Test Procedure for the NCP1632GEVB Evaluation Board

Required equipment –

(a) Chroma 61604 AC Source
(b) Kikusui PLZ1003WH High Voltage Electronic Load
(c) Keithley 2400 Source Meter
(d) Yokogawa WT210 Digital Power Meter
(e) Fluke 87-V Multimeter x 2
(f) Oscilloscope
(g) NCP1632PFCGEVB Evaluation Board

Equivalent test equipment may be substituted.

Figure 1 – NCP1632PFCGEVB Evaluation Board

Input Voltage Range	85 – 265 Vac
Output Voltage	390 V
Output Power Range	0 – 300 W
External Power Source Range	13 – 20 V
Minimum Efficiency	94 %

Table 1 – Board Specifications

Test Procedure:

1) Ensure that the electronic load is rated for “high voltage”, 500 V.
2) Connect the electronic load to the terminal labelled “VOUT” at the “VOUT CONNECTOR”. Set the load to 300 mA.
3) Connect one of the multimeters across the output terminals, VOUT & GND, to measure voltage.
4) Connect the second multimeter in series with the output and load to measure current.
5) Connect the Chroma AC power source to the terminals labelled “L” & “N” at the input connector “VAC_CONNECTOR”. Set input for 115 Vac, 60 Hz.
6) The digital power meter is connected at the input with the current meter in series with the supply and voltage meter across the input terminals as shown in Figure 2.

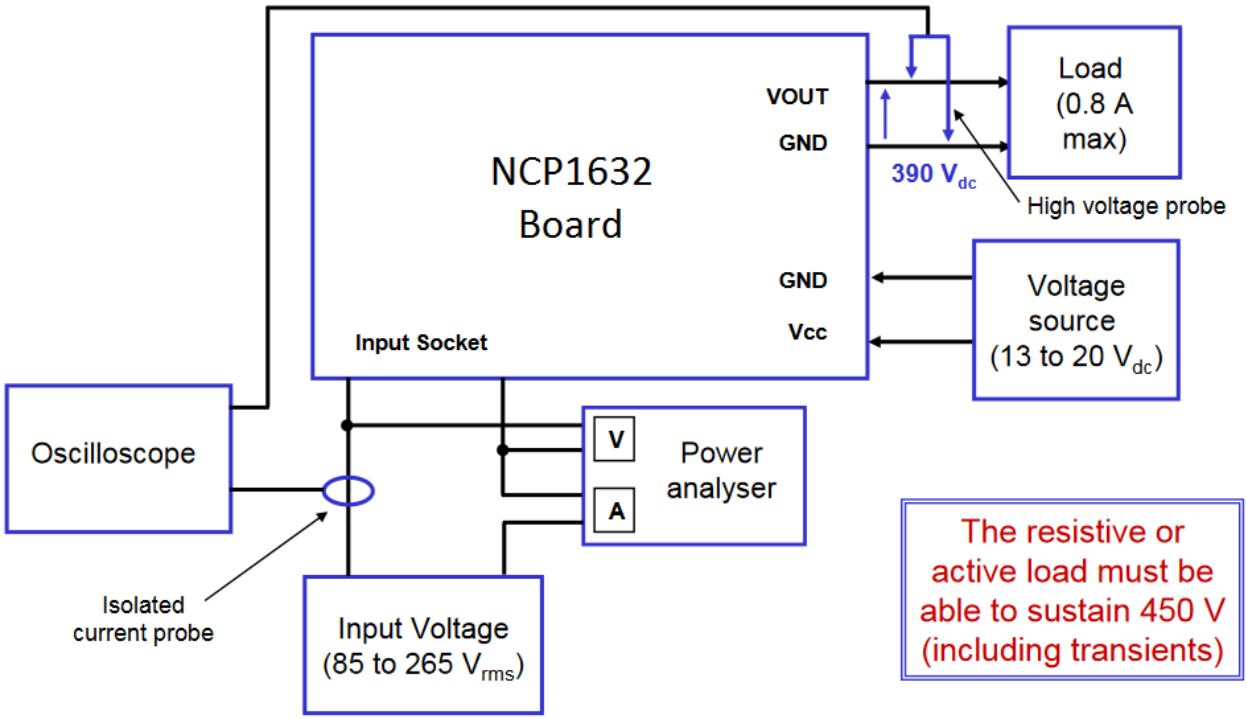

Figure 2 – Board Connections for Testing

7) Place a current probe to observe the input current.
8) Place high voltage probe on Vbulk test point.
9) Place low voltage probes on gate drive signal, DRV1 test point & PFCok test point.
10) Apply the IC bias supply voltage, 15 V, to the terminal labelled “VCC” at the “VCC CONNECTOR”.
11) Confirm that the current consumption from the VCC supply is roughly 570 µA.
12) Turn on the AC source.

13) Increase the output load to 0.6 A.
14) Measure output current (Iout) & output voltage (Vout) using the connected multimeters.
15) Measure power factor (PF) and input power (Pin) from the power meter.
16) Calculate the efficiency using the equation, efficiency = (Iout*Vout)/Pin x 100 %.
17) Repeat measurements with the AC source set to 85 Vac/60 Hz, 230 Vac/50 Hz & 265 Vac/50 Hz.
18) Verify that the results match the expected performance in table 2.
19) Turn off AC source.
20) Ensure that the Vout voltage has discharged and multimeter across output reads 0 V before continuing.
21) Disconnect equipment.
22) End of test.

85 Vac, 60 Hz 0.6 A Load	Output Voltage : 390 V
	Power Factor > 0.98,
	Efficiency > 95%
115 Vac, 60 Hz 0.6 A Load	Output Voltage : 390 V
	Power Factor > 0.98,
	Efficiency > 96%
230 Vac, 50 Hz 0.6 A Load	Output Voltage : 390 V
	Power Factor > 0.97,
	Efficiency > 97.5%
265 Vac, 50 Hz 0.6 A Load	Output Voltage : 390 V
	Power Factor > 0.94
	Efficiency > 97.5%

Table 2 – Expected Results

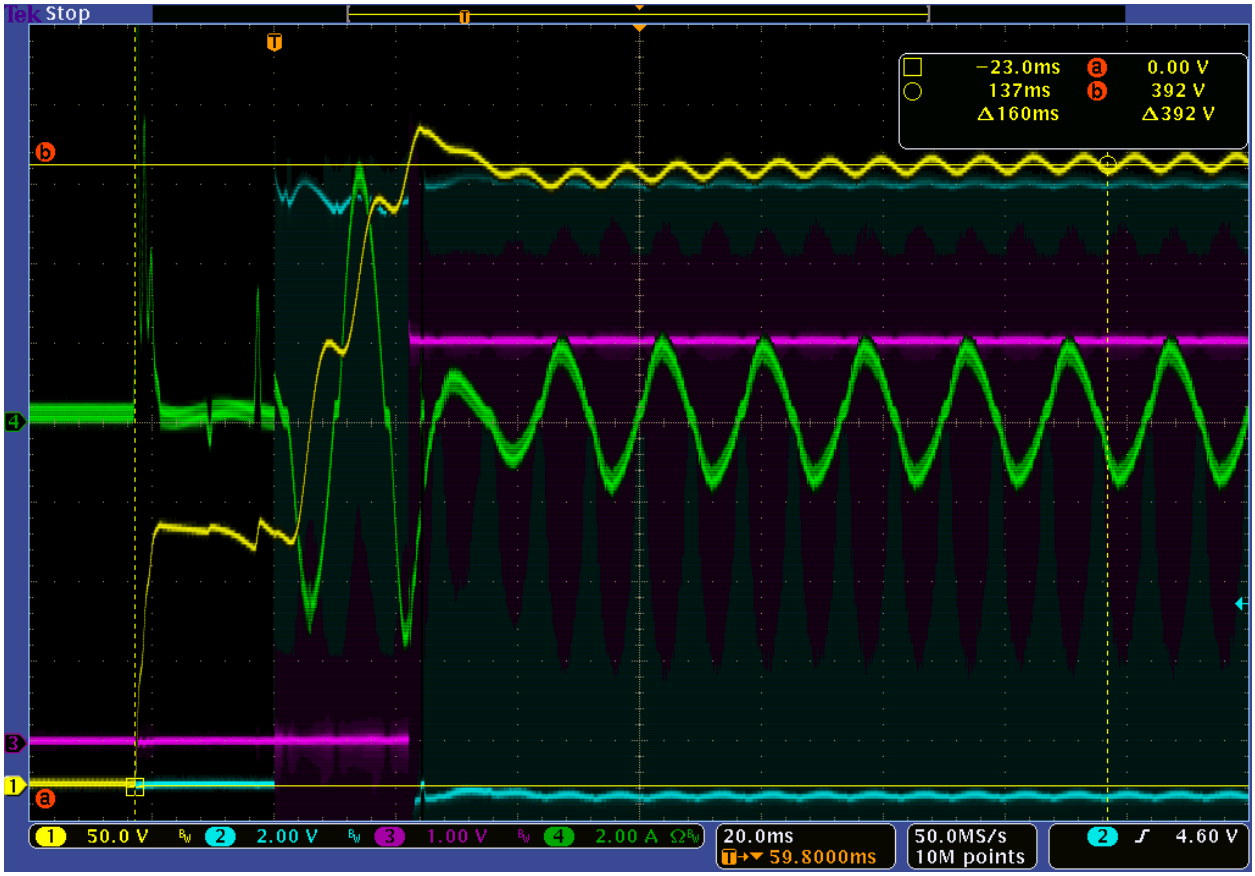

Figure 3 – Start-up waveforms at 115 Vac, 0.3 A load – Vout (Yellow), DRV1 (Blue), Input current (Green) & PFCok signal (Purple)

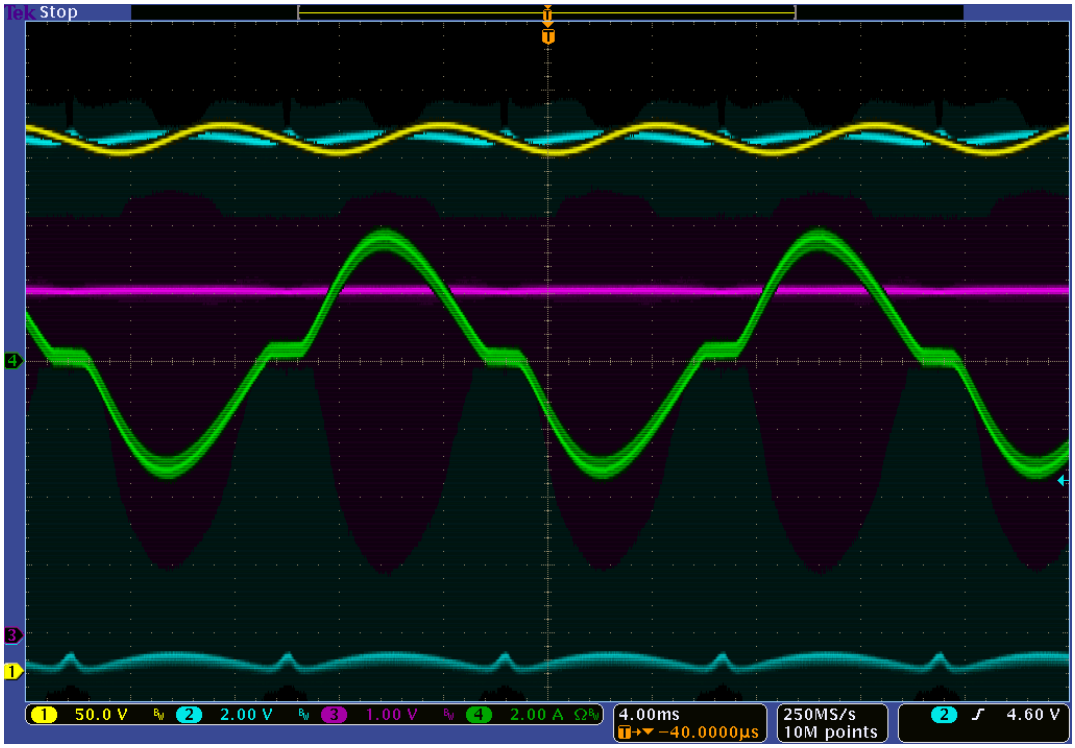

Figure 4 – Input Current (Green) & Vout (Yellow) at 115 Vac, 0.6 A

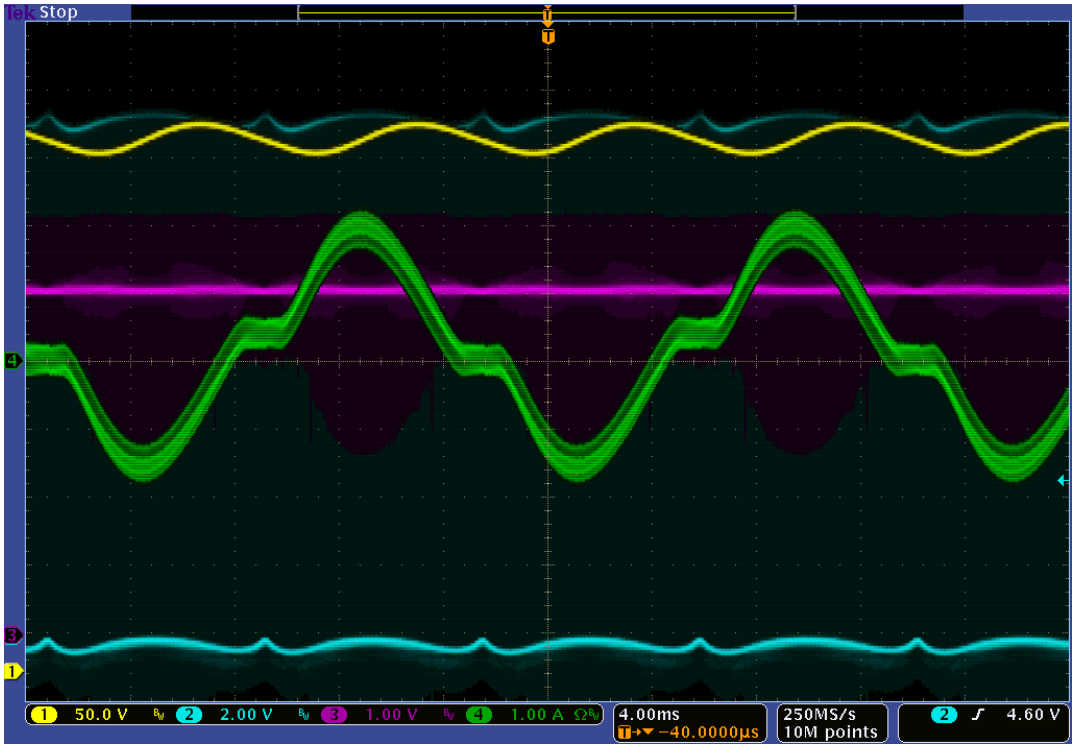

Figure 5 – Input Current (Green) & Vout (Yellow) at 230 Vac, 0.6 A