



# New Product Announcement

## AP43776Q

### AP43776Q Dual-Port USB Power Delivery Protocol Decoder for Automotive Charging

The AP43776Q is an automotive-compliant, USB Type-C® Power Delivery (PD) 3.1, Standard Power Range (SPR), 3.3V~21V decoder dedicated to power source applications with legacy capability.

It is compliant with USB Type-C specification Rev 1.2 and USB power delivery specification Rev 3.0 Silicon Compliance Certification: TID – 6206). It also has passed QC4/4+/QC5 Compliance Certification by GRL (QC20211008263).

The device supports Programmable Power Supply (PPS) with 20mV/step resolution and 50mA/step current resolution for optimal battery thermal management.

I2C interface and GPIO pins are available to facilitate multi-port, independent output voltage applications with built-in smart power sharing firmware. Smart features such as low-battery and thermal power management, as well as charging status or fault indication, are supported via customizable built-in firmware.

This part supports DisplayPort™ Alternate Mode by decoding the CC pin handshaking and via I2C controlling the SS data switches.

The device is available in the Wettable Flank W-QFN4040-20 (SWP) (Type A1) package.

*Automotive-compliant – AEC-Q100 grade 1 qualified in IATF 16949 certified manufacturing sites and supports PPAP documentation.*

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#### The DIODES Advantage

The automotive-compliant, dual-port, USB PD protocol decoder is for multi-port, fast-charging applications.

- Supports Two Independent USB Type-C PD Ports with USB PD3.1 SPR (3.3V~21V) Voltages**  
 Multiple USB Type-C ports with independent charging output voltages for optimized power usage
- Enables USB Type-C PD with DisplayPort Alt Mode**  
 Fully supports USB Type-C over Alternate Mode to allow upstream-facing port (UFP) video data (DisplayPort, USB 3.1) into infotainment systems
- CC1/CC2 Short-Protection to  $V_{BUS}$**   
 To avoid damages caused by unintended shorts between CC1/2 pins and  $V_{BUS}$  pin
- Supports E-Marker Cable Detection with Built-In  $V_{CONN}$  Switch and Overcurrent Protection (OCP)**  
 Aides USB Type-C cable authentication
- I2C/UART Interface Enables Inter-Chip Communication**
  - 1) Supports smart power sharing for up to four USB Type-C PD ports
  - 2) Saves the USB Type-C PD port  $V_{BUS}$  output MOS switch by using the synchronous buck-boost controller/converter's MOS

#### Applications

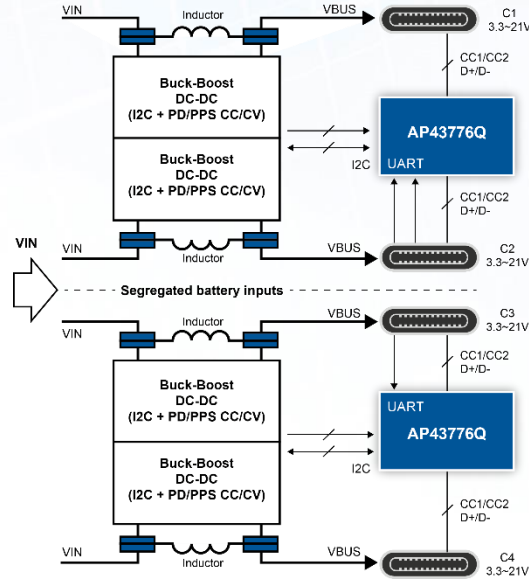
- In-vehicle USB PD3.1 SPR multi-port charging
- Quad USB PD3.1 SPR ports supporting smart power sharing

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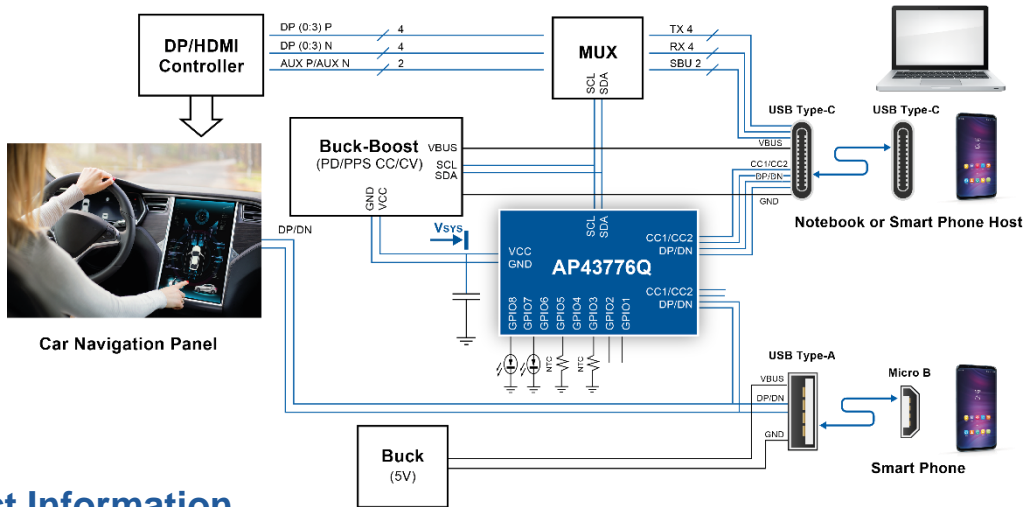
## AP43776Q

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## Application Schematics



## AP43776Q Dual-Port with DP-Alt Mode and BC 1.2 DCP Mode in Vehicles



### Product Information

Part Number	VCC Max	Typical Operating Current	Max Sleep Current	Compatible Protocol	Package
	V	mA	µA		
<a href="#">AP43776QZDZW20-13</a>	6	1.5	1200	USB PD3.1 SPR & QC4/4+/5	W-QFN4040-20 (SWP) (Type A1)

### Ordering Information

Orderable Device	Compliance (Only Automotive Supports PPAP)	Packaging	Moisture Sensitivity	Packing	
				Quantity	Carrier
<a href="#">AP43776QZDZW20-13</a>	<a href="#">Automotive</a>	W-QFN4040-20 (SWP) (Type A1)	MSL-1	3,000	13" Tape & Reel