

FED40 SERIES

DC-DC CONVERTER

2:1 WIDE INPUT RANGE
UP TO 40 Watts



FEATURES

- NO MINIMUM LOAD REQUIRED
- 1600VDC INPUT TO OUTPUT ISOLATION
- STANDARD 2.00 X 1.00 X 0.40 INCH
- SIX-SIDED CONTINUOUS SHIELD
- SAFETY MEETS UL60950-1, EN60950-1, IEC60950-1, & EN50155
- 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	LOW STANDBY POWER
----------------------	-------------------	-----	-----	-----	-----	-----	-------------------------

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 (1)
	VDC	VDC	mA	mA	%	μF
FED40-12S3P3	9 ~ 18	3.3	10000	20	90	26600
FED40-12S05	9 ~ 18	5	8000	20	91	20000
FED40-12S12	9 ~ 18	12	3333	20	91	3900
FED40-12S15	9 ~ 18	15	2666	20	91	2600
FED40-12S24	9 ~ 18	24	1666	20	91	1300
FED40-12D12	9 ~ 18	±12	±1666	20	90	± 2600
FED40-12D15	9 ~ 18	±15	±1333	20	91	± 1600
FED40-12D24	9 ~ 18	±24	±833	20	91	±650
FED40-24S3P3	18 ~ 36	3.3	10000	15	91	26600
FED40-24S05	18 ~ 36	5	8000	15	92	20000
FED40-24S12	18 ~ 36	12	3333	15	92	3900
FED40-24S15	18 ~ 36	15	2666	15	92	2600
FED40-24S24	18 ~ 36	24	1666	15	91	1300
FED40-24D12	18 ~ 36	±12	±1666	15	90	± 2600
FED40-24D15	18 ~ 36	±15	±1333	15	91	± 1600
FED40-24D24	18 ~ 36	±24	±833	15	91	±650
FED40-48S3P3	36 ~ 75	3.3	10000	10	91	26600
FED40-48S05	36 ~ 75	5	8000	10	92	20000
FED40-48S12	36 ~ 75	12	3333	10	92	3900
FED40-48S15	36 ~ 75	15	2666	10	92	2600
FED40-48S24	36 ~ 75	24	1666	10	92	1300
FED40-48D12	36 ~ 75	±12	±1666	10	91	± 2600
FED40-48D15	36 ~ 75	±15	±1333	10	91	± 1600
FED40-48D24	36 ~ 75	±24	±833	10	90	±650

PART NUMBER STRUCTURE

FED40	-	48	S	05	-	N	HS
Series Name		Input Voltage (VDC)	Output Quantity	Output Voltage (VDC)		Remote Control options	Heat-sink
		12: 9~18 24: 18~36 48: 36~75	S: Single D: Dual	3P3: 3.3 05: 5 12: 12 15: 15 24: 24 12: ±12 15: ±15 24: ±24		□: Positive logic N: Negative logic	□: No Heat-sink HS: Heat-sink HC: Heat-sink with Clamp

INPUT SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating input voltage range	12Vin(nom) 24Vin(nom) 48Vin(nom)	9 18 36	12 24 48	18 36 75	VDC
Start-up voltage	12Vin(nom) 24Vin(nom) 48Vin(nom)			9 18 36	VDC
Shutdown voltage	12Vin(nom) 24Vin(nom) 48Vin(nom)		8 16 32		VDC
Start up time	Constant resistive load Power up Remote ON/OFF		60 60		ms
Input surge voltage	1 second, max. 12Vin(nom) 24Vin(nom) 48Vin(nom)			25 50 100	VDC
Input filter				Pi type	
Remote ON/OFF	Referred to -Vin pin Positive logic DC-DC ON (Standard) DC-DC OFF Negative logic DC-DC ON (Option) DC-DC OFF Input current of Ctrl pin Remote off input current	-0.5		0.5	mA mA

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	No Load to Full Load Single Dual	-0.5 -1.0		+0.5 +1.0	%
Cross regulation	Asymmetrical load 25%/100% FL Dual	-5.0		+5.0	%
Voltage adjustability	Single output 3.3Vout, 5Vout, 12Vout 15Vout, 24Vout	-10 -10		+10 +20	%
Ripple and noise	Measured by 20MHz bandwidth With a 0.1μF/50V X7R MLCC 3.3Vout, 5Vout 12Vout, 15Vout 24Vout		75 100 150	100 125 200	mVp-p
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 5Vout 12Vout 15Vout 24Vout		3.9 6.2 15 20 30		VDC
Over load protection	% of Iout rated; Hiccup mode		150		%
Short circuit protection				Continuous, automatic recovery	

GENERAL SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Isolation voltage	1 minute Input to Output Input (Output) to Case	1600 1600			VDC
Isolation resistance	500VDC	1			GΩ
Isolation capacitance				1500	pF
Switching frequency		225	250	275	kHz
Safety meets				UL60950-1 EN60950-1 IEC60950-1	
Case material				Copper	
Base material				FR4 PCB	
Potting material				Silicone (UL94 V-0)	
Weight				32g (1.13oz)	
MTBF	MIL-HDBK-217F, Full load.			1.066 x 10 ⁶	hrs

ENVIRONMENTAL SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating ambient temperature		-40		+85	°C
Maximum case temperature				+105	°C
Over temperature protection			+115		°C
Storage temperature range		-55		+125	°C
Thermal impedance	Vertical direction by natural convection (20LFM) Without Heat-sink With Heat-sink		10.8 10.3		°C/W
Thermal shock					MIL-STD-810F
Vibration					MIL-STD-810F
Relative humidity					5% to 95% RH

EMC SPECIFICATIONS

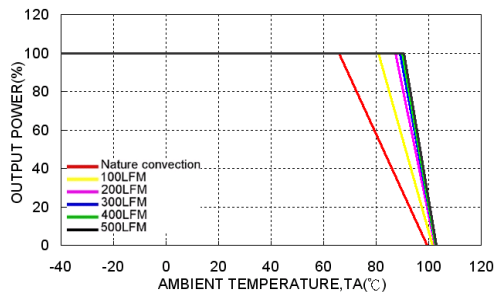
Parameter	Conditions	Level
EMI ⁽²⁾	EN55022	Class A
ESD	EN61000-4-2 Air ± 8kV and Contact ± 6kV	Perf. Criteria A
Radiated immunity	EN61000-4-3 20 V/m	Perf. Criteria A
Fast transient ⁽³⁾	EN61000-4-4 ± 2kV	Perf. Criteria A
Surge ⁽³⁾	EN61000-4-5 ± 2kV	Perf. Criteria A
Conducted immunity	EN61000-4-6 10 Vr.m.s	Perf. Criteria A

Note:

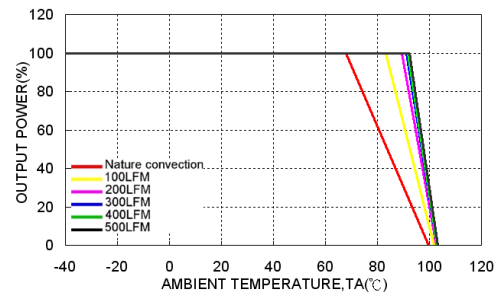
- Test by minimum input and constant resistive load.
- The standard modules meets EMI Class A or Class B with external components. For further information, please contact with P-DUKE.
- The external input components are required if the module has to meet EN61000-4-4, EN61000-4-5.
The FED40-12□□□ recommended an aluminum electrolytic capacitor (Nippon chemi-con KY series, 220μF/100V) and a TVS (SMDJ58A, 58V, 3000Watt peak pulse power) to connect in parallel.
The FED40-24□□□ recommended an aluminum electrolytic capacitor (Nippon chemi-con KY series, 220μF/100V) and a TVS (SMDJ64A, 64V, 3000Watt peak pulse power) to connect in parallel.
The FED40-48□□□ recommended an aluminum electrolytic capacitor (Nippon chemi-con KY series, 220μF/100V) and a TVS (SMDJ120A, 120V, 3000Watt peak pulse power) to connect in parallel.

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

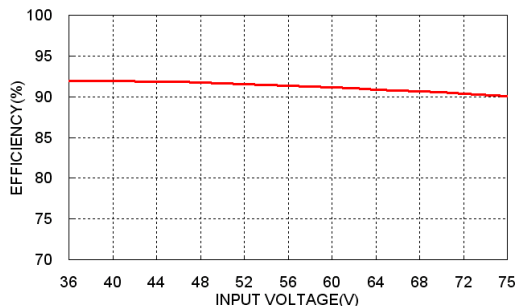
CHARACTERISTIC CURVE



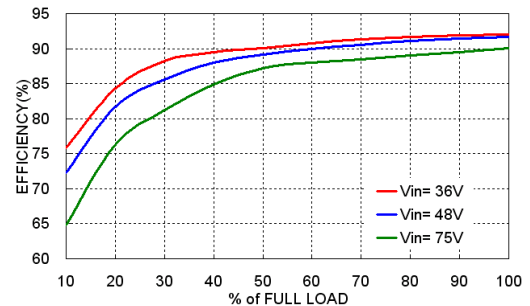
FED40-48S05 Derating Curve



FED40-48S05 Derating Curve with Heat-sink

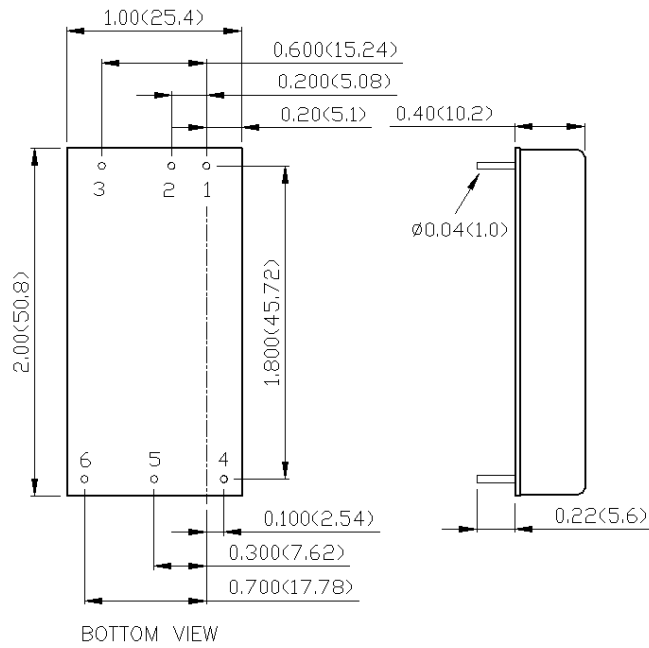


FED40-48S05 Efficiency VS Input Voltage



FED40-48S05 Efficiency VS Output Load

MECHANICAL DRAWING

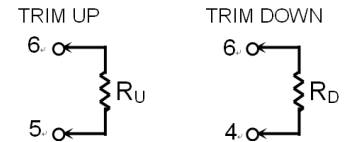


PIN CONNECTION

PIN	SINGLE	DUAL
1	+ Vin	+ Vin
2	- Vin	- Vin
3	Ctrl	Ctrl
4	+ Vout	+ Vout
5	- Vout	Common
6	Trim	- Vout

EXTERNAL OUTPUT TRIMMING

Output can be externally trimmed by using the method shown below.



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)