

TOSHIBA GATE TURN-OFF THYRISTOR

SG1500EX24

INVERTER APPLICATION

- Repetitive Peak off-state Voltage : $V_{DRM} = 2500 \text{ V}$ (Note 1)
- R.M.S On-State Current : $I_T(\text{RMS}) = 750 \text{ A}$
- Peak Turn-Off Current : $I_{TGQM} = 1500 \text{ A}$
- Critical Rate of Rise of On-State Current : $di/dt = 500 \text{ A}/\mu\text{s}$
- Critical Rate of Rise of off-State Voltage : $dv/dt = 1000 \text{ V}/\mu\text{s}$

MAXIMUM RATINGS

CHARACTERISTIC	SYMBOL	RATING	UNIT
Repetitive Peak Off-state Voltage (Note 1)	V_{DRM}	2500	V
Repetitive Peak Reverse Voltage	V_{RRM}	16	V
Peak Turn-Off Current (Note 2)	I_{TGQM}	1500	A
R.M.S On-State Current (Note 3)	$I_T(\text{RMS})$	750	A
Peak One Cycle Surge On-State Current (Non Repetitive, 10 ms-Width Half Sine Waveform)	I_{TSM}	8000	A
Critical Rate Of Rise Of On-State Current (Note 4)	di/dt	500	A / μs
Peak Gate Current	I_{GM}	400	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}	16	V
Operating Junction Temperature Range	T_j	-40~125	°C
Storage Temperature Range	T_{stg}	-40~150	°C
Mounting Force	—	13.7 ± 1.4	kN

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

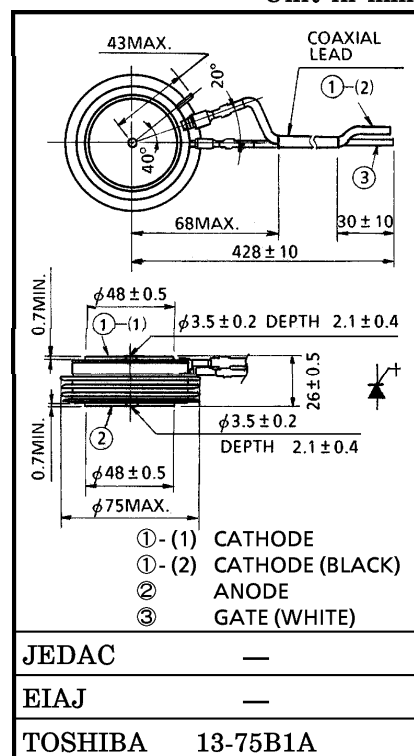
(Note 2) : $V_{DM} \leq 2000 \text{ V}$, $C_S = 3 \mu\text{F}$, $R_S = 5 \Omega$, $di_{GQ}/dt = 30 \text{ A}/\mu\text{s}$, $V_{DSP} \leq 650 \text{ V}$,
 $L_S \leq 0.2 \mu\text{H}$

(Note 3) : 50 Hz Half Sine Waveform at $T_f = 78^\circ\text{C}$

(Note 4) : $V_D = 1250 \text{ V}$, $I_{GM} = 15 \text{ A}$, $T_j = 125^\circ\text{C}$

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

Unit in mm



Weight : 520 g

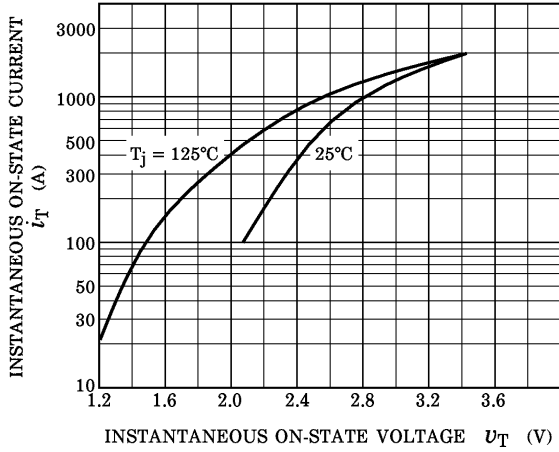
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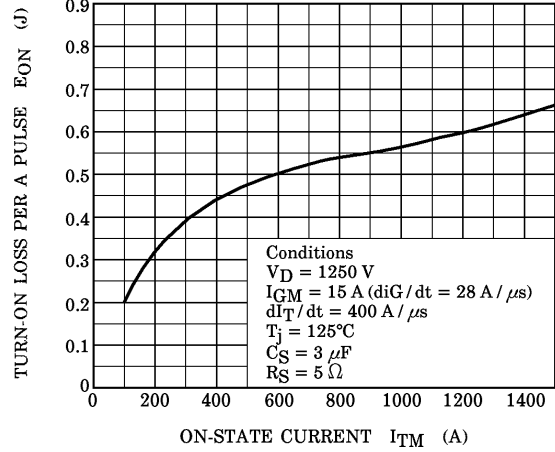
ELECTRICAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Repetitive Peak Off-State Current	I_{DRM}	$V_{DRM} = 2500\text{ V}$, $V_{GK} = -2\text{ V}$, $T_j = 125^\circ\text{C}$	—	—	40	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}	$I_{TM} = 1500\text{ A}$, $T_j = 125^\circ\text{C}$	—	—	3.0	V	
Gate Trigger Voltage	V_{GT}	$V_D = 24\text{ V}$, $R_L = 0.1\ \Omega$	$T_j = -40^\circ\text{C}$	—	—	1.50	V
			$T_j = 25^\circ\text{C}$	—	—	1.00	V
$T_j = 0^\circ\text{C}$	—		—	6.0	A		
$T_j = 25^\circ\text{C}$	—		—	2.0	A		
Turn-On Delay Time	t_d	$V_D = 1250\text{ V}$, $di/dt = 300\text{ A}/\mu\text{s}$,	—	—	3.0	μs	
Turn-On Time	t_{gt}	$I_{GM} = 15\text{ A}$, $I_T = 1500\text{ A}$, $T_j = 25^\circ\text{C}$	—	—	10.0	μs	
Critical Rate of Rise of Off-State Voltage	dv/dt	$V_{DRM} = 1700\text{ V}$, $T_j = 125^\circ\text{C}$, $V_{GK} = -2\text{ V}$, Exponential Rise	1000	—	—	$\text{V}/\mu\text{s}$	
Storage Time	t_s	$I_{TGQ} = 1500\text{ A}$, $V_{DM} = 2000\text{ V}$, $R_S = 5\ \Omega$,	—	—	20	μs	
Gate Turn-Off Time	t_{gq}	$V_D = 1250\text{ V}$,	—	—	22	μs	
Tail Time	t_{tail}	$di_{GQ}/dt = 30\text{ A}/\mu\text{s}$, $C_S = 3\ \mu\text{F}$, $V_{DSP} \leq 650\text{ V}$,	—	50	—	μs	
Gate Turn-Off Current	I_{GQ}	$T_j = 125^\circ\text{C}$, $L_S \leq 0.2\ \mu\text{H}$	—	400	—	A	
Thermal Resistance (Junction to Fin)	$R_{th(j-f)}$	DC	—	—	0.028	$^\circ\text{C}/\text{W}$	

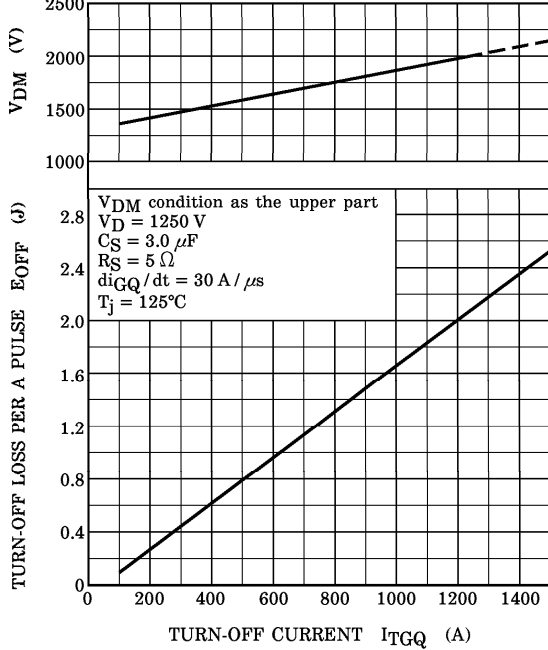
$i_T - v_T$ (MAX.)



$E_{ON} - I_{TM}$ (TYP.)



$E_{OFF} - I_{TGQ}$ (TYP.)



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

