



**POWER MATE  
TECHNOLOGY CO.,LTD.**

# FEC15-SERIES



**UL E193009  
TUV R2054607  
CB JPTUV-001421  
CE MARK**

- 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

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 and UL1950. 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 25°C 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		± 1%
Load regulation	10% to 100% FL	Single Dual	± 1% ± 2%
Cross regulation (Dual)	Asymmetrical load 25% / 100% FL		± 5%
Ripple and noise	20MHz bandwidth	Single Dual	50mVp-p 75mVp-p
Temperature coefficient			±0.02% / °C, max
Transient response recovery time	25% load step change		500uS
Over voltage protection (Zener diode clamp)	3.3V output		3.9V
	5V output		6.2V
	12V output		15V
	15V output		18V
Over load protection	% of FL at nominal input		150% typ
Short circuit protection			Hiccup, automatics recovery
INPUT SPECIFICATIONS			
Input voltage range	12V nominal input		9 – 18VDC
	24V nominal input		18 – 36VDC
	48V nominal input		36 – 75VDC
Input filter			Pi type
Input surge voltage 100mS max	12V input		36VDC
	24V input		50VDC
	48V input		100VDC
Input reflected ripple (Note 2)	Nominal Vin and full load		20mA <sub>p-p</sub>
Start up time	Nominal Vin and constant resistor load		20mS typ
Remote ON/OFF (Note 3) (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	
Remote off input current	Nominal input		2.5mA

GENERAL SPECIFICATIONS			
Efficiency			See table
Isolation voltage			1600VDC, min
Isolation resistance			10 <sup>9</sup> ohms, min
Isolation capacitance			300pF, max
Switching frequency	Single output		500KHz, typ
	Dual output		300KHz, typ
Approvals and standard			IEC60950, UL1950, EN60950
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 <sup>6</sup> hrs
ENVIRONMENTAL SPECIFICATIONS			
Operating temperature range			-40°C ~ +85°C (with derating)
Maximum case temperature			100°C
Storage temperature range			-55°C ~ +105°C
Thermal impedance (Note 5)	Nature convection		12°C/Watt
	Nature convection with heat-sink		10°C/Watt
Thermal shock			MIL-STD-810D
Vibration			10~55Hz, 2G, 30minutes along X,Y and Z
Relative humidity			5% to 95% RH
EMC CHARACTERISTICS			
Conducted emissions	EN55022		Level A
Radiated emissions	EN55022		Level A
ESD	EN61000-4-2		Perf. Criteria2
Radiated immunity	EN61000-4-3		Perf. Criteria2
Fast transient	EN61000-4-4		Perf. Criteria2
Surge	EN61000-4-5		Perf. Criteria2
Conducted immunity	EN61000-4-6		Perf. Criteria2



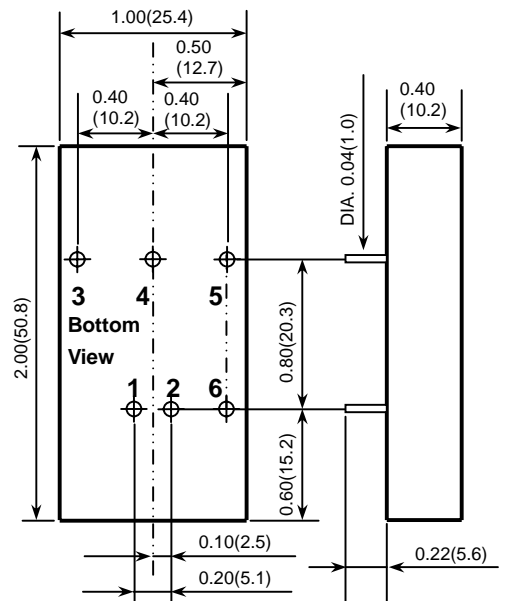
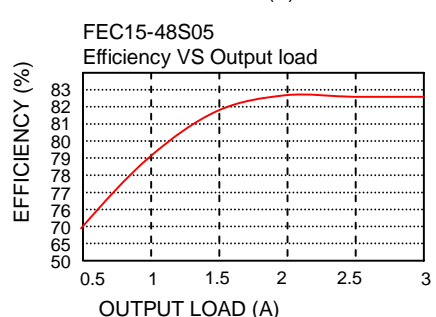
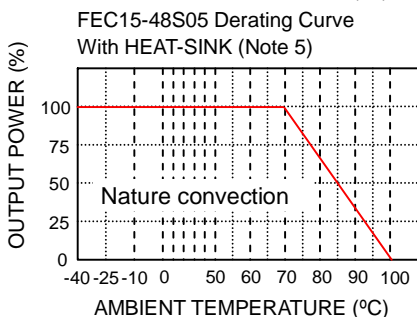
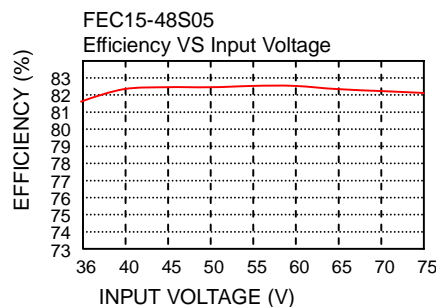
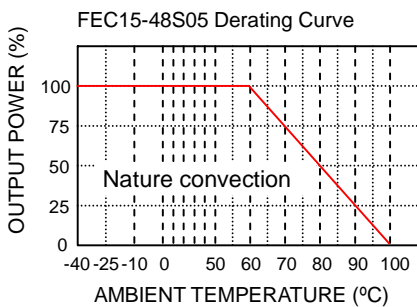
**15 WATTS  
DC-DC CONVERTER**

Model Number	Input Range	Output Voltage	Output Current	Input Current <sup>(6)</sup>	Eff <sup>(7)</sup> (%)	Capacitor <sup>(8)</sup> 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**

- 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
- Simulated source impedance of 12uH. 12uH inductor in series with +Vin.
- 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)
- BELLCORE TR-NWT-000332. Case I: 50% Stress, Temperature at 40°C. (Ground fixed and controlled environment)
- Heat sink is optional and P/N: 7G-0020A
- Maximum value at nominal input voltage and full load
- Typical value at nominal input voltage and full load
- Test by minimum Vin and constant resistor load.

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)



Note: 1. All dimensions in Inches (mm)  
2. Pin Pitch tolerance ±0.014(0.35)