

# FEC30W SERIES

DC-DC CONVERTER



4 : 1 ULTRA WIDE INPUT RANGE  
UP TO 30Watts



## FEATURES

- NO MINIMUM LOAD REQUIRED
- 1600VDC INPUT TO OUTPUT ISOLATION
- STANDARD 2.00 X 1.60 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
FEC30-24S1P5W	10 ~ 40	1.5	8	35	80	65000
FEC30-24S1P8W	10 ~ 40	1.8	8	35	83	65000
FEC30-24S2P5W	10 ~ 40	2.5	8	40	85	33000
FEC30-24S3P3W	10 ~ 40	3.3	6	50	87	19500
FEC30-24S05W	10 ~ 40	5	6	65	87	10200
FEC30-24S12W	10 ~ 40	12	2.5	65	87	3300
FEC30-24S15W	10 ~ 40	15	2	70	88	1100
FEC30-24D12W	10 ~ 40	±12	±1.25	30	84	±1000
FEC30-24D15W	10 ~ 40	±15	±1	35	85	±680
FEC30-48S1P5W	18 ~ 75	1.5	8	20	80	65000
FEC30-48S1P8W	18 ~ 75	1.8	8	20	83	65000
FEC30-48S2P5W	18 ~ 75	2.5	8	25	86	33000
FEC30-48S3P3W	18 ~ 75	3.3	6	30	87	19500
FEC30-48S05W	18 ~ 75	5	6	30	88	10200
FEC30-48S12W	18 ~ 75	12	2.5	35	87	3300
FEC30-48S15W	18 ~ 75	15	2	45	88	1100
FEC30-48D12W	18 ~ 75	±12	±1.25	25	85	±1000
FEC30-48D15W	18 ~ 75	±15	±1	25	86	±680

## PART NUMBER STRUCTURE

FEC30	-	48	S	05	W	-	N	HS
Series Name		Input Voltage (VDC)	Output Quantity	Output Voltage (VDC)	Input Range		Remote Control Option	Assembly Option
		24: 10~40 48: 18~75	S: Single	1P5: 1.5 1P8: 1.8 2P5: 2.5 3P3: 3.3 05: 5 12: 12 15: 15	4:1		□: Positive logic N: Negative logic	□: None HS: Heat-sink HC: Heat-sink & Clamp
			D: Dual	12: ±12 15: ±15				

**INPUT SPECIFICATIONS**

Parameter	Conditions		Min.	Typ.	Max.	Unit	
Operating input voltage range	24Vin(nom)		10	24	40	VDC	
	48Vin(nom)		18	48	75		
Input reflected ripple current			20			mAp-p	
Start up voltage	24Vin(nom)					10 18	
	48Vin(nom)						
Shutdown voltage	24Vin(nom)					8 16	
	48Vin(nom)						
Start up time	Constant resistive load	Power up				10	
		Remote ON/OFF					
Input surge voltage	100 ms, max.	24Vin(nom)				50 100	
		48Vin(nom)					
Input filter			L-C type				
Remote ON/OFF	Referred to -Vin pin	Positive logic	DC-DC ON				Open or 3 ~ 12VDC Short or 0 ~ 1.2VDC Short or 0 ~ 1.2VDC Open or 3 ~ 12VDC
		(Standard)	DC-DC OFF				
		Negative logic	DC-DC ON				
		(Option)	DC-DC OFF				
		Input current of Ctrl pin	-0.5			+0.5	mA
		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		-0.5			+0.5 %	
Load regulation	No Load to Full Load	Single				-0.5 +0.5 %	
		Dual					
Cross regulation	Asymmetrical load 25%/100% FL	Dual				-5.0 +5.0 %	
Voltage adjustability						-10 +10 %	
Ripple and noise	20MHz bandwidth With a 0.1µF/50V MLCC	Others				60	
		5Vout				75	
		12Vout, 15Vout				100	
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				3.9	
		1.8Vout				3.9	
		2.5Vout				3.9	
		3.3Vout				3.9	
		5Vout				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				
Isolation resistance	500VDC		1			GΩ	
Isolation capacitance						1000	pF
Switching frequency			270	300	330	kHz	
Safety approvals						UL60950-1 EN60950-1 IEC60950-1	
Case material						Nickel-coated copper	
Base material						FR4 PCB	
Potting material						Epoxy (UL94 V-0)	
Weight						48g (1.69oz)	
MTBF	MIL-HDBK-217F, Full load					7.598 x 10 <sup>5</sup> hrs	

**ENVIRONMENTAL SPECIFICATIONS**

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating ambient temperature	With derating	-40		+85	°C
Maximum case temperature				+100	°C
Over temperature protection			+115		°C
Storage temperature range		-55		+125	°C
Thermal impedance	Vertical direction by natural convection (20LFM) Without heat-sink With heat-sink		10 8.24		°C/W
Thermal shock					MIL-STD-810F
Vibration					MIL-STD-810F
Relative humidity					5% to 95% RH

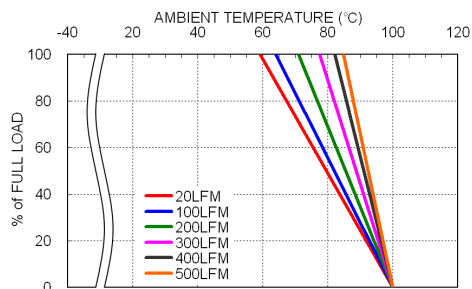
**EMC SPECIFICATIONS**

Parameter	Conditions	Level
EMI <sup>(2)</sup>	EN55022	Class A, Class B
ESD	EN61000-4-2 Air ± 8kV and Contact ± 6kV	Perf. Criteria B
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 B
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

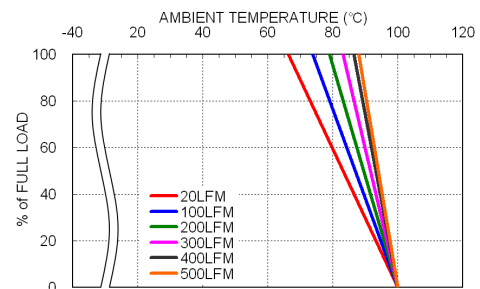
**Note:**

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: Nippon chemi-con KY series, 220µF/100V.

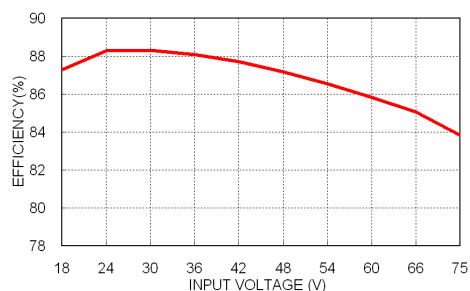
**CAUTION:** This power module is not internally fused. An input line fuse must always be used.

**CHARACTERISTIC CURVE**


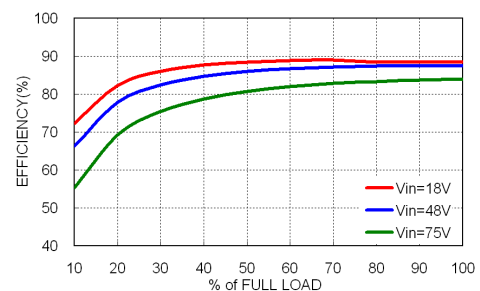
FEC30-48S05W Derating Curve



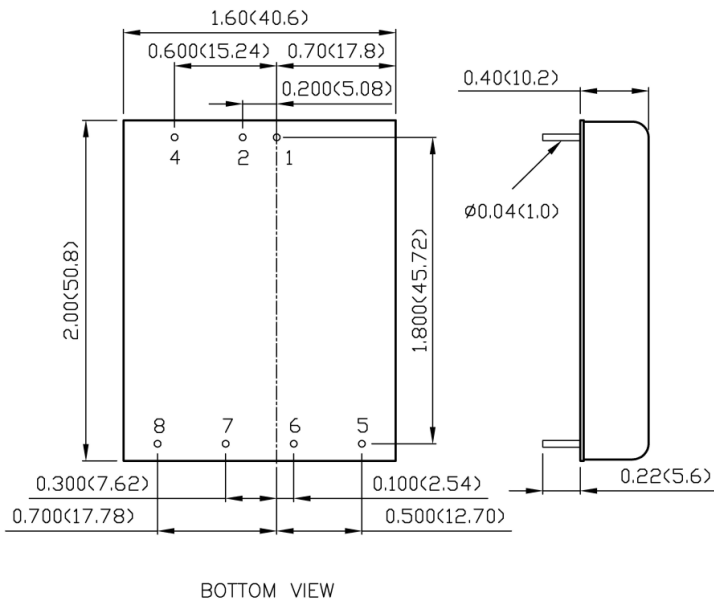
FEC30-48S05W Derating Curve With Heat-sink



FEC30-48S05W Efficiency vs. Input Voltage



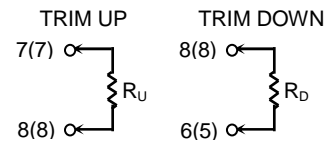
FEC30-48S05W Efficiency vs. Output Load

**MECHANICAL DRAWING**

**PIN CONNECTION**

PIN	SINGLE	DUAL
1	+Vin	+Vin
2	-Vin	-Vin
4	Ctrl	Ctrl
5	No pin	+Vout
6	+Vout	Common
7	-Vout	-Vout
8	Trim	Trim

**EXTERNAL OUTPUT TRIMMING**

Output can be externally trimmed by using the method shown below.  
( ) for dual output trim.



1. All dimensions in inch (mm)
2. Tolerance :x.xx±0.02 (x.xx±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)