

DC-DC CONVERTER ACM 60/Ks, .../KsI

DEFENSE CONVERTER.

FOR CHASSIS MOUNTING



HIGHLIGHTS

- + Output Power up to 60 Watts*
- + Efficiency up to 84 %
- + Wide Temperature Range
- + No External Filter required
- + MIL-STD-461G
- + MIL-STD-1275E
- + RoHS compliance

INPUT

Input Voltage Nominal	12, 24, 28 VDC
Input Voltage Operating	9,0 - 60 VDC
Input Voltage Range	60,0 - 80,0 VDC ($\leq 1,0$ sec)
No Load Input Current	See table page 2

OUTPUT

Output Voltage	12 V (other voltages on request)
Initial Set Accuracy	< 2 % (no load)
Minimum Load	No minimum load
Short circuit	Continuous short circuit proof
Line Regulation	$< 0,5$ %
Load Regulation	< 3 % (0 % - 100 % load)
Ripple & Noise	< 2 % pk-pk, 20 MHz bandwidth
Start Time	< 300 ms
Max. Output Capacitance	500 μ F x $I_{out, nom}$
Temperature Coefficient	< 0.01 %/°C

FEATURES

Enable Signal	ON $\geq 3,0$ V or open
	OFF $\leq 0,8$ V or short
Active Inrush Current Limitation	DEF STAN 61-5 part C issue 6

PROTECTION

Over Voltage Protection (OVP)	120-130 % $V_{out, max}$
Over Current Protection (OCP)	$I_{out, nom} > 105$ %
Over Temperature Protection (OTP)	Shutdown at +101 - 110 °C baseplate-temp. with about 5°C hysteresis and auto recovery.

GENERAL

Isolation	1500 VDC Input to Output 1000 VDC Input to Earth (PE) 500 VDC Output to Earth (PE)
Switching Frequency	Typ. 65 kHz
Dimensions [mm]	147 x 35 x 46
Weight	approx. 400 g
MTBF	tbid

ENVIRONMENTAL

Operating Ambient Temp	-40 °C to + 85 °C* -55 °C to + 85 °C*, screening (optional)
Operating Baseplate Temp	-40 °C to 100 °C
Storage Temperature	-55 °C to 105 °C
Operating Humidity	95 % relative humidity 240 hrs MIL-STD-810H method 507.2
Vibration	5 to 500 Hz MIL-STD-810H method 514.8
Shock	40 G MIL-STD-810H method 516.8
Bump	2000 bumps in each axis 40 G MIL-STD-810H method 516.8
Salt Atmosphere	48 hrs MIL-STD-810H method 509.7
Altitude	Up to 5000 m

EMC

Conducted Emissions	MIL-STD-461G, CE101/CE102**
Radiated Emissions	MIL-STD-461G, RE101/RE102**, navy mobile and army.
Immunity	MIL-STD-461G, CS101/CS116/CS117 RS101/RS103, Criteria A MIL-STD-1275E, spikes 250V for 100us, Criteria B surge 100V for 50ms, Criteria A
Load Dump	DEF STAN 61-5 part 6 issue 6, Criteria B

*Derating by Input Voltage 9 V...18 V see page 4

** In built-in condition the devices may show different EMC properties.

TECHNICAL DATA

For $T_{amb}=25^{\circ}\text{C}$, $V_{in nom}$, $I_{out nom}$, unless otherwise specified

SPECIFICATION Input 9,0 – 60,0 VDC

TYPE		ACM60/Ks / ACM60/Ks* / ACM60/Ksl / ACM60/Ksl*			
ORDER NUMBER		73 65 12 0622 3 / 73 65 12 0629 4 / 73 65 12 0632 6 / 73 65 12 0639 7			
CHARACTERISTIC		Unit			
INPUT	Input Voltage Nominal	V	12	24	28
	Input Voltage Range	V	9...19	18...38	15,5...60
	Under Voltage Turn-on	V		<10,0	
	Under Voltage Turn-off	V		<8,5	
	Input Current @ Full Load	A	4,5	3,0	2,5
	Input Current @ No Load	A	0,03	0,02	0,02
	Recommended External Fuse	A		6,3**	
OUTPUT	Output Voltage Nominal	V	12,0		
	Output Current Nominal	A	5,0***		
	Output Power	W	60****		
	Efficiency @ Full Load (typical)	%	80	83	84
	Output Current limit	A	6,3...7,7		
	Short Circuit Current (typical)		18 (pulse approx. 2Hz)****		
	Transient Response 25 % / 75 % Load Step Recovery Time < 1 ms	mV	±150		

* For models with pin cover

** max. 6,3 A, recommended : Schurter 0001.1012 or LS circuit breaker with Z-characteristic

*** Derating see page 5

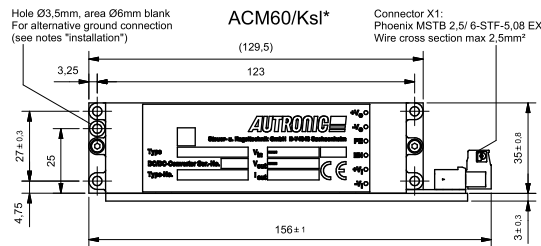
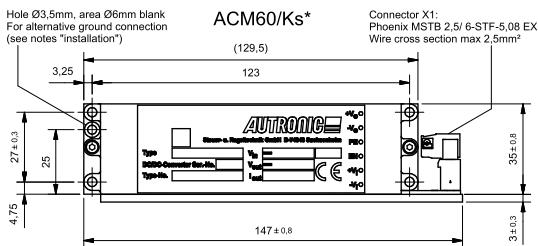
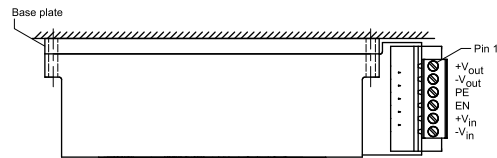
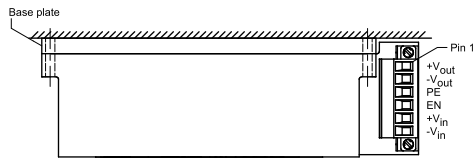
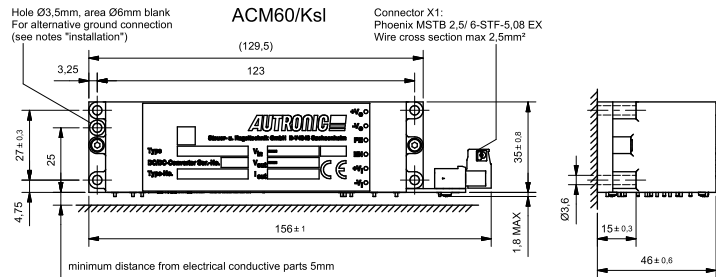
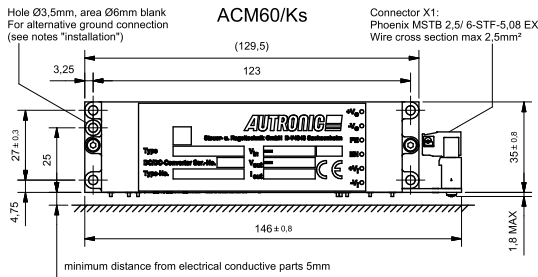
**** Pulsating current time duration 90 ms

TECHNICAL DATA

For $T_{amb}=25^{\circ}C, V_{in nom}, I_{out nom}$, unless otherwise specified

MECHANICAL DETAILS

- Dimensions are in mm
- Unless otherwise specified, general tolerances $\pm 0,5$ are for values in brackets (XX)
Values not in brackets are according to ISO-2768-1m



*For models with pin cover

*For models with pin cover

Resin compound: Polyurethane blue, UL94-V0, EN45545-2:2016-02 - HL3 (R24)

PINNING

Pin	Function
X1-1	-V _{out}
X1-2	-V _{out}
X1-3	PE
X1-4	EN
X1-5	+V _{in}
X1-6	-V _{in}

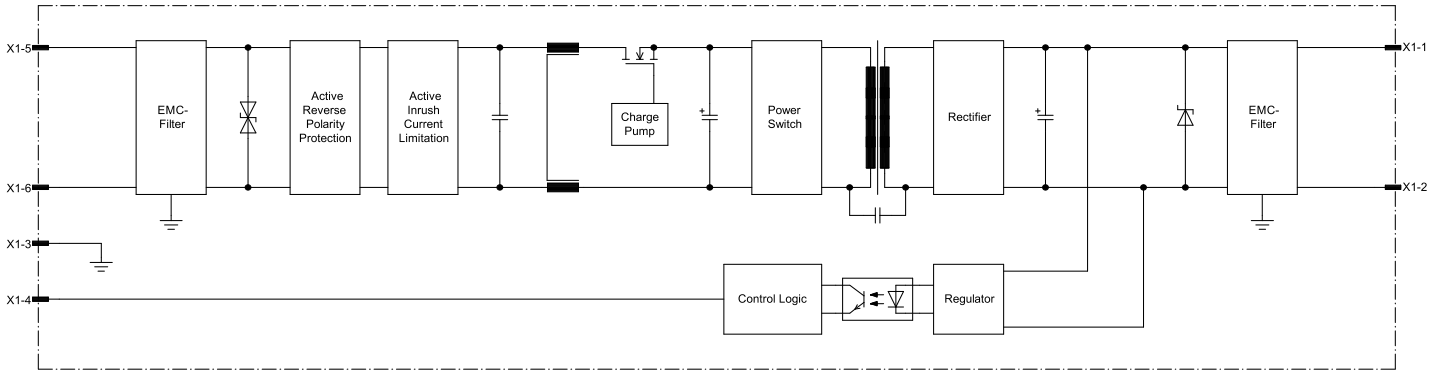
NOTES

- Installation instructions:
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, carry off heat, fastening and protection against accidental contact. Plug in not under voltage. The base plate has to be grounded by using thread rolling screws M 4 according to DIN 7500. An alternative connection to ground **can be realized by a special mounting hole**, which is free of anodizing surface.
- Fault protection: For input protection a time-lag fuse corresponding to IEC 60127-2 must be installed. For recommended rating of the fuse refer to specification table above. Pay attention on sufficient current source in case of short circuit. In some applications 2 fuses would be necessary, one in each input line.

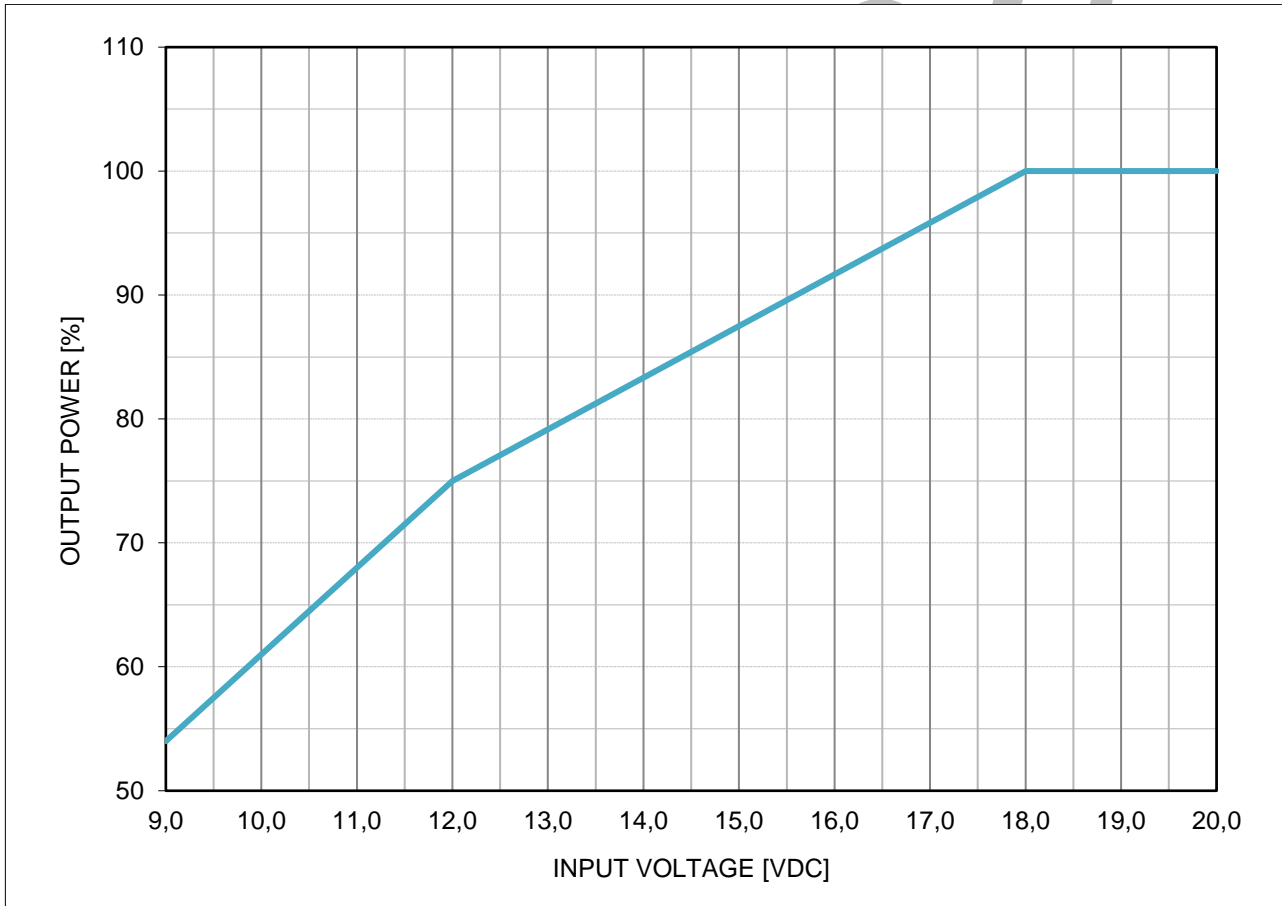
TECHNICAL DATA

For $T_{amb}=25^{\circ}\text{C}$, $V_{in\ nom}$, $I_{out\ nom}$, unless otherwise specified

BLOCK DIAGRAM



OUTPUT POWER DERATING



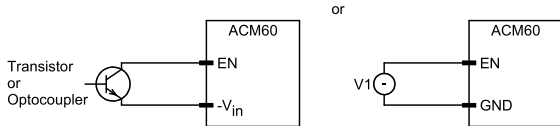
DESCRIPTION OF FEATURES

For $T_{amb}=25^{\circ}\text{C}$, $V_{in\ nom}$, $I_{out\ nom}$, unless otherwise specified

ENABLE SIGNAL

The module may be disabled by pulling EN low with respect to the $-$ Input.

This may be done with an open collector transistor, relay, optocoupler, or an external control voltage (V1).



Open-collector:

Leakage current $\leq 100\ \mu\text{A}$

Min. $V_{CE0} \geq 20\ \text{V}$

V1:

3,5...5 V (Enable active)

0...0,8 V (Enable inactive)

When not in use, leave Enable pin not-connected.

In case of wrong polarity the EN switching circuit must be protected too.

Please contact Autronic for more details.

CHANGE HISTORY

Revision	Date	Author	Modification
e04	2021-06-29	A.Ehrhardt	Development
e05	2021-09-10	A.Ehrhardt	Navy Mobile and Army
e06	2022-05-02	A.Ehrhardt	Mechanical dimensions

Preliminary