



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
- 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

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	Hiccup, automatics recovery		

GENERAL SPECIFICATIONS

Efficiency	See table		
Isolation voltage	Input to Output	1600VDC, min. 1minute	
	Input(Output) to case	1600VDC, min. 1minute	
Isolation resistance	10 ⁹ ohms, min.		
Isolation capacitance	300pF, max.		
Switching frequency	Single output	500KHz±10%	
	Dual output	300KHz±10%	
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 1)	BELLCORE TR-NWT-000332	2.041 x 10 ⁶ hrs	
	MIL-HDBK-217F	1.044 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 ~ +105°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	
ESD	EN61000-4-2	Air Contact	± 8KV
			± 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

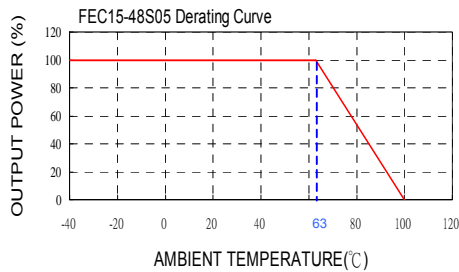


Model Number	Input Range	Output Voltage	Output Current		Output (4) Ripple & Noise	Input Current		Eff (4) (%)	Capacitor (5) Load max
			Min. load	Full load		No load (3)	Full load (2)		
FEC15-12S33	9 ~ 18 VDC	3.3 VDC	0mA	4000mA	50mVp-p	30mA	1467mA	79	10200μF
FEC15-12S05	9 ~ 18 VDC	5 VDC	15mA	3000mA	50mVp-p	25mA	1603mA	82	7050μF
FEC15-12S12	9 ~ 18 VDC	12 VDC	0mA	1250mA	50mVp-p	25mA	1524mA	86	1035μF
FEC15-12S15	9 ~ 18 VDC	15 VDC	0mA	1000mA	50mVp-p	20mA	1524mA	86	705μF
FEC15-12D05	9 ~ 18 VDC	± 5 VDC	0mA	± 1500mA	75mVp-p	20mA	1582mA	83	± 1020μF
FEC15-12D12	9 ~ 18 VDC	± 12 VDC	0mA	± 625mA	75mVp-p	30mA	1524mA	86	± 495μF
FEC15-12D15	9 ~ 18 VDC	± 15 VDC	±10mA	± 500mA	75mVp-p	35mA	1563mA	84	± 165μF
FEC15-24S33	18 ~ 36 VDC	3.3 VDC	0mA	4000mA	50mVp-p	15mA	724mA	80	10200μF
FEC15-24S05	18 ~ 36 VDC	5 VDC	15mA	3000mA	50mVp-p	10mA	781mA	84	7050μF
FEC15-24S12	18 ~ 36 VDC	12 VDC	0mA	1250mA	50mVp-p	20mA	772mA	85	1035μF
FEC15-24S15	18 ~ 36 VDC	15 VDC	10mA	1000mA	50mVp-p	15mA	772mA	85	705μF
FEC15-24D05	18 ~ 36 VDC	± 5 VDC	0mA	± 1500mA	75mVp-p	15mA	781mA	84	± 1020μF
FEC15-24D12	18 ~ 36 VDC	± 12 VDC	0mA	± 625mA	75mVp-p	25mA	762mA	86	± 495μF
FEC15-24D15	18 ~ 36 VDC	± 15 VDC	0mA	± 500mA	75mVp-p	25mA	762mA	86	± 165μF
FEC15-48S33	36 ~ 75 VDC	3.3 VDC	0mA	4000mA	50mVp-p	10mA	357mA	81	10200μF
FEC15-48S05	36 ~ 75 VDC	5 VDC	0mA	3000mA	50mVp-p	20mA	396mA	83	7050μF
FEC15-48S12	36 ~ 75 VDC	12 VDC	10mA	1250mA	50mVp-p	15mA	377mA	87	1035μF
FEC15-48S15	36 ~ 75 VDC	15 VDC	0mA	1000mA	50mVp-p	15mA	381mA	86	705μF
FEC15-48D05	36 ~ 75 VDC	± 5 VDC	0mA	± 1500mA	75mVp-p	10mA	386mA	85	± 1020μF
FEC15-48D12	36 ~ 75 VDC	± 12 VDC	0mA	± 625mA	75mVp-p	15mA	372mA	88	± 495μF
FEC15-48D15	36 ~ 75 VDC	± 15 VDC	0mA	± 500mA	75mVp-p	15mA	377mA	87	± 165μF

Note

- BELLCORE TR-NWT-000332. Case 1: 50% Stress, Temperature at 40°C. MIL-HDBK-217F Notice2 @Ta=25 °C, Full load(Ground, Benign, controlled environment).
- Maximum value at nominal input and full load
- Typical value at nominal input and no load.
- Typical value at nominal input and full load.
- Test by minimum input and constant resistive load.
- 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.
- 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)
- Heat-sink is optional and P/N: 7G-0020C-F.
- The FEC15 series can meet EN55022 Class A with parallel an external capacitor to the input pins.
Recommend: 12VDC input : 6.8μF/50V 1812 MLCC . 24VDC input : 2.2μF/50V 1812 MLCC . 48VDC input: 1.5μF/100V 1812 MLCC.
- 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.

CAUTION: This power module is not internally fused. An input line fuse must always be used.



FEC15-48S05 Derating Curve
With Heat-sink (Note 8)

