

TOSHIBA BI-DIRECTIONAL TRIODE THYRISTOR SILICON PLANAR TYPE

SM3G48, USM3G48, SM3J48, USM3J48

AC POWER CONTROL APPLICATIONS

- Repetitive Peak Off-State Voltage : $V_{DRM}=400, 600V$
- R.M.S On-State Current : $I_T(RMS)=3A$
- Gate Trigger Current : $I_{GT}=20mA$ Max.

Unit in mm

SM3G48, SM3J48	USM3G48, USM3J48
JEDEC —	JEDEC —
EIAJ —	EIAJ —
TOSHIBA 13-10J1A	TOSHIBA 13-10J2A

MAXIMUM RATINGS

Weight : 1.7g

CHARACTERISTIC	SYMBOL	RATING	UNIT
Repetitive Peak Off-State Voltage	V_{DRM}	400	V
(U)SM3G48		600	
(U)SM3J48			
R.M.S On-State Current	$I_T(RMS)$	3	A
Peak One Cycle Surge On-State Current (Non-Repetitive)	I_{TSM}	30 (50Hz)	A
		33 (60Hz)	
I^2t Limit Value	I^2t	4.5	A^2s
Critical Rate of Rise of On-State Current (Note 1)	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 Forward Gate Voltage	V_{GM}	10	V
Peak Forward Gate Current	I_{GM}	2	A
Junction Temperature	T_j	$-40 \sim 125$	$^{\circ}C$
Storage Temperature Range	T_{stg}	$-40 \sim 125$	$^{\circ}C$

(Note 1) $V_{DRM} = 0.5 \times \text{Rated}$

$$I_{TM} \leq 4.5A$$

$$t_{gw} \geq 10\mu s$$

$$t_{gr} \leq 250ns$$

$$i_{gp} = I_{GT} \times 2.0$$

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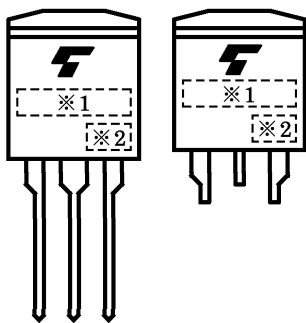
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ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

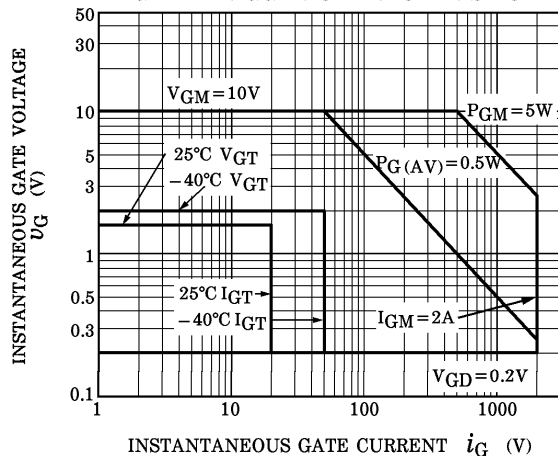
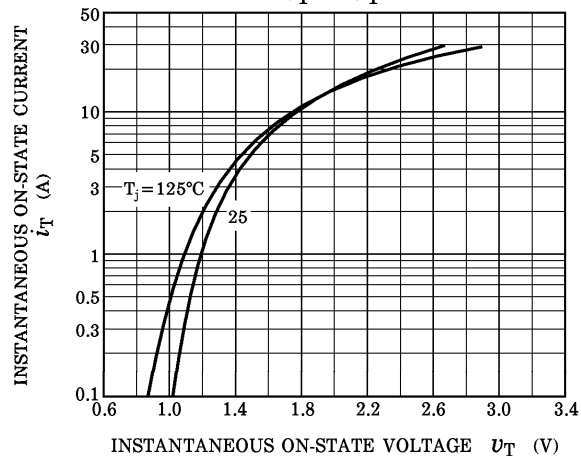
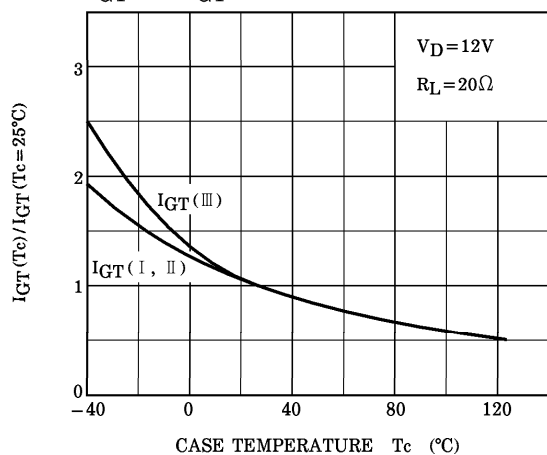
CHARACTERISTIC		SYMBOL	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Repetitive Peak Off-State Current		I _{DRM}	V _{DRM} =Rated		—	—	20	μA
Gate Trigger Voltage	I	V _{GT}	V _D =12V R _L =20Ω	T2(+), GATE(+)	—	—	1.5	V
	II			T2(+), GATE(−)	—	—	1.5	
	III			T2(−), GATE(−)	—	—	1.5	
	IV			T2(−), GATE(+)	—	1.0	—	
Gate Trigger Current	I	I _{GT}	V _D =12V R _L =20Ω	T2(+), GATE(+)	—	—	20	mA
	II			T2(+), GATE(−)	—	—	20	
	III			T2(−), GATE(−)	—	—	20	
	IV			T2(−), GATE(+)	—	50	—	
Peak On-State Voltage		V _{TM}	I _{TM} =4.5A		—	—	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		—	—	30	mA
Thermal Resistance		R _{th(j-c)}	Junction to Case, AC		—	—	3.6	°C / W
Critical Rate of Rise of Off-State Voltage		dv / dt	V _{DRM} =Rated, T _j =125°C Exponential Rise		—	300	—	V / μs
Critical Rate of Rise of Off-State Voltage at Commutation		(dv / dt) _c	V _{DRM} =400V, T _j =125°C (di / dt) _c =−2.0A / ms		10	—	—	V / μs

MARKING

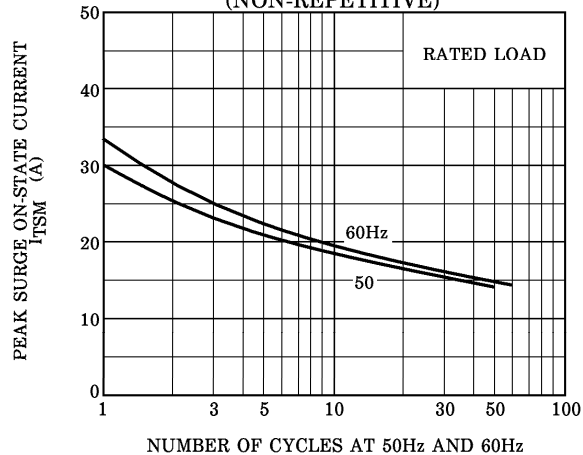
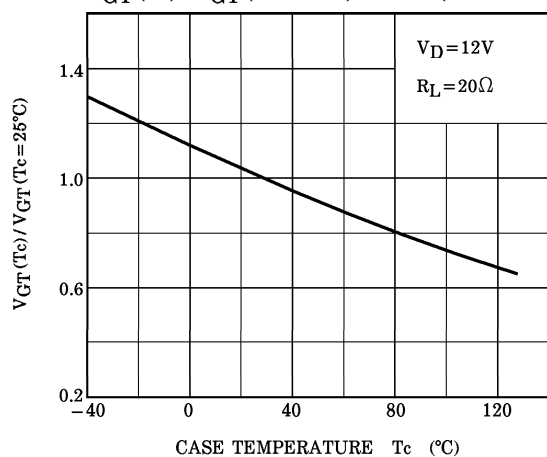


NUMBER	SYMBOL	MARK
※ 1	TYPE	SM3G48, USM3G48
		SM3J48, USM3J48
※ 2	Lot Number Month (Starting from Alphabet A) Year (Last Decimal Digit of the Current Year)	Example 8A : January 1998 8B : February 1998 8L : December 1998

GATE TRIGGER CHARACTERISTIC

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

SURGE ON-STATE CURRENT (NON-REPETITIVE)

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