

RAA229139

Digital Triple Output, 8-Phase Configurable, SVI3 PWM Controller

Description

The [RAA229139](#) is a digital triple output multiphase ($X+Y+Z \leq 8$) PWM controller compliant with AMD SVI3 specifications.

The RAA229139 can be configured to support flexible phase assignments up to a maximum of eight phases on Rail 0, a maximum of three phases on Rail 1, and up to two phases on Rail 2. For example, 6+1+1, 6+2+0, 4+3+1, or a single output operation as a 8+0+0 configuration are supported. The RAA229139 supports the AMD SVI3 interface along with PMBus V1.3 specifications, making it ideal for controlling the microprocessor core and system rails in AMD SVI3 platforms.

The RAA229139 uses the proprietary Renesas digital synthetic current modulation scheme to achieve the industry-best combination of transient response, ease of tuning, and efficiency across the full load range. Diode emulation and automatic phase add/drop features allow extracting maximum efficiency from the converter regardless of load conditions. Use the intuitive Renesas PowerNavigator™ software to configure and monitor the device. With minimal external components, easy configuration, robust fault management, and highly accurate regulation capability, implementing a high-performance, multiphase regulator has never been easier.

Applications

- Core, Graphics, and Auxiliary rails for AMD SVI3 processors

Features

- Advanced linear digital modulation scheme
 - Auto phase add/drop with PFM mode for excellent load vs efficiency profile
 - Dual edge modulation with optional diode braking for faster transient response
 - Excellent VOTF performance
 - Zero latency synthetic current control for excellent high frequency current balance
- Flexible phase assignment from 0 to 8 phases on Rail 0, 0 to 3 phases on Rail 1, and 0 to 2 phases on Rail 2
- SVI3 Type II support on Rail 2
- Up to 1MHz switching frequency operation for high density designs
- Differential remote voltage sensing supports $\pm 0.5\%$ closed-loop system accuracy over load, line, and temperature
- Highly accurate current sensing for excellent load-line regulation and accurate OCP
- Comprehensive fault management enables high reliability systems
 - Pulse-by-pulse (per phase) and total output current limiting
 - Black box status recording capability with first fault indicator
- Intuitive configuration using PowerNavigator
- SMBus and PMBus V1.3 compatible
- Full compliance to AMD SVI3 spec up to 50MHz

1. Overview

1.1 Typical Application

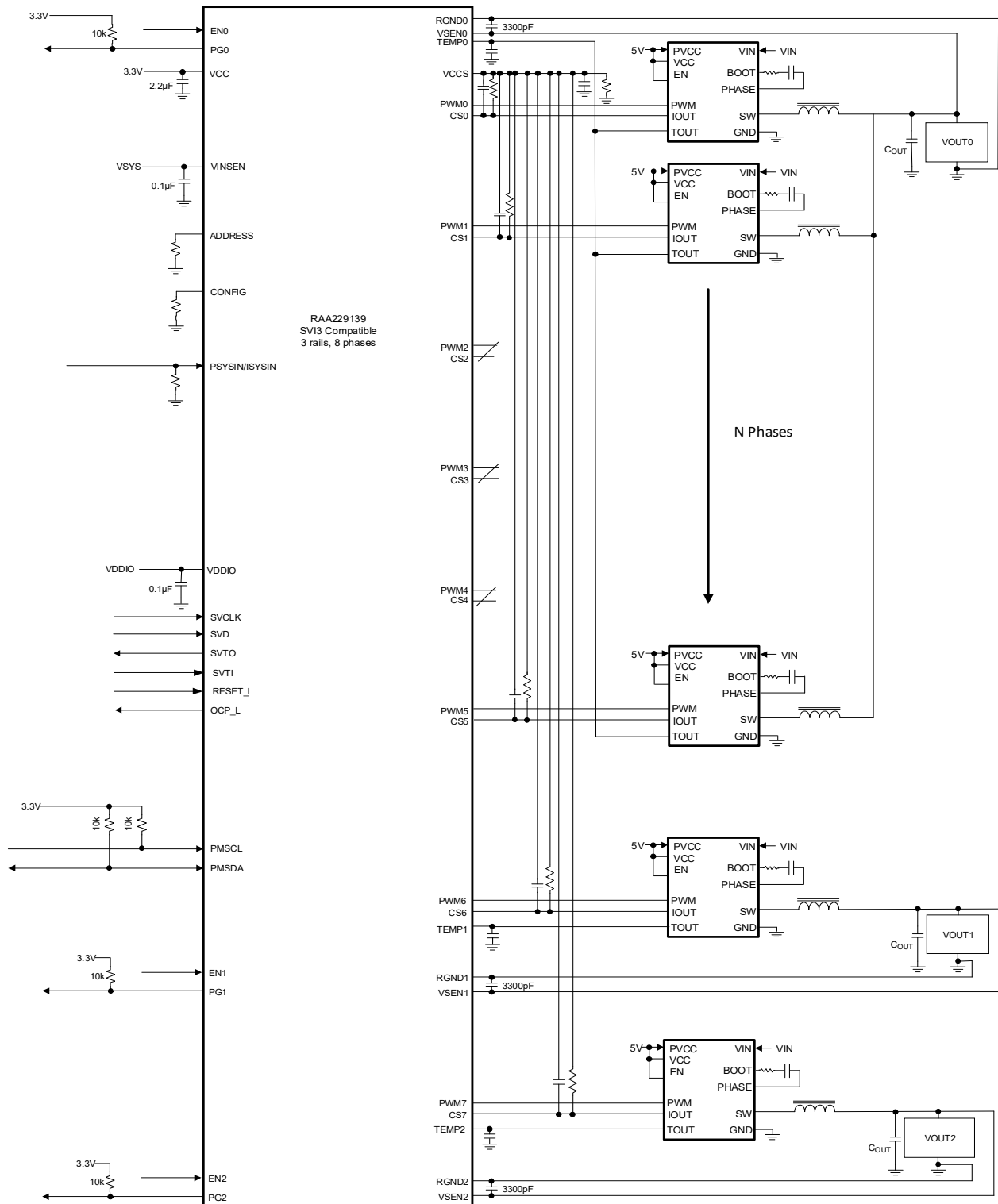


Figure 1. 6+1+1 with Smart Power Stage

1.2 Block Diagram

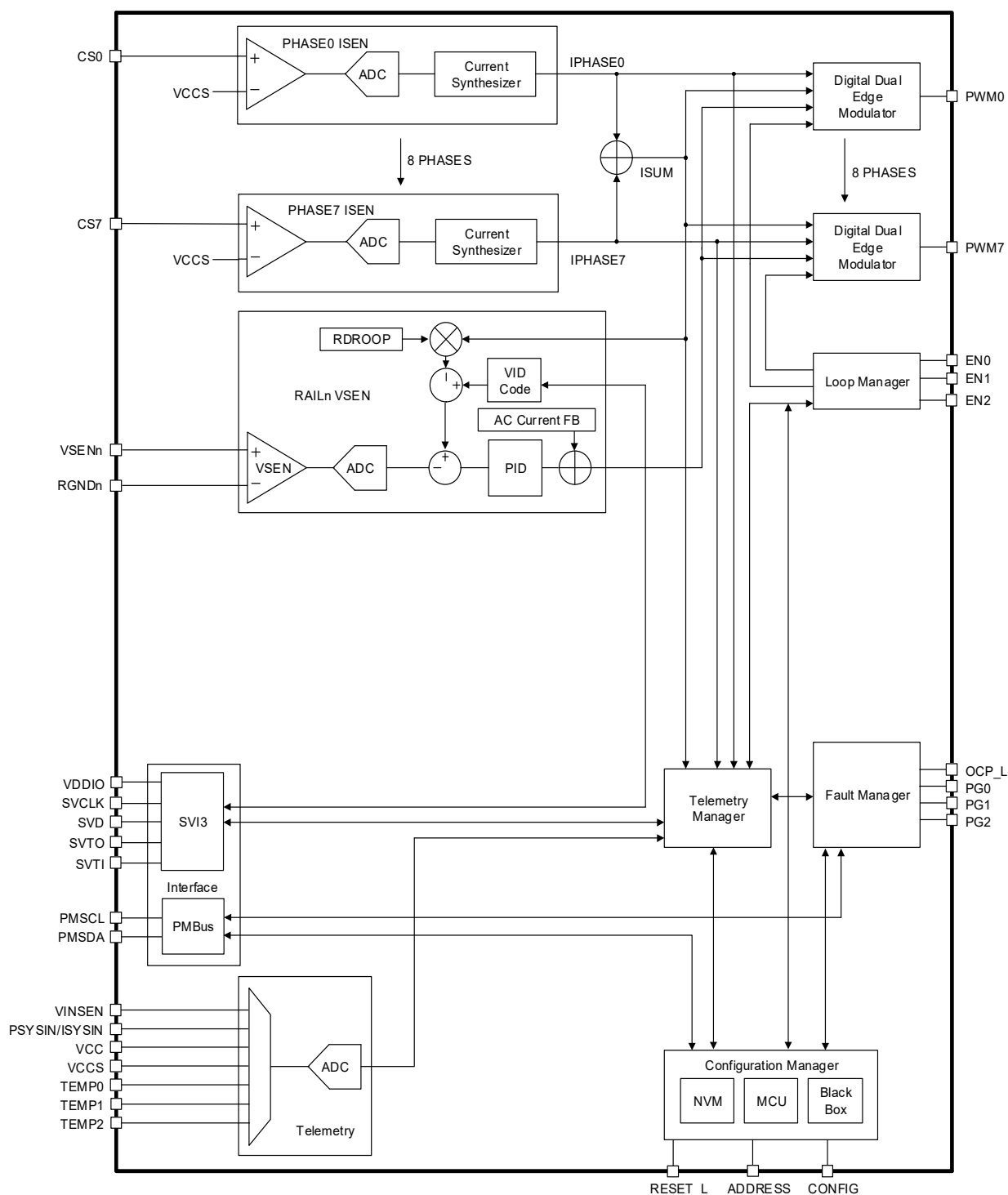


Figure 2. Internal Block Diagram

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Corporate Headquarters

TOYOSU FORESIA, 3-2-24 Toyosu,
Koto-ku, Tokyo 135-0061, Japan
www.renesas.com

Contact Information

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