# High Performance Uart TFT Graphics Controller

**LT7689** is an efficient serial Uart TFT panel controller. Its interior combines the Cortex-M4 MCU and 2D TFT graphical display accelerators. The main function is to provide Uart serial communication, so that the main MCU can easily present the information that will be displayed to the TFT panel with simple serial instructions. In addition to bringing its own high-performance M4 MCUs, the internal hardware also provides graphics acceleration, PIP (Picture-in-Picture), geometry drawing and other functions. It can improve TFT display efficiency and reduce the time it takes for MCU to process graphical displays. The LT7689 supports an RGB interface display with a display resolution ranging from 320 x 240 (QVGA) to 1280 x 1024 (SXGA) of 16/18/24bits TFT RGB panel.

The M4 core speed of the LT7689 has a maximum of 150MHz and contains 512KBytes Flashbytes, 256Kbytes SRAM, 2D graphics acceleration display, and 128Mb display memory. Supported serial panel instructions include picture display, GIF animation display, loop chart display, power-on image display, progress bar display, text string display, QR code generation, audio playback, and the effect of combining touch screen to achieve touch function, etc. more than 70 instructions. With the serial panel development software and simulation tool of Levetop, can quickly complete the small and medium-sized TFT serial display scheme. In addition to the serial-screen Uart communication interface, the LT7689 also provides multiple groups of SCI (Uart) interfaces that can connect components such as blue tooth modules, WiFi modules, etc. USB interfaces, SD cards, analog input AIN, PWM and INT interrupts are also available. These interfaces can also be set up as normal IO interfaces. LT7689 also embedded a RTC.

he LT7689 can also be used as a master MCU with TFT controller due to its high-capacity Flash and SRAM. The hardware's graphics acceleration engine (BTE), geometric drawing engine more support display rotation, picture mirror shooting, picture-in-picture (PIP/child picture) and graphics mixed transparent display, as well as painting points, drawing lines, drawing curves, ellipses, triangles, rectangles, rounded rectangles, cylinders, tables and other functions. The LT7689's powerful display capabilities are ideal for use in electronic products with TFT-LCD screens, such as smart home appliances, automotive dashboards, motorcycle panels, multi-function transaction machines, industrial control, electronic instruments, medical beauty equipment, testing equipment, charging equipment, hydropower meters, smart audio player with TFT panel, etc.

## Features

- Embedded M4 MCU, 512KB Flash, 256KB SRAM
- Support Three SCI(Uart), Two SPI Interface
- Support USB2.0, SPI SD, I2C Interface
- Support up to 1280*1024 TFT Panel with 16/18/24bit RGB Format
- Embedded Geometric and 2D Graphics Engine
- Embedded 128Mb Display Memory
- Support PWM, GPIO, DAC, ADC Interface
- Support Levetop's Develop Software Tool
- Support USB update for SPI Flash
- Support AES/DES and CRC
- Embedded Real Time Clock
- Embedded Clock Gen, for max. 150MHz Speed
- Voltage: 3.0V~3.6V,
- Package: QFN-96 (10*10mm$^2$)

## Application Diagram