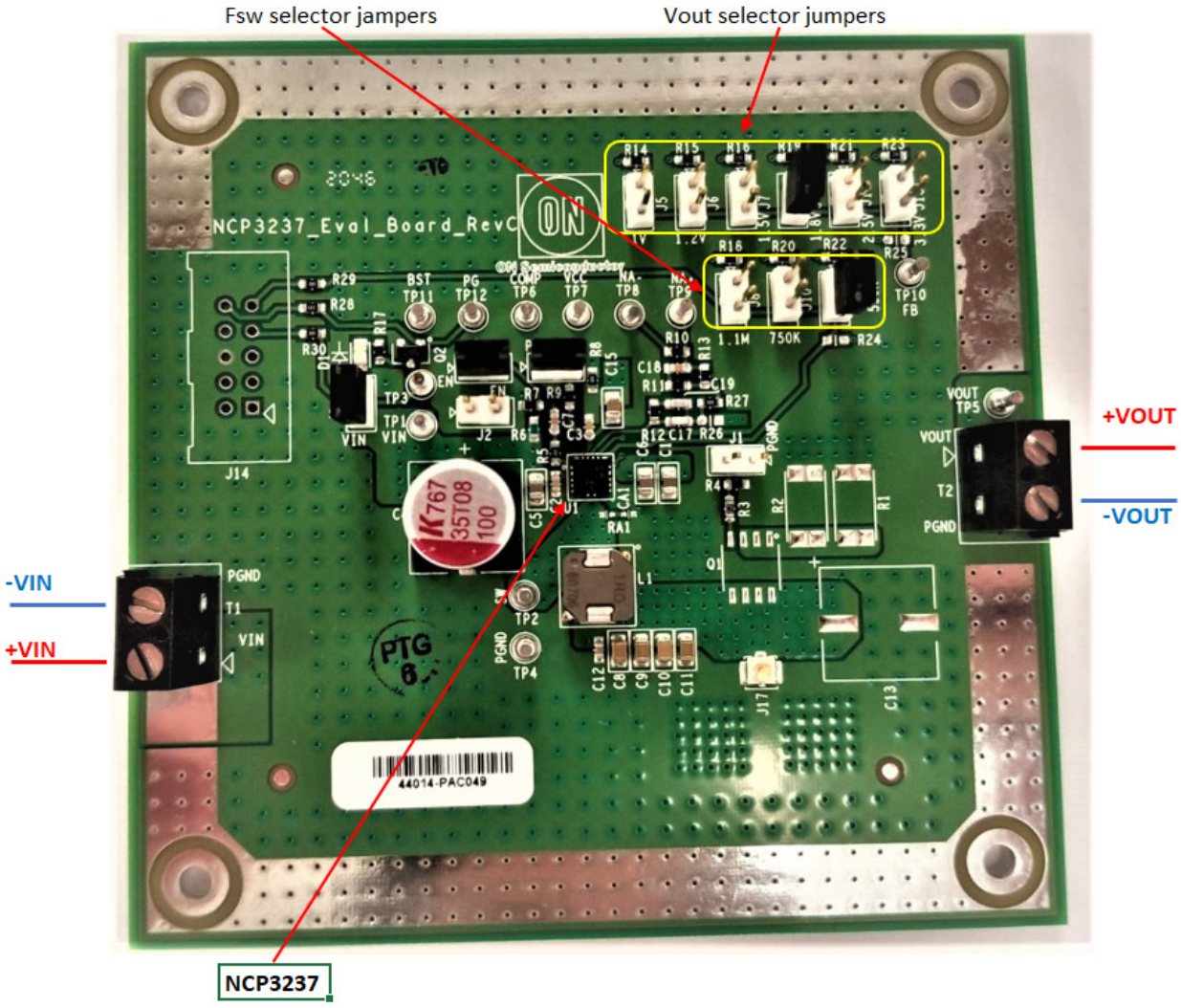
Test Procedure for the NCP3237GEVB Evaluation Board

I. Description and scope

This document applies to the NCP3237_EVB_REV_C Evaluation Board (EVB) PCB fab with a NCP3237 single−phase synchronous buck converter. This device is able to deliver up to 8 A output current over a wide output voltage range from 0.6 V to 12 V (up to 80% of VIN).

II. EVB Photo – Below is a photo of the standard **NCP3237GEVB**



Typical jumper setting as above

III. Input/Output Connections

Table NCP3237GEVB Connectors and Test Points

DESIGNATOR	Function description
J1	2 pin header, Optional
J2	2-pin header for enable. Add shunt to connect EN to ground and disable device.
J3	2-pin header, Add shunt to enable Vin LED indicator or remove if don't need it.
J5	2 pin header, add a shunt to set Vout to a fixed value of 1V
J6	2 pin header, add a shunt to set Vout to a fixed value of 1.2V
J7	2 pin header, add a shunt to set Vout to a fixed value of 1.5V
J8	2-pin header, Add shunt to set Fsw to 1.1MHz
J9	2 pin header, add a shunt to set Vout to a fixed value of 1.8V
J10	2-pin header, Add shunt to set Fsw to 750KHz
J11	2 pin header, add a shunt to set Vout to a fixed value of 2.5V
J12	2-pin header, Add shunt to set Fsw to 550KHz
J13	2 pin header, add a shunt to set Vout to a fixed value of 3.3V
J14	2 pin header, Optional
J15	2 pin header, add shunt to enable board from Vin
J16	2-pin header for power good resistor pull up connection. Add a shunt to pull up to VCC.
J17	Header for Vout ripple and load transient response measurements
TP1	**VIN** test point
TP2	**SW** node test point
TP3	**EN** test point
TP4	**PGND** test point
TP5	**Vout** test point
TP6	**COMP** test point
TP7	**VCC** test point
TP8	**NA-** negativ test point for network analizer
TP9	**NA+** pozitive test point for network analizer
TP10	**FB** test point
TP11	**BST** test point
TP12	**PGOOD** test point
T1	**VIN** input voltage terminal
T2	**VOUT** terminal to connect load

Table1.

Equipment needed:

1. Power supply variable from +4.5V to +20V, 5A or greater capability with pair of 20-AWG or better connection wires.

2. Oscilloscope, minimum of 2 channels and 100 MHz bandwidth for each channel.
3. Electronic load with CC and CR modes available, capability with less than 1 V input and up to 20A load. The load must be connected to the Evaluation Board through a pair of 20-AWG wires or better.
4. NCP3237GEVB Evaluation Board, documentation (schematic, BOM, data sheet, etc.).

Test Procedure for the NCP3237GEVB Evaluation Board:

1. Visually inspect printed circuit board (PCB) assembly to verify that there are no broken or unintentional missing components, obvious shorts or any other anomalies.

2. Set the power supply to + 5V and turn it off. Connect it to the T1 input connector of the board, observing the polarity (negative - "GND", and "VIN" - positive). Leave the output unconnected to an electronic load.

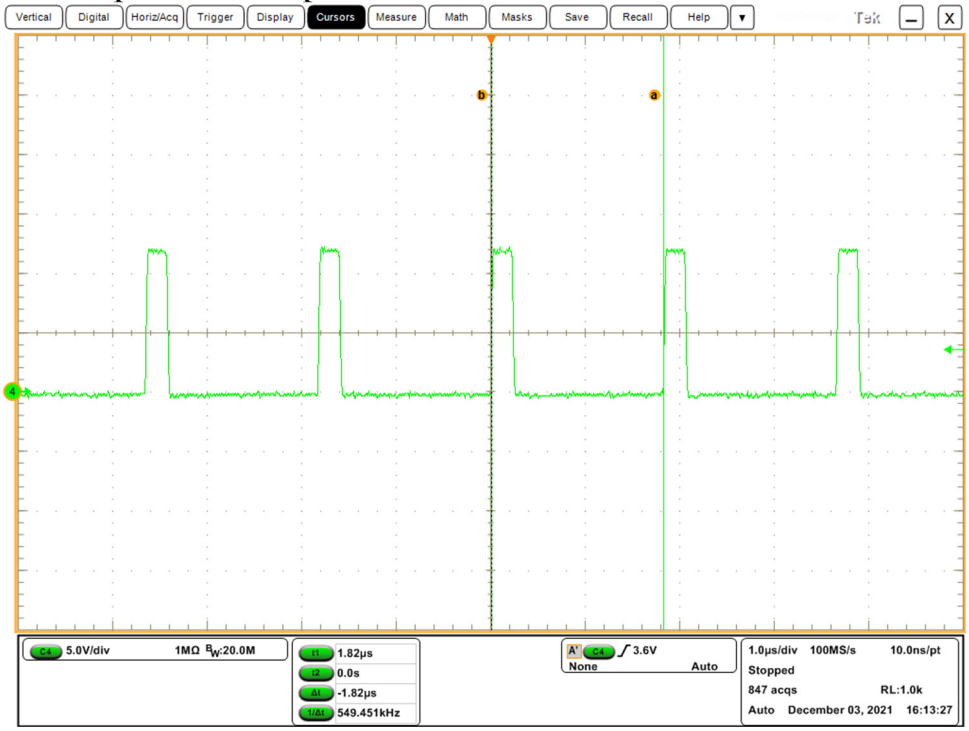
3. Select the desired output voltage according available on the board VOUT voltage selector jumpers J5,J6,J7,J9,J11 and J13 (see **Table1**) by installing shunt across selected (one jumper at the time). When all VOUT voltage selector jumpers is off the output voltage will set to 0.6V automatically. Same way select the Switching frequency by J8,J10 or J12. Install shunt across the J15 to enable board. Put shunt across the J16 to pull-up PGOOD to Vcc in order to monitor PGOOD state.

4. After verifying the correct input and load connections and verifying the input voltage and current limit settings of the input supply, turn on power to the EVB. If no values were changed on the EVB prior to this, the output voltage and Switching frequency should match the selected in advance. Connect an oscilloscope probe to the SW test point (TP2) and verify that the switching frequency is correct. At this time, you may also start raising the input supply voltage up to the maximum of 17V to verify that the EVB will operate at that voltage.
To test the current capability of the EVB, set the input voltage to a value +9V, electronic load to 0A and gradually Increase the load current up to 8A. Verify the output can maintain about desired value at max load. Monitor the switch node on an oscilloscope while stepping to load from 0A to max, switching frequency should remain at about selected in advance with the same duty cycle. Repeat this test for input voltages +12V and +17V respectively to make sure the EVB perform stable with no issues.

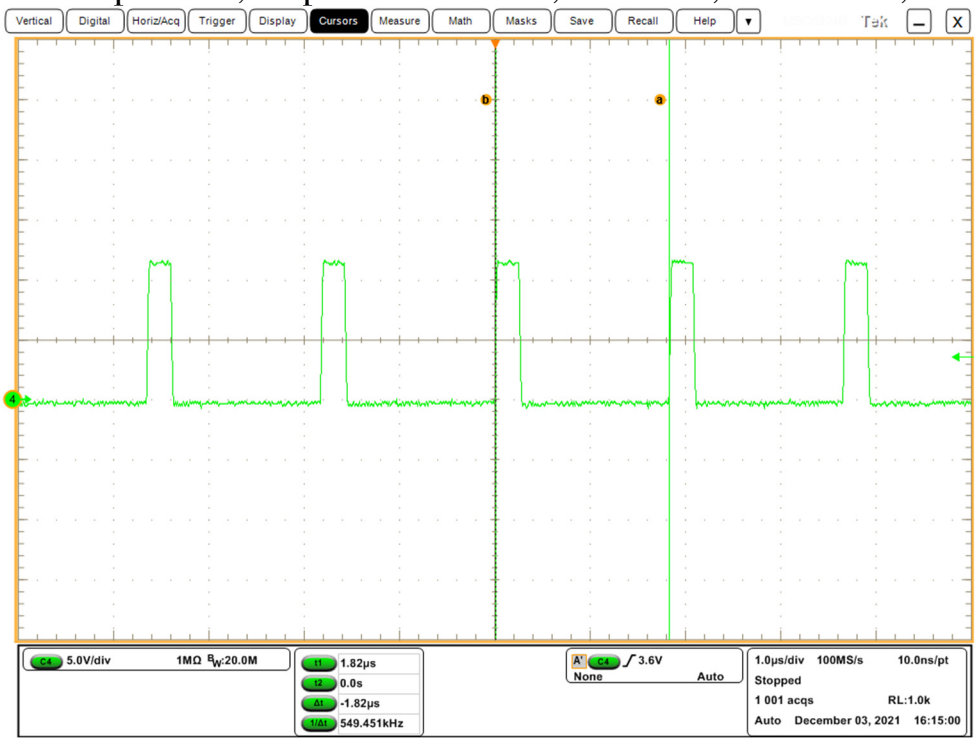
Notes: To power EVB board with a Vin range of + 4.5V to + 8V, use an external pull-up voltage between + 2V and + 5V.

Example of SW waveforms are as follows:

CCM operation, output current = 0A, Vin=12V, Vout=1.5V, Fsw=550KHz



CCM operation, output current = 8A, Vin=12V, Vout=1.5V, Fsw=550KHz



5. Check the over-current protection (OCP) by either shorting the output of the EVB or increasing the load current setting of the electronic load until the EVB shuts off, signaled by the PGOOD signal asserted low. This current should be a minimum of 11-13 A.

This concludes the test of the NCP3237GEVB. Please turn off all power before disconnecting power supplies and electronic load.