

# ON Semiconductor

## Is Now



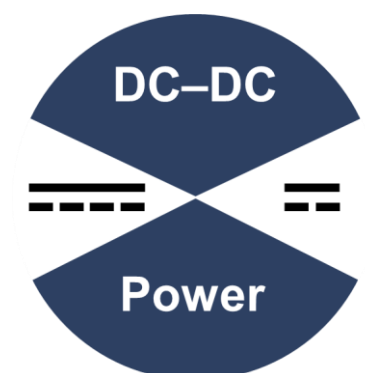
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**ON Semiconductor®**

# **Strata Enabled FAN6500XX 65V Sync Buck EVB User Guide**



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## Introduction

The STR-FAN6500XX-GEVB provides an easy to use evaluation platform within the Strata Development Environment for the FAN65004B, FAN65004C, FAN65005A, and FAN65008B synchronous buck regulators from ON Semiconductor. Strata gives the developer access to any collateral one may need, including datasheets, BOMs and schematics, as well as providing a user interface for testing the performance of the FAN6500XX series of parts. This document will provide instructions on how to use the evaluation board.

## Features

- Vin range from 4.5 V to 65 V
- Fixed frequency voltage mode PWM control with input voltage feed-forward
- Adjustable switching frequency from 100 kHz to 1 MHz
- Selectable CCM PWM mode or PFM Mode for light loads
- Wide array of protection circuits including OCP, TSD, OVP, UVP and SCP
- Continuous output current depending on specific part:
  - FAN65004B – 6 A
  - FAN65004C – 6 A
  - FAN65005A – 8 A
  - FAN65008B – 10 A

## Applications

- High Voltage POL Module
- Telecommunications: Base Station Power Supplies
- Networking: Computing, Battery Management Systems, USB-PD
- Industrial Equipment: Automation, Power Tools, Slot Machines

## User Guide

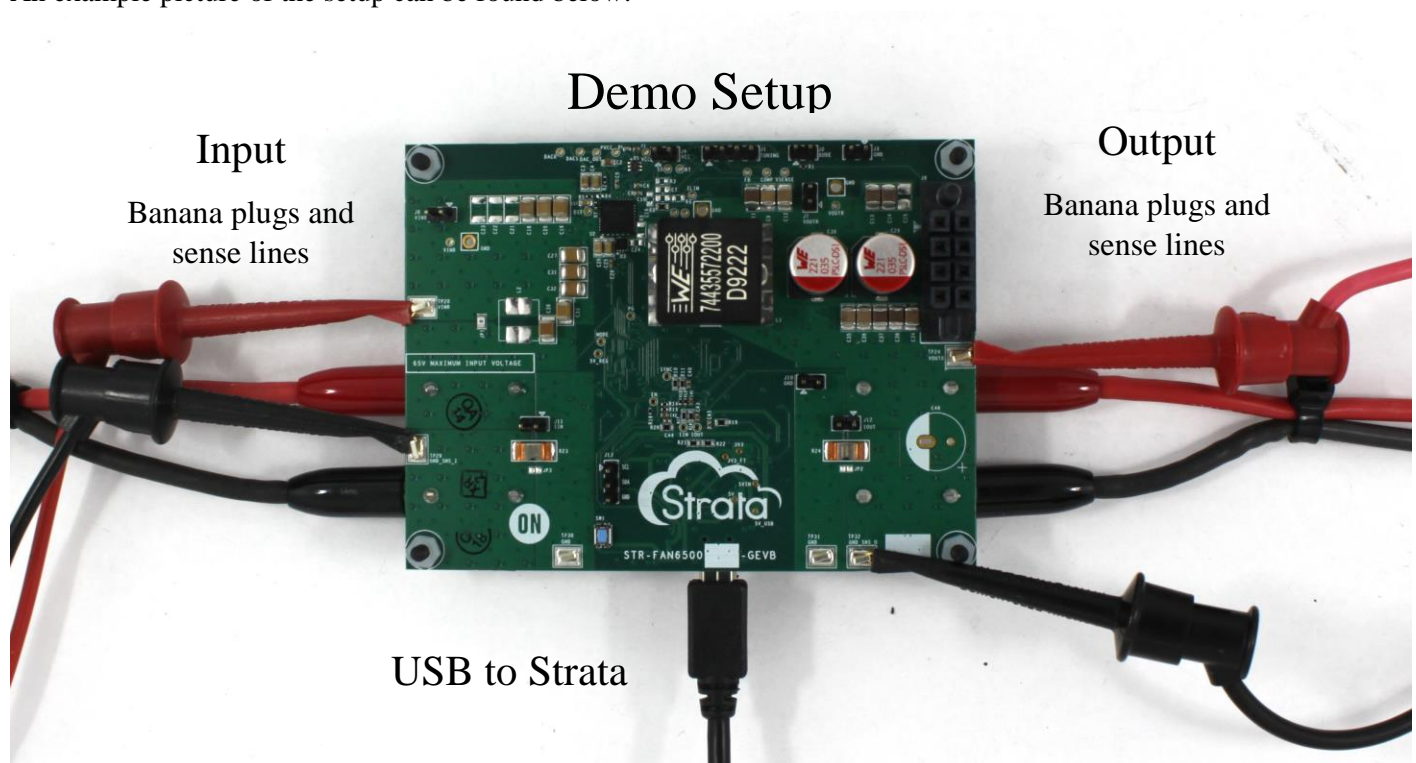
This section will explain how to use the Strata Enabled STR-FAN6500XX EVB in a step-by-step manner and will cover both the hardware required as well as how to use the User Interface (UI) in Strata. Please ensure that the latest version of Strata is installed before connecting to the board. The latest version can be downloaded from the [ON Semiconductor website](http://onsemi.com).

### Hardware Setup

The hardware required to use the Strata Enabled STR-FAN6500XX EVB are a computer (with Windows), a power supply, and a load. Sense lines are recommended if available with equipment being used. Follow the steps below to get started:

1. Connect the EVB to a computer using the mini USB connector J23 on the bottom of the board.
2. Connect the power supply to the input of the board using the banana jacks J19 (positive terminal) and J21 (negative terminal).
3. Connect the load to the output of the board using the banana jacks J18 (positive terminal) and J20 (negative terminal).

An example picture of the setup can be found below:



## User Interface

The UI within the Strata app will allow the user to control and monitor the evaluation board without requiring other lab equipment or training. The steps below include the details on how to start the Strata application.

1. First, download and install the most recent version of Strata. It can be found [here](#).
2. Open the Strata app. Login and the home screen will appear.
3. The app will automatically detect the device and will bring up the UI for the board that is plugged in.
4. The round button with a question mark in the top right corner is the Help button, and it will show the user what everything on the UI is doing.
5. The UI features telemetry for basic measurements such as input and output voltage and current, as well as control over the output parameters as well as some of the FAN6500XX features.

## FAN6500xx

### Input

**DO NOT Exceed LDO Input Voltage more than 65V**

VIN Ready  
(under 4.5V)



Input Voltage

0.07 V

Input Current

0.00 A

VCC

5.17

PVCC

0.09 V

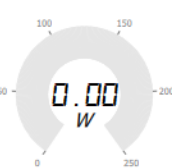
VBST

0.00 V

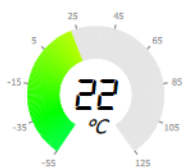
### Board Temperature, Power Loss, Output Power & Efficiency



Power Loss



Output Power



Board Temperature

DLT  
Connected



OS/ALERT



### Output

PGOOD



Output Voltage

0.36 V

Output Current

0.00 A

Switch Frequency

100 kHz

1.2 MHz

240

Select Output Voltage

2 V

28 V

5

OCP Threshold

5.5 A

21.5 A

10

### Control

Enable (EN)



Sync Mode

Master

Operating Mode

DCM

Soft Start

3ms

VCC Source

5V\_REG

## Telemetry, Controls, and Functionality

This section will discuss some UI elements specific to this design.

1. **VBST** – This box displays a calculated value for the bootstrap pin, which is calculated based on the input voltage, output voltage, and the VCC voltage. The calculation does not hold in DCM, so the box is disabled while operating in DCM.
2. **OC Threshold slider** – This slider adjust the OCP level of the buck regulator. The FAN6500XX series used peak current detection for the OCP and SCP detection. Therefore, the OCP value on the slider may not match exactly with the measured OCP value.
3. **DLT Connected checkbox** – The Dynamic Load Tool (DLT) is an ON Semi board which provides a platform for consistent AC measurements. When connected, the return current will not flow through the output current sense amplifiers, hence some of the UI elements will be disabled.
4. **Sync Mode** – This combo box sets the part to be in master or slave mode. In master mode, the switching frequency is generated internally in the FAN6500XX based on the resistor tied to the RT pin. In master mode, the switching frequency is sent out via the SYNC pin. In slave mode, the SYNC pin becomes an input, and the FAN6500XX will match the switching frequency seen on the SYNC pin.
5. **Operating Mode** – This combo box switches between Discontinuous Mode (DCM) and Forced Continuous Conduction Mode (FCCM). In DCM, the part will skip pulses in order to save power at lower output power levels, and in FCCM the part will operate with a fixed frequency.
6. **Soft Start** – This combo box allows the user to specify soft start times by adding or removing a parallel capacitor to the soft start pin.
7. **VCC Source** – This combo box allows the user to specify the source of the VCC voltage. The PVCC option supplies the VCC pin with the internally generated 5V rail, while the USB 5V option supplied the VCC pin with 5V from USB.

### OTP note

As of 1/6/2021 the FAN65004B, FAN65005A, and FAN65008B parts have OTP disabled. This error is being corrected in the next production batch, with a TBD date.

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