

IX02 – SPI to xBus breakout (SC18IS602B)

Technical Reference (PDFs)

XinaBox Rapid Prototyping Range [generic, Bjarke preparing draft]

XinaBox Getting Started [generic, Bjarke preparing draft]

IX02 Datasheet [pdf of Wiki product page]

SC18IS602B Datasheet [pdf from the manufacturer, same you have been using]

Product Details

Overview [1 line description]

This xChip is an interface breakout module.

Important

This xChip forms part of the XinaBox Rapid Prototyping Range. Check out the above PDF on “XinaBox Rapid Prototyping Range” for buyer guidance and other necessary parts.

xChips connect to each other using custom connectors, also sold by RS. Please click on the link(s) below to add the appropriate connectors.

This xChip needs an xBus connector (RS Product Codes:123-4567 xxx) to connect to other xChips. [relevant for this IX02].

Description

This xChip is an interface breakout module. The SC18IS602B is designed to serve as an interface between a standard I²C-bus of a microcontroller and an SPI bus. The IX02 is an SPI to xBus breakout designed for breadboarding with SPI and I²C devices. This allows the microcontroller to communicate directly with SPI devices through its I²C-bus.

The SC18IS602B operates as an I²C-bus slave-transmitter or slave-receiver and an SPI master. It controls all the SPI bus-specific sequences, protocol, and timing. It has its own internal oscillator, and it supports four SPI chip select outputs that may be configured as GPIO when not used.

Product Highlights

- I²C-bus slave interface operating up to 400 kHz
- SPI master operating up to 1.8 Mbits/s

Applications

- Converting I²C-bus to SPI
- Adding additional SPI devices to an existing system

Specifications

- 200-byte data buffer
- Up to four slave select outputs
- Up to four programmable I/O pins
- Low power mode
- Internal oscillator option
- Active LOW interrupt option

IX03 – UART to xBus breakout (SC16IS750IBS/SC16IS750)

Technical Reference (PDFs)

XinaBox Rapid Prototyping Range [generic, Bjarke preparing draft]

XinaBox Getting Started [generic, Bjarke preparing draft]

IX03 Datasheet [pdf of Wiki product page]

SC16IS750IBS Datasheet [pdf from the manufacturer, same you have been using]

Product Details

Overview

This xChip is an interface breakout module and is based on the SC16IS750IBS (or SC16IS750) chipset, which is a slave I²C-bus/SPI interface to a single-channel high performance UART.

Important

This xChip forms part of the XinaBox Rapid Prototyping Range. Check out the above PDF on “XinaBox Rapid Prototyping Range” for buyer guidance and other necessary parts.

xChips connect to each other using custom connectors, also sold by RS. Please click on the link(s) below to add the appropriate connectors.

This xChip needs an xBus connector (RS Product Codes:123-4567 xxx) to connect to other xChips. [relevant for this IX03].

Description

This xChip is an interface breakout module and is based on the SC16IS750IBS (or SC16IS750) chipset, which is a slave I²C-bus/SPI interface to a single-channel high performance UART. IX03 is a UART to xBus breakout designed for breadboarding with UART and I²C devices.

The SC16IS750 supports SPI clock speeds up to 4 Mbit/s and has programmable I/O pins. The SC18IS740/750/760's internal register set is backward-compatible with the widely used and widely popular 16C450. This allows the software to be easily written or ported from another platform.

Product Highlights

- Based on SC16IS750IBS from NXP Semiconductors

Applications

- Factory automation and process control
- Portable and battery operated devices
- Cellular data devices

Specifications

- Baud rates up to 5 Mbit/s in 16 clock mode
- Auto hardware flow control using RTS/CTS
- Auto software flow control with programmable Xon/Xoff characters
- Single or double Xon/Xoff characters
- Automatic RS-485 support (automatic slave address detection)
- Single full-duplex UART
- Selectable I²C-bus or SPI interface
- Industrial temperature range: -40°C to +95°C

- 64 bytes FIFO (transmitter and receiver)

MD01 – Spacer

Technical Reference (PDFs)

XinaBox Rapid Prototyping Range [generic, Bjarke preparing draft]

XinaBox Getting Started [generic, Bjarke preparing draft]

MD01 Datasheet [pdf of Wiki product page]

Product Details

Overview

This xChip is used as a placeholder for mechanical strength and xBus redundancy.

Important

This xChip forms part of the XinaBox Rapid Prototyping Range. Check out the above PDF on “XinaBox Rapid Prototyping Range” for buyer guidance and other necessary parts.

xChips connect to each other using custom connectors, also sold by RS. Please click on the link(s) below to add the appropriate connectors.

This xChip needs an xBus connector (RS Product Codes:123-4567 xxx) to connect to other xChips. [relevant for this MD01].

Description

This xChip is used as a placeholder for mechanical strength and xBus redundancy. The MD01 blank xChip or dummy xChip also contains a QR code that points to the online store.

Product Highlights

- Mechanical placeholder
- All signals and power are carried to create redundancy

Applications

- Mechanical interface
- xBus redundancy

MD02 – Blank without I2C

Technical Reference (PDFs)

XinaBox Rapid Prototyping Range [generic, Bjarke preparing draft]

XinaBox Getting Started [generic, Bjarke preparing draft]

MD02 Datasheet [pdf of Wiki product page]

Product Details

Overview

This xChip is used to break the I²C bus communication.

Important

This xChip forms part of the XinaBox Rapid Prototyping Range. Check out the above PDF on “XinaBox Rapid Prototyping Range” for buyer guidance and other necessary parts.

xChips connect to each other using custom connectors, also sold by RS. Please click on the link(s) below to add the appropriate connectors.

This xChip needs an xBus connector (RS Product Codes:123-4567 xxx) to connect to other xChips. [relevant for this MD02].

Description

This xChip is used to break the I²C bus communication. This allows users to use the AI01 multiplexer without confusing the circuit.

Product Highlights

- No I²C bus
- All signals and power are carried to create redundancy except for I²C

Applications

- No I²C bus
- xBus redundancy except for I²C

MD03 – Blank without Serial

Technical Reference (PDFs)

XinaBox Rapid Prototyping Range [generic, Bjarke preparing draft]

XinaBox Getting Started [generic, Bjarke preparing draft]

MD03 Datasheet [pdf of Wiki product page]

Product Details

Overview

This xChip is a blank chip without the serial bus.

Important

This xChip forms part of the XinaBox Rapid Prototyping Range. Check out the above PDF on “XinaBox Rapid Prototyping Range” for buyer guidance and other necessary parts.

xChips connect to each other using custom connectors, also sold by RS. Please click on the link(s) below to add the appropriate connectors.

This xChip needs an xBus connector (RS Product Codes:123-4567 xxx) to connect to other xChips. [relevant for this MD03].

Description

This xChip is a blank chip without the serial bus. This chip won't allow the serial bus channel to go through it.

Product Highlights

- No serial bus
- All signals and power are carried to create redundancy except for serial

Applications

- No serial bus
- xBus redundancy except for serial

OC05 – Servo Driver (PCA9685, BU33SD5)

Technical Reference (PDFs)

XinaBox Rapid Prototyping Range [generic, Bjarke preparing draft]

XinaBox Getting Started [generic, Bjarke preparing draft]

OC05 Datasheet [pdf of Wiki product page]

PCA9685 Datasheet [pdf from the manufacturer, same you have been using]

BU33SD5 Datasheet [pdf from the manufacturer, same you have been using]

Product Details

Overview

This xChip is an output control module, based on the PCA9685 from NXP Semiconductors, which is an I²C-controlled Pulse Width Modulation (PWM) controller with a built-in clock.

Important

This xChip forms part of the XinaBox Rapid Prototyping Range. Check out the above PDF on “XinaBox Rapid Prototyping Range” for buyer guidance and other necessary parts.

xChips connect to each other using custom connectors, also sold by RS. Please click on the link(s) below to add the appropriate connectors.

This xChip needs an xBus connector (RS Product Codes:123-4567 xxx) to connect to other xChips. [relevant for this OC05].

Description

This xChip is an output control module, based on the PCA9685 from NXP Semiconductors, which is an I²C-controlled Pulse Width Modulation or PWM controller with a built-in clock.

This controller used as an interface to accurately drive up to 8 servo motors. The module accepts an input power source locally to drive the motors.

The OC05 xChip is a servo motor controller driver that uses the PCA9685 PWM controller as servo interface supported by a BU33SD5 regulator to drive and accurately control up to 8 servo motors on a single module and act as a system power supply. The module has 8 standard 2.54 mm (0.1”) servo headers, plus 1 standard 2.54 mm (0.1”) battery/BEC input header.

Product Highlights

- Servo motor controller/driver
- Connect up to 8 servos
- Standard 2/54 mm servo motor header
- Support for 8 different I2C addresses (possible to connect up to 64 servos)

Applications

- Robotics
- Motion control
- Actuator interfaces
- Positional control

Specifications

- PCA9685:
 - 8 PWM drivers
 - 1 MHz Fast-mode Plus compatible I²C-bus interface

- 4096-step (12-bit) linear programmable PWM output varying from fully off (default) to maximum PWM.
- Internal power-on reset
- No output glitches on power-up
- Low standby current
- BU33SD5:
 - Output current range: 0 to 500 mA
 - Operating temperature range: -40°C to +105°C
 - Output voltage accuracy: $\pm 2.0\%$
 - Circuit current: 33 μ A(Typ.)
 - Standby current: 0 μ A(Typ.)

OC06 – Stepper Driver (DRV8825, PCA9554A)

Technical Reference (PDFs)

XinaBox Rapid Prototyping Range [generic, Bjarke preparing draft]

XinaBox Getting Started [generic, Bjarke preparing draft]

OC06 Datasheet [pdf of Wiki product page]

DRV8825 Datasheet [pdf from the manufacturer, same you have been using]

PCA9554A Datasheet [pdf from the manufacturer, same you have been using]

Product Details

Overview

This xChip is an output control module, based on the PCA9554A by Texas Instruments, which is an 8-bit I/O expander for the two-line bidirectional bus (I²C).

Important

This xChip forms part of the XinaBox Rapid Prototyping Range. Check out the above PDF on “XinaBox Rapid Prototyping Range” for buyer guidance and other necessary parts.

xChips connect to each other using custom connectors, also sold by RS. Please click on the link(s) below to add the appropriate connectors.

This xChip needs an xBus connector (RS Product Codes:123-4567 xxx) to connect to other xChips. [relevant for this OC06].

Description

This xChip is an output control module, based on the PCA9554A by Texas Instruments, which is an 8-bit I/O expander for the two-line bidirectional bus (I²C).

On this xChip, the PCA9554A drives the control signals of a DRV8825 Stepper Motor Controller. The PCA9554A accepts control commands through the I²C interface which provide the control signals to the DRV8825.

The DRV8825 provides an integrated motor driver solution for printers, scanners, and other automated equipment applications. The OC06 has one H-bridge driver and a microstepping indexer, and is intended to drive a bipolar stepper motor.

This xChip is capable of driving an individual stepper motor only. When more than one stepper motor is required, the physical address of the PCA9554A can be changed by soldering the I²C address selection pads.

Product Highlights

- Stepper motor controller/driver
- Connects a single stepper via screw terminals
- External motor supply input via screw terminal (Max 47 V)
- 2.5 A continuous motor output current
- Built-in microstepping indexer
- Up to 1/32 microstepping

Applications

- Robotics
- Precision control
- Accurate positional control systems
- CNC machines

Specifications

- DRV8825:
 - PWM microstepping stepper motor driver:
 - Built-in microstepping indexer
 - Up to 1/32 microstepping
 - Multiple decay modes:
 - Mixed decay
 - Slow decay
 - Fast decay
 - 2.5 A maximum drive current at 24 V
 - Low current sleep mode
 - Protection features:
 - Overcurrent protection (OCP)
 - Thermal shutdown (TSD)
 - VM undervoltage lockout (UVLO)
 - Fault condition indication pin (nFAULT)
- PCA9554A:
 - 400 kHz Fast I²C bus
 - Three hardware address pins allow up to eight I²C addresses
 - Internal power-on reset
 - No glitch on power up
 - Latched outputs with high-current drive

OD01 – OLED Display 128x64 (SSD1306)

Technical Reference (PDFs)

XinaBox Rapid Prototyping Range [generic, Bjarke preparing draft]

XinaBox Getting Started [generic, Bjarke preparing draft]

OD01 Datasheet [pdf of Wiki product page]

SSD1306 Datasheet [pdf from the manufacturer, same you have been using]

Product Details

Overview

This xChip is an output display module and is equipped with an OLED display unit that is capable of displaying any text or graphics.

Important

This xChip forms part of the XinaBox Rapid Prototyping Range. Check out the above PDF on “XinaBox Rapid Prototyping Range” for buyer guidance and other necessary parts.

xChips connect to each other using custom connectors, also sold by RS. Please click on the link(s) below to add the appropriate connectors.

This xChip needs an xBus connector (RS Product Codes:123-4567 xxx) to connect to other xChips. [relevant for this OD01].

Description

This xChip is an output display module and is equipped with an OLED display unit that is capable of displaying any text or graphics. This display can be very useful as a sensor data display.

These miniature display are about 0.96” diagonal, but very readable due to the high contrast of OLED technology. This display is made of 128x64 individual monochrome OLED pixels, each one is turned on or off by the controller chip. Because the display makes its own light, no backlight is required. This reduced the power required to run the OLED and is why the display has such high contrast; we really like this miniature display for its crispness!

Product Highlights

- Monochrome OLED display
- 128x64 dot matrix
- Built-in controller
- Based on SSD1306

Applications

- Graphical interfaces
- Sensor readout display
- Game interface
- Data graph display

Specifications

- Resolution: 128x64 dot matrix panel
- For matrix display
 - Segment maximum source current: 100 uA
 - Common maximum sink current: 15 mA
 - 256 step contrast brightness current control

- Embedded 128x64 bit SRAM display buffer
 - 8-bit 6800/8080-series parallel interface
 - I²C interface
- Screen saving continuous scrolling function in both horizontal and vertical direction.
- RAM write synchronization signal
- Programmable frame rate and multiplexing ratio
- Row re-mapping and column re-mapping
- On-chip oscillator
- Chip layout for GOC & COF
- Wide range of operating temperature: -40°C to 85°C

PB01 – Dual AA Battery Power Pack (AAT1217)

Technical Reference (PDFs)

XinaBox Rapid Prototyping Range [generic, Bjarke preparing draft]

XinaBox Getting Started [generic, Bjarke preparing draft]

PB01 Datasheet [pdf of Wiki product page]

AAT1217 Datasheet [pdf from the manufacturer, same you have been using]

Product Details

Overview

This xChip is a power module that houses 2 x AA batteries to supply power to other connected xChips.

Important

This xChip forms part of the XinaBox Rapid Prototyping Range. Check out the above PDF on “XinaBox Rapid Prototyping Range” for buyer guidance and other necessary parts.

xChips connect to each other using custom connectors, also sold by RS. Please click on the link(s) below to add the appropriate connectors.

This xChip needs an xBus connector (RS Product Codes:123-4567 xxx) to connect to other xChips. [relevant for this PB01].

Description

This xChip is a power module that houses 2 x AA batteries to supply power to other connected xChips.

The PB01 features an AAT1217, which is a highly efficient, synchronous, fixed frequency(1.2 MHz), step-up converter designed for battery-powered applications. The high switching frequency and integrated control circuitry maintains excellent regulation, ripple, and transient response throughout the full load range.

Light load operation and low quiescent current allow the AAT1217 to maintain high efficiency performance for light load conditions. A 1.2A peak inductor current limit, allow for the AAT1217 is capable of delivering 400mA from dual AA cells batteries.

Product Highlights

- 400 mA output current
- Over-current protection
- High efficiency: Up to 93% efficiency
- 1.2 MHz fixed switching frequency
- 1.2 A current limit
- Light load mode operation

Applications

- Remote sensing
- IoT applications
- Provides system power

Specifications

- Internal synchronous rectifier
- Fixed frequency Pulse Width Modulation (PWM) current mode control scheme with internal compensation.

- EMI reduction anti-ringing control circuitry
- Low shutdown current: $<1.0 \mu\text{A}$
- -40°C to $+85^{\circ}\text{C}$ ambient temperature range

PB02 – Coin Battery Power Pack (AAT1217)

Technical Reference (PDFs)

XinaBox Rapid Prototyping Range [generic, Bjarke preparing draft]

XinaBox Getting Started [generic, Bjarke preparing draft]

BD01 Datasheet [pdf of Wiki product page]

AAT1217 Datasheet [pdf from the manufacturer, same you have been using]

Product Details

Overview

This xChip is a power module that houses a single CR2032 coin cell to supply power to other connected xChips.

Important

This xChip forms part of the XinaBox Rapid Prototyping Range. Check out the above PDF on “XinaBox Rapid Prototyping Range” for buyer guidance and other necessary parts.

xChips connect to each other using custom connectors, also sold by RS. Please click on the link(s) below to add the appropriate connectors.

This xChip needs an xBus connector (RS Product Codes:123-4567 xxx) to connect to other xChips. [relevant for this PB02].

Description

This xChip is a power module that houses a single CR2032 coin cell to supply power to other connected xChips.

The PB02 features an AAT1217, which is a highly efficient, synchronous, fixed frequency (1.2 MHz), step-up converter designed for battery-powered applications. The high switching frequency and integrated control circuitry maintains excellent regulation, ripple, and transient response throughout the full load range.

Light load operation and low quiescent current allow the AAT1217 to maintain high efficiency performance for light load conditions. A 1.2A peak inductor current limit, allow for the AAT1217 is capable of delivering 400mA from from a single CR2032 coin cell.

Product Highlights

- 400 mA output from single CR2032 coin cell
- Over-current protection
- High efficiency: Up to 93% efficiency
- 1.2 MHz fixed switching frequency
- 1.2 A current limit
- Light load mode operation

Applications

- Remote sensing
- IoT applications
- Provides system power

Specifications

- Internal synchronous rectifier
- Fixed frequency Pulse Width Modulation (PWM) current mode control scheme with internal compensation

- EMI reduction anti-ringing control circuitry
- Low shutdown current: $<1.0 \mu\text{A}$
- -40°C to $+85^{\circ}\text{C}$ ambient temperature range