High Efficiency DC-DC Converter Family Extends Output Power To 100 W

Silanna Semiconductor has extended its CO_2 Smart Power family of wide-voltage, high-frequency point-of-load converters with a 100-W device targeting USB-PD applications designed to deliver industry-leading efficiency. Operating at a switching speed of 667 kHz, the SZDL3105B fully-integrated dc-dc converter (buck regulator) can supply up to 5 A and 100 W of output power. This new device extends the power output capability of the regulator over that of the previously introduced SZPL3102A, which supported PD ports up to 65 W (See "Buck Regulators Deliver High Efficiency, Small Size For USB-PD Applications," which was published in the December 2020 issue of this newsletter.)

According to the vendor, this device accommodates industry-leading wide input and output ranges that support up to 27 V input and is supplied in a 4-mm x 4-mm QFN package. See Fig. 1.

Tim Wilhelm, director of marketing, explained, "Higher switching frequency means a smaller, lower cost, higher performing output filter that has delighted the clients we have sampled. The SZDPL3105B device enables ground-breaking efficiencies in the smallest size and weight designs. Our support tools give customers the flexibility and confidence to quickly increase the performance efficiency. This ultimately increases power density with volumes approaching 12% of that required by low-frequency competitive solutions. The SZDL3105 significantly reduces BOM cost, design cycles and time to market."

The SZDL3105B has unique features that optimize its performance in USB port power supply applications including USB-PD and fast charging power adapters, high power density dc-dc power supplies, high-efficiency power adapters and battery chargers for mobile devices. Extremely low operating power dissipation enables the very low no-load power that is an important specification for regulatory certification.

The converter IC generates 3.3-V to 21-V output at 5 A, which covers USB-PD 3.0 and PPS applications; accepts 7-V to 27-V input; and includes dual-input LDOs (V_{IN} and V_{OUT}) for product bias, optimizing overall efficiency.

Meanwhile, internal and external feedback resistor divider flexibility supports custom design, while a momentary internal feedback path allows for clean and well-controlled start-up operation until external USB port controllers can bias themselves and smoothly take over control of the output voltage (Fig. 2).

SZDL3105B devices are being sampled to key accounts and will be fully released in the second half of 2021. More information is available at https://www.powerdensity.com or by contacting sales@silannasemi.com.

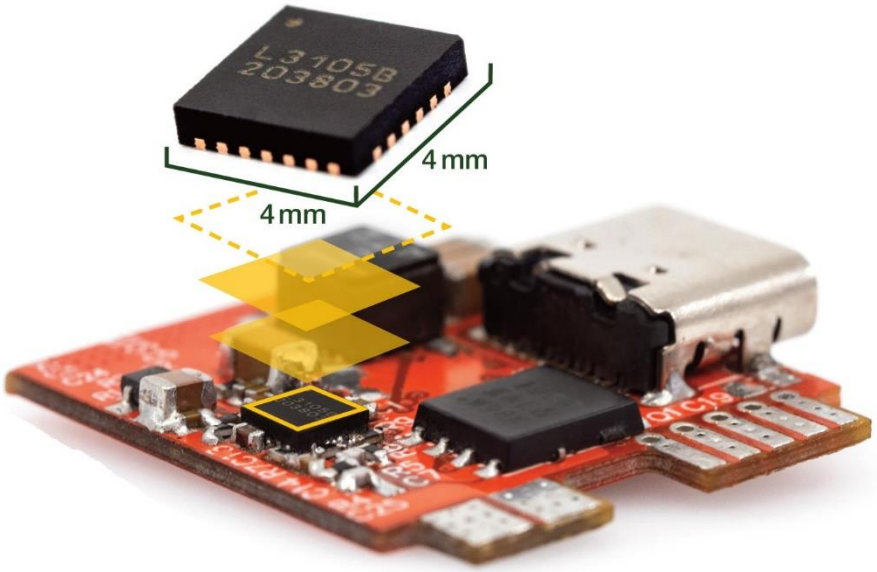

Fig. 1. Operating at a switching speed of 667kHz, the SZDL3105B is a buck converter IC that can supply up to 5 A and 100 W of output power. It accommodates industry-leading wide input (7 V to 27 V) and output (3.3 V to 21 V) ranges and is supplied in a tiny 4-mm x 4-mm QFN package.

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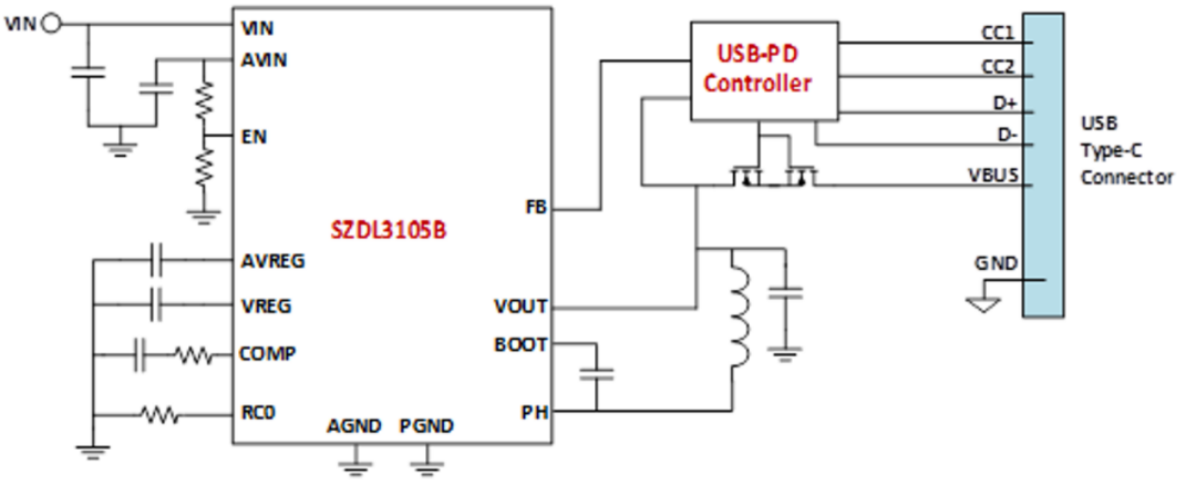
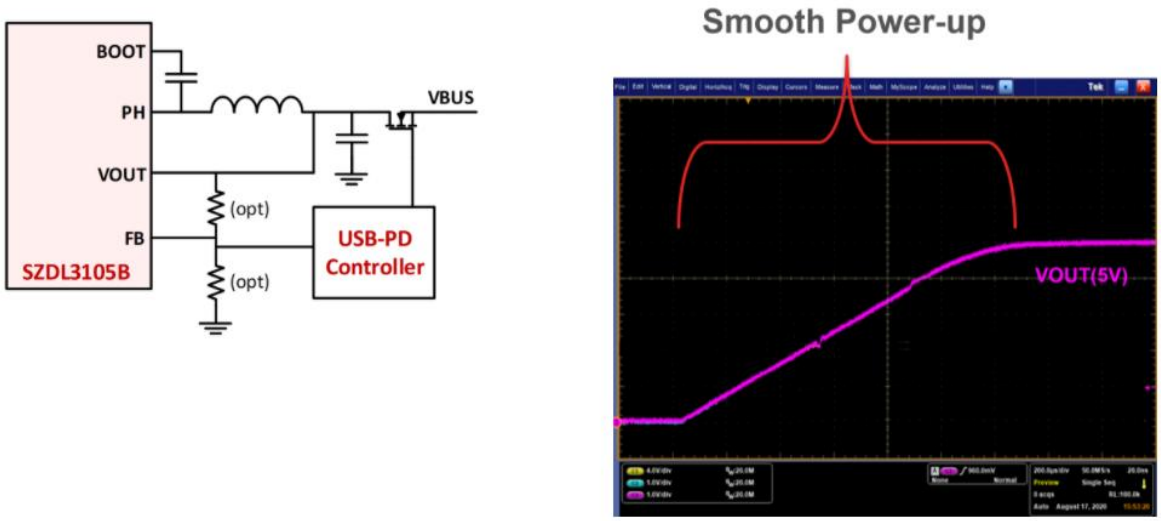


(a)



(b)

Fig. 2. The SZDL3105B 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 (a). On start-up, the SZDL3105B device employs an internal feedback path to allow smooth regulation until an external PD controller powers up and becomes available to regulate the output voltage (b). Following this initial start-up period, the SZDL3105B disconnects the internal FB divider. The SZDL3105A device expects feedback exclusively from an external resistor divider for output voltage regulation.

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