

# FED30W SERIES

DC-DC CONVERTER

4 : 1 ULTRA WIDE INPUT RANGE  
UP TO 30Watts



## FEATURES

- 1600VDC INPUT TO OUTPUT ISOLATION
- STANDARD 2.00 X 1.00 X 0.40 INCH
- SIX-SIDED CONTINUOUS SHIELD
- 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

1600VDC ISOLATION	REMOTE CONTROL	UVP	OCP	SCP	OVP	OTP
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## TECHNICAL SPECIFICATION

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

Model Number	Input Range	Output Voltage	Output Current @Full Load	Input Current @ No Load	Efficiency	Maximum Capacitor Load (1)
	VDC	VDC	A	mA	%	µF
FED30-24S1P5W	9 ~ 36	1.5	8.5	70	80	20000
FED30-24S2P5W	9 ~ 36	2.5	8	70	83	20000
FED30-24S3P3W	9 ~ 36	3.3	7.5	70	86	20000
FED30-24S05W	9 ~ 36	5	6	105	88	14400
FED30-24S5P1W	9 ~ 36	5.1	6	105	88	14400
FED30-24S12W	9 ~ 36	12	2.5	20	89	3000
FED30-24S15W	9 ~ 36	15	2	30	89	2000
FED30-24D05W	9 ~ 36	±5	±3	90	88	±3000
FED30-24D12W	9 ~ 36	±12	±1.25	25	87	±2000
FED30-24D15W	9 ~ 36	±15	±1	25	87	±1300
FED30-48S1P5W	18 ~ 75	1.5	8.5	30	80	20000
FED30-48S2P5W	18 ~ 75	2.5	8	45	84	20000
FED30-48S3P3W	18 ~ 75	3.3	7.5	45	86	20000
FED30-48S05W	18 ~ 75	5	6	65	88	14400
FED30-48S5P1W	18 ~ 75	5.1	6	65	88	14400
FED30-48S12W	18 ~ 75	12	2.5	60	90	3000
FED30-48S15W	18 ~ 75	15	2	50	91	2000
FED30-48D05W	18 ~ 75	±5	±3	50	88	±3000
FED30-48D12W	18 ~ 75	±12	±1.25	15	88	±2000
FED30-48D15W	18 ~ 75	±15	±1	15	88	±1300

## PART NUMBER STRUCTURE

FED30	-	48	S	05	W	-	N	HS
Series Name		Input Voltage (VDC)	Output Quantity	Output Voltage (VDC)	Input Range		Remote Control Option	Assembly Option
		24: 9~36 48: 18~75	S: Single	1P5: 1.5 2P5: 2.5 3P3: 3.3 05: 5 5P1: 5.1 12: 12 15: 15	4:1		<input type="checkbox"/> Positive logic <input checked="" type="checkbox"/> Negative logic	<input type="checkbox"/> None HS: Heat-sink HC: Heat-sink & Clamp
			D: Dual	05: ±5 12: ±12 15: ±15				

**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			20			mAp-p
Start up voltage	24Vin(nom)					VDC
	48Vin(nom)		9			
Shutdown voltage	24Vin(nom)		8			VDC
	48Vin(nom)		16			
Start up time	Constant resistive load	Power up	30			ms
		Remote ON/OFF	30			
Input surge voltage	100 ms, max.	24Vin(nom)	50			VDC
		48Vin(nom)	100			
Input filter			Pi type			
Remote ON/OFF	Referred to -Vin pin	Positive logic	DC-DC ON	Open or 3 ~ 12VDC		mA
		(Standard)	DC-DC OFF	Short or 0 ~ 1.2VDC		
		Negative logic	DC-DC ON	Short or 0 ~ 1.2VDC		
		(Option)	DC-DC OFF	Open or 3 ~ 12VDC		
		Input current of Ctrl pin		-0.5	+0.5	
		Remote off input current		3.0		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	Single	-0.5		+0.5	%
		Dual	-1.0		+1.0	
Cross regulation	Asymmetrical load 25%/100% FL	Dual	-5.0		+5.0	%
Voltage adjustability	Single output		-10		+10	%
Ripple and noise	20MHz bandwidth	Others	100			mVp-p
	With a 1µF/50V MLCC	12Vout, 15Vout	150			
Temperature coefficient			-0.02		+0.02	%/°C
Transient response recovery time	25% load step change		250			µs
Over voltage protection	Zener diode clamp	1.5Vout	2.0			VDC
		2.5Vout	3.3			
		3.3Vout	3.9			
		5Vout, 5.1Vout	6.2			
		12Vout	15			
		15Vout	18			
Over load protection	% of Iout rated		150			%
Short circuit protection			Continuous, automatic recovery			

**GENERAL SPECIFICATIONS**

Parameter	Conditions		Min.	Typ.	Max.	Unit
Isolation voltage	1 minute	Input to Output	1600			VDC
		Input (Output) to Case	1600			
Case grounding			Connect case to -Vin with decoupling Y Cap			
Isolation resistance	500VDC		1			GΩ
Isolation capacitance			1500			pF
Switching frequency			387	430	473	kHz
Safety approvals			IEC60950-1, UL60950-1, EN60950-1			
Case material			Nickel-coated copper			
Base material			FR4 PCB			
Potting material			Epoxy (UL94 V-0)			
Weight			30.5g (1.07oz)			
MTBF	MIL-HDBK-217F, Full load		1.288 x 10 <sup>6</sup>			hrs

**ENVIRONMENTAL SPECIFICATIONS**

Parameter	Conditions		Min.	Typ.	Max.	Unit
Operating ambient temperature	Without derating		-40		+50	°C
	With derating		+50		+85	
Maximum case temperature			+105			°C
Over temperature protection			115			°C
Storage temperature range			-55		+125	°C
Thermal impedance	Vertical direction by natural convection (20LFM)	Without heat-sink	12			°C/W
		With heat-sink	10			
Thermal shock			MIL-STD-810F			
Vibration			MIL-STD-810F			
Relative humidity			5% to 95% RH			

## EMC SPECIFICATIONS

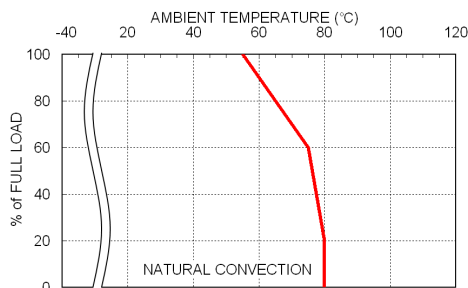
Parameter	Conditions		Level
EMI <sup>(2)</sup>	EN55022		Class A
ESD	EN61000-4-2	Air ± 8kV and Contact ± 6kV	Perf. Criteria A
Radiated immunity	EN61000-4-3	10 V/m	Perf. Criteria A
Fast transient <sup>(3)</sup>	EN61000-4-4	±2kV	Perf. Criteria A
Surge <sup>(3)</sup>	EN61000-4-5	±1kV	Perf. Criteria A
Conducted immunity	EN61000-4-6	10 Vr.m.s	Perf. Criteria A
Power frequency magnetic field	EN61000-4-8	100A/m continuous; 1000A/m 1 second	Perf. Criteria A

### Note:

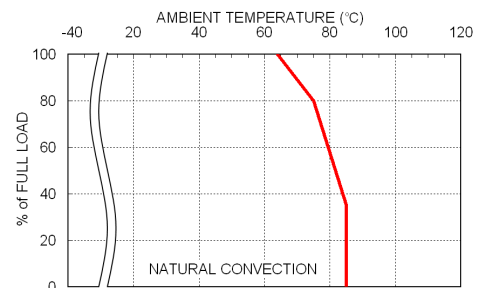
1. Test by minimum input and constant resistive load.
2. The standard module meets EN55022 Class A and Class B with external components. For further information, please contact with P-DUKE.
3. An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5.  
The filter capacitor Power Mate suggest: 24VDC input Nippon chemi-con KY series, 330µF/50V  
The filter capacitor Power Mate suggest::48VDC input Nippon chemi-con KY series, 220µF/100V

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

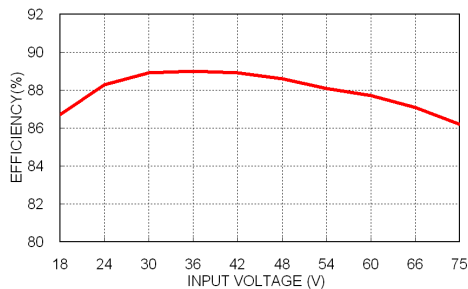
## CHARACTERISTIC CURVE



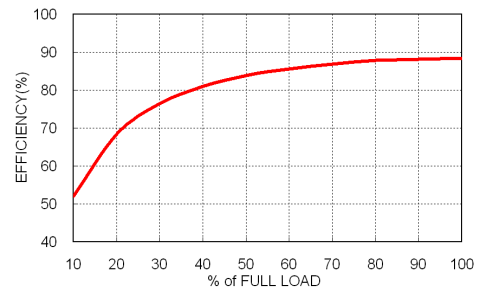
FED30-48S05W Derating Curve



FED30-48S05W Derating Curve With Heat-sink

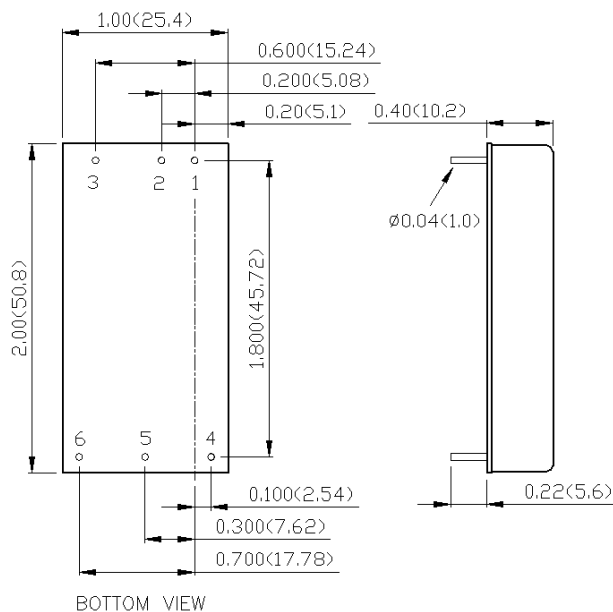


FED30-48S05W Efficiency vs. Input Voltage



FED30-48S05W Efficiency vs. Output Load

## MECHANICAL DRAWING

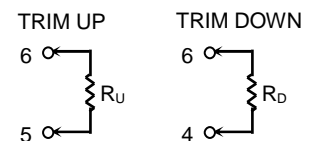


### PIN CONNECTION

PIN	SINGLE	DUAL
1	+Vin	+Vin
2	-Vin	-Vin
3	Ctrl	Ctrl
4	+Vout	+Vout
5	-Vout	Common
6	Trim	-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±0.02 (x.x±0.5)  
x.xxx±0.01 (x.xx±0.25)
3. Pin pitch tolerance ±0.01 (0.25)
4. Pin dimension tolerance ±0.004(0.1)