

DC-DC CONVERTERS

REGULATED, 2:1 WIDE INPUT RANGE, 15 WAT

LOW PROFILE, SINGLE & DUAL OUTPUT
LPA15 SERIES



FEATURES

- 2:1 Wide Input Voltage Range
- No Minimum Load Required
- High Efficiency Up to 89%
- Extra Small Low Profile Package: 1.0" × 1.0" × 0.39"
- Six Sided Continuous Shield
- Safety Meets UL60950-1, EN60950-1 and IEC60950-1
- CE Mark
- Compliant to RoHS & Reach

SELECTION GUIDE All specifications are typical at nominal input, full load and 25°C, unless otherwise noted.

Input Voltage Range Vdc	Output Voltage Vdc	Output Current at Full Load mA	Input Current at No Load mA	Efficiency %	Model Number	Maximum Capacitor Load ⁽¹⁾ µF
9 - 18	3.3	4000	120	84	LPA15-12S33	12000
9 - 18	5	3000	90	88	LPA15-12S5	6000
9 - 18	12	1300	30	86	LPA15-12S12	1000
9 - 18	15	1000	30	88	LPA15-12S15	660
9 - 18	24	625	20	89	LPA15-12S24	200
18 - 36	3.3	4000	50	86	LPA15-24S33	12000
18 - 36	5	3000	65	88	LPA15-24S5	6000
18 - 36	12	1300	20	87	LPA15-24S12	1000
18 - 36	15	1000	20	88	LPA15-24S15	660
18 - 36	24	625	15	89	LPA15-24S24	200
36 - 75	3.3	4000	25	86	LPA15-48S33	12000
36 - 75	5	3000	35	88	LPA15-48S5	6000
36 - 75	12	1300	12	88	LPA15-48S12	1000
36 - 75	15	1000	12	88	LPA15-48S15	660
36 - 75	24	625	10	89	LPA15-48S24	200
9 - 18	±5	±1500	30	85	LPA15-12-5	±3000
9 - 18	±12	±625	30	87	LPA15-12-12	±520
9 - 18	±15	±500	30	88	LPA15-12-15	±330
9 - 18	±24	±315	20	89	LPA15-12-24	±100
18 - 36	±5	±1500	15	85	LPA15-24-5	±3000
18 - 36	±12	±625	15	88	LPA15-24-12	±520
18 - 36	±15	±500	25	88	LPA15-24-15	±330
18 - 36	±24	±315	15	89	LPA15-24-24	±100
36 - 75	±5	±1500	12	85	LPA15-48-5	±3000
36 - 75	±12	±625	15	89	LPA15-48-12	±520
36 - 75	±15	±500	20	88	LPA15-48-15	±330
36 - 75	±24	±315	10	89	LPA15-48-24	±100

*Use Suffix after Model Number:

Standard	Negative logic remote ON/OFF	Suffix "D"	Without Control and Trim Pin
Suffix "A"	Positive logic remote ON/OFF	Suffix "E"	Positive logic remote ON/OFF without Trim pin
Suffix "B"	Without Ctrl pin	Suffix "HS"	Heat Sink
Suffix "C"	Negative Logic Remote ON/OFF without trim pin	Suffix "HC"	Heat Sink with clamp

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Input Specifications			Output Specifications		
Operating input voltage range, Vdc	9 Min., 12 Typ., 18 Max.	12Vin(nom)	Voltage accuracy, %	-1.0 Min., 1.0 Max	
	18 Min., 24 Typ., 36 Max.	24Vin(nom)	Line regulation, %	Low Line to High Line at Full Load	
	36 Min., 48 Typ., 75 Max.	48Vin(nom)		-0.2 Min., 0.2 Max.	Single
Start up voltage, Vdc	9 Max.	12Vin(nom)	-0.5 Min., 0.5 Max.	Dual	
	18 Max.	24Vin(nom)	Load regulation, %	-0.2 Min., 0.2 Max.	
	36 Max.	48Vin(nom)		No Load to Full Load, Single	
Shutdown voltage, Vdc	8 Typ.	12Vin(nom)	Cross regulation, %	-1.0 Min., 1.0 Max.	
	14.5 Typ.	24Vin(nom)		No Load to Full Load, Dual	
	30.5 Typ.	48Vin(nom)	Voltage and adjustability ⁽²⁾ , %	-5.0 Min., 5.0 Max.	
Start up time, ms	Constant resistive load			Asymmetrical load 25%/100%FL, Dual	
	30 Max.	Power up	Ripple and noise, mVp-p	-10 Min., 20 Max.	
	30 Max.	Remote ON/OFF		-10 Min., 10 Max.	
Input surge voltage, Vdc	1 second, max.		Temperature coefficient, %/°C	Measured by 20MHz bandwidth	
	36 Max.	12Vin(nom)		75 Typ.	
	50 Max.	24Vin(nom)	With a 1µF M/C X7R and a 10µF T/C, 3.3Vout, 5Vout, Single		
Input filter	Pi type		Transient response recovery time, µs	100 Typ.	
	100 Max.	48Vin(nom)		With a 1µF M/C X7R and a 10µF T/C, 12Vout, 15Vout, Single	
	Input reflected ripple current, mA _{p-p}	Referred to -Vin pin		Over voltage protection, Vdc	100 Typ.
Open or 3 - 15 Vdc		Positive logic, DC-DC ON	With a 6.8µF/50V X7R MLCC, 24Vout, Single		
Short or 0 - 1.2 Vdc		(Option), DC-DC OFF	100 Typ.		
Remote ON/OFF	Short or 0 - 1.2 Vdc	Negative logic, DC-DC ON	Over load protection, %	With a 4.7µF/50V X7R MLCC per output, 24Vout, Dual	
	Open or 3 - 15 Vdc	(Standard), DC-DC OFF		100 Typ.	
	-0.5 Min., 1 Max., mA	Input current of Ctrl pin	Short circuit protection		With a 1µF M/C X7R and a 10µF T/C per output, Others, Dual
2.5 mA Typ.	Remote off input current	Continuous, automatic recovery			

General Specifications				
Isolation voltage, Vdc	1 minute	Input to Output	1600 Min.	
	1 minute	Input (Output) to Case	1000 Min.	
Isolation resistance, GΩ	500Vdc		1 Min.	
Isolation capacitance, pF			1000 Max.	
Switching frequency, kHz			360 Min.	400 Typ. 440 Max.
Design meet safety standard	UL60950-1, EN60950-1, IEC60950-1			

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Environmental Specifications

Operating ambient temperature, °C	Without derating	-40 Min.	60 Max.
	With derating	+60 Min.	105 Max.
Maximum case temperature, °C			105 Max.
Storage temperature range, °C		-55 Min.	125 Max.
Thermal impedance, °C/W	Vertical direction by natural convection (20LFM)		
	Without heat-sink		18.2 Typ.
	With heat-sink		15.8 Typ.
Thermal shock		MIL-STD-810F	
Vibration		MIL-STD-810F	
Relative humidity		5% to 95% RH	

Physical Specifications

Case material	Nickel-coated copper
Base material	FR4 PCB
Potting material	Epoxy (UL94 V-0)
Weight	15g (0.53oz)
MTBF	1.600×10 ⁶ hrs, MIL-HDBK-217F, Full load

EMC Specifications

Specifications	Conditions	Level
EMI ⁽³⁾	EN55022	Class A
		Class B
ESD	EN61000-4-2 Air ±8kV and Contact ±6kV	Perf. Criteria A
Radiated immunity	EN61000-4-3 10V/m	Perf. Criteria A
Fast transient ⁽⁴⁾	EN61000-4-4 ±2kV	Perf. Criteria A
Surge ⁽⁴⁾	EN61000-4-5 ±1kV	Perf. Criteria A
Conducted immunity	EN61000-4-6 3Vr.m.s	Perf. Criteria A

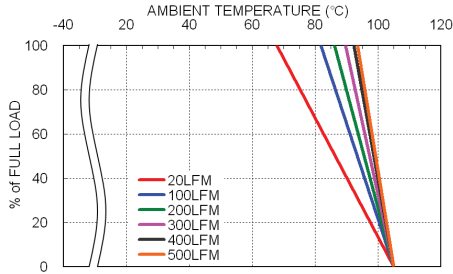
Note:

1. Test by minimum input and constant resistive load.
2. Trimming allows the user to increase or decrease the output voltage set point of the module. This is accomplished by connecting an external resistor between the Trim pin and either the +Vout pin or the -Vout pin.
3. The standard modules meet EN55022 Class A without external components and meet Class B with external components. For further information, please contact Polytron Devices.
4. An external input filter capacitor is required if the module has to meet EN6100-4-4. EN61000-4-5. Recommended 2 pcs of aluminum electrolytic capacitor (Nippon Chemi-con KY series, 220µF/100V) to connect in parallel.

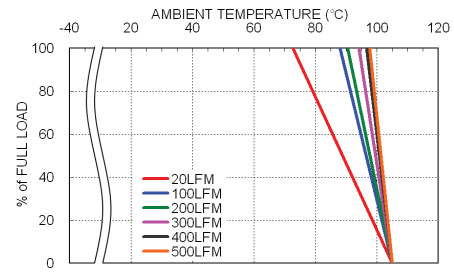
CAUTION: This power module is not internally fused. An input line fuse must always be used.

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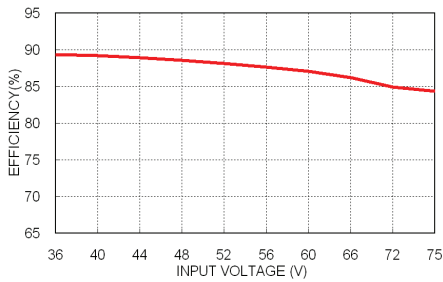
Characteristic Curve



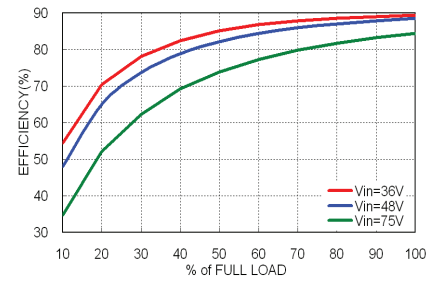
LPA15-48S5 Derating Curve



LPA15-48S5 Derating Curve With Heat-sink

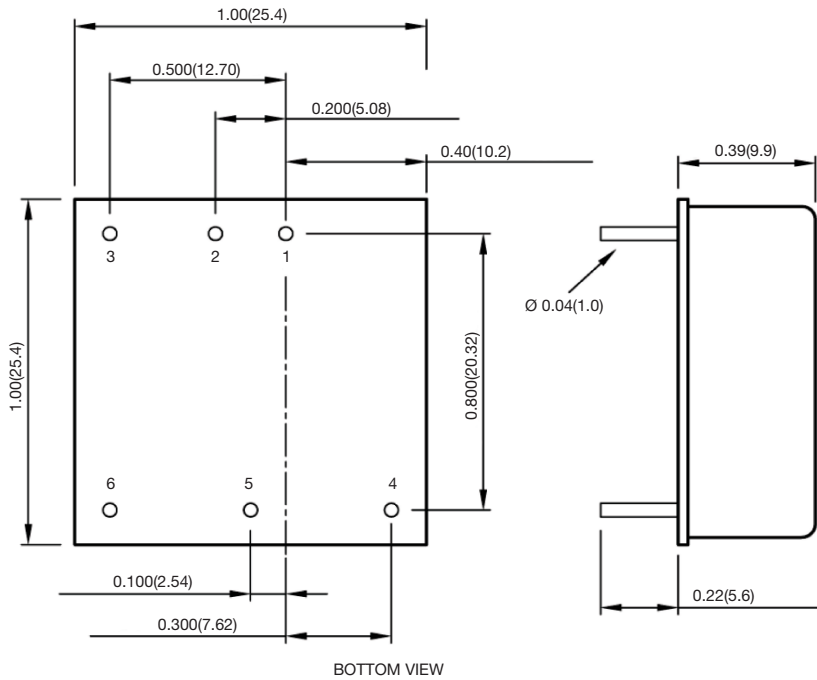


LPA15-48S5 Efficiency vs. Input Voltage



LPA15-48S5 Efficiency vs. Output Load

Mechanical Drawing

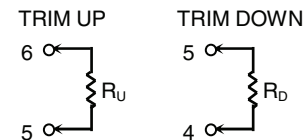


PIN CONNECTION

PIN	SINGLE	DUAL
1	+Vin	+Vin
2	-Vin	-Vin
3	Ctrl	Ctrl
4	+Vout	+Vout
5	Trim	Common
6	-Vout	-Vout

EXTERNAL OUTPUT TRIMMING

Output can be externally trimmed by using the method shown below.



1. All dimensions in inch (mm)
2. Tolerance: $x.xx \pm 0.02$ ($x.x \pm 0.5$) $x.xxx \pm 0.01$ ($x.xx \pm 0.25$)
3. Pin pitch tolerance ± 0.01 (0.25)
4. Pin dimension tolerance ± 0.004 (0.1)