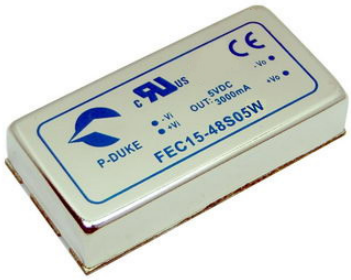
POWER MATE TECHNOLOGY CO., LTD.

FEC15W SERIES

15 WATTS DC-DC CONVERTER



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

APPLICATIONS

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

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.

TECHNICAL SPECIFICATION

All specifications are typical at nominal input, full load and 25ºC 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% / ºC, max.
Transient response recovery time 25% load step change			250μs
Over voltage protection Zener diode clamp	3.3VDC output 5VDC output 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	10^9 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	2.430×10^6 hrs

INPUT SPECIFICATIONS

Input voltage range	24VDC nominal input 48VDC nominal input		9 ~ 36VDC 18 ~ 75VDC
Input filter			Pi type
Input surge voltage	24VDC input 48VDC input		50VDC 100ms,max 100VDC 100ms,max
Input reflected ripple current			20mAp-p
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 < Vr < 12V Short or 0V < Vr < 1.2V
(Negative logic)	DC-DC ON DC-DC OFF		Short or 0V < Vr < 1.2V Open or 3 V < Vr < 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		-40ºC ~ +76ºC (without derating) +76ºC ~ +105ºC (with derating)
Maximum case temperature		105ºC
Storage temperature range		-55ºC ~ +125ºC
Thermal impedance (Note 7)	Natural convection Natural convection with heat-sink	12ºC/Watt 10ºC/Watt
Thermal shock		MIL-STD-810F
Vibration		MIL-STD-810F
Relative humidity		5% to 95% RH

EMC CHARACTERISTICS

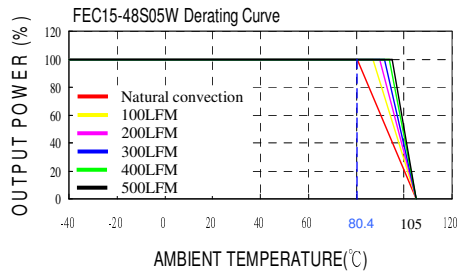
EMI (Note 8)	EN55022			Class A, Class B
ESD	EN61000-4-2	Air Contact	± 8kV ± 6kV	Perf. Criteria B
Radiated immunity	EN61000-4-3		10 V/m	Perf. Criteria A
Fast transient (Note 9)	EN61000-4-4		± 2kV	Perf. Criteria B
Surge (Note 9)	EN61000-4-5		± 1kV	Perf. Criteria A
Conducted immunity	EN61000-4-6		10 Vr.m.s	Perf. Criteria A

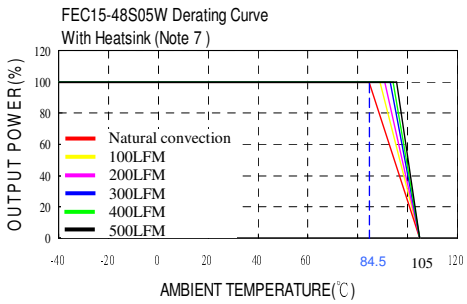
Model Number	Input Range	Output Voltage	Output Current		Output [2] Ripple & Noise	No Load [3] Input Current	Eff [4] (%)	Capacitor [5] Load max
			Min. load	Full load				
FEC15-24S3P3W	9 ~36 VDC	3.3 VDC	0mA	4500mA	50mVp-p	50mA	86	14700μF
FEC15-24S05W	9 ~ 36 VDC	5 VDC	0mA	3000mA	50mVp-p	65mA	87	7200μF
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

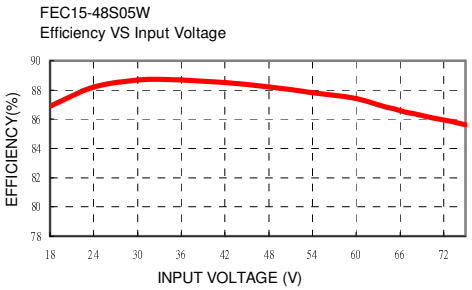
Note:

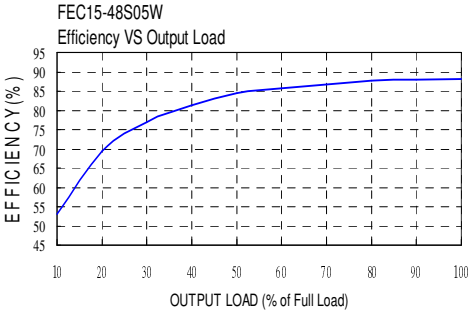
1. MIL-HDBK-217F @Ta=25 ºC, Full load.
2. Typical value at nominal input and full load. (20MHZ BW.)
3. Typical value at nominal input and no load.
4. Typical value at nominal input and full load.
5. Test by minimum input and constant resistive load.
6. The ON/OFF control pin voltage is referenced to -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.

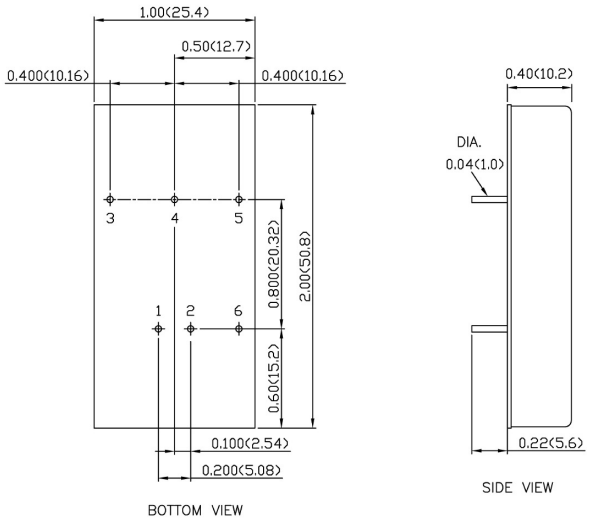








MECHANICAL DRAWING :



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)

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)