ETX

ETX-GLX

User's Manual



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Part Number: 50-1J008-1020

ADLINK TECHNOLOGY INC.

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Revision History

Release	Date	Change(s)
2.00	2007/11/09	Initial release
2.01	2007/11/15	LVDS Specification correction
2.10	2008/07/24	Correct Functional Diagram Correct VGA specification Correct System Resources (I/O Address Map) Correct BIOS chapter (Advanced BIOS Features, Advanced Chipset Features) Correct address, revise layout
2.11	2009/03/17	Add "single channel 18-bit LVDS support by BOM option"

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Preface

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Conventions

Take note of the following conventions used throughout this manual to make sure that users perform certain tasks and instructions properly.



Additional information, aids, and tips that help users perform tasks.



Information to prevent *mino*r physical injury, component damage, data loss, and/or program corruption when trying to complete a task.



Information to prevent *serious* physical injury, component damage, data loss, and/or program corruption when trying to complete a specific task.

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1 Introduction

ETX-GLX is a low power ETX® module that complies with the new ETX® revision 3.02 form factor specifications. ETX® revision 3.02 adds two SATA port connectors to the ETX module while maintaining full backward compatibility with the previous ETX® rev 2.x designs. Therefore existing ETX® carrier board do not have to be modified to be able to use this new SATA storage feature.

The Computer on Module concept of off-the-shelf core modules, combined with custom made carrier boards, dramatically reduces product development time and time to market. With all major functions already included on the Computer on Module, system developers and OEM can now concentrate on their core competencies and unique system values of their product. The ETX form factor is competitively priced for OEM projects with production quantities ranging from 500 to 50,000 pieces.

The new ETX-GLX targets markets for Medical Automation, Gaming, Instrumentation, POS, Mobile Computing and Transportation where low power, medium performance and extended graphic support is required.

The ETX-GLX, based on AMD's Geode™ LX 800 processor and CS5536 companion chipset, constitutes the perfect balance between computing performance and low power consumption. It supports up to 1 GB DDR400 in a single SODIMM socket or optionally can be equipped with 128 MB or 256 MB DDR400 memory soldered on the module.

The module supports advanced display features such as high resolution Analog VGA support up to 1920 x 1440 and single or dual channel 24-bit LVDS panels at max. 1600 x 1200 resolution. The board can optionally be equipped with an advanced Focus TV Encoder Chip that supports Standard Definition and High Definition TV Output, The Focus FS 455 covers a wide TV resolution spectrum, from standard NTSC/PAL, through 480p, 720p to 1080i.

The module further incorporates an Intel based 10/100Base-T Ethernet port, an PATA EIDE controller supporting both PIO and UDMA modes, a dual port SATA controller, 4 USB v2.0 ports, two serial ports, one parallel port (SPP/ECP/EPP) shared with FDD, one PS2 keyboard/mouse interface, AC'97 audio interface and power management functionality.

The ETX-GLX has full support for PCI and legacy ISA and comes with embedded features such as Watchdog controller, RS-232 console redirection and CMOS EEPROM backup for BIOS settings and battery-less operation. The ETX-GLX is a revision controlled product aimed at applications that require a guaranteed long production life support.

ETX-GLX is a RoHS compliant and lead free product

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2 Specifications

2.1 General

- Embedded Processor: AMD Geode™ LX 800 CPU 500 MHz.
- Chipset: Geode™ CS5536 companion device
- Memory: 128/256 MB of soldered onboard DDR 400 memory and one 200-pin socket for additional, up to 1 GB DDR 400 SODIMM. (Max. of soldered onboard plus socket memory is 1 GB)
- Cache: 128 KB L2 cache
- Enhanced IDE: two ports: one port supports two devices that can operate in PIO modes 0 to 4, MDMA modes 0 to 2, or UDMA modes 0 to 5 (up to 100 MB/s); another port from VIA 6421A, for two enhanced IDE devices, supports ATA PIO mode 4, multi-word DMA-mode 2 drivers and UltraDMA-mode6



The IDE port (secondary port) from VIA 6421A does not support CompactFlash®. For CompactFlash® support, please connect to the Primary IDE port.

- SATA: Complies with Serial ATA Specification Revision 1.0; Dual channel master mode PCI supporting up to two S-ATA devices.
- BIOS: AWARD 4 Mb Flash BIOS with ACPI 2.0 and APM power management with console redirection and CMOS backup in onboard EEPROM
- Hardware Monitor: integrated in Winbond W83627HG monitors supply voltages and CPU temperature
- Watchdog Timer: 255-level timer generates RESET
- Expansion: 16-bit ISA and 32-bit PCI 2.2

2.2 Display

- VGA: (integrated in AMD Geode™LX 800 CPU companion device)
  - Supports up to 1920x1440x32 bpp resolution at 85 Hz
  - Supports up to 1600x1200x32 bpp resolution at 100 Hz

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- LVDS: (NS DS90C387A LVDS transmitter)
  - Single or dual channel 24-bit
  - Supports SVGA through QXGA panel resolutions
  - Compatible with ANSI/TIA/EIA-644-1995 LVDS Standard
  - Backward compatible with FPD-Link
  - Single channel 18-bit LVDS support by BOM option
- TV OUT (optional): (Focus FS455)
  - Supports NTSC and PAL spectrum output for 480p, 720p and 1080i resolution
  - Programmable 2D scaling

2.3 Multi I/O

- Chipset: Winbond W83627HG
- Serial: 2 high speed RS-232C
  - COM1 - 16550 UART: up to 115Kbits/sec
  - COM2 - 16550 UART: up to 115Kbits/sec
- Parallel: SPP, EPP and ECP mode (pins shared with FDD)
- FDD: single FDD (pins shared with LPT1)
- IrDA: supports SIR IrDA 1.1 compliant
- USB: supports up to four ports ver 2.0
- Keyboard & Mouse: one PS/2 keyboard and one PS/2 mouse

2.4 Audio

- Chipset: included on CS5536
- Audio Codec: AC'97 type Realtek ALC655

2.5 LAN

- Chipset: Intel® 82551QM
- Interface: 10BASE-T/100BASE-TX with TCP/UDP/IP checksum off-loading and PXE boot support

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2.6 Power Supply and Environment

- Power Requirements:

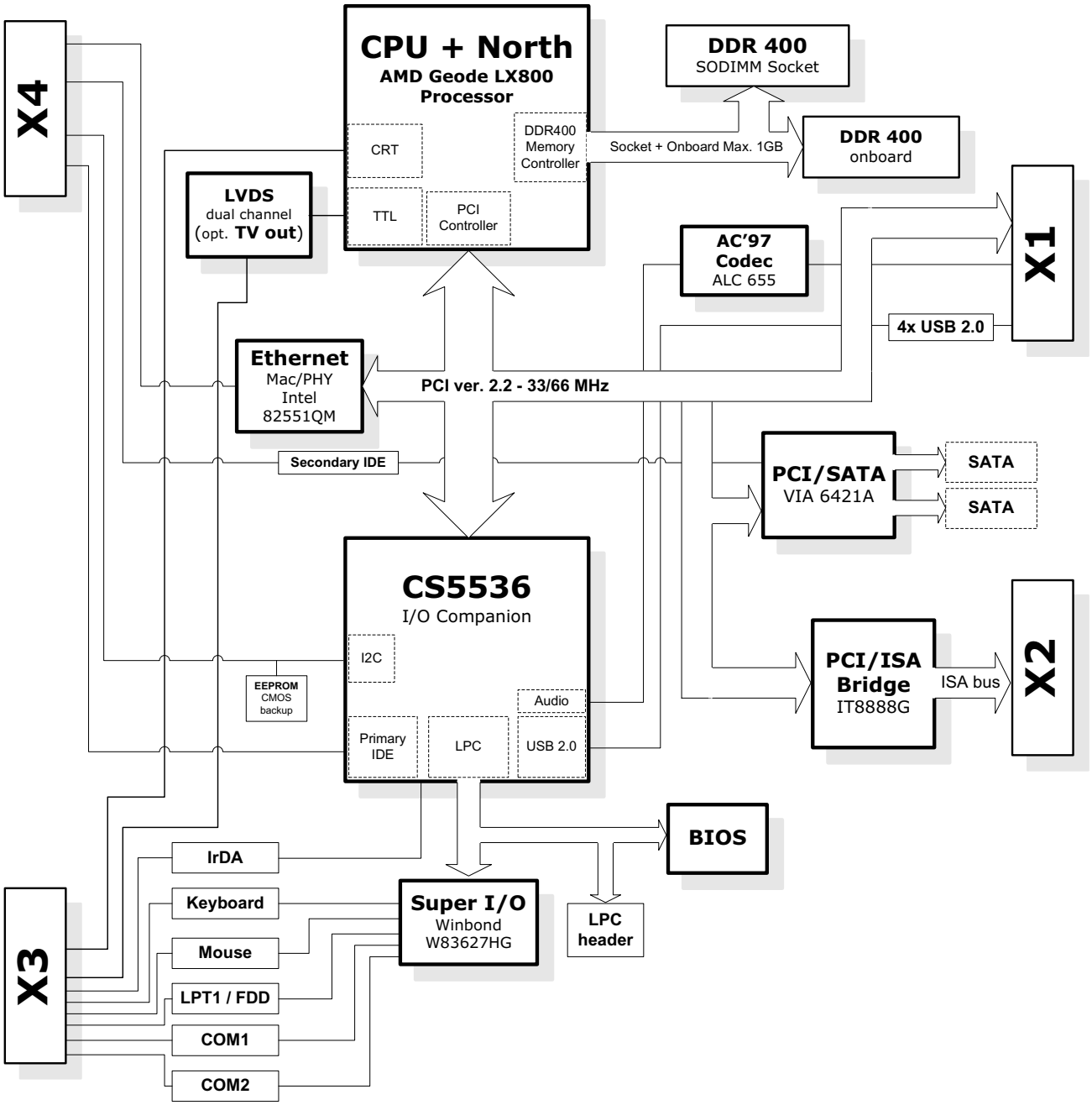
AMD Geode™ LX 800 with 256 MB soldered DDR400					
	+5 V(mA)	5 VSB(mA)	+5 V(W)	5 VSB(W)	Total(W)
Light Load	1216	153.2	6.08	0.766	6.08
Full Load	1438	153.2	7.19	0.766	7.19

AMD Geode™ LX 800 with 512 MB socket memory					
	+5 V(mA)	5 VSB(mA)	+5 V(W)	5 VSB(W)	Total(W)
Light Load	1346	164.1	6.73	0.821	6.73
Full Load	1522	164.1	7.61	0.821	7.61

- Operating Temperature: 0 °C to 60 °C (32 °F to 140 °F)
- Relative Humidity: up to 90% at 55°C
- ETX Board Dimensions: 95 mm x 114 mm (3.7" x 4.5")
- Weight: 72 grams without memory onboard, 74 grams with soldered memory

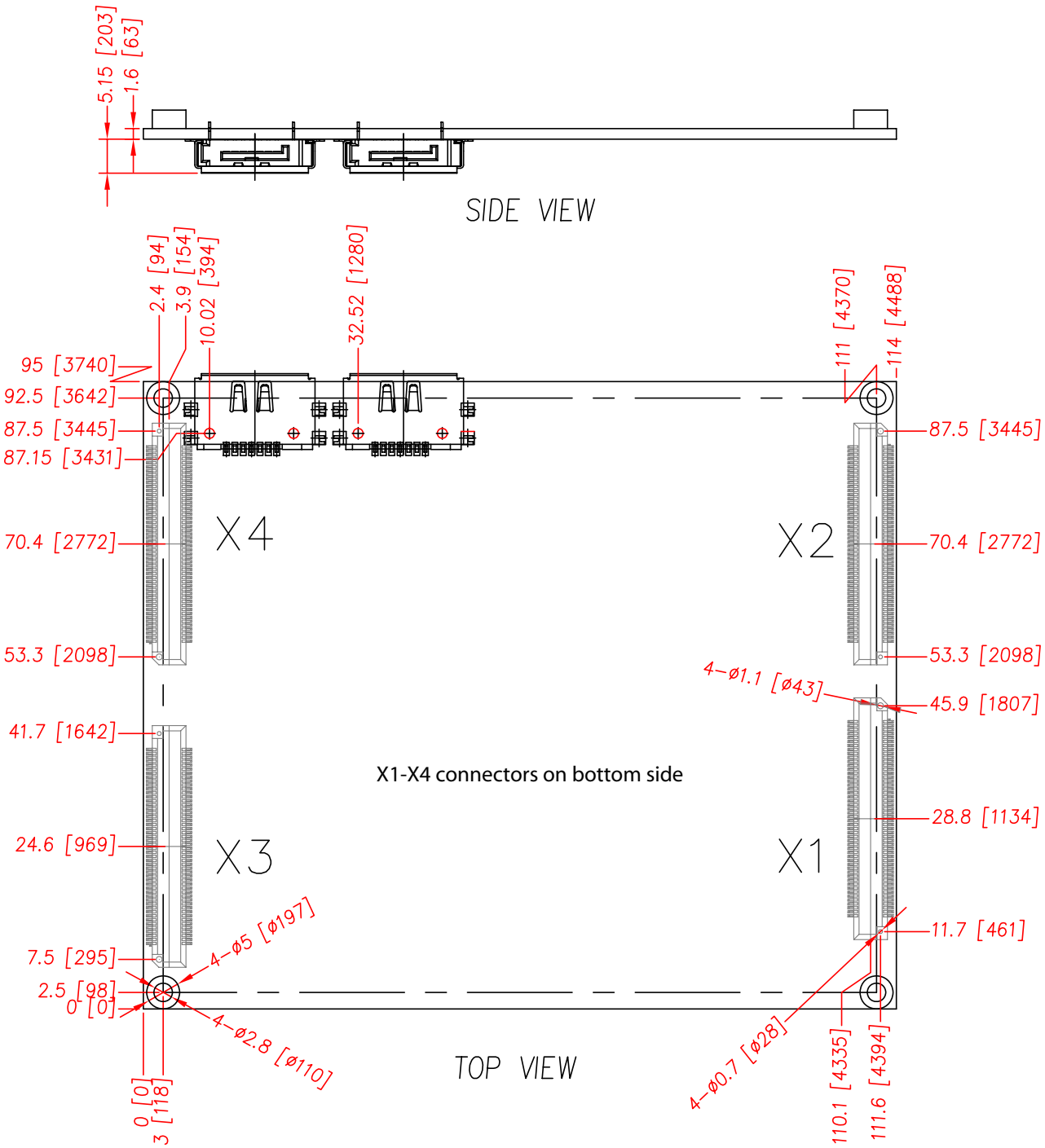
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3 Functional Diagram



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4 Mechanical Dimensions



All ∅ tolerances ± 0.05 mm
Other tolerances ± 0.2 mm

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5 Watchdog Timer



ETX-GLX implements a watchdog timer (WDT) embedded in the LPC based Winbond 83627HG Super I/O controller.

The Watchdog timer consists of a one-second/minute resolution counter (CRF6 of logical device 8 of 83627HG) and two Watchdog control registers (CRF5 and CRF7 of logical device 8). Once a value is set in the WDT, the timer begins to count down.

Any movement in the keyboard, mouse, or software reset of the value will cause a reload of the timer value. The Watchdog output is connected to “reset”. When the system hangs up without software re-trigger, the system will be reset.

The Watchdog timer has a one second granularity up to 255 seconds or a one minute granularity up to 255 minutes. The keyboard and mouse will only reset the WDT if Bit 7 and 6 of CRF7 is set; that is values greater than C0h or 192 decimal.

To configure the registers, the following sequence should be followed:

- Writing 87h to location 2Eh twice to enter the extended function mode
- Configure the registers to set up the WDT
- Writing 0AAh to location 2Eh to exit the extended function mode

The sample code shown on the following pages resets the system after 15 seconds. Both keyboard and mouse interrupts will reload the WDT from CRF6.

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WDT Sample Code

```
begin:

;------------------------------------------------------
; Enter extended function mode, interrupt double-write
;------------------------------------------------------

   mov dx,2Eh
   mov al,87h
   out dx,al
   out dx,al
   mov dx,2Eh
   mov al,2bh     ;CR2B, bit4 -> 0 = WDTO
                  ;bit4 -> 1 = GP24
   out dx,al
   mov dx,2Fh
   mov al,0C0h
   out dx,al

   mov dx,2Eh
   mov al,07h
   out dx,al
   mov dx,2Fh
   mov al,08h     ;device 8
   out dx,al

   mov dx,2Eh
   mov al,30h
   out dx,al

   mov dx,2Fh
   mov al,01h     ;enable device 8
   out dx,al

   mov dx,2Eh
   mov al,0F7h
   out dx,al      ;device 8, CRF7
   mov dx,2Fh
   mov al,0C0h
   out dx,al
```

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```
   mov dx,2Eh
   mov al,0F5h    ;device 8, CRF5
   out dx,al
   mov dx,2Fh
   mov al,00h     ;bit3 -> 0 = second
                  ;bit3 -> 1 = minute
   out dx,al
   mov dx,2Eh
   mov al,0F6h    ;device 8, CRF6
   out dx,al
   mov dx,2Fh
   mov al,0Fh
   out dx,al

;-------------------------------------------------------
; Exit extended function mode
;-------------------------------------------------------

   mov dx,2Eh
   mov al,0AAh
   out dx,al

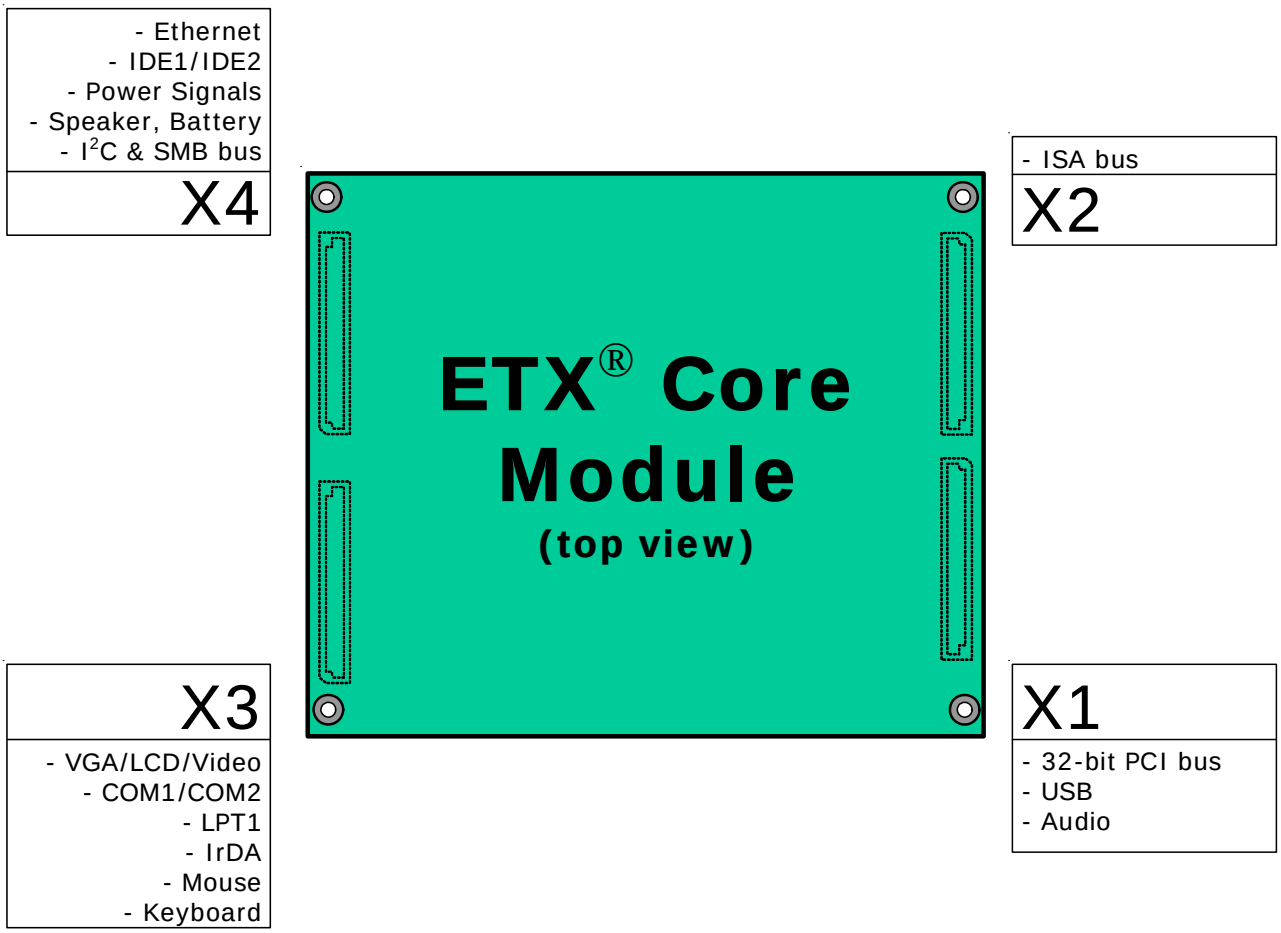
.exit

end
```

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6 Connectors

6.1 Connector Location



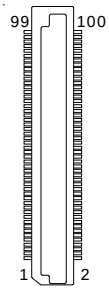
6.2 Pin Compatibility

All pins on X1, X2, X3, and X4 of the ETX-GLX comply with pin and signal descriptions used in the ETX® Specification ver. 3.02. This document contains a description of pins, signal descriptions, and mechanical characteristics of the ETX® form factor.

An additional document, “ETX® Design Guide” gives a general introduction to carrier board designs for ETX® modules.

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6.3 X1 Connector: PCI-bus, USB, & Audio



Signals and Pins

Pin	Signal	Pin	Signal
1	GND	2	GND
3	PCICLK3	4	PCICLK4
5	GND	6	GND
7	PCICLK1	8	PCICLK2
9	REQ3#	10	GNT3#
11	GNT2#	12	3V[1]
13	REQ2#	14	GNT1#
15	REQ1#	16	3V[1]
17	GNT0#	18	RSV
19	5VCC	20	5VCC
21	SERIRQ	22	REQ0#
23	AD0	24	3V[1]
25	AD1	26	AD2
27	AD4	28	AD3
29	AD6	30	AD5
31	CBE0#	32	AD7
33	AD8	34	AD9
35	GND	36	GND
37	AD10	38	AUXAL
39	AD11	40	MIC
41	AD12	42	AUXAR
43	AD13	44	ASVCC
45	AD14	46	SDNL
47	AD15	48	ASSGND
49	CBE1#	50	SNDR

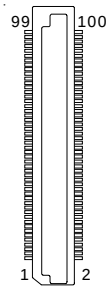
Pin	Signal	Pin	Signal
51	5VCC	52	5VCC
53	PAR	54	SERR#
55	GPERR	56	RSV
57	PME#	58	USB2-
59	LOCK#	60	DEVSEL#
61	TRDY#	62	USB3-
63	IRDY#	64	STOP#
65	FRAME#	66	USB2+
67	GND	68	GND
69	AD16	70	CBE2#
71	AD17	72	USB3+
73	AD19	74	AD18
75	AD20	76	USB0N
77	AD22	78	AD21
79	AD23	80	USB1-
81	AD24	82	CBE3#
83	5VCC	84	5VCC
85	AD25	86	AD26
87	AD28	88	USB0+
89	AD27	90	AD29
91	AD30	92	USB1+
93	PCIRST#	94	AD31
95	INTC#	96	INTD#
97	INTA#	98	INTB#
99	GND	100	GND

NOTE: [1]The 3V (3.3 V ±5%) is generated on-board. Pins may be used to power devices on the carrier board up to a maximum load of 500 mA.

CAUTION: DO NOT CONNECT THE 3V PIN TO AN EXTERNAL 3.3 V SUPPLY POWER

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6.4 X2 Connector: ISA Bus



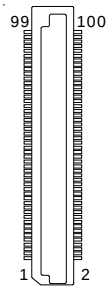
Signals and Pins

Pin	Signal	Pin	Signal
1	GND	2	GND
3	SD14	4	SD15
5	SD13	6	MASTER#
7	SD12	8	DREQ7
9	SD11	10	DACK7#
11	SD10	12	DREQ6
13	SD9	14	DACK6#
15	SD8	16	DREQ5
17	MEMW#	18	DACK5#
19	MEMR#	20	DREQ0
21	LA17	22	DACK0#
23	LA18	24	IRQ14
25	LA19	26	IRQ15
27	LA20	28	IRQ12[1]
29	LA21	30	IRQ11
31	LA22	32	IRQ10
33	LA23	34	IO16#
35	GND	36	GND
37	SBHE#	38	M16#
39	SA0	40	OSC
41	SA1	42	BALE
43	SA2	44	TC
45	SA3	46	DACK2#
47	SA4	48	IRQ3
49	SA5	50	IRQ4

Pin	Signal	Pin	Signal
51	VCC	52	VCC
53	SA6	54	IRQ5
55	SA7	56	IRQ6
57	SA8	58	IRQ7
59	SA9	60	SYSCLK
61	SA10	62	REFSH#
63	SA11	64	DREQ1
65	SA12	66	DACK1#
67	GND	68	GND
69	SA13	70	DREQ3
71	SA14	72	DACK3#
73	SA15	74	IOR#
75	SA16	76	IOW#
77	SA18	78	SA17
79	SA19	80	SMEMR#
81	IOCHRDY	82	AEN
83	VCC	84	VCC
85	SD0	86	SMEMW#
87	SD2	88	SD1
89	SD3	90	NOWS#
91	DREQ2	92	SD4
93	SD5	94	IRQ9
95	SD6	96	SD7
97	IOCHK#	98	RSTDRV
99	GND	100	GND

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6.5 X3 Connector: CRT, LCD (LVDS), & Video



Signals and Pins

Pin	Signal	Pin	Signal
1	GND	2	GND
3	R	4	B
5	HSY	6	G
7	VSY	8	DDCK
9	NC	10	DDDA
11	LCD16	12	LCD18
13	LCD17	14	LCD19
15	GND	16	GND
17	LCD13	18	LCD15
19	LCD12	20	LCD14
21	GND	22	GND
23	LCD8	24	LCD11
25	LCD9	26	LCD10
27	GND	28	GND
29	LCD4	30	LCD7
31	LCD5	32	LCD6
33	GND	34	GND
35	LCD1	36	LCD3
37	LCD0	38	LCD2
39	5VCC	40	5VCC
41	JILI_SDA	42	LTGO0
43	JILI_SCL	44	BLON#
45	NC	46	DIGON
47	COMP	48	Y
49	NC	50	C

First LVDS Channel

Signal	LVDS Signal
LCD0	Txout 0-
LCD1	Txout 0+
LCD2	Txout 1-
LCD3	Txout 1+
LCD4	Txout 2-
LCD5	Txout 2+
LCD6	Txclk -
LCD7	Txclk +
LCD8*	Txout 3-
LCD9*	Txout 3+

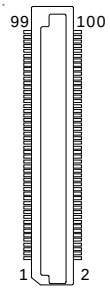
Second LVDS Channel

Signal	LVDS Signal
LCD10*	Txout 0-
LCD11*	Txout 0+
LCD12*	Txout 1-
LCD13*	Txout 1+
LCD14*	Txout 2-
LCD15*	Txout 2+
LCD16*	Txclk -
LCD17*	Txclk +
LCD18*	Txout 3-
LCD19*	Txout 3+

* NC for 18-bit single channel BOM option

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6.6 X3 Connector: COM1/2, LPT1 or FDD, IrDA, Mouse, & Keyboard



Signals and Pins

LPT Mode

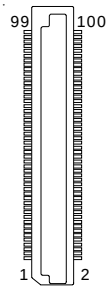
Pin	Signal	Pin	
51	LPT/FLPY#	52	RESERVED
53	5VCC	54	GND
55	STB#	56	AFD#
57	RESERVED	58	PD7
59	IRRX	60	ERR#
61	IRTX	62	PD6
63	RXD2	64	INIT#
65	GND	66	GND
67	RTS2#	68	PD5
69	DTR2#	70	SLIN#
71	DCD2#	72	PD4
73	DSR2#	74	PD3
75	CTS2#	76	PD2
77	TXD2	78	PD1
79	RI2#	80	PD0
81	5VCC	82	5VCC
83	RXD1	84	ACK#
85	RTS1#	86	BUSY
87	DTR1#	88	PE
89	DCD1#	90	SLCT#
91	DSR1#	92	MSCLK
93	CTS1#	94	MSDAT
95	TXD1	96	KBCLK
97	RI1#	98	KBDAT
99	GND	100	GND

FDD Mode

Pin	Signal	Pin	Signal
51	LPT/FLPY#	52	RESERVED
53	5VCC	54	GND
55	RESERVED	56	DENSEL
57	RESERVED	58	RESERVED
59	IRRX	60	HDSEL#
61	IRTX	62	RESERVED
63	RXD2	64	DIR#
65	GND	66	GND
67	RTS2#	68	RESERVED
69	DTR2#	70	STEP#
71	DCD2#	72	DSKCHG#
73	DSR2#	74	RDATA#
75	CTS2#	76	WP#
77	TXD2	78	TRK0#
79	RI2#	80	INDEX#
81	5VCC	82	5VCC
83	RXD1	84	DRV
85	RTS1#	86	MOT
87	DTR1#	88	WDATA#
89	DCD1#	90	WGATE#
91	DSR1#	92	MSCLK
93	CTS1#	94	MSDAT
95	TXD1	96	KBCLK
97	RI1#	98	KBDAT
99	GND	100	GND

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6.7 X4 Connector: IDE1, IDE2, Ethernet, & Miscellaneous



Signals and Pins

Pin	Signal	Pin	Signal
1	GND	2	GND
3	5V_SB	4	PWGIN
5	PS_ON	6	SPEAKER
7	PWRBTN#	8	BATT
9	KBINH	10	LILED#
11	RSMRST#[1]	12	ACTLED#
13	ROMKBCS#[2]	14	SPDLED#
15	EXT_PRG[2]	16	I2CLK[3]
17	5VCC	18	5VCC
19	OVCR#	20	NC
21	EXTSMI#	22	I2DAT[3]
23	SMBCLK[3]	24	SMBDATA[3]
25	S_CS3#	26	SMBALRT#
27	S_CS1#	28	NC
29	S_A2	30	P_CS3#
31	S_A0	32	P_CS1#
33	GND	34	GND
35	PDIAG_S	36	P_A2
37	S_A1	38	P_A0
39	S_INTRQ	40	P_A1
41	BATLOW#[2]	42	GPE1#[2]
43	S_AK#	44	P_INTRQ
45	S_RDY	46	P_AK#
47	S_IOR#	48	P_RDY
49	5VCC	50	5VCC

Pin	Signal	Pin	Signal
51	S_IOW#	52	P_IOR#
53	S_DRQ	54	P_IOW#
55	S_D15	56	P_DRQ
57	S_D0	58	P_D15
59	S_D14	60	P_D0
61	S_D1	62	P_D14
63	S_D13	64	P_D1
65	GND	66	GND
67	S_D2	68	P_D13
69	S_D12	70	P_D2
71	S_D3	72	P_D12
73	S_D11	74	P_D3
75	S_D4	76	P_D11
77	S_D10	78	P_D4
79	S_D5	80	P_D10
81	5VCC	82	5VCC
83	S_D9	84	P_D5
85	S_D6	86	P_D9
87	S_D8	88	P_D6
89	GPE2#[2]	90	CBLID_P#
91	RXD#	92	P_D8
93	RXD	94	S_D7
95	TXD#	96	P_D7
97	TXD	98	HDRST#
99	GND	100	GND

NOTE:

[1]May be affected by external circuitry to reset the power management logic of the ETX module. Most designs do not use and pin is not connected.

[2]Reserved, do not connect

[3]See also: section 7.7 System Management Bus (I2C-compatible)

[4]Available, but not supported on the ETX-GLX

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7 System Resources

7.1 System Memory Map

Address Range (decimal)	Address Range (hex)	Size	Description
1024 KB - TOM	100000 - NA	NA	Note 1
960 KB - 1024 KB	F0000 - FFFFF	64 KB	System BIOS Area
928 KB - 960 KB	E0000 - EFFFF	64 KB	Extended System BIOS Area
800 KB - 928 KB	C8000 - E7FFF	160 KB	Expansion ROM, Note 2
768 KB - 800 KB	C0000 - C7FFF	32 KB	Onboard VGA BIOS, Note 2
640 KB - 768 KB	A0000 - BFFFF	128 KB	Video Buffer & SMM space
0 KB - 640 KB	00000 - 7FFFF	640 KB	Conventional Memory

NOTE:

[1]T.O.M = Top of memory. Some memory ranges like frame buffer (8M to 254M set by BIOS setting) and ACPI reserved area are unavailable for use.

[2]When another PCI VGA card is used, it may need more memory range than 32KB. The VGA BIOS area may be changed to 48 KB or 64 KB When secondary IDE channel has drive or onboard LAN PXE functionality is enabled, it will occupy memory from expansion ROM range. Otherwise, available expansion ROM area can be forwarded to ISA bus.

7.2 Direct Memory Access Channels

Channel Number	Data Width	System Resource
0	8-bits or 16-bits	Open, Note 1
1	8-bits or 16-bits	Parallel Port, Notes 1 & 2
2	8-bits or 16-bits	Floppy Controller, Notes 1 & 2
3	8-bits or 16-bits	Parallel Port, Notes 1 & 2
4	8-bits or 16-bits	Reserved, Cascade Channel
5	16-bits	Open, Note 1
6	16-bits	Open, Note 1
7	16-bits	Open, Note 1

NOTE:

[1]DMA request from ISA bridge is no longer served by south bridge on this platform. These DMA channels can be free on LPC bus, not ISA bus.

[2]Only one of floppy controller and parallel controller can be used due to common hardware interface. ECP mode of parallel port will occupy channel 1 or 3.

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7.3 I/O Address Map

Address	Size	Description
0000 - 00FF	256 bytes	Motherboard Resources
01F0 - 01F7	8 bytes	Primary IDE Channels
0278 - 027F	8 bytes	Parallel Port 2 (LPT2), Note 1
0294 - 0297	4 bytes	Onboard Sensor Index/Data Port
02E8 - 02EF	8 bytes	Serial Port 4 (COM4), Note 2
02F8 - 02FF	8 bytes	Serial Port 2 (COM2), Note 2
0378 - 037F	8 bytes	Parallel Port 2 (LPT1), Note 1
03B0 - 03BB	12 bytes	Video (Monochrome)
03BC - 03BF	4 bytes	Parallel Port 3 (LPT3), Note 2
03C0 - 03DF	32 bytes	Video (VGA)
03E8 - 03EF	8 bytes	Serial Port 3 (COM3), Note 2
03F0 - 03F5	6 bytes	Diskette Controller, Note 1
03F6 - 03F7	2 bytes	Primary IDE Command/Status Ports
03F8 - 03FF	8 bytes	Serial Port 1 (COM1), Note 2
04D0 - 04D1	2 bytes	Motherboard Resources
1000 - 1FFF	4 K byte	SMBus control addresses
6100 – 61FF	256 bytes	GPIO control addresses
6200 – 62FF	256 bytes	Motherboard Resources
9D00 -9DFF	256 bytes	Power management configuration addresses
2000 - FFFF	NA	PCI Bus, Note 3

NOTE:

[1]The occupancy of I/O range depends on BIOS setting, only one I/O range will be used and the others are forwarded to LPC bus.

[2]The occupancy of I/O range depends on BIOS setting. If external Super I/O controller is present for two external serial ports on ISA bus, the I/O range must be set in BIOS in order to make sure they are really for warded to ISA bus.

[3]The BIOS assigns PCI I/O resource from F000h downwards. Non PnP/PCI devices must not occupy I/O resource in these areas to avoid abnormal behavior. Not all available I/O below 1000h can be used on ISA bus. It must set I/O windows in ISA bridge. Refer to BIOS manual for more detailed about configuring resource windows of PCI-to-ISA bridge. There are six windows can be configured. Defaults are 200H - 21FH, 230H - 26FH, 280H - 281H, 2C0H - 2DFH, 300H - 33FH and 380H - 39FH. Please note the windows range can not cover the used I/O, or some functions will work failure.

Some IO addresses like GPIO control addresses, SMBus control addresses and power management configuration addresses also can't be used for normal PCI device. It will cause unexpected problem.

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7.4 Interrupt Request (IRQ) Lines

PIC Mode

IRQ#	Typical Interrupt Resource	Connected to Pin	Available
0	AT Timer	NA	NA
1	Keyboard	NA	NA
2	Cascade interrupt	NA	NA
3	COM2/PCI device I	RQ3 via SERIRQ	Note 1 & 2
4	COM1/PCI device	IRQ4 via SERIRQ	Note 1 & 2
5	LPT2/PCI device	IRQ5 via SERIRQ	Note 1 & 2
6	Floppy Drive Controller	IRQ6 via SERIRQ	NA
7	LPT1/PCI device	IRQ7 via SERIRQ	Note 1 & 2
8	System CMOS/Real-time clock	NA	NA
9	Microsoft ACPI-Compliant System	IRQ9 via SERIRQ	Note 1 & 3
10	ISA/PCI device	IRQ10 via SERIRQ	Note 1
11	ISA/PCI device	IRQ11 via SERIRQ	Note 2
12	PS/2 Mouse	IRQ12 via SERIRQ	NA
13	Math Processor	NA	NA
14	IDE Controller	IRQ14	NA
15	ISA/PCI device	IRQ15 via SERIRQ	Note 2

In PIC mode, the PCI bus interrupt line can be routed to any available IRQ and they are shared by PCI devices.

NOTE:

[1]It can be enabled/disable for onboard devices. If disabled, there is BIOS setup to decide the usage of IRQ, PCI or ISA device

[2]BIOS setup can reserve IRQ for Legacy IRQ device. It is through PCI-to-ISA bridge via SERIRQ.

[3]In ACPI mode, IRQ9 is used for the SCI to issue ACPI event. SCI is System Control Interrupt.

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7.5 PCI Configuration Space Map

Bus #	Device #	Function #	Routing	Description
00h	01h	00h	internal	AMD Host Bridge
00h	01h	01h	internal	AMD VGA Controller
00h	01h	02h	internal	AMD entertainment en/decryption
00h	0Dh	00h	internal	PCI-to-ISA Bridge
00h	0Eh	00h	INTB	Intel Ethernet Controller
00h	0Fh	00h	internal	AMD ISA Bridge
00h	0Fh	02h	internal	AMD IDE Controller
00h	0Fh	03h	internal	AMD Audio Device
00h	0Fh	04h	internal	AMD USB OHCI
00h	0Fh	05h	internal	AMD USB EHCI
00h	11h	00h	INTA - INTD	VIA RAID Connector
01h	03h	00h	INTA - INTD	External PCI Slot 1
01h	04h	00h	INTA - INTD	External PCI Slot 2
01h	05h	00h	INTA - INTD	External PCI Slot 3
01h	06h	00h	INTA - INTD	External PCI Slot 4

7.6 PCI Interrupt Routing Map

Sys Line	PCI Bus INT Line	VGA	LAN	IDE	Multimedia	OHCI 1	OHCI 2	PCI Slot1	PCI Slot2	PCI Slot3	PCI Slot4
INTA	INTA	x	x					INTA	INTD	INTC	INTB
INTB	INTB				x			INTB	INTA	INTD	INTC
INTC	INTC							INTC	INTB	INTA	INTD
INTD	INTD					x	x	INTD	INTC	INTB	INTA

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7.7 System Management Bus (I2C-compatible)

Internally the SMB bus and I2C bus are one and the same. The CS5536 Southbridge supports SMBDAT and SMBCLK lines that are I2C-compatible.

The X4 connector has pins for both the I2C and SMB bus. Both are connected to the same internal bus: the SMB bus. It is advisable to always connect external I2C devices to the I2C pins and SMB devices to the SMB pins to ensure compatibility with other modules that might support two internal busses (a separate I2C and SMB bus).

Address	Function	Device
94h	Support TV out	FS455
48/4Ah	Super I/O Read/Write	SIO
A2h	Memory SPD	On Board Ram
A0h	Memory SPD	SO-DIMM
AEh	CMOS backup	EEPROM1
ACh	CMOS backup	EEPROM2

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8 Phoenix Award BIOS

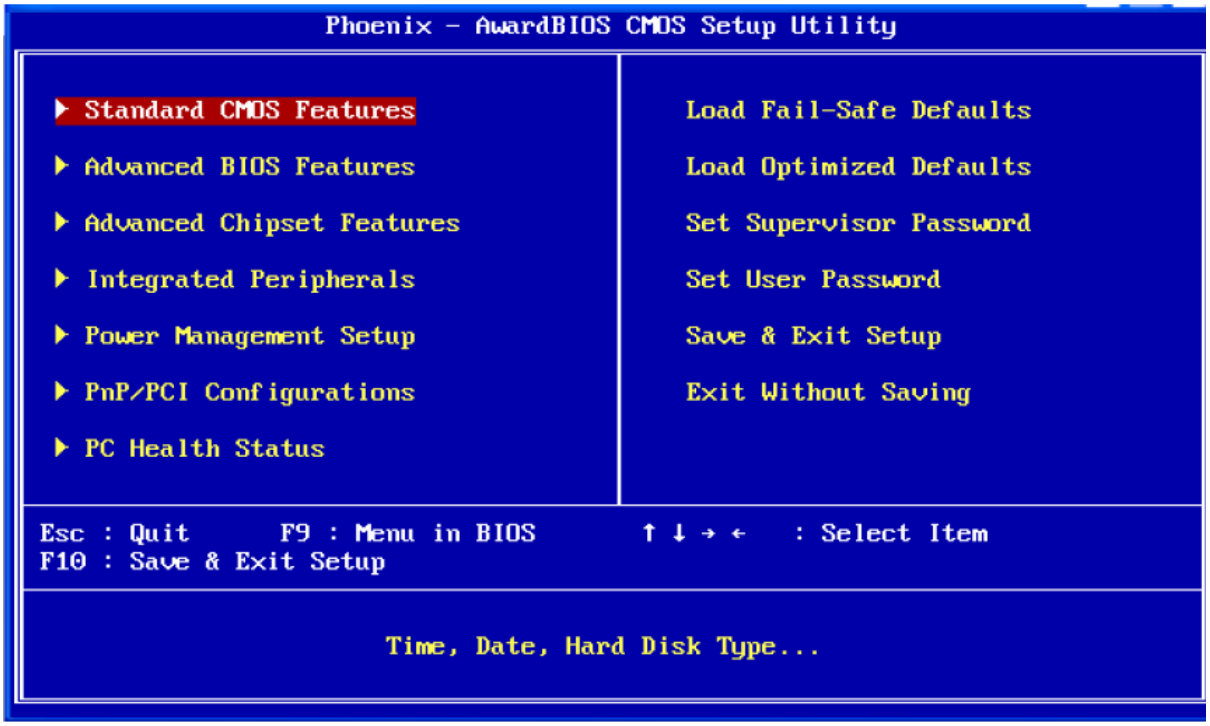
8.1 Description

The module uses a Phoenix Award PCI/ISA BIOS ver 6.0 for system configuration. The Award BIOS setup program is designed to provide maximum flexibility in configuring the system by offering various selectable options to meet end-user requirements. This chapter is written to assist you in the proper usage of these features.

To access the Phoenix AWARD PCI/ISA BIOS Setup program, during initial system power up;

Press the <Del> key

The Main Menu will be displayed.



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8.2 Main Menu Setup Items

The main menu includes the following setup categories. Recall that some systems may not include all entries.

Standard CMOS Features (see section 8.3)

Sets basic system configuration.

Advanced BIOS Features (see section 8.4)

Sets advanced features available on the system.

Advanced Chipset Features (see section 8.5)

Changes values in the chipset registers and optimizes system performance.

Integrated Peripherals (see section 8.6)

Specifies settings for integrated peripherals.

Power Management Setup (see section 8.7)

Specifies settings for power management.

PnP/PCI Configuration (see section 8.8)

Specifies settings for PnP/PCI. (Only applicable if your system supports PnP/PCI)

PC Health Status (see section 8.9)

Monitors CPU and system temperatures.

Frequency/Voltage Control

Specifies frequency/voltage control settings.

Load Fail-Safe Defaults

Loads the BIOS default values for the minimal/stable performance for your system to operate.

Load Optimized Defaults

Loads BIOS default values (factory settings) for optimal system performance.

Supervisor/User Password

Sets User and Supervisor Passwords.

Save & Exit Setup

Saves CMOS value changes to CMOS and exits setup.

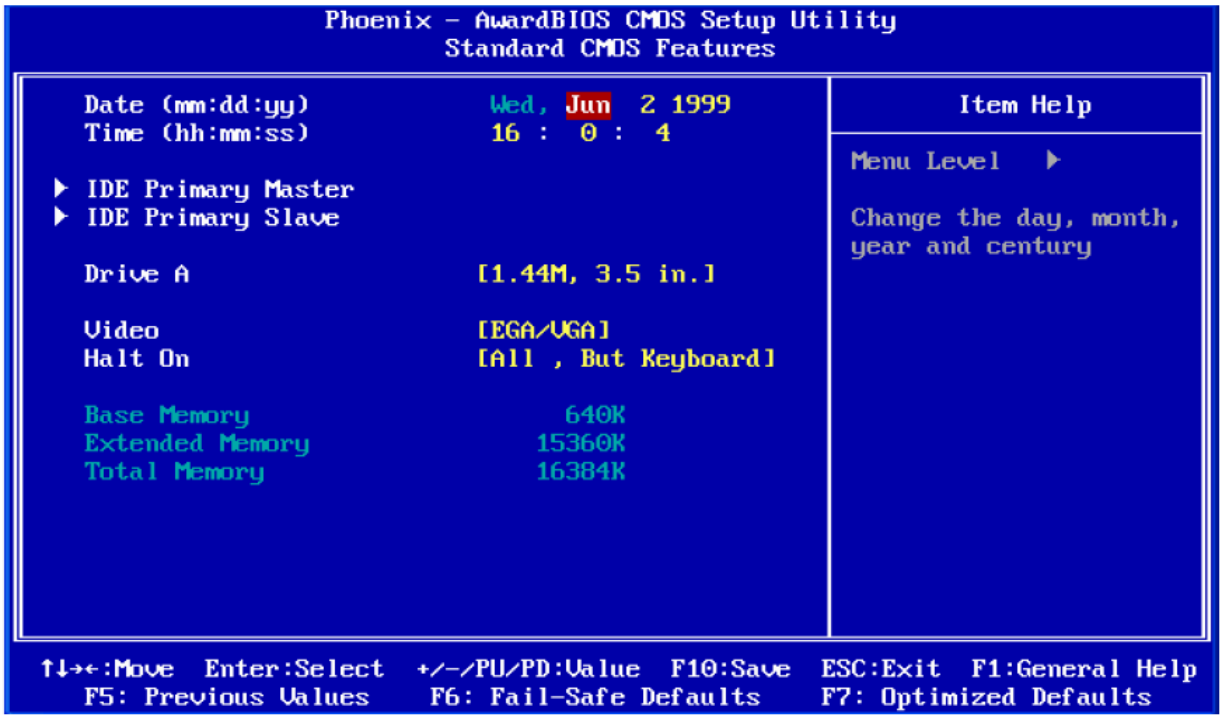
Exit Without Saving

Abandons all CMOS value changes and exits setup.

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8.3 Standard CMOS Features

The main menu includes the following setup categories. Recall that some systems may not include all entries.



Date

The BIOS determines the day of the week from other date information.

Time

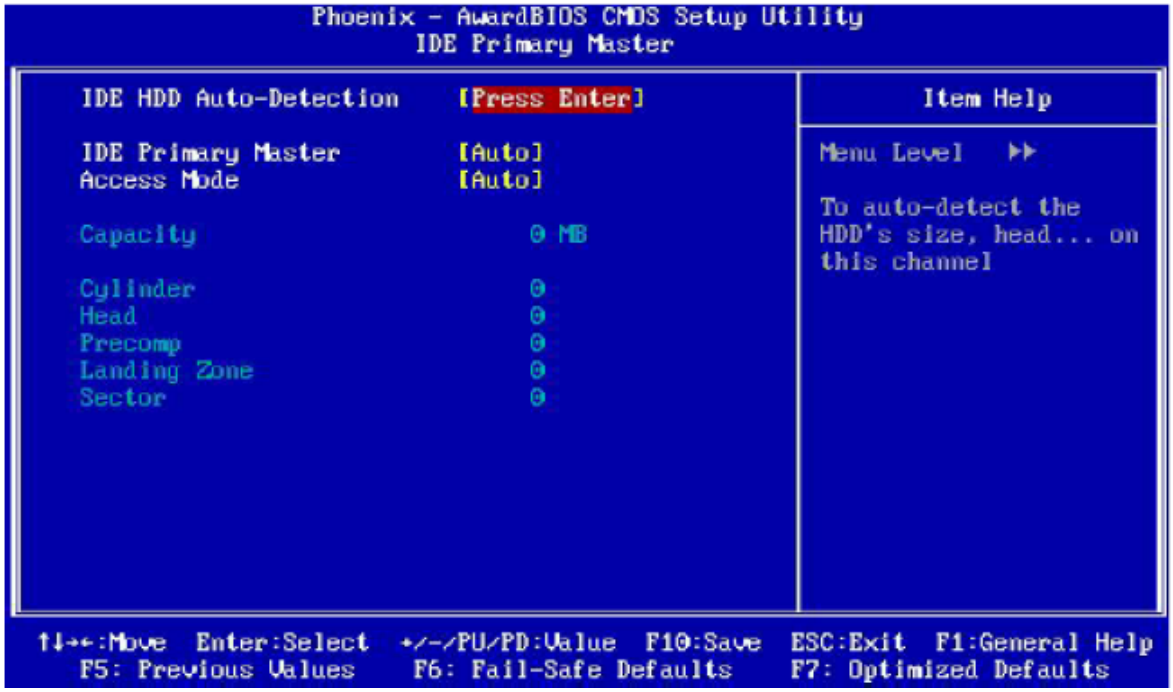
The time format is based on the 24-hour military-time clock. For example, 1 P.M. is 13:00:00. Press the LEFT arrow key "←" or (appropriate key to move to the desired field). Press the <PgUp> or <PgDn> keys to increment the setting, or type the desired value directly into the field.

IDE Primary Master/Slave Items

This selection brings up a configuration menu of the designated Drive.

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IDE HDD Auto-detection: Press Enter Press Enter to auto-detect the HDD on this channel. If detection is successful, it fills the remaining fields on this menu.



IDE Primary Master: None/Auto/Manual Selecting 'manual' allows the user to set the remaining fields on this screen. Selects the type of fixed disk. "User Type" will let you select the number of cylinders, heads, etc.

NOTE: PRECOMP=65535 means NONE.

Capacity: Auto display disk size Disk drive capacity (approximated).

NOTE: Disk size is usually slightly greater than the size of a formatted disk given by a disk checking program.

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Access Mode: CHS/LBA/Large/Auto Selects the access mode for a hard disk The following options are selectable only if the 'IDE Primary Master' item is set to 'Manual'

Cylinder: Min = 0 Max = 65535 Sets the number of cylinders for a hard disk.

Head: Min = 0 Max = 255 Sets the number of read/write heads

Precomp: Min = 0 Max = 65535



Setting a value of 65535 means no hard disk

Landing zone: Min = 0 Max = 65535



Setting a value of 65535 means no hard disk

Sector: Min = 0 Max = 255 Number of sectors per track

Drive A

The GLX 800 supports one FDD drive. Because the FDD and LPT1 share the same pins on the X3 connector, only one may be used at a time. Either LPT1 or FDD can be enabled in the following BIOS menu:

- Integrated Peripherals
- Onboard parallel Port / FDD

Allows enabling/disabling of LPT1 resources or switching to FDD mode. After enabling the FDD, select the correct specifications for the diskette drive:

- None: No diskette drive installed
- 360 KB: 5.25 inch PC-type standard drive
- 1.2 MB: 5.25 inch AT-type high-density drive
- 720 KB: 3.5 inch double-sided drive
- 1.44 MB: 3.5 inch double-sided drive
- 2.88 MB: 3.5 inch double-sided drive IDE Primary and Secondary Master/Slave Items

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Video

Selects the type of primary video subsystem in your computer. The BIOS usually detects the correct video type automatically. The BIOS supports a secondary video subsystem, but is not selected in Setup.

Halt On

During the Power On Self Test (POST), the computer stops if the BIOS detects a hardware error.

The BIOS can be instructed to ignore certain errors during POST and continue the bootup process. The options are as follows:

▶No errors: POST does not stop for any errors.

▶All errors: POST stops for any nonfatal error and will prompt the user to take any corrective measures.

▶All, But Keyboard: POST does not stop for a keyboard error, but stops for all other errors.

▶All, But Diskette: POST does not stop for diskette drive errors, but stops for all other errors.

▶All, But Disk/Key: POST does not stop for a keyboard or disk errors, but stops for all other errors.

Base Memory

Displays the amount of conventional memory detected during boot up.

Extended Memory

Displays the amount of extended memory detected during boot up.

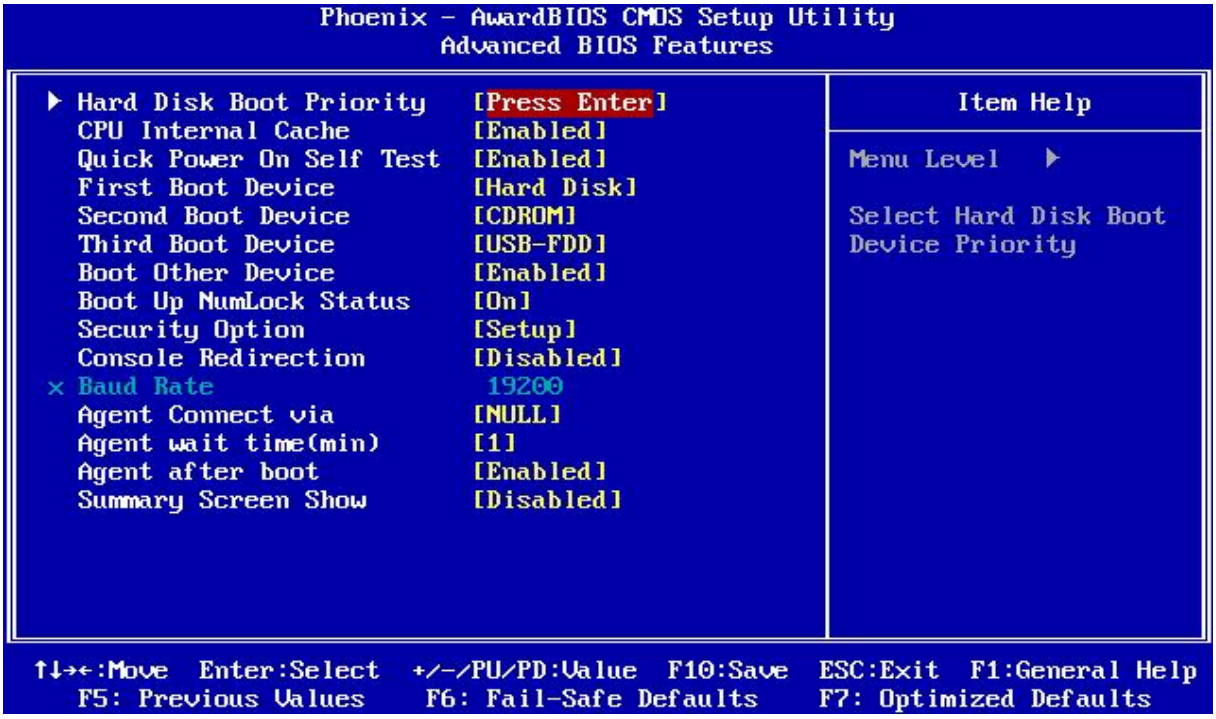
Total Memory

Displays the total memory available on the system.

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8.4 Advanced BIOS Features

This section allows users to configure the system for basic operation. The following features can be selected: system default speed, boot-up sequence, keyboard operation, shadowing, security, CPU internal cache, and CPU external cache.



Hard Disk Boot Priority

Allows Hard Disk Boot Device Priority.

CPU Internal Cache

Enables/disables CPU internal Cache.

Quick Power On Self Test

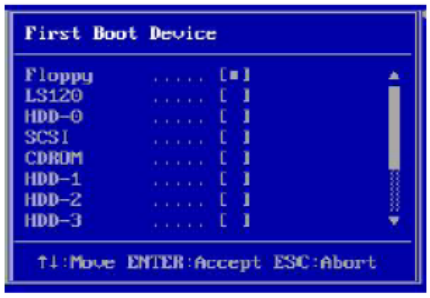
Speeds up the Power On Self Test (POST). If enabled, the BIOS will shorten the test time or skip some check items during POST (default setting: Enabled).

First/Second/Third Boot Device

Pressing <Enter> displays the Boot Device Menu. The BIOS will attempt to load the operating system from the selected device (see menu for options).

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Boot Other Device



Enables the BIOS to boot from a second or third device if booting from the first device fails. When disabled the BIOS will not attempt booting from alternative devices.

Boot-Up NumLock Status

Selects the power on state for system NumLock. Options: On/Off

Security Option

Selects whether a password is required every time the system boots or only when setup is entered. Options include:

- System: The system will not boot without password access and access to Setup will be denied if an incorrect password is entered at the prompt.
- Setup: The system will boot, but access to Setup will be restricted without password access.

To disable security, select PASSWORD SETTINGS in the Main Menu. The user will then be prompted to enter a password. To disable security, DO NOT type anything, only press <Enter>. Once security is disabled, the system will boot and setup can be accessed.

Remote Console Function

Enables remote access through POST messages and commands through serial-port access.

NOTE: Remote Console is a character-based terminal application. It supports either VT100 or ANSI terminals. It does not support graphics or graphical user interfaces.

Console Redirection

Enables/Disables the remote Console Function: The default value is Enabled.

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Baud Rate

When Console Redirection is Enabled, the BIOS will allow users to set the serial port's operating baud rate. Options: 9600 bps, 19200 bps, 38400 bps, 57600 bps, and 115200 bps



The Baud Rate settings between the ETX-GLX and its monitoring computer must be the same. If they are different, an error message, "Award Preboot Agent Installation Failed" will display and the equipment will not properly communicate.

Agent Connect via

Enables direct connection mode. The ETX-GLX BIOS only supports NULL mode (connecting two computers to a null modem for direct connection).

Agent Wait Time (min)

Select the amount of time (min) to wait for a successful connection. If the the time limit is exceeded, the ETX-GLX will not communicate with its remote host.

Agent After Boot

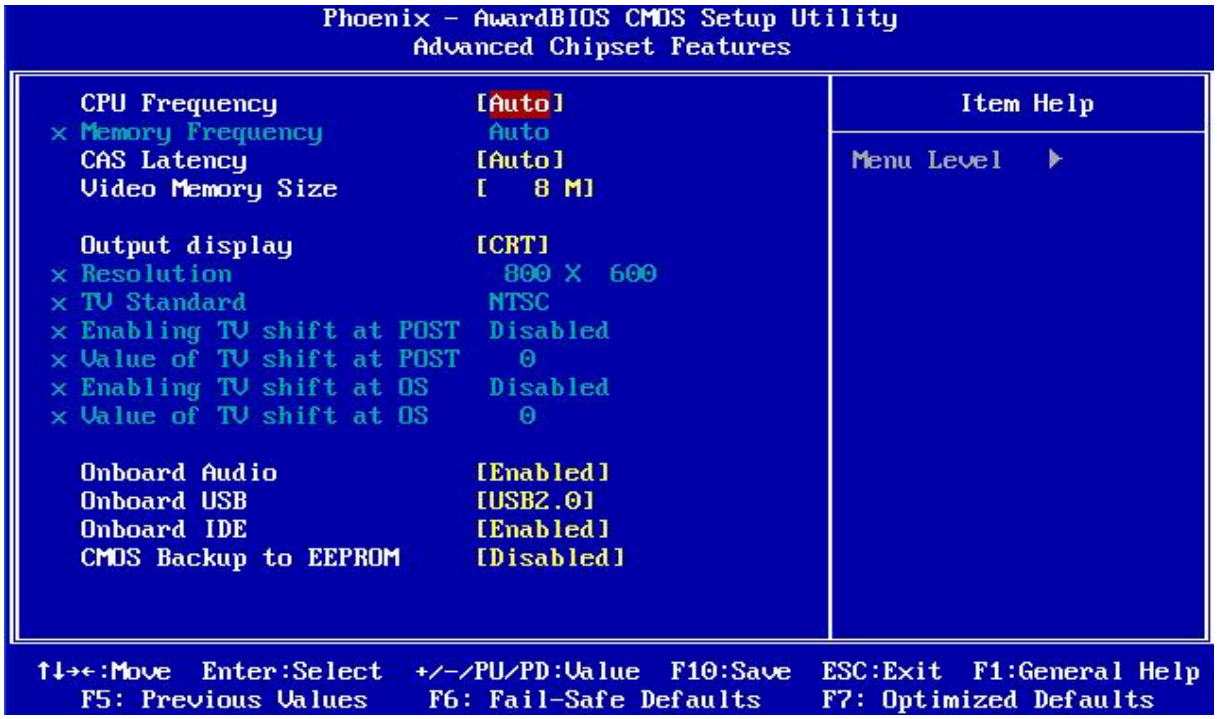
Monitors text-based applications (such as DOS) after POST. The default setting is Disabled.

Summary Screen Show

When this item is set to Enabled, all system information like CPU type, onboard devices and PCI devices list will be shown on screen after BIOS detects system devices.

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8.5 Advanced Chipset Features



CPU Frequency

Selects the CPU frequency.
Options: Auto, 333 MHz, 400 MHz, 433 MHz, and 500 MHz

Memory Frequency

Selects the memory frequency.
Options: Auto, 200 MHz, 266 MHz, 333 MHz, and 400 MHz

CAS Latency

When synchronous DRAM is installed, the number of CAS latency clock cycles depend on the DRAM timing.
Options: Auto, 1.5, 2.0, 2.5, 3.0, and 3.5 micro sec

Video Memory Size

Selects the video memory size.
Options: None/0 MB, 8 MB, 16 MB, 32 MB, 64 MB, and 128 MB

Output Display

Selects the output display device. Allows user to configure the type of external display used.
Options: TV & CRT, CRT, and Panel & CRT

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Resolution

Panel & CRT of Output display will Enable the flat panel resolution selection of output Resolution: 640 x 480, 800 x 600, 1024 x 768, 1280 x 1024, and 1600 x 1200

TV Standard

TV & CRT of output display will open the settings of TV out format.
Options: NTSC, PAL, and HDTV.

Enable TV shift at POST/OS

The timing out from GLX may not meet every TV machine. Sometimes it shifts to right and sometimes it shifts to left at POST stage or operating system stage. These items provide a selection for adjusting the location of whole TV display.
Options: Shift Right/Shift Left/Disabled.

Value of TV shift at POST/OS

Give a value in this field can provide the shift of TV display. These settings are related to enabling TV shift setting.
The valid value is listed at help description of these items.

Onboard USB

Turns On/Off the USB 2.0, USB1.1 support on USB ports
Options: USB2.0/USB1.1/Disabled

Onboard IDE

Turns On/Off the onboard primary IDE Port.
Options: Disabled/Enabled

Onboard Audio

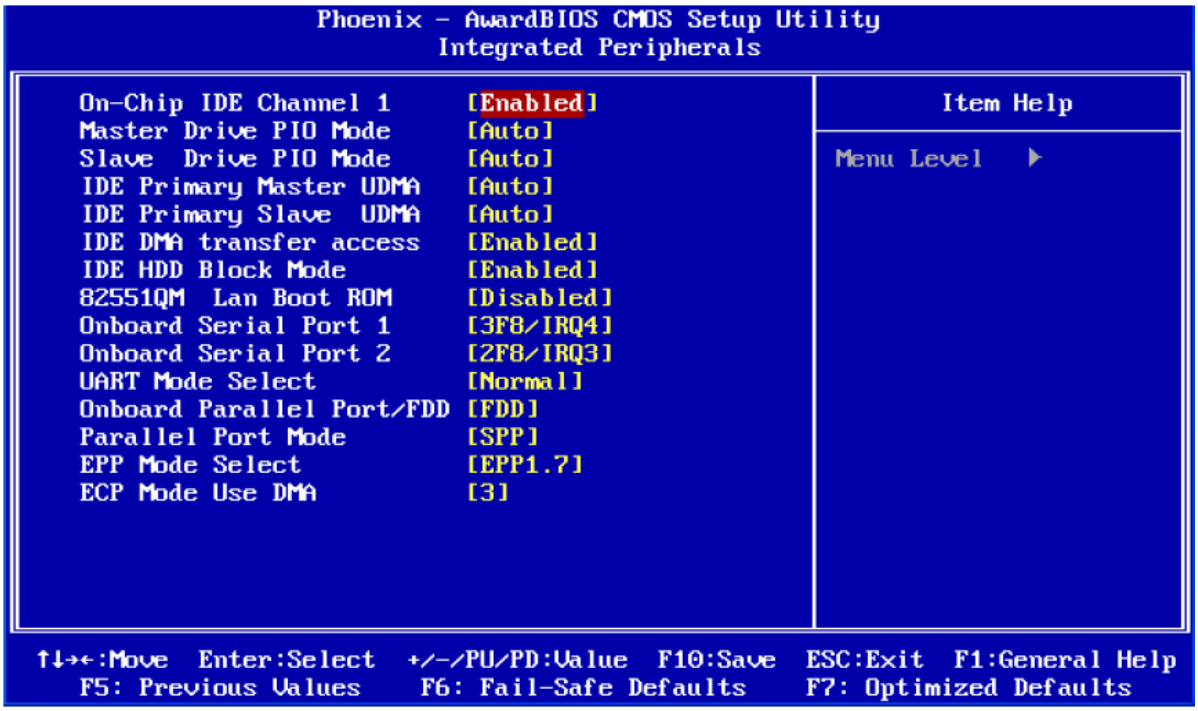
Turns On/Off the onboard audio.
Options: Disabled/Enabled

CMOS Backup to EEPROM

The ETX-GLX has an onboard EEPROM to provide storage for CMOS backup. If the system is using no CMOS battery and has no permanent 5Vsb, then CMOS settings will be lost after power down. When the CMOS backup feature is enabled, the BIOS copies CMOS settings into EEPROM after saving and exiting from BIOS setup menu. After storing CMOS data into EEPROM, the contents of EEPROM are regarded as valid backup image. On boot up, if CMOS settings are lost and a valid backup image exists, and the “CMOS to EEPROM Backup” is enabled, the backup image will be copied back to CMOS at boot up.

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8.6 Integrated Peripherals



OnChip IDE Channel 1

The integrated peripheral controller contains an IDE interface with support for one IDE channel.

Master/Slave Drive PIO Mode

The four IDE PIO (Programmed Input/Output) fields allow users to set a PIO mode (0 to 4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device. Options: Auto, Mode 0, Mode 1, Mode 2, Mode 3, and Mode 4.

IDE Primary & Secondary Master/Slave UDMA

Ultra DMA implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver. If your hard drive and your system software both support Ultra DMA, select Auto to enable BIOS support.

IDE DMA Transfer Access

Enables/Disables IDE DMA Transfer Access

IDE HDD Block Mode

Enhances disk performance by allowing multi-sector data transfers and eliminates the interrupt handling time for each sector.

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82551QM LAN Boot ROM

Enables/Disables PXE functions. The PXE function allows system boot from a network environment. A DHCP server connection is required for this function.

Onboard Serial Port 1/2

Selects the address and interrupt for serial ports.

UART Mode Select

Selects the IR (Infra-Red) mode. The onboard serial port 2 offers IrDA and ASKIR modes. Use this menu to select the mode supported by your external IR device.



Choosing the wrong IR mode will prevent your computer from communicating with an external IR device.

Onboard Parallel Port/FDD

Assigns resources to LPT1 or an FDD drive. LPT1 and FDD share the same pins on the X3 connector and only one may be used at a time.

EPP Mode Select

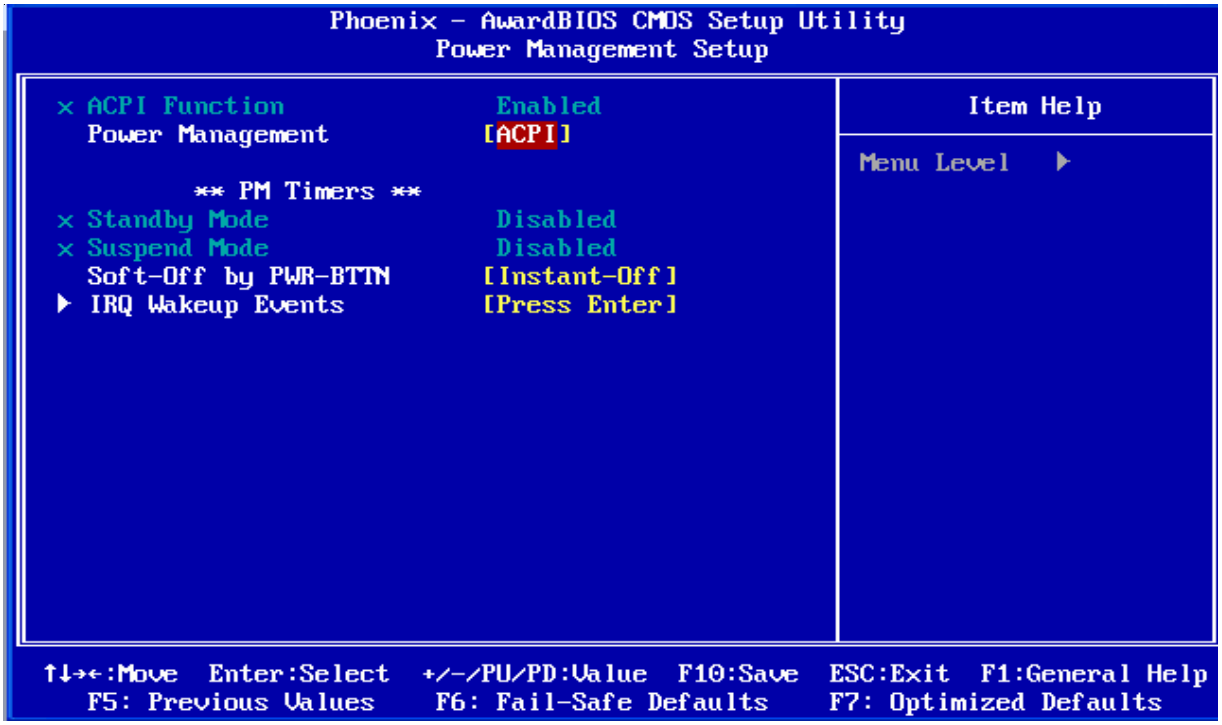
Selects the version of EPP transfer protocol that the parallel port should use. Users may choose the EPP 1.7 or EPP 1.9 version. Generally, EPP 1.9 is the preferred setting because it supports newer EPP 1.9 devices and most EPP 1.7 devices, while offering other advantages such as support for longer cables. However, certain EPP 1.7 devices can not work properly with an EPP 1.9 port. EPP 1.9 is recommended for general use, however, if there are problems connecting to parallel port devices, switch to EPP 1.7

ECP Mode Use DMA

Determines which DMA channel the parallel port should use when it is in ECP mode. The ECP mode uses the DMA protocol to achieve data transfer rates of up to 2.5 Mbits/s and provides symmetric bidirectional communications.

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8.7 Power Management Setup



ACPI Function

Enabled only if the operating system supports ACPI (Advanced Configuration and Power Interface) specifications.

Power Management

This item allows you to select the type of Power Management: Options: Disabled, Legacy, APM, or ACPI.

Standby Mode (**PM Timers**): This Submenu appears only when "Legacy" is enabled in the Power Management menu. Standby mode conserves power by turning off the display and the hard drive after a predetermined period of inactivity (a time-out). When the computer exits standby mode, it returns to the same operating state it was in before entering standby mode. Options: 1 sec, 5 sec, 10 sec, 15 sec, 30 sec, 45 sec, 1 min, 5 min, 10 min, 15 min, 30 min, 45 min, 60 min, 90 min, and 120 min

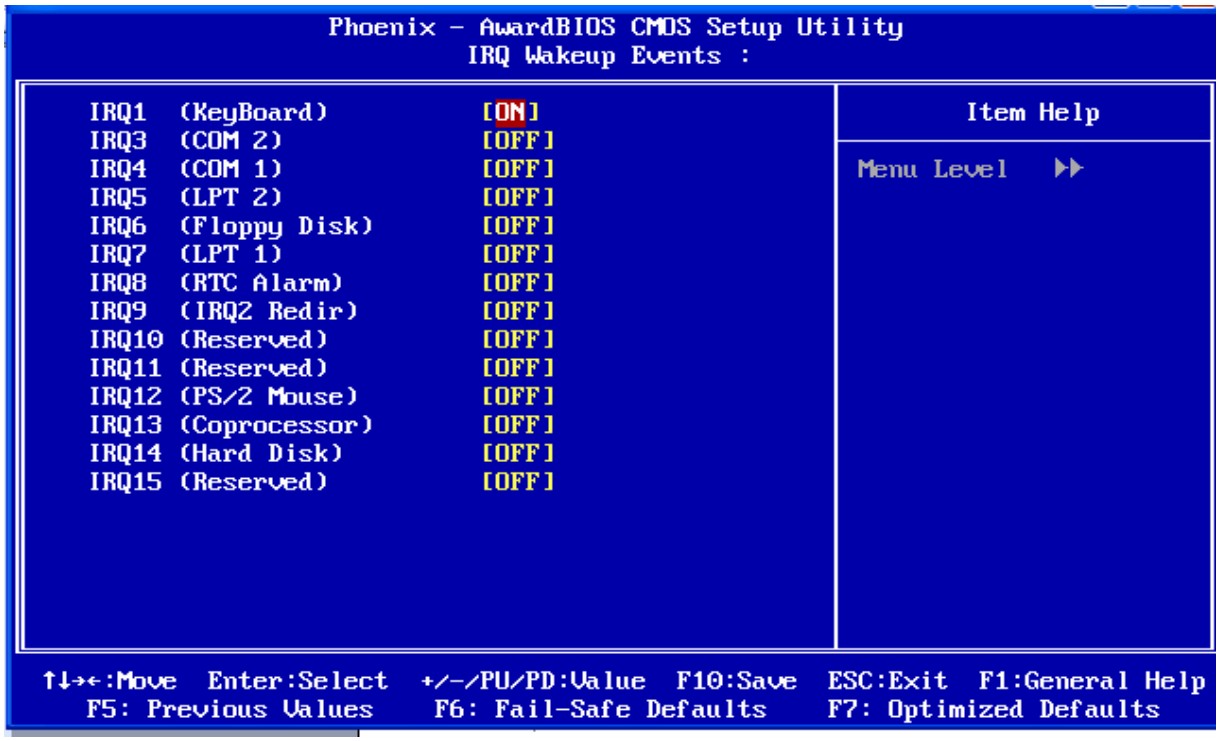
Suspend Mode (**PM Timers**): Sets the period of time after which the suspend mode activates. Options: 1 sec, 5 sec, 10 sec, 15 sec, 30 sec, 45 sec, 1 min, 5 min, 10 min, 15 min, 30 min, 45 min, 60 min, 90 min, and 120 min

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Soft-Off by PWR-BTTN: Configures the power button:

- Instant-Off: The power button functions as a normal power-on/-off button.
- Delay 4 Sec: The system is turned off if the power button is pressed for more than four seconds.

IRQ Wakeup Events:

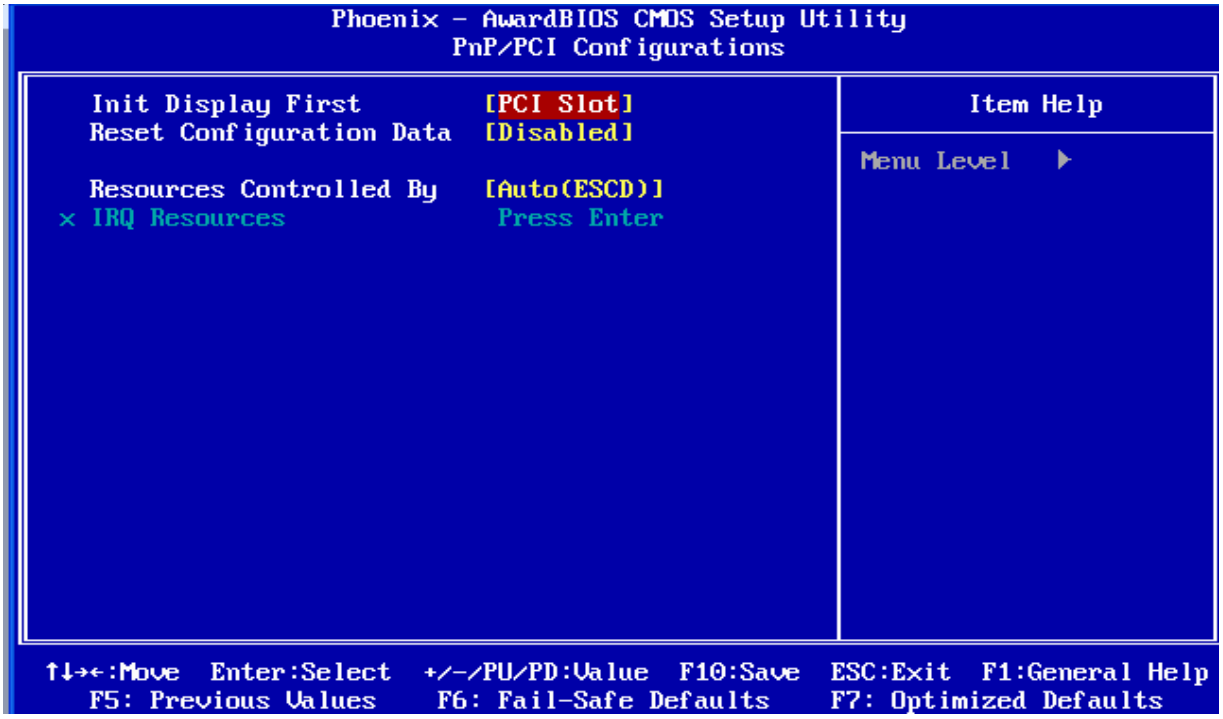


IRQ1-15: Enables or disables IRQ Wakeup Events.

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8.8 PnP/PCI Configurations

This section describes configuring the PCI (Personal Computer Interconnect) bus system. PCI is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its own components.



Init Display First

Selects whether to first activate the PCI slot or on-chip VGA.

Reset Configuration Data

Resets the Extended System Configuration Data (ESCD). The default is set to Disabled. Enable if system does not properly function or communicate with add-ons/peripherals or in the event of a system crash where the operating system cannot boot. Options: Enabled/Disabled.

Resources Controlled By

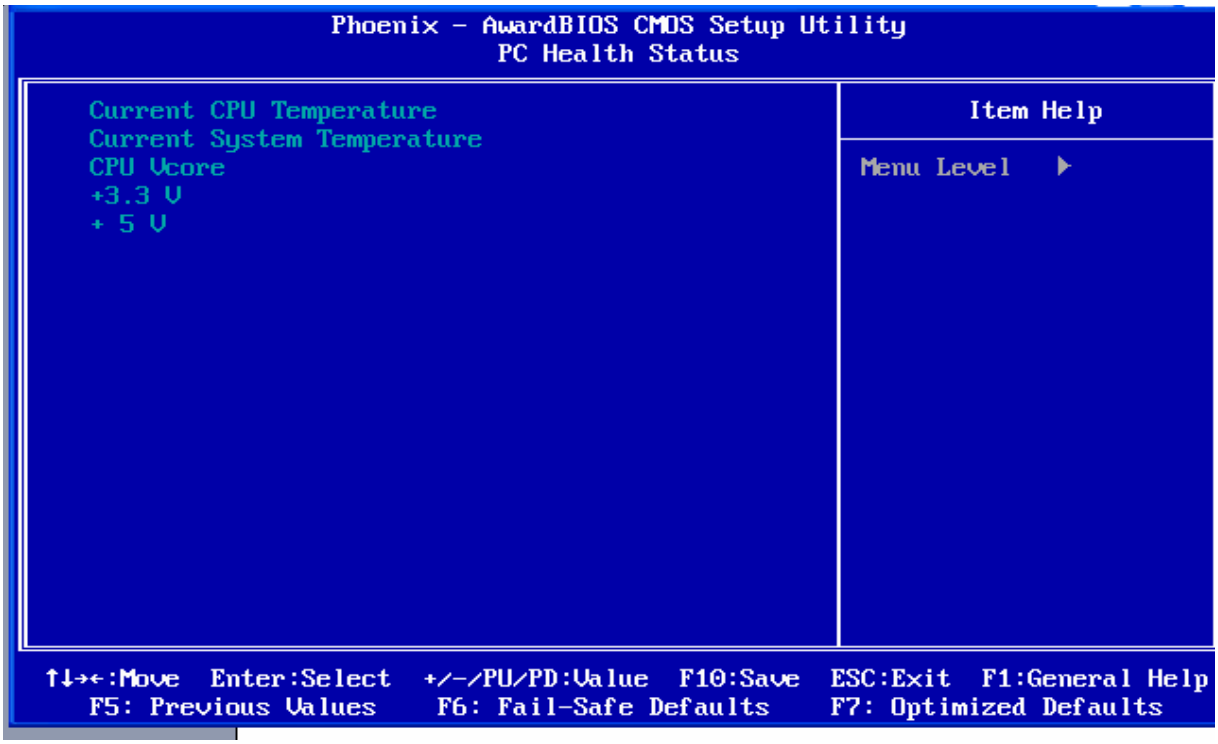
Automatically configures all boot, and Plug and Play compatible devices. If set to Auto, all interrupt requests (IRQ) and DMA assignment fields are cleared, as the BIOS automatically assigns them.

▶ IRQ Resources:

When controlling resources manually, assign each system interrupt specifically, depending on the type of device (PCI or ISA) using the interrupt. Options: (IRQ´s) PCI device, Reserved (for ISA-Devices).

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8.9 PC Health Status



Current CPU Temp.

Displays the current CPU temperature.

Current System Temp.

Displays the current system temperature.

CPU VCORE, +3.3 V, +5 V

Displays the actual voltage levels on the board

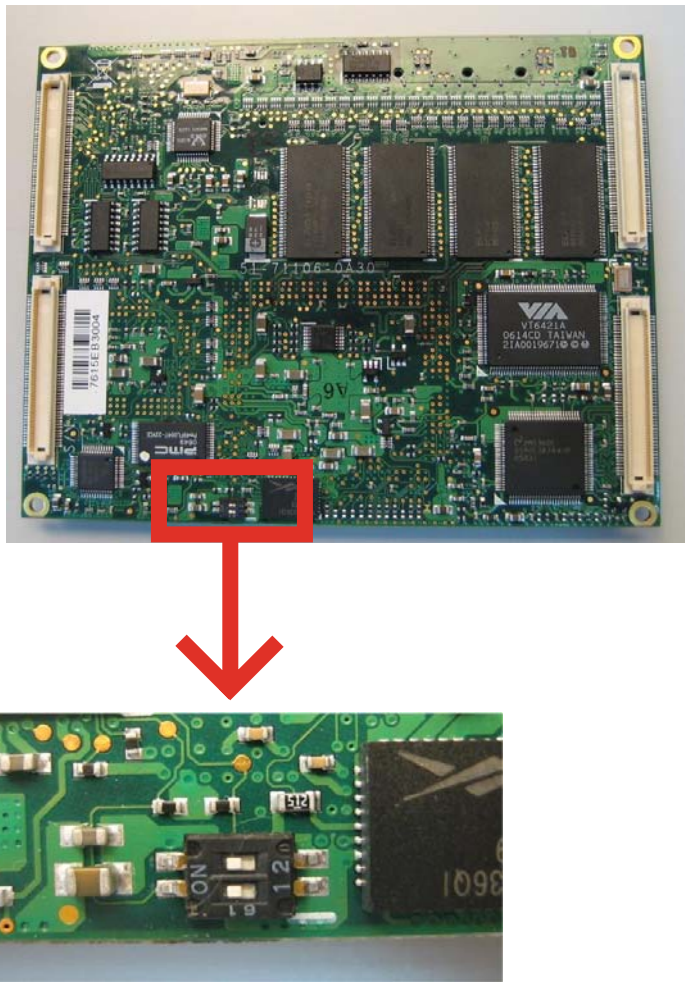
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Appendix A: **Onboard DIP Switch for Power Mode Settings**

A.1 Onboard DIP switch location and function

A board configuration DIP switch is located on the backside of the ETX module just on the edge and near the BIOS component- PMC PM49FL004T-33VCE.

The DIP switch can be used to adjust the AT/ATX mode for the power supply.



A.2 AT/ATX Mode Settings

AT mode or ATX mode can be selected as below. The default setting is ATX mode.

SWITCH	ON	OFF
1	AT Power Mode	ATX Power Mode (default)
2	Not Used	Not Used

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Appendix B: **Heatspreaders**

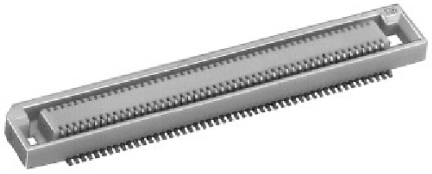
B.1 **Carrier Board ETX connecter heights** (Hirose FX8/FX8C Receptacles)

For different stacking heights, the receptacles for ETX carrier boards are available in two heights, 3 mm and 9.5 mm. When 3 mm receptacles are chosen, the carrier board should be free of components.

FX8-100S-SV

100-pin board-to-board connector for
- 3 mm board stacking

This connector can be used with:
- 3 mm through-hole standoffs (SMT)
- 3 mm threaded standoffs (DIP)



FX8C-100S-SV5

100-pin board-to-board connector for
9.5 mm board stacking

This connector can be used with:
- 9.5 mm through-hole standoffs (SMT)
- 9.5 mm threaded standoffs (DIP)



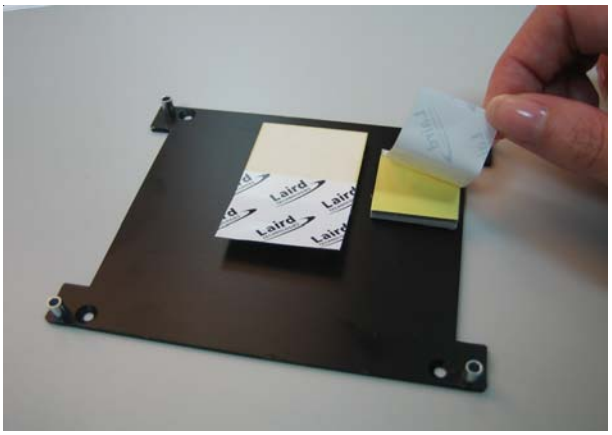
FX8C/FX8 Common Spec

- Current capacity 0.4 A per pin
- Rated voltage 100 V AC
- Insulation resistance 100 m or greater at 250 V DC
- Withstand voltage 300 V AC r.m.s.
- Contact resistance 45 m or less at 100 mA DC
- Insulation PPS resin (light brown, UL94V-0)
- Contacts phosphor bronze (gold plated contacts and leads)

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B.2 Heatspreader Introduction

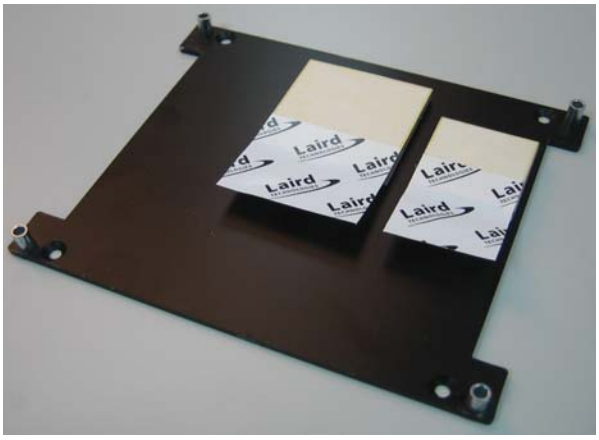
The heatspreader function is to ensure an identical mechanical profile for every ETX module. Therefore, the heat solution, that is built on top of the heatspreader, is compatible with any ETX module.



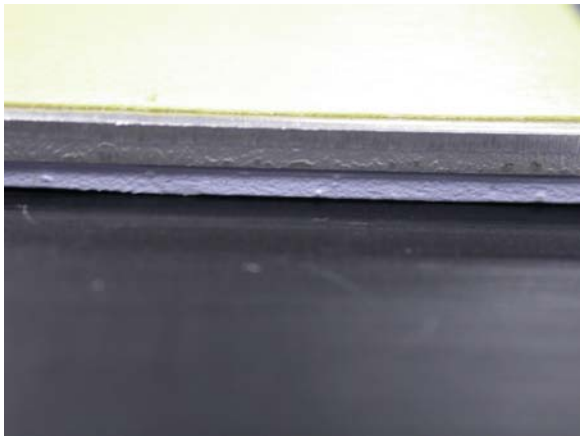
Remove the protective layer from CPU and companion device pads before placing the heatspreader on the module.



Heatspreader placed on ETX-GLX.



Heatpads for CPU's and companion device.



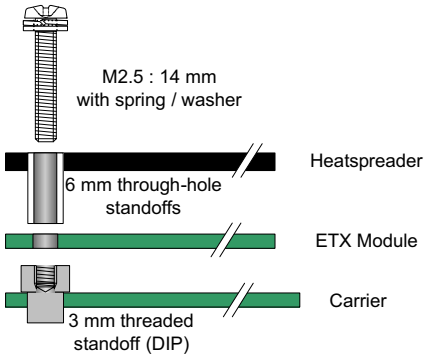
From top to bottom:
- Face change (yellow)
- Aluminum pad (silver)
- Flexible heat pad (gray)
- Aluminum heatspreader plate (black)

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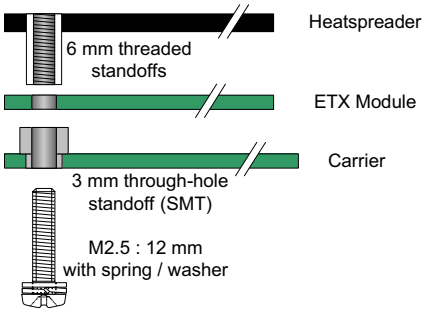
B.3 Mounting procedures

There are several standard ways to mount an ETX board with a heatspreader on a carrier board. ETX boards may be mounted with 9 mm ETX connectors on the carrier board or standard 3 mm connectors. ETX boards may also be 'bottom' mounted using 6 mm threaded standoffs or 'top' mounted using 3 mm or 9.5 mm threaded standoffs.

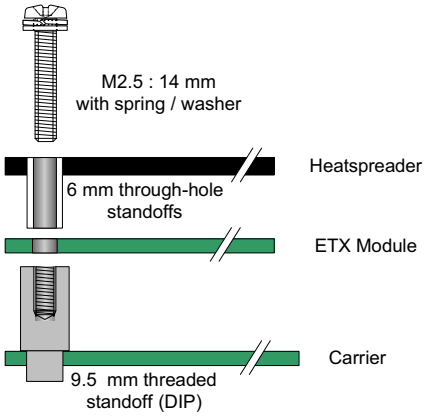
Top Mounting
3 mm Hirose FX8-100S-SV
Carrier Board Connectors



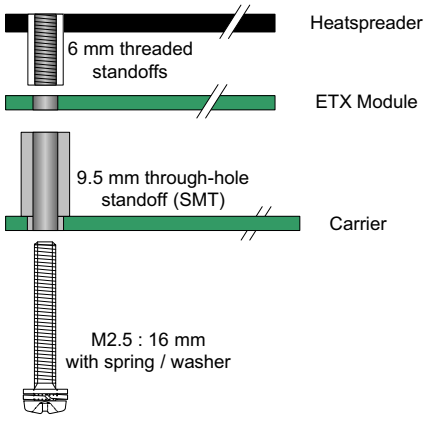
Bottom Mounting
3 mm Hirose FX8-100S-SV
Carrier Board Connectors



Top Mounting
9 mm Hirose FX8C-100S-SV5
Carrier Board Connectors



Bottom Mounting
9 mm Hirose FX8C-100S-SV5
Carrier Board Connectors

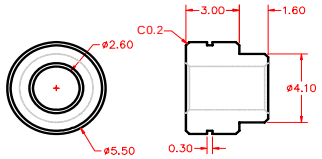


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B.4 Standoffs

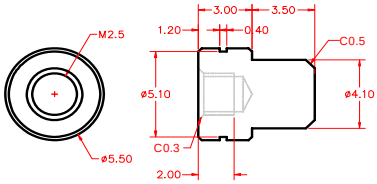
For different mounting procedures there are different, readily available standoffs. Note that threaded standoffs are all DIP and the through-hole standoffs are all SMT. Other types not listed can be made available upon request.

33- 72000- 0030



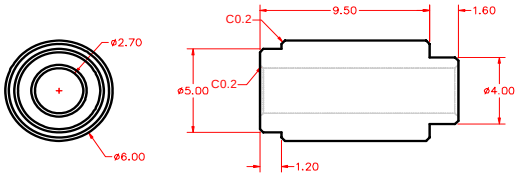
3 mm through-hole standoff (SMT type) for **HTS-GLX** with 3 mm Hirose carrier board connectors

33- 72011- 0030



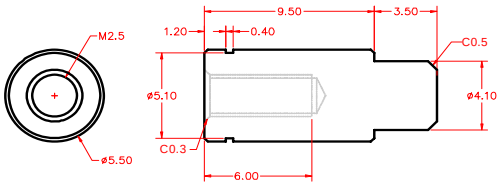
3 mm threaded standoff (DIP type) for **HTS-GLX-T** with 3 mm Hirose carrier board connectors

33- 72007-9P50



9.5 mm through-hole standoff (SMT type) for **HTS-GLX** with 9 mm Hirose carrier board connectors

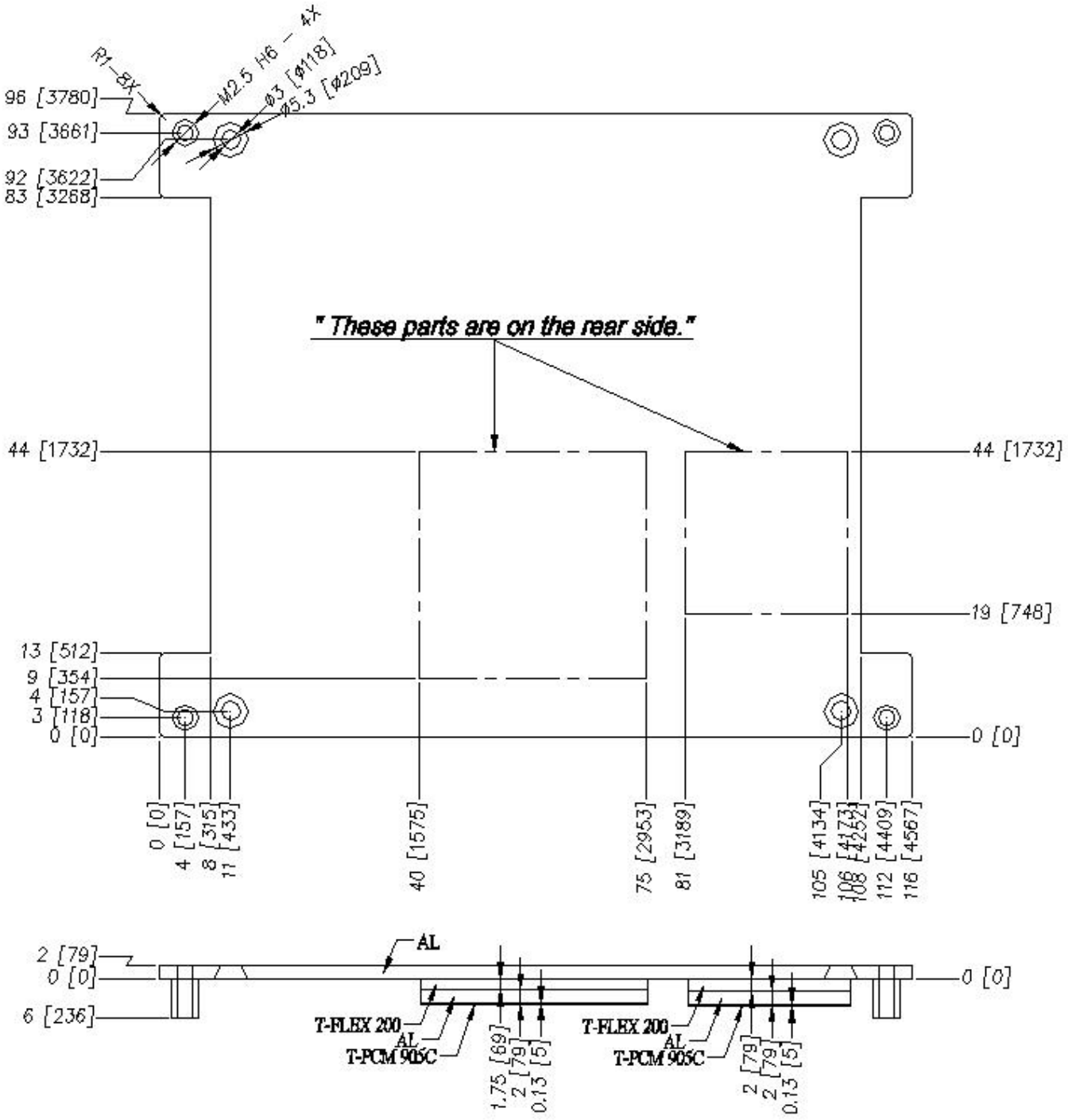
33- 72011-9P50



9.5 mm threaded standoff (DIP type) for **HTS-GLX-T** with 9 mm Hirose carrier board connectors

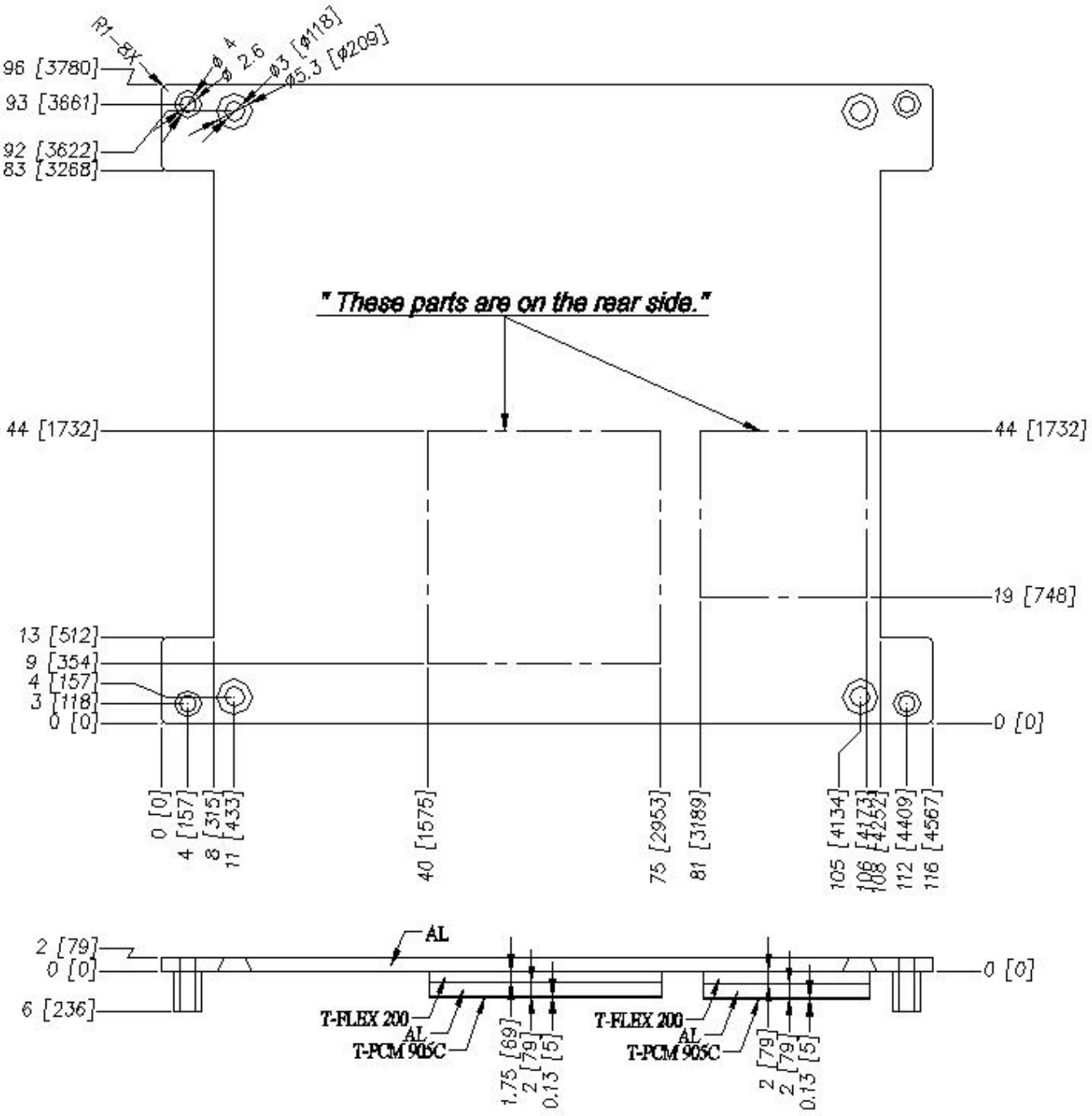
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B.5 Heatspreader Dimensions for HTS-GLX



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B.6 Heatspreader Dimensions for HTS-GLX-T



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Important Safety Instructions

For user safety, please read and follow all instructions, warnings, cautions, and notes marked in this manual and on the associated equipment before handling/operating the equipment.

- Read these safety instructions carefully.
- Keep this user's manual for future reference.
- Read the specifications section of this manual for detailed information on the operating environment of this equipment.
- When installing/mounting or uninstalling/removing equipment:

  - Turn off power and unplug any power cords/cables.

- To avoid electrical shock and/or damage to equipment:
  - Keep equipment away from water or liquid sources;
  - Keep equipment away from high heat or high humidity;
  - Keep equipment properly ventilated (do not block or cover ventilation openings);
  - Make sure to use recommended voltage and power source settings;
  - Always install and operate equipment near an easily accessible electrical socket-outlet;
  - Secure the power cord (do not place any object on/over the power cord);
  - Only install/attach and operate equipment on stable surfaces and/or recommended mountings; and,
  - If the equipment will not be used for long periods of time, turn off and unplug the equipment from its power source.
- Never attempt to fix the equipment. Equipment should only be serviced by qualified personnel.
- A Lithium-type battery may be provided for uninterrupted, backup or emergency power.



Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.

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- Equipment must be serviced by authorized technicians when:
  - The power cord or plug is damaged;
  - Liquid has penetrated the equipment;
  - It has been exposed to high humidity/moisture;
  - It is not functioning or does not function according to the user's manual;
  - It has been dropped and/or damaged; and/or,
  - It has an obvious sign of breakage.

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Getting Service

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Taipei County 235, Taiwan
台北縣中和市建一路 166 號 9 樓
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Email: service@adlinktech.com

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