

TOSHIBA

SG3000GXH24

TOSHIBA GATE TURN-OFF THYRISTOR

SG3000GXH24

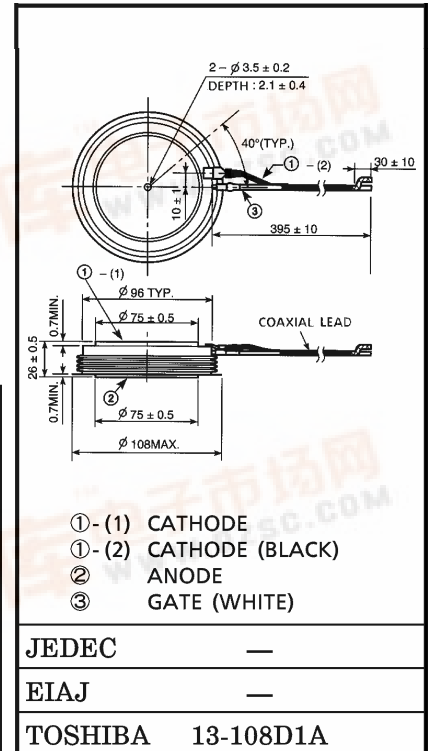
INVERTER APPLICATION

Unit in mm

- Repetitive Peak Off-State Voltage : $V_{DRM} = 4500\text{ V}$
- R.M.S On-State Current : $I_T(\text{RMS}) = 1200\text{ A}$
- Peak Turn-Off Current : $I_{TGQM} = 3000\text{ A}$
- Critical Rate of Rise of On-State Current : $di/dt = 400\text{ A}/\mu\text{s}$
- Critical Rate of Rise of Off-State Voltage : $dv/dt = 1000\text{ V}/\mu\text{s}$

MAXIMUM RATINGS

CHARACTERISTIC	SYMBOL	RATING	UNIT
Repetitive Peak Off-State Voltage (Note 1)	V_{DRM}	4500	V
Repetitive Peak Reverse Voltage	V_{RRM}	16	V
Peak Turn-Off Current (Note 2)	I_{TGQM}	3000	A
R.M.S On-State Current (Note 3)	$I_T(\text{RMS})$	1200	A
Peak One Cycle Surge On-State Current (Non Repetitive, 10 ms-Width Half Sine Waveform)	I_{TSM}	16000	A
Critical Rate of Rise of On-State Current (Note 4)	di/dt	400	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	$P_{RG(AV)}$	150	W
R.M.S Gate Current (Note 5)	$I_G(\text{RMS})$	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	—	33.3 ± 4.9	kN



Weight : 1290 g

(Note 1) : $V_{GK} = -2\text{ V}$

(Note 2) : $V_{DM} = 4500\text{ V}$, $C_S = 6\ \mu\text{F}$, $R_S = 5\ \Omega$, $di_{GQ}/dt = 50\text{ A}/\mu\text{s}$, $V_{DSP} \leq 850\text{ V}$, $L_S \leq 0.3\ \mu\text{H}$

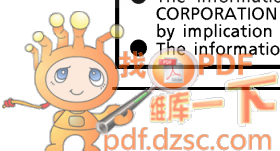
(Note 3) : 50 Hz Half Sine Waveform at $T_f = 76^\circ\text{C}$

(Note 4) : $V_D = 1/2 V_{DRM}$, $I_{GM} = 25\text{ A}$

(Note 5) : Ambient Temperature of coaxial gate-cathode lead = 90°C

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ELECTRICAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN	TYP.	MAX	UNIT	
Repetitive Peak Off-State Current	I_{DRM}	$V_{DRM} = \text{Rated}, V_{GK} = -2 \text{ V}, T_j = 125^\circ\text{C}$	—	—	100	mA	
Repetitive Peak Reverse Current	I_{RRM}	$V_{RRM} = \text{Rated}, T_j = 125^\circ\text{C}$	—	—	10	mA	
Repetitive Peak Reverse Gate Current	I_{RGM}	$V_{RGM} = 16 \text{ V}, T_j = 125^\circ\text{C}$	—	—	10	mA	
Peak On-State Voltage	V_{TM}	$I_{TM} = 3000 \text{ A}, T_j = 125^\circ\text{C}$	—	—	4.0	V	
Gate Trigger Voltage	V_{GT}	$V_D = 24 \text{ V}, R_L = 0.1 \Omega$	$T_j = -40^\circ\text{C}$	—	—	1.7	V
			$T_j = 25^\circ\text{C}$	—	—	1.5	
Gate Trigger Current	I_{GT}		$T_j = -40^\circ\text{C}$	—	—	8.5	A
			$T_j = 25^\circ\text{C}$	—	—	3.5	
Turn-On Delay Time	t_d	$V_D = 1/2 V_{DRM}, I_{TM} = 3000 \text{ A}, di/dt = 400 \text{ A}/\mu\text{s}, I_{GM} = 25 \text{ A}, T_j = 25^\circ\text{C}$	—	—	3	μs	
Turn-On Time	t_{gt}		—	—	10	μs	
Critical Rate of Rise of Off-State Voltage	dv/dt	$V_{DRM} = 2/3 \text{ RATED}, \text{Exponential Rise}, T_j = 125^\circ\text{C}, V_{GK} = -2 \text{ V}$	1000	—	—	$\text{V}/\mu\text{s}$	
Storage Time	t_s	$I_{TGQ} = 3000 \text{ A}, V_{DM} = 4500 \text{ V},$	—	—	27	μs	
Gate Turn-Off Time	t_{gq}	$V_D = 1/2 V_{DRM}, di_{GQ}/dt = 50 \text{ A}/\mu\text{s},$	—	—	30	μs	
Tail Time	t_{tail}	$C_S = 6 \mu\text{F}, R_S = 5 \Omega,$	—	—	80	μs	
Gate Turn-Off Current	I_{GQ}	$T_j = 125^\circ\text{C}, L_S \leq 0.3 \mu\text{H}$	—	700	—	A	
Thermal Resistance (Junction to Fin)	$R_{th(j-f)}$	DC	—	—	0.016	$^\circ\text{C}/\text{W}$	

