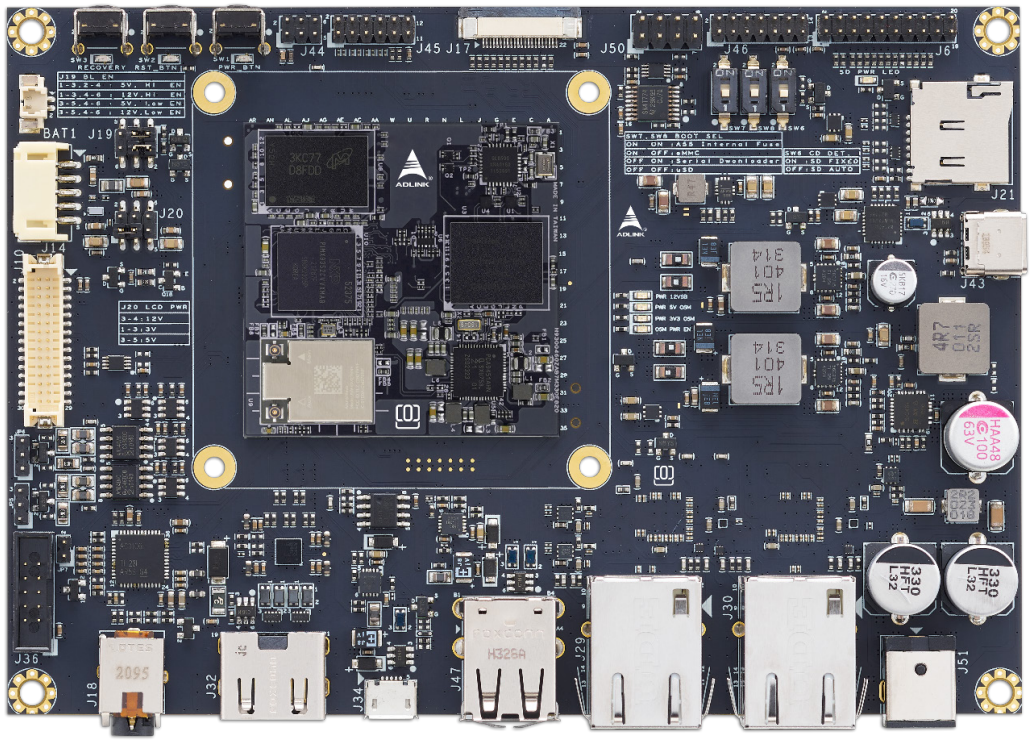
SBC3-IMX93

User's Guide



OPEN STANDARD MODULE™

Revision:	Rev. 1.1
Date:	2025-11-25
Part Number:	50M-77A09-1010

ADLINK LEADING EDGE COMPUTING

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

Revision History

Revision	Description	Date	Author
1.0	Initial release	2025-01-10	AL
1.1	Specifications, block diagram pinout and signal descriptions, and onboard jumpers and switches updated	2025-11-25	AL

Copyright © 2025 ADLINK Technology, Inc.
Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Preface

Disclaimer

Information in this document is provided in connection with ADLINK products. No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document. Except as provided in ADLINK´s Terms and Conditions of Sale for such products, ADLINK assumes no liability whatsoever, and ADLINK disclaims any express or implied warranty, relating to sale and/or use of ADLINK products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright or other intellectual property right. If you intend to use ADLINK products in or as medical devices, you are solely responsible for all required regulatory compliance, including, without limitation, Title 21 of the CFR (US), Directive 2007/47/EC (EU), and ISO 13485 & 14971, if any. ADLINK may make changes to specifications and product descriptions at any time, without notice.

Environmental Responsibility

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





California Proposition 65 Warning: This product can expose you to chemicals including acrylamide, arsenic, benzene, cadmium, Tris(1,3-dichloro-2-propyl)phosphate (TDCPP), 1,4-Dioxane, formaldehyde, lead, DEHP, styrene, DINP, BBP, PVC, and vinyl materials, which are known to the State of California to cause cancer, and acrylamide, benzene, cadmium, lead, mercury, phthalates, toluene, DEHP, DIDP, DnHP, DBP, BBP, PVC, and vinyl materials, which are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Trademarks

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

Copyright © 2025 ADLINK Technology Incorporated

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

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

Safety Instructions

For user safety, please read and follow all Instructions, **WARNING**s, **CAUTION**s, and **NOTE**s marked in this manual and on the associated equipment before handling/operating the equipment.

Read these safety instructions carefully.

- Keep this manual for future reference.
- Read the specifications section of this manual for detailed information on the operating environment of this equipment.
- Turn off power and unplug any power cords/cables when installing/mounting or un-installing/removing equipment.
- To avoid electrical shock and/or damage to equipment:
- Keep equipment away from water or liquid sources;
- Keep equipment away from high heat or high humidity;
- Keep equipment properly ventilated (do not block or cover ventilation openings);
- Make sure to use recommended voltage and power source settings;
- Always install and operate equipment near an easily accessible electrical socket outlet;
- Secure the power cord (do not place any object on/over the power cord);
- Only install/attach and operate equipment on stable surfaces and/or recommended mountings;
- If the equipment will not be used for long periods of time, turn off the power source and unplug the equipment.

Copyright © 2025 ADLINK Technology, Inc.
Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Conventions

The following conventions may be used throughout this manual, denoting special levels of information.

Note: This information adds clarity or specifics to text and illustrations.

Caution: This information indicates the possibility of minor physical injury, component damage, data loss, and/or program corruption.

Warning: This information warns of possible serious physical injury, component damage, data loss, and/or program corruption.

Copyright © 2025 ADLINK Technology, Inc.
Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Getting Services

Ask an Expert: https://www.adlinktech.com/en/Askanexpert

ADLINK Technology, Inc.
No. 66, Huaya 1st Rd., Guishan District, Taoyuan City 333411, Taiwan
Tel: +886-3-216-5088
Fax: +886-3-328-5706
Email: service@adlinktech.com

Ampro ADLINK Technology, Inc.
6450 Via Del Oro, San Jose, CA 95119-1208, USA
Tel: +1-408-360-0200
Toll Free: +1-800-966-5200 (USA only)
Fax: +1-408-600-1189
Email: info@adlinktech.com

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

ADLINK Technology GmbH
Hans-Thoma-Strasse 8-10, 68163 Mannheim, Germany
Tel: +49-621-43214-0
Fax: +49-621 43214-30
Email: emea@adlinktech.com

Please visit the Contact page at www.adlinktech.com for information on how to contact the ADLINK regional office nearest you.

Copyright © 2025 ADLINK Technology, Inc.
Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Table of Contents

Revision History 2
Preface 3
List of Figures 9
1. Introduction 10
1.1. The OSM Form Factor 10
1.2. Product Brief 10
2. Specifications 11
2.1. Board Specifications 11
2.2. Module Interface 12
2.3. Graphics and Video 12
2.4. USB Interfaces 12
2.5. Backlight Power 12
2.6. LCD Power 12
2.7. Networking 12
2.8. Storage 13
2.9. Camera Interface 13
2.10. Audio 13
2.11. Communication 13
2.12. Power Supply 13
2.13. Mechanical and Environmental 14
3. Block Diagram 15
4. Pinout and Signal Descriptions 16
4.1. Pin Summary 16
4.2. Signal Terminology Descriptions 18
4.3. Signal Description by Function 19
4.4. DSI 19
4.5. HDMI 19
4.6. LVDS 19
4.7. MIPI CSI Camera 20
4.8. Audio 21
4.9. LAN Ports 21
4.10. SDIO 21

Copyright © 2025 ADLINK Technology, Inc.
Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

5. Pin Headers for Slow Speed Signals 22
5.1. GPIO Header (J6) 22
5.2. I²C 23
5.3. SPI 23
5.4. CAN bus 24
5.5. UARTS 24
5.6. PWM and ADC 25
5.7. JTAG 25
6. Onboard Jumpers and Switches 27
6.1.1 Connector Specifications 27
6.1.2 Boot Select Switches 27
6.1.3 LCD Panel and Backlight Voltage Settings 28

Copyright © 2025 ADLINK Technology, Inc.
Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

List of Figures

Figure 1 – Module function diagram 15
Figure 2 –SBC3-IMX93 (Top) 16
Figure 3– SBC3-IMX93 (Bottom) 17

Copyright © 2025 ADLINK Technology, Inc.
Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

1. Introduction

1.1. The OSM Form Factor

The OSM ("Open Standard Module") Open Standard Module™ specification facilitates the development, production, and distribution of embedded modules tailored for renowned MCU32, ARM, and x86 architectures. This standard is increasingly relevant for IoT applications, as it merges the benefits of modular embedded computing with the growing demands for cost efficiency, compactness, and versatile interfaces.

The modules serve as building blocks for portable and stationary embedded systems. They integrate the core CPU and support circuits, including DRAM, boot flash, power sequencing, and CPU power supplies. The modules are used with application-specific carrier boards to implement features such as audio CODECs, touch controllers, wireless devices, PHY, and more. The modular design not only promotes scalability and fast time to market but also ensures upgradability, all while maintaining low costs, low power consumption, and a compact physical size.

SGeT STANDARDIZATION GROUP FOR EMBEDDED TECHNOLOGIES

OSM module and carrier specifications are available online at: https://sget.org/standards/osm/

1.2. Product Brief

The SBC3-IMX93 is a 3.5-inch single-board computer designed for industrial applications that require extended temperature ranges and shock-resistant durability. Powered by the advanced i.MX93 microprocessor, it offers enhanced security features and high-performance Cortex-A55 cores.

Copyright © 2025 ADLINK Technology, Inc.
ADLINK LEADING EDGE COMPUTING
LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

2. Specifications

2.1. Board Specifications

Form factor

3.5" form factor

Power supply

Voltage range: from 15 to 30 VDC

Graphics

HDMI over DSI to HDMI bridge (ADV7535)

LVDS single-channel

USB

3 USB2.0 interfaces (2x type A, 1x microUSB)

Communication

2 Gbe ethernet port with TI DP83867IR phy

Slow-speed signals

4x PWM / 2x ADC on header (J50)

2x CAN header (JP5 & JP6)

2x I2C on header (J44)

2x SPI on header (J45)

14x GPIO on header (J6)

3x UART on header (J46)

Copyright © 2025 ADLINK Technology, Inc.
Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

2.2. Module Interface

1x LGA Footprint: Supports OSM LGA-type modules

2.3. Graphics and Video

HDMI Port: Routed through a DSI to HDMI bridge
LVDS Output: Single-channel LVDS to Hirose connector

2.4. USB Interfaces

3x USB ports:

- 1x OTG (On-The-Go)
- 2x Host USB 2.0

2.5. Backlight Power

Selectable 5V or 12V, switchable via jumper

2.6. LCD Power

3V, 5V, or 12V DC for LCD

2.7. Networking

LAN0 & LAN1: Connected to RJ45 connectors via a PHY.

Copyright © 2025 ADLINK Technology, Inc.
Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

2.8. Storage

microSD Slot: Connected to SDIO A.

2.9. Camera Interface

CSI Interface: Routed to a 22-pin CSI connector, with 2 lanes available.

2.10. Audio

TI TLV320AIC3106 Audio Codec: Connected to I^2S A

2.11. Communication

Dual CAN Interface: Equipped with CAN transceivers on the board for communication.

2.12. Power Supply

The board is powered by a Barrel type connector, accepting 15 to 30 VDC.

Copyright © 2025 ADLINK Technology, Inc.
Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

2.13. Mechanical and Environmental

Form Factor solder down module

SGET OSM Specifications 1.1 Size L

Carrier dimension

3.5" standard

Operating temperature

Standard: 0°C to 60°C / -40°C to 85°C

Humidity

5-90% RH operating, non-condensing

5-95% RH storage (and operating with conformal coating)

Shock and vibration

IEC 60068-2-64 and IEC-60068-2-27, MIL-STD-202 F, Method 213B, Table 213-I,

Condition A and Method 214A, Table 214-I, Condition D

Copyright © 2025 ADLINK Technology, Inc.
Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

3. Block Diagram

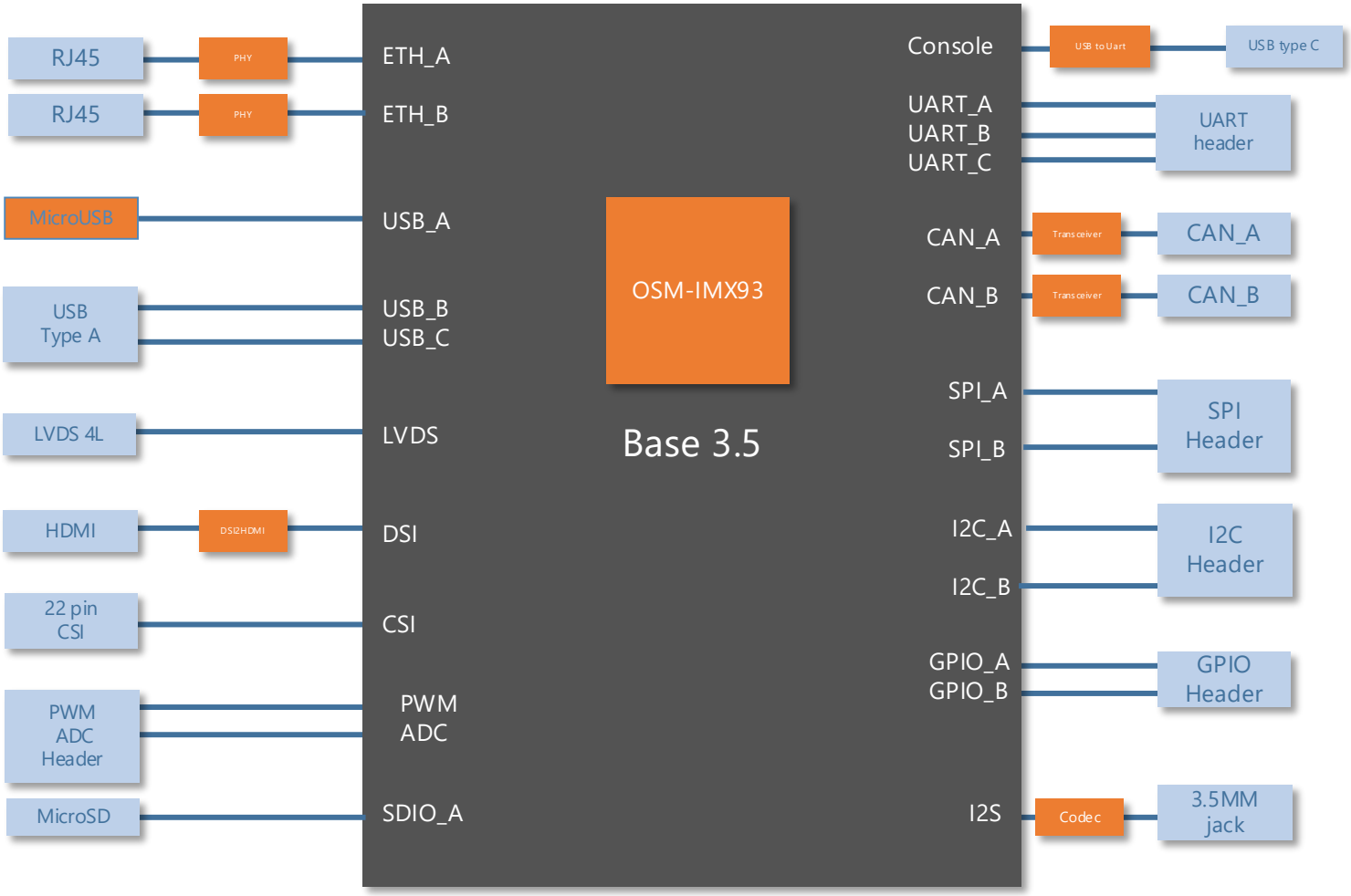


Figure 1 – Module function diagram

Copyright © 2025 ADLINK Technology, Inc.
Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

4. Pinout and Signal Descriptions

4.1. Pin Summary

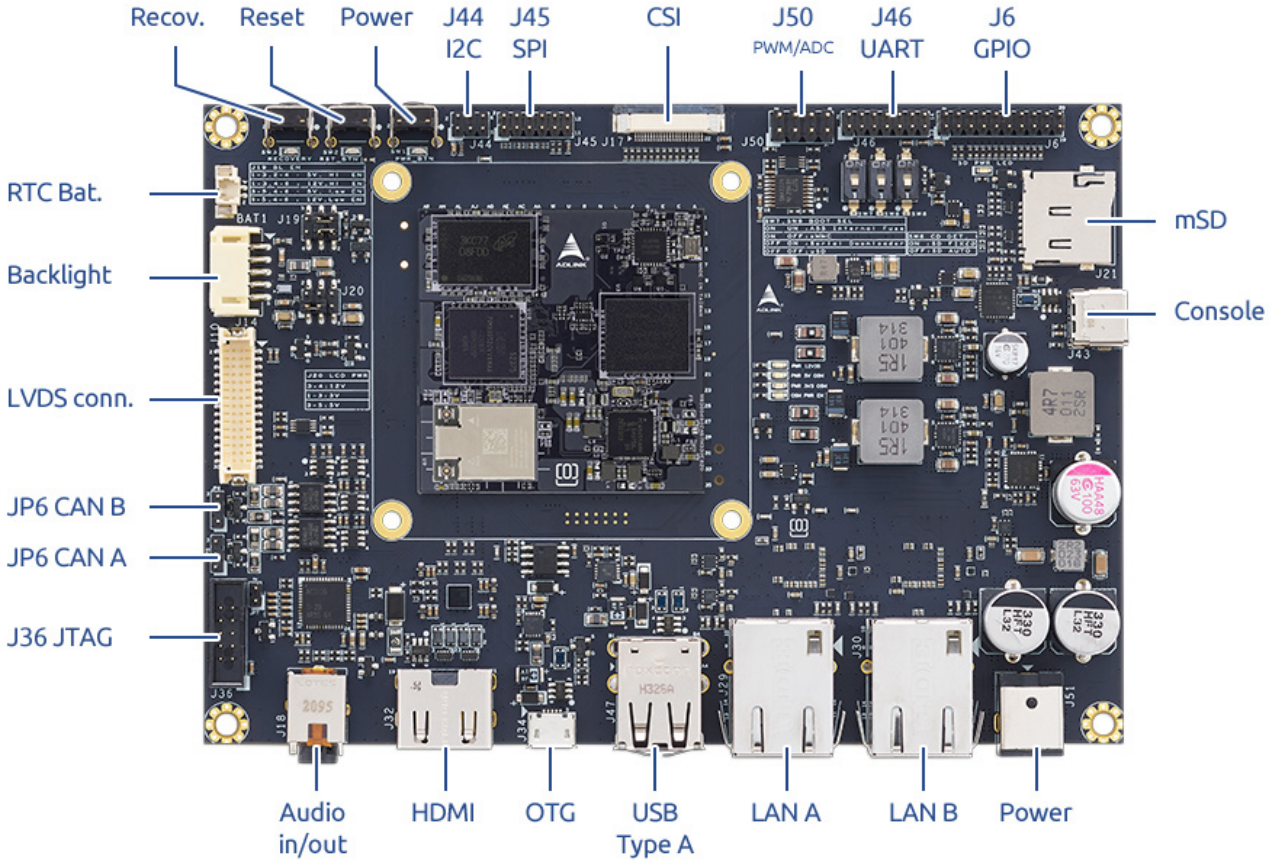


Figure 2 –SBC3-IMX93 (Top)

Copyright © 2025 ADLINK Technology, Inc.
Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

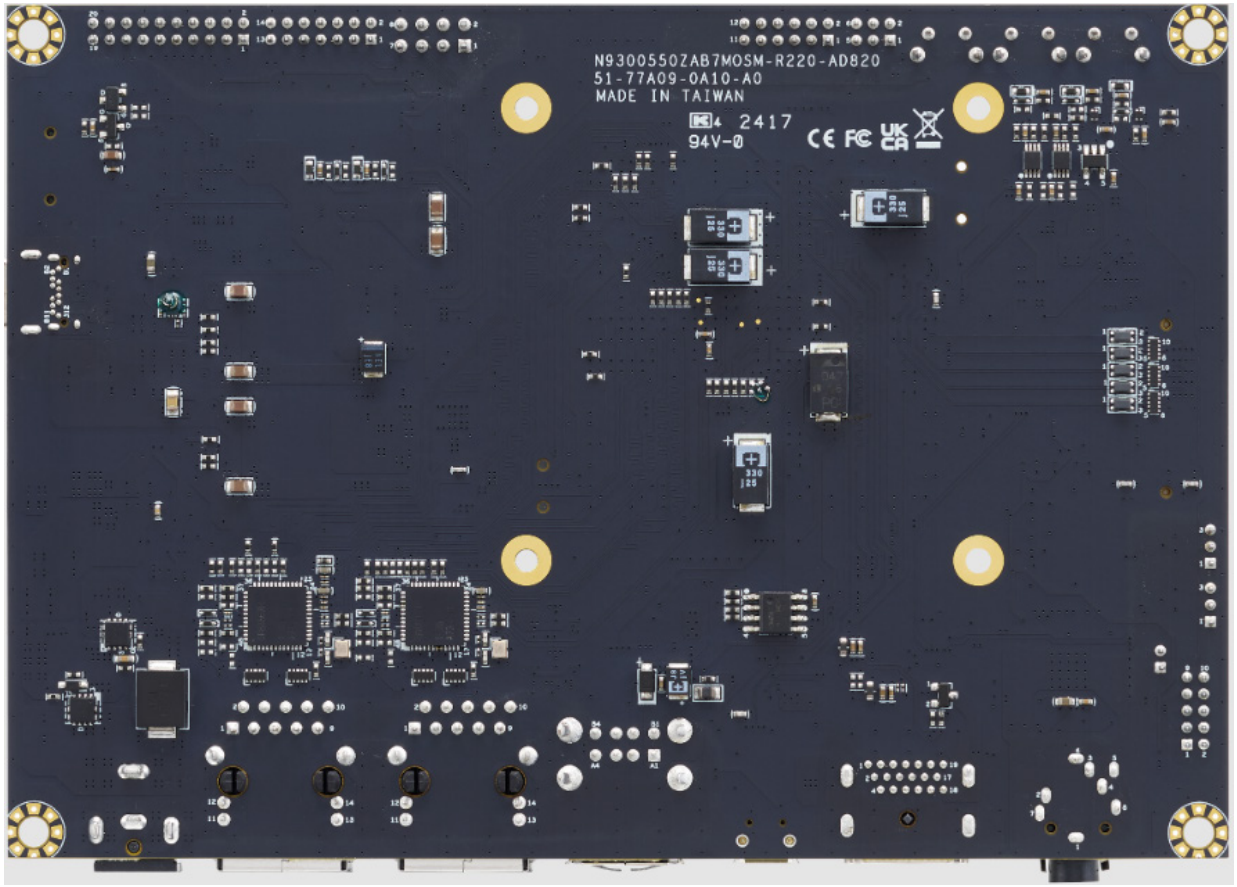


Figure 3– SBC3-IMX93 (Bottom)

Copyright © 2025 ADLINK Technology, Inc.
Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

4.2. Signal Terminology Descriptions

The following information provides descriptions of the terms used in the signal description table:

Term	Description
I	Input to the module
O	Output from the module
O OD	Open drain output from the module
I OD	Open drain input to the module, with mandatory PU (pull up) on module
OD	Open drain
I/O	Bi-directional Input/Output
PU	PU (pull-up) resistor on module
PD	PD (pull-down) resistor on module
VDD_IN	Main power source from carrier to module
CMOS	Logic input or output
GBE MDI	Differential analog signaling for Gigabit Media Dependent Interface
LVDS DP	Low Voltage Differential Signal for DisplayPort interface
LVDS D-PHY	Low Voltage Differential Signal for MIPI CSI-2 cameras and DSI displays
LVDS M-PHY	Low Voltage Differential Signal for MIPI CSI-3 cameras
LVDS LCD	Low Voltage Differential Signal for LCD displays
LVDS PCIE	Low Voltage Differential Signal for PCIe
LVDS SATA	Low Voltage Differential Signal for SATA
TMDS HDMI	Transition Minimized Differential Signal for HDMI displays
USB	DC coupled differential signaling for traditional (non-Superspeed) USB signals
USB SS	Differential signal for SuperSpeed USB signals
USB VBUS 5V	5V tolerant input for USB VBUS detection
3.3V	3.3V Power Domain: Active while CARRIER_PWRON is high and CARRIER_SBY# is NOT active (i.e. both signals are high)
1.8V	1.8V Power Domain: Active while CARRIER_PWRON is high and CARRIER_SBY# is NOT active (i.e. both signals are high)
3.3Vsb	3.3V Power Domain: Active while CARRIER_PWRON is high (regardless of CARRIER_SBY#)
1.8Vsb	1.8V Power Domain: Active while CARRIER_PWRON is high (regardless of CARRIER_SBY#)

Copyright © 2025 ADLINK Technology, Inc.
Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

4.3. Signal Description by Function

4.4. DSI

All DSI signals are sent to a DSI-to-HDMI bridge.

Note: DSI is routed to the ADV7535 and output to the HDMI connector.

4.5. HDMI

The connector is located on the carrier, with a maximum resolution of up to 1080p.

Note: HDMI is derived from DSI signals over the ADV7535/WLCSP-49, with support provided in the Yocto standard.

4.6. LVDS

The connector is placed on the carrier: Hirose DF13E-30DP

Pin	Description	Pin	Description
1	VDD	2	VDD
3	LVDS_A0_P	4	LVDS_A0_N
5	LVDS_A1_P	6	LVDS_A1_N
7	LVDS_A2_P	8	LVDS_A2_N
9	LVDS_A3_P	10	LVDS_A3_N
11	LVDSA_CLKP	12	LVDSA_CLKN
13	LVDS_CTRL_CLK	14	LVDS_CTRL_DAT

J14: Backlight connector

Pin	Description
1	ENABLE
2	GND
3	12V_carrier
4	Backlight Control
5	5V_carrier

Copyright © 2025 ADLINK Technology, Inc.
Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

15	GND	16	GND
17	N/A	18	N/A
19	N/A	20	N/A
21	N/A	22	N/A
23	N/A	24	N/A
25	N/A	26	N/A
27	GND	28	GND
29	GND	30	GND

4.7. MIPI CSI Camera

22-pin CSI connector (RPI-compatible pinout)

Pin	Description
1	GND
2	CSI_DATA0_N_R
3	CSI_DATA0_P_R
4	GND
5	CSI_DATA1_N_R
6	CSI_DATA1_P_R
7	GND
8	CSI_CLOCK_N_R
9	CSI_CLOCK_P_R
10	GND
11	NI
12	NI
13	GND
14	NI

Copyright © 2025 ADLINK Technology, Inc.
ADLINK LEADING EDGE COMPUTING
Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

15	NI
16	GND
17	CAM_ENABLE
18	CAM_PWR_LED
19	GND
20	CSI_I2C_SCL_3V3
21	CSI_I2C_SDA_3V3
22	3V3_carrier

4.8. Audio

Connector located on carrier, standard 3.5 mm audio jack with mic

Note: CTIA pinout order

4.9. LAN Ports

2x RJ45 connectors for wired network interfaces

The network interfaces come from the SoC over 2 TI DP83867IR phy

4.10. SDIO

One MicroSD card-slot is located on the carrier, acting as device storage or boot media.

Copyright © 2025 ADLINK Technology, Inc.
Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

5. Pin Headers for Slow Speed Signals

5.1. GPIO Header (J6)

Pin	Description	Pin	Description
1	1V8_carrier	2	GND
3	GPIO_A_0	4	GPIO_B_0
5	GPIO_A_1	6	GPIO_B_1
7	GPIO_A_2	8	GPIO_B_2
9	GPIO_A_3	10	GPIO_B_3
11	GPIO_A_4	12	GPIO_B_4
13	GPIO_A_5	14	GPIO_B_5
15	N/A	16	GPIO_B_6
17	N/A	18	GPIO_B_7
19	GND	20	1V8_carrier

Note: GPIO's 4,5,6, and 7 are reserved for board functions.

Copyright © 2025 ADLINK Technology, Inc.
Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

5.2. I²C

All I2C busses are located on header J44

Pin	Description	Pin	Description
1	3V3_carrier	2	GND
3	I2C_A_SCL_3V3	4	I2C_B_SCL_3V3
5	I2C_A_SDA_3V3	6	I2C_B_SDA_3V3

5.3. SPI

All SPI busses are located on header J45

Pin	Description	Pin	Description
1	SPI_A_SDI_IO0	2	SPI_B_SDI
3	SPI_A_SDO_IO1	4	SPI_B_SDO
5	SPI_A_CS0#	6	SPI_B_CS0#
7	SPI_A_CS1#	8	SPI_B_CS1#
9	SPI_A_SCK	10	SPI_B_SCK
11	VCC_OUT_IO	12	GND

Note: **During boot**, SPI_A_SCK and SPI_A_CS0# must be kept low.

Copyright © 2025 ADLINK Technology, Inc.
Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

5.4. CAN bus

CAN buses located on header JP5 & JP6, and the transceiver is already inline

JP5

Pin	Description
1	CAN_A_H_C
2	CAN_A_L_C
3	GND

JP6

Pin	Description
1	CAN_B_H_C
2	CAN_B_L_C
3	GND

5.5. UARTS

All available UARTs are located on header J46

Pin	Description	Pin	Description
1	UART_A_TX	2	UART_A_RX
3	UART_A_RTS#	4	UART_A_CTS#
5	UART_B_TX	6	UART_B_RX
7	UART_B_RTS#	8	UART_B_CTS#
9	UART_C_TX	10	UART_C_RX
11	1V8_carrier	12	GND
13	3V3_carrier	14	5V_carrier

Copyright © 2025 ADLINK Technology, Inc.
ADLINK LEADING EDGE COMPUTING
Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Note: The console is directly available via a Type-C connector located on the board, with no need for adapters.

5.6. PWM and ADC

PWM and ADC share J50 header

Pin	Description	Pin	Description
1	ADC_0	2	GND
3	ADC_1	4	GND
5	PWM_0	6	PWM_1
7	PWM_2	8	PWM_3

5.7. JTAG

JTAG signals are located on header J36 and JP7

Pin	Description	Pin	Description
1	1V8_carrier	2	JTAG_TMS
3	GND	4	JTAG_TCK
5	GND	6	JTAG_TDO
7	JTAG_RTCK	8	JTAG_TDI
9	GND	10	SYS_RST#

Copyright © 2025 ADLINK Technology, Inc.
Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

JP7 PIN	Description
1	JTAG_nTRST
2	JTAG_DEBUG_EN

Copyright © 2025 ADLINK Technology, Inc.
Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

6. Onboard Jumpers and Switches

6.1.1 Connector Specifications

List of connectors and counterparts:

- DC Jack: 2.5mm
- LVDS Connector: 15P x 2, P=1.25mm wafer (DF13E-30DP-1.25V(52), Hirose)
- Backlight Connector: 5P, 2mm pitch
- MIPI-CSI: FPC, 22P, 0.5mm pitch (identical to Raspberry Pi)

Header Pinouts:

All headers are 2.0mm pitch, except for the ADC/PWM header, which uses 2.54mm pitch.

- J6: GPIO Header – 10P x 2, P=2.0mm
- J19: LCD Backlight Voltage Select – 3P x 2, P=2.0mm
- J44: I2C Header – 3P x 2, P=2.0mm
- J45: SPI Header – 6P x 2, P=2.0mm
- J45: UART Header – 7P x 2, P=2.0mm
- JP5/6: CAN Header – 3P x 1, P=2.0mm
- J50: ADC and PWM Header – 4P x 2, P=2.54mm

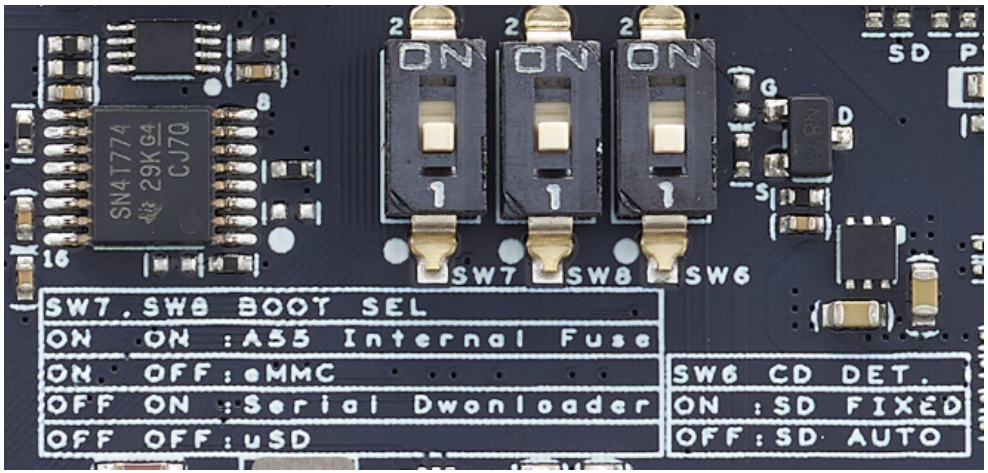
6.1.2 Boot Select Switches

The i.MX93 can boot from different media; therefore, different boot media can be enabled via switch combinations:

- eMMC on-module storage
- SDIO SD Card located on the carrier
- Serial boot mode, used with Universal Update Utility (UUU) to provision the board

Copyright © 2025 ADLINK Technology, Inc.
ADLINK LEADING EDGE COMPUTING
Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

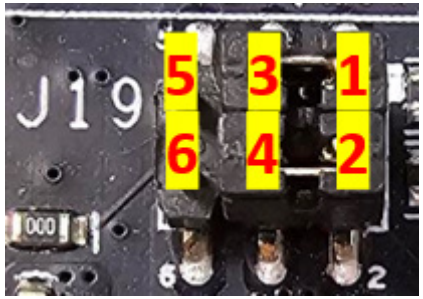
- SW7 and SW8 are used to select the boot media, with SW8 also used for SD card detection.



6.1.3 LCD Panel and Backlight Voltage Settings

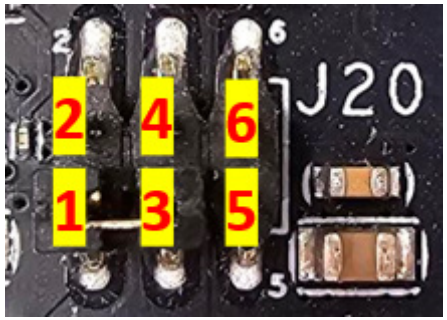
The J19/J20 pinouts are labeled as shown below:

The LCD backlight enable signal provides 5V/12V options via J19



Copyright © 2025 ADLINK Technology, Inc.
ADLINK LEADING EDGE COMPUTING
Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

The LCD panel power offers a selection of 3/5/12 VDC via J20



Copyright © 2025 ADLINK Technology, Inc.
Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000