TENTATIVE

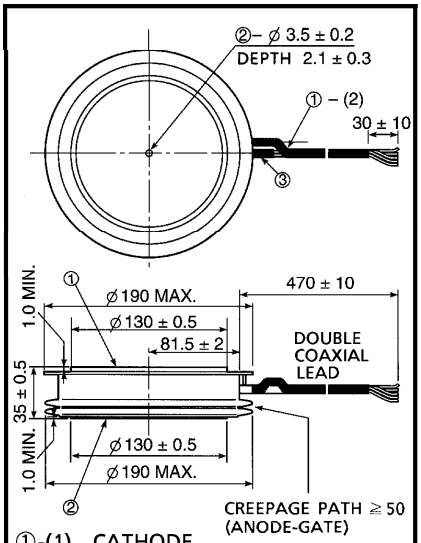
TOSHIBA GATE TURN-OFF THYRISTOR

SG6000JX28

INVERTER APPLICATION

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

Unit in mm



①-(1) CATHODE
①-(2) CATHODE (BLACK)
② ANODE
③ GATE (WHITE)

JEDAC	—
EIAJ	—
TOSHIBA	—

Weight : 6000 g

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)	$I_{T\,(RMS)}$	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	$P_{FG\,(AV)}$	190	W
Average Reverse Gate Power Dissipation	$P_{RG\,(AV)}$	550	W
R.M.S Gate Current (Note 5)	$I_{G\,(RMS)}$	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 V

(Note 2) : V_D = 4000 V, $V_{DM} \leqq$ 6000 V, $C_S \geqq$ 6 μF, $di_{GQ}/dt \geqq$ 60 A / μs, $V_{DSP} \leqq$ 1200 V, $L_S \leqq$ 80 nH (without snubber diode)

(Note 3) : 50 Hz Half Sine Waveform

(Note 4) : $V_D \leqq$ 4000 V, $I_{TM} \leqq$ 6000 A, $I_G \geqq$ 80 A ($t_r \leqq$ 1 μs), f ≦ 50 Hz, $C_S \leqq$ 6 μF, $R_S \geqq$ 5 Ω, 25°C ≦ T_j ≦ 125°C [There is no VD fluctuation just before the GTO turning on.]

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

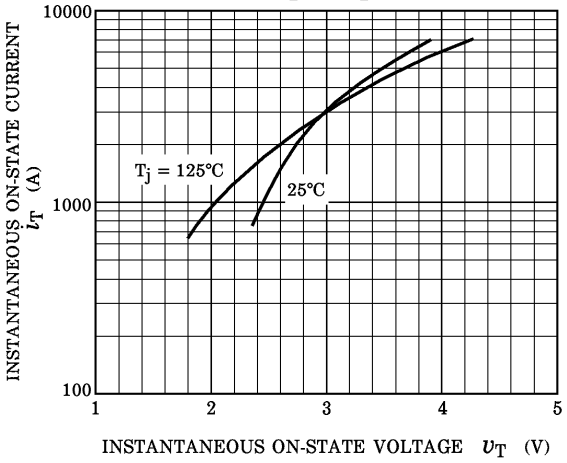
961001EAA1

ELECTRICAL CARACTERISTICS

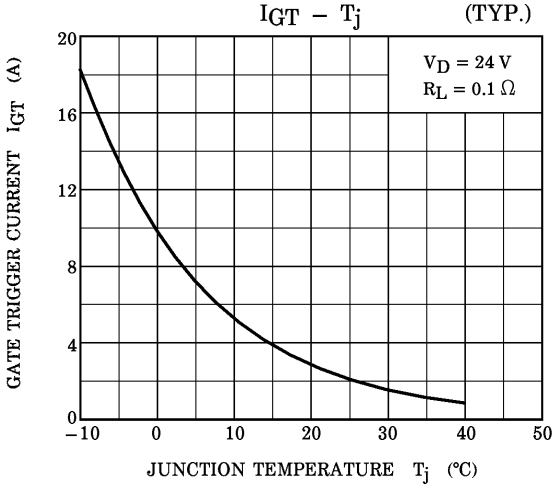
CHARACTERISTICS	SYMBOL	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Repetitive Peak Off-State Current	I_{DRM}	V_{DRM} = 6000 V, V_{GK} = −2 V, T_j = 125°C		—	—	200	mA
Repetitive Peak Reverse Current	I_{RRM}	V_{RRM} = 17 V, T_j = 125°C		—	—	10	mA
Repetitive Peak Reverse Gate Current	I_{RGM}	V_{RGM} = 17 V, T_j = 125°C		—	—	10	mA
Peak On-State Voltage	V_{TM}	I_{TM} = 6000 A, T_j = 125°C		—	4.0	—	V
Gate Trigger Voltage	V_{GT}	V_D = 24 V, R_L = 0.2 Ω	T_j = −40°C	—	—	—	V
			T_j = 25°C	—	—	2.0	
Gate Trigger Current	I_{GT}		T_j = 0°C	—	—	20	A
			T_j = 25°C	—	—	10	
Turn-On Delay Time	t_d	V_D = 4000 V, I_{TM} = 6000 A, di / dt = 500 A / μs, I_{GM} = 80 A (t_r = 1 μs), T_j = 25°C, Non-Snubber, f = 1 Hz		—	—	3.0	μs
Turn-On Time	t_{gt}			—	—	10	
Critical Rate of Rise of Off-State Voltage	dv / dt	V_{DRM} = 4000 V, V_{GK} = −10 V, Exponential Rise Waveform, T_j = 125°C		1250	—	—	V / μs
Storage Time	t_s	I_{TGQ} = 6000 A, V_{DM} = 6000 V, T_j = 125°C, $V_D \leqq$ 4000 V, f = 1 Hz, C_S = 6 μF, di_{GQ} / dt ≒ 80 A / μs, off squeeze current ≧ 600 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	$R_{th\,(j\text{-}f)}$	Junction to fin		—	—	0.0044	°C / W

(*) : V_D = 4000 V

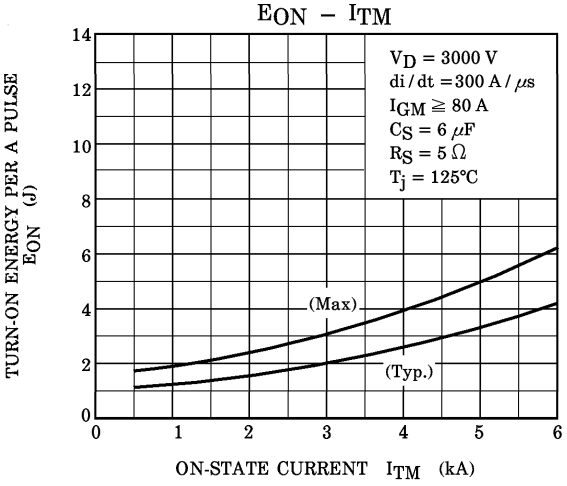
$i_T - v_T$ (MAX.)



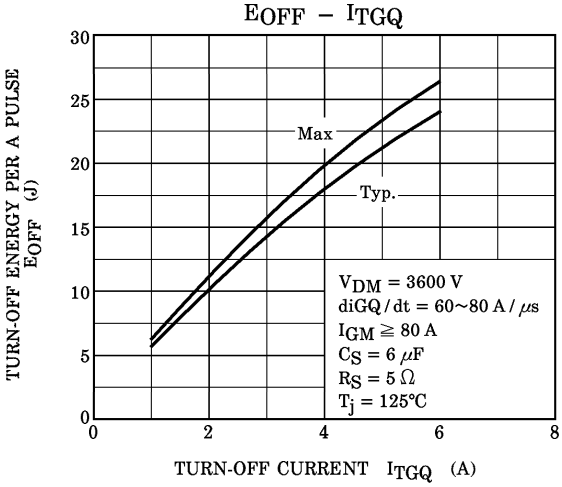
$I_{GT} - T_j$ (TYP.)



$E_{ON} - I_{TM}$



$E_{OFF} - I_{TGQ}$



$r_{th\,(j\text{-}f)} - t$ (MAX.)