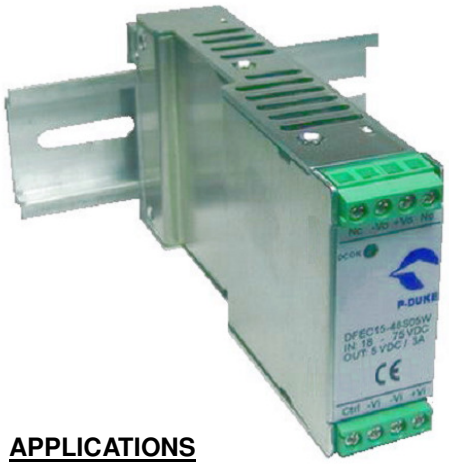
**POWER MATE TECHNOLOGY CO., LTD.**

# DFEC15W SERIES

**15 WATTS DC-DC CONVERTER**



## FEATURES

- DIN RAIL DC/DC CONVERTERS
- 15 WATTS MAXIMUM OUTPUT POWER
- OFFER SINGLE AND DUAL OUTPUT
- OVERLOAD AND SHORT CIRCUIT PROTECTION
- OVER VOLTAGE PROTECTION
- RELIABLE SNAP-ON FOR DIN RAIL TS-35/7.5 OR TS-35/15
- I/O-ISOLATION 1600 VDC
- CASE PROTECTION MEET IP20(IEC60529)
- INTERNAL INPUT FUSE PROTECTION
- INTERNAL INPUT REVERSAL POLARITY PROTECTION
- INTERNAL INPUT IN-RUSH CURRENT LIMIT CIRCUIT
- INTERNAL OUTPUT DC-OK INDICATOR
- MEET EN55022 CLASS B
- COMPLIANT TO RoHS EU DIRECTIVE 2011/65/EU

## APPLICATIONS

Communication System
Industry Control System
Factory Automatic Equipment
Semiconductor Equipment

## DESCRIPTION

The DFEC15W series was designed to easy application of din rail DC-DC converters. Easy installation is provided with snap-on mounting on the DIN-rail. Internal protection circuits such as input reversal and in-rush current limit protection, as well as output short-circuit and over-voltage protection. A green LED at the front displays the status of the output(s).

## TECHNICAL SPECIFICATION

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

### OUTPUT SPECIFICATIONS

| | | | |
|---|---|---|---|
| Output power | | | 15 Watts, max |
| Voltage accuracy | | 3.3Vout<br>Others | ± 2.0%<br>± 1.2% |
| Minimum load | | | 0% |
| Line regulation | LL to hl at Full load | Single<br>Dual | ± 0.2%<br>± 0.5% |
| Load regulation | No load to Full load | 3.3Vout<br>Others | ± 2.0%<br>± 1.5% |
| Load cross regulation (Note 6) | | Dual | ± 5% |
| Ripple and noise | 20MHz bandwidth | | 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<br>5VDC output<br>12VDC output<br>15VDC output | | 3.9VDC<br>6.2VDC<br>15VDC<br>18VDC |
| Output indicator | | | Green LED |
| 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<br>Input(Output) to Chassis | 1600VDC, min. 1minute<br>1600VDC, min. 1minute |
| Isolation resistance | 500VDC | $10^9$ ohms, min |
| Isolation capacitance | | 4000pF, max |
| Switching frequency | | 400kHz±10% |
| Design meets safety standard | | IEC60950-1, UL60950-1, EN60950-1 |
| Chassis material | | Aluminum |
| Dimensions | | 4.92 X2.27 X 0.97 Inch<br>(125.0 X 57.6 X 24.5 mm) |
| Weight | | 147.5g (5.19oz) |
| MTBF (Note 1) | MIL-HDBK-217F | 1.618 x $10^6$ hrs |

### INPUT SPECIFICATIONS

| | | | |
|---|---|---|---|
| Input voltage range | 24VDC nominal input<br>48VDC nominal input | | 9.5 ~ 36VDC<br>18 ~ 75VDC |
| Input surge voltage | 24VDC input<br>48VDC input | | 50VDC 100ms,max<br>100VDC 100ms,max |
| Input fuse (slow blow) | 24VDC input<br>48VDC input | | 6A<br>4A |
| In-rush current | | | 15A |
| Input reflected ripple current | | | 10mAp-p |
| Start up time | Nominal input and constant resistive load | Power up | 100ms |
| Start-up voltage | 24VDC input<br>48VDC input | | 9.5VDC<br>18VDC |
| Shutdown voltage | 24VDC input<br>48VDC input | | 7.5VDC<br>15VDC |
| Remote ON/OFF (Option) (Note 7) | | | |
| (Positive logic) | | DC-DC ON<br>DC-DC OFF | Open or 3 V < Vr < 12V<br>Short or 0V < Vr < 1.2V |
| (Negative logic) | | DC-DC ON<br>DC-DC OFF | Short or 0V < Vr < 1.2V<br>Open or 3 V < 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 ~ +85ºC (without derating)<br>+85ºC ~ +95ºC (with derating) |
| Storage temperature range | -40ºC ~ +105ºC |
| Thermal shock | MIL-STD-810F |
| Vibration | MIL-STD-810F |
| Relative humidity | 5% to 95% RH |

### EMC CHARACTERISTICS

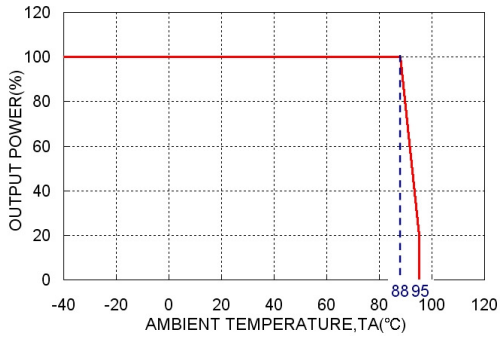
| | | | | |
|---|---|---|---|---|
| EMI | EN55022 | | | Class B |
| ESD | EN61000-4-2 | Air<br>Contact | ± 8kV<br>± 6kV | Perf. Criteria A |
| Radiated immunity | EN61000-4-3 | | 10 V/m | Perf. Criteria A |
| Fast transient | EN61000-4-4 | | ± 2kV | Perf. Criteria A |
| Surge | EN61000-4-5 | | ± 0.5kV | Perf. Criteria A |
| Conducted immunity | EN61000-4-6 | | 10 Vr.m.s | Perf. Criteria A |

| 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 | | | | |
| DFEC15-24S3P3W | 9.5 ~ 36 VDC | 3.3 VDC | 0mA | 4500mA | 50mVp-p | 52mA | 84 | 14700μF |
| DFEC15-24S05W | 9.5 ~ 36 VDC | 5 VDC | 0mA | 3000mA | 50mVp-p | 67mA | 85 | 7200μF |
| DFEC15-24S5P1W | 9.5 ~ 36 VDC | 5.1 VDC | 0mA | 3000mA | 50mVp-p | 67mA | 85 | 7200μF |
| DFEC15-24S12W | 9.5 ~ 36 VDC | 12 VDC | 0mA | 1250mA | 75mVp-p | 26mA | 85 | 1250μF |
| DFEC15-24S15W | 9.5 ~36 VDC | 15 VDC | 0mA | 1000mA | 75mVp-p | 26mA | 85 | 800μF |
| DFEC15-24D05W | 9.5 ~ 36 VDC | ± 5 VDC | 0mA | ± 1500mA | 75mVp-p | 57mA | 85 | ± 3600μF |
| DFEC15-24D12W | 9.5 ~ 36 VDC | ± 12 VDC | 0mA | ± 625mA | 75mVp-p | 35mA | 86 | ± 625μF |
| DFEC15-24D15W | 9.5 ~ 36 VDC | ± 15 VDC | 0mA | ± 500mA | 75mVp-p | 35mA | 86 | ± 400μF |
| DFEC15-48S3P3W | 18 ~ 75 VDC | 3.3 VDC | 0mA | 4500mA | 50mVp-p | 37mA | 84 | 14700μF |
| DFEC15-48S05W | 18 ~ 75 VDC | 5 VDC | 0mA | 3000mA | 50mVp-p | 38mA | 86 | 7200μF |
| DFEC15-48S5P1W | 18 ~ 75 VDC | 5.1 VDC | 0mA | 3000mA | 50mVp-p | 38mA | 86 | 7200μF |
| DFEC15-48S12W | 18 ~ 75 VDC | 12 VDC | 0mA | 1250mA | 75mVp-p | 18mA | 85 | 1250μF |
| DFEC15-48S15W | 18 ~ 75 VDC | 15 VDC | 0mA | 1000mA | 75mVp-p | 18mA | 85 | 800μF |
| DFEC15-48D05W | 18 ~ 75 VDC | ± 5 VDC | 0mA | ± 1500mA | 75mVp-p | 37mA | 86 | ± 3600μF |
| DFEC15-48D12W | 18 ~ 75 VDC | ± 12 VDC | 0mA | ± 625mA | 75mVp-p | 20mA | 86 | ± 625μF |
| DFEC15-48D15W | 18 ~ 75 VDC | ± 15 VDC | 0mA | ± 500mA | 75mVp-p | 20mA | 86 | ± 400μF |

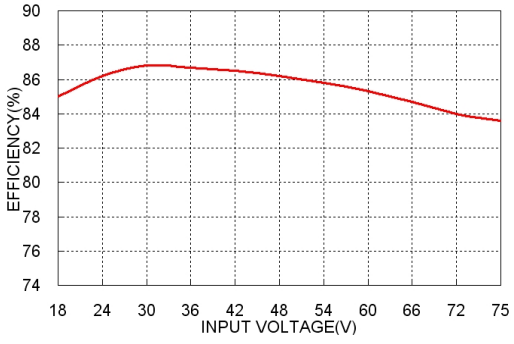
Note:

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. Cross regulation for dual output : asymmetrical load 25% / 100% FL
7. The ON/OFF control pin voltage is referenced to -INPUT .
   To order positive logic ON/OFF control add the suffix-P (Ex:DFEC15-48S05W-P)
   To order negative logic ON/OFF control add the suffix-N (Ex:DFEC15-48S05W-N)

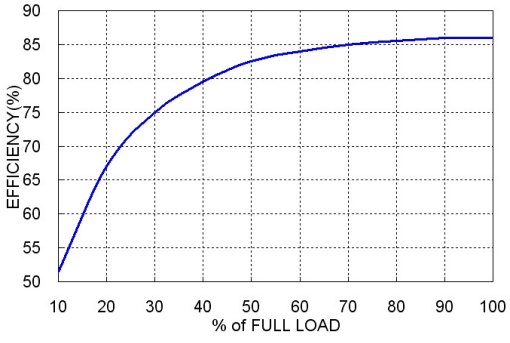
DFEC15-48S05W Derating Curve



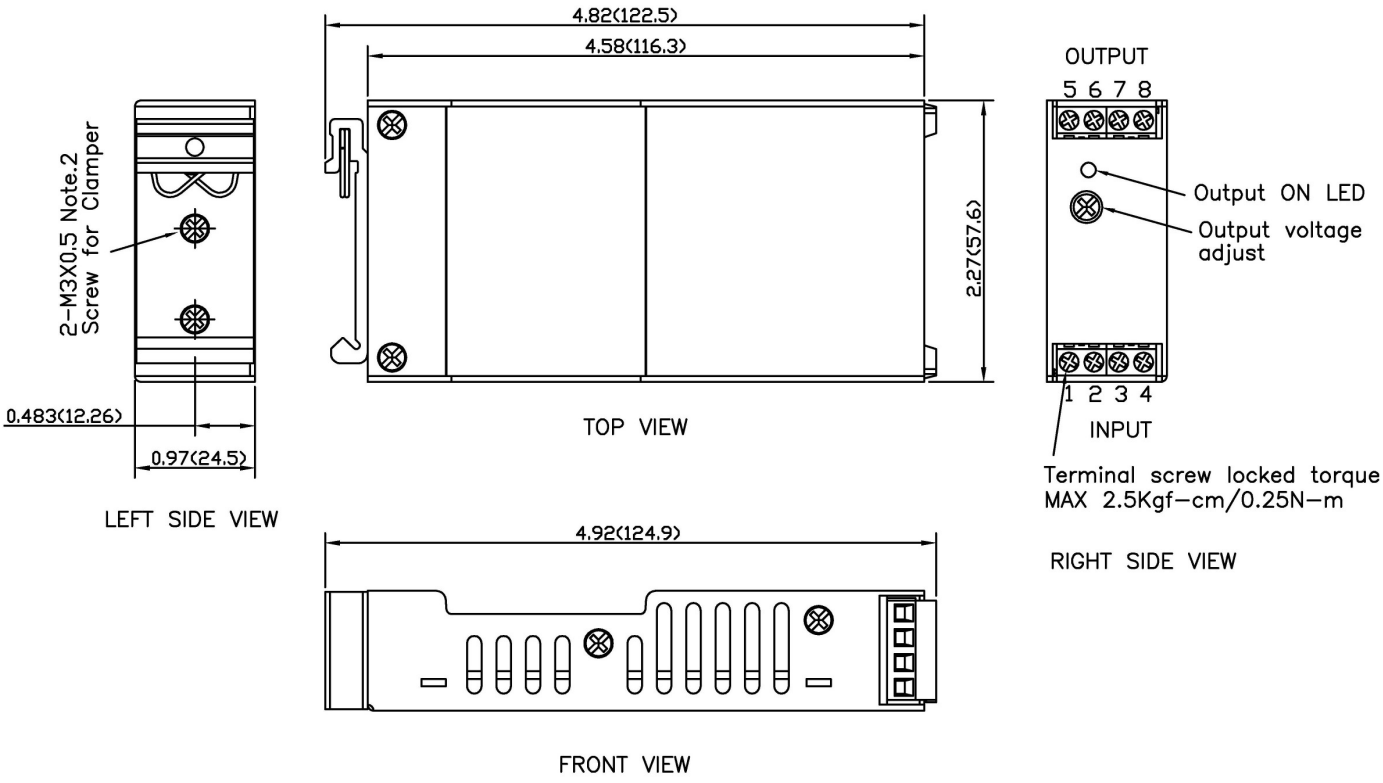

DFEC15-48S05W Efficiency VS Input Voltage




DFEC15-48S05W Efficiency VS Output Current



## MECHANICAL DRAWING :




Note: 1.All dimensions in inch(mm)
Tolerance : x.xx±0.02(x.x±0.5)
x.xxx±0.01(x.xx±0.25)
2.The screw locked torque: MAX 5.0kgf-cm/0.49N-m

| PIN CONNECTION | | |
|---|---|---|
| PIN | SINGLE | DUAL |
| 1 | CTRL | CTRL |
| 2 | -INPUT | -INPUT |
| 3 | -INPUT | -INPUT |
| 4 | +INPUT | +INPUT |
| 5 | NC | NC |
| 6 | -OUTPUT | -OUTPUT |
| 7 | +OUTPUT | COMMON |
| 8 | NC | +OUTPUT |

※ NC：No Connection
※ Screw terminals – wire range from 14 to 18 AWG

| PRODUCT OPTIONS TABLE | |
|---|---|
| Option | Suffix |
| Positive logic Remote ON/OFF | -P |
| Negative logic Remote ON/OFF | -N |