



DC-DC CONVERTERS

REGULATED, 4:1 WIDE INPUT RANGE UP TO 10 WATTS

LOW PROFILE, SINGLE & DUAL OUTPUT

LPB10 SERIES

FEATURES

- 4:1 Ultra Wide Input Voltage Range
- No Minimum Load Required
- High Efficiency Up to 92%
- 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 - 36	3.3	3000	6	85	LPB10-24S33	3500
9 - 36	5	2000	6	87	LPB10-24S5	2500
9 - 36	12	830	6	90	LPB10-24S12	430
9 - 36	15	670	6	91	LPB10-24S15	350
9 - 36	24	416	6	90	LPB10-24S24	125
18 - 75	3.3	3000	4	85	LPB10-48S33	3500
18 - 75	5	2000	4	87	LPB10-48S5	2500
18 - 75	12	830	4	90	LPB10-48S12	430
18 - 75	15	670	4	90	LPB10-48S15	350
18 - 75	24	416	4	90	LPB10-48S24	125
9 - 36	±5	±1000	6	87	LPB10-24-5	±1440
9 - 36	±12	±416	6	89	LPB10-24-12	±250
9 - 36	±15	±333	6	89	LPB10-24-15	±180
18 - 75	±5	±1000	4	87	LPB10-48-5	±1440
18 - 75	±12	±416	4	89	LPB10-48-12	±250
18 - 75	±15	±333	4	89	LPB10-48-15	±180

*Use Suffix after Model Number:

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

LPB10 SERIES

Input Specifications			Output Specifications		
Operating input voltage range, Vdc	9 Min., 24 Typ., 36 Max.	24Vin(nom)	Output power, W	11 Max.	Output voltage trimmed up 10%
	18 Min., 48 Typ., 75 Max.	48Vin(nom)		12 Max.	Output voltage trimmed up 20%
Start up voltage, Vdc	9 Max.	24Vin(nom)	Voltage accuracy, %	-1.0 Min., +1.0 Max	
	18 Max.	48Vin(nom)		Line regulation, %	
Shutdown voltage, Vdc	8 Typ.	24Vin(nom)	Load regulation, %		-0.2 Min., +0.2 Max.
	16 Typ.	48Vin(nom)		-0.5 Min., +0.5 Max.	Dual
Start up time, ms	Constant resistive load		Cross regulation, %	-0.2 Min., +0.2 Max.	No Load to Full Load, Single
	30 Max.	Power up		-1.0 Min., +1.0 Max.	No Load to Full Load, Dual
	30 Max.	Remote ON/OFF		-0.1 Min., +0.1 Max.	10% Load to 90% Load, Single
Input surge voltage, Vdc	1 second, max.		Voltage and adjustability ⁽²⁾ , %	-0.8 Min., +0.8 Max.	10% Load to 90% Load, Dual
	50 Max.	24Vin(nom)		-5.0 Min., +5.0 Max.	Asymmetrical load 25%/100%FL, Dual
	100 Max.	48Vin(nom)		-10 Min., +10 Max.	Single Output, 3.3Vout, 12Vout
Input reflected ripple current, mAp-p	30 Typ.	Nominal input and Full load	Ripple and noise, mVp-p	-10 Min., +20 Max.	Others
Remote ON/OFF		Referred to -Vin pin	Temperature coefficient, %/°C	-0.2 Min., -0.2 Max.	
	Open or 3 - 15 Vdc	Positive logic, DC-DC ON		Transient response recovery time, µs	250 Typ.
	Short or 0 - 1.2 Vdc	(Option), DC-DC OFF	Over voltage protection, Vdc		3.7 Min., 5.4 Max.
	Short or 0 - 1.2 Vdc	Negative logic, DC-DC ON		6.3 Min., 7.4 Max.	5Vout
	Open or 3 - 15 Vdc	(Standard), DC-DC OFF		13.5 Min., 19.6 Max.	12Vout
	-0.5 Min., 1 Max., mA	Input current of Ctrl pin		18.3 Min., 22.0 Max.	15Vout
2.5 mA Typ.	Remote off input current	29.1 Min., 32.5 Max.	24Vout		
			Over load protection, %	150 Typ.	% of lout rated; Hiccup mode
			Short circuit protection	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					1500 Max.
Switching frequency, kHz			297 Min.	330 Typ.	363 Max.

Environmental Specifications

Operating ambient temperature, °C	Without derating	-40 Min.		+81 Max.
	With derating	+81 Min.		+105 Max.
Maximum case temperature, °C				+105 Max.
Storage temperature range, °C	Others	-55 Min.		+125 Max.
Thermal impedance, °C/W	Vertical direction by natural convection (20LFM)			
	Without heat-sink			+16.18 Typ.
	With heat-sink			+15.13 Typ.
Thermal shock		MIL-STD-810F		
Vibration		MIL-STD-810F		
Relative humidity		5% to 95% RH		

LPB10 SERIES

Physical Specifications	
Design meet safety standard	UL60950-1, EN60950-1, IEC60950-1
Case material	Copper
Base material	FR4 PCB
Potting material	Epoxy (UL94 V-0)
Weight	16.5g (0.58oz)
MTBF	3.376×10 ⁶ hrs, MIL-HDBK-217F, Full load

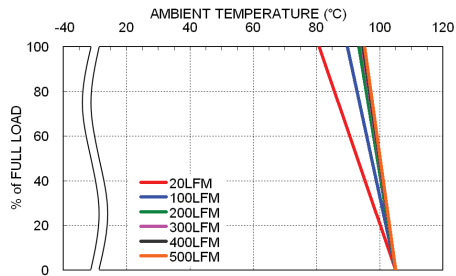
EMC Specifications			
Specifications	Conditions		Level
EMI ⁽³⁾	EN55022		Class A
			Class B
ESD	EN61000-4-2	Air ±8kV and Contact ±6kV	Perf. Criteria A
Radiated immunity	EN61000-4-3	10V/m	Perf. Criteria A
Fast transient ⁽⁴⁾	EN61000-4-4	±2kV	Perf. Criteria A
Surge ⁽⁴⁾	EN61000-4-5	±1kV	Perf. Criteria A
Conducted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

Note:

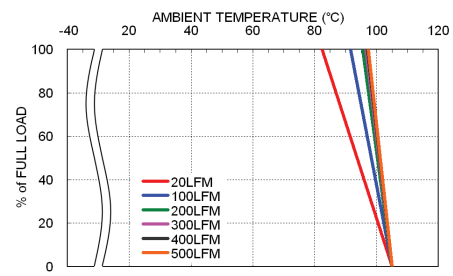
1. Test by minimum input and constant resistive load.
2. Trimming allows the user to increase or decrease the output voltage set point of the module. This is accomplished by connecting an external resistor between the Trim pin and either the +Vout pin or the -Vout pin.
3. The standard modules meet EN55022 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.

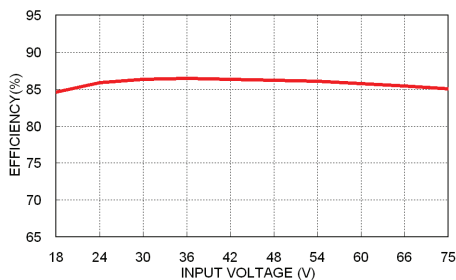
Characteristic Curve



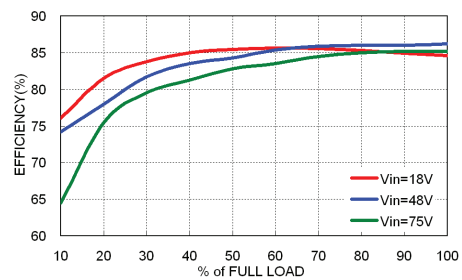
LPB10-48S5 Derating Curve



LPB10-48S5 Derating Curve With Heat-sink



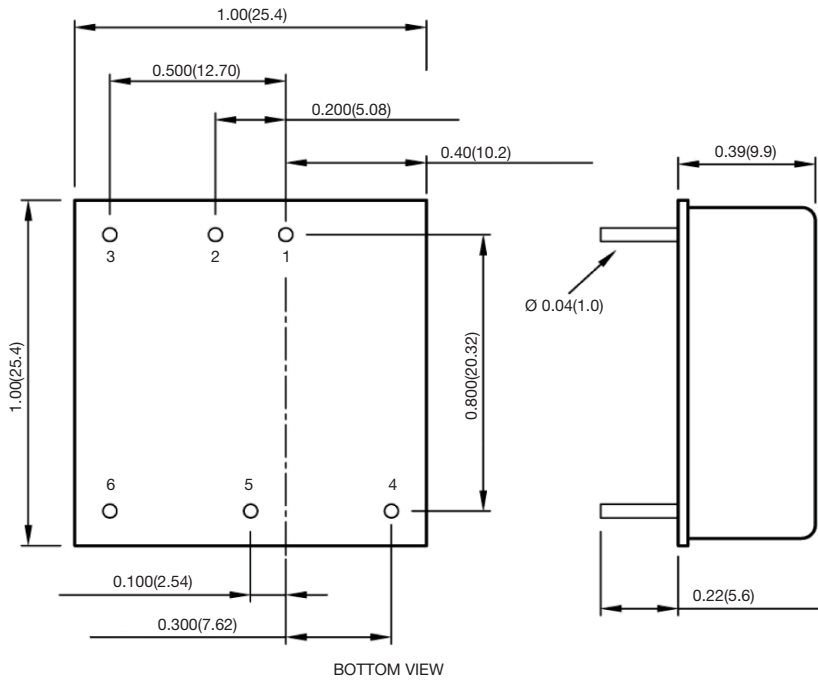
LPB10-48S5 Efficiency vs. Input Voltage



LPB10-48S5 Efficiency vs. Output Load

LPB10 SERIES

Mechanical Drawing

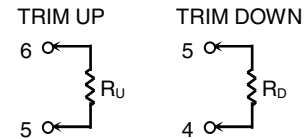


PIN CONNECTION

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)