

300 mA HIGH-WITHSTANDING-VOLTAGE MOLD SCR

DESCRIPTION

The 03P4MG and 03P6MG are P-gate fully diffused mold SCRs with an average on-state current of 300 mA. The repeat peak off-state voltages (and reverse voltages) are 400 and 600 V.

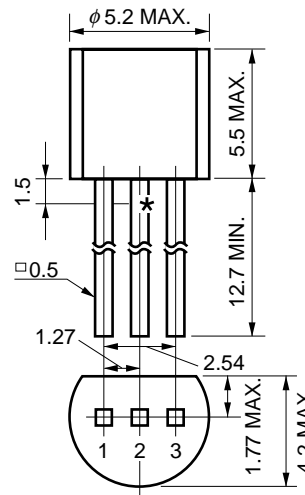
FEATURES

- 400 and 600 V high-withstanding-voltage series of products
- The non-repetitive withstanding voltage is a high 700 V, making it easy to harmonize the rise voltage of the surge absorber.
- High-sensitivity thyristor ( $I_{GT} = 3$  to  $50 \mu A$ )
- Employs flame-retardant epoxy resin (UL94V-0)

APPLICATIONS

Leakage breakers, SSRs, various type of alarms, consumer electronic equipments and automobile electronic components

PACKAGE DRAWING (Unit: mm)



Electrode connection  
1: Gate  
2: Anode  
3: Cathode

\*T<sub>c</sub> test bench-mark  
Standard weight: 0.3 g

ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 25°C)

Parameter	Symbol	Ratings		Unit	Remarks
		03P4MG	03P6MG		
Non-repetitive Peak Reverse Voltage	V <sub>RSM</sub>	700	700	V	R <sub>GK</sub> = 1 kΩ
Non-repetitive Peak Off-state Voltage	V <sub>DSM</sub>	700	700	V	R <sub>GK</sub> = 1 kΩ
Repetitive Peak Reverse Voltage	V <sub>RRM</sub>	400	600	V	R <sub>GK</sub> = 1 kΩ
Repetitive Peak Off-state Voltage	V <sub>DRM</sub>	400	600	V	R <sub>GK</sub> = 1 kΩ
Average On-state Current	I <sub>T(AV)</sub>	300 (T <sub>A</sub> = 30°C, Single half-wave, θ = 180°)		mA	Refer to Figure 10.
Effective On-state Current	I <sub>T(RMS)</sub>	470		mA	—
★ Surge On-state Current	I <sub>TSM</sub>	8 (f = 50 Hz, Sine half-wave, 1 cycle)		A	Refer to Figure 2.
Fusing Current	$\int i^2 dt$	0.15 (1 ms ≤ t ≤ 10 ms)		A <sup>2</sup> s	—
Critical Rate of On-state Current of Rise	di <sub>T</sub> /dt	20		A/μs	—
Peak Gate Power Dissipation	P <sub>GM</sub>	100 (f ≥ 50 Hz, Duty ≤ 10%)		mW	Refer to Figure 3.
Average Gate Power Dissipation	P <sub>G(AV)</sub>	10		mW	Refer to Figure 3.
Peak Gate Forward Current	I <sub>FGM</sub>	100 (f ≥ 50 Hz, Duty ≤ 10%)		mA	—
Peak Gate Reverse Voltage	V <sub>RGM</sub>	6		V	—
Junction Temperature	T <sub>j</sub>	-40 to +125		°C	—
Storage Temperature	T <sub>stg</sub>	-55 to +150		°C	—

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**ELECTRICAL CHARACTERISTICS (T<sub>j</sub> = 25°C, R<sub>θK</sub> = 1 kΩ)**

Parameter	Symbol	Conditions	Specifications			Unit	Remarks	
			MIN.	TYP.	MAX.			
Non-repetitive Peak Reverse Current	I <sub>RRM</sub>	V <sub>RM</sub> = V <sub>RDM</sub>	T <sub>j</sub> = 25°C	-	-	10	μA	-
			T <sub>j</sub> = 125°C	-	-	100	μA	-
Non-repetitive Peak Off-state Current	I <sub>DRM</sub>	V <sub>DM</sub> = V <sub>DRM</sub>	T <sub>j</sub> = 25°C	-	-	10	μA	-
			T <sub>j</sub> = 125°C	-	-	100	μA	-
Critical Rate-of-rise of Off-state Voltage	dV <sub>D</sub> /dt	T <sub>j</sub> = 125°C, V <sub>DM</sub> = $\frac{2}{3}$ V <sub>DRM</sub>	10	-	-	V/μs	-	
On-state Voltage	V <sub>T</sub>	I <sub>T</sub> = 4 A	-	-	2.2	V	Refer to Figure 1.	
Gate Trigger Current	I <sub>GT</sub>	V <sub>DM</sub> = 6 V, R <sub>L</sub> = 100 Ω	3	-	50	μA	-	
Gate Trigger Voltage	V <sub>GT</sub>	V <sub>DM</sub> = 6 V, R <sub>L</sub> = 100 Ω	-	-	0.8	V	-	
Gate Non-trigger Voltage	V <sub>GD</sub>	T <sub>j</sub> = 125°C, V <sub>DM</sub> = $\frac{V_{DRM}}{2}$	0.2	-	-	V	-	
Holding Current	I <sub>H</sub>	V <sub>DM</sub> = 24 V, I <sub>TM</sub> = 4 A	-	-	5	mA	-	
Turn-off Time	t <sub>q</sub>	T <sub>j</sub> = 125°C, I <sub>T</sub> = 200 mA, dI <sub>R</sub> /dt = 15 A/μs, V <sub>R</sub> ≥ 25 V, V <sub>DM</sub> = $\frac{2}{3}$ V <sub>DRM</sub> , dV <sub>D</sub> /dt = 10 V/μs	-	60	-	μs	-	
Thermal Resistance	R <sub>th(j-c)</sub>	Junction-to-case DC	-	-	50	°C/W	Refer to Figure 14.	
	R <sub>th(j-a)</sub>	Junction-to-ambient DC	-	-	230	°C/W	Refer to Figure 14.	

**TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)**

Figure 1. i<sub>r</sub> vs. v<sub>T</sub> Characteristics

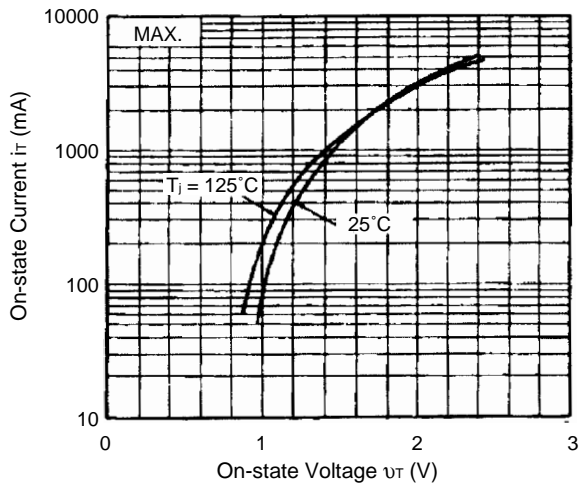


Figure 2. I<sub>rSM</sub> Rating

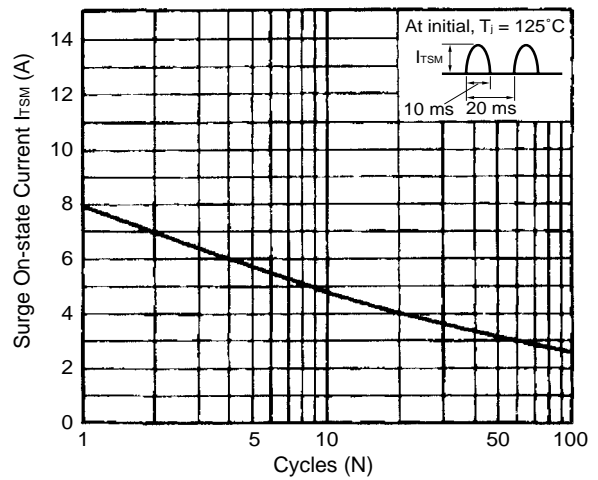


Figure 3. Gate Rating

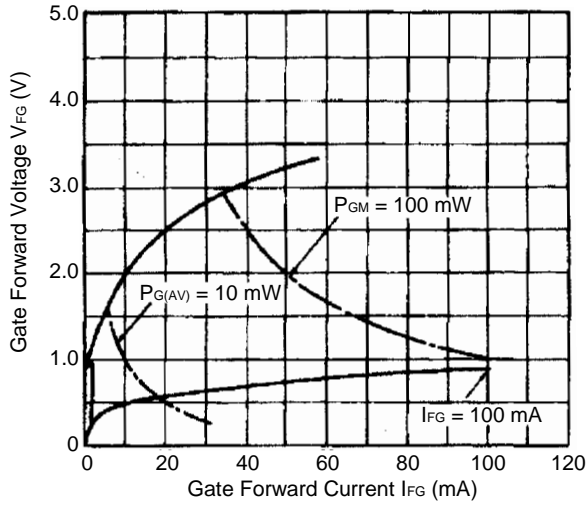


Figure 4. Example of Gate Characteristics

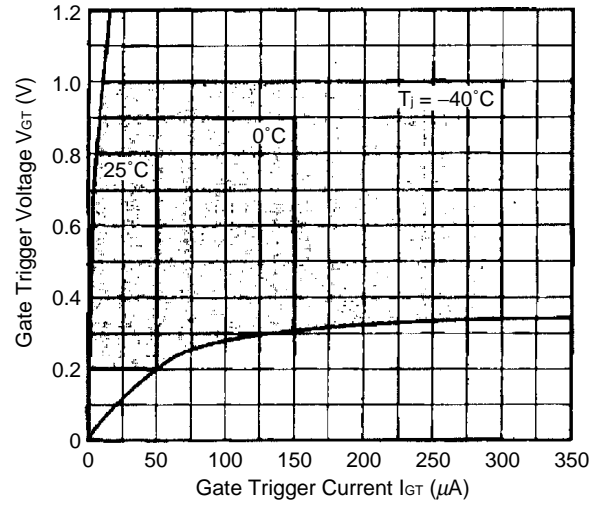


Figure 5.  $I_{GT}$  vs.  $T_A$  Example of Characteristics

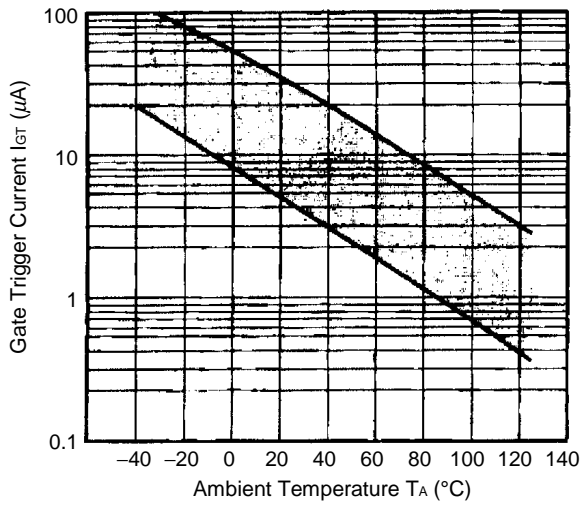


Figure 6.  $V_{GT}$  vs.  $T_A$  Example of Characteristics

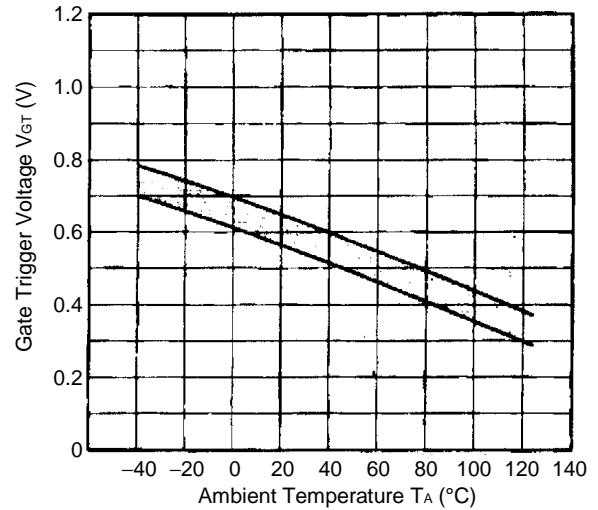


Figure 7.  $i_{GS}$  vs.  $\tau$  Example of Characteristics

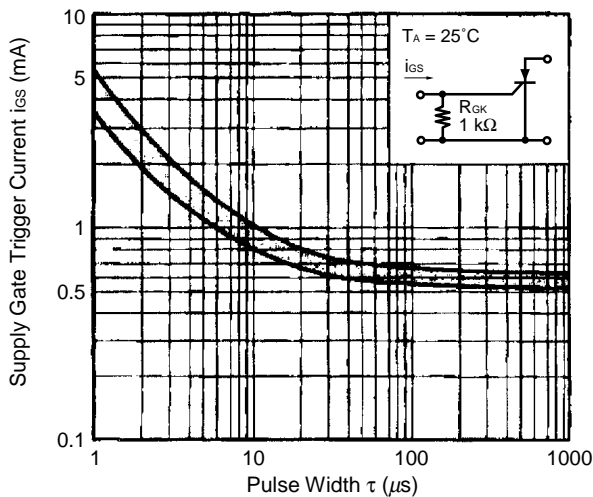


Figure 8.  $v_{GT}$  vs.  $\tau$  Example of Characteristics

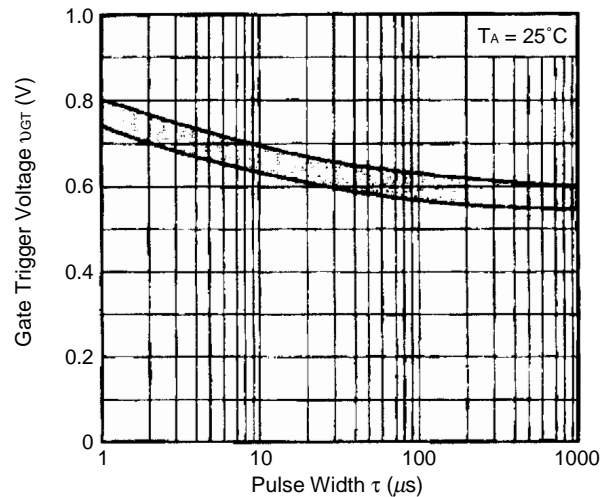


Figure 9.  $P_{T(AV)}$  vs.  $I_{T(AV)}$  Characteristics

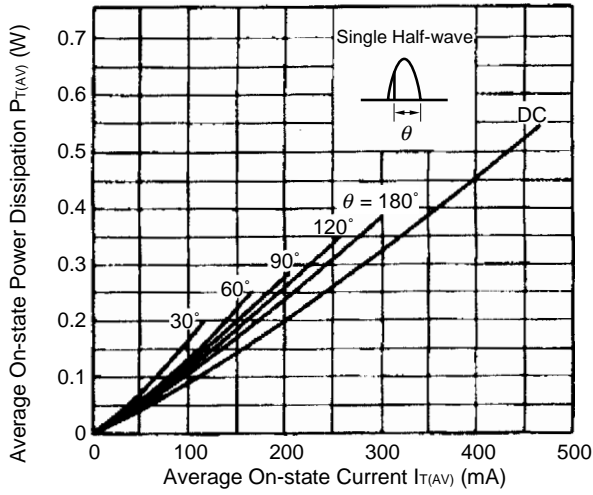


Figure 10.  $T_A$  vs.  $I_{T(AV)}$  Characteristics

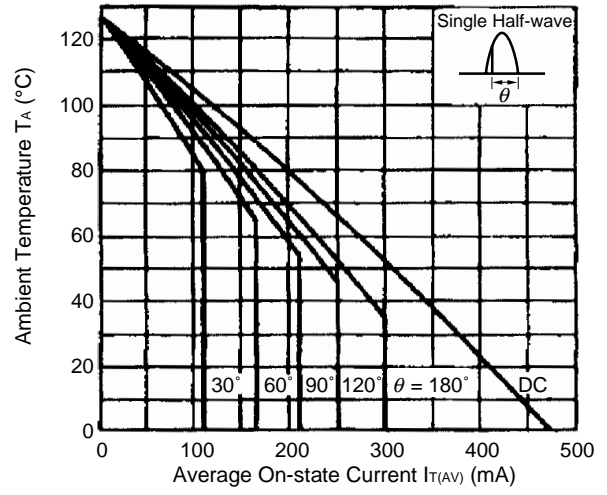


Figure 11.  $P_{T(AV)}$  vs.  $I_{T(AV)}$  Characteristics

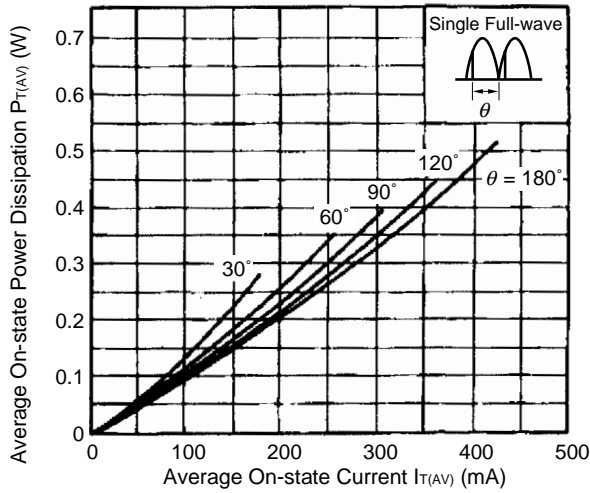


Figure 12.  $T_A$  vs.  $I_{T(AV)}$  Characteristics

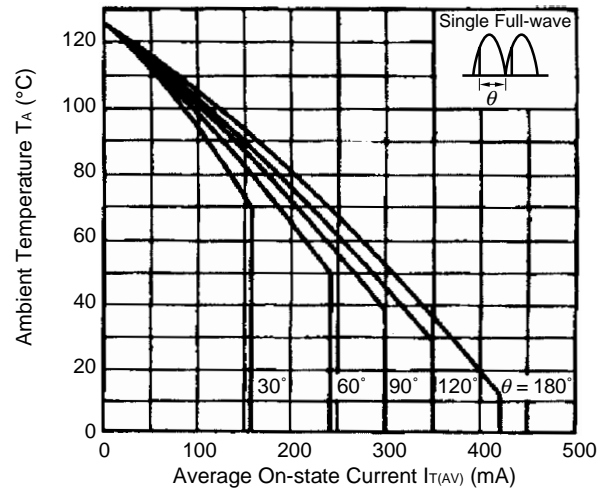


Figure 13.  $I_H$  vs.  $T_A$  Example of Characteristics

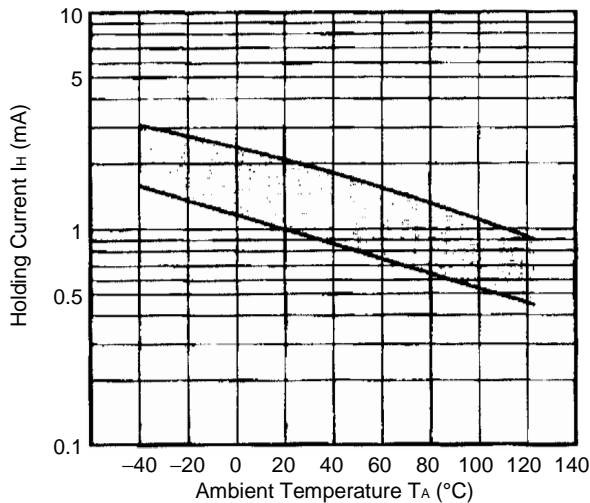
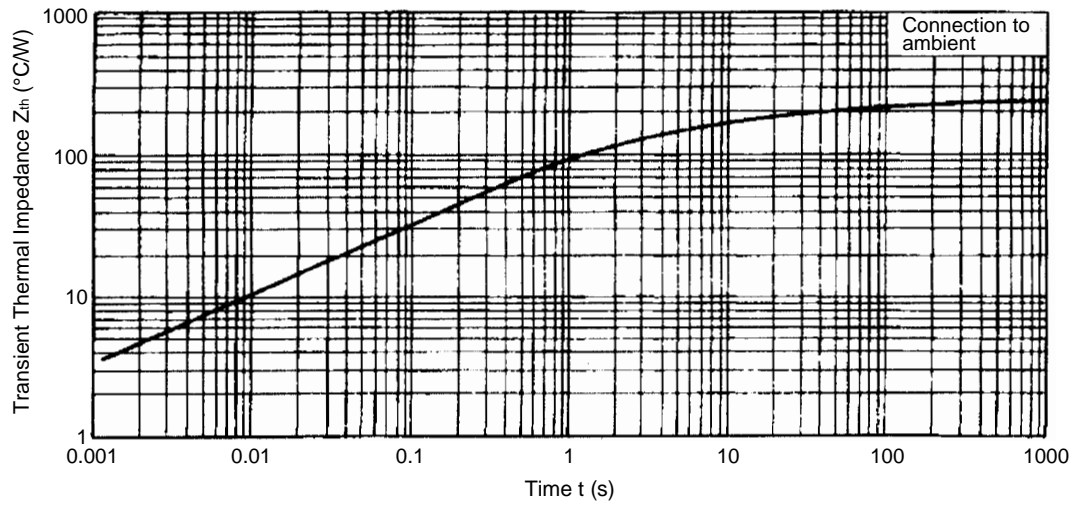


Figure 14.  $Z_{th}$  Characteristics



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