

## Miniature High Voltage Modules

### Description:

The Mini high voltage modules TBC450 series have been designed for optimum APD application. It integrated temperature compensating circuit so that the bias voltage of APD can be changed as the temperature of the environment change. The output current is limited to a safe level so that the APD is protected against overload. The output voltage parameters can be regulated using either an analog control voltage or voltage divider, or via the digital serial port.



### Features:

Output voltage up to -450V/450V

Temperature compensation, short circuit protection circuit, Current foldback circuit,

Low ripple<50mv, High accuracy<0.2%, Compact shielded housing (26.5mm\*26.5mm\*5mm)

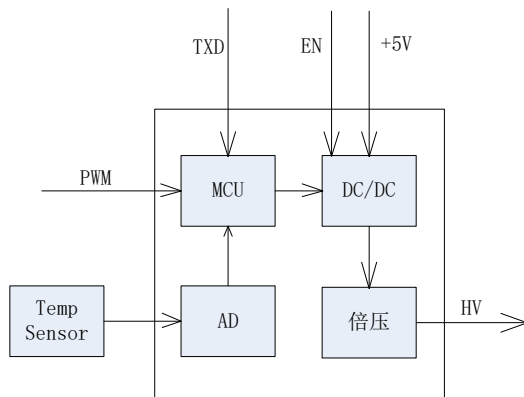
### Application:

High voltage for APD, High voltage for PIN photodiode, High voltage for Piezoelectric device

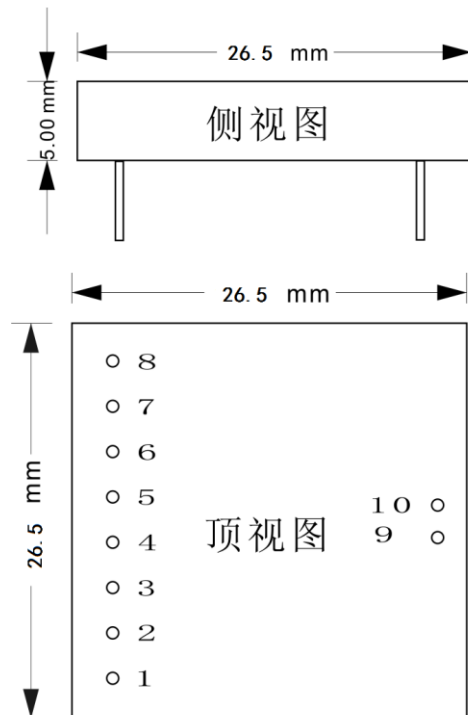
### Electrical characteristics @23°C:

Characteristic	TBC-450N	TBC-450P
Input voltage	4.5~5.5V	4.5~5.5V
Output voltage	-40~-450V	40~450V
Output current	Max0.5mA	Max0.5mA
Operating temperature	-40~70°C	-40~70°C
Temperature sensor	Pt1000	Pt1000
Output setup	TTL series port	TTL series port
Outline	26.5*26.5*5mm	26.5*26.5*5mm
Weight	8g	8g

## Schematic Diagram:



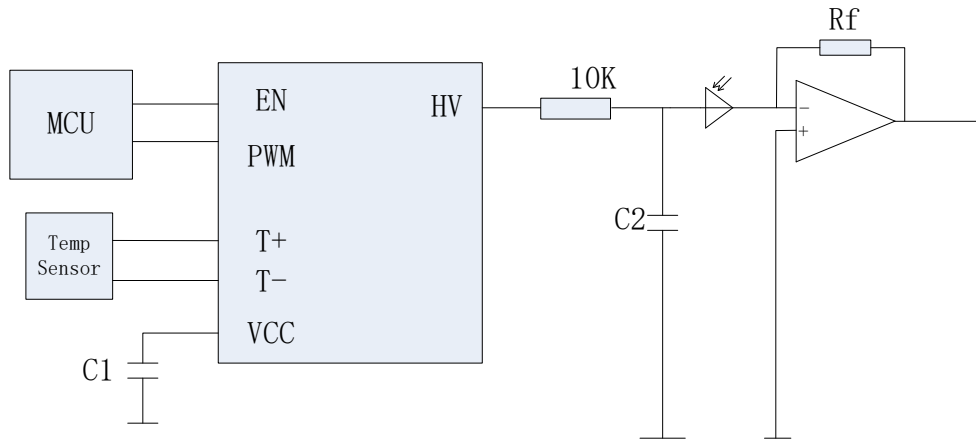
## Package Drawing:



标号	引脚	备注
1	VIN+	电源输入+
2	GND	地
3	RXD	串口接收
4	EN	使能端
5	T-	温度传感-
6	T+	温度传感+
7	GND	地
8	PWM	模拟控制电压
9	HV	高压输出
10	GND	地

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## Application drawing:



## Connection Configuration :

1. Pin1 is connected to +5v,
2. Pin2 is connected to GND
3. Pin3 is serial receiver to true parameter. (the input level is compatible with 3.3/5.0V, the communication protocol is on below sheet)
4. Pin4 is enable high voltage (connect high level= high voltage output, connect GND= no high voltage output)
5. Pin5, Pin6 is connected to temperature sensor (PT1000) , no polarity.
6. Pin7 is connected to GND, Pin8 is connected to the input of PWM.

## Description of PWM controll:

One side the output voltage is controlled by ambient temperature, the other side it can be adjusted with the duty of PWM signal. (PWM signal: Frequency is 1~10KHZ Amplitude is 3.3~5v, Duty is 5%~99%)

$$V_{out} = V_{temp} * Duty$$

Vout: output high voltage,

Vtemp: the amplitude of high voltage when it changed with temperature

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## Communication control protocol:

1. Baud rate: 115200
2. Parity bit: Nothing
3. Data bit: 8
4. Stop bit: 1

Function	B0	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10
Setup param	AA	02	00	D4	02	08	00	21	00	00	BB

### Description:

B4 B5 :to setup the output voltage when it is -40°C。

Setup value =Output high voltage\*10, e.g to setup the high voltage into 52V, the output voltage will be 520—0X0208

B6 B7 : to setup the temperature varying coefficient of output voltage。 Setup value=output voltage\*10, e.g.to setup the high coefficient is 3.3V, the output will be 33—0X0021

B8 B9 :to setup the work mode。 When we setup it into“00 00”, the output is changed with ambient temperature. When we setup it into “00 01”, the output voltage will be changed with not only ambient temperature, but also the PWM input voltage.

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