

TOSHIBA BI-DIRECTIONAL TRIODE THYRISTOR SILICON PLANAR TYPE

SM16GZ47, SM16JZ47, SM16GZ47A, SM16JZ47A

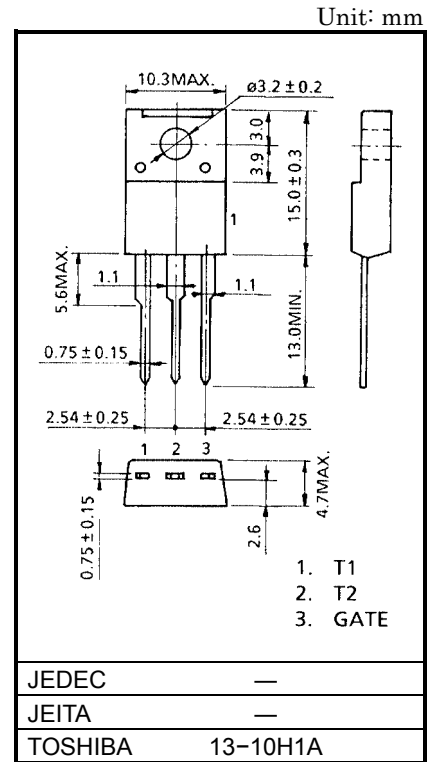
AC POWER CONTROL APPLICATIONS

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

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MAXIMUM RATINGS

CHARACTERISTIC	SYMBOL	RATING	UNIT
Repetitive Peak Off-State Voltage	V_{DRM}	400	V
		600	
R.M.S On-State Current (Full Sine Waveform $T_c = 73^\circ C$)	$I_T (RMS)$	16	A
Peak One Cycle Surge On-State Current (Non-Repetitive)	I_{TSM}	150 (50Hz)	A
		165 (60Hz)	
$I^2 t$ Limit Value	$I^2 t$	112.5	$A^2 s$
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	-40~125	$^\circ C$
Storage Temperature Range	T_{stg}	-40~125	$^\circ C$
Isolation Voltage (AC, $t = 1 \text{ min.}$)	V_{ISOL}	1500	V



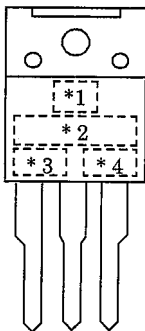
Weight: 1.7g

Note 1: di / dt Test condition
 $V_{DRM} = 0.5 \times \text{Rated}$
 $I_{TM} \leq 25A$
 $t_{gw} \geq 10\mu s$
 $t_{gr} \leq 250ns$
 $i_{GP} = I_{GT} \times 2.0$

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

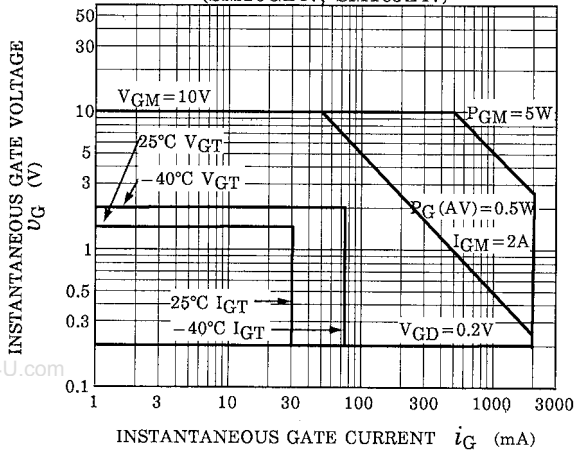
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN	TYP.	MAX	UNIT	
Repetitive Peak Off-State Current		I_{DRM}	$V_{DRM} = \text{Rated}$	—	—	20	μA	
Gate Trigger Voltage	I	V_{GT}	$V_D = 12\text{V}, R_L = 20\Omega$	T2 (+), Gate (+)	—	—	1.5	V
	II			T2 (+), Gate (-)	—	—	1.5	
	III			T2 (-), Gate (-)	—	—	1.5	
	IV			T2 (-), Gate (+)	—	—	—	
Gate Trigger Current	SM16GZ47 SM16JZ47	I_{GT}	$V_D = 12\text{V}, R_L = 20\Omega$	T2 (+), Gate (+)	—	—	30	mA
				T2 (+), Gate (-)	—	—	30	
				T2 (-), Gate (-)	—	—	30	
				T2 (-), Gate (+)	—	—	—	
	SM16GZ47A SM16JZ47A			T2 (+), Gate (+)	—	—	20	
				T2 (+), Gate (-)	—	—	20	
				T2 (-), Gate (-)	—	—	20	
				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	—	—	2.5	$^\circ\text{C} / \text{W}$	
Critical Rate of Rise of Off-State Voltage	SM16GZ47 SM16JZ47	dv / dt	$V_{DRM} = \text{Rated}, T_j = 125^\circ\text{C}$ Exponential Rise	—	300	—	V / μs	
	SM16GZ47A SM16JZ47A			—	200	—		
Critical Rate of Rise of Off-State Voltage at Commutation	SM16GZ47 SM16JZ47	$(dv / dt)_c$	$V_{DRM} = 400\text{V}, T_j = 125^\circ\text{C}$ $(di / dt)_c = -8.7\text{A} / \text{ms}$	10	—	—	V / μs	
	SM16GZ47A SM16JZ47A			4	—	—		

MARKING

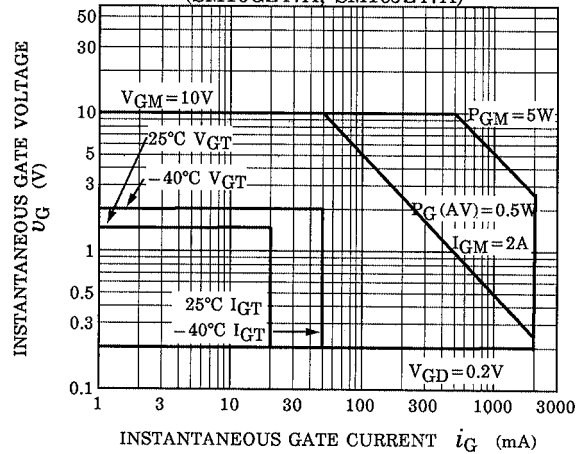


* NUMBER	SYMBOL	MARK
* 1	Toshiba Product Mark	
* 2	TYPE	SM16GZ47, SM16GZ47A
		SM16JZ47, SM16JZ47A
* 3	SM16GZ47A, SM16JZ47A	A
* 4	Lot Number Month (Starting from Alphabet A) Year (Last Decimal Digit of the Current Year)	Example 8A : January 1998 8B : February 1998 8L : December 1998

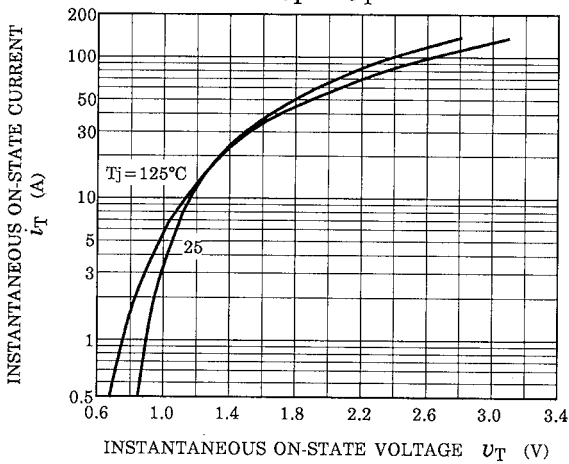
GATE TRIGGER CHARACTERISTIC
(SM16GZ47, SM16JZ47)



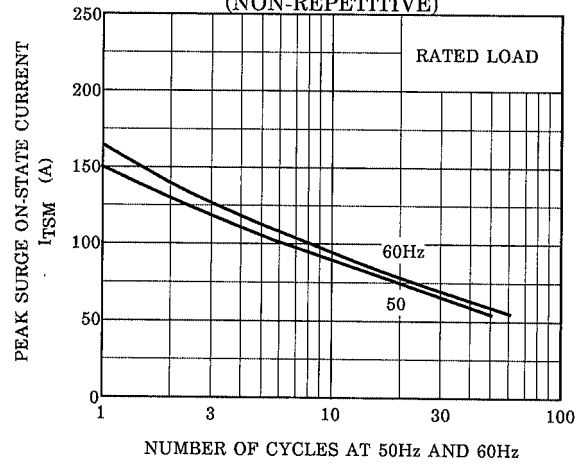
GATE TRIGGER CHARACTERISTIC
(SM16GZ47A, SM16JZ47A)



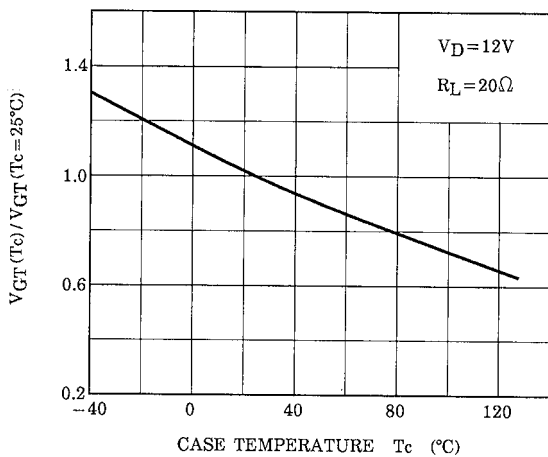
$i_T - v_T$



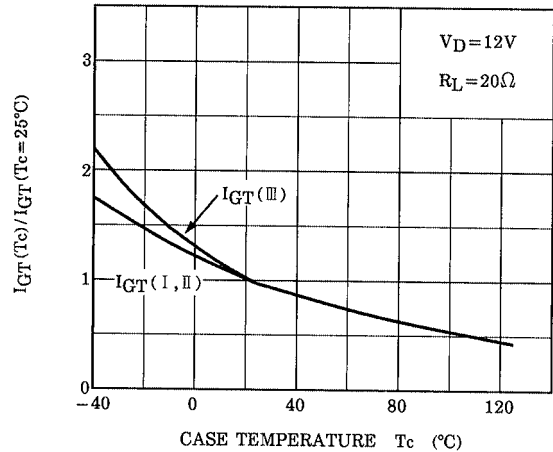
SURGE ON-STATE CURRENT
(NON-REPETITIVE)

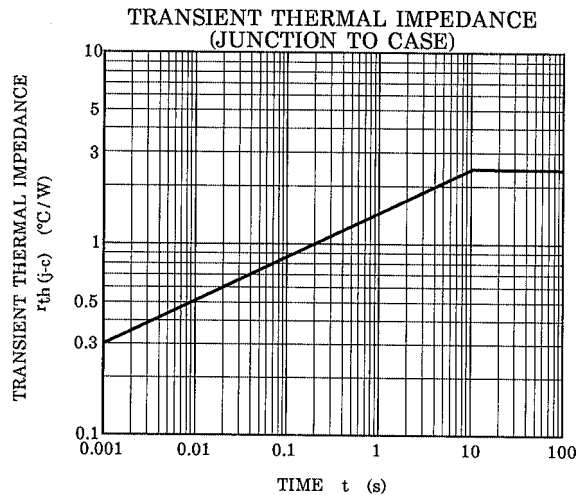
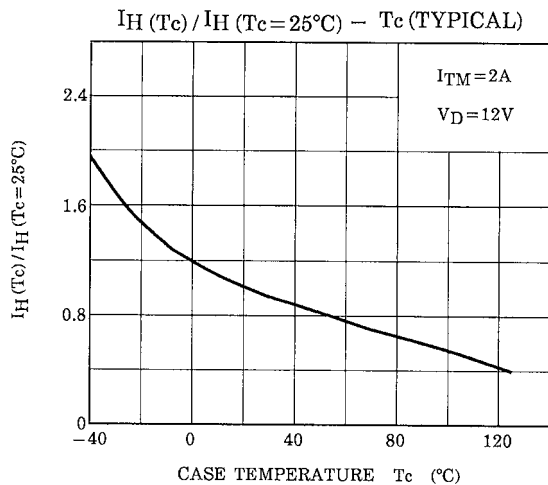
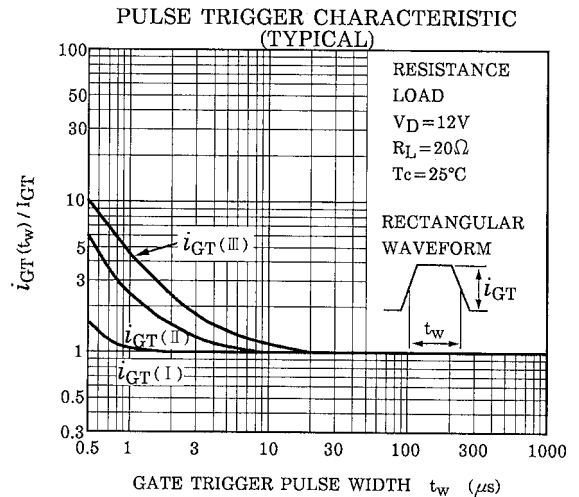
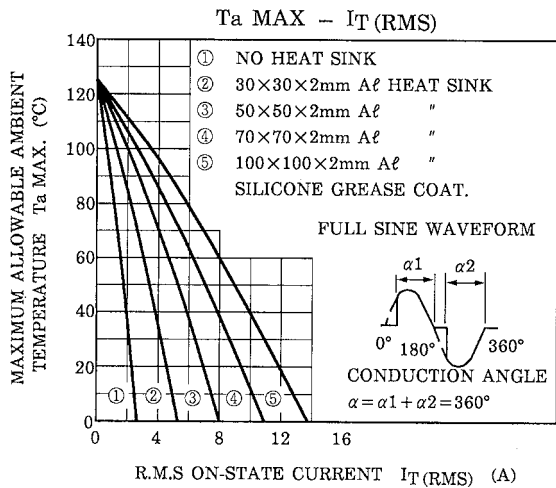
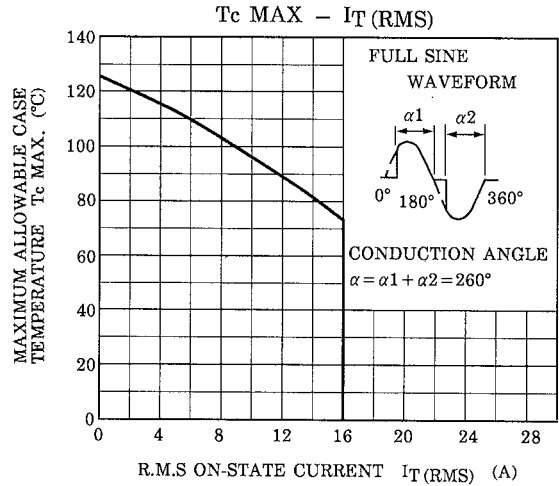
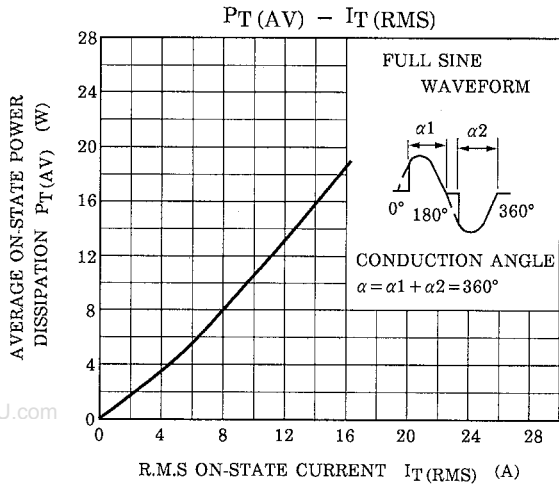


$V_{GT}(T_c) / V_{GT}(T_c = 25^\circ\text{C}) - T_c$ (TYPICAL)



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





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