



FEATURES

- 20 WATTS MAXIMUM OUTPUT POWER
- OUTPUT CURRENT UP TO 5.5A
- STANDARD 2.00 X 1.00 X 0.40 INCH PACKAGE
- HIGH EFFICIENCY UP TO 89%
- 4:1 ULTRA WIDE INPUT VOLTAGE RANGE
- SIX-SIDED CONTINUOUS SHIELD
- FIXED SWITCHING FREQUENCY
- CE MARK MEETS 2006/95/EC, 2011/95/EC AND 2004/108/EC
- SAFETY MEETS UL60950-1, EN60950-1 AND IEC60950-1
- ISO9001 CERTIFIED MANUFACTURING FACILITIES
- COMPLIANT TO RoHS EU DIRECTIVE 2011/65/EU

OPTIONS

Negative logic Remote On/Off

APPLICATIONS

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

DESCRIPTION

The FED20W series offer 20 watts of output power from a 2.00 x 1.00 x 0.40 inch package. The FED20W series with 4:1 ultra wide input voltage of 9~36 and 18~75VDC and features 1600VDC 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		20 Watts, max.
Voltage accuracy		± 1%
Minimum load		0%
Voltage adjustability	Single output	± 10%
Line regulation	LL to HL at Full Load	Single ± 0.2%
		Dual ± 0.5%
Load regulation	No Load to Full Load	Single ± 0.5%
		Dual ± 1%
Cross regulation (Dual)	Asymmetrical load 25% / 100% FL	± 5%
Ripple and noise	20MHz bandwidth (Measured with a 0.1µF/50V MLCC)	See table
Temperature coefficient		±0.02% / °C, max.
Transient response recovery time	25% load step change	250µs
Over voltage protection	3.3VDC output	3.9VDC
	5VDC output	6.2VDC
Zener diode clamp	12VDC output	15VDC
	15VDC output	18VDC
Over load protection	% of FL at nominal input	150%
Short circuit protection		Continuous, automatic 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		1500pF, max.
Switching frequency		400kHz±10%.
Design meet safety standard	IEC60950-1, UL60950-1, EN60950-1	
Case material	Nickel-coated copper	
Base material	FR4 PCB	
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)	MIL-HDBK-217F	1.851 x 10 ⁶ 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 input and constant resistive load	Power up 20ms
		Remote ON/OFF 20ms
Start-up voltage	24VDC input	9VDC
	48VDC input	18VDC
Shutdown voltage	24VDC input	7.5VDC
	48VDC input	15VDC
Remote ON/OFF (Note 6)	(Positive logic)(Standard)	DC-DC ON Open or 3V < Vr < 12V
		DC-DC OFF Short or 0V < Vr < 1.2V
		(Negative logic)(Option)
Input current of remote control pin	Nominal input	-0.5mA ~ +0.5mA
		Remote off state input current
ENVIRONMENTAL SPECIFICATIONS		
Operating ambient temperature	-40°C ~ +66°C (without derating)	
	+66°C ~ +105°C (with derating)	
Maximum case temperature	105°C	
Storage temperature range	-55°C ~ +125°C	
Thermal impedance (Note 7)	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 8)	EN55022	Class A, Class B
ESD	EN61000-4-2	Air ± 8kV
		Contact ± 6kV
Radiated immunity	EN61000-4-3	10 V/m Perf. Criteria A
Fast transient (Note 9)	EN61000-4-4	± 2kV Perf. Criteria B
Surge (Note 9)	EN61000-4-5	± 1kV Perf. Criteria A
Conducted immunity	EN61000-4-6	10 Vr.m.s Perf. Criteria A

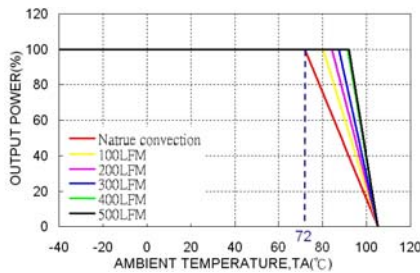
Model Number	Input Range	Output Voltage	Output Current		Output ⁽²⁾ Ripple & Noise	No Load ⁽³⁾ Input Current	Eff ⁽⁴⁾ (%)	Capacitor ⁽⁵⁾ Load max
			Min. load	Full load				
FED20-24S3P3W	9 ~ 36 VDC	3.3 VDC	0mA	5500mA	60mVp-p	50mA	85	18000μF
FED20-24S05W	9 ~ 36 VDC	5 VDC	0mA	4000mA	75mVp-p	65mA	88	9600μF
FED20-24S12W	9 ~ 36 VDC	12 VDC	0mA	1670mA	75mVp-p	22mA	86	1650μF
FED20-24S15W	9 ~ 36 VDC	15 VDC	0mA	1330mA	75mVp-p	22mA	86	1050μF
FED20-24D05W	9 ~ 36 VDC	±5 VDC	0mA	±2000mA	100mVp-p	55mA	88	±4800μF
FED20-24D12W	9 ~ 36 VDC	±12 VDC	0mA	±833mA	100mVp-p	30mA	87	±825μF
FED20-24D15W	9 ~ 36 VDC	±15 VDC	0mA	±667mA	100mVp-p	30mA	87	±525μF
FED20-48S3P3W	18 ~ 75 VDC	3.3 VDC	0mA	5500mA	60mVp-p	35mA	85	18000μF
FED20-48S05W	18 ~ 75 VDC	5 VDC	0mA	4000mA	75mVp-p	35mA	88	9600μF
FED20-48S12W	18 ~ 75 VDC	12 VDC	0mA	1670mA	75mVp-p	15mA	87	1650μF
FED20-48S15W	18 ~ 75 VDC	15 VDC	0mA	1330mA	75mVp-p	15mA	87	1050μF
FED20-48D05W	18 ~ 75 VDC	±5 VDC	0mA	±2000mA	100mVp-p	35mA	89	±4800μF
FED20-48D12W	18 ~ 75 VDC	±12 VDC	0mA	±833mA	100mVp-p	17mA	88	±825μF
FED20-48D15W	18 ~ 75 VDC	±15 VDC	0mA	±667mA	100mVp-p	17mA	88	±525μF

Note:

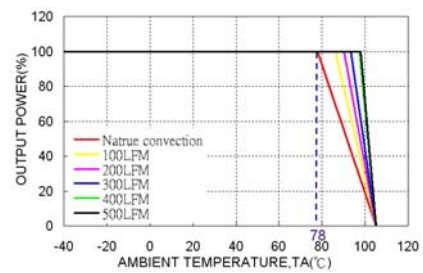
- MIL-HDBK-217F @Ta=25 °C, Full load.
- Typical value at nominal input and full load. (20MHZ BW.)
- Typical value at nominal input and no load.
- Typical value at nominal input and full load.
- Test by minimum input and constant resistive load.
- The ON/OFF control pin voltage is referenced to -INPUT
To order negative logic ON/OFF control add the suffix-N (Ex: FED20-48S05W-N)
- Heat-sink is optional and P/N: 7G-0020C-F.
- The FED20W 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, 220 μF/100V.

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

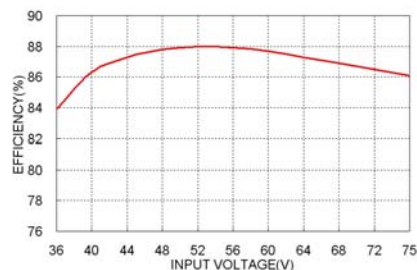
FED20-48S05W Derating Curve



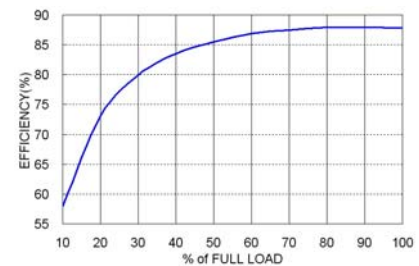
FED20-48S05W Derating Curve With Heat-sink (Note 7)



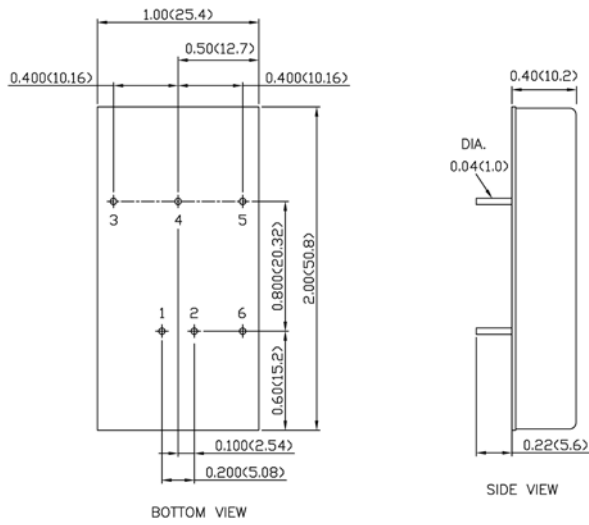
FED20-48S05W Efficiency VS Input Voltage



FED20-48S05W 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 ±0.01 (0.25)
3. Pin dimension tolerance ±0.004 (0.1)

PIN CONNECTION		
PIN	SINGLE	DUAL
1	+ INPUT	+ INPUT
2	- INPUT	- INPUT
3	+ OUTPUT	+ OUTPUT
4	TRIM	COMMON
5	- OUTPUT	- OUTPUT
6	CTRL	CTRL

EXTERNAL OUTPUT TRIMMING

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

TRIM UP

TRIM DOWN