

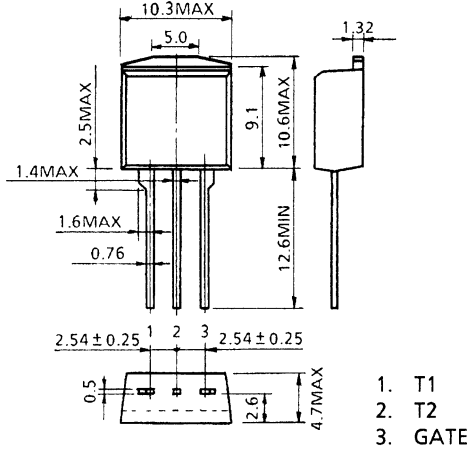
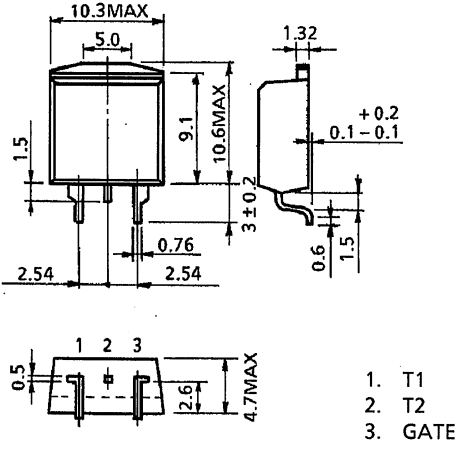
TOSHIBA BI-DIRECTIONAL TRIODE THYRISTOR SILICON PLANAR TYPE

SM3G48, USM3G48, SM3J48, USM3J48

AC POWER CONTROL APPLICATIONS

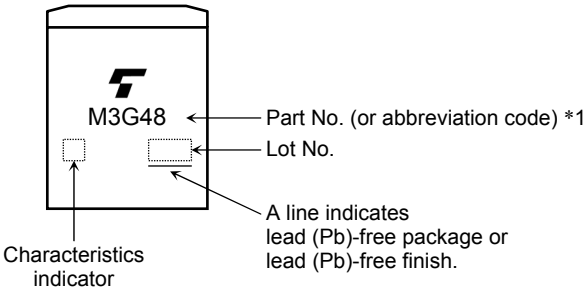
- Repetitive Peak Off-State Voltage: $V_{DRM}=400V, 600V$
- R.M.S On-State Current: $I_T (RMS)=3A$
- Gate Trigger Current: $I_{GT}=20mA$ Max.

Unit: mm

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

Weight: 1.7g

MARKING



*1	Part No. (or abbreviation code)	Part No.
	M3G48	SM3G48, USM3G48
	M3J48	SM3J48, USM3J48

ABSOLUTE MAXIMUM RATINGS

CHARACTERISTIC	SYMBOL	RATING	UNIT
Repetitive Peak Off-State Voltage	(U)SM3G48	400	V
	(U)SM3J48	600	
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 / μs
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	-40~125	°C
Storage Temperature Range	T_{stg}	-40~125	°C

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

$I_{TM} \leq 4.5A$

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

$t_{gr} \leq 250ns$

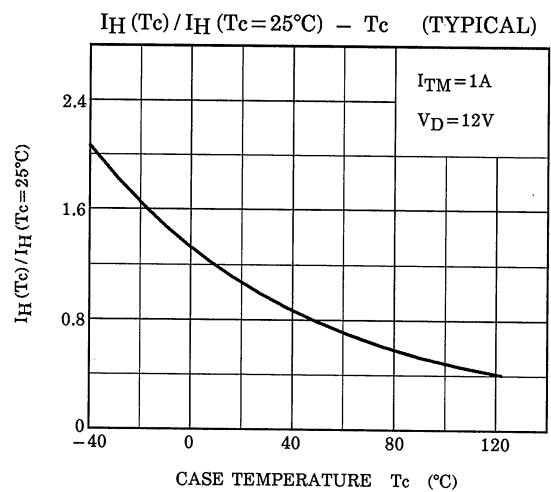
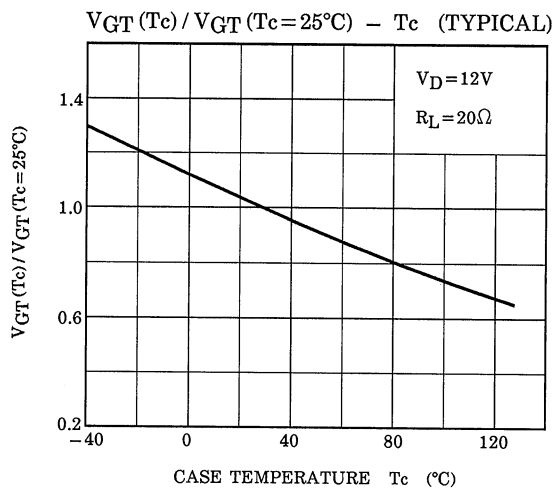
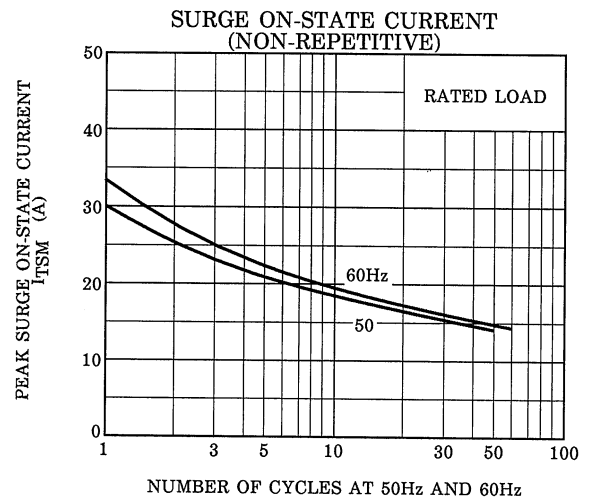
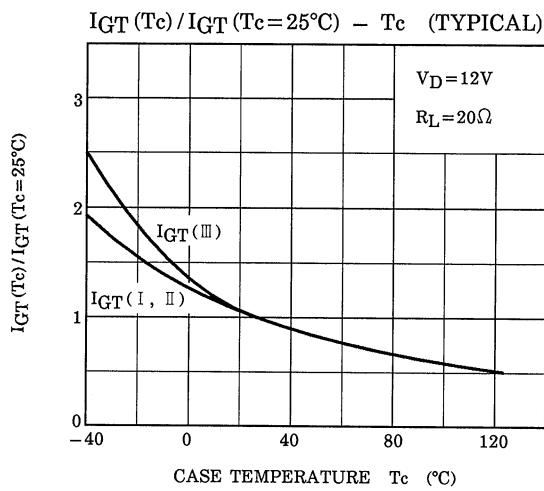
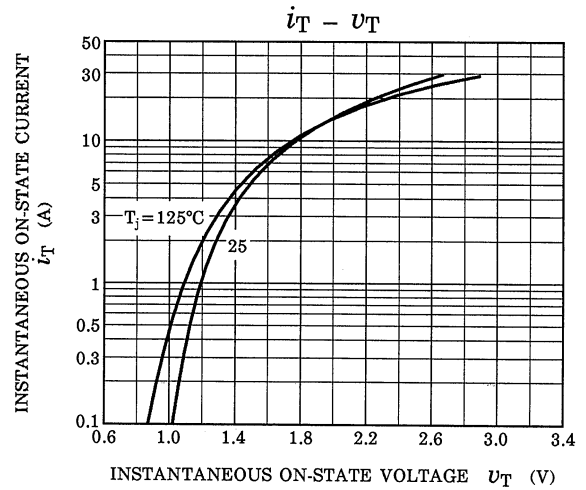
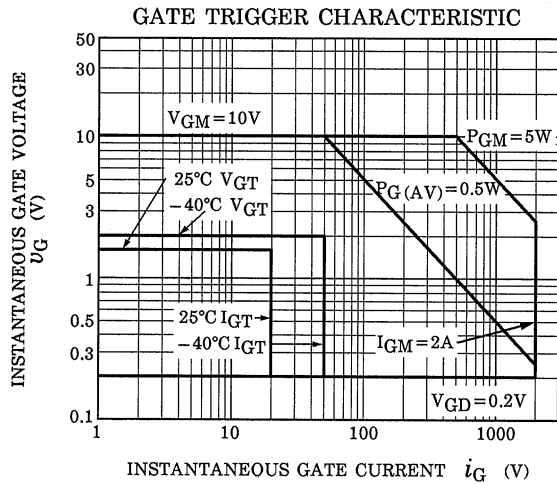
$I_{gp} = I_{GT} \times 2.0$

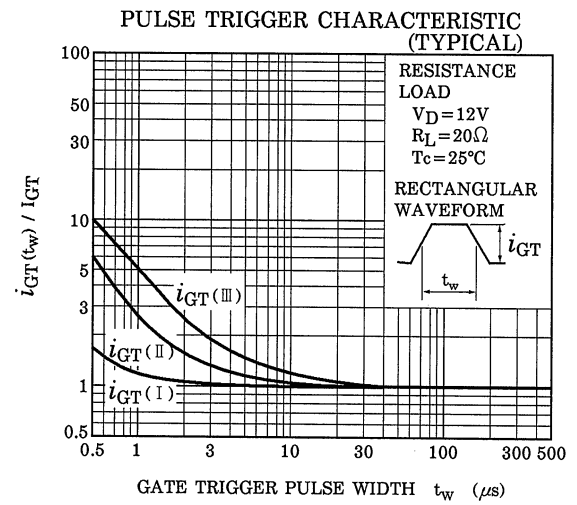
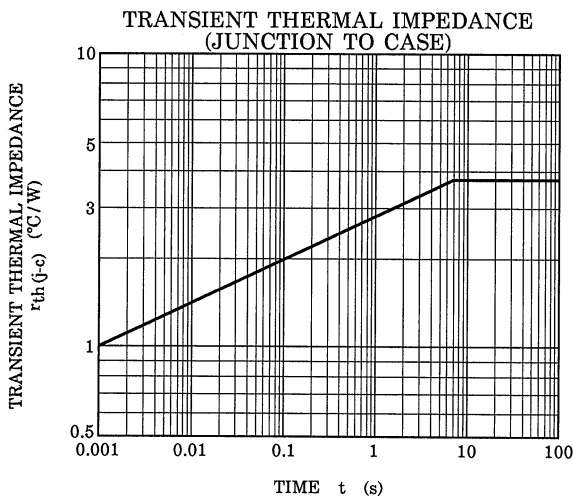
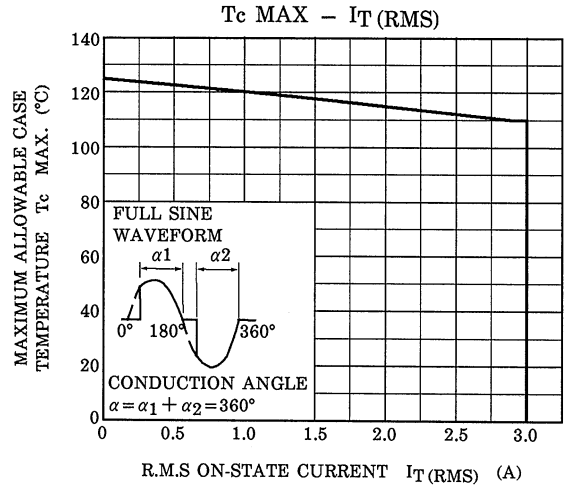
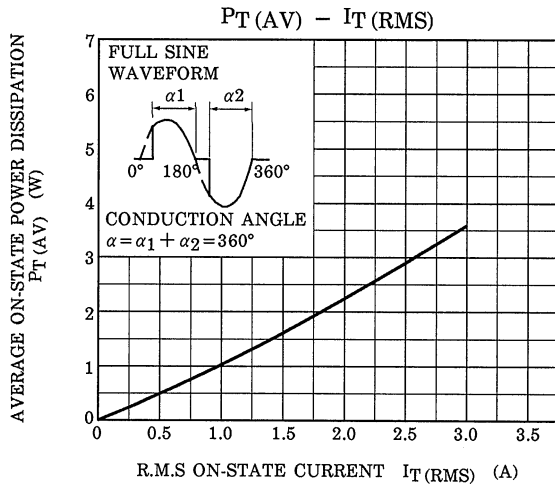
Note 2: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) 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		—	—	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 (+)	—	—	—	
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 (+)	—	—	—	
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





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20070701-EN

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