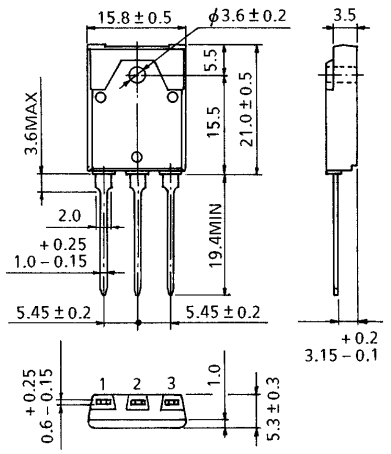
TOSHIBA BI-DIRECTIONAL TRIODE THYRISTOR SILICON PLANAR TYPE

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 / μs
- Isolation Voltage : V_{ISOL} = 1500 V AC



1. T1
2. T2
3. GATE

JEDEC	—
EIAJ	—
TOSHIBA	13-16A1A

Weight : 2.0 g

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 Ta = 82°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 / 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

(Note 1) : di / dt test condition

V_{DRM} = 0.5 × Rated, $I_{TM} \leqq$ 25 A, $t_{gw} \geqq$ 10 μs, $t_{gr} \leqq$ 250 ns, $\iota_{gp} = I_{GT} \times 2.0$

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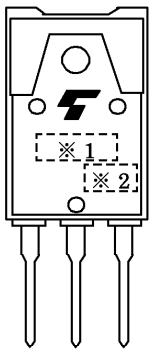
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

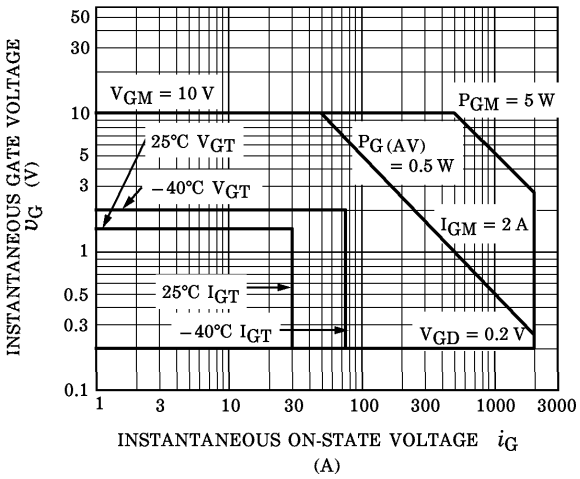
CHARACTERISTIC		SYMBOL	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Repetitive Peak Off-State Current		I_{DRM}	V_{DRM} = Rated		—	—	20	μA
Gate Trigger Voltage	Ⅰ	V_{GT}	V_D = 12 V, R_L = 20 Ω	T2 (+), Gate (+)	—	—	1.5	V
	Ⅱ			T2 (+), Gate (−)	—	—	1.5	
	Ⅲ			T2 (−), Gate (−)	—	—	1.5	
	Ⅳ			T2 (−), Gate (+)	—	—	—	
Gate Trigger Current	Ⅰ	I_{GT}	V_D = 12 V, R_L = 20 Ω	T2 (+), Gate (+)	—	—	30	mA
	Ⅱ			T2 (+), Gate (−)	—	—	30	
	Ⅲ			T2 (−), Gate (−)	—	—	30	
	Ⅳ			T2 (−), Gate (+)	—	—	—	
Peak On-State Voltage		V_{TM}	I_{TM} = 25 A		—	—	1.5	V
Gate Non-Trigger Voltage		V_{GD}	V_D = Rated, Tc = 125°C		0.2	—	—	V
Holding Current		I_H	V_D = 12 V, I_{TM} = 1 A		—	—	50	mA
Thermal Resistance		Rth (j-c)	Junction to Case, AC		—	—	1.8	°C / W
Critical Rate of Rise of Off-State Voltage		dv / dt	V_{DRM} = Rated, T_j = 125°C Exponential Rise		—	300	—	V / μs
Critical Rate of Rise of Off-State Voltage at Commutation		(dv / dt) c	V_{DRM} = 400 V, T_j = 125°C (dv / dt) c = −8.7 A / ms		10	—	—	V / μs

MARKING

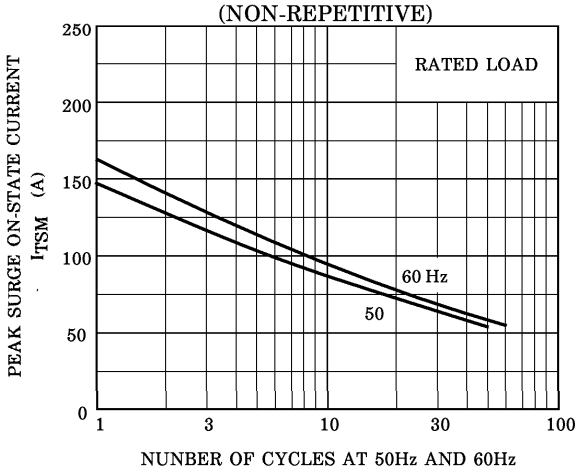


※NUMBER	SYMBOL		MARK
※1	TYPE	M16GZ51	SM16GZ51
		M16JZ51	SM16JZ51
※2	Lot Number □□ Month (Starting from Alphabet A) Year (Last Decimal Digit of the Current Year)		Example 8A : January 1998 8B : Febrary 1998 8L : December 1998

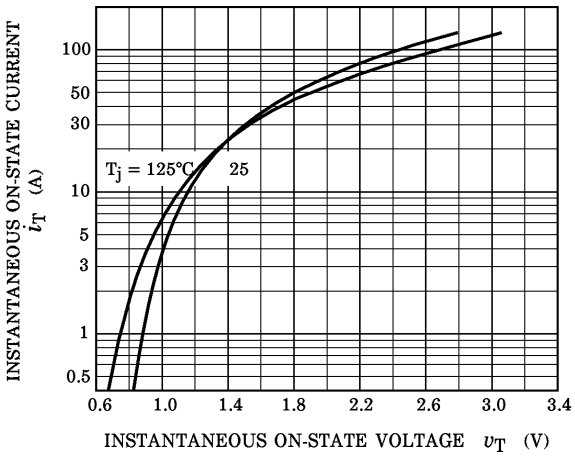
GATE TRIGGER CHARACTERISTIC



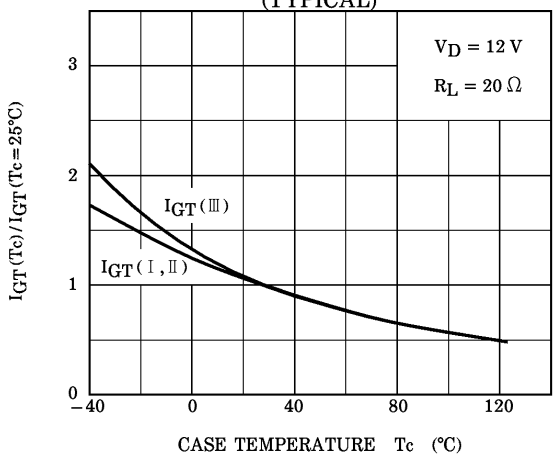
SURGE ON-STATE CURRENT (NON-REPETITIVE)



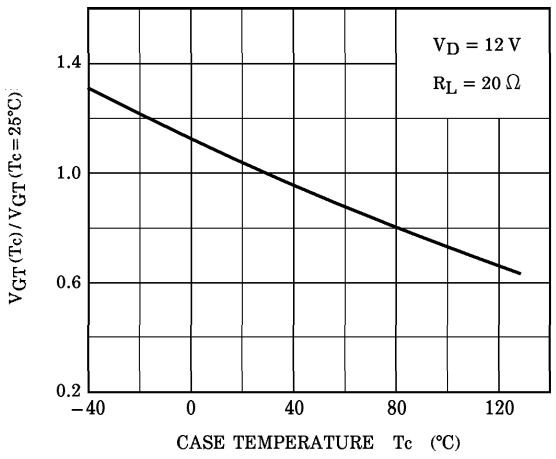
$i_T - v_T$



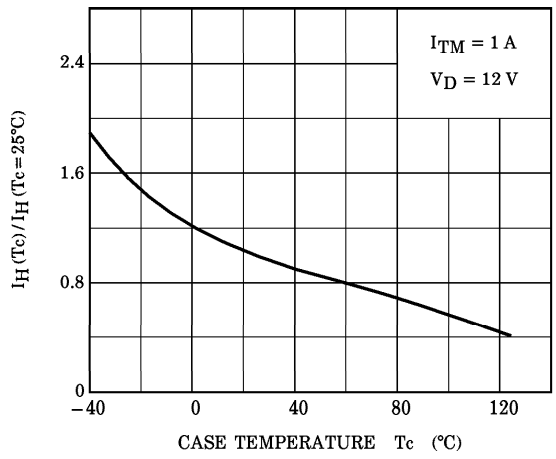
I_{GT} (Tc) / I_{GT} (Tc = 25°C) − Tc (TYPICAL)



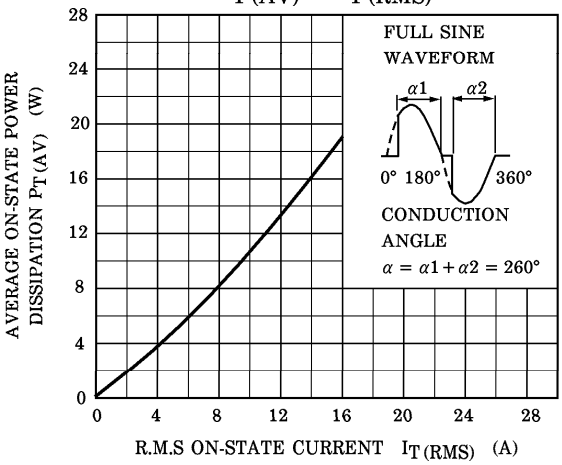
V_{GT} (Tc) / V_{GT} (Tc = 25°C) − Tc (TYPICAL)



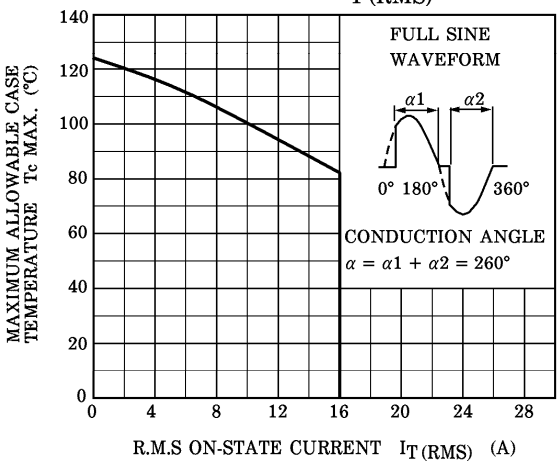
I_H (Tc) / I_H (Tc = 25°C) − Tc (TYPICAL)



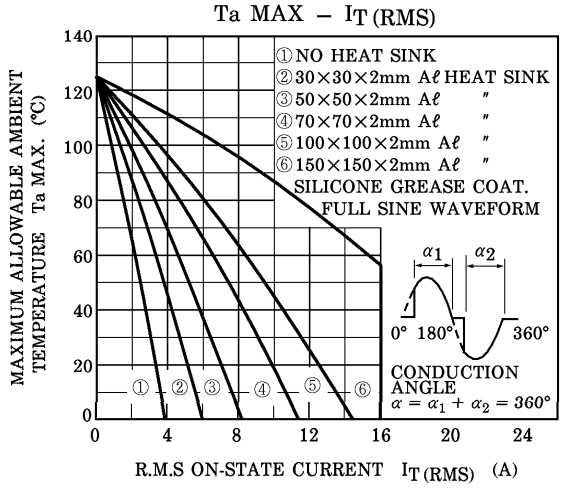
$P_{T(AV)}$ – $I_{T(RMS)}$



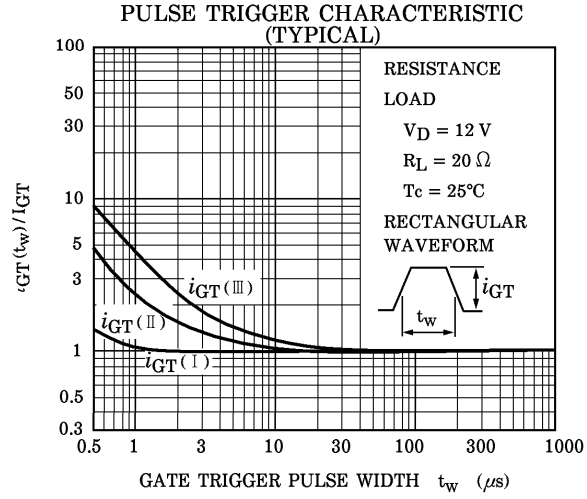
T_c MAX – $I_{T(RMS)}$



T_a MAX – $I_{T(RMS)}$



PULSE TRIGGER CHARACTERISTIC (TYPICAL)



TRANSIENT THERMAL IMPEDANCE (JUNCTION TO CASE)