4. Application

The 5” LCM is a Human Machine Interface （HMI） solution combining an onboard processor and memory touch display with ADE Editor software for HMI GUI project development.
Using the ADE Editor software, you can quickly develop the HMI GUI by drag-and-drop components (graphics, text, button, slider etc.) and Blocky instructions for coding at display side

5. Features

- WVGA (800×480 pixels) resolution.
- Projected Capacitive Touch
- Work with ADE for delivering the Smart HMI total solution
- 32-bit ARM CPU @480Mhz with 32MB DRAM
- Built-in 2Gb (256MB) Flash memory for storage
- Support ARGB888 (16.7M colors) with 256 level of transparency
- Support LCM backlight control
- Support GPIO, PWM, input-Capture and ADC functions
- Support UART communication interfaces
- Support USB interface for downloading designs from ADE

6. General Specifications

Item	Specifications	Unit
Screen Size	5 (5:3 diagonal)	inch
Display Format	800RGB(H)×480(V)	dot
Active Area	108(H)×64.8(V)	mm
Pixel Pitch	0.135(H)×0.135(V)	mm
Pixel Configuration	RGB Vertical Stripe	-
Display Mode	IPS Type / Transmissive Mode / Normally Black	-
Surface Treatment	Clear (7H)	-
Viewing Direction	Full view angle	-
Outline Dimension	118.5(W)×77.55(H)×17(D)	mm
Weight	（110.2）	g
RoHS Compliance	RoHS Compliance	-

7. Absolute Maximum Ratings

7.1 Absolute Ratings of Environment

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Storage Temperature	T_{ST}	-30	+80	°C	(1)(2)
Operating Ambient Temperature	T_{OP}	-20	+70	°C	(1)(2)

Note1: Background color changes slightly depending on ambient temperature.
This phenomenon is reversible.

Note2: Please refer to item of RELIABILITY.

7.2 Electrical Absolute Ratings

(Ta=25±2°C, GND=0V)

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Input supply voltage with respect to GND	VCC	+4.75	+5.5	V	-
IO Voltage with respect to GND	-	+3.3V (+/- 10%)	+5.5	V	(1)

Note1: IO Voltage is specified under the no-pull configuration.

8. Electrical Characteristics

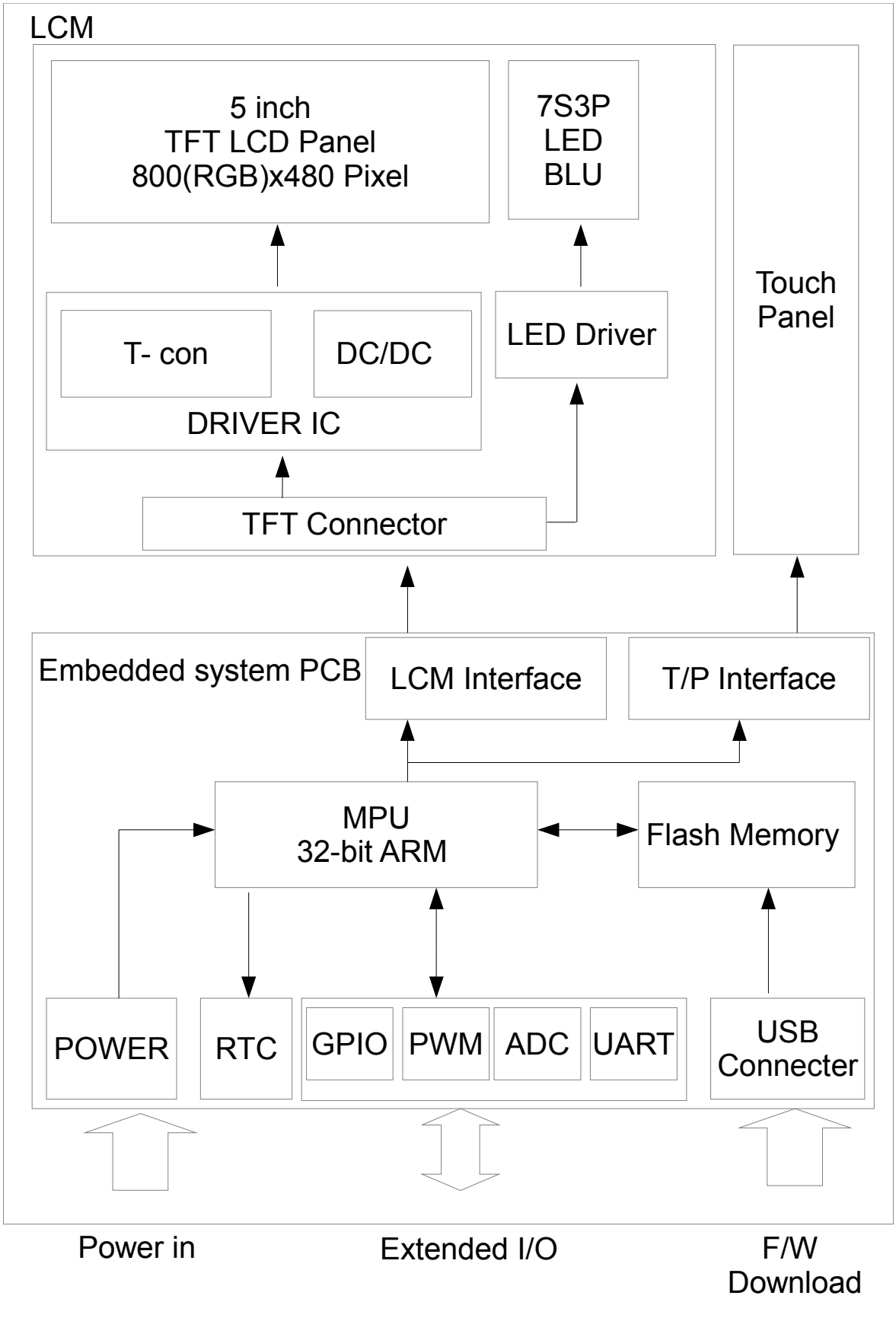
8.1 DC Characteristics

(Ta=25±2°C)

Item	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Power Supply Voltage	VCC	4.75	5.0	5.5	V	Input
Operating current with B/L(100%)	ICC		750	1050	mA	
Extended IO Voltage	VDD	3.0	3.3	3.5	V	
MPU interface Input High Level	VIH	VDD – 0.4	-	VDD	V	-
MPU interface Input Low Level	VIL	0	-	0.3VDD	V	
MPU interface Output High Level	VOH	0.7VDD	-	VDD	V	-
MPU interface Output Low Level	VOL	0	-	0.3VDD	V	-
LED life time	-	50000	60000	-	Hr	(1)

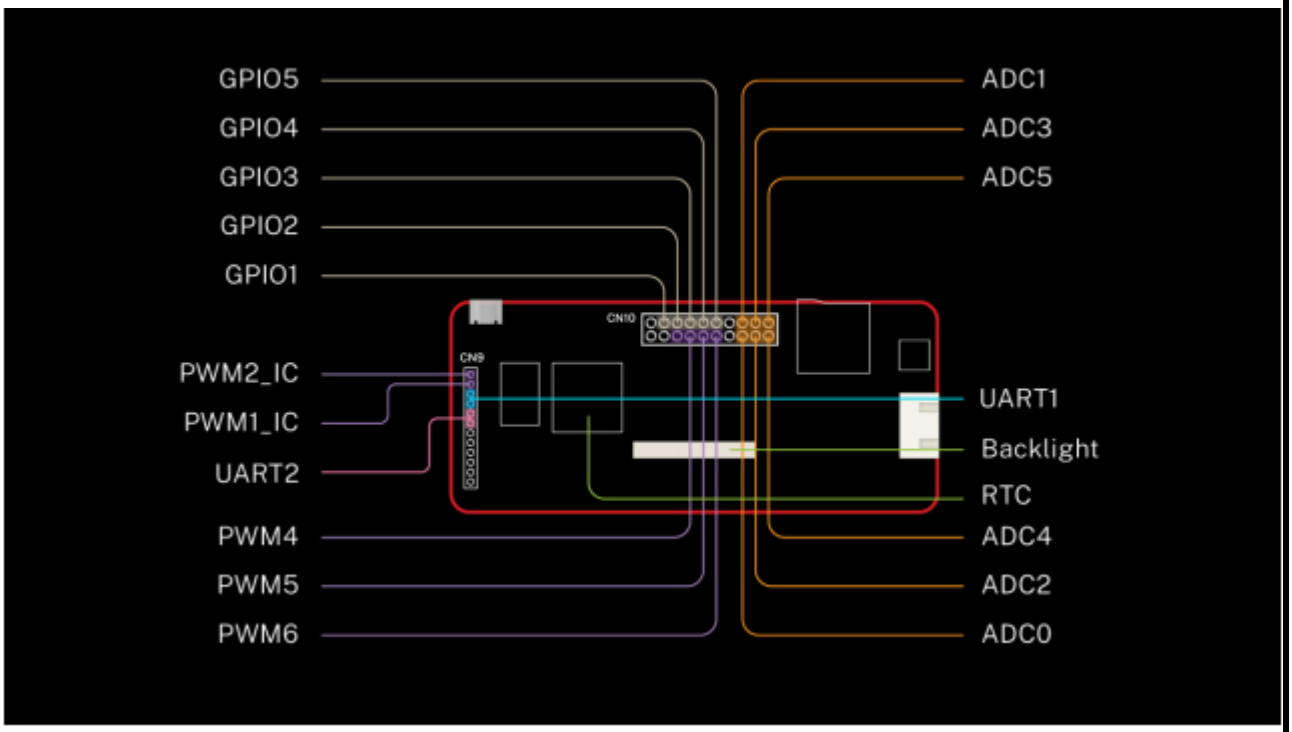
Note (1)：LED life time is defined as under 25±2°C , when the average brightness decrease to 50% of original brightness

9. Block Diagram



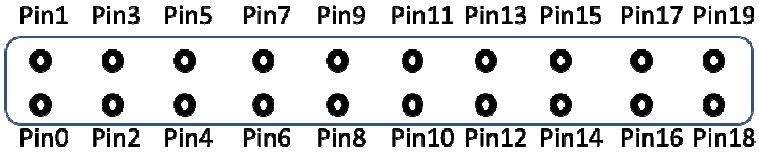
10. Input / Output Terminals Pin Assignment

10.1 USER I/O



10.1.1. CN10

Connector：CHERNG WEEI：P40X-MTN-A-12-20 OR EQUIVALENT

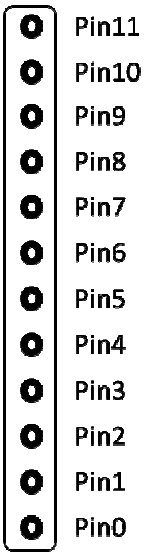


Pin No.	Symbol	I/O	Description
0	VCC	O	DC 5V output
1	GND	O	Ground
2	VDD	O	DC 3.3V
3	GPIO1	I/O	General purpose Input and Output. For input mode, the signal is treated as a digital input with selection for pull-up, pull-down or no-pull attribute. For output mode, the signal is generated as a digital signal. The output can be set as a regular output or a push-pull output.
4	Reserved	N/A	Reserved
5	GPIO2	I/O	The functionality is the same as that of GPIO1. Please refer to GPIO1 description for details.

Pin No.	Symbol	I/O	Description
6	PWM4	I/O	This pin offers three different functions: GPIO, PWM and Input-capture. Users can select which function to be assigned to this pin inside ADE. For PWM, this pin generates digital pulses based on the parameters including frequency and duration set in the ADE. For the input-capture, the capture mode and the corresponding behavior are all set inside ADE.
7	GPIO3	I/O	The functionality is the same as that of GPIO1. Please refer to GPIO1 description for details.
8	PWM5	I/O	This pin shares the same functionality as that of PWM4. Please refer to PWM4 description for details.
9	GPIO4	I/O	The functionality is the same as that of GPIO1. Please refer to GPIO1 description for details.
10	PWM6	I/O	This pin shares the same functionality as that of PWM4. Please refer to PWM4 description for details.
11	GPIO5	I/O	The functionality is the same as that of GPIO1. Please refer to GPIO1 description for details.
12:13	GND	O	Ground
14	ADC0	I/O	This pin offers the two functions: GPIO and ADC. For GPIO function, this pin offers the same functionality as that of GPIO1.
15	ADC1	I/O	The functionality is the same as that of ADC0. Please refer to ADC0 description for details.
16	ADC2	I/O	The functionality is the same as that of ADC0. Please refer to ADC0 description for details.
17	ADC3	I/O	The functionality is the same as that of ADC0. Please refer to ADC0 description for details.
18	ADC4	I/O	The functionality is the same as that of ADC0. Please refer to ADC0 description for details.
19	ADC5	I/O	The functionality is the same as that of ADC0. Please refer to ADC0 description for details.

10.1.2. CN9

Connector：CHERNG WEEI：P30X-MTN-A-12-AT OR EQUIVALENT



Pin No.	Symbol	I/O	Description
0	VCC	O	DC 5V output
1	VDD	O	DC 3.3V output
2	GND	O	Ground
3	Reset	O	Reset signal. Active low.
4:5	Reserved	N/A	Reserved Signal
6	UART2_TX	I/O	TX for UART2 The Baud rate is set in the ADE. The communication protocol is described in this document.
7	UART2_RX	I/O	RX for UART2 The Baud rate is set in the ADE. The communication protocol is described in this document.
8	UART1_TX	I/O	TX for UART1 The Baud rate is set in the ADE. The communication protocol is described in this document.
9	UART1_RX	I/O	RX for UART1

Pin No.	Symbol	I/O	Description
10	PWM1_IC	I/O	This pin offers three different functions: GPIO, PWM and Input-capture. Users can select which function to be assigned to this pin inside ADE. For PWM, this pin generates digital pulses based on the parameters including frequency and duration set in the ADE. For the input-capture, the capture mode and the corresponding behavior are all set inside ADE.
11	PWM2_IC	I/O	This pin shares the same functionality as that of PWMIC_1. Please refer to PWMIC_1 description for details.

10.2 Power In Connector

Connector：JST：S4B-XH-SM4-TB OR EQUIVALENT

No.	Symbol	I/O	Functions
1	GND	I	Ground
2	NC	-	Reserved
3	NC	-	Reserved
4	VCC	I	DC 5V Input

11.UART Communication Protocol

The default UART communication protocol will be described in this section. However, we do allow customization of the protocol. Please contact us for the customization service.

Command Format

Command	Lead Byte	Type	3rd Byte	4th Byte	Other Bytes
Set Register	0x11	0x00	Register ID Low Byte	Register ID High Byte	Data Payload
Read Register	0x11	0x01	Register ID Low Byte	Register ID High Byte	N/A

Data Payload Format

Payload Type	ID Byte	Length Low Byte	Length High Byte	Tailing Bytes
Boolean	0x00	0x01	0x00	Data Bytes
String	0x01	0x01~0xFF	0x00~0XFF	Data Bytes
Integer	0x02	0x01/0x02/0x04/0x08	0x00	Data Bytes
Unsigned Integer	0x03	0x01/0x02/0x04/0x08	0x00	Data Bytes
Floating Point	0x04	0x04/0x08	0x00	Data Bytes

Note: Data bytes are of the little-Endian format.

12. Optical Characteristics

The optical characteristics should be measured in a dark environment (≦ 1 lux) or equivalent state with the methods shown in Note (4).

Item		Symbol	Conditions	Min.	Typ.	Max.	Unit	Note
Contrast Ratio		CR	θ_x=0°, θ_Y =0° Normal Viewing Angle	800	（1000）	-	-	(2)
Response Time		$T_{R+}T_F$		-	30	40	ms	(3)
Luminance(Center)		Y		1060	（1140）	-	cd/m^2	(4)
Brightness uniformity		BUNI		75	(80)	-	%	(5)
Color Chromaticity	Red	Rx		0.540	0.590	0.640	-	(1),(4)
		Ry		0.305	0.355	0.405	-	
	Green	Gx		0.325	0.375	0.425	-	
		Gy		0.525	0.575	0.625	-	
	Blue	Bx		0.095	0.145	0.195	-	
		By		0.070	0.120	0.170	-	
	White	Wx		0.270	0.32	0.370	-	
		Wy		0.315	0.365	0.415	-	
Viewing Angle	Horizontal	θ_x+	CR≥10	70	（80）	-	deg.	
		θ_x-		70	（80）	-		
	Vertical	θ_Y+		70	（80）	-		
		θ_Y-		70	（80）	-		

16.Outline Drawing