

TOSHIBA BI-DIRECTIONAL TRIODE THYRISTOR SILICON PLANAR TYPE

SM6G45, SM6J45, SM6G45A, SM6J45A

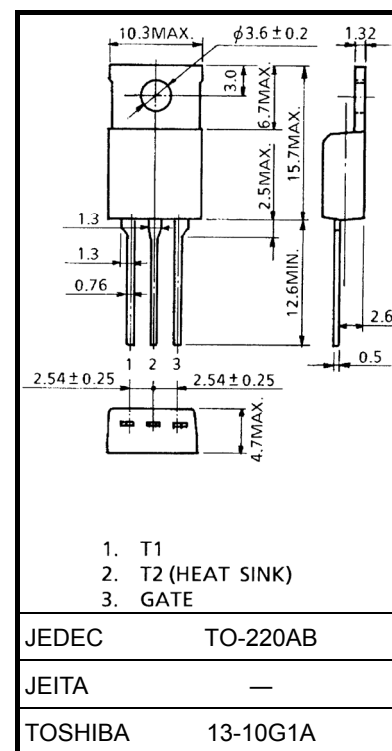
AC POWER CONTROL APPLICATIONS

Unit: mm

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

ABSOLUTE MAXIMUM RATINGS

CHARACTERISTIC		SYMBOL	RATING	UNIT
Repetitive Peak Off-State Voltage	SM6G45 SM6G45A	V _{DRM}	400	V
	SM6J45 SM6J45A		600	
R.M.S On-State Current (Full Sine Waveform T _c = 104°C)		I _T (RMS)	6	A
Peak One Cycle Surge On-State Current (Non-Repetitive)		I _{TSM}	60 (50Hz)	A
			66 (60Hz)	
I ² t Limit Value		I ² t	18	A ² s
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



Weight: 2.0 g (typ.)

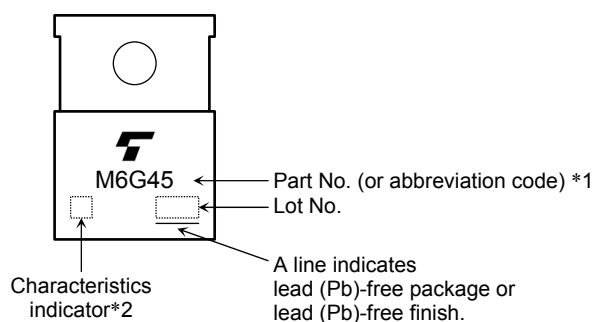
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/Derating Concept and Methods) and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

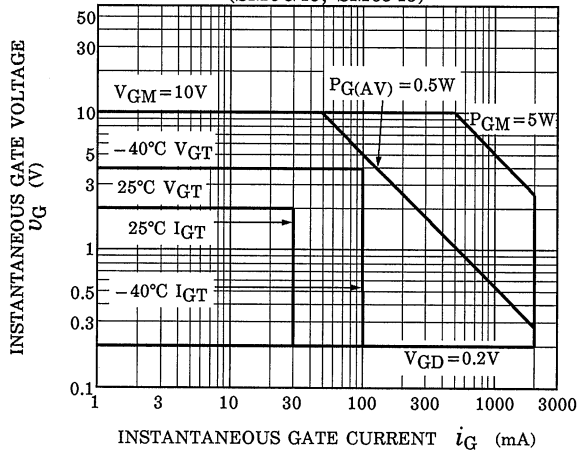
CHARACTERISTIC			SYMBOL	TEST CONDITION		MIN	TYP.	MAX	UNIT
Repetitive Peak Off-State Current			I _{DRM}	V _{DRM} = Rated, T _j = 125°C		—	—	2	mA
Gate Trigger Voltage	SM6G45 SM6J45	I	V _{GT}	V _D = 12V R _L = 20Ω	T2 (+), Gate (+)	—	—	2	V
		II			T2 (+), Gate (—)	—	—	2	
		III			T2 (—), Gate (—)	—	—	2	
	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

MARKING

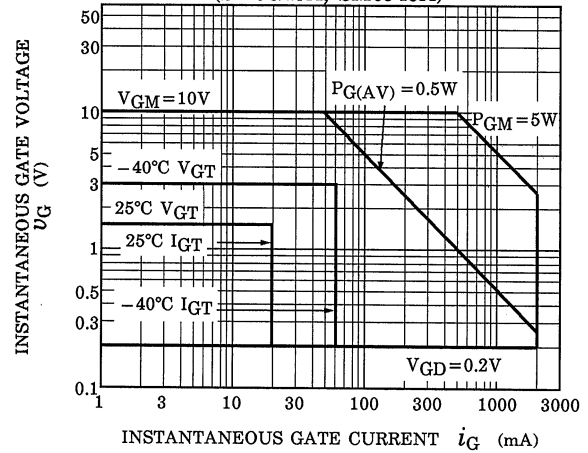


	Part No. (or abbreviation code)	Part No.
*1	M6G45	SM6G45, SM6G45A
	M6J45	SM6J45, SM6J45A
*2	Nothing	SM6G45, SM6J45
	A	SM6G45A, SM6J45A

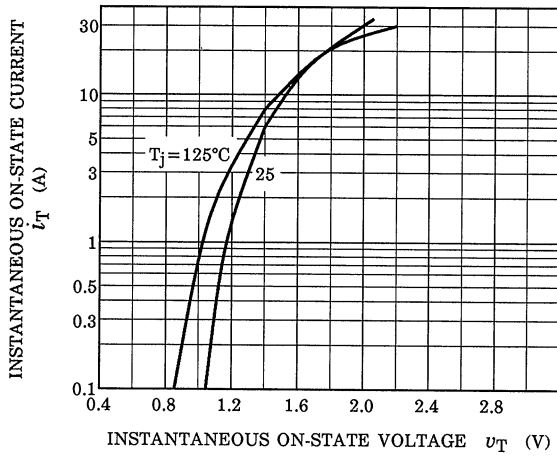
GATE TRIGGER CHARACTERISTIC
(SM6G45, SM6J45)



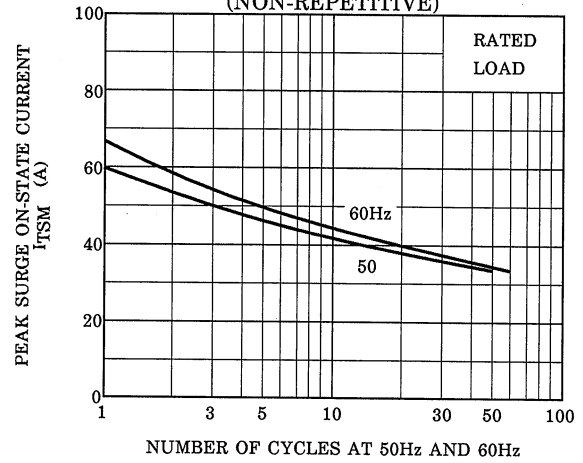
GATE TRIGGER CHARACTERISTIC
(SM6G45A, SM6J45A)



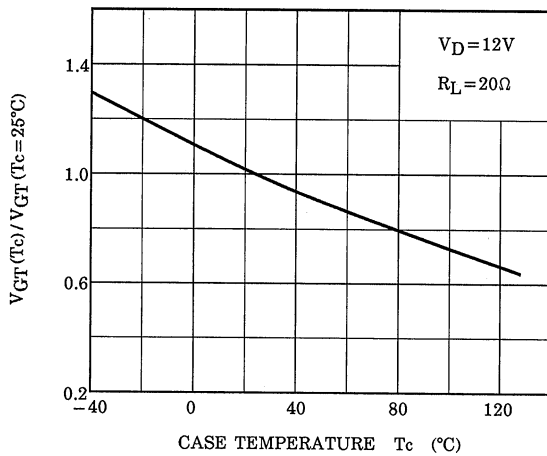
$i_T - v_T$



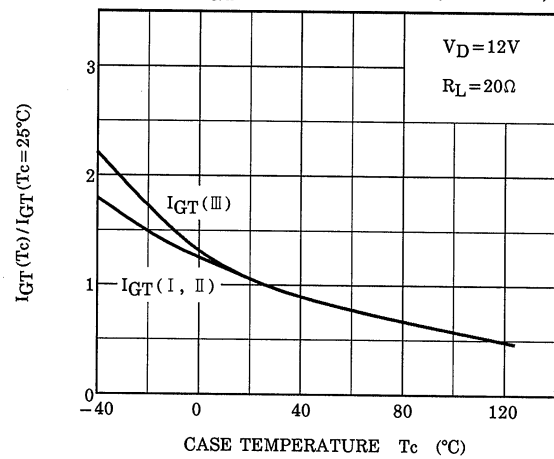
SURGE ON-STATE CURRENT
(NON-REPETITIVE)

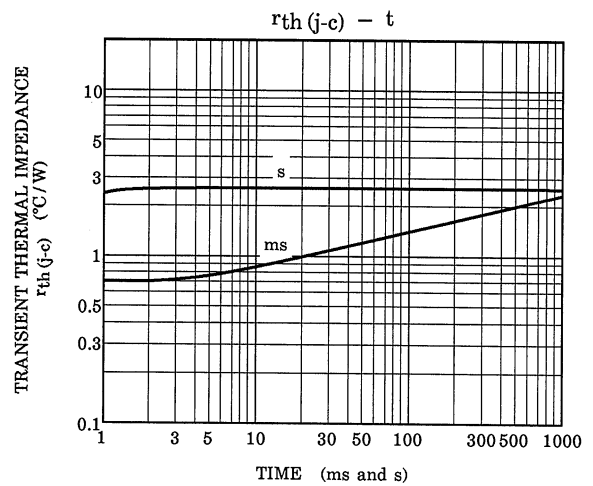
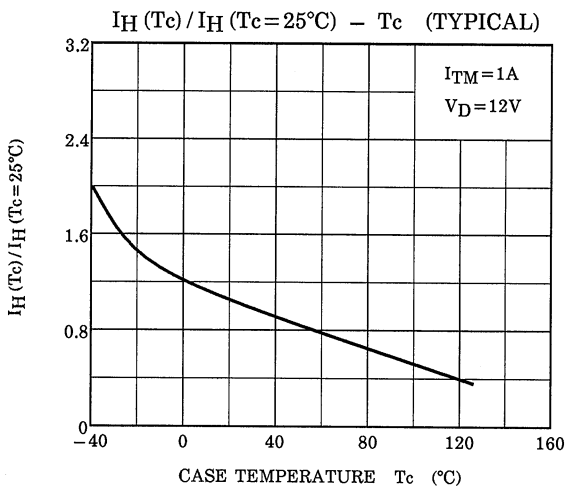
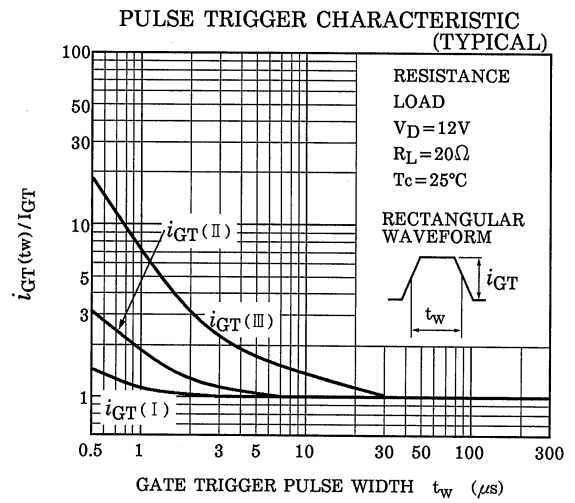
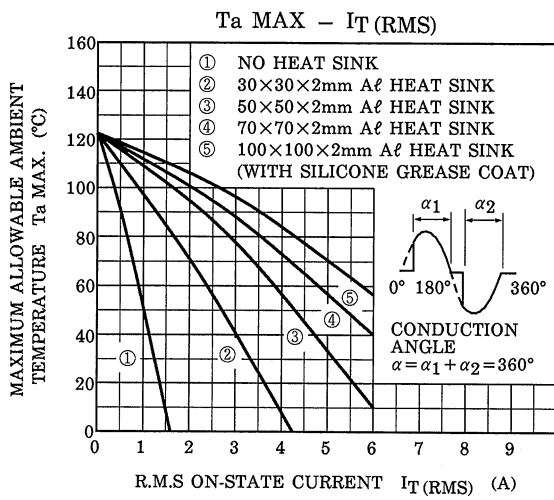
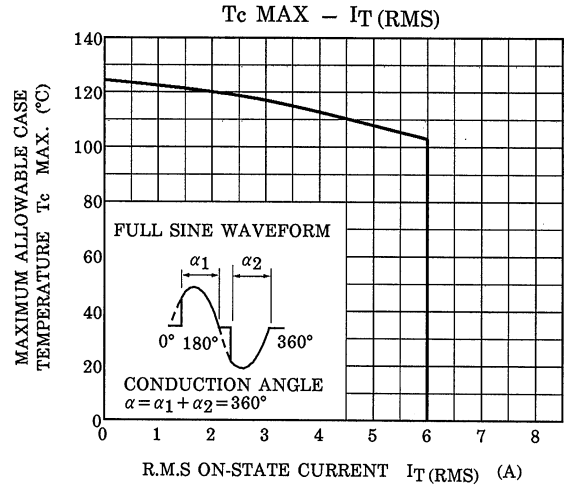
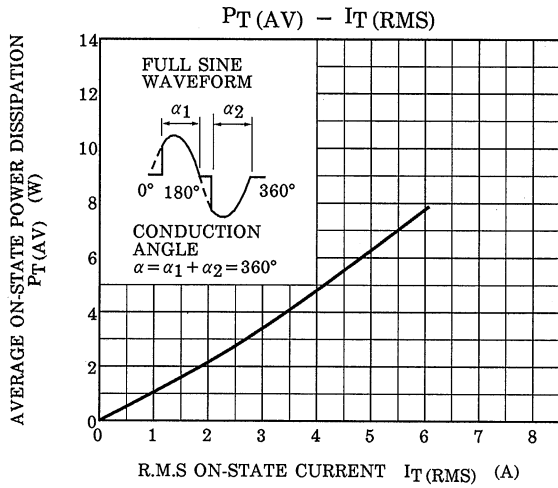


$V_{GT}(T_c) / V_{GT}(T_c = 25^\circ\text{C}) - T_c$ (TYPICAL)



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





RESTRICTIONS ON PRODUCT USE

20070701-EN

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