FED20W SERIES

FEATURES

- **20 WATTS MAXIMUM OUTPUT POWER**
- **OUTPUT CURRENT UP TO 5.5A**
- **STANDARD 2" X 1" X 0.4" 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, 93/68/EEC AND 2004/108/EC**
- **UL60950-1, EN60950-1 AND IEC60950-1 LICENSED**
- **ISO9001 CERTIFIED MANUFACTURING FACILITIES**
- **COMPLIANT TO RoHS EU DIRECTIVE 2002/95/EC**

APPLICATIONS

Wireless Network
Telecom/Datacom
Industry Control System
Measurement
Semiconductor Equipment

OPTIONS

Negative logic Remote On/Off

DESCRIPTION

The FED20W series offer 20 watts of output power from a 2 x 1 x 0.4 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 25ºC otherwise noted

OUTPUT SPECIFICATIONS

Output power			20 Watts, max
Voltage accuracy	Full load and nominal Vin		± 1%
Minimum load			0%
Voltage adjustability	Single output		± 10%
Line regulation	LL to HL at Full Load	Single Dual	± 0.2% ± 0.5%
Load regulation	No Load to Full Load	Single Dual	± 0.5% ± 1%
Cross regulation (Dual)	Asymmetrical load 25% / 100% FL		± 5%
Ripple and noise	20MHz bandwidth (Measured with a 0.1uF/50V MLCC)		See table
Temperature coefficient			±0.02% / ºC, max
Transient response recovery time	25% load step change		250uS
Over voltage protection Zener diode clamp	3.3V output 5V output 12V output 15V output		3.9V 6.2V 15V 18V
Over load protection	% of FL at nominal input		150%, typ
Short circuit protection			Hiccup, automatics recovery

GENERAL SPECIFICATIONS

Efficiency		See table
Isolation voltage	Input to Output Input(Output) to case	1600VDC, min 1600VDC, min
Case grounding		Connect case to -Vin with decoupling Y Cap
Isolation resistance		10^9ohms, min
Isolation capacitance		1500pF, max
Switching frequency		400KHz, typ
Approvals and 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 (50.8X 25.4 X 10.2 mm)
Weight		27g (0.95oz)
MTBF (Note 1)	BELLCORE TR-NWT-000332 MIL-HDBK-217F	1.620×10^6 hrs 6.590×10^5 hrs

INPUT SPECIFICATIONS

Input voltage range	24V nominal input 48V nominal input		9 – 36VDC 18 – 75VDC
Input filter			Pi type
Input voltage variation	dv/dt		5V/mS, max (Complies with ETS300 132 part 4.4)
Input surge voltage 100mS max	24V input 48V input		50VDC 100VDC
Input reflected ripple current	Nominal Vin and full load		20mAp-p
Start up time	Nominal Vin and constant resistive load	Power up Remote ON/OFF	20mS, typ 20mS, typ
Start-up voltage	24V input 48V input		9VDC 18VDC
Shutdown voltage	24V input 48V input		7.5VDC 15VDC
Remote ON/OFF (Note 6) (Positive logic)(Standard)	DC-DC ON DC-DC OFF		Open or 3V < Vr < 12V Short or 0V < Vr < 1.2V
(Negative logic)(Option)	DC-DC ON DC-DC OFF		Short or 0V < Vr < 1.2V Open or 3V < Vr < 12V
Input current of remote control pin	Nominal Vin		-0.5mA ~ +0.5mA
Remote off state input current	Nominal Vin		2.5mA

ENVIRONMENTAL SPECIFICATIONS

Operating ambient temperature		-40ºC ~ +66ºC (without derating) +66ºC ~ +105ºC (with derating)
Maximum case temperature		105ºC
Storage temperature range		-55ºC ~ +125ºC
Thermal impedance (Note 7)	Nature convection Nature convection with heat-sink	12ºC/Watt 10ºC/Watt
Thermal shock		MIL-STD-810F
Vibration		10~55Hz, 10G, 30minutes along X,Y and Z
Relative humidity		5% to 95% RH

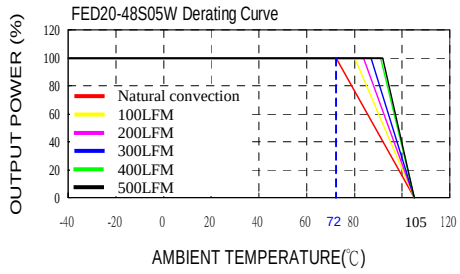
EMC CHARACTERISTICS

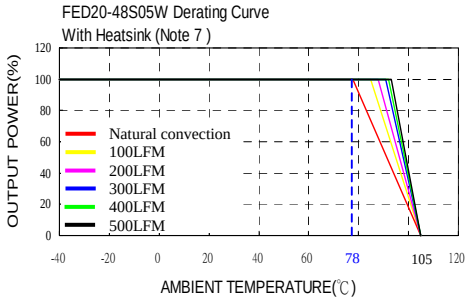
EMI (Note 8)	EN55022			Class A
ESD	EN61000-4-2	Air Contact	± 8KV ± 6KV	Perf. Criteria B
Radiated immunity	EN61000-4-3		10 V/m	Perf. Criteria A
Fast transient	EN61000-4-4		± 2KV	Perf. Criteria B
Surge (Note 9)	EN61000-4-5		± 1KV	Perf. Criteria B
Conducted immunity	EN61000-4-6		10 Vr.m.s	Perf. Criteria A

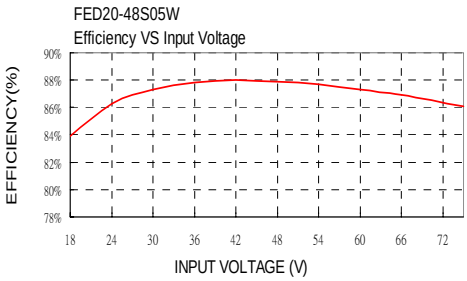
Model Number	Input Range	Output Voltage	Output Current		Output[4] Ripple & Noise	Input Current		Eff [4] (%)	Capacitor[5] Load max
			Min. load	Full load		No Load[3]	Full Load[2]		
FED20-24S3P3W	9 – 36 VDC	3.3 VDC	0mA	5500mA	60mVp-p	50mA	934mA	85	18000uF
FED20-24S05W	9 – 36 VDC	5 VDC	0mA	4000mA	75mVp-p	65mA	992mA	88	9600uF
FED20-24S12W	9 – 36 VDC	12 VDC	0mA	1670mA	75mVp-p	22mA	1018mA	86	1650uF
FED20-24S15W	9 – 36 VDC	15 VDC	0mA	1330mA	75mVp-p	22mA	1014mA	86	1050uF
FED20-24D05W	9 – 36 VDC	±5 VDC	0mA	±2000mA	100mVp-p	55mA	992mA	88	±4800uF
FED20-24D12W	9 – 36 VDC	±12 VDC	0mA	±833mA	100mVp-p	30mA	1004mA	87	±825uF
FED20-24D15W	9 – 36 VDC	±15 VDC	0mA	±667mA	100mVp-p	30mA	1005mA	87	±525uF
FED20-48S3P3W	18 – 75 VDC	3.3 VDC	0mA	5500mA	60mVp-p	35mA	467mA	85	18000uF
FED20-48S05W	18 – 75 VDC	5 VDC	0mA	4000mA	75mVp-p	35mA	496mA	88	9600uF
FED20-48S12W	18 – 75 VDC	12 VDC	0mA	1670mA	75mVp-p	15mA	503mA	87	1650uF
FED20-48S15W	18 – 75 VDC	15 VDC	0mA	1330mA	75mVp-p	15mA	501mA	87	1050uF
FED20-48D05W	18 – 75 VDC	±5 VDC	0mA	±2000mA	100mVp-p	35mA	490mA	89	±4800uF
FED20-48D12W	18 – 75 VDC	±12 VDC	0mA	±833mA	100mVp-p	17mA	496mA	88	±825uF
FED20-48D15W	18 – 75 VDC	±15 VDC	0mA	±667mA	100mVp-p	17mA	496mA	88	±525uF

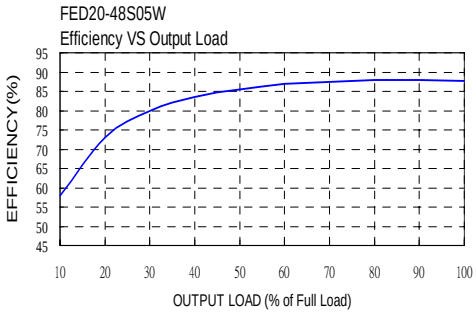
Note:

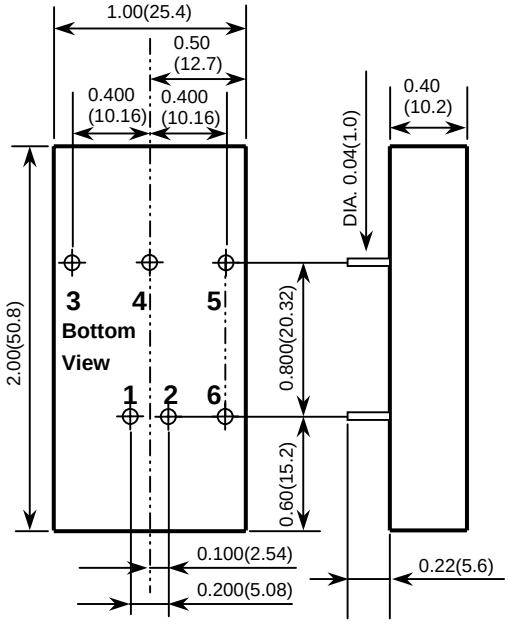
1. BELLCORE TR-NWT-000332. Case 1: 50% Stress, Temperature at 40ºC.
   MIL-HDBK-217F Notice2 @Ta=25 ºC, Full load(Ground, Benign, controlled environment)
2. Maximum value at nominal input voltage and full load.
3. Typical value at nominal input voltage and no load.
4. Typical value at nominal input voltage and full load.
5. Test by minimum Vin and constant resistive load.
6. The ON/OFF control pin voltage is referenced to -Vin.
   To order negative logic ON/OFF control add the suffix-N (Ex: FED20-48S05W-N)
7. Heat sink is optional and P/N: 7G-0020A.
8. 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.
9. An external filter capacitor is required if the module has to meet EN61000-4-5.
   The filter capacitor Power Mate suggest: Nippon chemi-con KY series, 220μF/100V, ESR 48mΩ.









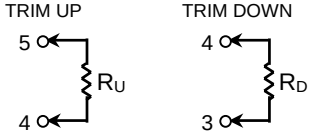


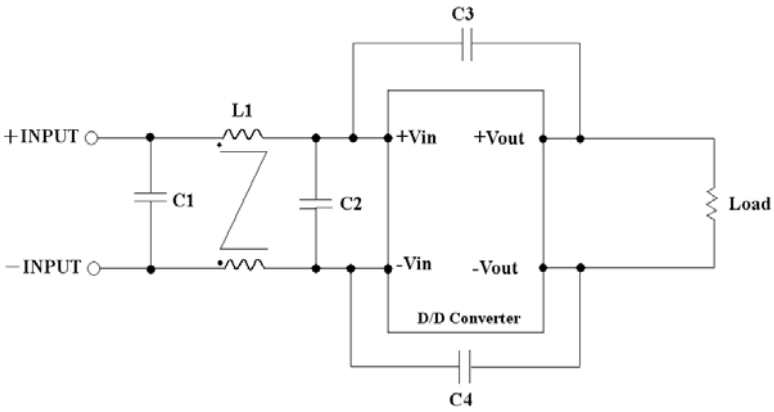
1. All dimensions in Inches (mm)
   Tolerance: X.XX±0.02 (X.X±0.5)
   X.XXX±0.01 (X.XX±0.25)
2. Pin pitch tolerance ±0.01(0.25)
3. Pin dimension tolerance ±0.004 (0.1)

PIN 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.

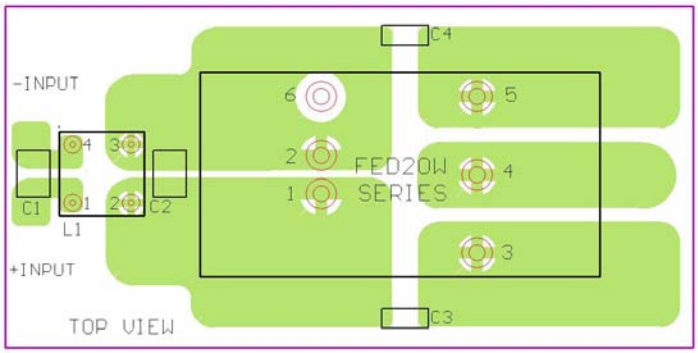




Recommended Filter for EN55022 Class B Compliance

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