



High-end Power Semiconductor Manufacturer

## ZP500A 3800-4400V Standard Rectifier Diode

- High power cycling capability
- Low on-state and switching losses
- Optimized for line frequency rectifiers
- Designed for traction and industrial applications



Average forward current		$I_{FAV}$	500 A	
Repetitive peak reverse voltage		$V_{RRM}$	3800 – 4400 V	
$V_{RRM}$ , V	3800	4000	4200	4400
Voltage code	38	40	42	44
$T_j$ , °C	-60 – 150			

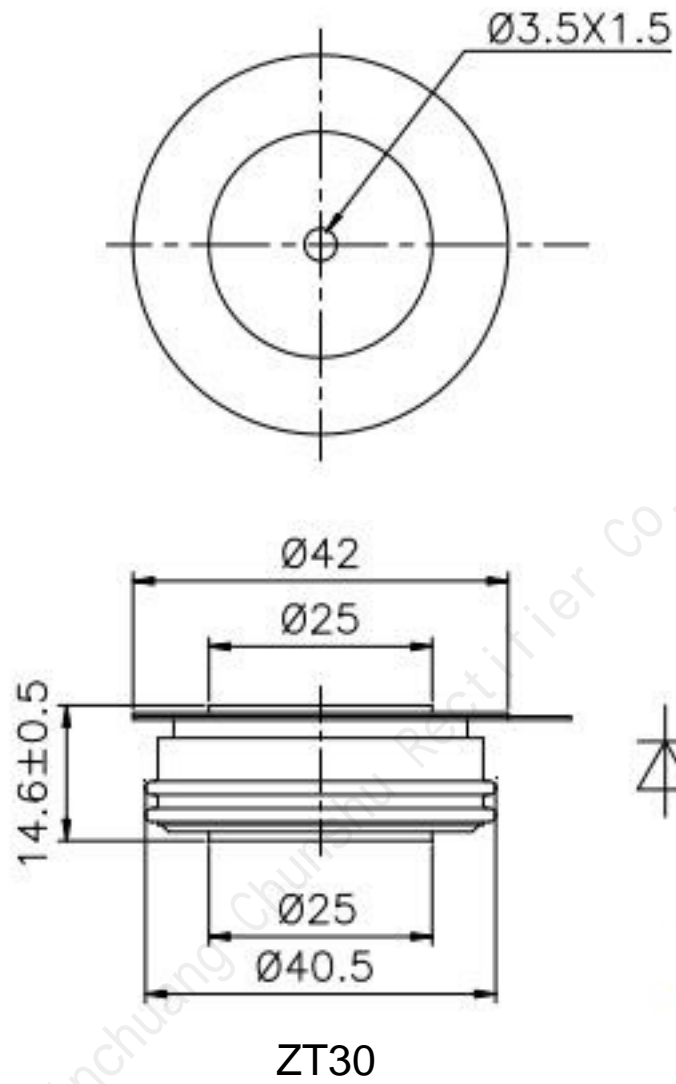
### MAXIMUM ALLOWABLE RATINGS

Symbols and parameters		Units	Values	Test conditions
<b>ON-STATE</b>				
$I_{FAV}$	Average forward current	A	500	$T_c=100\text{ }^\circ\text{C}$ ; Double side cooled; 180° half-sine wave; 50 Hz
$I_{FRMS}$	RMS forward current	A	785	$T_c=101\text{ }^\circ\text{C}$ ; Double side cooled; 180° half-sine wave; 50 Hz
$I_{FSM}$	Surge forward current	kA	6.5 7.5	$T_j=T_{j\text{ max}}$ $T_j=25\text{ }^\circ\text{C}$ 180° half-sine wave; 50 Hz ( $t_p=10\text{ ms}$ ); single pulse; $V_R=0\text{ V}$ ;
			7.0 8.1	$T_j=T_{j\text{ max}}$ $T_j=25\text{ }^\circ\text{C}$ 180° half-sine wave; 60 Hz ( $t_p=8.3\text{ ms}$ ); single pulse; $V_R=0\text{ V}$ ;
$I^2t$	Safety factor	$A^2s\cdot 10^3$	210 280	$T_j=T_{j\text{ max}}$ $T_j=25\text{ }^\circ\text{C}$ 180° half-sine wave; 50 Hz ( $t_p=10\text{ ms}$ ); single pulse; $V_R=0\text{ V}$ ;
			200 270	$T_j=T_{j\text{ max}}$ $T_j=25\text{ }^\circ\text{C}$ 180° half-sine wave; 60 Hz ( $t_p=8.3\text{ ms}$ ); single pulse; $V_R=0\text{ V}$ ;
<b>BLOCKING</b>				
$V_{RRM}$	Repetitive peak reverse voltages	V	3800 – 4400	$T_{j\text{ min}} < T_j < T_{j\text{ max}}$ ; 180° half-sine wave; 50 Hz;
$V_{RSM}$	Non-repetitive peak reverse voltages	V	3900 – 4500	$T_{j\text{ min}} < T_j < T_{j\text{ max}}$ ; 180° half-sine wave; 50 Hz; single pulse;
$V_R$	Reverse continuous voltages	V	$0.75\cdot V_{RRM}$	$T_j=T_{j\text{ max}}$ ;
<b>THERMAL</b>				
$T_{stg}$	Storage temperature	°C	-60 – 150	
$T_j$	Operating junction temperature	°C	-60 – 150	
<b>MECHANICAL</b>				
F	Mounting force	kN	9.0 – 11.0	
a	Acceleration	$m/s^2$	50	Device unclamped
			100	Device clamped

## CHARACTERISTICS

Symbols and parameters		Units	Values	Conditions
<b>ON-STATE</b>				
$V_{FM}$	Peak forward voltage, max	V	2.02	$T_j=25\text{ }^\circ\text{C}; I_{FM}=1570\text{ A}$
$V_{F(TO)}$	Forward threshold voltage, max	V	1.07	$T_j=T_{j\text{ max}}$
$r_T$	Forward slope resistance, max	m $\Omega$	0.910	$0.5\pi I_{FAV} < I_T < 1.5\pi I_{FAV}$
<b>BLOCKING</b>				
$I_{RRM}$	Repetitive peak reverse current, max	mA	50	$T_j=T_{j\text{ max}};$ $V_R=V_{RRM}$
<b>THERMAL</b>				
$R_{thjc}$	Thermal resistance, junction to case, max	$^\circ\text{C/W}$	0.045	Double side cooled
$R_{thjc-A}$			0.099	Anode side cooled
$R_{thjc-K}$			0.081	Cathode side cooled
$R_{thck}$	Thermal resistance, case to heatsink, max	$^\circ\text{C/W}$	0.009	Direct current
<b>MECHANICAL</b>				
w	Weight, typ	g	210	
$D_s$	Surface creepage distance	mm (inch)	30.77 (1.211)	
$D_a$	Air strike distance	mm (inch)	24.40 (0.960)	

OVERALL DIMENSIONS



All dimensions in millimeters