

25 Watt - LD25W Series

CONSTANT VOLTAGE OR CONSTANT CURRENT LED DRIVER WITH DIMMING



DIMMING
LD25W Series
25W

Model: LD25W Series

- Drive Mode: Constant Current or Constant Voltage
- Technology: PFC Off-Line Switch Mode
- Output Power: 25W Max.
- Input Voltage: 90 to 305VAC, 47- 63Hz
- Number of Outputs: One
- Output Voltages: 4VDC - 72VDC
- Output Currents: 350mA - 2080mA
- Optional 0-10V or PWM Positive Dimming 10% ~ 100%

Environmental

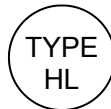
1. Operating temperature: Tc 90C Maximum. Reference -30 to +60°C ambient
2. Storage temperature range: -40 to +85°C
3. Humidity (non-condensing): 5% - 95%RH
4. Cooling: Convection
5. Vibration Frequency: 5-55Hz/2g, 30 minutes
6. Impact resistance: 1g/s
7. MTBF@ 40°C: 482,000 hours @ Full Load per MIL-217F Notice 2.

Safety and Compliance

1. UL8750, EN61347, CSA 22.2 safety recognized, UL Type HL
2. FCC, 47CFR Part 15 Class B & EN55015 compliant.
3. Water resistant and Dust Proof Design: IP66, NEMA4, for Dry, Damp, Wet Locations.
4. Compact, Lightweight Design.
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.
8. EN61000-4-5: 2kV L-N, 8/20 µsec surge protection.

Electrical Specifications at 25°C

- Input voltage range: 90 to 305VAC
- Frequency: 47- 63HZ
- Power Factor: ≥ 0.90 at $\geq 70\%$ Load, 120Vac/230Vac, $\geq 88\%$ Load 277Vac
- THD%: $\leq 20\%$ at $\geq 60\%$ Load, 120Vac/230Vac/277Vac
- Inrush current: $<15A$ at 25C, 277Vac, cold start, Full Load
- Input current: 0.25A at 120Vac, 60Hz, Full Load
- Efficiency: 83% typical 230Vac Full Load
- Line regulation accuracy: $\pm 3\%$
- Load regulation accuracy: $\pm 4\%$
- Leakage current: 400uA typical; Hold up time: half cycle



IP66



Constant Current Versions

Part Number ⁽²⁾	US Class 2	CN Class 2	Output Voltage Range	Output Constant Current	Current Accuracy	Output Power Maximum	Typical Efficiency ⁽¹⁾
LD25W-72-C0350	NO	NO	24 - 72 VDC	350 mA	$\pm 3\%$	25W	86%
LD25W-62-C0400	NO	NO	21 - 62 VDC	400 mA	$\pm 3\%$	25W	85%
LD25W-56-C0450	NO	NO	19 - 56 VDC	450 mA	$\pm 3\%$	25W	84%
LD25W-45-C0560	YES	YES	15 - 45 VDC	560 mA	$\pm 3\%$	25W	84%
LD25W-42-C0595	YES	YES	14 - 42 VDC	595 mA	$\pm 3\%$	25W	84%
LD25W-40-C0620	YES	YES	13 - 40 VDC	620 mA	$\pm 3\%$	25W	84%
LD25W-36-C0700	YES	YES	12 - 36 VDC	700 mA	$\pm 3\%$	25W	83%
LD25W-28-C0850	YES	YES	10 - 28 VDC	850 mA	$\pm 3\%$	25W	82%
LD25W-24-C1040 ⁽⁵⁾	YES	YES	8 - 24 VDC	1040 mA	$\pm 3\%$	25W	82%
LD25W-20-C1250	YES	YES	7 - 20 VDC	1250 mA	$\pm 3\%$	25W	82%
LD25W-18-C1400	YES	YES	6 - 18 VDC	1400 mA	$\pm 3\%$	25W	81%
LD25W-16-C1560	YES	YES	6 - 16 VDC	1560 mA	$\pm 3\%$	25W	81%
LD25W-14-C1750	YES	YES	5 - 14 VDC	1750 mA	$\pm 3\%$	25W	80%
LD25W-12-C2080 ⁽⁵⁾	YES	YES	4 - 12 VDC	2080 mA	$\pm 3\%$	25W	78%

Notes

1. Typical efficiency measured at 230VAC input, full load
2. For dimmable versions add appropriate designator to the end of the part number: For Example: LD25W-18-C1400-RD is 0-10V or resistance dimmable version, LD25W-18-C1400-PD is PWM dimmable version.
-RD 0-10V & Resistance dimmable version comes with an extra two wires +Purple/-Grey on the output side.
-PD PWM Dimmable version comes with an extra two wires +Purple/-Grey on the output side.
3. -RD 0-10V Dimming is compatible with most quality 0-10V wall dimmers and direct 0-10V analog signal. See page 3 for details.
4. -PD PWM version is PWM Dimmable via a positive 10% to 100% Duty Cycle, 500Hz to 1.5KHz, 0-10V Pulse. See page 4 for details.
5. SAM Recognized.

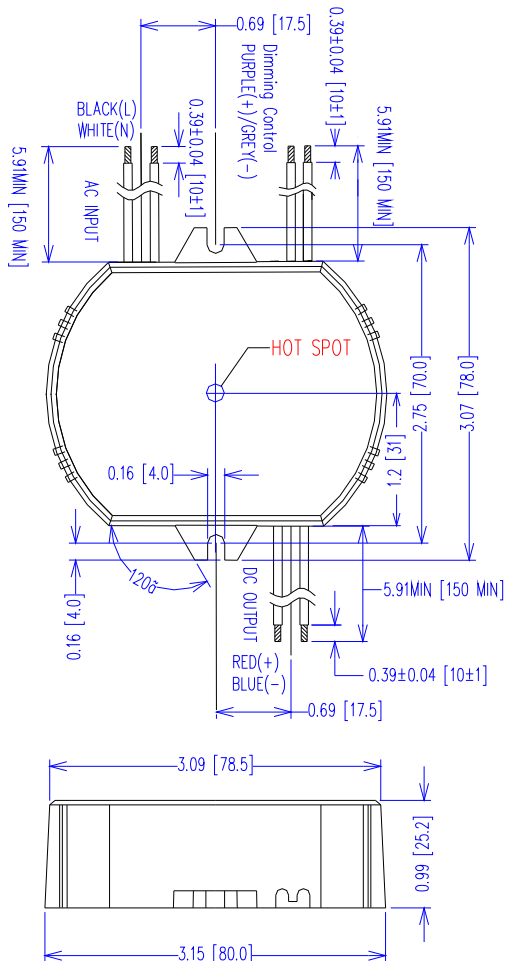
25W**LD25W Series****DIMMING****LED Optimized Drivers**

25 Watt - LD25W Series

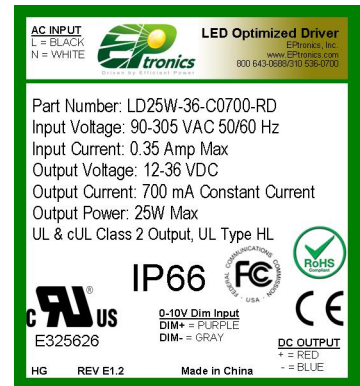
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Constant Voltage Versions

Part Number	US Class 2	CN Class 2	Output Constant Voltage	Output Current Maximum	Voltage Accuracy	Output Power Maximum	Typical Efficiency ⁽¹⁾
LD25W-72	NO	NO	72 VDC	88 - 350 mA	± 5%	25W	86%
LD25W-62	NO	NO	62 VDC	100 - 400 mA	± 5%	25W	85%
LD25W-56	NO	NO	56 VDC	113 - 450 mA	± 5%	25W	84%
LD25W-45	YES	YES	45 VDC	140 - 560 mA	± 5%	25W	84%
LD25W-40	YES	YES	40 VDC	155 - 620 mA	± 5%	25W	84%
LD25W-36	YES	YES	36 VDC	175 - 700 mA	± 5%	25W	83%
LD25W-28	YES	YES	28 VDC	213 - 850 mA	± 5%	25W	82%
LD25W-24 ⁽⁵⁾	YES	YES	24 VDC	260 - 1040 mA	± 5%	25W	82%
LD25W-20	YES	YES	20 VDC	313 - 1250 mA	± 5%	25W	82%
LD25W-18	YES	YES	18 VDC	350 - 1400 mA	± 5%	25W	81%
LD25W-16	YES	YES	16 VDC	390 - 1560 mA	± 5%	25W	81%
LD25W-14	YES	YES	14 VDC	438 - 1750 mA	± 5%	25W	80%
LD25W-12 ⁽⁵⁾	YES	YES	12 VDC	520 - 2080 mA	± 5%	25W	78%

Mechanical Dimensions: Inches [mm]

Material: Black PC ABS Plastic Case
Fully Encapsulated
Weight: 198 grams (7.0 oz) Typical

Labeling Example

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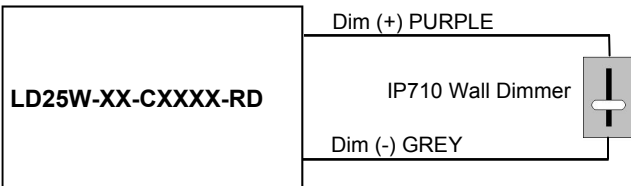
-RD 2-Wire 0-10V CCR Dimming Scheme

Parameters	Minimum	Typical	Maximum
Source Current out of 0-10V Purple Wire	0mA	—	2mA
Absolute Voltage Range on 0-10V (+) Purple Wire	-2.0V	—	+15V
Sink Current into 0-10V Purple Wire	0mA	—	1.2mA

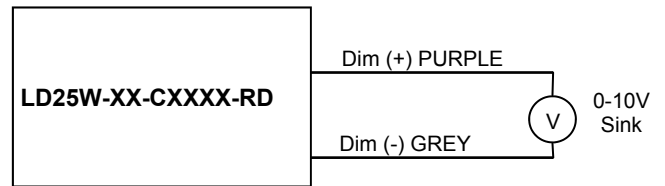
Notes

- RD 0-10V dimmable version comes with an extra two wires +Purple/-Grey on the output side.
- RD version is compatible with most 0-10V Wall Slide dimmers and direct 0-10V analog signal.
Recommended wall slide dimmer is Leviton IP710 or equivalent
- RD 0-10V dimmable version is not intended to dim below about 5% @ 0V or 10% @ 1.0V
- RD 0-10V dimmable version output will be 100% with Purple/Grey open and minimum with Purple/Grey Shorted.

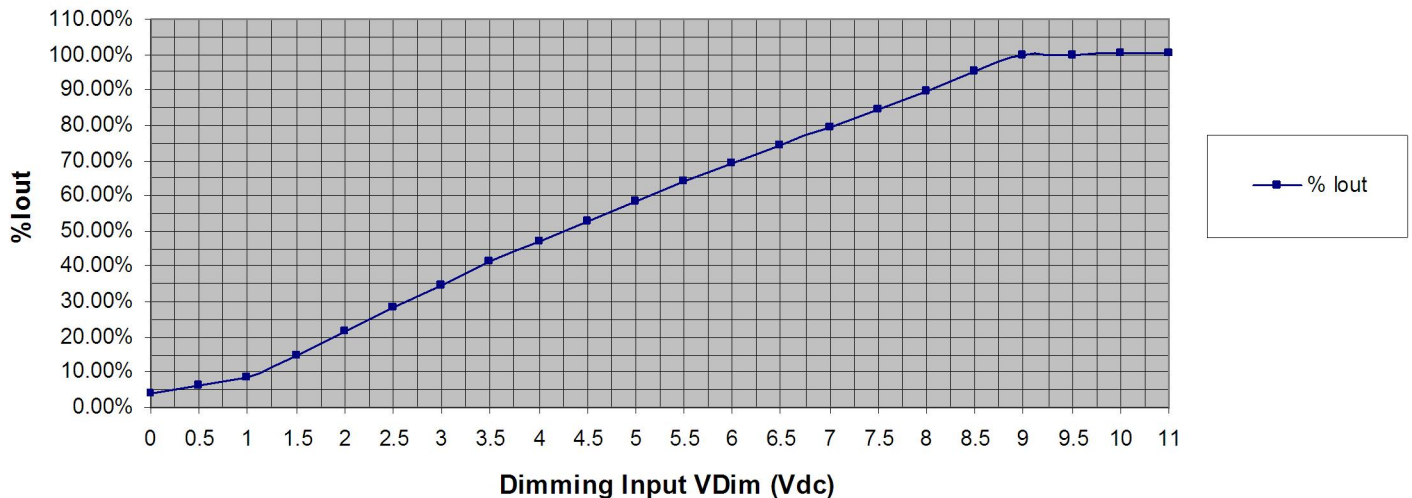
-RD 2-Wire Resistance Dimming Scheme



-RD 2-Wire 0-10V Analog Dimming Scheme



% Output Current vs. 0-10VDC Dimming Input



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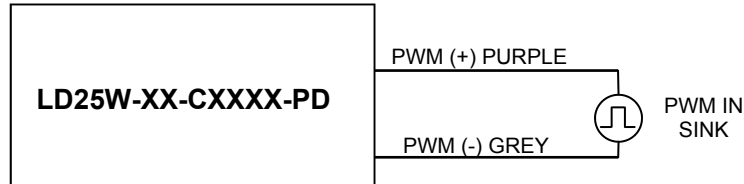
-PD 2-Wire CCR PWM Positive Dimming Scheme

Parameters	Minimum	Typical	Maximum
Absolute Maximum Voltage Range on PWM Input (Purple Wire)	-2.0V	10V	+15V
Input LOW Level Voltage Range (Purple Wire)	-2.0V	0V	+5.5V
Input HIGH Level Voltage Range (Purple Wire)	+9.0V	10V	+15V
Current into PWM Input (Purple Wire)	0mA	—	1.2mA
Source Current out of PWM Input (Purple Wire)	0mA	—	2mA
PWM Input Signal Frequency	500Hz	—	1500Hz
PWM Input Signal Positive Duty Cycle	0%	10-90%	100%

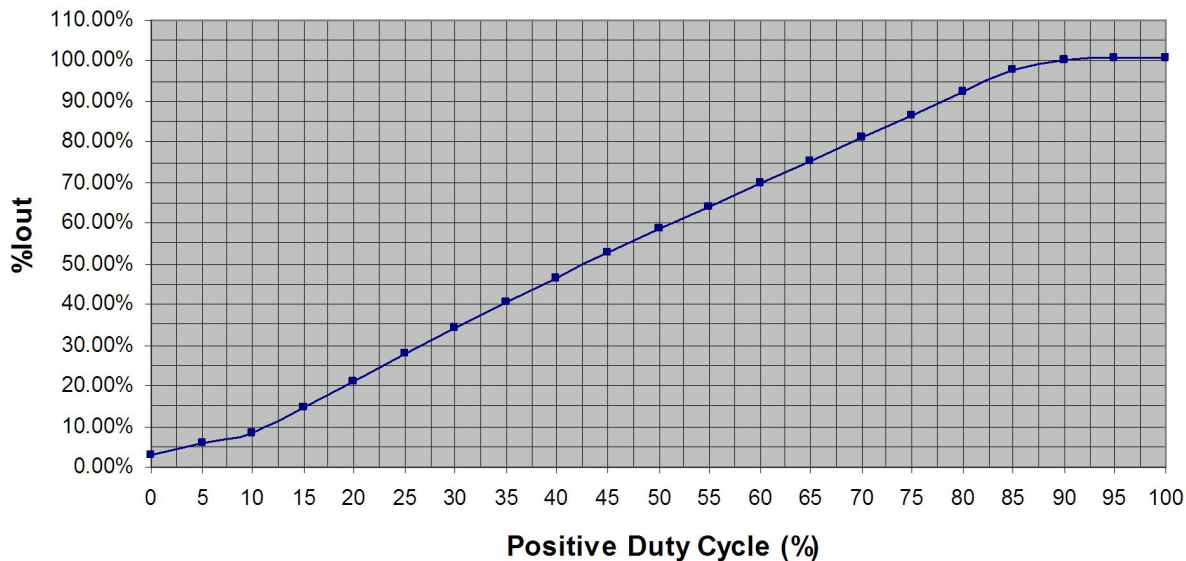
Notes

- PD PWM Dimmable version comes with an extra 2 wires +Purple/-Grey on the output side.
- PD PWM Dimmable version is not intended to dim below about 5% @ 0% Duty Cycle or 10% @ 10% Duty Cycle
- PD PWM dimmable version output will be 100% with Purple/Grey open and minimum with Purple/Grey Shorted.

-PD 2-Wire PWM Positive Dimming Scheme



% Output Current vs. 1.0 kHz, Positive Duty Cycle Dimming Input



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Input Specifications

Parameter	Min.	Typ.	Max.	Notes/Conditions
Input Voltage	90 Vac	—	305 Vac	120, 230, 240, 277 Vac Nominal Values
Input Frequency	47 Hz	—	63 Hz	50/60Hz Nominal
Input AC Current	—	—	0.24 A	Measured at 120Vac/60Hz Input, Output Full load.
	—	—	0.13 A	Measured at 230Vac/60Hz Input, Output Full load.
Inrush Current (Peak)	—	—	15A	Measured at 277Vac/60Hz Input, Output Full Load, Ta 25°C, Cold Start 50% I _{peak} duration \approx 750 μ sec ($1/2 \cdot I_p^2 \cdot t$)
Inrush Current (I ² t)	—	—	0.09 A ² s	
Leakage Current	—	—	0.28mA	Measured at 120Vac/60Hz Input, Output Full load.
	—	—	0.75mA	Measured at 277Vac/60Hz Input, Output Full load.
THD	—	—	20%	Measured at 120, 230, 277Vac Input, Output \geq 60% Load
Power Factor (PF)	0.90	—	—	\geq 0.90 at \geq 70% Load, 120Vac/230Vac, \geq 88% Load 277Vac

Output Specifications

Parameter	Min.	Typ.	Max.	Notes/Conditions
DC Output Voltage	Per Table	—	Per Table	Per Tables on Page 1
DC Output Constant Current	-3%	Per Table	+3%	Per Tables on Page 1
Output Power	—	—	Per Table	Per Tables on Page 1
Ripple & Noise (V _{pk-pk})	—	—	20% V _o	20 MHz BW, Full load output in parallel with 0.1 μ F ceramic & 10 μ F Electrolytic.
Ripple (I _{pk-pk})	—	—	50% I _o	20 MHz BW, Full load output in parallel with 0.1 μ F ceramic & 10 μ F Electrolytic. 120 Hz component
Start-up Time	—	700 mS	1000 mS	Measured at 120Vac/60Hz Input, Output Full load.
Hold-up Time	—	30 mS	—	Typical @ 277Vac Input, Output Full load.

Environmental Specifications

Parameter	Min.	Typ.	Max.	Notes/Conditions
Case Temperature (T _c)	-30 °C	—	+90 °C	Measured at location specified on case.
Operating Temperature (T _a)	-30 °C	—	+60 °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	—	—	95% 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	482,000 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)	—	—	120% V _o	No Damage, Auto recovery after fault is removed.

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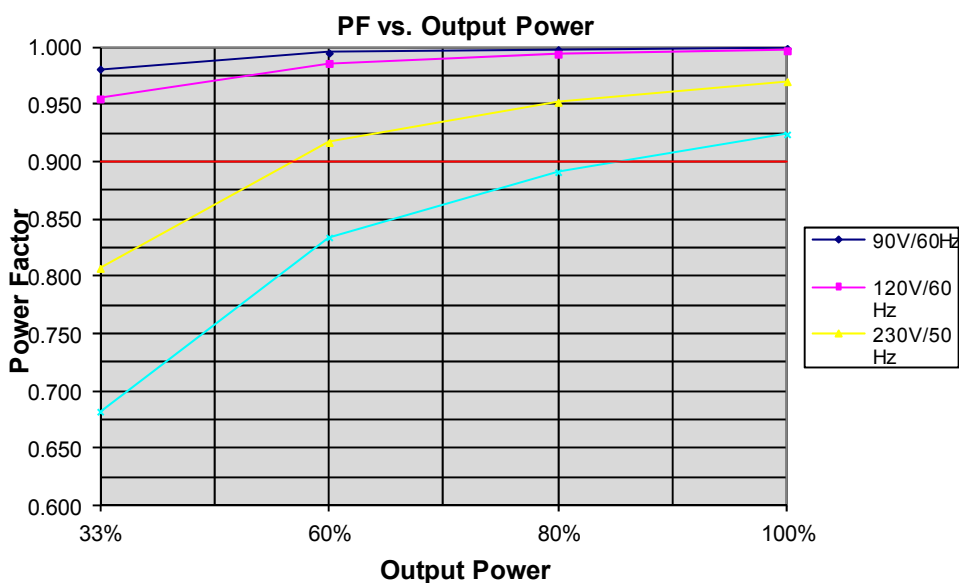
Safety Compliance

Safety	Notes/Standards
UL/CUL	UL8750, UL1310 for UL Class 2 & CAN/CSA C22.2 No. 250.13, UL Type HL
CE	EN61347-1, EN61347-2-13
Withstand Voltage	Input to Output: 3750 Vac
Isolation Resistance	Input to Output: >100 M Ω , 500VDC @ 25 °C, 70 % RH
Dimming Circuit	Dim+ Purple/Dim- Grey are considered part of the secondary circuit.

EMC Compliance

Standard	Notes/Conditions
FCC, 47CFR Part 15	Class B
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, $\geq 80\%$ 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 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)

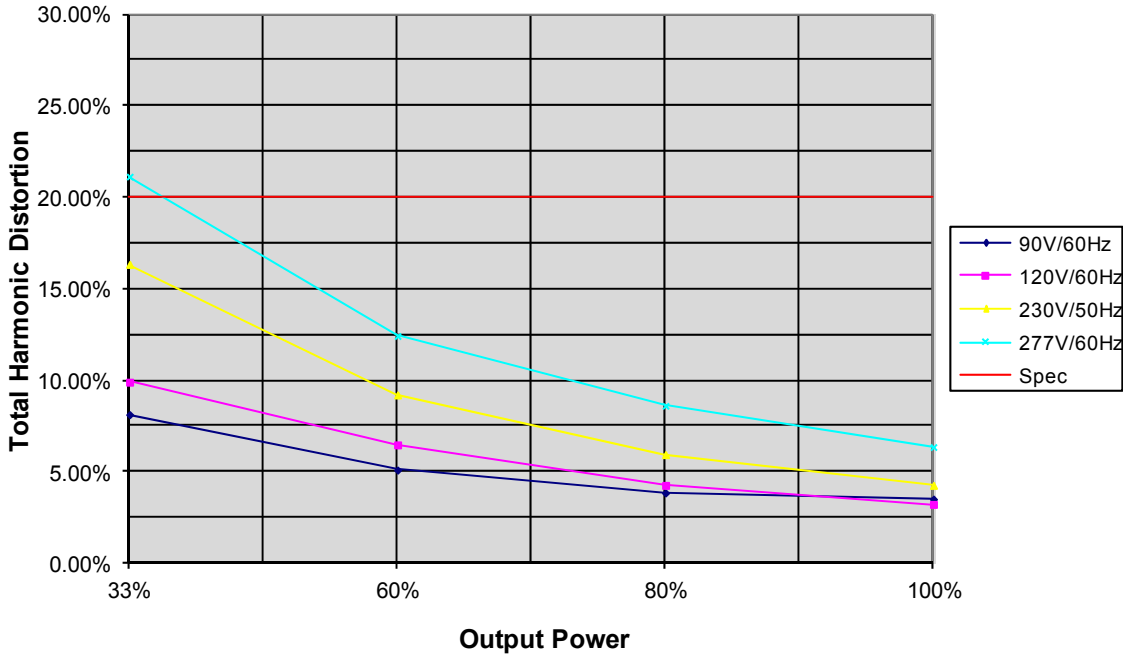


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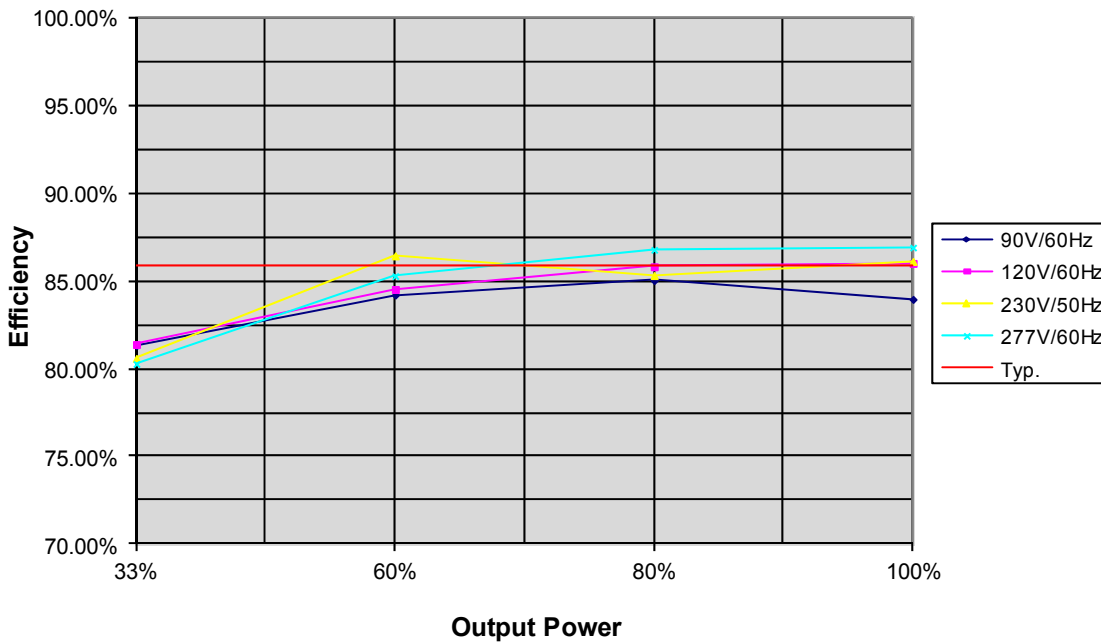
THD Curves (Typical)

THD vs. Output Power



Efficiency Curve (Typical)

Efficiency vs. Output Power



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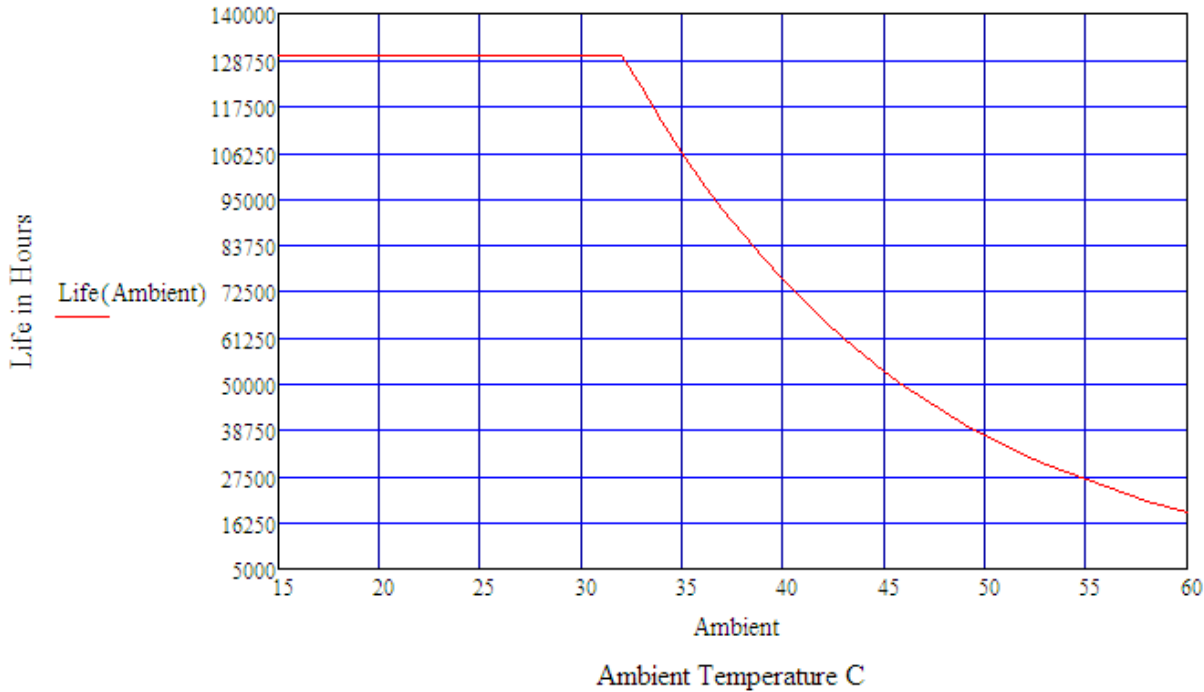
LED Optimized Drivers

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CONSTANT VOLTAGE OR CONSTANT CURRENT LED DRIVER WITH DIMMING

Life vs. Ambient Temperature

LD25W Estimated Life Full Load @ 120Vac



Life vs. Case (Tc) Temperature

LD25W Estimated Life Full Load @ 120Vac

