

# LED15W SERIES

DC-DC CONVERTER

4:1 ULTRA 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
LED15-24S3P3W	9 ~ 36	3.3	4000	60	85	12000
LED15-24S05W	9 ~ 36	5	3000	70	87	6000
LED15-24S12W	9 ~ 36	12	1300	10	86	1000
LED15-24S15W	9 ~ 36	15	1000	10	86	660
LED15-48S3P3W	18 ~ 75	3.3	4000	40	85	12000
LED15-48S05W	18 ~ 75	5	3000	40	87	6000
LED15-48S12W	18 ~ 75	12	1300	10	86	1000
LED15-48S15W	18 ~ 75	15	1000	10	86	660

## PART NUMBER STRUCTURE

LED15	-	48	S	05	W	-	A
Series Name		Input Voltage (VDC)	Output Quantity	Output Voltage (VDC)	Input Range		Option
		24: 9~36 48: 18~75	S: Single	3P3: 3.3 05: 5 12: 12 15: 15	4:1		□: 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)	9	24	36	VDC	
	48Vin(nom)	18	48	75		
Input reflected ripple current	Nominal input and Full load	30			mAp-p	
Start-up voltage	24Vin(nom)				9	
	48Vin(nom)				18	
Shutdown voltage	24Vin(nom)				8	
	48Vin(nom)				16	
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		2.5	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 <sup>(2)</sup>		-10		+10	%
Ripple and noise	Measured by 20MHz bandwidth, With a 1μF M/C X7R and a 10μF T/C	100			mVp-p
Temperature coefficient		-0.02		+0.02	%/°C
Transient response recovery time	25% load step change	250			μs
Over voltage protection		3.3Vout	3.7	5.4	VDC
		5Vout	5.6	7.0	
		12Vout	13.8	17.5	
		15Vout	16.8	20.5	
Over load protection	% of Iout rated; Hiccup mode	150			%
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	1	GΩ		
Isolation capacitance		1500			pF
Switching frequency	3.3Vout, 5Vout 12Vout, 15Vout	315	350	385	kHz
		360	400	440	
Safety approvals		UL60950-1 EN60950-1 IEC60950-1			
Weight		10.5g (0.36oz)			
MTBF	MIL-HDBK-217F, Full load	2,444 x 10 <sup>6</sup> hrs			

## ENVIRONMENTAL SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating ambient temperature	With derating	-40		+120	°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

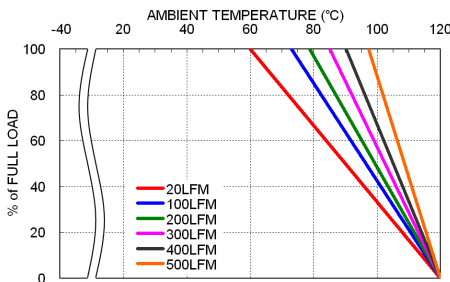
Parameter	Conditions	Level
EMI <sup>(3)</sup>	EN55022	Class A, Class B
Radiated immunity	EN61000-4-3 10 V/m	Perf. Criteria A
Fast transient <sup>(4)</sup>	EN61000-4-4 ± 2kV	Perf. Criteria A
Surge <sup>(4)</sup>	EN61000-4-5 ± 1kV	Perf. Criteria A
Conducted immunity	EN61000-4-6 3 Vr.m.s	Perf. Criteria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

**Note:**

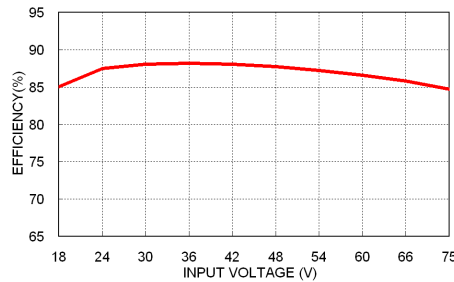
1. Test by minimum input and constant resistive load.
2. Trimming allows the user to increase or decrease the output voltage set point of the module. This is accomplished by connecting an external resistor between the TRIM pin and either +Vout pin or -Vout pin.
3. The standard modules meet EN55022 Class A and Class B with external components. For further information, please contact with P-DUKE.
4. 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 $\mu$ F/100V.

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

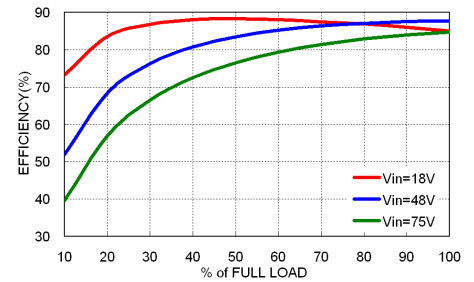
**CHARACTERISTIC CURVE**



LED15-48S05W Derating Curve



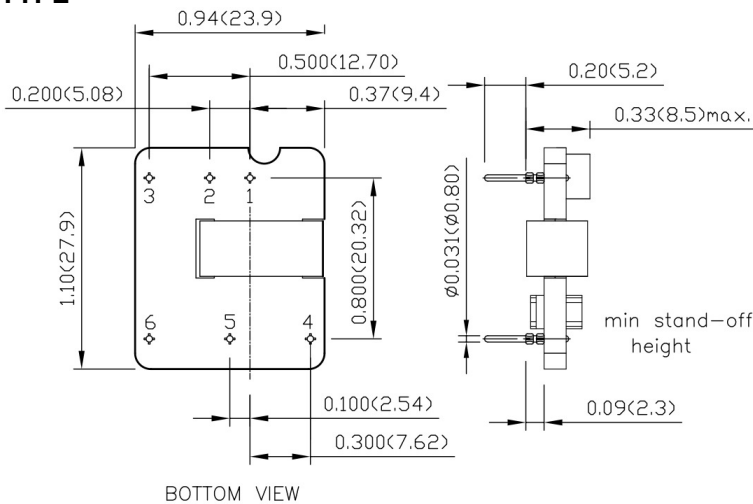
LED15-48S05W Efficiency vs. Input Voltage



LED15-48S05W Efficiency vs. Output Load

**MECHANICAL DRAWING**

**DIP TYPE**



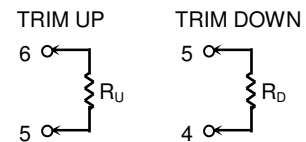
BOTTOM VIEW

**PIN CONNECTION**

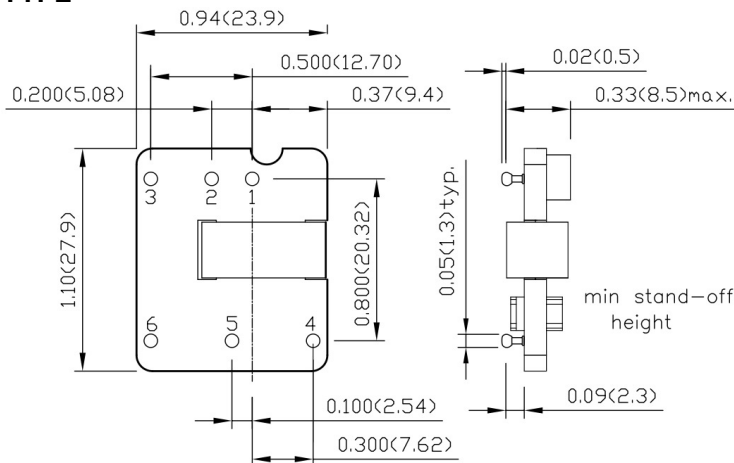
PIN	DEFINE
1	+Vin
2	-Vin
3	Ctrl
4	+Vout
5	Trim
6	-Vout

**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)