AmITX-BE-G

User's Manual

Mini-ITX Embedded Motherboard with
2nd Gen AMD® Embedded R-Series APU
and AMD® A77E Fusion Controller Hub



Manual Revision:	1.01
Revision Date:	March 15, 2016
Part Number:	50-1X013-1010

ADLINK TECHNOLOGY INC.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Revision History

Revision	Description	Date	By
1.00	Initial release	2015-11-20	JC
1.01	Correct Front Panel CN26 connector information	2016-03-15	JC

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Preface

Copyright 2015-16 ADLINK Technology, Inc.

This document contains proprietary information protected by copyright. All rights are reserved. No part of this manual may be reproduced by any mechanical, electronic, or other means in any form without prior written permission of the manufacturer.

Disclaimer

The information in this document is subject to change without prior notice in order to improve reliability, design, and function and does not represent a commitment on the part of the manufacturer. In no event will the manufacturer be liable for direct, indirect, special, incidental, or consequential damages arising out of the use or inability to use the product or documentation, even if advised of the possibility of such damages.

Environmental Responsibility

ADLINK is committed to fulfill its social responsibility to global environmental preservation through compliance with the European Union's Restriction of Hazardous Substances (RoHS) directive and Waste Electrical and Electronic Equipment (WEEE) directive. Environmental protection is a top priority for ADLINK. We have enforced measures to ensure that our products, manufacturing processes, components, and raw materials have as little impact on the environment as possible. When products are at their end of life, our customers are encouraged to dispose of them in accordance with the product disposal and/or recovery programs prescribed by their nation or company.

AmITX-BE-G is a RoHS compliant and leadfree product

Trademarks

Product names mentioned herein are used for identification purposes only and may be trademarks and/or registered trademarks of their respective companies.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Table of Contents

Revision History **2**

Preface **3**

1. Introduction **7**

1.1. Packing List 7

1.2. Optional Accessories 7

2. Specifications **8**

2.1. Core System 8

2.2. Rear I/O Connectors 8

2.3. Internal Headers and Connectors 8

2.4. Form Factor 8

2.5. SEMA Board Controller 9

2.6. Debug Header 9

2.7. Video 9

2.8. Audio 9

2.9. LAN 9

2.10. Trusted Platform Module (TPM) 9

2.11. Power Specification 10

2.12. Temperatures 10

2.13. Environmental 10

2.14. Operating Systems 10

2.15. Power Consumption 11

2.16. Functional Diagram 12

3. Mechanical Layout **13**

3.1. Onboard Connectors 13

3.2. Rear IO Connectors 13

3.3. Mechanical Dimensions 14

3.4. Thermal Solutions 16

4. Connectors and Jumpers **17**

4.1. Rear IO Connectors 17

4.1.1. DisplayPort 17

4.1.2. USB Connectors 17

4.1.3. Ethernet Connectors (LAN1, LAN2) 18

4.1.4. Audio Connectors 18

4.2. Internal Connectors 19

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

4.2.1. ATX Power Connector (ATX_PWR, proprietary) 19
4.2.2. SATA Connectors (SATA0/1/2) 20
4.2.3. SATA Power Connector (ST_PWR1/2) 20
4.2.4. USB Header 21
4.2.5. PS/2 Keyboard and Mouse Connector 22
4.2.6. Internal Audio Connector 22
4.2.7. CPU Fan and System Fan Connectors 23
4.2.8. Serial COM Port Connectors 23
4.2.9. LVDS Connector 25
4.2.10. LVDS Auxiliary Connector 26
4.2.11. Front Panel Connector 27
4.2.12. Feature Connector 28
4.2.13. SPI Header 29
4.2.14. DB40 Debug Board Connector 30
4.3. Jumper and Switch Settings 31
4.3.1. Jumper and Switch Locations 31
4.3.2. ATX/AT Mode Selection (JPATX) 31
4.3.3. Clear CMOS (CMOS) 31
4.3.4. Mini-PCE/mSATA Selection (JPMSATA) 32
4.3.5. COM Port (SER1) Power Selection (JPS3P) 32
4.3.6. LVDS Backlight Power Selection (JPL1) 32
4.3.7. LVDS Panel Power Selection (JPL2) 32
4.3.8. LVDS Backlight Enable Selection (JPL3) 32
4.3.9. BIOS Switch Setting (SW2, SW3) 33
4.4. Onboard Connector Information 34
5. Driver Installation 35
6. Smart Embedded Management Agent (SEMA) 36
6.1. Board Specific SEMA Functions 36
6.1.1. Voltages 36
6.1.2. Main Current 37
6.1.3. BMC Status 37
6.1.4. Exception Codes 37
6.1.5. BMC Flags 38
7. System Resources 39
7.1. System Memory Map 39
7.2. Direct Memory Access Channels 39
7.3. I/O Map 40
7.3.1. I/O Map 40

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

7.3.2. IRQ Lines PIC mode 41
7.3.3. IRQ Lines APIC mode 41
7.4. PCI Configuration Space Map 42
7.5. PCI Interrupt Routing Map 43
7.6. SMBus Address Table 43
8. BIOS Setup 44
8.1. Menu Structure 44
8.2. Main 45
8.2.1. System Information 45
8.2.2. Memory Information 45
8.2.3. System Management 45
8.2.4. System Date and Time 49
8.3. Advanced 49
8.3.1. CPU 49
8.3.2. Memory 50
8.3.3. Graphics 50
8.3.4. SATA 51
8.3.5. USB 52
8.3.6. Network 52
8.3.7. PCI and PCIe 53
8.3.8. USB 56
8.3.9. ACPI and Power Management 57
8.3.10. Sound 57
8.3.11. Serial Port Console 57
8.3.12. Trusted Computing 58
8.3.13. Thermal 58
8.3.14. Miscellaneous 59
8.4. Boot 59
8.4.1. Boot Configuration 59
8.5. Security 60
8.5.1. Password Description 60
8.6. Save & Exit 61
Safety Instructions 62
Getting Service 63

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

1. Introduction

The AmITX-BE-G is a Mini-ITX motherboard supporting the 2nd Generation AMD R-Series APU (codename: “Bald Eagle”) with A77E Fusion Controller Hub. The AmITX-BE-G is specifically designed for gaming, infotainment, and customers who need high-level processing and excellent graphics performance with low power consumption in a long product life solution. The AmITX-BE-G AMD R-Series APU features a Heterogeneous System Architecture (HSA) and non-ECC type DDR3L dual-channel memory at 1333/1600 MHz to provide excellent overall performance.

The AmITX-BE-G features four DisplayPorts, dual Gigabit Ethernet port, USB 3.0 ports, USB 2.0 ports, SATA 6 Gb/s ports, and High Definition Audio with 7.1 channels. Support is provided for one PCIe x16, one PCIe x1, and two Mini PCIe slots. A feature connector provides access to GPIO, SMBus, and I2C signals. The board is equipped with SPI AMI EFI BIOS, supporting embedded features such as hardware monitor and watchdog timer.

Integrated AMD Radeon HD 9000 Graphics includes features such as OpenGL 4.2, DirectX 11.1, OpenCL 1.2, OpenGLES 2.0, OpenCV support for H.264, MPEG2, VC1, MPEG4, WMV9, and MVC hardware decode. Graphics outputs include four DisplayPort outputs and optional dual-channel 18/24-bit LVDS. In addition, up to four independent displays are supported.

Available Models

Model Number	AMD APU	Core Speed	Total Design Power
AmITX-BE-G-RX427BB	RX-427BB (4C/8CU)	2.7 GHz	35W
AmITX-BE-G-RX425BB	RX-425BB (4C/6CU)	2.5 GHz	35W
AmITX-BE-G-RX225FB	RX-225FB (2C/3CU)	2.2 GHz	17W

Latest revision of the datasheet, user’s manual, BIOS, drivers, and board support packages, can be downloaded from the product webpage: http://www.adlinktech.com/PD/web/PD_detail.php?cKind=&pid=1443

1.1. Packing List

- AmITX-BE-G Mini-ITX motherboard
- ATX/AT power cable (P/N: 30-20872-0000)
- SATA dual power cable (P/N: 30-20875-0000)
- SATA cable (P/N: 30-10057-0600)
- Rear I/O shield (P/N: 34-25316-0000)

1.2. Optional Accessories

- COM port cable, 1 port (P/N: 30-20876-0000)
- PS/2 KB/MS cable (P/N: 30-20873-0000)
- USB 2.0 cable, 2 ports (P/N: 30-20874-1000)

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

2. Specifications

2.1. Core System

- CPU: Dual or quad-core AMD R-Series APU (codename: “Bald Eagle”)
  - RX-427BB 2.7 GHz (3.6 GHz boost), 35W (4C/8CU)
  - RX-425BB 2.5 GHz (3.4 GHz boost), 35W (4C/6CU)
  - RX-225FB 2.2 GHz (3.0 GHz boost), 17W (2C/3CU)
- Cache: 4MB L2 cache for RX-427BB and RX-425BB, 2MB L2 cache for RX-225FB
- Memory: Dual channel non-ECC 1333/1600 MHz DDR3L memory up to 16GB in dual SODIMM sockets
- Chipset: AMD A77E Fusion Controller Hub (codename: “Bolton-E4”)
- Embedded BIOS: AMI EFI in 8MB SPI BIOS

2.2. Rear I/O Connectors

- Display: 4x DisplayPort (AmITX-BE-G-LVDS SKU: 3x DisplayPort)
- LAN: Dual GbE RJ-45
- USB: 4x USB 3.0, 4x USB 2.0
- Audio: 7.1 channel audio via 5 jacks and S/PDIF output on rear I/O

2.3. Internal Headers and Connectors

- PCI Express: PCIe x16 (Gen3), PCIe x1 (Gen2)
- 2x Mini PCIe: one PCIe+USB (top side); one PCIe+USB or mSATA by jumper setting (bottom side)
- USB: 2x USB 2.0 via onboard header, 2x USB 2.0 via front panel connector, one vertical USB 2.0 port
- SATA: 3x SATA 6 Gb/s
- SATA Power Connector
- Serial: 3x RS-232 headers, 1x RS-232/422/485 headers with 5V/12V power support by jumper select (JPS3P, default NC)
- LVDS (optional)
- Front Panel Header
- Audio Header
- Feature Connector Header
- PS/2 KB/MS Connector
- SPI Header
- ATX Power Connector

2.4. Form Factor

- Mini-ITX: 170mm x 170mm

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

2.5. SEMA Board Controller

- ADLINK Smart Embedded Management Agent (SEMA)
  - Voltage/Current monitoring
  - Power sequence debug support
  - AT/ATX mode control
  - Logistics and Forensic information
  - Flat Panel Control
  - General Purpose I2C
  - Failsafe BIOS (dual BIOS)
  - Watchdog Timer and Fan Control

2.6. Debug Header

- 40-pin Multipurpose Flat Cable Connector: used in combination with DB-40 Debug Module providing BIOS POST code LED, BMC access, SPI BIOS flashing, power testpoints, debug LEDs.

2.7. Video

- GPU Feature Support: Integrated AMD Radeon HD 9000 Series supporting four independent displays and Heterogeneous System Architecture (HSA).
  - 3D graphics hardware acceleration
  - Support for DirectX 11.1, OpenCL 1.2, OpenGL 4.2, OpenGLES 2.0 and OpenCV
  - Video decode hardware acceleration (UVD 4.2) including support for H.264, MPEG2, VC-1, MPEG4, WMV9 and MVC formats
  - Video encode hardware acceleration (VCE 2.0) including support for H.264, SVC formats and specific support for video conferencing and wireless display applications
  - AMD Eyefinity technology
  - AMD Dual Graphics technology

  Note: the availability of the features may vary between operating systems (Win 7/8, WES 7/8, Linux)

- Display Interface Support
  - 4x DisplayPort v1.2 with resolution up to 3840 x 2160 @ 30Hz
  - LVDS (optional): single/dual channel 18/24-bit LVDS (through eDP to LVDS bridge IC)

2.8. Audio

- Audio Codec: Realtek ALC886

2.9. LAN

- Intel MAC/PHY: Intel® i211AT (MAC/PHY) Ethernet controller
- Interface: 10/100/1000 GbE connection

2.10. Trusted Platform Module (TPM)

- Chipset: Atmel AT97SC3204 (optional)
- Type: TPM1.2

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

2.11. Power Specification

- Power Modes: AT and ATX mode (AT mode start controlled by BMC)
- Standard Voltage Input: ATX = 12V ±5%, 5Vsb ±5% or AT = 12V ±5%
- Power Management: ACPI 4.0 compliant
- Power States: Supports C1-C6, S0, S1, S4, S3, S5, (Wake-on-USB S3/S4, WoL S3/S4/S5)

2.12. Temperatures

- Operating Temperature: 0°C to 60°C
- Storage Temperature: -20°C to 80°C

2.13. Environmental

- Humidity: 10-90% RH operating, non-condensing
  5-95% RH storage (and operating with conformal coating)
- Shock and Vibration: IEC 60068-2-64 and IEC-60068-2-27
  MIL-STD-202F, Method 213B, Table 213-I, Condition A and Method 214A, Table 214-I, Condition D
- HALT: Thermal Stress, Vibration Stress, Thermal Shock and Combined Test

2.14. Operating Systems

- Standard Support: Windows 7/8 32/64-bit, Linux 32/64-bit
- Extended Support (BSP): WES7, WE8S, Linux

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

2.15. Power Consumption

System Configuration	
Memory Slot1	Transcend 8G 2Rx8 DDR3L 1600 SODIMM
Memory Slot2	Transcend 8G 2Rx8 DDR3L 1600 SODIMM
Graphics	AMD Radeon R7 Graphics
HDD	WD WD500AAKX, 3.5" 500GB
Monitor	Hanns.G HZ222
Power Supply	FSP Group INC. FSP600-80PSA 600W
Video Resolution	1680 x 1050 x32bit
BIOS	1.09
BMC F/W	1v3
Utilities	PassMark BurnInTest™ 7.1 AMD System Stress Test

- AMD RX-425BB 2.5GHz with Radeon R6 Graphics

Power State	BIOS PSS Support Enabled		BIOS PSS Support Disabled	
	Current (A)/Voltage (V)	Power (W)	Current (A)/Voltage (V)	Power (W)
Windows 7 (Idle)	1.16/12.05	13.978	1.25/12.05	15.0625
Windows 7 (Typical)[1]	3.55/12.07	42.8485	3.56/12.07	42.9692
Windows 7 (Max loading)[2]	3.62/12.07	43.6934	3.65/12.08	44.092
S1[3]	N/A	N/A		
S3	0.21/5.01	1.0521		
S5	0.15/5.01	0.7515		

Notes: (1) Typical mode measurement when running BurnInTest.
(2) Max loading measurement when running AMD System Stress Test.
(3) S1 state not supported.

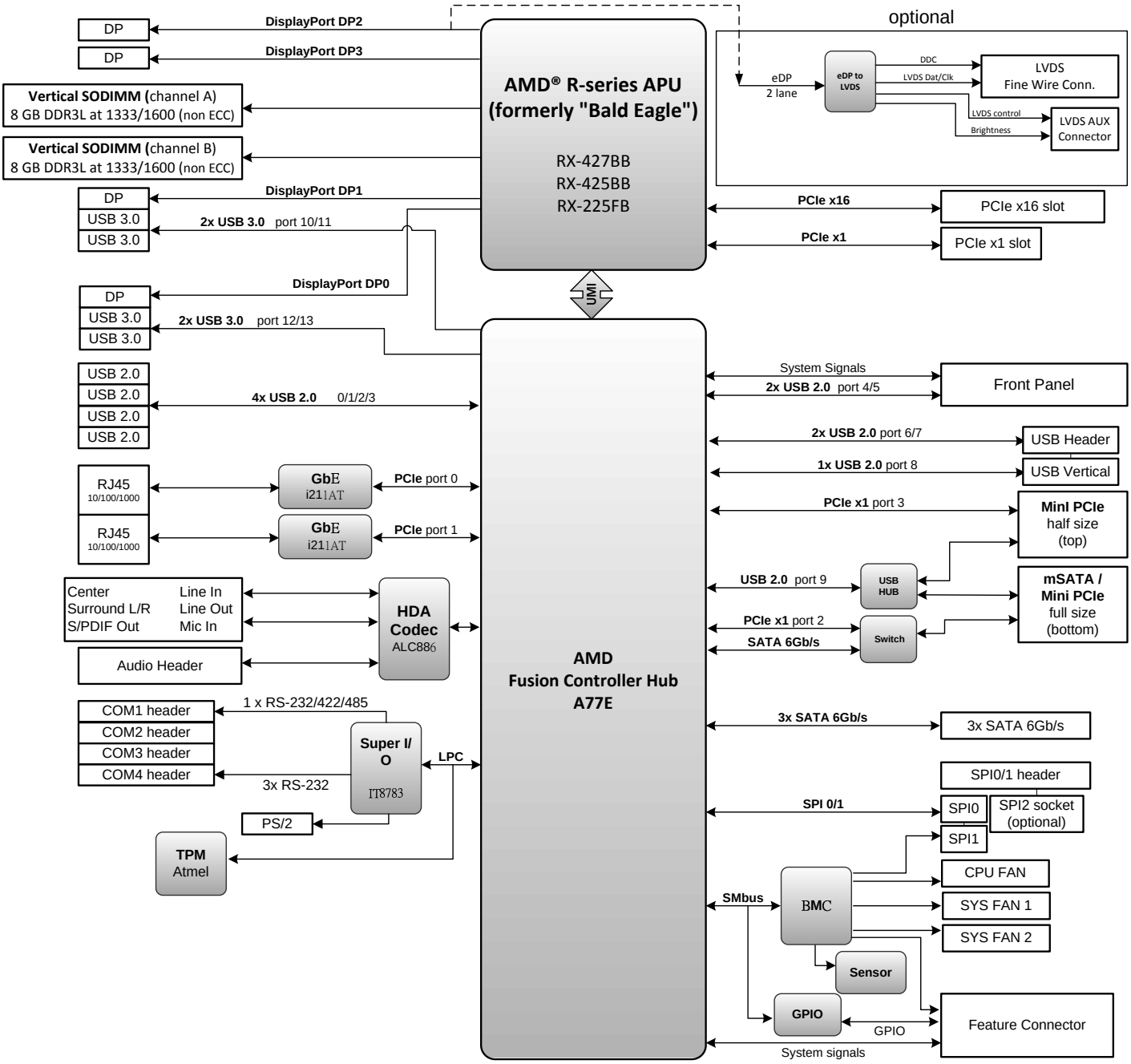
- AMD RX-225FB 2.2GHz with AMD Radeon R4 Graphics

Power State	BIOS PSS Support Enabled		BIOS PSS Support Disabled	
	Current (A)/Voltage (V)	Power (W)	Current (A)/Voltage (V)	Power (W)
Windows 7 (Idle)	1.18/12.05	14.219	1.18/12.05	14.219
Windows 7 (Typical)[1]	2.15/12.14	26.101	2.16/12.14	26.2224
Windows 7 (Max loading)[2]	2.22/12.14	26.9508	2.23/12.14	27.0722
S1[3]	N/A	N/A		
S3	0.23/5.01	1.1523		
S5	0.15/5.01	0.7515		

Notes: (1) Typical mode measurement when running BurnInTest.
(2) Max loading measurement when running AMD System Stress Test.
(3) S1 state not supported.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

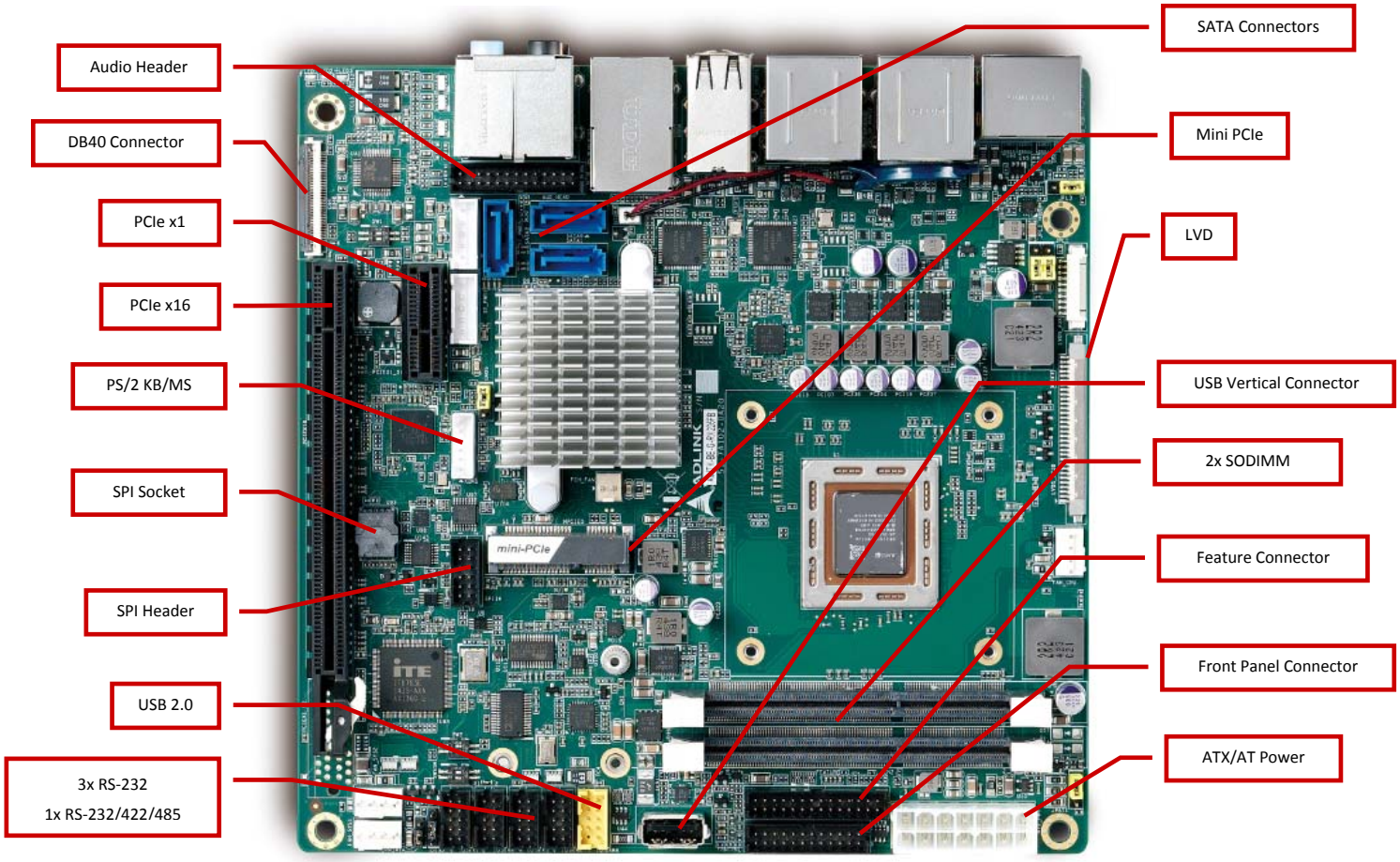
2.16. Functional Diagram



LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

3. Mechanical Layout

3.1. Onboard Connectors



3.2. Rear IO Connectors

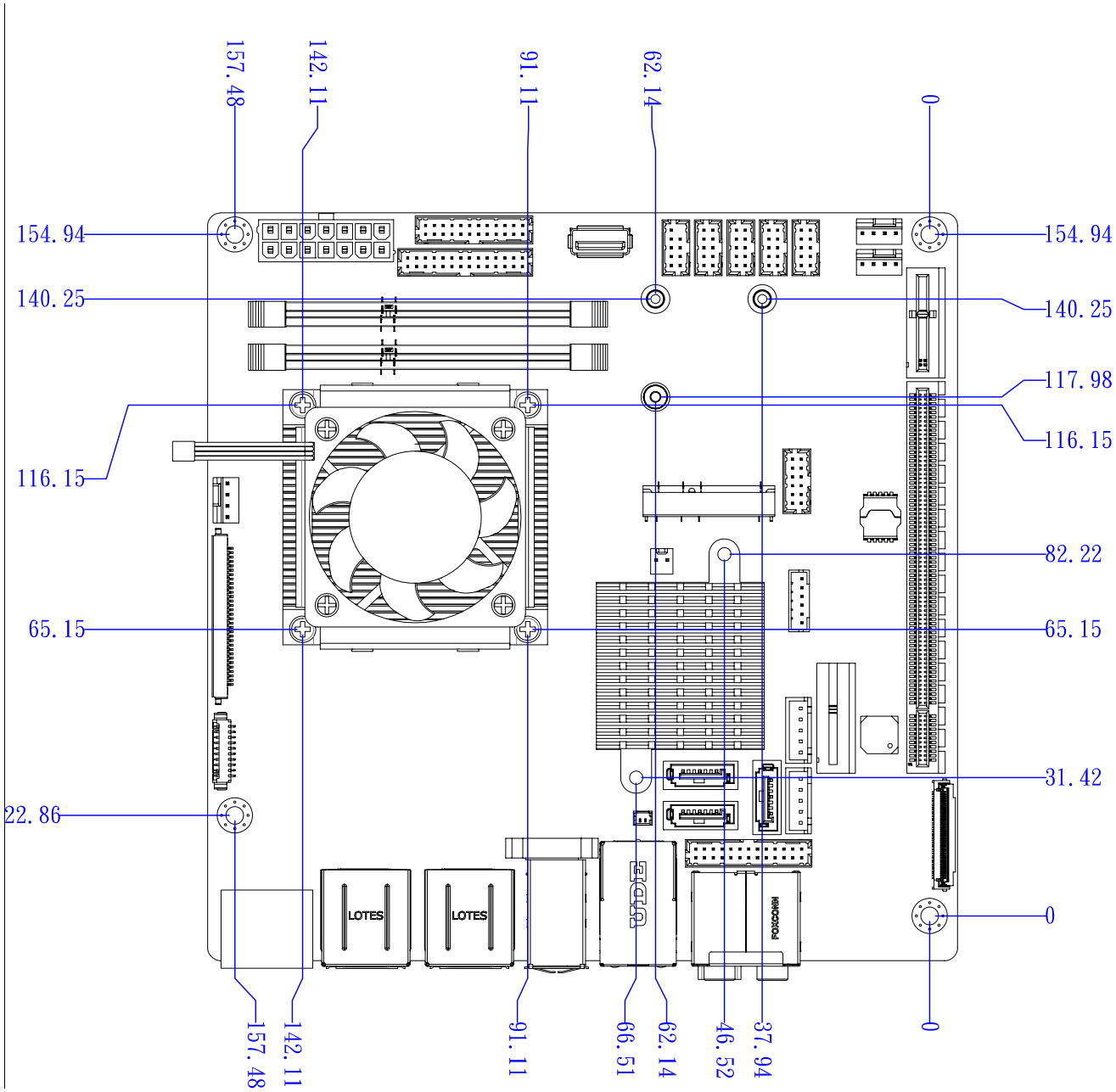


DP	USB 3.0	USB 3.0	USB 2.0	LAN	Audio
DP	DP	DP		LAN	

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

3.3. Mechanical Dimensions

Top View

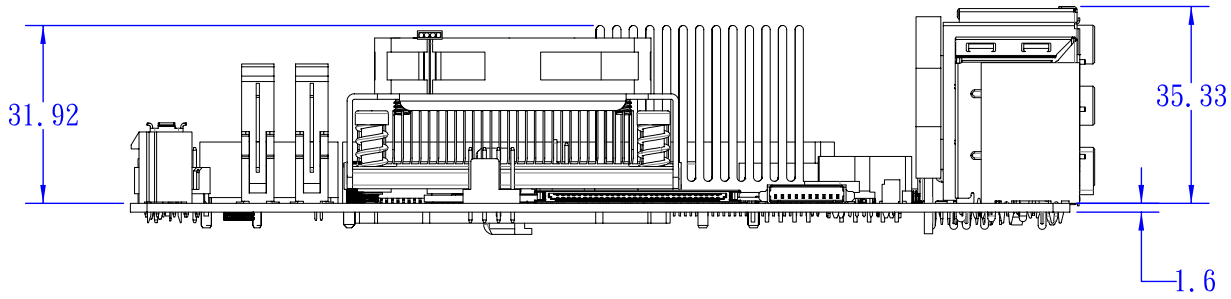


Dimensions: mm

All tolerances ±0.2mm

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Side View



Dimensions: mm

All tolerances ±0.2mm

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

3.4. Thermal Solutions

5010-CU-CJ APU Cooler Standard Temp.: 0°C to 60°C P/N: 32-20478-0000	
5010-AL-RG APU Cooler Standard Temp.: 0°C to 60°C P/N: 32-20499-0000	

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

4. Connectors and Jumpers

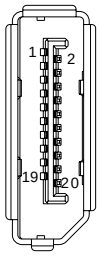
See 3.1 Onboard Connectors on page 13 for connector locations.

4.1. Rear IO Connectors

4.1.1. DisplayPort

Three DisplayPort v1.2 specification ports up to 3840x2160 @ 30 Hz.

Pin #	Signal	Pin #	Signal
1	CN_DP0_P	2	Ground
3	CN_DP0_N	4	CN_DP1_P
5	Ground	6	CN_DP1_N
7	CN_DP2_P	8	Ground
9	CN_DP2_N	10	CN_DP3_P
11	Ground	12	CN_DP3_N
13	CN_CAD-L	14	CN_CEC
15	CN_AUX_P	16	Ground
17	CN_AUX_N	18	DDP_HPD
19	Ground	20	P3V3

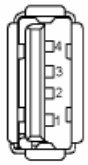


4.1.2. USB Connectors

- 5Vsb is supplied during power down to allow wakeup on USB device activity during S3~S4 state
- 1.5A for device power supply protected by a resettable 2A fuse

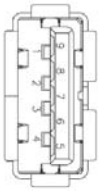
USB 2.0:

Pin #	Signal
1	Vcc
2	UV0-
3	UV0+
4	GND



USB 3.0:

Pin #	Signal
1	USB3.0_P5VA
2	USB2_CMAN
3	USB2_CMAP
4	GND
5	USB3A_CMRXN
6	USB3A_CMRXP
7	GND
8	USB3A_CMTXN
9	USB3A_CMTXP

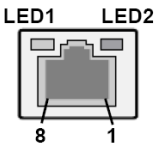


LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

4.1.3. Ethernet Connectors (LAN1, LAN2)

Dual 10/100/1000Mbit/s LAN Ethernet controllers based on Intel® i211AT, support PXE and WOL over both LANs.

Pin #	10BASE-T/100BASE-TX	1000BASE-T
1	TX+	LAN_MDI0+
2	TX-	LAN_MDI0-
3	RX+	LAN_MDI1+
4	--	LAN_MDI2+
5	--	LAN_MDI2-
6	RX-	LAN_MDI1-
7	--	LAN_MDI3+
8	--	LAN_MDI3-



LED1 (Speed)		LED2 (Link/Activity)	
Status	Description	Status	Description
Off	10 Mb connection	Off	No Link
Green	100 Mb connection	Orange	Linked
Orange	1 Gb connection	Blinking	Data Activity

4.1.4. Audio Connectors

- 7.1 channel audio via 5 jacks and S/PDIF output on rear I/O
- Realtek ALC886 codec

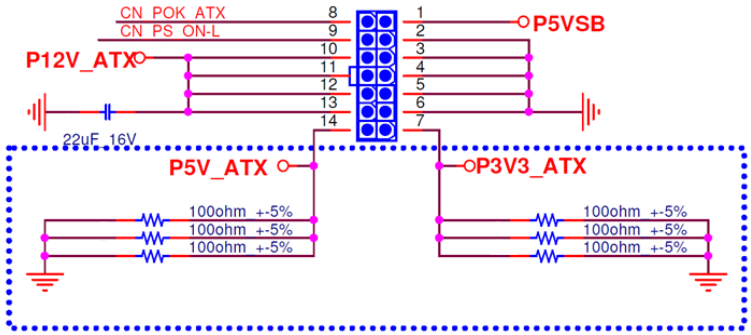
LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

4.2. Internal Connectors

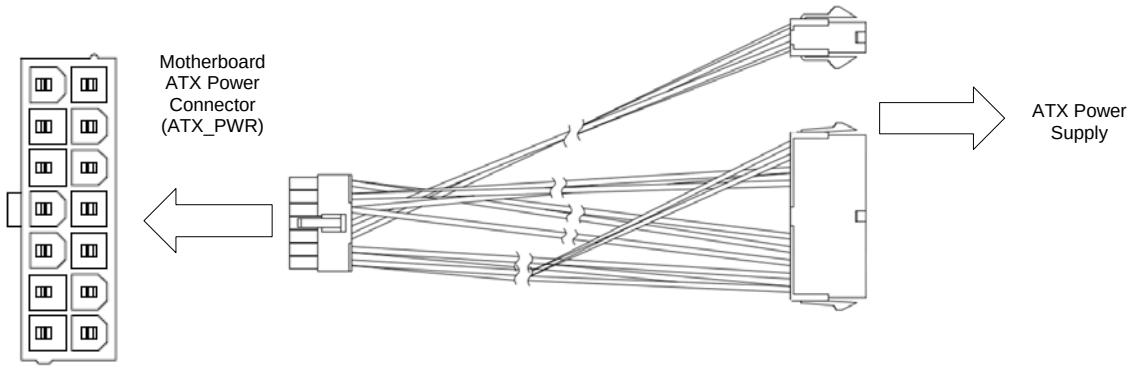
4.2.1. ATX Power Connector (ATX_PWR, proprietary)

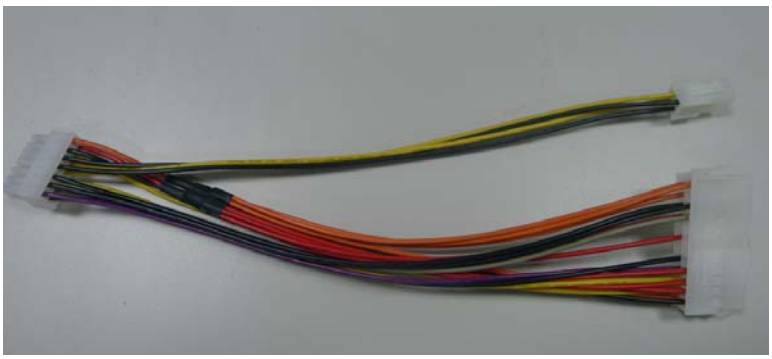
AmITX-HL-G supports a proprietary internal ATX Power Connector (ATX_PWR). An adapter cable is provided for connection to a standard ATX power supply.

Pin #	Signal	Pin #	Signal
1	SB5V	8	P_OK
2	GND	9	PS_ON#
3	GND	10	+12V
4	GND	11	+12V
5	GND	12	+12V
6	GND	13	+12V
7	3.3V	14	+5V



ATX Adapter Cable: ADLINK Part. No. 30-20872-0000 (length 250 mm)





LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

4.2.2. SATA Connectors (SATA0/1/2)

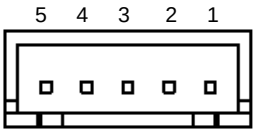
Three SATA 6 Gbps ports are available on the AmITX-HL-G (H81: 2x SATA 6 Gbps and 1x SATA 3 Gbps).

Pin #	Signal
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

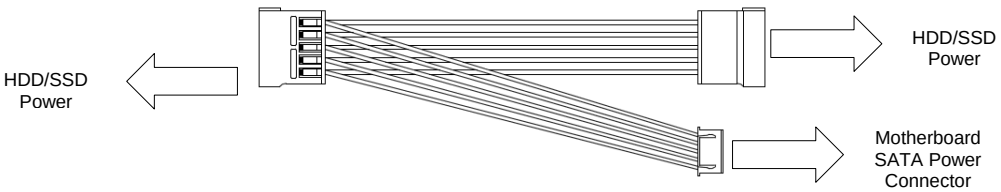


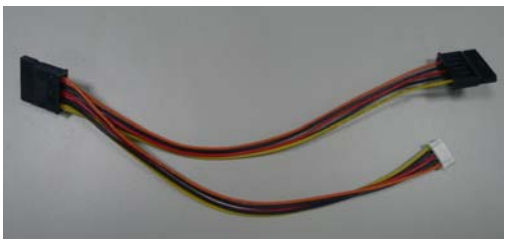
4.2.3. SATA Power Connector (ST_PWR1/2)

Pin #	Signal
1	12V
2	GND
3	5V
4	GND
5	3.3V



SATA Power Cable: ADLINK Part. No.: 30-20875-0000 (length 200 mm)

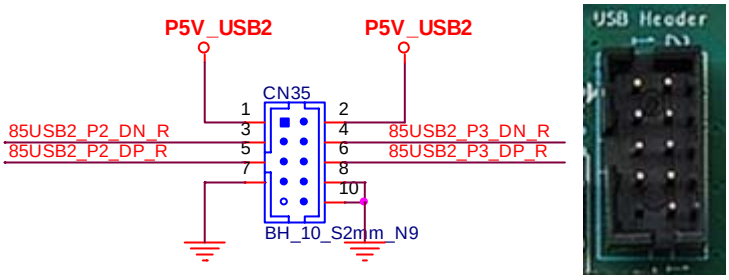




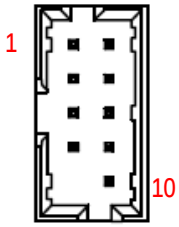
Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

4.2.4. USB Header

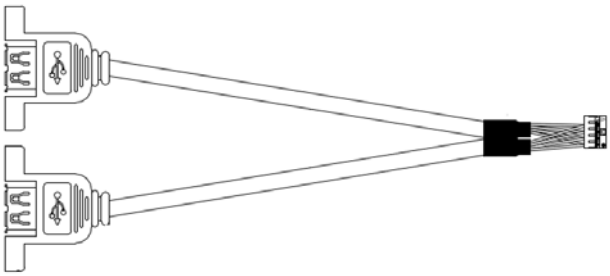
5V/SB5V: 5V supplies for external devices. SB5V is supplied during power down to allow wakeup on USB device activity during S3~S4 state.



Pin #	Signal	Pin #	Signal
1	P5V_USB	2	P5V_USB
3	P2_DN_R-	4	P3_DN_R
5	P2_DP_R	6	P3_DP_R
7	GND	8	GND
9	KEY	10	GND



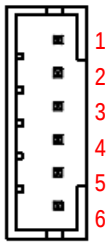
USB Cable (optional):
USB 2.0 Header to 2x Female Type-A Cable (length 200mm), P/N: 30-20874-1000



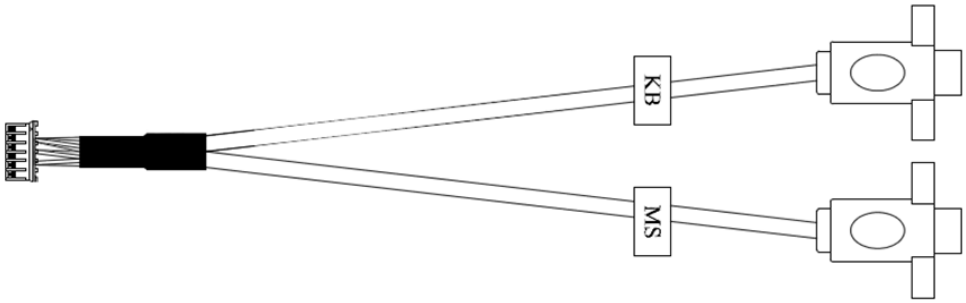
4.2.5. PS/2 Keyboard and Mouse Connector

6 pin 2.0 pitch standard wafer connector. No support for PS/2 KB/MS wake function

Pin #	Signal
1	MSCLK
2	V5S_S3
3	MSDATA
4	GND
5	KBDATA
6	KBCLK



KB/MS Cable (optional):
PS/2 KB/MS Cable (length 400mm), P/N: 30-20873-0000

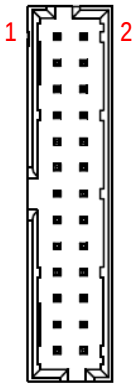


4.2.6. Internal Audio Connector

2x13-pin 2.0 pitch standard wafer connector.

Note: Signals shared with Audio Connector on Rear I/O.

Signal	Pin #	Pin #	Signal
LFE-OUT	1	2	CEN-OUT
AAGND	3	4	AAGND
FRONT-OUT-L	5	6	FRONT-OUT-R
AAGND	7	8	AAGND
REAR-OUT-L	9	10	REAR-OUT-R
SIDE-OUT-L	11	12	SIDE-OUT-R
AAGND	13	14	AAGND
MIC1-L	15	16	MIC1-R
AAGND	17	18	AAGND
LINE1-L	19	20	LINE1-R
MUTE	21	22	AAGND
GND	23	24	NC
SPDIF-OUT	25	26	GND

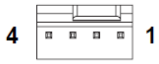


LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

4.2.7. CPU Fan and System Fan Connectors

Pin 3 and 4 are connected (monitored and managed) by SEMA controller.

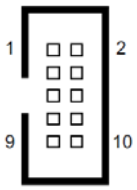
Pin #	Signal
1	GND
2	Fan Power (+12V)
3	Fan Sense
4	Fan Speed Control



4.2.8. Serial COM Port Connectors

Four internal Serial Ports (SER1-4)

Serial Port	Functions
SER1	Supports RS-232 / RS-422 / RS-485, 5V/12V power support by jumper select (JPS3P, default NC). SWS1M: Switch for mode selection of SER1 (default RS-232).
SER2	Supports RS-232 only
SER3	Supports RS-232 only
SER4	Supports RS-232 only



RS-232

Pin #	Signal	Pin #	Signal
1	DCD	2	DSR
3	RxD	4	RTS
5	TxD	6	CTS
7	DTR	8	RI
9	GND	10	5V / 12V

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

RS-422 (SER1 only)

Pin #	Signal	Pin #	Signal
1	Tx-	2	Tx+
3	Rx+	4	Rx-
5	—	6	—
7	—	8	—
9	GND	10	5V / 12V

RS-485 (SER1 only)

Pin #	Signal	Pin #	Signal
1	Tx/Rx-	2	Tx/Rx+
3	—	4	—
5	—	6	—
7	—	8	—
9	GND	10	5V / 12V

SER1 Mode Switch (SWS1M)

SWS1M (SER1 MODE SEL)			
	RS-232 (default)	RS-422	RS-485
1	ON	ON	OFF
2	OFF	ON	ON

Note: See Section 4.3.5COM Port (SER1) Power Selection (JPS3P)

COM Cable (optional):
COM Port Cable (length 250mm), P/N: 30-20876-0000



Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

4.2.9. LVDS Connector

FFC Connector : Female, 30pin, 1mm pitch. (JAE, FI-X30SSLA-HF)
Supports non-EDID type LCD panels.

Signal	Description
LVDS A0..A3	LVDS A Channel data
LVDS ACLK	LVDS A Channel clock
LVDS B0..B3	LVDS B Channel data
LVDS BCLK	LVDS B Channel clock
VDD ENABLE	Output Display Enable.
LCDVCC	VCC supply to the display. Power-on/off sequencing depending on selected display type in the BIOS Setup. Switchable by jumper either 3.3V (default) or 5V. Maximum load is 1A total for both voltages.
DDC CLK	DDC Channel Clock
DDC DAT	DDC Channel Data

Note	Type	Signal	Pin #	Pin #	Signal	Type	Note
	LVDS	LVDS A0-	1	16	LVDS B1+	LVDS	
	LVDS	LVDS A0+	2	17	POWER GND	PWR	Max. 0.5A
	LVDS	LVDS A1-	3	18	LVDS B2-	LVDS	
	LVDS	LVDS A1+	4	19	LVDS B2+	LVDS	
	LVDS	LVDS A2-	5	20	LVDS BCLK-	LVDS	
	LVDS	LVDS A2+	6	21	LVDS BCLK+	LVDS	
Max. 0.5A	PWR	POWER GND	7	22	LVDS B3-	LVDS	
	LVDS	LVDS ACLK-	8	23	LVDS B3+	LVDS	
	LVDS	LVDS ACLK+	9	24	POWER GND	PWR	Max. 0.5A
	LVDS	LVDS A3-	10	25	DDC DATA	OT	PU 2K2Ω, 3.3V
	LVDS	LVDS A3+	11	26	VDD ENABLE	OT	3.3V level
	LVDS	LVDS B0-	12	27	DDC CLK	OT	PU 2K2Ω, 3.3V
	LVDS	LVDS B0+	13	28	LCDVCC	PWR	Max 0.5A
Max. 0.5A	PWR	POWER GND	14	29	LCDVCC	PWR	Max 0.5A
	LVDS	LVDS B1-	15	30	LCDVCC	PWR	Max 0.5A

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

4.2.10. LVDS Auxiliary Connector

Wafer 1x10 pin: 1.25 mm pitch (MOLEX, 53261-1071)

Pin	Type	Signal	Note
1	OT	BKLT_EN#	3.3V level
2	PWR	GND	Max. 0.5A
3	PWR	GND	Max. 0.5A
4	PWR	BKLT_PWR	Max. 0.5A
5	PWR	BKLT_PWR	Max. 0.5A
6	PWR	BKLT_PWR	Max. 0.5A
7	PWR	BKLT_PWR	Max. 0.5A
8	PWR	GND	Max. 0.5A
9	PWR	GND	Max. 0.5A
10	OT	BKLT_CTL	3.3V level

Signal	Description
BKLT_EN#	Backlight Enable signal (active low) Optional to invert this signal to active high BKLT_EN (by jumper)
BKLT_PWR	Backlight Power switchable by jumper either 5V (default) or 12V. Maximum 1A per pin for both voltages
BKLT_CTL	Backlight control, PWM signal to implement voltage in the range 0-3.3V

See Section 4.3 Jumper and Switch Settings for Backlight Power Selection (JPL1), Panel Power Selection (JPL2), and Backlight Enable Jumper Selection (JPL3) settings.

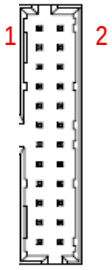
LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

4.2.11. Front Panel Connector

2x12-pin 2.0 pitch standard wafer connector

The front panel connector of AmITX-HL-G provides two USB2.0 header, Audio MIC-In / Line-Out, ATX power switch, Reset, HDD LED, and SUS LED (System Power LED).

Pin #	Signal	Ioh/ Iol	Type	Note		Pin #	Signal	Type	Ioh/ Iol	Note
1	USB6/7_5V	-	PWR	1		2	USB6/7_5V	PWR	-	1
3	USB6-	-				4	USB7-		-	
5	USB6+	-				6	USB7+		-	
7	GND	-	PWR			8	GND	PWR	-	
9	Mute	-	Mute			10	LINE2-L		-	
11	+5V	-	PWR	2		12	+5V	PWR	-	2
13	SATA_LED#	25/25mA	O			14	SUS_LED	O	7mA	3
15	GND	-	PWR			16	PWRBTN_IN#	I		
17	RSTIN#	-	I			18	GND	PWR	-	
19	SB3V3	-	PWR			20	LINE2-R		-	
21	AGND	-	PWR			22	AGND	PWR	-	
23	MIC2-L	-	AI			24	MIC2-R	AI	-	



Note 1: 5V/SB5V: 5V supplies for external devices. SB5V is supplied during power down to allow wakeup on USB device activity during S3~S4 state.

Note 2: Maximum load is 1A.

Note 3: SUS_LED (System Power LED): Connect to the power status indicator on the chassis front panel. The LED is on when the system is operating. The LED keeps blinking when the system is in S1/S3 sleep state. The LED is off when the system is in S4 sleep state or powered off (S5).

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

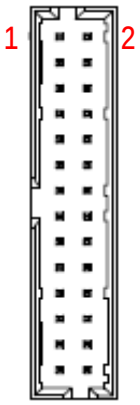
4.2.12. Feature Connector

2x13-pin 2.0 pitch standard wafer connector

The feature connector of AmITX-HL-G provides Case Open, I²C, SMBus, and GPIO(10pin).

Signal	Description
TEMPS	Analogue temp sensor, connect to analog input of BMC
EXT_BAT	Connect to RTC power
CASE_OPEN#	Any time case open occurred, system will notice/show case open alert in POST when the next booting.
I2CC / I2CD	Connect to BMC (I2C Master)
I2C	SEMA

Pin #	Signal	Pull U/D	Ioh/ Iol	Type	Note		Pin #	Signal	Type	Ioh/ Iol	Pull U/D	Note
1	CASE_OPEN#	PU 2M	-	I			2	SMBC	OT	/4mA	PU 10K	1
3	GND	-	-	PWR			4	SMBD	OT	/4mA	PU 10K	1
5	TEMPS	-		I	2		6	I2CC	OT	-	PU 10K	1
7	EXT_BAT	-		PWR			8	I2CD	OT	-	PU 10K	1
9	SB3V3	-	-	PWR			10	SB5V	PWR	-	-	
11	GND	-	-	PWR			12	GND	PWR	-	-	
13	GPIO0	-	PU10K3V3	IOT			14	GPIO1	IOT		PU10K3V3	
15	GPIO2	-	PU10K3V3	IOT			16	GPIO3	IOT		PU10K3V3	
17	GPIO4	-	PU10K3V3	IOT			18	GPIO5	IOT		PU10K3V3	
19	GPIO6	-	PU10K3V3	IOT			20	GPIO7	IOT		PU10K3V3	
21	GPIO8		PU10K3V3	IOT			22	GPIO9	IOT		PU10K3V3	
23	GND	-		PWR			24	SUS_S3#	O	25/25mA	-	
25	12V	-	-	PWR			26	SUS_S4#	O	25/25mA	-	
27	PWR_OK	-	25/25mA	O			28	SUS_S5#	O	25/25mA	-	



Note 1: Pull-up to +3V3Dual (+3V3 or SB3V3).

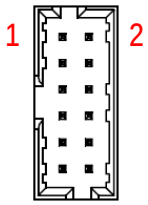
Note 2: Input to SEMA.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

4.2.13. SPI Header

2x6-pin 2.0 pitch standard wafer connector

Type	Signal	Pin #		Pin #	Signal	Type
	CLK	1		2	SB3V3	PWR
I	CS0#	3		4	ADDIN	IO
I	CS1#	5		6	NC	-
I	MOSI	7		8	ISOLATE	IO
O	MISO	9		10	GND	PWR
IO	SPI_IO2_#WP	11		12	SPI_IO3_#HOLD	IO

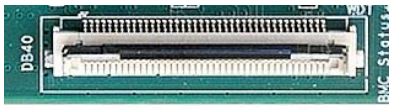


Signal	Description
CLK	Serial Clock
SB3V3	3.3V Standby Voltage power line. Normally output power, but when Motherboard is turned off then the on-board SPI Flash can be 3.3V power sourced via this pin.
CS0#	CS0# Chip Select 0, active low.
ADDIN	ADDIN input signal must be NC.
MOSI	Master Output, Slave Input
ISOLATE#	The ISOLATE# input, active low, is normally NC, but must be connected to GND when loading SPI flash. Power Supply to the Motherboard must be turned off when loading SPI flash. The pull up resistor is connected via diode to 5VSB.
MISO	Master Input, Slave Output
SPI_IO2_#WP	SPI Data I/O: A bidirectional signal used to support the new Dual IO Fast Read, Quad IO Fast Read and Quad Output Fast Read modes. This signal is not used in Dual Output Fast Read mode.
SPI_IO3_#HOLD	SPI Data I/O: A bidirectional signal used to support the new Dual IO Fast Read, Quad IO Fast Read and Quad Output Fast Read modes. This signal is not used in Dual Output Fast Read mode.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

4.2.14. DB40 Debug Board Connector

FPC Connector Type: FCI 59GF Flex 10042867



1 40

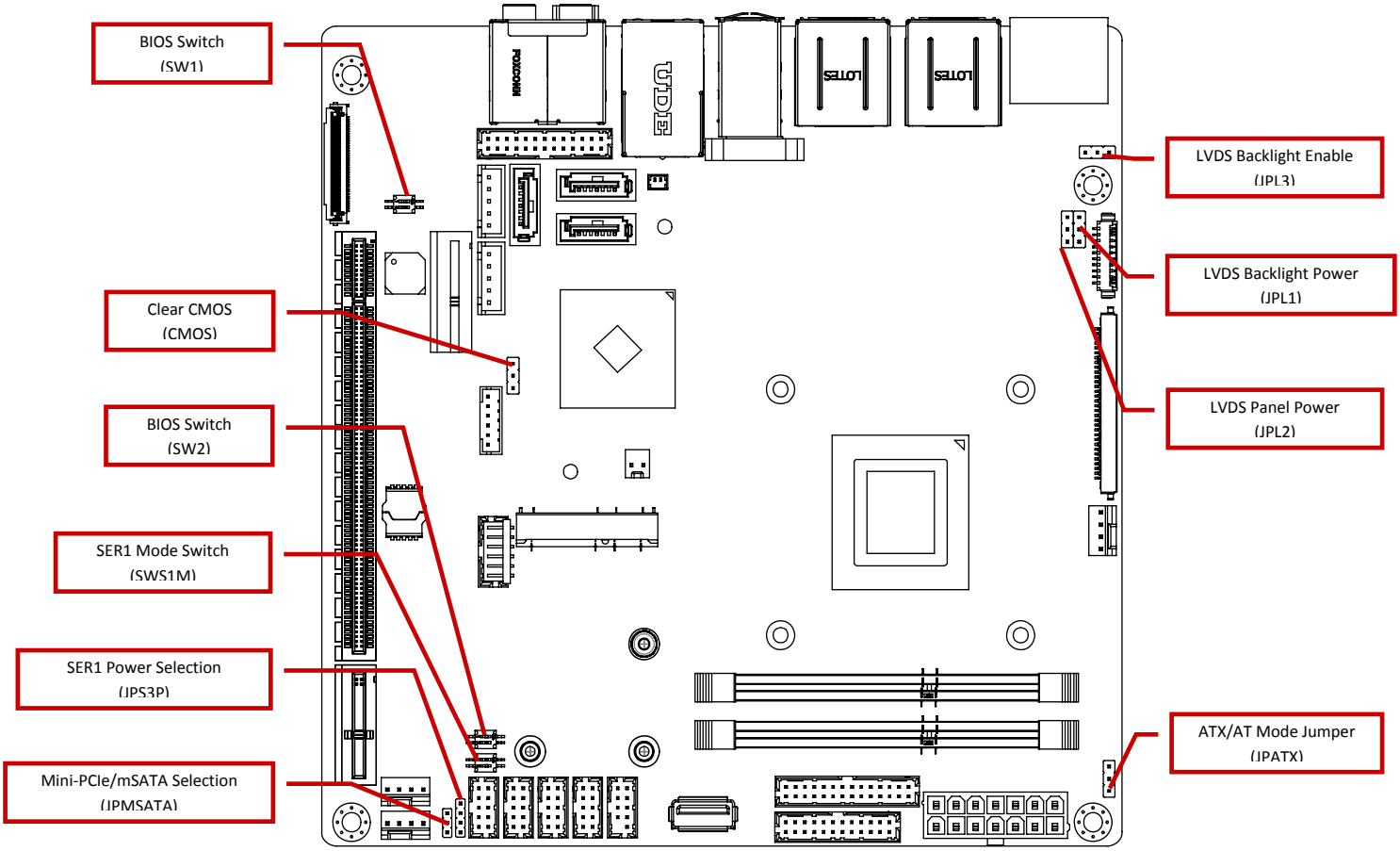
Pin	Interface	Signal	Remark	Pin	Interface	Signal	Remark
1	SPI Program interface	VCC_SPI_IN	SPI Power Input from flash tool to module. HW need add MOS FET to switch SPI power for SPI ROM	21	BMC Program interface (continued)	TXD6	
2		GND		22		RXD6	
3		SPI_BIOS_CS0#		23		FUMD0	
4		SPI_BIOS_CS1#		24		RESET_IN#	
5		SPI_BIOS_MISO		25		DATA	
6		SPI_BIOS_MOSI		26		CLK	
7		SPI_BIOS_CLK		27		OCD0A	Include a jumper to connect OCD0A via 1K0 pull-up to 3.3V_BMC
8	LPC Bus	3V3_LPC	System power 3.3V provide from COM module	28		OCD0B	Include a jumper to connect OCD0A via 1K0 pull-up to 3.3V_BMC
9		GND		29	Test points	PWRBTN#	
10		CB_RESET#	Platform Reset	30		SYS_RESET#	
11		RST#		31		CB_RESET#	
12		CLK33_LPC		32		CB_PWROK	
13		LPC_FRAME#		33		SUS_S3#	
14		LPC_AD3		34		SUS_S4#	
15		LPC_AD2		35		SUS_S5#	
16		LPC_AD1	always power 3.3V provide from COM module	36	BMC Debug signals	POSTWDT_DIS#	Connect to Jumper for Debug
17		LPC_AD0		37		SEL_BIOS	Connect to Jumper for Debug
18	BMC Program interface	3.3V_BMC	always power 3.3V provide from COM module	38		BIOS_MODE	Connect to Jumper for Debug
19		3.3V_BMC	always power 3.3V provide from COM module	39		BMC_STATUS	
20		GND		40	Reserved		

Note: the pin description on the Debug Module is the inverse of that on the motherboard.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

4.3. Jumper and Switch Settings

4.3.1. Jumper and Switch Locations



4.3.2. ATX/AT Mode Selection (JPATX)

JPATX_BOOT MODE	
1-2	ATX (default)
2-3	AT

4.3.3. Clear CMOS (CMOS)

CMOS	
1-2	Normal (default)
2-3	Clear CMOS

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

4.3.4. Mini-PCE/mSATA Selection (JPMSATA)

Sets the function of the Mini PCIe slot on the bottom side of th board.

JPMSATA (Mini-PCIe/mSATA SEL)	
1-2	Mini-PCIe (default)
2-3	mSATA

4.3.5. COM Port (SER1) Power Selection (JPS3P)

JPS3P (SER1 PWR SEL)	
1-2	5V
2-3	NC (default)
3-4	12V

4.3.6. LVDS Backlight Power Selection (JPL1)

JPL1_BKLTPWR	
1-2	12V
2-3	5V (default)

4.3.7. LVDS Panel Power Selection (JPL2)

JPL2_PANELPWR	
1-2	5V
2-3	3.3V (default)

4.3.8. LVDS Backlight Enable Selection (JPL3)

JPL3_BKLTEN	
1-2	Active High
2-3	Active Low (default)

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

4.3.9. BIOS Switch Setting (SW2, SW3)

Failsafe Mode (default): Boot up by SPI0 with fail safe SPI0 + SPI1 support.

Fail Safe SPI0 + SPI1 (default)		
	SW2	SW3
1	ON	OFF
2	OFF	OFF

Normal BIOS Mode: Boot up from SPI0

Boot up by SPI0		
	SW2	SW3
1	ON	OFF
2	ON	OFF

Normal BIOS Mode: Boot up by SPI2 (optional socket SPI)

Boot up by SPI2		
	SW2	SW3
1	ON	OFF
2	ON	ON

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

4.4. Onboard Connector Information

Connector	CN#	Onboard Connector		Mating Connector		ADLINK Cable
		Manufacturer	Part No.	Manufacturer	Part No.	
COM Port	CN36-39	JVE	23N6850-10S10B-01G-B-01	YOUNG YAK	YY-1970H-2*5P (PH2.0)	30-20876-0000 (optional)
ATX power		Molex	9359-12P	E.C.I	E.C.I 5016H-2*7P (PH4.2)	30-20872-0000 (standard)
PS/2 KB/MS	CN3	JVE	24W1140-06S10-01T-3.4-CS01	E.C.I	E.C.I 2020 -06P (PH2.0)	30-20873-0000 (optional)
USB	CN35	JVE	23N6850-10S10B-01G-B-V9-01	YOUNG YAK	YY-1970H-2*5P (PH2.0)	30-20874-1000 (optional)
SATA Power	CN29	JVE	24W1170-05S10-01T-3.4-CS01	YOUNG YAK	YY-1970H-2*5P (PH2.0)	30-20875-0000 (standard)
SATA	CN16-17	WIN WIN	WATM-07DBN4B2B8UW			30-10057-0600 (standard)
DB-40		Molex	502790-4091			30-30016-0000 (optional)
LVDS	CN21	JVE	FI-X30SSLA-HF	WELL-LIN ENTERPRISE	WL1058-HL-30P (PH1.0)	
LVDS Auxiliary	CN45	Molex	53261-1071	WELL-LIN ENTERPRISE	WL1025-H-10P (PH1.25)	
Feature	CN14	JVE	23N6850-28S10B-01G-C-01	JWT	JWT A2005H00-2C*14 (PH2.0)	
Audio	CN9	JVE	23N6850-26S10B-01G-C-01	JWT	JWT A2005H00-2CX13P (PH2.0)	
Front Panel	CN26	JVE	23N6850-24S10B-01G-C-01	YY	YY-1970H-2*12P (PH2.0)	

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

5. Driver Installation

TheAmITX-BE-G drivers for Windows 7 (32-bit/64-bit) and Windows 8 (32-bit/64-bit) can be downloaded from the ADLINK website (http://www.adlinktech.com/PD/big5/PD_detail.php?cKind=&pid=1443).

Windows 7 32/64-bit

Chipset	\1. 13-12_win7_win8_32-64_sbl\
Display	\2. Display Driver for Win7_32-64 & Win8.1_64\14.201.1009-140819a-175280c-aes\
Audio	\3.Audio Codec ALC886\
LAN	\4.i211\
Controller Hub-A77E	\5. AHCI_Driver_1_3_1\AHCI_Driver_1_3_1_220\
IOMMU	\6.AmdIOV\

The driver installation procedure for Windows 7 32-bit is outlined below. Install the Windows operating system before installing any driver. Most standard I/O device drivers are installed during Windows installation.

1. Install the Chipset driver by running the program \1.13-12_win7_win8_32-64_sbl\Setup.exe. Follow the instructions given and reboot when instructed.
2. Install the Display driver and utilities by running the program \2.Display Driver for Win7_32-64 & Win8.1_64\14.201.1009-140819a-175280c-aes\Setup.exe. Follow the instructions given and reboot when instructed.
3. Install the Audio driver by running the program \3.Audio Codec ALC886\win7_win8_win81_r272.exe. Follow the instructions given and reboot if required.
4. Install the LAN driver by running the progr1m \4.i210\PROWin32.exe. Follow the instructions given and reboot if required.
5. Install the Controller Hub-A77E driver by running the program \5.AHCI_Driver_1_3_1\AHCI_Driver_1_3_1_220\Setup.exe. Follow the instructions given and reboot if required.
6. Install the IOMMU driver by Device manager. Find other devices\PCI Device and click “Update Driver”. Find \6.AmdIOV\ folder and install driver.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

6. Smart Embedded Management Agent (SEMA)

The onboard microcontroller (BMC) implements power sequencing and Smart Embedded Management Agent (SEMA) functionality.

The microcontroller communicates via the System Management Bus with the CPU/chipset. The following functions are implemented.

- Total operating hours counter. Counts the number of hours the module has been run in minutes.
- On-time minutes counter. Counts the seconds since last system start.
- Temperature monitoring of CPU and board temperature. Minimum and maximum temperature values of CPU and board are stored in flash.
- Power cycles counter
- Boot counter. Counts the number of boot attempts.
- Watchdog Timer (Type-II). Set / Reset / Disable Watchdog Timer. Features auto-reload at power-up.
- System Restart Cause. Power loss / BIOS Fail / Watchdog / Internal Reset / External Reset
- Fail-safe BIOS support. In case of a boot failure, hardware signals tells external logic to boot from fail-safe BIOS.
- Flash area. 1kB Flash area for customer data
- 128 Bytes Protected Flash area. Keys, IDs, etc. can be stored in a write- and clear-protectable region.
- Board Identify. Vendor / Board / Serial number / Production Date
- Main-current & voltage. Monitors drawn current and main voltages

For a detailed description of SEMA features and functionality, please refer to the SEMA Technical Manual and SEMA Software Manual, downloadable at: http://www.adlinktech.com/PD/web/PD_detail.php?cKind=&pid=1274

6.1. Board Specific SEMA Functions

6.1.1. Voltages

The BMC of the cExpress-BT implements a voltage monitor and samples several onboard voltages. The voltages can be read by calling the SEMA function “Get Voltages”. The function returns a 16-bit value divided into high-byte (MSB) and low-byte (LSB).

ADC Channel	Voltage Name	Voltage Formula [V]
0	CPU-Vcore	(MSB<<8 + LSB) x 3.3 / 1024
1	GFX-Vcore	(MSB<<8 + LSB) x 3.3 / 1024
2	+V1.05S	(MSB<<8 + LSB) x 3.3 / 1024
3	Vmem	(MSB<<8 + LSB) x 3.3 / 1024
4	+V1.0V	(MSB<<8 + LSB) x 3.3 / 1024
5	+V3.3V	(MSB<<8 + LSB) x 1.1 x 3.3 / 1024
6	+VIN	(MSB<<8 + LSB) x 6.000 x 3.3 / 1024
7	(MAIN CURRENT)	Use Main Current Function

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

6.1.2. Main Current

The BMC of the cExpress-BT implements a current monitor. The current can be read by calling the SEMA function “Get Main Current”. The function returns four 16-bit values divided in high-byte (MSB) and low-byte (LSB). These 4 values represent the last 4 currents drawn by the board. The values are sampled every 250ms. The order of the 4 values is NOT in chronological order. Access by the BMC may increase the drawn current of the whole system. In this case, there are still 3 samples not influenced by the read access.

Main Current = (MSB_n<<8 + LSB_n) x 8.06mA

6.1.3. BMC Status

This register shows the status of BMC controlled signals on the cExpress-BT.

Status Bit	Signal
0	WDT_OUT
1	LVDS_VDDEN
2	LVDS_BKLTEN
3	BIOS_MODE
4	POSTWDT_DISn
5	SEL_BIOS
6	BIOS_DIS0n
7	BIOS_DIS1n

6.1.4. Exception Codes

In case of an error, the BMC drives a blinking code on the blue Status LED (LED1). The same error code is also reported by the BMC Flags register. The Exception Code is not stored in the Flash Storage and is cleared when the power is removed. Therefore, a “Clear Exception Code” command is not needed or supported.

Exception Code	Error Message
0	NOERROR
2	NO_SUSCLK
3	NO_SLP_S5
4	NO_SLP_S4
5	NO_SLP_S3
6	BIOS_FAIL
7	RESET_FAIL
8	POWER_FAIL
9	LOW_VIN
10	VCORE
11	VGFX
12	V1P05S
13	VMEM

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Exception Code	Error Message
14	V1P0A
15	V3P3A
16	+P12V_5V
18	CRITICAL_TEMP
19	NO_CB_PWROK
20	NO_HW_PWORK
21	NO_V1P24A_PG

6.1.5. BMC Flags

The BMC Flags register returns the last detected Exception Code since power-up and shows the BIOS in use and the power mode.

Bit	Description
[0 ~ 4]	Exception Code
[6]	0 = AT mode 1 = ATX mode
[7]	0 = Standard BIOS 1 = Fail-safe BIOS.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

7. System Resources

7.1. System Memory Map

Address Range (decimal)	Address Range (hex)	Size	Description
(4GB-8MB)	FF800000 – FFFFFFFF	8 MB	High BIOS Area
(4GB-20MB) – (4GB-19MB-1)	FEC00000 – FECFFFFF	1 MB	APIC Configuration Space
960 K – 1024 K	F0000 – FFFFF	64 KB	System BIOS Area
896 K – 960 K	E0000 – EFFFF	64 KB	Extended System BIOS Area
768 K – 896 K	C0000 – DFFFF	128 KB	PCI expansion ROM area C0000 – C7FFF: Onboard VGA BIOS
640 K – 768 K	A0000 – BFFFF	128 KB	Video Buffer & SMM space
0 K – 640 K	00000 – 9FFFF	640 KB	DOS Area

7.2. Direct Memory Access Channels

Channel Number	Data Width	System Resource
0	8-bits	Open
1	8-bits	Open
2	8-bits	Open
3	8-bits	Open
4		Direct Memory Access Controller
5	16-bits	Open
6	16-bits	Open
7	16-bits	Open

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

7.3. I/O Map

7.3.1. I/O Map

Hex Range	Device
000-01F	DMA controller 1, 8237A-5 equivalent
020-02D and 030-03F	Interrupt controller 1, 8259 equivalent
02E-02F 04E-04F	LPC SIO (IT8783E) configuration index/data registers
040-042 050-052	Timer, 8254-2 equivalent
060, 062, 064, 066	8742 equivalent (keyboard)
061	NMI control and status
070-077	Real Time Clock Controller(bit 7 -NMI mask)
080-091	DMA page register
092	Reset (Bit 0)/ Fast Gate A20 (Bit 1)
093-09F	DMA page registers continued
0A0-0B1 and 0B4-0BD	Interrupt controller 2, 8259 equivalent
0B2 and 0B3	APM control
0C0-0DF	DMA controller 2, 8237A-5 equivalent
0F0	Read: PCI and Master abort. Note (1) Write: FERR#/ IGNNE# /Interrupt controller
2E8-2EF	Serial port 4
2F8-2FF	Serial port 2
3E8-3EF	Serial port 3
3F8-3FF	Serial port 1
B00	SMBUS IO base
CF9	Reset Control register (8 bit I/O)

Note (1): A read to this address will subtractive decode from PCI, where it will master abort.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

7.3.2. IRQ Lines PIC mode

IRQ#	Typical Intterupt Resource	Connected to Pin	Available
0	Counter 0	N/A	No
1	Keyboard controller	N/A	No
2	Cascade interrupt from slave PIC	N/A	No
3	Serial Port 2 (COM2)	IRQ3 via SERIRQ / PIRQ	Note (1)
4	Serial Port 1 (COM1)	IRQ4 via SERIRQ / PIRQ	Note (1)
5	Parallel Port 2 (LPT2)	IRQ5 via SERIRQ / PIRQ	Note (1)
6	Generic	IRQ6 via SERIRQ / PIRQ	No
7	Generic	IRQ7 via SERIRQ / PIRQ	Note (1)
8	Real-time clock	N/A	No
9	Generic	N/A	Note (1)
10	Serial Port 3 (COM3)	IRQ10 via SERIRQ / PIRQ	Note (1)
11	Serial Port 4 (COM4)	IRQ11 via SERIRQ / PIRQ	Note (1)
12	PS/2 Mouse	IRQ12 via SERIRQ / PIRQ	Note (1)
13	Math Processor	N/A	Note (1)
14	Primary IDE controller	IRQ14 via SERIRQ / PIRQ	Note (1)
15	Secondary IDE controller	IRQ15 via SERIRQ / PIRQ	Note (1)

Note(1): These IRQs can be used for PCI devices when onboard device is disabled.

7.3.3. IRQ Lines APIC mode

IRQ#	Typical Interupt Resource
0	High precision even timer/System timer
3	Serial Port 2
4	Serial Port 1
5	Serial Port 3
6	Serial Port 4
8	High precision even timer
13	Numeric data processor
14	ATA Channel 0
15	ATA Channel 1
16	High Definition Audio Controller
17	Standard Enhanced PCI to USB Host Controller
18	Standard OpenHCD USB Host Controller
19	AMD SATA Controller
27	High Definition Audio Controller

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

7.4. PCI Configuration Space Map

Bus Number	Device Number	Function Number	Routing	Description
00h	00h	00h	N/A	AMD Host Bridge
00h	00h	02h	Internal	AMD System Device
00h	01h	00h	Internal	ATI VGA Controller(PCI Express)
00h	01h	01h	Internal	ATI Multimedia(PCI Express)
00h	02h	00h	Internal	AMD Host Bridge#0
00h	03h	00h	Internal	AMD Host Bridge#1
00h	04h	00h	Internal	AMD Host Bridge#2
00h	10h	00h	Internal	AMD Serial Bus Controller (PCI Express)
00h	10h	01h	Internal	AMD Serial Bus Controller (PCI Express)
00h	11h	00h	Internal	AMD AHCI 1.0 Controller
00h	12h	00h	Internal	ATMD USB OHCI
00h	12h	02h	Internal	AMD USB2 EHCI
00h	13h	00h	Internal	AMD USB OHCI
00h	13h	02h	Internal	AMD USB2 EHCI
00h	14h	00h	Internal	AMD SMBus
00h	14h	01h	Internal	AMD IDE Controller
00h	14h	02h	Internal	AMD Multimedia
00h	14h	03h	Internal	AMD ISA Bridge
00h	14h	04h	Internal	AMD PCI-to-PCI Bridge
00h	14h	05h	Internal	AMD USB OHCI
00h	15h	00h	Internal	AMD PCI-to-PCI Bridge#0
00h	15h	01h	Internal	AMD PCI-to-PCI Bridge#1
00h	15h	02h	Internal	AMD PCI-to-PCI Bridge#2
00h	15h	03h	Internal	AMD PCI-to-PCI Bridge#3
00h	18h	00h	N/A	AMD Host Bridge#0
00h	18h	01h	N/A	AMD Host Bridge#1
00h	18h	02h	N/A	AMD Host Bridge#2
00h	18h	03h	N/A	AMD Host Bridge#3
00h	18h	04h	N/A	AMD Host Bridge#4
00h	18h	05h	N/A	AMD Host Bridge#5
02	00h	00h	Internal	Intel Ethernet controller (PCI Express)
03h	00h	00h	Internal	Intel Ethernet controller (PCI Express)

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

7.5. PCI Interrupt Routing Map

PIRQ	INT Line	AMD VGA Controller	AMD IDE Controller	AMD AHCI Controller	SMBus Controller	OHCI 0/1/2	AMD Multimedia	Intel Ethernet Controller	Intel Ethernet Controller
A	Int0	INTC	INTA	INTD		INTC	INTA	INTA	INTA
B	Int1	INTD	INTB					INTB	INTB
C	Int2	INTA						INTC	INTC
D	Int3	INTB						INTD	INTD

PIRQ	AMD Host Bridge#0	AMD Host Bridge#1	AMD PCI-to-PCI Bridge#0	AMD PCI-to-PCI Bridge#1	AMD PCI-to-PCI Bridge#2	AMD PCI-to-PCI Bridge#3
A	INTA	INTC	INTA	INTB	INTC	INTD
B	INTB	INTD	INTB	INTC	INTD	INTA
C		INTE	INTC	INTD	INTA	INTB
D		INTF	INTD	INTA	INTB	INTC

7.6. SMBus Address Table

Device	Address
0x40	PCA9535BS
0x50	SEMA
0xA0	DIMM A
0xA4	DIMM B
0xC0	NXP (LVDS SKU)

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

8. BIOS Setup

8.1. Menu Structure

This section presents the six primary menus of the BIOS Setup Utility. Use the following table as a quick reference for the contents of the BIOS Setup Utility. The subsections in this section describe the submenus and setting options for each menu item. The default setting options are presented in bold, and the function of each setting is described in the right hand column of the respective table.

Main	Advanced	Boot	Security	Save & Exit
- BIOS Information - Memory Information - System Management ▶ - System Date - System Time	- CPU ▶ - Memory ▶ - Graphics ▶ - SATA ▶ - USB ▶ - Network ▶ - PCI and PCIe ▶ - Super IO ▶ - ACPI and Power Management ▶ - Sound ▶ - Serial Port Console ▶ - Trusted Computing ▶ - Thermal ▶ - Miscellaneous ▶	- Boot Configuration ▶ - CSM Parameters ▶	- Password Description - Secure Boot Menu ▶	- Reset Options - Save Options

Notes:

▶ indicates a submenu

Gray text indicates info only

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

8.2. Main

The Main Menu provides read-only information about your system and also allows you to set the System Date and Time. Refer to the tables below the screen shot of this menu for details of the submenus and settings.

8.2.1. System Information

Feature	Options	Description
Project Version	Info only	ADLINK BIOS version
Build Date and Time	Info only	Date the BIOS was built

8.2.2. Memory Information

Feature	Options	Description
Total Memory	Info only	Display total memory information

8.2.3. System Management

8.2.3.1. System Management > Board Information

Board Information	Info only	
SEMA Firmware	Read only	Display SEMA firmware
Build Date	Read only	Display SEMA firmware build date
SEMA Boot loader	Read only	Display SEMA boot loader
Build Date	Read only	Display SEMA boot loader build date
Hardware Version	Read only	Display SEMA hardware version
Serial Number	Read only	Display SEMA serial number
Manufacturing Date	Read only	Display SEMA manufacturing date
Last Repair Date	Read only	Display SEMA last repair date
MAC ID	Read only	Display SEMA MAC ID
SEMA Features:	Read only	Display SEMA features

8.2.3.2. System Management > Temperatures and Fan Speed

Feature	Options	Description
Temperatures and Fan	Info only	
CPU Temperature	Info only	
Current	Read only	Display current CPU temperature
Startup	Read only	Display CPU startup temperature
Min	Read only	Display CPU min. temperature
Max	Read only	Display CPU max. temperature

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Board Temperatures	Info only	
Current	Read only	Display current board temperature
Startup	Read only	Display board startup temperature
Min	Read only	Display board min. temperature
Max	Read only	Display board max. temperature
CPU Fan Speed	Read only	Display CPU fan speed
System Fan1 Speed	Read only	Display system fan speed
System Fan2 Speed	Read only	Display system fan speed

8.2.3.3. System Management > Power Consumption

Feature	Options	Description
Power Consumption	Info only	
Current Input Current	Read only	Display input current
Current Input Power	Read only	Display input power
VCC-Vcore	Read only	Display actual VCC-Vcore voltage
V1P0S	Read only	Display actual V1P0S voltage
VDDQ	Read only	Display actual VDDQ voltage
VRTC	Read only	Display actual VRTC voltage
V3P3S	Read only	Display actual V3P3S voltage
V3P3A	Read only	Display actual V3P3A voltage
V5_DUAL	Read only	Display actual V5_DUAL voltage
V12	Read only	Display actual V12 voltage

8.2.3.4. System Management > Runtime Statistics

Feature	Options	Description
Runtime Statistics	Info only	
Total Runtime	Read only	The returned value specifies the total time in minutes the system is running in S0 state.
Current Runtime	Read only	The returned value specifies the time in seconds the system is running in S0 state. This counter is cleared when the system is removed from the external power supply.
Power Cycles	Read only	The returned value specifies the number of times the external power supply has been shut down
Boot Cycles	Read only	The Bootcounter is increased after a HW- or SW-Reset or after a successful power-up.
Boot Reason	Read only	The boot reason is the event which causes the reboot of the system.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

8.2.3.5. System Management > Flags

Feature	Options	Description
Flags	Info only	
BMC Flags	Read only	
BIOS Select	Read only	Display the selection of current BIOS ROM.
ATX/AT-Mode	Read only	Display ATX/AT-Mode.
Exception Code	Read only	System exception reason.

8.2.3.6. System Management > Power Up

Feature	Options	Description
Power Up	Info only	
Power Up watchdog Attention: F12 disables the Power Up Watchdog.	Enabled Disabled	The Power-Up Watchdog resets the system after a certain amount of time after power-up.
Power-up Mode Attention: The Power-Up Mode only has effect, if the module is in ATX-Mode.	Turn on Remain off Last State	Turn On: The machine starts automatically when the power supply is turned on. Remain Off :To start the machine the power button has to be pressed. Last State: when powered on during a power failure the system will automatically power on when power is restored

8.2.3.7. System Management > LVDS Backlight

Feature	Options	Description
LVDS Backlight	Info only	
LVDS Backlight Bright	255	The value range starts by 0 and ends by 255.

8.2.3.8. System Management > Smart Fan

Feature	Options	Description
Smart Fan	Info only	
CPU Smart FanTemperature Source	CPU Sensor System Sensor	Select CPU smart fan source
CPU Fan Mode	AUTO (Smart Fan) Fan Off Fan On	Select CPU fan mode
Trigger Point 1	Read only	
Trigger Temperature	15	Specifies the temperature threshold at which the BMC turns on the CPU fan with the specified PWM level
PWM Level	30	Select PWM level
Trigger Point 2	Read only	
Trigger Temperature	60	Specifies the temperature threshold at which the BMC turns on

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Feature	Options	Description
		CPU fan the specified PWM level
PWM Level	40	Select PWM level
Trigger Point 3	Read only	
Trigger Temperature	70	Specifies the temperature threshold at which the BMC turns on CPU fan the specified PWM level
PWM Level	63	Select PWM level
Trigger Point 4	Read only	
Trigger Temperature	80	Specifies the temperature threshold at which the BMC turns on CPU fan the specified PWM level
PWM Level	100	Select PWM level
System Smart Fan1Temperature Source	CPU Sensor System Sensor	Select System smart Fan1Temperature source
System Fan1 Mode	AUTO (Smart Fan) Fan Off Fan On	Select System fan1 mode
Trigger Point 1	Read only	
Trigger Temperature	15	Specifies the temperature threshold at which the BMC turns on the System fan1 with the specified PWM level
PWM Level	30	Select PWM level
Trigger Point 2	Read only	
Trigger Temperature	60	Specifies the temperature threshold at which the BMC turns on System fan1 the specified PWM level
PWM Level	40	Select PWM level
Trigger Point 3	Read only	
Trigger Temperature	70	Specifies the temperature threshold at which the BMC turns on System fan1 the specified PWM level
PWM Level	63	Select PWM level
Trigger Point 4	Read only	
Trigger Temperature	80	Specifies the temperature threshold at which the BMC turns on System fan1 the specified PWM level
PWM Level	100	Select PWM level
System Smart Fan2Temperature Source	CPU Sensor System Sensor	Select System smart Fan2Temperature source
System Fan2 Mode	AUTO (Smart Fan) Fan Off Fan On	Select System fan2 mode
Trigger Point 1	Read only	
Trigger Temperature	15	Specifies the temperature threshold at which the BMC turns on the System fan2 with the specified PWM level
PWM Level	30	Select PWM level
Trigger Point 2	Read only	
Trigger Temperature	50	Specifies the temperature threshold at which the BMC turns on

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Feature	Options	Description
		System fan2 the specified PWM level
PWM Level	40	Select PWM level
Trigger Point 3	Read only	
Trigger Temperature	58	Specifies the temperature threshold at which the BMC turns on System fan2 the specified PWM level
PWM Level	63	Select PWM level
Trigger Point 4	Read only	
Trigger Temperature	65	Specifies the temperature threshold at which the BMC turns on System fan2 the specified PWM level
PWM Level	100	Select PWM level

8.2.4. System Date and Time

Feature	Options	Description
System Date	Weekday, MM/DD/YYYY	Requires the alpha-numeric entry of the day of the week, day of the month, calendar month, and all 4 digits of the year, indicating the century and year (Fri XX/XX/20XX)
System Time	HH/MM/SS	Presented as a 24-hour clock setting in hours, minutes, and seconds

8.3. Advanced

This menu contains the settings for most of the user interfaces in the system

8.3.1. CPU

Feature	Options	Description
CPU	Info only	
Socket0	Info only	Display socket0
Processor Family	Info only	Display processor family
Processor Model	Info only	Display processor model
Max Speed	Info only	Display max. speed
Min Speed	Info only	Display min. speed
Microcode Patch Level	Info only	Display microcode patch level
Cache per Core	Info only	
L1 Instruction Cache	Info only	Display cache info
L1 Data Cache	Info only	Display cache info
L2 Cache	Info only	Display cache info
L3 Cache	Info only	Display cache info
Module Version	Info only	Display CPU Module Version

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Feature	Options	Description
AGESA Version	Info only	Display AGESA Version
PSS Support	Disabled Enabled	Enable/disable the generation of ACPI _PPC, _PSS, and _PCT objects.
PSTATE Adjustment	PState 0 PState 1 PState 2 PState 3 PState 4 PState 5 PState 6 PState 7	Provide to adjust startup P-state level.
PPC Adjustment	PState 0 PState 1 PState 2 PState 3 PState 4	Provide to adjust _PPC object.
SVM Mode	Disabled Enabled	Enable/disable CPU Virtualization
C6 Mode	Disabled Enabled	Enable/disable C6

8.3.2. Memory

Feature	Options	Description
North Bridge Configuration	Info only	
Memory Information	Info only	
Total Memory	Info only	Display total memory
DIMM#0/1	Info only	Display DIMM#0/1
Memory Clock	Auto 800MHz 1066MHz 1333MHz 1600MHz 1866MHz	This Option Allows User to select different Memory Clock. Default value is 800Mhz.

8.3.3. Graphics

Feature	Options	Description
Graphics	Info only	
IGD VBIOS Version	Info only	
IOMMU	Disabled Enabled	Enable/Disable IOMMU Support
Integrated Graphics	Auto Disabled Force	Enable Integrate Graphics Controller

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Feature	Options	Description
Primary Video Adaptor	Auto Int Graphics (IGD) Ext Graphics (PEG)	Select Internal/External Graphics
PSPP Policy	Disabled Performance Balanced-High Balanced-Low Power Saving	PCIe Speed Power Policy
DDI port detection	Disabled Enabled	DDI port detection
Lamar DP0 OutputMode	DP Mode Disabled	Lamar First Display Port Output Mode
Lamar DP1 OutputMode	DP Mode Disabled	Lamar Second Display Port Output Mode
Lamar DP2 OutputMode	DP Mode Disabled	Lamar Third Display Port Output Mode
DP PORT2 Ouput Type	DP LVDS	DP PORT2 Ouput Type control funciton.

8.3.4. SATA

Feature	Options	Description
SATA	Info only	
OnChip SATA Channel	Disabled Enabled	
OnChip SATA Type	Native IDE AHCI Legacy IDE AHCI as ID 7804	Native IDE AHCI Legacy IDE AHCI as ID 7804
OnChip IDE Mode	Legacy mode Native mode	
SATA PortX	Info only	
ESATA PORT on PORTX	Disabled Enabled	SATA port X support ESATA Enable/disable
SATA Power on PORTX	Enabled Power Down	SATA port Power Enable/disable
SATA PORTX MODE	Auto GEN1 GEN2	

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

8.3.5. USB

Feature	Options	Description
USB	Info only	
USB Module Version	Info only	
USB Devices	Info only	Drives, keyboards, mouse, hubs
Legacy USB Support	Enabled Disabled Auto	Enables legacy USB support. Auto option disables legacy support if no USB devices are connected. Disable option will keep USB devices available only for EFI applications and setup.
XHCI Hand-off	Enabled Disabled	This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by the XHCI OS driver.
EHCI Hand-off	Disabled Enabled	This is a workaround for OSes without EHCI hand-off support. The EHCI ownership change should be claimed by the EHCI OS driver.
USB Mass Storage Driver Support	Disabled Enabled	Enable/Disable USB mass storage driver support.
SB USB Configuration	Submenu	
USB hardware delays and time-outs:	Info only	
USB transfer time-out	1 sec 5 sec 10 sec 20 sec	The time-out value for control, bulk, and interrupt transfers
Device reset time-out	10 sec 20 sec 30 sec 40 sec	USB mass storage device Start Unit command time-out.
Device power-up delay	Auto Manual	Maximum time the device will take before it properly reports itself to the Host Controller. 'Auto' uses default value: for a Root port it is 100 ms, for a Hub port the delay is taken from Hub descriptor.
Mass Storage Devices	Info only	List current USB mass storage devices.

8.3.6. Network

Feature	Options	Description
Network	Info only	
Network Stack	Disabled Enabled	Enable/Disable UEFI network stack.
UEFI PXE Driver	Disabled Enabled	Enable/Disable UEFI PXE Driver.
LAN1 device enable/disable	Disabled Enabled	LAN1 device enable/disable
LAN2 device enable/disable	Disabled Enabled	LAN2 device enable/disable

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

8.3.7. PCI and PCIe

Feature	Options	Description
PCI Bus Driver Version	Info only	
PCI Common Settings	Info only	
PCI Latency Timer	32 PCI Bus Clocks 64 PCI Bus Clocks 96 PCI Bus Clocks 128 PCI Bus Clocks 160 PCI Bus Clocks 192 PCI Bus Clocks 224 PCI Bus Clocks 248 PCI Bus Clocks	Value to be programmed into PCI Latency Timer Register.
VGA Palette Snoop	Disabled Enabled	Enables or Disables VGA Palette Registers Snooping.
PERR# Generation	Disabled Enabled	Enables or Disables PCI Device to Generate PERR#.
SERR# Generation	Disabled Enabled	Enables or Disables PCI Device to Generate SERR#.
PCI Express Settings	Submenu	
PCI Express GEN 2 Settings	Submenu	
SB GPP Port Configuration	Submenu	

8.3.7.1. PCI and PCIe > PCIe Configuration

Feature	Options	Description
PCI Express Device Register Settings	Info only	
Relaxed Ordering	Disabled Enabled	Enables or Disables PCI Express device relaxed ordering.
Extended Tag	Disabled Enabled	If Enabled, allows device to use 8-bit tag field as a requester.
No Snoop	Disabled Enabled	Enables or Disables PCI Express device No Snoop option.
Maximum Payload	Auto 128 Bytes 256 Bytes 512 Bytes 1024 Bytes 2048 Bytes 4096 Bytes	Set maximum payload of PCI Express device or allow system BIOS to select the value.
Maximum Read Request	Auto 128 Bytes 256 Bytes 512 Bytes 1024 Bytes 2048 Bytes 4096 Bytes	Set maximum read request size of PCI Express device or allow system BIOS to select the value.
PCI Express Link Register Settings	Info only	
ASPM Support WARNING: Enabling ASPM may cause some	Disabled Auto Force L0s	Set the ASPM Level: Force L0s - Force all links to L0s Auto - BIOS auto configure Disabled - Disables ASPM

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

PCI-E devices to fail		
Extended Synch	Disabled Enabled	If enabled, allows generation of Extended Synchronization patterns.
Link Training Retry	Disable 2 3 5	Defines number of retry attempts software will take to retrain the link if previous training attempt was unsuccessful.
Link Training Timeout (Us)	100	Defines number of microseconds software will wait before polling 'Link Training' bit in Link Status register. Value range from 10 to 10000 uS.
Unpopulated Links	Keep Link ON Disabled	In order to save power, software will disable unpopulated PCI Express links if this option set to Disabled.
Restore PCIE Registers	Enabled Disabled	On non-PCI Express aware OSes (pre Windows Vista) some devices may not be correctly reinitialized after S3. Enabling this restores PCI Express device configurations on S3 resume. Warning: Enabling this may cause issues with other hardware after S3 resume.

8.3.7.2. PCI and PCIe > PCI Express GEN 2 Settings

Feature	Options	Description
PCI Express Port x	Info only	
Completion Timeout	Default Shorter Longer Disabled	In device Functions that support Completion Timeout programmability, allows system software to modify the Completion Timeout value. 'Default' 50us to 50ms. If 'Shorter' is selected, software will use shorter timeout ranges supported by hardware. If 'Longer' is selected, software will use longer timeout ranges.
ARI Forwarding	Disabled Enabled	If supported by hardware and set to 'Enabled', the Downstream Port disables its traditional Device Number field being 0 enforcement when turning a Type1 Configuration Request into a Type0 Configuration Request, permitting access to Extended Functions in an ARI Device immediately below the Port. Default value: Disabled
AtomicOp Requester Enable	Disabled Enabled	If supported by hardware and set to 'Enabled', this function initiates AtomicOp Requests only if Bus Master Enable bit is in the Command Register Set.
AtomicOp Egress Blocking	Disabled Enabled	If supported by hardware and set to 'Enabled', outbound AtomicOp Requests via Egress Ports will be blocked.
IDO Request Enable	Disabled Enabled	If supported by hardware and set to 'Enabled', this permits setting the number of ID-Based Ordering (IDO) bit (Attribute[2]) requests to be initiated.
IDO Completion Enable	Disabled Enabled	If supported by hardware and set to 'Enabled', this permits setting the number of ID-Based Ordering (IDO) bit (Attribute[2]) requests to be initiated.
LTR Mechanism Enable	Disabled Enabled	If supported by hardware and set to 'Enabled', this enables the Latency Tolerance Reporting (LTR) Mechanism.
End-End TLP Prefix Blocking	Disabled Enabled	If supported by hardware and set to 'Enabled', this function will block forwarding of TLPs containing End-End TLP Prefixes.
PCI Express GEN2 Link Register Settings	Info only	
Target Link Speed	Auto Force to 2.5 GT/s Force to 5.0 GT/s	If supported by hardware and set to 'Force to 2.5 GT/s' for Downstream Ports, this sets an upper limit on Link operational speed by restricting the values advertised by the Upstream component in its training sequences. When 'Auto' is selected

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Feature	Options	Description
		HW initialized data will be used.
Clock Power Management	**Disabled** Enabled	If supported by hardware and set to 'Enabled', the device is permitted to use CLKREQ# signal for power management of Link clock in accordance to protocol defined in appropriate form factor specification.
Compliance SOS	**Disabled** Enabled	If supported by hardware and set to 'Enabled', this will force LTSSM to send SKP Ordered Sets between sequences when sending Compliance Pattern or Modified Compliance Pattern.
Hardware Autonomous Width	Disabled **Enabled**	If supported by hardware and set to 'Disabled', this will disable the hardware's ability to change link width except width size reduction for the purpose of correcting unstable link operation.
Hardware Autonomous Speed	Disabled **Enabled**	If supported by hardware and set to 'Disabled', this will disable the hardware's ability to change link speed except speed rate reduction for the purpose of correcting unstable link operation.

8.3.7.3. PCI and PCIe > SB GPP Port Configuration

Feature	Options	Description
SB GPP Function	Disabled **Enabled**	
GPP Port Link Configuration	x4 mode 2:2 mode 2:1:1 mode **1:1:1:1 mode**	
GPP Link ASPM	**Disabled** L0s L1 L0s+ L1	
GPP Gen2	Disabled **Enabled**	
UMI Gen2	Disabled **Enabled**	
GPP HW Compliance Mode	**Disabled** Port A Port B Port C Port D	
SB GPP LANE REVERSAL	**Disabled** Enabled	
UMI PHY PLL Power Down	Disabled **Enabled**	
SB GPP PHY PLL Power Down	Disabled **Enabled**	

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

8.3.8. USB

Feature	Options	Description
Super IO	Info only	
IT8783F Super IO Chip	Info only	
Serial Port 1 Configuration Serial Port Device Settings Change Settings	 Enabled Disabled IO=3F8h; IRQ=4 Auto IO=3F8h; IRQ=4 IO=3F8h; IRQ=3,4,5,6,7,10,11,12 IO=2F8h; IRQ=3,4,5,6,7,10,11,12 IO=3E8h; IRQ=3,4,5,6,7,10,11,12 IO=2E8h; IRQ=3,4,5,6,7,10,11,12	 Enable/Disable Serial Port 1 (COM0). Fixed configuration of serial port. Select an optimal setting for Super IO device.
Serial Port 2 Configuration Serial Port Device Settings Change Settings	 Enabled Disabled IO=2F8h; IRQ=3 Auto IO=2F8h; IRQ=3 IO=3F8h; IRQ=3,4,5,6,7,10,11,12 IO=2F8h; IRQ=3,4,5,6,7,10,11,12 IO=3E8h; IRQ=3,4,5,6,7,10,11,12 IO=2E8h; IRQ=3,4,5,6,7,10,11,12	 Enable/Disable Serial Port 2 (COM1). Fixed configuration of serial port. Select an optimal setting for Super IO device.
Serial Port 3 Configuration Serial Port Device Settings Change Settings	 Enabled Disabled IO=3E8h; IRQ=5 Auto IO=3E8h; IRQ=5 IO=3F8h; IRQ=3,4,5,6,7,10,11,12 IO=2F8h; IRQ=3,4,5,6,7,10,11,12 IO=3E8h; IRQ=3,4,5,6,7,10,11,12 IO=2E8h; IRQ=3,4,5,6,7,10,11,12	 Enable/Disable Serial Port 3 (COM2). Fixed configuration of serial port. Select an optimal setting for Super IO device.
Serial Port 4 Configuration Serial Port Device Settings Change Settings	 Enabled Disabled IO=2F8h; IRQ=6 Auto IO=2E8h; IRQ=6 IO=3F8h; IRQ=3,4,5,6,7,10,11,12 IO=2F8h; IRQ=3,4,5,6,7,10,11,12 IO=3E8h; IRQ=3,4,5,6,7,10,11,12 IO=2E8h; IRQ=3,4,5,6,7,10,11,12	 Enable/Disable Serial Port 4 (COM3). Fixed configuration of serial port. Select an optimal setting for Super IO device.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

8.3.9. ACPI and Power Management

Feature	Options	Description
ACPI and Power Management	Info only	
Enable ACPI Auto Configuration	Disabled Enabled	Enables or disables BIOS ACPI Auto Configuration.
Enable Hibernation	Disabled Enabled	Enables or disables system's ability to hibernate (OS/S4 Sleep State). This option may be not effective with some OSes.
ACPI Sleep State	Suspend Disabled S3 only (Suspend to RAM)	Select the highest ACPI sleep state the system will enter when the Suspend button is pressed.
Lock Legacy Resources	Disabled Enabled	Enables or Disables Lock of Legacy Resources

8.3.10. Sound

Feature	Options	Description
Sound	Info only	
HD Audio Azalia Device	Auto Disabled Enabled	Control detection of the Azalia device. Disabled = Azalia will be unconditionally disabled. Enabled = Azalia will be unconditionally enabled. Auto = Azalia will be enabled if present, disabled otherwise.
Azalia Snoop	Disabled Enabled	Enable/Disable Azalia docking support of audio controller.

8.3.11. Serial Port Console

Feature	Options	Description
Serial Port Console	Info only	
COM0	Info only	
Console Redirection	Disabled Enabled	Console Redirection enable or disable.
Console Redirection Settings	Submenu	The settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.

8.3.11.1. Serial Port Console > Console Redirection Settings

Feature	Options	Description
COM0 Console Redirection Settings	Info only	
Terminal Type	VT100 VT100+ VT-UTF8 ANSI	VT100: ASCII char set. VT100+: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes. ANSI: Extended ASCII char set.
Bits per second	9600 19200 38400	Selects serial port transmission speed. The speed must be matched on the remote computer. Long or noisy lines may require lower speeds.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Feature	Options	Description
	57600 115200	
Data Bits	7 8	Select data bits.
Parity	None Even Odd Mark Space	Select parity.
Stop Bits	1 2	Select number of stop bits.
Flow Control	None Hardware RTS/CTS	Select flow control.
VT-UTF8 Combo Key Support	Disabled Enable	Enable VT-UTF8 combination key support for ANSI/VT100 terminals.
Recorder Mode	Disabled Enable	With this mode enabled only text will be sent. This is to capture terminal data.
Resolution 100x31	Disabled Enable	Enables or disables extended terminal resolution
Legacy OS Redirection	80x24 80x25	On legacy OSes, the number of rows and columns supported by redirection
Putty KeyPad	VT100 LINUX XTERMR6 SCO ESCN VT400	Select FunctionKey and KeyPad on Putty.
Redirection After BIOS Post	Always Enabled BootLoader	The Settings specify if BootLoader is selected, then legacy console redirection is disabled before booting to legacy OS. Default value is Always Enable which means legacy console redirection is enabled for legacy OS.

8.3.12. Trusted Computing

Feature	Options	Description
Configuration	Info only	
Security Device Support	Disabled Enabled	Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
Current Status Information	Info only	

8.3.13. Thermal

Feature	Options	Description
Thermal	Info only	
Active Cooling Trip Point	Disabled 40 C 50 C 60 C 70 C BMC Default	This value is the temperature threshold of the Active Cooling Trip Point.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Passive Cooling Trip Point	Disabled 70 C 80 C	This value is the temperature threshold of the Passive Cooling Trip Point.
Critical Trip Point	Disabled 65 C 75 C 85 C	This value is the temperature threshold of the Critical Trip Point.
Watchdog ACPI Event Shutdown	Disabled Enabled	Watchdog ACPI Event Shutdown Enabled/Disabled

8.3.14. Miscellaneous

Feature	Options	Description
Miscellaneous	Info only	
Chassis Intrusion Support	Enabled Disabled	Chassis Intrusion Support
Beep Control	Enabled Disabled	Beep Control

8.4. Boot

8.4.1. Boot Configuration

Feature	Options	Description
Boot Configuration	Info only	
Setup Prompt Timeout	1	Number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting.
Bootup NumLock State	On Off	Select the keyboard NumLock state.
Quiet Boot	Disabled Enabled	Enable or disables Quiet Boot option.
Fast Boot	Disabled Enabled	Enables or disables boot with initialization of a minimal set of devices required to launch active boot option. Has no effect on BBS boot options.
Boot Option Priorities	Info only	
Hard Drive BBS Priorities	Info only	
CSM16 Parameters	Submenu	CSM16 configuration:GateA20 Active, Option ROM Message,Int19 Trap Response, etc.
CSM Parameters	Submenu	CSM configuration: Enable/Disable, Option ROM execution settings, etc.

8.4.1.1. Boot Configuration > CSM16 Parameters

Feature	Options	Description
CSM16 Parameters	Info	

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Feature	Options	Description
CSM16 Module Version	Info only	
GataA20 Active	Upon Request Always	Upon Request – GA20 can be disabled using BIOS services. Always – do not allow disabling of GA20; this option is useful when any RT code is executed above 1MB.
Option ROM Messages	Force BIOS Keep Current	Set display mode for Option ROM.
INT19 Trap Response	Immediate Postponed	BIOS reaction on INT19 trapping by Option ROM: Immediate - execute the trap right away; Postponed – execute the trap during legacy boot.

8.4.1.2. Boot Configuration > CSM Parameters

Feature	Options	Description
Launch CSM	Enabled Disable	Launch CSM
Boot option filter	UEFI and Legacy Legacy only UEFI only	This option controls what devices system can boot to
Launch PXE OpROM policy	Do not launch UEFI only Legacy only	Controls the execution of UEFI and Legacy PXE OpROM
Launch Storage OpROM policy	Do not launch UEFI only Legacy only	Controls the execution of UEFI and Legacy Storage OpROM
Launch Video OpROM policy	Do not launch UEFI only Legacy only	Controls the execution of UEFI and Legacy Video OpROM
Other PCI device ROM priority	UEFI OpROM Legacy OpROM	For PCI devices other than Network, Mass storage or Video defines which OpROM to launch

8.5. Security

8.5.1. Password Description

Feature	Options	Description
Administrator Password	Enter password	
User Password	Enter password	
Secure Boot menu	Submenu	Customizable Secure Boot settings.

8.5.1.1. Secure Boot Menu

Feature	Options	Description
System Mode	Setup	
Secure Boot	Info only	
Secure Boot	Disabled Enabled	Secure Boot can be enabled if: 1. System running in User mode with enrolled Platform Key (PK)

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

		2. CSM function is disabled.
Secure Boot Mode	Standard Custom	Secure Boot mode selector. 'Custom' Mode enables users to change Image Execution policy and manage Secure Boot keys.

8.6. Save & Exit

Feature	Options	Description
Save Changes and Exit	Yes No	Exit system setup after saving the changes.
Discard Changes and Exit	Yes No	Exit system setup without saving any changes.
Save Changes and Reset	Yes No	Reset the system after saving the changes.
Discard Changes and Reset	Yes No	Reset system setup without saving any changes.
Save Options	Info only	
Save Changes	Yes No	Save Changes done so far to any of the setup options.
Discard Changes	Yes No	Discard Changes done so far to any of the setup options.
Restore Defaults	Yes No	Restore/Load Default values for all the setup options.
Save as User Defaults	Yes No	Save the changes done so far as User Defaults.
Restore User Defaults	Yes No	Restore the User Defaults to all the setup options.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Safety Instructions

Read and follow all instructions marked on the product and in the documentation before you operate your system. Retain all safety and operating instructions for future use.

- Please read these safety instructions carefully.
- Please keep this User's Manual for later 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 the 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.
  - 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.



CAUTION

Risk of explosion if battery is replaced with one of an incorrect type. Dispose of used batteries according to their instructions.

- 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.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Getting Service

ADLINK Technology, Inc.
Address: 9F, No.166 Jian Yi Road, Zhonghe District
New Taipei City 235, Taiwan
Tel: +886-2-8226-5877
Fax: +886-2-8226-5717
Email: service@adlinktech.com

Ampro ADLINK Technology, Inc.
Address: 5215 Hellyer Avenue, #110, San Jose, CA 95138, USA
Tel: +1-408-360-0200
Toll Free: +1-800-966-5200 (USA only)
Fax: +1-408-360-0222
Email: info@adlinktech.com

ADLINK Technology (China) Co., Ltd.
Address: 300 Fang Chun Rd., Zhangjiang Hi-Tech Park, Pudong New Area
Shanghai, 201203 China
Tel: +86-21-5132-8988
Fax: +86-21-5132-3588
Email: market@adlinktech.com

ADLINK Technology Beijing
Address: Rm. 801, Power Creative E, No. 1, B/D, Shang Di East Rd.
Beijing, 100085 China
Tel: +86-10-5885-8666
Fax: +86-10-5885-8625
Email: market@adlinktech.com

ADLINK Technology Shenzhen
Address: 2F, C Block, Bldg. A1, Cyber-Tech Zone, Gao Xin Ave. Sec. 7, High-Tech Industrial Park S.
Shenzhen, 518054 China
Tel: +86-755-2643-4858
Fax: +86-755-2664-6353
Email: market@adlinktech.com

LiPPERT ADLINK Technology GmbH
Address: Hans-Thoma-Strasse 11, D-68163, Mannheim, Germany
Tel: +49-621-43214-0
Fax: +49-621 43214-30
Email: emea@adlinktech.com

PENTA ADLINK Technology GmbH
Ulrichsbergerstrasse 17
94469 Deggendorf, Germany
Tel: +49 (0) 991 290 94 – 10
Fax: +49 (0) 991 290 94 - 29
Email: emea@adlinktech.com

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

ADLINK Technology, Inc. (French Liaison Office)
Address: 6 allée de Londres, Immeuble Ceylan
91940 Les Ulis, France
Tel: +33 (0) 1 60 12 35 66
Fax: +33 (0) 1 60 12 35 66
Email: france@adlinktech.com

ADLINK Technology Japan Corporation
Address: KANDA374 Bldg. 4F, 3-7-4 Kanda Kajicho, Chiyoda-ku
Tokyo 101-0045, Japan
Tel: +81-3-4455-3722
Fax: +81-3-5209-6013
Email: japan@adlinktech.com

ADLINK Technology, Inc. (Korean Liaison Office)
Address: 2F, Kyungdong B/D, 4 Sunae-ro 46 beon-gil
Bundang-gu, Seongnam-si, Gyeonggi-do, Korea, 13595
Toll Free +82-80-800-0585
Tel +82-31-786-0585
Fax +82-31-786-0583
Email: korea@adlinktech.com

ADLINK Technology Singapore Pte. Ltd.
Address: 84 Genting Lane #07-02A, Cityneon Design Centre
Singapore 349584
Tel: +65-6844-2261
Fax: +65-6844-2263
Email: singapore@adlinktech.com

ADLINK Technology Singapore Pte. Ltd. (Indian Liaison Office)
Address: #50-56, First Floor, Spearhead Towers
Margosa Main Road (between 16th/17th Cross), Malleswaram
Bangalore - 560 055, India
Tel: +91-80-65605817, +91-80-42246107
Fax: +91-80-23464606
Email: india@adlinktech.com

ADLINK Technology, Inc. (Israeli Liaison Office)
Address: 27 Maskit St., Corex Building
PO Box 12777
Herzliya 4673300, Israel
Tel: +972-77-208-0230
Fax: +972-77-208-0230
Email: israel@adlinktech.com

ADLINK Technology, Inc. (UK Liaison Office)
Tel: +44 774 010 59 65
Email: UK@adlinktech.com

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000