SKU:DFR1037 (https://www.dfrobot.com/product-2755.html)

INTRODUCTION

DFR1037 GP8501 (2-Channel PWM to 0-2.5V/VCC DAC Module)

FUNCTIONS

FEATURES

DIMENSION

FUNCTIONAL DIAGRAM

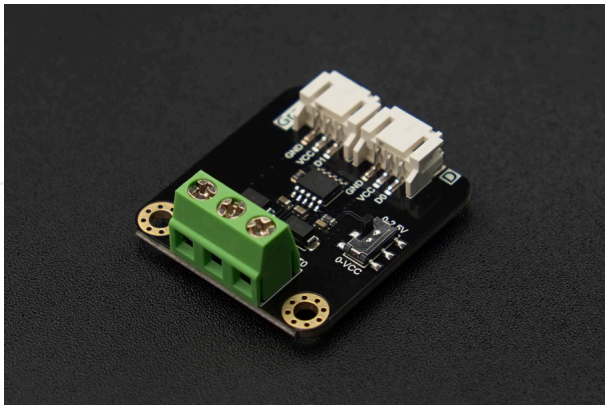
SPECIFICATIONS

TUTORIAL

More Documents

FAQ

(https://www.dfrobot.com/product-2755.html)



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.

INTRODUCTION
DFR1037 GP8501 (2-Channel PWM to 0-2.5V/VCC DAC Module)
FUNCTIONS
FEATURES
DIMENSION
FUNCTIONAL DIAGRAM
SPECIFICATIONS
TUTORIAL
More Documents
FAQ

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:

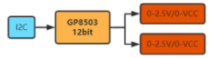
- Laboratory testing equipment
- Automatic motor speed control
- Indoor and outdoor lighting control
- Automated volume adjustment
- Backlight control for displays

  etc.

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

INTRODUCTION
DFR1037 GP8501 （2-Channel PWM to 0-2.5V/VCC DAC Module)
FUNCTIONS
FEATURES
DIMENSION
FUNCTIONAL DIAGRAM
SPECIFICATIONS
TUTORIAL
More Documents
FAQ

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.

DFR1037 GP8501 （2-Channel PWM to 0-2.5V/VCC DAC Module)

FUNCTIONS

This is a 2-channel analog voltage output DAC module with PWM communication, 8-bit resolution, and 0.1% 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.

PWM signal drive allows the module to be controlled by MCU digital ports, providing a simple and convenient usage. The design with two channels also enables effective cost reduction for the project.

INTRODUCTION
DFR1037 GP8501 (2-Channel PWM to 0-2.5V/VCC DAC Module)
FUNCTIONS
FEATURES
DIMENSION
FUNCTIONAL DIAGRAM
SPECIFICATIONS
TUTORIAL
More Documents
FAQ

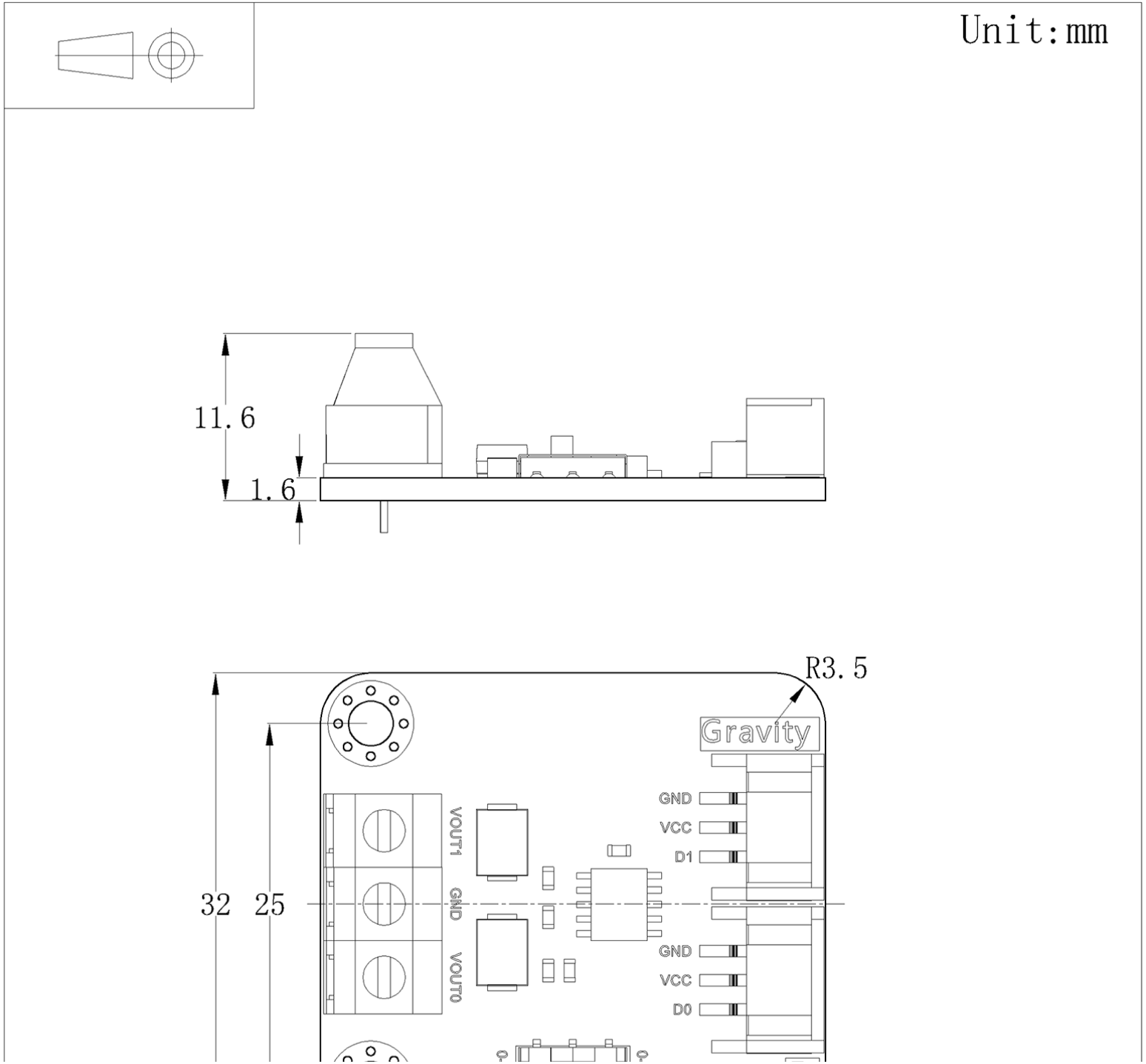
FEATURES

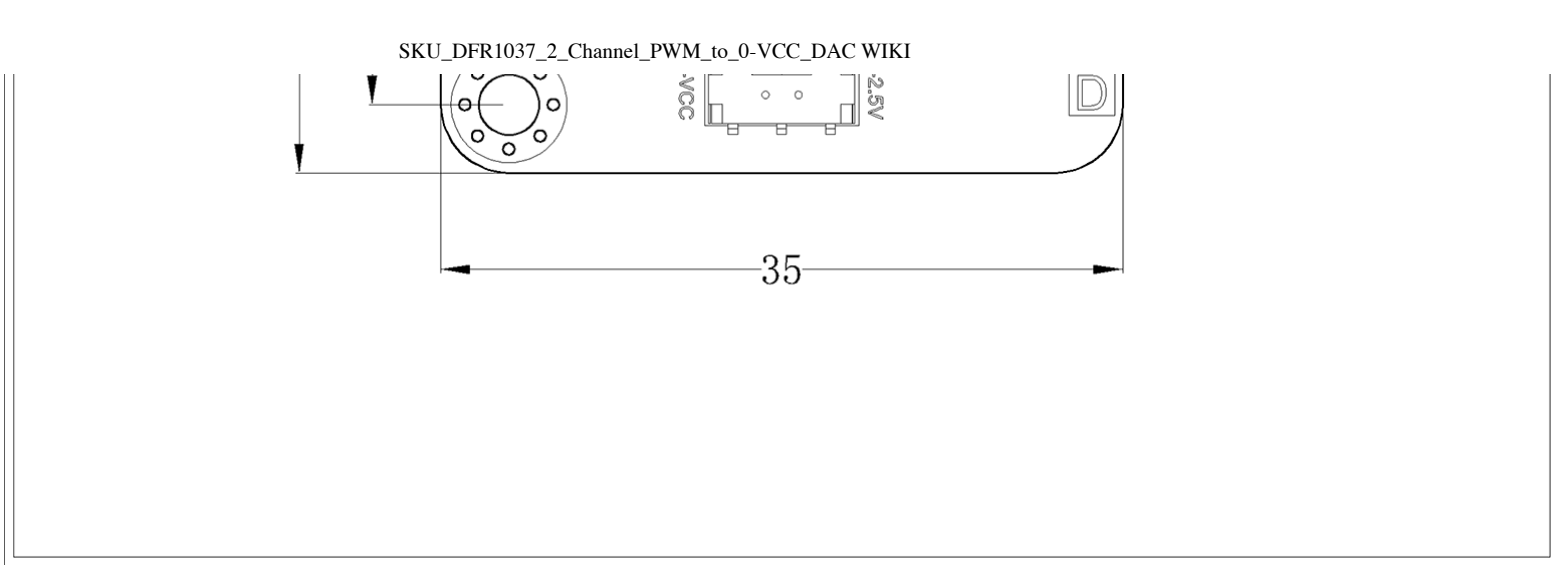
- Support 3.3-V-5V power supply.
- Output voltage linearity error of 0.1%.
- Two channels of voltage output, either 0-2.5V or 0-VCC, enabling connection and control of standard analog voltage devices.
- Gravity interface, PWM communication, Arduino control, suitable for program automation control.
- PWM signals can be utilized to drive the module, enabling it to be controlled simply by the digital port of the MCU.

INTRODUCTION
DFR1037 GP8501 (2-Channel PWM to 0-2.5V/VCC DAC Module)
FUNCTIONS
FEATURES
DIMENSION
FUNCTIONAL DIAGRAM
SPECIFICATIONS
TUTORIAL
More Documents
FAQ

DIMENSION

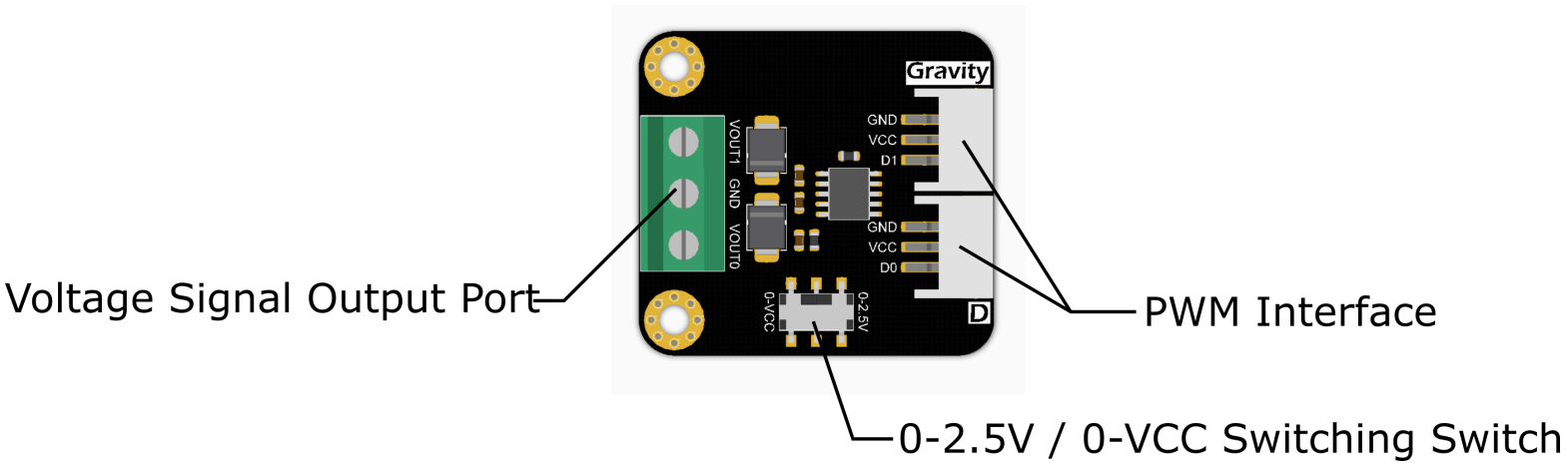
INTRODUCTION
DFR1037 GP8501 (2-Channel PWM to 0-2.5V/VCC DAC Module)
FUNCTIONS
FEATURES
DIMENSION
FUNCTIONAL DIAGRAM
SPECIFICATIONS
TUTORIAL
More Documents
FAQ





INTRODUCTION
DFR1037 GP8501 (2-Channel PWM to 0-2.5V/VCC DAC Module)
FUNCTIONS
FEATURES
DIMENSION
FUNCTIONAL DIAGRAM
SPECIFICATIONS
TUTORIAL
More Documents
FAQ

FUNCTIONAL DIAGRAM



Name	Description	Remarks
PWM Interface	VCC	Positive terminal of the power supply (3.3V-5V)
	GND	Negative terminal of the power supply
	D0	PWM Input Port 0

INTRODUCTION
DFR1037 GP8501 (2-Channel PWM to 0-2.5V/VCC DAC Module)
FUNCTIONS
FEATURES
DIMENSION
FUNCTIONAL DIAGRAM
SPECIFICATIONS
TUTORIAL
More Documents
FAQ

Name	Description	Remarks
	D1	PWM Input Port 1
0-2.5V/0-VCC Switching Switch	0-VCC	Switch output voltage to 0V-VCC
	0-2.5V	Switch output voltage to 0V-2.5V
Voltage Signal Output Port	VOUT0	Positive terminal of output voltage signal 0
	VOUT1	Positive terminal of output voltage signal 1
	GND	Negative terminal of the output voltage signal

SPECIFICATIONS

- Chip Type: GP8501
- Operating Voltage: 3.3V-5V
- Output Voltage: 0-2.5V or 0-VCC
- Number of Channels: 2 channels
- Communication Method: PWM
- Resolution: 8-bit
- Value Range: 0 - 255 corresponding to 0-2.5V or 0-VCC
- Output voltage linearity error: 0.1%

TUTORIAL

In this example, We will demonstrate the varying voltage values output by two channels in two different states.

Input signal value range: 0-255

INTRODUCTION
DFR1037 GP8501 (2-Channel PWM to 0-2.5V/VCC DAC Module)
FUNCTIONS
FEATURES
DIMENSION
FUNCTIONAL DIAGRAM
SPECIFICATIONS
TUTORIAL
More Documents
FAQ

In the state of 0-2.5V：

- Channel 0 inputs 176, resulting in an output of 1.725V.
- Channel 1 inputs 103, resulting in an output of 1.009V.

In the state of 0-VCC：

- Channel 0 inputs 176, resulting in an output of 3.29V.
- Channel 1 inputs 103, resulting in an output of 1.926V.

SOFTWARE REQUIREMENTS

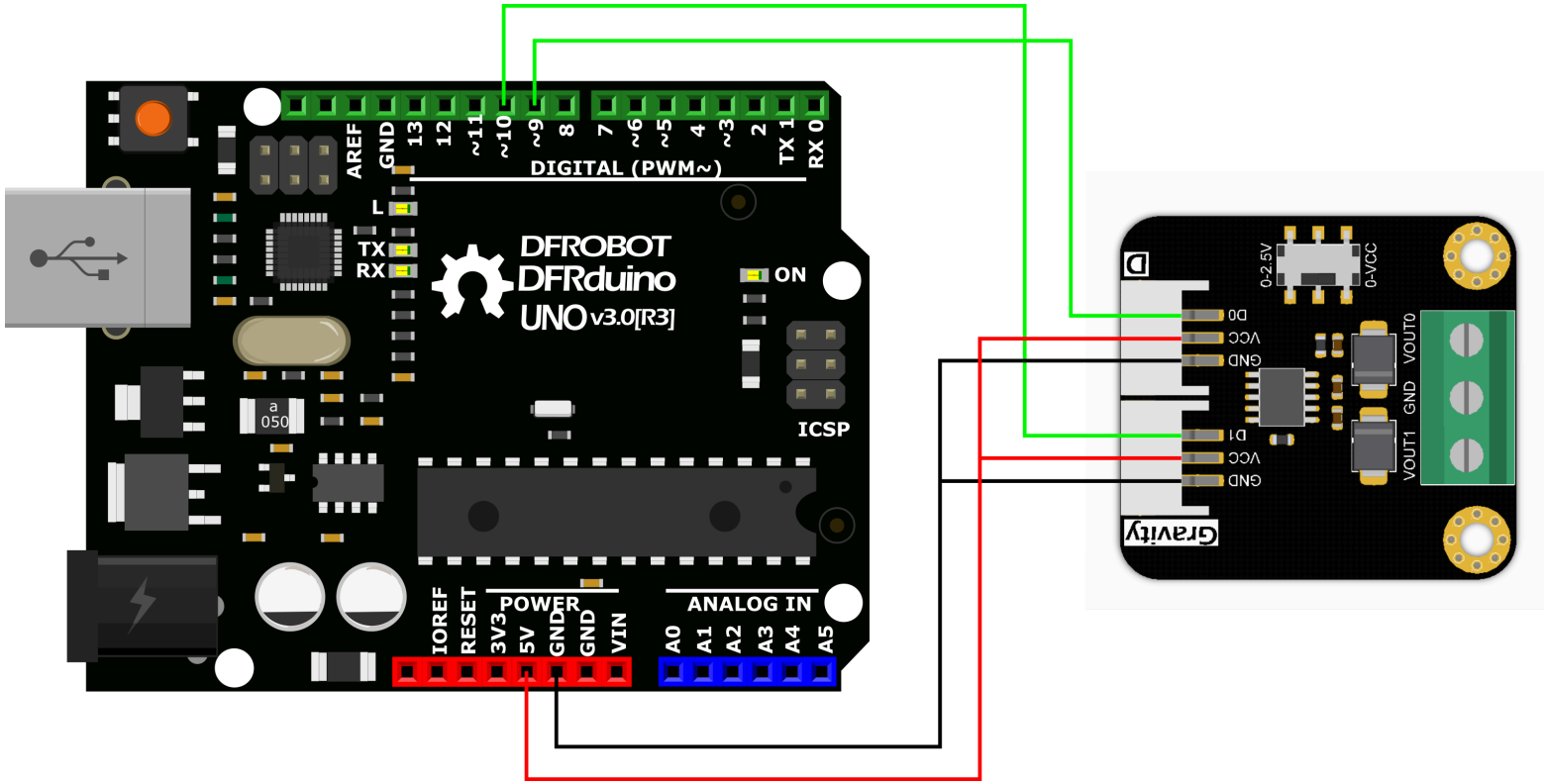
- Download Arduino IDE： Click to download Arduino IDE (https://www.arduino.cc/en/Main/Software)
- Download Arduino libraries： Click to download https://github.com/DFRobot/DFRobot_GP8XXX (https://github.com/DFRobot/DFRobot_GP8XXX)

  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.

INTRODUCTION
DFR1037 GP8501 (2-Channel PWM to 0-2.5V/VCC DAC Module)
FUNCTIONS
FEATURES
DIMENSION
FUNCTIONAL DIAGRAM
SPECIFICATIONS
TUTORIAL
More Documents
FAQ

HARDWARE CONNECTION



INTRODUCTION
DFR1037 GP8501 (2-Channel PWM to 0-2.5V/VCC DAC Module)
FUNCTIONS
FEATURES
DIMENSION
FUNCTIONAL DIAGRAM
SPECIFICATIONS
TUTORIAL
More Documents
FAQ

SAMPLE CODE

```
#include <DFRobot_GP8XXX.h>

//#define SINGLE_CHANNEL
#ifdef SINGLE_CHANNEL
//Single-channel output IO port
int pwmPin0 = 9;
DFRobot_GP8501 GP8501(pwmPin0);
#else
//Dual-channel output IO port
int pwmPin0 = 9;
int pwmPin1 = 10;
DFRobot_GP8501 GP8501(pwmPin0,pwmPin1);
#endif

void setup() {

  GP8501.begin();

  /**
   * @brief. Configuring different channel outputs for DAC values
   * @param data pwm
   * @n. Optional parameters (0-255) correspond to voltage ranges of (0-2.5V) or (0-VCC), and
   * @param channel. Output channel
   * @n  0:Channel 0  (effective when configuring PWM0 output.)
   * @n  1:Channel 1  (effective when configuring PWM1 output.)
   * @n  2:All Channels (effective when configuring Dual-channel output.)
   */
  GP8501.setDACOutVoltage(176,0);//At 0-2.5V voltage range, Channel 0 outputs 1.725V, whereas
  GP8501.setDACOutVoltage(103,1);//At 0-2.5V voltage range, Channel 1 outputs 1.009V, whereas

}

void loop() {
```

```
}
```

INTRODUCTION
DFR1037 GP8501 (2-Channel PWM to 0-2.5V/VCC DAC Module)
FUNCTIONS
FEATURES
DIMENSION
FUNCTIONAL DIAGRAM
SPECIFICATIONS
TUTORIAL
More Documents
FAQ

RESULT

After downloading the program, the measured output voltage of channel 0 under the 0-2.5V state is 1.725V, and the output voltage of channel 1 is 1.009V. Under the 0-VCC state, the actual output voltage of channel 0 is 3.29V, and the output voltage of channel 1 is 1.926V.

More Documents

DFR1037 Documents：

DFR1037-Schematics.pdf
(https://dfimg.dfrobot.com/60c1e008bddfc41c3293de80/wiki/9ae8a6cc76ff446bdcac6584926c945a.pdf)

DFR1037_Dimensions.pdf
(https://dfimg.dfrobot.com/60c1e008bddfc41c3293de80/wiki/84f8a9fcd5fb46974385a51cf1fd4d73.pdf)

DFR1037_3D File.rar
(https://dfimg.dfrobot.com/60c1e008bddfc41c3293de80/wiki/c78f0337203f829361d667786cf52f20.rar)

DFR1037_2D_CAD File.rar
(https://dfimg.dfrobot.com/60c1e008bddfc41c3293de80/wiki/da5df8613e5783cf2c13b057bd7cd874.rar)

DFR1037_GP8501 Datasheet.pdf
(https://dfimg.dfrobot.com/60c1e008bddfc41c3293de80/wiki/bf9af01eb96766df66b05800de4d6a83.pdf)

INTRODUCTION
DFR1037 GP8501 (2-Channel PWM to 0-2.5V/VCC DAC Module)
FUNCTIONS
FEATURES
DIMENSION
FUNCTIONAL DIAGRAM
SPECIFICATIONS
TUTORIAL
More Documents
FAQ

FAQ

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

Get **2-Channel PWM to 0-VCC DAC Module** (https://www.dfrobot.com/product-2755.html) from DFRobot Store or **DFRobot Distributor**. (https://www.dfrobot.com/distributor)

Turn to the Top