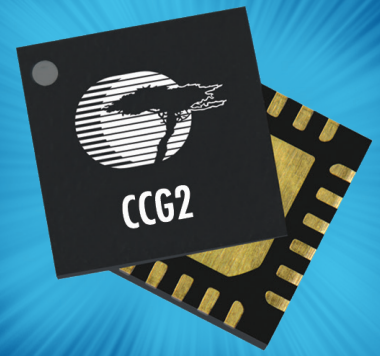


CYPRESS

# EZ-PD™ CCG2: 60W CAR CHARGER REFERENCE DESIGN



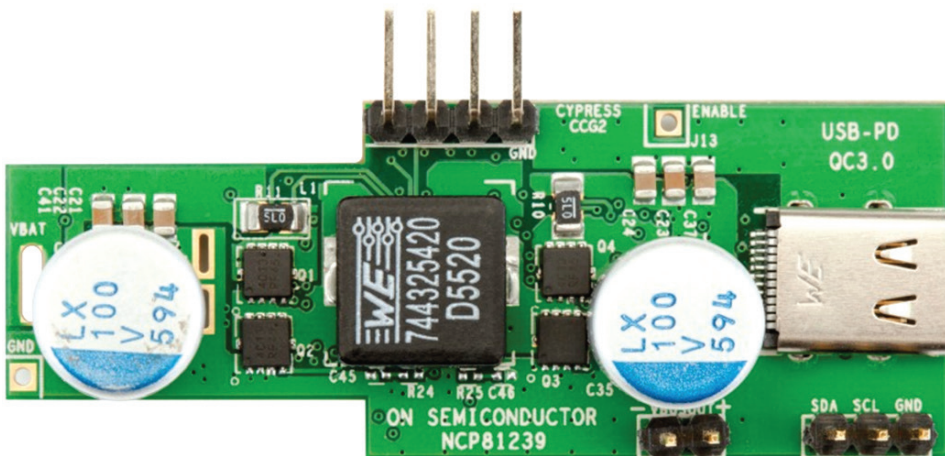
## PRODUCT OVERVIEW

### INTRODUCTION:

The CCG2 60W Car Charger reference design is a receptacle based USB Type-C Charger with USB PD 2.0 support. In the USB PD mode, the design supports 5V@3A, 7V@3A, 8V@3A, 9V@3A, 12V@3A, 15V@3A and 20V@3A output. The board can also be programmed to support any output voltage between 0 to 20V with a 100mV resolution. The reference design works with a standard Cigarette Lighter Adapter (CLA) and supports wide DC input range from 4V to 24V.

The two major components on the board are Cypress's EZ-PD CCG2 (CYPD2134-24LQXIT) controller and On Semiconductor's NCP81239 DC-DC Buck-Boost controller.

The CCG2 controller handles the USB Type-C interface, USB Power Delivery (PD) 2.0, cable compensation and Over Current Protection (OCP). The buck-boost conversion, Over Current Protection (OCP) and Over Voltage Protection (OVP) are handled by On Semiconductor's NCP81239 DC-DC Buck-Boost controller. The board hardware design files (schematic, bill of materials, layout etc) and reference firmware are readily available for customers to reduce the design cycle time.

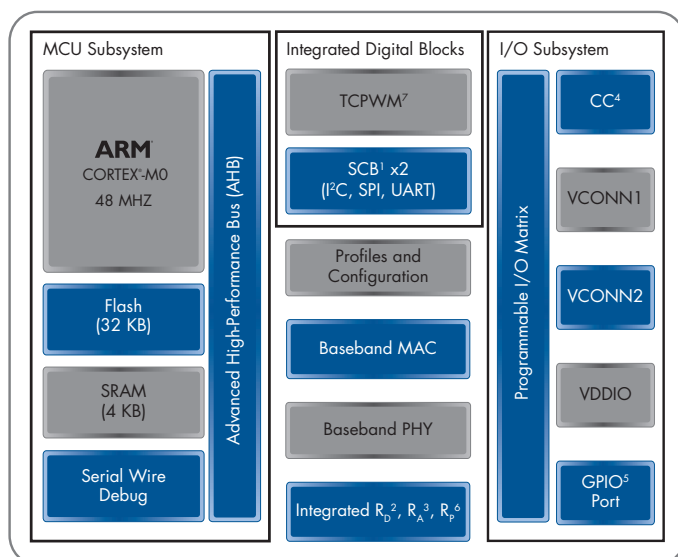


For more information on the design, please visit reference design webpage:  
[www.cypress.com/documentation/reference-designs/ccg2-60w-car-charger-reference-design](http://www.cypress.com/documentation/reference-designs/ccg2-60w-car-charger-reference-design)

### FEATURES

- USB Power Delivery support on Type-C Port
- Wide operating input range: 4V to 24V
- Over Current and Over Voltage Protection
- Cable Compensation
- Reduce design cycle time

## BLOCK DIAGRAMS



<sup>1</sup> Serial communication block configurable as UART, SPI or I<sup>2</sup>C  
<sup>2</sup> Termination resistor read as a UFP  
<sup>3</sup> Termination resistor read as an Electronically Marked Cable Assembly (EMCA)  
<sup>4</sup> Configuration Channel  
<sup>5</sup> General-purpose input/output  
<sup>6</sup> Current sources to indicate a DFP  
<sup>7</sup> Timer, counter, pulse-width modulation block

CCG2: USB Type-C Port controller

## FEATURES

- 32-Bit MCU subsystem:
  - 48-MHz ARM<sup>®</sup> Cortex<sup>®</sup>-M0 MCU
  - 32 KB Flash and 4 KB SRAM
- Type-C support
  - Integrated Type-C Transceiver with termination resistors
  - Supports one USB Type-C port
  - 2x I<sup>2</sup>C/SPI/UART interface to EEPROM/device controller
- Power
  - Wide operating voltages: 2.7 V – 5.5 V
- System-Level ESD on CC and VCONN Pins
  - ± 8-kV Contact Discharge and ±15-kV Air Gap Discharge based on IEC61000-4-2 level 4C
- Packages
  - 1.63 mm × 2.03 mm, 20-ball wafer-level CSP (WLCSP) with 0.4-mm ball pitch
  - 2.5 mm × 3.5 mm × 0.6 mm 14-pin DFN
  - 4.0 mm × 4.0 mm × 0.55 mm 24-pin QFN
  - Supports industrial temperature range (-40 °C to +85 °C)
- Firmware upgradability over CC or I<sup>2</sup>C

## CCG2 PORTFOLIO

Part Number	Application	Termination Resistor	Role	Package
CYPD2103-20FNXIT	Cable	R <sub>A</sub>	EMCA	20-Ball CSP
CYPD2103-14LHXIT	Cable	R <sub>A</sub>	EMCA	14-Pin DFN
CYPD2104-20FNXIT	Accessory	R <sub>A</sub> , R <sub>D</sub>	UFP	20-Ball CSP
CYPD2105-20FNXIT	Active Cable	R <sub>A</sub>	EMCA	20-Ball CSP
CYPD2120-24LQXIT	C-DP, C-HDMI	R <sub>A</sub> , R <sub>D</sub>	UFP	24-Pin QFN
CYPD2122-24LQXIT	Note Books	R <sub>P</sub> , R <sub>D</sub>	DRP	24-Pin QFN
CYPD2134-24LQXIT	Adapters, Chargers	R <sub>P</sub>	DFP	24-Pin QFN
CYPD2122-20FNXIT	Tablets	R <sub>P</sub> , R <sub>D</sub>	DRP	24-Pin QFN

## GETTING STARTED

For more information, please contact [Online Tech Support Case System](#) or visit [www.cypress.com/ccg2](http://www.cypress.com/ccg2)

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