

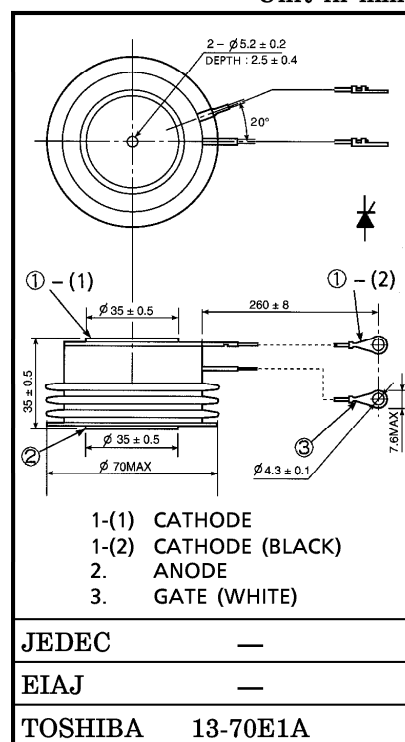
TOSHIBA ALLOY-FREE THYRISTOR

SF500EX32, SF500FX32

HIGH POWER CONTROL APPLICATIONS

Unit in mm

- Repetitive Peak Off-State Voltage : V_{DRM}
- Repetitive Peak Reverse Voltage : V_{RRM}
- Average On-State Current : $I_T(AV) = 500A$
- Turn-Off Time : $t_q = 400\mu s$ (Max.)
- Critical Rate of Rise of On-State Current : $di/dt = 200A/\mu s$
- Critical Rate of Rise of Off-State Voltage : $dv/dt = 500V/\mu s$
- Weight : 480g
- Flat Package



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MAXIMUM RATINGS

CHARACTERISTIC		SYMBOL	RATING	UNIT
Repetitive Peak Off-State Voltage and Repetitive Peak Reverse Voltage	SF500EX32	V_{DRM} V_{RRM}	2500	V
	SF500FX32		3000	
Non-Repetitive Peak Reverse Voltage (Non-Repetitive < 5ms, $T_j = 0 \sim 125^\circ\text{C}$)	SF500EX32	V_{RSM}	2750	V
	SF500FX32		3100	
R.M.S On-State Current		$I_{\text{T (RMS)}}$	785	A
Average On-State Current		$I_{\text{T (AV)}}$	500	A
Peak One Cycle Surge On-State Current (Non-Repetitive)		I_{TSM}	8000 (50Hz)	A
			8800 (60Hz)	
I^2t Limit Value		I^2t	3.2×10^5	A^2s
Critical Rate of Rise of On-State Current (Note)		di / dt	200	$\text{A} / \mu\text{s}$
Peak Gate Power Dissipation		P_{GM}	20	W
Average Gate Power Dissipation		$P_{\text{G (AV)}}$	4	W
Peak Forward Gate Current		I_{GM}	4	A
Peak Forward Gate Voltage		V_{FGM}	20	V
Peak Reverse Gate Voltage		V_{RGM}	5	V
Junction Temperature		T_j	$-40 \sim 125$	$^\circ\text{C}$
Storage Temperature Range		T_{stg}	$-40 \sim 125$	$^\circ\text{C}$
Mounting Force		—	14.7 ± 1.5	kN

Note : $V_D = 1/2$ Rated, $f = 50\text{Hz}$, $T_j = 120^\circ\text{C}$, Gate Supply ($V_G = 15\text{V}$, $R_G = 8\Omega$, $t_r \leq 1\mu\text{s}$)

ELECTRICAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	MAX.	UNIT
Repetitive Peak Off-State Current and Repetitive Peak Reverse Current	I_{DRM} I_{RRM}	$V_{DRM} = V_{RRM} = \text{Rated}$ $T_j = 125^\circ\text{C}$	—	50	mA
Peak On-State Voltage	V_{TM}	$I_{TM} = 1600\text{A}$, $T_j = 25^\circ\text{C}$	—	2.16	V
Gate Trigger Voltage	V_{GT}	$V_D = 6\text{V}$, $R_L = 6\Omega$	$T_j = -40^\circ\text{C}$	—	4.5
			$T_j = 25^\circ\text{C}$	0.6	2.5
Gate Trigger Current	I_{GT}		$T_j = -40^\circ\text{C}$	—	400
			$T_j = 25^\circ\text{C}$	15	250
Gate Non-Trigger Voltage	V_{GD}	$V_D = 1/2 \text{ Rated}$, $T_j = 125^\circ\text{C}$	0.2	—	V
Gate Non-Trigger Current	I_{GD}		5	—	mA
Delay Time	t_d	$V_D = 1/2 \text{ Rated}$, $T_j = 25^\circ\text{C}$ Gate Supply	—	4	μs
Gate Turn-On Time	t_{gt}	($V_G = 15\text{V}$, $R_G = 8\Omega$, $t_r \leq 1\mu\text{s}$)	—	6	μs
Turn-Off Time	t_q	$I_T = 800\text{A}$, $V_R \geq 50\text{V}$ $dv/dt = 20\text{V}/\mu\text{s}$, $T_j = 120^\circ\text{C}$ $V_{DRM} = 1/2 \text{ Rated}$	—	400	μs
Holding Current	I_H	$T_j = 25^\circ\text{C}$, $R_L = 6\Omega$	—	300	mA
Critical Rate of Rise of Off-State Voltage	dv/dt	$V_{DRM} = 2/3 \text{ Rated}$, $T_j = 125^\circ\text{C}$ Gate Open, Exponential Rise	500	—	$\text{V}/\mu\text{s}$
Thermal Resistance (Junction to Case)	$R_{th(j-f)}$	DC	—	0.05	$^\circ\text{C}/\text{W}$

