RTKA214409DE0000BU

The RTKA214409DE0000BU evaluation board provides a simple platform to evaluate the RAA214409 LDO. The evaluation board offers the user a view at 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-89 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 RAA214409 is a fixed output voltage, low-quiescent current, low-dropout regulator capable of sourcing up to 150mA to a load. The LDO has a wide input voltage range of 9.3V 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: 9.3V 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 9V
- Stable with 2.2µF minimum ceramic output capacitor
- Overcurrent and over-temperature protection
- Junction temperature range: -40°C to 125°C

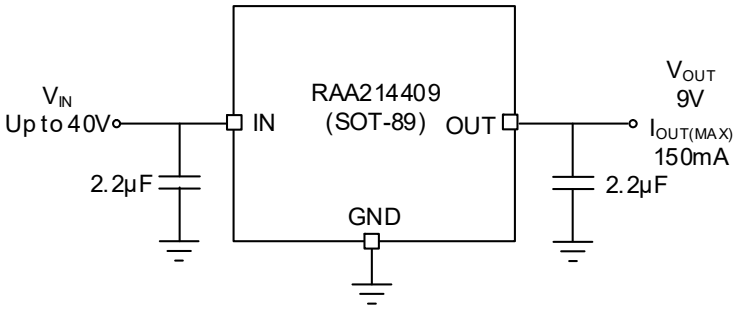

Figure 1. Block Diagram

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1. Functional Description

The RTKA214409DE0000BU evaluation board provides a simple platform to evaluate the RAA214409 LDO. The ordering information for the specific voltage option is shown in the Ordering Information table. Jumpers on VIN_J2 and VOUT_J2 are required to connect the SOT-89 3-lead package.

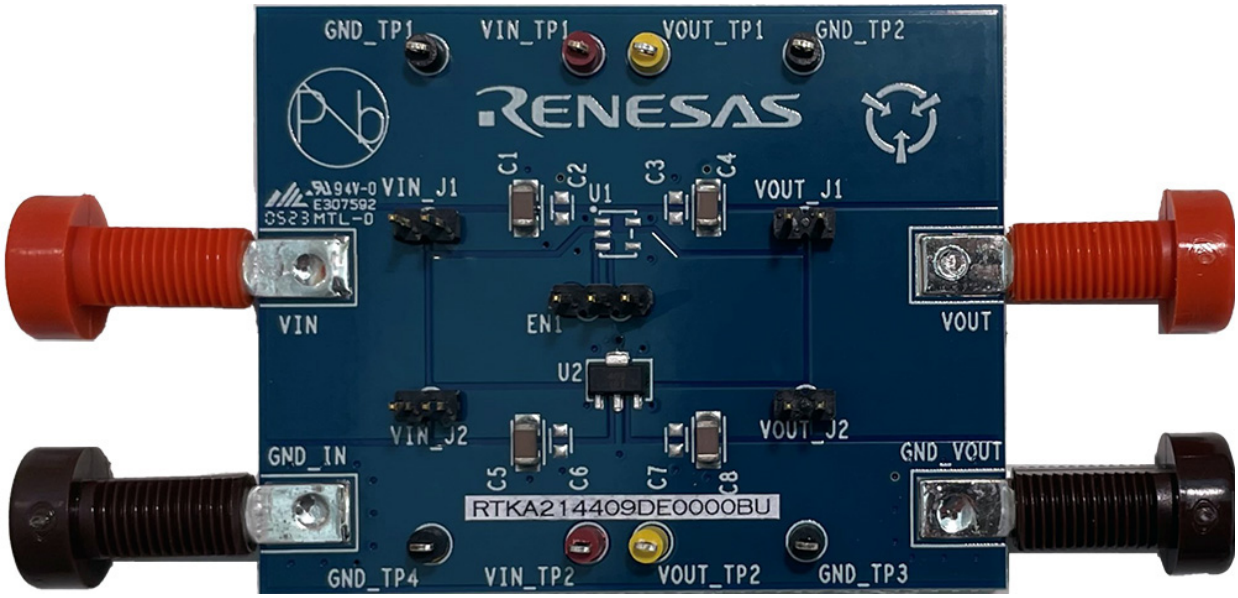

Figure 2. RTKA214409DE0000BU Board

1.1 Quick Start Guide

1. Verify Jumper VIN_J2 and Jumper VOUT_J2 are in the circuit and that VIN_J1 and Jumper VOUT_J1 are not in the circuit.
2. Connect the input supply to VIN and GND_IN (banana jack) to an external power supply.
3. Connect a voltmeter across VOUT_TP1 and GND_TP2 (mini test point).
4. If required, connect a load to VOUT and GND_OUT (banana jack).
5. Observe the output voltage.
6. The following test points are provided for easy connection to the input and output voltages: VIN_TP2, GND_TP4, VOUT_TP2, GND_TP3.

1.2 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 good 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.

1.3 Schematic Drawing

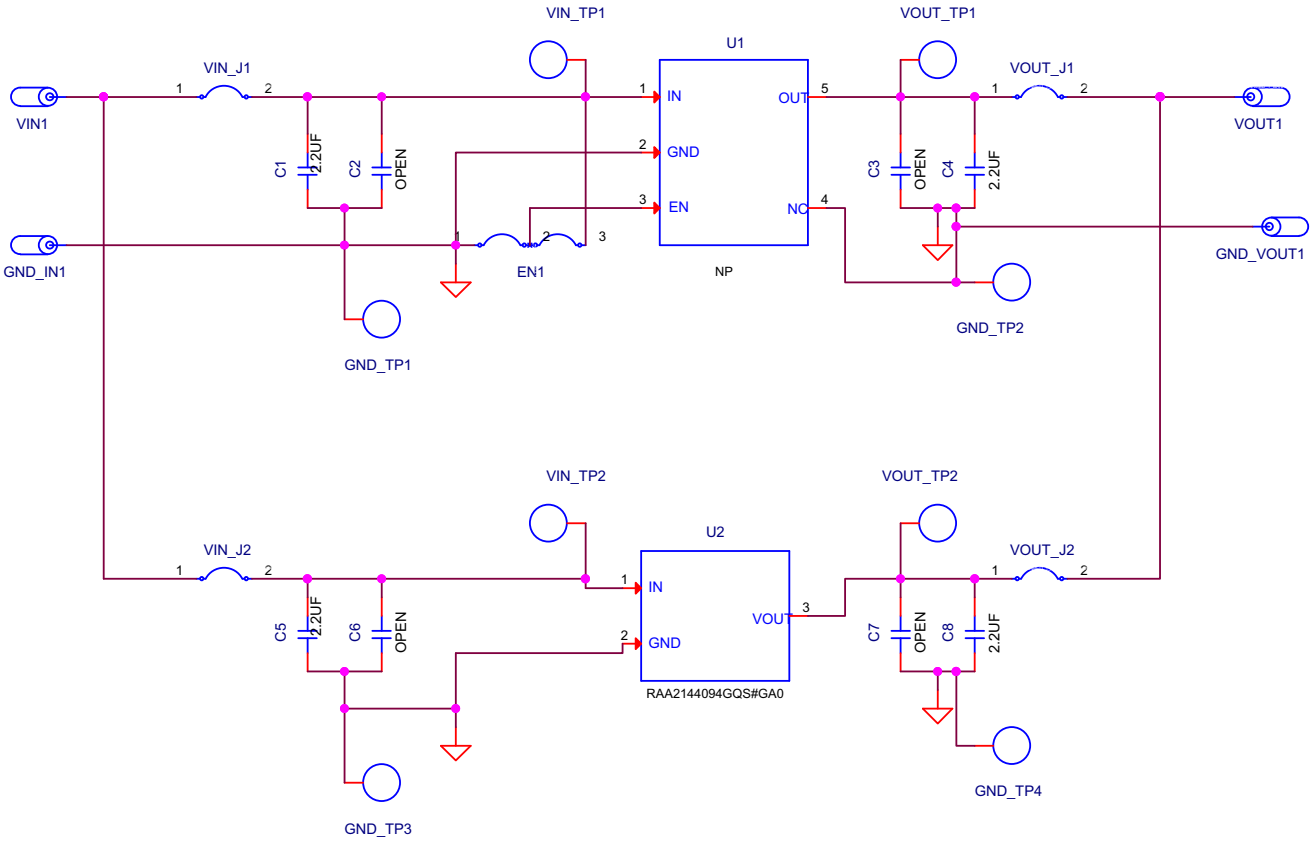

Figure 3. RTKA214409DE0000BU Schematic

1.4 Bill of Materials

Qty	Reference Designator	Description	Manufacturer	Manufacturer Part
1	-	PWB-PCB, RTKA214403XDE0000BU, REVA, ROHS	MTL (Multilayer PCB International (HK) CO.LTD)	RTKA214403XDE0000BURVAPCB
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, 1×3, BREAKAWY 1×36, 2.54mm, ROHS	Berg/FCI	68000-236HLF
4	VIN_J1, VIN_J2, VOUT_J1, VOUT_J2	CONN-HEADER, 1×2, RETENTIVE, 2.54mm, 0.230 × 0.120, ROHS	Berg/FCI	69190-202HLF
1	U2	IC-9V, 150mA, LDO REGULATOR, 3P, TSOT-89, ROHS	Renesas Electronics	RAA2144094GQS#GA0

1.5 Board Layout

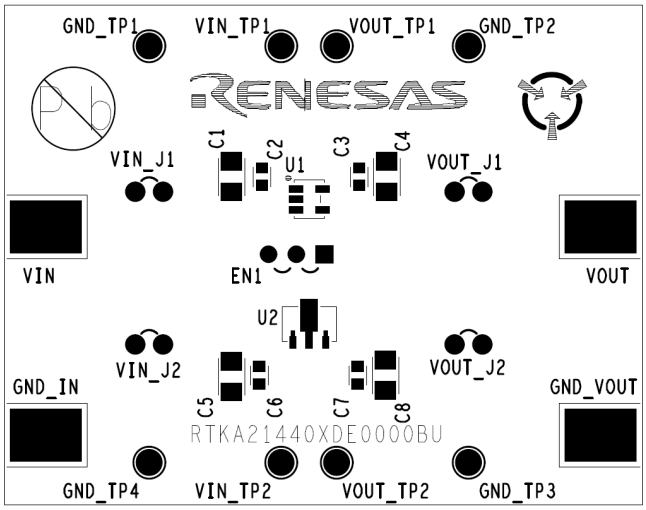

Figure 4. Top Layer Silk Screen

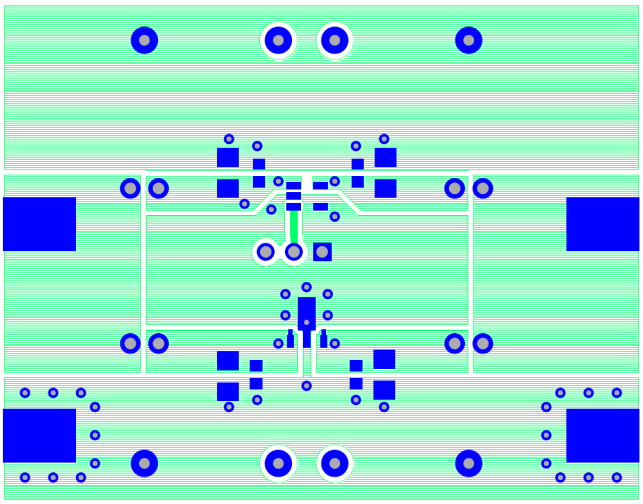

Figure 5. Top Layer

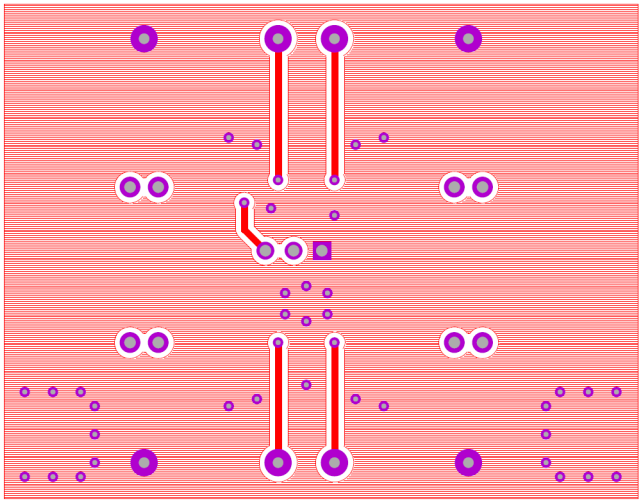

Figure 6. Bottom Layer

2. Ordering Information

Part Number	Description
RTKA214409DE0000BU	RAA214409 9V board option (SOT-89 package)

3. Revision History

Rev.	Date	Description
1.00	Aug 16, 2023	Initial release

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