

TOSHIBA BI-DIRECTIONAL TRIODE THYRISTOR SILICON PLANAR TYPE

# SM3G45,SM3J45

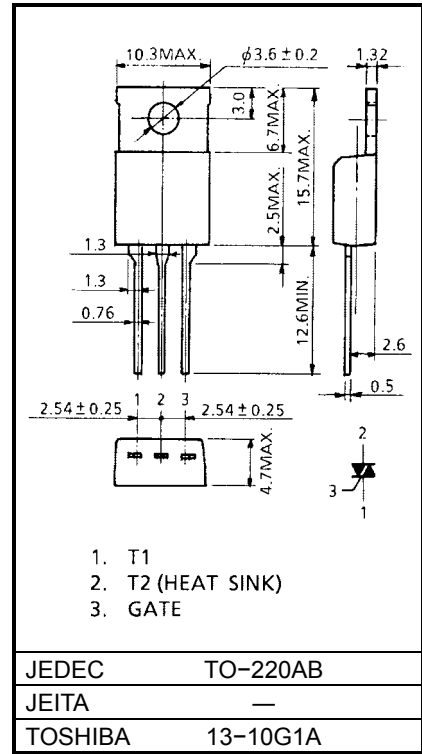
## AC POWER CONTROL APPLICATIONS

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

## MAXIMUM RATINGS

CHARACTERISTIC	SYMBOL	RATING	UNIT
Repetitive Peak Off-State Voltage	SM3G45	400	V
	SM3J45	600	
R.M.S On-State Current (Full Sine Waveform $T_c = 111^\circ C$ )	$I_T (RMS)$	3	A
Peak One Cycle Surge On-State Current (Non-Repetitive)	$I_{TSM}$	30 (50Hz)	A
		33 (60Hz)	
$I^2 t$ Limit Value	$I^2 t$	4.5	$A^2 s$
Critical Rate of Rise of On-State Current	di / dt	50	A / $\mu s$
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	$^\circ C$
Storage Temperature Range	$T_{stg}$	-40~125	$^\circ C$

Unit: mm

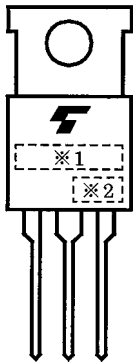


Weight: 2.0g

## ELECTRICAL CHARACTERISTICS (Ta = 25°C)

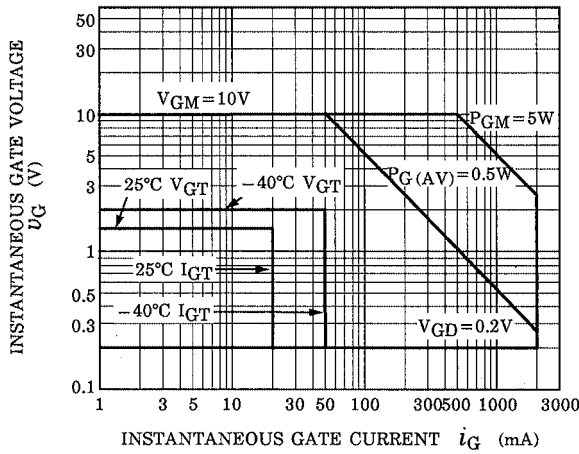
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN	TYP.	MAX	UNIT	
Repetitive Peak Off-State Current		$I_{DRM}$	$V_{DRM} = \text{Rated}$	—	—	20	$\mu\text{A}$	
Gate Trigger Voltage	I	$V_{GT}$	$V_D = 12\text{V}$ $R_L = 20\Omega$	T2 (+), Gate (+)	—	—	1.5	V
	II			T2 (+), Gate (-)	—	—	1.5	
	III			T2 (-), Gate (-)	—	—	1.5	
	IV			T2 (-), Gate (+)	—	—	—	
Gate Trigger Current	I	$I_{GT}$	$V_D = 12\text{V}$ $R_L = 20\Omega$	T2 (+), Gate (+)	—	—	20	mA
	II			T2 (+), Gate (-)	—	—	20	
	III			T2 (-), Gate (-)	—	—	20	
	IV			T2 (-), Gate (+)	—	—	—	
Peak On-State Voltage		$V_{TM}$	$I_{TM} = 4.5\text{A}$	—	—	1.5	V	
Gate Non-Trigger Voltage		$V_{GD}$	$V_D = \text{Rated}, T_c = 125^\circ\text{C}$	0.2	—	—	V	
Holding Current		$I_H$	$V_D = 12\text{V}, I_{TM} = 0.2\text{A}$	—	—	30	mA	
Critical Rate of Rise of Off-State Voltage		$dv/dt$	$V_D = V_{DRM}, T_j = 125^\circ\text{C}$ Exponential Rise	100	—	—	V / $\mu\text{s}$	
Critical Rate of Rise of Off-State Voltage at Commutation		$(dv/dt)_c$	$V_{DRM} = 400\text{V}, (di/dt)_c = -2\text{A/ms}$ $T_j = 125^\circ\text{C}$	10	—	—	V / $\mu\text{s}$	
Thermal Resistance		$R_{th(j-c)}$	Junction to Case, AC	—	—	3.3	$^\circ\text{C/W}$	

## MARKING

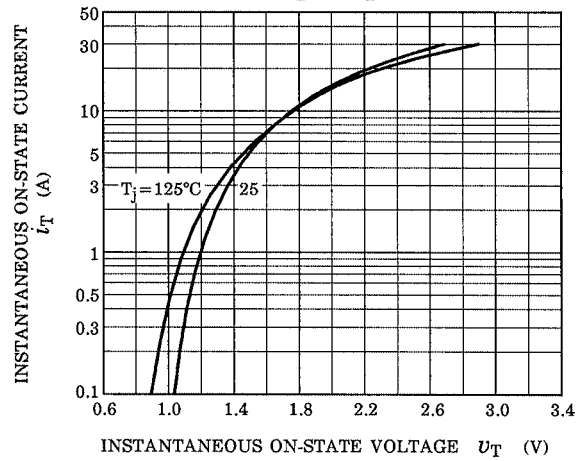


NUMBER	SYMBOL		MARK
* 1	TYPE	SM3G45	M3G45
		SM3J45	M3J45
* 2	Lot Number 		Example 8A : January 1998 8B : February 1998 8L : December 1998

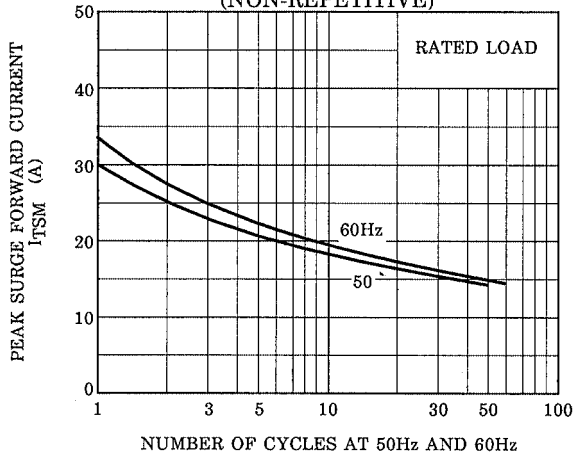
GATE TRIGGER CHARACTERISTIC



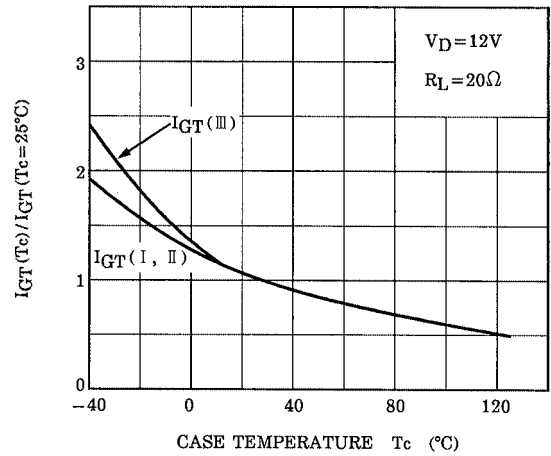
$i_T - v_T$



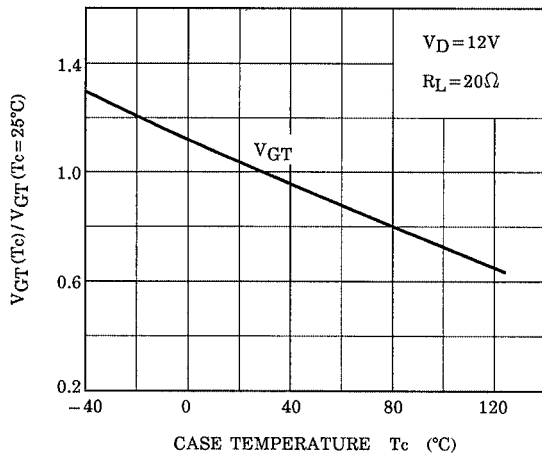
SURGE ON-STATE CURRENT (NON-REPETITIVE)



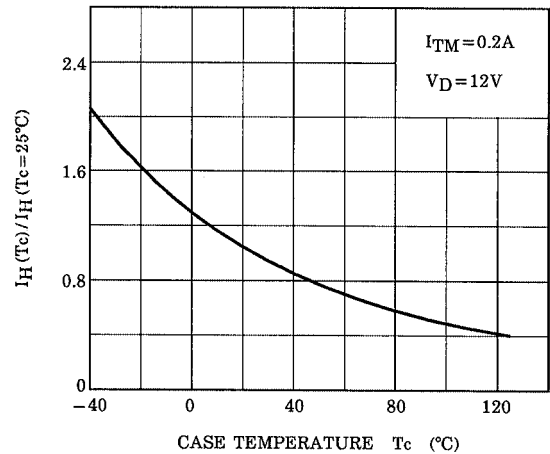
$I_{GT}(T_c) / I_{GT}(T_c = 25^\circ C) - T_c$  (TYPICAL)

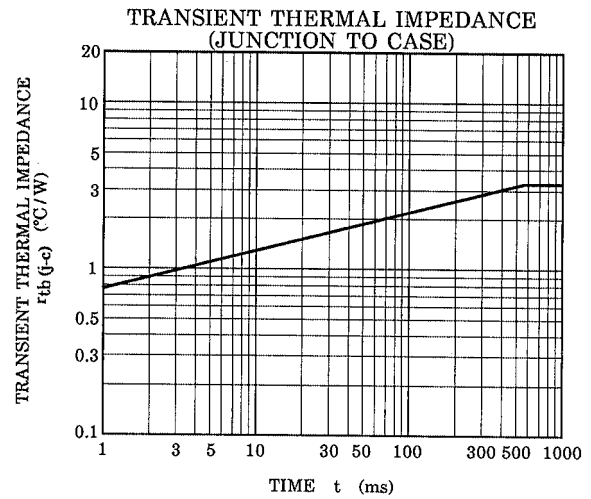
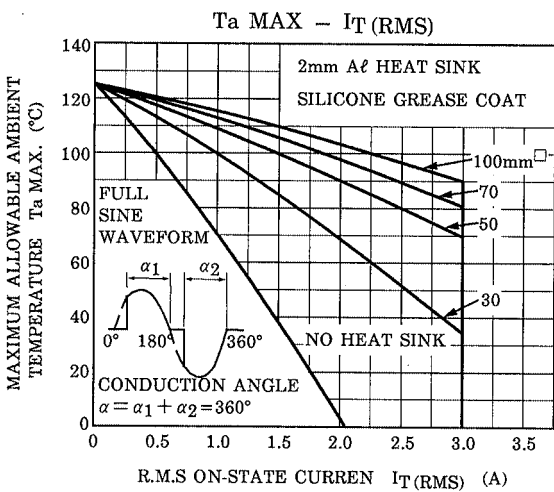
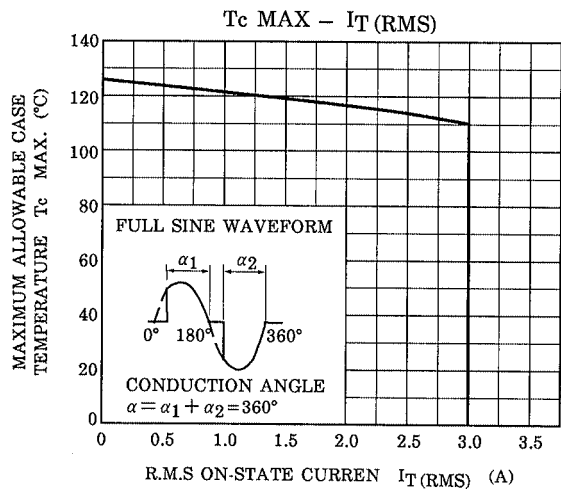
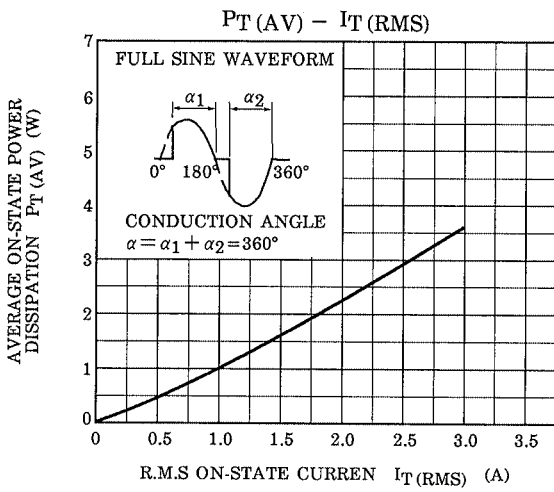
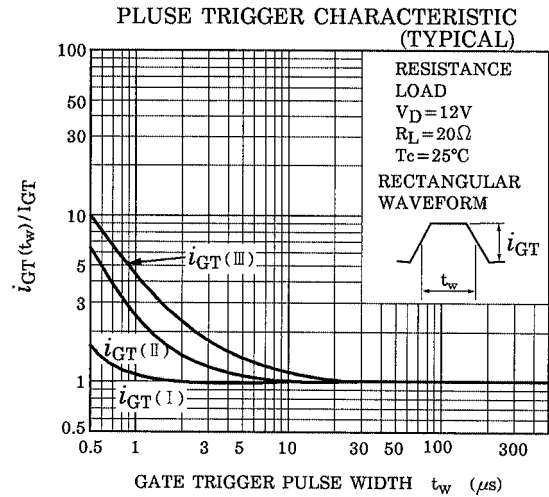
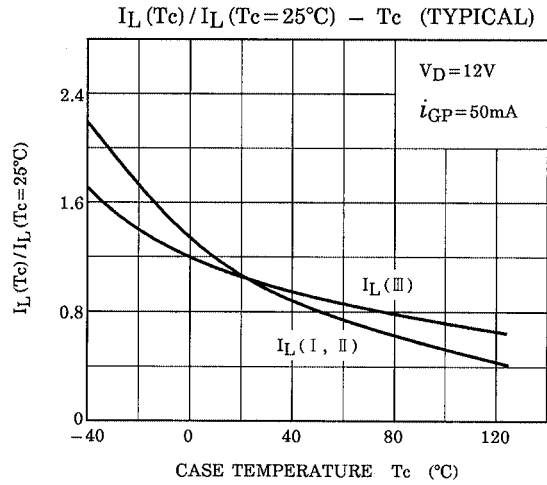


$V_{GT}(T_c) / V_{GT}(T_c = 25^\circ C) - T_c$  (TYPICAL)



$I_H(T_c) / I_H(T_c = 25^\circ C) - T_c$  (TYPICAL)





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