

TOSHIBA BI-DIRECTIONAL TRIODE THYRISTOR SILICON PLANAR TYPE

# SM6G45, SM6J45, SM6G45A, SM6J45A

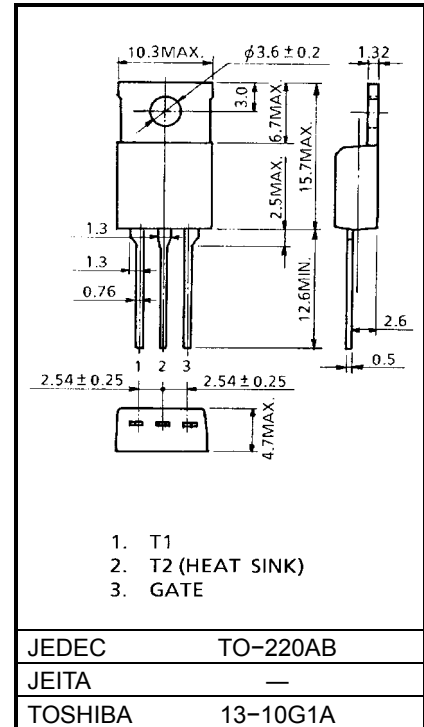
## AC POWER CONTROL APPLICATIONS

- Repetitive Peak Off-State Voltage :  $V_{DRM} = 400, 600V$
- R.M.S ON-State Current :  $I_T (RMS) = 6A$
- High Commutating ( $dv / dt$ )

## MAXIMUM RATINGS

CHARACTERISTIC		SYMBOL	RATING	UNIT
Repetitive Peak Off-State Voltage	SM6G45 SM6G45A	V <sub>DRM</sub>	400	V
	SM6J45 SM6J45A		600	
R.M.S On-State Current (Full Sine Waveform Tc = 104°C)		I <sub>T</sub> (RMS)	6	A
Peak One Cycle Surge On-State Current (Non-Repetitive)		I <sub>TSM</sub>	60 (50Hz)	A
			66 (60Hz)	
I <sup>2</sup> t Limit Value		I <sup>2</sup> t	18	A <sup>2</sup> s
Critical Rate of Rise of On-State Current		di / dt	50	A / μs
Peak Gate Power Dissipation		P <sub>GM</sub>	5	W
Average Gate Power Dissipation		P <sub>G</sub> (AV)	0.5	W
Peak Gate Voltage		V <sub>GM</sub>	10	V
Peak Gate Current		I <sub>GM</sub>	2	A
Junction Temperature		T <sub>j</sub>	-40~125	°C
Storage Temperature Range		T <sub>stg</sub>	-40~125	°C

Unit: mm

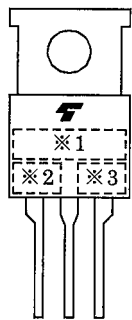



Weight: 2.0g

## ELECTRICAL CHARACTERISTICS (Ta = 25°C)

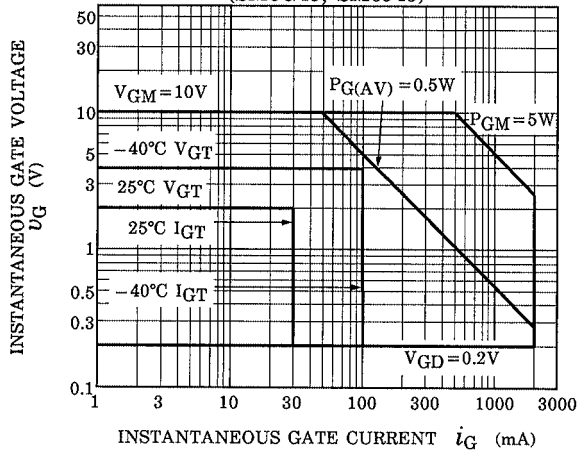
CHARACTERISTIC			SYMBOL	TEST CONDITION		MIN	TYP.	MAX	UNIT
Repetitive Peak Off-State Current			I <sub>DRM</sub>	V <sub>DRM</sub> = Rated, T <sub>j</sub> = 125°C		—	—	2	mA
Gate Trigger Voltage	SM6G45 SM6J45	I	V <sub>GT</sub>	V <sub>D</sub> = 12V R <sub>L</sub> = 20Ω	T2 (+), Gate (+)	—	—	2	V
		II			T2 (+), Gate (–)	—	—	2	
		III			T2 (–), Gate (–)	—	—	2	
		IV			T2 (–), Gate (+)	—	—	—	
	SM6G45A SM6J45A	I			T2 (+), Gate (+)	—	—	1.5	
		II			T2 (+), Gate (–)	—	—	1.5	
		III			T2 (–), Gate (–)	—	—	1.5	
		IV			T2 (–), Gate (+)	—	—	—	
Gate Trigger Current	SM6G45 SM6J45	I	I <sub>GT</sub>	V <sub>D</sub> = 12V R <sub>L</sub> = 20Ω	T2 (+), Gate (+)	—	—	30	mA
		II			T2 (+), Gate (–)	—	—	30	
		III			T2 (–), Gate (–)	—	—	30	
		IV			T2 (–), Gate (+)	—	—	—	
	SM6G45A SM6J45A	I			T2 (+), Gate (+)	—	—	20	
		II			T2 (+), Gate (–)	—	—	20	
		III			T2 (–), Gate (–)	—	—	20	
		IV			T2 (–), Gate (+)	—	—	—	
Peak On-State Voltage			V <sub>TM</sub>	I <sub>TM</sub> = 9A		—	—	1.5	V
Gate Non-Trigger Voltage			V <sub>GD</sub>	V <sub>D</sub> = Rated, T <sub>c</sub> = 125°C		0.2	—	—	V
Holding Current			I <sub>H</sub>	V <sub>D</sub> = 12V, I <sub>TM</sub> = 1A		—	—	50	mA
Thermal Resistance			R <sub>th (j–c)</sub>	Junction to Case, AC		—	—	2.5	°C / W
Critical Rate of Rise of Off-State Voltage at Commutation	SM6G45 SM6J45	(dv / dt) c	V <sub>DRM</sub> = 400V, (di / dt) c = –3.3A / ms T <sub>j</sub> = 125°C	10	—	—	V / μs		
	SM6G45A SM6J45A			4	—	—			

## MARKING

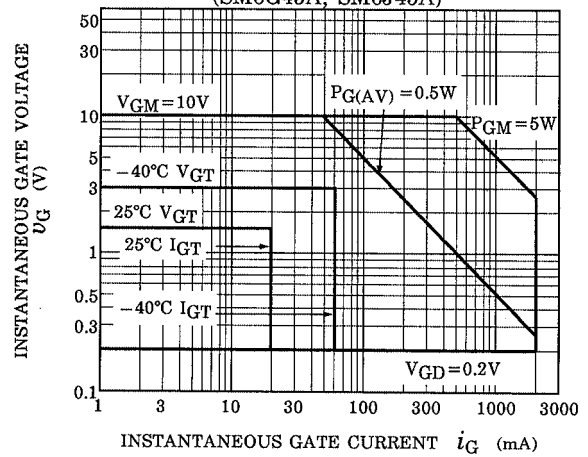


NUMBER	SYMBOL		MARK
* 1	TYPE	SM6G45, SM6G45A	M6G45
		SM6J45, SM6J45A	M6J45
* 2		SM6G45A, SM6J45A	A
* 3	Lot Number 		Example 8A : January 1998 8B : February 1998 8L : December 1998

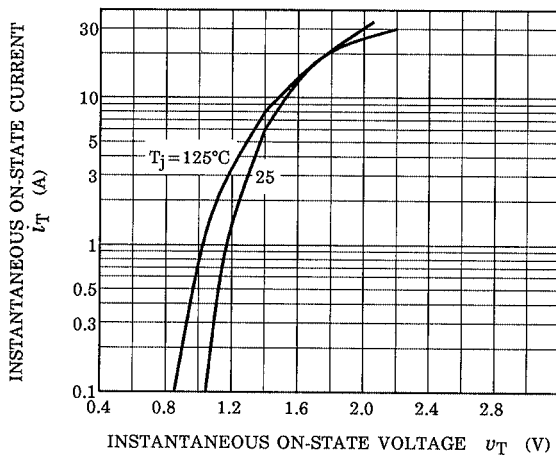
GATE TRIGGER CHARACTERISTIC  
(SM6G45, SM6J45)



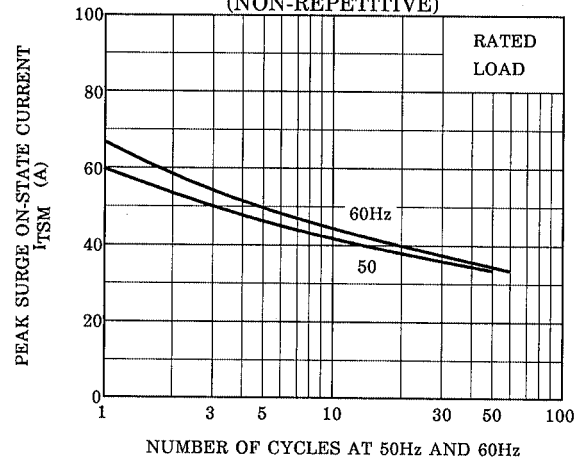
GATE TRIGGER CHARACTERISTIC  
(SM6G45A, SM6J45A)



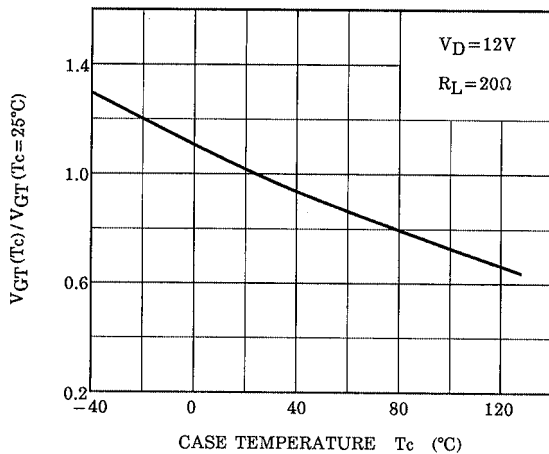
$i_T - v_T$



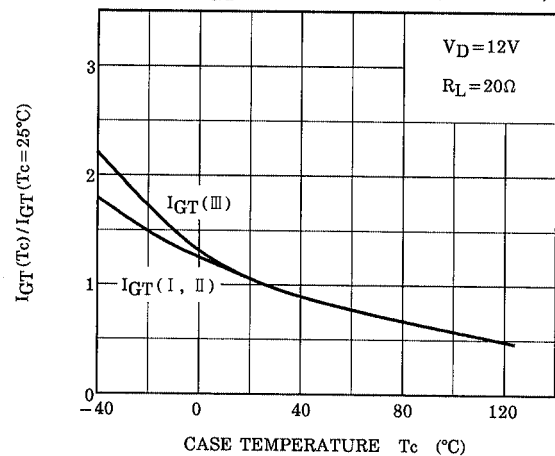
SURGE ON-STATE CURRENT  
(NON-REPETITIVE)

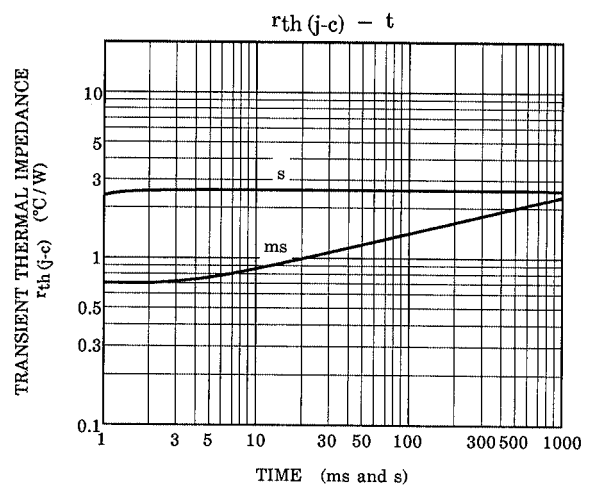
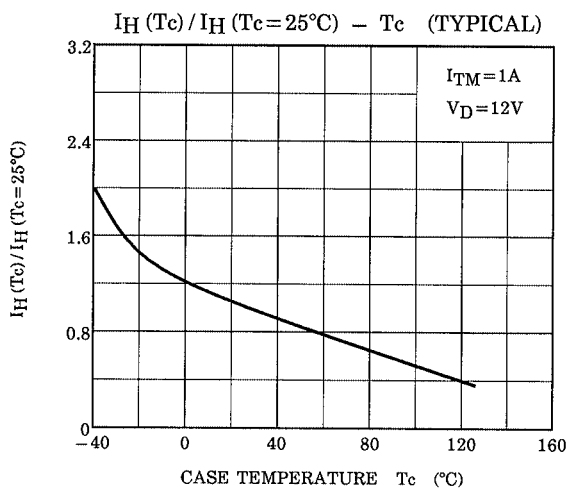
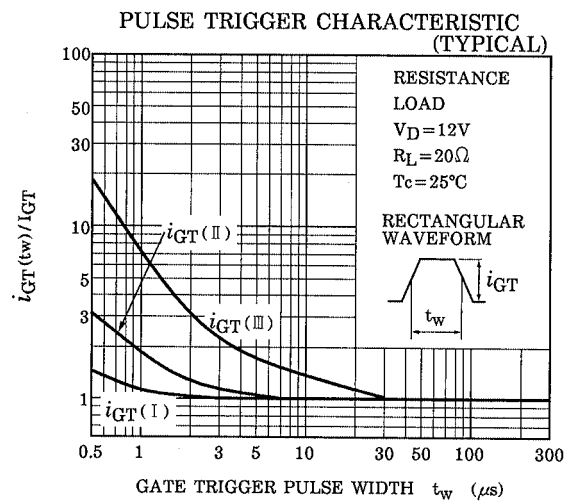
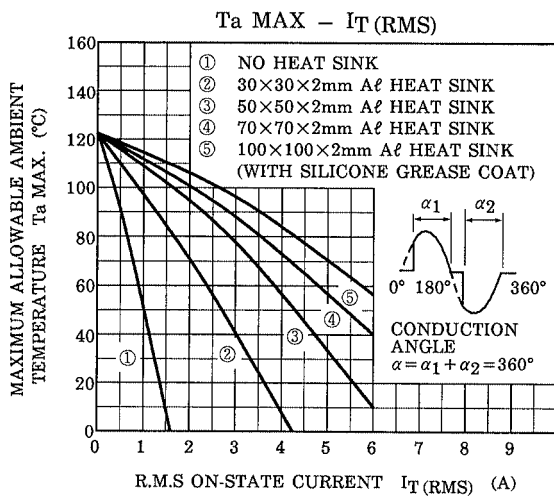
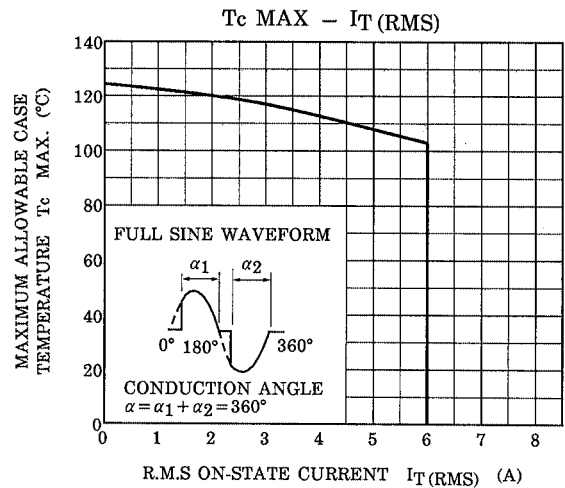
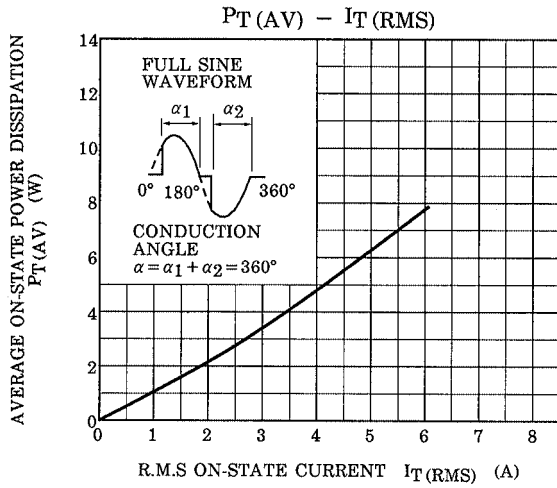


$V_{GT}(T_c) / V_{GT}(T_c = 25^\circ\text{C}) - T_c$  (TYPICAL)



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





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