



FEATURES

- 40 WATTS MAXIMUM OUTPUT POWER
- OUTPUT CURRENT UP TO 10A
- STANDARD 2.00 X 2.00 X 0.40 INCH PACKAGE
- HIGH EFFICIENCY UP TO 89%
- 4:1 ULTRA WIDE INPUT VOLTAGE RANGE
- SIX-SIDED CONTINUOUS SHIELD
- FIXED SWITCHING FREQUENCY
- UL60950-1, EN60950-1, & IEC60950-1 SAFETY APPROVALS
- CE MARKED
- COMPLIANT TO RoHS II & REACH

OPTIONS

Negative logic Remote On/Off

APPLICATIONS

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

DESCRIPTION

The FEC40W series offer 40 watts of output power from a 2.00 x 2.00 x 0.40 inch package. The FEC40W series with 4:1 ultra wide input voltage of 9~36VDC and 18~75VDC and features 2000VDC of isolation, short-circuit and over-voltage protection.

TECHNICAL SPECIFICATION

All specifications are typical at nominal input, full load and 25°C otherwise noted

OUTPUT SPECIFICATIONS		
Output power		40 Watts, max.
Voltage accuracy		± 1%
Minimum load (Note 6)		See Table
Voltage adjustability (Note 7)	Single and Dual output	± 10%
Line regulation	LL to HL at Full Load	Single/Dual ± 0.2%
Load regulation (Note 8)	Min. Load to Full Load	Single ± 0.5% Dual ± 1%
Load cross regulation (Note 9)		Dual ± 5%
Ripple and noise	20MHz bandwidth	See table
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
Zener diode clamp	±12VDC output	±15VDC
	±15VDC output	±18VDC
Over load protection	% of FL at nominal input	150%, max.
Short circuit protection		Continuous, automatics recovery
GENERAL SPECIFICATIONS		
Efficiency		See table
Isolation voltage	Input to Output	1600VDC, min. 1minute
	Input(Output) to Case	1600VDC, min. 1minute
Case grounding		Connect case to -INPUT with decoupling Y Cap
Isolation resistance	500VDC	10 ⁹ ohms, min.
Isolation capacitance		2500pF, max.
Switching frequency		300kHz±10%
Safety approvals		IEC60950-1, UL60950-1, & EN60950-1
Case material		Nickel-coated copper
Base material		FR4 PCB
Potting material		Epoxy (UL94 V-0)
Dimensions		2.00 X 2.00 X 0.40 Inch (50.8 X 50.8 X 10.2 mm)
Weight		60g (2.11oz)
MTBF (Note 1)	MIL-HDBK-217F	6.617 x 10 ⁵ hrs

INPUT SPECIFICATIONS		
Input voltage range	24VDC nominal input	9 ~ 36VDC
	48VDC nominal input	18 ~ 75VDC
Input filter		Pi type
Input surge voltage	24VDC input	50VDC 100ms, max.
	48VDC input	100VDC 100ms, max.
Input reflected ripple current		20mA _{p-p}
Start up time	Nominal Vin and constant resistive load	Power up 20ms, max.
		Remote ON/OFF 20ms, max.
Start-up voltage	24VDC input	9VDC
	48VDC input	18VDC
Shutdown voltage	24VDC input	8VDC
	48VDC input	16VDC
Remote ON/OFF (Note 10)		
Positive logic (standard)	DC-DC ON	Open or 3V < Vr < 12V
	DC-DC OFF	Short or 0V < Vr < 1.2V
Negative logic (option)	DC-DC ON	Short or 0V < Vr < 1.2V
	DC-DC OFF	Open or 3V < Vr < 12V
Input current of remote control pin	Nominal input	-0.5mA ~ +0.5mA
Remote off state input current	24VDC input	10mA
	48VDC input	5mA
ENVIRONMENTAL SPECIFICATIONS		
Operating ambient temperature	-40°C ~ +50°C (without derating)	
	+50°C ~ +105°C (with derating)	
Maximum case temperature		+105°C
Storage temperature range		-55°C ~ +125°C
Over temperature protection		+110°C
Thermal impedance (Note 11)	Without Heat-sink	9.2°C/Watt
	With Heat-sink	7.6°C/Watt
Thermal shock		MIL-STD-810F
Vibration		MIL-STD-810F
Relative humidity		5% to 95% RH
EMC CHARACTERISTICS		
EMI (Note 12)	EN55022	Class A, Class B
ESD	EN61000-4-2	Air ± 8kV Perf. Criteria A
		Contact ± 6kV Perf. Criteria A
Radiated immunity	EN61000-4-3	10 V/m Perf. Criteria A
Fast transient (Note 13)	EN61000-4-4	± 2kV Perf. Criteria B
Surge (Note 13)	EN61000-4-5	± 1kV Perf. Criteria A
Conducted immunity	EN61000-4-6	10 Vr.m.s Perf. Criteria A

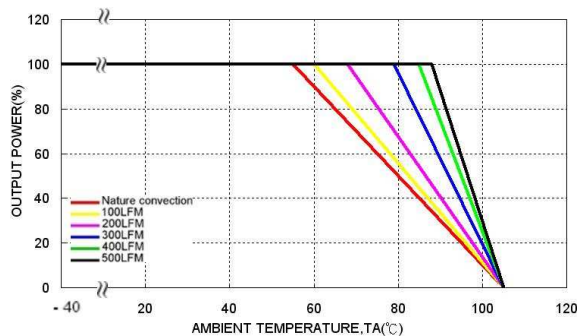
Model Number	Input Range	Output Voltage	Output Current		Output ⁽²⁾ Ripple & Noise	No load ⁽³⁾ Input Current	Eff ⁽⁴⁾ (%)	Capacitor ⁽⁵⁾ Load max
			Min. load	Full load				
FEC40-24S3P3W	9 ~ 36 VDC	3.3 VDC	0mA	10000mA	50mVp-p	75mA	87	25750μF
FEC40-24S05W	9 ~ 36 VDC	5 VDC	0mA	8000mA	50mVp-p	95mA	88	13600μF
FEC40-24S12W	9 ~ 36 VDC	12 VDC	50mA	3333mA	75mVp-p	50mA	87	2360μF
FEC40-24S15W	9 ~ 36 VDC	15 VDC	50mA	2666mA	75mVp-p	50mA	87	1510μF
FEC40-24D12W	9 ~ 36 VDC	± 12 VDC	±65 mA	± 1667mA	120mVp-p	60mA	86	± 1200μF
FEC40-24D15W	9 ~ 36 VDC	± 15 VDC	±50 mA	± 1333mA	150mVp-p	70mA	86	± 750μF
FEC40-48S3P3W	18 ~ 75 VDC	3.3 VDC	0mA	10000mA	50mVp-p	55mA	87	25750μF
FEC40-48S05W	18 ~ 75 VDC	5 VDC	0mA	8000mA	50mVp-p	60mA	89	13600μF
FEC40-48S12W	18 ~ 75 VDC	12 VDC	50mA	3333mA	75mVp-p	30mA	87	2360μF
FEC40-48S15W	18 ~ 75 VDC	15 VDC	50mA	2666mA	75mVp-p	25mA	88	1510μF
FEC40-48D12W	18 ~ 75 VDC	± 12 VDC	±65 mA	± 1667mA	120mVp-p	30mA	86	± 1200μF
FEC40-48D15W	18 ~ 75 VDC	± 15 VDC	±60 mA	± 1333mA	150mVp-p	30mA	86	± 750μF

Note

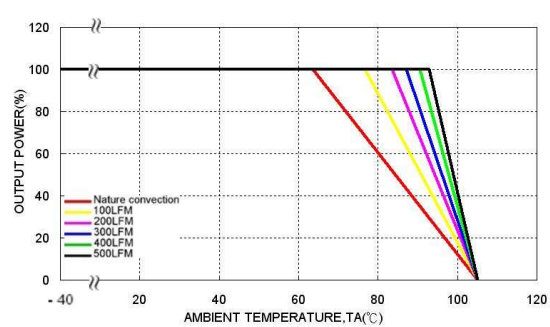
- MIL-HDBK-217F @Tc=70 °C, Full load.
- Typical value at nominal input and full load. (20MHz BW.)
- Typical value at nominal input and no load.
- Typical value at nominal input and full load.
- Test by minimum input and constant resistive load.
- The output requires minimum loading on the output to maintain specified regulation. Operation under no-load condition will not damage these devices, however they may not meet all listed specification.
- For the single output: Maximum output deviation is 10% inclusive of remote sense and trim. If remote sense is not being used, the +SENSE should be connected to its corresponding +OUTPUT and likewise the -SENSE should be connected to its corresponding -OUTPUT.
- Load regulation for dual output : Min load to 100% load balanced on all outputs.
- Cross regulation for dual output : asymmetrical load 25% / 100% FL
- The CTRL pin voltage is referenced to -INPUT
To order negative logic ON/OFF control add the suffix-N (Ex: FEC40-24S05W-N).
- Heat-sink is optional and P/N : 7G-0026C-F.
- The FEC40W series standard module meets EN55022 Class A and Class B with external components.
For more detail information, please contact with P-DUKE.
- 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, 220μF/100V.

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

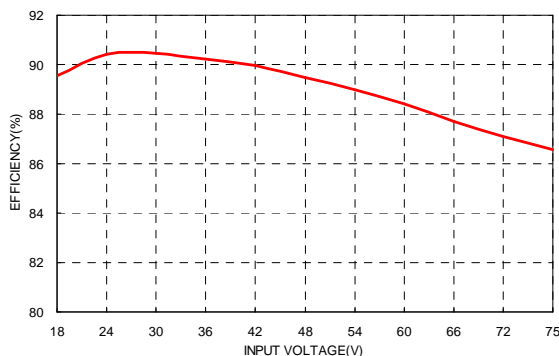
FEC40-48S05W Derating Curve



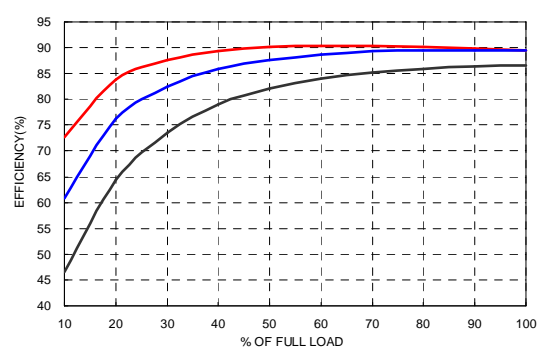
FEC40-48S05W Derating Curve With Heat-sink(Note 11)



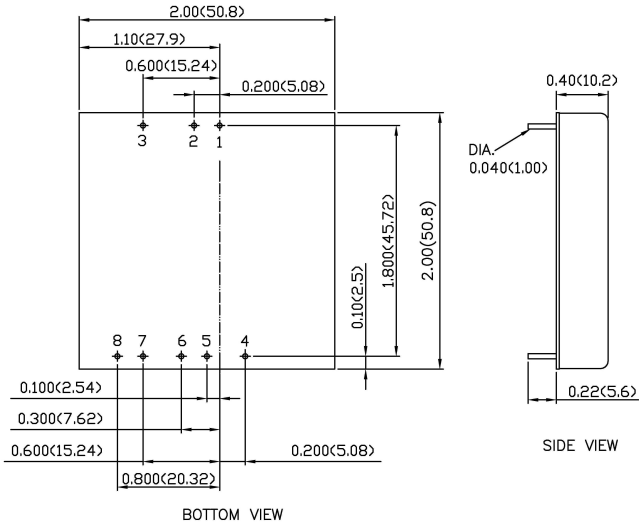
FEC40-48S05W Efficiency VS Input Voltage



FEC40-48S05W Efficiency VS Output Load



MECHANICAL DRAWING



1. All dimensions in Inch (mm)
Tolerance: X.XX±0.02 (X.X±0.5)
X.XXX±0.01 (X.XX±0.25)
2. Pin pitch tolerance ±0.014(0.35)
3. Pin dimension tolerance ±0.004 (0.1)

PIN CONNECTION		
PIN	SINGLE	DUAL
1	+INPUT	+INPUT
2	-INPUT	-INPUT
3	CTRL	CTRL
4	-SENSE	+OUTPUT
5	+SENSE	COM
6	+OUTPUT	COM
7	-OUTPUT	-OUTPUT
8	TRIM	TRIM

EXTERNAL OUTPUT TRIMMING

Output can be externally trimmed by using the method shown below.
() for dual output trim

