



High-end Power Semiconductor Manufacturer

## ZK100A 2000-2600V Fast Recovery Diode

- Low switching losses
- Low reverse recovery charge High
- power cycling capability



|                                 |            |           |                                |
|---------------------------------|------------|-----------|--------------------------------|
| Average forward current         |            | $I_{FAV}$ | 100 A                          |
| Repetitive peak reverse voltage |            | $V_{RRM}$ | 2000 – 2600 V                  |
| Reverse recovery time           |            | $t_{rr}$  | 2.00, 2.50, 3.20, 4.00 $\mu$ s |
| $V_{RRM}$ , V                   | 2000       | 2200      | 2400                           |
| Voltage code                    | 20         | 22        | 24                             |
| $T_j$ , °C                      | – 60 – 125 |           |                                |

### MAXIMUM ALLOWABLE RATINGS

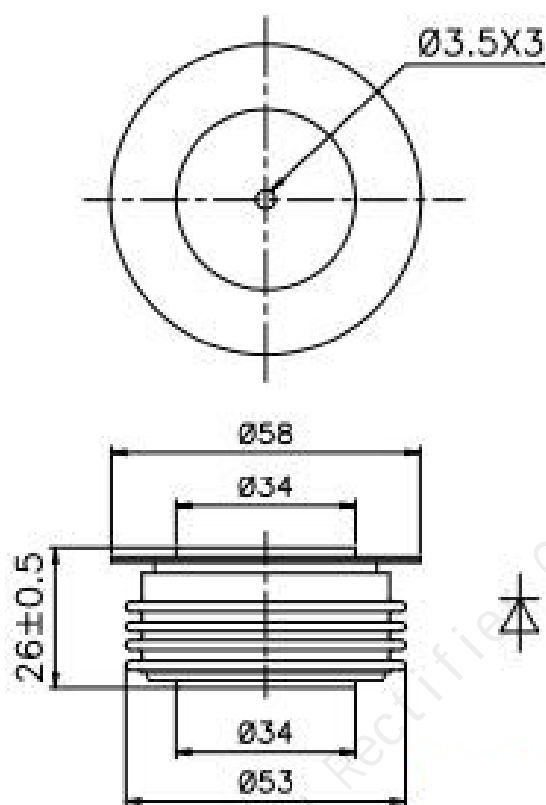
| Symbols and parameters |                                      | Units                            | Values               | Test conditions                                                                                  |                                                                                       |
|------------------------|--------------------------------------|----------------------------------|----------------------|--------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| ON-STATE               |                                      |                                  |                      |                                                                                                  |                                                                                       |
| I <sub>FAV</sub>       | Average forward current              | A                                | 100                  | T <sub>c</sub> =85 °C; Double side cooled; 180° half-sine wave; 50 Hz                            |                                                                                       |
| I <sub>FRMS</sub>      | RMS forward current                  | A                                | 157                  | T <sub>c</sub> =85 °C; Double side cooled; 180° half-sine wave; 50 Hz                            |                                                                                       |
| I <sub>FSM</sub>       | Surge forward current                | kA                               | 5.0<br>5.8           | T <sub>j</sub> =T <sub>j max</sub><br>T <sub>j</sub> =25 °C                                      | 180° half-sine wave;<br>t <sub>p</sub> =10 ms; single pulse;<br>V <sub>R</sub> =0 V;  |
|                        |                                      |                                  | 5.5<br>6.5           | T <sub>j</sub> =T <sub>j max</sub><br>T <sub>j</sub> =25 °C                                      | 180° half-sine wave;<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> | 120<br>160           | T <sub>j</sub> =T <sub>j max</sub><br>T <sub>j</sub> =25 °C                                      | 180° half-sine wave;<br>t <sub>p</sub> =10 ms; single pulse;<br>V <sub>R</sub> =0 V;  |
|                        |                                      |                                  | 120<br>170           | T <sub>j</sub> =T <sub>j max</sub><br>T <sub>j</sub> =25 °C                                      | 180° half-sine wave;<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                                | 2000–2600            | 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                                | 2100–2700            | T <sub>j min</sub> < T <sub>j</sub> < T <sub>j max</sub> ;<br>180° half-sine wave; single pulse; |                                                                                       |
| V <sub>R</sub>         | Reverse continuous voltages          | V                                | 0.6·V <sub>RRM</sub> | T <sub>j</sub> =T <sub>j max</sub> ;                                                             |                                                                                       |
| THERMAL                |                                      |                                  |                      |                                                                                                  |                                                                                       |
| T <sub>stg</sub>       | Storage temperature                  | °C                               | –60–55               |                                                                                                  |                                                                                       |
| T <sub>j</sub>         | Operating junction temperature       | °C                               | –60–125              |                                                                                                  |                                                                                       |
| MECHANICAL             |                                      |                                  |                      |                                                                                                  |                                                                                       |
| F                      | Mounting force                       | kN                               | 9.0–11.0             |                                                                                                  |                                                                                       |
| a                      | Acceleration                         | m/s <sup>2</sup>                 | 50                   | Device clamped                                                                                   |                                                                                       |

## CHARACTERISTICS

| Symbols and parameters |                                           | Units        | Values                    | Conditions                                                                                                                            |                     |
|------------------------|-------------------------------------------|--------------|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| ON-STATE               |                                           |              |                           |                                                                                                                                       |                     |
| V <sub>FM</sub>        | Peak forward voltage, max                 | V            | 3.50                      | T <sub>j</sub> =25 °C; I <sub>FM</sub> =314 A                                                                                         |                     |
| V <sub>F(TO)</sub>     | Forward threshold voltage, max            | V            | 1.35                      | T <sub>j</sub> =T <sub>j max</sub> ;                                                                                                  |                     |
| r <sub>T</sub>         | Forward slope resistance, max             | mΩ           | 2.50                      | 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>                                                              |                     |
| SWITCHING              |                                           |              |                           |                                                                                                                                       |                     |
| Q <sub>rr</sub>        | Total recovered charge, max               | μC           | 60                        | T <sub>j</sub> =T <sub>j max</sub> ; I <sub>FM</sub> = I <sub>FAV</sub> ;<br>di <sub>R</sub> /dt=-100 A/μs;<br>V <sub>R</sub> =100 V; |                     |
| t <sub>rr</sub>        | Reverse recovery time <sup>1)</sup> , max | μs           | 2.00, 2.50,<br>3.20, 4.00 |                                                                                                                                       |                     |
| I <sub>rrM</sub>       | Peak reverse recovery current, max        | A            | tbd*                      |                                                                                                                                       |                     |
| THERMAL                |                                           |              |                           |                                                                                                                                       |                     |
| R <sub>thjc</sub>      | Thermal resistance, junction to case, max | °C/W         | 0.0400                    | Direct current                                                                                                                        | Double side cooled  |
| R <sub>thjc-A</sub>    |                                           |              | 0.0880                    |                                                                                                                                       | Anode side cooled   |
| R <sub>thjc-K</sub>    |                                           |              | 0.0720                    |                                                                                                                                       | Cathode side cooled |
| R <sub>thck</sub>      | Thermal resistance, case to heatsink, max | °C/W         | 0.0080                    | Direct current                                                                                                                        |                     |
| MECHANICAL             |                                           |              |                           |                                                                                                                                       |                     |
| w                      | Weight, max                               | 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)          |                                                                                                                                       |                     |

\* **tbd** – data will be refined as additional tests are conducted and statistics are collected.

## OVERALL DIMENSIONS



ZT40

All dimensions in millimeters