12 Watt LD12W -RD Series

CONSTANT CURRENT LED DRIVER WITH DIMMING

Model: LD12W Series

- Drive Mode: Constant Current with Dimming
- Technology: PFC Off-Line Switch Mode
- Output Power: 12W
- Input Voltage: 120 to 277VAC, 47- 63Hz
- Number of Outputs: One
- Output Voltages: 4VDC - 48VDC
- Output Currents: 250mA - 1000mA
- Dimming: 0-10V or Optional PWM 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: 550,000 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, Short term (60 Second) 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: 120 - 277Vac (Full Range 100 to 305VAC)
- Frequency: 47- 63HZ
- Power Factor: ≥ 0.90 at ≥ 60% Load 120Vac/230Vac, ≥ 90% Load 277Vac
- THD%: ≤ 20% at ≥ 50% Load, 120Vac/230Vac, ≥ 60% Load 277Vac
- Inrush current: <10A at 25C, 230V, cold start, Max. Load
- Input current: 0.13A at 120Vac, 60Hz, Maximum Load
- Efficiency: 77% typical at 230Vac 50Hz
- Maximum output power: Per table below
- Line regulation accuracy: ± 3%
- Load regulation accuracy: ± 4%

c UL us E325626 | TYPE HL | CE | FC | IP66 | RoHS Compliant

Constant Current Versions with 0-10V Dimming

Part Number (2)	US Class 2	CN Class 2	Output Voltage Range	Output Constant Current	Current Accuracy	Output Power Maximum	Typical Efficiency (1)
LD12W-48-C0250-RD	YES	YES	16 - 48 VDC	250 mA	± 4%	12W	80%
LD12W-36-C0350-RD	YES	YES	12 - 36 VDC	350 mA	± 4%	12.6W	80%
LD12W-36-C0250-RD	YES	YES	12 - 36 VDC	250 mA	± 4%	9W	77%
LD12W-24-C0500-RD	YES	YES	8 - 24 VDC	500 mA	± 4%	12W	78%
LD12W-16-C0800-RD	YES	YES	6 - 16 VDC	800 mA	± 4%	12.8W	78%
LD12W-16-C0700-RD	YES	YES	6 - 16 VDC	700 mA	± 4%	11.2W	78%
LD12W-12-C1000-RD	YES	YES	4 - 12 VDC	1000 mA	± 4%	12W	77%

Notes

1. Typical efficiency measured at 230VAC input, full load
2. For PWM dimmable version replace –RD with –PD: For Example: LD20W-18-C1400-PD is PWM dimmable version.
   -RD 0-10V & Resistance dimmable version comes with an extra two wires +Purple/-Gray on the output side.
   -PD PWM Dimmable version comes with an extra two wires +Purple/-Gray 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.

Custom designs available. Please consult the factory.

Specifications subject to change without notice

LED Optimized Drivers

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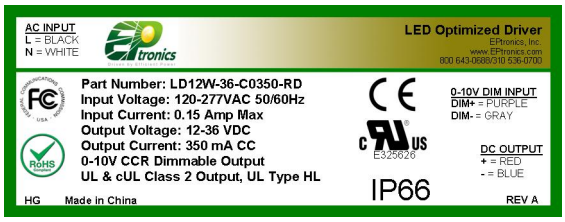
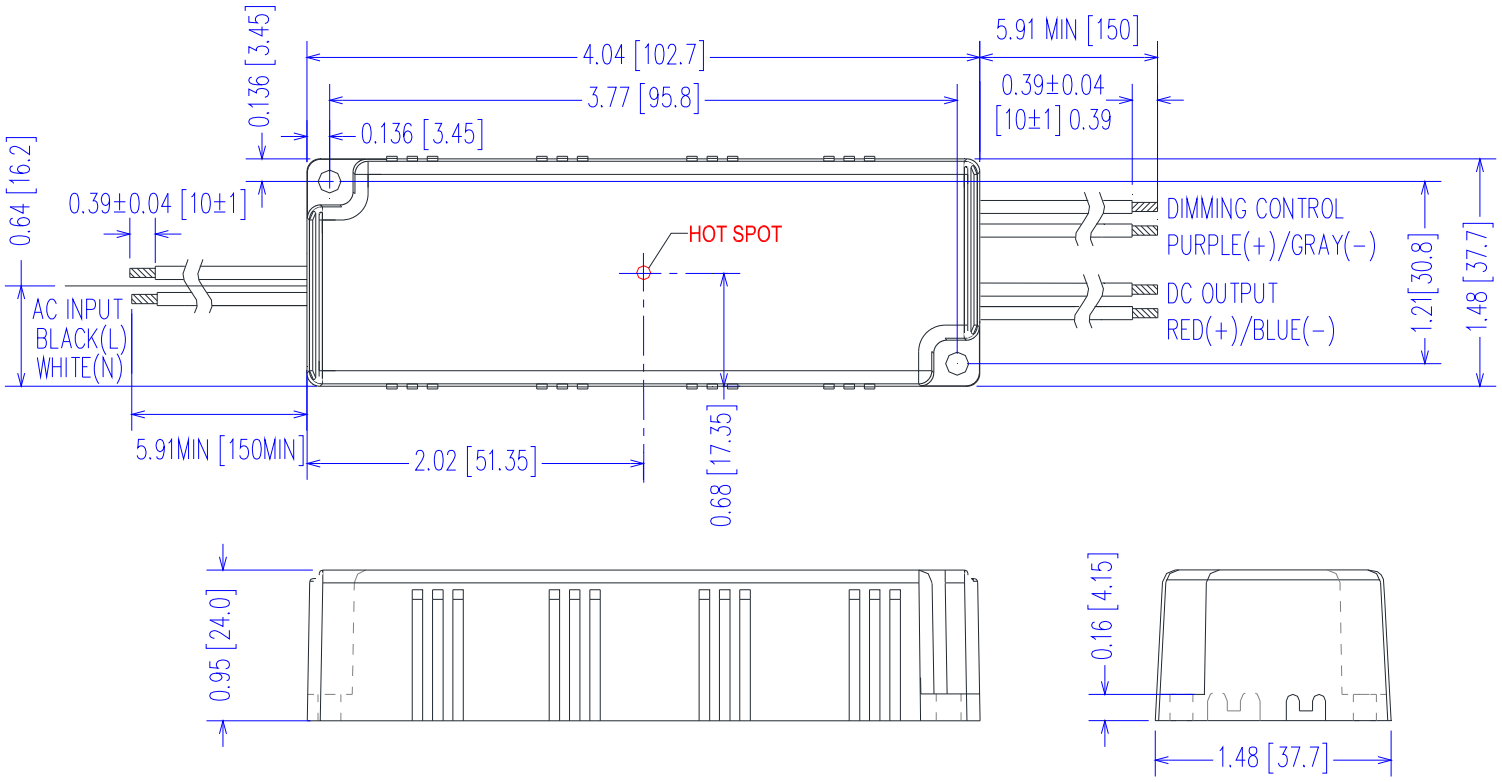
Mechanical Dimensions: Inches [mm]

Material: Black PC ABS Plastic Case
Fully Encapsulated
Weight: 165 grams (5.8 oz) Typical

Labeling Example





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CONSTANT CURRENT LED DRIVER WITH DIMMING

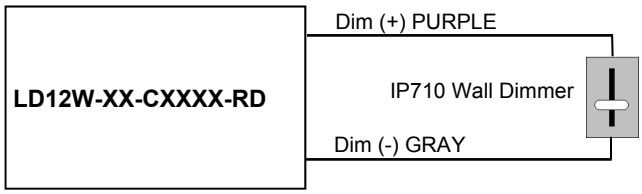
-RD 0-10V Dimming Scheme

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

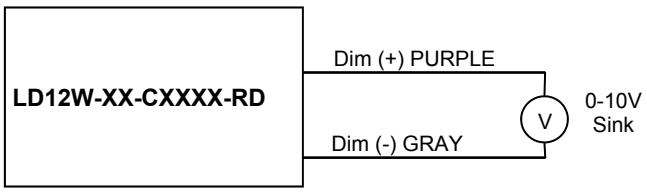
Notes

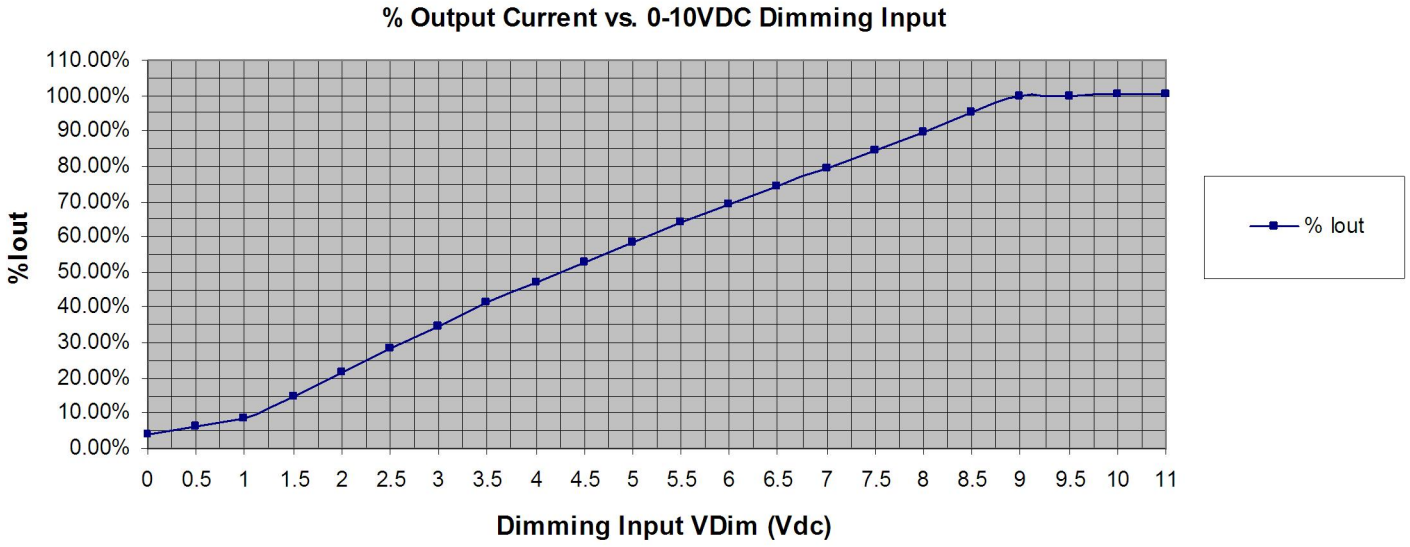
1. -RD 0-10V dimmable version comes with an extra two wires +Purple/-Grey on the output side.
2. -RD version is compatible with most 0-10V Wall Slide dimmers and direct 0-10V analog signal. Recommended dimmer is Leviton IP710 or equivalent
3. -RD 0-10V dimmable version is not intended to dim below about 5% @ 0V or 10% @ 1.0V
4. -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





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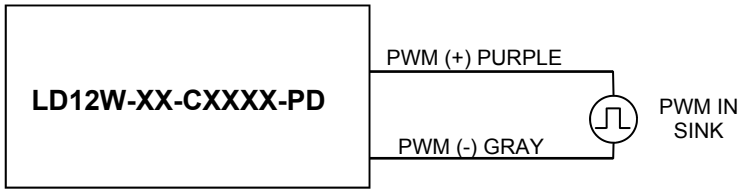
-PD PWM Positive Dimming Scheme

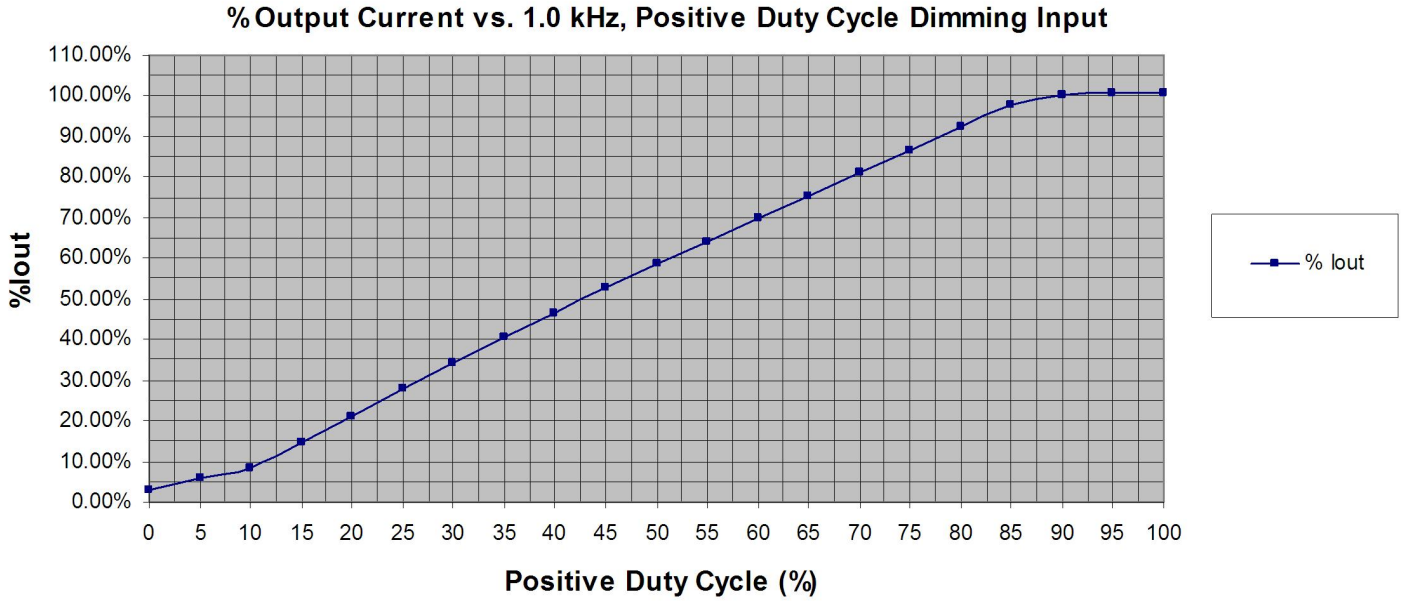
Parameters	Minimum	Typical	Maximum
Absolute Maximum Voltage Range on PWM Input (Purple Wire)	-2.0V	10V	+15V
Input LOW Level Voltage Range (Purple Wire)	-2.0V	0V	+5.5V
Input HIGH Level Voltage Range (Purple Wire)	+9.0V	10V	+15V
Source Current out of PWM Input (Purple Wire)	0mA	—	2mA
PWM Input Signal Frequency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

Notes

1. -PD PWM Dimmable version comes with an extra 2 wires +Purple/-Grey on the output side.
2. -PD PWM Dimmable version is not intended to dim below about 5% @ 0% Duty Cycle or 10% @ 10% Duty Cycle
3. -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





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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	——	——	0.13A	Measured at 120Vac/60Hz Input, Output Full load.
	——	——	0.07A	Measured at 230Vac/50Hz Input, Output Full load.
	——	——	0.06A	Measured at 277Vac/60Hz Input, Output Full load.
Inrush Current (Peak)	——	——	10A	Measured at 277Vac/60Hz Input, Output Full Load, Ta 25^{O}C, Cold Start 50% Ipeak duration ~750 µsec ($1/2*Ip^{2}*t$)
Inrush Current (I^2t)	——	——	0.04 A^2s	
Leakage Current	——	0.36mA	0.50mA	Measured at 120Vac/60Hz Input, Output Full load.
	——	0.61mA	0.75mA	Measured at 277Vac/60Hz Input, Output Full load.
THD	——	——	20%	THD%: ≤ 20% at ≥ 50% Load, 120Vac/230Vac, ≥ 60% Load 277Vac
Power Factor (PF)	0.90	——	——	PF: ≥ 0.90 at ≥ 60% Load 120Vac/230Vac, ≥ 90% 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	-4%	Per Table	+4%	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	——	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 (Tc)	-30 ^{O}C	——	+90 ^{O}C	Measured at location specified on case.
Operating Temperature (Ta)	-30 ^{O}C	——	+60 ^{O}C	This is a reference range. Tc controls temperature range.
Storage Temperature (Ts)	-40 ^{O}C	——	+85 ^{O}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, Ta = 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% Io	Constant Current Limiting circuit.
Output Over Voltage (OVP)	——	——	120% Vo	No Damage, Auto recovery after fault is removed.

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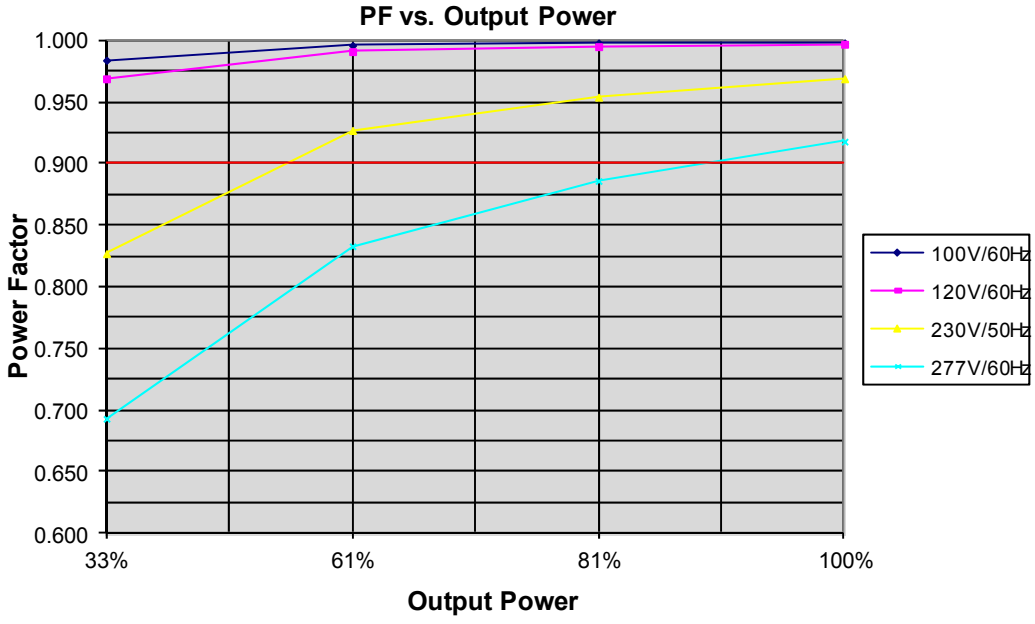
Safety Compliance

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 MΩ, 500VDC @ 25 ^{O}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, ≥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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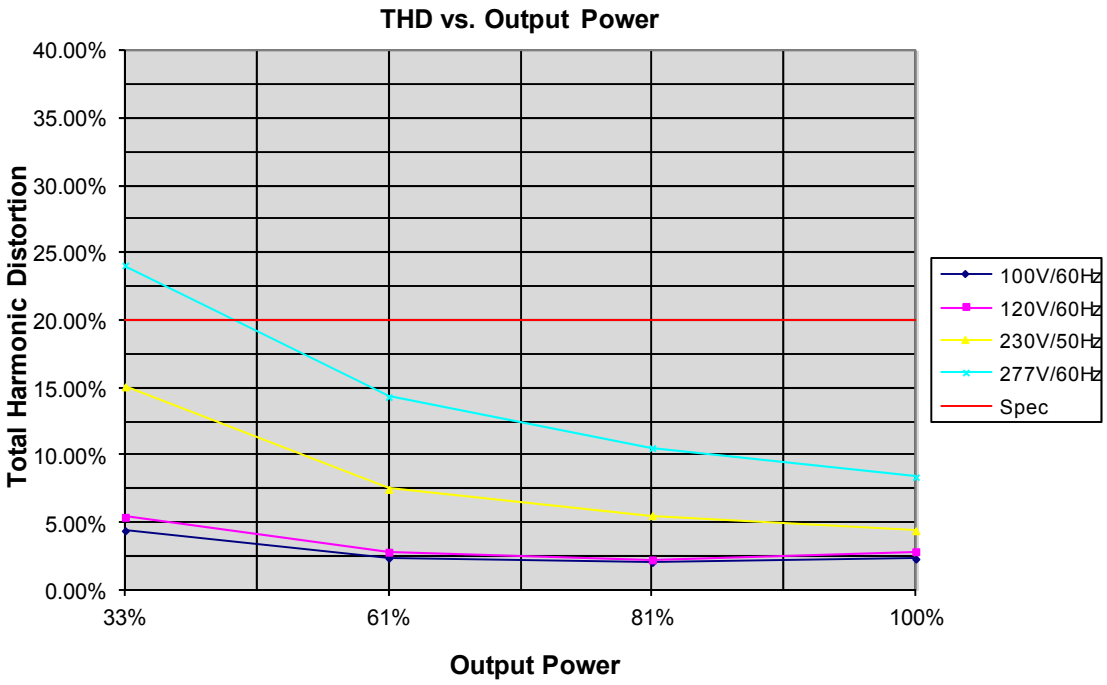
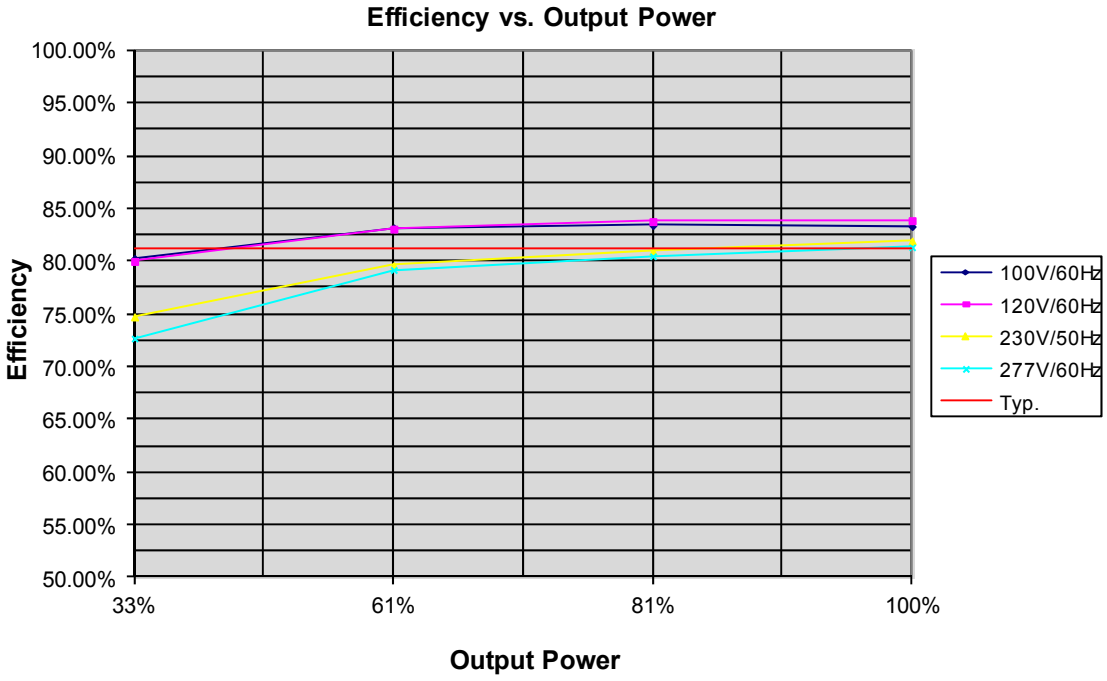
THD Curves (Typical)



Efficiency Curve (Typical)



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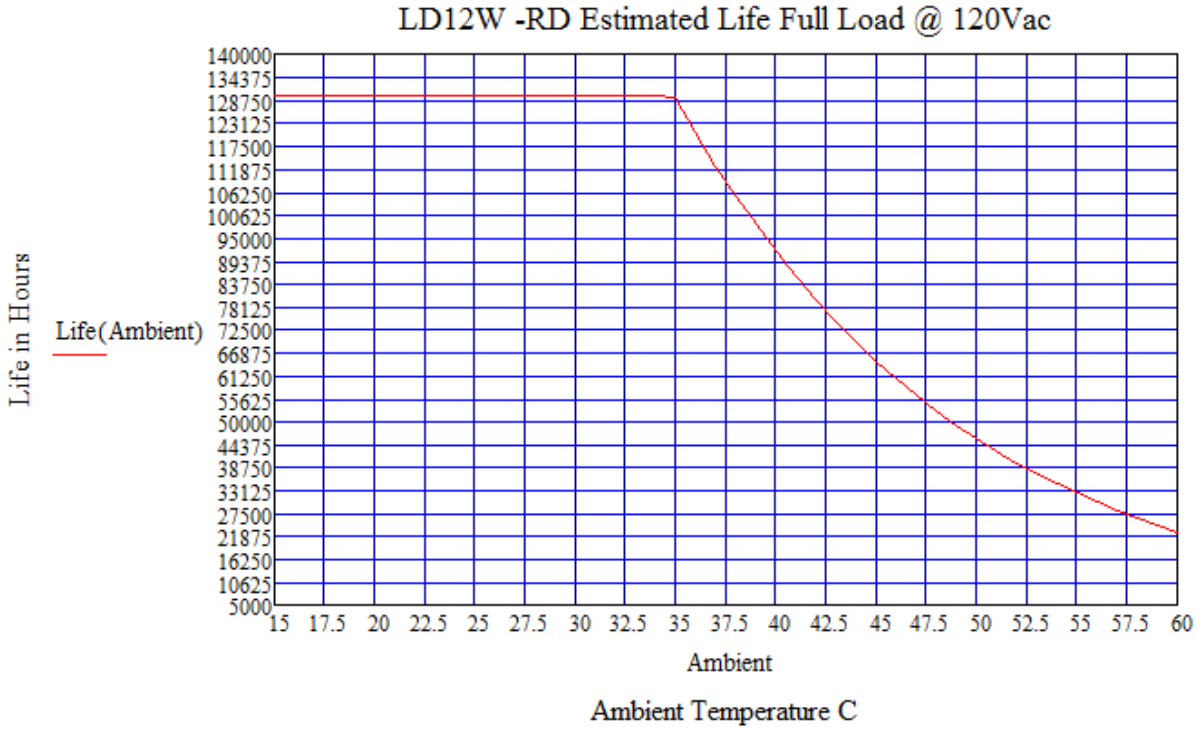
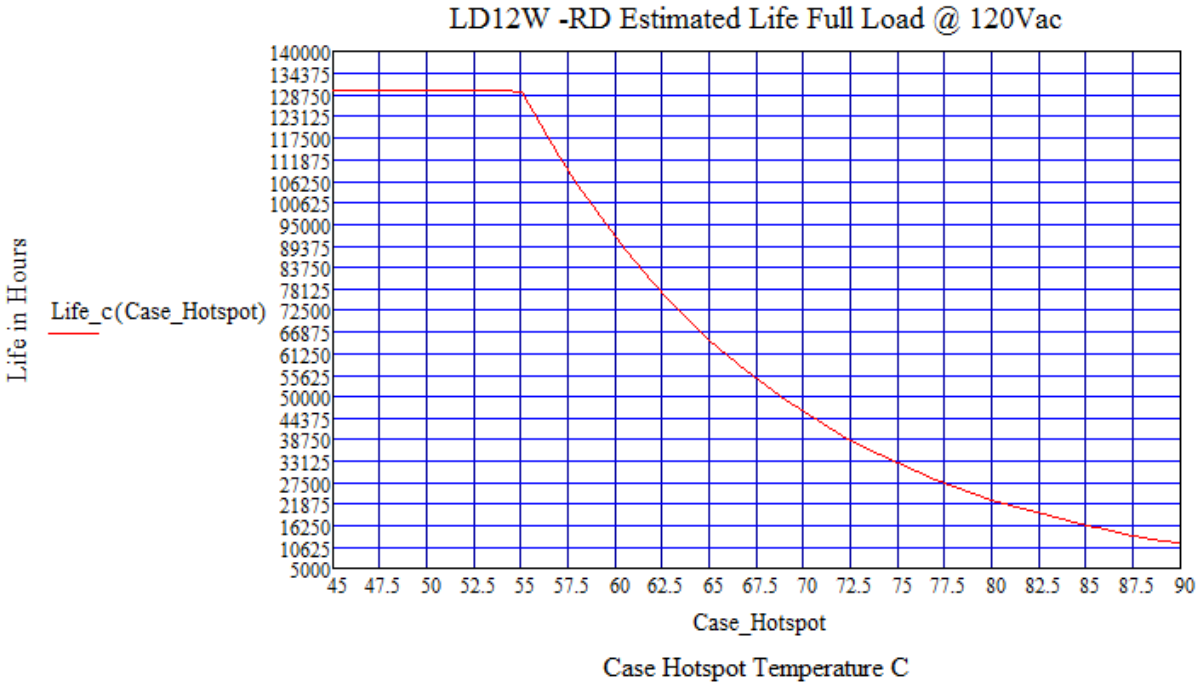
Life vs. Ambient Temperature



Life vs. Case (Tc) Temperature



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