POWER MATE TECHNOLOGY CO.,LTD.

FED20-SERIES

- 1.5V, 1.8V, 2.5V, 3.3V, 5V, 12V, 15VDC OUTPUT
- OUTPUT CURRENT UP TO 6A
- 20 WATTS MAXIMUM OUTPUT POWER
- 2:1 WIDE INPUT VOLTAGE RANGE
- SAFETY APPROVAL PENDING
- SIX-SIDED CONTINUOUS SHIELD
- HIGH EFFICIENCY UP TO 89%
- STANDARD 2" x 1" x 0.4" PACKAGE
- FIXED SWITCHING FREQUENCY

UL E193009
TUV R50018446
CB JPTUV-005032
CE MARK

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 18-36 and 36-75VDC and features 1600VDC of isolation, short-circuit and over-voltage protection, as well as six sided shielding. A safety approvals to EN60950 and UL1950. All models are particularly suited to telecommunications, industrial, mobile telecom and test equipment applications.

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%
Voltage adjustability		± 10%
Minimum load		0%
Line regulation	LL to HL at Full Load	± 0.2%
Load regulation	10% to 100% FL	± 0.5%
Ripple and noise	20MHz bandwidth (Measured with a 104pF/50V MLCC)	75mVp-p
Temperature coefficient		±0.02% / ºC, max
Transient response recovery time	25% load step change	300uS
Over voltage protection Zener diode clamp	1.5V output 1.8V output 2.5V output 3.3V output 5V output 12V output 15V output	3.9V 3.9V 3.9V 3.9V 6.2V 15V 18V
Over load protection	% of FL at nominal input	150% typ
Short circuit protection		Hiccup, automatics recovery

INPUT SPECIFICATIONS

Input voltage range	24V nominal input 48V nominal input	18 – 36VDC 36 – 75VDC
Input filter (Note 1)		L-C 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 (Note 2)	Nominal Vin and full load	20mAp-p
Start up time	Nominal Vin and constant resistor load	10mS typ
Remote ON/OFF (Note 3)		
	DC-DC ON	Open or 3.5V < Vr < 12V
	DC-DC OFF	Short or 0V < Vr < 1.2V
Remote off input current	Nominal Vin	2.5mA

GENERAL SPECIFICATIONS

Efficiency	See table
Isolation voltage	1600VDC, min
Isolation resistance	10^9 ohms, min
Isolation capacitance	1000pF, max
Switching frequency	500KHz, typ
Approvals and standard	IEC60950, UL60950, EN60950
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 4)	1.791 x 10^6 hrs

ENVIRONMENTAL SPECIFICATIONS

Operating temperature range		-40ºC ~ +85ºC (with derating)
Maximum case temperature		100ºC
Storage temperature range		-55ºC ~ +105ºC
Thermal impedance (Note 5)	Nature convection Nature convection with heat-sink	12ºC/Watt 10ºC/Watt
Thermal shock		MIL-STD-810D
Vibration		10~55Hz, 2G, 30minutes along X,Y and Z
Relative humidity		5% to 95% RH

EMC CHARACTERISTICS

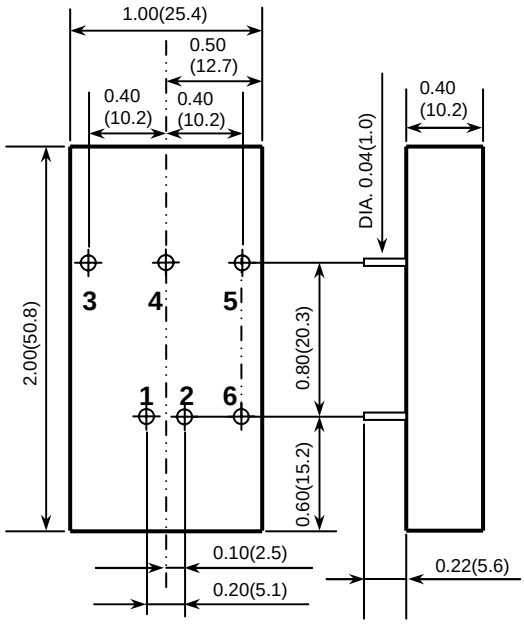
Conducted emissions	EN55022	Level A
Radiated emissions	EN55022	Level A
ESD	EN61000-4-2	Perf. Criteria2
Radiated immunity	EN61000-4-3	Perf. Criteria2
Fast transient	EN61000-4-4	Perf. Criteria2
Surge	EN61000-4-5	Perf. Criteria2
Conducted immunity	EN61000-4-6	Perf. Criteria2

20 WATTS DC-DC CONVERTER

Model Number	Input Range	Output Voltage	Output Current	Input Current (6)	Eff (7) (%)	Capacitor (8) Load max
FED20-24S1P5	18 – 36 VDC	1.5 VDC	6000mA	500mA	79	65000uF
FED20-24S1P8	18 – 36 VDC	1.8 VDC	6000mA	577mA	82	65000uF
FED20-24S2P5	18 – 36 VDC	2.5 VDC	6000mA	781mA	84	33000uF
FED20-24S3P3	18 – 36 VDC	3.3 VDC	5000mA	838mA	86	13000uF
FED20-24S05	18 – 36 VDC	5 VDC	4000mA	992mA	88	6800uF
FED20-24S12	18 – 36 VDC	12 VDC	1670mA	1006mA	87	2200uF
FED20-24S15	18 – 36 VDC	15 VDC	1330mA	1001mA	87	755uF
FED20-48S1P5	36 – 75 VDC	1.5 VDC	6000mA	247mA	80	65000uF
FED20-48S1P8	36 – 75 VDC	1.8 VDC	6000mA	285mA	83	65000uF
FED20-48S2P5	36 – 75 VDC	2.5 VDC	6000mA	386mA	85	33000uF
FED20-48S3P3	36 – 75 VDC	3.3 VDC	5000mA	414mA	87	13000uF
FED20-48S05	36 – 75 VDC	5 VDC	4000mA	490mA	89	6800uF
FED20-48S12	36 – 75 VDC	12 VDC	1670mA	497mA	88	2200uF
FED20-48S15	36 – 75 VDC	15 VDC	1330mA	500mA	87	755uF

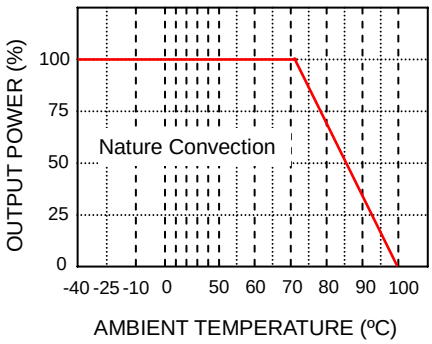
Note

1. An external filter capacitor is required for normal operation. The capacitor should be capable of handing 1A ripple current for 48V/24V models. Power mate suggest: Nippon chemi-con KMF series, 220μF/100V, ESR 90mΩ.
2. Simulated source impedance of 12uH. 12uH inductor on series with +Vin.
3. The ON/OFF control function. There are positive logic (standard) and negative logic (option). The pin voltage is referenced to negative input
   To order negative logic ON/OFF control add the suffix-N (Ex: FED20-24S05-N)
4. BELLCORE TR-NWT-000332. Case I: 50% Stress, Temperature at 40ºC. (Ground fixed and controlled environment).
5. Heat sink is optional and P/N: 7G-0020A.
6. Maximum value at nominal input voltage and full load.
7. Typical value at nominal input voltage and full load.
8. Test by minimum Vin and constant resistor load.

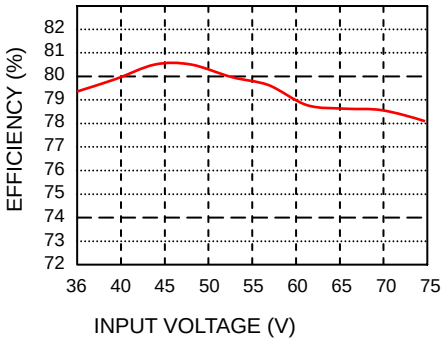


1. All dimensions in Inches (mm)
2. Pin Pitch tolerance ±0.014(0.35)

FED20-48S1P5
Derating Curve without Heat-Sink

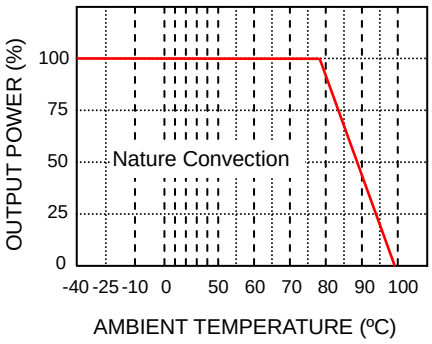


FED20-48S1P5
Efficiency VS Input voltage

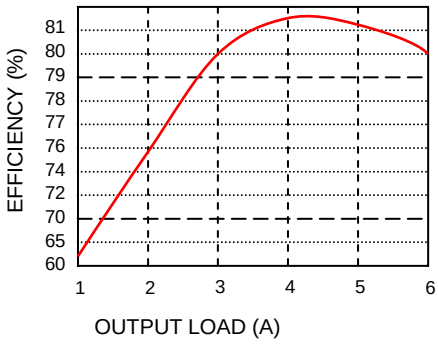


PIN CONNECTION	
PIN	DEFINE
1	+ INPUT
2	- INPUT
3	+ OUTPUT
4	TRIM
5	- OUTPUT
6	CTRL

FED20-48S1P5 (Note 5)
Derating Curve with Heat-Sink



FED20-48S1P5
Efficiency VS Output load



EXTERNAL OUTPUT TRIMMING

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