

Article Overview

STM32 microcontrollers with the LTDC peripheral can directly drive parallel RGB interfaces, including 24-bit LCD-TFT and AMOLED displays.

STM32 LTDC Overview

STM32 MCUs equipped with the LCD-TFT Display Controller (LTDC) can generate up to 24-bit parallel RGB signals, allowing direct connection to high-resolution display panels without CPU intervention. The LTDC can autonomously fetch pixel data from internal or external memory, supporting smooth graphics rendering and reducing CPU load. This makes STM32 MCUs suitable for applications requiring graphical user interfaces (GUIs) in mobile, industrial, or consumer devices.

Supported Display Types

- o LCD-TFT Panels: Standard parallel RGB interfaces (RGB565, RGB666, RGB888) are supported directly by the LTDC.
- o AMOLED Displays: Parallel RGB interfaces can also be driven without additional controllers.
- o LVDS Displays: STM32 RGB output can be serialized using LVDS transmitter ICs (e.g., TI SN75LVDS84) to drive LVDS panels.

Implementation Considerations

- o Pin Usage: Driving a 24-bit RGB interface requires many MCU pins (typically 28), which may conflict with other peripherals like USB or DCMI. Choosing a larger package MCU or using external serializers can mitigate pin conflicts.
- o Alternative Approaches: If pin count or peripheral conflicts are an issue, external ICs or FPGAs can convert SPI or parallel data to RGB signals, though STM32 MCUs themselves are the most common solution for direct RGB driving.
- o Performance: The LTDC supports high-resolution graphics with minimal CPU load, making it ideal for embedded GUI applications.

Summary

STM32 MCUs with LTDC are fully capable of driving parallel RGB interfaces for LCD-TFT and AMOLED displays. For LVDS displays, the RGB output can be serialized using dedicated transmitter ICs. Designers should consider pin availability and peripheral conflicts when selecting the MCU package, and external solutions like FPGAs or specialized ICs can be used if direct MCU driving is impractical.

ST can drive RGB interfaces

Previously I've written drivers from scratch to drive display with 8-bit parallel (8080-I/II) interface. That's definitely way easier than

By providing 24 constant-current outputs capable of driving RGB LEDs at up to 80mA, the STP24DP05 from a world

Our STM32 graphical user interface ecosystem offers a comprehensive set of tools and resources to help you succeed. Design

The ST7789, ST7789C, ST7789V, ST7789V2, ST7789V3, ST7789VI, ST7789H2, and ST7789VW RGB display controllers are

RGB LED Matrix Interface with STM32 | Full Tutorial + Demo ? In this video, we'll walk you

Learn how the RGB interface is used in embedded systems to drive LCD displays. Explore its benefits, limitations,

MIPI RGB Display Driver Types of Display This display driver supports displays with 16 bit parallel

As long as these are both at the same voltage (3.3V in this case), you can certainly get data from point A to point B

Introduction The new high power and brightness RGB LEDs are going to be used in many different lighting applications as

Some RGB LCDs only use the "RGB" interface, eliminating the need to send commands for LCD

Description The STEVAL-ILL073V1 is a high brightness, RGB LED array driver system evaluation board with local dimming and

Energy-efficient LED driver ICs for general lighting, display backlighting, automotive, signage and traffic signals. Topologies include

Hello, I have a STM32F407 microcontroller with a FSMC interface, which I would like to use to drive this display: NHD

ST7789-RGB Library designed to initialize displays with a ST7789 driver using RGB interface. Tested on ST7789V / ST7789VW.

ST can drive RGB interfaces

This blog outlines the steps required to interface an STM32F7 series MCU with Tianma TM121JDGP30 TFT LCD

ST7701S Display Driver Models This display driver supports displays with 16 bit parallel interfaces, often

Web: <https://www.kremgroup.co.za>

