MP2155

High Efficiency Single Inductor Buck-Boost Converter with 2.2A Switches

PRELIMINARY SPECIFICATIONS SUBJECT TO CHANGE

MPS CONFIDENTIAL AND PROPRIETARY INFORMATION– INTERNAL USE ONLY

DESCRIPTION

The MP2155 is a highly efficient, low quiescent current Buck-Boost converter, which operates from input voltage above, below and equal to the output voltage. The device provides power solution for products powered by a one-cell Lithium-Ion or multi-cell alkaline battery applications where the output voltage is within battery voltage range.

The MP2155 uses a current mode, fixed frequency PWM control for optimal stability and transient response. The fixed 1MHz switching frequency and integrated low $R_{DS(ON)}$ N-channel and P-channel MOSFETs to minimize the solution footprint while maintaining high efficiency.

To ensure the longest battery life MP2155 has an optional pulse skipping mode that reduces switching frequency under light load conditions. For other low noise applications where variable frequency power save mode may cause interference, the logic control input MODE pin forces fixed frequency PWM operation under all load conditions.

The MP2155 operates with input voltage from 2V to 5.5V to provide adjustable output voltage (1.5V to 5V). With an input from 2.7V to 5.5V it can supply a maximum 1A current to load at 3.3V output voltage. The MP2155 is available in small QFN10-3x3mm package.

FEATURES

- High efficiency up to 95%.
- Load disconnect during shutdown
- Input voltage range: 2V to 5.5V
- Adjustable output voltage from 1.5V to 5V
- 3.3V/1A load capability from 2.7V-to-5.5V Vin
- 1MHz switching frequency
- Pulse skipping mode at light load
- Typical 80μA Quiescent current
- Internal loop compensation for fast response
- Internal soft start
- OTP, hiccup SCP
- Available in small 3x3mm QFN10 package

APPLICATIONS

- POS products
- Portable instruments
- Wireless handsets
- PDA
- MP3 players

All MPS parts are lead-free and adhere to the RoHS directive. For MPS green status, please visit MPS website under Quality Assurance.

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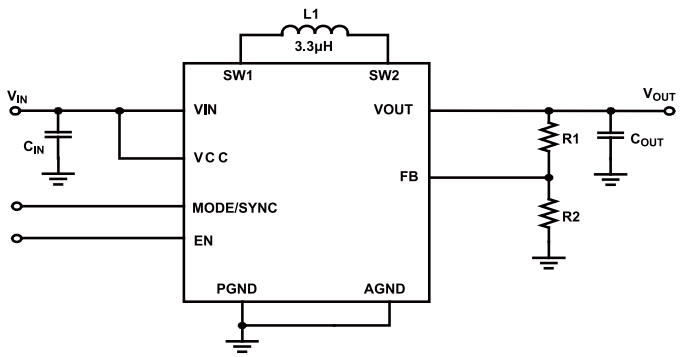
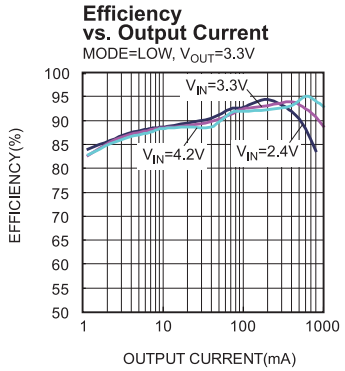
TYPICAL APPLICATION



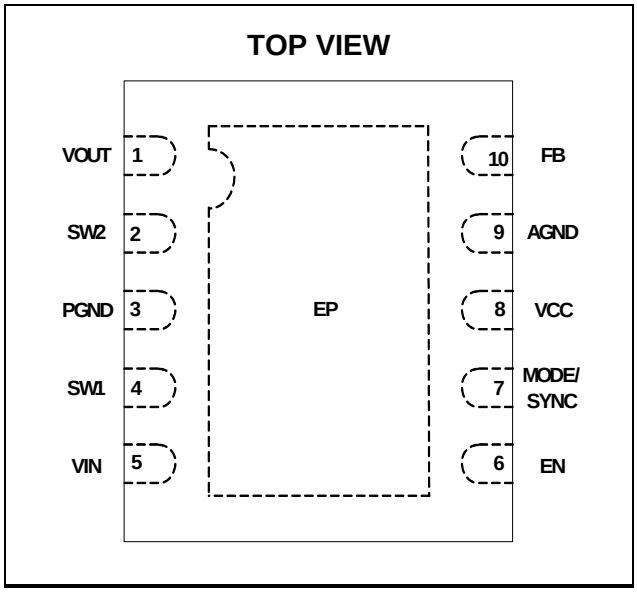


ORDERING INFORMATION

Part Number*	Package	Top Marking
MP2155GQ*	QFN10 (3X3)	ADR

* For Tape & Reel, add suffix –Z (e.g. MP2155GQ–Z);

PACKAGE REFERENCE



ABSOLUTE MAXIMUM RATINGS (1)

IN to GND .....–0.3V to 6.5V
SW1/2 to GND .....–0.3V(-2V for <10ns) to 6.5V
All Other Pins.....–0.3V to 6.5 V
Junction Temperature.....150°C
Lead Temperature .....260°C
Continuous Power Dissipation (T_A = +25°C) (3)
QFN10 3X3mm..... 2.5W
Storage Temperature..... -65°C to +150°C

Recommended Operating Conditions (4)

Supply Voltage V_{IN} .....2V to 5.5V
Output Voltage V_{OUT}.....1.5V to 5V
Operating Junct. Temp. (T_J).... –40°C to +125°C

Thermal Resistance (5) θ_{JA} θ_{JC}

3X3 QFN10..... 50 ..... 12... °C/W

Notes:

1) Exceeding these ratings may damage the device
2) The maximum allowable power dissipation is a function of the maximum junction temperature T_J (MAX), the junction-to-ambient thermal resistance θ_{JA}, and the ambient temperature T_A. The maximum allowable continuous power dissipation at any ambient temperature is calculated by P_D (MAX) = (T_J (MAX)-T_A)/θ_{JA}. Exceeding the maximum allowable power dissipation will cause excessive die temperature, and the regulator will go into thermal shutdown. Internal thermal shutdown circuitry protects the device from permanent damage.
3) The device is not guaranteed to function outside of its operating conditions.
4) Measured on JESD51-7, 4-layer PCB.