Technical documentation
Last changed on: 13.06.2018

APS series

Small High Voltage Print Module for PCB mounting

- 100 V – 1 kV versions available
- patented resonance converter technology
- controlled by analog set voltage
- analog monitor voltage
- low ripple and noise, low EMI
- RoHS compliant

Document history

Version	Date	Major changes
2.0	28.02.2017 13.06.2018	Relayouted documentation Improved documentation

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1 General description

The APS High Voltage Power Supply module series is a very small DC/DC power converter which can be mounted and soldered on printed circuit boards (PCB). The output voltage is controllable with an analog control voltage. Therefore a potentiometer or fixed resistor can be used. The patented resonance converter technology and moulded metal box shielding guarantee lowest electromagnetic interference and low ripple and noise of the output voltage.

Customized versions can be produced on request.

2 Technical Data

SPECIFICATIONS	APS 0.5 W	APS 1 W
Polarity	Factory fixed, positive or negative	
Ripple and noise [1]	typ. < 10 mV_{p-p} | max. < 30 mV_{p-p} [f > 10 Hz] < 5 mV_{p-p} [f > 2 kHz]	
Stability [ΔV_{out} vs. ΔV_{in}] [1]	< 1 • 10^{-3} • V_{nom}	
Stability - [ΔV_{out} vs. ΔR_{load}] [1]	< 2 • 10^{-3} • V_{nom}	
Temperatur coefficient	< 50 ppm/K	
Supply voltage [2] V_{in}	4.5 – 5.5 V	11.5 – 15.5 V
Supply current I_{in} at V_{out} = 0 at V_{out} = V_{nom} / no load at V_{out} = V_{nom} / with load	 < 5 mA < 25mA < 180 mA	 < 5 mA < 18mA < 150 mA
Set / Monitor voltage	0 - 2.5 V	0 – 5 V
Adjustment accuracy	± 1 %	
Signal /ON	/ON: = 0 (LOW or open) ⇒ V_{OUT} according setting 5.5V ≥ $V_{/ON}$ >2.5V(HIGH) ⇒ V_{OUT} =0 !	
Reference voltage V_{ref} (internal)	2.5 V ±1%	5 V ±1%
Control V_{set} - version 1	with R_{set} connected between V_{set} and GND: R_{set} =V_{out} ∗10kΩ/(| V_{nom} | – V_{out})	
Control V_{set} - version 2	with V_{set} (Ri<<10 kΩ): 0 ≤ V_{set} ≤ 2.5V ⇒ 0 ≤ V_{out} ≤ V_{nom} ±1.0% NOTE: Output voltage is internally not limited! At V_{set} > 2.5 V ⇒ V_{out} > V_{nom} is possible! Do not use V_{set} > 2.5 V !	with V_{set} (Ri<<10 kΩ): 0 ≤ V_{set} ≤ 5V ⇒ 0 ≤ V_{out} ≤ V_{nom} ±1.0% NOTE: Output voltage is internally not limited! At V_{set} > 5 V ⇒ V_{out} > V_{nom} is possible. Do not use V_{set} > 5 V !
Protection	Overload and short circuit protected	
HV connector	Pin	
Case	Metal box steel, moulded	
Dimensions – L/W/H	40 / 16 / 11mm^3	
Operating temperature	0 - 40 °C	
Storage temperature	-20 – 60 °C	

[1] Specifications for stability, ripple and noise are guaranteed in the range 2% • V_{nom} < V_{out} ≤ V_{nom}
[2] Blocking circuit is recommended for ripple rejection to input line with 22 µF // 100 nF near pin IN

Table 1: Technical data: Specifications

CONFIGURATIONS				
Type	**V_{nom}**	**I_{nom}***	**P_{nom}**	**Item code**
APx 01 505 5	100 V	5 mA	0.5 W	AP001505x05
APx 02 255 5	200 V	2.5 mA	0.5 W	AP002255x05
APx 04 125 5	400 V	1.2 mA	0.5 W	AP004125x05
APx 06 804 5	600 V	0.8 mA	0.5 W	AP006804x05
APx 08 604 5	800 V	0.6 mA	0.5 W	AP008604x05
APx 10 504 5	1 kV	0.5 mA	0.5 W	AP010504x05
APx 01 605 12	100 V	6 mA	1W	AP001605x12
APx 02 505 12	200 V	5 mA	1W	AP002505x12
APx 04 255 12	400 V	2,5 mA	1W	AP004255x12
APx 06 165 12	600 V	1.6 mA	1 W	AP006165x12
APx 08 125 12	800 V	1.2 mA	1 W	AP008125x12
APx 10 105 12	1 kV	1 mA	1 W	AP010105x12
*) I_{out} is limited to approx. 1.5 • I_{nom}				

Table 2: Technical data: Configurations

OPTIONS / ORDER INFO	INFO	EXAMPLE
POLARITY	Positive: **x = p**, negative **x = n**	AP**p** 02 255 5

Table 3: Technical data: Options and order information

3 Dimensional drawing

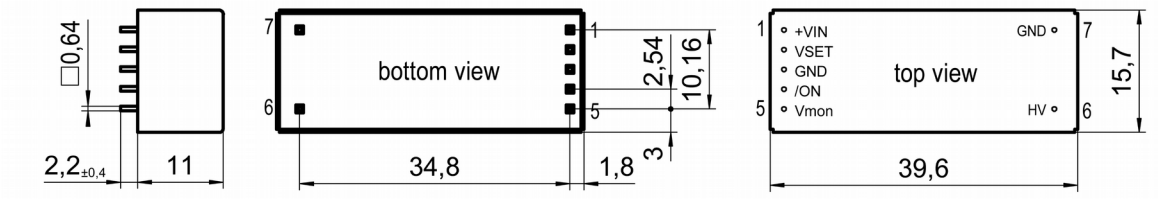

Figure 1: dimensional drawing APS

4 PIN assignment

PIN	NAME	DESCRIPTION	VALUE
1	**+VIN**	V_{in} Supply voltage	+5 V | +12 V
2	**VSET**	V_{set} Set voltage	0..2.5 V | 0..5 V
3/7	**GND**	Ground	
4	**/ON**	Signal ON	TTL-level, LOW or n.c. => HV ON; HIGH => HV OFF
5	**VMON**	V_{mon} Monitor voltage	0..2.5 V | 0..5 V
6	**HV**	V_{out} High voltage output	
Note: Case is connected to GND			

Table 4: Technical data: options and order information

5 Control principle

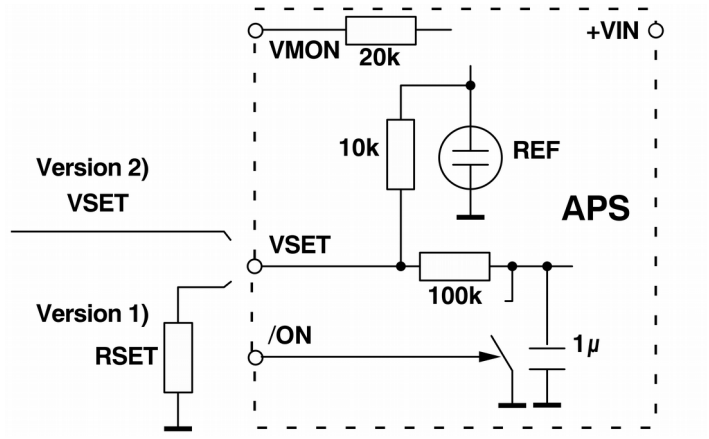

Figure 1: Control principle of APS HV supply series

6 Warranty & Service

This device is made with high care and quality assurance methods. The factory warranty is up to 12 months, starting from date of issue (invoice). Within this period a 5 years warranty extension can be ordered at additional charge. Please contact iseg sales department.

ATTENTION
Repair and maintenance may only be performed by trained and authorized personnel. For repair please follow the RMA instructions on our website: www.iseg-hv.com/en/support/rma

7 Manufacturer´s contact

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