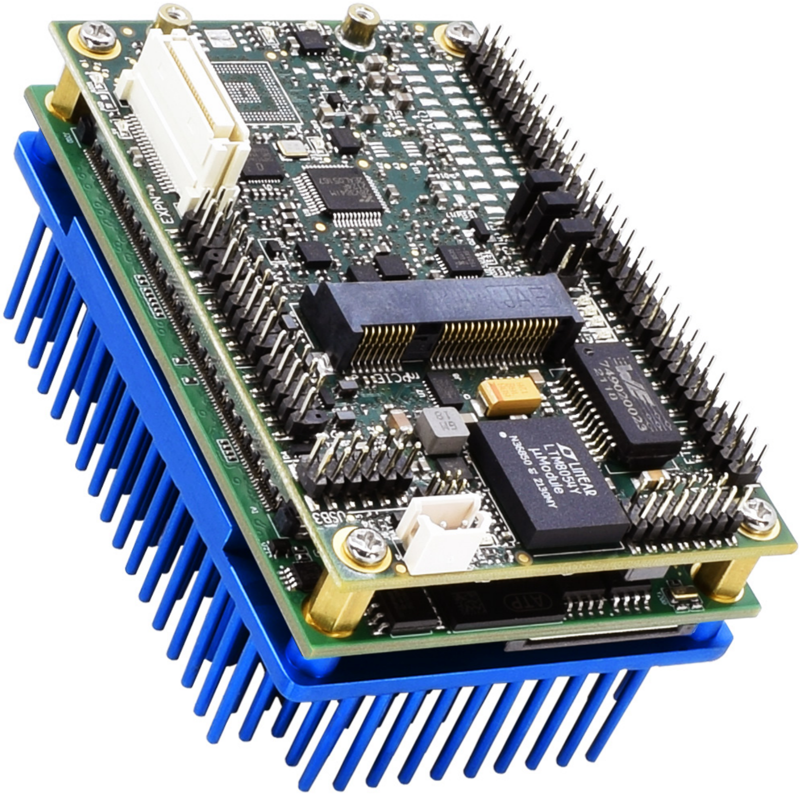
SBC-ZETA-3950

Mini Rugged Single Board Computer
with Intel Atom® E3950 Processor

Product Manual



Revision History

Document Version	Last Updated Date	Brief Description of Change
v1.0	3/19/2026	Initial release

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Table of Contents

1. Before You Begin

Review the warnings in this section and the best practice recommendations (See “Best Practices” on page 43.) when using and handling the WINSYSTEMS SBC-ZETA-3950 module. Following these recommendations provides an optimal user experience and prevents damage. Read through this document and become familiar with the SBC-ZETA-3950 before proceeding.

APPLYING CONFORMAL COATING AFTER PURCHASE WILL VOID YOUR WARRANTY. FAILING TO COMPLY WITH THESE BEST PRACTICES MAY DAMAGE THE PRODUCT AND VOID YOUR WARRANTY.

1.1 Warnings

Only qualified personnel should configure and install the SBC-ZETA-3950. While observing best practices, pay particular attention to the following:.

WARNING!

ESD-Sensitive Electronic Equipment

Observe ESD-safe handling procedures when working with this product.
Always use this product in a properly grounded work area and wear appropriate ESD-preventive clothing and/or accessories.
Always store this product in ESD-protective packaging when not in use.

2. Introduction

This manual provides configuration and usage information for the SBC-ZETA-3950. If you still have questions, contact Technical Support at +1-817-274-7553, Monday through Friday, between 8 AM and 5 PM Central Time or on the website at https://winsystems.com/support/.

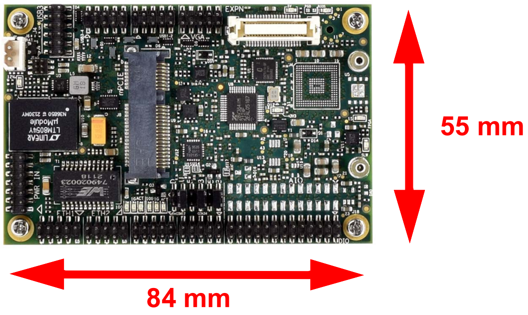
NOTE DIO and GPIO are used interchangeably.

3. Functionality

The WINSYSTEMS' SBC-ZETA-3950 rugged embedded single board computer meets the needs of industrial applications where reliability in harsh conditions and space are critical. This embedded computer supports a wide range of uses such as industrial automation, energy management, transportation management, security applications, and Mil/COTS. The small size and high feature density also make it an ideal choice for mobile uses such as vehicle applications.

The SBC-ZETA-3950 delivers a full embedded computer in the ultra-compact COM Express® Mini Type 10 form factor of 84mm x 55mm x 47mm (2.16" x 3.3" x 1.84"). It consists of 2 boards and a heatsink and functions in extended operating temperature ranges of -40°C to +85°C. The carrier hosts the power supply and exposes the I/O connectors, and the computer-on-module (COM) features an Intel Atom® Apollo Lake E3950 quad-core processor to deliver features and performance. With the separate COM, it allows for retaining the carrier board while scaling the CPU over the application lifetime.

It supports Microsoft® Windows 10, Ubuntu Linux, and other x86 real-time operating systems. Drivers are available from the SBC-ZETA-3950 product page on the WINSYSTEMS website.



4. Features and Specifications

4.1 Specifications

Features and Specifications	
PART NUMBER	SBC-ZETA-3950
PROCESSOR	Intel Atom® Apollo Lake E3950 Processor Cores: 4 Speed: 1.6 (2.0) GHz Cache: 2 MB L2 Base Power: 12W
OPERATING SYSTEM	Ubuntu Linux, Windows 10 IoT, other x86 real-time OS
SOFTWARE	Custom configurable UEFI based AMI BIOS
SECURITY	On-board discrete TPM 2.0 hardware security
RAM	8GB soldered down LPDDR4, 2400 MT/s
STORAGE	128GB soldered down eMMC 1x mSATA / Mini PCIe socket
DISPLAY	Dual Display, HD 1x VGA (DDI to VGA via CH7517 conversion) LVDS interface (single ch 24-bit)
AUDIO	HD Audio: Available on the future expansion feature; an adapter is required to use the Audio feature.
NETWORK	2x 1Gb Ethernet, Intel i210
EXPANSION	1x Mini PCIe / mSATA socket, support for full length cards (PCIe and USB) 1x Micro SD socket
I/O	16x GPIO 5x USB 2.0 (1 used for Mini PCIe) 1x USB 3.0 1x mini PCIe 4x RS-232/422/485 Watchdog Timer 1 sec.-255 min.
OTHER CONNECTORS	External Fan Connector Expansion Connector Debug Interface Connector
POWER	Input: Variable of +6V to +36V * See product manual for PassMark® details.
Typical Power Use	**TPU:** 8W* **TDP:** 6W - 15.5W*
BATTERY	An external battery backup connector is provided to maintain the real-time clock.

Features and Specifications	
THERMAL SOLUTION	Heatsink
MECHANICAL	Dimensions: 55mm x 84mm x 47mm (2.16" x 3.3" x 1.84") Weight: 161 g / 5.7 oz
ENVIRONMENTAL	Industrial Temperature: -40°C to +85°C (-40°F to +185°F) Humidity: 5% to 95% non-condensing RoHS Compliant
MTBF	717,128 hrs
Warranty and Support	Limited two-year Warranty and Free Technical Support

NOTE Requires the heatsink to achieve maximum 85°C. The maximum measurable temperature on any spot of the heatsink, and module surfaces must not exceed 85°C.

Contact WINSYSTEMS at https://winsystems.com/contact/ for more information.

5. Power Consumption Details

5.1 Power Input Ratings

Below are the power input ratings for the SBC-ZETA-3950.

Power Input Ratings	
Power Input	Variable of +6V to +36V
Typical Power Use	**TPU:** 8W* Average power use under a standard load. **TDP:** 6W - 15.5W* See Passmark® test results starting on page 11

5.2 PassMark Information

What is PassMark®?

PassMark refers to both a software company and its popular benchmarking software, PerformanceTest, which is used to evaluate a computer's performance. The company is known for its benchmark tests that measure the performance of a computer's CPU, graphics, hard drive, and memory. The benchmark scores allow users to compare their PC's performance against millions of other computers worldwide.

PassMark (https://www.passmark.com/) has offered industry standard PC benchmarking and diagnostic solutions since 1998 and as such provides an industry accepted standardized way to measure and compare the power consumption of computers.

WINSYSTEMS uses a PassMark PerformanceTest that is a comprehensive benchmarking tool that evaluates the power performance of the SBC-ZETA-3950. Below in Section 6 you can view the PassMark Test Results table which includes the SBC Setup showing you how the SBC was set up for the test. It also includes the Burn-In Features used and the BIOS Idle, OS Idle and the Load test results.

Contact an engineer if you have additional questions about the PassMark test results at https://winsystems.com/support/.

5.3 PassMark Test Setup and Results

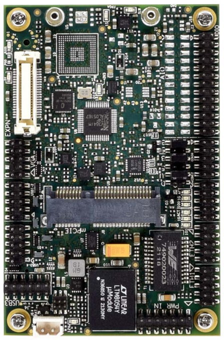
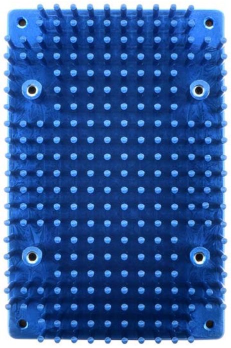
Here is the PassMark Test Results table which includes the SBC Test Setup and the load test results for various standard PassMark setups.

PassMark® Test Setup and Results for SBC-ZETA-3950-8G128D										
SBC Test Setup										
RAM: 8GB OS: Windows 10 IOT SW: PassMark, HWInfo Thermal: Heatsink		**DC IN**	**BIOS PL1-PL2**	**Burn-In Feature**	**Functional Test**	**Idle (BIOS)**	**Idle (OS)**	**Setup 1 50% Load**	**Setup 2 50% Load**	**Setup 3 50% Load**
		12V	12W - 15W			8.0W*	6.0W*	15.0W*	8.0W*	16.0W*
CPU (C460)	**E3950**				Passed	X	X	X	X	X
RAM	**8GB**				Passed	X	X	X	X	X
eMMC	**128MB**				Passed	X	X	X	X	X
OS	**Windows 10 IOT**				Passed					
SW	**Passmark, HWInfo**				Passed					
VGA	**ASUS 1920x1080**				Passed	X	X	X	X	X
mPCIe/mSATA	**mSATA**				Passed	X	X			
uSD	**Delkin Device 8GB**				Passed					X
USB2_1	**Keyboard**				Passed	X	X			
USB2_2	**Mouse**				Passed	X	X			
USB2_3	**Keyboard**				Passed			X	X	X
USB2_4	**Mouse**				Passed			X	X	X
USB3_1	**Modified Cable**				Passed					
COM1	**3F8, IRQ4**				Passed					
COM2	**2F8, IRQ3**				Passed					
COM3	**3E8, IRQ7**				Passed					
COM4	**Configuration**				Passed					
ENET_1	**I210 (00:01:45:0A:F5:28)**				Passed				X	X
ENET_2	**I210 (00:06:D5:28:80:50)**				Passed					
				CPU				X	X	X
				RAM					X	X
				Video					X	X
				2D Graphic						X
				3D Graphic 1x1920x1080				X		X
				Disk						X
				Sound						X
				Network					X	X
				GPGPU						X

*Instantaneous power draw can be higher.

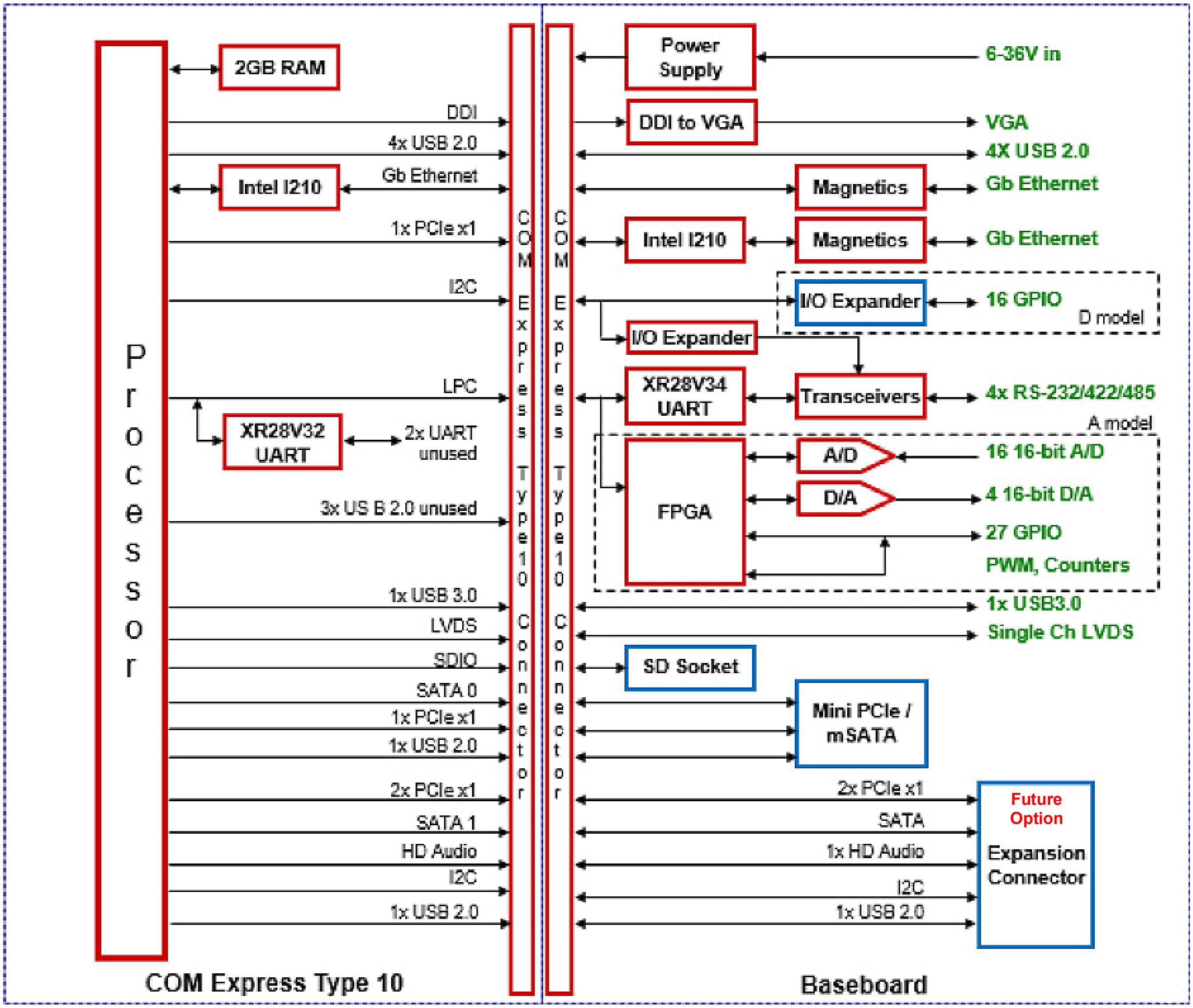
6. Part Numbers / Ordering Information

Part Number	Description
SBC-ZETA-3950-8G128D	SBC with Intel Atom® E3950, 8GB RAM, 128GB eMMC, digital I/O, heatsink

Part Number	Top View	Bottom View
SBC-ZETA-3950-8G128D		

7. Product Overview

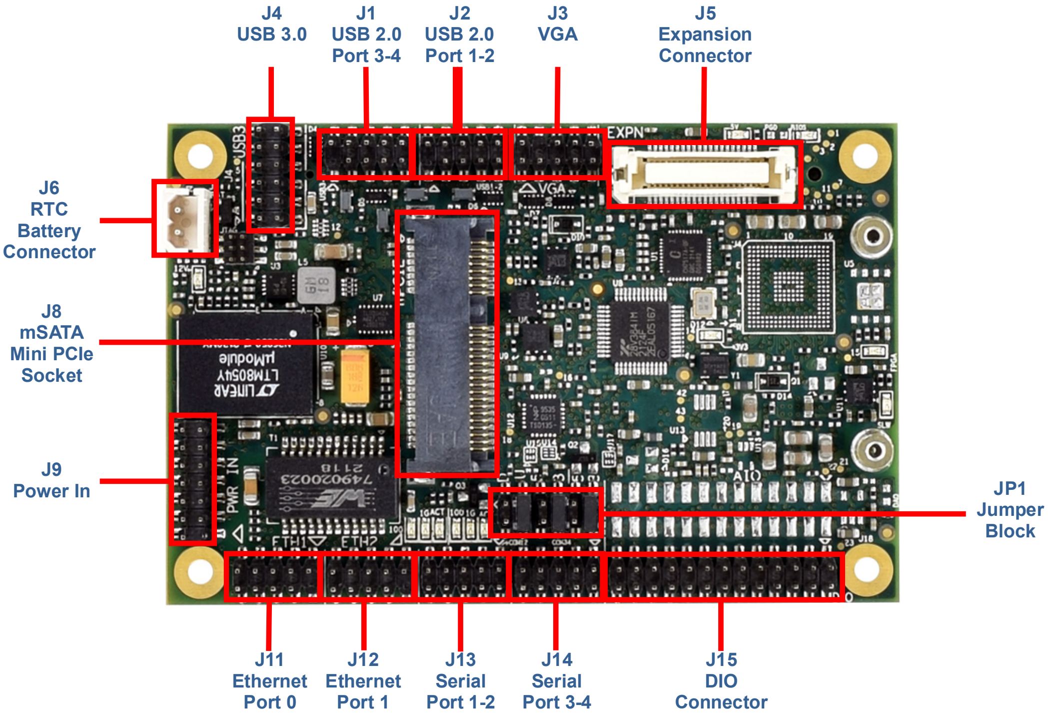
7.1 Block Diagram



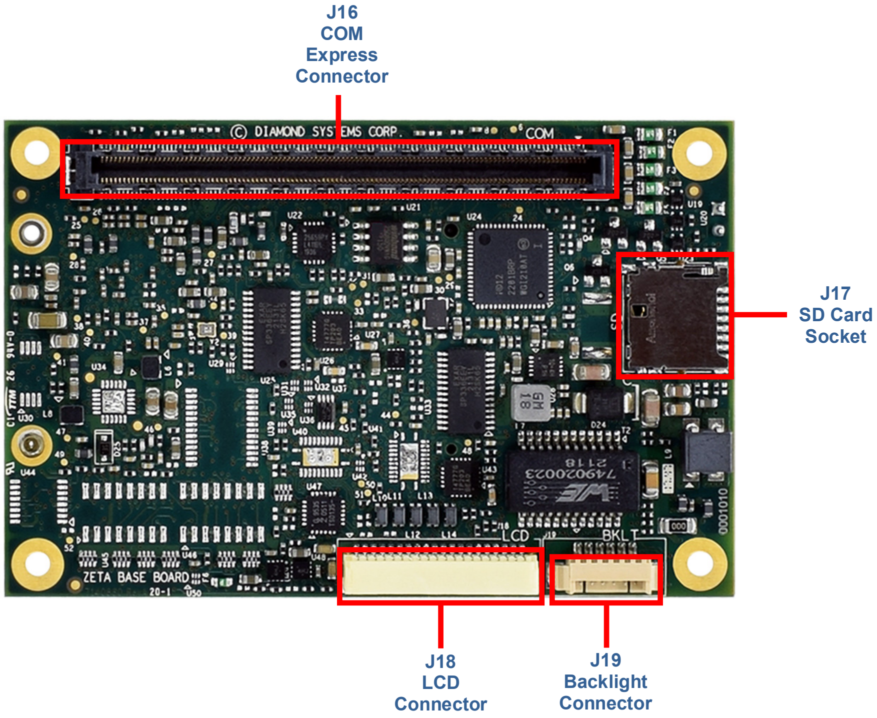
8. I/O Connector & Jumper Locations

This section describes the SBC-ZETA-3950 Connector & Jumper locations.

Carrier Top View



Carrier Bottom View



COM Top View

9. COM & Carrier Jumper and Connector Summary

	COM Jumper and Connector Summary	
Item	**Description**	**Reference**
J2	Debug Interface Connector	page 22
J3	External Fan Connector	page 22

	Carrier Jumper and Connector Summary	
Item	**Description**	**Reference**
J9	Power Input	page 23
J6	RTC Battery Input	page 23
J13, J14	Serial Ports	page 23
J1, J2	USB 2.0 Ports	page 25
J4	USB 3.0 Port	page 26
J11, J12	Ethernet	page 26
J8	mSATA / mPCIe	page 27
J17	Micro SD	page 28
J3	VGA	page 28
J18	LVDS	page 29
J19	LCD Backlight	page 29
J15	Digital I/O	page 30
J5	Expansion connector	page 30
JP1	Jumper Descriptions	page 32

10. Feature Descriptions and Pinouts

10.1 Feature Description

10.1.1 Power Supply

The SBC-ZETA-3950 can be powered from any DC power supply with an output voltage range of +6V to +36V. This range makes it compatible with standard power supply voltages of 12V, 24V, and 28V. In addition, the SBC-ZETA-3950 can operate in a vehicle environment due to its ability to run on 6VDC.

Maximum allowable reflected ripple, measured at the voltage input connector is 50mV p-p.

10.1.2 Ethernet

The SBC-ZETA-3950 supports one standard and one optional 10/100/1000 Ethernet port. The standard port comes directly from the COM module. The optional port is derived from the Intel WGI210IT PCIe Ethernet controller. This controller is accessed via x1 PCIe lane from the COM. Both ports have on board magnetics to allow use with a standard Ethernet cable.

On-board LEDs are provided for Link, Activity, and Speed on each port. The LEDs are located along the board edge near the Ethernet connectors. Both connectors provide access to the LED signals.

10.1.3 Micro SD

The SBC-ZETA-3950 supports one micro SD connector with 4-bit data 3.3V for an additional low-cost storage option.

10.1.4 USB

The SBC-ZETA-3950 supports 5 USB2.0 ports and one USB 3.0 port.

- Four USB2.0 ports are routed to 2x5 headers for use with cables.
- One USB2.0 port is interfaced to the PCIe Mini card socket to support USB minicards.
- The USB 3.0 port is routed to a 2x6 pin header. This pin header is compatible with the Intel standard dual USB 3.0 connector for convenience.
- Two additional USB 2.0 channels are available on the expansion connector. A adapter board is required to use these. Future availability.

10.1.5 VGA

The SBC-ZETA-3950 supports VGA display interface. DDI to VGA converter chip (CH7517) is used to covert DDI from COM connector to VGA signals.

10.1.6 LCD

The SBC-ZETA-3950 supports a 24-bit single channel LVDS display through a 1x20 RA latching connector. Separate backlight supply connector provides LCD backlight supply and PWM control. Backlight supply is given externally through the main power input connector.

10.1.7 Audio

HD audio from the COM will be available on the expansion connector. An adapter will be required to utilized the audio feature. Future availability.

10.1.8 Serial Ports

The SBC-ZETA-3950 supports 4 serial ports using an LPC UART (XR28V384). UARTs from the COM are not utilized. Protocol selection and RS-422/485 line termination are provided using an I2C digital I/O expander chip driven by the COM. The configuration can be done in the BIOS and also via user application software.

10.1.9 RTC Battery Backup

A 2x1 connector is provided for connecting an external battery backup to maintain the real-time clock. The allowable battery voltage range is 3.0-3.6VDC.

The backup battery is not required to maintain custom BIOS settings.

10.1.10 mSATA/PCIe Mini-card Socket

The SBC-ZETA-3950 provides one mSATA/Mini PCIe socket. This socket supports full-size PCIe Minicards and mSATA cards.

10.1.11 PCIe Link Routing

The SBC-ZETA-3950 makes use of 3 PCIe lanes from the COM connector

- Lane 1 - MiniPCIe socket
- Lane 2 - Second Gigabit Ethernet through i210 Ethernet controller
- Lanes 3 & 4 - Adapter board expansion socket

10.1.12 GPIO

16 GPIO are available via I2C expander circuit (PCA9535) on the digital I/O header.

10.1.13 LED Indicators

The SBC-ZETA-3950 provides the following LED indicators.

- Power on - Green LED (for 12V, 5V and 3.3V)
- Power Good - Green LED for Power Good indication
- BIOS LED - Green LED to indicate Module is booted successfully
- Ethernet - Green LED for Link, activity, and speed for each port

10.1.14 Expansion Connector

The SBC-ZETA-3950 will in future support I/O Expansion capability via a high-density 40-pin connector. Using an adapter board for I/O access will enable:

- Two PCIe x 1 lanes
- HD Audio interface
- SATA interface
- USB2.0 interface
- I2C interface

10.1.15 eMMC Storage

The SBC-ZETA-3950 provides an on-board high-speed eMMC for data storage, compliant with JEDEC eMMC v5.1 standard. Typical use case for the on-board industrial eMMC is storing your operating system and enabling a write-protection method to lock down the OS from being written to. See the following table for specifications regarding the on-board industrial eMMC.

On-board industrial eMMC				
Size	**HS400 Sequential Read**	**HS400 Sequential Write**	**TBW**	**Data Rention**
128 GB	300 MB/s	170 MB/s	824 TB	~300 P/E Cycles

10.1.16 TPM 2.0

The SBC-ZETA-3950 provides an on-board discrete TPM 2.0 hardware security chip.

10.1.17 Memory

8GB of soldered down LPDDR4 memory is available on the SBC-ZETA-3950. This memory can operate up to 2400 MT/s.

11. Getting Started

11.1 System Setup

1. Attach the VGA cable 6981084 and USB cables 6981082 as needed.
2. Attach display, keyboard, and mouse (if needed) to the cables.
3. Check the jumpers as described in Section 7 for a default settings or change as desired.
4. Connect power to power input connector J9 using your own power supply with power cable 6981070. The input connector and cable are keyed to prevent incorrect connection. **WARNING: Attaching the power connector incorrectly will destroy the Zeta base board!**

For a quick verification that the system is set up and working properly, if no boot device is attached, the system will boot to shell utility in case of Arbor module.

11.2 Boot Device Options

The SBC-ZETA-3950 can boot from mSATA or any of the available USB ports or micro SD card (linux only). The SBC-ZETA-3950 can be booted from micro SD card for linux OS. The SBC-ZETA-3950 can be booted from an external hard drive connected mini card to SATA adapter board.

WARNING: It is possible to destroy the SBC by connecting a SATA cable incorrectly (reverse orientation or offset from correct position). Always use keyed cables to avoid connection errors.

The Boot device selection and priority are configured in the **BIOS** Boot menu. Only devices which are connected to the SBC will appear in the list of options. Therefore, if user wants to select a hard drive or USB device as the boot device, the SBC should be connected first, then boot up, enter the BIOS, and select the desired device as the boot device. Boot type order can be changed using ‘+’/’-’ key.

The following are a few examples of boot scenarios.

- Attach a mSATA device on the shared mSATA / PCIe MiniCard socket
- Attach a bootable USB device to one of the USB ports
- Attach a M.2 SATA SSD to M.2 socket on daughter board
- Connect an externally powered SATA hard drive to shared mSATA / PCIe
- PXE boot
- Micro SD Card (Linux only)MiniCard socket using mini card to SATA-adapter board

11.3 Installing OS and Booting

The following steps describe how to install an operating system from a mSATA using a WINSYSTEMS module. Follow the below steps to install a 64-bit Windows 10 legacy operating system on a mSATA or eMMC.

Connect a USB drive containing 64-bit Windows 10 to a USB port of (J1 or J4) of the SBC-ZETA-3950. Power ON the board.

1. Enter the BIOS menu by pressing DEL key. The mSATA and USB device and OS should be detected in BIOS under boot devices.
2. Under Boot Type Order, set the highest priority for USB.
3. Save the BIOS settings and restart.
4. The Windows 10 installer will start running. Follow the instructions to complete the installation.
5. Upon successful installation, boot to Windows 10 and install the necessary drivers, as required.
6. Upon restart, to boot from mSATA, go to BIOS menu and under Boot Type Order set highest priority to Hard disk.

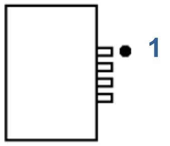
12. COM Pinout and Signal Description

12.1 Debug Interface Connector (J2)

JTAG debug at connector J2 is available upon request. Contact WINSYSTEMS at +1-817-274-7553. Alternatively, USB debugging is supported via USB 3.2, Gen 1 Port 0 for code development.

12.2 External Fan Connector (J3)

Layout and Pin Reference

Function	External Fan Connnection		
Location	J3		
Pinout	**Pin**	**Description**	
	1	Vin	
	2	TACH	
	3	PWM	
	4	GND	

Connector

- Pico-Lock PCB Header, 1.00mm Pitch
- Part Number: 503763-0491

Matching Connector

- Molex Pico-Lock Receptacle Crimp Housing, 1.00mm Pitch
- Part Number: 503764-0401

13. Carrier Pinout and Signal Description

13.1 Power Input (J9)

The pinout of the power input connector is shown below. Although 4 power and 6 ground pins are provided, not all pins need to be connected. Each connector pin can support up to 2A. The number of connections can be determined by the total power consumption of the SBC-ZETA-3950 plus all attached I/O (adapter board, mSATA and mini PCIe modules, and USB devices) divided by the input voltage, divided by 2A.

Pinout	Description	Pin	Pin	Description
	Key	1	2	GND
	VIN	3	4	GND
	VIN	5	6	GND
	VIN	7	8	GND
	VIN	9	10	GND
	SYS_RST_R#	11	12	GND
	VCC_5V/12P0_BKLT	13	14	PWRBTN#

13.2 RTC Battery Input (J6)

The pinout for the RTC battery connector is shown below. The battery input voltage range is 3.0 – 3.6VDC.

Pinout	Description	Pin
	RTC_BATT	1
	GND	2

13.3 Serial Ports (J13 and J14)

Serial ports 1 and 2 are provided on connector J13, and serial ports 3 and 4 are provided on connector J14. All four serial ports support RS432, RS422 and RS485 modes.

13.3.1 RS232 Mode

Pinout	Description	Pin	Pin	Description
	TX1	1	2	RTS1
	RX1	3	4	CTS1
	GND	5	6	GND
	TX2	7	8	RTS2
	RX2	9	10	CTS2
	Description	**Pin**	**Pin**	**Description**
	TX3	1	2	RTS3
	RX3	3	4	CTS3
	GND	5	6	GND
	TX4	7	8	RTS4
	RX4	9	10	CTS4

13.3.2 RS422 Mode

Pinout	Description	Pin	Pin	Description
	TX1+	1	2	TX1-
	RX1+	3	4	RX1-
	GND	5	6	GND
	TX2+	7	8	TX2-
	RX2+	9	10	RX2-
	Description	**Pin**	**Pin**	**Description**
	TX3+	1	2	TX3-
	RX3+	3	4	RX3-
	GND	5	6	GND
	TX4+	7	8	TX4-
	RX4+	9	10	RX4-

13.3.3 RS485 Mode

Pinout	Description	Pin	Pin	Description
	TX1/RX1+	1	2	TX1/RX1-
	NC	3	4	NC
	GND	5	6	GND
	TX2/RX2+	7	8	TX2/RX2-
	NC	9	10	NC
	Description	**Pin**	**Pin**	**Description**
	TX3/RX3+	1	2	TX3/RX3-
	NC	3	4	NC
	GND	5	6	GND
	TX4/RX4+	7	8	TX4/RX4-
	NC	9	10	NC

13.4 USB 2.0 Ports (J1 and J2)

USB port 0 and 1 are provided on connector J2, and USB port 2 and 3 are provided on connector J1. Pinout for the connector is shown below:

Pinout	Description	Pin	Pin	Description
	Key	1	2	Shield
	GND (USB1 Pwr-)	3	4	GND (USB0 Pwr-)
	USB1 Data+	5	6	USB0 Data+
	USB1 Data-	7	8	USB0 Data-
	USB1 Pwr+	9	10	USB0 Pwr+
	Description	**Pin**	**Pin**	**Description**
	Key	1	2	Shield
	GND (USB3 Pwr-)	3	4	GND (USB2 Pwr-)
	USB3 Data+	5	6	USB2 Data+
	USB3 Data-	7	8	USB2 Data-
	USB3 Pwr+	9	10	USB2 Pwr+

13.5 USB 3.0 Port (J4)

One USB 3.0 port is provided on connector J4. The pinout for the connector is shown below:

Pinout	Description	Pin	Pin	Description
	Key	1	2	Shield
	GND (USB1 Pwr-)	3	4	GND (USB0 Pwr-)
	USB1 Data+	5	6	USB0 Data+
	USB1 Data-	7	8	USB0 Data-
	USB1 Pwr+	9	10	USB0 Pwr+

13.6 Ethernet (J11 and J12)

Two 10/100/1000 BASE-T Ethernet ports are provided on connectors J11 and J12. The connector pinouts are shown below. Port 1 is derived from the COM, and port 2 is derived from an Intel i210 PCIe Ethernet controller on the carrier.

Pinout	Description	Pin	Pin	Description
	NC	1	2	CH1_Key
	CH1_D0+	3	4	CH1_D0-
	CH1_D1+	5	6	CH1_D1-
	CH1_D2+	7	8	CH1_D2-
	CH1_D3+	9	10	CH1_D3-
	Description	**Pin**	**Pin**	**Description**
	NC	1	2	CH2_Key
	CH2_D0+	3	4	CH2_D0-
	CH2_D1+	5	6	CH2_D1-
	CH2_D2+	7	8	CH2_D2-
	CH2_D3+	9	10	CH2_D3-

13.7 mSATA / mPCIe (J8)

Pinout	PCIe MiniCard	mSATA	Pin	Pin	mSATA / PCIe MiniCard
	Wake-		1	2	+3.3V
	NC	NC	3	4	GND
	NC	NC	5	6	+1.5V
	Clkreq-		7	8	NC
	GND	GND	9	10	NC
	PCIe 0 Clk-	PCIe 0 Clk- *	11	12	NC
	PCIe 0 Clk+	PCIe 0 Clk+ *	13	14	NC
	GND	GND	15	16	NC
			KEY		
	NC	NC	17	18	GND
	NC	NC	19	20	Disable-
	GND	GND	21	22	PCIe Reset-
	PCIe 0 RX-	SATA 0 RX+	23	24	+3.3V
	PCIe 0 RX+	SATA 0 RX-	25	26	GND
	GND	GND	27	28	+1.5V
	GND	GND	29	30	SMB Clk
	PCIe 0 TX-	SATA 0 TX-	31	32	SMB Data
	PCIe 0 TX+	SATA 0 TX+	33	34	GND
	GND	GND	35	36	USB2_N
	GND	GND	37	38	USB2_P
	+3.3V	+3.3V	39	40	GND
	+3.3V	+3.3V	41	42	WWAN LED-
	Ground	Ground	43	44	WLAN LED-
	NC	NC	45	46	WPAN LED-
	NC	NC	47	48	+1.5V
	Pull-up to +3.3V	Pull-up to +3.3V	49	50	GND
	NC	NC	51	52	+3.3V
	GND	GND	P1	P2	GND

13.8 Micro SD (J17)

A Micro SD card is supported on connector J17.The Micro SD can be used as a boot device or storage device in Linux. It can be used only as a storage device in Windows 7 and 10.

Pinout	Description	Pin
	DAT2	1
	CD/DAT3	2
	CMD	3
	VDD 3.3V	4
	CLK	5
	Ground	6
	DAT0	7
	DAT1	8

13.9 VGA (J3)

The VGA interface is provided on connector J3. Pinout for the connector is shown below:

Pinout	Description	Pin	Pin	Description
	RED	1	2	Ground
	GREEN	3	4	Key
	BLUE	5	6	Ground
	HSYNC	7	8	DDC-Data
	VSYNC	9	10	DDC-Clock

13.10 LVDS (J18)

The single-channel LVDS interface is provided on connector J18. The pinout is shown below:

Pinout	Description	Pin
	VCC_5V_LVDS_CON	1
	V_3P3_LVDS_CON	2
	LVDS_A_CH_CLK_P	3
	LVDS_A_CH_CLK_N	4
	GND	5
	LVDS_A_CH_0_P	6
	LVDS_A_CH_0_N	7
	GND	8
	LVDS_A_CH_1_P	9
	LVDS_A_CH_1_N	10
	GND	11
	LVDS_A_CH_2_P	12
	LVDS_A_CH_2_N	13
	GND	14
	LVDS_A_CH_3_P	15
	LVDS_A_CH_3_N	16
	LVDS_DDC_CLK	17
	LVDS_DDC_DAT	18
	GND	19
	GND	20

13.11 LCD Backlight (J19)

The pinout for the connector is shown below:

Pinout	Description	Pin
	Power +5V/+12V	1
	Power +5V/+12V	2
	Ground	3
	Ground	4
	LCD backlight Enable signal	5
	LCD PWM signal	6

13.12 Digital I/O (J15)

The Digital I/O pinout for the SBC-ZETA-3950 is shown below.

Pinout	Description	Pin	Pin	Description
	DIO A0	1	2	DIO A1
	DIO A2	3	4	DIO A3
	DIO A4	5	6	DIO A5
	DIO A6	7	8	DIO A7
	DIO B0	9	10	DIO B1
	DIO B2	11	12	DIO B3
	DIO B4	13	14	DIO B5
	DIO B6	15	16	DIO B7
	NC	17	18	NC
	NC	19	20	NC
	NC	21	22	NC
	NC	23	24	NC
	+5V/3.3V fused	25	26	Dground

13.13 Expansion Connector (J5)

Pinout	Description	Pin	Pin	Description
	+5V	1	2	+5V
	PCIe_Exp2_T+ (NC)	3	4	PCIe_Exp1_T+
	PCIe_Exp2_T-(NC)	5	6	PCIe_Exp1_T
	GND	7	8	GND
	PCIe_Exp2_R+(NC)	9	10	PCIe_Exp1_R+
	PCIe_Exp2_R-(NC)	11	12	PCIe_Exp1_R
	GND	13	14	GND
	PCIe_Exp2_C+(NC)	15	16	PCIe_Exp1_C+
	PCIe_Exp2_C-(NC)	17	18	PCIe_Exp1_C-
	+3.3V	19	20	GND
	SATA-T+	21	22	PCIe_Exp1_clkreq-(NC)
	SATA-T-	23	24	PCIe_Exp2_clkreq-(NC)
	+3.3V	25	26	USB2_D4_P
	SATA-R+	27	28	USB2_D4_N
	SATA-R-	29	30	GND
	+3.3V	31	32	Host Reset-
	AC_SDIN0	33	34	I2C_Data
	AC_BITCLK	35	36	I2C_Clk
	AC_SDOUT	37	38	AC_SYNC
	AC_RST#	39	40	GND

13.13.1 Expansion Connector Pinout Descriptions (Future option)

Signal name	Description
PCIe_Exp1_T+ PCIe_Exp1_T- PCIe_Exp1_R+	PCIe Lane 1
PCIe_Exp1_R- PCIe_Exp1_C+	
PCIe_Exp1_C- PCIe_Exp1_clkreq-(NC)	
PCIe_Exp2_T+ (NC) PCIe_Exp2_T-(NC)	PCIe Lane2. Not available in EmNANO i2300
PCIe_Exp2_R+(NC) PCIe_Exp2_R-(NC)	
PCIe_Exp2_C+(NC) PCIe_Exp2_C-(NC)	
PCIe_Exp2_clkreq-(NC)	
SATA-T+ SATA-T- SATA-R+	SATA
SATA-R-	
AC_SDIN0 AC_BITCLK	HD Audio Link
AC_SDOUT AC_RST#	
AC_SYNC	
I2C_Data	I2C interface
I2C_Clk	
USB2_D4_P USB2_D4_N	USB2.0 Interface
Host Reset-	Reset from Processor
+5V	5V supply from Carrier board
+3.3V	3.3V supply from Carrier board
GND	Digital ground

14. Jumper Descriptions

The default jumper positions are shown in red.

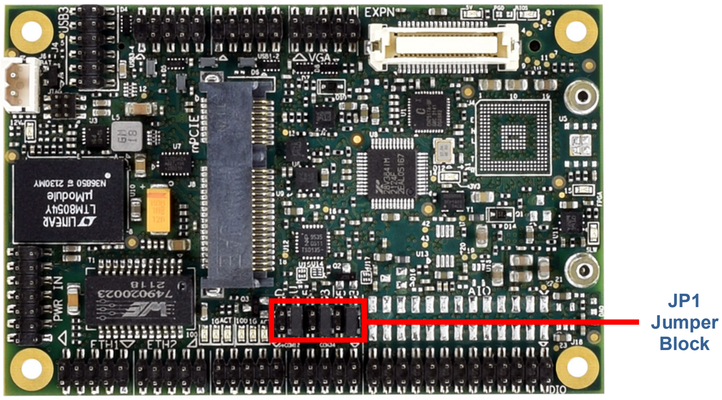


Figure: SBC-ZETA-3950 default jumper location

Jumper	Position	Description
JP1	1-2 3-4	LVDS PWM =3.3V LVDS PWM =5V
	5-6 7-8	VIO_DIO = 3.3V VIO_DIO = 5.0V
	9-10 11-12	DIO Pulled up DIO Pulled down

Table: SBC-ZETA-3950 board Jumper JP1 details

15. Mass Storage

The SBC-ZETA-3950 comes with 128GB of eMMC storage. Systems which do not require any additional I/O beyond the carrier features may use the carrier's MiniCard/mSATA socket to contain the system bootable mass storage. For Linux operation, the Micro SD socket may also be used for mass storage, leaving the MiniCard socket available for expansion. A system running Windows must use the minicard/mSATA socket or the eMMC for the boot device.

Mounting hardware is metric panhead M2.5 4-5mm length for mSATA sockets and M3 3-4mm length for the M.2 socket. Mounting screws should be pre-installed on the mounting posts for the memory sockets. Remove the screws from the mounting standoffs before installing the flash disk. Install the flash disk by sliding it into the socket at a slight angle. Push down until it contacts the standoff, then secure it with the screws.

Most common mSATA modules should work with SBC-ZETA-3950. WINSYSTEMS offers a number of modules that are tested and qualified for use.

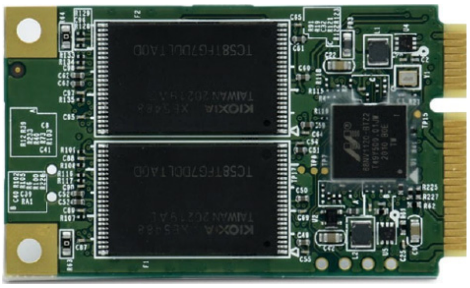


Figure: Example mSATA module for additional mass storage on the SBC-ZETA-3950.

16. Digital I/O

SBC-ZETA-3950 models provide 16 digital I/O coming from an I2C I/O expander chip. The digital I/O consists of 16 I/O lines organized as two 8-bit ports A and B. They may be configured with a jumper for either 3.3V or 5V logic levels, and they may also be configured with a jumper for 10K ohm pull-up or pull-down resistors. These jumper settings apply to both ports collectively; it is not possible to configure one port for 3.3V and the other for 5V at the same time, or to configure one port for pull-up and other for pull-down simultaneously. For safety and to prevent glitches, on power up or reset, all ports reset to input mode and all port data registers reset to all 0.

- 16 digital I/O lines
- Programmable direction in 8-bit groups
- User-selectable 3.3V / 5V logic levels
- User-selectable 10K pull-up / pull-down resistors

The circuit controller is PCA9535 I2C to GPIO Expander that interfaces to the processor via the I2C bus from COM express connector. 7bit I2C address for the GPIO expander is 0x22. Please refer Section Digital I/O (J15) Digital IO Connector pinouts.

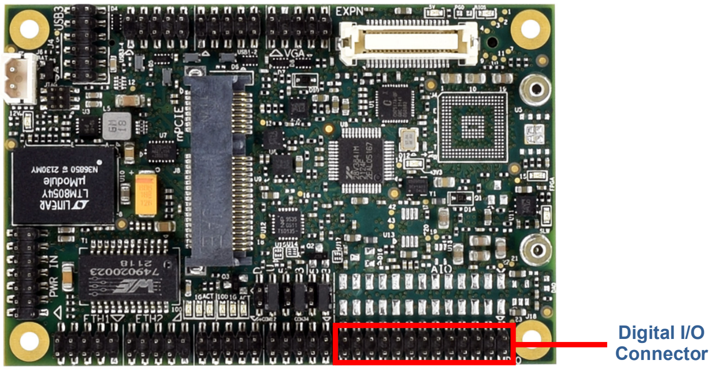


Figure: Digital I/O connector

16.1 Block Diagram

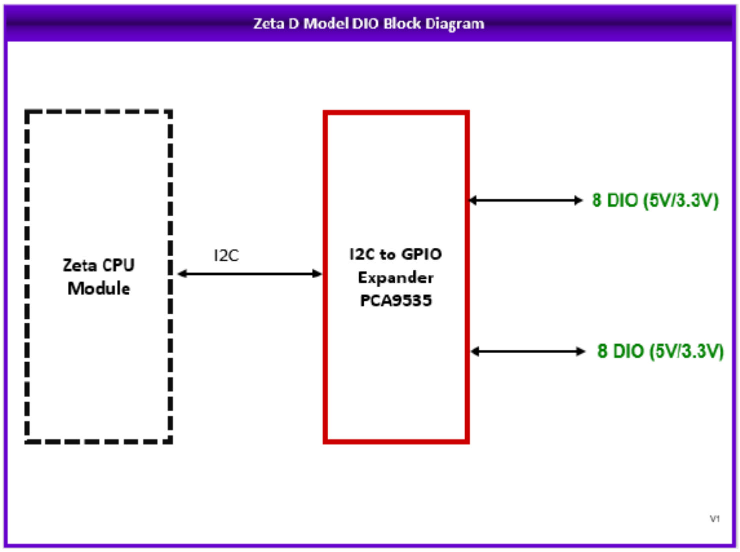


Figure: D Model Digital I/O Block Diagram

16.2 Digital IO Specification

No of IO lines	16
Direction	Programmable bit by bit
Polarity	Programmable bit by bit
Input voltage	VDD= 5V
Logic 0:	0.0V min, 1.5V max, ±1uA
Logic 1:	3.5V min, 5.5V max, ±1uA
Output Voltage	VDD= 5V
Logic 0:	0.0V min, 0.7V max, +14mA(Typ)
Logic 1:	4.1V min, 5.0V max, -10mA(Typ)
Input voltage	VDD= 3.3V
Logic 0:	0.0V min, 0.99V max, ±1uA
Logic 1:	2.31V min, 3.3V max, ±1uA
Output Voltage	VDD= 3.3V
Logic 0:	0.0V min, 0.7V max, +14mA(Typ)
Logic 1:	2.65V min, 3.3V max, -10mA(Typ)

16.3 Configuration and Programming

Please refer to the PCA9535 Datasheet (available via online search) for programming instructions for the digital I/O. The PCA9535 uses I2C address 0100 010x (where x is the read/write-bit). The PCA9535 has 4 registers for each 8-bit data register: An input register, an output register, a polarity register, and a direction register. DIO port A (J15 pins 1-8) corresponds to PCA9535 port 0, and DIO port B (J15 pins 9-16) corresponds to PCA9535 port 1.

17. BIOS Functionality

17.1 Software Description

This section provides details on the AMI BIOS components to be used in the implementation of the SBC-ZETA-3950 BIOS firmware.

17.1.1 Software Design Specification: UEFI Operating System Support

The BIOS supports the booting of the following UEFI compliant operating systems:

- Windows 10 x64, IoT Enterprise, IoT Core, and Professional
- Linux x64
- Most x86 operating systems

17.1.2 Software Design Specification: Legacy Operating System Support

The BIOS supports the booting of the following legacy OS capabilities:

- MS-DOS 6
- Compatibility support module (CSM)
- Legacy boot support
- Legacy option ROM support

17.1.3 Software Design Specification: Boot Device Configuration

The BIOS supports booting an OS from the following devices:

- USB mass storage device
- Serial ATA (SATA) device
- Network boot - PXE
- eMMC
- M.2 mass storage device

17.1.4 Software Design Specification: BIOS Update Mechanisms

The BIOS supports the following update mechanisms:

- BIOS update with UEFI shell
- Software utilities
- Flash recovery via USB mass storage device
- Flash recovery via eMMC device
- Embedded controller (EC) firmware update with UEFI shell

17.1.5 Software Design Requirements: BIOS Components

The BIOS includes the following components:

- **Advanced Host Controller Interface (AHCI) support:** Provides SATA-host controller functionality.
- **Display switching in setup:** Implements display switching using theUEFI GOP driver under the SETUP environment.
- **Boot order:** Generates the default boot order on the platform’s first boot.
- **Boot/resume from S4 device:** Allows the platform to boot from the last S4 hibernated device, disregarding the current boot priority.
- **Cryptographic support:** Provides cryptographic related libraries, PPI, and UEFI protocols for security modules (secure FW update, secure boot, etc.)
- **Source level support:** Provides source level debug functionality for the BIOS project.
- **Fastboot:** Provides optimization of the boot time.
- **Fixed boot order:** Provides infrastructure that allows custom handling of available boot options to meet specific customer needs. Custom boot behavior may include different requests, such as always boot from specific device, default support of various kinds of grouping of boot devices.
- **Generic error logging:** Provides support for logging POST and runtime errors to the GPNV area.
- **Keyboard controller emulation** for USB keyboard/mouse.
- **Physical memory testing:** Supports testing of physical memory present in the system.
- RTC registration and ability to handle wakeup from S5 sleep state.

- **Secure boot support:** provides support and functionality to conform with UEFI 2.3.1 secure boot requirements and includes the following components:
  - Extended functionality of EFI NVRAM driver with support for authenticated EFI variables.
  - EFI image authentication module that installs EFI security architecture protocol with image authentication and image execution policy.
  - Secure boot variable (PK, KEK, db, and dbx) provisioning.
- Support for the booting to the built in UEFI shell.

17.2 BIOS Update with UEFI Shell

17.2.1 Scope

The Unified Extensible Firmware Interface (EFI or UEFI for short) is a new model for the interface between operating systems and firmware. It provides a standard environment for booting an operating system and running pre-boot applications.

An optional feature of a UEFI implementation is the ability to boot the system to a built-in shell. The UEFI shell provides a command prompt and a rich set of commands that extend and enhance the capability of the UEFI BIOS.

This section describes the process for updating the SBC-ZETA-3950 BIOS firmware image using the built-in UEFI shell.

17.2.2 Process

1. Insert a USB flash drive containing the BIOS update program into a USB socket on the SBC-ZETA-3950 platform.
2. Turn on the SBC-ZETA-3950 and press the **ESC** or **DEL** key during the boot process, which starts the BIOS setup utility.
3. In the BIOS setup utility, use the cursor keys to highlight the **Save & Exit** menu option.
4. Use the cursor keys to select **UEFI: Built-In EFI Shell** from the list of boot devices displayed under the **Boot Override** section.
5. Press Enter
   The SBC-ZETA-3950 executes the built-in UEFI shell, and displays a list of attached storage devices. The USB flash drive shows up in the list; depending on other boot devices attached, it may be listed as **fs0**, **fs1**, etc.

6. From the UEFI shell command prompt, enter the following command where `N` is the number of the fs device representing the USB flash drive:
   `fsN:`
   Example: `fs1:`
   The shell prompt changes to indicate that device fsN is now the active storage device, e.g., `fs1:`
7. Execute the following command:
   `ls`
   The output of the `ls` command is similar to the display listing available with the Linux or MS-DOS list directory command. If the correct storage device was selected in step 6 above, the `ls` command should show the BIOS update program in the directory listing obtained with the ls command.
8. Assuming the BIOS update program is named `Update.efi`, enter the following command at the shell command prompt:
   `Update.efi`
   The BIOS update program begins executing.
9. When the update program completes, power cycle the platform to force the new BIOS image to load and execute.

Verify that the BIOS update was successful by comparing the displayed BIOS version with the version specified in the BIOS update notification.

17.2.3 Process

1. Insert a USB flash drive containing the EC update program into a USB socket on the SBC-ZETA-3950 platform.
2. Turn on the SBC-ZETA-3950 and press the **ESC** or **DEL** key during the boot process, which starts the BIOS setup utility.
3. In the BIOS setup utility, use the cursor keys to highlight the **Save & Exit** menu option.
4. Use the cursor keys to select **UEFI: Built-In EFI Shell** from the list of boot devices displayed under the **Boot Override** section.
5. Press **Enter**.
   The SBC-ZETA-3950 executes the built-in UEFI shell, and displays a list of attached storage devices. The USB flash drive shows up in the list; depending on other boot devices attached, it may be listed as **fs0**, **fs1**, etc.
6. From the UEFI shell command prompt, enter the following command where `N` is the number of the fs device representing the USB flash drive:
   `fsN:`
   Example: `fs1:`
   The shell prompt changes to indicate that device fsN is now the active storage device, e.g., `fs1:`

7. Execute the following command:
   ```
   ls
   ```
   The output of the `ls` command is similar to the display listing available with the Linux or MS-DOS list directory command. If the correct storage device was selected in step 6 above, the `ls` command should show the EC update program in the directory listing obtained with the `ls` command.
8. Assuming the EC update program is named `Update.efi`, enter the following command at the shell command prompt:
   ```
   Update.efi
   ```
   The EC update program begins executing.
9. When the update program completes, power cycle the platform to force the new EC image to load and execute.
10. Verify that the EC update was successful by comparing the displayed EC version in the BIOS with the version specified in the EC update notification.

18. Accessories

18.1 Cables

Cable set for SBC-ZETA-3950
Part Number
CBL-SET-ZETA-1

18.1.1 I/O Cables

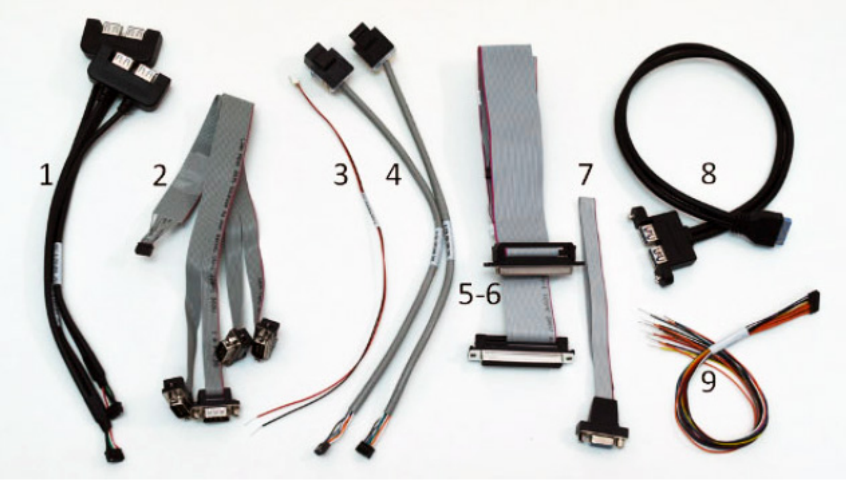
The SBC-ZETA-3950 cable set includes cables for all I/O features on the SBC except LCD. Details are provided below.

An LCD / backlight cable kit is available for specific displays used in our manufacturing environment. Customers may purchase this cable kit as a starting point and modify the LCD ends to support their specific display.

No	Function	Cable ID	Reference
1	Dual USB 2.0 cable (x2)	6981082	J1, J2
2	Dual Serial cable (x2)	6981075	J13, J14
3	External battery cable (x1)	6980524	J6
4	Ethernet cable (x2)	6981080	J11, J12
5-6	Digital I/O cable (x1)	6980516	J15
7	VGA cable (x1)	6981084	J3
8	Dual USB 3.0 cable (x1)	6980102	J4
9	Power input cable (x1)	6981070	J9

Table: SBC-ZETA-3950 board I/O cables

NOTE The Cable ID are cable set component identifiers, not orderable part numbers.



18.1.2 List of IO Connectors and Mating Cables

The following table provides a summary of all user-accessible I/O connectors on the board.

Function	No	Description	Mating Connector	Cable ID	Reference
USB 2.0	1	2x5 2mm pitch vertical pin header	*	6981082	J1, J2
Serial Ports	2	2x5 2mm pitch vertical pin header	*	6981075	J13, J14
External Battery	3	2 pos. through-hole vertical shrouded pin header, 0.1” pitch	Molex Spox	6980524	J6
GbE Ethernet	4	2x5 2mm pitch vertical pin header	*	6981080	J11, J12
Digital I/O	5-6	2x13 2mm pitch vertical pin header	*	6980516	J15
VGA	7	2x5 2mm pitch vertical pin header 20 Positions Header Connector	*	6981084	J3
USB 3.0	8	2x6 2mm pitch vertical pin header	*	6980102	J4
Power in	9	2x7 2mm pitch vertical pin header	*	6981070	J9
LVDS	NA	0.039" (1.00mm) Surface Mount, Right Angle Tin	*	Custom	J18
PCIe Minicard / mSATA	*	52-pin Minicard, full size	*	NA	J8
SD Card	*	10 (8 + 2) Position Card Connector	*	NA	J17
Expansion Connector	*	2x20 .635mm / .025” pitch SMD	Molex 53627-0474	NA	J5

Table: SBC-ZETA-3950 board connector details

18.1.3 Other

Contact Sales at +1-817-274-7553, Monday through Friday, between 8 AM and 5 PM Central Time or by email at https://winsystems.com/contact/ for accessories per your requirments.

Appendix A. Best Practices

The following paragraphs outline the best practices for operating the SBC-ZETA-3950 in a safe, effective manner, that does not damage the board. Read this section carefully.

Important Safe Handling Information

WARNING!

ESD-Sensitive Electronic Equipment

Observe ESD-safe handling procedures when working with this product.
Always use this product in a properly grounded work area and wear appropriate ESD-preventive clothing and/or accessories.
Always store this product in ESD-protective packaging when not in use.

Safe Handling Precautions

The SBC-ZETA-3950 contains a high number of I/O connectors with connection to sensitive electronic components. This creates many opportunities for accidental damage during handling, installation and connection to other equipment. The list here describes common causes of failure found on boards returned to WINSYSTEMS for repairs. This information is provided as a source of advice to help you prevent damaging your SBC-ZETA-3950 (or any vendor's) embedded computer boards.

ESD Damage – This type of damage is usually almost impossible to detect, because there is no visual sign of failure or damage. The symptom is that the board eventually simply stops working, because some component becomes defective. Usually the failure can be identified and the chip can be replaced. To prevent ESD damage, always follow proper ESD-prevention practices when handling computer boards.

Damage during handling or storage – On some boards we have noticed physical damage from mishandling. A common observation is that a screwdriver slipped while installing the board, causing a gouge in the PCB surface and cutting signal traces or damaging components.

Another common observation is damaged board corners, indicating the board was dropped. This may or may not cause damage to the circuitry, depending on what is near the corner. Most of our boards are designed with at least 25 mils clearance between the board edge and any component pad, and ground / power planes are at least 20 mils from the edge to avoid possible shorting from this type of damage. However, these design rules are not sufficient to prevent damage in all situations.

A third cause of failure is when a metal screwdriver tip slips, or a screw drops onto the board while it is powered on, causing a short between a power pin and a signal pin on a component. This can cause overvoltage / power supply problems described below. To avoid this type of failure, only perform assembly operations when the system is powered off.

Sometimes boards are stored in racks with slots that grip the edge of the board. This is a common practice for board manufacturers. However, our boards are generally very dense, and if the board has components very close to the board edge, they can be damaged or even knocked off the board when the board tilts back in the rack. Diamond recommends that all our boards be stored only in individual ESD-safe packaging. If multiple boards are stored together, they should be contained in bins with dividers between boards. Do not pile boards on top of each other or cram too many boards into a small location. This can cause damage to connector pins or fragile components.

Power supply wired backwards – Our power supplies and boards are not designed to withstand a reverse power supply connection. This will destroy each IC that is connected to the power supply (i.e. almost all ICs). In this case the board will most likely will be unrepairable and must be replaced. A chip destroyed by reverse power or by excessive power will often have a visible hole on the top or show some deformation on the top surface due to vaporization inside the package. **Check twice before applying power!**

Bent connector pins – This type of problem is often only a cosmetic issue and is easily fixed by bending the pins back to their proper shape one at a time with needle-nose pliers. The most common cause of bent connector pins is when a PC/104 board is pulled off the stack by rocking it back and forth left to right, from one end of the connector to the other. As the board is rocked back and forth it pulls out suddenly, and the pins at the end get bent significantly. The same situation can occur when pulling a ribbon cable off of a pin header. If the pins are bent too severely, bending them back can cause them to weaken unacceptably or even break, and the connector must be replaced.

Power Supply Budget

Evaluate your power supply budget. It is usually good practice to budget twice the typical power requirement for all of your devices.

Zero-load Power Supply

Use a zero-load power supply whenever possible. A zero-load power supply does not require a minimum power load to regulate. If a zero-load power supply is not appropriate for your application, then verify that the SBC-ZETA-3950 typical load is not lower than the power supply's minimum load. If the SBC-ZETA-3950 board does not draw enough power to meet the power supply's minimum load, then the power supply does not regulate properly and can cause damage to the SBC-ZETA-3950.

Use Proper Power Connections (Voltage)
When verifying the voltage, measure it at the power connector on the carrier board. Measuring it at the power supply does not account for voltage drop through the wire and connectors.

The SBC-ZETA-3950 requires +6V to +36V to operate. Verify the power connections. Incorrect voltages can cause catastrophic damage.

Power Harness

Minimize the length of the power harness. This reduces the amount of voltage drop between the power supply and the SBC-ZETA-3950.

Gauge Wire

Use the largest gauge wire that the pin and connector manufacture allows. Most pin and connector manufacturers have a maximum gauge wire they recommend for their pins.

Contact Points

WINSYSTEMS boards mostly use connectors with gold finish contacts. Gold finish contacts are used exclusively on high-speed connections. Power and lower speed peripheral connectors may use a tin finish as an alternative contact surface. It is critical that the contact material in the mating connectors is matched properly (gold to gold and tin to tin). Contact areas made with dissimilar metals can cause oxidation/corrosion, resulting in unreliable connections.

Pin Contacts

Often the pin contacts used in cabling are not given enough attention. The ideal choice for a pin contact would include a design similar to Molex or Trifurcon designs, which provide three distinct points to maximize the contact area and improve connection integrity in high shock and vibration applications.

Power Down

Make sure that power has been removed from the system before making or breaking any connections.

Power Supply OFF—Always turn off the power supply before connecting to the embedded system. Do not hot-plug the SBC-ZETA-3950 on a host carrier board that is already powered.

I/O Connections OFF—Turn off all I/O connections before connecting them to the embedded computer modules or any I/O cards. Connecting hot signals can cause damage whether the embedded system is powered or not.

Mounting and Protecting the SBC-ZETA-3950

To avoid damage, mount the SBC-ZETA-3950 properly. Standoff kits are available and recommended for use with the SBC-ZETA-3950.

Placing the SBC-ZETA-3950 on mounting standoffs—Be careful when placing the SBC-ZETA-3950 on the mounting standoffs. Sliding the board around until the standoffs are visible from the top can cause component damage on the bottom of the board.

Do not bend or flex the SBC-ZETA-3950—Bending or flexing can cause irreparable damage. Embedded computer modules are especially sensitive to flexing or bending around ball grid array (BGA) devices. BGA devices are extremely rigid by design, and flexing or bending the embedded computer module can cause the BGA to tear away from the printed circuit board.

Mounting holes—The mounting holes are plated on the top, bottom, and through the barrel of the hole. Traces are often routed in the inner layers right below, above, or around the mounting holes.

- Never use a drill or any other tool in an attempt to make the holes larger.
- Never use screws with oversized heads. The head could come in contact with nearby components causing a short or physical damage.
- Never use self-tapping screws; they compromise the walls of the mounting hole.
- Never use oversized screws that cut into the walls of the mounting holes.
- Always use all of the mounting holes. By using all of the mounting holes, you provide the support the embedded computer module needs to prevent bending or flexing.

Avoid cutting the SBC-ZETA-3950—Never use star washers or any fastening hardware that cut into the SBC-ZETA-3950.

Avoid over-tightening of mounting hardware—Causing the area around the mounting holes to compress could damage interlayer traces around the mounting holes.

Use appropriate tools—Always use tools that are appropriate for working with small hardware. Large tools can damage components around the mounting holes.

Conformal Coating

Conformal coating by any source other than WINSYSTEMS voids the product warranty and will not be accepted for repair by WINSYSTEMS. If such a product is sent to WINSYSTEMS for repair, it will be returned at customer expense and no service will be performed. A WINSYSTEMS product conformally coated by WINSYSTEMS will be subject to regular WINSYSTEMS warranty terms and conditions.

Operations/Product Manuals

Every WINSYSTEMS product has an Operations manual or Product manual.

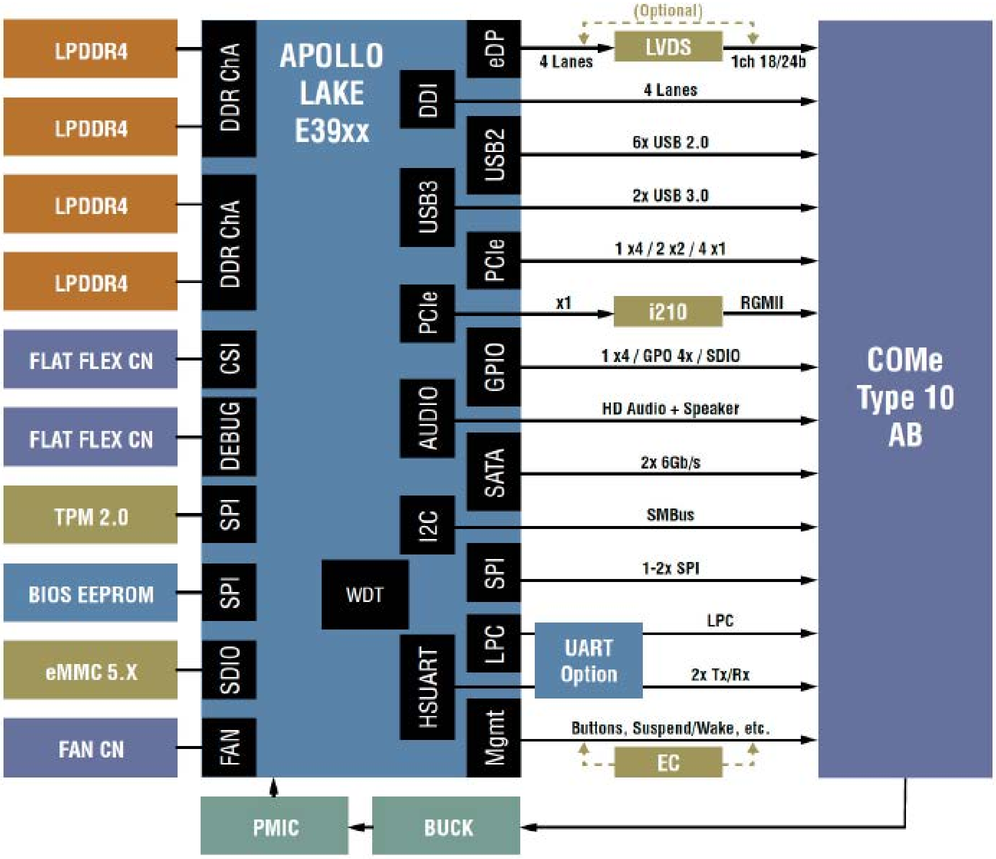
Periodic updates—Operations/product manuals are updated often. Periodically check the WINSYSTEMS website https://www.winsystems.com/ for revisions.

Check pin-outs—Always check the pin-out and connector locations in the manual before plugging in a cable. Many I/O modules have identical headers for different functions and plugging a cable into the wrong header can have disastrous results.

Contact an engineer—If a diagram or chart in a manual does not seem to match your board, or if you have additional questions, contact a WINSYSTEMS engineer at +1-817-274-7553.

Appendix B. COMeT10 Block Diagram

System Block Diagram for the COMeT10-3900 only.



Appendix C. Mechanical Drawings

SBC-ZETA-3950-8G128D

The form factor of the board is COM Express Nano Type 10 with dimensions of 55mm x 84mm x 47mm (2.16" x 3.3" x 1.840").

Figure 1: Mechanical Outline, Top View

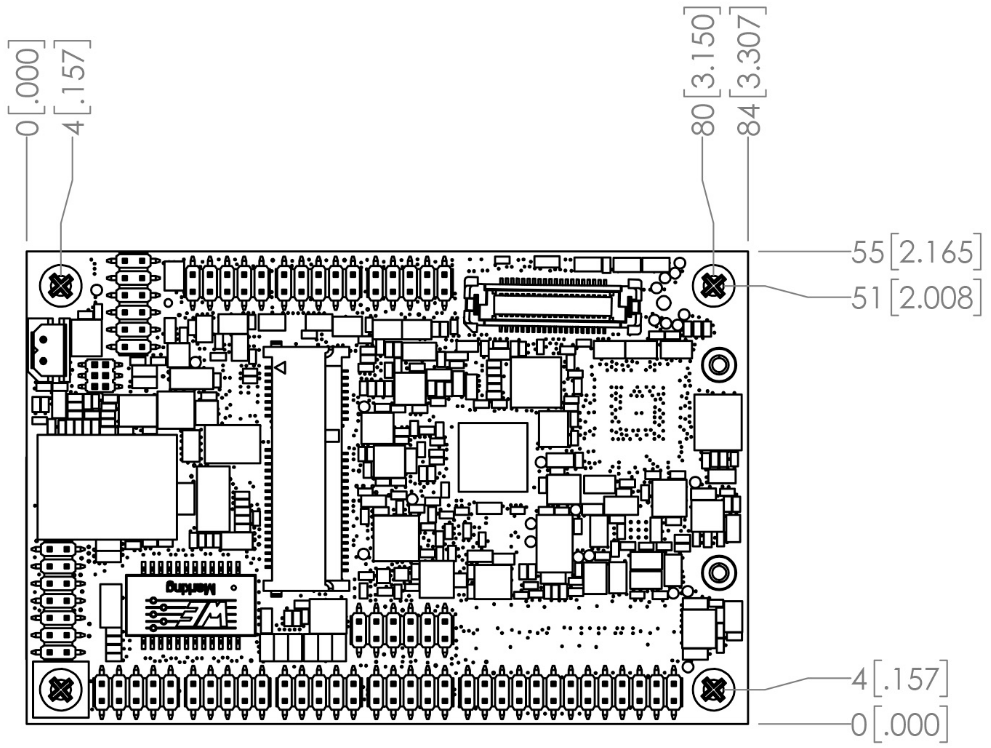


Figure 2: Mechanical Outline, Side View

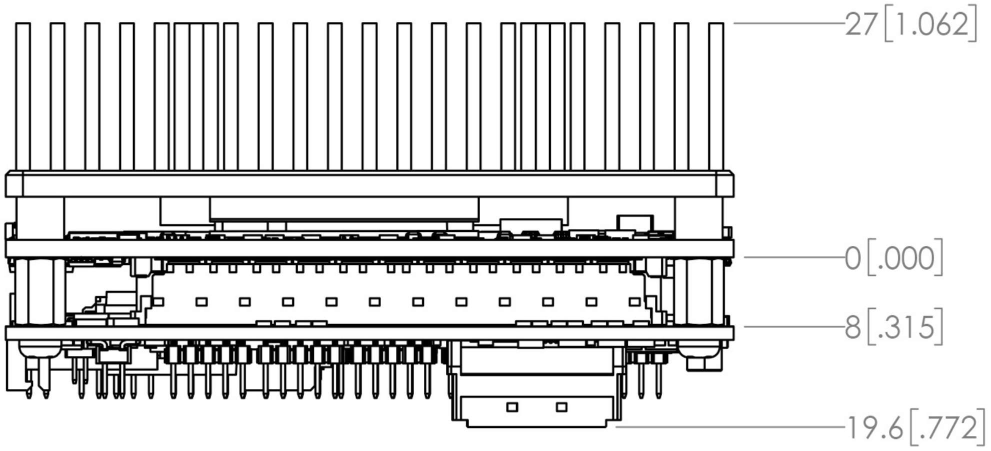
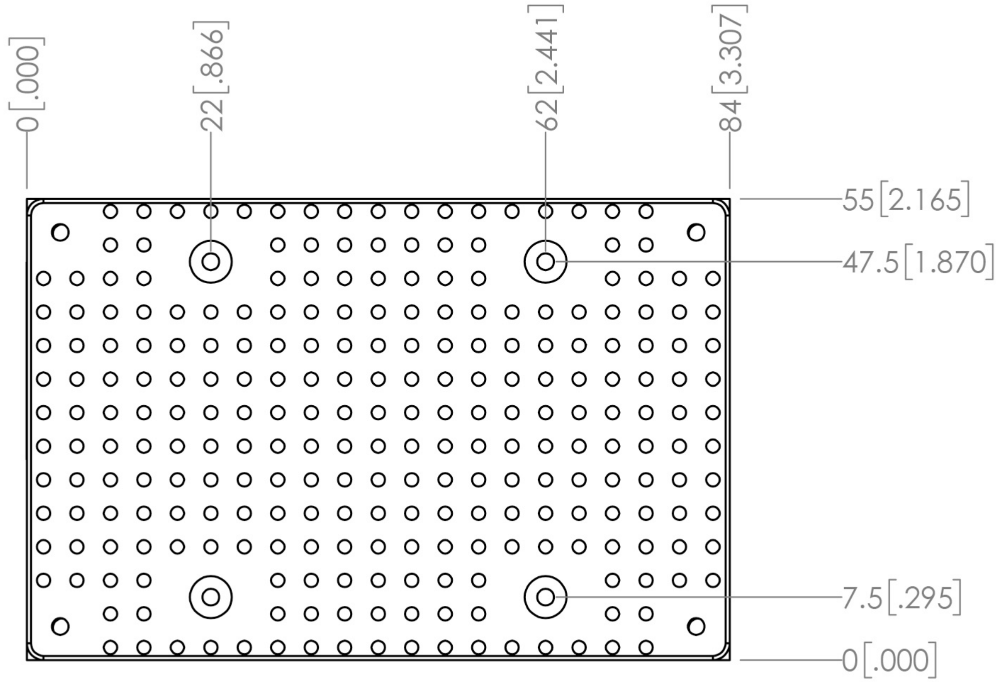


Figure 3: Mechanical Outline, Bottom View



Appendix D. Warranty Information

Full warranty information is at https://winsystems.com/company-policies/warranty/