

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

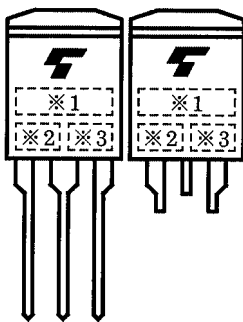
- Repetitive Peak Off-State Voltage : $V_{DRM}=400, 600V$
- R.M.S. On-State Current : $I_T (RMS) =12A$
- Gate Trigger Current : $I_{GT}=30mA$ Max.
: $I_{GT}=20mA$ Max. ("A"Type)

Unit in mm

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

Weight : 1.7g

MARKING



NUMBER	SYMBOL		MARK
*1	TYPE	SM12G48, SM12G48A, USM12G48, USM12G48A	SM12G48
		SM12J48, SM12J48A, USM12J48, USM12J48A	SM12J48
*2		SM12G48A, SM12J48A, USM12G48A, USM12J48A	A
*3	Lot Number ← Month (Starting from Alphabet A) ← Year (Last Decimal Digit of the Year of Manufacture)		Example 8A : January 1998 8B : February 1998 8L : December 1998

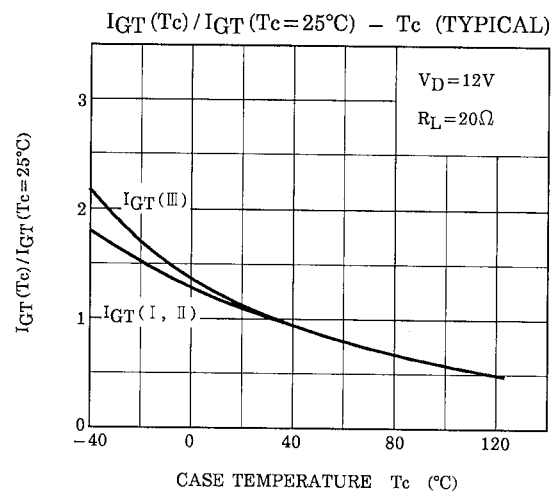
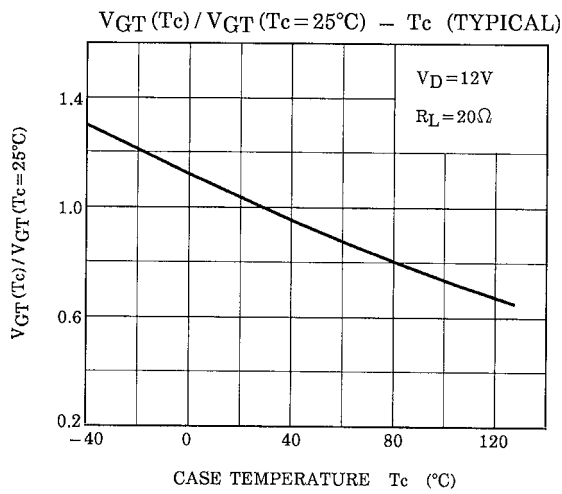
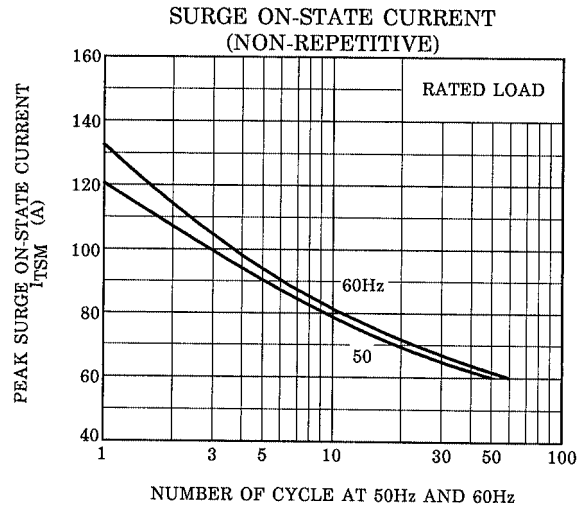
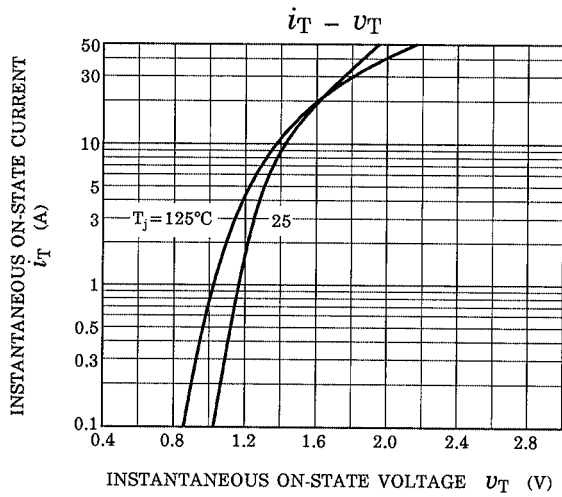
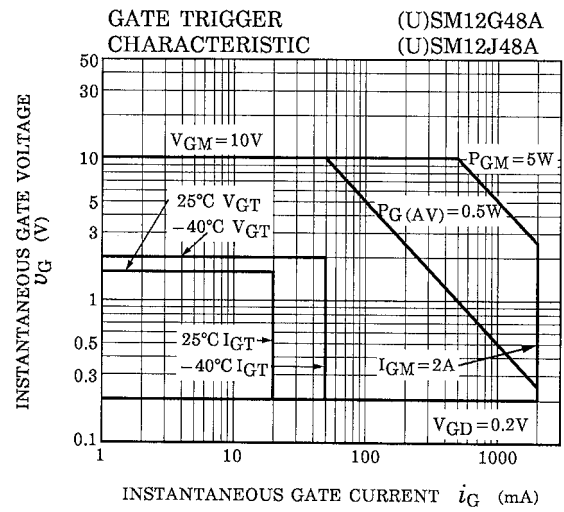
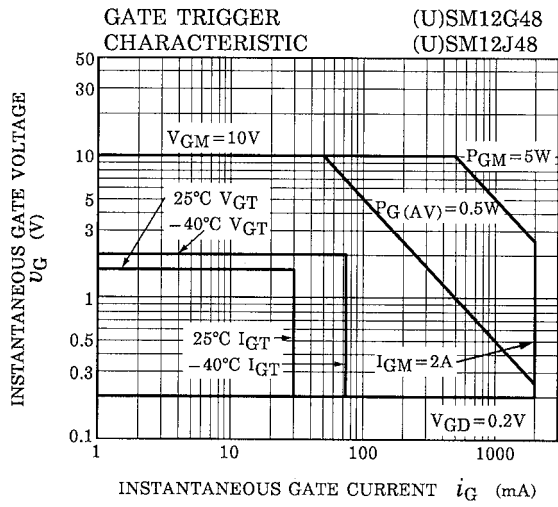
MAXIMUM RATINGS

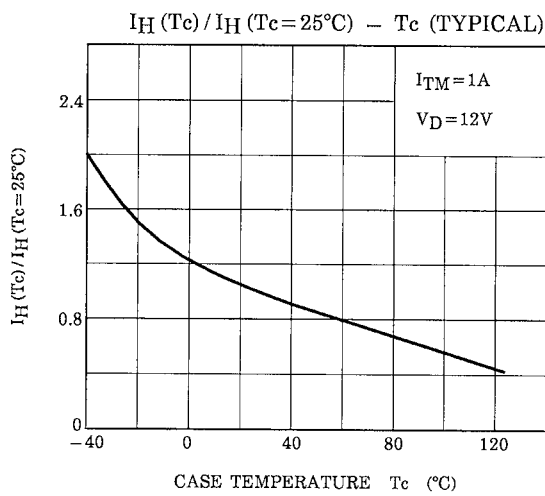
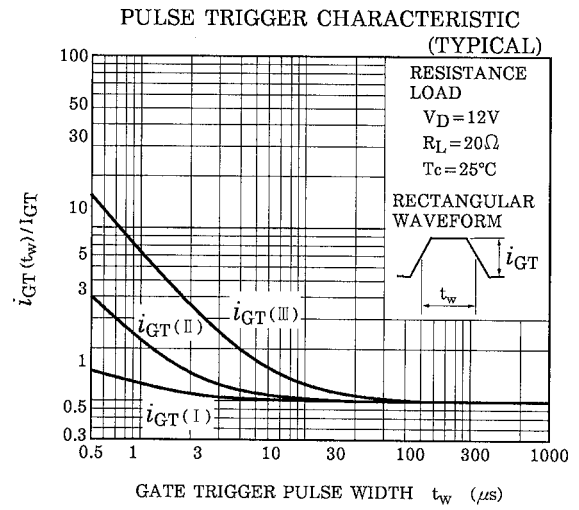
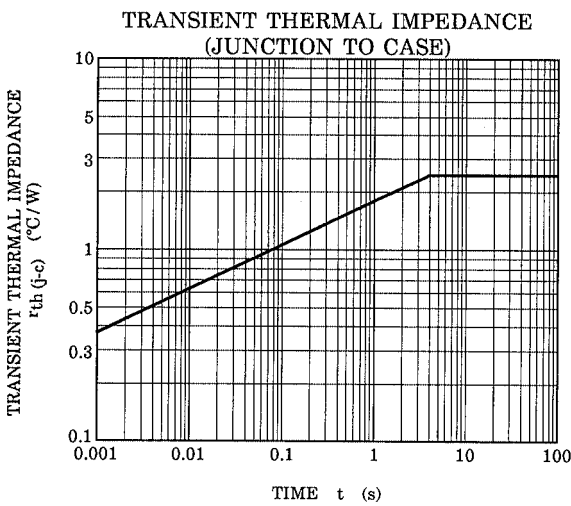
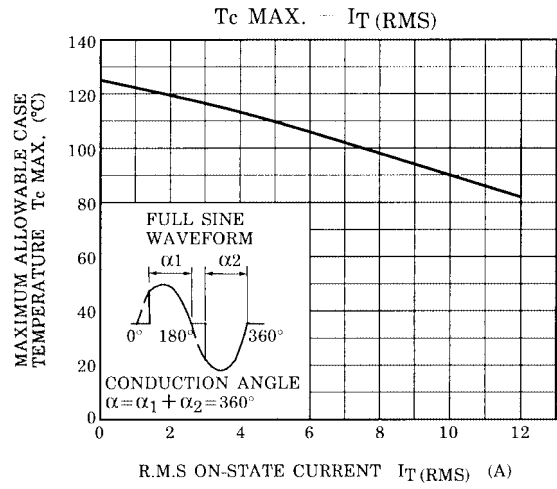
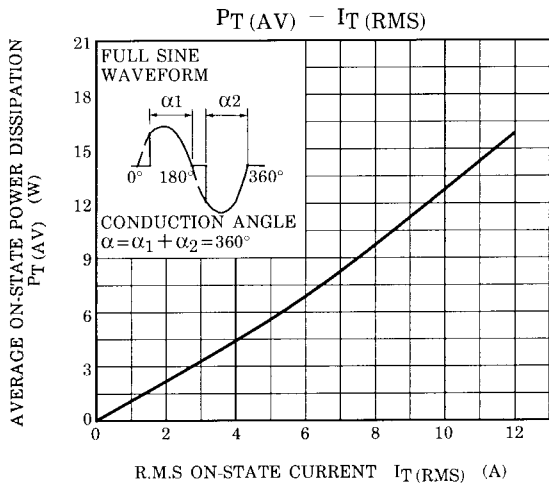
CHARACTERISTIC		SYMBOL	RATING	UNIT
Repetitive Peak Off-State Voltage	(U)SM12G48 (U)SM12G48A	V_{DRM}	400	V
	(U)SM12J48 (U)SM12J48A		600	
R.M.S On-State Current		I_T (RMS)	12	A
Peak One Cycle Surge On-State Current (Non-Repetitive)		I_{TSM}	120 (50Hz)	A
			132 (60Hz)	
I^2t Limit Value		I^2t	72	A^2s
Critical 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 : $V_{DRM}=0.5 \times \text{Rated}$
 $I_{TM} \leq 15A$
 $t_{gw} \geq 10\mu s$
 $t_{gr} \leq 250ns$
 $i_{gp} = I_{GT} \times 2.0$

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		V_{GT}	$V_D = 12V$ $R_L = 20\Omega$	T2 (+), Gate (+)	—	—	1.5	V
				T2 (+), Gate (-)	—	—	1.5	
				T2 (-), Gate (-)	—	—	1.5	
				T2 (-), Gate (+)	—	—	—	
Gate Trigger Current	SM12G48 SM12J48	I_{GT}	$V_D = 12V$ $R_L = 20\Omega$	T2 (+), Gate (+)	—	—	30	mA
				T2 (+), Gate (-)	—	—	30	
				T2 (-), Gate (-)	—	—	30	
				T2 (-), Gate (+)	—	—	—	
	SM12G48A SM12J48A			T2 (+), Gate (+)	—	—	20	
				T2 (+), Gate (-)	—	—	20	
				T2 (-), Gate (-)	—	—	20	
				T2 (-), 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	dv/dt	$V_{DRM} = \text{Rated}, T_j = 125^{\circ}C$ Exponential Rise	—	300	—	V / μs	
	(U)SM12G48A (U)SM12J48A			—	200	—		
Critical Rate of Rise of Off-State Voltage at Commutation	(U)SM12G48 (U)SM12J48	$(dv/dt)_c$	$V_{DRM} = 400V, T_j = 125^{\circ}C$ $(di/dt)_c = -6.5A/ms$	10	—	—	V / μs	
	(U)SM12G48A (U)SM12J48A			4	—	—		





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