# 30W Fully Integrated Synchronous Boost Converter Evaluation Board

## FEATURES

- Wide 2.7V-14V Input Voltage Range
- Wide 4.5V-14.6V Output Voltage Range
- 13mΩ/11mΩ $R_{dson}$ Internal Power MOSFETs
- Up to 12A Switch Current and Programmable Peak Current Limit
- Adjustable 200K-2.2MHz Switching Frequency:
- Selectable PFM or Forced PWM Mode
- Programmable Soft Start
- Output and Feedback Overvoltage Protection
- Thermal Shutdown Protection at 150°C
- DFN-20 3.5mmx4.5mm Package

## APPLICATIONS

- Bluetooth Audio
- Power Banks
- POS System
- E-Cigarette
- USB Power Delivery

## DESCRIPTION

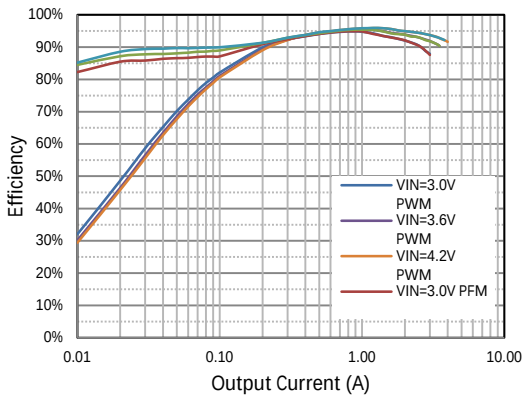
The EV12A0-B-01A Evaluation Board is designed to demonstrate the capabilities of SCT12A0, a high efficiency fully integrated synchronous boost converter. It offers a very compact solution to achieve up to 30W continuous output power over a wide input supply range. The constant off-time peak current-mode operation provides fast transient response and eases loop stabilization. The device features include over-current protection, output over voltage protection and thermal shutdown. The SCT12A0 is available in a space-saving 20-pin DFN 3.5mmx4.5mm package.

This user's guide describes the characteristics,

| | | |
|---|---|---|
| Input Voltage | DC up to 14V | 2.7V-8.4V |
| Output Voltage | JP2: ON PWM | 9V ± 2.5% |
| Output Current | Continuous DC current | 3A |
| Frequency | Default | 560KHz |




EV12A0-B-01A Evaluation Board Top View




Efficiency


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## QUICK START PROCESURE

Evaluation board EV12A0-B-01A is easy to set up to evaluate the performance of the SCT12A0. Refer to Figure 1 for proper measurement equipment setup and follow the procedure below:

1. Place jumpers in the following positions:
   JP1: ON Connect $V_{IN}$ supply to $V_{IN}$ pin of IC.
   JP2: ON Select Forced PWM mode. OFF Select PFM mode.
   JP3: ON Connect EN pin to $V_{CC}$ to enable IC.
2. 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 14V, and supports sufficient current limit.
3. Check the output voltage at J3. The output voltage should be 9V 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 JP3.

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.

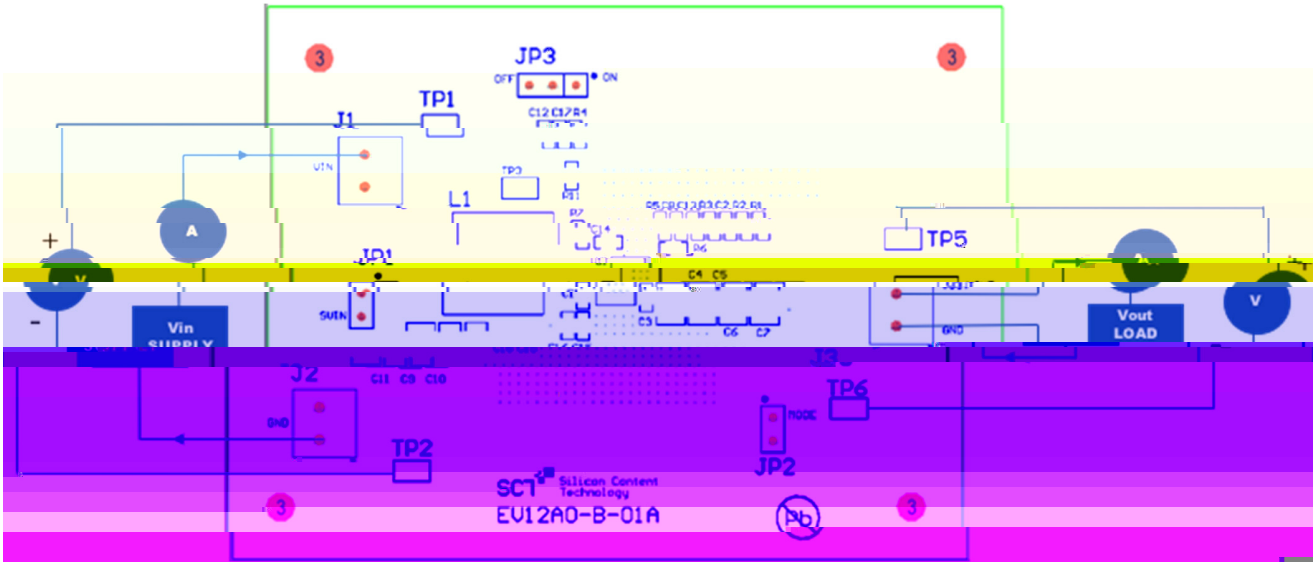
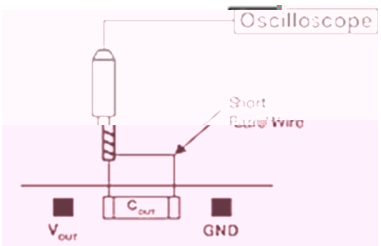
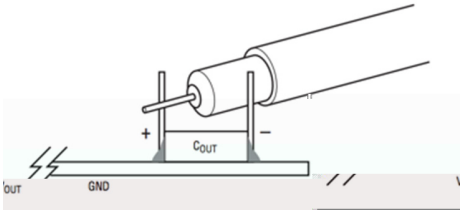



Figure 1. Proper Supply, Load and Measurement Equipment Setup






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## SCHEMATIC DIAGRAM

Figure 3. Evaluation Board Schematic

## BILL OF MATERIALS

Table 2. Bills of Materials

| | | | | |
|---|---|---|---|---|
| Silicon Content Technology | SCT12A0 | U1 | SCT12A0, 30W Synchronous Boost Converter DFN-20L 3.5mmX4.5mm with thermal pad | 1 |
| Wurth Elektronix | 61300211121 | JP1, JP2, JP3 | Header, 100mil, 2x1, Tin, TH | 3 |
| Wurth Elektronix | 691 214 110 002S | J1, J2, J3 | Terminal Block, 6A, 3.5mm Pitch, 2-Pos, TH | 3 |
| Wurth Elektronix | 885 012 206 0-88 à | ,h Ǝ Ž ᴰ ᵐ я | 08 N 3nfn 88 MMM ž Ǝ M ŋ ŏ k,h ɑ ] | P |


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## EVB TEST RESULTS

Vin=3.6V, Vout=9V, unless otherwise noted

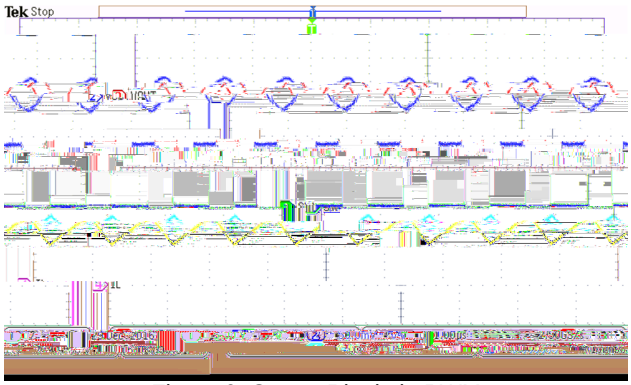



Figure 6. Output Ripple in PWM

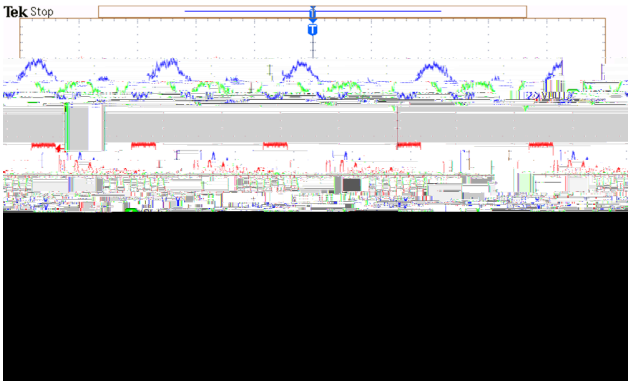



Figure 7. Output Ripple in DCM

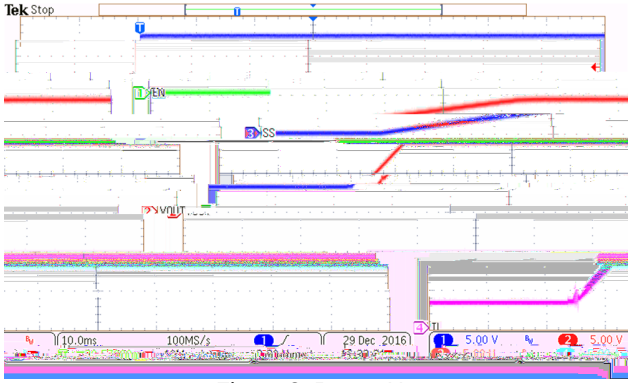



Figure 8. Power Up



Figure 9. Load Transient (Iout=2A to 3A, SR=250mA/us)

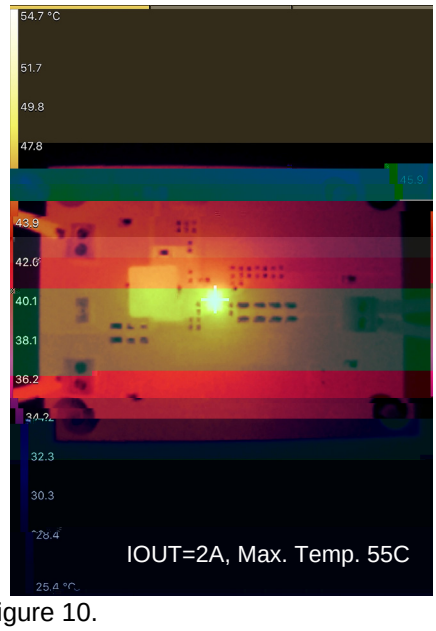



Figure 10.

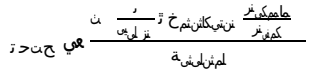



Figure 11.


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## OPTIONAL MODIFICATION

The resistor connected from FSW to SW R7 (Default 255KΩ) sets switching frequency of the converter. Use equation 1 to set a desired frequency.



(1)

where:

f


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