EmSMK-i2403

SMARC® R2.0 CPU Module

Quick Installation Guide

Version 1.0

Form Factor	CPU	Video
SMARC CPU Module	***Intel Atom X7-E3950/ X5-E3940/ X5-E3930 Processor***	***eDP/ DP++/ HDMI/ MIPI***

LAN	Audio	I/O
Intel® i210IT PCIe GbE controller	***HD Audio Link***	***USB 3.0/ USB 2.0/ SATA/ PCIe/ SDIO/ I2S/ UART***

♦ Technical Support

If you have any technical difficulties, please consult the user's manual first at:

http://www.arbor-technology.com

Please do not hesitate to call or e-mail our customer service when you still can not find out the answer.

http://www.arbor-technology.com

E-mail: info@arbor.com.tw

Declaration of Conformity

FCC Class A

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions : (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

4041240301100P

Packing List

Before starting with the installation, make sure the following items are shipped:

1 x EmSMK-i2403 SMARC CPU Module

1 x Quick Installation Guide

Ordering Information

EmSMK-i2403-E3950-8GB	Intel® Atom™ Processor x7-E3950 SMARC R2.0 CPU module w/ 8GB memory down, -20 ~85°C
EmSMK-i2403-E3940-8GB	Intel® Atom™ Processor x5-E3940 SMARC R2.0 CPU module w/ 8GB memory down, -20 ~85°C
EmSMK-i2403-E3930-8GB	Intel® Atom™ Processor x5-E3930 SMARC R2.0 CPU module w/ 8GB memory down, -20 ~85°C

Optional Accessories

PBS-9015	SMARC R2.0 Carrier Board
HS-2403-F1	Heat spreader
CBK-02-9015-00	Cable kit: 1 x COM Cable 1 x SATA Cable

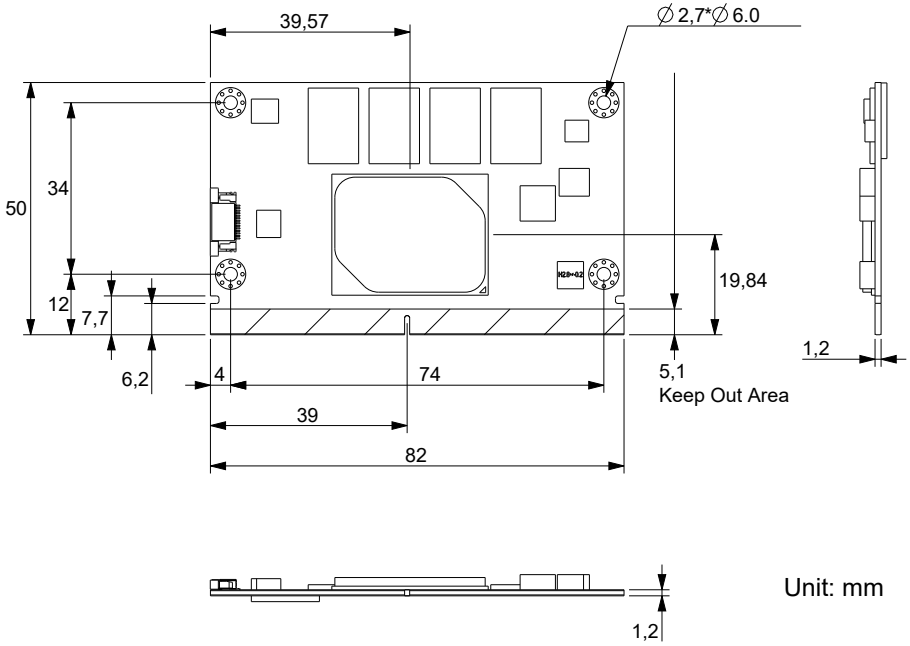
Specifications

Form Factor	SMARC CPU Module
CPU	Soldered onboard Intel® Atom™ x7-E3950 1.6GHz Atom™ x5-E3940 1.6GHz Atom™ x5-E3930 1.3GHz Processor
Memory	Soldered onboard 8GB LPDDR4 SDRAM
BIOS	AMI BIOS
Watchdog Timer	1~255 levels reset
USB	6 x USB 2.0 ports 2 x USB 3.0 ports
Expansion	4 x PCIex1 lanes, SDIO, I²S, I²C, SMBus
GPIO	8-bit Programmable
Serial Port	4 x UART ports (2 x HSUART, 2 x UART)
Storage	1 x Serial ATA port Soldered onboard eMMC (OEM request)
Ethernet	1 x Intel i210IT PCIe controller
Audio	HD Audio Link
Graphics Chipset	SoC integrated Intel Gen9 graphic
Graphics Interface	1 x eDP, 1 x DP++, 1 x HDMI port
MIPI-CSI	1 x MIPI-CSIx4 & 1 x MIPI-CSIx2 (OEM request)
OS Support	Windows 10 Linux
Power Requirement	+3~5.25V power input
Power Consumption	0.71A@5.25V (X7-E3950 typical CPU module only)
Operating Temp.	-20 ~ 85ºC (-4 ~ 185ºF)
Operating Humidity	10 ~ 95% @ 85ºC (non-condensing)
Dimension (L x W)	82 x 50 mm

Driver Installation

The CPU module supports Windows 10. To install the drivers, please visit our website at **www.arbor-technology.com** and download the driver pack from the **Download Center page**. If you need login access, please contact your local ARBOR sales representative.

Board Dimensions

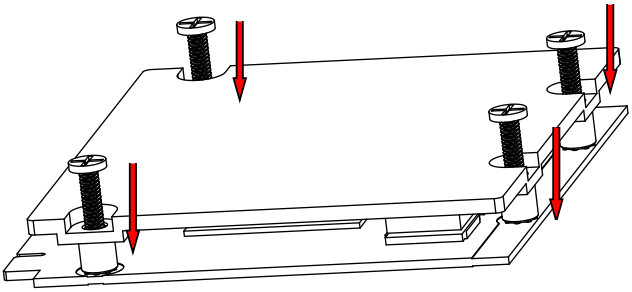


Unit: mm

Heat Spreader Installation

To install the heat spreader:

See the illustration below. Mount the heat spreader to the board. Fix the heat spreader in place with fours screws.



Connector Pin Assignment

P-Pin	Primary (Top) Side	S-Pin	Secondary (Bottom) Side
P1	SMB_ ALERT_1V8#	S1	CAM1_SCL
P2	GND1	S2	CAM1_SDA
P3	CSI1_CK+	S3	GND25
P4	CSI1_CK-	S4	RSVD5
P5	NC	S5	CAM0_SCL
P6	GBE0_SDP	S6	CAM_MCK
P7	CSI1_RX0+	S7	CAM0_SDA
P8	CSI1_RX0-	S8	CSI0_CK+
P9	GND2	S9	CSI0_CK-
P10	CSI1_RX1+	S10	GND26
P11	CSI1_RX1-	S11	CSI0_RX0+
P12	GND3	S12	CSI0_RX0-
P13	CSI1_RX2+	S13	GND27
P14	CSI1_RX2-	S14	CSI0_RX1+
P15	GND4	S15	CSI0_RX1-
P16	CSI1_RX3+	S16	GND28
P17	CSI1_RX3-	S17	NC
P18	GND5	S18	NC
P19	GBE_MDI3-	S19	NC
P20	GBE_MDI3+	S20	NC
P21	GBE_LINK100#	S21	NC
P22	GBE_LINK1000#	S22	NC
P23	GBE_MDI2-	S23	NC
P24	GBE_MDI2+	S24	NC
P25	GBE_LINK_ACT#	S25	GND29
P26	GBE_MDI1-	S26	NC
P27	GBE_MDI1+	S27	NC
P28	NC	S28	NC
P29	GBE_MDI0-	S29	PCIE_D_TX+
P30	GBE_MDI0+	S30	PCIE_D_TX-

P-Pin	Primary (Top) Side	S-Pin	Secondary (Bottom) Side
P31	NC	S31	NC
P32	GND6	S32	PCIE_D_RX+
P33	SDIO_WP	S33	PCIE_D_RX-
P34	SDIO_CMD	S34	GND30
P35	SDIO_CD#	S35	USB4+
P36	SDIO_CK	S36	USB4-
P37	SDIO_PWR_EN	S37	USB3_VBUS_DET
P38	GND7	S38	AUDIO_MCK
P39	SDIO_D0	S39	I2S0_LRCK
P40	SDIO_D1	S40	I2S0_SDOUT
P41	SDIO_D2	S41	I2S0_SDIN
P42	SDIO_D3	S42	I2S0_CK
P43	SPI0_CS0#	S43	ESPI_ALERT0#
P44	SPI0_CK	S44	ESPI_ALERT1#
P45	SPI0_DIN	S45	NC
P46	SPI0_DO	S46	NC
P47	GND8	S47	GND31
P48	SATA_TX+	S48	I2C_GP_CK
P49	SATA_TX-	S49	I2C_GP_DAT
P50	GND9	S50	HDA_SYNC
P51	SATA_RX+	S51	HDA_SDO
P52	SATA_RX-	S52	HDA_SDI
P53	GND10	S53	HDA_CLK
P54	ESPI_CS0#	S54	SATA_ACT#
P55	ESPI_CS1#	S55	USB5_EN_OC#
P56	ESPI_CK	S56	NC
P57	ESPI_IO_0	S57	NC
P58	ESPI_IO_1	S58	ESPI_RESET#
P59	GND11	S59	USB5+
P60	USB0+	S60	USB5-
P61	USB0-	S61	GND32
P62	USB0_EN_OC#	S62	USB3_SSTX+
P63	USB_VBUS_DET	S63	USB3_SSTX-

P-Pin	Primary (Top) Side	S-Pin	Secondary (Bottom) Side
P64	USB0_OTG_ID	S64	GND33
P65	USB1+	S65	USB3_SSRX+
P66	USB1-	S66	USB3_SSRX-
P67	USB1_EN_OC#	S67	GND34
P68	GND12	S68	USB3+
P69	USB2+	S69	USB3-
P70	USB2-	S70	GND35
P71	USB2_EN_OC#	S71	USB2_SSTX+
P72	RSVD1	S72	USB2_SSTX-
P73	NC	S73	GND36
P74	NC	S74	USB2_SSRX+
P75	PCIE_A_RST#	S75	USB2_SSRX-
P76	USB4_EN_OC#	S76	PCIE_B_RST#
P77	NC	S77	PCIE_C_RST#
P78	NC	S78	PCIE_C_RX+
P79	GND13	S79	PCIE_C_RX-
P80	PCIE_C_REFCK+	S80	GND37
P81	PCIE_C_REFCK-	S81	PCIE_C_TX+
P82	GND14	S82	PCIE_C_TX-
P83	PCIE_A_REFCK+	S83	GND38
P84	PCIE_A_REFCK-	S84	PCIE_B_REFCK+
P85	GND15	S85	PCIE_B_REFCK-
P86	PCIE_A_RX+	S86	GND39
P87	PCIE_A_RX-	S87	PCIE_B_RX+
P88	GND16	S88	PCIE_B_RX-
P89	PCIE_A_TX+	S89	GND40
P90	PCIE_A_TX-	S90	PCIE_B_TX+
P91	GND17	S91	PCIE_B_TX-
P92	SMARC_HDMI1_TXP2	S92	GND41
P93	SMARC_HDMI1_TXN2	S93	DP0_LANE0+

P-Pin	Primary (Top) Side	S-Pin	Secondary (Bottom) Side
P94	GND18	S94	DP0_LANE0-
P95	SMARC_HDMI1_TXP1	S95	DP0_AUX_SEL
P96	SMARC_HDMI1_TXN1	S96	DP0_LANE1+
P97	GND19	S97	DP0_LANE1-
P98	SMARC_HDMI1_TXP0	S98	DP0_HPD
P99	SMARC_HDMI1_TXN0	S99	DP0_LANE2+
P100	GND20	S100	DP0_LANE2-
P101	SMARC_HDMI1_TXP3	S101	GND42
P102	SMARC_HDMI1_TXN3	S102	DP0_LANE3+
P103	GND21	S103	DP0_LANE3-
P104	SMARC_DDI1_HPDET	S104	USB3_OTG_ID
P105	SMARC_DDI1_AUXP	S105	DP0_AUX+
P106	SMARC_DDI1_AUXN	S106	DP0_AUX-
P107	DDI1_DDC_AUX_SEL	S107	NC
P108	GPIO0	S108	NC
P109	GPIO1	S109	NC
P110	GPIO2	S110	GND43
P111	GPIO3	S111	NC
P112	HDA_RST#	S112	NC
P113	FAN_PWMOUT	S113	NC
P114	FAN_TACHIN	S114	NC
P115	GPIO7	S115	NC
P116	GPIO8	S116	NC
P117	GPIO9	S117	NC
P118	GPIO10	S118	NC
P119	GPIO11	S119	GND44
P120	GND22	S120	NC
P121	I2C_PM_CK	S121	NC
P122	I2C_PM_DAT	S122	NC
P123	BOOT_SEL0#	S123	NC
P124	BOOT_SEL1#	S124	GND44

P-Pin	Primary (Top) Side	S-Pin	Secondary (Bottom) Side
P125	BOOT_SEL2#	S125	eDP_TX0_P
P126	RESET_OUT#	S126	eDP_TX0_N
P127	RESET_IN#	S127	LCD_BKLT_EN
P128	POWER_BTN#	S128	eDP_TX1_P
P129	SER0_TX	S129	eDP_TX1_N
P130	SER0_RX	S130	GND46
P131	SER0_RTS#	S131	eDP_TX2_P
P132	SER0_CTS#	S132	eDP_TX2_N
P133	GND23	S133	LCD_VDD_EN
P134	SER1_TX	S134	eDP_AUX_P
P135	SER1_RX	S135	eDP_AUX_N
P136	SER2_TX	S136	GND47
P137	SER2_RX	S137	eDP_TX3_P
P138	SER2_RTS#	S138	eDP_TX3_N
P139	SER2_CTS#	S139	NC
P140	SER3_TX	S140	NC
P141	SER3_RX	S141	LCD_BKLT_PWM
P142	GND24	S142	NC
P143	NC	S143	GND48
P144	NC	S144	eDP0_HPD
P145	NC	S145	WDT_TIME_OUT#
P146	NC	S146	PCIE_WAKE#
P147	VDD_IN1	S147	VDD_RTC
P148	VDD_IN2	S148	LID#
P149	VDD_IN3	S149	SLEEP#
P150	VDD_IN4	S150	VIN_PWR_BAD#
P151	VDD_IN5	S151	CHARGING#
P152	VDD_IN6	S152	CHARGER_ PRSNT#
P153	VDD_IN7	S153	CARRIER_STBY#
P154	VDD_IN8	S154	CARRIER_PWR_ON
P155	VDD_IN9	S155	FORCE_RECOV#
P156	VDD_IN10	S156	BATLOW#
		S157	TEST#
		S158	GND49