

TOSHIBA BI-DIRECTIONAL TRIODE THYRISTOR ILLICON PLANAR TYPE

SM25GZ51, SM25JZ51

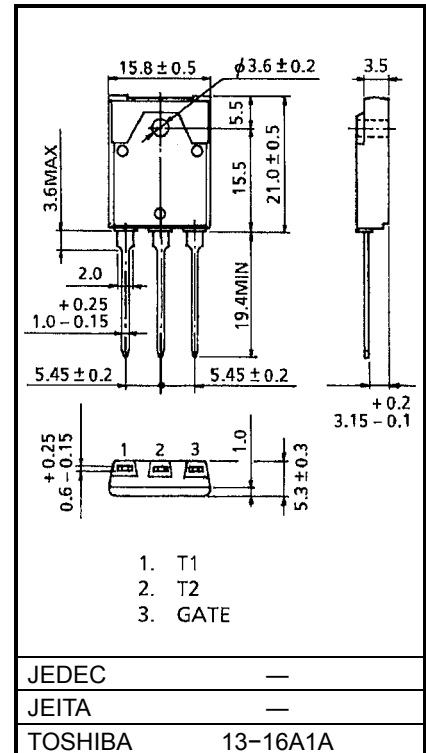
Unit: mm

AC POWER CONTROL APPLICATIONS

- 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	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)	
$I^2 t$ Limit Value	$I^2 t$	260	$A^2 s$
Critical Rate of Rise of On-State Current (Note 1)	di / dt	50	$A / \mu s$
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	$-40 \sim 125$	$^\circ C$
Storage Temperature Range	T_{stg}	$-40 \sim 125$	$^\circ C$
Isolation Voltage (AC, $t = 1 \text{ min.}$)	V_{Isol}	1500	V



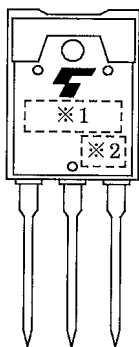
Weight: 5.9g

Note 1: di / dt Test Condition
 $V_{DRM} = 0.5 \times \text{Rated}$
 $I_{TM} \leq 40A$
 $t_{gw} \geq 10\mu s$
 $t_{gr} \leq 250ns$
 $i_{gp} = I_{GT} \times 2.0$

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

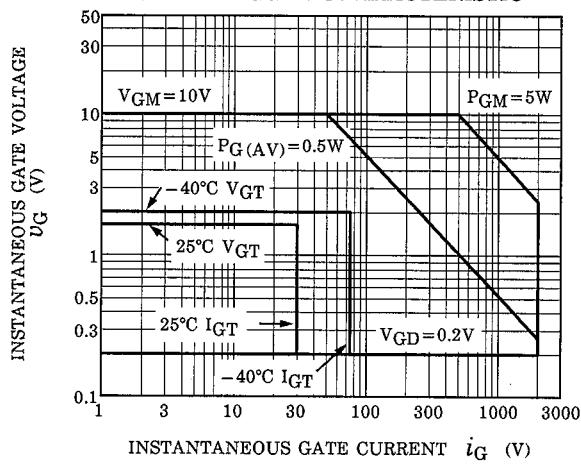
CHARACTERISTIC		SYMBOL	TEST CONDITION		MIN	TYP.	MAX	UNIT
Repetitive Peak Off-State Current		I_{DRM}	$V_{DRM} = \text{Rated}$		—	—	20	μA
Gate Trigger Voltage	I	V_{GT}	$V_D = 12\text{V}$ $R_L = 20\Omega$	T2 (+), Gate (+)	—	—	1.5	V
	II			T2 (+), Gate (-)	—	—	1.5	
	III			T2 (-), Gate (-)	—	—	1.5	
Gate Trigger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

MARKING

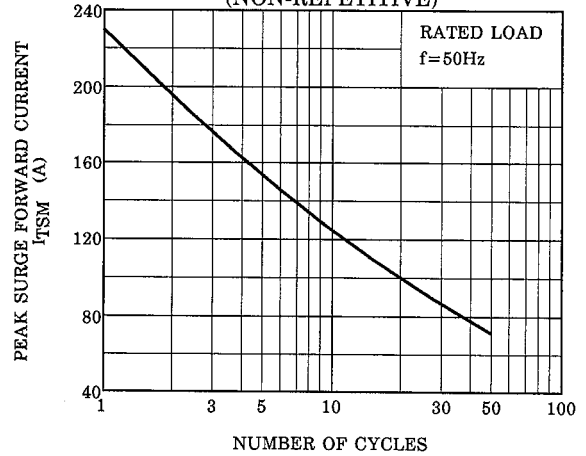


NUMBER	SYMBOL		MARK
*1	TYPE	SM25GZ51	M25GZ51
		SM25JZ51	M25JZ51
*2	Lot Number  Month (Starting from Alphabet A) Year (Last Decimal Digit of the Current Year)		Example 8A : January 1998 8B : February 1998 8L : December 1998

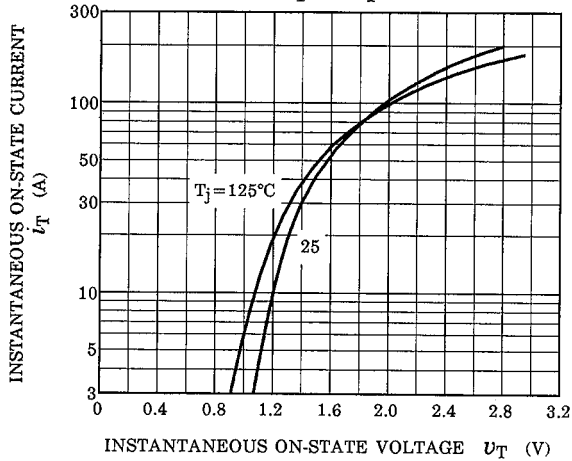
GATE TRIGGER CHARACTERISTIC



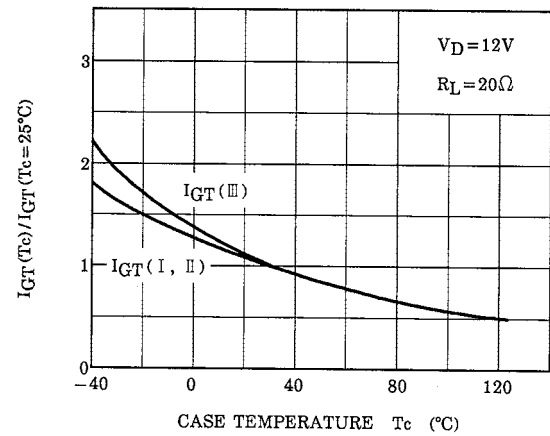
SURGE ON-STATE CURRENT (NON-REPETITIVE)



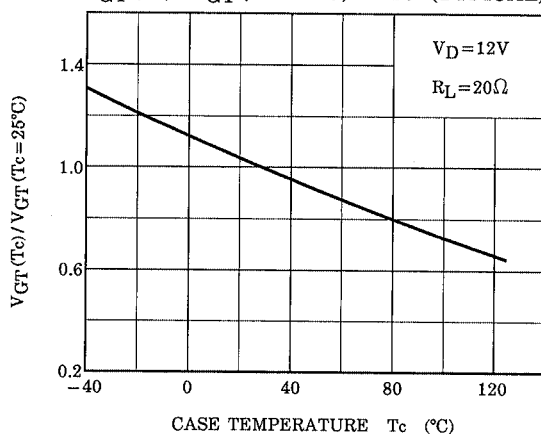
$i_T - v_T$



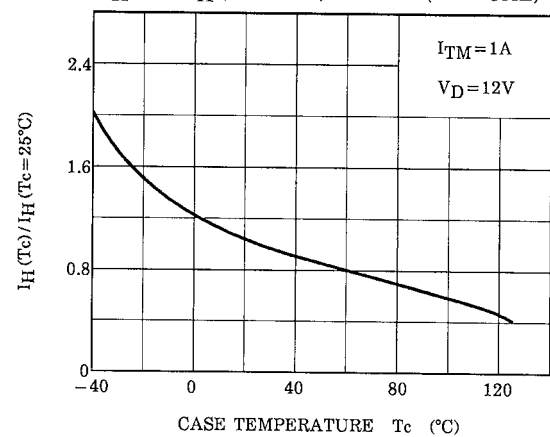
$I_{GT}(T_c)/I_{GT}(T_c=25^\circ C) - T_c$ (TYPICAL)

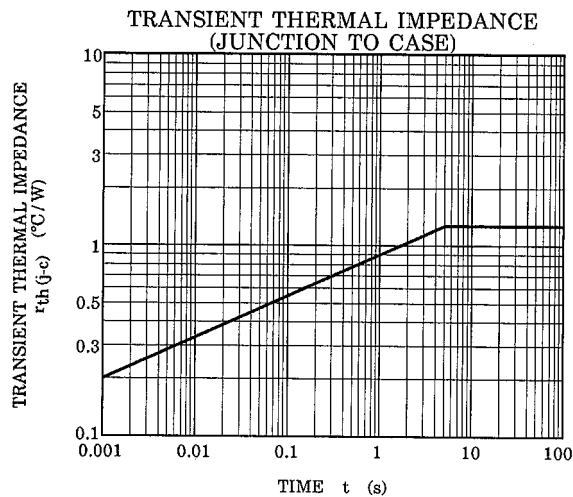
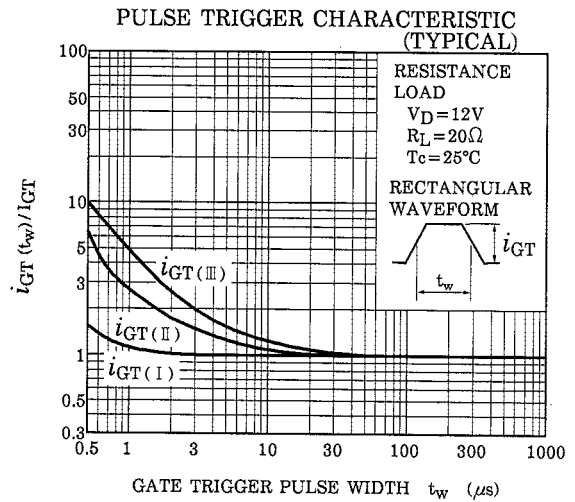
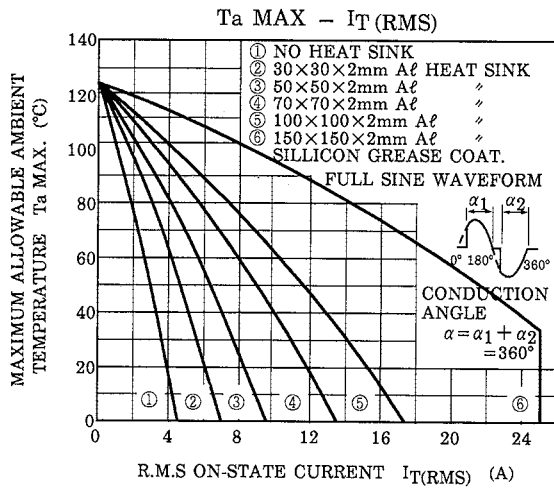
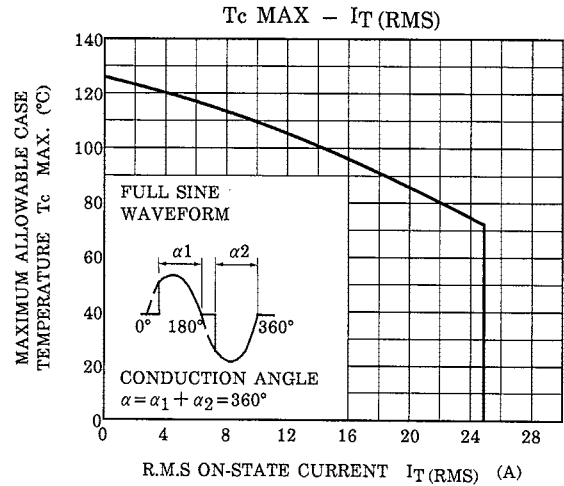
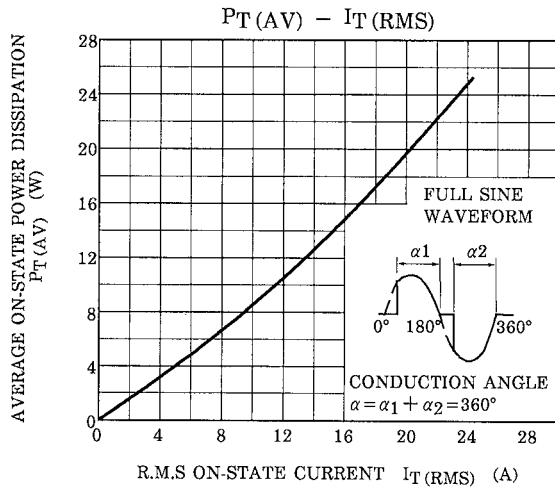


$V_{GT}(T_c)/V_{GT}(T_c=25^\circ C) - T_c$ (TYPICAL)



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





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