

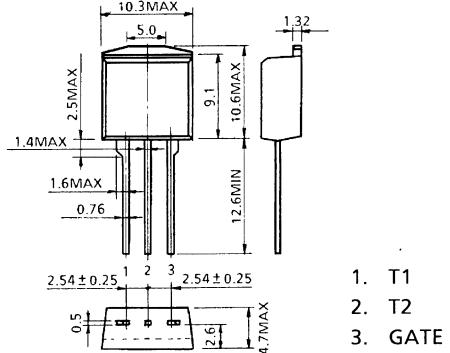
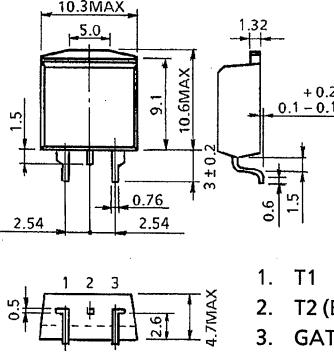
TOSHIBA BI-DIRECTIONAL TRIODE THYRISTOR SILICON PLANAR TYPE

**SM8G48, USM8G48, SM8J48, USM8J48  
SM8G48A, USM8G48A, SM8J48A, USM8J48A**

## AC POWER CONTROL APPLICATIONS

- Repetitive Peak Off-State Voltage:  $V_{DRM} = 400V, 600V$
- R.M.S On-State Current:  $I_T$  (RMS) = 8A
- Gate Trigger Current:  $I_{GT} = 30mA$  Max.  
:  $I_{GT} = 20mA$  Max. ("A"Type)

Unit: mm

SM8G48, SM8J48, SM8G48A, SM8J48A	USM8G48, USM8J48, USM8G48A, USM8J48A
 <p>1. T1 2. T2 3. GATE</p>	 <p>1. T1 2. T2 (BACK SIDE) 3. GATE</p>
JEDEC —	JEDEC —
JEITA —	JEITA —
TOSHIBA 13-10J1A	TOSHIBA 13-10J2A

Weight: 1.7g

## ABSOLUTE MAXIMUM RATINGS

CHARACTERISTIC		SYMBOL	RATING	UNIT
Repetitive Peak Off-State Voltage	(U)SM8G48 (U)SM8G48A	$V_{DRM}$	400	V
	(U)SM8J48 (U)SM8J48A		600	
R.M.S On-State Current		$I_T$ (RMS)	8	A
Peak One Cycle Surge On-State Current (Non-Repetitive)		$I_{TSM}$	80 (50Hz)	A
			88 (60Hz)	
$I^2t$ Limit Value		$I^2t$	32	$A^2s$
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 Forward Gate Voltage		$V_{GM}$	10	V
Peak Forward Gate Current		$I_{GM}$	2	A
Junction Temperature		$T_j$	-40~125	$^{\circ}C$
Storage Temperature Range		$T_{stg}$	-40~125	$^{\circ}C$

Note 1:  $V_{DRM} = 0.5 \times$  Rated

$I_{TM} \leq 12A$

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

$t_{gr} \leq 250ns$

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

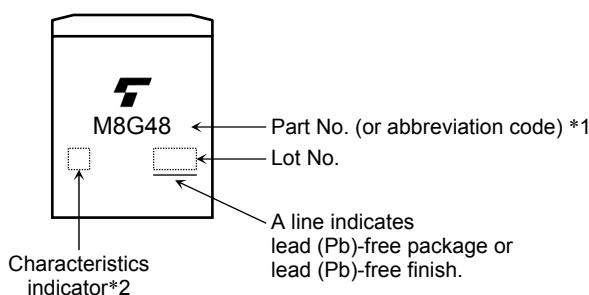
Note 2: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/Derating Concept and Methods) and individual reliability data (i.e. reliability test report and estimated failure rate, etc.).

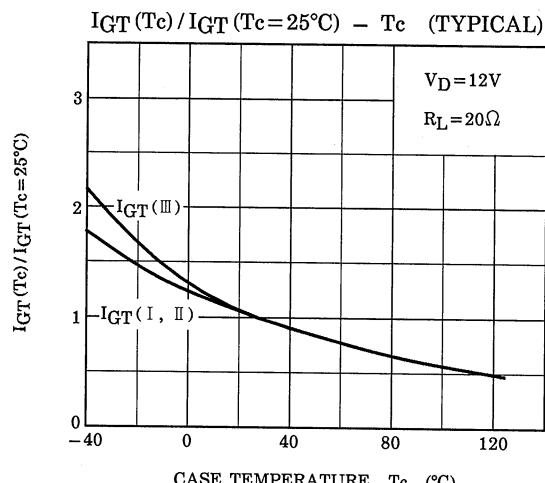
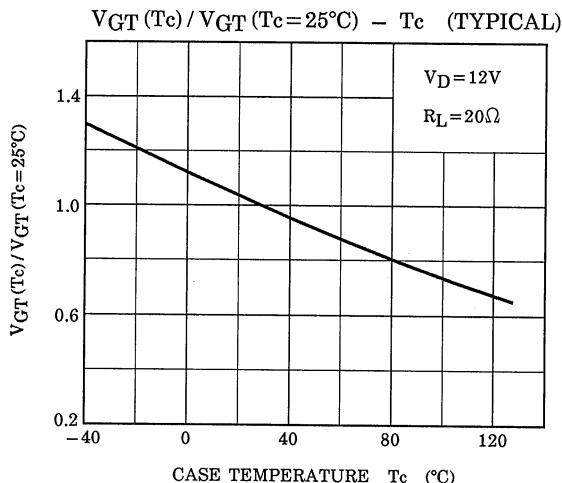
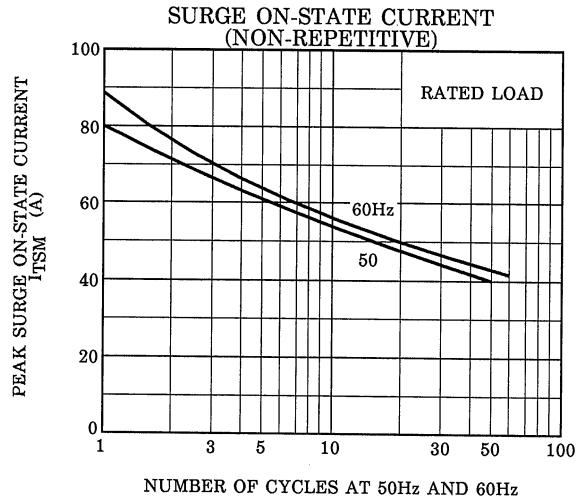
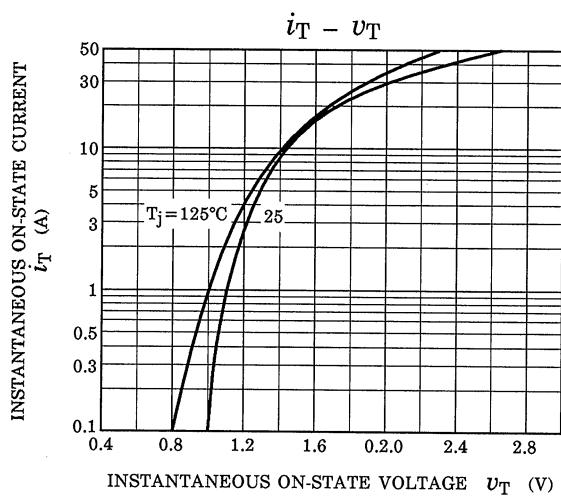
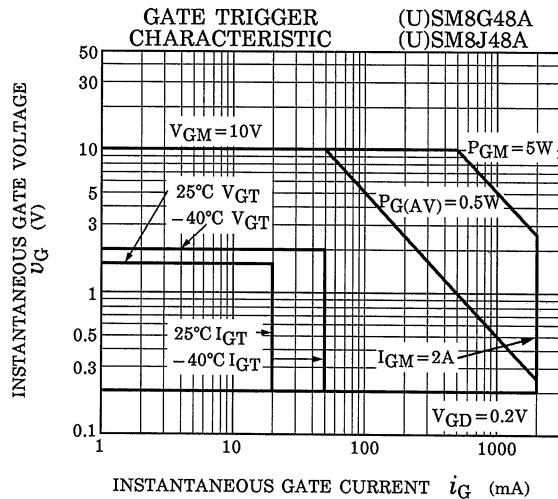
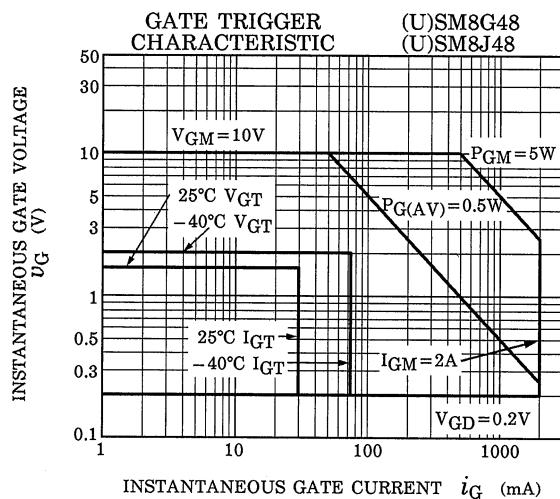
## ELECTRICAL CHARACTERISTICS (Ta = 25°C)

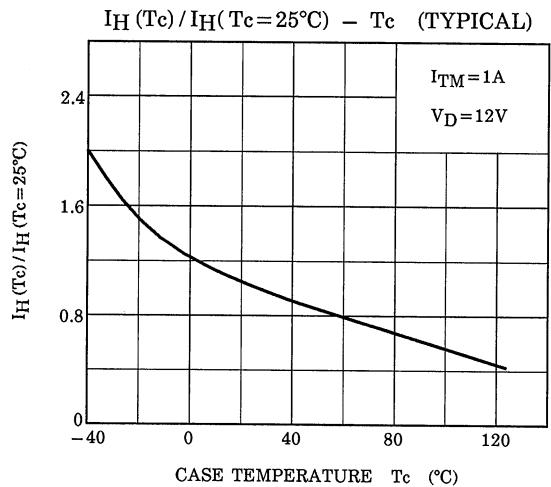
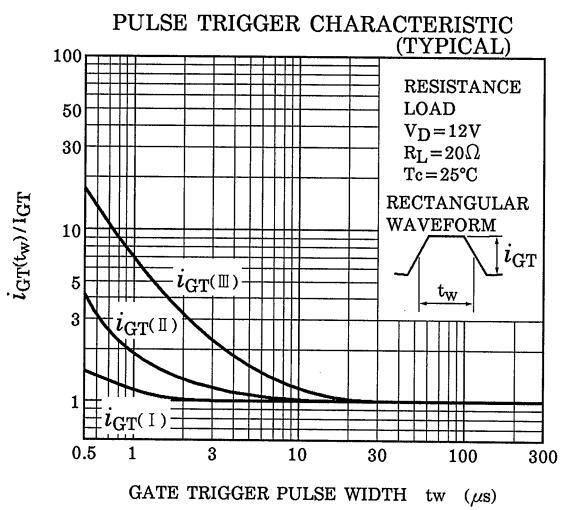
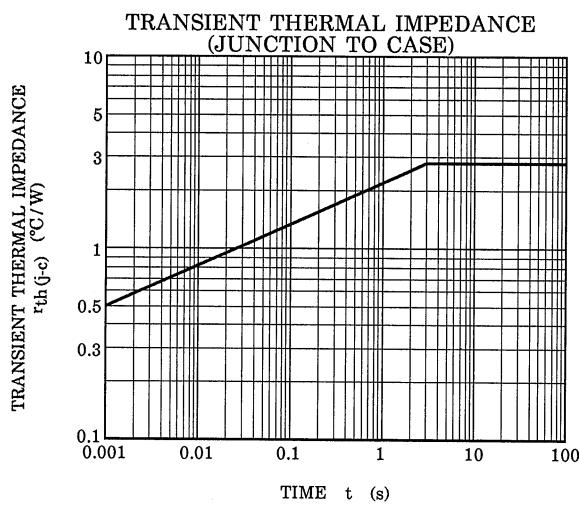
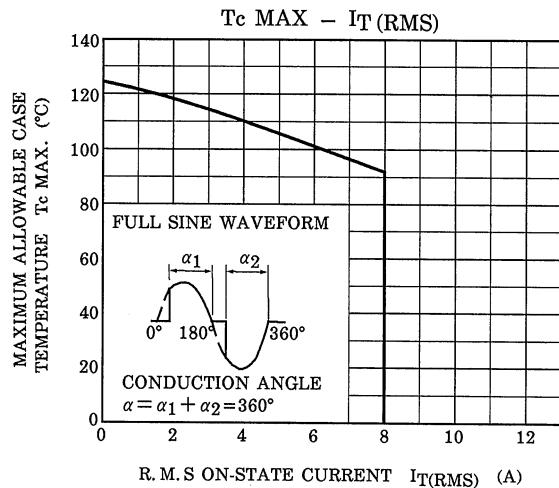
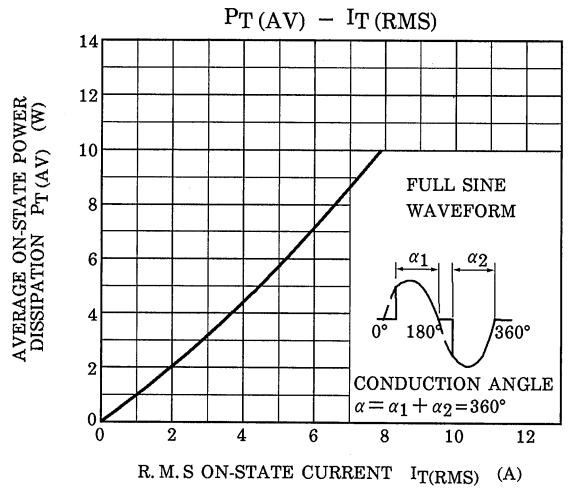
CHARACTERISTIC		SYMBOL	TEST CONDITION		MIN	TYP.	MAX	UNIT
Repetitive Peak Off-State Current		I <sub>DRM</sub>	V <sub>DRM</sub> = Rated		—	—	20	µA
Gate Trigger Voltage	I	V <sub>GT</sub>	V <sub>D</sub> = 12V R <sub>L</sub> = 20Ω	T2 (+), Gate (+)	—	—	1.5	V
	II			T2 (+), Gate (-)	—	—	1.5	
	III			T2 (-), Gate (-)	—	—	1.5	
	IV			T2 (-), Gate (+)	—	—	—	
Gate Trigger Current	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 (+)	—	—	—	
	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> = 12A		—	—	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		—	—	2.8	°C / W
Critical Rate of Rise of Off-State Voltage	(U)SM8G48 (U)SM8J48	dv / dt	V <sub>DRM</sub> = Rated, T <sub>j</sub> = 125°C Exponential Rise	— 300 —		—	—	V / µs
	(U)SM8G48A (U)SM8J48A			— 200 —		—	—	
Critical Rate of Rise of Off-State Voltage at Commutation	(U)SM8G48 (U)SM8J48	(dv / dt) c	V <sub>DRM</sub> = 400V, T <sub>j</sub> = 125°C (di / dt) c = -4.5A / ms	10 — —		—	—	V / µs
	(U)SM8G48A (U)SM8J48A			4 — —		—	—	

## MARKING



	Part No. (or abbreviation code)	Part No.
*1	M8G48	SM8G48, SM8G48A
		USM8G48, USM8G48A
M8J48	SM8J48, SM8J48A	SM8J48, SM8J48A
		USM8J48, USM8J48A
*2	Nothing	SM8G48, SM8J48
		USM8G48, USM8J48
A	SM8G48A, SM8J48A	SM8G48A, SM8J48A
		USM8G48A, USM8J48A





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