STR-NCP323XX-EVK FAQ

ON Semiconductor®

Contents

1 General Operation

1.1 "How do I enable the board through Strata?"

Question	How do I enable the board through Strata?
Answer	Ensure that both the USB cable is connected to a computer running the Strata UI, and the EVB has at least 4.5V applied at the input.

1.2 "The controller is shutting off unexpectedly, what could be wrong?"

Question	The controller is shutting off unexpectedly, what could be wrong?

Answer	A protection feature is most likely being tripped. The NCP323XX EVBs are equipped with the following protection features.
	
	- **Over Temperature Protection**
	  - Internal to NCP3235, External on NCP3232/1.
	  - Both FETs are turned off at 150C with 25C Hysteresis.
	  - EVB size causes quick board heating under high load conditions.
	- **Over Current Protection**
	  - After 3 consecutive over-current events, the NCP323XX will enter hiccup/latch mode.
	  - Over current threshold is adjustable in Strata
	- **Over/Under Voltage protection**
	  - Voltage at the FB pin is monitored; if the voltage is above 700mV or below 500mV, the NCP323XX will enter hiccup mode.
	- **Under-voltage Lock-out**
	  - If the input voltage falls below 4.5v, Strata will disable the part.
	  - The part cannot be enabled again until Strata has detected at least 4.5V in the EVB input.

2 Strata Telemetry

2.1 "Why is my efficiency reading so volatile?"

Question	Why is my efficiency reading so volatile?
Answer	Under no or light-loading conditions, the small changes in voltage readings cause the efficiency reading to fluctuate- sometimes in large swings. To resolve this issue, ensure that the EVB has at least 1A of load.

2.2 "Thermal shutdown is occurring, but Strata displays a temperature much less than the OTP threshold?"

Question	Thermal shutdown is occurring, but Strata displays a temperature much less than the OTP threshold?
Answer	The Strata temperature sensor is independent of the OTP sense circuit. Strata's temperature sensor senses the temperature of the GND copper shape of the NCP323XX controller. Generally, this shape will have a lower temperature than the die-temperature of the controller. We are working on methods to improve this discrepancy.

2.3 "How accurate is Strata's voltage measurement"

Question	How accurate is Strata's voltage measurement?
Answer	Strata measures voltage through a low-pass filter using a 12-bit ADC. ADC (MCU) Datasheet: https://www.silabs.com/documents/public/data-sheets/efm32gg-datasheet.pdf

2.4 "How accurate is Strata's current measurement"

Question	How accurate is Strata's current measurement?
Answer	Strata measures current through ON's current-sense amplifiers over a 1% tolerance 2mOhm resistor using a 12-bit ADC. The current-sense amplifier has a maximum DC offset error of 35uV with a 10ppm/C Gain error drift. Current Sense Amplifier Datasheet: https://www.onsemi.com/pub/Collateral/NCS210R-D.PDF

3 Strata Configurability

3.1 "Why does the EVB shut down when I change output voltage?"

Question	Why does the EVB shut down when I change output voltage?
Answer	When changing the output voltage to a lower value, if the controller is in discontinuous conduction mode, the voltage at the FB will violate the over-voltage threshold, causing the part to shut down. This can be fixed by putting the controller into a FCCM state before changing output voltages. Newer versions of Strata should prevent users from changing the output voltage while the controller in enabled.

3.2 “My EVB does not turn off at the specified OCP threshold?”

Question	My EVB does not turn off at the specified OCP threshold?
Answer	The NCP323XX controllers use a low-side current sensing method for the OCP feature. This will trip on inductor peak current, which can vary widely across different applications. The OCP threshold within Strata should be viewed as approximate, and was configured with a low duty cycle, low inductor value in mind. (worse case). The following equation displays the factors which affect inductor peak current: $$I_{peak} = \frac{(Vin - Vout) * (\frac{Vout}{Vin})}{Fsw * Lout}$$ Where Fsw is switching frequency and Lout is the output inductor value.