

TOSHIBA BI-DIRECTIONAL TRIODE THYRISTOR SILICON PLANAR TYPE

# SM25GZ51, SM25JZ51

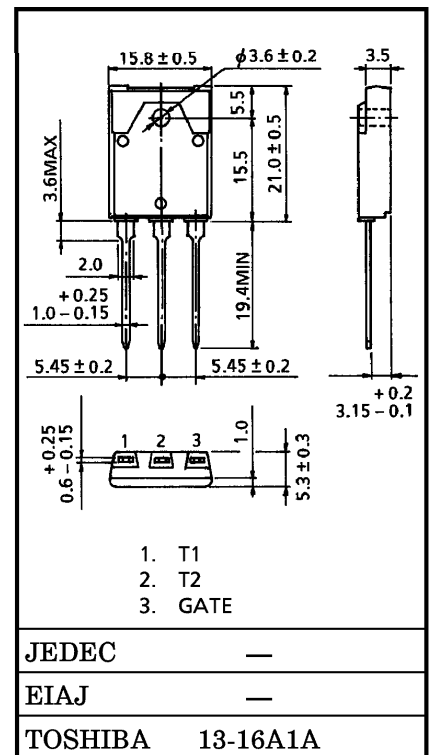
AC POWER CONTROL APPLICATIONS

Unit in mm

- Repetitive Peak Off-State Voltage :  $V_{DRM}=400, 600V$
- R.M.S On-State Current :  $I_T(RMS)=25A$
- High Commutating (dv/dt) :  $(dv/dt)_c=10V/\mu s$
- Isolation Voltage :  $V_{Isol}=1500V AC$

**MAXIMUM RATINGS**

CHARACTERISTIC		SYMBOL	RATING	UNIT
Repetitive Peak Off-State Voltage	SM25GZ51	$V_{DRM}$	400	V
	SM25JZ51		600	
R.M.S On-State Current (Full Sine Waveform $T_c=73^\circ C$ )		$I_T(RMS)$	25	A
Peak One Cycle Surge On-State Current (Non-Repetitive)		$I_{TSM}$	230 (50Hz)	A
			253 (60Hz)	
I <sup>2</sup> t Limit Value		$I^2t$	260	A <sup>2</sup> s
Critical Rate of Rise of On-State Current (Note 1)		di/dt	50	A/μs
Peak Gate Power Dissipation		$P_{GM}$	5	W
Average Gate Power Dissipation		$P_G(AV)$	0.5	W
Peak Gate Voltage		$V_{GM}$	10	V
Peak Gate Current		$I_{GM}$	2	A
Junction Temperature		$T_j$	-40~125	°C
Storage Temperature Range		$T_{stg}$	-40~125	°C
Isolation Voltage (AC, t=1 min.)		$V_{Isol}$	1500	V



Weight : 5.9g

Note 1 : di/dt Test Condition

$$V_{DRM} = 0.5 \times \text{Rated}$$

$$I_{TM} \leq 40A$$

$$t_{gw} \geq 10\mu s$$

$$t_{gr} \leq 250ns$$

$$i_{gp} = I_{GT} \times 2.0$$

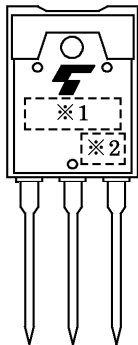
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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

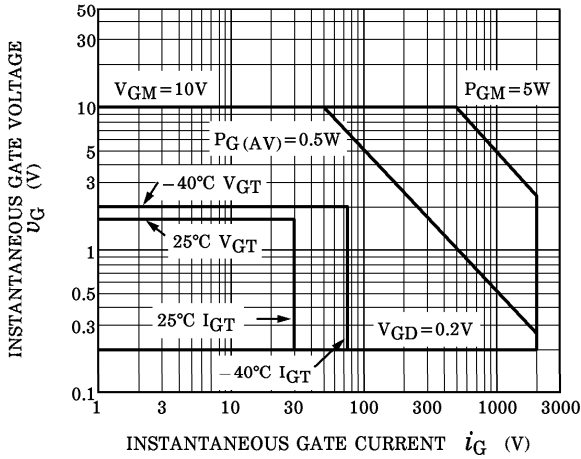
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Repetitive Peak Off-State Current	$I_{DRM}$	$V_{DRM} = \text{Rated}$	—	—	20	$\mu A$	
Gate Trigger Voltage	I II III $V_{GT}$	$V_D = 12V$ $R_L = 20\Omega$	T2(+), GATE(+)	—	—	1.5	V
			T2(+), GATE(-)	—	—	1.5	
			T2(-), GATE(-)	—	—	1.5	
Gate Trigger Current	I II III $I_{GT}$	$V_D = 12V$ $R_L = 20\Omega$	T2(+), GATE(+)	—	—	30	mA
			T2(+), GATE(-)	—	—	30	
			T2(-), GATE(-)	—	—	30	
Peak On-State Voltage	$V_{TM}$	$I_{TM} = 40A$	—	—	1.5	V	
Gate Non-Trigger Voltage	$V_{GD}$	$V_D = \text{Rated}, T_c = 125^\circ C$	0.2	—	—	V	
Holding Current	$I_H$	$V_D = 12V, I_{TM} = 1A$	—	—	60	mA	
Thermal Resistance	$R_{th(j-c)}$	Junction to Case, AC	—	—	1.3	$^\circ C / W$	
Critical Rate of Rise of Off-State Voltage	$dv / dt$	$V_{DRM} = \text{Rated}, T_j = 125^\circ C$ Exponential Rise	—	300	—	$V / \mu s$	
Critical Rate of Rise of Off-State Voltage at Commutation	$(dv / dt)_c$	$V_{DRM} = 400V, T_j = 125^\circ C$ $(di / dt)_c = -15A / ms$	10	—	—	$V / \mu s$	

MARKING

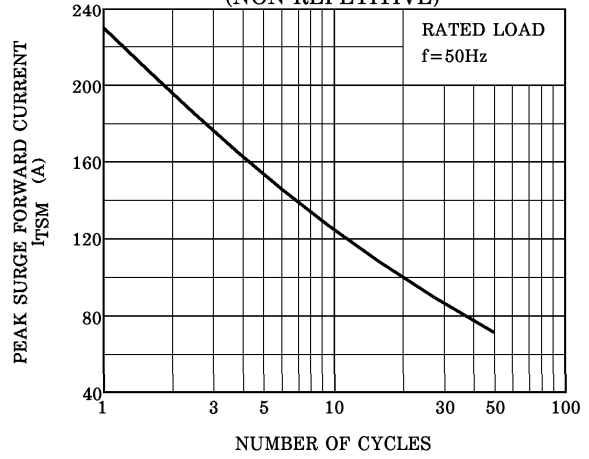


NUMBER	SYMBOL	MARK
※ 1	TYPE	SM25GZ51
		SM25JZ51
※ 2	Lot Number <div style="display: flex; align-items: center;"> <div style="border: 1px solid black; width: 15px; height: 15px; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 15px; height: 15px; margin-right: 5px; margin-left: 10px;"></div> <div style="margin-left: 10px;"> <p>Month (Starting from Alphabet A)</p> <p>Year (Last Decimal Digit of the Current Year)</p> </div> </div>	Example 8A : January 1998 8B : February 1998 8L : December 1998

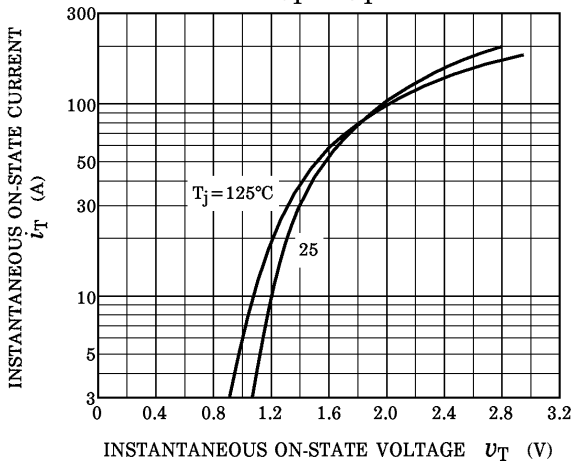
GATE TRIGGER CHARACTERISTIC



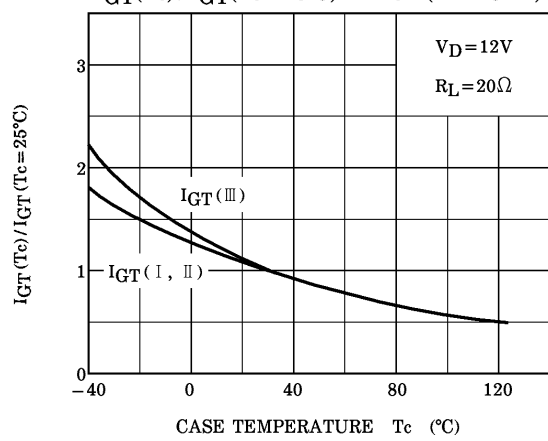
SURGE ON-STATE CURRENT (NON-REPETITIVE)



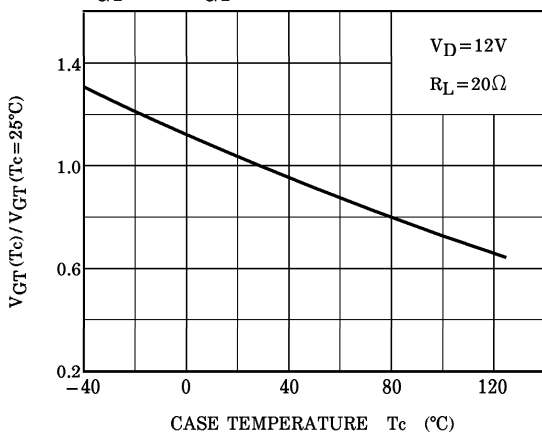
$i_T - U_T$



$I_{GT}(T_c) / I_{GT}(T_c=25^\circ\text{C}) - T_c$  (TYPICAL)



$V_{GT}(T_c) / V_{GT}(T_c=25^\circ\text{C}) - T_c$  (TYPICAL)



$I_H(T_c) / I_H(T_c=25^\circ\text{C}) - T_c$  (TYPICAL)

