



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
- UL60950-1, EN60950-1, & IEC60950-1 SAFETY APPROVALS
- CE MARKED
- COMPLIANT TO RoHS II & REACH

APPLICATIONS

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

OPTIONS

Negative logic Remote On/Off

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 A

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
	12VDC output	15VDC
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%.
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 1.00 X 0.40 Inch (50.8X 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)	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	Nominal input	2.5mA
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 Perf. Criteria B
		Contact ± 6kV Perf. Criteria B
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

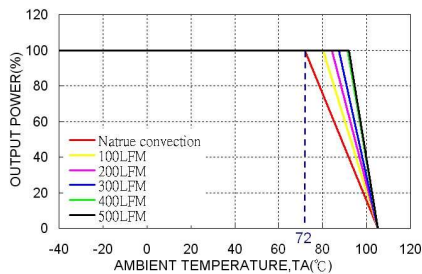
Model Number	Input Range	Output Voltage	Output Current		Output ⁽²⁾ Ripple & Noise	No Load ⁽³⁾ Input Current	Eff ⁽⁴⁾ (%)	Capacitor ⁽⁵⁾ Load max
			Min. load	Full load				
FED20-24S3P3W	9 ~ 36 VDC	3.3 VDC	0mA	5500mA	60mVp-p	50mA	85	18000μF
FED20-24S05W	9 ~ 36 VDC	5 VDC	0mA	4000mA	75mVp-p	65mA	88	9600μF
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:

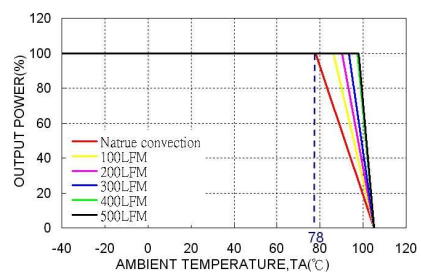
1. MIL-HDBK-217F @Ta=25 °C, Full load.
2. Typical value at nominal input and full load. (20MHZ BW.)
3. Typical value at nominal input and no load.
4. Typical value at nominal input and full load.
5. Test by minimum input and constant resistive load.
6. The ON/OFF control pin voltage is referenced to -INPUT
To order negative logic ON/OFF control add the suffix-N (Ex: FED20-48S05W-N)
7. Heat-sink is optional and P/N: 7G-0020C-F.
8. The FED20W series standard module meets EN55022 Class A and Class B with external components.
For more detail information, please contact with P-DUKE.
9. 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 μ F/100V.

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

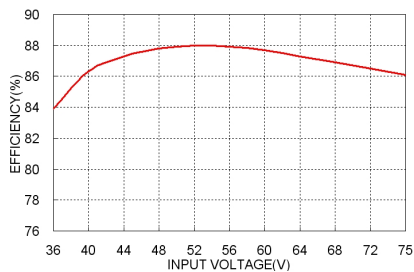
FED20-48S05W Derating Curve



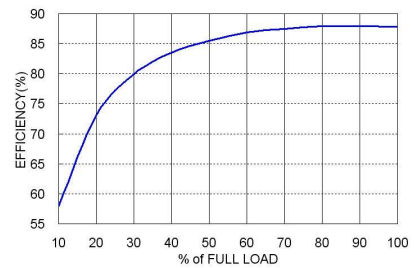
FED20-48S05W Derating Curve With Heat-sink (Note 7)



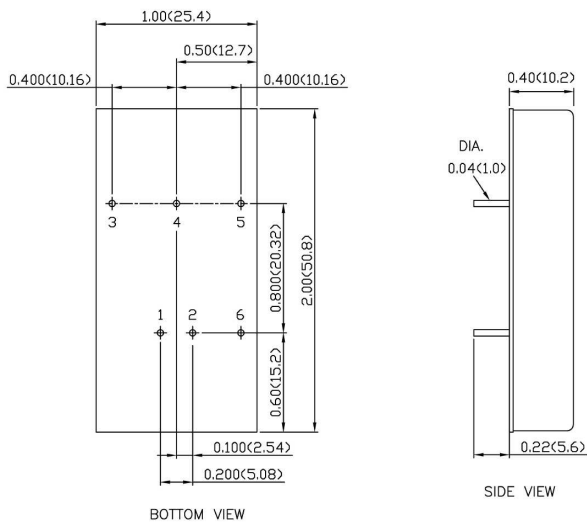
FED20-48S05W Efficiency VS Input Voltage



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