# Application Note

# AN_184

# FTDI Device Input Output Pin States

**Version 3.5**

**Issue Date: 21-11-2023**

This application note describes the reset, suspend and active states of the input / output pins of the following devices: FT232R, FT245R, FT232RN, FT245RN, FT232H, FT2232H/FT2232H-56Q, FT4232H/FT42323H-56Q, FT232HP/FT233HP, FT2232HP/FT2233HP, FT4232HP/FT4233HP, FT2232D, FT200XD, FT201X, FT220X, FT221X, FT230X, FT234XD, FT231X, FT240X, FT120, FT121, FT122, FT313H, FT4222H & FT260

Use of FTDI devices in life support and/or safety applications is entirely at the user's risk, and the user agrees to defend, indemnify and hold harmless FTDI from any and all damages, claims, suits or expense resulting from such use.

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# 1 Introduction

This application note explains the various states of input and output pins of the following FTDI devices:

FT232R, FT245R, FT232RN, FT245RN, FT232H, FT2232H, FT2232H-56Q, FT4232H, FT4232H-56Q, FT232HP, FT233HP, FT2232HP, FT2233HP, FT4232HP, FT4233HP, FT2232D, FT200XD, FT201X, FT220X, FT221X, FT230X, FT231X, FT234XD, FT240X, FT120, FT121, FT122, FT313H, FT4222H and FT260.

**Note:** The convention used throughout this document for active low signals is the signal name followed by a #.

## 1.1 Applicable Documents

The following data sheets can be downloaded by clicking on the appropriate links below:

FT232R USB UART IC Data Sheet

FT245R USB FIFO Data Sheet

FT232RN USB UART IC Data Sheet

FT245RN USB FIFO Data Sheet

FT232H Single Channel Hi-Speed USB to Multipurpose UART/FIFO IC Data Sheet

FT2232H Hi-Speed Dual USB UART/FIFO IC Data Sheet

FT4232H Hi-Speed Quad USB UART IC Data Sheet

FT233HP/FT232HP High Speed USB Bridge with Type-C/PD3.0 Controller

FT2233HP/FT2232HP High Speed USB Bridge with Type-C/PD3.0 Controller

FT4233HP/FT4232HP High Speed USB Bridge with Type-C/PD3.0 Controller

FT2232D Dual USB UART/FIFO IC Data Sheet

FT200XD Full-Speed USB to I2C bridge in 10 pin DFN package Data Sheet

FT201X Full-Speed USB to I2C bridge Data Sheet

FT220X Full-Speed USB to 4-bit SPI/FT1248 bridge Data Sheet

FT221X Full-Speed USB to 8-bit SPI/FT1248 bridge Data Sheet

FT230X Full-Speed USB to basic UART Data Sheet

FT231X Full-Speed USB to full handshake UART Data Sheet

FT234XD Full-Speed USB to basic UART Data Sheet

FT240X Full-Speed USB to 8-bit FIFO Data Sheet

FT120 USB Full-Speed Device Controller Data Sheet

FT121 USB Full-Speed Device Controller Data Sheet

FT122 USB Full-Speed Device Controller Data Sheet

FT313H Hi-Speed Host Controller

FT4222H Hi-Speed Quad SPI/I2C IC Data Sheet

FT260 Full speed HID Class USB to UART/I2C Datasheet


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# 2 FT232R/FT232RN – I/O Pins

| FT232R/FT232RN | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Pin Name** | **Pin Number (QFN)** | **Pin Number (SSOP)** | **RESET# Low** | **SUSPEND (Pull Down IO Pins in USB Suspend - Not Set)** | **SUSPEND (Pull Down IO Pins in USB Suspend – Set)** | **During Enumeration (out of reset prior to EEPROM read)** | **Active (device enumerated after EEPROM read)** |
| CBUS 0 | 22 | 23 | TriSt- PU | Selected Function | TriSt-PD | Driving Low | Selected Function |
| CBUS 1 | 21 | 22 | TriSt- PU | Selected Function | TriSt-PD | Driving Low | Selected Function |
| CBUS 2 | 10 | 13 | TriSt- PU | Selected Function | TriSt-PD | Driving Low | Selected Function |
| CBUS 3 | 11 | 14 | TriSt | Selected Function | TriSt-PD | Input | Selected Function |
| CBUS 4 | 9 | 12 | TriSt | Selected Function | TriSt-PD | Input | Selected Function |
| TXD | 30 | 1 | TriSt- PU | Output | TriSt-PD | Output | Output |
| DTR# | 31 | 2 | TriSt- PU | Output | TriSt-PD | Output | Output |
| RTS# | 32 | 3 | TriSt- PU | Output | TriSt-PD | Output | Output |
| RXD | 2 | 5 | TriSt- PU | Input - PU | TriSt-PD | TriSt- PU | Input- PU |
| RI# | 3 | 6 | TriSt- PU | Input - PU | TriSt-PD | TriSt- PU | Input – PU |
| DSR# | 6 | 9 | TriSt- PU | Input - PU | TriSt-PD | TriSt- PU | Input – PU |
| DCD# | 7 | 10 | TriSt- PU | Input - PU | TriSt-PD | TriSt- PU | Input – PU |
| CTS# | 8 | 11 | TriSt- PU | Input - PU | TriSt-PD | TriSt- PU | Input - PU |

**Table 2.1 FT232R/FT232RN I/O States**


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## 2.1 FT232R/FT232RN - CBUS Selected Function

| FT232R/FT232RN | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Pin** | **TX DN** | **PWR ON#** | **RXLE D#** | **TXLE D#** | **TX & RXLE D#** | **SLEE P#** | **CLK 48** | **CLK 24** | **CLK 12** | **CL K6** | **I/O Mo de** | **BitBang WRn** | **BitBang RDn** |
| CBUS 0 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| CBUS 1 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| CBUS 2 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | × | ✓ |
| CBUS 3 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | × | ✓ |
| CBUS 4 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | × | × | × |

**Table 2.2 FT232R/FT232RN CBUS Selected Functions**


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# 3 FT245R/FT245RN – I/O Pins

| FT245R/FT245RN | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Pin Name** | **Pin Number (QFN)** | **Pin Number (SSOP)** | **RESET# Low** | **SUSPENDED (Pull Down IO Pins in USB Suspend - Not Set)** | **SUSPEND (Pull Down IO Pins in USB Suspend – Set)** | **During Enumeration (out of reset prior to EEPROM read)** | **Active (device enumerated after EEPROM read)** |
| RXF# | 22 | 23 | TriSt-PU | RXF# | TriSt-PD | Driving Low | Output |
| TXE# | 21 | 22 | TriSt-PU | TXE# | TriSt-PD | Driving Low | Output |
| RD# | 10 | 13 | TriSt-PU | RD# | TriSt-PD | Driving Low | Input |
| WR | 11 | 14 | TriSt | WR# | TriSt-PD | Input | Input |
| PWREN# | 9 | 12 | TriSt | PWREN# | TriSt-PD | Input | PWREN# |
| D0 | 30 | 1 | TriSt-PU | TriSt- PU driving when RD# is low | TriSt-PD | Output | Input- PU driving when RD# is low |
| D1 | 2 | 5 | TriSt-PU | TriSt- PU driving when RD# is low | TriSt-PD | TriSt- PU | Input - PU driving when RD# is low |
| D2 | 32 | 3 | TriSt-PU | TriSt- PU driving when RD# is low | TriSt-PD | Output | Input - PU driving when RD# is low |
| D3 | 8 | 11 | TriSt-PU | TriSt- PU driving when RD# is low | TriSt-PD | TriSt- PU | Input - PU driving when RD# is low |
| D4 | 31 | 2 | TriSt-PU | TriSt- PU driving when RD# is low | TriSt-PD | Output | Input - PU driving when RD# is low |
| D5 | 6 | 9 | TriSt-PU | TriSt- PU driving when RD# is low | TriSt-PD | TriSt- PU | Input - PU driving when RD# is low |
| D6 | 7 | 10 | TriSt-PU | TriSt- PU driving when RD# is low | TriSt-PD | TriSt- PU | Input - PU driving when RD# is low |
| D7 | 3 | 6 | TriSt-PU | TriSt- PU driving when RD# is low | TriSt-PD | TriSt- PU | Input - PU driving when RD# is low |

**Table 3.1 FT245R/FT245RN I/O States**


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# 4 FT232H– I/O Pins

| FT232H | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Pin Number** | **Pin Name** | **RESET# Low** | **Default** | **SUSPEND (Pull Down IO Pins in USB Suspend - Not Set)** | **SUSPEND (Pull Down IO Pins in USB Suspend – Set)** | **During Enumeration (out of reset prior to EEPROM read)** | **Active (device enumerated after EEPROM read)** |
| 13 | ADBUS0 | TriSt | TXD | Function | TriSt-PD | Output | Function |
| 14 | ADBUS1 | TriSt -PU | RXD | Function | TriSt-PD | Input-PU | Function |
| 15 | ADBUS2 | TriSt | RTS# | Function | TriSt-PD | Output | Function |
| 16 | ADBUS3 | TriSt -PU | CTS# | Function | TriSt-PD | Input-PU | Function |
| 17 | ADBUS4 | TriSt | DTR# | Function | TriSt-PD | Output | Function |
| 18 | ADBUS5 | TriSt -PU | DSR# | Function | TriSt-PD | Input-PU | Function |
| 19 | ADBUS6 | TriSt -PU | DCD# | Function | TriSt-PD | Input-PU | Function |
| 20 | ADBUS7 | TriSt -PU | RI# | Function | TriSt-PD | Input-PU | Function |
| 21 | ACBUS0 | TriSt-PU | TriSt-PU | Function/ Selection | TriSt-PD | TriSt-PU | Function/ Selection |
| 25 | ACBUS1 | TriSt-PU | TriSt-PU | Function/ Selection | TriSt-PD | TriSt- PU | Function/ Selection |
| 26 | ACBUS2 | TriSt-PU | TriSt-PU | Function/ Selection | TriSt-PD | TriSt- PU | Function/ Selection |
| 27 | ACBUS3 | TriSt-PU | TriSt-PU | Function/ Selection | TriSt-PD | TriSt- PU | Function/ Selection |
| 28 | ACBUS4 | TriSt-PU | TriSt-PU | Function/ Selection | TriSt-PD | TriSt- PU | Function/ Selection |
| 29 | ACBUS5 | TriSt-PU | TriSt-PU | Function/ Selection | TriSt-PD | TriSt- PU | Function/ Selection |
| 30 | ACBUS6 | TriSt-PU | TriSt-PU | Function/ Selection | TriSt-PD | TriSt- PU | Function/ Selection |
| 31 | ACBUS7 | TriSt-PD | TriSt-PD | Input-PD or MPSSE | TriSt-PD | TriSt-PD | Input-PD or MPSSE |
| 32 | ACBUS8 | TriSt-PU | TriSt-PU | Function/ Selection | TriSt-PD | TriSt- PU | Function/ Selection |
| 33 | ACBUS9 | TriSt-PU | TriSt-PU | Function/ Selection | TriSt-PD | TriSt- PU | Function/ Selection |

**Table 4.1 FT232H I/O States**


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## 4.1 FT232H - Selected Functions

| FT232H | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Pin | | Pin functions (depends on configuration) | | | | | | | | |
| Pin # | Pin Name | ASYNC Serial RS232 | 245 FIFO SYNC | 245 FIFO | ASYNC Bit-bang | SYNC Bit-bang | MPSSE | Fast Serial interface | CPU Style FIFO | FT1248 |
| 13 | ADBUS0 | TXD | D0 | D0 | D0 | D0 | TCK/SK | FSDI | D0 | MIOSI0 |
| 14 | ADBUS1 | RXD | D1 | D1 | D1 | D1 | TDI/DO | FSCLK | D1 | MIOSI1 |
| 15 | ADBUS2 | RTS# | D2 | D2 | D2 | D2 | TDO/DI | FSDO | D2 | MIOSI2 |
| 16 | ADBUS3 | CTS# | D3 | D3 | D3 | D3 | TMS/CS | FSCTS | D3 | MIOSI3 |
| 17 | ADBUS4 | DTR# | D4 | D4 | D4 | D4 | GPIOL0 | ** TriSt-UP | D4 | MIOSI4 |
| 18 | ADBUS5 | DSR# | D5 | D5 | D5 | D5 | GPIOL1 | ** TriSt-UP | D5 | MIOSI5 |
| 19 | ADBUS6 | DCD# | D6 | D6 | D6 | D6 | GPIOL2 | ** TriSt-UP | D6 | MIOSI6 |
| 20 | ADBUS7 | RI# | D7 | D7 | D7 | D7 | GPIOL3 | ** TriSt-UP | D7 | MIOSI7 |
| 21 | ACBUS0 | * TXDEN | RXF# | RXF# | ACBUS0 | ACBUS0 | GPIOH0 | ** ACBUS0 | CS# | SCLK |
| 25 | ACBUS1 | ** ACBUS1 | TXE# | TXE# | WRSTB# | WRSTB# | GPIOH1 | ** ACBUS1 | A0 | SS_N |
| 26 | ACBUS2 | ** ACBUS2 | RD# | RD# | RDSTB# | RDSTB# | GPIOH2 | ** ACBUS2 | RD# | MISO |
| 27 | ACBUS3 | * RXLED# | WR | WR | ACBUS3 | ACBUS3 | GPIOH3 | ** ACBUS3 | WR | ACBUS3 |
| 28 | ACBUS4 | * TXLED# | SIWU# | SIWU# | SIWU# | SIWU# | GPIOH4 | SIWU# | **Note 1** | ACBUS4 |
| 29 | ACBUS5 | ** ACBUS5 | CLKOUT | ACBUS5 | ** ACBUS5 | ** ACBUS5 | GPIOH5 | ** ACBUS5 | ** ACBUS5 | ACBUS5 |
| 30 | ACBUS6 | ** ACBUS6 | OE# | ACBUS6 | ACBUS6 | ACBUS6 | GPIOH6 | ** ACBUS6 | ** ACBUS6 | ACBUS6 |
| 31 | ACBUS7 | PWRSAV# | PWRSAV# | PWRSAV# | PWRSAV# | PWRSAV# | *** GPIOH7 | PWRSAV# | PWRSAV# | PWRSAV# |
| 32 | ACBUS8 | ** ACBUS8 | ** ACBUS8 | ** ACBUS8 | ** ACBUS8 | ** ACBUS8 | ** ACBUS8 | ** ACBUS8 | ** ACBUS8 | ACBUS8 |
| 33 | ACBUS9 | ** ACBUS9 | ** ACBUS9 | ** ACBUS9 | ** ACBUS9 | ** ACBUS9 | ** ACBUS9 | ** ACBUS9 | ** ACBUS9 | ACBUS9 |

**Table 4.2 FT232H Selected Functions**

Pins marked * are EEPROM selectable.

Pins marked ** default to tri-stated inputs with an internal 75KΩ (approx.) pull up resistor to VCCIO.

Pin marked *** default to GPIO line with an internal 75KΩ pull down resistor to GND. This pin can be enabled USBVCC mode instead of GPIO mode using the EEPROM.

**Note 1:** To wake up the USB device in this mode, put ACBUS0 from "HIGH" to "LOW", set ACBUS1 To "HIGH", and put ACBUS3 from "HIGH" to "LOW"


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# 5 FT232HP/FT233HP

| FT232HP (56 pin) FT233HP (64 pin) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Pin Number (56 pin - QFN)** | **Pin Number (64 Pin -QFN/ LQFP)** | **Pin Name** | **RESET# Low** | **Default** | **SUSPEND (Pull Down IO Pins in Suspend - Not Set)** | **SUSPEND (Pull Down IO Pins in USB Suspend – Set)** | **During Enumeration (out of reset prior to EEPROM read)** | **Active (device enumerated after EEPROM read)** |
| 23 | 28 | ADBUS0 | TriSt | TXD | Function | TriSt-PD | Output | Function |
| 24 | 29 | ADBUS1 | TriSt - PU | RXD | Function | TriSt-PD | Input-PU | Function |
| 25 | 30 | ADBUS2 | TriSt | RTS# | Function | TriSt-PD | Output | Function |
| 26 | 31 | ADBUS3 | TriSt - PU | CTS# | Function | TriSt-PD | Input-PU | Function |
| 27 | 32 | ADBUS4 | TriSt | DTR# | Function | TriSt-PD | Output | Function |
| 29 | 34 | ADBUS5 | TriSt - PU | DSR# | Function | TriSt-PD | Input-PU | Function |
| 30 | 35 | ADBUS6 | TriSt - PU | DCD# | Function | TriSt-PD | Input-PU | Function |
| 31 | 36 | ADBUS7 | TriSt - PU | RI# | Function | TriSt-PD | Input-PU | Function |
| 32 | 37 | ACBUS0 | TriSt-PU | TriSt-PU | Function/ Selection | TriSt-PD | TriSt-PU | Function/ Selection |
| 33 | 38 | ACBUS1 | TriSt-PU | TriSt-PU | Function/ Selection | TriSt-PD | TriSt- PU | Function/ Selection |
| 34 | 39 | ACBUS2 | TriSt-PU | TriSt-PU | Function/ Selection | TriSt-PD | TriSt- PU | Function/ Selection |
| 35 | 40 | ACBUS3 | TriSt-PU | TriSt-PU | Function/ Selection | TriSt-PD | TriSt- PU | Function/ Selection |
| 37 | 42 | ACBUS4 | TriSt-PU | TriSt-PU | Function/ Selection | TriSt-PD | TriSt- PU | Function/ Selection |
| 38 | 43 | ACBUS5 | TriSt-PU | TriSt-PU | Function/ Selection | TriSt-PD | TriSt- PU | Function/ Selection |
| 39 | 44 | ACBUS6 | TriSt-PU | TriSt-PU | Function/ Selection | TriSt-PD | TriSt- PU | Function/ Selection |
| 42 | 47 | ACBUS7 | TriSt-PD | TriSt-PD | Input-PD or MPSSE | TriSt-PD | TriSt-PD | Input-PD or MPSSE |
| 43 | 48 | ACBUS8 | TriSt-PU | TriSt-PU | Function/ Selection | TriSt-PD | TriSt- PU | Function/ Selection |
| 44 | 49 | ACBUS9 | TriSt-PU | TriSt-PU | Function/ Selection | TriSt-PD | TriSt- PU | Function/ Selection |

**Table 5.1 FT232HP/ FT233HP I/O States**


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## 5.1 FT232HP/FT233HP - Selected Functions

| FT232HP (56 pin) FT233HP (64 pin) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Pin | | | Pin functions (depends on configuration) | | | | | | | | |
| 56 Pin # | 64 Pin # | Pin Name | ASYNC Serial RS232 | 245 FIFO SYNC | 245 FIFO | ASYNC Bit-bang | SYNC Bit-bang | MPSSE | Fast Serial interface | CPU Style FIFO | FT1248 |
| 23 | 28 | ADBUS0 | TXD | D0 | D0 | D0 | D0 | TCK/SK | FSDI | D0 | MIOSI0 |
| 24 | 29 | ADBUS1 | RXD | D1 | D1 | D1 | D1 | TDI/DO | FSCLK | D1 | MIOSI1 |
| 25 | 30 | ADBUS2 | RTS# | D2 | D2 | D2 | D2 | TDO/DI | FSDO | D2 | MIOSI2 |
| 26 | 31 | ADBUS3 | CTS# | D3 | D3 | D3 | D3 | TMS/CS | FSCTS | D3 | MIOSI3 |
| 27 | 32 | ADBUS4 | DTR# | D4 | D4 | D4 | D4 | GPIOL0 | ** TriSt-UP | D4 | MIOSI4 |
| 29 | 34 | ADBUS5 | DSR# | D5 | D5 | D5 | D5 | GPIOL1 | ** TriSt-UP | D5 | MIOSI5 |
| 30 | 35 | ADBUS6 | DCD# | D6 | D6 | D6 | D6 | GPIOL2 | ** TriSt-UP | D6 | MIOSI6 |
| 31 | 36 | ADBUS7 | RI# | D7 | D7 | D7 | D7 | GPIOL3 | ** TriSt-UP | D7 | MIOSI7 |
| 32 | 37 | ACBUS0 | * TXDEN | RXF# | RXF# | ACBUS0 | ACBUS0 | GPIOH0 | ** ACBUS0 | CS# | SCLK |
| 33 | 38 | ACBUS1 | ** ACBUS1 | TXE# | TXE# | WRSTB# | WRSTB # | GPIOH1 | ** ACBUS1 | A0 | SS_N |
| 34 | 39 | ACBUS2 | ** ACBUS2 | RD# | RD# | RDSTB# | RDSTB# | GPIOH2 | ** ACBUS2 | RD# | MISO |
| 35 | 40 | ACBUS3 | * RXLED# | WR | WR | ACBUS3 | ACBUS3 | GPIOH3 | ** ACBUS3 | WR | ACBUS3 |
| 37 | 42 | ACBUS4 | * TXLED# | SIWU # | SIWU# | SIWU# | SIWU# | GPIOH4 | SIWU# | **Note 1** | ACBUS4 |
| 38 | 43 | ACBUS5 | ** ACBUS5 | CLKO UT | ACBUS5 | ** ACBUS5 | ** ACBUS5 | GPIOH5 | ** ACBUS5 | ** ACBUS 5 | ACBUS5 |
| 39 | 44 | ACBUS6 | ** ACBUS6 | OE# | ACBUS6 | ACBUS6 | ACBUS6 | GPIOH6 | ** ACBUS6 | ** ACBUS 6 | ACBUS6 |
| 42 | 47 | ACBUS7 | PWRSAV # | PWRS AV# | PWRSAV # | PWRSAV # | PWRSAV # | *** GPIOH7 | PWRSAV# | PWRS AV# | PWRSAV # |
| 43 | 48 | ACBUS8 | ** ACBUS8 | ** ACBU S8 | ** ACBUS8 | ** ACBUS8 | ** ACBUS8 | ** ACBUS8 | ** ACBUS8 | ** ACBUS 8 | ACBUS8 |
| 44 | 49 | ACBUS9 | ** ACBUS9 | ** ACBU S9 | ** ACBUS9 | ** ACBUS9 | ** ACBUS9 | ** ACBUS9 | ** ACBUS9 | ** ACBUS 9 | ACBUS9 |

**Table 5.2 FT232HP/ FT233HP Selected Functions**

Pins marked * are EEPROM selectable.

Pins marked ** default to tri-stated inputs with an internal 75KΩ (approx.) pull up resistor to VCCIO.

Pin marked *** default to GPIO line with an internal 75KΩ pull down resistor to GND. This pin can be enabled USBVCC mode instead of GPIO mode using the EEPROM.

**Note 1:** To wake up the USB device in this mode, put ACBUS0 from "HIGH" to "LOW", set ACBUS1 To "HIGH", and put ACBUS3 from "HIGH" to "LOW"


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# 6 FT2232H/FT2232H-56Q

## 6.1 FT2232H/FT2232H-56Q – Channel A Pins

| FT2232H Channel A | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Pin Number (56 pin - VQFN)** | **Pin Number (64 Pin - QFN/ LQFP)** | **Pin Name** | **RESET# Low** | **Default** | **SUSPEND (Pull Down IO Pins in Suspend - Not Set)** | **SUSPEND (Pull Down IO Pins in USB Suspend – Set)** | **During Enumeration (out of reset prior to EEPROM read)** | **Active (device enumerated after EEPROM read)** |
| 12 | 16 | ADBUS0 | TriSt | TXD | Function | TriSt-PD | TXD | Function |
| 13 | 17 | ADBUS1 | TriSt-PU | RXD | Function | TriSt-PD | RXD | Function |
| 14 | 18 | ADBUS2 | TriSt | RTS# | Function | TriSt-PD | RTS# | Function |
| 15 | 19 | ADBUS3 | TriSt-PU | CTS# | Function | TriSt-PD | CTS# | Function |
| 17 | 21 | ADBUS4 | TriSt | DTR# | Function | TriSt-PD | DTR# | Function |
| 18 | 22 | ADBUS5 | TriSt-PU | DSR# | Function | TriSt-PD | DSR# | Function |
| 19 | 23 | ADBUS6 | TriSt-PU | DCD# | Function | TriSt-PD | DCD# | Function |
| 20 | 24 | ADBUS7 | TriSt-PU | RI# | Function | TriSt-PD | RI# | Function |
| 22 | 26 | ACBUS0 | TriSt | TXDEN | Function | TriSt-PD | TXDEN | Function |
| 23 | 27 | ACBUS1 | TriSt-PU | TriSt-PU | Function | TriSt-PD | TriSt-PU | Function |
| 24 | 28 | ACBUS2 | TriSt-PU | TriSt-PU | Function | TriSt-PD | TriSt-PU | Function |
| 25 | 29 | ACBUS3 | TriSt-PU | RXLED# | Function | TriSt-PD | TriSt-PU | Function |
| 26 | 30 | ACBUS4 | TriSt-PU | TXLED# | Function | TriSt-PD | TriSt-PU | Function |
| 27 | 32 | ACBUS5 | TriSt-PU | TriSt-PU | Function | TriSt-PD | TriSt-PU | Function |
| 28 | 33 | ACBUS6 | TriSt-PU | TriSt-PU | Function | TriSt-PD | TriSt-PU | Function |
| 29 | 34 | ACBUS7 | TriSt-PU | TriSt-PU | Function | TriSt-PD | TriSt-PU | Function |

**Table 6.1 FT2232H(-56Q) I/O States Channel A**


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## 6.2 FT2232H/FT2232H-56Q – Channel B Pins

| FT2232H Channel B | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Pin Number (56 Pin - VQFN)** | **Pin Number (64 Pin - QFN/ LQFP)** | **Pin Name** | **RESET# Low** | **Default** | **SUSPEND (Pull Down IO Pins in Suspend - Not Set)** | **SUSPEND (Pull Down IO Pins in USB Suspend – Set)** | **During Enumeration (out of reset prior to EEPROM read)** | **Active (device enumerated after EEPROM read)** |
| 32 | 38 | BDBUS0 | TriSt | TXD | Function | TriSt-PD | TXD | Function |
| 33 | 39 | BDBUS1 | TriSt-PU | RXD | Function | TriSt-PD | RXD | Function |
| 34 | 40 | BDBUS2 | TriSt | RTS# | Function | TriSt-PD | RTS# | Function |
| 35 | 41 | BDBUS3 | TriSt-PU | CTS# | Function | TriSt-PD | CTS# | Function |
| 37 | 43 | BDBUS4 | TriSt | DTR# | Function | TriSt-PD | DTR# | Function |
| 38 | 44 | BDBUS5 | TriSt-PU | DSR# | Function | TriSt-PD | DSR# | Function |
| 39 | 45 | BDBUS6 | TriSt-PU | DCD# | Function | TriSt-PD | DCD# | Function |
| 40 | 46 | BDBUS7 | TriSt-PU | RI# | Function | TriSt-PD | RI# | Function |
| 42 | 48 | BCBUS0 | TriSt | TXDEN | Function | TriSt-PD | TXDEN | Function |
| 46 | 52 | BCBUS1 | TriSt-PU | TriSt-PU | Function | TriSt-PD | TriSt-PU | Function |
| 47 | 53 | BCBUS2 | TriSt-PU | TriSt-PU | Function | TriSt-PD | TriSt-PU | Function |
| 48 | 54 | BCBUS3 | TriSt-PU | TriSt-PU | Function | TriSt-PD | TriSt-PU | Function |
| 49 | 55 | BCBUS4 | TriSt-PU | TriSt-PU | Function | TriSt-PD | TriSt-PU | Function |
| 51 | 57 | BCBUS5 | TriSt-PU | TriSt-PU | Function | TriSt-PD | TriSt-PU | Function |
| 52 | 58 | BCBUS6 | TriSt-PU | TriSt-PU | Function | TriSt-PD | TriSt-PU | Function |
| 53 | 59 | BCBUS7 | TriSt-PD | TriSt-PD | Function | TriSt-PD | TriSt-PD | Function |

**Table 6.2 FT2232H(-56Q) I/O States Channel B**


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## 6.3 FT2232H / FT2232H -56Q - Selected Functions

| FT2232H | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Pin | | | Pin functions (depends on configuration) | | | | | | | | |
| 56 Pin # | 64 Pin # | Pin Name | ASYNC Serial (RS232) | 245 FIFO SYNC | 245 FIFO | ASYNC Bit-bang | SYNC Bit-bang | MPSSE | Fast Serial interface | CPU Style FIFO | Host Bus Emulation |
| Channel A | | | | | | | | | | | |
| 12 | 16 | ADBUS0 | TXD | D0 | D0 | D0 | D0 | TCK/SK | USES CHANNEL B | D0 | AD0 |
| 13 | 17 | ADBUS1 | RXD | D1 | D1 | D1 | D1 | TDI/DO | | D1 | AD1 |
| 14 | 18 | ADBUS2 | RTS# | D2 | D2 | D2 | D2 | TDO/DI | | D2 | AD2 |
| 15 | 19 | ADBUS3 | CTS# | D3 | D3 | D3 | D3 | TMS/CS | | D3 | AD3 |
| 17 | 21 | ADBUS4 | DTR# | D4 | D4 | D4 | D4 | GPIOL0 | | D4 | AD4 |
| 18 | 22 | ADBUS5 | DSR# | D5 | D5 | D5 | D5 | GPIOL1 | | D5 | AD5 |
| 19 | 23 | ADBUS6 | DCD# | D6 | D6 | D6 | D6 | GPIOL2 | | D6 | AD6 |
| 20 | 24 | ADBUS7 | RI# | D7 | D7 | D7 | D7 | GPIOL3 | | D7 | AD7 |
| 22 | 26 | ACBUS0 | TXDEN | RXF# | RXF# | ** | ** | GPIOH0 | | CS# | A8 |
| 23 | 27 | ACBUS1 | ** | TXE# | TXE# | WRSTB# | WRSTB# | GPIOH1 | | A0 | A9 |
| 24 | 28 | ACBUS2 | ** | RD# | RD# | RDSTB# | RDSTB# | GPIOH2 | | RD# | A10 |
| 25 | 29 | ACBUS3 | RXLED# | WR# | WR# | ** | ** | GPIOH3 | | WR# | A11 |
| 26 | 30 | ACBUS4 | TXLED# | SIWUA | SIWUA | SIWUA | SIWUA | GPIOH4 | | SIWUA | A12 |
| 27 | 32 | ACBUS5 | ** | CLKOUT | ** | ** | ** | GPIOH5 | | ** | A13 |
| 28 | 33 | ACBUS6 | ** | OE# | ** | ** | ** | GPIOH6 | | ** | A14 |
| 29 | 34 | ACBUS7 | ** | ** | ** | ** | ** | GPIOH7 | | ** | A15 |
| Channel B | | | | | | | | | | | |
| 32 | 38 | BDBUS0 | TXD | | D0 | D0 | D0 | TCK/SK | FSDI | D0 | CS# |
| 33 | 39 | BDBUS1 | RXD | | D1 | D1 | D1 | TDI/DO | FSCLK | D1 | ALE |
| 34 | 40 | BDBUS2 | RTS# | | D2 | D2 | D2 | TDO/DI | FSDO | D2 | RD# |
| 35 | 41 | BDBUS3 | CTS# | | D3 | D3 | D3 | TMS/CS | FSCTS | D3 | WR# |
| 37 | 43 | BDBUS4 | DTR# | | D4 | D4 | D4 | GPIOL0 | | D4 | IORDY |
| 38 | 44 | BDBUS5 | DSR# | | D5 | D5 | D5 | GPIOL1 | | D5 | CLKOUT |
| 39 | 45 | BDBUS6 | DCD# | | D6 | D6 | D6 | GPIOL2 | | D6 | I/O0 |
| 40 | 46 | BDBUS7 | RI# | | D7 | D7 | D7 | GPIOL3 | | D7 | I/O1 |
| 42 | 48 | BCBUS0 | TXDEN | | RXF# | ** | ** | GPIOH0 | | CS# | ** |
| 46 | 52 | BCBUS1 | ** | | TXE# | WRSTB# | WRSTB# | GPIOH1 | | A0 | ** |
| 47 | 53 | BCBUS2 | ** | | RD# | RDSTB# | RDSTB# | GPIOH2 | | RD# | ** |
| 48 | 54 | BCBUS3 | RXLED# | | WR# | ** | ** | GPIOH3 | | WR# | ** |
| 49 | 55 | BCBUS4 | TXLED# | | SIWUB | SIWUB | SIWUB | GPIOH4 | SIWUB | SIWUB | ** |
| 51 | 57 | BCBUS5 | ** | | ** | ** | ** | GPIOH5 | | ** | ** |
| 52 | 58 | BCBUS6 | ** | | ** | ** | ** | GPIOH6 | | ** | ** |
| 53 | 59 | BCBUS7 | PWRSAV# | PWRSAV# | PWRSAV# | PWRSAV# | PWRSAV# | GPIOH7 | PWRSAV# | PWRSAV# | PWRSAV# |

**Table 6.3 FT2232H(-56Q) Selected Functions**

Pins marked ** default to tri-stated inputs with an internal 75KΩ (approx.) pull up resistor to VCCIO.


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# 7 FT2232HP / FT2233HP

## 7.1 FT2232HP / FT2233HP - Channel A pins

| FT2232HP (68 pin) FT2233HP (76 pin/80 pin) Channel A | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Pin Number | | | Pin Name | RESET# Low | Default | SUSPEND (Pull Down IO Pins in Suspend - Not Set) | SUSPEND (Pull Down IO Pins in USB Suspend – Set) | During Enumeration (out of reset prior to EEPROM read) | Active (device enumerated after EEPROM read) |
| 68 Pin # | 76 Pin # | 80 Pin # | | | | | | | |
| 6 | 8 | 8 | ADBUS0 | TriSt | TXD | Function | TriSt-PD | TXD | Function |
| 7 | 9 | 9 | ADBUS1 | TriSt-PU | RXD | Function | TriSt-PD | RXD | Function |
| 11 | 13 | 13 | ADBUS2 | TriSt | RTS# | Function | TriSt-PD | RTS# | Function |
| 12 | 14 | 14 | ADBUS3 | TriSt-PU | CTS# | Function | TriSt-PD | CTS# | Function |
| 13 | 15 | 15 | ADBUS4 | TriSt | DTR# | Function | TriSt-PD | DTR# | Function |
| 14 | 16 | 16 | ADBUS5 | TriSt-PU | DSR# | Function | TriSt-PD | DSR# | Function |
| 15 | 17 | 17 | ADBUS6 | TriSt-PU | DCD# | Function | TriSt-PD | DCD# | Function |
| 16 | 18 | 18 | ADBUS7 | TriSt-PU | RI# | Function | TriSt-PD | RI# | Function |
| 17 | 19 | 19 | ACBUS0 | TriSt | TXDEN | Function | TriSt-PD | TXDEN | Function |
| 18 | 20 | 21 | ACBUS1 | TriSt-PU | TriSt-PU | Function | TriSt-PD | TriSt-PU | Function |
| 19 | 21 | 22 | ACBUS2 | TriSt-PU | TriSt-PU | Function | TriSt-PD | TriSt-PU | Function |
| 20 | 22 | 23 | ACBUS3 | TriSt-PU | RXLED# | Function | TriSt-PD | TriSt-PU | Function |
| 21 | 23 | 24 | ACBUS4 | TriSt-PU | TXLED# | Function | TriSt-PD | TriSt-PU | Function |
| 22 | 24 | 25 | ACBUS5 | TriSt-PU | TriSt-PU | Function | TriSt-PD | TriSt-PU | Function |
| 23 | 25 | 26 | ACBUS6 | TriSt-PU | TriSt-PU | Function | TriSt-PD | TriSt-PU | Function |
| 24 | 26 | 27 | ACBUS7 | TriSt-PU | TriSt-PU | Function | TriSt-PD | TriSt-PU | Function |

**Table 7.1 FT2232HP / FT2233HP I/O States Channel A**


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## 7.2 FT2232HP / FT2233HP - Channel B pins

| FT2232HP (68 pin) FT2233HP (76 pin / 80 pin) Channel B | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Pin Number | | | Pin Name | RESET# Low | Default | SUSPEND (Pull Down IO Pins in Suspend - Not Set) | SUSPEND (Pull Down IO Pins in USB Suspend – Set) | During Enumeration (out of reset prior to EEPROM read) | Active (device enumerated after EEPROM read) |
| 68 Pin # | 76 Pin # | 80 Pin # | | | | | | | |
| 34 | 36 | 37 | BDBUS0 | TriSt | TXD | Function | TriSt-PD | TXD | Function |
| 35 | 37 | 38 | BDBUS1 | TriSt-PU | RXD | Function | TriSt-PD | RXD | Function |
| 36 | 38 | 39 | BDBUS2 | TriSt | RTS# | Function | TriSt-PD | RTS# | Function |
| 37 | 39 | 40 | BDBUS3 | TriSt-PU | CTS# | Function | TriSt-PD | CTS# | Function |
| 38 | 40 | 41 | BDBUS4 | TriSt | DTR# | Function | TriSt-PD | DTR# | Function |
| 40 | 42 | 43 | BDBUS5 | TriSt-PU | DSR# | Function | TriSt-PD | DSR# | Function |
| 41 | 42 | 44 | BDBUS6 | TriSt-PU | DCD# | Function | TriSt-PD | DCD# | Function |
| 42 | 44 | 45 | BDBUS7 | TriSt-PU | RI# | Function | TriSt-PD | RI# | Function |
| 45 | 48 | 50 | BCBUS0 | TriSt | TXDEN | Function | TriSt-PD | TXDEN | Function |
| 46 | 49 | 51 | BCBUS1 | TriSt-PU | TriSt-PU | Function | TriSt-PD | TriSt-PU | Function |
| 47 | 50 | 52 | BCBUS2 | TriSt-PU | TriSt-PU | Function | TriSt-PD | TriSt-PU | Function |
| 48 | 51 | 53 | BCBUS3 | TriSt-PU | RXLED# | Function | TriSt-PD | TriSt-PU | Function |
| 49 | 52 | 54 | BCBUS4 | TriSt-PU | TXLED# | Function | TriSt-PD | TriSt-PU | Function |
| 50 | 53 | 55 | BCBUS5 | TriSt-PU | TriSt-PU | Function | TriSt-PD | TriSt-PU | Function |
| 52 | 56 | 58 | BCBUS6 | TriSt-PU | TriSt-PU | Function | TriSt-PD | TriSt-PU | Function |
| 53 | 57 | 59 | BCBUS7 | TriSt-PD | TriSt-PD | Function | TriSt-PD | TriSt-PD | Function |

**Table 7.2 FT2232HP / FT2233HP I/O States Channel B**


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## 7.3 FT2232HP / FT2233HP – Selected Functions

| FT2232HP (68 pin) FT2233HP (76 pin/80 pin) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pin | | | | Pin functions (depends on configuration) | | | | | | | | |
| 68 Pin # | 76 Pin # | 80 Pin # | Pin Name | ASYNC Serial (RS232) | 245 FIFO SYNC | 245 FIFO | ASYNC Bit-bang | SYNC Bit-bang | MPSSE | Fast Serial interface | CPU Style FIFO | Host Bus Emulation |
| Channel A | | | | | | | | | | | | |
| 6 | 8 | 8 | ADBUS0 | TXD | D0 | D0 | D0 | D0 | TCK/SK | USES CHANNEL B | D0 | AD0 |
| 7 | 9 | 9 | ADBUS1 | RXD | D1 | D1 | D1 | D1 | TDI/DO | | D1 | AD1 |
| 11 | 13 | 13 | ADBUS2 | RTS# | D2 | D2 | D2 | D2 | TDO/DI | | D2 | AD2 |
| 12 | 14 | 14 | ADBUS3 | CTS# | D3 | D3 | D3 | D3 | TMS/CS | | D3 | AD3 |
| 13 | 15 | 15 | ADBUS4 | DTR# | D4 | D4 | D4 | D4 | GPIOL0 | | D4 | AD4 |
| 14 | 16 | 16 | ADBUS5 | DSR# | D5 | D5 | D5 | D5 | GPIOL1 | | D5 | AD5 |
| 15 | 17 | 17 | ADBUS6 | DCD# | D6 | D6 | D6 | D6 | GPIOL2 | | D6 | AD6 |
| 16 | 18 | 18 | ADBUS7 | RI# | D7 | D7 | D7 | D7 | GPIOL3 | | D7 | AD7 |
| 17 | 19 | 19 | ACBUS0 | TXDEN | RXF# | RXF# | ** | ** | GPIOH0 | | CS# | A8 |
| 18 | 20 | 21 | ACBUS1 | ** | TXE# | TXE# | WRSTB# | WRSTB# | GPIOH1 | | A0 | A9 |
| 19 | 21 | 22 | ACBUS2 | ** | RD# | RD# | RDSTB# | RDSTB# | GPIOH2 | | RD# | A10 |
| 20 | 22 | 23 | ACBUS3 | RXLED# | WR# | WR# | ** | ** | GPIOH3 | | WR# | A11 |
| 21 | 23 | 24 | ACBUS4 | TXLED# | SIWUA | SIWUA | SIWUA | SIWUA | GPIOH4 | | SIWUA | A12 |
| 22 | 24 | 25 | ACBUS5 | ** | CLKOUT | ** | ** | ** | GPIOH5 | | ** | A13 |
| 23 | 25 | 26 | ACBUS6 | ** | OE# | ** | ** | ** | GPIOH6 | | ** | A14 |
| 24 | 26 | 27 | ACBUS7 | ** | ** | ** | ** | ** | GPIOH7 | | ** | A15 |
| Channel B | | | | | | | | | | | | |
| 34 | 36 | 37 | BDBUS0 | TXD | | D0 | D0 | D0 | TCK/SK | FSDI | D0 | CS# |
| 35 | 37 | 38 | BDBUS1 | RXD | | D1 | D1 | D1 | TDI/DO | FSCLK | D1 | ALE |
| 36 | 38 | 39 | BDBUS2 | RTS# | | D2 | D2 | D2 | TDO/DI | FSDO | D2 | RD# |
| 37 | 39 | 40 | BDBUS3 | CTS# | | D3 | D3 | D3 | TMS/CS | FSCTS | D3 | WR# |
| 38 | 40 | 41 | BDBUS4 | DTR# | | D4 | D4 | D4 | GPIOL0 | | D4 | IORDY |
| 40 | 42 | 43 | BDBUS5 | DSR# | | D5 | D5 | D5 | GPIOL1 | | D5 | CLKOUT |
| 41 | 42 | 44 | BDBUS6 | DCD# | | D6 | D6 | D6 | GPIOL2 | | D6 | I/O0 |
| 42 | 44 | 45 | BDBUS7 | RI# | | D7 | D7 | D7 | GPIOL3 | | D7 | I/O1 |
| 45 | 48 | 50 | BCBUS0 | TXDEN | | RXF# | ** | ** | GPIOH0 | | CS# | ** |
| 46 | 49 | 51 | BCBUS1 | ** | | TXE# | WRSTB# | WRSTB# | GPIOH1 | | A0 | ** |
| 47 | 50 | 52 | BCBUS2 | ** | | RD# | RDSTB# | RDSTB# | GPIOH2 | | RD# | ** |
| 48 | 51 | 53 | BCBUS3 | RXLED# | | WR# | ** | ** | GPIOH3 | | WR# | ** |
| 49 | 52 | 54 | BCBUS4 | TXLED# | | SIWUB | SIWUB | SIWUB | GPIOH4 | SIWUB | SIWUB | ** |
| 50 | 53 | 55 | BCBUS5 | ** | | ** | ** | ** | GPIOH5 | | ** | ** |
| 52 | 56 | 58 | BCBUS6 | ** | | ** | ** | ** | GPIOH6 | | ** | ** |
| 53 | 57 | 59 | BCBUS7 | PWRSAV# | PWRSAV# | PWRSAV# | PWRSAV# | PWRSAV# | GPIOH7 | PWRSAV# | PWRSAV# | PWRSAV# |

**Table 7.3 FT2232HP / FT2233HP Selected Functions**

Pins marked ** default to tri-stated inputs with an internal 75KΩ (approx.) pull up resistor to VCCIO.


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# 8 FT4232H / FT4232H -56Q

## 8.1 FT4232H / FT4232H -56Q – Channel A Pins

| FT4232H Channel A | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Pin Number (56 Pin - VQFN)** | **Pin Number (64 Pin - QFN/ LQFP)** | **Pin Name** | **RESET# Low** | **Default** | **SUSPEND (Pull Down IO Pins in Suspend - Not Set)** | **SUSPEND (Pull Down IO Pins in USB Suspend – Set)** | **During Enumeration (out of reset prior to EEPROM read)** | **Active (device enumerated after EEPROM read)** |
| 12 | 16 | ADBUS0 | TriSt-PU | TXD | TXD | TriSt-PD | TXD | TXD |
| 13 | 17 | ADBUS1 | TriSt-PU | RXD | RXD | TriSt-PD | RXD | RXD |
| 14 | 18 | ADBUS2 | TriSt-PU | RTS# | RTS# | TriSt-PD | RTS# | RTS# |
| 15 | 19 | ADBUS3 | TriSt-PU | CTS# | CTS# | TriSt-PD | CTS# | CTS# |
| 17 | 21 | ADBUS4 | TriSt-PU | DTR# | DTR# | TriSt-PD | DTR# | DTR# |
| 18 | 22 | ADBUS5 | TriSt-PU | DSR# | DSR# | TriSt-PD | DSR# | DSR# |
| 19 | 23 | ADBUS6 | TriSt-PU | DCD# | DCD# | TriSt-PD | DCD# | DCD# |
| 20 | 24 | ADBUS7 | TriSt-PU | RI# | Selection | TriSt-PD | RI# | Selection |

**Table 8.1 FT4232H(-56Q) I/O States Channel A**

## 8.2 FT4232H / FT4232H -56Q – Channel B Pins

| FT4232H Channel B | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Pin Number (56 Pin - VQFN)** | **Pin Number (64 Pin - QFN/ LQFP)** | **Pin Name** | **RESET# Low** | **Default** | **SUSPEND (Pull Down IO Pins in Suspend - Not Set)** | **SUSPEND (Pull Down IO Pins in USB Suspend – Set)** | **During Enumeration (out of reset prior to EEPROM read)** | **Active (device enumerated after EEPROM read)** |
| 22 | 26 | BDBUS0 | TriSt-PU | TXD | TXD | TriSt-PD | TXD | TXD |
| 23 | 27 | BDBUS1 | TriSt-PU | RXD | RXD | TriSt-PD | RXD | RXD |
| 24 | 28 | BDBUS2 | TriSt-PU | RTS# | RTS# | TriSt-PD | RTS# | RTS# |
| 25 | 29 | BDBUS3 | TriSt-PU | CTS# | CTS# | TriSt-PD | CTS# | CTS# |
| 26 | 30 | BDBUS4 | TriSt-PU | DTR# | DTR# | TriSt-PD | DTR# | DTR# |
| 27 | 32 | BDBUS5 | TriSt-PU | DSR# | DSR# | TriSt-PD | DSR# | DSR# |
| 28 | 33 | BDBUS6 | TriSt-PU | DCD# | DCD# | TriSt-PD | DCD# | DCD# |
| 29 | 34 | BDBUS7 | TriSt-PU | RI# | Selection | TriSt-PD | RI# | Selection |

**Table 8.2 FT4232H(-56Q) I/O States Channel B**


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## 8.3 FT4232H / FT4232H -56Q – Channel C Pins

| FT4232H Channel C | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Pin Number (56 Pin - VQFN)** | **Pin Number (64 Pin - QFN/ LQFP)** | **Pin Name** | **RESET# Low** | **Default** | **SUSPEND (Pull Down IO Pins in Suspend - Not Set)** | **SUSPEND (Pull Down IO Pins in USB Suspend – Set)** | **During Enumeration (out of reset prior to EEPROM read)** | **Active (device enumerated after EEPROM read)** |
| 32 | 38 | CDBUS0 | TriSt-PU | TXD | TXD | TriSt-PD | TXD | TXD |
| 33 | 39 | CDBUS1 | TriSt-PU | RXD | RXD | TriSt-PD | RXD | RXD |
| 34 | 40 | CDBUS2 | TriSt-PU | RTS# | RTS# | TriSt-PD | RTS# | RTS# |
| 35 | 41 | CDBUS3 | TriSt-PU | CTS# | CTS# | TriSt-PD | CTS# | CTS# |
| 37 | 43 | CDBUS4 | TriSt-PU | DTR# | DTR# | TriSt-PD | DTR# | DTR# |
| 38 | 44 | CDBUS5 | TriSt-PU | DSR# | DSR# | TriSt-PD | DSR# | DSR# |
| 39 | 45 | CDBUS6 | TriSt-PU | DCD# | DCD# | TriSt-PD | DCD# | DCD# |
| 40 | 46 | CDBUS7 | TriSt-PU | RI# | Selection | TriSt-PD | RI# | Selection |

**Table 8.3 FT4232H(-56Q) I/O States Channel C**

## 8.4 FT4232H / FT4232H -56Q – Channel D Pins

| FT4232H Channel D | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Pin Number (56 Pin - VQFN)** | **Pin Number (64 Pin - QFN/ LQFP)** | **Pin Name** | **RESET# Low** | **Default** | **SUSPEND (Pull Down IO Pins in Suspend - Not Set)** | **SUSPEND (Pull Down IO Pins in USB Suspend – Set)** | **During Enumeration (out of reset prior to EEPROM read)** | **Active (device enumerated after EEPROM read)** |
| 42 | 48 | DDBUS0 | TriSt-PU | TXD | TXD | TriSt-PD | TXD | TXD |
| 46 | 52 | DDBUS1 | TriSt-PU | RXD | RXD | TriSt-PD | RXD | RXD |
| 47 | 53 | DDBUS2 | TriSt-PU | RTS# | RTS# | TriSt-PD | RTS# | RTS# |
| 48 | 54 | DDBUS3 | TriSt-PU | CTS# | CTS# | TriSt-PD | CTS# | CTS# |
| 49 | 55 | DDBUS4 | TriSt-PU | DTR# | DTR# | TriSt-PD | DTR# | DTR# |
| 51 | 57 | DDBUS5 | TriSt-PU | DSR# | DSR# | TriSt-PD | DSR# | DSR# |
| 52 | 58 | DDBUS6 | TriSt-PU | DCD# | DCD# | TriSt-PD | DCD# | DCD# |
| 53 | 59 | DDBUS7 | TriSt-PD | RI# | Selection | TriSt-PD | RI# | Selection |

**Table 8.4 FT4232H(-56Q) I/O States Channel D**


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## 8.5 FT4232H / FT4232H -56Q - Selected Functions

| FT4232H | | | | | | |
|---|---|---|---|---|---|---|
| Pins | | | Pin functions (depend on configuration) | | | |
| 56 Pin # | 64 Pin # | Pin Name | ASYNC Serial (RS232) | ASYNC Bit-bang | SYNC Bit-bang | MPSSE |
| Channel A | | | | | | |
| 12 | 16 | ADBUS0 | TXD | D0 | D0 | TCK/SK |
| 13 | 17 | ADBUS1 | RXD | D1 | D1 | TDI/DO |
| 14 | 18 | ADBUS2 | RTS# | D2 | D2 | TDO/DI |
| 15 | 19 | ADBUS3 | CTS# | D3 | D3 | TMS/CS |
| 17 | 21 | ADBUS4 | DTR# | D4 | D4 | GPIOL0 |
| 18 | 22 | ADBUS5 | DSR# | D5 | D5 | GPIOL1 |
| 19 | 23 | ADBUS6 | DCD# | D6 | D6 | GPIOL2 |
| 20 | 24 | ADBUS7 | RI#/ TXDEN* | D7 | D7 | GPIOL3 |
| Channel B | | | | | | |
| 22 | 26 | BDBUS0 | TXD | D0 | D0 | TCK/SK |
| 23 | 27 | BDBUS1 | RXD | D1 | D1 | TDI/DO |
| 24 | 28 | BDBUS2 | RTS# | D2 | D2 | TDO/DI |
| 25 | 29 | BDBUS3 | CTS# | D3 | D3 | TMS/CS |
| 26 | 30 | BDBUS4 | DTR# | D4 | D4 | GPIOL0 |
| 27 | 32 | BDBUS5 | DSR# | D5 | D5 | GPIOL1 |
| 28 | 33 | BDBUS6 | DCD# | D6 | D6 | GPIOL2 |
| 29 | 34 | BDBUS7 | RI#/ TXDEN* | D7 | D7 | GPIOL3 |
| Channel C | | | | | | |
| 32 | 38 | CDBUS0 | TXD | D0 | D0 | RS232 or Bit-Bang interface |
| 33 | 39 | CDBUS1 | RXD | D1 | D1 | RS232 or Bit-Bang interface |
| 34 | 40 | CDBUS2 | RTS# | D2 | D2 | RS232 or Bit-Bang interface |
| 35 | 41 | CDBUS3 | CTS# | D3 | D3 | RS232 or Bit-Bang interface |
| 37 | 43 | CDBUS4 | DTR# | D4 | D4 | RS232 or Bit-Bang interface |
| 38 | 44 | CDBUS5 | DSR# | D5 | D5 | RS232 or Bit-Bang interface |
| 39 | 45 | CDBUS6 | DCD# | D6 | D6 | RS232 or Bit-Bang interface |
| 40 | 46 | CDBUS7 | RI#/ TXDEN* | D7 | D7 | RS232 or Bit-Bang interface |
| Channel D | | | | | | |
| 42 | 48 | DDBUS0 | TXD | D0 | D0 | RS232 or Bit-Bang interface |
| 46 | 52 | DDBUS1 | RXD | D1 | D1 | RS232 or Bit-Bang interface |
| 47 | 53 | DDBUS2 | RTS# | D2 | D2 | RS232 or Bit-Bang interface |
| 48 | 54 | DDBUS3 | CTS# | D3 | D3 | RS232 or Bit-Bang interface |
| 49 | 55 | DDBUS4 | DTR# | D4 | D4 | RS232 or Bit-Bang interface |
| 51 | 57 | DDBUS5 | DSR# | D5 | D5 | RS232 or Bit-Bang interface |
| 52 | 58 | DDBUS6 | DCD# | D6 | D6 | RS232 or Bit-Bang interface |
| 53 | 59 | DDBUS7 | RI#/ TXDEN* | D7 | D7 | RS232 or Bit-Bang interface |

**Table 8.5 FT4232H(-56Q) Selected Functions**

Pins marked * are EEPROM selectable.


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# 9 FT4232HP / FT4233HP

## 9.1 FT4232HP / FT4233HP – Channel A Pins

| FT4232HP (68 pin) FT4233HP (76 pin / 80 pin) Channel A | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Pin Number | | | Pin Name | RESET# Low | Default | SUSPEND (Pull Down IO Pins in Suspend - Not Set) | SUSPEND (Pull Down IO Pins in USB Suspend – Set) | During Enumeration (out of reset prior to EEPROM read) | Active (device enumerated after EEPROM read) |
| 68 Pin # | 76 Pin # | 80 Pin # | | | | | | | |
| 6 | 8 | 8 | ADBUS0 | TriSt | TXD | Function | TriSt-PD | TXD | Function |
| 7 | 9 | 9 | ADBUS1 | TriSt-PU | RXD | Function | TriSt-PD | RXD | Function |
| 11 | 13 | 13 | ADBUS2 | TriSt | RTS# | Function | TriSt-PD | RTS# | Function |
| 12 | 14 | 14 | ADBUS3 | TriSt-PU | CTS# | Function | TriSt-PD | CTS# | Function |
| 13 | 15 | 15 | ADBUS4 | TriSt | DTR# | Function | TriSt-PD | DTR# | Function |
| 14 | 16 | 16 | ADBUS5 | TriSt-PU | DSR# | Function | TriSt-PD | DSR# | Function |
| 15 | 17 | 17 | ADBUS6 | TriSt-PU | DCD# | Function | TriSt-PD | DCD# | Function |
| 16 | 18 | 18 | ADBUS7 | TriSt-PU | RI# | Function | TriSt-PD | RI# | Function |

**Table 9.1 FT4232HP / FT4233HP I/O States Channel A**

## 9.2 FT4232HP / FT4233HP – Channel B Pins

| FT4232HP (68 pin) FT4233HP (76 pin / 80 pin) Channel B | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Pin Number | | | Pin Name | RESET# Low | Default | SUSPEND (Pull Down IO Pins in Suspend - Not Set) | SUSPEND (Pull Down IO Pins in USB Suspend – Set) | During Enumeration (out of reset prior to EEPROM read) | Active (device enumerated after EEPROM read) |
| 68 Pin # | 76 Pin # | 80 Pin # | | | | | | | |
| 17 | 19 | 19 | BDBUS0 | TriSt | TXD | Function | TriSt-PD | TXD | Function |
| 18 | 20 | 21 | BDBUS1 | TriSt-PU | RXD | Function | TriSt-PD | RXD | Function |
| 19 | 21 | 22 | BDBUS2 | TriSt-PU | RTS# | Function | TriSt-PD | RTS# | Function |
| 20 | 22 | 23 | BDBUS3 | TriSt-PU | CTS# | Function | TriSt-PD | CTS# | Function |
| 21 | 23 | 24 | BDBUS4 | TriSt-PU | DTR# | Function | TriSt-PD | DTR# | Function |
| 22 | 24 | 25 | BDBUS5 | TriSt-PU | DSR# | Function | TriSt-PD | DSR# | Function |
| 23 | 25 | 26 | BDBUS6 | TriSt-PU | DCD# | Function | TriSt-PD | DCD# | Function |
| 24 | 26 | 27 | BDBUS7 | TriSt-PU | RI# | Function | TriSt-PD | RI# | Function |

**Table 9.2 FT4232HP / FT4233HP I/O States Channel B**


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## 9.3 FT4232HP / FT4233HP – Channel C Pins

| FT4232HP (68 pin) FT4233HP (76 pin / 80 pin) Channel C | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Pin Number | | | Pin Name | RESET# Low | Default | SUSPEND (Pull Down IO Pins in Suspend - Not Set) | SUSPEND (Pull Down IO Pins in USB Suspend – Set) | During Enumeration (out of reset prior to EEPROM read) | Active (device enumerated after EEPROM read) |
| 68 Pin # | 76 Pin # | 80 Pin # | | | | | | | |
| 34 | 36 | 37 | CDBUS0 | TriSt | TXD | Function | TriSt-PD | TXD | Function |
| 35 | 37 | 38 | CDBUS1 | TriSt-PU | RXD | Function | TriSt-PD | RXD | Function |
| 36 | 38 | 39 | CDBUS2 | TriSt | RTS# | Function | TriSt-PD | RTS# | Function |
| 37 | 39 | 40 | CDBUS3 | TriSt-PU | CTS# | Function | TriSt-PD | CTS# | Function |
| 38 | 40 | 41 | CDBUS4 | TriSt | DTR# | Function | TriSt-PD | DTR# | Function |
| 40 | 42 | 43 | CDBUS5 | TriSt-PU | DSR# | Function | TriSt-PD | DSR# | Function |
| 41 | 43 | 44 | CDBUS6 | TriSt-PU | DCD# | Function | TriSt-PD | DCD# | Function |
| 42 | 44 | 45 | CDBUS7 | TriSt-PU | RI# | Function | TriSt-PD | RI# | Function |

**Table 9.3 FT4232HP / FT4233HP I/O States Channel C**

## 9.4 FT4232HP / FT4233HP – Channel D Pins

| FT4232HP (68 pin) FT4233HP (76 pin / 80 pin) Channel D | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Pin Number | | | Pin Name | RESET# Low | Default | SUSPEND (Pull Down IO Pins in Suspend - Not Set) | SUSPEND (Pull Down IO Pins in USB Suspend – Set) | During Enumeration (out of reset prior to EEPROM read) | Active (device enumerated after EEPROM read) |
| 68 Pin # | 76 Pin # | 80 Pin # | | | | | | | |
| 45 | 48 | 50 | DDBUS0 | TriSt | TXD | Function | TriSt-PD | TXD | Function |
| 46 | 49 | 51 | DDBUS1 | TriSt-PU | RXD | Function | TriSt-PD | RXD | Function |
| 47 | 50 | 52 | DDBUS2 | TriSt-PU | RTS# | Function | TriSt-PD | RTS# | Function |
| 48 | 51 | 53 | DDBUS3 | TriSt-PU | CTS# | Function | TriSt-PD | CTS# | Function |
| 49 | 52 | 54 | DDBUS4 | TriSt-PU | DTR# | Function | TriSt-PD | DTR# | Function |
| 50 | 53 | 55 | DDBUS5 | TriSt-PU | DSR# | Function | TriSt-PD | DSR# | Function |
| 51 | 56 | 58 | DDBUS6 | TriSt-PU | DCD# | Function | TriSt-PD | DCD# | Function |
| 52 | 57 | 59 | DDBUS7 | TriSt-PU | RI# | Function | TriSt-PD | RI# | Function |

**Table 9.4 FT4232HP / FT4233HP I/O States Channel D**


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## 9.5 FT4232HP / FT4233HP – Selected Functions

| FT4232HP (68 pin) FT4233HP (76 pin / 80 pin) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Pins | | | | Pin functions (depend on configuration) | | | |
| 68 Pin # | 76 Pin # | 80 Pin # | Pin Name | ASYNC Serial (RS232) | ASYNC Bit-bang | SYNC Bit-bang | MPSSE |
| Channel A | | | | | | | |
| 6 | 8 | 8 | ADBUS0 | TXD | D0 | D0 | TCK/SK |
| 7 | 9 | 9 | ADBUS1 | RXD | D1 | D1 | TDI/DO |
| 11 | 13 | 13 | ADBUS2 | RTS# | D2 | D2 | TDO/DI |
| 12 | 14 | 14 | ADBUS3 | CTS# | D3 | D3 | TMS/CS |
| 13 | 15 | 15 | ADBUS4 | DTR# | D4 | D4 | GPIOL0 |
| 14 | 16 | 16 | ADBUS5 | DSR# | D5 | D5 | GPIOL1 |
| 15 | 17 | 17 | ADBUS6 | DCD# | D6 | D6 | GPIOL2 |
| 16 | 18 | 18 | ADBUS7 | RI#/ TXDEN* | D7 | D7 | GPIOL3 |
| Channel B | | | | | | | |
| 17 | 19 | 19 | BDBUS0 | TXD | D0 | D0 | TCK/SK |
| 18 | 20 | 21 | BDBUS1 | RXD | D1 | D1 | TDI/DO |
| 19 | 21 | 22 | BDBUS2 | RTS# | D2 | D2 | TDO/DI |
| 20 | 22 | 23 | BDBUS3 | CTS# | D3 | D3 | TMS/CS |
| 21 | 23 | 24 | BDBUS4 | DTR# | D4 | D4 | GPIOL0 |
| 22 | 24 | 25 | BDBUS5 | DSR# | D5 | D5 | GPIOL1 |
| 23 | 25 | 26 | BDBUS6 | DCD# | D6 | D6 | GPIOL2 |
| 24 | 26 | 27 | BDBUS7 | RI#/ TXDEN* | D7 | D7 | GPIOL3 |
| Channel C | | | | | | | |
| 34 | 36 | 37 | CDBUS0 | TXD | D0 | D0 | RS232 or Bit-Bang interface |
| 35 | 37 | 38 | CDBUS1 | RXD | D1 | D1 | RS232 or Bit-Bang interface |
| 36 | 38 | 39 | CDBUS2 | RTS# | D2 | D2 | RS232 or Bit-Bang interface |
| 37 | 39 | 40 | CDBUS3 | CTS# | D3 | D3 | RS232 or Bit-Bang interface |
| 38 | 40 | 41 | CDBUS4 | DTR# | D4 | D4 | RS232 or Bit-Bang interface |
| 40 | 42 | 43 | CDBUS5 | DSR# | D5 | D5 | RS232 or Bit-Bang interface |
| 41 | 43 | 44 | CDBUS6 | DCD# | D6 | D6 | RS232 or Bit-Bang interface |
| 42 | 44 | 45 | CDBUS7 | RI#/ TXDEN* | D7 | D7 | RS232 or Bit-Bang interface |
| Channel D | | | | | | | |
| 45 | 48 | 50 | DDBUS0 | TXD | D0 | D0 | RS232 or Bit-Bang interface |
| 46 | 49 | 51 | DDBUS1 | RXD | D1 | D1 | RS232 or Bit-Bang interface |
| 47 | 50 | 52 | DDBUS2 | RTS# | D2 | D2 | RS232 or Bit-Bang interface |
| 48 | 51 | 53 | DDBUS3 | CTS# | D3 | D3 | RS232 or Bit-Bang interface |
| 49 | 52 | 54 | DDBUS4 | DTR# | D4 | D4 | RS232 or Bit-Bang interface |
| 50 | 53 | 55 | DDBUS5 | DSR# | D5 | D5 | RS232 or Bit-Bang interface |
| 51 | 56 | 58 | DDBUS6 | DCD# | D6 | D6 | RS232 or Bit-Bang interface |
| 52 | 57 | 59 | DDBUS7 | RI#/ TXDEN* | D7 | D7 | RS232 or Bit-Bang interface |

**Table 9.5 FT4232HP / FT4233HP Selected Functions**

Pins marked * are EEPROM selectable.


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# 10 FT2232D – Channel A Pins

| FT2232D Channel A | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Pin Number** | **Pin Name** | **RESET# Low** | **Default** | **SUSPEND (Pull Down IO Pins in Suspend - Not Set)** | **SUSPEND (Pull Down IO Pins in USB Suspend – Set)** | **During Enumeration (out of reset prior to EEPROM read)** | **Active (device enumerated after EEPROM read)** |
| 24 | ADBUS0 | TriSt | TXD | Function | TriSt- PD | TriSt | Function |
| 23 | ADBUS1 | TriSt-PU | RXD | Function | TriSt- PD | TriSt-PU | Function |
| 22 | ADBUS2 | TriSt | RTS# | Function | TriSt- PD | TriSt | Function |
| 21 | ADBUS3 | TriSt-PU | CTS# | Function | TriSt- PD | TriSt-PU | Function |
| 20 | ADBUS4 | TriSt | DTR# | Function | TriSt- PD | TriSt | Function |
| 19 | ADBUS5 | TriSt-PU | DSR# | Function | TriSt- PD | TriSt-PU | Function |
| 17 | ADBUS6 | TriSt-PU | DCD# | Function | TriSt- PD | TriSt-PU | Function |
| 16 | ADBUS7 | TriSt-PU | RI# | Function | TriSt- PD | TriSt-PU | Function |
| 15 | ACBUS0 | TriSt | TXDEN | Function | TriSt- PD | TriSt | Function |
| 13 | ACBUS1 | TriSt | SLEEP# | Function | TriSt- PD | TriSt | Function |
| 12 | ACBUS2 | TriSt-PU | RXLED# | Function | TriSt- PD | TriSt-PU | Function |
| 11 | ACBUS3 | TriSt-PU | TXLED# | Function | TriSt- PD | TriSt-PU | Function |

**Table 10.1 FT2232D I/O States Channel A**

## 10.1 FT2232D – Channel B Pins

| FT2232D Channel B | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Pin Number** | **Pin Name** | **RESET# Low** | **Default** | **SUSPEND (Pull Down IO Pins in Suspend - Not Set)** | **SUSPEND (Pull Down IO Pins in USB Suspend – Set)** | **During Enumeration (out of reset prior to EEPROM read)** | **Active (device enumerated after EEPROM read)** |
| 40 | BDBUS0 | TriSt | TXD | Function | TriSt- PD | TriSt | Function |
| 39 | BDBUS1 | TriSt-PU | RXD | Function | TriSt- PD | TriSt-PU | Function |
| 38 | BDBUS2 | TriSt | RTS# | Function | TriSt- PD | TriSt | Function |
| 37 | BDBUS3 | TriSt-PU | CTS# | Function | TriSt- PD | TriSt-PU | Function |
| 36 | BDBUS4 | TriSt | DTR# | Function | TriSt- PD | TriSt | Function |
| 35 | BDBUS5 | TriSt-PU | DSR# | Function | TriSt- PD | TriSt-PU | Function |
| 33 | BDBUS6 | TriSt-PU | DCD# | Function | TriSt- PD | TriSt-PU | Function |
| 32 | BDBUS7 | TriSt-PU | RI# | Function | TriSt- PD | TriSt-PU | Function |
| 30 | BCBUS0 | TriSt | TXDEN | Function | TriSt- PD | TriSt | Function |
| 29 | BCBUS1 | TriSt | SLEEP# | Function | TriSt- PD | TriSt | Function |
| 28 | BCBUS2 | TriSt-PU | RXLED# | Function | TriSt- PD | TriSt-PU | Function |
| 27 | BCBUS3 | TriSt-PU | TXLED# | Function | TriSt- PD | TriSt-PU | Function |

**Table 10.2 FT2232D I/O States Channel B**


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## 10.2 FT2232D - Selected Functions – Channel A

| Pin# | Generic Pin name | Pin Definitions by Chip Mode **Note 1 | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 232 UART Mode | 245 FIFO | Enhanced Asynchronous and Synchronous Serial | MPSSE **Note 3 | MCU Host Bus Emulation Mode **Note 4 | Fast Opto-Isolated Serial Mode | CPU FIFO Interface Mode |
| 24 | ADBUS0 | TXD | D0 | D0 | TCK/SK AD0 | **Note 2 | D0 | D0 |
| 23 | ADBUS1 | RXD | D1 | D1 | TDI/D0 | AD1 | D1 | D1 |
| 22 | ADBUS2 | RTS# | D2 | D2 | TDO/DI | AD2 | D2 | D2 |
| 21 | ADBUS3 | CTS# | D3 | D3 | TMS/CS AD3 | D3 | | D3 |
| 20 | ADBUS4 | DTR# | D4 | D4 | GPIOL0 | AD4 | D4 | D4 |
| 19 | ADBUS5 | DSR# | D5 | D5 | GPIOL1 | AD5 | D5 | D5 |
| 17 | ADBUS6 | DCD# | D6 | D6 | GPIOL2 | AD6 | D6 | D6 |
| 16 | ADBUS7 | RI# | D7 | D7 | GPIOL3 | AD7 | D7 | D7 |
| 15 | ACBUS0 | TXDEN | RXF# | WR# **Note 5 | GPIOH0 | I/O0 | CS# | CS# |
| 13 | ACBUS1 | SLEEP# | TXE# | RD# **Note 5 | GPIOH1 | I/O1 | A0 | A0 |
| 12 | ACBUS2 | RXLED# | RD# | WR# **Note 6 | GPIOH2 | IORDY | RD# | RD# |
| 24 | ADBUS0 | TXD | D0 | D0 | TCK/SK AD0 | **Note 2 | D0 | |
| 11 | ACBUS3 | TXLED# | WR | RD# **Note 6 | GPIOH3 | OSC | WR# | WR# |

**Table 10.3 Pin Definition by Chip Mode - Channel A**

**Note 1:** 232 UART, 245 FIFO, CPU FIFO Interface, and Fast Opto-Isolated modes are enabled in the external EEPROM. Enhanced Asynchronous and Synchronous Bit-Bang modes, MPSSE, and MCU Host Bus Emulation modes are enabled using the driver command set bit mode.

**Note 2:** Channel A can be configured in another IO mode if channel B is in Fast Opto-Isolated Serial Mode. If both Channel A and Channel B are in Fast Opto-Isolated Serial Mode all of the IO will be on Channel B.

**Note 3:** MPSSE is Channel A only.

**Note 4:** MCU Host Bus Emulation requires both Channels.

**Note 5:** The Bit-Bang Mode (synchronous and asynchronous) WR# and RD# strobes are on these pins when the main Channel mode is 245 FIFO, CPU FIFO interface, or Fast Opto-Isolated Serial Modes.

**Note 6:** The Bit-Bang Mode (synchronous and asynchronous) WR# and RD# strobes are on these pins when the main Channel mode is 232 UART Mode.


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## 10.3 FT2232D - Selected Function – Channel B

| Pin# | Generic Pin name | Pin Definitions by Chip Mode **Note 1 | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 232 UART Mode | 245 FIFO | Enhanced Asynchronous and Synchronous Serial | MPSSE **Note 3 | MCU Host Bus Emulation Mode **Note 4 | Fast Opto-Isolated Serial Mode | CPU FIFO Interface Mode |
| 40 | BDBUS0 | TXD | D0 | D0 | A8 | FSDI | D0 | D0 |
| 39 | BDBUS1 | RXD | D1 | D1 | A9 | FSCLK | D1 | D1 |
| 38 | BDBUS2 | RTS# | D2 | D2 | A10 | FSDO | D2 | D2 |
| 37 | BDBUS3 | CTS# | D3 | D3 | A11 | FSCTS | D3 | D3 |
| 36 | BDBUS4 | DTR# | D4 | D4 | A12 | **Note 2 | D4 | D4 |
| 35 | BDBUS5 | DSR# | D5 | D5 | A13 | D5 | | D5 |
| 33 | BDBUS6 | DCD# | D6 | D6 | A14 | D6 | | D6 |
| 32 | BDBUS7 | RI# | D7 | D7 | A15 | D7 | | D7 |
| 30 | BCBUS0 | TXDEN | RXF# | WR# **Note 7 | CS# | CS# | | CS# |
| 29 | BCBUS1 | SLEEP# | TXE# | RD# **Note 7 | ALE | A0 | | A0 |
| 28 | BCBUS2 | RXLED# | RD# | WR# **Note 6 | RD# | RD# | | RD# |
| 27 | BCBUS3 | TXLED# | WR | RD# **Note 6 | WR# | WR# | | WR# |

**Table 10.4 Pin Definition by Chip Mode - Channel B**

**Note 1:** 232 UART, 245 FIFO, CPU FIFO Interface, and Fast Opto-Isolated modes are enabled in the external EEPROM. Enhanced Asynchronous and Synchronous Bit-Bang modes, MPSSE, and MCU Host Bus Emulation modes are enabled using the driver command set bit mode.

**Note 2:** Channel A can be configured in another IO mode if channel B is in Fast Opto-Isolated Serial Mode. If both Channel A and Channel B are in Fast Opto-Isolated Serial Mode all of the IO will be on Channel B.

**Note 3:** MPSSE is Channel A only.

**Note 4:** MCU Host Bus Emulation requires both Channels.

**Note 5:** The Bit-Bang Mode (synchronous and asynchronous) WR# and RD# strobes are on these pins when the main Channel mode is 245 FIFO, CPU FIFO interface, or Fast Opto-Isolated Serial Modes.

**Note 6:** The Bit-Bang Mode (synchronous and asynchronous) WR# and RD# strobes are on these pins when the main Channel mode is 232 UART Mode.

**Note 7:** The Bit-Bang Mode (synchronous and asynchronous) WR# and RD# strobes are on these pins when the main Channel mode is 245 FIFO, CPU FIFO interface. Bit-Bang mode is not available on Channel B when Fast Opto-Isolated Serial Mode is enabled.


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# 8 FT200XD – I/O Pins

| FT200XD | | | | | | |
|---|---|---|---|---|---|---|
| **Pin Name** | **Pin Number** | **RESET# Low** | **SUSPEND (Pull Down IO Pins in USB Suspend - Not Set)** | **SUSPEND (Pull Down IO Pins in USB Suspend – Set)** | **During Enumeration (out of reset prior to EEPROM read)** | **Active (device enumerated after EEPROM read)** |
| SDA | 8 | TriSt-PU | SDA | TriSt-PD | SDA | SDA |
| SCL | 6 | TriSt-PU | SCL | TriSt-PD | SCL | SCL |
| CBUS0 | 5 | TriSt-PU | Function | TriSt-PD | TriSt-PU | Function |

**Table 8.1 FT200XD I/O States**

**Note 1:** When used in Input Mode, the input pins are pulled to VCCIO via internal 75kΩ (approx.) resistors. These pins can be programmed to gently pull low during USB suspend (PWREN# = "1") by setting an option in the MTP memory.

**Note 2:** Clock stretching is not supported.


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# 9 FT201X – I/O Pins

| FT201X | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Pin Name** | **Pin Number (QFN)** | **Pin Number (SSOP)** | **RESET# Low** | **SUSPEND (Pull Down IO Pins in USB Suspend - Not Set)** | **SUSPEND (Pull Down IO Pins in USB Suspend – Set)** | **During Enumeration (out of reset prior to EEPROM read)** | **Active (device enumerated after EEPROM read)** |
| SDA | 2 | 4 | TriSt-PU | SDA | TriSt-PD | SDA | SDA |
| SCL | 16 | 2 | TriSt-PU | SCL | TriSt-PD | SCL | SCL |
| CBUS 0 | 12 | 15 | TriSt-PU | Function | TriSt-PD | TriSt-PU | Function |
| CBUS 1 | 11 | 14 | TriSt-PU | Function | TriSt-PD | TriSt-PU | Function |
| CBUS 2 | 5 | 7 | TriSt-PU | Function | TriSt-PD | TriSt-PU | Function |
| CBUS 3 | 14 | 16 | TriSt-PU | Function | TriSt-PD | TriSt-PU | Function |
| CBUS 4 | 4 | 6 | TriSt-PU | Function | TriSt-PD | TriSt-PU | Function |
| CBUS 5 | 15 | 1 | TriSt-PU | Function | TriSt-PD | TriSt-PU | Function |

**Table 9.1 FT201X I/O States**

**Note 1:** When used in Input Mode, the input pins are pulled to VCCIO via internal 75kΩ (approx.) resistors. These pins can be programmed to gently pull low during USB suspend (PWREN# = "1") by setting an option in the MTP memory.

**Note 2:** Clock stretching is not supported.


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# 10 FT220X – I/O Pins

| FT220X | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Pin Name** | **Pin Number (QFN)** | **Pin Number (SSOP)** | **RESET# Low** | **SUSPEND (Pull Down IO Pins in USB Suspend - Not Set)** | **SUSPEND (Pull Down IO Pins in USB Suspend – Set)** | **During Enumeration (out of reset prior to EEPROM read)** | **Active (device enumerated after EEPROM read)** |
| MIOSIO[0] | 15 | 1 | TriSt-PU | MIOSIO[0] | TriSt-PD | MIOSIO[0] | MIOSIO[0] |
| MIOSIO[1] | 2 | 4 | TriSt-PU | MIOSIO[1] | TriSt-PD | MIOSIO[1] | MIOSIO[1] |
| MIOSIO[2] | 16 | 2 | TriSt-PU | MIOSIO[2] | TriSt-PD | MIOSIO[2] | MIOSIO[2] |
| MIOSIO[3] | 4 | 6 | TriSt-PU | MIOSIO[3] | TriSt-PD | MIOSIO[3] | MIOSIO[3] |
| CLK | 12 | 15 | TriSt-PU | CLK (Input-PU) | TriSt-PD | CLK (Input-PU) | CLK (Input-PU) |
| CS# | 11 | 14 | TriSt-PU | CS# (Input-PU) | TriSt-PD | CS# (Input-PU) | CS# (Input-PU) |
| MISO | 5 | 7 | TriSt-PU | MISO | TriSt-PD | MISO | MISO |
| CBUS3 | 14 | 16 | TriSt-PU | Function | TriSt-PD | TriSt-PU | Function |

**Table 10.1 FT220X I/O States**

**Note:** When used in Input Mode, the input pins are pulled to VCCIO via internal 75kΩ (approx.) resistors. These pins can be programmed to gently pull low during USB suspend (PWREN# = "1") by setting an option in the MTP memory.


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# 11 FT221X – I/O Pins

| FT221X | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Pin Name** | **Pin Number (QFN)** | **Pin Number (SSOP)** | **RESET# Low** | **SUSPEND (Pull Down IO Pins in USB Suspend - Not Set)** | **SUSPEND (Pull Down IO Pins in USB Suspend – Set)** | **During Enumeration (out of reset prior to EEPROM read)** | **Active (device enumerated after EEPROM read)** |
| MIOSIO[0] | 17 | 20 | TriSt-PU | MIOSIO[0] | TriSt-PD | MIOSIO[0] | MIOSIO[0] |
| MIOSIO[1] | 1 | 4 | TriSt-PU | MIOSIO[1] | TriSt-PD | MIOSIO[1] | MIOSIO[1] |
| MIOSIO[2] | 19 | 2 | TriSt-PU | MIOSIO[2] | TriSt-PD | MIOSIO[2] | MIOSIO[2] |
| MIOSIO[3] | 6 | 9 | TriSt-PU | MIOSIO[3] | TriSt-PD | MIOSIO[3] | MIOSIO[3] |
| MIOSIO[4] | 18 | 1 | TriSt-PU | MIOSIO[4] | TriSt-PD | MIOSIO[4] | MIOSIO[4] |
| MIOSIO[5] | 4 | 7 | TriSt-PU | MIOSIO[5] | TriSt-PD | MIOSIO[5] | MIOSIO[5] |
| MIOSIO[6] | 5 | 8 | TriSt-PU | MIOSIO[6] | TriSt-PD | MIOSIO[6] | MIOSIO[6] |
| MIOSIO[7] | 2 | 5 | TriSt-PU | MIOSIO[7] | TriSt-PD | MIOSIO[7] | MIOSIO[7] |
| CLK | 15 | 18 | TriSt-PU | Input-PU | TriSt-PD | Input-PU | CLK(Input-PU) |
| CS# | 14 | 17 | TriSt-PU | Input-PU | TriSt-PD | Input-PU | CS#(Input-PU) |
| MISO | 7 | 10 | TriSt-PU | MISO | TriSt-PD | MISO | MISO |
| CBUS3 | 16 | 19 | TriSt-PU | Function | TriSt-PD | Function | Function |

**Table 11.1 FT221X I/O States**

**Note:** When used in Input Mode, the input pins are pulled to VCCIO via internal 75kΩ (approx.) resistors. These pins can be programmed to gently pull low during USB suspend (PWREN# = "1") by setting an option in the MTP memory.


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# 12 FT230X – I/O Pins

| FT230X | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Pin Name** | **Pin Number (QFN)** | **Pin Number (SSOP)** | **RESET# Low** | **SUSPEND (Pull Down IO Pins in USB Suspend - Not Set)** | **SUSPEND (Pull Down IO Pins in USB Suspend – Set)** | **During Enumeration (out of reset prior to EEPROM read)** | **Active (device enumerated after EEPROM read)** |
| TXD | 15 | 1 | TriSt-PU | TXD | TriSt-PD | TXD | Output (TXD) |
| RXD | 2 | 4 | TriSt-PU | RXD | TriSt-PD | RXD | Input (RXD) |
| RTS# | 16 | 2 | TriSt-PU | RTS# | TriSt-PD | RTS# | Output (RTS#) |
| CTS# | 4 | 6 | TriSt-PU | CTS# | TriSt-PD | CTS# | Input (CTS#) |
| CBUS0 | 12 | 15 | TriSt-PU | Function | TriSt-PD | TriSt-PU | Function |
| CBUS1 | 11 | 14 | TriSt-PU | Function | TriSt-PD | TriSt-PU | Function |
| CBUS2 | 5 | 7 | TriSt-PU | Function | TriSt-PD | TriSt-PU | Function |
| CBUS3 | 14 | 16 | TriSt-PU | Function | TriSt-PD | TriSt-PU | Function |

**Table 12.1 FT230X I/O States**

**Note:** When used in Input Mode, the input pins are pulled to VCCIO via internal 75KΩ (approx.) resistors. These pins can be programmed to gently pull low during USB suspend (PWREN# = "1") by setting an option in the MTP memory.


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# 13 FT231X – I/O Pins

| FT231X | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Pin Name** | **Pin Number (QFN)** | **Pin Number (SSOP)** | **RESET# Low** | **SUSPEND (Pull Down IO Pins in USB Suspend - Not Set)** | **SUSPEND (Pull Down IO Pins in USB Suspend – Set)** | **During Enumeration (out of reset prior to EEPROM read)** | **Active (device enumerated after EEPROM read)** |
| TXD | 17 | 20 | TriSt-PU | TXD | TriSt-PD | TXD | TXD |
| RXD | 1 | 4 | TriSt-PU | RXD | TriSt-PD | RXD | RXD |
| RTS# | 19 | 2 | TriSt-PU | RTS# | TriSt-PD | RTS# | RTS# |
| CTS# | 6 | 9 | TriSt-PU | CTS# | TriSt-PD | CTS# | CTS# |
| DTR# | 18 | 1 | TriSt-PU | DTR# | TriSt-PD | DTR# | DTR# |
| DSR# | 4 | 7 | TriSt-PU | DSR# | TriSt-PD | DSR# | DSR# |
| DCD# | 5 | 8 | TriSt-PU | DCD# | TriSt-PD | DCD# | DCD# |
| RI# | 2 | 5 | TriSt-PU | RI# | TriSt-PD | RI# | RI# |
| CBUS0 | 15 | 18 | TriSt-PU | Function | TriSt-PD | TriSt-PU | Function |
| CBUS1 | 14 | 17 | TriSt-PU | Function | TriSt-PD | TriSt-PU | Function |
| CBUS2 | 7 | 10 | TriSt-PU | Function | TriSt-PD | TriSt-PU | Function |
| CBUS3 | 16 | 19 | TriSt-PU | Function | TriSt-PD | TriSt-PU | Function |

**Table 13.1 FT231X I/O States**

**Note:** When used in Input Mode, the input pins are pulled to VCCIO via internal 75KΩ (approx.) resistors. These pins can be programmed to gently pull low during USB suspend (PWREN# = "1") by setting an option in the MTP memory.


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# 14 FT234XD – I/O Pins

| FT234XD | | | | | | |
|---|---|---|---|---|---|---|
| **Pin Name** | **Pin Number** | **RESET# Low** | **SUSPEND (Pull Down IO Pins in USB Suspend - Not Set)** | **SUSPEND (Pull Down IO Pins in USB Suspend – Set)** | **During Enumeration (out of reset prior to EEPROM read)** | **Active (device enumerated after EEPROM read)** |
| TXD | 7 | TriSt-PU | TXD | TriSt-PD | TXD | Output (TXD) |
| RXD | 10 | TriSt-PU | RXD | TriSt-PD | RXD | Input (RXD) |
| RTS# | 8 | TriSt-PU | RTS# | TriSt-PD | RTS# | Output (RTS#) |
| CTS# | 11 | TriSt-PU | CTS# | TriSt-PD | CTS# | Input (CTS#) |
| CBUS0 | 6 | TriSt-PU | Function | TriSt-PD | TriSt-PU | Function |

**Table 14.1 FT234XD I/O States**

**Note:** When used in Input Mode, the input pins are pulled to VCCIO via internal 75KΩ (approx.) resistors. These pins can be programmed to gently pull low during USB suspend (PWREN# = "1") by setting an option in the MTP memory.


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# 15 FT240X – I/O Pins

| FT240X | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Pin Name** | **Pin Number (QFN)** | **Pin Number (SSOP)** | **RESET# Low** | **SUSPEND (Pull Down IO Pins in USB Suspend - Not Set)** | **SUSPEND (Pull Down IO Pins in USB Suspend – Set)** | **During Enumeration (out of reset prior to EEPROM read)** | **Active (device enumerated after EEPROM read)** |
| RESET# | 13 | 16 | Input-PU | Input-PU | Input-PU | Input-PU | Input-PU |
| SIWU# | 7 | 10 | TriSt-PU | Input-PU | TriSt-PD | Input-PU | Input-PU |
| CBUS5 | 20 | 23 | TriSt-PU | Function | TriSt-PD | TriSt-PU | Function |
| CBUS6 | 19 | 22 | TriSt-PU | Function | TriSt-PD | TriSt-PU | Function |
| D0 | 21 | 24 | TriSt-PU | D0 | TriSt-PD | D0 | D0 |
| D1 | 1 | 4 | TriSt-PU | D1 | TriSt-PD | D1 | D1 |
| D2 | 23 | 2 | TriSt-PU | D2 | TriSt-PD | D2 | D2 |
| D3 | 6 | 9 | TriSt-PU | D3 | TriSt-PD | D3 | D3 |
| D4 | 22 | 1 | TriSt-PU | D4 | TriSt-PD | D4 | D4 |
| D5 | 4 | 7 | TriSt-PU | D5 | TriSt-PD | D5 | D5 |
| D6 | 5 | 8 | TriSt-PU | D6 | TriSt-PD | D6 | D6 |
| D7 | 2 | 5 | TriSt-PU | D7 | TriSt-PD | D7 | D7 |
| RD# | 8 | 11 | TriSt-PU | RD# (Input-PU) | TriSt-PD | RD# (Input-PU) | RD# (Input-PU) |
| WR | 9 | 12 | TriSt-PU | WR (Input-PD) | TriSt-PD | WR (Input-PD) | WR (Input-PD) |
| TXE# | 17 | 20 | TriSt-PU | TXE# (OP) | TriSt-PD | TXE# (OP) | TXE# (OP) |
| RXF# | 18 | 21 | TriSt-PU | RXF# (OP) | TriSt-PD | RXF# (OP) | RXF# (OP) |

**Table 15.1 FT240X I/O States**

**Note:** When used in Input Mode, the input pins are pulled to VCCIO via internal 75KΩ (approx.) resistors. These pins can be programmed to gently pull low during USB suspend (PWREN# = "1") by setting an option in the MTP memory.


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# 16 FT120 – I/O Pins

| FT120 | | | | | | |
|---|---|---|---|---|---|---|
| **Pin Name** | **Pin Number (QFN)** | **Pin Number (TSSOP)** | **RESET# Low** | **SUSPEND** | **During Enumeration (out of reset)** | **Active (device enumerated)** |
| DATA0 | 26 | 1 | TriSt | TriSt | TriSt, driving when RD_N is low and CS_N or DMACK_N is low | TriSt, driving when RD_N is low and CS_N is low or DMACK_N is low |
| DATA1 | 27 | 2 | TriSt | TriSt | | |
| DATA2 | 28 | 3 | TriSt | TriSt | | |
| DATA3 | 1 | 4 | TriSt | TriSt | | |
| DATA4 | 2 | 6 | TriSt | TriSt | | |
| DATA5 | 3 | 7 | TriSt | TriSt | | |
| DATA6 | 4 | 8 | TriSt | TriSt | | |
| DATA7 | 5 | 9 | TriSt | TriSt | | |
| SUSPEND | 8 | 12 | Driving Low | TriSt | Output | Output |
| CLKOUT | 9 | 13 | Driving Low | Output | Output | Output |
| INT_n | 10 | 14 | Driving High | Output | Output | Output |
| GL_n | 17 | 21 | Driving High | Output | Output | Output |
| DMREQ | 13 | 17 | Driving Low | Output | Output | Output |

**Table 16.1 FT120 I/O States**


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# 17 FT121 – I/O Pins

| FT121 | | | | | | |
|---|---|---|---|---|---|---|
| **Pin Name** | **Pin Number (QFN)** | **Pin Number (TSSOP)** | **RESET# Low** | **SUSPEND** | **During Enumeration (out of reset)** | **Active (device enumerated)** |
| MOSI | 7 | 9 | TriSt | TriSt | Output | Output |
| MISO | 6 | 8 | TriSt | TriSt | Output | Output |

**Table 17.1 FT121 I/O States**


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# 18 FT122 – I/O Pins

| FT122 | | | | | | |
|---|---|---|---|---|---|---|
| **Pin Name** | **Pin Number (QFN)** | **Pin Number (TSSOP)** | **RESET# Low** | **SUSPEND** | **During Enumeration (out of reset)** | **Active (device enumerated)** |
| D0 | 26 | 1 | TriSt | TriSt | TriSt, driving when RD_N is low and CS_N or DMACK_N is low | TriSt, driving when RD_N is low and CS_N is low or DMACK_N is low |
| D1 | 27 | 2 | TriSt | TriSt | | |
| D2 | 28 | 3 | TriSt | TriSt | | |
| D3 | 1 | 4 | TriSt | TriSt | | |
| D4 | 3 | 6 | TriSt | TriSt | | |
| D5 | 4 | 7 | TriSt | TriSt | | |
| D6 | 5 | 8 | TriSt | TriSt | | |
| D7 | 6 | 9 | TriSt | TriSt | | |
| SUSPEND | 9 | 12 | Driving Low | TriSt | Output | Output |
| CLKOUT | 10 | 13 | Driving Low | Output | Output | Output |
| INT_n | 11 | 14 | Driving High | Output | Output | Output |
| GL_n | 18 | 21 | Driving High | Output | Output | Output |
| DMREQ | 14 | 17 | Driving Low | Output | Output | Output |

**Table 18.1 FT122 I/O States**


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# 19 FT313H – I/O Pins

| FT313 | | | | | |
|---|---|---|---|---|---|
| **Pin Name** | **Pin Number (QFN)** | **Pin Number (LQFP)** | **Pin Number (TQFP)** | **RESET# Low** | **Active** |
| AD0 | 2 | 2 | 2 | TriSt | Input/Output |
| AD1 | 3 | 3 | 3 | TriSt | Input/Output |
| AD2 | 4 | 4 | 4 | TriSt | Input/Output |
| AD3 | 5 | 5 | 5 | TriSt | Input/Output |
| AD4 | 7 | 7 | 7 | TriSt | Input/Output |
| AD5 | 8 | 8 | 8 | TriSt | Input/Output |
| AD6 | 9 | 9 | 9 | TriSt | Input/Output |
| AD7 | 10 | 10 | 10 | TriSt | Input/Output |
| AD8 | 11 | 11 | 11 | TriSt | Input/Output |
| AD9 | 12 | 12 | 12 | TriSt | Input/Output |
| AD10 | 13 | 13 | 13 | TriSt | Input/Output |
| AD11 | 14 | 14 | 14 | TriSt | Input/Output |
| AD12 | 16 | 16 | 16 | TriSt | Input/Output |
| AD13 | 17 | 17 | 17 | TriSt | Input/Output |
| AD14 | 18 | 18 | 18 | TriSt | Input/Output |
| AD15 | 19 | 19 | 19 | TriSt | Input/Output |

**Table 19.1 FT313H I/O States**


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# 20 FT4222H Rev A – I/O Pins

## 20.1 Configuration Mode 0

| FT4222H CNFMODE0 | | | I/O Status in Revision-A | | | | |
|---|---|---|---|---|---|---|---|
| **Pin Number** | **Pin Name** | **Default Function** | **When Reset** | **After Reset** | **During Enumeration** | **SUSPEND (Default)** | **Active Function (After Enum.)** |
| 8 | SCK | SCK (Master) | Undefined | TriSt | Output-Low | (Output-Low) | Function* |
| 9 | MISO | MISO (Master) | TriSt | TriSt | Output-Low | (Output-Low) | Function* |
| 10 | MOSI | MOSI (Master) | TriSt | TriSt | Output-Low | (Output-Low) | Function* |
| 11 | IO2 | IO2 (Master) | TriSt | TriSt | Output-Low | (Output-Low) | Function* |
| 12 | IO3 | IO3 (Master) | TriSt | TriSt | Output-Low | (Output-Low) | Function* |
| 13 | GPIO0 | GPIO0 | TriSt | TriSt | Output-Low | (Output-Low) | Function* |
| 14 | GPIO1 | GPIO1 | TriSt | TriSt | Output-Low | (Output-Low) | Function* |
| 15 | GPIO2 | SUSP_OUT | TriSt | TriSt | Output-Low | (Output-High) | Function** |
| 16 | GPIO3 | WAKEUP | TriSt | TriSt | TriSt | (TriSt) | Function** |
| 17 | SS0O | SS0O | Output | Output-High | Output-Low | (Output-Low) | Default* |
| 32 | SS | SS | TriSt | TriSt | TriSt | TriSt | Default* |

**Table 20.1 FT4222H Rev. A I/O States Configuration Mode0**

**Default*:** Default means the function is as referred to in the column – "Default Function"

**Function*:** Function means that the function for each pin can be selected by the support library (LibFT4222)

**Function**:** Function means that the function for each pin can be selected by the support library (LibFT4222) or FTDI - FT Prog Setting

**(I/O Status):** I/O Status with parentheses means the I/O status will be changed by the support library (LibFT4222) or can be set by FTDI - FT Prog Setting


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## 20.2 Configuration Mode 1

| FT4222H CNFMODE1 | | | I/O Status in Revision-A | | | | |
|---|---|---|---|---|---|---|---|
| **Pin Number** | **Pin Name** | **Default Function** | **When Reset** | **After Reset** | **During Enumeration** | **SUSPEND (Default)** | **Active Function (After Enum.)** |
| 8 | SCK | SCK (Master) | Undefined | TriSt | Output-Low | (Output-Low) | Function* |
| 9 | MISO | MISO (Master) | TriSt | TriSt | Output-Low | (Output-Low) | Function* |
| 10 | MOSI | MOSI (Master) | TriSt | TriSt | Output-Low | (Output-Low) | Function* |
| 11 | IO2 | IO2 (Master) | TriSt | TriSt | Output-Low | (Output-Low) | Function* |
| 12 | IO3 | IO3 (Master) | TriSt | TriSt | Output-Low | (Output-Low) | Function* |
| 13 | GPIO0 | SS1O (Master) | TriSt | TriSt | Output-Low | (Output-Low) | Default* |
| 14 | GPIO1 | SS2O (Master) | TriSt | TriSt | Output-Low | (Output-Low) | Default* |
| 15 | GPIO2 | SUSP_OUT | TriSt | TriSt | Output-Low | (Output-High) | Function** |
| 16 | GPIO3 | WAKEUP | TriSt | TriSt | TriSt | (TriSt) | Function** |
| 17 | SS0O | SS0O | Output | Output-High | Output-Low | (Output-Low) | Default* |
| 32 | SS | SS | TriSt | TriSt | TriSt | TriSt | Default* |

**Table 20.2 FT4222H Rev. A I/O States Configuration Mode1**

**Default*:** Default means the function is as referred to in the column – "Default Function"

**Function*:** Function means that the function for each pin can be selected by the support library (LibFT4222)

**Function**:** Function means that the function for each pin can be selected by the support library (LibFT4222) or FTDI - FT Prog Setting

**(I/O Status):** I/O Status with parentheses means the I/O status will be changed by the support library (LibFT4222) or can be set by FTDI - FT Prog Setting


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## 20.3 Configuration Mode 2

| FT4222H CNFMODE2 | | | I/O Status in Revision-A | | | | |
|---|---|---|---|---|---|---|---|
| **Pin Number** | **Pin Name** | **Default Function** | **When Reset** | **After Reset** | **During Enumeration** | **SUSPEND (Default)** | **Active Function (After Enum.)** |
| 8 | SCK | SCK (Master) | Undefined | TriSt | Output-Low | (Output-Low) | Function* |
| 9 | MISO | MISO (Master) | TriSt | TriSt | Output-Low | (Output-Low) | Function* |
| 10 | MOSI | MOSI (Master) | TriSt | TriSt | Output-Low | (Output-Low) | Function* |
| 11 | IO2 | IO2 (Master) | TriSt | TriSt | Output-Low | (Output-Low) | Function* |
| 12 | IO3 | IO3 (Master) | TriSt | TriSt | Output-Low | (Output-Low) | Function* |
| 13 | GPIO0 | SS1O (Master) | TriSt | TriSt | Output-Low | (Output-Low) | Default* |
| 14 | GPIO1 | SS2O (Master) | TriSt | TriSt | Output-Low | (Output-Low) | Default* |
| 15 | GPIO2 | SS3O (Master) | TriSt | TriSt | Output-Low | (Output-Low) | Default* |
| 16 | GPIO3 | WAKEUP | TriSt | TriSt | TriSt | (TriSt) | Function** |
| 17 | SS0O | SS0O | Output | Output-High | Output-Low | (Output-Low) | Default* |
| 32 | SS | SS | TriSt | TriSt | TriSt | TriSt | Default* |

**Table 20.3 FT4222H Rev. A I/O States Configuration Mode2**

**Default*:** Default means the function is as referred to in the column – "Default Function"

**Function*:** Function means that the function for each pin can be selected by the support library (LibFT4222)

**Function**:** Function means that the function for each pin can be selected by the support library (LibFT4222) or FTDI - FT Prog Setting

**(I/O Status):** I/O Status with parentheses means the I/O status will be changed by the support library (LibFT4222) or can be set by FTDI - FT Prog Setting


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## 20.4 Configuration Mode 3

| FT4222H CNFMODE3 | | | I/O Status in Revision-A | | | | |
|---|---|---|---|---|---|---|---|
| **Pin Number** | **Pin Name** | **Default Function** | **When Reset** | **After Reset** | **During Enumeration** | **SUSPEND (Default)** | **Active Function (After Enum.)** |
| 8 | SCK | SCK (Master) | Undefined | TriSt | Output-Low | (Output-Low) | Function* |
| 9 | MISO | MISO (Master) | TriSt | TriSt | Output-Low | (Output-Low) | Function* |
| 10 | MOSI | MOSI (Master) | TriSt | TriSt | Output-Low | (Output-Low) | Function* |
| 11 | IO2 | IO2 (Master) | TriSt | TriSt | Output-Low | (Output-Low) | Function* |
| 12 | IO3 | IO3 (Master) | TriSt | TriSt | Output-Low | (Output-Low) | Function* |
| 13 | GPIO0 | GPIO0 | TriSt | TriSt | Output-Low | (Output-Low) | Function* |
| 14 | GPIO1 | GPIO1 | TriSt | TriSt | Output-Low | (Output-Low) | Function* |
| 15 | GPIO2 | SUSP_OUT | TriSt | TriSt | Output-Low | Output-High | Default* |
| 16 | GPIO3 | WAKEUP | TriSt | TriSt | TriSt | (TriSt) | Default* |
| 17 | SS0O | SS0O | Output | Output-High | Output-Low | (Output-Low) | Default* |
| 32 | SS | SS | TriSt | TriSt | TriSt | TriSt | Default* |

**Table 20.4 FT4222H Rev. A I/O States Configuration Mode3**

**Default*:** Default means the function is as referred to in the column – "Default Function"

**Function*:** Function means that the function for each pin can be selected by the support library (LibFT4222)

**Function**:** Function means that the function for each pin can be selected by the support library (LibFT4222) or FTDI - FT Prog Setting

**(I/O Status):** I/O Status with parentheses means the I/O status will be changed by the support library (LibFT4222) or can be set by FTDI - FT Prog Setting


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# 21 FT4222H Rev B, C, D – I/O Pins

## 21.1 Configuration Mode 0

| FT4222H CNFMODE0 | | | I/O Status in Revision-B, C, D | | | | |
|---|---|---|---|---|---|---|---|
| **Pin Number** | **Pin Name** | **Default Function** | **When Reset** | **After Reset** | **During Enumeration** | **SUSPEND (Default)** | **Active Function (After Enum.)** |
| 8 | SCK | SCK (Master) | Undefined | TriSt | Output-Low | (TriSt) | Function* |
| 9 | MISO | MISO (Master) | TriSt | TriSt | TriSt | (TriSt) | Function* |
| 10 | MOSI | MOSI (Master) | TriSt | TriSt | Output-High | (TriSt) | Function* |
| 11 | IO2 | IO2 (Master) | TriSt | TriSt | TriSt | (TriSt) | Function* |
| 12 | IO3 | IO3 (Master) | TriSt | TriSt | TriSt | (TriSt) | Function* |
| 13 | GPIO0 | GPIO0 | TriSt | TriSt | TriSt | (TriSt) | Function* |
| 14 | GPIO1 | GPIO1 | TriSt | TriSt | TriSt | (TriSt) | Function* |
| 15 | GPIO2 | SUSP_OUT | TriSt | TriSt | Output-Low | (Output-High) | Function** |
| 16 | GPIO3 | WAKEUP | TriSt | TriSt | TriSt | (TriSt) | Function** |
| 17 | SS0O | SS0O | Output | Output-High | Output-High | (Output-High) | Default* |
| 32 | SS | SS | TriSt | TriSt | TriSt | TriSt | Default* |

**Table 21.1 FT4222H Rev. B, C, D I/O States Configuration Mode0**

**Default*:** Default means the function is as referred to in the column – "Default Function"

**Function*:** Function means that the function for each pin can be selected by the support library (LibFT4222)

**Function**:** Function means that the function for each pin can be selected by the support library (LibFT4222) or FTDI - FT Prog Setting

**(I/O Status):** I/O Status with parentheses means the I/O status will be changed by the support library (LibFT4222) or can be set by FTDI - FT Prog Setting


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## 21.2 Configuration Mode 1

| FT4222H CNFMODE1 | | | I/O Status in Revision-B, C, D | | | | |
|---|---|---|---|---|---|---|---|
| **Pin Number** | **Pin Name** | **Default Function** | **When Reset** | **After Reset** | **During Enumeration** | **SUSPEND (Default)** | **Active Function (After Enum.)** |
| 8 | SCK | SCK (Master) | Undefined | TriSt | Output-Low | (TriSt) | Function* |
| 9 | MISO | MISO (Master) | TriSt | TriSt | TriSt | (TriSt) | Function* |
| 10 | MOSI | MOSI (Master) | TriSt | TriSt | Output-High | (TriSt) | Function* |
| 11 | IO2 | IO2 (Master) | TriSt | TriSt | TriSt | (TriSt) | Function* |
| 12 | IO3 | IO3 (Master) | TriSt | TriSt | TriSt | (TriSt) | Function* |
| 13 | GPIO0 | SS1O | TriSt | TriSt | Output-High | (Output-High) | Default* |
| 14 | GPIO1 | SS2O | TriSt | TriSt | Output-High | (Output-High) | Default* |
| 15 | GPIO2 | SUSP_OUT | TriSt | TriSt | Output-Low | (Output-High) | Function** |
| 16 | GPIO3 | WAKEUP | TriSt | TriSt | TriSt | (TriSt) | Function** |
| 17 | SS0O | SS0O | Output | Output-High | Output-High | (Output-High) | Default* |
| 32 | SS | SS | TriSt | TriSt | TriSt | (TriSt) | Default* |

**Table 21.2 FT4222H Rev. B, C, D I/O States Configuration Mode1**

**Default*:** Default means the function is as referred to in the column – "Default Function"

**Function*:** Function means that the function for each pin can be selected by the support library (LibFT4222)

**Function**:** Function means that the function for each pin can be selected by the support library (LibFT4222) or FTDI - FT Prog Setting

**(I/O Status):** I/O Status with parentheses means the I/O status will be changed by the support library (LibFT4222) or can be set by FTDI - FT Prog Setting


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## 21.3 Configuration Mode 2

| FT4222H CNFMODE2 | | | I/O Status in Revision-B, C, D | | | | |
|---|---|---|---|---|---|---|---|
| **Pin Number** | **Pin Name** | **Default Function** | **When Reset** | **After Reset** | **During Enumeration** | **SUSPEND (Default)** | **Active Function (After Enum.)** |
| 8 | SCK | SCK (Master) | Undefined | TriSt | Output-Low | (TriSt) | Function* |
| 9 | MISO | MISO (Master) | TriSt | TriSt | TriSt | (TriSt) | Function* |
| 10 | MOSI | MOSI (Master) | TriSt | TriSt | Output-High | (TriSt) | Function* |
| 11 | IO2 | IO2 (Master) | TriSt | TriSt | TriSt | (TriSt) | Function* |
| 12 | IO3 | IO3 (Master) | TriSt | TriSt | TriSt | (TriSt) | Function* |
| 13 | GPIO0 | SS1O | TriSt | TriSt | Output-High | (Output-High) | Default* |
| 14 | GPIO1 | SS2O | TriSt | TriSt | Output-High | (Output-High) | Default* |
| 15 | GPIO2 | SS3O | TriSt | TriSt | Output-High | (Output-High) | Default* |
| 16 | GPIO3 | WAKEUP | TriSt | TriSt | TriSt | (TriSt) | Function** |
| 17 | SS0O | SS0O | Output | Output-High | Output-High | (Output-High) | Default* |
| 32 | SS | SS | TriSt | TriSt | TriSt | TriSt | Default* |

**Table 21.3 FT4222H Rev. B, C, D I/O States Configuration Mode2**

**Default*:** Default means the function is as referred to in the column – "Default Function"

**Function*:** Function means that the function for each pin can be selected by the support library (LibFT4222)

**Function**:** Function means that the function for each pin can be selected by the support library (LibFT4222) or FTDI - FT Prog Setting

**(I/O Status):** I/O Status with parentheses means the I/O status will be changed by the support library (LibFT4222) or can be set by FTDI - FT Prog Setting


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## 21.4 Configuration Mode 3

| FT4222H CNFMODE3 | | | I/O Status in Revision-B, C, D | | | | |
|---|---|---|---|---|---|---|---|
| **Pin Number** | **Pin Name** | **Default Function** | **When Reset** | **After Reset** | **During Enumeration** | **SUSPEND (Default)** | **Active Function (After Enum.)** |
| 8 | SCK | SCK (Master) | Undefined | TriSt | Output-Low | (TriSt) | Function* |
| 9 | MISO | MISO (Master) | TriSt | TriSt | TriSt | (TriSt) | Function* |
| 10 | MOSI | MOSI (Master) | TriSt | TriSt | Output-High | (TriSt) | Function* |
| 11 | IO2 | IO2 (Master) | TriSt | TriSt | TriSt | (TriSt)) | Function* |
| 12 | IO3 | IO3 (Master) | TriSt | TriSt | TriSt | (TriSt) | Function* |
| 13 | GPIO0 | GPIO0 | TriSt | TriSt | TriSt | (TriSt) | Function* |
| 14 | GPIO1 | GPIO1 | TriSt | TriSt | TriSt | (TriSt) | Function* |
| 15 | GPIO2 | SUSP_OUT | TriSt | TriSt | Output-Low | (Output-High) | Default* |
| 16 | GPIO3 | WAKEUP | TriSt | TriSt | TriSt | (TriSt) | Default* |
| 17 | SS0O | SS0O | Output | Output-High | Output-High | (Output-High) | Default* |
| 32 | SS | SS | TriSt | TriSt | TriSt | (TriSt) | Default* |

**Table 21.4 FT4222H Rev. B, C, D I/O States Configuration Mode3**

**Default*:** Default means the function is as referred to in the column – "Default Function"

**Function*:** Function means that the function for each pin can be selected by the support library (LibFT4222)

**Function**:** Function means that the function for each pin can be selected by the support library (LibFT4222) or FTDI - FT Prog Setting

**(I/O Status):** I/O Status with parentheses means the I/O status will be changed by the support library (LibFT4222) or can be set by FTDI - FT Prog Setting.


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# 22 FT260 – I/O Pins

| FT260 | | | | I/O Status | | | |
|---|---|---|---|---|---|---|---|
| **Pin Number** | **Pin Name** | **Init. Default Function (During Enum.)** | **Active Function (After Enum.)** | **When Reset** | **After Reset** | **During Enumeration** | **SUSPEND (Default)** |
| 7 | TX_ACTIVE | TX_ACTIVE *N3, *N4 | As Init. | TriSt | TriSt | (Output-Low) *N3, *N4 | (Output-Low) *N4,*U |
| 8 | RTSN | GPIOB | As Init./ RTSN*U | TriSt | TriSt | TriSt | (TriSt) *N4,*U |
| 9 | CTSN | GPIOE | As Init./ CTSN*U | TriSt | TriSt | TriSt | (TriSt) *N4,*U |
| 10 | RXD | RXD/ GPIOC*N1 | As Init. | TriSt-PU | TriSt-PU | TriSt-PU | (TriSt-PU) *N4,*U |
| 11 | TXD | TXD/ GPIOD*N1 | As Init. | TriSt | TriSt | Output-High/ TriSt*N1 | (Output-High) / (TriSt)*N1 *N4,*U |
| 12 | GPIO0 | SCL | As Init. | TriSt | TriSt | TriSt*N5 | (TriSt) *N4,*U |
| 13 | GPIO1 | SDA | As Init. | TriSt | TriSt | TriSt*N5 | (TriSt) *N4,*U |
| 14 | GPIO2 | SUSP_OUT# *N3, *N4 | As Init. | TriSt | TriSt | (Output-High) *N3, *N4 | (Output-Low) *N4,*U |
| 15 | GPIO3 | WAKEUP *N4 | As Init./ GPIO3*U | TriSt | TriSt | TriSt | (TriSt) *N4,*U |
| 17 | GPIO4 | GPIO4 | As Init./ DCD*U | TriSt | TriSt | TriSt | (TriSt) *N4,*U |
| 18 | GPIO5 | GPIO5 | As Init./ RI*U | TriSt | TriSt | TriSt | (TriSt) *N4,*U |
| 16 | DTRN | GPIOF (see important notes) | As Init./ DTRN*U | TriSt-PU | Output-High | TriSt-PU | (TriSt-PU) *N4,*U |
| 27 | BCD_DET | BCD_DET *N3, *N4 | As Init. | Output-Low | Output-Low *N2 | (Output-Low) *N3, *N4 | (Output-Low) *N4,*U |
| 28 | DSRN | GPIOH | As Init./ DSRN*U | TriSt | TriSt | TriSt | (TriSt) *N4,*U |

**Table 22.1 FT260 I/O States**

***N1 :** Default function will be set as GPIO when CNFMODE1 (I2C only)
***N2 :** BCD_DET polarity can be changed via eFuse
***N3 :** function can be set or I/O status will be changed via eFuse
***N4 :** function can be set or I/O status will be changed via EEPROM
***N5 :** Internal TriSt(Open-drain) but with on-board pull-high resistor for I2C bus
***U :** function can be enabled via USB command
**(I/O Status) :** I/O Status with parentheses means it can be changed.

**Important Notes**

**Note 1:** The DTRN pin must be high when the device is powered up and comes out of reset. If this pin is low during start-up, the device will enter test mode which is reserved for FTDI use only. Device pins will behave differently in test mode compared to the normal user mode shown in the table above and may drive out signals.

**Note 2:** The GPIO0 and GPIO1 pins act as SCL and SDA to check for, and to read from, the external EEPROM on start-up. If using as GPIO, the user should consider that there will be activity on these pins when designing their external circuit.


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# Appendix A – References

## Document References

FT232R USB UART IC Data Sheet
FT245R USB FIFO Data Sheet
FT232RN USB UART IC Data Sheet
FT245RN USB FIFO Data Sheet
FT232H Single Channel Hi-Speed USB to Multipurpose UART/FIFO IC Data Sheet
FT2232H Hi-Speed Dual USB UART/FIFO IC Data Sheet
FT4232H Hi-Speed Quad USB UART IC Data Sheet
FT233HP/FT232HP High Speed USB Bridge with Type-C/PD3.0 Controller
FT2233HP/FT2232HP High Speed USB Bridge with Type-C/PD3.0 Controller
FT4233HP/FT4232HP High Speed USB Bridge with Type-C/PD3.0 Controller
FT2232D Dual USB UART/FIFO IC Data Sheet
FT200XD Full-Speed USB to I2C bridge in 10 pin DFN package Data Sheet
FT201X Full-Speed USB to I2C bridge Data Sheet
FT220X Full-Speed USB to 4-bit SPI/FT1248 bridge Data Sheet
FT221X Full-Speed USB to 8-bit SPI/FT1248 bridge Data Sheet
FT230X Full-Speed USB to basic UART Data Sheet
FT231X Full-Speed USB to full handshake UART Data Sheet
FT234XD Full-Speed USB to basic UART Data Sheet
FT240X Full-Speed USB to 8-bit FIFO Data Sheet
FT120 USB Full-Speed Device Controller Data Sheet
FT121 USB Full-Speed Device Controller Data Sheet
FT122 USB Full-Speed Device Controller Data Sheet
FT313H Hi-Speed Host Controller
FT4222H Hi-Speed Quad SPI/I2C IC Data Sheet
FT260 Full speed HID Class USB to UART/I2C Datasheet

## Acronyms and Abbreviations

| Terms | Description |
|---|---|
| PD | Internal pull-down resistor to GND |
| PU | Internal pull-up resistor to VCCIO |
| TriSt | High-impedance off-state (‘tristate’) |
| USB | Universal Serial Bus |
| USB-IF | USB Implementers Forum |


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# Appendix B – List of Tables and Figures

## List of Tables



## List of Figures

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# Appendix C – Revision History

Document Title: AN_184 FTDI Device Input Output Pin States

Document Reference No.: FT_000507

Clearance No.: FTDI#237

Product Page: https://ftdichip.com/product-category/products/ic/

Document Feedback: Send Feedback

| Revision | Changes | Date |
|---|---|---|
| 1.0 | Initial Release | 2011-11-24 |
| 2.0 | Updated to include FT-X series, FT12 series & FT313H | 2012-03-13 |
| 3.0 | Updated to include FT4222H | 10-09-2015 |
| 3.1 | Updated FT4222H rev. D I/O Pins in section 21.<br>Updated Table 2.2 Bit bang WR# strobe CBUS availability. | 19-04-2018 |
| 3.2 | Added FT260 | 12-05-2020 |
| 3.3 | Updated Section 21 and 22 | 13-07-2020 |
| 3.4 | Updated Table 6.3 and 6.4 | 14-05-2021 |
| 3.4 | Added pin numbers for the FT2232H-56Q and FT4232H-56Q<br>Updated to include Power delivery ICs<br>Update Section 4-1, 5, 5-1<br>Updated section 6.3 and 7.3 | 04-08-2023 |
| 3.5 | Edited Table 2.1 and 3.1.<br>Added FT232RN/FT245RN. | 21-11-2023 |


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