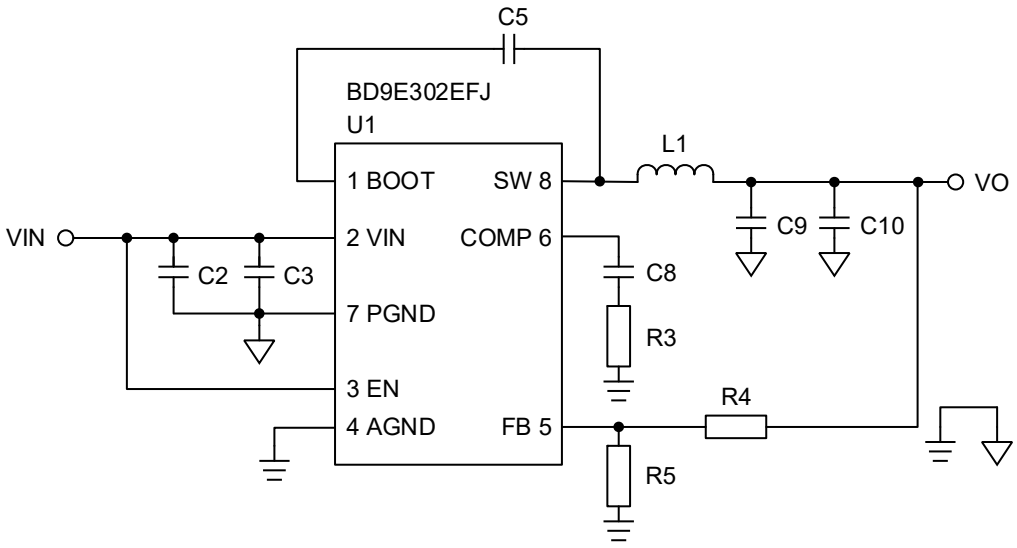
Switching Regulator Series

BD9E302EFJ Reference Circuit

IC Product Name	BD9E302EFJ
Topology	Buck (Step-Down) Switching Regulator
Type	Non-Isolation

	Input	Output
1	7.0V to 23V	3.3V, 3A
2	7.2V to 28V	5.0V, 3A

Typical Application Circuit



EN pin setting（3-pin）

Terminal state	IC operation
2.5V～VIN	Normal operation
GND～0.8V	Power down

Output voltage setting

$$V_{OUT} = \frac{R_4 + R_5}{R_5} \times 0.8\ [V]$$

Input/output voltage conditions are required to satisfy the following equations:

$V_{OUT} = (V_{IN} \times 0.143)V \sim (V_{IN} \times 0.7)V$
$(V_{IN} \times 0.143) \geq 1.0V$

Bill of Materials

1. V_O=3.3V (V_{IN}=7.0V to 23V)

Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C2	Ceramic Capacitor	10μF	50V, X5R, ±10%	GRM32ER61H106KA12	MURATA	3225
1	C3	Ceramic Capacitor	0.1μF	50V, X5R, ±20%	GRM155R61H104ME14	MURATA	1005
1	C5	Ceramic Capacitor	0.1μF	25V, X5R, ±20%	GRM155R61E104MA87	MURATA	1005
1	C8	Ceramic Capacitor	6800pF	25V, X7R, ±10%	GRM155R71E682KA01	MURATA	1005
2	C9, C10	Ceramic Capacitor	22μF	6.3V, X5R, ±20%	GRM32DR60J226MA01	MURATA	3225
1	L1	Inductor	3.3μH	See the recommended inductor list of separate volume.			
1	R3	Resistor	6.8kΩ	0.063W, 50V, 5%	MCR01MZPJ682	ROHM	1005
1	R4	Resistor	75kΩ	0.063W, 50V, 1%	MCR01MZPF7502	ROHM	1005
1	R5	Resistor	24kΩ	0.063W, 50V, 1%	MCR01MZPF2402	ROHM	1005
1	U1	IC	-	Buck DC/DC Converter	BD9E302EFJ	ROHM	HTSOP-J8

2. V_O=5.0V (V_{IN}=7.2V to 28V)

Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C2	Ceramic Capacitor	10μF	50V, X5R, ±10%	GRM32ER61H106KA12	MURATA	3225
1	C3	Ceramic Capacitor	0.1μF	50V, X5R, ±20%	GRM155R61H104ME14	MURATA	1005
1	C5	Ceramic Capacitor	0.1μF	25V, X5R, ±20%	GRM155R61E104MA87	MURATA	1005
1	C8	Ceramic Capacitor	6800pF	25V, X7R, ±10%	GRM155R71E682KA01	MURATA	1005
2	C9, C10	Ceramic Capacitor	22μF	16V, X5R, ±20%	GRM32ER61C226ME20	MURATA	3225
1	L1	Inductor	4.7μH	See the recommended inductor list of separate volume.			
1	R3	Resistor	10kΩ	0.063W, 50V, 5%	MCR01MZPJ103	ROHM	1005
1	R4	Resistor	430kΩ	0.063W, 50V, 1%	MCR01MZPF4303	ROHM	1005
1	R5	Resistor	82kΩ	0.063W, 50V, 1%	MCR01MZPF8202	ROHM	1005
1	U1	IC	-	Buck DC/DC Converter	BD9E302EFJ	ROHM	HTSOP-J8

Precautions for use

(1) This document provides the BOM for evaluation boards. Small parts can also be selected for resistor, capacitor, and coil.
(2) When miniaturizing a resistor, consider decrease in rated power and withstand voltage.
(3) When miniaturizing a ceramic capacitor, consider decrease in withstand voltage. In addition, the capacity may be decreased by DC bias characteristics, and the desired characteristics may not be obtained.
(4) If ceramic capacitor models differ even when they have the same capacity and withstand voltage, the capacity may be decreased by DC bias characteristics depending on the model, and desired characteristics may not be obtained. Be sure to check the DC bias characteristics.
(5) When miniaturizing a coil, consider increase in direct current resistance and decrease in rated current. An increase in DC resistance can cause a deterioration of power conversion efficiency. A decrease in rated current can saturate the coil when outputting a large current, which may deteriorate efficiency or make it impossible to obtain the desired output current.
(6) If there is a possibility that the output will short-circuit, use a coil with a rated current that is larger than the maximum IC output current. For example, even when up to 100 mA is actually used for an IC that can output 1 A, select a coil whose rated current is larger than 1 A. If a coil with a small rated current is used, it will be saturated by a large current in the event of output short-circuiting, resulting in a steep increase in output voltage. The IC may be broken down because the processing speed of the overcurrent protecting function of the IC cannot keep up with the increase in voltage.
(7) This circuit constant is the value for our evaluation board. It may be necessary to adjust the constant for the actual board. Carry out suitable evaluations.

Notes

1) The information contained herein is subject to change without notice.

2) Before you use our Products, please contact our sales representative and verify the latest specifications :

3) Although ROHM is continuously working to improve product reliability and quality, semiconductors can break down and malfunction due to various factors.
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