

TC48480C040-06WTC

Features:

- Based on T5L0, running DGUS II system.
- 4 inch, 480*480 pixels resolution, 262K colors, IPS-TFT-LCD, wide viewing angle.
- Full lamination capacitive touch, beautiful product and reliable structure.
- Special COF screen for Thermostat.



1 Interface Definition

Pin	Definition	Function
1~2	GND	GND
3~19	IO1~IO17	IO interface
20	RX2	DIN
21	TX2	DOUT
22	TR5	485 /TR
23	TR4	485 /TR
24	RX5	485 /UART_RX5
25	TX5	485 /UART_TX5
26	RX4	485 /UART_RX4
27	TX4	485 /UART_TX5
28	ADC6	ADC6
29	ADC7	ADC7
30	VBAT	RTC
31	SPK	Speaker
32	VCC_EN	Power
33	SD_CLK	SD_CLK
34	SD_CMD	SD_CMD
35~38	DATA0~DATA3	DATA
39~40	+5V	Power

2 Specification Parameters

2.1 Product Parameters

Main Chip	T5L0
User Interface	40Pin_0.5mm FPC
FLASH	16M Bytes
UI Version	DGUSII / TA
Display Color	262K colors
Dimensions	4 inch
Resolution	480*480
Active Area (A.A.)	71.86mm (W) * 70.18mm (H)
View Area (V.A.)	71.86mm (W) * 67.96mm (H)
Viewing Angle	Wide viewing angel, typical value of 85°/85°/85°/85°(L/R/U/D)
Backlight Service Life	>20000 hours (Time of the brightness decaying to 50% on the condition of continuous working with the maximum brightness)
Brightness	250nit
Brightness Control	0~100 grade (When the brightness is adjusted to 1%~30% of the maximum brightness, flickering may occur and is not recommended to use in this range)
Type	CTP (Capacitive Touch Panel)
Structure	G+G structure
Touch Mode	Support point touch and drag
Surface Hardness	6H
Light Transmittance	Over 90%
Life	Over 1,000,000 times touch

2.2 Interface Parameters

Item	Conditions	Min	Typ.	Max	Unit
Baud Rate	User Set (Configure the CFG file)	3150	115200	3225600	bps
Output Voltage (TXD)	Output 1	3.0	3.3	-	V
	Output 0	-	0	0.3	V
Input Voltage (RXD)	Input 1	-	-	3.3	V
	Input 0	0	-	0.5	V
Interface	UART2: TTL; UART4: RS485; (Only available after OS configuration) UART5: RS485; (Only available after OS configuration)				
Data Format	UART2: N81; UART4: N81/E81/O81/N82; 4 modes (OS configuration) UART5: N81/E81/O81/N82; 4 modes (OS configuration)				

2.3 Electrical Specifications

Rated Power	<2W	
Operating Voltage	4.5~5.5V, typical value of 5V	
Operating Current	280mA	VCC=5V, max backlight
	80mA	VCC=5V, backlight off
Recommended power supply: 5V 0.5A DC		

2.4 Operating Environment

Operating Temperature	-10°C~60°C
Storage Temperature	-20°C~70°C
Operating Humidity	10%~90%RH, typical value of 60% RH

3 Reliability Test

Before mass production of smart screens, a series of procedural reliability tests need to be conducted according to actual application requirements and product specification control standards to ensure product quality.

3.1 ESD Test

Test temperature: 25°C

Test process: the product was placed on the test bench to perform contact and air discharge in turn of the serial screen iron frame and display area. During the experimental process, it was observed whether the screen is dead, black, white, splash, or reboot. According to the experiment results, the performance is in line with the criteria GB/T 17626.2 B level and above.

Discharge Type	Discharge Value	Result
Contact discharge	±4KV	Normal operation
Air discharge	±8KV	Normal operation

3.2 High and Low Temperature Test

Test temperature:-20~70°C

Test process: the product will be placed obliquely in the high and low temperature test chamber for 12h for 20 on and off cycles. Then it will be check at room temperature after power on for the appearance and function, CTP offset situation, jumping point, page random switching and failure.

Temperature	Result
High temperature(70°C)	Normal operation
Low temperature(-20°C)	Normal operation

4 Debugging Tools

It is recommended for new users of DWIN smart LCMs to purchase official accessories. For more details, please refer to customer service center.



HDL 672 debug board

5 T5L0 ASIC

T5L0 ASIC is a low-power, cost-effective, GUI and application highly integrated single-chip dual-core ASIC designed by DWIN Technology for small-size LCD and mass produced in 2020.

(1) Mature and stable 8051 core which is the most widely used with the maximum operating frequency of T5L is up to 250MHz, 1T(single instruction cycle)high speed operation.

(2) Separate GUI CPU core running DGUS II System:

- High-speed display memory, 2.4GB/S bandwidth. 18-bit color display resolution support up to 1024*768 (TA mode), 854*480 (DGUS mode).
- 2D hardware acceleration and the UI with animation and icons as its main feature is extremely cool and smooth.
- Images and icons stored in JPEG format. Adopt Low-cost 16Mbytes SPI Flash.
- High quality ratio and sound restoration and playback.
- 128Kbytes variable storage space for exchanging data with OS CPU Core and memory.
- 2 10-bit 800KHz DC/DC controllers simplify LED backlight, analog power design and save cost and space.
- Support DGUS development and simulation on PC. Support back-end remote upgrade.

(3) Separate CPU (OS CPU) core runs user 8051 code or DWIN OS system and user CPU is omitted in practical application:

- Standard 8051 core and instruction set, 64Kbytes code space, 32Kbytes on-chip RAM.
- 64-bit integer mathematical operation unit (MDU), including 64-bit MAC and 64-bit divider.
- Built-in software WDT, 3 16-bit Timers, 12 interrupt signals support up to four levels of interrupt nesting.
- Support IAP online simulation and debugging with unlimited breakpoints.
- Upgrade code online through DGUS system.

(4) 1Mbytes on-chip Flash with DWIN patent encryption technology ensure code and data security.

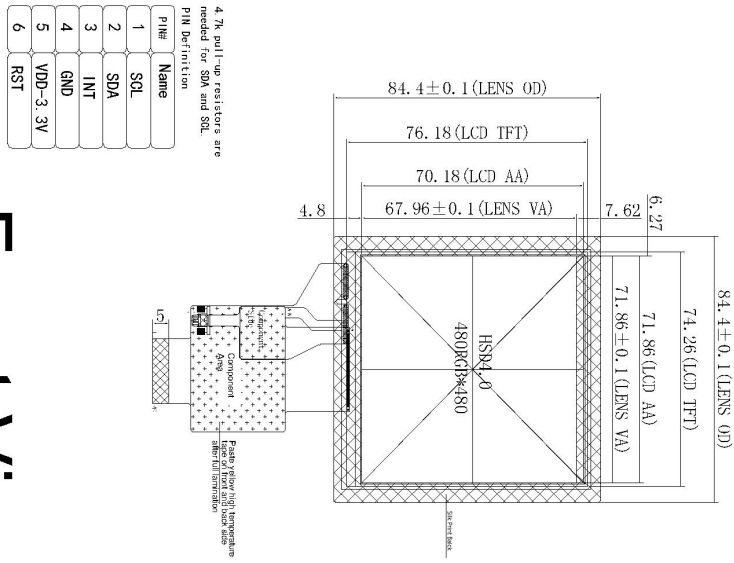
(5) Operating temperature ranges from -40°C to +85°C (IC operating temperature customizable from -55°C to 105°C).

(6) Low power consumption and strong anti-interference ability. It can work stably on double-sided PCB and passes EMC/EMI test easily.

6 Packing Capacity & Dimension

Dimension				
Dimension	84.4(W) * 84.4(H) * 4.25(T) mm			
Net Weight	55g			
Packing Capacity				
Model	Size	Layer	Quantity/Layer	Quantity(Pcs)
Carton:	415mm(L)*250mm(W)*200mm(H)	-	-	100

Disclaimer: The product design is subject to alternation and improvement without prior notice.

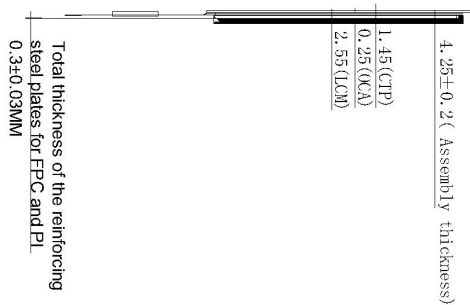


4.7k pull-up resistors are needed for SDA and SCL.

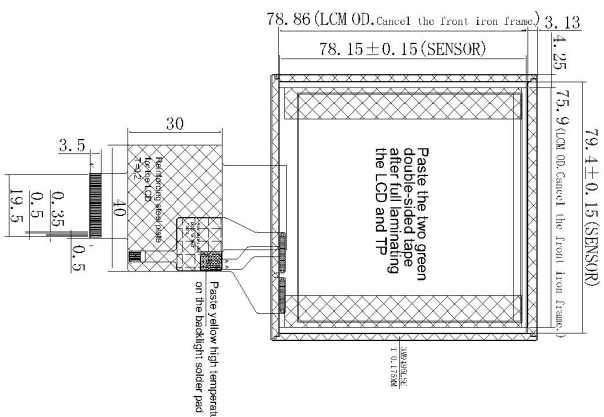
Pin Definition

Pin#	Name
1	SCL
2	SDA
3	INT
4	GND
5	VDD-3.3V
6	RST

Front View



Side View



Back View

Pin#	Name	21	TX2
1	GND	22	TR5
2	GND	23	TR4
3	I01	24	RX5
4	I02	25	TX5
5	I03	26	RX4
6	I04	27	TX4
7	I05	28	AD06
8	I06	29	AD07
9	I07	30	VBAT
10	I08	31	SPK
11	I09	32	VCC_EN
12	I10	33	SD_CLK
13	I11	34	SD_CMD
14	I12	35	DATA0
15	I13	36	DATA1
16	I14	37	DATA2
17	I15	38	DATA3
18	I16	39	+5V
19	I17	40	+5V
20	RX2		



IC: ST7701S
LCD: HSD040BPNI-A (IPS)

REVISION RECORD		VER	DATE	DWIN Technology Co., Ltd	
1	First release	V1-1	20230704	FILE NAME : TC48480C040-06WTC	TOLERANCES : ±0.2
2				CUSTOMER NAME :	EXCISE :
3				DESIGN :	SCALE : 1:1
4				DESIGN BR :	DATE : 20230704
5				CHECKED BR :	DATE :
6				APPROVAL BR :	DATE :



7 Record of Revision

Rev	Date	Content	Editor
00	2023-04-23	First Edition	YML

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Thank you all for continuous support of DWIN, and your approval is the driving force of our progress!

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