

DMG24240F013_03WN

Features:

- Based on T5L0-Q88, running DGUS II HMI platform.
- 1.28 inch, 240*240 resolution, IPS-TFT LCD.
- COF structure. The entire core circuit of the smart screen is fixed on the FPC of LCM, featured by light and thin structure, low cost and easy production.



1 External Interface

NO.	Definition	Type	Functional Description
1	VCC	P	Power Input
2	TX	O	UART Transmit
3	RX	I	UART Receive
4	GND	P	GND

2 Specification Parameters

2.1 Product Parameters

Main Chip	T5L0-Q88
User Interface	4Pin_1.0mm FPC
FLASH	16M Bytes
UI Version	DGUS II / TA
Power Supply	10PIN_4PINZJB adapter board power supply
Dimensions	1.28-inch
Resolution	240*240
Active Area (AA)	Diameter=32.40mm
Viewing Area (VA)	Diameter=33.00mm
Viewing Angle	Wide viewing angle (85°/85°/85°/85° typical), high contrast, and good color reproduction.
Backlight Service Life	>20000 hours
Brightness	350nit
Brightness Control	100-level brightness adjustment (Flickering may occur at 1%-30% of max brightness; not recommended for use in this range)
Note: Use dynamic screen saver to prevent afterimages from prolonged fixed page display.	

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				
Data Format	UART2: N81				

2.3 Electrical Specifications

Rated Power	<2W	
Operating Voltage	4.5-5.5V, typical value of 5V	
Operating Current	75mA	VCC=5V, max backlight
	40mA	VCC=5V, backlight off
Recommended power supply: 5V 1A DC.		

2.4 Operating Environment

Operating Temperature	-10°C to 60°C (5V @ 60% RH)
Storage Temperature	-20°C to 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 humidity: 50%RH.

Test process: Place the product on the test bench fixture (approximately 15cm in height), and perform contact and air discharge tests on the smart LCM. Observe if any freezing, black or white screen, flickering, or rebooting occurs during the test.

Test conclusion: The product's ESD performance meets GB/T 17626.2 Class B standards.

Test standard : EN 61000-4-2:2009 IEC 61000-4-2:2008 GB/T 17626.2-2018

Other:

Table 1: Electrostatic Discharge Immunity (Air Discharge)

Test Points Locations	Test Levels							
	-2kV	+2kV	-4kV	+4kV	-8kV	+8kV	-15kV	+15kV
Screen					A	A		
/	/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/	/

Table 2: Electrostatic Discharge Immunity (Direct Contact)

Test Points Locations	Test Levels							
	-2kV	+2kV	-4kV	+4kV	-6kV	+6kV	-8kV	+8kV
Jo	/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/	/
/	/	/	/	/	/	/	/	/

4 Debug

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

Adapter board model: 10PIN_4PINZJB, 130-SDK



Operation steps: open serial assistant - custom function command - set command - send.

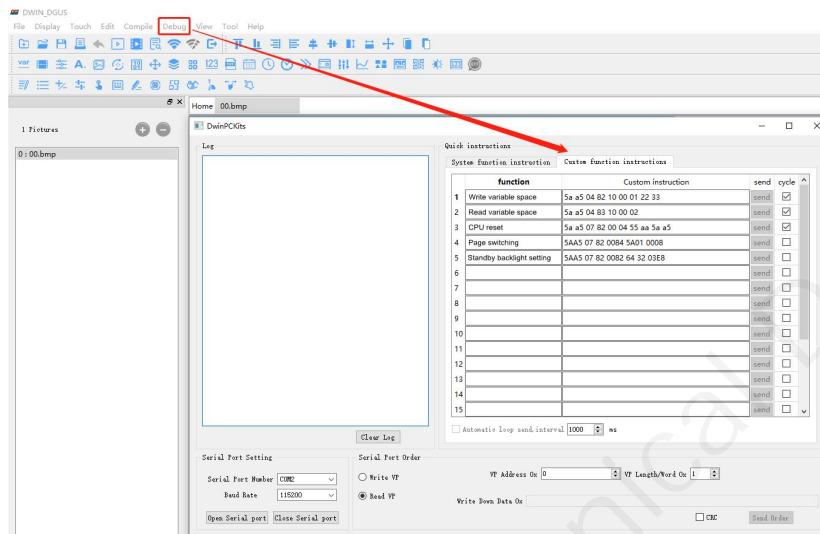
For example:

(1) Page switching

Tx: 5AA5 07 82 0084 5A01 0008

(2) Standby backlight setting

Tx: 5AA5 07 82 0082 64 32 03E8



DGUS operation

5 T5L0-Q88 ASIC

T5L0 Q88 ASIC is a small package, 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 2023.

(1) Mature and stable 8051 core which is the most widely used with the maximum operating frequency of T5L is up to 400MHz, 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 backend 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.
- 15 IOs, 4-channel UARTs, 1-channel CAN, up to 8-channel 12-bit A/Ds and 2-channle 16-bit PWM of adjustable resolution.
- 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).

DWIN encourages users to design your own customized product based on T5L.

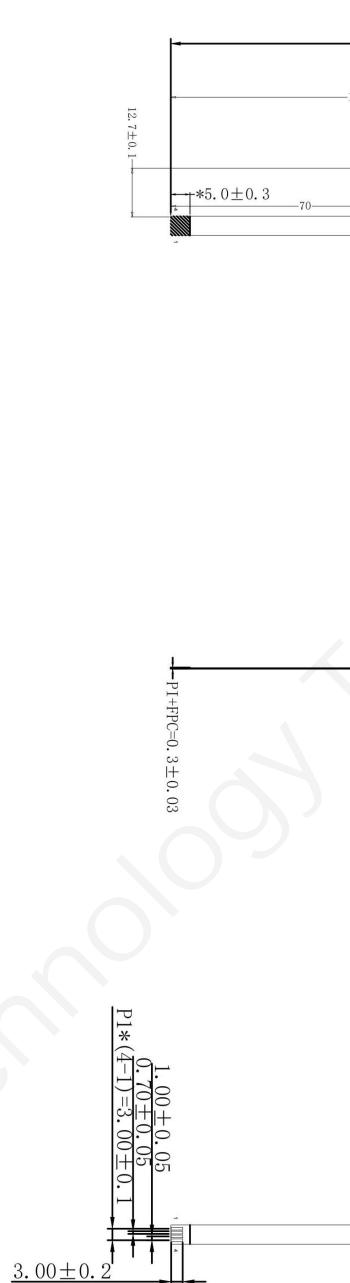
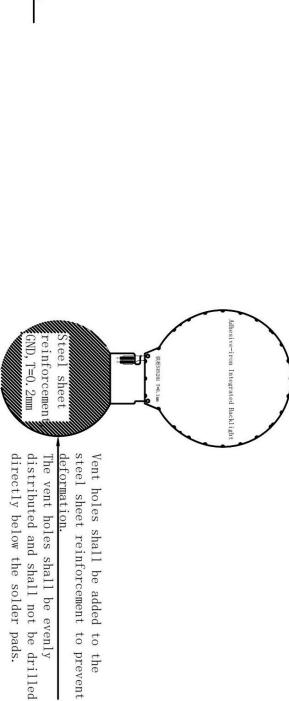
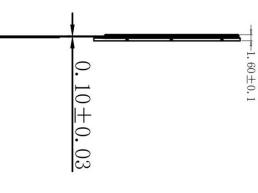
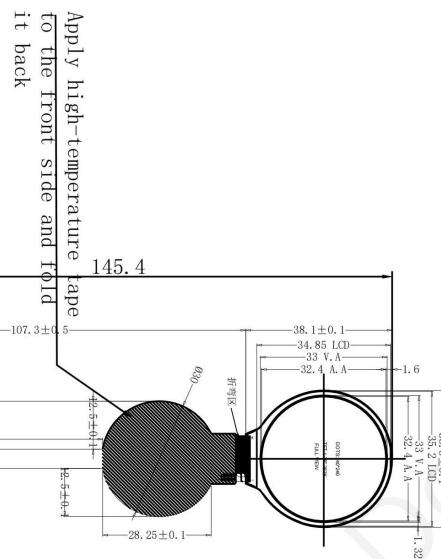
6 Packing & dimensions

Dimension				
Dimension	35.60(W) ×145.40(H) ×1.60(T) mm			
Net Weight	7g			
Packing Capacity				
Model	Size	Layer	Quantity/Layer	Quantity(Pcs)
Carton	450mm(L)×385mm(W)×205mm(H)	-	-	100

Front view

Side view

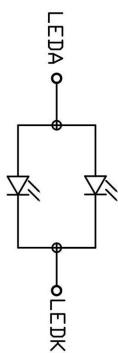
Back view



PIN	Symbol
1	VCC
2	TX
3	RX
4	GND

NOTES:

1. Display: 1.28" TFT IPS, NORMALLY BLACK;
2. Driver IC: GC9101
3. STORAGE TEMPERATURE: -20° C TO 70° C;
4. OPERATING TEMPERATURE: -10° C TO 60° C;
5. BRIGHTNESS: -cd/m² (MTN);
6. CHROMATICITY COORDINATE: X: 0.31 ± 0.03, Y: 0.31 ± 0.03;
7. CRITICAL DIMENSION: (*) REFERENCE DIMENSION;
8. GENERAL TOLERANCE (Tolerance not marked): ± 0.2;
9. Compliant with Class 1 environmentally prohibited controlled substances.



IF=40mA VF=2.8V~3.2V

REVISION RECORD			VIR	DATE	DWIN Technology	
First Edition	V1-1	20240109	FILE NAME :	DMG24240F013_03WN	TOLERANCES :	± 0.2
CUSTOMER NAME :			SENSOR:		ANGLES :	± 0.1°
DESIGN :			RELEASE:	1-1	SCALE :	1:1
DRAWN BY	H.Z.Q		DATE	20240109	UNIT :	mm
CHECKED BY			DATE		PRO. (3)	
APPROVED BY			DATE		SHEET :	1/1

8 Revision records

Rev	Revise Date	Content	Editor
00	2024-11-29	First Edition	Xu Ying
01	2025-09-09	Add adapter model	Xu Ying

Please contact us if you have any questions about the use of this document or our products, or if you would like to know the latest information about our products:

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- Customer service email: dwinhmi@dwin.com.cn
- DWIN Developer Forum: <https://forums.dwin-global.com/>

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

Important Disclaimer

DWIN reserves the right to make any changes to product designs without prior notice.

Customers should ensure strictly adhering to all the relevant standards and requirements during the product application process, including but not limited to functional safety, information security, and regulatory provisions.

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