

36V, 2 μ A I_Q, 100mA, Low Dropout Voltage Linear Regulator Evaluation Board

General Description

The RTQ2569 is a high input voltage (36V), low quiescent current (2 μ A), low-dropout linear regulation(LDO) capable of sourcing 100mA. This document explains the function and use of the RTQ2569 evaluation board (EVB), and provides information to enable operation, modification of the evaluation board and circuit to suit individual requirements

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Performance Specification Summary

Summary of the RTQ2569-50GQW-QA Evaluation Board performance specification is provided in Table 1. The ambient temperature is 25°C.

Table 1. RTQ2569GQW Evaluation Board Performance Specification Summary

Specification	Test Conditions	Min	Typ	Max	Unit
Input Voltage Range		5	--	36	V
Output Current		0	--	0.1	A
Default Output Voltage		--	5	--	V
Dropout Voltage	$V_{CC} = V_{OUT}$, $V_{OUT} \geq 3.5V$, $I_{LOAD} = 10mA$	--	0.2	0.36	V
V_{CC} Consumption Current	$V_{CC} = V_{EN} = 15V$, $V_{OUT} \leq 5.5V$, $I_{LOAD} = 0mA$	--	2	3.5	μA
Line Regulation	$V_{OUT} + 1 < V_{CC} < 36V$, $I_{LOAD} = 1mA$	--	0.04	0.6	%
Load Regulation	$V_{CC} = V_{OUT} + 4V$, $0mA < I_{LOAD} < 100mA$ $-40^{\circ}C \leq T_J \leq 105^{\circ}C$	--	--	1	%
Output Current Limit	$V_{CC} = V_{OUT} + 6V$	200	275	350	mA

Power-up Procedure

Suggestion Required Equipments

- RTQ2569-50GQW-QA Evaluation Board
- DC power supply capable of at least 30V and 0.2A
- Electronic load capable of 6A
- Function Generator
- Oscilloscope

Quick Start Procedures

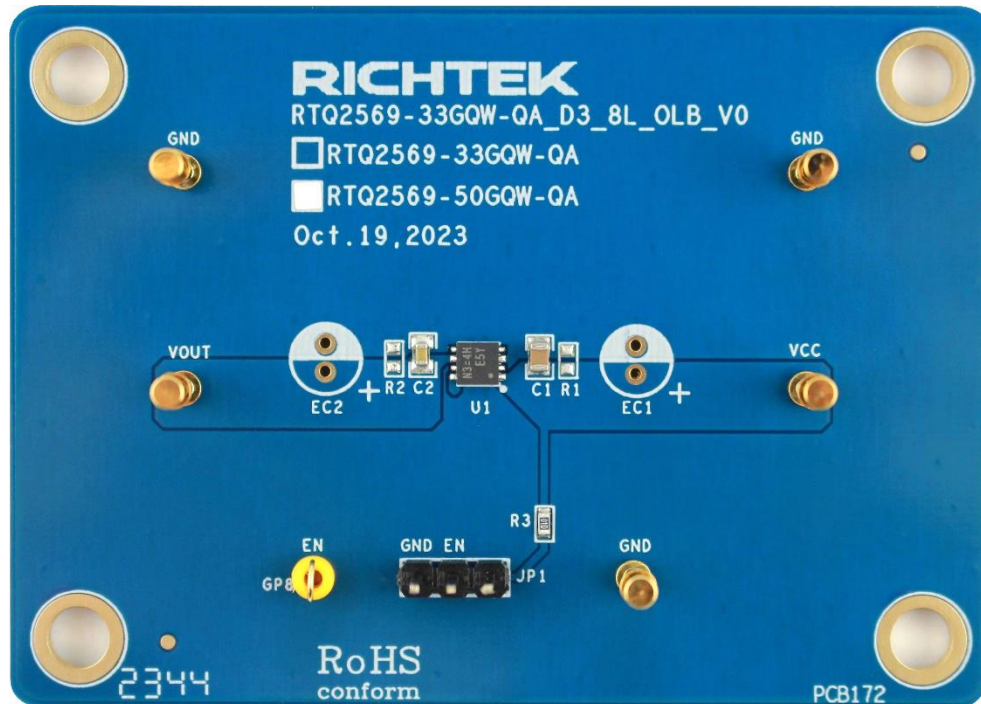
The Evaluation Board is fully assembled and tested. Follow the steps below to verify board operation. Do not turn on supplies until all connections are made. When measuring the output voltage ripple, care must be taken to avoid a long ground lead on the oscilloscope probe. Measure the output voltage ripple by touching the probe tip and ground ring directly across the last output capacitor.

Proper measurement equipment setup and follow the procedure below.

- 1) With power off, connect the input power supply to VIN and GND pins.
- 2) With power off, connect the electronic load between the VOUT and nearest GND pins.
- 3) Turn on the power supply at the input. Make sure that the input voltage does not exceeds 30V on the Evaluation Board.
- 4) Check for the proper output voltage using a voltmeter.
- 5) Once the proper output voltage is established, adjust the load within the operating ranges and observe the output voltage regulation, ripple voltage, efficiency and other performance.

Detailed Description of Hardware

Headers Description and Placement



Carefully inspect all the components used in the EVB according to the following Bill of Materials table, and then make sure all the components are undamaged and correctly installed. If there is any missing or damaged component, which may occur during transportation, please contact our distributors or e-mail us at evb_service@richtek.com.

Test Points

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

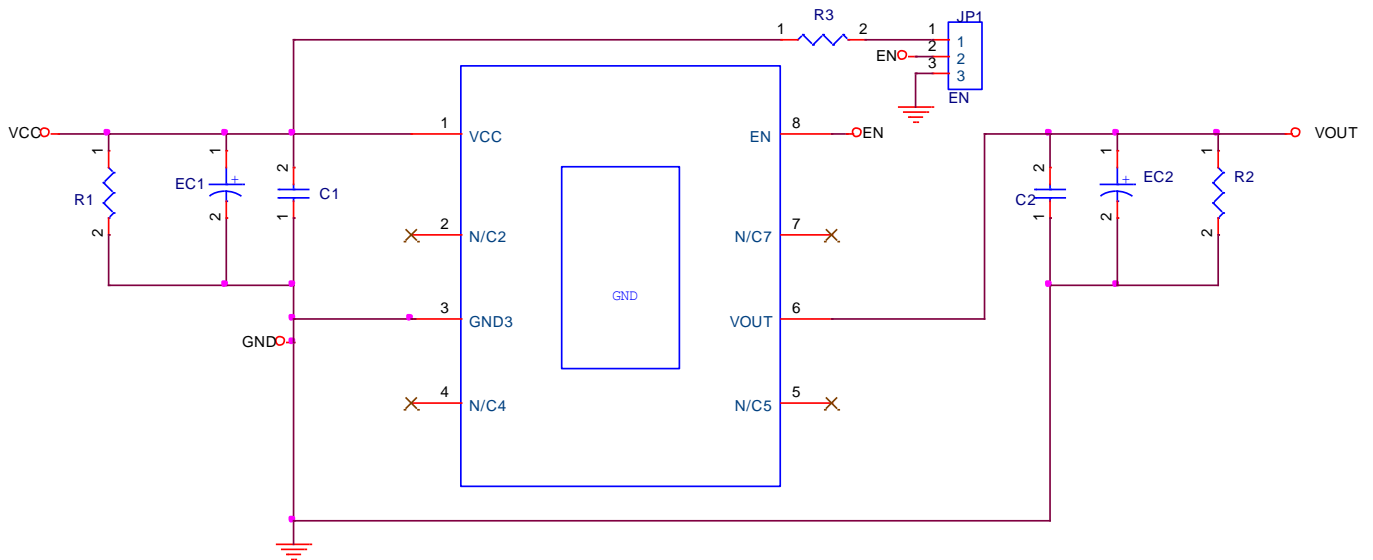
Test Point/ Pin Name	Function
VCC	Input voltage.
VOUT	Output voltage.
GND	Ground.
EN	Enable test point.
JP1	EN jumper. Connect EN to ground to disable, open to enable.

Bill of Materials

VIN = 12V, VOUT = 5.0V, IOUT = 0.5A, fsw = 500kHz						
Reference	Count	Part Number	Value	Description	Package	Manufacturer
U1	1	RTQ2569GQW-50GQW-QA	RTQ2569-QA	LDO	WDFN-8L 3x3	RICHTEK
C1	1	0805B105K500CT	1 μ F	Capacitor, Ceramic, 50V, X7R	0805	WALSN
C2	1	GRM188R61C225KE15D	2.2 μ F	Capacitor, Ceramic, 16V, X7R	0603	MURATA
R3	1	WR06X1003FTL	100k	Resistor, Chip, 1/10W, 1%	0603	WALSIN

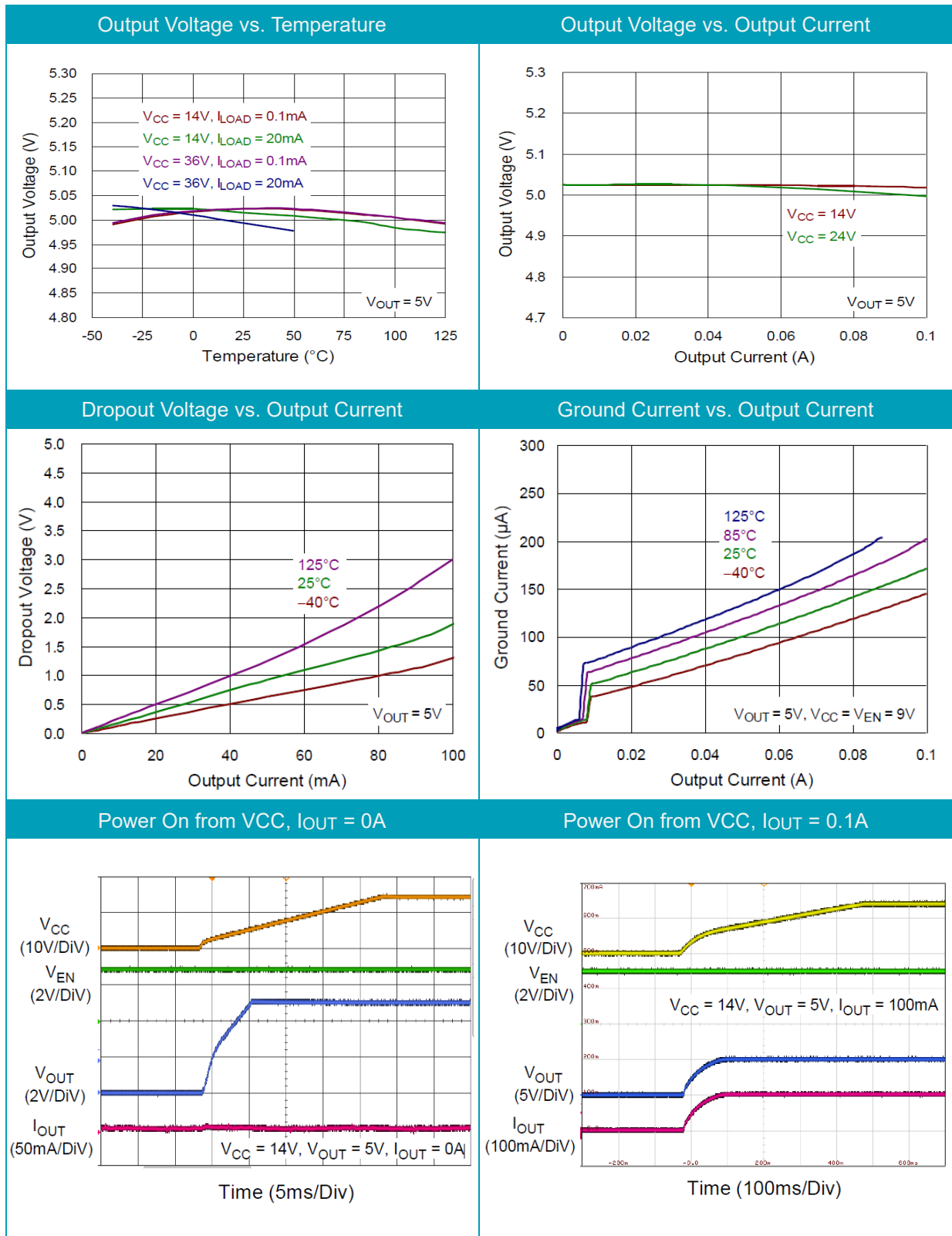
Typical Applications

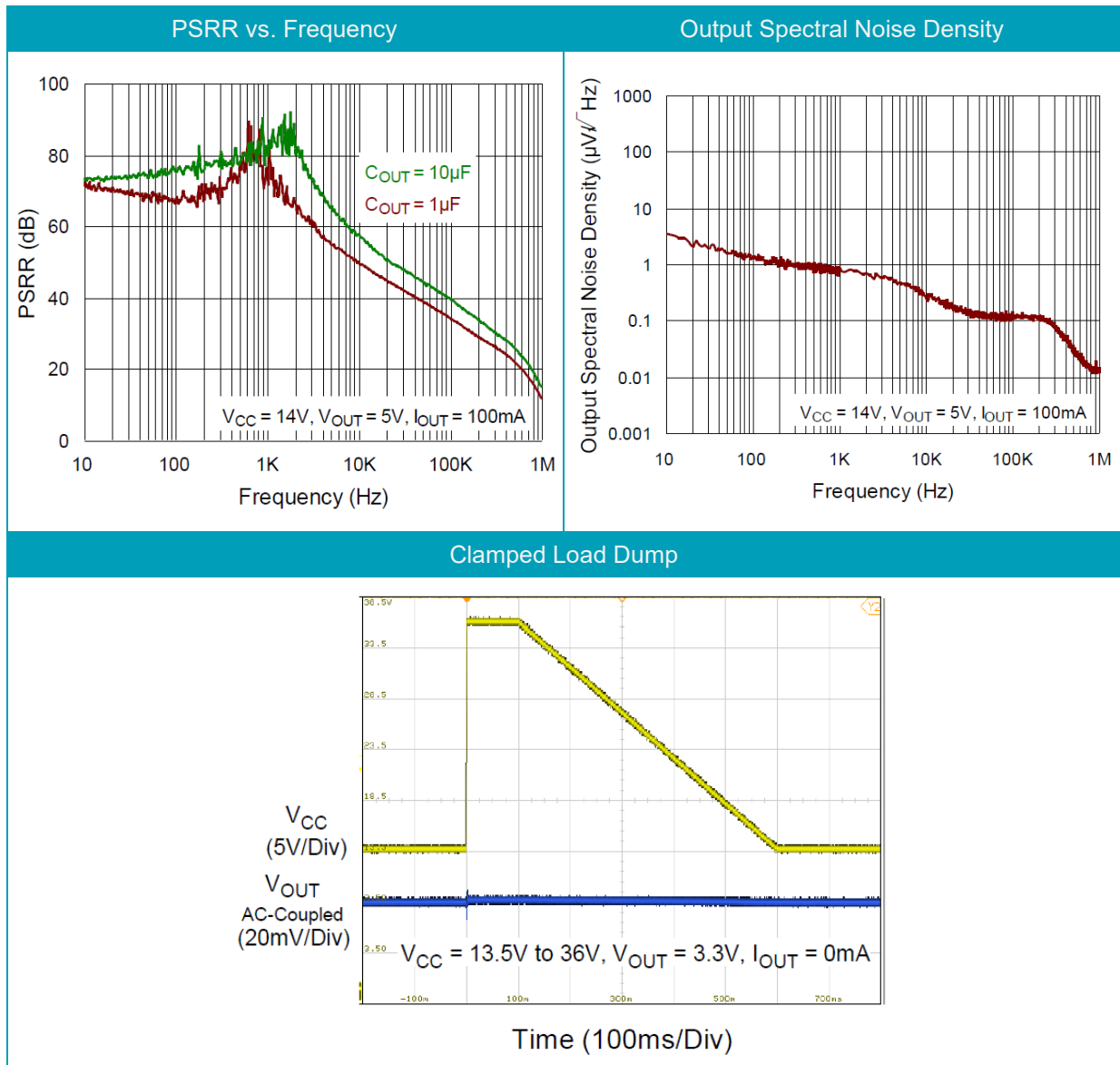
EVB Schematic Diagram



1. The capacitance values of the input and output capacitors will influence the input and output voltage ripple.
2. MLCC capacitors have degrading capacitance at DC bias voltage, and especially smaller size MLCC capacitors will have much lower capacitance.

Measure Result





Note: When measuring the input or output voltage ripple, care must be taken to avoid a long ground lead on the oscilloscope probe. Measure the output voltage ripple by touching the probe tip directly across the output capacitor.

Evaluation Board Layout

Figure 1 to Figure 2 are RTQ2569 Evaluation Board layout. This board size is 70mm x 50mm and is constructed on two-layer PCB, outer layers with 2 oz. Cu and inner layers with 1 oz. Cu.

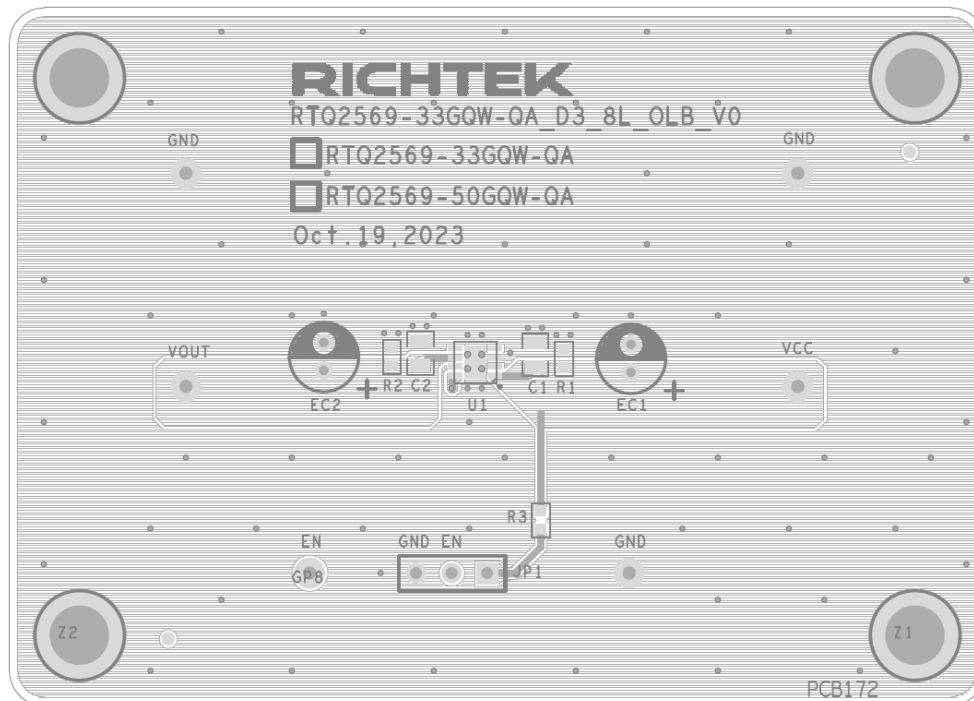


Figure 1. Top View

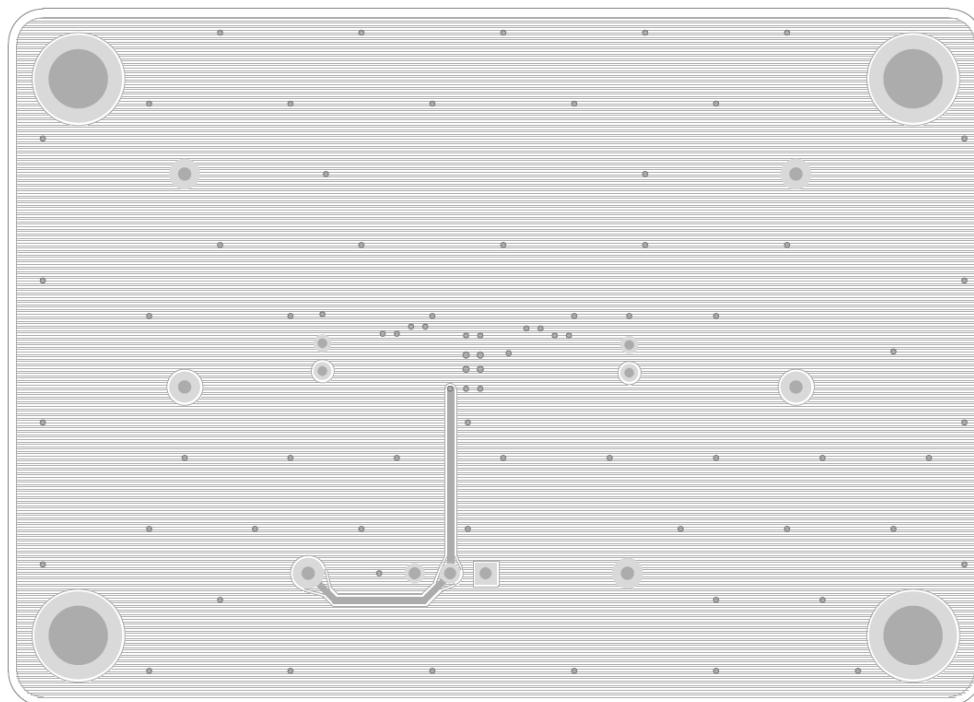


Figure 2. Bottom View

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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