

Figure 2. Rectification of Input Ripple

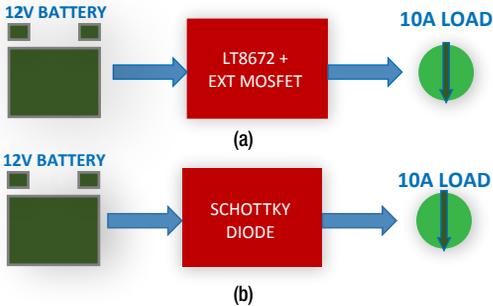


Figure 3. System Configuration (a) LT8672 Controlled System (b) Schottky Diode System

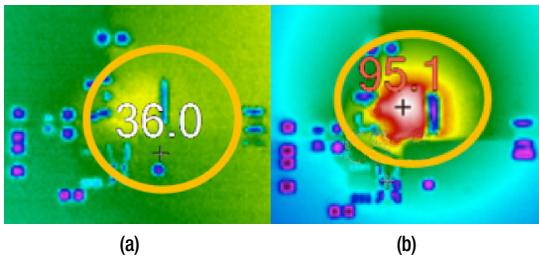


Figure 4. Thermal Performance Comparison (a) LT8672 Controlled System (b) Schottky Diode System

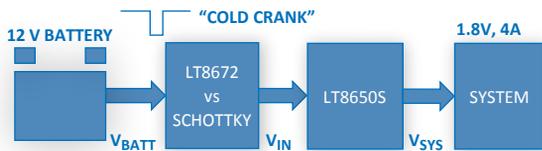


Figure 5. System Configuration for Cold Crank Test

Figure 5 shows a comparative cold crank test setup using an LT8650S step-down converter as the downstream test system. The LT8650S output is set to 1.8V at a constant load of 4A, and its minimum input operating requirement is 3V. The results are shown in Figure 6.

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When V_{BATT} drops to 3.2V, the LT8672 controlled system (a) maintains $V_{IN} > 3V$, allowing the LT8650S to keep its output V_{SYS} stable at 1.8V, while in the Schottky diode system (b) the input voltage V_{IN} of the LT8650S drops below its minimum operating voltage, preventing it from maintaining 1.8V at its output V_{SYS} .

Integrated Boost Regulator

Many alternative active rectifier controllers use a charge pump to power the gate driver. These solutions often cannot provide strong gate charging current and a regulated output voltage, limiting the frequency range and performance of continuous rectification. The LT8672's integrated boost regulator provides a tightly regulated gate driver voltage with strong gate driver current.

Conclusion

The LT8672 is able to rectify high frequency AC ripple on automotive supplies. It uses an integrated boost regulator to drive a MOSFET for ultrafast response during continuous rectification, an improvement over charge pump solutions. It provides rectification and reverse input protection with low power dissipation and an ultra-wide operational range (desirable for cold crank) in a tiny 10-lead MSOP package.

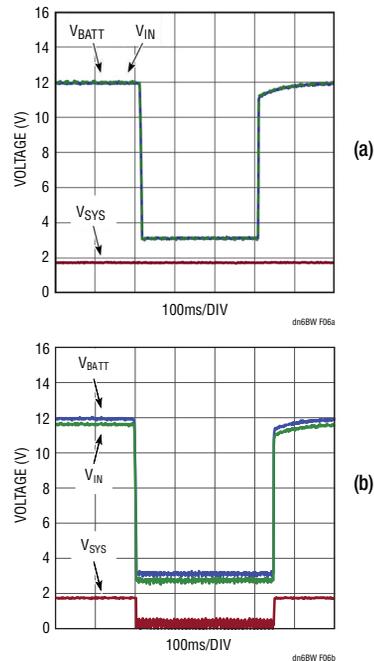


Figure 6 System Voltage Comparison Under "Cold Crank" (a) LT8672 Controlled System (b) Schottky Diode System

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