

TOSHIBA BI-DIRECTIONAL TRIODE THYRISTOR SILICON PLANAR TYPE

SM16GZ51, SM16JZ51

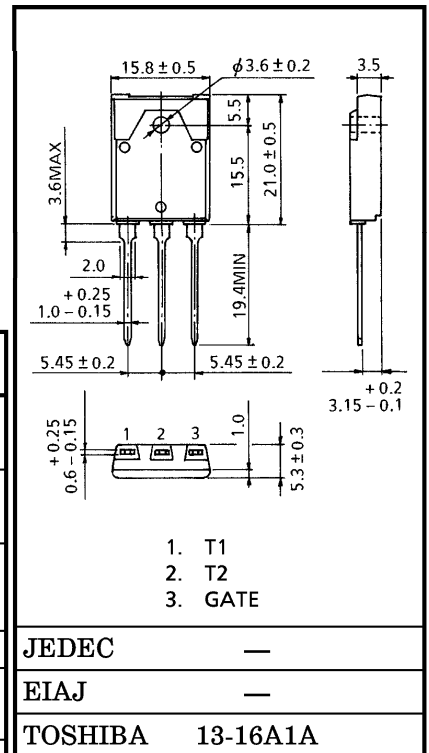
AC POWER CONTROL APPLICATIONS

Unit in mm

- Repetitive Peak off-State Voltage : $V_{DRM} = 400, 600$ V
- R.M.S On-State Current : $I_T(RMS) = 16$ A
- High Commutating (dv / dt) : $(dv / dt)_c = 10$ V / μ s
- Isolation Voltage : $V_{ISOL} = 1500$ V AC

MAXIMUM RATINGS

CHARACTERISTIC		SYMBOL	RATING	UNIT
Repetitive Peak Off-State Voltage	SM16GZ51	V_{DRM}	400	V
	SM16JZ51	V_{RRM}	600	
R. M. S. On-tate Current (Full Sine Waveform $T_a = 82^\circ$ C)		$I_T(RMS)$	16	A
Peak One Cylce Surge On-State Current (Non-Repetitive)		I_{TSM}	150 (50 Hz)	A
			165 (60 Hz)	
I^2t Limit Value		I^2t	112.5	A^2s
Critical Rate of Rise of On-State Current (Note 1)		di / dt	50	A / μ 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	-40~125	$^\circ$ C
Storage Temperature Range		T_{stg}	-40~125	$^\circ$ C
Isolation Voltage (AC, t = 1 min.)		V_{ISOL}	1500	V



Weight : 2.0 g

(Note 1) : di / dt test condition

$$V_{DRM} = 0.5 \times \text{Rated}, I_{TM} \leq 25 \text{ A}, t_{gw} \geq 10 \mu\text{s}, t_{gr} \leq 250 \text{ ns}, t_{gp} = I_{GT} \times 2.0$$

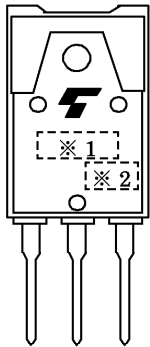
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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

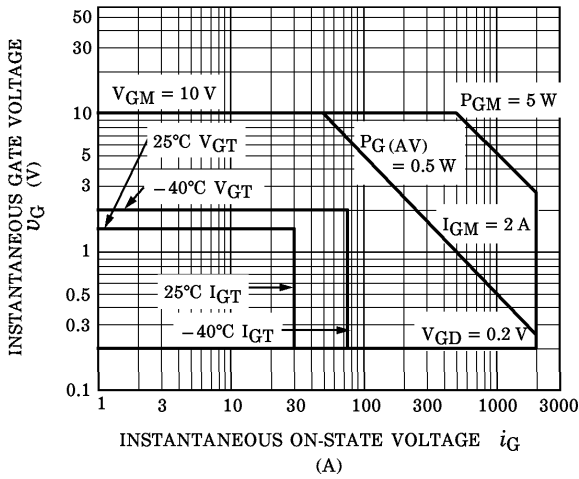
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Repetitive Peak Off-State Current	I_{DRM}	$V_{DRM} = \text{Rated}$	—	—	20	μA	
Gate Trigger Voltage	I II III IV V_{GT}	$V_D = 12\text{ V}, R_L = 20\ \Omega$	T2 (+), Gate (+)	—	—	1.5	V
			T2 (+), Gate (-)	—	—	1.5	
			T2 (-), Gate (-)	—	—	1.5	
			T2 (-), Gate (+)	—	—	—	
Gate Trigger Current	I II III IV I_{GT}	$V_D = 12\text{ V}, R_L = 20\ \Omega$	T2 (+), Gate (+)	—	—	30	mA
			T2 (+), Gate (-)	—	—	30	
			T2 (-), Gate (-)	—	—	30	
			T2 (-), Gate (+)	—	—	—	
Peak On-State Voltage	V_{TM}	$I_{TM} = 25\text{ A}$	—	—	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	$V_D = 12\text{ V}, I_{TM} = 1\text{ A}$	—	—	50	mA	
Thermal Resistance	$R_{th(j-c)}$	Junction to Case, AC	—	—	1.8	$^\circ\text{C}/\text{W}$	
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	$(dv/dt)_c$	$V_{DRM} = 400\text{ V}, T_j = 125^\circ\text{C}$ $(dv/dt)_c = -8.7\text{ A/ms}$	10	—	—	$\text{V}/\mu\text{s}$	

MARKING

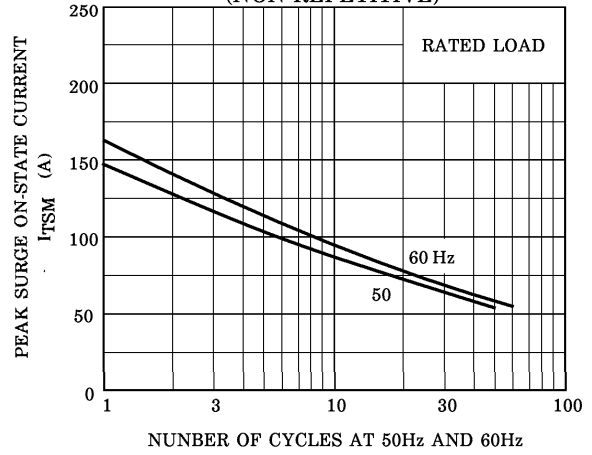


※ NUMBER	SYMBOL	MARK
※ 1	TYPE	M16GZ51
		M16JZ51
※ 2	Lot Number <div style="display: flex; align-items: center;"> <div style="border: 1px solid black; width: 15px; height: 15px; margin-right: 5px;"></div> <div style="border: 1px solid black; width: 15px; height: 15px; margin-right: 5px; margin-left: 10px;"></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

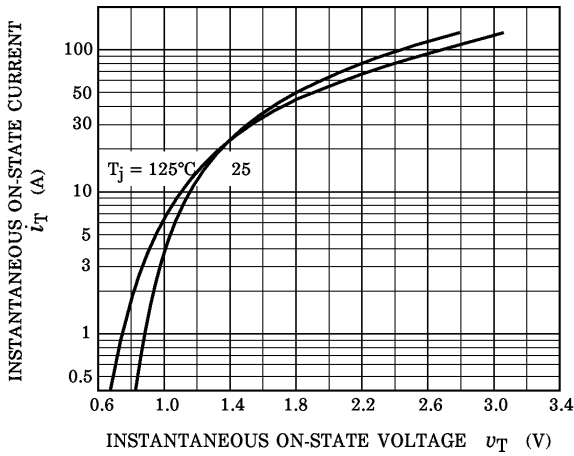
GATE TRIGGER CHARACTERISTIC



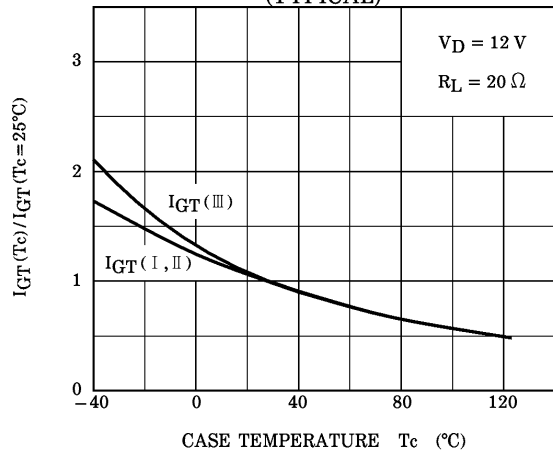
SURGE ON-STATE CURRENT (NON-REPETITIVE)



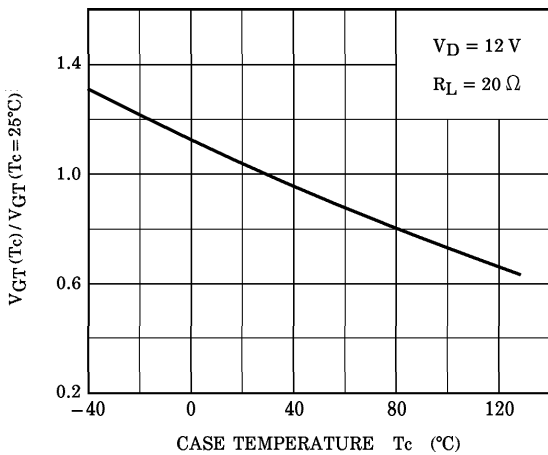
$i_T - v_T$



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

