

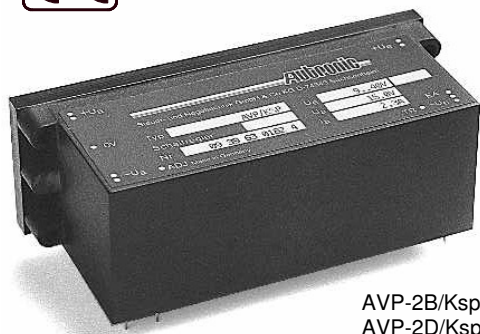
DC-DC Converter AVP-2B/Ks and ...2D/Ks

Output power up to 51 Watts

Isolated – Bipolar (...-2B...) and dual (...-2D...) Output
PCB (.../Ksp) and Chassis Mounting (.../Ks)

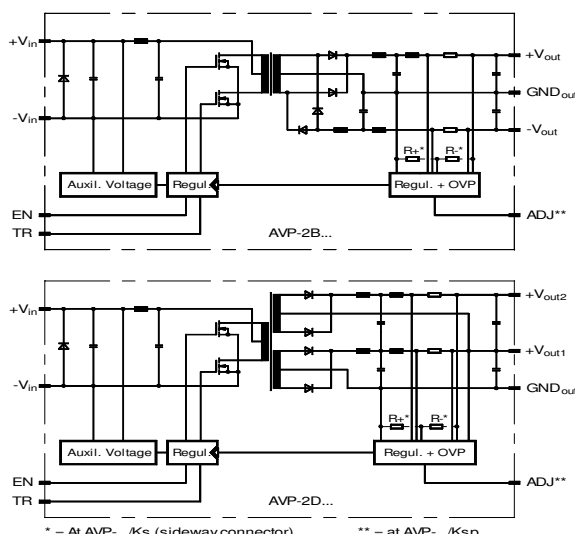


AVP-2B/Ks
AVP-2D/Ks



AVP-2B/Ksp
AVP-2D/Ksp

Block diagrams



* = At AVP-.../Ks (sideway connector)

** = at AVP-.../Ksp

* At 5 V: 1,5%

** At AVP-.../Ksp 12 mV smaller values. The respective other output burdens with $I_{out\ nom}$

*** $I_{out\ min} = 0,1 I_{out\ nom}$. At the AVP-.../Ksp 7 mV smaller values

The respective other output burdens with $I_{out\ nom}$

**** When heat sink is not connected. Class A (QP) when heat sink is connected to earth. In built-in condition our devices may show different EMC properties.

Technology

- Power section in 67kHz-MOSFET-technology
- Regulator section in SMT

Special Features

- Electrostatic discharge according to EN 61000-4-2:2009 (testing level 4): 8 kV contact (base plate)/ 15 kV air
- Burst transients according to EN 61000-4-4:2004 (class 3): 2 kV
- Surge according to EN 61000-4-5:2006 (class 2): 0,5 kV symmetric
- Conducted emission: Input filtering according to EN 55022:2006, class B (QP)****
- Reverse polarity protection
- Zero load operation and short circuit protected
- Distribution of the total output power on to both outputs is possible up to a proportion of 1 : 4
- Overtemperature shutdown
- No overshoot of output voltage at switching on
- Remote off (EN) with TTL – L-signal
- Overvoltage protection in the output circuit, at the voltages $+V_{out}$ and $+V_{out2}$ even in case of external supply (OVP)
- Extremely low thermal stress of sensitive components due to dissipated power loss over mounting surface
- Vibration resistant and indifferent to humidity due to encapsulated case

Specifications

at $\vartheta_{amb}=25^{\circ}\text{C}$, $V_{in\ nom}$, 0,77 $I_{out\ nom}$

Temperature

Ambient air	ϑ_{amb}	$= -40^{\circ}\text{C}...+85^{\circ}\text{C}$
Storage	ϑ_S	$= -40^{\circ}\text{C}...+100^{\circ}\text{C}$
Rise in case	$\Delta \vartheta_{Cperm}$	$\leq 20\text{ K}$
Permissible rise on base plate	$\Delta \vartheta_{Bperm}$	$\leq 25\text{ K}$
Necessary thermal resistance of mounting surface (chassis) to ambient	R_{thBA}	$\leq 3\text{ K/W}$

Output voltages

Tolerance (AVP/..Ks)	$\Delta V_{out1}/\Delta V_{out2}$	$\leq \pm 0,25\ (0,5)^*/\pm 3$
Output ripple at $\vartheta_{amb} = -40^{\circ}\text{C}...+85^{\circ}\text{C}$	$V_{out\ ripple}$	$\leq 3,5\%$
Temperature coefficient	TC	$\leq 0,016\%/K$

Regulation at $\vartheta_{amb} = -40^{\circ}\text{C}...+85^{\circ}\text{C}$

Line reg. for V_{in} range	ΔV_{out}	$\leq 2\text{ mV}$
Load reg. static	$\Delta V_{out1}/\Delta V_{out2}$	$\leq 13/113\text{ mV/A}^{**}$
Load change (25°C)	ΔV_{out1}	$\leq 62\ (32)\text{ mV/A}^{***}$
	ΔV_{out2}	$\leq 132\ (92)\text{ mV/A}^{***}$

OVP

Starting point /%	$\leq 130\% V_{out\ nom}$
Admissible continuous external current I_{ext}	$\leq 4,5\text{ A}$

Isolation voltage-strength

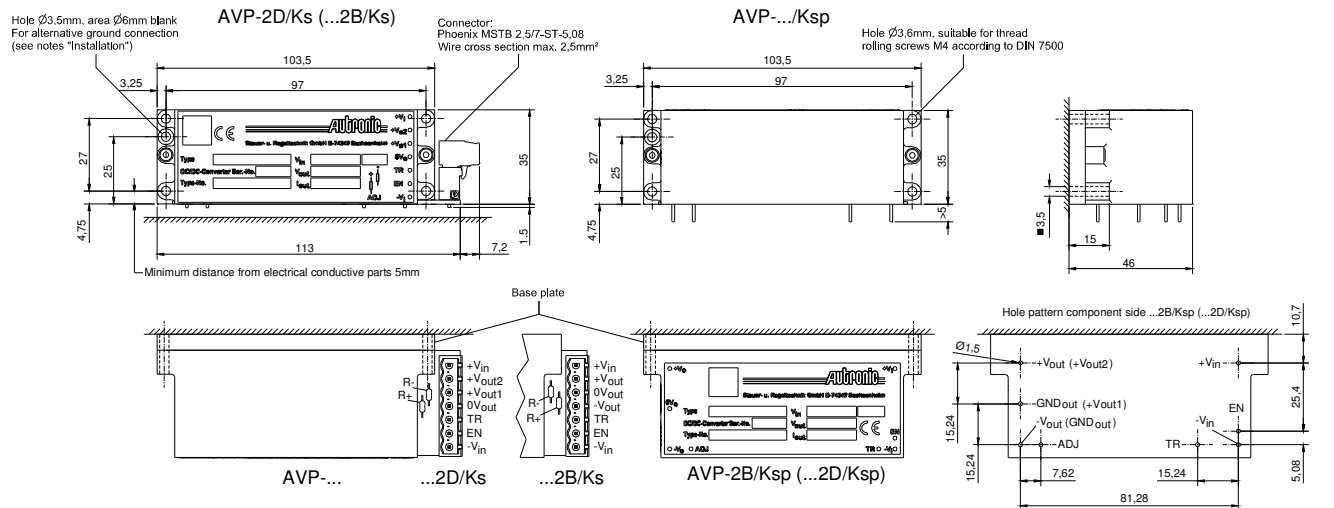
In-/Output	$\geq 1,5\text{ kVrms}$
Input to base plate	$\geq 1,5\text{ kVrms}$
Output to base plate	$\geq 0,5\text{ kVrms}$
Resistance In-/Output	$R_{iso} \geq 1,5\text{ GOhm}$
Capacitance In-/Output	$C_{iso} \geq 2200\text{ pF}$

Weight AVP-2B/Ks / AVP-2D/Ksp	$M = 315/295\text{ g}$
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Drawings

Dimensions in mm

Tolerance: general $\pm 1\text{mm}$



Operating Instructions

Installation: The converters have to be installed according to the guidelines currently in force, like other open electronic component assemblies. Attention must be paid to sufficient ventilation, fastening and protection against accidental contact! The mounting surface has to be even with a thermal resistance as described under "Specifications". If more than one converter is mounted on the same mounting surface the thermal resistance has to be divided by the quantity of converters used. The base plate has to be grounded by using thread rolling screws M 4 according to DIN 7500. Pay attention to ESD handling procedures.

Caution: The Pins on the PCB can carry dangerous voltages!

Reverse polarity protection: If reverse polarity connection of the input voltage can not be excluded, an external time-lag fuse must be installed. Size: $I_{\text{rat}} = 1,5 \times I_{\text{in max}}$ (max. 10 A). Pay attention on sufficient current of source in case of short-circuit!

Excess temperature protection: In case temperature exceeds 101 °C, typ. 105 °C, (due to inadmissible operation conditions) the output voltages are automatically switched off and restarted after cooling down about 10 K.

Overvoltage protection: Internally caused overvoltages at the outputs lead to a thyristor-controlled short-circuit of output 1 for AVP-2B and for output 2 for AVP-2D and all outputs shut down. External caused overvoltages at output 1 for AVP-2B and output 2 for AVP-2D lead also to a thyristor-controlled short-circuit of these outputs. After elimination of the overvoltages the outputs restart automatically.

External shut down (EN): $V < 0,8\text{ V}$ at pin "EN" to pin $-V_{\text{in}}$ switches off the output. $I_{\text{source}} 500\text{ }\mu\text{A}$.

Current limiting: $I_{\text{out lim}} = 1,1 \dots 1,2 I_{\text{out nom}}$. At more than 50% overload and in case of short circuit (even at one output only), both outputs switch off and restart automatically latest after 1 s of elimination of the overload.

Tracking operation: If the TR pins of two or more converters are connected, the output voltages in case of short-circuit or overload go synchronously down.

Adjustment: Connection of the pins "ADJ" and "GND" for the AVP-.../Ksp modules or inserting a wire to "R+" for the AVP-.../Ks modules increases at the AVP-2B both output voltages of about 8%, at the for AVP-2D V_{out1} of about 6%. Intermediate values are obtained by means of a resistor. By connecting "ADJ" and "+ V_{out1} " pins with a resistor (AVP-.../Ksp) i.e. adding a resistor for "R-" (AVP-.../Ks) ensures that the output voltages may be lowered down by max. 8%.

Standard converters AVP-2B/Ks(p) and AVP-2D/Ks(p)

$V_{out1/2}$ V	$I_{out1/2\ nom}^{2)}$ A	$V_{in\ nom}$ V	$V_{in\ range}$ V	$I_{in\ max}$ A	$\eta^{3)}$ %	Type	Order Number	
							AVP-2B/Ks(p)	AVP-2D/Ks(p)
+12/-12	1,7/1,7	12/24	9...40	5,6	83	AVP-2B...	09 38 62 0112 6	09 38 62 0172 6
	1,9/1,9	24	15...36	3,8	86		09 38 92 0112 9	09 38 92 0172 9
	2,0/2,0	48	32...74	1,8	87		09 38 52 0112 8	09 38 52 0172 8
	2,0/2,0	110	66...154	0,9	88		09 38 72 0112 4	09 38 72 0172 4
+15/-15	1,3/1,3	12/24	9...40	5,3	83		09 38 63 0112 5	09 38 63 0172 5
	1,6/1,6	24	15...36	3,6	87		09 38 93 0112 8	09 38 93 0172 8
	1,7/1,7	48	32...74	1,8	88		09 38 53 0112 7	09 38 53 0172 7
	1,7/1,7	110	66...154	0,9	89		09 38 73 0112 3	09 38 73 0172 3
+5 ¹⁾ /+12	3,5/1,5	12/24	9...40	5,5	80	AVP-2D...	09 40 62 0112 6	09 40 62 0172 6
	3,9/1,8	24	15...36	3,5	81		09 40 920 112 9	09 40 92 0172 9
	4,3/2,0	48	32...74	1,8	81		09 40 52 0112 8	09 40 52 0172 8
	4,3/2,0	110	66...154	0,9	82		09 40 72 0112 4	09 40 72 0172 4
+5 ¹⁾ /+15	3,5/1,3	12/24	9...40	5,5	80		09 40 63 0112 5	09 40 63 0172 5
	3,9/1,5	24	15...36	3,6	81		09 40 93 0112 8	09 40 93 0172 8
	4,3/1,7	48	32...74	1,8	81		09 40 53 0112 7	09 40 53 0172 7
	4,3/1,7	110	66...154	0,9	82		09 40 73 0112 3	09 40 73 0172 3

1) Adjusted to 5,1 V

2) For $\vartheta_{amb} = -40^{\circ}\text{C} \dots 55^{\circ}\text{C}$. Derating from 55°C to 85°C : 1,25%/°C,

I_{out} between 85°C and 95°C linear decreasing to 0 A

3) At $V_{in\ nom}$ and 0,77 $I_{out\ nom}$

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