HL7603

2.5MHz Synchronous Boost Converter with Bypass Mode

Overview

The HL7603 provides a power supply solution for products powered by Li-Ion Battery, Silicon Anode Battery or LiFePO4 Battery. By combining built-in power transistors, synchronous rectifier, and low supply current, this IC is optimized for single-cell portable applications like in mobile devices, tablet PCs, wearable devices or accessories.

The HL7603 is a boost regulator designed to provide a minimum output voltage from a single-cell Li-Ion battery, even when the battery voltage is below system minimum requirement. This extends the battery run-time and overcomes input current and voltage limitations of the powered system. The output voltage regulation is guaranteed up to a maximum load current of 4A in continue and 5A in peak(<10mS). The regulator can transit smoothly between Bypass Mode and normal Boost Mode and also can work under Forced Bypass Mode for minimizing quiescent current.

The HL7603 is available in a 16-bump, 0.4mm pitch, Wafer-Level Chip-Scale Package (WLCSP).

Features

- Input Voltage Range: 2.3V~5.5V
- Output Voltage Range:
  - Adjustable by I^2C: 2.85V to 5.5V
- Low IQ operating current:
  - 15uA IQ under Low IQ Forced Bypass Mode
  - 20uA IQ under Normal Forced Bypass Mode
  - 40uA IQ under Auto PFM Mode
- Maximum Output Current:
  - Continuous 4A with 2.7V to 3.6V
  - Peak 5A@10mS with 2.7V to 3.6V
  - Continuous 3A with 2.7V to 4.5V
- Efficiency:
  - >94.0% at V_{IN}=2.7V, V_{OUT}=3.4V, I_{OUT}=0.1A
  - >93.5% at V_{IN}=2.7V, V_{OUT}=3.4V, I_{OUT}=0.5A
  - >93.5% at V_{IN}=2.7V, V_{OUT}=3.4V, I_{OUT}=1.0A
  - >87.0% at V_{IN}=2.7V, V_{OUT}=3.4V, I_{OUT}=3.0A
  - >83.0% at V_{IN}=2.7V, V_{OUT}=4.5V, I_{OUT}=3.0A
  - >86.5% at V_{IN}=3.0V, V_{OUT}=4.5V, I_{OUT}=3.0A
- 2.5MHz Operation Frequency with Seamless PWM/PFM Transition
- Bypass Mode Rdson: 10mohm@TYP
- Optional Auto Bypass Mode and Forced Bypass Mode
- Optional Forced PWM Mode and Auto PFM Mode for Boost Operating Mode.
- Output Active Discharge Availability
- Comprehensive Protections
  - Input Under-Voltage Lockout (UVLO)
  - Over Current and Short-Circuit Protection
  - Thermal Shut-down
  - VIN Over Voltage Protection
- Compatible 1.2V/1.8V I/O Logic Voltage Level
- WLCSP-16, 1.80mm * 1.80mm = 3.24 mm^2 with 0.4mm Pitch

Applications

- Smart Phones and Tablet PC
- Wireless Communication Device
- 2G/3G/4G RF Power Amplifier
- Audio Power Amplifiers
- USB OTG Power Source
- Si-Anode Battery Powered Devices

Simplified Application Diagrams

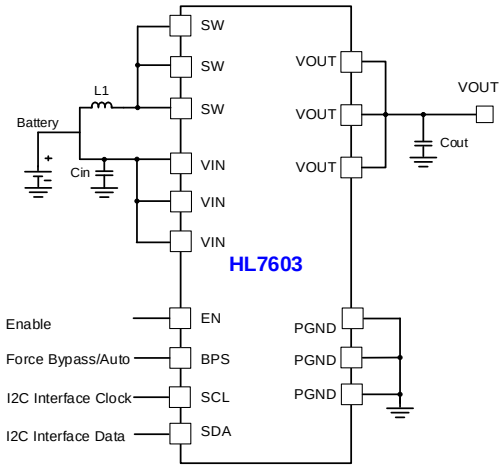

Figure 1 HL7603WL01/02 Typical Application Diagram

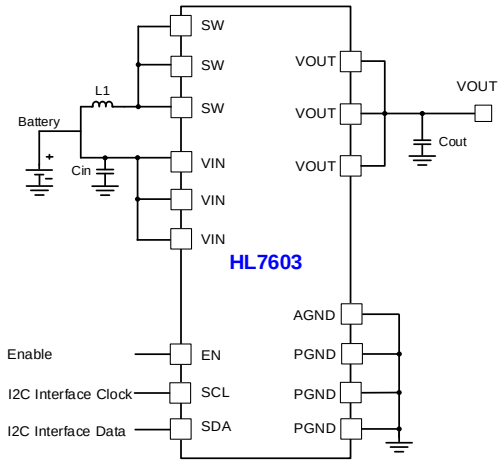

Figure 2 HL7603WL03/04 Typical Application Diagram

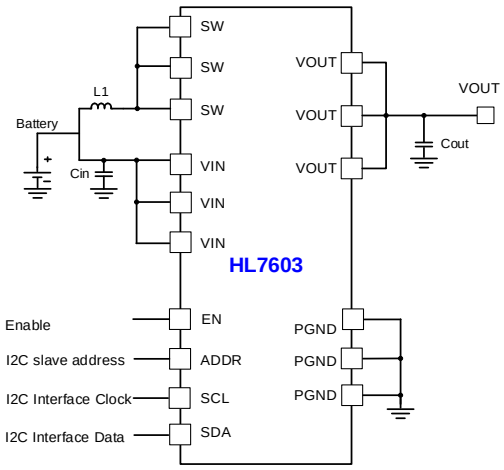

Figure 3 HL7603WL05/06/07 Typical Application Diagram

Ordering Information

Part Number	Default VOUT	Enable & BPS Logic	7bit I²C ADDR	D1 PIN
HL7603WL01	VOUT=3.6V.	EN=L, BPS=L/H, Shutdown EN=H, BPS=L, Normal Forced Bypass EN=H, BPS=H, Auto Bypass Mode	0X75	BPS
HL7603WL02	VOUT=3.6V	EN=L, BPS=L, Low IQ Forced Bypass EN=L, BPS=H, Shutdown EN=H, BPS=L, Normal Forced Bypass EN=H, BPS=H, Auto Bypass Mode	0X75	BPS
HL7603WL03	VOUT=3.6V	EN=H enable device(DEV_EN bit = 1b by default) Default Mode: Auto Bypass Mode	0X75	AGND
HL7603WL04	VOUT=3.6V	EN=H && DEV_EN bit = 1b enable device (DEV_EN bit = 0b by default) Default Mode: Auto Bypass Mode	0X75	AGND
HL7603WL05	VOUT=3.6V	EN=H enable device(DEV_EN bit = 1b by default), Default Mode: Auto Bypass Mode	ADDR = L, 0X75 ADDR = H, 0X76 ADDR = FLOAT, 0X77	ADDR
HL7603WL06	VOUT=3.6V	EN=H && DEV_EN bit = 1b enable device(DEV_EN bit = 0b by default) Default Mode: Auto Bypass Mode	ADDR = L, 0X75 ADDR = H, 0X76 ADDR = FLOAT, 0X77	ADDR
HL7603WL07	VOUT=3.4V	EN=H enable device(DEV_EN bit = 1b by default), Default Mode: Auto Bypass Mode	ADDR = L, 0X75 ADDR = H, 0X76 ADDR = FLOAT, 0X77	ADDR

For other default output voltage and maximum load current options, contact a Halo Micro sales representative.

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