POWER MATE TECHNOLOGY CO.,LTD.

FEC15-SERIES

- **15 WATTS OUTPUT POWER**
- **2:1 WIDE INPUT VOLTAGE RANGE**
- **INTERNATIONAL SAFETY STANDARD APPROVAL**
- **SIX-SIDED CONTINUOUS SHIELD**
- **HIGH EFFICIENCY UP TO 88%**
- **STANDARD 2" X 1" X 0.4" PACKAGE**
- **FIXED SWITCHING FREQUENCY**

UL E193009
TUV
CB
CE MARK

The FEC15 series offer 15 watts of output power from a 2 x 1 x 0.4 inch package. The FEC15 series with 2:1 wide input voltage of 9-18, 18-36 and 36-75VDC. The FEC15 features 1600VDC of isolation, short-circuit and over-voltage protection, as well as six sided shielding. A safety approval to EN60950-1 and UL60950-1. All models are particularly suited to telecommunications, industrial, mobile telecom and test equipment applications.

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 (Note 1)			10% of FL
Line regulation	LL to HL at Full Load		± 0.5%
Load regulation	10% to 100% FL	Single Dual	± 0.5% ± 1%
Cross regulation (Dual)	Asymmetrical load 25% / 100% FL		± 5%
Ripple and noise	20MHz bandwidth	Single Dual	50mVp-p 75mVp-p
Temperature coefficient			±0.02% / ºC, max
Transient response recovery time	25% load step change		250uS
Over voltage protection (Zener diode clamp)	3.3V output 5V output 12V output 15V output		3.9V 6.2V 15V 18V
Over load protection	% of FL at nominal input		150% max
Short circuit protection			Hiccup, automatics recovery

INPUT SPECIFICATIONS

Input voltage range		12V nominal input 24V nominal input 48V nominal input	9 – 18VDC 18 – 36VDC 36 – 75VDC
Input filter			Pi type
Input surge voltage 100mS max		12V input 24V input 48V input	36VDC 50VDC 100VDC
Input reflected ripple (Note 2)	Nominal Vin and full load		20mAp-p
Start up time	Nominal Vin and constant resistive load	Power up	20mS typ
Remote ON/OFF (Note 3)			
(Positive logic)	DC-DC ON DC-DC OFF		Open or 3.5V < Vr < 12V Short or 0V < Vr < 1.2V
(Negative logic)	DC-DC ON DC-DC OFF		Short or 0V < Vr < 1.2V Open or 3.5V < Vr < 12V
Remote off input current	Nominal input		20mA

GENERAL SPECIFICATIONS

Efficiency		See table
Isolation voltage		1600VDC, min
Isolation resistance		10^9 ohms, min
Isolation capacitance		300pF, max
Switching frequency	Single output Dual output	500KHz, typ 300KHz, typ
Approvals and standard		IEC60950-1, UL60950-1, EN60950-1
Case material		Nickel-coated copper
Base material		Non-conductive black plastic
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 4)		2.041 x 10^6 hrs

ENVIRONMENTAL SPECIFICATIONS

Operating temperature range		-40ºC ~ +85ºC (with derating)
Maximum case temperature		100ºC
Storage temperature range		-55ºC ~ +105ºC
Thermal impedance (Note 5)	Nature convection Nature convection with heat-sink	12ºC/Watt 10ºC/Watt
Thermal shock		MIL-STD-810D
Vibration		10~55Hz, 10G, 30minutes along X,Y and Z
Relative humidity		5% to 95% RH

EMC CHARACTERISTICS

Conducted emissions	EN55022	Class A
Radiated emissions	EN55022	Class A
ESD	EN61000-4-2	Perf. Criteria B
Radiated immunity	EN61000-4-3	Perf. Criteria A
Fast transient	EN61000-4-4	Perf. Criteria B
Surge	EN61000-4-5	Perf. Criteria B
Conducted immunity	EN61000-4-6	Perf. Criteria A

15 WATTS DC-DC CONVERTER

Model Number	Input Range	Output Voltage	Output Current	Input Current (6)	Eff (7) (%)	Capacitor (8) Load max
FEC15-12S33	9 – 18 VDC	3.3 VDC	4000mA	1467mA	79	10200uF
FEC15-12S05	9 – 18 VDC	5 VDC	3000mA	1603mA	82	7050uF
FEC15-12S12	9 – 18 VDC	12 VDC	1250mA	1524mA	86	1035uF
FEC15-12S15	9 – 18 VDC	15 VDC	1000mA	1524mA	86	705uF
FEC15-12D05	9 – 18 VDC	± 5 VDC	± 1500mA	1582mA	83	± 1020uF
FEC15-12D12	9 – 18 VDC	± 12 VDC	± 625mA	1524mA	86	± 495uF
FEC15-12D15	9 – 18 VDC	± 15 VDC	± 500mA	1563mA	84	± 165uF
FEC15-24S33	18 – 36 VDC	3.3 VDC	4000mA	724mA	80	10200uF
FEC15-24S05	18 – 36 VDC	5 VDC	3000mA	781mA	84	7050uF
FEC15-24S12	18 – 36 VDC	12 VDC	1250mA	772mA	85	1035uF
FEC15-24S15	18 – 36 VDC	15 VDC	1000mA	772mA	85	705uF
FEC15-24D05	18 – 36 VDC	± 5 VDC	± 1500mA	781mA	84	± 1020uF
FEC15-24D12	18 – 36 VDC	± 12 VDC	± 625mA	762mA	86	± 495uF
FEC15-24D15	18 – 36 VDC	± 15 VDC	± 500mA	762mA	86	± 165uF
FEC15-48S33	36 – 75 VDC	3.3 VDC	4000mA	357mA	81	10200uF
FEC15-48S05	36 – 75 VDC	5 VDC	3000mA	396mA	83	7050uF
FEC15-48S12	36 – 75 VDC	12 VDC	1250mA	377mA	87	1035uF
FEC15-48S15	36 – 75 VDC	15 VDC	1000mA	381mA	86	705uF
FEC15-48D05	36 – 75 VDC	± 5 VDC	± 1500mA	386mA	85	± 1020uF
FEC15-48D12	36 – 75 VDC	± 12 VDC	± 625mA	372mA	88	± 495uF
FEC15-48D15	36 – 75 VDC	± 15 VDC	± 500mA	377mA	87	± 165uF

Note

1. The FEC15 series required a minimum 10% 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
2. Please add an external filter at converter input terminals when measuring input reflected ripple, as figure 1.
   L: Simulated source impedance of 12 μH C: Nippon chemi-con KMF series 100 μF/100V
3. The ON/OFF control is option function. There are positive logic and negative logic. The pin voltage is referenced to negative 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)
4. BELLCORE TR-NWT-000332. Case 1: 50% Stress, Temperature at 40ºC. (Ground fixed and controlled environment)
5. Heat sink is optional and P/N: 7G-0020A
6. Maximum value at nominal input voltage and full load
7. Typical value at nominal input voltage and full load
8. Test by minimum Vin and constant resistive load.

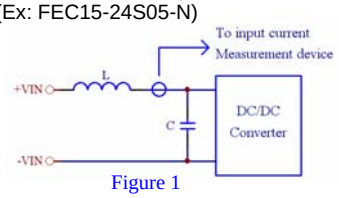
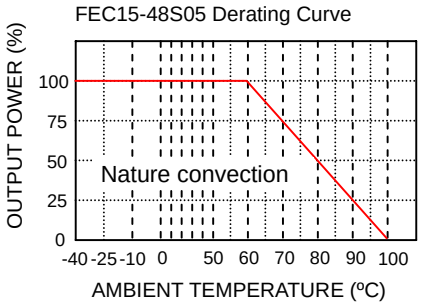
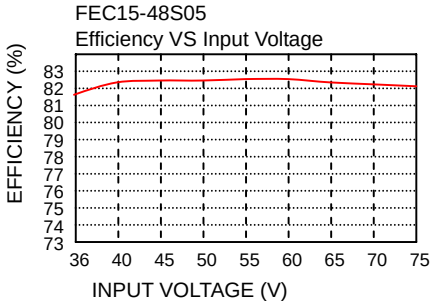
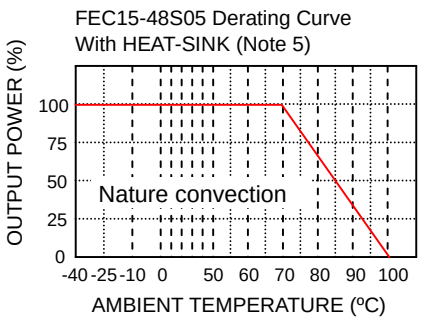


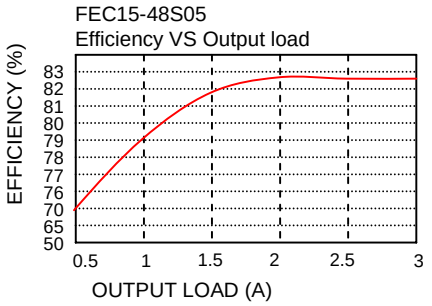
Figure 1

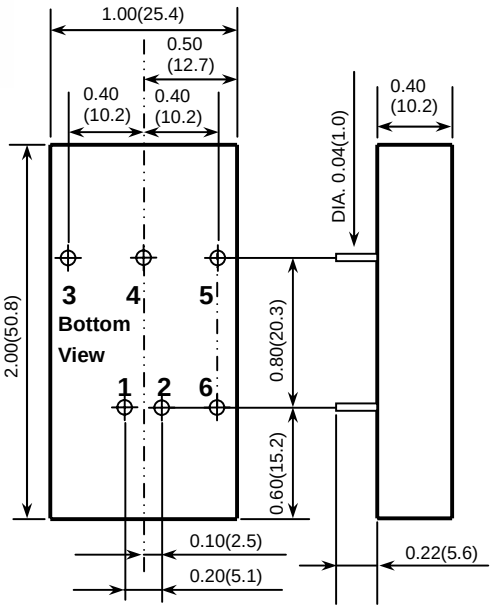
PIN CONNECTION		
PIN	SINGLE	DUAL
1	+ INPUT	+ INPUT
2	- INPUT	- INPUT
3	+ OUTPUT	+ OUTPUT
4	NO PIN	COMMON
5	- OUTPUT	- OUTPUT
6	CTRL (Option)	CTRL (Option)











1. All dimensions in Inches (mm)
   Tolerance x.xx±0.02(x.x±0.5)
2. Pin Pitch tolerance ±0.014(0.35)