

TOSHIBA BI-DIRECTIONAL TRIODE THYRISTOR SILICON PLANAR TYPE

SM3GZ47, SM3JZ47

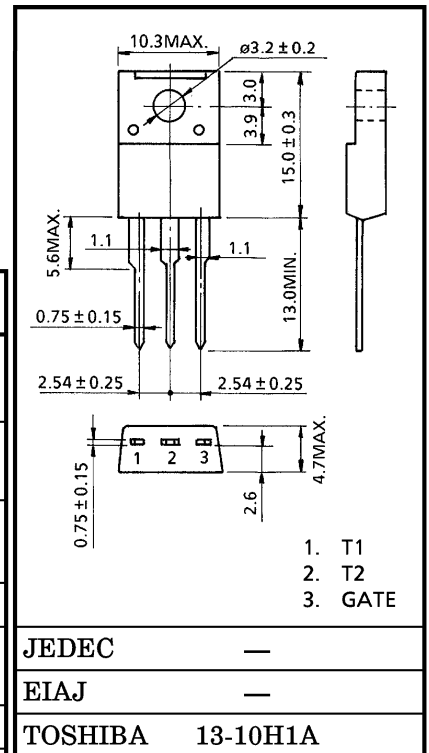
AC POWER CONTROL APPLICATIONS

Unit in mm

- Repetitive Peak Off-State Voltage : $V_{DRM} = 400, 600V$
- 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	V_{DRM}	400	V
		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^2t Limit Value ($t = 1 \sim 10ms$)	I^2t	4.5	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_{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, $t = 1min.$)	V_{ISOL}	1500	V



Weight : 1.7g

Note1: di / dt test condition
 $V_{DRM} = 0.5 \times \text{Rated}$
 $I_{TM} \leq 4.5A$
 $t_{gw} \geq 10 \mu s$
 $t_{gr} \leq 250ns$
 $i_{gp} = I_{GT} \times 2.0$

961001EAA2

● TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.

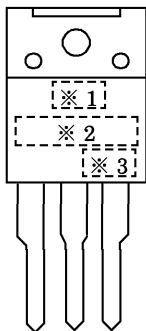
● The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.

● The information contained herein is subject to change without notice.

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

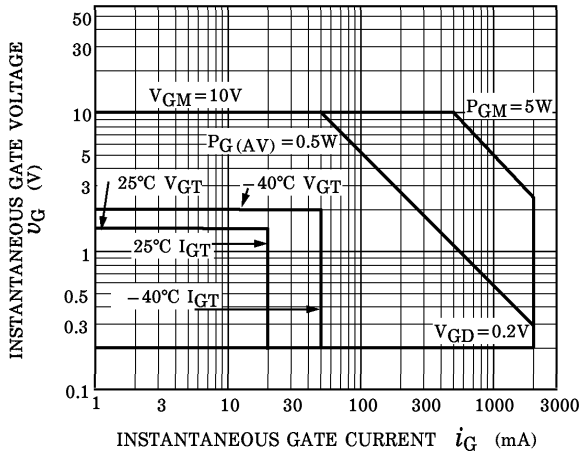
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Repetitive Peak Off-State Current	I_{DRM}	$V_{DRM} = \text{Rated}$	—	—	20	μA	
Gate Trigger Voltage	I II III IV V_{GT}	$V_D = 12\text{V}$, $R_L = 20\Omega$	T2(+), Gate(+)	—	—	1.5	V
			T2(+), Gate(-)	—	—	1.5	
			T2(-), Gate(-)	—	—	1.5	
			T2(-),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

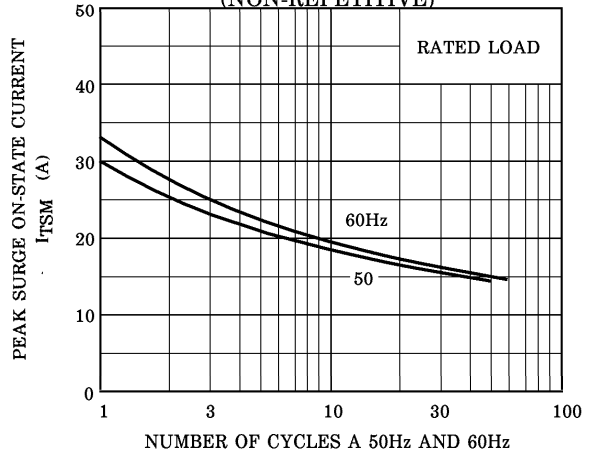


※NUMBER	SYMBOL	MARK
※1	TOSHIBA PRODUCT MARK	
※2	TYPE	SM3GZ47
		SM3JZ47
※3	Lot Number ↑ Month (Starting from Alphabet A) ↑ Year (Last Decimal Digit of the Current Year)	Example 8A : January 1998 8B : February 1998 8L : December 1998

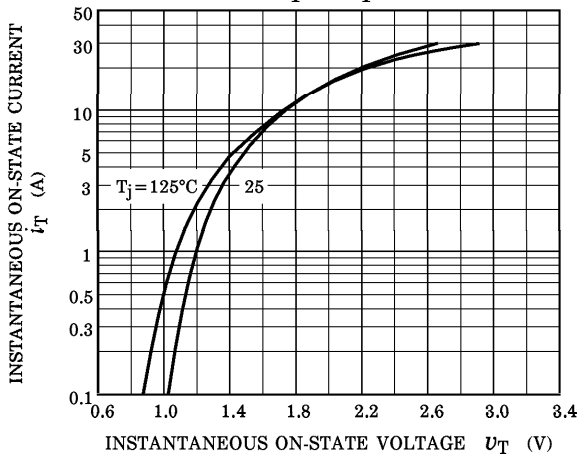
GATE TRIGGER CHARACTERISTIC



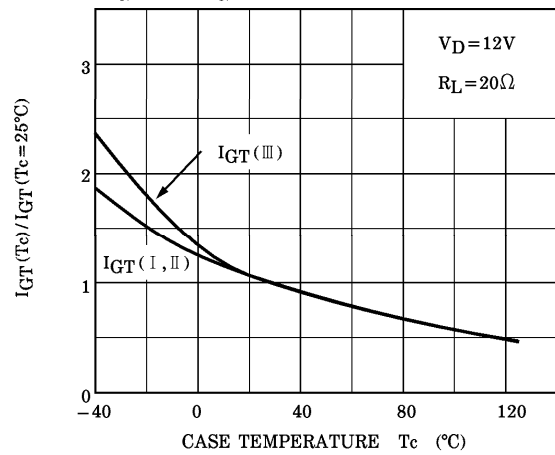
SURGE ON-STATE CURRENT (NON-REPETITIVE)



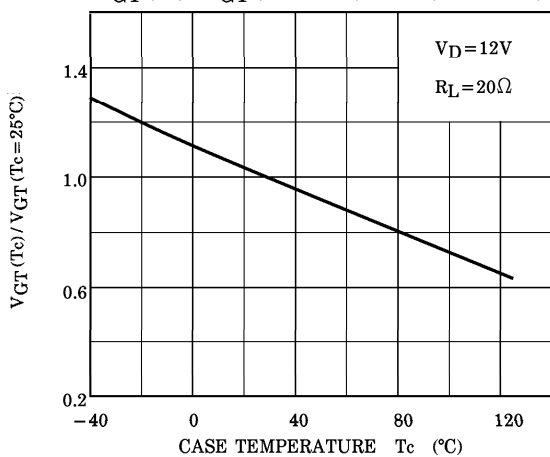
$i_T - v_T$



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



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



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

