



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			

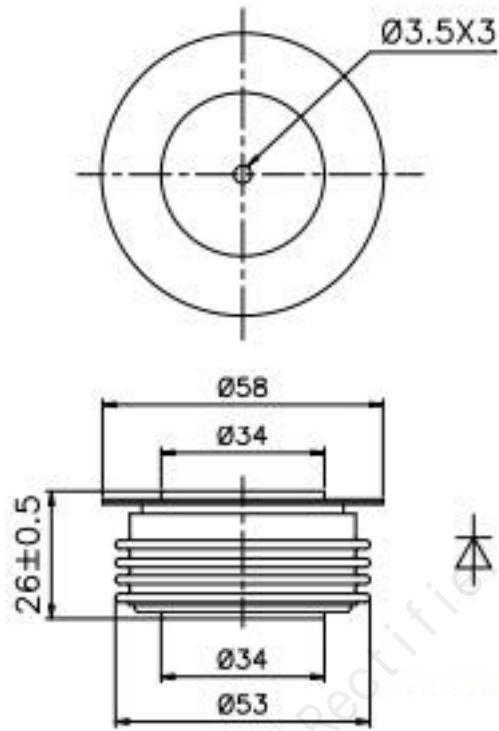
### MAXIMUM ALLOWABLE RATINGS

Symbols and parameters		Units	Values	Test conditions
<b>ON-STATE</b>				
$I_{FAV}$	Average forward current	A	500	$T_c=100$ °C; Double side cooled; 180° half-sine wave; 50 Hz
$I_{FRMS}$	RMS forward current	A	785	$T_c=106$ °C; Double side cooled; 180° half-sine wave; 50 Hz
$I_{FSM}$	Surge forward current	kA	7.5 8.6	$T_j=T_{j\max}$ $T_j=25$ °C; 180° half-sine wave; 50 Hz ( $t_p=10$ ms); single pulse; $V_R=0$ V;
			8.0 9.2	$T_j=T_{j\max}$ $T_j=25$ °C; 180° half-sine wave; 60 Hz ( $t_p=8.3$ ms); single pulse; $V_R=0$ V;
$I^2t$	Safety factor	$A^2s \cdot 10^3$	280 365	$T_j=T_{j\max}$ $T_j=25$ °C; 180° half-sine wave; 50 Hz ( $t_p=10$ ms); single pulse; $V_R=0$ V;
			265 350	$T_j=T_{j\max}$ $T_j=25$ °C; 180° half-sine wave; 60 Hz ( $t_p=8.3$ ms); single pulse; $V_R=0$ V;
<b>BLOCKING</b>				
$V_{RRM}$	Repetitive peak reverse voltages	V	3800–4400	$T_{j\min} < T_j < T_{j\max}$ ; 180° half-sine wave; 50 Hz;
$V_{RSM}$	Non-repetitive peak reverse voltages	V	3900–4500	$T_{j\min} < T_j < T_{j\max}$ ; 180° half-sine wave; 50 Hz; single pulse;
$V_R$	Reverse continuous voltages	V	$0.75 \cdot V_{RRM}$	$T_j=T_{j\max}$ ;
<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	$^\circ\text{C/W}$	0.040	Direct current	Double side cooled
$R_{thjc-A}$			0.088		Anode side cooled
$R_{thjc-K}$			0.072		Cathode side cooled
$R_{thck}$	Thermal resistance, case to heatsink, max	$^\circ\text{C/W}$	0.008	Direct current	
<b>MECHANICAL</b>					
w	Weight, typ	g	180		
$D_s$	Surface creepage distance	mm (inch)	23.69 (0.933)		
$D_a$	Air strike distance	mm (inch)	19.10 (0.752)		

OVERALL DIMENSIONS



ZT40

All dimensions in millimeters