

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.

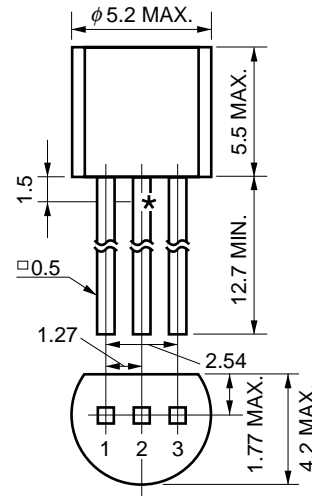
FEATURES

- 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_c test bench-mark
Standard weight: 0.3 g

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

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

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ELECTRICAL CHARACTERISTICS (T_j = 25°C, R_{θK} = 1 kΩ)

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

TYPICAL CHARACTERISTICS (T_A = 25°C)

Figure 1. i_r vs. v_T Characteristics

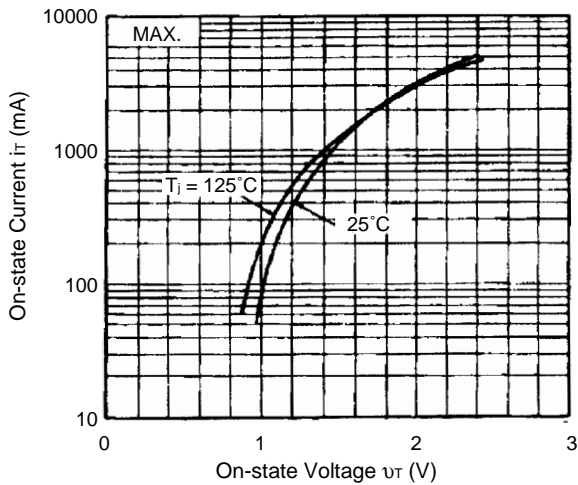


Figure 2. I_{rSM} Rating

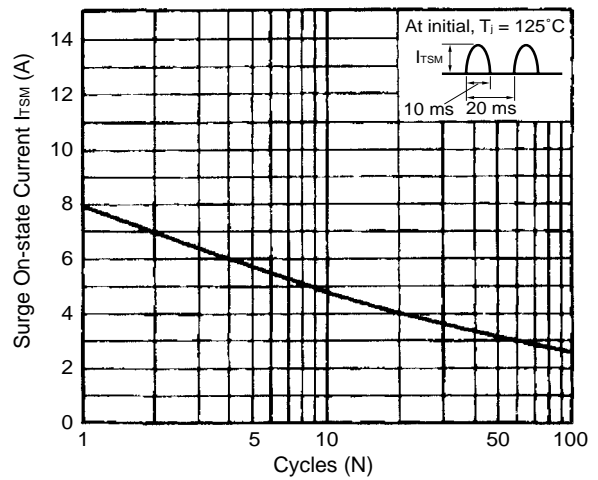


Figure 3. Gate Rating

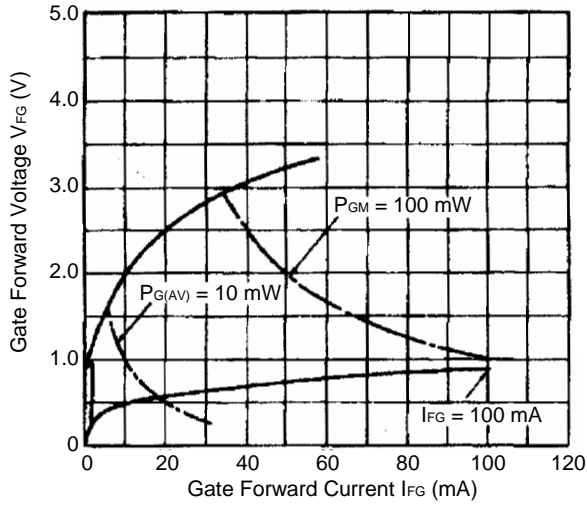


Figure 4. Example of Gate Characteristics

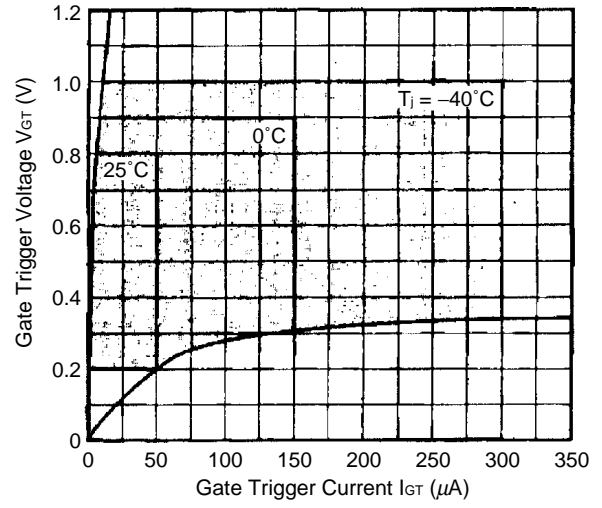


Figure 5. I_{GT} vs. T_A Example of Characteristics

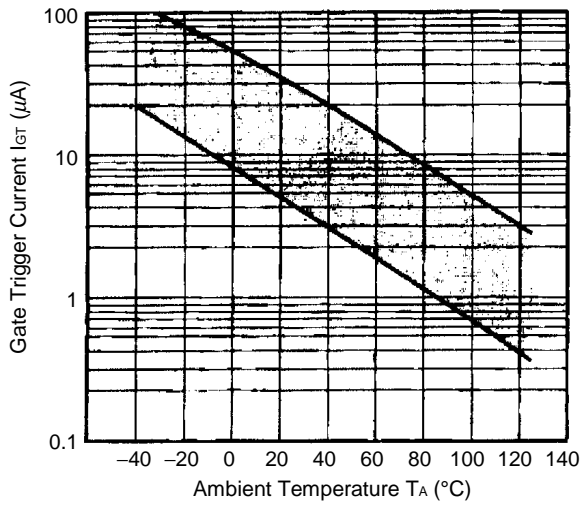


Figure 6. V_{GT} vs. T_A Example of Characteristics

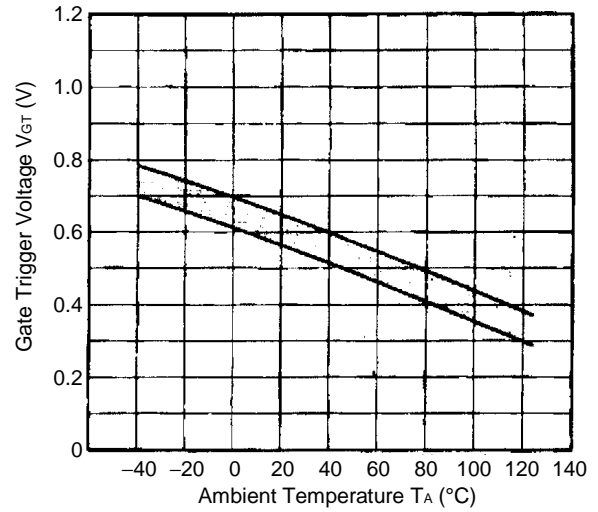


Figure 7. i_{GS} vs. τ Example of Characteristics

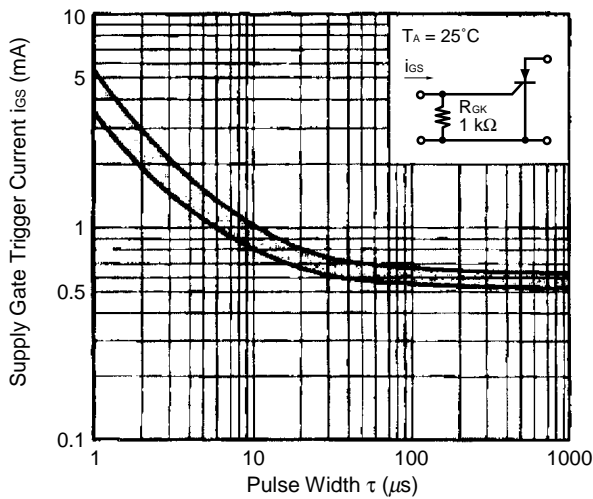


Figure 8. v_{GT} vs. τ Example of Characteristics

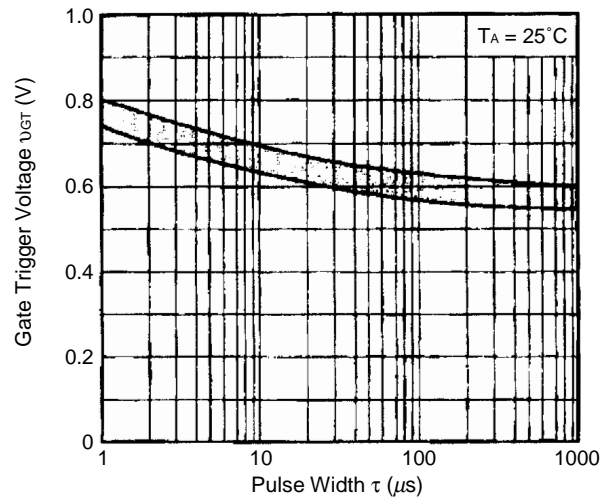


Figure 9. $P_{T(AV)}$ vs. $I_{T(AV)}$ Characteristics

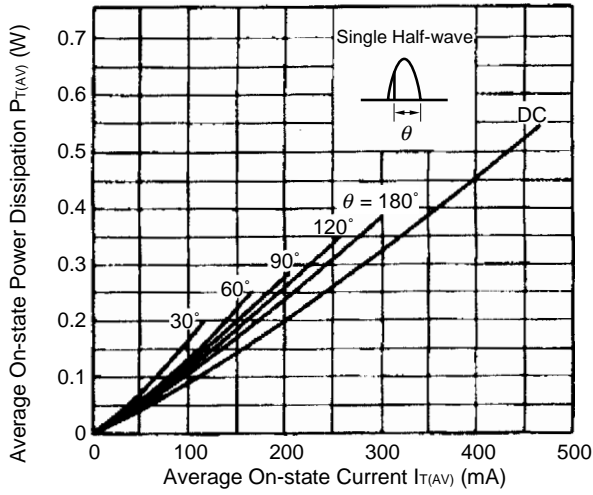


Figure 10. T_A vs. $I_{T(AV)}$ Characteristics

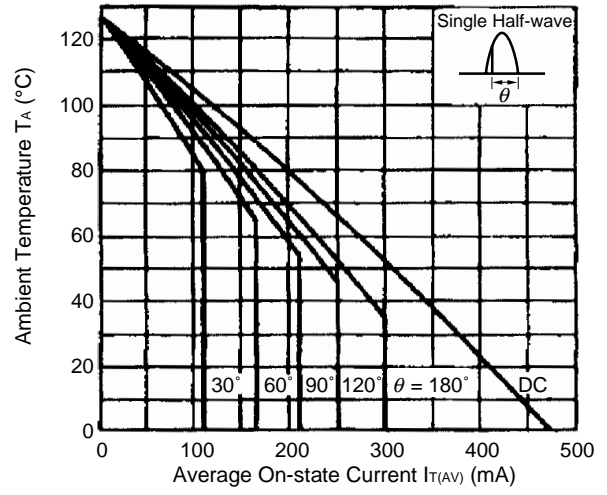


Figure 11. $P_{T(AV)}$ vs. $I_{T(AV)}$ Characteristics

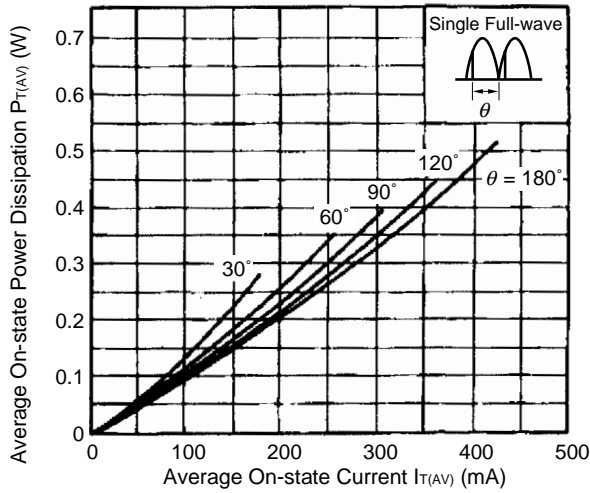


Figure 12. T_A vs. $I_{T(AV)}$ Characteristics

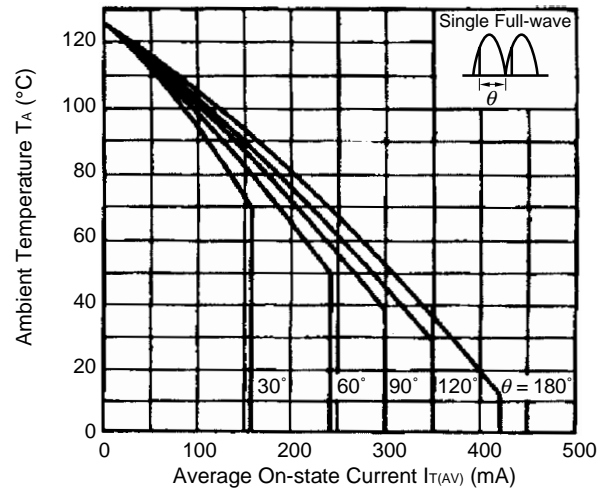


Figure 13. I_H vs. T_A Example of Characteristics

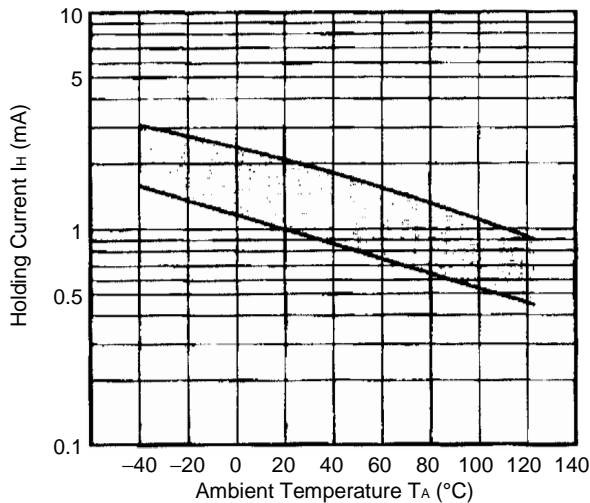
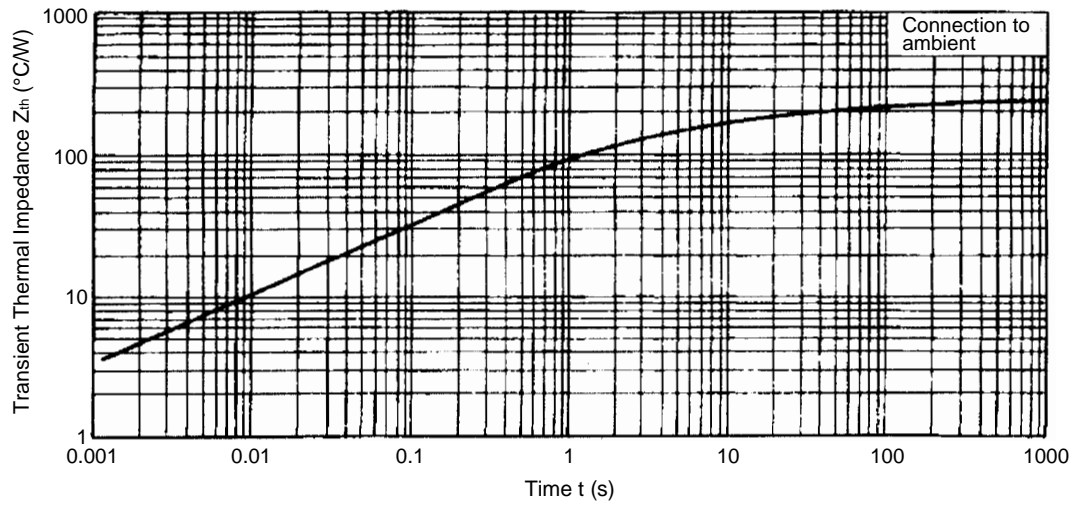


Figure 14. Z_{th} Characteristics



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