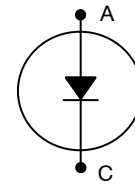


Extremefast Diode with Solderable Top Metal

650 V, 200 A

PCRKA20065F8M1



Features

- AEC-Q101 Qualified
- Maximum Junction Temperature 175°C
- Extremefast Technology with Soft Recovery
- Low Forward Voltage ($V_F = 1.35\text{ V (Typ.) @ } I_F = 200\text{ A}$)
- Cathode Pad covered with Solderable Metal Layer

Applications

- Automotive Traction Modules
- General Power Modules

ORDERING INFORMATION

| Part Number | PCRKA20065F8M1 | |
|----------------------------|---|----------------|
| Packing | Wafer (sawn on foil) | |
| | mils | μm |
| Die Size | 197 × 394 | 5,000 × 10,000 |
| Anode Area | 183 × 381 | 4,668 × 9,668 |
| Die Thickness | 3 | 78 |
| Top Metal | 6 μm AlCu + 1.15 μm Ti/NiV/Ag (STM) | |
| Back Metal | 0.65 μm NiV/Ag | |
| Topside Passivation | Silicon Nitride plus Polyimide | |
| Wafer Diameter | 200 mm | |
| Max Possible Die Per Wafer | 487 | |

ABSOLUTE MAXIMUM RATINGS ($T_{VJ} = 25^\circ\text{C}$ unless otherwise noted)

| Parameter | Symbol | Ratings | Units |
|---|-----------|-------------|------------------|
| Repetitive Peak Reverse Voltage | V_{RRM} | 650 | V |
| DC Forward Current, limited by T_J max | I_F | (Note 1) | A |
| Pulsed Forward Current, t_p limited by T_J max (Note 2) | I_{FM} | 900 | A |
| Operating Junction Temperature | T_J | -40 to +175 | $^\circ\text{C}$ |
| Storage Temperature Range | T_{stg} | +17 to +25 | $^\circ\text{C}$ |

1. Depends on the thermal properties of assembly.
2. Not subject to production test – verified by design/characterization.

PCRKA20065F8M1

ELECTRICAL CHARACTERISTICS OF THE DIODE ($T_J = 25^\circ\text{C}$ unless otherwise noted)

| Parameter | Symbol | Test Condition | Min. | Typ. | Max. | Units |
|--|----------|-----------------------|------|------|------|---------------|
| Static Characteristics (Tested on wafers) | | | | | | |
| Breakdown Voltage | V_{BR} | $I_R = 1 \text{ mA}$ | 650 | - | - | V |
| Reverse Leakage Current | I_R | $V_R = 650 \text{ V}$ | - | - | 30 | μA |
| Forward Voltage | V_F | $I_F = 100 \text{ A}$ | - | 1.15 | 1.7 | V |

Electrical Characteristics (Not subject to production test – verified by design / characterization)

| | | | | | | | |
|--------------------------|----------|---|---------------------------|-----|------|-----|---------------|
| Forward Voltage | V_F | $I_F = 200 \text{ A}$ | $T_J = 25^\circ\text{C}$ | - | 1.35 | 1.9 | V |
| | | | $T_J = 175^\circ\text{C}$ | - | 1.3 | - | V |
| Reverse Recovery Charge | Q_{rr} | $I_F = 200 \text{ A}, V_R = 400 \text{ V}$ $di_F/dt = 1000 \text{ A}/\mu\text{s}, T_J = 25^\circ\text{C}$ | | - | 3.2 | - | μC |
| Reverse Recovery Current | I_{rr} | | | - | 55 | - | A |
| Reverse Recovery Time | T_{rr} | | | - | 117 | - | ns |
| Reverse Recovery Charge | Q_{rr} | $I_F = 200 \text{ A}, V_R = 400 \text{ V}$ $di_F/dt = 1000 \text{ A}/\mu\text{s}, T_J = 175^\circ\text{C}$ | | - | 15.1 | - | μC |
| | | | | | - | 122 | - |
| Reverse Recovery Time | T_{rr} | | - | 247 | - | nS | |

3. For ordering, technique and other information on **onsemi** automotive bare die products, please contact automotivebaredie@onsemi.com.

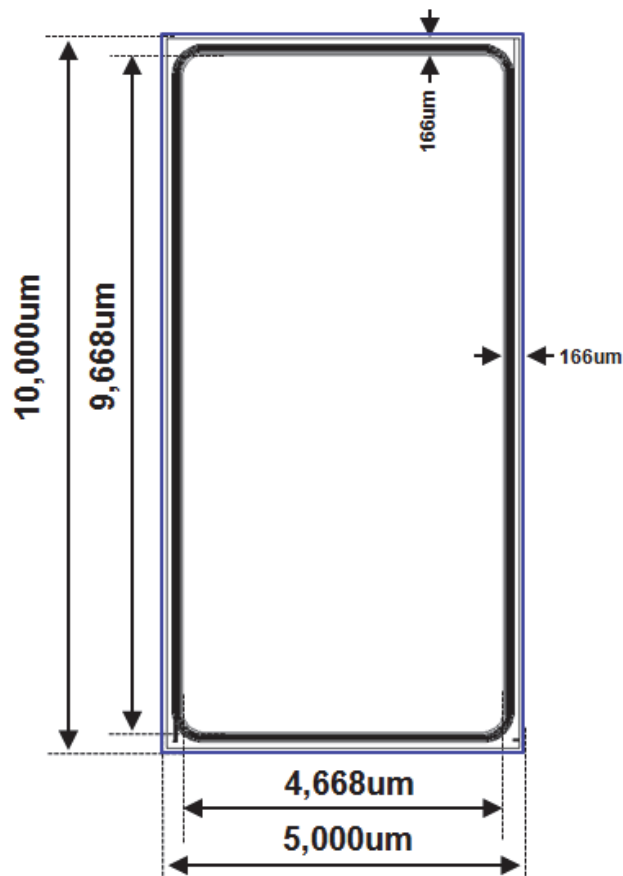


Figure 1. Dimensional Outline and Pad Layout

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