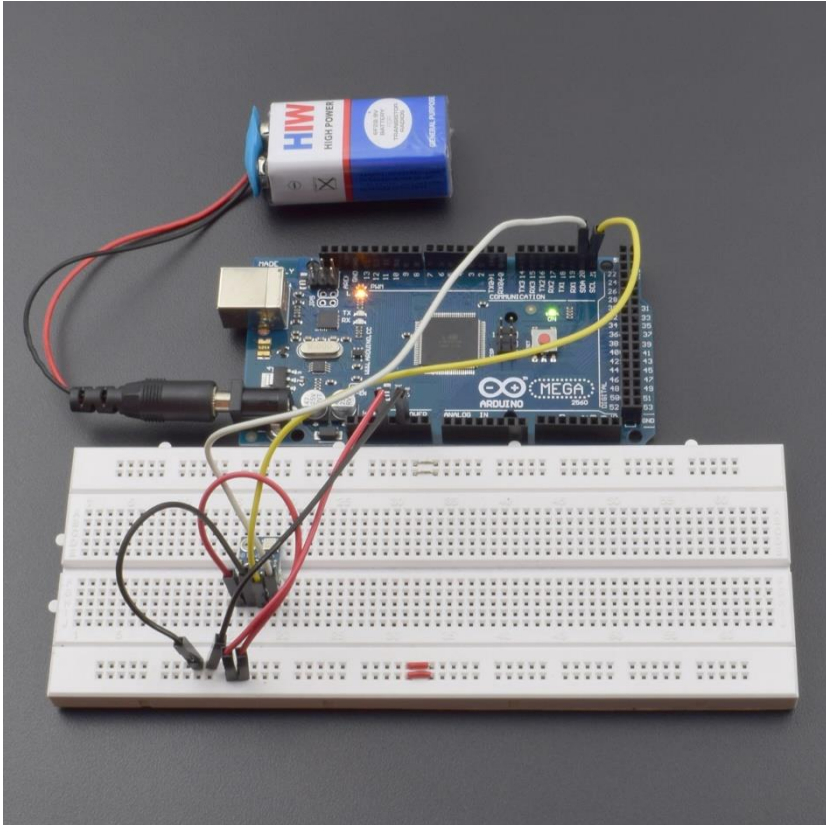

Measure Temperature and Pressure from BMP180
GY-68 Module Interfacing with Arduino Mega

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This pressure sensor is a BMP-180 based digital barometric pressure sensor module and is functional compatible with older BMP-085 digital pressure sensor with less power consumption smaller in size and more accurate. BMP180 combines barometric pressure, temperature and altitude. The I2C allows easy interface with any microcontroller. On board 3.3V LDO regulator makes this board fully 5V supply compatible. BMP-180 can measure pressure range from 300 to 1100hPa

(+9000m to -500m relating to sea level) with an accuracy down to 0.02hPa (0.17m) in advance resolution mode. BMP-180 is an improved replacement for BMP-085 sensor.

Specifications

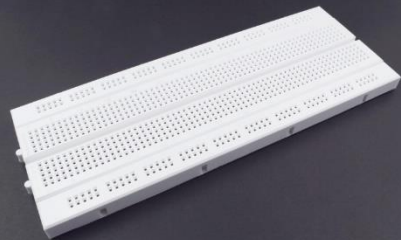
BMP 180 PRESSURE SENSOR MODULE

- Supply Voltage: 1.8V to 3.6V
- Low power consumption: 0.5uA at 1Hz
- I2C interface
- Max I2C Speed: 3.5Mhz
- Very low noise: up to 0.02hPa (17cm)
- Pressure Range: 300hPa to 1100hPa (+9000m to -500m)

Hardware Required

- Arduino MEGA with USB Cable - 1
- BMP180 Digital pressure sensor - 1
- Battery Snapper with DC Jack - 1
- Jumper wire (Male to male) - 40 pieces
- 9v Battery - 1
- Single stand wire 2m - 1
- Breadboard 840 points - 1

Breadboard 840pt - 1



BMP180 Digital pressure sensor - 1



9V Battery with snapper - 2



Arduino Mega with USB Cable - 1



Single Strand Wire 2mt - 1



Jumper Wire 40 pcs (Male to Male)



Software Required

Arduino IDE ((Programmable platform for Arduino boards)

You can download it from this link:

<https://www.arduino.cc/en/Main/Software>

Library Required

Click on this link to download BMP180 MEGA library

<https://goo.gl/H7zz08>

OR

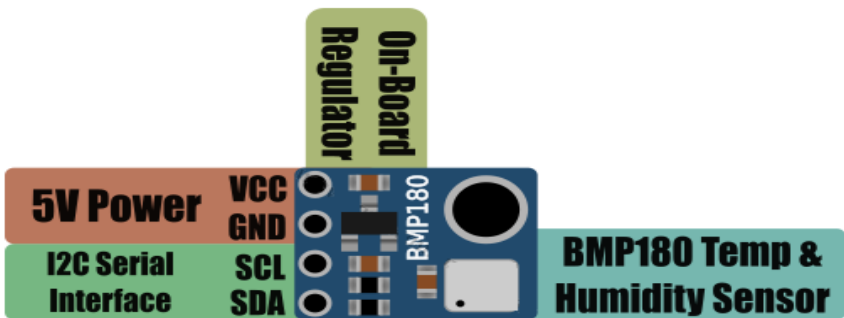
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OR

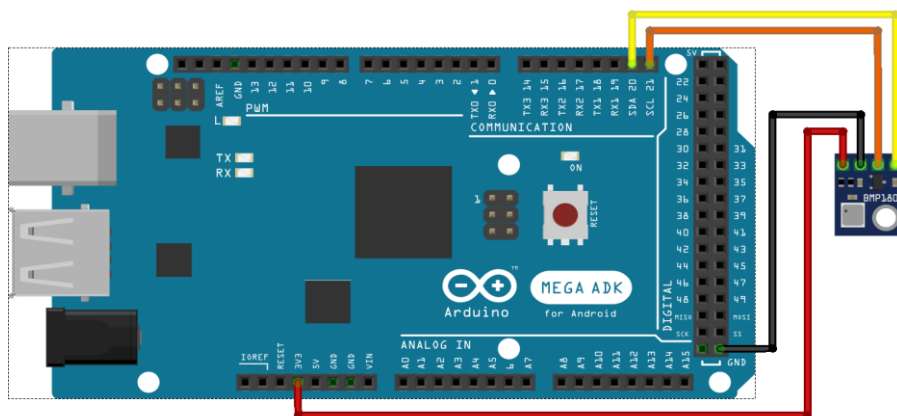
<https://goo.gl/VsY7oy>

Pin Description

BMP180 Digital pressure module



Circuit Diagram



- VIN (or VCC) Bmp180 -> Arduino 3.3V
- GND -> GND
- SCL -> SCL
- SDA -> SDA

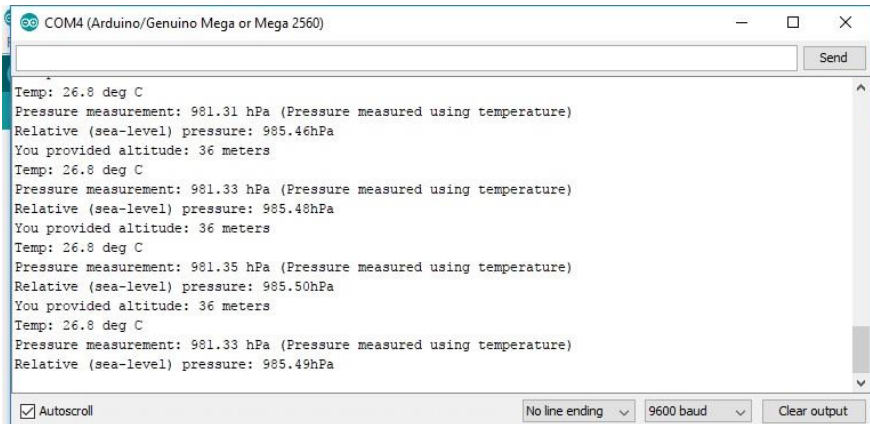
Code

Click to see the code or copy the link:

https://docs.google.com/document/d/e/2PACX-1vQNACWenmx7ldjKzGIU4vgau-1cKRnUtv_sbiiyk2QjoAYmRJR_kyYq3Nx4V7uJP-5LfRfx-XyTPLi7/pub

Working

In this we are trying to measure the temperature and pressure using BMP180 (barometric pressure Sensor). First it will show the atmospheric temperature and pressure but as we apply some Pressure on the bmp180 the values will change. We can see the output in the serial monitor.



The screenshot shows the serial monitor window for a COM4 port, displaying the output of an Arduino program. The output consists of five identical blocks of text, each representing a single sensor reading. Each block contains four lines: temperature, pressure measurement, relative pressure, and altitude. The values for temperature, pressure measurement, and relative pressure are constant across all blocks, while the altitude value varies slightly. The serial monitor interface includes a 'Send' button, a scroll bar, and settings for 'Autoscroll', 'No line ending', '9600 baud', and 'Clear output'.

```
COM4 (Arduino/Genuino Mega or Mega 2560)
Temp: 26.8 deg C
Pressure measurement: 981.31 hPa (Pressure measured using temperature)
Relative (sea-level) pressure: 985.46hPa
You provided altitude: 36 meters
Temp: 26.8 deg C
Pressure measurement: 981.33 hPa (Pressure measured using temperature)
Relative (sea-level) pressure: 985.48hPa
You provided altitude: 36 meters
Temp: 26.8 deg C
Pressure measurement: 981.35 hPa (Pressure measured using temperature)
Relative (sea-level) pressure: 985.50hPa
You provided altitude: 36 meters
Temp: 26.8 deg C
Pressure measurement: 981.33 hPa (Pressure measured using temperature)
Relative (sea-level) pressure: 985.49hPa
```

☒ Autoscroll No line ending 9600 baud Clear output



ROBOTICS EMBEDDED EDUCATION SERVICES PVT. LTD.

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Email - suppourt@rees52.com

Specification of Thermoelectric Module

TEC1-12706

Description

The 127 couples, 40 mm × 40 mm size single stage module is made of selected high performance ingot to achieve superior cooling performance and greater delta T up to 70 °C, designed for superior cooling and heating up to 100 °C requirement. If higher operation or processing temperature is required, please specify, we can design and manufacture the custom made module according to your special requirements.

Features

- High effective cooling and efficiency.
- No moving parts, no noise, and solid-state
- Compact structure, small in size, light in weight
- Environmental friendly, RoHS compliant
- Precise temperature control
- Exceptionally reliable in quality, high performance

Application

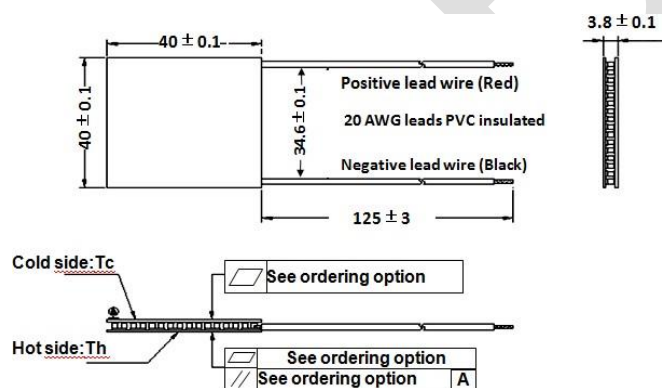
- Food and beverage service refrigerator
- Portable cooler box for cars
- Liquid cooling
- Temperature stabilizer
- Photonic and medical systems

Performance Specification Sheet

Th(°C)	27	50	Hot side temperature at environment: dry air, N ₂
DT _{max} (°C)	70	79	Temperature Difference between cold and hot side of the module when cooling capacity is zero at cold side
U _{max} (Voltage)	16.0	17.2	Voltage applied to the module at DT _{max}
I _{max} (amps)	6.1	6.1	DC current through the modules at DT _{max}
Q _{Cmax} (Watts)	61.4	66.7	Cooling capacity at cold side of the module under DT=0 °C
AC resistance(ohms)	2.0	2.2	The module resistance is tested under AC
Tolerance (%)	± 10		For thermal and electricity parameters

Geometric Characteristics

Dimensions in millimeters



Sealing Option

A. Solder:

1. T100: BiSn (T_{melt} = 138 °C)

B. Sealant:

1. NS: No sealing (Standard)
2. SS: Silicone sealant
3. EPS: Epoxy sealant
4. Customer specify sealing

other than above

C. Ceramics:

1. Alumina (Al₂O₃, white 96%)
2. Aluminum Nitride (AlN)

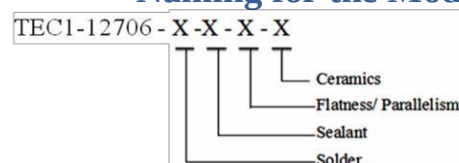
D. Ceramics Surface Options:

1. Blank ceramics (not metallized)
2. Metallized (Au plating)

Ordering Option

Suffix	Thickness (mm)	Flatness/ Parallelism (mm)	Lead wire length(mm) Standard/Optional length
TF	0:3.8±0.1	0:0.035/0.035	125±3/Specify
TF	1:3.8±0.05	1:0.025/0.025	125±3/Specify
TF	2:3.8±0.025	2:0.015/0.015	125±3/Specify
Eg. TF01: Thickness 3.8 ± 0.1 (mm) and Flatness 0.025 / 0.025 (mm)			

Naming for the Module

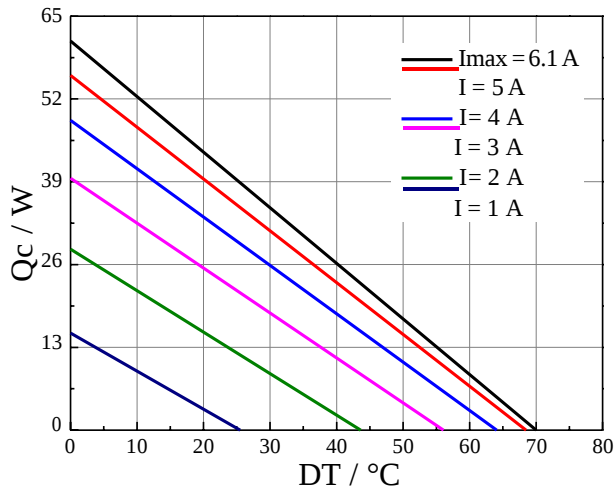


TEC1-12706-T100-NS -TF01 -AlO	
T100: BiSn (T _{melt} =138°C)	AIO: Alumina white 96%
NS: No sealing	TF01: Thickness ± 0.1 (mm) and Flatness/Parallelism 0.025/0.025(mm)

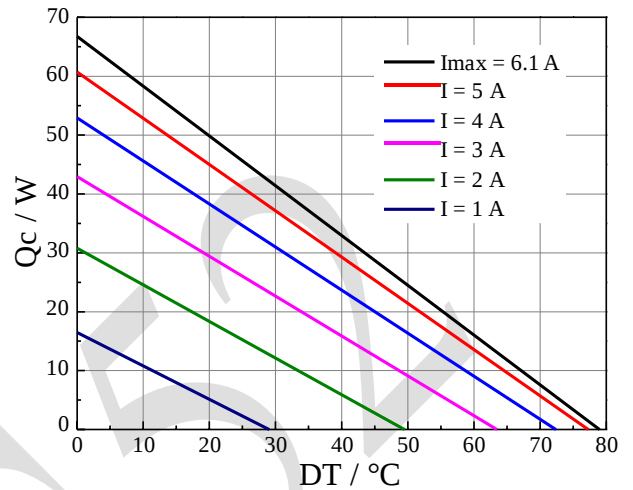
Specification of Thermoelectric Module

TEC1-12706

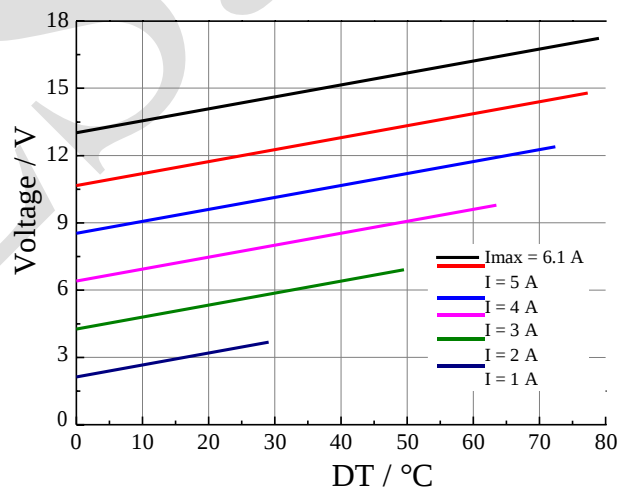
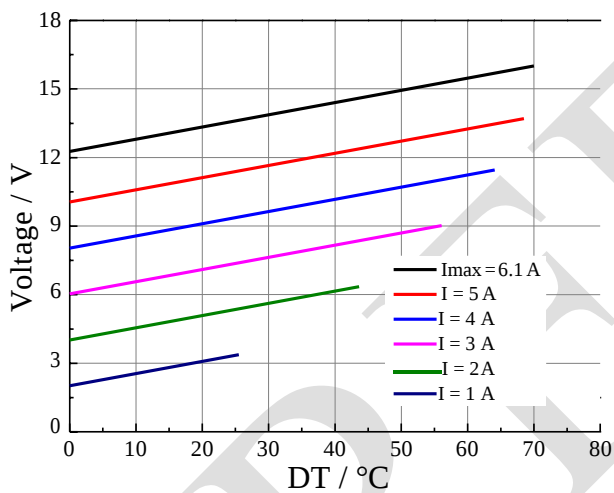
Performance Curves at $T_h=27^\circ\text{C}$



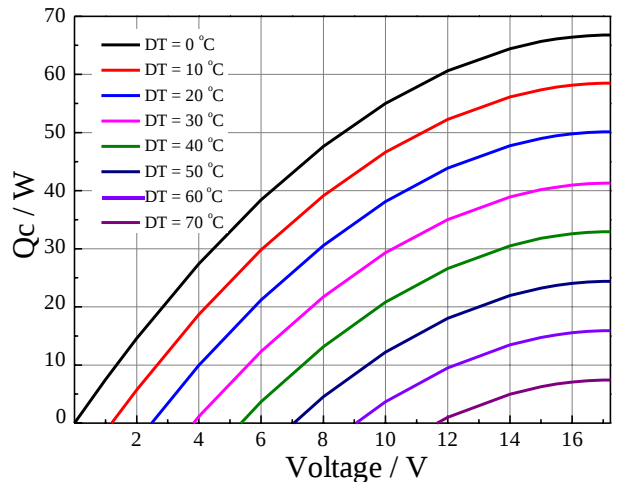
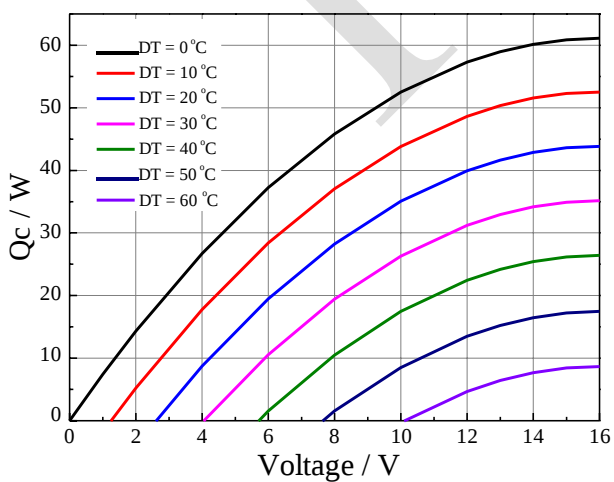
Performance Curves at $T_h=50^\circ\text{C}$



Standard Performance Graph $Q_c = f(DT)$



Standard Performance Graph $V = f(\Delta T)$

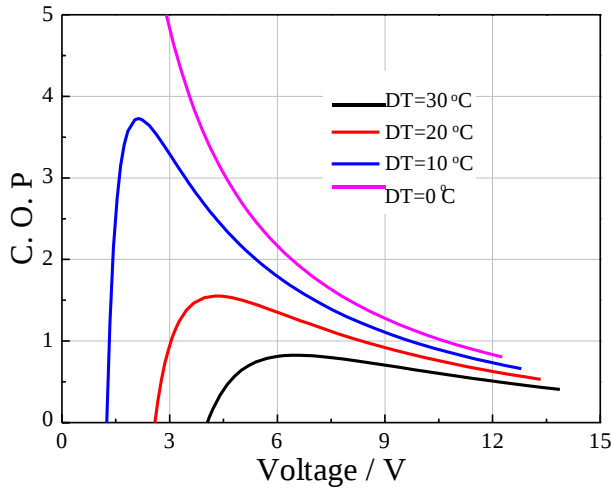


Standard Performance Graph $Q_c = f(V)$

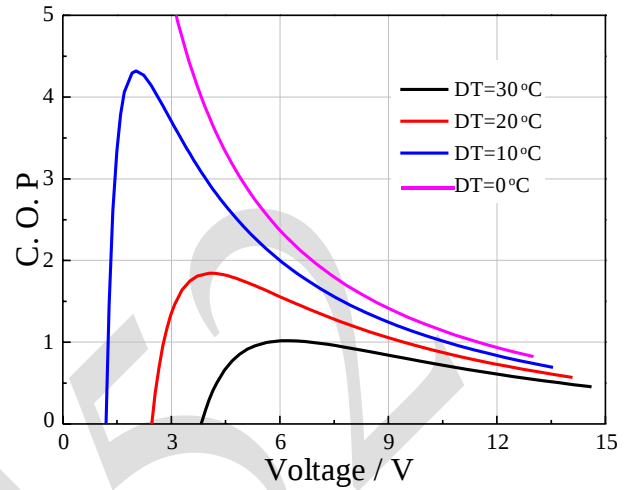
Specification of Thermoelectric Module

TEC1-12706

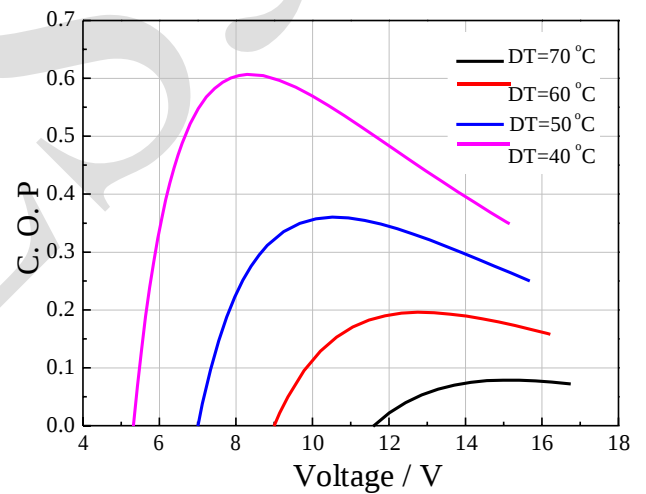
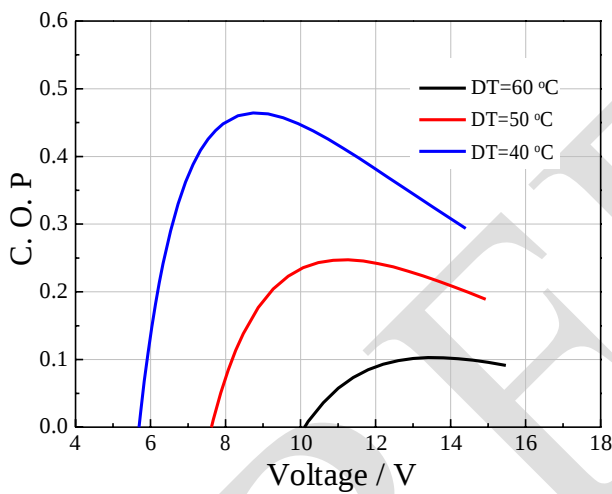
Performance Curves at $T_h=27\text{ }^\circ\text{C}$



Performance Curves at $T_h=50\text{ }^\circ\text{C}$



Standard Performance Graph $\text{COP} = f(V)$ of ΔT ranged from 0 to $30\text{ }^\circ\text{C}$



Standard Performance Graph $\text{COP} = f(V)$ of ΔT ranged from 40 to 60/70 $^\circ\text{C}$

Remark: The coefficient of performance (COP) is the cooling power Q_c /Input power ($V \times I$).

Operation Cautions

- Cold side of the module stucked on the object being cooled
- Hot side of the module mounted on a heat radiator
- Storage module below $100\text{ }^\circ\text{C}$
- Operation below $I_{\max}$ or $V_{\max}$
- Work under DC