Compact High Efficiency Synchronous Buck-Boost Converter for High-Power Density Portable Applications

The AP72200 is a high current synchronous buck-boost converter providing high efficiency, excellent transient response, and high output voltage accuracy. It’s ideal for battery powered applications like smartphones, tablets, and other handheld devices.

The AP72200 uses an I²C, two-wire interface to dynamically program the output voltage along with other device configuration options. Its I²C interface supports bit rates up to 3.4Mbit/s (High-speed mode).

The AP72200 utilizes a low resistance, 4-switch H-Bridge configuration to support buck and boost operations with at least 2A output current. It also has outstanding line and load transient responses and a seamless transition between buck and boost modes.

Its current-mode control scheme handles wide input/output voltage ratios and has 3 modes of operation:
- PFM (support LLHE)
- PWM (lower ripple)
- Ultrasonic – no audible noise

The AP72200 also features UVLO, OTP, and OCP to protect the chip.

The AP72200 is available in the small 2.125mm x 1.750mm, 20-ball WLCSP package.

The Diodes Advantage

**High Efficiency Synchronous DC-DC Buck-Boost Converter**

- **V\textsubscript{IN} 2.3V to 5.5V**
  Works across the full voltage range of a single-cell Li-Ion battery

- **Output Voltage range: 2.6V to 5.14V**

- **2A Output Current for V\textsubscript{OUT}=3.4V and V\textsubscript{IN}>2.9V and Efficiency up to 97%**
  Longer battery life

- **Dynamically Program AP72200 through I²C Interface**
  Supports standard-mode, fast-mode, fast-mode plus, and high-speed mode
  Controls output voltage setting, output voltage ramp up/down slew rates
  Controls output OVP threshold, OCP threshold, and other device configurations

- **PFM/PWM/USM Operation**
  PFM Mode for high light load efficiency through MODE Pin or I²C programming
  PWM Mode for low output ripple through MODE Pin or I²C programming
  Ultrasonic mode for avoiding audible range through I²C programming

Applications

- Smartphones
- Tablets
- Portable Consumer Devices
## Typical Application Schematic

![Typical Application Schematic](image)

## Product Portfolio

<table>
<thead>
<tr>
<th>Part #</th>
<th>VIN Range (V)</th>
<th>VOUT Range (V)</th>
<th>Switches Current (A)</th>
<th>Switching frequency (MHz)</th>
<th>Iq (µA)</th>
<th>Ambient Temperature (°C)</th>
<th>Programmable I^2^C</th>
<th>Modes</th>
<th>Package</th>
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</thead>
<tbody>
<tr>
<td>AP72200</td>
<td>2.3 to 5.5</td>
<td>2.6 to 5.14</td>
<td>4.3</td>
<td>2.5</td>
<td>20</td>
<td>-30 to 85</td>
<td>Up to 3.4MHz</td>
<td>PFM USM PWM</td>
<td>WLCSP</td>
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## Ordering Information

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<thead>
<tr>
<th>Part Number</th>
<th>Package Code</th>
<th>Package</th>
<th>Identification Code</th>
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<tbody>
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<td>AP72200CT20-7</td>
<td>W-WLB2118-20</td>
<td>WLCSP-20</td>
<td>D7</td>
<td>7 Inch</td>
<td>3000</td>
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