



# Power Mate Technology, Inc UFED20W Series

Chassis-Mount DC-DC Converter  
Up to 20 Watts

**3**  
YEARS  
WARRANTY

ROHS  
COMPLIANT

REACH  
COMPLIANT



Automation



Datacom



IPC



Industry



Measurement



Telecom



Automobile



Boat



Charger



Medical



PV



Railway

CB CE UK  
CA

**1600**  
VDC  
Isolation  
Voltage

**4 : 1**  
Wide  
Input  
Range

**FUSE**  
Installed

**INRUSH  
CURRENT  
LIMIT**

Internal  
EN55032  
Class **B**  
Filter

**NO**  
Min. Load  
Required

**REMOTE  
ON  
OFF**

**REVERSE  
POLARITY  
PROTECTION**

**OCP**

**OVP**

**SCP**

**UVP**

## PART NUMBER STRUCTURE

| UFED20 -    | 48                        | S                      | 05                                                                 | W -            | N                                                            | R                                                       | EC                                                                                                                                   |
|-------------|---------------------------|------------------------|--------------------------------------------------------------------|----------------|--------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Series Name | Input<br>Voltage<br>(VDC) | Output<br>Quantity     | Output<br>Voltage<br>(VDC)                                         | Input<br>Range | Remote Control<br>Options                                    | Conformal Coating<br>Options                            | Assembly<br>Options                                                                                                                  |
|             | 24:9.5~36<br>48:18~75     | S:Single<br><br>D:Dual | 3P3:3.3<br>05:5<br>12:12<br>15:15<br><br>05:±5<br>12:±12<br>15:±15 | 4:1            | <input type="checkbox"/> :Positive logic<br>N:Negative logic | <input type="checkbox"/> : None<br>R: Conformal Coating | <input type="checkbox"/> : None<br>EC: Enclosed Mounting Type<br>DR: Din Rail Mounting Type<br>ED: Enclosed & Din Rail Mounting Type |

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

| Model Number   | Input Range | Output Voltage | Output Current @Full Load | Input Current @No Load | Efficiency | Maximum Capacitor Load |
|----------------|-------------|----------------|---------------------------|------------------------|------------|------------------------|
|                | VDC         | VDC            | mA                        | mA                     | %          | μF                     |
| UFED20-24S3P3W | 9.5 ~ 36    | 3.3            | 5500                      | 51                     | 84         | 18000                  |
| UFED20-24S05W  | 9.5 ~ 36    | 5              | 4000                      | 66                     | 87         | 9600                   |
| UFED20-24S12W  | 9.5 ~ 36    | 12             | 1670                      | 25                     | 85         | 1650                   |
| UFED20-24S15W  | 9.5 ~ 36    | 15             | 1330                      | 26                     | 85         | 1050                   |
| UFED20-24D05W  | 9.5 ~ 36    | ±5             | ±2000                     | 58                     | 87         | ±4800                  |
| UFED20-24D12W  | 9.5 ~ 36    | ±12            | ±833                      | 33                     | 86         | ±825                   |
| UFED20-24D15W  | 9.5 ~ 36    | ±15            | ±667                      | 34                     | 86         | ±525                   |
| UFED20-48S3P3W | 18 ~ 75     | 3.3            | 5500                      | 36                     | 84         | 18000                  |
| UFED20-48S05W  | 18 ~ 75     | 5              | 4000                      | 36                     | 87         | 9600                   |
| UFED20-48S12W  | 18 ~ 75     | 12             | 1670                      | 17                     | 86         | 1650                   |
| UFED20-48S15W  | 18 ~ 75     | 15             | 1330                      | 17                     | 86         | 1050                   |
| UFED20-48D05W  | 18 ~ 75     | ±5             | ±2000                     | 36                     | 88         | ±4800                  |
| UFED20-48D12W  | 18 ~ 75     | ±12            | ±833                      | 19                     | 87         | ±825                   |
| UFED20-48D15W  | 18 ~ 75     | ±15            | ±667                      | 19                     | 87         | ±525                   |

| 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    |
| Start up voltage              |                         | 24Vin(nom)                |           |      |      | 9.5                 | VDC  |
|                               |                         | 48Vin(nom)                |           |      |      | 18                  |      |
| Shutdown voltage              |                         | 24Vin(nom)                |           | 7    | 8    | 9                   | VDC  |
|                               |                         | 48Vin(nom)                |           | 14.5 | 16   | 17.5                |      |
| Start up time                 | 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            | DC-DC ON  |      |      | Open or 3 ~ 12VDC   |      |
|                               |                         | (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                 | mA   |
|                               |                         | Remote off input current  |           |      | 2.5  |                     | mA   |

## OUTPUT SPECIFICATIONS

| Parameter                        | Conditions                         |                                           | Min.         | Typ.                           | Max.         | Unit  |
|----------------------------------|------------------------------------|-------------------------------------------|--------------|--------------------------------|--------------|-------|
| Voltage accuracy                 |                                    | 3.3Vout<br>Others                         | -1.5<br>-1.0 |                                | +1.5<br>+1.0 | %     |
| Line regulation                  | Low Line to High Line at Full Load | Single<br>Dual                            | -0.2<br>-0.5 |                                | +0.2<br>+0.5 | %     |
| Load regulation                  | No Load to Full Load               | 3.3Vout<br>Others                         | -1.5<br>-1.0 |                                | +1.5<br>+1.0 | %     |
| Cross regulation                 | Asymmetrical load 25%/100% FL      | Dual                                      | -5.0         |                                | +5.0         | %     |
| Voltage adjustability            | Single output                      |                                           | -10          |                                | +10          | %     |
| Ripple and noise                 | Measured by 20MHz bandwidth        | Single 3.3Vout<br>Dual Others<br>Dual All |              | 60<br>75<br>100                |              | mVp-p |
| 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<br>5Vout<br>12Vout<br>15Vout      |              | 3.9<br>6.2<br>15<br>18         |              | VDC   |
| Output indicator                 |                                    |                                           |              | Green LED                      |              |       |
| Over load protection             | % of Iout rated                    |                                           |              | 150                            |              | %     |
| Short circuit protection         |                                    |                                           |              | Continuous, automatic recovery |              |       |

## GENERAL SPECIFICATIONS

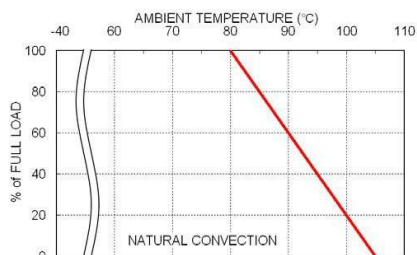
| Parameter             | Conditions               |                                              | Min.         | Typ. | Max.                        | Unit |
|-----------------------|--------------------------|----------------------------------------------|--------------|------|-----------------------------|------|
| Isolation voltage     | 1 minute                 | Input to Output<br>Input (Output) to Chassis | 1600<br>1600 |      |                             | VDC  |
| Isolation resistance  | 500VDC                   |                                              | 1            |      |                             | GΩ   |
| Isolation capacitance |                          |                                              |              |      | 4000                        | pF   |
| Switching frequency   |                          |                                              | 360          | 400  | 440                         | kHz  |
| Safety approvals      | IEC/ EN/ UL62368-1       |                                              |              |      | UL:E193009<br>CB:UL(Demko)  |      |
| Chassis material      |                          |                                              |              |      | Aluminum                    |      |
| Conformal coating     |                          |                                              |              |      | Impregnating varnish        |      |
| Weight                |                          |                                              |              |      | 89g (3.13oz)                |      |
| MTBF                  | MIL-HDBK-217F, Full load |                                              |              |      | 1.966 x 10 <sup>6</sup> hrs |      |

## ENVIRONMENTAL SPECIFICATIONS

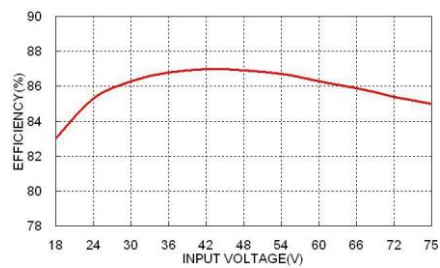
| Parameter                     | Conditions |                                                            | Min. | Typ. | Max.                                                         | Unit |
|-------------------------------|------------|------------------------------------------------------------|------|------|--------------------------------------------------------------|------|
| Operating ambient temperature |            | With derating                                              | -40  |      | +105                                                         | °C   |
| Storage temperature range     |            |                                                            | -40  |      | +105                                                         | °C   |
| Thermal shock                 |            |                                                            |      |      | MIL-STD-810F                                                 |      |
| Vibration                     |            | 00S00W -00<br>00S00W -00EC<br>00S00W -00DR<br>00S00W -00ED |      |      | MIL-STD-810F<br>MIL-STD-810F<br>IEC60068-2-6<br>IEC60068-2-6 |      |
| Relative humidity             |            |                                                            |      |      | 5% to 95% RH                                                 |      |

| EMC SPECIFICATIONS             |                                                               |                  |
|--------------------------------|---------------------------------------------------------------|------------------|
| Parameter                      | Conditions                                                    | Level            |
| EMI                            | EN55032                                                       | Class B          |
| EMS                            | EN55024                                                       |                  |
| ESD                            | EN61000-4-2 Air $\pm 8\text{kV}$ and Contact $\pm 6\text{kV}$ | Perf. Criteria A |
| Radiated immunity              | EN61000-4-3 10V/m                                             | Perf. Criteria A |
| Fast transient                 | EN61000-4-4 $\pm 2\text{kV}$                                  | Perf. Criteria A |
| Surge                          | EN61000-4-5 $\pm 0.5\text{kV}$                                | Perf. Criteria A |
| Conducted immunity             | EN61000-4-6 10Vr.m.s                                          | Perf. Criteria A |
| Power frequency magnetic field | EN61000-4-8 100A/m continuous; 1000A/m 1 second               | Perf. Criteria A |

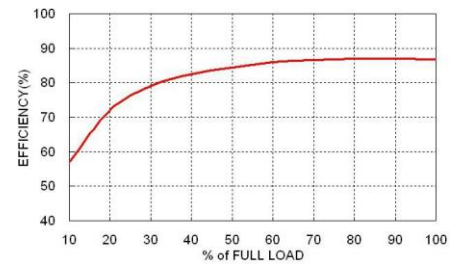
### CHARACTERISTIC CURVE



UFED20-48S05W Derating Curve



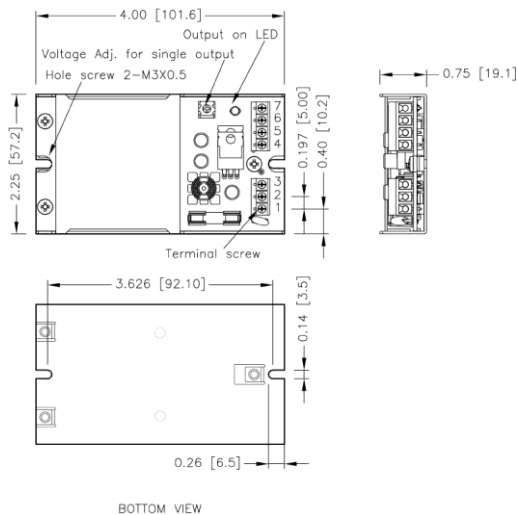
UFED20-48S05W Efficiency vs. Input Voltage



UFED20-48S05W Efficiency vs. Output Load

## MECHANICAL DRAWING

### CHASSIS MOUNTING TYPE



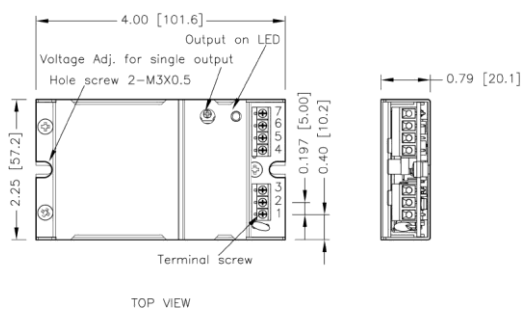
### TERMINAL CONNECTION

| NO. | SINGLE | DUAL   |
|-----|--------|--------|
| 1   | +Vin   | +Vin   |
| 2   | -Vin   | -Vin   |
| 3   | Ctrl   | Ctrl   |
| 4   | NC     | NC     |
| 5   | -Vout  | -Vout  |
| 6   | +Vout  | Common |
| 7   | 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]  
X.XXX±0.01 [X.XX±0.25]
3. Hole screw locked torque :  
MAX 5.0kgf - cm/0.49N - m
4. Terminal screw locked torque :  
MAX 2.5kgf - cm/0.25N - m

### ENCLOSED MOUNTING TYPE



### DIN RAIL MOUNTING TYPE

