

RTKA214403DE0000BU

The RTKA214403DE0000BU evaluation board provides a simple platform to evaluate the RAA214403 LDO. The evaluation board offers the user a view of the SOT-23 5-lead package. Footprints for both the SOT-23 and SOT-89 packages are on the evaluation board, but only the SOT-23 version is populated. The user must place jumpers on the input and output associated with the IC. The board contains all the important circuitry required to characterize critical performance parameters.

The RAA214403 is a fixed output voltage, low-quiescent current, and low-dropout regulator capable of sourcing up to 150mA to a load. The LDO has a wide input voltage range of 3.6V to 40V (at 10mA load) with up to 45V line transient tolerance.

Features

- Typical low-quiescent current: 3.8µA at no load
- Typical shutdown current: <1µA
- Wide input voltage range: 3.6V to 40V with 45V line transient tolerance
- Max output current: 150mA
- Output voltage accuracy: ±3% over line, load, and temperature
- Typical dropout voltage: 0.8V at 150mA
- Fixed output voltage of 3.3V
- Stable with 2.2µF minimum ceramic output capacitor
- Overcurrent and over-temperature protection
- Junction temperature range: -40°C to 125°C

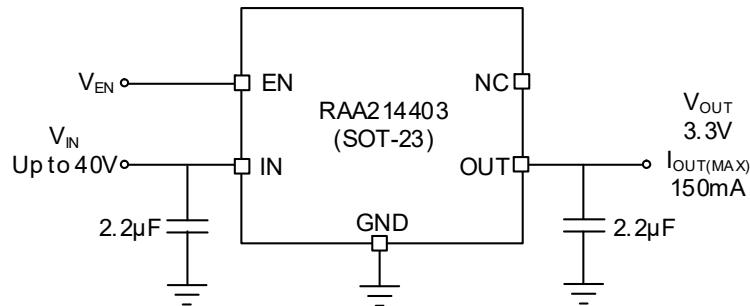


Figure 1. Block Diagram

Contents

| | |
|---|----------|
| 1. Functional Description | 3 |
| 1.1 Enabling and Disabling the Device SOT-23 Device | 3 |
| 1.2 Quick Start Guide | 3 |
| 1.3 Layout Guidelines | 4 |
| 1.4 Schematic Drawing | 4 |
| 1.5 Bill of Materials | 5 |
| 1.6 Board Layout | 6 |
| 2. Ordering Information | 6 |
| 3. Revision History | 6 |

1. Functional Description

The RTKA214403DE0000BU evaluation board provides a simple platform to evaluate the RAA214403 LDO in the SOT-23 5-lead package. The ordering information for the specific voltage option is shown in the [Ordering Information](#) table. Jumpers on VIN_J1 and VOUT_J1 are required to connect the SOT-23 5-lead package.

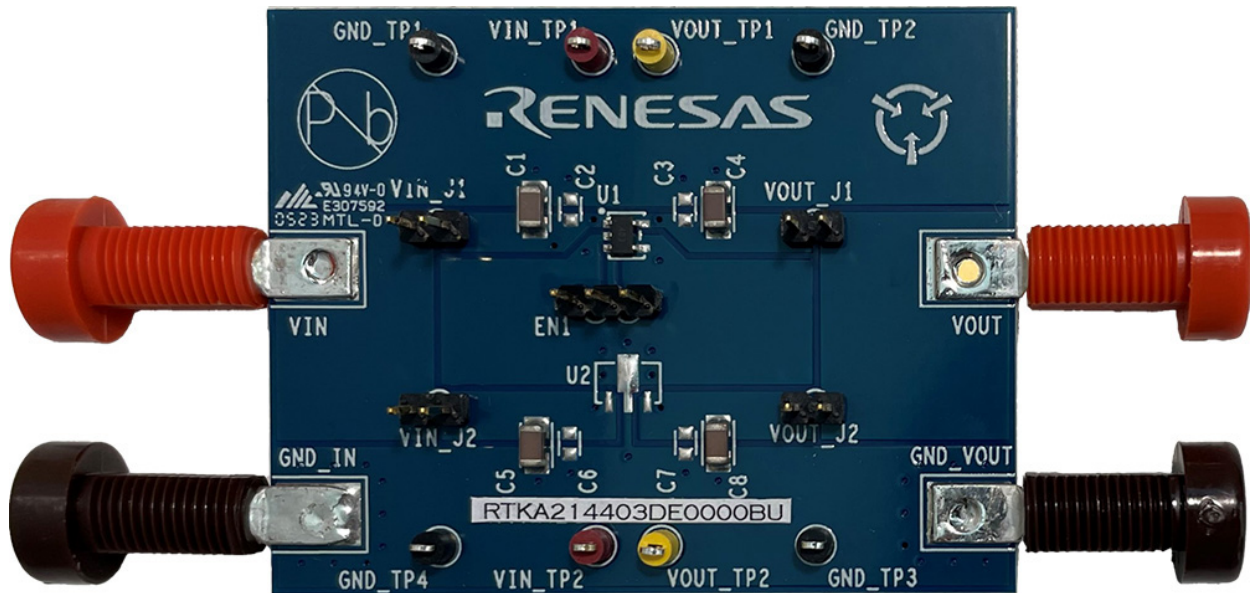


Figure 2. RTKA214403DE0000BU Board

1.1 Enabling and Disabling the Device SOT-23 Device

Jumper EN1 enables or disables the SOT-23 device. To ENABLE the device, connect the jumper to the left. This connects the VIN voltage to the enable pin. To DISABLE the device, connect the jumper to the right. This connects the ground to the enable pin.

1.2 Quick Start Guide

1. Verify Jumper VIN_J1 and Jumper VOUT_J1 are in the circuit and that VIN_J2 and Jumper VOUT_J2 are not in the circuit.
2. Verify Jumper EN1_J1 is in the circuit and connected to the left. This applies the VIN voltage to the Enable pin; the part will be on. To disable the part, move the jumper EN1_J1 to the right position.
3. Connect the input supply to VIN and GND_IN (banana jack) to an external power supply.
4. Connect a voltmeter across VOUT_TP1 and GND_TP2 (mini test point).
5. If required, connect a load to VOUT and GND_OUT (banana jack).
6. Observe the output voltage.
7. The following test points are provided for easy connection to the input and output voltages: VIN_TP1, GND_TP1, VOUT_TP1, GND_TP2.

1.3 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. The input and output capacitors should have a reliable ground connection and be placed 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.

1.4 Schematic Drawing

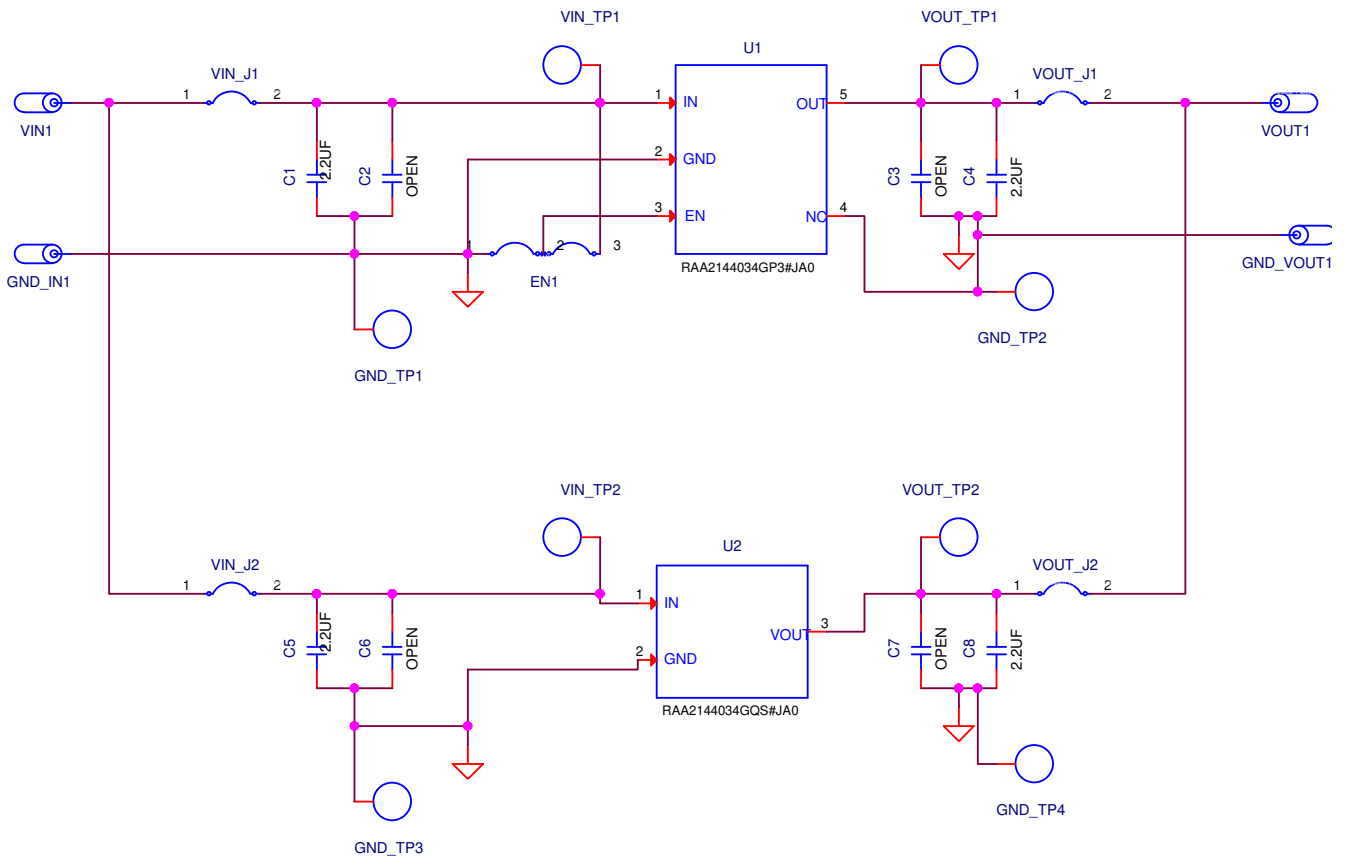


Figure 3. RTKA214403DE0000BU Schematic

1.5 Bill of Materials

| Qty | Reference Designator | Description | Manufacturer | Manufacturer Part Number |
|-----|----------------------------------|--|--|-------------------------------|
| 1 | - | PWB-PCB,- RTKA214403XDE0000BU, REVA, ROHS | MTI (Multilayer PCB International (HK) CO.LTD) | RTKA214403XDE0000B URVAPCB |
| 0 | C2,C3,C6,C7 | CAP, SMD, 0603, DNP-PLACE HOLDER, ROHS | - | - |
| 4 | C1,C4,C5,C8 | CAP, SMD, 1206, 2.2μF, 100V, 10%, X7R, ROHS | Yageo | CC1206KKX7R0BB225 |
| 2 | VIN,VOUT | CONN-BANANA JACK, INSULATED, ORANGE, NYLON, ROHS | Johnson Components | 108-0906-001 |
| 2 | GND_IN, GND_VOUT | CONN-BANANA JACK, FEMALE, TH, W/SOLDER TABS, BROWN, ROHS | Cinch | 108-0908-001 |
| 2 | VIN_TP1, VIN_TP2 | CONN-MINI TEST PT, VERTICAL, RED, ROHS | Keystone | 5000 |
| 4 | GND_TP1-GND_TP4 | CONN-MINI TEST PT, VERTICAL, BLK, ROHS | Keystone | 5001 |
| 2 | VOUT_TP1, VOUT_TP2 | CONN-MINI TEST POINT, VERTICAL, YEL, ROHS | Keystone | 5004 |
| 1 | EN1 | CONN-HEADER,1x3, BREAKAWY 1x36, 2.54mm, ROHS | Berg/FCI | 68000-236HLF |
| 4 | VIN_J1, VIN_J2, VOUT_J1, VOUT_J2 | CONN-HEADER, 1x2, RETENTIVE, 2.54mm, 0.230X 0.120, ROHS | Berg/FCI | 69190-202HLF |
| 1 | U1 | IC-3.3V, 150mA, LDO REGULATOR, 5P, TSOT-23, ROHS | Renesas Electronics | RAA2144034GP3#JA0 |

1.6 Board Layout

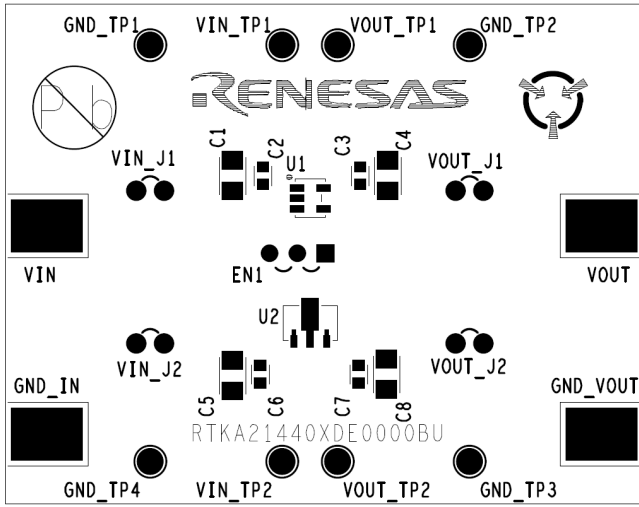


Figure 4. Top Layer Silk Screen

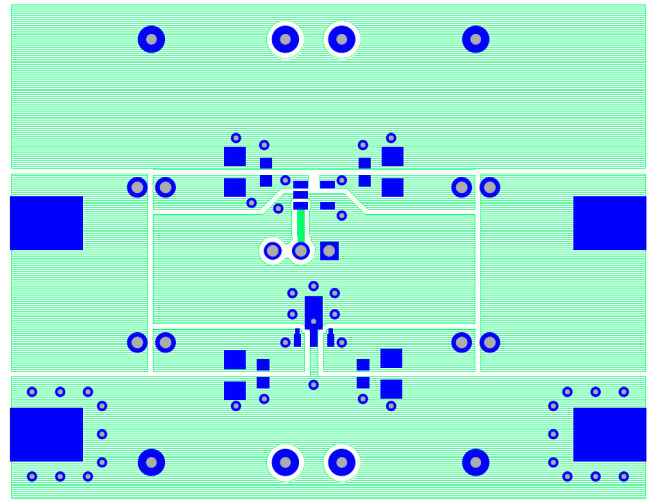


Figure 5. Top Layer

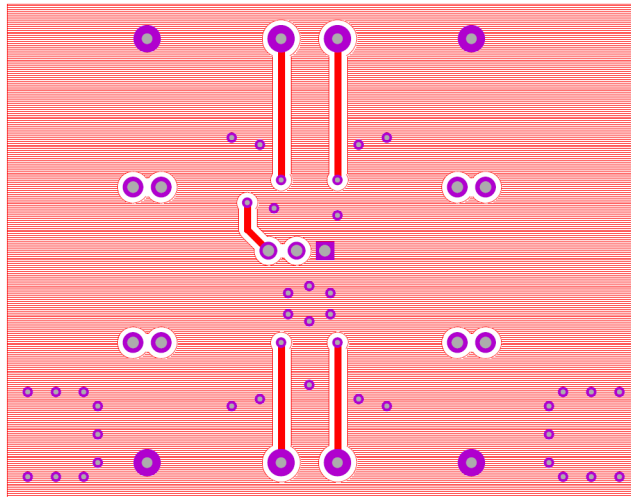


Figure 6. Bottom Layer

2. Ordering Information

| Part Number | Description |
|--------------------|--|
| RTKA214403DE0000BU | RAA214403 3.3V board option (SOT-23 package) |

3. Revision History

| Rev. | Date | Description |
|------|--------------|-----------------|
| 1.00 | Jul 26, 2023 | Initial release |

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