

PF5300_PF5301_PF5302

12 A / 8 A / 15 A core supply regulators with AVP and watchdog

Rev. 2 — 5 June 2023

Product short data sheet



Document Information

Information	Content
Keywords	Safety, SBC, automotive, low power, ASIL D, industrial
Abstract	The PF5300, PF5301, and PF5302 integrate high-performance buck converters, 12 A, 8 A, and 15 A, respectively, to power high-end automotive and industrial processors. With adaptive voltage positioning and a high-bandwidth loop, they offer transient regulation to minimize capacitor requirements.



1 Overview

The PF5300, PF5301, and PF5302 integrate high-performance buck converters, 12 A, 8 A, and 15 A, respectively, to power high-end automotive and industrial processors.

With adaptive-voltage positioning and a high-bandwidth loop, they offer transient regulation to minimize capacitor requirements.

Clock synchronization and spread-spectrum features reduce EMC issues in the system. The PF5300/PF5301/PF5302 can operate as standalone point-of-load regulator ICs or as companion chips to a larger PMIC.

Built-in one-time programmable (OTP) memory stores key startup configurations, drastically reducing external components. Regulator parameters are adjustable through high-speed I²C after startup, offering flexibility for different system states.

PF5300/PF5301/PF5302 have been developed to comply with the ISO 26262 automotive safety specification. They include configurable feature sets to fit in or support applications with safety levels up to ASIL D.

To simplify, PF5300 is used in this document to refer to PF5300, PF5301, and PF5302. Unless explicitly mentioned, references to PF5300 include PF5301 and PF5302.

2 Features

The PF5300/PF5301/PF5302 integrate a high-performance 12 A / 8 A /15 A buck converter to power high-end automotive and industrial processors.

- High-performance core buck regulator
 - 12 A, 5 V_{IN} buck regulator - internal FETs (PF5300)
 - 8 A, 5 V_{IN} buck regulator - internal FETs (PF5301)
 - 15 A, 5 V_{IN} buck regulator - internal FETs (PF5302)
 - 2.7 V to 5.5 V input range
 - 0.5 V to 1.2 V output range
 - High efficiency
 - $\pm 1\%$ output accuracy
 - 2 MHz to 3 MHz switching frequency
 - Dynamic voltage scaling
 - Programmable adaptive-voltage positioning (AVP) (droop)
- 1.5 μ A quiescent current in OFF mode
- Fast startup time (< 500 μ s)
- OTP memory for device configuration
- Overtemperature protection
- Safety features
 - Available in ASIL D, ASIL B, and QM variations
 - Watchdog timer
 - 1 % OV/UV monitoring
 - PGOOD output
 - Analog built-in self-test
- AEC-Q100 qualified version available
- Rated from -40 °C to 150 °C T_j
- 3.5 mm x 4.5 mm WF-QFN package

3 Simplified application diagram

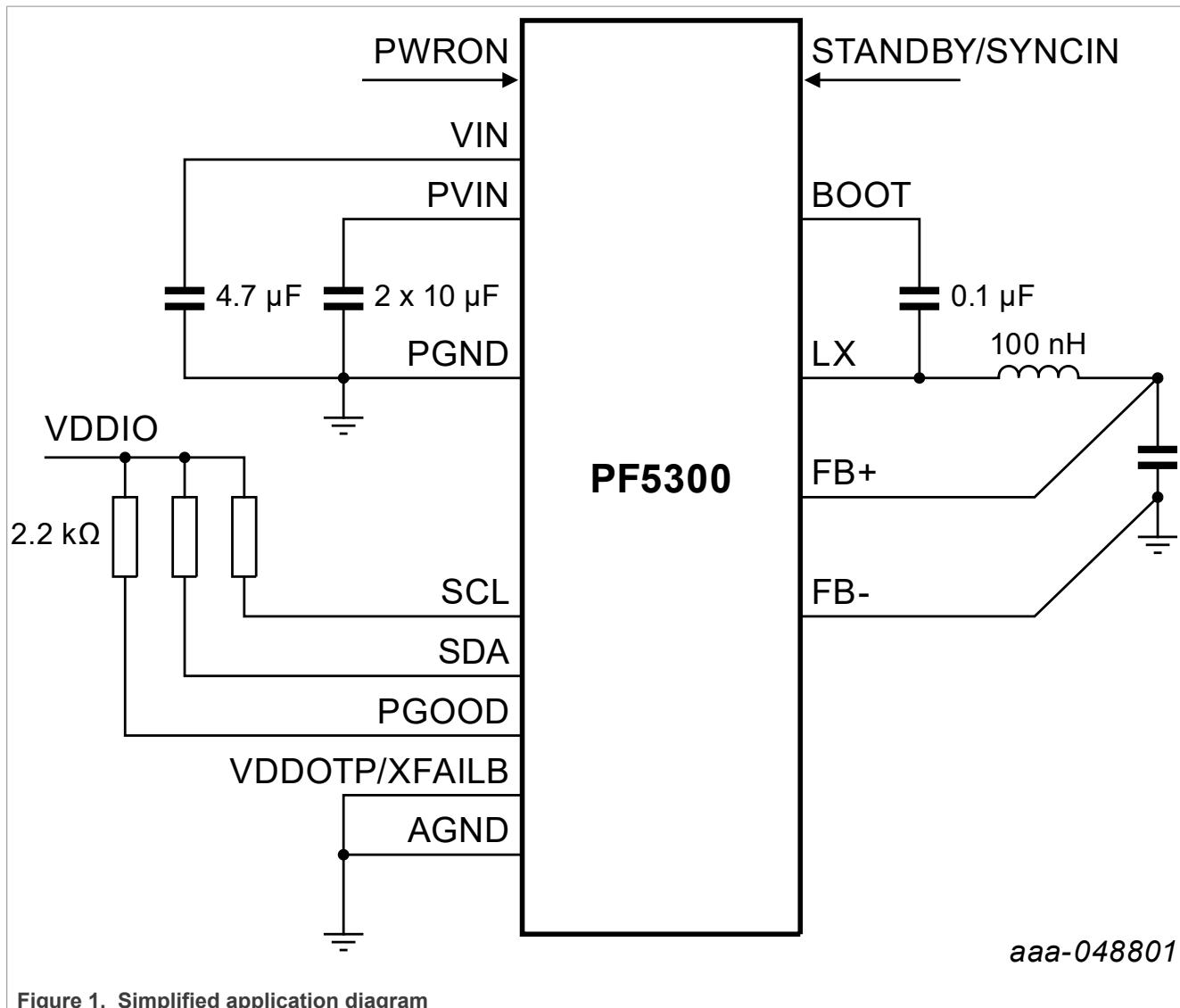


Figure 1. Simplified application diagram

4 Applications

- Automotive – infotainment, gateway, domain controllers
- High-end consumer and industrial

5 General description

5.1 Functional block diagram

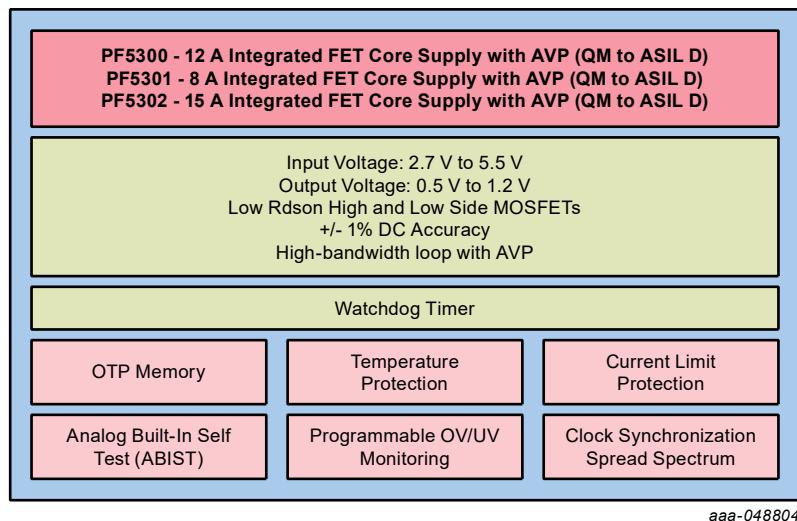


Figure 2. Functional block diagram

6 Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
PF5300_PF5301_PF5302_SDS v.2	20230605	Product short data sheet	—	PB_PF5300 v.1
Modifications	<ul style="list-style-type: none">Replaced product brief format with short data sheet formatAdded disclaimer regarding suitability for use in industrial applications (functional safety)			
PB_PF5300 v.1	20210910	Product brief	—	—

7 Legal information

7.1 Data sheet status

Document status ^{[1][2]}	Product status ^[3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

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[2] The term 'short data sheet' is explained in section "Definitions".

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