SCT2A26 Evaluation Board User's Guide

FEATURES

- Wide Input Range: 5.5V-100V
- Maximum Output Voltage: 30V
- 2A Continuous Output Current
- 4A Peak Current Limit
- Integrated 500mΩ High-Side Power MOSFET
- 140uA Quiescent Current
- 1.2V ±2% Feedback Reference Voltage
- 4ms Internal Soft-start Time
- Fixed Switching Frequency at 300KHz
- COT Control Mode with Integrated Loop Compensation
- Precision Enable Threshold for Programmable Input Voltage Under-voltage Lock Out Protection (UVLO) Threshold and Hysteresis
- Cycle-by-Cycle Current Limiting
- Over-Voltage Protection
- Over-Temperature Protection
- Available in an ESOP-8 Package

APPLICATIONS

- GPS Tracker
- E-bike, Scooter
- Moto Drives, Drones
- 48V Industry Power Bus System

DESCRIPTION

The EV2A26-B-01A Evaluation Board is designed to demonstrate the capabilities of SCT2A26, high efficiency non-synchronous step-down DCDC converter supporting up to 2A continuous output current from an input source from 5.5V to 100V.

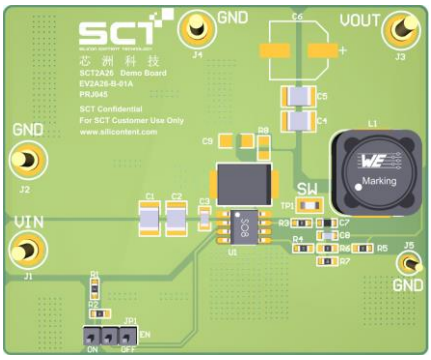
The SCT2A26 integrates an 500mΩ high-side MOSFET and has 4A peak output current limit to support high peak current application in GPS tracker with 4G Module. The converter supports Pulse Frequency Modulation (PFM) mode at light load with typical 140uA low quiescent current, which enables the converter to achieve the high-power efficiency during light-load or no-load conditions. The SCT2A26, adopting the constant-on time (COT) mode control with integrated loop compensation greatly simplifies the converter off-chip configuration.

This user's guide describes the characteristics, operation and the use of the EV2A26-B-01A Evaluation Module including EVM specifications, recommended test setup, test result, schematic diagram, bill of materials, and the board layout.

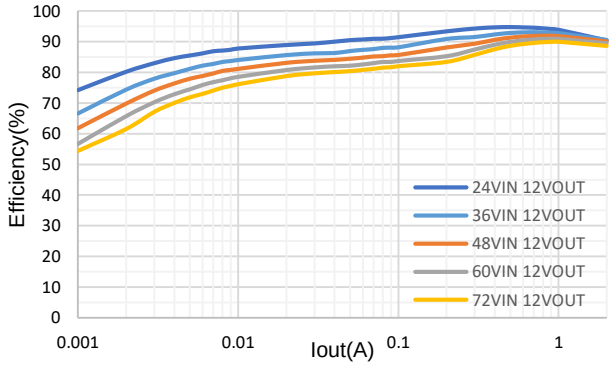
Board Number	IC Number
EV2A26-B-01A	SCT2A26

PERFORMANCE SUMMARY

Parameter	Condition	Value
Input Voltage	DC up to 100V	5.5V-100V
Output Voltage	Iout=0A~2A	12V ± 2%
Output Current	Continuous DC current	2A



EV2A26-B-01A Evaluation Board Top View



SCT2A26 Efficiency, Freq.=300KHz

QUICK START PROCESURE

Evaluation board EV2A26-B-01A is easy to set up to evaluate the performance of SCT2A26 asynchronous step-down DCDC converter. Refer to Figure 1 for proper measurement equipment setup and follow the procedure below:

1. Place jumpers in the following positions:
   - J1, J2: Connect the power supply to the input of converter.
   - J3, J4: Connect the load to the output of converter.
   - JP1: Enable. Enable Jumper. EN pin floats to enable IC, Install OFF shunt to disable IC.
2. With power off, connect the input power supply to J1 V_{IN} connector and J2 GND connector. Make sure that the input voltage does not exceed 100V, and supports sufficient current limit. Turn on the power at the input.
3. Check the output voltage at J3 and J4. The output voltage should be 12V 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.
5. Users can place C6 for better load transient performance.

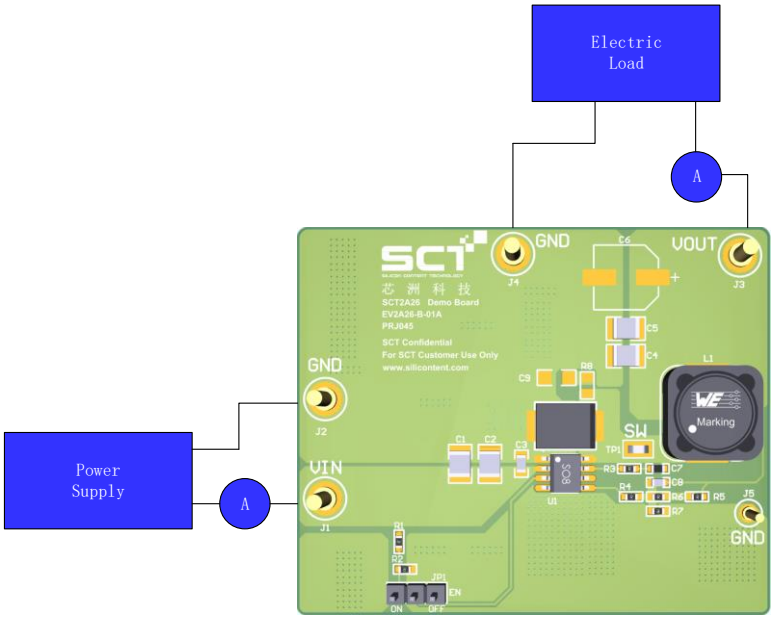


Figure 1. Power Supply, Load and Measurement Equipment Setup

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

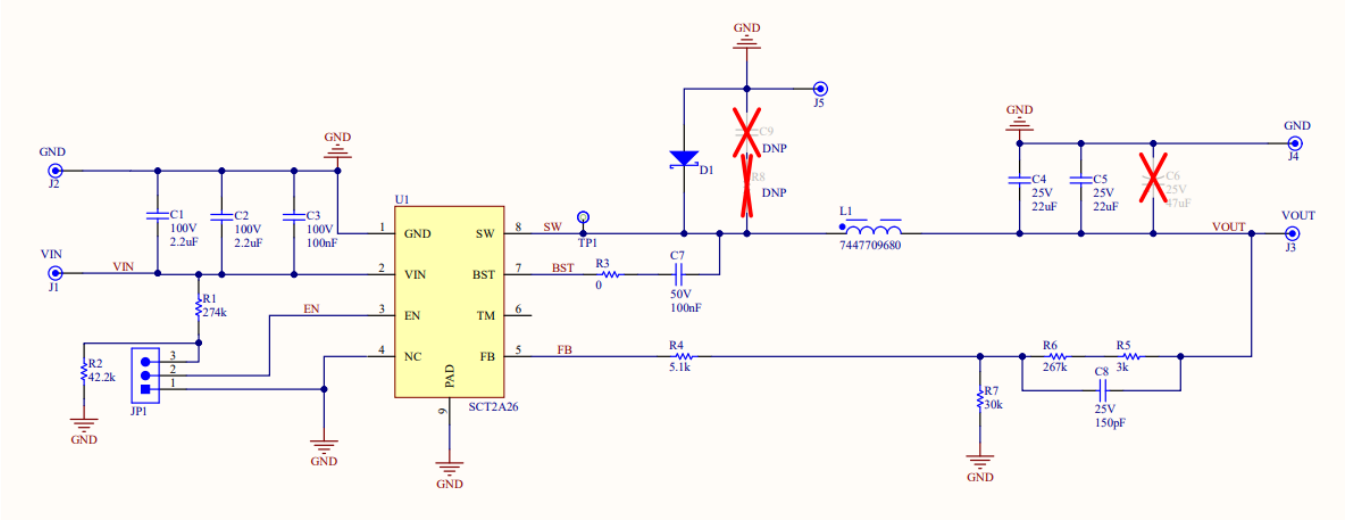


Figure 3. SCT2A26 EVM Schematic

BILL OF MATERIALS

Table 1. SCT2A26 EVM Bills of Materials

Footprint	PartNumber	Manufacture	Designator	Description	Quantity
C1210	885012209071	Wurth Electronix	C1,C2	CAP, CERM, 2.2uF, 100V, +/- 10%, X7R, 1210	2
C0805	885012207128	Wurth Electronix	C3	CAP, CERM, 100nF, 100V, +/- 10%, X7R, 0805	1
C1210	885012209074	Wurth Electronix	C4, C5	CAP, CERM, 22uF, 25V, +/- 10%, X7R, 1210	2
SMT E-cap-phy8	875075555002	Wurth Electronix	C6	CAP, AL, 47uF, 25V, +/- 8%, SMT	1
C0603	885012206095	Wurth Electronix	C7	CAP, CERM, 100nF, 50V, +/- 10%, X7R, 0603	1
C0603	885012206054	Wurth Electronix	C8	CAP, CERM, 150pF, 25V, +/- 10%, X7R, 0603	1
SMC(DO-214AB)	SS510	MDD	D1	Diode, Schottky Barrier Rectifier, 100V, 5A	1
Terminal_2.1	Terminal_2.1	Terminal	J1, J2, J3, J4	Terminal，copper pillar，2.1mm	4
Terminal_1.1	Terminal_1.1	Terminal	J5	Terminal，copper pillar，1.1mm	1
Jumpr-3	613 003 111 21	Wurth Electronix	JP1	Header, THT, pitch 2.54mm, Single Row, Vertical, 3p	1
WE-PD_1210	7447709680	Wurth Electronix	L1	WE-PD SMT Power Inductor, size 1210, 68uH, 3.2A, 89mOhm	1
R0603	RT0603BRE07274KL	YAGEO	R1	Resistor, 274k, 0.1% 0.1W, 0603	1
R0603	RC0603FR-0742K2L	YAGEO	R2	Resistor, 42.2k, 1% 0.1W, 0603	1
R0603	RC0603FR-070RL	YAGEO	R3	Resistor, 0, 1% 0.1W, 0603	1
R0603	RC0603FR-075K1L	YAGEO	R4	Resistor, 5.1k, 1% 0.1W, 0603	1
R0603	RT0603BRD073KL	YAGEO	R5	Resistor, 3k, 1% 0.1W, 0603	1
R0603	RT0603BRD07267KL	YAGEO	R6	Resistor, 267k, 1% 0.1W, 0603	1
R0603	RC0603FR-0730KL	YAGEO	R7	Resistor, 30k, 1% 0.1W, 0603	1
Testpoint_SMD	5015	Keystone	TP1	Test Point, Multipurpose, SMD, TH	1
ESOP8	SCT2A26	Silicontent Technology	U1	5.5V-100V Vin, 4A Peak Current Limit, High Efficiency Asynchronous Stepdown DCDC Converter	1

PRINTED CIRCUIT BOARD LAYOUT

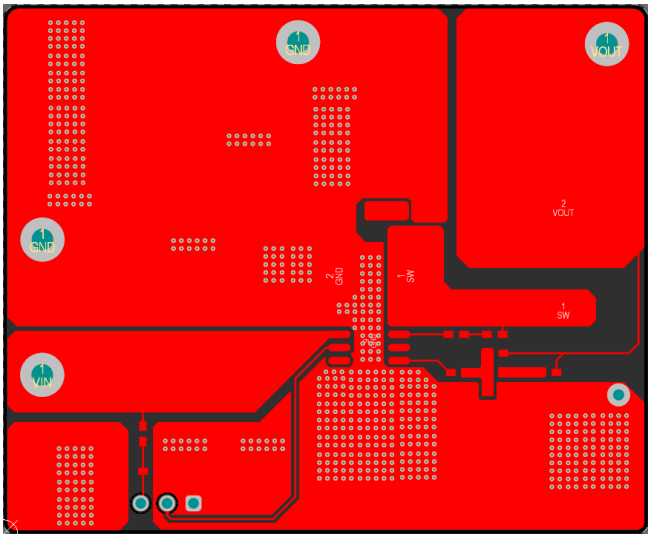


Figure 4. Top Layer

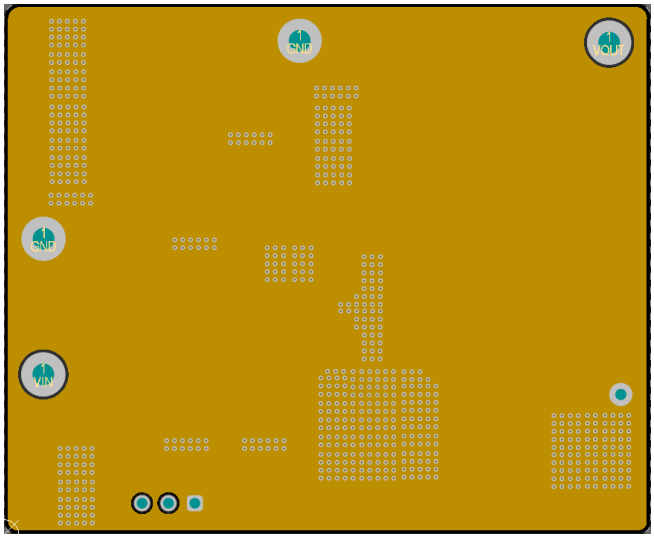


Figure 5. Internal 1 Layer

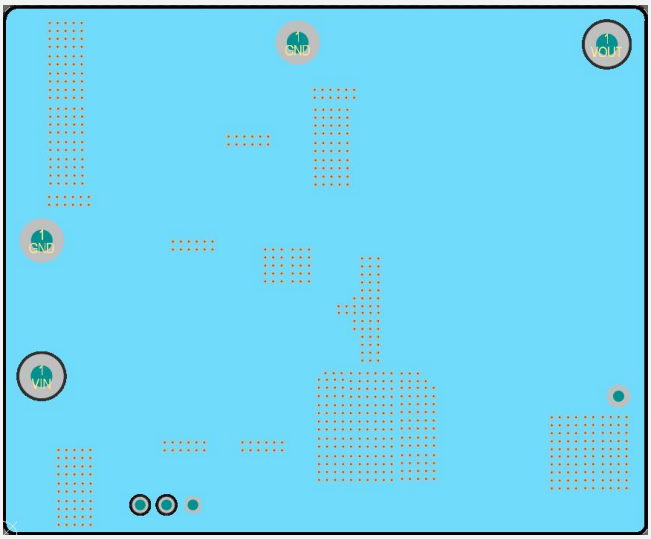


Figure 6. Internal 2 Layer

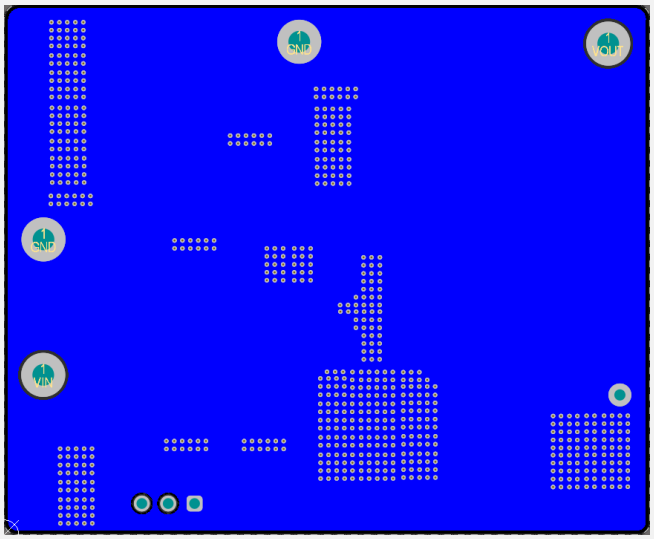


Figure 7. Bottom Layer

EVB TEST RESULTS

Vin=48V, Vout=12V, unless otherwise noted

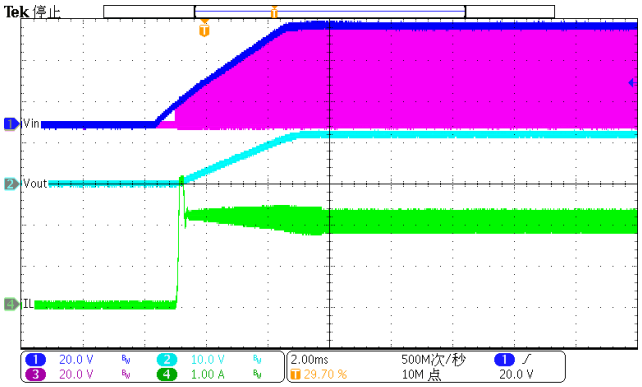


Figure 8. Power up

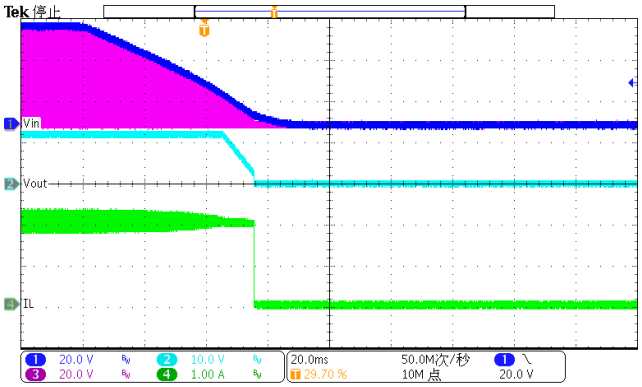


Figure 9. Power down

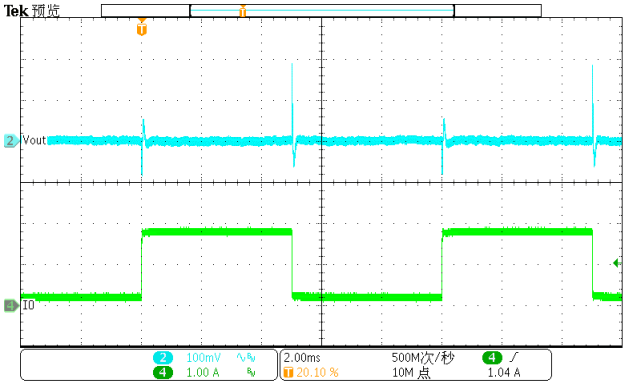


Figure 10.Load Transient (0.2A-1.8A, 1.6A/us)

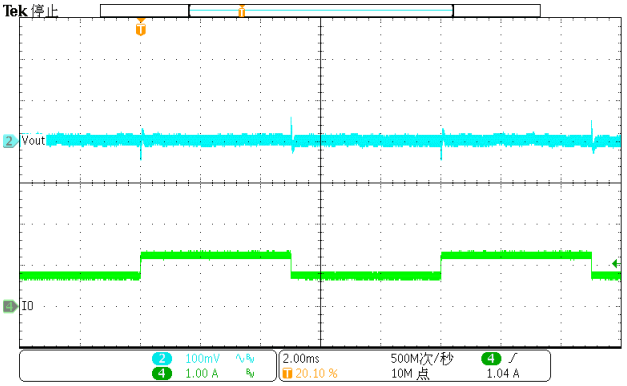


Figure 11. Load Transient (0.75A-1.25A, 1.6A/us)

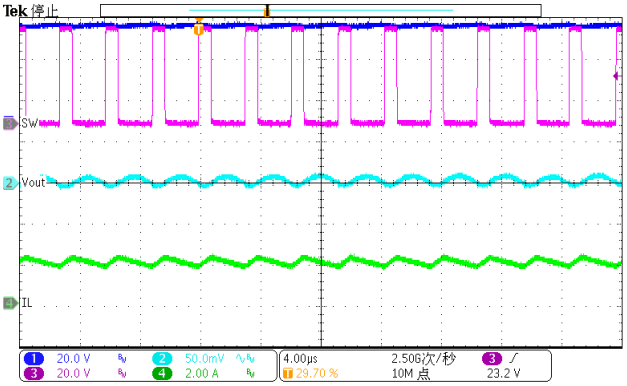


Figure 12. SW and Vout Ripple

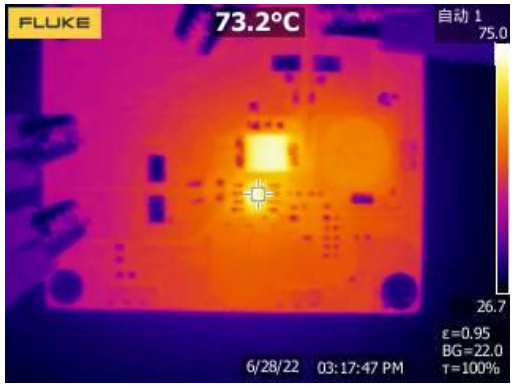


Figure 13. Thermal, 48VIN, 12Vout,2A

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