FEATURES

- 6-phase single loop configurable PWM Controller
- Serial I2C control for Vout changes
- Programmable Constant Current Protection
- Dead-phase Protection and Flag
- Min/Max Telemetry registers and real-time monitoring via I2C (IIN, VIN, IOUT, VOUT, Temp)
- Programmable 1-phase or 2-phase for Light Loads and Active Diode Emulation for Very Light Loads
- IR Adaptive Transient Algorithm (ATA) minimizes output bulk capacitors and system cost
- IR Efficiency Shaping Features including Variable Gate Drive and Dynamic Phase Control
- Auto-Phase Detection with auto-compensation
- Fault Protection: Output OVP, UVP, OC Warn, OCP, OT Warn, OTP
- Multiple Time Programming (MTP) with integrated charge pump for easy custom configuration
- Compatible with IR ATL and 3.3V tri-state Drivers
- 200kHz to 2MHz switching frequency per phase
- +3.3V supply voltage; -40°C to 85°C Ambient
- Pb-Free, Halogen Free, RoHS, 5x5mm, 40-pin, 0.4mm pitch QFN

APPLICATIONS

- Supports Phase Redundant based Server systems
- Server CPU
- Server Memory

DESCRIPTION

The IR3590 is a 6-phase digital, single loop, multi-phase buck controller with a feature set optimized to support redundant power supply systems. The IR3590 includes IR's Efficiency Shaping Technology to deliver exceptional efficiency at minimum cost across the entire load range. IR Variable Gate Drive optimizes the MOSFET gate drive voltage based on real-time load current. IR's Dynamic Phase Control adds/drops phases based upon load current. The IR3590 can be configured to enter 1-phase operation and active diode emulation mode automatically or by command.

IR's unique Adaptive Transient Algorithm (ATA), based on proprietary non-linear digital PWM algorithms, minimizes output bulk capacitors, and improves transient response and form factor.

The I2C interface can communicate with up to 127 IR3590-based VR loops. Device configuration and fault parameters are easily defined using the IR Digital Power Design Center (DPDC) GUI and stored in on-chip MTP. MTP storage saves pins and enables a small package size.

The IR3590 extensive fault protection includes output OV, UV and OC protection, a thermistor based OT protection input with a VRHOT signal output, and a selectable and separate Over Current warning flag through the ALERT#

ORDERING INFORMATION

Base Part Number	Package Type	Standard Pack		Orderable Part Number
		Form	Quantity	
IR3590	QFN 5 mm x 5 mm	Tape and Reel	3000	IR3590MxxyyTRP[2]
IR3590	QFN 5 mm x 5 mm	Tape and Reel	3000	IR3590MTRPBF[1]
IR3590	QFN 5 mm x 5 mm	Tray	4900	IR3590MTYPBF[1]

Notes:

1. Unprogrammed/blank parts will not start up until programmed in order to ensure a safe power up.

2. Customer Specific Configuration File, where xx = Customer ID and yy = Configuration File (Codes assigned by IR Marketing).