

CYPRESS

EZ-PD™ CCG3: POWER BANK REFERENCE DESIGN



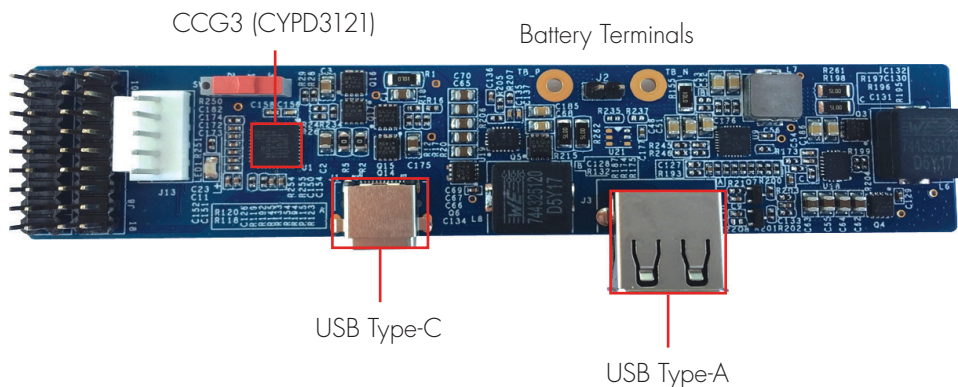
PRODUCT OVERVIEW

INTRODUCTION:

The CCG3 Power Bank reference design has a portable external battery which stores charge when connected to a charger and later delivers charge to an attached device. This solution has a USB Type-C receptacle which acts as a power source or sink and a legacy USB Type-A receptacle which acts as a power source.

The CCG3 integrates USB Type-C, USB Power Delivery, Over Voltage and Over Current protection, and high-voltage regulator reducing the BOM cost. Other major components in the reference design are MPS's MP2636 (Single Cell Battery Charger) and MP9184A (Boost Converter).

Cypress has developed a reference schematic to enable customer to speed up their design and development cycle. The board hardware design files (schematic, bill of materials, layout etc) are available for customers to reduce their design cycle time.



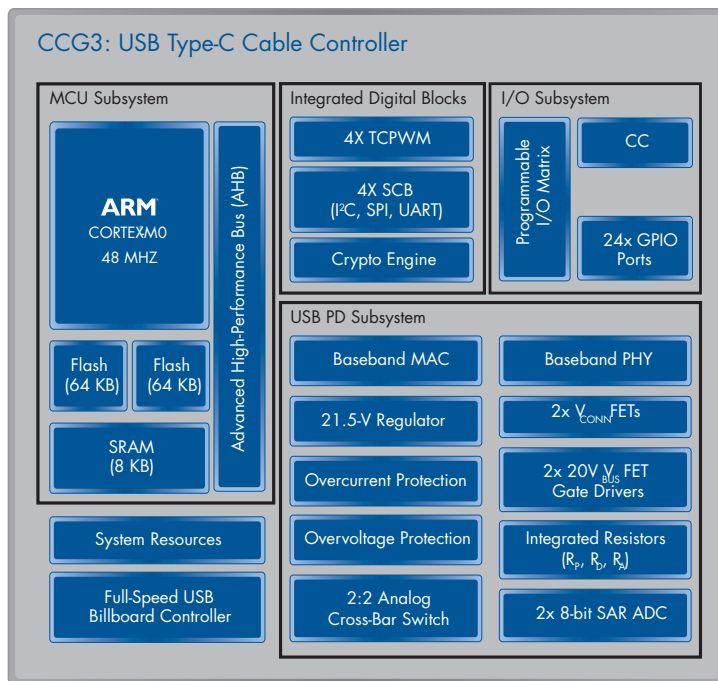
For more information on the design, please visit reference design webpage:

www.cypress.com/documentation/reference-designs/ez-pd-ccg3-usb-type-c-power-bank-solution

FEATURES

- USB Type-C port acting as a source and sink supporting USB Power Delivery
- USB Type-A port acting as source supporting legacy charging protocols: BC v1.2, Quick Charge 3.0
- Provides up to 18W (12V@1.5A, 9V@2A, 5V@3A) on the Type-C port
- Supports 1-Cell battery configuration
- Supports firmware upgrade for CCG3 over CC/USB

BLOCK DIAGRAMS



¹ Timer/counter/pulse-width modulator block

² Serial communication block configurable as UART, SPI or I2C

³ Circuits to control the gates of external power Field-Effect Transistors (FETs) on VBUS (5-20 V)

⁴ Termination resistors: RP read as a DFP, RD as a UFP, RA as an EMCA

EZ-PD CCG3 Block Diagram

FEATURES

- Direct 20-V Operation:
 - 2.7V to 21.5V operation
 - Integrates VBUS gate drivers
 - OVP and OCP
- Dead Battery Detection support
- Supports one USB Type-C port
- USB Billboard Controller:
 - Supports USB Billboard Device Class
- Crypto Engine:
 - Hardware encryption acceleration
 - Supports USB Authentication
- Dual 64KB Flash Memory:
 - Supports fail-safe firmware updates
- System-Level ESD Protection
 - On CC, SBU, D_{PLUS}, D_{MINUS} and V_{BUS} pins
 - ± 8-kV Contact Discharge and ±15-kV Air Gap Discharge based on IEC61000-4-2 level 4C
- Packages
 - 3.18 mm × 2.63 mm, 42-ball wafer-level CSP (WLCSP) with 0.4-mm ball pitch
 - 5.0 mm × 5.0 mm, 0.5 mm 32-pin QFN
 - 6.0 mm × 6.0 mm, 0.5 mm 40-pin QFN
 - Supports industrial temperature range (-40 °C to +105 °C)
- Firmware upgradability over USB, CC or I²C

EZ-PD CCG3 PORTFOLIO

Part number	Application	Role	Termination Resistor	Pin/Package
CYPD3105-42FXNI	Thunderbolt Active Cable	EMCA	Ra	42-CSP
CYPD3120-40LQXI	Dongle	UFP	Rd	40-QFN
CYPD3121-40LQXI	Monitor/Dock (UFP), Power Bank	DRP	Rp,Rd	40-QFN
CYPD3122-40LQXI	Monitor/Dock (DFP)	DFP	Rp	40-QFN
CYPD3125-40LQXI	Notebook	DRP	Rp,Rd	40-QFN
CYPD3135-40LQXI/Q	Power Adapter	DFP	Rp,Rd	40-QFN
CYPD3123-40LQXI	Charge-Through Dongle	DRP	Rp,Rd	40-QFN
CYPD3135-32LQXQT	Power Adapter	DFP	Rp	32-QFN
CYPD3126-42FNXIT	Notebooks, Smartphones	DRP	Rp, Rd, Rd_Db	42-CSP

GETTING STARTED

For more information, please contact [Online Tech Support Case System](#) or visit www.cypress.com/ccg3

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