



**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 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		± 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% / °C, max	
Transient response recovery time	25% load step change		250uS	
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% max	
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 _{p-p}	
Start up time	Nominal Vin and constant resistive load	Power up	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		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		-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, 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
	EN55022(Note 6)	Class B
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

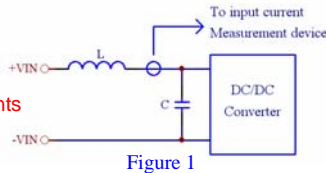


15 WATTS DC-DC CONVERTER

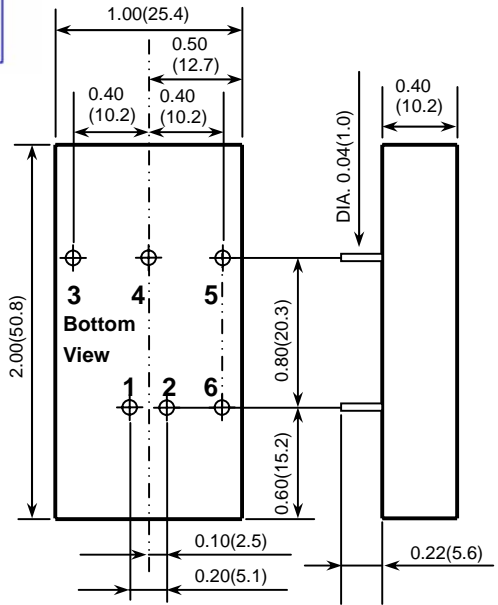
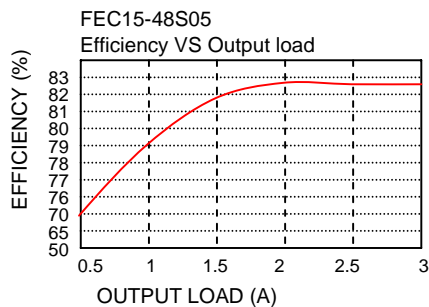
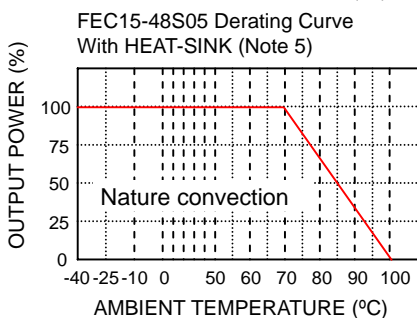
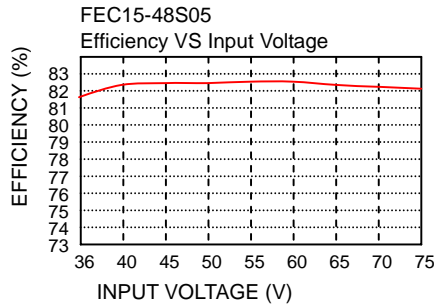
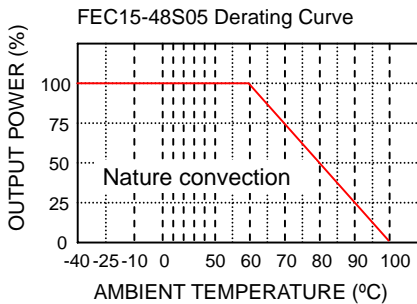
Model Number	Input Range	Output Voltage	Output Current	Input Current ⁽⁷⁾	Eff ⁽⁸⁾ (%)	Capacitor ⁽⁹⁾ Load max
FEC15-12S33	9 – 18 VDC	3.3 VDC	4000mA	1467mA	79	10200uF
FEC15-12S05	9 – 18 VDC	5 VDC	3000mA	1603mA	82	7050uF
FEC15-12S12	9 – 18 VDC	12 VDC	1250mA	1524mA	86	1035uF
FEC15-12S15	9 – 18 VDC	15 VDC	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
- 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
- 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 1: 50% Stress, Temperature at 40°C. (Ground fixed and controlled environment)
- Heat sink is optional and P/N: 7G-0020A
- The FEC15 meets EN55022 class B with external components connected before the input pin to the converter.**
- Maximum value at nominal input voltage and full load
- Typical value at nominal input voltage and full load
- Test by minimum Vin and constant resistive 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)



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