

TOSHIBA GATE TURN-OFF THYRISTOR

SG1200EX24

INVERTER APPLICATION

- Repetitive Peak Off-State Voltage : $V_{DRM} = 2500\text{ V}$
- R.M.S On-State Current : $I_T(\text{RMS}) = 500\text{ A}$
- Peak Turn-Off Current : $I_{TGQM} = 1200\text{ A}$
- Critical Rate of Rise of On-State Current : $di/dt = 250\text{ A}/\mu\text{s}$
- Critical Rate of Rise of Off-State Voltage : $dv/dt = 900\text{ V}/\mu\text{s}$

MAXIMUM RATINGS

CHARACTERISTIC	SYMBOL	RATING	UNIT
Repetitive Peak Off-State Voltage (Note 1)	V_{DRM}	2500	V
Repetitive Peak Reverse Voltage	V_{RRM}	15	V
Peak Turn-Off Current (Note 2)	I_{TGQM}	1200	A
R.M.S On-State Current (Note 3)	$I_T(\text{RMS})$	500	A
Peak One Cycle Surge On-State Current (Non Repetitive, 10 ms Width Half Sine Waveform)	I_{TSM}	6500	A
Critical Rate of Rise of On-state Current (Note 4)	di/dt	250	A / μs
Peak Gate Current	I_{GM}	450	A
Average Gate Power Dissipation	$P_G(\text{AV})$	80	W
R.M.S Gate Current (Note 5)	$I_G(\text{RMS})$	42	A
Peak Reverse Gate Voltage (at Static)	V_{RGM}	15	V
Operating Junction Temperature Range	T_j	-40~125	°C
Storage Temperature Range	T_{stg}	-40~150	°C
Mounting Force	—	11.8±1.2	kN

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

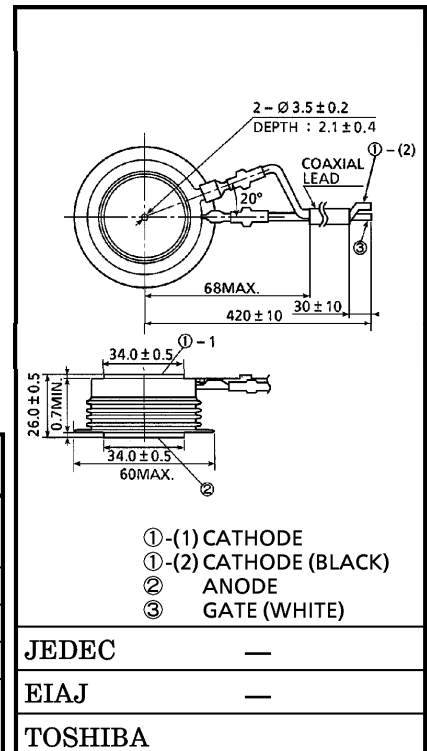
(Note 2) : $V_{DM} \leq 2000\text{ V}$, $C_S \geq 2.0\ \mu\text{F}$, $di_{GQ}/dt \geq 30\text{ A}/\mu\text{s}$, $L_S \leq 0.2\ \mu\text{H}$ ($V_{DSP} \leq 600\text{ V}$)

(Note 3) : 50 Hz Half Sine Waveform at $T_f \leq 82^\circ\text{C}$

(Note 4) : $V_D \leq 1250\text{ V}$, $I_{GM} \geq 18\text{ A}$ ($t_r \leq 1\ \mu\text{s}$)

(Note 5) : Ambient temperature of coaxial gate and cathode lead $\leq 90^\circ\text{C}$

Unit in mm



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ELECTRICAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Repetitive Peak Off-State Current	I_{DRM}	$V_{DRM} = 2500 \text{ V}$, $V_{GK} = -2 \text{ V}$, $T_j = 125^\circ\text{C}$	—	—	20	mA	
Repetitive Peak Reverse Current	I_{RRM}	$V_{RRM} = 16 \text{ V}$, $T_j = 125^\circ\text{C}$	—	—	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}	$I_{TM} = 1000 \text{ A}$, $T_j = 125^\circ\text{C}$	—	—	2.6	V	
Gate Trigger Voltage	V_{GT}	$V_D = 24 \text{ V}$, $R_L = 0.1 \Omega$	$T_j = -40^\circ\text{C}$	—	—	V	
	$T_j = 25^\circ\text{C}$		—	—	1.2		
Gate Trigger Current	I_{GT}		$T_j = 0^\circ\text{C}$	—	—	—	A
	$T_j = 25^\circ\text{C}$		—	—	1.5		
Turn-On Delay Time	t_d	$V_D = 1250 \text{ V}$, $I_{TM} = 1200 \text{ A}$, $di/dt = 250 \text{ A}/\mu\text{s}$,	—	—	2.0	μs	
Turn-On Time	t_{gt}	$I_{GM} = 18 \text{ A}$ ($t_r = 1 \mu\text{s}$), $T_j = 25^\circ\text{C}$	—	—	8.0	μs	
Critical Rate of Rise of Off-State Voltage	dv/dt	$V_{DRM} = 1700 \text{ V}$, $V_{GK} = -2 \text{ V}$, Exponential Rise, $T_j = 125^\circ\text{C}$	900	—	—	$\text{V}/\mu\text{s}$	
Storage Time	t_s	$I_{TGQ} = 1200 \text{ A}$,	—	—	18	μs	
Gate Turn-Off Time	t_{gq}	$V_D = 1250 \text{ V}$, $V_{DM} = 1700 \text{ V}$, $C_S = 2.0 \mu\text{F}$, $T_j = 125^\circ\text{C}$,	—	—	20	μs	
Gate Turn-Off Current	I_{GQ}	$di_{GQ}/dt = 30 \text{ A}/\mu\text{s}$,	—	320	—	A	
Tail Time	t_{tail}	Off Squeeze Current $\geq 265 \text{ mA}$	—	51	—	μs	
Thermal Resistance (Junction to Fin)	$R_{th(j-f)}$	DC	—	—	0.045	$^\circ\text{C}/\text{W}$	

