

2 A HIGH-SPEED SWITCHING SCR

The 2S2M and 2S4M are P-gate fully diffused mold SCRs with an average on-current of 2 A. The repeat peak off-voltages (and reverse voltages) are 200 V and 400 V.

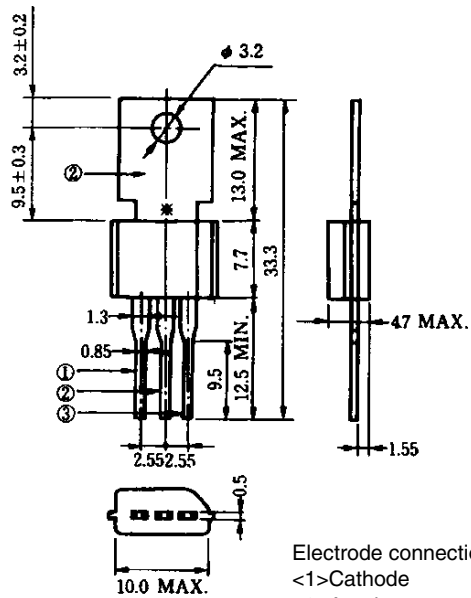
FEATURES

- This transistor is designed for high-speed switching and is ideal for use in commercial frequencies, high-frequency pulse applications, and inverter applications.
- This transistor features a small and lightweight package and is easy to handle even on the mounting surface due to its TO-202AA dimensions. Processing of lead wires and heatsink (tablet) using jigs is also possible.
- Employs flame-retardant epoxy resin (UL94V-0).

APPLICATIONS

Consumer electronic equipments, ignitors of devices for light industry, inverter, and solenoid valve drives

PACKAGE DRAWING (UNIT: mm)



Electrode connection
<1>Cathode
<2>Anode
<3>Gate
Standard weight: 1.4

*TC test bench-mark

ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

Parameter	Symbol	2S2M	2S4M	Ratings	Unit
Non-repetitive peak reverse voltage	V_{RSM}	300	500	V	$R_{GK} = 1 \text{ k}\Omega$
Non-repetitive peak off-state voltage	V_{DSM}	300	500	V	$R_{GK} = 1 \text{ k}\Omega$
Repetitive peak reverse voltage	V_{RRM}	200	400	V	$R_{GK} = 1 \text{ k}\Omega$
Repetitive peak off-voltage	V_{DRM}	200	400	V	$R_{GK} = 1 \text{ k}\Omega$
Average on-state current	$I_{T(AV)}$	2 (Tc = 77°C, Single half-wave, $\theta = 180^\circ$)		A	Refer to Figure 6 and 7.
Surge on-state current	I_{TSM}	20 (f = 50 Hz, Sine half-wave, 1 cycle)		A	Refer to Figure 2.
High-frequency peak on-state current	I_{TRM}	15 (Tc = 65°C, f = 10 kp.p.s, $t_p = 10 \mu\text{s}$)		A	—
Fusing current	$\int i^2 dt$	1.6 (1 ms ≤ t ≤ 10 ms)		A ² s	—
Critical rate of rise of on-state current	di_T/dt	50		A/ μs	—
Peak gate power dissipation	P_{GM}	0.5 (f ≥ 50 Hz, Duty ≤ 10%)		W	—
Average gate power dissipation	$P_{G(AV)}$	0.1		W	—
Peak gate forward current	I_{FGM}	0.2 (f ≥ 50 Hz, Duty ≤ 10%)		A	—
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_{GK} = 1 kΩ)

Parameter	Symbol	Conditions	Specifications			Unit	Remarks
			MIN.	TYP.	MAX.		
Repeat peak off-state current	I _{DRM}	V _{DM} = V _{DRM}	T _j = 25°C		10	μA	-
			T _j = 125°C		200		
Repetitive peak reverse current	I _{RRM}	V _{RM} = V _{RRM}	T _j = 25°C		10	μA	-
			T _j = 125°C		200		
On voltage	V _{TM}	T _j = 25°C, I _{TM} = 4 A	-	-	2.2	V	Refer to Figure 9.
Gate trigger voltage	V _{GT}	V _{DM} = 6 V, R _L = 100 Ω	-	-	0.8	μA	Refer to Figure 8.
Gate trigger current	I _{GT}	V _{DM} = 6 V, R _L = 100 Ω	-	-	300	V	-
Gate non-trigger voltage	V _{GD}	T _j = 125°C, V _{DM} = 1/2 V _{DRM}	0.2	-	-	V	-
Critical rate of-rise of off-state voltage	dv/dt	T _j = 125°C, V _{DM} = 2/3 V _{DRM}	10	-	-	V/μs	-
Holding current	I _H	T _j = 25°C, V _D = 24 V	-	-	10	mA	-
Commutating turn-off time	T _q	T _j = 125°C, I _T = 2 A V _{DM} = 2/3 V _{DRM} , V _R = 50 V dv/dt = 10 V/μs	-	-	15	μs	-
Turn-on time	T _{gt}	T _j = 125°C, V _{DM} = 2/3 V _{DRM} I _{TM} = 30 A I _G = 5 mA, t _{IG} = 5 μs	-	-	2	μs	-
Thermal resistance	R _{th(j-c)}	Junction-to-case DC	-	-	10	°C/W	Refer to Figure 13.
	R _{th(j-a)}	Junction-to-ambient DC	-	-	75		

TYPICAL CHARACTERISTICS (T_a = 25°C)

Figure 1. i_T vs. v_T Characteristics

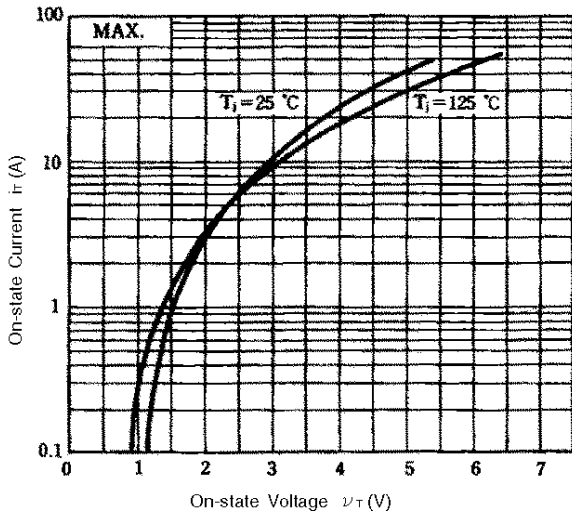


Figure 2. I_{TSM} Rating

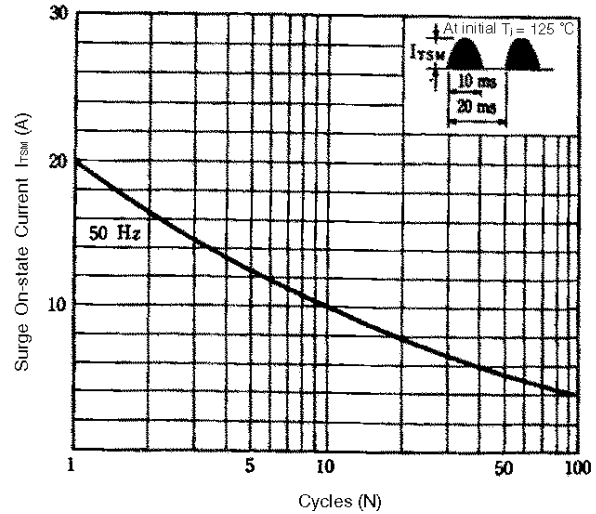


Figure 3. I_{TRM} vs. t_P Rating

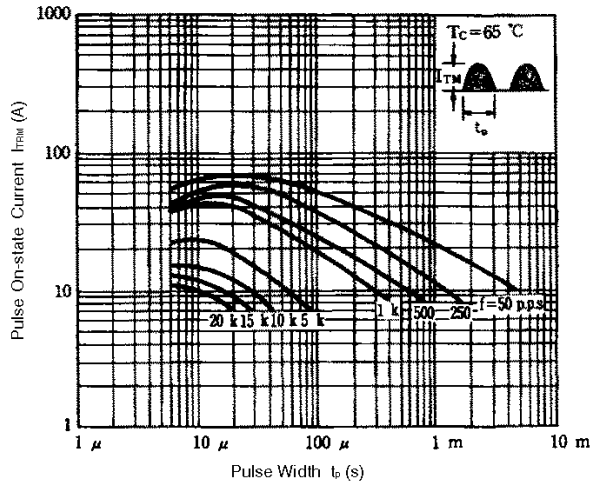


Figure 4. I_{TRM} vs. t_P Rating

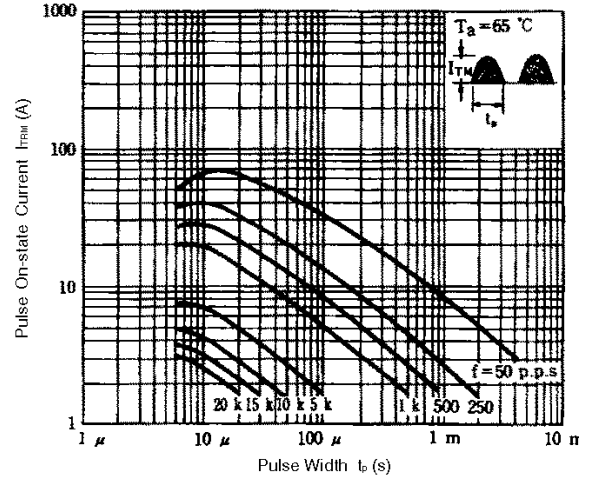


Figure 5. $P_{T(AV)}$ vs. $I_{T(AV)}$ Characteristics

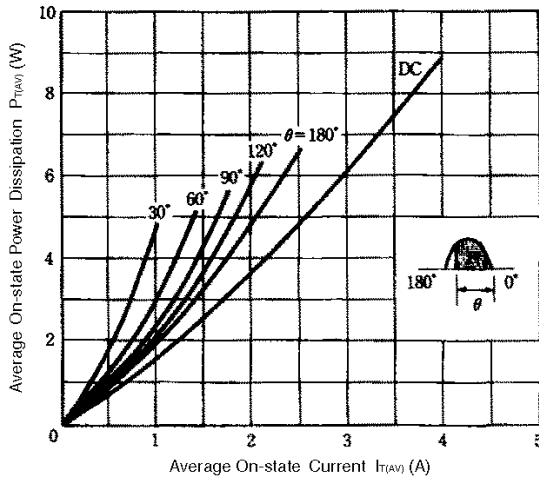


Figure 6. T_C vs. $I_{T(AV)}$ Rating

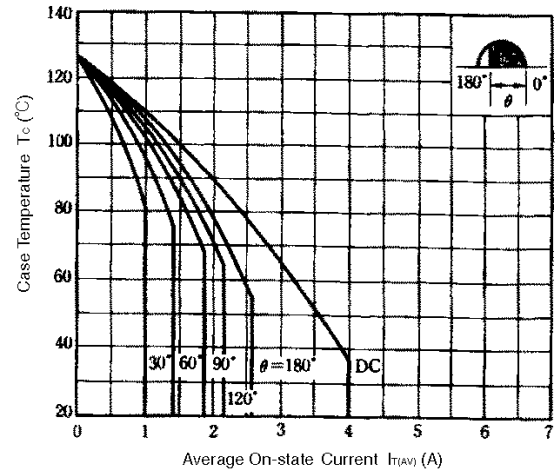


Figure 7. T_A vs. $I_{T(AV)}$ Rating

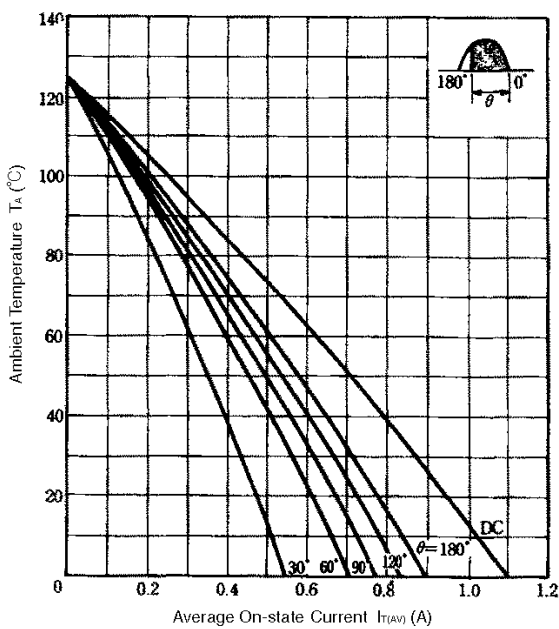


Figure 8. I_{GT} vs. T_A Example of Characteristics

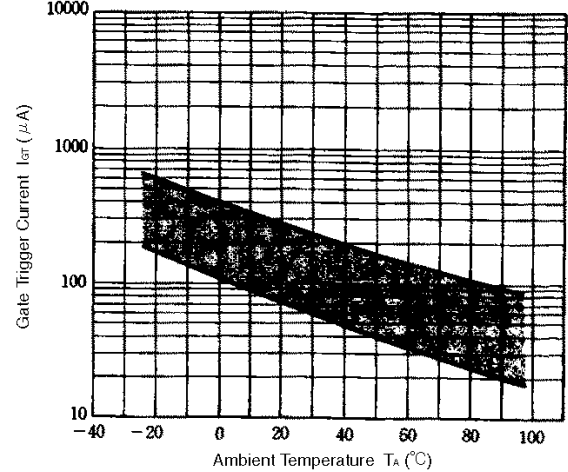


Figure 9. V_{GT} vs. T_A Example of Characteristics

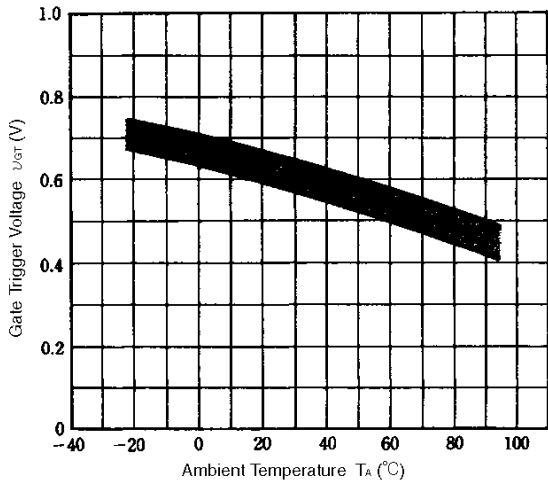


Figure 10. i_{GS} vs. τ Example of Characteristics

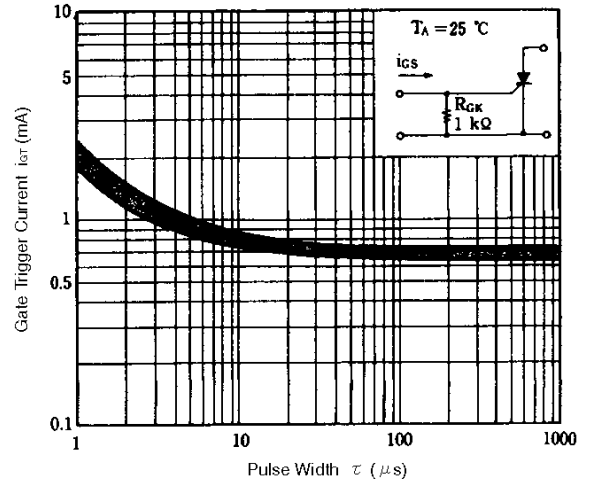


Figure 11. V_{GT} vs. τ Example of Characteristics

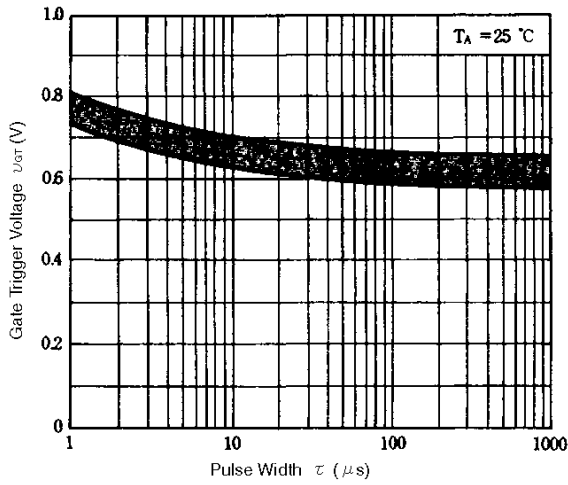


Figure 12. I_H vs. T_A Example of Characteristics

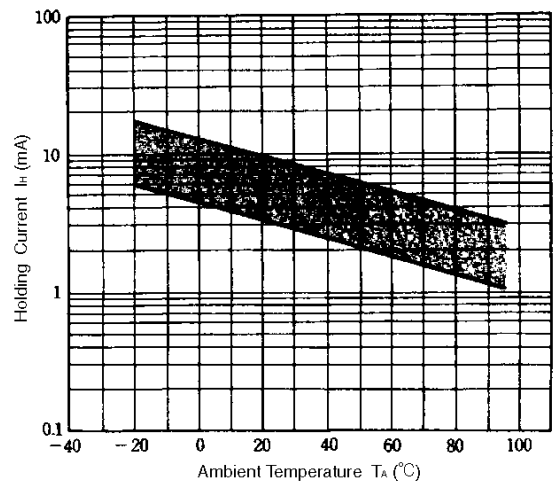
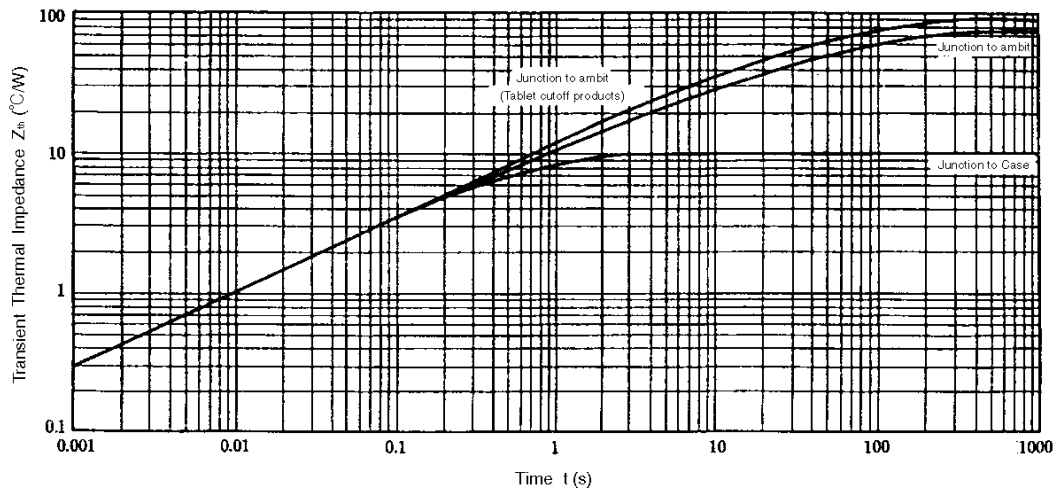


Figure 13. Z_{th} Characteristics



[MEMO]

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