



High-end Power Semiconductor Manufacturer

## ZP1000A 1000-1800V 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         |           | $I_{FAV}$ |      | 1000 A        |      |
| Repetitive peak reverse voltage |           | $V_{RRM}$ |      | 1000 – 1800 V |      |
| $V_{RRM}$ , V                   | 1000      | 1200      | 1400 | 1600          | 1800 |
| Voltage code                    | 10        | 12        | 14   | 16            | 18   |
| $T_j$ , °C                      | -60 – 190 |           |      |               |      |

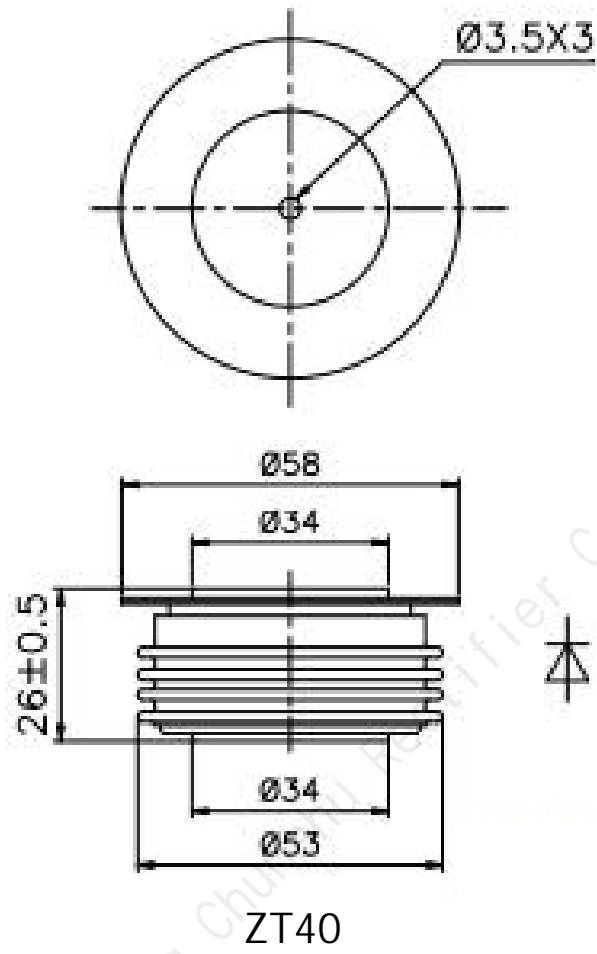
### MAXIMUM ALLOWABLE RATINGS

| Symbols and parameters |                                      | Units             | Values               | Test conditions  |  |
|------------------------|--------------------------------------|-------------------|----------------------|--|--|
| <b>ON-STATE</b>        |                                      |                   |                      |  |  |
| $I_{FAV}$              | Average forward current              | A                 | 1000                 | $T_c=100$ °C; Double side cooled; 180° half-sine wave; 50 Hz                 |  |
| $I_{FRMS}$             | RMS forward current                  | A                 | 1570                 | $T_c=117$ °C; Double side cooled; 180° half-sine wave; 50 Hz                 |  |
| $I_{FSM}$              | Surge forward current                | kA                | 16.0<br>18.0         | $T_j=T_{j\max}$<br>$T_j=25$ °C   | 180° half-sine wave; 50 Hz<br>( $t_p=10$ ms); single pulse;<br>$V_R=0$ V;  |
|                        |                                      |                   | 17.0<br>20.0         | $T_j=T_{j\max}$<br>$T_j=25$ °C   | 180° half-sine wave; 60 Hz<br>( $t_p=8.3$ ms); single pulse;<br>$V_R=0$ V; |
| $I^2t$                 | Safety factor                        | $A^2s \cdot 10^3$ | 1280<br>1620         | $T_j=T_{j\max}$<br>$T_j=25$ °C   | 180° half-sine wave; 50 Hz<br>( $t_p=10$ ms); single pulse;<br>$V_R=0$ V;  |
|                        |                                      |                   | 1195<br>1660         | $T_j=T_{j\max}$<br>$T_j=25$ °C   | 180° half-sine wave; 60 Hz<br>( $t_p=8.3$ ms); single pulse;<br>$V_R=0$ V; |
| <b>BLOCKING</b>        |                                      |                   |                      |  |  |
| $V_{RRM}$              | Repetitive peak reverse voltages     | V                 | 1000–1800            | $T_{j\min} < T_j < T_{j\max}$ ;<br>180° half-sine wave; 50 Hz;               |  |
| $V_{RSM}$              | Non-repetitive peak reverse voltages | V                 | 1100–1900            | $T_{j\min} < T_j < T_{j\max}$ ;<br>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                | -60–190              |  |  |
| $T_j$                  | Operating junction temperature       | °C                | -60–190              |  |  |
| <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                  | 1.56             | $T_j=25\text{ }^\circ\text{C}; I_{FM}=3140\text{ A}$ |                     |
| $V_{F(TO)}$            | Forward threshold voltage, max            | V                  | 0.97             | $T_j=T_{j\text{ max}}$                               |                     |
| $r_T$                  | Forward slope resistance, max             | m $\Omega$         | 0.360            | $0.5\pi I_{FAV} < I_T < 1.5\pi I_{FAV}$              |                     |
| <b>BLOCKING</b>        |   |                    |                  |  |                     |
| $I_{RRM}$              | Repetitive peak reverse current, max      | mA                 | 50               | $T_j=T_{j\text{ max}}$<br>$V_R=V_{RRM}$              |                     |
| <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<br>(inch)       | 23.69<br>(0.933) |  |                     |
| $D_a$                  | Air strike distance                       | mm<br>(inch)       | 19.10<br>(0.752) |  |                     |

OVERALL DIMENSIONS



All dimensions in millimeters