1.9 Inch 170x320 IPS TFT LCD Capacitive Touch Display Module 8-Bit SPI 400 cd/m2 Waterproof

Our Product Introduction

Basic Information

- Place of Origin: China
- Brand Name: chenghao optoelectronic
- Certification: RoHS & CE & FCC
- Model Number: CH190QV02A-CT
- 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: CH190QV02A-CT
- Display Mode: Transmissive / Normally Black
- Screen Size: 1.9 Inch
- Resolution: 170x320 (RGB)
- Viewing Direction: Free View (IPS)
- Screen Brightness: 400 Cd/m2
- Module Interface: 4-line 8bit SPI / I80-system 8-bit I/F
- FPC Pin Numbers: 25-Pin
- Operating Temperature: -20 C ~ +70 C
- Storage Temperature: -30 C ~ +80 C
- Module Size: 49.72 X 25.80 Mm
- Active Area Size: 42.72 X 22.70 Mm
- Highlight: **1.9 inch IPS TFT LCD touch screen**, **170x320 waterproof touch display module**, **8-bit SPI capacitive touch screen**

More Images

Product Description

The CH190QV02A-CT is a compact 1.9-inch TFT LCD display module designed for applications requiring a high-performance small-format display with integrated capacitive touch functionality. This module features a 170x320 (RGB) pixel resolution in an IPS (In-Plane Switching) panel configuration with transmissive, normally black display mode, delivering exceptional image quality with wide viewing angles and consistent color reproduction from virtually any direction.

With a brightness rating of 400 cd/m2, this display module is well-suited for both indoor and outdoor environments where readability in ambient lighting conditions is important. The module supports dual interface options including 4-line 8-bit SPI and i80-system 8-bit parallel interface, providing flexible integration with a wide range of microcontrollers and embedded systems.

The integrated capacitive touch panel (CTP) utilizes I2C communication protocol for reliable and responsive touch input, eliminating the need for separate touch controller integration. The overall module dimensions measure 49.72mm x 25.80mm (TFT OD) with an active area of 42.72mm x 22.70mm, housed within a LENS outer dimension of 55.83mm x 29.50mm. The display employs a 0.7mm thick glass cover lens for surface protection.

Designed with a waterproof structure and a 25-pin FPC connector (FH35C-25S-0.3SHW(50)), this module can withstand challenging operating environments while maintaining reliable signal connectivity. The module operates within a voltage range of 2.8V to 3.3V and is suitable for applications in industrial control, medical equipment, smart home devices, portable instruments, and IoT terminals where space efficiency and display quality are critical requirements.

The capacitive touch interface supports multi-touch gestures, enhancing user interaction in menu-driven interfaces and control panel applications. The IPS technology ensures that the display maintains excellent contrast and color accuracy at viewing angles of up to 80 degrees in all directions, making it ideal for devices where multiple users may need to view the screen simultaneously or where the display may be positioned at varying angles within the final product enclosure.

Product Features

1. Compact 1.9-Inch IPS Display with 170x320 Resolution

The CH190QV02A-CT utilizes advanced IPS (In-Plane Switching) technology to deliver exceptional viewing performance in a compact 1.9-inch form factor. Unlike standard TN panels that suffer from color shifting and contrast degradation at off-center angles, this IPS module maintains consistent color accuracy and image quality across a full 80-degree viewing cone in all directions. The 170x320 pixel resolution provides crisp, readable text and detailed graphics within a small active area of just 42.72mm x 22.70mm, making it ideal for space-constrained applications such as handheld instruments, medical probes, and compact HMI panels where every millimeter counts.

2. Sunlight Readable 400 cd/m2 Brightness

With a brightness rating of 400 cd/m2, this display module offers excellent readability in both indoor and semi-outdoor environments. The high-luminance backlight ensures that on-screen content remains visible under bright ambient lighting conditions, such as warehouse floor terminals, outdoor monitoring equipment, or automotive dashboard displays. When combined with the IPS panel's naturally high contrast ratio, the 400 cd/m2 backlight delivers vibrant colors and deep blacks that enhance user experience across diverse application scenarios.

3. Integrated Capacitive Touch with I2C Interface

The module comes with a factory-bonded capacitive touch panel (CTP) that eliminates the complexity of sourcing and assembling a separate touch component. The touch controller communicates via the industry-standard I2C protocol, allowing seamless integration with most mainstream microcontrollers without the need for additional driver development. The glass cover lens with a thickness of 0.7mm provides robust surface protection while maintaining excellent touch sensitivity and optical clarity. This integrated solution reduces BOM costs, saves PCB space, and accelerates time-to-market for product developers.

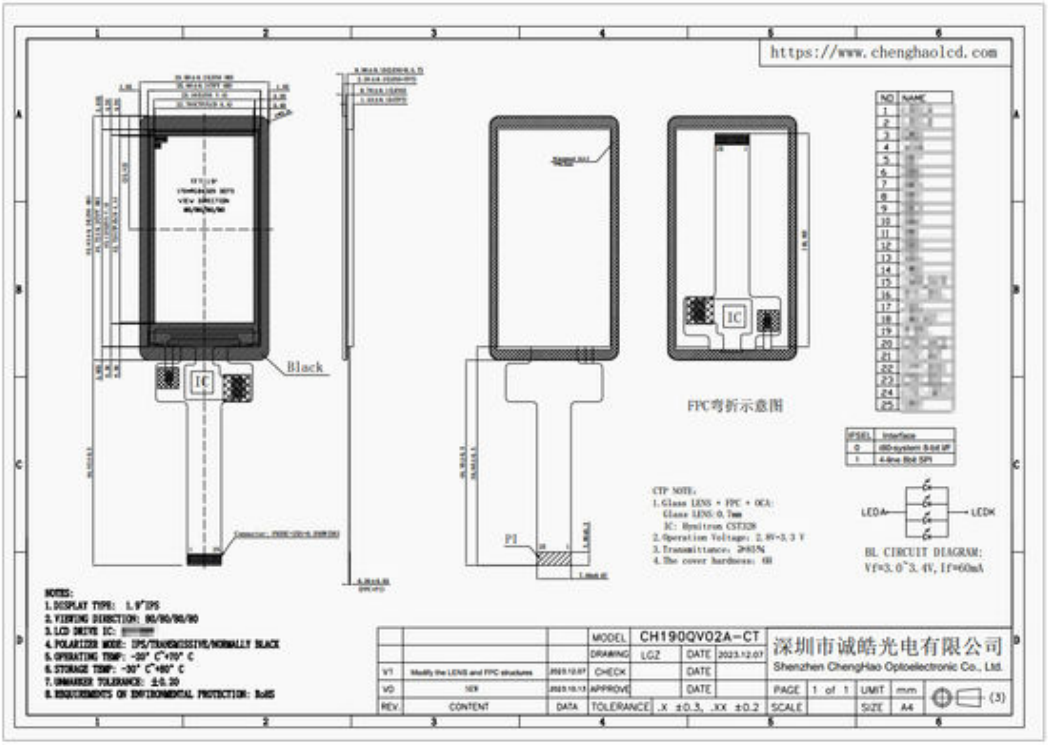
4. Dual Interface Flexibility: SPI and i80 Parallel

The CH190QV02A-CT supports both 4-line 8-bit SPI and i80-system 8-bit parallel interface modes, giving designers the freedom to choose the most appropriate interface for their application. SPI mode is ideal for systems with limited GPIO availability, requiring only minimal pin connections for display control. The i80 parallel interface offers higher data throughput, making it suitable for applications that require frequent screen updates or animated content. This dual-interface design ensures compatibility with a wide range of MCU platforms including STM32, ESP32, Renesas.

5. Waterproof Structure for Harsh Environments

Engineered with a dedicated waterproof construction, this LCD module is designed to operate reliably in environments where moisture, dust, or condensation may be present. The protective sealing around the LENS and FPC assembly, combined with the 0.7mm cover glass and D.S.T (Double-Sided Tape) structure, creates a barrier against ingress of liquids and particulates. This makes the module an excellent choice for outdoor equipment, food processing machinery, medical sterilization areas, and industrial automation systems where environmental resilience is a critical requirement.

Product Drawing



Detailed Specifications

Parameter	Value
Module Name	1.9 inch TFT LCD Display Module

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Module No	CH190QV02A-CT
Display Mode	Transmissive / Normally Black
Screen Size	1.9 inch
Resolution	170x320 (RGB)
Viewing Direction	Free View (IPS)
Screen Brightness	400 cd/m2
Module Interface	4-line 8bit SPI / i80-system 8-bit I/F
FPC Pin numbers	25-Pin
Operating Temperature	-20 C ~ +70 C
Storage Temperature	-30 C ~ +80 C
Module Size	49.72 x 25.80 mm
Active Area Size	42.72 x 22.70 mm
Touch Type	Capacitive Touch (CTP)

Customized Introduction

Shenzhen Chenghao Optoelectronic Co., Ltd. offers comprehensive customization services for TFT LCD modules, mono LCD displays, color OLED modules, and mono OLED modules. With years of experience in display module manufacturing, we understand that off-the-shelf display solutions do not always meet the specific requirements of every application. Our engineering team works closely with clients to develop tailored display solutions that address unique design constraints, environmental conditions, and performance targets.

FPC Customization: We offer flexible FPC (Flexible Printed Circuit) design and fabrication services, including custom shape structure, gold finger shape, and pin count adjustments. Whether you need a specific connector orientation, extended cable length, or additional EMI shielding, our FPC customization capabilities ensure seamless integration with your main PCB design.

Interface Customization: Our modules support a wide variety of interface options including SPI, MCU, RGB, MIPI, LVDS, eDP, and HDMI. We can adapt the driving scheme to match your preferred MCU or application processor, reducing the need for level shifters or protocol converters in your system architecture.

Brightness Customization: Depending on your application environment, we offer standard brightness levels (200-300 cd/m2), high brightness options (500 cd/m2 and above), and adjustable backlight configurations. For the CH190QV02A-CT, the standard 400 cd/m2 brightness can be customized to suit specific indoor or outdoor visibility requirements.

Touch Panel Options: We provide capacitive touch (CTP), resistive touch, and no-touch configurations based on your application needs. For devices requiring glove operation or stylus input, resistive touch is available. For modern interfaces demanding multi-touch gestures and smooth user interaction, our capacitive touch solutions deliver excellent responsiveness.

Anti-Glare (AG) Treatment: To improve readability in bright environments, we offer anti-glare surface treatment that reduces ambient light reflection. This is particularly beneficial for outdoor devices, automotive displays, and medical equipment where screen glare can compromise usability.

Glass Cover Lens Customization: Our glass cover lens customization service allows for adjustments to thickness (from 0.5mm to 2.0mm), shape (rounded corners, notches, or special cutouts), color (white, black, or custom), and silk-screen printing (logos, icons, or decorative borders). The CH190QV02A-CT features a 0.7mm cover lens with black silk-screen border, and we can modify these parameters to match your product design aesthetic.

With our flexible MOQ and rapid prototyping capabilities, Chenghao is your ideal partner for customized display solutions that accelerate your product development cycle and reduce time-to-market.

Application Cases

1. Industrial Handheld Terminal

The compact 1.9-inch form factor and waterproof construction make the CH190QV02A-CT an excellent choice for handheld industrial terminals used in warehouse management, logistics tracking, and field service applications. The 170x320 pixel resolution provides sufficient screen real estate for displaying inventory lists, barcode scanning results, and navigation prompts while maintaining a device footprint small enough for one-handed operation. The 400 cd/m2 brightness ensures readability in both indoor warehouses and outdoor loading areas, while the capacitive touch interface enables intuitive menu navigation and data entry without the need for physical keypads. The waterproof structure protects the display from moisture and dust encountered in industrial environments, extending the device lifespan and reducing maintenance requirements.

2. Medical Monitoring Device

In the medical field, the CH190QV02A-CT is well-suited for portable diagnostic equipment and patient monitoring devices where size, reliability, and display quality are critical. The IPS technology delivers consistent color reproduction and contrast at wide viewing angles, which is essential for medical professionals who may need to view the display from various positions during procedures. The capacitive touch interface allows for gloved-hand operation when configured appropriately, making it suitable for clinical environments where hygiene protocols require barrier protection. The module's wide operating temperature range and waterproof design also make it appropriate for sterilization-capable medical devices that must withstand periodic cleaning and disinfection.

3. Smart Home Control Panel

The slim profile and integrated touch capability of the CH190QV02A-CT make it an ideal display solution for smart home control panels, thermostats, and environmental monitoring interfaces. The 1.9-inch display is large enough to show temperature readings, humidity levels, system status icons, and touch-based controls while remaining unobtrusive when mounted on walls or integrated into home automation equipment. The dual interface options (SPI and i80) provide flexibility for integration with popular smart home controllers and IoT gateway platforms, while the 400 cd/m2 brightness ensures the display remains readable under various indoor lighting conditions from dimly lit hallways to sunlit living rooms.

FAQ

Q1: Can this display module be used outdoors?

Yes, the CH190QV02A-CT features a 400 cd/m2 backlight brightness, which provides good readability in semi-outdoor environments and shaded outdoor areas. For direct sunlight applications, we recommend evaluating the display under your specific lighting conditions. Our customization service can also increase the brightness to 500 cd/m2 or higher if needed.

Q2: What is the interface voltage level of this module?

The module operates at an I/O voltage of 2.8V to 3.3V, compatible with standard 3.3V logic systems. If your system uses a different logic level (such as 1.8V or 5V), we can provide recommendations for appropriate level shifting solutions.

Q3: Does the capacitive touch panel support multi-touch gestures?

Yes, the integrated capacitive touch controller supports basic multi-touch gestures including tap, double-tap, swipe, and pinch-zoom. The I2C interface provides responsive touch data transmission for smooth user

interaction. The touch panel can also be customized for gloved-hand operation if required for medical or industrial applications.

Q4: What is the minimum order quantity (MOQ) for this model?

Our standard MOQ for this model starts from a reasonable minimum batch. For prototyping and small-scale production, we offer sample quantities. Please contact our sales team for specific MOQ information based on your project requirements.

Q5: Can the FPC connector or cable length be customized?

Absolutely. As described in our customization introduction, we offer full FPC customization including connector type, pin count, cable length, and gold finger design. If the standard FH35C-25S-0.3SHW(50) connector configuration does not match your PCB layout, our engineering team can design a customized FPC solution to ensure proper fit and reliable connectivity.

Q6: Is the display suitable for battery-powered devices?

> Yes, with an operating voltage of 2.8V to 3.3V and efficient backlight driver design, this module is well-suited for battery-powered portable devices. The typical power consumption can be further optimized through backlight brightness adjustment and sleep mode control. Please contact us for detailed power consumption specifications for your specific usage scenario.

Q7: Does the module come with RoHS certification?

Yes, all Shenzhen Chenghao Optoelectronic Co., Ltd. products are manufactured in compliance with RoHS directives. Our manufacturing processes follow strict environmental and quality control standards. RoHS certification documents are available upon request.

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