

Component Specifications

Contents

0.1	ESP32-WROVER-E	2
0.2	MLX90640 Thermal Infrared Sensor	3
0.3	LDO Voltage Regulator (XC6206P332MR)	4
0.4	ILI9341 TFT Display	5
0.5	CH340 USB to Serial Converter IC	6
0.6	TP4056 Li-Ion Battery Charging IC	7

0.1 ESP32-WROVER-E



Figure 1: ESP32-WROVER-E Module

Specifications

- **Chipset:** ESP32-D0WD-V3 with dual-core Xtensa® 32-bit LX6 up to 240 MHz.
- **Flash Memory:** 4 MB external SPI flash.
- **PSRAM:** 8 MB SPI PSRAM.
- **Wireless:** Wi-Fi (802.11 b/g/n) + Bluetooth v4.2.
- **Antenna:** On-board or IPEX connector.
- **Voltage:** 3.0 V to 3.6 V (typical 3.3 V).
- **Sleep Current:** As low as 10 μ A.
- **GPIOs:** 34.
- **Interfaces:** UART, SPI, I2C, etc.
- **Peripherals:** Hall sensor, temperature sensor, capacitive touch.
- **Temperature:** -40°C to 85°C .
- **Dimensions:** $18 \times 31.4 \times 3.3$ mm.

0.2 MLX90640 Thermal Infrared Sensor

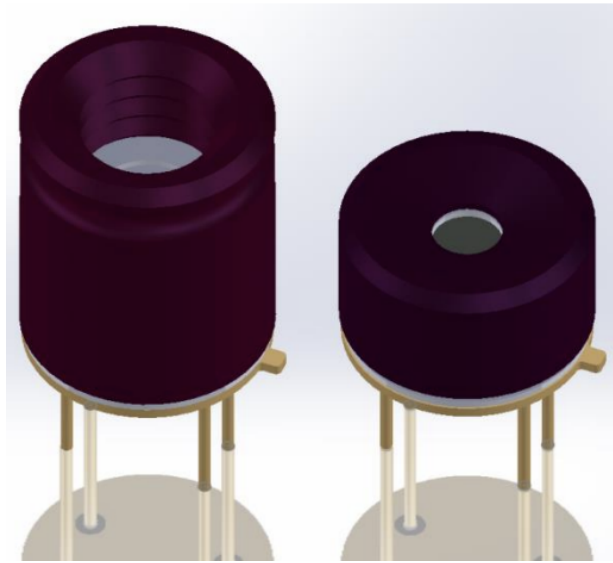


Figure 2: MLX90640 Thermal Sensor

Specifications

- **Array:** 32×24 pixels.
- **Package:** TO-39.
- **Spectral Range:** $7.5 - 13.5 \mu\text{m}$.
- **FOV:** $55^\circ \times 35^\circ$, $110^\circ \times 75^\circ$, $40^\circ \times 10^\circ$.
- **Accuracy:** $\pm 1^\circ\text{C}$ ($0-50^\circ\text{C}$).
- **Range:** -40°C to $+300^\circ\text{C}$.
- **Sensitivity:** 0.1 K.
- **Voltage:** $3.3\text{V} \pm 5\%$.
- **Current:** 23 mA.
- **Interface:** I²C.
- **Frame Rate:** 0.5 to 64 Hz.
- **EEPROM:** Internal.
- **Pixel Pitch:** 0.9 mm.
- **Optical Axis:** 6.52 mm from base.
- **Size:** 8.9 mm diameter \times 10.9 mm height.
- **Temp. Range:** -40°C to $+85^\circ\text{C}$ (operating), -40°C to $+125^\circ\text{C}$ (storage).

0.3 LDO Voltage Regulator (XC6206P332MR)



Figure 3: LDO Voltage Regulator

Specifications

- **Model:** XC6206P332MR
- **Output Voltage:** 3.3V
- **Max Current:** 250 mA
- **Dropout:** 250 mV @ 100 mA
- **Input Range:** 2.0V to 6.0V
- **Accuracy:** $\pm 2\%$
- **Quiescent Current:** 8 μ A
- **Protection:** Current limiter, thermal shutdown
- **Package:** SOT-23
- **Applications:** Battery systems, low-power microcontrollers

0.4 ILI9341 TFT Display



Figure 4: ILI9341 TFT Display

Specifications

- **Type:** TFT LCD
- **Resolution:** 240×320 pixels
- **Size:** 2.4" or 2.8"
- **Colors:** 262K
- **Driver:** ILI9341
- **Interfaces:** Parallel, SPI, RGB
- **Voltages:** 1.65V–3.3V (digital), 2.5V–3.3V (analog)
- **Frame Memory:** 172800 bytes
- **Features:** Power saving, display inversion, idle mode
- **Touch:** Not included
- **Backlight:** LED (external control)

0.5 CH340 USB to Serial Converter IC



Figure 5: CH340 USB to Serial Converter IC

Specifications

- **Type:** USB to UART bridge
- **USB:** 1.1, 2.0, 3.0 compatible
- **Voltage:** 5V (CH340G), supports 3.3V logic
- **Baud Rate:** 50 bps to 2 Mbps
- **Package:** SOP-16
- **Oscillator:** 12 MHz crystal required
- **Drivers:** Needed on Windows
- **Interfaces:** TXD, RXD, RTS, CTS, etc.
- **Flow Control:** Hardware software supported
- **Applications:** USB-to-serial, embedded systems

0.6 TP4056 Li-Ion Battery Charging IC



Figure 6: TP4056 Charging IC

Specifications

- **Type:** Linear Li-Ion Charger
- **Charge Voltage:** 4.2V
- **Charge Current:** Up to 1000 mA
- **Package:** ESOP-8
- **Input Voltage:** 4.0V to 8.0V
- **Indication:** STAT pin (active low)
- **Trickle Threshold:** 2.9V
- **Accuracy:** $\pm 1.5\%$
- **Standby Current:** 100 μ A
- **Protections:** Thermal, battery temp, recharge
- **Applications:** Power banks, portable devices