思远半导体

General Description

SY5501 is specially designed for TWS earbuds, providing a perfect solution for charging and isolated communication. It integrates linear charger, discharge protection, single-line bidirectional data communication between cradle and earbuds and I2C communication interface to allow for charging-discharge management and protocol communication. SY5501 supports adjustment of maximum charging current via external resistor, and adjust constant charge current (ICC) and floating charging voltage (VFLOAT) through I2C. The integrated NTC ensures safer charging and discharging of the battery. The battery discharge protection and ship mode ensure low power loss of earbuds system. The integrated private protocol allows private control command to be sent from the cradle SoC via VIN to control SY5501, So that to turn on/off and reset the BLE SoC of earbuds. SY5501 also supports identification of earbuds in or out of the cradle and notify the BLE SoC . Multiple functions and low power loss ensure a shorter development cycle of Bluetooth earbuds, and the simplified 1.6mmx1.6mm QFN14 package greatly saves space for Bluetooth earbuds solution.
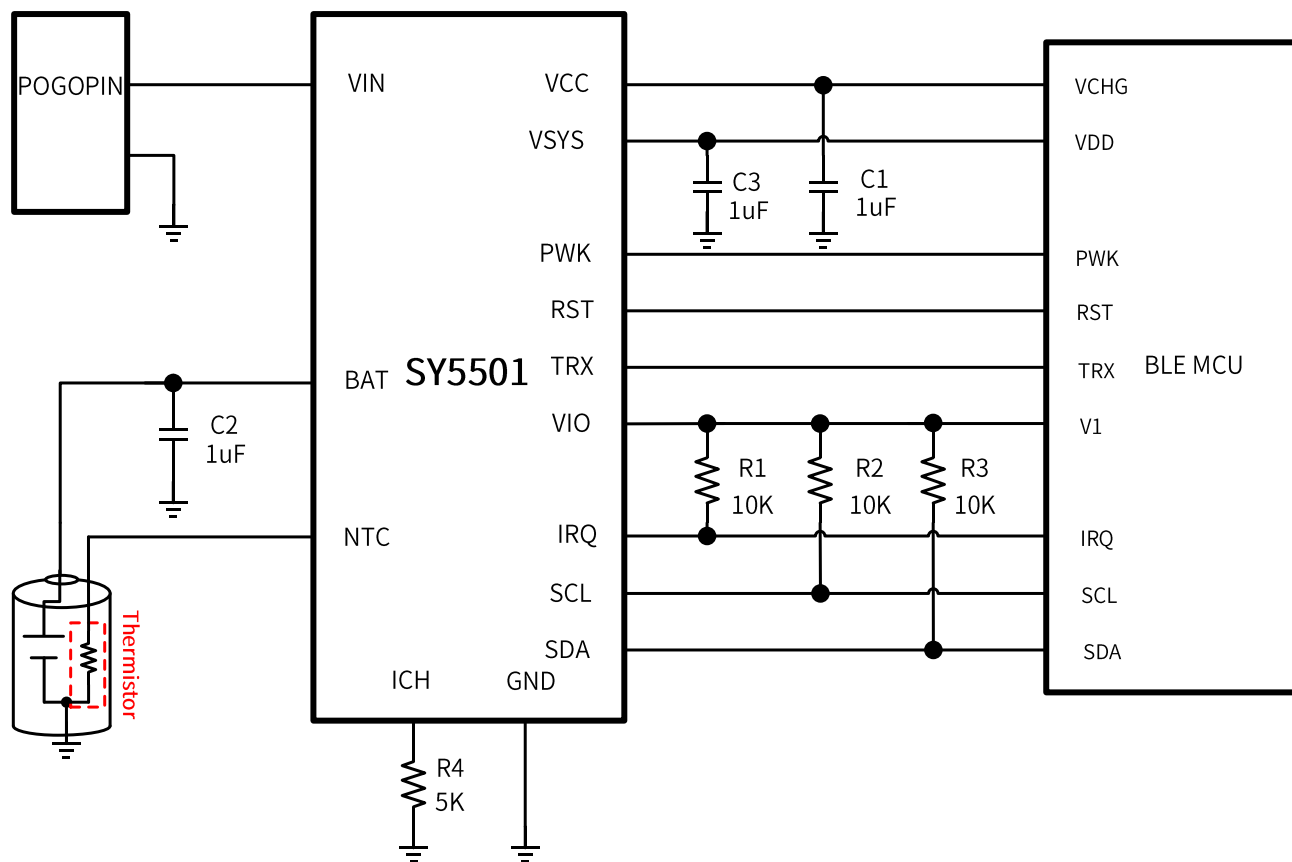
Applications

Bluetooth earbuds

Features

◆ 1uA VBAT standby current

◆ 300nA current in shipmode

◆ 12V withstand voltage at VIN

◆ VIN OVP=6V, 450mA over-current protection

◆ Adjustable linear charging current via ICH pin within the range of 10-300mA at 8 levels by percentage

◆ Adjustable floating charge voltage 4.2/4.35/4.4/4.45V, with ±0.5% accuracy

◆ Separately adjustable trickle current and cut-off current

◆ Automatic recharge

◆ Active recharge with multiple levels of adjustable voltage

◆ Integrated NTC detection for JEITA temperature interval protection

◆ Integrated charging over-voltage, over-temperature and timeout protection

◆ Integrated discharging under-voltage, over-current and short-circuit protection Integrated bidirectional communication automatic switching of communication direction at a rate up to 3Mbps

◆ Integrated private protocol command to be controlled by the cradle SoC via VIN Integrated in-case/out-of-case detection by sending a reset or wake-up signal to Bluetooth SoC respectively

◆ I2C control, status reading, and interrupt output

Typical Application Circuit

Typical Application Circuit of SY5501