

# Circuit Description

The circuit board consists of power supply module, main chip HC32F460PETB-LQFP100 MCU core; LCD screen module; CH340 USB-Serial module; ESP32-S RF module, include RF antenna; tmc2209 stepper driver module; input and output interface circuit.

## 1. HC32F460PETB-LQFP100 MCU:

The HC32F460 series is a high-performance MCU based on ARM® Cortex®-M4 32-bit RISC CPU with a maximum operating frequency of 200MHz

The HC32F460 series integrates high-speed on-chip memory, including a maximum of 512KB of Flash and a maximum of 192KB of SRAM. The Flash access acceleration unit is integrated to realize the single-cycle program execution of the CPU on the Flash. The polled bus matrix allows multiple bus masters to access memory and peripherals simultaneously. Bus master includes CPU, DMA, USB-specific DMA, etc.

## 2. ESP32-S RF module:

### a) CPU and Memory:

ESP32C3 Xtensa 32-bit LX6 Dual-core processor, up to 600 DMIPS. 448 KByte ROM 520 KByte SRAM 16 KByte SRAM in RTC. QSPI can connect up to 4\* Flash/SRAM, each flash should be less than 16 Mbytes. Supply Voltage: 2.2V~3.6V K

### b) 2.4G WIFI Frequency:

802.11 b/g/n/e/i

802.11 n (2.4 GHz), up to 150 Mbps

802.11 e: QoS for wireless multimedia technology.

WMM-PS, UAPSD

MPDU and A-MSDU aggregation

Block ACK

Fragmentation and defragmentation

Automatic Beacon monitoring/scanning

802.11 i security features: pre-authentication and TSN

Wi-Fi Protected Access (WPA)/WPA2/WPA2-Enterprise/Wi-Fi Protected Setup (WPS)

Infrastructure BSS Station mode/SoftAP mode

Wi-Fi Direct (P2P), P2P Discovery, P2P Group Owner mode and P2P Power Management UMA compliant and certified

Antenna included

### **3. TMC2209 step motor driver**

The TMC2209 is an ultra-silent motor driver IC for two phase stepper motors

- a) 2-phase stepper motors up to 2.8A coil current (peak), 2A RMS**
- b) STEP/DIR Interface with 8, 16, 32 or 64 microstep pin setting**

### **4. CH340 USB-Serial Module**

Full speed USB device interface, conforms to USB Specification Version 2.0, needs a 12MHz crystal externa

### **5. Power supply**

Power source is supplied by AC 220/110V, 50/60Hz. The device does not deliver radio frequency energy to transducers operating in the frequency range of 9kHz to 30 MHz. It is not subject to Declaration of Conformity or Verification under Part 15.109 of the FCC Rules.