MPQ8655

16V, 30A, Scalable, Digital, Synchronous Step-Down Converter with PMBus

DESCRIPTION

The MPQ8655 is a fully integrated, PMBus-compliant, high-frequency, synchronous buck converter. The MPQ8655 offers a very compact solution that achieves up to 30A of output current (I_{OUT}) per phase, with excellent load and line regulation across a wide input supply range. The MPQ8655 operates at high efficiency across a wide I_{OUT} load range.

The PMBus interface provides converter configurations and monitors key parameters.

The MPQ8655 adopts MPS's proprietary multi-phase constant-on-time (MCOT) control, which provides fast transient response and eases loop stabilization. The MCOT scheme also allows multiple MPQ8655 devices to be connected in parallel, with excellent current sharing and phase interleaving for high-current applications.

Fully integrated protection features include over-current protection (OCP), over-voltage protection (OVP), under-voltage protection (UVP), and over-temperature protection (OTP).

The MPQ8655 requires a minimal number of readily available, standard external components, and is available in a TQFN-25 (4mmx5mm) package.

FEATURES

- PMBus 1.3 Compliant
- Scalable Multi-Phase Operation
- 3.1V to 16V Input Voltage (V_{IN}) with External 3.3V V_{CC} Bias
- 4V to 16V V_{IN} with Internal Bias
- 30A Continuous Output Current (I_{OUT}) per Phase
- Low On Resistance ($R_{DS(ON)}$) Integrated Power MOSFETs
- Lossless and Accurate On-Die Current Sensing
- Adaptive Multi-Phase Constant-On-Time (MCOT) for Ultra-Fast Transient Response
- Stable with Zero-ESR Output Capacitors
- 0.5% Reference Voltage (V_{REF}) Across 0°C to 70°C Junction Temperature (T_J) Range
- Output Voltage (V_{OUT}) True Remote Sense
- V_{OUT}, I_{OUT}, V_{IN}, and T_J Reporting
- V_{OUT} Adjustable from 0.4V to 0.9 x V_{IN}, Up to 5.5V Max
- Built-In Multiple-Time Programmable (MTP) Memory to Store Custom Configurations
- Configurable via PMBus:
  - V_{OUT}
  - I_{OUT} Limit
  - Selectable Pulse-Skip Mode or Forced Continuous Conduction Mode (FCCM)
  - Soft-Start Time (t_{SS})
  - Selectable 400kHz, 600kHz, 800kHz, or 1000kHz Switching Frequency (f_{SW})
  - OCP, OVP, and OTP with Options for Hiccup or Latch-Off Mode
  - Ramp Compensation
- Available in a TQFN-25 (4mmx5mm) Package

APPLICATIONS

- Telecom and Networking Systems
- Base Stations
- Servers

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