

PAM2321 TDFN3x3-10 EV Board User Guide

AE Department

1. Revision Information

Date	Revision	Description Initial Release	Comment
2011/09	V1.0	Initial Release	

2. PAM2321 General Description

The PAM2321 is a 2A step-down converter with a typical input voltage of 3.3V and a fixed output voltage of 1.2V or an adjustable output. The 3MHz switching frequency enables the use of small external components. The ultra-small 3mm x 3mm footprint and high efficiency make the PAM2321 an ideal choice for portable applications.

The PAM2321 delivers 2A maximum output current while consuming only 55μ A no-load quiescent current. Low R_{DS(ON)} integrated MOSFETs and 100% duty cycle operation make the PAM2321 the ideal choice for high output voltage, high current applications which require a low dropout threshold.

The PAM2321 provides excellent transient response and output accuracy across the operating range.

The PAM2321 maintains high efficiency throughout the load range. The PAM2321 automatically optimizes efficiency during light load mode (PSM) and maintains constant frequency and low output ripple during PWM mode.

Over-temperature and short circuit protection safeguard the PAM2321 and system components from damage.

The PAM2321 is available in a Pb-free, ultra-small, low profile, TDFN 3X3-10 and DFN 3X3-6 package. The product is rated over a temperature range of -40°C to +85°C.

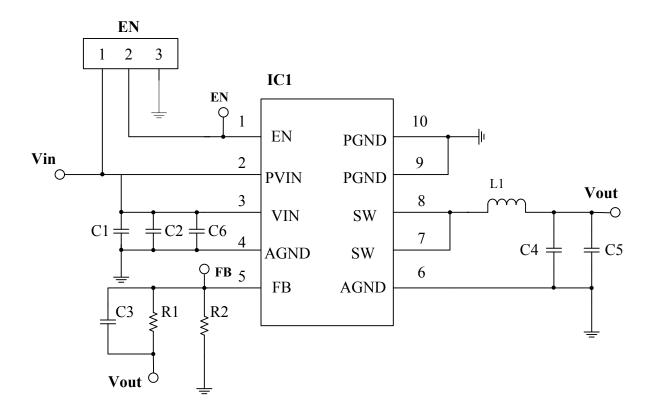


3. Key Features

- 2A Maximum Output Current
- Tiny 0.47μH Chip Inductor
- Excellent Transient Response
- Input Voltage: 2.7V to 5.5V
- Fixed or Adjustable Output Voltage Options:
 - Fixed Output Voltage: 1.2V
 - Adjustable Output Voltage: 1.0V to 3.3V
- High Efficiency with 3MHz Switching Frequency

- 55µA No Load Quiescent Current
- 100% Duty Cycle Low-Dropout Operation
- Internal Soft Start
- Over-Temperature and Current Limit Protection
- <1µA Shutdown Current
- -40°C to +85°C Temperature Range
- Pb-Free/Halogen Free Package
- RoHS/REACH Compliant

4. EV Board Schematic

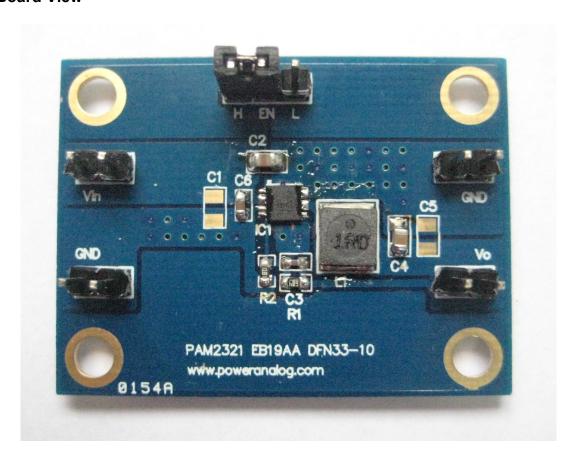




5. EVB PAM2321 EB19AA DFN33-10 Description

PAM2321 EB19AA DFN33-10 is an evaluation board for the PAM2321 TDFN3X3-10, a DC/DC converter. The board is targeted to be used in providing a simple and convenient evaluation environment for the PAM2321. Requires parts, power supply connectors etc. on the board, which makes it easy to be evaluated.

6. EV Board View



7. Resistor Slect for Output Voltage Setting

	$V_{OUT} = (1+R1/R2) \times V$	$_{REF}$ ($V_{REF} = 0.6$)	/)
Vo	R1	R2	L
1.2V	150k	150k	0.47µH
1.5V	225k	150k	0.47µH
1.8V	300k	150k	0.47µH
2.5V	475k	150k	1.0µH
3.3V	680k	150k	1.0µH



8. External Components Selection

Input & Output Capacitors (C2, C6; C4)

- (1) For lower output ripple, low ESR is required.
- (2) Low leakage current needed, X5R/X7R ceramic recommend, multiple capacitor parallel connection.

Feed Forward Capacitor (C3)

- (1) Lower the output ripple
- (2) Low leakage current needed, 100pF, COH/CH 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) Inductance saturate current must higher than the output current

9. Evaluation Board BOM List

Item	Value	Type	Rating	Description	Vender and Part No.
C2 10µF	10uF	X5R/X7R,	10V	Input coupling CAP	TAIYO YUDEN
	Ceramic/0805	10 4	input coupling of ti	EMK212ABJ106KD-T	
C6 1µF	X5R/X7R,	25V	Input coupling CAP	TAIYO YUDEN	
	Ceramic/0603			TMK107 BJ105KA-T	
C4 10µF	X5R/X7R,	10V	Output CAP	TAIYO YUDEN	
	Ceramic/0805	100		EMK212ABJ106KD-T	
C3 100pF	COH/CH,	50V	Feed forward CAP	TAIYO YUDEN	
	Ceramic/0402	30 V		UMK105CH101JV-F	
L1 1µH	>	>3A	Inductor	744042001	
		>3A		Wurth	
R1	680K	0603	1%	Valtage set DEC	
R2	150K	0603	1%	Voltage set RES	
IC1		PAM2321	TDFN3x3-10		
РСВ		PAM2321 EB19AA			
	DFN33-10				

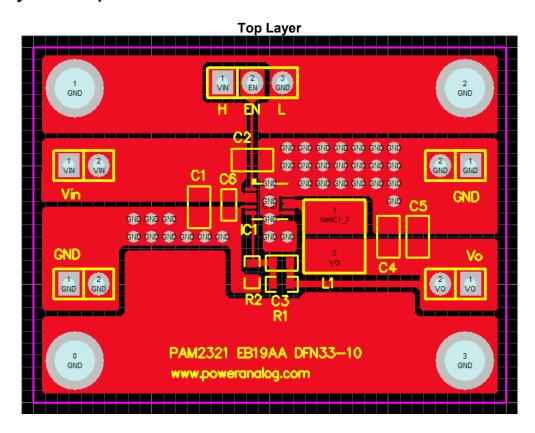


10. PCB Layout Guideline

The following guidelines should be used to help ensure a proper layout:

- 1). The input capacitor should be close to IC as close as possible.
- 2). Must put a small decoupling capacitor between Vin Pin and AGND Pin.
- 3). Minimize the switching loop area to avoid excessive switching noise.
- 4). AGND and PGND should connect at input capacitor GND.
- 5). For the good thermal dissipation, PAM2321 has a heat dissipate pad in the bottom side, it should be soldered to PCB surface. For the copper area can't be large in the component side, so we can use multiple vias connect to other side of the PCB.

11. PCB Layout Example





11. PCB Layout Example (cont.)

