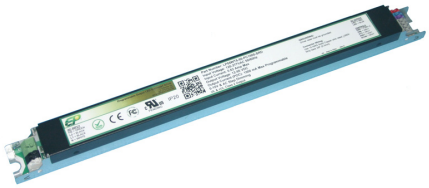
LED Optimized Drivers

55 Watt - LP55WT5-55-PC1500-SRD

FLICKER FREE PROGRAMMABLE LED DRIVER WITH 0-10V DIMMING



55W
LP55WT5
STEP DIMMING

Model: LP55WT5 Series

- Drive Mode: Flicker Free Programmable Constant Current
- Technology: PFC Corrected 2-Stage Switch Mode
- Output Power: 55W Max.
- Input Voltage: 120 to 277VAC, 50/60Hz
- Output Voltage: 12 - 55VDC
- Output Current: Set by resistor value (Rset)
- Programmable Output Current (POC): 100 - 1500mA
- 0-10V Dimming 0% - 100%
- Step Dimming 40% or 100% Via AC Line Input#1 and #2
  Step Dimming Minimum POC ≥ 700mA[(2)]

Environmental

1. Operating temperature: Tc 80C Maximum. Reference -30 to +50°C ambient
2. UL Type TL (Tref Max/Meas. Tref): 90/68°C
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: 352,000 hours @ Full Load per MIL-217F Notice 2.

Safety and Compliance

1. UL8750, EN61347, CSA 22.2 safety recognized, UL Type TL
2. FCC, 47CFR Part 15 Class A certified
3. Damp & Dust resistant design IP20
   NEMA1, for Dry & Damp Locations.
4. T5 Ballast 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.
8. EN61000-4-5: 2kV/4kV 8/20 µsec transient protection.

Electrical Specifications at 25°C

- Input voltage range: 120-277Vac (Full range 108 to 305Vac)
- Frequency: 47 - 63HZ
- Power Factor: ≥ 0.90 at ≥ 50% Load, 120Vac/230Vac, ≥ 65% Load, 277Vac
- THD%: ≤ 20% at ≥ 50% Load, 120Vac/230Vac, ≥ 65% Load, 277Vac
- Inrush current: <30A at 25C, 277Vac, cold start, Max. Load
- Input current: 0.56A Maximum @ 120Vac
- Efficiency: 88% typical at 230Vac Full Load
- Constant Current regulation: ± 3% Over Input Line Variation
- Load regulation accuracy: ± 4%
- Leakage current: 700uA typical; Hold up time: half cycle

c UL us E325626 · TYPE TL · CE · FC · IP20 · RoHS Compliant

Programmable Constant Current Version

Part Number	US Class 2	CN Class 2	Output Voltage Range	Output Constant Current [(2)(3)]	Current Accuracy	Output Power Maximum [(2)]	Typical Efficiency [(1)]
LP55WT5-55-PC1500-SRD	YES	YES	12 - 55 VDC	100 mA to 1500 mA	± 5%	55W	88%

Notes

1. Typical efficiency measured at 230VAC input, Iout 1.0A, full load
2. Keep POC (Programmable Output Current) set to ≥700mA, RSET ≥1.87K Ohms, for proper Step Dimming Operation. Refer to Power Operating Window graph.
   Keep POC (Programmable Output Current) within 55W Power Operating Window. Refer to Power Operating Window graph. Part will foldback output Voltage to maintain power limits.
3. Shipped from factory with RSET OPEN, factory Default Iout = 1500mA

Custom designs available. Please consult with the factory.

Specifications subject to change without notice

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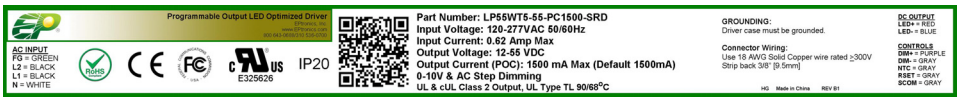
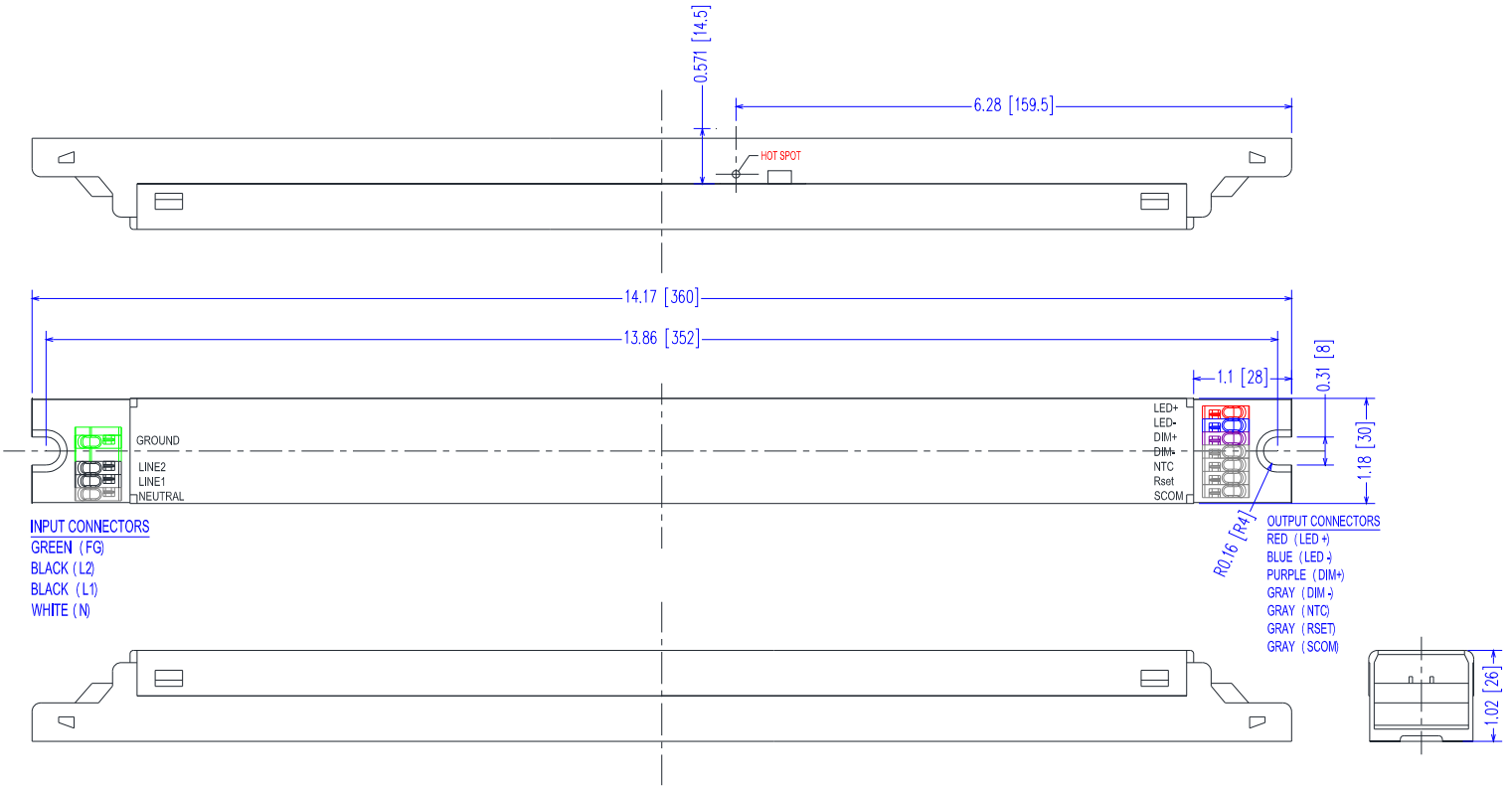
FLICKER FREE PROGRAMMABLE LED DRIVER WITH 0-10V DIMMING

Mechanical Dimensions: Inches [mm]

Material: Metal Housing
Weight: 12 oz (340 grams) Typical
Case must be grounded in end use application

Labeling Example





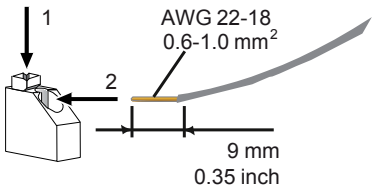
Case Parameter	Inches [mm]
Length	14.17 [360]
Width	1.2 [30.0]
Height	1.02 [26.0]
Mounting Length	13.86 [352]
Connectors	UL, KF250-3.5, WAGO 250-402 Push Pin or equivalent.

LED wiring distance

Recommended maximum wiring distance at full load.

AWG	#22	#21	#20	#19	#18
Distance (m)	10	12	14	18	22
Distance (ft)	32.8	39.4	45.9	59	72.2

KF250-3.5 CONNECTORS



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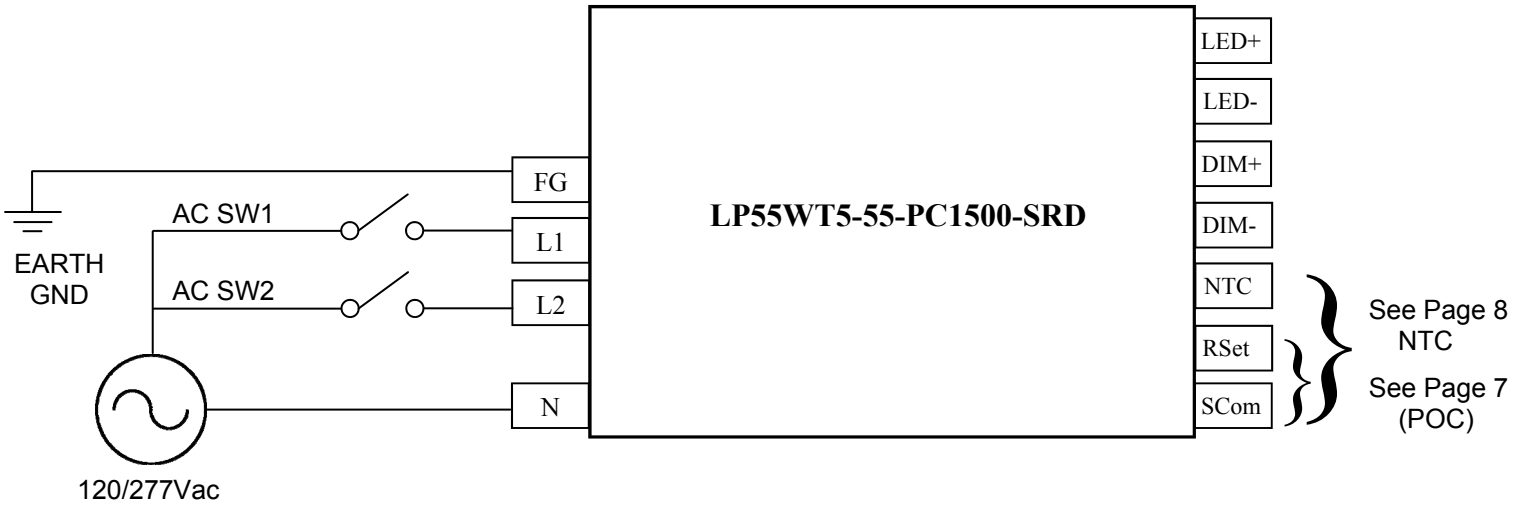
FLICKER FREE PROGRAMMABLE LED DRIVER WITH 0-10V DIMMING

Step Dimming

AC Switch Selectable Step Dimming:
Minimum (POC) ≥700mA, RSET ≥ 1.87K Ohms.
Step dimming is disabled at POC ≤650mA, RSET ≤ 1.69K Ohms
Step dimming level is ~40% of Programmed Output Current (POC)



SW1	SW2	Iout	Pin
Open	Open	0%	0% (OFF)
Open	Closed	40%	<50%
Closed	Open	40%	<50%
Closed	Closed	100%	100%

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FLICKER FREE PROGRAMMABLE LED DRIVER WITH 0-10V DIMMING

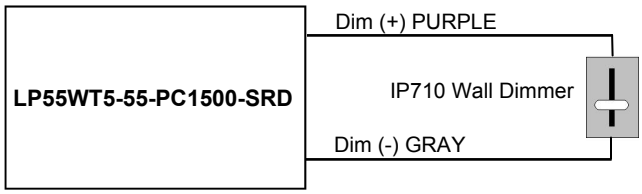
-RD 0-10V CCR Dimming Scheme

Parameters	Minimum	Typical	Maximum
Source Current out of 0-10V Purple Wire	0mA	—	1.5mA
Absolute Voltage Range on 0-10V (+) Purple Wire	-2.0V	—	+15V

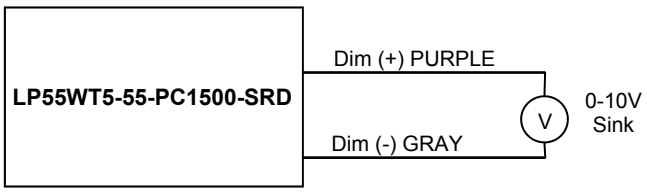
Notes

1. Part comes with two dimming input connectors +Purple/-Gray on the output side.
2. Part 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. Output current will be 0% when Vdim ≤1.00V. This is dim to zero operation.
4. Output will be 100% with Purple/Gray open and 0% with Purple/Gray Shorted.

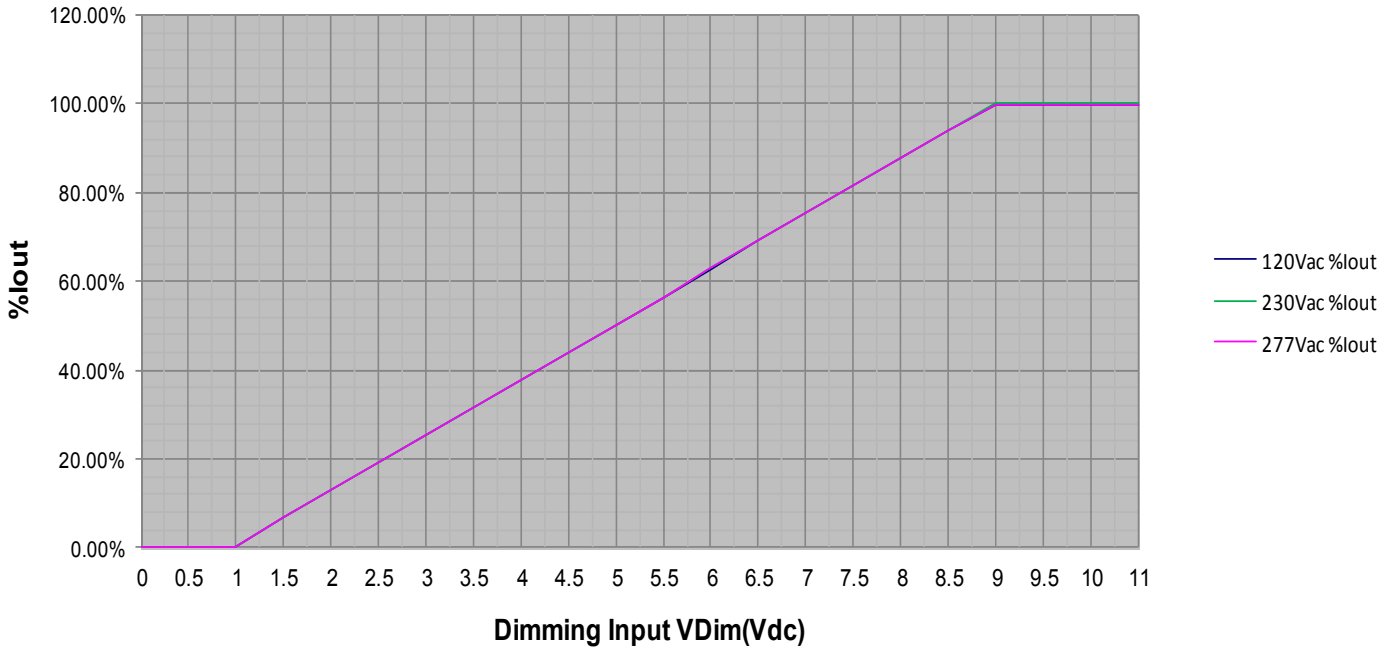
-RD 2-Wire Resistance Dimming Scheme



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



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



Specifications subject to change without notice

Custom designs available. Please consult with the factory.

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FLICKER FREE PROGRAMMABLE LED DRIVER WITH 0-10V DIMMING

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	——	——	0.56 A	Measured at 120Vac/60Hz Input, Output Full load.
	——	——	0.25 A	Measured at 277Vac/60Hz Input, Output Full load.
Inrush Current (Peak)	——	18A	30A	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^{2}t)	——	——	0.33 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 ≥ 50% Load, 120Vac/230Vac, ≥ 65% Load, 277Vac
Power Factor (PF)	0.90	——	——	Measured at ≥ 50% Load, 120Vac/230Vac, ≥ 65% Load, 277Vac

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) Rset resistor is Per table on Page 5
Output Power	——	——	55W	Voltage Foldback
Ripple & Noise (Vpk-pk)	——	——	3% Vo	20 MHz BW, Full load output in parallel with 0.1 µF ceramic & 10 µF Electrolytic.
Ripple (Ipk-pk)	——	——	4% Io	20 MHz BW, Full load output in parallel with 0.1 µF ceramic & 10 µF Electrolytic. 120 Hz component (Flicker Free)
Start-up Time	——	500 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	——	+80 ^{O}C	Measured at location specified on case.
Operating Temperature (Ta)	-30 ^{O}C	——	+50 ^{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	——	——	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	——	352,000 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)	——	——	105% Vo	No Damage, Auto recovery after fault is removed.
Output Power Limit (OPL)	——	——	55W	Voltage Foldback

Custom designs available. Please consult with the factory.

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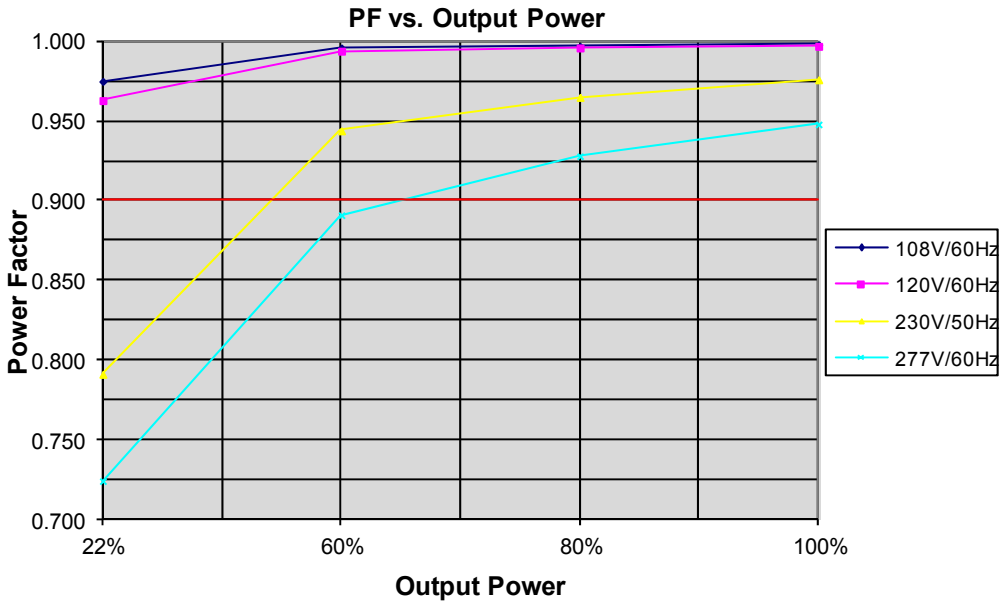
Safety Compliance

Safety	Notes/Standards
UL/CUL	UL8750, UL1310 for UL Class 2 & CAN/CSA C22.2 No. 250.13, UL Type TL 90/68^{O}C
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
0-10V Dimming Circuit	Dim+ Purple/Dim- Gray are considered part of the secondary circuit.
Step Dimming Circuit	Step Dimming is part of the primary circuit.
FG	The metal case of the driver must be connected to earth ground (FG) in the end-use application.

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 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): Vout 55V @ Iout 1000mA



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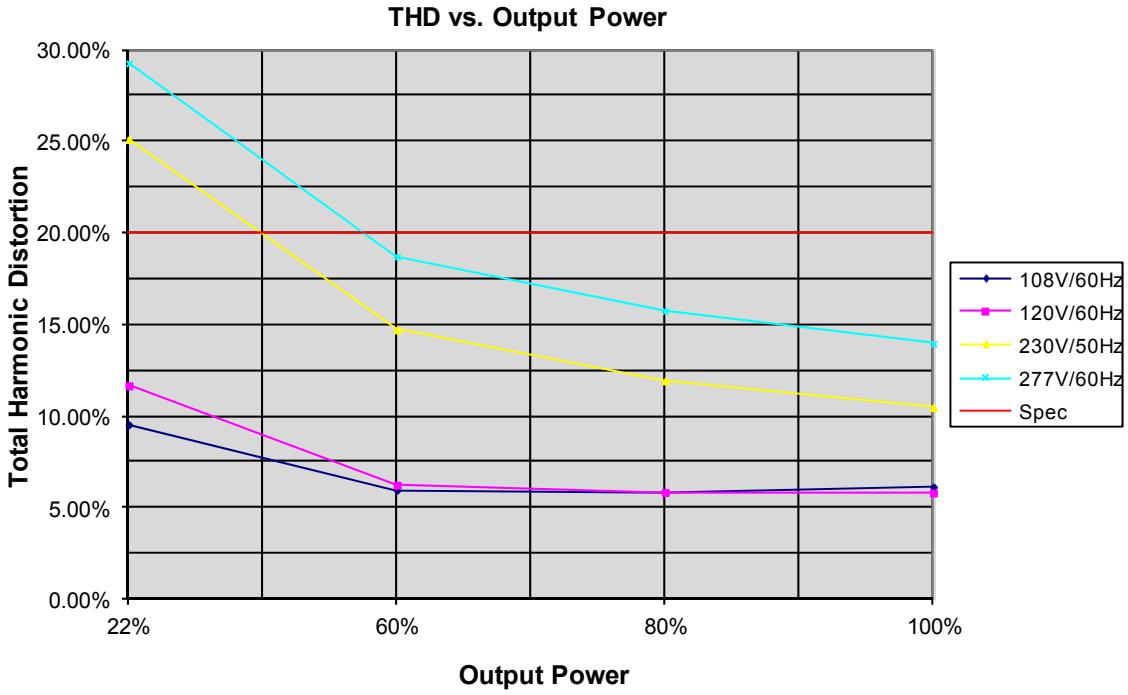
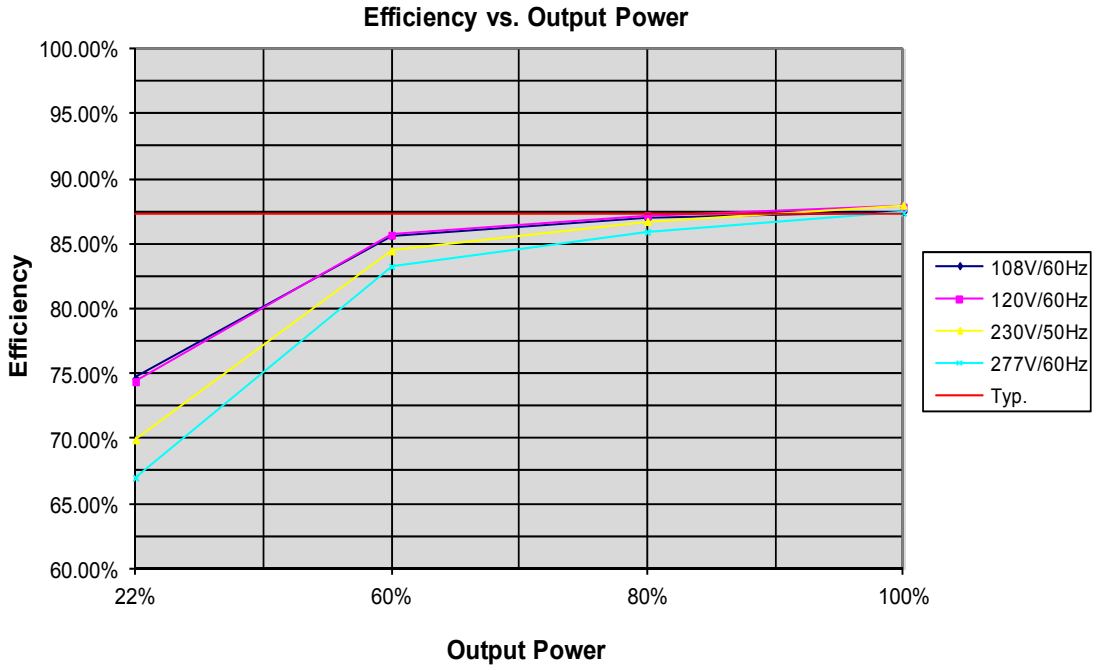
THD Curves (Typical): Vout 55V @ Iout 1000mA



Efficiency Curves (Typical): Vout 55V @ Iout 1000mA



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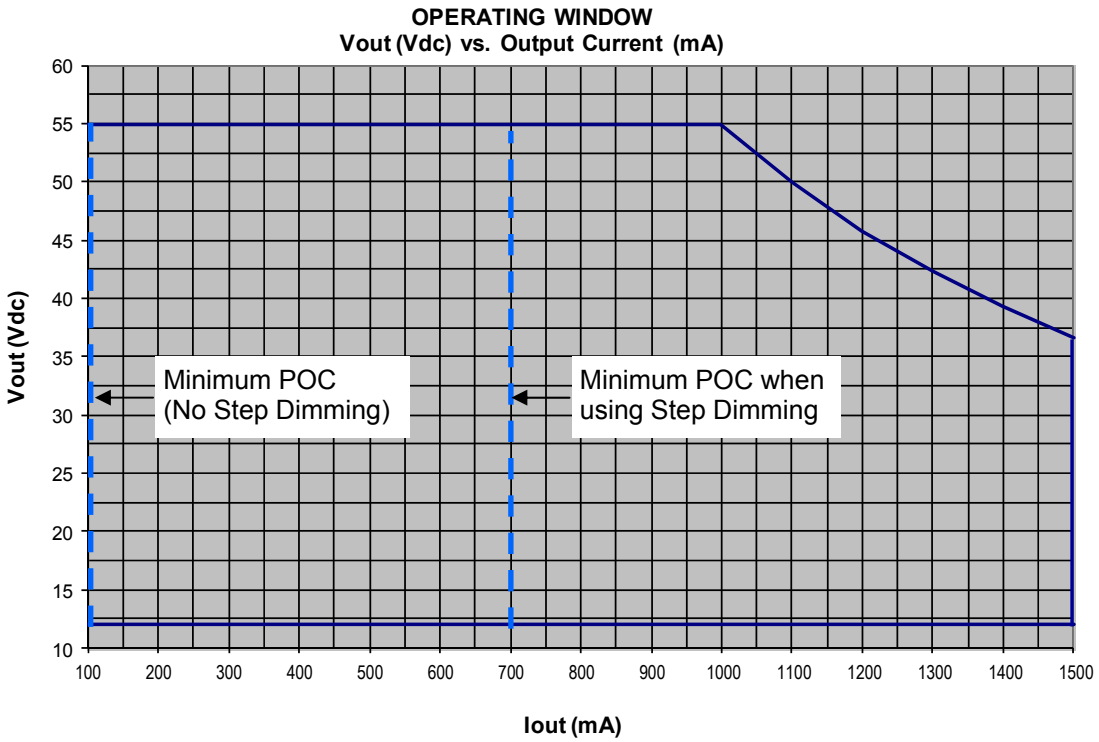
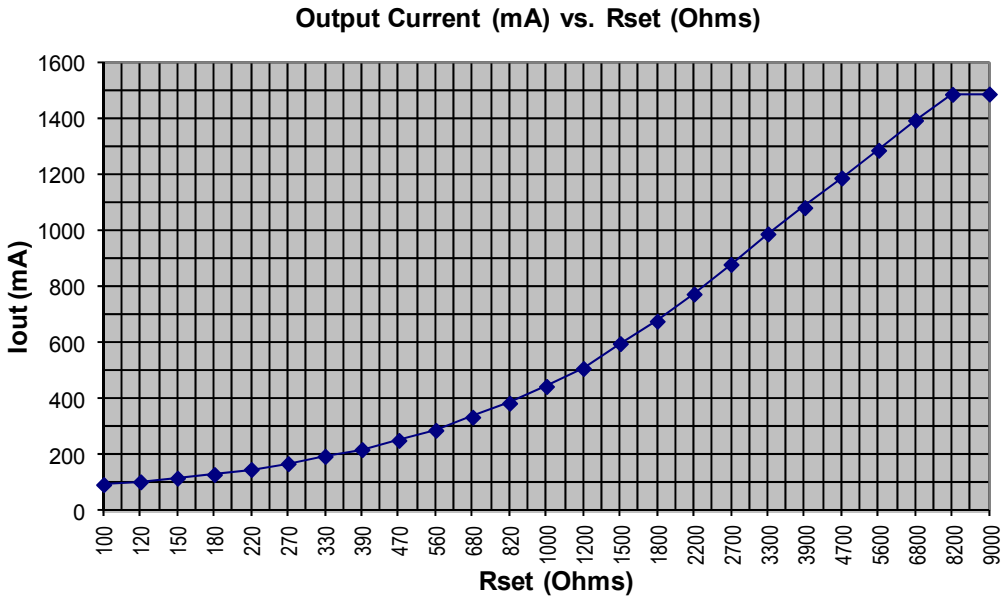
Power Operating Window



POC (Programmable Output Current)

Rset (Ohms)	Iout (mA)
100	100
162	130
230	160
270	180
320	200
395	230
442	250
569	300
698	350
845	400
996	450
1150	500
1490	600
1870	700
2300	800
2800	900
3320	1000
3660	1050
5230	1250
5700	1300
6220	1350
6800	1400
7460	1450
8200	1500
9000	1500

POC Setting:
Output Current vs. Rset value is within ± 5%
Rset can be any ≥1/4W, ± 1%, ≥20V rated resistor



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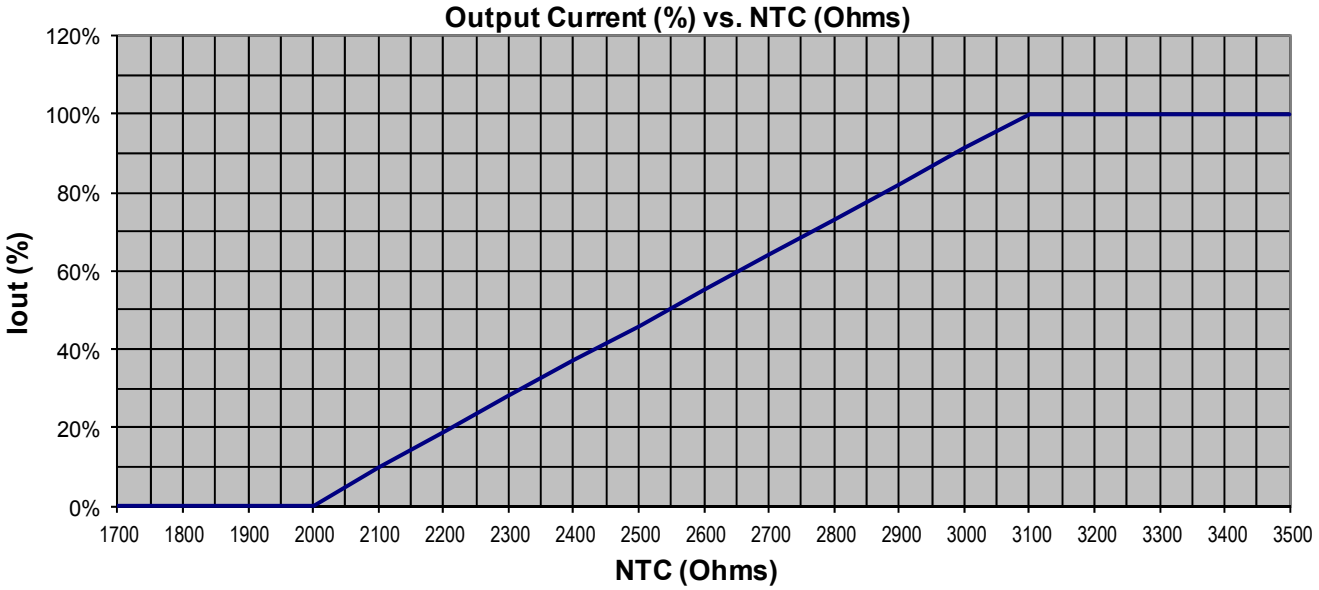
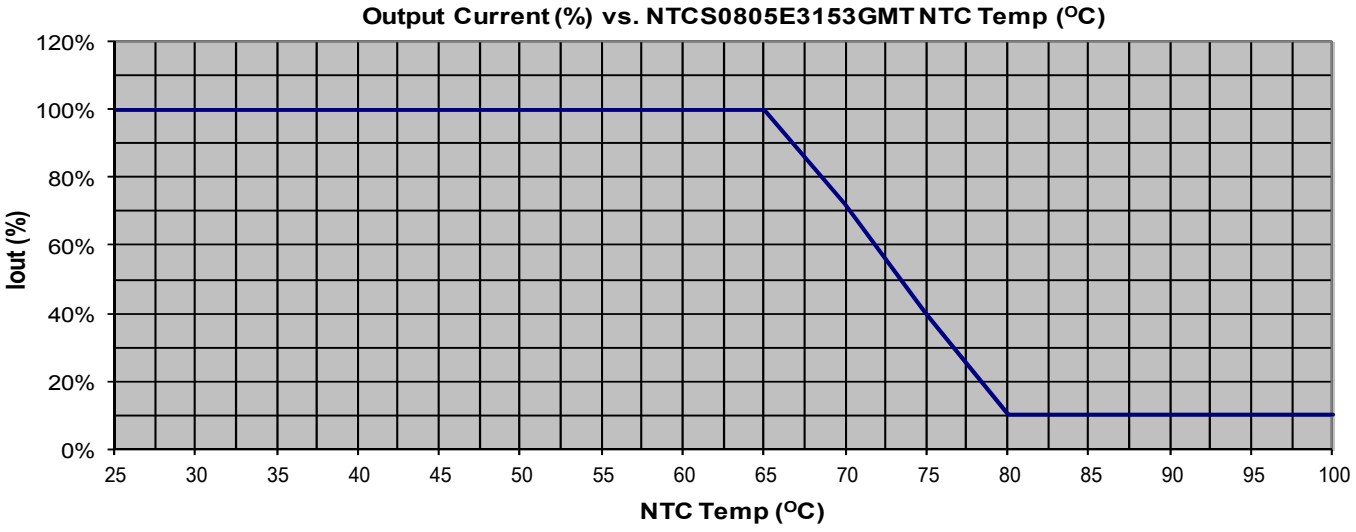
Module Temperature Protection using External NTC

Factory settings:
NTC Minimum Ohms= 2.0K
NTC Minimum Level (%) ~ 0% Iout,
NTC Maximum Ohms = 3.2K, 100% Iout



Module Temperature Protection Example

NTC = 805SMD, R_{25C} = 15K Ohm ± 2%, R_{64C} = 3700, Vishay Part#: NTCS0805E3153GMT
Default Settings: NTC Max = 3.0K, NTC MIN = 2.0K, Iout Min = 10%



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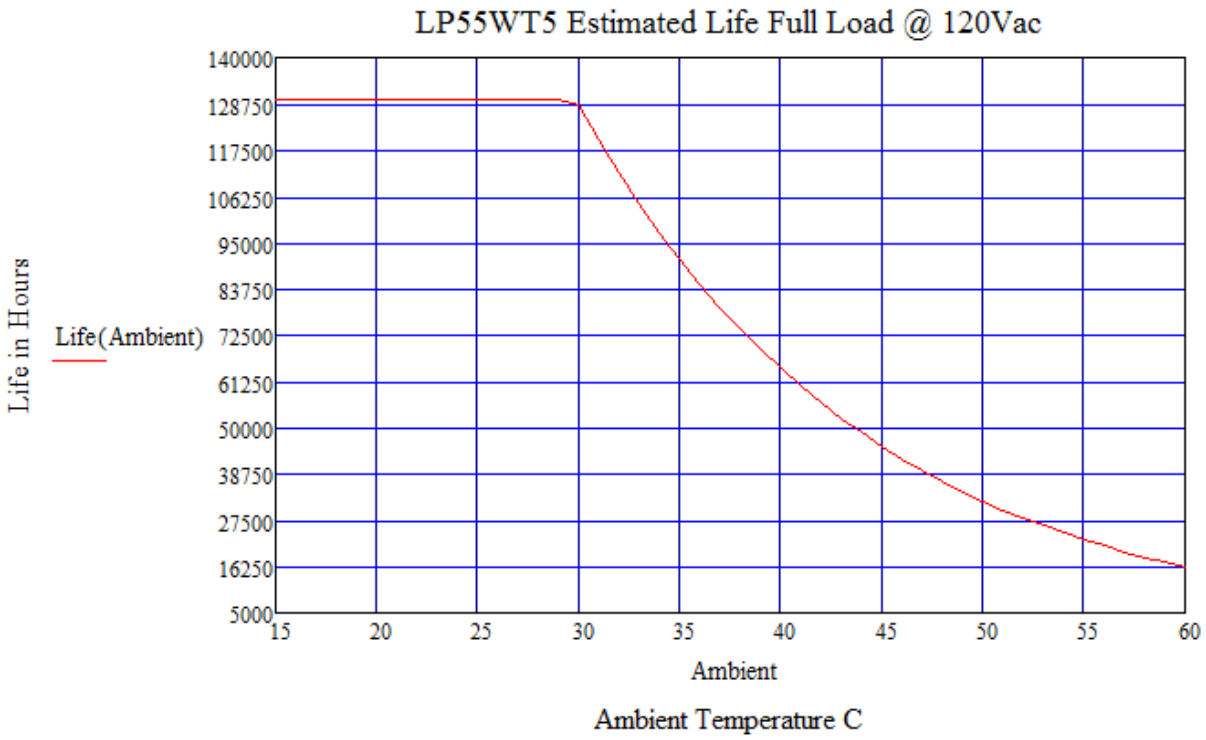
Life vs. Ambient Temperature



Life vs. Case (Tc) Temperature