- Adjustable receive buffer timeout.
- Option for transmit and receive LED drive signals on each channel.
- Enhanced bit-bang Mode interface option with RD# and WR# strobes
- FT245B-style FIFO interface option with bidirectional data bus and simple 4 wire handshake interface.
- Highly integrated design includes +1.8V LDO regulator for VCORE, integrated POR function and on chip clock multiplier PLL (12MHz – 480MHz).
- Asynchronous serial UART interface option with full hardware handshaking and modem interface signals.
- Fully assisted hardware or X-On / X-Off software handshaking.
- UART Interface supports 7/8 bit data, 1/2 stop bits, and Odd/Even/Mark/Space/No Parity.
- Auto-transmit enable control for RS485 serial applications using TXDEN pin.
- Operational configuration mode and USB Description strings configurable in external EEPROM over the USB interface.
- Configurable I/O drive strength (4, 8, 12 or 16mA) and slew rate.
- Low operating and USB suspend current.
- Supports bus powered, self powered and highpower bus powered USB configurations.
- UHCI/OHCI/EHCI host controller compatible.
- USB Bulk data transfer mode (512 byte packets in High Speed mode).
- +1.8V (chip core) and +3.3V I/O interfacing (+5V Tolerant).
- Extended -40°C to 85°C industrial operating temperature range.
- Compact 64-LD Lead Free LQFP or QFN package
- +3.3V single supply operating voltage range

Part No.	Description
FT2232 HL T&R	IO USB/2xUART/FIFO LQFP64
FT2232 HQ T&R	IO USB/2xUART/FIFO QFN64

	Part No.	Ord. No.
S	FT2232HL T&R	72508
O	FT2232HQ T&R	72509

FT4232 H Series -
Hi-Speed Quad USB UART IC

The FT4232H is FTDI's 5th generation of USB devices. The FT4232H is a USB 2.0 High Speed (480Mb/s) to UART/MPSSE ICs. The device features 4 UARTs. Two of these have an option to independently configure an MPSSE engine. This allows the FT4232H to operate as two UART/Bit-Bang ports plus two MPSSE engines used to emulate JTAG, SPI, I2C, Bit-bang or other synchronous serial modes. The FT4232H has the following advanced features:

- Single chip USB to quad serial ports with a variety of configurations.
- Entire USB protocol handled on the chip. No USB specific firmware programming required.
- USB 2.0 High Speed (480Mbits/Second) and Full Speed (12Mbits/Second) compatible.
- Two Multi-Protocol Synchronous Serial Engine (MPSSE) on channel A and channel B, to simplify synchronous serial protocol (USB to JTAG, I2C, SPI or bit-bang) design.
- Independent Baud rate generators.
- RS232/RS422/RS485 UART Transfer Data Rate up to 12Mbaud.
- FTDI's royalty-free Virtual Com Port (VCP) and Direct (D2XX) drivers eliminate the requirement for USB driver development in most cases.
- Optional traffic TX/RX indicators can be added with LEDs and an external 74HC595 shift register.
- Adjustable receive buffer timeout.
- Support for USB suspend and resume conditions via PWREN#, SUSPEND# and RI# pins.
- Highly integrated design includes +1.8V LDO regulator for VCORE, integrated POR function and on chip clock multiplier PLL (12MHz – 480MHz).
- Auto-transmit enable control for RS485 serial applications using TXDEN pin.
- Operational configuration mode and USB Description strings configurable in external EEPROM over the USB interface.
- Low operating and USB suspend current.
- Configurable I/O drive strength (4,8,12 or 16mA) and slew rate.
- Supports bus powered, self powered and highpower bus powered USB configurations.
- UHCI/OHCI/EHCI host controller compatible.
- USB Bulk data transfer mode (512 byte packets in High Speed mode).
- Dedicated Windows DLLs available for USB to JTAG, USB to SPI, and USB to I2C applications.
- +1.8V (chip core) and +3.3V I/O interfacing (+5V Tolerant).
- Extended -40°C to 85°C industrial operating temperature range.
- +3.3V single supply operating voltage range.

Part No.	Description
FT4232 HL T&R	IO USB/4xUART/FIFO LQFP64
FT4232 HQ T&R	IIO USB/4xUART/FIFO QFN64

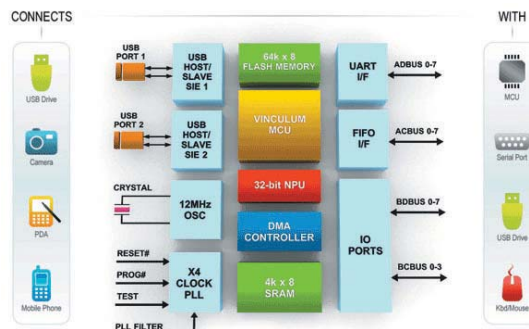|	Part No.	Ord. No.
S	FT4232 HL T&R	72510
O	FT4232HQ T&R	72511

VNCL1A

The Vinculum family of USB Host Controller ICs not only handle the USB Host Interface and data transfer functions, but owing to the inbuilt 8/32-bit MCU and embedded Flash memory, Vinculum encapsulates the USB device classes as well. When interfacing to mass storage devices such as USB Flash drives, Vinculum also transparently handles the FAT file structure communicating via UART, SPI or parallel FIFO interfaces via a simple to implement command set.

The initial product member of the family is the VNC1L device which features two USB Ports which can be individually configured by firmware as Host or Slave ports.

Key VNC1L features:
- 8/32 bit V-MCU Core
- Dual DMA controllers for hardware acceleration
- 64k Embedded Flash Program Memory
- 4k internal Data SRAM
- 2 x USB 2.0 Slow/Full speed Host/Slave Ports
- UART, SPI and Parallel FIFO interfaces
- PS2 legacy Keyboard and Mouse Interfaces
- Up to 28 GPIO pins depending on configuration
- 3.3V operation with 5V safe inputs
- Low power operation (25mA running/2mA standby)
- Inbuilt FTDI firmware easily updated in the field
- LQFP-48 RoHS compliant package
- Multi-processor configuration capable

	Part No.	Ord. No.
S	VNC 1L-1A	57555

FTDI Modules
DLP-USB Series

The DLP-USB module is a low cost integrated module featuring FTDI's FT232BL or FT245BL 2nd generation. Ideal for rapid prototyping, an attractive quantity discount structure also makes this module suitable for incorporation into low/medium volume finished product designs. Integral 93C46 EEPROM on-board for easy OEM customisation. The DLP-USB plugs into a standard 24-pin 0.6in wide DIP socket.

	Part No.	Ord. No.
S	DLP-USB 232M	42417
S	DLP-USB 245M	42418

MM 232-R

The MM232R is a mini development module for the FT232RQ IC device. It is a little bigger than a USB connector, and provides USB - Serial UART interface in a extremely small form factor. It is ideal for new development purposes, and also for adding a USB interface to existing product designs.

Based on the FT232RQ device, the MM232R supports RTS/CTS hardware handshaking and is powered from the USB port. Serial data communication is possible at up to 3MBaud at TTL level. In addition, some of the EEPROM configurable CBUS pins of the FT232R are brought out allowing the MM232 to be used to provide clock signals to external logic.

	Part No.	Ord. No.
S	MM 232R	60339