

TOSHIBA BI-DIRECTIONAL TRIODE THYRISTOR SILICON PLANAR TYPE

SM16G45, SM16J45, SM16G45A, SM16J45A

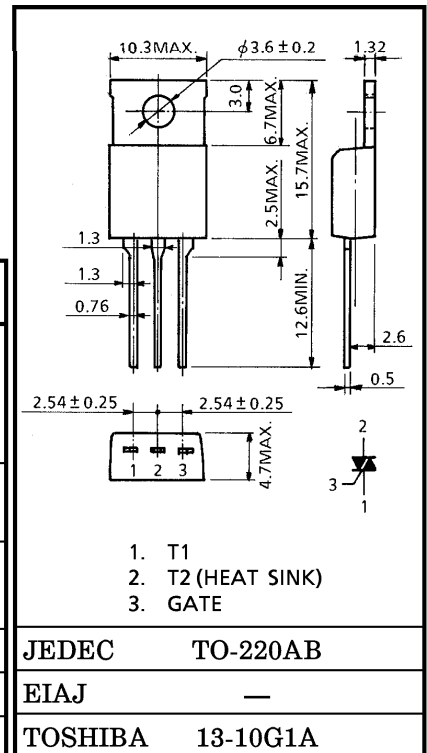
AC POWER CONTROL APPLICATIONS

Unit in mm

- Repetitive Peak Off-State Voltage : $V_{DRM}=400, 600V$
- R.M.S On-State Current : $I_T(RMS)=16A$
- High Commutating (dv / dt)

MAXIMUM RATINGS

CHARACTERISTIC		SYMBOL	RATING	UNIT
Repetitive Peak Off-State Voltage	SM16G45 SM16G45A	V_{DRM}	400	V
	SM16J45 SM16J45A		600	
R.M.S On-State Current (Full Sine Waveform $T_c=100^\circ C$)		$I_T(RMS)$	16	A
Peak One Cycle Surge On-State Current (Non-Repetitive)		I_{TSM}	150 (50Hz)	A
			165 (60Hz)	
I ² t Limit Value		I^2t	112.5	A ² 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

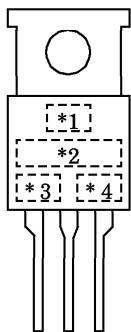
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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

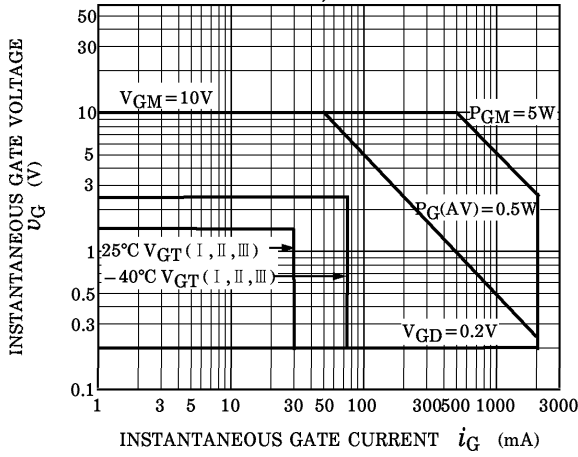
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Repetitive Peak Off-State Current		I_{DRM}	$V_{DRM} = \text{Rated}$	—	—	20	μA	
Gate Trigger Voltage		V_{GT}	$V_D = 12V, R_L = 20\Omega$	T2 (+), Gate (+)	—	—	1.5	V
				T2 (+), Gate (-)	—	—	1.5	
				T2 (-), Gate (-)	—	—	1.5	
				T2 (-), Gate (+)	—	—	—	
Gate Trigger Current	SM16G45 SM16J45	I_{GT}	$V_D = 12V, R_L = 20\Omega$	T2 (+), Gate (+)	—	—	30	mA
				T2 (+), Gate (-)	—	—	30	
				T2 (-), Gate (-)	—	—	30	
				T2 (-), Gate (+)	—	—	—	
	SM16G45A SM16J45A			T2 (+), Gate (+)	—	—	20	
				T2 (+), Gate (-)	—	—	20	
				T2 (-), Gate (-)	—	—	20	
				T2 (-), Gate (+)	—	—	—	
Peak On-State Voltage		V_{TM}	$I_{TM} = 25A$	—	—	1.5	V	
Gate Non-Trigger Voltage		V_{GD}	$V_D = \text{Rated}, T_c = 125^\circ C$	0.2	—	—	V	
Holding Current		I_H	$V_D = 12V, I_{TM} = 2A$	—	—	50	mA	
Critical Rate of Rise of Off-State Voltage at Commutation	SM16G45 SM16J45	$(dv/dt)_c$	$V_D = 400V, (di/dt)_c = -8.7A/ms, T_j = 125^\circ C$	10	—	—	V / μs	
	SM16G45A SM16J45A			4	—	—		
Thermal Resistance		$R_{th(j-c)}$	Junction to Case, AC	—	—	1.4	$^\circ C / W$	

MARKING

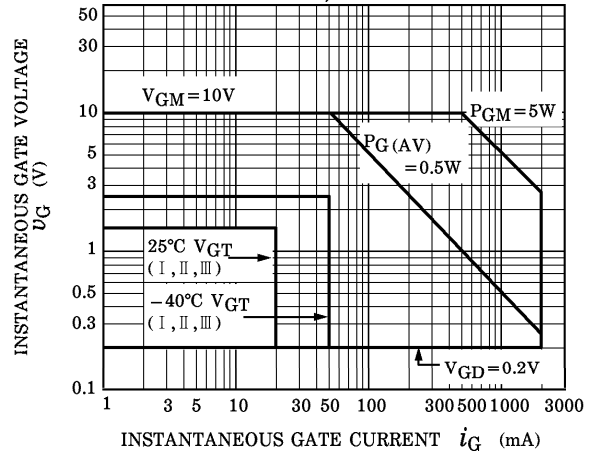


* NUMBER	SYMBOL	MARK
* 1	Toshiba Product Mark	
* 2	TYPE	SM16G45, SM16G45A
		SM16J45, SM16J45A
* 3	SM16G45A, SM16J45A	A
* 4	Lot Number Month (Starting from Alphabet A) Year (Last Decimal Digit of the Current Year)	Example 8A : January 1998 8B : February 1998 8L : December 1998

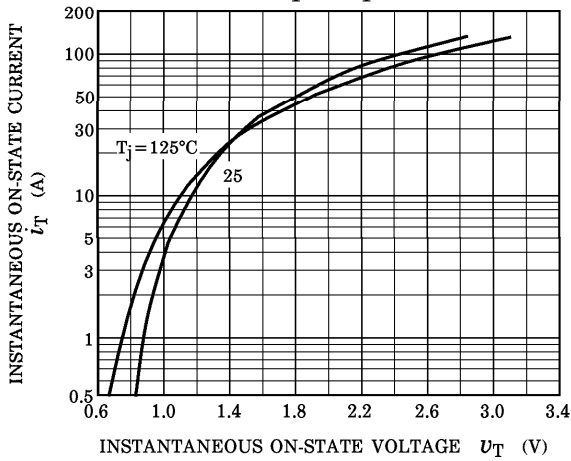
GATE TRIGGER CHARACTERISTIC
SM16G45, SM16J45



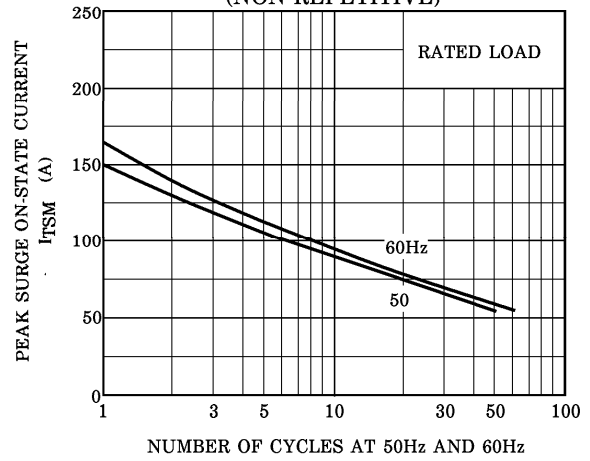
GATE TRIGGER CHARACTERISTIC
SM16G45A, SM16J45A



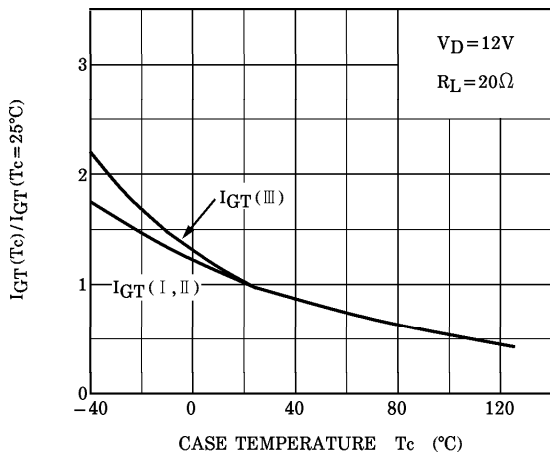
$i_T - v_T$



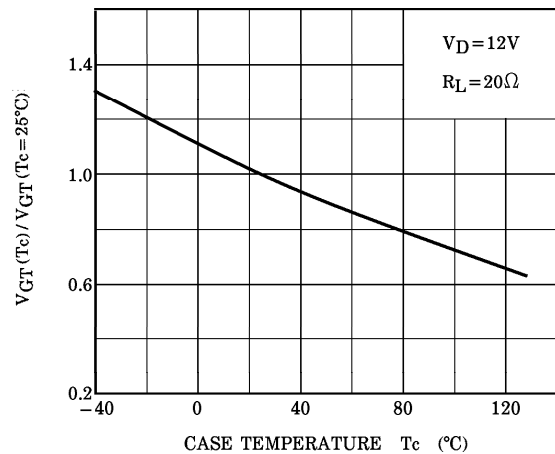
SURGE ON-STATE CURRENT
(NON-REPETITIVE)



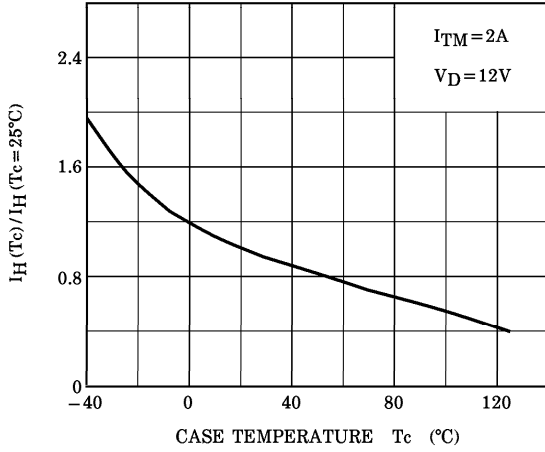
$I_{GT}(T_c) / I_{GT}(T_c = 25^\circ\text{C}) - T_c$ (TYPICAL)



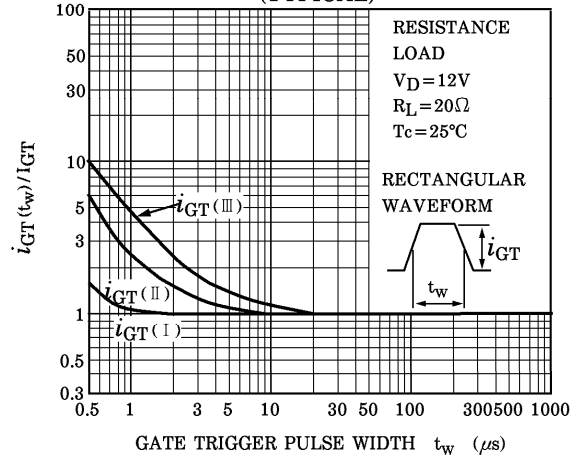
$V_{GT}(T_c) / V_{GT}(T_c = 25^\circ\text{C}) - T_c$ (TYPICAL)



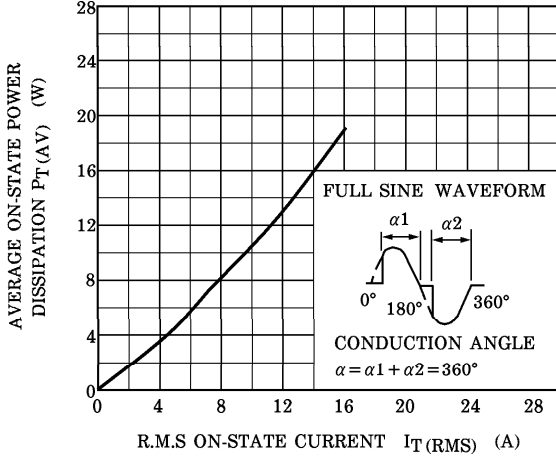
$I_H(T_c) / I_H(T_c = 25^\circ\text{C}) - T_c$ (TYPICAL)



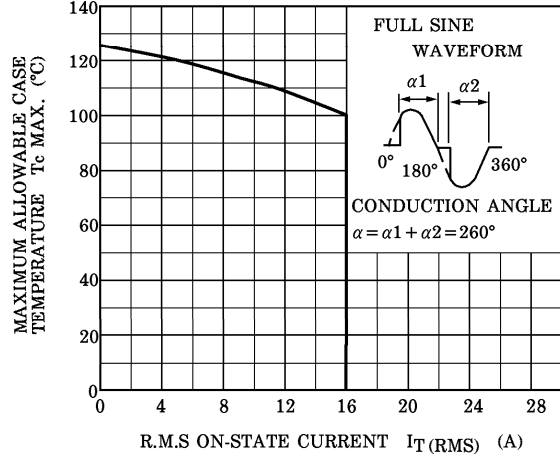
PULSE TRIGGER CHARACTERISTIC (TYPICAL)



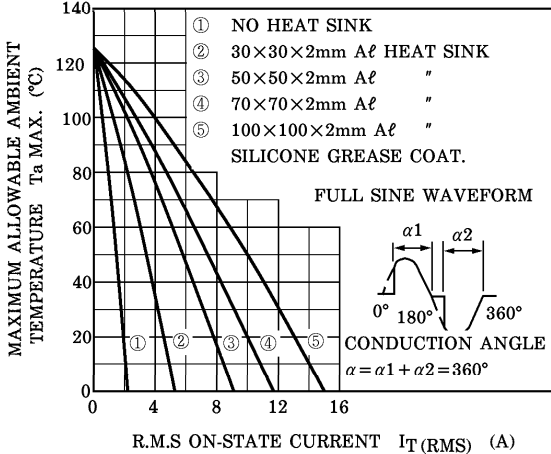
$P_T(AV) - I_T(RMS)$



$T_c \text{ MAX} - I_T(RMS)$



$T_a \text{ MAX} - I_T(RMS)$



TRANSIENT THERMAL IMPEDANCE (JUNCTION TO CASE)

