



T52P1700F Series

1500 - 2000 V_{RMS}, 1700 A_{RMS}

Fast Recovery Thyristor

Features:

- All Diffused Structure
- Interdigitated 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⁾
T52P1700F1500	1500	1500	1600
T52P1700F1600	1600	1600	1700
T52P1700F1700	1700	1700	1800
T52P1700F1800	1800	1800	1900
T52P1700F1900	1900	1900	2000
T52P1700F2000	2000	2000	2100

V_{RRM} = Repetitive peak reverse voltage

V_{DRM} = Repetitive peak off state voltage

V_{RSM} = Non repetitive peak reverse voltage⁽²⁾

Repetitive peak reverse leakage and off state leakage	I _{RRM} / I _{DRM}	20 mA 65 mA ⁽³⁾
Critical rate of voltage rise	dV/dt ⁽⁴⁾	500 V/μsec

Conducting - On State

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
RMS value of on-state current	I _{TRMS}		1700		A	Nominal value
Peak one cycle surge (non-repetitive) current	I _{TSM}		20000		A	8.3 msec (60Hz), sinusoidal wave-shape, 180° conduction, T _J = 125°C
			18400		A	10.0 msec (50Hz), sinusoidal wave-shape, 180° conduction, T _J = 125°C
I square t	I ² t		1.66x10 ⁶		A ² s	8.3 msec and 10.0 msec
Latching current	I _L		1000		mA	V _D = 24 V; R _L = 12 ohms
Holding current	I _H		500		mA	V _D = 24 V; I = 2.5 A
Peak on-state voltage	V _{TM}		2.2		V	I _{TM} = 3400 A; Duty cycle ≤ 0.01%

Notes:

All ratings are specified for T_J=25°C unless otherwise stated.

(1) All voltage ratings are specified for an applied 50Hz/60Hz 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.



Critical rate of rise of on-state current ^(5, 6)	di/dt		800		A/ μ s	Switching from $V_{DRM} \leq 1000$ V, non-repetitive
Critical rate of rise of on-state current ⁽⁶⁾	di/dt		200		A/ μ s	Switching from $V_{DRM} \leq 1000$ V

Gating

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Peak gate power dissipation	P_{GM}		200		W	$t_p = 40$ μ s
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; $T_J = -40^\circ$ C $V_D = 6$ V; $R_L = 3$ ohms; $T_J = +25^\circ$ C $V_D = 6$ V; $R_L = 3$ ohms; $T_J = +125^\circ$ 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; $T_J = -40^\circ$ C $V_D = 6$ V; $R_L = 3$ ohms; $T_J = 0-125^\circ$ C $V_D = \text{Rated } V_{DRM}$; $R_L = 1000$ ohms; $T_J = +125^\circ$ C
Peak negative voltage	V_{GRM}		5		V	

Dynamic

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Delay time	t_d		1.5	0.7	μ s	$I_{TM} = 500$ A; $V_D = \text{Rated } V_{DRM}$ Gate pulse: $V_G = 20$ V; $R_G = 20$ ohms; $t_r = 0.1$ μ s; $t_p = 20$ μ s
Turn-off time (with $V_R = -50$ V)	t_q		50		μ s	$I_{TM} = 1000$ A; $di/dt = 25$ A/ μ s; $V_R \geq -50$ V; Re-applied $dV/dt = 200$ V/ μ s linear to 80% V_{DRM} ; $V_G = 0$; $T_J = 125^\circ$ C; Duty cycle $\geq 0.01\%$
Reverse recovery charge	Q_{rr}		*	2000	μ C	$I_{TM} = 1000$ A; $di/dt = 25$ A/ μ s; $V_R \geq -50$ 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	$R_{\Theta(j-c)}$		0.023 0.046		°C/W	Double sided cooled Single sided cooled
Thermal resistance - case to sink	$R_{\Theta(j-c)}$		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

