i7990N

Boost Converter and Current Monitor for APD

GENERAL DESCRIPTION

The i7990N consists of a constant-frequency pulse-width modulating (PWM) step-up DC-DC converter with an internal switch and a current monitor with high-speed adjustable current limiting. This device can generate output voltages up to 60V and provides current monitoring up to 4mA (up to 240mW). The i7990N can be used for a wide variety of applications such as avalanche photodiode biasing, PIN biasing, and varactor biasing. The i7990N operates from 2.8V to 5.5V.

The constant-frequency (400kHz), PWM architecture provides low-noise output voltage that is easy to filter. A high-voltage, internal power switch allows this device to boost output voltages up to 60V. Internal soft-start circuitry limits the input current when the boost converter starts. The i7990N features a shutdown mode to save power.

The i7990N includes a current monitor with more than three decades of dynamic range and monitors current ranging from 500nA to 4mA with high accuracy. Resistor-adjustable current limiting protects the APD from optical power transients. A clamp diode protects the monitor's output from overvoltage conditions. Other protection features include cycle-by-cycle current limiting of the boost converter switch, undervoltage lockout, and thermal shutdown if the die temperature reaches +150℃.

Applications

• PIN/APD Biasing Supply and Monitoring.
• Low-Noise Varactor Diode Bias Supplies.
• SDH/SONET/Ethernet/FTTH/GPON Application.

FEATURES

- Input Voltage Range +2.8V to +5.5V
- Wide Output-Voltage Range from (V_{IN}+5V) to 60V
- 240mW Boost Converter Output Power
- Accurate ±5% (5:1) High-Side Current Monitor
- Resistor-Adjustable Ultra-Fast APD Current Limit
- The i7990N is available in a 3mm x 3mm, 16-pin QFN package and operates over the -40℃ to +85℃ automotive temperature range.
- Open-Drain Current-Limit Indicator Flag Constant PWM Frequency (400kHz) Provides Easy
- Filtering in Low-Noise Applications
- 2μA (max) Shutdown Current
- -40℃ to +85℃ Temperature Range
- Internal 1Ω (typ) 60V Switch