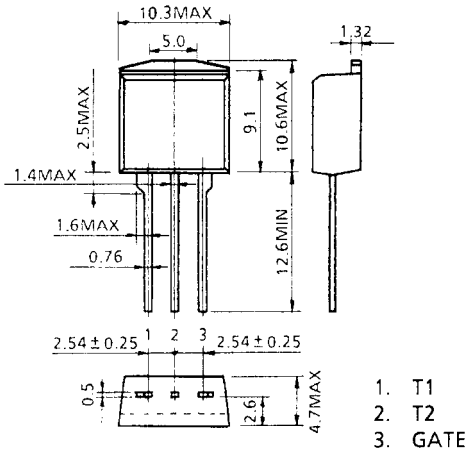
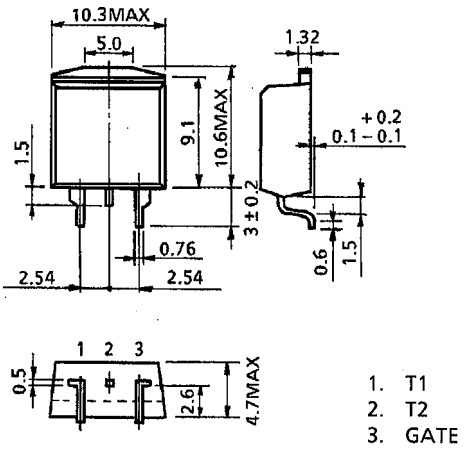
TOSHIBA BI-DIRECTIONAL TRIODE THYRISTOR SILICON PLANAR TYPE

SM3G48,USM3G48,SM3J48,USM3J48

AC POWER CONTROL APPLICATIONS

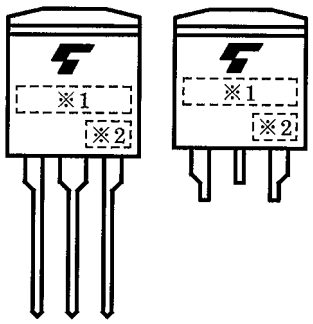
- Repetitive Peak Off-State Voltage : V_{DRM}=400, 600V
- R.M.S On-State Current : $I_{T\ (RMS)}$=3A
- Gate Trigger Current : I_{GT}=20mA Max.

Unit in mm

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

Weight : 1.7g

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

MAXIMUM RATINGS

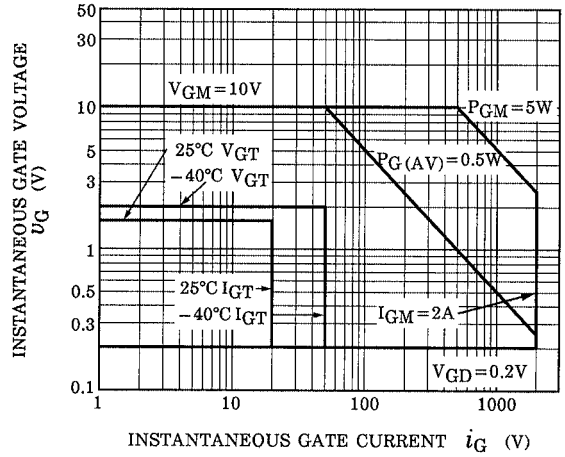
CHARACTERISTIC		SYMBOL	RATING	UNIT
Repetitive Peak Off-State Voltage	(U)SM3G48	V_{DRM}	400	V
	(U)SM3J48		600	
R.M.S On-State Current		$I_{T\ (RMS)}$	3	A
Peak One Cycle Surge On-State Current (Non-Repetitive)		I_{TSM}	30 (50Hz)	A
			33 (60Hz)	
I^2t Limit Value		I^2t	4.5	A^2s
Critical Rate of Rise of On-State 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×Rated
I_{TM}≤4.5A
t_{gw}≥10μs
t_{gr}≤250ns
i_{gp}=I_{GT}×2.0

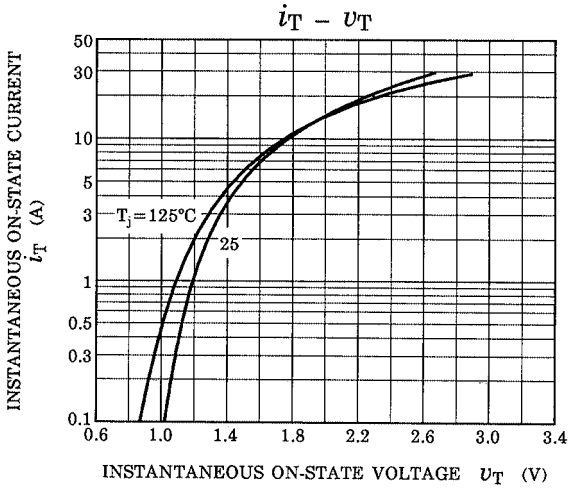
ELECTRICAL CHARACTERISTICS (Ta=25°C)

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	I	I_{GT}	V_D=12V, R_L=20Ω	T2 (+), Gate (+)	—	—	20	mA
	II			T2 (+), Gate (−)	—	—	20	
	III			T2 (−), Gate (−)	—	—	20	
	IV			T2 (−), Gate (+)	—	—	—	
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		$R_{th\ (j-c)}$	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

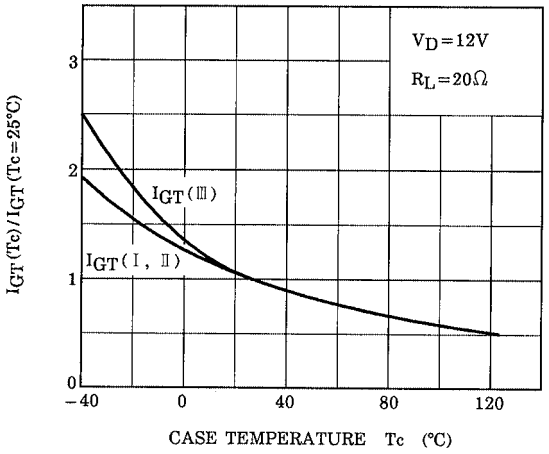
GATE TRIGGER CHARACTERISTIC



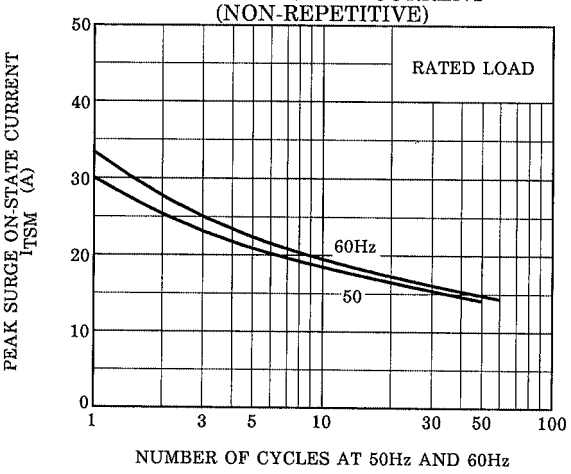
i_T – v_T



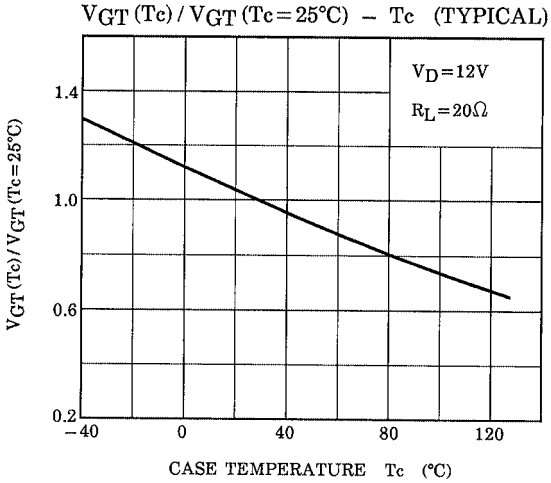
I_{GT} (Tc) / I_{GT} (Tc = 25°C) – Tc (TYPICAL)



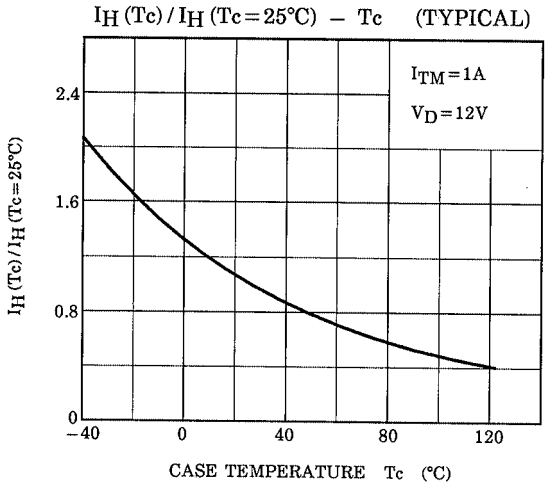
SURGE ON-STATE CURRENT (NON-REPETITIVE)



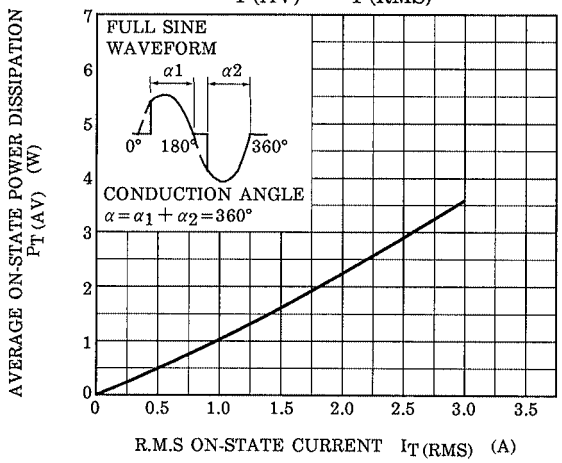
V_{GT} (Tc) / V_{GT} (Tc = 25°C) – Tc (TYPICAL)



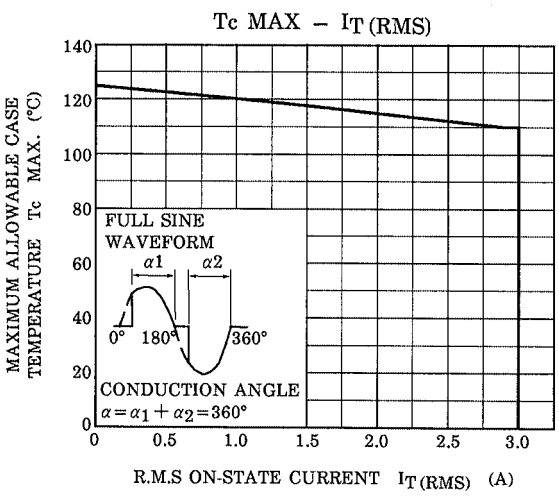
I_H (Tc) / I_H (Tc = 25°C) – Tc (TYPICAL)



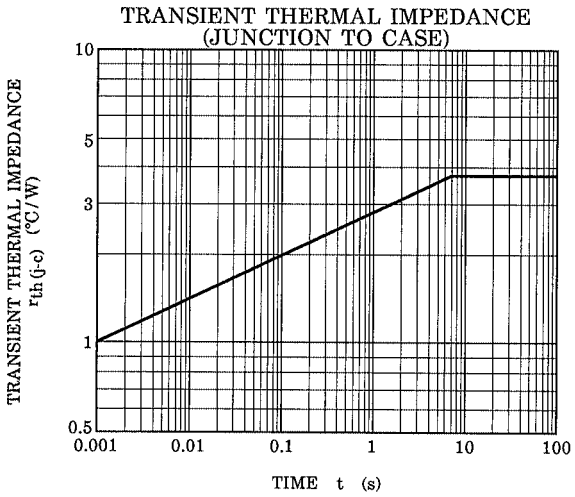
$P_{T(AV)}$ – $I_{T(RMS)}$



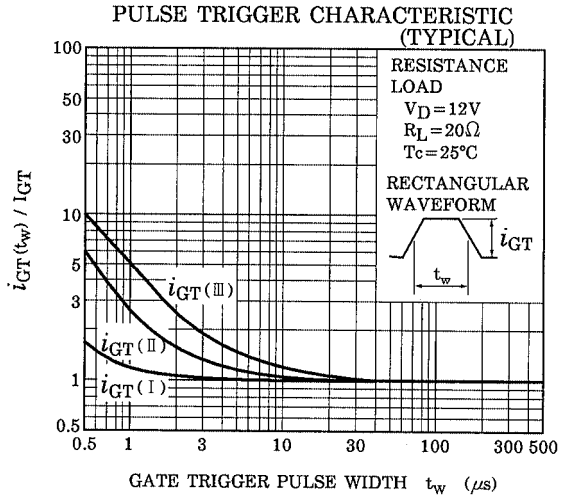
Tc MAX – $I_{T(RMS)}$



TRANSIENT THERMAL IMPEDANCE (JUNCTION TO CASE)



PULSE TRIGGER CHARACTERISTIC (TYPICAL)



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