



USB



HI-SPEED USB TRANSCEIVER

Type number	Package	Remarks	Clock frequency	speed modes	# of bits	main supply voltage	digital I/O I/F voltage	charge pump regulator
CP2147BE	SOT313-2 (LQFP48)	host, peripheral	12 MHz	high-speed, full-speed	16	3.0 V to 3.6 V	3.3 V or 5.0 V	
ISP1504ABS	SOT617-1 (HVQFN32)	host, peripheral + OTG	19.2 MHz	high-speed, full-speed, low-speed	8		1.65 V to 3.6 V	embedded
ISP1504CBS	SOT617-1 (HVQFN32)	host, peripheral + OTG	26 MHz	high-speed, full-speed, low-speed	8		1.65 V to 3.6 V	embedded
ISP1505ABS	SOT616-1 (HVQFN24)	host, peripheral + SRP OTG	19.2 MHz	high-speed, full-speed, low-speed	8		1.65 V to 1.95 V	
ISP1505CBS	SOT616-1 (HVQFN24)	host, peripheral + SRP OTG	26 MHz	high-speed, full-speed, low-speed	8		1.65 V to 1.95 V	
ISP1506ABS	SOT616-1 (HVQFN24)	host, peripheral + OTG	19.2 MHz	high-speed, full-speed, low-speed	4		1.65 V to 3.6 V	embedded
ISP1506BBS	SOT616-1 (HVQFN24)	host, peripheral + OTG	26 MHz	high-speed, full-speed, low-speed	4		1.65 V to 3.6 V	embedded

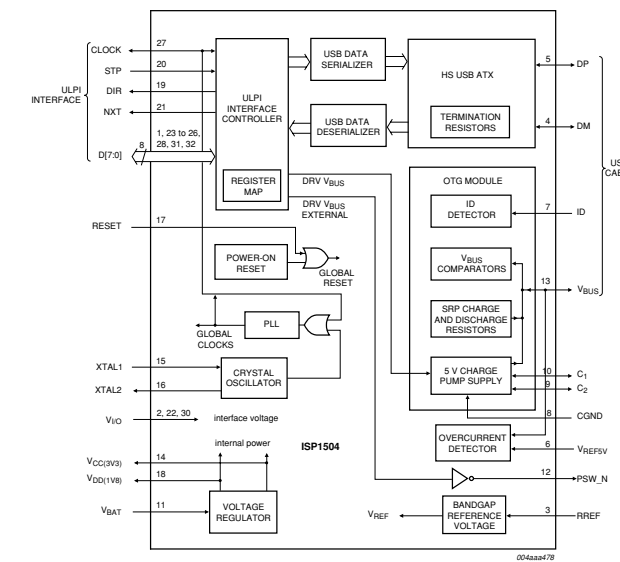
Related literature

- ISP1504, ISP1505, ISP1506 ULPI transceivers for use with Hi-Speed USB host, peripheral, and OTG cores (leaflet)
- UTMI+ White Paper
- ISP1504 ULPI transceiver eval board, supporting Hi-Speed USB host, peripheral and OTG (user manual)
- ISP1505 ULPI Transceiver eval board, supporting Hi-speed USB host and peripheral (user manual)
- ISP1506 ULPI transceiver eval board, supporting Hi-Speed USB host, peripheral and OTG (user manual)

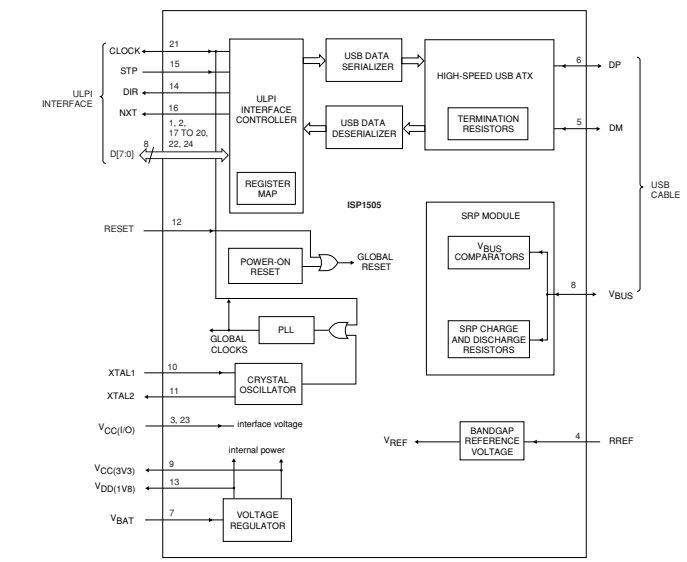
Order code

- 9397 750 12949 utmiplus_whitepaper.pdf
- UM10058
- UM10062
- UM10063

ISP1504 block diagram



ISP1505 block diagram



Features

ISP1504, ISP1505, ISP1506

for use with ASICs, FPGAs, and SoCs that have a USB controller with Hi-Speed USB host, peripheral, or OTG functionality support high-, full-, and low-speed data

ISP1504

interfacing to host, peripheral, and dual-role OTG device cores used in portable devices or systems with a built-in USB OTG dual-role core built-in charge pump supplies V_{BUS} . Also supports external V_{BUS}

ISP1505

optimized for use in standalone systems such as set-top boxes or PC peripherals, interfaces to host and peripheral cores 12-pin Link-to-Phy interface supports Session Request Protocol (SRP)

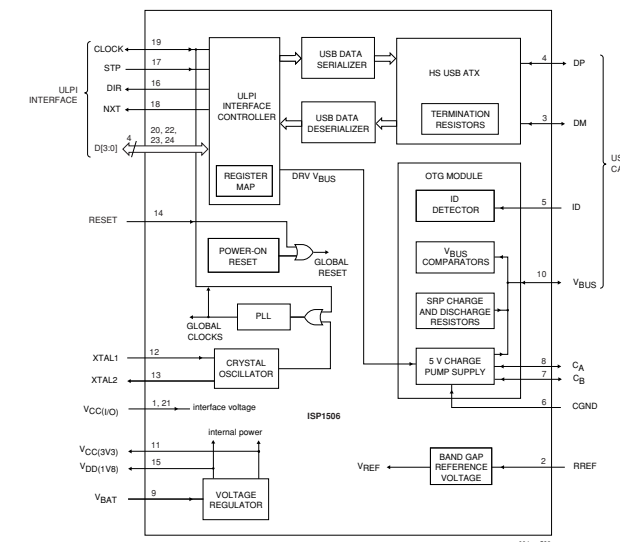
ISP1506

for portable applications with tight size constraints 4-bit DDR bus means the Link-to-Phy interface uses only 8 pins to reduce power consumption, the digital I/O voltage interface operates between 1.65 V and 1.95 V built-in charge pump supplies V_{bus}

Applications

- Set-top box
- MP3 player
- Digital still camera
- Mobile phone

ISP1506 block diagram



Why choose Philips Semiconductors?

...CP2147

- * speeds time to market and reduces risk for ASIC and FPGA designs
- * 16-bit bidirectional data bus interface SIE cores runs at 30 MHz, enabling effective FPGA verification
- * Designed for ASIC/FPGA development provides a Hi-Speed USB analog front-end for ASICs and FPGAs that have built-in USB SIE cores
- * legacy compliant with Original USB full-speed transceiver interface
- * Designed for bus-powered applications with low suspend currents, it can be used in self-, hybrid-, or bus-powered conditions.
- * Loopback test mode for SIE self-test
- * Internal power-on reset
- * NRZI encoding and decoding

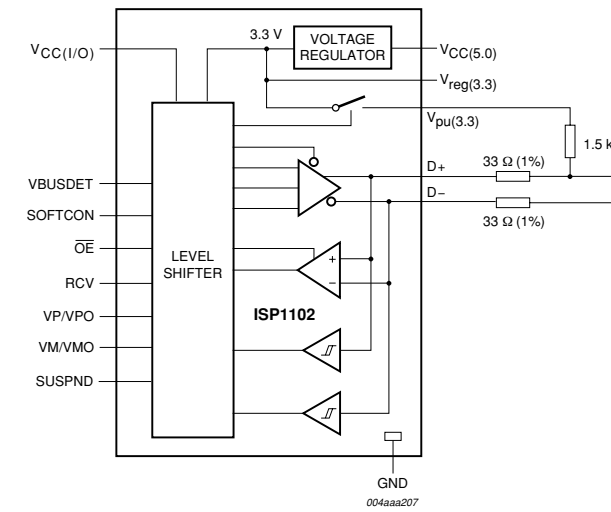
...ISP1504, ISP1505, ISP1506

- * allow ease of working with other Hi-Speed USB building blocks because they have been streamlined to the UTMI+ Low Pin Interface specification
- * there's a chip to cater for each customer's requirement

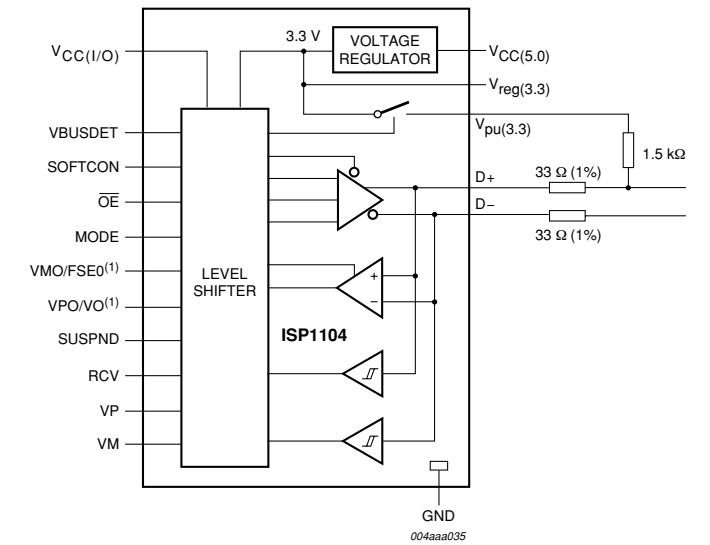
USB TRANSCEIVERS

Type number	Package	Remarks	speed modes	main supply voltage	digital I/O I/F voltage	input modes	integrated voltage regulator
ISP1102BS	SOT773-1 (HVQFN14)	host/peripheral; good for 3.3 V supply voltage	full-speed	3.0 V to 3.6 V	1.65 V to 3.6 V	bidirectional i/p mode; V _{BUS} detection but not in 'suspend' mode	5 V-to-3.3 V
ISP1102W	SOT639-2 (HBCC16)	host/peripheral; good for 3.3 V supply voltage	full-speed	3.0 V to 3.6 V	1.65 V to 3.6 V	bidirectional i/p mode; V _{BUS} detection but not in 'suspend' mode	5 V-to-3.3 V
ISP1104W	SOT639-2 (HBCC16)	host/peripheral	full-speed	3.0 V to 3.6 V	1.65 V to 3.6 V	selectable differential or single-ended i/p mode; V _{BUS} detection	5 V-to-3.3 V
ISP1105BS	SOT758-1 (HVQFN16)	host/peripheral	full-speed, low-speed	3.0 V to 3.6 V	1.65 V to 3.6 V	selectable differential or single-ended i/p mode	5 V-to-3.3 V
ISP1105W	SOT639-2 (HBCC16)	host/peripheral	full-speed, low-speed	3.0 V to 3.6 V	1.65 V to 3.6 V	selectable differential or single-ended i/p mode	5 V-to-3.3 V
ISP1106DH	SOT403-1 (TSSOP16)	host/peripheral	full-speed, low-speed	3.0 V to 3.6 V	1.65 V to 3.6 V	differential i/p mode	5 V-to-3.3 V
ISP1106W	SOT639-2 (HBCC16)	host/peripheral	full-speed, low-speed	3.0 V to 3.6 V	1.65 V to 3.6 V	differential i/p mode	5 V-to-3.3 V

ISP1102 block diagram



ISP1104 block diagram



Related literature

Title	Order code
ISP110x: USB Physical Layer Transceiver for SoC Applications (leaflet)	9397 750 13953
ISP110x Product Selection Guide	UM10008
White Paper: USB Full-Speed Transceiver Interface	AN10011
ISP110x Interfacing (application note)	AN10001
ISP110x Eval Kit User Manual for the HBCC package	UM10001
ISP110x Eval Board User Manual for the HVQFN Package	UM10025

Features

ISP1102

- Bidirectional differential
- VBUSDET but not in suspend mode
- Works very well with 3.3V supply voltage
- Full-speed only

ISP1104

- Single-ended or differential (selectable) with VBUSDET for switching from USB to other serial protocols
- Full-speed only

ISP1105

- Single-ended or differential (selectable)
- Full-speed/low-speed select

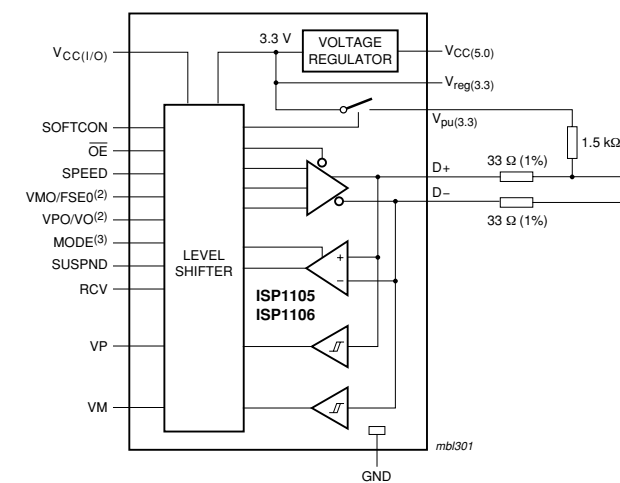
ISP1106

- Differential
- Full-speed/low-speed select

Applications

- Mobile phone
- Digital camera
- PDA

ISP1105, ISP1106 block diagram



Why choose Philips Semiconductors?

...ISP1102, ISP1104, ISP1105, ISP1106

- * voltages down to 1.65 V. Good for mobile and portable applications, which often require operation at 1.8 V
- * integrated 5V-to-3.3V voltage regulator reduces BOM
- * small chip-scale packaging

USB CARKIT TRANSCEIVER

Type number	Package	Other specs	Other interfaces	speed modes	main supply voltage	digital I/O I/F voltage	integrated voltage regulator
ISP1109BS	SOT617-1 (HVQFN32)	carkit standard CEA-936-A	SPI (up to 26 MHz), I ² C-bus (up to 400 kHz), UART passthro	full-speed, low-speed	3.0V to 3.6V	1.65 V to 3.6 V	5V-to-3.3V

 Related literature

Title	Order code
ISP1109 USB Carkit Transceiver (leaflet)	9397 750 14074
ISP1109 PC Eval Kit User Manual	UM10059

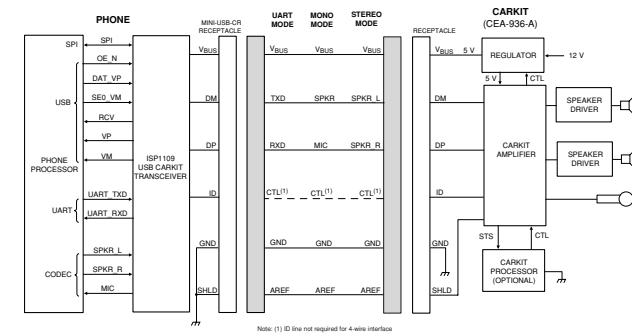
Features

- ISP1109**
- Full-speed (12 Mbit/s) and low-speed (1.5 Mbit/s) data transfer rates
- Built-in analog switches support analog audio signals multiplexed on DP and DM lines
- Supports SPI up to 26 MHz and I²C-bus up to 400 kHz serial interface to access control and status registers
- Supports On-The-Go (OTG) Session Request Protocol (SRP)
- Supports Power-down mode: entire chip consumes < 12 µA current
- Supports UART pass-through on DP and DM lines
- Flexible power supply input of 3.0V to 5.25 V
- Wide range digital interfacing I/O voltage 1.65 V to 3.6 V
- Supports charger current switching (ISET) detection
- Small HVQFN32 (5 x 5 mm²) halogen- and lead-free package

Applications

Mobile phone that supports carkit application

CEA-936-A carkit diagram, featuring ISP1109



Why choose Philips Semiconductors?

- ...ISP1109**
- * USB transceiver that supports CEA-936-A, Mini-USB Analog Carkit Interface specification. Therefore good for European Union and North American countries whose legislation requires carkit components that support CEA-936-A

USB ON-THE-GO TRANSCEIVER

Type number	Package	speed modes	main supply voltage	digital I/O I/F voltage	charge pump regulator
ISP1301BS	SOT616-1 (HVQFN24)	full-speed, low-speed	2.7V to 4.5 V	1.65 V to 3.6 V	outputs V _{BUS} voltage 4.4 V to 5.25 V at current > 8 mA, tunable by external capacitor

 Related literature

Title	Order code
ISP1301: USB On-The-Go Physical Layer Transceiver (leaflet)	9397 750 10476
ISP1301 Evaluation Board User's Guide	UM10028

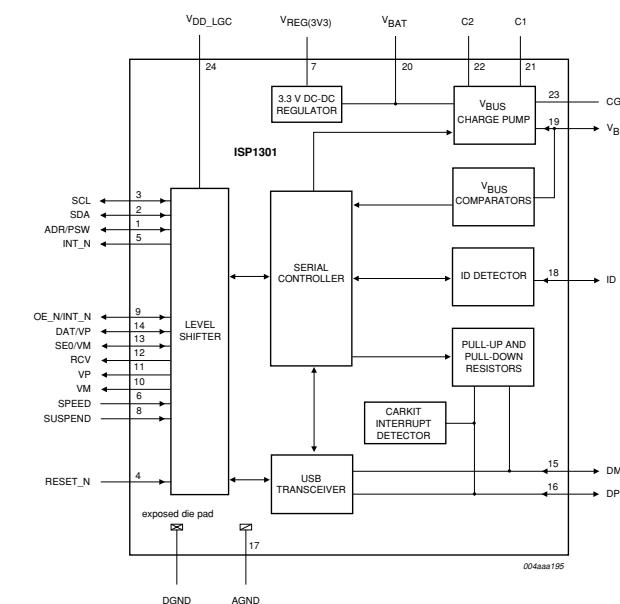
Features

- ISP1301**
- Flexible general-purpose buffer mode supports serial communication interfaces used with UARTs (e.g., RS-232)
- Full-speed (12 Mbit/s) and low-speed (1.5 Mbit/s) data transfer rates
- Serial I²C interface for OTG status and command controls
- Supports mini USB audio interface
- Supports data line V_{BUS} pulsing session request
- Contains HNP command and status registers

Applications

- Digital camera
- Video recorder
- Digital audio player
- Mobile phone

ISP1301 block diagram



Why choose Philips Semiconductors?

- ...ISP1301**
- * gives product designers a flexible, low-cost way to add OTG functionality to a wide variety of portable and mobile digital products
- * enables ASICs, FPGAs, and SoCs with a built-in USB OTG dual-role core to interface with the USB physical layer
- * allows end-product long battery life: global power down mode reduces power consumption to bare minimum
- * makes end-product easy to use

USB HOSTS

Type number	Package	Remarks	speed modes	# downstream ports	parallel I/F between HC and μ P	main supply voltage	integrated voltage regulator
ISP1160BD/01	SOT314-2 (LQFP64)	host stack written in C	full-speed, low-speed	2	up to 15 MB/s	3.3 V or 5.0 V	5 V-to-3.3 V
ISP1160BM/01	SOT414-1 (LQFP64)	host stack written in C	full-speed, low-speed	2	up to 15 MB/s	3.3 V or 5.0 V	5 V-to-3.3 V

Related literature

Title	Order code
ISP1160 USB Host Controller (leaflet)	9397 750 10517
ISP1160 PC Eval Kit User's Guide	UM10018
ISP116x Microsoft Win CE version 4.1 Accelent Development Setup User's Guide	UM10034
ISP116x Add-On Evaluation Kit with Intel® PXA250 Integrated Development Platform (user manual)	UM10035
ISP1160 Embedded Programming Guide	AN10003
Interrupt Control for ISP116x (application note)	AN10014
ISP1160 Low Current Consumption (application note)	AN10022
Interfacing ISP1160x to Fujitsu SPARClike RISC Processor (application note)	AN10023
Interfacing ISP1160x to Hitachi SH7709 RISC Processor (application note)	AN10024
Interfacing ISP1160x to Intel StrongARM® SA1110 Processor (application note)	AN10025
Interfacing ISP1160x to Motorola DragonBall® EZ RISC Processor (application note)	AN10026
Interfacing ISP1160x to NEC V832 Processor (application note)	AN10027
Handling Reset in the ISP116x (application note)	AN10044

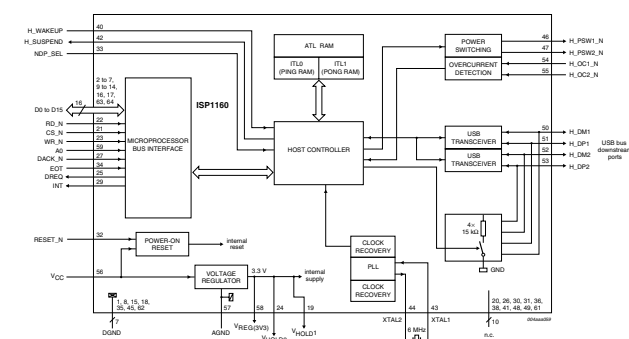
Features

ISP1160/01
Well-suited for embedded systems and portable devices that require a USB host
Allows embedded systems can themselves act as USB hosts, without the intervention of a PC
Glueless interface to various microcontrollers and RISC processors
Low EMI performance: 6 MHz crystal or oscillator

Applications

- Digital camera
- PDA
- Game console
- Smart phone

ISP1160/01 block diagram



Why choose Philips Semiconductors?

- ...ISP1160/01
- * well-suited for embedded systems and portable devices that require a USB host
 - * allows embedded systems can themselves act as USB hosts, without the intervention of a PC
 - * Glueless interface to various microcontrollers and RISC processors
 - * low EMI performance: 6 MHz crystal or oscillator

PCI-BASED HI-SPEED USB HOSTS

Type number	Package	Other interfaces	speed modes	# downstream ports	main supply voltage	core voltage
ISP1562BE	SOT407-1 (LQFP100)	PCI, EHCI 1.0	high-speed, full-speed, low-speed	2	3.0 V to 3.6 V	1.8 V
ISP1563BM	SOT420-1 (LQFP128)	PCI, EHCI 1.0	high-speed, full-speed, low-speed	4	3.0 V to 3.6 V	1.8 V

Related literature

Title	Order code
ISP1562, ISP1563 Low-power Hi-Speed USB PCI host controllers with two or four downstream ports (leaflet)	9397 750 14075
ISP1562 Eval board User Manual	UM10065

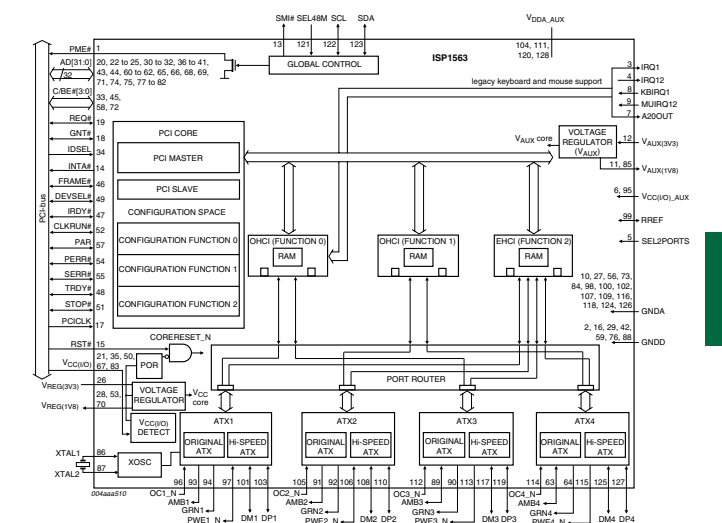
Features

ISP1562, ISP1563
One Hi-Speed USB EHCI core
Two USB OHCI cores
Four transceivers that support multiple data rates
Compatible with leading OS drivers (Windows XP, Windows 2000, Red Hat Linux, etc.)

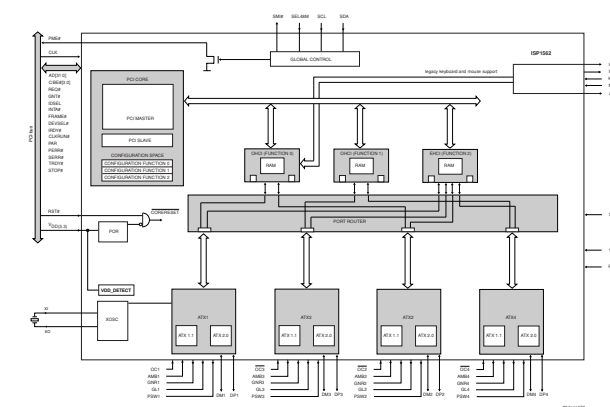
Applications

- Digital consumer appliances, e.g., DTV
- Web appliances, e.g., routers
- Portable PCs
- Set-top box

ISP1563 block diagram



ISP1562 block diagram



Why choose Philips Semiconductors?

- ...ISP1562, ISP1563
- * low power, PCI-based host controller, with two or four downstream facing ports
 - * OHCI- and EHCI-compliant

HI-SPEED USB HOSTS FOR EMBEDDED SYSTEMS

Type number	Package	Remarks	speed modes	# downstream ports	main supply voltage	digital I/O I/F voltage	core voltage
ISP1760BE	SOT425-1 (LQFP128)	embedded host; memory-mapped CPU I/F to any 32-bit or 16-bit I/F	high-speed, full-speed, low-speed	3	3.0V to 3.6V	1.65V to 3.6V	1.8V
ISP1760ET	SOT857-1 (TFBGA128)	embedded host; memory-mapped CPU I/F to any 32-bit or 16-bit I/F	high-speed, full-speed, low-speed	3	3.0V to 3.6V	1.65V to 3.6V	1.8V

Features

ISP1760

Fully compliant with USB Specification Rev. 2.0 and EHCI Specification Rev. 1.0

High-speed (480 Mbit/s), full-speed (12 Mbit/s) and low-speed (1.5 Mbit/s) data transfer rates

EHCI with Transaction Translator for complete backward compatibility with full-speed and low-speed USB devices

Flexible options for host system CPU

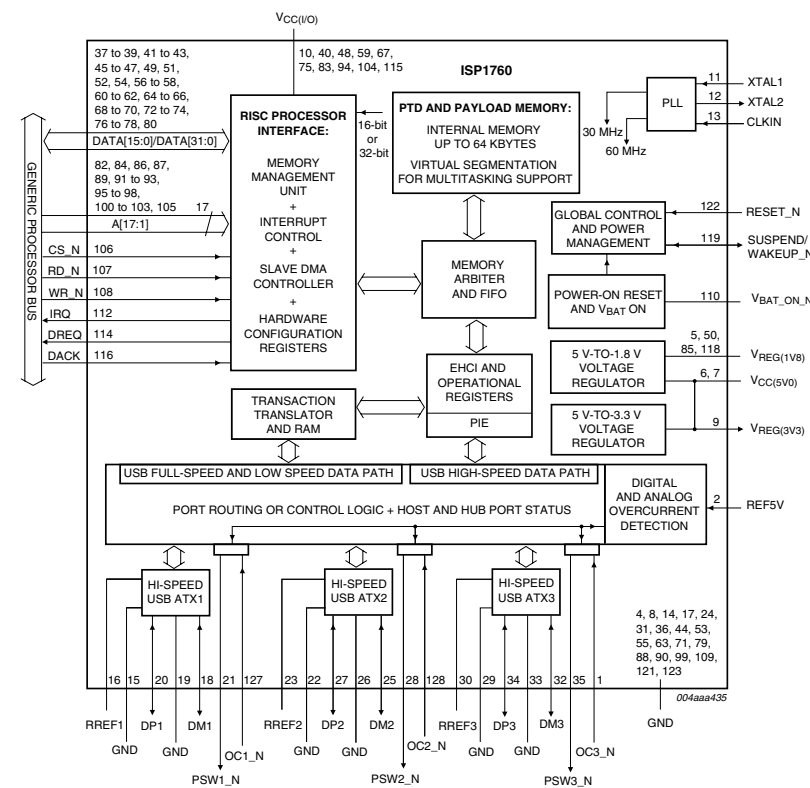
- Generic processor interface
- 16- or 32-bit data bus with 64k addressable space
- Slave DMA support for reduced CPU load

Built-in 64k RAM for multi-function, multi-peripheral support

Very low power consumption

- Internal core operates at 1.8V from external 3.3V supply
- Tolerant I/O for low-voltage CPU interface (1.8V to 3.3V)

ISP1760 block diagram



Related literature

Title

- ISP1760, ISP1761 Hi-Speed USB host and OTG controllers for consumer and communications applications (leaflet)
- Interfacing the ISP176x to Intel PXA255 Processor (application note)
- ISP176x Linux Programming Guide
- Embedded Systems Design with the ISP176x (application note)
- ISP176x Hi-Speed USB Controller PCI Demo Board (user manual)
- ISP176x Hi-Speed USB On-The-Go Host Controller Accelent PXA255 Demo Board (user manual)

Order code

- 9397 750 11327
- AN10037
- AN10042
- AN10043
- UM10056
- UM10057

Applications

- Set-top box
- Digital TV
- DVD recorder
- PDA
- Digital video camera
- Digital still camera
- Printer
- Memory card readers
- Hard disk drives
- Mobile phone

Why choose Philips Semiconductors?

...ISP1760

- * High performance Hi-Speed USB host controller for embedded applications
- * brings the same reliable, easy-to-use USB host capabilities typically associated with a PC to the home entertainment environment
- * Used in a set-top box (STB), a digital TV (DTV), or a DVD recorder, for example, the ISP1760 provides reliable, high-speed connectivity to a variety of peripherals, including digital still cameras (DSCs), digital video cameras (DVCs), printers, hard disk drives and memory card readers.
- * With ISP1760 built into their home entertainment systems, consumers can easily use a Hi-Speed USB storage device for fast media file transfer or for video streaming playback and record. Or they can quickly transfer high-resolution pictures from their Hi-Speed USB-enabled digital camera, viewing files on a large-screen TV and printing color copies.
- * The ISP1760 is also well suited to printer applications, making it easy to print directly from a DSC with USB function -- without connecting through a PC.
- * Also, a multimemory card IC can be connected to the ISP1760 port in the printer, supporting multiple Flash memory card interfaces such as CompactFlash™ (CF), SmartMedia™ (SM), Memory Stick® (MS), xD-PictureCard™ MultiMediaCard™ (MMC), and Secure Digital™ (SD).
- * Backed by Philips FlexiUSB stack, the Philips USB software stack suite. FlexiUSB stack is a mature, operating-system independent USB stack that supports a multi-threading and multi-tasking software environment, enabling quick design-in on a proven, robust software platform. This is especially important in embedded applications, where the operating system may not provide native support for USB. The Hi-Speed USB version of FlexiUSB stack supports WinCE, Linux, Symbian, VxWorks, µTRON and Nucleus.

USB HOST/PERIPHERAL

Type number	Package	Remarks	speed modes	# downstream ports	# upstream ports	parallel I/F between HC and μ P	# endpoints	main supply voltage	integrated voltage regulator
ISP1161A1BD	SOT314-2 (LQFP64)	can act as peripheral, host or both	full-speed, low-speed for HC, full-speed for DC	2	1	up to 15 MB/s	14	3.3 V or 5.0 V	5V-to-3.3 V
ISP1161A1BM	SOT414-1 (LQFP64)	can act as peripheral, host or both	full-speed, low-speed for HC, full-speed for DC	2	1	up to 15 MB/s	14	3.3 V or 5.0 V	5V-to-3.3 V

Features

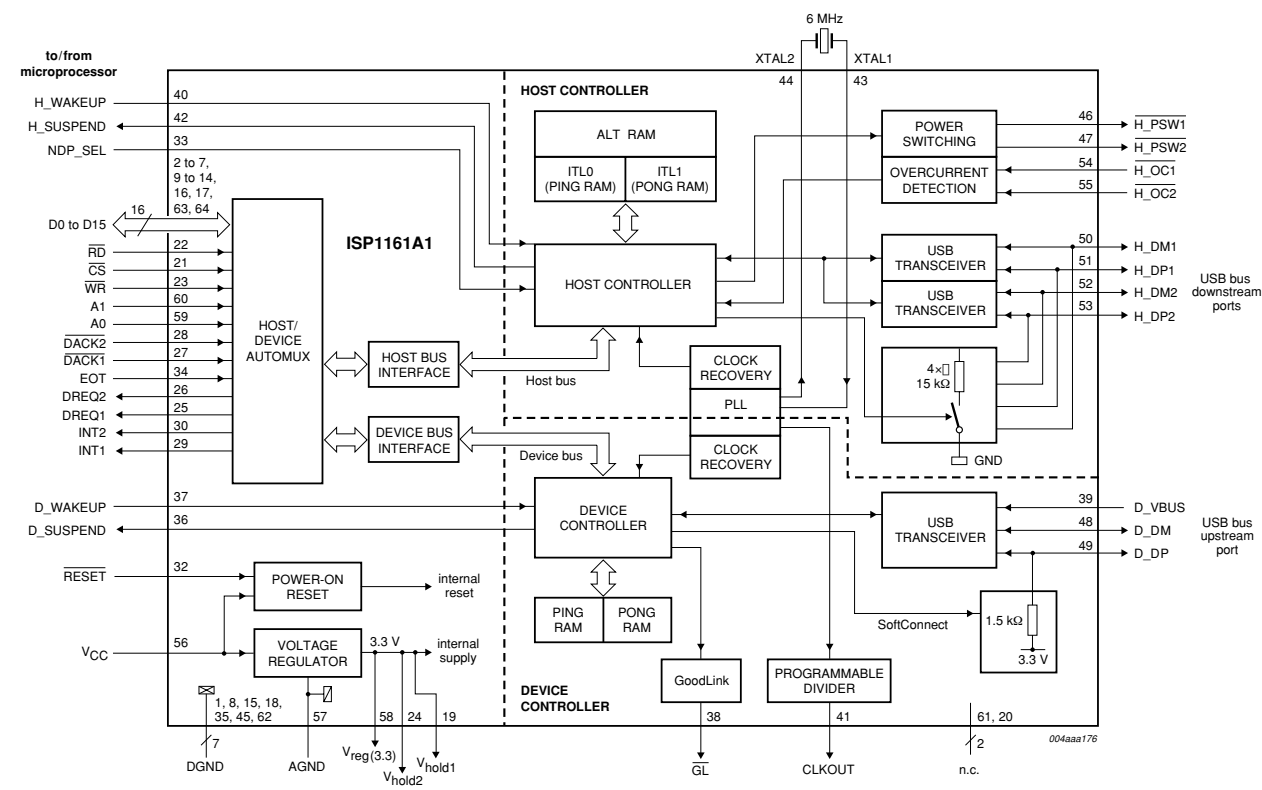
ISP1161A1

- Enhanced Original USB OHCI-compliant host with two downstream ports
- Peripheral controller with one upstream facing port and 14 programmable USB endpoints
- High-speed parallel interface for the most popular RISC processors, DSPs and microprocessors
- Dual-buffering scheme for device transfers and host transactions
- 6 MHz crystal or oscillator for low EMI performance
- Host stack written in C

Applications

- Digital camera
- PDA
- Mobile phone

ISP1161A1 block diagram



Related literature

Title

- ISP1161A1 Single-chip USB Host and Device Controller (leaflet)
- ISP1161x PCI Eval Board User's Guide
- ISP116x PCI/DOS Mini Evaluation Kit (user manual)
- ISP1161 Kenobi2 (user manual)
- ISP1161 Yebisu (user manual)
- ISP1161x ISA/Linux Eval Kit Software User's Guide
- ISP116x Microsoft Win CE version 4.1 Accelent Development Setup User's Guide
- ISP116x Add-On Evaluation Kit with Intel® PXA250 Integrated Development Platform
- ISP116x Win CE version 4.2 Accelent Development Setup User's Guide
- ISP1161x Embedded Programming Guide
- Interrupt Control for ISP116x
- Interfacing ISP1161x to Fujitsu SPARClite RISC Processor
- Interfacing ISP1161x to Hitachi SH7709 RISC Processor
- Interfacing ISP1161x to Intel StrongARM® SA1110 Processor
- Interfacing ISP1161x to Motorola DragonBall® EZ RISC Processor
- Interfacing ISP1161x to NEC V832 Processor
- Odd or Even byte indicator in the ISP1161A1
- Simultaneous DMA and PIO access in the ISP1161x, ISP1181x and ISP136x Device Controller
- ISP1161x Programming Guide
- Handling Reset in the ISP116x

Order code

- 9397 750 10421
- UM10006
- UM10007
- UM10010
- UM10013
- UM10026
- UM10034
- UM10035
- UM10048
- AN10005
- AN10014
- AN10015
- AN10016
- AN10021
- AN10017
- AN10018
- AN10029
- AN10030
- AN10036
- AN10044

Why choose Philips Semiconductors?

...ISP1161A1

- * Allows the host and the peripheral functions to coexist and operate simultaneously.
- * Provides point-to-point connectivity between the PC and an embedded system, or between embedded systems
- * This means embedded systems such as PDAs, smart phones, digital still cameras and game consoles can act as USB hosts, without the intervention of a PC
- * Using software controls, it can be configured to operate as a standalone host, as a peripheral, or with both host and peripheral functions operating simultaneously

USB ON-THE-GO DUAL-ROLE CONTROLLERS

Type number	Package	Remarks	main supply voltage	core voltage	charge pump regulator
ISP1362BD	SOT314-2 (LQFP64)	host, peripheral, dual-role OTG	3.0 V to 3.6 V	3.3 V	built-in
ISP1362EE	SOT543-1 (TFBGA64)	host, peripheral, dual-role OTG	3.0 V to 3.6 V	3.3 V	built-in

Features

ISP1362

Flexible hardware or software configuration of HNP and SRP for OTG dual-role devices

USB host controller incorporates patent-pending architectural enhancements

- requires minimal interrupts from CPU
- enhanced control, bulk, interrupt, and isochronous data transfer

Dedicated physical buffer memories for host (4096 bytes) and peripheral (2462 bytes) controllers

Two USB ports enable three application modes: OTG, host only (two ports), and simultaneous host and peripheral

High-speed, 16-bit PIO and DMA interface accommodates popular CPUs

3.3 V operating voltage with built-in charge pump for V_{BUS} generation

- supports USB port voltage requirement of 4.0 V to 5.5 V
- optional support for external V_{BUS} source
- output current adjustable with external capacitor



Related literature

Title

- ISP1362: Single-chip USB OTG host and peripheral controller for point-to-point connectivity in embedded systems and peripherals (leaflet)
- ISP1362 Embedded Programming Guide
- ISP1362 PCI Eval Board User's Guide
- ISP1362 Linux Stack User's Guide
- ISP1362 PCI DOS X2 User's Guide
- ISP1362 WASABI-Hot! Demo: User's Guide
- ISP1362 with PXA250 IDP User Guide
- ISP1362 OTG Add-On Evaluation Kit (Linux) with Intel® PXA250 Integrated Development Platform (user manual)
- ISP1362 OTG Add-On Evaluation Kit (Linux) with Intel® PXA250 Integrated Development Platform (Rev 4) (user manual)
- ISP1362 PCI Eval Kit with ARM Integrator Platform User's Guide

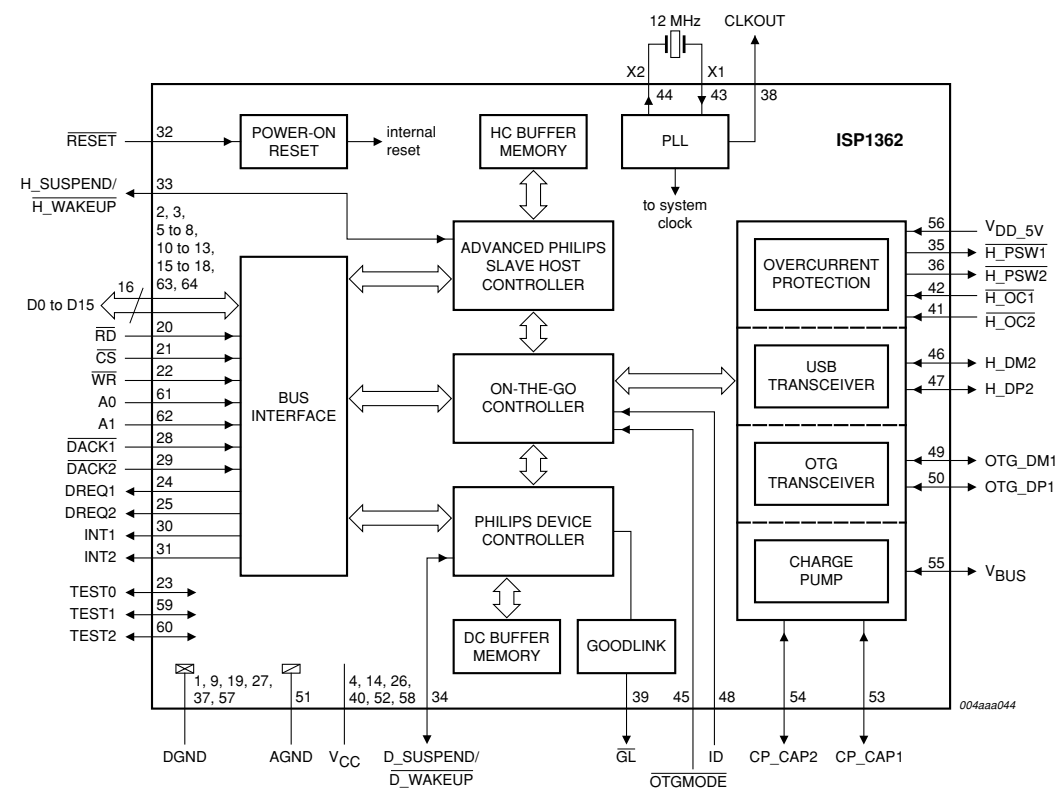
Order code

- 9397 750 10417
- AN10008
- UM10012
- UM10010
- UM10015
- UM10017
- UM10022
- UM10027
- UM10032
- UM10052

Applications

- Digital camera
- PDA
- Mobile phone
- Printer
- Mass storage
- Digital audio player

ISP1362 block diagram



Why choose Philips Semiconductors?

...ISP1362

- * Using the ISP1362, developers can create OTG-compliant dual-role products capable of point-to-point communication, functioning as a host or traditional peripheral, and dynamically switching host/peripheral roles on demand.
- * Focus on power efficiency makes it ideal for small handheld devices, or any product where battery life and small, compact size are key.
- * OTG-compliant products hold the potential to increase productivity and simplify connectivity in a wide variety of everyday tasks such as file sharing, data synchronization, and uploading or downloading files.
- * The OTG supplement also specifies power-saving features and new cabling options to promote acceptance in smaller battery-powered devices

HI-SPEED USB ON-THE-GO DUAL-ROLE CONTROLLERS

Type number	Package	Remarks	speed modes	# downstream ports	main supply voltage	digital I/O I/F voltage	core voltage
ISP1761BE	SOT425-1 (LQFP128)	host, peripheral, OTG; memory-mapped CPU I/F to any 32-bit or 16-bit I/F	high-speed, full-speed, low-speed	2; 1 OTG	3.0 V to 3.6 V	1.65 V to 3.6 V	1.8 V
ISP1761ET	SOT857-1 (TFB-GA128)	host, peripheral, OTG; memory-mapped CPU I/F to any 32-bit or 16-bit I/F	high-speed, full-speed, low-speed	2; 1 OTG	3.0 V to 3.6 V	1.65 V to 3.6 V	1.8 V

Features

ISP1761

Fully compliant with USB Specification Rev. 2.0, On-The-Go Supplement Rev. 1.0a, and EHCI Specification Rev. 1.0

High-speed (480 Mbit/s), full-speed (12 Mbit/s) and low-speed (1.5 Mbit/s) data transfer rates

EHCI with Transaction Translator for complete backward compatibility with full-speed and low-speed USB transfer rates

Flexible options for host system CPU

Generic processor interface

16- or 32-bit data bus with 64k addressable space

Slave DMA support for reduced CPU load

Built-in RAM for multi-function, multi-peripheral support:

64k RAM for host controller

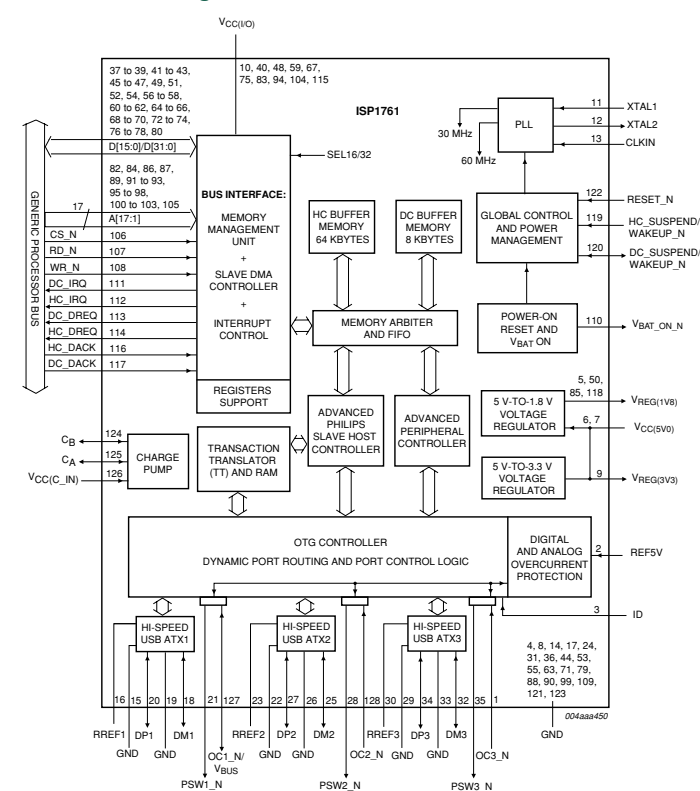
8k additional RAM for peripheral controller

Very low power consumption

Internal core operates at 1.8 V from external 3.3 V supply

Tolerant I/O for low-voltage CPU interface (1.8 V to 3.3 V)

ISP1761 block diagram



Related literature

Title

- ISP1760, ISP1761 Hi-Speed USB host and OTG controllers for consumer and communications applications (leaflet)
- Interfacing the ISP176x to Intel PXA255 Processor (application note)
- ISP1761 Peripheral DMA Initialization (application note)
- ISP176x Linux Programming Guide
- Embedded Systems Design with the ISP176x (application note)
- ISP176x Hi-Speed USB Controller PCI Demo Board (user manual)
- ISP176x Hi-Speed USB On-The-Go Host Controller Accelent PXA255 Demo Board (user manual)

Order code

- 9397 750 11327
- AN10037
- AN10040
- AN10042
- AN10043
- UM10056
- UM10057

Applications

Set-top box

Digital TV

DVD recorder

PDA

Digital video camera

Digital still camera

Printer

Scanner

Memory card readers

Hard disk drives

Mobile phone

Why choose Philips Semiconductors?

...ISP1761

- * Combines a standard host function with USB OTG capability makes for a very flexible solution, allowing a portable device like a mobile phone, a DVC, a DSC, or a personal digital assistant (PDA) to support any USB-enabled peripheral, including keychain storage
- * Using the ISP1761, a mobile phone can be equipped with a high-resolution digital camera or an MPEG video camera.
- * The phone can connect to a PC for quick upload and download of still images, for streaming, recording or editing video, or for data synchronization.
- * A hard disk drive (HDD) can be attached to the OTG port to store still pictures and movie clips.
- * The Hi-Speed USB host port can also serve as an expansion bus for attaching other modules such as Bluetooth® wireless connectivity, wireless LAN (WLAN) functions, a multimed memory card, or a global positioning system (GPS).
- * The portable device becomes the center of connectivity, providing fast, reliable data transfers without a PC.
- * The internal charge pump drives to the OTG port a current of up to 50 mA, many times higher than the minimum value defined in the OTG specification.
- * Backed by Philips FlexiUSB™ stack, the Philips USB software stack suite. FlexiUSB stack is a mature, operating-system independent USB stack that supports a multi-threading and multi-tasking software environment, enabling quick design-in on a proven, robust software platform

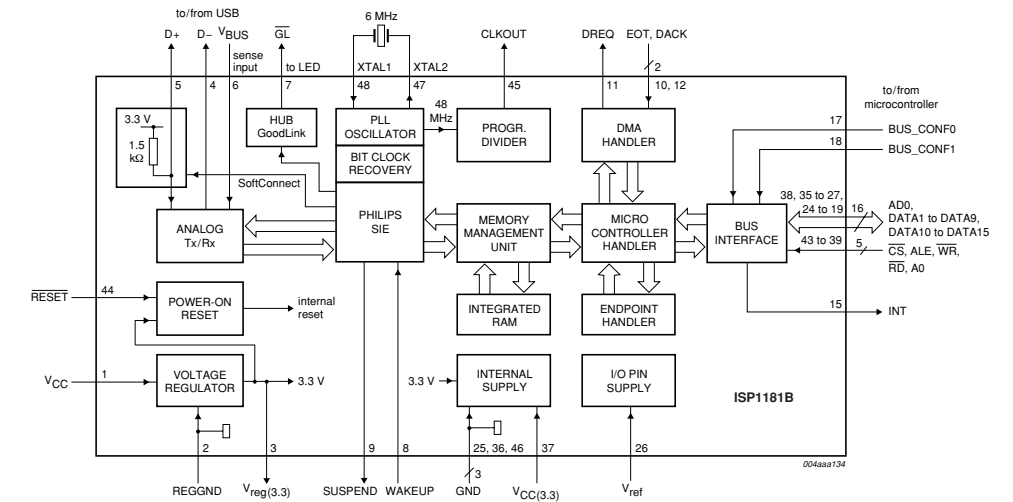
USB PERIPHERALS

Type number	Package	speed modes	parallel I/F between HC and μ P	# of bits	# endpoints	FIFO size	main supply voltage	bus-powered	integrated voltage regulator
PDIUSB12D	SOT136 (SO28)	full-speed	2 MB/s	8	6	320 MB	3.3 V or 5.0 V	Y	3.3 V
PDIUSB12PW	SOT361 (TSSOP28)	full-speed	2 MB/s	8	6	320 MB	3.3 V or 5.0 V	Y	3.3 V
ISP1181BBS	SOT619-2 (HVQFN48)	full-speed	max 11.1 MB/s	16	16	2,462 byte	3.3 V or 5.0 V	Y	5 V-to-3.3 V
ISP1181BDGG	SOT362-1 (TSSOP48)	full-speed	max 11.1 MB/s	16	16	2,462 byte	3.3 V or 5.0 V	Y	5 V-to-3.3 V

Related literature

Title	Order code
PDIUSB12 USB Interface Device with Parallel Bus (leaflet)	9397 750 10515
PDIUSB12 USB EPP Eval Kit user manual	UM10053
ISP1181B USB Interface Device with Parallel Bus (leaflet)	9397 750 10422
ISP1181A/ISP1181B Frequently Asked Questions (FAQs)	AN10010
Interrupt Control for ISP1181x (application note)	AN10015
Simultaneous DMA and PIO access in the ISP1161x, ISP1181x and ISP136x Device Controller (application note)	AN10030
ISP118x USB-to-RS-232 Reference Kit (user manual)	UM10002
ISP1181x Microcontroller Eval Kit User Manual	UM10064

ISP1181B block diagram



Features

PDIUSB12

- Supports 12 Mbit/s data rate
- General-purpose 2 Mbyte/s parallel interface
- Variable data rates: 1 Mbyte/s (Bulk mode), 1 Mbit/s (Isochronous mode)
- Integrated 320 bytes of multi-configuration FIFO memory
- Complies with ACPI, OnNow and USB power management requirements

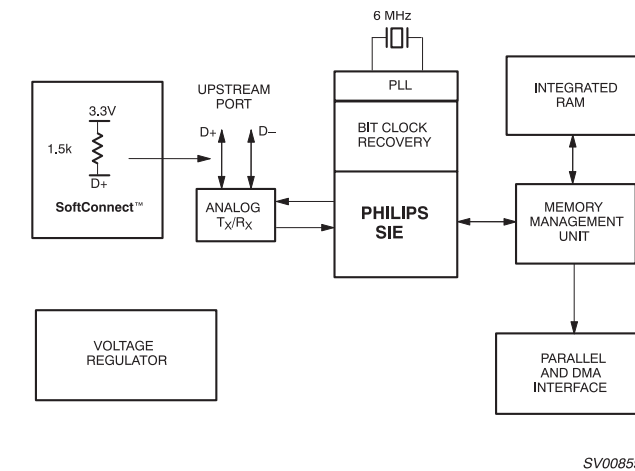
ISP1181B

- Supports 12 Mbit/s data rate
- High-speed parallel interface (11.1 Mbyte/s or 90 ns read/write cycle)
- Complies with ACPI, OnNow and USB power management requirements
- GoodLink(tm) allows visual USB traffic monitoring, helping reduce field support and hotline costs. SoftConnect™ provides an extra level of peripheral control to the host connection. LazyClock keeps a very low clock frequency during suspend mode.

Applications

- Digital camera
- PDA
- Printer
- Modem
- Router
- Scanner

PDIUSB12 block diagram



Why choose Philips Semiconductors?

- ...PDIUSB12**
 - The glueless parallel interface, along with the FlexiUSB architecture, lets designers choose the best microcontroller or micro-processor for their system. The ability to reuse architecture and firmware investments shortens development time, eliminates risk, and reduces overall cost.
 - double-buffering scheme for endpoints ensures high throughput and ease of real-time data transfer.
 - supported by complete evaluation kits and application notes
- ...ISP1181B**
 - High bandwidth, high-speed access time, and integrated memory mean excellent performance and fast response times. The ISP1181B features a 16-bit parallel I/O port, and multiconfiguration, double-buffered FIFO memory. The FIFO's 2462 bytes allow more data to be saved at one time.
 - supports both fully autonomous, multiconfiguration DMA operation, and local DMA transfer. The double-buffering scheme for endpoints ensures high throughput and ease of real-time data transfer.
 - supported by complete evaluation kits and application notes

LOW-POWER USB PERIPHERAL

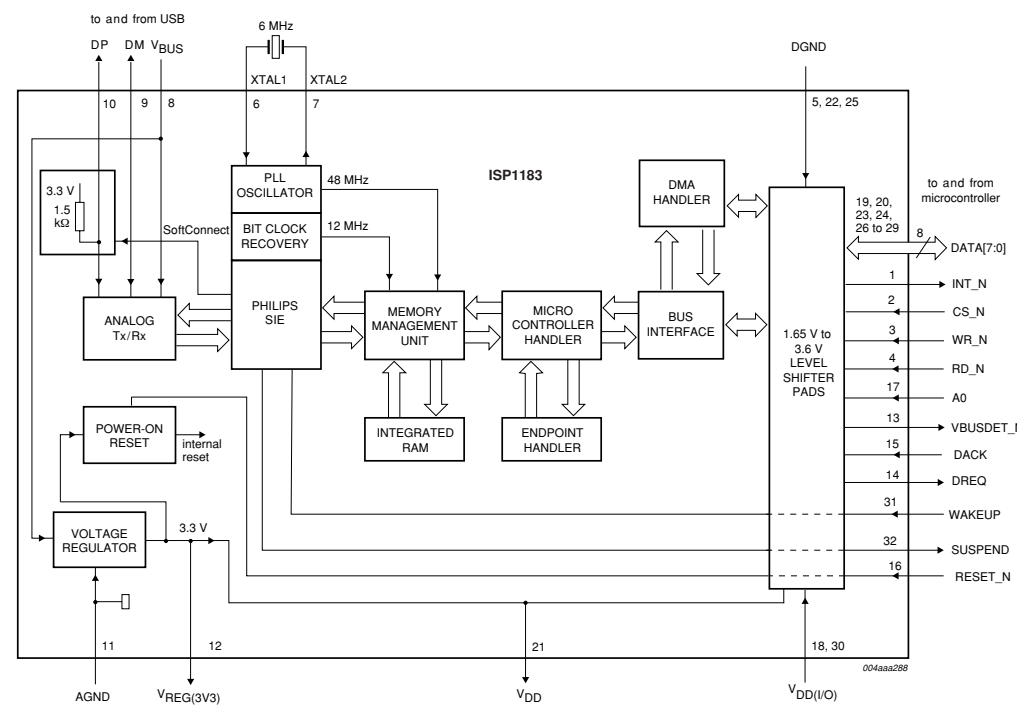
Type number	Package	speed modes	parallel I/F between HC and μ P	# of bits	# endpoints	FIFO size	main supply voltage	digital I/O I/F voltage	bus-powered	integrated voltage regulator
ISP1183BS	SOT617-1 (HVQFN32)	full-speed	max 11.1 MB/s	8	16	2,462 byte	3.0 V to 3.6 V	1.65 V to 3.6 V	Y	5 V-to-3.3 V

Features

ISP1183

- Supports 12 Mbit/s data rate
- Complies with ACPI, OnNow and USB power management requirements -- low suspend current and low-power operation
- Integrated voltage regulator for bus-powered operation
- I/O voltage range enables direct connection to battery-operated devices
- Integrated clock multiplier PLL supports low-cost 6-MHz crystal
- 2462 bytes of multi-configuration FIFO memory
- High-speed parallel interface (11.1 Mbyte/s or 90 ns read/write cycle)
- Complies with ACPI, OnNow and USB power management requirements
- GoodLink™ allows visual USB traffic monitoring, helping reduce field support and hotline costs. SoftConnect™ provides an extra level of peripheral control to the host connection. LazyClock keeps a very low clock frequency during suspend mode.

ISP1183 block diagram



Related literature

- Title**
- ISP1183 Low-power, low-pin-count USB interface device for portable applications (leaflet)
 - ISP1183 Firmware Programming Guide
 - ISP1183 PC Eval kit User's Guide
 - ISP1183 Microcontroller Eval Kit User's Guide

- Order code**
- 9397 750 11475
 - UM10043
 - UM10044
 - UM10050

Applications

- Digital still camera
- Digital video camera
- Mobile phone
- PDA
- MP3 player

Why choose Philips Semiconductors?

...ISP1183

- * Optimized for portable applications, it is a low-power, low-pin-count USB peripheral controller
- * high-speed, 8-bit, general-purpose parallel interface lets designers choose the best controller or processor for their system, also making it compatible with most existing system architectures and firmware. The result is fast, efficient development of a cost-effective USB product
- * supported by complete evaluation kits and application notes

LOW-POWER, HI-SPEED USB PERIPHERALS

Type number	Package	Other specs	Other interfaces	speed modes	CPU I/F mode	# endpoints	main supply voltage	digital I/O I/F voltage	core voltage	bus-powered
ISP1582BS	SOT684-1 (HVQFN56)	OTG SRP		high-speed, full-speed	generic mode	14	3.0V to 3.6V	1.65V to 3.6V	1.8V	Y (current < 100 mA)
ISP1583BS	SOT804-1 (HVQFN64)	OTG SRP	ATA/ATAPI	high-speed, full-speed	generic & split bus modes	14	3.0V to 3.6V	1.65V to 3.6V	1.8V	Y (current < 100 mA)

Related literature

- Title**
- ISP1582/83 Low-power Hi-Speed USB interface devices with USB OTG support for portable applications (leaflet)
 - Control Pipe of ISP1582/83 (application note)
 - Special Function Registers: Differences between ISP1581 and ISP1582/83 (application note)
 - ISP1582 Programming Guide
 - Interfacing the ISP1582 to the Intel PXA250 Processor (application note)
 - ISP1582/83 Firmware Programming Guide
 - ISP1582/83 Clearing of the IN Buffer (application note)
 - ISP1582 PC Eval Kit (PCI) User's Guide
 - ISP1583 Hi-Speed USB Split Bus Eval Kit User's Guide
 - ISP1583 Hi-Speed USB Mass Storage Eval Kit User's Guide
 - ISP1582 Hi-Speed USB PCI Mass Storage Kit User's Guide
 - ISP1582 PCI Mass Storage Kit Firmware Guide
 - ISP1582 WinCE 4.1 Accelent Development Setup User's Guide
 - ISP1582 WinCE 4.1 CEPC Development Setup User's Guide
 - ISP1582/83 Mass Storage on WinCE 5.0 CEPC Development Setup (user manual)

Order code

- 9397 750 11478
- AN10031
- AN10032
- AN10033
- AN10038
- AN10039
- AN10045
- UM10036
- UM10038
- UM10039
- UM10040
- UM10042
- UM10047
- UM10049
- UM10056

Features

ISP1582

- Supports 480 Mbit/s and 12 Mbit/s data rates
- Fall-back mode for Original USB operation
- supports Generic Mode on the CPU interface
- two supply voltages: a main voltage of 3.0V to 3.6V, and a digital I/O interface voltage of 1.65V to 3.6V

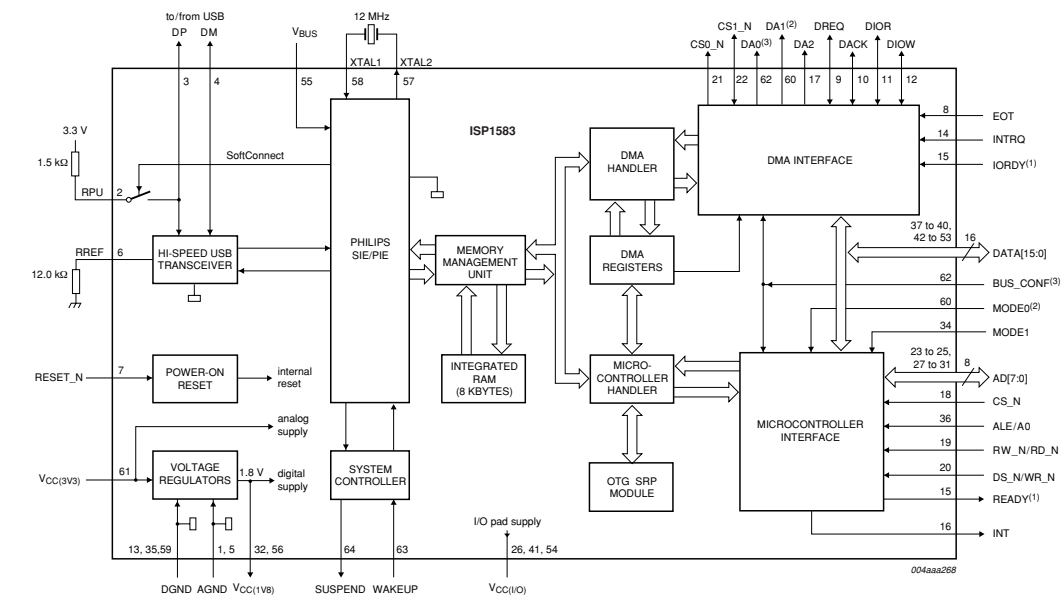
ISP1583

- Supports 480 Mbit/s and 12 Mbit/s data rates
- Fall-back mode for Original USB operation
- supports Generic Mode and Split Bus on the CPU interface and also supports direct interface to any ATA/ATAPI device
- two supply voltages: a main voltage of 3.0V to 3.6V, and a digital I/O interface voltage of 1.65V to 3.6V

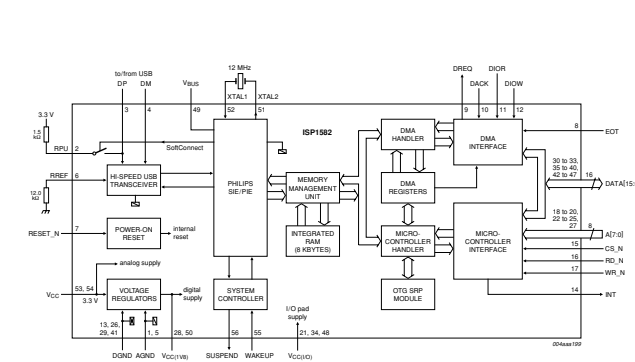
Applications

- Digital still camera
- Digital video camera
- Portable storage
- PDA
- MP3 player

ISP1583 block diagram



ISP1582 block diagram



Why choose Philips Semiconductors?

...ISP1582

- * designed for portable Hi-Speed USB applications, with support for USB OTG peripheral-only features
- * Fully autonomous DMA operation (including auto-download, auto-repeat and auto-execution functions) saves the device from continually re-enabling or re-initializing the DMA function
- * Resets can be controlled through an internal power-on and low-voltage reset circuit, or via software
- * Low power consumption in the operating and power-down modes makes it suitable for bus-powered applications. The core operating voltage is 1.8V, with 3.3V-to-1.8V voltage regulators to maintain low power

...ISP1583

- * designed for portable Hi-Speed USB applications, with support for USB OTG peripheral-only features
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- * Resets can be controlled through an internal power-on and low-voltage reset circuit, or via software
- * Low power consumption in the operating and power-down modes makes it suitable for bus-powered applications. The core operating voltage is 1.8V, with 3.3V-to-1.8V voltage regulators to maintain low power

HI-SPEED USB HUBS

Type number	Package	speed modes	# downstream ports	main supply voltage
ISP1520BD	SOT314-2 (LQFP64)	high-speed, full-speed, low-speed	4	3.3 V, 5.0 V
ISP1521BE	SOT315-1 (LQFP80)	high-speed, full-speed, low-speed	7	3.3 V, 5.0 V

Related literature

Title	Order code
ISP152x Single-chip Hi-Speed USB Hub Controller (leaflet)	9397 750 10677
ISP1520 Hi-Speed USB Hub Demo Board User Manual	UM10014
ISP1521 Hi-Speed USB Hub Demo Board User Manual	UM10011

Features

ISP1520, ISP1521

Supports 480 Mbit/s, 12 Mbit/s and 1.5 Mbit/s data rates

Fall-back mode for Original USB operation

A simple I²C bus interface (master/slave) reads vendor ID, product ID, and configuration bits from an external microcontroller or an external three-state EEPROM

ISP1520

4 configurable ports

ISP1521

7 configurable ports

Applications

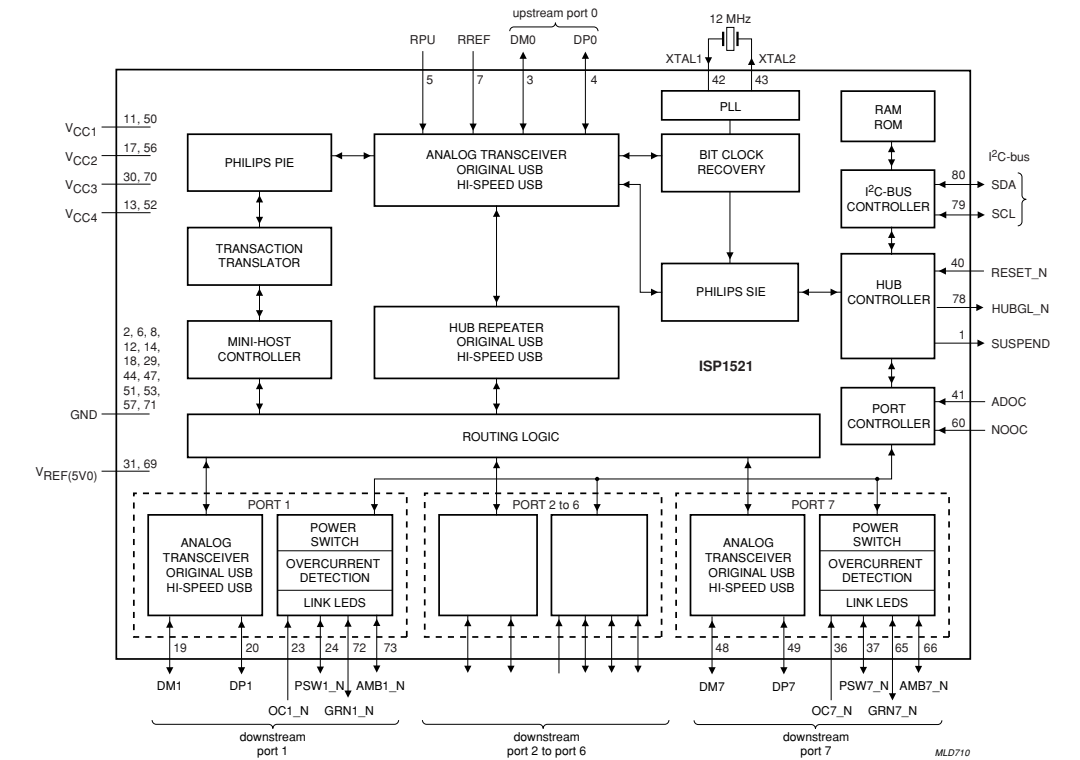
Docking station

Internal hub

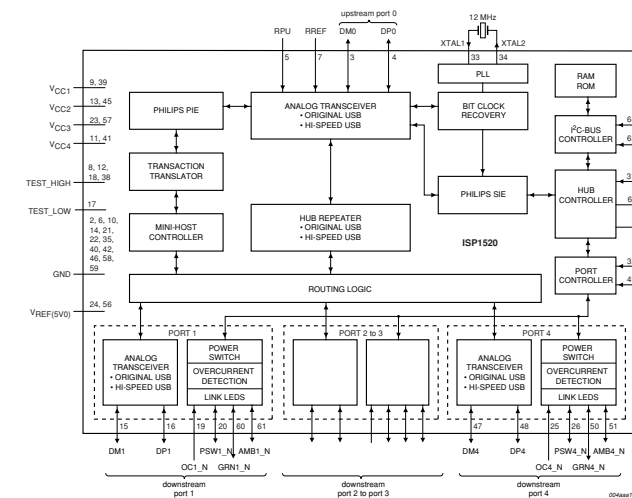
Legacy-free PCs and hub boxes

Monitor hub

ISP1521 block diagram



ISP1520 block diagram



Why choose Philips Semiconductors?

...ISP1520, ISP1521

* Is a standalone Hi-Speed USB hub controller that integrates a high-performance USB transaction translator, a Philips SIE and a Philips transceiver onto a single chip