SCT9332 Evaluation Board User's Guide

FEATURES

- EMI Reduction with Switching Node Ringing-free
- 3.8V-32V Wide Input Voltage Range
- Up to 3.5A Continuous Output Load Current
- 0.8V ±1% Output Voltage
- Fully Integrated 74mΩ Rdson High-side MOSFET and 40mΩ Rdson Low-side MOSFET
- Supports Pulse Width Modulation (PWM)
- Low-Dropout (LDO) Mode
- 450KHz Switching Frequency with ±6% Frequency Spread Spectrum FSS Modulation
- 100ns Minimum On-time
- Precision Enable Threshold for Programmable UVLO Threshold and Hysteresis
- Low Drop-Out LDO Operation
- Pulse Skipping Modulation PSM in Light Load
- 4ms Built-in Soft-start Time
- Power Good Indicator with 5MΩ Internal Pull-up
- Available in , V-DFN3020-13/SWP Package

APPLICATIONS

- White Goods, Home Appliance
- network systems
- Audio, WiFi Speaker
- Printer, Charging Station

DESCRIPTION

The EV9332-B-01A Evaluation Board is designed to demonstrate the capabilities of SCT9332, what are 3.5A, EMI friendly synchronous buck converters with up to 32V wide input voltage range. The SCT9331 dopts peak current mode control with integrated compensation network. The device has a Power Good Indicator with a pull-up resistance of 5MΩ.

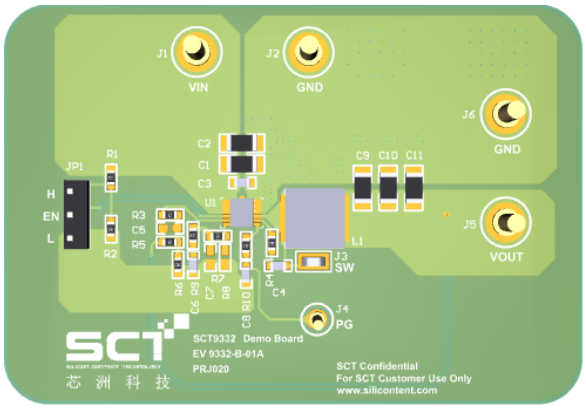
This user's guide describes the characteristics, operation and the use of the EV9332-B-01A Evaluation Module including EVM specifications, recommended test setup, test result, schematic diagram, bill of materials, and the board layout.

Board Number	IC Number
EV9332-B-01A	SCT9332

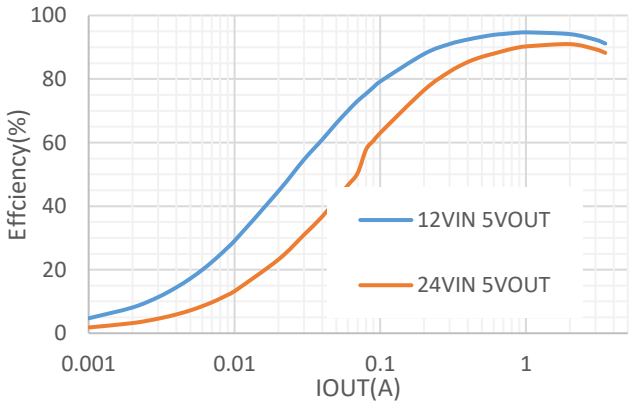
PERFORMANCE SUMMARY

Table 1. Performance — Specifications are at TA = 25°C

Parameter	Condition	Value
Input Voltage	DC up to 32V	3.8V-32V
Output Voltage	PFM	5V ± 1%
Output Current	Continuous DC current	3.5A
Frequency	Default	450KHz



SCT9332 Evaluation Board Top View



SCT9332 Efficiency

QUICK START PROCESURE

Evaluation board EV9332-B-01A is easy to set up to evaluate the performance of the SCT9332. Refer to Figure 1 for proper measurement equipment setup and follow the procedure below:

1. Place jumpers in the following positions:
   - J1, J2: Input terminal. Connect the power supply to the input of converter.
   - J5, J6 Output terminal. Connect the load to the output of converter.
   - JP1: Enable Jumper. Install ON shunt to connect EN pin to Vin through a 100KΩ resistor to enable IC.
2. Install OFF shunt to disable IC. With power off, connect the input power supply to J1 V_{IN} connector and J2 GND connector. Turn on the power at the input. Make sure that the input voltage does not exceed 32V, and supports sufficient current limit.
3. Check the output voltage at J5, J6. The output voltage should be 5V typical. Once the proper output voltage is established, adjust the load within the operating range and observe the output voltage regulation, output voltage ripple, efficiency and other parameters.
4. To use the enable function, apply a digital input to the EN pin of JP1.

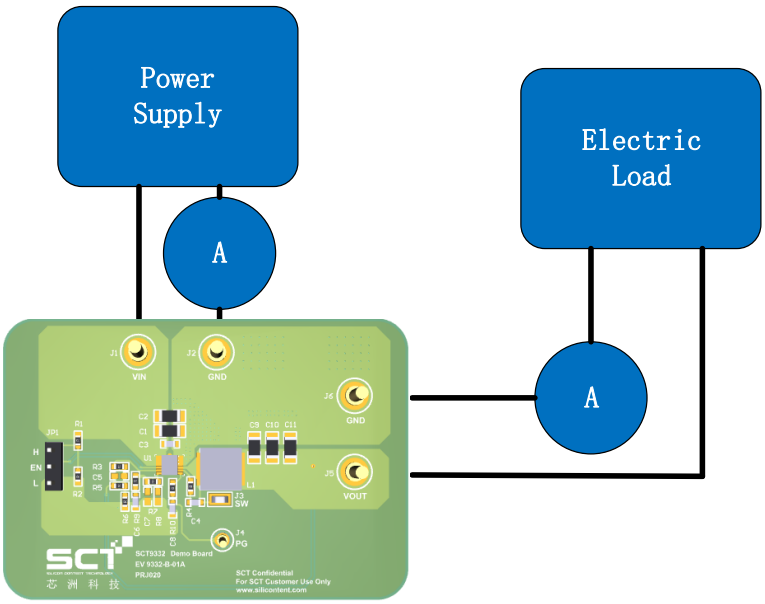


Figure 1. Proper Supply, Load and Measurement Equipment Setup

NOTE: When measuring the voltage ripple, care must be taken to avoid a long ground lead on the oscilloscope probe. Measure the input or output voltage ripple by touching the probe tip directly across relevant capacitor of VIN or VOUT. See Figure 2 for proper scope probe technique.

Figure 2. Measuring Voltage Ripple Across Terminals or Directly Across Ceramic Capacitor

SCHEMATIC DIAGRAM

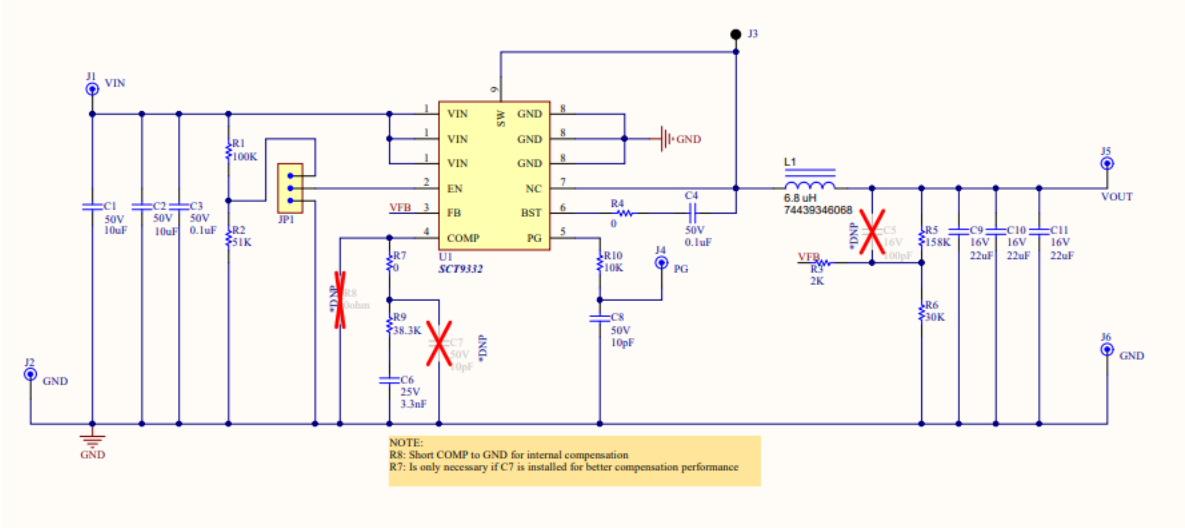


Figure 3. SCT9332 Evaluation Board Schematic

BILL OF MATERIALS

Table 2. Bills of Materials

Manufacture	Comment	Designator	Description	Quantity
Silicon Content Technology	SCT9332	U1	SCT9332, 3.8V-32V Vin, 3.5A, Low Quiescent Current Synchronous Step-down Converter	1
Wurth Elektronik	613 003 111 21	JP1	'Header, 100mil, 3x1, Tin plated, TH	1
QJJCJ	Terminal_2.1	J1, J2, J5, J6	Terminal	4
Wurth Elektronik	885 012 209 073	C1,C2	CAP, CERM, 10 uF, 50 V, +/- 10%, X7R, 1210	2
Wurth Elektronik	885 012 206 095	C3, C4	CAP, CERM, 0.1 uF, 50 V, +/- 10%, X7R, 0603	2
Wurth Elektronik	885012206062	C6	CAP, CERM, 3.3nF, 25 V, +/- 10%, X7R, 0603	1
AVX	06035C100KAT2A	C8	CAP, CERM, 10pF, 50 V, +/- 10%, X7R, 0603	1
Wurth Elektronik	885 012 109 010	C9, C10, C11	CAP, CERM, 22 uF, 16V, +/-10%, X7R, 1210	3
Wurth Elektronik	885012206028	C5	CAP, CERM, 100 pF, 16 V, +/- 10%, X7R, 0603	0
AVX	06035C100KAT2A	C7	CAP, CERM, 10 pF, 50 V, +/- 10%, X7R, 0603	0
Wurth Elektronik	74439346068	L1	Inductor, WE-XHMI, 6.8uH, 3.5 A, SMD	1
Yageo	RC0603FR-07100KL	R1	RES, 100 k, 1%, 0.1 W, 0603	1
Yageo	RC0603FR-0751KL	R2	RES, 51 k, 1%, 0.1 W, 0603	1
Yageo	RC0603FR-072KL	R3	RES, 2k, 1%, 0.1 W, 0603	1
Yageo	RC0603FR-070KL	R4,R7	RES, 0, 1%, 0.1 W, 0603	2
Yageo	RC0603FR-07158KL	R5	RES, 158k, 1%, 0.1 W, 0603	1
Yageo	RC0603FR-0730KL	R6	RES, 30k, 1%, 0.1 W, 0603	1
Yageo	RC0603FR-0738K3L	R9	RES, 38.3k, 1%, 0.1 W, 0603	1
Yageo	RC0603FR-0710KL	R10	RES, 10k, 1%, 0.1 W, 0603	1

PRINTED CIRCUIT BOARD LAYOUT

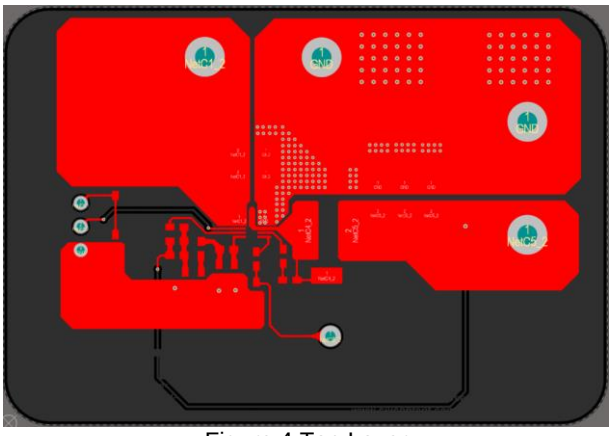


Figure 4.Top Layer

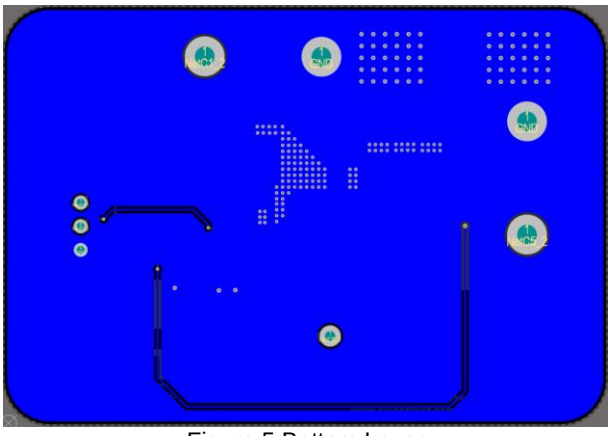


Figure 5.Bottom Layer

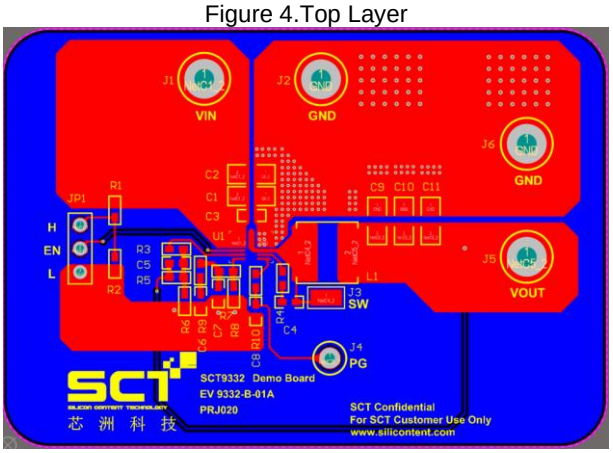


Figure 6. Composite View

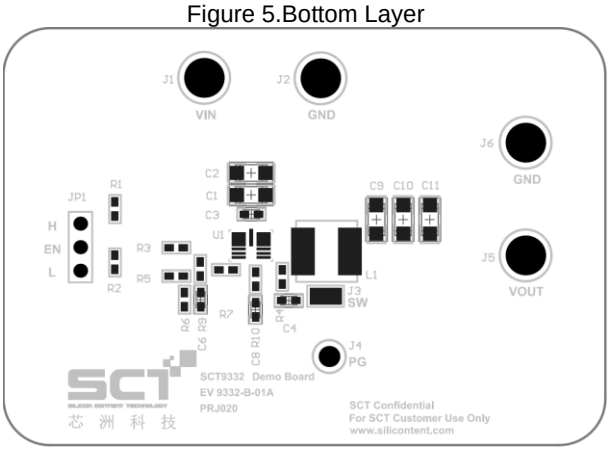


Figure 7. Assemble Drawing

EVB TEST RESULTS

Vin=12V, Vout=5V, unless otherwise noted

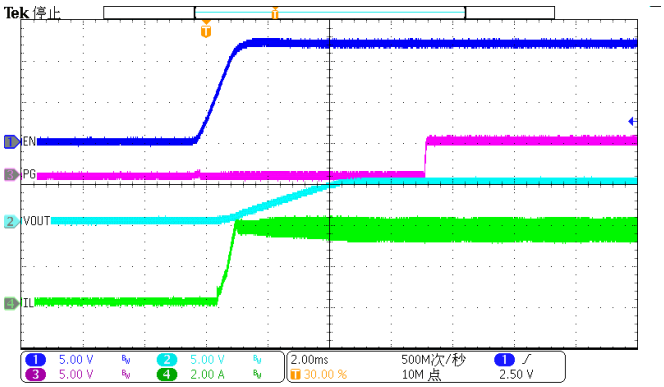


Figure 8. Power Up

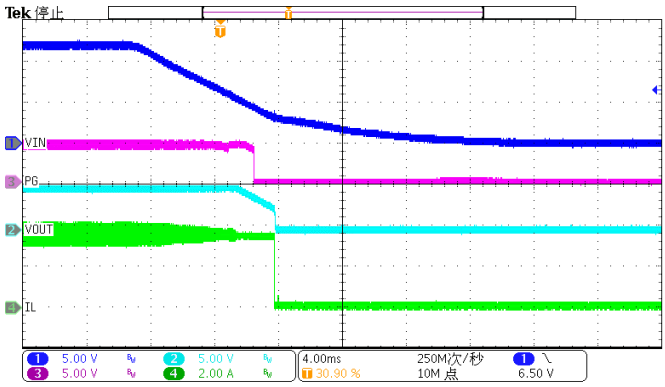


Figure 9. Power Down

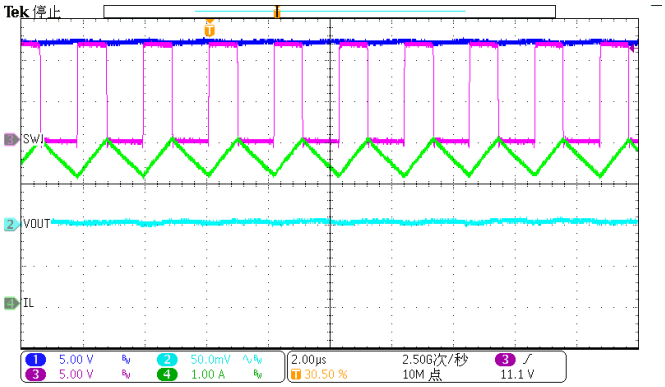


Figure 10. SW node waveform and Output Ripple, IOUT=3.5A

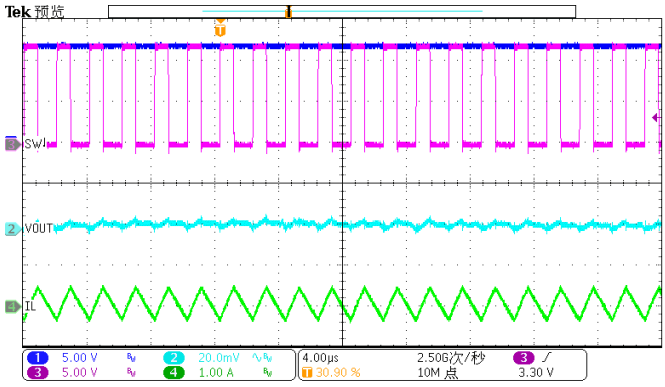


Figure 11. SW node Waveform and Output Ripple, IOUT=10mA

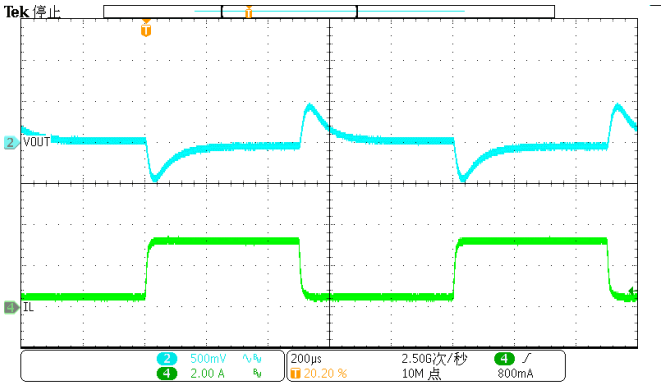


Figure 12. Load Transient
VOUT=5V, IOUT=0.35A to 3.15A, SR=1600mA/us

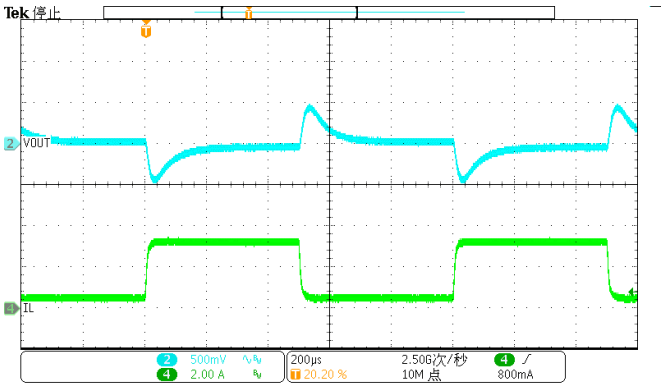


Figure 13. Load Transient
VOUT=5V, IOUT=0.875A to 2.625A, SR=250mA/us

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