

## USB Type-C And USB Power Delivery Controllers Have Fully Integrated Power Paths

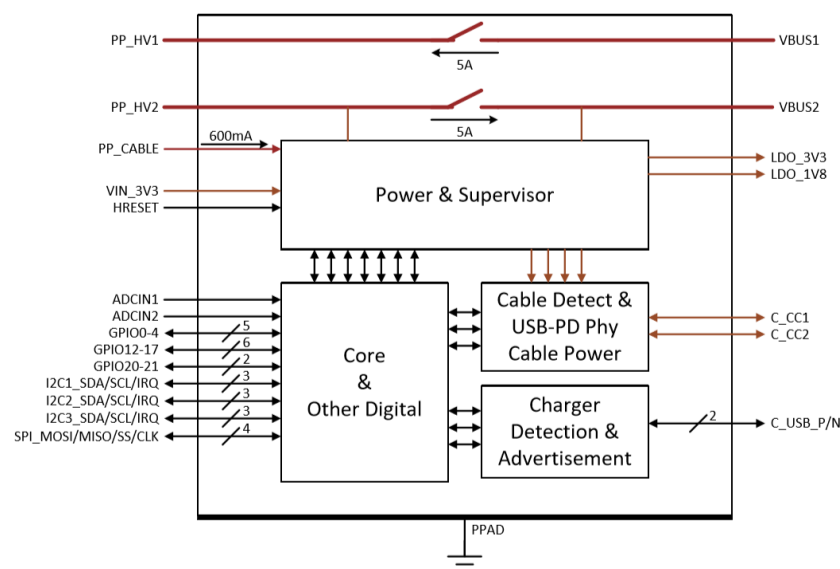
[Texas Instruments'](#) two new USB Type-C and USB Power Delivery (PD) controllers feature fully integrated power paths to simplify designs, minimize solution size and speed time to market. According to TI, the TPS65987D and TPS65988 offer system designers the industry's highest level of integration which can reduce design complexity and overall cost.

The devices are said to be the industry's first USB PD controllers to source 100 W and 200 W of power, respectively, to support computing applications and enable the benefits of USB Type-C in additional applications such as cordless power tools, gaming and virtual reality headsets (Fig. 1). The TPS65987D, a single-port device designed to source 100 W of power, integrates independent 20-V, 5-A source and sink load switches. Low  $R_{DS(ON)}$  (25 m $\Omega$ ) and reverse current protection in the TPS65987D provide a comprehensive solution for managing a port's charging needs. The dual-port TPS65988 can source 200 W of power, and offers two integrated 5-A bidirectional load switches and external power-path control to enable simultaneous 5-A source capability.

The devices are USB PD 3.0-certified, UL recognized, and International Electrotechnical Commission (IEC) safety-certified, and come preprogrammed to support several of the most common use cases including DisplayPort and Thunderbolt applications. Additional use cases are supported through an easy-to-use configuration tool.

The TPS65987D and TPS65988 are said to enable simpler designs with fewer components and the industry's highest power level. Fully integrated USB PD controllers can help designers reduce design complexity, compared to discrete implementations which typically require 18 external power-path components. In addition, the new controllers offer integrated reverse current protection for multiple power paths, to further save board space and protect the system and controller from overcurrent (Fig. 2).

200 W of power allows fast USB Type-C charging, with two integrated 5-A FET paths to enable high-power applications such as PC notebooks, docking stations or connected peripherals while maintaining low  $R_{DS(ON)}$  for efficient charging with minimal power loss. Both devices are available now from the TI store and authorized distributors in 7-mm-by-7-mm split-pad QFN packaging. The TPS65987D and TPS65988 are priced at \$1.99 and \$2.99 each, respectively, in 1,000-unit quantities. For more information, see the TPS65987D product [page](#) and the TPS65988 product [page](#).



*Fig. 1. According to TI, the new USB Type-C and USB Power Delivery (PD) controllers offer system designers the industry's highest level of integration which can reduce design complexity and overall cost. The devices are also described as the industry's first USB PD controllers to source 100 W and 200 W of power. A simplified block diagram for the TPS65987D is shown here.*

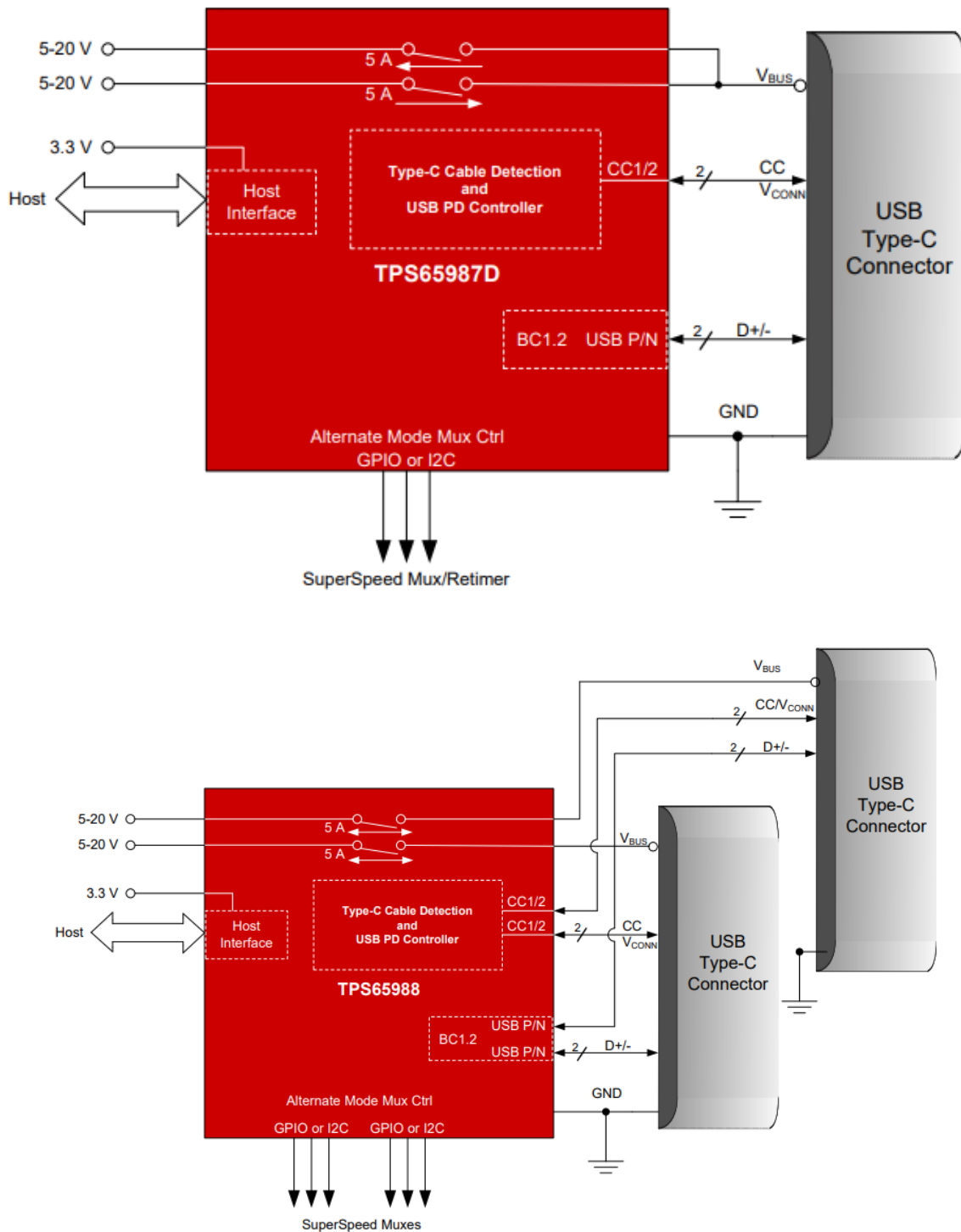


Fig. 2. The TPS65987D, a single-port device designed to source 100 W of power (shown in top diagram), integrates independent 20-V, 5-A source and sink load switches. The dual-port TPS65988 (shown in bottom diagram) can source 200 W of power, and offers two integrated 5-A bidirectional load switches and external power-path control to enable simultaneous 5-A source capability.