# Overview

**D12x** is a high-performance, domestically developed and independently designed, industrial-grade MCU for high-definition display and intelligent control based on RISC-V. It is equipped with a powerful 2D graphics acceleration processor, a PNG/JPEG decoding engine, and a rich variety of interfaces. It supports a wide industrial temperature range, and features high reliability and high openness. It can be widely applied in the fields of smart industries and smart homes, such as industrial automation control, serial port displays, etc.

# Features

## ✧ CPU Core

- Single-Core 32-bit RISC-V CPU
- 480MHz@1.2V
- I/D Cache: 32KB+32KB

## ✧ Memory Subsystem

- 32KB BROM, 32KB SRAM
- Equipped with 4/8-MB PSRAM with a maximum speed of 200 MHz
- Support boot media QSPI NAND、QSPI NOR、EMMC、SD card
- Support mass product with SD card
- Support security boot, firmware protection and SPI encryption

## ✧ Multiple Media Subsystem

- Support PNG decode (up to 4K*4K), JPEG decoder (up to 8K*8K)
- RGB888/I8080/SPI screen interface output
- PNG decoding and JPEG decoding at 720P@60fps
- Up to 1080P@60fps of 2D image acceleration
- Rotation at any angle, scaling, and transparent overlay
- Gamma, dithering, and color matrix adjustments

## ✧ Peripherals

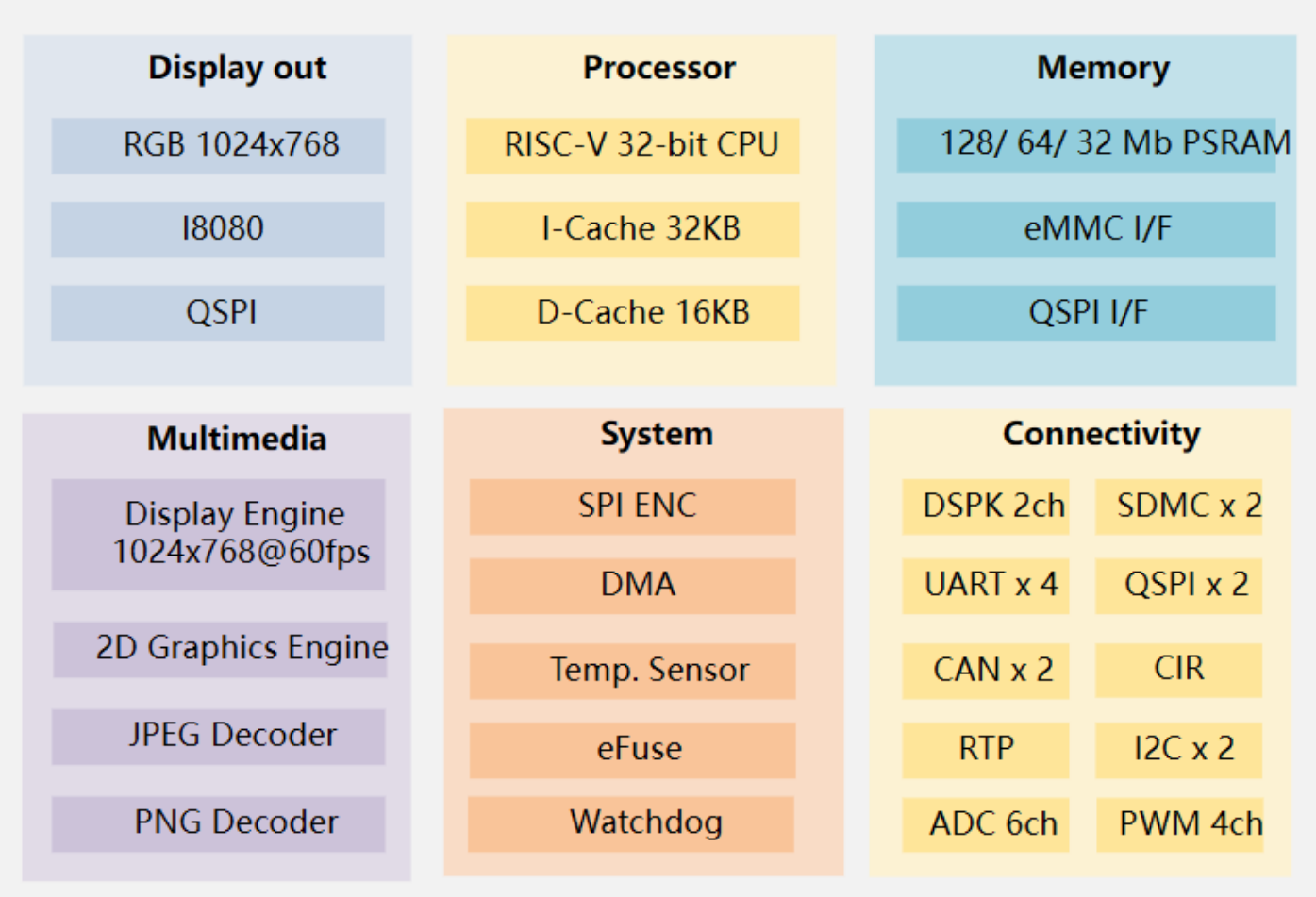
- Two SPI interfaces
- Two SD card/ SDIO interfaces
- Two I2C interfaces
- Dual CAN2.0A/B compatible interfaces
- Four PWMs
- Four UARTs with automatic RS485 receive-transmit control switching
- Six groups of GPIOs totaling 60 independently configurable IOs
- One CIR with infrared input and output functions
- Four-wire resistive touch screen (RTP)

## ✧ Package

- QFN68 (7x7mm with an interval of 0.35mm)
- Packaging options with PSRAM, NOR Flash, SPI NAND
- Tj -40~125℃

## ✧ Software

- RT-Thread and Bare-metal system support
- VS Code and other IDE tools available
- LVGL/AWTK and other GUI framework support




D12X Architecture