

TOSHIBA BI-DIRECTIONAL TRIODE THYRISTOR SILICON PLANAR TYPE

**SM12G45, SM12J45, SM12G45A, SM12J45A**

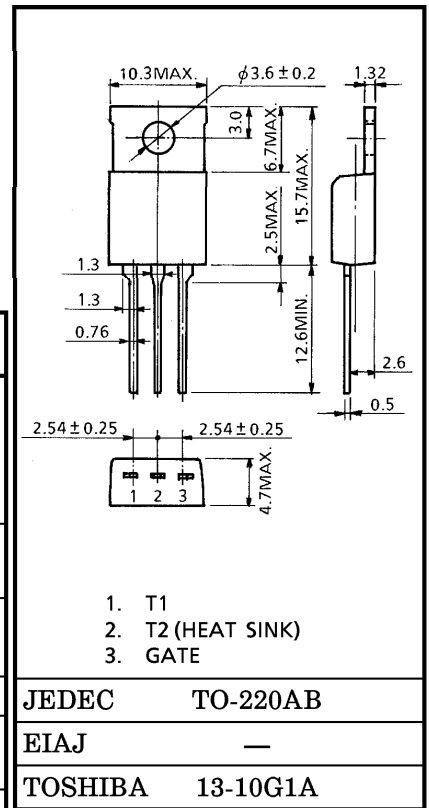
AC POWER CONTROL APPLICATIONS

Unit in mm

- Repetitive Peak Off-State Voltage :  $V_{DRM} = 400, 600V$
- R.M.S On-State Current :  $I_T (RMS) = 12A$
- High Commutating (dv / dt)

MAXIMUM RATINGS

CHARACTERISTIC		SYMBOL	RATING	UNIT
Repetitive Peak Off-State Voltage	SM12G45 SM12G45A	$V_{DRM}$	400	V
	SM12J45 SM12J45A		600	
R.M.S On-State Current (Full Sine Waveform $T_c = 98^\circ C$ )		$I_T (RMS)$	12	A
Peak One Cycle Surge On-State Current (Non-Repetitive)		$I_{TSM}$	120 (50Hz)	A
			132 (60Hz)	
I <sup>2</sup> t Limit Value (t = 1~10ms)		I <sup>2</sup> t	72	A <sup>2</sup> 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	°C
Storage Temperature Range		$T_{stg}$	-40~125	°C



Weight : 2.0g

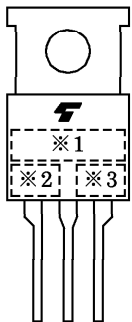
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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

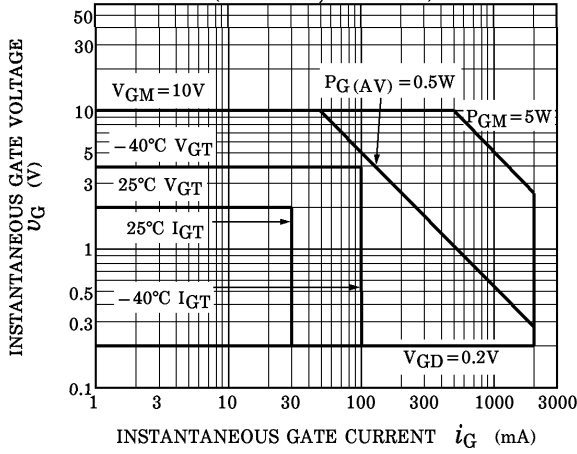
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Repetitive Peak Off-State Current		$I_{DRM}$	$V_{DRM} = \text{Rated}, T_j = 125^\circ\text{C}$	—	—	2	mA	
Gate Trigger Voltage	SM12G45 SM12J45	I	$V_D = 12\text{V}, R_L = 20\Omega$	T2 (+), Gate (+)	—	—	2	V
		II		T2 (+), Gate (-)	—	—	2	
		III		T2 (-), Gate (-)	—	—	2	
		IV		T2 (-), Gate (+)	—	—	—	
	SM12G45A SM12J45A	I		T2 (+), Gate (+)	—	—	1.5	
		II		T2 (+), Gate (-)	—	—	1.5	
		III		T2 (-), Gate (-)	—	—	1.5	
		IV		T2 (-), Gate (+)	—	—	—	
Gate Trigger Current	SM12G45 SM12J45	I	$V_D = 12\text{V}, R_L = 20\Omega$	T2 (+), Gate (+)	—	—	30	mA
		II		T2 (+), Gate (-)	—	—	30	
		III		T2 (-), Gate (-)	—	—	30	
		IV		T2 (-), Gate (+)	—	—	—	
	SM12G45A SM12J45A	I		T2 (+), Gate (+)	—	—	20	
		II		T2 (+), Gate (-)	—	—	20	
		III		T2 (-), Gate (-)	—	—	20	
		IV		T2 (-), Gate (+)	—	—	—	
Peak On-State Voltage		$V_{TM}$	$I_{TM} = 17\text{A}$	—	—	1.5	V	
Gate Non-Trigger Voltage		$V_{GD}$	$V_D = \text{Rated}, T_c = 125^\circ\text{C}$	0.2	—	—	V	
Holding Current		$I_H$	$V_D = 12\text{V}, I_{TM} = 1\text{A}$	—	—	50	mA	
Thermal Resistance		$R_{th(j-c)}$	Junction to Case, AC	—	—	1.8	$^\circ\text{C}/\text{W}$	
Critical Rate of Rise of Off-State Voltage at Commutation	SM12G45 SM12J45	$(dv/dt)_c$	$V_{DRM} = 400\text{V}$ $(di/dt)_c = -6.5\text{A/ms}$	10	—	—	$\text{V}/\mu\text{s}$	
	SM12G45A SM12J45A			4	—	—		

MARKING

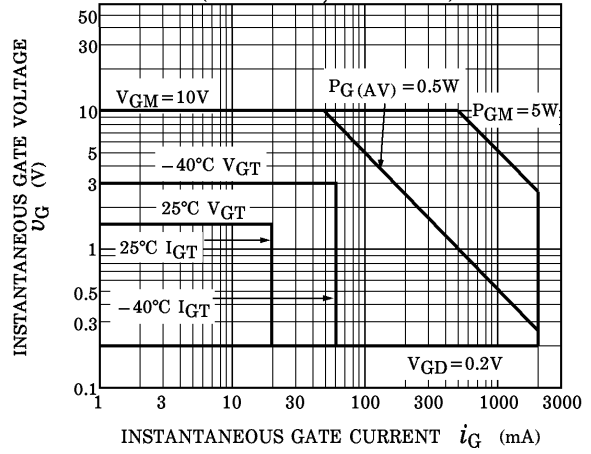


NUMBER	SYMBOL	MARK
※1	TYPE	SM12G45, SM12G45A
		SM12J45, SM12J45A
※2	SM12G45A, SM12J45A	A
※3	Lot Number  Month (Starting from Alphabet A) Year (Last Decimal Digit of the Current Year)	Example 8A : January 1998 8B : February 1998 8L : December 1998

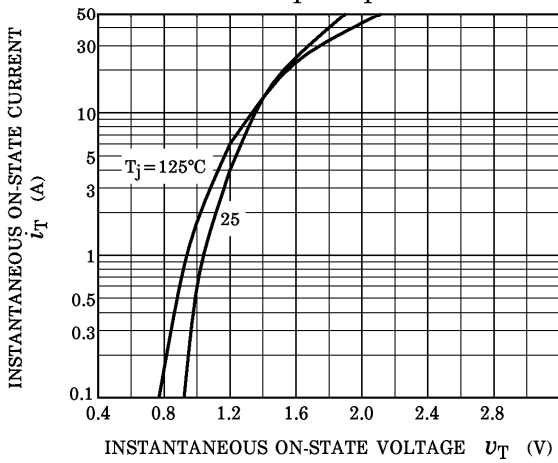
**GATE TRIGGER CHARACTERISTIC**  
(SM12G45, SM12J45)



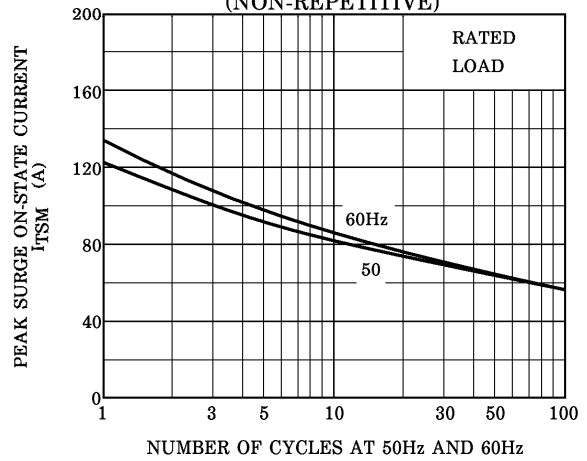
**GATE TRIGGER CHARACTERISTIC**  
(SM12G45A, SM12J45A)



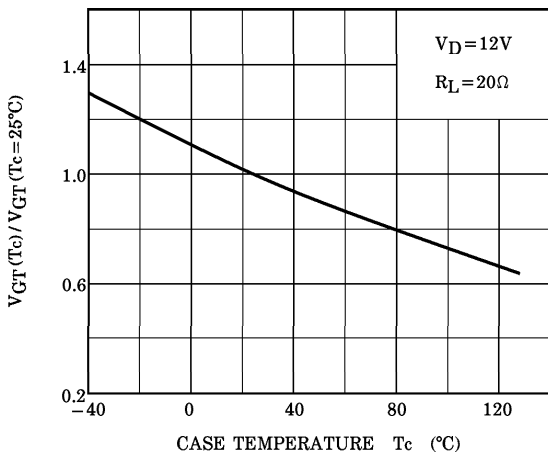
$i_T - v_T$



**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)

