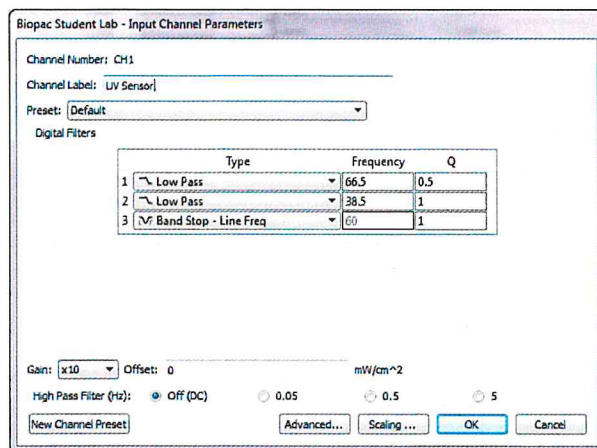


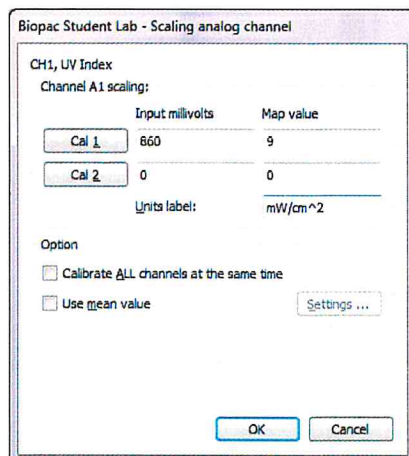
The Sensor uses a UV photodiode (Roithner LaserTechnik GUVA-S12SD), which can detect light in the range of 240nm - 370nm (covering UVB and most of UVA spectrum). The signal level from the photodiode is very small, in the nano-ampere level, so an op-amp is used to amplify the signal to a more manageable volt-level.

The analog output voltage is: $V_o = (4.3/5) * \text{Diode-Current (in } \mu\text{A)}$. For example, if the photocurrent is 1 μA (9 mW/cm^2), the output voltage is 860 mV.

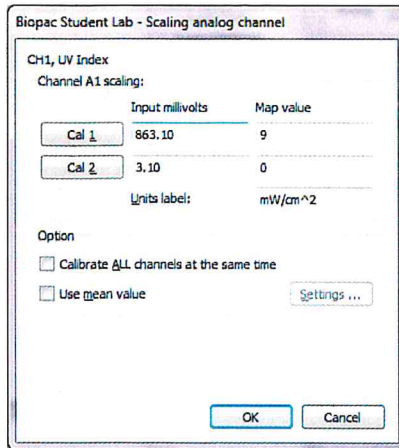
Channel Gain and filtering setup for UV Power or UV Index:



If UV Power (mW/cm^2) is desired, setup the channel Scaling as follows:



To calibrate (compensate for offset), temporarily block the light sensor and click “Cal 2”. Manually add the “Input millivolts” value obtained for “Cal 2” to the “Cal 1” value. For example if after clicking “Cal 2”, the Input millivolts value reads 3.10 millivolts, then you would manually change the “Cal 1” input millivolts to 863.10 millivolts ($860 + 3.10$).



Biopac Student Lab - Scaling analog channel

CH1, UV Index

Channel A1 scaling:

	Input millivolts	Map value
Cal 1	863.10	9
Cal 2	3.10	0

Units label: mW/cm²

Option

☐ Calibrate ALL channels at the same time

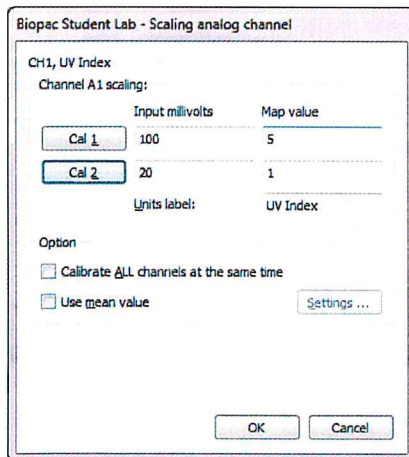
☐ Use mean value

Settings ...

OK Cancel

If UV Index is desired, then multiply the output voltage by 50 to obtain the approximate UV index. For example, if the output voltage is 100 mV, then the UV Index is about 5.

To calibrate, setup the channel Scaling as follows:



Biopac Student Lab - Scaling analog channel

CH1, UV Index

Channel A1 scaling:

	Input millivolts	Map value
Cal 1	100	5
Cal 2	20	1

Units label: UV Index

Option

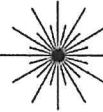
☐ Calibrate ALL channels at the same time

☐ Use mean value

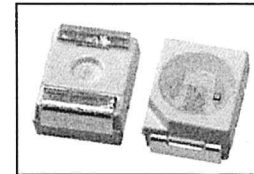
Settings ...

OK Cancel

Note: The UV sensor is sensitive to motion artifact so it must be held in a stationary position when taking measurements.



GUVA-S12SD



TECHNICAL DATA

UV-B Sensor

Features

- Gallium Nitride Based Material
- Schottky-type Photodiode
- Photovoltaic Mode Operation
- Good Visible Blindness
- High Responsivity & Low Dark Current

Applications

- UV Index Monitoring
- UV-A Lamp Monitoring

Absolute Maximum Ratings

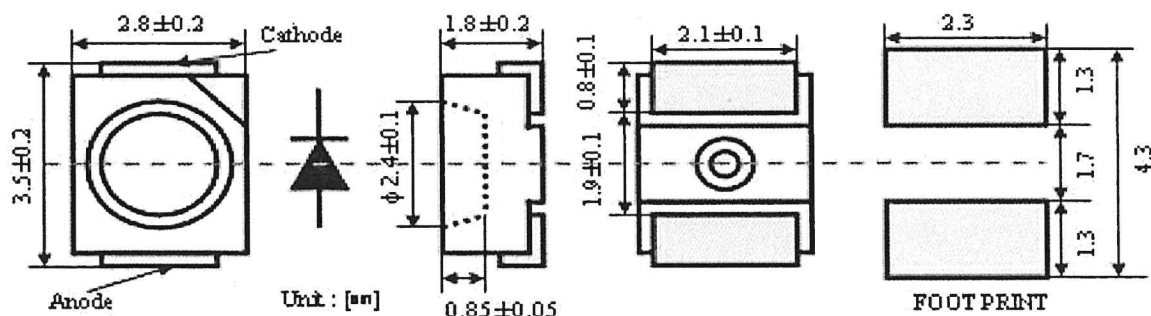
Item	Symbol	Value	Unit
Forward Current	I_F	1	mA
Reverse Voltage	V_R	5	V
Operating Temperature	T_{op}	-30 ... +85	°C
Storage Temperature	T_{st}	-40 ... +90	°C
Soldering Temperature *	T_{sol}	260	°C

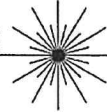
* must be completed within 10 seconds

Characteristics (25°C)

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Dark Current	I_D	$V_R = 0.1 \text{ V}$	-	-	1	nA
Photo Current	I_{PD}	UVA Lamp, 1 mW/cm ²	-	113	-	nA
		1 UVI	-	26	-	nA
Temperature Coefficient	I_{TC}	UVA Lamp	-	0.08	-	% / °C
Responsivity	R	$\lambda = 300 \text{ nm}, V_R = 0 \text{ V}$	-	0.14	-	A/W
Spectral Detection Range	λ	10% of R	240	-	370	nm

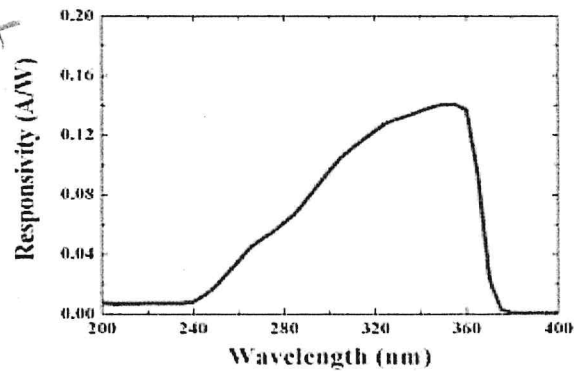
Package Dimension



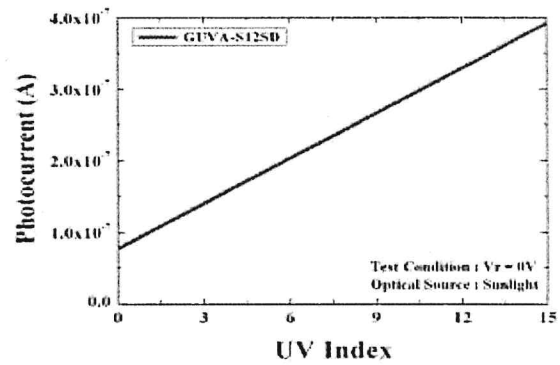
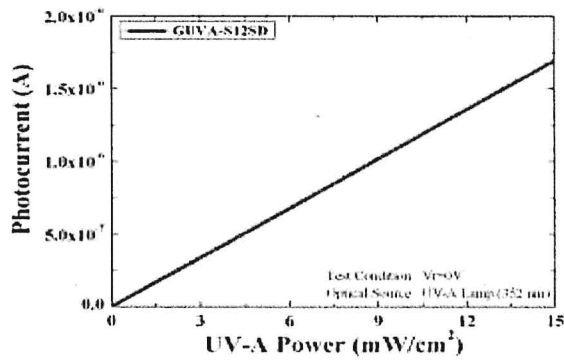


Responsivity Curve

Amperes / Watt



Photocurrent along UV Power



From Adafruit website: <https://www.adafruit.com/products/1918>

Analog UV Light Sensor Breakout – GUVVA-S12SD

Extend your light-sensing spectrum with this analog UV sensor module. It uses a UV photodiode, which can detect the 240–370nm range of light (which covers UVB and most of UVA spectrum). The signal level from the photodiode is very small, in the nano-ampere level, so we tossed on an opamp to amplify the signal to a more manageable volt-level.

This sensor is much simpler than our Si1145 breakout, it only does one thing and gives an analog voltage output instead of requiring a complicated I2C setup procedure. This makes it better for simple projects. It also has a 'true' UV sensor instead of a calibrated light-sensor. To use, power the sensor and op-amp by connecting V+ to 2.7–5.5VDC and GND to power ground. Then read the analog signal from the OUT pin. The output voltage is: $V_o = 4.3 * \text{Diode-Current-ixn-uA}$. So if the photocurrent is 1 uA (9 mW/cm²), the output voltage is 4.3V. You can also convert the voltage to UV Index by dividing the output voltage by 0.1V. So if the output voltage is 0.5V, the UV Index is about 5.

