

POWER MATE
TECHNOLOGY CO., LTD.
FED30W SERIES

DC-DC CONVERTER



4 : 1 ULTRA WIDE INPUT RANGE
 UP TO 30Watts



FEATURES

- 1600VDC INPUT TO OUTPUT ISOLATION
- STANDARD 2.00 X 1.00 X 0.40 INCH
- SIX-SIDED CONTINUOUS SHIELD
- UL60950-1, EN60950-1, & IEC60950-1 SAFETY APPROVALS
- CE MARKED
- COMPLIANT TO RoHS II & REACH

APPLICATIONS

- WIRELESS NETWORK
- TELECOM/DATACOM
- INDUSTRY CONTROL SYSTEM
- DISTRIBUTED POWER ARCHITECTURES
- SEMICONDUCTOR EQUIPMENT

| | | | | | | |
|--------------------------|-----------------------|------------|------------|------------|------------|------------|
| 1600VDC ISOLATION | REMOTE CONTROL | UVP | OCP | SCP | OVP | OTP |
|--------------------------|-----------------------|------------|------------|------------|------------|------------|

TECHNICAL SPECIFICATION All specifications are typical at nominal input, full load and 25°C otherwise noted

| Model Number | Input Range | Output Voltage | Output Current @Full Load | Input Current @ No Load | Efficiency | Maximum Capacitor Load (1) |
|---------------|-------------|----------------|---------------------------|-------------------------|------------|----------------------------|
| | VDC | VDC | A | mA | % | µF |
| FED30-24S1P5W | 9 ~ 36 | 1.5 | 8.5 | 70 | 80 | 20000 |
| FED30-24S2P5W | 9 ~ 36 | 2.5 | 8 | 70 | 83 | 20000 |
| FED30-24S3P3W | 9 ~ 36 | 3.3 | 7.5 | 70 | 86 | 20000 |
| FED30-24S05W | 9 ~ 36 | 5 | 6 | 105 | 88 | 14400 |
| FED30-24S5P1W | 9 ~ 36 | 5.1 | 6 | 105 | 88 | 14400 |
| FED30-24S12W | 9 ~ 36 | 12 | 2.5 | 20 | 89 | 3000 |
| FED30-24S15W | 9 ~ 36 | 15 | 2 | 30 | 89 | 2000 |
| FED30-24D05W | 9 ~ 36 | ±5 | ±3 | 90 | 88 | ±3000 |
| FED30-24D12W | 9 ~ 36 | ±12 | ±1.25 | 25 | 87 | ±2000 |
| FED30-24D15W | 9 ~ 36 | ±15 | ±1 | 25 | 87 | ±1300 |
| FED30-48S1P5W | 18 ~ 75 | 1.5 | 8.5 | 30 | 80 | 20000 |
| FED30-48S2P5W | 18 ~ 75 | 2.5 | 8 | 45 | 84 | 20000 |
| FED30-48S3P3W | 18 ~ 75 | 3.3 | 7.5 | 45 | 86 | 20000 |
| FED30-48S05W | 18 ~ 75 | 5 | 6 | 65 | 88 | 14400 |
| FED30-48S5P1W | 18 ~ 75 | 5.1 | 6 | 65 | 88 | 14400 |
| FED30-48S12W | 18 ~ 75 | 12 | 2.5 | 60 | 90 | 3000 |
| FED30-48S15W | 18 ~ 75 | 15 | 2 | 50 | 91 | 2000 |
| FED30-48D05W | 18 ~ 75 | ±5 | ±3 | 50 | 88 | ±3000 |
| FED30-48D12W | 18 ~ 75 | ±12 | ±1.25 | 15 | 88 | ±2000 |
| FED30-48D15W | 18 ~ 75 | ±15 | ±1 | 15 | 88 | ±1300 |

PART NUMBER STRUCTURE

| | | | | | | | | |
|--------------|---|-----------------------|-----------------|---|-------------|---|--|---|
| FED30 | - | 48 | S | 05 | W | - | N | HS |
| Series Name | | Input Voltage (VDC) | Output Quantity | Output Voltage (VDC) | Input Range | | Remote Control Option | Assembly Option |
| | | 24: 9~36 48: 18~75 | S: Single | 1P5: 1.5 2P5: 2.5 3P3: 3.3 05: 5 5P1: 5.1 12: 12 15: 15 | 4:1 | | □: Positive logic N: Negative logic | □: None HS: Heat-sink HC: Heat-sink & Clamp |
| | | | D: Dual | 05: ±5 12: ±12 15: ±15 | | | | |

INPUT SPECIFICATIONS

| Parameter | Conditions | | Min. | Typ. | Max. | Unit | |
|--------------------------------|-------------------------|---------------------------|-----------|---------------------|------|-------|----|
| Operating input voltage range | 24Vin(nom) | | 9 | 24 | 36 | VDC | |
| | 48Vin(nom) | | 18 | 48 | 75 | | |
| Input reflected ripple current | | | 20 | | | mAp-p | |
| Start up voltage | 24Vin(nom) | | | | | VDC | |
| | 48Vin(nom) | | 9 | | | | |
| Shutdown voltage | 24Vin(nom) | | 8 | | | VDC | |
| | 48Vin(nom) | | 16 | | | | |
| Start up time | Constant resistive load | Power up | 30 | | | ms | |
| | | Remote ON/OFF | 30 | | | | |
| Input surge voltage | 100 ms, max. | 24Vin(nom) | 50 | | | VDC | |
| | | 48Vin(nom) | 100 | | | | |
| Input filter | | | Pi type | | | | |
| Remote ON/OFF | Referred to -Vin pin | Positive logic | DC-DC ON | Open or 3 ~ 12VDC | | | mA |
| | | (Standard) | DC-DC OFF | Short or 0 ~ 1.2VDC | | | |
| | | Negative logic | DC-DC ON | Short or 0 ~ 1.2VDC | | | |
| | | (Option) | DC-DC OFF | Open or 3 ~ 12VDC | | | |
| | | Input current of Ctrl pin | | -0.5 | +0.5 | | |
| | | Remote off input current | 3.0 | | | mA | |

OUTPUT SPECIFICATIONS

| Parameter | Conditions | | Min. | Typ. | Max. | Unit |
|----------------------------------|------------------------------------|----------------|--------------------------------|------|-------|---------|
| Voltage accuracy | | | -1.0 | | +1.0 | % |
| Line regulation | Low Line to High Line at Full Load | | -0.2 | | +0.2 | % |
| Load regulation | No Load to Full Load | Single | -0.5 | | +0.5 | % |
| | | Dual | -1.0 | | +1.0 | |
| Cross regulation | Asymmetrical load 25%/100% FL | Dual | -5.0 | | +5.0 | % |
| Voltage adjustability | Single output | | -10 | | +10 | % |
| Ripple and noise | 20MHz bandwidth | Others | 100 | | | mVp-p |
| | With a 1 μ F/50V MLCC | 12Vout, 15Vout | 150 | | | |
| Temperature coefficient | | | -0.02 | | +0.02 | %/°C |
| Transient response recovery time | 25% load step change | | 250 | | | μ s |
| Over voltage protection | Zener diode clamp | 1.5Vout | 2.0 | | | VDC |
| | | 2.5Vout | 3.3 | | | |
| | | 3.3Vout | 3.9 | | | |
| | | 5Vout, 5.1Vout | 6.2 | | | |
| | | 12Vout | 15 | | | |
| | | 15Vout | 18 | | | |
| Over load protection | % of Iout rated | | 150 | | | % |
| Short circuit protection | | | Continuous, automatic recovery | | | |

GENERAL SPECIFICATIONS

| Parameter | Conditions | | Min. | Typ. | Max. | Unit |
|-----------------------|--------------------------|------------------------|--|------|------|------------|
| Isolation voltage | 1 minute | Input to Output | 1600 | | | VDC |
| | | Input (Output) to Case | 1600 | | | |
| Case grounding | | | Connect case to -Vin with decoupling Y Cap | | | |
| Isolation resistance | 500VDC | | 1 | | | G Ω |
| Isolation capacitance | | | 1500 | | | pF |
| Switching frequency | | | 387 | 430 | 473 | kHz |
| Safety approvals | | | IEC60950-1, UL60950-1, EN60950-1 | | | |
| Case material | | | Nickel-coated copper | | | |
| Base material | | | FR4 PCB | | | |
| Potting material | | | Epoxy (UL94 V-0) | | | |
| Weight | | | 30.5g (1.07oz) | | | |
| MTBF | MIL-HDBK-217F, Full load | | 1.288 x 10 ⁶ | | | hrs |

ENVIRONMENTAL SPECIFICATIONS

| Parameter | Conditions | | Min. | Typ. | Max. | Unit |
|-------------------------------|--|-------------------|--------------|------|------|------|
| Operating ambient temperature | Without derating | | -40 | | +50 | °C |
| | With derating | | +50 | | +85 | |
| Maximum case temperature | | | +105 | | | °C |
| Over temperature protection | | | 115 | | | °C |
| Storage temperature range | | | -55 | | +125 | °C |
| Thermal impedance | Vertical direction by natural convection (20LFM) | Without heat-sink | 12 | | | °C/W |
| | | With heat-sink | 10 | | | |
| Thermal shock | | | MIL-STD-810F | | | |
| Vibration | | | MIL-STD-810F | | | |
| Relative humidity | | | 5% to 95% RH | | | |

EMC SPECIFICATIONS

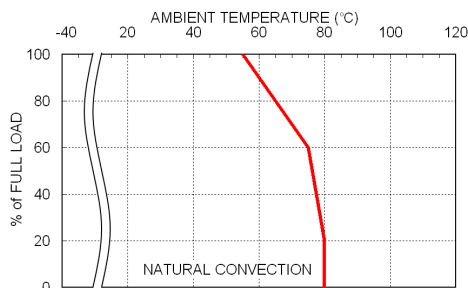
| Parameter | Conditions | Level |
|--------------------------------|---|------------------|
| EMI (2) | EN55022 | Class A |
| ESD | EN61000-4-2 Air ± 8kV and Contact ± 6kV | Perf. Criteria A |
| Radiated immunity | EN61000-4-3 10 V/m | Perf. Criteria A |
| Fast transient (3) | EN61000-4-4 ±2kV | Perf. Criteria A |
| Surge (3) | EN61000-4-5 ±1kV | Perf. Criteria A |
| Conducted immunity | EN61000-4-6 10 Vr.m.s | Perf. Criteria A |
| Power frequency magnetic field | EN61000-4-8 100A/m continuous; 1000A/m 1 second | Perf. Criteria A |

Note:

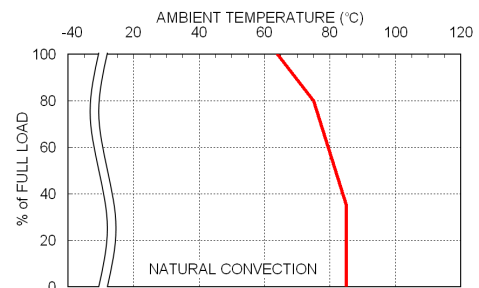
1. Test by minimum input and constant resistive load.
2. The standard module meets EN55022 Class A and Class B with external components. For further information, please contact with P-DUKE.
3. An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5.
The filter capacitor Power Mate suggest: 24VDC input Nippon chemi-con KY series, 330µF/50V
The filter capacitor Power Mate suggest::48VDC input Nippon chemi-con KY series, 220µF/100V

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

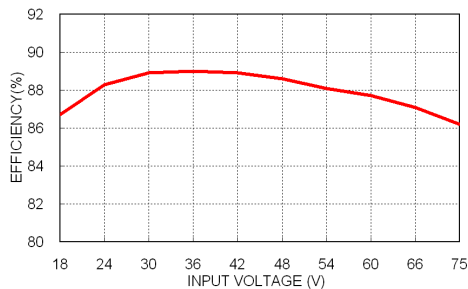
CHARACTERISTIC CURVE



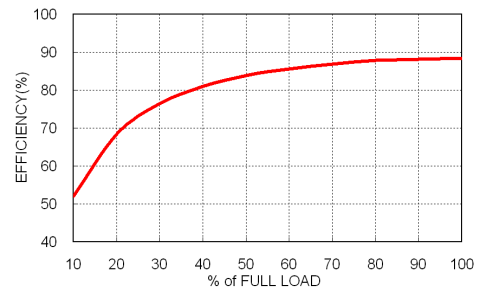
FED30-48S05W Derating Curve



FED30-48S05W Derating Curve With Heat-sink

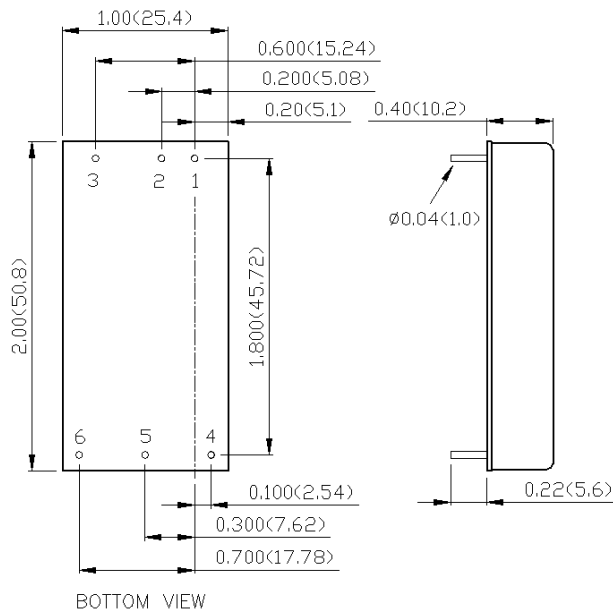


FED30-48S05W Efficiency vs. Input Voltage



FED30-48S05W Efficiency vs. Output Load

MECHANICAL DRAWING

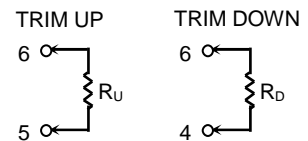


PIN CONNECTION

| PIN | SINGLE | DUAL |
|-----|--------|--------|
| 1 | +Vin | +Vin |
| 2 | -Vin | -Vin |
| 3 | Ctrl | Ctrl |
| 4 | +Vout | +Vout |
| 5 | -Vout | Common |
| 6 | Trim | -Vout |

EXTERNAL OUTPUT TRIMMING

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



1. All dimensions in inch (mm)
2. Tolerance :x.xx±0.02 (x.x±0.5)
x.xxx±0.01 (x.xx±0.25)
3. Pin pitch tolerance ±0.01 (0.25)
4. Pin dimension tolerance ±0.004(0.1)