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ICs Simplify USB Type-C Power Delivery, Enable HostFlexing And PDBalancing

Microchip Technology has two new solutions that simplify USB Type-C power delivery (PD) for a range of applications. As one of the industry's first USB-IF-certified USB 3.1 SmartHub devices with integrated support for power delivery (TID1212), the USB705x family enables fast device charging and introduces unique PD implementations called HostFlexing and PDBalancing. The UPD301A is a standalone USB type-C PD controller that significantly simplifies the implementation of basic USB type-C PD charging functionality, making it well suited for applications from rear seat charging in vehicles to portable equipment to public charging stations.

The USB705x family's HostFlexing feature simplifies the user's docking station experience by allowing all USB type-C ports to function as the "notebook" port, eliminating the need for cryptic labels that try and explain overall functionality of each USB type-C port. Meanwhile PDBalancing provides a methodology for manufacturers to manage overall system power through centralized control, ultimately saving money for consumers by being able to charge a number of PD-enabled devices with less overall power.

To meet consumer demand for faster mobile device charging and data streaming, the USB705x family combines native support for USB type-C PD with the 5-Gbps SuperSpeed data rates of USB 3.1. Well suited for docks, PC monitors and automotive infotainment, the family—consisting of the USB7050, USB7051, USB7052 and USB7056—provides a range of USB configurations to meet varying PD and USB type-C design needs (see the application block diagram in the figure).

For example, the USB7050 supports three PD-enabled upstream and downstream USB type-C ports, while the USB7056 provides only one upstream port alongside five traditional type-A downstream ports. The new hubs also support driver assistance applications that are available on all mobile handsets, allowing the graphical user interface of a phone to be displayed on a vehicle's screen while simultaneously charging the mobile device.

With smartphones increasingly requiring more than standard BC 1.2 power, designers of electronic systems need to be able to easily implement basic high-powered charging in systems. The UPD301A provides a simple, standalone solution for implementing USB type-C PD charging in a variety of applications. The device supports both single- and dual-port operation and uses a pin-configurable implementation that focuses on ease of use. The UPD301 complements Microchip's expansive family of USB hubs and enables solutions from charge-only to full data, video and power management.

"With the acceleration of USB type-C PD in phones, PCs and portable devices, it's critical that designers of new computing systems and automotive infotainment systems are easily able to add USB type-C PD functionality to designs," said Charles Forni, vice president of Microchip's USB and Networking business unit.

The USB705x and UPD301 come with a complete solution including the MPLAB Connect Configurator hub configuration tool, evaluation boards with schematics and Gerber files to reduce development time.

The UPD301A is available today starting at $1.50 in 10,000-unit quantities. The USB705x family is available today with options and pricing for 10,000-unit quantities as shown in the table. For more information on the USB705x see the USB Hubs page. For more information on the UPD301, see its product page.

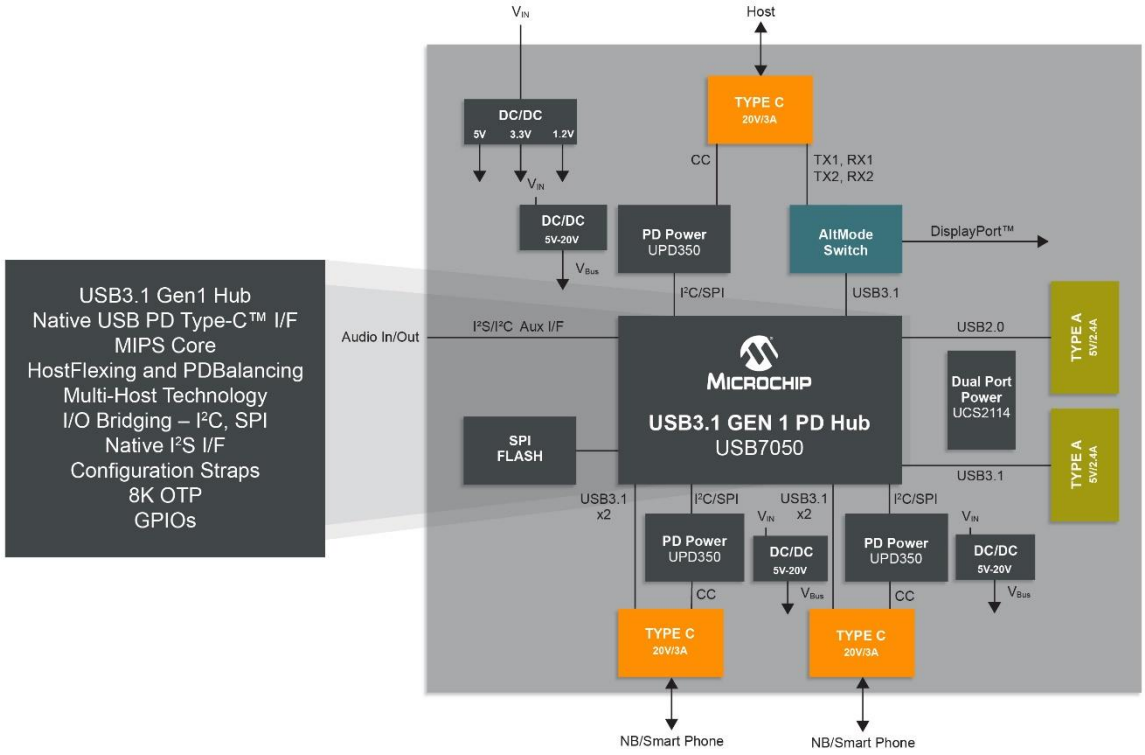

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Figure. The USB705x family, with one of the industry's first USB-IF-certified USB 3.1 SmartHub devices, enables fast device charging and introduces unique PD implementations called HostFlexing and PDBalancing. Another new device, the UPD301A is a standalone USB type-C PD controller for basic USB type-C PD charging functionality, making it well suited for applications from rear seat charging in vehicles to portable equipment to public charging.

Table. Key features and pricing for the USB705x USB 3.1 SmartHub ICs.

Device	PD upstream	PD type-C downstream	Standard type-C downstream*	Type-A downstream	Pricing
USB7050**	Yes	2 ports	None	2 ports	$5.09
USB7051	Yes	1 port	1 port	2 ports	$4.95
USB7052	Yes	None	2 ports	2 ports	$4.82
USB7056	Yes	None	1 port	5 ports	$5.35

*Standard type-C means 15-W power only (does not include PD).
**Automotive qualified (AEC-Q100)