



## FEATURES

- 15 WATTS OUTPUT POWER
- OUTPUT CURRENT UP TO 4.5A
- STANDARD 2.00 X 1.00 X 0.40 INCH PACKAGE
- HIGH EFFICIENCY UP TO 88%
- 4:1 ULTRA WIDE INPUT VOLTAGE RANGE
- SIX-SIDED CONTINUOUS SHIELD
- FIXED SWITCHING FREQUENCY
- UL60950-1, EN60950-1, & IEC60950-1 SAFETY APPROVALS
- CE MARKED
- COMPLIANT TO RoHS II & REACH

## OPTIONS

Positive logic & Negative logic Remote On/Off

## DESCRIPTION

The FEC15W series offer 15 watts of output power from a 2.00 x 1.00 x 0.40 inch package. The FEC15W series with 4:1 ultra wide input voltage of 9~36 and 18~75 VDC.

## APPLICATIONS

Wireless Network  
Telecom/Datacom  
Industry Control System  
Measurement Equipment  
Semiconductor Equipment

## TECHNICAL SPECIFICATION

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

OUTPUT SPECIFICATIONS			
Output power			15 Watts, max.
Voltage accuracy			± 1%
Minimum load			0%
Line regulation	LL to HL at Full load	Single Dual	± 0.2% ± 0.5%
Load regulation	No load to Full load	Single Dual	± 0.5% ± 1%
Cross regulation (Dual)	Asymmetrical load 25% / 100% FL		± 5%
Ripple and noise	20MHz bandwidth (Measured with a 0.1µF/50V MLCC)	See table	
Temperature coefficient		±0.02% / °C, max.	
Transient response recovery time	25% load step change	250µs	
Over voltage protection	3.3VDC output 5VDC output Zener diode clamp 12VDC output 15VDC output	3.9VDC 6.2VDC 15VDC 18VDC	
Over load protection	% of FL at nominal input	150%.	
Short circuit protection	Continuous, automatics recovery		
GENERAL SPECIFICATIONS			
Efficiency			See table
Isolation voltage	Input to Output Input(Output) to case	1600VDC, min. 1minute 1600VDC, min. 1minute	
Case grounding		Connect case to -INPUT with decoupling Y Cap	
Isolation resistance	500VDC	10 <sup>9</sup> ohms, min.	
Isolation capacitance		1500pF, max.	
Switching frequency		400kHz±10%.	
Safety approvals	IEC60950-1, UL60950-1, & EN60950-1		
Case material	Nickel-coated copper		
Base material	FR4 PCB		
Potting material	Epoxy (UL94 V-0)		
Dimensions	2.00 X 1.00 X 0.40 Inch (50.8 X 25.4 X 10.2 mm)		
Weight	27g (0.95oz)		
MTBF (Note 1)	MIL-HDBK-217F		
	2.430 x 10 <sup>6</sup> hrs		

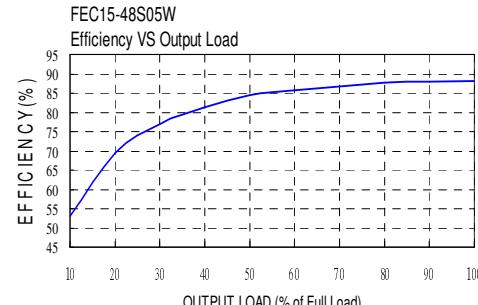
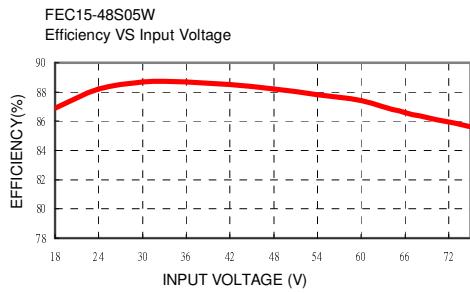
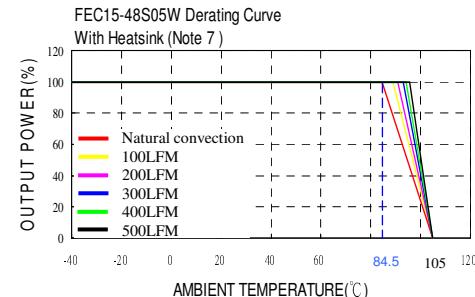
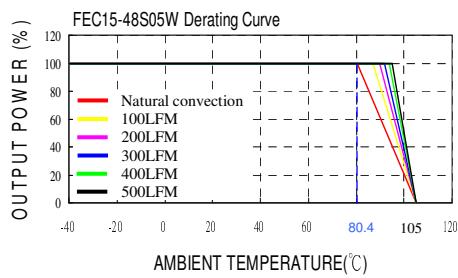
INPUT SPECIFICATIONS			
Input voltage range	24VDC nominal input 48VDC nominal input	9 ~ 36VDC 18 ~ 75VDC	
Input filter		Pi type	
Input surge voltage			
Input reflected ripple current		50VDC 100ms,max 100VDC 100ms,max	20mA <sub>p-p</sub>
Start up time	Nominal input and constant resistive load	Power up	20ms.
Start-up voltage	24VDC input 48VDC input	9VDC 18VDC	
Shutdown voltage	24VDC input 48VDC input	7.5VDC 15VDC	
Remote ON/OFF (Option) (Note 6)			
(Positive logic)	DC-DC ON DC-DC OFF	Open or 3 V < V <sub>r</sub> < 12V Short or 0V < V <sub>r</sub> < 1.2V	
(Negative logic)	DC-DC ON DC-DC OFF	Short or 0V < V <sub>r</sub> < 1.2V Open or 3 V < V <sub>r</sub> < 12V	
Input current of Remote control pin	Nominal input	-0.5mA ~ + 0.5mA	
Remote off state input current	Nominal input	2.5mA	
ENVIRONMENTAL SPECIFICATIONS			
Operating ambient temperature			-40°C ~ +76°C (without derating) +76°C ~ +105°C (with derating)
Maximum case temperature			105°C
Storage temperature range			-55°C ~ +125°C
Thermal impedance (Note 7)	Natural convection Natural convection with heat-sink	12°C/Watt 10°C/Watt	
Thermal shock		MIL-STD-810F	
Vibration		MIL-STD-810F	
Relative humidity		5% to 95% RH	
EMC CHARACTERISTICS			
EMI (Note 8)	EN55022	Class A, Class B	
ESD	EN61000-4-2	Air Contact	± 8kV ± 6kV
Radiated immunity	EN61000-4-3	10 V/m	Perf. Criteria A
Fast transient (Note 9)	EN61000-4-4	± 2kV	Perf. Criteria B
Surge (Note 9)	EN61000-4-5	± 1kV	Perf. Criteria A
Conducted immunity	EN61000-4-6	10 V <sub>r.m.s</sub>	Perf. Criteria A

Model Number	Input Range	Output Voltage	Output Current		Output <sup>(2)</sup> Ripple & Noise	No Load <sup>(3)</sup> Input Current	Eff <sup>(4)</sup> (%)	Capacitor <sup>(5)</sup> Load max
			Min. load	Full load				
FEC15-24S3P3W	9 ~36 VDC	3.3 VDC	0mA	4500mA	50mVp-p	50mA	86	14700µF
FEC15-24S05W	9 ~ 36 VDC	5 VDC	0mA	3000mA	50mVp-p	65mA	87	7200µF
FEC15-24S5P1W	9 ~ 36 VDC	5.1 VDC	0mA	3000mA	50mVp-p	65mA	87	7200µF
FEC15-24S12W	9 ~ 36 VDC	12 VDC	0mA	1250mA	75mVp-p	22mA	87	1250µF
FEC15-24S15W	9 ~ 36 VDC	15 VDC	0mA	1000mA	75mVp-p	22mA	87	800µF
FEC15-24D05W	9 ~ 36 VDC	± 5 VDC	0mA	± 1500mA	75mVp-p	55mA	87	± 3600µF
FEC15-24D12W	9 ~ 36 VDC	± 12 VDC	0mA	± 625mA	75mVp-p	30mA	88	± 625µF
FEC15-24D15W	9 ~ 36 VDC	± 15 VDC	0mA	± 500mA	75mVp-p	30mA	88	± 400µF
FEC15-48S3P3W	18 ~ 75 VDC	3.3 VDC	0mA	4500mA	50mVp-p	35mA	86	14700µF
FEC15-48S05W	18 ~ 75 VDC	5 VDC	0mA	3000mA	50mVp-p	35mA	88	7200µF
FEC15-48S5P1W	18 ~ 75 VDC	5.1 VDC	0mA	3000mA	50mVp-p	35mA	88	7200µF
FEC15-48S12W	18 ~ 75 VDC	12 VDC	0mA	1250mA	75mVp-p	15mA	87	1250µF
FEC15-48S15W	18 ~ 75 VDC	15 VDC	0mA	1000mA	75mVp-p	15mA	87	800µF
FEC15-48D05W	18 ~ 75 VDC	± 5 VDC	0mA	± 1500mA	75mVp-p	35mA	88	± 3600µF
FEC15-48D12W	18 ~ 75 VDC	± 12 VDC	0mA	± 625mA	75mVp-p	17mA	88	± 625µF
FEC15-48D15W	18 ~ 75 VDC	± 15 VDC	0mA	± 500mA	75mVp-p	17mA	88	± 400µF

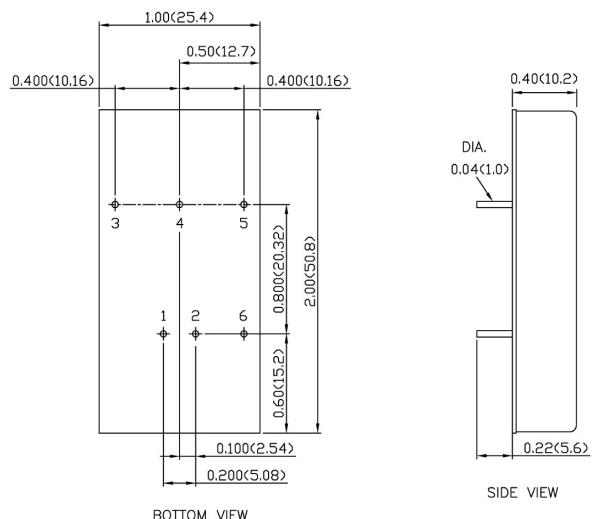
Note:

1. MIL-HDBK-217F @Ta=25 °C, Full load.
2. Typical value at nominal input and full load. (20MHZ BW.)
3. Typical value at nominal input and no load.
4. Typical value at nominal input and full load.
5. Test by minimum input and constant resistive load.
6. The ON/OFF control pin voltage is referenced to -INPUT .  
To order positive logic ON/OFF control add the suffix-P (Ex: FEC15-48S05W-P)  
To order negative logic ON/OFF control add the suffix-N (Ex: FEC15-48S05W-N)
7. Heat-sink is optional and P/N: 7G-0020C-F.
8. The FEC15W series standard module meets EN55022 Class A and Class B with external components.  
For more detail information, please contact with P-DUKE.
9. 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.



**MECHANICAL DRAWING :**



PIN CONNECTION		
PIN	SINGLE	DUAL
1	+ INPUT	+ INPUT
2	- INPUT	- INPUT
3	+ OUTPUT	+ OUTPUT
4	NO PIN	COMMON
5	- OUTPUT	- OUTPUT
6	CTRL(Option)	CTRL(Option)

BOTTOM VIEW

1. All dimensions in Inch (mm)
- Tolerance: X.XX±0.02 (X.X±0.5)  
X.XXX±0.01 (X.XX±0.25)
2. Pin pitch tolerance ±0.01 (0.25)
3. Pin dimension tolerance ±0.004 (0.1)