

User's Guide to Powering Up and Using the NCP3284 Evaluation Board,

Rev. D

This guide is intended to assist those using the NCP3284 Evaluation Board, Rev. D. It will provide useful tips and procedures for powering up and using the Evaluation Board (EVB).

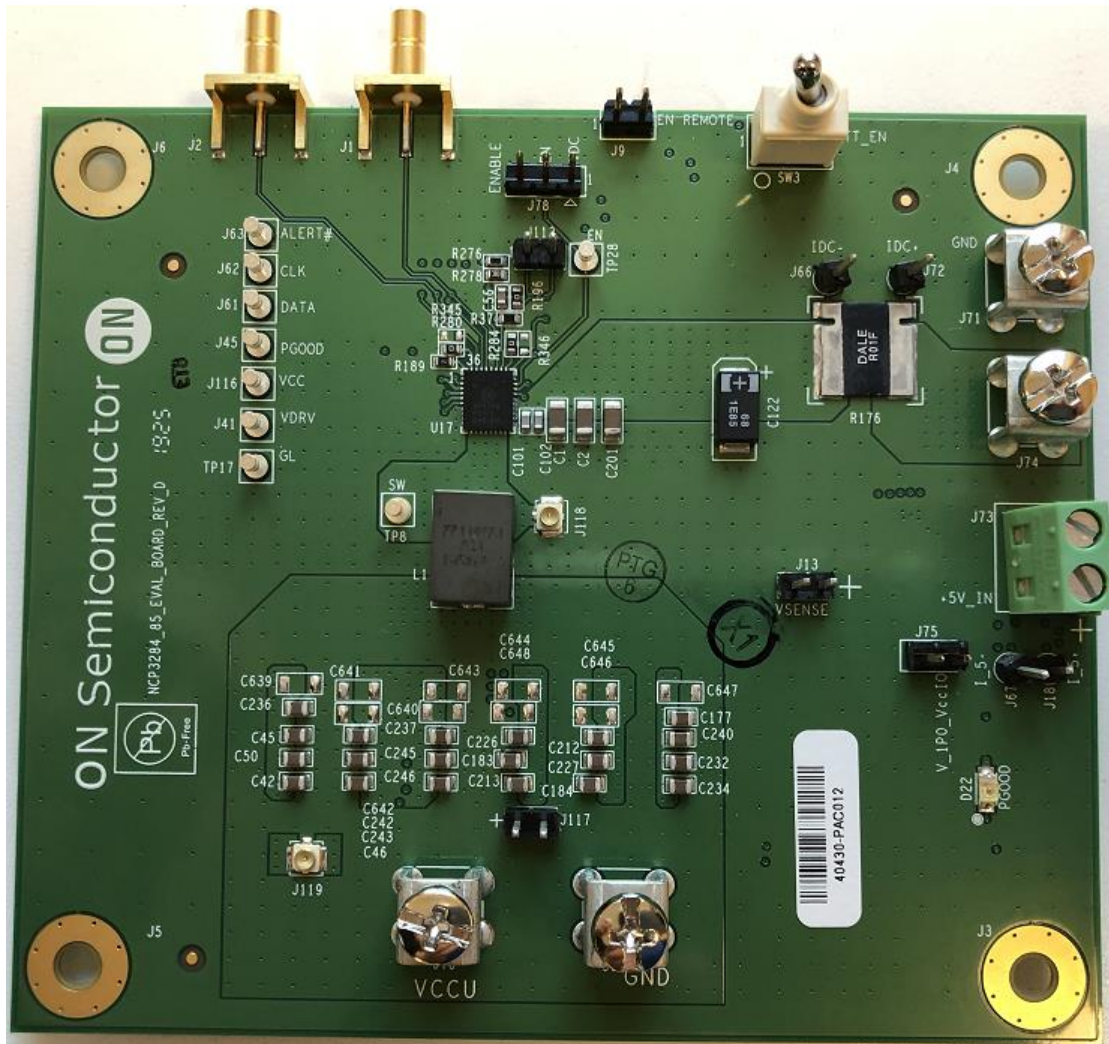
Description – The NCP3284 Evaluation Board Rev. D is a test vehicle for the NCP3284 single-phase point-of-load (POL) voltage regulator. The printed circuit board assembly (PCBA) contains all the circuitry and connections necessary to evaluate the performance of the NCP3284 under various load and system conditions.

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Photo of NCP3284 EVB

Enable Switch



Input Power

+5 V power

Output Power

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Connection instructions – The EVB has a basic connection scheme independent of how the device is powered. The terminals labeled “Input Power” are for the input voltage rail, sometimes called Input Voltage, VBAT or battery voltage. This is the high voltage rail (~6 V to 18 V) for the input of the regulator. (Cables capable of high current with low voltage drop are required to test this board).

There is a second pair of power input terminals (Logic Power in the photo) which requires +5 V. This is intended for powering various logic and LDO circuits on the EVB, independently of the input power and the device LDO (VDRV in the schematic).

In general, then, connect the battery voltage to Input Power and +5 V to Logic Power. **Set the initial current limit for each supply to 1 A, or less.** In both cases, the minus, or ground, terminal is the top position and the plus terminal is the bottom position.

The EVB has one 3-pin header, J78, which configures the enable functionality of the EVB. We recommend that the jumper be set so that pins 2 and 3 (left two pins) of J78 are shorted (default condition). This configures the enable switch (SW3) to be the default method for starting the EVB. The other method of enabling the device is to have the board enable as the input power is applied, via the voltage divider set by R131 and R130. This is accomplished by moving the jumper position of J78 to pins 1 and 2 (right two pins).

Once the power inputs and enabling scheme have been set up, apply power and toggle the enable switch (if used) and the EVB should power up and the green LED indicating PGOOD should light.

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Connection instructions, cont. – Check to see that the output is $1.000\text{ V} \pm 5\text{ mV}$, or better. The switching frequency seen on an oscilloscope should be approximately 550 to 600 kHz in Forced CCM mode (FCCM).

If the board powers up successfully, at this time you can increase the current limit of the supplies. At 1 V output, the minimum current required from the input power supply is 3 A for a 25 to 30 A load. The input power supply current limit should be set at 5 amps in order to test the OCP of the board. For the logic power, the current limit can be left at 1 A.

Loading the output and checking over-current protection (OCP) - Connect a suitable electronic load to the output terminals. The electronic load should be capable of sinking at least 40 A at an input voltage at the load terminals of 1 V, or less. As pre-configured, the OCP threshold of the EVB is 33 A at the valley of the inductor ripple. This translates to 36-37 A DC at the output terminals. As the OCP threshold is approached, the switch node waveform will change frequency noticeably, until the OCP trigger point is reached. Once the protection is triggered, the board will latch off, and can only be restarted by removing the load and either cycling the input voltage or toggling the enable switch, depending on which method was used to enable the EVB.

This ends this description of the NCP3284 BGA359 EVB. If you have questions, please contact Antonio Germano, by one of the following methods.

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