P24ALD-Series 100…900 mA Step-Up LED Driver

PHI-CON

- Power LED Driver with constant current output
- High efficiency up to 95 %
- Wide input voltage range
- Open circuit and short circuit protection
- Adjustable output current
- On/Off - remote control input
- Standard 2" x 1" package

Model guide

Type	Input voltage range [V_{DC}]	Vin under voltage protection		Output voltage range [V_{DC}]	Output current [mA] nom.	Output power [w] max.	Ripple & noise [mV] max.	Efficiency typ. [%]	Capacity load max. [µF]
		Lock in [V] typ.	Lock out [V] typ.						
P24ALD010	9...36	7.6	6.8	14…48	100	4.8	250	83…88	47
P24ALD015	9...36	7.6	6.8	14…48	150	7.2	350	86…91	100
P24ALD025	9...36	7.6	6.8	14…48	250	12	450	89…93	100
P24ALD030	9...36	7.6	6.8	14…48	300	14	450	89…94	100
P24ALD035	9...36	7.6	6.8	14…48	350	16.8	600	89.5…94	100
P24ALD050	9...18	7.6	6.8	14…45	500	24	650	90…95	47
	18…36			23…48					
P24ALD060	9...18	7.6	6.8	14…38	600	28.8	650	91…95	47
	18…36			23…48					
P24ALD070	9...18	7.6	6.8	14…32	700	33.6	700	91.5…95	47
	18…36			23…48					
P24ALD090	20…30	15.6	14.6	25…48	900	43.2	400	92…95	47

Specifications

Input Filter:	Capacitor
Enable input -EN- Pin 3	
On / Off Enable input "EN"	"On" Open EN-input "Off" connected to "–Vin"
Control current "EN" input	< 1.5 µA @ < 3 V
"Off" state idle input current	1.3 mA @ Vin 9…32 V 8 mA @ Vin 32…36 V
Input -DIM- Pin 2 (analog control mode)	
"Off" state control voltage	0 … 0.3 V
Control voltage Dim range	0.4 … 1.7 V for Iout: 0 … 100 %
"On" state	1.7 … 5 V (8 V max. absolute)
Dim control current	< 1.5 µA @ 0.4 …1.7 V DIM
Input -DIM- Pin 2 (PWM control mode)	
"On" state threshold level	0.4 … 5 V (8 V max. absolute)
"Off" state threshold level	0 … 0.3 V
PWM-frequency	100 Hz … 1 kHz
Output	
Current accuracy	±5 %
Over voltage protection	52 V
Short circuit protection	Continuously
Restart after short circuit	After removed short circuit and an input voltage interruption
Softstart time, without C-load	50 ms, max.
Temperature coefficient	± 0.03 % / °C

General	
Switching frequency	370 kHz, typ.
Standard in accordance with	EN / IEC 60950-1 EN / IEC 61347-2-13 UL8750
Radiated emissions	EN55015
EMS immunity	EN61547
ESD	EN61000-4-2 perf. criteria A
Radiated immunity	EN61000-4-3 perf. criteria A
Fast transient *	EN61000-4-4 perf. criteria A
Surge *	EN61000-4-5 perf. criteria A
Conducted immunity	EN61000-4-6 pref. criteria A
PFMF	EN61000-4-8 pref. criteria A
Reliability calculated (MIL-HDBK-217 F)	MTBF > 840 k hours
Environmental	
Operating temperature	-40°C … 85°C (with derating)
Storage temperature	-55 °C to +125 °C
Maximum case temp.	+105 °C
Thermal imdance	17 K/W @ free air convection
Humidity	95 % rel. Humidity
Physical	
Dimensions	26.1 x 51.5 x 15.8 mm
Weight	38 g
Case material	Plastic, UL94-V0 rated
Potting material	Epoxy, UL94-V0 rated
Absolute maximum ratings	
Soldering temperature	260°C, 10s, 1.5mm from case

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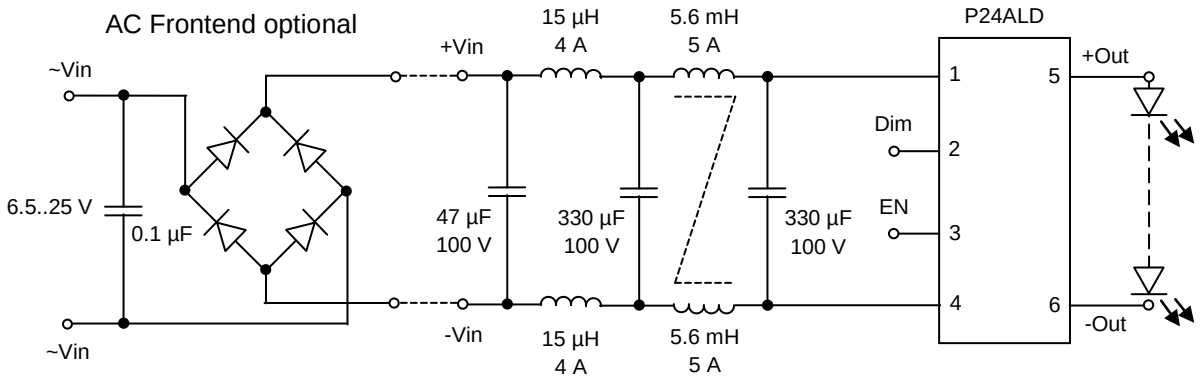
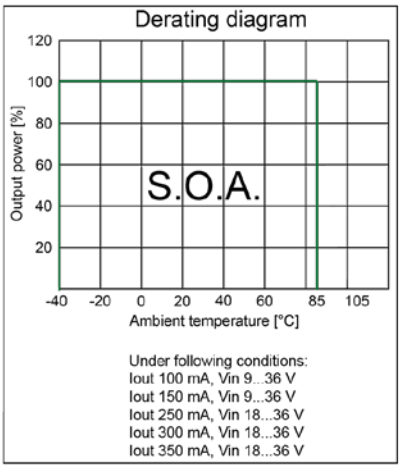
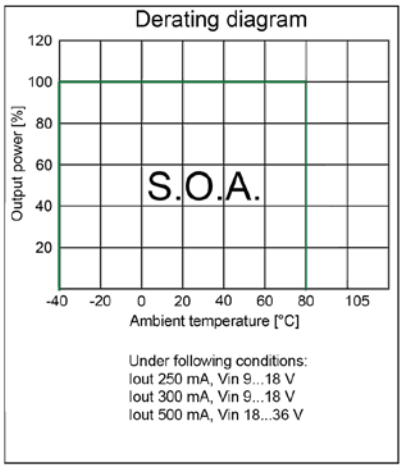
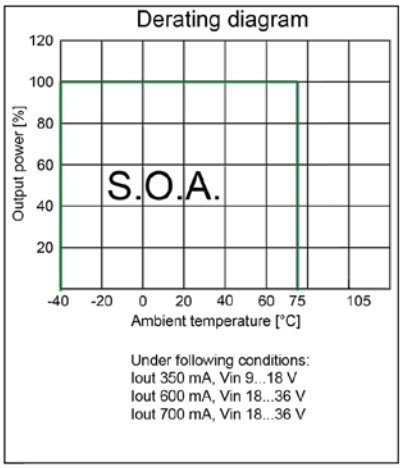
EMC circuit suggestion

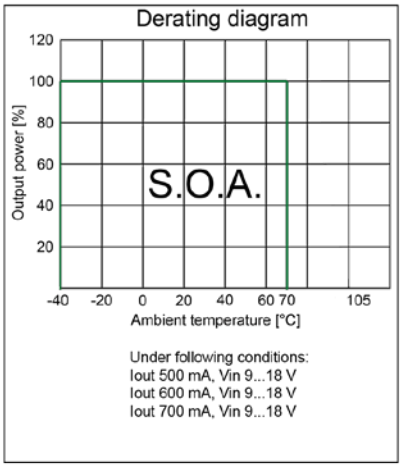


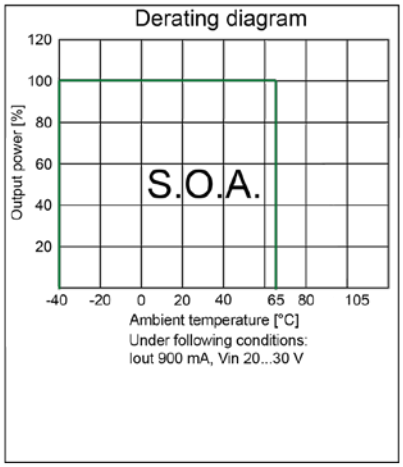
Efficiency vs output load











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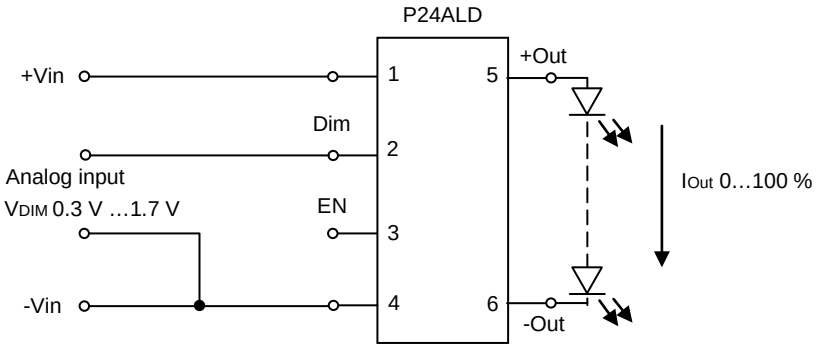
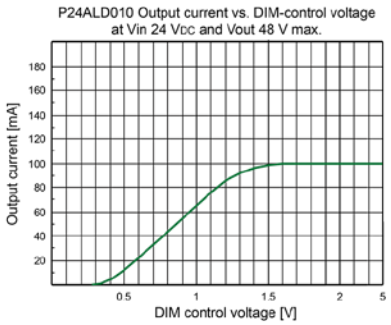
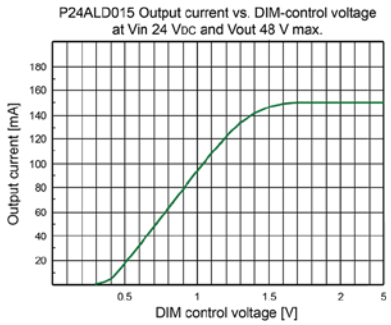
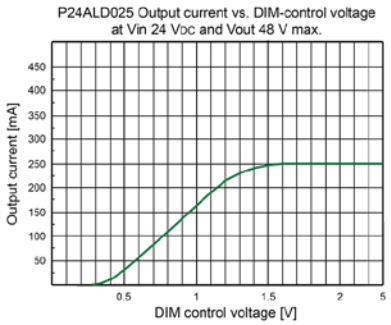
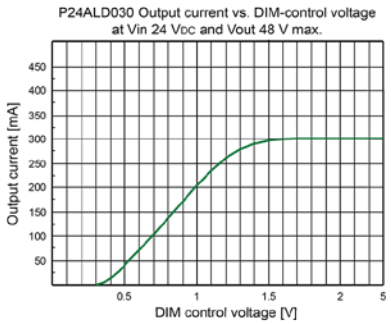
Dim application circuit analog

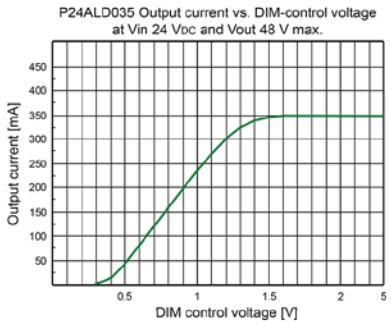


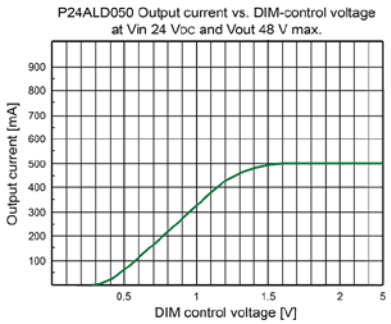


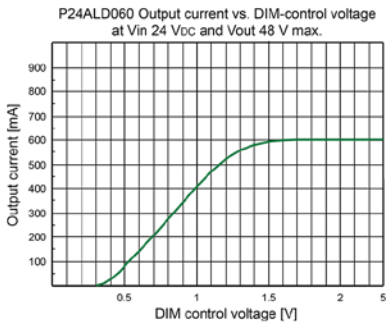


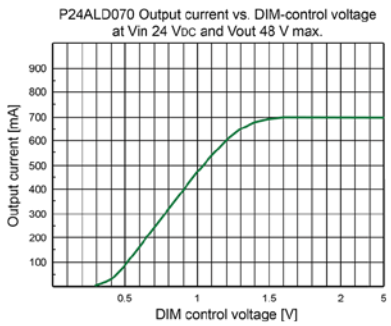


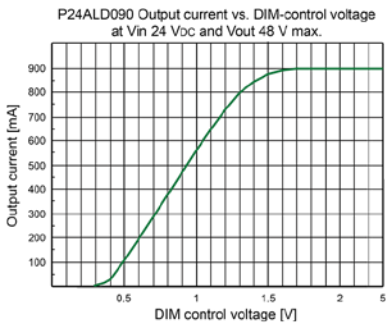












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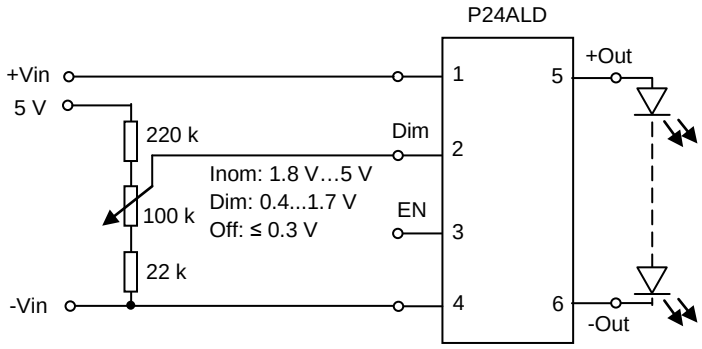
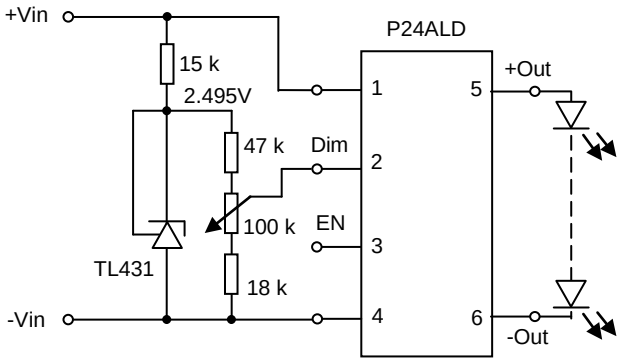
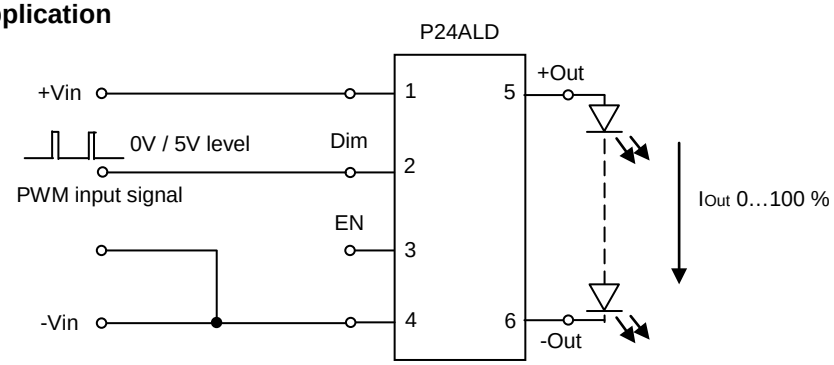
Dim circuit analog application via potentiometer and external stabilised 5 V



Dim circuit analog application via potentiometer and voltage reference via TL431



Dim circuit PWM application



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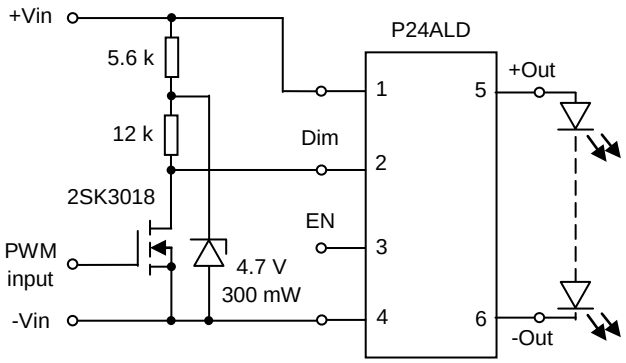
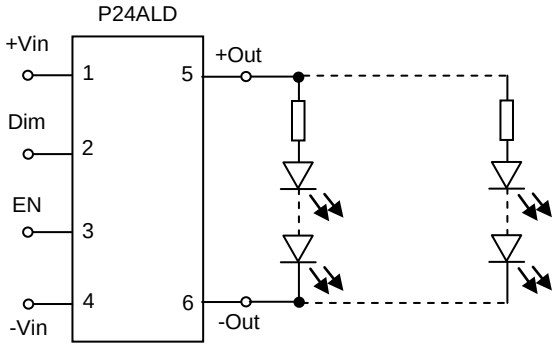
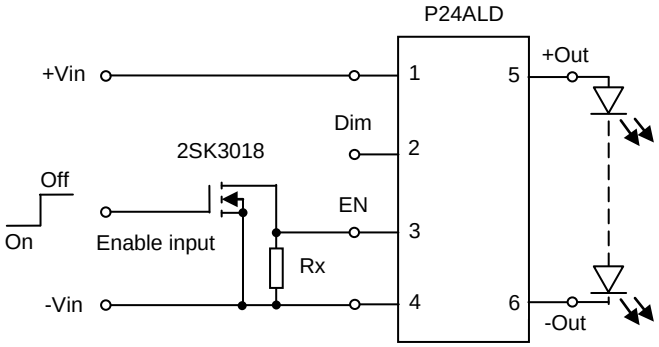
Dim circuit PWM application with signal level



Application circuit multi string



Enable input, Under voltage protection



Type	Rx [kΩ]	Vin threshold lock in [V]	Vin threshold lock out [V]
P24ALD010 P24ALD015 P24ALD025 P24ALD030 P24ALD035 P24ALD050 P24ALD060 P24ALD070	∞	7.6	6.8
	12	11	10.2
	10	11.5	10.7
	7.5	13	12.2
	4.7	16.2	15.4
	3.3	20.5	19.7
	2.7	23.2	22.2
	2.4	25.0	24.0
	2.0	28.5	27.5
	1.8	30.8	29.8

Type	Rx [kΩ]	Vin threshold lock in [V]	Vin threshold lock out [V]
P24ALD090	∞	15.6	14.6
	12	21.5	19.7
	10	22.5	20.7
	7.5	25.0	22.5

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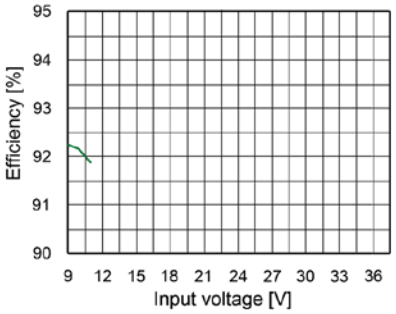
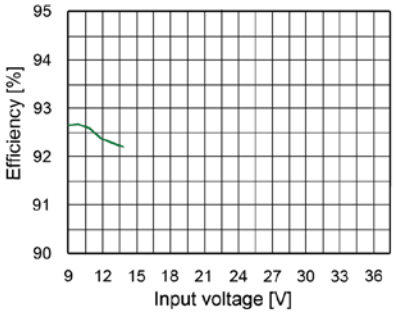
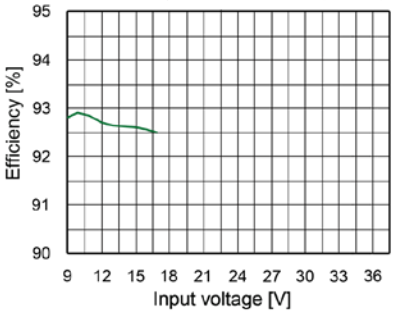
P24ALD030 Efficiency vs Vin & Vout 14 V (4 LEDs)



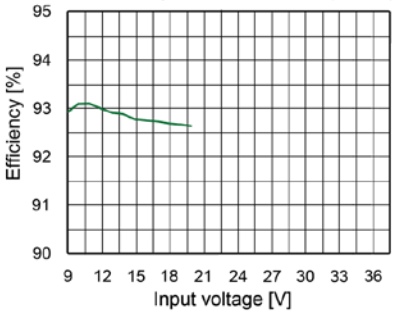
P24ALD030 Efficiency vs Vin & Vout 17.5 V (5 LEDs)



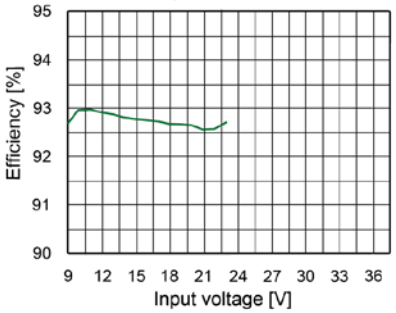
P24ALD030 Efficiency vs Vin & Vout 21 V (6 LEDs)



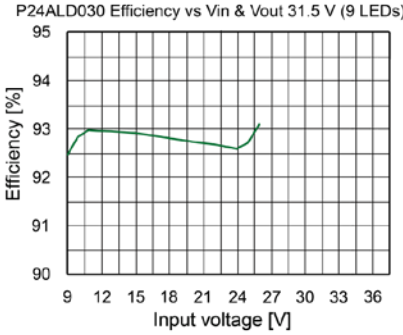
P24ALD030 Efficiency vs Vin & Vout 24.5 V (7 LEDs)



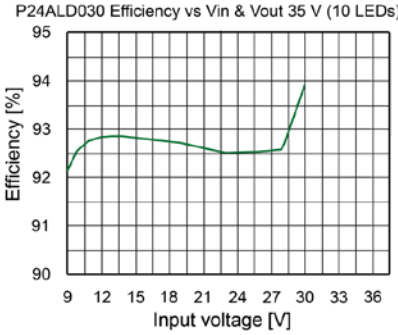
P24ALD030 Efficiency vs Vin & Vout 28 V (8 LEDs)



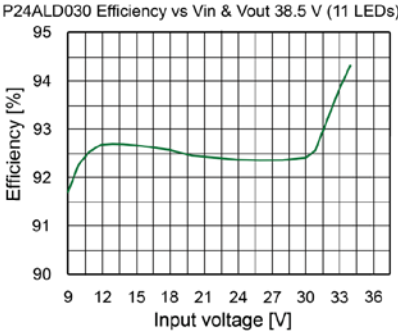
P24ALD030 Efficiency vs Vin & Vout 31.5 V (9 LEDs)



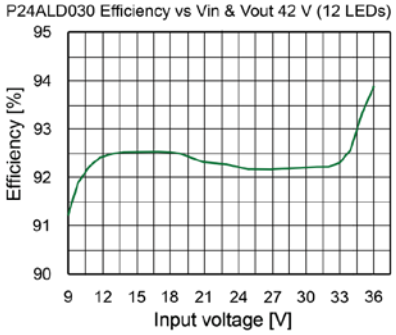
P24ALD030 Efficiency vs Vin & Vout 35 V (10 LEDs)



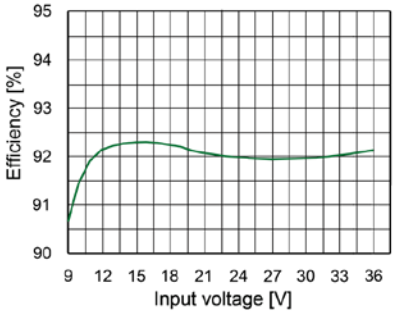
P24ALD030 Efficiency vs Vin & Vout 38.5 V (11 LEDs)



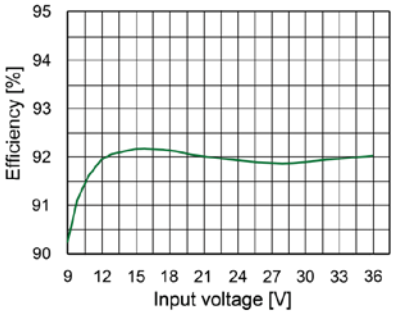
P24ALD030 Efficiency vs Vin & Vout 42 V (12 LEDs)



P24ALD030 Efficiency vs Vin & Vout 45.5 V (13 LEDs)



P24ALD030 Efficiency vs Vin & Vout 49 V (14 LEDs)



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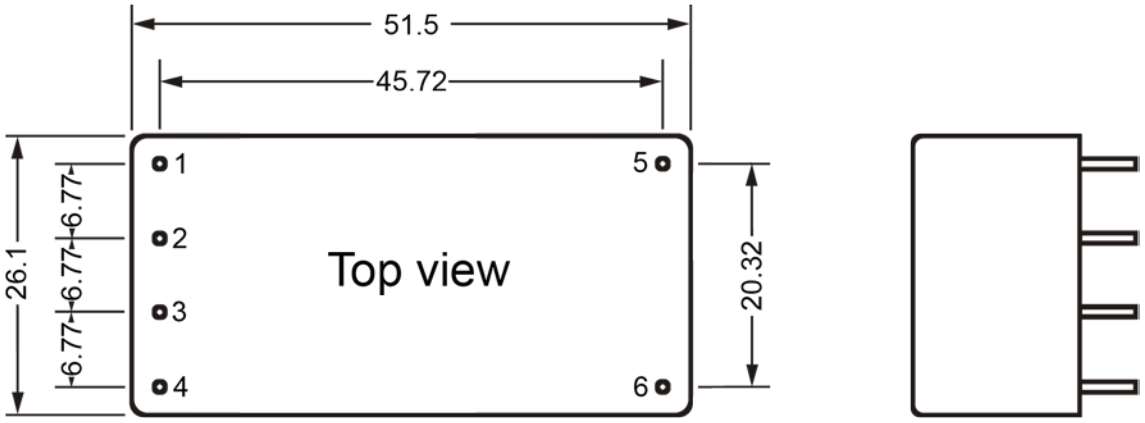
P24ALD-Series 100..900 mA Step-Up LED Driver

PHI-CON

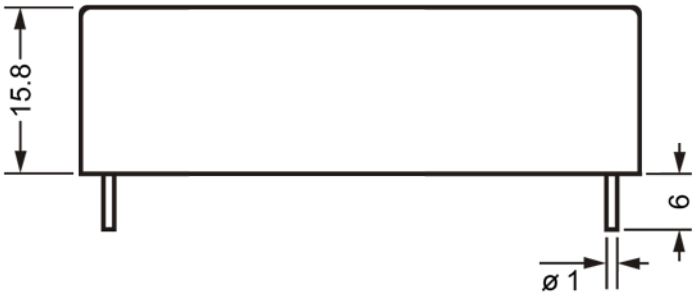
Designation key

		Nominal input voltage		Series designation	Function		Output current	
P	PHI-CON	**24**	24 V	**A**	**LD**	LED Driver	**010**	100 mA
							015	150 mA
							025	250 mA
							030	300 mA
							035	350 mA
							050	500 mA
							060	600 mA
							070	700 mA
							090	900 mA

Dimensions



Dimensions in mm
1. Pin tolerance ± 0.05 mm
2. Pin pitch & lenght tolerance ± 0.05 mm
3. Case tolerance: ± 0.5 mm



Pin assignment	
1	+Vin
2	Dim
3	Enable
4	-Vin
5	+LED output
6	-LED output

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