

High Voltage, High Efficiency 65W Buck Converter

Features

- Selectable Switching Frequency up to 2 MHz
- Optimal High Efficiencies for 3.3 V to 21 V Vout
- Maximum Output Current of 3.25 A
- Wide Input Voltage Range: 7 V to 27 V
- Selectable Soft Start Times
- OCP/OVP/OTP Protections
- Programmable UVLO
- 3 mm x 3 mm QFN Package

Applications

- VBUS Supply Generation for USB-PD Ports:
 - Multiple Output USB-PD Chargers
 - Charging Hubs
 - Displays and Televisions
 - Laptop Docking Stations
- High Voltage POL Supplies

Product Description

The SZPL3102A is a fully integrated high efficiency synchronous buck DC/DC converter intended to be paired with certain USB-PD Controllers having their own feedback resistor divider. The SZPL3103A is different in that it requires an external feedback divider. Both devices are optimized for the highest efficiency performance, including dual input LDOs for self-bias, across a wide output voltage range.

The SZPL3102A is designed to supply the full range VBUS rail for USB-PD ports and can be controlled by popular USB-PD controllers or fast charging devices. On start-up, the device employs an internal feedback path to allow safe regulation until the external PD controller powers up and becomes available to regulate the output voltage. Following this initial start-up period, the SZPL3102A hands over output control to the external PD controller. The SZPL3103A feedback exclusively uses an external resistor divider for output voltage regulation.

The SZPL3102A and SZPL3103A are available in a compact 3 mm x 3 mm custom QFN package, delivering high power density with a minimal number of external components.

Application Diagram

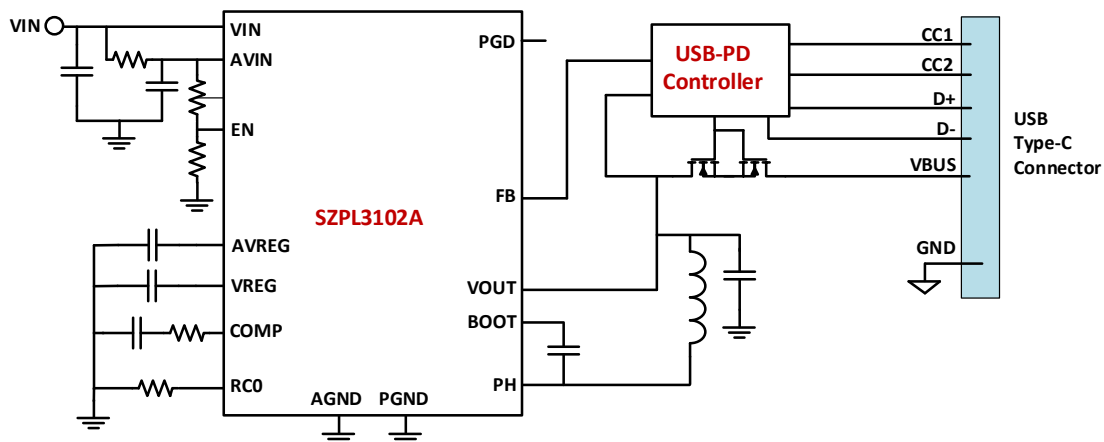


Figure 1. Typical SZPL3102A USB-PD Port Application Diagram

Package Pinout

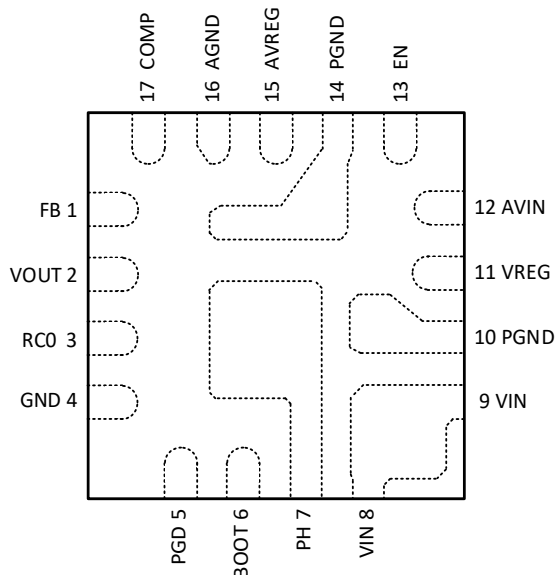


Figure 2. Package Pinout - Top View

Pin Definitions

Pin #	Name	Description
1	FB	Feedback input pin, nominally regulated to 1.25 V. For SZPL3102A: connect to the tap of a VOUT-to-AGND resistor divider network and the analog feedback control output of PD controller. For SZPL3103A: connect to the tap of external VOUT-to-AGND resistor divider network.
2	VOUT	Voltage sense line from regulated output of converter and secondary input to internal LDOs.
3	RC0	Analog input. A resistor to ground sets switching frequency (F_{sw}) and soft start time (t_{ss}).
4	GND	Connect to ground.
5	PGD	Power good output signal. Active high, open drain output. Connect to pullup resistor to VREG.
6	BOOT	Bootstrap high side driver voltage supply. Connect to 0.1 μ F capacitor to PH node.
7	PH	Phase (switch) node of the buck converter's output FETs. Connect to output inductor.
8, 9	VIN	Input voltage to the buck converter's output FETs (high side drain). Locally decouple with 1 μ F + 0.1 μ F capacitors, followed by enough capacitors to provide the required input RMS current.
10	PGND	Power ground connection of output FETs (low side source). Connect to ground.
11	VREG	Internal 3.3 V LDO output. Connect to a 1 μ F bypass capacitor to ground.
12	AVIN	Input voltage to the buck converter for analog circuits. Connect to tap of VIN RC low-pass filter.
13	EN	Analog control input. A potential higher than the UVLO threshold enables switching operation and output soft start process. A potential lower than the shutdown threshold places the device in a low power state. Decouple with one 1 nF to 100 nF capacitor placed close to the part. See the Functional Description paragraph for a more detailed explanation of operation.
14	PGND	Connect to ground.
15	AVREG	Internal 3.3 V LDO output. Connect a 1 μ F bypass capacitor to ground.
16	AGND	Connect to ground.
17	COMP	Compensation error amplifier output. Connect to a RC network to ground. See the Applications Information section for recommendations.

Functional Block Diagram

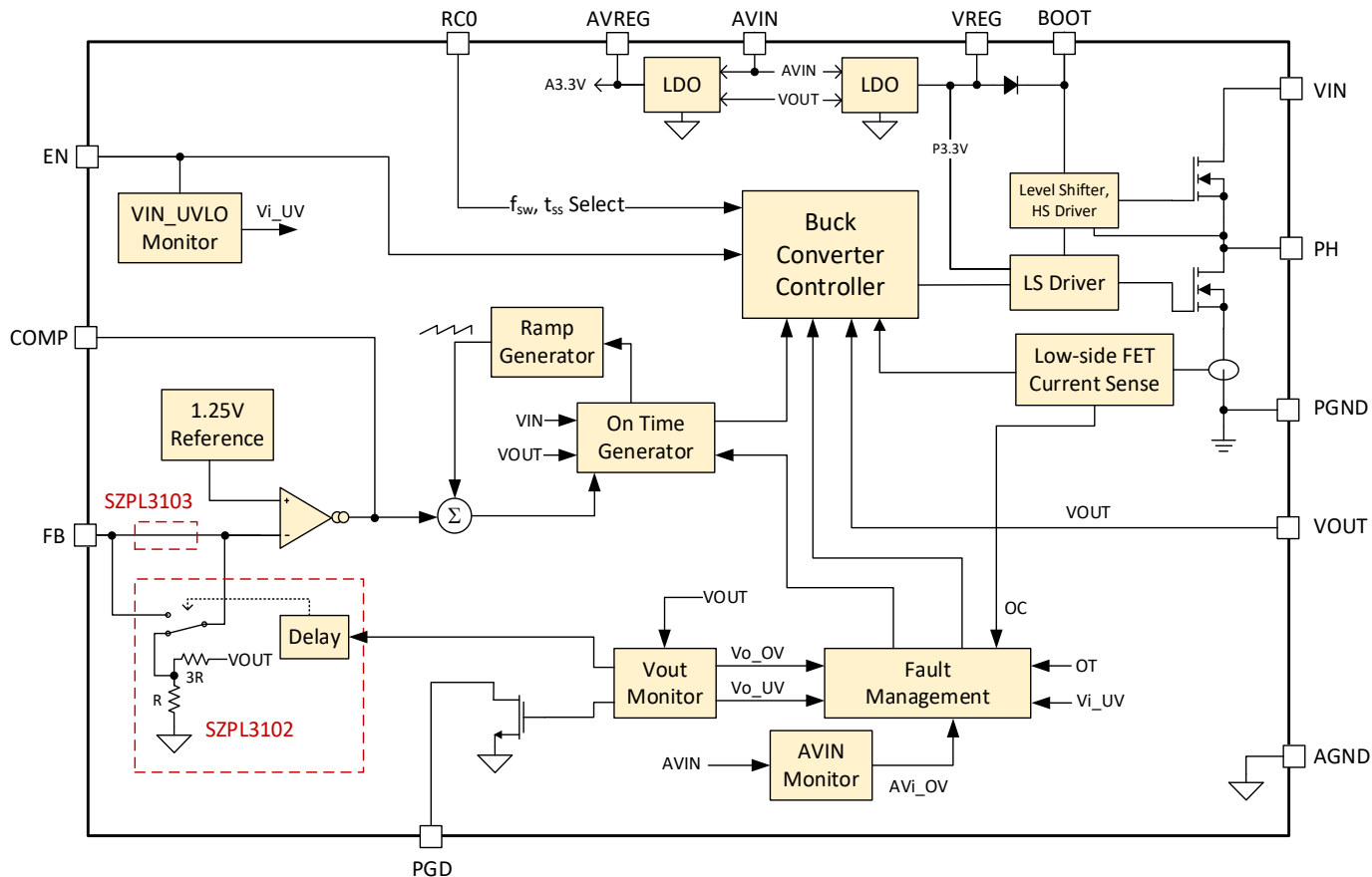


Figure 3. Functional Block Diagram

Product Ordering Information

Part Number	Package	Description
SZPL3102A-CF33	QFN (3 mm x 3 mm)	Integrated, Wide Voltage, Buck Converter with Momentary Feedback Divider
SZPL3103A-CF33	QFN (3 mm x 3 mm)	Integrated, Wide Voltage, Point of Load Buck Converter

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