MAIN FEATURES

- 85 – 264 V_{AC} universal input voltage range
- 200 W rated power
- 1.00" (25.4 mm) low profile package (28.4 W/in^3)
- High efficiency (up to 94%)
- No-load low power consumption: <0.3 W for 12, 24, V_{DC}; <0.4W for 48 V_{DC} standard output variants.
- Low earth leakage current: <300 µA
- Over temperature protection, auto recovery
- Output over voltage protection, latch off
- Overload and short circuit protections, auto recovering
- Metallic protecting cage on semi-potted PWA
- IEC safety installation Class I
- Certified to the latest IEC/EN/UL 62368-1 edition
- Compliant to EN 55032 and certified to CISPR-FCC Class B
- Meet IEC/EN 60335-1 requirements for household appliances
- Operating Altitude up to 5000 m (OVC II), up to 2000 m (OVC III)
- RoHS-3 compliant (EU directive 2015/863)
- 5 years warranty

E134098

DESCRIPTION

The LPD200 is a series of Audio/Video IT/Industrial grade power supplies designed to offer the high-power density and high efficiency that space constrained and power demanding systems need. Available in 12, 24, and 48 V_{DC} outputs, this series of high-performance AC-DC power supplies provides up to 200 W steady output power with moving air, or from 190 W upwards with convection cooling over the 110 – 240 V_{AC} nominal input voltage range, all in a compact 2.28 x 3.09 x 1.00" form factor package. The semi-potted base-plate package allows thermal management through conduction cooling particularly needed in those installations where the heat can be dispelled solely through solid thermal path.
The series also includes 15, 28, 30, 36 and 54V versions whose availability will be assessed upon demand.
With 94% typical efficiency and extremely low (< 0.3 / 0.4 W) power consumption at no-load, the LPD200 facilitates thermal management and equipment design, including compatibility with the latest environmental legislations. The LPD200 series meets the latest IEC/EN/UL 62368-1 safety standards, including the EMC standard EN55032 and CISPR/FCC Class B specifications for conducted noise emissions, and EN55035 / EN 61000-6-2 / EN 61204-3 for EMC immunity, making the series suitable for use in a wide range of Audio/Video, IT / Industrial applications worldwide.
The series comes configured in the IEC protective Class I.

MARKET SEGMENTS AND APPLICATIONS

- Integrated Wireless Backhaul Mobile LTE-A, 5G
- Desktop 3D Scanners / Printers
- LED Signage / Lighting Systems
- Voice and Data Center Solution
- Fiber Optics Telecommunication Systems
- Video/Imaging Systems

MODEL CODING AND OUTPUT RATINGS

Model Number	Output Voltage V_{OUT} [V]	Voltage Accuracy (1) [%]	I_{OUT} Current Forced Air (2) [A]	I_{OUT} Current Convection [A]	I_{OUT} Current Conduction (3) [A]	V_{OUT} Ripple (4) [mV]	Typical Efficiency (5) [%]
LPD200-12-SP	12	±1	16.67	9.17	14.17	150	92
LPD200-15-SP	15	±1	13.33	7.33	11.33	150	92
LPD200-24-SP	24	±1	8.33	4.58	7.08	200	94
LPD200-28-SP	28	±1	7.14	3.93	6.07	200	93
LPD200-30-SP	30	±1	6.66	3.67	5.67	200	93
LPD200-36-SP	36	±1	5.55	3.06	4.72	200	94
LPD200-48-SP	48	±1	4.16	2.29	3.54	200	94
LPD200-54-SP	54	±1	3.70	2.04	3.15	200	93

Notes:

1. At full load
2. 14 CFM forced air cooling at >110 V_{AC}
3. Thermal contact with 177.8 x 177.8 x 2.0 mm (7.00 x 7.00 x 0.08 in) metallic plate
4. 0.1 µF ceramic capacitor and 10 µF electrolytic capacitor in parallel at load, 20 MHz BW
5. Typical values at 230 V_{AC}, full load, 25 °C ambient temperature

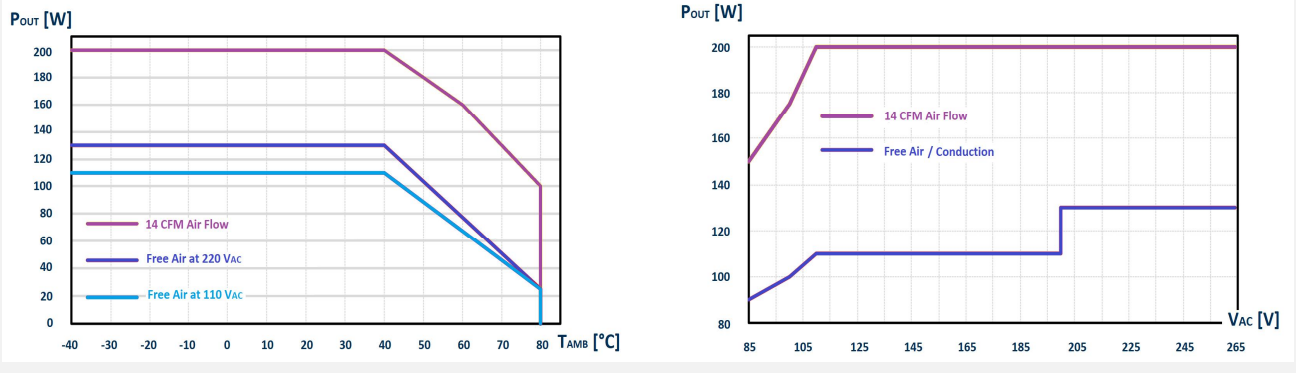
INPUT SPECIFICATIONS

Specification	Test Conditions / Notes	Min.	Nominal	Max.	Units
AC Input Voltage		85	100-240	264	V_{AC}
Input Frequency		47	50/60	63	Hz
Input Current	RMS at 100 V_{AC}, maximum load	-	-	3.15	A
Inrush Current (peak)	240 V_{AC}, 25 °C ambient, cold start	-	-	85	A
Fusing	Time Lag, 3.15 A, 250 V on both L and N	-	5	-	A
Efficiency	At 230 V_{AC}, 100 % rated load, 25 °C T_{AMB} 12, 15 V_{DC} 24, 36, 48 V_{DC} 28, 30, 54 V_{DC}	 - - -	 92 94 93	 - - -	%
No-load Power Consumption	At 115-230 V_{RMS}, no load, 12, 15, 24, 28, 30, 36 V 48, 54 V variants	- -	- -	0.3 0.4	W
Power Factor	At full rated load, 230 V_{AC}, 50 Hz input voltage	0.96	0.98	-	-
Harmonic Current	Complies with EN-61000-3-2, Classes A, D				
Fluctuations and Flicker	Complies with EN-61000-3-3 at nominal voltages and full load				
Earth Leakage Current	Normal conditions, 264 V_{AC}, 60 Hz	-	-	300	µA
Touch Leakage Current	Normal conditions, 264 V_{AC}, 60 Hz	-	-	100	µA

OUTPUT SPECIFICATIONS

Specification	Test Conditions / Notes	Min.	Nom.	Max.	Units
Output Voltage	±1 % set point accuracy for all voltage variants.	-	12	-	
	At 100 % load, 25 °C T_{AMB}, 100-240 V_{AC}	-	15	-	
		-	24	-	
		-	28	-	V
		-	30	-	
		-	36	-	
		-	48	-	
		-	54	-	
Output Voltage Adjustment	$P_{OUT} \leq P_{RATED}$, Through potentiometer	5	-	5	%
Rated Currents	≥ 110 V_{AC}, 14 CFM air flow				
	12 V_{DC}	-	-	16.67	
	15 V_{DC}	-	-	13.33	
	24 V_{DC}	-	-	8.33	
	28 V_{DC}	-	-	7.14	A
	30 V_{DC}	-	-	6.66	
	36 V_{DC}	-	-	5.55	
	48 V_{DC}	-	-	4.16	
	54 V_{DC}	-	-	3.70	
	See output power de-rating curves below				
	≥ 110 V_{AC}, free air				
	12 V_{DC}	-	-	9.17	
	15 V_{DC}	-	-	7.33	
	24 V_{DC}	-	-	4.58	
	28 V_{DC}	-	-	3.93	A
	30 V_{DC}	-	-	3.67	
	36 V_{DC}	-	-	3.06	
	48 V_{DC}	-	-	2.29	
	54 V_{DC}	-	-	2.04	
	See output power de-rating curves below				
	≥ 110 V_{AC}, Conduction (18 x 18 x 2 mm plate)				
	12 V_{DC}	-	-	14.17	
	15 V_{DC}	-	-	11.33	
	24 V_{DC}	-	-	7.08	
	28 V_{DC}	-	-	6.07	A
	30 V_{DC}	-	-	5.67	
	36 V_{DC}	-	-	4.72	
	48 V_{DC}	-	-	3.54	
	54 V_{DC}	-	-	3.15	
	See output power de-rating curves below				
Load Regulation	90 – 264 V_{AC} 10 – 100 % rated load	-	-	±0.5	$\%V_{OUT}$
Line Regulation	Full load V_{AC}: 90 – 264 V_{RMS}	-	-	±0.2	$\%V_{OUT}$
Transient Response	25% load changes at 1 A/µs 12 V_{DC} at 2200 µF Load / I_{OUT}> 0.5 A 24 V_{DC} at 1000 µF Load / I_{OUT}> 0.5 A 48 V_{DC} at 560 µF Load / I_{OUT}> 0.5 A	-	-	±5	$\%V_{OUT}$
Ripple and Noise	12, 15 V_{DC}	-	-	150	
	24, 28, 30, 36, 48, 54 V_{DC}	-	-	200	mV
	Peak-to-peak, 20 MHz BW. 100 nF ceramic and 10 µF electrolytic caps at the load				
Turn-on Overshoot		-	-	TBV	$\%V_{OUT}$
Hold-up Time	At 115 V_{IN}, full load, for all models	10	12	-	ms
Minimum Load	All models	0	-	-	A
Maximum Load Capacitance	At nominal V_{IN}, 25 °C ambient, max load				
	12 V_{DC}			6800	
	15 V_{DC}			5360	
	24 V_{DC}	-	-	3440	
	28 V_{DC}	-	-	3440	µF
	30 V_{DC}	-	-	3220	
	36 V_{DC}			2680	
	48 V_{DC}			2000	
	54 V_{DC}			1560	
Temperature Drift		-0.05	-	+0.05	%V/°C

Output Power Ratings / De-ratings



PROTECTION FEATURES

Specification	Test Conditions / Notes	Min.	Nominal	Max.	Units
Input Fuse	Time Lag, 3.15 A, 250 V on L1 and L2	-	5	-	A
Over Current	At nominal input voltages Hiccup mode, auto-recovering	125	145	165	%$I1_{MAX}$
Short Circuit	At nominal input voltages Hiccup mode, auto-recovering	-	-	-	
Over Voltage	12 V_{DC}	-	16	-	
	15 V_{DC}	-	20	-	
	24 V_{DC}	-	32	-	V
	28 V_{DC}	-	35	-	
	30 V_{DC}	-	35	-	
	36 V_{DC}	-	45	-	
	48 V_{DC}	-	55	-	
	54 V_{DC}	-	63	-	
	Unit shut down and latch off (AC recycle)				
Over Temperature	Hiccup mode, auto-recovering	-	-	-	
Isolation Primary-to- Secondary	Reinforced	4250	-	-	V_{AC}
Isolation Input-to-PE	Basic	2000			V_{AC}
Isolation Output-to-PE	Basic	2000	-	-	V_{AC}

ENVIRONMENTAL SPECIFICATIONS

Specification	Test Conditions / Notes	Min	Nominal	Max	Units
Operating Temperature Range	Ambient temperature	-40	-	80	°C
	Case Temperature (T_C centre of base plate)	-40	-	90	
Storage Temperature Range		-40	-	85	°C
Humidity	RH, Non-condensing Operating	-	-	93	%
	Non-operating			95	%
Operating Altitude	OVC II	-	-	5000	m
	OVC III	-	-	3000	
Shock	Meet MIL-STD-810F Table 516.5, Table 516.5-I 10 ms, each axis (±X, ±Y, ±Z), 3 times				
Vibration	Meet MIL-STD-810F Table 514.5C-VIII, 15÷2000 Hz, X-Y-Z axis, 1 hour each, total 3 hour				
MTBF	Full Load, 115 V_{AC}, 25 °C ambient GB, MIL-HDBK-217F	450	-	-	K hours
Useful Life	Within nominal input voltage range, 75% rated load, 40 °C ambient, 100% duty	26	-	-	K hours
Thermal Considerations	The output power derating curves relevant to forced and free air cooling are herein provided. These curves can be used as a guideline to assess the limit in performance of a power supply once installed in a system providing controlled air flow at a certain input voltage and ambient temperature. Conduction cooling installation thermal performance should be verified and assessed physically in any specific case.				

ELECTROMAGNETIC COMPATIBILITY (EMC) – EMISSIONS

Phenomenon	Conditions / Notes	Standard	Equipment Performance Class
Conducted	115 V_{RMS}, 230 V_{RMS}. Maximum load.	EN 55032 (ITE) 47 CFR FCC Part 15 EN 55011 (IMS)	B
Radiated		EN 55032 (ITE) 47 CFR FCC Part 15 EN 55011 (IMS)	B
Line Voltage Fluctuation and Flicker	At 2 0%, 50 % and 100 % maximum load. Nominal input voltages.	EN 61000-3-3	A
Harmonic Current Emission	At nominal input voltages	EN 61000-3-2	A, C, D

ELECTROMAGNETIC COMPATIBILITY EMC) – IMMUNITY

Phenomenon	Conditions / Notes	Standard	Test Level	Performance criteria
	Reference standard for IT equipment: EN 55035, EN 61000-6-2, EN 61204-3			
ESD	8 kV air discharge, 4 kV contact, at any point of the system.	EN 61000-4-2	3	A
Radiated Field	10 V/m, 80-1000 MHz, 1 KHz 80% AM	EN 61000-4-3	3	A
Electric Fast Transient	±2 kV on AC power port for 1 minute; ±1 kV on signal/control lines	EN 61000-4-4	3	A
Surge	± 2 kV line to line; ± 4 KV line to earth; on AC power port	EN 61000-4-5	3	A A
Conducted RF Immunity	10 V_{RMS}, 0,15-80 MHz, 1 KHz, 80 % AM	EN 61000-4-6	3	A
Dips and Interruptions	100 – 240 V_{AC}			
	30% Dip, 10 ms	EN61000-4-11		A
	60% Dip, 100 ms	EN61000-4-11		A
	>95% Dip, 5000 5s	EN61000-4-11		A
	Interrupts > 95 % for 5 s	EN61000-4-11		B

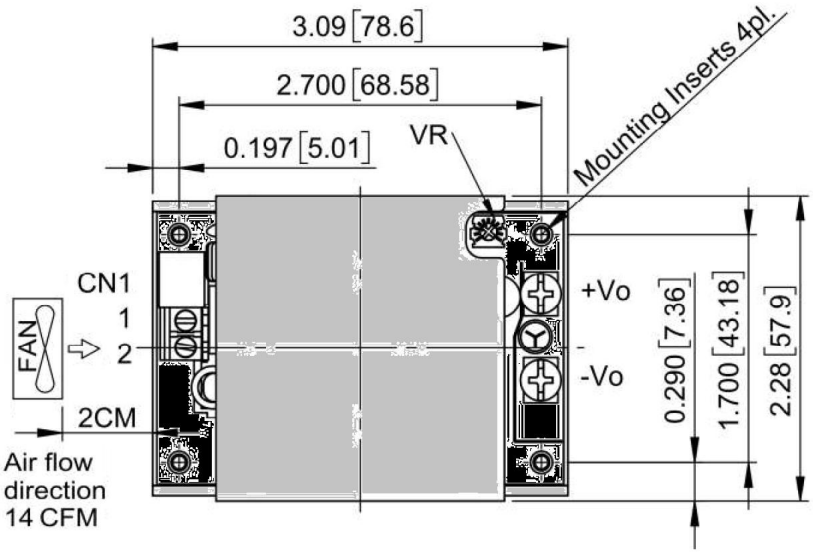
SAFETY AGENCIES APPROVALS

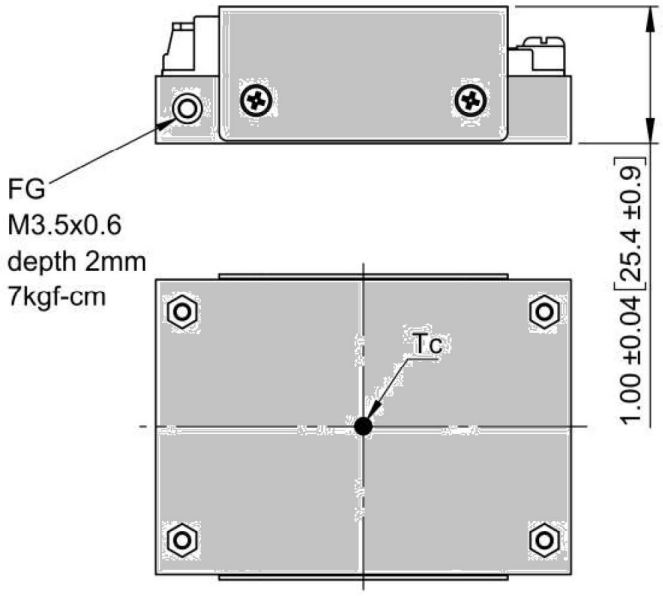
Certification Body	Safety Standards and file numbers	Category
CSA/UL	UL 63268-1	Audio Video and Information Technology Equipment
IEC IECEE CB Certification	IEC/EN 62368-1	Audio Video and Information Technology Equipment
CE	Directive 2014/35/EU: Electrical Safety: Low Voltage electrical equipment (LVD)	Audio Video and Information Technology Equipment
	Directive 2014/30/EU: Electromagnetic Compatibility (EMC)	
	Directive EU 2015/863 (RoHS 3)	

OUTLINE DRAWING AND CONNECTIONS

Overall dimensions: 57.9 x 78.6 x 25.4 mm (2.28 x 3.09 x 1.00 in)

Weight: 195 g (0.43 lb)





Dimensions: in [mm]
Tolerance in: x.xx=±0.03. x .xxx=±0.020
mm: x.x=±0.7, x.xx=±0.50

AC Input Connector(CN1):ECE ETB22

Pin	Function	Mating Wire Range
1	ACL	14~18 AWG
2	ACN	

DC Output Connector:KANG YANG PCB-58M4

Function	The screw locked torque
+Vo	M4 7kgf-cm
-Vo	

Mounting Inserts

Option
∅3.2 Through depth 10.5mm
M3x0.5 Threaded depth 10.5mm

REVISION HISTORY

Rev.	Date	Originator	Comments
Draft	May 7th, 2024	M. Petritoli	First release
0	July 25th, 2024	M. Petritoli	• IEC safety installation Class II removed • 15, 28, 30, 36 and 54 V variants included together with relevant specifications • No load power consumption specified for 48, 54 V variants • Immunity std updated to EN 55035 (replacing EN 55024) • Immunity against ESD level changed
1	Oct 24th, 2024	D. Azzeruoli	• Head description change • Input minimum voltage updated to 85 V • Main Feature and Description chapters updated • V_{OUT} adjustment range amended to ±5%
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