PAM2304EV Board User Guide

AE Department

1. Revision Information

Date	Revision	Description	Comment
2011/01	V1.0	Initial release	

2. PAM2303 General Description

The PAM2304 is a step-down current-mode, DC-DC converter. At heavy load, the constant frequency PWM control performs excellent stability and transient response. To ensure the longest battery life in portable applications, the PAM2304 provides a power -saving Pulse-Skipping Modulation (PSM) mode to reduce quiescent current under light load operation to save power.

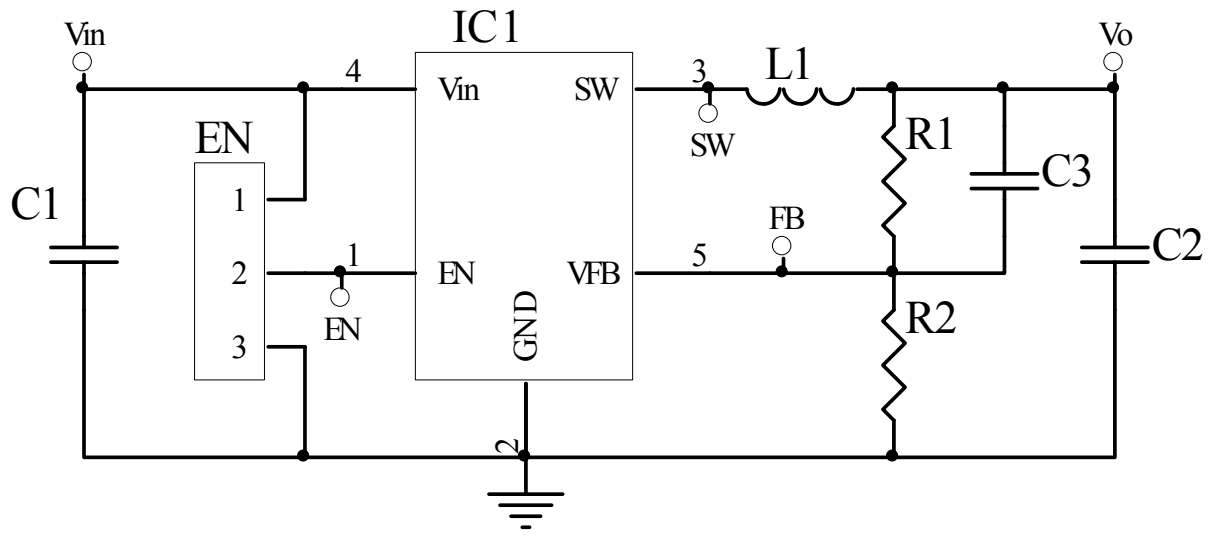
The PAM2304 supports a range of input voltages from 2.5V to 5.5V, allowing the use of a single Li+/Li-polymer cell, multiple Alkaline/NiMH cell, USB, and other standard power sources. The output voltage is adjustable from 0.6V to the input voltage, while the part number suffix PAM2304-XX indicates pre-set output voltage of 3.3V, 2.8V, 2.5V, 1.8V, 1.5V, 1.2V or adjustable. All versions employ internal power switch and synchronous rectifier to minimize external part count and achieve high efficiency. During shutdown, the input is disconnected from the output and the shutdown current is less than 1uA. Other key features include under-voltage lockout to prevent deep battery discharge.

The PAM2304 is available in SOT23-5 packages.

3. Key Features

- Efficiency up to 94%
- 40uA(TYP.) Quiescent Current
- Internal Synchronous Rectifier
- 3MHz Switching frequency to minimize inductor value
- Soft Start
- Under-Voltage Lockout
- Short Circuit Protection
- Up to 1A output current
- Thermal Shutdown
- 5-pin Small SOT23-5 Package
- RoHS Pass and Green Package

4. EV Board Schematic

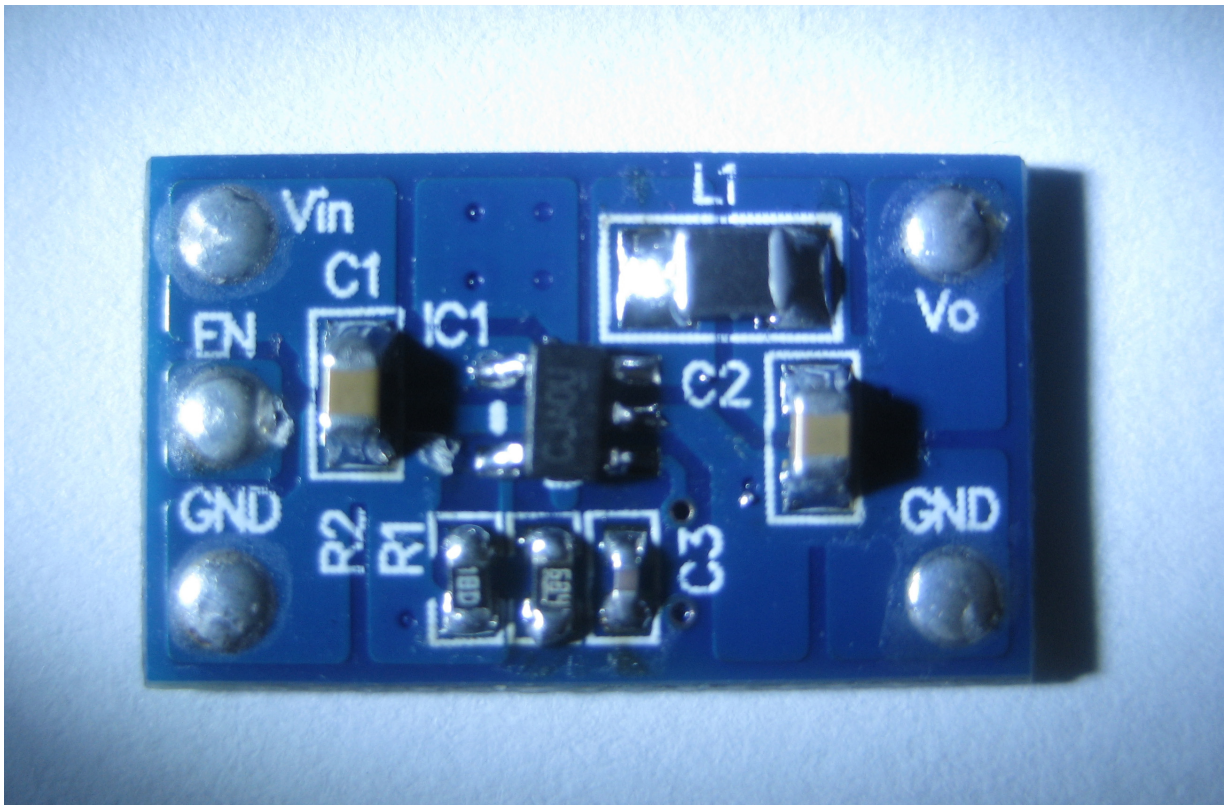


5. EVB PAM2304 EB11AA Description

PAM2304 EB11AA is an evaluation board for the PAM2304, a 3MHz DC/DC converter.
The board is targeted to be used in providing a simple and convenient evaluation environment for the PAM2304. Requires parts, power supply jacks etc. on the board, which makes it easy to be evaluated.

6. EV Board View

Top View



EV board operational sequence:

a. Connect power supply to V_{IN} and GND.
b. Connect load to V_O and GND.
c. Connect EN to high to enable the chip.
d. This demo board output current is up to 500mA.

7. EV Board BOM List

Item	Value	Type	Rating	Description	Vender and Part No.
C1	10μF	X5R/X7R, Ceramic/0805	10V	Input coupling CAP	JMK212BJ106MA
C2	10μF	X5R/X7R, Ceramic/0805	10V	Input coupling CAP	JMK212BJ106MA
C3	100pF	NPO/COG, 0603	50V	Forward CAP	UMK105 CG101JV-F
L1	1μH	1008	0.5A	Inductor	Wurth 74479787210
IC1	PAM2304	SOT-23-5		Power management IC	PAM2304
PCB		PAM2304 EB11AA 20*12mm			

$V_{OUT} = (1+R1/R2) \times V_{REF}$ (V_{REF} = 0.6V)

Vo	R1	R2
1.2V	150k	150k
1.5V	225k	150k
1.8V	300k	150k
2.5V	475k	150k
3.3V	680k	150k

8. External Compnents Selection

Input & output Capacitors (C1, C2)

(1) For lower output ripple, low ESR is required.

(2) Low leakage current needed, 10uF, X5R/X7R ceramic recommend

Feed forward capacitor (C3)

(1) Lower the output ripple

(2) Low leakage current needed, 20-100pF, NPO/COG ceramic recommend

Output Voltage programmer resistors (R1, R2)

(1) For programmer output voltage

(2) For accurate output voltage, 1% tolerance is required.

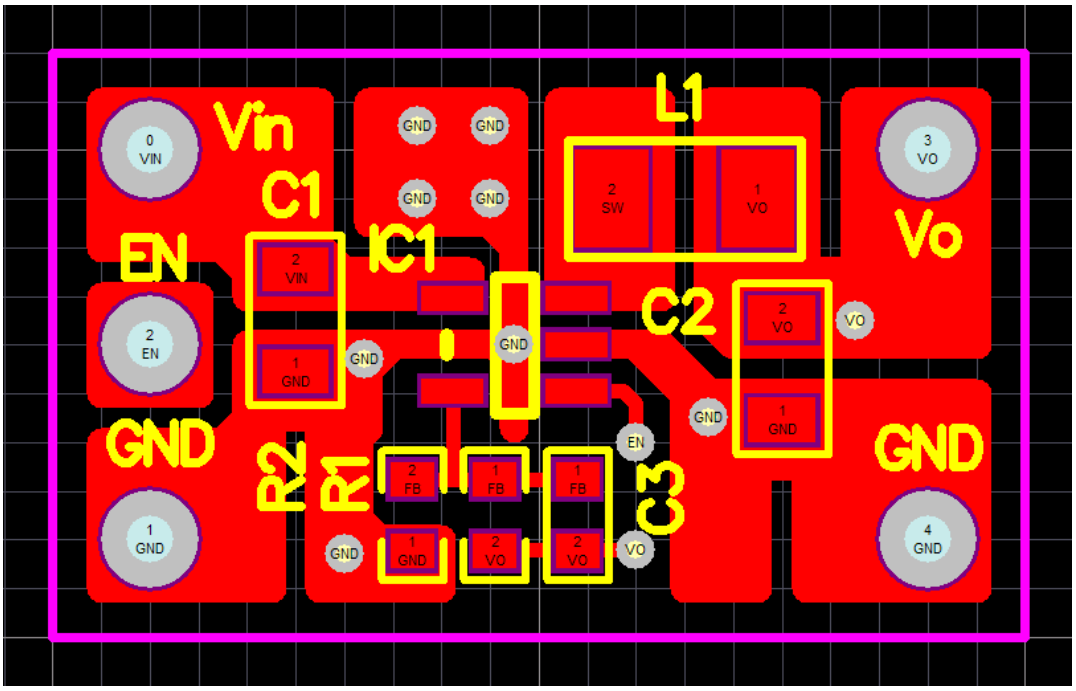
Inductor (L1)

(1) Low DCR for good efficiency

(2) Inductor rated Current must higher than the output current

9. PCB Layout Example

Top Layer



Bottom Layer