

Linear Regulator

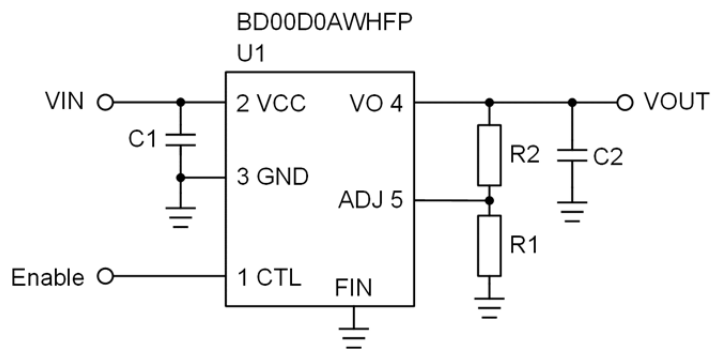
Application Information

IC Product Name	BD00D0AWHFP
Topology	LDO Linear Regulator
Type	Voltage source

	Input	Output
1	4.0V to 25V	3.0V, 2A ^{*1}
2	4.3V to 25V	3.3V, 2A ^{*1}
3	6.0V to 25V	5.0V, 2A ^{*1}
4	7.0V to 25V	6.0V, 2A ^{*1}
5	10V to 25V	9.0V, 2A ^{*1}
6	13V to 25V	12V, 2A ^{*1}
7	16V to 25V	15V, 2A ^{*1}

^{*1} Not to exceed power dissipation.

■ Typical Application Circuit



■ EN terminal setting

Terminal state	IC operation
2.0V ~ 25V	Normal operation
0V ~ 0.8V	Power down

■ Output voltage setting

$$V_{OUT} = \frac{R_1 + R_2}{R_1} \times 0.75 [V]$$

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

$$V_{OUT} = 3.0V \sim (V_{IN} - 1.0)V \quad \text{at } I_O = 1A$$

$$(V_{IN} - 1.0) \leq 15V$$

The use of resistors with $R_1=5k\Omega$ to $10k\Omega$ recommended.

■ Bill of Materials

1. $V_O=3.0V$ ($V_{IN}=4.0V$ to $25V$)

Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C1	Ceramic Capacitor	4.7 μ F	50V, B, $\pm 10\%$	GRM32EB31H475KA87	MURATA	3225
1	C2	Ceramic Capacitor	4.7 μ F	6.3V, B, $\pm 10\%$	GRM21BB10J475KA11	MURATA	2012
1	R1	Resistor	10k Ω	0.063W, 50V, 1%	MCR01MZPF1002	ROHM	1005
1	R2	Resistor	30k Ω	0.063W, 50V, 1%	MCR01MZPF3002	ROHM	1005
1	U1	IC	-	LDO Linear Regulator	BD00D0AWHFP	ROHM	HRP5

2. $V_O=3.3V$ ($V_{IN}=4.3V$ to $25V$)

Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C1	Ceramic Capacitor	4.7 μ F	50V, B, $\pm 10\%$	GRM32EB31H475KA87	MURATA	3225
1	C2	Ceramic Capacitor	4.7 μ F	6.3V, B, $\pm 10\%$	GRM21BB10J475KA11	MURATA	2012
1	R1	Resistor	7.5k Ω	0.063W, 50V, 1%	MCR01MZPF7501	ROHM	1005
1	R2	Resistor	18k Ω	R2=18k Ω +7.5k Ω	MCR01MZPF1802	ROHM	1005
1		Resistor	7.5k Ω	0.063W, 50V, 1%	MCR01MZPF7501	ROHM	1005
1	U1	IC	-	LDO Linear Regulator	BD00D0AWHFP	ROHM	HRP5

3. $V_O=5.0V$ ($V_{IN}=6.0V$ to $25V$)

Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C1	Ceramic Capacitor	2.2 μ F	50V, B, $\pm 10\%$	GRM31CB31H225KA87	MURATA	3216
1	C2	Ceramic Capacitor	4.7 μ F	10V, B, $\pm 10\%$	GRM31CB11A475KA01	MURATA	3216
1	R1	Resistor	9.1k Ω	0.063W, 50V, 1%	MCR01MZPF9101	ROHM	1005
1	R2	Resistor	51k Ω	R2=51k Ω +560 Ω	MCR01MZPF5102	ROHM	1005
1		Resistor	560k Ω	0.063W, 50V, 1%	MCR01MZPF5600	ROHM	1005
1	U1	IC	-	LDO Linear Regulator	BD00D0AWHFP	ROHM	HRP5

4. $V_O=6.0V$ ($V_{IN}=7.0V$ to $25V$)

Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C1	Ceramic Capacitor	2.2 μ F	50V, B, $\pm 10\%$	GRM31CB31H225KA87	MURATA	3216
1	C2	Ceramic Capacitor	4.7 μ F	10V, B, $\pm 10\%$	GRM31CB11A475KA01	MURATA	3216
1	R1	Resistor	7.5k Ω	0.063W, 50V, 1%	MCR01MZPF7501	ROHM	1005
1	R2	Resistor	51k Ω	R2=51k Ω +1.5k Ω	MCR01MZPF5102	ROHM	1005
1		Resistor	1.5k Ω	0.063W, 50V, 1%	MCR01MZPF1501	ROHM	1005
1	U1	IC	-	LDO Linear Regulator	BD00D0AWHFP	ROHM	HRP5

■ Bill of Materials (continued)

5. $V_O=9.0V$ ($V_{IN}=10V$ to $25V$)

Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C1	Ceramic Capacitor	2.2 μ F	50V, B, $\pm 10\%$	GRM31CB31H225KA87	MURATA	3216
1	C2	Ceramic Capacitor	4.7 μ F	16V, B, $\pm 10\%$	GRM31CB11C475KA01	MURATA	3216
1	R1	Resistor	10k Ω	0.063W, 50V, 1%	MCR01MZPF1002	ROHM	1005
1	R2	Resistor	110k Ω	0.063W, 50V, 1%	MCR01MZPF1103	ROHM	1005
1	U1	IC	-	LDO Linear Regulator	BD00D0AWHFP	ROHM	HRP5

6. $V_O=12V$ ($V_{IN}=13V$ to $25V$)

Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C1	Ceramic Capacitor	2.2 μ F	50V, B, $\pm 10\%$	GRM31CB31H225KA87	MURATA	3216
1	C2	Ceramic Capacitor	4.7 μ F	25V, B, $\pm 10\%$	GRM32DB11E475KA61	MURATA	3225
1	R1	Resistor	10k Ω	0.063W, 50V, 1%	MCR01MZPF1002	ROHM	1005
1	R2	Resistor	150k Ω	0.063W, 50V, 1%	MCR01MZPF1503	ROHM	1005
1	U1	IC	-	LDO Linear Regulator	BD00D0AWHFP	ROHM	HRP5

7. $V_O=15V$ ($V_{IN}=16V$ to $25V$)

Count	Reference Designator	Type	Value	Description	Manufacturer Part Number	Manufacturer	Configuration (mm)
1	C1	Ceramic Capacitor	2.2 μ F	50V, B, $\pm 10\%$	GRM31CB31H225KA87	MURATA	3216
1	C2	Ceramic Capacitor	4.7 μ F	25V, B, $\pm 10\%$	GRM32DB11E475KA61	MURATA	3225
1	R1	Resistor	10k Ω	0.063W, 50V, 1%	MCR01MZPF1002	ROHM	1005
1	R2	Resistor	180k Ω	R2=180k Ω +10k Ω	MCR01MZPF1803	ROHM	1005
1		Resistor	10k Ω	0.063W, 50V, 1%	MCR01MZPF1002	ROHM	1005
1	U1	IC	-	LDO Linear Regulator	BD00D0AWHFP	ROHM	HRP5

■ Precautions for use

- (1) This document provides the BOM for evaluation boards. Small parts can also be selected for resistor, and capacitor.
- (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) 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.

Notice

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- Our Products are designed and manufactured for application in ordinary electronic equipments (such as AV equipment, OA equipment, telecommunication equipment, home electronic appliances, amusement equipment, etc.). If you intend to use our Products in devices requiring extremely high reliability (such as medical equipment ^(Note 1), transport equipment, traffic equipment, aircraft/spacecraft, nuclear power controllers, fuel controllers, car equipment including car accessories, safety devices, etc.) and whose malfunction or failure may cause loss of human life, bodily injury or serious damage to property ("Specific Applications"), please consult with the ROHM sales representative in advance. Unless otherwise agreed in writing by ROHM in advance, ROHM shall not be in any way responsible or liable for any damages, expenses or losses incurred by you or third parties arising from the use of any ROHM's Products for Specific Applications.

(Note1) Medical Equipment Classification of the Specific Applications

JAPAN	USA	EU	CHINA
CLASS III	CLASS III	CLASS II b	CLASS III
CLASS IV		CLASS III	

- ROHM designs and manufactures its Products subject to strict quality control system. However, semiconductor products can fail or malfunction at a certain rate. Please be sure to implement, at your own responsibilities, adequate safety measures including but not limited to fail-safe design against the physical injury, damage to any property, which a failure or malfunction of our Products may cause. The following are examples of safety measures:
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 - Installation of redundant circuits to reduce the impact of single or multiple circuit failure
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 - Use of our Products in any types of liquid, including water, oils, chemicals, and organic solvents
 - Use of our Products outdoors or in places where the Products are exposed to direct sunlight or dust
 - Use of our Products in places where the Products are exposed to sea wind or corrosive gases, including Cl₂, H₂S, NH₃, SO₂, and NO₂
 - Use of our Products in places where the Products are exposed to static electricity or electromagnetic waves
 - Use of our Products in proximity to heat-producing components, plastic cords, or other flammable items
 - Sealing or coating our Products with resin or other coating materials
 - Use of our Products without cleaning residue of flux (even if you use no-clean type fluxes, cleaning residue of flux is recommended); or Washing our Products by using water or water-soluble cleaning agents for cleaning residue after soldering
 - Use of the Products in places subject to dew condensation
- The Products are not subject to radiation-proof design.
- Please verify and confirm characteristics of the final or mounted products in using the Products.
- In particular, if a transient load (a large amount of load applied in a short period of time, such as pulse. is applied, confirmation of performance characteristics after on-board mounting is strongly recommended. Avoid applying power exceeding normal rated power; exceeding the power rating under steady-state loading condition may negatively affect product performance and reliability.
- De-rate Power Dissipation (Pd) depending on Ambient temperature (Ta). When used in sealed area, confirm the actual ambient temperature.
- Confirm that operation temperature is within the specified range described in the product specification.
- ROHM shall not be in any way responsible or liable for failure induced under deviant condition from what is defined in this document.

Precaution for Mounting / Circuit board design

- When a highly active halogenous (chlorine, bromine, etc.) flux is used, the residue of flux may negatively affect product performance and reliability.
- In principle, the reflow soldering method must be used on a surface-mount products, the flow soldering method must be used on a through hole mount products. If the flow soldering method is preferred on a surface-mount products, please consult with the ROHM representative in advance.

For details, please refer to ROHM Mounting specification

Precautions Regarding Application Examples and External Circuits

1. If change is made to the constant of an external circuit, please allow a sufficient margin considering variations of the characteristics of the Products and external components, including transient characteristics, as well as static characteristics.
2. You agree that application notes, reference designs, and associated data and information contained in this document are presented only as guidance for Products use. Therefore, in case you use such information, you are solely responsible for it and you must exercise your own independent verification and judgment in the use of such information contained in this document. ROHM shall not be in any way responsible or liable for any damages, expenses or losses incurred by you or third parties arising from the use of such information.

Precaution for Electrostatic

This Product is electrostatic sensitive product, which may be damaged due to electrostatic discharge. Please take proper caution in your manufacturing process and storage so that voltage exceeding the Products maximum rating will not be applied to Products. Please take special care under dry condition (e.g. Grounding of human body / equipment / solder iron, isolation from charged objects, setting of ionizer, friction prevention and temperature / humidity control).

Precaution for Storage / Transportation

1. Product performance and soldered connections may deteriorate if the Products are stored in the places where:
 - [a] the Products are exposed to sea winds or corrosive gases, including Cl₂, H₂S, NH₃, SO₂, and NO₂
 - [b] the temperature or humidity exceeds those recommended by ROHM
 - [c] the Products are exposed to direct sunshine or condensation
 - [d] the Products are exposed to high Electrostatic
2. Even under ROHM recommended storage condition, solderability of products out of recommended storage time period may be degraded. It is strongly recommended to confirm solderability before using Products of which storage time is exceeding the recommended storage time period.
3. Store / transport cartons in the correct direction, which is indicated on a carton with a symbol. Otherwise bent leads may occur due to excessive stress applied when dropping of a carton.
4. Use Products within the specified time after opening a humidity barrier bag. Baking is required before using Products of which storage time is exceeding the recommended storage time period.

Precaution for Product Label

QR code printed on ROHM Products label is for ROHM's internal use only.

Precaution for Disposition

When disposing Products please dispose them properly using an authorized industry waste company.

Precaution for Foreign Exchange and Foreign Trade act

Since concerned goods might be fallen under listed items of export control prescribed by Foreign exchange and Foreign trade act, please consult with ROHM in case of export.

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