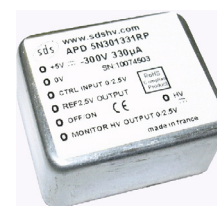


# APD Series

PCB mount ultra compact, regulated, high voltage DC-DC converter



64 standard products  
 Pout : 100 mW  
 Vout : 0 to 200V, 300V, 400V or 500V  
 Vin : [4.5;5.5]Vdc or [11.5;15.5]Vdc  
 Reference : see chart for complete reference



## General Description

The highly compact APD-Series is specifically designed to meet the needs of professionals working to develop products for the growing commercial, and research, applications of avalanche photodiodes. These units enable customers in domains including laser range finders, fiber optic telecommunications and particle physics to achieve greater quantum efficiency and reduced total leakage current.

|                           |                                  |                                  |
|---------------------------|----------------------------------|----------------------------------|
| Miniature and lightweight | Tight line / load regulation     | Low ripple (<20mV p. to p.)      |
| PCB flat mounting         | Output current limit protection  | Low noise due to metal shielding |
| Inhibition mode           | Temperature coefficient 50ppm/°C | 2.5V reference (optional)        |

| Parameters                                | Specifications   |                          |                          |                          |                          |
|---|--|--------------------------|--------------------------|--------------------------|--------------------------|
| Input voltage Vin                         | APD5: [4.5;5.5]Vdc<br>APD12: [11.5;15.5]Vdc  |                          |                          |                          |                          |
| Input current                             | Inhibition mode <5mA, at full output voltage, full load:<br><table border="1"> <tr> <td>&lt;65mA for the 200V model</td> <td>&lt;60mA for the 300V model</td> <td>&lt;55mA for the 400V model</td> <td>&lt;50mA for the 500V model</td> </tr> </table> | <65mA for the 200V model | <60mA for the 300V model | <55mA for the 400V model | <50mA for the 500V model |
| <65mA for the 200V model                  | <60mA for the 300V model   | <55mA for the 400V model | <50mA for the 500V model |                          |                          |
| HV output Vout (pin 7 or lead - optional) | Programmable nominal voltage,<br>Refer to the Selection Guide for voltage ranges   |                          |                          |                          |                          |
| Polarity                                  | Fixed positive or negative   |                          |                          |                          |                          |
| HV setting (pins 3)                       | Via external voltage source 0/2.5V<br>Accuracy : ±0.1 % at full scale  |                          |                          |                          |                          |
| Max. output current Iout                  | Refer to the Selection Guide   |                          |                          |                          |                          |
| Load voltage regulation                   | ±0,01 % of full output voltage for no load to full load  |                          |                          |                          |                          |
| Line voltage regulation                   | ±0,01 % of full output voltage over specified input voltage range  |                          |                          |                          |                          |
| Residual ripple                           | Less than 20mV peak-to-peak at full output voltage and current<br>Less than 5mV peak-to-peak at 200V and 200µA   |                          |                          |                          |                          |
| Temperature coefficient                   | <50ppm/°C  |                          |                          |                          |                          |
| Output HV monitoring (pin 2)              | 0/2.5V signal<br>Accuracy: ±0.2 %<br>Output impedance: 1k  |                          |                          |                          |                          |

# APD Series

PCB mount ultra compact, regulated, high voltage DC-DC converter

| Parameters                                  | Specifications   |
|---|--|
| Output reference voltage (pin 4 - optional) | 2.5V $\pm$ 0.5 %, TC :50ppm/ $^{\circ}$ C, max. output current: 1mA                                |
| HV power ON/OFF (pin 5)                     | ON: 0 volt, connected to ground<br>OFF: not connected<br>Open collector compatible                 |
| Operating temperature                       | -10 $^{\circ}$ C to +50 $^{\circ}$ C   |
| Storage temperature                         | -40 $^{\circ}$ C to +70 $^{\circ}$ C   |
| Safeguards                                  | Output current internally limited<br>Soft start feature: the start is guaranteed without overshoot |

| Package Configuration |  |
|-----------------------|--|
| Case material         | Tin steel plate<br>Thickness 0.5 mm                              |
| Case dimensions LxHxW | 25.5 x 11.0 x 20.5 mm  |
| Pins                  | 0.63 x 0.63mm square pins,<br>length: > 2 mm<br>spacing: 2.54 mm |
| Weight                | 13g  |
| Lead (optional)       | Coaxial cable (RG178)<br>Diameter = 2 mm<br>Length = 500 mm      |
| Insulation            | Fully potted in an epoxy resin                                   |

| Pin Connections  |   |
|------------------|---|
| Line input       | 1. Vin<br>2. GND  |
| HV setting       | 3. Control input 0/2.5V<br>4. Control reference voltage 2.5V (optional) |
| Inhibition input | 5. ON/OFF   |
| HV monitoring    | 6. Vout monitoring 0/2.5V   |
| HV output        | 7. Vout   |

## Main applications:

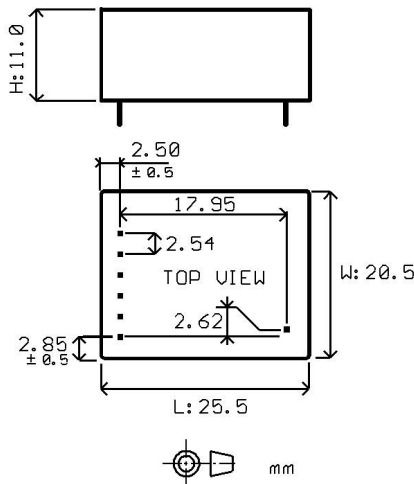
Fiber-optic telecom detectors  
Avalanche photodiodes  
Particle physics detectors  
Laser range finder detectors  
Thin-film bias  
Silicon photomultipliers (SiPM)  
Multi-pixel photon counter (MPCC)



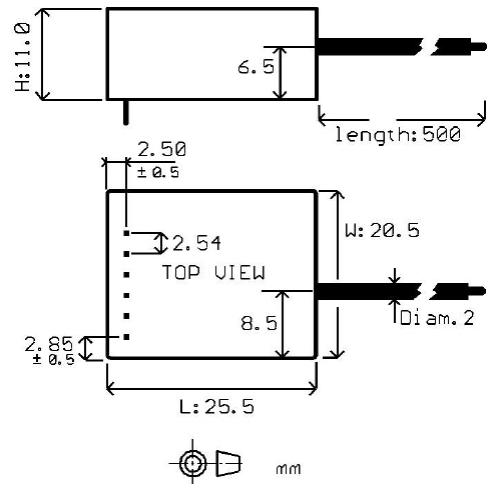
# APD Series

PCB mount ultra compact, regulated, high voltage DC-DC converter

## Mechanical Dimensions

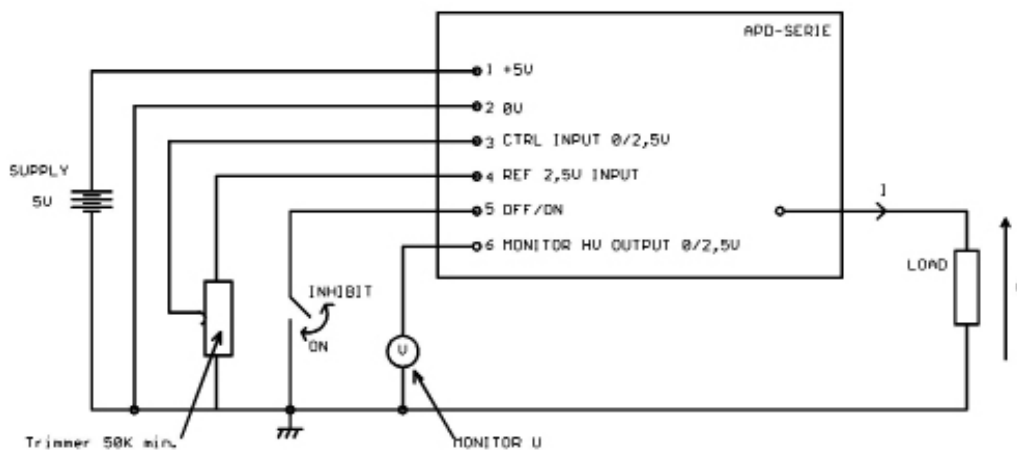


Seven pins: square 0.63 x 0.63 mm  
 APD5 x 0.50.1-C x

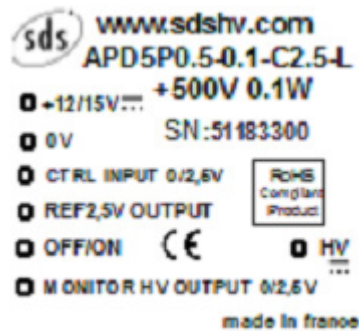


Six pins: square 0.63 x 0.63 mm  
 APD5 x 0.50.1-Cx-L

## Functional Diagram for the model with the 2.5V voltage reference



## Marking

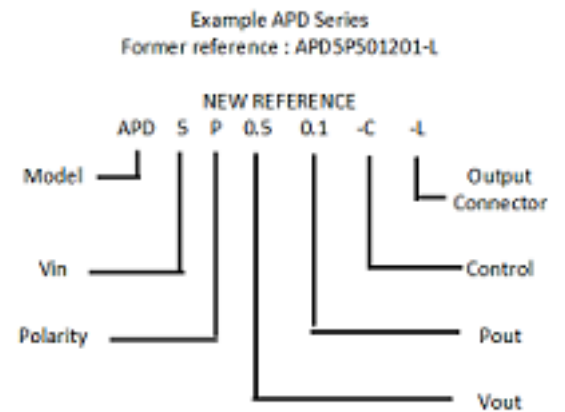


# APD Series

PCB mount ultra compact, regulated, high voltage DC-DC converter

## Ordering information

|                  |   |                       |
|------------------|---|-----------------------|
| Model            | Name of the series                                | APD                   |
| Vin              | 4.5Vdc to 5.5Vdc                                  | 5 for [4.5;5.5]Vdc    |
|                  | 11.5Vdc to 15.5Vdc                                | 12 for [11.5;15.5]Vdc |
| Polarity         | Positive output voltage                           | P                     |
|                  | Negative output voltage                           | N                     |
| Vout             | Output voltage                                    | See Ordering Code     |
| Pout             | Output in Watt                                    | See Ordering Code     |
| Option           | +2.5V control reference voltage                   | C2.5                  |
|                  | No reference voltage (the pin 4 is still present) | C0                    |
| Output connector | Output voltage through pin                        |                       |
|                  | Output voltage through lead                       | L                     |



### Ordering example

The ordering code of a positive +500V@100mW psu under 5Vdc with the optional 2.5 V reference voltage and with the lead for the HV output is:  
APD5P0.5-0.1-C2.5-L

### Ordering voltage and power code

- The power supplies have a 6-element order code:
  - The first 3 letters refer to the series
  - The first 2 digits indicate the value of the input voltage
  - the following letter indicates the polarity
  - the following number indicates the output voltage in kV
  - the last digit indicates the power in Watt
  - the next digit refers to the control voltage
  - the last digit refers to the output connector

# APD Series

PCB mount ultra compact, regulated, high voltage DC-DC converter

| Vout | Iout / Pout  | Vin     | Polarity | +2.5 réf. | former reference | NEW REFERENCE        |
|------|--------------|---------|----------|-----------|------------------|----------------------|
| 500V | 200µA /100mW | 5V      | +        | yes       | APD5P501201-*    | APD5P0.5-0.1-C2.5-*  |
|      |              |         |          | no        | APD5P501201-*    | APD5P0.5-0.1-C0-*    |
|      |              |         | -        | yes       | APD5N501201-*    | APD5N0.5-0.1-C2.5-*  |
|      |              |         |          | no        | APD5N501201-*    | APD5N0.5-0.1-C0-*    |
|      |              | 12V-15V | +        | yes       | APD12P501201-*   | APD12P0.5-0.1-C2.5-* |
|      |              |         |          | no        | APD12P501201-*   | APD12P0.5-0.1-C0-*   |
|      |              |         | -        | yes       | APD12N501201-*   | APD12N0.5-0.1-C2.5-* |
|      |              |         |          | no        | APD12N501201-*   | APD12N0.5-0.1-C0-*   |
| 400V | 250µA /100mW | 5V      | +        | yes       | APD5P401125-*    | APD5P0.4-0.1-C2.5-*  |
|      |              |         |          | no        | APD5P401125-*    | APD5P0.4-0.1-C0-*    |
|      |              |         | -        | yes       | APD5N401125-*    | APD5N0.4-0.1-C2.5-*  |
|      |              |         |          | no        | APD5N401125-*    | APD5N0.4-0.1-C0-*    |
|      |              | 12V-15V | +        | yes       | APD12P401125-*   | APD12P0.4-0.1-C2.5-* |
|      |              |         |          | no        | APD12P401125-*   | APD12P0.4-0.1-C0-*   |
|      |              |         | -        | yes       | APD12N401125-*   | APD12N0.4-0.1-C2.5-* |
|      |              |         |          | no        | APD12N401125-*   | APD12N0.4-0.1-C0-*   |
| 300V | 330µA /100mW | 5V      | +        | yes       | APD5P301331-*    | APD5P0.3-0.1-C2.5-*  |
|      |              |         |          | no        | APD5P301331-*    | APD5P0.3-0.1-C0-*    |
|      |              |         | -        | yes       | APD5N301331-*    | APD5N0.3-0.1-C2.5-*  |
|      |              |         |          | no        | APD5N301331-*    | APD5N0.3-0.1-C0-*    |
|      |              | 12V-15V | +        | yes       | APD12P301331-*   | APD12P0.3-0.1-C2.5-* |
|      |              |         |          | no        | APD12P301331-*   | APD12P0.3-0.1-C0-*   |
|      |              |         | -        | yes       | APD12N301331-*   | APD12N0.3-0.1-C2.5-* |
|      |              |         |          | no        | APD12N301331-*   | APD12N0.3-0.1-C0-*   |
| 200V | 500µA /100mW | 5V      | +        | yes       | APD5P301331-*    | APD5P0.2-0.1-C2.5-*  |
|      |              |         |          | no        | APD5P201501-*    | APD5P0.2-0.1-C0-*    |
|      |              |         | -        | yes       | APD5N201501-*    | APD5N0.2-0.1-C2.5-*  |
|      |              |         |          | no        | APD5N201501-*    | APD5N0.2-0.1-C0-*    |
|      |              | 12V-15V | +        | yes       | APD12P201501-*   | APD12P0.2-0.1-C2.5-* |
|      |              |         |          | no        | APD12P201501-*   | APD12P0.2-0.1-C0-*   |
|      |              |         | -        | yes       | APD12N201501-*   | APD12N0.2-0.1-C2.5-* |
|      |              |         |          | no        | APD12N201501-*   | APD12N0.2-0.1-C0-*   |

\*specify at the end of the ordering code «L» for a lead for the HV output

Other output voltages and output currents are available upon request.

Do not hesitate to ask us about any parameter you would like to see changed for your application.



This High Voltage power supply satisfies the requirements of EC Directives Safety.

Non contractual document.

All specifications are subject to change without notice.

RV09/2019

