The **N681389** implements a single channel FXS telephone line interface optimized for short loop applications. It integrates SLCC (Subscriber Line Control Circuit) functionality with a programmable CODEC and a DC/DC controller. The SLCC supports internal ringing up to $50V_{rms}$ (4 REN) ideal for Customer Premise Equipment (CPE). The CODEC can be configured for μ-law, A-law or 16-bit linear PCM encoding. It also supports a comprehensive set of signaling capabilities required to supervise and control the telephone lines. These include tone generation, ring tones, DTMF detection/ generation as well as FSK generation. An on-chip Pulse Width Modulation (PWM) driver allows control of an inductor based DC/DC converter. Programmable impedance and trans-hybrid balancing allow for worldwide deployment.

Target Applications:

- **Residential VoIP Gateways / Routers/ IP-PBX**
- **Analog Telephone Adapter (ATA)**
- **Integrated Access Devices**
- **Set Top Boxes**

Key Features:

- **Complete BORSCHT functions**
- **Internal balanced and unbalanced ringing up to 50 Vrms (4 REN)**
- **Integrated Power Management Options**
  - Integrated DC/DC controller regulates battery voltage to minimize power dissipation in all operating modes
  - Programmable external battery switching

- **Programmable linefeed characteristics**
  - Ringing Frequency, Amplitude, and Cadence
  - Trapezoidal and Sinusoidal waveforms
  - Two wire AC impedance, and trans-hybrid balance
  - Constant Current feed (5mA to 45mA)
  - Ring Trip and Loop Closure Thresholds
  - Ground Key Detection and Ground Start.
  - Ground Fault Detection

- **Programmable signal generation and detection**
  - DTMF generation/ detection and Tone generation
  - Frequency Shift Keying (FSK) Enhanced Caller ID generation (Type I and Type II)

- **Loop test and diagnostics support**
  - Integrated loopback modes
  - Real-time linefeed monitoring
  - On-chip temperature sensor
  - Line Card Diagnostics Support

- **Digital interfaces**
  - PCM: G.711 μ-Law, A-Law and 16-bit linear
  - SPI bus
  - Programmable audio path gains

Line Card Diagnostics Support

- **On-chip PLL for flexible clocking options including 1.0 MHz and 2.0 MHz BCLK operation**
- **Wideband and Narrowband codec**
- **Operating Characteristics**
  - Digital I/O Voltage range: 1.8V ~ 3.3V
  - Temperature range: -40°C ~ 85°C

- **Package**
  - QFN-44