RTKA214223DR0000BU

The RTKA214223DR0000BU demonstration board provides a simple platform for demonstrating the RAA214223 LDO linear regulator. The board features convenient connection points for input, output, and enable. With a small form factor, the board integrates into another system as a daughter card or a module.

The RAA214223 is offered in a 5Ld TSOT23 package. The RTKA214223DR0000BU demonstration board operates from a supply voltage of 4V to 20V DC with a fixed output voltage of 3.3V at a load up to 150mA.

Features

- Wide input voltage range 4V to 20V
- 3.3V fixed output voltage
- Excellent line and load regulation
- Stable with as low as 1µF MLCC output capacitor
- Integrated fault protections including over-temperature shutdown and current limit

Specifications

This board is specified for the following operating conditions:

- V_{IN} supply: 4V to 20V
- V_{OUT}: 3.3V
- Load step: Up to 150mA
- Short-circuit current limit: 220mA

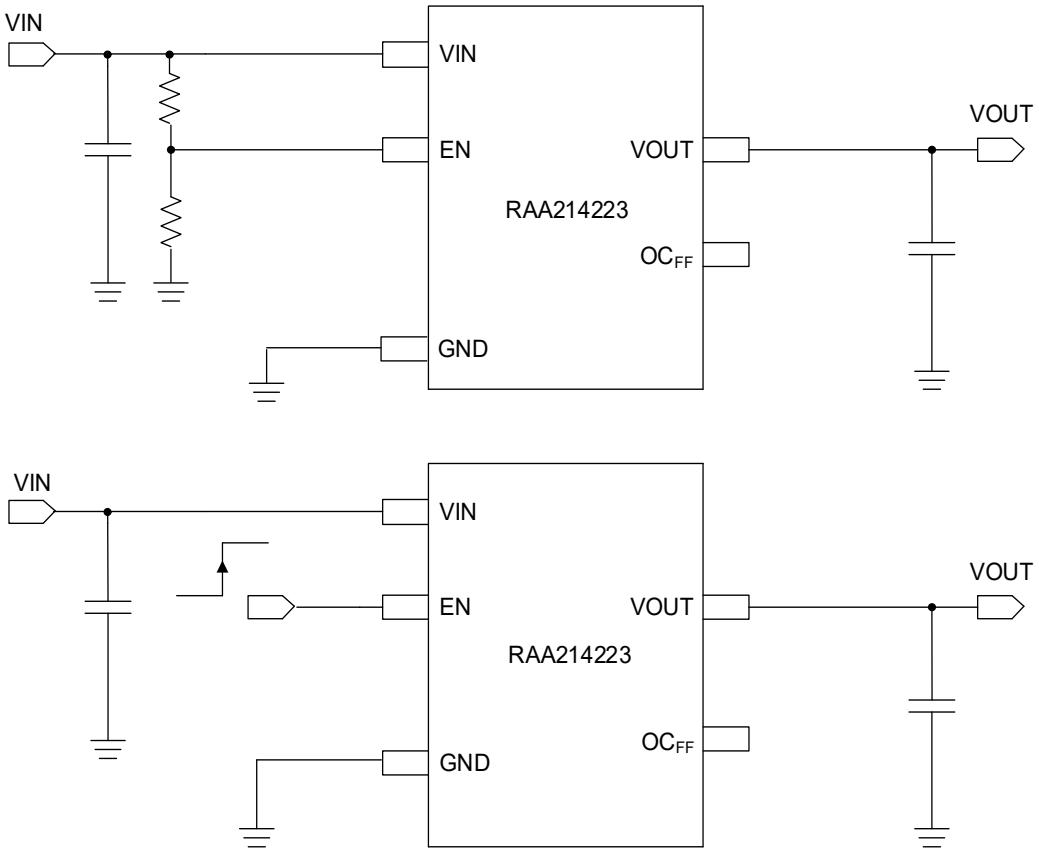

Figure 1. Block Diagram

Contents

1. Functional Description

The RTKA214223DR0000BU provides you with an easy setup to demonstrate the functionality of the RAA214223 LDO linear regulator. This demonstration board includes an input capacitor, output capacitor, and a placeholder for an optional 10 to 22pF capacitor between the VOUT and OCFF pins. This capacitor is not required but can be used to improve the transient response or startup overshoot. Connectors for input, output, and the enable signal are populated on the board for simple connections. Also, use the pads for these connectors to solder or connect the small demonstration board to other systems.

1.1 Setup and Configuration

1.1.1 Recommended Equipment

- Power supply that delivers up to 20V with at least 0.5A source current capability.
- Second power supply that delivers up to 20V (optional).
- DC electronic load to draw current out of the LDO output.
- Oscilloscope to monitor input voltage, output voltage, and load current.

1.1.2 Quick Start Guide

1. Connect a power supply to the VIN terminals on board TP1 and GND.
2. If an external EN signal is needed, connect a second power supply to the EN terminals TP5 and GND.
3. Alternatively, connect TP5 and TP1 so that the input voltage enables the IC.
4. Connect the DC load to the output terminals TP2 and GND.
5. Turn on the VIN supply at the required voltage, up to 20V.
6. If applicable, turn on the EN power supply at the required voltage, up to 20V.
7. Verify output voltage and load current on the oscilloscope.

2. Board Design

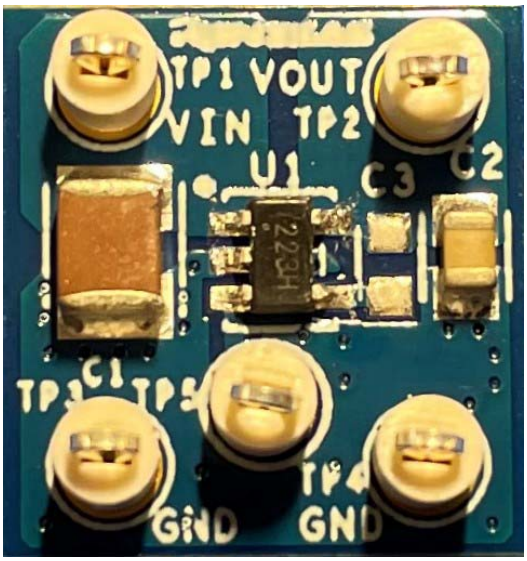

Figure 2. RTKA214223DR0000BU Evaluation Board (Top), 0.530 × 0.575in

2.1 PCB Layout Guidelines

For best thermal performance, use as many vias as possible to connect the top layer PCB thermal land to ground planes on other PCB layers.

Place the components connected to the ADJ pin as close to the pin as possible to allow the shortest possible routing; with this method, the parasitic capacitance on the pin is minimized.

2.2 Schematic Diagrams

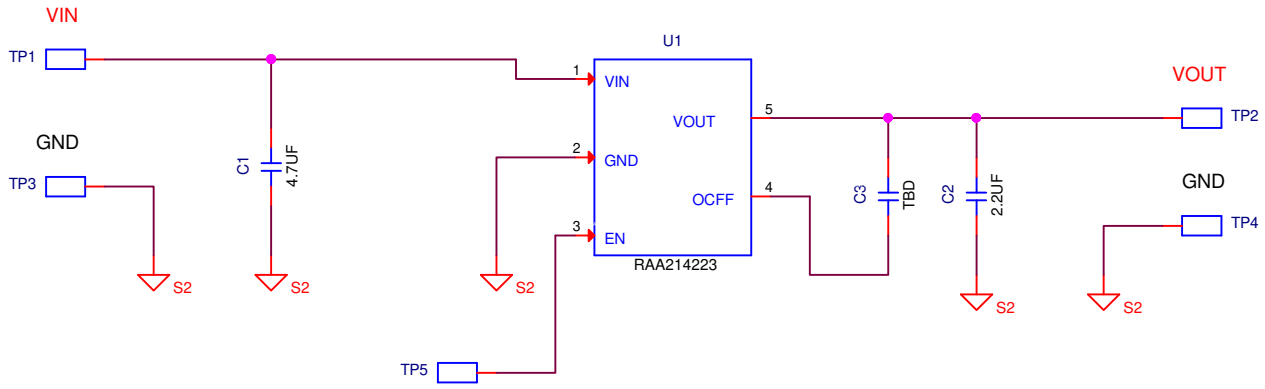

Figure 3. RTKA214223DR0000BU Schematic

2.3 Bill of Materials

Qty	Reference Designator	Description	Manufacturer	Manufacturer Part Number
5	TP1, TP2, TP3, TP4, TP5	Miniature White Test Point	Keystone	5002
1	C1	Ceramic Chip Cap, 4.7µF	TDK	CGA6M3X7S2A475K200AB
1	C2	Ceramic Cap, 2.2µF	Murata	GRM21BR71E225KA73L
1	U1	150mA 20V LDO Linear Regulator	Renesas	RAA214223

2.4 Board Layout

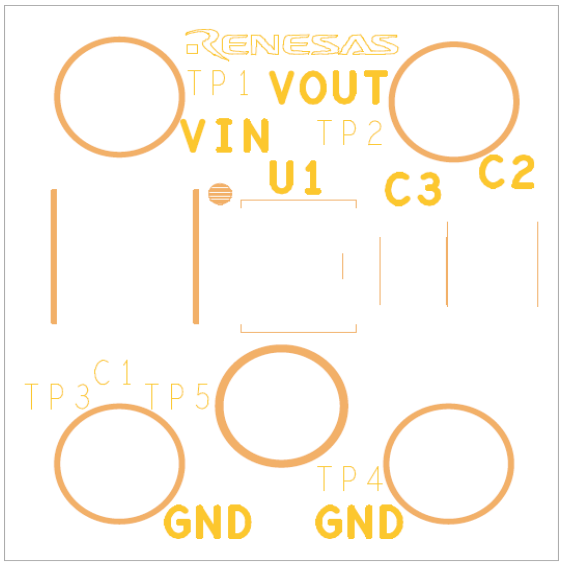

Figure 4. Silkscreen Top Layer

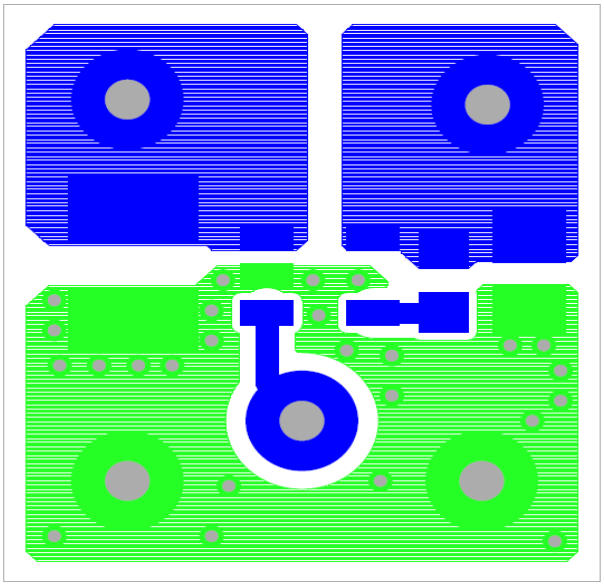

Figure 5. Layer 1

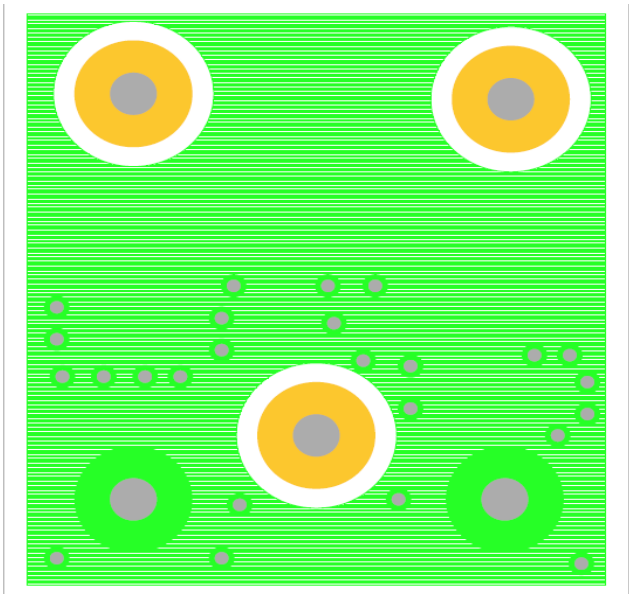

Figure 6. Layer 2

Figure 7. Silkscreen Bottom Layer

3. Ordering Information

Part Number	Description
RTKA214223DR0000BU	RAA214223 Demonstration Board

4. Revision History

Revision	Date	Description
1.00	Jun 9, 2023	Initial release

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