

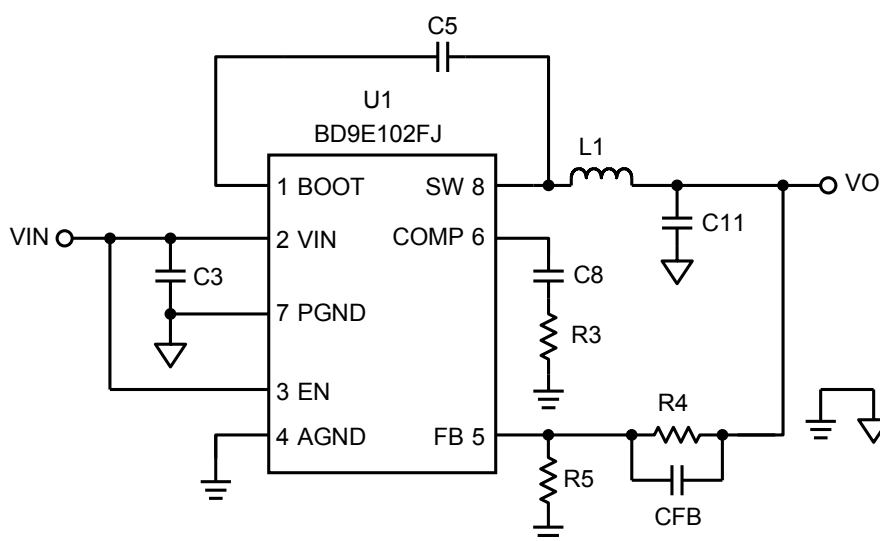
DC/DC Converter

Application Information

IC Product Name	BD9E102FJ
Topology	Buck (Step-Down) Switching Regulator
Type	Non-Isolation

	Input	Output
1	7.2V to 26V	5.0V, 1A

■ Typical Application Circuit



■ EN terminal setting (3-pin)

Terminal state	IC operation
$\geq 2.5V$	Normal operation
$\leq 0.8V$	Power down

■ Output voltage setting

$$V_{OUT} = \frac{R_4 + R_5}{R_5} \times 1.0 [V]$$

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. $V_O=5.0V$ ($V_{IN}=7.2V$ to $26V$)

Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C3	Ceramic Capacitor	10 μ F	50V, B, $\pm 10\%$	GRM32EB31H106KA12	MURATA	3225
1	C5	Ceramic Capacitor	0.1 μ F	25V, B, $\pm 20\%$	GRM155B31E104MA87	MURATA	1005
1	C8	Ceramic Capacitor	2200pF	25V, B, $\pm 10\%$	GRM155B11E222KA01	MURATA	1005
1	C11	Ceramic Capacitor	22 μ F	10V, B, $\pm 10\%$	GRM31CB31A226KE19	MURATA	3216
1	CFB	Ceramic Capacitor	33pF	25V, CH, $\pm 5\%$	GRM1552C1E330JA01	MURATA	1005
1	L1	Inductor	6.8 μ H	$\pm 30\%$, DCR=52m Ω max, 2.3A	MSS6132-682ML	Coilcraft	6161
				$\pm 30\%$, DCR=99.6m Ω max, 2.5A	LQH5BPN6R8NT0	Murata	5050
				$\pm 20\%$, DCR=82.6m Ω max, 2.2A	CDRH4D22HPNP-4R7NC	Sumida	4747
				$\pm 20\%$, DCR=55.9m Ω max, 2.6A	NRS6028T6R8MMGJV	TAIYO YUDEN	6060
				$\pm 20\%$, DCR=67.6m Ω max, 2.5A	NRS5030T6R8MMGJV	TAIYO YUDEN	4949
				$\pm 30\%$, DCR=35.1m Ω max, 2.1A	CLF6045T-6R8N	TDK	6259
				$\pm 20\%$, DCR=100m Ω max, 1.65A	VLF504015MT-6R8M	TDK	5040
				$\pm 30\%$, DCR=54m Ω max, 1.95A	B1079AS-4R7N (DS73LC)	TOKO	7676
				$\pm 20\%$, DCR=44.6m Ω max, 5.5A	IHLP2525EZER6R8M01	VISHAY	6965
				$\pm 30\%$, DCR=45m Ω max, 1.7A	744053006 (WE-TPC 5828)	WÜRTH	5858
1	R3	Resistor	24k Ω	0.063W, 50V, 5%	MCR01MZPJ243	ROHM	1005
1	R4	Resistor	430k Ω	0.063W, 50V, 1%	MCR01MZPF4303	ROHM	1005
1	R5	Resistor	82k Ω	0.063W, 50V, 1%	MCR01MZPF8202	ROHM	1005
1	U1	IC	-	Buck DC/DC Converter	BD9E102FJ	ROHM	SOP-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.

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