



# SC2004 USB-PD Controller with Multiple Fast Charge Protocols Integrated

## 1 Description

The SC2004 is a highly integrated PD controller for power consumer applications. It complies with the latest USB Type-C and PD 3.0 standards and supports the most popular high voltage fast charge protocols with DPDM interface. The IC mainly targets for mobile equipment applications.

The SC2004 supports wide operation voltage range with 30V maximum rating, and without the need of an external LDO. It minimizes external components by integrating USB PD baseband PHY, Type-C detection, voltage and current sense, 10-bit ADC, VBUS discharging path, the NMOS gate driver, I2C interface and protection circuits, so to allow easy system design and low BOM cost. Its embedded micro-controller and 32-KB MTP provide highly flexible and cost effective solution to many applications.

The SC2004 supports various protection mechanisms, including over voltage protection, under voltage protection, over current protection, short circuit protection, over temperature protection, DP/DM pin over voltage protection, and CC pin over voltage protection, so to effectively ensure the stable and reliable operation of the system.

The SC2004 is available in 32-pin QFN packages.

## 2 Features

- **USB Type-C**
  - Support Type-C sink protocols
  - Support dead battery
- **USB Power Delivery**
  - Support UFP/DFP USB PD 3.0
  - Hardware BMC transmitter and receiver
  - Full feature physical layer
  - Hardware CRC
  - Hardware reset
  - Integrate PD 3.0 protocol engine
- **DPDM Fast Charging Interface**
  - Firmware controlled DPDM interface
  - Support Apple charging, BC1.2, DCP, HVDCP, FC, AFC, FCP, and other proprietary charging protocols
- **Power**
  - Wide operation range: 2.7V to 24.5V (30V tolerant)
  - Integrated 5V and 1.8V LDOs
- **MCU Subsystem**
  - Integrated CPU
  - 32-KB MTP ROM and 2-KB RAM
  - Support I2C interface and multiple I/Os
  - CC program function
- **Analog Block**
  - Up to 6-channel 10-bit ADC to monitor the voltage / current / external signals
  - Integrated current sense amplifier
  - Integrated NMOS gate driver for isolation MOS
  - Integrated VBUS discharging paths at both sides of isolation MOS
- **Protections**
  - On chip OVP, OCP, SCP, UVP and OTP
  - VBUS to CC / DPDM short protection
- **Package**
  - 32-pin QFN

## 3 Applications

- Bluetooth speakers
- Mobile devices
- Wireless charge
- Other fast charge instruments

## 4 Device Information

Part Number	Package	BODY SIZE
SC2004QDER	QFN-32	4mm x 4mm x 0.75mm