POWER MATE TECHNOLOGY CO., LTD.

FED20W SERIES

20 WATTS DC-DC CONVERTER

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

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 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 0.1μF/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	3.3VDC output 5VDC output 12VDC output 15VDCoutput		3.9VDC 6.2VDC 15VDC 18VDC
Over load protection	% of FL at nominal input		150%
Short circuit protection			Continuous, automatics recovery

GENERAL SPECIFICATIONS		
Efficiency		See table
Isolation voltage	Input to Output Input(Output) to case	1600VDC, min. 1minute 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	1.851×10^6 hrs

INPUT SPECIFICATIONS			
Input voltage range	24VDC nominal input 48VDC nominal input		9 ~ 36VDC 18 ~ 75VDC
Input filter			Pi type
Input surge voltage	24VDC input 48VDC input		50VDC 100ms,max 100VDC 100ms,max
Input reflected ripple current			20mAp-p
Start up time	Nominal input and constant resistive load	Power up Remote ON/OFF	20ms 20ms
Start-up voltage	24VDC input 48VDC input		9VDC 18VDC
Shutdown voltage	24VDC input 48VDC 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 input		-0.5mA ~ +0.5mA
Remote off state input current	Nominal input		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)	Natural convection Natural 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, Class B
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 B
Surge (Note 9)	EN61000-4-5		± 1kV	Perf. Criteria A
Conducted immunity	EN61000-4-6		10 Vr.m.s	Perf. Criteria A

FED20W SERIES

20 WATTS DC-DC CONVERTER

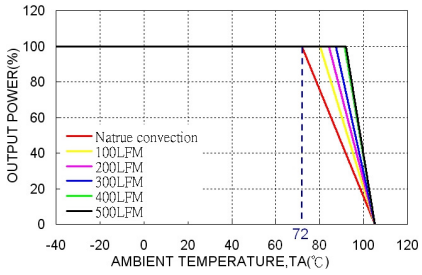
Model Number	Input Range	Output Voltage	Output Current		Output[2] Ripple & Noise	No Load[3] Input Current	Eff [4] (%)	Capacitor[5] Load max
			Min. load	Full load				
FED20-24S3P3W	9 ~ 36 VDC	3.3 VDC	0mA	5500mA	60mVp-p	50mA	85	18000μF
FED20-24S05W	9 ~ 36 VDC	5 VDC	0mA	4000mA	75mVp-p	65mA	88	9600μF
FED20-24S12W	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:

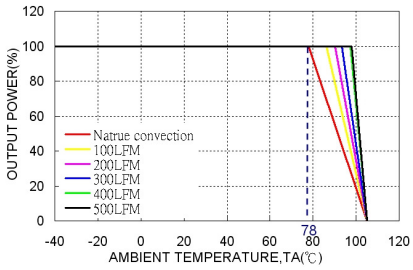
1. MIL-HDBK-217F @Ta=25 ºC, Full load.
2. Typical value at nominal input and full load. (20MHZ BW.)
3. Typical value at nominal input and no load.
4. Typical value at nominal input and full load.
5. Test by minimum input and constant resistive load.
6. The ON/OFF control pin voltage is referenced to -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, 220μF/100V.

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

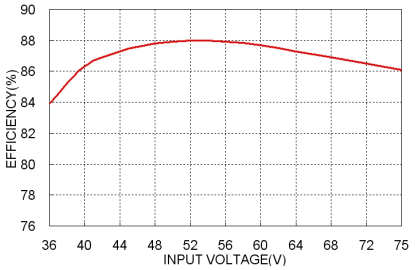
FED20-48S05W Derating Curve



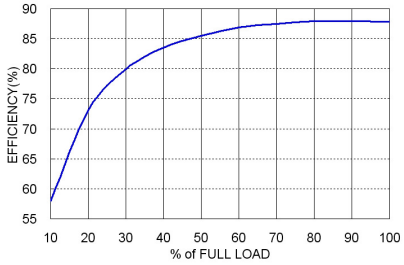
FED20-48S05W Derating Curve With Heat-sink (Note 7)



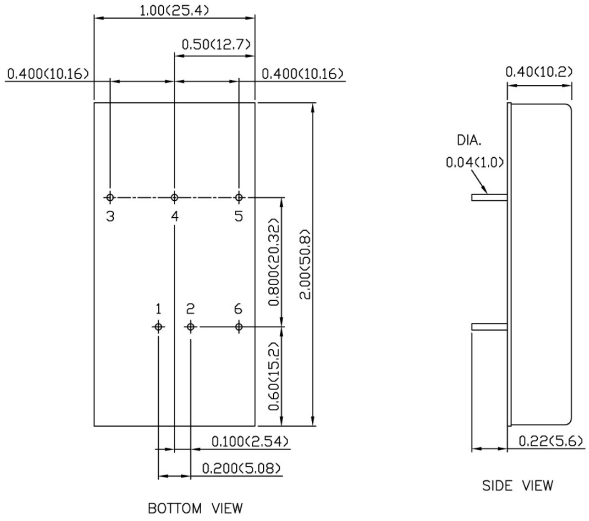
FED20-48S05W Efficiency VS Input Voltage



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.