

FEATURES

- Dual output 2/3/4+1 phase PWM Controller (CHL8212/13/14)
- Single output 3 phase PWM Controller (CHL8203)
- Easiest layout and fewest pins in the industry
- Footprint compatible with CHL8225 (CHL8213/14) for analog and power signals
- Up to 3 VID select lines for dynamic voltage transitions
- Slow OCP for Thermal Design Current (TDC) protection
- I2C interface for configuration & telemetry
- Pin programmable I2C address (CHL8203/13/14)
- Overclocking support with I2C voltage override and Vmax setting
- Flexible I2C bus security features
- I2C security enable pin (CHL8203/13/14)
- Independent loop switching frequencies from 200kHz to 1.2MHz per phase
- CHiL Efficiency Shaping with Dynamic Phase Control (DPC)
- 1-phase & Active Diode Emulation modes for light load efficiency
- CHiL Adaptive Transient Algorithm (ATA) on both loops minimizes output bulk capacitors and system cost
- Per-Loop Fault Protection: OVP, UVP, OCP
- Thermal Protection (OTP) and VRHOT# flag (CHL8203/13/14)
- Multiple time programmable (MTP) memory for custom configuration
- Compatible with CHiL ATL and 3.3V tri-state Drivers
- 3.3V +10%/-15% supply voltage; 0°C to 85°C operation
- Pb-Free, RoHS, QFN packages

DESCRIPTION

The CHL8212/13/14 are dual-loop digital multi-phase buck controllers and the CHL8203 is a single-loop digital multiphase buck controller designed for GPU voltage regulation. Dynamic voltage control is provided by registers which are programmed through I2C and then selected using a 3-bit parallel bus for fast access.

The CHL8203/12/13/14 include CHiL Efficiency Shaping Technology to deliver exceptional efficiency at minimum cost across the entire load range. CHiL Dynamic Phase Control adds/drops active phases based upon load current and can be configured to enter 1-phase operation and diode emulation mode automatically or by command.

CHiL's unique Adaptive Transient Algorithm (ATA), based on proprietary non-linear digital PWM algorithms, minimizes

output bulk capacitors and Multiple Time Programmable (MTP) storage saves pins and enables a small package size. Device configuration and fault parameters are easily defined using the CHiL Intuitive Power Designer (IPD) GUI and stored in on-chip MTP.

The CHL8203/12/13/14 provides extensive OVP, UVP, OCP and OTP fault protection and the CHL8203/13/14 includes thermistor based temperature sensing with VRHOT signal.

The CHL8203/12/13/14 includes numerous features like register diagnostics for fast design cycles and platform differentiation, truly simplifying VRD design and enabling fastest time-to-market (TTM) with "set-and-forget" methodology.

APPLICATIONS

- Multi-phase GPU systems
- GDDR memory

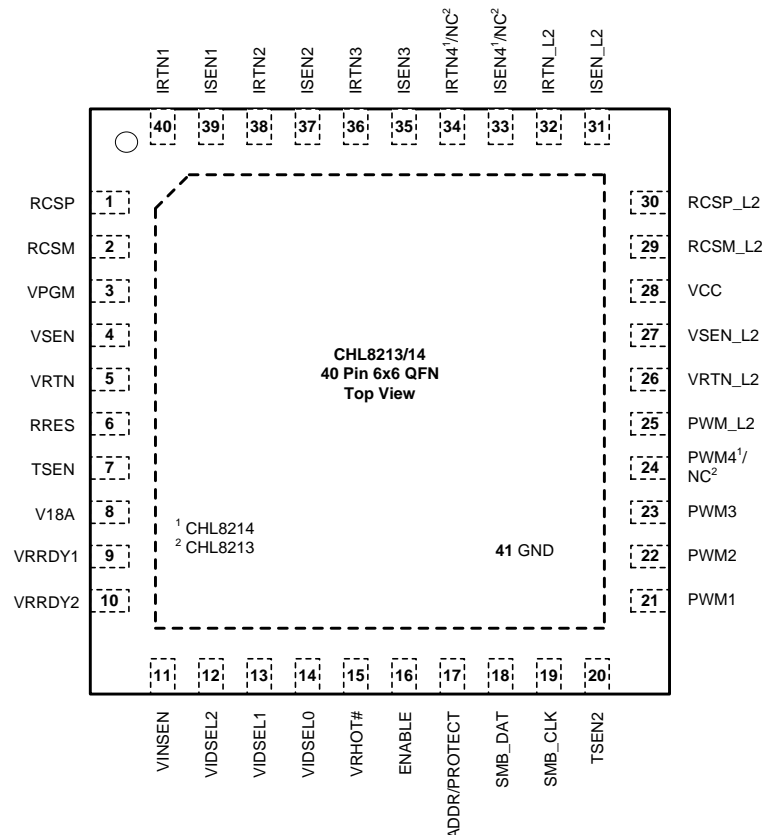


Figure 1: CHL8213 & CHL8214 Packages

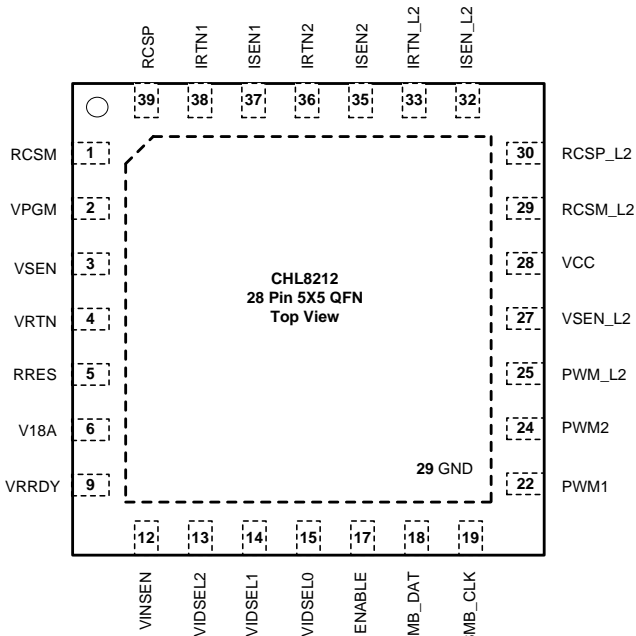


Figure 2: CHL8212 Package

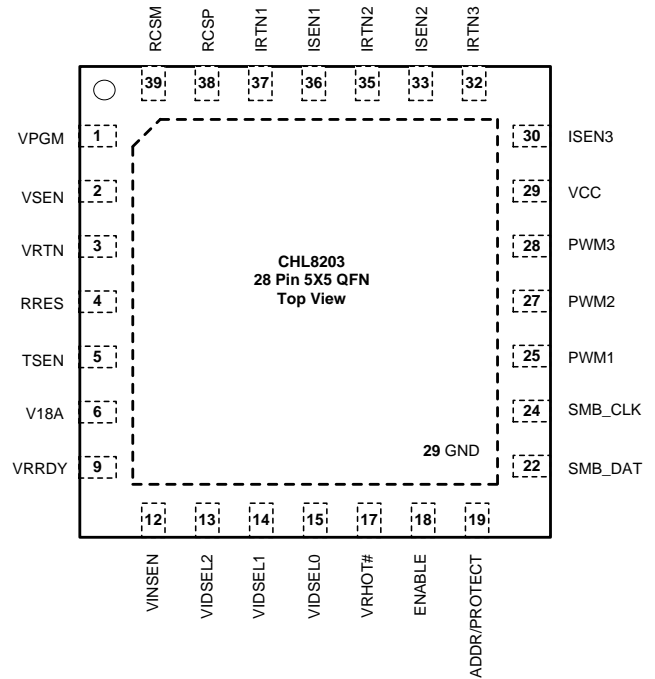
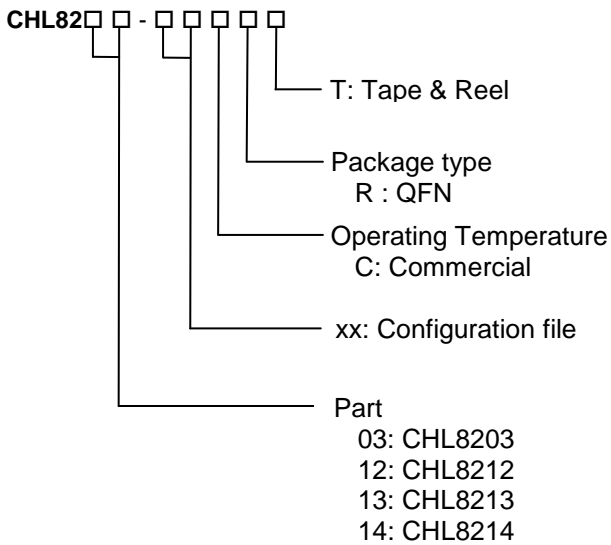


Figure 3: CHL8203 Package

ORDERING INFORMATION



Package	Tape & Reel Qty	Part Number
QFN	3000	CHL8203-00CRT ¹
QFN	3000	CHL8203-xxCRT ²
QFN	3000	CHL8212-00CRT ¹
QFN	3000	CHL8212-xxCRT ²
QFN	3000	CHL8213-00CRT ¹
QFN	3000	CHL8213-xxCRT ²
QFN	3000	CHL8214-00CRT ¹
QFN	3000	CHL8214-xxCRT ²

Notes

- 1 For unprogrammed/default parts, use configuration file 00. Unprogrammed parts will not start up until programmed in order to insure a safe power up.
- 2 -xx indicates a customer specific configuration file