Shaoxing Yuli Semiconductor CO.,LTD

绍 兴 宇 力 半 导 体 有 限 公 司

U3510C Data Sheet

V 1.1

Switching Current Limit Step-Down Converter

■ General Description

The U3510C is a high-voltage, step-down, switching regulator that drives External power MOSFET. The input range accommodates a variety of step-down applications, making it ideal for automotive, industry, and lighting applications. Hysteretic voltage-mode control is employed for very fast response. UNIU's proprietary feedback control scheme minimizes the number of required external components.

The switching frequency is 80KHz, allowing for small component size. Thermal shutdown and short -circuit shutdown (SCS) provide reliable and fault tolerant operations. Low quiescent current allows the U3510C to be used in batter-powered applications.

■ Key Features

- Internal integrated bootstrap power supply circuit
- DC-DC 12V Typical Switching Current Application
- Hysteretic Control: No Compensation
- 80KHz Switching Frequency
- PWM Control Input for step-down Application
- Short-Circuit Shutdown (SCS) with Integrated IC
- Low Quiescent Current
- Thermal Shutdown

■ Applications

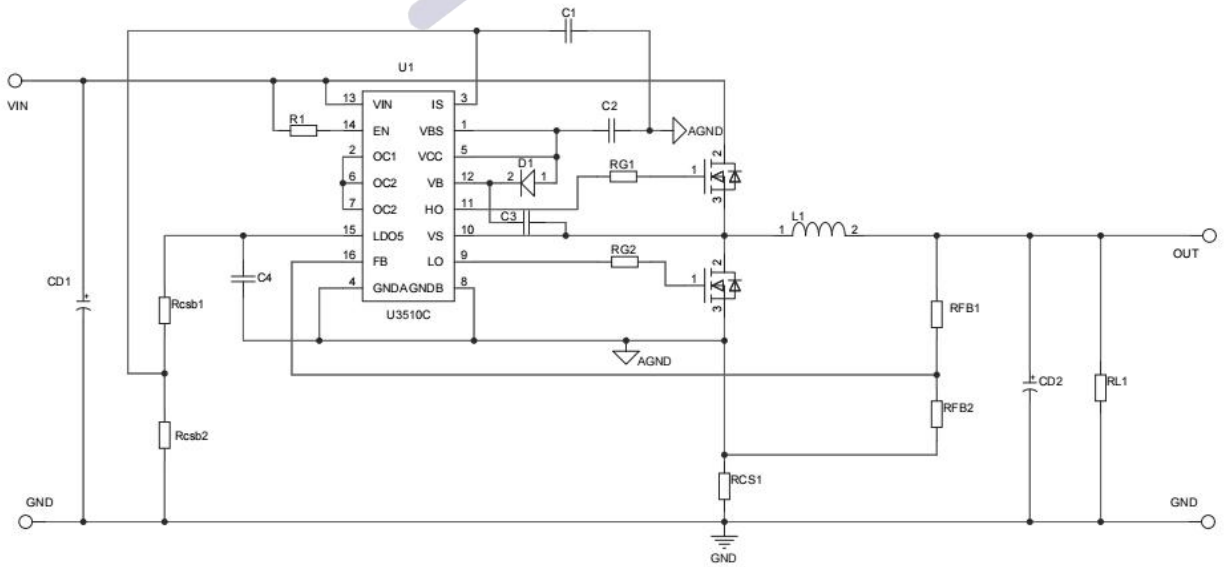
- Scooters, E-Bike Control Power Supplies
- Solar Energy Systems
- Automotive System Power
- Industrial Power Supplies
- High-Power LED Drivers

■ Output Power Table

Part Number	Package	VIN MAX	IO+/IO-	OUT
U3510C	SOP-16	200V	1.2A/1.5A	ADJ

Note:1.Default for Buck Converter Application.
2.The practical output power is determined by the output voltage and thermal condition.

■ Typical Application



■ Description (Cont.)

The U3510C voltage-mode controller with line feed-forward drives external high-side and low-side N-channel power switches with robust 12V gate drivers suitable for standard-threshold MOSFET. Adaptively-timed gate drivers with 1.2A source and 1.5A sink capability minimize body diode conduction during switching transitions, reducing switching losses and improving thermal performance when driving MOSFET at high input voltage and high frequency. The U3510C can be powered from the output of the switching regulator or another available source, further improving efficiency.

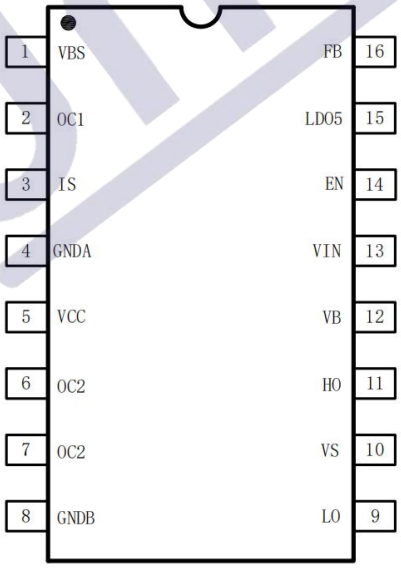
Additional features of the U3510C include a configurable soft start, an open-drain power-good monitor for fault reporting and output- monitoring, monotonic start-up into prebiased loads, integrated VCC bias supply regulator and bootstrap diode, external power supply tracking, precision enable input with hysteresis for adjustable line under-voltage lockout (UVLO), hiccup-mode overload protection, and thermal shutdown protection with automatic recovery.

The U3510C controller is offered in a 10mm × 6.3mm thermally enhanced, 16-pin SOP package with additional spacing for high-voltage pins and wettable flanks for optical inspection of solder joint fillets.

■ Pin Configuration and Functions

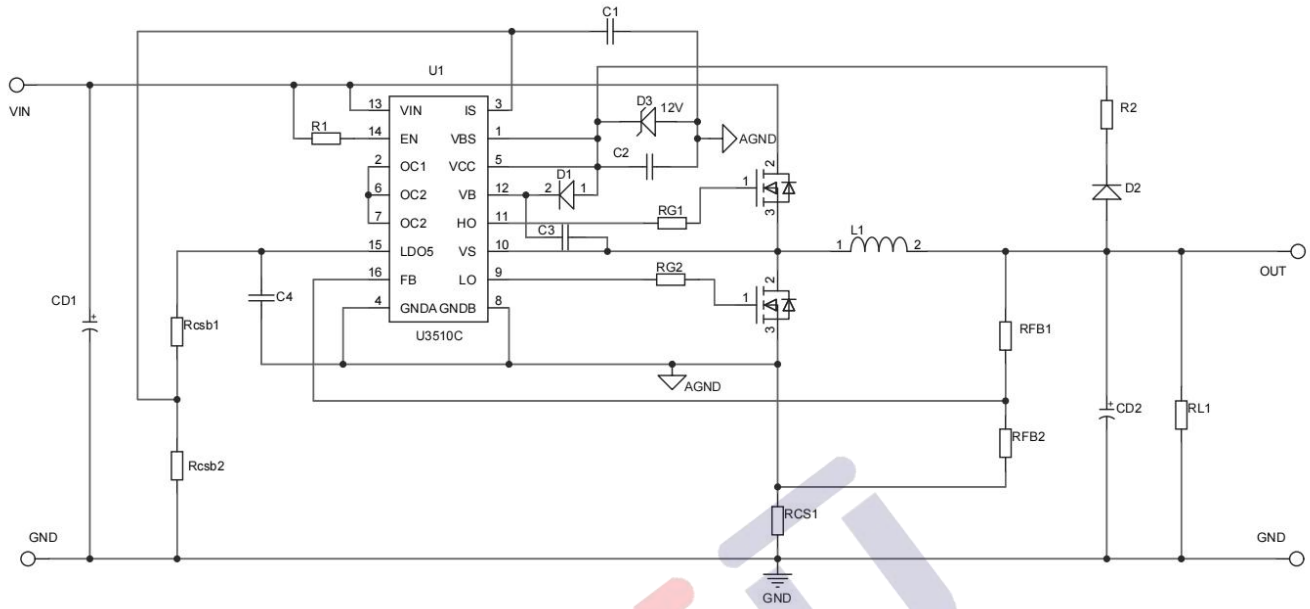
RGY Package 16-Pin SOP With Wettable Flanks

Top View

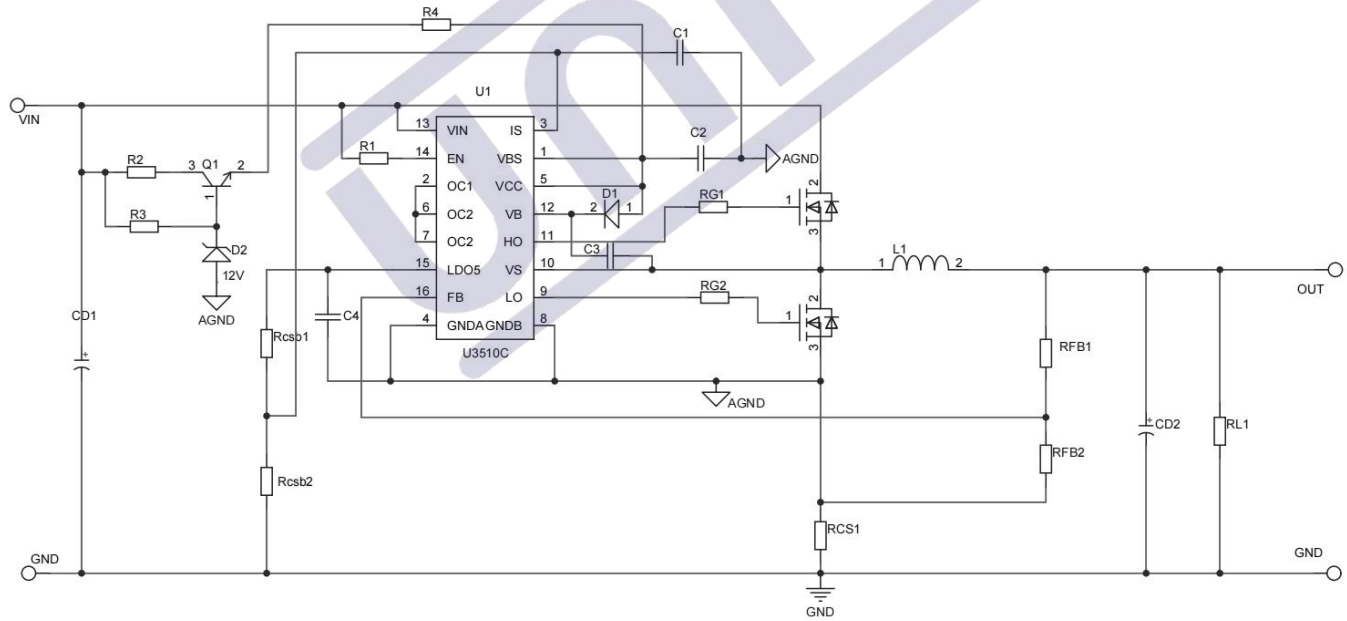


■ Typical Application

APP1:V_{OUT} > 10V



APP2:V_{OUT} < 10V



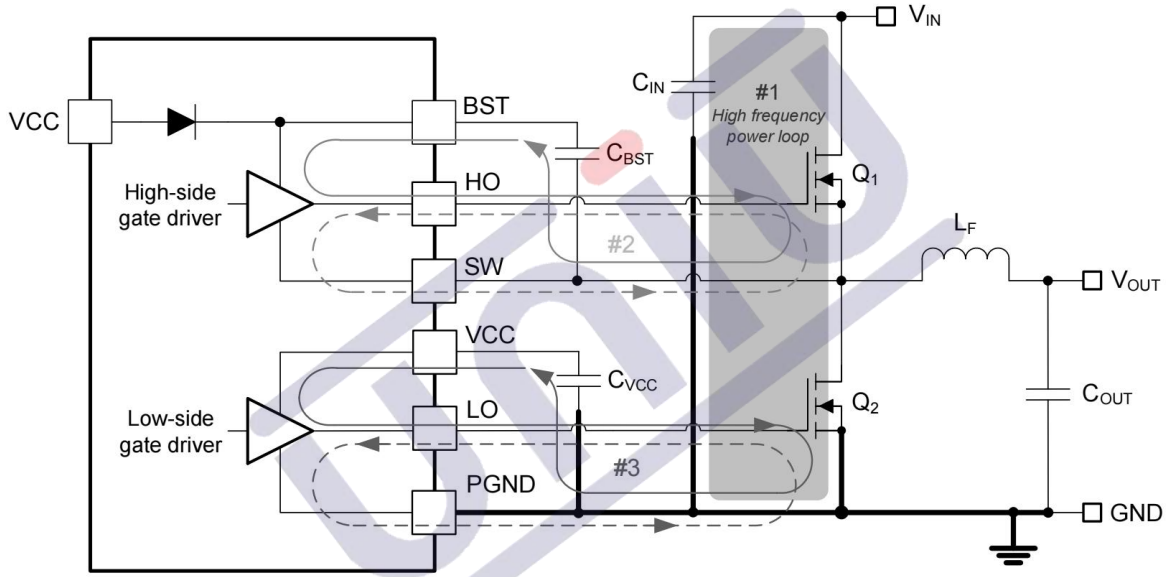
Layout

Layout Guidelines

Proper PCB design and layout is important in a high-current, fast-switching circuits (with high current and voltage

slew rates) to assure appropriate device operation and design robustness. As expected, certain issues must be considered before designing a PCB layout using the U3510C.The high-frequency power loop of the buck converter power stage is denoted by #1 in the shaded area. The topological architecture of a buck converter means that particularly high di/dt current flows in the components of loop 1, and it becomes mandatory to reduce the parasitic inductance of this loop by minimizing its effective loop area. Also important are the gate drive loops of the low-side and high-side MOSFETs, denoted by 2 and 3.

DC/DC Regulator Ground System With Power Stage and Gate Drive Circuit Switching Loops.



Three wire step-down circuit ground Layout reference.

1、Version Record

Date	Rev.	Description
2022/09/28	1.0	First Release
2024/05/15	1.1	Layout Adjustment

2、Contact

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