



Wireless Network  
Telecom/Datacom  
Industry Control System  
Measurement  
Semiconductor Equipment

### FEATURES

- 30 WATTS MAXIMUM OUTPUT POWER
- OUTPUT CURRENT UP TO 8.5A
- STANDARD 2.00 X 1.00 X 0.40 INCH
- HIGH EFFICIENCY UP TO 91%
- 2:1 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

### OPTIONS

NEGATIVE LOGIC REMOTE ON/OFF

### DESCRIPTION

The FED30 series offer 30 watts of output power from a 2 x 1 x 0.4 inch package. FED30 series have 2:1 wide input voltage of 9~18VDC, 18~36 and 36~75VDC. The FED30 series have features 1600VDC of isolation, short circuit protection, over-current protection, over-voltage protection, over-temperature protection and six sided shielding.

## TECHNICAL SPECIFICATION

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

| OUTPUT SPECIFICATIONS                        |   |  |                      |
|--|---|--|----------------------|
| Output power                                 | 30 Watts max.                                     |  |                      |
| Voltage accuracy                             | ±1%   |  |                      |
| Voltage adjustability                        | Single output                                     | ± 10%  |                      |
| Minimum load                                 | 0%  |  |                      |
| Line regulation                              | LL to HL at Full Load                             | ± 0.2%                                       |                      |
| Load regulation                              | No load to Full load                              | Single<br>Dual                               | ± 0.5%<br>± 1%       |
| Cross regulation (Dual)                      | Asymmetrical load 25% / 100% FL                   | ± 5%   |                      |
| Ripple and noise                             | 20MHz bandwidth<br>(Measured with a 1uF/50V MLCC) | 1.5-5.1Vo<br>12-15Vo                         | 100mVp-p<br>150mVp-p |
| Temperature coefficient                      | ±0.02% / °C, max.                                 |  |                      |
| Transient response recovery time             | 25% load step change                              | 250µs  |                      |
| Over voltage protection<br>Zener diode clamp | 1.5V  | Output                                       | 2.0V                 |
|  | 2.5V  | Output                                       | 3.3V                 |
|  | 3.3V  | Output                                       | 3.9V                 |
|  | 5.0V & 5.1V & ±5V                                 | Output                                       | 6.2V                 |
|  | 12V & ±12V<br>15V & ±15V                          | Output<br>Output                             | 15V<br>18V           |
| Over load protection                         | % of FL at nominal input                          | 150%   |                      |
| Short circuit protection                     | Continuous, automatic recovery                    |  |                      |
| GENERAL SPECIFICATIONS                       |   |  |                      |
| Efficiency                                   | See table   |  |                      |
| Isolation voltage                            | Input to Output<br>Input (Output) to Case         | 1600VDC min. 1minute<br>1600VDC min. 1minute |                      |
| Case grounding                               | Connect case to -input                            | with decoupling Y Cap                        |                      |
| Isolation resistance                         | 500VDC  | 10 <sup>9</sup> ohms, min.                   |                      |
| Isolation capacitance                        | 1500pF, max.                                      |  |                      |
| Switching frequency                          | 430kHz± 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<br>(50.8X 25.4 X 10.2 mm) |  |                      |
| Weight                                       | 30.5g(1.07oz)                                     |  |                      |
| MTBF (Note 1)                                | MIL-HDBK-217F                                     | 1.453 x 10 <sup>6</sup> hrs.                 |                      |

| INPUT SPECIFICATIONS                                 |   |                         |                         |  |
|--|---|-------------------------|-------------------------|--|
| Input voltage range                                  | 12VDC nominal input                       | 9 ~ 18VDC               |                         |  |
|  | 24VDC nominal input                       | 18 ~ 36VDC              |                         |  |
|  | 48VDC nominal input                       | 36 ~ 75VDC              |                         |  |
| Input filter   | Pi type                                   |                         |                         |  |
| Input surge voltage                                  | 12VDC input                               | 25VDC 100ms, max.       |                         |  |
|  | 24VDC input                               | 50VDC 100ms, max.       |                         |  |
|  | 48VDC input                               | 100VDC 100ms, max.      |                         |  |
| Input reflected ripple current                       | 20mA <sub>p-p</sub>                       |                         |                         |  |
| Start up time  | Nominal input and constant resistive load | Power up                | 30ms                    |  |
|  |   | Remote ON/OFF           | 30ms                    |  |
| Start-up voltage                                     | 12VDC input                               | 9VDC, max.              |                         |  |
|  | 24VDC input                               | 18VDC, max.             |                         |  |
|  | 48VDC input                               | 36VDC, max.             |                         |  |
| Shutdown voltage                                     | 12VDC input                               | 8VDC                    |                         |  |
|  | 24VDC input                               | 16VDC                   |                         |  |
|  | 48VDC input                               | 32VDC                   |                         |  |
| Remote ON/OFF (Note 5)<br>(Positive logic)(Standard) | DC-DC ON                                  | Open or 3V < Vr < 12V   |                         |  |
|  | DC-DC OFF                                 | Short or 0V < Vr < 1.2V |                         |  |
|  | (Negative logic)(Option)                  | DC-DC ON                | Short or 0V < Vr < 1.2V |  |
|  |   | DC-DC OFF               | Open or 3V < Vr < 12V   |  |
| Input current of Remote control pin                  | Nominal Input                             | -0.5mA ~ +0.5mA         |                         |  |
| Remote off state input current                       | Nominal Input                             | 3mA                     |                         |  |

| ENVIRONMENTAL SPECIFICATIONS  |                                   |           |  |
|-------------------------------|-----------------------------------|-----------|--|
| Operating ambient temperature | -40°C to +50°C (without derating) |           |  |
|                               | +50°C to +85°C (with derating)    |           |  |
| Maximum case temperature      | 105°C                             |           |  |
| Storage temperature range     | -55°C to +125°C                   |           |  |
| Over temperature protection   | 115°C                             |           |  |
| Thermal impedance<br>(Note 6) | Nature convection                 | 12°C/Watt |  |
|                               | Nature convection with heat-sink  | 10°C/Watt |  |
| Thermal shock                 | MIL-STD-810F                      |           |  |
| Vibration                     | MIL-STD-810F                      |           |  |
| Relative humidity             | 5% to 95% RH                      |           |  |

| EMC CHARACTERISTICS     |             |                  |                        |
|-------------------------|-------------|------------------|------------------------|
| EMI (Note 7)            | EN55022     | Class A, Class B |                        |
| ESD                     | EN61000-4-2 | Air              | ± 8kV Perf. Criteria A |
|                         |             | Contact          | ± 6kV Perf. Criteria A |
| Radiated immunity       | EN61000-4-3 | 10 V/m           | Perf. Criteria A       |
| Fast transient (Note 8) | EN61000-4-4 | ± 2kV            | Perf. Criteria A       |
| Surge (Note 8)          | EN61000-4-5 | ± 1kV            | Perf. Criteria A       |
| Conducted immunity      | EN61000-4-6 | 10 Vr.m.s        | Perf. Criteria A       |

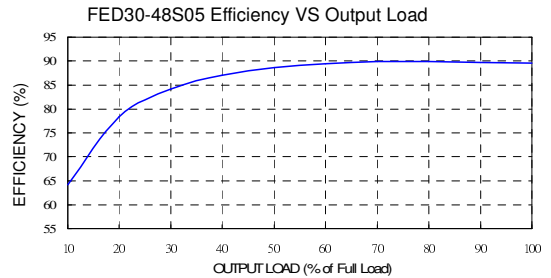
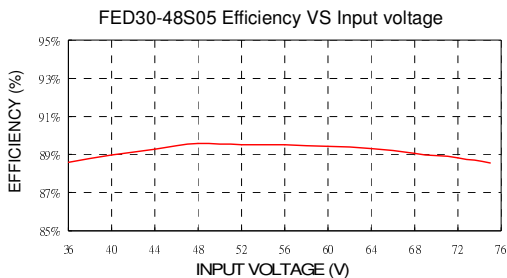
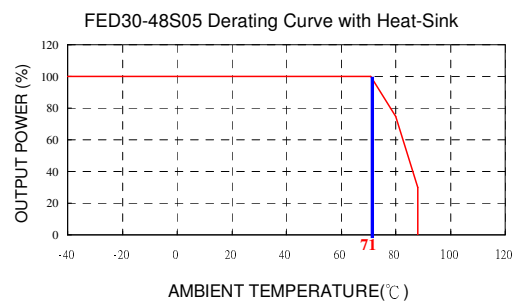
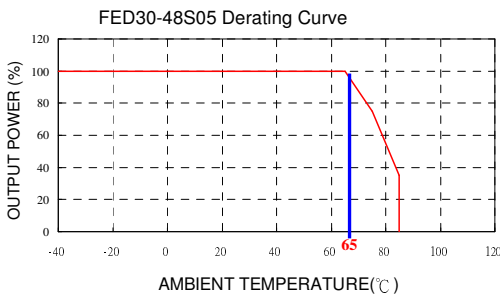


| Model Number | Input Range | Output Voltage | Output Current |           | Output <sup>(3)</sup><br>Ripple & Noise | No load <sup>(2)</sup><br>Input Current | Eff <sup>(3)</sup><br>(%) | Capacitor <sup>(4)</sup><br>Load max |
|--------------|-------------|----------------|----------------|-----------|---|---|---------------------------|--------------------------------------|
|              |             |                | Min. Load      | Max. Load |   |   |                           |                                      |
| FED30-12S1P5 | 9 ~ 18 VDC  | 1.5 VDC        | 0mA            | 8500mA    | 100mVp-p                                | 70mA                                    | 79                        | 20000μF                              |
| FED30-12S2P5 | 9 ~ 18 VDC  | 2.5 VDC        | 0mA            | 8000mA    | 100mVp-p                                | 100mA                                   | 84                        | 20000μF                              |
| FED30-12S3P3 | 9 ~ 18 VDC  | 3.3 VDC        | 0mA            | 8000mA    | 100mVp-p                                | 90mA                                    | 85                        | 20000μF                              |
| FED30-12S05  | 9 ~ 18 VDC  | 5.0 VDC        | 0mA            | 6000mA    | 100mVp-p                                | 130mA                                   | 87                        | 14400μF                              |
| FED30-12S5P1 | 9 ~ 18 VDC  | 5.1 VDC        | 0mA            | 6000mA    | 100mVp-p                                | 130mA                                   | 87                        | 14400μF                              |
| FED30-12S12  | 9 ~ 18 VDC  | 12 VDC         | 0mA            | 2500mA    | 150mVp-p                                | 90mA                                    | 89                        | 3000μF                               |
| FED30-12S15  | 9 ~ 18 VDC  | 15 VDC         | 0mA            | 2000mA    | 150mVp-p                                | 80mA                                    | 89                        | 2000μF                               |
| FED30-12D05  | 9 ~ 18 VDC  | ±5VDC          | 0mA            | ±3000mA   | 100mVp-p                                | 90mA                                    | 87                        | ± 3000μF                             |
| FED30-12D12  | 9 ~ 18 VDC  | ±12VDC         | 0mA            | ±1250mA   | 150mVp-p                                | 50mA                                    | 87                        | ± 2000μF                             |
| FED30-12D15  | 9 ~ 18 VDC  | ±15VDC         | 0mA            | ±1000mA   | 150mVp-p                                | 40mA                                    | 87                        | ± 1300μF                             |
| FED30-24S1P5 | 18 ~ 36 VDC | 1.5 VDC        | 0mA            | 8500mA    | 100mVp-p                                | 50mA                                    | 80                        | 20000μF                              |
| FED30-24S2P5 | 18 ~ 36 VDC | 2.5 VDC        | 0mA            | 8000mA    | 100mVp-p                                | 50mA                                    | 85                        | 20000μF                              |
| FED30-24S3P3 | 18 ~ 36 VDC | 3.3 VDC        | 0mA            | 8000mA    | 100mVp-p                                | 50mA                                    | 87                        | 20000μF                              |
| FED30-24S05  | 18 ~ 36 VDC | 5.0 VDC        | 0mA            | 6000mA    | 100mVp-p                                | 75mA                                    | 90                        | 14400μF                              |
| FED30-24S5P1 | 18 ~ 36 VDC | 5.1 VDC        | 0mA            | 6000mA    | 100mVp-p                                | 75mA                                    | 90                        | 14400μF                              |
| FED30-24S12  | 18 ~ 36 VDC | 12 VDC         | 0mA            | 2500mA    | 150mVp-p                                | 40mA                                    | 91                        | 3000μF                               |
| FED30-24S15  | 18 ~ 36 VDC | 15 VDC         | 0mA            | 2000mA    | 150mVp-p                                | 30mA                                    | 91                        | 2000μF                               |
| FED30-24D05  | 18 ~ 36 VDC | ±5VDC          | 0mA            | ±3000mA   | 100mVp-p                                | 70mA                                    | 90                        | ± 3000μF                             |
| FED30-24D12  | 18 ~ 36 VDC | ±12VDC         | 0mA            | ±1250mA   | 150mVp-p                                | 30mA                                    | 89                        | ± 2000μF                             |
| FED30-24D15  | 18 ~ 36 VDC | ±15VDC         | 0mA            | ±1000mA   | 150mVp-p                                | 30mA                                    | 90                        | ± 1300μF                             |
| FED30-48S1P5 | 36 ~ 75 VDC | 1.5 VDC        | 0mA            | 8500mA    | 100mVp-p                                | 45mA                                    | 80                        | 20000μF                              |
| FED30-48S2P5 | 36 ~ 75 VDC | 2.5 VDC        | 0mA            | 8000mA    | 100mVp-p                                | 45mA                                    | 85                        | 20000μF                              |
| FED30-48S3P3 | 36 ~ 75 VDC | 3.3 VDC        | 0mA            | 8000mA    | 100mVp-p                                | 30mA                                    | 87                        | 20000μF                              |
| FED30-48S05  | 36 ~ 75 VDC | 5.0 VDC        | 0mA            | 6000mA    | 100mVp-p                                | 45mA                                    | 90                        | 14400μF                              |
| FED30-48S5P1 | 36 ~ 75 VDC | 5.1 VDC        | 0mA            | 6000mA    | 100mVp-p                                | 45mA                                    | 89                        | 14400μF                              |
| FED30-48S12  | 36 ~ 75 VDC | 12 VDC         | 0mA            | 2500mA    | 150mVp-p                                | 40mA                                    | 91                        | 3000μF                               |
| FED30-48S15  | 36 ~ 75 VDC | 15 VDC         | 0mA            | 2000mA    | 150mVp-p                                | 40mA                                    | 91                        | 2000μF                               |
| FED30-48D05  | 36 ~ 75 VDC | ±5VDC          | 0mA            | ±3000mA   | 100mVp-p                                | 35mA                                    | 90                        | ± 3000μF                             |
| FED30-48D12  | 36 ~ 75 VDC | ±12VDC         | 0mA            | ±1250mA   | 100mVp-p                                | 30mA                                    | 88                        | ± 2000μF                             |
| FED30-48D15  | 36 ~ 75 VDC | ±15VDC         | 0mA            | ±1000mA   | 150mVp-p                                | 20mA                                    | 89                        | ± 1300μF                             |

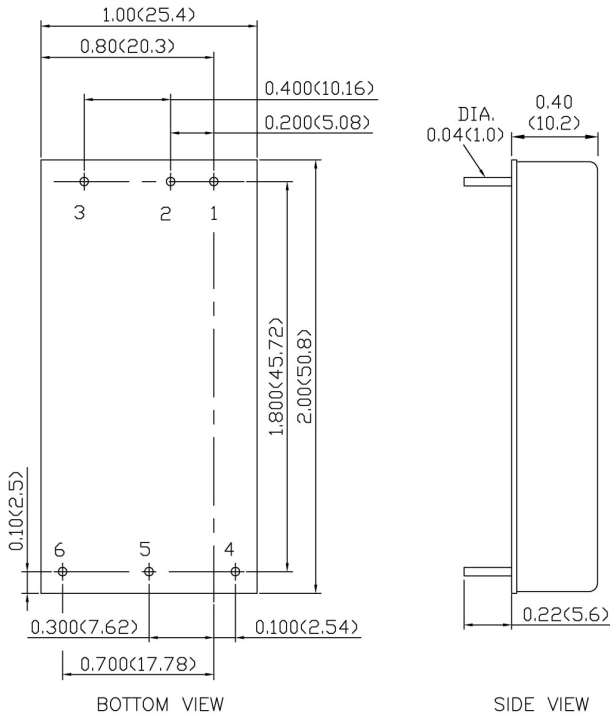
**Note**

- MIL-HDBK-217F @Ta=25 °C, Full load.
- Typical value at nominal input voltage and no load.
- Typical value at nominal input voltage and full load.
- Test by minimum input and constant resistive load.
- The CTRL pin voltage is referenced to -INPUT.
- Heat-sink is optional and P/N: 7G-0020A-F.
- The FED30 series standard module meets EN55022 Class A and Class B with external components. For more detail information, please contact with P-DUKE.
- An external filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5. The filter capacitor Power Mate suggest: 12 VDC INPUT & 24 VDC INPUT : Nippon chemi-con KY series, 330μF/50V. 48 VDC INPUT : Nippon chemi-con KY series, 220μF/100V.

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



## 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              | CTRL     | CTRL     |
| 4              | + OUTPUT | + OUTPUT |
| 5              | - OUTPUT | COMMON   |
| 6              | TRIM     | - OUTPUT |

