



TPF SERIES 38MM

1500-2000 V_{RRM}, 1150 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⁾
T38P1150F1500	1500	1500	1600
T38P1150F1600	1600	1600	1700
T38P1150F1700	1700	1700	1800
T38P1150F1800	1800	1800	1900
T38P1150F1900	1900	1900	2000
T38P1150F2000	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}	15 mA 50 mA ⁽³⁾
Critical rate of voltage rise ⁽⁴⁾	dV/dt	500 V/μsec

Conducting - On State

Parameter	Symbol	Min	Max.	Typ.	Units	Conditions
RMS value of on-state current	I _{TRMS}		1150		A	Nominal value
Peak one cycle surge (non-repetitive) current	I _{TSM}		9000		A	8.3 msec (60Hz), sinusoidal wave-shape, 180° conduction, T _J = 125°C
			8200		A	10.0 msec (50Hz), sinusoidal wave-shape, 180° conduction, T _J = 125°C
I square t	I ² t		336000		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}		2.5		V	I _{TM} = 2300 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/μs	Switching from V _{DRM} ≤ 1000 V, non-repetitive
Critical rate of rise of on-state current ⁽⁶⁾	di/dt		400		A/μs	Switching from V _{DRM} ≤ 1000 V

Gating

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Peak gate power dissipation	P _{GM}		200		W	t _p = 40 μs
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}		400 200 150		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}	0.25	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	Min.	Max.	Typ.	Units	Conditions
Delay time	t _d		1.5	0.5	μs	I _{TM} = 500 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		55		μs	I _{TM} = 500 A; di/dt = 25 A/μs; V _R ≥ -50 V; Re-applied dV/dt = 200 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} = 500 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	$R_{\theta(j-c)}$		0.040 0.080		°C/W	Double sided cooled Single sided cooled
Thermal resistance – case to sink	$R_{\theta(c-s)}$		0.015 0.030		°C/W	Double sided cooled * Single sided cooled *
Mounting force	P	3000 13.3	3500 15.5		lb. kN	
Weight	W			9 225	oz. g	

* Mounting surfaces smooth, flat and greased

CASE OUTLINE AND DIMENSIONS

