



High-end Power Semiconductor Manufacturer

## ZP800A 1000-2000V 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         |           |      |      | $I_{FAV}$ |      | 800 A         |      |      |      |
| Repetitive peak reverse voltage |           |      |      | $V_{RRM}$ |      | 1000 – 2000 V |      |      |      |
| $V_{RRM}$ , V                   | 1000      | 1100 | 1200 | 1300      | 1400 | 1500          | 1600 | 1800 | 2000 |
| Voltage code                    | 10        | 11   | 12   | 13        | 14   | 15            | 16   | 18   | 20   |
| $T_j$ , °C                      | -60 – 190 |      |      |           |      |               |      |      |      |

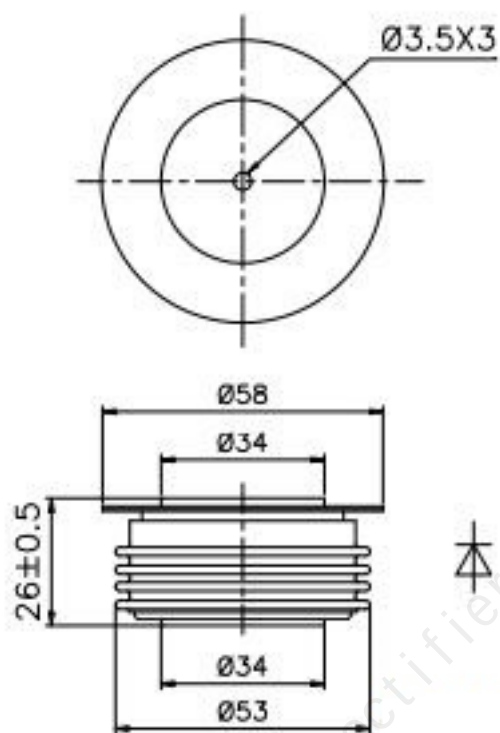
### MAXIMUM ALLOWABLE RATINGS

| Symbols and parameters |                                      | Units                            | Values                | Test conditions                                                                                        |                                                                                               |
|------------------------|--------------------------------------|----------------------------------|-----------------------|--------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| ON-STATE               |                                      |                                  |                       |                                                                                                        |                                                                                               |
| I <sub>FAV</sub>       | Average forward current              | A                                | 800                   | T <sub>c</sub> =100 °C; Double side cooled;<br>180° half-sine wave; 50 Hz                              |                                                                                               |
| I <sub>FRMS</sub>      | RMS forward current                  | A                                | 1256                  | T <sub>c</sub> =145 °C; Double side cooled;<br>180° half-sine wave; 50 Hz                              |                                                                                               |
| I <sub>FSM</sub>       | Surge forward current                | kA                               | 12.0<br>13.0          | T <sub>j</sub> =T <sub>j max</sub><br>T <sub>j</sub> =25 °C                                            | 180° half-sine wave; 50 Hz<br>(t <sub>p</sub> =10 ms); single pulse;<br>V <sub>R</sub> =0 V;  |
|                        |                                      |                                  | 13.0<br>15.0          | T <sub>j</sub> =T <sub>j max</sub><br>T <sub>j</sub> =25 °C                                            | 180° half-sine wave; 60 Hz<br>(t <sub>p</sub> =8.3 ms); single pulse;<br>V <sub>R</sub> =0 V; |
| I <sup>2</sup> t       | Safety factor                        | A <sup>2</sup> s·10 <sup>3</sup> | 720<br>950            | T <sub>j</sub> =T <sub>j max</sub><br>T <sub>j</sub> =25 °C                                            | 180° half-sine wave; 50 Hz<br>(t <sub>p</sub> =10 ms); single pulse;<br>V <sub>R</sub> =0 V;  |
|                        |                                      |                                  | 700<br>930            | T <sub>j</sub> =T <sub>j max</sub><br>T <sub>j</sub> =25 °C                                            | 180° half-sine wave; 60 Hz<br>(t <sub>p</sub> =8.3 ms); single pulse;<br>V <sub>R</sub> =0 V; |
| BLOCKING               |                                      |                                  |                       |                                                                                                        |                                                                                               |
| V <sub>RRM</sub>       | Repetitive peak reverse voltages     | V                                | 1000–2000             | T <sub>j min</sub> < T <sub>j</sub> < T <sub>j max</sub> ;<br>180° half-sine wave; 50 Hz;              |                                                                                               |
| V <sub>RSM</sub>       | Non-repetitive peak reverse voltages | V                                | 1100–2100             | T <sub>j min</sub> < T <sub>j</sub> < T <sub>j max</sub> ;<br>180° half-sine wave; 50 Hz;single pulse; |                                                                                               |
| V <sub>R</sub>         | Reverse continuous voltages          | V                                | 0.75·V <sub>RRM</sub> | T <sub>j</sub> =T <sub>j max</sub> ;                                                                   |                                                                                               |
| THERMAL                |                                      |                                  |                       |                                                                                                        |                                                                                               |
| T <sub>stg</sub>       | Storage temperature                  | °C                               | -60–50                |                                                                                                        |                                                                                               |
| T <sub>j</sub>         | Operating junction temperature       | °C                               | -60–190               |                                                                                                        |                                                                                               |
| MECHANICAL             |                                      |                                  |                       |                                                                                                        |                                                                                               |
| F                      | Mounting force                       | kN                               | 9.0–11.0              |                                                                                                        |                                                                                               |
| a                      | Acceleration                         | m/s <sup>2</sup>                 | 50<br>100             | Device unclamped<br>Device clamped                                                                     |                                                                                               |

## CHARACTERISTICS

| Symbols and parameters |                                           | Units        | Values           | Conditions                                                               |                     |
|------------------------|-------------------------------------------|--------------|------------------|--------------------------------------------------------------------------|---------------------|
| ON-STATE               |                                           |              |                  |                                                                          |                     |
| V <sub>FM</sub>        | Peak forward voltage, max                 | V            | 1.61             | T <sub>j</sub> =25 °C; I <sub>FM</sub> =2512 A                           |                     |
| V <sub>F(TO)</sub>     | Forward threshold voltage, max            | V            | 1.01             | T <sub>j</sub> =T <sub>j max</sub> ;                                     |                     |
| r <sub>T</sub>         | Forward slope resistance, max             | mΩ           | 0300             | 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           | 50               | 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         | 0.036            | Direct current                                                           | Double side cooled  |
| R <sub>thjc-A</sub>    |                                           |              | 0.079            |                                                                          | Anode side cooled   |
| R <sub>thjc-K</sub>    |                                           |              | 0.065            |                                                                          | Cathode side cooled |
| R <sub>thck</sub>      | Thermal resistance, case to heatsink, max | °C/W         | 0.008            | Direct current                                                           |                     |
| MECHANICAL             |                                           |              |                  |                                                                          |                     |
| w                      | Weight, typ                               | g            | 180              |                                                                          |                     |
| D <sub>s</sub>         | Surface creepage distance                 | mm<br>(inch) | 23.69<br>(0.933) |                                                                          |                     |
| D <sub>a</sub>         | Air strike distance                       | mm<br>(inch) | 19.10<br>(0.752) |                                                                          |                     |

## OVERALL DIMENSIONS



ZT40

All dimensions in millimeters