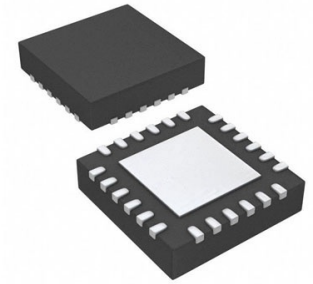


Switching Battery Charger Li-Ion/Li-Pol 3000mA 3.5V to 4.44V 24-Pin VQFN EP T/R



Images are for reference only

Manufacturer: [Texas Instruments, Inc](#)

Package/Case: VQFN24

Product Type: Power Management ICs

RoHS: RoHS Compliant/Lead free 

Lifecycle: Active

[Inquiry](#)

General Description

The bq24296/bq24297 are highly-integrated switch-mode battery charge management and system power path management devices for 1 cell Li-Ion and Li-polymer batteries in a wide range of smart phone and tablet applications.

Its low impedance power path optimizes switch-mode operation efficiency, reduces battery charge time and extends battery life during discharging phase. The I2C serial interface with charging and system settings makes the device a truly flexible solution.

The device supports 3.9-V to 6.2-V USB input sources, including standard USB host port and USB charging port with 6.4-V over-voltage protection. The device is compliant with USB 2.0 and USB 3.0 power specifications with input current and voltage regulation. To set the default input current limit, the bq24296 takes the result from the detection circuit in the system, such as USB PHY device and the bq24297 detects the input source through D+/D- detection following the USB battery charging spec 1.2. In addition, the bq24297 detects non-standard 2-A/1-A adapters. The device also supports USB On-the-Go operation by providing fast startup and supplying adjustable voltage 4.55-V to 5.5-V (default 5 V) on the VBUS with an accurate current limit up to 1.5 A. The power path management regulates the system slightly above battery voltage but does not drop below 3.5-V minimum system voltage (programmable). With this feature, the system keeps operating even when the battery is completely depleted or removed. When the input source current or voltage limit is reached, the power path management automatically reduces the charge current to zero and then starts discharges the battery until the system power requirement is met. This supplement mode operation keeps the input source from getting overloaded.

The device initiates and completes a charging cycle when host control is not available. It automatically charges the battery in three phases: pre-conditioning, constant current, and constant voltage. In the end, the charger automatically terminates when the charge current is below a preset limit in the constant voltage phase. Later on, when the battery voltage falls below the recharge threshold, the charger automatically starts another charging cycle.

The charge device provides various safety features for battery charging and system operation, including negative thermistor monitoring, charging safety timer, and over-voltage/over-current protections. The thermal regulation reduces charge current when the junction temperature exceeds 120°C (programmable).

The STAT output reports the charging status and any fault conditions. The INT immediately notifies the host when a fault occurs.

The bq24296 and bq24297 are available in a 24-pin, 4.00 × 4.00 mm² thin VQFN package.

Key Features

90% High Efficiency Switch Mode 3-A Charger

3.9-V to 6.2-V Single Input USB-Compliant Charger with 6.4-V Over-Voltage Protection

USB Host or Charging Port D+/D- Detection Compatible to USB Battery Charger Spec (BC1.2)

Supports Nonstandard 2-A/1-A Adapters Detection (bq24297)

Input Voltage and Current Limit Supports USB 2.0 and USB 3.0

Input Current Limit: 100 mA, 150 mA, 300 mA, 900 mA, 1 A, 1.5 A, 2 A, and 3 A

USB OTG with Adjustable Output 4.55 V to 5.5 V at 1 A or 1.5 A

Fast OTG Startup (22 ms Typ)

90% 5-V Boost Mode Efficiency

Accurate $\pm 15\%$ Hiccup Mode Over-Current Protection

Narrow VDC (NVDC) Power Path Management

Instant System On with No Battery or Deeply Discharged Battery

Ideal Diode Operation in Battery Supplement Mode

1.5-MHz Switching Frequency for Low Profile 1.2-mm Inductor

I2C Port for Optimal System Performance and Status Reporting

Autonomous Battery Charging With or Without Host Management

Battery Charge Enable and Preconditioning

Charge Termination and Recharge

High Accuracy

High Integration

Power Path Management

Synchronous Switching MOSFETs

Integrated Current Sensing

Bootstrap Diode

Internal Loop Compensation

Safety

Battery Temperature Sensing for Charging and Discharging in OTG Mode

Battery Charging Safety Timer

Thermal Regulation and Thermal Shutdown

Input and System Over-Voltage Protection

MOSFET Over-Current Protection

Charge Status Outputs for LED or Host Processor

Maximum Power Tracking Capability by Input Voltage Regulation

20- μ A Low Battery Leakage Current and Support Shipping Mode

4.00-mm \times 4.00-mm VQFN-24 Package

Recommended For You

BQ51013BRHLR

Texas Instruments, Inc
VQFN20

BQ51050BRHLT

Texas Instruments, Inc
QFN

BQ51050BRHLR

Texas Instruments, Inc
VQFN-20

BQ24045DSQR

Texas Instruments, Inc
WSON10

BQ24725ARGRT

Texas Instruments, Inc
QFN

BQ7693000DBT

Texas Instruments, Inc
TSSOP30

BQ25896RTWT

Texas Instruments, Inc
QFN24

TL432BQDBZR

Texas Instruments, Inc
SOT23-3

BQ2050HSN-A508

Texas Instruments, Inc
SOP16

BQ24192RGER

Texas Instruments, Inc
VQFN24

BQ2000SN-B5

Texas Instruments, Inc
SOP8

BQ24105RHLR

Texas Instruments, Inc
VQFN20

BQ24190RGER

Texas Instruments, Inc
VQFN24

BQ24010DRCR

Texas Instruments, Inc
QFN

TPS54360BQDDAQ1

Texas Instruments, Inc
SOP-8