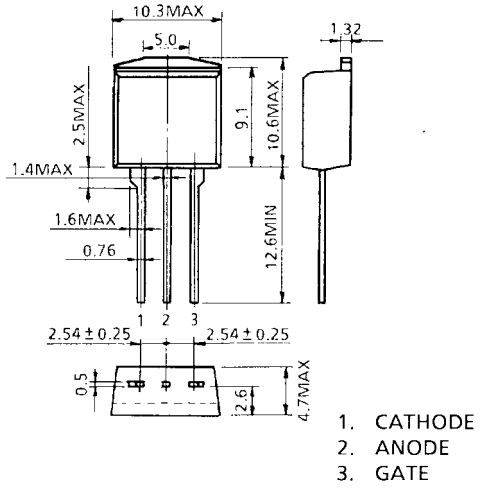
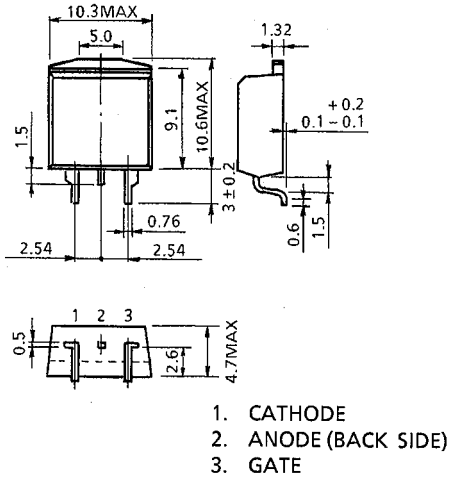
TOSHIBA THYRISTOR SILICON PLANAR TYPE

SF5G48,SF5J48,USF5G48,USF5J48

MEDIUM POWER CONTROL APPLICATIONS

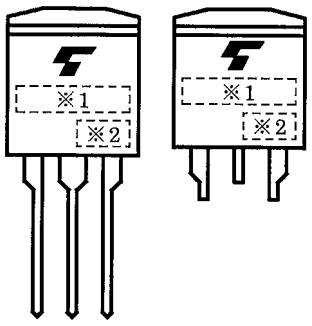
- Repetitive Peak Off−State Voltage : V_{DRM} = 400, 600V
  Repetitive Peak Reverse Voltage : V_{RRM} = 400, 600V
- Average On−State Current : $I_{T\ (AV)}$ = 5A
- Gate Trigger Current : I_{GT} = 10mA Max.

Unit: mm

SF5G48·SF5J48		USF5G48·USF5J48	
			
JEDEC	—	JEDEC	—
JEITA	—	JEITA	—
TOSHIBA	13−10J1B	TOSHIBA	13−10J2B

Weight: 1.7g

MARKING



*1	MARK	F5G48	TYPE NAME	SF5G48, USF5G48
		F5J48		SF5J48, USF5J48
*2	Lot Number □□ ← Month (Starting from Alphabet A) ↑ Year (Last Decimal Digit of the Current Year)			

MAXIMUM RATINGS

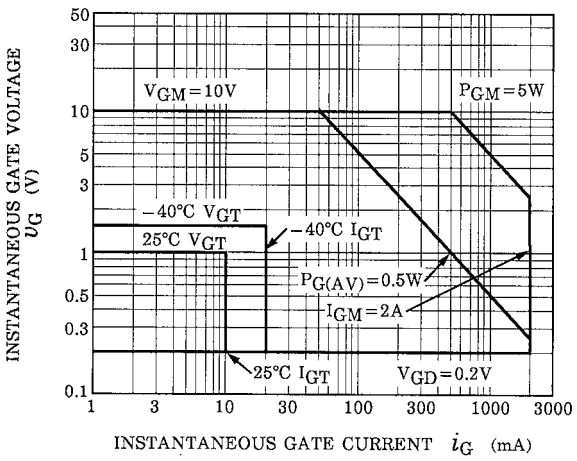
CHARACTERISTIC		SYMBOL	RATING	UNIT
Repetitive Peak Off−State Voltage and Repetitive Peak Reverse Voltage	SF5G48	V_{DRM} V_{RRM}	400	V
	USF5G48			
	SF5J48		600	
	USF5J48			
Non−Repetitive Peak Reverse Voltage (Non−Repetitive < 5ms T_j = 0~125°C)	SF5G48	V_{RSM}	500	V
	USF5G48			
	SF5J48		720	
	USF5J48			
Average On−State Current		$I_{T\ (AV)}$	5	A
R.M.S On−State Current		$I_{T\ (RMS)}$	7.8	A
Peak One Cycle Surge On−State Current (Non−Repetitive)		I_{TSM}	80 (50Hz)	A
			88 (60Hz)	
I^2t Limit Value		I^2t	32	A^2s
Critical Rate of Rise of On−State Current (Note 1)		di /dt	100	A / μs
Peak Gate Power Dissipation		P_{GM}	5	W
Average Gate Power Dissition		$P_{G\ (AV)}$	0.5	W
Peak Forward Gate Voltage		V_{FGM}	10	V
Peak Reverse Gate Voltage		V_{RGM}	−5	V
Peak Forward Gate Current		I_{GM}	2	A
Junction Temperature		T_j	−40~125	°C
Strage Temperature Range		T_{stg}	−40~125	°C

Note 1: V_{DRM} = 0.5 × Rated
$I_{TM} \leq 15A$
$t_{gw} \geq 10\mu s$
$t_{gr} \leq 250ns$
$i_{gp} = I_{GT} \times 2.0$

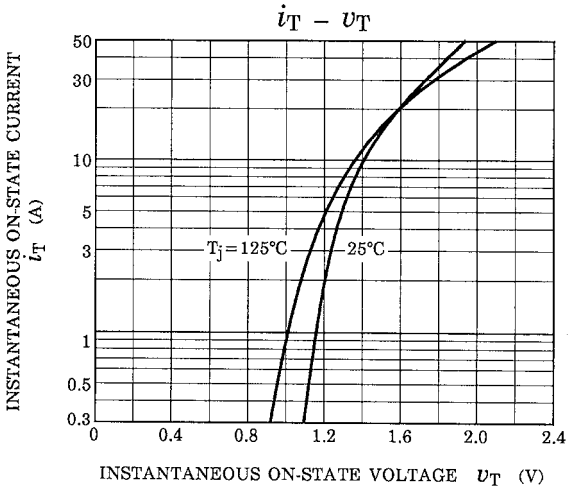
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN	TYP.	MAX	UNIT
Repetitive Peak Off−State Current and Repetitive Peak Reverse	I_{DRM} I_{RRM}	$V_{DRM} = V_{RRM}$ = Rated	—	—	10	μA
Peak On−State Voltage	V_{TM}	I_{TM} = 15A	—	—	1.5	V
Gate Trigger Voltage	V_{GT}	V_D = 6V, R_L = 10Ω	—	—	1.0	V
Gate Trigger Current	I_{GT}		—	—	10	mA
Gate Non−Trigger Voltage	V_{GD}	V_D = Rated × 2 / 3, Tc = 125°C	0.2	—	—	V
Critical Rate of Rise of Off−State Voltage	dv / dt	V_{DRM} = Rated, Tc = 125°C Exponential Rise	—	50	—	V / μs
Holding Current	I_H	V_D = 6V, I_{TM} = 1A	—	—	40	mA
Latching Current	I_L	V_D = 6V, f = 50Hz t_{gw} = 50μs, i_G = 30mA	—	—	50	mA
Thermal Resistance	$R_{th\ (j-c)}$	Junction to Case, DC	—	—	3.2	°C / W

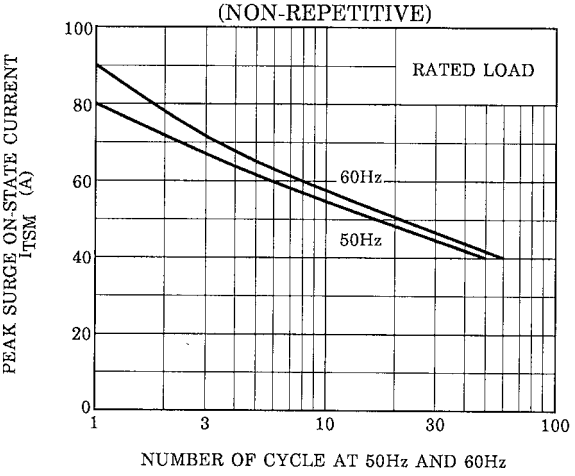
GATE TRIGGER CHARACTERISTIC



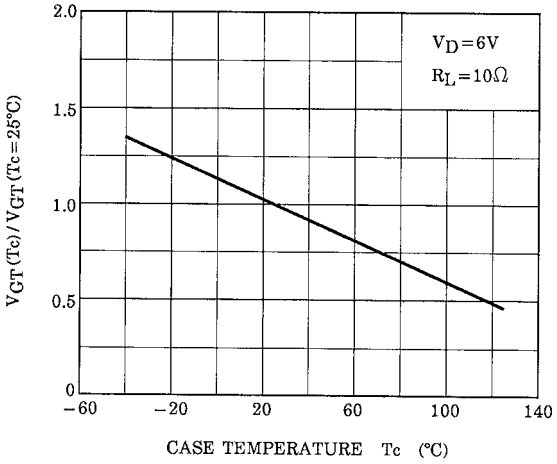
$i_T - v_T$



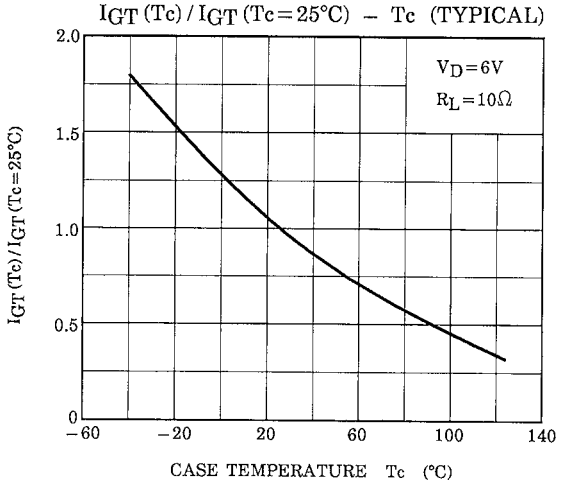
SURGE ON-STATE CURRENT
(NON-REPETITIVE)



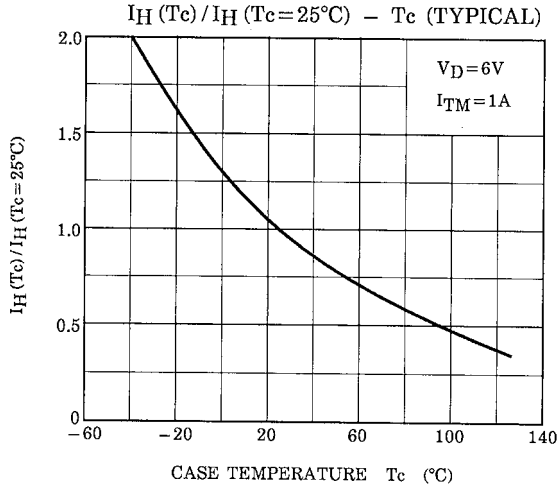
V_{GT} (Tc) / V_{GT} (Tc=25°C) − Tc (TYPICAL)



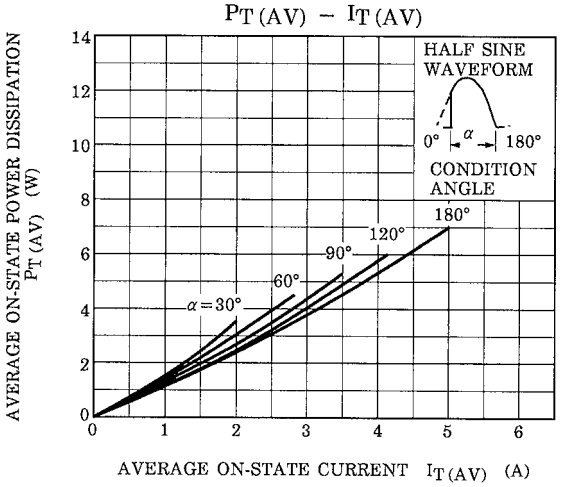
I_{GT} (Tc) / I_{GT} (Tc=25°C) − Tc (TYPICAL)



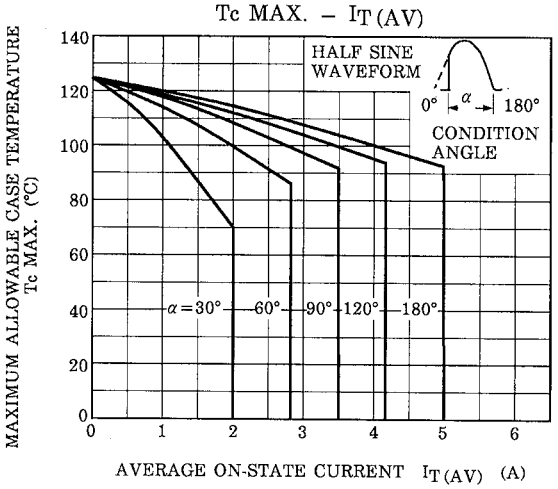
I_H (Tc) / I_H (Tc=25°C) − Tc (TYPICAL)



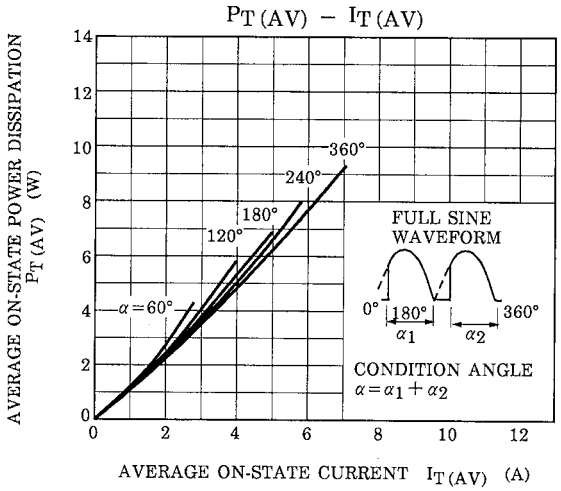
$P_{T(AV)}$ – $I_{T(AV)}$



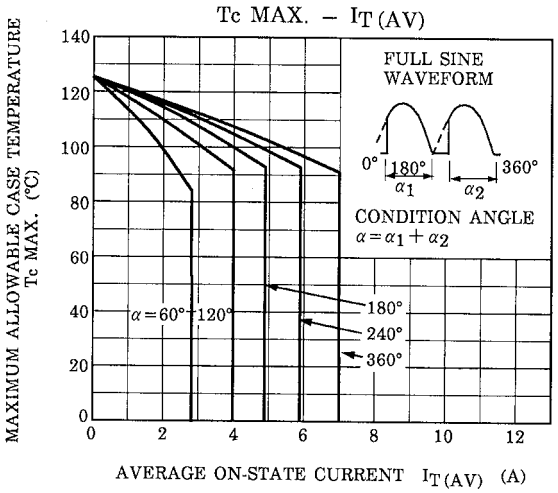
Tc MAX. – $I_{T(AV)}$



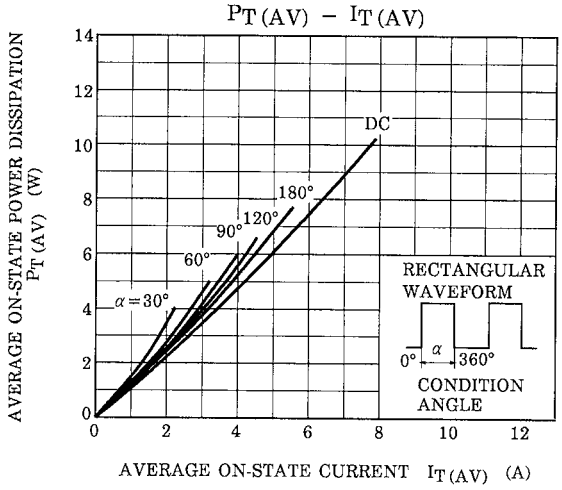
$P_{T(AV)}$ – $I_{T(AV)}$



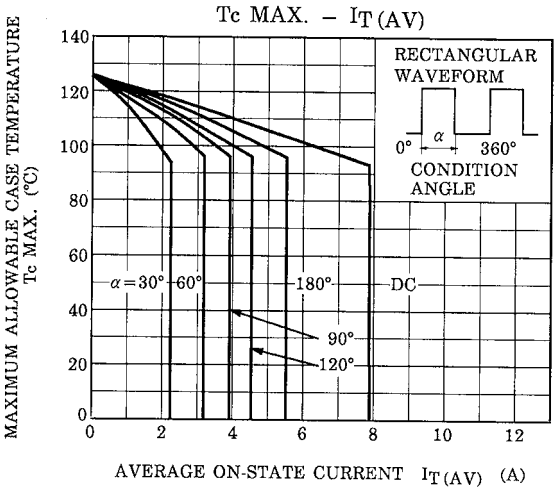
Tc MAX. – $I_{T(AV)}$



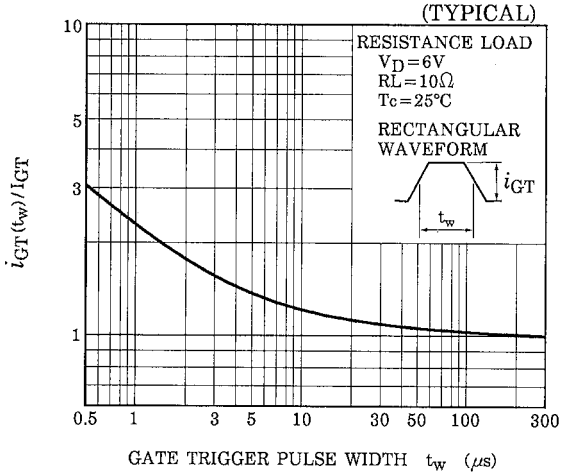
$P_{T(AV)}$ – $I_{T(AV)}$



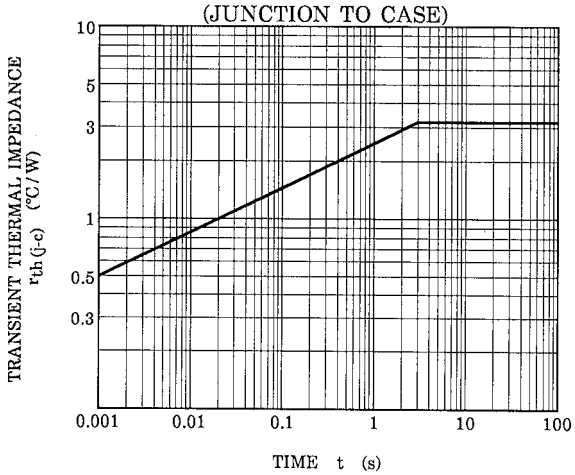
Tc MAX. – $I_{T(AV)}$



PULSE TRIGGER CHARACTERISTIC
(TYPICAL)



TRANSIENT THERMAL IMPEDANCE
(JUNCTION TO CASE)



RESTRICTIONS ON PRODUCT USE

000707EAA

- TOSHIBA is continually working to improve the quality and reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such TOSHIBA products could cause loss of human life, bodily injury or damage to property.
  In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent TOSHIBA products specifications. Also, please keep in mind the precautions and conditions set forth in the “Handling Guide for Semiconductor Devices,” or “TOSHIBA Semiconductor Reliability Handbook” etc..
- The TOSHIBA products listed in this document are intended for usage in general electronics applications (computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.). These TOSHIBA products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury (“Unintended Usage”). Unintended Usage include atomic energy control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, combustion control instruments, medical instruments, all types of safety devices, etc.. Unintended Usage of TOSHIBA products listed in this document shall be made at the customer’s own risk.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.