

TENTATIVE

TOSHIBA GATE TURN-OFF THYRISTOR

SG6000JX28

INVERTER APPLICATION

- Repetitive Peak Off-State Voltage : $V_{DRM} = 6000 \text{ V}$
- R.M.S On-State Current : $I_T(\text{RMS}) = 2700 \text{ A}$
- Peak Turn-Off Current : $I_{TGQM} = 6000 \text{ A}$
- Critical Rate of Rise of On-State Current : $di/dt = 500 \text{ A}/\mu\text{s}$
- Critical Rate of Rise of Off-State Voltage : $dv/dt = 1250 \text{ V}/\mu\text{s}$

MAXIMUM RATINGS

CHARACTERISTIC	SYMBOL	RATING	UNIT
Repetitive Peak Off-State Voltage (Note 1)	V_{DRM}	6000	V
Repetitive Peak Reverse Voltage	V_{RRM}	17	V
Peak Turn-Off Current (Note 2)	I_{TGQM}	6000	A
R.M.S On-State Current (Note 3)	$I_T(\text{RMS})$	2700	A
Peak One Cycle Surge On-State Current (Non Repetitive, 10 ms-Width Half Sine Waveform)	I_{TSM}	46000	A
Critical Rate of Rise of On-State Current (Note 4)	di/dt	500	A / μs
Peak Forward Gate Current	I_{FGM}	250	A
Average Forward Gate Power Dissipation	$P_{FG}(\text{AV})$	190	W
Average Reverse Gate Power Dissipation	$P_{RG}(\text{AV})$	550	W
R.M.S Gate Current (Note 5)	$I_G(\text{RMS})$	84	A
Peak Reverse Gate Voltage (At Static)	V_{RGM}	17	V
Operation Junction Temperature Range	T_j	-40~125	°C
Storage Temperature Range	T_{stg}	-40~150	°C
Mounting Force	—	80±8.0	kN

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

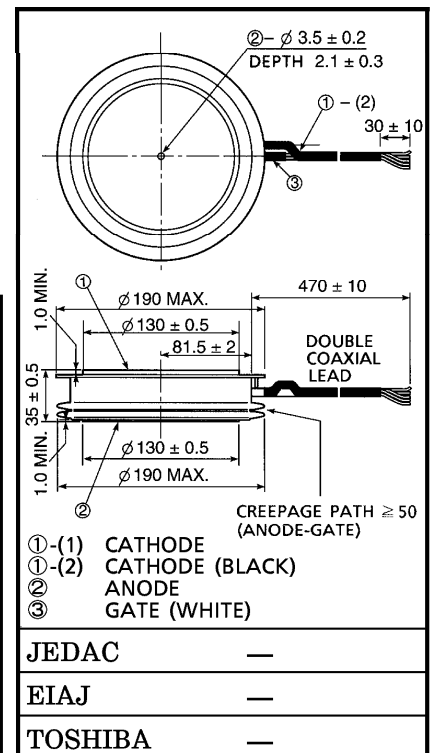
(Note 2) : $V_D = 4000 \text{ V}$, $V_{DM} \leq 6000 \text{ V}$, $C_S \geq 6 \mu\text{F}$, $di_{GQ}/dt \geq 60 \text{ A}/\mu\text{s}$, $V_{DSP} \leq 1200 \text{ V}$,
 $L_S \leq 80 \text{ nH}$ (without snubber diode)

(Note 3) : 50 Hz Half Sine Waveform

(Note 4) : $V_D \leq 4000 \text{ V}$, $I_{TM} \leq 6000 \text{ A}$, $I_G \geq 80 \text{ A}$ ($t_r \leq 1 \mu\text{s}$), $f \leq 50 \text{ Hz}$, $C_S \leq 6 \mu\text{F}$, $R_S \geq 5 \Omega$,
 $25^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$ [There is no V_D fluctuation just before the GTO turning on.]

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

Unit in mm



Weight : 6000 g

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ELECTRICAL CHARACTERISTICS

CHARACTERISTICS	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Repetitive Peak Off-State Current	I_{DRM}	$V_{\text{DRM}} = 6000 \text{ V}$, $V_{\text{GK}} = -2 \text{ V}$, $T_j = 125^\circ\text{C}$	—	—	200	mA
Repetitive Peak Reverse Current	I_{RRM}	$V_{\text{RRM}} = 17 \text{ V}$, $T_j = 125^\circ\text{C}$	—	—	10	mA
Repetitive Peak Reverse Gate Current	I_{RGM}	$V_{\text{RGM}} = 17 \text{ V}$, $T_j = 125^\circ\text{C}$	—	—	10	mA
Peak On-State Voltage	V_{TM}	$I_{\text{TM}} = 6000 \text{ A}$, $T_j = 125^\circ\text{C}$	—	4.0	—	V
Gate Trigger Voltage	V_{GT}	$V_{\text{D}} = 24 \text{ V}$, $R_{\text{L}} = 0.2 \Omega$	$T_j = -40^\circ\text{C}$	—	—	V
			$T_j = 25^\circ\text{C}$	—	2.0	
Gate Trigger Current	I_{GT}		$T_j = 0^\circ\text{C}$	—	20	A
			$T_j = 25^\circ\text{C}$	—	10	
Turn-On Delay Time	t_{d}	$V_{\text{D}} = 4000 \text{ V}$, $I_{\text{TM}} = 6000 \text{ A}$, $di/dt = 500 \text{ A}/\mu\text{s}$, $I_{\text{GM}} = 80 \text{ A}$ ($t_{\text{r}} = 1 \mu\text{s}$), $T_j = 25^\circ\text{C}$, Non-Snubber, $f = 1 \text{ Hz}$	—	—	3.0	μs
Turn-On Time	t_{gt}		—	—	10	
Critical Rate of Rise of Off-State Voltage	dv/dt	$V_{\text{DRM}} = 4000 \text{ V}$, $V_{\text{GK}} = -10 \text{ V}$, Exponential Rise Waveform, $T_j = 125^\circ\text{C}$	1250	—	—	$\text{V}/\mu\text{s}$
Storage Time	t_{s}	$I_{\text{TGQ}} = 6000 \text{ A}$, $V_{\text{DM}} = 6000 \text{ V}$, $T_j = 125^\circ\text{C}$, $V_{\text{D}} \leq 4000 \text{ V}$, $f = 1 \text{ Hz}$, $C_{\text{S}} = 6 \mu\text{F}$, $di_{\text{GQ}}/dt \doteq 80 \text{ A}/\mu\text{s}$, off squeeze current $\geq 600 \text{ mA}$	—	—	30	μs
Gate Turn-Off Time	t_{gq}		—	—	33	
Tail Time	t_{tail}		—	(*) 100	—	
Gate Turn-Off Current	I_{GQ}		—	—	1800	A
Thermal Resistance	$R_{\text{th(j-f)}}$	Junction to fin	—	—	0.0044	$^\circ\text{C}/\text{W}$

(*) : $V_{\text{D}} = 4000 \text{ V}$

