

TOSHIBA GATE TURN-OFF THYRISTOR

**SG2200FXF24, SG2200GXH24**

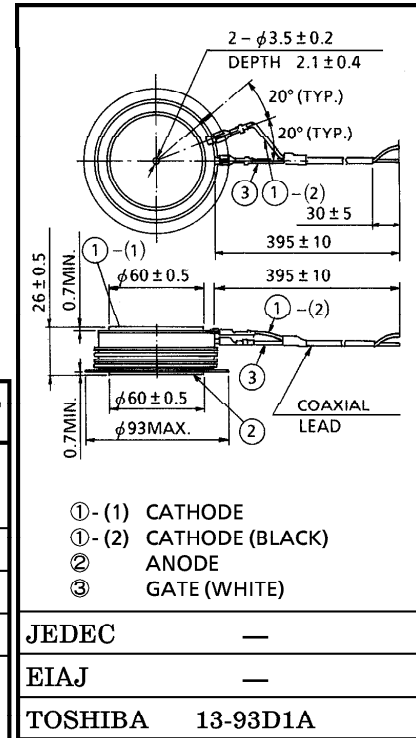
INVERTER APPLICATION

Unit in mm

- Repetitive Peak Off-State Voltage :  $V_{DRM}=4500V, 3300V$
- R.M.S On-State Current :  $I_T(RMS)=1000A$
- Peak Turn-Off Current :  $I_{TGQM}=2200A$
- Critical Rate of Rise of On-State Current :  $di/dt=400A/\mu s$
- Critical Rate of Rise of Off-State Voltage :  $dv/dt=1000V/\mu s$

MAXIMUM RATINGS

CHARACTERISTIC		SYMBOL	RATING	UNIT
Repetitive Peak Off-State Voltage (Note 1)	SG2200FXF24	$V_{DRM}$	3300	V
	SG2200GXH24		4500	
Repetitive Peak Reverse Voltage		$V_{RRM}$	16	V
Peak Turn-Off Current (Note 2)		$I_{TGQM}$	2200	A
R.M.S On-State Current (Note 3)		$I_T(RMS)$	1000	A
Peak One Cycle Surge On-State Current (Non Repetitive, 10ms-Width Half Sine Waveform)		$I_{TSM}$	16000	A
Critical Rate of Rise of On-State Current (Note 4)		$di/dt$	400	A / $\mu s$
Peak Forward Gate Current		$I_{FGM}$	100	A
Average Forward Gate Power Dissipation		$P_{FG(AV)}$	50	W
Average Reverse Gate Power Dissipation		$P_{RG(AV)}$	120	W
R.M.S Gate Current (Note 5)		$I_G(RMS)$	42	A
Peak Reverse Gate Voltage (at Static)		$V_{RGM}$	16	V
Operating Junction Temperature Range		$T_j$	-40~125	°C
Storage Temperature Range		$T_{stg}$	-40~150	°C
Mounting Force		—	20.6±2.9	kN



Weight : 800g

- Note 1  $V_{GK} = -2V$
- Note 2  $V_{DM} = V_{DRM}, C_S = 4\mu F, R_S = 5\Omega, di_{GQ}/dt = 35A/\mu s, V_{DSP} \leq 650V, L_S \leq 0.3\mu H$
- Note 3 50Hz Half Sine Waveform at  $T_f = 76^\circ C$
- Note 4  $V_D = 1/2 V_{DRM}, I_{GM} = 25A$
- Note 5 Ambient Temperature of coaxial gate-cathode lead =  $90^\circ C$

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## ELECTRICAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Repetitive Peak Off-State Current	$I_{DRM}$	$V_{DRM} = \text{Rated}$ , $V_{GK} = -2V$ , $T_j = 125^\circ C$	—	—	100	mA	
Repetitive Peak Reverse Current	$I_{RRM}$	$V_{RRM} = \text{Rated}$ , $T_j = 125^\circ C$	—	—	10	mA	
Repetitive Peak Reverse Gate Current	$I_{RGM}$	$V_{RGM} = 16V$ , $T_j = 125^\circ C$	—	—	10	mA	
Peak On-State Voltage	$V_{TM}$	$I_{TM} = 2200A$ , $T_j = 125^\circ C$	—	—	3.5	V	
Gate Trigger Voltage	$V_{GT}$	$V_D = 24V$ , $R_L = 0.1\Omega$	$T_j = -40^\circ C$	—	—	1.7	V
	$T_j = 25^\circ C$		—	—	1.2		
Gate Trigger Current	$I_{GT}$		$T_j = -40^\circ C$	—	—	7.5	A
			$T_j = 25^\circ C$	—	—	3.0	
Turn-On Delay Time	$t_d$	$V_D = 1/2V_{DRM}$ , $di/dt = 400A/\mu s$ , $I_{GM} = 25A$ , $T_j = 25^\circ C$	—	—	3	$\mu s$	
Turn-On Time	$t_{gt}$		—	—	10	$\mu s$	
Critical Rate of Rise of Off-State Voltage	$dv/dt$	$V_{DRM} = 2/3RATED$ , Exponential Rise, $T_j = 125^\circ C$ , $V_{GK} = -2V$	1000	—	—	$V/\mu s$	
Storage Time	$t_s$	$I_{TGQ} = 2200A$ , $V_{DM} = V_{DRM}$ , $V_D = 1/2V_{DRM}$ , $di_{GQ}/dt = 35A/\mu s$ , $C_S = 4\mu F$ , $R_S = 5\Omega$ , $T_j = 125^\circ C$ , $L_S \leq 0.3\mu H$	—	—	23	$\mu s$	
Gate Turn-Off Time	$t_{gq}$		—	—	25	$\mu s$	
Tail Time	$t_{tail}$		—	100	—	$\mu s$	
Gate Turn-Off Current	$I_{GQ}$		—	520	—	A	
Thermal Resistance (Junction to Fin)	$R_{th(j-f)}$		DC	—	—	0.020	$^\circ C/W$

