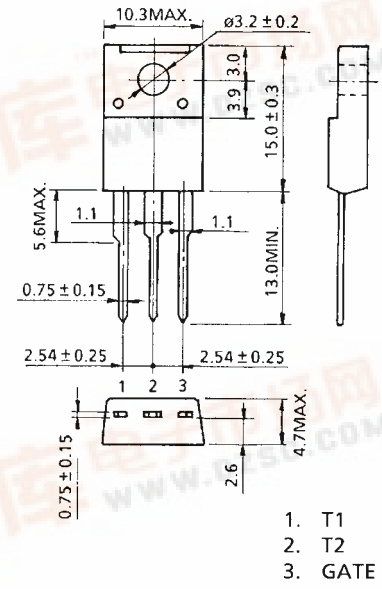
TOSHIBA BI-DIRECTIONAL TRIODE THYRISTOR SILICON PLANAR TYPE

SM3GZ47,SM3JZ47

AC POWER CONTROL APPLICATIONS

- Repetitive Peak Off-State Voltage : V_{DRM} = 400, 600V
- R.M.S ON-State Current : $I_{T\ (RMS)}$ = 3A
- High Commutating (dv / dt)
- Isolation Voltage : V_{ISOL} = 1500V AC

Unit: mm



JEDEC	—
JEITA	—
TOSHIBA	13-10H1A

Weight: 1.7g

MAXIMUM RATINGS

CHARACTERISTIC		SYMBOL	RATING	UNIT
Repetitive Peak Off-State Voltage	SM3GZ47	V_{DRM}	400	V
	SM3JZ47		600	
R.M.S On-State Current (Full Sine Waveform Tc = 110°C)		$I_{T\ (RMS)}$	3	A
Peak One Cycle Surge On-State Current (Non-Repetitive)		I_{TSM}	30 (50Hz)	A
			33 (60Hz)	
I^2t Limit Value (t = 1~10ms)		I^2t	4.5	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 = 1min.)		V_{ISOL}	1500	V

Note 1: di / dt test condition

V_{DRM} = 0.5×Rated

$I_{TM} \leq 4.5A$

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

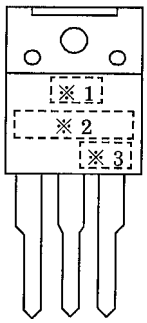
$t_{gr} \leq 250ns$

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

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

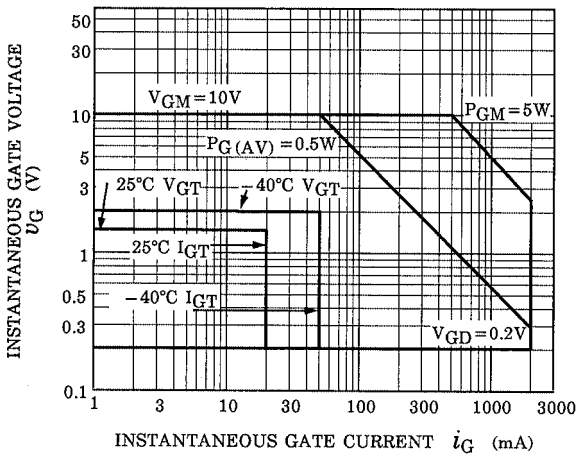
CHARACTERISTIC		SYMBOL	TEST CONDITION		MIN	TYP.	MAX	UNIT
Repetitive Peak Off−State Current		I_{DRM}	V_{DRM} = Rated		—	—	20	μA
Gate Trigger Voltage	I	V_{GT}	V_D = 12V, R_L = 20Ω	T2 (+), Gate (+)	—	—	1.5	V
	II			T2 (+), Gate (−)	—	—	1.5	
	III			T2 (−), Gate (−)	—	—	1.5	
	IV			T2 (−), Gate (+)	—	—	—	
Gate Trigger Current	I	I_{GT}	V_D = 12V, R_L = 20Ω	T2 (+), Gate (+)	—	—	20	mA
	II			T2 (+), Gate (−)	—	—	20	
	III			T2 (−), Gate (−)	—	—	20	
	IV			T2 (−), Gate (+)	—	—	—	
Peak On−State Voltage		V_{TM}	I_{TM} = 4.5A		—	—	1.5	V
Gate Non−Trigger Voltage		V_{GD}	V_D = Rated, Tc = 125°C		0.2	—	—	V
Holding Current		I_H	V_D = 12V, I_{TM} = 1A		—	—	30	mA
Thermal Resistance		$R_{th\ (j-c)}$	Junction to Case, AC		—	—	4.2	°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} = 400V, T_j = 125°C (di /dt) c = −2.0A / ms		10	—	—	V / μs

MARKING

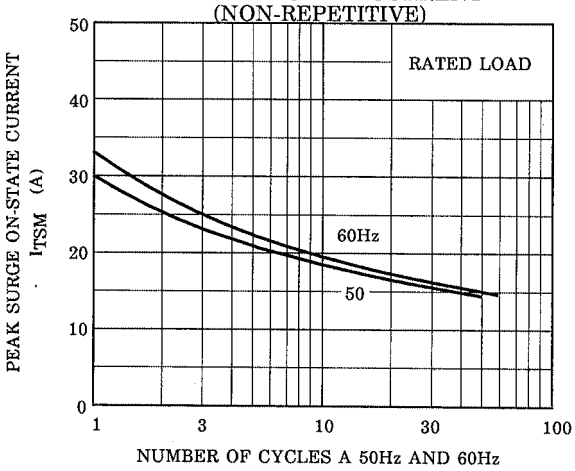


NUMBER	SYMBOL		MARK
* 1	TOSHIBA PRODUCT MARK		
* 2	TYPE	SM3GZ47	M3GZ47
		SM3JZ47	M3JZ47
* 3	Lot Number □ □ Month (Starting from Alphabet A) Year (Last Decimal Digit of the Current Year)		Example 8A : January 1998 8B : Febrary 1998 8L : December 1998

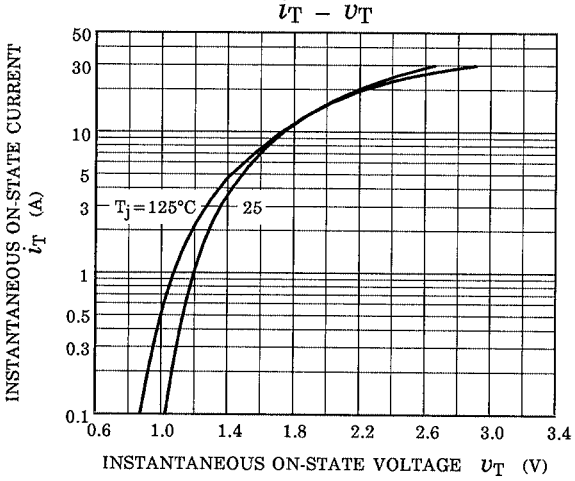
GATE TRIGGER CHARACTERISTIC



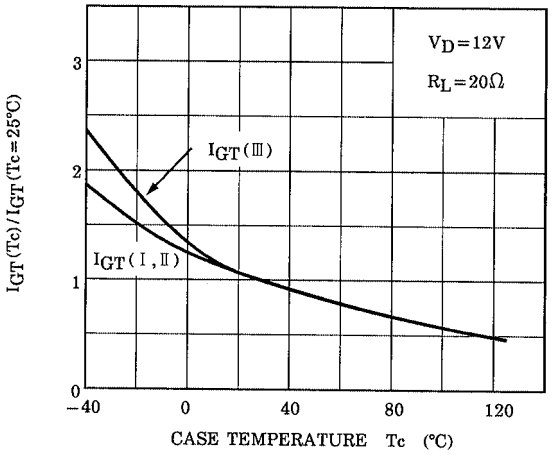
SURGE ON-STATE CURRENT (NON-REPETITIVE)



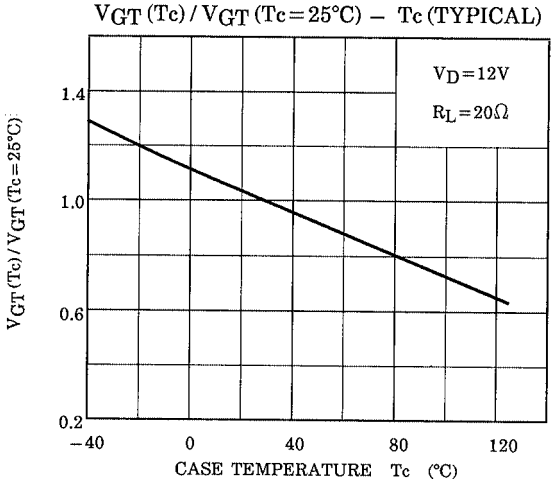
$i_T - v_T$



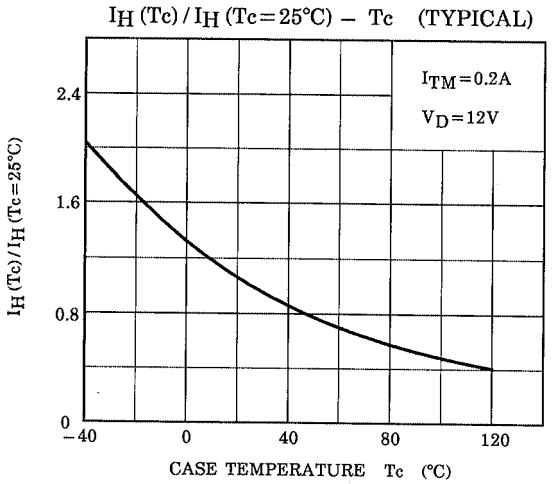
I_{GT} (Tc) / I_{GT} (Tc=25°C) − Tc (TYPICAL)



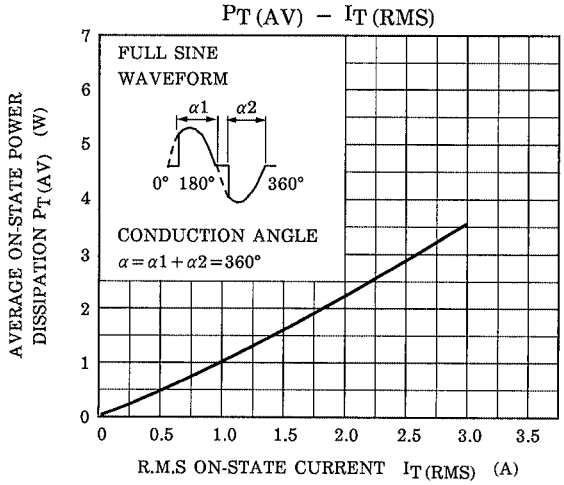
V_{GT} (Tc) / V_{GT} (Tc=25°C) − Tc (TYPICAL)



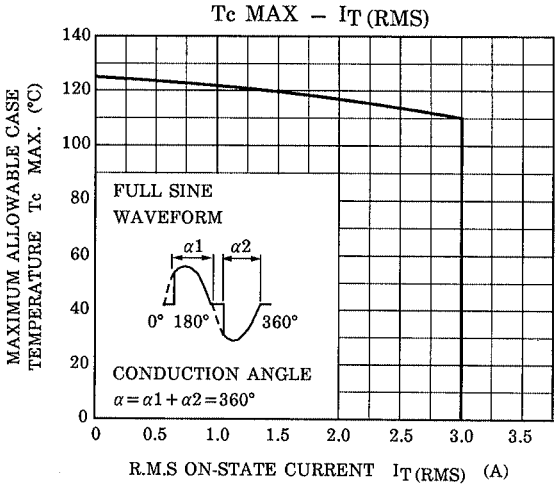
I_H (Tc) / I_H (Tc=25°C) − Tc (TYPICAL)



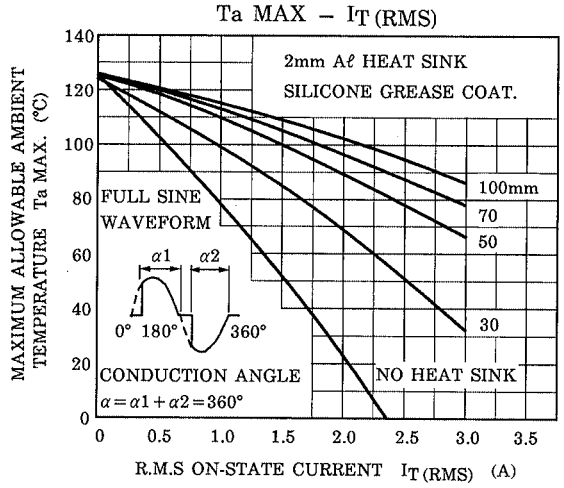
$P_{T(AV)}$ – $I_{T(RMS)}$



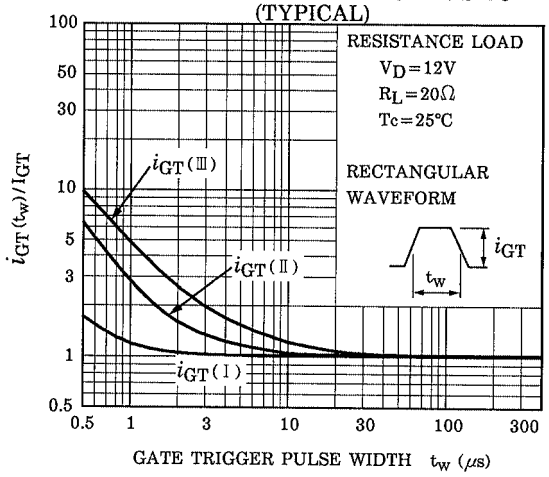
Tc MAX – $I_{T(RMS)}$



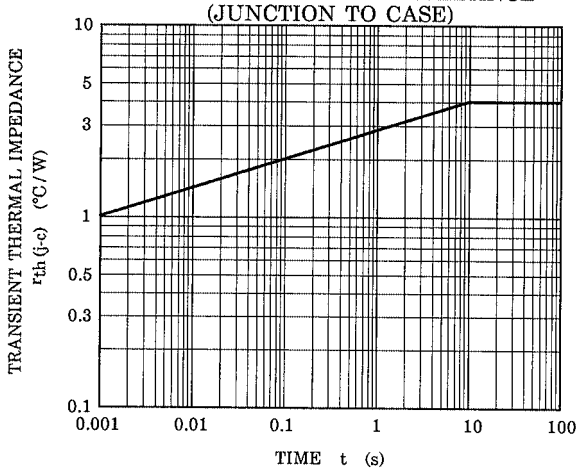
Ta MAX – $I_{T(RMS)}$



PULSE TRIGGER CHARACTERISTIC (TYPICAL)



TRANSIENT THERMAL IMPEDANCE (JUNCTION TO CASE)



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