

# XinaBox Datasheet PB04 - Dual AA Intelligent Battery Power Pack



## Contents

- 1 Overview
- 2 Applications
- 3 Specifications
- 4 External Links

## Overview

This xCHIP module houses 2 AA batteries to supply power to other connected xCHIPS. The PB04 makes use of the INA199A2 current sensor and MAX11647 Analog to Digital Converter. These two low-cost precision sensors allows for accurately measuring power usage, battery voltage and current draw.

The PB04 features an AAT1217 which is a high efficiency, synchronous, fixed frequency, step-up converter designed for battery-powered applications. The high 1.2 MHz switching frequency and completely integrated control circuitry maintains excellent regulation, ripple, and transient response throughout the full load range.

Light load mode operation and low quiescent current allow the AAT1217 to maintain high efficiency performance for light load conditions. With a 1.2A peak inductor current limit, the AAT1217 is capable of delivering 400mA from dual AA cells batteries.

### Product Highlights

- Provides Battery ([https://en.wikipedia.org/wiki/Battery\\_\(electricity\)](https://en.wikipedia.org/wiki/Battery_(electricity))) Voltage (<https://en.wikipedia.org/wiki/Voltage>) (V) Measurement
- Provides Instantaneous Battery ([https://en.wikipedia.org/wiki/Battery\\_\(electricity\)](https://en.wikipedia.org/wiki/Battery_(electricity))) Current ([https://en.wikipedia.org/wiki/Electric\\_current](https://en.wikipedia.org/wiki/Electric_current)) (I)(mA) Consumption
- 400 mA Output Current
- Over-Current Protection
- High Efficiency: Up to 93% Efficiency
- 1.2 MHz Fixed Switching Frequency
- 1.2 A Current Limit
- Light Load Mode Operation

## Applications

- Power Usage Monitoring
- Remote Sensing
- IoT Applications

## Specifications

### AAT1217

- 400 mA Output from Dual AA Cell
- High Efficiency: Up to 93% Efficiency
- Internal Synchronous Rectifier
- Fixed Frequency Pulse Width Modulation (PWM) Current Mode Control Scheme with Internal Compensation
- 1.2 MHz Fixed Switching Frequency
- 1.2 A Current Limit
- Light Load Mode Operation
- Over-Current Protection
- EMI Reduction Anti-Ringing Control Circuitry
- Low Shutdown Current: <1.0  $\mu$ A
- -40°C to +85°C Ambient Temperature Range

### INA199A2

- Offset Voltage:  $\pm 150 \mu$ V (Maximum) (Enables Shunt Drops of 10-mV Full-Scale)
- Accuracy:
  1. Gain Error  $\pm 1.5\%$
  2. 0.5- $\mu$ V/°C Offset Drift
  3. 10-ppm/°C Gain Drift
- Quiescent Current: 100  $\mu$ A

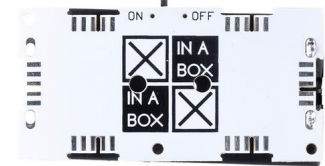
### MAX11647

- Internal Reference
- Internal Clock
- Internal FIFO with Channel-Scan Mode

## PB04 - Dual AA Intelligent Battery Power Pack (AAT1217, INA199, MAX11647)



Front



Back

CHIP

<b>Main Category</b>	Power
<b>Sub Category</b>	Battery
<b>Introduced</b>	1 January 2017
<b>Current version</b>	1.0.1
<b>Current version date</b>	1 January 2017
<b>Dimensions</b>	
<b>Size</b>	2x4U (32x64mm)
<b>Weight</b>	14 g (excluding batteries)
<b>Height</b>	21.6/17.2/3.3 mm
<b>Main Chip Set</b>	
<b>Main Chip</b>	MAX11647/INA199A2/AAT1217
<b>I<sup>2</sup>C Configuration</b>	
<b>Default Address</b>	0x36

- Low Power:
  1. 670 $\mu$ A at 94.4ksps
  2. 230 $\mu$ A at 40ksps
  3. 60 $\mu$ A at 10ksps
  4. 6 $\mu$ A at 1ksps
  5. 0.5 $\mu$ A in Power-Down Mode

## External Links

### Datasheet

- AAT1217 From Skyworks Solutions Inc ([http://www.skyworksinc.com/uploads/documents/AAT1217\\_202050B.pdf](http://www.skyworksinc.com/uploads/documents/AAT1217_202050B.pdf))
- INA199A2 From Texas Instruments (<http://www.ti.com/lit/ds/symlink/ina199.pdf>)
- MAX11647 From Maxim Integrated Products (<https://datasheets.maximintegrated.com/en/ds/MAX11646-MAX11647.pdf>)

### Shop

- Buy PB04 (<https://xinabox.cc/products/PB04>)

### Featured Projects

- Weather Station, With A Shake! ([https://www.hackster.io/Brittany\\_Bull/weather-station-with-a-shake-06c8a5](https://www.hackster.io/Brittany_Bull/weather-station-with-a-shake-06c8a5))
- Valentine's Day Inspired Beating Heart and Message ([https://www.hackster.io/Brittany\\_Bull/valentine-s-day-inspired-beating-heart-and-message-daf661](https://www.hackster.io/Brittany_Bull/valentine-s-day-inspired-beating-heart-and-message-daf661))

### GitHub Libraries

- Arduino ([https://github.com/xinabox/Arduino\\_PB04](https://github.com/xinabox/Arduino_PB04))
- MakeCode (<https://github.com/xinabox/pxt-PB04>)