

**Technical documentation**  
Last changed on: 28.02.2017

# 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	Relayouted 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	typ. < 10 mV <sub>p-p</sub>   max. < 30 mV <sub>p-p</sub> [f > 10 Hz] < 5 mV <sub>p-p</sub> [f > 2 kHz]	
Stability [ΔV <sub>out</sub> vs. ΔVin]	< 1 • 10 <sup>-3</sup> • V <sub>nom</sub>	
Stability - [ΔV <sub>out</sub> vs. ΔR <sub>load</sub> ]	< 2 • 10 <sup>-3</sup> • V <sub>nom</sub>	
Temperatur coefficient	< 50 ppm/K	
Supply voltage <sup>(1)</sup> V <sub>in</sub>	4.5 – 5.5 V	11.5 – 15.5 V
Supply current I <sub>in</sub> at V <sub>out</sub> = 0 at V <sub>out</sub> = V <sub>nom</sub> / no load at V <sub>out</sub> = V <sub>nom</sub> / 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 <sub>OUT</sub> according setting 5.5V ≥ V <sub>ON</sub> >2.5V(HIGH) ⇒V <sub>OUT</sub> =0 !	
Reference voltage V <sub>ref</sub> (internal)	2.5 V ±1%	5 V ±1%
Control V <sub>set</sub> - version 1	with R <sub>set</sub> connected between V <sub>set</sub> and GND: R <sub>set</sub> =V <sub>out</sub> *10kΩ/(  V <sub>nom</sub>   – V <sub>out</sub> )	
Control V <sub>set</sub> - version 2	with V <sub>set</sub> (Ri<<10 kΩ): 0 ≤ V <sub>set</sub> ≤ 2.5V ⇒0 ≤ V <sub>out</sub> ≤ V <sub>nom</sub> ±1.0% <b>NOTE: Output voltage is internally not limited!</b> At V <sub>set</sub> > 2.5 V ⇒V <sub>out</sub> > V <sub>nom</sub> is possible! Do not use V <sub>set</sub> > 2.5 V !	with V <sub>set</sub> (Ri<<10 kΩ): 0 ≤ V <sub>set</sub> ≤ 5V ⇒0 ≤ V <sub>out</sub> ≤ V <sub>nom</sub> ±1.0% <b>NOTE: Output voltage is internally not limited!</b> At V <sub>set</sub> > 5 V ⇒V <sub>out</sub> > V <sub>nom</sub> is possible. Do not use V <sub>set</sub> > 5 V !
Protection	Overload and short circuit protected	
HV connector	Pin	
Case	Metal box steel, moulded	
Dimensions – L/W/H	40 / 16 / 11mm <sup>3</sup>	
Operating temperature	0 - 40 °C	
Storage temperature	-20 – 60 °C	
<sup>1)</sup> 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 <sub>nom</sub>	I <sub>nom</sub> *	P <sub>nom</sub>	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 <sub>out</sub> is limited to approx. 1.5 • I <sub>nom</sub>				

Table 2: Technical data: Configurations

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

Table 3: Technical data: Options and order information

### 3 Dimensional drawing

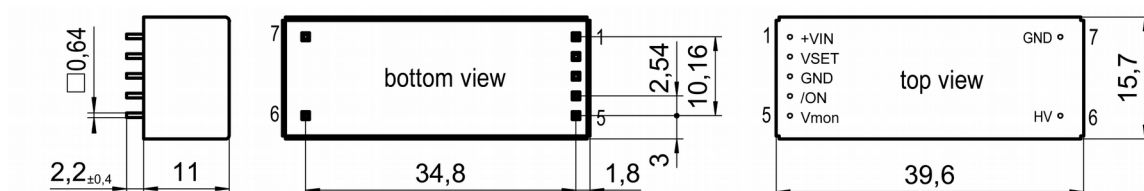


Figure 1: dimensional drawing APS

### 4 PIN assignment

PIN	NAME	DESCRIPTION	VALUE
1	+VIN	V <sub>in</sub> Supply voltage	+5 V   +12 V
2	VSET	V <sub>set</sub> 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 <sub>mon</sub> Monitor voltage	0..2.5 V   0..5 V
6	HV	V <sub>out</sub> High voltage output	
Note: Case is connected to GND			

Table 4: Technical data: options and order information

