T52P1500S Series

500-2800 V_{RMS}, 1500 A_{AVG}
Standard Recovery Thyristor

Features:

- All Diffused Structure
- Center Amplifying Gate Configuration
- Blocking capability up to 2000 volts
- Guaranteed Maximum Turn-Off Time
- High dV/dt Capability
- Pressure Assembled Device

ELECTRICAL CHARACTERISTICS AND RATINGS

Blocking - Off State

Device Type	V_{RRM} (1)	V_{DRM} (1)	V_{RSM} (1)
T52P1500S500	500	500	600
T52P1500S1000	1000	1000	1100
T52P1500S1200	1200	1200	1300
T52P1500S1600	1600	1600	1700
T52P1500S1800	1800	1800	1900
T52P1500S2000	2000	2000	2100
T52P1500S2200	2200	2200	2300
T52P1500S2800	2800	2800	2900

V_{RRM} = Repetitive peak reverse voltage
V_{DRM} = Repetitive peak off state voltage
V_{RSM} = Non repetitive peak reverse voltage (2)

Notes:
All ratings are specified for T_J=25°C unless otherwise stated.
(1) All voltage ratings are specified for an applied 50Hz/60zHz sinusoidal waveform over the temperature range -40 to +125°C.
(2) 10 msec. max. pulse width
(3) Maximum value for T_J = 125°C.
(4) Minimum value for linear and exponential waveshape to 80% rated V_{DRM}. Gate open. T_J = 125°C.
(5) Non-repetitive value.
(6) The value of di/dt is established in accordance with EIA/NIMA Standard RS-397, Section 5-2-2-6. The value defined would be in addition to that obtained from a snubber circuit, comprising a 0.2 µF capacitor and 20 ohms resistance in parallel with the thyristor under test.

Repetitive peak reverse leakage and off state leakage	I_{RRM} / I_{DRM}	15 mA 65 mA (3)
Critical rate of voltage rise	dV/dt (4)	400 V/µsec

Conducting - On State

Parameter	Symbol	Min.	Max.	Units	Conditions
Average value of on-state current	$I_{T(AV)}$		1500	A	Sinewave,180° conduction, T_c=65°C
RMS value of on-state current	I_{TRMS}		2400	A	Nominal value
Peak one cycle surge (non-repetitive) current	I_{TSM}		23000 21000	A A	8.3 msec (60Hz), sinusoidal wave-shape, 180° conduction, T_J = 125°C 10.0 msec (50Hz), sinusoidal wave-shape, 180° conduction, T_J = 125°C
I square t	I^2t		$2.2x10^6$	A^2s	8.3 msec and 10.0 msec
Latching current	I_L		800	mA	V_D = 24 V; R_L= 12 ohms
Holding current	I_H		400	mA	V_D = 24 V; I = 2.5 A

Peak on-state voltage	V_{TM}		1.65	V	I_{TM} = 3000 A; Duty cycle ≤ 0.01%
Critical rate of rise of on-state current [5, 6]	di/dt		400	A/µs	Switching from V_{DRM} ≤ 1000 V, non-repetitive
Critical rate of rise of on-state current [6]	di/dt		100	A/µs	Switching from V_{DRM} ≤ 1000 V

Gating

Parameter	Symbol	Min.	Max.	Units	Conditions
Peak gate power dissipation	P_{GM}		200	W	t_p = 40 us
Average gate power dissipation	$P_{G(AV)}$		5	W	
Peak gate current	I_{GM}		10	A	
Gate current required to trigger all units	I_{GT}		300 150 125	mA mA mA	V_D = 6 V;R_L = 3 ohms; T_J = -40°C V_D = 6 V;R_L = 3 ohms; T_J = +25°C V_D = 6 V;R_L = 3 ohms; T_J = +125°C
Gate voltage required to trigger all units	V_{GT}	0.30	5 3	V V V	V_D = 6 V;R_L = 3 ohms; T_J = -40°C V_D = 6 V;R_L = 3 ohms; T_J = 0-125°C V_D = Rated V_{DRM}; R_L = 1000 ohms; T_J = + 125°C
Peak negative voltage	V_{GRM}		5	V	

Dynamic

Parameter	Symbol	Max.	Typ.	Units	Conditions
Delay time	t_d	1.5	0.7	µs	I_{TM} = 50 A; V_D = Rated V_{DRM} Gate pulse: V_G = 20 V; R_G = 20 ohms; t_r = 0.1 µs; t_p = 20 µs
Turn-off time (with V_R = -50 V)	t_q	250	150	µs	I_{TM} = 1000 A; di/dt = 25 A/µs; V_R ≥ -50 V; Re-applied dV/dt = 20 V/µs linear to 80% V_{DRM}; V_G = 0; T_J = 125°C; Duty cycle ≥ 0.01%
Reverse recovery charge	Q_{rr}	*		µC	I_{TM} = 1000 A; di/dt = 25 A/µs; V_R ≥ -50 V

* For guaranteed max. value contact factory.

THERMAL AND MECHANICAL CHARACTERISTICS AND RATINGS

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Operating temperature	T_J	-40	+125		°C	
Storage temperature	T_{STG}	-40	+150		°C	
Thermal resistance – junction to case	$R_{\Theta (j-c)}$		0.025 0.050		°C/W	Double sided cooled Single sided cooled
Thermal resistance – case to sink	$R_{\Theta (c-s)}$		0.010 0.020		°C/W	Double sided cooled * Single sided cooled *
Mounting force	P	5500 24.5	6000 26.7		lb. kN	
Weight	W			16 460	oz. g	

* Mounting surfaces smooth, flat, and greased

CASE OUTLINE AND DIMENSIONS