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## 36V, 2 $\mu$ A I<sub>Q</sub>, 200mA Low Dropout Voltage Linear Regulator

### *Purpose*

The RT9069 is stable with the ceramic output capacitor over its wide input range from 3.5V to 36V and the entire range of output load current (0mA to 200mA). This document explains the function and use of the RT9069 evaluation board (EVB), and provides information to enable operation, modification of the evaluation board and circuit to suit individual requirements.

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## Introduction

### General Product Information

The RT9069 is a low-dropout (LDO) voltage regulators with enable function offering the benefits of high input voltage, low-dropout voltage, low-power consumption, and miniaturized packaging.

The features of low quiescent current as low as 2 $\mu$ A and zero disable current is ideal for powering the battery equipment to a longer service life. The RT9069 is stable with the ceramic output capacitor over its wide input range from 3.5V to 36V and the entire range of output load current (0mA to 200mA).

### Product Feature

- 2 $\mu$ A Ground Current at no Load
- $\pm$ 2% Output Accuracy
- 200mA Output Current with EN
- Zero Disable Current
- Maximum Operating Input Voltage 36V
- Dropout Voltage : 0.2V at 10mA / VIN 5V
- Stable with Ceramic or Tantalum Capacitor
- Current Limit Protection
- Over-Temperature Protection
- RoHS Compliant and Halogen Free

### Key Performance Summary Table

Key Features	Evaluation Board Number : PCB031_V1
Input Voltage Range	3.5V to 36V
Max Output Current	200mA
Default Output Voltage	3.3V
Default Marking & Package Type	RT9069-33GQU, UDFN-6L1.6x1.6

## Bench Test Setup Conditions

### Headers Description and Placement



Please carefully inspect the EVB IC and external components, comparing them to the following Bill of Materials, to ensure that all components are installed and undamaged. If any components are missing or damaged during transportation, please contact the distributor or send e-mail to [evb\\_service@richtek.com](mailto:evb_service@richtek.com)

### Test Points

The EVB is provided with the test points and pin names listed in the table below.

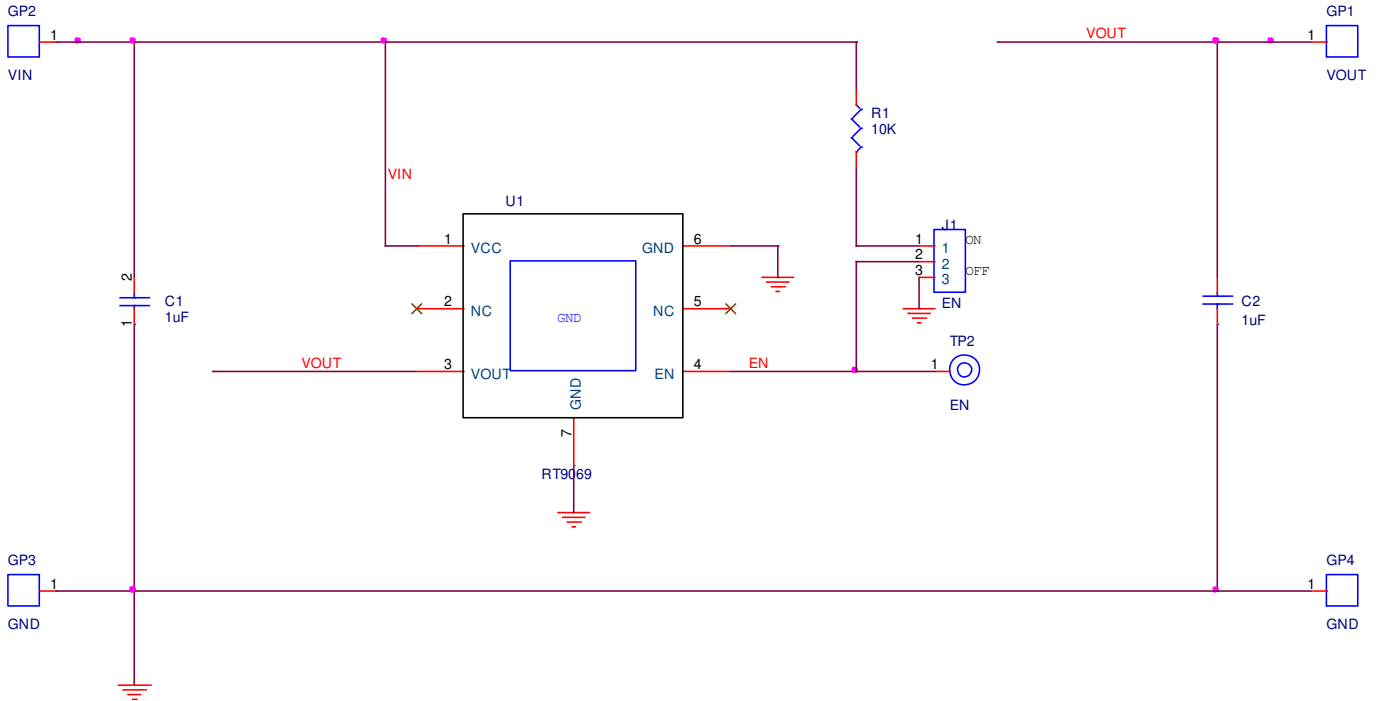
Test point/ Pin name	Signal	Comment (expected waveforms or voltage levels on test points)
<b>VCC</b>	Input voltage	The RT9069 is a high input voltage linear regulator designed especially for low external component systems. The input voltage range is from 3.5V to 36V.
<b>EN</b>	Enable Control Input.	The RT9069 delivers the output power when it is set to enable state. When it works in disable state, there is no output power and the operation quiescent current is zero.
<b>VOUT</b>	Output of the Regulator.	The RT9069 builds in a P-MOSFET output transistor which provides a low switch-on resistance for low dropout voltage applications.
<b>GND</b>	Ground	Ground.

### Power-up & Measurement Procedure

1. Connect input power ( $3.5V < V_{IN} < 36V$ ) and input ground to VIN and GND test pins respectively.
2. Connect positive end and negative terminals of load to VOUT and GND test pins respectively.
3. There is a 3-pin header "EN" for enable control. To use a jumper at "H" option to tie EN test pin to input power VIN for enabling the device. Inversely, to use a jumper at "L" option to tie EN test pin and ground GND for disabling the device.
4. Verify the output voltage (approximately 1.0V) between VOUT and GND.
5. Connect an external load up to 50mA to the VOUT and GND terminals and verify the output voltage and current.

**Schematic, Bill of Materials & Board Layout**

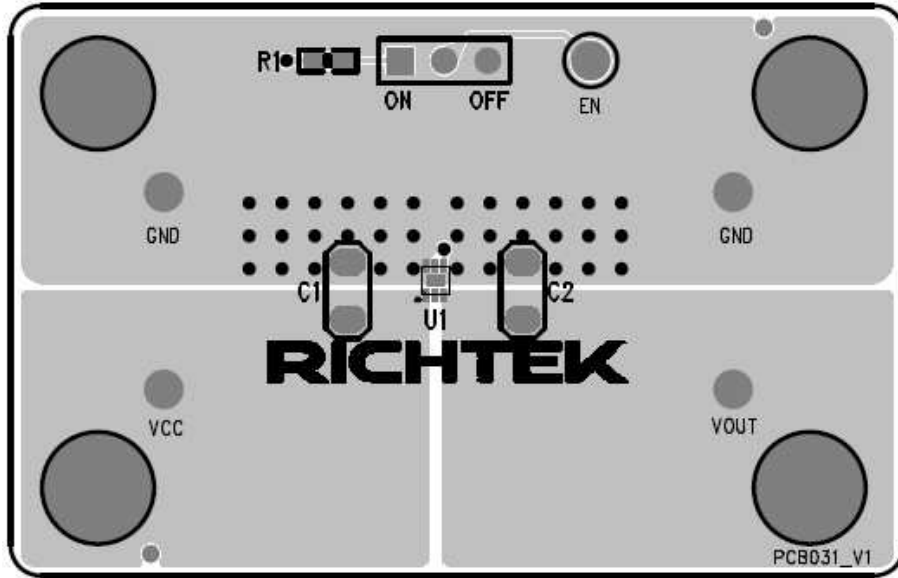
**EVB Schematic Diagram**



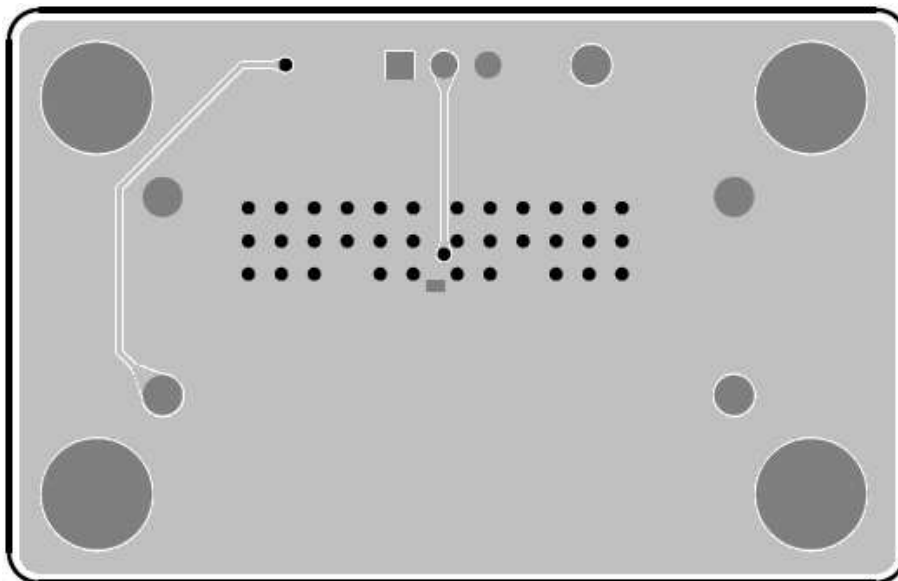
**Bill of Materials**

Reference	Qty	Part Number	Description	Package	Manufacture
U1	1	RT9069-33GQU	LDO	UDFN-6L 1.6x1.6	RICHTEK
C1, C2	2	GRM31CR71E106KA12L	1 $\mu$ F/50V/X7R	C-1206	MURATA
R1	1		10k	R-0603	

**PCB Layout**



Top View



Bottom View

### ***More Information***

For more information, please find the related datasheet or application notes from Richtek website <http://www.richtek.com>.

### ***Important Notice for Richtek Evaluation Board***

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