SKU:DFR1035 (https://www.dfrobot.com/product-2753.html)

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DFR1035 GP8512 (1-Channel 15bit I2C to 0-2.5V/VCC DAC Module)
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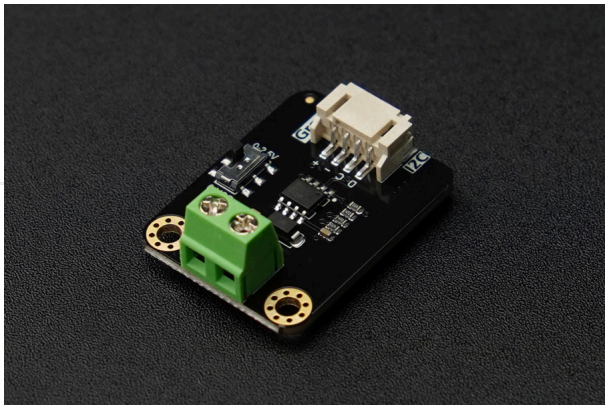

INTRODUCTION

DAC series modules are a range of products that can be controlled through I2C or PWM signals to generate voltage or current output signals. They possess the capability to produce a variety of analog voltage or current signals, including 0-5V, 0-10V, 0-2.5V, 0-VCC, and 0-25mA.

An analog quantity refers to the continuous variation of voltage magnitude (or current magnitude) within a specific range. Due to its stability, long transmission distance, and ease of use, it has found widespread application in the field of industrial automation control, including:

- Motor speed control
- Sound intensity control
- Temperature regulation
- Adjustment of light brightness
- Valve angle modulation

  etc.

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This series of DAC products not only offers a variety of output signal ranges, but also provides three selectable resolutions: 8-bit, 12-bit, and 15-bit. It allows for the choice of either single-channel or dual-channel configurations, and multiple modules can be cascaded to form a multi-channel output. When coupled with Arduino controllers, Raspberry Pi, STM32, and similar controllers, it finds application in various automation control scenarios, including:

- Laboratory testing equipment
- Automatic motor speed control
- Indoor and outdoor lighting control
- Automated volume adjustment
- Backlight control for displays

  etc.

The following table presents the functional parameters of each DAC product for reference in the selection process.

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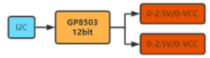
0-2.5V/VCC Product

SKU	Name	Chip modle	Functional Diagram	Number of Channels	Output	Input	Resolution	Linearity error	Product Features
DFR1034	2-channel I2C to 0-2.5V/0-VCC	GP8503		2	0-2.5V/VCC	I2C	12bit	0.10%	2 channels, expandable up to 8 modules through cascading.
DFR1037	2-channel PWM to 0-2.5V/0-VCC	GP8501		2	0-2.5V/VCC	PWM	8bit	0.10%	2 channels, PWM input, versatile compatibility.
DFR1035	1-channel I2C to 0-2.5V/0-VCC	GP8512		1	0-2.5V/VCC	I2C	15bit	0.01%	High resolution and precision.

0-5V/10V Product

SKU	Name	Chip modle	Functional Diagram	Number of Channels	Output	Input	Resolution	Linearity error	Product Features
DFR0971	2-channel I2C to 0-5V/0-10V	GP8403		2	0-5V/10V	I2C	12bit	0.10%	2 channels, expandable up to 8 modules through cascading.
DFR1073	2-channel 15bit I2C to 0-5V/0-10V	GP8413		2	0-5V/10V	I2C	15bit	0.01%	2 channels, offering high resolution andprecision, expandable up to 8 modules throughcascading.
DFR1071	1-channel 15bit I2C to 0-5V/0-10V	GP8211S		1	0-5V/10V	I2C	15bit	0.01%	High resolution and precision.
DFR1036	1-channel PWM to 0-5V/0-10V	GP8101S		1	0-5V/10V	PWM	8bit	0.10%	PwM input, versatile compatibility.

4-20mA Product

SKU	Name	Chip modle	Functional Diagram	Number of Channels	Output	Input	Resolution	Linearity error	Product Features
DFR0972	1-channel I2C转4-20mA	GP8302		1	0-20mA	I2C	12bit	0.10%	More stable current signal.

DFR1035 GP8512 (1-Channel 15bit I2C to 0-2.5V/VCC DAC Module)

FUNCTIONS

This is a 1-channel analog voltage output DAC module with I2C communication, 15-bit resolution, and 0.01% output voltage linearity error. It is well-suited for control projects operating within the 3.3V range, such as ESP32, Raspberry Pi, STM32, and other microcontrollers that require analog signal output.

The high precision and resolution of this module make it suitable for control scenarios that require higher signal accuracy, such as fine speed control or angle control.

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FEATURES

- Support 3.3V-5V power supply.
- Output voltage linearity error of 0.01%.
- Two channels of voltage output, either 0-2.5V or 0-VCC, enabling connection and control of standard analog voltage devices.
- Gravity interface, I2C communication, Arduino control, suitable for program automation control.
- The high precision and resolution of this module make it suitable for control scenarios that require higher signal accuracy.

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DIMENSION

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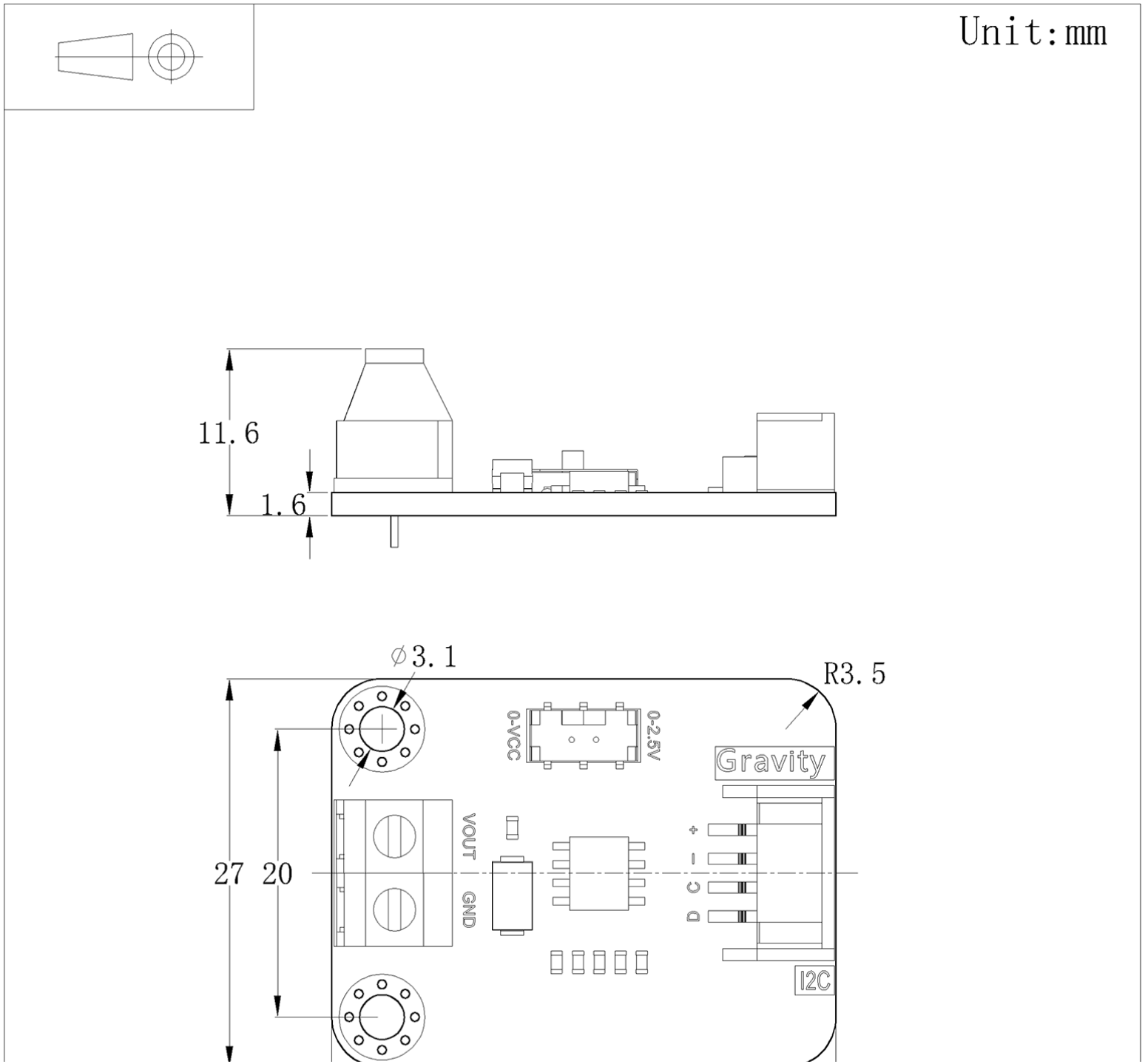

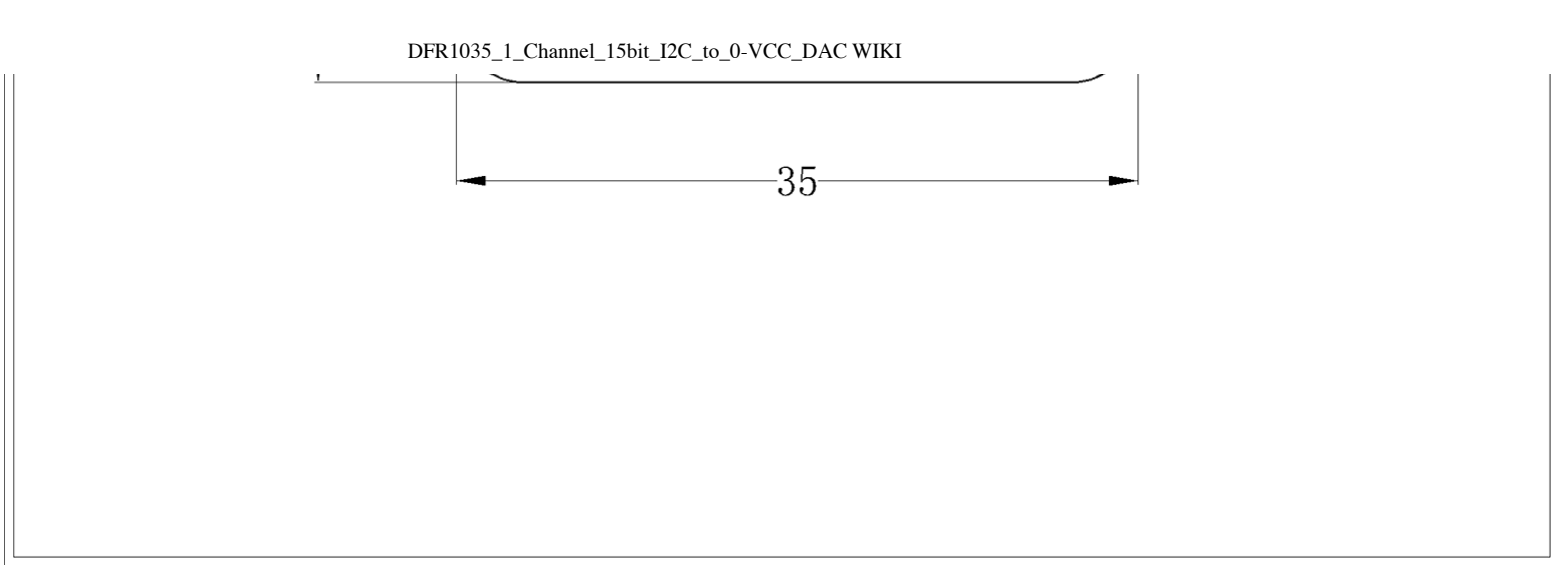

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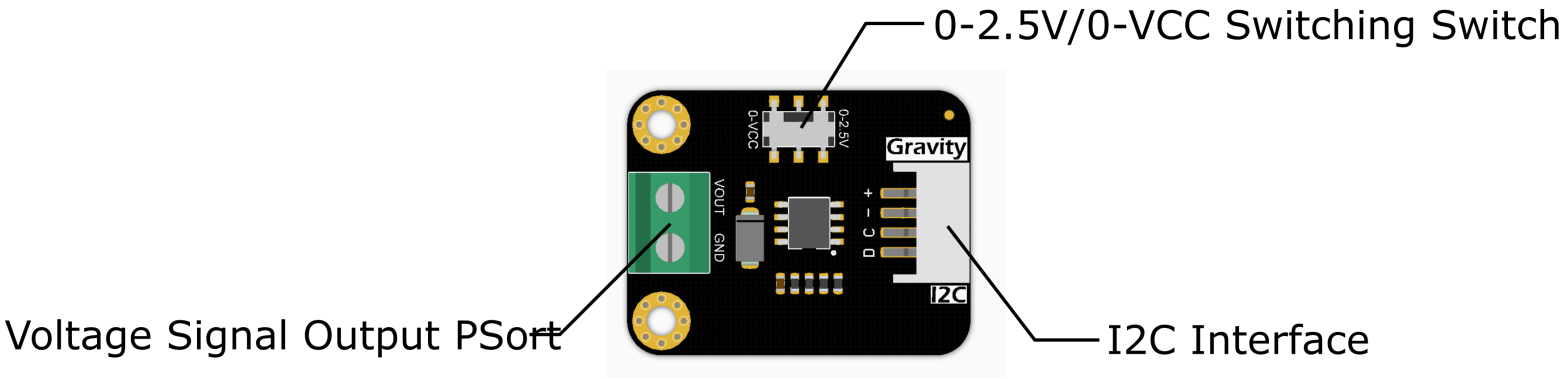
FUNCTIONAL DIAGRAM



Name	Description	Remarks
12C Interface	+	Positive terminal of the power supply (3.3V-5V)
	-	Negative terminal of the power supply
	C	SCL
	D	SDA

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Name	Description	Remarks
0-2.5V/0-VCC Switching Switch	0-VCC	Switch output voltage to 0V-VCC(Supply voltage)
	0-2.5V	Switch output voltage to 0V-2.5V
Voltage Signal Output Port	VOUT	Positive terminal of output voltage signal
	GND	Negative terminal of the output voltage signal

SPECIFICATIONS

- Chip Type: GP8512
- Operating Voltage: 3.3V-5V
- Output Voltage: 0-2.5V or 0-VCC
- Number of Channels: 1 channel
- Communication Method: I2C
- Resolution: 15-bit
- Value Range: 0 - 32767 corresponding to 0-2.5V or 0-VCC
- Output voltage linearity error: 0.01%

TUTORIAL

In this example，We will demonstrate the generation of distinct voltage values under two different conditions.

Input signal value range: 0 - 32767

- In the state of 0-2.5V： input 24903, resulting in an output of 1.9V.
- In the state of 0-VCC： input 24903, resulting in an output of 3.8V.

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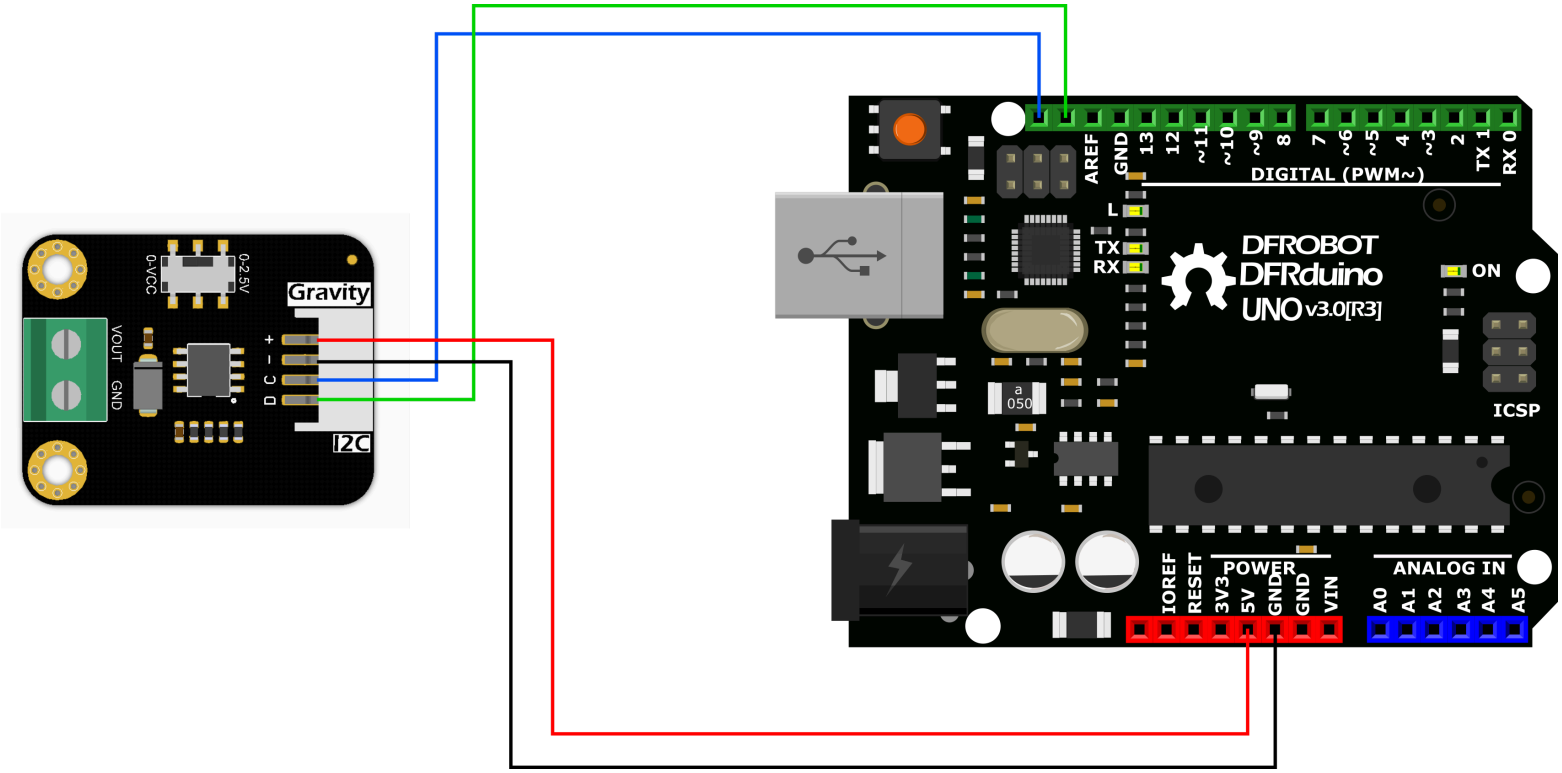
SOFTWARE REQUIREMENTS

- Download Arduino IDE： Click to download Arduino IDE (https://www.arduino.cc/en/Main/Software)
- Download Arduino libraries： Click to download https://github.com/DFRobot/DFRobot_GP8XXX (https://github.com/DFRobot/DFRobot_GP8XXX)

  Click the link to view：How to install the library?; (http://www.dfrobot.com.cn/community/forum.php?mod=viewthread&tid=1854&page=1&extra=#pid6955)

  Note: All modules in this series utilize the same library.

HARDWARE CONNECTION



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SAMPLE CODE

```
#include <DFRobot_GP8XXX.h>

DFRobot_GP8512 GP8512;

void setup() {

  Serial.begin(9600);

  while(GP8512.begin()!=0){
    Serial.println("Communication with the device has encountered a failure. Please verify th
    delay(1000);
  }

  /**
   * @brief. Set the output DAC value.
   * @param data. Data values corresponding to voltage values
   * @n (0 - 32767) This module is a 15-bit precision DAC module, hence the values ranging fr
   */
  GP8512.setDACOutVoltage(24903);//Output voltage of 1.9V under the 0-2.5V state and 3.8V und

  delay(1000);
  //The set voltage is saved internally in the chip for power-off retention.
  //GP8512.store();
}

void loop() {

}
```

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RESULT

After downloading the program, the voltmeter was used to measure the actual output voltage of 1.9V under the 0-2.5V state and 3.8V under the 0-VCC state.

More Documents

DFR1035 Documents：

DFR1035-Schematics.pdf (https://dfimg.dfrobot.com/60c1e008bddfc41c3293de80/wiki/0ec475a94ef31d1c9e1e2836a28640df.pdf)

DFR1035_Dimensions.pdf (https://dfimg.dfrobot.com/60c1e008bddfc41c3293de80/wiki/c58eb6244d08c878317fc9091cd63d3d.pdf)

DFR1035_3D File.rar (https://dfimg.dfrobot.com/60c1e008bddfc41c3293de80/wiki/79f1d014a135a8f45531e867fef7125f.rar)

DFR1035_2D_CAD File.rar (https://dfimg.dfrobot.com/60c1e008bddfc41c3293de80/wiki/ad770bcda51f00243d06a4b518e23de7.rar)

DFR1035_GP8512 Datasheet.pdf (https://dfimg.dfrobot.com/60c1e008bddfc41c3293de80/wiki/72881389b63c151cc6b863caca88f4fa.pdf)

FAQ

For any questions, advice or cool ideas to share, please visit the **DFRobot Forum** (https://www.dfrobot.com/forum/).

Get **1-Channel I2C to 0-VCC DAC Module** (https://www.dfrobot.com/product-2753.html) from DFRobot Store or **DFRobot Distributor**. (https://www.dfrobot.com/distributor)

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