



RoHS EmSMK-i2403 SMARC R2.0 CPU Module Installation Guide

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RoHS EmSMK-i2403 SMARC R2.0 CPU Module



Quick Installation Guide

Form Factor SMARC CPU Module	CPU Intel Atom X7-E3950/ X5-E3940/ X5-E3930 Processor	Video eDP/ DP++/ HDMI/ MIPI
LAN Intel® i210IT PCIe GbE controller	Audio HD Audio Link	I/O 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.

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 PCIe1 lanes, SDIO, I2S, I2C, SMBus
GPIO	8-bit Programmable

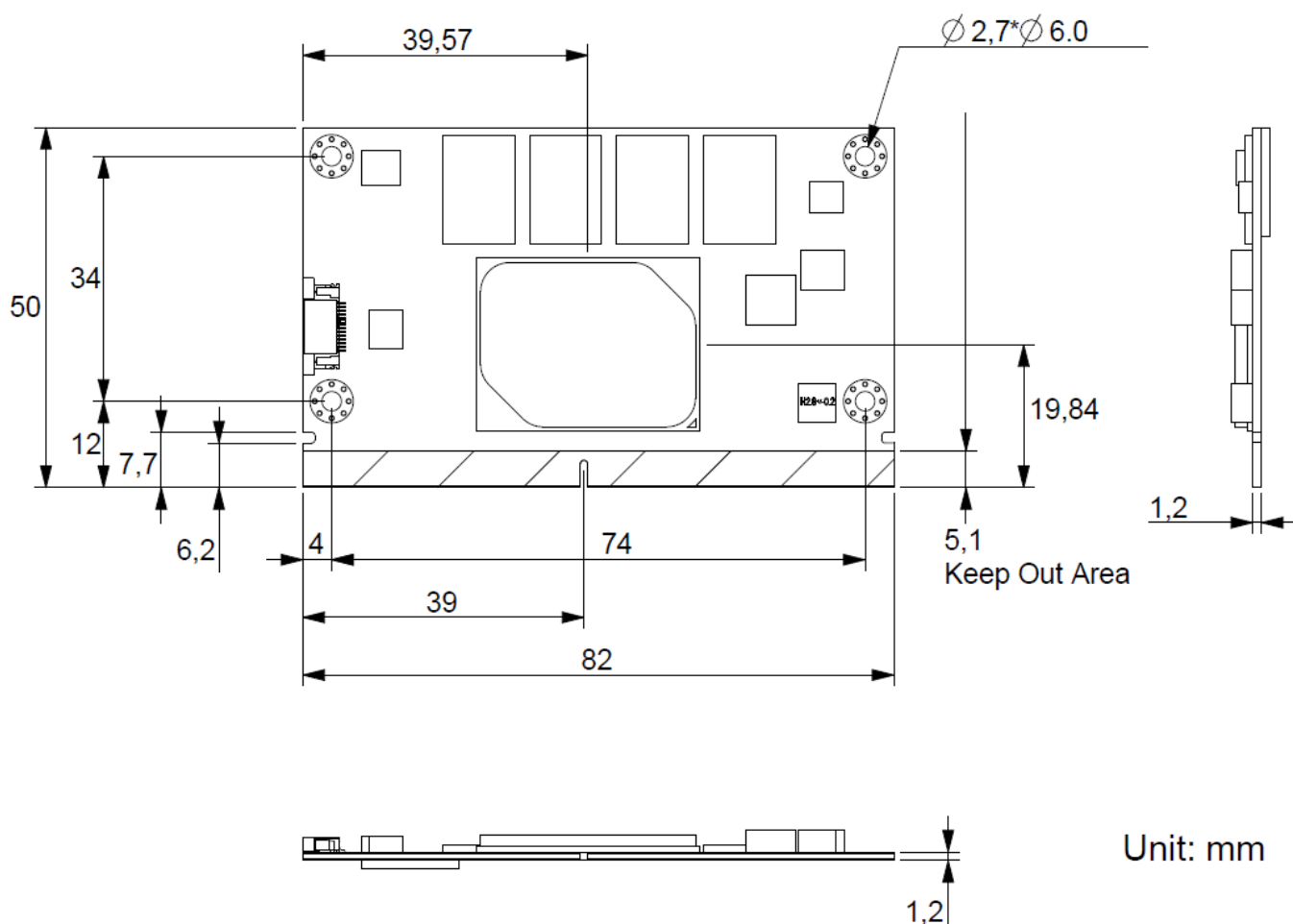
Serial Port	4 x UART ports (2 x HSUART, 2 x UART)
Storage	1 x Serial ATA port Soldered onboard eMMC (OEM request)
Ethernet	1 x Intel i210IT PCIe controller
Audio	HD Audio Link
Graphics Chipset	SoC integrated Intel Gen9 graphic
Graphics Interface	1 x eDP, 1 x DP++, 1 x HDMI port
MIPI-CSI	1 x MIPI-CSIx4 & 1 x MIPI-CSIx2 (OEM request)
OS Support	Windows 10 Linux
Power Requirement	+3~5.25V power input
Power Consumption	<u>0.71A@5.25V</u> (X7-E3950 typical CPU module only)

Operating Temp.	-20 ~ 85°C (-4 ~ 185°F)
Operating Humidity	10 ~ 95% @ 85°C (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 web-site at www.arbor-technology.com and download the driver pack from the Down-load Center page. If you need login access, please contact your local ARBOR sales representative.

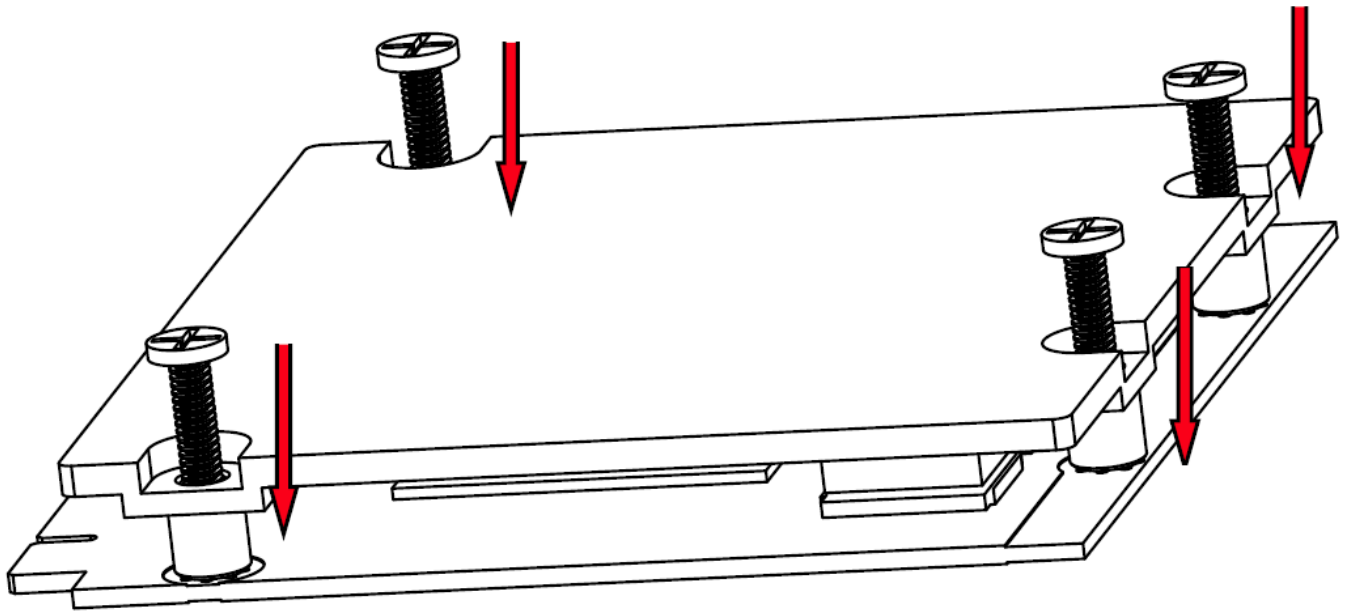
Board Dimensions



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 four screws.



Connector Pin Assignment

P - Pin	Primary (Top) Side	S - Pin	Secondary (Bottom) Side	P - Pin	Primary (Top) Side	S - Pin	Secondary (Bottom) Side	
P1	SMB_ALERT_1 V8#	S1	CAM1_SCL	P31	NC	S31	NC	
P2	GND1	S2	CAM1_SDA	P32	GND6	S32	PCIE_D_RX+	
P3	CSI1_CK+	S3	GND25	P33	SDIO_WP	S33	PCIE_D_RX-	
P4	CSI1_CK-	S4	RSVD5	P34	SDIO_CMD	S34	GND30	
P5	NC	S5	CAM0_SCL	P35	SDIO_CD#	S35	USB4+	
P6	GBE0_SDP	S6	CAM_MCK	P36	SDIO_CK	S36	USB4-	
P7	CSI1_RX0+	S7	CAM0_SDA	P37	SDIO_PWR_EN	S37	USB3_VBUS_DET	

				P 3 8	GND7	S 3 8	AUDIO_MCK	
P 8	CSI1_RX0-	S 8	CSI0_CK+	P 3 9	SDIO_D0	S 3 9	I2S0_LRCK	
P 9	GND2	S 9	CSI0_CK-	P 4 0	SDIO_D1	S 4 0	I2S0_SDOUT	
P 1 0	CSI1_RX1+	S 1 0	GND26	P 4 1	SDIO_D2	S 4 1	I2S0_SDIN	
P 1 1	CSI1_RX1-	S 1 1	CSI0_RX0+	P 4 2	SDIO_D3	S 4 2	I2S0_CK	
P 1 2	GND3	S 1 2	CSI0_RX0-	P 4 3	SPI0_CS0#	S 4 3	ESPI_ALERT0#	
P 1 3	CSI1_RX2+	S 1 3	GND27	P 4 4	SPI0_CK	S 4 4	ESPI_ALERT1#	
P 1 4	CSI1_RX2-	S 1 4	CSI0_RX1+	P 4 5	SPI0_DIN	S 4 5	NC	
P 1 5	GND4	S 1 5	CSI0_RX1-	P 4 6	SPI0_DO	S 4 6	NC	
P 1 6	CSI1_RX3+	S 1 6	GND28	P 4 7	GND8	S 4 7	GND31	
P 1 7	CSI1_RX3-	S 1 7	NC	P 4 8	SATA_TX+	S 4 8	I2C_GP_CK	
P 1 8	GND5	S 1 8	NC	P 4 9	SATA_TX-	S 4 9	I2C_GP_DAT	
P 1 9	GBE_MDI3-	S 1 9	NC	P 5 0	GND9	S 5 0	HDA_SYNC	
P 2 0	GBE_MDI3+	S 2 0	NC	P 5 1	SATA_RX+	S 5 1	HDA_SDO	
P 2 1	GBE_LI NK100#	S 2 1	NC	P 5 2	SATA_RX-	S 5 2	HDA_SDI	
P 2 2	GBE_LI NK1000 #	S 2 2	NC	P		S	HDA_CL	

P 2 3	GBE_M DI2-	S 2 3	NC	5 3	GND10	5 3	K	
P 2 4	GBE_M DI2+	S 2 4	NC	P 5 4	ESPI_C S0#	S 5 4	SATA_A CT#	
P 2 5	GBE_LI NK_ACT #	S 2 5	GND29	P 5 5	ESPI_C S1#	S 5 5	USB5_E N_OC#	
P 2 6	GBE_M DI1-	S 2 6	NC	P 5 6	ESPI_C K	S 5 6	NC	
P 2 7	GBE_M DI1+	S 2 7	NC	P 5 7	ESPI_IO _0	S 5 7	NC	
P 2 8	NC	S 2 8	NC	P 5 8	ESPI_IO _1	S 5 8	ESPI_R ESET#	
P 2 9	GBE_M DI0-	S 2 9	PCIE_D_ TX+	P 5 9	GND11	S 5 9	USB5+	
P 3 0	GBE_M DI0+	S 3 0	PCIE_D_ TX-	P 6 0	USB0+	S 6 0	USB5-	
				P 6 1	USB0-	S 6 1	GND32	
				P 6 2	USB0_E N_OC#	S 6 2	USB3_S STX+	
				P 6 3	USB_VB US_DET	S 6 3	USB3_S STX-	

P - P i n	Primary (Top) Side	S - P i n	Seconda ry (Bott om) Sid e	P - P i n	Primary (Top) Side	S - P i n	Seconda ry (Bott om) Sid e	
P 6 4	USB0_O TG_ID	S 6 4	GND33	P 9 4	GND18	S 9 4	DP0_LA NE0-	
P 6 5	USB1+	S 6 5	USB3_S SRX+	P 9 5	SMARC _HDMI1 _TXP1	S 9 5	DP0_AU X_SEL	
P	USB1-	S	USB3_S					

6		6	SRX-	P	SMARC	S	DP0_LA	
6		6		9	_HDMI1	9	NE1+	
				6	_TXN1	6		
P	USB1_E	S	GND34	P		S	DP0_LA	
6	N_OC#	6		9	GND19	9	NE1-	
7		7		7		7		
P	GND12	S	USB3+					
6		6		P	SMARC	S	DP0_HP	
8		8		9	_HDMI1	9	D	
				8	_TXP0	8		
P	USB2+	S	USB3-					
6		6		P	SMARC	S	DP0_LA	
9		9		9	_HDMI1	9	NE2+	
				9	_TXN0	9		
P	USB2-	S	GND35					
7		7		P		S	DP0_LA	
0		0		1	GND20	1	NE2-	
				0		0		
P	USB2_E	S	USB2_S					
7	N_OC#	7	STX+	P	SMARC	S	GND42	
1		1		1	_HDMI1	1		
				0	_TXP3	0		
P	RSVD1	S	USB2_S					
7		7	STX-	P	SMARC	S	DP0_LA	
2		2		1	_HDMI1	1	NE3+	
				0	_TXN3	0		
P	NC	S	GND36					
7		7		P		S	DP0_LA	
3		3		1	GND21	1	NE3-	
				0		0		
P	NC	S	USB2_S					
7		7	SRX+	P	SMARC	S	USB3_O	
4		4		1	_DDI1_	1	TG_ID	
				0	HPDET	0		
				4		4		
P	PCIE_A	S	USB2_S					
7	_RST#	7	SRX-	P	SMARC	S	DP0_AU	
				1	_DDI1_	1	X+	
				0	AUXP	0		
P	USB4_E	S	PCIE_B_					
7	N_OC#	7	RST#	P	SMARC	S	DP0_AU	
				1	_DDI1_	1	X-	
				0	AUXN	0		
P	NC	S	PCIE_C_					
7		7	RST#	P	DDI1_D	S	NC	
				1	DC_AU	1		
P	NC	S	PCIE_C_		X_SEL	0		
7		7	RX+	7		7		
P	NC	S	PCIE_C_					
7		7	RX-					
P	GND13	S	PCIE_C_					
7		7	RX-					
P	PCIE_C	S	GND37					
8	_REFCK	8						
0	+	0						
P	PCIE_C	S						

81	_REFCK-	81	PCIE_C_TX+	P108	GPIO0	S108	NC	
P82	GND14	S82	PCIE_C_TX-	P109	GPIO1	S109	NC	
P83	PCIE_A_REFCK+	S83	GND38	P110	GPIO2	S110	GND43	
P84	PCIE_A_REFCK-	S84	PCIE_B_REFCK+	P111	GPIO3	S111	NC	
P85	GND15	S85	PCIE_B_REFCK-	P112	HDA_RST#	S112	NC	
P86	PCIE_A_RX+	S86	GND39	P113	FAN_PWMOUT	S113	NC	
P87	PCIE_A_RX-	S87	PCIE_B_RX+	P114	FAN_TACHIN	S114	NC	
P88	GND16	S88	PCIE_B_RX-	P115	GPIO7	S115	NC	
P89	PCIE_A_TX+	S89	GND40	P116	GPIO8	S116	NC	
P90	PCIE_A_TX-	S90	PCIE_B_TX+	P117	GPIO9	S117	NC	
P91	GND17	S91	PCIE_B_TX-	P118	GPIO10	S118	NC	
P92	SMARC_HDMI1_TXP2	S92	GND41	P119	GPIO11	S119	GND44	
				P		S		

P 9 3	SMARC _HDMI1 _TXN2	S 9 3	DP0_LA NE0+	1 2 0	GND22	1 2 0	NC	
				P 1 2 1	I2C_PM _CK	S 1 2 1	NC	
				P 1 2 2	I2C_PM _DAT	S 1 2 2	NC	
				P 1 2 3	BOOT_ SEL0#	S 1 2 3	NC	
				P 1 2 4	BOOT_ SEL1#	S 1 2 4	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_PRSENT#
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

Documents / Resources

	RoHS EmSMK-i2403 SMARC R2.0 CPU Module [pdf] Installation Guide EmSMK-i2403 SMARC R2.0 CPU Module, EmSMK-i2403, SMARC R2.0 CPU Module, SMARC R2.0 Module, CPU Module, Module
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