

# FED20W SERIES

DC / DC Single & Dual Output: 20 Watts



## Features

- 4:1 wide Input range option 9~36V & 18~75V
- Single & Dual outputs
- Industry Standard 2 x 1in package
- High efficiency up to 83%
- Regulated output & Short circuit protection
- 1600V isolation
- Five sided continuous copper shield
- Remote ON / OFF Positive Logic – Standard
- Remote ON / OFF Negative Logic – Option
- High operating temperature +85°C
- Zero load operation
- Safety EN60950, UL1950
- EMC Compliant

## Specifications:

<b>Input Voltage</b>	24VDC ( 9 ~ 36 ) 48VDC ( 18 ~ 75 )	<b>Efficiency</b>	Model dependant 86 ~ 88%
<b>Input Filter</b>	Pi type	<b>Isolation</b>	1600VDC
<b>Input Surge Voltage.</b> ( 100mS )	24V: 50VDC. 48V: 100VDC	<b>Isolation Cap.</b>	1500pF
<b>Input Reflected Ripple Current</b>	20mA pk-pk ( @ nominal input & 100% load	<b>Switching Freq.</b>	Standard 400KHz
<b>Start Up time</b>	20mS constant resistive load	<b>Safety</b>	EN60950-1, UL60950-1
<b>Remote ON/OFF</b> ( Positive logic –Standard )	DC-DC ON Open or 3.0V < Vr < 12V DC-DC OFF Short or 0V < Vr < 1.2V	<b>Case Material</b>	Nickel-coated copper
( Negative logic - Option )	DC-DC ON Short or 0V < Vr < 1.2V DC-DC OFF Open or 3.0V < Vr < 12V Input current of remote control pin: 0.5mA Remote off state input current: 2.5mA	<b>Base Material</b>	Non-conductive black plastic
<b>Output power</b>	20 watts	<b>Potting</b>	Epoxy UL94-V0
<b>Voltage Accuracy</b>	±1.0%	<b>Dimensions</b>	50.8 x 25.4 x 10.2mm
<b>Voltage Trim</b>	±10% via external resistor network ( Single output )	<b>Weight</b>	27g
<b>Minim Load</b>	Zero	<b>MTBF</b>	1.691 x 10 <sup>6</sup> Hrs
<b>Line Regulation</b>	Single ±0.2% Dual ±0.5%	<b>Operating Temp</b>	-40°C to +66°C ( without derating ) -40°C to +100°C ( with derating )
<b>Load Regulation</b>	Single ±0.5% , Dual ±1% ( 0% -100% load )	<b>Case Temp</b>	+100°C maximum case temperature
<b>Cross Regulation</b>	±5% Asymmetrical load: 25-100% load )	<b>Thermal Impedance</b>	12°C / watt Standard convection 10°C / watt with optional heatsink
<b>Ripple &amp; noise</b>	See table. 20MHZ bandwidth	<b>Thermal shock</b>	MIL-STD-810F
<b>Temp. Coefficient</b>	±0.02% / °C	<b>Vibration</b>	10-55Hz, 10G, 30min along X, Y,Z
<b>Transient Response</b>	250uS ( 25% load step change )	<b>Humidity</b>	5-95% RH
<b>Over Voltage Protection</b>	3.3V: 3.9V 5.0V: 6.2V 12V: 15V 15V: 18V	<b>EMC</b>	EN55022 Class A Consult office for Class B design
<b>Overload Protection</b>	Typically 150% of load	<b>ESD</b>	EN61000-4-2
<b>Short Circuit protection</b>	Continuous hiccup mode	<b>Radiated Immunity</b>	EN61000-4-3
		<b>Fast Transients</b>	EN61000-4-4
		<b>Surge</b>	EN61000-4-5
		<b>Conducted Immunity</b>	EN61000-4-6

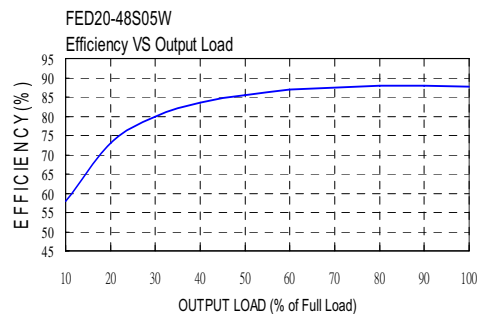
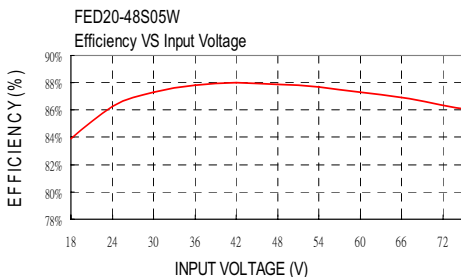
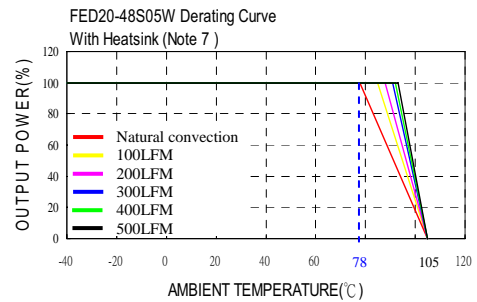
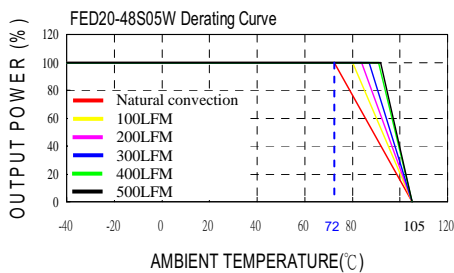
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Model	Input V	Output V	Output Current		Output Ripple & Noise	Input Current		Eff (%)	Capacitor Load max
			Min. load	Full load		No Load	Full Load		
FED20-24S3P3W	9 – 36 V	3.3 V	0mA	5500mA	60mVp-p	50mA	934mA	85	18000uF
FED20-24S05W	9 – 36 V	5 V	0mA	4000mA	75mVp-p	65mA	992mA	88	9600uF
FED20-24S12W	9 – 36 V	12 V	0mA	1670mA	75mVp-p	22mA	1018mA	86	1650uF
FED20-24S15W	9 – 36 V	15 V	0mA	1330mA	75mVp-p	22mA	1014mA	86	1050uF
FED20-24D05W	9 – 36 V	±5 V	0mA	±2000mA	100mVp-p	55mA	992mA	88	±4800uF
FED20-24D12W	9 – 36 V	±12 V	0mA	±833mA	100mVp-p	30mA	1004mA	87	±825uF
FED20-24D15W	9 – 36 V	±15 V	0mA	±667mA	100mVp-p	30mA	1005mA	87	±525uF
FED20-48S3P3W	18 – 75 V	3.3 V	0mA	5500mA	60mVp-p	35mA	467mA	85	18000uF
FED20-48S05W	18 – 75 V	5 V	0mA	4000mA	75mVp-p	35mA	496mA	88	9600uF
FED20-48S12W	18 – 75 V	12 V	0mA	1670mA	75mVp-p	15mA	503mA	87	1650uF
FED20-48S15W	18 – 75 V	15 V	0mA	1330mA	75mVp-p	15mA	501mA	87	1050uF
FED20-48D05W	18 – 75 V	±5 V	0mA	±2000mA	100mVp-p	35mA	490mA	89	±4800uF
FED20-48D12W	18 – 75 V	±12 V	0mA	±833mA	100mVp-p	17mA	496mA	88	±825uF
FED20-48D15W	18 – 75 V	±15 V	0mA	±667mA	100mVp-p	17mA	496mA	88	±525uF

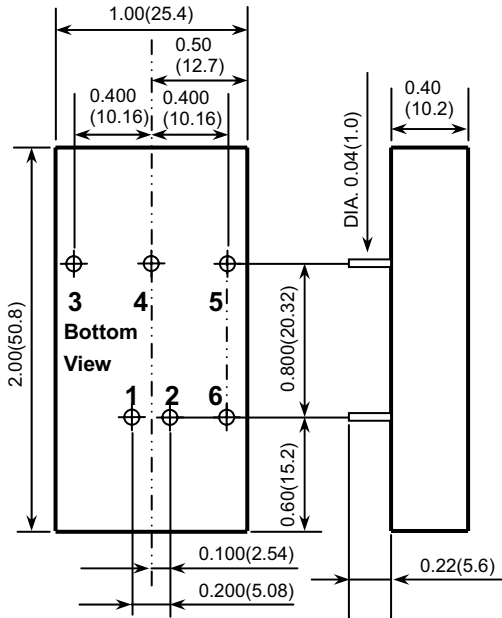
Notes:

- MTBF as per BELLCORE TR-NWT-000332. Case 1: 50% Stress, Temperature at 40°C. (Ground fixed and controlled environment). MIL-STD-217F Notice2 @Ta=25 °C, Full load(Ground, Benign, controlled environment)
- Typical values at nominal input voltage and full resistive load.
- Test by minimum Vin and constant resistive load.
- The ON/OFF control pin voltage is referenced to -Vin.  
To order negative logic ON/OFF control add the suffix-N (eg: FED20-48S05W-N)
- Heat sink is optional and **P/N: 7G-0020A**.
- The FED20W series can meet EN55022 Class A with parallel an external capacitor to the input pins.  
Recommend : 24Vin : NA. 48Vin : 1µF/100V 1210 MLCC.
- An external filter capacitor is required if the module has to meet EN61000-4-5.  
Filter capacitor recommended: Nippon chemi-con KY series, 220µF/100V, ESR 48mΩ.



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1. All dimensions in Inches (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)

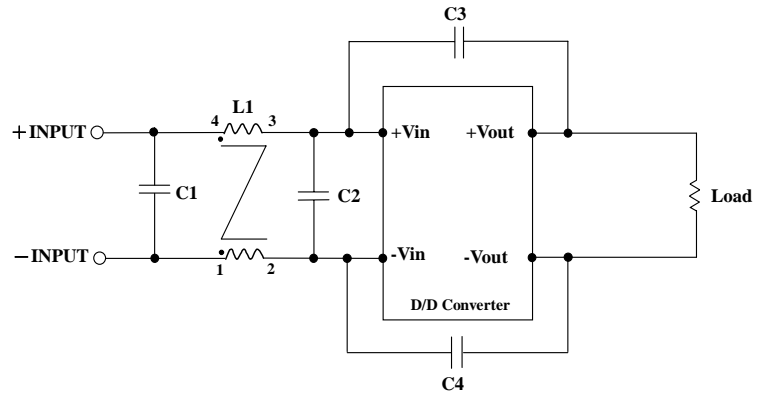
Pin Assignment		
PIN	SINGLE	DUAL
1	+ INPUT	+ INPUT
2	- INPUT	- INPUT
3	+ OUTPUT	+ OUTPUT
4	TRIM	COMMON
5	- OUTPUT	- OUTPUT
6	CTRL	CTRL

**EXTERNAL OUTPUT TRIMMING**

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

TRIM UP

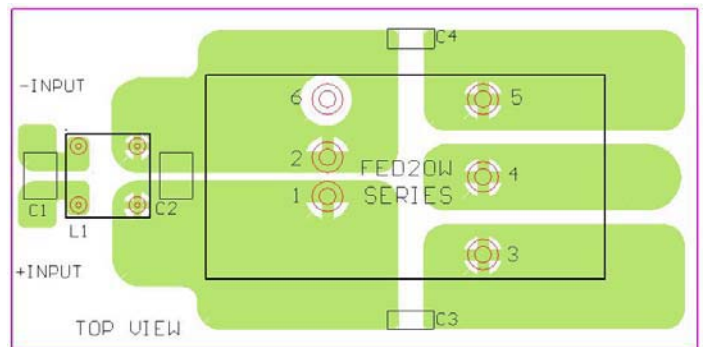
TRIM DOWN



### Recommended Filter for EN55022 Class B Compliance

The components used in the above figure, together with the manufacturers' part numbers for these components, are as follows:

	C1	C2	C3	C4	L1
FED20-24xxxW	4.7uF/50V 1812 MLCC	N/A	1000pF/2KV MLCC	1000pF/2KV MLCC	450uH Common Choke PMT-048
FED20-48xxxW	2.2uF/100V 1812 MLCC	2.2uF/100V 1812 MLCC	1000pF/2KV MLCC	1000pF/2KV MLCC	325uH Common Choke PMT-050



### Recommended EN55022 Class B Filter Circuit Layout