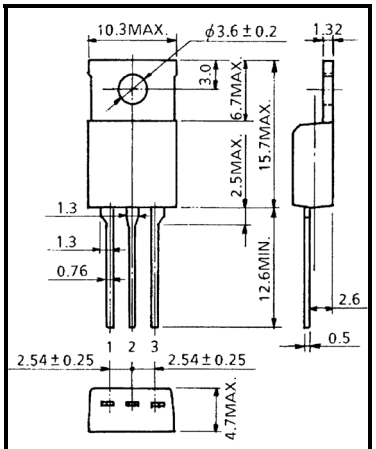
TOSHIBA THYRISITOR SILICON PLANAR TYPE

SF5G42, SF5J42

MEDIUM POWER CONTROL APPLICATIONS

- Repetitive Peak Off−State Voltage: V_{DRM} = 400V, 600V
  Repetitive Peak Reverse Voltage: V_{RRM} = 400V, 600V
- Average On−State Current: $I_{T(AV)}$ = 5A
- JEDEC TO−220AB Package.

Unit: mm



1. CATHODE
2. ANODE (HEAT SINK)
3. GATE

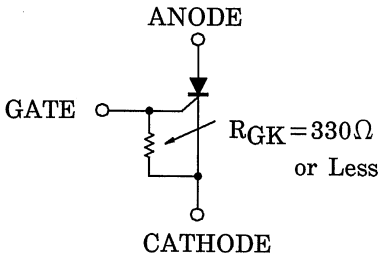
JEDEC	TO-220AB
JEITA	—
TOSHIBA	13-10G1B

Weight: 2.0 g (typ.)

MAXIMUM RATINGS

CHARACTERISTIC		SYMBOL	RATING	UNIT
Repetitive Peak Off−State Voltage and Repetitive Peak Reverse Voltage (RGK = 330Ω)	SF5G42	V_{DRM} V_{RRM}	400	V
	SF5J42		600	
Non−Repetitive Peak Reverse Voltage (Non−Repetitive<5ms, Tj = 0~125°C, RGK = 330Ω)	SF5G42	V_{RSM}	500	V
	SF5J42		720	
Average On−State Current (Half Sine Waveform Tc = 91°C)		$I_{T\ (AV)}$	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
Peak Gate Power Dissipation		P_{GM}	0.5	W
Average Gate Power Dissipation		$P_{G\ (AV)}$	0.05	W
Peak Forward Gate Voltage		V_{FGM}	5	V
Peak Reverse Gate Voltage		V_{RGM}	−5	V
Peak Forward Gate Current		I_{GM}	200	mA
Junction Temperature		T_j	−40~125	°C
Storage Temperature Range		T_{stg}	−40~125	°C

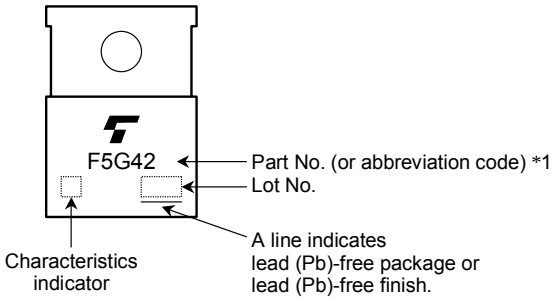
Note: Should be used with gate resistance as shown below.



ELECTRICAL CHARACTERISTICS (Ta = 25°C)

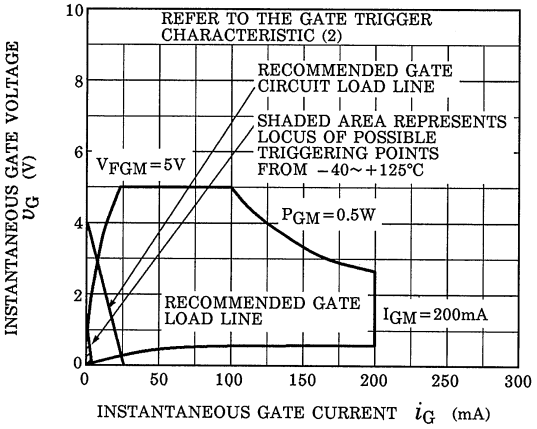
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN	TYP.	MAX	UNIT
Repetitive Peak Off−State Current and Repetitive Peak Reverse Current	I_{DRM} I_{RRM}	$V_{DRM} = V_{RRM}$ = Rated T_j = 125°C, R_{GK} = 330Ω	—	—	2	mA
Peak On−State Voltage	V_{TM}	I_{TM} = 15A	—	—	1.6	V
Gate Trigger Voltage	V_{GT}	V_D = 6V, R_L = 100Ω R_{GK} = 330Ω	—	—	0.8	V
Gate Trigger Current	I_{GT}		—	—	200	μA
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 × 2 / 3, Tc = 75°C R_{GK} = 330Ω, Exponential Rise	—	50	—	V / μs
Holding Current	I_H	R_L = 100Ω, R_{GK} = 330Ω	—	4	—	mA
Thermal Resistance	$R_{th\ (j-c)}$	Junction to Case	—	—	3	°C / W

MARKING

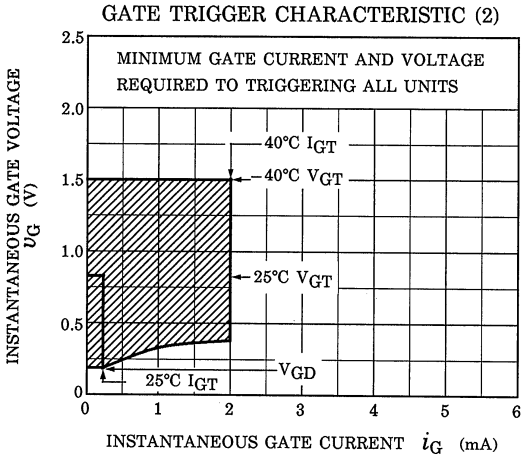


*1	Part No. (or abbreviation code)	Part No.
	F5G42	SF5G42
	F5J42	SF5J42

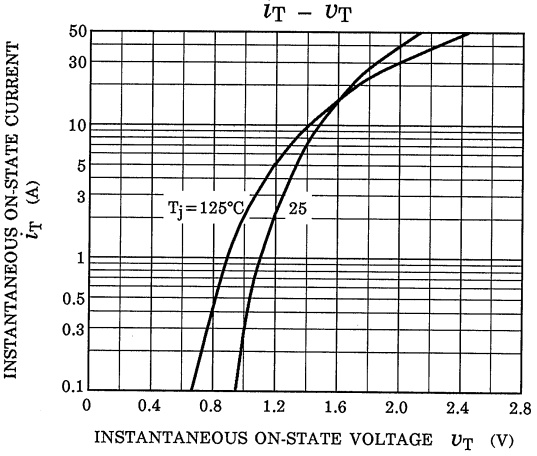
GATE TRIGGER CHARACTERISTIC (1)



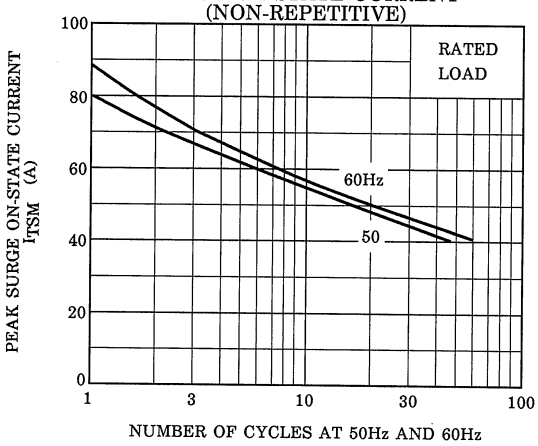
GATE TRIGGER CHARACTERISTIC (2)



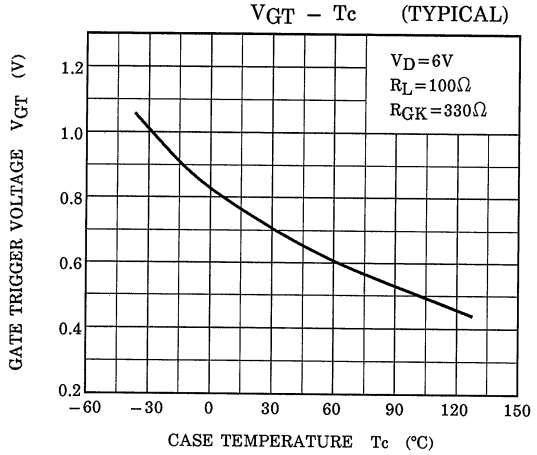
iT − vT



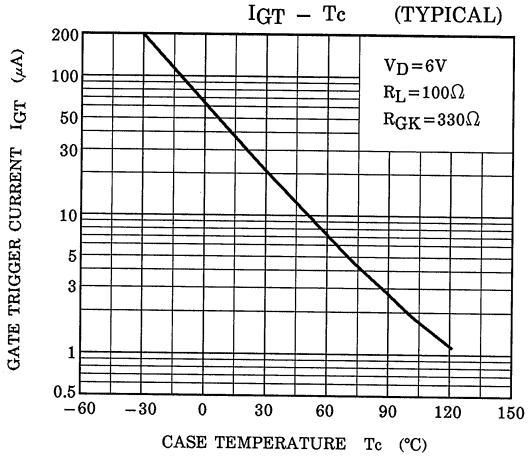
SURGE ON-STATE CURRENT (NON-REPETITIVE)



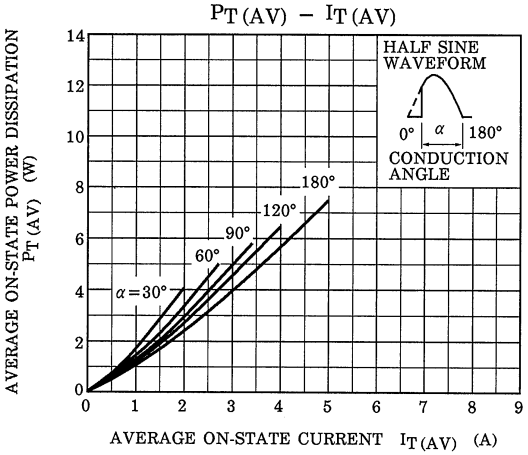
VGT − Tc (TYPICAL)



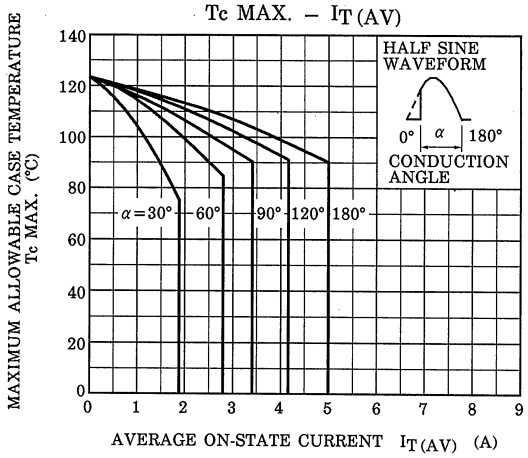
IGT − Tc (TYPICAL)



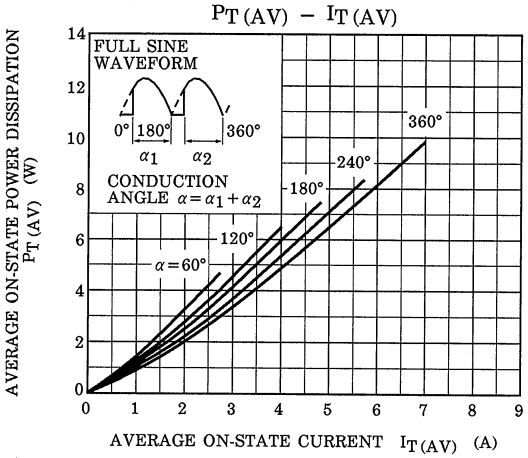
$P_{T(AV)} - I_{T(AV)}$



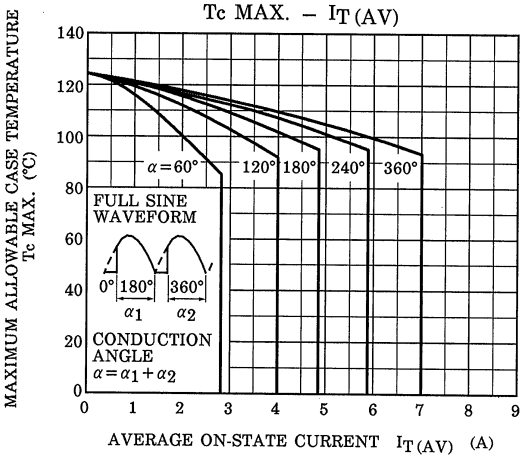
Tc MAX. – $I_{T(AV)}$



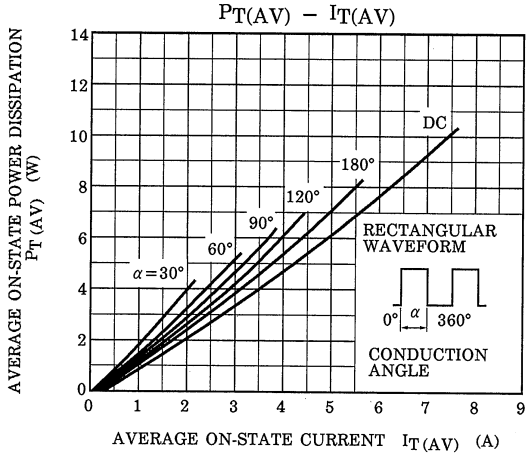
$P_{T(AV)} - I_{T(AV)}$



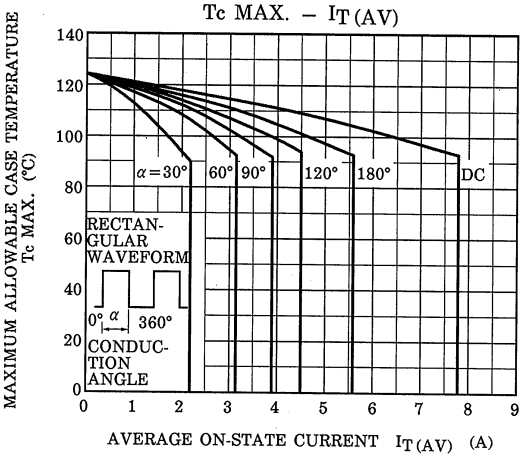
Tc MAX. – $I_{T(AV)}$



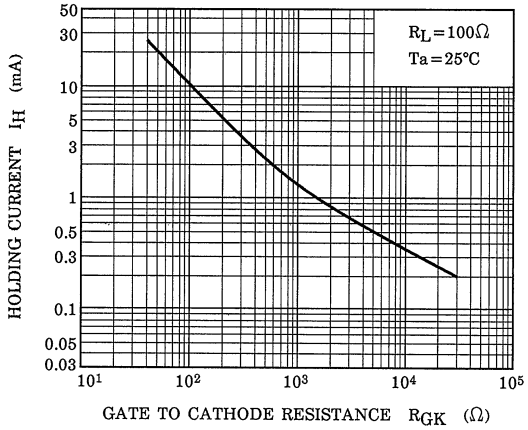
$P_{T(AV)} - I_{T(AV)}$



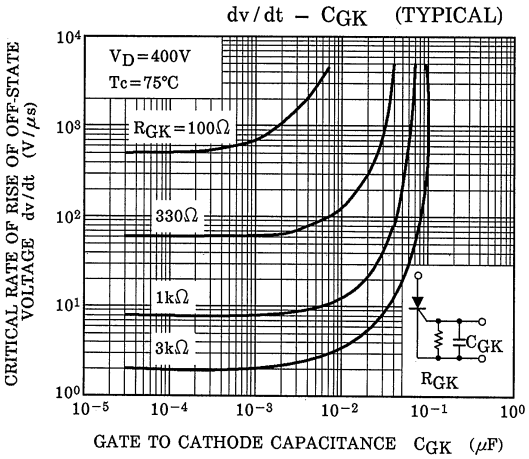
Tc MAX. – $I_{T(AV)}$



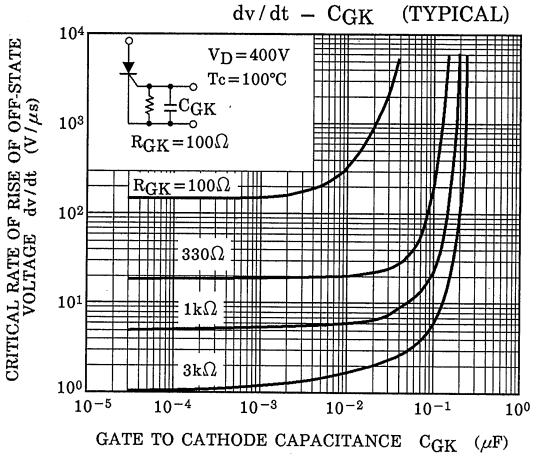
I_H – R_{GK}



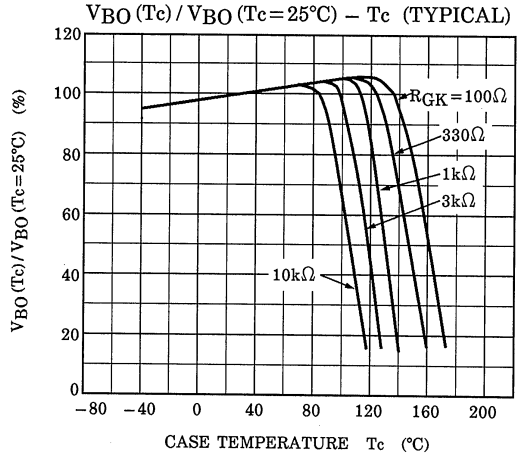
dv/dt – C_{GK} (TYPICAL)



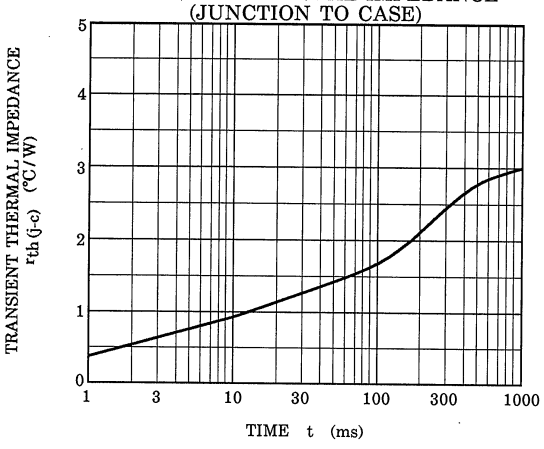
dv/dt – C_{GK} (TYPICAL)



V_{BO} (Tc) / V_{BO} (Tc=25°C) – Tc (TYPICAL)



TRANSIENT THERMAL IMPEDANCE (JUNCTION TO CASE)



RESTRICTIONS ON PRODUCT USE

030619EAA

- The information contained herein is subject to change without notice.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA for any infringements of patents or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of TOSHIBA or others.
- 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.
- TOSHIBA products should not be embedded to the downstream products which are prohibited to be produced and sold, under any law and regulations.