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Switching Regulator Series

1ch Buck-Boost DC/DC Converter BD8306MUV EVK

BD8306MUV-EVK-001 (3.7V→3.3V, 1A)

Introduction

This user's guide will provide the steps necessary to operate and evaluate the BD8306MUV Buck-Boost DC/DC Converter. Component selection, operating procedures and application data are included in this document.

Description

BD8306MUV-EVK-001 uses ROHM's highly-efficient Buck-Boost DC/DC Converter IC BD8306MUV and outputs 3.3V from 2.8V to 5.5V input voltage with one coil. This IC adopts the original Buck-Boost drive system and creates a more efficient power supply than the conventional SEPIC-system or H-bridge system switching regulators. A fixed Soft Start circuit prevents inrush current during startup along with UVLO (Under Voltage Lock Out) and TSD (Thermal Shutdown Detection), OCP (Over Current Protection) protection circuits. The Under Voltage Lock Out and hysteresis can be set by external resistor using STB pin. STB pin allows for simple ON/OFF control of the IC to reduce standby current consumption.

Application

General Portable Equipment

DSC

DVC

Cellular Phone

PDA

LED

Operating Limits

Parameter	Min	Typ	Max	Units	Conditions
Input Voltage	2.8	3.7	5.5	V	
Output Voltage		3.3		V	
Output Current Range			1.0	A	VCC>2.8V
Operating Frequency		1.0		MHz	
UVLO Detect Voltage		1.6		V	VCC sweep down
UVLO Release Voltage		1.7		V	VCC sweep up

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EVK

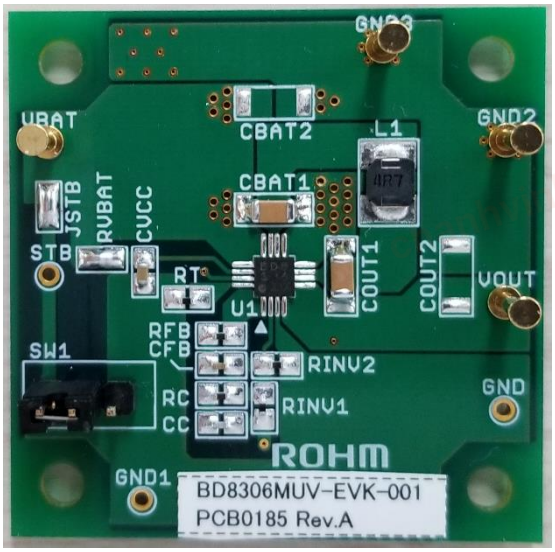


Figure 1. BD8306MUV-EVK-001

EVK Schematic

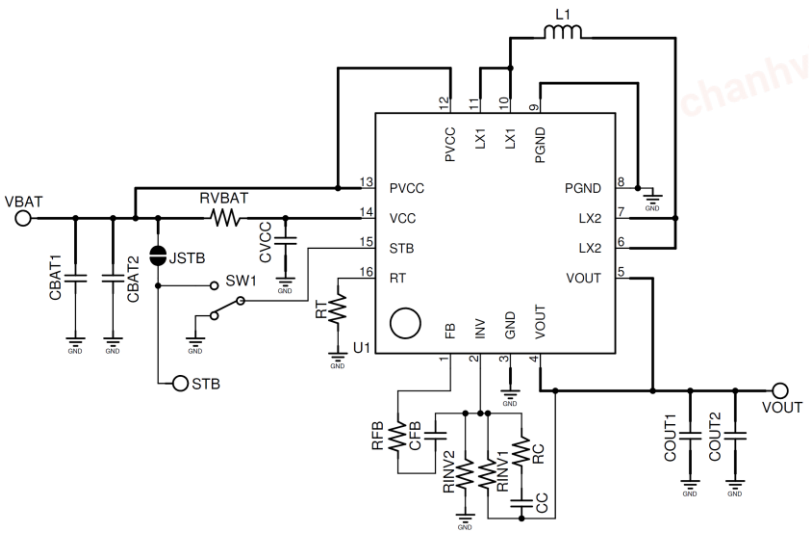


Figure 2. BD8306MUV-EVK-001 Schematic

Operating Procedure

1. Turn off the power supply and connect power supply's GND pin to the GND3 pin of the EVK.
2. Connect the power supply's VCC pin to the VBAT pin of the EVK.
3. Connect the jumper of SW1 to the left short position. (The VBAT pin input voltage is input to the STB pin.)
4. Check if the electronic load is turned off and connect the electronic load to the VOUT pin and the GND2 pin of the EVK.
5. Connect the voltmeter to the VOUT pin and the GND2 pin of the EVK.
6. Turn on the power supply and check if the measured value of the voltmeter is 3.3V.
7. Turn on the electronic load.

Notes: The board does not support hot plugging protection. Do not perform hot plugging on this board.

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SW Condition Table

Table 1. SW1 Condition Table

Condution	Content
Left short	VBAT pin and STB pin are short-circuited
Right short	GND and STB pin are short-circuited

BOM

Table 2. Bill of Materials

No.	Value	Description	Part No.	Manufactuer
IC				
U1	-	Buck-Boost DC/DC	BD8306MUV	ROHM
Capacitor				
CBAT1	10μF	Capacitor, Chip, 10V, B	-	-
CBAT2	-	Not installed	-	-
COUT1	10μF	Capacitor, Chip, 10V, B	-	-
COUT2	-	Not installed	-	-
CC	120pF	Capacitor, Chip, 50V, CH	-	-
CFB	2200pF	Capacitor, Chip, 50V, B	-	-
CVCC	1μF	Capacitor, Chip, 50V, B	-	-
Resistor				
RC	4.7kΩ	Resistor, Chip, 50V, 0.063W, ±1%	-	-
RFB	4.7kΩ	Resistor, Chip, 50V, 0.063W, ±1%	-	-
RINV1	56kΩ	Resistor, Chip, 50V, 0.063W, ±1%	-	-
RINV2	10kΩ	Resistor, Chip, 50V, 0.063W, ±1%	-	-
RT	39kΩ	Resistor, Chip, 50V, 0.063W, ±1%	-	-
RVBAT	Short	-	-	-
Inductor				
L1	4.7μH	Inductor, 1.35A	1231AS-H-4R7M	Murata
Switch				
SW1	-	Pin header, 2.54mm x3contacts	61300311121	Wurth Elektronik

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Board Layout

EVK PCB information

Number of Layers	Material	Board Size	Copper Thickness
4	FR-4	40mm x 40mm x 1.6mmt	1oz (35µm)

Followings are the layout of BD8306MUV-EVK-001.

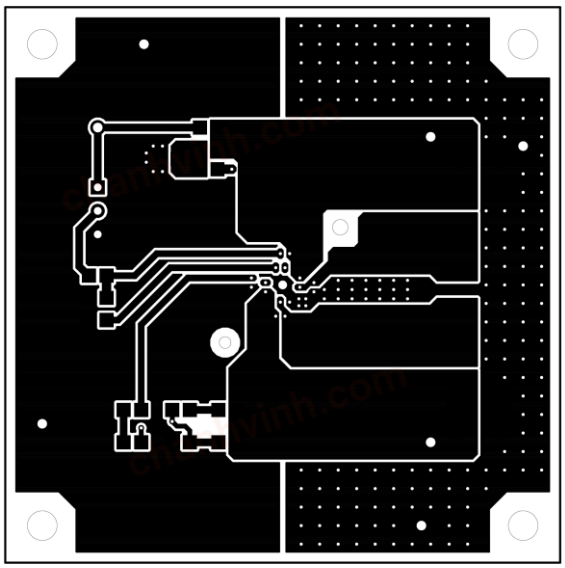


Figure 3. Top Layer Layout

(Top View)

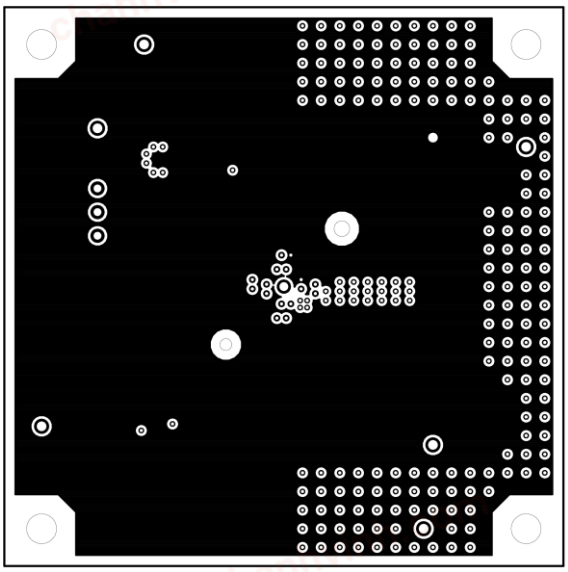


Figure 4. Middle1 Layer Layout

(Top View)

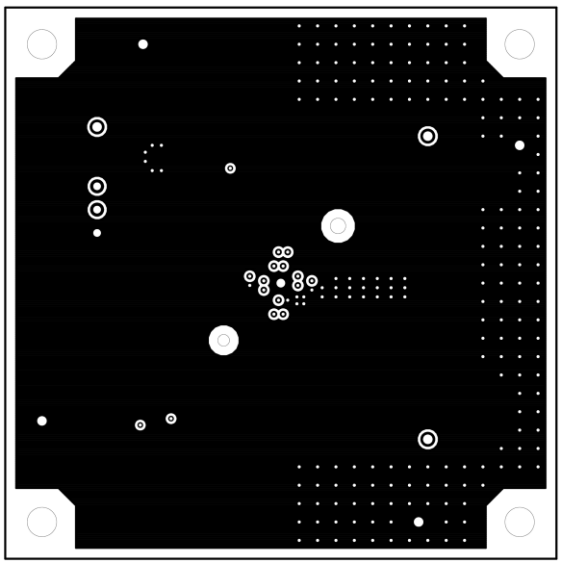


Figure 5. Middle2 Layer Layout

(Top View)

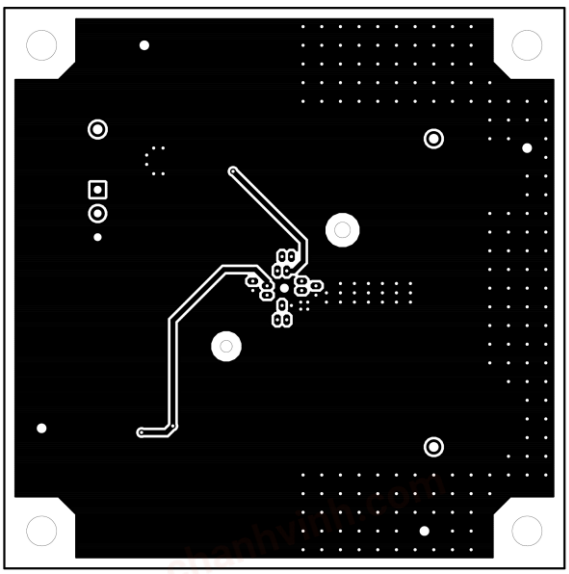


Figure 6. Bottom Layer Layout

(Top View)

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Reference Application Data

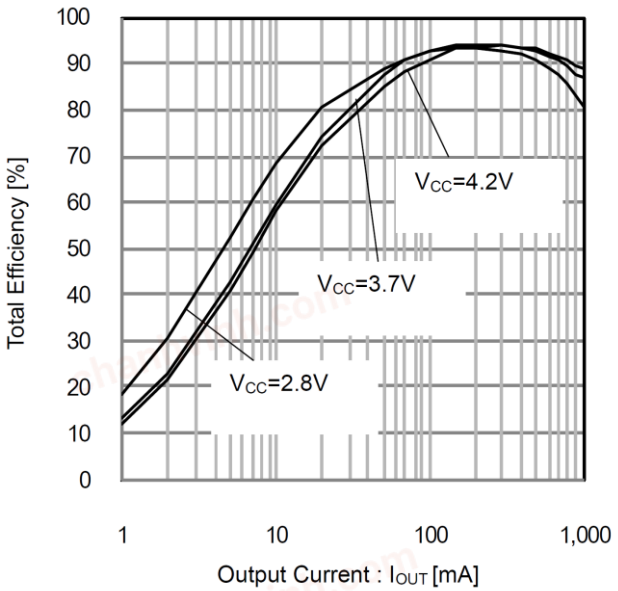


Figure 7. Total Efficiency vs Output Current
(Power Conversion Efficiency)

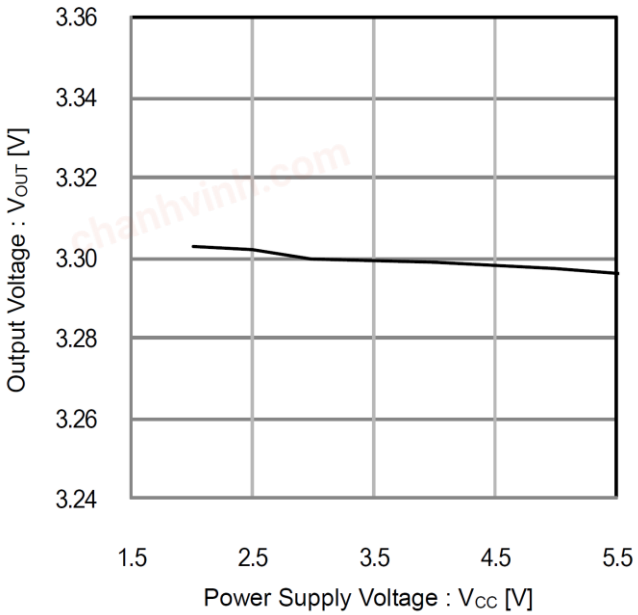


Figure 8. Output Voltage vs Power Supply Voltage
(Output Current = 500mA)

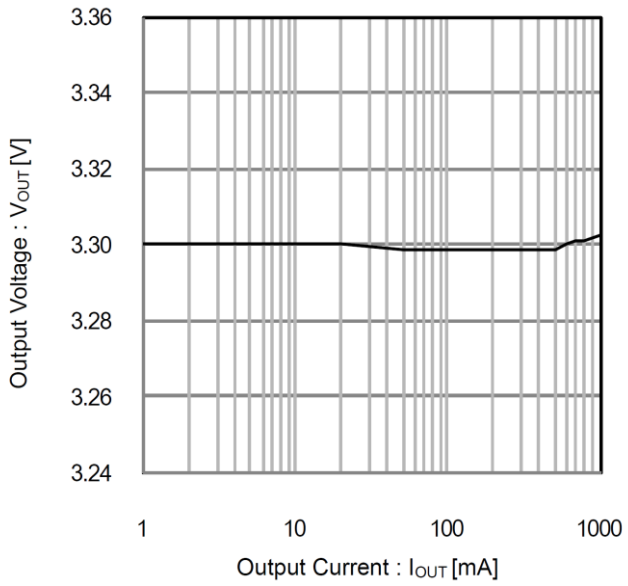


Figure 9. Output Voltage vs Output Current

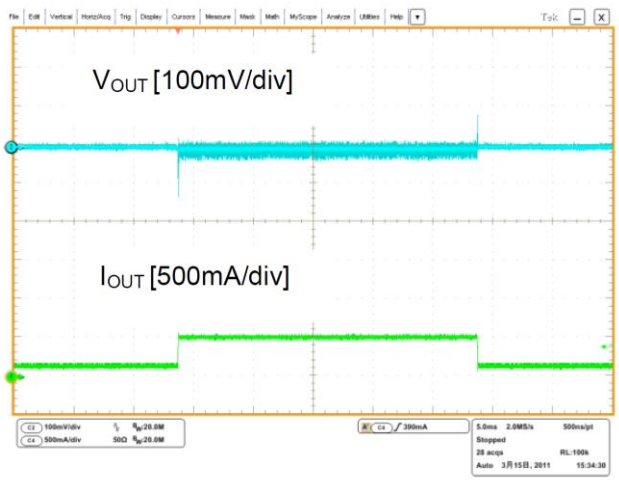


Figure 10. Output Current Response
(Output Current = 100mA ⇔ 500mA
5msec/div)

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Revision History

Date	Revision Number	Description
22. Jun. 2020	001	Initial release

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Notes

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