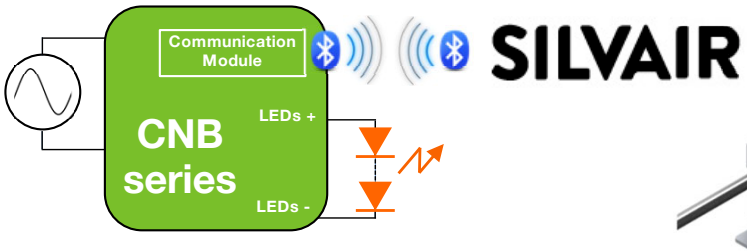
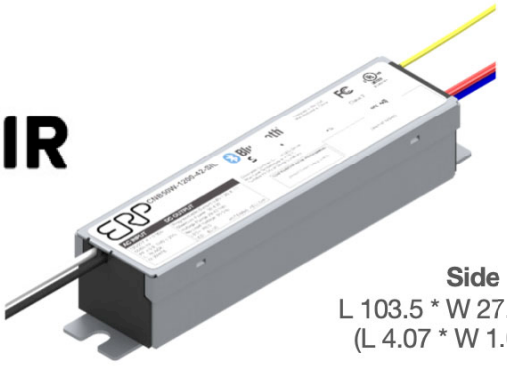
CNB50/30 Series

CNB50 50 W
CNB30 30 W

50 & 30 W Programmable CC Class 2 LED Driver with Integrated Bluetooth® Mesh

Nominal Input Voltage	Max. Output Power	Output Current	Efficiency	Max. Case Temperature	THD	Power Factor	Dimming Method	Dimming Range	Startup Time
120 & 277 Vac	50 W	300 mA to 1200 mA	up to 90% typical	90°C (measured at the hot spot)	< 20%	> 0.9	Bluetooth	1 - 100%	300 ms typical

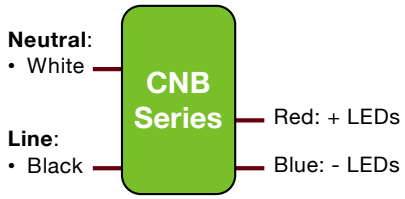




Side Leads
L 103.5 * W 27.3 * H 22.65 mm
(L 4.07 * W 1.07 * H 0.89 in.)

FEATURES

- UL Class P
- Class 2 power supply
- Lifetime: 50,000 hours @ Tc ≤ 75°C
- 90°C maximum case hot spot temperature
- IP20-rated case with silicone-based potting
- Surge protection:
  - IEC61000-4-5: 2 kV line to line/2 kV line to earth
  - 2.5 kV ring wave: ANSI/IEEE c62.41.1-2002 & c62.41.2-2002 category A
- Complies with ENERGY STAR®, DLC (DesignLight Consortium®) and CA Title 24 technical requirements



Wiring Diagram

NFC PROGRAMMING

- Current: 100% to 50% in each voltage range
- Data log read: SKU, S/N, lot code, hours of operation, FW rev., power cycles

APPLICATIONS

- Commercial lighting
- Architectural lighting
- Indoor lighting

c UL us LISTED FC ENERGY STAR CA Title 24 5 Year Warranty

50 & 30 W Programmable CC Class 2 LED Driver with Integrated Bluetooth® Mesh

1 - ORDERING INFORMATION

Part Number	Nominal Input Voltage (Vac)	Max Output Power (W)	Iout (mA)	Vout Min. (Vdc)	Vout Nom. (Vdc)	Vout Max. (Vdc)*	Open Loop (No Load) Voltage (Vdc)	Comments
120 & 277 VAC NOMINAL INPUT VOLTAGE								
CNB30W								
CNB30W-0600-42-SIL	120 & 277	25.2	300 to 600	28	37.8	42	50	Rigado BMD-300/1 Bluetooth Mesh module with Silvair Bluetooth firmware, with wire whip antenna, Side Leads case
CNB50W								
CNB50W-1200-42-SIL	120 & 277	50.4	600 to 1200	28	37.8	42	50	Rigado BMD-300/1 Bluetooth Mesh module with Silvair software, with wire whip antenna, Side Leads case

** The forward voltage (Vf) of the LED load should not exceed Vout Max. of the driver under worst case field operating conditions which are the Vf max. of the LED load under lowest temperature and highest forward current conditions. As a general design guideline, the nominal LED load Vf measured at the operating current and at room temperature should be ≤ Vout Nom. of the driver.*

Programming Wand

Part number: NFC_WAND

Notes:

1. *For additional options of output voltage, contact your sales representative or send an email to: SaveEnergy@erp-power.com*
2. *Please order the programming wand using the part number NFC_WAND.*

50 & 30 W Programmable CC Class 2 LED Driver with Integrated Bluetooth® Mesh

2 - INPUT SPECIFICATION (@25°C ambient temperature)

	Units	Minimum	Typical	Maximum	Notes
Input Voltage Range (Vin)	Vac	90	120 & 277	305	•The rated output current for each model is achieved at Vin≥108 Vac & at Vin≥198 Vac •At nominal load
Input Frequency Range	Hz	47	60	63	
Input Current (Iin)	A			0.5 A @ 120 Vac 0.23 A @ 277 Vac	
Power Factor (PF)		0.9	> 0.9		•At nominal input voltage and with nominal LED voltage •From 100% to 50% of rated power
Inrush Current	A	Meets NEMA-410 requirements			•At any point on the sine wave and 25°C •Active limiting inrush current is available as an option. Please contact your ERP representative or send an email to SaveEnergy@erp-power.com.
Leakage Current	mA			0.3 mA @ 120 Vac 0.7 mA @ 277 Vac	Measured per IEC60950-1
Input Harmonics	Complies with IEC61000-3-2 for Class C equipment				
Total Harmonics Distortion (THD)				20%	•At nominal input voltage and nominal LED voltage •From 100% to 50% of rated power •Complies with DLC (Design Light Consortium) technical requirements
Efficiency	%	-	up to 90%	-	Measured with nominal input voltage, a full sinusoidal wave form and without dimmer attached.
Isolation	The AC input to the main DC output is isolated				

3 - MAIN OUTPUT SPECIFICATION (@25°C ambient temperature)

	Units	Minimum	Typical	Maximum	Notes
Output Voltage (Vout)	Vdc				See ordering information for details
Output Current (Iout)	mA				•See ordering information for details •The rated output current for each model is achieved at Vin≥108 Vac & at Vin≥198 Vac.
Output Current Regulation	%	-5	±2.5	5	•At nominal AC line voltage •Includes load and current set point variations
Output Current Overshoot	%	-	-	10	The driver does not operate outside of the regulation requirements for more than 500 ms during power on with nominal LED load and without dimmer.
Ripple Current	≤ 10% of rated output current for each model				•Measured at nominal LED voltage and nominal input voltage without dimming •Calculated in accordance with the IES Lighting Handbook, 9th edition
Dimming Range (% of Iout)	%	1		100	•Dimming is controlled by Bluetooth mesh from 1% to 100%. •Dimming performance is optimal when the driver is operated at its nominal output voltage matching the LED nominal Vf (forward voltage). Dimming performance may vary when the driver is operated near its minimum output voltage.
Start-up Time	ms		300	500	•Without any dimmer attached, and at nominal input voltages and nominal load •Measured from application of AC line voltage to 100% light output •Complies with ENERGY STAR® luminaire specification and CA Title 24
Isolation	The main DC output is certified and tested per UL8750 Class 2 or LED Class 2				

50 & 30 W Programmable CC Class 2 LED Driver with Integrated Bluetooth® Mesh

4 – BLUETOOTH DIMMING CONTROL

Dimming is controlled by Bluetooth mesh from 1% to 100%.

5 - ENVIRONMENTAL CONDITIONS

	Units	Minimum	Typical	Maximum	Notes
Operating Ambient Temperature (Ta)	°C	-20		50	50°C is the non-derated temperature (Refer to section 8 "Output power de-rating at higher temperatures".
Maximum Case Temperature (Tc)	°C			+90	Case temperature measured at the hot spot •tc (see label in page 12)
Storage Temperature	°C	-40		+85	
Humidity	%	5	-	95	Non-condensing
Cooling	Convection cooled				
Acoustic Noise	dBA			24	Measured at a distance of 1 meter, without dimmer
Mechanical Shock Protection	per EN60068-2-27				
Vibration Protection	per EN60068-2-6 & EN60068-2-64				
MTBF	> 200,000 hours when operated at nominal input and output conditions, and at Tc ≤ 75°C				
Lifetime	50,000 hours at Tc ≤ 75°C maximum case hot spot temperature (see hot spot •tc on label in page 12)				

6 - EMC COMPLIANCE AND SAFETY APPROVALS

EMC Compliance			
Conducted and Radiated EMI	Compliant with FCC CFR Title 47 Part 15 Class B at 120 Vac & Class A at 277 Vac		
Harmonic Current Emissions		IEC61000-3-2	For Class C equipment
Voltage Fluctuations & Flicker		IEC61000-3-3	
Immunity Compliance	**ESD (Electrostatic Discharge)**	IEC61000-4-2	6 kV contact discharge, 8 kV air discharge, level 3
	RF Electromagnetic Field Susceptibility	IEC61000-4-3	3 V/m, 80 - 1000 MHz, 80% modulated at a distance of 3 meters
	Electrical Fast Transient	IEC61000-4-4	± 2 kV on AC power port for 1 minute, ±1 kV on signal/control lines
	Surge	IEC61000-4-5	± 2 kV line to line (differential mode) /± 2 kV line to common mode ground
		ANSI/IEEE c62.41.1-2002 & c62.41.2-2002 category A, 2.5 kV ring wave	
	Conducted RF Disturbances	IEC61000-4-6	3V, 0.15-80 MHz, 80% modulated
	Voltage Dips	IEC61000-4-11	>95% dip, 0.5 period; 30% dip, 25 periods; 95% reduction, 250 periods

Safety Agency Approvals	
cUL	UL8750 listed Class 2

Safety					
	Units	Minimum	Typical	Maximum	Notes
Hi Pot (High Potential) or Dielectric voltage-withstand	Vdc	2500			•Insulation between the input (AC line and Neutral) and the output •Tested at the RMS voltage equivalent of 1768 Vac

50 & 30 W Programmable CC Class 2 LED Driver with Integrated Bluetooth® Mesh

7 - PROTECTION FEATURES

Input Over Current Protection

The CNB series incorporates a primary AC line fuse for input over current protection to prevent damage to the LED driver and meet product safety requirements as outlined in Section 6.

Short Circuit and Over Current Protection

The CNB50/30 series is protected against short-circuit such that a short from any output to return shall not result in a fire hazard or shock hazard. The driver shall hiccup as a result of a short circuit or over current fault. Removal of the fault will return the driver to within normal operation. The driver shall recover, with no damage, from a short across the output for an indefinite period of time.

Internal Over temperature Protection

The CNB50/30 series is equipped with internal temperature sensor on the primary power train. Failure to stay within the convection power rating will result in the power supply reducing the available current (fold back) below the programmed amount. The main output current will be restored to the programmed value when the temperature of the built-in temperature sensor cools adequately.

Output Open Load Protection

When the LED load is removed, the output voltage of the CNB50/30 series is typically limited to 1.3 times the maximum output voltage of each model.

8 - OUTPUT POWER DE-RATING AT ELEVATED TEMPERATURES

The CNB50/30 series can be operated with cooling air temperatures above 40°C by linearly de-rating the total maximum output power (or current) by 2.5%/°C typical until internal over temperature protection activates.

50 & 30 W Programmable CC Class 2 LED Driver with Integrated Bluetooth® Mesh

9 - PROGRAMMING

The CNB series can be programmed by placing the programming wand over the NFC receiver area of the driver and by plugging the USB other end of the wand into a computer. ***The driver does not need to be powered on during the programming process.***

When ordering the CNB series, please make sure you order a programming wand. The part number for the programming wand is "NFC_WAND".

Programming is done by using the ERP GUI (Graphical User Interface), which enables the user to adjust output current from 100% to 50%.

Please note that, for each model, the **default output current setting is 50% of max current**. For example, the default output current setting for the CNB50W-1200-42 is 600 mA.

Furthermore, when programming the driver with a computer using the programming wand, you can access the driver's internal data log and read the following information: SKU, serial number, manufacturing lot code, hours of operation, firmware revision, and power cycles.

For more information, please refer to the GUI user's manual at:
https://www.erp-power.com/our-products/programming-software/

Figure 1

50 & 30 W Programmable CC Class 2 LED Driver with Integrated Bluetooth® Mesh

10 - PREDICTED LIFETIME VERSUS CASE AND AMBIENT TEMPERATURE

Lifetime is defined by the measurement of the temperatures of all the electrolytic capacitors whose failure would affect light output under the nominal LED load and worst case AC line voltage. The graphs in figures 2 and 3 are determined by the electrolytic capacitor with the shortest lifetime, among all electrolytic capacitors. It represents a worst case scenario in which the LED driver is powered 24 hours/day, 7 days/week. The lifetime of an electrolytic capacitor is measured when any of the following changes in performance are observed:

1) Capacitance changes more than 20% of initial value
2) Dissipation Factor (tan δ): 150% or less of initial specified value
3) Equivalent Series Resistance (ESR): 150% or less of initial specified value
4) Leakage current: less of initial specified value

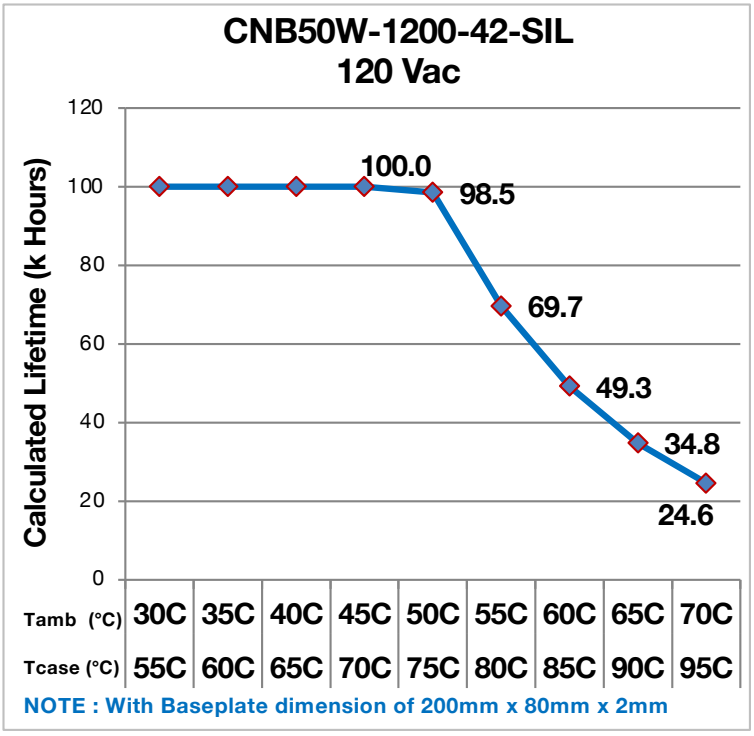


Figure 2

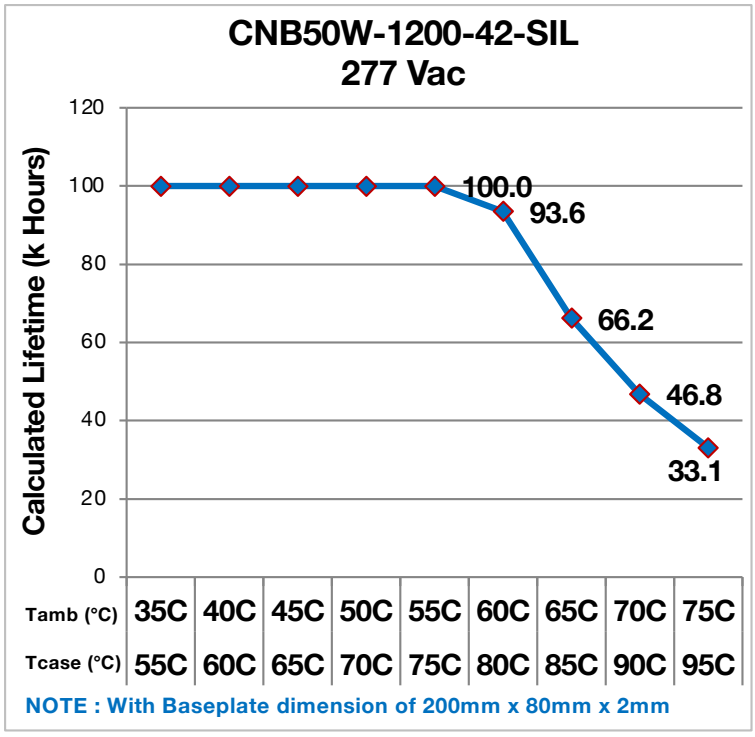


Figure 3

Notes:

- *The ambient temperature $T_{ambient}$ and the differential between $T_{ambient}$ and T_{case} mentioned in the above graphs are relevant only as long as both the driver and the light fixture are exposed to the same ambient room temperature. If the LED driver is housed in an enclosure or covered by insulation material, then the ambient room temperature is no longer valid. In this situation, please refer only to the case temperature T_{case}.*
- *It should be noted the graph "Lifetime vs. Ambient Temperature" may have an error induced in the final application if the mounting has restricted convection flow around the case. For applications where this is evident, the actual case temperature measured at the Tc point in the application should be used for reliability calculations.*

50 & 30 W Programmable CC Class 2 LED Driver with Integrated Bluetooth® Mesh

11 – EFFICIENCY VERSUS LOAD

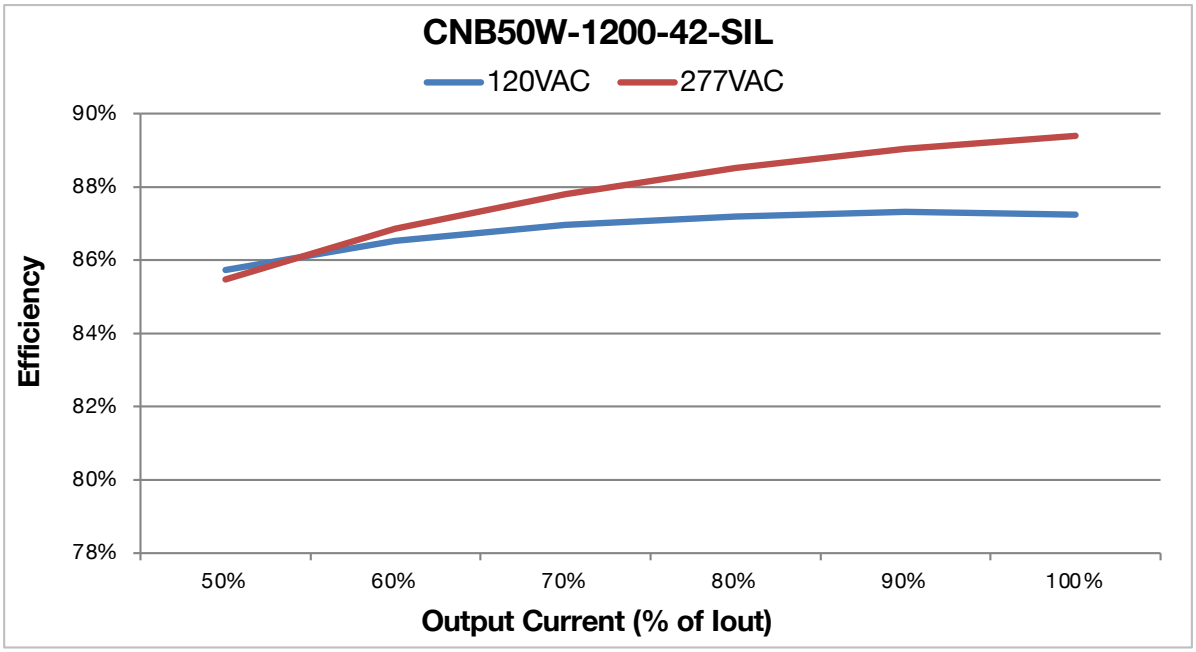


Figure 4

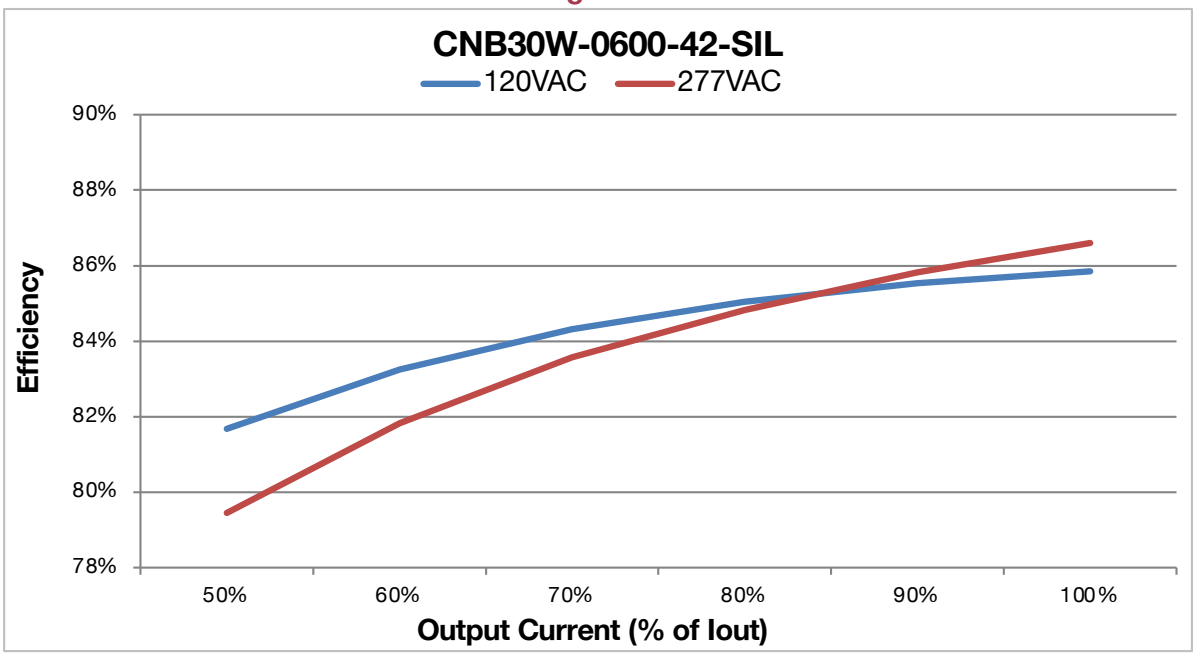


Figure 5

50 & 30 W Programmable CC Class 2 LED Driver with Integrated Bluetooth® Mesh

12 – POWER FACTOR VERSUS LOAD

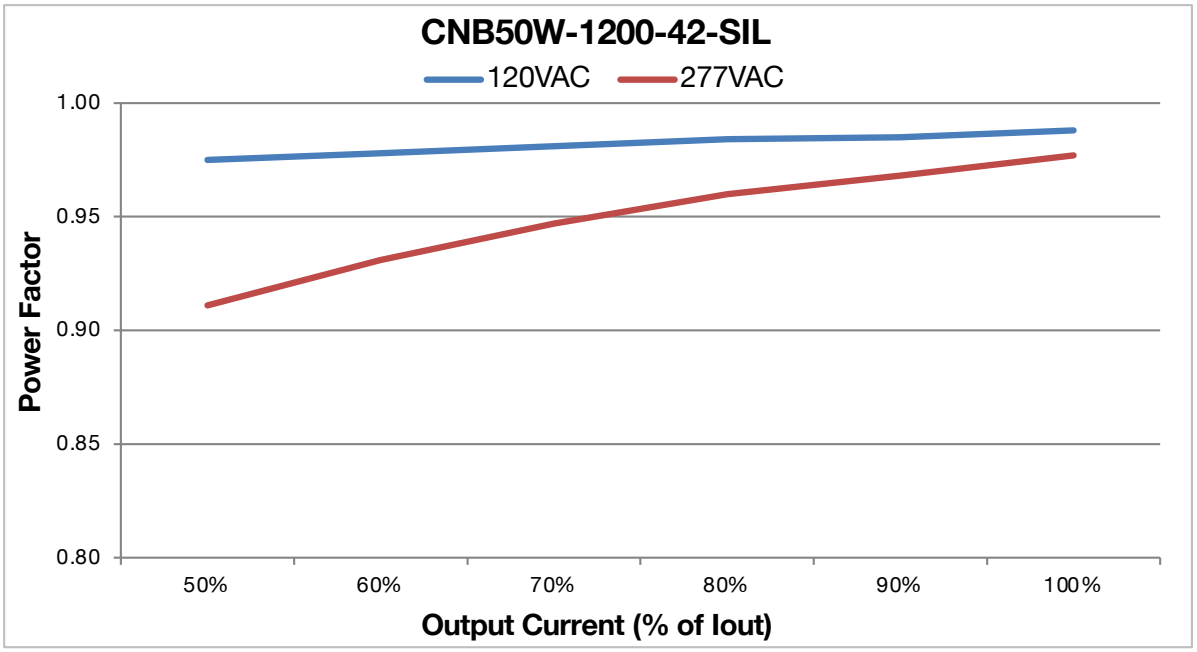


Figure 6

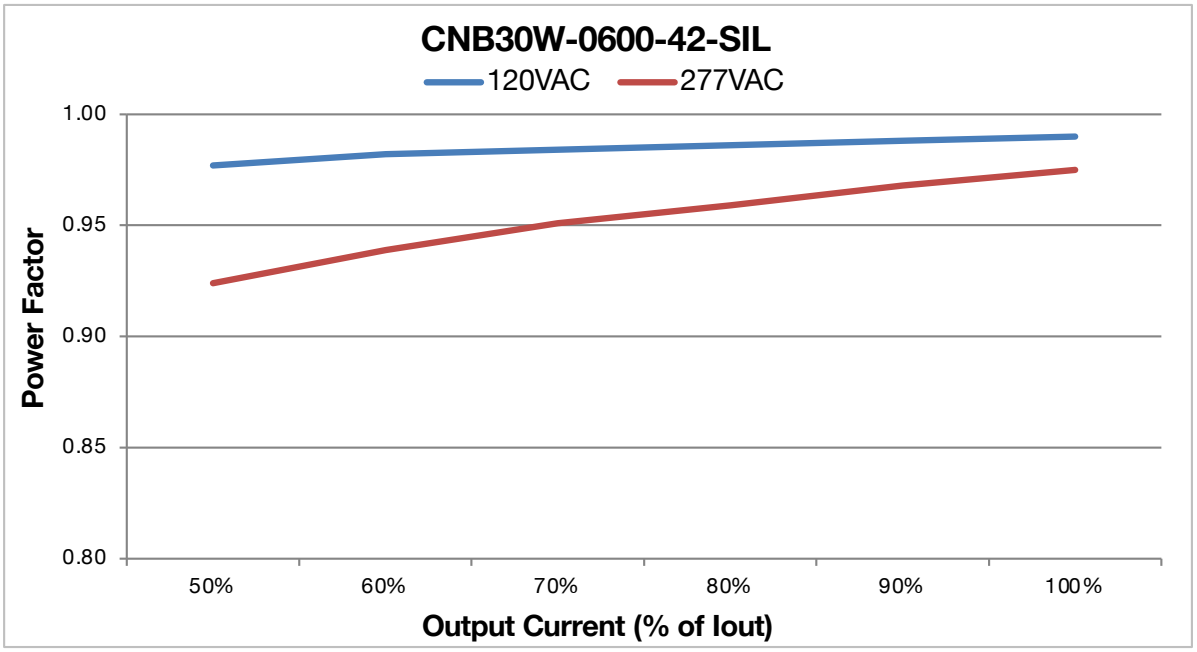


Figure 7

50 & 30 W Programmable CC Class 2 LED Driver with Integrated Bluetooth® Mesh

13 – TOTAL HARMONIC DISTORTION (THD) VERSUS LOAD

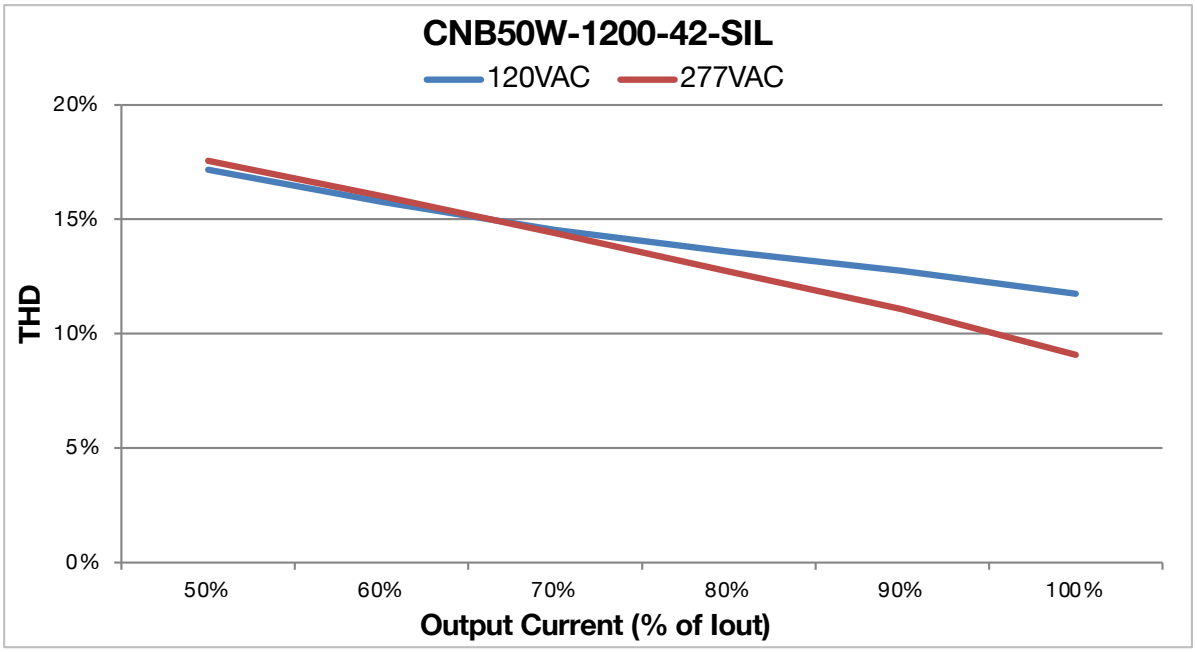


Figure 8

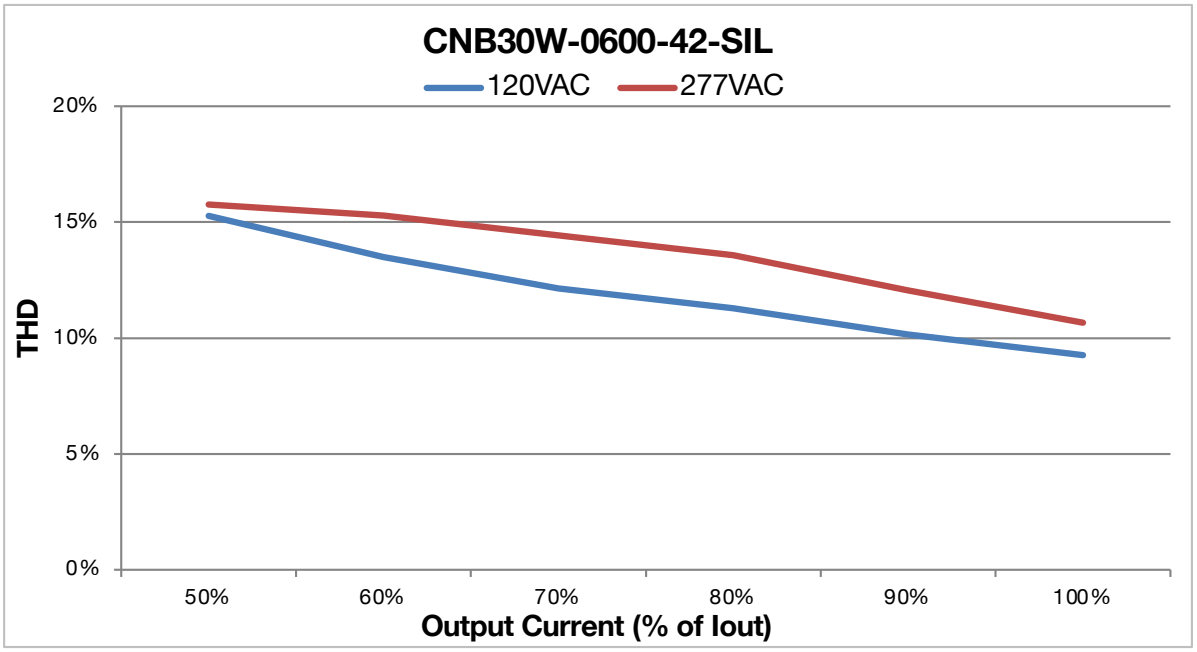


Figure 9

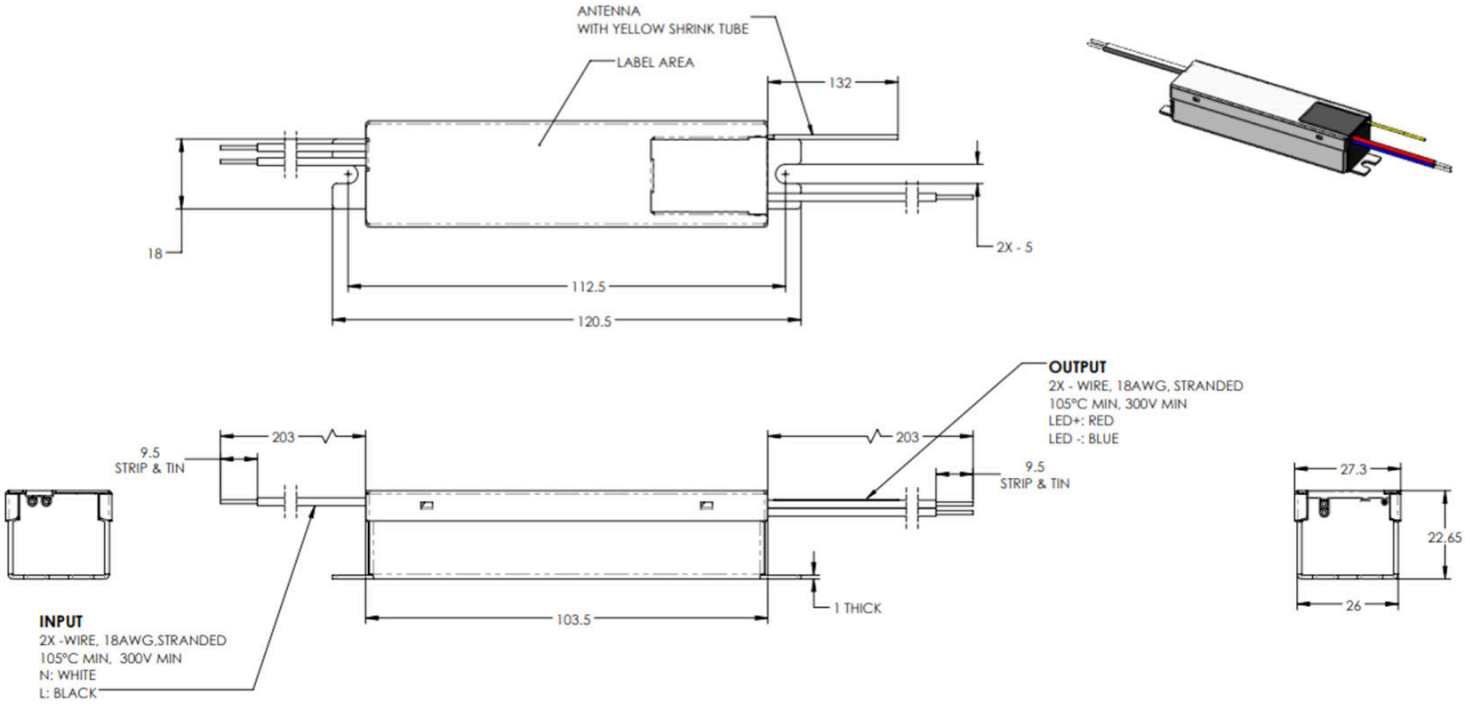
50 & 30 W Programmable CC Class 2 LED Driver with Integrated Bluetooth® Mesh

14 - MECHANICAL DETAILS

- **Packaging:** Aluminum case
- **I/O Connections:**
  - **Models with flying leads:** 18 AWG on all leads, 203mm (8 in) long, 105°C rated, stranded, stripped by approximately 9.5 mm, and tinned. All the wires, on both input and output, have a 300 V insulation rating.
- **Ingress Protection:** IP20 rated
- **Mounting Instructions**: The CNB50/30 driver case must be secured on a flat surface through the two mounting tabs, shown here below in the case outline drawings.

15 - OUTLINE DRAWINGS

Dimensions: L 103.5 * W 27.3 * H 22.65 mm (L 4.07 * W 1.07 * H 0.89 in.)
Volume: 64.0 cm³ (3.89 in³)
Weight: 114 g (4.02 oz)



All dimensions are in mm

Figure 10

50 & 30 W Programmable CC Class 2 LED Driver with Integrated Bluetooth® Mesh

16 - LABELING

The CNB50W-1200-42-SIL is used in figure 11 as an example to illustrate a typical label.

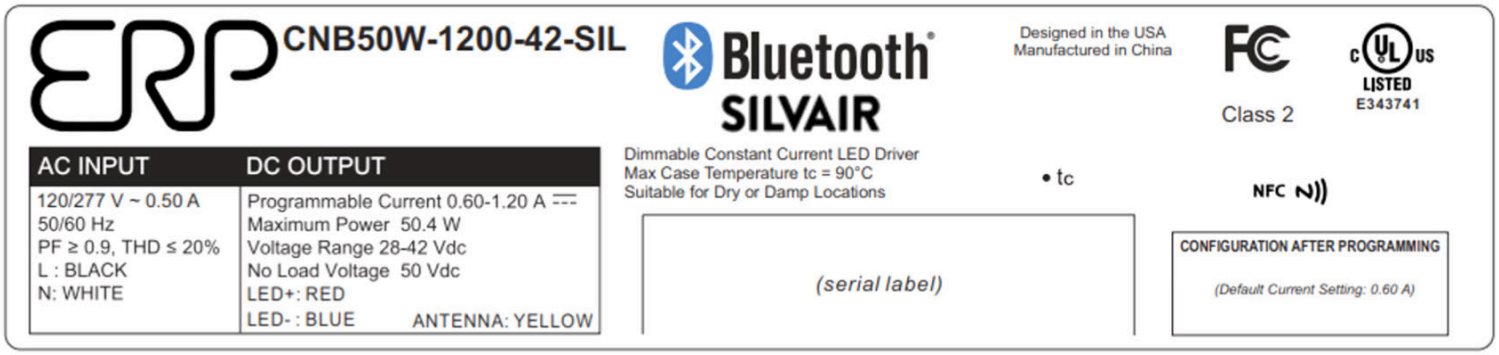


Figure 11

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