

TOSHIBA GATE TURN-OFF THYRISTOR

SG3000EX24

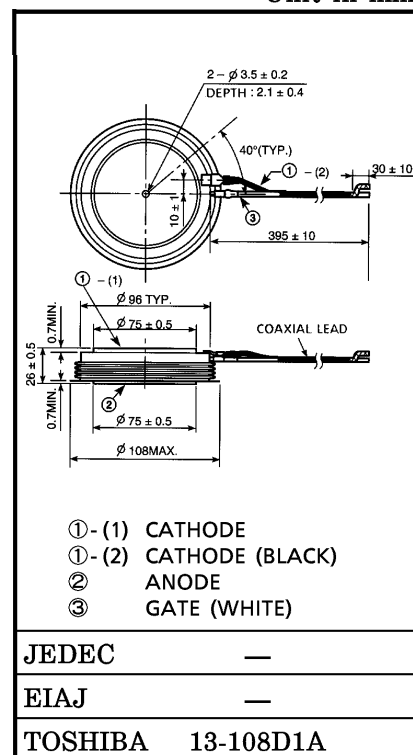
INVERTER APPLICATION

Unit in mm

- Repetitive Peak Off-State Voltage : $V_{DRM} = 2500 \text{ V}$
- R.M.S On-State Current : $I_{T(RMS)} = 1600 \text{ A}$
- 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}	2500	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)	$I_{T(RMS)}$	1600	A
Peak One Cycle Surge On-State Current (Non Repetitive, 10 ms-Width Half Sine Waveform)	I_{TSM}	22000	A
Critical Rate of Rise of On-State Current (Note 4)	di/dt	400	$\text{A}/\mu\text{s}$
Peak Forward Gate Current	I_{FGM}	100	A
Average Forward Gate Power Dissipation	$P_{FG(AV)}$	50	W
Average Reverse Gate Power Dissipation	$P_{RG(AV)}$	150	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	$-40 \sim 125$	$^{\circ}\text{C}$
Storage Temperature Range	T_{stg}	$-40 \sim 150$	$^{\circ}\text{C}$
Mounting Force	—	33.3 ± 4.9	kN



Weight : 1290 g

(Note 1) : $V_{GK} = -2 \text{ V}$ (Note 2) : $V_{DM} = 2500 \text{ V}$, $C_S = 6 \mu\text{F}$, $R_S = 5 \Omega$, $di_{GQ}/dt = 30 \text{ A}/\mu\text{s}$, $V_{DSP} \leq 750 \text{ V}$,
 $L_S \leq 0.2 \mu\text{H}$ (Note 3) : 50 Hz Half Sine Waveform at $T_f = 75^{\circ}\text{C}$ (Note 4) : $V_D = 1/2 V_{DRM}$, $I_{GM} = 30 \text{ A}$ (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}	$I_{TM} = 3000\text{ A}$, $T_j = 125^\circ\text{C}$	—	—	3.0	V
Gate Trigger Voltage	V_{GT}	$V_D = 24\text{ V}$, $R_L = 0.1\ \Omega$	$T_j = -40^\circ\text{C}$	—	—	1.5
			$T_j = 25^\circ\text{C}$	—	—	1.2
Gate Trigger Current	I_{GT}		$T_j = -40^\circ\text{C}$	—	—	10
			$T_j = 25^\circ\text{C}$	—	—	4.0
Turn-On Delay Time	t_d	$V_D = 1/2 V_{DRM}$, $I_{TM} = 3000\text{ A}$, $di/dt = 400\text{ A}/\mu\text{s}$, $I_{GM} = 30\text{ A}$, $T_j = 25^\circ\text{C}$	—	—	3.0	μs
Turn-On Time	t_{gt}		—	—	10	μs
Critical Rate of Rise of Off-State Voltage	dv/dt	$V_{DRM} = 2/3 \text{ RATED}$, Exponential Rise, $T_j = 125^\circ\text{C}$, $V_{GK} = -2\text{ V}$	1000	—	—	$\text{V}/\mu\text{s}$
Storage Time	t_s	$I_{TGQ} = 3000\text{ A}$, $V_{DM} = 2500\text{ V}$, $V_D = 1/2 V_{DRM}$, $di_{GQ}/dt = 30\text{ A}/\mu\text{s}$, $C_S = 6\ \mu\text{F}$, $R_S = 5\ \Omega$, $T_j = 125^\circ\text{C}$, $L_S \leq 0.2\ \mu\text{H}$	—	—	28	μs
Gate Turn-Off Time	t_{gq}		—	—	30	μs
Tail Time	t_{tail}		—	—	90	μs
Gate Turn-Off Current	I_{GQ}		—	650	—	A
Thermal Resistance (Junction to Fin)	$R_{th(j-f)}$	DC	—	—	0.016	$^\circ\text{C}/\text{W}$

