ILM139C RGB LED Matrix

Datasheet

1 Features

- 13x9 RGB LED matrix
- Small 26mm*18mm Footprint
- 2mm pitch, 1mm x 1mm LEDs
- Based on IS31FL3741A LED driver
- Individual LED PWM control
- 2.7V–5.5V input voltage range
- Qwiic-compatible connector
- Optional 2-pin power connector
- I^2C address selection via jumpers

2 Description

This compact RGB LED matrix module integrates a high-density 13×9 full-color LED array with an onboard IS31FL3741 driver IC. Designed for seamless integration into I2C-based systems, the module supports individual PWM control of all 351 LEDs and features a robust, stackable form factor suitable for embedded, wearable, and interactive display applications.

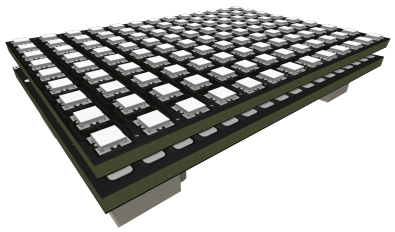

Figure 1: Module Overview

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Revision History

Date	Description
2025-05-13	Initial release

Table 1: Revision History

3 Device Overview

3.1 Part Number Options

PART NUMBER	PACKAGE	DESCRIPTION
ILM139C	26mm × 18mm × 3.2mm	Complete module
ILM139CD	Driver board	IS31FL3741A module
ILM139CM	LED matrix board	13x9 RGB LED matrix module

Table 2: Part Number Options

3.2 Pin Configuration and Functions

Label	Description
SDA	I^2C data
SCL	I^2C clock
INT	Interrupt output
SDB	Shutdown
3.3V	QWIIC 3.3V
VCC	2.7V 5.5V Power supply input
GND	Ground
3.3V->VCC Jumper	0603 SMD Jumper. If present, VCC=QWIIC 3.3V

Table 3: Pin description

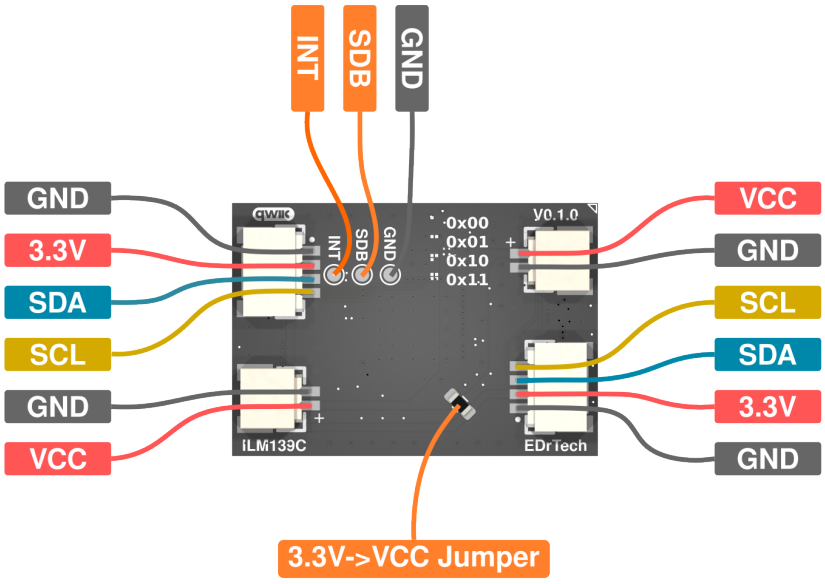

Figure 2: Module Pins

4 Specifications

4.1 Absolute Maximum Ratings

PARAMETER	MAX RATING	UNIT
Supply Voltage (VCC)	6.0	V
Storage Temperature	-40 to 85	°C

Table 4: Absolute Maximum Ratings

4.2 Recommended Operating Conditions

PARAMETER	TYPICAL	UNIT
Input Voltage	3.3 – 5.0	V
Operating Temp. Range	-20 to +70	°C

Table 5: Recommended Operating Conditions

4.3 Electrical Characteristics

PARAMETER	TYPICAL	UNIT
I^2C Clock Rate	1000	kHz
LED Current (adjustable)	1–30	mA

Table 6: Electrical Characteristics

5 Feature Description

5.1 Modular Construction

The ILM139C is split into two boards, simplifying repairs and customization. The LED matrix board can be removed or replaced independently of the driver.

5.2 Qwiic Interface and Power Options

The Qwiic system provides a 4-pin JST-SH connector for quick daisy-chaining of I^2C devices. Power is typically supplied via Qwiic (3.3V). A solderable SMD jumper on the back of the driver board connects 3.3V from Qwiic to the VCC rail.
Important: If the jumper is soldered, do not connect another external power supply to the 2-pin VCC/GND connector to avoid damaging the module.
If you wish to use external power (3.3–5V), leave the jumper open and connect a regulated supply to the 2-pin header.

5.3 LED Control and Flexibility

Each LED can be controlled independently for color and brightness. The IS31FL3741A handles PWM, current control, and I^2C interfacing. For advanced settings, refer to the IS31FL3741A datasheet

6 Getting Started

6.1 Using Arduino

To use ILM139C with Arduino:

1. Connect the Qwiic cable to your controller.
2. Solder the SMD jumper on the ILM139CD driver board if using Qwiic power.
3. Install the library: `https://example.com/ILM139C-Arduino`
4. Upload the basic example sketch.

```
 Wire.begin();
ILM139C.begin();
ILM139C.setPixel(5, 3, 255, 0, 0);
```

7 Part numbering Information

PART NUMBER	ORDER CODE	DESCRIPTION
ILM139C	ILM139C-BASE	Full RGB Matrix Module
ILM139CD	ILM139C-DRV	Driver Moduleonly
ILM139CM	ILM139C-MTX	LED Matrix only

Table 7: Ordering Information