Manuals+ — User Manuals Simplified.

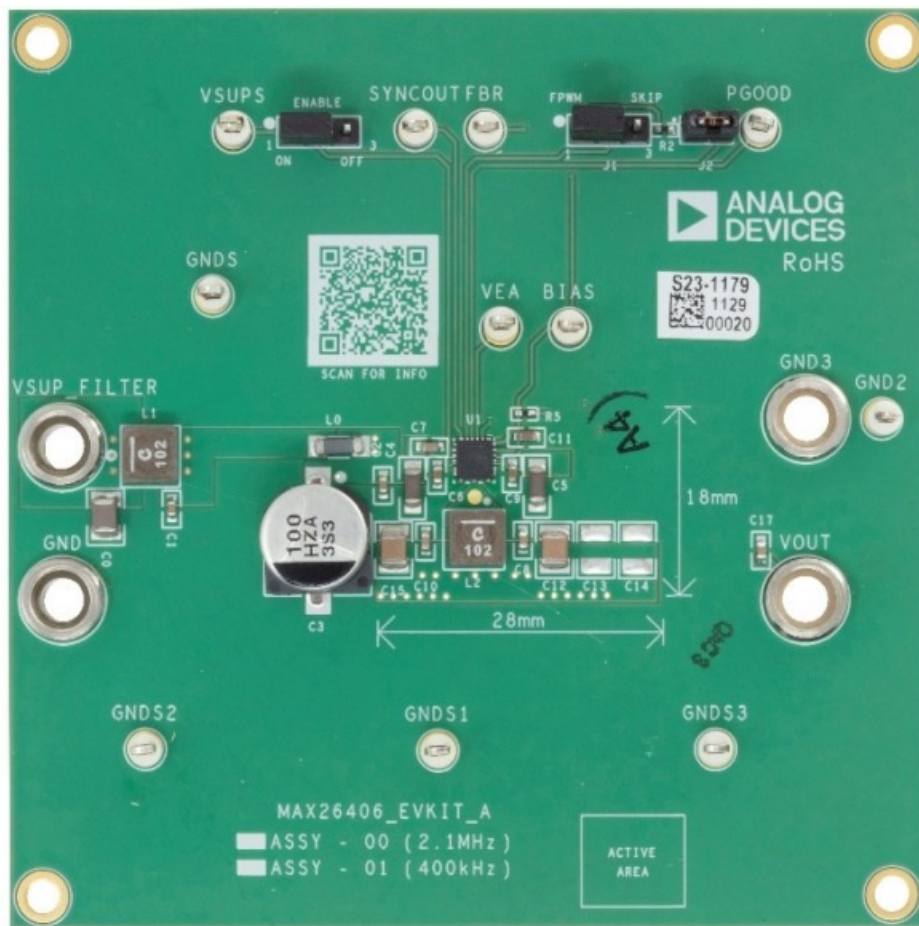# ANALOG DEVICES MAX26404 Evaluation Board Kit User Guide

Contents

ANALOG DEVICES MAX26404 Evaluation Board Kit

General Description

The MAX26406 evaluation kit (EV kit) provides a proven design to evaluate the MAX26406, 2.1MHz synchronous Silent Switcher® buck converter in a 17-pin, side-wettable FC2QFN package. The various test points and jumpers are included for the evaluation.

The MAX26406 EV kit comes with the MAX26406AFOBY+ installed (2.1MHz, 3.3V). The MAX26406 EV kit output voltage is fixed and is easily configured with minimum component changes. Use this EV kit to evaluate all variants of the MAX26404/MAX26405/MAX26406 with minimal component changes.

Benefits And Features

- 3V to 36V Input Supply Range
- 5V or 3.3V Fixed Output Voltage, or Adjustable Between 0.8V and 10V
- Delivers up to 6A Output Current (up to 5A for MAX26405, up to 4A for MAX26404)
- Frequency Synchronization Input
- 99% Duty-Cycle Operation with Low Dropout
- Spread Spectrum Frequency Modulation
- Voltage-Monitoring PGOOD Output
- Proven PCB Layout
- Fully Assembled and Tested

Ordering Information appears at end of data sheet.

Quick Start

Required Equipment

- MAX26406 EV kit
- Power supply
- Voltmeter
- Electronic load

This MAX26406 EV kit user guide must be used with the **MAX26404/MAX26405/MAX26406** data sheet.

Procedure

The EV kit is fully assembled and tested. To verify the board operation, do the following steps:

1. While observing safe electrostatic discharge (ESD) practices, carefully remove the MAX26406 EV kit board out of its packaging. Inspect the board to ensure that no damage occurred during shipment. Jumpers/shunts are preinstalled prior to testing and packaging.
2. Verify that all jumpers are in their default positions, as shown in Table 1.
3. Connect the positive and negative terminals of the power supply to the VSUP_FILTER and GND test pads, respectively.
4. Connect the positive terminal of the voltmeter to VOUT and the negative terminal to GND3.
5. Set the power supply voltage to 14V. Turn on the power supply.
6. Make sure that the voltmeter displays an output voltage of 3.3V.
7. Connect the electronic load positive terminal to VOUT and the negative terminal to GND3. Set the load to 1A.
8. Turn on the electronic load and increase the current to 6A.
9. Make sure that the voltmeter displays the output voltage of 3.3V ± 1.8%.

EV Kit Photo
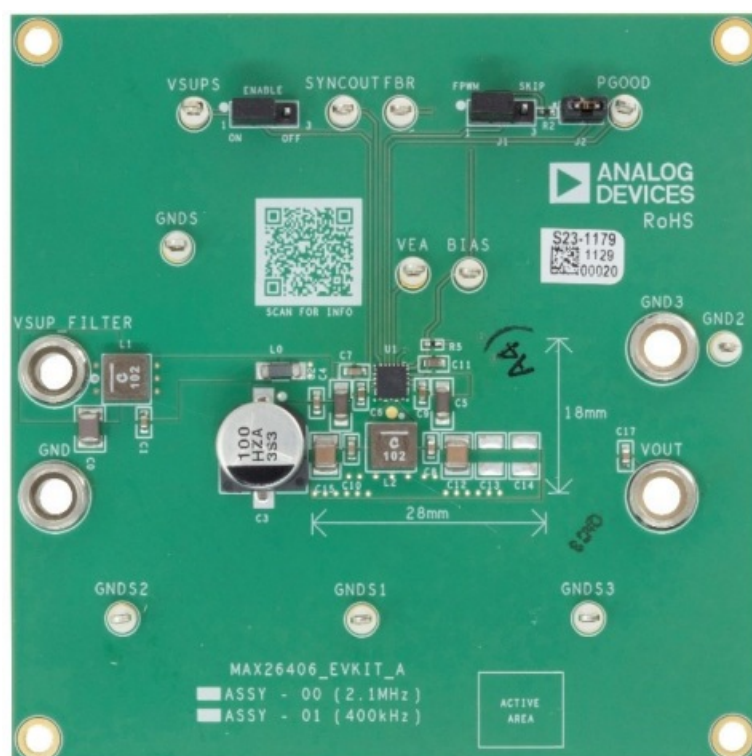
Table 1. Jumper Connection Guide

JUMPER	DEFAULT CONNECTION	FEATURE
ENABLE	Pin 1-2	Buck controller enabled.
J1	Pin 1-2	Forced-PWM Mode.
J2	Pin 1-2	PGOOD is pulled up to BIAS when OUT is in regulation.

Detailed Description

The MAX26406 EV kit provides a proven layout for all variants of the MAX26404/MAX26405/MAX26406 synchronous buck regulator. The device accepts input voltages as high as 36V and delivers up to 6A (5A for MAX26405, 4A for MAX26404).

Synchronization Input (SYNC)

The device can operate in two modes: Forced-PWM (FPWM) or Skip mode. Skip mode has better efficiency for light-load conditions. When SYNC is pulled low, the IC operates in Skip mode for light loads and PWM mode for larger loads. When SYNC is pulled high, the device is forced to operate in PWM mode across all load conditions. SYNC is also used to synchronize with an external clock. The device operates in FPWM mode when SYNC is connected to an external clock.

Buck Output Monitoring (PGOOD)

This EV kit provides a power-good output test point (PGOOD) to monitor the status of the buck output (OUT). PGOOD is high impedance when the output is in regulation. PGOOD is low impedance when the output voltage drops below 7% (typ) of its nominal regulated voltage.

Programming Buck Output Voltage

The EV kit comes installed with MAX26406AFOBVY+, which can provide a fixed 3.3V output voltage or an adjustable 0.8V to 10V output voltage. To program VOUT voltage, place appropriate resistors in the positions R7 and R8 according to the following equation:

$$R_7 = R_8 \times (\frac{V_{OUT}}{V_{FB}} - 1)$$

- where VFB = 0.8V and R8 = 10kΩ~100kΩ.

Replace output capacitors C12 to C15 with appropriate capacitors according to Table 1. Recommended Components for Adjustable Output Voltage, as shown in the MAX26404/MAX26405/MAX26406 data sheet. A feedforward capacitor C16 in parallel with R7 is also recommended for the adjustable output configuration. For the C16 value, refer to the MAX26404/MAX26405/MAX26406 data sheet.

Evaluating Other Variants

The EV kit comes installed with the 3.3V/2.1MHz, 6A variant (MAX26406AFOBY+). The other MAX26404/MAX26405/MAX26406 variants can be installed with minimal component changes.

Ordering Information

PART	TYPE
MAX26406EVKIT#	3.3V/2.1MHz EV Kit

#Denotes RoHS-compliant.

MAX26406 EV Kit Bill of Materials

| PARTS COMMON TO ALL VARIANTS				
REFERENCE DESIGNATOR	MANUFACTURER PART NUMBER	MANUFACTURER	VALUE	DESCRIPTION
BIAS, FBR, GND2, GNDS, GNDS1-GNDS3, PGOOD, SYNCOUT, VEA,VSUPS	5012	KEYSTONE	N/A	TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.445IN; BOARD HOLE=0.063IN; WHITE; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;
C0	CGA6P3X7S1H106K250AB	TDK	10UF	CAP; SMT (1210); 10UF; 10%; 50V; X7S; CERAMIC
C1, C2	CGA3E2X7R1H222K080AD	TDK	2200PF	CAP; SMT (0603); 2200PF; 10%; 50V; X7R; CERAMIC
C3	EEH-ZA1H101P	PANASONIC	100UF	CAP; SMT (CASE_G); 100UF; 20%; 50V; ALUMINUM- ELECTROLYTIC
C4, C5	CGA5L3X7R1H475K160AB	TDK	4.7UF	CAP; SMT (1206); 4.7UF; 10%; 50V; X7R; CERAMIC
C6, C9	UMK107BJ105KA	TAIYO YUDEN	1UF	CAP; SMT (0603); 1UF; 10%; 50V; X5R; CERAMIC
C7, C8, C10, C17	CGA3E2X7R1H104K080AE	TDK	0.1UF	CAP; SMT (0603); 0.1UF; 10%; 50V; X7R; CERAMIC
C11	GRM188Z71C225KE43	MURATA	2.2UF	CAP; SMT (0603); 2.2UF; 10%; 16V; X7R; CERAMIC
ENABLE, J1	PEC03SAAN	SULLINS	PEC03SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 3PINS

GND, GND3, VOUT, VSUP_FILTER	575-4	KEYSTONE	575-4	RECEPTACLE; JACK; BANANA; 0.203IN [5.2MM] DIA X 0.218IN [5.5MM] L; 0.203 D/0.218L; NICKEL PLATED BRASS
J2	PEC02SAAN	SULLINS	PEC02SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 2PINS
L0	BLM41PG600SH1	MURATA	60	INDUCTOR; SMT (1806); FERRITE-BEAD; 60 IMPEDANCE AT 100MHz; 6A
R2	ERA-2AEB103	PANASONIC	10K	RES; SMT (0402); 10K; 0.10%; +/- 25PPM/DEGK; 0.0630W
R4, R5	RC0402JR-070RL	YAGEO PHYCOMP	0	RES; SMT (0402); 0; 5%; JUMPER; 0.0630W
C16				Do not install
R6				Do not install
R7, R8				Do not install

2.1MHz VARIANT				
REFERENCE DESIGNATOR	**MANUFACTURER PART NUMBER**	**MANUFACTURER**	**VALUE**	**DESCRIPTION**
L1	XEL5030-102ME	COILCRAFT	1UH	INDUCTOR, SMT, 1UH
L2	XEL5030-102ME	COILCRAFT	1UH	
C12, C15	CGA6P1X7R1C226M250AC	TDK	22UF	CAP; SMT (1210); 22UF; 10%; 16V; X7R; CERAMIC
C13, C14				Do not install
U1	MAX26406AFOBY+	ANALOG DEVICES	MAX26406AFOBY+	IC, 17 FC2QFN, 6A, 3.3V, 2.1 MHz

| 400KHz VARIANT				
REFERENCE DESIGNATOR	MANUFACTURER PART NUMBER	MANUFACTURER	VALUE	DESCRIPTION
L1	XEL5030-222ME	COILCRAFT	2.2UH	INDUCTOR, SMT, 2.2UH
L2	XEL6060-472ME	COILCRAFT	4.7UH	INDUCTOR, SMT, 4.7UH
C12, C13, C15	GRT32EC81C476KE13	MURATA	47UF	CAP; SMT (1210); 47UF; 10%; 16V; X6S; CERAMIC
C14				Do not install
U1	MAX26406AFODY+	ANALOG DEVICES	MAX26406AFODY+	IC; 17 FC2QFN; 6A; 3.3V; 400 KHz

MAX26406 EV Kit Schematic
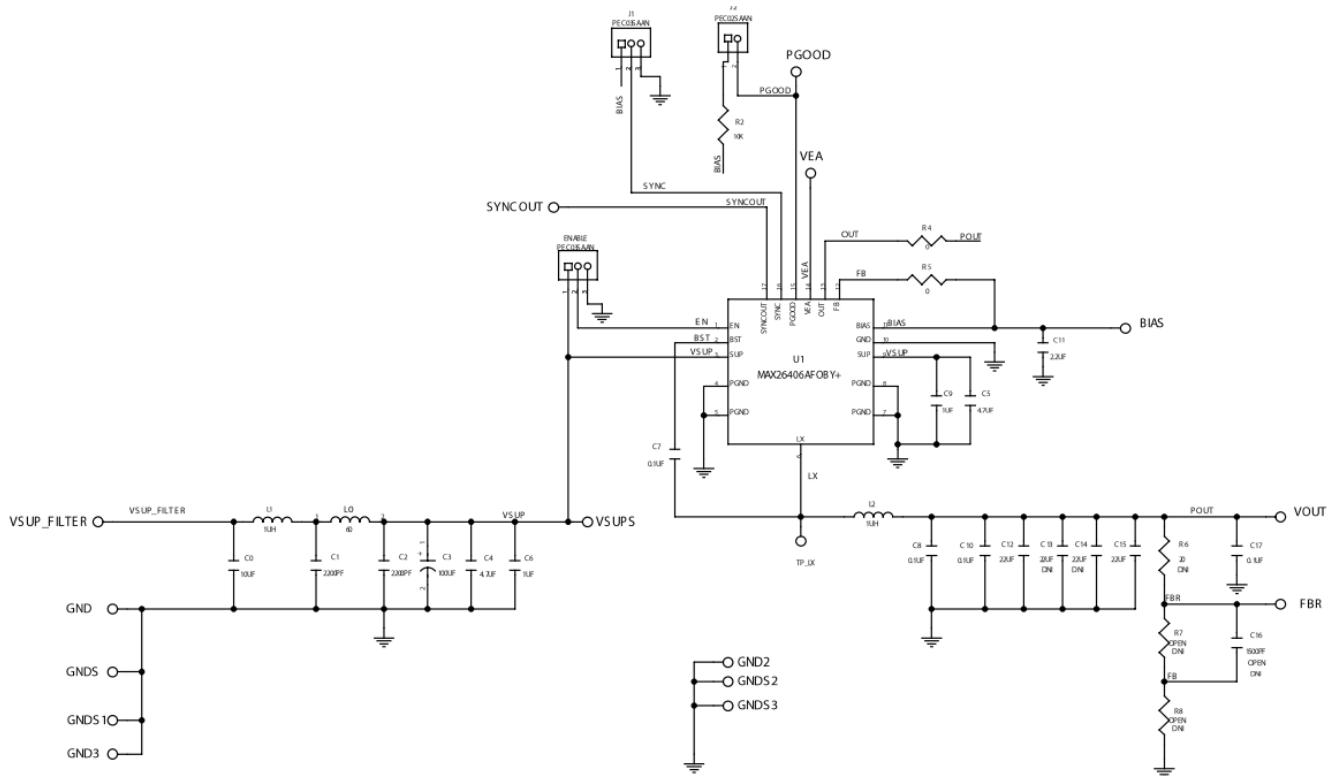
MAX26406 EV Kit PCB Layout Diagrams
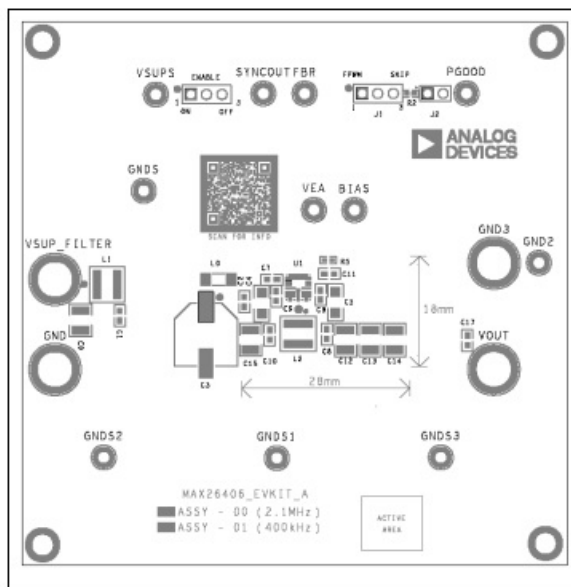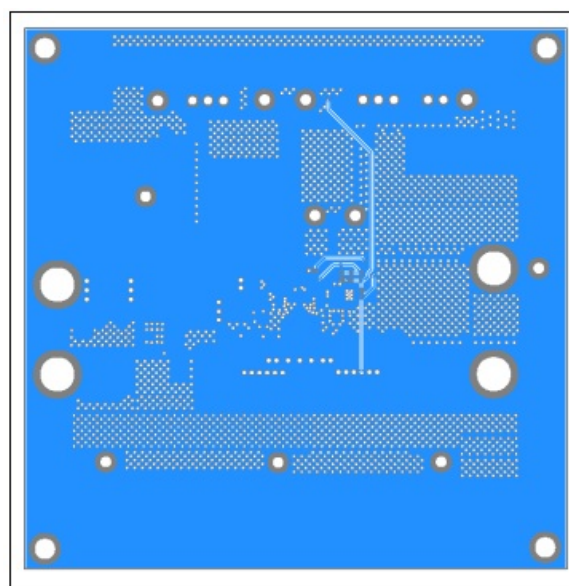
MAX26406 EV Kit Component Placement Guide—Top Silkscreen
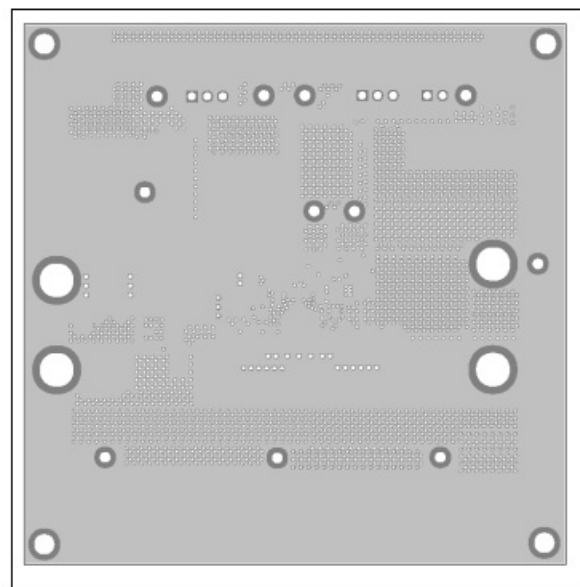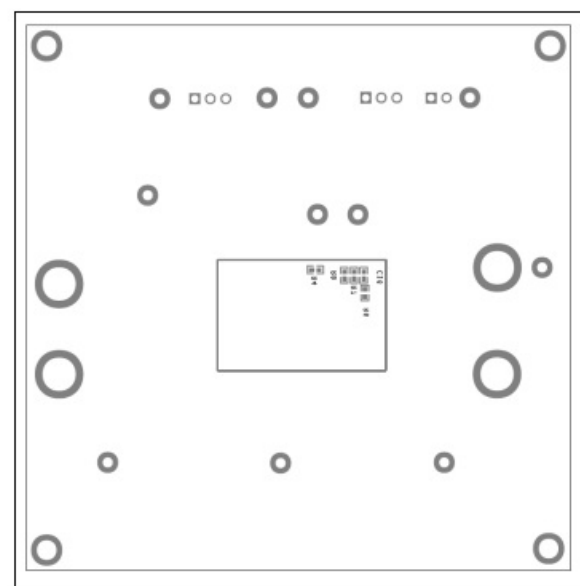

MAX26406 EV Kit PCB Layout—Layer 2
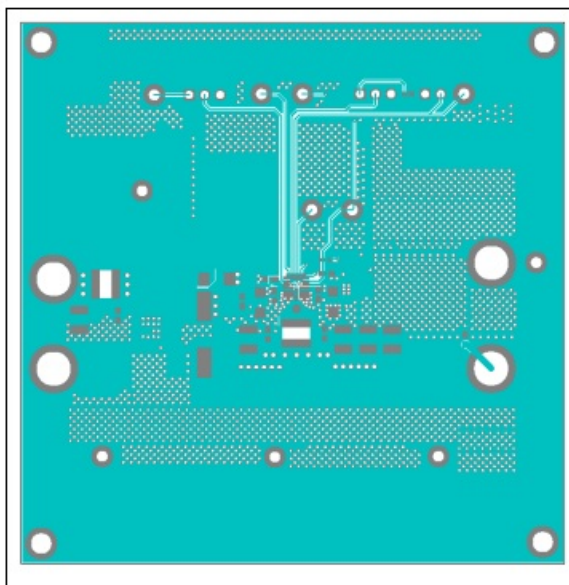
MAX26406 EV Kit PCB Layout—Top
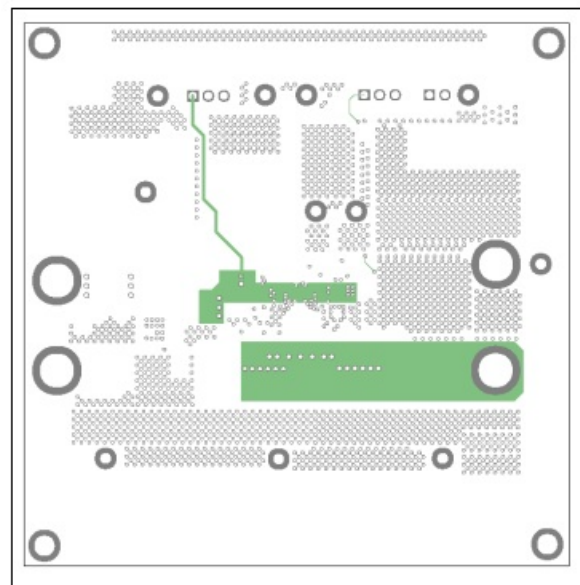
MAX26406 EV Kit PCB Layout—Layer 3

MAX26406 EV Kit PCB Layout—Bottom

MAX26406 EV Kit Component Placement Guide—Bottom Silkscreen

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	6/24	Initial release	—

Notes

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Documents / Resources

ANALOG DEVICES MAX26404 Evaluation Board Kit [pdf] User Guide
MAX26404, MAX26405, MAX26406, MAX26404 Evaluation Board Kit, MAX26404, Evaluation Board Kit, Board Kit, Kit

References

- **User Manual**