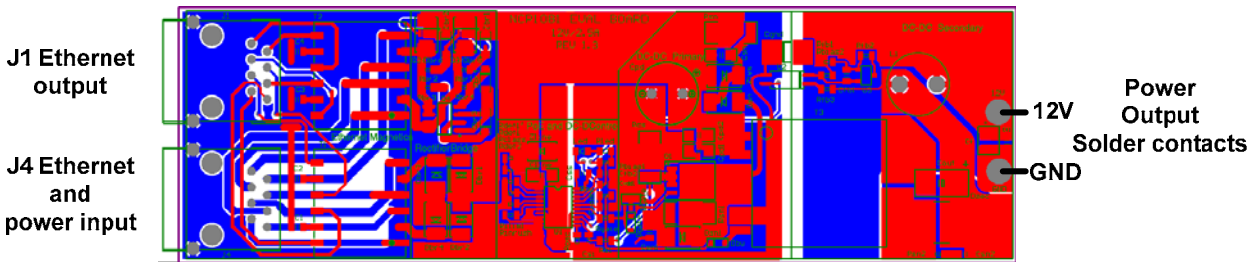
ON Semiconductor

# Test Procedure for the NCP1081SPCGEVB Evaluation Board

**Board connectors**




## Operational description

### *Normal operation*

The NCP1081SPCEVB implements a PoE power splitter. A splitter splits the power from the data on a PoE enabled network.
When the board operates without faults, the output connector should show a regulated output voltage of 12V and Ethernet traffic should be passed from J4 to J1.

### *Fault management*

The NCP1081 silicon has a built in thermal protection. If the temperature is too high, the DC/DC will stop operation and output voltage drops to zero. As soon as the silicon cools down, the DC/DC starts to operate again. When there's a heat issue on the board, the output voltage will slowly oscillate between 0 and 12V.
None of the external components are protected. Most vulnerable components are the switching MOSFET and secondary rectifying diode. On failure of the MOSFET, the output voltage will remain zero and the silicon will likely enter thermal protection. The above mentioned oscillation will not be visible. When the secondary diode breaks down, the output voltage will be zero, or some noisy level, lower than 12V.

## Required test equipment

1. 30 PoE PSE (Power Source Equipment) equipment (Phihong POE30U, Farnell 1266818 ) or 57V,30W lab supply with Ethernet and power mixing board.
2. Oscilloscope
3. 30W load: 5Ohm Rheostat (Farnell 1129931) or 4.8Ohm resistor or programmable current sink.
4. 2 CAT5, UTP Ethernet cables with RJ45 connectors.

## Test Procedure:

1. Zero load, output voltage check.

Connect a scope to the output power solder contacts and set to the scope to the voltage range that allows measurement of 12V DC.

Connect the Ethernet cable, carrying power to J4, the Ethernet and power input, RJ45 connector.
Monitor that the output voltage ramps up to the regulated 12V and is stable.

2. Maximum load, output voltage check.
Connect a scope to the output power solder contacts and set to the scope to the voltage range that allows measurement of 12V DC.
Connect a 12V, 30W load to the output.
Connect the Ethernet cable, carrying power to J4, the Ethernet and power input, RJ45 connector.
Monitor that the output voltage ramps up to the regulated 12V.
Set the scope to peak detection and measure the noise (high frequency spikes) and ripple (250kHz triangular oscillation). The noise and ripple should be less than 200mV peak to peak.
Disconnect the load while the board is powered and connect the load again. Capture the output voltage during the load step from zero to full load on the scope and check if there's no sustained oscillation.

3. Maximum load, Ethernet connectivity
Connect a scope to the output power solder contacts and set to the scope to the voltage range that allows measurement of 12V DC.
Connect a 12V, 30W load to the output.
Connect the Ethernet cable, carrying power to J4, the Ethernet and power input, RJ45 connector.
Monitor that the output voltage ramps up to the regulated 12V.
Connect another Ethernet cable to J1 and to an Ethernet device. Check that Ethernet data is passed from the network to the Ethernet device, through J4 and J1, by means of a HTTP, FTP ping, or Ethernet network traffic analyzer.

## Ethernet wiring

| RJ45 Pin # | Wire Color (T568A) | Wire Diagram (T568A) | 10Base-T Signal 100Base-TX Signal | 1000Base-T Signal |
|---|---|---|---|---|
| 1 | White/Green | | Transmit+ | BI_DA+ |
| 2 | Green | | Transmit- | BI_DA- |
| 3 | White/Orange | | Receive+ | BI_DB+ |
| 4 | Blue | | Unused | BI_DC+ |
| 5 | White/Blue | | Unused | BI_DC- |
| 6 | Orange | | Receive- | BI_DB- |
| 7 | White/Brown | | Unused | BI_DD+ |
| 8 | Brown | | Unused | BI_DD- |

Straight-Through Cable Pin Out for T568A

| RJ45 Pin # | Wire Color (T568B) | Wire Diagram (T568B) | 10Base-T Signal 100Base-TX Signal | 1000Base-T Signal |
|---|---|---|---|---|
| 1 | White/Orange | | Transmit+ | BI_DA+ |
| 2 | Orange | | Transmit- | BI_DA- |
| 3 | White/Green | | Receive+ | BI_DB+ |
| 4 | Blue | | Unused | BI_DC+ |
| 5 | White/Blue | | Unused | BI_DC- |
| 6 | Green | | Receive- | BI_DB- |
| 7 | White/Brown | | Unused | BI_DD+ |
| 8 | Brown | | Unused | BI_DD- |

Straight-Through Cable Pin Out for T568B