

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: $I_{GT} = 30mA \text{ Max.}$
: $I_{GT} = 20mA \text{ Max.}$ ("A"Type)

Unit: mm

SM8G48, SM8J48, SM8G48A, SM8J48A	USM8G48, USM8J48, USM8G48A, USM8J48A
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 / μs
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: $V_{DRM} = 0.5 \times \text{Rated}$
 $I_{TM} \leq 12A$
 $t_{gw} \geq 10\mu s$
 $t_{gr} \leq 250ns$
 $i_{gp} = I_{GT} \times 2.0$

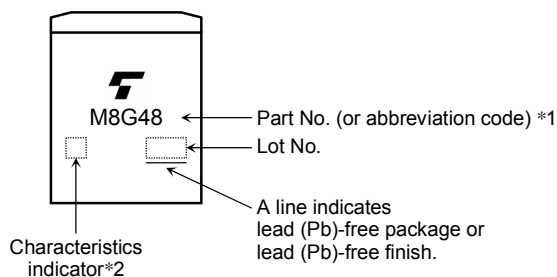
Note 2: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

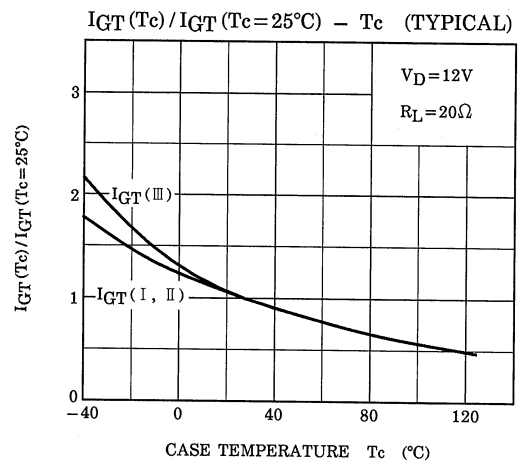
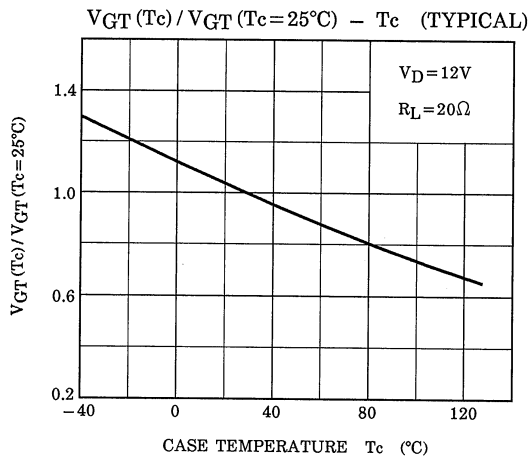
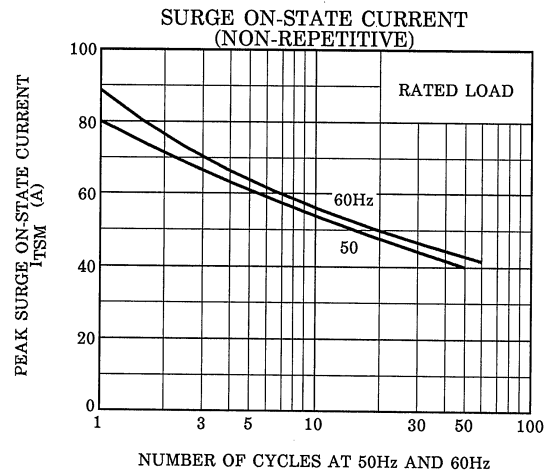
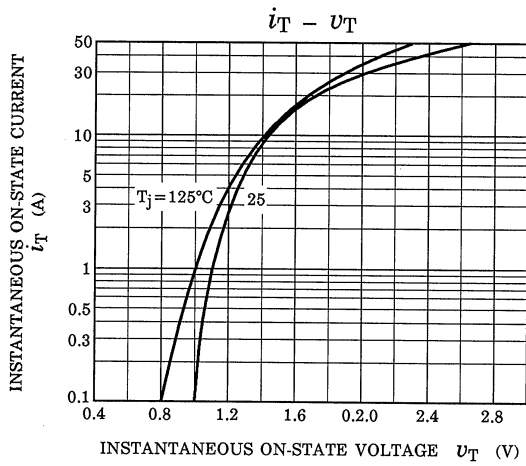
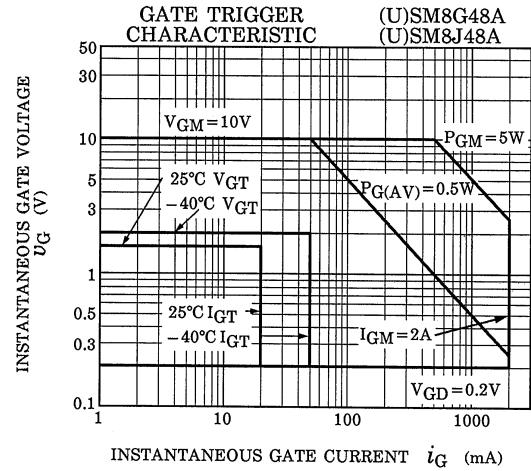
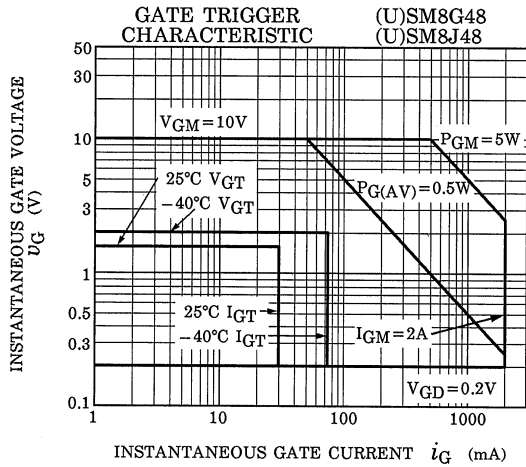
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

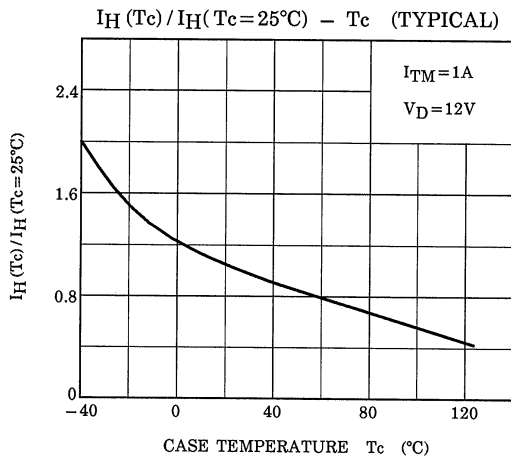
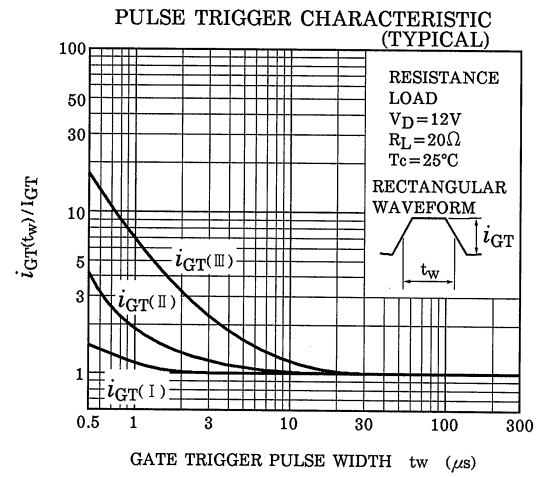
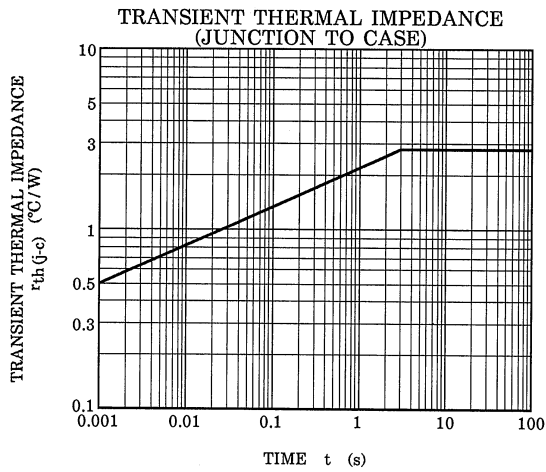
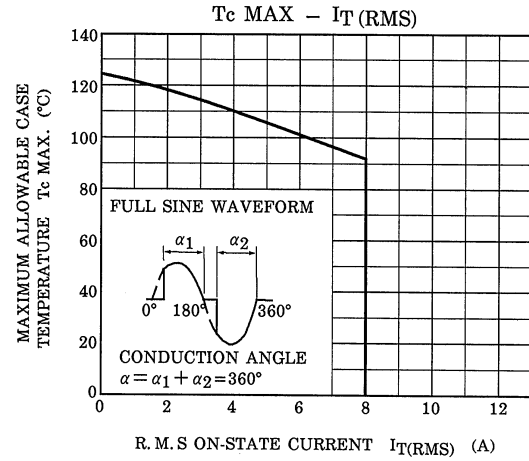
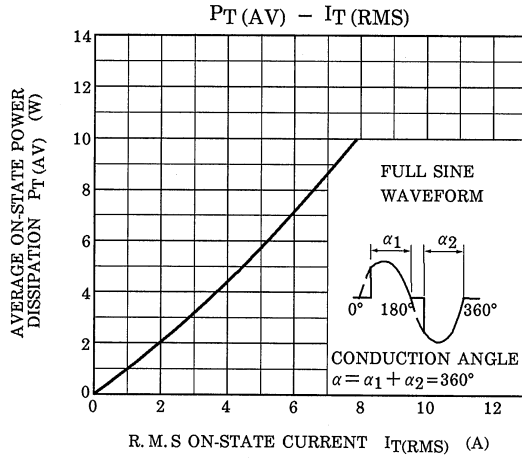
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN	TYP.	MAX	UNIT	
Repetitive Peak Off-State Current		I_{DRM}	$V_{DRM} = \text{Rated}$	—	—	20	μA	
Gate Trigger Voltage	I	V_{GT}	$V_D = 12\text{V}$ $R_L = 20\Omega$	T2 (+), Gate (+)	—	—	1.5	V
	II			T2 (+), Gate (-)	—	—	1.5	
	III			T2 (-), Gate (-)	—	—	1.5	
	IV			T2 (-), Gate (+)	—	—	—	
Gate Trigger Current	(U)SM8G48 (U)SM8J48	I_{GT}	$V_D = 12\text{V}$ $R_L = 20\Omega$	T2 (+), Gate (+)	—	—	30	mA
				T2 (+), Gate (-)	—	—	30	
				T2 (-), Gate (-)	—	—	30	
				T2 (-), Gate (+)	—	—	—	
	(U)SM8G48A (U)SM8J48A			T2 (+), Gate (+)	—	—	20	
				T2 (+), Gate (-)	—	—	20	
				T2 (-), Gate (-)	—	—	20	
				T2 (-), Gate (+)	—	—	—	
Peak On-State Voltage		V_{TM}	$I_{TM} = 12\text{A}$	—	—	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	—	—	2.8	$^\circ\text{C} / \text{W}$	
Critical Rate of Rise of Off-State Voltage	(U)SM8G48 (U)SM8J48	dv / dt	$V_{DRM} = \text{Rated}, T_j = 125^\circ\text{C}$ Exponential Rise	—	300	—	V / μs	
	(U)SM8G48A (U)SM8J48A			—	200	—		
Critical Rate of Rise of Off-State Voltage at Commutation	(U)SM8G48 (U)SM8J48	$(dv / dt)_c$	$V_{DRM} = 400\text{V}, T_j = 125^\circ\text{C}$ $(di / dt)_c = -4.5\text{A} / \text{ms}$	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
		USM8J48, USM8J48A
*2	Nothing	SM8G48, SM8J48
		USM8G48, USM8J48
	A	SM8G48A, SM8J48A
		USM8G48A, USM8J48A





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