

Product features:

- ◆ Encapsulation: 89.00\*63.50\*25.00mm
- ◆ Input voltage range: 200-1500VDC
- ◆ Isolation voltage: 4000VAC
- ◆ Operating temperature range: -40℃ - +70℃
- ◆ High efficiency up: 80% (Typ.)
- ◆ Protection function :  
Input undervoltage protection, reverse connection protection,  
Output short circuit protection and overvoltage protection,
- ◆ Application areas:  
Photovoltaic tracking system, junction box, energy storage system and other fields



Selection Guide

| Part No.    | Input Voltage (VDC) | Output Power (W) | Output Voltage (VDC) | Output Current (A)MAX. | Full Load Efficiency (%)Typ. | Max. Capacitive Load(μF) |
|-------------|---------------------|------------------|----------------------|------------------------|------------------------------|--------------------------|
| HPV20-29S05 | 200 - 1500          | 10               | 5                    | 2                      | 68                           | 6000                     |
| HPV20-29S12 |                     | 20               | 12                   | 1.67                   | 78                           | 2000                     |
| HPV20-29S15 |                     | 20               | 15                   | 1.33                   | 80                           | 1200                     |
| HPV20-29S24 |                     | 20               | 24                   | 0.83                   | 80                           | 470                      |

Input Specifications

| Item                          | Operating Conditions | Min.                                                                            | Typ. | Max.  | Unit |
|-------------------------------|----------------------|---------------------------------------------------------------------------------|------|-------|------|
| Input voltage range           |                      | 200                                                                             | --   | 1500  | VDC  |
| Input current                 | 200VDC               | --                                                                              | --   | 0.16  | A    |
|                               | 800VDC               | --                                                                              | --   | 0.04  |      |
|                               | 1500VDC              | --                                                                              | --   | 0.022 |      |
| Impact current                | 200VDC               | --                                                                              | 30   | --    |      |
|                               | 1500VDC              | --                                                                              | 90   | --    |      |
| Input undervoltage protection |                      | Under-voltage protection point: 130-198V, under-voltage release point: 155-200V |      |       |      |
| Fuse                          |                      | 4A/1500VDC                                                                      |      |       |      |
| Hot Plug                      |                      | Unavailable                                                                     |      |       |      |

## Output Specifications

| Item                          | Operating Conditions           | Min.                                    | Typ.  | Max.  | Unit |
|-------------------------------|--------------------------------|-----------------------------------------|-------|-------|------|
| Output voltage accuracy       | Full load                      | --                                      | ±1.0  | ±3    | %    |
| Linear adjustment rate        |                                | --                                      | ±0.5  | ±1.2  |      |
| Load regulation rate          |                                | --                                      | ±1    | ±2    |      |
| Ripple&Noise                  | 20MHz bandwidth (peak-to-peak) | --                                      | --    | 200   | mV   |
| Temperature drift coefficient |                                | --                                      | ±0.03 | ±0.15 | %/°C |
| Min. load                     |                                | 10                                      | --    | --    | %    |
| Short circuit protection      |                                | Hiccup style, Continuous, self-recovery |       |       |      |
| Power outage holding time     | Vin=800VDC                     | --                                      | 5     | --    | ms   |

## General Specifications

| Item                  | Operating Conditions                                    |            |                   | Min.                                       | Typ. | Max. | Unit   |
|-----------------------|---------------------------------------------------------|------------|-------------------|--------------------------------------------|------|------|--------|
| Insulation voltage    | Input - output, 1 minute, leakage current less than 5mA |            |                   | 4000                                       | --   | --   | VAC    |
| Power reduction       | -40°C-0°C                                               | 200-300VDC | HPV20-29S05/12/15 | 0.75                                       | --   | --   | % / °C |
|                       | +50°C-+70°C                                             |            | HPV20-29S series  | 1.5                                        | --   | --   |        |
| Switching frequency   |                                                         |            |                   | --                                         | 65   | --   | kHz    |
| Operating Temperature |                                                         |            |                   | -40                                        | --   | +70  | °C     |
| Storage Temperature   |                                                         |            |                   | -40                                        | --   | +85  |        |
| Storage Humidity      | Non-condensing                                          |            |                   | --                                         | --   | 95   | %RH    |
| Soldering Profile     | Wave soldering                                          |            |                   | 260 ± 5°C ; time: 5 - 10s                  |      |      |        |
|                       | Manual welding                                          |            |                   | 360 ± 10°C ; time: 3 - 5s                  |      |      |        |
| Safety standards      |                                                         |            |                   | Accord withUL1741& EN62109-1, BS EN62109-1 |      |      |        |
| MTBF                  | MIL-HDBK-217F@25°C                                      |            |                   | ≥300,000h                                  |      |      |        |

## Mechanical Specifications

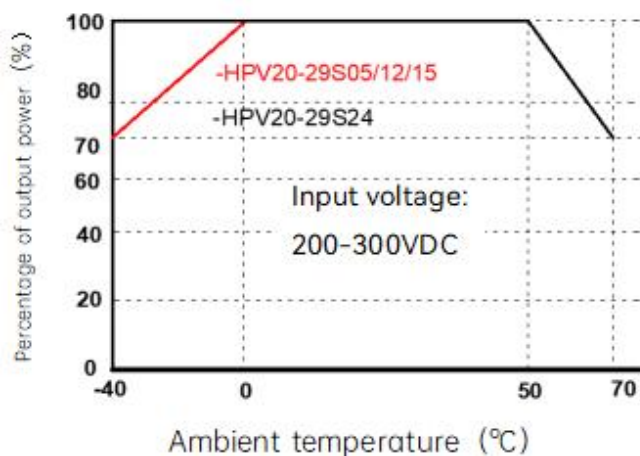
|                    |                                                                   |
|--------------------|-------------------------------------------------------------------|
| Case Material      | Black plastic; flame-retardant and heat-resistant(UL 94V-0 rated) |
| Package Dimensions | 89.00 x 63.50 x 25.00mm                                           |
| Weight             | 210g (Typ.)                                                       |
| Cooling Method     | Free air convection                                               |

## EMC characteristic

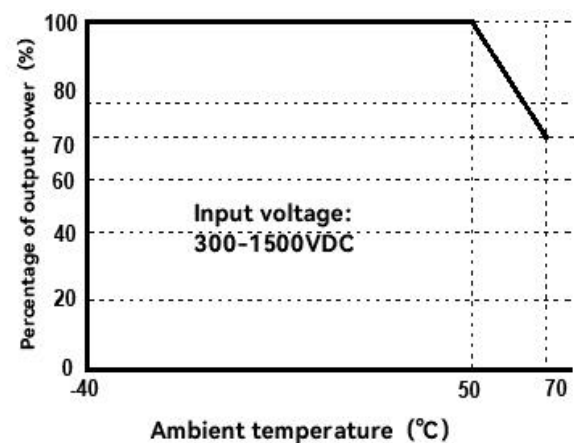
|     |       |                                                                                               |                  |
|-----|-------|-----------------------------------------------------------------------------------------------|------------------|
| EMI | CE    | CISPR32/EN55032 CLASS A (Figure 2)                                                            |                  |
|     | RE    | CISPR32/EN55032 CLASS A (Figure 2)                                                            |                  |
| EMS | RS    | IEC/EN61000-4-3 10V/m                                                                         | perf. Criteria A |
|     | EFT   | IEC/EN61000-4-4 $\pm 2$ KV<br>IEC/EN61000-4-4 $\pm 4$ KV (Figure 2)                           | perf. Criteria B |
|     | Surge | IEC/EN61000-4-5 line to line $\pm 1$ KV<br>IEC/EN61000-4-5 line to line $\pm 2$ KV (Figure 2) | perf. Criteria A |
|     | CS    | IEC/EN61000-4-6 10Vr.m.s                                                                      | perf. Criteria A |
|     | ESD   | IEC/EN61000-4-2 Contact $\pm 6$ KV/Air $\pm 8$ KV                                             | perf. Criteria A |

## Typical Characteristic Curves

Temperature reduction curve

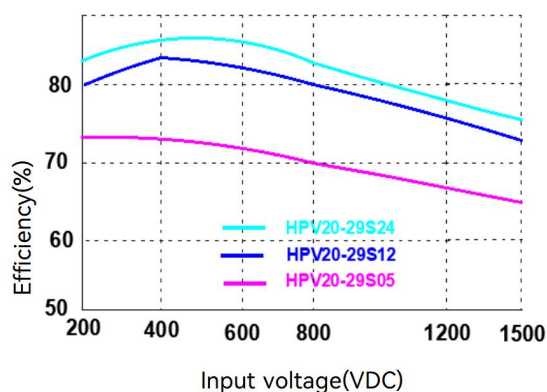


Temperature reduction curve

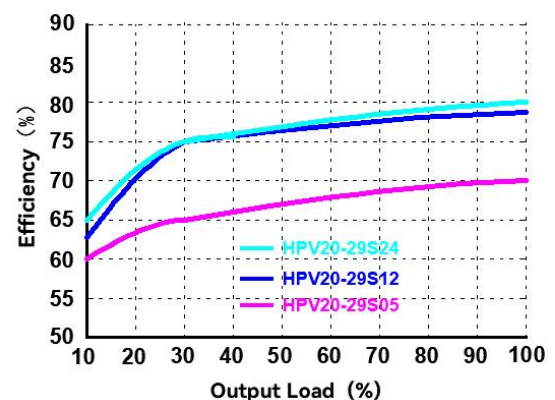


This product is suitable for use in natural air cooling environment, if used in closed environment please consult our FAE.

Efficiency VS input voltage curve (Full load)



Efficiency VS Output Load curve (Vin=800VDC)



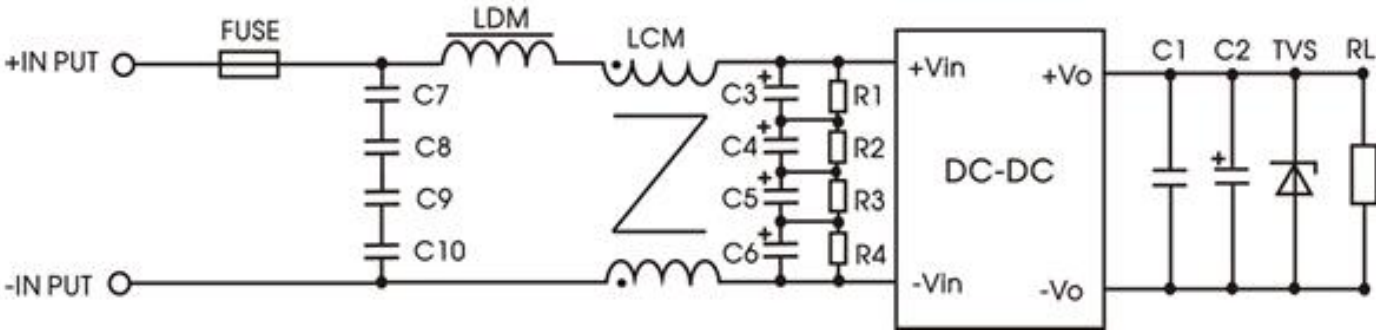
Typical Circuit Design and Application

| Application circuit (Figure 1) | Recommended capacitance load value table |                          |           |           |          |
|--------------------------------|------------------------------------------|--------------------------|-----------|-----------|----------|
|                                | output voltage                           | 5VDC                     | 12VDC     | 15VDC     | 24VDC    |
|                                | FUSE                                     | 2A/1000VDC, Be available |           |           |          |
|                                | C1 (μF)                                  | 1                        |           |           |          |
|                                | C2 (μF)                                  | 120uF/35V                | 120uF/35V | 120uF/35V | 68uF/35V |
|                                | TVS                                      | SMBJ7.0A                 | SMBJ20A   | SMBJ20A   | SMBJ30A  |

Note: The output filter capacitor C1 is a ceramic capacitor, recommended to be 1μF. C2 should be an electrolytic capacitor, preferably a high-frequency low-resistance type. Refer to the technical specifications provided by manufacturers for capacitance values and current ratings. The voltage rating of the capacitor must exceed 80% of its rated value. TVS diodes are recommended for protecting downstream circuits during module malfunctions.

EMC solutions-recommended circuits

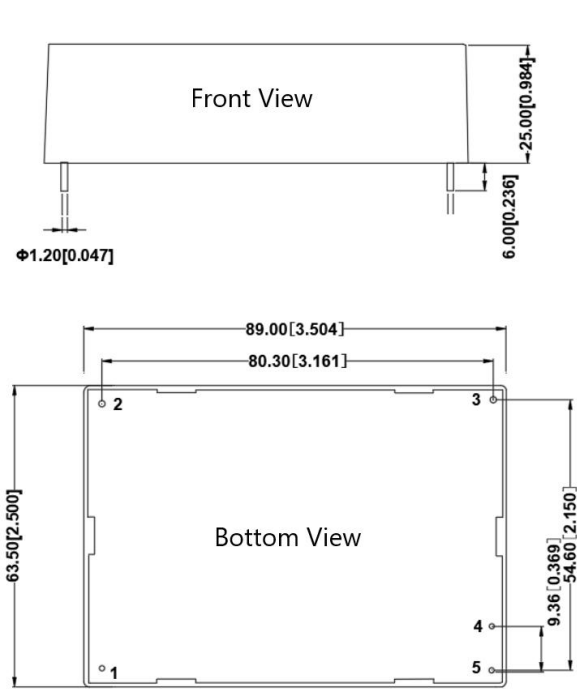
EMC recommended circuit (Figure 2)



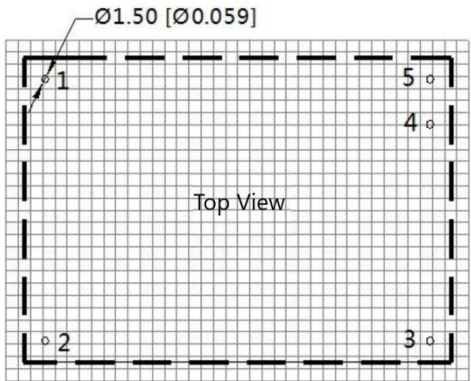
| EMI recommended parameter table |                      |
|---------------------------------|----------------------|
| Component model                 | Recommendation value |
| C3、C4、C5、C6                     | 10μF/400VDC          |
| C7、C8、C9、C10                    | 224K/275VAC          |
| R1、R3、R3、R4                     | 1MΩ/0.25W            |
| LDM                             | 1.2mH/0.38A          |
| LCM                             | 10mH                 |
| FUSE                            | 2A/1000VDC, Required |

Dimensions and Recommended Layout

External dimensionsPCB printed layout



Note:  
Dimension unit: mm[inch]  
Terminal diameter tolerance:  $\pm 0.10[\pm 0.004]$   
Unmarked tolerance:  $\pm 0.50[\pm 0.020]$



The grid spacing is 2.54 x 2.54 mm

| Pin definition table |          |
|----------------------|----------|
| pin                  | function |
| 1                    | -Vin     |
| 2                    | +Vin     |
| 3                    | NC       |
| 4                    | -Vo      |
| 5                    | +Vo      |

Package description

| Information on packaging of pearl cotton      |                                        |                            |
|-----------------------------------------------|----------------------------------------|----------------------------|
| Number of pear l cotton products (pcs/cotton) | Number of inner box products (pcs/box) | Number of full boxes (pcs) |
| 12                                            | 36                                     | 72                         |

## Note:

- ✧ The input voltage should not exceed the specified range value, otherwise it may cause permanent and irreparable damage;
- ✧ It is recommended to use at a load of over 5%. If the load is below 5%, the ripple index of the product may exceed the specifications, but it does not affect the reliability of the product;
- ✧ The maximum capacitive load is tested within the input voltage range and under full load conditions;
- ✧ Unless otherwise specified, all indicators in this manual are measured at Ta=25 °C, humidity<75% RH, nominal input voltage, and output rated load;
- ✧ All indicator testing methods in this manual are based on our company's corporate standards;
- ✧ Our company can provide product customization, and specific requirements can be directly contacted by our technical personnel;
- ✧ Product specifications are subject to change without prior notice.

## WIER Guangdong Science & Technology Co., Ltd

<http://www.wierpower.com>

Telephone: 0756-3620097

Address: 2nd Floor, R&D Building, No. 10, Innovation Coast Technology 2nd Road, Tangjiawan Town, Gaoxin District, Zhuhai City

## E-mail

Sales Email: [sales@wierpower.com](mailto:sales@wierpower.com)

Technical Support Email: [fae@wierpower.com](mailto:fae@wierpower.com)

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