



# 26V Buck Charger Controller with Hybrid Power Boost Mode and I2C Interface

## 1 Descriptions

SC8831A is a synchronous buck charger, which supports buck mode and boost mode during forward charging or reverse discharging operations. SC8831A manages 1S to 4S battery charging from a wide input range from 4.5V to 26V, and supports automatic system power selection with NMOS drivers on the battery side and adapter side.

The device adopts hybrid power boost architecture which allows the battery to work with the adapter to supply the system load when it exceeds the adapter capability in turbo mode. The adapter supplies the system power directly and charges the battery pack with dynamic power management to avoid over-loading. As the system power increases, the charging current will reduce to maintain the adapter current in regulation. If the system power continuously increases and hybrid power boost mode will be triggered to supplement system power.

Through the I2C interface, the user can set the charging current, charging voltage, input current limit, current limits, switching frequency, and other parameters flexibly. Besides, charging and discharging current also can be set in real-time via the external ILIM pin.

SC8831A can operate in learn mode and ship mode to meet the user's demands. Full protection is supported including over-temperature protection, adapter, and battery over-voltage protection, input MOSFETs over-current protection, battery, inductor, and MOSFET short circuit protection.

SC8831A is available in a 4mm x 4mm QFN-28 Package.

## 3 Applications

- Personal Digital Assistant
- Industrial Equipment
- Equipment with Rechargeable Batteries

## 2 Features

- Wide Input Range: 4.5V to 26V, 30V sustainable
- Buck Battery Charger for 1 to 4 Cell Batteries
- Automatic Power Source selection from Adapter or Battery with integrated NMOS Driver
- $\pm 0.4\%$  Charge Voltage Accuracy for 2-4cells with 16mV/step
- $\pm 2\%$  Input Current Accuracy with 64mA/step (10m $\Omega$ )
- $\pm 2\%$  Charge Current Accuracy with 64mA/step(10m $\Omega$ )
- $\pm 2\%$  Discharge Current Accuracy with 512mA/step 10m $\Omega$ )
- Dynamic Power Path Management
- Hybrid Power Boost Operation for Turbo Mode
- Ultra-Fast Transient Response Time to Enter Hybrid Boost Mode
- I2C Interface
- Charge Current And Discharge Current Can be Limited by An External Resistor in Real-Time
- Switching Frequency: 300/400/600/800kHz
- Low Adapter Standby Current
- Automatic End of Charge
- Learn Mode for Battery Gauge
- Ship Mode
- Protection including UVP, OVP, OCP, SCP, OTP
- QFN-28Package

## 4 Device Information

ORDER NUMBER	PACKAGE	BODY SIZE
SC8831AQDER	28 Pin QFN	4mm x 4mm x 0.75mm