Test Procedure for the NCP10970BGEVB Demoboard

ON Semiconductor®

01/21/2020

Required Equipment:
Current limited 90 ÷ 265 Vrms AC source (current limited to avoid board destruction in case of defective part) (e.g. KEYSIGHT 6813B) ………………………………………...……….. 1pc
AC Wattmeter (e.g. Tektronix PA1000) …………………………………………...…1pc
DC Amp-Meter able to measure up to 1 A DC (e.g. KEITHLEY 2000) ………………….1pc
DC Volt-Meter able to measure up to 30 V DC (e.g. KEITHLEY 2000) …...…………….1pc
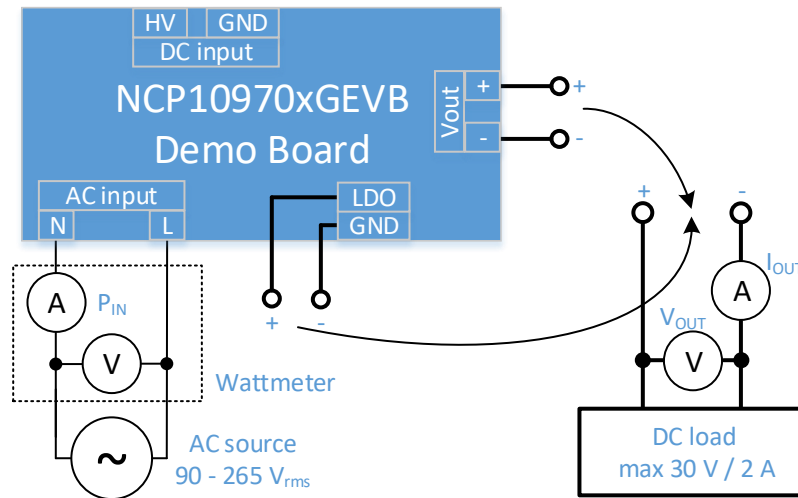DC Electronic Load (e.g. AGILENT 6060B) …………………………………………….. 1pc

Figure 1: Test Setup

The following steps describe the test procedure for all boards. Please connect the boards and equipment based on Figure 1.

Test Procedure:
1. Apply an input voltage V_{IN} = 90 V_{rms} to NCP10970xGEVB demo.
2. Check that Vout = 16 V (note 1) and LDO output = 3.3 V (for NCP10970AGEVB) or 5 V (for NCP10970BGEVB).
3. Connect the DC load to Vout terminals.
4. Set the load current to I_{OUT} = 150 mA. Verify that the output voltage is still present (note 2).
5. Set load current to I_{OUT} = 0 mA and reconnect the DC load to LDO terminals.
6. Set the load current to I_{OUT} = 120 mA. Verify that the output voltage is still present (note 3).
7. Change an input voltage to V_{IN} = 265 V_{rms}.
8. If the DC load stayed connected to LDO terminals, verify that the output voltage is still present.
9. Set load current to I_{OUT} = 0 mA and reconnect the DC load to Vout terminals.
10. Set the load current to I_{OUT} = 150 mA. Verify that the output voltage is still present.
11. Turn off AC source.
12. End of the test.

Test of OCP protection:
1. Apply an input voltage V_{IN} = 90 V_{rms} to NCP10970xGEVB demo.
2. Connect the DC load to Vout terminals. Verify that the output voltage is present (note 2).
3. Set the load current to I_{OUT} = 250 mA. The output voltage goes to zero and controller goes to auto-recovery protection mode, i.e. it tries to resume operation.
4. Set the load current to I_{OUT} = 0 mA. Verify that the output voltage goes back to normal operation mode.
5. Reconnect the DC load to LDO terminals. Verify that the output voltage is present (note 3).
6. Set the load current to I_{OUT} = 250 mA. The output voltage goes to zero and controller goes to auto-recovery protection mode, i.e. it tries to resume operation.
7. Set the load current to I_{OUT} = 0 mA. Verify that the output voltage goes back to normal operation mode.
8. Turn off AC source.
9. End of the test.

Note 1: The unloaded output voltage Vout can be up to 17 V.
Note 2: The loaded output voltage Vout is ~ 14.4 V plus some small drop on cables and connectors.
Note 3: The output voltage of LDO is fixed to 3.3 V or 5 V based on the tested version. You can see only small drop based on the voltage drop on cables and connectors.

Be careful when manipulating the boards in operation, lethal voltages up to 400V are present on the primary side. An isolation transformer is also recommended for safer manipulations.