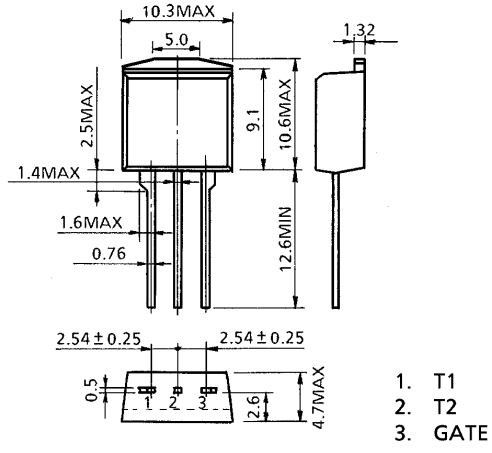
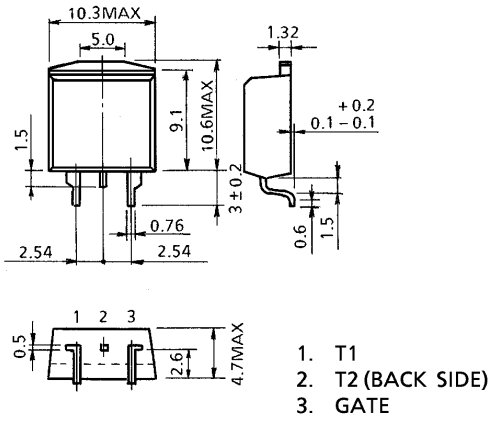
TOSHIBA BI-DIRECTIONAL TRIODE THYRISTOR SILICON PLANAR TYPE

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 —
EIAJ —	EIAJ —
TOSHIBA 13-10J1A	TOSHIBA 13-10J2A

Weight : 1.7g

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 Dissition		$P_{G\,(AV)}$	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	°C
Storage Temperature Range		T_{stg}	−40~125	°C

(Note 1) V_{DRM}=0.5×Rated
$I_{TM} \leqq 17A$
$t_{gw} \geqq 10\mu s$
$t_{gr} \leqq 250ns$
$i_{gp}=I_{GT}\times 2.0$

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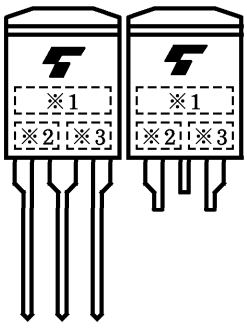
MAXIMUM RATINGS (Ta = 25°C)

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	(U)SM12G48, (U)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 (+)	—	—	—	
	(U)SM12G48A, (U)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, Tc = 125°C		0.2	—	—	V
Holding Current			I_H	V_D = 12V, I_{TM} = 1A		—	—	50	mA
Termal 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	—	—	

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 Current Year)		Example 8A:January 1998 8B:Febrary 1998 8L:December 1998

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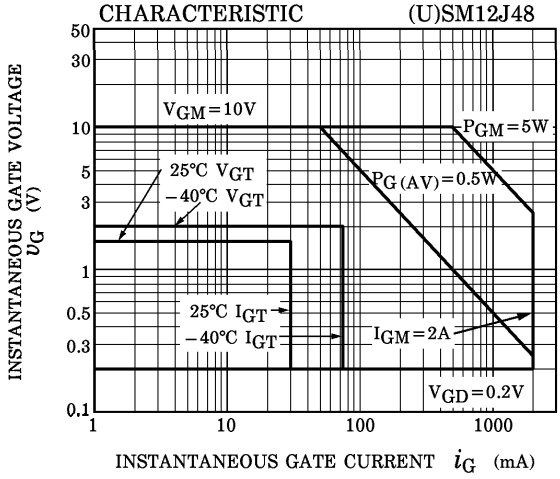
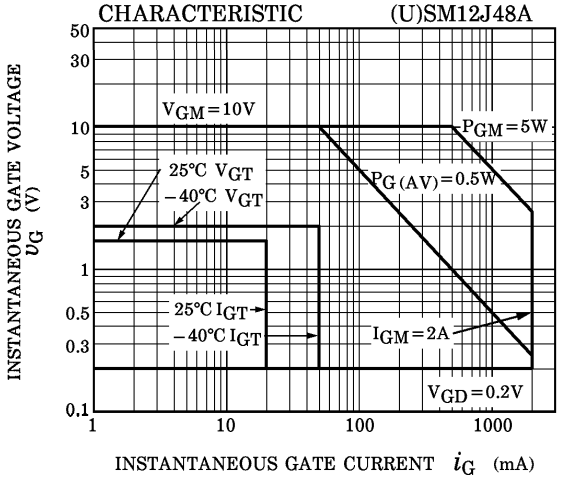
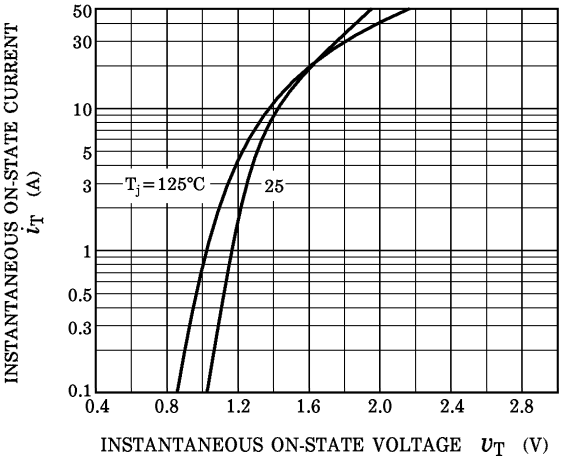
GATE TRIGGER CHARACTERISTIC (U)SM12G48 (U)SM12J48



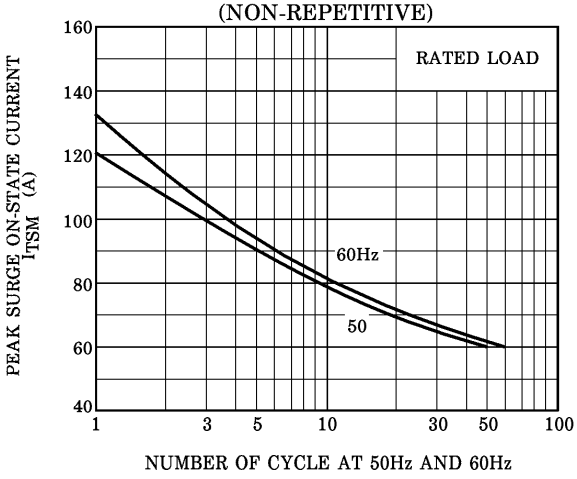
GATE TRIGGER CHARACTERISTIC (U)SM12G48A (U)SM12J48A



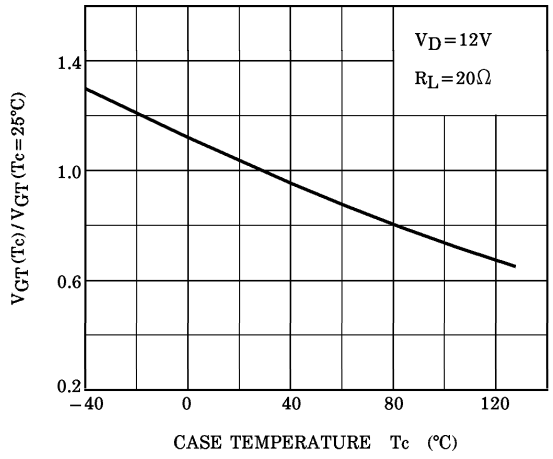
$i_T - v_T$



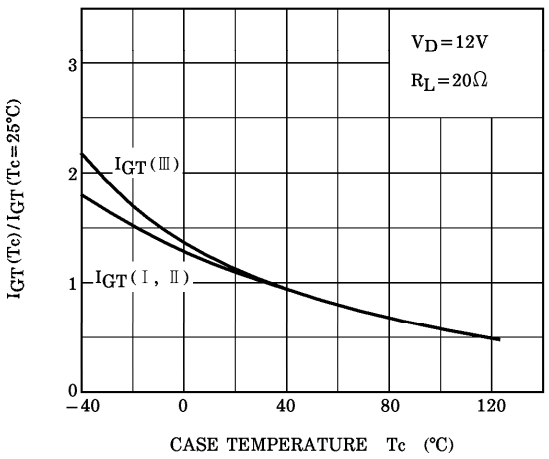
SURGE ON-STATE CURRENT (NON-REPETITIVE)



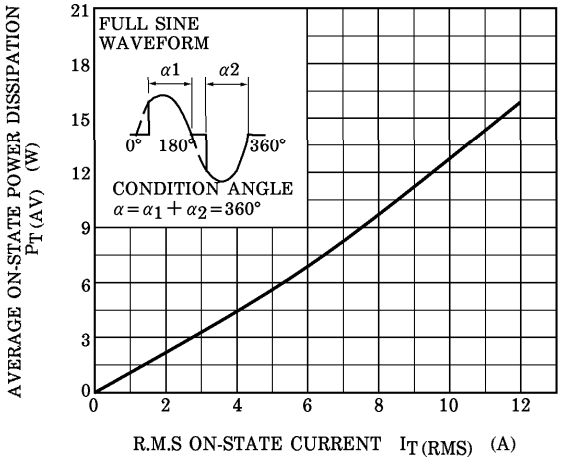
V_{GT} (Tc) / V_{GT} (Tc=25°C) − Tc (TYPICAL)



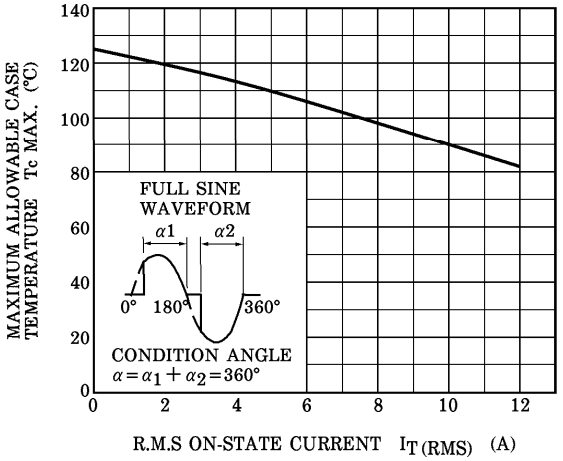
I_{GT} (Tc) / I_{GT} (Tc=25°C) − Tc (TYPICAL)



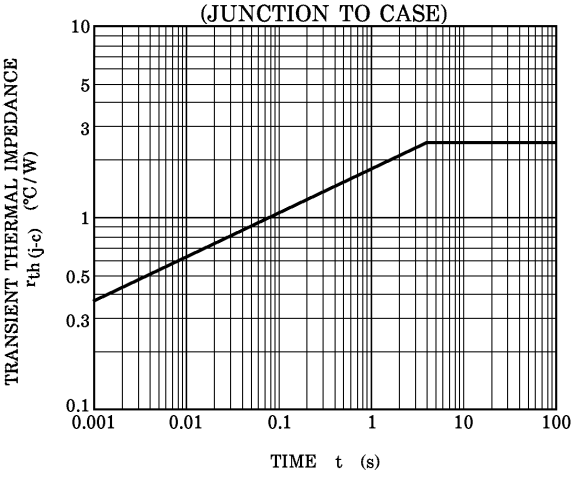
$P_{T(AV)}$ – $I_{T(RMS)}$



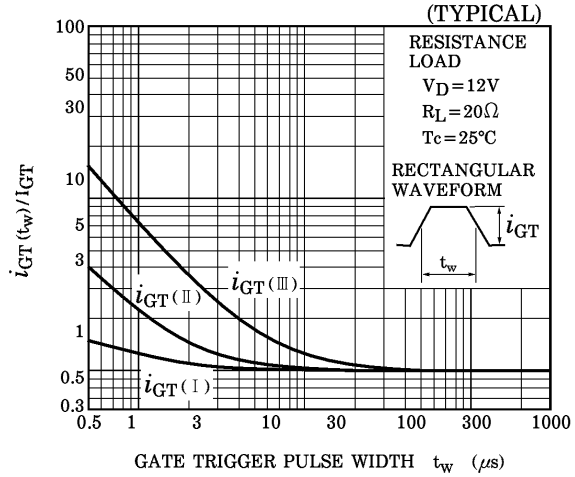
Tc MAX. – $I_{T(RMS)}$



TRANSIENT THERMAL IMPEDANCE (JUNCTION TO CASE)



PULSE TRIGGER CHARACTERISTIC (TYPICAL)



I_H (Tc) / I_H (Tc = 25°C) – Tc (TYPICAL)