

FEC40W SERIES

DC-DC CONVERTER

4 : 1 ULTRA WIDE INPUT RANGE
UP TO 40Watts



FEATURES

- 1600VDC INPUT TO OUTPUT ISOLATION
- STANDARD 2.00 X 2.00 X 0.40 INCH
- SIX-SIDED CONTINUOUS SHIELD
- UL60950-1, EN60950-1, & IEC60950-1 SAFETY APPROVALS
- CE MARKED
- COMPLIANT TO RoHS II & REACH

APPLICATIONS

- WIRELESS NETWORK
- TELECOM/DATACOM
- INDUSTRY CONTROL SYSTEM
- DISTRIBUTED POWER ARCHITECTURES
- SEMICONDUCTOR EQUIPMENT

1600VDC ISOLATION	REMOTE CONTROL	UVP	OCP	SCP	OVP	OTP
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TECHNICAL SPECIFICATION

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

Model Number	Input Range	Output Voltage	Output Current @ Full Load		Input Current @ No Load	Efficiency	Maximum Capacitor Load (2)
	VDC	VDC	Min. Load (1) mA	Full Load A	mA	%	µF
FEC40-24S3P3W	9 ~ 36	3.3	0	10	75	87	25750
FEC40-24S05W	9 ~ 36	5	0	8	95	88	13600
FEC40-24S12W	9 ~ 36	12	50	3.33	50	87	2360
FEC40-24S15W	9 ~ 36	15	50	2.67	50	87	1510
FEC40-24D12W	9 ~ 36	±12	±65	±1.67	60	86	±1200
FEC40-24D15W	9 ~ 36	±15	±50	±1.33	70	86	±750
FEC40-48S3P3W	18 ~ 75	3.3	0	10	55	87	25750
FEC40-48S05W	18 ~ 75	5	0	8	60	89	13600
FEC40-48S12W	18 ~ 75	12	50	3.33	30	87	2360
FEC40-48S15W	18 ~ 75	15	50	2.67	25	88	1510
FEC40-48D12W	18 ~ 75	±12	±65	±1.67	30	87	±1200
FEC40-48D15W	18 ~ 75	±15	±60	±1.33	30	86	±750

PART NUMBER STRUCTURE

FEC40	-	48	S	05	W	-	N	HS
Series Name		Input Voltage (VDC)	Output Quantity	Output Voltage (VDC)	Input Range		Remote Control Option	Assembly Option
		24: 9~36 48: 18~75	S: Single	3P3: 3.3 05: 5 12: 12 15: 15	4:1		□: Positive logic N: Negative logic	□: None HS: Heat-sink HC: Heat-sink & Clamp
			D: Dual	12: ±12 15: ±15				

INPUT SPECIFICATIONS

Parameter	Conditions		Min.	Typ.	Max.	Unit	
Operating input voltage range	24Vin(nom)		9	24	36	VDC	
	48Vin(nom)		18	48	75		
Input reflected ripple current			20			mAp-p	
Start up voltage	24Vin(nom)					VDC	
	48Vin(nom)		9 18				
Shutdown voltage	24Vin(nom)		8			VDC	
	48Vin(nom)		16				
Start up time	Constant resistive load	Power up	20			ms	
		Remote ON/OFF	20				
Input surge voltage	100 ms, max.	24Vin(nom)	50			VDC	
		48Vin(nom)	100				
Input filter	Advice Electronics Ltd		Pi type				
Remote ON/OFF Advice Building, 16 Atir Yeda St., Kfar Saba, 4464321, Israel • Tel: +972-3-9000910 • sales@advice.co.il • www.advice.co.il	Referred to -Vin pin	Positive logic (Standard)	DC-DC ON	Open or 3 ~ 12VDC			mA
			DC-DC OFF	Short or 0 ~ 1.2VDC			
		Negative logic (Option)	DC-DC ON	Short or 0 ~ 1.2VDC			
			DC-DC OFF	Open or 3 ~ 12VDC			
		Input current of Ctrl pin		-0.5		+0.5	
Remote off	24Vin(nom)		10				
input current	48Vin(nom)		5				

OUTPUT SPECIFICATIONS

Parameter	Conditions		Min.	Typ.	Max.	Unit
Voltage accuracy			-1.0		+1.0	%
Line regulation	Low Line to High Line at Full Load		-0.2		+0.2	%
Load regulation	Min. Load to Full Load	Single	-0.5		+0.5	%
		Dual	-1.0		+1.0	
Cross regulation	Asymmetrical load 25%/100% FL	Dual	-5.0		+5.0	%
Voltage adjustability ⁽³⁾			-10		+10	%
Ripple and noise	20MHz bandwidth	Single	3.3Vout, 5Vout	50		mVp-p
			12Vout, 15Vout	75		
		Dual	12Vout	120		
			15Vout	150		
Temperature coefficient			-0.02		+0.02	%/°C
Transient response recovery time	25% load step change			250		µs
Over voltage protection	Zener diode clamp	3.3Vout		3.9		VDC
		5Vout		6.2		
		12Vout		15		
		15Vout		18		
Over load protection	% of Iout rated				150	%
Short circuit protection			Continuous, automatic recovery			

GENERAL SPECIFICATIONS

Parameter	Conditions		Min.	Typ.	Max.	Unit
Isolation voltage	1 minute	Input to Output	1600			VDC
		Input (Output) to Case	1600			
Case grounding	Connect case to -Vin with decoupling Y Cap					
Isolation resistance	500VDC		1			GΩ
Isolation capacitance					2500	pF
Switching frequency			270	300	330	kHz
Safety approvals			UL60950-1 EN60950-1 IEC60950-1			
Case material			Nickel-coated copper			
Base material			FR4 PCB			
Potting material			Epoxy (UL94 V-0)			
Weight			60g (2.11oz)			
MTBF	MIL-HDBK-217F, Full load		6.617 x 10 ⁵ hrs			

ENVIRONMENTAL SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating ambient temperature	Without derating	-40		+50	°C
	With derating	+50		+105	
Maximum case temperature				+105	°C
Over temperature protection			+110		°C
Storage temperature range		-55		+125	°C
Thermal impedance	Natural convection (20LFM)	Without heat-sink	9.2		°C/W
		With heat-sink	7.6		
Thermal shock					MIL-STD-810F
Vibration					MIL-STD-810F
Relative humidity					5% to 95% RH

EMC SPECIFICATIONS

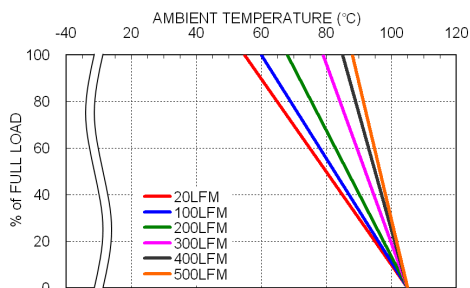
Parameter	Conditions	Level
EMI ⁽⁴⁾	EN55022	Class A, Class B
ESD	EN61000-4-2 Air ± 8kV and Contact ± 6kV	Perf. Criteria A
Radiated immunity	EN61000-4-3 10 V/m	Perf. Criteria A
Fast transient ⁽⁵⁾	EN61000-4-4 ±2kV	Perf. Criteria B
Surge ⁽⁵⁾	EN61000-4-5 ±1kV	Perf. Criteria A
Conducted immunity	EN61000-4-6 10 Vr.m.s	Perf. Criteria A
Power frequency magnetic field	EN61000-4-8 100A/m continuous; 1000A/m 1 second	Perf. Criteria A

Note:

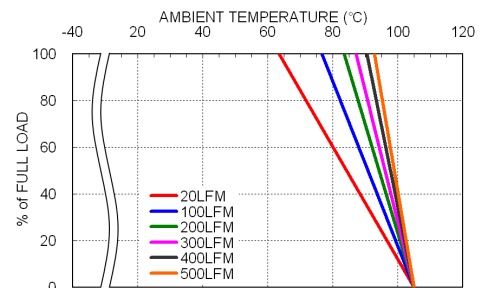
- The output requires a minimum loading on the output to maintain specified regulation. Operation under no-load condition will not damage these devices, however they may not meet all listed specification.
- Test by minimum input and constant resistive load.
- For the single output: Maximum output deviation is 10% inclusive of remote sense and trim. If remote sense is not being used, the +Sense should be connected to its corresponding +Vout and likewise the -Sense should be connected to its corresponding -Vout.
- The standard module meets EN55022 Class A and Class B with external components. For further 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.

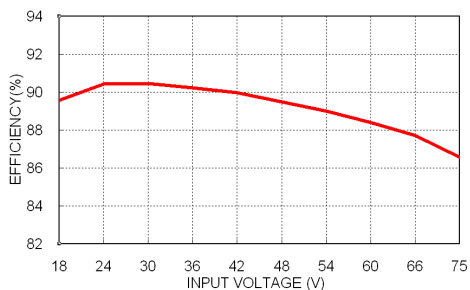
CHARACTERISTIC CURVE



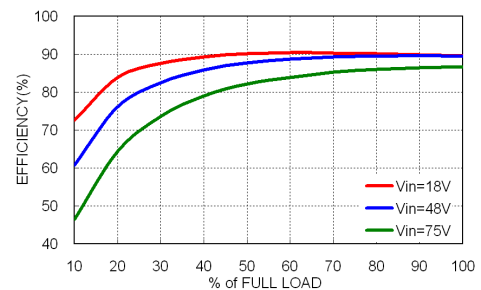
FEC40-48S05W Derating Curve



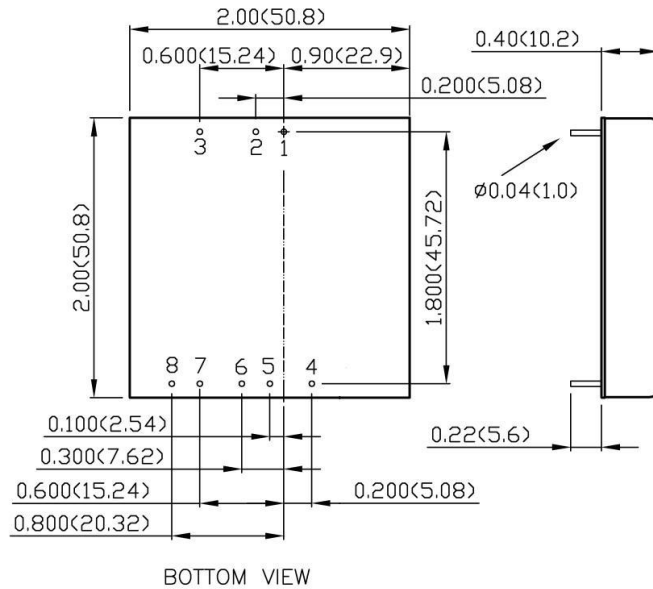
FEC40-48S05W Derating Curve With Heat-sink



FEC40-48S05W Efficiency vs. Input Voltage



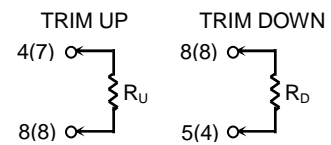
FEC40-48S05W Efficiency vs. Output Load

MECHANICAL DRAWING

PIN CONNECTION

PIN	SINGLE	DUAL
1	+Vin	+Vin
2	-Vin	-Vin
3	Ctrl	Ctrl
4	-Sense ⁽³⁾	+Vout
5	+Sense ⁽³⁾	Common
6	+Vout	Common
7	-Vout	-Vout
8	Trim	Trim

EXTERNAL OUTPUT TRIMMING

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



1. All dimensions in inch (mm)
2. Tolerance :x.xx±0.02 (x.x±0.5)
x.xxx±0.01 (x.xx±0.25)
3. Pin pitch tolerance ±0.01 (0.25)
4. Pin dimension tolerance ±0.004(0.1)