ASIX Introduction

ASIX Electronics Corporation is a leading fabless semiconductor supplier with focus on networking, communication and connectivity applications. ASIX was founded in May 1995 in Hsinchu Science Park, Taiwan, and has been listed on Taiwan OTC Stock Exchange (TAIEX code 3169) since November 2009. ASIX's customers include those companies with premium brand name in the networking and communication industries. ASIX works closely with the leaders in the networking industry to provide highly integrated solution for customer applications. ASIX has been certified as an ISO 9001 and 14001 suppliers. This achievement represents our continuing commitment to maintain a world-class quality system.

Technology

The main force of ASIX Electronics are in R&D team with majority of them are seasoned designers or managers. ASIX's pool of talent is the most important property of the company itself. The team has developed a series of successful products in the past, and commits to do so for the years to come.

- Embedded Networking Solution: Fast Ethernet, Gigabit Ethernet
- Bus Connecting Solution: USB 1.1, USB 2.0 ,USB3.0
- Integrated SoC Solution

Products:

ASIX Electronics specializes in network connectivity solutions and provides Ethernet-centric silicon products such as non-PCI Ethernet controller, USB-to-LAN controller, and network SoC for embedded networking applications. ASIX Electronics has established a good track record by providing the following world's first products:

- USB 3.0 to Gigabit Ethernet Controller
- USB 2.0 to Gigabit Ethernet Controller
- Non-PCI Gigabit Ethernet Controller
- Single Chip Microcontroller with TCP/IP, 10/100M Fast Ethernet MAC/PHY, and Flash Memory
- Industry smallest single chip embedded Ethernet MCU in 8x8mm 80-pin TFBGA package

ASIX Electronics provides innovative, and yet cost effective products to the customers for emerging communication and networking applications. The current offerings are as follow:

§Embedded Ethernet (Non-PCI or Local Bus):

- 2-port Non-PCI Fast Ethernet Coontrller
- 2-port MII/RMII Fast Ethernet Controller
- 1-port Non-PCI Gigabit Ethernet Controller
- 1-port Non-PCI Fast Ethernet Controller

§SuperSpeed USB-to-LAN:

- USB 3.0 to Gigabit Ethernet Controller
- USB 2.0 to Gigabit Ethernet Controller
- USB 2.0 to Fast Ethernet Controller
- USB Hub/Ethernet Combo

§Embedded Network SoC/USB SoC:

- Single Chip Microcontroller with TCP/IP, 10/100M Fast Ethernet MAC/PHY, and Flash Memory
- Single Chip Microcontroller with TCP/IP and 802.11 WLAN MAC/Baseband
- 2/4-Port USB KVM Switch Soc

§I/O Connectivity:

- PCIe Bridge
- PCI Bridge

• USB Bridge
• RS-232/RS-485 Transceivers
• EL Drivers

§Embedded Wireless Modules
• Embedded Wi-Fi Modules
• Embedded Bluetooth Modules

§Embedded Ethernet ICs
• Non-PCI Gigabit Ethernet ;
• Non-PCI Fast Ethernet;
• MII/RMII Fast Ethernet;
• Ethernet PHY

P/N	Function	Ethernet port number	Bus width (bits)	Package	Temperature Range (℃)
AX88180	Non-PCI Gigabit Ethernet	1	16/32	LQFP-128	0～+70
AX88782	Non-PCI Fast Ethernet	2	8/16	LQFP-80	0～+70
AX88783	Non-PCI Fast Ethernet	2	8/16/32	LQFP-128	0～+70
AX88780	Non-PCI Fast Ethernet	1	16/32	LQFP-128	0～+70
AX88796C	Non-PCI Fast Ethernet	1	12/4/8/16	LQFP-64	0～+70 -40～+85
AX88796B	Non-PCI Fast Ethernet	1	8/16	LQFP-64	0～+70 -40～+85
AX88196B	Non-PCI Fast Ethernet	1	8/16	LQFP-100	0～+70 -40～+85
AX88613	MII Fast Ethernet	2	4/3	LQFP-80	0～+70
AX88201	10/100M Fast Ethernet PHY with IEEE 1588 PTP and 802.3az EEE				

• Embedded Ethernet Application Block Diagrams:

This solution targets devices with micro-controller, which comes without PCI bus interface, but with a non-PCI or SRAM type interface. In this case, the highly integrated Non-PCI bus Ethernet MAC+PHY controller is used to connect these devices to Ethernet. This solution provides the easiest way to connect the embedded system to the network for the reason that majority of the micro-controller all support Non-PCI local bus interface. Engineers are able to design very-low-cost, and yet high-performance embedded systems, which offer remote access capabilities in addition to Internet connectivity. This solution is suitable for home appliances, factory/building automation, industrial equipment, security systems, remote control/monitoring/management, streaming media, and multimedia networking. In addition, for broadband applications such as POS terminals, WLAN AP, broadband routers, VoIP, content distribution, IP STB, IP cameras, digital video recorders, DVD recorders/players, high-definition TV (HDTV), digital media adapters, game consoles, home gateways, and IPTV, this solution can also be attractive and cost effective.

Fig 1 Monitor, Control, or Access Your Device over the Internet

§SuperSpeed USB-to-LAN ICs:

- USB3.0 to Gigabit Ethernet
- USB2.0 to Gigabit Ethernet
- USB2.0 to Fast Ethernet
- USB2.0 Hub/Ethernet Combo

P/N	Function	Package	Temperature Range (°C)
AX88179	USB3.0-to-Giga	QFN-68	0～+70
AX88178A	USB2.0-to-Giga(MAC/PHY)	QFN-68	0～+70
AX88178	USB2.0-to-Giga(MAC only) with GMII Interface	LQFP-128	0～+70
AX88772C	USB2.0-to-10/100Mbps with Microsoft AOAC	LQFP-64	0～+70
AX88772B	USB2.0-to-10/100Mbps	LQFP-64	0～+70 -45～+85
AX88772A	USB2.0-to-10/100Mbps	LQFP-64	0～+70
AX88172A	USB2.0-to-10/100Mbps with MII interface	LQFP-80	0～+70
AX88772	USB2.0-to-10/100Mbps	LQFP-128	0～+70
MCS7832	USB2.0-to-10/100Mbps	LQFP-64	0～+70
MCS7830	USB2.0-to-10/100Mbps (MII LQFP-128)	TQFP-80/LQFP-128	0～+70
AX88760	USB2.0-to-10/100Mbps Combo Controller	LQFP-100	0～+70

•USB to-LAN Application Block Diagrams:

This solution targets microcontrollers that already have a USB host interface embedded. In this case, an internal or external USB-to-LAN controller can be used to connect these devices to the Ethernet.

The so-called USB-to-LAN approach converts an USB 2.0/3.0 signal to the Fast Ethernet/Gigabit Ethernet interface through an USB-to-LAN controller used in the cradle or docking station for the mobile devices. Because the USB 2.0/3.0 uses a compact four/nine-pin connector, this solution reduces many of the pin-out connections between the cradle/docking station and the mobile devices. Another, more flexible way is to use an external USB-to-LAN dongle to connect the mobile devices to the network if the microcontroller within the devices has a built-in USB host interface. This will leverage the SuperSpeed and serial bus characteristic of USB 3.0, to improve the performance of the devices.

This solution is suitable for computer peripherals, handheld devices, home electronics and appliances, streaming media, broadband media, and other consumer electronics such as for Notebooks/MIDs/UMPCs/Tablet PCs, ultrabooks, USB to Ethernet dongles, cradles/port replicators/docking stations, game consoles, digital-home appliances, and any embedded system using a standard USB port.

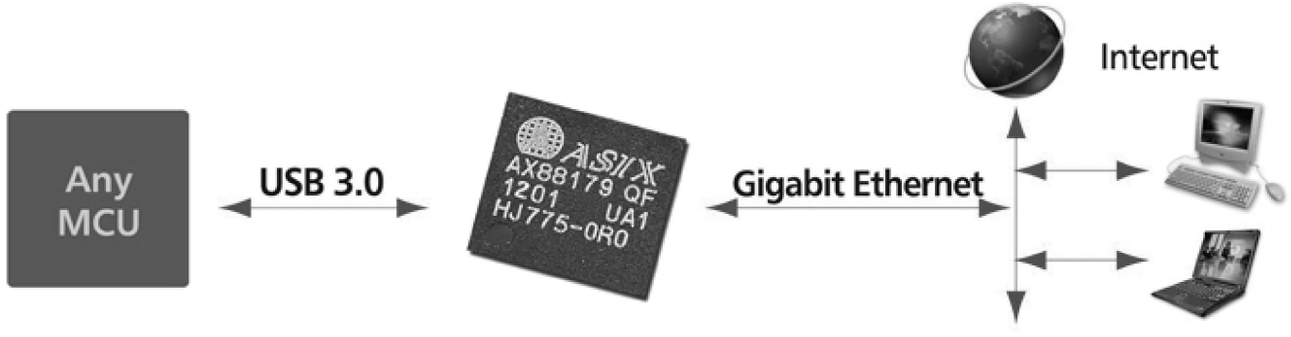


Fig 1 ASIX is a Market Leader for providing USB-to-LAN Solution

§Embedded Network SoC/USB SoCs:

• Embedded Wi-Fi SoC

P/N	Function	Package	Temperature Range（℃）
AX22001	WLAN SoC	LQFP-128	0～+70

•Embedded Ethernet SoC

P/N	Function	Package	Temperature Range（℃）
AX11001	Ethernet SoC 128KB Flash	LQFP-80	0～+70/-40～+85
AX11005	Ethernet SoC 512KB Flash	LQFP-80	0～+70/-40～+85
AX11015	Ethernet SoC s 512KB Flash Local Bus	LQFP-128	0～+70/-40～+85

•USB KVM Switch Socs

P/N	Function	Package	Temperature Range（℃）
AX68002	2Port KVM SoC	QFN-64	0～+70
AX68004	4Port KVM SoC	LQFP-100	0～+70

•Embedded Network SoC/USB KVM SoC Application Block Diagrams:

This solution is those micro-controllers, which already integrate both Ethernet and Wi-Fi Connectivities, the so-called single chip SoC solution. The AX110xx family is the world's first high-performance 8-bit microcontroller to deliver the 10/100Mbps Fast Ethernet MAC/PHY, the TCP/IP accelerator, and the flash memory in a single chip. With this highly integrated system-on-a-chip solution, the AX110xx family provides a very small form-factor solution to enable embedded system designers to design compact, low-power, high-performance, yet low-cost, embedded and industrial Ethernet applications for the growing embedded networking markets.

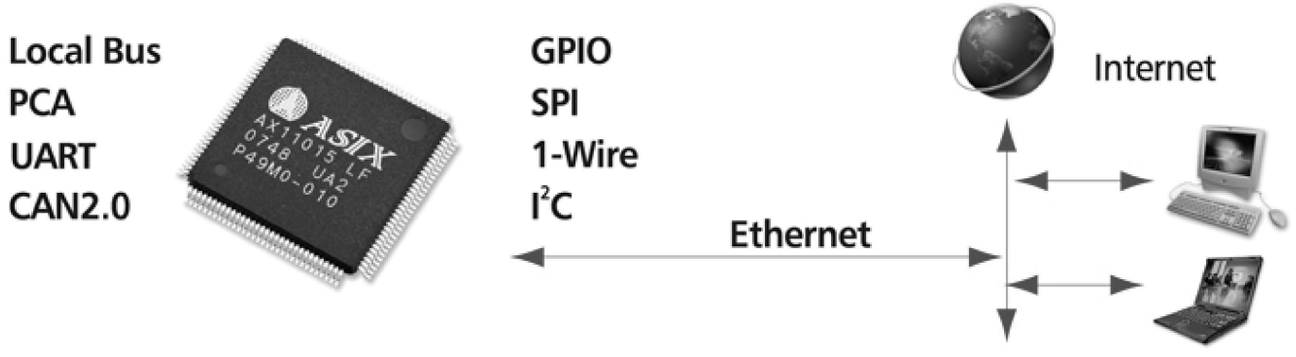
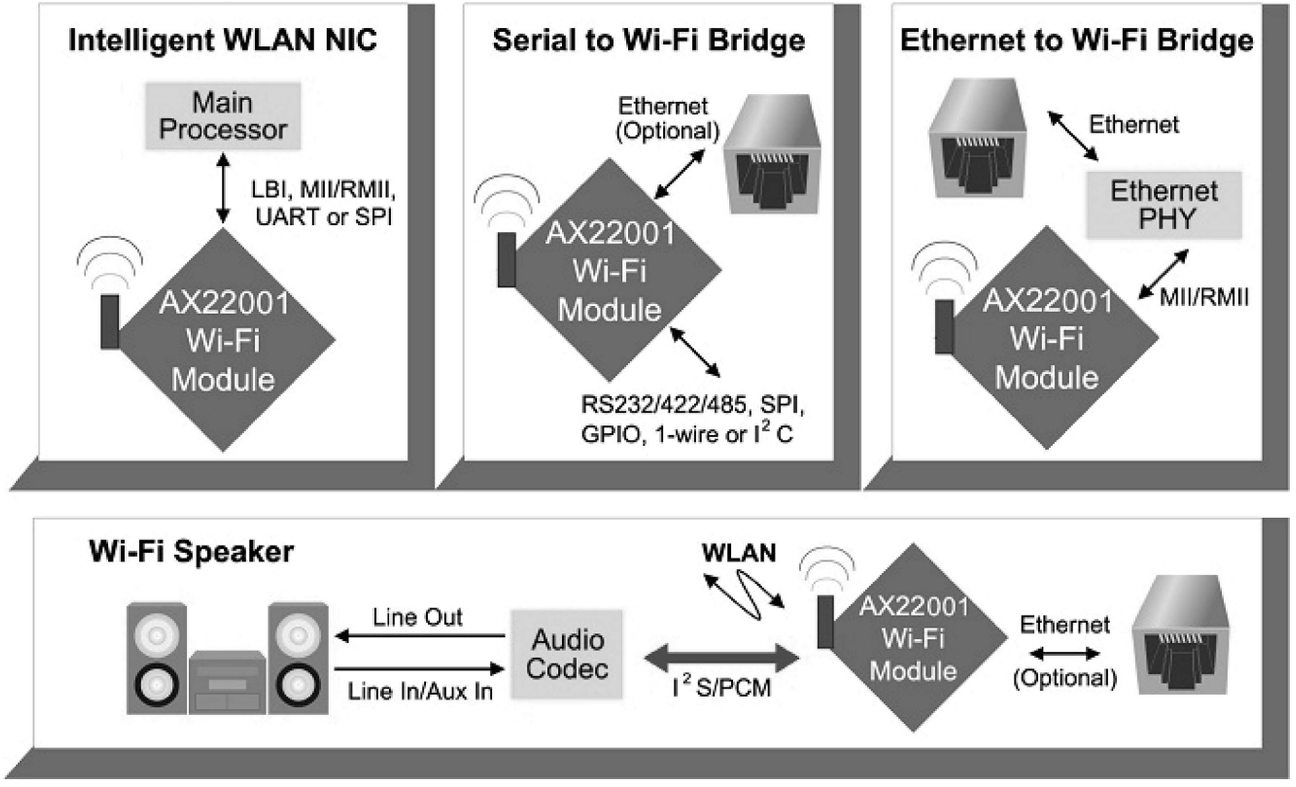


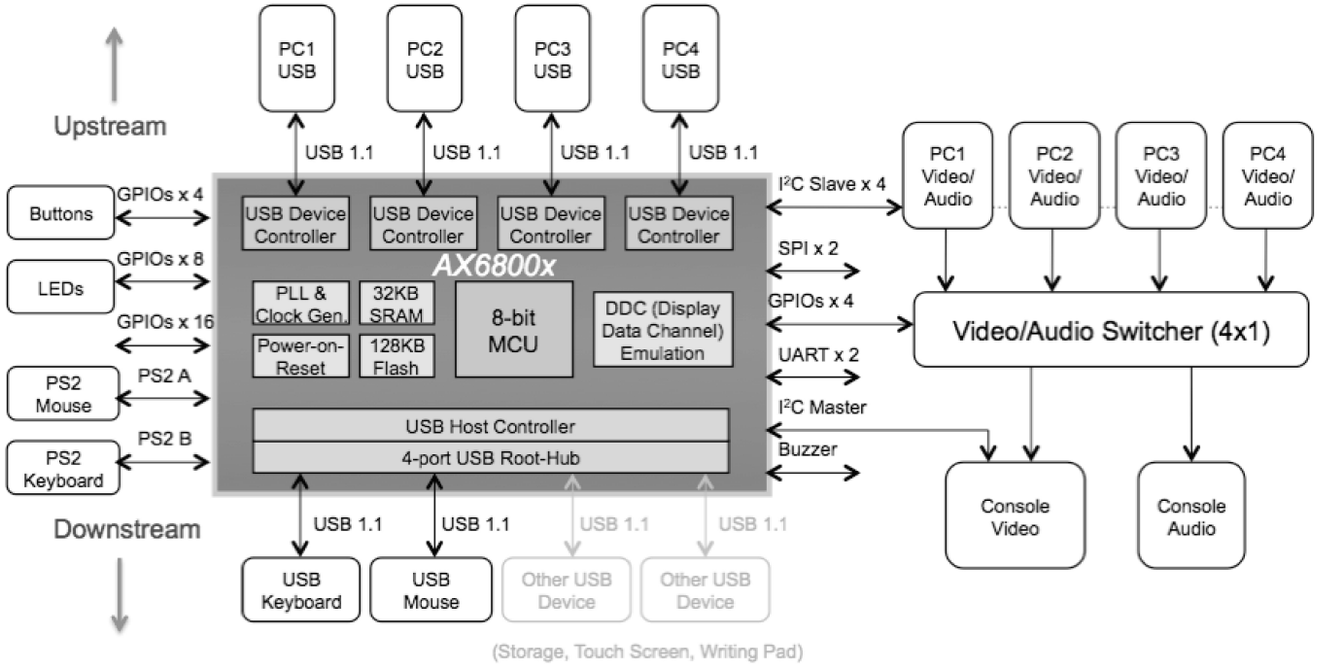
Fig 1 Network MCU Connecting Directly to the Internet

There is a growing need to add wireless network connectivity into embedded systems, such as adding remote control capability to embedded devices and enabling user's smartphone to take control over Wi-Fi. Machine-to-Machine (M2M) or Internet of Things (IoT) communications will be the primary market demand for the embedded networking system for the years to come.The AX22001 is a single chip micro-controller with TCP/IP and 802.11 WLAN MAC/baseband. Leveraging prevalent Wi-Fi infrastructure in home and office environment, the new single-chip Wi-Fi SoC, AX22001, provides cost competitive wireless connectivity solution for bridging uncompressed digital audio data, compressed digital video data and serial/parallel user data through its versatile interfaces over the Wi-Fi network. This solution makes the devices very compact, and is suitable for home appliances, factory/building automation, industrial equipments, security systems, remote control/monitoring/management, and streaming media applications such as Wi-Fi speakers, Intelligent WLAN NIC, iPhone-controlled toys, POS terminals, vending machines, IP camera, Internet radio, automatic meter reading, environmental monitoring systems, network sensors, networked UPS, Serial(RS232/SPI) to Ethernet/Wi-Fi adapters, and Ethernet/Wi-Fi to ZigBee bridges,

AX22001 Application Diagram



Ethernet to Wi-Fi bridges, can also find this solution quite attractive in cost, space, and power consumption-wise.



§I/O Connectivity ICs

- PCIe Bridge
- PCI Bridge
- USB Bridge
- R232/RS485 TransceiversDrivers
- EL Drivers
- PCIe ICs :

P/N	Function	Description	Package
MCS9900	PCIe to Serial or Parallel with GPIO's Bridge	Can be configured as 4Serial or 2Serial + 1Parallel through Mode Select pins & also supports Cascade Master or Slave Mode.	128-LQFP
MCS9901	PCIe to Dual Serial ports or one Paralle and six GPIO's.PCIe to Dual Serial ports or one Paralle and six GPIO's.	Hardwired to 2Serial + 1Parallel mode. Can be programmed to lower configurations through EEPROM i.e 2Serial or 1Serial & 1Parallel or 1Parallel. Supports Slave mode of Cascade.	128-LQFP
MCS9904	PCIe to four serial ports and eight GPIO's	Hardwired to 4Serial mode. Can be programmed to lower configuration i.e 3Serial or 2Serial or 1Serial through EEPROM. Supports Slave mode of Cascade.	128-LQFP
MCS9922	PCIe to tow serial ports and eight GPIO's	Hardwired to 2Serial mode. Can be programmed to lower configurations through EEPROM i.e 1 Serial. Supports Slave mode of Cascade.	128-LQFP
MCS9990	PCIe to Four USB2.0 with ISA interface	Port 2 can support OTG Mode	128-LQFP
AX99100	PCIe to Dual/Quad Serial and Parallel Bridge	4S,2S1P,PCIe to ISA,PCIe to SPI	68-QFN

- PCI ICs :

P/N	Function	Description	Package
MCS9865	PCI to Multi IO (2S+1P, 2P, ISA) Controller	Supports dual-channel high performance Serial Ports, dual enhanced IEEE 1284 compliant parallel ports and an ISA style interface	128-LQFP
MCS9845	PCI to Dual Serial and ISA Controller	It has two 16C450/16C550 compatible UART channels and ISA style interface to add external UARTS and Parallel Port	128-QFP
MCS9835	PCI to Dual Serial and Single Parallel Controller	It has two 16C450/16C550 compatible UART channels and one IEEE 1284 compliant parallel port.	128-QFP
MCS9820	PCI to Single Serial Controller	It has one 16C450/16C550 compatible UART.	128-QFP
MCS9815	PCI to Dual Parallel Controller	2P	128-QFP
MCS9805	PCI to Single Parallel Controller	1P	128-QFP

Part No.	USB Speed	Serial	Parallel	IrDA	Temp Range (°C)	Package
MCS7840	2.0	4-port	-	-	0 ~ +70	LQFP-64
MCS7820	2.0	2-port	-	-	0 ~ +70	LQFP-48
MCS7810	2.0	1-port	-	-	0 ~ +70	LQFP-48
MCS7780	1.1	-	-	1-port	0 ~ +70	SSOP-28
MCS7720	1.1	2-port	-	-	0 ~ +70	QFP-48
MCS7715	1.1	1-port	1-port	-	0 ~ +70	QFP-48
MCS7705	1.1	-	1-port	-	0 ~ +70	QFP-48

- USB ICs:
- RS232/RS485 ICs:

5V RS232 Interface Selection Guide

Part No.	Supply Voltage	Typical Icc Current (mA)	# of RS232 Tx	# of RS232 Rx	# of Rx active in SD	# of 0.1uF caps	Data Rate(Kbps)	ESD on RS232 I/O	Shut Down	Wake Up	TTL Tri-State	Number of Pins	Package Type
ZT202E	+5V	3.0	2	2	0	4	250	±15kV	No	No	No	16	PDIO, nSOIC, wSOIC, TSSOP
ZT202F	+5V	3.0	2	2	0	4	1000	±15kV	No	No	No	16	PDIO, nSOIC, wSOIC, TSSOP
ZT232E	+5V	3.0	2	2	0	4	250	±15kV	No	No	No	16	PDIO, nSOIC, wSOIC, TSSOP
ZT232F	+5V	3.0	2	2	0	4	1000	±15kV	No	No	No	16	PDIO, nSOIC, wSOIC, TSSOP
ZT207E	+5V	3.0	5	3	0	4	250	±15kV	No	No	No	24	PDIP, SSOP, WSOIC
ZT207F	+5V	3.0	5	3	0	4	1000	±15kV	No	No	No	24	PDIP, SSOP, WSOIC
ZT208E	+5V	3.0	4	4	0	4	250	±15kV	No	No	No	24	PDIP, SSOP, WSOIC
ZT208F	+5V	3.0	4	4	0	4	1000	±15kV	No	No	No	24	PDIP, SSOP, WSOIC
ZT211E	+5V	3.0	4	5	0	4	250	±15kV	Yes	No	Yes	28	SSOP, WSOIC
ZT211F	+5V	3.0	4	5	0	4	1000	±15kV	Yes	No	Yes	28	SSOP, WSOIC
ZT213AE	+5V	3.0	4	5	2	4	250	±15kV	Yes	Yes	Yes	28	SSOP, WSOIC
ZT213E	+5V	3.0	4	5	2	4	250	±15kV	Yes	Yes	Yes	28	SSOP, WSOIC
ZT213F	+5V	3.0	4	2	2	4	1000	±15kV	Yes	Yes	Yes	28	SSOP, WSOIC

3V RS485 Interface Selection Guide

Part No.	Supply Voltage	Typical Icc Current (mA)	# of Tx/Rx	Duplex	Data Rate (Mbps)	ESD on RS232 I/O	# of Tx/Rx on Bus	Slew Rate Limit	Rx Input Filtering	Low-Power Shutdown	Tx/Rx Enable	Hot Swap	Number of Pins	Package Type
ZT3483E	+3V	0.4	1/1	Half	0.25	±15kV	32	Yes	Yes	Yes	Yes	No	8	PDIO, nSOIC
ZT3485E	+3V	0.4	1/1	Half	16	±15kV	32	No	No	Yes	Yes	No	8	PDIO, nSOIC
ZT3488E	+3V	0.4	1/1	Full	0.25	±15kV	32	Yes	Yes	No	No	No	8	PDIO, nSOIC
ZT3490E	+3V	0.4	1/1	Full	16	±15kV	32	No	No	No	No	No	8	PDIO, nSOIC
ZT3491E	+3V	0.4	1/1	Full	16	±15kV	32	No	No	Yes	Yes	No	14	PDIO, nSOIC
ZT3070E	+3V	0.4	1/1	Full	0.25	±15kV	256	Yes	Yes	Yes	Yes	No	14	PDIO, nSOIC
ZT3071E	+3V	0.4	1/1	Full	0.25	±15kV	256	Yes	No	No	No	No	8	PDIO, nSOIC, MSOP
ZT3072E	+3V	0.4	1/1	Half	0.25	±15kV	256	Yes	Yes	Yes	Yes	No	8	PDIO, nSOIC, MSOP
ZT3073E	+3V	0.4	1/1	Full	0.5	±15kV	256	Yes	Yes	Yes	Yes	No	14	PDIO, nSOIC
ZT3075E	+3V	0.4	1/1	Half	0.5	±15kV	256	Yes	Yes	Yes	Yes	No	8	PDIO, nSOIC, MSOP
ZT3076E	+3V	0.4	1/1	Full	16	±15kV	256	No	Yes	Yes	Yes	No	14	PDIO, nSOIC
ZT3077E	+3V	0.4	1/1	Full	16	±15kV	256	No	No	No	No	No	8	PDIO, nSOIC, MSOP
ZT3078E	+3V	0.4	1/1	Half	16	±15kV	256	No	Yes	Yes	Yes	No	8	PDIO, nSOIC, MSOP
ZT3070S	+3V	0.4	1/1	Full	0.25	±15kV	256	Yes	Yes	Yes	Yes	No	14	PDIO, nSOIC
ZT3071S	+3V	0.4	1/1	Full	0.25	±15kV	256	Yes	No	No	No	Yes	8	PDIO, nSOIC, MSOP
ZT3072S	+3V	0.4	1/1	Half	0.25	±15kV	256	Yes	Yes	Yes	Yes	Yes	8	PDIO, nSOIC, MSOP
ZT3073S	+3V	0.4	1/1	Full	0.5	±15kV	256	Yes	Yes	Yes	Yes	Yes	14	PDIO, nSOIC
ZT3075S	+3V	0.4	1/1	Half	0.5	±15kV	256	Yes	Yes	Yes	Yes	Yes	8	PDIO, nSOIC, MSOP
ZT3076S	+3V	0.4	1/1	Full	16	±15kV	256	No	Yes	Yes	Yes	Yes	14	PDIO, nSOIC
ZT3077S	+3V	0.4	1/1	Full	16	±15kV	256	No	No	No	No	Yes	8	PDIO, nSOIC, MSOP
ZT3078S	+3V	0.4	1/1	Half	16	±15kV	256	No	Yes	Yes	Yes	Yes	8	PDIO, nSOIC, MSOP

5V RS485 Interface Selection Guide

Part No.	Supply Voltage	Typical Icc Current (mA)	# of Tx/Rx	Duplex	Data Rate (Mbps)	ESD on RS232 I/O	# of Tx/Rx on Bus	Slew Rate Limit	Low-Power Shutdown	Tx/Rx Enable	Hot Swap	Number of Pins	Package Type
ZT483E	+5V	0.4	1/1	Half	0.25	±15kV	32	Yes	Yes	Yes	No	8	PDIO, nSOIC
ZT485E	+5V	0.4	1/1	Half	10	±15kV	32	No	Yes	Yes	No	8	PDIO, nSOIC
ZT488E	+5V	0.4	1/1	Full	0.25	±15kV	32	Yes	No	No	No	8	PDIO, nSOIC
ZT489E	+5V	0.4	1/1	Full	0.25	±15kV	32	Yes	Yes	Yes	No	14	PDIO, nSOIC
ZT490E	+5V	0.4	1/1	Full	10	±15kV	32	No	No	No	No	8	PDIO, nSOIC
ZT491E	+5V	0.4	1/1	Full	10	±15kV	32	No	Yes	Yes	No	14	PDIO, nSOIC
ZT487E	+5V	0.4	1/1	Half	0.25	±15kV	128	Yes	Yes	Yes	No	8	PDIO, nSOIC
ZT483H	+5V	0.4	1/1	Half	0.25	±15kV	256	Yes	Yes	Yes	No	8	PDIO, nSOIC
ZT485H	+5V	0.4	1/1	Half	10	±15kV	256	No	Yes	Yes	No	8	PDIO, nSOIC
ZT488H	+5V	0.4	1/1	Full	0.25	±15kV	256	Yes	No	No	No	8	PDIO, nSOIC
ZT489H	+5V	0.4	1/1	Full	0.25	±15kV	256	Yes	Yes	Yes	No	14	PDIO, nSOIC
ZT490H	+5V	0.4	1/1	Full	10	±15kV	256	No	No	No	No	8	PDIO, nSOIC
ZT491H	+5V	0.4	1/1	Full	10	±15kV	256	No	Yes	Yes	No	10, 14	PDIO, nSOIC, MOSP
ZT13085E	+5V	0.4	1/1	Half	2.5	±15kV	256	No	Yes	Yes	No	8	PDIO, nSOIC
ZT3080E	+5V	0.4	1/1	Full	0.25	±15kV	256	Yes	Yes	Yes	No	14	PDIO, nSOIC
ZT3081E	+5V	0.4	1/1	Full	0.25	±15kV	256	Yes	No	No	No	8	PDIO, nSOIC, MOSP
ZT3082E	+5V	0.4	1/1	Half	0.25	±15kV	256	Yes	Yes	Yes	No	8	PDIO, nSOIC, MOSP
ZT3083E	+5V	0.4	1/1	Full	1	±15kV	256	Yes	Yes	Yes	No	14	PDIO, nSOIC
ZT3084E	+5V	0.4	1/1	Full	1	±15kV	256	Yes	No	No	No	8	PDIO, nSOIC, MOSP
ZT3085E	+5V	0.4	1/1	Half	1	±15kV	256	Yes	Yes	Yes	No	8	PDIO, nSOIC, MOSP
ZT3086E	+5V	0.4	1/1	Full	20	±15kV	256	No	Yes	Yes	No	14	PDIO, nSOIC
ZT3087E	+5V	0.4	1/1	Full	20	±15kV	256	No	No	No	No	8	PDIO, nSOIC, MOSP
ZT3088E	+5V	0.4	1/1	Half	20	±15kV	256	No	Yes	Yes	No	8	PDIO, nSOIC, MOSP
ZT13080S	+5V	0.4	1/1	Full	0.25	±15kV	256	Yes	Yes	Yes	Yes	14	PDIO, nSOIC
ZT13085S	+5V	0.4	1/1	Half	0.5	±15kV	256	Yes	Yes	Yes	Yes	8	PDIO, nSOIC, MOSP
ZT13086S	+5V	0.4	1/1	Full	16	±15kV	256	No	Yes	Yes	Yes	14	PDIO, nSOIC

- EL Drivers ICs:

EL Drivers Selection Guide

Part No.	Supply Voltage	Standby Current (uA)	Lamp Size (sq.in)	Typical Vpp(V)	Lamp Freq(Hz)	Package Type	Comments
ZSP4403	2.2V to 5.0V	0.05	1.0 to 10	195	400	8-MSOP	Single R controls osc freq. High output ideal for large display panel.
ZSP4412A	2.2V to 3.6V	0.01	0.5 to 2.0	160	256	8-MSOP, 8-nSOIC, Die in wafflepack & wafer form	Ext oscillator source required. Very low power, Die sales available.
ZSP4422A	2.2V to 5.0V	0.05	1.0 to 10	140	352	8-MSOP, 8-nSOIC	One ext cap controls osc freq. Low power. Die sales available.
ZSP4423	2.2V to 6.0V	0.01	1.0 to 10	150	300	8-MSOP, 8-nSOIC	Ext cap to select osc freq. Very low operating current.
ZSP4425	1.1V to 1.7V, 2.2V to 3.3V	1.0	0.5 to 6.0	160	400	8-MSOP, 8-nSOIC	Works in dual voltage ranges. Ext cap to select osc and lamp freq.
ZSP4491	2.2V to 6.0V	0.1	1.0 to 10	180	350	10-MSOP	Single IC driver 2 EL lamps independently with one inductor coil. Single ext R controls osc freq.

IO ICs Application Block Diagrams:

Fig 1 PCIe Connectivity Solutions

The PCI ridge series, MCS98xx,provide OEMs low cost solutions for developing products that bring single and multi-port Parallel, Serial and ISA devices to the market place. PCI is an interconnection system between a microprocessor and attached devices. The MCS98xx supports 3.3/V PCI bus signaling specifications at full 33 MHz clock speed and allows direct interface to the system bus, delivering a significant reduction in board space requirements.

Fig 2 PCI Connectivity Solutions

The USB bridge series, MC78xx/MCS 77xx provides OEM customers and end users an instant, no-hassle way to connect existing devices to next generation computer peripherals. By providing bridging solutions, ASIX can incorporate support for legacy devices such as Serial, Paralle1 and IrDA as well as advancing the next generation of USB technologies.

Fig 3 USB Connectivity Solutions

§Embedded Wireless Modules

Embedded Wi-Fi Modules:

AXM22001-2A-C -- IEEE 802.11b/g WiFi Module Board

The AXM22001-2A-C is a 2.4GHz 802.11b/g WiFi module board which integrates AX22001 and Airoha AL2230S RF transceiver on board to provide a complete WiFi module solution with various user or host interfaces supported. The AXM22001-2A-C is a surface mountable module with castellated mounting holes which offers smaller-form-factor, lower-cost, pre-calibrated RF front-end and pre-certified WiFi module board to free the user from RF and antenna design tasks and regulatory compliance testing, ultimately providing quicker time to market. The user can design his host board with desired function and interface circuits and assemble it with the AXM22001-2A-C WiFi module board through the castellated mounting holes.

Feature:

- Integrated 2.4GHz, IEEE 802.11b/g compatible WiFi connectivity
- Integrated PCB antenna
- Max outdoor range up to 300m (984 ft.), line of sight
- Supports operation in Simple AP(SAP) or Station (In Infrastructure or Ad-Hoc) mode
- Supports 802.11i security:
- WEP-64/128, TKIP (WPA-PSK) and AES (WPA2-PSK) in Station mode
- WEP-64/128 in SAP mode
- Dual 8-bit 1T 8051/80390 CPU @ 80MHz
- 1MB shared Flash memory for MCPU and WCPU program code and configuration data storage
- 64KB data memory for MCPU
- 4 UART interfaces
- High Speed SPI interface (master or slave mode)
- I²S or PCM interface
- Local Bus host interface (master or slave mode)
- MII or RMII interface
- I²C interface
- Up to 32 GPIOs (4 GPIO ports of 8 bits each)
- Supports real-time clock, with option to use independent power supply from lithium battery
- Supports TCP, UDP, ICMP, IGMP, IPv4, DHCP, BOOTP, ARP, DNS, SMTP, SNTP, UPnP, PPPoE and HTTP in software
- Supports network boot over Ethernet or WiFi using BOOTP and TFTP
- Single operating voltage: 3.3V typical
- Board size: 51.0mm x 28.0mm x 4.5mm surface mountable module

Embedded Bluetooth Modules:

ASIX Part No.	BT Spec.	Memory	I/O	Other Interface	Output Power
AXB031 (CSR1010)	BLE 4.0/4.1	64KB ROM, 64KB RAM, 64KB EEPROM	12 DIOs, 3 AIOs	UART, I²C, SPI, PWMx4	7.5dBm
AXB032 (CSR1010)	BLE 4.0/4.1	64KB ROM, 64KB RAM, 64KB EEPROM	12 DIOs, 3 AIOs	UART, I²C, SPI, PWMx4, Antenna	7.5dBm
AXB033 (CSR1011)	BLE 4.0/4.1	64KB ROM, 64KB RAM, 64KB EEPROM	32 DIOs, 3 AIOs	UART, I²C, SPI, PWMx4, Antenna	7.5dBm
AXB051 (BC05-MM)	BR/EDR/HS 2.0/2.1/3.0	2MB Flash,1MB SPI Flash(for Phonebook)	11 DIOs, 2 AIOs	UART, I²C, SPI,USB, Digital-PCM, SPDIF, I²S	Class 2 (1mW, 0dBm)
AXB052 (BC05-MM)	BR/EDR/HS 2.0/2.1/3.0	2MB Flash	14 DIOs, 2 AIOs	UART, I²C, SPI, USB, Digital-PCM, SPDIF, I²S	Class 2 (1mW, 0dBm)
AXB081 (CSR8670)	Dual mode 3.0/4.0	2MB eFlash, 2MB SPI Flash	20 DIOs, 2 AIOs	UART, I²C, SPI, USB, Digital-PCM, SPDIF, I²S	Class 2 (4dBm)

ASIX Part No.	Sensitivity	Power Consumption	Dimension	Pin Count	Temp Range (℃)
AXB031 (CSR1010)	-92.5dBm	< 16mA(Tx/Rx peak), <1mA(Idle), <5uA(Deep Sleep)	20 x 12 x 2 mm^3	24	-20 ~ +75
AXB032 (CSR1010)	-92.5dBm	< 16mA(Tx/Rx peak), <1mA(Idle), <5uA(Deep Sleep)	11 x 11 x 2 mm^3	24	-20 ~ +75
AXB033 (CSR1011)	-92.5dBm	< 16mA(Tx/Rx peak), <1mA(Idle), <5uA(Deep Sleep)	23 x 13 x 2 mm^3	49	-25 ~ +85
AXB051 (BC05-MM)	-80dBm	< 35mA(A2DP Playing), <1mA(Idle), <30mA(HFP Talking)	24 x 17.6 x 2 mm^3	48	-25 ~ +85
AXB052 (BC05-MM)	-80dBm	< 35mA(A2DP Playing), <1mA(Idle), <30mA(HFP Talking)	20 x 15 x 2 mm^3	64	-25 ~ +85
AXB081 (CSR8670)	-83dBm	< 13mA(Operation), <1mA(Idle), <55uA(Deep Sleep)	17.8 x 15.8 x 1.8 mm^3	62	-20 ~ +75

Embedded Wireless Modules

This solution is designed to address the needs of new wireless applications, such as ultra-low power consumption, fast connection times, reliability, and security. It will allow consumers to control any Bluetooth Smart enabled device in the home from wherever they are, including lighting, heating, appliances, and security systems.

Tailor made for Bluetooth Smart market, the cost effective Bluetooth 4.0 AXB031 and AXB033 modules are perfect for body worn medical sensors, sports and fitness sensors, activity monitors, remote controls, smart home, commercial/industrial automation and any other application that requires connectivity to a smartphone, tablet, or other Bluetooth Smart devices, and also provides a dual-mode Bluetooth 4.0 audio module, AXB081, and two Bluetooth 3.0 audio modules, AXB051/AXB052, for the fast-growing wireless audio applications, such as wireless stereo speakers, headphones, home theater, automotive hands-free, and MirrorLink car player applications.

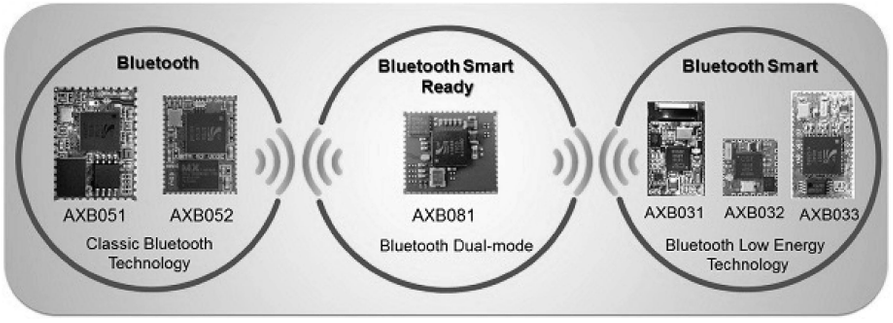


Fig 13 ASIX Provides Complete Embedded Bluetooth Modules