

FED30 SERIES

DC-DC CONVERTER

2:1 WIDE INPUT RANGE
UP TO 30Watts



FEATURES

- NO MINIMUM LOAD REQUIRED
- 1600VDC INPUT TO OUTPUT ISOLATION
- STANDARD 2.00 X 1.00 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 (1)
	VDC	VDC	A	mA		
FED30-12S1P5	9 ~ 18	1.5	8.5	70	79	20000
FED30-12S2P5	9 ~ 18	2.5	8	100	84	20000
FED30-12S3P3	9 ~ 18	3.3	8	90	85	20000
FED30-12S05	9 ~ 18	5	6	130	87	14400
FED30-12S5P1	9 ~ 18	5.1	6	130	87	14400
FED30-12S12	9 ~ 18	12	2.5	90	89	3000
FED30-12S15	9 ~ 18	15	2	80	89	2000
FED30-12D05	9 ~ 18	±5	±3	90	87	±3000
FED30-12D12	9 ~ 18	±12	±1.25	50	87	±2000
FED30-12D15	9 ~ 18	±15	±1	40	87	±1300
FED30-24S1P5	18 ~ 36	1.5	8.5	50	80	20000
FED30-24S2P5	18 ~ 36	2.5	8	50	85	20000
FED30-24S3P3	18 ~ 36	3.3	8	50	87	20000
FED30-24S05	18 ~ 36	5	6	75	90	14400
FED30-24S5P1	18 ~ 36	5.1	6	75	90	14400
FED30-24S12	18 ~ 36	12	2.5	40	91	3000
FED30-24S15	18 ~ 36	15	2	30	91	2000
FED30-24D05	18 ~ 36	±5	±3	70	90	±3000
FED30-24D12	18 ~ 36	±12	±1.25	30	89	±2000
FED30-24D15	18 ~ 36	±15	±1	30	90	±1300
FED30-48S1P5	36 ~ 75	1.5	8.5	45	80	20000
FED30-48S2P5	36 ~ 75	2.5	8	45	85	20000
FED30-48S3P3	36 ~ 75	3.3	8	30	87	20000
FED30-48S05	36 ~ 75	5	6	45	90	14400
FED30-48S5P1	36 ~ 75	5.1	6	45	89	14400
FED30-48S12	36 ~ 75	12	2.5	40	91	3000
FED30-48S15	36 ~ 75	15	2	40	91	2000
FED30-48D05	36 ~ 75	±5	±3	35	90	±3000
FED30-48D12	36 ~ 75	±12	±1.25	30	88	±2000
FED30-48D15	36 ~ 75	±15	±1	20	89	±1300

PART NUMBER STRUCTURE
FED30 - 48 S 05 - N HS

Series Name	Input Voltage (VDC)	Output Quantity	Output Voltage (VDC)	Remote Control Option	Assembly Option
	12: 9-18 24: 18-36 48: 36-75	S: Single D: Dual	1P5: 1.5 2P5: 2.5 3P3: 3.3 05: 5 5P1: 5.1 12: 12 15: 15 05: ±5 12: ±12 15: ±15	<input type="checkbox"/> : Positive logic N: Negative logic	<input type="checkbox"/> : None 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
Input reflected ripple current	Nominal input and Full load		20		mAp-p
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		30 30		ms
Input surge voltage	100 ms, max. 12Vin(nom) 24Vin(nom) 48Vin(nom)			25 50 100	VDC
Input filter				Pi type	
Remote ON/OFF	Referred to -Vin pin Positive logic (Standard) Negative logic (Option) Input current of Ctrl pin Remote off input current			Open or 3 ~ 12VDC Short or 0 ~ 1.2VDC Short or 0 ~ 1.2VDC Open or 3 ~ 12VDC	-0.5 3.0 +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	-10		+10	%
Ripple and noise	Measured by 20MHz bandwidth With a 1µF/50V MLCC 12Vout, 15Vout		100 150		mVp-p
Temperature coefficient		-0.02		+0.02	%/°C
Transient response recovery time	25% load step change		250		µs
Over voltage protection	1.5Vout 2.5Vout 3.3Vout 5Vout, 5.1Vout 12Vout 15Vout		2.0 3.3 3.9 6.2 15 18		VDC
Over load protection	% of lout rated		150		%
Short circuit protection			Continuous, automatics recovery		

GENERAL SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Isolation voltage	1 minute Input to Output Input(Output) to Case	1600 1600			VDC
Case grounding		Connect case to -Vin with decoupling Y Cap			
Isolation resistance	500VDC	1			GΩ
Isolation capacitance				1500	pF
Switching frequency		387	430	473	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					30.5g (1.07oz)
MTBF	MIL-HDBK-217F, Full load				1.453 x 10 ⁶ hrs

ENVIRONMENTAL SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating ambient temperature	Without derating With derating	-40 +50		+50 +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		12 10		°C/W
Thermal shock					MIL-STD-810F
Vibration					MIL-STD-810F
Relative humidity					5% to 95% RH

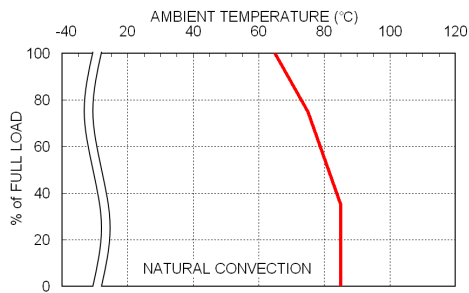
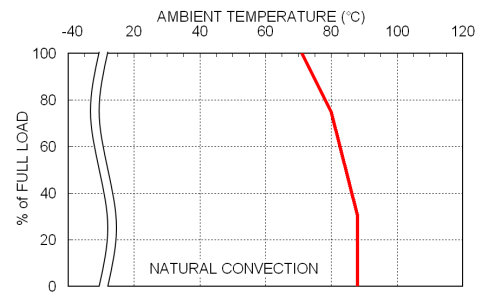
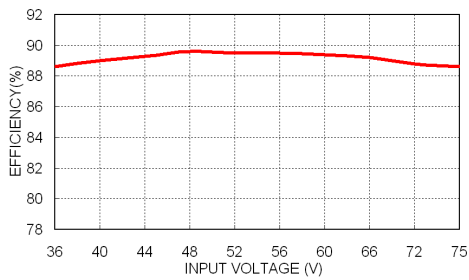
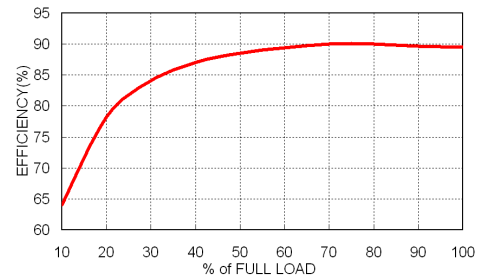
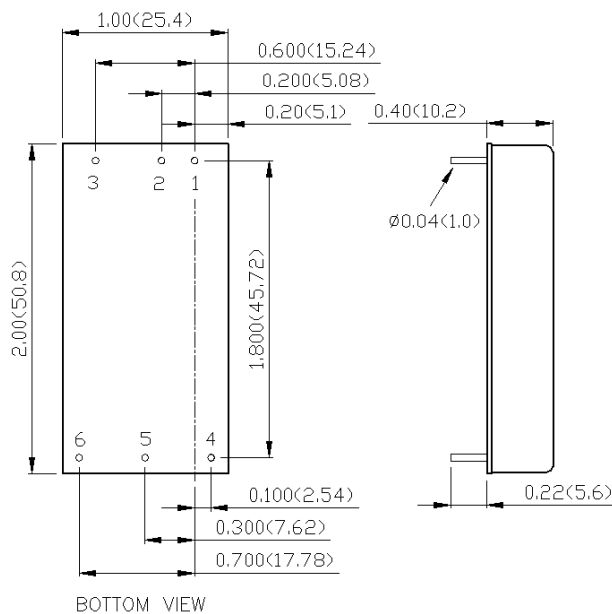
EMC SPECIFICATIONS

Parameter	Conditions	Level
EMI ⁽²⁾	EN55022	Class A, 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 ⁽³⁾	EN61000-4-4 ± 2kV	Perf. Criteria A
Surge ⁽³⁾	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:

- Test by minimum input and constant resistive load.
- The standard module meet 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: 12VDC input & 24VDC input Nippon chemi-con KY series, 330µF/50V
48VDC input Nippon chemi-con KY series, 220µF/100V

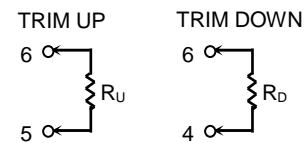
CAUTION: This power module is not internally fused. An input line fuse must always be used.

CHARACTERISTIC CURVE

FED30-48S05 Derating Curve

FED30-48S05 Derating Curve With Heat-sink

FED30-48S05 Efficiency vs. Input Voltage

FED30-48S05 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)