UNIWIN-M823-V1.0 Face Recognition Gate Control Motherboard

Technical Specification

Revision History

	Notes	Date
1	Created	2023-04

1 Product Overview

UNIWIN-M823-V1.0 is an advanced face recognition gate control motherboard developed based on the EEASYTECH SV823 main control chip. This motherboard is equipped with built-in 256MB DDR3L and 8GB eMMC, supporting MIPI/LVDS screen display and dual MIPI cameras.

The SV823 is a professional AI SoC with integrated neural network acceleration engine, designed for video security systems, residential access control, gate management, building intercoms, and smart cabinet applications. Its neural processing unit delivers up to 1.0 TOPS deep neural network computing performance. Typical applications include face recognition with liveness detection, gesture recognition, and people counting. The integrated dual-core processor with DVFS support provides rich general-purpose computing capabilities for customized applications. The integrated H.265/H.264 video codec ensures real-time encoding and decoding, delivering high-resolution, high-frame-rate, and high-quality images. The high-performance ISP supports 3D noise reduction, ensuring excellent performance in low-light scenarios. It can simultaneously process two digital camera interfaces. The display processing unit supports hardware mouse layer, graphics layer, and video layer overlay, accelerating GUI and video synthesis.

Key Features:

- Dual-Core CPU@1.2G，NPU@1.0 TOPS
- Supports MIPI screen display with a resolution of up to 1920×1200@60Hz
- Supports LVDS screen display with a resolution of up to 1280×800@60Hz
- Dual 2MP cameras, integrated high-performance ISP, supports 3D noise reduction
- Supports 2.4G WIFI
- Supports CAT1 4G

- Rich expansion interfaces including 3 TTL serial ports, relay, Wiegand IN, Wiegand OUT, Ethernet, etc.

2 Product Specifications

Hardware Specifications:

CPU	EEASYTECH SV823，Dual-Core CPU
NPU	Built-in convolutional neural network accelerator NPU, 1T computing power
Memory	DDR3L 256MB
Storage	EMMC　8GB/16G/32G（default 8GB）
Display Interface	MIPI interface, supports up to 1920×1200@60Hz LVDS interface, supports up to 1280×800@60Hz
Network	100M Ethernet port, supports Ethernet
	WIFI module, supports Wi-Fi 802.11b/g/n protocol
	Supports 4G（optional）
RTC	Built-in RTC battery
Interfaces	Supports dual MIPI cameras

	1 USB port（USB OTG function）
	3 TTL interfaces, 1 Wiegand IN, 1 Wiegand OUT, onboard relay, and other rich peripheral interfaces for connecting card readers, scanners, ID modules, etc.
	Built-in amplifier, supports 2W 8Ω speaker
Audio Input	Supports MIC, 1 microphone interface
Touch Screen	Supports capacitive touch screen
Fill Light	Supports RGB light and infrared fill light

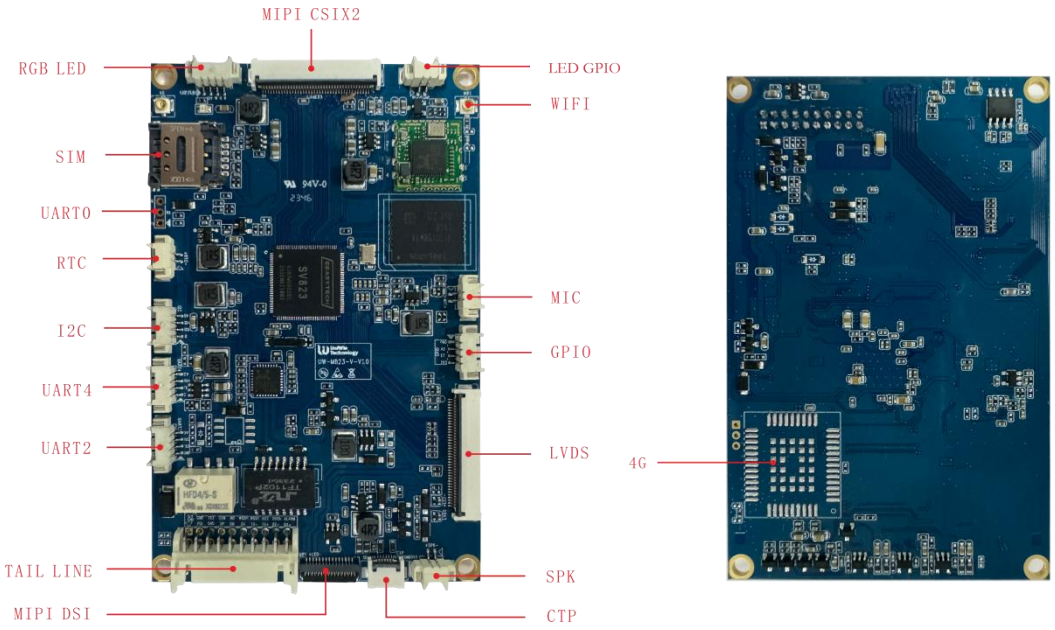
Software Specifications:

OS	Linux system
Face Algorithm	Dynamic face detection and tracking based on video stream, 1:N recognition algorithm; Dynamic dual camera anti-counterfeiting, completely solving the deception of photos and videos on various carriers; Supports 20,000 face database entries and 100,000 recognition records; At 20,000 face entries, achieves 0.01% false acceptance rate and 97% pass rate
Application Software	Supports saving on-site images during face recognition or stranger detection; Management system backend deployed via public cloud; Supports local face registration, database import, network settings, liveness detection switch, and other basic functions.

API Interface	Framework provides C/C++ API; Supports online API(HTTPS);

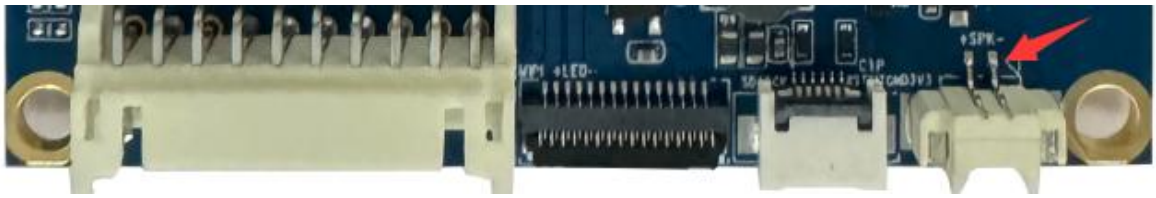
3 main interfaces

3.1 Interface diagram



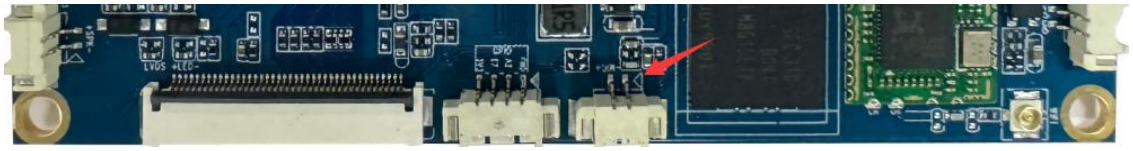
3.2 Main Interfaces Introduction

- **SPK(Triangle marks Pin 1, 2PIN/1.25mm) Speaker Interface**



S/N	Definition	Attribute	Description
1	OUTN	Output	Audio - signal (connect to speaker -)
2	OUTP	Output	Audio + signal (connect to speaker +)

◆ **MIC(Triangle marks Pin 1， 2PIN/1.25) MIC Microphone Interface**



S/N	Definition	Attribute	Description
1	MIC-	Audio Input	Audio input negative
2	MIC+	Audio Input	Audio input positive

◆ **RTC BAT(Triangle marks Pin 1， 2PIN/1.25mm) RTC Battery Interface**

S/N	Definition	Attribute	Description
1	3V Battery -	Power	3V battery negative
2	3V Battery +	Power	3V battery positive

◆ **WHITE LIGHT IO(Triangle marks Pin 1， 2PIN/1.25mm) White Light Fill Light IO Control**

S/N	Definition	Attribute	Description
1	WLED-PWR	Signal Output	GPIOE8 high level turns on white LED
2	GND	Ground	Ground

◆ **RGB LIGHT POWER(Triangle marks Pin 1， 2PIN/1.25mm) RGB Fill Light Power**

S/N	Definition	Attribute	Description
1	12V	Power	Power
2	LED-W	Power	White LED negative
3	LED-G	Power	Green LED negative
4	LED-R	Power	Red LED negative

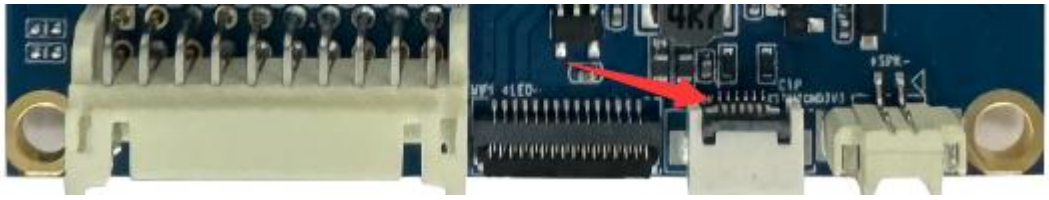
◆ **UART2(Triangle marks Pin 1， 4PIN/1.25mm) TTL Serial Port**

S/N	Definition	Attribute	Description
1	GND	Ground	Ground
2	TX2	Signal Output	TTL serial port
3	RX2	Signal Input	TTL serial port
4	5V	Power	5V power supply

◆ **UART4(Triangle marks Pin 1， 4PIN/1.25mm) TTL Serial Port**

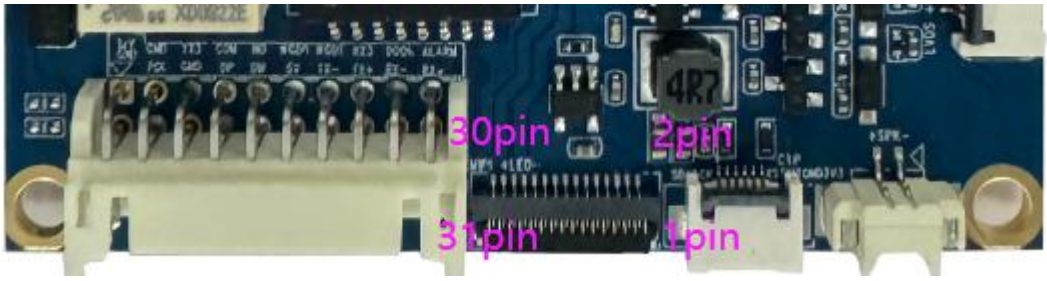
S/N	Definition	Attribute	Description
1	GND	Ground	Ground
2	TX4	Signal Output	TTL serial port
3	RX4	Signal Input	TTL serial port
4	5V	Power	5V power supply

◆ **CTP(Triangle marks Pin 1， 6PIN/0.5mm) CTP Capacitive Touch Screen Interface**



S/N	Definition	Attribute	Description
1	SDA	I/O	I2C data
2	SCK	Output	Clock signal
3	REST	Output	Reset
4	INT	Input	Interrupt
5	GND	Ground	Ground
6	3.3V	output	3.3V output

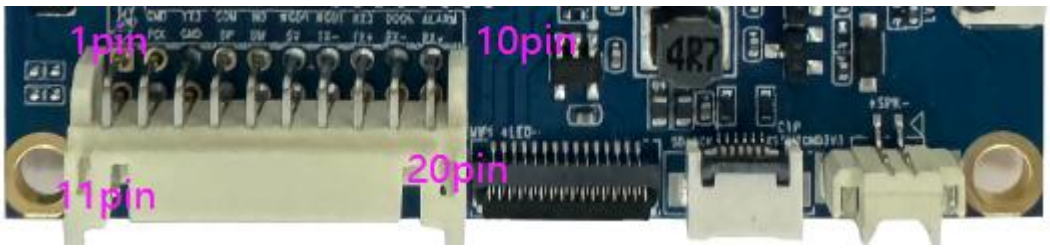
◆ **MIPI LCD(Triangle marks Pin 1， 31PIN/0.3mm) MIPI Signal Output**



S/N	Definition	Attribute	Description
1-2	AVCC	Power	3.3V power supply
3	DVCC	Power	1.8V power supply
4	GND	Ground	Ground

5	RESET	Signal Input	Reset pin
6	DVCC	Power	1.8V power supply
7	GND	Ground	Ground
8	DSI-D3N	Output	MIPI DATA
9	DSI-D3P	Signal Input	MIPI DATA
10	GND	Ground	Ground
11	DSI-D0N	Output	MIPI DATA
12	DSI-D0P	Signal Input	MIPI DATA
13	GND	Ground	Ground
14	DSI-CLKN	Output	MIPI CLK
15	DSI-CLKP	Signal Input	MIPI CLK
16	GND	Ground	Ground
17	DSI-D1N	Output	MIPI DATA
18	DSI-D1P	Signal Input	MIPI DATA
19	GND	Ground	Ground
20	DSI-D2N	Output	MIPI DATA
21	DSI-D2P	Signal Input	MIPI DATA
22-23	GND	Ground	Ground
24	LED-	Power	Backlight power negative
25	LED-	Power	Backlight power negative
26	LED-	Power	Backlight power negative
27	LED-	Power	Backlight power negative
28	NC	NC	NC
29~31	LED+	Power	Backlight power positive

◆ **TAIL LINE Interface（Triangle marks Pin 1，30PIN/2.0）**



S/N	Definition	Attribute	Description
1	12V	Power	+12Vpower input
2	GND	Ground	Ground
3	UART3 TX	Control Line	TTL TX，configurable as RS485 A

4	COM	Control Line	Relay common terminal
5	NO	Control Line	Relay normally open
6	WGOD0	Data Line	Wiegand output D0
7	WGOD1	Data Line	Wiegand output D1
8	UART3 RX	Signal Input	TTL RX，configurable as RS485 B
9	DOOR	Data Line	Input interface for door open button
10	ALARM	Data Line	Input interface for door sensor
11	GND	Ground	Ground
12	POL	Data Line	Force upgrade input
13	GND	Ground	Ground
14	USB_OTG_ DP	Input/Output	D+ signal line
15	USB_OTG_ DM	Input/Output	signal line
16	USB 5V	Power Output	+5V Power Output
17	TX-	Ethernet Line	Ethernet TX-
18	TX+	Ethernet Line	Ethernet TX+
19	RX-	Ethernet Line	Ethernet RX-
20	RX+	Ethernet Line	Ethernet RX+

- **MIPI CSIX2 (Triangle marks Pin 1， 40PIN/0.5mm) Dual MIPI Camera Interface (Dual or Single Camera)**

S/N	Definition	Attribute	Description
1	VDD2V8	Power	2.8V output
2	VDD3V3	Power	3.3V output
3	IR-PWDN	Output	IR_Camera power-down control signal
4	IR-RST	Output	IR_Camera reset signal
5	SCL	Output	SCL signal
6	SDA	Input/Output	SDA signal
7	GND	Ground	Ground
8	IR-XCLK	Output	IR_Camera main clock

9	GND	Ground	Ground
10	IR-MCP	Input/Output	IR_Camera MIPI clock channel positive
11	IR-MCN	Input/Output	IR_Camera MIPI clock channel negative
12	GND	Ground	Ground
13	IR-D0P	Input/Output	IR_Camera MIPI data channel 0 positive
14	IR-D0N	Input/Output	IR_Camera MIPI data channel 0 negative
15	GND	Ground	Ground
16	IR-D1P	Input/Output	IR_Camera MIPI data channel 1 positive
17	IR-D1N	Input/Output	IR_Camera MIPI data channel 1 negative
18	GND	Ground	Ground
19	DOVDD1V8	Power	1.8V output
20	FSYC-IN	/	NC
21	LED-GPIO	/	NC
22	IR-DVDD1V2	Power	1.2V output
23	RGB-DVDD1V2	Power	1.2V output
24	RGB-PWDN	Output	RGB_Camera power-down control signal
25	RGB-RST	Output	RGB_Camera reset signal
26	GND	Ground	Ground
27	RGB-XCLK	Output	RGB_Camera main clock
28	GND	Ground	Ground
29	RGB-MCP	Input/Output	RGB_Camera MIPI clock channel positive
30	RGB-MCN	Input/Output	RGB_Camera MIPI clock channel negative
31	GND	Ground	Ground
32	RGB-D0P	Input/Output	RGB_Camera data channel 0 positive
33	RGB-D0N	Input/Output	RGB_Camera data channel 0 negative
34	GND	Ground	Ground
35	RGB-D1P	Input/Output	RGB_Camera MIPI data channel 1 positive
36	RGB-D1N	Input/Output	RGB_Camera MIPI data channel 1 negative
37	GND	Ground	Ground
38	5V	Power	Power
39	5V	Power	Power
40	5V	Power	Power

◆ **LVDS LCD(Triangle marks Pin 1，40PIN/0.5)　LVDS Signal Output**

S/N	Definition	Attribute	Description
1	VCOM	Power	VCOM power output
2	VCC_LCD	Output	+3.3V power positive output
3	VCC_LCD	Output	+3.3V power positive output
4	NC	NC	NC
5	RESET	Output	Reset signal
6	STBYB	Output	Default high level
7	GND	Ground	Ground
8	LVDS_D0N	Output	Pixel0 Negative Data (Odd)
9	LVDS_D0P	Output	Pixel0 Positive Data (Odd)
10	GND	Ground	Ground
11	LVDS_D1N	Output	Pixel1 Negative Data (Odd)
12	LVDS_D1P	Output	Pixel1 Positive Data (Odd)
13	GND	Ground	Ground
14	LVDS_D2N	Output	Pixel2 Negative Data (Odd)
15	LVDS_D2P	Output	Pixel2 Positive Data (Odd)
16	GND	Ground	Ground
17	LVDS_CLKN	Output	Negative Sampling Clock (Odd)
18	LVDS_CLKP	Output	Positive Sampling Clock (Odd)
19	GND	Ground	Ground
20	LVDS_D3N	Output	Pixel3 Negative Data (Even)
21	LVDS_D3P	Output	Pixel3 Positive Data (Even)
22	GND	Ground	Ground
23-24	NC	NC	NC
25	GND	Ground	Ground
26-27	NC	NC	NC
28	SELB	Output	Default high level

29	AVDD	Output	+9.6V power positive output
30	GND	Ground	Ground
31	LED-	Input	Backlight negative input (constant current)
32	LED-	Input	Backlight negative input (constant current)
33	TCLRL	Output	Default high level
34	TRUDL	Output	Default high level
35	VGL	Output	-6V negative voltage output
36-37	NC	NC	NC
38	VGH	Output	+18V positive voltage output
39	LED+	Output	Backlight positive output (constant current)
40	LED+	Output	Backlight positive output (constant current)

4 Dimensions

4.1 Board Dimensions

PCB length 95.4mm,width：60.9mm，hole diameter:3.5mm, overall board height is approximately 10mm. For detailed drawings, contact sales for DXF files.