

TOSHIBA GATE TURN-OFF THYRISTOR

SG2000R24, SG2000U24, SG2000W24, SG2000EX24

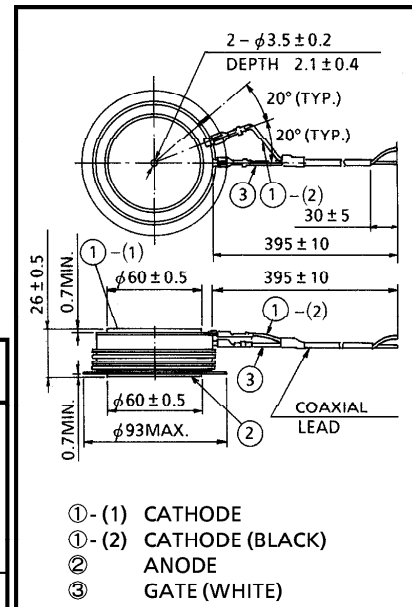
CHOPPER, INVERTER APPLICATION

Unit in mm

- Repetitive Peak Off-State Voltage
: $V_{DRM}=1300, 1600, 1800, 2500V$
- R.M.S On-State Current : $I_T(RMS)=1050A$
- Peak Turn-Off Current : $I_{TGQM}=2000A$
- Critical Rate of Rise of On-State Current : $di/dt=300A/\mu s$
- Critical Rate of Rise of Off-State Voltage : $dv/dt=1000V/\mu s$

MAXIMUM RATINGS

CHARACTERISTIC		SYMBOL	RATING	UNIT
Repetitive Peak Off-State Voltage (Note 1)	SG2000R24	V_{DRM}	1300	V
	SG2000U24		1600	
	SG2000W24		1800	
	SG2000EX24		2500	
Repetitive Peak Reverse Voltage		V_{RRM}	16	V
Peak Turn-Off Current (Note 2)		I_{TGQM}	2000	A
R.M.S On-State Current (Note 3)		$I_T(RMS)$	1050	A
Peak One Cycle Surge On-State Current (Non-Repetitive, 10ms Width Half Sine Waveform)		I_{TSM}	14000	A
Critical Rate of Rise of On-State Current (Note 4)		di/dt	300	$A/\mu s$
Peak Forward Gate Current		I_{FGM}	70	A
Average Forward Gate Power Dissipation		$P_{FG(AV)}$	14	W
Average Reverse Gate Power Dissipation		$P_{RG(AV)}$	120	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	$-40\sim 125$	$^{\circ}C$
Storage Temperature Range		T_{stg}	$-40\sim 150$	$^{\circ}C$
Mounting Force		—	19.6 ± 2.0	kN



JEDEC —
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TOSHIBA 13-93D1A

Weight : 800g

Note 1. $R_{GK}=10\Omega$ Note 2. $C_S=4\mu F$, $R_S=5\Omega$, $di_{GQ}/dt=40A/\mu s$, $I_{GQ}\leq 450A$, $V_{DM}=V_{DRM}$, $T_j=125^{\circ}C$
 $V_{DSP}\leq 600V$, $L_S\leq 0.3\mu H$ Note 3. Half Sine Waveform $T_f=80^{\circ}C$ Note 4. $V_D=1/2$ Rated, $I_G=30A$ 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}	$V_{DRM} = \text{Rated}$, $R_{GK} = 10\Omega$, $T_j = 125^\circ\text{C}$	—	—	50	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}	$V_{RGM} = \text{Rated}$, $T_j = 125^\circ\text{C}$	—	—	10	mA
Peak On-State Voltage	V_{TM}	$I_{TM} = 2000\text{A}$, $T_j = 125^\circ\text{C}$	—	—	2.4	V
Gate Trigger Voltage	V_{GT}	$V_D = 24\text{V}$, $R_L = 0.1\Omega$	$T_j = -40^\circ\text{C}$	—	1.5	V
			$T_j = 25^\circ\text{C}$	—	1.0	
Gate Trigger Current	I_{GT}		$T_j = -40^\circ\text{C}$	—	6.0	A
			$T_j = 25^\circ\text{C}$	—	2.5	
Turn-On Delay Time	t_d	$V_D = 1/2 \text{ Rated}$, $di/dt = 300\text{A}/\mu\text{s}$, $I_{TM} = 2000\text{A}$, $I_G = 30\text{A}$, $t_r = 1\mu\text{s}$, $T_j = 25^\circ\text{C}$	—	—	2.0	μs
Turn-On Time	t_{gt}		—	—	10	μs
Critical Rate of Rise of Off-State Voltage	dv/dt	$V_{DRM} = 2/3 \text{ Rated}$, $T_j = 125^\circ\text{C}$, $V_{GK} = -2\text{V}$, Exponential Rise	1000	—	—	$\text{V}/\mu\text{s}$
Storage Time	t_s	$I_T = 2000\text{A}$, $V_D = 1/2 \text{ Rated}$, $V_{DM} = V_{DRM}$, $C_S = 4\mu\text{F}$, $diGQ/dt = 40\text{A}/\mu\text{s}$, $T_j = 125^\circ\text{C}$, $L_S \leq 0.3\mu\text{H}$	—	—	20	μs
Gate Turn-Off Time	t_{gq}		—	—	23	μs
Tail Time	t_{tail}		—	—	60	μs
Gate Turn-Off Current	I_{GQ}		—	450	—	A
Thermal Resistance (Junction to Fin)	$R_{th(j-f)}$	DC	—	—	0.02	$^\circ\text{C}/\text{W}$

