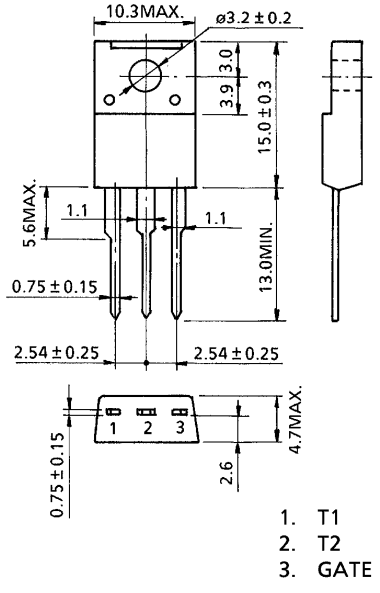
TOSHIBA BI-DIRECTIONAL TRIODE THYRISTOR SILICON PLANAR TYPE

SM12GZ47, SM12JZ47, SM12GZ47A, SM12JZ47A

AC POWER CONTROL APPLICATIONS

Unit in mm

- Repetitive Peak off-State Voltage : V_{DRM}=400, 600V
- R.M.S On-State Current : $I_{T(RMS)}$=12A
- High Commutating (dv / dt)
- Isolation Voltage : V_{Isol}=1500V AC



JEDEC	—
EIAJ	—
TOSHIBA	13-10H1A

Weight : 1.7g

MAXIMUM RATINGS

CHARACTERISTIC		SYMBOL	RATING	UNIT
Repetitive Peak Off-State Voltage and Repetitive Peak Reverse Voltage	SM12GZ47 SM12GZ47A	V_{DRM}	400	V
	SM12JZ47 SM12JZ47A		600	
R. M. S. On-tate Current (Full Sine Waveform TC=72°C)		$I_{T(RMS)}$	12	A
Peak One Cylce Surge On-State Current (Non-Repetitive)		I_{TSM}	120 (50Hz)	A
			132 (60Hz)	
I^2t Limit Value		I^2t	72	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_{FGM}	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

$I_{TM} \leqq 17A$

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

$t_{gr} \leqq 250ns$

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

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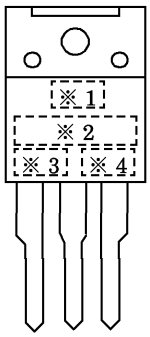
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

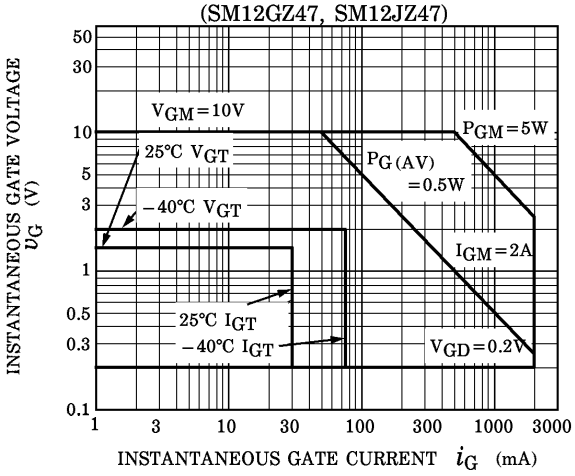
CHARACTERISTIC			SYMBOL	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Repetitive Peak Off-State Current			I_{DRM}	V_{DRM} = Rated		—	—	20	μA
Gate Trigger Voltage		Ⅰ	V_{GT}	V_D = 12V, R_L = 20Ω	T2(+), Gate(+)	—	—	1.5	V
		Ⅱ			T2(+), Gate(−)	—	—	1.5	
		Ⅲ			T2(−), Gate(−)	—	—	1.5	
		Ⅳ			T2(−), Gate(+)	—	—	—	
Gate Trigger Current	SM12GZ47 SM12JZ47	Ⅰ	I_{GT}	V_D = 12V, R_L = 20Ω	T2(+), Gate(+)	—	—	30	mA
		Ⅱ			T2(+), Gate(−)	—	—	30	
		Ⅲ			T2(−), Gate(−)	—	—	30	
		Ⅳ			T2(−), Gate(+)	—	—	—	
	SM12GZ47A SM12JZ47A	Ⅰ			T2(+), Gate(+)	—	—	20	
		Ⅱ			T2(+), Gate(−)	—	—	20	
		Ⅲ			T2(−), Gate(−)	—	—	20	
		Ⅳ			T2(−), Gate(+)	—	—	—	
Peak On-State Voltage			V_{TM}	I_{TM} = 17A		—	—	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		—	—	50	mA
Thermal Resistance			Rth (j-c)	Junction to Case, AC		—	—	3.0	°C / W
Critical Rate of Rise of Off-State Voltage	SM12GZ47 SM12JZ47		dv / dt	V_{DRM} = Rated, T_j = 125°C Exponential Rise		—	300	—	V / μs
	SM12GZ47A SM12JZ47A					—	200	—	
Critical Rate of Rise of Off-State Voltage at Commutation	SM12GZ47 SM12JZ47		(dv / dt) c	V_{DRM} = 400V, T_j = 125°C (dv / dt) c = −6.5A / ms		10	—	—	V / μs
	SM12GZ47A SM12JZ47A					4	—	—	

MARKING

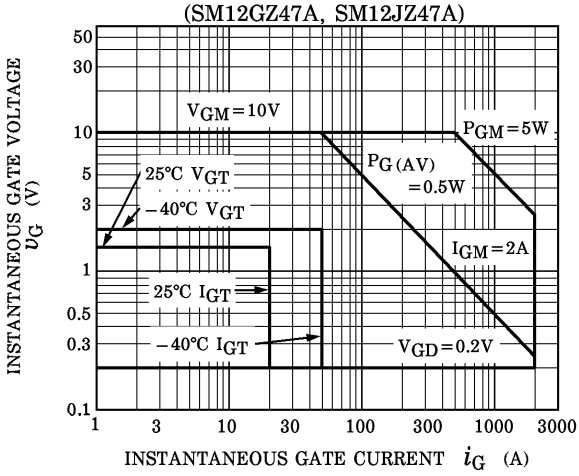


※NUMBER	SYMBOL		MARK
※1	TOSHIBA PRODUCT MARK		
※2	TYPE	SM12GZ47, SM12GZ47A	M12GZ47
		SM12JZ47, SM12JZ47A	M12JZ47
※3		SM12GZ47A, SM12JZ47A	A
※2	Lot Number □□ Month (Starting from Alphabet A) Year (Last Decimal Digit of the Current Year)		Example 8A : January 1998 8B : Febrary 1998 8L : December 1998

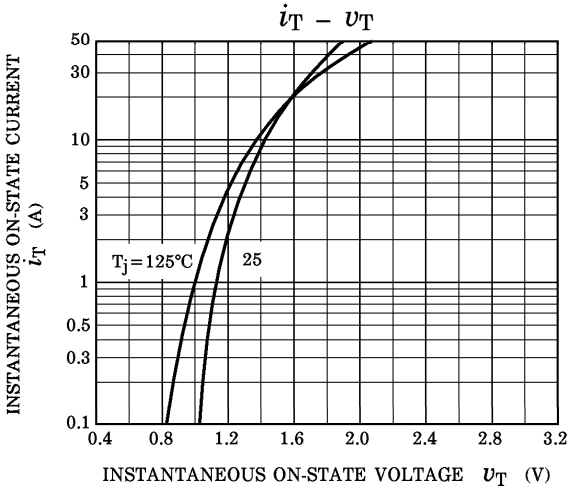
GATE TRIGGER CHARACTERISTIC
(SM12GZ47, SM12JZ47)



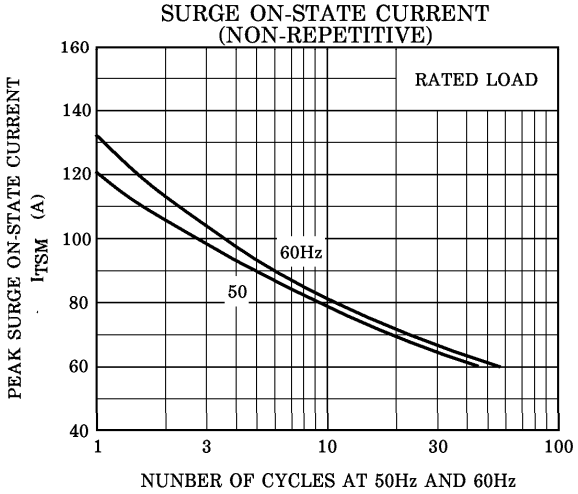
GATE TRIGGER CHARACTERISTIC
(SM12GZ47A, SM12JZ47A)



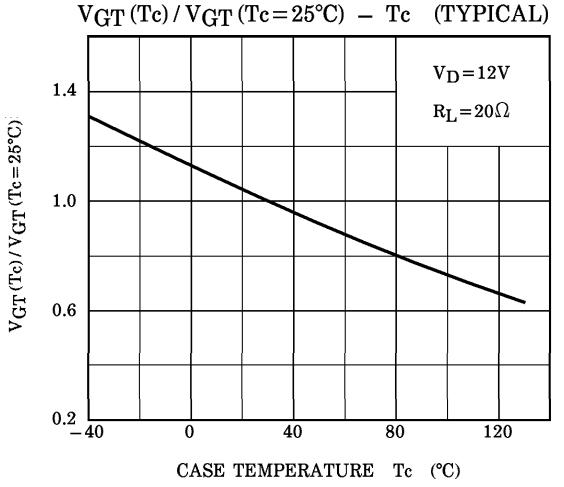
$i_T - v_T$



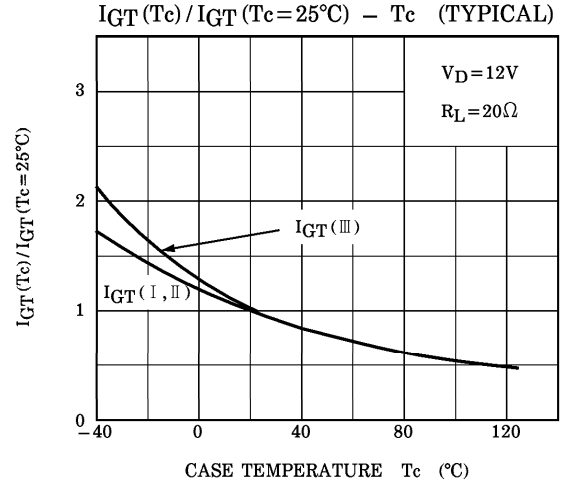
SURGE ON-STATE CURRENT
(NON-REPETITIVE)



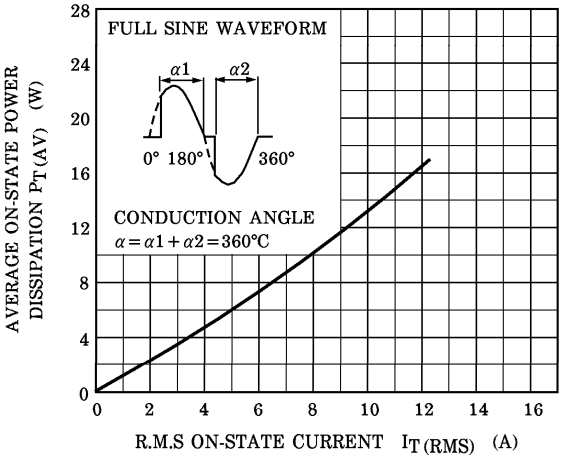
V_{GT} (Tc) / V_{GT} (Tc=25°C) − Tc (TYPICAL)



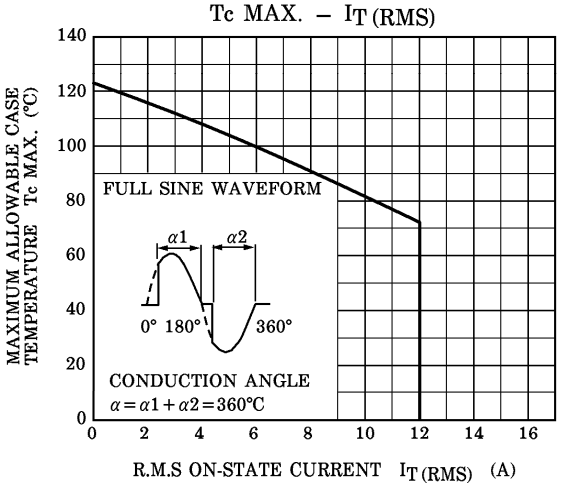
I_{GT} (Tc) / I_{GT} (Tc=25°C) − Tc (TYPICAL)



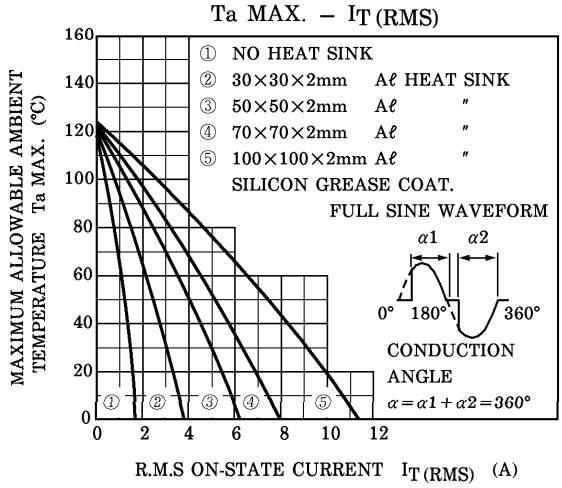
$P_{T(AV)}$ – $I_{T(RMS)}$



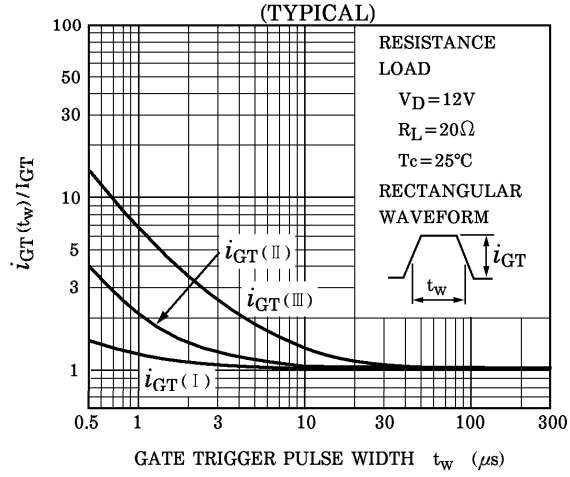
T_c MAX. – $I_{T(RMS)}$



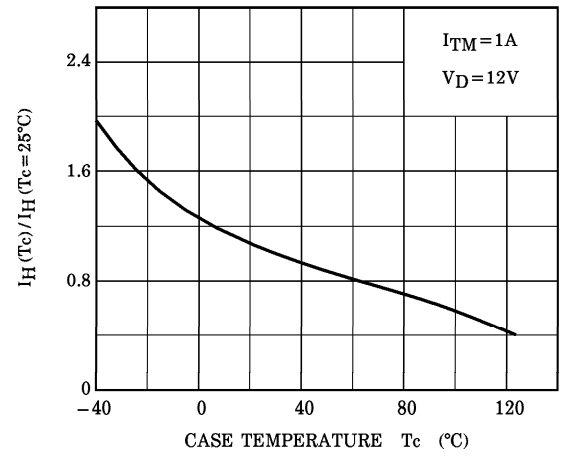
T_a MAX. – $I_{T(RMS)}$



PULSE TRIGGER CHARACTERISTIC (TYPICAL)



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



TRANSIENT THERMAL IMPEDANCE (JUNCTION TO CASE)