SCT9325 Evaluation Board User's Guide

FEATURES

- EMI Reduction with Switching Node Ringing-free
- 3.8V-32V Wide Input Voltage Range
- Up to 2A Continuous Output Load Current
- 5V ±1% Output Voltage
- Fully Integrated 130mΩ R_{dson} High-side MOSFET and 70mΩ R_{dson} Low-side MOSFET
- 1uA Shut-down Current
- 20uA Ultra Low Quiescent Current
- 500KHz Switching Frequency with ±6% Frequency Spread Spectrum FSS Modulation
- 80ns 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
- Thermal Shutdown Protection at 160°C
- Available in SOP-8L Package

APPLICATIONS

- White Goods, Home Appliance
- Surveillance
- Audio, WiFi Speaker
- Printer, Charging Station
- DTV, STB, Monitor/LCD Display

DESCRIPTION

The EV9325-B-01A Evaluation Board is designed to demonstrate the capabilities of SCT9325, what are 2A, EMI friendly synchronous buck converters with up to 32V wide input voltage range. The SCT9325, features an ultra-low quiescent operating current of 20uA. The SCT9325 is available in a low-profile SOP-8 package.

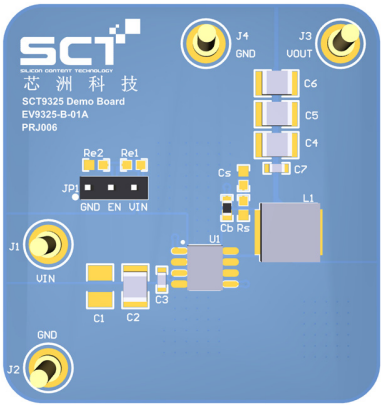
This user's guide describes the characteristics, operation and the use of the EV9325-B-01A Evaluation Module including EVM specifications, recommended test setup, test result, schematic diagram, bill of materials, and the board layout.

Board Number	IC Number
EV9325-B-01A	SCT9325

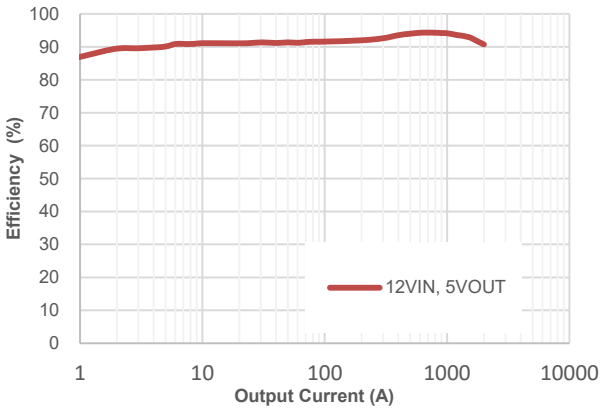
PERFORMANCE SUMMARY

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	2A
Frequency	Default	500KHz



SCT9325 Evaluation Board Top View



SCT9325 Efficiency

QUICK START PROCESURE

Evaluation board EV9325-B-01A is easy to set up to evaluate the performance of the SCT9325. 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.
   - J3, J4 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 J3, J4. 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.

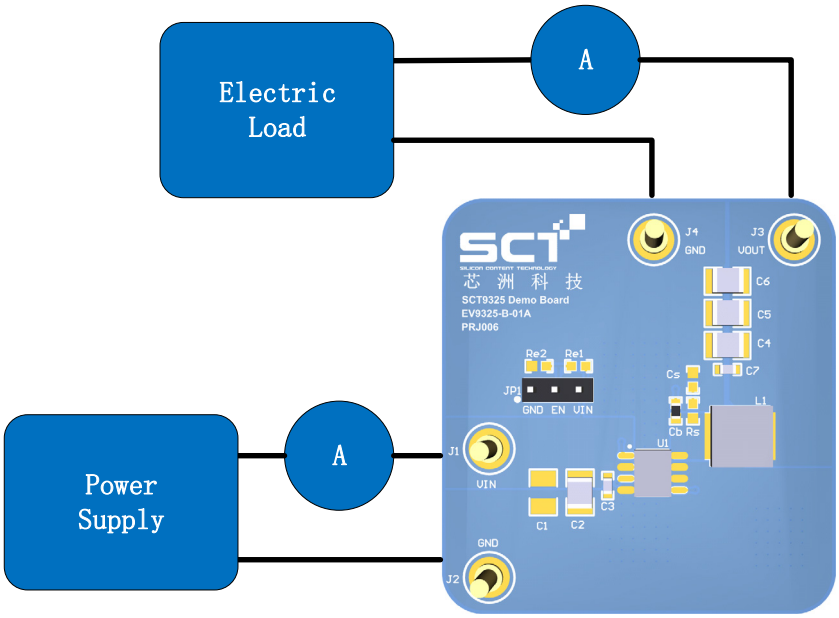


Figure 1. Proper Supply, Load and Measurement Equipment Setup

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

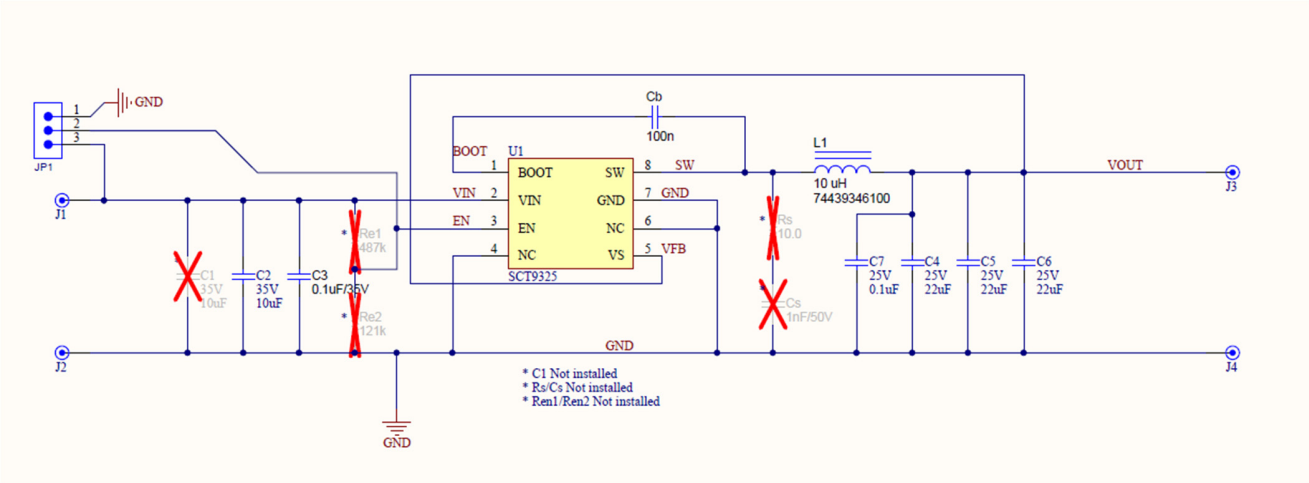


Figure 3. SCT9325 Evaluation Board Schematic

BILL OF MATERIALS

Table 2. Bills of Materials

Manufacture	Comment	Designator	Description	Quantity
Silicon Content Technology	SCT9325	U1	SCT9325, 3.8V-28V Vin, 3A, Low Quiescent Current Synchronous Step-down Converter ESOP-8	1
Wurth Elektronik	613 003 111 21	JP1	'Header, 100mil, 3x1, Tin plated, TH	1
QJJCJ	Terminal_2.1	J1, J2, J3, J4	Terminal	4
Wurth Elektronik	Not Install	C1	CAP, CERM, 10 Uf，35 V, +/- 10%, X7R, 1210	0
Murata	GRM32ER7YA106KA12L	C2	CAP, CERM, 10 uF, 35 V, +/- 10%, X7R, 1210	1
Wurth Elektronik	885 012 206 095	C3, Cb	CAP, CERM, 0.1 uF, 50 V, +/- 10%, X7R, 0603	2
Wurth Elektronik	885 012 109 010	C4, C5, C6	CAP, CERM, 22 uF, 16V, +/-10%, X7R, 1210	3
YAGEO	CC0603KRX7R8BB104	C7	CAP, CERM,0.1uF, 25V,+/- 10%, X7R, 0603	1
Wurth Elektronik	885 012 206 083	Cs	CAP, CERM, 1000 pF, 50 V, +/- 10%, X7R, 0603	0
Wurth Elektronik	74439346100	L1	Inductor, WE-XHMI, 10 uH, 5 A, 26.5 mohm, SMD	1
Yageo	RC0603FR-07487KL	Re1	RES, 487 k, 1%, 0.1 W, 0603	0
Yageo	RC0603FR-07121KL	Re2	RES, 121 k, 1%, 0.1 W, 0603	0
Vishay	CRCW060310R0FKEA	Rs	RES, 10.0, 1%, 0.1 W, 0603	0

PRINTED CIRCUIT BOARD LAYOUT

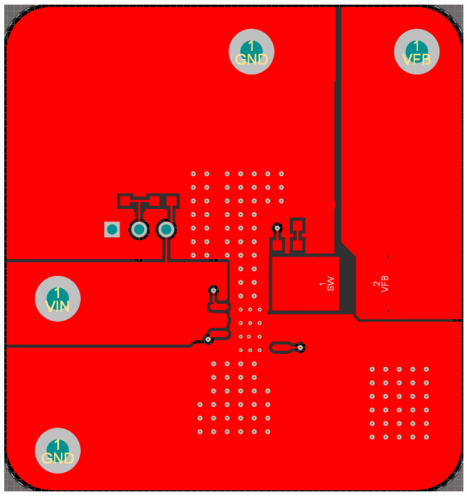


Figure 4.Top Layer

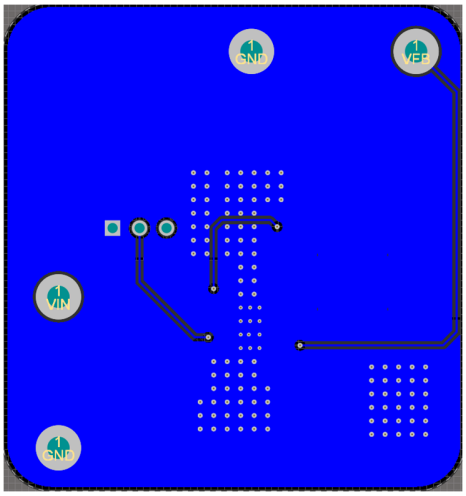


Figure 5.Bottom Layer

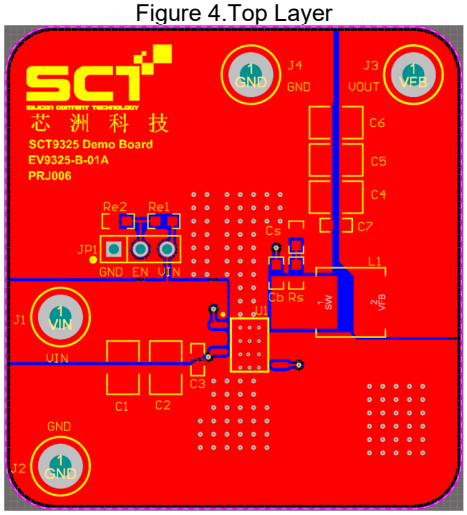


Figure 6. Composite View

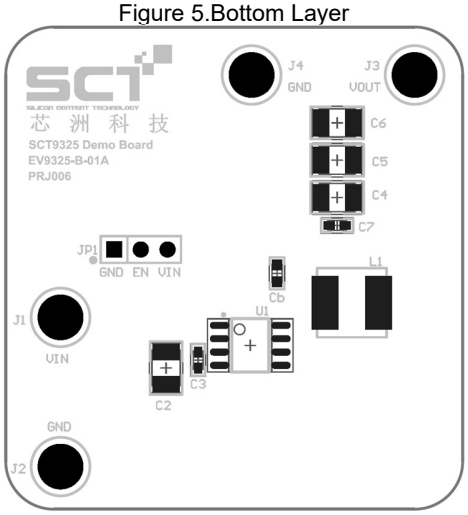


Figure 7. Assemble Drawing

EVB TEST RESULTS

Vin=24V, Vout=5V, 2A loading, unless otherwise noted

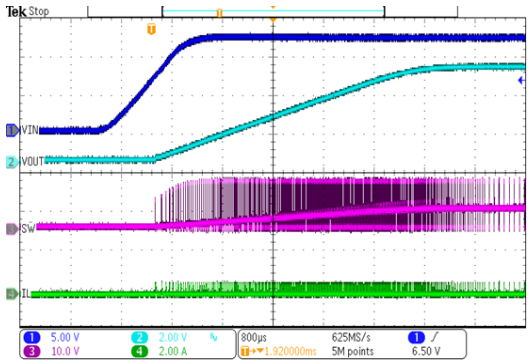


Figure 8. Power Up

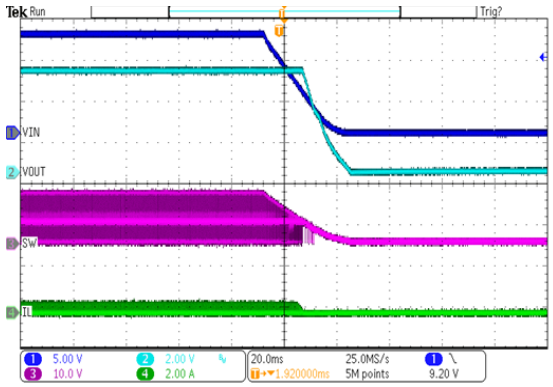


Figure 9. Power Down

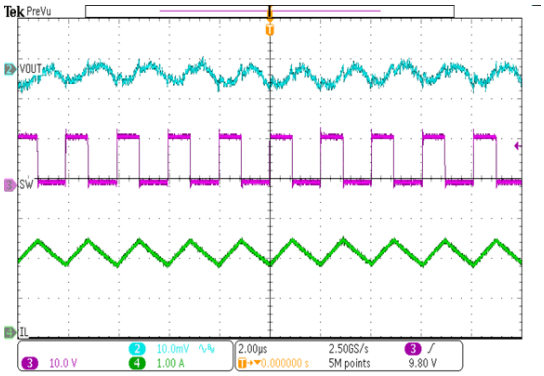


Figure 10. SW node waveform and Output Ripple, IOUT=2A

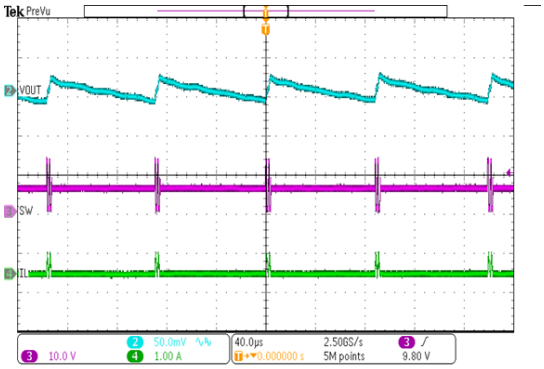


Figure 11. SW node Waveform and Output Ripple, IOUT=10mA

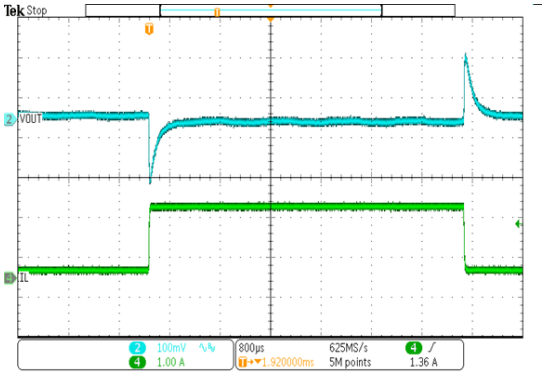


Figure 12. Load Transient
VOUT=5V, IOUT=0.2A to 1.8A, SR=250mA/us

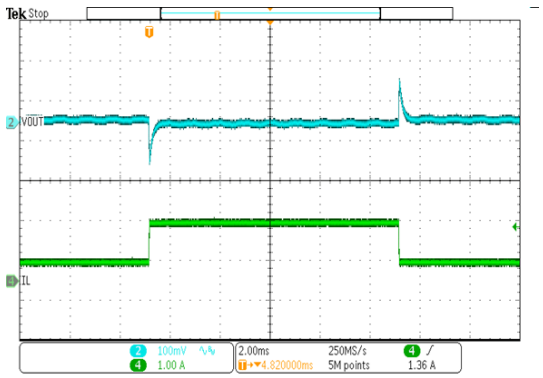


Figure 13. Load Transient
VOUT=5V, IOUT=0.5A to 1.5A, SR=250mA/us

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