NXP low-power bridges
SC16IS750/52/60/62

Low-power bridges for I²C or SPI to UART or IrDA or GPIO

These compact protocol converters create seamless, low-power, low-voltage connections for the most widely used interfaces (I²C, GPIO, IrDA, SPI, UART), making it easy to add multiple devices to any application with I²C or SPI bus interfaces. The result is increased design flexibility with reduced complexity, lower software overhead, and faster time-to-market.

Features

▸ 2.5- or 3.3-V operation with inputs tolerant to 5 V
▸ Low power consumption (<30 μA sleep mode, <6 mA operating)
▸ Selectable I²C or SPI bus interface
▸ Eight GPIO pins (also configurable as modem control)
▸ High-speed (5 Mbps) 16C-core-based single/dual UARTs
▸ 64-byte UART FIFO depth (Tx/Rx)
▸ Automatic hardware and software UART flow controls
▸ Automatic RS-485 support on each UART port
▸ Industrial temperature range (-40 to +85°C)
▸ TSSOP or HVQFN package

Applications

▸ Systems that need asynchronous serial ports
▸ IrDA remote controls
▸ TV tuners, IP set-top boxes, PDAs, media PCs
▸ Mobile TVs and smartphones
▸ Bluetooth interfaces, GPS navigation
▸ Wireless LAN radios, barcode scanners
▸ Portable medical equipment
▸ Industrial control, power-metering equipment
▸ Extra serial ports for software debug
▸ Switches, hubs, routers
▸ Car infotainment

The NXP low-power bridges SC16IS750/52/60/62 simplify design and reduce system cost by making it easy to add devices to an application.

Each IC is equipped with up to eight GPIO, supports IrDA, and offers automatic RS-485 slave detection. A host interface can be reduced from 15 wires to 2 or 4, so the PCB layout is smaller and less expensive.

When used with a microcontroller or a CPU, the bridges provide simple, effective expansion with minimum overhead.

Functional overview

For designs using RS-485 communication, the UART features automatic slave address detection. The RTS pin is

founded by Philips

automatically inverted during transmission, enabling auto-direction functions. The UART also features automatic hardware and software control, so the data flow can be regulated to prevent data overflow or lost data. Automatic hardware control uses RTS/CTS pins; automatic software flow control uses programmable XON/XOFF characters (single or double). Also, to provide maximum firmware compatibility and reduce design time, each UART is register-compatible with industry-standard UARTs, so software from previous designs can be ported quickly.

The IrDA interface makes wireless connectivity possible, so the system can communicate with PDAs, consumer remote controls, and other wireless devices.

To increase design flexibility, each bridge offers up to eight extra GPIO, which can be used for such functions as controlling LEDs or fans, or detecting push-buttons/keypads.

Operating characteristics

Each bridge supports 2.5- to 3.3-V operation with 5-V tolerant inputs. All consume less than 30 µA in sleep mode and less than 6 mA in operating mode. The UART baud rate is up to 5 Mbps with a 16x clock, and each UART has a FIFO depth of 64 bytes (transmitter and receiver). The bridges operate at a maximum clock frequency of 48 MHz (2.5 V) or 80 MHz (3.3-V) and throughout the industrial temperature range (-40 to +85 °C)
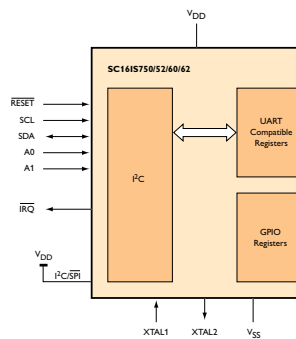
Host interface

When operating as an I²C slave, the bridges operate at up to 400 kbps with a choice of 16 hardware-selectable addresses. When operating as an SPI slave, the bridges can operate at up to 15 Mbps.

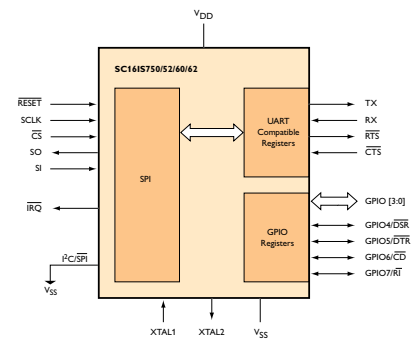For more information, please visit:
www.nxp.com/interface

For technical support, please send questions to:
interface.support@nxp.com
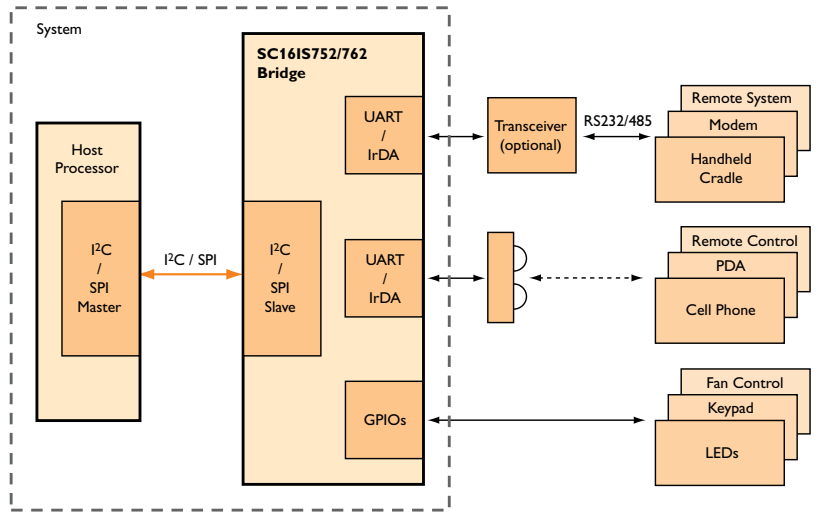
SC16IS7xx usage scenarios

SC16IS7xx block diagram
(I²C-to-UART interface)

SC16IS7xx block diagram
(SPI-to-UART interface)

Ordering information

Type number	UART channels	IrDA SIR speed	SPI speed up to	Package	Package dimensions
SC16IS750IBS	1	115 Kbps	4 Mbps	HVQFN24	4.1 x 4.1 x 1.0 mm
	1	115 Kbps	4 Mbps	TSSOP24	7.9 x 4.5 x 1.1 mm
SC16IS752IBS	2	115 Kbps	4 Mbps	HVQFN32	5.1 x 5.1 x 1.0 mm
	2	115 Kbps	4 Mbps	TSSOP28	9.8 x 4.5 x 1.1 mm
SC16IS760IBS	1	1.152 Mbps	15 Mbps	HVQFN24	4.1 x 4.1 x 1.0 mm
	1	1.152 Mbps	15 Mbps	TSSOP24	7.9 x 4.5 x 1.1 mm
SC16IS762IBS	2	1.152 Mbps	15 Mbps	HVQFN32	5.1 x 5.1 x 1.0 mm