

RTKA58000DR0000BU

Adjustable Output Voltage Low Iq Current LDO Regulator Demonstration Board

The RTKA58000DR0000BU demonstration board is a simple platform for evaluating the [RRP58000](#) low-dropout regulator (LDO). It provides a view of the HMSOP 8-lead package. The board contains all the necessary circuitry for characterizing critical performance parameters.

RRP58000 is an LDO featuring a low-quiescent current and an adjustable output voltage from 1.24V to 15V. It can efficiently deliver up to 50mA to a load and has a wide input voltage range of 3.5V to 80V.

Features

- Typical low-quiescent current: 5.8µA at no load
- Typical shutdown current: ≤0.2µA
- Wide input voltage range: 3.5V to 80V.
- Max output current: 50mA
- Output voltage accuracy: ±2.5% over line, load, and temperature
- Typical dropout voltage: ≤0.8V at 50mA
- Adjustable output voltage (1.24V - 15V)
- Stable with 2.2µF minimum ceramic output capacitor
- Overcurrent and over-temperature protection
- Junction temperature range: -40°C to 125°C

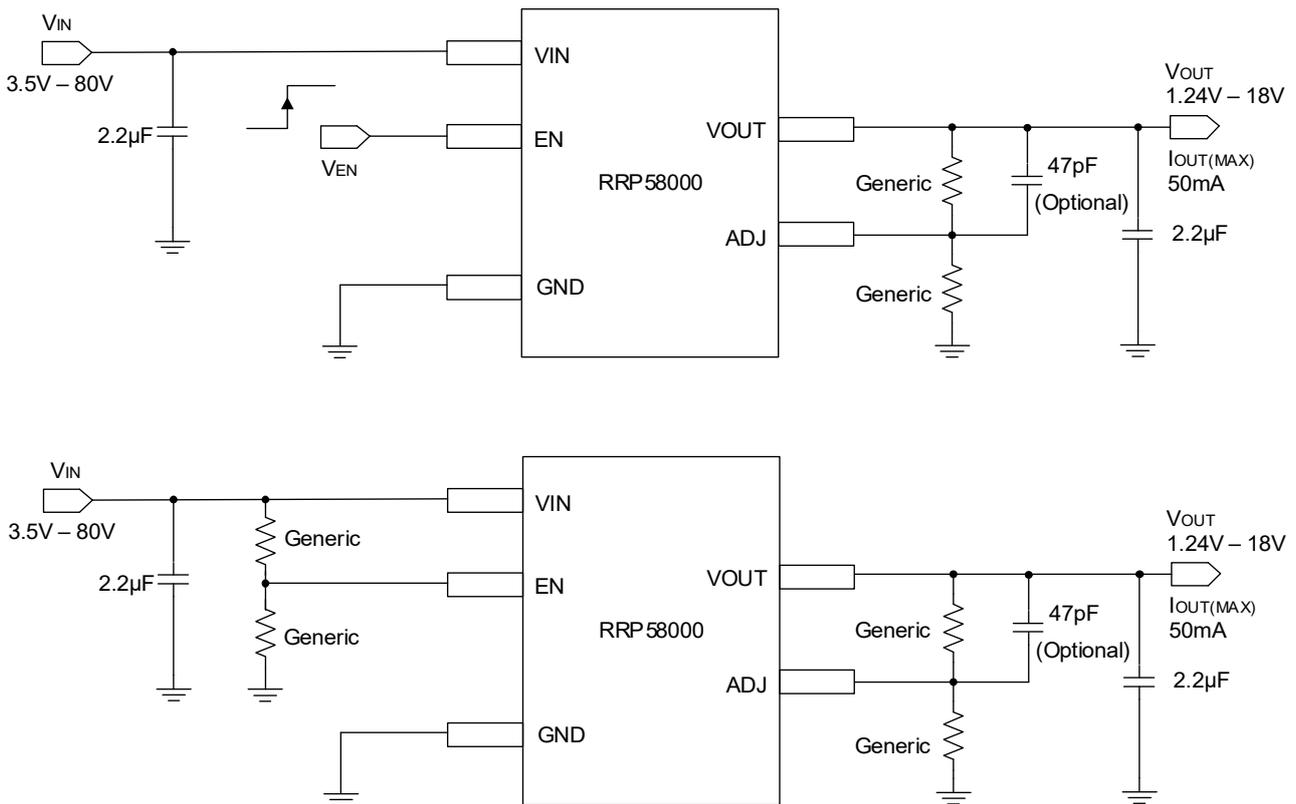


Figure 1. Block Diagram - 8 Ld HMSOP

Contents

1. Functional Description	3
1.1 Quick Start Guide	3
1.1.1 Package Evaluation	3
2. Board Design	3
2.1 Layout Guidelines	3
2.2 Schematic Drawing	4
2.3 Bill of Materials	4
2.4 Board Layout	5
3. Ordering Information	5
4. Revision History	5

1. Functional Description

The RTKA58000DR0000BU demonstration board provides a simple platform to evaluate the RRRP58000 LDO in the HMSOP 8-lead package. The ordering information is shown in the [Ordering Information](#) table. A jumper is needed to select the predefined VOUT with JP1 to JP6.

1.1 Quick Start Guide

1.1.1 Package Evaluation

1. Place a jumper on the preferred VOUT. Use JP6 if the preferred VOUT is not one of the JP1 to JP5. Refer to the Output Voltage section in the *RRP58000 Datasheet* to configure the required VOUT with R8.
2. Ensure the enable (SW1) is in the OFF position.
3. Ensure the external power supply is OFF.
4. Connect the input supply to VIN (TP1) and GND (TP2) to an external power supply.
5. Connect a voltmeter across VOUT (TP6) and GND (TP9).
6. If required, connect a load to VOUT (TP7) and GND (TP8).
7. Turn on the external power supply then toggle the enable (SW1) to ON position.
8. Observe the output voltage.
9. This board has three enable choices: EN to VIN, EN to VIN divider, and EN to external supply.

2. Board Design



Figure 2. RTKA58000DR0000BU Board

2.1 Layout Guidelines

A good PCB layout is important to achieve expected performance. Consideration should be taken when placing the components, routing the trace to minimize the ground impedance, and keeping the parasitic inductance low. Ensure the input and output capacitors have a good ground connection and place as close to the IC as possible.

The ground pad of the IC is connected to a large ground copper plane on the bottom layer for effective thermal dissipation.

2.2 Schematic Drawing

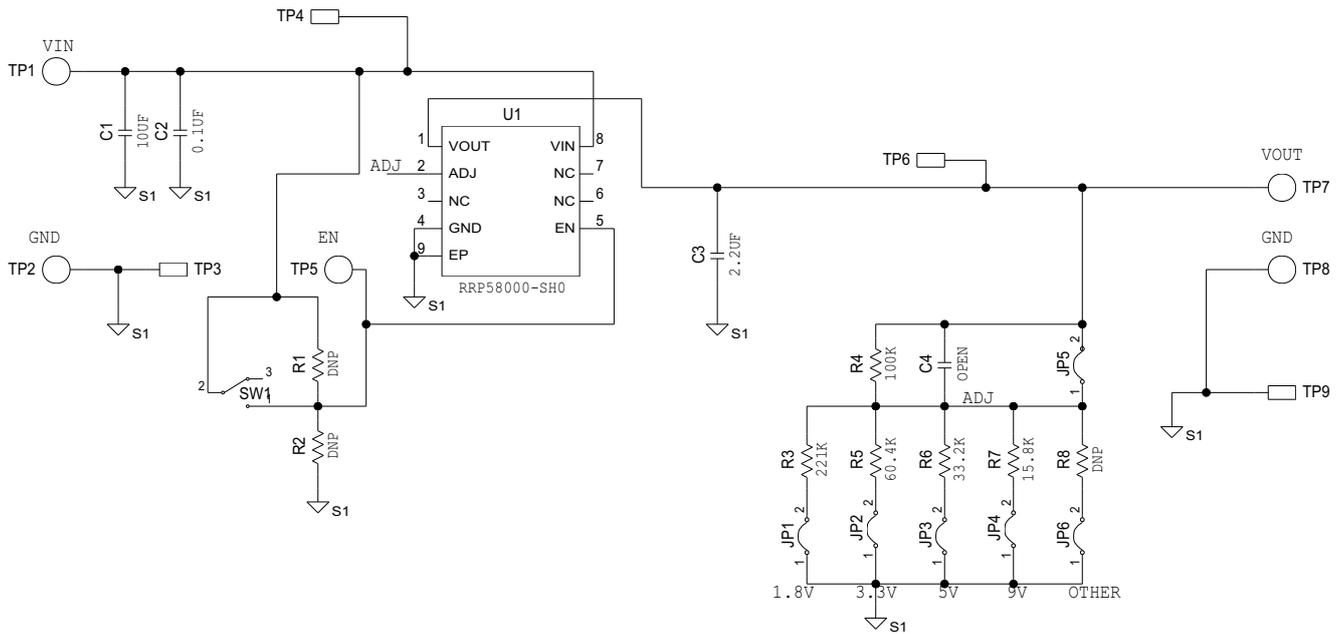


Figure 3. RTKA58000DR0000BU Schematic

2.3 Bill of Materials

Qty	Ref Designator	Description	Manufacturer	Part Number
1	-	PWB-PCB, RTKA58000DR0000BU, REVA, ROHS	MTL (Multilayer PCB International (HK) CO.LTD	RTKA58000DR0000BUREVAPCB
5	TP1, TP2, TP5, TP7, TP8	CONN-TURRET, TERMINAL POST, TH, ROHS	Keystone Electronics	1514-2
4	TP3, TP4, TP6, TP9	CONN-MINI TEST POINT, VERTICAL, WHITE, ROHS	Keystone Electronics	5002
1	C3	CAP, SMD, 1206, 2.2µF, 50V, 10%, X7R, ROHS	Murata	GRM31CR71H225KA88L-T
1	C1	CAP, SMD, 1210, 10µF, 100V, 10%, X7S, ROHS	Murata	GRM32EC72A106KE05L-T
1	SW1	SWITCH-TOGGLE, SMD, 6PIN, SPDT, 2POS, ON-NONE	C&K	GT11MSCBE-T
0	R8	RES, SMD, 0603, DNP-PLACE HOLDER, ROHS	Various	Generic
0	C4	CAP, SMD, 0603, DNP-PLACE HOLDER, ROHS	Various	Generic
1	C2	CAP-AEC-Q200, SMD, 0805, 0.1µF, 100V, 10%, X7R, ROHS	Kemet	C0805C104K1RACTU-T
0	R1, R2	RESISTOR, SMD, 0603, 0.1%, MF, DNP-PLACE HOLDER	Various	Generic
1	R4	RES, SMD, 0603, 100K, 1/10W, 1%, TF, ROHS	Yageo	RC0603FR-07100KL-T

Qty	Ref Designator	Description	Manufacturer	Part Number
1	R7	RES, SMD, 0603, 15.8K, 1/10W, 1%, TF, ROHS	Yageo	RC0603FR-0715K8L-T
1	R3	RES, SMD, 0603, 221K, 1/10W, 1%, TF, ROHS	Yageo	RC0603FR-07221KL-T
1	R6	RES, SMD, 0603, 33.2K, 1/10W, 1%, TF, ROHS	Yageo	RC0603FR-0733K2L-T
1	R5	RES, SMD, 0603, 60.4K, 1/10W, 1%, TF, ROHS	Yageo	RC0603FR-0760K4L-T
6	JP1-JP6	CONN-HEADER, 1x2, RETENTIVE, 2.54mm, ROHS	Amphenol ICC	69190-202HLF
1	U1	IC-LDO REGULATOR, 1.23V-15V, 50mA, 8P, MSOP, ROHS	Renesas Electronics	RRP58000-SH0

2.4 Board Layout

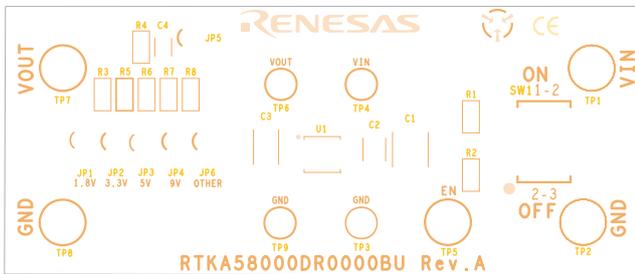


Figure 4. Top Layer Silkscreen

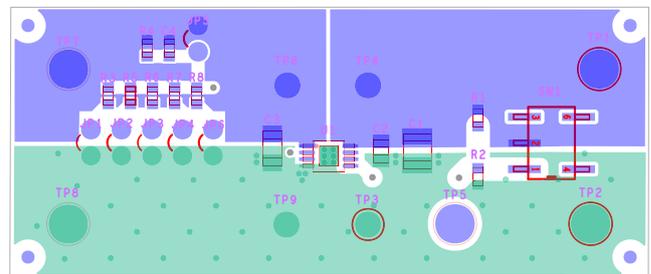


Figure 5. Top Layer

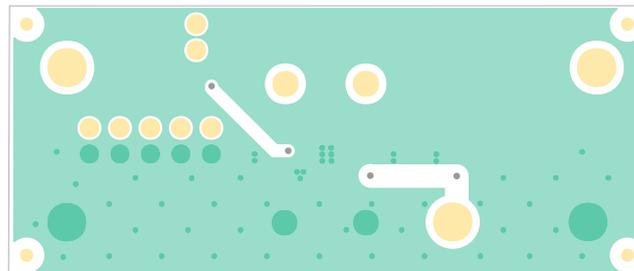


Figure 6. Bottom Layer

3. Ordering Information

Part Number	Description
RTKA58000DR0000BU	RRP58000 adjustable output voltage demonstration board

4. Revision History

Rev.	Date	Description
1.01	Jun 3, 2024	Updated Features: Typical low-quiescent current and Typical dropout voltage.
1.00	May 28, 2024	Initial release

IMPORTANT NOTICE AND DISCLAIMER

RENESAS ELECTRONICS CORPORATION AND ITS SUBSIDIARIES (“RENESAS”) PROVIDES TECHNICAL SPECIFICATIONS AND RELIABILITY DATA (INCLUDING DATASHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES “AS IS” AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT OF THIRD-PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for developers who are designing with Renesas products. You are solely responsible for (1) selecting the appropriate products for your application, (2) designing, validating, and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, or other requirements. These resources are subject to change without notice. Renesas grants you permission to use these resources only to develop an application that uses Renesas products. Other reproduction or use of these resources is strictly prohibited. No license is granted to any other Renesas intellectual property or to any third-party intellectual property. Renesas disclaims responsibility for, and you will fully indemnify Renesas and its representatives against, any claims, damages, costs, losses, or liabilities arising from your use of these resources. Renesas' products are provided only subject to Renesas' Terms and Conditions of Sale or other applicable terms agreed to in writing. No use of any Renesas resources expands or otherwise alters any applicable warranties or warranty disclaimers for these products.

(Disclaimer Rev.1.01 Jan 2024)

Corporate Headquarters

TOYOSU FORESIA, 3-2-24 Toyosu,
Koto-ku, Tokyo 135-0061, Japan
www.renesas.com

Trademarks

Renesas and the Renesas logo are trademarks of Renesas Electronics Corporation. All trademarks and registered trademarks are the property of their respective owners.

Contact Information

For further information on a product, technology, the most up-to-date version of a document, or your nearest sales office, please visit www.renesas.com/contact-us/.