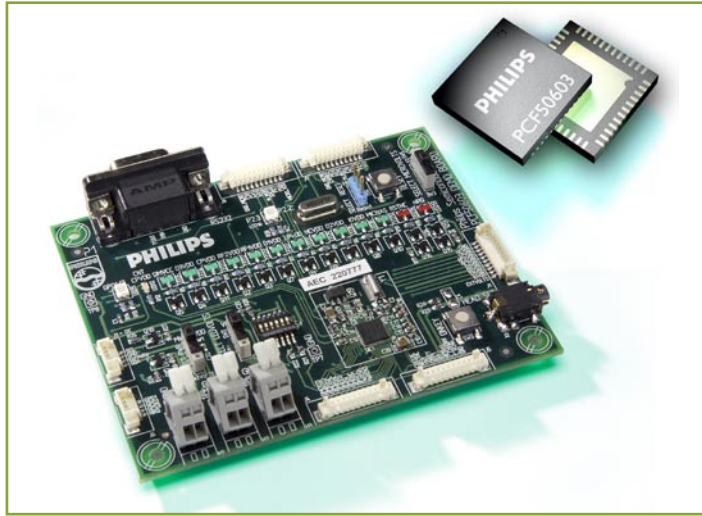


# PCF50603

## Single-chip Power Management Unit for mobile phones

Designed for use in low-end and mid-range cellular handsets, the PCF50603 PMU provides power management for an entire mobile phone. It delivers industry-leading standby times and offers real-time, software-controlled power management.



### Key features

- Complete system power management in a single chip
  - Sophisticated on/off control
  - Programmable power supplies
  - Flexible battery management
  - SIM-card interface
  - Support for audio peripherals
- Fully compatible with Nexperia Cellular System Solution and most other basebands
- Real-time power management to dramatically reduce power consumption and extend battery life
  - Adapts to different operating conditions
  - Mask-programmable start-up settings for custom operation
- Enables industry-leading standby time
  - Standby current consumption as low as 80  $\mu$ A
- Supports NiCd/NiMH and Li-Ion/Li-Polymer battery packs
- Requires only a few, low-cost external components
- Space-saving HVQFN package (6 mm x 6 mm)
- Complete evaluation kit with PC control software available

### General information

The PCF50603 is a highly integrated, single-chip power management unit (PMU) designed for worldwide use in low-end and mid-range cellular handsets. Providing sophisticated on/off control, programmable power supplies, flexible battery management, a SIM-card interface, support for audio peripherals and more, the PCF50603 is optimized for both performance and cost.

It is one of the PMUs offered in Philips Nexperia Cellular System Solutions. Thanks to its I<sup>2</sup>C software control and mask programmability, the PCF50603 can be configured to work with virtually every core chipset on the market. Available in a small HVQFN leadless package (6 mm x 6 mm), the PCF50603 takes up very little space and requires only a few, low-cost external components.

### Functional overview

The PCF50603 includes four types of functional blocks: communications and control, power supplies, battery management, and support for audio and specials.

#### Sophisticated communication and control

The PCF50603 controls the power ramp-up and ramp-down sequences in a cellular phone. It also controls several system operating modes, including active, save, standby, no power, and sleep. A range of integrated features supports sophisticated power control and battery management. A serial 400-kHz I<sup>2</sup>C link delivers control data and status to and from the core chipset. An interrupt controller generates the interrupt request for the host controller. All interrupts can be masked. A temperature-high sensor provides thermal protection for the entire PMU. An optional external 32-768-kHz oscillator generates the real-time clock (RTC) and provides time reference and alarm functions with wake-up control. The integrated SIM-card interface operates in transparent mode or sequencer mode. Both modes include an arbiter and signal-level translators. There are two pins for accessory recognition. If a charger is inserted in the bottom connector, the PMU will automatically boot up the phone. The PMU also responds to headset connection or removal, and the pressing of a button.

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## Single-chip Power Management Unit for mobile phones



### Programmable power supplies

The PCF50603 integrates a 75-mA charge pump and nine additional linear regulators. The power supplies support two operating modes – on and off. In addition, five of the nine power supplier support an ECO mode.

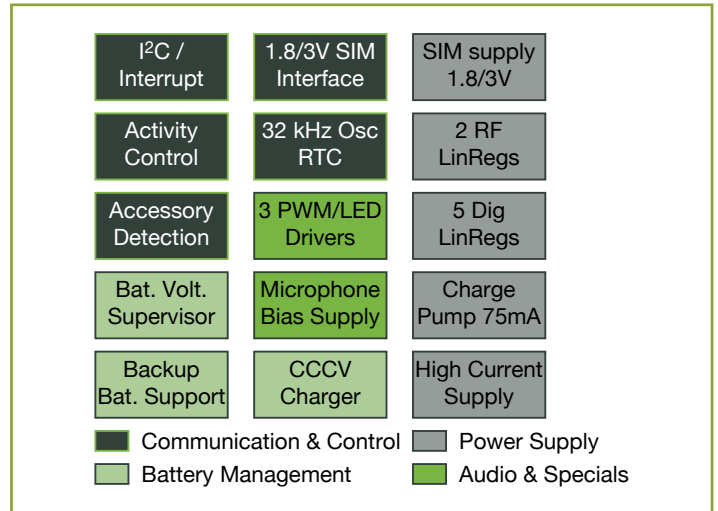
The ECO mode is a low-power mode that limits output current to 1 mA, while significantly reducing internal power consumption. Using the I<sup>2</sup>C bus, the power supplies can be actively managed to optimize power consumption at all times. When the send and receive functions of a phone are not in use, for example, the RF supplies can be switched off. Or, when the phone is in sleep mode, the memory and core supplies can use the ECO mode to retain data without straining the battery. Start-up and reset voltages are mask-programmable for custom operation. The power supplies require only a standard 470 nF or 4700 nF external ceramic capacitor.

### Flexible battery management

The PCF50603 operates from a three-cell NiCd/NiMH or a one-cell Li-Ion/Li-Polymer battery pack. Enhanced 6 kV ESD protection is provided on all pins connected to the main battery pack, the charger, and the SIM card. There are two battery chargers on-chip, a main charger and a backup battery charger. The main battery charger uses a constant-current/constant-voltage (CC/CV) charging method or, through software control, a pulse-charging method. To keep core functions active or to retain RTC and alarm information when the main battery is removed, the PMU can be connected to a backup battery. The backup battery charger is programmable and is suitable for use with Goldcap or Li-Ion/Li-Polymer batteries.

### Audio and specials

The PCF50603 has three open-drain General Purpose Outputs (GPOs) that can be connected to two pulse-width modulators (PWMs) and two on-chip LED drivers. An integrated microphone bias supply offers low noise and high power-supply rejection.



The PCF50603 provides complete system power management in a single chip

### Evaluation kit and PC software

The PCF50603 evaluation kit includes an evaluation board, documentation, and PC-based control software that makes it simple for hardware designers to modify programmable settings and customize operation. Please email orders to [PMU.customer.support@philips.com](mailto:PMU.customer.support@philips.com).

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Date of release: July 2003  
Document order number: 9397 750 11316

Published in The Netherlands