

TOSHIBA BI-DIRECTIONAL TRIODE THYRISTOR SILICON PLANAR TYPE

## SM16GZ47, SM16JZ47, SM16GZ47A, SM16JZ47A

### AC POWER CONTROL APPLICATIONS

- Repetitive Peak Off-State Voltage:  $V_{DRM} = 400V, 600V$
- 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	SM16GZ47 SM16GZ47A	400	V
	SM16JZ47 SM16JZ47A	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

Note 1:  $di / dt$  Test condition

$$V_{DRM} = 0.5 \times \text{Rated}$$

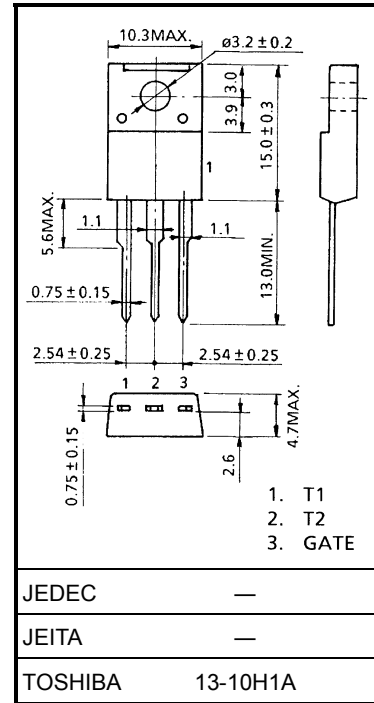
$$I_{TM} \leq 25A$$

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

$$t_{gr} \leq 250ns$$

$$I_{GP} = I_{GT} \times 2.0$$

Unit: mm

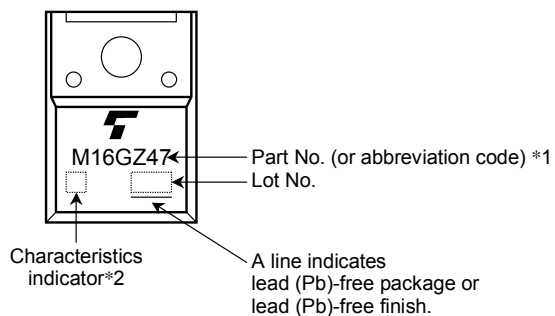


Weight: 1.7 g (typ.)

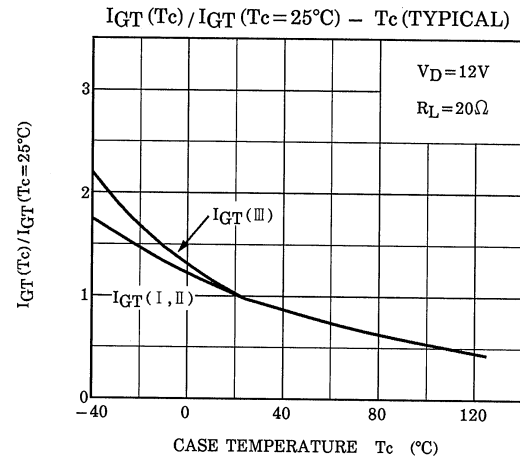
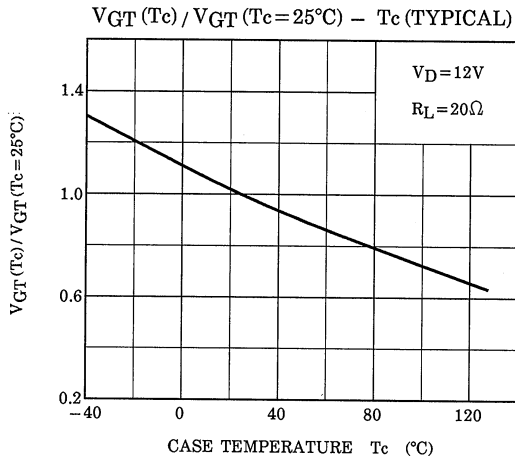
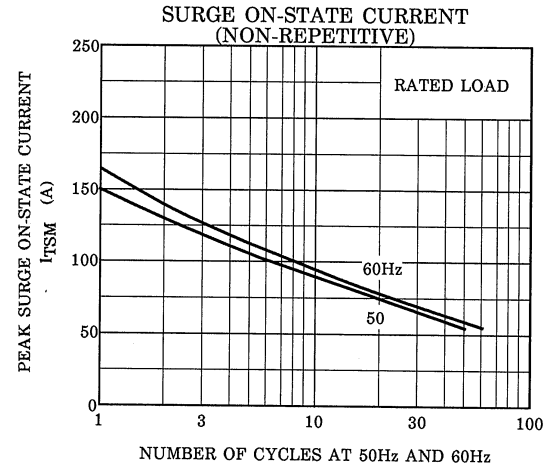
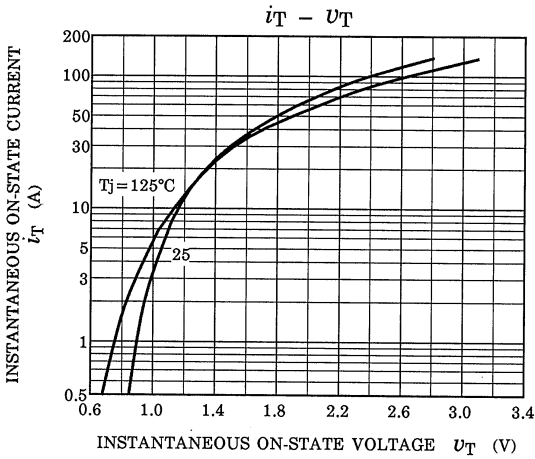
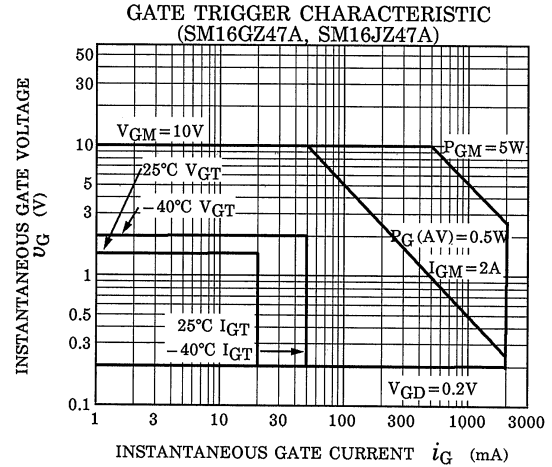
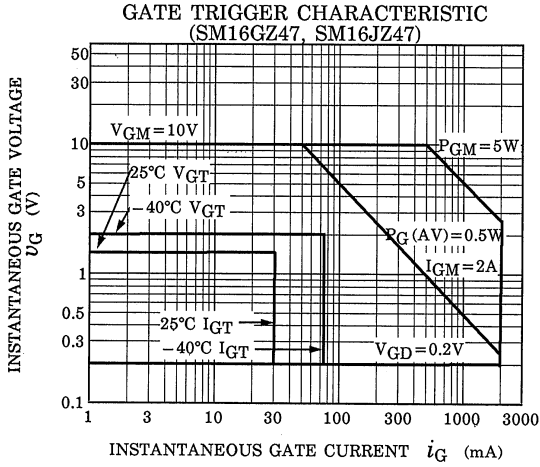
## ELECTRICAL CHARACTERISTICS (Ta = 25°C)

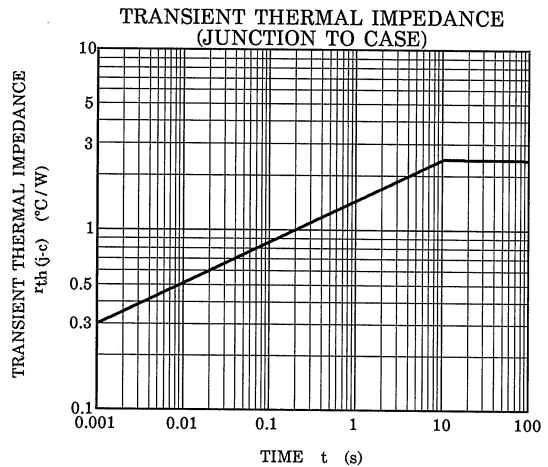
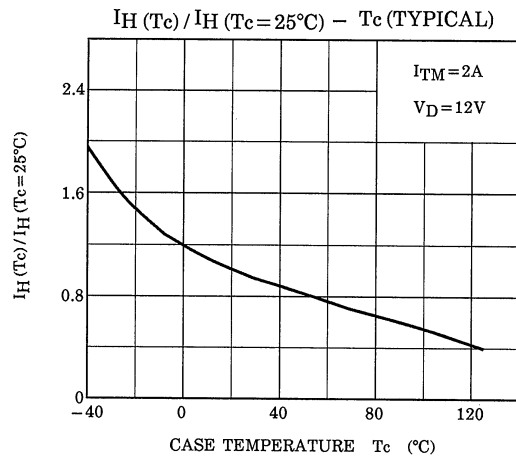
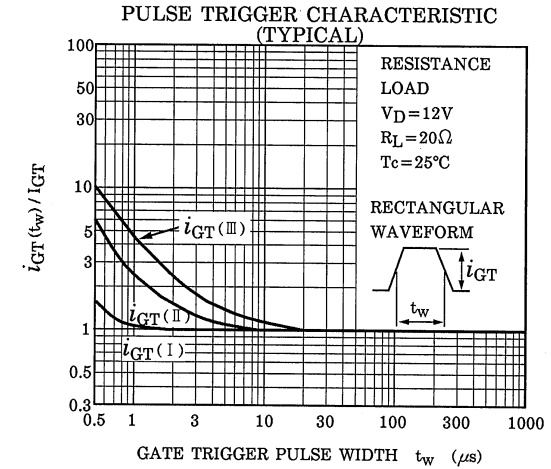
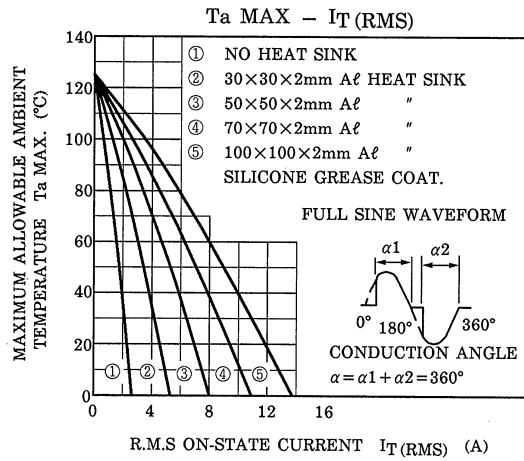
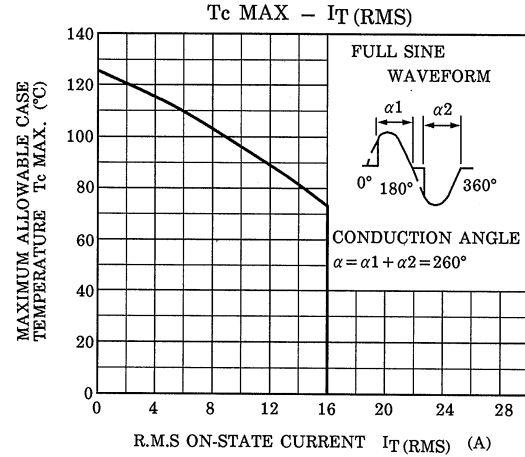
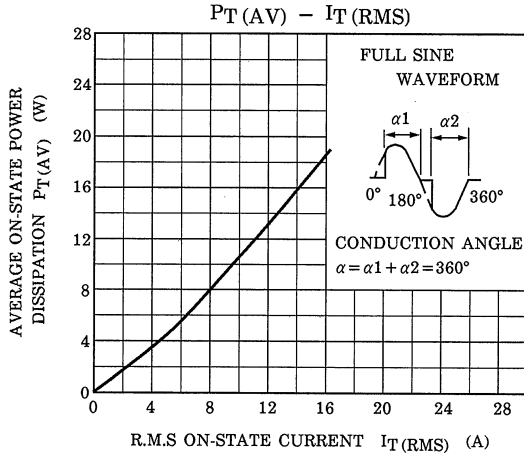
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN	TYP.	MAX	UNIT	
Repetitive Peak Off-State Current		$I_{DRM}$	$V_{DRM} = \text{Rated}$	—	—	20	$\mu\text{A}$	
Gate Trigger Voltage	I	$V_{GT}$	$V_D = 12\text{V}, R_L = 20\Omega$	T2 (+), Gate (+)	—	—	1.5	V
	II			T2 (+), Gate (-)	—	—	1.5	
	III			T2 (-), Gate (-)	—	—	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 / $\mu\text{s}$	
	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 / $\mu\text{s}$	
	SM16GZ47A SM16JZ47A			4	—	—		

## MARKING



	Part No. (or abbreviation code)	Part No.
*1	M16GZ47	SM16GZ47, SM16GZ47A
	M16JZ47	SM16JZ47, SM16JZ47A
*2	Nothing	SM16GZ47, SM16JZ47
	A	SM16GZ47A, SM16JZ47A





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