

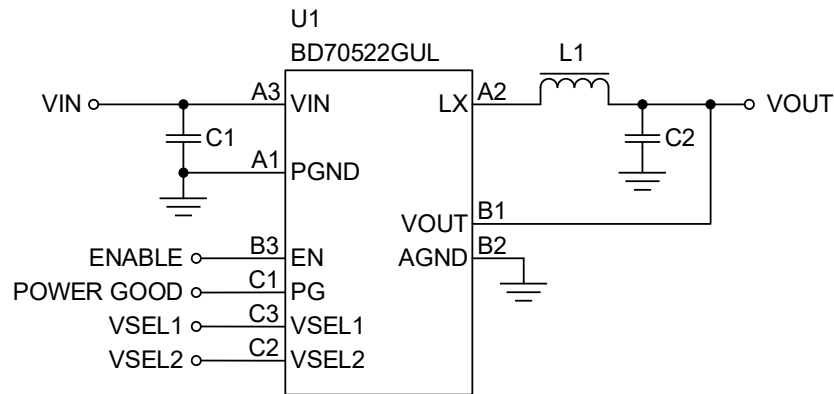
Switching Regulator Series

BD70522GUL Reference Circuit

IC Product Name	BD70522GUL
Topology	Buck (Step-Down) Switching Regulator
Type	Non-Isolation

	Input	Output
1	2.5V to 5.5V	1.2V, 500mA
2	2.5V to 5.5V	1.5V, 500mA
3	2.5V to 5.5V	1.8V, 500mA
4	2.5V to 5.5V	2.0V, 500mA
5	2.5V to 5.5V	2.5V, 500mA
6	2.8V to 5.5V	2.8V, 500mA
7	3.0V to 5.5V	3.0V, 500mA
8	3.2V to 5.5V	3.2V, 500mA
9	3.3V to 5.5V	3.3V, 500mA

Typical Application Circuit



EN pin setting (B3-pin)

Terminal state	IC operation
1.1V~VIN	Normal operation
GND~0.3V	Power down

PG pin setting (C1-pin)

PG pin is an open-drain output, pull up with a resistor. However, do not pull up PG pin to a voltage which is higher than VIN voltage. If not used, this pin can be left open.

Output voltage setting (C2, C3-pin)

VOUT	VSEL1 (C3-pin)	VSEL2 (C2-pin)
1.2V	GND	OPEN
1.5V	OPEN	GND
1.8V	GND	GND
2.0V	VIN	GND
2.5V	OPEN	VIN
2.8V	VIN	OPEN
3.0V	OPEN	OPEN
3.2V	GND	VIN
3.3V	VIN	VIN

These pins have three states. Also, these settings cannot be changed while the IC is operating.

Bill of Materials

When using the IC by switching the output voltage, use the bill of materials with the highest output voltage.

1. $V_O=1.2V$ ($V_{IN}=2.5V$ to $5.5V$)

Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C1	Ceramic Capacitor	10 μ F	10V, X5R, \pm 20%	GRM219R61A106ME47	MURATA	2012
1	C2	Ceramic Capacitor	22 μ F	4V, X5R, \pm 20%	GRM186R60G226ME15	MURATA	1608
1	L1	Inductor	2.2 μ H	See the recommended inductor list of separate volume.			
1	U1	IC	-	Buck DC/DC Converter	BD70522GUL	ROHM	VCSP50L1C

2. $V_O=1.5V$ ($V_{IN}=2.5V$ to $5.5V$)

Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C1	Ceramic Capacitor	10 μ F	10V, X5R, \pm 20%	GRM219R61A106ME47	MURATA	2012
1	C2	Ceramic Capacitor	22 μ F	4V, X5R, \pm 20%	GRM186R60G226ME15	MURATA	1608
1	L1	Inductor	2.2 μ H	See the recommended inductor list of separate volume.			
1	U1	IC	-	Buck DC/DC Converter	BD70522GUL	ROHM	VCSP50L1C

3. $V_O=1.8V$ ($V_{IN}=2.5V$ to $5.5V$)

Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C1	Ceramic Capacitor	10 μ F	10V, X5R, \pm 20%	GRM219R61A106ME47	MURATA	2012
1	C2	Ceramic Capacitor	22 μ F	6.3V, X5R, \pm 20%	GRM187R60J226ME15	MURATA	1608
1	L1	Inductor	2.2 μ H	See the recommended inductor list of separate volume.			
1	U1	IC	-	Buck DC/DC Converter	BD70522GUL	ROHM	VCSP50L1C

4. $V_O=2.0V$ ($V_{IN}=2.5V$ to $5.5V$)

Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C1	Ceramic Capacitor	10 μ F	10V, X5R, \pm 20%	GRM219R61A106ME47	MURATA	2012
1	C2	Ceramic Capacitor	22 μ F	6.3V, X5R, \pm 20%	GRM187R60J226ME15	MURATA	1608
1	L1	Inductor	2.2 μ H	See the recommended inductor list of separate volume.			
1	U1	IC	-	Buck DC/DC Converter	BD70522GUL	ROHM	VCSP50L1C

5. $V_O=2.5V$ ($V_{IN}=2.5V$ to $5.5V$)

Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C1	Ceramic Capacitor	10 μ F	10V, X5R, \pm 20%	GRM219R61A106ME47	MURATA	2012
1	C2	Ceramic Capacitor	22 μ F	6.3V, X5R, \pm 20%	GRM21BR60J226ME39	MURATA	2012
1	L1	Inductor	2.2 μ H	See the recommended inductor list of separate volume.			
1	U1	IC	-	Buck DC/DC Converter	BD70522GUL	ROHM	VCSP50L1C

Bill of Materials (continued)

When using the IC by switching the output voltage, use the bill of materials with the highest output voltage.

6. $V_O=2.8V$ ($V_{IN}=2.8V$ to 5.5V)

Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C1	Ceramic Capacitor	10 μ F	10V, X5R, \pm 20%	GRM219R61A106ME47	MURATA	2012
1	C2	Ceramic Capacitor	22 μ F	16V, X5R, \pm 20%	GRM21BR61C226ME44	MURATA	2012
1	L1	Inductor	2.2 μ H	See the recommended inductor list of separate volume.			
1	U1	IC	-	Buck DC/DC Converter	BD70522GUL	ROHM	VCSP50L1C

7. $V_O=3.0V$ ($V_{IN}=3.0V$ to 5.5V)

Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C1	Ceramic Capacitor	10 μ F	10V, X5R, \pm 20%	GRM219R61A106ME47	MURATA	2012
1	C2	Ceramic Capacitor	22 μ F	16V, X5R, \pm 20%	GRM21BR61C226ME44	MURATA	2012
1	L1	Inductor	2.2 μ H	See the recommended inductor list of separate volume.			
1	U1	IC	-	Buck DC/DC Converter	BD70522GUL	ROHM	VCSP50L1C

8. $V_O=3.2V$ ($V_{IN}=3.2V$ to 5.5V)

Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C1	Ceramic Capacitor	10 μ F	10V, X5R, \pm 20%	GRM219R61A106ME47	MURATA	2012
1	C2	Ceramic Capacitor	22 μ F	6.3V, X5R, \pm 20%	GRM31CR60J226ME19	MURATA	3216
1	L1	Inductor	2.2 μ H	See the recommended inductor list of separate volume.			
1	U1	IC	-	Buck DC/DC Converter	BD70522GUL	ROHM	VCSP50L1C

9. $V_O=3.3V$ ($V_{IN}=3.3V$ to 5.5V)

Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C1	Ceramic Capacitor	10 μ F	10V, X5R, \pm 20%	GRM219R61A106ME47	MURATA	2012
1	C2	Ceramic Capacitor	22 μ F	6.3V, X5R, \pm 20%	GRM31CR60J226ME19	MURATA	3216
1	L1	Inductor	2.2 μ H	See the recommended inductor list of separate volume.			
1	U1	IC	-	Buck DC/DC Converter	BD70522GUL	ROHM	VCSP50L1C

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

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