POWER MATE TECHNOLOGY CO.,LTD.

FED20-SERIES



FEATURES

- 20 WATTS MAXIMUM OUTPUT POWER
- OUTPUT CURRENT UP TO 6A
- STANDARD 2.0 X 1.0 X 0.4 INCH PACKAGE
- HIGH EFFICIENCY UP TO 89%
- 2:1 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 Equipment
Semiconductor Equipment

OPTIONS

Negative logic Remote On/Off

DESCRIPTION

The FED20 series offer 20 watts of output power from a 2 x 1 x 0.4 inch package. The FED20 series with 2:1 wide input voltage of 9-18, 18-36 and 36-75VDC 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	± 0.2%
Load regulation	No Load to Full Load	± 0.5%
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% / ºC, max.
Transient response recovery time	25% load step change	250μS
Over voltage protection Zener diode clamp	1.5V output 1.8V output 2.5V output 3.3V output 5V output 12V output 15V output	3.9VDC 3.9VDC 3.9VDC 3.9VDC 6.2VDC 15VDC 18VDC
Over load protection	% of FL at nominal input	150%, max.
Short circuit protection		Hiccup, automatics recovery

GENERAL SPECIFICATIONS

Efficiency		See table
Isolation voltage	Input to Output Input(Output) to case	1600VDC, min. 1600VDC, min.
Isolation resistance		10^9 ohms, min.
Isolation capacitance		1000pF, max.
Switching frequency		500KHz, typ.
Approvals and standard		IEC60950-1, UL60950-1, EN60950-1
Case material		Nickel-coated copper
Base material		Non-conductive black plastic
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)	BELLCORE TR-NWT-000332 MIL-HDBK-217F	1.791 x 10^6 hrs 6.842 x 10^5 hrs

INPUT SPECIFICATIONS

Input voltage range	12V nominal input 24V nominal input 48V nominal input	9 – 18VDC 18 – 36VDC 36 – 75VDC
Input filter		L-C type
Input surge voltage 100mS max	12V input 24V input 48V input	36VDC 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	10mS, typ. 10mS, typ.
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 ~ +85ºC (with derating)
Maximum case temperature		100ºC
Storage temperature range		-55ºC ~ +105ºC
Thermal impedance (Note 7)	Nature convection Nature convection with heat-sink	12ºC/Watt 10ºC/Watt
Thermal shock		MIL-STD-810F
Vibration		MIL-STD-810F
Relative humidity		5% to 95% RH

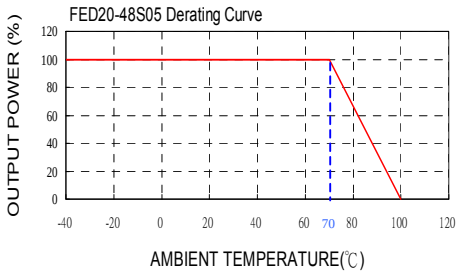
EMC CHARACTERISTICS

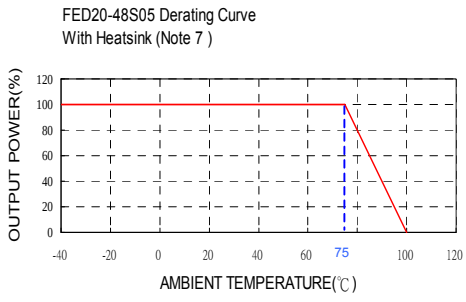
EMI (Note 8)	EN55022			Class A
ESD	EN61000-4-2	Air Contact	± 8KV ± 6KV	Perf. Criteria B
Radiated immunity	EN61000-4-3		10 V/m	Perf. Criteria A
Fast transient (Note 9)	EN61000-4-4		± 2KV	Perf. Criteria A
Surge (Note 9)	EN61000-4-5		± 1KV	Perf. Criteria B
Conducted immunity	EN61000-4-6		10 Vr.m.s	Perf.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

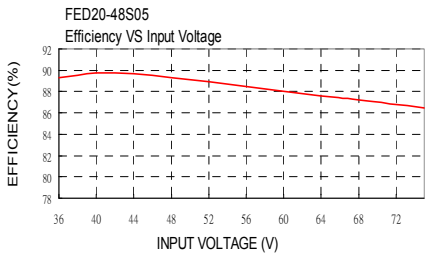
Model Number	Input Range	Output Voltage	Output Current		Output (4) Ripple & Noise	Input Current		Eff (4) (%)	Capacitor (5) Load max
			Min. load	Full load		No load (3)	Full load (2)		
FED20-12S1P5	9 – 18 VDC	1.5 VDC	0mA	6000mA	60mVp-p	70mA	1014mA	78	65000μF
FED20-12S1P8	9 – 18 VDC	1.8 VDC	0mA	6000mA	60mVp-p	75mA	1200mA	79	65000μF
FED20-12S2P5	9 – 18 VDC	2.5 VDC	0mA	6000mA	60mVp-p	80mA	1582mA	83	33000μF
FED20-12S3P3	9 – 18 VDC	3.3 VDC	0mA	5000mA	60mVp-p	115mA	1698mA	85	13000μF
FED20-12S05	9 – 18 VDC	5 VDC	0mA	4000mA	75mVp-p	75mA	2008mA	87	6800μF
FED20-12S12	9 – 18 VDC	12 VDC	0mA	1670mA	75mVp-p	90mA	2037mA	86	2200μF
FED20-12S15	9 – 18 VDC	15 VDC	0mA	1330mA	75mVp-p	35mA	2027mA	86	755μF
FED20-12D12	9 – 18 VDC	±12VDC	0mA	±833mA	100mVp-p	45mA	2032mA	86	±680μF
FED20-12D15	9 – 18 VDC	±15VDC	0mA	±667mA	100mVp-p	50mA	2034mA	86	±450μF
FED20-24S1P5	18 – 36 VDC	1.5 VDC	0mA	6000mA	60mVp-p	35mA	493mA	80	65000μF
FED20-24S1P8	18 – 36 VDC	1.8 VDC	0mA	6000mA	60mVp-p	45mA	584mA	81	65000μF
FED20-24S2P5	18 – 36 VDC	2.5 VDC	0mA	6000mA	60mVp-p	40mA	781mA	84	33000μF
FED20-24S3P3	18 – 36 VDC	3.3 VDC	0mA	5000mA	60mVp-p	30mA	838mA	86	13000μF
FED20-24S05	18 – 36 VDC	5 VDC	0mA	4000mA	75mVp-p	35mA	980mA	89	6800μF
FED20-24S12	18 – 36 VDC	12 VDC	0mA	1670mA	75mVp-p	55mA	1006mA	87	2200μF
FED20-24S15	18 – 36 VDC	15 VDC	0mA	1330mA	75mVp-p	40mA	1002mA	87	755μF
FED20-24D12	18 – 36 VDC	±12VDC	0mA	±833mA	100mVp-p	30mA	1004mA	87	±680μF
FED20-24D15	18 – 36 VDC	±15VDC	0mA	±667mA	100mVp-p	30mA	993mA	88	±450μF
FED20-48S1P5	36 – 75 VDC	1.5 VDC	0mA	6000mA	60mVp-p	15mA	247mA	80	65000μF
FED20-48S1P8	36 – 75 VDC	1.8 VDC	0mA	6000mA	60mVp-p	20mA	288mA	82	65000μF
FED20-48S2P5	36 – 75 VDC	2.5 VDC	0mA	6000mA	60mVp-p	30mA	391mA	84	33000μF
FED20-48S3P3	36 – 75 VDC	3.3 VDC	0mA	5000mA	60mVp-p	15mA	414mA	87	13000μF
FED20-48S05	36 – 75 VDC	5 VDC	0mA	4000mA	75mVp-p	20mA	490mA	89	6800μF
FED20-48S12	36 – 75 VDC	12 VDC	0mA	1670mA	75mVp-p	35mA	497mA	88	2200μF
FED20-48S15	36 – 75 VDC	15 VDC	0mA	1330mA	75mVp-p	50mA	501mA	87	755μF
FED20-48D12	36 – 75 VDC	±12VDC	0mA	±833mA	100mVp-p	20mA	496mA	88	±680μF
FED20-48D15	36 – 75 VDC	±15VDC	0mA	±667mA	100mVp-p	20mA	496mA	88	±450μF

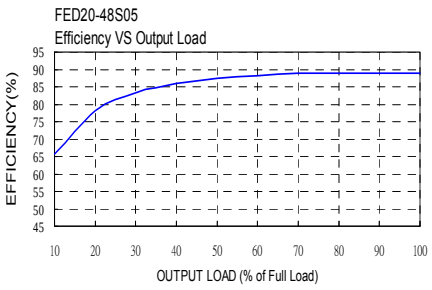
Note

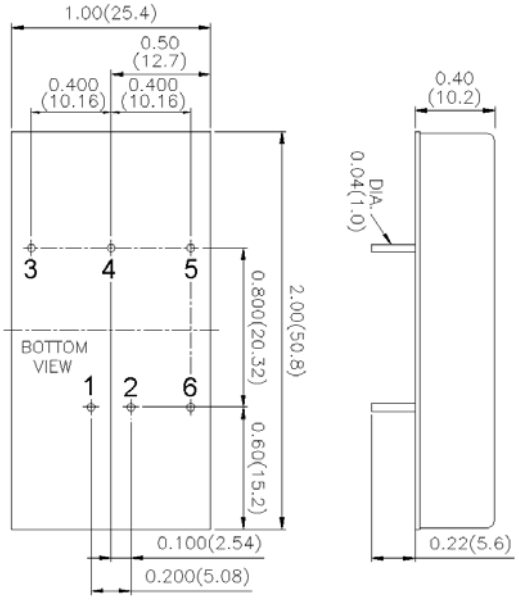
1. BELLCORE TR-NWT-000332. Case 1: 50% Stress, Temperature at 40ºC.
   MIL-HDBK-217F Notice2 @Ta=25 ºC, Full load(Ground, Benign, controlled environment).
2. Maximum value at nominal input voltage and full load.
3. Typical value at nominal input voltage and no load.
4. Typical value at nominal input 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: FED20-24S05-N).
7. Heat sink is optional and P/N: 7G-0020C-F.
8. The FED20 series can meet EN55022 Class A with parallel an external capacitor to the input pins.
   Recommend: 12Vin : 4.7μF/50V 1812 MLCC .
   24Vin : 2.2μF/50V 1812 MLCC .
   48Vin : 2.2μF/100V 1812 MLCC.
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, 220μF/100V, ESR 48mΩ.









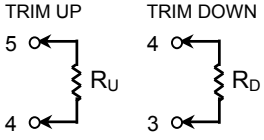


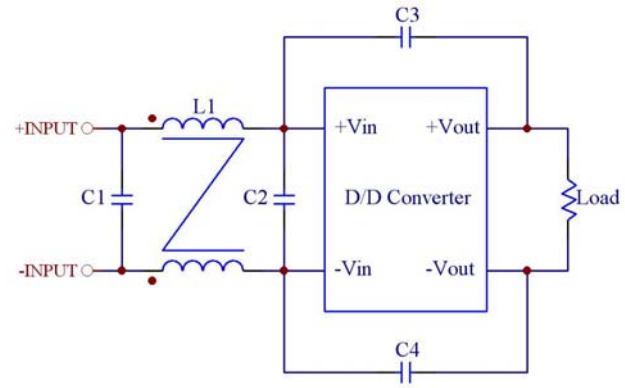
1. All dimensions in Inches (mm)
   Tolerance: X.XX±0.02 (X.X±0.5)
   X.XXX±0.01 (X.XX±0.25)
2. Pin pitch tolerance ±0.01(0.25)
3. Pin dimension tolerance ±0.004 (0.1)

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.

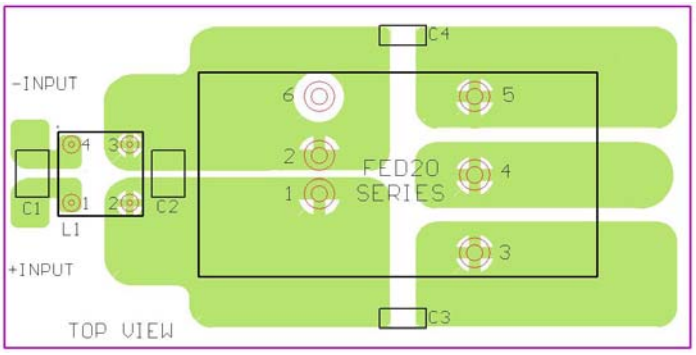




Recommended Filter for EN55022 Class B Compliance

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

	C1	C2	C3	C4	L1
FED20-12xxx	3.3μF/50V 1812 MLCC	3.3μF/50V 1812 MLCC	1000pF/2KV MLCC	1000pF/2KV MLCC	450μH Common Choke PMT-048
FED20-24xxx	4.7μF/50V 1812 MLCC	N/A	1000pF/2KV MLCC	1000pF/2KV MLCC	450μH Common Choke PMT-048
FED20-48xxx	2.2μF/100V 1812 MLCC	2.2μF/100V 1812 MLCC	1000pF/2KV MLCC	1000pF/2KV MLCC	325μH Common Choke PMT-050



Recommended EN55022 Class B Filter Circuit Layout

Стандарт Электрон Связь

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