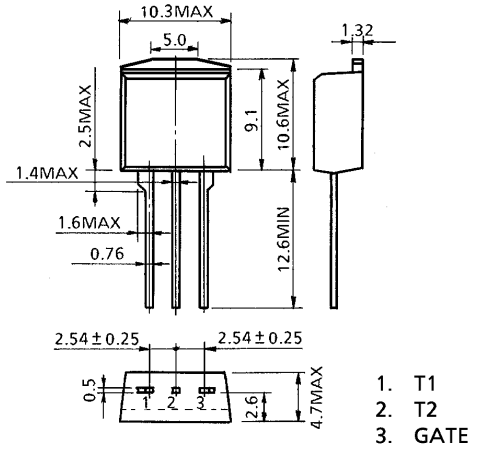
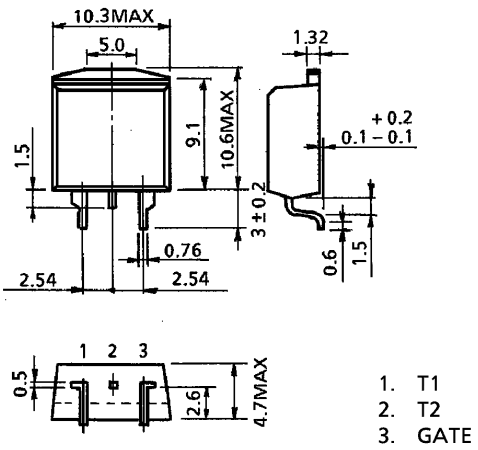
TOSHIBA BI-DIRECTIONAL TRIODE THYRISTOR SILICON PLANAR TYPE

SM3G48, USM3G48, SM3J48, USM3J48

AC POWER CONTROL APPLICATIONS

- Repetitive Peak Off-State Voltage : V_{DRM} = 400, 600V
- R.M.S On-State Current : $I_{T\,(RMS)}$ = 3A
- Gate Trigger Current : I_{GT} = 20mA Max.

Unit in mm

SM3G48, SM3J48	USM3G48, USM3J48
	
JEDEC —	JEDEC —
EIAJ —	EIAJ —
TOSHIBA 13-10J1A	TOSHIBA 13-10J2A

MAXIMUM RATINGS

Weight : 1.7g

CHARACTERISTIC		SYMBOL	RATING	UNIT
Repetitive Peak Off-State Voltage	(U)SM3G48	V_{DRM}	400	V
	(U)SM3J48		600	
R.M.S On-State Current		$I_{T\,(RMS)}$	3	A
Peak One Cycle Surge On-State Current (Non-Repetitive)		I_{TSM}	30 (50Hz)	A
			33 (60Hz)	
I^2t Limit Value		I^2t	4.5	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	°C
Storage Temperature Range		T_{stg}	−40~125	°C

(Note 1) $V_{DRM} = 0.5 \times$ Rated
$I_{TM} \leqq 4.5A$
$t_{gw} \geqq 10\mu s$
$t_{gr} \leqq 250ns$
$i_{gp} = I_{GT} \times 2.0$

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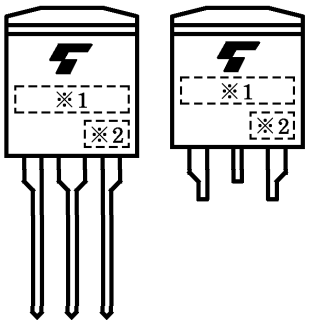
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

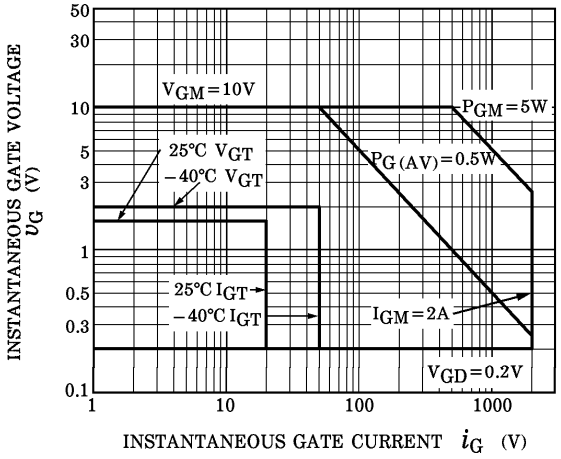
CHARACTERISTIC		SYMBOL	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Repetitive Peak Off-State Current		I_{DRM}	V_{DRM} = Rated		—	—	20	μA
Gate Trigger Voltage	Ⅰ	V_{GT}	V_D = 12V, R_L = 20Ω	T2(+), GATE(+)	—	—	1.5	V
	Ⅱ			T2(+), GATE(−)	—	—	1.5	
	Ⅲ			T2(−), GATE(−)	—	—	1.5	
	Ⅳ			T2(−), GATE(+)	—	1.0	—	
Gate Trigger Current	Ⅰ	I_{GT}	V_D = 12V, R_L = 20Ω	T2(+), GATE(+)	—	—	20	mA
	Ⅱ			T2(+), GATE(−)	—	—	20	
	Ⅲ			T2(−), GATE(−)	—	—	20	
	Ⅳ			T2(−), GATE(+)	—	50	—	
Peak On-State Voltage		V_{TM}	I_{TM} = 4.5A		—	—	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		—	—	30	mA
Thermal Resistance		$R_{th\,(j\text{-}c)}$	Junction to Case, AC		—	—	3.6	°C / W
Critical Rate of Rise of Off-State Voltage		dv / dt	V_{DRM} = Rated, T_j = 125°C, Exponential Rise		—	300	—	V / μs
Critical Rate of Rise of Off-State Voltage at Commutation		(dv / dt) c	V_{DRM} = 400V, T_j = 125°C, (di / dt) c = −2.0A / ms		10	—	—	V / μs

MARKING

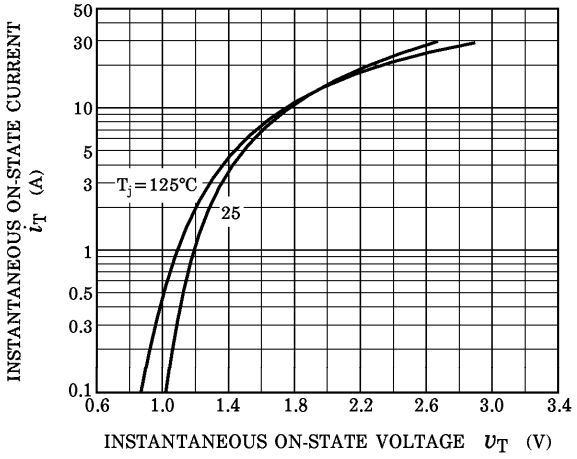


NUMBER	SYMBOL		MARK
※ 1	TYPE	SM3G48, USM3G48	M3G48
		SM3J48, USM3J48	M3J48
※ 2	Lot Number □□ Month (Starting from Alphabet A) Year (Last Decimal Digit of the Current Year)		Example 8A : January 1998 8B : Febrary 1998 8L : December 1998

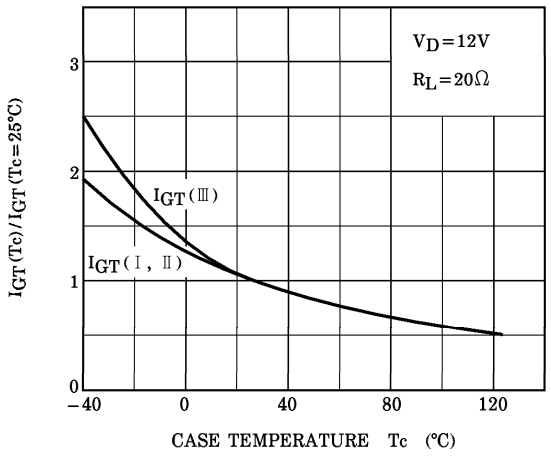
GATE TRIGGER CHARACTERISTIC



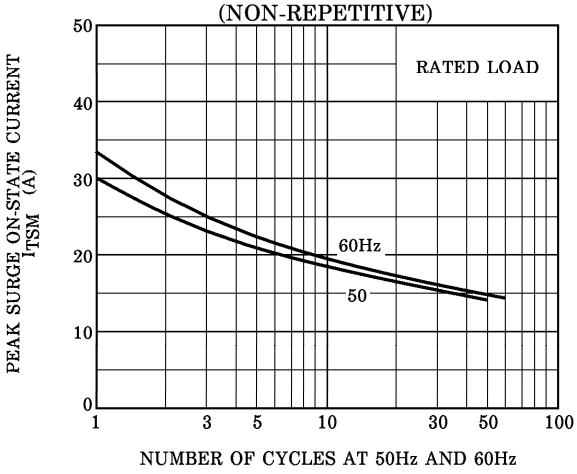
$i_T - v_T$



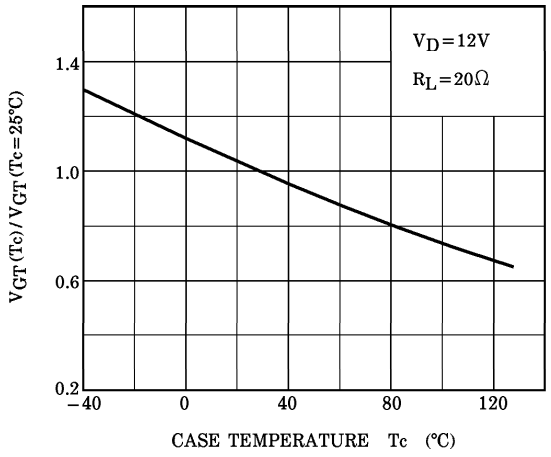
I_{GT} (Tc) / I_{GT} (Tc = 25°C) − Tc (TYPICAL)



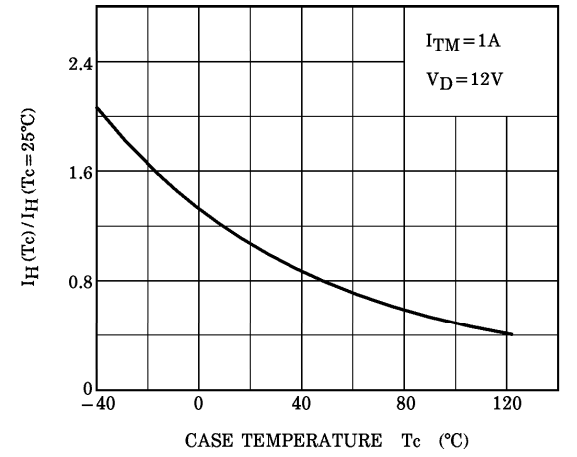
SURGE ON-STATE CURRENT (NON-REPETITIVE)



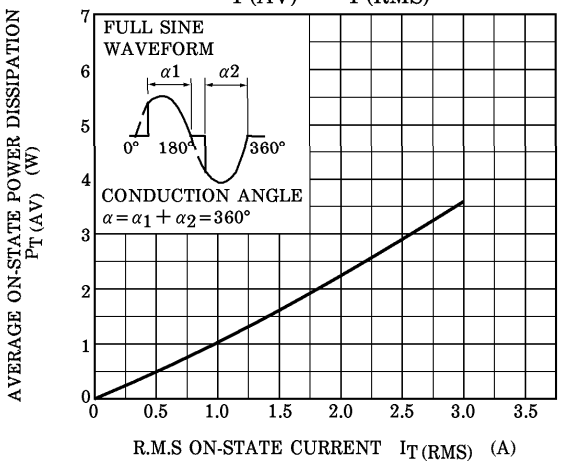
V_{GT} (Tc) / V_{GT} (Tc = 25°C) − Tc (TYPICAL)



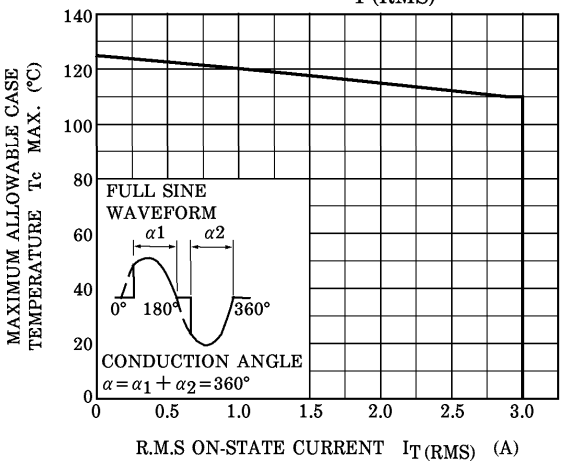
I_H (Tc) / I_H (Tc = 25°C) − Tc (TYPICAL)



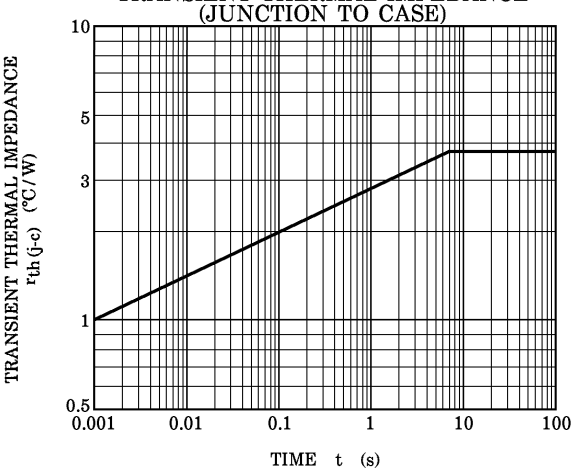
$P_{T(AV)}$ – $I_{T(RMS)}$



Tc MAX – $I_{T(RMS)}$



TRANSIENT THERMAL IMPEDANCE (JUNCTION TO CASE)



PULSE TRIGGER CHARACTERISTIC (TYPICAL)