

FEATURES

- Intel VR11.1, VR11.0 compliant Digital PWM Controller for multi-phase power conversion
- High performance, easy-to-use digital feedback control using no external components
- Minimizes output bulk capacitors with Dynamic Digital Control to regulate load transients
- Selectable for 1, 2, 3 and 4 phase operation
- 200kHz to 1MHz configurable switching frequency, accuracy better than 5%
- Configurable Load Line from 0.6 to 1.4mΩ
- VR11.1 compliant light load efficiency mode
- Highly accurate IMON output
- Differential DCR current sensing
- Digital phase current balancing
- Configurable soft-start
- Digitally adjustable OVP, UVP, OCP fault control
- SMBus interface for configuring and monitoring
- +3.3V supply voltage
- 0°C to 85°C operation
- Compatible with many external MOSFET drivers - ODB type, Tri-state type and CHiL proprietary Active Tri-level

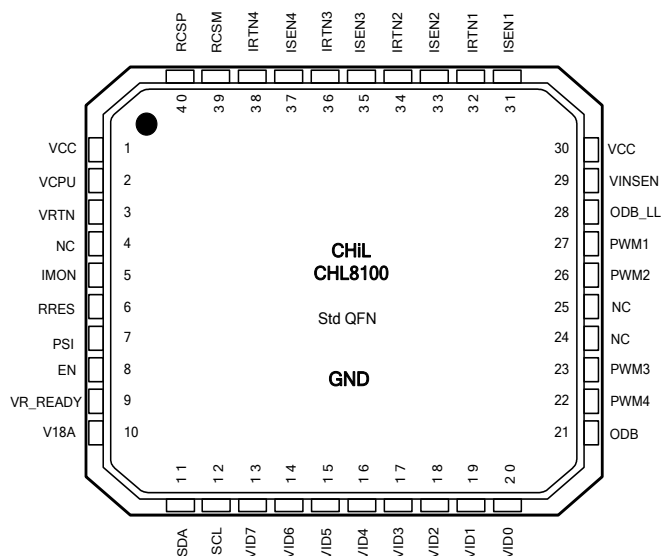


Figure 1. CHL8100 QFN Package

DESCRIPTION

The CHL8100 is a digital mixed-signal multiphase synchronous buck controller designed to power high performance microprocessors. It supports core voltage and load requirements for INTEL® VR11.1 and VR11.0 processors. This controller IC is intended for VR designs using up to four interleaved synchronous buck phases and capable of delivering up to 150A. The switching frequency of each phase can be digitally configured from 200 kHz up to 1 MHz.

The CHL8100 utilizes non-volatile memory (NVM) to store device operating parameters. Designers can access, modify and store the parameters using the CHiL Intuitive Power Designer (IPD) GUI via the industry standard SMBUS interface. This reduces design optimization time and provides flexibility in optimizing the VR design for size, cost and efficiency. It also reduces the number of package pins and external passives resulting in cost and board space savings.

CHiL's unique Adaptive Transient Algorithm (ATA) minimizes the VR output bulk capacitors while ensuring that CPU voltage regulation requirements are maintained. Fast response to load transients is achieved through advanced and proprietary non-linear digital PWM control. The controller incorporates accurate phase current balancing and supports configurable over-current protection. The CHL8100 includes VR11.1 features such as a fully compliant Power Status Indicator (PSI) mode for improved light load efficiency and accurate current monitor output (IMON).

The CHL8100 also provides configurable OVP, OCP, and output UVP fault protection. These and other parameters are easily defined using the CHiL Intuitive Power Designer (IPD) software which allows engineers to create a complete VR design, generate configuration files and automatically download them to the CHL8100.

APPLICATIONS

- Multiphase synchronous buck converter for desktop and server computers using Intel® VR11.x microprocessors
- High current DC/DC Converters for powering graphics processors, memory, and ASICs

FUNCTIONAL BLOCK DIAGRAM

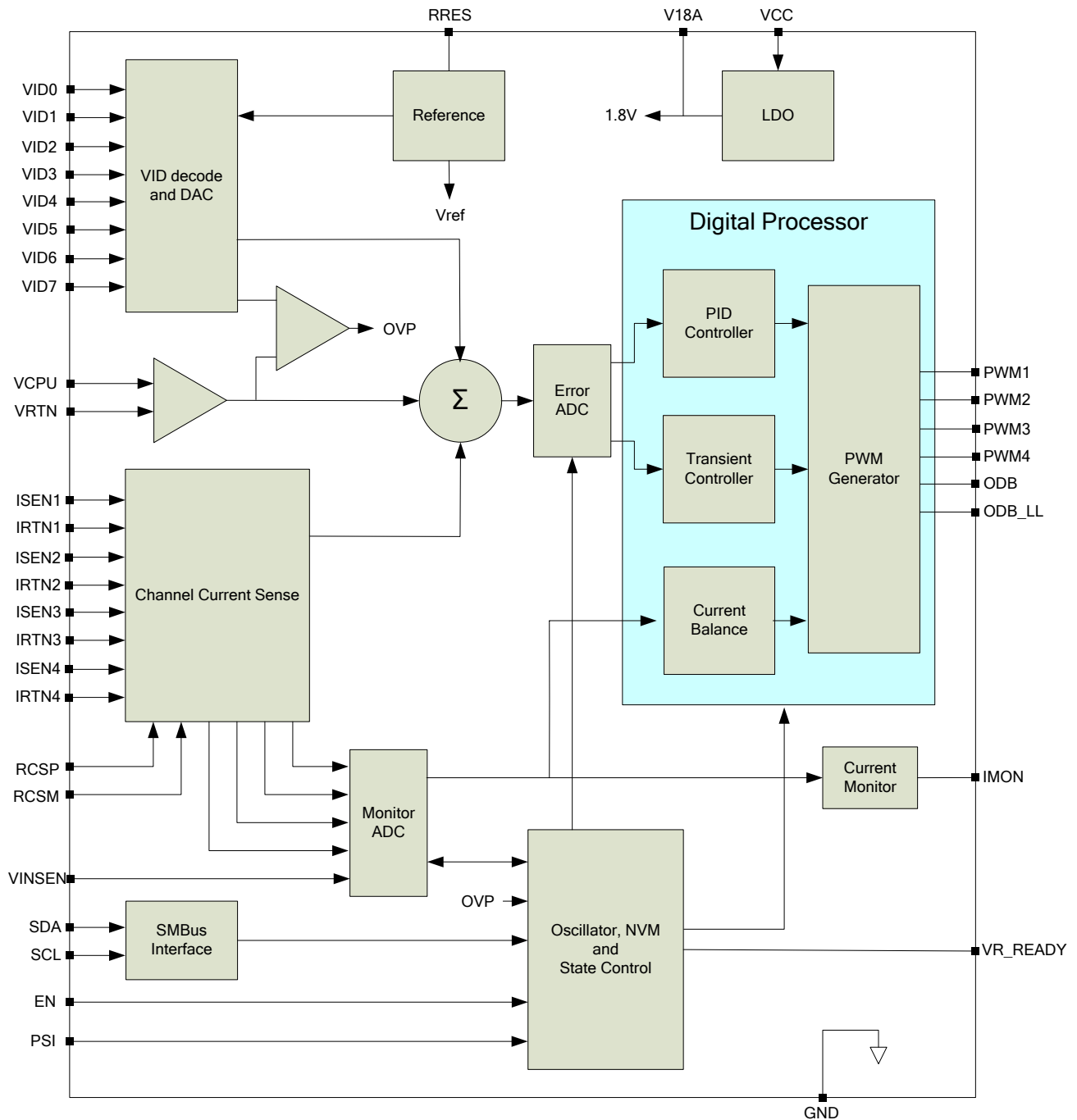


Figure 2 . Simplified Block Diagram

TYPICAL APPLICATIONS

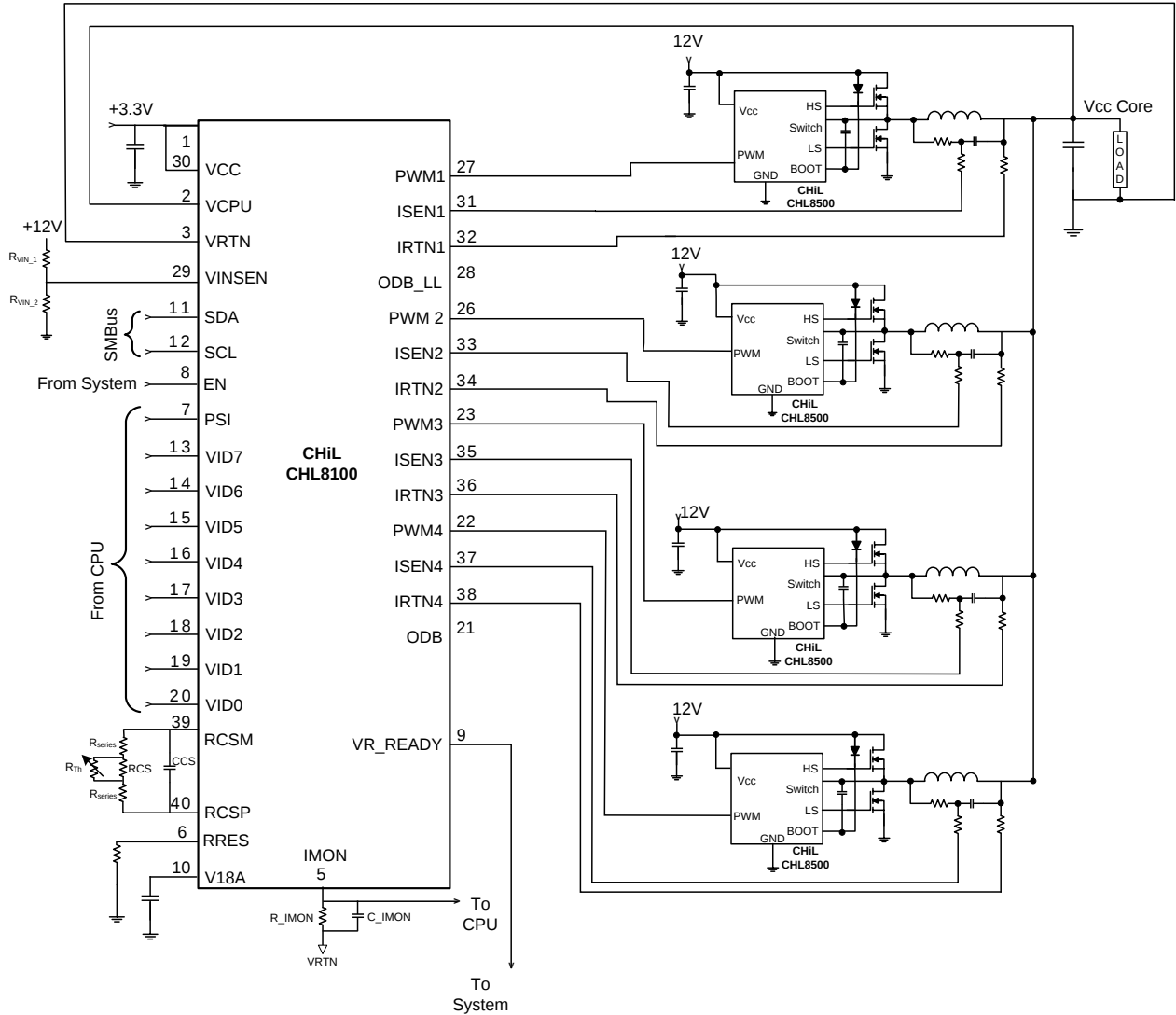


Figure 3 . 4-Phase VRD using CHL8100 Controller & CHL8500 MOSFET drivers

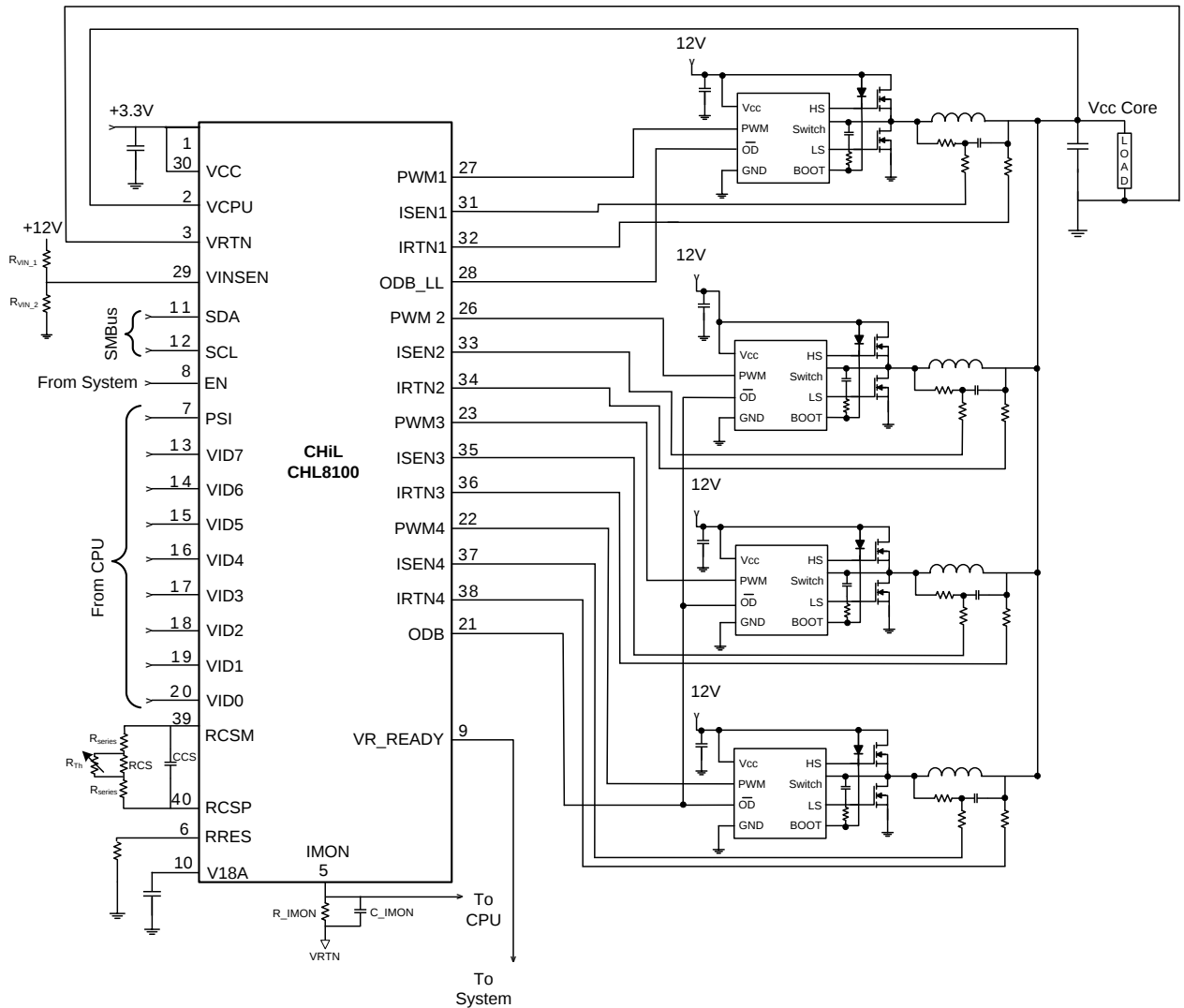


Figure 4 . 4-Phase VRD using CHL8100 & ODB Type MOSFET drivers

ORDERING INFORMATION

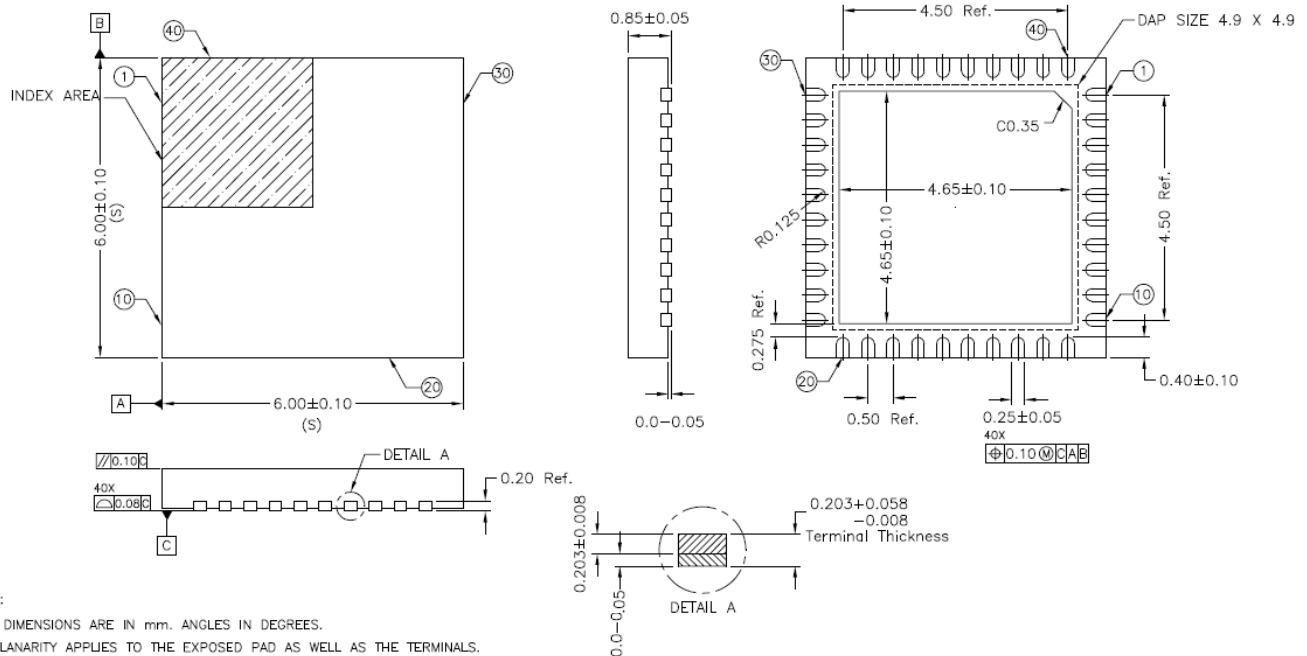
CHL8100 □ □ □

└─ T: Tape & Reel

└─ Package type
R : QFN

└─ Operating Temperature Range
C: Commercial Standard

Package	Tape & Reel Qty	Part Number
QFN	3000	CHL8100CRT

PACKAGE INFORMATION

NOTE :

1. ALL DIMENSIONS ARE IN mm. ANGLES IN DEGREES.
2. COPLANARITY APPLIES TO THE EXPOSED PAD AS WELL AS THE TERMINALS. COPLANARITY SHALL NOT EXCEED 0.08 mm.
3. WARPAGE SHALL NOT EXCEED 0.10 mm.
4. PACKAGE LENGTH / PACKAGE WIDTH ARE CONSIDERED AS SPECIAL CHARACTERISTIC. (S)
5. REFER JEDEC MO-220.
6. L/F STOCK# FR0124 (Ag Ring), NSE PKG CODE NQ66B040A OR NQ-600E600B040A