



DFED20W SERIES

DIN RAIL DC-DC CONVERTER

4:1 ULTRA WIDE INPUT RANGE
UP TO 20 Watts



FEATURES

- NO MINIMUM LOAD REQUIRED
- 1600VDC INPUT TO OUTPUT ISOLATION
- SCREW TERMINALS FOR INPUT AND OUTPUT CONNECTIONS
- RELIABLE SNAP-ON FOR DIN RAIL TS-35/7.5 OR TS-35/15
- CASE PROTECTION MEET IP20(IEC60529)
- INTERNAL OUTPUT DC-OK INDICATOR
- MEET EN55022 CLASS B
- SAFETY MEETS UL60950-1, EN60950-1, & IEC60950-1
- CE MARKED
- COMPLIANT TO RoHS II & REACH

APPLICATIONS

- COMMUNICATION SYSTEM
- INDUSTRY CONTROL SYSTEM
- FACTORY AUTOMATIC EQUIPMENT
- SEMICONDUCTOR EQUIPMENT

| | | | | | | | | |
|-------------------|----------------|-----|-----|-----|-----|---------------|--------------|-----------------------------|
| 1600VDC ISOLATION | REMOTE CONTROL | UVP | OCP | SCP | OVP | FUSE INCLUDED | INRUSH LIMIT | REVERSE POLARITY PROTECTION |
|-------------------|----------------|-----|-----|-----|-----|---------------|--------------|-----------------------------|

TECHNICAL SPECIFICATION

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

| Model Number | Input Range VDC | Output Voltage VDC | Output Current @ Full Load mA | Input Current @ No Load mA | Efficiency % | Maximum Capacitor Load (1) µF |
|----------------|--------------------|-----------------------|----------------------------------|-------------------------------|-----------------|----------------------------------|
| DFED20-24S3P3W | 9.5 ~ 36 | 3.3 | 5500 | 52 | 83 | 18000 |
| DFED20-24S05W | 9.5 ~ 36 | 5 | 4000 | 67 | 86 | 9600 |
| DFED20-24S12W | 9.5 ~ 36 | 12 | 1670 | 26 | 84 | 1650 |
| DFED20-24S15W | 9.5 ~ 36 | 15 | 1330 | 27 | 84 | 1050 |
| DFED20-24D05W | 9.5 ~ 36 | ±5 | ±2000 | 59 | 86 | ±4800 |
| DFED20-24D12W | 9.5 ~ 36 | ±12 | ±833 | 34 | 85 | ±825 |
| DFED20-24D15W | 9.5 ~ 36 | ±15 | ±667 | 35 | 85 | ±525 |
| DFED20-48S3P3W | 18 ~ 75 | 3.3 | 5500 | 37 | 83 | 18000 |
| DFED20-48S05W | 18 ~ 75 | 5 | 4000 | 37 | 86 | 9600 |
| DFED20-48S12W | 18 ~ 75 | 12 | 1670 | 18 | 85 | 1650 |
| DFED20-48S15W | 18 ~ 75 | 15 | 1330 | 18 | 85 | 1050 |
| DFED20-48D05W | 18 ~ 75 | ±5 | ±2000 | 37 | 87 | ±4800 |
| DFED20-48D12W | 18 ~ 75 | ±12 | ±833 | 20 | 86 | ±825 |
| DFED20-48D15W | 18 ~ 75 | ±15 | ±667 | 20 | 86 | ±525 |

PART NUMBER STRUCTURE

| | | | | | | | |
|-------------|---|-------------------------|-----------------|---------------------------------------|-------------|---|--|
| DFED20 | - | 48 | S | 05 | W | - | N |
| Series Name | | Input Voltage (VDC) | Output Quantity | Output Voltage (VDC) | Input Range | | Remote Control Option |
| | | 24: 9.5-36 48: 18-75 | S: Single | 3P3: 3.3 05: 5 12: 12 15: 15 | 4:1 | | □: Positive logic N: Negative logic |
| | | | D: Dual | 05: ±5 12: ±12 15: ±15 | | | |

INPUT SPECIFICATIONS

| Parameter | Conditions | Min. | Typ. | Max. | Unit | |
|--------------------------------|---|---------------------------|-----------|---------------------|-------|----|
| Operating input voltage range | 24Vin(nom) | 9.5 | 24 | 36 | VDC | |
| | 48Vin(nom) | 18 | 48 | 75 | | |
| Input fuse (slow blow) | 24Vin(nom) | | 6 | | A | |
| | 48Vin(nom) | | 4 | | | |
| In-rush current | | | 15 | | A | |
| Input reflected ripple current | Nominal input and Full load | | 10 | | mAp-p | |
| Start up voltage | 24Vin(nom) | | | 9.5 | VDC | |
| | 48Vin(nom) | | | 18 | | |
| Shutdown voltage | 24Vin(nom) | | 7.5 | | VDC | |
| | 48Vin(nom) | | 15 | | | |
| Start up time | Nominal input and Constant resistive load | Power up | 100 | | ms | |
| | | Remote ON/OFF | 20 | | | |
| Input surge voltage | 100ms, max. | 24Vin(nom) | | 50 | VDC | |
| | | 48Vin(nom) | | 100 | | |
| Remote ON/OFF | Referred to -Vin pin | Positive logic (Standard) | DC-DC ON | Open or 3 ~ 12VDC | | |
| | | | DC-DC OFF | Short or 0 ~ 1.2VDC | | |
| | | Negative logic (Option) | DC-DC ON | Short or 0 ~ 1.2VDC | | |
| | | | DC-DC OFF | Open or 3 ~ 12VDC | | |
| | | Input current of Ctrl pin | -0.5 | | 0.5 | mA |
| | | Remote off input current | | | 2.5 | mA |

OUTPUT SPECIFICATIONS

| Parameter | Conditions | Min. | Typ. | Max. | Unit |
|----------------------------------|------------------------------------|---------|-----------------------|-------|--------------------------------|
| Voltage accuracy | 3.3Vout | -1.5 | | +1.5 | % |
| | Others | -1.0 | | +1.0 | |
| Line regulation | Low Line to High Line at Full Load | Single | -0.2 | +0.2 | % |
| | | Dual | -0.5 | +0.5 | |
| Load regulation | No Load to Full Load | -1.5 | | +1.5 | % |
| Cross regulation | Asymmetrical load 25%/100% FL | -5.0 | | +5.0 | % |
| Voltage adjustability | Single output | -10 | | +10 | % |
| Ripple and noise | Measured by 20MHz bandwidth | Single | 3.3Vout, | 60 | mVp-p |
| | | | 5Vout, 12Vout, 15Vout | 75 | |
| | | Dual | All | 100 | |
| Temperature coefficient | | -0.02 | | +0.02 | %/°C |
| Transient response recovery time | 25% load step change | | 250 | | µs |
| Over voltage protection | Zener diode clamp | 3.3Vout | | 3.9 | VDC |
| | | 5Vout | | 6.2 | |
| | | 12Vout | | 15 | |
| | | 15Vout | | 18 | |
| Output indicator | | | | | Green LED |
| Over load protection | % of Iout rated; Hiccup mode | | 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 Chassis | 1600 | | |
| Isolation resistance | 500VDC | 1 | | | GΩ |
| Isolation capacitance | | | | 4000 | pF |
| Switching frequency | | 360 | 400 | 440 | kHz |
| Safety meets | | | | | UL60950-1 EN60950-1 IEC60950-1 |
| Chassis material | | | | | Aluminum |
| Weight | | | | 147.5g (5.19oz) | |
| MTBF | MIL-HDBK-217F, Full load | | | | 1.619 x 10 ⁶ hrs |

ENVIRONMENTAL SPECIFICATIONS

| Parameter | Conditions | Min. | Typ. | Max. | Unit |
|-------------------------------|------------------|------|------|------|--------------|
| Operating ambient temperature | Without derating | -40 | | +78 | °C |
| | With derating | +78 | | +93 | |
| Storage temperature range | | -40 | | +105 | °C |
| Thermal shock | | | | | MIL-STD-810F |
| Vibration | | | | | MIL-STD-810F |
| Relative humidity | | | | | 5% to 95% RH |

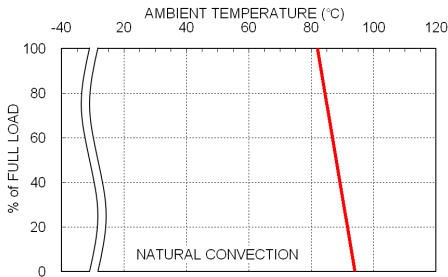
EMC SPECIFICATIONS

| Parameter | Conditions | Level |
|--------------------------------|-------------|------------------|
| EMI | EN55022 | Class B |
| ESD | EN61000-4-2 | Perf. Criteria A |
| Radiated immunity | EN61000-4-3 | Perf. Criteria A |
| Fast transient | EN61000-4-4 | Perf. Criteria A |
| Surge | EN61000-4-5 | Perf. Criteria A |
| Conducted immunity | EN61000-4-6 | Perf. Criteria A |
| Power frequency magnetic field | EN61000-4-8 | Perf. Criteria A |

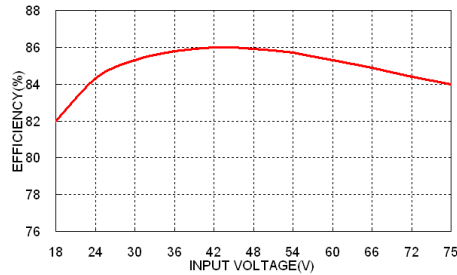
Note:

1. Test by minimum input and constant resistive load.

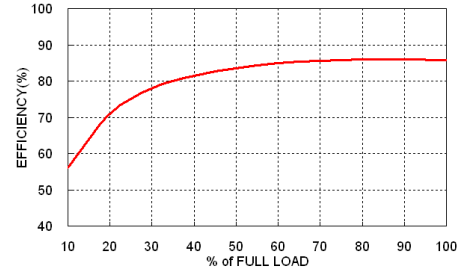
CHARACTERISTIC CURVE



DFED20-48S05W Derating Curve

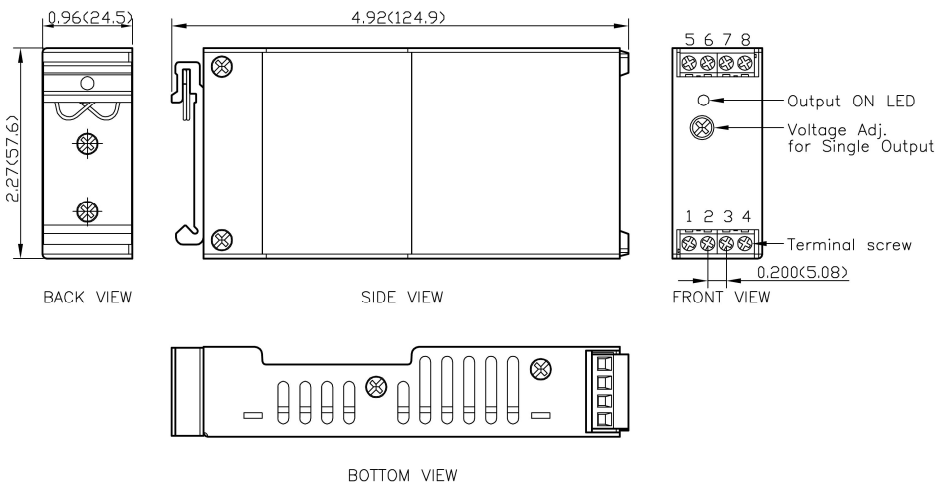


DFED20-48S05W Efficiency vs. Input Voltage



DFED20-48S05W Efficiency vs. Output Load

MECHANICAL DRAWING



PIN CONNECTION

| PIN | SINGLE | DUAL |
|-----|--------|--------|
| 1 | Ctrl | Ctrl |
| 2 | -Vin | -Vin |
| 3 | -Vin | -Vin |
| 4 | +Vin | +Vin |
| 5 | NC | NC |
| 6 | -Vout | -Vout |
| 7 | +Vout | Common |
| 8 | NC | +Vout |

* NC : No Connection

* Screw terminals –
wire range from 14 to 18 AWG

1. All dimensions in Inch (mm)
2. Tolerance : X.XX±0.02 (X.X±0.5)
4. Tolerance : X.XXX±0.01 (X.XX±0.25)
3. Terminal screw locked torque :
MAX 2.5kgf-cm (0.25N-m)