

50 Watt - LP50WT5-55-PC1400-RD

PROGRAMMABLE LED DRIVER WITH 0-10V DIMMING & 12V@200mA AUX

Model: LP50WT5 Series

- Drive Mode: Programmable Constant Current
- Input Voltage: 120 to 277VAC, 50/60Hz
- Output Voltage: 12 - 55VDC, AUX 12V@200mA
- Output Current: GUI Programmable
- Programmable Output Current (POC): 400 - 1400mA
- 0-10V Linear Dimming 1% - 100%^(B)
- Dim to Zero? YES/NO setting.^(C)
- Soft Start? YES/NO setting.^(D)

Environmental

1. Operating temperature: Tc 90C Maximum. Reference -40 to +50°C ambient
2. UL Class P
3. Storage temperature range: -40 to +85°C
4. Humidity (non-condensing): 5% - 90%RH
5. Cooling: Convection
6. Vibration Frequency: 5-55Hz/2g, 30 minutes
7. Impact resistance: 1g/s
8. MTBF@ 25°C: 362,000 hours @ Full Load per MIL-217F Notice 2.

Safety and Compliance

1. UL8750, EN61347, CSA 22.2 safety listed, UL Class P
2. FCC, 47CFR Part 15 Class A certified
3. Damp & Dust resistant design IP20 NEMA1, for Dry & Damp Locations.
4. T5 Rectangular style metal case.
5. Safety Isolation between Primary and Secondary
6. Meets EN61000-3-2 & EN61000-3-3 Class C
7. Protection: output over-voltage, output over-current, output short circuit, auto-recovery. Over Temp Foldback.
8. EN61000-4-5: 2.5kV/4kV 8/20 µsec transient protection.

Electrical Specifications at 25°C

- Input voltage range: 120-277Vac (Full range 108 to 305Vac)
- Frequency: 47 - 63HZ
- THD%: ≤ 20% at ≥ 30% Output Power, 120Vac/230Vac/277Vac 50/60Hz
- Power Factor: ≥ 0.90 at ≥ 40% Output Power, 120Vac/230Vac/277Vac 50/60Hz
- Inrush current: <5.3A at 25C, 120Vac, cold start, Max. Load
- Input current: 0.52A Maximum @ 120Vac
- Efficiency: 87% typical at 230Vac Full Load
- Constant Current regulation: ± 3% Over Input Line Variation
- Load regulation accuracy: ± 3%
- Leakage current: 700uA Max. @ 277Vac

Programmable Parameters

Programmable Parameter	Programmable Minimum Value	Programmable Maximum Value	Factory Default	GUI Programmable
Output Constant Current (Iout) ^(A)	400 mA	1400 mA	1400 mA	YES
Disable Dimming?	NO	YES	NO	YES
Dimming Curves: LINEAR or LOG ^(B)	1% (Min Dim)	N/A Fixed 100%	LIN 1% (Min Dim)	YES
Dim to Zero? ^(C)	NO	YES	NO	YES
Soft Start? ^(D)	NO	YES	NO	YES
NTC Minimum Ohms ⁽³⁾	1K Ω	10K Ω	2K Ω	YES
NTC Minimum %Iout	~ 0%	100%	~ 10%	YES
NTC Maximum Ohms ⁽³⁾	2K Ω	10K Ω	6.3K Ω	YES
Constant Lumen Output Lookup Table	1kHours/50% Iout	254k Hours/100%, Max 8 entry Lookup Table	Disabled	YES
End of Life Indicator	1k Hours	254k Hours	Disabled	YES

A. Output Current: Set using EP-PRG-01 USB Programmer interface & EPtronics PC based GUI Software.

Programmable Output Current (POC): 400 - 1400mA Power limited to 50W maximum by Voltage foldback.

B. Minimum Dimming current: If Dim to Zero = NO then Min Dim is 3mA or 1%, or % Set whichever is greater.

C. Dim to Zero?: If YES then will always dim to 0mA at Vdim ≤ 1.00V regardless of Min Dim% Setting.

D. Soft Start?: See page 7. NO, startup <500ms. YES, time to first light (100mA) <500ms, aesthetic fade on to 100% programmed Iout will be ~ 3500ms. Start-up time & Soft Start time are set to meet CA Title 24-2016.

Programmable Constant Current Version



IP20



Part Number	US/CN Class 2	Output Voltage Range	Output Constant Current ⁽²⁾⁽³⁾	Current Accuracy ⁽²⁾	Output Power Maximum ⁽²⁾	Typical Efficiency ⁽¹⁾
LP50WT5-55-PC1400-RD	YES	12 - 55 VDC	400 mA to 1400 mA	± 5%	50W	87%

Notes

1. Typical efficiency measured at 230VAC input, Output full load
2. Keep POC (Programmable Output Current) within 50W Maximum Power Operating Window. Refer to Power Operating Window graph. Part will foldback output Voltage to maintain power limits. See Page 7 for Power Operating Window.
3. NTC Minimum value set must not exceed 70% of Maximum value set. See page 8 for NTC graphs
4. See page 9 for GUI programming notes.

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LED Optimized Drivers

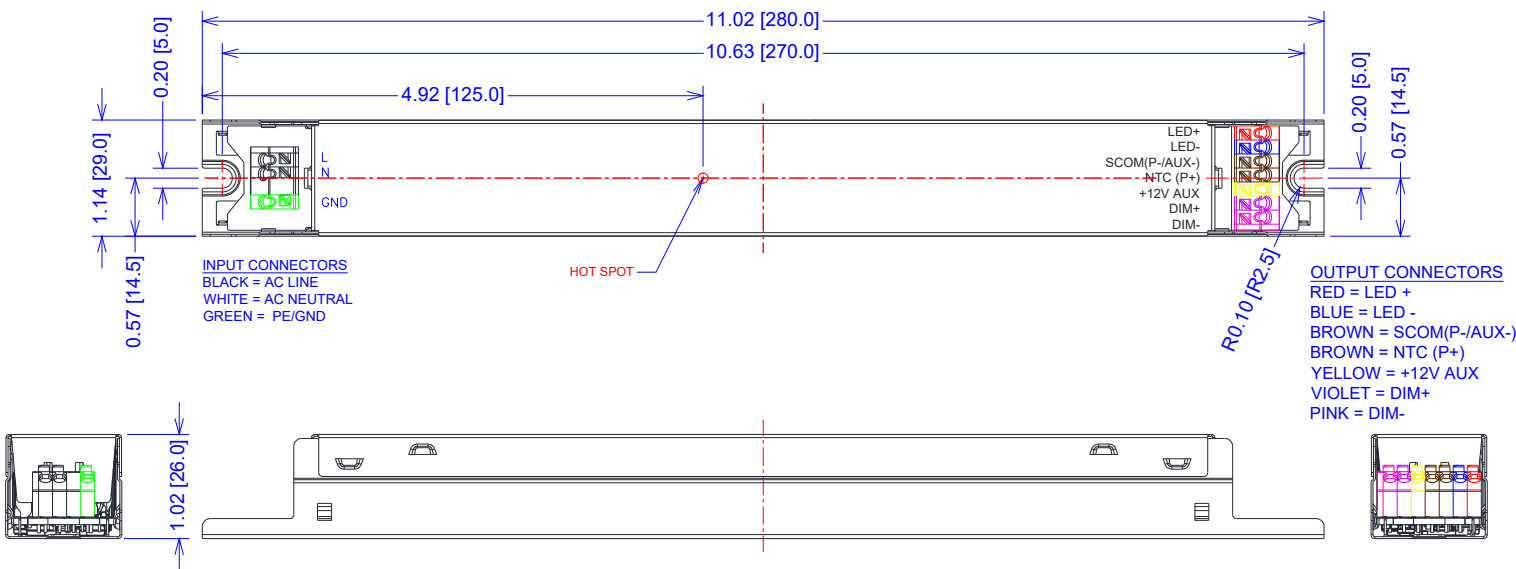
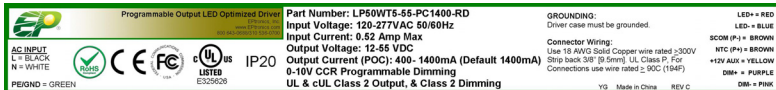
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Mechanical Dimensions: Inches [mm]

Material: Metal Housing
Weight: 10 oz (283 grams) Typical
Case must be grounded in end use application

Labeling Example



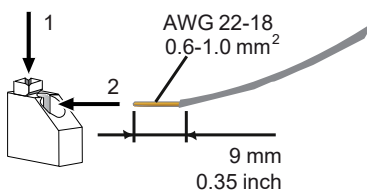
Case Parameter	Inches [mm]
Length	11.02 [280.0]
Width	1.14 [29.0]
Height	1.02 [26.0]
Mounting Length	10.63 [270]
Connectors	UL, KF250-3.5, WAGO 250-402 Push Pin or equivalent.

LED wiring distance:

Recommended maximum wiring distance:
35.70V@1400mA with ~5% Vout Drop.

AWG	#22	#21	#20	#19	#18	#16
Distance (m)	12.0	15.2	19.1	24.1	30.4	48.4
Distance (ft)	39.5	49.8	62.8	79.2	99.8	158.7

KF250-3.5 CONNECTORS



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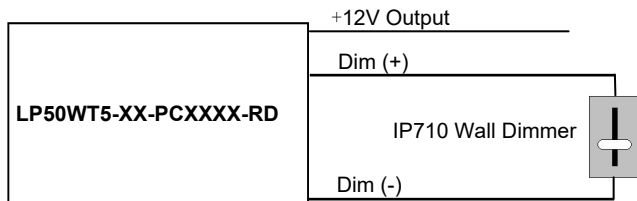
-RD, 0-10V & Resistance Dimming Scheme

Parameters	Minimum	Typical	Maximum
12V Auxiliary Output	11V	12.0V	13.0V
12V Auxiliary Output Source Current	0mA	—	200mA
Absolute Voltage Range on 0-10V Input (DIM+)	-2.0V	—	+15V
Source Current out of 0-10V Input (DIM+)	0uA	—	250uA
Dim: Class 2 Isolated from AC input and Outputs	2.5kV	—	—

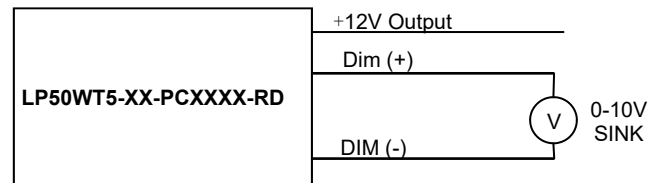
Notes

1. Part comes with DIM+, DIM- & +12V auxiliary connectors. +12V auxiliary return is SCOM.
2. Part is compatible with most 0-10V Wall Slide dimmers and direct 0-10V analog signal. Recommended dimmer is Leviton IP710 or equivalent connected between DIM+ and DIM- connectors. +12V auxiliary is not used for dimming.
3. Dimmed output current will be Minimum Programmed Dim% Value when $V_{dim} \leq 1.00V$.
4. Output will be 100% with DIM+/DIM- open and Minimum Programmed Value with DIM+/DIM- Shorted.
5. Minimum dimming level & Dim to Zero? are programmable with EPtronics LED Driver Interface Programming Tool.

-RD 2-Wire Resistance Dimming Scheme

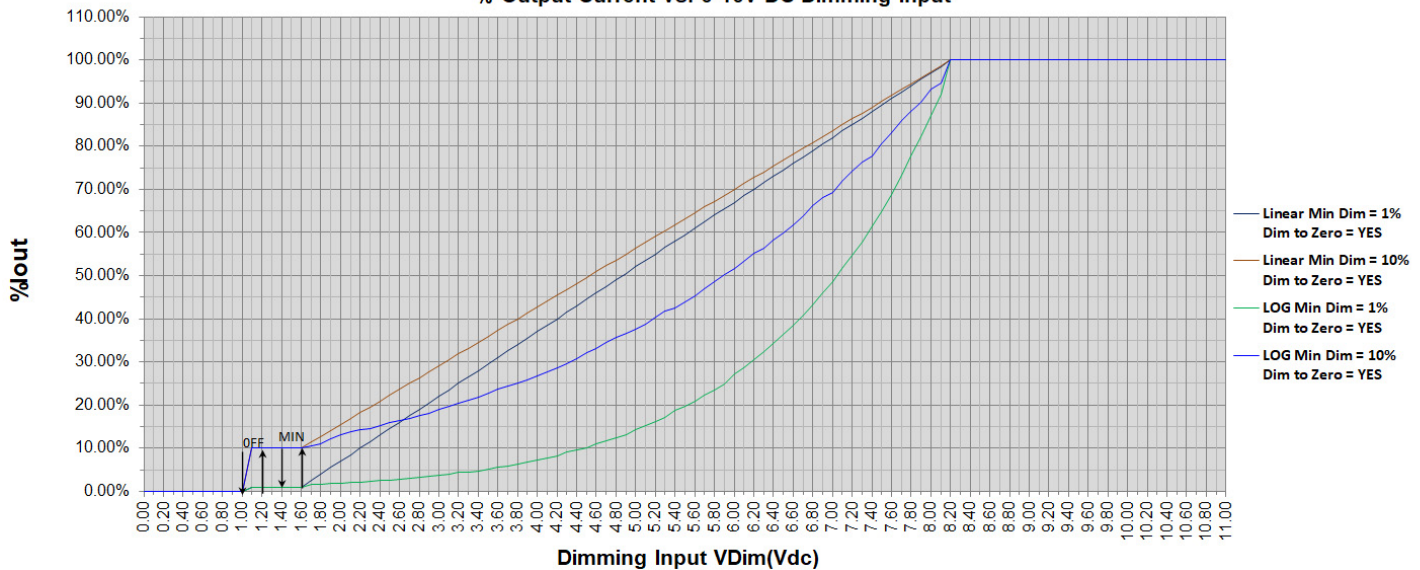


-RD 2-Wire 0-10V Dimming Scheme



Typical Dimming Curves: Dim to Zero? = YES

% Output Current Vs. 0-10V DC Dimming Input



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Input Specifications

Parameter	Min.	Typ.	Max.	Notes/Conditions
Input Voltage	108 Vac	—	305 Vac	120, 230, 240, 277 Vac Nominal Values
Input Frequency	47 Hz	—	63 Hz	50/60Hz Nominal
Input AC Current	—	—	0.52 A	Measured at 120Vac/60Hz Input, Output Full load.
	—	—	0.22 A	Measured at 277Vac/60Hz Input, Output Full load.
Inrush Current (Peak) I _{pk} 10%P _w ≤50usec	—	—	5.30 A	Measured at 120Vac/60Hz Input, Output Full Load, Ta 25°C, Cold Start
	—	—	22.60 A	Measured at 277Vac/60Hz Input, Output Full Load, Ta 25°C, Cold Start
Leakage Current	—	—	0.50mA	Measured at 120Vac/60Hz Input, Output Full load.
	—	—	0.70mA	Measured at 277Vac/60Hz Input, Output Full load.
THD	—	—	20%	Measured at 120, 230, 277Vac Input, Output Power ≥30%
Power Factor (PF)	0.90	—	—	Measured at 120, 230, 277Vac Input, Output Power ≥40%

Output Specifications

Parameter	Min.	Typ.	Max.	Notes/Conditions
DC Output Voltage	Per Table	—	Per Table	Per Table on Page 1
DC Output Current (POC)	-5%	Per Table	+5%	Programmable Output Current (POC)
Output Power	—	—	50W	Voltage Foldback
Ripple & Noise (V _{pk-pk})	—	—	3% V _o	20 MHz BW, Full load output in parallel with 0.1 μF ceramic & 10 μF Electrolytic.
Ripple (I _{pk-pk})	—	—	5% I _o	20 MHz BW, Full load output in parallel with 0.1 μF ceramic & 10 μF Electrolytic. 120 Hz component (Flicker Free)
Start-up Time, Soft Start = NO	—	450 mS	500 mS	Measured at 120Vac/60Hz Input, Output Full load.
Auxiliary Output (V)	11	12	13	@ 200mA Maximum

Environmental Specifications

Parameter	Min.	Typ.	Max.	Notes/Conditions
Case Temperature (T _c)	-40 °C	—	+90 °C	Measured at location specified on case.
Operating Temperature (T _a)	-40 °C	—	+50 °C	This is a reference range. T _c controls temperature range.
Storage Temperature (T _s)	-40 °C	—	+85 °C	Non operating temperature range.
Operating Humidity	—	—	90% RH	Relative Humidity, non-condensing.
Vibration	5 Hz	—	55 Hz	2G, 10 minutes/1 cycle, period 30 minutes, each along X, Y, Z axis.
MTBF	—	362,000 Hours	—	MIL-HDBK-217F Notice 2, T _a = 25C, Output Full Load.

Protection Specifications

Parameter	Min.	Typ.	Max.	Notes/Conditions
Output Short Circuit (SCP)	—	—	—	No Damage, Auto recovery after short is removed.
Output Over Current (OCP)	—	—	+8% I _o	Constant Current Limiting circuit.
Output Over Voltage (OVP)	—	—	105% V _o	No Damage, Auto recovery after fault is removed.
Output Power Limit (OPL)	—	—	50W	Voltage Foldback
Over Temp Protection (OTP)	—	—	100C	Foldback at T _c >100C

Safety Compliance

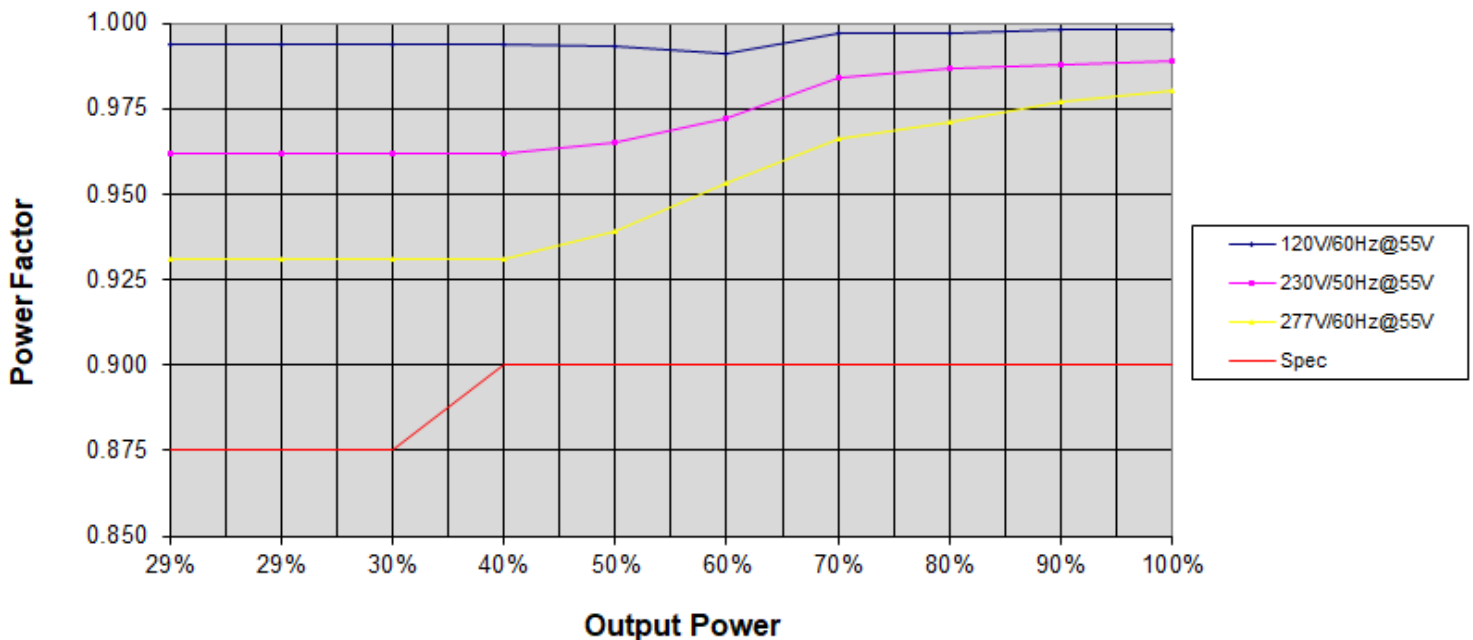
Safety	Notes/Standards
UL/CUL Listed UL Class P	UL8750 & CAN/CSA C22.2 No. 250.13, UL Class P
CE	EN61347-1, EN61347-2-13
Withstand Voltage	Input to Output: 1610 Vac
Isolation Resistance	Input to Output: >100 MΩ, 500VDC @ 25 °C, 70 % RH
0-10V Class 2 Isolated Dimming Circuit	Dim+/Dim- are Class 2 Isolated from all other inputs & outputs. Dimming can be wired as a Class 1 or Class 2 circuit.
FG	The metal case of the driver must be connected to earth ground (FG) in the end-use application.
Sound Rating	<24dB Class A

EMC Compliance

Standard	Notes/Conditions
FCC, 47CFR Part 15	Class A
EN 55015	Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment.
EN 61000-3-2	Part 3-2: Limits for harmonic current emissions Class C, ≥80% Rated Power
EN 61000-3-3	Part 3-3: Limitation of voltage changes, voltage fluctuations and flicker.
EN 61000-4-5	Part 4-5: Surge Immunity test, 2.0 kV L-N, 4 kV L-FG & N-FG
Energy Star	Energy Star transient protection: Ballast or driver shall comply with ANSI/IEEE C62.41.1-2002 and ANSI/IEEE C62.41.2-2002, Category A operation. The line transient shall consist of seven strikes of a 100 kHz ring wave, 2.5 kV level, for both common mode and differential mode.

Power Factor Curves (Typical)

PF vs. Output Power



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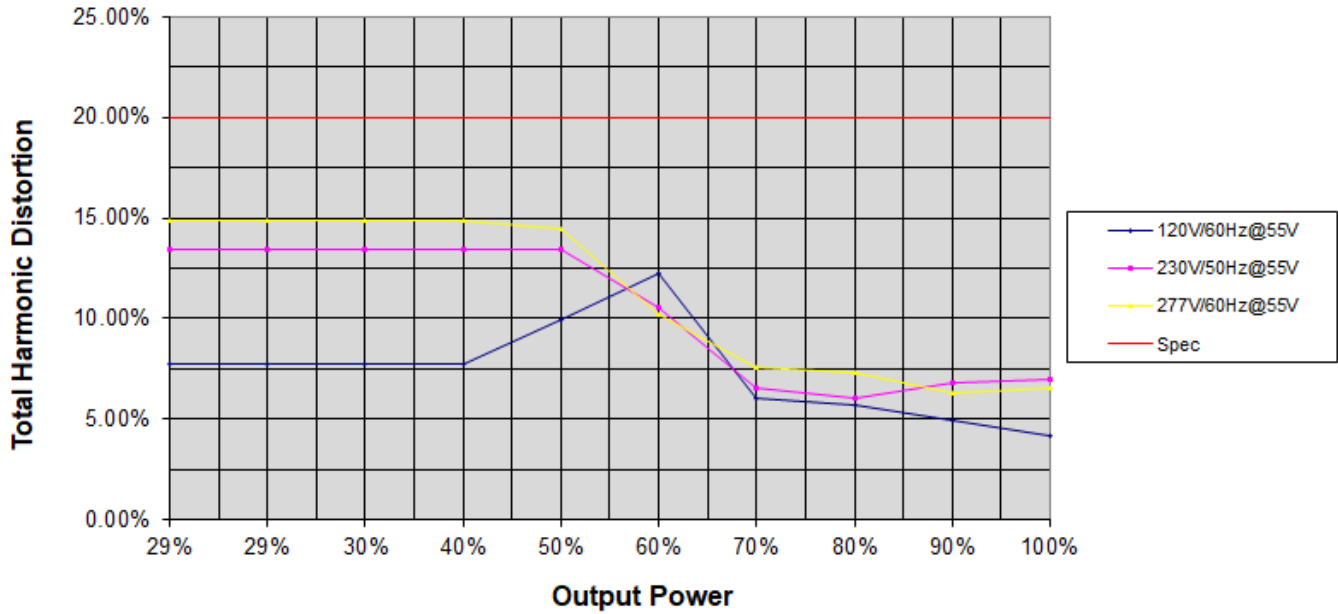
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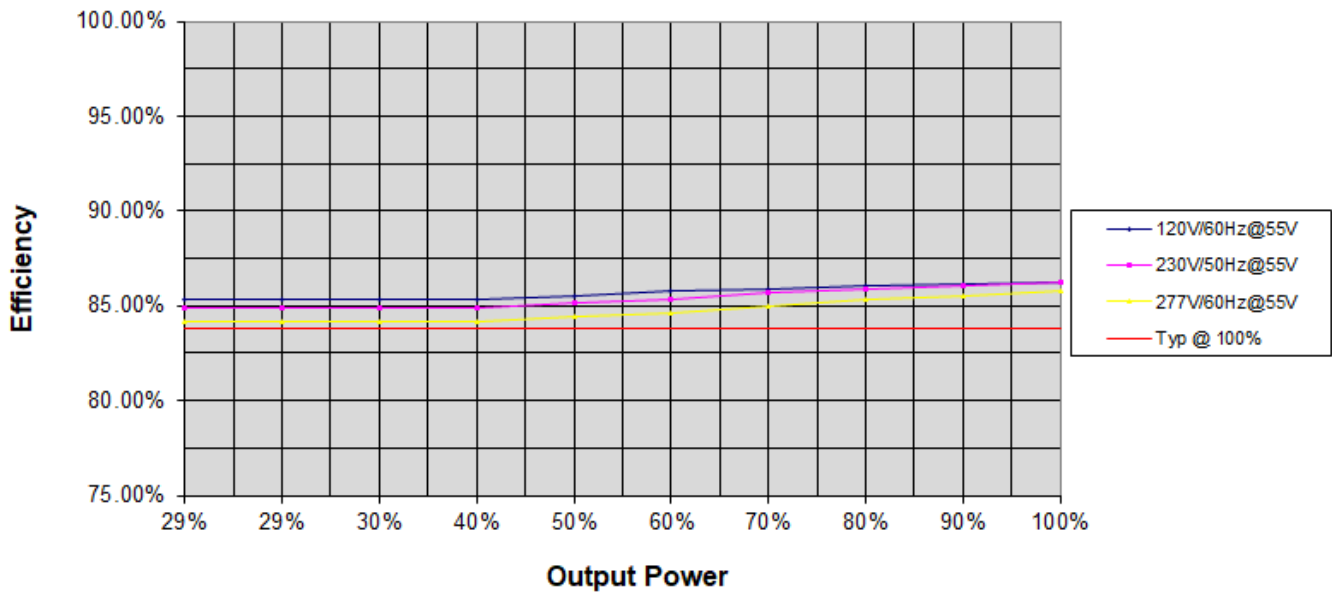
THD Curves (Typical)

THD vs. Output Power



Efficiency Curves (Typical)

Efficiency vs. Output Power



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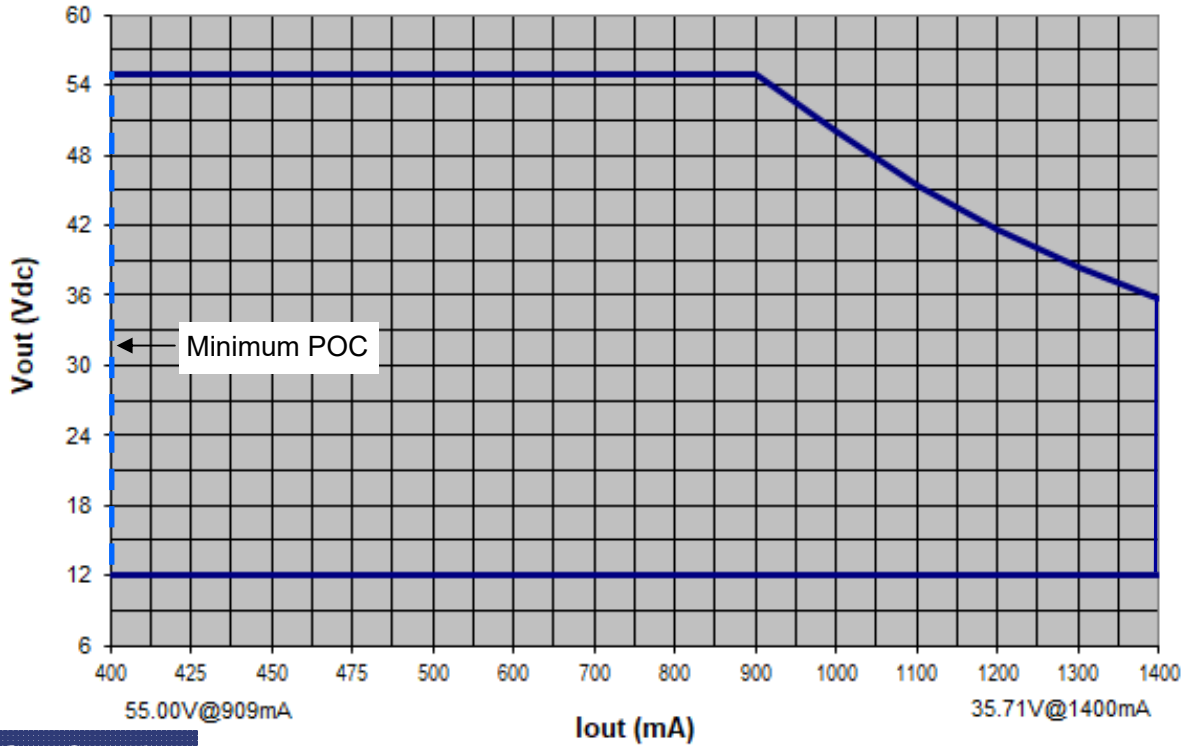
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Power Operating Window

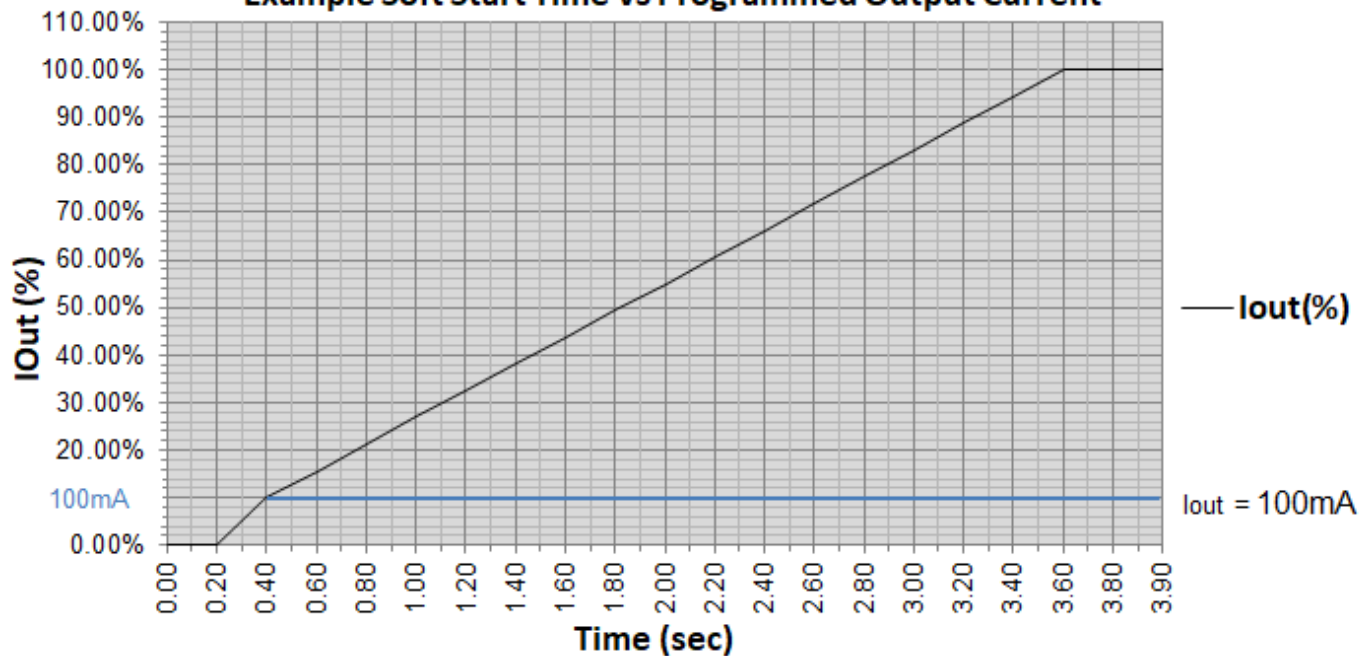
LP50WT5-55-PC1400-RD OPERATING WINDOW
Vout (Vdc) vs. Output Current (mA)



Soft Start Operation

Specification: Time-To-First-Light (100mA) <500ms, Time to 90% Iout ~ 3 Seconds, Time to 100% Iout <4.0 Seconds

Example Soft Start Time vs Programmed Output Current



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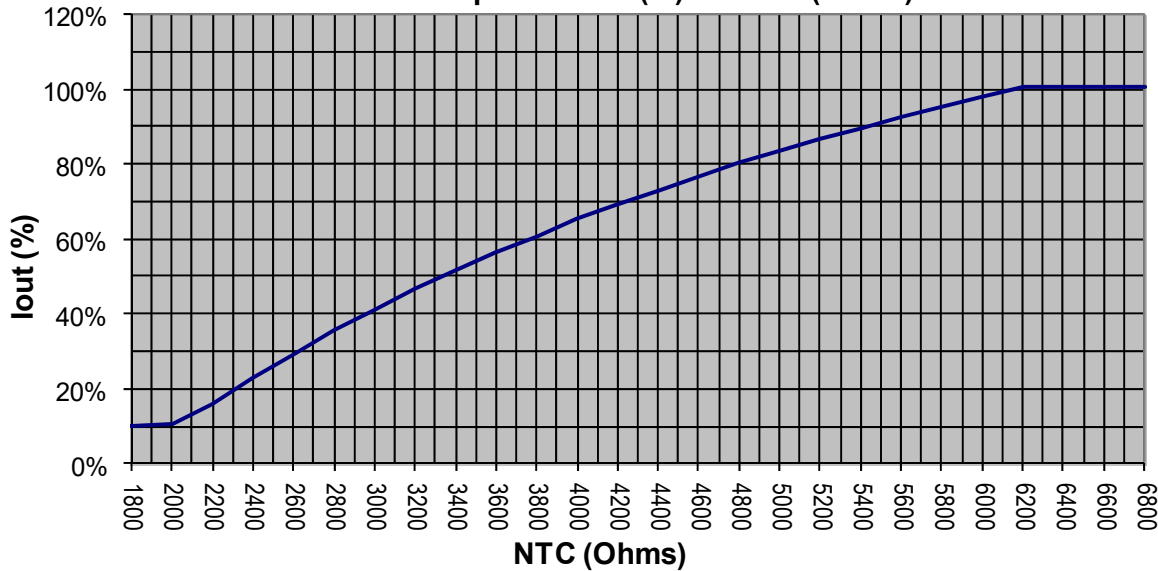
Module Temperature Protection using External NTC

Example: NTC High, NTC Low and NTC Minimum Iout% can be programmed using EP Programmer USB interface & EPtronics PC based GUI Software.

Factory Default Settings: NTC Low = 2.0K \approx 10% Iout, NTC High = 6.3K, 100% Iout

Programmable settings: NTC Minimum Level (%), NTC Minimum Ohms, NTC Maximum Ohms.

Output Current (%) vs. NTC (Ohms)

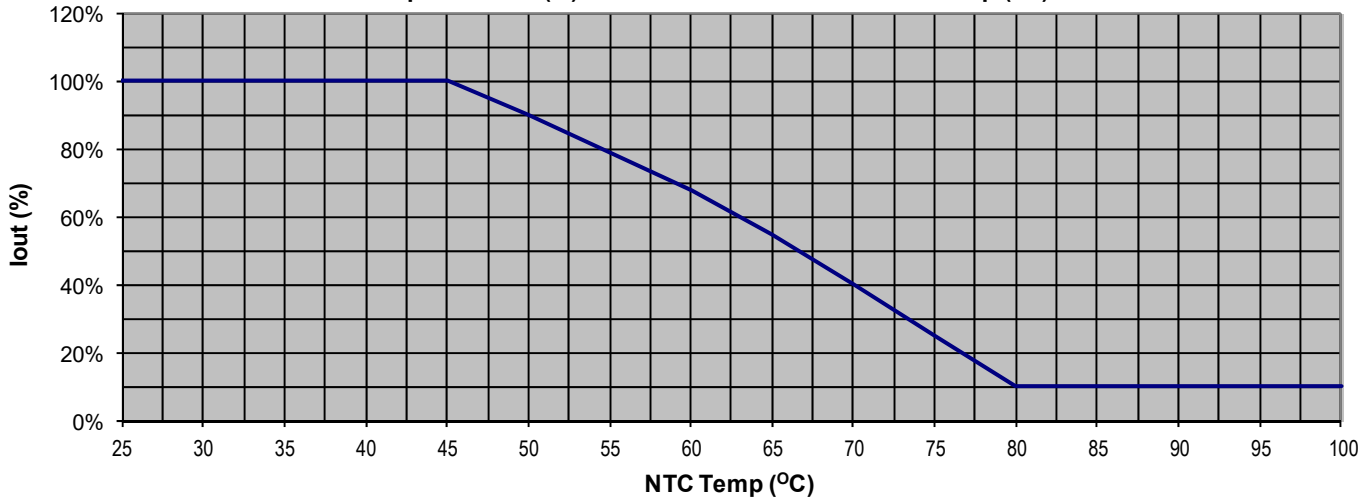


Module Temperature Protection Example

NTC = 805SMD, $R_{25C} = 15K \text{ Ohm} \pm 2\%$, $R_{64C} = 3700$, Vishay Part#: NTCS0805E3153GMT

With part set: NTC Max = 6.3K, NTC MIN = 2.0K, Iout Min = 10%

Output Current (%) vs. NTCS0805E3153GMT NTC Temp (°C)



EPtronics LED Driver Interface Programming Tool: PC Based Software

Programmable Output Current (POC): Programmable Iout Per table page 1

Programmable NTC settings: NTC Minimum Level (%), NTC Minimum Ohms, NTC Maximum Ohms.

Factory Default: NTC Minimum = 2.0K, \approx 10% Iout, NTC Maximum = 6.3K, 100% Iout

Programmable dimming curve: Linear or LOG

Factory Default: Linear Dimming Curve

Programmable Minimum Dim Level: 1% (Min Dim) to 100% Iout programmed value.

Factory Default: Min dim level 1% (Actual Min Dim per specifications)

Programmable Dim to Zero?: YES or NO. YES will cause 0mA at \leq 1.0V, else will be Minimum Dim Level.

Factory Default: NO

EPtronics LED Driver Interface Programming Tool:

The EPtronics LED Driver Interface Programming Tool is a programming and configuration tool for EPtronics intelligent programmable LED drivers. It consists of the EP Programming Interface (EP-PRG-01) which is connected between the USB port of a computer and the LED driver being programmed, and the EPtronics LED Driver Interface Programming Tool software. The EPtronics LED Driver Interface Programming Tool software is a PC based graphical user interface that allows the user to program and configure the operating parameters of an EPtronics Programmable LED Driver. This interface allows the operator to set the LED drivers output current within its specified range, in the increments specified. It also provides the ability to enable/disable and control features like "Dimming", "Auxiliary Output", "NTC Thermal Protection", "Constant Lumen Module" & "End-of-life indicator" when available in the EPtronics intelligent LED driver being programmed.

EP Programming Interface: (EP-PRG-01)

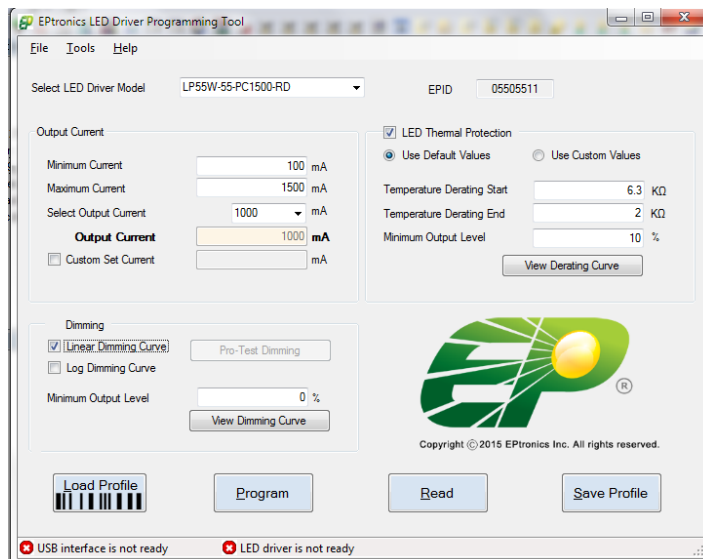
is the physical USB unit connected between the USB port of a computer and the LED driver being programmed. This unit also provides all power required to the LED driver being programmed. No connection to an AC power source is required for programming the LED driver.

EPtronics LED Driver Interface Programming Software:

The EPtronics LED Driver Interface Programming software is the windows based GUI that allows the user to assign custom part numbers to the LED driver being programmed. The user can then save the profile to a computer disk and recall as needed. The user can then use the "Auto Program" feature to quickly program as many LED drivers with the saved profile as is required. Each driver programming simply requires a click of the mouse to program in a single step or the use of an EPtronics Programming Cradle which will auto program upon insertion the an LED driver into the cradle.

The EPtronics LED Driver Interface Programming software supports bar code scanners. The barcode scanner can be used to automate the programming of the attached LED driver. This barcode scanner interface also provides an option to either enable or disable logging of the parameters to an excel file.

Note: The programming of the LED driver does not require the input be connected to an AC power connection. The EP Programming Interface and the required LED driver circuitry will be powered from the EP-PRG-01 module via the USB connection to a computer. For new GUI settings to take effect the AC input must cycled off/on and the USB interface disconnected.



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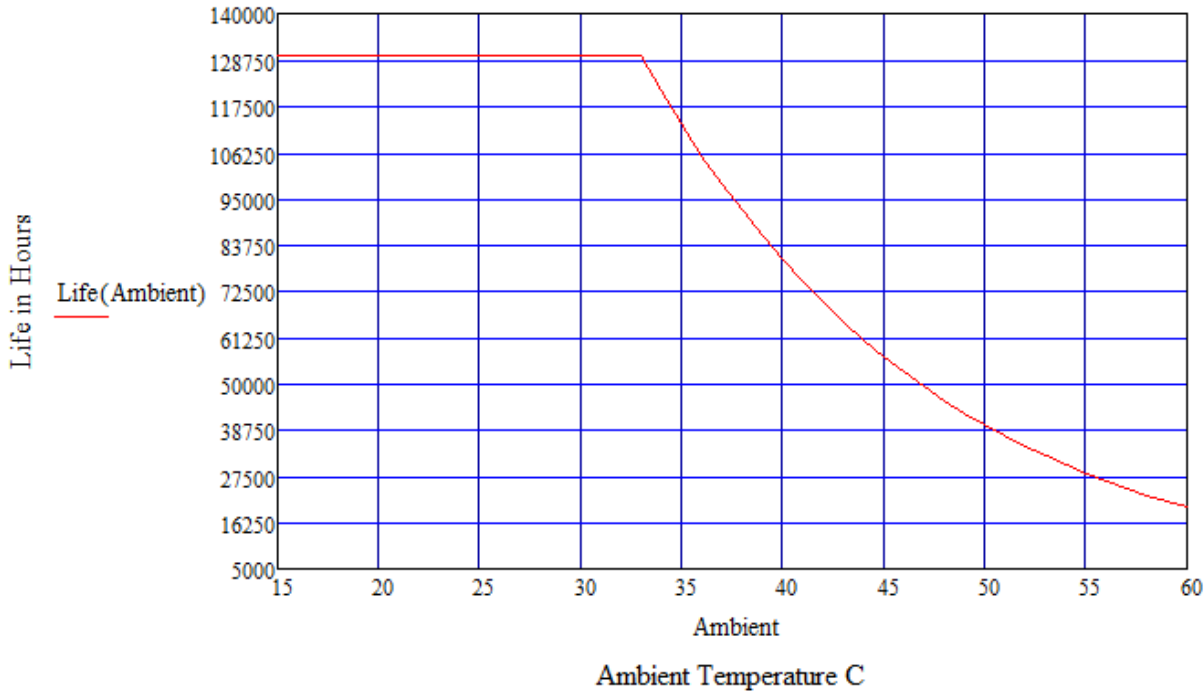
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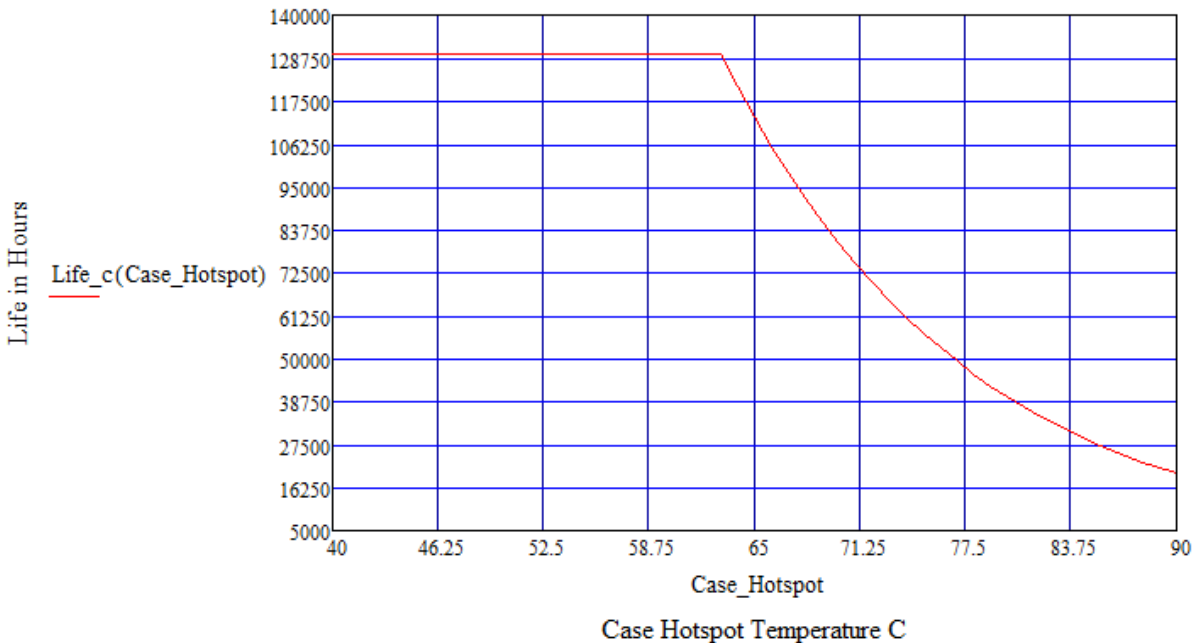
Life vs. Ambient Temperature

LP50WT5 Estimated Life Full Load @ 120Vac



Life vs. Case (Tc) Temperature

LP50WT5 Estimated Life Full Load @ 120Vac





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Revision History

REV - Change Date	Description of Changes		
	Items	Changed From	Changed To
REV A - 2018-05-15	Initial preliminary spec release	SP34 (No Aux)	with 12V@200mA AUX
REV C - 2022-06-10	Update	PF/THD Specs	Updated
REV C - 02/07/2023	Soft Start	Soft Start Time to first light value 400mA	Soft Start Time to first light value. changed to 100mA

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