



# TPS SERIES 30MM

1000 - 2000  $V_{RRM}$ , 600  $A_{AVG}$   
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	$V_{RRM}^{(1)}$	$V_{DRM}^{(1)}$	$V_{RSM}^{(1)}$
T30P600S1000	1000	1000	1100
T30P600S1200	1200	1200	1300
T30P600S1400	1400	1400	1500
T30P600S1600	1600	1600	1700
T30P600S1800	1800	1800	1900
T30P600S2000	2000	2000	2100

$V_{RRM}$  = Repetitive peak reverse voltage

$V_{DRM}$  = Repetitive peak off state voltage

$V_{RSM}$  = Non repetitive peak reverse voltage<sup>(2)</sup>

Repetitive peak reverse leakage and off state leakage	$I_{RRM} / I_{DRM}$	15 mA 30 mA <sup>(3)</sup>
Critical rate of voltage rise	$dV/dt^{(4)}$	200 V/ $\mu$ sec

### Conducting - On State

Parameter	Symbol	Min	Max.	Typ.	Units	Conditions
Average value of on-state current	$I_{T(AV)}$		600		A	Sinewave, 180° conduction, $T_c=65^\circ\text{C}$
RMS value of on-state current	$I_{TRMS}$		940		A	Nominal value
Peak one cycle surge (non-repetitive) current	$I_{TSM}$		7500		A	8.3 msec (60Hz), sinusoidal wave-shape, 180° conduction, $T_j = 125^\circ\text{C}$ 10.0 msec (50Hz), sinusoidal wave-shape, 180° conduction, $T_j = 125^\circ\text{C}$
			7200		A	
I square t	$I^2t$		235000		$A^2s$	8.3 msec and 10.0 msec
Latching current	$I_L$		800		mA	$V_D = 24\text{ V}; R_L = 12\text{ ohms}$
Holding current	$I_H$		400		mA	$V_D = 24\text{ V}; I = 2.5\text{ A}$

### Notes:

All ratings are specified for  $T_j=25^\circ\text{C}$  unless otherwise stated.

(1) All voltage ratings are specified for an applied 50Hz/60Hz sinusoidal waveform over the temperature range  $-40$  to  $+125^\circ\text{C}$ .

(2) 10 msec. max. pulse width

(3) Maximum value for  $T_j = 125^\circ\text{C}$ .

(4) Minimum value for linear and exponential wave shape to 80% rated  $V_{DRM}$ . Gate open.  $T_j = 125^\circ\text{C}$ .

(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  $\mu\text{F}$  capacitor and 20 ohms resistance in parallel with the thyristor under test.



Peak on-state voltage	$V_{TM}$		2.30		V	$I_{TM} = 3000 \text{ A}$ ; Duty cycle $\leq 0.01\%$
Critical rate of rise of on-state current <sup>(5, 6)</sup>	$di/dt$		400		A/ $\mu\text{s}$	Switching from $V_{DRM} \leq 1000 \text{ V}$ , non-repetitive
Critical rate of rise of on-state current <sup>(6)</sup>	$di/dt$		150		A/ $\mu\text{s}$	Switching from $V_{DRM} \leq 1000 \text{ V}$

**Gating**

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Peak gate power dissipation	$P_{GM}$		200		W	$t_p = 40 \mu\text{s}$
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	$V_D = 6 \text{ V}; R_L = 3 \text{ ohms}; T_J = -40^\circ\text{C}$ $V_D = 6 \text{ V}; R_L = 3 \text{ ohms}; T_J = +25^\circ\text{C}$ $V_D = 6 \text{ V}; R_L = 3 \text{ ohms}; T_J = +125^\circ\text{C}$
Gate voltage required to trigger all units	$V_{GT}$	0.15	5 3		V V V	$V_D = 6 \text{ V}; R_L = 3 \text{ ohms}; T_J = -40^\circ\text{C}$ $V_D = 6 \text{ V}; R_L = 3 \text{ ohms}; T_J = 0-125^\circ\text{C}$ $V_D = \text{Rated } V_{DRM}; R_L = 1000 \text{ ohms}; T_J = +125^\circ\text{C}$
Peak negative voltage	$V_{GRM}$		5		V	

**Dynamic**

Parameter	Symbol	Min.	Max.	Typ.	Units	Conditions
Delay time	$t_d$		1.5	0.7	$\mu\text{s}$	$I_{TM} = 50 \text{ A}; V_D = \text{Rated } V_{DRM}$ Gate pulse: $V_G = 20 \text{ V}; R_G = 20 \text{ ohms}; t_r = 0.1 \mu\text{s}; t_p = 20 \mu\text{s}$
Turn-off time (with $V_R = -50 \text{ V}$ )	$t_q$		200	125	$\mu\text{s}$	$I_{TM} = 500 \text{ A}; di/dt = 25 \text{ A}/\mu\text{s}; V_R \geq -50 \text{ V}; \text{Re-applied } dV/dt = 20 \text{ V}/\mu\text{s}$ linear to $80\% V_{DRM}; V_G = 0; T_J = 125^\circ\text{C}; \text{Duty cycle} \geq 0.01\%$
Reverse recovery charge	$Q_{rr}$		*		$\mu\text{C}$	$I_{TM} = 500 \text{ A}; di/dt = 25 \text{ A}/\mu\text{s}; V_R \geq -50 \text{ V}$

\* For guaranteed max. value, contact factory.

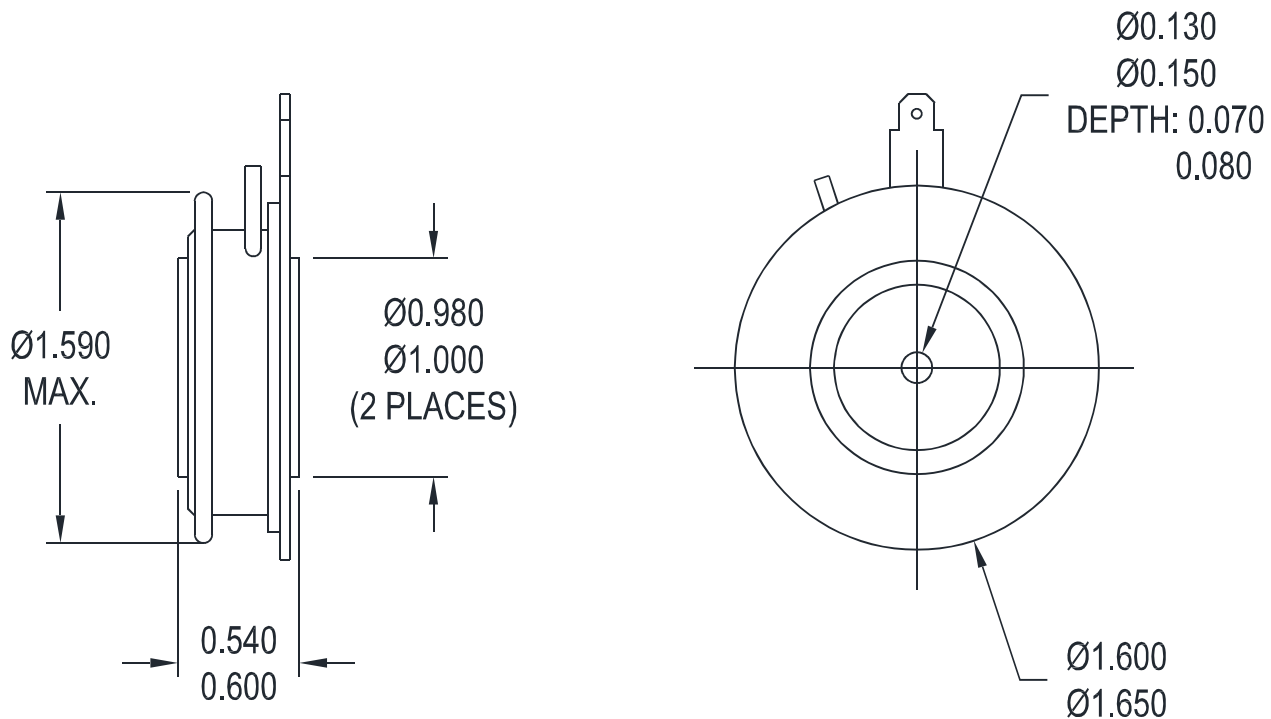


**THERMAL AND MECHANICAL CHARACTERISTICS AND RATINGS**

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	$R_{\Theta(j-c)}$	0.045 (1)	0.055 (2)		°C/W	Double sided cooled (1) @ 2000LB, (2) @ 800LB
Thermal resistance - case to sink	$R_{\Theta(c-s)}$		0.030 0.060		°C/W	Double sided cooled * Single sided cooled *
Mounting force	P	800 3.6	2500 11.1		lb. kN	
Weight	W			2.5 70	oz. g	

\* Mounting surfaces smooth, flat and greased

**CASE OUTLINE AND DIMENSIONS**





CHARACTERISTICS CURVES AND GRAPHS

