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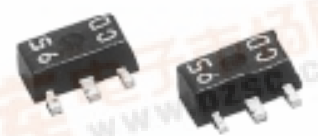
MITSUBISHI SEMICONDUCTOR (THYRISTOR)

CR05AS

LOW POWER USE

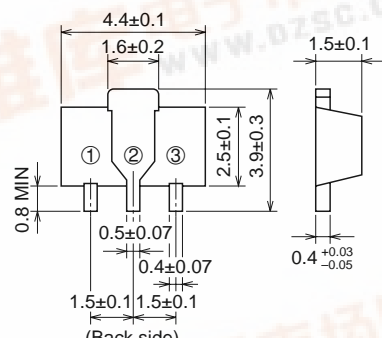
NON-INSULATED TYPE, PLANAR PASSIVATION TYPE

CR05AS




- I_T (AV) **0.5A**
- V_{DRM} **200V/400V**
- I_{GT} **100 μ A**

OUTLINE DRAWING Dimensions in mm



(Back side)



- ① T1 TERMINAL
- ② T2 TERMINAL
- ③ GATE TERMINAL

SOT-89

APPLICATION

Solid state relay, strobe flasher, ignitor, hybrid IC

MAXIMUM RATINGS

Symbol	Parameter	Voltage class		Unit
		4 (marked "CB")	8 (marked "CD")	
VRRM	Repetitive peak reverse voltage	200	400	V
VRSM	Non-repetitive peak reverse voltage	300	500	V
VR (DC)	DC reverse voltage	160	320	V
VDRM	Repetitive peak off-state voltage *1	200	400	V
VD (DC)	DC off-state voltage *1	160	320	V

Symbol	Parameter	Conditions	Ratings	Unit
I_T (RMS)	RMS on-state current		0.79	A
I_T (AV)	Average on-state current	Commercial frequency, sine half wave, 180° conduction, $T_a=57^\circ\text{C}$ *2	0.5	A
I_{TSM}	Surge on-state current	60Hz sine half wave 1 full cycle, peak value, non-repetitive	10	A
I^2_t	I^2_t for fusing	Value corresponding to 1 cycle of half wave 60Hz, surge on-state current	0.4	A ² s
PGM	Peak gate power dissipation		0.1	W
PG (AV)	Average gate power dissipation		0.01	W
VFGM	Peak gate forward voltage		6	V
VRGM	Peak gate reverse voltage		6	V
IFGM	Peak gate forward current		0.1	A
T_j	Junction temperature		-40 ~ +125	°C
T_{stg}	Storage temperature		-40 ~ +125	°C
—	Weight	Typical value	48	mg

*1 With Gate-to-cathode resistance $R_{GK}=1k\Omega$



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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} =1.5A, instantaneous value	—	—	1.9	V
V _{GT}	Gate trigger voltage	T _a =25°C, V _D =6V, I _T =0.1A *4	—	—	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 *4	1	—	100*3	μA
I _H	Holding current	T _j =25°C, V _D =12V, R _{GK} =1kΩ	—	—	3	mA
R _{th(j-a)}	Thermal resistance	Junction to ambient *2	—	—	70	°C/W

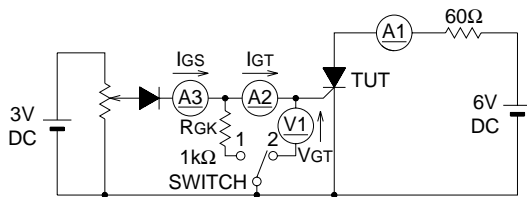
*2. Soldering with ceramic plate (25mm × 25mm × t0.7).

*3. 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

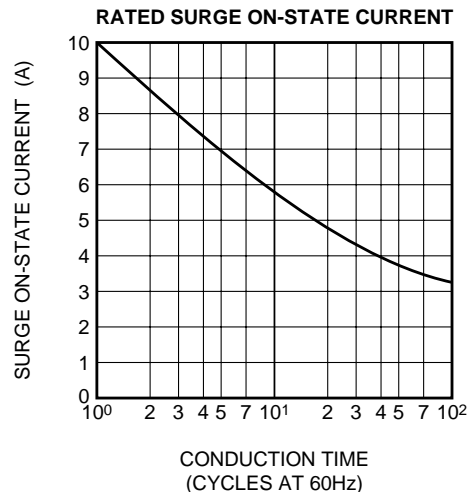
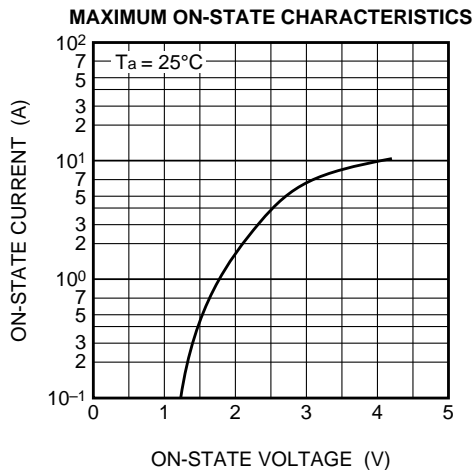
The above values do not include the current flowing through the 1kΩ resistance between the gate and cathode.

*4. I_{GT}, V_{GT} measurement circuit.



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

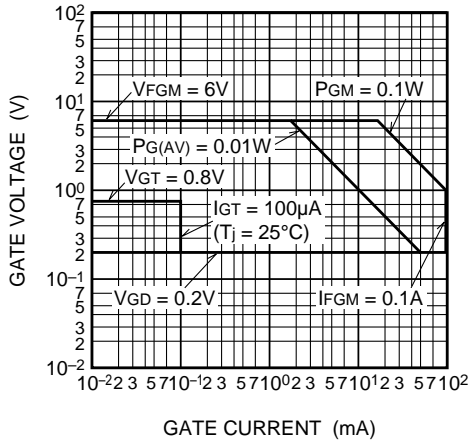
PERFORMANCE CURVES



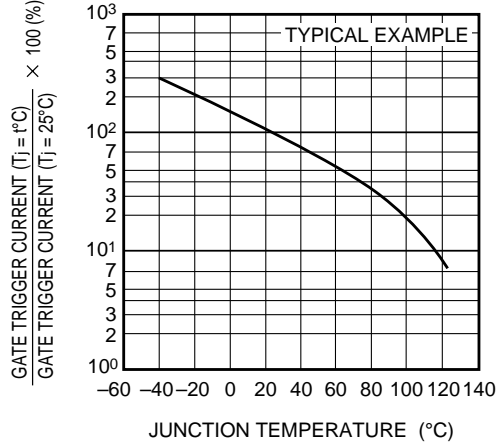
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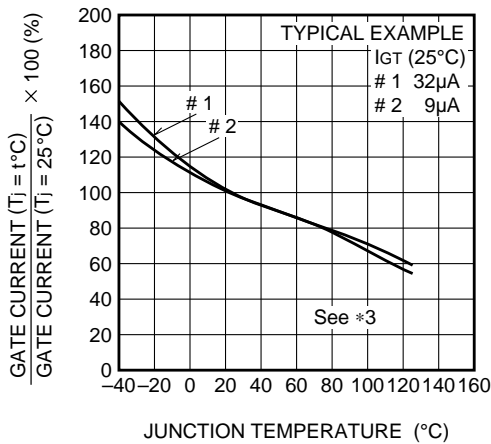
GATE CHARACTERISTICS



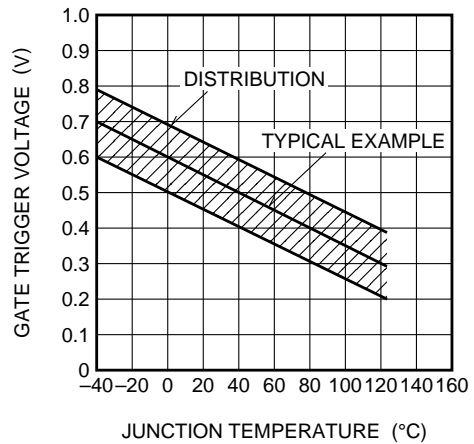
GATE TRIGGER CURRENT VS. JUNCTION TEMPERATURE



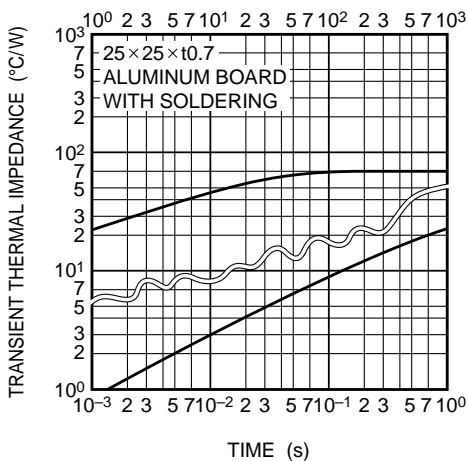
GATE CURRENT VS. JUNCTION TEMPERATURE



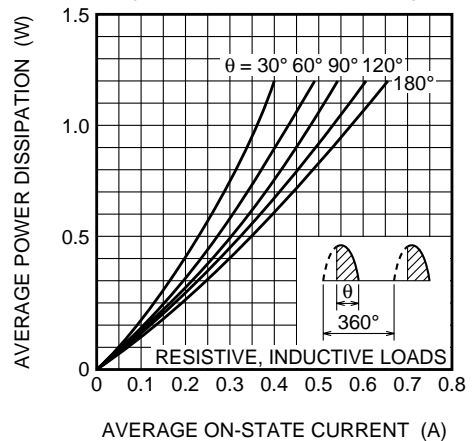
GATE TRIGGER VOLTAGE VS. JUNCTION TEMPERATURE



MAXIMUM TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (JUNCTION TO AMBIENT)



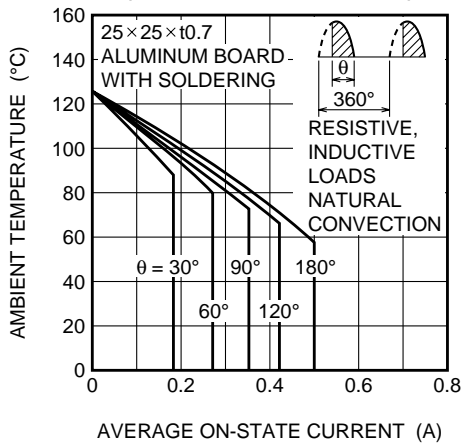
MAXIMUM AVERAGE POWER DISSIPATION (SINGLE-PHASE HALF WAVE)



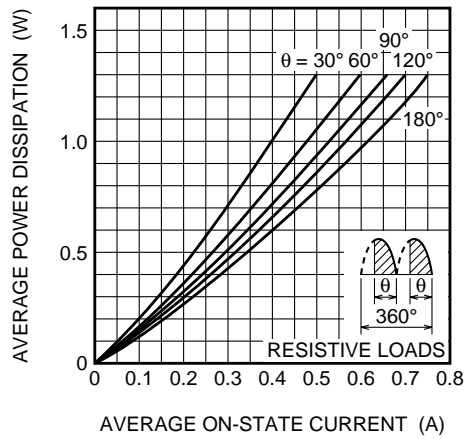
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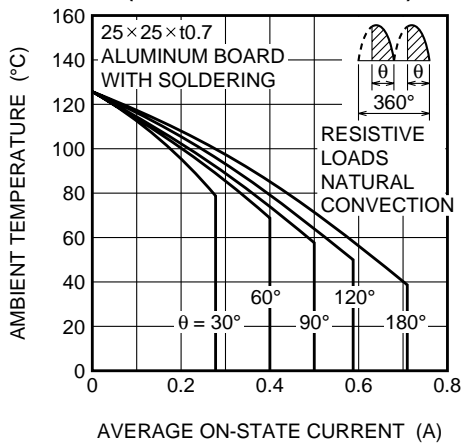
ALLOWABLE AMBIENT TEMPERATURE VS. AVERAGE ON-STATE CURRENT (SINGLE-PHASE HALF WAVE)



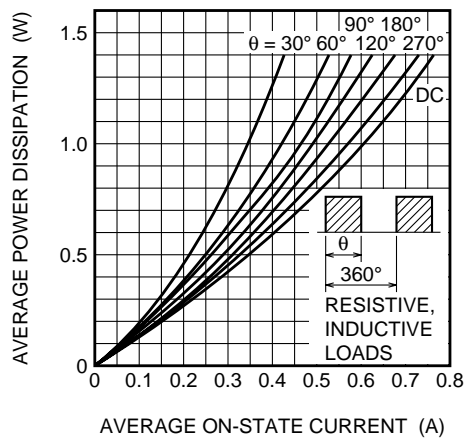
MAXIMUM AVERAGE POWER DISSIPATION (SINGLE-PHASE FULL WAVE)



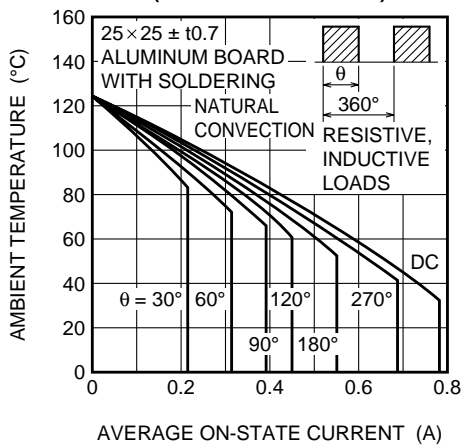
ALLOWABLE AMBIENT TEMPERATURE VS. AVERAGE ON-STATE CURRENT (SINGLE-PHASE FULL WAVE)



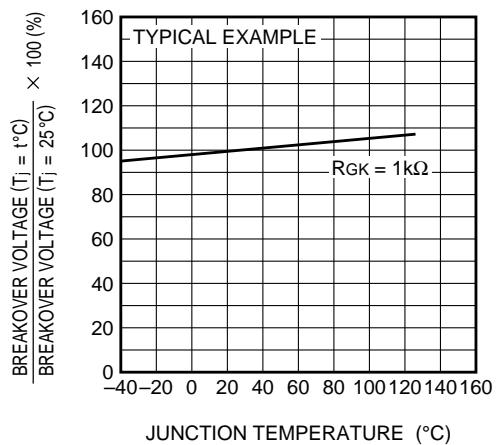
MAXIMUM AVERAGE POWER DISSIPATION (RECTANGULAR WAVE)



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



BREAKOVER VOLTAGE VS. JUNCTION TEMPERATURE



CR05AS

LOW POWER USE
NON-INSULATED TYPE, PLANAR PASSIVATION TYPE

