NCN26010BMNEVB 10BASE-T1S Power Supply and Adapter Board User's Manual

EVBUM2834/D

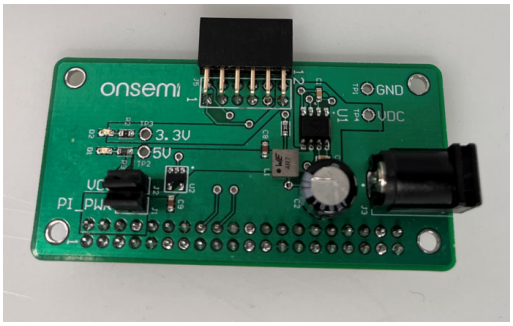


Figure 1. Board Photo

Introduction

The NCN26010BMNEVB is a PCB designed to allow customers to connect to **onsemi**'s NCN26010XMNEVB 10BASE−T1S SPI enabled 10BASE−T1S MACPHY Evaluation board to Raspberry Pi single board computers (SBC). Its main purpose is to act as a physical interface adapter, routing the PMOD connection of the NCN26010XMNEVB to the appropriate pins on the 40 pin Raspberry Pi SBC.

Features

The NCN26010BMNEVB bridge board includes all circuitry to allow powering both a Raspberry Pi and an **onsemi** NCN26010XMNEVB 10BASE−T1S MACPHY evaluation board as well as establish a connection between the MAPHY evaluation board and the Raspberry Pi. It features a DC/DC SMPS buck converter (NCV891330PD50R2G) that accepts any voltage between 8V and 28V and generates a regulated 5V supply, capable of sourcing 3A of continuous current. This is sufficient to power any Raspberry Pi model available today.

The board also contains a linear 3.3 V Voltage regulator (NCP115ASN330T2G) that provides a stable 3.3 V supply to the Connected 10BASE−T1S MACPHY evaluation board.

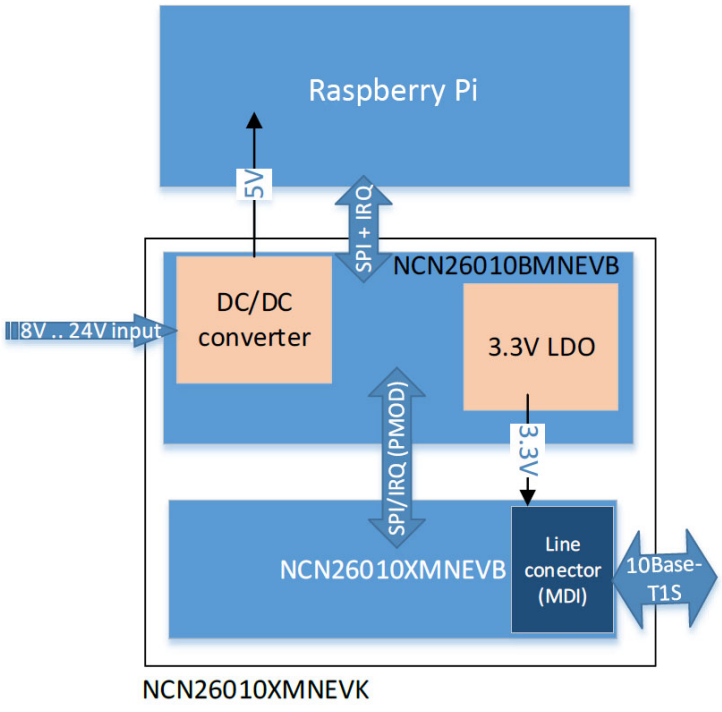


Figure 2. Evaluation Kit Simplified Block Diagram

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APPLICATIONS INFORMATION

Together with the NCN26010XMNEVB, the bridge board NCN26010BMNEVB builds an evaluation kit also available as NCN26010XMNEVK.

Connectors and Jumper Locations

The following picture shows the top view of the EVB:

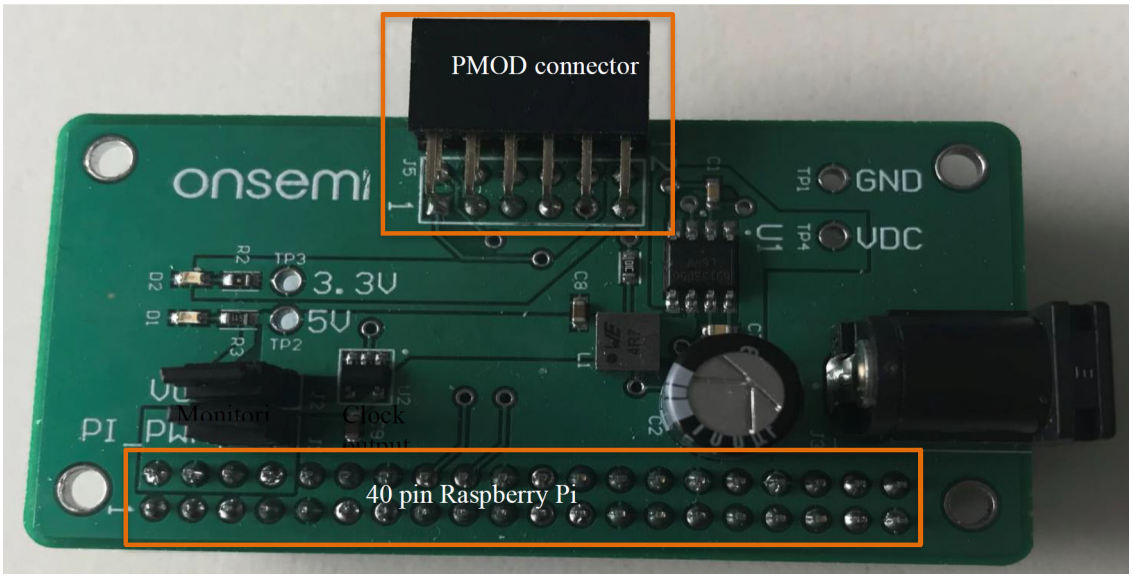


Figure 3. NCN26010BMNEVB “Bridge” Board

When connected to a complete node, the setup is as shown in Figure 4.

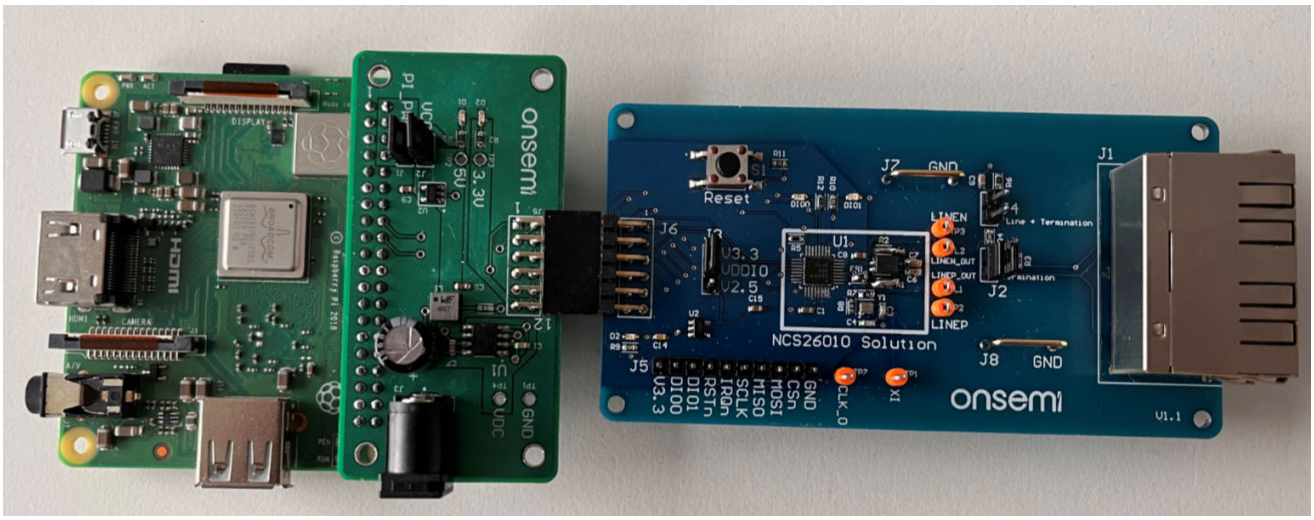


Figure 4. Raspberry Pi 3A+ connected to the Evaluation Kit consisting of NCN26010BNMEVB and NCN26010XMNEVB

Power Supply, Test Points and Connectors

NCN26010BMNEVB can be powered though the J3 Barrel Connector. The input voltage can be anywhere between 8 V and 28 V. The pin inside the barrel connector connects to VDC.

Following is a list of all connectors and test points on the NCN26010BMNEVB evaluation board.

Table 1. TEST POINTS AND JUMPERS

Name on Board	Function	Comment
TP1	GND	Ground connection
TP2	VDC	Can be used to measure the input voltage VDC (8 V to 28 V). Users could also use this test point for feeding the input voltage to the board. This way power would not have to enter from the J3 barrel connector.
TP3	3.3V	This test point can be used to monitor the VCC voltage being passed to the PMOD connector.
TP4	5V	TP4 can be used to monitor the 5 V output of the DC/DC converter on the bridge board
J1	PI_PWR	When both the NCN26010XMNEVB and the Raspberry Pi are powered by their own external power supplies, this jumper needs to be left open. When the Raspberry Pi is powered from its micro−USB port and should also provide power to the MACPHY evaluation board connected via the J5 PMOD connector, then this jumper needs to be closed. When powering the entire setup with the bridge board's DC/DC converter, the jumper also needs to be closed.
J2	VCC	To power a MACPHY evaluation board through the PMOD connector, J2 needs to be closed. Otherwise, it needs to be left open, if the MACHY evaluation board is powered by an external power supply. J2 can also be used to do current measurements of the connected NCN26010XMNEVB, by connecting a current meter instead of closing the jumper.
J5	PMOD	PMOD master connector. Pinned out to work with NCN26010XMNEVB evaluation board
Pi	Raspberry Pi	40 pin Raspberry PI connector. Plugs in to a Raspberry Pi SBC.

For pinout of the PMOD and the Raspberry Pi connectors refer to the board schematic and the bottom of this document.
Note that the connections match the appropriate Raspberry Pi and NCN26010XMNEVB connectors.

NCN26010BMNEVB Schematic

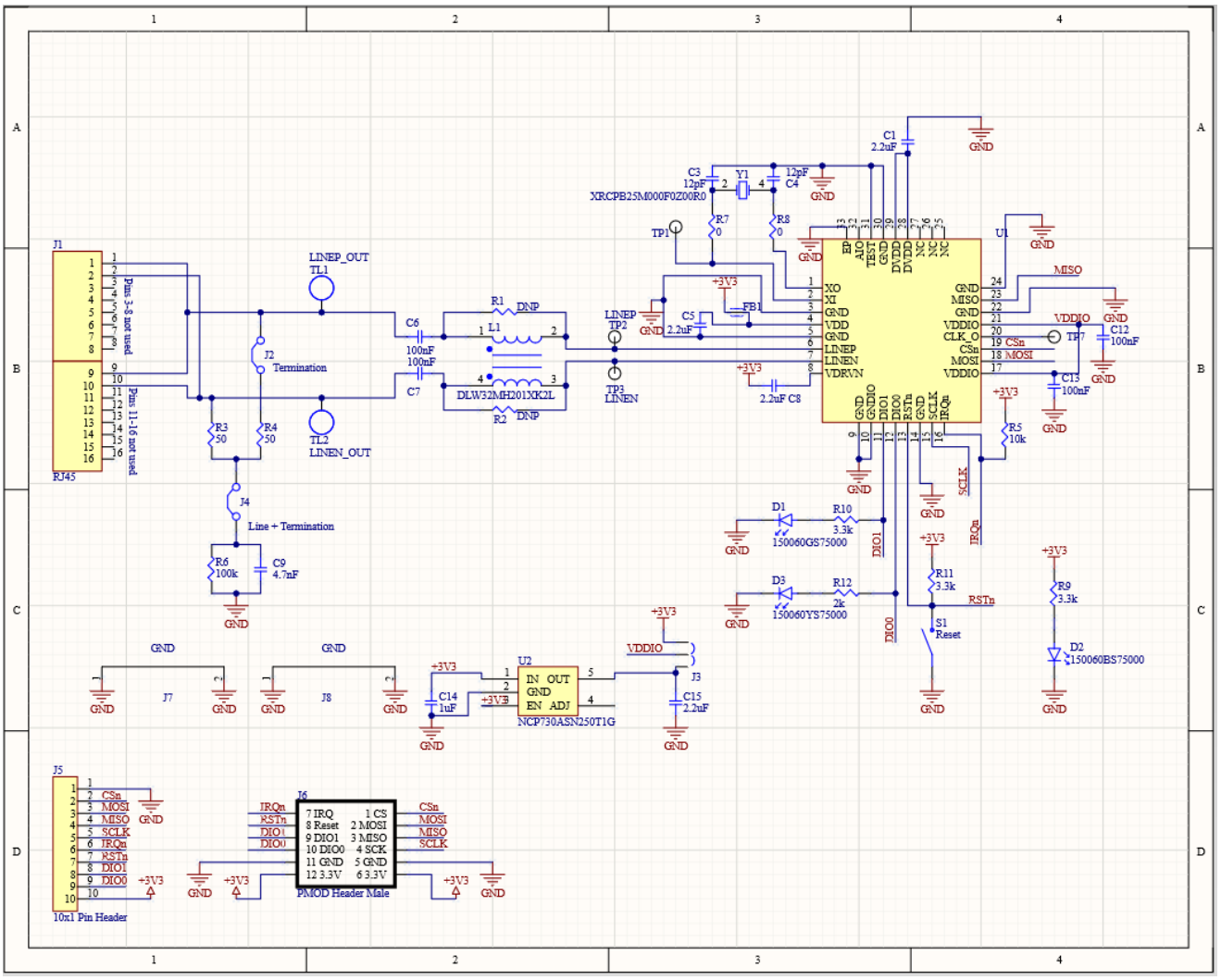


Figure 5. NCN26010BMNEVB Schematic

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