

NV8664ST50T3GEVB

NCV8664 Evaluation Board User's Manual



ON Semiconductor®

<http://onsemi.com>

EVAL BOARD USER'S MANUAL

Description

The NCV8664 is a precision 3.3 V and 5.0 V fixed output, low dropout integrated voltage regulator with an output current capability of 150 mA. Careful management of light load current consumption, combined with a low leakage process, achieve a typical quiescent ground current of 22 μ A. The output voltage is accurate within $\pm 2.0\%$, and maximum dropout voltage is 600 mV at full rated load current. The following ceramic capacitors are the recommended values to be used with these devices; $C_{in} = 0.1 \mu$ F, $C_{out} = 10 \mu$ F.

Features

- $\pm 2.0\%$ Output Accuracy, Over Full Temperature Range
- 30 μ A Maximum Quiescent Current at $I_{out} = 100 \mu$ A
- 600 mV Maximum Dropout Voltage at 150 mA Load Current

- Wide Input Voltage Operating Range of 5.5 V to 45 V
- Internal Fault Protection
 - -42 V Reverse Voltage
 - Short Circuit/Overcurrent
 - Thermal Overload

Board Notes

Max voltage on V_{in} cap not to exceed 35 V.

Board Layouts

These boards are shown in sets of 2 due to the minimum board size requirement of most board fabrication houses. When sent out for fabrication, it must be indicated that the center line of the board set be V-scored to allow board separation.

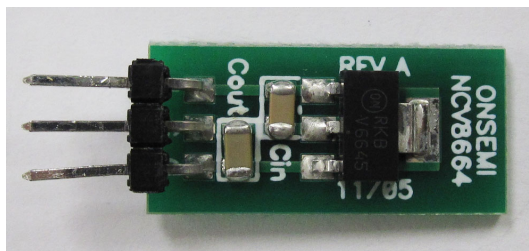


Figure 1. Evaluation Board Photo

NV8664ST50T3GEVB

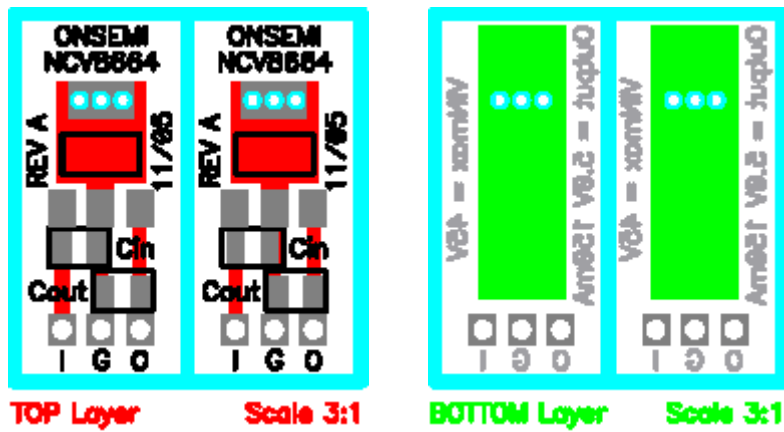


Figure 2. SOT-223 Evaluation Board

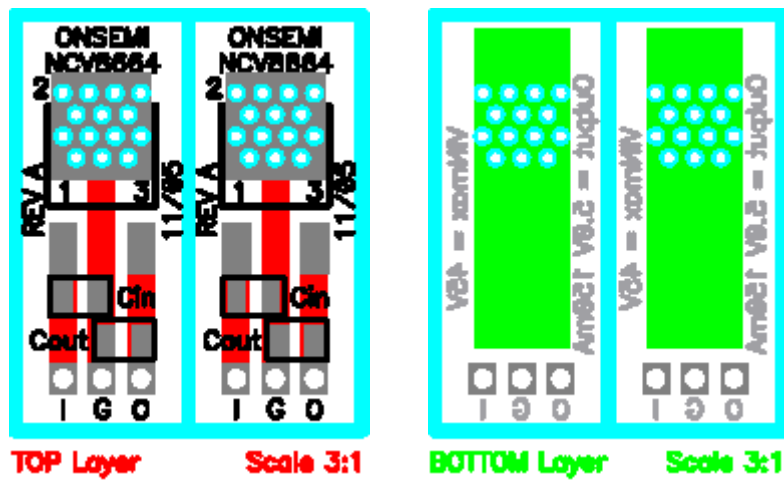


Figure 3. DPAK Evaluation Board

SCHEMATIC FOR THE NCV8664 EVALUATION BOARD

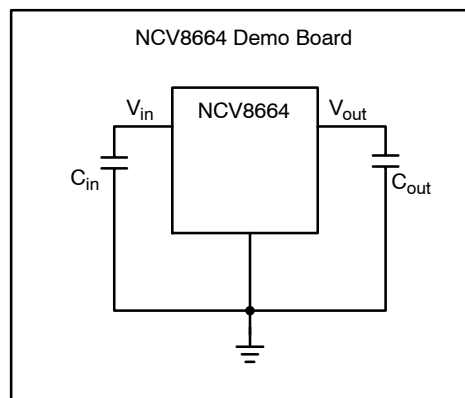


Figure 4. NCV8664 Evaluation Board Circuit

NV8664ST50T3GEVB

Table 1. BILL OF MATERIALS FOR THE NCV8664 EVALUATION BOARD

Value	Tolerance	Footprint	Manufacturer	Part Number	Substitution Allowed	Lead Free
-------	-----------	-----------	--------------	-------------	----------------------	-----------

SOT223 BOM

–	–	–	Advanced Circuits	NCV8664DPAK3DemoBoard	No	Yes
–	–	SOT223	On Semiconductor	NCV8664ST50R3G	No	Yes
–	–	–	Molex/Waldom Electronics Corporation	22-28-8030	Yes	Yes
0.1 μ F	10%	1206	Murata Electronics North America	GRM319R71H104KA01D	Yes	Yes
10 μ F	10%	1206	Murata Electronics North America	GRM31CR71C106KAC7L	Yes	Yes

DPAK BOM

–	–	–	Advanced Circuits	NCV8664DPAK3DemoBoard	No	Yes
–	–	DPAK	On Semiconductor	NCV8664DT50RKG	No	Yes
–	–	–	Molex/Waldom Electronics Corporation	22-28-8030	Yes	Yes
0.1 μ F	10%	1206	Murata Electronics North America	GRM319R71H104KA01D	Yes	Yes
10 μ F	10%	1206	Murata Electronics North America	GRM31CR71C106KAC7L	Yes	Yes

Test Procedure

Required Equipment:

- Resistive Load
- 2 Multimeters
- One NCV8664 Evaluation Board
- DC Power Supply

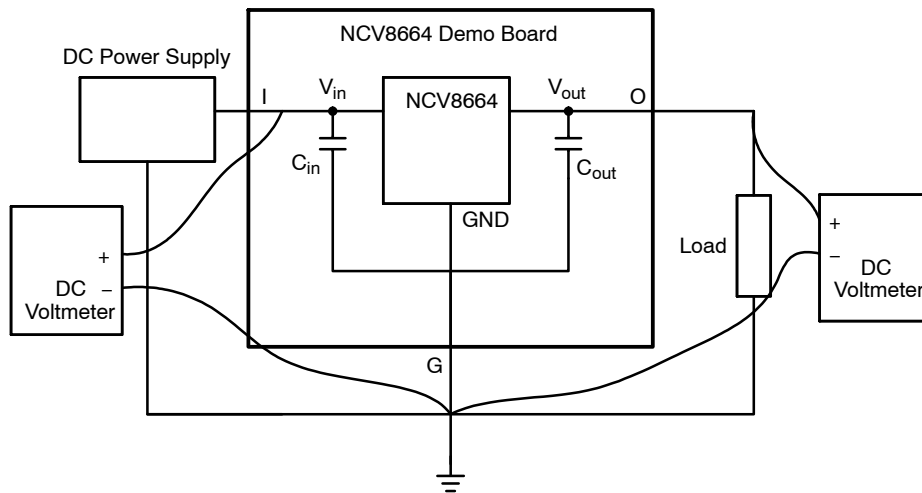


Figure 5. Dropout Voltage Test Setup

Dropout Voltage Verification Steps

1. Connect circuit as shown in Figure 5.
2. Set $V_{in} = 13.5$ V, Record V_{out} .
3. Reduce V_{in} until V_{out} has dropped by 100 mV.
4. Subtract V_{out} from V_{in} . Resulting Voltage is Dropout Voltage.

NV8664ST50T3GEVB

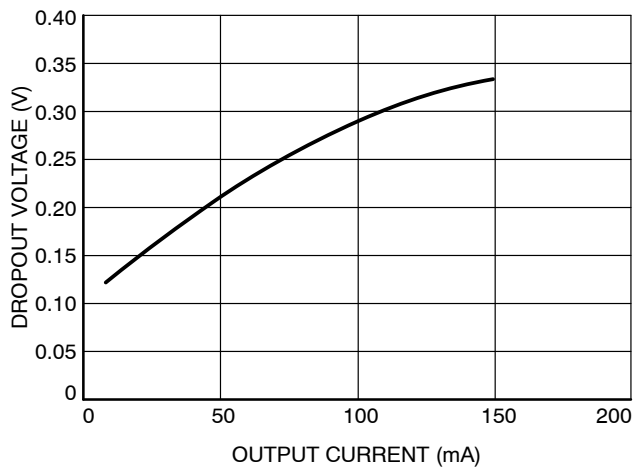


Figure 6. Dropout Voltage vs. Output Current

Quiescent Current Verification Steps

1. Connect circuit as shown in Figure 7.
2. Set $V_{in} = 13.5$ V.
3. Subtract Output Current from Input Current.

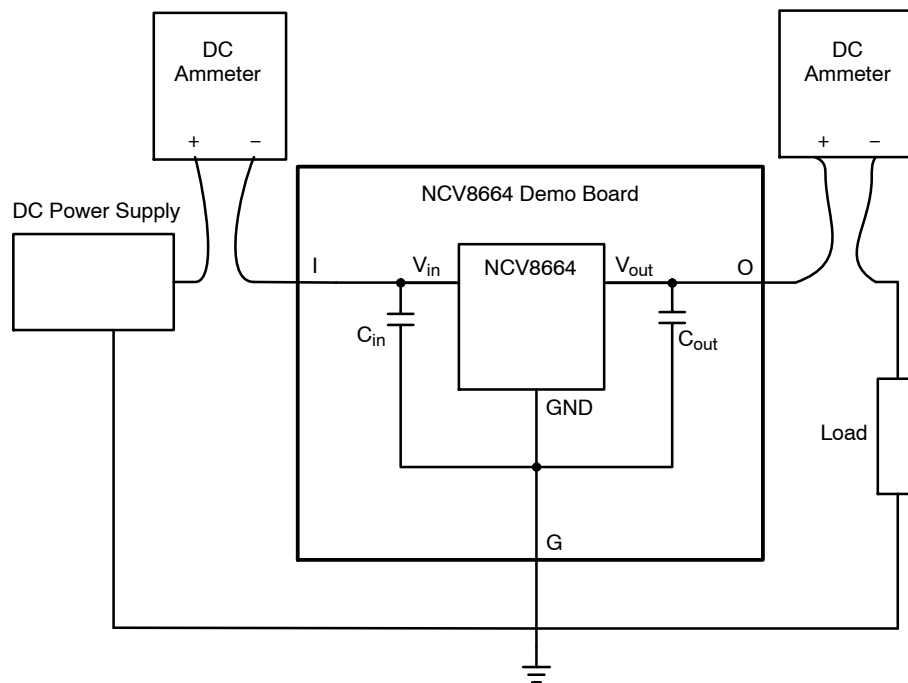


Figure 7. Quiescent Current Verification Setup

NV8664ST50T3GEVB

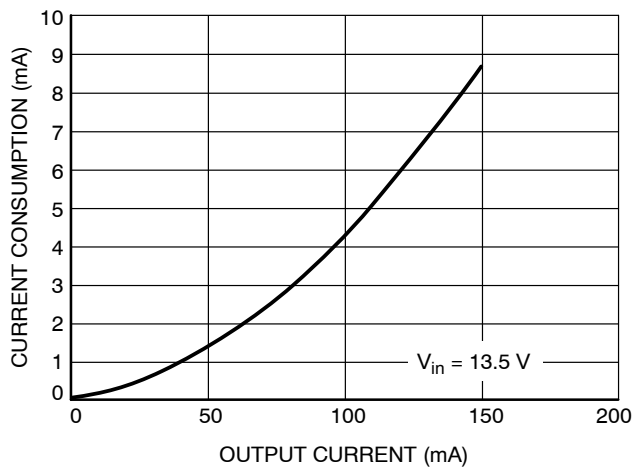


Figure 8. Current Consumption vs. Output Current

Output Voltage Verification Steps

1. Connect circuit as shown in Figure 9.
2. Set output load to $100\ \Omega$, Set $V_{in} = 0\text{ V}$, Record V_{out} .
3. Increase V_{in} , measure V_{out} .

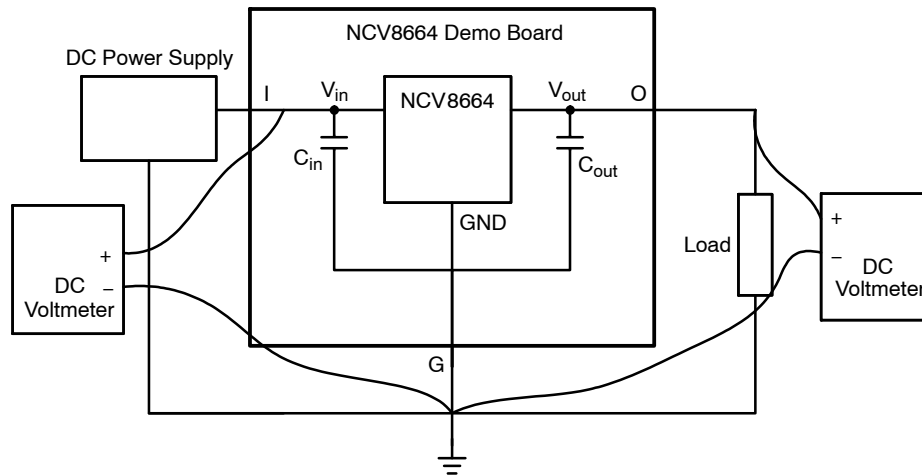


Figure 9. Quiescent Current Verification Setup

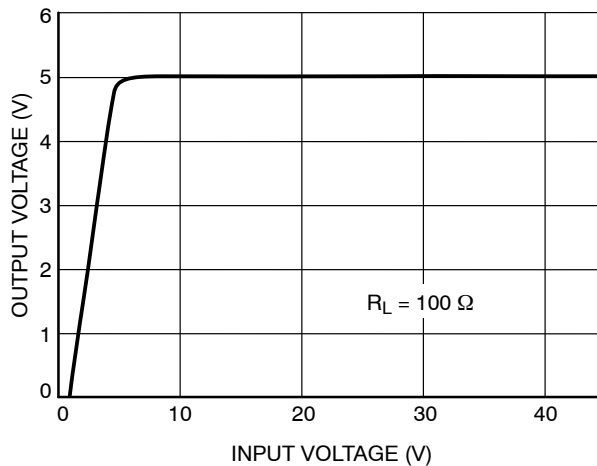


Figure 10. Input Voltage vs. Output Voltage

onsemi, **onsemi**, and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "**onsemi**" or its affiliates and/or subsidiaries in the United States and/or other countries. **onsemi** owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of **onsemi**'s product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. **onsemi** is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

The evaluation board/kit (research and development board/kit) (hereinafter the "board") is not a finished product and is not available for sale to consumers. The board is only intended for research, development, demonstration and evaluation purposes and will only be used in laboratory/development areas by persons with an engineering/technical training and familiar with the risks associated with handling electrical/mechanical components, systems and subsystems. This person assumes full responsibility/liability for proper and safe handling. Any other use, resale or redistribution for any other purpose is strictly prohibited.

THE BOARD IS PROVIDED BY ONSEMI TO YOU "AS IS" AND WITHOUT ANY REPRESENTATIONS OR WARRANTIES WHATSOEVER. WITHOUT LIMITING THE FOREGOING, ONSEMI (AND ITS LICENSORS/SUPPLIERS) HEREBY DISCLAIMS ANY AND ALL REPRESENTATIONS AND WARRANTIES IN RELATION TO THE BOARD, ANY MODIFICATIONS, OR THIS AGREEMENT, WHETHER EXPRESS, IMPLIED, STATUTORY OR OTHERWISE, INCLUDING WITHOUT LIMITATION ANY AND ALL REPRESENTATIONS AND WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE, NON-INFRINGEMENT, AND THOSE ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE CUSTOM OR TRADE PRACTICE.

onsemi reserves the right to make changes without further notice to any board.

You are responsible for determining whether the board will be suitable for your intended use or application or will achieve your intended results. Prior to using or distributing any systems that have been evaluated, designed or tested using the board, you agree to test and validate your design to confirm the functionality for your application. Any technical, applications or design information or advice, quality characterization, reliability data or other services provided by **onsemi** shall not constitute any representation or warranty by **onsemi**, and no additional obligations or liabilities shall arise from **onsemi** having provided such information or services.

onsemi products including the boards are not designed, intended, or authorized for use in life support systems, or any FDA Class 3 medical devices or medical devices with a similar or equivalent classification in a foreign jurisdiction, or any devices intended for implantation in the human body. You agree to indemnify, defend and hold harmless **onsemi**, its directors, officers, employees, representatives, agents, subsidiaries, affiliates, distributors, and assigns, against any and all liabilities, losses, costs, damages, judgments, and expenses, arising out of any claim, demand, investigation, lawsuit, regulatory action or cause of action arising out of or associated with any unauthorized use, even if such claim alleges that **onsemi** was negligent regarding the design or manufacture of any products and/or the board.

This evaluation board/kit does not fall within the scope of the European Union directives regarding electromagnetic compatibility, restricted substances (RoHS), recycling (WEEE), FCC, CE or UL, and may not meet the technical requirements of these or other related directives.

FCC WARNING – This evaluation board/kit is intended for use for engineering development, demonstration, or evaluation purposes only and is not considered by **onsemi** to be a finished end product fit for general consumer use. It may generate, use, or radiate radio frequency energy and has not been tested for compliance with the limits of computing devices pursuant to part 15 of FCC rules, which are designed to provide reasonable protection against radio frequency interference. Operation of this equipment may cause interference with radio communications, in which case the user shall be responsible, at its expense, to take whatever measures may be required to correct this interference.

onsemi does not convey any license under its patent rights nor the rights of others.

LIMITATIONS OF LIABILITY: **onsemi** shall not be liable for any special, consequential, incidental, indirect or punitive damages, including, but not limited to the costs of requalification, delay, loss of profits or goodwill, arising out of or in connection with the board, even if **onsemi** is advised of the possibility of such damages. In no event shall **onsemi**'s aggregate liability from any obligation arising out of or in connection with the board, under any theory of liability, exceed the purchase price paid for the board, if any.

The board is provided to you subject to the license and other terms per **onsemi**'s standard terms and conditions of sale. For more information and documentation, please visit www.onsemi.com.

ADDITIONAL INFORMATION

TECHNICAL PUBLICATIONS:

Technical Library: www.onsemi.com/design/resources/technical-documentation
onsemi Website: www.onsemi.com

ONLINE SUPPORT: www.onsemi.com/support

For additional information, please contact your local Sales Representative at
www.onsemi.com/support/sales

