

# URED20W SERIES

DC-DC CONVERTER

4:1 ULTRA WIDE INPUT RANGE  
UP TO 20 Watts



## FEATURES

- NO MINIMUM LOAD REQUIRED
- 1600VDC INPUT TO OUTPUT ISOLATION
- APPLICATION OF CHASSIS-MOUNT DC/DC CONVERTERS
- SCREW TERMINALS FOR INPUT AND OUTPUT CONNECTIONS
- INTERNAL INPUT FUSE PROTECTION
- INTERNAL OUTPUT LED INDICATOR
- MEET EN55022 CLASS B
- SAFETY MEETS UL60950-1, EN60950-1, IEC60950-1, & EN50155
- CE MARKED
- COMPLIANT TO RoHS II & REACH

## APPLICATIONS

- RAILWAY SYSTEM
- WIRELESS NETWORK
- TELECOM/DATACOM
- INDUSTRY CONTROL SYSTEM
- MEASUREMENT EQUIPMENT
- SEMICONDUCTOR EQUIPMENT

| 1600VDC<br>ISOLATION | REMOTE<br>CONTROL | UVP | OCP<br>SCP | OVP | FUSE<br>INCLUDED | INRUSH<br>LIMIT | REVERSE<br>POLARITY<br>PROTECTION | LOW<br>STANDBY<br>POWER |
|----------------------|-------------------|-----|------------|-----|------------------|-----------------|-----------------------------------|-------------------------|
|----------------------|-------------------|-----|------------|-----|------------------|-----------------|-----------------------------------|-------------------------|

## 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            | mA                        | mA                      | %          | μF                         |
| URED20-24S3P3W  | 9 ~ 36      | 3.3            | 4500                      | 8                       | 84         | 7000                       |
| URED20-24S05W   | 9 ~ 36      | 5              | 4000                      | 8                       | 87         | 5000                       |
| URED20-24S12W   | 9 ~ 36      | 12             | 1670                      | 8                       | 88         | 850                        |
| URED20-24S15W   | 9 ~ 36      | 15             | 1330                      | 8                       | 87         | 700                        |
| URED20-24D12W   | 9 ~ 36      | ±12            | ± 833                     | 8                       | 87         | ± 500                      |
| URED20-24D15W   | 9 ~ 36      | ±15            | ± 667                     | 8                       | 88         | ± 350                      |
| URED20-48S3P3W  | 18 ~ 75     | 3.3            | 4500                      | 6                       | 84         | 7000                       |
| URED20-48S05W   | 18 ~ 75     | 5              | 4000                      | 6                       | 87         | 5000                       |
| URED20-48S12W   | 18 ~ 75     | 12             | 1670                      | 6                       | 88         | 850                        |
| URED20-48S15W   | 18 ~ 75     | 15             | 1330                      | 6                       | 88         | 700                        |
| URED20-48D12W   | 18 ~ 75     | ±12            | ± 833                     | 6                       | 87         | ± 500                      |
| URED20-48D15W   | 18 ~ 75     | ±15            | ± 667                     | 6                       | 88         | ± 350                      |
| URED20-110S3P3W | 43 ~ 160    | 3.3            | 4500                      | 5                       | 84         | 7000                       |
| URED20-110S05W  | 43 ~ 160    | 5              | 4000                      | 5                       | 86         | 5000                       |
| URED20-110S12W  | 43 ~ 160    | 12             | 1670                      | 5                       | 87         | 850                        |
| URED20-110S15W  | 43 ~ 160    | 15             | 1330                      | 5                       | 87         | 700                        |
| URED20-110D12W  | 43 ~ 160    | ±12            | ± 833                     | 5                       | 87         | ± 500                      |
| URED20-110D15W  | 43 ~ 160    | ±15            | ± 667                     | 5                       | 88         | ± 350                      |

## PART NUMBER STRUCTURE

|             |                                      |                 |                                       |             |                                        |                                                                                                                            |    |
|-------------|--------------------------------------|-----------------|---------------------------------------|-------------|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------|----|
| URED20 -    | 48                                   | S               | 05                                    | W           | -                                      | N                                                                                                                          | EC |
| Series Name | Input Voltage (VDC)                  | Output Quantity | Output Voltage (VDC)                  | Input Range | Remote Control Option                  | Assembly Option                                                                                                            |    |
|             | 24: 9~36<br>48: 18~75<br>110: 43~160 | S: Single       | 3P3: 3.3<br>05: 5<br>12: 12<br>15: 15 | 4:1         | □: Positive logic<br>N: Negative logic | □: No Assembly Option<br>EC: Enclosed Mounting Type<br>DR: Din Rail Mounting Type<br>ED: Enclosed & Din Rail Mounting Type |    |
|             |                                      | D: Dual         | 12: ±12<br>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   |       |
|                                | 110Vin(nom)                 |                           |           | 43                  | 110  | 160  |       |
| Input fuse (slow blow)         | 24Vin(nom)                  |                           |           | 6                   |      |      | A     |
|                                | 48Vin(nom)                  |                           |           | 4                   |      |      |       |
|                                | 110Vin(nom)                 |                           |           | 2                   |      |      |       |
| In-rush current                |                             |                           |           | 15                  |      |      | A     |
| Input reflected ripple current | Nominal input and Full load |                           |           | 30                  |      |      | mAp-p |
| Start up voltage               | 24Vin(nom)                  |                           |           | 9                   |      |      | VDC   |
|                                | 48Vin(nom)                  |                           |           | 18                  |      |      |       |
|                                | 110Vin(nom)                 |                           |           | 43                  |      |      |       |
| Shutdown voltage               | 24Vin(nom)                  |                           |           | 8                   |      |      | VDC   |
|                                | 48Vin(nom)                  |                           |           | 16                  |      |      |       |
|                                | 110Vin(nom)                 |                           |           | 40                  |      |      |       |
| Start up time                  | Constant resistive load     | Power up                  |           | 100                 |      |      | ms    |
|                                |                             | Remote ON/OFF             |           | 30                  |      |      |       |
| Input surge voltage            | 1 second, max.              | 24Vin(nom)                |           | 50                  |      |      | VDC   |
|                                |                             | 48Vin(nom)                |           | 100                 |      |      |       |
|                                |                             | 110Vin(nom)               |           | 170                 |      |      |       |
| Remote ON/OFF                  | Referenced to –Vin pin      | Positive logic            | DC-DC ON  | Open or 3 ~ 15VDC   |      |      | 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 ~ 15VDC   |      |      |       |
|                                |                             | Input current of CTRL pin |           | -0.5                | 1    |      |       |
|                                |                             | Remote off input current  |           | 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               | 3.3Vout | -1.5                           |           | +1.5  | %     |
|                                  |                                    | Others  | -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                 | Measured by 20MHz bandwidth        |         |                                | 75        |       | 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 |                                | 3.9       |       | VDC   |
|                                  |                                    | 5Vout   |                                | 6.2       |       |       |
|                                  |                                    | 12Vout  |                                | 15        |       |       |
|                                  |                                    | 15Vout  |                                | 20        |       |       |
| 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           | 1600 |      |                                                 | VDC  |
|                        |                          | Input (Output) to Chassis | 1000 |      |                                                 |      |
| Isolation resistance   | 500VDC                   |                           | 1    |      |                                                 | GΩ   |
| Isolation capacitance  |                          |                           |      | 5000 |                                                 | pF   |
| Switching frequency    |                          |                           | 297  | 330  | 363                                             | kHz  |
| Safety meets           |                          |                           |      |      | UL60950-1<br>EN60950-1<br>IEC60950-1<br>EN50155 |      |
| Chassis material       |                          |                           |      |      | Aluminum                                        |      |
| Weight                 |                          |                           |      |      | 105g (3.70oz)                                   |      |
| MTBF                   | MIL-HDBK-217F, Full load |                           |      |      | 1.338 x 10 <sup>6</sup> hrs                     |      |

## ENVIRONMENTAL SPECIFICATIONS

| Parameter                     | Conditions                        | Min.       | Typ. | Max.                  | Unit |
|-------------------------------|-----------------------------------|------------|------|-----------------------|------|
| Operating ambient temperature | without derating<br>with derating | -40<br>+78 |      | +78<br>+100           | °C   |
| Storage temperature range     |                                   | -40        |      | +105                  | °C   |
| Thermal shock                 |                                   |            |      | MIL-STD-810F          |      |
| Shock                         |                                   |            |      | EN61373, MIL-STD-810F |      |
| Vibration                     |                                   |            |      | EN61373, MIL-STD-810F |      |
| Relative humidity             |                                   |            |      | 5% to 95% RH          |      |

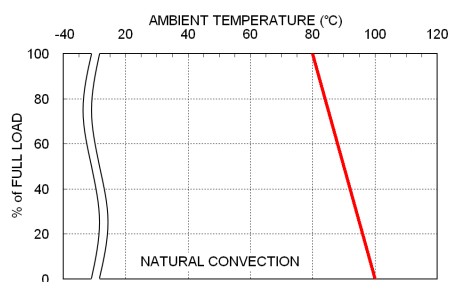
## EMC SPECIFICATIONS

| Parameter          | Conditions                                        | Level            |
|--------------------|---------------------------------------------------|------------------|
| EMI                | EN55022                                           | Class B          |
| ESD                | EN61000-4-2 Air $\pm 8$ kV and Contact $\pm 6$ kV | Perf. Criteria A |
| Radiated immunity  | EN61000-4-3 20V/m                                 | Perf. Criteria A |
| Fast transient     | EN61000-4-4 $\pm 2$ kV                            | Perf. Criteria A |
| Surge              | EN61000-4-5 $\pm 1$ kV                            | Perf. Criteria A |
| Conducted immunity | EN61000-4-6 10Vr.m.s                              | Perf. Criteria A |

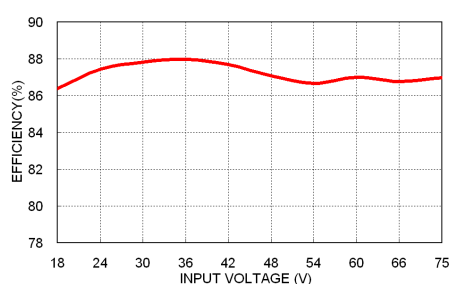
### Note:

1. Test by minimum input and constant resistive load.

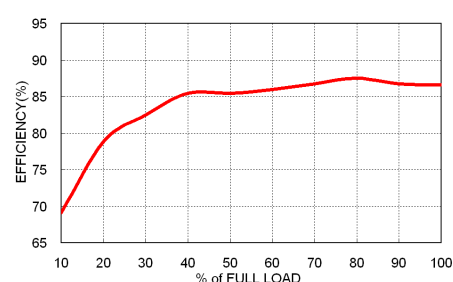
## CHARACTERISTIC CURVE



URED20-48S05W Derating Curve

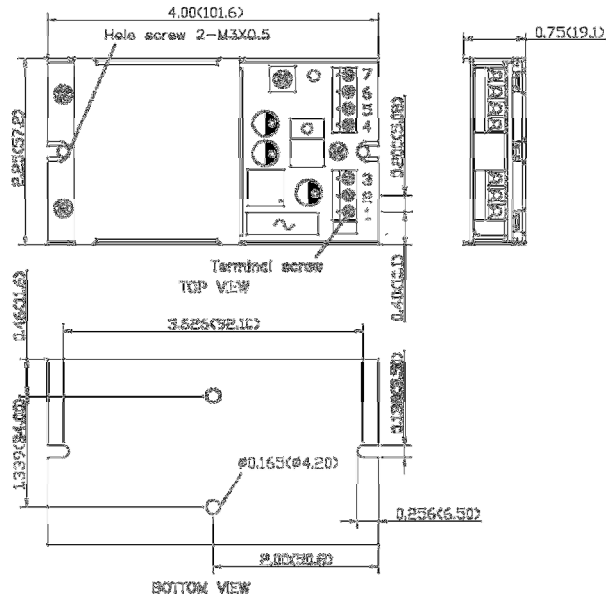


URED20-48S05W Efficiency vs. Input Voltage



URED20-48S05W Efficiency vs. Output Load

## CHASSIS MOUNTING TYPE

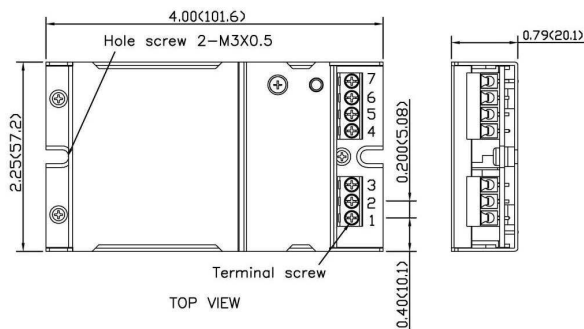


## PIN CONNECTION

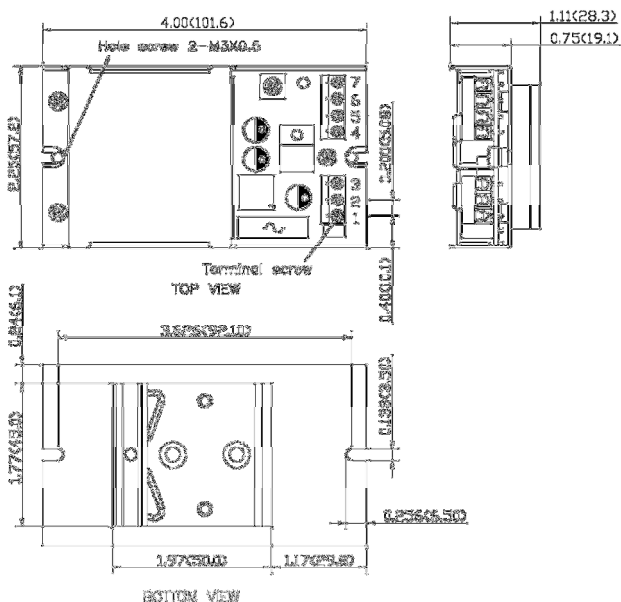
| PIN | SINGLE | DUAL   |
|-----|--------|--------|
| 1   | +Vin   | +Vin   |
| 2   | -Vin   | -Vin   |
| 3   | Ctrl   | Ctrl   |
| 4   | NC     | NC     |
| 5   | -Vout  | -Vout  |
| 6   | +Vout  | Common |
| 7   | NC     | +Vout  |

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

## ENCLOSED MOUNTING TYPE



## DIN RAIL MOUNTING TYPE



- All dimensions in Inch (mm)
- Tolerance : X.XX±0.02 (X.X±0.5)  
X.XXX±0.01 (X.XX±0.25)
- Hole screw locked torque :  
MAX 5.0kgf—cm (0.49N—m)
- Terminal screw locked torque :  
MAX 2.5kgf—cm (0.25N—m)