

28V 8A Fast-PWM Synchronous Step-Down Converter

DESCRIPTION

The MT3998 is a fully integrated high efficiency synchronous step-down converter which requires a minimum number of external components. It offers a very compact solution with 8A continuous output current over a wide input range. The MT3998 employs proprietary Constant On-Time (COT) control scheme providing superior transient response and maintaining constant switching frequency in the continuous conduction mode operation. The external ramp compensation network allows stable operation with ultra-low equivalent series resistance (ESR) output ceramic capacitors. An error amplifier in the control loop provides excellent line and load regulation.

The operating frequency can be set with an external resistor for a 200KHz to 1.2MHz range or synchronized to an external clock using the internal PLL. The MT3998 also features a precision 0.6V reference and a power good output indicator. The SS pin programs output voltage slew rate during start-up. The SYNC/MODE pin selects among Ultrasonic, pulse-skipping, or forced PWM mode operation at light loads or MT3998 can synchronize to an external clock.

The MT3998 integrates extensive protection functions including Input 2.7V under-voltage lockout (UVLO), thermal shutdown, input over-voltage protection (OVP), cycle by-cycle current limiting, and short-circuit protection. The converter is available in a small QFN_4mmx4mm_20L or QFN_3mmx3mm_16L package.

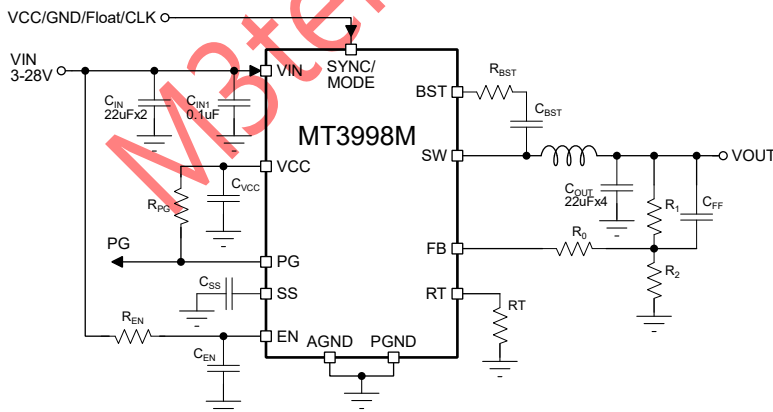
FEATURES

- Input Voltage Range from 3V to 28V.
- $\pm 1\%$ 0.6V Feedback Voltage Accuracy
- 8A continuous output current
- Support 100% duty cycle Low Dropout Operation
- Stable operation with output low ESR ceramic capacitors
- Fast PWM COT control with superior transient performance
- External Programmable and Synchronizable Switching frequency: 200KHz to 1.2MHz
- Selectable Ultrasonic (UA) Mode or Pulse-Skip Mode (PSM) for High Light Load Efficiency
- Integrate 20m Ω /10m Ω HS/LS Power Switches for QFN 3mmx3mm_16L
Integrate 28m Ω /17m Ω HS/LS Power Switches for QFN 4mmx4mm_20L
- Accurate 1.26V EN threshold with 280mV Hysteresis
- 130 μ A Low Quiescent Current in PSM mode
- Internal fixed or External programmable Soft-start Time
- Output Discharging Function in Shutdown
- Thermal Shutdown
- Hiccup Mode Short Circuit Protection
- Small 4mmx4mm 20 lead QFN / 3mmx3mm 16 lead QFN packages

APPLICATIONS

- USB Type-C/PD Docking Station
- Networking Systems
- Industrial PC
- Flat Panel Television and Monitors
- Distributed Power Systems

TYPICAL APPLICATIONS



MT3998MQDR Efficiency vs Load Current (MODE=GND/FLOAT, RT=31.6K Ω)

