

TOSHIBA THYRISTOR SILICON PLANAR TYPE

## SF5G48, SF5J48, USF5G48, USF5J48

### MEDIUM POWER CONTROL APPLICATIONS

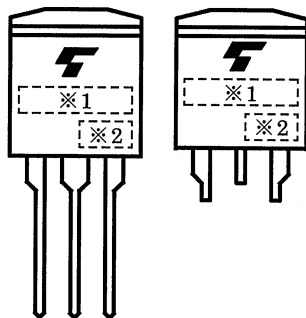
- Repetitive Peak Off-State Voltage :  $V_{DRM} = 400, 600V$   
 Repetitive Peak Reverse Voltage :  $V_{RRM} = 400, 600V$
- Average On-State Current :  $I_T (AV) = 5A$
- Gate Trigger Current :  $I_{GT} = 10mA \text{ Max.}$

Unit: mm

SF5G48-SF5J48	USF5G48-USF5J48
<p>1. CATHODE 2. ANODE 3. GATE</p>	<p>1. CATHODE 2. ANODE (BACK SIDE) 3. GATE</p>
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

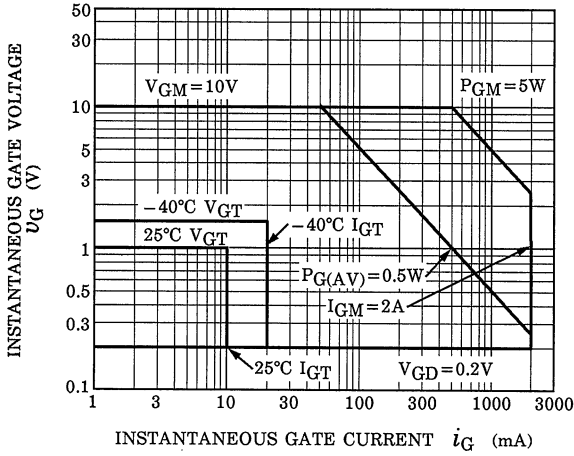
CHARACTERISTIC		SYMBOL	RATING	UNIT
Repetitive Peak Off-State Voltage and Repetitive Peak Reverse Voltage	SF5G48	$V_{DRM}$ $V_{RRM}$	400	V
	USF5G48			
	SF5J48		600	
	USF5J48			
Non-Repetitive Peak Reverse Voltage (Non-Repetitive < 5ms $T_j = 0 \sim 125^\circ\text{C}$ )	SF5G48	$V_{RSM}$	500	V
	USF5G48			
	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 / $\mu s$
Peak Gate Power Dissipation		$P_{GM}$	5	W
Average Gate Power Dissipation		$P_G (AV)$	0.5	W
Peak Forward Gate Voltage		$V_{FGM}$	10	V
Peak Reverse Gate Voltage		$V_{RGM}$	-5	V
Peak Forward Gate Current		$I_{GM}$	2	A
Junction Temperature		$T_j$	-40~125	$^\circ\text{C}$
Storage Temperature Range		$T_{stg}$	-40~125	$^\circ\text{C}$

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

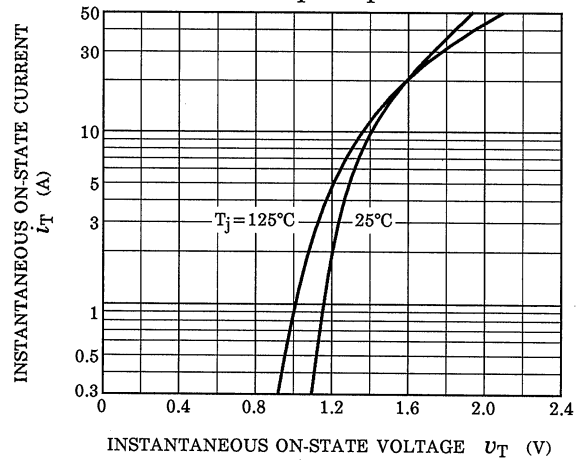
## ELECTRICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )

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

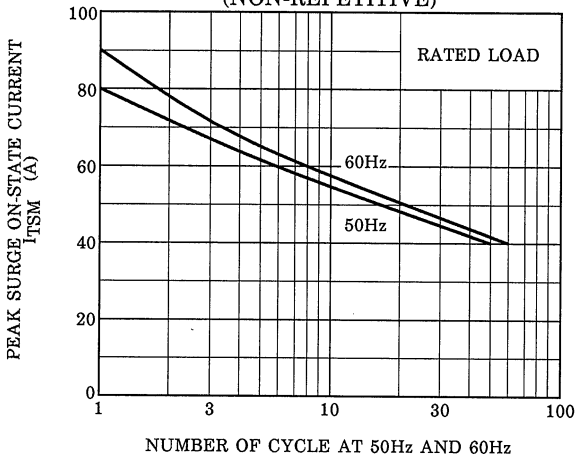
GATE TRIGGER CHARACTERISTIC



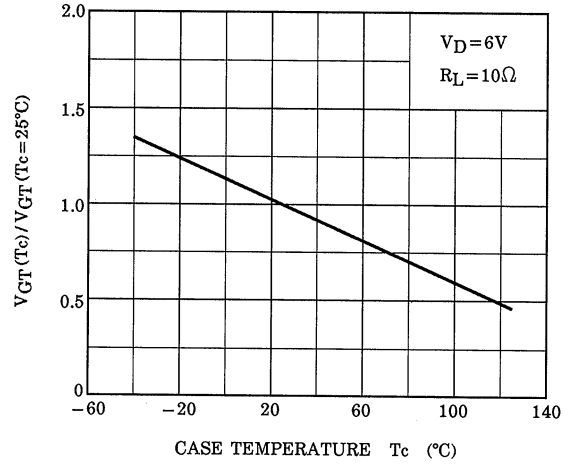
$i_T - U_T$



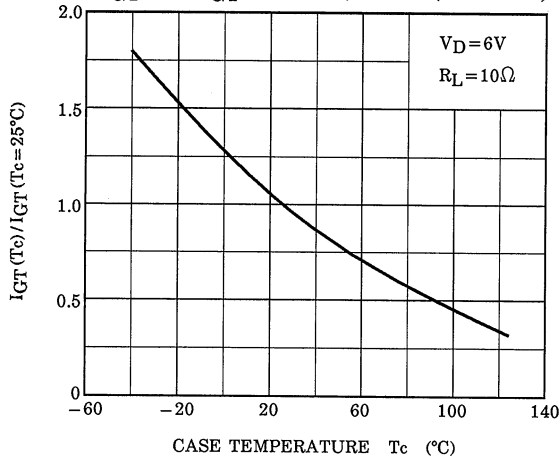
SURGE ON-STATE CURRENT (NON-REPETITIVE)



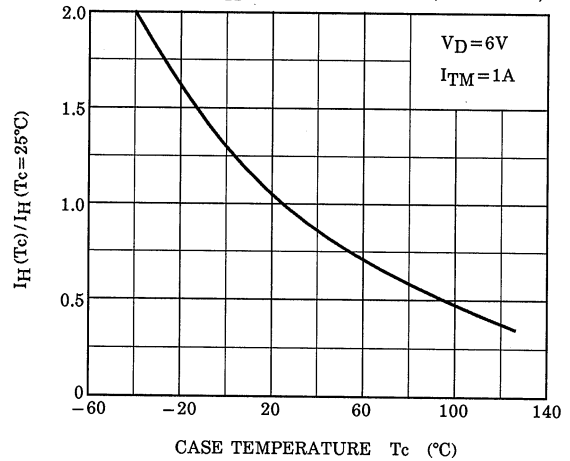
$V_{GT}(T_c) / V_{GT}(T_c = 25^\circ C) - T_c$  (TYPICAL)

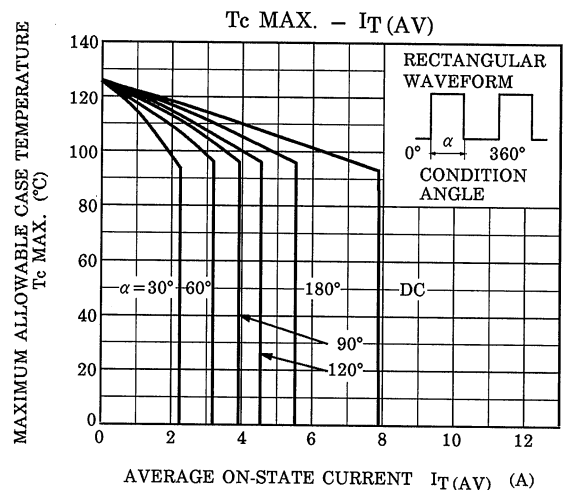
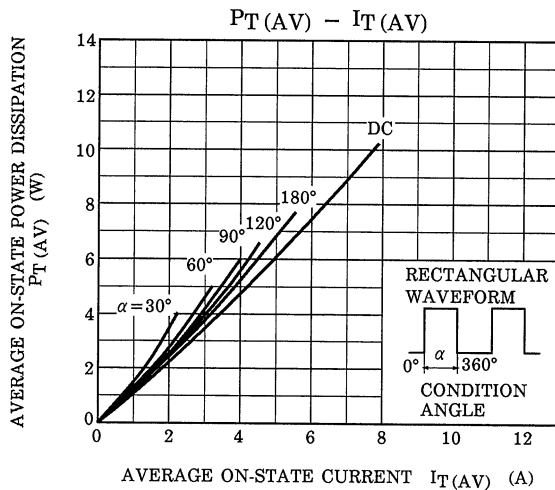
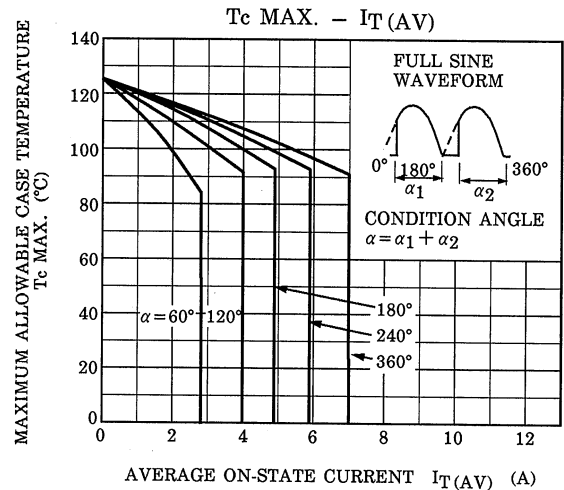
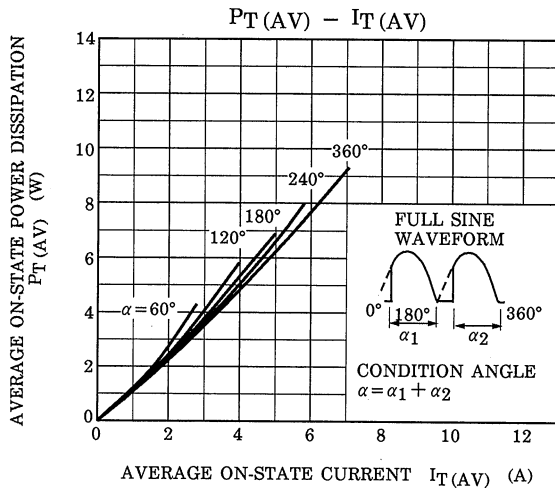
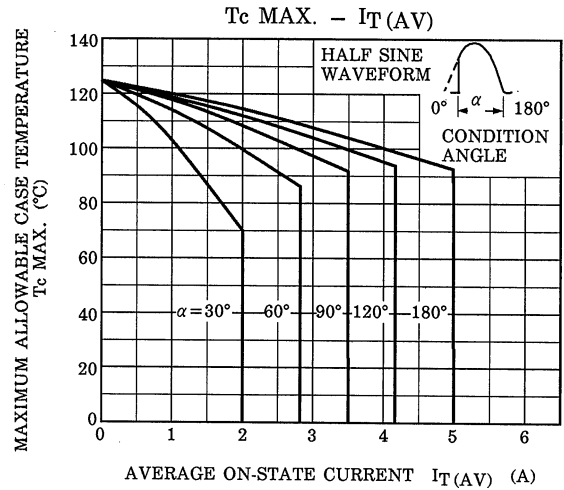
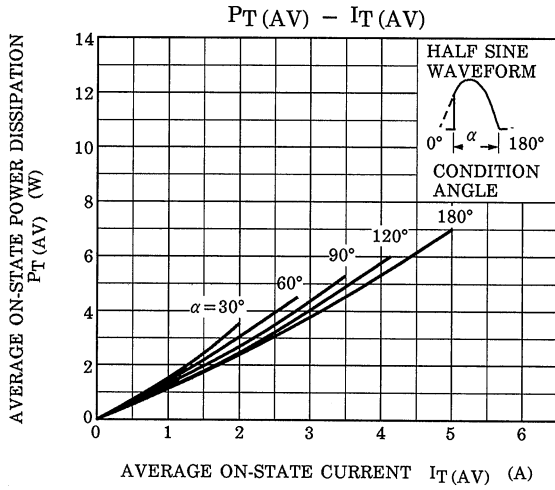


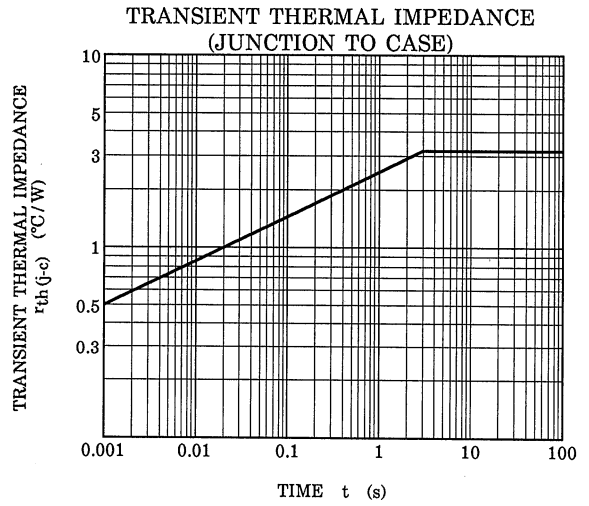
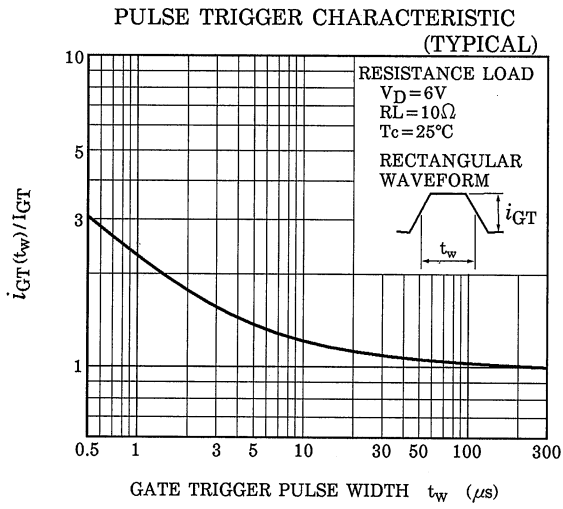
$I_{GT}(T_c) / I_{GT}(T_c = 25^\circ C) - T_c$  (TYPICAL)



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







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