

TOSHIBA GATE TURN-OFF THYRISTOR REVERSE CONDUCTING TYPE

# SGR3000GXH26

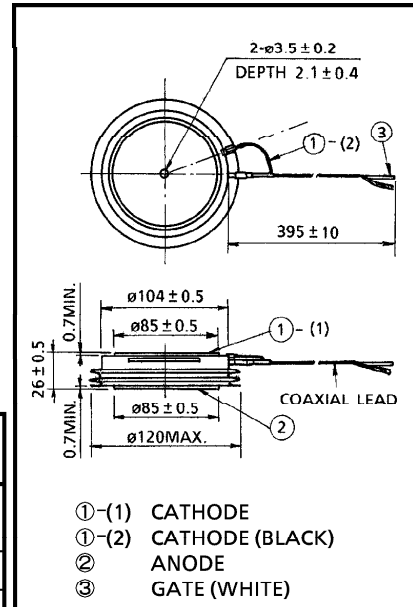
INVERTER APPLICATION

Unit in mm

- Repetitive Peak Off-State Voltage :  $V_{DRM}=4500V$  (Note 1)
- R.M.S On-State Current :  $I_T(RMS)=1200A$  ( $T_f=77^\circ C$ )
- R.M.S Reverse Current :  $I_R(RMS)=900A$  ( $T_f=77^\circ C$ )
- Peak Turn-Off Current :  $I_{TGQM}=3000A$
- Critical Rate of Rise of On-State Current :  $di/dt=600A/\mu s$
- Critical Rate of Rise of Off-State Current :  $dv/dt=1000V/\mu s$

**MAXIMUM RATINGS**

CHARACTERISTIC	SYMBOL	RATING	UNIT
Repetitive Peak Off-State Voltage (Note 1)	$V_{DRM}$	4500	V
Peak Turn-Off Current (Note 2)	$I_{TGQM}$	3000	A
R.M.S On-State Current (Note 3)	$I_T(RMS)$	1200	A
R.M.S Reverse Current (Note 3)	$I_R(RMS)$	900	A
Peak One Cycle Surge On-State Current (non repetitive, 10ms-width half sine waveform)	$I_{TSM}$	16000	A
Peak One Cycle Surge Reverse Current (non repetitive, 10ms-width half sine waveform)	$I_{RSM}$	14000	A
Critical Rate of Rise of On-State Current (Note 4)	$di/dt$	600	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	$P_{RG(AV)}$	230	W
Peak Reverse Gate Power Dissipation	$P_{RGM}$	30	kW
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	$^\circ C$
Storage Temperature Range	$T_{stg}$	-40~150	$^\circ C$
Mounting Force	—	$39.2 \pm 4.9$	kN



JEDEC	—
EIAJ	—
TOSHIBA	13-120K1A

Weight : 1700g

Note 1 :  $V_{GK} \leq -2V$

Note 2 :  $V_{DM}=4000V$ ,  $C_S=3.5\mu F$ ,  $R_S=5\Omega$ ,  $di_{GQ}/dt=50A/\mu s$ ,  $L_S \leq 0.2\mu H$ ,  $V_{DSP} \leq 1030V$

Note 3 : 50Hz Half Sine Waveform at  $T_f=77^\circ C$

Note 4 :  $V_D=1/2 V_{DRM}$ ,  $I_{TM}=4000A$ ,  $I_{GM} \geq 25A$

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	$I_{DRM}$	$V_{DRM} = \text{RATED}$ , $V_{GK} = -2V$ , $T_j = 125^\circ\text{C}$	—	—	150	mA	
Repetitive Peak Reverse Gate Current	$I_{RGM}$	$V_{RGM} = 18V$ , $T_j = 25^\circ\text{C}$	—	—	250	mA	
Peak On-State Voltage	$V_{TM}$	$I_{TM} = 3000A$ , $T_j = 125^\circ\text{C}$	—	—	4.0	V	
Peak Reverse Voltage	$V_{RM}$	$I_{RM} = 3000A$ , $T_j = 125^\circ\text{C}$	—	—	4.0	V	
Gate Trigger Voltage	$V_{GT}$	$V_D = 24V$ , $R_L = 0.1\Omega$	$T_j = -40^\circ\text{C}$	—	—	1.5	V
	$T_j = 25^\circ\text{C}$		—	—	1.20		
Gate Trigger Current	$I_{GT}$		$T_j = -40^\circ\text{C}$	—	—	8.0	A
	$T_j = 25^\circ\text{C}$		—	—	3.0		
Turn-On Delay Time	$t_d$	$V_D = 1/2 V_{DRM}$ , $I_{TM} = 4000A$ , $di/dt = 600A/\mu s$ , $I_{GM} = 25A$ , $di_G/dt = 10A/\mu s$ , $T_j = 25^\circ\text{C}$	—	—	3	$\mu s$	
Turn-On Time	$t_{gt}$		—	—	10		
Critical Rate of Rise of Off-State Voltage	$dv/dt$	$V_{DRM} = 2/3 \text{ RATED}$ , $T_j = 125^\circ\text{C}$ , $V_{GK} = -15V$	1000	—	—	$V/\mu s$	
Storage Time	$t_s$	$V_{DM} = 4000V$ , $I_{TGQ} = 3000A$ , $V_D = 1/2 V_{DRM}$ , $di_{GQ}/dt = 50A/\mu s$ , $C_S = 3.5\mu F$ , $R_S = 5\Omega$ , $T_j = 125^\circ\text{C}$ , $L_S \leq 0.2\mu H$	—	—	27.0	$\mu s$	
Gate Turn-Off Time	$t_{gq}$		—	—	30.0		
Gate Turn-Off Current	$I_{GQ}$		—	—	800	A	
Tail Time	$t_{tail}$		( $V_D = 1000V$ )	—	—	115	$\mu s$
Commutating Critical Rate of Rise of Off-State Voltage	$dv/dt (c)$	$I_{RM} = 3500A$ , $di_R/dt = 300A/\mu s$ , $V_D = 1500V$ , $V_{DM} = 3000V$ , $C_S = 3.5\mu F$ , $V_{GK} = -2V$ , $T_j = 125^\circ\text{C}$	350	—	—	$V/\mu s$	
Reverse Recovery Charge	$Q_{rr}$	$I_{RM} = 2000A$ , $V_D = 500V$ , $di_R/dt = 100A/\mu s$ , $T_j = 125^\circ\text{C}$ (no snubber circuit)	—	—	2200	$\mu C$	
Peak Reverse Recovery Current	$I_{rr}$		—	—	500	A	
Thermal Resistance (Junction to Fin)	$R_{th(j-f)}$	DC	GTO Side	—	—	0.016	$^\circ\text{C}/W$
			Diode Side	—	—	0.025	

