ON Semiconductor

Test Procedure for the NCL30002DIM1GEVB Evaluation Board

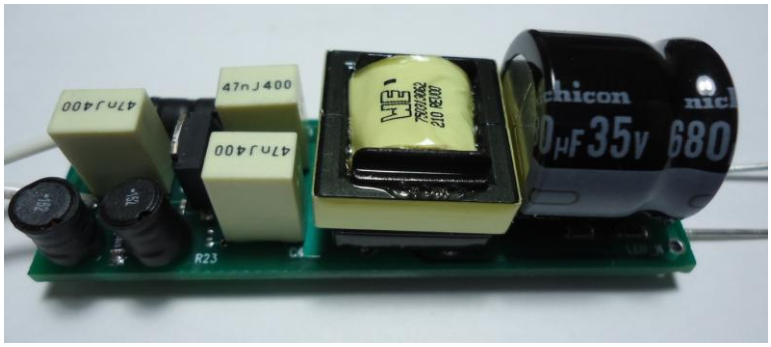
Overview

This procedure describes the calibration and functional testing of the high power factor NCL30002 buck LED driver. There are 4 versions covered by this test procedure.

	Non Dimming	Dimming
120V ac Nominal Mains	NCL30002LED1GEVB	NCL30002DIM1GEVB
230V ac Nominal Mains	NCL30002LED2GEVB	NCL30002DIM2GEVB

Basic Specifications

Input Voltage – 100 V ac to 132 V ac or 200V ac to 265V ac
Input Frequency – 50/60 Hz
Output Voltage – 22 V dc to 26 V dc
Output Current –750 mA dc Nominal



Equipment Needed

AC Source – 100V ac to 265 V ac 50/60 Hz Minimum 1A ac capability
AC Wattmeter – 30W Minimum, True RMS Input Voltage and Current, Power Factor 0.2% accuracy or better
DC Voltmeter – 30V dc minimum 0.1% accuracy or better
DC Ammeter – 1A dc minimum 0.1% accuracy or better
LED Load – 24 V dc nominal (8 LEDs) rated for at least 750 mA dc operation

Calibration Procedure

1. Connect the Unit Under Test (UUT) per the test set up in Figure 1

2.

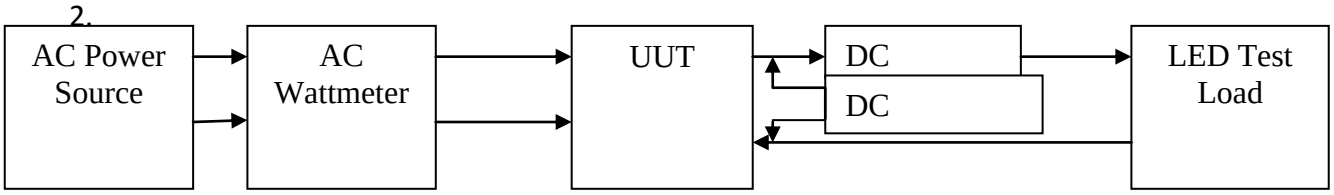


Figure 1 Test Set Up

3. Set the AC source to 120V ±1V ac RMS 60 Hz or 230V ±2V ac RMS 50 Hz.

4. Adjust R17 such that the output current at 100 V ac and 132 V ac or 200 V ac and 265 V ac are equal or as close as adjustment allows.

Note: Unless otherwise specified, all voltage measurements are taken at the terminals of the UUT.

Functional Test Procedure

NCL30002LED1GEVB / NCL30002DIM1GEVB
120V ac Nominal
Connect the UUT per figure 1

Test Condition	Test Variable	Test Limits		Pass / Fail (Circle One)
		Min	Max	
Vin = 120V ac	Output Current	713mA	788mA	Pass / Fail
Vin = 100V ac	Output Current	713mA	788mA	Pass / Fail
Vin = 132V ac	Output Current	713mA	788mA	Pass / Fail
Vin = 120V ac	Power Factor	0.9	-	Pass / Fail
Vin = 120V ac Vout = 24V	Non Dimming Efficiency[1]	88%	-	Pass / Fail
	Dimming[2] Efficiency[1]	83%	-	Pass / Fail

NCL30002DIM2GEVB / NCL30002LED2GEVB
230V ac Nominal
Connect the UUT per figure 1

Test Condition	Test Variable	Test Limits		Pass / Fail (Circle One)
		Min	Max	
Vin = 230V ac	Output Current	713mA	788mA	Pass / Fail
Vin = 200V ac	Output Current	713mA	788mA	Pass / Fail
Vin = 265V ac	Output Current	713mA	788mA	Pass / Fail
Vin = 230V ac	Power Factor	0.9	-	Pass / Fail
Vin = 230V ac Vout =24V	Non Dimming Efficiency[1]	88%	-	Pass / Fail
	Dimming[2] Efficiency[1]	83%	-	Pass / Fail

1. Efficiency $= \frac{Vout \times Iout}{Pin} \times 100\%$
2. This measurement is taken without a dimmer in series.

Dimming Operation

NCL30002DIM1GEVB / NCL30002DIM2GEVB Only

1. Operate the driver through the dimmer on the LED load at nominal line over the full range of the dimmer.

Verify that the LEDs dim smoothly over the full range of control.