



## FEATURES

- 30 WATTS MAXIMUM OUTPUT POWER
- OUTPUT CURRENT UP TO 6A
- STANDARD 2.00 X 1.60 X 0.40 INCH PACKAGE
- HIGH EFFICIENCY UP TO 90%
- 2:1 WIDE INPUT VOLTAGE RANGE
- SIX-SIDED CONTINUOUS SHIELD
- FIXED SWITCHING FREQUENCY
- OFFER SINGLE AND DUAL OUTPUT
- UL60950-1, EN60950-1, & IEC60950-1 SAFETY APPROVALS
- CE MARKED
- COMPLIANT TO RoHS II & REACH

## APPLICATIONS

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

## DESCRIPTION

The FEC30 series offer 30 Watts of output power from a 2.00 x 1.60 x 0.40 inch package. The FEC30 series with 2:1 wide input voltage of 9~18VDC, 18~36VDC and 36~75VDC and features 1600VDC of isolation, short-circuit and over-voltage protection.

## TECHNICAL SPECIFICATION

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

OUTPUT SPECIFICATIONS			
Output power			30 Watts, max.
Voltage accuracy			± 1%
Minimum load			0%
Voltage adjustability			± 10%
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		300µs
Over voltage protection Zener diode clamp	1.5VDC output		3.9VDC
	1.8VDC output		3.9VDC
	2.5VDC output		3.9VDC
	3.3VDC output		3.9VDC
	5VDC output		6.2VDC
Over load protection	12VDC output		15VDC
	15VDC output		18VDC
Over load protection	% of FL at nominal input		150%, max.
Short circuit protection			Continuous, automatic recovery
GENERAL SPECIFICATIONS			
Efficiency			See table
Isolation voltage	Input to Output		1600VDC, min. 1minute
	Input (Output) to Case		1600VDC, min. 1minute
Isolation resistance	500VDC		10 <sup>9</sup> ohms, min.
Isolation capacitance			1000pF, max.
Switching frequency			300kHz±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 1.60 X 0.40 Inch (50.8 X 40.6 X 10.2 mm)
Weight			48g (1.69oz)
MTBF (Note 1)	MIL-HDBK-217F		1.283 x 10 <sup>6</sup> hrs

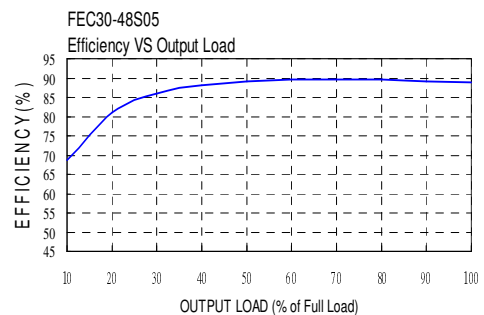
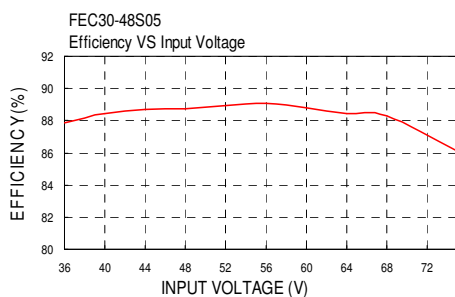
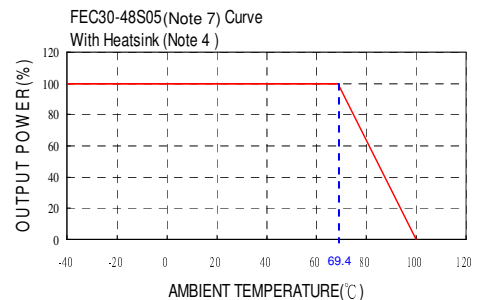
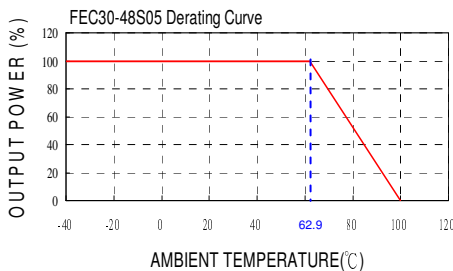
INPUT SPECIFICATIONS			
Input voltage range	12VDC nominal input		9 ~ 18VDC
	24VDC nominal input		18 ~ 36VDC
	48VDC nominal input		36 ~ 75VDC
Input filter			L-C type
Input surge voltage	12VDC input		36VDC 100ms,max
	24VDC input		50VDC 100ms,max
	48VDC input		100VDC 100ms,max
Input reflected ripple current			30mA <sub>p-p</sub>
Start up time	Nominal input and constant resistive load		25mS
	Power up Remote ON/OFF		25mS
Start-up voltage	12VDC input		9VDC
	24VDC input		17.8VDC
	48VDC input		36VDC
Shutdown voltage	12VDC input		8VDC
	24VDC input		16VDC
	48VDC input		33VDC
Remote ON/OFF (Note 6) (Positive logic)	DC-DC ON		Open or 3.0V < Vr < 12V
	DC-DC OFF		Short or 0V < Vr < 1.2V
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 ~ +85°C (with derating)
Maximum case temperature			100°C
Storage temperature range			-55°C ~ +125°C
Over temperature protection			115°C
Thermal impedance (Note 7)	Natural convection		10°C/Watt
	Natural convection with heat-sink		8.24°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	± 8kV Perf. Criteria B
		Contact	± 6kV Perf. Criteria B
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 B
Conducted immunity	EN61000-4-6		10 Vr.m.s Perf. Criteria A

Model Number	Input Range	Output Voltage	Output Current		Output (2) Ripple & Noise	No load (3) Input Current	Eff (4) (%)	Capacitor (5) Load max
			Min. load	Full load				
FEC30-12S1P5	9 ~ 18 VDC	1.5 VDC	0mA	6000mA	50mVp-p	100mA	78	85800μF
FEC30-12S1P8	9 ~ 18 VDC	1.8 VDC	0mA	6000mA	50mVp-p	100mA	81	65000μF
FEC30-12S2P5	9 ~ 18 VDC	2.5 VDC	0mA	6000mA	50mVp-p	110mA	83	33000μF
FEC30-12S3P3	9 ~ 18 VDC	3.3 VDC	0mA	6000mA	50mVp-p	115mA	85	19500μF
FEC30-12S05	9 ~ 18 VDC	5 VDC	0mA	6000mA	50mVp-p	95mA	87	10200μF
FEC30-12S12	9 ~ 18 VDC	12 VDC	0mA	2500mA	75mVp-p	170mA	88	3240μF
FEC30-12S15	9 ~ 18 VDC	15 VDC	0mA	2000mA	75mVp-p	210mA	88	1100μF
FEC30-12D12	9 ~ 18 VDC	±12 VDC	0mA	±1250mA	100mVp-p	60mA	87	±1020μF
FEC30-12D15	9 ~ 18 VDC	±15 VDC	0mA	±1000mA	100mVp-p	40mA	87	±675μF
FEC30-24S1P5	18 ~ 36 VDC	1.5 VDC	0mA	6000mA	50mVp-p	50mA	80	85800μF
FEC30-24S1P8	18 ~ 36 VDC	1.8 VDC	0mA	6000mA	50mVp-p	35mA	82	65000μF
FEC30-24S2P5	18 ~ 36 VDC	2.5 VDC	0mA	6000mA	50mVp-p	45mA	84	33000μF
FEC30-24S3P3	18 ~ 36 VDC	3.3 VDC	0mA	6000mA	50mVp-p	50mA	86	19500μF
FEC30-24S05	18 ~ 36 VDC	5 VDC	0mA	6000mA	50mVp-p	50mA	88	10200μF
FEC30-24S12	18 ~ 36 VDC	12 VDC	0mA	2500mA	75mVp-p	80mA	89	3300μF
FEC30-24S15	18 ~ 36 VDC	15 VDC	0mA	2000mA	75mVp-p	90mA	89	1100μF
FEC30-24D12	18 ~ 36 VDC	±12 VDC	0mA	±1250mA	100mVp-p	30mA	88	±1020μF
FEC30-24D15	18 ~ 36 VDC	±15 VDC	0mA	±1000mA	100mVp-p	30mA	88	±675μF
FEC30-48S1P5	36 ~ 75 VDC	1.5 VDC	0mA	6000mA	50mVp-p	20mA	81	85800μF
FEC30-48S1P8	36 ~ 75 VDC	1.8 VDC	0mA	6000mA	50mVp-p	20mA	83	65000μF
FEC30-48S2P5	36 ~ 75 VDC	2.5 VDC	0mA	6000mA	50mVp-p	25mA	85	33000μF
FEC30-48S3P3	36 ~ 75 VDC	3.3 VDC	0mA	6000mA	50mVp-p	30mA	87	19500μF
FEC30-48S05	36 ~ 75 VDC	5 VDC	0mA	6000mA	50mVp-p	35mA	89	10200μF
FEC30-48S12	36 ~ 75 VDC	12 VDC	0mA	2500mA	75mVp-p	35mA	90	3300μF
FEC30-48S15	36 ~ 75 VDC	15 VDC	0mA	2000mA	75mVp-p	55mA	90	1100μF
FEC30-48D12	36 ~ 75 VDC	±12 VDC	0mA	±1250mA	100mVp-p	20mA	88	±1020μF
FEC30-48D15	36 ~ 75 VDC	±15 VDC	0mA	±1000mA	100mVp-p	20mA	88	±675μF

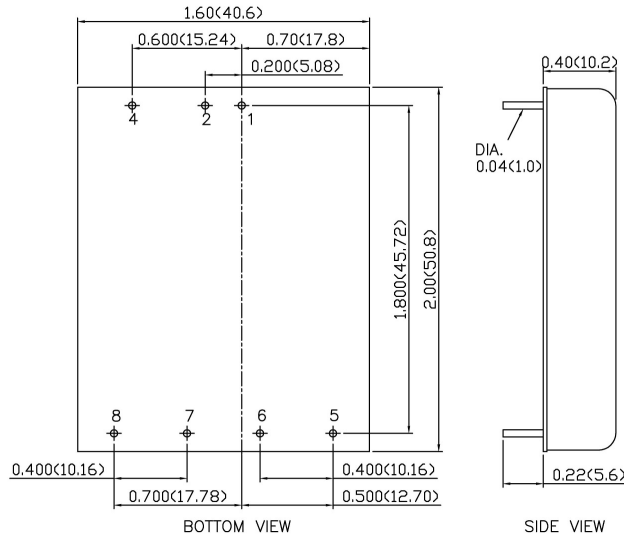
**Note**

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 CTRL pin voltage is referenced to -INPUT.
7. Heat-sink is optional and P/N: 7G-0011C-F.
8. The FEC30 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, 220μF/100V.

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



## MECHANICAL DRAWING



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

PIN CONNECTION		
PIN	SINGLE	DUAL
1	+ INPUT	+ INPUT
2	- INPUT	- INPUT
4	CTRL	CTRL
5	NO PIN	+ OUTPUT
6	+ OUTPUT	COMMON
7	- OUTPUT	- OUTPUT
8	TRIM	TRIM

