5 Inch IPS TFT LCD Module with Capacitive Touch - 900 cd/m² High Brightness SPI Display

Our Product Introduction

Basic Information

- Place of Origin: China
- Brand Name: chenghao optoelectronic
- Certification: RoHS & CE & FCC
- Model Number: CH500WV05B-CT-PA
- Minimum Order Quantity: 100 pcs
- Price: Negotiable
- Packaging Details: Standard export packaging
- Delivery Time: 7-15 work days
- Payment Terms: T/T
- Supply Ability: 300,000 pieces/month

Product Specification

- Module No: CH500WV05B-CT-PA
- Display Mode: Transmissive, Normally Black, Anti-Glare
- Screen Size: 5.0 Inch
- Resolution: 800 X 480
- Viewing Direction: 80/80/80/80
- Screen Brightness: 900 Cd/m2
- Module Interface: SPI
- FPC Pin Numbers: 20-pin
- Module Size: 120.7 X 75.8 Mm
- Active Area Size: 108.0 X 64.8 Mm
- Touch Panel Type: Capacitive Touch Panel
- Highlight: **5 inch IPS TFT LCD module**, **capacitive touch LCD display**, **high brightness SPI display**

More Images

Product Description

The CH500WV05B-CT-PA is a 5.0 inch IPS TFT LCD module featuring an integrated capacitive touch panel and an onboard EVE2 graphics controller. With a resolution of 800 x 480 WVGA pixels and an ultra-high brightness of 900 cd/m², this display delivers exceptional image clarity and sunlight readability, making it ideal for outdoor kiosks, medical devices, and industrial HMI applications where strong ambient light is present. The advanced IPS technology provides a wide viewing angle of 80/80/80/80 degrees, ensuring consistent color reproduction and image quality from virtually any direction without color shift or inversion. Equipped with a standard SPI interface that also supports D-SPI and Q-SPI modes, this module offers flexible and high-speed data communication while minimizing the number of required I/O pins on the host controller. The display operates in transmissive mode with normally black technology and features an anti-glare surface treatment to effectively minimize reflections from ambient light sources. The integrated capacitive touch panel with a durable glass lens cover provides responsive, accurate, and multi-touch input capability. A built-in PCB driver board is attached to the back of the module, incorporating an EVE2 embedded video engine that handles display rendering, touch processing, and audio output, significantly reducing the burden on the host microcontroller and simplifying system design. With dual connection options including a 20-pin IDC box header and a 20-pin FFC connector, this module offers versatile integration possibilities for a wide range of embedded applications across industrial, medical, and smart home markets.

Product Features

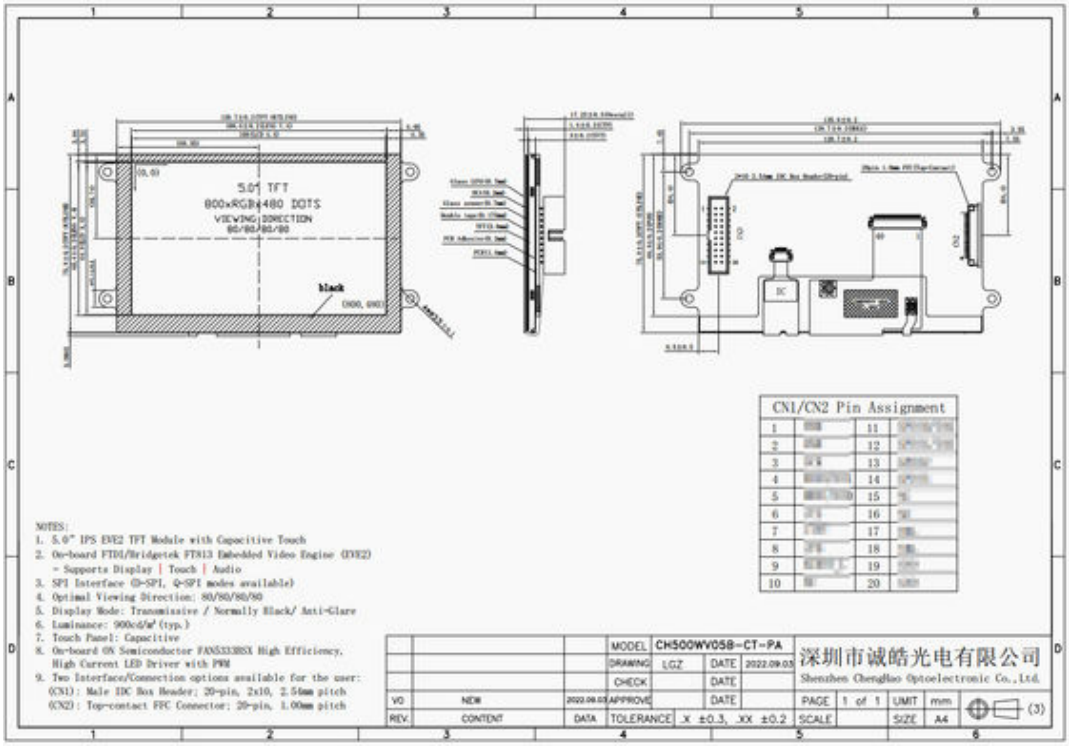
Ultra-High Brightness for Sunlight Readability: With a typical brightness of 900 cd/m², the display remains clearly visible even under direct sunlight. This makes it an excellent choice for outdoor kiosks, marine electronics, garden equipment interfaces, and any application where the display must compete with strong ambient light. The high-luminance LED backlight circuit, driven by a dedicated high-efficiency LED driver with PWM control, ensures consistent brightness while maintaining power efficiency.

Integrated EVE2 Graphics Controller for Simplified System Design The onboard * Embedded Video Engine (EVE2) integrates display control, touch management, and audio output into a single chip. This eliminates the need for a separate graphics controller or frame buffer, significantly reducing BOM cost, PCB space, and firmware development time. The EVE2 supports advanced graphics primitives, widget rendering, and audio playback, enabling rich human-machine interfaces with just a low-cost SPI-enabled microcontroller.

Full Viewing Angle IPS Display Technology: The IPS (In-Plane Switching) panel delivers superior color performance with 80/80/80/80 degree viewing angles in all directions. Unlike standard TN panels, colors remain stable and accurate without inversion or significant brightness loss when viewed from extreme angles. This is particularly important for devices with wide or adjustable viewing positions, such as medical equipment, industrial control panels, and in-vehicle displays shared between driver and passenger.

Dual Interface Connectivity for Flexible Integration: The module offers two independent connection options: a 20-pin 2x10 IDC box header with 2.54mm pitch and a 20-pin 1.0mm pitch top-contact FFC connector. This dual-interface design allows engineers to choose the most suitable connection method for their specific PCB layout and mechanical constraints. The flexible connectivity reduces the need for custom adapter boards and simplifies prototyping, production, and field maintenance.

Product Drawing



Detailed Specifications

Parameter	Value
Module Name	5.0" IPS EVE2 TFT Module with Capacitive Touch
Module No	CH500WV05B-CT-PA
Display Mode	Transmissive / Normally Black / Anti-Glare
Screen Size	5.0 inch
Resolution	800 x 480 (WVGA)
Viewing Direction	80/80/80/80 (Full viewing angle)
Screen Brightness	900 cd/m² (typ.)
Module Interface	SPI (D-SPI, Q-SPI compatible)
FPC Pin Numbers	20-pin (IDC Box Header 2x10 2.54mm / FFC 1.0mm)
Module Size	120.7 x 75.8 mm (TFT Outline)
Active Area Size	108.0 x 64.8 mm
Touch Panel Type	Capacitive Touch Panel (with Glass Lens Cover)

Customized Introduction

At Shenzhen ChengHao Optoelectronic Co., Ltd., we specialize in providing professional customization services for TFT LCD modules, monochrome LCD displays, and color and monochrome OLED modules. For the CH500WV05B-CT-PA and similar display modules, we offer comprehensive customization options to meet diverse application requirements. Our FPC customization service allows adjustment of form factor structure and pin configuration to match specific connector layouts. We support multiple interface types including SPI, MCU, RGB, MIPI, LVDS, and HDMI, enabling seamless integration with various host controllers. Brightness levels can be tailored from standard 200-300 cd/m² to high-brightness configurations exceeding 500 cd/m² according to the target environment. Touch panel options include capacitive touch, resistive touch, or no touch

configuration. We also provide glass lens cover customization with adjustable thickness, shape, color, silk-screen printing, and hole cutting. Surface treatment options such as anti-glare (AG), anti-reflective (AR), and anti-fingerprint (AF) coatings are available to enhance display performance in challenging application environments. Whether you need a standard module or a fully customized display solution, our engineering team is ready to support your project from concept through production.

Application Cases

Industrial Control and HMI Panels: The 5.0-inch size with 800x480 resolution is ideal for industrial human-machine interfaces used in PLC programming terminals, CNC machine controllers, and factory automation panels. The high brightness and anti-glare surface ensure readability in brightly lit factory environments, while the capacitive touch interface provides intuitive operator interaction. The SPI interface simplifies connection to common industrial microcontrollers, and the wide viewing angle allows operators to read the display from different positions around the equipment.

Medical Device Displays: The IPS technology with 80/80/80/80 viewing angles makes this module suitable for medical monitoring equipment, portable diagnostic devices, and patient information terminals where accurate color reproduction and readability from various angles are critical. The integrated touch panel enables hygienic, button-free interfaces that are easier to clean and sterilize. The EVE2 controller reduces the processing load on the medical device's main processor, helping meet power consumption and certification requirements.

Smart Home and IoT Control Panels: This display module is an excellent choice for smart home control hubs, automation panels, and IoT gateway interfaces. The compact 5-inch form factor fits well into wall-mounted panels and desktop devices. The built-in audio output capability of the EVE2 controller enables voice prompts and alert tones without additional audio hardware. The capacitive touch interface supports modern gesture-based interaction, and the high brightness ensures readability in both dark hallways and sunlit living rooms.

FAQ

Q: What is the typical application for the CH500WV05B-CT-PA module?A: This module is designed for industrial HMI, medical equipment, smart home control panels, outdoor kiosks, and any embedded system requiring a high-brightness color display with touch interface. Its integrated EVE2 graphics controller makes it particularly suitable for applications where reducing host processor load and simplifying hardware design are priorities.

Q: Does the module include the touch panel, or do I need to purchase it separately?A: The CH500WV05B-CT-PA comes with an integrated capacitive touch panel and a glass lens cover pre-assembled. No additional touch panel purchase is required. The touch controller is handled by the onboard EVE2 processor, so no external touch controller IC is needed.

Q: What microcontrollers or processors are compatible with the SPI interface?A: Any microcontroller with an SPI interface can communicate with this module, including STM32, ESP32, Arduino, Raspberry Pi Pico, and many others. The EVE2 graphics controller handles all display rendering and touch processing, so the host MCU only needs to send graphics commands via SPI, making it compatible even with low-pin-count and low-performance microcontrollers.

Q: Can I use both the IDC header and the FFC connector simultaneously?A: No, CN1 (IDC Box Header) and CN2 (FFC Connector) share the same pin assignments and are designed as alternative connection options. You should use only one connection method at a time. Choose the option that best matches your PCB layout and mechanical design.

Q: What is the advantage of the onboard EVE2 controller compared to a standard TFT module?A: The EVE2 controller eliminates the need for a separate graphics processor, frame buffer RAM, and touch controller. It handles display initialization, graphics rendering, touch sensing, and audio playback all in one

chip. This reduces BOM cost, PCB complexity, power consumption, and firmware development time. Applications that would typically require an high-end microcontroller with TFT-LCD controller can use a simpler, lower-cost SPI-enabled MCU instead.

Q: Does the anti-glare surface affect touch sensitivity? A: No, the anti-glare (AG) surface treatment is applied to the outer surface of the glass lens cover and does not affect the capacitive touch sensitivity or accuracy. The AG treatment reduces reflections from ambient light sources, improving readability without compromising touch performance.

Q: What is the lifespan of the LED backlight at 900 cd/m² brightness?A: The LED backlight is rated for typically 30,000 to 50,000 hours of operation at rated current. The onboard LED driver with PWM control allows the backlight brightness to be adjusted, which can extend the backlight lifespan when operating at reduced brightness levels in indoor environments.

Shenzhen ChengHao Optoelectronic Co., Ltd.

+86 755-27806536 add@chenghaolcm.com chenghaolcd.com

7th floor, building C5, Hengfeng Industrial City, Hangcheng street, Bao'an District, Shenzhen