

TOSHIBA GATE TURN-OFF THYRISTOR REVERSE CONDUCTING TYPE

SGR3000GXH28

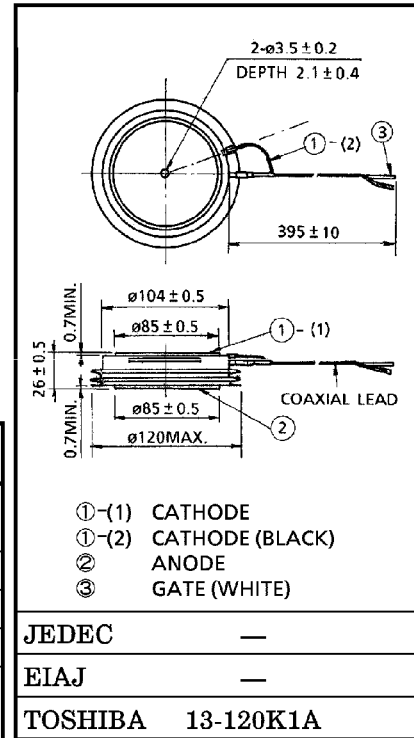
INVERTER APPLICATION

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 Voltage : $dv/dt=1000V/\mu s$
- Suitable For 3000V DC Off-State Voltage Application

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 / μs
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 ± 4.9	kN



Weight : 1700g

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

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

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

Note 4 : $V_D=3000V$, $I_{TM}=4000A$, $I_{GM}=25A$

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}	$V_{DRM}=4500V$, $V_{GK}=-2V$, $T_j=125^\circ C$	—	—	150	mA	
Repetitive Peak Reverse Gate Current	I_{RGM}	$V_{RGM}=18V$, $T_j=25^\circ C$	—	—	250	mA	
Peak On-State Voltage	V_{TM}	$I_{TM}=3000A$, $T_j=125^\circ C$	—	—	4.0	V	
Peak Reverse Voltage	V_{RM}	$I_{RM}=3000A$, $T_j=125^\circ C$	—	—	4.0	V	
Gate Trigger Voltage	V_{GT}	$V_D=24V$, $R_L=0.1\Omega$	$T_j=-40^\circ C$	—	—	V	
	$T_j=25^\circ C$		—	—	1.20		
Gate Trigger Current	I_{GT}		$T_j=-40^\circ C$	—	—	A	
	$T_j=25^\circ C$		—	—	3.0		
Turn-On Delay Time	t_d	$V_D=2800V$, $I_{TM}=3000A$, $di/dt=600A/\mu s$, $I_{GM}=25A$, $di_G/dt=10A/\mu s$, $T_j=25^\circ C$	—	—	3	μs	
Turn-On Time	t_{gt}		—	—	10		
Critical Rate of Rise of Off-State Voltage	dv/dt	$V_D=3000V$, Exponential Rise, $T_j=125^\circ C$, $V_{GK}=-15V$	1000	—	—	V / μs	
Storage Time	t_s	$I_{TGQ}=3000A$, $V_{DM}=4000V$, $V_D=2800V$, $di_{RG}/dt=50A/\mu s$, $C_S=3.5\mu F$, $R_S=5\Omega$, $T_j=125^\circ C$, $L_S\leq 0.2\mu H$	—	—	29.7	μs	
Gate Turn-Off Time	t_{gq}		—	—	33.0		
Tail Time	t_{tail}		—	—	115		
Gate Turn-Off Current	I_{GQ}		—	880	—	A	
Commutating Critical Rate of Rise of Off-State Voltage	$dv/dt(c)$	$I_{RM}=3500A$, $di_R/dt=300A/\mu s$, $V_D=1500V$, $V_{DM}=3000V$, $C_S=3.5\mu F$, $V_{GK}=-15V$, $T_j=125^\circ C$	350	—	—	V / μs	
Reverse Recovery Charge	Q_{rr}	$I_R=2000A$, $V_D=500V$, $di_R/dt=100A/\mu s$, $T_j=125^\circ C$ (no snubber circuit)	—	—	3300	μC	
Thermal Resistance (Junction to Fin)	$R_{th(j-f)}$	DC	GTO Side	—	—	0.016	$^\circ C/W$
			Diode Side	—	—	0.025	

