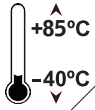
Wide Operating Temperature



EmCORE-i89M2

3.5" Compact Board

Quick Installation Guide

Version 1.4

Form Factor	CPU	Video
3.5" Compact Board	*Soldered onboard 6th Generation Intel® Core™ Processor*	*Dual Channel 24-bit LVDS/ HDMI/ DisplayPort*

I/O	LAN	Audio
SATA/ Mini PCIe/ USB 3.0/ USB 2.0/ COM/ NGFF	*1 x Intel® i219LM PCIe PHY 1 x Intel® i210IT PCIe GbE*	*Realtek ALC886 HD Audio CODEC, MIC-in/ Line-out/ Line-in*

♦ Technical Support

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

https://www.arbor-technology.com

Contact our customer service at the following addresses if your problem persists.

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.

4041890200140P

Packing List

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

1 x EmCORE-i89M2 3.5" Compact Board with Cooler

1 x Quick Installation Guide

If any of the aforelisted items is damaged or missing, contact your vendor immediately.

Ordering Information

EmCORE-i89M2-6442EQ	6th Generation Intel® Core™ i5-6442EQ / QM170 3.5" compact board
EmCORE-i89M2-6822EQ	6th Generation Intel® Core™ i7-6822EQ / QM170 3.5" compact board

Optional Accessories

CBK-15-89M2-00	Cable kit 1 x Audio cable 2 x SATA cables 1 x SATA power cable 2 x USB 2.0 cables 1 x USB 3.0 cable 2 x LAN cables 6 x COM cables

Driver (6.6A) Installation

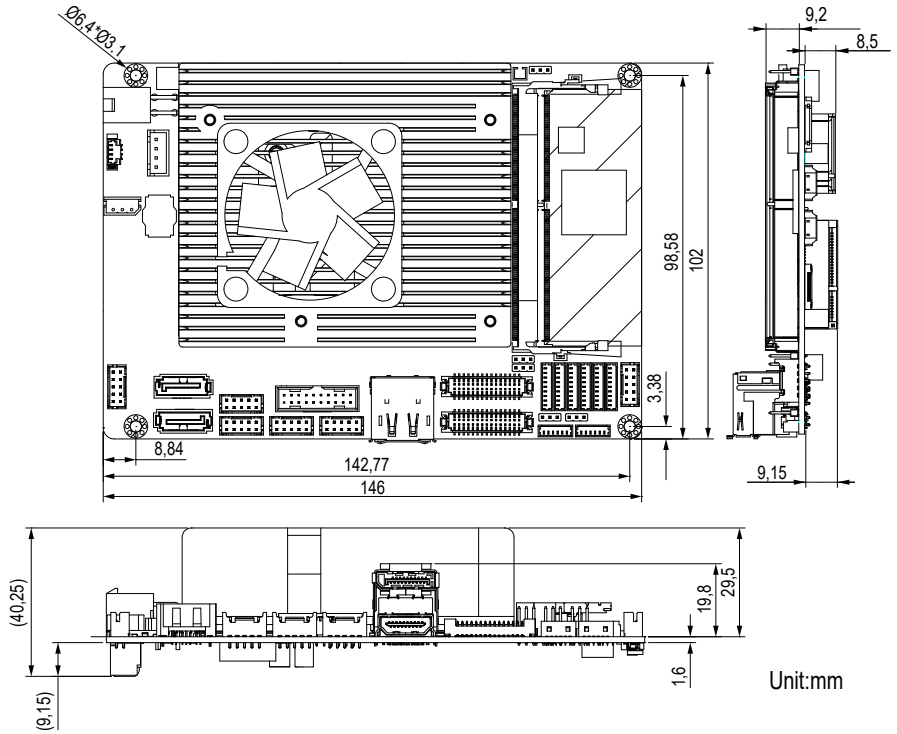
To install the drivers, please visit our website at **www.arbor-technology.com** and download the driver pack from the product page.

The driver path is listed as below:

Windows 7 & Windows 10 64-bit

Chipset	\i89X\Chipset\Chipset_10.1.1.13_Public
Audio	\i89X\Audio\7687_PG436_Win10_Win8.1_Win8_Win7_WHQLx64
LAN	\i89X\Ethernet
Graphic	\i89X\Graphic\IntelR Graphics Driver Production Version 15.40.16.64.4364
ME	\i89X\ME\Intel(R)_ME_11.0_Corporate_11.0.0.1202
RAID	\i89X\RAID\Intel Rapid Storage Technology Driver 14.8.0.1042
USB3.0	\i89X\USB3.0\win8.1 64bit\Intel_USB_3.0_xHC_Adaptation_ Driver_MR1_Release_1.0.1.45_PV

Board Dimensions



Specifications

Form Factor	3.5" Compact Board
CPU	Soldered onboard 6th Generation Intel® Quad Core™ Processor i5-6442EQ 1.9GHz (base)/2.7GHz (Turbo) ; i7-6822EQ 2.0GHz 2.0GHz (Base)/2.8GHz(Turbo)
Chipset	Intel® PCH QM170
Memory	1 x DDR4 SO-DIMM socket, supporting 2133/1866MHz SDRAM up to 16GB
BIOS	AMI UEFI BIOS
Watchdog Timer	1~255 levels reset
Super I/O	Fintek F81866
USB Port	2 x USB 3.0/2.0 ports 4 x USB 2.0 ports
Serial Port	6 x COM ports - 4 x RS-232 - 2 x RS-232/422/485 selectable
Expansion	1 x Mini-Card Socket
Storage	2 x Serial ATA ports with 600MB/s HDD transfer rate
	1 x NGFF M.2 socket for M-Key to support SATA/PCIe x4 depending on SSD module
Ethernet Chipset	1 x Intel® i219LM PCIe PHY 1 x Intel® i210IT PCIe GbE controller
Digital I/O	8-bit Programmable
Audio	Realtek® ALC886 HD Audio CODEC, Mic-in/ Line-in/ Line-out
Graphic Chipset	Integrated Intel® HD Graphics 5x0
Graphic Interface	2 x Dual Channel 24-bit LVDS
	1 x HDMI
	1 x DisplayPort
OS Support	
Windows 7, Windows 10 64-bit, Linux Ubuntu	
Power Requirement	+12V DC-In
Power Consumption	1.77A @+12V with i5-6442EQ (Typical) 1.82A @+12V with i7-6822EQ (Typical)
Operating Temp.	-40 ~ 85°C (-40 ~ 185ºF)
Operating Humidity	10 ~ 95% @ 85°C (non-condensing)
Dimensions (L x W)	146 x 102 mm (5.7" x 4.0")

Jumpers & Connectors Quick Reference

Jumpers

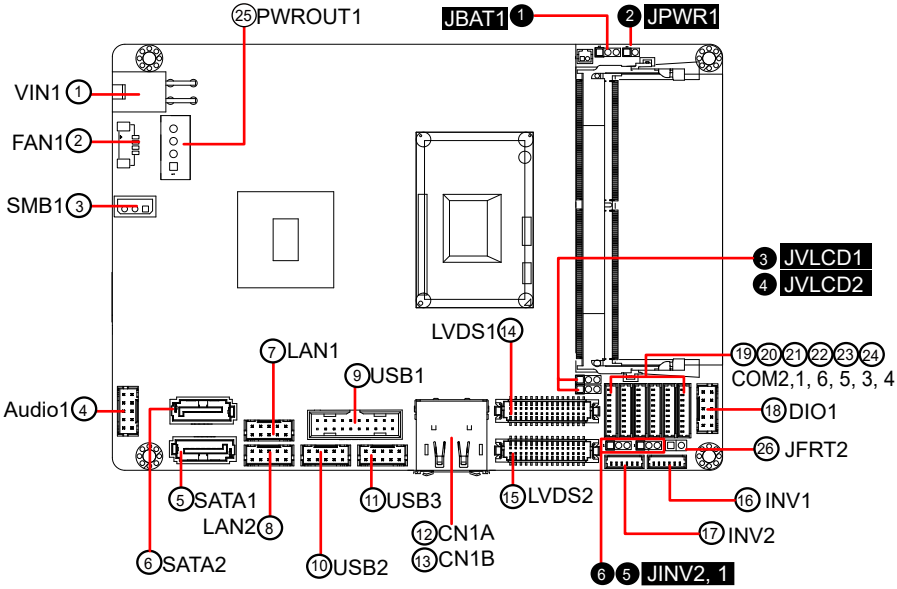
Jumper	Description
❶JBAT1	Clears/keeps CMOS
❷JPWR1	Sets the AT/ATX mode
❸❹JVLCD1, 2	Sets the power voltage for LVDS1, 2
❺❻JINV1, 2	Sets the inverter voltage for LVDS1, 2

Connectors

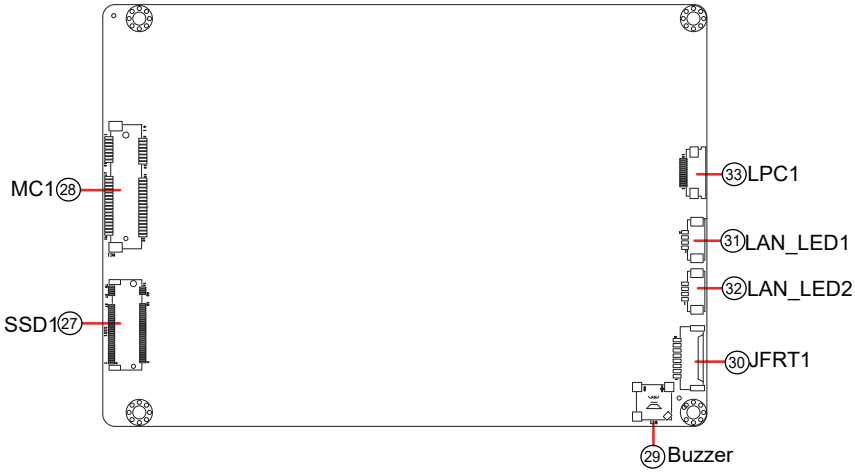
Connector	Description
①VIN1	12V DC IN connector
②FAN1	CPU fan connector
③SMB1	SMBus connector
④Audio1	Audio connector
⑤⑥SATA1, 2	Serial ATA connectors
⑦⑧LAN1, 2	Ethernet connectors
⑨USB1	USB 3.0 connector
⑩⑪USB2, 3	USB 2.0 connectors
⑫CN1A	DisplayPort connector
⑬CN1B	HDMI connector
⑭⑮LVDS1, 2	LVDS1, 2 LCD panel connectors
⑯⑰INV1, 2	LCD1, 2 inverter connectors
⑱DIO1	Digital I/O connector
⑲~㉔ COM1~6	Serial port connectors COM1-2: RS-232/422/485 selectable, COM3-6: RS-232
㉕PWROUT1	SATA power connector
㉖JFRT2	Power Button
㉗SSD1	NGFF M.2 M-Key socket
㉘MC1	Mini-card socket
㉙BUZZER	Buzzer
㉚JFRT1	Front-panel connector
㉛㉜LAN_LED1, 2	LAN1, 2 LEDs
㉝LPC1	Low pin count connector

Jumper & Connector Locations

Board Top



Board Bottom



Jumpers

❶ JBAT1: Clears/keeps CMOS

Jumper type: 2.00 mm pitch 1x3-pin header

Pin	Description	
1-2	Keeps CMOS (default)	
2-3	Clears CMOS	

❷ JPWR1: Sets the AT/ATX mode

Jumper type: 2.00mm pitch 2x3-pin header

Pin	Description	
Short	ATX (default)	
Open	AT	

❸❹ JVLCD1, 2: Sets the power voltage for LVDS1, 2

Jumper type: 2.00mm pitch 1x3-pin header

Pin	Description	
1-2	+5V	
2-3	+3.3V (default)	

❺❻ JINV1,2: Sets the inverter voltage for LVDS1, 2

Jumper type: 2.00mm pitch 1x3-pin header

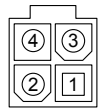
Pin	Description	
1-2	+12V (default)	
2-3	+5V	

Connectors

①VIN1: 12V DC IN Connector

Connector Type: 4-pin power connector

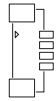
Pin	Desc.	Pin	Desc.
4	+12V	3	+12V
2	GND	1	GND



② FAN1: CPU Fan Connector

Connector type: 2.54mm pitch 1x4-pin wafer connector.

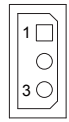
Pin	Description
1	GND
2	+12V
3	RPM
4	CTRL



③ SMB1: SMBus Connector

Connector type: 2.54mm pitch 1x3-pin header

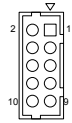
Pin	Description
1	SM_DATA
2	SM_CLK
3	GND



④ AUDIO1: Audio connector

Connector type: 2.00mm pitch 2x5-pin box wafer connector

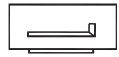
Pin	Description	Pin	Description
2	LINE_R	1	LINE_L
4	GND3	3	GND1
6	NC/MIC2	5	MIC1
8	GND4	7	GND2
10	LOUT_R	9	LOUT_L



⑤⑥ SATA1, 2: Serial ATA connectors

Connector type: SATA connector

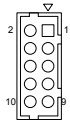
The pin assignments conform to the industry standard.



⑦⑧ LAN1, 2: Ethernet connectors

Connector type: 2.00mm pitch 2x5-pin wafer connector that supports 10/100/1000Mbps fast Ethernet

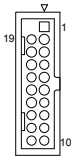
Pin	Description	Pin	Description
2	MDI0-	1	MDI0+
4	MDI2+	3	MDI1+
6	MDI1-	5	MDI2-
8	MDI3-	7	MDI3+
10	N/C	9	N/C



⑨USB1: USB 3.0 connector

Connector type: 2.00mm pitch 2x10-pin box header

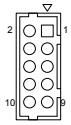
Pin	Description	Pin	Description
		1	+V5S
19	+V5S	2	USB3_RXN1
18	USB3_RXN2	3	USB3_RXP1
17	USB3_RXP2	4	GND
16	GND	5	USB3_TXN1
15	USB3_TXN2	6	USB3_TXP1
14	USB3_TXP2	7	GND
13	GND	8	USBP1N
12	USBP2N	9	USBP1P
11	USBP2P	10	N/C



⑩⑪ USB2, 3: USB 2.0 connectors

Connector type: 2.00mm pitch 2x5-pin wafer connector

Pin	Description	Pin	Description
2	+5VS	1	+5VS
4	USBP4N	3	USBP3N
6	USBP4P	5	USBP3P
8	GND	7	GND
10	GND	9	GND



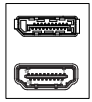
⑫ CN1A: DisplayPort Connector

Connect the display device to the DisplayPort

⑬ CN1B: HDMI connector

Connector type: 19-pin HDMI connector with flange

The pin assignments conform to the industry standard.



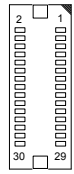
CN1A

CN1B

⑭⑮ LVDS1, 2: LVDS1, 2 LCD panel connectors

Connector type: ACES 1.25mm 87209-3040-06 connector that supports 24-bit dual channels.

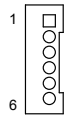
Pin	Description	Pin	Description
2	VDD2	1	VDD1
4	TX2_CLK+	3	TX1_CLK+
6	TX2_CLK-	5	TX1_CLK-
8	GND5	7	GND1
10	TX2_D0+	9	TX1_D0+
12	TX2_D0-	11	TX1_D0-
14	GND6	13	GND2
16	TX2_D1+	15	TX1_D1+
18	TX2_D1-	17	TX1_D1-
20	GND7	19	GND3
22	TX2_D2+	21	TX1_D2+
24	TX2_D2-	23	TX1_D2-
26	GND8	25	GND4
28	TX2_D3+	27	TX1_D3+
30	TX2_D3-	29	TX1_D3-



⑯⑰ INV1, 2: LCD1, 2 inverter connectors

Connector type: 1.25mm pitch 1x6-pin box wafer connector

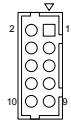
Pin	Description
1	LVDS_INV_VDD
2	LVDS_INV_VDD
3	LVDS_BKLT_EN
4	LVDS_BKLT_CTRL
5	GND
6	GND



⑱ DIO1: Digital I/O Connector

Connector type: 2.00mm pitch 2x5-pin box headers

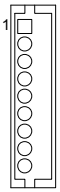
Pin	Desc.	Pin	Desc.
2	DIO1	1	DIO0
4	DIO3	3	DIO2
6	DIO5	5	DIO4
8	DIO7	7	DIO6
10	GND	9	+V5S



⑲~㉔ COM1~6: Serial port connector
COM1-2: RS-232/422/485 selectable
COM3-6: RS-232

Connector type: 1.25mm pitch 1x9-pin wafer connector

	COM1-2			COM3-6
Pin	RS-232	RS-422	RS-485	RS-232
1	XDCD1#	T-	D-	XDCD#
2	XDSR1#			XDSR#
3	XRXD1	T+	D+	XRXD
4	XRTS1#			XRTS#
5	XTXD1	R+		XTXD
6	XCTS1#			XCTS#
7	XDTR1#	R-		XDTR#
8	XRI1#			XRI#
9	GND			GND



㉕ PWROUT1: SATA power connector

Connector type: 2.50mm pitch 1x4-pin wafer connector

Pin	Description
1	+5VS
2	GND
3	GND
4	+12VS

㉖ JFRT2: Power Button

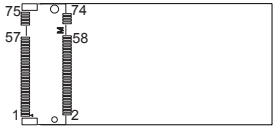
Jumper type: 2.00mm pitch 1x2-pin header

Pin	Description
1	PSON+
2	PSON-

㉗ SSD1: NGFF M.2 M-Key Socket

Connector Type: NGFF M.2 socket for M-Key 22x42 type to support SATA/PCIe x4 depending on SSD module

The pin assignments conform to the industry standard.



㉘ MC1: Mini-card socket

Connector type: Onboard 0.8mm-pitch 52-pin edge card connector

The pin assignments conform to the industry standard.

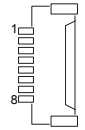
㉙ BUZZER: BUZZER

Type: Onboard buzzer

㉚ JFRT1:Front-panel connector

Connector type: Onboard 1.25mm pitch 1x8-pin wafer connector

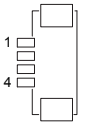
Pin	Description
1	RSTBTN#
2	GND
3	PW_LED
4	GND
5	HDD_LED
6	-HDDLED
7	SPKOUT+
8	SPKOUT#



㉛㉜ LAN_LED1, 2: LAN1, 2 LED

Connector type: Onboard 1.25mm pitch 1x4 pin wafter connector

Pin	Description
1	LAN_LED_LNK#_ACT
2	+V3.3M_LAN
3	LAN_LED_100#
4	LAN_LED_1000#



㉝LPC1: Low Pin Count Connector

Connector type: Onboard 1.25mm pitch 1x14 pin wafter connector

Pin	Description
1	LD0
2	LD1
3	LD2
4	LD3
5	GND1
6	L_FRAME#
7	SER_IRQ
8	LPC_RST#
9	GND3
10	LPC_CLK(33M)
11	GND4
12	GND5
13	VCC3(1)
14	VCC3(2)