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Color 12 Click

PID: MIKROE-5724

Color 12 Click is a compact add-on board providing an accurate color-sensing solution. This board features the BU27006MUC-Z, a digital color sensor from Rohm Semiconductor with an integrated flicker sensing function. The BU27006MUC-Z can sense Red, Green, Blue (RGB), and Infrared light and efficiently convert them into digital values via the I2C interface. Its remarkable high sensitivity, wide dynamic range, and exceptional IR-cut characteristics enable precise illuminance measurement, typically up to 50klx, and accurate ambient light color temperature determination. Moreover, this sensor can effectively detect flicker noise originating from displays and room lighting, with a typical sensitivity of 10klx. This Click board™ is suitable for residential and commercial lighting management, contrast enhancement, detection of ambient for backlight control, and more.

How does it work?

Color 12 Click is based on the BU27006MUC-Z, an advanced digital color sensor from Rohm Semiconductor with an integrated flicker sensing function. The primary purpose of this sensor is to sense Red, Green, Blue (RGB), and Infrared light and convert them into digital values via the I2C interface. The BU27006MUC-Z stands out with its exceptional performance, high sensitivity, wide dynamic range, and excellent IR-cut characteristics. These features allow for precise illuminance measurement, typically up to 50klx, with peak wavelengths for red, green, and blue of 645/575/460nm, respectively, providing accurate information about the intensity of ambient light.

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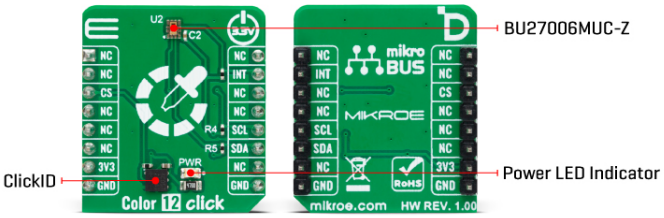

In addition, the BU27006MUC-Z excels at accurately determining the ambient light's color temperature. It can effectively detect flicker noise originating from displays and room lighting, with a typical sensitivity of 10klx. This Click board™ serves a wide range of residential and commercial lighting management applications. It can be employed for contrast enhancement in various settings where optimal lighting conditions are necessary for an immersive visual experience. Moreover, the accurate detection of ambient light makes it suitable for applications that require precise backlight control, ensuring optimal visibility and energy efficiency.

Color 12 Click communicates with MCU using the standard I2C 2-Wire interface to read data and configure settings, supporting Standard Mode operation with a clock frequency of 100kHz and Fast Mode up to 400kHz. Also, it uses an interrupt pin, the INT pin of the mikroBUS™ socket, used when an interrupt occurs to alert the system when some of the results cross upper or lower threshold settings.

This Click board™ can only be operated with a 3.3V logic voltage level. The board must perform appropriate logic voltage level conversion before using MCUs with different logic levels. However, the Click board™ comes equipped with a library containing functions and an example code that can be used as a reference for further development.

Specifications

Type	Optical
Applications	Can be used for residential and commercial lighting management, contrast enhancement, detection of ambient for backlight control, and more
On-board modules	BU27006MUC-Z - advanced digital color sensor from Rohm Semiconductor
Key Features	Senses RGB/IR, integrated flicker detection, built-in IR-cut filter, rejecting light noise for color sensning, I2C serial interface, vast detection rage, low power consumption, and more
Interface	I2C
Feature	ClickID

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Compatibility	mikroBUS™
Click board size	S (28.6 x 25.4 mm)
Input Voltage	3.3V

Pinout diagram

This table shows how the pinout on Color 12 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS™				Pin	Notes
	NC	1	AN	PWM	16	NC	
	NC	2	RST	INT	15	**INT**	Interrupt
ID COMM	**CS**	3	CS	RX	14	NC	
	NC	4	SCK	TX	13	NC	
	NC	5	MISO	SCL	12	**SCL**	I2C Clock
	NC	6	MOSI	SDA	11	**SDA**	I2C Data
Power Supply	**3.3V**	7	3.3V	5V	10	NC	
Ground	**GND**	8	GND	GND	9	**GND**	Ground

Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator

Color 12 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Lux Detection Range	-	50	-	klx
Flicker Detection Range	-	10	-	klx
Peak Wavelength (R/G/B/IR)		645/545/460/810		nm

Software Support

We provide a library for the Color 12 Click as well as a demo application (example), developed using MIKROE compilers. The demo can run on all the main MIKROE development boards.

Package can be downloaded/installed directly from NECTO Studio Package Manager (recommended), downloaded from our LibStock™ or found on MIKROE github account.

Library Description

This library contains API for Color 12 Click driver.

Key functions

- color12_get_color_data Color 12 gets the color measurement result function.
- color12_set_config Color 12 sets the configuration function.

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- color12_get_config Color 12 gets the configuration function.

Example Description

This library contains API for the Color 12 Click driver. The demo application sets sensor configuration and reads and displays RGB/IR measurement results.

The full application code, and ready to use projects can be installed directly from NECTO Studio Package Manager (recommended), downloaded from our LibStock™ or found on MIKROE github account.

Other MIKROE Libraries used in the example:

- MikroSDK.Board
- MikroSDK.Log
- Click.Color12

Additional notes and informations

Depending on the development board you are using, you may need USB UART click, USB UART 2 Click or RS232 Click to connect to your PC, for development systems with no UART to USB interface available on the board. UART terminal is available in all MIKROE compilers.

mikroSDK

This Click board™ is supported with mikroSDK - MIKROE Software Development Kit, that needs to be downloaded from the LibStock and installed for the compiler you are using to ensure proper operation of mikroSDK compliant Click board™ demo applications.

For more information about mikroSDK, visit the official page.

Resources

mikroBUS™

mikroSDK

Click board™ Catalog

Click boards™

ClickID

Downloads

Color 12 click example on Libstock

Color 12 click 2D and 3D files v100

BU27006MUC-Z datasheet

Color 12 click schematic v100