

PHASE CONTROL THYRISTOR

TOSHIBA {DISCRETE/PTO}

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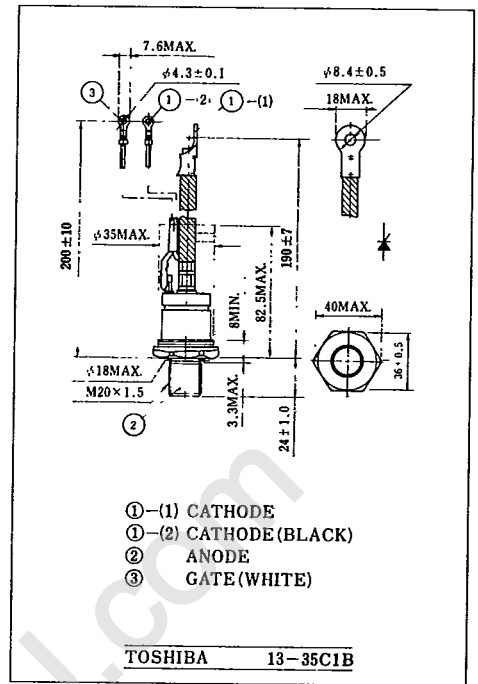
SF150U13

1600V 150A

Unit in mm

MAXIMUM RATINGS

CHARACTERISTIC	SYMBOL	RATING	UNIT
Repetitive Peak Off-State Voltage and Repetitive Peak Reverse Voltage	SF150L13	800	V
	SF150N13	1000	
	SF150Q13 and SF150R13	1200	
	SF150R13	1300	
	SF150U13	1600	
Non-Repetitive Peak Reverse Voltage (Non-Rep <5ms)	SF150L13	960	V
	SF150N13	1200	
	SF150Q13	1450	
	SF150R13	1500	
	SF150U13	1850	
$T_j = 0 \sim 125^\circ\text{C}$			
R.M.S. On-State Current	$I_{T(RMS)}$	236	A
Average On-State Current (Half Sine Waveform) (Note)	$I_{T(AV)}$	150	A
Peak One Cycle Surge On-State Current (Non-Repetitive)	I_{TSM}	3850 (60Hz)	A
		3500 (50Hz)	
I^2t Limit Value	I^2t	60×10^3	A^2s
Critical Rate of Rise of On-State Current (Note)	di/dt	100	$\text{A}/\mu\text{s}$
Peak Gate Power Dissipation	P_{GM}	16	W
Average Gate Power Dissipation	$P_{G(AV)}$	3	W
Peak Forward Gate Current	I_{GM}	4	A
Peak Forward Gate Voltage	V_{RGM}	16	V
Peak Reverse Gate Voltage	V_{FGM}	-5	V
Junction Temperature	T_j	-40 ~ 125	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-40 ~ 125	$^\circ\text{C}$
Stud Torque		340	kg cm

Note: $V_D = \frac{1}{2}$ Rated, $T_c = 120^\circ\text{C}$, Gate Supply ($V_G = 10\text{V}$, $R_G = 8\Omega$, $t_r \leq 1\mu\text{s}$)

ELECTRICAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	CONDITION	MIN.	MAX.	UNIT
Repetitive Peak Off-State Current and Repetitive Peak Reverse Current	I_{DRM} and I_{RRM}	$V_{DRM} = V_{RRM} = \text{Rated}$ $T_j = 125^\circ\text{C}$	—	20	mA
Peak On-State Voltage	V_{TM}	$I_{TM} = 500\text{A}$, $T_c = 25^\circ\text{C}$	—	1.70	V
Gate Trigger Voltage	V_{GT}	$V_D = 6\text{V}$, $R_L = 6\Omega$, $T_c = -40^\circ\text{C}$	—	4	V
		$T_c = 25^\circ\text{C}$	—	3	
		$T_c = 125^\circ\text{C}$	—	—	
Gate Trigger Current	I_{GT}	$V_D = 6\text{V}$, $R_L = 6\Omega$, $T_c = -40^\circ\text{C}$	—	300	mA
		$T_c = 25^\circ\text{C}$	—	150	
		$T_c = 125^\circ\text{C}$	—	—	
Gate Non-Trigger Voltage	V_{GD}	$V_D = \frac{1}{2}$ Rated, $T_c = 125^\circ\text{C}$	0.15	—	V
Gate Non-Trigger Current	I_{GD}	$V_D = \frac{1}{2}$ Rated, $T_c = 125^\circ\text{C}$	1.5	—	mA
Turn-On Time	t_{gt}	$V_D = 0.5$ Rated, $T_c = 25^\circ\text{C}$, Gate Supply ($V_G = 10\text{V}$, $R_G = 8\Omega$, $t_r \leq 1\mu\text{s}$)	—	6	μs
Delay Time	t_d	$T_c = 25^\circ\text{C}$, Gate Supply ($V_G = 10\text{V}$, $R_G = 8\Omega$, $t_r \leq 1\mu\text{s}$)	—	4	μs
Turn-Off Time	t_q	$I_T = 300\text{A}$, $V_R \geq 50\text{V}$, $dv/dt = 20\text{V}/\mu\text{s}$, V_{DRM} (reapplied) = $\frac{1}{2}$ Rated, $T_c = 120^\circ\text{C}$	—	150 (Typ.)	mA
Holding Current	I_H	$T_c = 25^\circ\text{C}$, $R_L = 6\Omega$	—	200	mA
Critical Rate of Rise of Off-State Voltage	dv/dt	$V_{DRM} = \frac{1}{2}$ Rated, $T_j = 125^\circ\text{C}$, Gate open, Exponential rise	200	—	$\text{V}/\mu\text{s}$
Thermal Resistance *	$R_{th(j-c)}$	DC	—	0.15	$^\circ\text{C}/\text{W}$

* Junction to Case

GATE TRIGGERING CHARACTERISTICS

