# Grove - High Temperature Sensor

Release date： 9/20/2015

Version： 1.0

Wiki: http://www.seeedstudio.com/wiki/Grove_-_High_Temperature_Sensor

Bazaar:http://www.seeedstudio.com/depot/Grove-High-Temperature-Sensor-p-1810.html

## Document Revision History

| Revision | Date | Author | Description |
|---|---|---|---|
| 1.0 | Sep 21, 2015 | Victor.He | Create file |
| | | | |

*Contents*

Document Revision History ..... 2
1. Introduction ..... 2
2. Specification ..... 3
3. Demonstration ..... 4
   3.1 Hardware Installation ..... 4
   3.2 Download Code and Upload ..... 4
   3.3 Open Serial Monitor and Get Data ..... 4
   3.4 K type thermocouple indexing table ..... 6
4. Resource ..... 7

## *Disclaimer*

*For physical injuries and possessions loss caused by those reasons which are not related to product quality, such as operating without following manual guide, natural disasters or force majeure, we take no responsibility for that.*

*Under the supervision of Seeed Technology Inc., this manual has been compiled and published which covered the latest product description and specification. The content of this manual is subject to change without notice.*

## *Copyright*

*The design of this product (including software) and its accessories is under tutelage of laws. Any action to violate relevant right of our product will be penalized through law. Please consciously observe relevant local laws in the use of this product.*

# 1. Introduction

Thermocouples are very sensitive, requiring a good amplifier with a cold - compensation reference. The Grove - Temperature Sensor USES a K type thermocouple Temperature detection, with a Thermistor to detect the ambient Temperature as Temperature compensation. The detectable range of this Sensor is -50-600℃ , and The accuracy is ±(2.0% + 2℃).

## 2. Specification

| | |
|---|---|
| Voltage | 3.3 ~ 5V |
| Max power rating at 25℃ | 300mW |
| Operating temperature range | -40 ~ +125 ℃ |
| The temperature measurement range is | -50 ~ +600℃ |
| Amplifier output voltage range | 0 ~ 3.3 V mv |
| Cold junction compensation (environment temperature measurement) | |
| Thermocouple temperature measurement accuracy | ± 2.0% (+ 2 ℃) |

# 3. Demonstration

Here is an example to show you how to read temperature information from the sensor.

We need a Seeeduino V3.0 and a Grove - High Temperature Sensor.

## 3.1 Hardware Installation

There's a I2C Port on Seeeduino, actually it's connect to A4 and A5 else. So we can use this port to read data from the sensor.

Let's plug this sensor to I2C port of Seeeduino.

## 3.2 Download Code and Upload

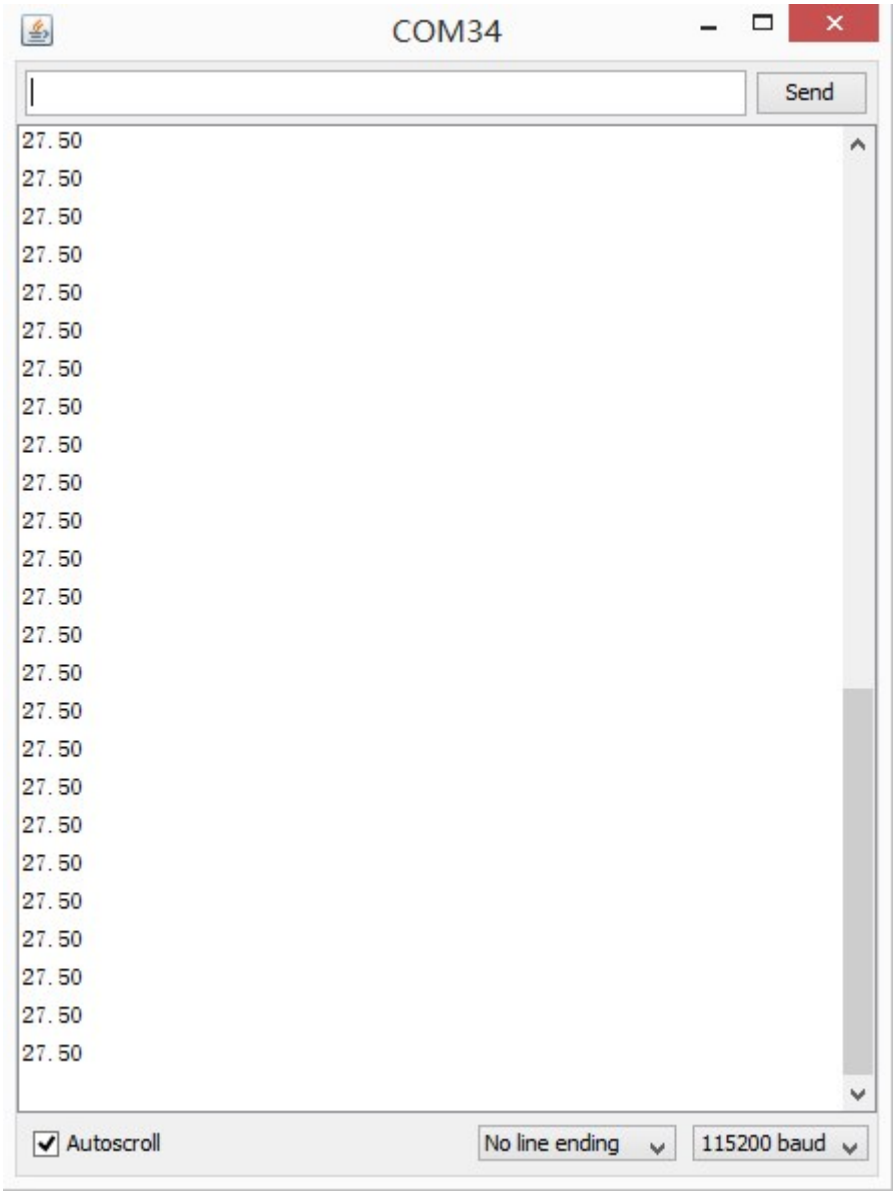
You can download the library in here

Then extract the library the Library folder of Arduino, open the demo in examples folder.

Then upload it to your Seeeduino.

## 3.3 Open Serial Monitor and Get Data

Then, open your Serial Monitor, you can find the temperature in Celsius here.


COM34
Send
27.50
27.50
27.50
27.50
27.50
27.50
27.50
27.50
27.50
27.50
27.50
27.50
27.50
27.50
27.50
27.50
27.50
27.50
27.50
27.50
27.50
27.50
27.50
27.50
27.50
Autoscroll
No line ending
115200 baud

## 3.4 K type thermocouple indexing table

As a reference, the following is K type thermocouple indexing table.

| | 0 | -5 | -10 | -15 | -20 | -25 | -30 | -35 | -40 | -45 | -50 | -55 | -60 | -65 | -70 | -75 | -80 | -85 | -90 | -95 | -100 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| -200 | -5.8914 | -5.9654 | -6.0346 | -6.099 | -6.1584 | -6.2127 | -6.2618 | -6.3056 | -6.3438 | -6.3765 | -6.4036 | -6.4251 | -6.4411 | -6.4518 | -6.4577 | | | | | | |
| -100 | -3.5536 | -3.7046 | -3.8523 | -3.9969 | -4.1382 | -4.2761 | -4.4106 | -4.5416 | -4.669 | -4.7927 | -4.9127 | -5.0289 | -5.1412 | -5.2496 | -5.354 | -5.4542 | -5.5503 | -5.6422 | -5.7297 | -5.8128 | -5.8914 |
| 0 | 0 | -0.1966 | -0.3919 | -0.5855 | -0.7775 | -0.9678 | -1.1561 | -1.3425 | -1.5269 | -1.7093 | -1.8894 | -2.0673 | -2.2428 | -2.416 | -2.5866 | -2.7547 | -2.9201 | -3.0828 | -3.2427 | -3.3996 | -3.5536 |
| | 0 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 100 |
| 0 | 0 | 0.1979 | 0.3969 | 0.597 | 0.7981 | 1.0002 | 1.2033 | 1.4071 | 1.6118 | 1.8171 | 2.0231 | 2.2296 | 2.4365 | 2.6437 | 2.8512 | 3.0589 | 3.2666 | 3.4743 | 3.6819 | 3.8892 | 4.0962 |
| 100 | 4.0962 | 4.3029 | 4.5091 | 4.7147 | 4.9199 | 5.1244 | 5.3284 | 5.5317 | 5.7345 | 5.9367 | 6.1383 | 6.3395 | 6.5402 | 6.7406 | 6.9406 | 7.1404 | 7.34 | 7.5396 | 7.7391 | 7.9387 | 8.1385 |
| 200 | 8.1385 | 8.3384 | 8.5386 | 8.7391 | 8.9399 | 9.1411 | 9.3427 | 9.5447 | 9.7472 | 9.95 | 10.1534 | 10.3571 | 10.5613 | 10.7659 | 10.9709 | 11.1763 | 11.3821 | 11.5882 | 11.7947 | 12.0015 | 12.2086 |
| 300 | 12.2086 | 12.4159 | 12.6236 | 12.8315 | 13.0396 | 13.248 | 13.4566 | 13.6654 | 13.8745 | 14.0837 | 14.2931 | 14.5028 | 14.7126 | 14.9226 | 15.1327 | 15.3431 | 15.5536 | 15.7642 | 15.975 | 16.186 | 16.3971 |
| 400 | 16.3971 | 16.6084 | 16.8198 | 17.0314 | 17.2431 | 17.4549 | 17.6669 | 17.8789 | 18.0911 | 18.3034 | 18.5158 | 18.7283 | 18.9409 | 19.1536 | 19.3663 | 19.5792 | 19.7921 | 20.0051 | 20.2181 | 20.4312 | 20.6443 |
| 500 | 20.6443 | 20.8574 | 21.0706 | 21.2838 | 21.4971 | 21.7103 | 21.9236 | 22.1368 | 22.35 | 22.5632 | 22.7764 | 22.9896 | 23.2027 | 23.4158 | 23.6288 | 23.8418 | 24.0547 | 24.2675 | 24.4802 | 24.6929 | 24.9055 |
| 600 | 24.9055 | 25.1179 | 25.3303 | 25.5426 | 25.7547 | 25.9668 | 26.1786 | 26.3904 | 26.602 | 26.8135 | 27.0249 | 27.236 | 27.4471 | 27.6579 | 27.8686 | 28.0791 | 28.2895 | 28.4996 | 28.7096 | 28.9194 | 29.129 |
| 700 | 29.129 | 29.3384 | 29.5476 | 29.7565 | 29.9653 | 30.1739 | 30.3822 | 30.5904 | 30.7983 | 31.006 | 31.2135 | 31.4207 | 31.6277 | 31.8345 | 32.041 | 32.2474 | 32.4534 | 32.6593 | 32.8649 | 33.0703 | 33.2754 |
| 800 | 33.2754 | 33.4803 | 33.6849 | 33.8893 | 34.0934 | 34.2973 | 34.501 | 34.7044 | 34.9075 | 35.1104 | 35.3131 | 35.5155 | 35.7177 | 35.9196 | 36.1212 | 36.3226 | 36.5238 | 36.7247 | 36.9254 | 37.1258 | 37.3259 |
| 900 | 37.3259 | 37.5258 | 37.7255 | 37.9249 | 38.124 | 38.3229 | 38.5215 | 38.7199 | 38.918 | 39.1159 | 39.3135 | 39.5109 | 39.708 | 39.9049 | 40.1015 | 40.2978 | 40.4939 | 40.6897 | 40.8853 | 41.0806 | 41.2756 |
| 1000 | 41.2756 | 41.4704 | 41.6649 | 41.8591 | 42.0531 | 42.2468 | 42.4403 | 42.6334 | 42.8263 | 43.0189 | 43.2112 | 43.4033 | 43.5951 | 43.7866 | 43.9777 | 44.1687 | 44.3593 | 44.5496 | 44.7396 | 44.9293 | 45.1187 |
| 1100 | 45.1187 | 45.3078 | 45.4966 | 45.6851 | 45.8733 | 46.0611 | 46.2487 | 46.4359 | 46.6227 | 46.8093 | 46.9955 | 47.1813 | 47.3668 | 47.552 | 47.7368 | 47.9213 | 48.1054 | 48.2892 | 48.4726 | 48.6556 | 48.8382 |
| 1200 | 48.8382 | 49.0205 | 49.2024 | 49.384 | 49.5651 | 49.7459 | 49.9263 | 50.1062 | 50.2858 | 50.4651 | 50.6439 | 50.8223 | 51.0003 | 51.178 | 51.3552 | 51.532 | 51.7085 | 51.8845 | 52.0602 | 52.2354 | 52.4103 |
| 1300 | 52.4103 | 52.5847 | 52.7588 | 52.9325 | 53.1058 | 53.2787 | 53.4512 | 53.6234 | 53.7952 | 53.9666 | 54.1377 | 54.3084 | 54.4788 | 54.6489 | 54.8186 | | | | | | |

## 4. Resource

Grove - High Temperature Sensor PDF

Grove - High Temperature Sensor Eagle File

High Temperature Sensor Library

Datasheet OPA333 PDF

Datasheet LMV358 PDF

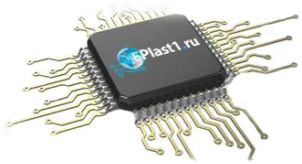
Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.




**Как с нами связаться**

**Телефон:** 8 (812) 309 58 32 (многоканальный)
**Факс:** 8 (812) 320-02-42
**Электронная почта:** org@eplast1.ru
**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.