USER GUIDE

mITX-BYT

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MITX-BYT - USER GUIDE

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Revision History

Revision	Brief Description of Changes	Date of Issue
1.0	Initial Issue	2018-May-15
1.1	Add a LPS power supply notice in Sec. 2.1	2020-May-05
1.2	Update Ethernet controller	2021-Jul-21
1.3	Update audio codec	2022-Feb-25

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Symbols

The following symbols may be used in this user guide

⚠DANGER	DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.
⚠WARNING	WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.
NOTICE	NOTICE indicates a property damage message.
⚠CAUTION	CAUTION indicates a hazardous situation which, if not avoided, may result in minor or moderate injury.
	Electric Shock! This symbol and title warn of hazards due to electrical shocks (> 60 V) when touching products or parts of products. Failure to observe the precautions indicated and/or prescribed by the law may endanger your life/health and/or result in damage to your material.
	ESD Sensitive Device! This symbol and title inform that the electronic boards and their components are sensitive to static electricity. Care must therefore be taken during all handling operations and inspections of this product in order to ensure product integrity at all times.
	HOT Surface! Do NOT touch! Allow to cool before servicing.
	Laser! This symbol inform of the risk of exposure to laser beam and light emitting devices (LEDs) from an electrical device. Eye protection per manufacturer notice shall review before servicing.
	This symbol indicates general information about the product and the user guide. This symbol also indicates detail information about the specific product configuration.
	This symbol precedes helpful hints and tips for daily use.

For Your Safety

Your new Kontron product was developed and tested carefully to provide all features necessary to ensure its compliance with electrical safety requirements. It was also designed for a long fault-free life. However, the life expectancy of your product can be drastically reduced by improper treatment during unpacking and installation. Therefore, in the interest of your own safety and of the correct operation of your new Kontron product, you are requested to conform with the following guidelines.

High Voltage Safety Instructions

As a precaution and in case of danger, the power connector must be easily accessible. The power connector is the product's main disconnect device.

⚠CAUTION

Warning

All operations on this product must be carried out by sufficiently skilled personnel only.

⚠CAUTION

Electric Shock!

Before installing a non hot-swappable Kontron product into a system always ensure that your mains power is switched off. This also applies to the installation of piggybacks. Serious electrical shock hazards can exist during all installation, repair, and maintenance operations on this product. Therefore, always unplug the power cable and any other cables which provide external voltages before performing any work on this product.

Earth ground connection to vehicle's chassis or a central grounding point shall remain connected. The earth ground cable shall be the last cable to be disconnected or the first cable to be connected when performing installation or removal procedures on this product.

Special Handling and Unpacking Instruction

NOTICE

ESD Sensitive Device!

Electronic boards and their components are sensitive to static electricity. Therefore, care must be taken during all handling operations and inspections of this product, in order to ensure product integrity at all times.

Do not handle this product out of its protective enclosure while it is not used for operational purposes unless it is otherwise protected.

Whenever possible, unpack or pack this product only at EOS/ESD safe work stations. Where a safe work station is not guaranteed, it is important for the user to be electrically discharged before touching the product with his/her hands or tools. This is most easily done by touching a metal part of your system housing.

It is particularly important to observe standard anti-static precautions when changing piggybacks, ROM devices, jumper settings etc. If the product contains batteries for RTC or memory backup, ensure that the product is not placed on conductive surfaces, including anti-static plastics or sponges. They can cause short circuits and damage the batteries or conductive circuits on the product.

Lithium Battery Precautions

If your product is equipped with a lithium battery, take the following precautions when replacing the battery.

⚠CAUTION

Danger of explosion if the battery is replaced incorrectly.

- Replace only with same or equivalent battery type recommended by the manufacturer.
- Dispose of used batteries according to the manufacturer's instructions.

General Instructions on Usage

In order to maintain Kontron's product warranty, this product must not be altered or modified in any way. Changes or modifications to the product, that are not explicitly approved by Kontron and described in this user guide or received from Kontron Support as a special handling instruction, will void your warranty.

This product should only be installed in or connected to systems that fulfill all necessary technical and specific environmental requirements. This also applies to the operational temperature range of the specific board version that must not be exceeded. If batteries are present, their temperature restrictions must be taken into account.

In performing all necessary installation and application operations, only follow the instructions supplied by the present user guide.

Keep all the original packaging material for future storage or warranty shipments. If it is necessary to store or ship the product then re-pack it in the same manner as it was delivered.

Special care is necessary when handling or unpacking the product. See Special Handling and Unpacking Instruction.

Quality and Environmental Management

Kontron aims to deliver reliable high-end products designed and built for quality, and aims to complying with environmental laws, regulations, and other environmentally oriented requirements. For more information regarding Kontron's quality and environmental responsibilities, visit http://www.kontron.com/about-kontron/corporate-responsibility/quality-management.

Disposal and Recycling

Kontron's products are manufactured to satisfy environmental protection requirements where possible. Many of the components used are capable of being recycled. Final disposal of this product after its service life must be accomplished in accordance with applicable country, state, or local laws or regulations.

WEEE Compliance

The Waste Electrical and Electronic Equipment (WEEE) Directive aims to:

- Reduce waste arising from electrical and electronic equipment (EEE)
- Make producers of EEE responsible for the environmental impact of their products, especially when the product become waste
- Encourage separate collection and subsequent treatment, reuse, recovery, recycling and sound environmental disposal of EEE
- Improve the environmental performance of all those involved during the lifecycle of EEE

Environmental protection is a high priority with Kontron.

Kontron follows the WEEE directive

You are encouraged to return our products for proper disposal.

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1/ Introduction

This user guide describe the mITX-BYT board made by Kontron. This board will also be denoted mITX-BYT within this user guide.

Use of this user guide implies a basic knowledge of PC-AT hardware and software. This user guide focuses on describing the mITX-BYT board's special features and is not intended to be a standard PC-AT textbook.

New users are recommended to study the short installation procedure stated in the following chapter before switching on the power.

All configuration and setup of the CPU board is either carried out automatically or manually by the user via the BIOS setup menus.

Latest revision of this user guide, datasheet, thermal simulations, BIOS, drivers, BSP's (Board Support Packages), mechanical drawings (2D and 3D) can de download from Kontron's Web Page.

2/ Installation Procedures

2.1. Installing the Board

NOTICE

ESD Sensitive Device

Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry.

- Wear ESD-protective clothing and shoes
- Wear an ESD-preventive wrist strap attached to a good earth ground
- Check the resistance value of the wrist strap periodically (1 MΩ to 10 MΩ)
- Transport and store the board in its antistatic bag
- Handle the board at an approved ESD workstation
- Handle the board only by the edges

To get the board running follow these steps. If the board shipped from KONTRON already has components like RAM and CPU cooler mounted, then skip the relevant steps below.

1. **Turn off the PSU (Power Supply Unit)**

NOTICE

Turn off PSU (Power Supply Unit) completely (no mains power connected to the PSU) or leave the Power Connectors unconnected while configuring the board. Otherwise, components (RAM, LAN cards etc.) might get damaged. Make sure to use +12 V DC single supply only. Alternatively, use a standard ATX PSU with suitable cable kit and PS-ON# active.

NOTICE

The power supply unit shall comply with the requirements as defined in IEC 62368-1 according Clause 6.2.2 to power source category PS2 "Limited Power Source".

2. **Insert the DDR3L 1333 / 1067 module(s)**

   Be careful to push the memory module in the slot(s) before locking the tabs.

3. **Connecting interfaces**

   Insert all external cables for hard disk, keyboard etc. A monitor must be connected in order to change BIOS settings.

4. **Connect and turn on PSU**

   Connect PSU to the board by the +12 V 3.0mm pitch 2x2-pin wafer connector or +12 V ~ +24 V DC jack.

5. **BIOS setup**

   Enter the BIOS setup by pressing the <DEL> key during boot up.

   Enter "Exit Menu" and Load Setup Defaults.

To clear all BIOS setting, including Password protection, activate "Clear CMOS Jumper" for 10 sec (without power connected).

6. **Mounting the board in chassis**

NOTICE

When mounting the board to chassis etc. please note that the board contains components on both sides of the PCB that can easily be damaged if board is handled

without reasonable care. A damaged component can result in malfunction or no function at all.

When fixing the board on a chassis, it is recommended to use screws with an integrated washer and a diameter of > 7 mm. Do not use washers with teeth, as they can damage the PCB and cause short circuits.

2.2. Chassis Safety Standards

Before installing the mITX-BYT in the chassis, users must evaluate the end product to ensure compliance with the requirements of the IEC60950-1 safety standard:

- The board must be installed in a suitable mechanical, electrical and fire enclosure.
- The system, in its enclosure, must be evaluated for temperature and airflow considerations.
- The board must be powered by a CSA or UL approved power supply that limits the maximum input current.
- For interfaces having a power pin such as external power or fan, ensure that the connectors and wires are suitably rated. All connections from and to the product shall be with SELV circuits only.
- Wires have suitable rating to withstand the maximum available power.
- The peripheral device enclosure fulfils the IEC60950-1 fire protecting requirements.

2.3. Lithium Battery Replacement

If replacing the lithium battery follow the replacement precautions stated in the notification below:

⚠CAUTION

Danger of explosion if the lithium battery is incorrectly replaced.

- Replace only with the same or equivalent type recommended by the manufacturer
- Dispose of used batteries according to the manufacturer's instructions

VORSICHT! Explosionsgefahr bei unsachgemäßem Austausch der Batterie.

- Ersatz nur durch denselben oder einen vom Hersteller empfohlenen gleichwertigen Typ
- Entsorgung gebrauchter Batterien nach Angaben des Herstellers

ATTENTION! Risque d'explosion avec l'échange inadéquat de la batterie.

- Remplacement seulement par le même ou un type équivalent recommandé par le producteur
- L'évacuation des batteries usagées conformément à des indications du fabricant

PRECAUCION! Peligro de explosión si la batería se sustituye incorrectamente.

- Sustituya solamente por el mismo o tipo equivalente recomendado por el fabricante
- Disponga las baterías usadas según las instrucciones del fabricante

ADVARSEL! Lithiumbatteri – Eksplosionsfare ved fejlagtig håndtering.

- Udskiftning må kun ske med batteri af samme fabrikat og type
- Levér det brugte batteri tilbage til leverandøren

ADVARSEL! Eksplosjonsfare ved feilaktig skifte av batteri.

- Benytt samme batteritype eller en tilsvarende type anbefalt av apparatfabrikanten
- Brukte batterier kasseres i henhold til fabrikantens instruksjoner

VARNING! Explosionsfara vid felaktigt batteribyte.

- Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren
- Kassera använt batteri enligt fabrikantens instruktion

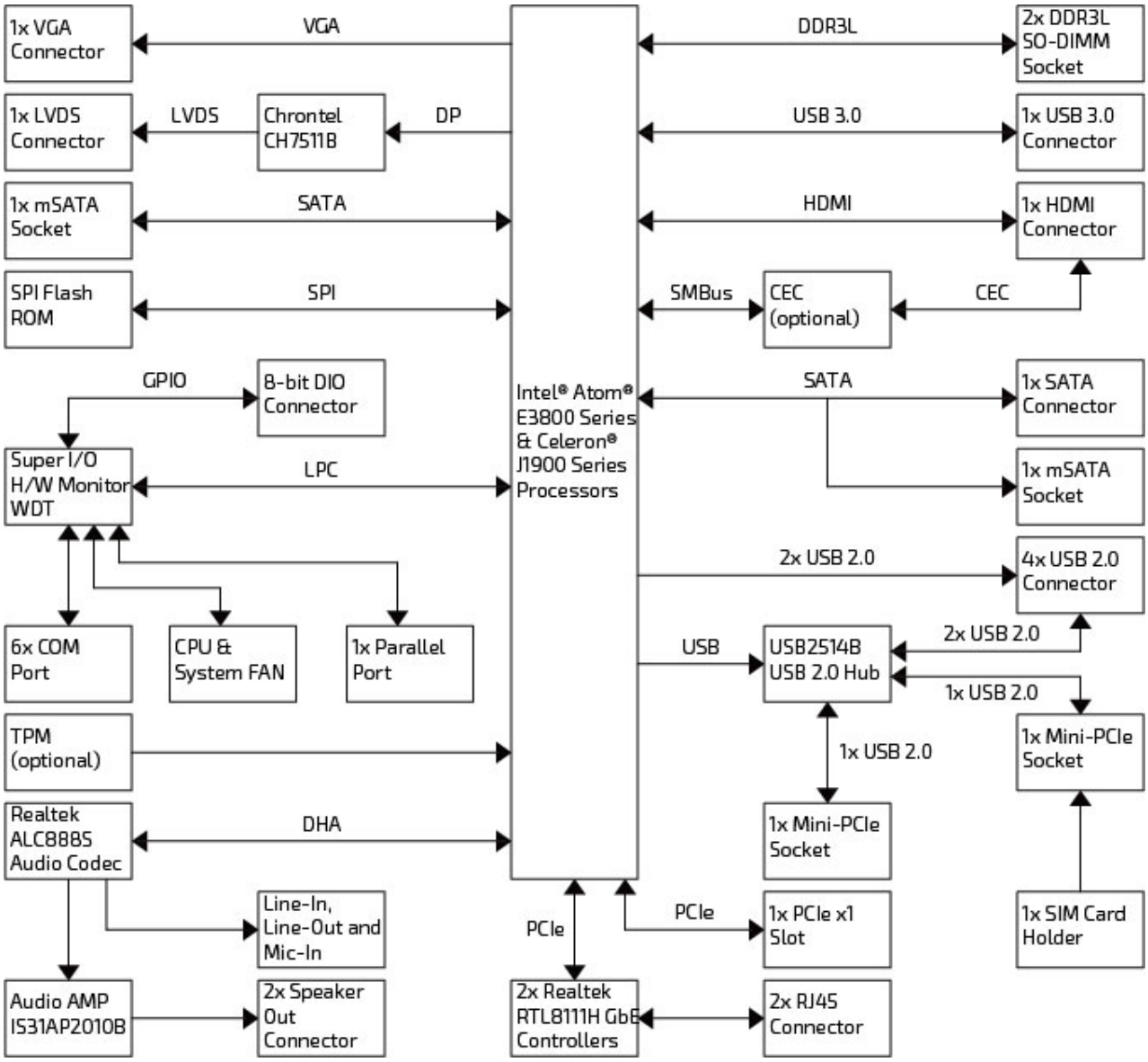
VAROITUS! Paristo voi räjähtää, jos se on virheellisesti asennettu.

- Vaihda paristo ainoastaan lalteval- mistajan suosittelemaan tyyppiln
- Hävitä käytetty paristo valmistajan ohjeiden mukaisesti

3/ System Specifications

3.1. System Block Diagram

Figure 1: System Block Diagram mITX-BYT



3.2. Component Main Data

The table below summarizes the features of the mITX-BYT motherboard.

Table 1: Component Main Data

System	
Processor	Intel® Atom® E3800 Series & Celeron® J1900 Series Processors
Memory	1x / 2x DDR3L SO-DIMM memory socket
Video	
Display Interface	▶ 1x LVDS (24-bit, 2-ch) ▶ 1x HDMI (on rear, 1920 x 1080 @ 60 Hz) ▶ 1x VGA (on rear, 2560 x 1600 @ 60 Hz)
Multiple Display	Dual
Audio	
Audio Codec	Realtek ALC888S
Audio Interface	▶ 2x Speaker-out (3 W) ▶ 1x Line-out (on rear) ▶ 1x Mic-in (on rear)
Network Connection	
Ethernet	2x GbE LAN (RJ45 on rear, Realtek RTL8111H)
Peripheral Connection	
USB	▶ 1x USB 3.0 (Type A on rear) ▶ 5x USB 2.0 (4x Type A on rear, 1x by header)
Serial Port	▶ 2x RS232/422/485 (DB9 on rear, w/ power selection) ▶ 4x RS232 (by header, w/ power selection)
Other I/Os	▶ 1x PS/2 Keyboard / Mouse (by header) ▶ 1x 8-bit DIO (by header) ▶ 1x Parallel Port (by header)
Storage & Expansion	
Storage & Expansion	▶ 1x SATA ▶ 1x mSATA (full size) ▶ 1x mPCIe (half size) ▶ 1x PCIe x1 ▶ 1x SIM Card Cage
Power	
Connector & Input Voltage	▶ Lockable DC Jack (on rear, DC 12 V ~ 24 V) ▶ 2x2-pin ATX Connector (DC 12 V)
Firmware	
BIOS	AMI uEFI BIOS w/ 64 Mb SPI Flash
Watchdog	Programmable WDT to generate system reset event
H/W Monitor	Voltages, Temperatures
Real Time Clock	SoC integrated RTC

TPM	Optional (Infineon SLB 9635 TPM 1.2)
System Control & Monitoring	
FP Header	▶ 1x Header for Reset button, HDD LED & External Speaker ▶ 1x Header for Power button, Power LED, Keyboard Lock & SM bus ▶ 1x Header for mPCIe activity LED
Cooling	
FAN	▶ 1x Wafer for CPU Smart Fan ▶ 1x Wafer for System Smart Fan
Software	
OS Support	Windows 7, Windows 8, Linux
Mechanical	
Dimension (L x W)	Mini-ITX (170 mm x 170 mm / 6.70" x 6.70")

3.3. Environmental Conditions

The mITX-BYT is compliant with the following environmental conditions. It is the customer's responsibility to provide sufficient airflow around each of the components to keep them within the allowed temperature range.

Table 2: Environmental Conditions

Operating Temperature	0 °C ~ 60 °C / 32 °F ~ 140 °F (Standard) -20 °C ~ 70 °C / -4 °F ~ 158 °F (Extended)
Storage Temperature	-20 °C ~ 80 °C / -4 °F ~ 176 °F (Standard) -40 °C ~ 85 °C / -40 °F ~ 185 °F (Extended)
Humidity	0 % ~ 95 %

3.4. Processor Support

The mITX-BYT is designed to support Intel® Atom® E3800 Series & Celeron® J1900 Series Processors. The BGA CPU is pre-mounted from factory. Kontron has defined the board versions as listed in the following table, so far all based on Embedded CPUs. Other versions are expected at a later date.

Table 3: Processor Support

Name	**Core #**	Speed	**Turbo**	Embedded	**Cache**	Socket	**TDP**	Tj
Celeron® J1900	4	2.00 GHz	2.42 GHz	Yes	2M	FCBGA1170	10 W	105 °C
Atom® E3845	4	1.91 GHz	-	Yes	2M	FCBGA1170	10 W	-40 °C ~ 110 °C
Atom® E3825	2	1.33 GHz	-	Yes	1M	FCBGA1170	6 W	-40 °C ~ 110 °C

Sufficient cooling must be applied to the CPU in order to remove the effect as listed as TDP (Thermal Design Power) in above table. The sufficient cooling is also depending on the worst case maximum ambient operating temperature and the actual worst case load of processor.

3.5. System Memory Support

The mITX-BYT has up to two DDR3L SO-DIMM sockets. The sockets support the following memory features:

- 1x DDR3L SO-DIMM 204-pin (for model with Atom® E3825)
- 2x DDR3L SO-DIMM 204-pin (for other models)
- Up to 4GB (for model with Atom® E3825)
- Up to 8GB (for other models)
- SPD timing supported
- ECC not supported

The installed DDR3L SO-DIMM should support the Serial Presence Detect (SPD) data structure. This allows the BIOS to read and configure the memory controller for optimal performance. If non-SPD memory is used, the BIOS will attempt to configure the memory settings, but performance and reliability may be impacted, or the board may not be able to boot totally.

3.5.1. Memory Operating Frequencies

In all modes, the frequency of system memory is the lowest frequency of all the memory modules placed in the system. Each memory module's frequency can be determined through the SPD registers on the memory modules.

The table below lists the resulting operating memory frequencies based on the combination of SO-DIMMs and processor.

Table 4: Memory Operating Frequencies

SO-DIMM Type	Module Name	Memory Data Transfer (MT/s)	Processor System Bus Frequency (MHz)	Resulting Memory Clock Frequency (MHz)	Peak Transfer Rate (MB/s)
DDR3L 1067	PC3-8500	1067	533	133	8533
DDR3L 1333	PC3-10600	1333	667	167	10667

Memory modules have in general a much lower longevity than embedded motherboards, and therefore EOL of modules can be expected several times during lifetime of the motherboard.

As a minimum it is recommend using Kontron memory modules for prototype system(s) in order to prove stability of the system and as for reference.

For volume production you might request to test and qualify other types of RAM. In order to qualify RAM it is recommend configuring 3 systems running RAM Stress Test program in heat chamber at 60° C for a minimum of 24 hours.

3.6. On-board Graphics Subsystem

The mITX-BYT supports Intel® HD Graphics technology for high quality graphics capabilities. All mITX-BYT versions support two displays pipes.

Up to two displays can be used simultaneously and be used to implement independent or cloned display configuration.

Table 5: Two-displays Configurations

Display 1	Display 2	Max. Resolution (Px) at 60 Hz	
		Display 1	Display 2
LVDS	HDMI	1920x1200	1920x1080
LVDS	VGA	1920x1200	2560x1600

Display 1	Display 2	Max. Resolution (Px) at 60 Hz	
		Display 1	Display 2
HDMI	VGA	1920x1080	2560x1600

3.7. Power Supply

In order to ensure safe operation of the board, the input power supply must monitor the supply voltage and shut down if the supply is out of range – refer to the actual power supply specification. Please note, in order to keep the power consumption to a minimal level, boards do not implement a guaranteed minimum load. In some cases, this can lead to compatibility problems with ATX power supplies that require a minimum load to stay in regulation. The mITX-BYT board must be powered either through the ATX+12V-4p (4-pole) connector using standard ATX power supply or through the DC power input jack to a DC 12V ~ 24V power source.

ATX12V supply: ATX+12V-4p connector must be used in according to the ATX12V PSU standard.

NOTICE

Hot Plugging power supply is not supported. Hot plugging might damage the board.

The requirements to the voltages of ATX power supply are as follows:

Table 6: Supply Voltages

Supply	Min.	Max.	Note
+12 V	11.4 V	12.6 V	Should be ±5% for compliance with the ATX specification

4/ Connector Locations

4.1. Top Side

Figure 2: Top Side

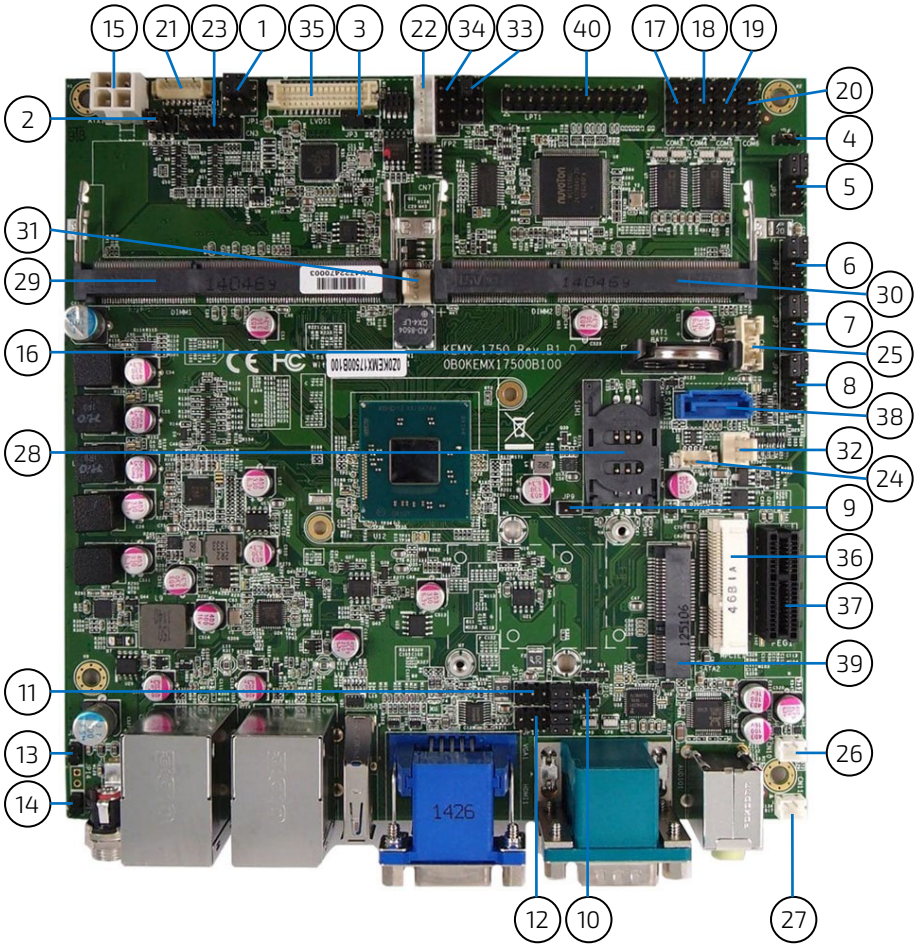


Table 7: Jumper List

Item	Designation	Description	See Chapter
1	JP1	Panel & Backlight Power Selection for LVDS1	7.18.1
2	JP2	Backlight Power Enable Selection for LVDS1	7.18.2
3	JP3	AT / ATX Mode Selection	7.18.3
4	JP4	LVDS1 Backlight DC / PWM Selection	7.18.4
5	JP5	Signal / Power Selection for COM5	7.18.5
6	JP6	Signal / Power Selection for COM6	7.18.5
7	JP7	Signal / Power Selection for COM3	7.18.5
8	JP8	Signal / Power Selection for COM4	7.18.5
9	JP9	ME F/W Selection	7.18.6
10	JP10	MPCIE Activity LED Indication	7.18.7
11	JP11	Signal / Power Selection for COM2	7.18.5
12	JP12	Signal / Power Selection for COM1	7.18.5
13	JP13	USB Power Selection	7.18.8

Item	Designation	Description	See Chapter
14	JP15	RTC Reset Selection	7.18.9

Table 8: Top Side Internal Connector Pin Assignment

Item	Designation	Description	See Chapter
15	ATX1	4-pin ATX Power Input Connector	7.1.1
16	BAT1	CR2032 Battery Holder	7.1.2
17	COM3	RS-232 Port 3 Pin Header	7.8
18	COM4	RS-232 Port 4 Pin Header	7.8
19	COM5	RS-232 Port 5 Pin Header	7.8
20	COM6	RS-232 Port 6 Pin Header	7.8
21	CN1	Panel Backlight Wafer for LVDS1	7.10
22	CN2	Keyboard & Mouse Wafer	7.16
23	CN3	Digital Input / Output Pin Header	7.11
24	CN5	USB2.0 Port USB DN1 Pin Header	7.5
25	CN8	HDD Power Output Wafer	7.4
26	CN10	Right Channel 3W Audio AMP Output Wafer	7.6
27	CN11	Left Channel 3W Audio AMP Output Wafer	7.6
28	SIM1	SIM Interface Wafer for MPCIE1	7.13
29	DIMM1	Primary DDR3 Memory SO-DIMM Socket	3.5
30	DIMM2	Secondary DDR3 Memory SO-DIMM Socket	3.5
31	FAN1	CPU FAN Wafer	7.2
32	FAN2	SYSTEM FAN Wafer	7.2
33	FP1	Front Panel 1 Pin Header	7.7
34	FP2	Front Panel 2 Pin Header	7.7
35	LVDS1	Primary 24-bit, 1-channel LVDS Panel Connector	7.9
36	MPCIE1	Half Size Mini-PCIE Express v1.2 Socket	7.12
37	PEG1	PCIE Express x1Slot	7.15
38	SATA1	Serial ATA Port 0 Connector	7.3
39	SATA2	Serial ATA Port-1 mSATA Socket (Full Size)	7.14
40	LPT1	Parallel Port Pin Header	7.17

4.2. Connector Panel Side

Figure 3: Connector Panel Side

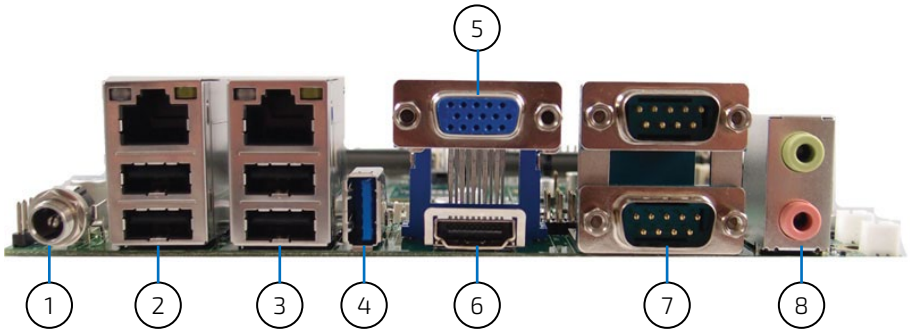


Table 9: Connector Panel Side Connector List

Item	Designation	Description	See Chapter
1	J1	Power Input DC Jack	6.7
2	CN4	LAN1 & USB2.0 Port 0,1 Connector	6.3 & 6.4
3	CN6	LAN2 & USB2.0 Port 2,3 Connector	6.3 & 6.4
4	USB1	USB3.0 Port 0 Connector	6.4
5	VGA1	VGA Connector	6.2
6	HDMI1	HDMI Connector	6.1
7	CN9	RS-232 / 422 / 485 Port 1, 2 Connector	6.5
8	AUDIO1	2 Stack-up Azalia Audio Phone Jack	6.6

5/ Connector Definitions

The following defined terms are used within this user guide to give more information concerning the pin assignment and to describe the connector's signals.

Defined Term	Description
Pin	Shows the pin numbers in the connector
Signal	The abbreviated name of the signal at the current pin The notation "XX#" states that the signal "XX" is active low
Note	Special remarks concerning the signal
Designation	Type and number of item described
See Chapter	Number of the chapter within this user guide containing a detailed description

The abbreviation TBD is used for specifications that are not available yet or which are not sufficiently specified by the component vendors.

6/ I/O-Area Connectors

6.1. HDMI Connector (HDMI1)

The HDMI connector is based on standard HDMI type A.

Figure 4: HDMI Connector HDMI1

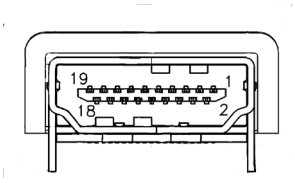


Table 10: Pin Assignment HDMI Connector HDMI1

Pin	Signal	Description	Note
1	TMDS Data2+		
2	Ground		
3	TMDS Data2–		
4	TMDS Data1+		
5	Ground		
6	TMDS Data1–		
7	TMDS Data0+		
8	Ground		
9	TMDS Data0–		
10	TMDS Clock+		
11	Ground		
12	TMDS Clock–		
13	Reserved		
14	Reserved		
15	DDC_CLK		
16	DDC_DATA		
17	Ground		
18	+5 V Power		
19	Hot Plug Detect		

6.2. VGA Connector (VGA1)

The external I/O connector panel supports one DB-15 VGA female port.

Figure 5: VGA Connector VGA1

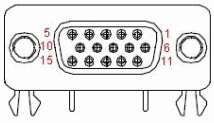


Table 11: Pin Assignment VGA Connector VGA1

Pin	Signal	Description	Note
1	Red		
2	Green		
3	Blue		
4	NC		
5	GND		
6	GND		
7	GND		
8	GND		
9	VCC		
10	GND		
11	NC		
12	DDC data		
13	HSYNC		
14	VSYNC		
15	DDC clock		

6.3. Ethernet Connectors (CN4 - LAN1 & CN6 - LAN2)

The mITX-BYT supports two channels of 10/100/1000 Mbit Ethernet, which are based Realtek RTL8111H controller.

In order to achieve the specified performance of the Ethernet port, Category 5 twisted pair cables must be used with 10/100 MByte and Category 5E, 6 or 6E with 1 Gbit LAN networks.

The signals for the Ethernet ports are as follows:

Figure 6: Ethernet Connectors CN4 - LAN1, CN6 - LAN2

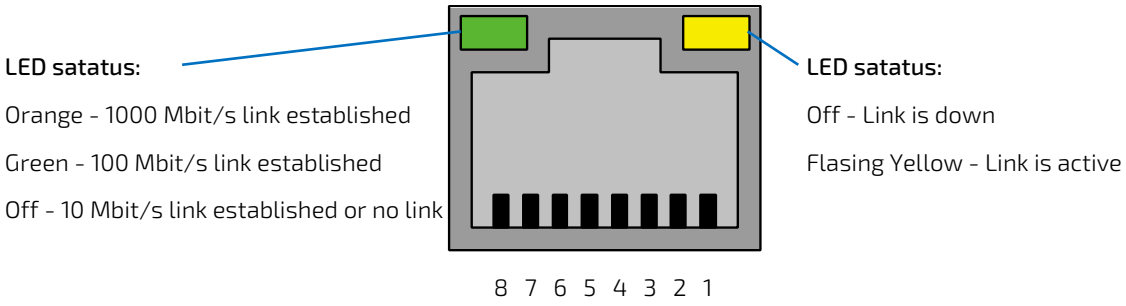


Table 12: Pin Assignment Ethernet Connectors CN4 - LAN1, CN6 - LAN2

Pin	Signal	Note
1	MDI[0]+	
2	MDI[0]-	
3	MDI[1]+	
4	MDI[1]-	
5	MDI[2]+	
6	MDI[2]-	
7	MDI[3]+	
8	MDI[3]-	

Signal Description

Signal	Description
MDI[0]+ / MDI[0]-	In MDI mode, this is the first pair in 1000Base-T, i.e. the BI_DA+/- pair, and is the transmit pair in 10Base-T and 100Base-TX. In MDI crossover mode, this pair acts as the BI_DB+/- pair, and is the receive pair in 10Base-T and 100Base-TX.
MDI[1]+ / MDI[1]-	In MDI mode, this is the second pair in 1000Base-T, i.e. the BI_DB+/- pair, and is the receive pair in 10Base-T and 100Base-TX. In MDI crossover mode, this pair acts as the BI_DA+/- pair, and is the transmit pair in 10Base-T and 100Base-TX.
MDI[2]+ / MDI[2]-	In MDI mode, this is the third pair in 1000Base-T, i.e. the BI_DC+/- pair. In MDI crossover mode, this pair acts as the BI_DD+/- pair.
MDI[3]+ / MDI[3]-	In MDI mode, this is the fourth pair in 1000Base-T, i.e. the BI_DD+/- pair.In MDI crossover mode, this pair acts as the BI_DC+/- pair.

'MDI' – media dependent Interface

6.4. USB Connectors (I/O Area)

The external I/O connector panel supports two dual USB 2.0 connectors and a single USB 3.0 connector.

USB3.0 ports are backward compatible with USB2.0.

Figure 7: USB 2.0 Connectors CN4 - USB 2.0 Port 0 / 1, CN6 - USB 2.0 Port 2 / 3

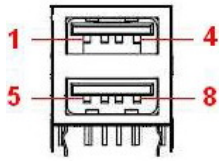


Table 13: Pin Assignment USB 2.0 Connectors CN4 - USB 2.0 Port 0 / 1, CN6 - USB 2.0 Port 2 / 3

Pin	Signal	Note
Top		
1	+USBVCC	
2	USB_A-	USB 2.0 Differential Pair (-)
3	USB_A+	USB 2.0 Differential Pair (+)
4	GND	
Bottom		
5	+USBVCC	
6	USB_B-	USB 2.0 Differential Pair (-)
7	USB_B+	USB 2.0 Differential Pair (+)
8	GND	

Figure 8: USB 3.0 Connector USB1

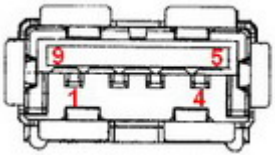


Table 14: Pin Assignment USB 3.0 Connector USB1

Pin	Signal	Note
1	+USBVCC*	+5 V Supply for USB device
2	USB_D-	USB 2.0 Differential Pair (-)
3	USB_D+	USB 2.0 Differential Pair (+)
4	GND	
5	USB_RX-	USB 3.0 Rx. Differential Pair (-)
6	USB_RX+	USB 3.0 Rx. Differential Pair (+)

Pin	Signal	Note
7	GND	
8	USB_TX-	USB 3.0 Tx. Differential Pair (-)
9	USB_TX+	USB 3.0 Tx. Differential Pair (+)

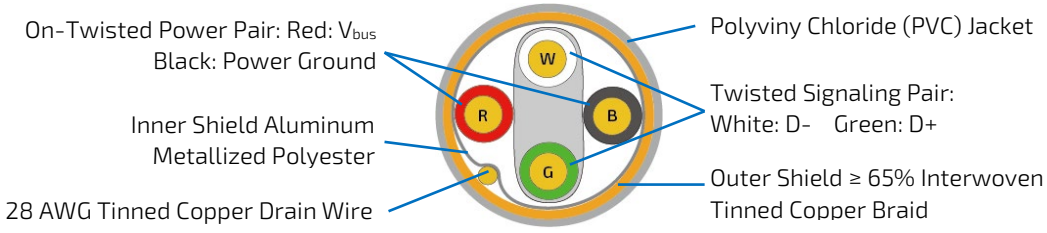
* **The power source of +USBVCC can be selected by JP13.**

Table 15: Signal Description

Signal	Description
USB_TX+, USB_TX-, USB_RX+, USB_RX-, USB_n-, USB_n-	Differential pair works as serial differential receive/transmit data lines. (n= A, B, D)
+USBVCC	5 V supply for external devices. VCC is supplied during power-down to allow wakeup on USB device activity. Protected by a 1A current limiting IC covering each of the USB port.

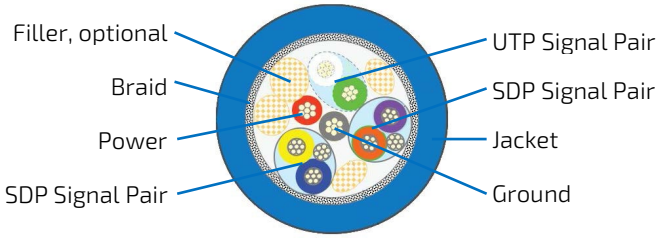
For HiSpeed rates it is required to use a USB cable, which is specified in USB 2.0 standard:

Figure 9: USB 2.0 High Speed Cable



For USB 3.0 cabling it is required to use only HiSpeed USB cable, specified in USB3.0 standard:

Figure 10: USB 3.0 High Speed Cable



6.5. Serial COM1 & COM2 Ports (CN9)

The external I/O connector panel supports one dual DB-9 RS-232/422/485 COM male ports.

Figure 11: Serial COM1 & COM2 Ports CN9

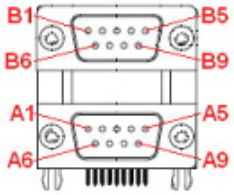


Table 16: Pin Assignment Serial COM1 & COM2 Ports CN9

Pin	RS232 Signal	RS422 Signal	Half Duplex RS485 Signal	Full Duplex RS485 Signal	Note
Top (COM1)					
B1	DCD*	TX-	DATA-	TX-	
B2	RXD	TX+	DATA+	RX+	
B3	TXD	RX+	N/A	TX+	
B4	DTR	RX-	N/A	RX-	
B5	GND	GND	GND	GND	
B6	DSR	N/A	N/A	N/A	
B7	RTS	N/A	N/A	N/A	
B8	CTS	N/A	N/A	N/A	
B9	RI*	N/A	N/A	N/A	
Bottom (COM2)					
A1	DCD*	TX-	DATA-	TX-	
A2	RXD	TX+	DATA+	RX+	
A3	TXD	RX+	N/A	TX+	
A4	DTR	RX-	N/A	RX-	
A5	GND	GND	GND	GND	
A6	DSR	N/A	N/A	N/A	
A7	RTS	N/A	N/A	N/A	
A8	CTS	N/A	N/A	N/A	
A9	RI*	N/A	N/A	N/A	

*: Pin configuration can be selected by Jumper JP11 (for COM2) and JP12 (for COM1).

RS232 / 422 / 485 can be selected in BIOS setup.

Table 17: Signal Description

Signal	Description
TXD	Transmitted Data, sends data to the communications link. The signal is set to the marking state (-12 V) on hardware reset when the transmitter is empty or when loop mode operation is initiated.
RXD	Received Data, receives data from the communications link.
DTR	Data Terminal Ready, indicates to the modem etc. that the on-board UART is ready to establish communication link.
DSR	Data Set Ready, indicates that the modem etc. is ready to establish a communications link.
RTS	Request To Send, indicates to the modem etc. that the on-board UART is ready to exchange data.
CTS	Clear To Send, indicates that the modem or data set is ready to exchange data.
DCD	Data Carrier Detect, indicates that the modem or data set has detected the data carrier.
RI	Ring Indicator, indicates that the modem has received a ringing signal from the telephone line.
TX+/-	Transmitted Data differential pair sends data to the communications link.
RX+/-	Received Data differential pair receives data from the communications link.
GND	Power Supply GND signal

6.6. Audio Jack (AUDIO1)

The external I/O connector panel supports one 3.5 mm dual-port Azalia audio phone jack for headset and microphone.

Figure 12: Audio Jack AUDIO1

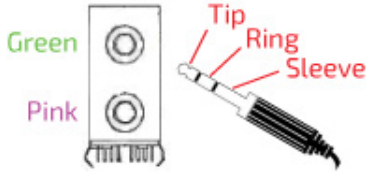


Table 18: Pin Assignment Audio Jack AUDIO1

Pin	Signal	Note
Top		
Tip	Line-Out_L	
Ring	Line-Out_R	
Sleeve	GND	
Bottom		
Tip	Mic-In_L	
Ring	Mic-In_R	
Sleeve	GND	

6.7. Power Input DC Jack (J1)

The external I/O connector panel supports one 2.5 mm DC jack for DC 12 V ~ 24 V power input.

Figure 13: Power Input DC Jack J1

Table 19: Pin Assignment Power Input DC Jack J1

Pin	Signal	Note
1	+12Vin ~ +24Vin	
2	GND	

7/ Internal Connectors

7.1. Power Connector

Power connector must be used to supply the board with +12 VDC.

NOTICE

Hot plugging any of the power connector is not allowed.

Hot plugging might damage the board. In other words, turn off main supply etc. to make sure all the power lines are turned off when connecting to the motherboard.

7.1.1. 4-pin ATX Power Input Connector (ATX1)

Figure 14: 4-pin ATX Power Input Wafer ATX1

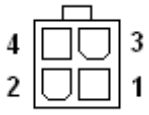


Table 20: Pin Assignment ATX1

Pin	Signal	Description
1	GND	Ground
2	GND	Ground
3	+12V	Power +12 V
4	+12V	Power +12 V

7.1.2. CR2032 Battery Holder (BAT1)

Figure 15: CR2032 Battery Holder BAT1

Table 21: Pin Assignment BAT1

Pin	Signal	Description
1	Battery+	
2	Battery-	

7.2. Fan Wafers (FAN1 & FAN2)

The CPU FAN Wafer (FAN1) is used for the connection of the FAN for the CPU while the System FAN Wafer (FAN2) for the connection of the FAN for the system.

Figure 16: Fan Wafer FAN1, FAN2

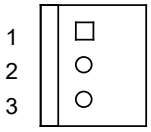


Table 22: Pin Assignment FAN1, FAN2

Pin	Signal	Description
1	GND	Ground
2	+12V*	Power +12 V
3	FAN_RPM	Sense signal for fan RPM

*: **PWM (Pulse-Width Modulation) Fan control supported**

Table 23: Signal description

Signal	Description
GND	Power Supply GND signal
+12V	+12V supply for fan
FAN_RPM	Sense input signal from the fan for rotation speed supervision RPM (Rotations Per Minute). The signal shall be generated by an open collector transistor or similar.

7.3. SATA (Serial ATA) Disk Interfaces (SATA1)

The SATA Port 0 connector (SATA1) supplies the data connection for the SATA hard disk and is SATA 2.0 compatible.

Figure 17: SATA Connector SATA1

Table 24: Pin Assignment SATA1

Pin	Signal	Note
1	GND	
2	TX+	
3	TX-	
4	GND	
5	RX-	
6	RX+	
7	GND	

Table 25: Signal Description

Signal	Description
RX+ / RX-	Host transmitter differential signal pair
TX+ / TX-	Host receiver differential signal pair

7.4. HDD Power Output Wafer (CN8)

Figure 18: HDD Power Output Wafer CN8

Table 26: Pin Assignment CN8

Pin	Signal	Note
1	+12V	
2	GND	
3	GND	
4	+5V	

7.5. USB Connectors (Internal) (CN5)

The USB connector (CN5) supports one USB 2.0 port.

Figure 19: USB 2.0 Port Wafer CN5

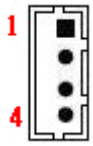


Table 27: Pin Assignment CN5

Pin	Signal	Note
1	+VCCUSB_DN12	
2	USBDN_1-	
3	USBDN_1+	
4	GND	

Table 28: Signal Description

Signal	Description
+VCCUSB_DN12	5 V supply for external devices. SB5V is supplied during power down to allow wakeup on USB device activity. Protected by active power switch 1 A fuse for each USB port.
USBDN_1-/+	Universal Serial Bus Differentials: Bus Data / Address / Command Bus.

7.6. Speaker Connector (CN10 & CN11)

The Speaker audio-out interface is available through the wafers CN10 and CN11. These outputs are shared with the audio output (Line-out) signals of the audio pin header AUDIO1.

Figure 20: 3W Audio AMP Output Wafer CN10 (Right Channel), CN11 (Left Channel)

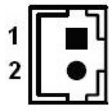


Table 29: Pin Assignment CN10, CN11

Pin	Signal	Note
1	Speaker+	
2	Speaker-	

7.7. Front Panel Pin Header (FP1 & FP2)

Figure 21: Front Panel Pin Header FP1

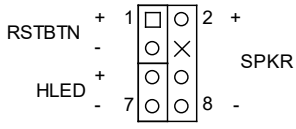


Table 30: Pin Assignment FP1

Pin	Signal	Note
1	Reset Button +	
2	Speaker +	
3	Reset Button -	
4	NC	
5	HDD LED +	
6	Internal Speaker -	
7	HDD LED -	
8	Speaker -	

Internal Buzzer is enabled when Pin6-8 is shorted.

Table 31: Signal Description

Signal	Description
Reset Button -/+	Reset Button. This 2-pin connector is for chassis mounted reset button for system reboot without turning off the system power.
HDD LED -/+	Hard Disk Drive Activity LED. This 2-pin connector is for HDD Activity LED. Connect the HDD Activity LED cable to this connector. The HDD LED lights up or flashes when data is read from or written to the HDD.
Internal Speaker - Speaker -/+	System warning speaker. The speaker allows user to hear beeps and warnings.

Figure 22: Front Panel Pin Header FP2

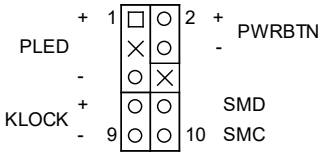


Table 32: Pin Assignment FP2

Pin	Signal	Note

Pin	Signal	Note
1	Power LED +	
2	Power Button +	
3	NC	
4	Power Button -	
5	Power LED -	
6	NC	
7	Keyboard Lock	
8	SMBus Data	
9	GND	
10	SMBus Clock	

Table 33: Signal Description

Signal	Description
Power LED -/+	System Power LED. The power LED lights up when users turn on the system power, and blinks when the system is in sleep mode.
Power Button -/+	The 2-pin connector is for the system power button. Pressing the power button turns the system on or puts the system in sleep or soft-off mode depending on the operating system settings. Pressing the power switch for more than four seconds while the system turns from ON to OFF.
Keyboard Lock	This connector connects to a chassis-mounted switch to allow the use of the keyboard lock feature.
SMBus Data	System Management Bus bidirectional data line
SMBus Clock	System Management Bus bidirectional clock line

7.8. Serial COM3 - COM6 Ports (COM3 - COM6)

Figure 23: Serial COM COM3 - COM6

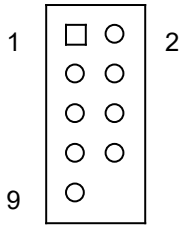


Table 34: Pin Assignment COM3 - COM6

Pin	RS232 Signal	Note
1	DCD / +12V / +5V*	
2	RXD	
3	TXD	
4	DTR	
5	GND	
6	DSR	
7	RTS	
8	CTS	
9	RI / +12V / +5V*	
10	NC, Key	

*: Pin configuration can be selected by Jumper JP5 (for COM5), JP6 (for COM6), JP7 (for COM3) and JP8 (for COM4).

The COM ports need to install an OS patch from ITE. The patch is only available for Windows and is not available Linux.

Table 35: Signal Description

Signal	Description
TXD	Transmitted Data, sends data to the communications link. The signal is set to the marking state (-12 V) on hardware reset when the transmitter is empty or when loop mode operation is initiated.
RXD	Received Data, receives data from the communications link.
DTR	Data Terminal Ready, indicates to the modem etc. that the on-board UART is ready to establish communication link.
DSR	Data Set Ready, indicates that the modem etc. is ready to establish a communications link.
RTS	Request To Send, indicates to the modem etc. that the on-board UART is ready to exchange data.
CTS	Clear To Send, indicates that the modem or data set is ready to exchange data.
DCD	Data Carrier Detect, indicates that the modem or data set has detected the data carrier.

Signal	Description
RI	Ring Indicator, indicates that the modem has received a ringing signal from the telephone line.
GND	Power Supply GND signal

7.9. LVDS Flat Panel Connector (LVDS1)

The LVDS connector is based on 30-pole connector type Hirose DF13-30DP-1.25(24).

Figure 24: LVDS Connector LVDS1

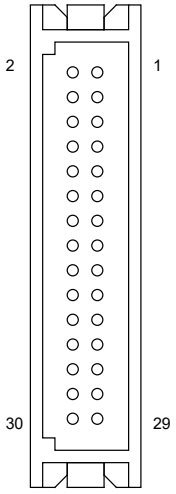


Table 36: Pin Assignment LVDS1

Pin	Signal	Note
1	VDD_EN	
2	GND	
3	+3.3V / +5V*	
4	+3.3V / +5V*	
5	TxclkA-	
6		
7	TxclkA+	
8		
9	GND	
10	GND	
11	TxoutA0-	
12		
13	TxoutA0+	
14		
15	TxoutA1-	
16		
17	TxoutA1+	
18		
19	TxoutA2-	
20		
21	TxoutA2+	
22		

Pin	Signal	Note
23	TxoutA3-	
24		
25	TxoutA3+	
26		
27	GND	
28	GND	
29	DDC_Data	
30	DDC_CLK	

* **Panel Power can be selected by JP4.**

Table 37: Signal Description

Signal	Description
TxoutA0..A3	LVDS A Channel data
TxclkA	LVDS A Channel clock
VDD_EN	Output Display Enable
DDC_DATA	DDC channel Data
DDC_CLK	DDC Channel Clock

7.10. Backlight Power Output Wafer (CN1)

Figure 25: Backlight Power Output Wafer CN1

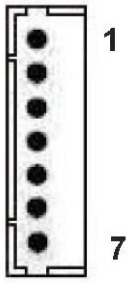


Table 38: Pin Assignment CN1

Pin	Signal	Note
1	BL_PWM*	
2	BL_ADJ*	
3	GND	
4	+5V / +12V**	
5	+5V / +12V**	
6	GND	
7	BL_EN***	

* BL_PWM and BL_ADJ can be set by JP4 and be set from 0V to 5V in BIOS setup.

** Backlight Power can be selected by JP1.

*** BL_EN can be selected by JP2.

Table 39: Signal Description

Signal	Description
BL_PWM	Backlight Adjustment PWM (Pulse Width Modulation) signal
BL_ ADJ	Backlight Adjustment Voltage signal
BL_EN	Backlight Enable signal

7.11. Digital Input / Output Pin Header (CN3)

Figure 26: Digital Input / Output Pin Header CN3

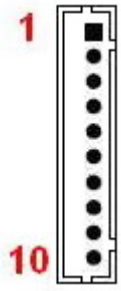


Table 40: Pin Assignment CN3

Pin	Signal	Note
1	DO0	
2	DI0	
3	DO1	
4	DI1	
5	DO2	
6	DI2	
7	DO3	
8	DI3	
9	+5VIO	
10	GND	

7.12. mPCIe Slot Connector (MPCIE1)

Half-sized Mini-PCI Express V1.2 socket (MPCIE1). Socket MPCIE1 supports mPCIe and USB2.0. The USB does support WAKE function.

Figure 27: mPCIe Slot Connector MPCIE1

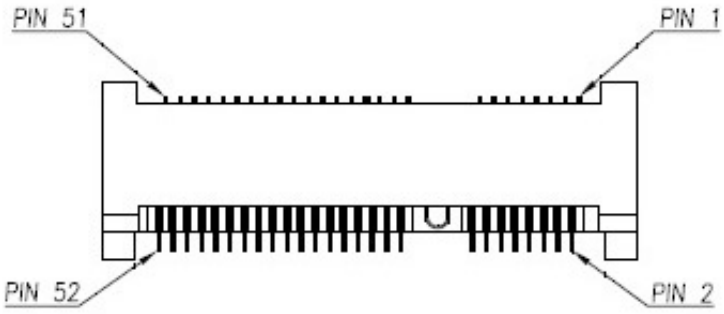


Table 41: Pin Assignment MPCIE1

Pin	Signal	Note
1	WAKE#	
2	+3.3VSB	
3	Reserved	
4	Ground	
5	Reserved	
6	+1.5V	
7	CLKREQ#	
8	NC	
9	Ground	
10	NC	
11	REFCLK-	
12	NC	
13	REFCLK+	
14	NC	
15	Ground	
16	NC	
17	Reserved	
18	Ground	
19	Reserved	
20	W_Disable#	
21	Ground	
22	PERST#	
23	PERn0	
24	+3.3VSB	
25	PERp0	

Pin	Signal	Note
26	Ground	
27	Ground	
28	+1.5V	
29	Ground	
30	SMB_CLK	
31	PETn0	
32	SMB_DATA	
33	PETp0	
34	Ground	
35	Ground	
36	USB_D-	
37	Ground	
38	USB_D+	
39	+3.3VSB	
40	Ground	
41	+3.3VSB	
42	LED_WWAN#	
43	Ground	
44	LED_WLAN#	
45	Reserved	
46	LED_WPAN#	
47	Reserved	
48	+1.5V	
49	Reserved	
50	Ground	
51	Reserved	
52	+3.3VSB	

7.13. SIM Card Socket for MPCIE1 (SIM1)

Figure 28: SIM Card Socket SIM1

Table 42: Pin Assignment SIM1

Pin	Signal	Description	Note
1	UIM_PWR	Power +5V or +3.3V	
2	UIM_RST	Reset signal	
3	UIM_CLK	Clock signal	
4	GND	Ground	
5	UIM_VPP	Programming voltage input	
6	UIM_DATA	Input or Output for serial data	

7.14. mSATA Socket (SATA2)

Full-sized mSATA socket (SATA2). The mSATA interface complies with SATA 2.0.

Figure 29: Serial ATA Port-1 mSATA Socket SATA2

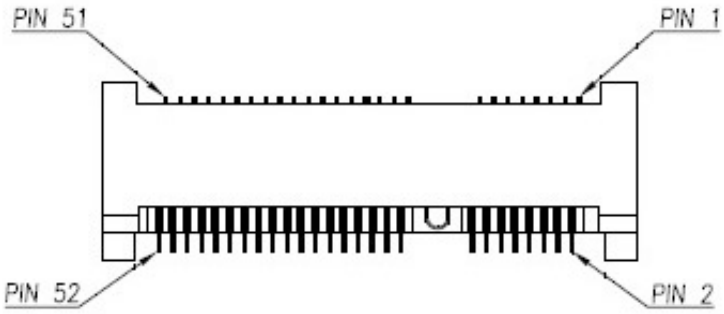


Table 43: Pin Assignment SATA2

Pin	Signal	Note
1	NC	
2	+3.3V	
3	NC	
4	Ground	
5	NC	
6	NC	
7	N/A	
8	NC	
9	Ground	
10	NC	
11	NC	
12	NC	
13	NC	
14	NC	
15	Ground	
16	NC	
17	NC	
18	Ground	
19	NC	
20	NC	
21	Ground	
22	NC	
23	SATA_RX+	
24	+3.3V	
25	SATA_RX-	
26	Ground	

Pin	Signal	Note
27	Ground	
28	NC	
29	Ground	
30	NC	
31	SATA_TX-	
32	NC	
33	SATA_TX+	
34	Ground	
35	Ground	
36	NC	
37	Ground	
38	NC	
39	+3.3V	
40	Ground	
41	+3.3V	
42	NC	
43	Ground	
44	NC	
45	NC	
46	NC	
47	NC	
48	NC	
49	NC	
50	Ground	
51	NC	
52	+3.3V	

7.15. PCI Express x1 Slot (PEG1)

The mITX-BYT supports PCI Express x1 via slot PEG1.

The 1-lane (x1) PCI Express (PEG1) (PCIe 2.0) port can be used for external PCI Express cards inclusive graphics card. The maximum theoretical bandwidth using 1 lane is 500 MB/s.

Figure 30: PCI Express x1 Slot PEG1

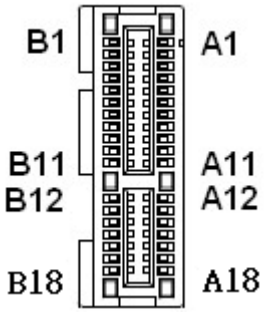


Table 44: Pin Assignment PEG1

Pin	Side B		Side A	
	Signal	Description	Signal	Description
1	+12V	+12 V power	PRSNT1#	Hot plug presence detect
2	+12V	+12 V power	+12V	+12 V power
3	Reserved		+12V	+12 V power
4	Ground		Ground	
5	SMCLK	SMBus clock	Reserved	
6	SMDAT	SMBus data	Reserved	
7	Ground		Reserved	
8	+3.3V	+3.3 V power	Reserved	
9	Reserved		+3.3V	+3.3 V power
10	+3.3VSB	+3.3 V standby power	+3.3V	+3.3 V power
11	WAKE#	Link reactivation	PERST#	PCI Express reset
12	Reserved		Ground	
13	Ground		REFCLK+	Reference clock, differential pair
14	HSOP0	Transmitter Lane 0, Differential pair	REFCLK-	
15	HSON0		Ground	
16	Ground		HSIP0	Receiver Lane 0, Differential pair
17	PRSNT2#	Hot plug presence detect	HSIN0	
18	Ground		Ground	

7.16. PS/2 Keyboard and Mouse Wafer (CN2)

Attachment of a PS/2 keyboard / mouse can be done through the pinrow connector CN2.

Figure 31: PS/2 Keyboard / Mouse Wafer CN2

Table 45: Pin Assignment CN2

Pin	Signal	Note
1	MSCLK	
2	VCC	
3	MSDAT	
4	KBDAT	
5	GND	
6	KBCLK	

Table 46: Signal Description

Signal	Description
MSCLK	Bi-directional clock signal used to strobe data/commands from/to the PS/2 mouse.
MSDAT	Bi-directional serial data line used to transfer data from or commands to the PS/2 mouse.
KBCLK	Bi-directional clock signal used to strobe data/commands from/to the PC-AT keyboard.
KBDAT	Bi-directional serial data line used to transfer data from or commands to the PC-AT keyboard.

7.17. Parallel Port Pin Header (LPT1)

Figure 32: Parallel Port Pin Header LPT1

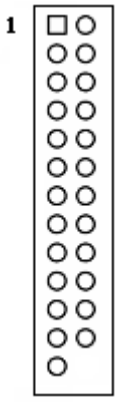


Table 47: Pin Assignment LPT1

Pin	Signal	Note
1	STB	
2	#AFD	
3	PD0	
4	#ERR	
5	PD1	
6	#INIT	
7	PD2	
8	#SLIN	
9	PD3	
10	GND	
11	PD4	
12	GND	
13	PD5	
14	GND	
15	PD6	
16	GND	
17	PD7	
18	GND	
19	#ACK	
20	GND	
21	BUSY	
22	GND	
23	PE	
24	GND	
25	SLCT	
26	GND	Remove Pin 26

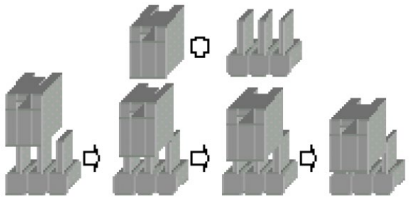
Table 48: Signal Description

Signal	Description
STB	Printer strobe. This pin is used to strobe the printing data into the printer.
AFD	Printer autofeed. This pin is used to advance one line after each line is printed.
PD0 .. PD7	Parallel port data bus 0 ..7. These pins provide a byte-wide input or output to the system.
ERR	Printer error. This pin is used to indicate that the printer has encountered an error.
INIT	Printer initialize. This pin is used to initialize the printer.
SLIN	Printer select input. This pin is used to indicate that an read or write operation is being directed to the printer.
ACK	Printer acknowledge. This pin is used to indicate that the printer has already received a character and is ready to accept another.
BUSY	Printer busy. This pin is used to indicate that the printer has a local operation in progress and cannot accept data.
PE	Printer paper end. This pin is used to indicate that the printer runs out of paper.
SLCT	Printer selected. This pin is used to indicate that the printer is selected.

7.18. Switches and Jumpers

The product has several jumpers which must be properly configured to ensure correct operation.

Figure 33: Jumper Connector



For a three-pin jumper (see Figure 35), the jumper setting is designated "1-2" when the jumper connects pins 1 and 2. The jumper setting is designated "2-3" when pins 2 and 3 are connected and so on. You will see that one of the lines surrounding a jumper pin is thick, which indicates pin No.1.

To move a jumper from one position to another, use needle-nose pliers or tweezers to pull the pin cap off the pins and move it to the desired position.

7.18.1. Panel & Backlight Power Selection for LVDS1 (JP1)

Figure 34: Panel & Backlight Power Selection JP1

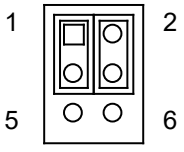


Table 49: Pin Assignment JP1

Jumper 1 Position		**Description**
Pin 1-3	**Pin 3-5**	
X	-	Backlight Power = +12V
-	X	Backlight Power = +5V
Jumper 2 Position		Description
Pin 2-4	Pin 4-6	
X	-	Panel Power = +3.3V
-	X	Panel Power = +5V

"X" = Jumper set (short) and "-" = jumper not set (open)

7.18.2. Backlight Power Enable Selection for LVDS1 (JP2)

Figure 35: Backlight Power Enable Selection JP2

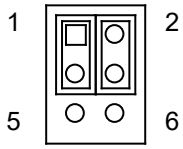


Table 50: Pin Assignment JP2

Jumper 1 Position		Description
Pin 1-3	**Pin 3-5**	
X	-	Backlight Enable Voltage = +3.3V
-	X	Backlight Enable Voltage = +5V
Jumper 2 Position		Description
Pin 2-4	Pin 4-6	
X	-	Active High
-	X	Active Low

"X" = Jumper set (short) and "-" = jumper not set (open)

7.18.3. AT / ATX Power Mode Selection (JP3)

Figure 36: AT / ATX Power Mode Selection JP3

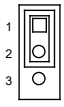


Table 51: Pin Assignment JP3

Jumper 1 Position		Description
Pin 1-2	**Pin 2-3**	
X	-	ATX Mode
-	X	AT Mode

"X" = Jumper set (short) and "-" = jumper not set (open)

7.18.4. LVDS1 Backlight DC / PWM Selection (JP4)

Figure 37: LVDS1 Backlight DC / PWM Selection JP4

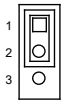


Table 52: Pin Assignment JP4

Jumper 1 Position	Description

Pin 1-2	Pin 2-3	
X	-	DC Mode
-	X	PWM Mode

"X" = Jumper set (short) and "-" = jumper not set (open)

7.18.5. Signal / Power Selection for COM1 ~ COM6 (JP5 ~ JP8, JP11 & JP12)

Figure 38: Signal / Power Selection JP5 ~ JP8, JP11, JP12

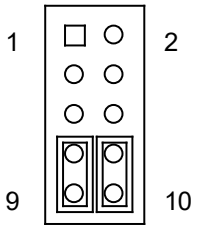


Table 53: Pin Assignment JP5 ~ JP8, JP11, JP12

Jumper 1 Position				Description
Pin 1-3	Pin 3-5	Pin 5-7	Pin 7-9	
X	-	-	-	Pin 1 = +12V
-	X	-	-	Pin 1 = +5V
-	-	X	-	Pin 1 = +5V
-	-	-	X	Pin 1 = DCD
Jumper 2 Position				Description
Pin 2-4	Pin 4-6	Pin 6-8	Pin 8-10	
X	-	-	-	Pin 9 = +12V
-	X	-	-	Pin 9 = +5V
-	-	X	-	Pin 9 = +5V
-	-	-	X	Pin 9 = RI

"X" = Jumper set (short) and "-" = jumper not set (open)

7.18.6. ME F/W Selection (JP9)

Figure 39: ME F/W Selection JP9

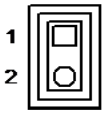


Table 54: Pin Assignment JP9

Jumper Position	Description

Pin 1-2	
X	ME F/W Disabled
-	Normal Operation

"X" = Jumper set (short) and "-" = jumper not set (open)

7.18.7. MPCIE Activity LED Indication (JP10)

Figure 40: MPCIE Activity LED Indication JP10

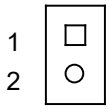


Table 55: Pin Assignment JP10

Pin	Signal	Note
1	LED+	
2	LED-	

7.18.8. USB Power Selection (JP13)

Figure 41: USB Power Selection JP13

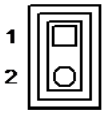


Table 56: Pin Assignment JP13

Jumper Position	Description
Pin 1-2	
X	USB power is always supply.
-	USB power will be cut off in S4 & S5 state.

"X" = Jumper set (short) and "-" = jumper not set (open)

7.18.9. RTC Reset Selection (JP15)

The "RTC Reset" jumper (JP15) can be used to reset the Real Time Clock (RTC) and drain RTC well.

The jumper has one position: Pin 1-2 and not mounted (default position). More information on setting the "RTC Reset" jumper can be founf in the following table.

Figure 42: RTC Reset Selection JP15

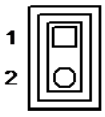


Table 57: Pin Assignment JP15

Jumper Position Pin 1-2	Description
X	Enable Clear CMOS RTC content (board does not boot with the jumper in this position)
-	Normal operation (default position)

"X" = Jumper set (short) and "-" = jumper not set (open)

Do not leave the jumper in position 1-2, otherwise if the power is disconnected, the battery will fully deplete within a few weeks.

8/ On-Board Connectors & Mating Connector Types

The Mating connectors / Cables are connectors or cable kits which are fitting the On-board connector.

The cable kits marked with "*" are included in the "mITX-BYT Cable & Driver Kit".

Table 58: On-Board Connectors & Mating Connector Types

Connector	On-Board Connectors		Mating Connectors / Cables	
	Manufact.	Type No.	Manufact.	Type No.
ATX Power Input (ATX1)	YIMTEX	576MWA2*02STR		
Battery Input (BAT1)	FOXCONN	BB3320E-1		
COM (COM3 ~ COM6)	YIMTEX	32510SAG1R(6T)		0C50400000000090L
Backlight Power (CN1)	Townes	1250W-07T1-V		
Keyboard / Mouse (CN2)	YIMTEX	503PW1*06ST-1R		0C5020002500010L
DIO (CN3)	YIMTEX	3322*05SAGR(6T)		0C5020000000070L
USB 2.0 (CN5)	Pinrex	712-73-04TWE0		0C5020000003220L
HDD Power Output (CN8)	Pinrex	721-93-04TWE9		0C5020000001590L
Audio AMP (CN10, CN11)	YIMTEX	503PW1*02STR & 503PW1*02ST-1R		
SIM (SIM1)	FOXCONN	WL608C3-M04-7F		
SO-DIMM (DIMM1, DIMM2)	ARGOSY	DDRSK-20401-TP9D		
FAN (FAN1, FAN2)	YIMTEX	521AW1*03ST-1R		
Front Panel (FP1)	YIMTEX	3322*04SAGR(6T)		
Front Panel (FP2)	YIMTEX	3322*05SAGR(6T)		
LVDS Panel (LVDS1)	HIROSE	DF13-30DP-1.25(24)		
mPCIe (MPCIE1)	FOXCONN	AS0B226-S99Q-7H		
PCI Express x1 (PEG1)	Win Win	WPES-036AN41B22UWS		
SATA (SATA1)	Win Win	WATM-07ABN4A2B8UW4		0C5020000004240L
mSATA (SATA2)	LOTES	AAA-PCI-046-K01		
Parallel Port (LPT1)	Pinrex	210-72-13GB11		0C5020002000010L

Please note that standard connectors like DP, mPCIe, Audio Jack, Ethernet and USB are not included in the list.

9/ BIOS

9.1. Starting the uEFI BIOS

The mITX-BYT is provided with a Kontron-customized, pre-installed and configured version of AMI Aptio® V uEFI BIOS. AMI BIOS firmware is based on the Unified Extensible Firmware Interface (UEFI) specification and the Intel® Platform Innovation Framework for EFI. This uEFI BIOS provides a variety of new and enhanced functions specifically tailored to the hardware features of the mITX-BYT.

The uEFI BIOS comes with a setup program that provides quick and easy access to the individual function settings for control or modification of the uEFI BIOS configuration. The setup program allows the accessing of various menus that provide functions or access to sub-menus with more specific functions of their own.

To start the uEFI BIOS setup program, follow the steps below:

1. Power on the board.
2. Wait until the first characters appear on the screen (POST messages or splash screen).
3. Press the <DEL> key.
4. If the uEFI BIOS is password-protected, a request for password will appear. Enter either the User Password or the Supervisor Password (see Security menu), press <RETURN>, and proceed with step 5.
5. A setup menu will appear.

The mITX-BYT uEFI BIOS setup program uses a hot key-based navigation system. A hot key legend bar is located on the bottom of the setup screens.

The following table provides information concerning the usage of these hot keys.

Table 59: Font Size Table

Hotkeys	Description
<F1>	The <F1> key invokes the General Help window.
<->	The <Minus> key selects the next lower value within a field.
<+>	The <Plus> key selects the next higher value within a field.
<F2>	The <F2> key loads the previous values.
<F3>	The <F3> key loads the standard default values.
<F4>	The <F4> key saves the current settings and exit the uEFI BIOS setup.
<→> or <←>	The <Left/Right> arrows selects major setup menus on the menu bar. For example: Main, Advanced, Security, etc.
< ↑ > or < ↓ >	The <Up/Down> arrows selects fields in the current menu. For example: A setup function or a sub-screen.
<ESC>	The <ESC> key exits a major setup menu and enter the Exit setup menu. Pressing the <ESC> key in a sub-menu displays the next higher menu level.
<RERURN>	The <RETURN> key executes a command or select a submenu.

9.2. Setup Menus

The Setup utility features shows six menus in the selection bar at the top of the screen:

- Main
- Advanced
- Power
- Boot
- Security
- Save & Exit

The Setup menus are selected via the left and right arrow keys. The currently active menu and the currently active uEFI BIOS Setup item are highlighted in white. Each Setup menu provides two main frames. The left frame displays all available functions. Functions that can be configured are displayed in blue. Functions displayed in gray provide information about the status or the operational configuration. The right frame displays an Item Specific Help window providing an explanation of the respective function.

9.2.1. Main Setup Menu

Upon entering the uEFI BIOS Setup program, the Main Setup menu is displayed. This screen lists the Main Setup menu sub-screens and provides basic system information. Additionally functions for setting the system time and date are offered.

Table 60: Main Setup Menu Sub-Screens and Functions

Function	Description
BIOS Information	Read only field. Displays information about the system BIOS
Memory Information	Read only field. Displays information about total memory
ME Information	Read only field. Displays information about Intel Management Engine (ME) version
TXE Information	Read only field. Displays information about TXE information
Firmware Information	Code version and firmware information
System Date	Set System Date
System Time	Set System Time

Figure 43: BIOS Main Menu Screen System Data and Time

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
Product Information					
Product Name		mITX-BYT-J1900			
BIOS Version		R1.00 (x64)			
BIOS Build Date		10/28/2014			
ME FW Version		01.01.00.1089			
CPU Information					
Intel® Celeron® CPU J1900 @ 1.99GHz					
Microcode Revision		811			
Processor Cores		4		→ ←: Select Screen	
Memory Information				↑ ↓: Select Item	
Total Size		4069 MB (DDR3L)		Enter: Select	
Frequency		1333 MHz		+/-: Change Opt.	
				F1: General Help	
System Date		[Mon 12/01/2014]		F2: Previous Values	
System Time		[17:23:12]		F3: Optimized Defaults	
				F4: Save & Exit	
Access Level		Administrator		ESC: Exit	
Version 2.16.1242. Copyright (C) 2013, American Megatrends, Inc.					

Feature	Option	Description
System Date	[dd/mm/yyyy]	Set the Date. Use Tab to switch between Data elements.
System Time	[hh:mm:ss]	Set the Time. Use Tab to switch between Time elements.

9.2.2. Advanced Setup Menu

The Advanced setup menu provides sub-screens and functions for advanced configurations. The following sub-screen functions are included in the menu:

- LAN & Audio Configuration
- Display Configuration
- Super IO Configuration
- CPU Chipset Configuration
- SATA Configuration
- USB Configuration
- DIO Configuration
- H/W Monitor

NOTICE

Setting items on this screen to incorrect values may cause the system to malfunction.

Figure 44: BIOS Advanced Menu

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
Onboard LAN1 Controller		[Enabled]			
Onboard LAN1 Boot		[Disabled]			
Onboard LAN2 Controller		[Enabled]			
Onboard LAN2 Boot		[Disabled]			
Audio Controller		[Enabled]		→ ←: Select Screen	
				↑ ↓: Select Item	
> Display Configuration				Enter: Select	
> Super IO Configuration				+/-: Change Opt.	
> CPU Chipset Configuration				F1: General Help	
> SATA Configuration				F2: Previous Values	
> USB Configuration				F3: Optimized Defaults	
> DIO Configuration				F4: Save & Exit	
> H/W Monitor				ESC: Exit	
Version 2.16.1242. Copyright (C) 2013, American Megatrends, Inc.					

Feature	Option	Description
Onboard LAN1 Controller	[Disabled], [Enabled]	Select whether to enable or disable Onboard LAN1 Controller.
Onboard LAN1 Boot	[Disabled], [Enabled]	Select whether to enable or disable load onboard PXE (Preboot Execution Environment).
Onboard LAN2 Controller	[Disabled], [Enabled]	Select whether to enable or disable Onboard LAN2 Controller.
Onboard LAN2 Boot	[Disabled], [Enabled]	Select whether to enable or disable load onboard PXE (Preboot Execution Environment).
Audio Controller	[Disabled], [Enabled]	Select whether to enable or disable Audio Controller.

Figure 45: BIOS Advanced Menu - Display Configuration

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
Display Configuration					
Primary Display		[Auto]			
UWA Frame Buffer Size		[256MB]		→ ←: Select Screen	
DVMT Pre-Allocated		[64M]		↑ ↓: Select Item	
DVMT Total Gfx Mem		[256M]		Enter: Select	
				+/-: Change Opt.	
Primary IGFX Boot Display		[VBIOS Default]		F1: General Help	
Active LVDS		[Disabled]		F2: Previous Values	
LVDS Panel Type*		[1024x768 18Bit 1CH]		F3: Optimized Defaults	
LVDS Backlight Control Mode*		[PWM]		F4: Save & Exit	
LVDS Backlight Control - Voltage*		[3.5V]		ESC: Exit	
Version 2.16.1242. Copyright (C) 2013, American Megatrends, Inc.					

* These items appear only when enbling Active LVDS.

Feature	Option	Description
Primary Display	[Auto], [IGD]	Select which graphic controller to be used as the primary display device.
UWA Frame Buffer Size	[128MB], [256MB], [512MB]	Select the Aperture Size.
DVMT Pre-Allocated	[64M], [96M], [128M], [160M], [192M], [224M], [256M], [288M], [320M], [352M], [384M], [416M], [448M], [480M], [512M]	Select DVMT Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.
DVMT Total Gfx Mem	[128M], [256M], [MAX]	Select DVMT Total Graphic Memory size used by the Internal Graphics Device.
Primary IGFX Boot Display	[VBIOS Default], [CRT], [HDMI], [LVDS]	Select the Video Device which will be activated during POST. This has no effect if external graphics present. Secondary boot display selection will appear based on your selection. DOS modes will be supported only on primary display.
Active LVDS	[Disabled], [Enabled]	Select the Active LVDS Configuration. [Disabled]: VBIOS does not enable LVDS. [Enabled]: VBIOS will enable LVDS.
LVDS Panel Type	[640x480 18Bit 1CH], [800x480 18Bit 1CH], [800x600 18Bit 1CH], [1024x768 18Bit 1CH], [1440x900 18Bit 1CH], [1600x900 18Bit 1CH]	Select the appropriate setup item for LVDS panel.
LVDS Backlight	[Voltage], [PWM]	Select the appropriate setup item for LVDS backlight control

Feature	Option	Description
Control Mode		mode.
LVDS Backlight Control - Voltage	[0.0V], [0.5V], [1.0V], [1.5V], [2.0V], [3.0V], [3.5V], [4.0V], [4.5V], [5.0V]	Select the voltage of LVDS backlight control mode.

Figure 46: BIOS Advanced Menu - Super IO Configuration

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
Super IO Configuration					
> Serial Port 1 Configuration				→ ←: Select Screen	
> Serial Port 2 Configuration				↑ ↓: Select Item	
> Serial Port 3 Configuration				Enter: Select	
> Serial Port 4 Configuration				+/-: Change Opt.	
> Serial Port 5 Configuration				F1: General Help	
> Serial Port 6 Configuration				F2: Previous Values	
> Parallel Port Configuration				F3: Optimized Defaults	
				F4: Save & Exit	
				ESC: Exit	
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Figure 47: BIOS Advanced Menu - Super IO Configuration - Serial Port 1 Configuration

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
Serial Port 1 Configuration					
Serial Port		[Enabled]		→ ←: Select Screen	
Device Settings		IO=3F8h; IRQ=4;		↑ ↓: Select Item	
				Enter: Select	
Change Setting		[Auto]		+/-: Change Opt.	
Serial Port 1 Type		[RS232]		F1: General Help	
RS485 Deplux Mode*		[Half Duplex]		F2: Previous Values	
				F3: Optimized Defaults	
				F4: Save & Exit	
				ESC: Exit	
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* These items appear only when selecting RS485 for the Serial Port 1 Type.

Feature	Option	Description
Serial Port	[Disabled], [Enabled]	Select whether to enable or disable Serial Port (COM).
Change Settings	[Auto], [IO=3F8h; IRQ=4;], [IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;], [IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;], [IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;], [IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;]	Select an optional setting for Super IO device.

Feature	Option	Description
Serial Port 1 Type	[RS232], [RS422], [RS485]	Select an appropriate type for Serial Port 1.
RS485 Duplex Mode	[Half Duplex], [Full Duplex]	Select an appropriate RS485 Duplex Mode.

Figure 48: BIOS Advanced Menu - Super IO Configuration - Serial Port 2 Configuration

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
Serial Port 2 Configuration					
Serial Port		[Enabled]		→←: Select Screen	
Device Settings		IO=2F8h; IRQ=3;		↑ ↓: Select Item	
				Enter: Select	
Change Setting		[Auto]		+/-: Change Opt.	
Serial Port 2 Type		[RS232]		F1: General Help	
RS485 Deplux Mode*		[Half Duplex]		F2: Previous Values	
				F3: Optimized Defaults	
				F4: Save & Exit	
				ESC: Exit	
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* These items appear only when selecting RS485 for the Serial Port 2 Type.

Feature	Option	Description
Serial Port	[Disabled], [Enabled]	Select whether to enable or disable Serial Port (COM).
Change Settings	[Auto], [IO=2F8h; IRQ=3;], [IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;], [IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;], [IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;], [IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;]	Select an optional setting for Super IO device.
Serial Port 2 Type	[RS232], [RS422], [RS485]	Select an appropriate type for Serial Port 2.
RS485 Duplex Mode	[Half Duplex], [Full Duplex]	Select an appropriate RS485 Duplex Mode.

Figure 49: BIOS Advanced Menu - Super IO Configuration - Serial Port 3 Configuration

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
Serial Port 3 Configuration					
Serial Port		[Enabled]		→ ←: Select Screen	
Device Settings		IO=3E8h; IRQ=7;		↑ ↓: Select Item	
				Enter: Select	
Change Setting		[Auto]		+/-: Change Opt.	
				F1: General Help	
				F2: Previous Values	
				F3: Optimized Defaults	
				F4: Save & Exit	
				ESC: Exit	
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Feature	Option	Description
Serial Port	[Disabled], [Enabled]	Select whether to enable or disable Serial Port (COM).
Change Settings	[Auto], [IO=3E8h; IRQ=7;], [IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;], [IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;], [IO=2F0h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;], [IO=2E0h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;]	Select an optional setting for Super IO device.

Figure 50: BIOS Advanced Menu - Super IO Configuration - Serial Port 4 Configuration

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
Serial Port 4 Configuration					
Serial Port		[Enabled]		→ ←: Select Screen	
Device Settings		IO=2E8h; IRQ=7;		↑ ↓: Select Item	
				Enter: Select	
Change Setting		[Auto]		+/-: Change Opt.	
				F1: General Help	
				F2: Previous Values	
				F3: Optimized Defaults	
				F4: Save & Exit	
				ESC: Exit	
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Feature	Option	Description
Serial Port	[Disabled], [Enabled]	Select whether to enable or disable Serial Port (COM).
Change Settings	[Auto], [IO=2E8h; IRQ=7;], [IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;], [IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;], [IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;], [IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;], [IO=2F0h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;], [IO=2E0h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;]	Select an optional setting for Super IO device.

Figure 51: BIOS Advanced Menu - Super IO Configuration - Serial Port 5 Configuration

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
Serial Port 5 Configuration					
Serial Port		[Enabled]		→ ←: Select Screen	
Device Settings		IO=2F0h; IRQ=7;		↑ ↓: Select Item	
				Enter: Select	
Change Setting		[Auto]		+/-: Change Opt.	
				F1: General Help	
				F2: Previous Values	
				F3: Optimized Defaults	
				F4: Save & Exit	
				ESC: Exit	
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Feature	Option	Description
Serial Port	[Disabled], [Enabled]	Select whether to enable or disable Serial Port (COM).
Change Settings	[Auto], [IO=2F0h; IRQ=7;], [IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;], [IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;], [IO=2F0h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;], [IO=2E0h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;]	Select an optional setting for Super IO device.

Figure 52: BIOS Advanced Menu - Super IO Configuration - Serial Port 6 Configuration

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
Serial Port 6 Configuration					
Serial Port		[Enabled]		→ ←: Select Screen	
Device Settings		IO=2E0h; IRQ=7;		↑ ↓: Select Item	
				Enter: Select	
Change Setting		[Auto]		+/-: Change Opt.	
				F1: General Help	
				F2: Previous Values	
				F3: Optimized Defaults	
				F4: Save & Exit	
				ESC: Exit	
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Feature	Option	Description
Serial Port	[Disabled], [Enabled]	Select whether to enable or disable Serial Port (COM).
Change Settings	[Auto], [IO=2E0h; IRQ=7;], [IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;], [IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;], [IO=2F0h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;], [IO=2E0h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;]	Select an optional setting for Super IO device.

Figure 53: BIOS Advanced Menu - Super IO Configuration - Parallel Port Configuration

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
Parallel Port Configuration					
Serial Port		[Enabled]		→ ←: Select Screen	
Device Settings		IO=378h; IRQ=5;		↑ ↓: Select Item	
				Enter: Select	
Change Setting		[Auto]		+/-: Change Opt.	
Device Mode		[STD Printer Mode]		F1: General Help	
				F2: Previous Values	
				F3: Optimized Defaults	
				F4: Save & Exit	
				ESC: Exit	
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Feature	Option	Description
Serial Port	[Disabled], [Enabled]	Select whether to enable or disable Serial Port (Parallel Port).
Change Settings	[Auto], [IO=378h; IRQ=5;], [IO=378h; IRQ=5, 6, 7, 9, 10, 11, 12;], [IO=278h; IRQ=5, 6, 7, 9, 10, 11, 12;], [IO=3BCh; IRQ=5, 6, 7, 9, 10, 11, 12;]	Select an optional setting for Super IO device.
Device Mode	[STD Printer Mode], [SPP Mode], [EPP 1-9 and SPP Mode 1-7]	Select an appropriate Device Mode.

Figure 54: BIOS Advanced Menu - CPU Chipset Configuration

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
CPU Chipset Configuration					
EIST		[Enabled]		→←: Select Screen	
Turbo Mode		[Enabled]		↑ ↓: Select Item	
Limit CPUID Maximum		[Disabled]		Enter: Select	
Execute Disable Bit		[Enabled]		+/-: Change Opt.	
Intel Virtualization Technology		[Disabled]		F1: General Help	
				F2: Previous Values	
				F3: Optimized Defaults	
				F4: Save & Exit	
				ESC: Exit	
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Feature	Option	Description
EIST	[Disabled], [Enabled]	Select whether to enable or disable Enhanced Intel SpeedStep Technology.
Turbo Mode	[Disabled], [Enabled]	Select whether to enable or disable turbo mode.
Limit CPUID Maximum	[Disabled], [Enabled]	Select whether to limit CPUID maximum value.
Execute Disable Bit	[Disabled], [Enabled]	Select whether to enable or disable Execute Disable Bit functionality, which prevents malicious buffer overflow attacks..
Intel Virtualization Technology	[Disabled], [Enabled]	Select whether to enable or disable Intel Virtualization Technology.

Figure 55: BIOS Advanced Menu - SATA Configuration

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
SATA Controller(s)					
Serial-ATA (SATA)		[Enabled]		→←: Select Screen	
SATA Mode		[AHCI Mode]		↑ ↓: Select Item	
				Enter: Select	
Serial ATA Port 1		Empty		+/-: Change Opt.	
Port 1		[Enabled]		F1: General Help	
mS ATA Port 1		Empty		F2: Previous Values	
Port 1		[Enabled]		F3: Optimized Defaults	
				F4: Save & Exit	
				ESC: Exit	
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Feature	Option	Description
Serial-ATA(SATA)	[Enabled], [Disabled]	Select whether to enable or disable SATA Device.
SATA Mode	[IDE Mode], [AHCI Mode]	Determine how SATA controller(s) operate.
Port 1	[Disabled], [Enabled]	Select whether to enable or disable SATA Port 1 or mSATA Port 1.

Figure 56: BIOS Advanced Menu - USB Configuration

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
USB Configuration					
USB Devices:				→ ←: Select Screen	
1 Keyboard, 2 Hubs				↑ ↓: Select Item	
				Enter: Select	
Legacy USB Support		[Enabled]		+/-: Change Opt.	
XHCI Legacy Support		[Enabled]		F1: General Help	
XHCI Hand-off		[Enabled]		F2: Previous Values	
EHCI Hand-off		[Disabled]		F3: Optimized Defaults	
USB Mass Storage Driver Support		[Enabled]		F4: Save & Exit	
XHCI Mode		[Smart Auto]		ESC: Exit	
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Feature	Option	Description
Legacy USB Support	[Enabled], [Disabled], [Auto]	Select whether to enable or disable Legacy USB support. AUTO option disables legacy support if no USB devices are connected.
XHCI Legacy Support	[Disabled], [Enabled]	Select whether to enable or disable XHCI Controller Legacy support.
XHCI Hand-off	[Enabled], [Disabled]	Select whether to enable or disable XHCI Hand-off function. This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
EHCI Hand-off	[Disabled], [Enabled]	Select whether to enable or disable EHCI Hand-off function.
USB Mass Storage Driver Support	[Disabled], [Enabled]	Select whether to enable or disable USB Mass Storage Driver Support.
XHCI Mode	[Smart Auto], [Enabled]	Determine the operating mode of the XHCI controller in OS.

Figure 57: BIOS Advanced Menu - DIO Configuration

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
DIO Configuration					
User Configuration		[Disabled]			
DO-1*		[Output Low]			
DO-2*		[Output Low]			
DO-3*		[Output Low]			
DO-4*		[Output Low]			
				→←: Select Screen	
DI-1		1		↑ ↓: Select Item	
DI-2		1		Enter: Select	
DI-3		1		+/-: Change Opt.	
DI-4		1		F1: General Help	
DO-1		0		F2: Previous Values	
DO-2		0		F3: Optimized Defaults	
DO-3		0		F4: Save & Exit	
DO-4		0		ESC: Exit	
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* These items appear only when enabling "User Configuration".

Feature	Option	Description
DO-1..4	[Output Low], [Output High]	Set up the DO pin value.

Figure 58: BIOS Advanced Menu - H/W Monitor

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
PC Health Status					
CPU Warning Temperature		[Disabled]			
> Smart FAN Configuration					
CPU Temperature		: +36 C			
System Temperature		: +33 C		→ ←: Select Screen	
				↑ ↓: Select Item	
CPU Fan Speed		: N/A		Enter: Select	
SYS Fan Speed		: N/A		+/-: Change Opt.	
				F1: General Help	
+VCORE		: +0.887 V		F2: Previous Values	
+VIN		: +12.164 V		F3: Optimized Defaults	
+5V		: +5.146 V		F4: Save & Exit	
+VMEN		: +1.373 V		ESC: Exit	
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Feature	Option	Description
CPU Warning Temperature	[Disabled], [80], [85], [90], [95]	Determine whether to enable or disable CPU Warning Temperature function and select a temperature that will sound an alarm.

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
Smart FAN Configuration					
CPU FAN Setting		[Manual Mode]		→ ←: Select Screen	
Manual Duty		255		↑ ↓: Select Item	
				Enter: Select	
SYS FAN Setting		[Manual Mode]		+/-: Change Opt.	
Manual Duty		255		F1: General Help	
				F2: Previous Values	
				F3: Optimized Defaults	
				F4: Save & Exit	
				ESC: Exit	
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Feature	Option	Description
CPU FAN Setting	[Manual Mode], [Smart Mode]	Switch the CPU FAN control mode.
SYS FAN Setting	[Manual Mode],	Switch the SYS FAN control mode.

Feature	Option	Description
	[Smart Mode]	

9.2.3. Power Setup Menu

The Power setup menu provides functions and a sub-screen for power configurations. The following sub-screen function is included in the menu:

- WatchDog Timer Configuration

Figure 59: BIOS Power Setup Menu

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
Power Management Configuration					
ACPI Sleep State		[S3 (Suspend to RAM)]			
Restore AC Power Loss		[Power Off]			
Power Saving Mode		[Disabled]		→ ←: Select Screen	
				↑ ↓: Select Item	
Resume Event Control				Enter: Select	
Resume From S3 By PS/2 Keyboard		[Disabled]		+/-: Change Opt.	
Resume From S3 By PS/2 Mouse		[Disabled]		F1: General Help	
Resume By PCIE Device		[Disabled]		F2: Previous Values	
Resume By Ring Device		[Disabled]		F3: Optimized Defaults	
Resume By RTC Alarm		[Disabled]		F4: Save & Exit	
> WatchDog Timer Configuration				ESC: Exit	
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Feature	Option	Description
ACPI Sleep State	[Suspend Disabled], [S1 (CPU Stop Clock)], {S3 (Suspend to RAM)]	Select whether to enable or disable suspend function and determine an appropriate suspend mode.
Restore AC Power Loss	[Power Off], [Power On], [Last State]	Control whether the system will stay on after AC power is removed and then restored. Select [Power Off] if you want the system to remain off after power restored. Select [Power On] if you use a power strip to turn the system on.
Power Saving Mode	[Disabled], [Enabled]	Select whether to enable Power Saving Mode.
Resume From S3 By PS/2 Keyboard	[Enabled], [Disabled]	Select whether to allow wakening the system up from the S3 sleep state by PS/2 keyboard.
Resume From S3 By PS/2 Mouse	[Enabled], [Disabled]	Select whether to allow wakening the system up from the S3 sleep state by PS/2 mouse.
Resume By PCIE Device	[Disabled], [Enabled]	Select whether to enable or disable Wake from PCIE Device.
Resume By Ring Device	[Disabled], [Enabled]	Select whether to enable or disable Wake from Ring Device.
Resume By RTC Alarm	[Disabled], [Enabled]	Select whether to enable or disable Wake Up on Alarm, to turn on your system on a special day of the month.

Figure 60: BIOS Power Setup Menu - WatchDog Timer Configuration

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
WatchDog Timer Configuration					
WDT Function		[Disabled]		→ ←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit	
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Feature	Option	Description
WDT Function	[Disabled], [Enabled]	Select whether to enable or disable WatchDog Timer function.

9.2.4. Boot Setup Menu

The boot setup menu lists the for boot device priority order, that is generated dynamically.

Figure 61: BIOS Boot Setup Menu

BIOS SETUP UTILITY					
Main	**Advanced**	**Power**	**Boot**	**Security**	**Save & Exit**
Boot Configuration					
Full Screen LOGO Display		[Disabled]			
Setup Prompt Timeout		1		→ ←: Select Screen	
Bootup NumLock State		[On]		↑ ↓: Select Item	
Keyboard Detect Warning		[Enabled]		Enter: Select	
				+/-: Change Opt.	
CSM Support		[Enabled]		F1: General Help	
Boot Option Filter		[Legacy Only]		F2: Previous Values	
				F3: Optimized Defaults	
Boot Option Priorities				F4: Save & Exit	
				ESC: Exit	
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Feature	Option	Description
Full Screen LOGO Display	[Disabled], [Enabled]	Select whether to enable or disable to display logo screen.
Bootup NumLock State	[On], [Off]	Select the state of the NumLock feature of the keyboard after Startup. [On]: The keys on the keypad will act as numeric keys. [Off]: The keys on the keypad will act as cursor keys.
Keyboard Detect Warning	[Disabled], [Enabled]	Select whether to enable or disable Keyboard Detect Warning function.
CSM Support	[Enabled], [Disabled]	Select whether to enable or disable CSM support.
Boot Option Filter	[UEFI and Legacy], [Legacy only], [UEFI only]	Control Legacy / UEFI ROMs priority.

9.2.5. Security Setup Menu

The Security setup menu provides information about the passwords and functions for specifying the security settings. The passwords are case-sensitive. The mITX-BYT provides no factory-set passwords.

NOTICE

If there is already a password installed, the system asks for this first. To clear a password, simply enter nothing and acknowledge by pressing <RETURN>. To set a password, enter it twice and acknowledge by pressing <RETURN>.

Figure 62: BIOS Boot Setup Menu

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
Password Description If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights The password length must be in the following range: Minimum Length 3 Maximum length 20 Administrator Password User Password				→ ←: Select Screen ↑ ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit	
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Feature	Description
Administrator Password	Set administrator password
User Password	Set user password

If only the administrator's password is set, then only access to setup is limited. The password is only entered when entering setup.

If only the user's password is set, then the password is a power on password and must be entered to boot or enter setup. Within the setup menu the user has administrator rights.

Password length requirements are maximum 20 characters and minimum 3 characters.

9.2.5.1. Remember the password

It is highly recommended to keep a record of all passwords in a safe place. Forgotten passwords results in being locked out of the system.

If the system cannot be booted because the User Password or the Supervisor Password are not know, contact Kontron Support for further assistance.

HDD security passwords cannot be cleared using the above method.

9.2.6. Save & Exit Setup Menu

The exit setup menu provides functions for handling changes made to the UEFI BIOS settings and the exiting of the setup program.

Figure 63: BIOS Boot Setup Menu

BIOS SETUP UTILITY					
Main	Advanced	Power	Boot	Security	Save & Exit
Save Changes and Reset					
Discard Changes and Reset					
				→←: Select Screen	
Save Options				↑ ↓: Select Item	
Save Changes				Enter: Select	
Discard Changes				+/-: Change Opt.	
				F1: General Help	
Restore Defaults				F2: Previous Values	
				F3: Optimized Defaults	
				F4: Save & Exit	
				ESC: Exit	
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Feature	Description
Save Changes and Exit	Exit system setup after saving the changes. Once you are finished making your selections, choose this option from the Exit menu to ensure the values you selected are saved to the CMOS RAM. The CMOS RAM is sustained by an onboard backup battery and stays on even when the PC is turned off. When you select this option, a confirmation window appears. Select [Yes] to save changes and exit.
Discard Changes and Exit	Exit system setup without saving any changes. Select this option only if you do not want to save the changes that you made to the Setup program. If you made changes to fields other than system date, system time, and password, the BIOS asks for a confirmation before exiting.
Save Changes	Save changes done so far to any of the setup values. This option allows you to save the selections you made. After selecting this option, a confirmation appears. Select [Yes] to save any changes.
Discard Changes	Discards changes done so far to any of the setup values. This option allows you to discard the selections you made and restore the previously saved values. After selecting this option, a confirmation appears. Select [Yes] to discard any changes and load the previously saved values.
Restore Defaults	Restore Default values for all the setup values. This option allows you to load optimal default values for each of the parameters on the Setup menus, which will provide the best performance settings for your system. The F9 key can be used for this operation.

Appendix A: List of Acronyms

The following table does not contain the complete acronyms used in signal names, signal type definitions or similar. A description of the signals is included in the I/O Connector and Internal connector chapters within this user guide.

Table 61: List of Acronyms

2D	Two-Dimensional
3D	Three-Dimensional
AT	Advanced Technology
ATX	Advanced Technology eXtended
BGA	Ball Grid Array
BIOS	Basic Input / Output System
BSP	Board Support Package
CMOS	Complementary Metal Oxide Semiconductor
CPU	Central Processing Unit
DC	Direct Current
DDC	Display Data Channel
DIO	Digital Input / Output
ECC	Error-Correcting Code
EEE	Electrical and Electronic Equipment
EOS	Electrical OverStress
ESD	ElectroStatic Discharge
GbE	Gigabit Ethernet
HDD	Hard Disk Drive
HDMI	High Definition Multimedia Interface
LAN	Local Area Network
LED	Light Emitting Device
LVDS	Low-Voltage Differential Signaling
ME F/W	Management Engine Firmware
mPCIe	mini Peripheral Component Interconnect express
PC-AT	Personal Computer - Advanced Technology
PCB	Printed Circuit Board
PSU	Power Supply Unit
PVC	PolyViny Chloride
PWM	Pulse Width Modulation
RAM	Random Access Memory
ROM	Read-Only Memory
RTC	Real-Time Clock
SATA	Serial Advanced Technology Attachment
SDP	Serial Download Protocol
SELV	Safety Extra-Low Voltage
SIM	Subscriber Identity Module
SMBus	System Management Bus
SoC	System on Chip
SO-DIMM	Small Outline Dual In-line Memory Module
SPD	Serial Presence Detect
SPI	Serial Peripheral Interface
TDP	Thermal Design Power
TPM	Trusted Platform Module
UEFI	Unified Extensible Firmware Interface
USB	Universal Serial Bus
UTP	Update Transfer Protocol
VGA	Video Graphics Array
WDT	WatchDog Timer
WEEE	Waste Electrical and Electronic Equipment

About Kontron

Kontron is a global leader in embedded computing technology (ECT). As a part of technology group S&T, Kontron offers a combined portfolio of secure hardware, middleware and services for Internet of Things (IoT) and Industry 4.0 applications. With its standard products and tailor-made solutions based on highly reliable state-of-the-art embedded technologies, Kontron provides secure and innovative applications for a variety of industries. As a result, customers benefit from accelerated time-to-market, reduced total cost of ownership, product longevity and the best fully integrated applications overall. Kontron is a listed company. Its shares are traded in the Prime Standard segment of the Frankfurt Stock Exchange and on other exchanges under the symbol "KBC". For more information, please visit: **www.kontron.com**

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