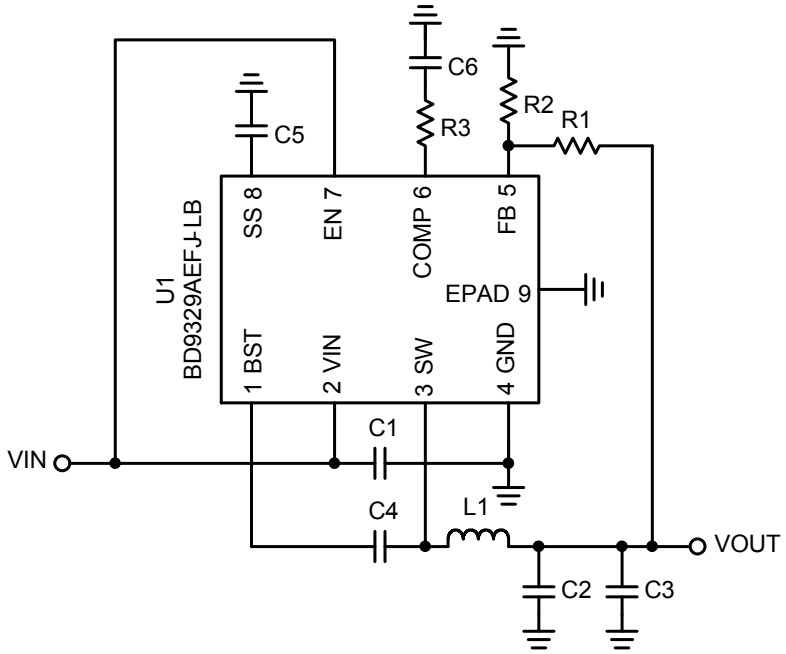
DC/DC Converter Application Information

IC Product Name	BD9329AEFJ-LB
Topology	Buck (Step-Down) Switching Regulator
Type	Non-Isolation

	Input	Output
1	4.2V to 18V	1.0V, 2.0A
2	4.2V to 18V	1.2V, 2.0A
3	4.2V to 18V	1.5V, 2.0A
4	4.2V to 18V	1.8V, 2.0A
5	4.8V to 18V	3.3V, 2.0A
6	7.2V to 18V	5.0V, 2.0A
7	12.9V to 18V	9.0V, 2.0A

Typical Application Circuit



EN terminal setting (7-pin)

Terminal state	IC operation
≥ 1.4V	Normal operation
≤ 1.0V	Power down

Output voltage setting

$$V_{OUT} = \frac{R_1 + R_2}{R_2} \times 0.9\ [V]$$

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

$$V_{OUT} = 0.9V \sim (V_{IN} \times 0.7)V$$

Bill of Materials

1. V_O=1.0V (V_{IN}=4.2V to 18V)

Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C1	Ceramic Capacitor	10µF	35V, B, ±10%	GRM32EB3YA106KA12	MURATA	3225
1	C2	Ceramic Capacitor	22µF	4V, B, ±20%	GRM219B30G226ME66	MURATA	2012
0	C3	Ceramic Capacitor	n/a	-	-	-	-
2	C4, C5	Ceramic Capacitor	0.1µF	16V, B, ±10%	GRM188B11C104KA01	MURATA	1608
1	C6	Ceramic Capacitor	0.022µF	16V, B, ±10%	GRM155B11C223KA01	MURATA	1005
1	L1	Inductor	10µH	±20%, DCR=29.82mΩmax, 7.6A	XAL6060-103ME	Coilcraft	6466
				±20%, DCR=87.26mΩmax, 4.4A	CDMC50D38T150NP-100MC	Sumida	5450
				±20%, DCR=24mΩmax, 4.49A	NS10155T100MNV	TAIYO YUDEN	101101
				±20%, DCR=25.2mΩmax, 6.7A	CLF12555T-100M	TDK	125121
				±20%, DCR=74mΩmax, 5.4A	FDSD0630-H-100M	TOKO	7066
				±20%, DCR=71.2mΩmax, 3.5A	IHLP2525CZER100M11	VISHAY	6965
				±20%, DCR=27mΩmax, 5.0A	7447714100 (WE-PD 1050)	WÜRTH	100100
1	R1	Resistor	3kΩ	0.063W, 50V, 1%	MCR01MZPF3001	ROHM	1005
1	R2	Resistor	27kΩ	0.063W, 50V, 1%	MCR01MZPF2702	ROHM	1005
1	R3	Resistor	1kΩ	0.063W, 50V, 5%	MCR01MZPJ102	ROHM	1005
1	U1	IC	-	Buck DC/DC Converter	BD9329AEFJ-LB	ROHM	HTSOP-J8

2. V_O=1.2V (V_{IN}=4.2V to 18V)

Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C1	Ceramic Capacitor	10µF	35V, B, ±10%	GRM32EB3YA106KA12	MURATA	3225
1	C2	Ceramic Capacitor	22µF	4V, B, ±20%	GRM219B30G226ME66	MURATA	2012
0	C3	Ceramic Capacitor	n/a	-	-	-	-
2	C4, C5	Ceramic Capacitor	0.1µF	16V, B, ±10%	GRM188B11C104KA01	MURATA	1608
1	C6	Ceramic Capacitor	0.022µF	16V, B, ±10%	GRM155B11C223KA01	MURATA	1005
1	L1	Inductor	10µH	±20%, DCR=29.82mΩmax, 7.6A	XAL6060-103ME	Coilcraft	6466
				±20%, DCR=87.26mΩmax, 4.4A	CDMC50D38T150NP-100MC	Sumida	5450
				±20%, DCR=24mΩmax, 4.49A	NS10155T100MNV	TAIYO YUDEN	101101
				±20%, DCR=25.2mΩmax, 6.7A	CLF12555T-100M	TDK	125121
				±20%, DCR=74mΩmax, 5.4A	FDSD0630-H-100M	TOKO	7066
				±20%, DCR=71.2mΩmax, 3.5A	IHLP2525CZER100M11	VISHAY	6965
				±20%, DCR=27mΩmax, 5.0A	7447714100 (WE-PD 1050)	WÜRTH	100100
1	R1	Resistor	10kΩ	0.063W, 50V, 1%	MCR01MZPF1002	ROHM	1005
1	R2	Resistor	30kΩ	0.063W, 50V, 1%	MCR01MZPF3002	ROHM	1005
1	R3	Resistor	1.2kΩ	0.063W, 50V, 5%	MCR01MZPJ122	ROHM	1005
1	U1	IC	-	Buck DC/DC Converter	BD9329AEFJ-LB	ROHM	HTSOP-J8

■ Bill of Materials (continued)

3. V_O=1.5V (V_{IN}=4.2V to 18V)

Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C1	Ceramic Capacitor	10µF	35V, B, ±10%	GRM32EB3YA106KA12	MURATA	3225
1	C2	Ceramic Capacitor	22µF	6.3V, B, ±20%	GRM319B30J226ME15	MURATA	3216
0	C3	Ceramic Capacitor	n/a	-	-	-	-
2	C4, C5	Ceramic Capacitor	0.1µF	16V, B, ±10%	GRM188B11C104KA01	MURATA	1608
1	C6	Ceramic Capacitor	0.01µF	16V, B, ±10%	GRM155B11C103KA01	MURATA	1005
1	L1	Inductor	10µH	±20%, DCR=29.82mΩmax, 7.6A	XAL6060-103ME	Coilcraft	6466
				±20%, DCR=87.26mΩmax, 4.4A	CDMC50D38T150NP-100MC	Sumida	5450
				±20%, DCR=24mΩmax, 4.49A	NS10155T100MNV	TAIYO YUDEN	101101
				±20%, DCR=25.2mΩmax, 6.7A	CLF12555T-100M	TDK	125121
				±20%, DCR=74mΩmax, 5.4A	FDSD0630-H-100M	TOKO	7066
				±20%, DCR=71.2mΩmax, 3.5A	IHLP2525CZER100M11	VISHAY	6965
				±20%, DCR=27mΩmax, 5.0A	7447714100 (WE-PD 1050)	WÜRTH	100100
1	R1	Resistor	10kΩ	0.063W, 50V, 1%	MCR01MZPF1002	ROHM	1005
1	R2	Resistor	15kΩ	0.063W, 50V, 1%	MCR01MZPF1502	ROHM	1005
1	R3	Resistor	2.2kΩ	0.063W, 50V, 5%	MCR01MZPJ222	ROHM	1005
1	U1	IC	-	Buck DC/DC Converter	BD9329AEFJ-LB	ROHM	HTSOP-J8

4. V_O=1.8V (V_{IN}=4.2V to 18V)

Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C1	Ceramic Capacitor	10µF	35V, B, ±10%	GRM32EB3YA106KA12	MURATA	3225
1	C2	Ceramic Capacitor	22µF	6.3V, B, ±20%	GRM319B30J226ME15	MURATA	3216
0	C3	Ceramic Capacitor	n/a	-	-	-	-
2	C4, C5	Ceramic Capacitor	0.1µF	16V, B, ±10%	GRM188B11C104KA01	MURATA	1608
1	C6	Ceramic Capacitor	6800pF	16V, B, ±10%	GRM15XB11C682KA86	MURATA	1005
1	L1	Inductor	10µH	±20%, DCR=29.82mΩmax, 7.6A	XAL6060-103ME	Coilcraft	6466
				±20%, DCR=87.26mΩmax, 4.4A	CDMC50D38T150NP-100MC	Sumida	5450
				±20%, DCR=24mΩmax, 4.49A	NS10155T100MNV	TAIYO YUDEN	101101
				±20%, DCR=25.2mΩmax, 6.7A	CLF12555T-100M	TDK	125121
				±20%, DCR=74mΩmax, 5.4A	FDSD0630-H-100M	TOKO	7066
				±20%, DCR=71.2mΩmax, 3.5A	IHLP2525CZER100M11	VISHAY	6965
				±20%, DCR=27mΩmax, 5.0A	7447714100 (WE-PD 1050)	WÜRTH	100100
2	R1, R2	Resistor	10kΩ	0.063W, 50V, 1%	MCR01MZPF1002	ROHM	1005
1	R3	Resistor	3.9kΩ	0.063W, 50V, 5%	MCR01MZPJ392	ROHM	1005
1	U1	IC	-	Buck DC/DC Converter	BD9329AEFJ-LB	ROHM	HTSOP-J8

■ Bill of Materials (continued)

5. V_O=3.3V (V_{IN}=4.8V to 18V)

Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C1	Ceramic Capacitor	10µF	35V, B, ±10%	GRM32EB3YA106KA12	MURATA	3225
1	C2	Ceramic Capacitor	22µF	16V, B, ±20%	GRM32EB31C226ME16	MURATA	3225
0	C3	Ceramic Capacitor	n/a	-	-	-	-
2	C4, C5	Ceramic Capacitor	0.1µF	16V, B, ±10%	GRM188B11C104KA01	MURATA	1608
1	C6	Ceramic Capacitor	3300pF	16V, B, ±10%	GRM15XB11C332KA86	MURATA	1005
1	L1	Inductor	10µH	±20%, DCR=29.82mΩmax, 7.6A	XAL6060-103ME	Coilcraft	6466
				±20%, DCR=87.26mΩmax, 4.4A	CDMC50D38T150NP-100MC	Sumida	5450
				±20%, DCR=24mΩmax, 4.49A	NS10155T100MNV	TAIYO YUDEN	101101
				±20%, DCR=25.2mΩmax, 6.7A	CLF12555T-100M	TDK	125121
				±20%, DCR=74mΩmax, 5.4A	FDSD0630-H-100M	TOKO	7066
				±20%, DCR=71.2mΩmax, 3.5A	IHLP2525CZER100M11	VISHAY	6965
				±20%, DCR=27mΩmax, 5.0A	7447714100 (WE-PD 1050)	WÜRTH	100100
1	R1	Resistor	20kΩ	0.063W, 50V, 1%	MCR01MZPF2002	ROHM	1005
1	R2	Resistor	7.5kΩ	0.063W, 50V, 1%	MCR01MZPF7501	ROHM	1005
1	R3	Resistor	7.5kΩ	0.063W, 50V, 5%	MCR01MZPJ752	ROHM	1005
1	U1	IC	-	Buck DC/DC Converter	BD9329AEFJ-LB	ROHM	HTSOP-J8

6. V_O=5.0V (V_{IN}=7.2V to 18V)

Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C1	Ceramic Capacitor	10µF	35V, B, ±10%	GRM32EB3YA106KA12	MURATA	3225
1	C2	Ceramic Capacitor	22µF	16V, B, ±20%	GRM32EB31C226ME16	MURATA	3225
0	C3	Ceramic Capacitor	n/a	-	-	-	-
2	C4, C5	Ceramic Capacitor	0.1µF	16V, B, ±10%	GRM188B11C104KA01	MURATA	1608
1	C6	Ceramic Capacitor	2200pF	25V, B, ±10%	GRM155B11E222KA01	MURATA	1005
1	L1	Inductor	10µH	±20%, DCR=29.82mΩmax, 7.6A	XAL6060-103ME	Coilcraft	6466
				±20%, DCR=87.26mΩmax, 4.4A	CDMC50D38T150NP-100MC	Sumida	5450
				±20%, DCR=24mΩmax, 4.49A	NS10155T100MNV	TAIYO YUDEN	101101
				±20%, DCR=25.2mΩmax, 6.7A	CLF12555T-100M	TDK	125121
				±20%, DCR=74mΩmax, 5.4A	FDSD0630-H-100M	TOKO	7066
				±20%, DCR=71.2mΩmax, 3.5A	IHLP2525CZER100M11	VISHAY	6965
				±20%, DCR=27mΩmax, 5.0A	7447714100 (WE-PD 1050)	WÜRTH	100100
1	R1	Resistor	8.2kΩ	0.063W, 50V, 1%	MCR01MZPF8201	ROHM	1005
1	R2	Resistor	1.8kΩ	0.063W, 50V, 1%	MCR01MZPF1800	ROHM	1005
1	R3	Resistor	11kΩ	0.063W, 50V, 5%	MCR01MZPJ113	ROHM	1005
1	U1	IC	-	Buck DC/DC Converter	BD9329AEFJ-LB	ROHM	HTSOP-J8

■ Bill of Materials (continued)

7. V_O=9.0V (V_{IN}=12.9V to 18V)

Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
3	C1, C2, C3	Ceramic Capacitor	10µF	35V, B, ±10%	GRM32EB3YA106KA12	MURATA	3225
2	C4, C5	Ceramic Capacitor	0.1µF	16V, B, ±10%	GRM188B11C104KA01	MURATA	1608
1	C6	Ceramic Capacitor	2200pF	25V, B, ±10%	GRM155B11E222KA01	MURATA	1005
1	L1	Inductor	10µH	±20%, DCR=29.82mΩmax, 7.6A	XAL6060-103ME	Coilcraft	6466
				±20%, DCR=87.26mΩmax, 4.4A	CDMC50D38T150NP-100MC	Sumida	5450
				±20%, DCR=24mΩmax, 4.49A	NS10155T100MNV	TAIYO YUDEN	101101
				±20%, DCR=25.2mΩmax, 6.7A	CLF12555T-100M	TDK	125121
				±20%, DCR=74mΩmax, 5.4A	FDSD0630-H-100M	TOKO	7066
				±20%, DCR=71.2mΩmax, 3.5A	IHLP2525CZER100M11	VISHAY	6965
				±20%, DCR=27mΩmax, 5.0A	7447714100 (WE-PD 1050)	WÜRTH	100100
1	R1	Resistor	27kΩ	0.063W, 50V, 1%	MCR01MZPF2702	ROHM	1005
1	R2	Resistor	3kΩ	0.063W, 50V, 1%	MCR01MZPF3000	ROHM	1005
1	R3	Resistor	11kΩ	0.063W, 50V, 5%	MCR01MZPJ113	ROHM	1005
1	U1	IC	-	Buck DC/DC Converter	BD9329AEFJ-LB	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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4) Examples of application circuits, circuit constants and any other information contained herein are provided only to illustrate the standard usage and operations of the Products. The peripheral conditions must be taken into account when designing circuits for mass production.

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