

## Optima Diode - Low forward voltage drop, Fast Recovery Diode

|                           |              |                            |              |
|---------------------------|--------------|----------------------------|--------------|
| <b>V<sub>RRM</sub></b>    | <b>600 V</b> | <b>I<sub>F</sub></b>       | <b>15 A</b>  |
| <b>V<sub>F(TYP)</sub></b> | <b>1.3 V</b> | <b>T<sub>RR(TYP)</sub></b> | <b>70 ns</b> |

### Features

- Fast recovery
- Low forward voltage
- Optimized trade-off performance between V<sub>F</sub> & T<sub>RR</sub>
- Soft recovery characteristic for better EMI
- High junction temperature 150 °C
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard

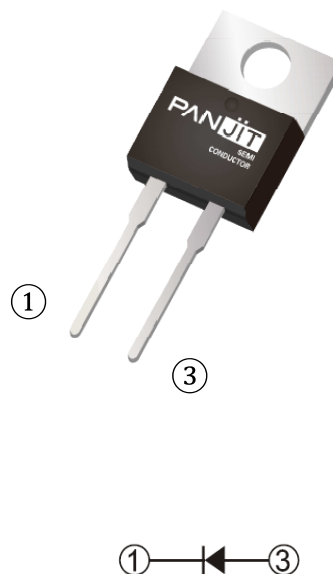
### Mechanical Data

- Case: TO-220AC molded plastic
- Terminals: Solderable per MIL-STD-750, Method 2026
- Approx. Weight: 0.067 ounces, 1.89 grams

### Application

- PFC, UPS, PV Inverter, EV Charging Station, Welder

### TO-220AC



## Maximum Ratings and Thermal Characteristics (T<sub>C</sub> = 25 °C unless otherwise specified)

| PARAMETER                                                                          | SYMBOL             | LIMIT   | UNITS |
|------------------------------------------------------------------------------------|--------------------|---------|-------|
| Repetitive Peak Reverse Voltage                                                    | V <sub>RRM</sub>   | 600     | V     |
| DC Blocking Voltage                                                                | V <sub>DC</sub>    | 600     | V     |
| Diode Forward Current @ T <sub>C</sub> =125°C                                      | I <sub>F(AV)</sub> | 15      | A     |
| Repetitive Peak Surge Current<br><i>t<sub>p</sub> = 8.3 ms, sine-wave, D=0.5</i>   | I <sub>FRM</sub>   | 30      | A     |
| Peak Forward Surge Current<br><i>t<sub>p</sub> = 8.3 ms, single half sine-wave</i> | I <sub>FSM</sub>   | 180     | A     |
| Maximum Power Dissipation                                                          | P <sub>total</sub> | 89      | W     |
| Operating Junction Temperature Range                                               | T <sub>J</sub>     | -55~150 | °C    |
| Storage Temperature Range                                                          | T <sub>STG</sub>   | -55~150 | °C    |

**Electrical Characteristics** ( $T_C = 25\text{ }^{\circ}\text{C}$  unless otherwise specified)

| PARAMETER                     | SYMBOL          | TEST CONDITION                                                                                                              | MIN. | TYP. | MAX. | UNITS                       |
|-------------------------------|-----------------|-----------------------------------------------------------------------------------------------------------------------------|------|------|------|-----------------------------|
| Forward voltage drop          | $V_F$           | $I_F = 15\text{ A}$ , $T_J = 25\text{ }^{\circ}\text{C}$                                                                    | -    | 1.3  | 1.8  | V                           |
|                               |                 | $I_F = 15\text{ A}$ , $T_J = 125\text{ }^{\circ}\text{C}$                                                                   | -    | 1.2  | -    |                             |
| Reverse leakage current       | $I_R$           | $V_R = 600\text{ V}$ , $T_J = 25\text{ }^{\circ}\text{C}$                                                                   | -    | -    | 100  | $\mu\text{A}$               |
|                               |                 | $V_R = 600\text{ V}$ , $T_J = 125\text{ }^{\circ}\text{C}$                                                                  | -    | -    | 500  | $\mu\text{A}$               |
| Reverse recovery time         | $T_{RR}$        | $I_F = 0.5\text{ A}$ , $I_R = 1\text{ A}$ ,<br>$I_{RR} = 0.25\text{ A}$<br>$T_J = 25\text{ }^{\circ}\text{C}$               | -    | -    | 45   | ns                          |
|                               |                 | $I_F = 1\text{ A}$ , $V_R = 30\text{ V}$ ,<br>$di/dt = 300\text{ A}/\mu\text{s}$ ,<br>$T_J = 25\text{ }^{\circ}\text{C}$    | -    | -    | 35   | ns                          |
| Reverse recovery time         | $T_{RR}$        | $I_F = 15\text{ A}$ , $V_R = 400\text{ V}$ ,<br>$di/dt = 300\text{ A}/\mu\text{s}$ ,<br>$T_J = 25\text{ }^{\circ}\text{C}$  | -    | 70   | 110  | ns                          |
| Peak recovery current         | $I_{RRM}$       |                                                                                                                             | -    | 5.4  | -    | A                           |
| Reverse recovery charge       | $Q_{RR}$        |                                                                                                                             | -    | 250  | -    | nC                          |
| Softness factor = $t_b / t_a$ | S               |                                                                                                                             | -    | 1.65 | -    |                             |
| Reverse recovery time         | $T_{RR}$        | $I_F = 15\text{ A}$ , $V_R = 400\text{ V}$ ,<br>$di/dt = 300\text{ A}/\mu\text{s}$ ,<br>$T_J = 125\text{ }^{\circ}\text{C}$ | -    | 100  | -    | ns                          |
| Peak recovery current         | $I_{RRM}$       |                                                                                                                             | -    | 10.7 | -    | A                           |
| Reverse recovery charge       | $Q_{RR}$        |                                                                                                                             | -    | 730  | -    | nC                          |
| Softness factor = $t_b / t_a$ | S               |                                                                                                                             | -    | 0.75 | -    |                             |
| Thermal Resistance            | $R_{\theta JC}$ |                                                                                                                             | -    | -    | 1.4  | $^{\circ}\text{C}/\text{W}$ |

TYPICAL CHARACTERISTIC CURVES

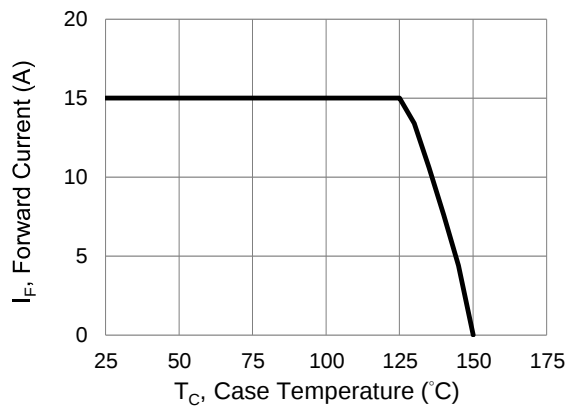


Fig.1 Forward Current Derating Curve

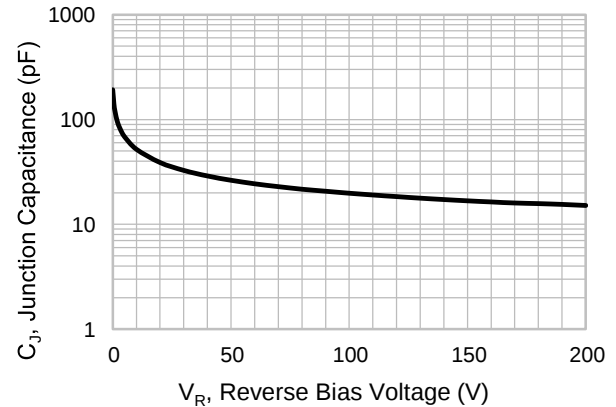


Fig.2 Typical Junction Capacitance

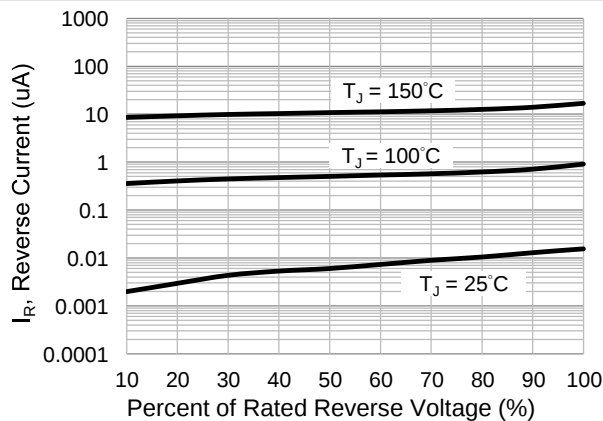


Fig.3 Typical Reverse Characteristics

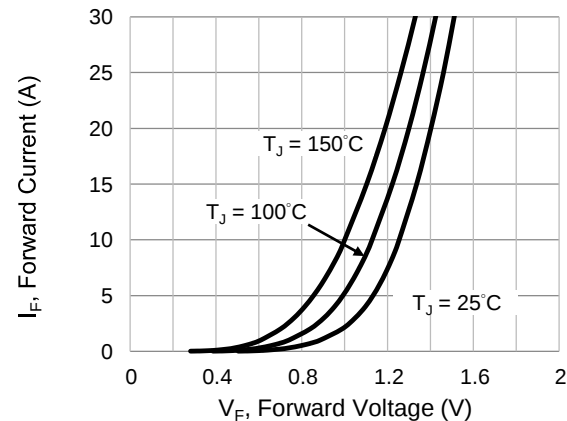


Fig.4 Typical Forward Characteristics

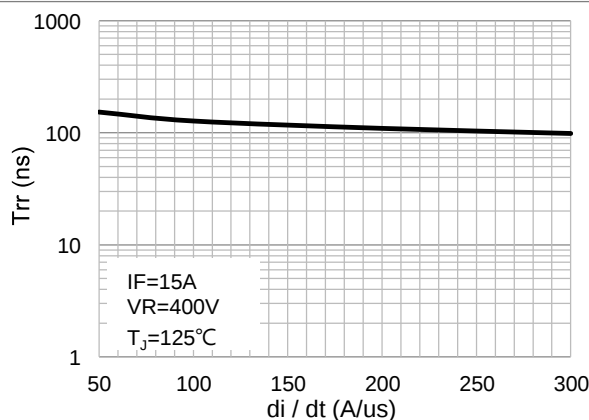


Fig.5 Typical Reverse Recovery Time Versus di/dt

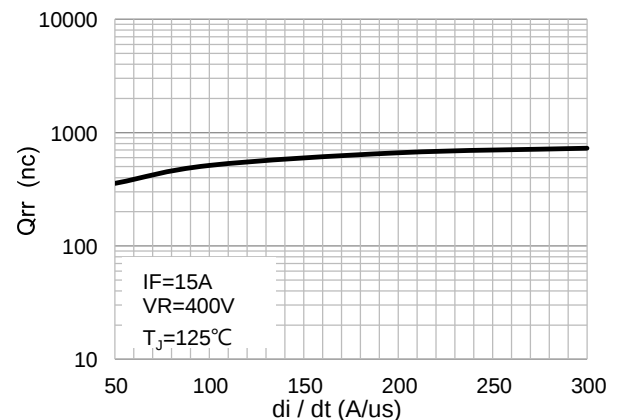
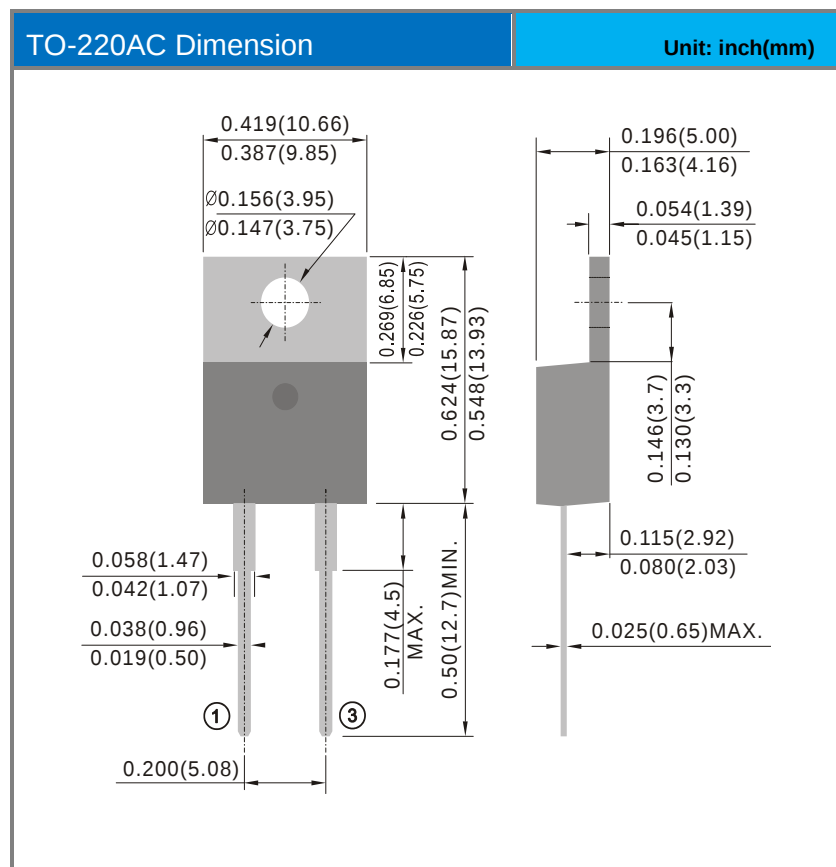


Fig.6 Typical Reverse Recovery Charges Versus di/dt

## Product and Packing Information

| Part No.   | Package Type | Packing Type | Marking   |
|------------|--------------|--------------|-----------|
| PSDP1560L1 | TO-220AC     | 50pcs / Tube | SDP1560L1 |

## Packaging Information



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