

TOSHIBA BI-DIRECTIONAL TRIODE THYRISTOR SILICON PLANAR TYPE

# SM16GZ47, SM16JZ47, SM16GZ47A, SM16JZ47A

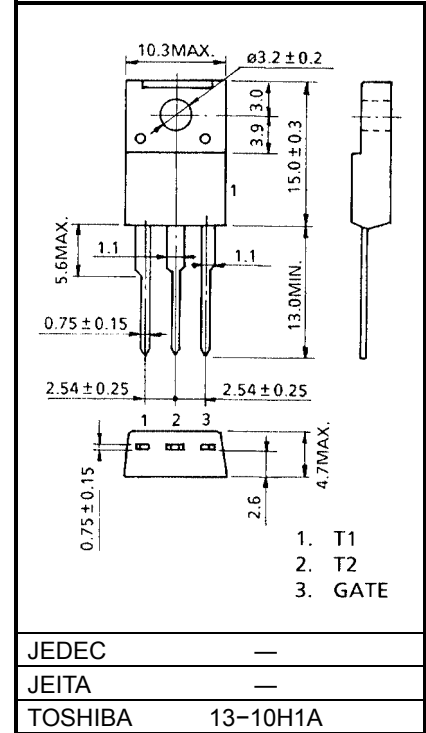
## AC POWER CONTROL APPLICATIONS

- 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 :  $V_{ISOL} = 1500V AC$

## 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

Unit: mm



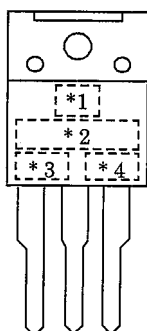
Weight: 1.7g

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

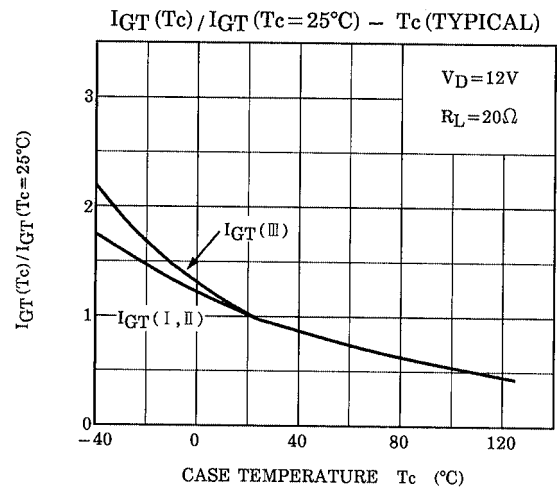
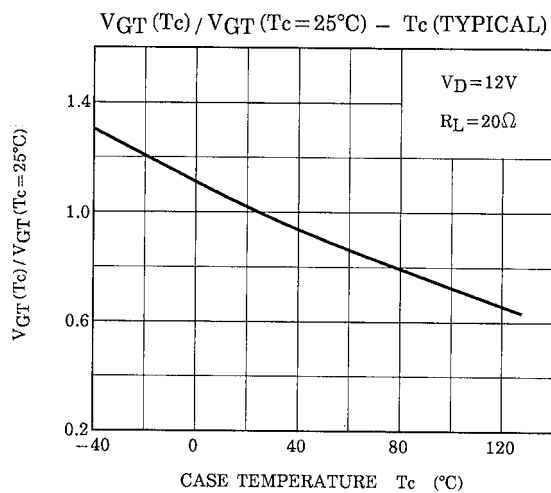
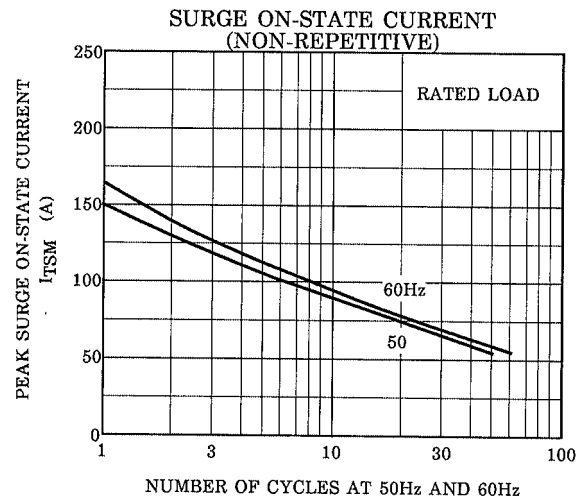
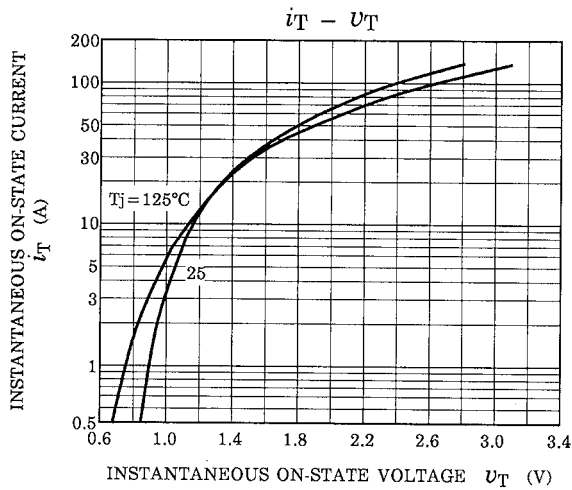
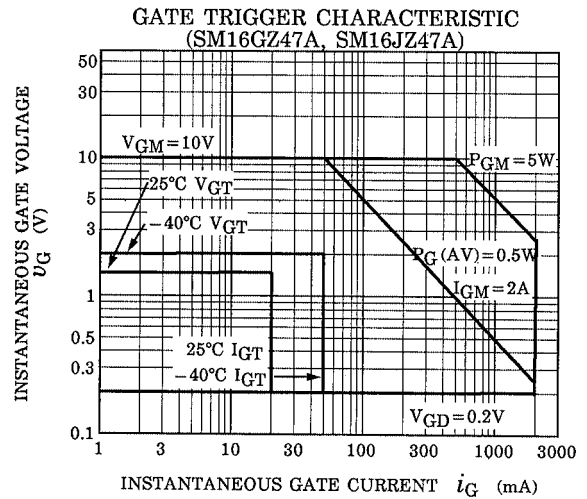
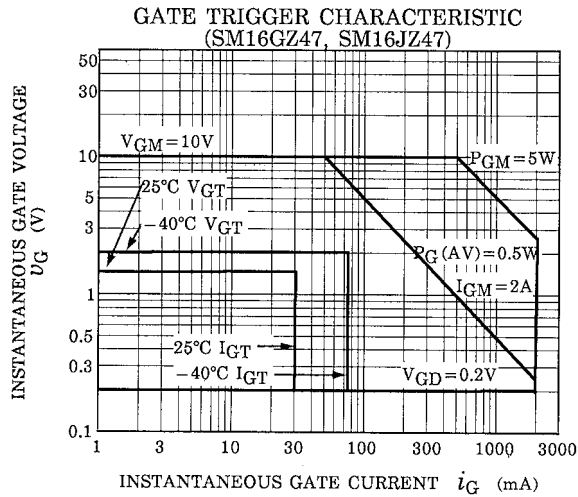
## ELECTRICAL CHARACTERISTICS (Ta = 25°C)

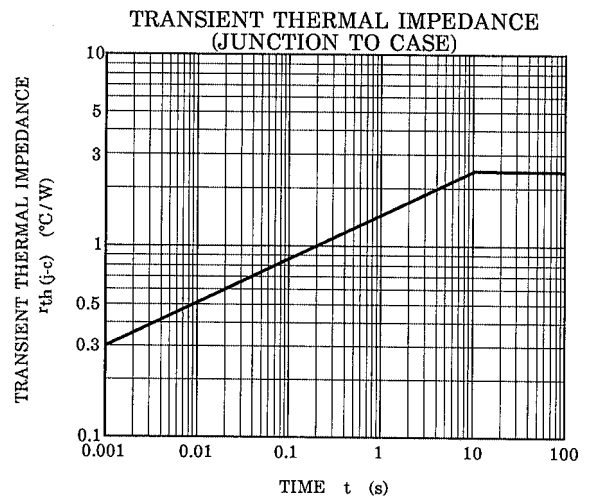
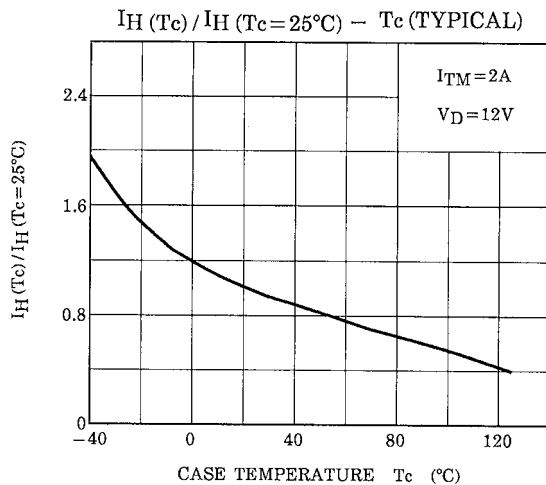
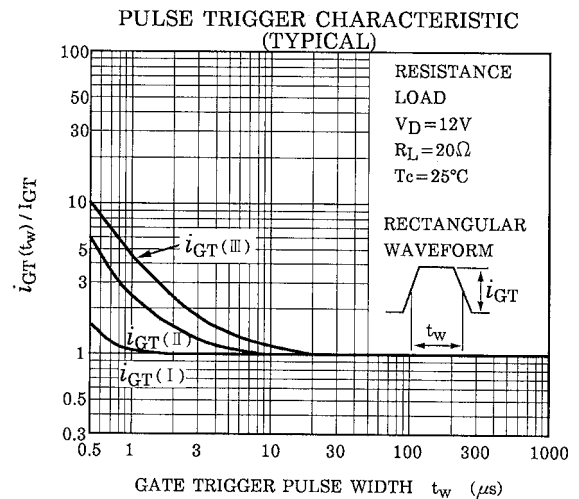
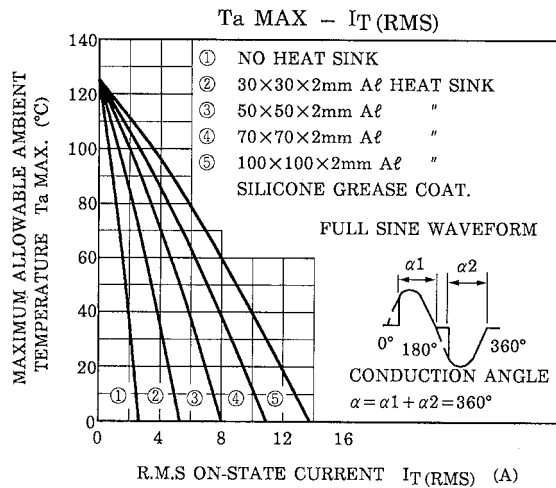
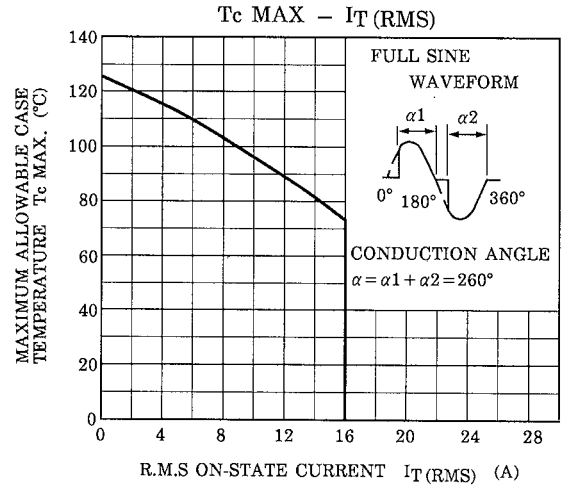
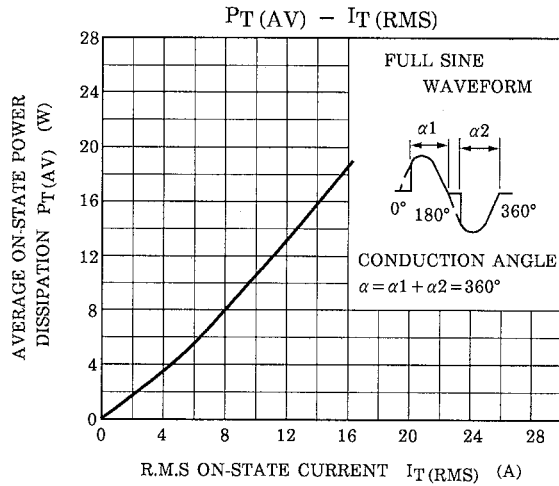
CHARACTERISTIC		SYMBOL	TEST CONDITION		MIN	TYP.	MAX	UNIT	
Repetitive Peak Off-State Current		I <sub>DRM</sub>	V <sub>DRM</sub> = Rated		—	—	20	μA	
Gate Trigger Voltage		I	V <sub>GT</sub>	V <sub>D</sub> = 12V, R <sub>L</sub> = 20Ω	T2 (+) , Gate (+)	—	—	1.5	V
		II			T2 (+) , Gate (–)	—	—	1.5	
		III			T2 (–) , Gate (–)	—	—	1.5	
		IV			T2 (–) , Gate (+)	—	—	—	
Gate Trigger Current	SM16GZ47 SM16JZ47	I	I <sub>GT</sub>	V <sub>D</sub> = 12V, R <sub>L</sub> = 20Ω	T2 (+) , Gate (+)	—	—	30	mA
		II			T2 (+) , Gate (–)	—	—	30	
		III			T2 (–) , Gate (–)	—	—	30	
		IV			T2 (–) , Gate (+)	—	—	—	
	SM16GZ47A SM16JZ47A	I			T2 (+) , Gate (+)	—	—	20	
		II			T2 (+) , Gate (–)	—	—	20	
		III			T2 (–) , Gate (–)	—	—	20	
		IV			T2 (–) , Gate (+)	—	—	—	
Peak On-State Voltage		V <sub>TM</sub>	I <sub>TM</sub> = 25A		—	—	1.5	V	
Gate Non-Trigger Voltage		V <sub>GD</sub>	V <sub>D</sub> = Rated, T <sub>c</sub> = 125°C		0.2	—	—	V	
Holding Current		I <sub>H</sub>	V <sub>D</sub> = 12V, I <sub>TM</sub> = 1A		—	—	50	mA	
Thermal Resistance		R <sub>th</sub> (j-c)	Junction to Case, AC		—	—	2.5	°C / W	
Critical Rate of Rise of Off-State Voltage	SM16GZ47 SM16JZ47	dv / dt	V <sub>DRM</sub> = Rated, T <sub>j</sub> = 125°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 <sub>DRM</sub> = 400V, T <sub>j</sub> = 125°C (di / dt) c = – 8.7A / ms		10	—	—	V / μs	
	SM16GZ47A SM16JZ47A				4	—	—		

## MARKING



* NUMBER	SYMBOL		MARK
* 1	Toshiba Product Mark		
* 2	TYPE	SM16GZ47, SM16GZ47A	M16GZ47
		SM16JZ47, SM16JZ47A	M16JZ47
* 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





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000707EAA

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