

TOSHIBA BI-DIRECTIONAL TRIODE THYRISTOR SILICON PLANAR TYPE

## SM12GZ47, SM12JZ47, SM12GZ47A, SM12JZ47A

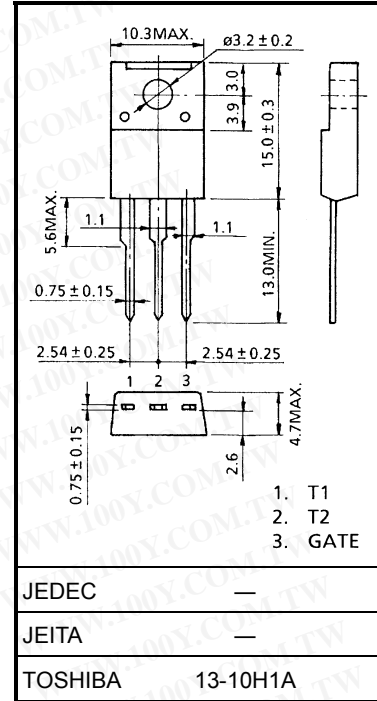
### AC POWER CONTROL APPLICATIONS

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

### 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-state Current (Full Sine Waveform TC = 72°C)		$I_T (RMS)$	12	A
Peak One Cycle 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	$A / \mu s$
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

Unit: mm



Weight: 1.7 g (typ.)

Note 1:  $di / dt$  test condition

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

$I_{TM} \leq 17A$

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

$t_{gr} \leq 250ns$

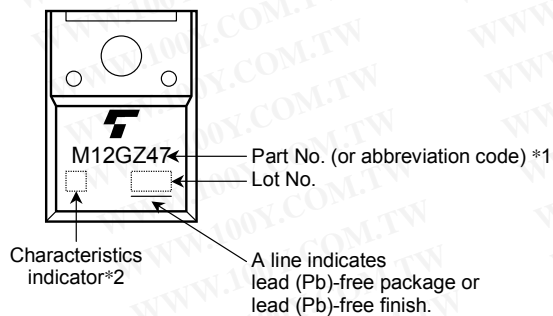
$i_{gp} = I_{GT} \times 2.0$

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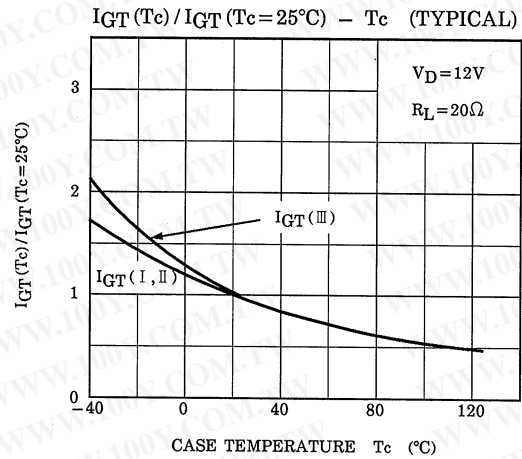
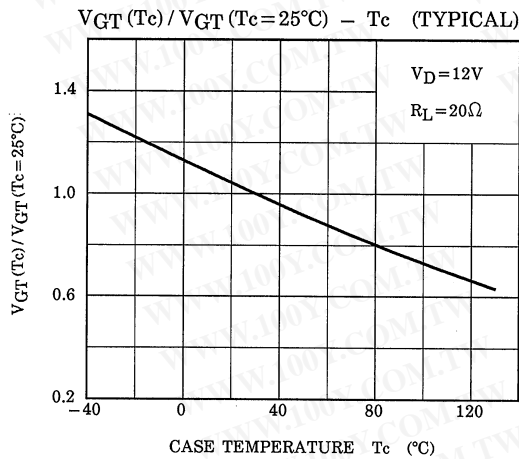
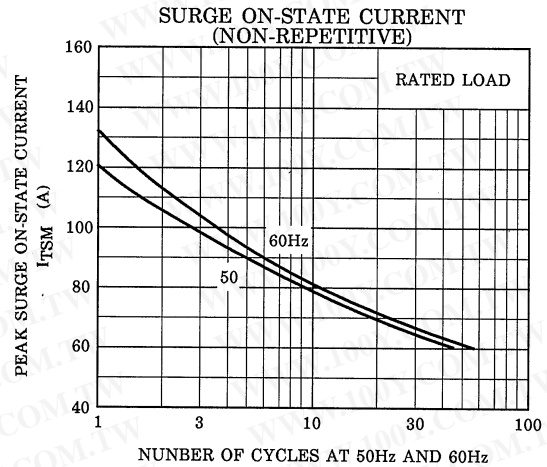
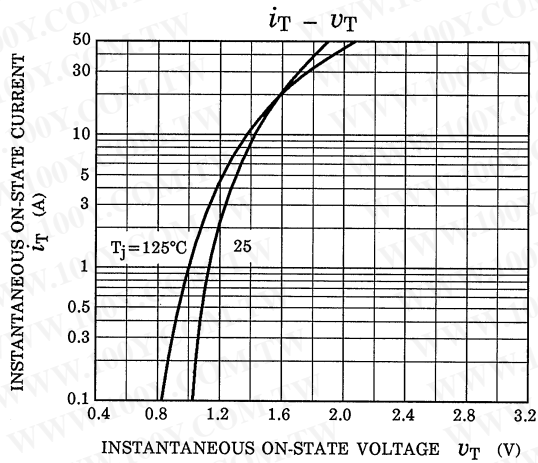
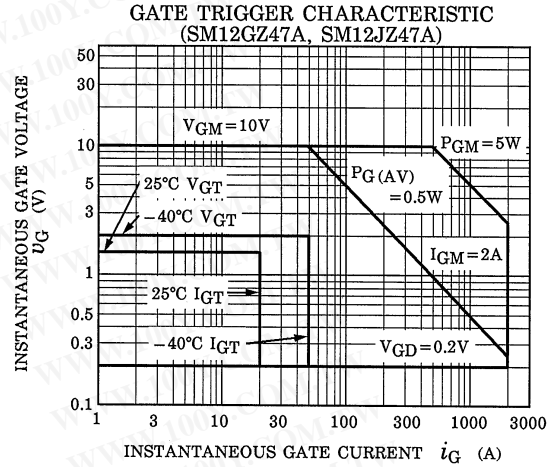
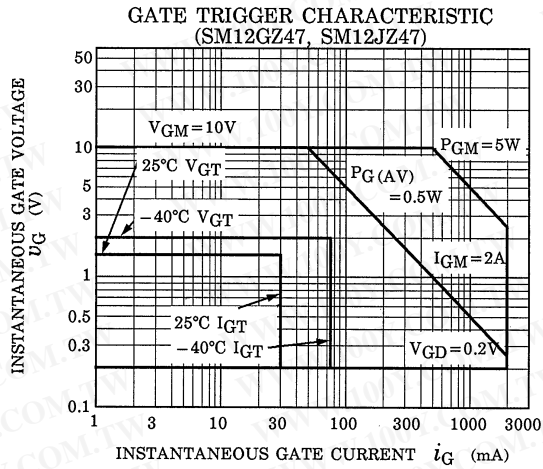
### ELECTRICAL CHARACTERISTICS (Ta = 25°C)

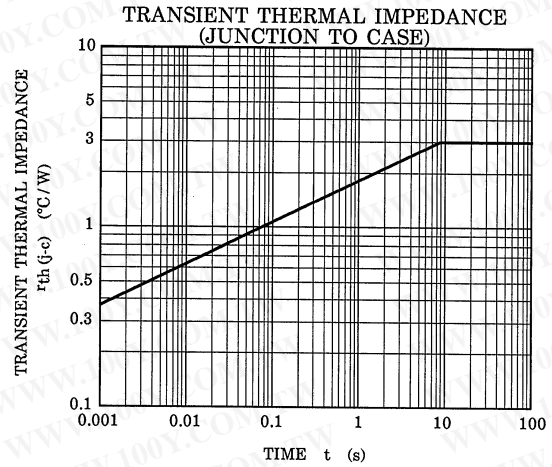
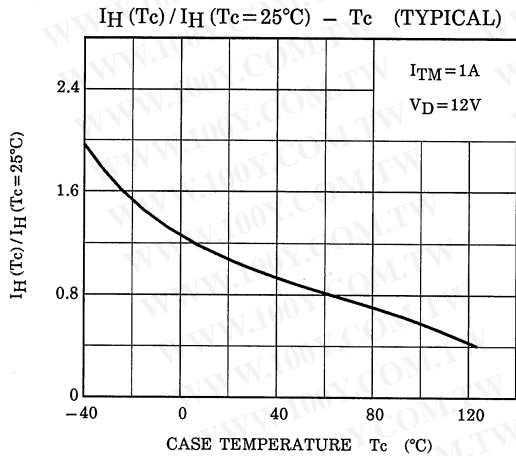
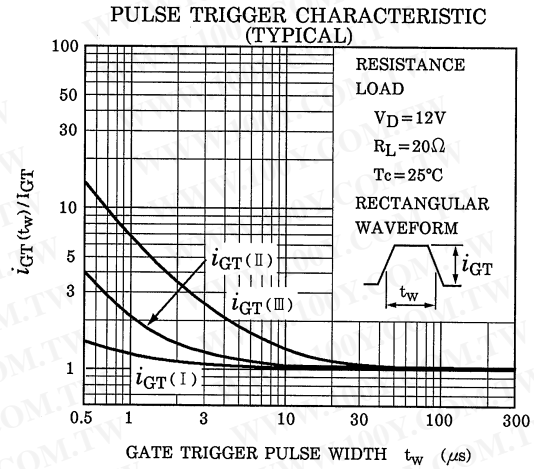
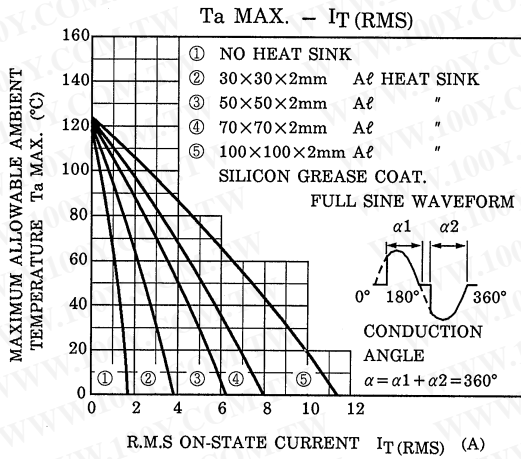
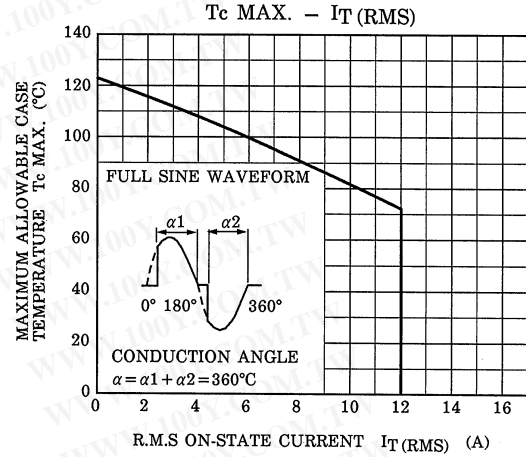
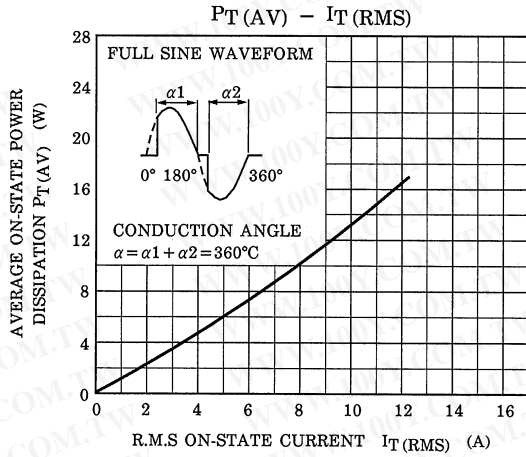
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN	TYP.	MAX	UNIT	
Repetitive Peak Off-State Current		$I_{DRM}$	$V_{DRM} = \text{Rated}$	—	—	20	$\mu\text{A}$	
Gate Trigger Voltage	I	$V_{GT}$	$V_D = 12\text{V}, R_L = 20\Omega$	T2 (+), Gate (+)	—	—	1.5	V
	II			T2 (+), Gate (-)	—	—	1.5	
	III			T2 (-), Gate (-)	—	—	1.5	
	IV			T2 (-), Gate (+)	—	—	—	
Gate Trigger Current	SM12GZ47 SM12JZ47	$I_{GT}$	$V_D = 12\text{V}, R_L = 20\Omega$	T2 (+), Gate (+)	—	—	30	mA
				T2 (+), Gate (-)	—	—	30	
				T2 (-), Gate (-)	—	—	30	
				T2 (-), Gate (+)	—	—	—	
	SM12GZ47A SM12JZ47A			T2 (+), Gate (+)	—	—	20	
				T2 (+), Gate (-)	—	—	20	
				T2 (-), Gate (-)	—	—	20	
				T2 (-), Gate (+)	—	—	—	
Peak On-State Voltage		$V_{TM}$	$I_{TM} = 17\text{A}$	—	—	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	—	—	3.0	$^\circ\text{C} / \text{W}$	
Critical Rate of Rise of Off-State Voltage	SM12GZ47 SM12JZ47	$dv / dt$	$V_{DRM} = \text{Rated}, T_j = 125^\circ\text{C}$ Exponential Rise	—	300	—	V / $\mu\text{s}$	
	SM12GZ47A SM12JZ47A			—	200	—		
Critical Rate of Rise of Off-State Voltage at Commutation	SM12GZ47 SM12JZ47	$(dv / dt)_c$	$V_{DRM} = 400\text{V}, T_j = 125^\circ\text{C}$ $(di / dt)_c = -6.5\text{A} / \text{ms}$	10	—	—	V / $\mu\text{s}$	
	SM12GZ47A SM12JZ47A			4	—	—		

### MARKING



	Part No. (or abbreviation code)	Part No.
*1	M12GZ47	SM12GZ47, SM12GZ47A
	M12JZ47	SM12JZ47, SM12JZ47A
*2	Nothing	SM12GZ47, SM12JZ47
	A	SM12GZ47A, SM12JZ47A





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