

## Features

- Wide Input4:1
- DIP Package、Din-Rail Series
- Working Temperature: -40°C~+85°C
- Isolation 1500VDC 0.5mA 1Minute
- Internal SMD Design
- Metal shell packaging
- Cooling Nature
- Good shielding and anti-interference performance, electromagnetic compatibility, lightning protection, output overcurrent, short circuit protection, overheating protection, self recovery and other functions

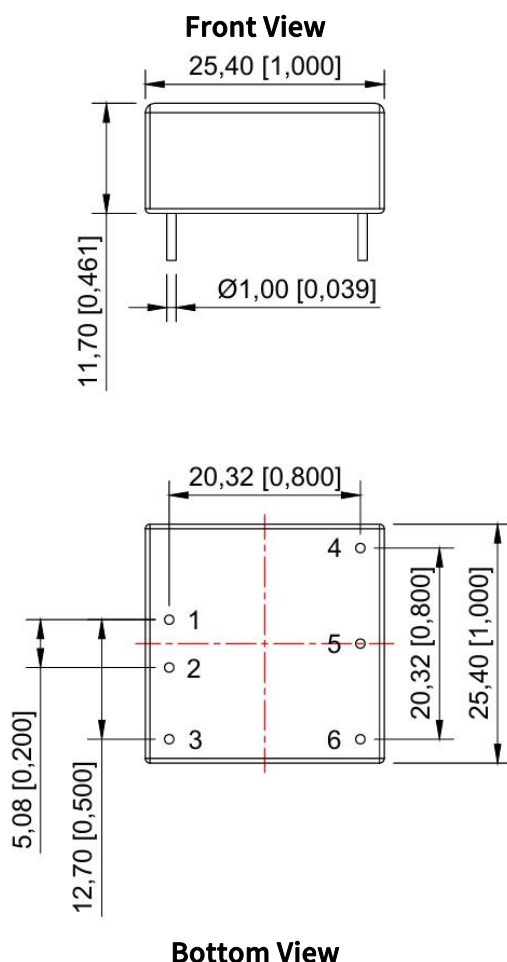
## Product Picture



EMC-EN55032  
EN55035  
LVD-EN62368

## Dimensions

### Dimensions of UFD\_S(D)\_E1-20 Series



Note: The grid distance: 2.54\*2.54mm

| Pin Mode |            |          |
|----------|------------|----------|
| Pin      | Single (S) | Dual (D) |
| 1        | Vin        | Vin      |
| 2        | GND        | GND      |
| 3        | CNT        | CNT      |
| 4        | 0V         | -XXVDC   |
| 5        | TRM        | COM      |
| 6        | +XXVDC     | +XXVDC   |

Note:

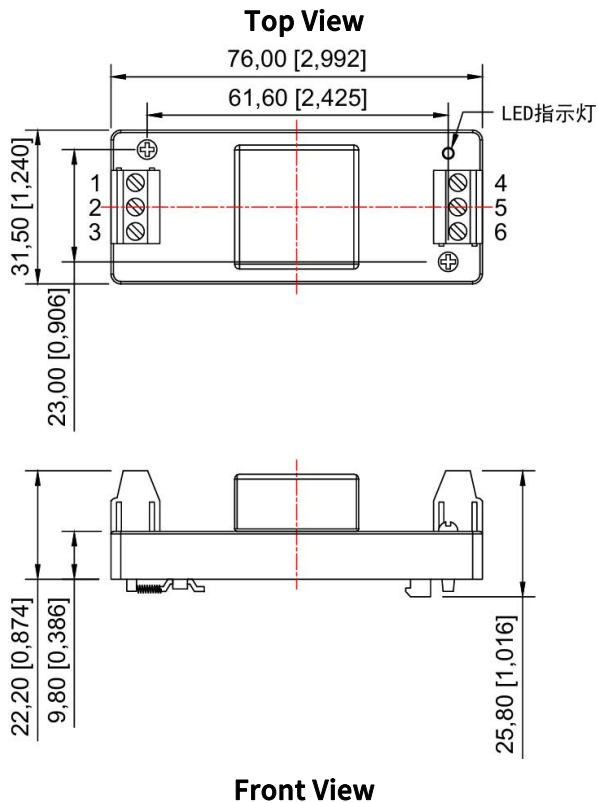
Unit: mm[inch]

Pin Section Tolerance :  $\pm 0.1[\pm 0.004]$

General Tolerance:  $\pm 0.25[\pm 0.01]$

The device layout is for reference only.

Dimensions of UFD\_S(D)\_ZDKE1-20 Series



| Pin Mode |            |          |
|----------|------------|----------|
| Pin      | Single (S) | Dual (D) |
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| 3        | Vin        | Vin      |
| 4        | 0V         | -XXVDC   |
| 5        | TRM        | COM      |
| 6        | +XXVDC     | +XXVDC   |

Note:

Unit: mm[inch]

General Tolerance:  $\pm 0.25[\pm 0.01]$

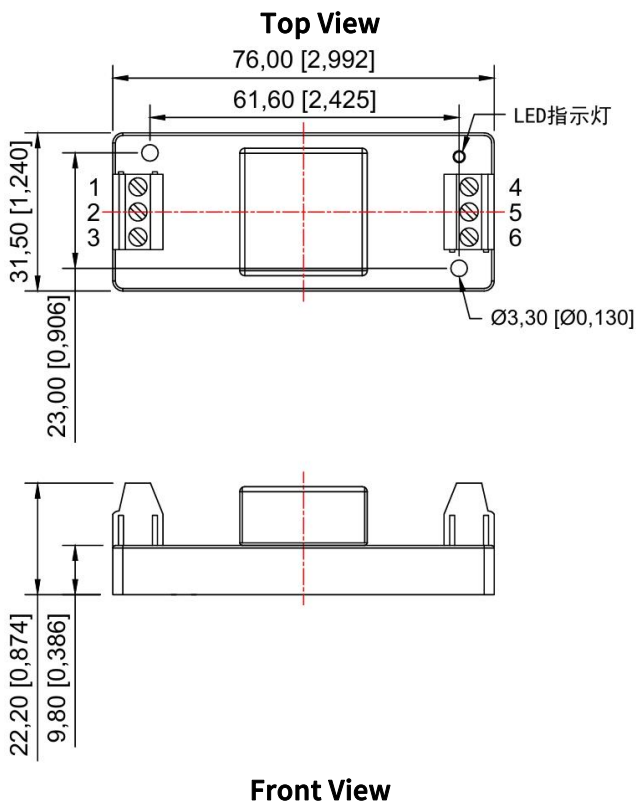
Wire strength: 24-12 AWG

Tightening torque: Max 0.4 N·m

Guide type: TS35

The device layout is for reference only.

Dimensions of UFD\_S(D)\_ZDE1-20 Series



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|----------|------------|----------|
| Pin      | Single (S) | Dual (D) |
| 1        | CNT        | CNT      |
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| 3        | Vin        | Vin      |
| 4        | 0V         | -XXVDC   |
| 5        | TRM        | COM      |
| 6        | +XXVDC     | +XXVDC   |

Note:

Unit: mm[inch]

General Tolerance:  $\pm 0.25[\pm 0.01]$

Wire strength: 24-12 AWG

Tightening torque: Max 0.4 N·m

The device layout is for reference only.

Applications

Railway communications, display screens, monitoring equipment, petrochemicals, industrial control, long-distance DC power supply systems, switching systems and other communication equipment, etc.

Selection Guide

| Items              | Vin(VDC)                             | Vout<br>(V±2%) | Current<br>(mA) | Efficiency<br>(%) | Isolation<br>(VDC) | Weight<br>(g±0.5) | Certificate |
|--------------------|--------------------------------------|----------------|-----------------|-------------------|--------------------|-------------------|-------------|
| UFD_S3.3E1-20      | 12(9-36)<br>24(18-72)<br>110(40-160) | 3.3            | 6060            | ≥82               | 1500               |                   |             |
| UFD_S05E1-20       |                                      | 5              | 4000            | ≥83               | 1500               |                   |             |
| UFD_S12E1-20       |                                      | 12             | 1667            | ≥83               | 1500               |                   |             |
| UFD_S15E1-20       |                                      | 15             | 1333            | ≥83               | 1500               |                   |             |
| UFD_S18E1-20       |                                      | 18             | 1111            | ≥83               | 1500               |                   |             |
| UFD_S24E1-20       |                                      | 24             | 833             | ≥84               | 1500               |                   |             |
| UFD_S28E1-20       |                                      | 28             | 714             | ≥84               | 1500               |                   |             |
| UFD_D05E1-20       |                                      | ±5             | ±2000           | ≥83               | 1500               |                   |             |
| UFD_D12E1-20       |                                      | ±12            | ±834            | ≥83               | 1500               |                   |             |
| UFD_D15E1-20       |                                      | ±15            | ±667            | ≥83               | 1500               |                   |             |
| UFD_D18E1-20       |                                      | ±18            | ±556            | ≥83               | 1500               |                   |             |
| UFD_S3.3ZD(K)E1-20 |                                      | 3.3            | 6060            | ≥82               | 1500               |                   |             |
| UFD_S05ZD(K)E1-20  |                                      | 5              | 4000            | ≥83               | 1500               |                   |             |
| UFD_S12ZD(K)E1-20  |                                      | 12             | 1667            | ≥83               | 1500               |                   |             |
| UFD_S15ZD(K)E1-20  |                                      | 15             | 1333            | ≥83               | 1500               |                   |             |
| UFD_S18ZD(K)E1-20  |                                      | 18             | 1111            | ≥83               | 1500               |                   |             |
| UFD_S24ZD(K)E1-20  |                                      | 24             | 833             | ≥84               | 1500               |                   |             |
| UFD_S28ZD(K)E1-20  |                                      | 28             | 714             | ≥84               | 1500               |                   |             |
| UFD_D05ZD(K)E1-20  |                                      | ±5             | ±2000           | ≥83               | 1500               |                   |             |
| UFD_D12ZD(K)E1-20  |                                      | ±12            | ±834            | ≥83               | 1500               |                   |             |
| UFD_D15ZD(K)E1-20  |                                      | ±15            | ±667            | ≥83               | 1500               |                   |             |
| UFD_D18ZD(K)E1-20  |                                      | ±18            | ±556            | ≥83               | 1500               |                   |             |

Note: Our company customizes any input/output module power supply for customers. If you have special requirements, please call our company. Unless otherwise specified, the input=Vi, and the characteristics of the module power supply should comply with the provisions of Table 1 and be applicable to the full temperature range (-40 °C ≤ Tc ≤ 85 °C)

Mechanical Specifications

|      |                                                  |
|------|--------------------------------------------------|
| Size | 25.40 x 25.40 x 11.70 mm, ZD(K): 76.00 x 31.5 mm |
|------|--------------------------------------------------|

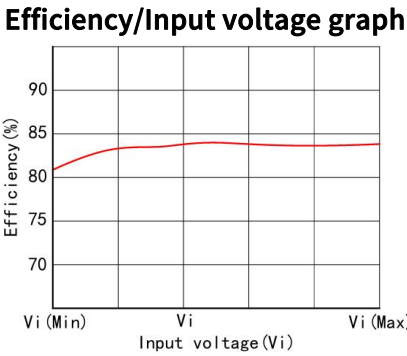
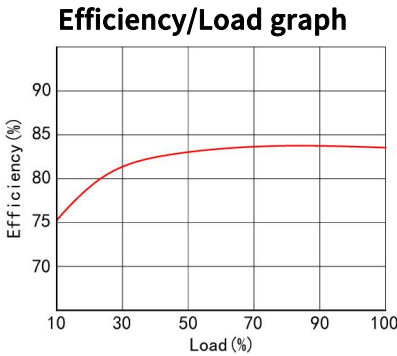
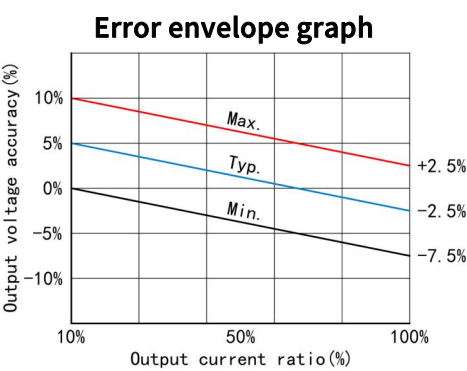
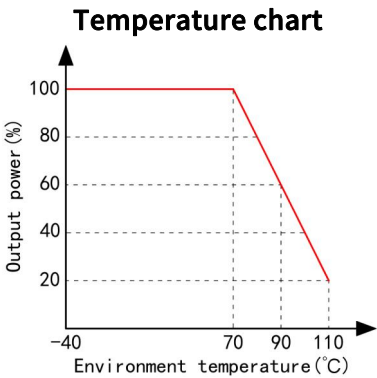
Electrical Characteristics

| Characteristics       | Symbol     | Condition $V_i$ , $-40^{\circ}\text{C} \leq T_c \leq 85$<br>(Unless Otherwise Specified ) | Min       | Max                                        | Unit       |
|-----------------------|------------|-------------------------------------------------------------------------------------------|-----------|--------------------------------------------|------------|
| Output Voltage        | $V_o$      | Full Load                                                                                 | $V_o-2\%$ | $V_o+2\%$                                  | V          |
| Output Current        | $I_{omax}$ | —                                                                                         | —         | $P(\text{Power})/U(\text{Output Voltage})$ | A          |
| Output Ripple Voltage | $V_{p-p}$  | Full Load, $V_i$ , BW=20MHz, Normal Temperature                                           | 100       | 240                                        | mV         |
| Output Noise Voltage  | $V_{p-p}$  | Full Load, $V_i$ , BW=20MHz, Normal Temperature                                           | 120       | 480                                        | mV         |
| Voltage Regulation    | $S_v$      | $V_{imin}$ , $V_i$ , $V_{imax}$ , Full Load                                               | —         | $<2\%$                                     | %          |
| Load Regulation       | $S_i$      | $V_i$ , $I_o=(10\% \sim 100\%)I_{omax}$                                                   | —         | $<1\%$                                     | %          |
| Efficiency            | $\eta$     | $V_i$ , Full Load, Normal Temperature                                                     | 82        | —                                          | %          |
| Insulation Resistance | $R_I$      | Input/Output , Test Voltage: 500VDC                                                       | 1000      | —                                          | M $\Omega$ |

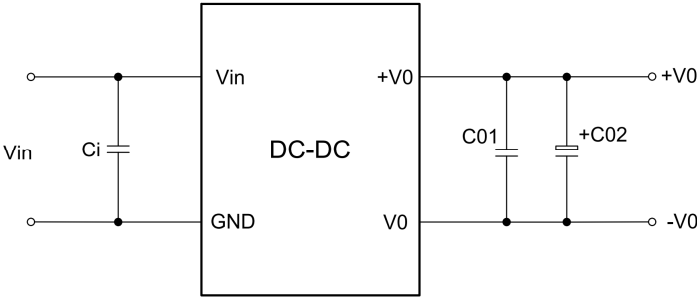
General Characteristics

|                       |                                                |         |
|-----------------------|------------------------------------------------|---------|
| EMC Specifications    | Magnetic Field Sensitivity Test                | GB-4943 |
|                       | Electrostatic Discharge Sensitivity Test       | GB-4943 |
|                       | Radiation Sensitivity Test                     | GB-4943 |
|                       | Conductivity Sensitivity Test                  | GB-4943 |
| Temperature Excursion | $\leq 0.02\%/^{\circ}\text{C}$                 |         |
| Storage Temperature   | $-40^{\circ}\text{C} \sim 125^{\circ}\text{C}$ |         |
| Switching Frequency   | 270KHz~400KHz                                  |         |
| Humidity              | 10%-90%RH                                      |         |
| Leak Current          | /                                              |         |
| MTBF                  | $>500000\text{H}$                              |         |

Product Characteristic Curves



Typical Application  
Design Reference



Recommendation Test

Filtering: In some circuits sensitive to noise and ripple, filtering capacitors can be externally connected to the input and output terminals of the DC/DC converter to reduce the impact of ripple on the system. However, the value of the filtering capacitor should be appropriate. If the capacitor is too large, it may cause startup problems. For each output, under the condition of ensuring safe and reliable operation, the maximum capacitance value of the filtering capacitor can refer to the external capacitance table. In order to obtain very low ripple, an "LC" filtering network can be connected to the input and output terminals of the DC/DC converter, so that the filtering effect will be better. At the same time, attention should be paid to the size of the inductance value and the frequency of the "LC" filtering network itself, which should be staggered with the frequency of the DC/DC module power supply to avoid mutual interference. For each output, under safe and reliable working conditions, it is recommended that its capacitive load value be detailed in Table 1.

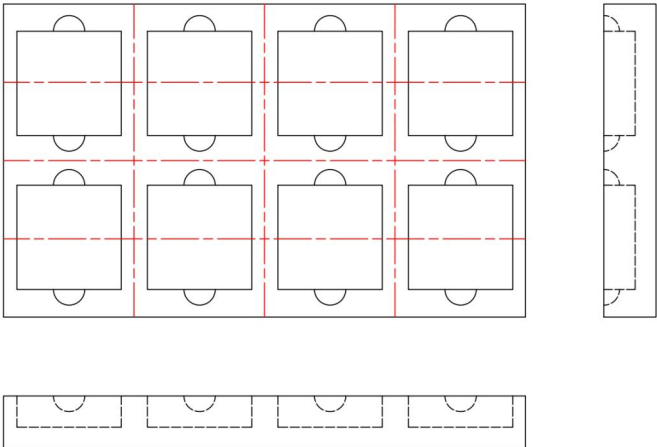
| Single Vout | Cout    | Dual Vout                        | Cout     |
|-------------|---------|----------------------------------|----------|
| 5-12VDC     | 22-68uF | $\pm 5\text{-}\pm 12\text{VDC}$  | 4.7-22uF |
| 24-48VDC    | 10-47uF | $\pm 24\text{-}\pm 48\text{VDC}$ | 4.7-10uF |

Table of recommended capacitive load values (Table 1)

Notice

Package

This series of modules are packed with shockproof and static-proof foam.



## **Transport**

The package is allowed to be transported by any means of transport, which shall avoid direct rain or snow and mechanical damage.

## **Storage**

The module should be stored in a warehouse with an ambient temperature of  $-40^{\circ}\text{C}$  to  $125^{\circ}\text{C}$ , a relative humidity of 20% to 95%, and no acidic, alkaline, or other harmful gases in the surrounding environment.

Note: The above are the performance indicators of the product series listed in this manual. Some indicators of non-standard models may exceed the above requirements. If there is any inconsistency between the manual and the product specification document, please refer to the specification document. If you have special requirements, please contact our company directly.