

TOSHIBA SM12(G,J)48,USM12(G,J)48,SM12(G,J)48A,USM12(G,J)48A

TOSHIBA BI-DIRECTIONAL TRIODE THYRISTOR SILICON PLANAR TYPE

SM12G48, USM12G48, SM12J48, USM12J48 SM12G48A, USM12G48A, SM12J48A, USM12J48A

AC POWER CONTROL APPLICATIONS

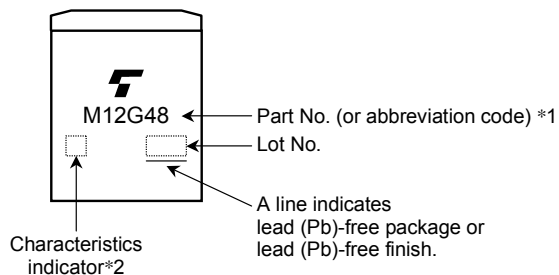
- Repetitive Peak Off-State Voltage : $V_{DRM}=400V, 600V$
- R.M.S. On-State Current : $I_T (RMS) =12A$
- Gate Trigger Current : $I_{GT}=30mA$ Max.
: $I_{GT}=20mA$ Max. ("A"Type)

Unit: mm

SM12G48, SM12J48, SM12G48A, SM12J48A	USM12G48, USM12J48, USM12G48A, USM12J48A
JEDEC —	JEDEC —
JEITA —	JEITA —
TOSHIBA 13-10J1A	TOSHIBA 13-10J2A

Weight: 1.7g

MARKING



	Part No. (or abbreviation code)	Part No.
*1	M12G48	SM12G48, SM12G48A
		USM12G48, USM12G48A
	M12J48	SM12J48, SM12J48A
		USM12J48, USM12J48A
*2	Nothing	SM12G48, SM12J48
		USM12G48, USM12J48
	A	SM12G48A, SM12J48A
		USM12G48A, USM12J48A

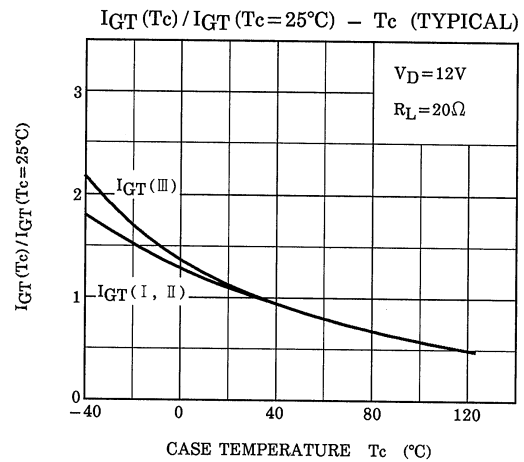
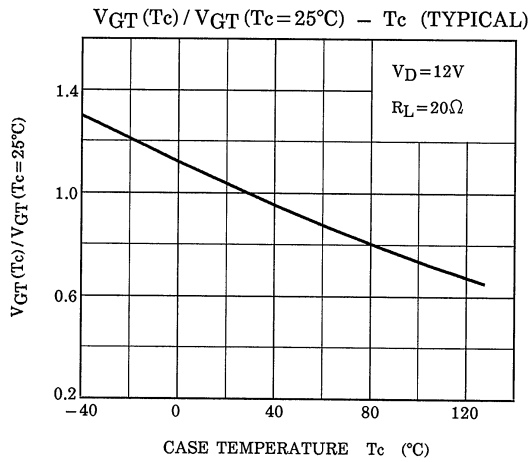
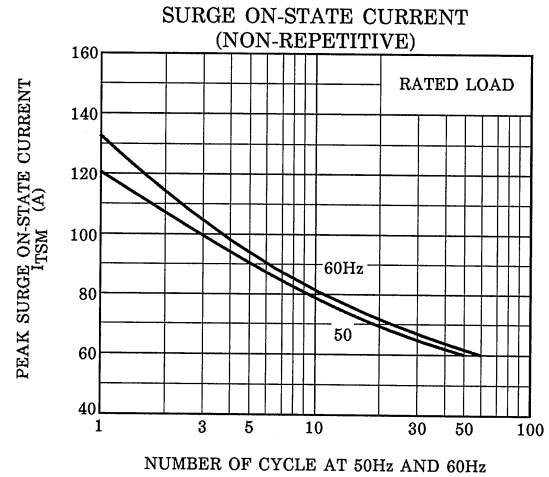
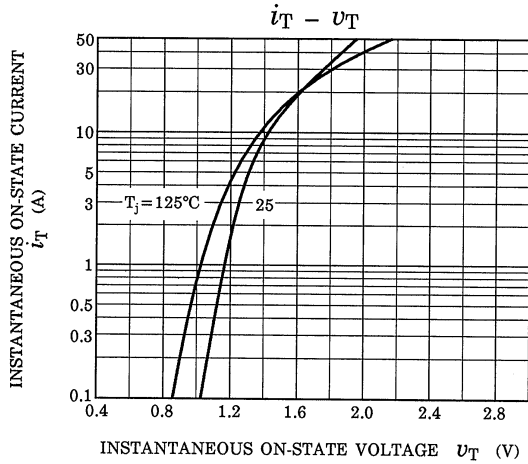
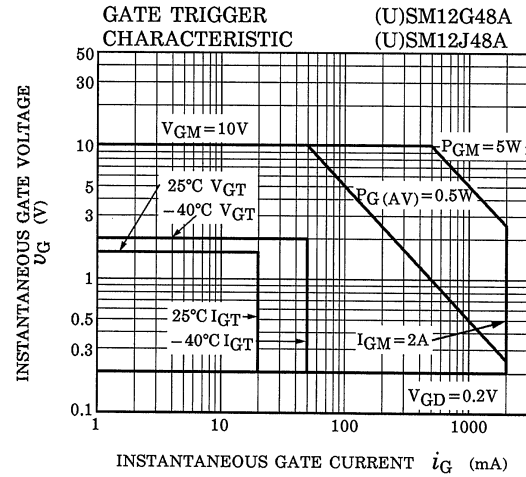
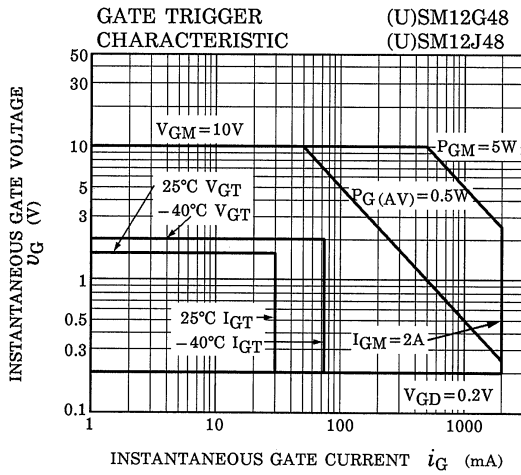
MAXIMUM RATINGS

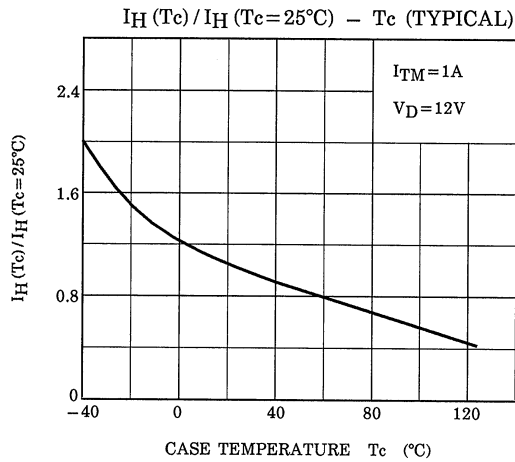
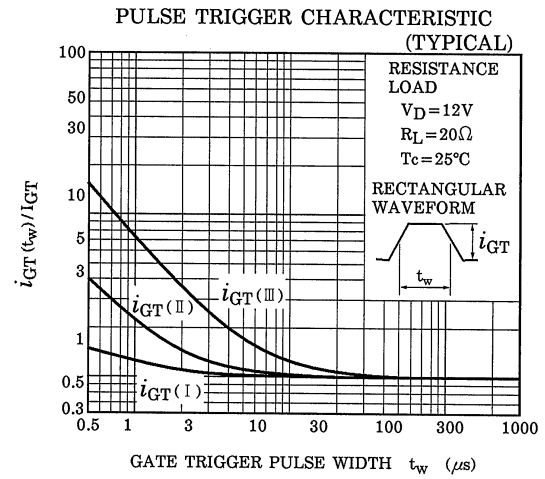
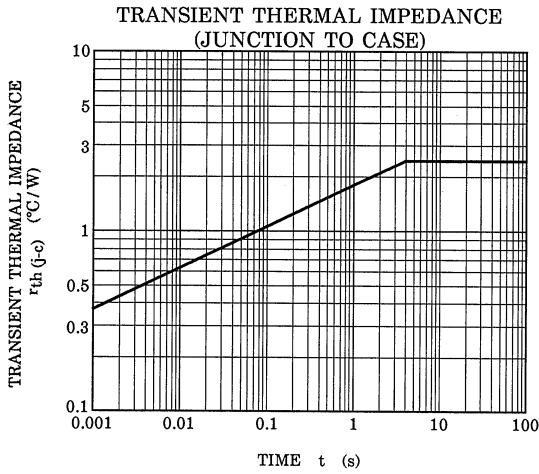
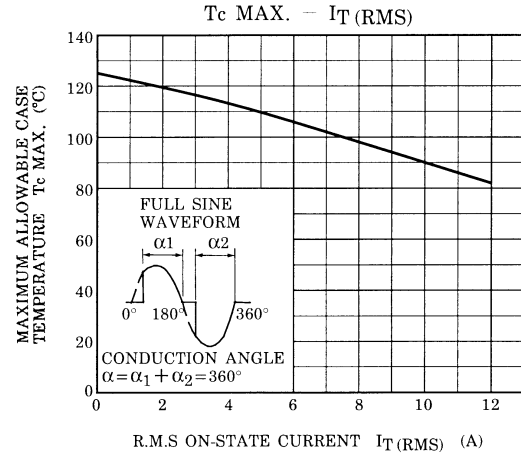
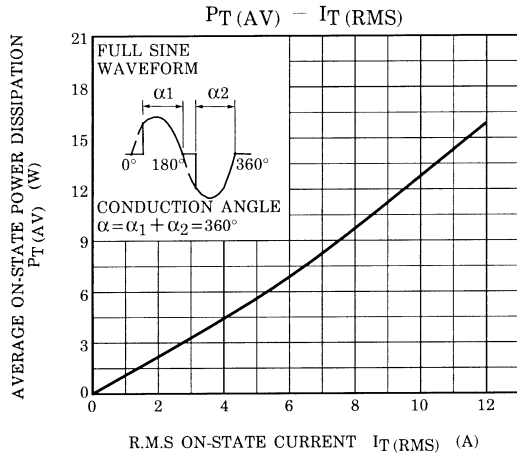
CHARACTERISTIC	SYMBOL	RATING	UNIT
Repetitive Peak Off-State Voltage	(U)SM12G48 (U)SM12G48A	V_{DRM}	V
	(U)SM12J48 (U)SM12J48A		
R.M.S On-State Current	$I_T (RMS)$	12	A
Peak One Cycle Surge On-State Current (Non-Repetitive)	I_{TSM}	120 (50Hz)	A
		132 (60Hz)	
I_t^2 Limit Value	I_t^2	72	$A^2 s$
Critical 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 : $V_{DRM}=0.5 \times \text{Rated}$
 $I_{TM} \leq 15A$
 $t_{gw} \geq 10\mu s$
 $t_{gr} \leq 250ns$
 $i_{gp} = I_{GT} \times 2.0$

ELECTRICAL CHARACTERISTICS ($T_a=25^{\circ}C$)

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	$V_D = 12V$ $R_L = 20\Omega$	$T_2 (+), \text{Gate } (+)$	—	1.5	V
	II			—	1.5	
	III			—	1.5	
	IV			—	—	
Gate Trigger Current	I	$V_D = 12V$ $R_L = 20\Omega$	$T_2 (+), \text{Gate } (+)$	—	30	mA
	II		$T_2 (+), \text{Gate } (-)$	—	30	
	III		$T_2 (-), \text{Gate } (-)$	—	30	
	IV		$T_2 (-), \text{Gate } (+)$	—	—	
	I		$T_2 (+), \text{Gate } (+)$	—	20	
	II		$T_2 (+), \text{Gate } (-)$	—	20	
	III		$T_2 (-), \text{Gate } (-)$	—	20	
	IV		$T_2 (-), \text{Gate } (+)$	—	—	
Peak On-State Voltage	V_{TM}	$I_{TM} = 17A$	—	—	1.5	V
Gate Non-Trigger Voltage	V_{GD}	$V_D = \text{Rated}, T_c = 125^{\circ}C$	0.2	—	—	V
Holding Current	I_H	$V_D = 12V, I_{TM} = 1A$	—	—	50	mA
Thermal Resistance	$R_{th (j-c)}$	Junction to Case, AC	—	—	2.4	$^{\circ}C / W$
Critical Rate of Rise of Off-State Voltage	(U)SM12G48 (U)SM12J48	$V_{DRM} = \text{Rated}, T_j = 125^{\circ}C$ Exponential Rise	—	300	—	V / μs
	(U)SM12G48A (U)SM12J48A		—	200	—	
Critical Rate of Rise of Off-State Voltage at Commutation	(U)SM12G48 (U)SM12J48	$V_{DRM} = 400V, T_j = 125^{\circ}C$ $(di / dt) c = -6.5A / ms$	10	—	—	V / μs
	(U)SM12G48A (U)SM12J48A		4	—	—	





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