POWER MATE TECHNOLOGY CO.,LTD.

FEC15W SERIES



FEATURES

- 15 WATTS OUTPUT POWER
- OUTPUT CURRENT UP TO 4.5A
- STANDARD 2.0 X 1.0 X 0.4 INCH PACKAGE
- HIGH EFFICIENCY UP TO 88%
- 4:1 ULTRA WIDE INPUT VOLTAGE RANGE
- SIX-SIDED CONTINUOUS SHIELD
- FIXED SWITCHING FREQUENCY
- RAILWAY APPLICATION
- CE MARK MEETS 2006/95/EC, 93/68/EEC AND 2004/108/EC
- UL60950-1, EN60950-1 AND IEC60950-1 LICENSED
- ISO9001 CERTIFIED MANUFACTURING FACILITIES
- COMPLIANT TO RoHS EU DIRECTIVE 2002/95/EC

APPLICATIONS

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

OPTIONS

Positive logic & Negative logic Remote On/Off

DESCRIPTION

The FEC15W series offer 15 watts of output power from a 2 x 1 x 0.4 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	Full load and nominal Vin		± 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	3.3V output 5V output 12V output 15V output		3.9VDC 6.2VDC 15VDC 18VDC
Over load protection	% of FL at nominal input		150%, typ.
Short circuit protection			Hiccup, automatics recovery

GENERAL SPECIFICATIONS

Efficiency		See table
Isolation voltage	Input to Output Input(Output) to case	1600VDC, min. 1600VDC, min.
Case grounding		Connect case to -Vin with decoupling Y Cap
Isolation resistance		10^9ohms, min.
Isolation capacitance		1500pF, max.
Switching frequency		400KHz, typ.
Approvals and standard		IEC60950-1, UL60950-1, EN60950-1
Case material		Nickel-coated copper
Base material		FR4 PCB
Potting material		Epoxy (UL94-V0)
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)	BELLCORE TR-NWT-000332 MIL-HDBK-217F	1.819 x 10^5 hrs 9.205 x 10^5 hrs

INPUT SPECIFICATIONS

Input voltage range	24V nominal input 48V nominal input		9 – 36VDC 18 – 75VDC
Input filter			Pi type
Input surge voltage 1Sec max	24V input 48V input		50VDC 100VDC
Input reflected ripple current	Nominal Vin and full load		20mAp-p
Start up time	Nominal Vin and constant resistive load	Power up	20mS, typ.
Start-up voltage	24V input 48V input		9VDC 18VDC
Shutdown voltage	24V input 48V 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 Vin	-0.5mA ~ + 0.5mA
Remote off state input current		Nominal Vin	2.5mA

ENVIRONMENTAL SPECIFICATIONS

Operating ambient temperature (Note 7)		-40ºC ~ +76ºC (without derating) +76ºC ~ +105ºC (with derating)
Maximum case temperature		105ºC
Storage temperature range		-55ºC ~ +125ºC
Thermal impedance (Note 8)	Nature convection Nature convection with heat-sink	12ºC/Watt 10ºC/Watt
Thermal shock		EN61373, MIL-STD-810F
Vibration		EN61373, MIL-STD-810F
Relative humidity		5% to 95% RH

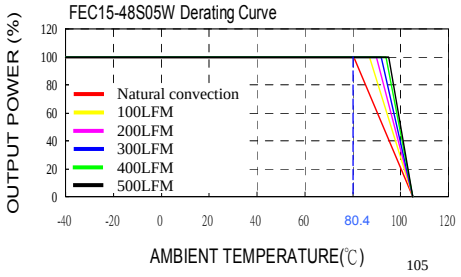
EMC CHARACTERISTICS

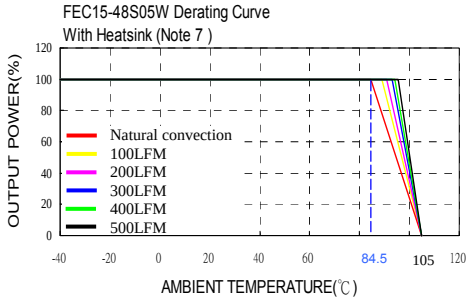
EMI (Note 9)	EN55022, EN55011			Class B
ESD	EN61000-4-2	Air Contact	± 8KV ± 6KV	Perf. Criteria B
Radiated immunity	EN61000-4-3		10 V/m	Perf. Criteria A
Fast transient(Note 10)	EN61000-4-4		± 2KV	Perf. Criteria B
Surge (Note 10)	EN61000-4-5		± 1KV	Perf. Criteria A
			± 2KV	Perf. Criteria B
Conducted immunity	EN61000-4-6		10 Vr.m.s	Perf. Criteria A

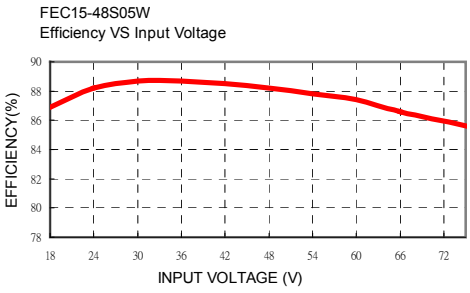
Model Number	Input Range	Output Voltage	Output Current		Output [4] Ripple & Noise	Input Current		Eff [4] (%)	Capacitor [5] Load max
			Min. load	Full load		No Load [3]	Full Load [2]		
FEC15-24S3P3W	9 – 36 VDC	3.3 VDC	0mA	4500mA	50mVp-p	50mA	755mA	86	14700μF
FEC15-24S05W	9 – 36 VDC	5 VDC	0mA	3000mA	50mVp-p	65mA	753mA	87	7200μF
FEC15-24S5P1W	9 – 36 VDC	5.1 VDC	0mA	3000mA	50mVp-p	65mA	768mA	87	7200μF
FEC15-24S12W	9 – 36 VDC	12 VDC	0mA	1250mA	75mVp-p	22mA	753mA	87	1250μF
FEC15-24S15W	9 – 36 VDC	15 VDC	0mA	1000mA	75mVp-p	22mA	753mA	87	800μF
FEC15-24D05W	9 – 36 VDC	± 5 VDC	0mA	± 1500mA	75mVp-p	55mA	753mA	87	± 3600μF
FEC15-24D12W	9 – 36 VDC	± 12 VDC	0mA	± 625mA	75mVp-p	30mA	744mA	88	± 625μF
FEC15-24D15W	9 – 36 VDC	± 15 VDC	0mA	± 500mA	75mVp-p	30mA	744mA	88	± 400μF
FEC15-48S3P3W	18 – 75 VDC	3.3 VDC	0mA	4500mA	50mVp-p	35mA	377mA	86	14700μF
FEC15-48S05W	18 – 75 VDC	5 VDC	0mA	3000mA	50mVp-p	35mA	372mA	88	7200μF
FEC15-48S5P1W	18 – 75 VDC	5.1 VDC	0mA	3000mA	50mVp-p	35mA	379mA	88	7200μF
FEC15-48S12W	18 – 75 VDC	12 VDC	0mA	1250mA	75mVp-p	15mA	377mA	87	1250μF
FEC15-48S15W	18 – 75 VDC	15 VDC	0mA	1000mA	75mVp-p	15mA	377mA	87	800μF
FEC15-48D05W	18 – 75 VDC	± 5 VDC	0mA	± 1500mA	75mVp-p	35mA	372mA	88	± 3600μF
FEC15-48D12W	18 – 75 VDC	± 12 VDC	0mA	± 625mA	75mVp-p	17mA	372mA	88	± 625μF
FEC15-48D15W	18 – 75 VDC	± 15 VDC	0mA	± 500mA	75mVp-p	17mA	372mA	88	± 400μF

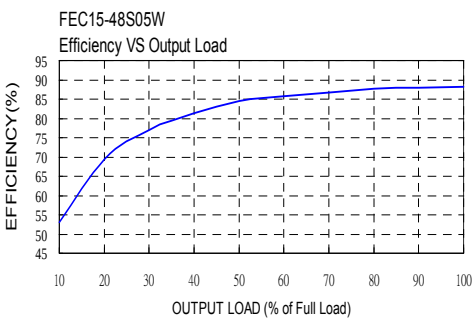
Note:

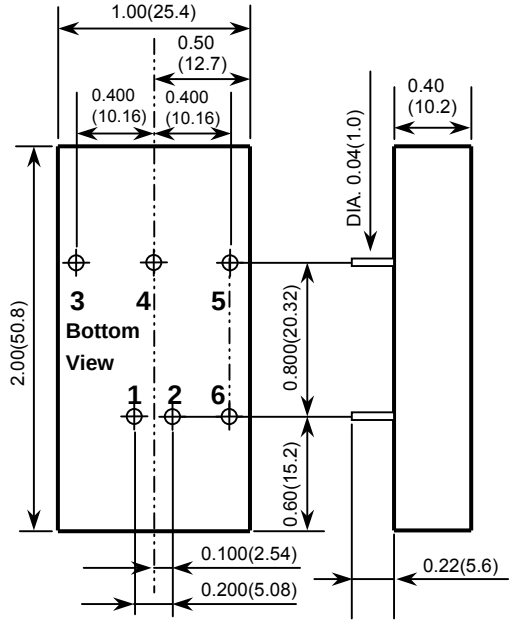
1. BELLCORE TR-NWT-000332. Case 1: 50% Stress, Temperature at 40ºC.
   MIL-HDBK-217F Notice2 @Ta=25 ºC, Full load(Ground, Benign, controlled environment)
2. Maximum value at nominal input voltage and full load.
3. Typical value at nominal input voltage and no load.
4. Typical value at nominal input voltage and full load.
5. Test by minimum Vin and constant resistive load.
6. The ON/OFF control pin voltage is referenced to -Vin.
   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. 0perating ambient temperature:
   Converter can meet the railway T2 temperature requirement at full load. The operating temperature can up to Ta = 85ºC as power derating from 100% to 80% for TX requirement.
8. Heat sink is optional and P/N: 7G-0020C-F.
9. EN55022 and EN50155
   1) To meet Class A with parallel an external capacitor to the input pins.
   Recommend : 24Vin : NA.
   48Vin : 1μF/100V 1210 MLCC.
   2) To meet Class B please refer to the suggestion filter in next page.
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 μF/100V, ESR 48mΩ.





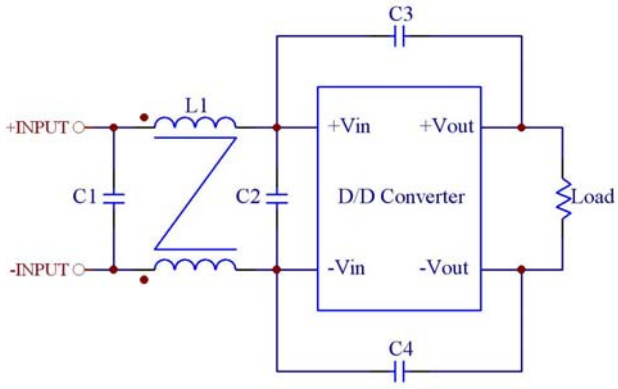






1. All dimensions in Inches (mm)
   Tolerance: X.XX±0.02 (X.X±0.5)
   X.XXX±0.01 (X.XX±0.25)
2. Pin pitch tolerance ±0.01(0.25)
3. Pin dimension tolerance ±0.004 (0.1)

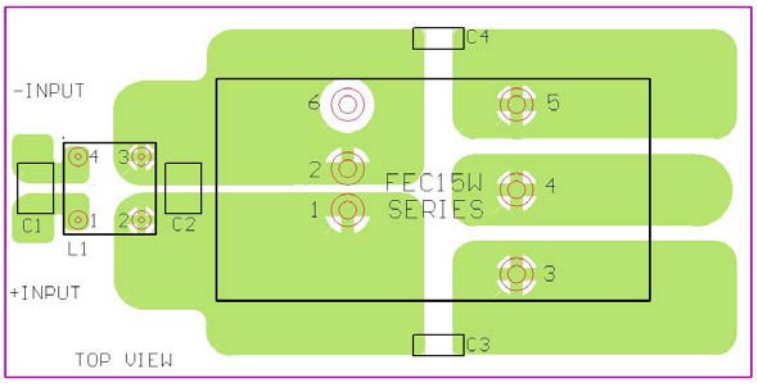
PIN CONNECTION		
PIN	SINGLE	DUAL
1	+ INPUT	+ INPUT
2	- INPUT	- INPUT
3	+ OUTPUT	+ OUTPUT
4	NO PIN	COMMON
5	- OUTPUT	- OUTPUT
6	CTRL (Option)	CTRL (Option)



Recommended Filter for EN55022 Class B Compliance

The components used in the above figure, together with the manufacturers' part numbers for these components, are as follows:

	C1	C2	C3	C4	L1
FEC15-24XXXW	2.2μF/50V 1812 MLCC	NA	1000pF/2KV MLCC	1000pF/2KV MLCC	450μH Common Choke PMT-048
FEC15-48XXXW	2.2μF/100V 1812 MLCC	2.2μF/100V 1812 MLCC	1000pF/2KV MLCC	1000pF/2KV MLCC	325μH Common Choke PMT-050



Recommended EN55022 Class B Filter Circuit Layout

Стандарт Электрон Связь

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