



Embedded Board Product Selection Guide

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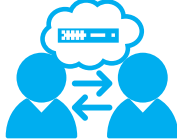
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Company Profile

Founded in 1999, Quanmax is committed to supply high-quality embedded computing products and solutions to help its clients develop a variety of computer-aided facilities for individual users and business firms in all industries including but not limited to

the following four categories: Infotainment, Automation, IoT and Network Security, on the basis of both volume production and customized project.

Areas of Expertise		Business Model	
 <p>Infotainment Digital Signage, Kiosk, Gaming</p>	 <p>Automation Factory / Machine / Building / Home Automation</p>	 <p>Volume Production</p>	
 <p>IoT</p>	 <p>Network Security</p>	 <p>Customized Project</p>	



Core Competence

With experienced engineering talents at a rate of 25% R&D headcount ratio, of which 50%+ have 7+ years of experience, Quanmax boasts the following competences and can therefore offer flexible, innovative and quality-assured products or a total solution to possible vertical application markets.

● **Customized design** at different levels of customization (based on client-owned design, joint design or derivative from Quanmax standard products) and volume;

- **Software integration** to ensure OS and/or software to perform as expected within the limits of the hardware;
- **System optimization** to keep the system running at expected performance with minimal resource consumption; and
- **Life cycle management**, such as ongoing product configuration change review, component obsolescence assessment and BOM health check, to help clients reduce overall costs to stay competitive in the market.



Quality & Environmental Compliance

As a member of the global community, Quanmax keeps putting its efforts on improving all manufacturing and administrative processes to further deliver even better products and services to users with the minimal negative impact to the environment. The quality and environmental compliance we make efforts to ensure includes:














- ISO 9001 Quality Management System;
- ISO 14001 Environmental Management;
- IECQ QC080000 Hazardous Substance Process Management;
- RoHS Directive;
- ISO 13485 Medical Devices Quality Management Systems; and
- FDA Medical Device Compliance.



Product Lines

Quanmax offers a wide variety of embedded boards and systems to fulfill various industrial applications under different environ-

mental conditions and system requirements. Now, the major product lines can be categorized into the following five ranges.

Embedded Boards		Infotainment	Automation	
Computer-on-Modules  Qseven COM Express Mini COM Express Compact		 	Fanned Box PCs 	
SCBs  Pico-ITX ECX			Fanless Box PCs 	
Industrial Motherboards  Mini-ITX Micro-ATX ATX		OPS Modules 	Rackmount Servers 	
IoT IoT Gateways 		Panel PCs  Open Frame Plastic Chassis Aluminum Bezel		
Network Security Ethernet Switch 		Monitors  Open Frame Flat Panel OPS-module-pluggable		



Milestone

1999.09 Founded in Taipei	2000.01 ISO 9001 Certificate	2003.01 Expand China Market	2005.09 Subsidiary in Japan	2007.08 Subsidiary in China	2008.05 Subsidiary in USA Management buyout from Kontron Company name change to Quanmax	2012.03 QC 080000 Certificate	2016
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Embedded Board Product Overview

Quanmax offers a wide range of embedded boards in different form factors, performance levels and environmental options for

integration into a variety of embedded systems.

Computer-on-Modules

Computer-on-Module (COM) is a small form-factor, ready-to-use embedded computing platform with processor, memory, core power, BIOS, OS, drivers and associated BSPs already integrated on the board and validated to ensure its compatibility and functionality. System developers can eliminate significant development risk and focus on their core

competence in developing carrier boards for application-specific systems. Quanmax now offers three kinds of platforms: Qseven™, COM Express® Mini and COM Express® Compact in different form factors respectively under this category to fulfill different applications and requirements.


Qseven™ **P.06**



70 x 70 mm (2.76" x 2.76")

Model	Processor	Chipset	Op.Temp.
KEEX-0200T	NXP ARM® i.MX6 Cortex®-A9	-	Ext


COM Express® Mini **P.08**



84 x 55 mm (3.31" x 2.17")

Model	Processor	Chipset	Op.Temp.
COMM-E380 Ser.	Intel® BayTrail based Atom™	-	Std / Ext

COM Express® Compact **P.10**



95 x 95 mm (3.74" x 3.74")

Model	Processor	Chipset	Op.Temp.
COMC-E380 Ser.	Intel® BayTrail based Atom™	-	Ext

SBCs

SBC (Single Board Computer) is a complete computer with all of its necessary components, including processor, memory, storage, I/Os and/or other features required for a functional computer, built onto a single circuit board. It is often housed inside a larger device or product to provide additional

intelligence or control the functions of machine or equipment. Quanmax now offers two kinds of platforms: Pico-ITX and ECX in different form factors respectively under this category to fulfill different applications and requirements.

Pico-ITX **P.12**



100 x 72 mm (3.94" x 2.83")

Model	Processor	Chipset	Op.Temp.
PITX-MX60 Ser.	NXP ARM® i.MX6 Cortex®-A9	-	Std / Ext



Model	Processor	Chipset	Op.Temp.
KEEX-5100 Ser.	Intel® Broadwell / Haswell ULT based Core™ i / Celeron®	-	Std / Ext
KEEX-8100 Ser.	Intel® Haswell M based Socket G3 Core™ i / Celeron®	HM87 / QM87	Std / Ext
KEEX-7101 Ser.	Intel® Ivy Bridge UE based Core™ i / Celeron®	QM77 / HM76	Std
KEEX-6100 Ser.	Intel® Sandy Bridge M based Socket G2 Core™ i	QM67 / HM65	Std / Ext
KEEX-6150 Ser.	Intel® Sandy Bridge UE based Celeron®	HM65	Std / Ext
KEEX-1850 Ser.	Intel® Braswell based Celeron®	-	Std / Ext
KEEX-1760 Ser.	Intel® BayTrail based Celeron® / Atom™	-	Std / Ext
KEEX-1652 Ser.	Intel® Cedarview based Atom™	NM10	Std / Ext
KEEX-1660	Intel® Cedarview based Atom™	NM10	Std

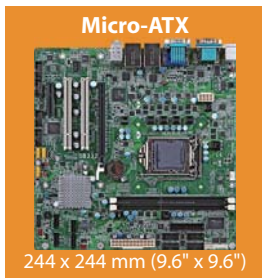
Industrial Motherboards

Industrial motherboard offers a greater number and variety of memory / storage sockets, expansion slots and I/O ports on a larger sized circuit board in comparison with SBC. Thus, it reserves flexibility for system upgrade in the future and enables connection to more peripheral devices, especially

legacy ones. Quanmax now offers three kinds of platforms: Mini-ITX, Micro-ATX and ATX in different form factors respectively under this category to fulfill different applications and requirements.



Model	Processor	Chipset	Op.Temp.
MITX-SLS0 Ser.	Intel® Skylake-S based Core™ i / Celeron®	H110 / Q170	Std
KEMX-8200 Ser.	Intel® Haswell DT based Socket H3 Core™ i / Celeron®	H81 / Q87	Std / Ext
KEMX-8000 Ser.	Intel® Haswell M based Socket G3 Core™ i / Celeron®	HM87 / QM87	Std / Ext
KEMX-7000	Intel® Ivy Bridge UE based Celeron®	HM76	Std
KEMX-6000 Ser.	Intel® Sandy Bridge M based Socket G2 Core™ i	QM67	Std / Ext
KEMX-1750 Ser.	Intel® BayTrail based Celeron® / Atom™	-	Std / Ext
KEMX-1702	Intel® BayTrail based Atom™	-	Std
KEMX-1600 Ser.	Intel® Cedarview based Atom™	NM10	Std / Ext



Model	Processor	Chipset	Op.Temp.
Coming Soon			



Model	Processor	Chipset	Op.Temp.
KEMB-8100 Ser.	Intel® Skylake-S based Socket H4 Core™ i / Celeron®	H110 / Q170	Std / Ext
KEMB-8000 Ser.	Intel® Haswell DT based Socket H3 Core™ i / Celeron®	H81 / Q87	Std / Ext



Qseven™ Module Product Matrix



P.07

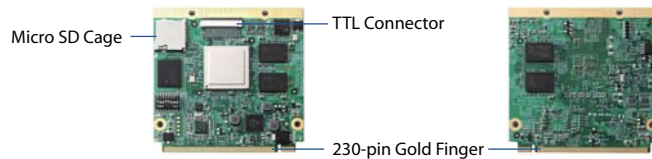
Series	KEEX-200T
Model	KEEX-200T
System	
Processor	ARM® Cortex®-A9 Core i.MX6 Dual Lite / Dual / Quad Automotive
Core Number	2 / 4
Cache	1M
Frequency	1GHz
Socket	FCPBGA 624
TDP	3.5W
Graphics	Vivante GC2000, Vivante GC355, Vivante GC320
Memory	1GB DDR3 memory Onboard
Storage	
eMMC	4GB eMMC NAND Flash onboard
SATA2	1
Micro SD Cage	1
Display Interface	
LVDS	2
HDMI	1
Ethernet	
LAN	1
USB	
USB2.0 Host	1
USB2.0 OTG	1
Expansion	
PCIex1	1
Power	
Input Voltage	DC 5V
Mechanical	
Dimension (L x W)	70 x 70 mm / 2.76" x 2.76"
Environmental	
Operating Temp.	-40°C ~ 85°C / -40°F ~ 185°F

KEEX-200T



Extended Temperature Computer-on-module in Qseven® Form Factor with Freescale ARM® Cortex®-A9 Core i.MX6 Processor

- Freescale ARM® Cortex®-A9 Core i.MX6 Dual Lite / Dual / Quad Automotive CPU
- 1GB DDR3 memory onboard
- 4GB eMMC NAND Flash onboard, 1x SATA for storage
- 2x LVDS, 1x HDMI for display output
- 1x LAN, 1x mPCIe for network connection and expansion
- 1x USB2.0 Host, 1x USB2.0 OTG for peripheral connection
- Extended temperature model available: -40°C ~ 84°C
- Evaluation / reference carrier board available



Processor	Freescale ARM® Cortex-A9 Core i.MX6 Dual Lite/ Dual/ Quad Automotive (Dual / Quad Core, 1M Cache, 1 GHz, 3.5W TDP)
Memory	1GB DDR3 memory Onboard
Storage	4GB eMMC NAND Flash onboard 1x SATA (via Gold Finger) 1x Micro SD Cage (on bottom)
Graphics Controller	Vivante GC2000, Vivante GC355, Vivante GC320
Display Interfaces	2x LVDS (18/24-bit, 1/2-ch, via Gold Finger) 1x HDMI (1920 x 1080, via Gold Finger) 1x TTL Connector
Audio Chipset	Freescale IIS SGT5000
Audio Interfaces	1x I2S / AC97 Bus (via Gold Finger)
Ethernet	1x LAN (via Gold Finger)
USB	1x USB 2.0 Host 1x USB 2.0 OTG
Other I/Os	1x SDIO (via Gold Finger) 1x SPI Bus (via Gold Finger) 1x CAN Bus (via Gold Finger) 3x I2C Bus (via Gold Finger) 1x JTAG (via Gold Finger) 3x UART (via Gold Finger)

Expansion	1x PCIe1 (via Gold Finger)
Power Supply	Input Voltage: DC 5V (via Gold Finger)
System Control & Monitoring	Power button (via Gold Finger) Reset button (via Gold Finger) Sleep button (via Gold Finger) Home button (via Gold Finger) Return button (via Gold Finger) Volume Up button (via Gold Finger) Volume Down button (via Gold Finger)
Cooling	Thermal / FAN Control (via Gold Finger)
OS Support	Android 4.2.2 / Embedded Linux 3.0.35
Dimensions (L x W)	Qseven™ (70 x 70 mm / 2.76" x 2.76")
Environmental Characteristics	Operating Temperature: -40°C ~ 85°C / -40°F ~ 185°F Storage Temperature: -40°C ~ 85°C / -40°F ~ 185°F Humidity: 5% ~ 85%
Certification	CE, FCC Class A

Ordering Information

Model Name	Part No.	Description
KEEX-200T	B3EX020T-001000N	QSeven™ Module, Freescale ARM® Cortex®-A9 Core i.MX6, 1GB DDR3 onboard, 4GB eMMC onboard, 1x SATA, 1x Micro SD Cage, 2x LVDS, 1x HDMI, 1x LAN, 1x USB2.0 Host, 1x USB2.0 OTG, 1x PCIe1, Op. Temp.: -40°C ~ 85°C





COM Express® Mini Module Product Matrix



P.09

Series	COMM-E380 Series
Model	COMM-E380/T, COMM-E381/T, COMM-E382/T
System	
Processor	Intel® Atom™ E3845
Core Number	4
Cache	2M
Frequency	1.91 GHz
Socket	CPU onboard (FCBGA1170)
TDP	10W
Graphics	Intel® HD Graphics
Memory	4GB DDR3L-1333 ECC memory onboard
Storage	
eMMC	0/8/16GB eMMC onboard
SATA2	2
Display Interface	
LVDS	1 (default, replaceable by eDP for option)
DP	1
Multiple Display	Dual
Ethernet	
LAN	1 (default, replaceable by PCIe1 for option)
USB	
USB3.0	1
USB2.0	7 (3x from CPU, 4x from HSIC Hub)
Serial Port	
Tx / Rx	2
Other I/Os	
8-bit GPIO	1 (shared w/ SDIO)
SDIO 3.0	1 (shared w/ GPIO)
LPC	1
I2C Bus	1
Expansion	
PCIex1	3 (+1 in case of LAN replaced by PCIe1)
Power	
Input Voltage	8.5V ~ 20V (Single Supply Power), 5VSB/12V (ATX)
Mechanical	
Dimension (L x W)	COM Express® Mini (84 x 55 mm / 3.31" x 2.17")
Pin-out Type	COM Express® R2.1 Type 10
Environmental	
Operating Temp.	0°C ~ 60°C / 32°F ~ 140°F (standard), -40°C ~ 85°C / -40°F ~ 185°F (extended)

COMM-E380 Series



Type 10 Pin-out

Standard / Extended Temperature COM Express® Mini Type 10 Module with Intel® BayTrail SoC Processor, Atom™ E3845

- Intel® Atom™ E3845 Quad Core Processor onboard
- 4GB DDR3L-1333 ECC memory onboard
- 8GB/16GB eMMC onboard, 2x SATA for storage
- 1x LVDS, 1x DP for video output
- 8x USB, 2x COM, I2C Bus, 8-bit GPIO / SDIO3.0, LPC for peripheral connection
- 1x LAN, 3x PCIe1 for data transmission
- Extended temperature model available: -40°C ~ 85°C
- Extended voltage range support: 8.5V ~ 20V
- Evaluation / reference carrier board available

Processor	Intel® Atom™ E3845 onboard (Quad Core, 2M Cache, 1.91 GHz, 10W TDP)
Memory	4GB DDR3L-1333 ECC memory onboard
Storage	8GB eMMC onboard (COMM-E381/T) 16GB eMMC onboard (COMM-E382/T) 2x SATA2
Graphics Controller	Intel® HD Graphics
Display Interfaces	1x LVDS (18/24-bit, 1/2-ch, 1920 x 1080 @ 60Hz, replaceable by eDP) 1x DP (2560 x 1080 @ 60Hz) Dual Display
Audio Chipset	Realtek ALC888
Ethernet	1x LAN (Intel® I210, replaceable by PCIe1 for option)
USB	1x USB3.0 7x USB2.0 (3x from CPU, 4x from HSIC Hub)
Serial Port	2x Tx/Rx
Other I/Os	1x 8-bit GPIO (shared w/ SDIO) 1x SDIO3.0 (share w/ GPIO) 1x LPC 1x I2C Bus

Expansion	3x PCIe1
Power Supply	Type: Single Supply Power, ATX Input Voltage: 8.5V ~ 20V (Single Supply Power), 5VSB/12V (ATX)
Firmware	BIOS: AMI uEFI BIOS w/ 64Mb SPI Flash Watchdog: Programmable WDT to generate system reset event H/W Monitor: Voltages, Temperatures Real Time Clock: Processor intergrated RTC TPM: Optional (Infineon SLB9660 v1.2)
Cooling	Smart Fan
OS Support	Windows, Linux
Dimension (L x W)	COM Express® Mini (84 x 55 mm / 3.31" x 2.17")
Pin-out Type	COM Express® R2.1 Type 10
Environmental Characteristics	Operating Temperature: 0°C ~ 60°C / 32°F ~ 140°F (Standard) -40°C ~ 85°C / -40°F ~ 185°F (Extended) Storage Temperature: -20°C ~ 80°C / -4°F ~ 176°F (Standard) -55°C ~ 85°C / -67°F ~ 185°F (Extended) Humidity: 0% ~ 95%
Certification	CE, FCC Class A

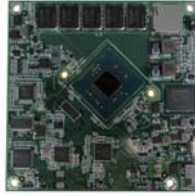
Ordering Information

Model Name	Part No.	Description
COMM-E380	TBD	COM Express® Mini Type 10, Intel® E3845, 4GB DDR3L, 2x SATA, 1x DP, 1x LVDS, 8x USB, 2x COM, 1x LAN, 3x PCIe1, Op. temp.: 0°C ~ 60°C
COMM-E381	TBD	COM Express® Mini Type 10, Intel® E3845, 4GB DDR3L, 8GB eMMC , 2x SATA, 1x DP, 1x LVDS, 8x USB, 2x COM, 1x LAN, 3x PCIe1, Op. temp.: 0°C ~ 60°C
COMM-E382	TBD	COM Express® Mini Type 10, Intel® E3845, 4GB DDR3L, 16GB eMMC , 2x SATA, 1x DP, 1x LVDS, 8x USB, 2x COM, 1x LAN, 3x PCIe1, Op. temp.: 0°C ~ 60°C
COMM-E380T	TBD	COM Express® Mini Type 10, Intel® E3845, 4GB DDR3L, 2x SATA, 1x DP, 1x LVDS, 8x USB, 2x COM, 1x LAN, 3x PCIe1, Op. temp.: -40°C ~ 85°C
COMM-E381T	TBD	COM Express® Mini Type 10, Intel® E3845, 4GB DDR3L, 8GB eMMC , 2x SATA, 1x DP, 1x LVDS, 8x USB, 2x COM, 1x LAN, 3x PCIe1, Op. temp.: -40°C ~ 85°C
COMM-E382T	TBD	COM Express® Mini Type 10, Intel® E3845, 4GB DDR3L, 16GB eMMC , 2x SATA, 1x DP, 1x LVDS, 8x USB, 2x COM, 1x LAN, 3x PCIe1, Op. temp.: -40°C ~ 85°C





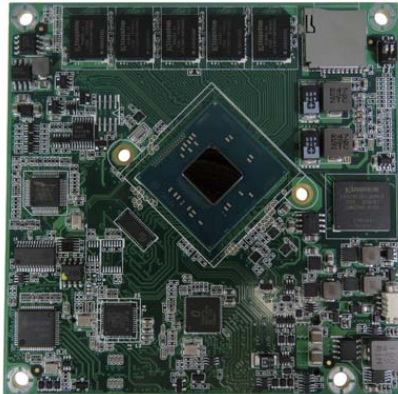
COM Express® Compact Module Product Matrix



P.11

Series		COMC-E380 Series
Model	COMC-E380T, COMC-E381T	
System		
Processor	Intel® Atom™ E3825 / E3845	
Core Number	2 / 4	
Cache	1M / 2M	
Frequency	1.33 GHz / 1.91 GHz	
Socket	CPU onboard (FCBGA1170)	
TDP	6W / 10W	
Graphics	Intel® HD Graphics	
Memory	2GB / 4GB DDR3L-1333 ECC memory onboard	
Storage		
eMMC	16GB / 32GB eMMC onboard	
SATA2	2	
Micro SD Cage	1	
Display Interface		
LVDS	1 (replaceable by DP for alternative)	
DP	1 (+1 in case of LVDS replaced by DP)	
VGA	1	
Multiple Display	Dual	
Ethernet		
LAN	1 (replaceable by PClex1 for option)	
USB		
USB3.0	1	
USB2.0	7 (3x from CPU, 4x from HSIC Hub)	
Serial Port		
Tx / Rx	2	
Other I/Os		
8-bit GPIO	1	
LPC	1	
I2C Bus	1	
Expansion		
PClex1	3 (+1 in case of LAN replaced by PClex1)	
Power		
Input Voltage	8.5V ~ 20V (Single Supply Power), 5VSB/12V (ATX)	
Mechanical		
Dimension (L x W)	COM Express® Compact (95 x 95 mm / 3.74" x 3.74")	
Pin-out Type	COM Express® R2.1 Type 6	
Environmental		
Operating Temp.	-40°C ~ 85°C / -40°F ~ 185°F	

COMC-E380 Series



Extended Temperature COM Express® Mini Type 6 Module with Intel® BayTrail SoC Processor, Atom™ E3825 / E3845

- Intel® Atom™ E3825 Dual Core / E3845 Quad Core Processor onboard
- 2GB / 4GB DDR3L-1333 ECC memory onboard
- 8GB/16GB eMMC onboard, 2x SATA for storage
- 1x LVDS/DP, 1x DP, 1x VGA for video output
- 8x USB, 2x COM, I2C Bus, 8-bit GPIO, LPC for peripheral connection
- 1x LAN, 3x PCIe1 for data transmission
- Extended operating temperature range: -40°C ~ 85°C
- Extended voltage range support: 8.5V ~ 20V
- Evaluation / reference carrier board available

Processor	COMC-E380T: Intel® Atom™ E3825 onboard (Dual Core, 1M Cache, 1.33 GHz, 6W TDP) COMC-E381T: Intel® Atom™ E3845 onboard (Quad Core, 2M Cache, 1.91 GHz, 10W TDP)
Memory	2GB DDR3L-1333 ECC memory onboard (COMC-E380T) 4GB DDR3L-1333 ECC memory onboard (COMC-E381T)
Storage	16GB eMMC onboard (COMC-E380T) 32GB eMMC onboard (COMC-E381T) 2x SATA2 1x Micro SD Cage
Graphics Controller	Intel® HD Graphics
Display Interfaces	1x LVDS/DP (18/24-bit, 1/2-ch, 1920 x 1080 @ 60Hz) 1x DP (2560 x 1080 @ 60Hz) 1x VGA Dual Display
Audio Chipset	Realtek ALC888
Ethernet	1x LAN (Intel® I210, replaceable by PCIe1 for option)
USB	1x USB3.0 7x USB2.0 (3x from CPU, 4x from HSIC Hub)
Serial Port	2x Tx/Rx

Other I/Os	1x 8-bit GPIO 1x LPC 1x I2C Bus
Expansion	3x PCIe1
Power Supply	Type: Single Supply Power, ATX Input Voltage: 8.5V ~ 20V (Single Supply Power), 5VSB/12V (ATX)
Firmware	BIOS: AMI uEFI BIOS w/ 64Mb SPI Flash Watchdog: Programmable WDT to generate system reset event H/W Monitor: Voltages, Temperatures Real Time Clock: Processor intergrated RTC TPM: Optional (Infineon SLB9660 v1.2)
Cooling	Smart Fan
OS Support	Windows, Linux
Dimension (L x W)	COM Express® Compact (95 x 95 mm / 3.74" x 3.74")
Pin-out Type	COM Express® R2.1 Type 6
Environmental Characteristics	Operating Temperature: -40°C ~ 85°C / -40°F ~ 185°F Storage Temperature: -55°C ~ 85°C / -67°F ~ 185°F Humidity: 0% ~ 95%
Certification	CE, FCC Class A

Ordering Information

Model Name	Part No.	Description
COMM-E380T	TBD	COM Express® Compact Type 6, Intel® E3825, 2GB DDR3L, 8GB eMMC, 2x SATA, 1x Micro SD, 1x LVDS/DP, 1x DP, 1x VGA, 8x USB, 2x COM, 1x LAN, 3x PCIe1, Op. temp.: -40°C ~ 85°C
COMM-E381T	TBD	COM Express® Compact Type 6, Intel® E3845, 4GB DDR3L, 16GB eMMC, 2x SATA, 1x Micro SD, 1x LVDS/DP, 1x DP, 1x VGA, 8x USB, 2x COM, 1x LAN, 3x PCIe1, Op. temp.: -40°C ~ 85°C



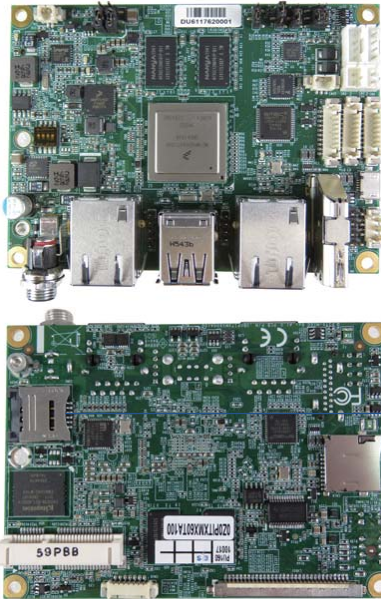
Pico-ITX SBC Product Matrix



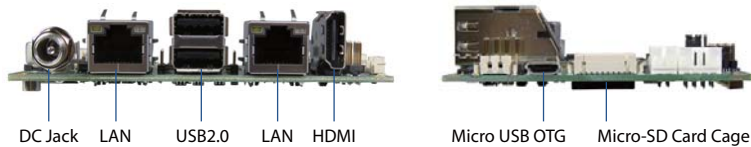
P.13

Series		PITX-MX60 Series
Model	PITX-MX60/T, PITX-MX61/T, PITX-MX62T, PITX-MX63T	
System		
Processor	Freescale® ARM® Cortex®-A9 Core i.MX6 Dual Automotive	
Core Number	2	
Cache	1M	
Frequency	1 GHz	
Socket	CPU onboard (FCPBGA 624)	
TDP	3.5W	
Graphics	Vivante GC2000, Vivante GC355, Vivante GC320	
Memory	1GB / 2GB DDR3-106 S1_DIMM memory onboard	
Storage		
eMMC	4GB / 8GB eMMC onboard	
Micro SD Cage	1 (on right)	
Display Interface		
LVDS	1	
HDMI	1 (on rear)	
Multiple Display	Dual	
Ethernet		
LAN	2 (on rear)	
USB		
USB2.0	3 (x2 Type A on rear)	
USB2.0 OTG	1 (Micro-USB on right)	
Serial Port		
RS-232/422/485	1	
RS-232	1	
Other I/Os		
CAN Bus	1	
GPIO / SPI / I2C	1	
Expansion		
mPCIe	1	
Micro-SIM Cage	1	
Power		
Input Voltage	DC 12V	
Mechanical		
Dimension (L x W)	Pico-ITX (100 x 72 mm / 3.94" x 2.83")	
Environmental		
Operating Temp.	0°C ~ 60°C / 32°F ~ 140°F (standard), -40°C ~ 85°C / -40°F ~ 185°F (extended)	

PITX-MX60 Series



Micro-SIM Card Cage



Standard / Extended Temperature Single Board Computer in Pico-ITX Form Factor w/ Freescale® ARM® Cortex®-A9 Core i.MX6 Dual Processor

- Freescale® ARM® Cortex®-A9 Core i.MX6 Dual Automotive Application Processor
- 1GB/2GB DDR3 1066 memory
- 4GB/8GB eMMC NAND Flash onboard, 1x Micro-SD Card Cage for storage
- 1x LVDS (18/24-bit Dual or Single Channel support), 1x HDMI for video output
- 2x LAN, 1x mPCIe, 1x Micro-SIM Card Cage for network connection
- 3x USB2.0, 1x USB OTG, 2x COM, 1x GPIO/SPI/I2C, 1x CAN for peripherals
- Extended temperature model available: -40°C ~ 85°C

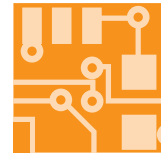
CPU Support	Freescale® ARM® Cortex®-A9 Core i.MX6 Dual Automotive Processor (Dual Core, 1M Cache, 1 GHz, 3.5W TDP)
Memory	1GB/2GB DDR3-1066 SI-DIMM Onboard
Storage	4GB/8GB eMMC NAND Flash onboard 1x Micro-SD Card Cage (on right)
Graphic Controller	Vivante GC2000, Vivante GC355, Vivante GC320
Display Interfaces	1x LVDS (18/24-bit, 1/2-ch, 1920 x 1200 @ 60Hz) 1x HDMI (1920 x 1080 @ 30Hz, on rear) Dual Display
Audio Chipset	Freescale SGLT5000
Audio Interfaces	2x Speaker-out (3W, ISSI IS31AP2010B) 1x Line-out (by header) 1x Mic-in (by header)
Ethernet	2x RJ-45 (on rear, 1x Micrel KSZ9031RXN, 1x Microchip LAN9500A)
USB	3x USB2.0 (2x Type A on rear, 1x by header) 1x USB OTG (Micro-USB on right)
Serial Ports	1x RS-232/422/485 (by header) 1x RS-232 (by header)

Other I/O Ports	1x GPIO / SPI / I2C 1x CAN Bus
Expansion	1x mPCIe Socket 1x Micro-SIM Card Cage
Power Supply	Connector: Lockable DC Jack (on rear) Input Voltage: DC 12V
System Control & Monitoring	1x Header for Front Panel (Power / Reset Switch)
Cooling	Fanless
OS Support	Linux 3.0.35
Dimensions (L x W)	Pico-ITX (100 x 72 mm / 3.94" x 2.83")
Environmental Characteristics	Operation Temp.: 0°C ~ 60°C / 32°F ~ 140°F (Standard) -40°C ~ 85°C / -40°F ~ 185°F (Extended) Storage Temp.: -20°C ~ 80°C / -4°F ~ 176°F (Standard) -55°C ~ 85°C / -67°F ~ 185°F (Extended) Humidity: 0% ~ 95%
Certification	CE, FCC Class A

Ordering Information

Model Name	Part No.	Description
PITX-MX60		Pico-ITX SBC, Freescale® ARM® Cortex®-A9 Core i.MX6 Dual Processor, 1GB DDR3, 4GB eMMC, 1x Micro-SD, 1x LVDS, 1x HDMI, 2x LAN, 1x mPCIe, 1x Micro-SIM, 3x USB2.0, 1x USB OTG, 2x COM, Op. temp.: 0°C ~ 60°C
PITX-MX60T		Pico-ITX SBC, Freescale® ARM® Cortex®-A9 Core i.MX6 Dual Processor, 1GB DDR3, 4GB eMMC, 1x Micro-SD, 1x LVDS, 1x HDMI, 2x LAN, 1x mPCIe, 1x Micro-SIM, 3x USB2.0, 1x USB OTG, 2x COM, Op. temp.: -40°C ~ 85°C
PITX-MX61		Pico-ITX SBC, Freescale® ARM® Cortex®-A9 Core i.MX6 Dual Processor, 2GB DDR3, 4GB eMMC, 1x Micro-SD, 1x LVDS, 1x HDMI, 2x LAN, 1x mPCIe, 1x Micro-SIM, 3x USB2.0, 1x USB OTG, 2x COM, Op. temp.: 0°C ~ 60°C
PITX-MX61T		Pico-ITX SBC, Freescale® ARM® Cortex®-A9 Core i.MX6 Dual Processor, 2GB DDR3, 4GB eMMC, 1x Micro-SD, 1x LVDS, 1x HDMI, 2x LAN, 1x mPCIe, 1x Micro-SIM, 3x USB2.0, 1x USB OTG, 2x COM, Op. temp.: -40°C ~ 85°C
PITX-MX62T		Pico-ITX SBC, Freescale® ARM® Cortex®-A9 Core i.MX6 Dual Processor, 1GB DDR3, 8GB eMMC, 1x Micro-SD, 1x LVDS, 1x HDMI, 2x LAN, 1x mPCIe, 1x Micro-SIM, 3x USB2.0, 1x USB OTG, 2x COM, Op. temp.: -40°C ~ 85°C
PITX-MX62T		Pico-ITX SBC, Freescale® ARM® Cortex®-A9 Core i.MX6 Dual Processor, 2GB DDR3, 8GB eMMC, 1x Micro-SD, 1x LVDS, 1x HDMI, 2x LAN, 1x mPCIe, 1x Micro-SIM, 3x USB2.0, 1x USB OTG, 2x COM, Op. temp.: -40°C ~ 85°C





ECX SBC Intel® CPU Support Matrix

	Processor Generation	Proc. Type	Processor / Chipset	Core Num.	Cache	Base Frequency	Socket	TDP	KEEX-5100 Series <small>P.18</small>	KEEX-8100 Series <small>P.19</small>
High Performance Platform	Broadwell	Mobile	Core™ i7-5650U	2	4M	up to 3.20 GHz	FCBGA1168	15W	KEEX-5106 KEEX-5106T	
	Broadwell	Mobile	Core™ i5-5350U	2	3M	up to 2.90 GHz	FCBGA1168	15W	KEEX-5104 KEEX-5104T	
	Broadwell	Mobile	Core™ i3-5010U	2	3M	2.10 GHz	FCBGA1168	15W	KEEX-5105 KEEX-5105T	
	Broadwell	Mobile	Celeron® 3765U	2	2M	1.90 GHz	FCBGA1168	15W	KEEX-5107 KEEX-5107T	
	Haswell	Mobile	Core™ i7-4650U	2	4M	up to 3.30 GHz	FCBGA1168	15W	KEEX-5103 KEEX-510B	
	Haswell	Mobile	Core™ i5-4300U	2	3M	up to 2.90 GHz	FCBGA1168	15W	KEEX-5101 KEEX-510T	
	Haswell	Mobile	Core™ i3-4010U	2	3M	1.70 GHz	FCBGA1168	15W	KEEX-5100 KEEX-510A	
	Haswell	Mobile	HM87 Core™ i / Celeron®	2 / 4	2M / 3M / 6M / 8M	2.00 ~ 3.90 GHz	FCPGA946	37W ~ 57W		KEEX-8100
	Haswell	Mobile	QM87 Core™ i / Celeron®	2 / 4	2M / 3M / 6M / 8M	2.00 ~ 3.90 GHz	FCPGA946	37W ~ 57W		KEEX-8101 KEEX-810A
	Ivy Bridge	Mobile	Core™ i7-3517UE + QM77	2	4M	up to 2.80 GHz	FCBGA1023	17W		
	Ivy Bridge	Mobile	Celeron® 1047UE + HM76	2	2M	1.40 GHz	FCBGA1023	17W		
	Sandy Bridge	Mobile	QM67 Core™ i7/i5	2 / 4	3M / 6M / 8M	2.10 ~ 3.70 GHz	FCPGA988	35W ~ 55W		
	Sandy Bridge	Mobile	HM65 Core™ i7/i5	2 / 4	3M / 6M / 8M	2.00 ~ 3.60 GHz	FCPGA988	35W ~ 45W		
	Sandy Bridge	Mobile	Celeron® 847E + HM65	2	2M	1.10 GHz	FCBGA1023	16W		
	Sandy Bridge	Mobile	Celeron® 827E + HM65	1	1.5M	1.40 GHz	FCBGA1023	17W		
Power Efficiency Platform	Braswell	Mobile	Celeron® N3160	4	2M	up to 2.24 GHz	-	6W		
	Braswell	Mobile	Celeron® N3060	2	2M	up to 2.48 GHz	-	6W		
	Bay Trail	Desktop	Celeron® J1900	4	2M	up to 2.42 GHz	FCBGA1170	10W		
	Bay Trail	Mobile	Atom™ E3845	4	2M	up to 1.91 GHz	FCBGA1170	10W		
	Bay Trail	Mobile	Atom™ E3825	2	1M	1.33 GHz	FCBGA1170	6W		
	Bay Trail	Mobile	Atom™ N2807	2	1M	up to 2.16 GHz	FCBGA1170	4.3W		
	Cedarview	Desktop	Atom™ D2550 + NM10	2	1M	1.86 GHz	FCBGA559	10W		

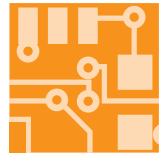
Model name marked in blue implies that it is a standard-temperature model.
 Model name marked in red implies that it is an extended-temperature model.



ECX SBC Intel® CPU Support Matrix (conti.)

Processor / Chipset	KEEX-7101 Series <small>P.20</small>	KEEX-6100 Series <small>P.21</small>	KEEX-6150 Series <small>P.22</small>	KEEX-1850 Series <small>P.23</small>	KEEX-1760 Series <small>P.24</small>	KEEX-1652 Series <small>P.25</small>	KEEX-1660 <small>P.26</small>
Core™ i7-5650U							
Core™ i5-5350U							
Core™ i3-5010U							
Celeron® 3765U							
Core™ i7-4650U							
Core™ i5-4300U							
Core™ i3-4010U							
HM87 Core™ i / Celeron®							
QM87 Core™ i / Celeron®							
Core™ i7-3517UE + QM77	KEEX-7101						
Celeron® 1047UE + HM76	KEEX-7103						
QM67 Core™ i7/i5		KEEX-6100 KEEX-610A					
HM65 Core™ i7/i5		KEEX-6101					
Celeron® 847E + HM65			KEEX-6151				
Celeron® 827E + HM65			KEEX-6150 KEEX-615A				
Celeron® N3160				KEEX-1854, KEEX-1856 KEEX-1854T			
Celeron® N3060				KEEX-1855 KEEX-1855T			
Celeron® J1900					KEEX-1760		
Atom™ E3845					KEEX-1761 KEEX-176T		
Atom™ E3825					KEEX-1762 KEEX-176A		
Atom™ N2807					KEEX-1763		
Atom™ D2550 + NM10						KEEX-1652 KEEX-165A	KEEX-1660

Model name marked in blue implies that it is a standard-temperature model.
 Model name marked in red implies that it is an extended-temperature model.




ECX SBC Product Matrix

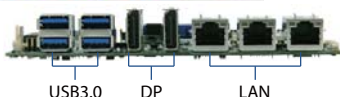
	 	 	 	 	 
Series	KEEX-5100 Series	KEEX-8100 Series	KEEX-7101 Series	KEEX-6100 Series	KEEX-6150 Series
Model	KEEX-5100/510A/5101/510T 5103/510B/5104/5104T/5105/ 5105T/5106/5106T/5107/5107T	KEEX-8100 / KEEX-8101 / KEEX-810A	KEEX-7101 / KEEX-7103	KEEX-6100 / KEEX-6101 / KEEX-610A	KEEX-6150 / KEEX-6151 / KEEX-615A
System					
Processor	Intel® Core™ i3-4010U/i5-4300U/ i7-4650U/i5-5350U/i3-5010U/ i7-5650U/Celeron® 3765U	Intel® Haswell Core™ i / Celeron®	Intel® Core™ i7-3517UE / Celeron® 1047UE	Intel® Sandy Bridge Core™ i7/i5	Intel® Celeron® 827E / Celeron® 847E
Core Number	2	2 / 4	2	2 / 4	1 / 2
Cache	2M / 3M / 4M	2M ~ 8M	4M / 2M	3M ~ 8M	1.5M / 2M
Frequency	1.70 ~ 3.30 GHz	2.00 ~ 3.90 GHz	up to 2.80 / 1.40 GHz	2.00 ~ 3.70 GHz	1.40 / 1.10 GHz
Socket	FCBGA1168	FCPGA946	FCBGA1023	FCPGA988	FCBGA1023
TDP	15W	37W ~ 57W	17W	35W ~ 55W	17W / 16W
Chipset	-	Intel® HM87 / QM87	Intel® QM77 / HM76	Intel® QM67 / HM65	Intel® HM65
Graphics	HD Graphics/6000/5500/5000/4400	Intel® HD Graphics / 4600	Intel® HD Graphics / 4000	Intel® HD Graphics 3300	Intel® HD Graphics
Memory	1x DDR3L SO-DIMM	1x DDR3L SO-DIMM	1x DDR3L SO-DIMM	1x DDR3 SO-DIMM	1x DDR3 SO-DIMM
Storage					
SATA2	2	2	2	2	2
mSATA	1 (shared w/ mPCIe)	2 (shared w/ mPCIe)	1 (shared w/ mPCIe)	-	-
Micro SD Card Cage	-	-	-	-	-
CF Socket	-	-	-	1	1
Display Interface					
LVDS	1	1	2	2	2
HDMI	-	1 (on rear)	1 (on rear)	1 (on rear)	1 (on rear)
DP	2 (on rear)	-	2 (on rear)	1 (on rear)	1 (on rear)
DVI-I	-	1 (on rear)	-	-	-
VGA	-	-	1	1 (on rear)	1 (on rear)
Multiple Display	Triple	Triple	Triple	Dual	Dual
Ethernet					
LAN	3 (on rear)	2 (on rear)	2 (on rear)	2 (on rear)	2 (on rear)
USB					
USB3.0	3 (on rear)	4 (2x on rear)	4 (on rear)	-	-
USB2.0	2	2	4	8 (4x on rear)	8 (4x on rear)
Serial Port					
RS-232/422/485	2	2	1	1	1
RS-232	-	-	1	1	1
Other I/Os					
8-bit DIO	1 (by header)	1 (by header)	1 (by header)	1 (by header)	1 (by header)
Expansion					
mPCIe	2 (1x shared w/ mSATA)	2 (shared w/ mSATA)	1 (shared w/ mSATA)	1	1
SIM Card Cage	1 (by wafer)	1 (by wafer)	1 (by wafer)	1 (by wafer)	-
Power					
Input Voltage	DC 12V	DC 12V	DC 12V	DC 12V	DC 12V
Mechanical					
Dimension (L x W)	ECX (146 x 105 mm)	ECX (146 x 105 mm)	ECX (146 x 105 mm)	ECX (146 x 105 mm)	ECX (146 x 105 mm)
Environmental					
Operating Temp.	0°C ~ 60°C / -20°C ~ 70°C	0°C ~ 60°C / -20°C ~ 70°C	0°C ~ 60°C	0°C ~ 60°C / -20°C ~ 70°C	0°C ~ 60°C / -20°C ~ 70°C



ECX SBC Product Matrix (conti.)

	 	 	 	 
Series	KEEX-1850 Series	KEEX-1760 Series	KEEX-1652 Series	KEEX-1660
Model	KEEX-1854 / 1855 / 1856 / 1854T / 1855T	KEEX-1760 / 1761 / 1762 / 1763 / 176T / 176A	KEEX-1652 / KEEX-165A	KEEX-1660
System				
Processor	Intel® Celeron® N3160 / Celeron® N3060	Intel® Celeron® J1900 / Atom™ E3845 / E3825 / N2807	Intel® Atom™ D2550	Intel® Atom™ D2550
Core Number	4 / 2	2 / 4	2	2
Cache	2M	2M / 1M	1M	1M
Frequency	up to 2.24 / up to 2.48 GHz	2.42 / 1.91 / 1.33 / 2.16 GHz	1.86 GHz	1.86 GHz
Socket	-	FCBGA1170	FCBGA559	FCBGA559
TDP	6W	10W / 6W / 4.3W	10W	10W
Chipset	-	-	Intel® NM10	Intel® NM10
Graphics	Intel® HD Graphics 400	Intel® HD Graphics	Intel® GMA 3650	Intel® GMA 3650
Memory	1x DDR3L SO-DIMM	1x DDR3L SO-DIMM	1x DDR3 SO-DIMM	1x DDR3 SO-DIMM
Storage				
SATA2	2 / 1	1	2	2
mSATA	1 / 0	1	1	-
Micro SD Card Cage	1	-	-	-
CF Socket	-	-	-	-
Display Interface				
LVDS	1	1	1	2
HDMI	1 (on rear)	1 (on rear)	1 (on rear)	1 (on rear)
DP	1 (on rear)	-	-	-
DVI-I	-	-	1 (on rear)	-
VGA	1	1 (on rear)	-	1 (on rear)
Multiple Display	Triple	Dual	Dual	Dual
Ethernet				
LAN	2 (on rear)	2 (on rear)	2 (on rear)	2 (on rear)
USB				
USB3.0	4 (on rear)	1 (on rear)	-	-
USB2.0	2	5 (2x on rear)	6 (4x on rear)	6 (4x on rear)
Serial Port				
RS-232/422/485	2	2	1	1
RS-232	4	4	5	1
Other I/Os				
8-bit DIO	1 (by header)	1 (by header)	1 (by header)	1 (by header)
Expansion				
mPCIe	2 / 1	1	1	2
SIM Card Cage	1 (by wafer)	1 (by wafer)	-	-
Power				
Input Voltage	DC 12V	DC 12V	DC 12V	DC 12V
Mechanical				
Dimension (L x W)	ECX (146 x 105 mm)	ECX (146 x 105 mm)	ECX (146 x 105 mm)	ECX (146 x 105 mm)
Environmental				
Operating Temp.	0°C ~ 60°C / -20°C ~ 70°C	0°C ~ 60°C / -20°C ~ 70°C	0°C ~ 60°C / -20°C ~ 70°C	0°C ~ 60°C

KEEX-5100 Series



Standard / Extended Temperature Single Board Computer in ECX Form Factor with 4th / 5th Gen. Intel® Haswell / Broadwell Processor

- Intel® 4th / 5th Gen. Intel® Haswell / Broadwell ULT Core™ i / Celeron® Processor
- 1x DDR3L 1333/1600 SO-DIMM up to 16GB
- 2x SATA, 1x mSATA for Storage
- 1x LVDS, 2x DP for video output
- 3x GbE, 2x mPCIe, 1x SIM card cage for network connection and expansion
- 4x USB3.0, 2x USB2.0, 2x COM, 1x 8-bit DIO for peripheral connection
- TPM & iAMT support
- Extended temperature model available: -20°C ~ 70°C

CPU Support	
KEEX-5100/510A:	Intel® Core™ i3-4010U onboard (Dual Core, 3M Cache, 1.70 GHz, FCBGA1168 socket, 15W TDP)
KEEX-5101/510T:	Intel® Core™ i5-4300U onboard (Dual Core, 3M Cache, up to 2.90 GHz, FCBGA1168 socket, 15W TDP)
KEEX-5103/510B:	Intel® Core™ i7-4650U onboard (Dual Core, 3M Cache, up to 3.30 GHz, FCBGA1168 socket, 15W TDP)
KEEX-5104/5104T:	Intel® Core™ i5-5350U onboard (Dual Core, 3M Cache, up to 2.90 GHz, FCBGA1168 socket, 15W TDP)
KEEX-5105/5105T:	Intel® Core™ i3-5010U onboard (Dual Core, 3M Cache, 2.10 GHz, FCBGA1168 socket, 15W TDP)
KEEX-5106/5106T:	Intel® Core™ i7-5650U onboard (Dual Core, 4M Cache, up to 3.20 GHz, FCBGA1168 socket, 15W TDP)
KEEX-5107/5107T:	Intel® Celeron® 3765U onboard (Dual Core, 2M Cache, 1.90 GHz, FCBGA1168 socket, 15W TDP)
Memory	
1x DDR3L 1333/1600 SO-DIMM up to 16GB	
Storage	
2x SATA2 1x mSATA (shared w/ mPCIe)	
Graphic Controller	
Intel® HD Graphics 6000 (KEEX-5104/5104T/5106/5106T) Intel® HD Graphics 5500 (KEEX-5105/5105T) Intel® HD Graphics 5000 (KEEX-5103/510B) Intel® HD Graphics 4400 (KEEX-5100/510A/5101/510T) Intel® HD Graphics (KEEX-5107/5107T)	
Display Interfaces	
1x LVDS (18/24-bit, 1/2-ch, 1920 x 1200 @ 60Hz) 2x DP (on rear, 3200x2000 for Haswell / 3840x2160 for Broadwell @ 60Hz) Triple Display	
Audio Chipset	
Realtek ALC662	
Audio Interfaces	
2x Speaker-out (3W, ISSI IS31AP2010B) 1x Line-in (by header) 1x Line-out (by header) 1x Mic-in (by header)	
Ethernet	
3x LAN (RJ-45 on rear, 2x Intel® I210-AT, 1x Intel® I218-LM)	

USB	
4x USB3.0 (Type A on rear) 2x USB2.0 (by header)	
Serial Ports	
2x RS-232/422/485 (by header)	
Other I/O Ports	
1x 8-bit DIO	
Expansion	
2x mPCIe Socket (1x shared w/ mSATA) 1x SIM Card Cage (by wafer)	
Power Supply	
Connector: 1x4-pin pitch 3.0mm wafer Input Voltage: DC 12V	
Firmware	
BIOS: AMI uEFI BIOS w/ 128Mb SPI Flash Watchdog: Programmable WDT to generate system reset event H/W Monitor: Voltages, Temperatures Real Time Clock: Processor integrated RTC TPM: for KEEEX-5101/03/04/06/0T/0B/04T/06T (Infineon SLB 9635 TPM 1.2) iAMT: for KEEEX-5101/03/04/06/0T/0B/04T/06T	
System Control & Monitoring	
1x Header for Reset button, HDD LED & External Speaker 1x Header for Power button, Power LED & SM bus 1x Header for mPCIe activity LED	
Cooling	
1x Smart Fan (by wafer)	
OS Support	
Windows, Linux	
Dimensions (L x W)	
ECX (146 x 105 mm / 5.75" x 4.13")	
Environmental Characteristics	
Operation Temp.: 0°C ~ 60°C / 32°F ~ 140°F (Standard) -20°C ~ 70°C / -4°F ~ 158°F (Extended) Storage Temp.: -20°C ~ 80°C / -4°F ~ 176°F (Standard) -40°C ~ 85°C / -40°F ~ 185°F (Extended) Humidity: 0% ~ 95%	
Certification	
CE, FCC Class A	

Ordering Information

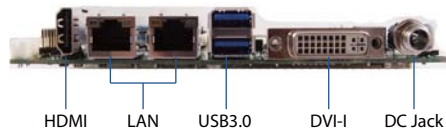
Model Name	Part No.	Description
KEEX-5100	B3EX5100-000000T	Intel® Core™ i3-4010U, Intel® HD Graphics 4400, w/o TPM & iAMT, Op. temp.: 0°C ~ 60°C
KEEX-5101	B3EX5100-010000T	Intel® Core™ i5-4300U, Intel® HD Graphics 4400, w/ TPM & iAMT, Op. temp.: 0°C ~ 60°C
KEEX-5103	B3EX5100-030000T	Intel® Core™ i7-4650U, Intel® HD Graphics 5000, w/ TPM & iAMT, Op. temp.: 0°C ~ 60°C
KEEX-5104	B3EX5100-040000T	Intel® Core™ i5-5350U, Intel® HD Graphics 6000, w/ TPM & iAMT, Op. temp.: 0°C ~ 60°C
KEEX-5105	B3EX5100-050000T	Intel® Core™ i3-5010U, Intel® HD Graphics 5500, w/o TPM & iAMT, Op. temp.: 0°C ~ 60°C
KEEX-5106	B3EX5100-060000T	Intel® Core™ i7-5650U, Intel® HD Graphics 6000, w/ TPM & iAMT, Op. temp.: 0°C ~ 60°C
KEEX-5107	B3EX5100-070000T	Intel® Celeron® 3765U, Intel® HD Graphics, w/o TPM & iAMT, Op. temp.: 0°C ~ 60°C
KEEX-510A	B3EX510A-000000T	Intel® Core™ i3-4010U, Intel® HD Graphics 4400, w/o TPM & iAMT, Op. temp.: -20°C ~ 70°C
KEEX-510T	B3EX510T-010000T	Intel® Core™ i5-4300U, Intel® HD Graphics 4400, w/ TPM & iAMT, Op. temp.: -20°C ~ 70°C
KEEX-510B	B3EX510B-010000T	Intel® Core™ i7-4650U, Intel® HD Graphics 5000, w/ TPM & iAMT, Op. temp.: -20°C ~ 70°C
KEEX-5104T	B3EX510T-040000T	Intel® Core™ i5-5350U, Intel® HD Graphics 6000, w/ TPM & iAMT, Op. temp.: -20°C ~ 70°C
KEEX-5105T	B3EX510T-051000T	Intel® Core™ i3-5010U, Intel® HD Graphics 5500, w/o TPM & iAMT, Op. temp.: -20°C ~ 70°C
KEEX-5106T	B3EX510T-061000T	Intel® Core™ i7-5650U, Intel® HD Graphics 6000, w/ TPM & iAMT, Op. temp.: -20°C ~ 70°C
KEEX-5107T	B3EX510T-071000T	Intel® Celeron® 3765U, Intel® HD Graphics, w/o TPM & iAMT, Op. temp.: -20°C ~ 70°C

KEEX-8100 Series



Standard / Extended Temperature Single Board Computer in ECX Form Factor w/ Intel® Haswell Processor + HM87/QM87 Chipset

- Intel® Socket G3 (FCPGA946) Haswell Core™ i / Celeron® Processor
- Intel® HM87 / QM87 Express Chipset
- 1x DDR3L 1333/1600 SO-DIMM up to 32GB
- 2x SATA, 2x mSATA for storage
- 1x LVDS, 1x DVI-I, 1x HDMI for video output
- 2x LAN, 2x mPCIe, 1x SIM Card Cage for network connection and expansion
- 4x USB3.0, 2x USB2.0, 2x COM, 1x 8-bit DIO for peripheral connection
- Extended temperature model available: -20°C ~ 70°C



CPU Support	Intel® Socket G3 (FCPGA946) Haswell Core™ i / Celeron® Processor (Dual / Quad Core, 2M ~ 8M Cache, 2.00 ~ 3.90 GHz, 37W ~ 57W TDP)
Chipset	KEEX-8100: Intel® HM87 KEEX-8101/810A: Intel® QM87
Memory	1x DDR3L 1333/1600 SO-DIMM up to 32GB
Storage	2x SATA 2x mSATA (shared w/ mPCIe)
Graphic Controller	Intel® HD Graphics 4600 (for Core™ i processor) Intel® HD Graphics (for Celeron® processor)
Display Interfaces	1x LVDS (24-bit, 2-ch, 1920 x 1200 @ 60Hz) 1x HDMI (on rear, 3840 x 2160 @ 60Hz) 1x DVI-I (on rear, 1920 x 1200 @ 60Hz) Triple Display
Audio Chipset	Realtek ALC662
Audio Interfaces	2x Speaker-out (3W) 1x Line-in (by header) 1x Line-out (by header) 1x Mic-in (by header)
Ethernet	2x LAN (RJ-45 on rear, 1x Intel® I217-LM, 1x Realtek RTL8111G)
USB	4x USB3.0 (2x Type A on rear, 2x by header) 2x USB2.0 (by header)
Serial Ports	2x RS-232/422/485 (by header)

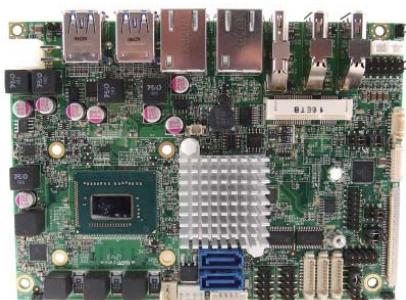
Other I/O Ports	1x 8-bit DIO
Expansion	2x mPCIe (shared w/ mSATA) 1x SIM Card Cage (by wafer)
Power Supply	Connector: Lockable DC Jack (on rear) Input Voltage: DC 12V
Firmware	BIOS: AMI uEFI BIOS w/ 128Mb SPI Flash Watchdog: Programmable WDT to generate system reset event H/W Monitor: Voltages, Temperatures Real Time Clock: Chipset integrated RTC TPM: for KEEEX-8101/810A (Infineon SLB 9635 TPM 1.2) iAMT: depending on processor
System Control & Monitoring	1x Header for Reset button, HDD LED & External Speaker 1x Header for Power button, Power LED & SM bus 1x Header for mPCIe activity LED
Cooling	1x Smart Fan (by wafer)
OS Support	Windows, Linux
Dimensions (L x W)	ECX (146 x 105 mm / 5.75" x 4.13")
Environmental Characteristics	Operation Temp.: 0°C ~ 60°C / 32°F ~ 140°F (Standard) -20°C ~ 70°C / -4°F ~ 158°F (Extended) Storage Temp.: -20°C ~ 80°C / -4°F ~ 176°F (Standard) -40°C ~ 85°C / -40°F ~ 185°F (Extended) Humidity: 0% ~ 95%
Certification	CE, FCC Class A

Ordering Information

Model Name	Part No.	Description
KEEX-8100	B3EX8100-00000T	ECX SBC, Intel® Socket G3 Haswell Processor, Intel® HM87 Chipset , 1x DDR3L SO-DIMM, 1x LVDS, 1x DVI-I, 1x HDMI, 2x LAN, 4x USB3.0, 2x USB2.0, 2x COM, 1x 8-bit DIO, 2x mPCIe / mSATA, w/o TPM, Op. temp.: 0°C ~ 60°C
KEEX-8101	B3EX8100-010000T	ECX SBC, Intel® Socket G3 Haswell Processor, Intel® QM87 Chipset , 1x DDR3L SO-DIMM, 1x LVDS, 1x DVI-I, 1x HDMI, 2x LAN, 4x USB3.0, 2x USB2.0, 2x COM, 1x 8-bit DIO, 2x mPCIe / mSATA, w/ TPM, Op. temp.: 0°C ~ 60°C
KEEX-810A	B3EX810A-010000T	ECX SBC, Intel® Socket G3 Haswell Processor, Intel® QM87 Chipset , 1x DDR3L SO-DIMM, 1x LVDS, 1x DVI-I, 1x HDMI, 2x LAN, 4x USB3.0, 2x USB2.0, 2x COM, 1x 8-bit DIO, 2x mPCIe / mSATA, w/ TPM, Op. temp.: -20°C ~ 70°C

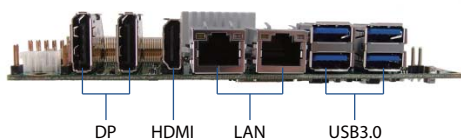


KEEX-7101 Series



Single Board Computer in ECX Form Factor w/ Intel® 3rd Gen. Intel® Ivy Bridge Processor

- Intel® 3th Gen. Intel® Ivy Bridge Core™ i7-3517UE / Celeron® 1047UE Processor
- Intel® QM77/ HM76 Express Chipset
- 1x DDR3 1333/1600 SO-DIMM up to 16GB
- 2x SATA, 1x mSATA for Storage
- 2x LVDS, 2x DP, 1x HDMI, 1x VGA for video output
- 2x GbE, 1x mPCIe, 1x SIM card cage for network connection and expansion
- 4x USB3.0, 4x USB2.0, 2x COM, 1x 8-bit DIO for peripheral connection
- TPM & iAMT support



CPU Support	
KEEX-7101: Intel® Core™ i7-3517UE (Dual Core, 4M Cache, up to 2.80 GHz, FCBGA1023 socket, 17W TDP)	
KEEX-7103: Intel® Celeron® 1047UE (Dual Core, 2M Cache, 1.40 GHz, FCBGA1023 socket, 17W TDP)	
Chipset	
KEEX-7101: Intel® QM77	
KEEX-7103: Intel® HM76	
Memory	
1x DDR3 1333/1600 SO-DIMM up to 16GB	
Storage	
2x SATA 1x mSATA (shared w/ mPCIe)	
Graphic Controller	
Intel® HD Graphics 4000 (KEEX-7101) Intel® HD Graphics (KEEX-7103)	
Display Interfaces	
2x LVDS (24-bit, 2-ch, 2560 x 1600 @ 60Hz) 1x HDMI (on rear, 1920 x 1200 @ 60Hz) 2x DP (on rear, 1920 x 1200 @ 60Hz) 1x VGA (by header, 2048 x 1536 @ 75Hz) Triple Display	
Audio Chipset	
Realtek ALC662	
Audio Interfaces	
2x Speaker-out (2W) 1x Line-in (by header) 1x Line-out (by header) 1x Mic-in (by header) 1x S/PDIF (by header)	
Ethernet	
2x LAN (RJ-45 on rear, 1x Intel® 82579, 1x Realtek RTL8111E)	
USB	
4x USB3.0 (Type A on rear) 4x USB2.0 (by header)	

Serial Ports	
1x RS-232/422/485 (by header) 1x RS-232 (by header)	
Other I/O Ports	
1x PS/2 Keyboard/Mouse (by wafer) 1x 8-bit DIO (by wafer)	
Expansion	
1x mPCIe (shared w/ mSATA) 1x SIM Card Cage (by wafer)	
Power Supply	
Connector: 2x2-pin ATX connector Input Voltage: DC 12V	
Firmware	
BIOS: AMI uEFI BIOS w/ 64Mb SPI Flash Watchdog: Programmable WDT to generate system reset event H/W Monitor: Voltages, Temperatures Real Time Clock: Pather Point intergrated RTC TPM: for KEEEX-7101 (Infineon SLB 9635 TPM 1.2) iAMT: for KEEEX-7101	
System Control & Monitoring	
1x Header for Reset button, HDD LED & External Speaker 1x Header for Power button, Power LED, Keyboard Lock & SM bus	
Cooling	
1x Smart Fan (by wafer)	
OS Support	
Windows, Linux	
Dimensions (L x W)	
ECX (146 x 105 mm / 5.75" x 4.13")	
Environmental Characteristics	
Operation Temp.: 0°C ~ 60°C / 32°F ~ 140°F Storage Temp.: -20°C ~ 80°C / -4°F ~ 176°F Humidity: 0% ~ 95%	
Certification	
CE, FCC Class A	

Ordering Information

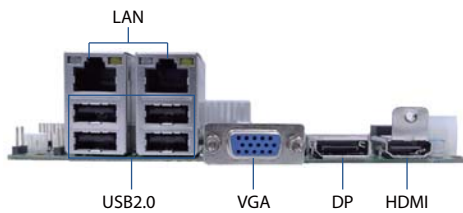
Model Name	Part No.	Description
KEEX-7101	B3EX7100-011000T	ECX SBC, Intel® Core™ i7-3517UE Processor, Intel® QM77 Chipset, 1x DDR3 SO-DIMM, 2x LVDS, 1x HDMI, 2x DP, 1x VGA, 2x LAN, 4x USB3.0, 4x USB2.0, 2x COM, 1x 8-bit DIO, 2x SATA, 1x mPCIe / mSATA, w/ TPM, w/ iAMT
KEEX-7103	B3EX7100-031000T	ECX SBC, Intel® Celeron® 1047UE Processor, Intel® QM87 Chipset, 1x DDR3 SO-DIMM, 2x LVDS, 1x HDMI, 2x DP, 1x VGA, 2x LAN, 4x USB3.0, 4x USB2.0, 2x COM, 1x 8-bit DIO, 2x SATA, 1x mPCIe / mSATA, w/o TPM, w/o iAMT

KEEX-6100 Series



Standard / Extended Temperature Single Board Computer in ECX Form Factor w/ Intel® Sandy Bridge Core™ i CPU + QM67/HM65 Chipset

- Intel® Socket G2 (FCPGA988) Sandy Bridge Core™ i7/i5 Processor
- Intel® QM67 / HM65 Express Chipset
- 1x DDR3 SO-DIMM
- 2x SATA, 1x CF Socket for storage
- 2x LVDS, 1x HDMI, 1x DP, 1x VGA for video output
- 2x LAN, 1x mPCIe, 1x SIM Card Cage for network connection and expansion
- 8x USB2.0, 2x COM, 1x 8-bit DIO for peripheral connection
- Extended temperature model available: -20°C ~ 70°C



CPU Support	
Intel® Socket G2 (FCPGA988) Sandy Bridge Core™ i7/i5 Processor (Dual / Quad Core, 3M ~ 8M Cache, 2.00 ~ 3.70 GHz, 35W ~ 55W TDP)	
Chipset	
KEEX-6100/610A: Intel® QM67 KEEX-6101: Intel® HM65	
Memory	
1x DDR3 1066/1333/1600 SO-DIMM up to 32GB/16GB	
Storage	
2x SATA 1x CF Socket	
Graphic Controller	
Intel® HD Graphics 3000	
Display Interfaces	
2x LVDS (24-bit, 2-ch, 1920 x 1200 @ 60Hz) 1x HDMI (on rear, 1920 x 1200 @ 60Hz) 1x DP (on rear, 1920 x 1200 @ 60Hz) 1x VGA (on rear, 2048 x 1536 @ 75Hz) Dual Display	
Audio Chipset	
Realtek ALC662-VC	
Audio Interfaces	
2x Speaker-out (2W) 1x Line-in (by header) 1x Line-out (by header) 1x Mic-in (by header) 1x S/PDIF (by header)	
Ethernet	
2x LAN (RJ-45 on rear, 1x Intel® 82579LM, 1x Realtek RTL8111C)	
USB	
8x USB2.0 (4x Type A on rear, 4x by header)	
Serial Ports	
1x RS-232/422/485 (by header) 1x RS-232 (by header)	

Other I/O Ports	
1x PS/2 Keyboard/Mouse (by header) 1x 8-bit DIO (by header) 1x IrDA (by header)	
Expansion	
1x mPCIe 1x SIM Card Cage (by wafer)	
Power Supply	
Connector: 2x2-pin ATX Connector Input Voltage: DC 12V	
Firmware	
BIOS: AMI uEFI Plug & Play SPI BIOS Watchdog: WDT supported 1 - 255 step offered H/W Monitor: Voltages, CPU & System Temperatures, Fan Real Time Clock: Chipset integrated RTC TPM: Yes (Infineon SLB 9635 TPM 1.2) iAMT: depending on processor	
Cooling	
1x Smart Fan (by wafer)	
OS Support	
Windows XP / XPe / Windows 7	
Dimensions (L x W)	
ECX (146 x 105 mm / 5.75" x 4.13")	
Environmental Characteristics	
Operation Temp.: 0°C ~ 60°C / 32°F ~ 140°F (Standard) -20°C ~ 70°C / -4°F ~ 158°F (Extended) Storage Temp.: -20°C ~ 80°C / -4°F ~ 176°F (Standard) -40°C ~ 85°C / -40°F ~ 185°F (Extended) Humidity: 0% ~ 95%	
Certification	
CE, FCC Class A	

Ordering Information

Model Name	Part No.	Description
KEEX-6100	B3EX6100-001002T	ECX SBC, Intel® Socket G2 Sandy Bridge Core™ i7/i5 Processor, Intel® QM67 Chipset, 1x DDR3 SO-DIMM, 2x LVDS, 1x HDMI, 1x DP, 1x VGA, 2x LAN, 8x USB2.0, 2x COM, 1x 8-bit DIO, 1x mPCIe, w/ TPM, Op. temp.: 0°C ~ 60°C
KEEX-6101	B3EX6100-011002T	ECX SBC, Intel® Socket G2 Sandy Bridge Core™ i7/i5 Processor, Intel® HM65 Chipset, 1x DDR3 SO-DIMM, 2x LVDS, 1x HDMI, 1x DP, 1x VGA, 2x LAN, 8x USB2.0, 2x COM, 1x 8-bit DIO, 1x mPCIe, w/ TPM, Op. temp.: 0°C ~ 60°C
KEEX-610A	B3EX610A-001001T	ECX SBC, Intel® Socket G2 Sandy Bridge Core™ i7/i5 Processor, Intel® QM67 Chipset, 1x DDR3 SO-DIMM, 2x LVDS, 1x HDMI, 1x DP, 1x VGA, 2x LAN, 8x USB2.0, 2x COM, 1x 8-bit DIO, 1x mPCIe, w/ TPM, Op. temp.: -20°C ~ 70°C

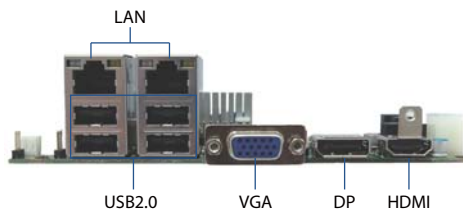


KEEX-6150 Series



Standard / Extended Temperature Single Board Computer in ECX Form Factor w/ Intel® Sandy Bridge Celeron® Processor + HM65 Chipset

- Intel® Sandy Bridge Processor, Celeron® 827E / 847E
- Intel® HM65 Express Chipset
- 1x DDR3 1066/1333 SO-DIMM up to 16GB
- 2x SATA, 1x CF Socket for storage
- 2x LVDS, 1x HDMI, 1x DP, 1x VGA for video output
- 2x LAN, 1x mPCIe for network connection and expansion
- 8x USB2.0, 2x COM, 1x 8-bit DIO for peripheral connection
- Extended temperature model available: -20°C ~ 70°C



CPU Support	
KEEX-6150/615A: Intel® Celeron® 827E Processor (Single Core, 1.5M Cache, 1.40 GHz, FCBGA1023, 17W TDP)	
KEEX-6151: Intel® Celeron® 847E Processor (Dual Core, 2M Cache, 1.10 GHz, FCBGA1023, 16W TDP)	
Chipset	
Intel® HM65	
Memory	
1x DDR3 1066/1333 SO-DIMM up to 16GB	
Storage	
2x SATA 1x CF Socket	
Graphic Controller	
Intel® HD Graphics	
Display Interfaces	
2x LVDS (24-bit, 2-ch, 1920 x 1200 @ 60Hz) 1x HDMI (on rear, 1920 x 1200 @ 60Hz) 1x DP (on rear, 1920 x 1200 @ 60Hz) 1x VGA (on rear, 1920 x 1200 @ 60Hz) Dual Display	
Audio Chipset	
Realtek ALC662	
Audio Interfaces	
2x Speaker-out (2W) 1x Line-in (by header) 1x Line-out (by header) 1x Mic-in (by header) 1x S/PDIF (by header)	
Ethernet	
2x LAN (RJ-45 on rear, 1x Intel® 82579, 1x Realtek RTL8111E)	
USB	
8x USB2.0 (4x Type A on rear, 4x by header)	

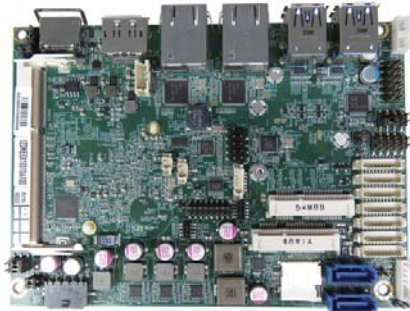
Serial Ports	
1x RS-232/422/485 (by header) 1x RS-232 (by header)	
Other I/O Ports	
1x PS/2 Keyboard/Mouse (by header) 1x 8-bit DIO (by header) 1x IrDA (by header)	
Expansion	
1x mPCIe	
Power Supply	
Connector: 2x2-pin ATX Connector Input Voltage: DC 12V	
Firmware	
BIOS: AMI uEFI BIOS w/ 32Mb SPI Flash Watchdog: Programmable WDT to generate system reset event H/W Monitor: Voltages, Temperatures Real Time Clock: Chipset integrated RTC	
Cooling	
1x Smart Fan (by wafer)	
OS Support	
Windows 7	
Dimensions (L x W)	
ECX (146 x 105 mm / 5.75" x 4.13")	
Environmental Characteristics	
Operation Temp.: 0°C ~ 60°C / 32°F ~ 140°F (Standard) -20°C ~ 70°C / -4°F ~ 158°F (Extended) Storage Temp.: -20°C ~ 80°C / -4°F ~ 176°F (Standard) -40°C ~ 85°C / -40°F ~ 185°F (Extended) Humidity: 0% ~ 95%	
Certification	
CE, FCC Class A	

Ordering Information

Model Name	Part No.	Description
KEEX-6150	B3EX6150-001000T	ECX SBC, Intel® Celeron® 827E Processor, Intel® HM65 Chipset, 1x DDR3 SO-DIMM, 2x LVDS, 1x HDMI, 1x DP, 1x VGA, 2x LAN, 8x USB2.0, 2x COM, 1x 8-bit DIO, 1x mPCIe, Op. temp.: 0°C ~ 60°C
KEEX-6151	B3EX6150-011000T	ECX SBC, Intel® Celeron® 847E Processor, Intel® HM65 Chipset, 1x DDR3 SO-DIMM, 2x LVDS, 1x HDMI, 1x DP, 1x VGA, 2x LAN, 8x USB2.0, 2x COM, 1x 8-bit DIO, 1x mPCIe, Op. temp.: 0°C ~ 60°C
KEEX-615A	B3EX615A-000000T	ECX SBC, Intel® Celeron® 827E Processor, Intel® HM65 Chipset, 1x DDR3 SO-DIMM, 2x LVDS, 1x HDMI, 1x DP, 1x VGA, 2x LAN, 8x USB2.0, 2x COM, 1x 8-bit DIO, 1x mPCIe, Op. temp.: -20°C ~ 70°C

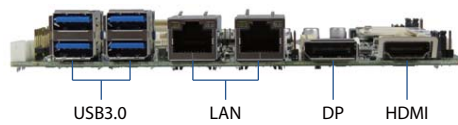


KEEX-1850 Series



Standard / Extended Temperature Single Board Computer in ECX Form Factor w/ Intel® Braswell SoC Processor

- Intel® Braswell SoC Processor, Celeron® N3160/N3060
- 1x DDR3L 1600 SO-DIMM up to 8GB
- 2x/1x SATA, 0x/1x mSATA, 1x Micro SD Card Cage for storage
- 1x LVDS / 1x VGA, 1x HDMI, 1x DP for video output
- 2x LAN, 2x/1x mPCIe, 1x SIM Card Cage for network connection and expansion
- 4x USB3.0, 2x USB2.0, 6x COM, 1x 8-bit DIO for peripheral connection
- Extended temperature model available: -20°C ~ 70°C



CPU Support	
KEEX-1854/1854T/1856: Intel® Celeron® N3160 SoC Processor (Quad Core, 2M Cache, up to 2.24 GHz, 6W TDP)	
KEEX-1855/1855T: Intel® Celeron® N3060 SoC Processor (Dual Core, 2M Cache, up to 2.48 GHz, 6W TDP)	
Memory	
1x DDR3L 1600 SO-DIMM Socket up to 8GB	
Storage	
2x SATA (KEEX-1854/1854T/1855/1855T)	
1x SATA (KEEX-1856)	
1x mSATA (full size, KEEX-1856)	
1x Micro SD Card Cage	
Graphic Controller	
Intel® HD Graphics 400	
Display Interfaces	
1x LVDS (24-bit, 2-ch, 1920 x 1200 @ 60Hz)	
1x VGA (by header, 1920 x 1200 @ 60Hz)	
1x HDMI (on rear, 2560 x 1600 @ 60Hz)	
1x DP (on rear, 3840 x 2160 @ 30Hz / 2560 x 1600 @ 60Hz)	
Triple Display: LVDS / VGA + HDMI + DP	
Audio Chipset	
Realtek ALC662	
Audio Interfaces	
2x Speaker-out (3W)	
1x Line-in (by header)	
1x Line-out (by header)	
1x Mic-in (by header)	
Ethernet	
2x LAN (RJ-45 on rear, Intel® I210-AT)	
USB	
4x USB3.0 (Type A on rear)	
2x USB2.0 (by header)	
Serial Ports	
2x RS-232/422/485 (by header)	
4x RS-232 (by header)	

Other I/O Ports	
1x 8-bit DIO (by header)	
Expansion	
2x mPCIe (1x full size, 1x half size, KEEX-1854/1854T/1855/1855T)	
1x mPCIe (full size, KEEX-1856)	
1x SIM Card Cage (by wafer)	
Power Supply	
Connector: 1x4-pin Lockable Wafer	
Input Voltage: DC 12V	
Firmware	
BIOS: AMI uEFI BIOS	
Watchdog: Programmable WDT to generate System reset event	
H/W Monitor: Voltages, Temperatures	
Real Time Clock: SoC intergrated RTC	
TPM: optional (Infineon SLB 9635 TPM 1.2)	
System Control & Monitoring	
1x Header for Reset button, HDD LED & External Speaker	
1x Header for Power button, Power LED & SM bus	
1x Header for mPCIe activity LED	
Cooling	
1x Smart Fan (by wafer)	
OS Support	
Windows / Linux	
Dimensions (L x W)	
ECX (146 x 105 mm / 5.75" x 4.13")	
Environmental Characteristics	
Operation Temp.: 0°C ~ 60°C / 32°F ~ 140°F (Standard)	
-20°C ~ 70°C / -4°F ~ 158°F (Extended)	
Storage Temp.: -20°C ~ 80°C / -4°F ~ 176°F (Standard)	
-40°C ~ 85°C / -40°F ~ 185°F (Extended)	
Humidity: 0% ~ 95%	
Certification	
CE, FCC Class A	

Ordering Information

Model Name	Part No.	Description
KEEX-1854	B3EX1850-041000T	ECX SBC, Intel® Celeron® N3160 Processor, 2x SATA, 2x mPCIe, Op. temp.: 0°C ~ 60°C
KEEX-1855	B3EX1850-051000T	ECX SBC, Intel® Celeron® N3060 Processor, 2x SATA, 2x mPCIe, Op. temp.: 0°C ~ 60°C
KEEX-1856	B3EX1850-161000T	ECX SBC, Intel® Celeron® N3160 Processor, 1x SATA, 1x mSATA, 1x mPCIe, Op. temp.: 0°C ~ 60°C
KEEX-1854T	B3EX185T-041000T	ECX SBC, Intel® Celeron® N3160 Processor, 2x SATA, 2x mPCIe, Op. temp.: -20°C ~ 70°C
KEEX-1855T	B3EX185T-051000T	ECX SBC, Intel® Celeron® N3060 Processor, 2x SATA, 2x mPCIe, Op. temp.: -20°C ~ 70°C

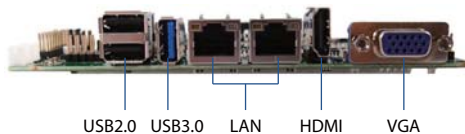


KEEX-1760 Series



Standard / Extended Temperature Single Board Computer in ECX Form Factor with Intel® Bay Trail Processor

- Intel® Bay Trail Processor, Celeron® J1900 / Atom™ E3845 / E3825 / N2807
- 1x DDR3L SO-DIMM up to 8GB / 4GB
- 1x SATA, 1x mSATA Socket for storage
- 1x LVDS, 1x HDMI, 1x VGA for display output
- 2x LAN, 1x mPCIe, 1x SIM Card Cage for network connection and expansion
- 1x USB3.0, 5x USB2.0, 6x COM, 1x 8-bit DIO for peripheral connection
- Extended temperature model available: -20°C ~ 70°C



CPU Support	
KEEX-1760: Intel® Celeron® J1900 Processor (Quad Core, 2M Cache, up to 2.42 GHz, FCBGA1170, 10W TDP)	
KEEX-1761/176T: Intel® Atom™ E3845 Processor (Quad Core, 2M Cache, up to 1.91 GHz, FCBGA1170, 10W TDP)	
KEEX-1762/176A: Intel® Atom™ E3825 Processor (Dual Core, 1M Cache, up to 1.33 GHz, FCBGA1170, 6W TDP)	
KEEX-1763: Intel® Atom™ N2807 Processor (Dual Core, 1M Cache, up to 2.16 GHz, FCBGA1170, 4.3W TDP)	
Memory	
1x DDR3L 1333 SO-DIMM up to 8GB (KEEX-1760/1761/176T)	
1x DDR3L 1067 SO-DIMM up to 8GB (KEEX-1762/176A)	
1x DDR3L 1333 SO-DIMM up to 4GB (KEEX-1763)	
Storage	
1x SATA	
1x mSATA	
Graphic Controller	
Intel® HD Graphics	
Display Interfaces	
1x LVDS (24-bit, 2-ch, 1920 x 1200 @ 60Hz)	
1x HDMI (on rear, 1920 x 1080 @ 60Hz)	
1x VGA (on rear, 2560 x 1600 @ 60Hz)	
Dual Display	
Audio Chipset	
Realtek ALC662	
Audio Interfaces	
2x Speaker-out (3W)	
1x Line-in (by header)	
1x Line-out (by header)	
1x Mic-in (by header)	
Ethernet	
2x LAN (RJ-45 on rear, 1x Intel® I210-AT, 1x Realtek RTL8111G)	
USB	
1x USB3.0 (Type A on rear)	
5x USB2.0 (2x Type A on rear, 3x by header)	

Serial Ports	
2x RS-232/422/485 (by header)	
4x RS-232 (by header)	
Other I/O Ports	
1x PS/2 Keyboard/Mouse (by header)	
1x 8-bit DIO (by header)	
Expansion	
1x mPCIe	
1x SIM Card Cage (by wafer)	
Power Supply	
Connector: 1x4-pin Lockable Wafer	
Input Voltage: DC 12V	
Firmware	
BIOS: AMI uEFI BIOS w/ 64Mb SPI Flash	
Watchdog: Programmable WDT to generate system reset event	
H/W Monitor: Voltages, Temperatures	
Real Time Clock: SoC integrated RTC	
TPM: optional for ATOM E3845™ (Infineon SLB 9635 TPM 1.2)	
System Control & Monitoring	
1x Header for Reset button, HDD LED & External Speaker	
1x Header for Power button, Power LED & SM bus	
1x Header for mPCIe activity LED	
Cooling	
1x Smart Fan (by wafer)	
OS Support	
Windows, Linux	
Dimensions (L x W)	
ECX (146 x 105 mm / 5.75" x 4.13")	
Environmental Characteristics	
Operation Temp.: 0°C ~ 60°C / 32°F ~ 140°F (Standard)	
-20°C ~ 70°C / -4°F ~ 158°F (Extended)	
Storage Temp.: -20°C ~ 80°C / -4°F ~ 176°F (Standard)	
-40°C ~ 85°C / -40°F ~ 185°F (Extended)	
Humidity: 0% ~ 95%	
Certification	
CE, FCC Class A	

Ordering Information

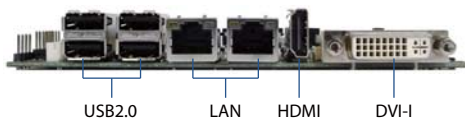
Model Name	Part No.	Description
KEEX-1760	B3EX1760-001001T	ECX SBC, Intel® Celeron® J1900, 1x DDR3L SO-DIMM up to 8GB, 1x LVDS, 1x HDMI, 1x VGA, Op. temp.: 0°C ~ 60°C
KEEX-1761	B3EX1760-011000T	ECX SBC, Intel® Atom™ E3845, 1x DDR3L SO-DIMM up to 8GB, 1x LVDS, 1x HDMI, 1x VGA, Op. temp.: 0°C ~ 60°C
KEEX-1762	B3EX1760-021000T	ECX SBC, Intel® Atom™ E3825, 1x DDR3L SO-DIMM up to 8GB, 1x LVDS, 1x HDMI, 1x VGA, Op. temp.: 0°C ~ 60°C
KEEX-1763	B3EX1760-031000T	ECX SBC, Intel® Atom™ N2807, 1x DDR3L SO-DIMM up to 4GB, 1x LVDS, 1x HDMI, 1x VGA, Op. temp.: 0°C ~ 60°C
KEEX-176T	B3EX176T-011000T	ECX SBC, Intel® Atom™ E3845, 1x DDR3L SO-DIMM up to 8GB, 1x LVDS, 1x HDMI, 1x VGA, Op. temp.: -20°C ~ 70°C
KEEX-176A	B3EX176A-021000T	ECX SBC, Intel® Atom™ E3825, 1x DDR3L SO-DIMM up to 8GB, 1x LVDS, 1x HDMI, 1x VGA, Op. temp.: -20°C ~ 70°C

KEEX-1652 Series



Standard / Extended Temperature Single Board Computer in ECX Form Factor w/ Intel® Cedarview Atom™ D2550 CPU + NM10 Chipset

- Intel® Cedarview Desktop Processor, Atom™ D2550
- Intel® NM10 Express Chipset
- 1x DDR3 800/1066 SO-DIMM up to 4GB
- 2x SATA, 1x mSATA for storage
- 1x LVDS, 1x HDMI, 1x DVI-I for display output
- 2x LAN, 1x mPCIe for network connection and expansion
- 6x USB2.0, 6x COM, 1x 8-bit DIO for peripheral connection
- Extended temperature model available: -20°C ~ 70°C



CPU Support	
Intel® Atom™ D2550 Processor (Dual Core, 1M Cache, 1.86 GHz, FCBGA559, 10W TDP)	
Chipset	
Intel® NM10 Express Chipset	
Memory	
1x DDR3 800/1066 SO-DIMM Socket up to 4GB	
Storage	
2x SATA 1x mSATA	
Graphic Controller	
Intel® Graphics Media Accelerator 3650	
Display Interfaces	
1x LVDS (18/24-bit, 1-ch, 1920 x 1200 @ 60Hz) 1x HDMI (on rear, 1920 x 1200 @ 60Hz) 1x DVI-I (on rear, 1920 x 1200 @ 60Hz) Dual Display	
Audio Chipset	
Realtek ALC662-VC	
Audio Interfaces	
2x Speaker-out (2W) 1x Line-in (by header) 1x Line-out (by header) 1x Mic-in (by header) 1x S/PDIF (by header)	
Ethernet	
2x LAN (RJ-45 on rear, Realtek RTL8111E)	
USB	
6x USB2.0 (4x Type A on rear, 2x by header)	
Serial Ports	
1x RS-232/422/485 (by header) 5x RS-232 (by header, 4x w/ power selection, 1x w/o power selection)	

Other I/O Ports	
1x 8-bit DIO (by header)	
Expansion	
1x mPCIe	
Power Supply	
Connector: 1x4-pin Lockable Wafer Input Voltage: DC 12V	
Firmware	
BIOS: AMI uEFI BIOS w/ 16Mb SPI Flash Watchdog: Super I/O integrated WDT, max. 65535 sec / min selectable H/W Monitor: Voltages, Temperatures Real Time Clock: Chipset integrated RTC	
System Control & Monitoring	
1x Header for Reset button, HDD LED & External Speaker 1x Header for Power button, Power LED, Keyboard lock & SM bus	
Cooling	
1x Smart Fan (by wafer)	
OS Support	
Windows 7	
Dimensions (L x W)	
ECX (146 x 105 mm / 5.75" x 4.13")	
Environmental Characteristics	
Operation Temp.: 0°C ~ 60°C / 32°F ~ 140°F (Standard) -20°C ~ 70°C / -4°F ~ 158°F (Extended)	
Storage Temp.: -20°C ~ 80°C / -4°F ~ 176°F (Standard) -40°C ~ 85°C / -40°F ~ 185°F (Extended)	
Humidity: 0% ~ 95%	
Certification	
CE, FCC Class A	

Ordering Information

Model Name	Part No.	Description
KEEX-1652	B3EX1650-021000T	ECX SBC, Intel® Atom™ D2550 Processor, Intel® NM10 Chipset, 1x DDR3 SO-DIMM, 1x LVDS, 1x HDMI, 1x DVI-I, 2x LAN, 6x USB2.0, 6x COM, 1x 8-bit DIO, 1x mPCIe, Op. temp.: 0°C ~ 60°C
KEEX-165A	B3EX165A-021000T	ECX SBC, Intel® Atom™ D2550 Processor, Intel® NM10 Chipset, 1x DDR3 SO-DIMM, 1x LVDS, 1x HDMI, 1x DVI-I, 2x LAN, 6x USB2.0, 6x COM, 1x 8-bit DIO, 1x mPCIe, Op. temp.: -20°C ~ 70°C

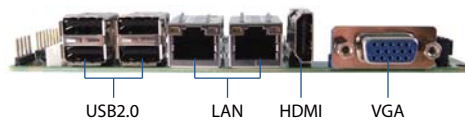


KEEX-1660



Standard / Extended Temperature Single Board Computer in ECX Form Factor w/ Intel® Cedarview Atom™ D2550 CPU + NM10 Chipset

- Intel® Cedarview Desktop Processor, Atom™ D2550
- Intel® NM10 Express Chipset
- 1x DDR3 800/1066 SO-DIMM up to 4GB
- 2x SATA for storage
- 2x LVDS, 1x HDMI, 1x VGA for display output
- 2x LAN, 2x mPCIe for network connection and expansion
- 6x USB2.0, 2x COM, 1x 8-bit DIO for peripheral connection



CPU Support	
Intel® Atom™ D2550 Processor	(Dual Core, 1M Cache, 1.86 GHz, FCBGA559, 10W TDP)
Chipset	
Intel® NM10 Express Chipset	
Memory	
1x DDR3 800/1066 SO-DIMM Socket up to 4GB	
Storage	
2x SATA	
Graphic Controller	
Intel® Graphics Media Accelerator 3650	
Display Interfaces	
1x LVDS (18/24-bit, 1-ch, 1920 x 1200 @ 60Hz)	
1x LVDS (18/24-bit, 2-ch, 1920 x 1200 @ 60Hz)	
1x HDMI (on rear, 1920 x 1200 @ 60Hz)	
1x VGA (on rear, 1920 x 1200 @ 60Hz)	
Dual Display	
Audio Chipset	
Realtek ALC662-VC	
Audio Interfaces	
2x Speaker-out (2W)	
1x Line-in (by header)	
1x Line-out (by header)	
1x Mic-in (by header)	
1x S/PDIF (by header)	
Ethernet	
2x LAN (RJ-45 on rear, Realtek RTL8111E)	
USB	
6x USB2.0 (4x Type A on rear, 2x by header)	

Serial Ports	
1x RS-232/422/485 (by header)	
1x RS-232 (by header)	
Other I/O Ports	
1x 8-bit DIO (by header)	
Expansion	
2x mPCIe	
Power Supply	
Connector: 1x4-pin Lockable Wafer	
Input Voltage: DC 12V	
Firmware	
BIOS: AMI uEFI BIOS w/ 16Mb SPI Flash	
Watchdog: Super I/O integrated WDT, max. 65535 sec / min selectable	
H/W Monitor: Voltages, Temperatures	
Real Time Clock: Chipset integrated RTC	
System Control & Monitoring	
1x Header for Reset button, HDD LED & External Speaker	
1x Header for Power button, Power LED, Keyboard lock & SM bus	
Cooling	
1x Smart Fan (by wafer)	
OS Support	
Windows 7	
Dimensions (L x W)	
ECX (146 x 105 mm / 5.75" x 4.13")	
Environmental Characteristics	
Operation Temp.: 0°C ~ 60°C / 32°F ~ 140°F	
Storage Temp.: -20°C ~ 80°C / -4°F ~ 176°F	
Humidity: 0% ~ 95%	
Certification	
CE, FCC Class A	

Ordering Information

Model Name	Part No.	Description
KEEX-1660	B3EX1660-001000T	ECX SBC, Intel® Atom™ D2550 Processor, Intel® NM10 Chipset, 1x DDR3 SO-DIMM, 2x SATA, 2x LVDS, 1x HDMI, 1x VGA, 2x LAN, 6x USB2.0, 2x COM, 1x 8-bit DIO, 2x mPCIe

MEMO



Mini-ITX Industrial MB CPU Support Matrix

	Processor Generation	Proc. Type	Processor / Chipset	Core Num.	Cache	Base Frequency	Socket	TDP	MITX-SLS0 Series <small>P.32</small>	KEMX-8200 Series <small>P.33</small>
High Performance Platform	Skylake	Desktop	H110 Core™ i	2 / 4	3M / 4M / 6M / 8M	2.20 ~ 4.20 GHz	FCLGA1151	35W ~ 91W	MITX-SLS0	
	Skylake	Desktop	Q170 Core™ i	2 / 4	3M / 4M / 6M / 8M	2.20 ~ 4.20 GHz	FCLGA1151	35W ~ 91W	MITX-SLS1 MITX-SLS1T	
	Haswell	Desktop	H81 Core™ i / Celeron®	2 / 4	2M / 3M / 4M / 6M / 8M	1.90 ~ 4.00 GHz	FCLGA1150	35W ~ 84W		KEMX-8200
	Haswell	Desktop	Q87 Core™ i / Celeron®	2 / 4	2M / 3M / 4M / 6M / 8M	2.00 ~ 4.00 GHz	FCLGA1150	35W ~ 84W		KEMX-8201 KEMX-8201T
	Haswell	Mobile	HM87 Core™ / Celeron®	2 / 4	2M / 3M / 6M / 8M	2.00 ~ 3.90 GHz	FCPGA946	37W ~ 57W		
	Haswell	Mobile	QM87 Core™ / Celeron®	2 / 4	2M / 3M / 6M / 8M	2.00 ~ 3.90 GHz	FCPGA946	37W ~ 57W		
	Ivy Bridge	Mobile	Celeron® 1047UE + HM76	2	2M	1.40 GHz	FCBGA1023	17W		
	Sandy Bridge	Mobile	QM67 Core™ i	2 / 4	3M / 6M / 8M	2.00 ~ 3.70 GHz	FCPGA988	35W ~ 55W		
Power Efficiency Platform	Bay Trail	Desktop	Celeron® J1900	4	2M	up to 2.42 GHz	FCBGA1170	10W		
	Bay Trail	Mobile	Atom™ E3845	4	2M	up to 1.91 GHz	FCBGA1170	10W		
	Bay Trail	Mobile	Atom™ E3825	2	1M	1.33 GHz	FCBGA1170	6W		
	Cedarview	Desktop	Atom™ D2550 + NM10	2	1M	1.86 GHz	FCBGA559	10W		

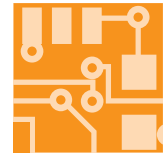
Model name marked in blue implies that it is a standard-temperature model.
 Model name marked in red implies that it is an extended-temperature model.



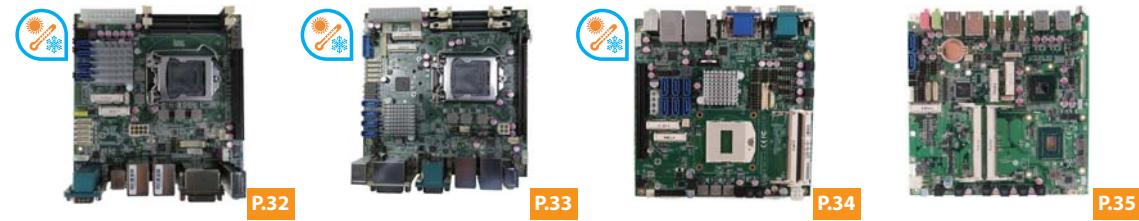
Mini-ITX Industrial MB CPU Support Matrix (conti.)

Processor / Chipset	KEMX-8000 Series <small>P.34</small>	KEMX-7000 <small>P.35</small>	KEMX-6000 Series <small>P.36</small>	KEMX-1750 Series <small>P.37</small>	KEMX-1702 <small>P.38</small>	KEMX-1600 Series <small>P.39</small>
H110 Core™ i						
Q170 Core™ i						
H81 Core™ i / Celeron®						
Q87 Core™ i / Celeron®						
HM87 Core™ / Celeron®	KEMX-8000					
QM87 Core™ / Celeron®	KEMX-8001 KEMX-800A					
Celeron® 1047UE + HM76		KEMX-7000				
QM67 Core™ i			KEMX-6000 KEMX-600A			
Celeron® J1900				KEMX-1750		
Atom™ E3845				KEMX-1751 KEMX-175A		
Atom™ E3825				KEMX-1752	KEMX-1702	
Atom™ D2550 + NM10						KEMX-1600, KEMX-1603 KEMX-160A

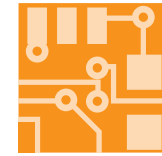
Model name marked in blue implies that it is a standard-temperature model.
 Model name marked in red implies that it is an extended-temperature model.



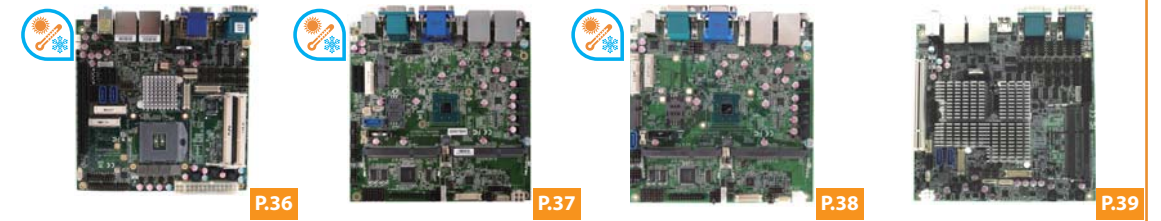
Mini-ITX MB Product Matrix



Series	MITX-SLS0 Series	KEMX-8200 Series	KEMX-8000 Series	KEMX-7000
Model	MITX-SLS0 / SLS1 / SLS1T	KEMX-8200 / 8201 / 8201T	KEMX-8000 / 8001 / 800A	KEMX-7000
System				
Processor	Intel® Skylake Core™ i	Intel® Haswell Core™ i / Celeron®	Intel® Haswell Core™ i / Celeron®	Intel® Celeron® 1047UE
Core Number	2 / 4	2 / 4	2 / 4	2
Cache	3M ~ 8M	2M ~ 8M	2M ~ 8M	2M
Frequency	2.20 ~ 4.20 GHz	1.90 ~ 4.00 GHz	2.00 ~ 3.90 GHz	1.40 GHz
Socket	FCLGA1151	FCLGA1150	FCPGA946	FCBGA1023
TDP	35W ~ 91W	35W ~ 84W	37W ~ 57W	17W
Chipset	Intel® H110 / Q170	Intel® H81 / Q87	Intel® HM87 / QM87	Intel® HM76
Graphics	Intel® HD Graphics 530 / 510	Intel® HD Graphics / 4600	Intel® HD Graphics / 4600 / 4400	Intel® HD Graphics
Memory	2x DDR4 SO-DIMM	2x DDR3 SO-DIMM	2x DDR3/L SO-DIMM	2x DDR3 SO-DIMM
Storage				
SATA2	4	4	6	2
mSATA	2 (shared w/ mPCIe) / 0	2 (shared w/ mPCIe) / 0	1 (shared w/ mPCIe)	1
CF Socket	-	-	-	-
Display Interface				
LVDS	1	1	1	1
eDP	-	1 (optional)	-	-
HDMI	-	-	1 (on rear)	1 (on rear)
DP	2 (on rear)	1 (on rear)	-	2 (on rear)
DVI-D	1 (on rear)	1 (on rear)	1 (on rear)	-
VGA	1	1 (on rear)	1 (on rear)	1
Multiple Display	Triple	Triple	Triple	Dual
Ethernet				
LAN	2 (on rear)	2 (on rear)	2 (on rear)	2 (on rear)
USB				
USB3.0	4 (on rear) / 6 (4x on rear)	2 (on rear) / 4 (2x on rear)	6 (4x on rear)	4 (on rear)
USB2.0	4 (2x on rear) / 6 (2x on rear)	6 (2x on rear) / 8 (2x on rear)	6	4
Serial Port				
RS-232/422/485	3 (2x on rear)	2 (1x on rear)	2 (on rear)	2
RS-232	3	4	4	-
Other I/Os				
8-bit DIO	1 (by header)	1 (by header)	1 (by header)	1 (by header)
Parallel Port	-	-	-	-
Expansion				
PCI	-	-	-	-
PCIex16	1	1	1	-
PCIex1	-	-	-	-
mPCIe	2 (shared w/ mSATA) / 2	2 (shared w/ mSATA) / 2	2 (1x shared w/ mSATA)	2
SIM Card Cage	1 (by wafer)	1 (by wafer)	1 (by wafer)	1 (by wafer)
Power				
Input Voltage	24-pin & 4-pin ATX	24-pin & 4-pin ATX	DC 9V ~ 24V	DC 9V ~ 24.5V
Mechanical				
Dimension (L x W)	Mini-ITX (170 x 170 mm)	Mini-ITX (170 x 170 mm)	Mini-ITX (170 x 170 mm)	Mini-ITX (170 x 170 mm)
Environmental				
Operating Temp.	0°C ~ 60°C / -20°C ~ 70°C	0°C ~ 60°C / -20°C ~ 70°C	0°C ~ 60°C / -20°C ~ 70°C	0°C ~ 60°C



Mini-ITX MB Product Matrix (conti.)



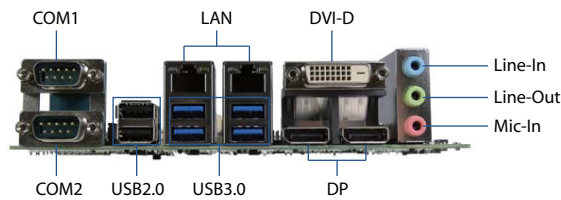
Series	KEMX-6000 Series	KEMX-1750 Series	KEMX-1702	KEMX-1600 Series
Model	KEMX-6000 / 600A	KEMX-1750 / 1751 / 1752 / 175A	KEMX-1702	KEMX-1600 / 1603 / 160A
System				
Processor	Intel® Sandy Bridge Core™ i	Intel® Celeron® J1900 / Atom™ E3845/25	Intel® Atom™ E3825	Intel® Atom™ D2550
Core Number	2 / 4	4 / 2	2	2
Cache	3M ~ 8M	2M / 1M	1M	1M
Frequency	2.00 ~ 3.70 GHz	upto 2.42 / upto 1.91 / 1.33 GHz	1.33 GHz	1.86 GHz
Socket	FCPGA988	FCBGA1170	FCBGA1170	FCBGA559
TDP	35W ~ 55W	10W / 6W	6W	10W
Chipset	Intel® QM67	-	-	Intel® NM10
Graphics	Intel® HD Graphics 3000	Intel® HD Graphics	Intel® HD Graphics	Intel® GMA 3650
Memory	2x DDR3 SO-DIMM	2x / 1x DDR3L SO-DIMM	1x DDR3L SO-DIMM	1x DDR3 SO-DIMM
Storage				
SATA2	5	1	1	2
mSATA	-	1	1	-
CF Socket	1	-	-	-
Display Interface				
LVDS	2	1	1	2
eDP	-	-	-	-
HDMI	1 (on rear)	1 (on rear)	1 (on rear)	1 (on rear)
DP	-	-	-	-
DVI-D	1 (on rear)	-	-	-
VGA	1 (on rear)	1	1	1 (on rear)
Multiple Display	Dual	Dual	Dual	Dual
Ethernet				
LAN	2 (on rear)	2 (on rear)	2 (on rear)	2 (on rear)
USB				
USB3.0	2 (on rear)	1 (on rear)	1 (on rear)	-
USB2.0	8 (2x on rear)	5 (4x on rear)	5 (4x on rear)	7 (4x on rear)
Serial Port				
RS-232/422/485	2 (on rear)	2 (on rear)	2 (on rear)	1 (on rear)
RS-232	4	4	4	9 (2x on rear) / 5 (2x on rear)
Other I/Os				
8-bit DIO	1 (by header)	1 (by header)	-	1 (by header)
Parallel Port	-	1 (by header)	1 (by header)	1 (by header)
Expansion				
PCI	-	-	-	1
PCIex16	1	-	-	-
PCIex1	-	1	-	-
mPCIe	2	1	2	1
SIM Card Cage	1 (by wafer)	1	1	1 (by wafer)
Power				
Input Voltage	24-pin & 4-pin ATX	DC 12V ~ 24V	DC 12V ~ 24V / DC 12V	DC 12V ~ 24V / DC 12V
Mechanical				
Dimension (L x W)	Mini-ITX (170 x 170 mm)	Mini-ITX (170 x 170 mm)	Mini-ITX (170 x 170 mm)	Mini-ITX (170 x 170 mm)
Environmental				
Operating Temp.	0°C ~ 60°C / -20°C ~ 70°C	0°C ~ 60°C / -20°C ~ 70°C	0°C ~ 60°C	0°C ~ 60°C / -20°C ~ 70°C

MITX-SLS0 Series



Standard / Extended Temperature Industrial Motherboard in Mini-ITX Form Factor with 6th Generation Intel® Core™ i Processor

- FCLGA1151 Socket 6th Generation Intel® Core™ i Processor
- Intel® H110 / Q170 Express Chipset
- 2x DDR4 1866/2133 SO-DIMM up to 32GB
- 2x SATA, 2x/0x mSATA for Storage
- 1x LVDS / 1x VGA, 1x DVI-D, 2x DP for display output
- 2x GbE, 1x PCIe16, 2x mPCIe, 1x SIM for network connection and expansion
- 4x/6x USB3.0, 4x/6x USB2.0, 6x COM, 1x 8-bit DIO for peripheral connection
- TPM & iAMT support
- Extended temperature model support: -20°C ~ 70°C



CPU Support	FCLGA1151 Socket 6th Generation Intel® Core™ i Processor (Dual / Quad Core, 3M ~ 8M Cache, 2.20 ~ 4.20 GHz, 35W ~ 91W TDP)
Chipset	MITX-SLS0: Intel® H110 MITX-SLS1/T: Intel® Q170
Memory	2x DDR4 1866/2133 SO-DIMM up to 32GB
Storage	4x SATA 2x mSATA (shared w/ mPCIe, MITX-SLS1/T only)
Graphic Controller	Intel® HD Graphics 530 / 510
Display Interfaces	1x LVDS (24-bit, 2-ch, 1920 x 1200 @ 60Hz) 1x VGA (by header, 1920 x 1200 @ 60Hz) 1x DVI-D (on rear, 2560 x 1600 @ 60Hz) 2x DP (on rear, 4096 x 2304 @ 60Hz) Triple Display (LVDS and VGA are alternative each other)
Audio Chipset	Realtek ALC662
Audio Interfaces	1x Line-in (on rear) 2x Line-out (1x on rear, 1x by header) 2x Mic-in (1x on rear, 1x by header) 1x S/PDIF (by header)
Ethernet	2x LAN (RJ-45 on rear, 1x Intel® I219-LM, 1x Intel® I210-AT)
USB	4x USB3.0 (Type A on rear, MITX-SLS0) 6x USB3.0 (4x Type A on rear, 2x by header, MITX-SLS1/T) 4x USB2.0 (2x Type A on rear, 2x by header, MITX-SLS0) 6x USB2.0 (2x Type A on rear, 4x by header, MITX-SLS1/T)
Serial Ports	3x RS-232/422/485 (2x DB9 on rear, 1x by header) 3x RS-232 (by header)

Other I/O Ports	1x PS/2 Keyboard/Mouse (by wafer) 1x 8-bit DIO (by wafer)
Expansion	1x PCIe16 2x mPCIe (MITX-SLS0) 2x mPCIe (shared w/ mSATA, MITX-SLS1/T) 1x SIM Card Cage (by wafer)
Power Supply	2x12-pin ATX connector (DC +5V / -5V / +12V / -12V / +3.3V / 5VSB) 2x2-pin ATX connector (DC 12V)
Firmware	BIOS: AMI uEFI BIOS w/ 128Mb SPI Flash Watchdog: Programmable WDT to generate system reset event H/W Monitor: Input & Core Voltages, CPU & System Temperatures Real Time Clock: Chipset integrated RTC TPM: for MITX-SLS1/T (Infineon SLB 9660 TPM 1.2) iAMT: for MITX-SLS1/T
System Control & Monitoring	1x Header for Reset button, HDD LED & External Speaker 1x Header for Power button, Power LED & SM bus 1x Header for LAN LED 1x Header for Port-80 Display
Cooling	2x Smart Fan (by wafer)
OS Support	Windows, Linux
Dimensions (L x W)	Mini-ITX (170 x 170 mm / 6.70" x 6.70")
Environmental Characteristics	Operation Temp.: 0°C ~ 60°C / 32°F ~ 140°F (Standard) -20°C ~ 70°C / -4°F ~ 158°F (Extended) Storage Temp.: -20°C ~ 80°C / -4°F ~ 176°F (Standard) -40°C ~ 85°C / -40°F ~ 185°F (Extended) Humidity: 0% ~ 95%
Certification	CE, FCC Class A

Ordering Information

Model Name	Part No.	Description
MITX-SLS0	BMTXSLS0-000000T	Mini-ITX MB, 6th Gen. Intel® Core™ i, Intel® H110, 2x DDR4 SO-DIMM, 1x LVDS / 1x VGA, 1x DVI-D, 2x DP, 2x LAN, 4x USB3.0, 4x USB2.0, 6x COM, 4x SATA, 2x mPCIe, 1x PCIe16, w/o TPM, w/o iAMT, Op. temp.: 0°C ~ 60°C
MITX-SLS1	BMTXSLS0-010000T	Mini-ITX MB, 6th Gen. Intel® Core™ i, Intel® Q170, 2x DDR4 SO-DIMM, 1x LVDS / 1x VGA, 1x DVI-D, 2x DP, 2x LAN, 6x USB3.0, 6x USB2.0, 6x COM, 4x SATA, 2x mPCIe/mSATA, 1x PCIe16, w/ TPM, w/ iAMT, Op. temp.: 0°C ~ 60°C
MITX-SLS1T	BMTXSLS1T-010000T	Mini-ITX MB, 6th Gen. Intel® Core™ i, Intel® Q170, 2x DDR4 SO-DIMM, 1x LVDS / 1x VGA, 1x DVI-D, 2x DP, 2x LAN, 6x USB3.0, 6x USB2.0, 6x COM, 4x SATA, 2x mPCIe/mSATA, 1x PCIe16, w/ TPM, w/ iAMT, Op. temp.: -20°C ~ 70°C

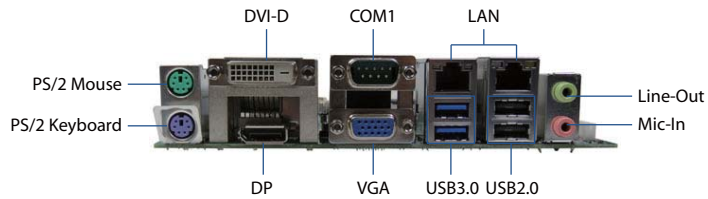


KEMX-8200 Series



Standard / Extended Temperature Industrial Motherboard in Mini-ITX Form Factor w/ Intel® Haswell Processor + H81/Q87 Chipset

- FCLGA1150 Socket Intel® Haswell Core™ i / Celeron® Processor
- Intel® H81 / Q87 Express Chipset
- 2x DDR3 1333/1600 SO-DIMM up to 32GB
- 4x SATA, 2x mSATA for storage
- 1x LVDS, 1x VGA, 1x DVI-D, 1x DP, 1x eDP (optional) for display output
- 2x LAN, 1x PCIe16, 2x mPCIe, 1x SIM for network connection and expansion
- 2x/4x USB3.0, 6x/8x USB2.0, 6x COM, 1x 8-bit DIO for peripheral connection
- Extended temperature model available: -20°C ~ 70°C



CPU Support	FCLGA1150 Socket 4th Generation Intel® Core™ i / Celeron® Processor (Dual / Quad Core, 2M ~ 8M Cache, 1.90 ~ 4.00 GHz, 35W ~ 84W TDP)
Chipset	KEMX-8200: Intel® H81 KEMX-8201/T: Intel® Q87
Memory	2x DDR3 1333/1600 SO-DIMM up to 32GB
Storage	4x SATA 2x mSATA (shared w/ mPCIe, KEMX-8201/T)
Graphic Controller	Intel® HD Graphics 4600 (Core™ i) Intel® HD Graphics (Celeron®)
Display Interfaces	1x LVDS (24-bit, 2-ch, 1920 x 1200 @ 60Hz) 1x VGA (on rear, 1920 x 1200 @ 60Hz) 1x DVI-D (on rear, 1920 x 1200 @ 60Hz) 1x DP (on rear, 2560 x 1600 @ 60Hz) 1x eDP (optional, 2560 x 1600 @ 60Hz) Triple Display
Audio Chipset	Realtek ALC662
Audio Interfaces	1x Speaker-out (3W) 1x Line-out (on rear) 1x Mic-in (on rear)
Ethernet	2x LAN (RJ-45 on rear, 1x Intel® I217-LM, 1x Intel® I210-AT)
USB	2x USB3.0 (Type A on rear, KEMX-8200) 4x USB3.0 (2x Type A on rear, 2x by header, KEMX-8201/T) 6x USB2.0 (2x Type A on rear, 4x by header, KEMX-8200) 8x USB2.0 (2x Type A on rear, 6x by header, KEMX-8201/T)
Serial Ports	2x RS-232/422/485 (1x DB9 on rear, 1x by header) 4x RS-232 (by header)

Other I/O Ports	1x PS/2 Keyboard (Mini-DIN on rear) 1x PS/2 Mouse (Mini-DIN on rear) 1x 8-bit DIO (by wafer)
Expansion	1x PCIe16 2x mPCIe (KEMX-8200) 2x mPCIe (shared w/ mSATA, KEMX-8201/T) 1x SIM Card Cage (by wafer)
Power Supply	2x12-pin ATX connector (DC +5V / -5V / +12V / -12V / +3.3V / 5VSB) 2x2-pin ATX connector (DC 12V)
Firmware	BIOS: AMI uEFI BIOS w/ 128Mb SPI Flash Watchdog: Programmable WDT to generate system reset event H/W Monitor: Input & Core Voltages, CPU & System Temperatures Real Time Clock: Chipset integrated RTC TPM: for KEMX-8201/T (Infineon SLB 9635 TPM 1.2) iAMT: depending on processor
System Control & Monitoring	1x Header for Reset button, HDD LED & External Speaker 1x Header for Power button, Power LED & SM bus
Cooling	2x Smart Fan (by wafer)
OS Support	Windows, Linux
Dimensions (L x W)	Mini-ITX (170 x 170 mm / 6.70" x 6.70")
Environmental Characteristics	Operation Temp.: 0°C ~ 60°C / 32°F ~ 140°F (Standard) -20°C ~ 70°C / -4°F ~ 158°F (Extended) Storage Temp.: -20°C ~ 80°C / -4°F ~ 176°F (Standard) -40°C ~ 85°C / -40°F ~ 185°F (Extended) Humidity: 0% ~ 95%
Certification	CE, FCC Class A

Ordering Information

Model Name	Part No.	Description
KEMX-8200	BMMX8200-001000T	Mini-ITX MB, FCLGA1150 Socket Intel® Haswell Processor, Intel® H81 Chipset, 1x LVDS, 1x DVI-D, 1x DP, 1x VGA, 2x LAN, 2x USB3.0, 6x USB2.0, 6x COM, 1x 8-bit DIO, 1x PCIe16, 2x mPCIe, w/o TPM, Op. temp.: 0°C ~ 60°C
KEMX-8201	BMMX8200-011000T	Mini-ITX MB, FCLGA1150 Socket Intel® Haswell Processor, Intel® Q87 Chipset, 1x LVDS, 1x DVI-D, 1x DP, 1x VGA, 2x LAN, 4x USB3.0, 8x USB2.0, 6x COM, 1x 8-bit DIO, 1x PCIe16, 2x mPCIe / mSATA, w/ TPM, Op. temp.: 0°C ~ 60°C
KEMX-8201T	BMMX820T-011000T	Mini-ITX MB, FCLGA1150 Socket Intel® Haswell Processor, Intel® Q87 Chipset, 1x LVDS, 1x DVI-D, 1x DP, 1x VGA, 2x LAN, 4x USB3.0, 8x USB2.0, 6x COM, 1x 8-bit DIO, 1x PCIe16, 2x mPCIe / mSATA, w/ TPM, Op. temp.: -20°C ~ 70°C

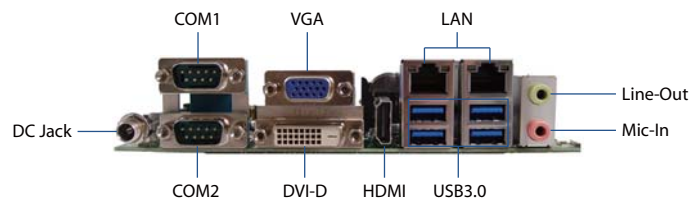


KEMX-8000 Series



Standard / Extended Temperature Industrial Motherboard in Mini-ITX Form Factor w/ Intel® Haswell Processor + HM87/QM87 Chipset

- FCPGA946 Socket Intel® Haswell Core™ i / Celeron® Processor
- Intel® HM87 / QM87 Express Chipset
- 2x DDR3/L 1333/1600 SO-DIMM up to 32GB
- 6x SATA, 1x mSATA for storage
- 1x LVDS, 1x VGA, 1x DVI-D, 1x HDMI for display output
- 2x LAN, 1x PCIe16, 2x mPCIe, 1x SIM for network connection and expansion
- 6x USB3.0, 6x USB2.0, 6x COM, 1x 8-bit DIO for peripheral connection
- Extended temperature model available: -20°C ~ 70°C



CPU Support	Socket G3 (FCPGA946) 4th Gen. Intel® Core™ i / Celeron® Processor (Dual / Quad Core, 2M ~ 8M Cache, 2.00 ~ 3.90 GHz, 37W ~ 57W TDP)
Chipset	KEMX-8000: Intel® HM87 KEMX-8001/800A: Intel® QM87
Memory	2x DDR3/L 1333/1600 SO-DIMM up to 32GB
Storage	6x SATA 1x mSATA (shared w/ mPCIe)
Graphic Controller	Intel® HD Graphics 4600 / 4400 (Core™ i) Intel® HD Graphics (Celeron®)
Display Interfaces	1x LVDS (18/24-bit, 1/2/4-ch, 1920 x 1200 @ 60Hz) 1x HDMI (on rear, 2560 x 1600 @ 60Hz) 1x DVI-D (on rear, 1920 x 1200 @ 60Hz) 1x VGA (on rear, 1920 x 1200 @ 60Hz) Triple Display
Audio Chipset	Realtek ALC662
Audio Interfaces	2x Speaker-out (3W) 1x Line-out (on rear) 1x Mic-in (on rear)
Ethernet	2x LAN (RJ-45 on rear, 1x Intel® I217-LM, 1x Intel® I210-AT)
USB	6x USB3.0 (4x Type A on rear, 2x by header) 6x USB2.0 (by header)
Serial Ports	2x RS-232/422/485 (DB9 on rear) 4x RS-232 (by header)

Other I/O Ports	1x 8-bit DIO (by header)
Expansion	1x PCIe16 2x mPCIe (1x shared w/ mSATA) 1x SIM Card Cage (by wafer)
Power Supply	Connector: DC Jack (on rear), 2x2-pin ATX Connector Input Voltage: DC 9V ~ 24V
Firmware	BIOS: AMI uEFI BIOS w/ 128Mb SPI Flash Watchdog: Programmable WDT to generate system reset event H/W Monitor: Voltages, Temperatures Real Time Clock: Chipset integrated RTC iAMT: depending on processor
System Control & Monitoring	1x Header for Reset button, HDD LED & External Speaker 1x Header for Power button, Power LED & SM bus 1x Header for mPCIe activity LED
Cooling	2x Smart Fan (by wafer)
OS Support	Windows, Linux
Dimensions (L x W)	Mini-ITX (170 x 170 mm / 6.70" x 6.70")
Environmental Characteristics	Operation Temp.: 0°C ~ 60°C / 32°F ~ 140°F (Standard) -20°C ~ 70°C / -4°F ~ 158°F (Extended) Storage Temp.: -20°C ~ 80°C / -4°F ~ 176°F (Standard) -40°C ~ 85°C / -40°F ~ 185°F (Extended) Humidity: 0% ~ 95%
Certification	CE, FCC Class A

Ordering Information

Model Name	Part No.	Description
KEMX-8000	BMMX8000-001000T	Mini-ITX MB, FCPGA946 Socket Intel® Haswell Processor, Intel® HM87 Chipset , 1x LVDS, 1x HDMI, 1x DVI-D, 1x VGA, 2x LAN, 6x USB3.0, 6x USB2.0, 6x COM, 1x 8-bit DIO, 1x PCIe16, 2x mPCIe, Op. temp.: 0°C ~ 60°C
KEMX-8001	BMMX8000-011000T	Mini-ITX MB, FCPGA946 Socket Intel® Haswell Processor, Intel® QM87 Chipset , 1x LVDS, 1x HDMI, 1x DVI-D, 1x VGA, 2x LAN, 6x USB3.0, 6x USB2.0, 6x COM, 1x 8-bit DIO, 1x PCIe16, 2x mPCIe, Op. temp.: 0°C ~ 60°C
KEMX-800A	BMMX800A-011000T	Mini-ITX MB, FCPGA946 Socket Intel® Haswell Processor, Intel® QM87 Chipset , 1x LVDS, 1x HDMI, 1x DVI-D, 1x VGA, 2x LAN, 6x USB3.0, 6x USB2.0, 6x COM, 1x 8-bit DIO, 1x PCIe16, 2x mPCIe, Op. temp.: -20°C ~ 70°C

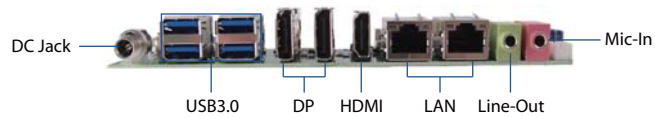


KEMX-7000



Industrial Motherboard in Mini-ITX Form Factor w/ Intel® Ivy Bridge Celeron® 1047UE CPU + HM76 Chipset

- Intel® Ivy Bridge Processor, Celeron® 1047UE
- Intel® HM76 Express Chipset
- 2x DDR3 1333/1600 SO-DIMM up to 16GB
- 2x SATA, 1x mSATA for storage
- 1x LVDS, 2x DP, 1x HDMI, 1x VGA for display output
- 2x LAN, 2x mPCIe, 1x SIM Card Cage for network connection and expansion
- 4x USB3.0, 4x USB2.0, 2x COM, 1x 8-bit DIO for peripheral connection



CPU Support	
Intel® Celeron® 1047UE Processor (Dual Core, 2M Cache, 1.40 GHz, FCBGA1023, 17W TDP)	
Chipset	
Intel® HM76	
Memory	
2x DDR3 1333/1600 SO-DIMM up to 16GB	
Storage	
2x SATA 1x mSATA	
Graphic Controller	
Intel® HD Graphics	
Display Interfaces	
1x LVDS (24-bit, 2-ch, 1920 x 1200 @ 60Hz) 2x DP (on rear, 2560 x 1600 @ 60Hz) 1x HDMI (on rear, 1920 x 1200 @ 60Hz) 1x VGA (by header, 1920 x 1200 @ 60Hz) Dual Display	
Audio Chipset	
Realtek ALC662	
Audio Interfaces	
2x Speaker-out (2W) 1x Line-out (on rear) 1x Mic-in (on rear) 1x Line-in (by header) 1x S/PDIF (by header)	
Ethernet	
2x LAN (RJ-45 on rear, 1x Intel® 82579, 1x Realtek RTL8111E)	
USB	
4x USB3.0 (Type A on rear) 4x USB2.0 (by header)	

Serial Ports	
2x RS-232/422/485 (by header)	
Other I/O Ports	
1x PS/2 Keyboard / Mouse (by header) 1x 8-bit DIO (by wafer)	
Expansion	
2x mPCIe 1x SIM Card Cage (by wafer)	
Power Supply	
Connector: DC Jack (on rear), 2x2-pin ATX Connector Input Voltage: DC 9V ~ 24.5V	
Firmware	
BIOS: AMI uEFI BIOS w/ 64Mb SPI Flash Watchdog: Programmable WDT to generate system reset event H/W Monitor: Voltages, Temperatures Real Time Clock: Chipset integrated RTC TPM: optional (Infineon SLB 9635 TPM 1.2)	
System Control & Monitoring	
1x Header for Reset button, HDD LED & External Speaker 1x Header for Power button, Power LED & SM bus	
Cooling	
2x Smart Fan (by wafer)	
OS Support	
Windows, Linux	
Dimensions (L x W)	
Mini-ITX (170 x 170 mm / 6.70" x 6.70")	
Environmental Characteristics	
Operation Temp.: 0°C ~ 60°C / 32°F ~ 140°F Storage Temp.: -20°C ~ 80°C / -4°F ~ 176°F Humidity: 0% ~ 95%	
Certification	
CE, FCC Class A	

Ordering Information

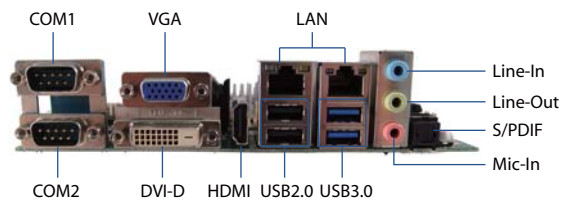
Model Name	Part No.	Description
KEMX-7000	BMMX7000-000000T	Mini-ITX MB, Intel® Celeron® 1047UE Processor, Intel® HM76 Chipset, 2x SATA, 1x mSATA, 1x LVDS, 2x DP, 1x HDMI, 1x VGA, 2x LAN, 4x USB3.0, 4x USB2.0, 2x COM, 1x 8-bit DIO, 2x mPCIe, 1x SIM

KEMX-6000 Series



Standard / Extended Temperature Industrial Motherboard in Mini-ITX Form Factor w/ Intel® Sandy Bridge Core™ i Processor + QM67 Chipset

- FCPGA988 Socket Intel® Sandy Bridge Core™ i Processor
- Intel® QM67 Express Chipset
- 2x DDR3 1066/1333 SO-DIMM up to 16GB
- 5x SATA, 1x CF Socket for storage
- 2x LVDS, 1x HDMI, 1x DVI-D, 1x VGA for display output
- 2x LAN, 1x PCIe16, 2x mPCIe, 1x SIM for network connection and expansion
- 2x USB3.0, 8x USB2.0, 6x COM, 1x 8-bit DIO for peripheral connection
- Extended temperature model available: -20°C ~ 70°C



CPU Support	
Socket G2 (FCPGA988) 2th Gen. Intel® Core™ i Processor (Dual / Quad Core, 3M ~ 8M Cache, 2.00 ~ 3.70 GHz, 35W ~ 55W TDP)	
Chipset	
Intel® QM67	
Memory	
2x DDR3 1066/1333 SO-DIMM up to 16GB	
Storage	
5x SATA 1x CF Socket (on bottom)	
Graphic Controller	
Intel® HD Graphics 3000	
Display Interfaces	
2x LVDS (24-bit, 2-ch, 1920 x 1200 @ 60Hz) 1x HDMI (on rear, 2560 x 1600 @ 60Hz) 1x DVI-D (on rear, 1920 x 1200 @ 60Hz) 1x VGA (on rear, 1920 x 1200 @ 60Hz) Dual Display	
Audio Chipset	
Realtek ALC888	
Audio Interfaces	
2x Speaker-out (2W) 1x Line-in (on rear) 2x Line-out (1x on rear, 1x by header) 2x Mic-in (1x on rear, 1x by header) 1x S/PDIF (on rear)	
Ethernet	
2x LAN (RJ-45 on rear, 1x Intel® 82579, 1x Intel® 82574)	
USB	
2x USB3.0 (Type A on rear) 8x USB2.0 (2x Type A on rear, 6x by header)	
Serial Ports	
2x RS-232/422/485 (DB9 on rear) 4x RS-232 (by header, 2x w/ power selection)	

Other I/O Ports	
1x PS/2 Keyboard / Mouse (by header) 1x 8-bit DIO (by header) 1x IrDA (by header)	
Expansion	
1x PCIe16 2x mPCIe 1x SIM Card Cage (by wafer)	
Power Supply	
2x12-pin ATX connector (DC +5V / -5V / +12V / -12V / +3.3V / 5VSB) 2x2-pin ATX connector (DC 12V)	
Firmware	
BIOS: AMI PnP Flash BIOS Watchdog: 1-255 step H/W Monitor: Voltages, Temperatures, Fan Speed TPM: Yes (Infineon SLB 9635 TPM 1.2) iAMT: iAMT 7.0 supported depending on processor	
System Control & Monitoring	
1x Header for Reset button, HDD LED & External Speaker 1x Header for Power button, Power LED, Keyboard Lock & SM bus 1x Header for mPCIe activity LED	
Cooling	
2x Smart Fan (by wafer)	
OS Support	
Windows, Linux	
Dimensions (L x W)	
Mini-ITX (170 x 170 mm / 6.70" x 6.70")	
Environmental Characteristics	
Operation Temp.: 0°C ~ 60°C / 32°F ~ 140°F (Standard) -20°C ~ 70°C / -4°F ~ 158°F (Extended) Storage Temp.: -20°C ~ 80°C / -4°F ~ 176°F (Standard) -40°C ~ 85°C / -40°F ~ 185°F (Extended) Humidity: 0% ~ 95%	
Certification	
CE, FCC Class A	

Ordering Information

Model Name	Part No.	Description
KEMX-6000	BMMX6000-001002T	Mini-ITX MB, FCPGA988 Socket Intel® Sandy Bridge Core™ i Processor, Intel® QM67 Chipset, 2x LVDS, 1x HDMI, 1x DVI-D, 1x VGA, 2x LAN, 2x USB3.0, 8x USB2.0, 6x COM, 1x 8-bit DIO, 1x PCIe16, 2x mPCIe, Op. temp.: 0°C ~ 60°C
KEMX-600A	BMMX600A-001002T	Mini-ITX MB, FCPGA988 Socket Intel® Sandy Bridge Core™ i Processor, Intel® QM67 Chipset, 2x LVDS, 1x HDMI, 1x DVI-D, 1x VGA, 2x LAN, 2x USB3.0, 8x USB2.0, 6x COM, 1x 8-bit DIO, 1x PCIe16, 2x mPCIe, Op. temp.: -20°C ~ 70°C

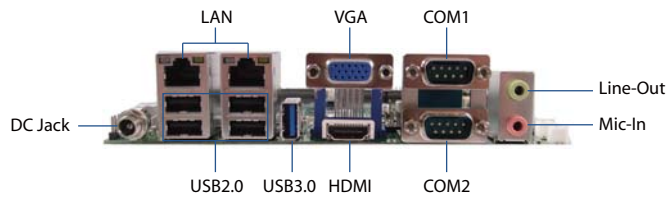


KEMX-1750 Series



Standard / Extended Temperature Industrial Motherboard in Mini-ITX Form Factor with Intel® Bay Trail SoC Processor

- Intel® Bay Trail Processor, Celeron® J1900 / Atom™ E3845 / E3825
- 2x/1x DDR3L 1333 SO-DIMM up to 8GB / 4GB
- 1x SATA, 1x mSATA for storage
- 1x LVDS, 1x HDMI, 1x VGA for display output
- 2x LAN, 1x PCIe1, 1x mPCIe, 1x SIM for network connection and expansion
- 1x USB3.0, 5x USB2.0, 6x COM, 1x 8-bit DIO for peripheral connection
- Extended temperature model available: -20°C ~ 70°C



CPU Support	
KEMX-1750: Intel® Celeron® J1900 SoC Processor (Quad Core, 2M Cache, up to 2.42 GHz, FCBGA1170, 10W TDP)	
KEMX-1751/175A: Intel® Atom™ E3845 SoC Processor (Quad Core, 2M Cache, up to 1.91 GHz, FCBGA1170, 10W TDP)	
KEMX-1752: Intel® Atom™ E3825 SoC Processor (Dual Core, 1M Cache, 1.33 GHz, FCBGA1170, 6W TDP)	
Memory	
2x DDR3L 1333 SO-DIMM up to 8GB (KEMX-1750/1751/175A)	
1x DDR3L 1333 SO-DIMM up to 4GB (KEMX-1752)	
Storage	
1x SATA	
1x mSATA	
Graphic Controller	
Intel® HD Graphics	
Display Interfaces	
1x LVDS (24-bit, 2-ch, 1920 x 1200 @ 60Hz)	
1x HDMI (on rear, 1920 x 1080 @ 60Hz)	
1x VGA (by header, 2560 x 1600 @ 60Hz)	
Dual Display	
Audio Chipset	
Realtek ALC662	
Audio Interfaces	
2x Speaker-out (3W)	
1x Line-out (on rear)	
1x Mic-in (on rear)	
Ethernet	
2x LAN (RJ-45 on rear, Realtek RTL8111G)	
USB	
1x USB3.0 (Type A on rear)	
5x USB2.0 (4x Type A on rear, 1x by header)	
Serial Ports	
2x RS-232/422/485 (DB9 on rear, w/ power selection)	
4x RS-232 (by header, w/ power selection)	

Other I/O Ports	
1x PS/2 Keyboard / Mouse (by header)	
1x 8-bit DIO (by wafer)	
1x Parallel Port (by header)	
Expansion	
1x PCIe1	
1x mPCIe	
1x SIM Card Cage	
Power Supply	
Connector: DC Jack (on rear), 2x2-pin ATX Connector	
Input Voltage: DC 12V ~ 24V	
Firmware	
BIOS: AMI uEFI BIOS w/ 64Mb SPI Flash	
Watchdog: Programmable WDT to generate system reset event	
H/W Monitor: Voltages, Temperatures	
Real Time Clock: SoC integrated RTC	
TPM: optional (Infineon SLB 9635 TPM 1.2)	
System Control & Monitoring	
1x Header for Reset button, HDD LED & External Speaker	
1x Header for Power button, Power LED, Keyboard Lock & SM bus	
1x Header for mPCIe activity LED	
Cooling	
2x Smart Fan (by wafer)	
OS Support	
Windows, Linux	
Dimensions (L x W)	
Mini-ITX (170 x 170 mm / 6.70" x 6.70")	
Environmental Characteristics	
Operation Temp.: 0°C ~ 60°C / 32°F ~ 140°F (Standard)	
-20°C ~ 70°C / -4°F ~ 158°F (Extended)	
Storage Temp.: -20°C ~ 80°C / -4°F ~ 176°F (Standard)	
-40°C ~ 85°C / -40°F ~ 185°F (Extended)	
Humidity: 0% ~ 95%	
Certification	
CE, FCC Class A	

Ordering Information

Model Name	Part No.	Description
KEMX-1750	BMMX1750-001000T	Mini-ITX MB, Intel® Celeron® J1900 Processor, 2x DDR3L SO-DIMM, 1x SATA, 1x mSATA, 1x LVDS, 1x HDMI, 1x VGA, 2x LAN, 1x USB3.0, 5x USB2.0, 6x COM, 1x 8-bit DIO, 1x PCIe1, 1x mPCIe, 1x SIM, Op. temp.: 0°C ~ 60°C
KEMX-1751	BMMX1750-011000T	Mini-ITX MB, Intel® Atom™ E3845 Processor, 2x DDR3L SO-DIMM, 1x SATA, 1x mSATA, 1x LVDS, 1x HDMI, 1x VGA, 2x LAN, 1x USB3.0, 5x USB2.0, 6x COM, 1x 8-bit DIO, 1x PCIe1, 1x mPCIe, 1x SIM, Op. temp.: 0°C ~ 60°C
KEMX-1752	BMMX1750-021000T	Mini-ITX MB, Intel® Atom™ E3825 Processor, 1x DDR3L SO-DIMM, 1x SATA, 1x mSATA, 1x LVDS, 1x HDMI, 1x VGA, 2x LAN, 1x USB3.0, 5x USB2.0, 6x COM, 1x 8-bit DIO, 1x PCIe1, 1x mPCIe, 1x SIM, Op. temp.: 0°C ~ 60°C
KEMX-175A	BMMX175A-011000T	Mini-ITX MB, Intel® Atom™ E3845 Processor, 2x DDR3L SO-DIMM, 1x SATA, 1x mSATA, 1x LVDS, 1x HDMI, 1x VGA, 2x LAN, 1x USB3.0, 5x USB2.0, 6x COM, 1x 8-bit DIO, 1x PCIe1, 1x mPCIe, 1x SIM, Op. temp.: -20°C ~ 70°C

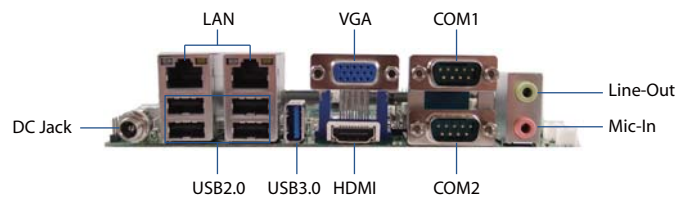


KEMX-1702



Industrial Motherboard in Mini-ITX Form Factor with Intel® Bay Trail SoC Processor

- Intel® Bay Trail Processor, Atom™ E3825
- 1x DDR3L 1333 SO-DIMM up to 4GB
- 1x SATA, 1x mSATA for storage
- 1x LVDS, 1x HDMI, 1x VGA for display output
- 2x LAN, 2x mPCIe, 1x SIM Card Cage for network connection and expansion
- 1x USB3.0, 5x USB2.0, 6x COM for peripheral connection



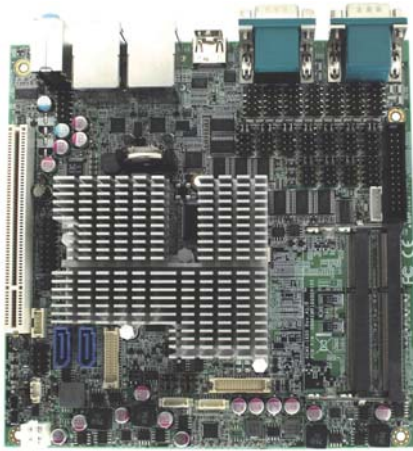
CPU Support	
Intel® Atom™ E3825 SoC Processor (Dual Core, 1M Cache, 1.33 GHz, FCBGA1170, 6W TDP)	
Memory	
1x DDR3L 1333 SO-DIMM up to 4GB	
Storage	
1x SATA 1x mSATA	
Graphic Controller	
Intel® HD Graphics	
Display Interfaces	
1x LVDS (24-bit, 2-ch, 1920 x 1200 @ 60Hz) 1x HDMI (on rear, 1920 x 1080 @ 60Hz) 1x VGA (by header, 2560 x 1600 @ 60Hz) Dual Display	
Audio Chipset	
Realtek ALC662	
Audio Interfaces	
2x Speaker-out (3W) 1x Line-out (on rear) 1x Mic-in (on rear)	
Ethernet	
2x LAN (RJ-45 on rear, Realtek RTL8111G)	
USB	
1x USB3.0 (Type A on rear) 5x USB2.0 (4x Type A on rear, 1x by header)	
Serial Ports	
2x RS-232/422/485 (DB9 on rear, w/ power selection) 4x RS-232 (by header, w/ power selection)	

Other I/O Ports	
1x PS/2 Keyboard / Mouse (by header) 1x Parallel Port (by header)	
Expansion	
2x mPCIe 1x SIM Card Cage	
Power Supply	
Connector: DC Jack (on rear), 2x2-pin ATX Connector Input Voltage: DC 12V ~ 24V (DC Jack), DC 12V (ATX Connector)	
Firmware	
BIOS: AMI uEFI BIOS w/ 64Mb SPI Flash Watchdog: Programmable WDT to generate system reset event H/W Monitor: Voltages, Temperatures Real Time Clock: SoC integrated RTC TPM: optional (Infineon SLB 9635 TPM 1.2)	
System Control & Monitoring	
1x Header for Reset button, HDD LED & External Speaker 1x Header for Power button, Power LED, Keyboard Lock & SM bus 1x Header for mPCIe activity LED	
Cooling	
2x Smart Fan (by wafer)	
OS Support	
Windows, Linux	
Dimensions (L x W)	
Mini-ITX (170 x 170 mm / 6.70" x 6.70")	
Environmental Characteristics	
Operation Temp.: 0°C ~ 60°C / 32°F ~ 140°F Storage Temp.: -20°C ~ 80°C / -4°F ~ 176°F Humidity: 0% ~ 95%	
Certification	
CE, FCC Class A	

Ordering Information

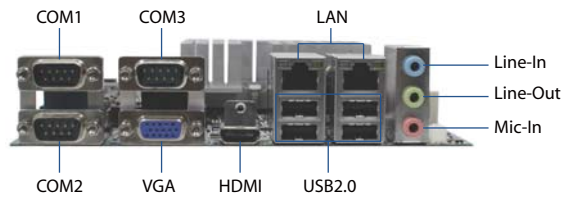
Model Name	Part No.	Description
KEMX-1702	BMMX1700-020000T	Mini-ITX MB, Intel® Atom™ E3825 Processor, 1x DDR3L SO-DIMM, 1x SATA, 1x mSATA, 1x LVDS, 1x HDMI, 1x VGA, 2x LAN, 1x USB3.0, 5x USB2.0, 6x COM, 2x mPCIe, 1x SIM

KEMX-1600 Series



Standard / Extended Temperature Industrial Motherboard in Mini-ITX Form Factor with Intel® Cedarview Atom™ D2550 CPU + NM10 Chipset

- Intel® Cedarview Processor, Atom™ D2550
- Intel® NM10 Express Chipset
- 1x DDR3L 800/1066 SO-DIMM up to 4GB
- 2x SATA for storage
- 2x LVDS, 1x HDMI, 1x VGA for display output
- 2x LAN, 1x PCI, 1x mPCIe, 1x SIM for network connection and expansion
- 7x USB2.0, 10x/6x COM, 1x 8-bit DIO for peripheral connection
- Extended temperature model available: -20°C ~ 70°C



CPU Support	
Intel® Atom™ D2550 Processor (Dual Core, 1M Cache, 1.86 GHz, FCBGA559, 10W TDP)	
Chipset	
Intel® NM10 Express Chipset	
Memory	
1x DDR3 800/1066 SO-DIMM Socket up to 4GB	
Storage	
2x SATA	
Graphic Controller	
Intel® Graphics Media Accelerator 3650	
Display Interfaces	
1x LVDS (18/24-bit, 1-ch, 1920 x 1200 @ 60Hz) 1x LVDS (18/24-bit, 2-ch, 1920 x 1200 @ 60Hz) 1x HDMI (on rear, 1920 x 1200 @ 60Hz) 1x VGA (on rear, 1920 x 1200 @ 60Hz) Dual Display	
Audio Chipset	
Realtek ALC662-VC	
Audio Interfaces	
2x Speaker-out (2W) 1x Line-in (on rear) 2x Line-out (1x on rear, 1x by header) 2x Mic-in (1x on rear, 1x by header) 1x S/PDIF (by header)	
Ethernet	
2x LAN (RJ-45 on rear, Realtek RTL8111E)	
USB	
7x USB2.0 (4x Type A on rear, 3x by header)	
Serial Ports	
1x RS-232/422/485 (DB9 on rear, w/ power selection) 9x RS-232 (2x DB9 on rear, 7x by header, w/ power selection, KEMX-1600) 5x RS-232 (2x DB9 on rear, 3x by header, w/ power selection, KEMX-1603)	

Other I/O Ports	
1x PS/2 Keyboard / Mouse (by header) 1x 8-bit DIO (by header) 1x Parallel Port (by header)	
Expansion	
1x PCI 1x mPCIe 1x SIM Card Cage (by wafer)	
Power Supply	
Connector: 2x2-pin ATX Connector Input Voltage: DC 12V ~ 24V (KEMX-1600) DC 12V (KEMX-1603)	
Firmware	
BIOS: AMI uEFI BIOS w/ 16Mb SPI Flash Watchdog: Super I/O integrated WDT, max. 65535 sec./min. selectable H/W Monitor: Voltages, Temperatures Real Time Clock: Chipset integrated RTC	
System Control & Monitoring	
1x Header for Reset button, HDD LED & External Speaker 1x Header for Power button, Power LED, Keyboard Lock & SM bus	
Cooling	
1x Smart Fan (by wafer)	
OS Support	
Windows 7	
Dimensions (L x W)	
Mini-ITX (170 x 170 mm / 6.70" x 6.70")	
Environmental Characteristics	
Operation Temp.: 0°C ~ 60°C / 32°F ~ 140°F (Standard) -20°C ~ 70°C / -4°F ~ 158°F (Extended) Storage Temp.: -20°C ~ 80°C / -4°F ~ 176°F (Standard) -40°C ~ 85°C / -40°F ~ 185°F (Extended) Humidity: 0% ~ 95%	
Certification	
CE, FCC Class A	

Ordering Information

Model Name	Part No.	Description
KEMX-1600	BMMX1600-001004T	Mini-ITX MB, Intel® Atom™ D2550 Processor, Intel® NM10 Chipset, 1x DDR3 SO-DIMM, 2x SATA, 2x LVDS, 1x HDMI, 1x VGA, 2x LAN, 7x USB2.0, 10x COM, 1x 8-bit DIO, 1x PCI, 1x mPCIe, DC 12V ~ 24V input, Op. temp.: 0°C ~ 60°C
KEMX-1603	BMMX1600-031004T	Mini-ITX MB, Intel® Atom™ D2550 Processor, Intel® NM10 Chipset, 1x DDR3 SO-DIMM, 2x SATA, 2x LVDS, 1x HDMI, 1x VGA, 2x LAN, 7x USB2.0, 6x COM, 1x 8-bit DIO, 1x PCI, 1x mPCIe, DC 12V input, Op. temp.: 0°C ~ 60°C
KEMX-160A	BMMX160A-031004T	Mini-ITX MB, Intel® Atom™ D2550 Processor, Intel® NM10 Chipset, 1x DDR3 SO-DIMM, 2x SATA, 2x LVDS, 1x HDMI, 1x VGA, 2x LAN, 7x USB2.0, 6x COM, 1x 8-bit DIO, 1x PCI, 1x mPCIe, DC 12V input, Op. temp.: -20°C ~ 70°C





ATX Industrial Motherboard Product Matrix



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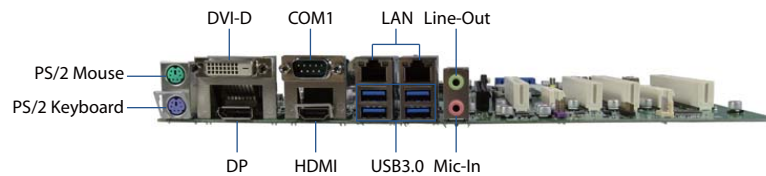
Series	KEMB-8100 Series	KEMB-8000 Series
Model	KEMB-8100/8101/8101T	KEMB-8000/8001/8001T
System		
Processor	6th Generation Intel® Core™ i Processor	4th Generation Intel® Core™ i Processor
Core Number	2 / 4	2 / 4
Cache	3M ~ 8M	2M ~ 8M
Frequency	2.20 GHz / 4.20 GHz	1.90 GHz / 4.00 GHz
Socket	FCLGA1151	FCLGA1150
TDP	35W ~ 91W	35W ~ 84W
Chipset	Intel® H110 / Q170	Intel® H81 / Q87
Graphics	Intel® HD Graphics 530 / 510	Intel® HD Graphics 4600
Memory	4x DDR4 1866/2133 UDIMM up to 64GB	2x/4x DDR3 1333/1600 SO-DIMM up to 16GB/64GB
Storage		
SATA2	4	4
mSATA	2 (shared w/ mPCIe) / 0	2 (shared w/ mPCIe) / 0
Display Interface		
HDMI	1	-
DP	1	1
DVI-D	1	1
VGA	1	1
Multiple Display	Triple	Triple
Ethernet		
LAN	2	2
USB		
USB3.0	4 / 6	2 / 4
USB2.0	4 / 6	6 / 8
Serial Port		
RS-232/422/485	2	2
RS-232	4	4
Other I/Os		
16-bit GPIO	1	1
Expansion		
PCI	4	4
PCIex16	1	1
PCIex4 / x2 / x1	2 / 0	-
PCIex1	2 / 0	2
mPCIe	1 / 2 (shared w/ mSATA)	1 / 2 (shared w/ mSATA)
SIM Card Cage	1	1
Power		
Input Voltage	24-pin & 4-pin ATX	24-pin & 4-pin ATX
Mechanical		
Dimension (L x W)	ATX (304.8 x 244 mm / 12" x 9.6")	ATX (304.8 x 244 mm / 12" x 9.6")
Environmental		
Operating Temp.	0°C ~ 60°C (Standard) / -20°C ~ 70°C (Extended)	0°C ~ 60°C (Standard) / -20°C ~ 70°C (Extended)

KEMB-8100 Series



Standard / Extended Temperature Industrial Motherboard in ATX Form Factor w/ 6th Gen. Intel® Core™ i Processor + H110/Q170 Chipset

- FCLGA1151 Socket 6th Generation Intel® Core™ i Processor
- Intel® H110 / Q170 Express Chipset
- 2x DDR4 1866/2133 UDIMM up to 64GB
- 2x SATA, 2x/0x mSATA for Storage
- 1x DVI-D, 1x DP, 1x HDMI, 1x VGA for display output
- 2x LAN, 1x/2x mPCIe, 1x SIM for network connection and expansion
- 4x PCI, 1x PCIe16, 2x PCIe1 or 2x PCIe4/PCIe3/PCIe1 for expansion
- 4x/6x USB3.0, 4x/6x USB2.0, 6x COM, 1x 16-bit DIO for peripheral connection
- Extended temperature model support: -20°C ~ 70°C



CPU Support	
FCLGA1151 Socket 6th Generation Intel® Core™ i Processor (Dual / Quad Core, 3M ~ 8M Cache, 2.20 ~ 4.20 GHz, 35W ~ 91W TDP)	
Chipset	
KEMB-8100: Intel® H110 KEMB-8101/T: Intel® Q170	
Memory	
4x DDR4 1866/2133 UDIMM up to 64GB	
Storage	
4x SATA 2x mSATA (shared w/ mPCIe, KEMB-8101/T only)	
Graphic Controller	
Intel® HD Graphics 530 / 510	
Display Interfaces	
1x DVI-D (on rear, 1920 x 1200 @ 60Hz) 1x DP (on rear, 4096 x 2304 @ 60Hz) 1x HDMI (on rear, 4096 x 2160 @ 24Hz) 1x VGA (by header, 1920 x 1200 @ 60Hz) Triple Display	
Audio Chipset	
Realtek ALC662	
Audio Interfaces	
2x Line-out (1x on rear, 1x by header) 2x Mic-in (1x on rear, 1x by header)	
Ethernet	
2x LAN (RJ-45 on rear, 1x Intel® I219-LM, 1x Intel® I210-AT)	
USB	
4x USB3.0 (Type A on rear, KEMB-8100) 6x USB3.0 (4x Type A on rear, 2x by header, KEMB-8101/T) 4x USB2.0 (by header, KEMB-8100) 6x USB2.0 (by header, KEMB-8101/T)	
Serial Ports	
2x RS-232/422/485 (1x DB9 on rear, 1x by header, w/ power selection) 4x RS-232 (by header, 2x w/ power selection)	
Other I/O Ports	
1x PS/2 Keyboard (Mini-DIN on rear) 1x PS/2 Mouse (Mini-DIN on rear) 1x 16-bit DIO (by header)	

Expansion	
4x PCI (32-bit/33MHz) 1x PCIe16 2x PCIe1 (KEMB-8100) 2x PCIe4 / PCIe2 / PCIe1 (KEMB-8101/T) 1x mPCIe (KEMB-8100) 2x mPCIe (shared w/ mSATA, KEMB-8101/T) 1x SIM Card Cage	
Power Supply	
2x12-pin ATX connector (DC +5V / -5V / +12V / -12V / +3.3V / 5VSB) 2x4-pin ATX connector (DC 12V)	
Firmware	
BIOS: AMI uEFI BIOS w/ 128Mb SPI Flash Watchdog: Programmable WDT to generate system reset event H/W Monitor: Input & Core Voltages, CPU & System Temperatures Real Time Clock: Chipset integrated RTC TPM: for KEMB-8101/T (Infineon SLB 9660 TPM 1.2) iAMT: depending on CPU	
System Control & Monitoring	
1x Header for Reset button, HDD LED & External Speaker 1x Header for Power button, Power LED & SM bus	
Cooling	
3x Smart Fan (by wafer)	
OS Support	
Windows, Linux	
Dimensions (L x W)	
ATX (304.8 x 244 mm / 12" x 9.6")	
Environmental Characteristics	
Operation Temp.: 0°C ~ 60°C / 32°F ~ 140°F (Standard) -20°C ~ 70°C / -4°F ~ 158°F (Extended) Storage Temp.: -20°C ~ 80°C / -4°F ~ 176°F (Standard) -40°C ~ 85°C / -40°F ~ 185°F (Extended) Humidity: 0% ~ 95%	
Certification	
CE, FCC Class A	

Ordering Information

Model Name	Part No.	Description
KEMB-8100	BMMB8100-00000T	ATX MB, 6th Gen. Intel® Core™ i, Intel® H110, 1x DVI-D, 1x DP, 1x HDMI, 1x VGA, 2x LAN, 4x USB3.0, 4x USB2.0, 6x COM, 4x SATA, 1x mPCIe, 4x PCI, 1x PCIe16, 2x PCIe1, w/o TPM, Op. temp.: 0°C ~ 60°C
KEMB-8101	BMMB8100-01000T	ATX MB, 6th Gen. Intel® Core™ i, Intel® Q170, 1x DVI-D, 1x DP, 1x HDMI, 1x VGA, 2x LAN, 6x USB3.0, 6x USB2.0, 6x COM, 4x SATA, 2x mPCIe/mSATA, 4x PCI, 1x PCIe16, 2x PCIe4/PCIe2/PCIe1, w/ TPM, Op. temp.: 0°C ~ 60°C
KEMB-8101T	BMMB810T-01000T	ATX MB, 6th Gen. Intel® Core™ i, Intel® Q170, 1x DVI-D, 1x DP, 1x HDMI, 1x VGA, 2x LAN, 6x USB3.0, 6x USB2.0, 6x COM, 4x SATA, 2x mPCIe/mSATA, 4x PCI, 1x PCIe16, 2x PCIe4/PCIe2/PCIe1, w/ TPM, Op. temp.: -20°C ~ 70°C

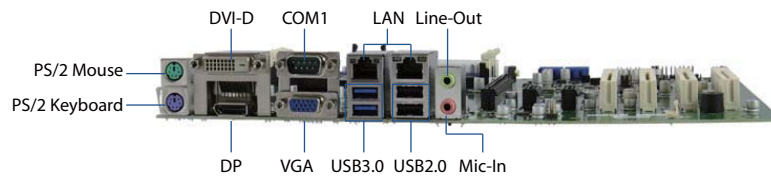


KEMB-8000 Series



Standard / Extended Temperature Industrial Motherboard in ATX Form Factor with 4th Gen. Intel® Core™ i Processor + H81/Q87 Chipset

- FCLGA1150 Socket 4th Generation Intel® Core™ i Processor
- Intel® H81 / Q87 Express Chipset
- 2x/4x DDR3 1333/1600 DIMM up to 16GB/32GB
- 4x SATA, 2x/0x mSATA for Storage
- 1x DVI-D, 1x DP, 1x VGA for display output
- 2x LAN, 1x/2x mPCIe, 1x SIM for network connection and expansion
- 4x PCI, 1x PCIe16, 2x PCIe1 for expansion
- 2x/4x USB3.0, 6x/8x USB2.0, 6x COM, 1x 16-bit DIO for peripheral connection
- Extended temperature model support: -20°C ~ 70°C



CPU Support	FCLGA1150 Socket 4th Generation Intel® Core™ i Processor (Dual / Quad Core, 2M ~ 8M Cache, 1.90 ~ 4.00 GHz, 35W ~ 84W TDP)
Chipset	KEMB-8000: Intel® H81 KEMB-8001/T: Intel® Q87
Memory	2x DDR3 1333/1600 DIMM up to 16GB (KEMB-8000) 4x DDR3 1333/1600 DIMM up to 32GB (KEMB-8001/T)
Storage	4x SATA 2x mSATA (shared w/ mPCIe, KEMB-8001/T only)
Graphic Controller	Intel® HD Graphics 4600
Display Interfaces	1x DVI-D (on rear, 1920 x 1200 @ 60Hz) 1x DP (on rear, 2560 x 1600 @ 60Hz) 1x VGA (on rear, 1920 x 1200 @ 60Hz) Triple Display
Audio Chipset	Realtek ALC662
Audio Interfaces	2x Line-out (1x on rear, 1x by header) 2x Mic-in (1x on rear, 1x by header)
Ethernet	2x LAN (RJ-45 on rear, 1x Intel® I217-LM, 1x Intel® I210-AT)
USB	2x USB3.0 (Type A on rear, KEMB-8000) 4x USB3.0 (2x Type A on rear, 2x by header, KEMB-8001/T) 6x USB2.0 (2x Type A on rear, 4x by header, KEMB-8000) 8x USB2.0 (2x Type A on rear, 6x by header, KEMB-8001/T)
Serial Ports	2x RS-232/422/485 (1x DB9 on rear, 1x by header, w/ power selection) 4x RS-232 (by header, 2x w/ power selection)
Other I/O Ports	1x PS/2 Keyboard (Mini-DIN on rear) 1x PS/2 Mouse (Mini-DIN on rear) 1x 16-bit DIO (by header)

Expansion	4x PCI (32-bit/33MHz) 1x PCIe16 2x PCIe1 1x mPCIe (KEMB-8000) 2x mPCIe (shared w/ mSATA, KEMB-8001/T) 1x SIM Card Cage
Power Supply	2x12-pin ATX connector (DC +5V / -5V / +12V / -12V / +3.3V / 5VSB) 2x2-pin ATX connector (DC 12V)
Firmware	BIOS: AMI uEFI BIOS w/ 128Mb SPI Flash Watchdog: Programmable WDT to generate system reset event H/W Monitor: Input & Core Voltages, CPU & System Temperatures Real Time Clock: Chipset integrated RTC TPM: for KEMB-8001/T (Infineon SLB 9635 TPM 1.2) iAMT: depending on CPU
System Control & Monitoring	1x Header for Reset button, HDD LED & External Speaker 1x Header for Power button, Power LED & SM bus
Cooling	3x Smart Fan (by wafer)
OS Support	Windows, Linux
Dimensions (L x W)	ATX (304.8 x 244 mm / 12" x 9.6")
Environmental Characteristics	Operation Temp.: 0°C ~ 60°C / 32°F ~ 140°F (Standard) -20°C ~ 70°C / -4°F ~ 158°F (Extended) Storage Temp.: -20°C ~ 80°C / -4°F ~ 176°F (Standard) -40°C ~ 85°C / -40°F ~ 185°F (Extended) Humidity: 0% ~ 95%
Certification	CE, FCC Class A

Ordering Information

Model Name	Part No.	Description
KEMB-8000	BMMB8000-00000T	ATX MB, 4th Gen. Intel® Core™ i, Intel® H81, 2x DDR3 DIMM, 1x DVI-D, 1x DP, 1x VGA, 2x LAN, 2x USB3.0, 6x USB2.0, 6x COM, 4x SATA, 1x mPCIe, 4x PCI, 1x PCIe16, 2x PCIe1, w/o TPM, Op. temp.: 0°C ~ 60°C
KEMB-8001	BMMB8000-01000T	ATX MB, 4th Gen. Intel® Core™ i, Intel® Q87, 4x DDR3 DIMM, 1x DVI-D, 1x DP, 1x HDMI, 1x VGA, 2x LAN, 4x USB3.0, 8x USB2.0, 6x COM, 4x SATA, 2x mPCIe/mSATA, 4x PCI, 1x PCIe16, 2x PCIe1, w/ TPM, Op. temp.: 0°C ~ 60°C
KEMB-8001T	BMMB800T-01000T	ATX MB, 4th Gen. Intel® Core™ i, Intel® Q87, 4x DDR3 DIMM, 1x DVI-D, 1x DP, 1x HDMI, 1x VGA, 2x LAN, 4x USB3.0, 8x USB2.0, 6x COM, 4x SATA, 2x mPCIe/mSATA, 4x PCI, 1x PCIe16, 2x PCIe1, w/ TPM, Op. temp.: -20°C ~ 70°C

MEMO



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