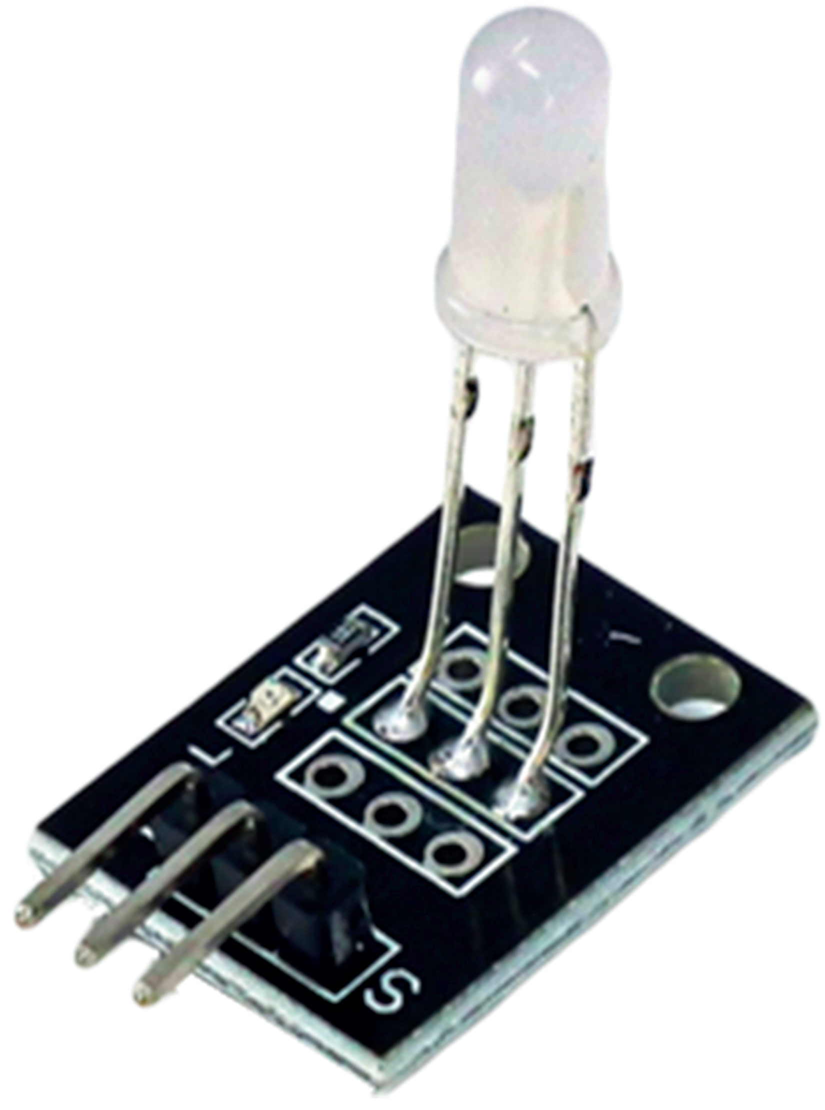
AZ-Delivery

Ihr Experte für Mikroelektronik!

KY-011 Bi-Color LED Modul 5mm Datenblatt



Contents:

1. Technical Data

LED module which provides a red and a green LED. These LEDs are connected with a common cathode.

Resistors are needed for different input voltages.

Vf [typ]= 2,0-2,5V

If= 20mA

Pre-resistors:

Rf (3,3V) [Green]= 120Ω

Rf (3,3V) [Red]= 120Ω

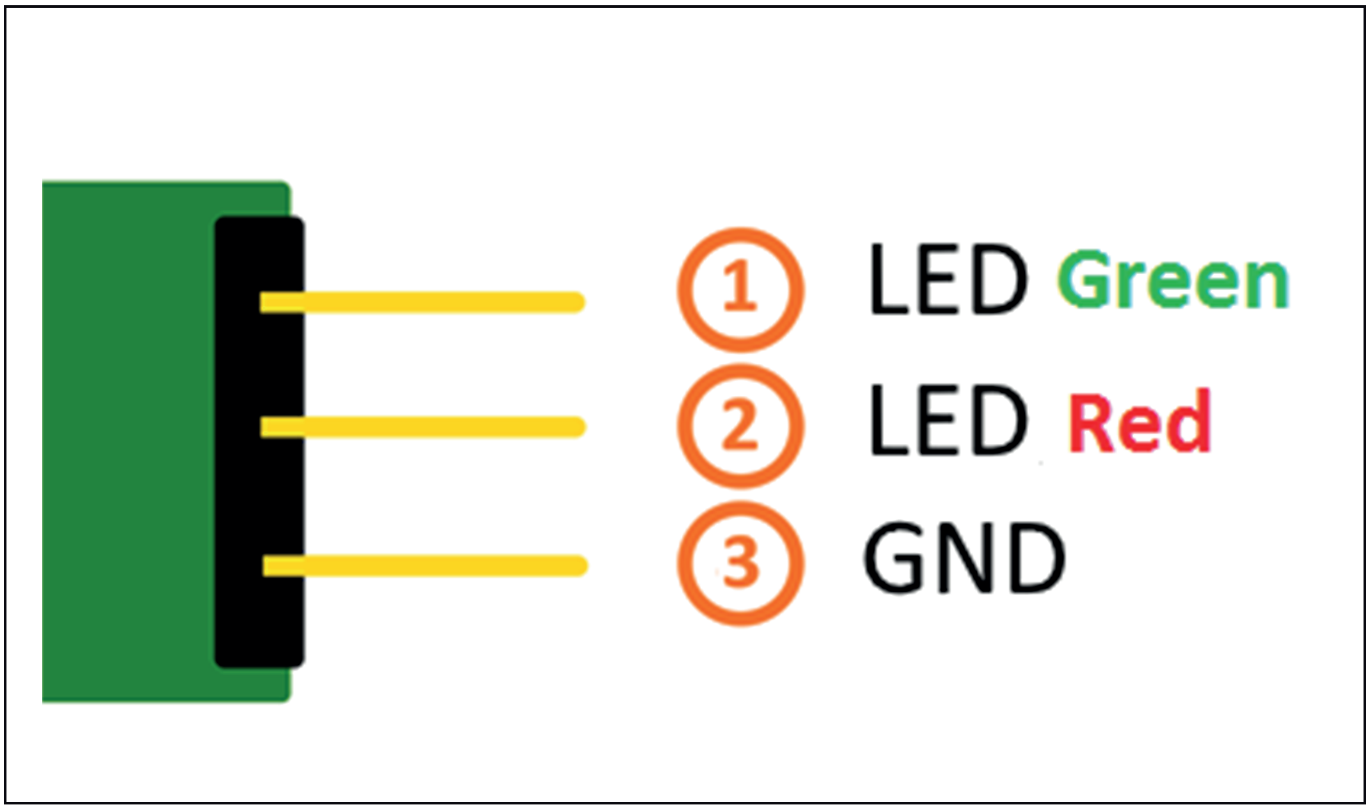
[for example using ARM CPU-Core based microcontroller like Raspbarry Pi]

Rf (5V) [Green] = 220Ω

Rf (5V) [Red] = 220Ω

[for example using Atmel Atmega based microcontroller like Arduino]

2. Pinout



3. Code Example Arduino

Code example ON/OFF

```
int Led_Red = 10;
int Led_Green = 11;

void setup ()
{
  // Output pin initialization for the LEDs
  pinMode (Led_Red, OUTPUT);
  pinMode (Led_Green, OUTPUT);
}

void loop () //Main program loop
{
  digitalWrite (Led_Red, HIGH); // LED will be switched on
  digitalWrite (Led_Green, LOW); // LED will be switched off
  delay (3000); // Waitmode for 3 seconds

  digitalWrite (Led_Red, LOW); // LED will be switched off
  digitalWrite (Led_Green, HIGH); // LED will be switched on
  delay (3000); // Waitmode for another 3 seconds in which the status of the LEDs are shifted.
}
```

Code example PWM

You can regulate the brightness of the LEDs via pulse-width modulation. The LEDs will be switched ON and OFF for specific time periods, in which the relation between ON and OFF leads to a relative brightness, because of the Inertia of the human eyesight, the human eye interprets the ON/OFF as a brightness change.

This module provides a few LEDs - with the overlay of the different brightness levels, you can create different colors. This will be shown in the following code example.

```
int Led_Red = 10;
int Led_Green = 11;

int val;

void setup () {
  // Output pin initialization for the LEDs
  pinMode (Led_Red, OUTPUT);
  pinMode (Led_Green, OUTPUT);
}
void loop () {
   // In this for loop, the two LEDs will get different PWM-Values.
   // Via mixing the brightness of the different LEDs, you will get different colors.
   for (val = 255; val> 0; val--)
      {
      analogWrite (Led_Green, val);
      analogWrite (Led_Red, 255-val);
      delay (15);
   }
   // You will go backwards through the color range in this second loop.
   for (val = 0; val <255; val++)
      {
      analogWrite (Led_Green, val);
      analogWrite (Led_Red, 255-val);
      delay (15);
   }
}
```

Connections Arduino:

LED Green = [Pin 10]
LED Red = [Pin 11]
Sensor GND = [Pin GND]

4. Code Example Raspberry Pi

Code example ON/OFF

```python
# Needed modules will be imported and configured.
import RPi.GPIO as GPIO
import time

GPIO.setmode(GPIO.BCM)

# Output pin declaration for the LEDs.
LED_Red = 5
LED_Green = 4
GPIO.setup(LED_Red, GPIO.OUT, initial= GPIO.LOW)
GPIO.setup(LED_Green, GPIO.OUT, initial= GPIO.LOW)

print "LED-Test [press ctrl+c to end the test]"

# Main program loop
try:
        while True:
            print("LED Red will be on for 3 seconds")
            GPIO.output(LED_Red,GPIO.HIGH) #LED will be switched on
            GPIO.output(LED_Green,GPIO.LOW) #LED will be switched off
            time.sleep(3) # Waitmode for 3 seconds
            print("LED Green will be on for 3 seconds")
            GPIO.output(LED_Red,GPIO.LOW) #LED will be switched off
            GPIO.output(LED_Green,GPIO.HIGH) #LED will be switched on
            time.sleep(3) #Waitmode for another 3 seconds in which the LEDs are shifted

# Scavenging work after the end of the program
except KeyboardInterrupt:
        GPIO.cleanup()
```

To start, enter the command:

```
sudo python KY011_RPI_ON-OFF.py
```

Code example PWM

You can regulate the brightness of the LEDs via pulse-width modulation. The LEDs will be switched ON and OFF of for specific time periods, in which the relation between ON and OFF leads to a relative brightness, because of the Inertia of the human eyesight, the human eye interprets the ON/OFF as a brightness change. For more information to that theme visit: [Artikel von mikrokontroller.net]

This module provides a few LEDs - with the overlay of the different brightness levels, you can create different colors. This will be shown in the following code example.
At the Raspberry Pi, only one Hardware-PWM channel is carried out unrestricted to the GPIO pins, why we have used Software-PWM at this example

```python
# Needed modules will be imported and configured
import random, time
import RPi.GPIO as GPIO

GPIO.setmode(GPIO.BCM)

# Output pin declaration for the LEDs.
LED_Red = 5
LED_Green = 4

# Set pins to output mode
GPIO.setup(LED_Red, GPIO.OUT)
GPIO.setup(LED_Green, GPIO.OUT)

Freq = 100 #Hz

# The specific colors will be initialized.
RED = GPIO.PWM(LED_Red, Freq)
GREEN = GPIO.PWM(LED_Green, Freq)
RED.start(0)
GREEN.start(0)

# This function generate the actually color
# You can change the color with the specific color variable.
# After the configuration of the color is finished, you will time.sleep to
# configure how long the specific will be displayed.

def LED_color(Red, Green, pause):
    RED.ChangeDutyCycle(Red)
    GREEN.ChangeDutyCycle(Green)
    time.sleep(pause)

    RED.ChangeDutyCycle(0)
    GREEN.ChangeDutyCycle(0)

print "LED-Test [press ctrl+c to end the test]"

# Main program loop:
# The task of this loop is to create for every single color an own variable.
# By mixing the brightness levels of the colors, you will get a color gradient.
try:
    while True:
        for x in range(0,2):
            for y in range(0,2):
                print (x,y)
                for i in range(0,101):
                    LED_color((x*i),(y*i),.02)

# Scavenging work after the end of the program
except KeyboardInterrupt:
        GPIO.cleanup()
```

To start, enter the command:

```
sudo python KY011_RPI_PWM.py
```

Connections Raspberry Pi:

LED Green = GPIO4 [Pin 16]
LED Red = GPIO5 [Pin 18]
Sensor GND = GND[Pin 6]