

TOSHIBA BI-DIRECTIONAL TRIODE THYRISTOR SILICON PLANAR TYPE

# SM3GZ47, SM3JZ47

## AC POWER CONTROL APPLICATIONS

- Repetitive Peak Off-State Voltage:  $V_{DRM} = 400V, 600V$
- R.M.S On-State Current:  $I_T (RMS) = 3A$
- High Commutating ( $dv / dt$ )
- Isolation Voltage:  $V_{ISOL} = 1500V$  AC

## MAXIMUM RATINGS

CHARACTERISTIC	SYMBOL	RATING	UNIT
Repetitive Peak Off-State Voltage	SM3GZ47	400	V
	SM3JZ47	600	
R.M.S On-State Current (Full Sine Waveform $T_c = 110^\circ C$ )	$I_T (RMS)$	3	A
Peak One Cycle Surge On-State Current (Non-Repetitive)	$I_{TSM}$	30 (50Hz)	A
		33 (60Hz)	
$I^2 t$ Limit Value ( $t = 1 \sim 10ms$ )	$I^2 t$	4.5	$A^2 s$
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	$T_j$	$-40 \sim 125$	$^\circ C$
Storage Temperature Range	$T_{stg}$	$-40 \sim 125$	$^\circ C$
Isolation Voltage (AC, $t = 1min.$ )	$V_{ISOL}$	1500	V

Note 1:  $di / dt$  test condition

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

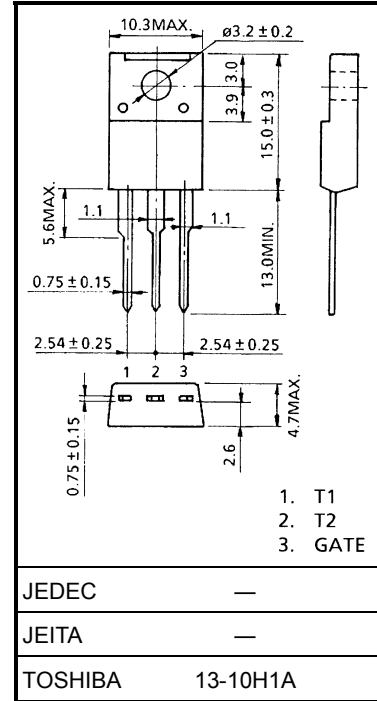
$$I_{TM} \leq 4.5A$$

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

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

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

Unit: mm

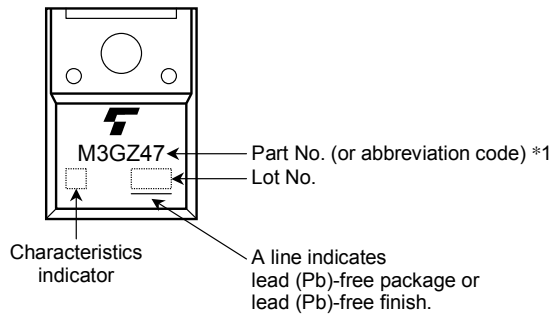


Weight: 1.7 g (typ.)

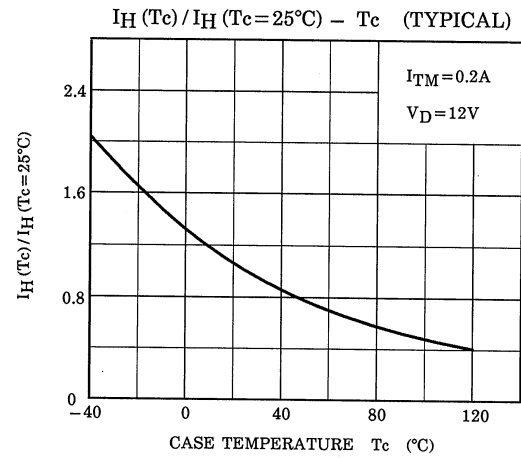
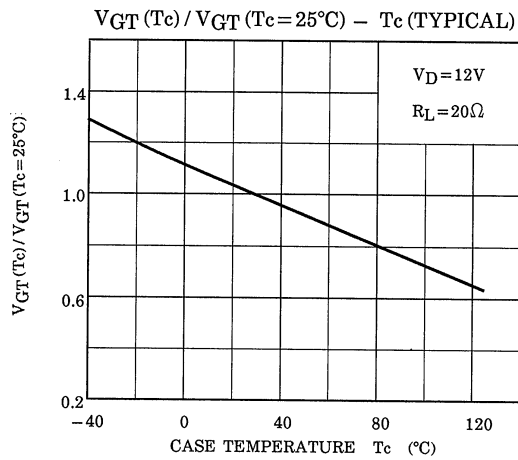
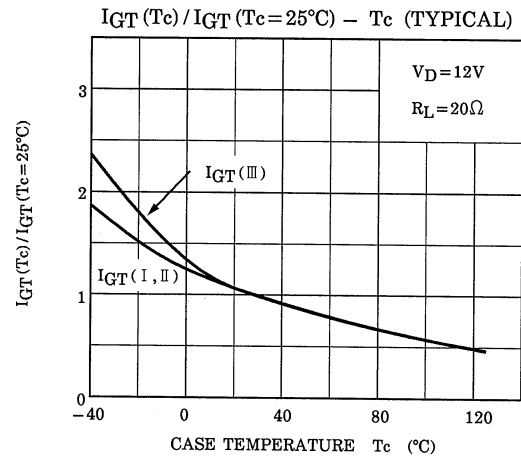
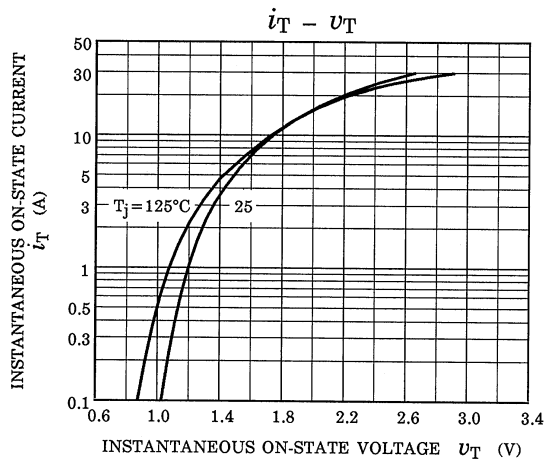
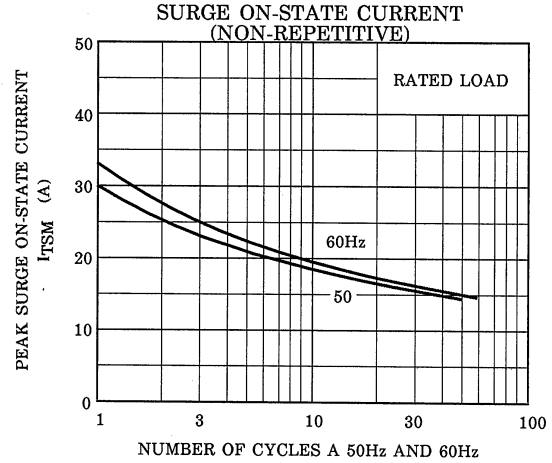
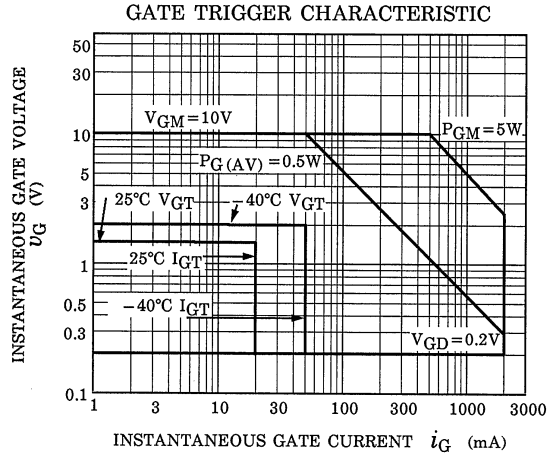
## ELECTRICAL CHARACTERISTICS (Ta = 25°C)

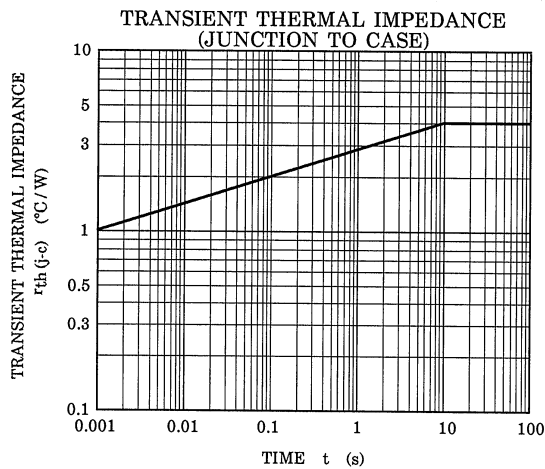
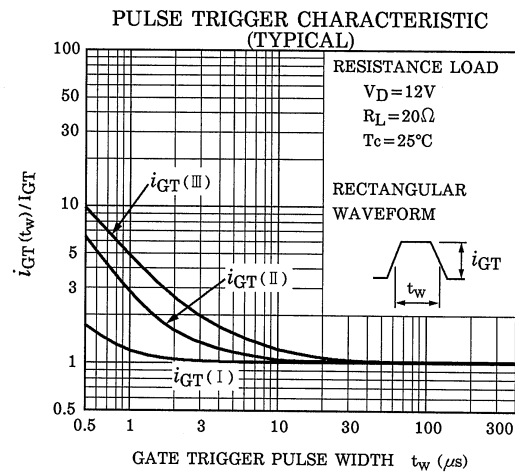
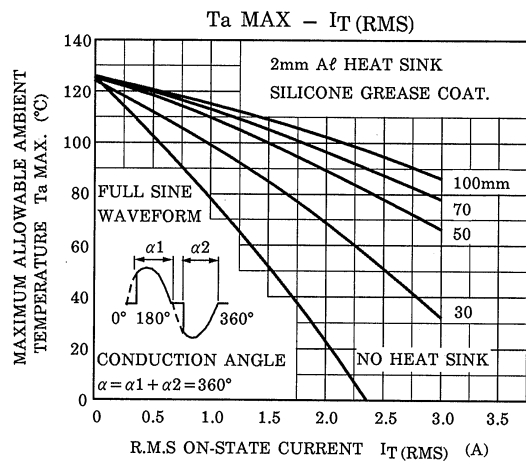
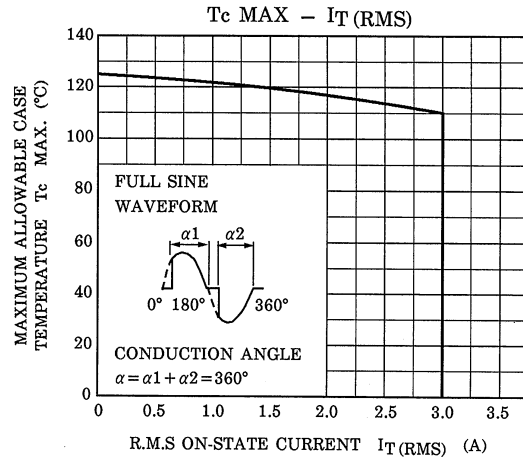
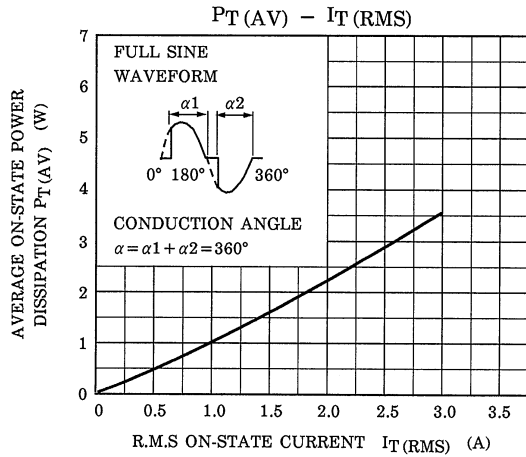
CHARACTERISTIC		SYMBOL	TEST CONDITION		MIN	TYP.	MAX	UNIT
Repetitive Peak Off-State Current		$I_{DRM}$	$V_{DRM} = \text{Rated}$		—	—	20	$\mu\text{A}$
Gate Trigger Voltage	I	$V_{GT}$	$V_D = 12\text{V}$ $R_L = 20\Omega$	T2 (+), Gate (+)	—	—	1.5	V
	II			T2 (+), Gate (—)	—	—	1.5	
	III			T2 (—), Gate (—)	—	—	1.5	
	IV			T2 (—), Gate (+)	—	—	—	
Gate Trigger Current	I	$I_{GT}$	$V_D = 12\text{V}$ $R_L = 20\Omega$	T2 (+), Gate (+)	—	—	20	mA
	II			T2 (+), Gate (—)	—	—	20	
	III			T2 (—), Gate (—)	—	—	20	
	IV			T2 (—), Gate (+)	—	—	—	
Peak On-State Voltage		$V_{TM}$	$I_{TM} = 4.5\text{A}$		—	—	1.5	V
Gate Non-Trigger Voltage		$V_{GD}$	$V_D = \text{Rated}$ , $T_c = 125^\circ\text{C}$		0.2	—	—	V
Holding Current		$I_H$	$V_D = 12\text{V}$ , $I_{TM} = 1\text{A}$		—	—	30	mA
Thermal Resistance		$R_{th(j-c)}$	Junction to Case, AC		—	—	4.2	$^\circ\text{C} / \text{W}$
Critical Rate of Rise of Off-State Voltage		$dv / dt$	$V_{DRM} = \text{Rated}$ , $T_j = 125^\circ\text{C}$ Exponential Rise		—	300	—	$\text{V} / \mu\text{s}$
Critical Rate of Rise of Off-State Voltage at Commutation		$(dv / dt)_c$	$V_{DRM} = 400\text{V}$ , $T_j = 125^\circ\text{C}$ $(di / dt)_c = -2.0\text{A} / \text{ms}$		10	—	—	$\text{V} / \mu\text{s}$

## MARKING



*1	Part No. (or abbreviation code)	Part No.
	M3GZ47	SM3GZ47
	M3JZ47	SM3JZ47





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