

12 Watt- LD12W Series

CONSTANT CURRENT LED DRIVER WITH DIMMING & DIM TO ZERO



12W
LD12W Series
DIMMING

Model: LD12W Series

- Drive Mode: Constant Current
- Technology: Advanced PFC Off-Line Switch Mode
- Output Power: 12W Max.
- Number of Outputs: One
- Output Voltages: 6VDC - 48VDC
- Output Currents: 250mA - 1000mA
- Optional 0-10V Linear Dimming 1% to 100%
- Dims to Zero @ $\leq 1.0V$, Standby Power $\leq 0.5W$

Environmental

1. Operating temperature: T_c 90°C Maximum. Reference -40 to +60°C ambient
2. UL Recognized, UL Type HL
3. Storage temperature range: -40 to +85°C
4. Humidity (non-condensing): 5% - 95%RH
5. Cooling: Convection
6. Vibration Frequency: 5-55Hz/2g, 30 minutes
7. Impact resistance: 1g/s
8. MTBF@ $T_c = 80^\circ C$: 550,000 hours @ Full Load per MIL-HDBK-217F Notice 2

Safety and Compliance

1. UL8750, EN61347, CSA 22.2 safety recognized, UL Type HL
2. FCC, 47CFR Part 15 & EN55015 compliant.
3. Water resistant and Dust Proof Design: IP66, NEMA4, for Dry & Damp Locations.
4. Compact, Lightweight Design.
5. Safety Isolation between Primary, Secondary & 0-10V Dim
6. Meets EN61000-3-2 & EN61000-3-3 Class C
7. Protection: output over-voltage, output over-current, output short circuit, over temperature, auto-recovery.
8. EN61000-4-5: 2kV L-N, 8/20 μ sec surge protection.

Electrical Specifications at 25°C

- Input voltage range: 120 to 277Vac (Full Range 100 to 305VAC)
- Frequency: 47- 63HZ
- Power Factor: ≥ 0.90 at 120/230/277Vac $\geq 50\%$ Load
- THD%: $\leq 20\%$ at 120/230/277Vac $\geq 50\%$ Load
- Inrush current: $<20A$ at 25°C, 277Vac, cold start, Full Load
- Input current: 0.13A Maximum at 120Vac, 60Hz, Full Load
- Efficiency: 80% typical 230Vac Full Load
- Line regulation accuracy: $\pm 3\%$
- Load regulation accuracy: $\pm 4\%$
- Leakage current: 277Vac, 700uA maximum



IP66



Constant Current Dimmable Versions

Part Number	US Class 2	CN Class 2	Output Voltage Range	Output Constant Current	Current Accuracy	Output Power Maximum	Typical Efficiency ⁽¹⁾
LD12W-48-C0250-RD ⁽⁵⁾	YES	YES	24 - 48 VDC	250 mA	$\pm 8\%$	12W	84%
LD12W-48-C0220-RD ⁽⁵⁾	YES	YES	24 - 48 VDC	220 mA	$\pm 8\%$	10.6W	82%
LD12W-48-C0150-RD ⁽⁵⁾	YES	YES	24 - 48 VDC	150 mA	$\pm 10\%$	7.2W	81%
LD12W-48-C0125-RD ⁽⁶⁾	YES	YES	24 - 48 VDC	125 mA	$\pm 10\%$	6W	81%
LD12W-36-C0350-RD	YES	YES	18 - 36 VDC	350 mA	$\pm 8\%$	12.6W	81%
LD12W-36-C0250-RD ⁽⁵⁾	YES	YES	18 - 36 VDC	250 mA	$\pm 8\%$	9W	80%
LD12W-24-C0500-RD	YES	YES	12 - 24 VDC	500 mA	$\pm 5\%$	12W	80%
LD12W-16-C0800-RD	YES	YES	8 - 16 VDC	800 mA	$\pm 5\%$	12.8W	80%
LD12W-16-C0700-RD	YES	YES	8 - 16 VDC	700 mA	$\pm 5\%$	11.2W	79%
LD12W-12-C1000-RD	YES	YES	6 - 12 VDC	1000 mA	$\pm 5\%$	12W	78%

Notes

1. Typical efficiency measured at 230VAC input, full load
2. -RD 0-10V standard dimmable part numbers shown. For other versions change designator at the end of the part number. For Example: LD20W-36-C0350 is non-dimmable version.
3. -RD 0-10V & Resistance dimmable version comes with an extra two wires +Violet/-Pink on the output side. (Legacy DIM- = GRAY)
4. -RD 0-10V Dimming is compatible with most quality 0-10V wall dimmers and direct 0-10V analog signal. See page 3 for details.
5. For Iout $>220mA$ and $<350mA$ tolerance is Iout $\pm 8\%$.
6. For Iout $<220mA$ tolerance is Iout $\pm 10\%$.

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LED Optimized Drivers

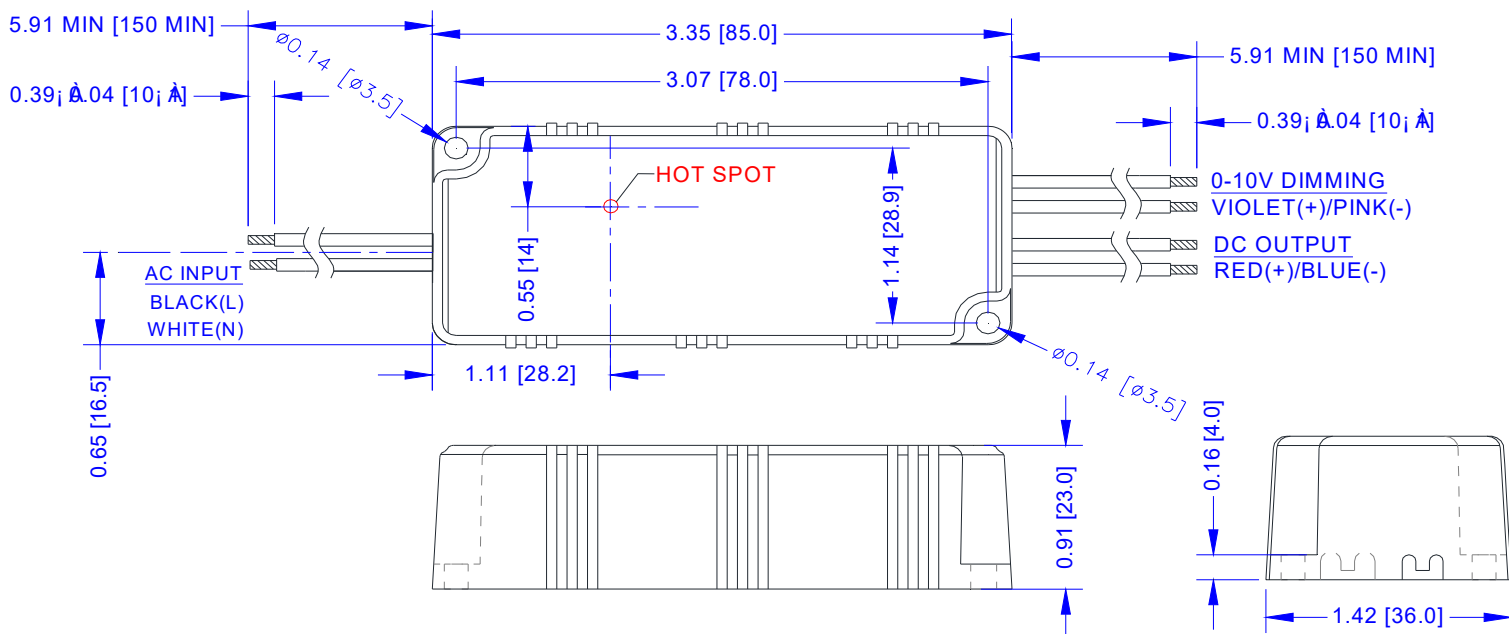
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Mechanical Dimensions: Inches [mm]

Material: Black PC ABS Plastic Case
Fully Encapsulated
Weight: 128 grams (4.5 oz) Typical

Labeling Example



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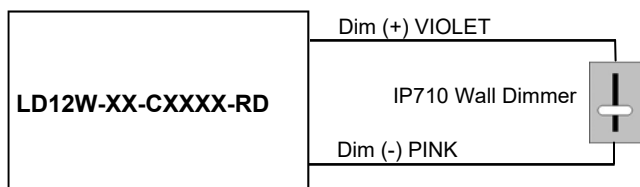
-RD 2-Wire 0-10V CCR Dimming Scheme

Parameters	Minimum	Typical	Maximum
Source Current out of 0-10V Violet Wire	0mA	—	1.0mA
Absolute Voltage Range on 0-10V (+) Violet Wire	-2.0V	—	+15V

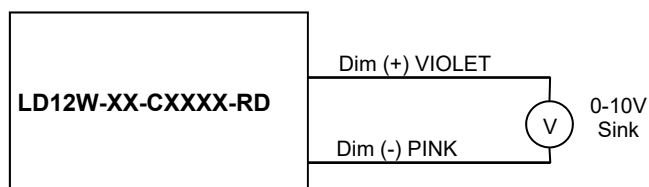
Notes

1. -RD 0-10V dimmable version comes with an extra two wires +Violet/-Pink on the output side.
2. -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
3. -RD 0-10V dimmable version is Dim to Zero @ ~1.00V and 1% Min Dim.
4. -RD 0-10V dimmable version output will be 100% with Violet/Pink open and minimum with Violet/Pink Shorted.
5. Dimming wires +Violet/-Pink must not touch any other wires or damage to LED Driver can occur.

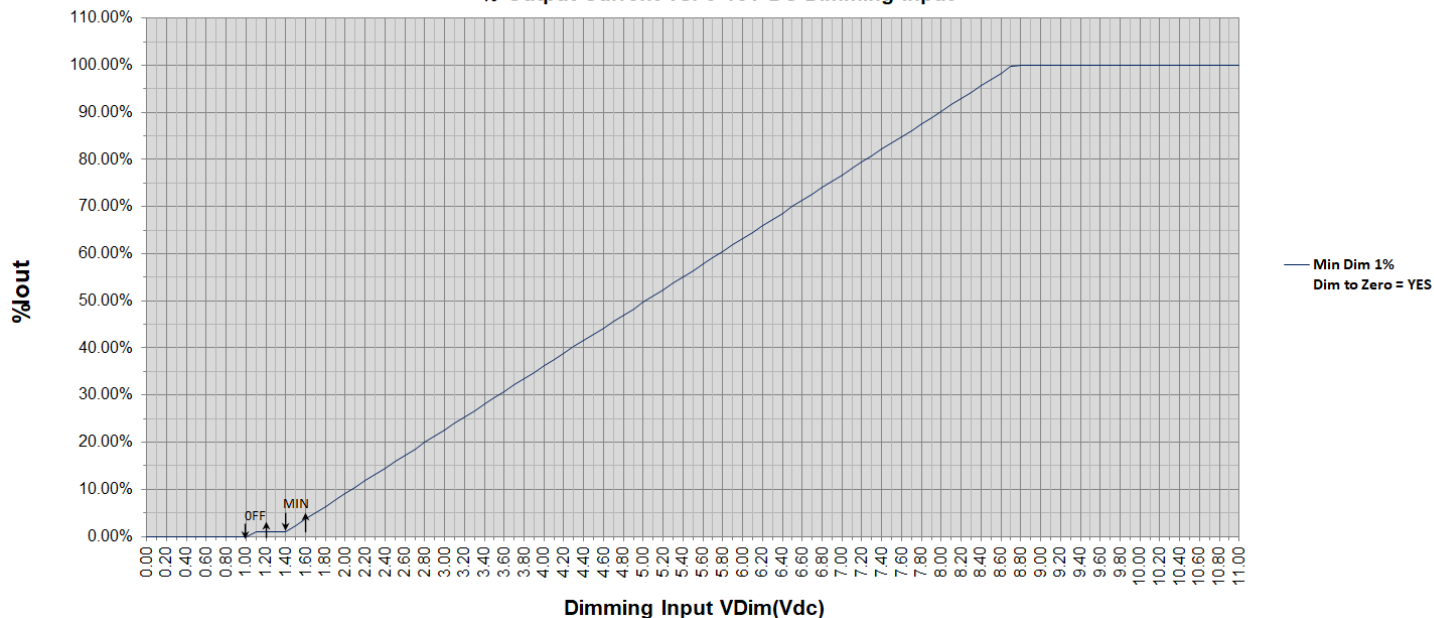
-RD 2-Wire Resistance Dimming Scheme



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



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



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Input Specifications

Parameter	Min.	Typ.	Max.	Notes/Conditions
Input Voltage	100 Vac	—	305 Vac	120, 230, 240, 277 Vac Nominal Values
Input Frequency	47 Hz	—	63 Hz	50/60Hz Nominal
Input AC Current	—	—	0.13 A	Measured at 120Vac/60Hz Input, Output Full load.
	—	—	0.06 A	Measured at 277Vac/60Hz Input, Output Full load.
Inrush Current (Peak) Ipk 10%Pw <50usec	—	—	20A	Measured at 120Vac/60Hz Input, Output Full Load, Ta 25°C, Cold Start
	—	—	25A	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 ≥50% Load
Power Factor (PF)	0.90	—	—	Measured at 120, 230, 277Vac Input, Output ≥50% Load
Standby Power (Dim to Zero)	—	—	0.5W	Measured at 120/230/277Vac, Dimmed to Zero (Vdim ≤0.9V)

Output Specifications

Parameter	Min.	Typ.	Max.	Notes/Conditions
DC Output Voltage	Per Table	—	Per Table	Per Tables on Page 1
DC Output Constant Current	-5%	Per Table	+5%	Per Tables on Page 1
Output Power	—	—	Per Table	Per Tables on Page 1
Ripple & Noise (Vpk-pk)	—	—	20% Vo	20 MHz BW, Full load output in parallel with 0.1 µF ceramic & 10 µF Electrolytic.
Ripple (Ipk-pk)	—	—	50% Io	20 MHz BW, Full load output in parallel with 0.1 µF ceramic & 10 µF Electrolytic. 120 Hz component
Start-up Time	—	—	500 mS	Measured at 120Vac/60Hz Input, Output Full load, VDim = 10.0V
Output Overshoot	-5%	—	+10%	Measured at 120Vac/60Hz Input, Output Full load @ AC Power ON

Environmental Specifications

Parameter	Min.	Typ.	Max.	Notes/Conditions
Case Temperature (Tc)	-40 °C	—	+90 °C	Measured at location specified on case.
Operating Temperature (Ta)	-40 °C	—	+60 °C	This is a reference range. Tc controls temperature range.
Storage Temperature (Ts)	-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	—	550,000 Hours	—	MIL-HDBK-217F Notice 2, Tc = 80C, 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)	—	—	+10% Io	Constant Current Limiting circuit.
Output Over Voltage (OVP)	—	—	+20% Vo	No Damage, Auto recovery after fault is removed.
Over Temp Protection (OTP)	95 °C	—	100 °C	Iout Foldback at Tc ≥95C, OFF @ Tc ~110C

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Safety Compliance

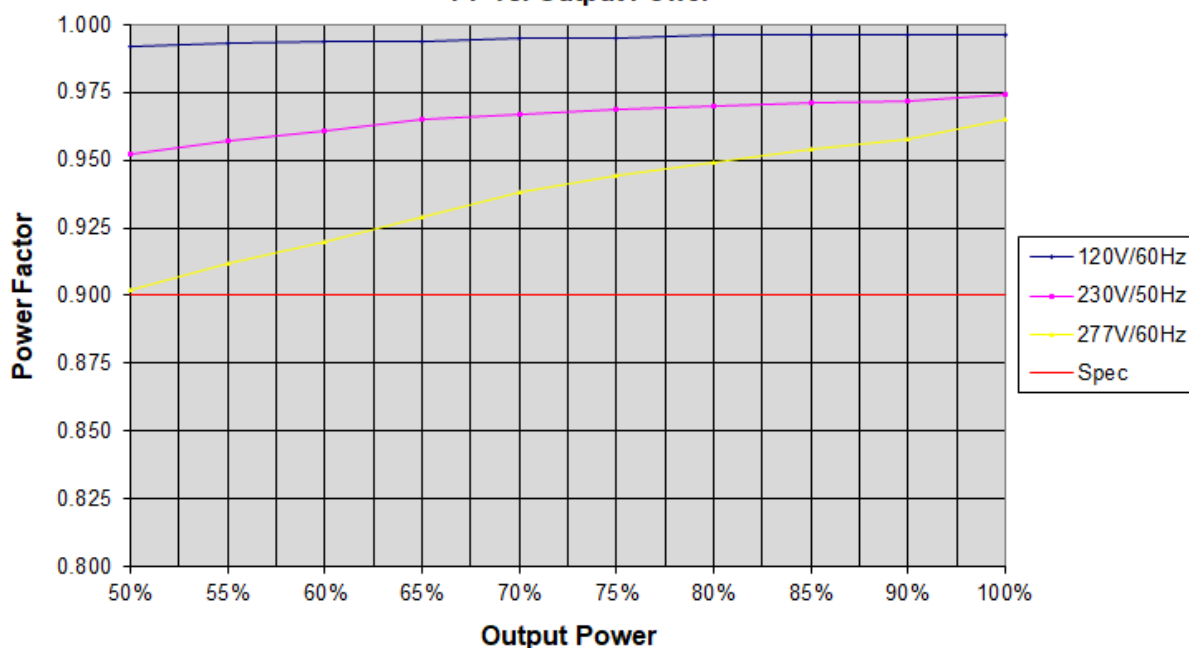
Safety	Notes/Standards
UL/CUL	UL8750 & CAN/CSA C22.2 No. 250.13, UL Type HL
CE	EN61347-1, EN61347-2-13, EN62493
Dielectric Withstand Voltage	Input to Output & Dimming: 3750 Vac (CE, ENEC covers UL 2000V requirement) Dimming to Output: 2500 Vac
Isolation Resistance	Input to Output: >100 MΩ, 500VDC @ 25 °C, 70 % RH
0-10V Class 2 Isolated Dimming Circuit	Dim+ Violet/Dim- Pink are Class 2 Isolated from all other inputs & outputs. 0-10VDC Dimming suitable for Class 1 or Class 2 circuit.
Sound Rating	<24dB Class A @ 1 Meter

EMC Compliance

Standard	Notes/Conditions
FCC, 47CFR Part 15 ANSI C63.4	Class B @120Vac, Class A @ 277Vac
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, ≥50% 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
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)

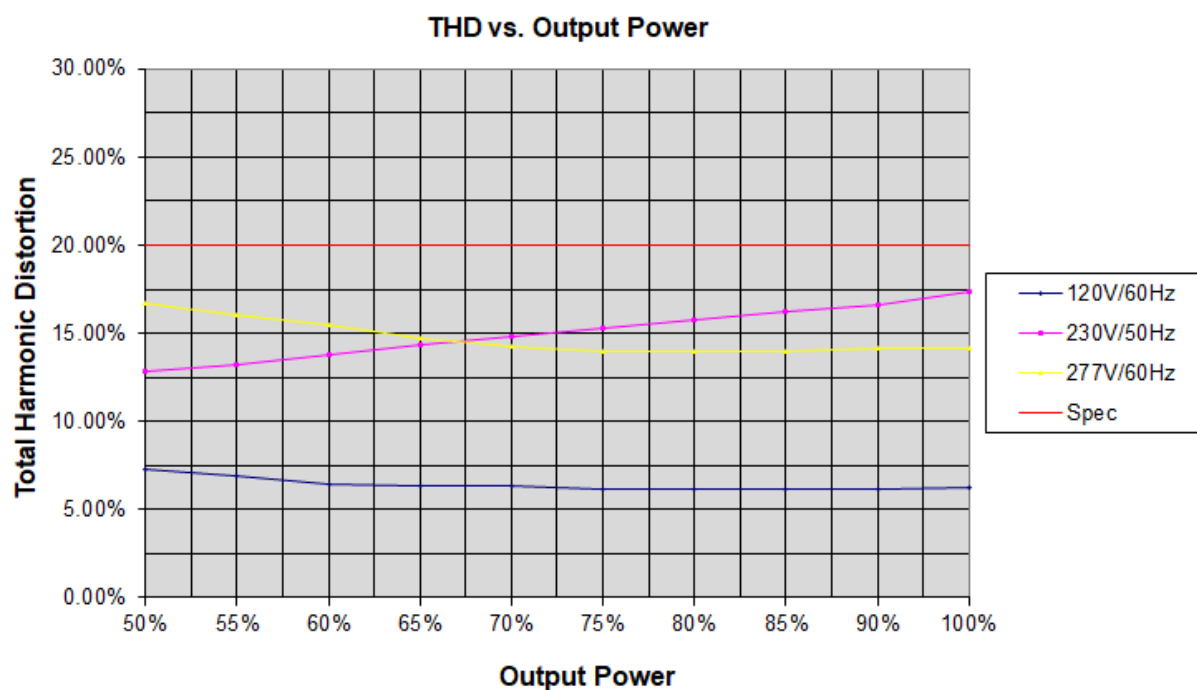
PF vs. Output Power



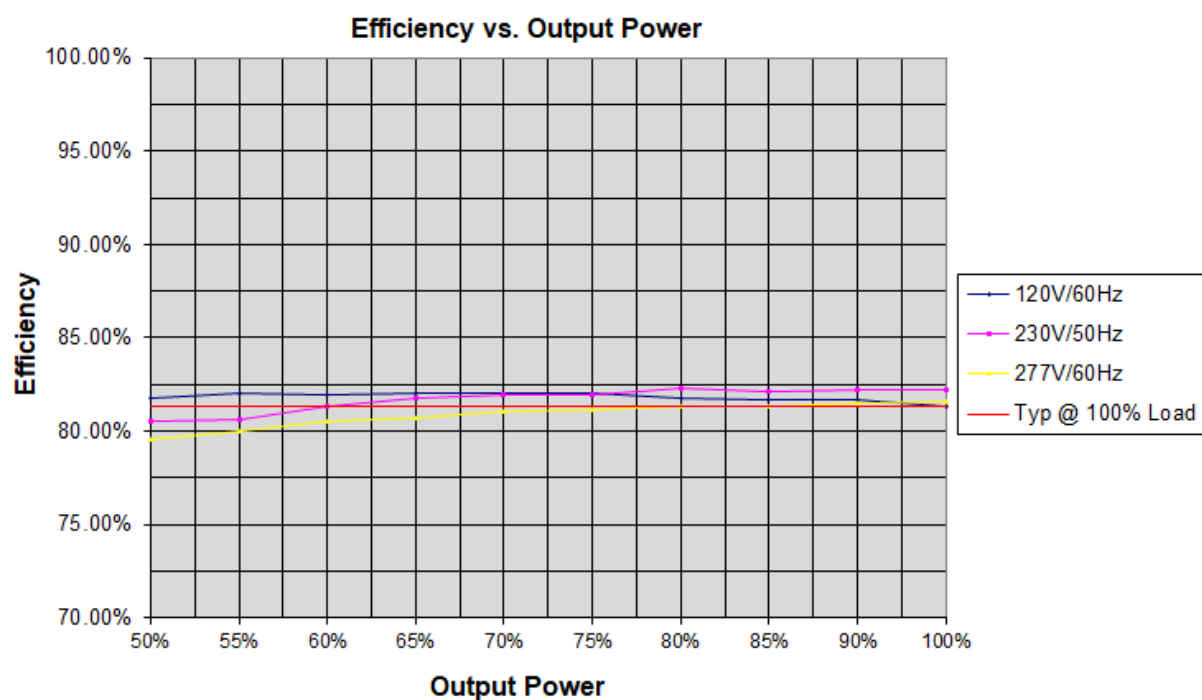
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THD Curves (Typical)



Efficiency Curve (Typical)



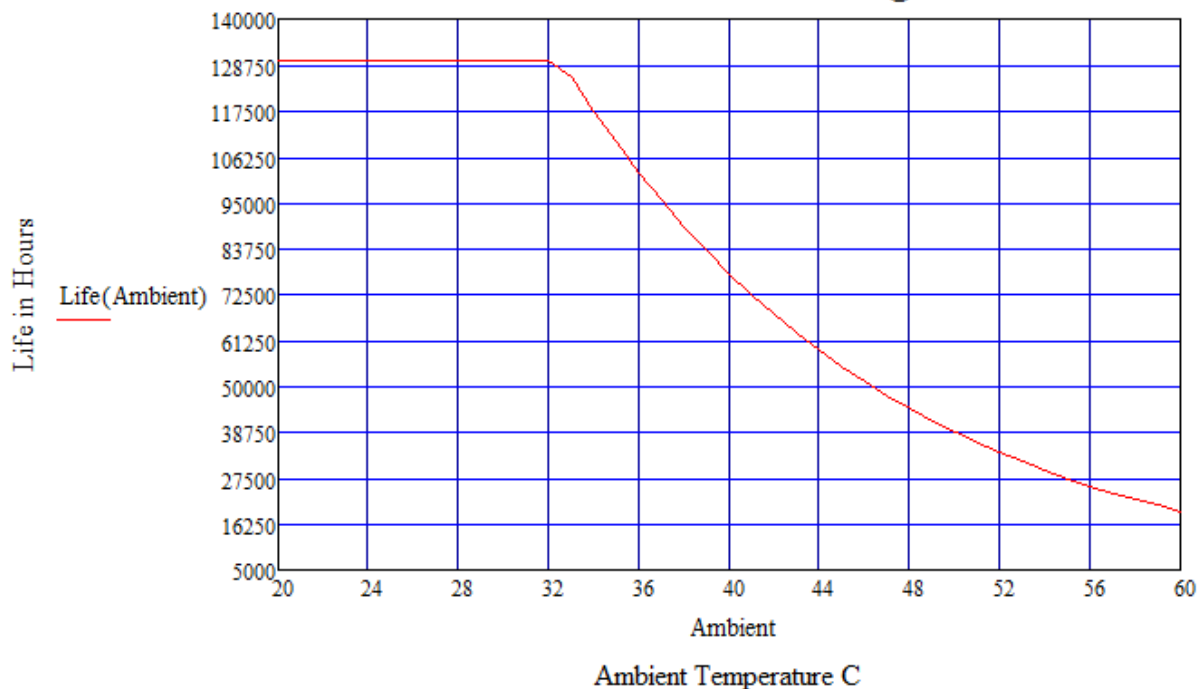
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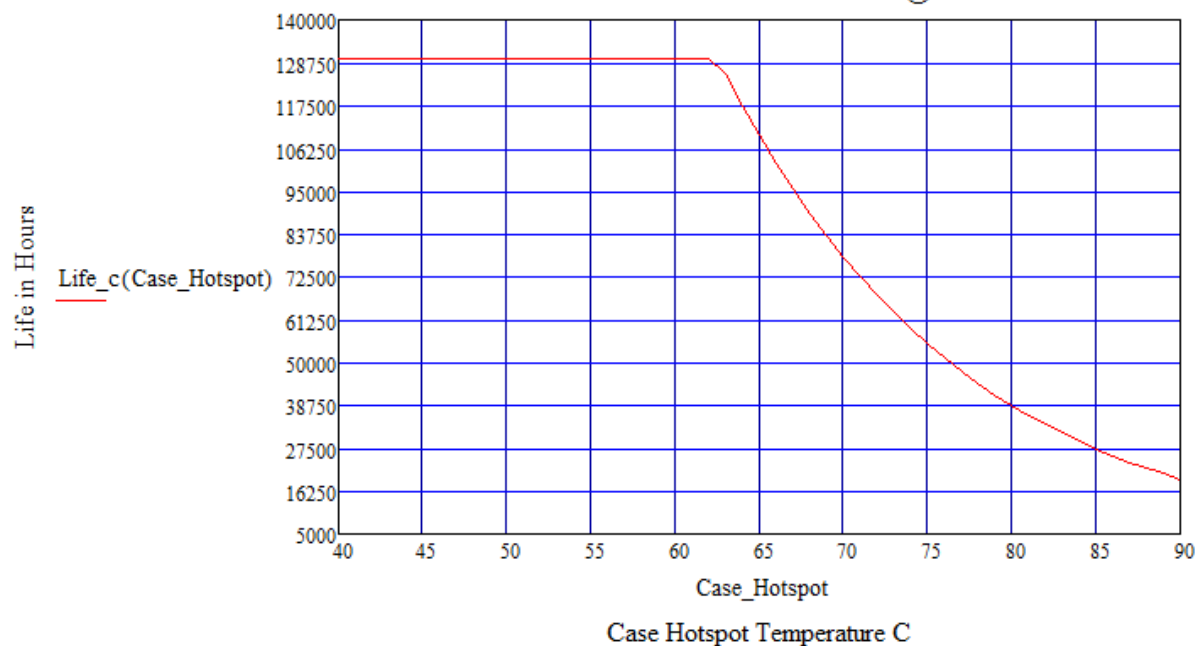
Life vs. Ambient Temperature

LD12W Estimated Life Full Load @ 120Vac



Life vs. Case (Tc) Temperature

LD12W Estimated Life Full Load @ 120Vac



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Revision History

REV - Change Date	Description of Changes		
	Items	Changed From	Changed To
REV F - 11/01/2020	Initial spec release	REV A1.2	REV F
REV F - 03/16/2021	Dimensions	Inaccurate L, W & H	Corrected. Same as REV E1.2 except hot spot location.
REV F - 06/16/2021	Tolerance for I _{OUT}	Tolerance for I _{OUT} +/-5%	Tolerance for I _{OUT} ≤350mA is +/- 8%
REV F - 08/18/2021	DIM Wire Colors	PURPLE/GREY	VIOLET/PINK, per NEMA 100
REV F - 06/08/2026	I _{OUT} %	For I _{OUT} <350mA tolerance is I _{OUT} ±8%	For I _{OUT} >220mA and <350mA tolerance is I _{OUT} ±8%. For I _{OUT} <220mA tolerance is I _{OUT} ±10%