

LED15 SERIES

DC-DC CONVERTER

2:1 WIDE INPUT RANGE
 UP TO 15Watts



FEATURES

- NO MINIMUM LOAD REQUIRED
- 2250VDC INPUT TO OUTPUT ISOLATION
- SMALL SIZE AND LOW PROFILE : 1.10 x 0.94 x 0.34 INCH
- SURFACE-MOUNT OR THROUGH-HOLE
- UL60950-1, EN60950-1, & IEC60950-1 SAFETY APPROVALS
- CE MARKED
- COMPLIANT TO RoHS II & REACH

APPLICATIONS

- WIRELESS NETWORK
- TELECOM/DATACOM
- INDUSTRY CONTROL SYSTEM
- DISTRIBUTED POWER ARCHITECTURES
- SEMICONDUCTOR EQUIPMENT

2250VDC ISOLATION	REMOTE CONTROL	UVP	OCP	SCP	OVP
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TECHNICAL SPECIFICATION

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

Model Number	Input Range VDC	Output Voltage VDC	Output Current @Full Load mA	Input Current @ No Load mA	Efficiency %	Maximum Capacitor Load (1) µF
LED15-24S3P3	18 ~ 36	3.3	3500	20	86	10000
LED15-24S05	18 ~ 36	5	3000	20	87	6000
LED15-24S12	18 ~ 36	12	1250	15	87	1000
LED15-24S15	18 ~ 36	15	1000	15	88	660
LED15-48S3P3	36 ~ 75	3.3	3500	15	85	10000
LED15-48S05	36 ~ 75	5	3000	15	87	6000
LED15-48S12	36 ~ 75	12	1250	10	87	1000
LED15-48S15	36 ~ 75	15	1000	10	88	660

PART NUMBER STRUCTURE

LED15 - **48** **S** **05** - **A**

Series Name Input Voltage (VDC) Output Quantity Output Voltage (VDC) Option

24: 18~36
 48: 36~75

S: Single

3P3: 3.3
 05: 5
 12: 12
 15: 15

- : Negative logic remote ON/OFF with DIP(Standard)
- A: Negative logic remote ON/OFF with SMT
- B: Positive logic remote ON/OFF with DIP
- C: Positive logic remote ON/OFF with SMT
- D: DIP type without Ctrl pin
- E: SMT type without Ctrl pin
- F: DIP type, negative logic remote ON/OFF without Trim pin
- G: SMT type, negative logic remote ON/OFF without Trim pin
- H: DIP type without Ctrl & Trim pin
- I: SMT type without Ctrl & Trim pin
- J: DIP type, positive logic remote ON/OFF without Trim pin
- K: SMT type, positive logic remote ON/OFF without Trim pin

INPUT SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit	
Operating input voltage range	24Vin(nom)	18	24	36	VDC	
	48Vin(nom)	36	48	75		
Input reflected ripple current	Nominal input and Full load	30			mAp-p	
Start-up voltage	24Vin(nom)				18	
	48Vin(nom)				36	
Shutdown voltage	24Vin(nom)				14.5	
	48Vin(nom)				30.5	
Start up time	Constant resistive load	Power up			30	
		Remote ON/OFF			30	
Input surge voltage	100ms, max.	24Vin(nom)				50
		48Vin(nom)				100
Remote ON/OFF	Referred to -Vin pin	Positive logic	DC-DC ON		Open or 3 ~ 15VDC Short or 0 ~ 1.2VDC Short or 0 ~ 1.2VDC Open or 3 ~ 15VDC	
		(Option)	DC-DC OFF			
		Negative logic	DC-DC ON			
		(Standard)	DC-DC OFF			
		Input current of Ctrl pin	-0.5	1.0	mA	
		Remote off input current		20	mA	

OUTPUT SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Voltage accuracy		-1.0		+1.0	%
Line regulation	Low Line to High Line at Full Load	-0.2		+0.2	%
Load regulation	No Load to Full Load	-0.2		+0.2	%
Voltage adjustability (2)		-10		+10	%
Ripple and noise	Measured by 20MHz bandwidth	3.3Vout, 5Vout		75	mVp-p
	With a 1μF M/C X7R and a 10μF T/C	12Vout, 15Vout		100	
Temperature coefficient		-0.02		+0.02	%/°C
Transient response recovery time	25% load step change, ΔIo/Δt=0.1A/us			300	μs
Over voltage protection		3.3Vout	3.7	5.4	VDC
		5Vout	5.6	7.0	
		12Vout	13.5	19.6	
		15Vout	16.8	20.5	
Over load protection	% of Iout rated; Hiccup mode			150	%
Output voltage overshoot				3	%
Short circuit protection		Continuous, automatic recovery			

GENERAL SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit	
Isolation voltage	1 minute Input to Output	2250			VDC	
Isolation resistance	500VDC	10			MΩ	
Isolation capacitance		1000			pF	
Switching frequency		3.3Vout, 5Vout	243	270	297	kHz
		12Vout, 15Vout	423	470	517	
Safety approvals					UL60950-1 EN60950-1 IEC60950-1	
Weight					10.5g (0.36oz)	
MTBF	MIL-HDBK-217F, Full load				3.438 x 10 ⁶ hrs	

ENVIRONMENTAL SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating ambient temperature (3)	With derating	-40		+105	°C
Storage temperature range		-55		+125	°C
Thermal shock					MIL-STD-810F
Vibration					MIL-STD-810F
Relative humidity					5% to 95% RH
Lead-free reflow solder process					IPC J-STD-020D
Moisture sensitivity level(MSL)					IPC J-STD-033B level 2a

EMC SPECIFICATIONS

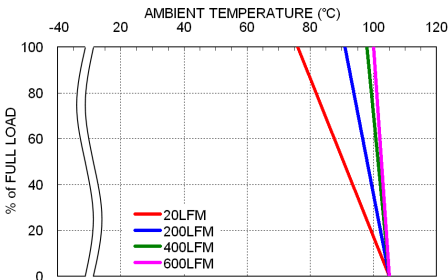
Parameter	Conditions	Level
EMI (4)	EN55022	Class A, Class B
Radiated immunity	EN61000-4-3 10 V/m	Perf. Criteria A
Fast transient (5)	EN61000-4-4 ± 2kV	Perf. Criteria B
Surge (5)	EN61000-4-5 ± 1kV	Perf. Criteria A
Conducted immunity	EN61000-4-6 10 Vr.m.s	Perf. Criteria A

Note:

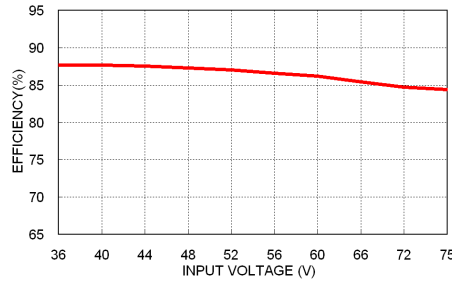
1. Test by minimum input and constant resistive load.
2. Trimming allows the user to increase or decrease the output voltage set point of the module. This is accomplished by connecting an external resistor between the Trim pin and either +Vout pin or -Vout pin.
3. The power module operates in a variety of thermal environments; however, sufficient cooling should be provided to help ensure reliable operation.
4. The standard modules meet EN55022 Class A and Class B with external components. For further information, please contact with P-DUKE.
5. An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5. The filter capacitor Power Mate suggest: Nippon chemi-con KY series, 220 μ F/100V.

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

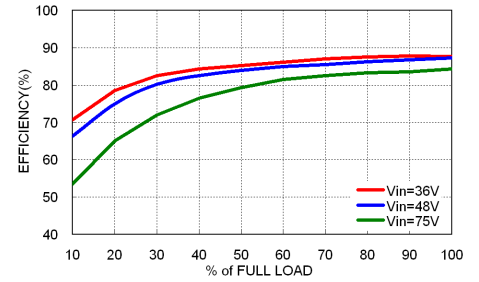
CHARACTERISTIC CURVE



LED15-48S05 Derating Curve



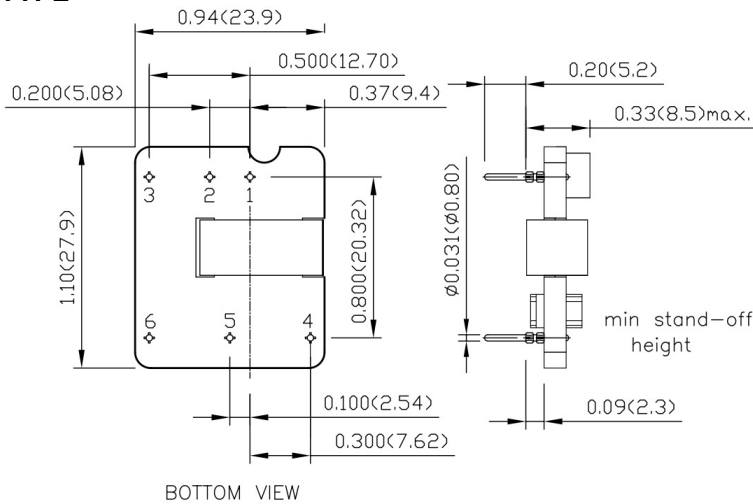
LED15-48S05 Efficiency vs. Input Voltage



LED15-48S05 Efficiency vs. Output Load

MECHANICAL DRAWING

DIP TYPE



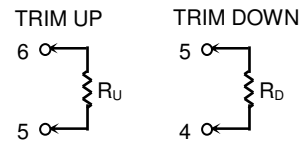
BOTTOM VIEW

PIN CONNECTION

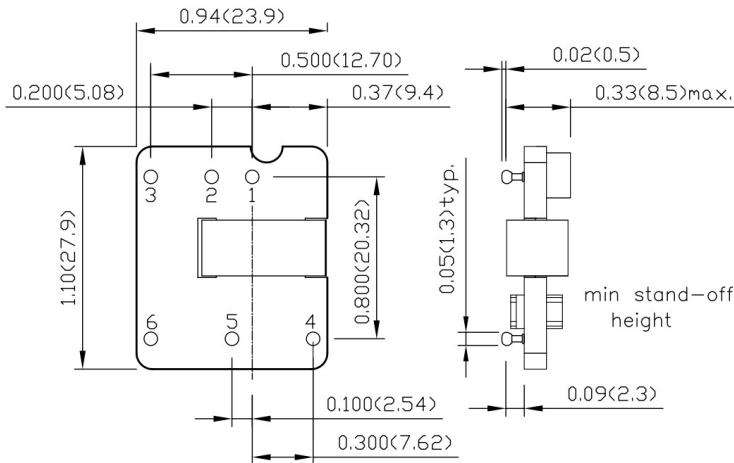
PIN	DEFINE
1	+Vin
2	-Vin
3	Ctrl
4	+Vout
5	Trim
6	-Vout

EXTERNAL OUTPUT TRIMMING

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



SMT TYPE



BOTTOM VIEW

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 \pm 0.01 (0.25)
4. Pin dimension tolerance \pm 0.004(0.1)