

(SG3000GXH24)

**INVERTER APPLICATION**

- Repetitive Peak Off-State Voltage :  $V_{DRM}=4500V$
- R.M.S On-State Current :  $I_T(RMS)=1200A$
- Peak Turn-Off Current :  $I_{TGQM}=3000A$
- Critical Rate of Rise of On-State Current :  $di/dt=400A/\mu s$
- 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)	$V_{DRM}$	4500	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)	$I_T(RMS)$	1200	A
Peak One Cycle Surge On-State Current (Non Repetitive, 10ms-Width Half Sine Waveform)	$I_{TSM}$	16000	A
Critical Rate of Rise of On-State Current (Note 4)	$di/dt$	400	A/ $\mu s$
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	$T_j$	-40~125	°C
Storage Temperature Range	$T_{stg}$	-40~150	°C
Mounting Force	—	$33.3 \pm 4.9$	kN

Note 1  $V_{GK} = -2V$

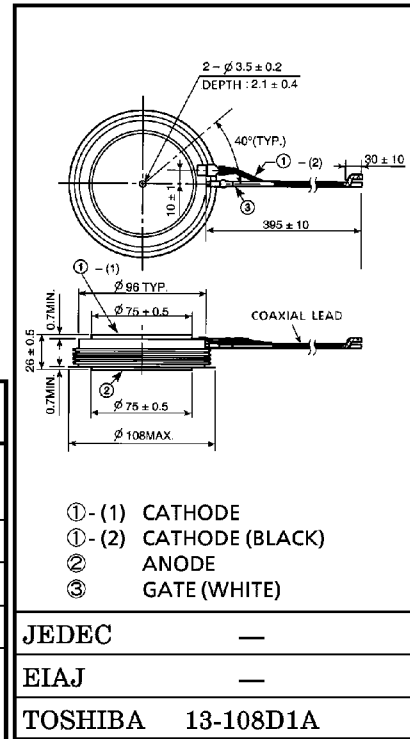
Note 2  $V_{DM}=4500V$ ,  $C_S=6\mu F$ ,  $R_S=5\Omega$ ,  $di_{GQ}/dt=50A/\mu s$ ,  $V_{DSP} \leq 850V$ ,  $L_S \leq 0.3\mu H$

Note 3 50Hz Half Sine Waveform at  $T_f=76^\circ C$

Note 4  $V_D=1/2 V_{DRM}$ ,  $I_{GM}=25A$

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

Unit in mm



Weight : 1290g

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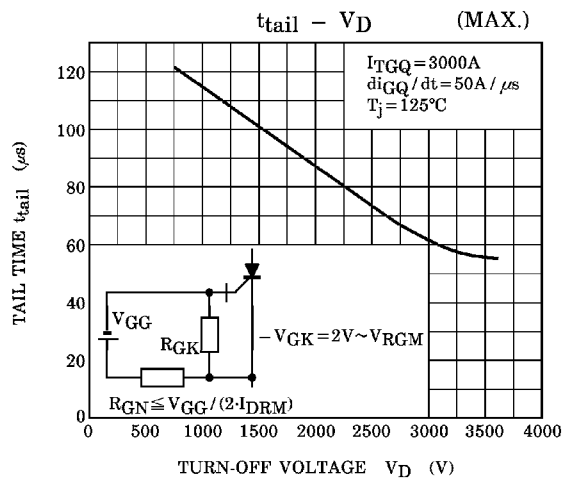
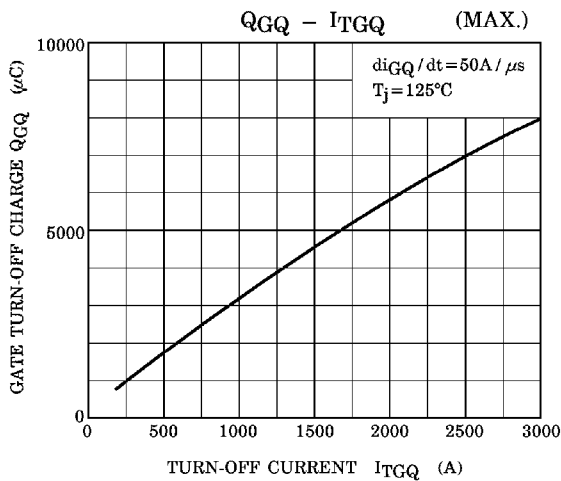
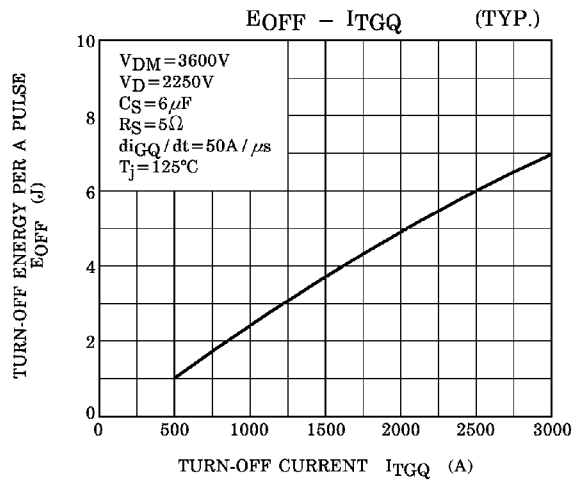
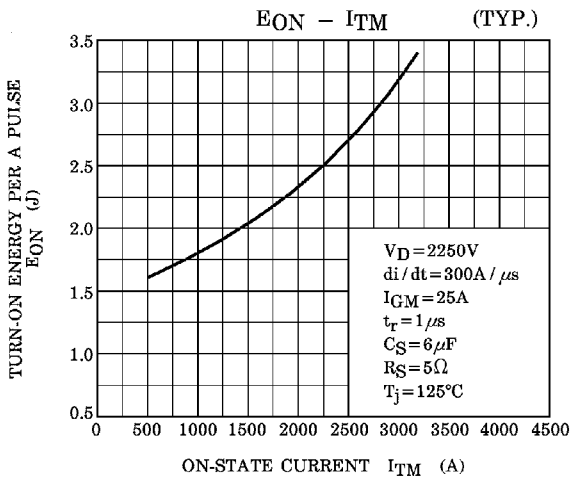
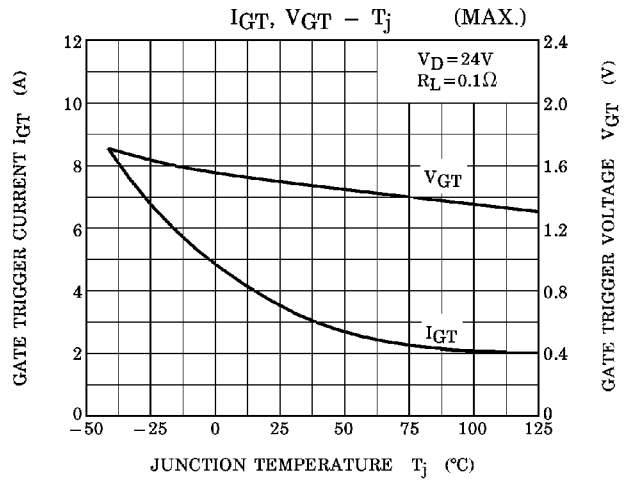
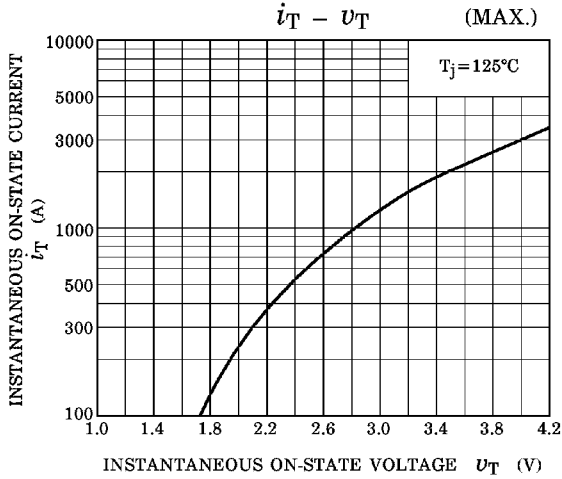
In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.

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ELECTRICAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Repetitive Peak Off-State Current	$I_{DRM}$	$V_{DRM} = \text{Rated}$ , $V_{GK} = -2V$ , $T_j = 125^\circ\text{C}$	—	—	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	$I_{RGM}$	$V_{RGM} = 16V$ , $T_j = 125^\circ\text{C}$	—	—	10	mA	
Peak On-State Voltage	$V_{TM}$	$I_{TM} = 3000A$ , $T_j = 125^\circ\text{C}$	—	—	4.0	V	
Gate Trigger Voltage	$V_{GT}$	$V_D = 24V$ , $R_L = 0.1\Omega$	$T_j = -40^\circ\text{C}$	—	—	1.7	V
			$T_j = 25^\circ\text{C}$	—	—	1.5	
Gate Trigger Current	$I_{GT}$		$T_j = -40^\circ\text{C}$	—	—	8.5	A
			$T_j = 25^\circ\text{C}$	—	—	3.5	
Turn-On Delay Time	$t_d$	$V_D = 1/2 V_{DRM}$ , $I_{TM} = 3000A$ , $di/dt = 400A/\mu s$ , $I_{GM} = 25A$ , $T_j = 25^\circ\text{C}$	—	—	3	$\mu s$	
Turn-On Time	$t_{gt}$		—	—	10	$\mu s$	
Critical Rate of Rise of Off-State Voltage	$dv/dt$	$V_{DRM} = 2/3 \text{ RATED}$ , Exponential Rise, $T_j = 125^\circ\text{C}$ , $V_{GK} = -2V$	1000	—	—	$V/\mu s$	
Storage Time	$t_s$	$I_{TGQ} = 3000A$ , $V_{DM} = 4500V$ , $V_D = 1/2 V_{DRM}$ , $di_{GQ}/dt = 50A/\mu s$ , $C_S = 6\mu F$ , $R_S = 5\Omega$ , $T_j = 125^\circ\text{C}$ , $L_S \leq 0.3\mu H$	—	—	27	$\mu s$	
Gate Turn-Off Time	$t_{gq}$		—	—	30	$\mu s$	
Tail Time	$t_{tail}$		—	—	80	$\mu s$	
Gate Turn-Off Current	$I_{GQ}$		—	700	—	A	
Thermal Resistance (Junction to Fin)	$R_{th(j-f)}$	DC	—	—	0.016	$^\circ\text{C}/W$	

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