T65P2500F Series

600 - 1600 V_{RMS}, 2500 A_{RMS}
Fast Recovery Thyristor

Features:

- All Diffused Structure
- Interdigitated Amplifying Gate Configuration
- Blocking capability up to 1600 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)
T65P2500F600	600	600	700
T65P2500F800	800	800	900
T65P2500F1000	1000	1000	1100
T65P2500F1200	1200	1200	1300
T65P2500F1400	1400	1400	1500
T65P2500F1600	1600	1600	1700

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 90 mA (3)
Critical rate of voltage rise	dV/dt (4)	500 V/µsec

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. TJ = 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.

Conducting - On State

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Average value of on-state current	I_{TRMS}		1600		A	Sinewave,180° conduction, T_C=65°C
RMS value of on-state current	I_{TRMS}		2500		A	Nominal value
Peak one cycle surge (non-repetitive) current	I_{TSM}		24500 22000		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		$2.5x10^6$		A^2s	8.3 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}		1.90		V	I_{TM} = 3000 A; Tj = 25 °C

Critical rate of rise of on-state current [5, 6]	di/dt		800		A/µs	Switching from $V_{DRM} \leq 1000$ V, non-repetitive
Critical rate of rise of on-state current [6]	di/dt		300		A/µs	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 us
Average gate power dissipation	$P_{G(AV)}$		5		W	
Peak gate current	I_{GM}		20		A	
Gate current required to trigger all units	I_{GT}		300 200 125		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 4		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}		20		V	

Dynamic

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Delay time	t_d		2.0		µs	I_{TM} = 50 A; V_D = 67% V_{DRM} Gate pulse: V_G = 30 V; R_G = 10 ohms; t_r = 0.1 µs; t_p = 20 µs
Turn-off time (with V_R = -50 V)	t_q		65		µs	I_{TM} > 2000 A; di/dt = 25 A/µs; $V_R \geq$ -50 V; Re-applied dV/dt = 400 V/µs linear to 67% V_{DRM} ; T_J = 125°C; Duty cycle ≥ 0.01%
Reverse recovery current	I_{rr}		200		A	I_{TM} > 2000 A; di/dt = 25 A/µs; $V_R \geq$ -50 V; T_J = 125°C

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	$R_{\Theta (j-c)}$		0.017		°C/W	Double sided cooled
Thermal resistance – case to sink	$R_{\Theta (c-s)}$		0.003		°C/W	Double sided cooled *
Mounting force	P	8000 35.5	10000 44.4		lb. kN	
Weight	W			2.1 953	Lb. g.	

* Mounting surfaces smooth, flat and greased

CASE OUTLINE AND DIMENSIONS