

80V/5mA, High-Voltage, Compact Boost Power Supply Using MAX1523 MAXREFDES1123

Design Verification Testing

Introduction

The MAXREFDES1123 is a compact boost power-supply design for high-voltage applications with low current requirements where extremely low cost and small size are top priorities. This design provides an 80V output and up to 5mA of load current. The reference design was subjected to design verification testing and the specification has been validated in laboratory conditions at a +25°C ambient temperature.

Test Equipment Used

The following test equipment was used for design verification:

- Power Supply: HP E3631A
- Oscilloscope: Tektronix TDS 3014
- Electronic Load: BK Precision 8500
- Digital Multimeter: Fluke 189

Tests Conducted

The tests listed below were completed on the MAXREFDES1123 and the results follow:

- Efficiency
- Output Voltage Ripple
- Switching Waveform
- Load Regulation

Test Results

Efficiency

Figure 1 demonstrates the efficiency measurement at 5V input voltage. The no-load efficiency is at 83.9% while the full-load efficiency is at 83%.

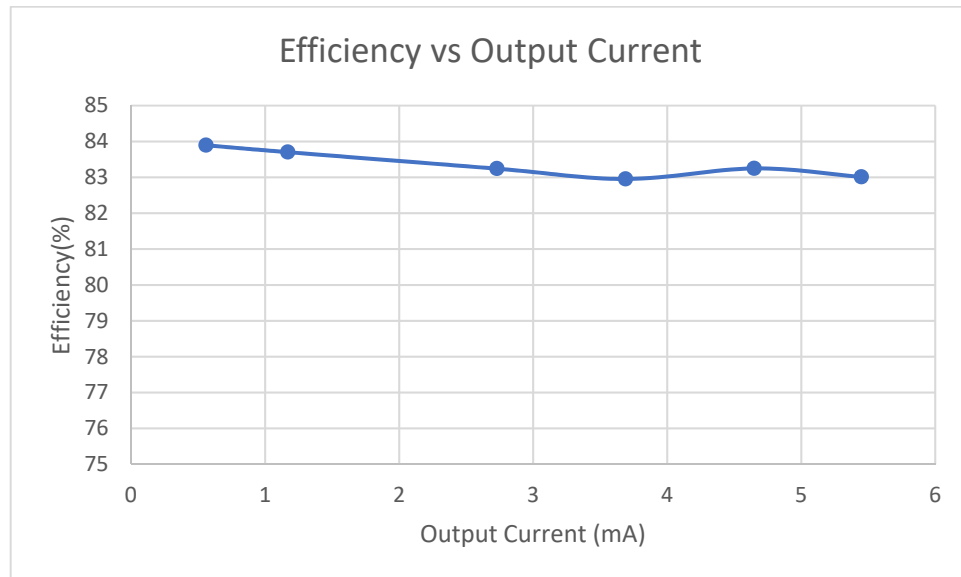


Figure 1. Efficiency measurement.

Output Voltage Ripple

Figure 2 demonstrates an output voltage ripple captured in full load operation. The V_{RIP} is at 226mV peak-to-peak, which is approximately 0.3% ripple for 80V output.

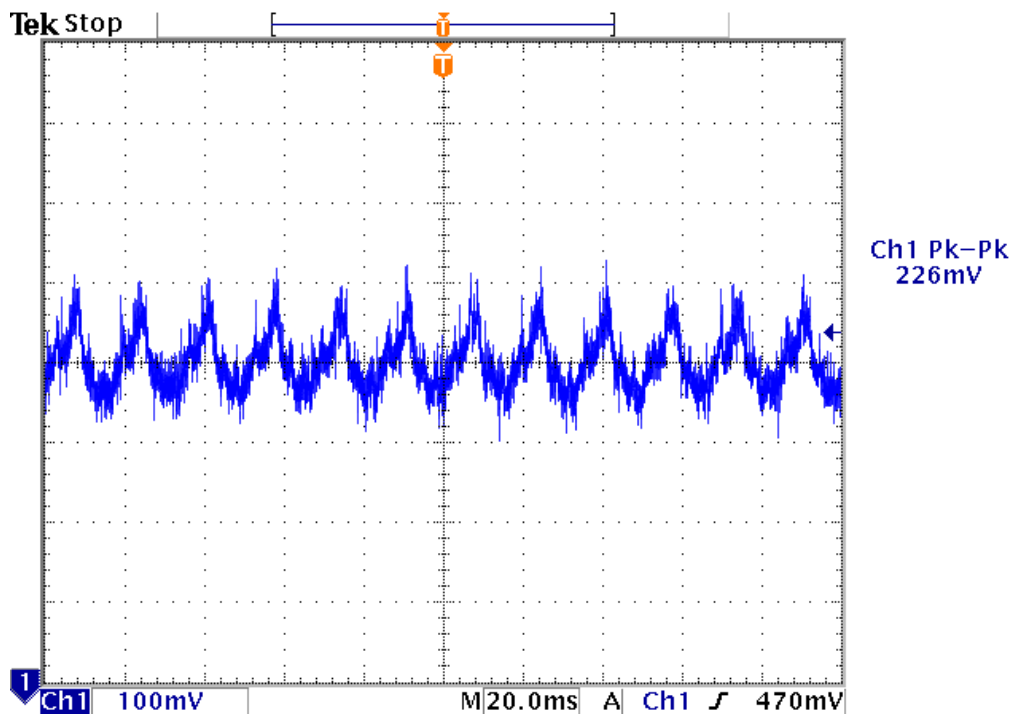


Figure 2. Output voltage ripple at full load.

Switching Waveform

Figure 3 demonstrates the switching waveform at the LX node in discontinuous conduction mode (DCM).

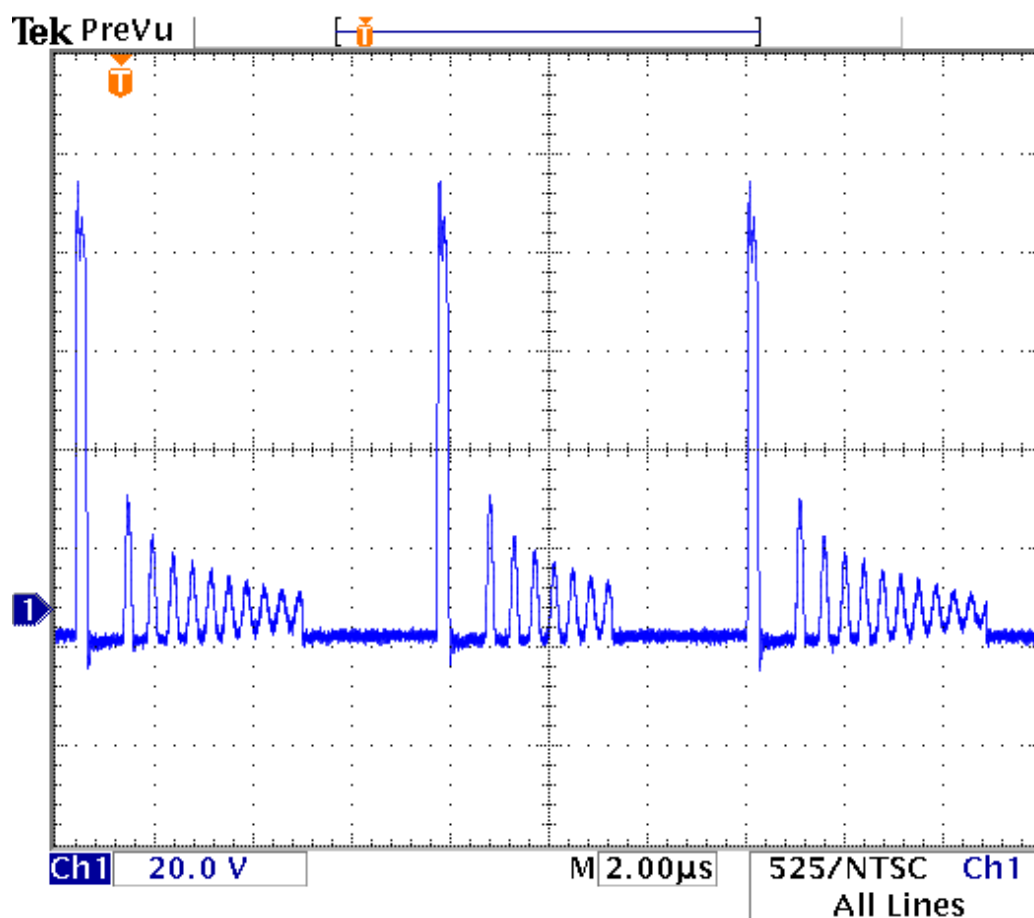


Figure 3. Switching waveform at the LX node.

Load Regulation

Figure 4 demonstrates the measurement of output voltage when the output current is varied. The output voltage is approximately at 79.5V, which is within 1% error margin of our design. As seen in the chart below, the load regulation for this design is regulated throughout the whole output load.

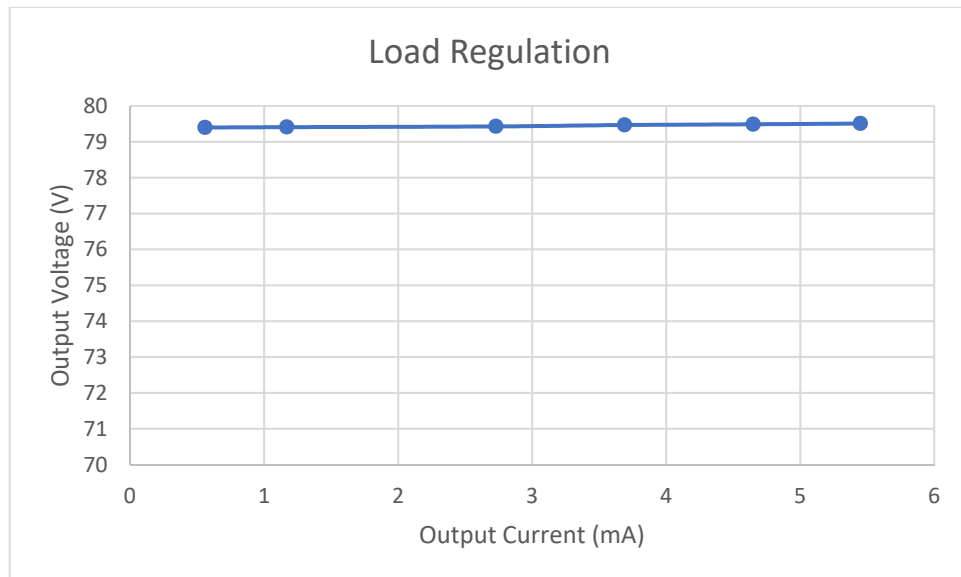


Figure 4. Switching waveform.

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