

ABC550-04 DC/DC CONVERTER OPERATION MANUAL

Mini High Voltage Modules



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 highly stable. 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 precisely modulated. The device has a wide range of operating voltage from 10 to 18 V. A Si-sensor with resistor characteristic is used as temperature sensor.

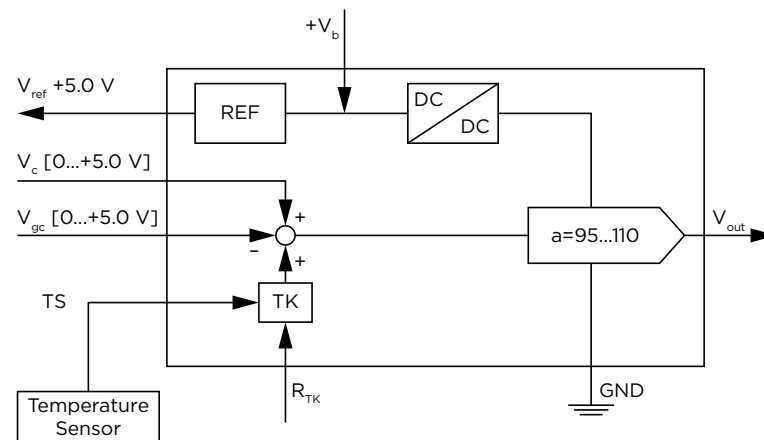
SPECIFICATIONS

Function	Value	Name	PIN
Operating voltage [V]	10 – 18	V_b	1
Gain control [V]	0 – 5	V_{GC}	2
Ground		GND	3
Control voltage [V]	0 – 3	V_c	4
	0 – 5		
Reference voltage [V]	5	V_{Ref}	5
Temperature Sensor	Si	TS	6
TC Adjustment	see curve	TC	7
Ground		GND	8
Output voltage @ $V_C = 0 - 5$ [V]	10 – 550	V_{out}	9
Current @ full load [mA]	60		
Output current [mA]	0.2 max.		
Operation temperature [°C]	0 to +70		
Storage temperature [°C]	-25 to +85		
Weight [g]	34		

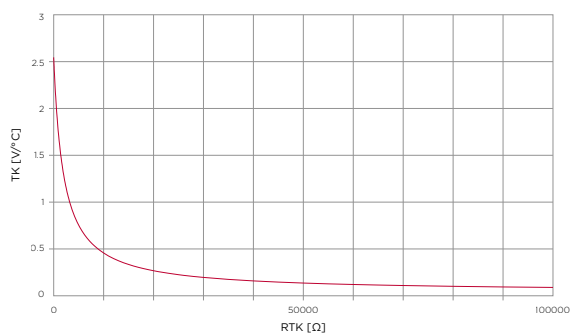
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PIN	Parameter	Conditions	Min.	Typ.	Max.
V_B	Input Voltage: Voltage range [VDC]	normal operation	+10.0		+18.0
		absolut maximum	-0.5		+20.0
	Current consumption [mA]	full load (500V, 0.2mA)			60
	Power consumption [mW]	no-load (500V, 0.0mA)	250		650
		full load (500V, 0.2mA)	350		750
V_{out}	Output: Voltage range [VDC]		<+10		+500
	Current range [μ A]		0.0		380
	Noise voltage [mVpp]	full load (500V, 0.2mA)		<20	100
	Offset voltage [VDC]		-1.0	± 0.3	+1.0
	Stability	Output current [mV/mA]		± 20	-500
		Input voltage [mV/V]	-5	< ± 1	+5
		Temperature [ppm/ $^{\circ}$ C]		± 50	± 100
	Voltage limitation [VDC]	$V_C > 5.0$ VDC	+505	+510	+515
	Current limitation [μ A]	$V_{out} > 10$ VDC	180	190	210
	Short circuit current [μ A]	$V_{out} < 10$ VDC			500
	Internal capacity [pF]			3300	
	External capacity [nF]				100
TS	Temperature sensor: Resistor [Ω]	T = +25 $^{\circ}$ C	2020	2030	2050
V_{GC}	Gain Control: Voltage [VDC]	normal operation	0.0		+5.0
		absolut maximum	-30		+35
	Input resistance [k Ω]		99	100	101
	Bandwidth [Hz]	$V_{out} = 40$ Vss, sinus, -3dB	DC		120
	Gain [V/V]	$G = dV_{out} / dV_{GC}$	-9.8	-10.0	-10.2
V_{Ref}	Reference Voltage: Voltage [VDC]	$V_B > 6.0$ V	+4.95	+5.0 $\pm$ 0.02	+5.05
	Output Current [mA]		0		4.5
	Internal resistance [Ω]			200	
V_C	Control Input: Voltage [VDC]	normal operation	0.0		+5.0
		absolut maximum	-30		+35
	Internal resistance [k Ω]		99	100	101
	Bandwidth [Hz]	VO= 100V-500V, sinus, -3 dB	DC		70
	Gain [V/V]	$G = VO / VC$	+99	100 $\pm$ 0.2	+101

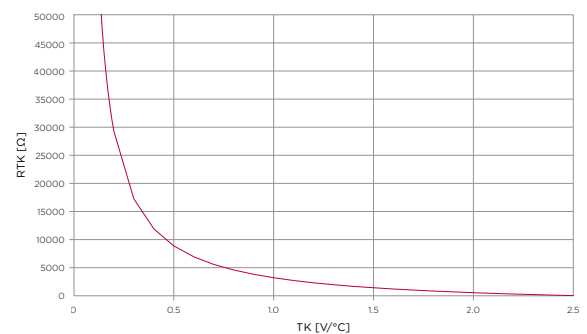
Fuction Diagram



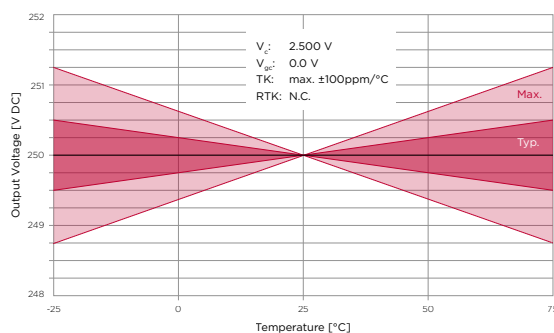
Relation between Temperature and Output Voltage



Fixing of the temperature coefficient



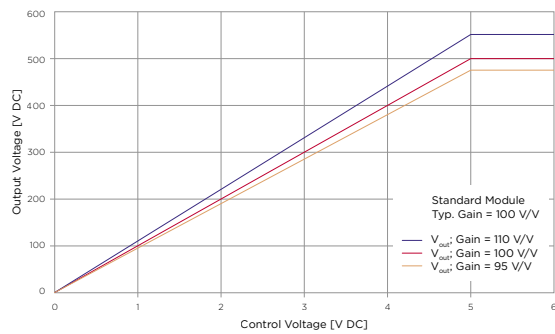
Fixing of the temperature coefficient



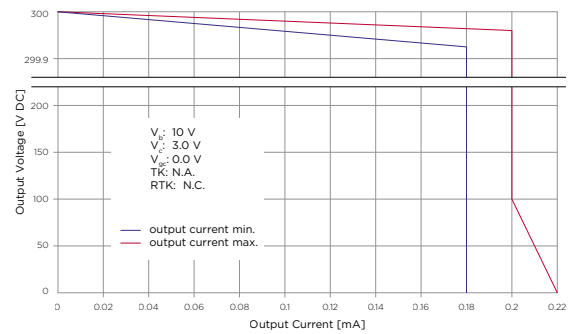
Stability of a certain output voltage

MINI HIGH VOLTAGE MODULES

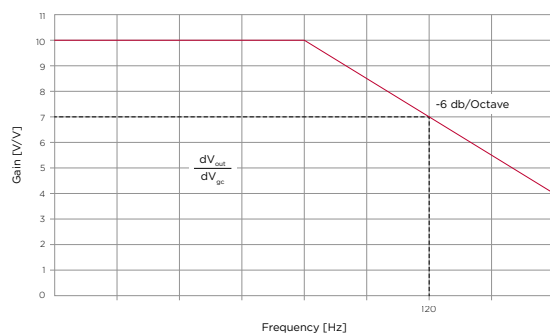
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Adjustment of the output voltage

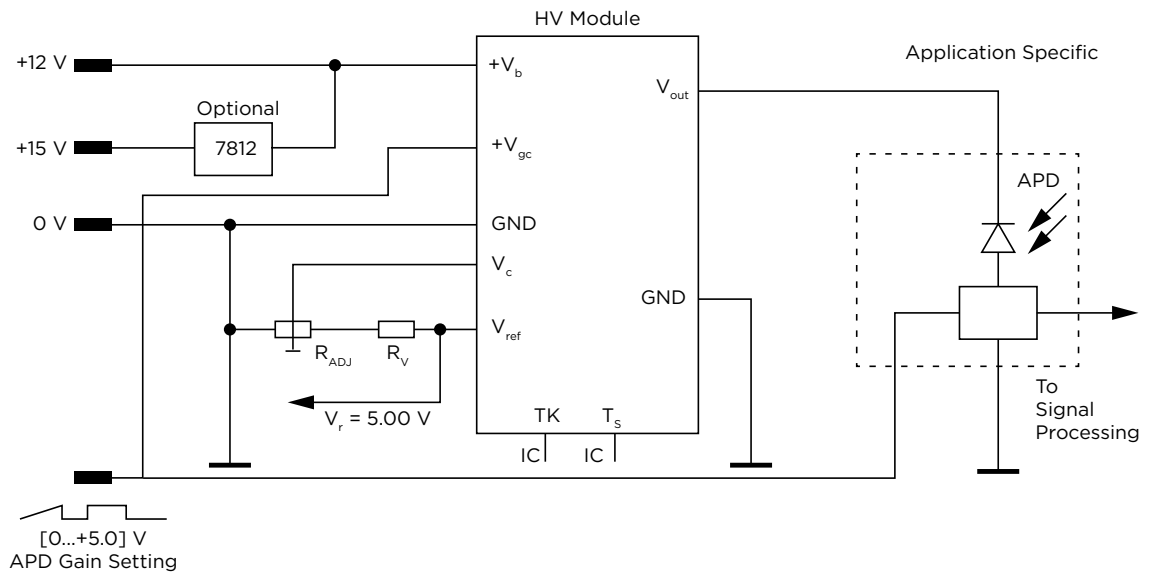


Current limitation

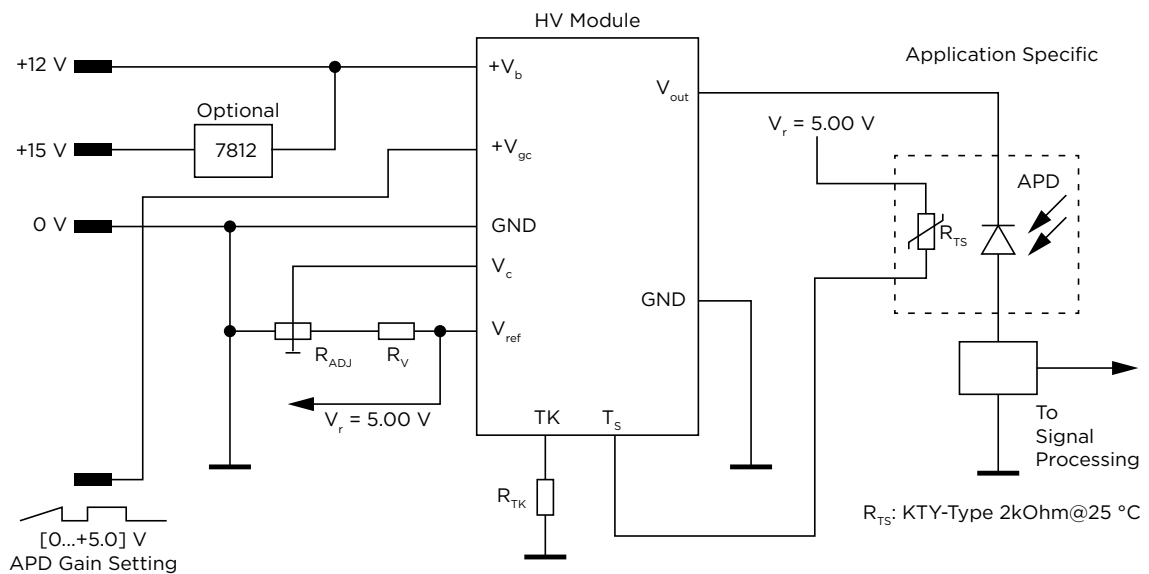


Adjustment of the APD gain

Temperature Independent Output Voltage

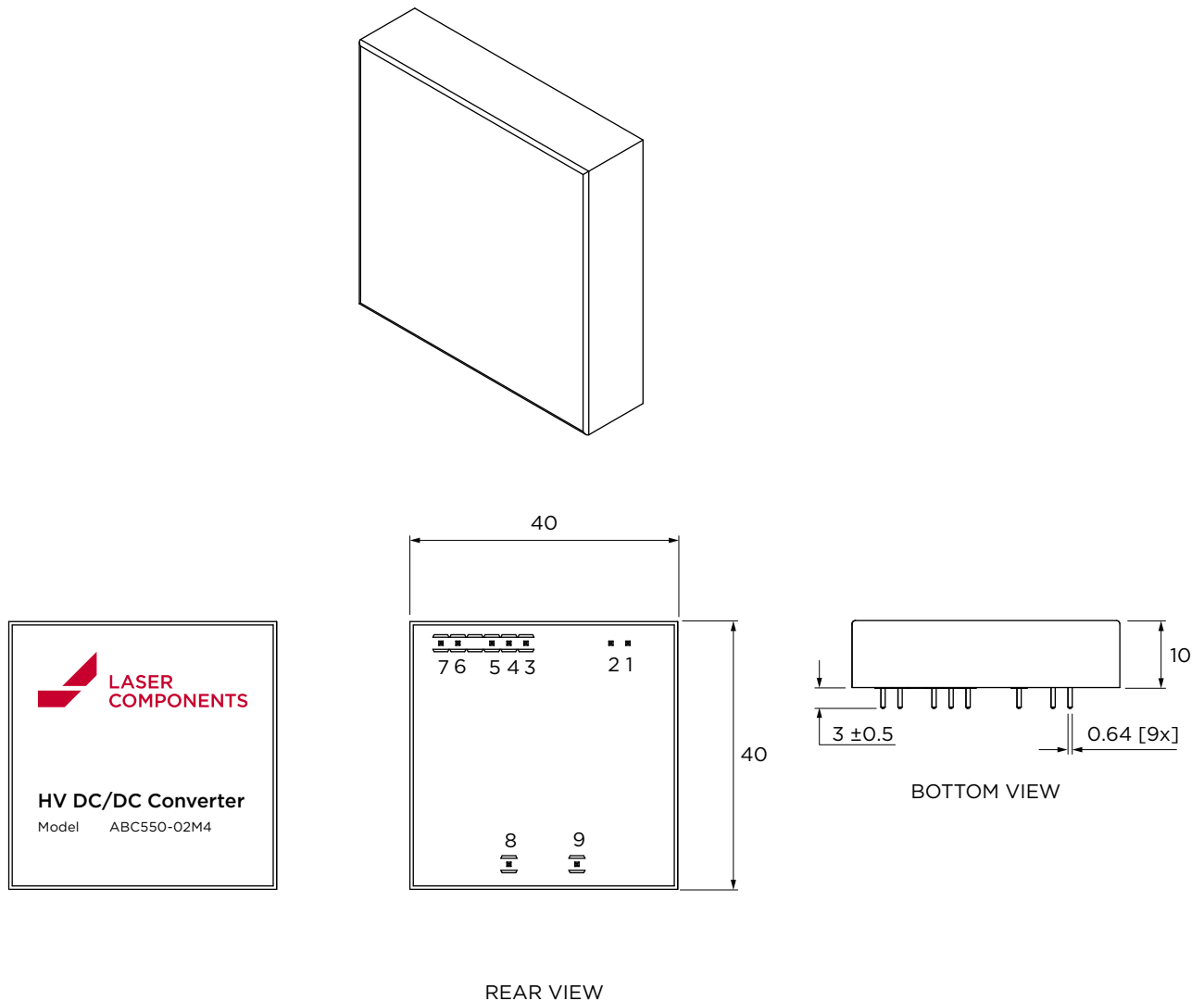


Temperature Compensated Voltage Supply (Constant Gain)



TECHNICAL DRAWING

Dimensions



ABC-Module

Units: mm

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