

Operation Manual for ABC300-04ML

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1. System Description

1.1. Hardware Features

The DC/DC converter of the ABC-series is especially adapted for the driving of avalanche diodes. The Output voltage is precisely adjustable and owns the necessary stability. The thermal coefficient can exactly aligned with the properties of the APD. Discrete APD can be used as well as APD-modules with integrated temperature sensor. The output current is limited to a safe value thus the APD is protected against overload. A precise reference voltage source is integrated. The output voltage can be adjusted by a simple potential divider or an external control voltage. By means of an additional control voltage the amplification of the APD can be adjusted either with a closed loop or can be tightly focused modulated. The device has a wide range of operating voltage from 6 to 15 V. A Si-sensor with resistor characteristic is used as temperature sensor.



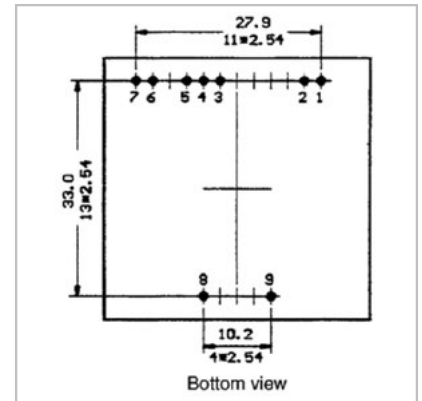
1.2. Specifications

Operation voltage	+6 ... 15 Volt
Current @ full load	60 mA
Control voltage	0 ... 3 Volt (0 ... 5 Volt)
Output voltage	+10 ... +300 Volt @ VC = 0 ... 3 Volt +10 ... +500 Volt @ VC = 0 ... 5 Volt
Output current	0.2 mA max. @ operation voltage > 8 Volt
Operation temperature	0 ... +70 °C
Storage temperature	-25 °C ... 85 °C
Weight	34 g

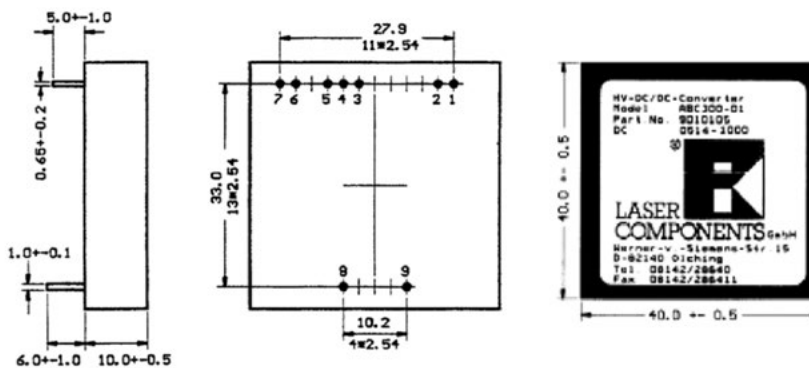
2. Hints

2.1. Pinout

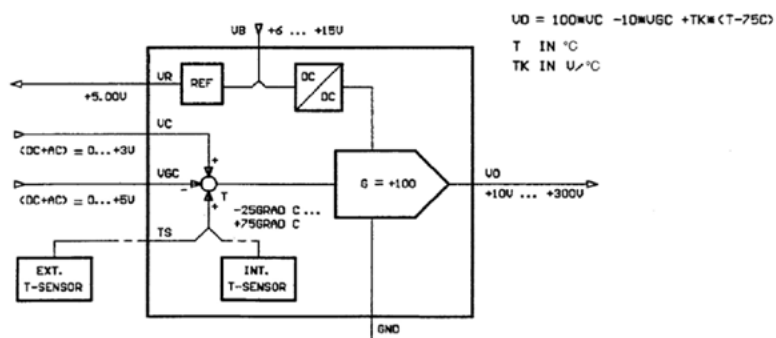
PIN	Name	Function	Characteristic
1	Vdd	supply voltage	+8 ... +18 VDC
2	VGC	gain control	0 ... +5 VDC
3	GND	ground	
4	VC	control voltage	0 ... +3 VDC 0 ... +5 VDC
5	VR	reference voltage	+5.000 VDC
6	TS	temperature sensor	SI
7	TC	TC adjustment	see curve
8	GND	ground	
9	+ VO	output voltage	+10 ... +300 VDC



2.1. Dimensions

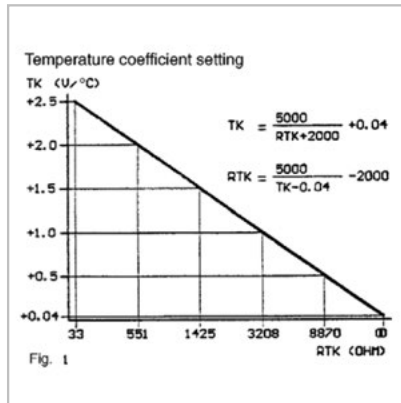


2.3. Function Diagram

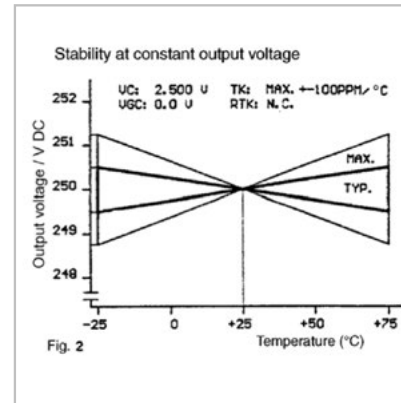


2.4. Relation between Temperature and Output Voltage

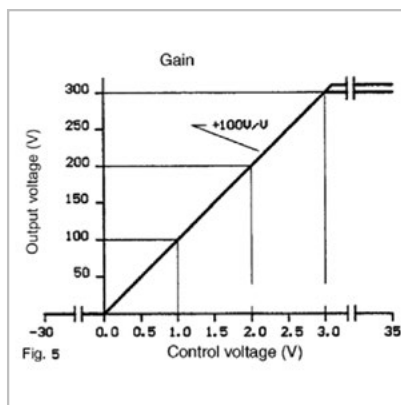
2.4.1. Fixing of the temperature coefficient



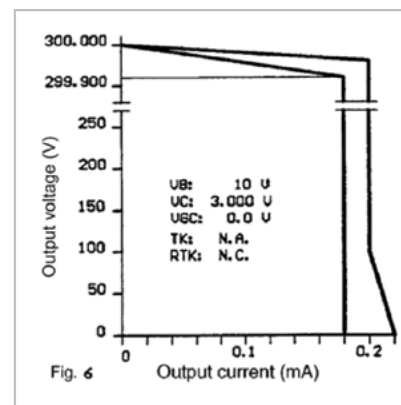
2.4.2. Stability at a certain output voltage



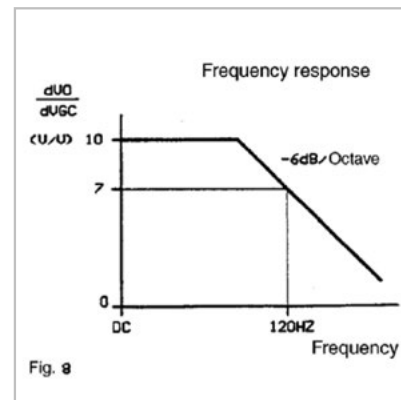
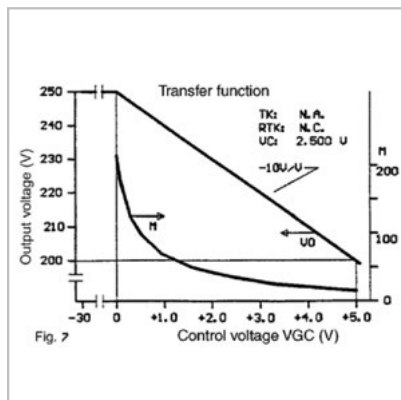
2.5. Adjustment of the output voltage



2.6. Current limitation



2.7. Adjustment of the APD Gain

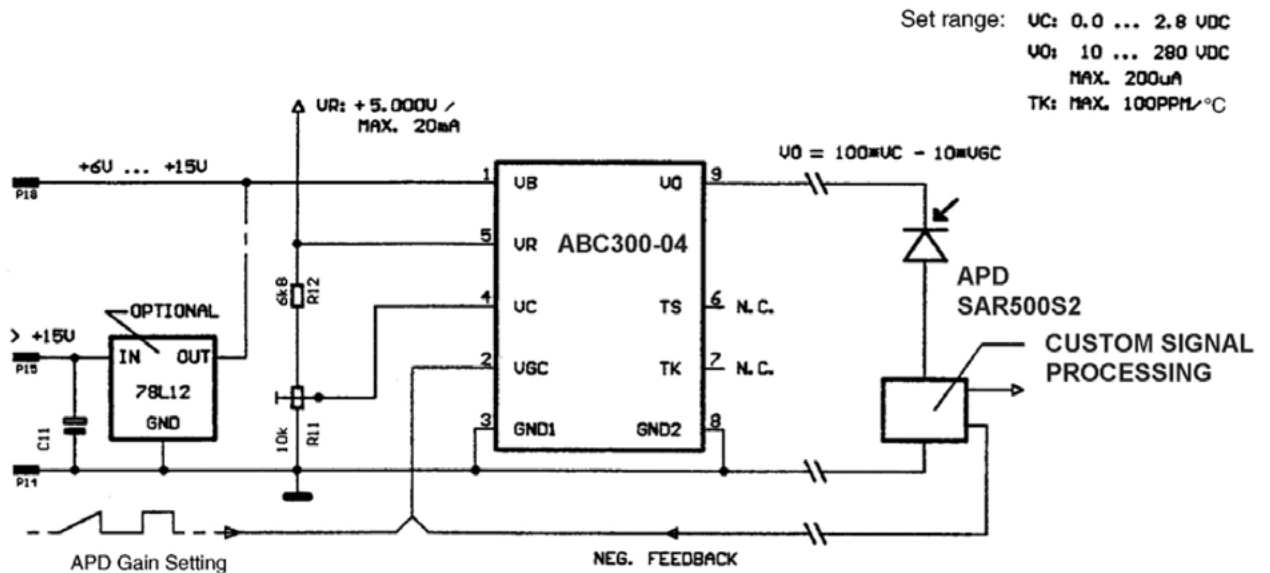


2.8. Specifications

Pin	Parameter	Conditions	Min	Typ	Max	Unit
VB	Input Voltage:					
	Voltage range	normal operation	+8.0		+18	VDC
		absolut maximum	-0.5		+20	VDC
	Current consumption	full load (300 V, 0.2 mA)			60	mA
VO	Power consumption	no-load (300 V, 0.0 mA)	250		650	mW
		full load (300 V, 0.2 mA)	350		750	mW
	Output:					
	Voltage range		<+10		+500	VDC
VO	Current range		0.0		380	μA
	Noise voltage	full load (300 V, 0.2 mA)		<20	100	mVpp
	Offset voltage		-1.0	±0.3	+1.0	VDC
	Stability	output current		±20	-500	mV/mA
		input voltage	-5	<±1	+5	mV/V
		temperature		±50	±100	ppm/°C
	Voltage limitation	VC > 3.0 VDC	+305	+310	+315	VDC
	Current limitation	VO > 10 VDC	180	190	210	μA
	Short circuit current	VO < 10 VDC			500	μA
	Internal capacity			3300		pF
	External capacity				100	nF
TS	Temperature sensor: Resistor	T= +25 °C	2020	2030	2050	Ω
VGC	Gain Control:					
	Voltage	normal operation	0.0		+5.0	VDC
		absolut maximum	-30		+35	VDC
	Input resistance		99	100	101	kΩ
VGC	Bandwidth	VO= 40 Vss, sinus, -3 dB	DC		120	Hz
	Gain	G= dVO / dVGC	-9.8	-10.0	-10.2	V/V
VR	Reference Voltage:					
	Voltage	VB > 6.0 V	+4.950	5.000± 0.020	5.050	VDC
	Output Current		0		4.5	mA
VC	Internal resistance			200		Ω
	Control Input:					
	Voltage	normal operation	0.0		+3.0	VDC
		absolut maximum	-30		+35	VDC
	Internal resistance		99	100	101	kΩ
	Gain	G= VO / VC	+99	100±0.2	+101	V/V
VC	Bandwidth	VO= 100V-300V, sinus, -3 dB	DC		70	Hz

3. Applications

3.1. Temperature Related Output Voltage



3.2. Temperature compensated voltage supply

- Constant Gain -

