
4 -16V Input, 20A Synchronous Buck Converter

1 Description

The SYQ5255 is a high-efficiency synchronous buck converter with a constant on-time(COT)control mode. Within a wide input supply range of 2.7V to 16V, it can achieve up to 20A of continuous output current and 24A valley inductor current.The SYQ5255 operates at high efficiency over a wide output current load range.

The SYQ5255 adopts an internal compensation, eliminating the need for external components. It supports differential remote sense, enabling the voltage feedback point to be placed closer to the power supply demand end of the subsequent stage, ensuring a more precise output voltage and fast transient response.

The SYQ5255 can be configured with different switching frequencies to adapt to different inductance values and EMI scenarios. The switching frequencies of 600kHz, 800kHz, and 1MHz can be configured by the external pull-down resistor of the MODE pin, along with two working modes: SKIP and FCCM mode.

The SYQ5255 incorporates a zero-cross detection(ZCD) mechanism,which enables it to transition to pulse frequency modulation (SKIP-mode) during light-load conditions. This function achieves a low quiescent operating current and high efficiency while maintaining excellent load and linear response characteristics.

In shutdown mode, the operating current of SYQ5255 drops below 1uA, significantly reducing system power consumption.

The SYQ5255 is available in a 4mm*3mm FCQFN package with 21-pin.

2 Applications

eSSD module
Servers, Cloud-Computing, Storage
Game Consoles and Graphic Cards
Industrial PC
5G

3 Features

- ◆ 4V to 16V input rang
- ◆ e without external bias
- ◆ 2.7V to 16V input range with external bias
- ◆ ranging from 4.8V to 5.5V
- ◆ 20A continuous output current
- ◆ Output voltage range: 0.6V to 5.5V
- ◆ Output reference voltage: 6V, ±1%
- ◆ Up to 93% efficiency at VIN=12V,VOUT=1V
- ◆ Differential remote sense
- ◆ External reference input for voltage tracking
- ◆ 1.0μA current into VIN pin during shutdown
- ◆ Programmable soft-start time
- ◆ Programmable valley current limit
- ◆ Programmable switching frequency: 600kHz,800kHz and 1MHz
- ◆ Selectable operation mode:SKIP or the forced continuous-conduction mode (FCCM)
- ◆ Power good clamped at low level during power failure
- ◆ Output sinking mode (OSM)
- ◆ Comprehensive protection:VIN_UVLO,VIN_OVP,VCC_UVLOO CP, UVP, OVP, OTP

4 Typical Application Circuit

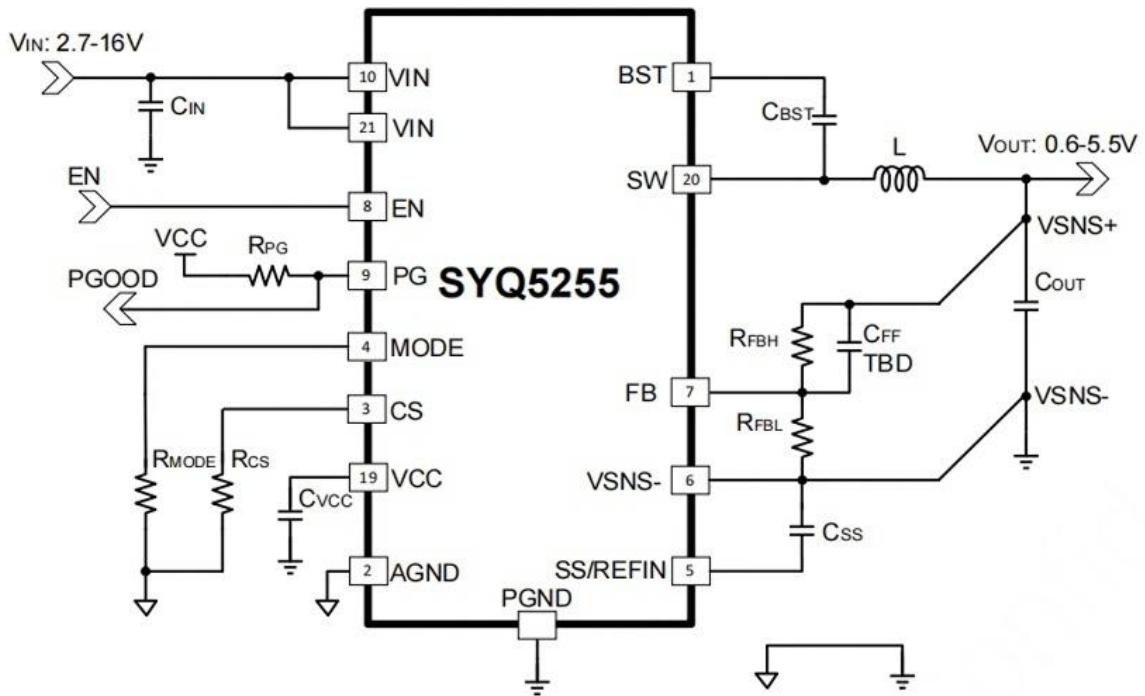


Figure 4-1. Typical Application Circuit