

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℃ to 60℃ (5V @ 60% RH) |
| Storage Temperature | -20℃ to 70℃ |
| 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.

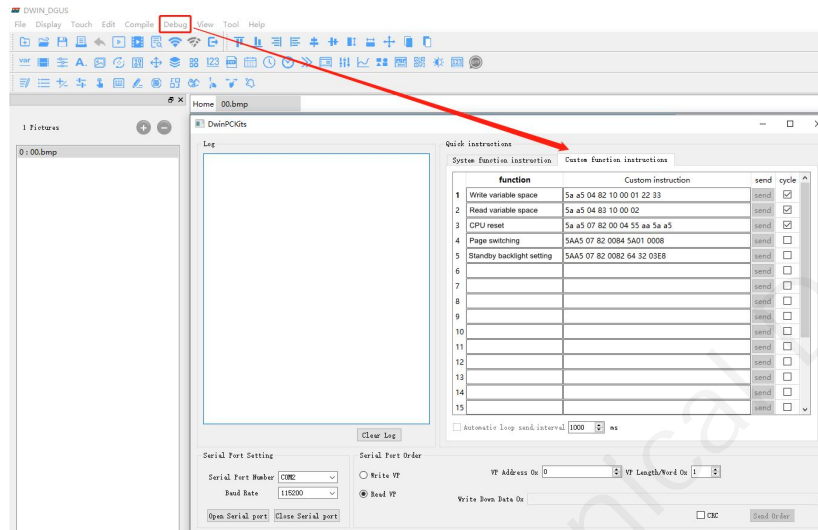
For example:

(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.

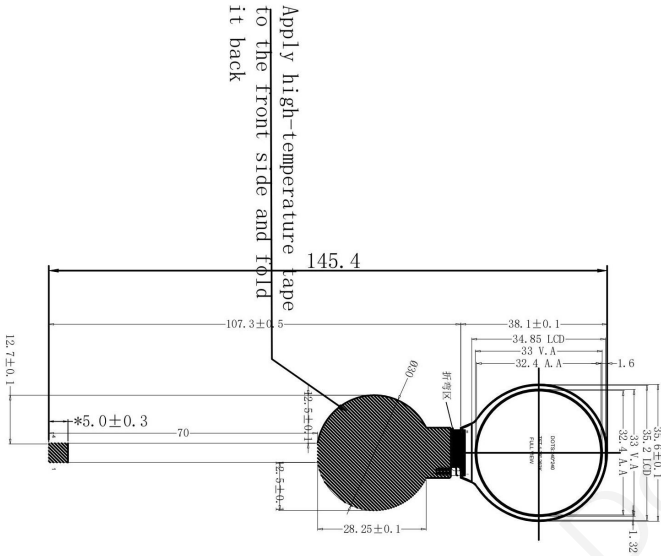
(5) Operating temperature ranges from -40℃ to +85℃(IC operating temperature customizable from -55℃ to 105℃).

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

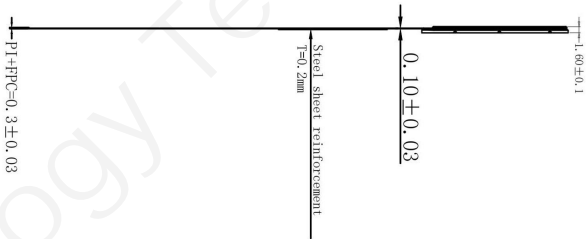
6 Packing & dimensions

| 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 |

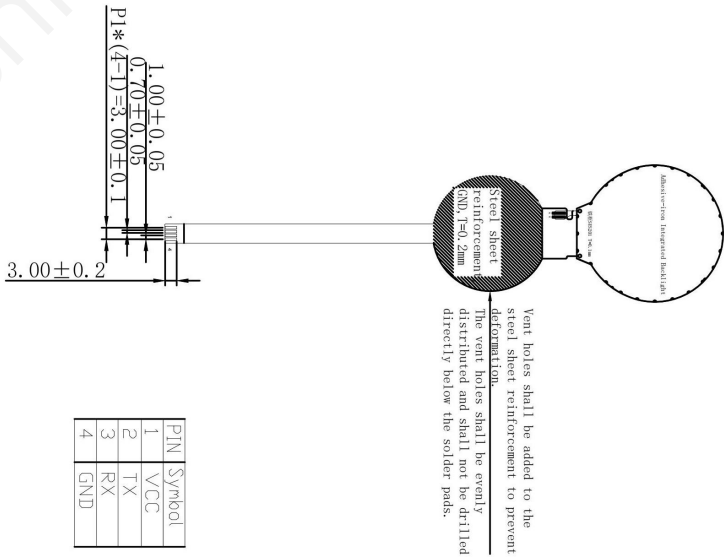
Front view



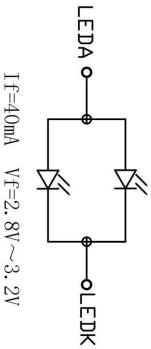
Side view



Back view



- NOTES:
1. Display: 1.28" TFT IPS, NORMALLY BLACK;
 2. Driver IC: GC9A01
 3. STORAGE TEMPERATURE: -20° C TO 70° C;
 4. OPERATING TEMPERATURE: -10° C TO 60° C;
 5. BRIGHTNESS: -cd/m² (MIN);
 6. CHROMATICITY COORDINATE:
 7. X: 0.31±0.03, Y: 0.31±0.03;
 8. Z: 0.31±0.03, Y: 0.31±0.03;
 9. REFERENCE DIMENSION: ()
 10. GENERAL TOLERANCE (Tolerance not marked): ±0.2.
 11. Compliant with Class I environmentally prohibited controlled substances.



| REVISION RECORD | | DWIN Technology | |
|-----------------|-----|-----------------|-------------------------------|
| First Edition | VER | DATE | FILE NAME : DMG24240F013_03WN |
| | | | CUSTOMER NAME : |
| | | | DESIGN : |
| | | | DRAWN BY : H.Z.Q |
| | | | CHECKED BY : |
| | | | DATE : |
| | | | DATE : |
| | | | APPROVED BY : |
| | | | DATE : |
| | | | PRO. (GND) |
| | | | 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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Thank you all for continuous support of DWIN, and your approval is the driving force of our progress!

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