

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

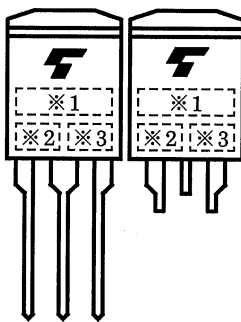
- Repetitive Peak Off-State Voltage : $V_{DRM}=400, 600V$
- R.M.S. On-State Current : $I_T (RMS) =12A$
- Gate Trigger Current : $I_{GT}=30mA$ Max.
: $I_{GT}=20mA$ Max. ("A"Type)

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

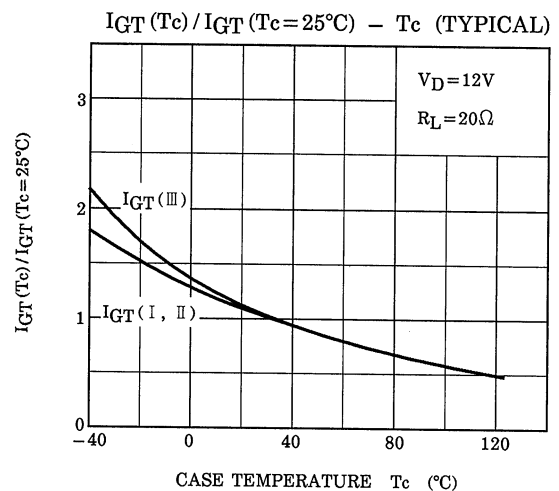
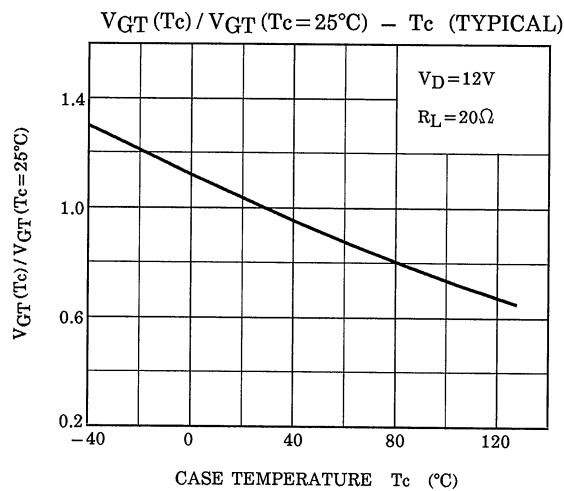
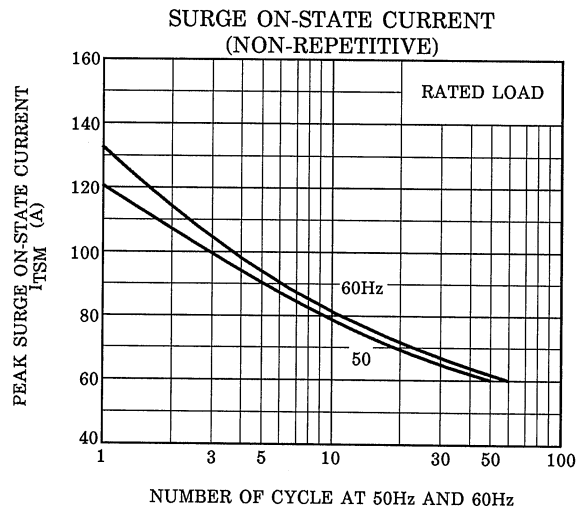
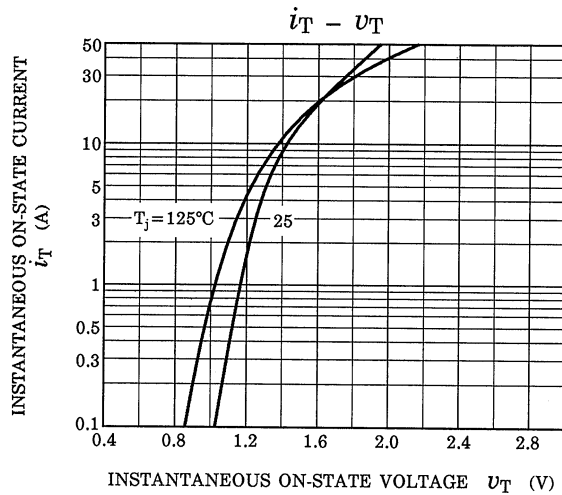
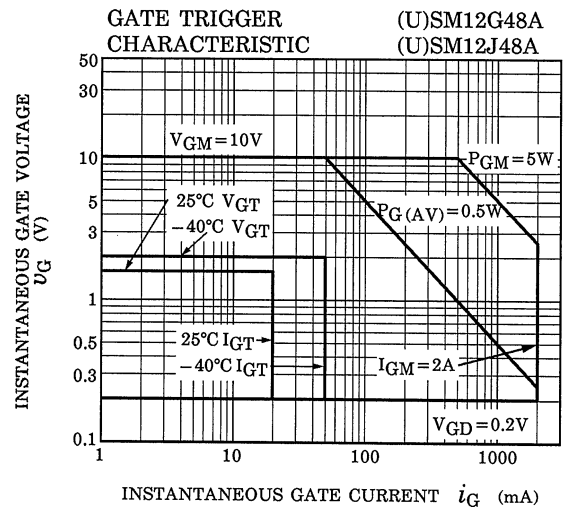
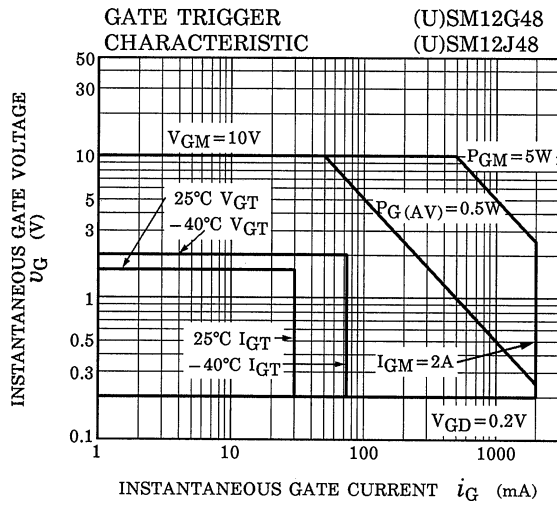
MAXIMUM RATINGS

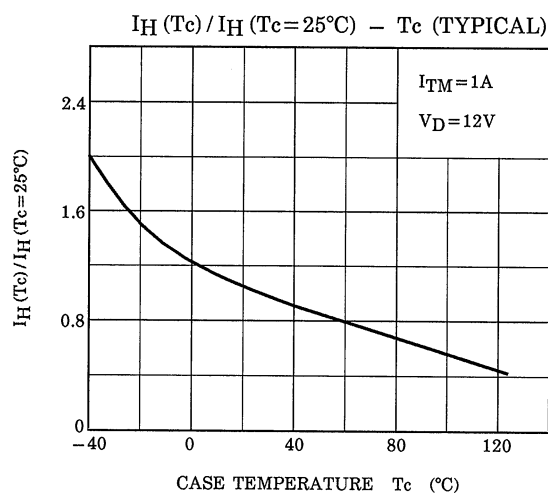
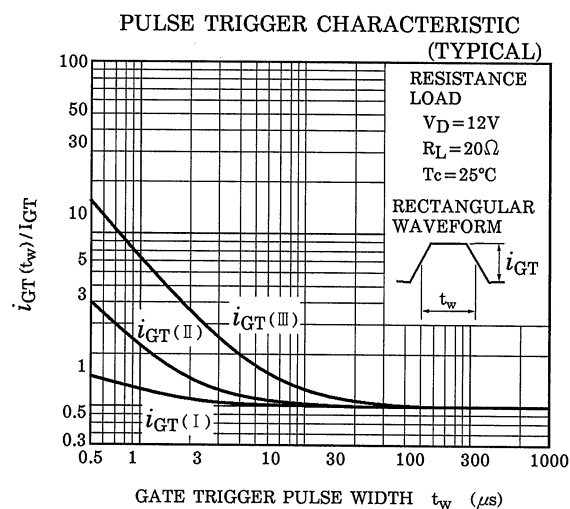
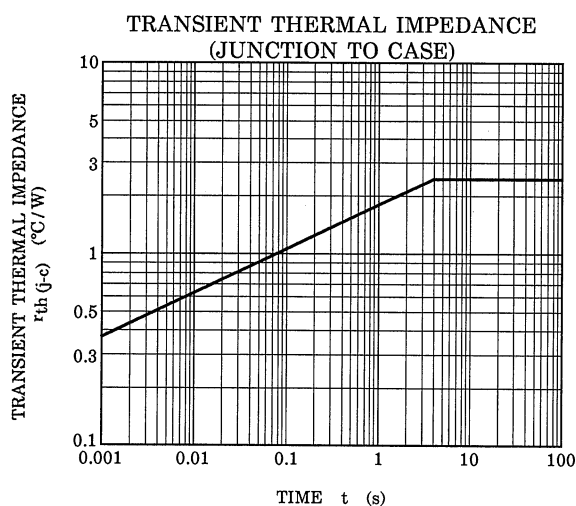
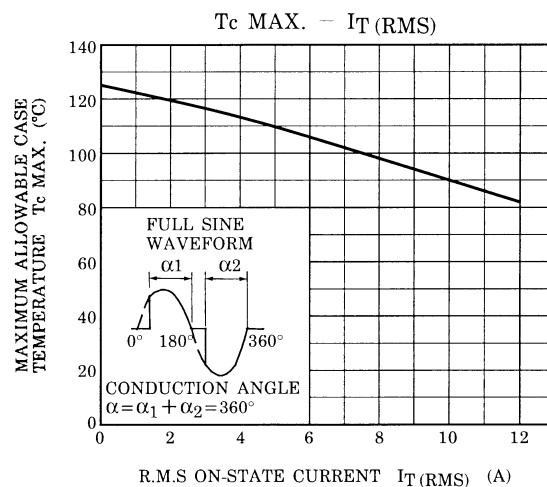
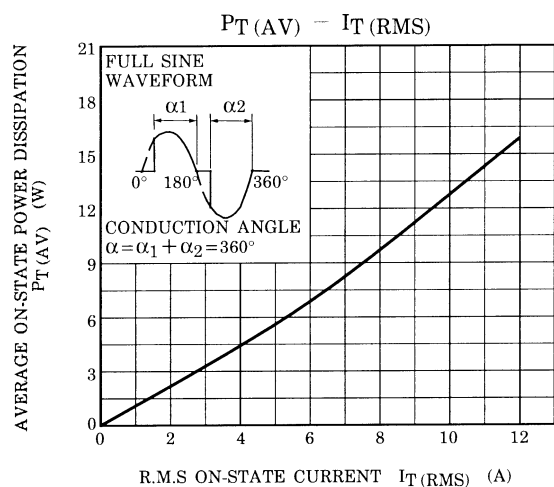
CHARACTERISTIC		SYMBOL	RATING	UNIT
Repetitive Peak Off-State Voltage	(U)SM12G48 (U)SM12G48A	V_{DRM}	400	V
	(U)SM12J48 (U)SM12J48A		600	
R.M.S On-State Current		$I_{\text{T}} (\text{RMS})$	12	A
Peak One Cycle Surge On-State Current (Non-Repetitive)		I_{TSM}	120 (50Hz)	A
			132 (60Hz)	
$I^2 t$ Limit Value		$I^2 t$	72	$\text{A}^2 \text{s}$
Critical Rate of Rise of On-State Current (Note 1)		di / dt	50	$\text{A} / \mu\text{s}$
Peak Gate Power Dissipation		P_{GM}	5	W
Average Gate Power Dissipation		$P_{\text{G}} (\text{AV})$	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	$^{\circ}\text{C}$
Storage Temperature Range		T_{stg}	-40~125	$^{\circ}\text{C}$

Note 1 : $V_{\text{DRM}}=0.5 \times \text{Rated}$
 $I_{\text{TM}} \leq 15\text{A}$
 $t_{\text{gw}} \geq 10\mu\text{s}$
 $t_{\text{gr}} \leq 250\text{ns}$
 $i_{\text{gp}} = I_{\text{GT}} \times 2.0$

ELECTRICAL CHARACTERISTICS (Ta=25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION		MIN.	TYP.	MAX.	UNIT	
Repetitive Peak Off-State Current		I _{DRM}	V _{DRM} =Rated		—	—	20	μA	
Gate Trigger Voltage		I	V _{GT}	V _D =12V R _L =20Ω	T2 (+) , Gate (+)	—	—	1.5	V
		II			T2 (+) , Gate (—)	—	—	1.5	
		III			T2 (—) , Gate (—)	—	—	1.5	
		IV			T2 (—) , Gate (+)	—	—	—	
Gate Trigger Current	SM12G48 SM12J48	I	I _{GT}	V _D =12V R _L =20Ω	T2 (+) , Gate (+)	—	—	30	mA
		II			T2 (+) , Gate (—)	—	—	30	
		III			T2 (—) , Gate (—)	—	—	30	
		IV			T2 (—) , Gate (+)	—	—	—	
	SM12G48A SM12J48A	I			T2 (+) , Gate (+)	—	—	20	
		II			T2 (+) , Gate (—)	—	—	20	
		III			T2 (—) , Gate (—)	—	—	20	
		IV			T2 (—) , Gate (+)	—	—	—	
Peak On-State Voltage		V _{TM}	I _{TM} =17A		—	—	1.5	V	
Gate Non-Trigger Voltage		V _{GD}	V _D =Rated, T _c =125°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	°C / W	
Critical Rate of Rise of Off-State Voltage	(U)SM12G48 (U)SM12J48	dv / dt	V _{DRM} =Rated, T _j =125°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°C (di / dt) c=–6.5A / ms	10	—	—	V / μs		
	(U)SM12G48A (U)SM12J48A			4	—	—			





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