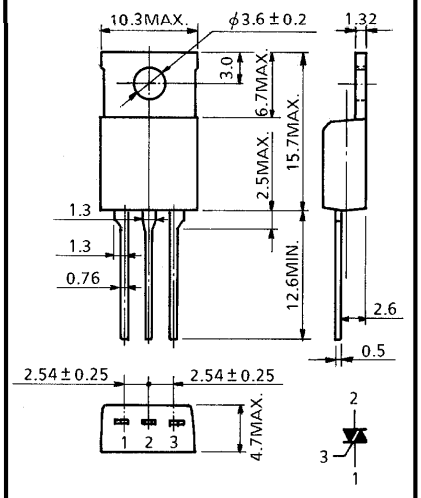
TOSHIBA BI-DIRECTIONAL TRIODE THYRISTOR SILICON PLANAR TYPE

SM3G45, SM3J45

AC POWER CONTROL APPLICATIONS

- Repetitive Peak Off-State Voltage : V_{DRM} = 400, 600V
- R.M.S ON-State Current : $I_{T\,(RMS)}$ = 3A
- High Commutating (dv / dt)

Unit in mm



1. T1
2. T2 (HEAT SINK)
3. GATE

JEDEC	TO-220AB
EIAJ	—
TOSHIBA	13-10G1A

Weight : 2.0g

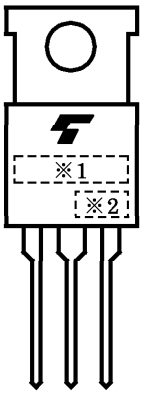
MAXIMUM RATINGS

CHARACTERISTIC		SYMBOL	RATING	UNIT
Repetitive Peak Off-State Voltage	SM3G45	V_{DRM}	400	V
	SM3J45		600	
R.M.S On-State Current (Full Sine Waveform Tc = 111°C)		$I_{T\,(RMS)}$	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		di / dt	50	A / μs
Peak Gate Power Dissipation		P_{GM}	5	W
Average Gate Power Dissipation		$P_{G\,(AV)}$	0.5	W
Peak Gate Voltage		V_{GM}	10	V
Peak Gate Current		I_{GM}	2	A
Junction Temperature		T_j	−40~125	°C
Storage Temperature Range		T_{stg}	−40~125	°C

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

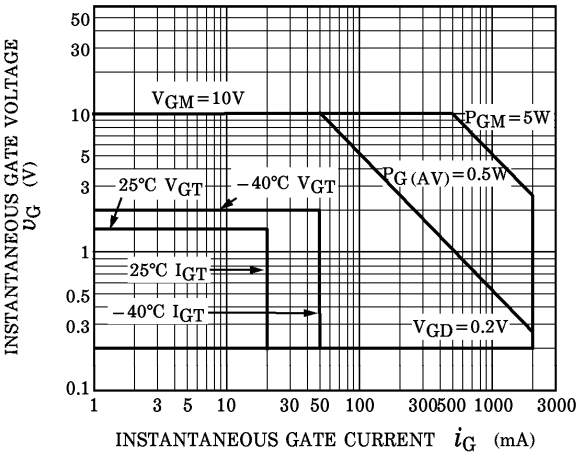
CHARACTERISTIC		SYMBOL	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Repetitive Peak Off-State Current		I_{DRM}	V_{DRM} = Rated		—	—	20	μA
Gate Trigger Voltage	Ⅰ	V_{GT}	V_D = 12V, R_L = 20Ω	T2 (+), Gate (+)	—	—	1.5	V
	Ⅱ			T2 (+), Gate (−)	—	—	1.5	
	Ⅲ			T2 (−), Gate (−)	—	—	1.5	
	Ⅳ			T2 (−), Gate (+)	—	—	—	
Gate Trigger Current	Ⅰ	I_{GT}		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} = 0.2A		—	—	30	mA
Critical Rate of Rise of Off-State Voltage		dv / dt	$V_D = V_{DRM}$, T_j = 125°C Exponential Rise		100	—	—	V / μs
Critical Rate of Rise of Off-State Voltage at Commutation		(dv / dt) c	V_{DRM} = 400V, (di /dt) c = −2A / ms T_j = 125°C		10	—	—	V / μs
Thermal Resistance		$R_{th\ (j\text{-}c)}$	Junction to Case, AC		—	—	3.3	°C / W

MARKING

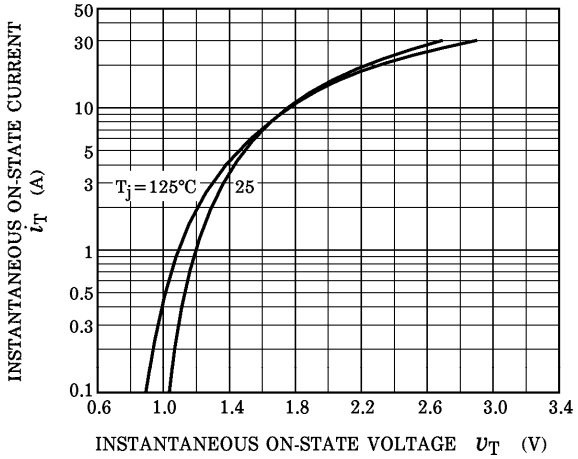


NUMBER	SYMBOL		MARK
※1	TYPE	SM3G45	M3G45
		SM3J45	M3J45
※2	Lot Number □ □ Month (Starting from Alphabet A) Year (Last Decimal Digit of the Current Year)		Example 8A : January 1998 8B : February 1998 8L : December 1998

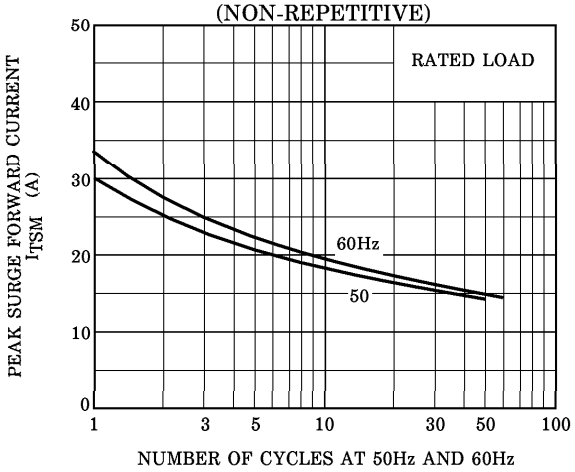
GATE TRIGGER CHARACTERISTIC



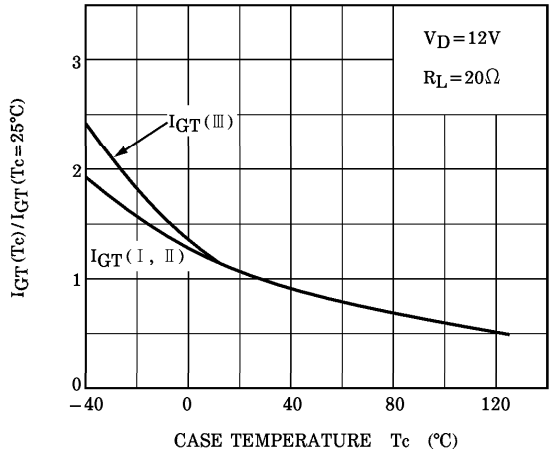
i_T – v_T



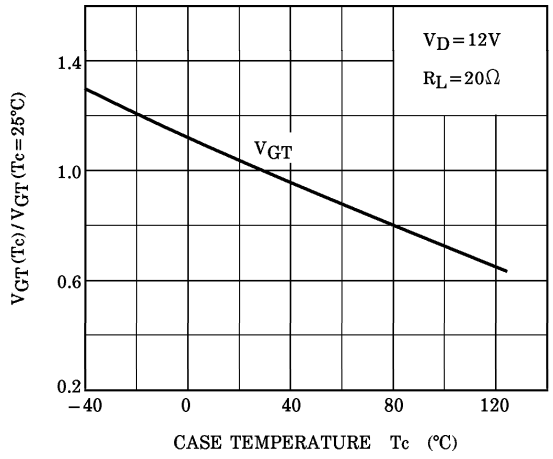
SURGE ON-STATE CURRENT
(NON-REPETITIVE)



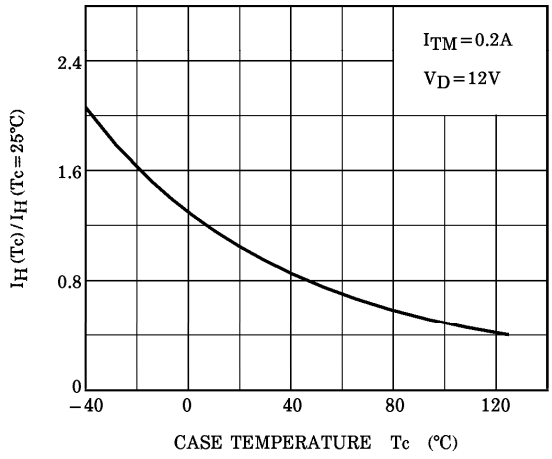
I_{GT} (Tc) / I_{GT} (Tc=25°C) – Tc (TYPICAL)



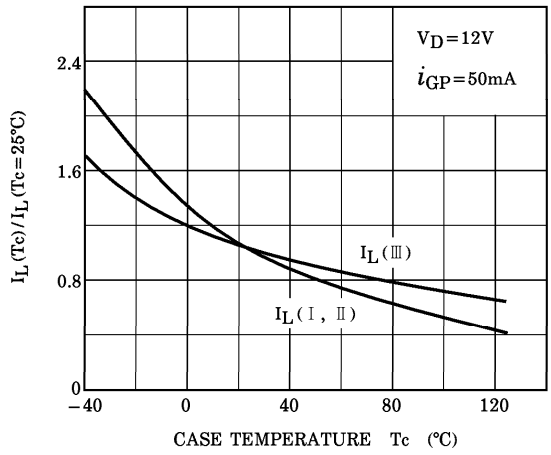
V_{GT} (Tc) / V_{GT} (Tc=25°C) – Tc (TYPICAL)



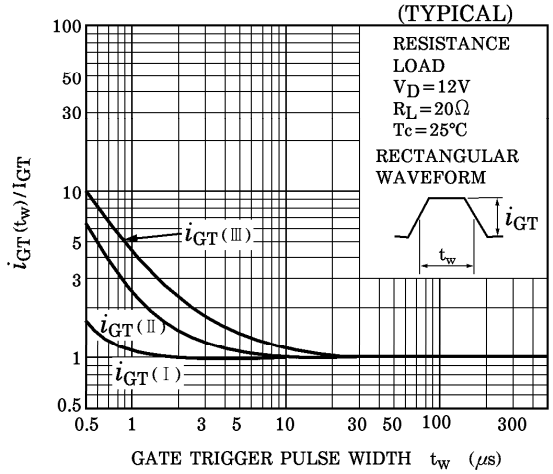
I_H (Tc) / I_H (Tc=25°C) – Tc (TYPICAL)



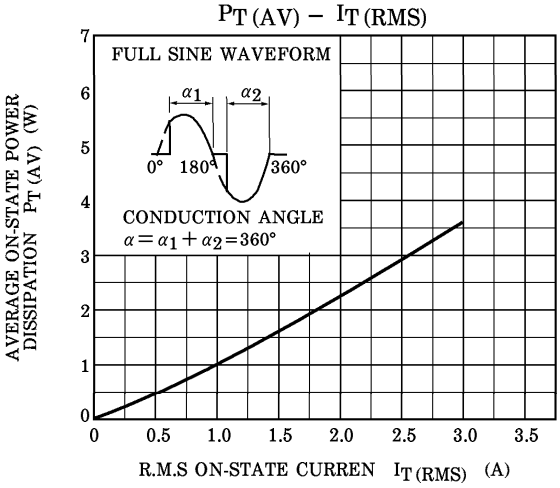
I_L (Tc) / I_L (Tc = 25°C) – Tc (TYPICAL)



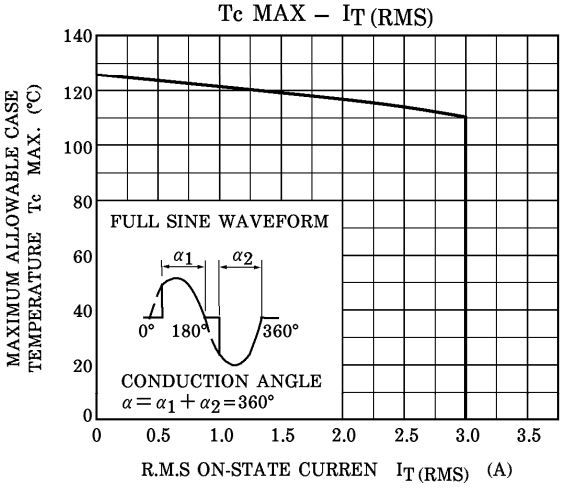
PLUSE TRIGGER CHARACTERISTIC (TYPICAL)



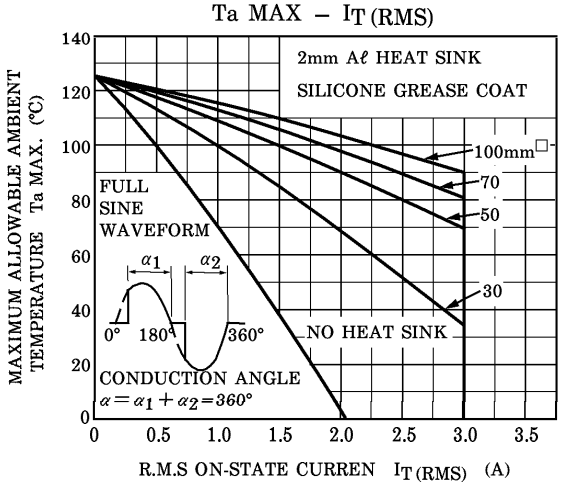
$P_{T(AV)}$ – $I_{T(RMS)}$



Tc MAX – $I_{T(RMS)}$



Ta MAX – $I_{T(RMS)}$



TRANSIENT THERMAL IMPEDANCE (JUNCTION TO CASE)