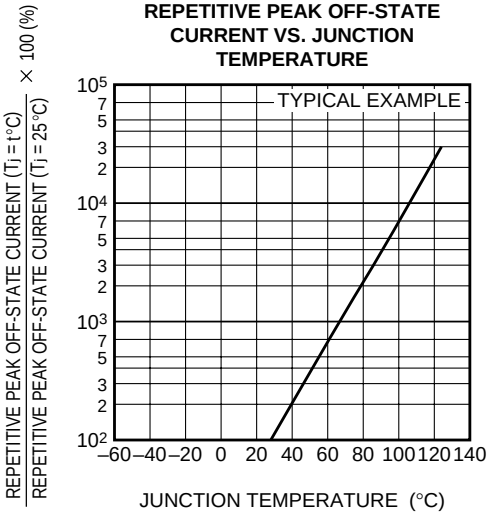
ALLOWABLE AMBIENT TEMPERATURE VS. RMS ON-STATE CURRENT



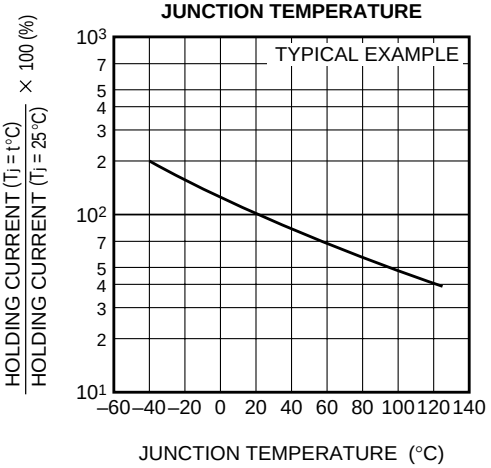
ALLOWABLE AMBIENT TEMPERATURE VS. RMS ON-STATE CURRENT



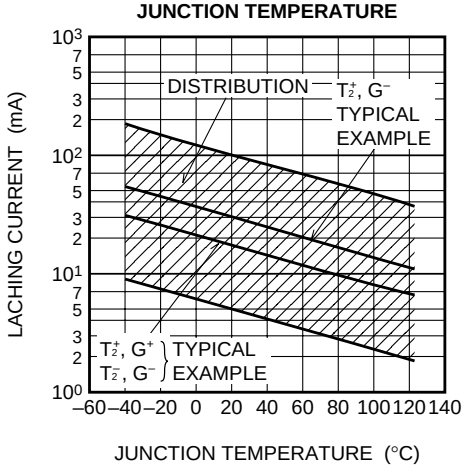
REPETITIVE PEAK OFF-STATE CURRENT VS. JUNCTION TEMPERATURE



HOLDING CURRENT VS. JUNCTION TEMPERATURE



LACHING CURRENT VS. JUNCTION TEMPERATURE



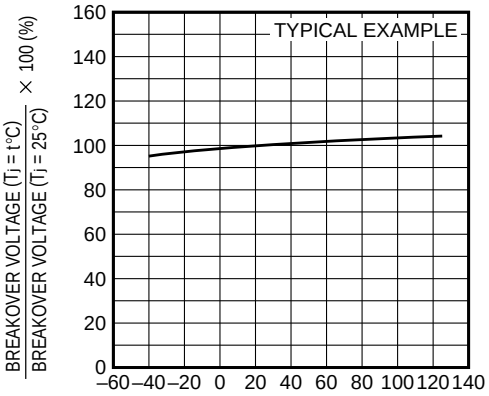
MITSUBISHI ELECTRIC

BCR3KM

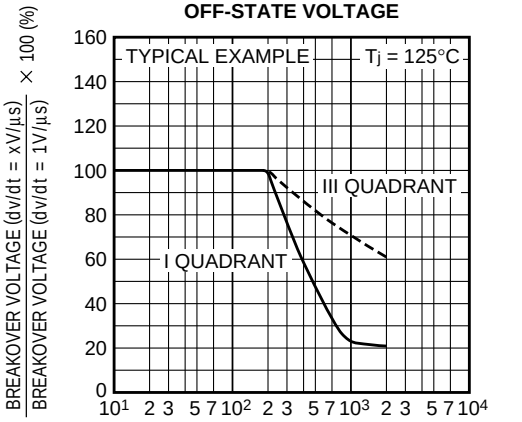
Refer to the page 6 as to the product guaranteed maximum junction temperature 150°C

LOW POWER USE
INSULATED TYPE, PLANAR PASSIVATION TYPE

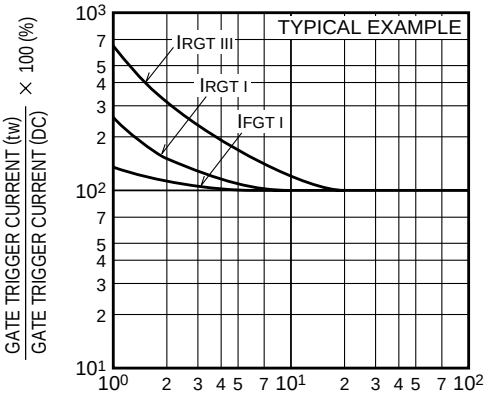
BREAKOVER VOLTAGE VS. JUNCTION TEMPERATURE



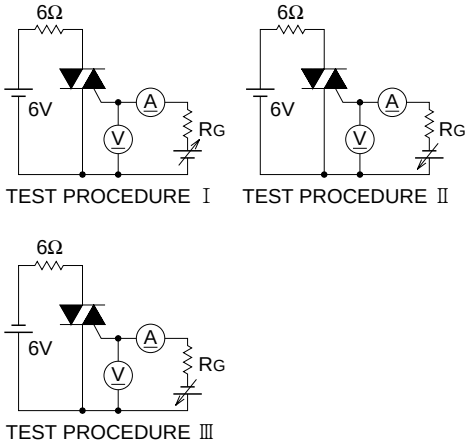
BREAKOVER VOLTAGE VS. RATE OF RISE OF OFF-STATE VOLTAGE



GATE TRIGGER CURRENT VS. GATE CURRENT PULSE WIDTH



GATE TRIGGER CHARACTERISTICS TEST CIRCUITS



MITSUBISHI ELECTRIC

BCR3KM

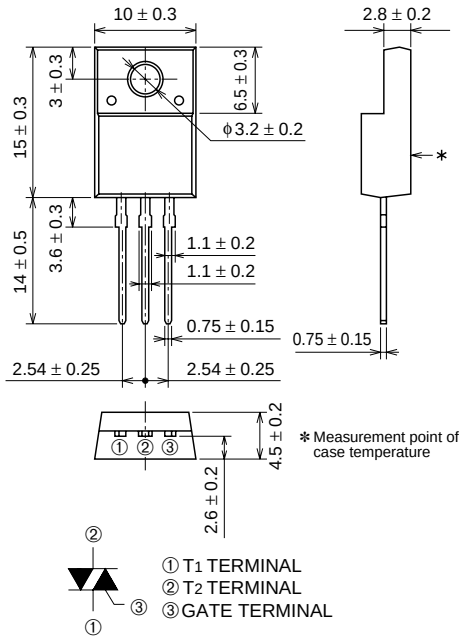
The product guaranteed maximum junction temperature 150°C (See warning.)

LOW POWER USE
INSULATED TYPE, PLANAR PASSIVATION TYPE

BCR3KM

- $I_{T\ (RMS)}$ 3A
- V_{DRM} 600V
- $I_{FGT\ I}$, $I_{RGT\ I}$, $I_{RGT\ III}$ 15mA (10mA) *3
- UL Recognized: Yellow Card No.E80276(N)
  File No. E80271

OUTLINE DRAWING **Dimensions in mm**



TO-220FN

APPLICATION

Control of heater such as electric rice cooker, electric pot

(Warning)
1. Refer to the recommended circuit values around the triac before using.
2. Be sure to exchange the specification before using. If not exchanged, general triacs will be supplied.

MAXIMUM RATINGS

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

Symbol	Parameter	Conditions	Ratings	Unit
$I_{T\ (RMS)}$	RMS on-state current	Commercial frequency, sine full wave 360° conduction, Tc=136°C	3	A
I_{TSM}	Surge on-state current	60Hz sinewave 1 full cycle, peak value, non-repetitive	30	A
I^2t	I^2t for fusing	Value corresponding to 1 cycle of half wave 60Hz, surge on-state current	3.7	A^2s
P_{GM}	Peak gate power dissipation		3	W
$P_{G\ (AV)}$	Average gate power dissipation		0.3	W
V_{GM}	Peak gate voltage		6	V
I_{GM}	Peak gate current		0.5	A
T_j	Junction temperature		–40 ~ +150	°C
T_{stg}	Storage temperature		–40 ~ +150	°C
—	Weight		2.0	g
V_{iso}	Isolation voltage	T_a=25°C, AC 1 minute, T_1 · T_2 · G terminal to case	2000	V

*1. Gate open.

MITSUBISHI ELECTRIC

BCR3KM

The product guaranteed maximum junction temperature 150°C (See warning.)

LOW POWER USE
INSULATED TYPE, PLANAR PASSIVATION TYPE

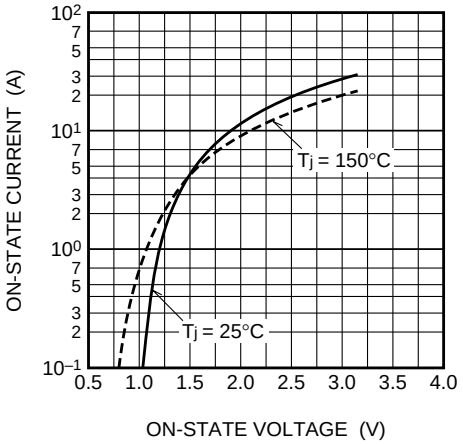
ELECTRICAL CHARACTERISTICS

Symbol	Parameter		Test conditions	Limits			Unit
				Min.	Typ.	Max.	
I_{DRM}	Repetitive peak off-state current		T_j=150°C, V_{DRM} applied	—	—	2.0	mA
V_{TM}	On-state voltage		T_C=25°C, I_{TM}=4.5A, 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	—	—	15✻3	mA
$I_{RGT\ I}$		II		—	—	15✻3	mA
$I_{RGT\ III}$		III		—	—	15✻3	mA
V_{GD}	Gate non-trigger voltage		T_j=125°C/150°C, V_D=1/2V_{DRM}	0.2/0.1	—	—	V
$R_{th\ (j-c)}$	Thermal resistance		Junction to case ✻4	—	—	4.0	°C/W
$R_{th\ (j-a)}$	Thermal resistance		Junction to ambient	—	—	50	°C/W

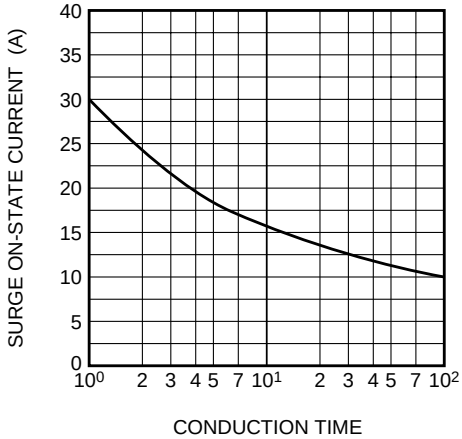
✻2. Measurement using the gate trigger characteristics measurement circuit.
✻3. High sensitivity (I_{GT}≤ 10mA) is also available. (I_{GT} item ①)
✻4. The contact thermal resistance $R_{th\ (c-f)}$ in case of greasing is 0.5°C/W.

PERFORMANCE CURVES

MAXIMUM ON-STATE CHARACTERISTICS



RATED SURGE ON-STATE CURRENT



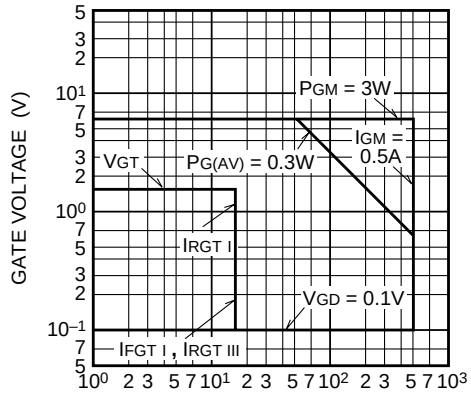
MITSUBISHI ELECTRIC

BCR3KM

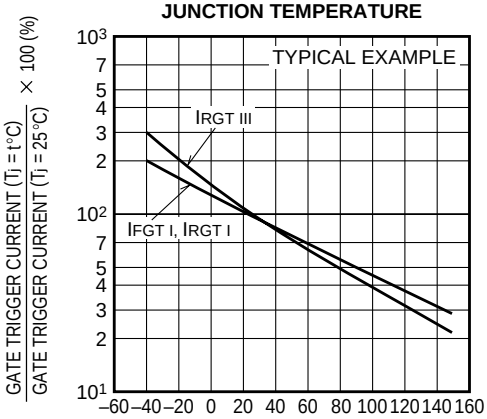
The product guaranteed maximum junction temperature 150°C (See warning.)

LOW POWER USE
INSULATED TYPE, PLANAR PASSIVATION TYPE

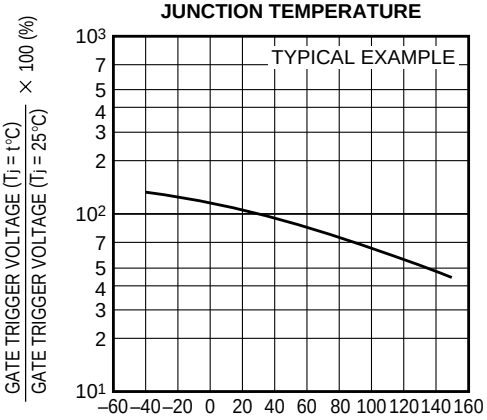
GATE CHARACTERISTICS (I, II AND III)



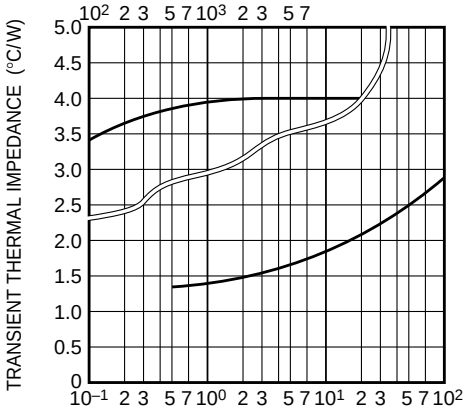
GATE TRIGGER CURRENT VS. JUNCTION TEMPERATURE



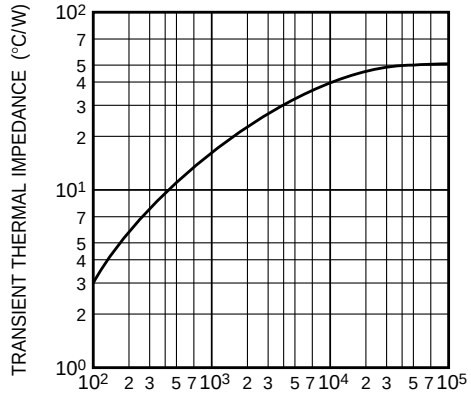
GATE TRIGGER VOLTAGE VS. JUNCTION TEMPERATURE



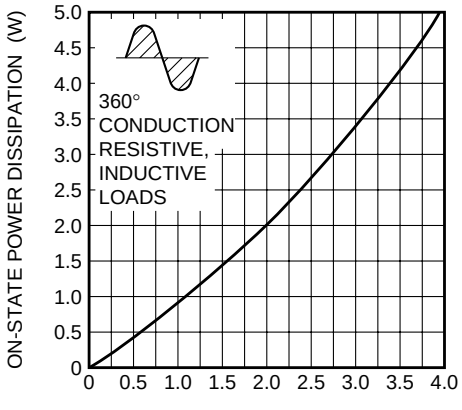
MAXIMUM TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO CASE)



MAXIMUM TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO AMBIENT)



MAXIMUM ON-STATE POWER DISSIPATION



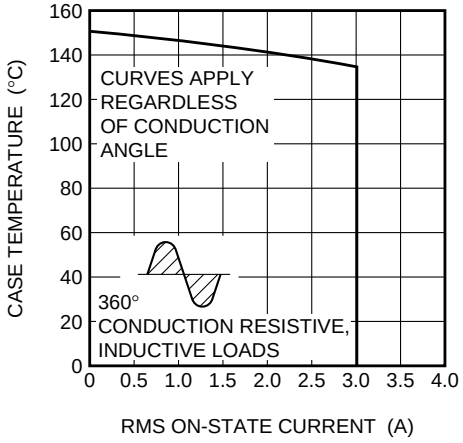
MITSUBISHI ELECTRIC

BCR3KM

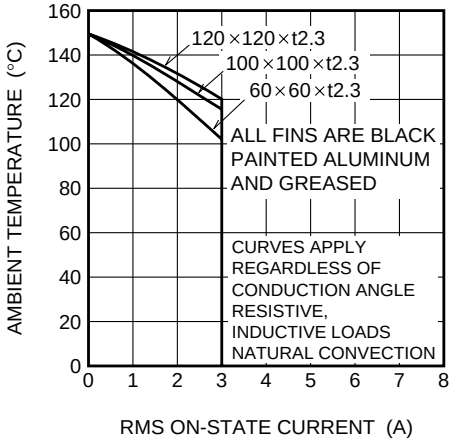
The product guaranteed maximum junction temperature 150°C (See warning.)

LOW POWER USE
INSULATED TYPE, PLANAR PASSIVATION TYPE

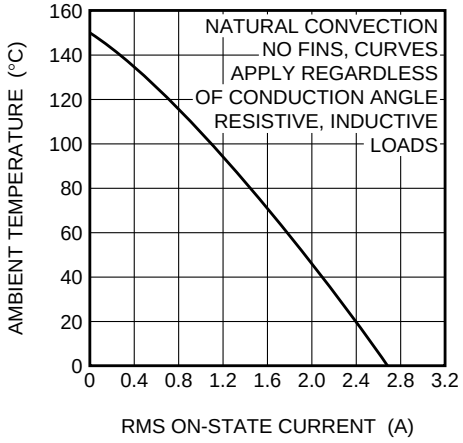
ALLOWABLE CASE TEMPERATURE VS. RMS ON-STATE CURRENT



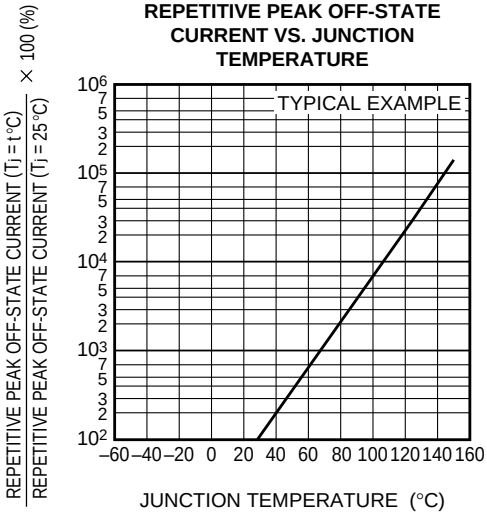
ALLOWABLE AMBIENT TEMPERATURE VS. RMS ON-STATE CURRENT



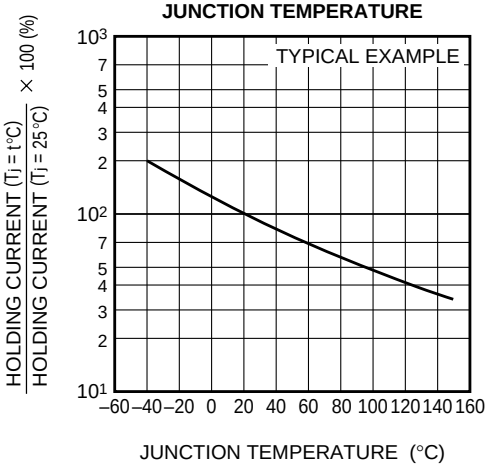
ALLOWABLE AMBIENT TEMPERATURE VS. RMS ON-STATE CURRENT



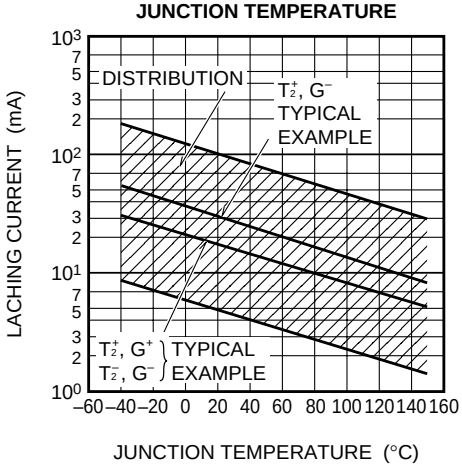
REPETITIVE PEAK OFF-STATE CURRENT VS. JUNCTION TEMPERATURE



HOLDING CURRENT VS. JUNCTION TEMPERATURE



LACHING CURRENT VS. JUNCTION TEMPERATURE



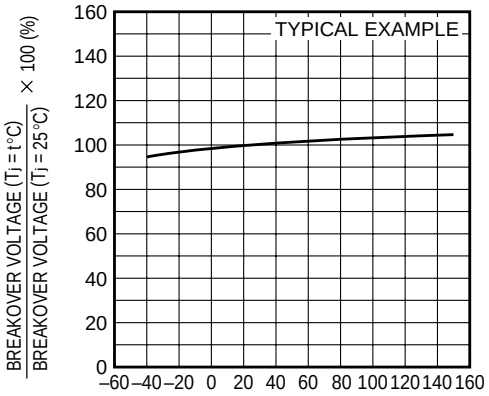
MITSUBISHI ELECTRIC

BCR3KM

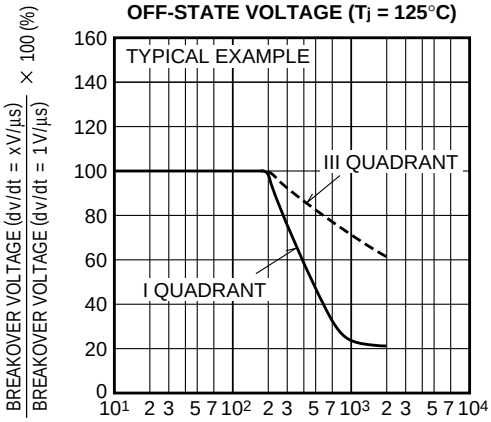
The product guaranteed maximum junction temperature 150°C (See warning.)

LOW POWER USE
INSULATED TYPE, PLANAR PASSIVATION TYPE

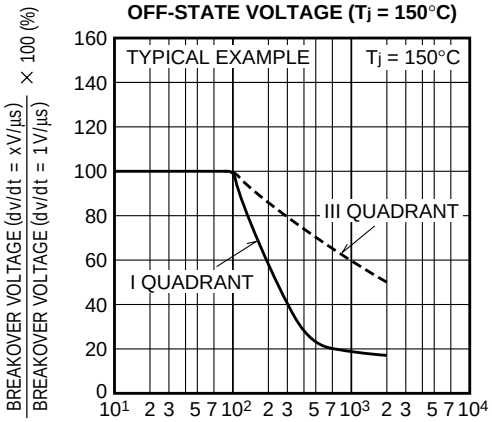
BREAKOVER VOLTAGE VS. JUNCTION TEMPERATURE



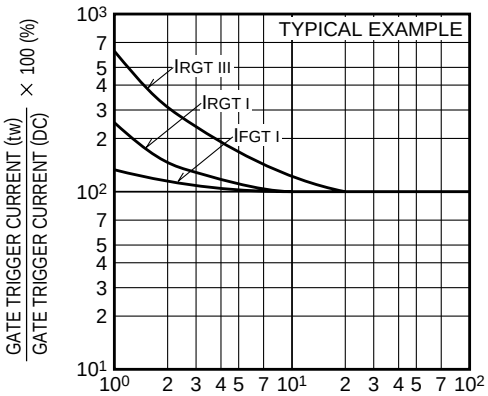
BREAKOVER VOLTAGE VS. RATE OF RISE OF OFF-STATE VOLTAGE (T_j = 125°C)



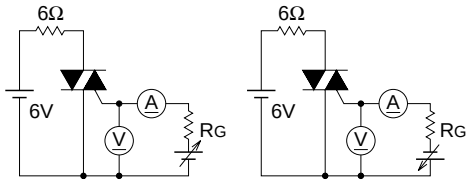
BREAKOVER VOLTAGE VS. RATE OF RISE OF OFF-STATE VOLTAGE (T_j = 150°C)

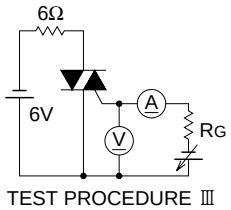


GATE TRIGGER CURRENT VS. GATE CURRENT PULSE WIDTH

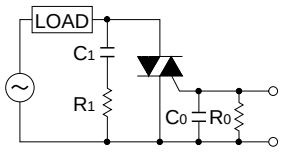


GATE TRIGGER CHARACTERISTICS TEST CIRCUITS





RECOMMENDED CIRCUIT VALUES AROUND THE TRIAC



C_1 = 0.1~0.47µF C_0 = 0.1µF
R_1 = 47~100Ω R_0 = 100Ω

MITSUBISHI ELECTRIC