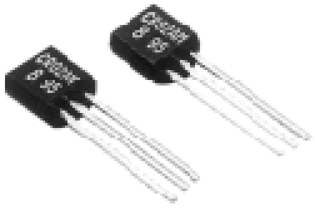
MITSUBISHI SEMICONDUCTOR ⟨THYRISTOR⟩

CR02AM

LOW POWER USE
PLANAR PASSIVATION TYPE

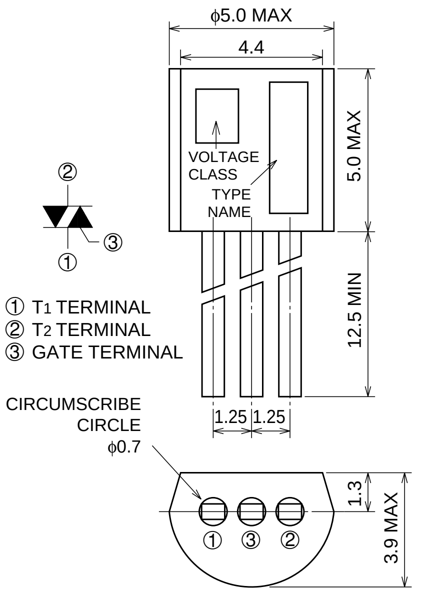
CR02AM



- **$I_{T\ (AV)}$ 0.3A**
- **V_{DRM} 200V/300V/400V**
- **I_{GT} 100µA**

OUTLINE DRAWING

Dimensions in mm



JEDEC : TO-92

APPLICATION

Solid state relay, leakage protector, fire alarm, timer, ringcounter, electric blankets, strobe flasher, other general purpose control applications

MAXIMUM RATINGS

Symbol	Parameter	Voltage class			Unit
		4	6	8	
V_{RRM}	Repetitive peak reverse voltage	200	300	400	V
V_{RSM}	Non-repetitive peak reverse voltage	300	400	500	V
$V_{R\ (DC)}$	DC reverse voltage	160	240	320	V
V_{DRM}	Repetitive peak off-state voltage ✻1	200	300	400	V
$V_{D\ (DC)}$	DC off-state voltage ✻1	160	240	320	V

Symbol	Parameter	Conditions	Ratings	Unit
$I_{T\ (RMS)}$	RMS on-state current		0.47	A
$I_{T\ (AV)}$	Average on-state current	Commercial frequency, sine half wave, 180° conduction, T_a=30°C	0.3	A
I_{TSM}	Surge on-state current	60Hz sine half wave 1 full cycle, peak value, non-repetitive	10	A
I^2t	I^2t for fusing	Value corresponding to 1 cycle of half wave 60Hz, surge on-state current	0.4	A^2s
P_{GM}	Peak gate power dissipation		0.1	W
$P_{G\ (AV)}$	Average gate power dissipation		0.01	W
V_{FGM}	Peak gate forward voltage		6	V
V_{RGM}	Peak gate reverse voltage		6	V
I_{FGM}	Peak gate forward current		0.1	A
T_j	Junction temperature		–40 ~ +125	°C
T_{stg}	Storage temperature		–40 ~ +125	°C
—	Weight	Typical value	0.23	g

✻1. With Gate-to-cathode resistance R_{GK}=1kΩ

ELECTRICAL CHARACTERISTICS

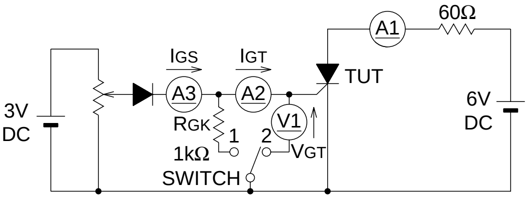
Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
I_{RRM}	Repetitive peak reverse current	T_j=125°C, V_{RRM} applied	—	—	0.1	mA
I_{DRM}	Repetitive peak off-state current	T_j=125°C, V_{DRM} applied, R_{GK}=1kΩ	—	—	0.1	mA
V_{TM}	On-state voltage	T_a=25°C, I_{TM}=0.6A, instantaneous value	—	—	1.6	V
V_{GT}	Gate trigger voltage	T_a=25°C, V_D=6V, I_T=0.1A ✻3	—	—	0.8	V
V_{GD}	Gate non-trigger voltage	T_j=125°C, V_D=1/2V_{DRM}, R_{GK}=1kΩ	0.2	—	—	V
I_{GT}	Gate trigger current	T_j=25°C, V_D=6V, I_T=0.1A ✻3	1	—	100✻2	µA
I_H	Holding current	T_j=25°C, V_D=12V, R_{GK}=1kΩ	—	—	3	mA
$R_{th\ (j\text{-}a)}$	Thermal resistance	Junction to ambient	—	—	180	°C/W

✻2. If special values of I_{GT} are required, choose at least two items from those listed in the table below. (Example: AB, BC)

Item	A	B	C
I_{GT} (µA)	1 ~ 30	20 ~ 50	40 ~ 100

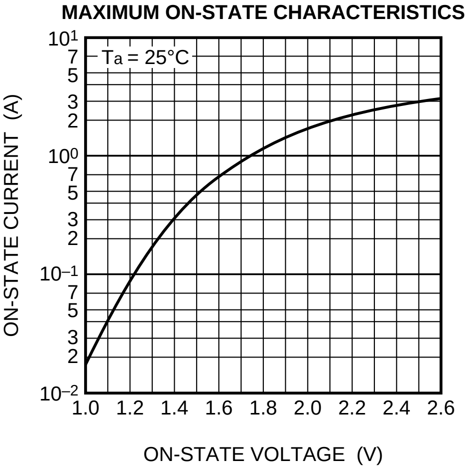
The above values do not include the current flowing through the 1kΩ resistance between the gate and cathode.

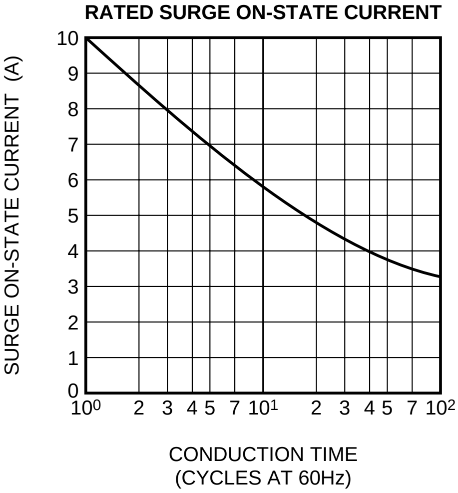
✻3. I_{GT}, V_{GT} measurement circuit.



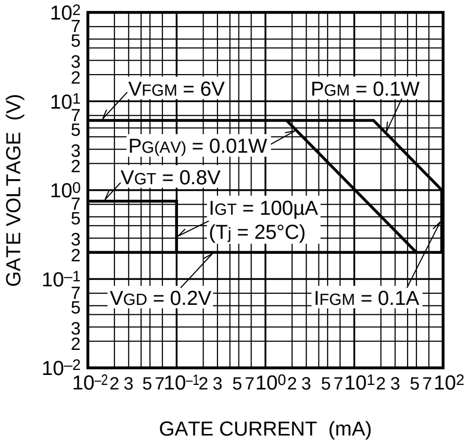
SWITCH 1 : I_{GT} measurement
SWITCH 2 : V_{GT} measurement
(Inner resistance of voltage meter is about 1kΩ)

PERFORMANCE CURVES

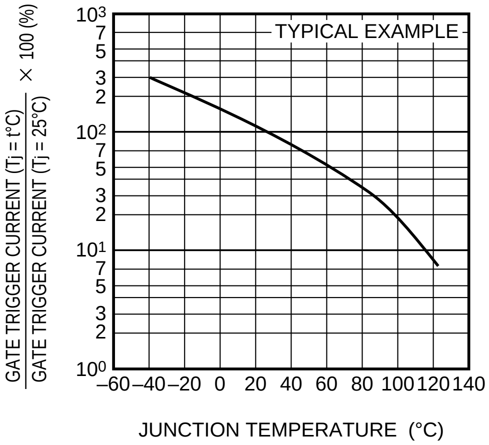

MAXIMUM ON-STATE CHARACTERISTICS


RATED SURGE ON-STATE CURRENT

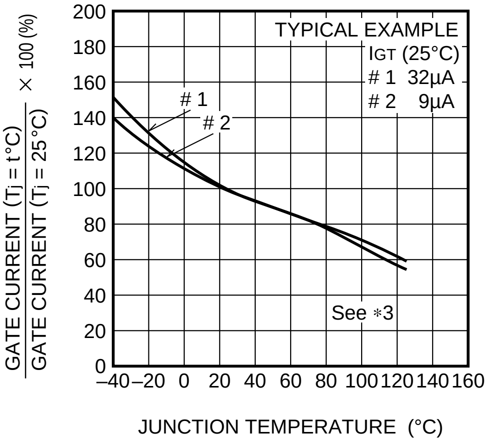
GATE CHARACTERISTICS



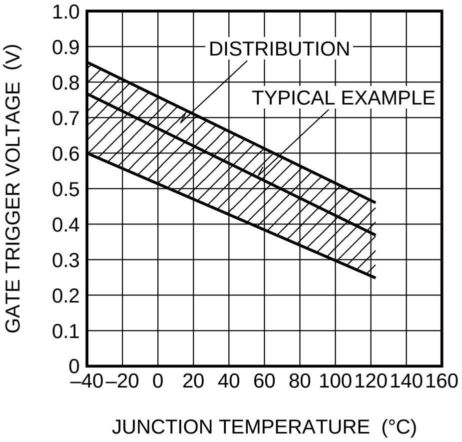
GATE TRIGGER CURRENT VS. JUNCTION TEMPERATURE



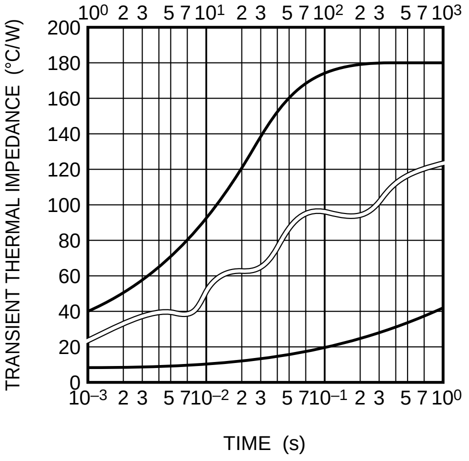
GATE CURRENT VS. JUNCTION TEMPERATURE



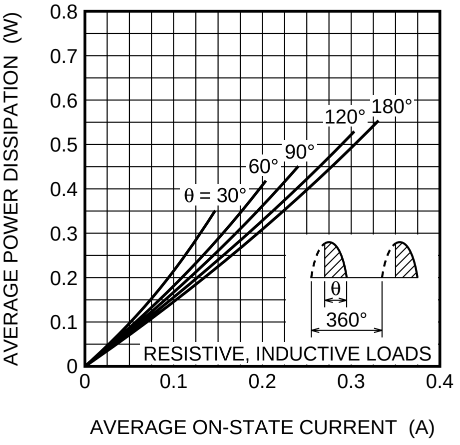
GATE TRIGGER VOLTAGE VS. JUNCTION TEMPERATURE



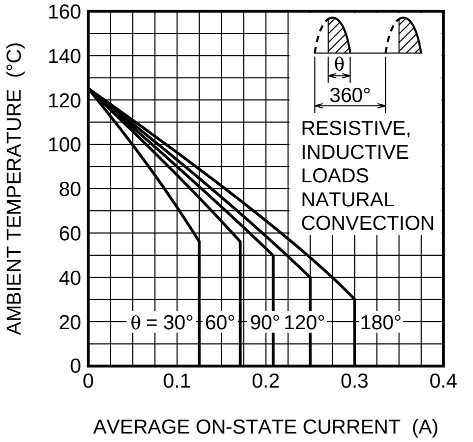
MAXIMUM TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO AMBIENT)



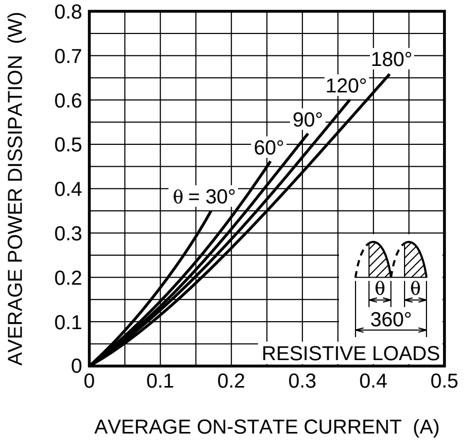
MAXIMUM AVERAGE POWER DISSIPATION (SINGLE-PHASE HALF WAVE)



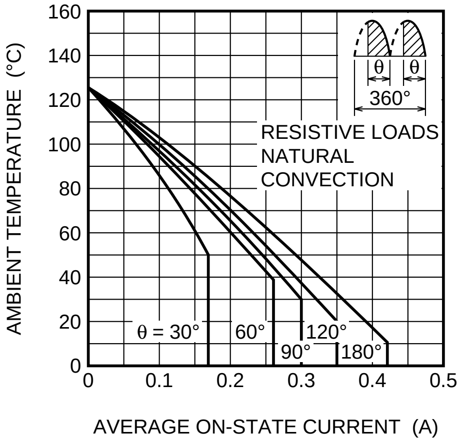
ALLOWABLE AMBIENT TEMPERATURE VS. AVERAGE ON-STATE CURRENT (SINGLE-PHASE HALF WAVE)



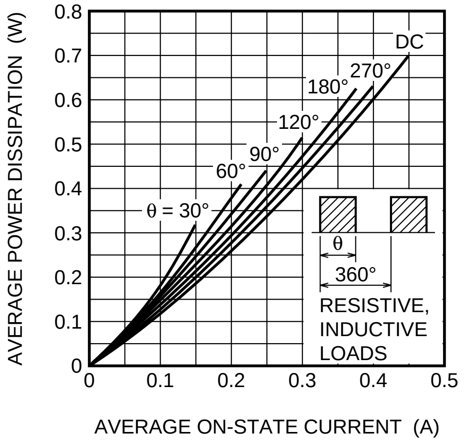
MAXIMUM AVERAGE POWER DISSIPATION (SINGLE-PHASE FULL WAVE)



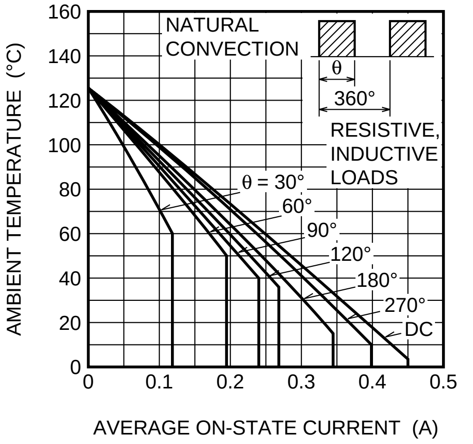
ALLOWABLE AMBIENT TEMPERATURE VS. AVERAGE ON-STATE CURRENT (SINGLE-PHASE FULL WAVE)



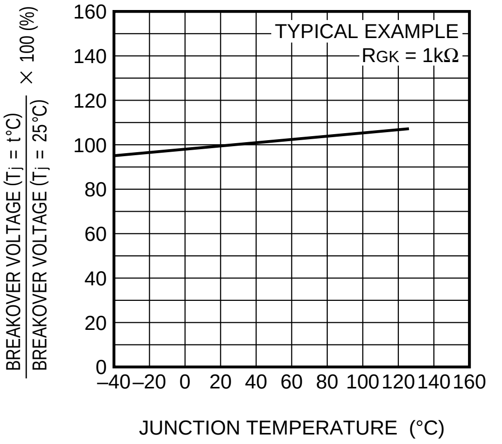
MAXIMUM AVERAGE POWER DISSIPATION (RECTANGULAR WAVE)



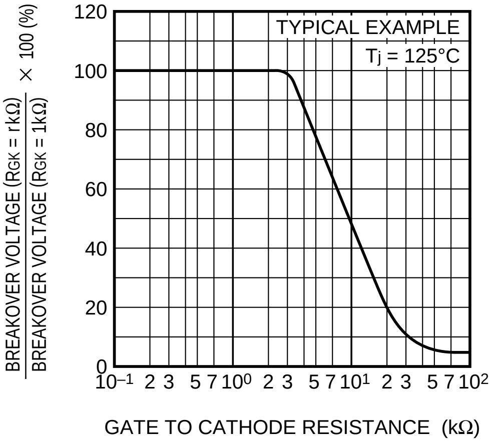
ALLOWABLE AMBIENT TEMPERATURE VS. AVERAGE ON-STATE CURRENT (RECTANGULAR WAVE)



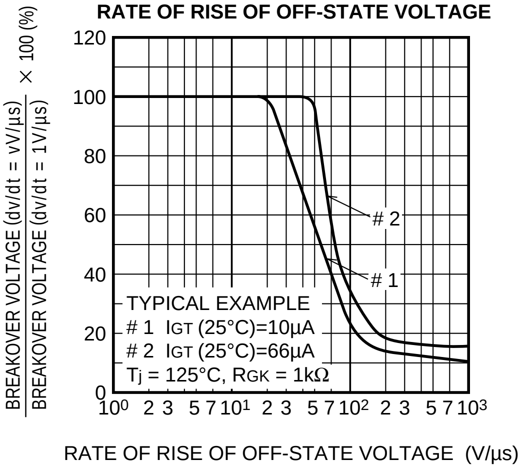
BREAKOVER VOLTAGE VS. JUNCTION TEMPERATURE



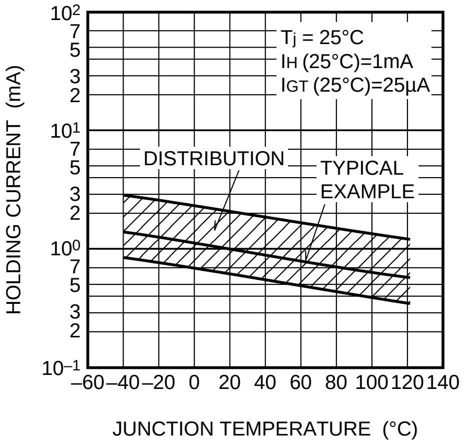
BREAKOVER VOLTAGE VS. GATE TO CATHODE RESISTANCE



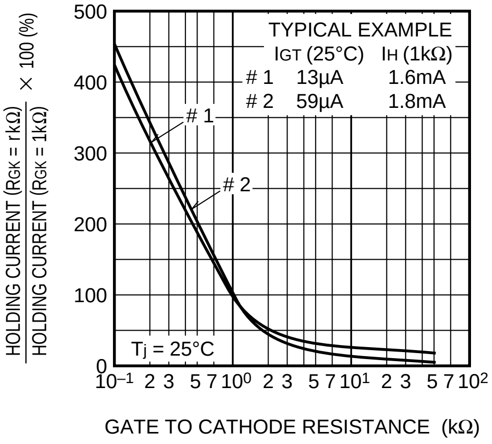
BREAKOVER VOLTAGE VS. RATE OF RISE OF OFF-STATE VOLTAGE



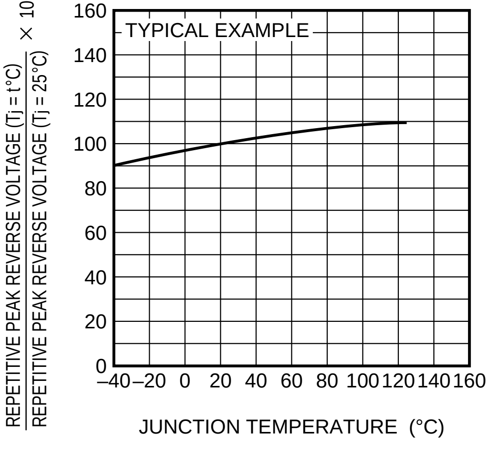
HOLDING CURRENT VS. JUNCTION TEMPERATURE



HOLDING CURRENT VS. GATE TO CATHODE RESISTANCE



REPETITIVE PEAK REVERSE VOLTAGE VS. JUNCTION TEMPERATURE



GATE TRIGGER CURRENT VS. GATE CURRENT PULSE WIDTH