

TOSHIBA GATE TURN-OFF THYRISTOR LOW SNUBBER TYPE

SG4000GXH29G

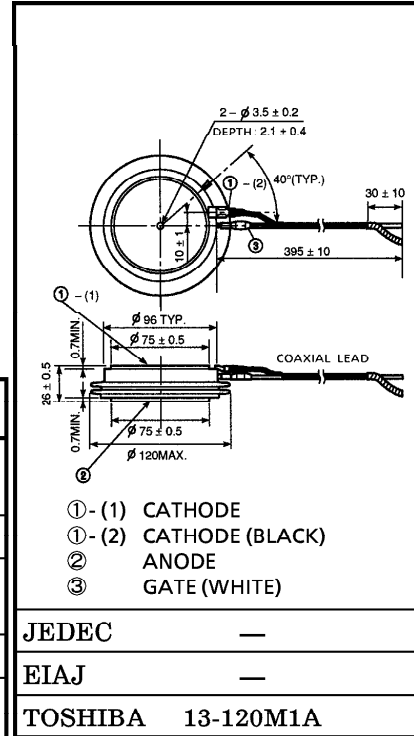
INVERTER APPLICATION

Unit in mm

- Repetitive Peak Off-State Voltage : $V_{DRM}=4500V$
- R.M.S On-State Current : $I_T(RMS)=1200A$
- Peak Turn-Off Current : $I_{TGQM}=4000A$
- Critical Rate of Rise of On-State Current : $di/dt=500A/\mu s$
- 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
Repetitive Peak Reverse Voltage	V_{RRM}	17	V
Peak Turn-Off Current (Note 2)	I_{TGQM}	4000 (6 μF) 3000 (3 μF)	A
R.M.S On-State Current (Note 3)	$I_T(RMS)$	1200	A
Peak One Cycle Surge On-State Current (Non Repetitive, 10ms-Width Half Sine Waveform)	I_{TSM}	20000	A
Critical Rate of Rise of On-State Current (Note 4)	di/dt	500	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	$P_{RG(AV)}$	250	W
R.M.S Gate Current (Note 5)	$I_G(RMS)$	42	A
Peak Reverse Gate Voltage (at Static)	V_{RGM}	17	V
Operating Junction Temperature Range	T_j	-40~125	°C
Storage Temperature Range	T_{stg}	-40~150	°C
Mounting Force	—	28.5~44.0	kN



Weight : 1500g

Note 1 : $V_{GK} = -2V$

Note 2 : $V_{DM} = 4500V$, $C_S = 6\mu F$ or $3\mu F$, $di_{GQ}/dt = 50A/\mu s$, $V_{DSP} \leq 1200V$ ($C_S = 6\mu F$),
 $L_S \leq 0.2\mu H$ (TOSHIBA method)

Note 3 : 50Hz Half Sine Waveform at $T_f = 76^\circ C$

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

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}	$V_{DRM}=4500V$, $V_{GK}=-2V$, $T_j=125^\circ C$	—	—	100	mA
Repetitive Peak Reverse Current	I_{RRM}	$V_{RRM}=17V$, $T_j=125^\circ C$	—	—	10	mA
Repetitive Peak Reverse Gate Current	I_{RGM}	$V_{RGM}=17V$, $T_j=125^\circ C$	—	—	10	mA
Peak On-State Voltage	V_{TM}	$I_{TM}=3000A$, $T_j=125^\circ C$	—	—	4.0	V
Gate Trigger Voltage	V_{GT}	$V_D=24V$, $R_L=0.1\Omega$	$T_j=-40^\circ C$	—	—	V
	$T_j=25^\circ C$		—	—	1.5	
Gate Trigger Current	I_{GT}		$T_j=-40^\circ C$	—	—	A
	$T_j=25^\circ C$		—	—	3.5	
Turn-On Delay Time	t_d	$V_D=2800V$, $di/dt=500A/\mu s$, $I_{GM}=25A$, $T_j=25^\circ C$	—	—	3	μs
Turn-On Time	t_{gt}		—	—	10	μs
Critical Rate of Rise of Off-State Voltage	dv/dt	$V_D=3000V$, $V_{GK}=-2V$, Exponential Rise, $T_j=125^\circ C$	1000	—	—	$V/\mu s$
Storage Time	t_s	$I_{TGQ}=4000A$, $V_{DM}=4500V$, $R_S=5\Omega$, $V_D=2800V$, $di_{GQ}/dt=50A/\mu s$, $C_S=6\mu F$, $V_{DSP}\leq 1200V$, $T_j=125^\circ C$, $L_S\leq 0.2\mu H$	—	—	33	μs
Gate Turn-Off Time	t_{gq}		—	—	35	μs
Tail Time	t_{tail}		—	—	150	μs
Gate Turn-Off Current	I_{GQ}		—	930	—	A
Thermal Resistance (Junction to Fin)	$R_{th(j-f)}$	DC	—	—	0.014	$^\circ C/W$

