

TOSHIBA BI-DIRECTIONAL TRIODE THYRISTOR SILICON PLANAR TYPE

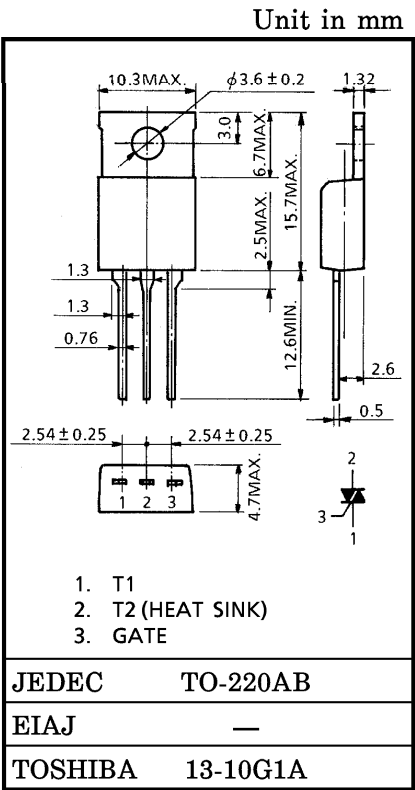
SM3G45, SM3J45

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	V _{DRM}	400	V
	SM3J45		600	
R.M.S On-State Current (Full Sine Waveform T _c =111°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 / 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 : 2.0g

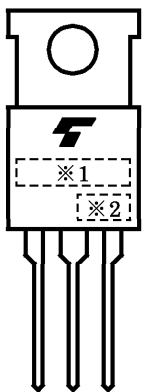
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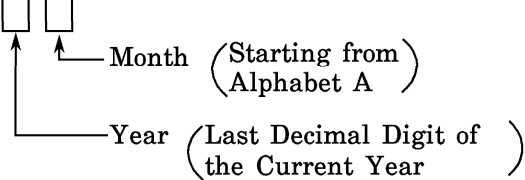
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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

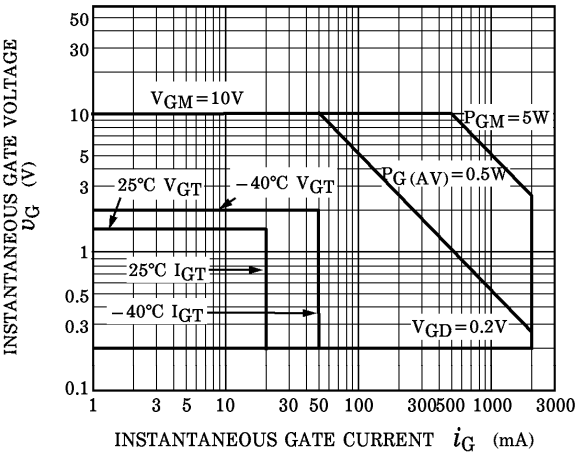
CHARACTERISTIC		SYMBOL	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Repetitive Peak Off-State Current		I_{DRM}	$V_{DRM} = \text{Rated}$		—	—	20	μA
Gate Trigger Voltage	I	V_{GT}	$V_D = 12\text{V}$ $R_L = 20\Omega$	T2 (+), Gate (+)	—	—	1.5	V
	II			T2 (+), Gate (—)	—	—	1.5	
	III			T2 (—), Gate (—)	—	—	1.5	
	IV			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	—	—	$\text{V} / \mu\text{s}$
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	—	—	$\text{V} / \mu\text{s}$
Thermal Resistance		$R_{th(j-c)}$	Junction to Case, AC		—	—	3.3	$^\circ\text{C} / \text{W}$

MARKING

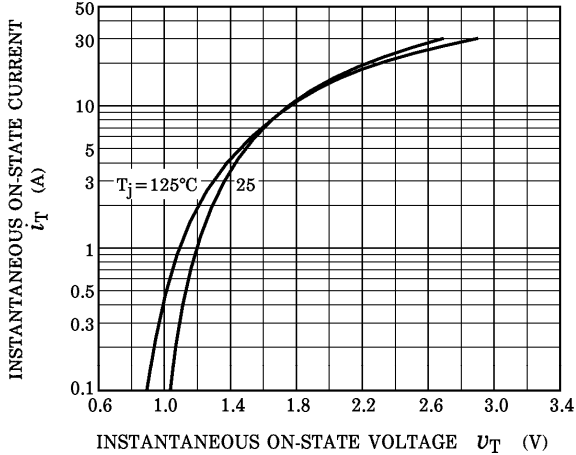


NUMBER	SYMBOL		MARK
※1	TYPE	SM3G45	M3G45
		SM3J45	M3J45
※2	Lot Number 		Example 8A : January 1998 8B : February 1998 8L : December 1998

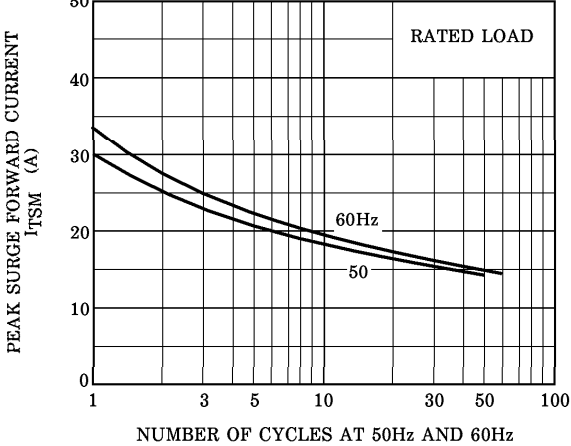
GATE TRIGGER CHARACTERISTIC



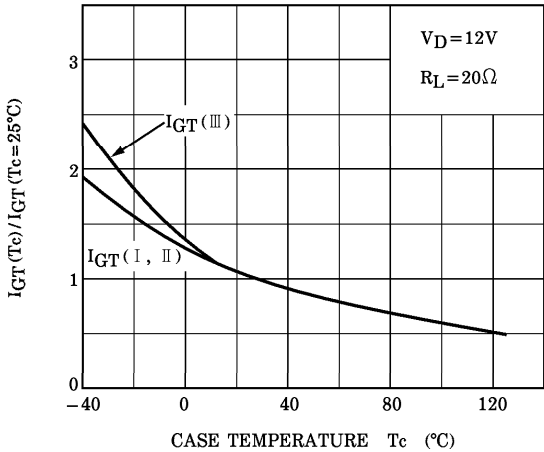
$i_T - v_T$



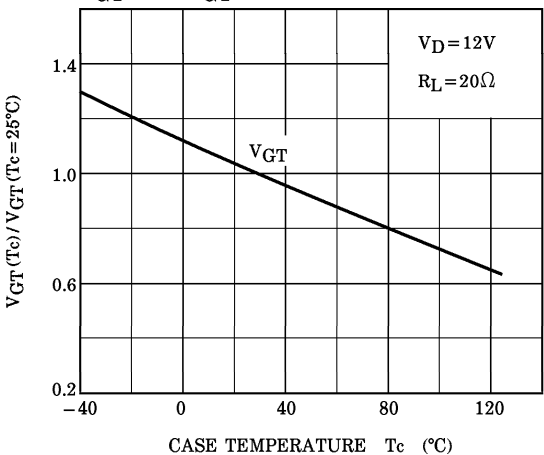
SURGE ON-STATE CURRENT (NON-REPETITIVE)



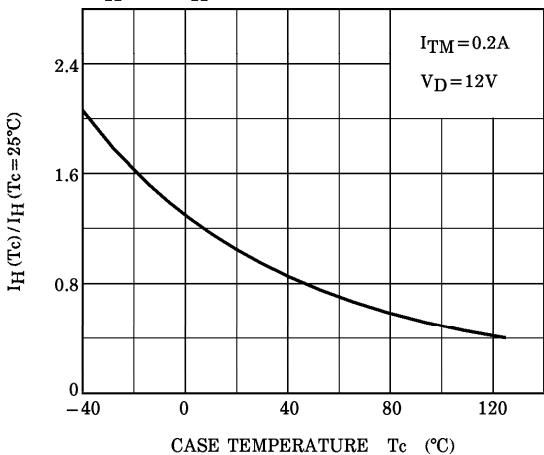
$I_{GT}(T_c) / I_{GT}(T_c=25^\circ C) - T_c$ (TYPICAL)

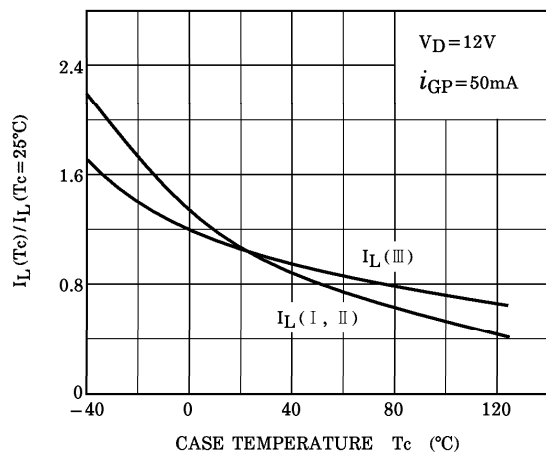


$V_{GT}(T_c) / V_{GT}(T_c=25^\circ C) - T_c$ (TYPICAL)

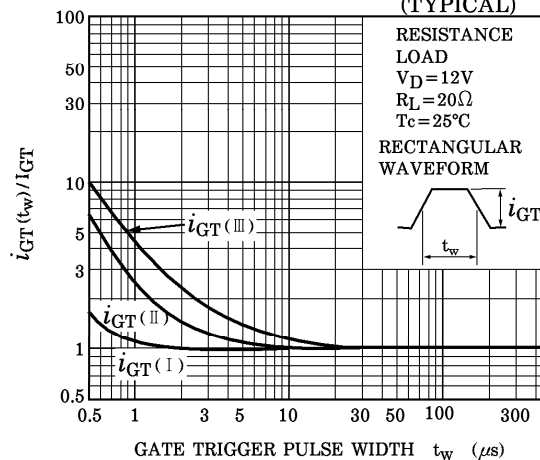
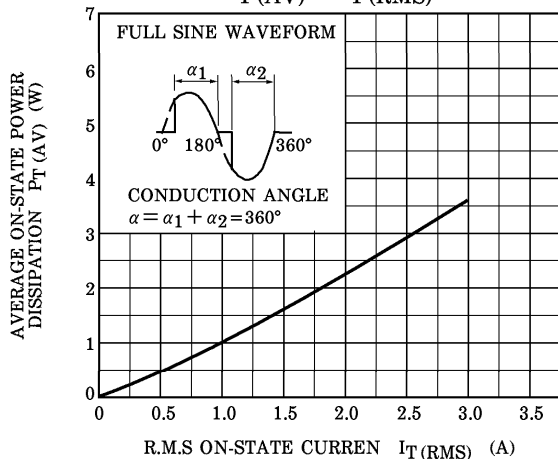
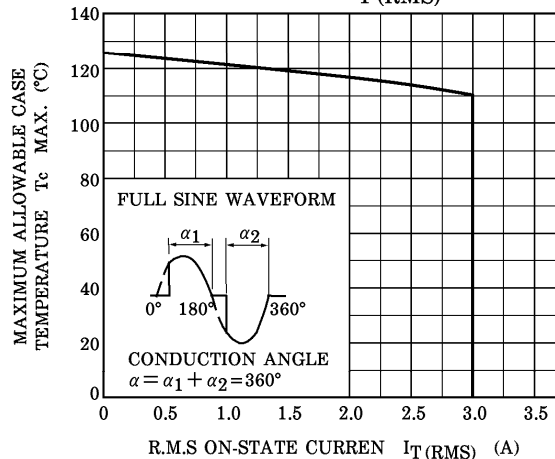
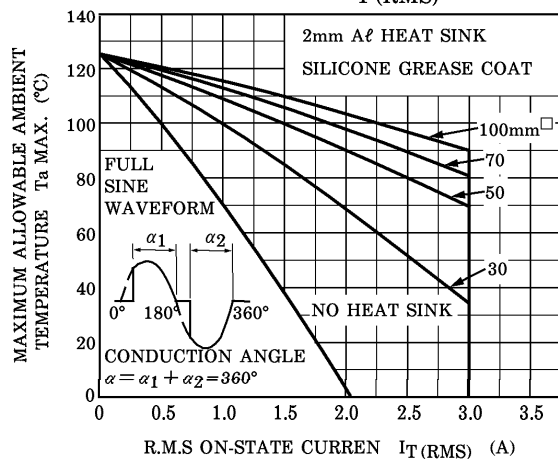


$I_H(T_c) / I_H(T_c=25^\circ C) - T_c$ (TYPICAL)



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

PLUSE TRIGGER CHARACTERISTIC (TYPICAL)

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

TRANSIENT THERMAL IMPEDANCE (JUNCTION TO CASE)

