The Diodes Advantage

- **Very low turn-OFF threshold, Very small MOSFET Propagation Delay, and Very low Drain Source ON Resistance**

  When operating in DC mode, the embedded AR30N60PPA MOSFET offers very low turn-OFF threshold ($V_{\text{THOFF}} = -4\text{mV}$ typical). Once this threshold is reached, the embedded MOSFET only takes $T_{\text{OFF}} = 30\text{ns}$ Typ. to shutoff. Additionally, the drain source ON resistance is $R_{\text{DSON}} = 15\text{m\Omega}$ typical.

- **Smart Synchronization Feature**

  With the AR30N60PPA operating in CC mode, the smart SYNC pin synchronizes with the primary-side controller to avoid shoot-through from occurring. As a result, unfavorable reverse condition of the embedded MOSFET is prevented.

- **Multiple Modes of Operation**

  AR30N60PPA is ideally suited for the fast-charging capable AC/DC power converters implemented in either the Flyback or the LLC-resonant topology, supporting many modes of operation such as DC, CC, and QR.

- **Fault Detection and System Protection**

  To protect the integrity of the system, the UVLO and OTP features of the AR30N60PPA guard against undervoltage and overtemperature, respectively.

Applications

- USB Type-C charger
- Flyback Conversion
- PC Power Supply
- AC/DC Battery Charger
- Fast Charging
- Switch-Mode Power Supply (SMPS)

AR30N60PPA is a high-performance Active/Synchronous Rectifier optimized for secondary-side synchronous rectification, providing an output voltage from 3.5V-6V.

AR30N60PPA integrates the MOSFET and controller which emulates the characteristics of a near-ideal diode rectifier. This reduces secondary-side energy consumption as well as improves primary-side power dissipation.

The smart SYNC pin, when connected to a suitable primary-side control signal, and under continuous conduction mode (CCM), allows the embedded MOSFET to work synchronously with the primary-side switch, thus avoiding the unfavorable shoot-through condition.

Other intelligent features which improve conversion efficiency and system integrity are: light-load detection to reduce standby power consumption, TON and TOFF/EN pins to prevent runaway ON-time due to the open-circuit or short-circuit conditions, SFB pin to provide overtemperature protection (OTP) and undervoltage lock-out (UVLO) to ensure system reliability.

AR30N60PPA is ideally suited for high-efficiency AC/DC power converters which support fast charging. In addition, the device supports either Flyback or LLC-resonant topology and operates under Discontinuous Conduction (DC), Continuous Conduction (CC), or Quasi-Resonant (QR) modes.

AR30N60PPA is housed in the small form-factor DFN6040 package, which is both halogen-free and RoHS-compliant. (See diodes.com for further details).
Typical Application Circuit

![Typical Application Circuit Diagram]

Product Portfolio

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Supply Voltage $V_{CC}$ (V)</th>
<th>Max Quiescent Current $I_{CC,\text{ON}}$ (mA)</th>
<th>Drain Voltage $V_D$ (V)</th>
<th>Mode of Operation</th>
<th>Switching Frequency $F_{SW}$ (KHz)</th>
<th>Turn-ON/Turn-OFF Delay Time (ns) $T_D\text{ON}$ $T_D\text{OFF}$</th>
<th>Gate Turn-OFF Threshold Voltage $V_{TH\text{OFF}}$ (mV)</th>
<th>Typ Drain Source ON Resistance $R_{DS\text{ON}}$ (mΩ)</th>
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<td>2.9</td>
<td>60</td>
<td>CCM DCM QR</td>
<td>600</td>
<td>30 30</td>
<td>-4</td>
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<td>DFN6040-22</td>
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Ordering Information

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<th>Tape Width (mm)</th>
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