



High-end Power Semiconductor Manufacturer

## ZP1250A 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         |           | $I_{FAV}$ |      | 1250 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   |
| $T_{jv}$ , °C                   | -60 – 190 |           |      |               |      |

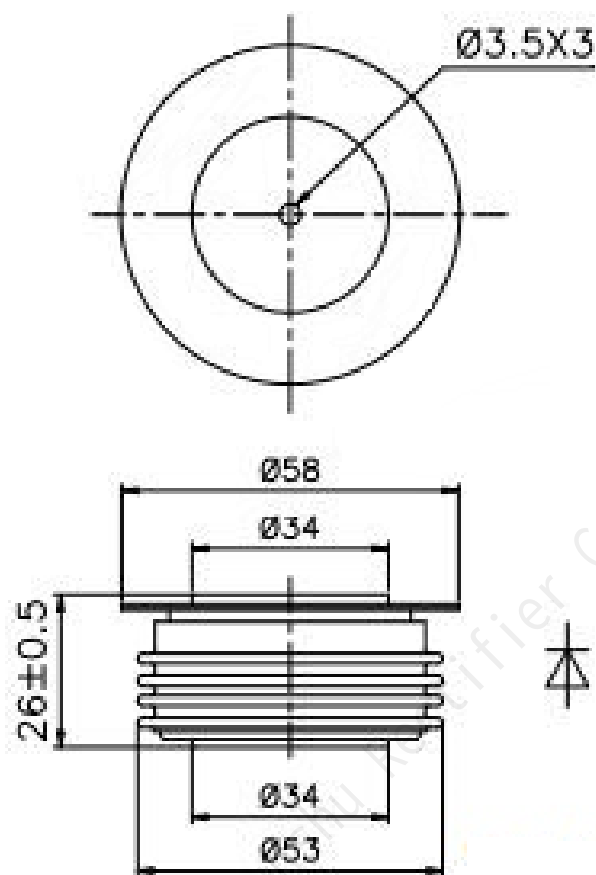
### MAXIMUM ALLOWABLE RATINGS

| Symbols and parameters |                                      | Units              | Values        | Test conditions                                                                       |                                                                                            |
|------------------------|--------------------------------------|--------------------|---------------|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| ON-STATE               |                                      |                    |               |                                                                                       |                                                                                            |
| $I_{FAV}$              | Average forward current              | A                  | 1250          | $T_c=100\text{ }^{\circ}\text{C}$ ; Double side cooled;<br>180° half-sine wave; 50 Hz |                                                                                            |
| $I_{FRMS}$             | RMS forward current                  | A                  | 1963          | $T_c=114\text{ }^{\circ}\text{C}$ ; Double side cooled;<br>180° half-sine wave; 50 Hz |                                                                                            |
| $I_{FSM}$              | Surge forward current                | kA                 | 20.0<br>23.0  | $T_j=T_{j\max}$<br>$T_j=25\text{ }^{\circ}\text{C}$                                   | 180° half-sine wave; 50 Hz<br>( $t_p=10\text{ ms}$ ); single pulse;<br>$V_R=0\text{ V}$ ;  |
|                        |                                      |                    | 21.0<br>24.0  | $T_j=T_{j\max}$<br>$T_j=25\text{ }^{\circ}\text{C}$                                   | 180° half-sine wave; 60 Hz<br>( $t_p=8.3\text{ ms}$ ); single pulse;<br>$V_R=0\text{ V}$ ; |
| $I^2t$                 | Safety factor                        | $A^2s\cdot 10^3$   | 2000<br>2645  | $T_j=T_{j\max}$<br>$T_j=25\text{ }^{\circ}\text{C}$                                   | 180° half-sine wave; 50 Hz<br>( $t_p=10\text{ ms}$ ); single pulse;<br>$V_R=0\text{ V}$ ;  |
|                        |                                      |                    | 1830<br>2390  | $T_j=T_{j\max}$<br>$T_j=25\text{ }^{\circ}\text{C}$                                   | 180° half-sine wave; 60 Hz<br>( $t_p=8.3\text{ ms}$ ); single pulse;<br>$V_R=0\text{ V}$ ; |
| BLOCKING               |                                      |                    |               |                                                                                       |                                                                                            |
| $V_{RRM}$              | 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                  | $0.75V_{RRM}$ | $T_j=T_{j\max}$ ;                                                                     |                                                                                            |
| THERMAL                |                                      |                    |               |                                                                                       |                                                                                            |
| $T_{stg}$              | Storage temperature                  | $^{\circ}\text{C}$ | -60–190       |                                                                                       |                                                                                            |
| $T_j$                  | Operating junction temperature       | $^{\circ}\text{C}$ | -60–190       |                                                                                       |                                                                                            |
| MECHANICAL             |                                      |                    |               |                                                                                       |                                                                                            |
| F                      | Mounting force                       | kN                 | 14.0–16.0     |                                                                                       |                                                                                            |
| a                      | Acceleration                         | $\text{m/s}^2$     | 50            | Device unclamped                                                                      |                                                                                            |
|                        |                                      |                    | 100           | Device clamped                                                                        |                                                                                            |

## CHARACTERISTICS

| Symbols and parameters |                                           | Units        | Values           | Conditions                                                               |                     |
|------------------------|-------------------------------------------|--------------|------------------|--------------------------------------------------------------------------|---------------------|
| ON-STATE               |                                           |              |                  |                                                                          |                     |
| V <sub>FM</sub>        | Peak forward voltage, max                 | V            | 1.66             | T <sub>j</sub> =25 °C; I <sub>FM</sub> =3925 A                           |                     |
| V <sub>F(TO)</sub>     | Forward threshold voltage, max            | V            | 0.97             | T <sub>j</sub> =T <sub>j max</sub> ;                                     |                     |
| r <sub>T</sub>         | Forward slope resistance, max             | mΩ           | 0.260            | 0.5 π I <sub>FAV</sub> < I <sub>T</sub> < 1.5 π I <sub>FAV</sub>         |                     |
| BLOCKING               |                                           |              |                  |                                                                          |                     |
| I <sub>RRM</sub>       | Repetitive peak reverse current, max      | mA           | 70               | T <sub>j</sub> =T <sub>j max</sub> ;<br>V <sub>R</sub> =V <sub>RRM</sub> |                     |
| THERMAL                |                                           |              |                  |                                                                          |                     |
| R <sub>thjc</sub>      | Thermal resistance, junction to case, max | °C/W         | 0.035            | Direct current                                                           | Double side cooled  |
| R <sub>thjc-A</sub>    |                                           |              | 0.077            |                                                                          | Anode side cooled   |
| R <sub>thjc-K</sub>    |                                           |              | 0.063            |                                                                          | Cathode side cooled |
| R <sub>thck</sub>      | Thermal resistance, case to heatsink, max | °C/W         | 0.006            | Direct current                                                           |                     |
| MECHANICAL             |                                           |              |                  |                                                                          |                     |
| w                      | Weight, typ                               | g            | 280              |                                                                          |                     |
| D <sub>s</sub>         | Surface creepage distance                 | mm<br>(inch) | 33.30<br>(1.311) |                                                                          |                     |
| D <sub>a</sub>         | Air strike distance                       | mm<br>(inch) | 22.50<br>(0.886) |                                                                          |                     |

## OVERALL DIMENSIONS



ZT40

All dimensions in millimeters