

**SERIES:** VFM-50-UW | **DESCRIPTION:** DC POWER LINE FILTER

**FEATURES**

- high efficiency 98%
- meet IEC/EN61000-4 standard
- compliant to railway standard EN50155
- CISPR22/EN55022 compliant
- DIP, Chassis and DIN Rail mounting version
- input voltage protection


**SPECIFICATIONS**

| parameter             | conditions/description                                                                                                          | min | typ       | max   | units |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------|-----|-----------|-------|-------|
| input voltage         |                                                                                                                                 | 40  | 110       | 160   | Vdc   |
| output power          |                                                                                                                                 |     |           | 50    | W     |
| no load input current | at 110 Vdc                                                                                                                      |     |           | 3     | mA    |
| efficiency            | at 110 Vdc, full load                                                                                                           |     | 98        |       | %     |
| isolation voltage     | +Vin to GND, -Vin to GND, at 1 minute and leakage current 5 mA max                                                              |     |           | 2,000 | Vac   |
| conducted emissions   | CISPR22/EN55022, 150 kHz ~ 30 MHz class B                                                                                       |     |           |       |       |
| radiated emissions    | CISPR22/EN55022, 30 MHz ~ 1 GHz class B                                                                                         |     |           |       |       |
| ESD                   | IEC/EN61000-4-2, air $\pm 8$ kV, contact $\pm 6$ kV, class B                                                                    |     |           |       |       |
| radiated immunity     | IEC/EN61000-4-3, 10 V/m, class A                                                                                                |     |           |       |       |
| EFT/burst             | IEC/EN61000-4-4, $\pm 4$ kV(5 kHz, 100 kHz), class B                                                                            |     |           |       |       |
| surge                 | IEC/EN61000-4-5, $\pm 2$ kV (1.2 $\mu$ s/50 $\mu$ s 2 $\Omega$ )/ $\pm 4$ kV (1.2 $\mu$ s/50 $\mu$ s 12 $\Omega$ ), class B     |     |           |       |       |
| conducted immunity    | IEC/EN61000-4-6, 10 Vr.m.s, class A                                                                                             |     |           |       |       |
| MTBF                  | as per MIL-HDBK-217F, 40°C                                                                                                      |     | 1,200,000 |       | hours |
| RoHS                  | yes                                                                                                                             |     |           |       |       |
| operating temperature |                                                                                                                                 | -40 |           | 85    | °C    |
| storage temperature   |                                                                                                                                 | -55 |           | 125   | °C    |
| storage humidity      | non-condensing                                                                                                                  | 5   |           | 95    | %     |
| vibration             | IEC/EN61373, 10 cycles in each axis, test time in each axis: 3 minute, frequency: 5-150 Hz, amplitude: 7.5mm, acceleration: 10g |     |           |       |       |

Notes: 1. All specifications are measured at Ta=25°C, humidity < 75%, nominal input voltage, and rated load, unless otherwise specified.

**PART NUMBER KEY**

**VFM-50-UW - X**

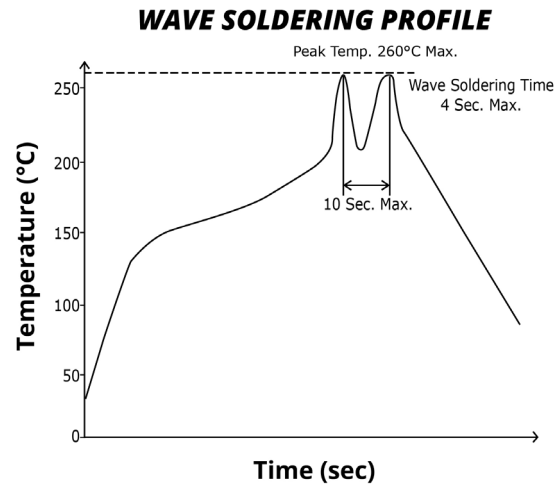
Base Number

Mounting Style:  
 D = board mount  
 T = chassis mount  
 DIN = DIN-rail mount

## SOLDERABILITY<sup>2</sup>

| parameter      | conditions/description     | min | typ | max | units |
|----------------|----------------------------|-----|-----|-----|-------|
| hand soldering | for 3~5 seconds            | 350 | 360 | 370 | °C    |
| wave soldering | see wave soldering profile |     |     | 260 | °C    |

Note: 2. For board mount models only.



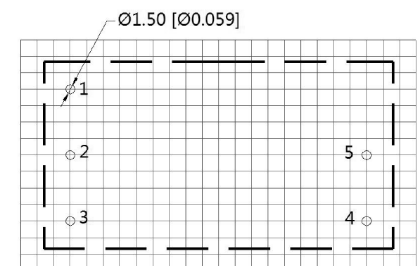
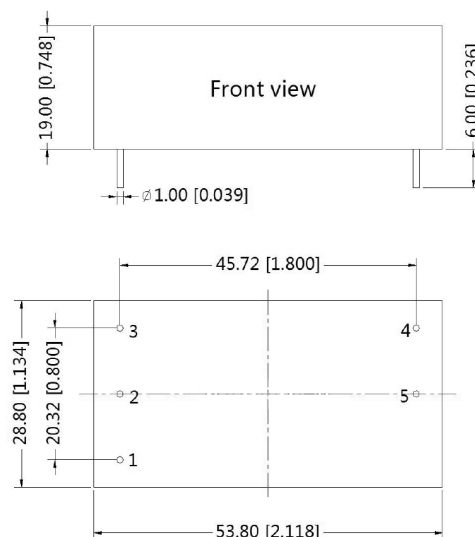
## MECHANICAL

| parameter     | conditions/description                                                                                                                                                                                     | min | typ            | max | units          |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----------------|-----|----------------|
| dimensions    | board mount: 53.80 x 28.80 x 19.00 [2.118 x 1.134 x 0.748 inch]<br>chassis mount: 76.00 x 31.50 x 27.80 [2.992 x 1.240 x 1.094 inch]<br>DIN-Rail mount: 76.00 x 31.50 x 32.40 [2.992 x 1.240 x 1.276 inch] |     |                |     | mm<br>mm<br>mm |
| case material | black flame-retardant heat-proof epoxy resin (UL94V-0)                                                                                                                                                     |     |                |     |                |
| weight        | board mount<br>chassis mount<br>DIN-rail mount                                                                                                                                                             |     | 50<br>70<br>90 |     | g<br>g<br>g    |

## MECHANICAL DRAWING (BOARD MOUNT)

units: mm [inch]  
tolerance:  $\pm 0.50$  [ $\pm 0.020$ ]  
pin diameter tolerance:  $\pm 0.10$  [ $\pm 0.004$ ]

| PIN CONNECTIONS |          |
|-----------------|----------|
| PIN             | Function |
| 1               | GND      |
| 2               | -Vin     |
| 3               | +Vin     |
| 4               | +Vout    |
| 5               | -Vout    |



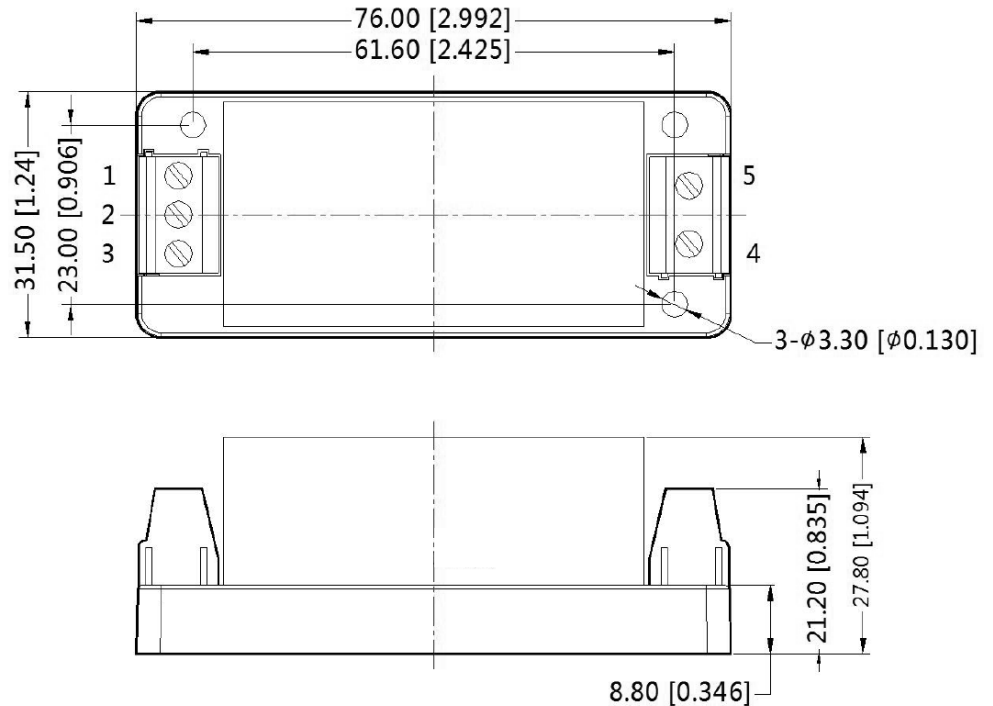
Note : Grid 2.54\*2.54mm  
Recommended PCB Layout  
Top View

## MECHANICAL DRAWING (CHASSIS MOUNT)

units: mm [inch]  
tolerance:  $\pm 0.50$  [ $\pm 0.020$ ]

wire range: 24~12 AWG  
tightening torque: 0.4 N\*m max

| PIN CONNECTIONS |          |
|-----------------|----------|
| PIN             | Function |
| 1               | GND      |
| 2               | -Vin     |
| 3               | +Vin     |
| 4               | +Vout    |
| 5               | -Vout    |

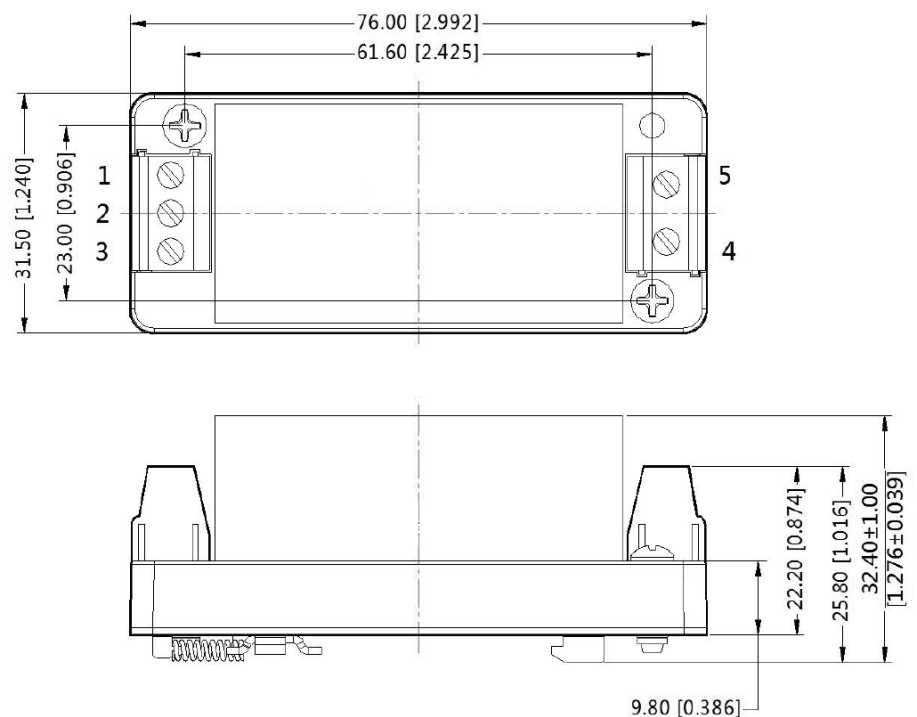


## MECHANICAL DRAWING (DIN-RAIL MOUNT)

units: mm [inch]  
tolerance:  $\pm 0.50$  [ $\pm 0.020$ ]

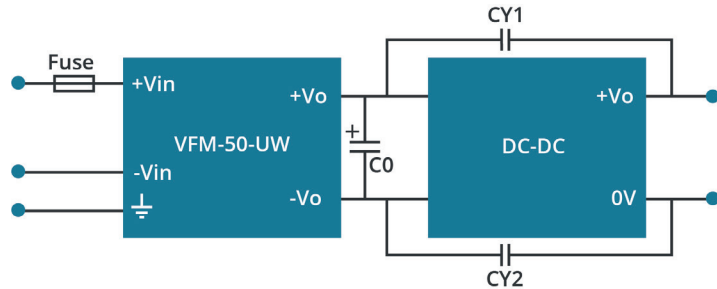
installed on DIN rail TS35  
wire range: 24~12 AWG  
tightening torque: 0.4 N\*m max

| PIN CONNECTIONS |          |
|-----------------|----------|
| PIN             | Function |
| 1               | GND      |
| 2               | -Vin     |
| 3               | +Vin     |
| 4               | +Vout    |
| 5               | -Vout    |



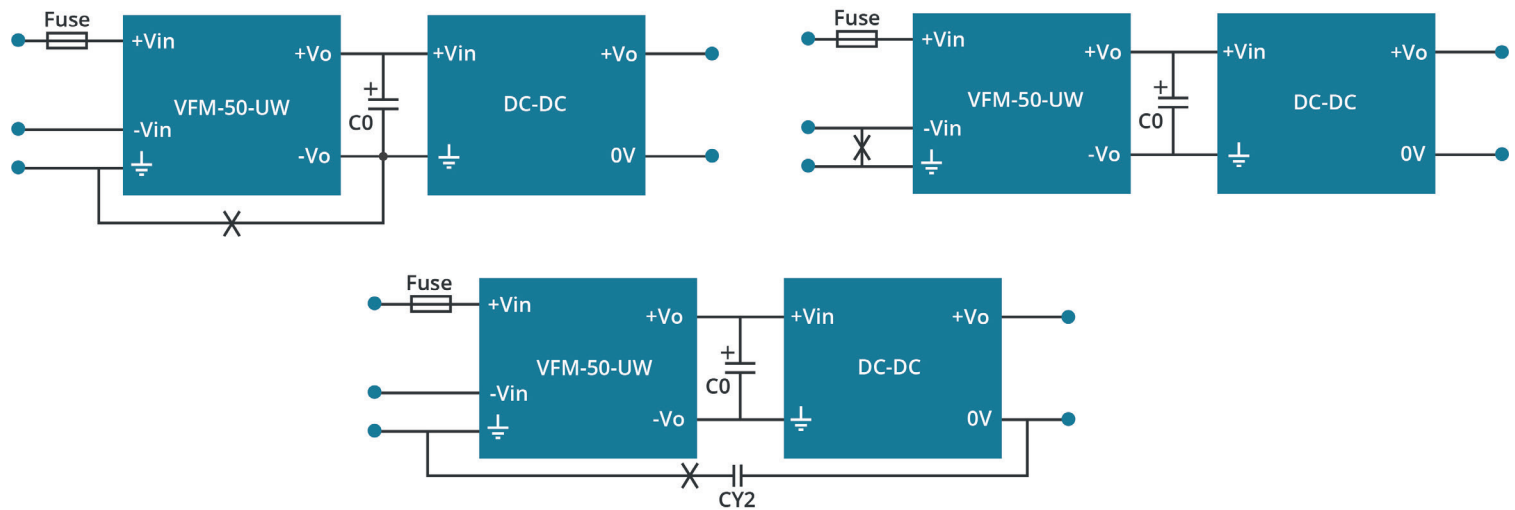
## APPLICATION CIRCUIT

Figure 1  
Application Circuit



| Recommended External Circuit Components |                                            |
|-----------------------------------------|--------------------------------------------|
| FUSE                                    | choose according to power module datasheet |
| C0                                      | 200 $\mu$ F / 400 V, electrolytic          |
| CY1, CY2                                | 1 nF / 2 kV                                |

Figure 2  
Non-supported Application for Module



## REVISION HISTORY

| rev. | description                                | date       |
|------|--------------------------------------------|------------|
| 1.0  | initial release                            | 12/17/2018 |
| 1.01 | circuit figures updated, packaging removed | 01/25/2022 |

The revision history provided is for informational purposes only and is believed to be accurate.



**CUI INC**  
a bel group

**Headquarters**  
20050 SW 112th Ave.  
Tualatin, OR 97062  
**800.275.4899**

Fax 503.612.2383  
**cui.com**  
techsupport@cui.com

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