

High Efficiency Rapid Charging

Qualcomm[®] Quick Charge 2.0-Compatible AC/DC Adapter Solution

Dialog QC 2.0 Rapid Charge Solution

- High efficiency
 -Up to 83% efficiency without synchronous rectifier
 - -Up to 88% efficiency with synchronous rectifier
- Primary-side current sensing no current sense resistor
- High power density for small form-factor rapid charging power supplies up to 40W
- ► Supports Quick Charge 2.0 HVDCP Class A (5V, 9V, 12V)

Dialog's rapid charge AC/DC adapter solution provides inherently higher efficiency to enable the higher power density needed for small form-factor Qualcomm Quick Charge 2.0 adapter applications.





The iW620 rapid charge interface IC detects commands from a QC 2.0-enabled mobile device via the USB cable, then communicates

with the iW1760 PWM primary-side controller and configures the power adapter output voltage. The iW620 ensures safe operation with programmable, patented active fast output voltage discharge from 9V or 12V down to 5V. So, when the USB cable is unplugged from a QC 2.0 phone and then used with a non-QC 2.0 phone, the iW620 rapidly discharges the output voltage down to 5V to protect the phone from damage.

Quick Quick Charge 2.0 / iW620 AC/DC Rapid Charge 2.0 Compatible **Charge Solution Benefits** Rapid \checkmark Up to 75% faster charge time vs High Charge Efficiency conventional USB charging dialog \checkmark High efficiency up to 88% 1620 ✓ Primary-side current control enables low cost implementation of different constant Up to Primary-40W current thresholds for each output voltage Side Control Output ✓ Backward compatible with 5V USB BC 1.2 mobile devices High **Power Density**



iW620+iW1760 – Qualcomm[®] Quick Charge 2.0-Compatible AC/DC Adapter Solution

Features

- Primary-side current sensing and control
- ► Up to 40W output power applications
- ▶ Wide operating voltage range: 3V to 25V
- ► No-load power consumption < 100mW
- Supports Qualcomm Quick Charge 2.0 High Voltage Dedicated Charging Port Class A (5V, 9V, 12V)
- ► Fast dynamic load regulation
- ► High Efficiency
 - Up to 83% (no synchronous rectifier) Up to 88% (using synchronous rectifier)
- Backward compatible with USB BC 1.2 Dedicated Charging Port

- Patented, programmable active fast output voltage discharge from 9V/12V to 5V at USB cable unplug or from a high voltage level to a lower level upon request with built-in switch or external switch
- Comprehensive protections
 - Adjacent pin-to-pin short circuit and floating pin protection
 - Built-in fault protections against output short-circuit, output over-voltage, output over-current, current-sense resistor short
 - Output current limit and overload protection
 - Dedicated pin for external over-temperature and overvoltage protection



Primary-Side Current Sensing and Control

Current sensing is performed by the iW1760 on the primary side, eliminating the need for a secondary-side current sense resistor for an inherently more efficient solution than competing QC 2.0 wall charger approaches. Primary-side current control also enables low cost implementation of different constant current thresholds for each output voltage.

iW1760 Typical Application Diagram



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