



FEATURES

- 15 WATTS OUTPUT POWER
- OUTPUT CURRENT UP TO 4A
- STANDARD 2.00 X 1.00 X 0.40 INCH PACKAGE
- HIGH EFFICIENCY UP TO 88%
- 2:1 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

APPLICATIONS

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

OPTIONS

Positive logic & Negative logic Remote On/Off

DESCRIPTION

The FEC15 series offer 15 watts of output power from a 2.00 x 1.00 x 0.40 inch package. The FEC15 series with 2:1 wide input voltage of 9~18VDC, 18~36VDC and 36~75VDC.

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 (Note 6)			See Table
Line regulation	LL to HL at Full Load		± 0.5%
Load regulation	Min. load to Full load	Single	± 0.5%
		Dual	± 1%
Cross regulation (Dual)	Asymmetrical load 25% / 100% FL		± 5%
Ripple and noise	20MHz bandwidth	Single	50mVp-p
		Dual	75mVp-p
Temperature coefficient			±0.02% / °C, max.
Transient response recovery time	25% load step change		250µs
Over voltage protection (Zener diode clamp)	3.3VDC output		3.9VDC
	5VDC output		6.2VDC
	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 ⁹ ohms, min.
Isolation capacitance			300pF, max.
Switching frequency	Single output		500kHz±10%
	Dual output		300kHz±10%
Safety approvals			IEC60950-1, UL60950-1, & EN60950-1
Case material			Nickel-coated copper
Base material			Non-conductive black plastic
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		2.318 x 10 ⁶ hrs

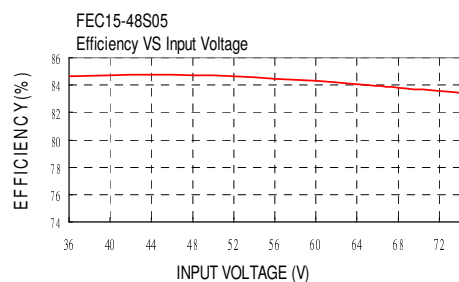
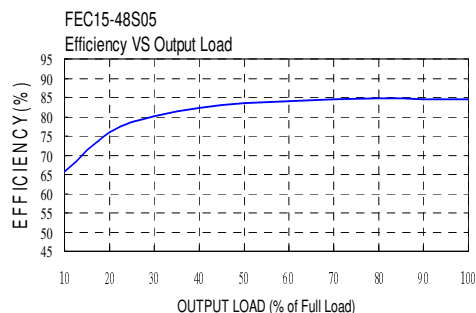
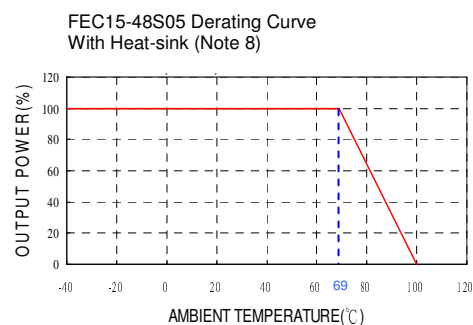
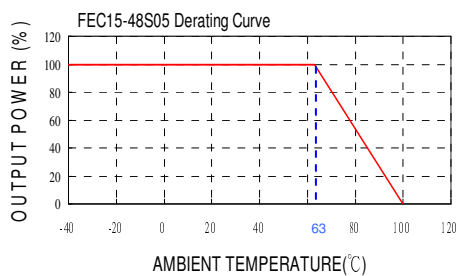
INPUT SPECIFICATIONS			
Input voltage range	12VDC nominal input		9 ~ 18VDC
	24VDC nominal input		18 ~ 36VDC
	48VDC nominal input		36 ~ 75VDC
Input filter			Pi type
Input surge voltage	12VDC input		36VDC 100ms, max.
	24VDC input		50VDC 100ms, max.
	48VDC input		100VDC 100ms, max.
Input reflected ripple current			20mA _{p-p}
Start up time	Nominal input and constant resistive load	Power up	20ms
Remote ON/OFF (Option) (Note 7)			
(Positive logic)	DC-DC ON		Open or 3.5V < Vr < 12V
	DC-DC OFF		Short or 0V < Vr < 1.2V
(Negative logic)	DC-DC ON		Short or 0V < Vr < 1.2V
	DC-DC OFF		Open or 3.5V < Vr < 12V
Input current of remote control pin	Nominal input		-0.5mA ~ +1mA
Remote off state input current	Nominal input		20mA
ENVIRONMENTAL SPECIFICATIONS			
Operating ambient temperature			-40°C ~ +85°C (with derating)
Maximum case temperature			100°C
Storage temperature range			-55°C ~ +125°C
Thermal impedance (Note 8)	Natural convection		12°C/Watt
	Natural convection with Heat-sink		10°C/Watt
Thermal shock			MIL-STD-810F
Vibration			MIL-STD-810F
Relative humidity			5% to 95% RH
EMC CHARACTERISTICS			
EMI (Note 9)	EN55022		Class A, Class B
ESD	EN61000-4-2	Air Contact	± 8kV Perf. Criteria B
			± 6kV
Radiated immunity	EN61000-4-3		10 V/m Perf. Criteria A
Fast transient (Note 10)	EN61000-4-4		± 2kV Perf. Criteria B
Surge (Note 10)	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				
FEC15-12S33	9 ~ 18 VDC	3.3 VDC	0mA	4000mA	50mVp-p	30mA	79	10200μF
FEC15-12S05	9 ~ 18 VDC	5 VDC	15mA	3000mA	50mVp-p	25mA	82	7050μF
FEC15-12S12	9 ~ 18 VDC	12 VDC	0mA	1250mA	50mVp-p	25mA	86	1035μF
FEC15-12S15	9 ~ 18 VDC	15 VDC	0mA	1000mA	50mVp-p	20mA	86	705μF
FEC15-12D05	9 ~ 18 VDC	± 5 VDC	0mA	± 1500mA	75mVp-p	20mA	83	± 1020μF
FEC15-12D12	9 ~ 18 VDC	± 12 VDC	0mA	± 625mA	75mVp-p	30mA	86	± 495μF
FEC15-12D15	9 ~ 18 VDC	± 15 VDC	±10mA	± 500mA	75mVp-p	35mA	84	± 165μF
FEC15-24S33	18 ~ 36 VDC	3.3 VDC	0mA	4000mA	50mVp-p	15mA	80	10200μF
FEC15-24S05	18 ~ 36 VDC	5 VDC	15mA	3000mA	50mVp-p	10mA	84	7050μF
FEC15-24S12	18 ~ 36 VDC	12 VDC	0mA	1250mA	50mVp-p	20mA	85	1035μF
FEC15-24S15	18 ~ 36 VDC	15 VDC	10mA	1000mA	50mVp-p	15mA	85	705μF
FEC15-24D05	18 ~ 36 VDC	± 5 VDC	0mA	± 1500mA	75mVp-p	15mA	84	± 1020μF
FEC15-24D12	18 ~ 36 VDC	± 12 VDC	0mA	± 625mA	75mVp-p	25mA	86	± 495μF
FEC15-24D15	18 ~ 36 VDC	± 15 VDC	0mA	± 500mA	75mVp-p	25mA	86	± 165μF
FEC15-48S33	36 ~ 75 VDC	3.3 VDC	0mA	4000mA	50mVp-p	10mA	81	10200μF
FEC15-48S05	36 ~ 75 VDC	5 VDC	0mA	3000mA	50mVp-p	20mA	83	7050μF
FEC15-48S12	36 ~ 75 VDC	12 VDC	10mA	1250mA	50mVp-p	15mA	87	1035μF
FEC15-48S15	36 ~ 75 VDC	15 VDC	0mA	1000mA	50mVp-p	15mA	86	705μF
FEC15-48D05	36 ~ 75 VDC	± 5 VDC	0mA	± 1500mA	75mVp-p	10mA	85	± 1020μF
FEC15-48D12	36 ~ 75 VDC	± 12 VDC	0mA	± 625mA	75mVp-p	15mA	88	± 495μF
FEC15-48D15	36 ~ 75 VDC	± 15 VDC	0mA	± 500mA	75mVp-p	15mA	87	± 165μF

Note

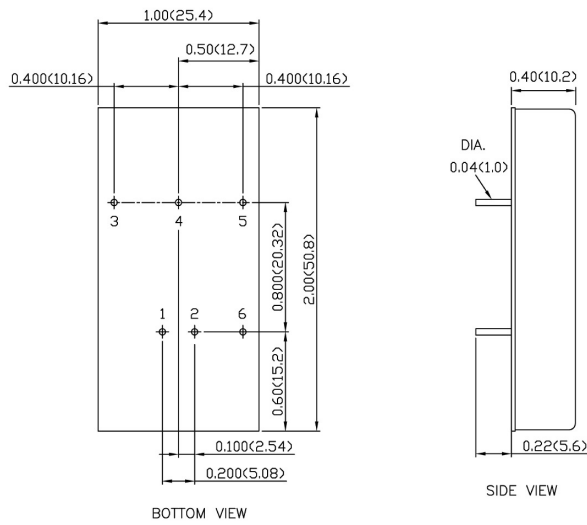
1. MIL-HDBK-217F @Ta=25 °C, Full load.
2. Typical value at nominal input and full load. (20MHZ BW.)
3. Typical value at nominal input and no load.
4. Typical value at nominal input and full load.
5. Test by minimum input and constant resistive load.
6. The output requires a minimum loading on the output to maintain specified regulation.
Operation under no-load condition will not damage these devices, however they may not meet all listed specification.
7. The CTRL pin voltage is referenced to -INPUT.
To order positive logic ON-OFF control add the suffix-P (Ex: FEC15-24S05-P)
To order negative logic ON-OFF control add the suffix-N (Ex: FEC15-24S05-N)
8. Heat-sink is optional and P/N: 7G-0020C-F.
9. The FEC15 series standard module meets EN55022 Class A and Class B with external components.
For more detail information, please contact with P-DUKE.
10. 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(Optional)	CTRL(Optional)

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)