ADLINK
Leading **EDGE COMPUTING**

Leading Computer-on-Modules
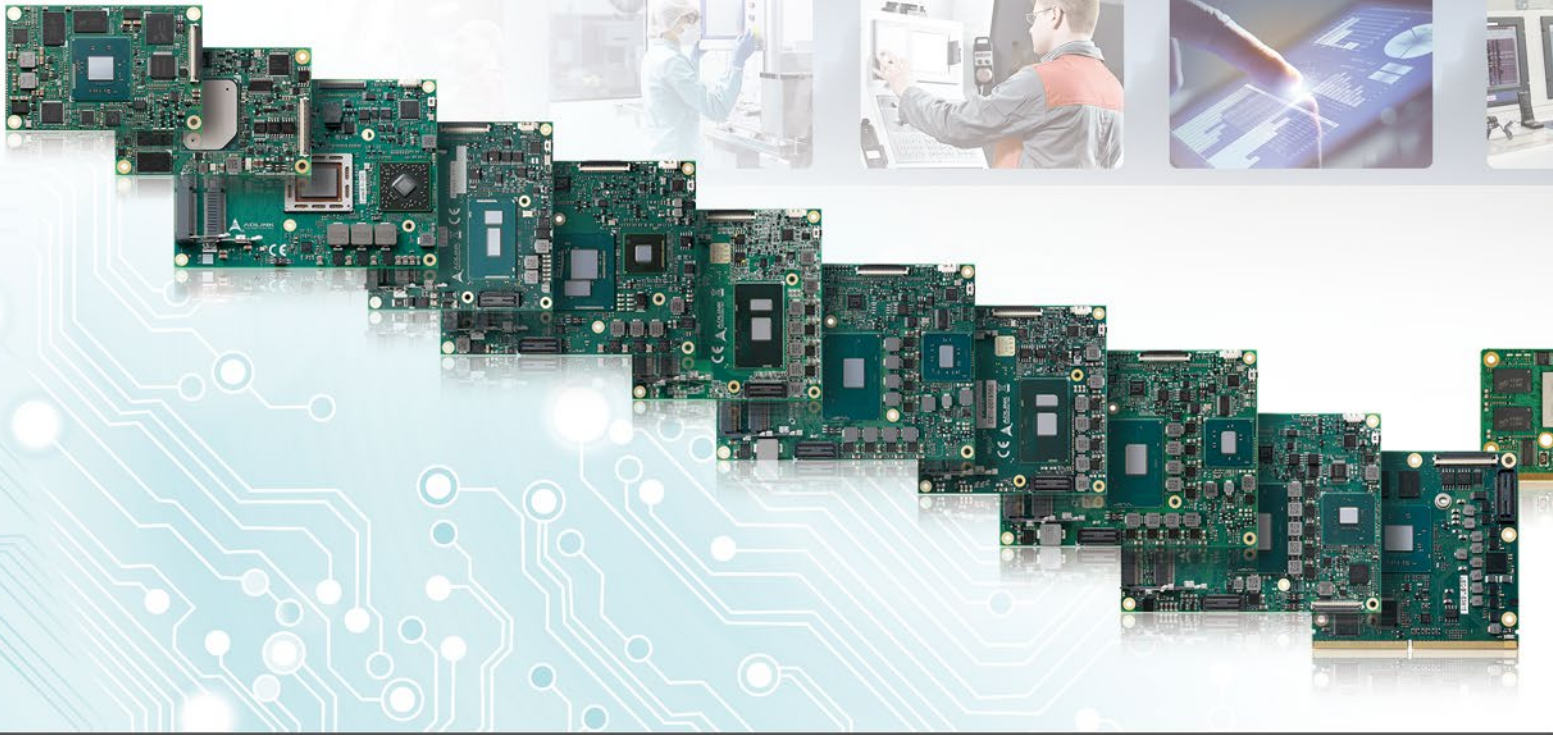
Most Robust, Best Support

COM Express®
SMARC®
Qseven®
ETX®

COM Express

The COM Express® standard (PICMG COM.0) is based on serial interfaces including PCI Express, SATA, USB, LVDS/eDP and DDI, allowing designers to utilize the latest technologies for future applications. ADLINK has heavily invested in the development and maintenance of the PICMG® COM Express specification since its creation.

ADLINK was chair of the PICMG subcommittee that was tasked with defining the COM Express COM.0 Revision 3.0 specification update. This revision includes the Type 7 definition that brings server class platform capabilities to COM Express modules and upgrades the Type 6, 10 definitions to align with recent market trends, such as IEEE 1588 support.

Leading in Quality

- Most robust and rugged design
- Compliance with MIL-STD
- Mandatory HALT testing

Leading in Production and Logistics

- Dual factory (Shanghai/Taipei) supply line security
- Operations and factory in close proximity (Shanghai)
- Logistics, operations and quality support centers in all major regions (Europe, US, Japan, China)

Leading in Product Longevity

- Exclusive use of embedded long life parts
- 7 to 10 years standard product life
- Fixed BOM offered to end users
- Early last buy announcement and production service after EOL

SMARC

ADLINK is a pioneer in the development of SMARC® modules. SMARC® is a versatile small form factor computer module definition targeting applications that require ultralow power, low cost and high performance. The SMARC specification, with its 314-pin board to board edge connector, is future proof by offering additional space for modern interfaces found on today's devices such as LVDS, PCIe, SATA, HDMI and DisplayPort.

QSEVEN

The Qseven® is a versatile small form factor computer-on-module standard targeting applications that require ultralow power, low cost and high performance.

ETX®

The ETX® computer-on-module specification includes the standard functions required for almost any application, such as graphics, Ethernet, audio, IDE, floppy, keyboard/mouse, parallel, serial and USB ports, and PCI and ISA system busses.

Leading in Product Innovation

- Leading embedded features
- Predictive maintenance
- Real-time optimization
- IoT API extensions to fog and the cloud

Leading in Support

- Global coverage, local expertise
- Local language technical support
- Pre-sales technical consultation
- Local carrier board design service
- Contract manufacturing
- Signal Integrity (SI) Lab available to customers for carrier board verification
- Software, firmware, BIOS adaptation
- Premier Intel® support access

Leading in Standardization

- PICMG
- SGET®
- PrismTech Vortex compatible

Leading Support

- Global coverage, local language and expertise
- Pre-sales technical consultancy
- Carrier board review support
- Local carrier board design service
- Pre/Post layout simulation service

- Signal Integrity (SI) Lab test service
- Power sequence verification testing
- Software, Coreboot, BIOS adaptation service
- Premier Intel® support access

ADLINK is an international company serving customers around the globe with branch offices and design centers in Asia, North America, and Europe.

At our headquarters in Taipei, ADLINK has its own state of the art Signal Integrity (SI) lab that has the capability to test all modern bus and interface signals inhouse. ADLINK extends this service specifically to its computer-on-module customers where SI quality verification is more challenging because of the board-to-board interconnects used with dual board solutions.

Extensive power sequence testing is another much needed qualification test before bringing your product to the market. Our lab setup will simulate any possible situation a product might experience when being operated by end users in the real world. When an issue is found in a product's power sequence, a simple remedy is a firmware update to adapt a module's power sequence to a specific carrier.

On the software side, ADLINK provides BSPs, BSP porting, embedded APIs & IoT abstraction, as well as customized BIOS and Coreboot support.


coreboot

Our success history and experience in industrial and embedded computing has allowed ADLINK to become a Premier Member of Intel® Internet of Things Solutions Alliance. Our close partnership with Intel allows us to deliver COM Express® products with the latest technologies and solutions for customers.

(intel) IoT Solutions Alliance Premier

Leading Quality

- Most robust and rugged design

- Full derating during initial design phase

- Mandatory HALT testing

- Compliance with MIL specifications

HASS - Highly Accelerated Stress Screen
HALT - Highly Accelerated Life Test

EXTREME RUGGED
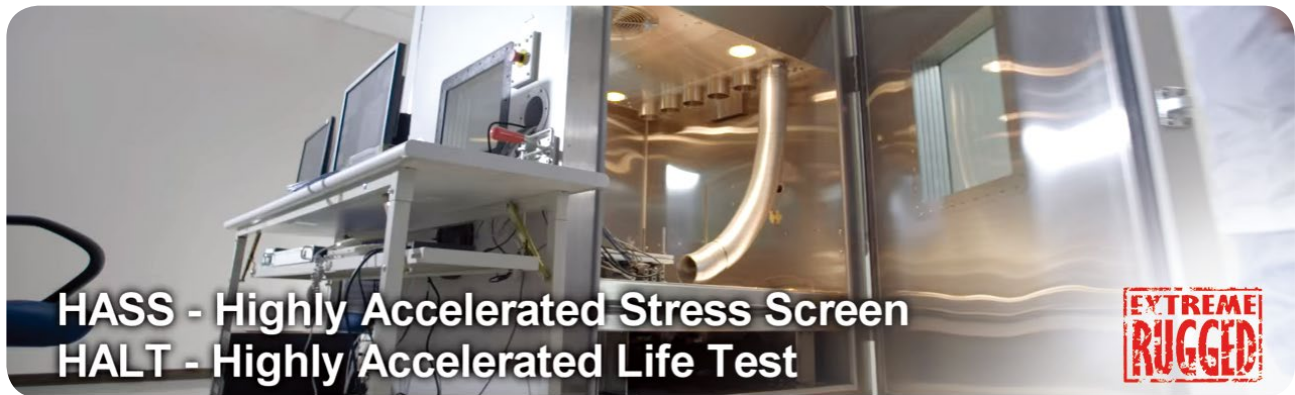
ADLINK's commitment to providing the highest quality products is evident in its design and verification approach. Products are built from the ground up to operate from -40 to +85 °C.

From full derating in initial design phase to mandatory HALT testing on prototypes, we ensure our products meet the robustness requirements of applications operating in the harshest environments and comply with relevant MIL specifications.

ADLINK has a long track record of being a trusted supplier of products that operate from -40 to +85 °C for more than 10 years for the following products: PC/104®, ETX®, COM Express®, SMARC® and Qseven®. Some of these products where previously sold and branded as "Ampro by ADLINK" and "LiPPERT by ADLINK".
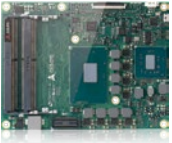
COM Express Type 6 Basic
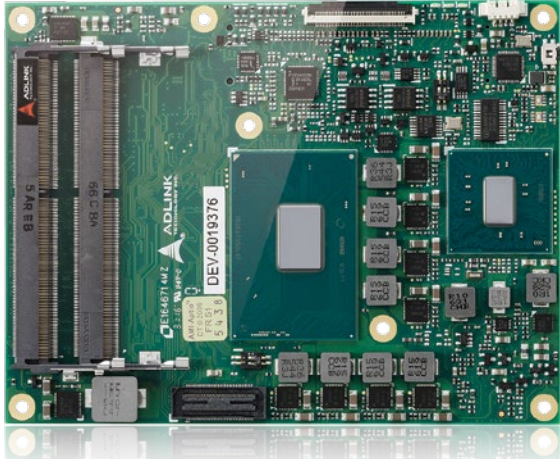
COM Express® Basic size Type 6 is the most popular and widely used computer-on-module form factor on the market. With pinouts closely matching the feature set of common x86 based silicon, two COM Express connectors allow for designs of up to 75 watts. The Type 6 pinout has a strong focus on multiple modern display outputs targeting applications such as medical, gaming, test and measurement and industrial automation.

Visual Oriented Applications

- 3 x DDI (Digital Display Interface) for HDMI/DisplayPort
- 1 x eDP (up to 4 lanes), or LVDS
- PCIe x16 Gen3 for external graphics
- 8x PCIe Gen3 for peripheral expansion to meet vertical requirements

- Up to 48GB DDR4 ECC or non-ECC memory
- SATA 6Gb/s, USB 3.0 and GbE
- Embedded design, EAPI/SEMA and backup BIOS to meet embedded requirements
- Extreme Rugged operating temperature range: -40°C to +85°C (selected low power SKUs)

4x USB 3.0 Upgrade	2x PCIe	DDI 1	DDI 2	DDI 3	16x PCIe	12V 5VSB
LPC/eSPI	GbE IEEE 1588	4x SATA	Audio	8x USB 2.0	6x PCIe / LVDS /eDP / CRT	

Product Name	Express-CF/CFE	Express-KL/KLE	Express-SL/SLE	Express-BL
Product Image	*Preliminary*	*New*		
CPU	8th Gen. Xeon®, Core™ i7 (6CPU Cores) Core™ i5/i3" (formerly"CoffeeLake-H")	7th Gen. Xeon® E3-1505M/E3-1505L Core™i7-7820EQ/i5-7440EQ/ i5-7442EQ/i3-7100E/7102E (formerly"KabyLake-H")	6th Gen. Xeon® E3-1515M (GT4e), E3-1505M/E3-1505L Core™ i7-6820EQ/6822EQ, i5-6440EQ/6442EQ i3-6100E/6102E, Celeron® G3900E/3902E	5th Gen. Xeon® E3-1278L(GT3e)/1258L Core™ i7-5850EQ(GT3e)/i7-5700EQ
Chipset	CM246 (ECC) QM370/HM370 (non-ECC)	CM238 (ECC) QM175/HM175 (non-ECC)	CM236 (ECC) QM170/HM170 (non-ECC)	QM87
Memory	48 GB DDR4 at 2400/2133 MHz (ECC for Express-CFE)	32 GB DDR4 at 2133/1867 MHz (ECC for Express-KLE)	32 GB DDR4 at 2133/1867 MHz (ECC for Express-SLE)	32 GB DDR3L at 1600/1333 MHz
BIOS Type	AMI Aptio V	AMI Aptio V	AMI Aptio V	AMI Aptio V
Graphics Outputs	LVDS (or eDP 1.4) 3x DDI (DP/HDMI) (or VGA)	LVDS (or eDP 1.4) 3x DDI (DP/HDMI)	LVDS (or eDP 1.3) 3x DDI (DP/HDMI)	LVDS (or eDP) 3x DDI (DP/HDMI) VGA
Graphics Features	DX 12, OpenGL 5.0 and ES 2.0, OpenCL 2.1 H.265(HEVC) 10-bit codec / VP9 10-bit decode	DX 12, OpenGL 4.4 and ES 2.0, OpenCL 2.1 H.265(HEVC) 10-bit codec / VP9 10-bit decode	DX 12, OpenGL 4.4 and ES 2.0, OpenCL 2.1 H.265(HEVC) & VP8 8-bit codec	DX 11.1, OpenGL 4.3
LAN	Intel® i219LM/V	Intel® i219LM/V	Intel® i219LM/V	Intel® i218LM
USB	4x USB 3.0, 4x USB 2.0	4x USB 3.0, 4x USB 2.0	4x USB 3.0, 4x USB 2.0	4x USB 3.0, 4x USB 2.0
Serial ATA	4x at 6Gb/s	4x at 6Gb/s	4x at 6Gb/s	4x at 6Gb/s
PCI Express	PCI Express x16 Gen3 (or 2x8 or 1x8 plus 2x4) 8x PCI Express x1 Gen3	PCI Express x16 Gen3 (or 2x8 or 1x8 plus 2x4) 8x PCI Express x1 Gen3	PCI Express x16 Gen3 (or 2x8 or 1x8 plus 2x4) 8x PCI Express x1 Gen3	PCI Express x16 Gen3 (or 2x8 or 1x8 plus 2x4) 7x PCI Express x1 Gen3
Audio	ALC886 (carrier board)	ALC886 (carrier board)	ALC886 (carrier board)	ALC886 (carrier board)
TPM (opt.)	Yes (TPM 2.0)	Yes (TPM 2.0)	Yes (TPM 1.2)	Yes (TPM 1.2)
Management Bus	I²C, SMBus	I²C, SMBus	I²C, SMBus	I²C, SMBus
Embedded Features	EAPI/SEMA, Backup BIOS, Debug/JTAG	EAPI/SEMA, Backup BIOS, Debug/JTAG	EAPI/SEMA, Backup BIOS, Debug/JTAG	EAPI/SEMA, Backup BIOS, Debug/JTAG
Power Supply	8.5-20 V / 5Vsb ±5% (ATX) 8.5-20V (AT)	8.5-20 V / 5Vsb ±5% (ATX) 8.5-20V (AT)	8.5-20 V / 5Vsb ±5% (ATX) 8.5-20V (AT)	8.5-20 V / 5Vsb ±5% (ATX) 8.5-20V (AT)
Operating Temperature	Standard: 0°C to +60°C	Standard: 0°C to +60°C Extreme Rugged: -40°C to +85°C (standard 12V input only)	Standard: 0°C to +60°C Extreme Rugged: -40°C to +85°C (standard 12V input only)	Standard: 0°C to +60°C Extreme Rugged: -40°C to +85°C (standard 12V input only)
OS Support	Windows 10 64-bit, Yocto Linux 64-bit, VxWork 64-bit	Windows 10 64-bit, Yocto Linux 64-bit, VxWork 64-bit	Windows 10/8.1 64-bit, Windows 7 32/64-bit, WES 7 32/64-bit, Yocto Linux 64-bit, VxWork 64-bit	Windows 8.1 64-bit, Windows 7 32/64-bit, WES 7 32/64-bit, Linux 64-bit, VxWork 64-bit
Form Factor & Compatibillity	PICMG COM.0 R3.0, Type 6 Basic size: 95 x 125 mm	PICMG COM.0 R2.1, Type 6 Basic size: 95 x 125 mm	PICMG COM.0 R2.1, Type 6 Basic size: 95 x 125 mm	PICMG COM.0 R2.1, Type 6 Basic size: 95 x 125 mm

Notes:
- TPM support by BOM option
- Optional -40°C to +85°C support: Standard product with 100% ETT screening available for selected CPU SKUs and std. 12V power supply only
- All specifications are subject to change without further notice.

COM Express Type 6 Compact
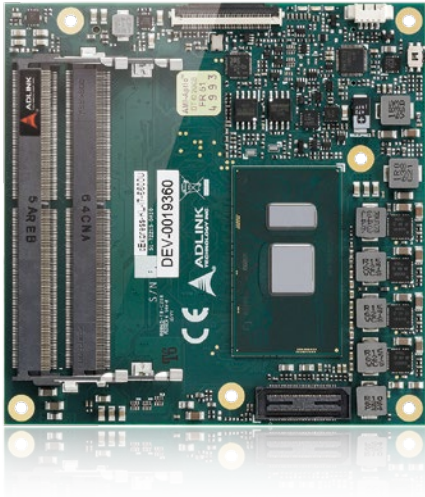
The COM Express® Compact Type 6 form factor is ideally suited to single chip x86 solutions (SoCs) with a power range between 5 to 20 watts. To reach these kind of low power envelopes peak performance and feature sets have been reduced compared to silicon used on the Basic size modules. Utilizing both Intel® Core™ and Atom® SoCs, Compact size modules are typically targeted at mid- and entry level applications such as transportation, robotics, edge servers, industrial control, and HMIs in the industrial and medical fields.

Mid and Entry Level Applications

- ULT Intel® Core™ i7/i5/i3, Atom®, Pentium®, Celeron® in the range of 5 to 20 watts

- Up to 2 DDI for HDMI/DisplayPort and eDP (up to 4 lanes), or LVDS, or VGA

- Maximum of 6x PCIe x1 Gen 3

- At least 2x SATA and full 8 port USB support

- Up to 48GB DDR4 ECC or non-ECC memory

- SATA 6Gb/s (Gen3), USB 3.0 and GbE

- AMI Aptio UEFI and Coreboot supported

- SEMA/EAPI Embedded library support

- Standard temperature versions supports wide voltage input from 5 to 20V

- Extreme Rugged versions support -40°C to +85°C

Starter Kit order process

1 Select a COM Express module, memory and thermal solution

2 Contact an ADLINK sales representative in your region

3 Get the specific part number for your starter kit

Product Name	cExpress-KL	cExpress-SL	cExpress-BL	cExpress-AL	cExpress-BW	cExpress-BT
Product Image						
SoC	7th Gen. Core™ i7-7600U/i5-7300U i3-7100U/ Celeron® 3965U (formerly"KabyLake-U")	6th Gen. Core™ i7-6600U/i5-6300U i3-6100U Celeron® 3955U	5th Gen. Core™ i7-5650U/i5-5350U i3-5010U/ Celeron® 3765U	Atom® E3950/E3940/ E3930 (eTEMP) Pentium® N4200 Celeron® N3350 (formerly"Apollo Lake")	Pentium® N3710/ Celeron® N3160/ N3060/N3010 Atom® x5-E8000	Atom® 3845/3827/3826/ 3825/3815/3805 Pentium® N2930 Celeron® N1900
Memory	32 GB DDR4 at 2133/1867 MHz	32 GB DDR4 at 2133/1867 MHz	32 GB DDR3L at 1600/1333 MHz	8 GB DDR3L at 1867/1600 MHz	8 GB DDR3L at 1600/1333 MHz	8 GB DDR3L at 1333/1066 MHz
BIOS Type	AMI Aptio V	AMI Aptio V	AMI Aptio V	AMI Aptio V	AMI Aptio V	AMI Aptio IV
Bootloader	-	-	-	Coreboot	Coreboot	Coreboot
Graphics Outputs	LVDS (or eDP 1.4) 2x DDI (DP/HDMI) (or VGA)	LVDS (or eDP 1.3) 2x DDI (DP/HDMI)	LVDS (or eDP) 2x DDI (DP/HDMI)	LVDS (or eDP 1.4) 2x DDI (DP/HDMI) (or VGA)	eDP (or LVDS) Up to 3x DDI (DP/HDMI)	2x DDI (DP/HDMI) (or LVDS) VGA
Graphics Features	DX 12, OpenGL 4.4 and ES 2.0, OpenCL 2.1 H.265(HEVC) 10-bit codec / VP9 10-bit decode	DX 12, OpenGL 4.4 and ES 2.0, OpenCL 2.1 H.265(HEVC) 8-bit codec / VP8 8-bit codec	DX 11.1, OpenGL 4.2/4.0	DX 12 OpenGL 4.3, ES 3.0, OpenCL 2.0 H.265(HEVC) 8-bit codec / VP9 8-bit decode	DX 11.1, OpenGL 4.2, ES 3.0, OpenCL 1.2	DX 11, OpenGL 3.2, ES 2.0, OpenCL 1.1
LAN	Intel® i219LM/V	Intel® i219LM/V	Intel® I218LM/V	Intel® i210/i211(IEEE 1588)	Intel® i210/i211	Intel® i210/i211
USB	4x USB 3.0, 4x USB 2.0	4x USB 3.0, 4x USB 2.0	2x USB 3.0, 6x USB 2.0	3x USB 3.0, 5x USB 2.0 (USB OTG at 0)	4x USB 3.0, 4x USB 2.0	1x USB 3.0, 6x USB 2.0
Serial ATA	3x at 6Gb/s	3x at 6Gb/s (i7/i5/i3) 2x at 6Gb/s (3955U)	4x at 6Gb/s	2x at 6Gb/s	2x at 6Gb/s	2x at 3Gb/s
PCI Express	5 PCIe x1 Gen3 (3965U for Gen2) (6 PCIe x1 w/o GbE, opt.)	5 PCIe x1 Gen3 (3955U for Gen2) (6 PCIe x1 w/o GbE, opt.)	4x PCIe x1 Gen2 (5 PCIe x1 w/o GbE, opt.)	4 PCIe x1 Gen2 (3 devices) (5 PCIe x1 with PCIe switch, opt.)	3 PCIe x1 Gen2 (5 PCIe x1 with PCIe switch, opt.)	3 PCIe x1 Gen2 (4 PCIe x1 w/o GbE, opt.)
eMMC (opt.)	-	-	-	8/16/32GB	-	8/16/32GB
SD	-	-	-	Yes	Yes	Yes (mini SD slot on module)
Audio	ALC886 (carrier board)	ALC886 (carrier board)	ALC886 (carrier board)	ALC886 (carrier board)	ALC886 (carrier board)	ALC886 (carrier board)
TPM (opt.)	Yes (TPM 2.0)	Yes (TPM 1.2)	Yes (TPM 1.2)	Yes (TPM 1.2)	Yes (TPM 1.2)	Yes (TPM 1.2)
Management Bus	I²C, SMBus	I²C, SMBus	I²C, SMBus	I²C, SMBus	I²C, SMBus	I²C, SMBus
Embedded Features	EAPI/SEMA, Backup BIOS, Debug/JTAG	EAPI/SEMA, Backup BIOS, Debug/JTAG	EAPI/SEMA, Backup BIOS, Debug/JTAG	EAPI/SEMA, Backup BIOS, Debug/JTAG	EAPI/SEMA, Backup BIOS, Debug/JTAG	EAPI/SEMA, Backup BIOS, Debug/JTAG
Power Supply	5-20 V / 5Vsb ±5% (ATX), 5-20V (AT)	5-20 V / 5Vsb ±5% (ATX), 5-20V (AT)	5-20 V / 5Vsb ±5% (ATX), 5-20V (AT)	4.75-20 V / 5Vsb ±5% (ATX), 4.75-20V (AT)	5-20 V / 5Vsb ±5% (ATX), 5-20V (AT)	5-20 V / 5Vsb ±5% (ATX), 5-20V (AT)
Operating Temperature	Standard: 0°C to +60°C Extreme Rugged: -40°C to +85°C (standard 12V input only)	Standard: 0°C to +60°C Extreme Rugged: -40°C to +85°C (standard 12V input only)	Standard: 0°C to +60°C Extreme Rugged: -40°C to +85°C (standard 12V input only)	Standard: 0°C to +60°C Extreme Rugged: -40°C to +85°C (standard 12V input only)	Standard: 0°C to +60°C	Standard: 0°C to +60°C Extreme Rugged: -40°C to +85°C (standard 12V input only)
OS support	Windows 10 64-bit, Yocto Linux 64-bit, VxWork 64-bit	Windows 10/8.1 64-bit, Windows 7 32/64-bit, WES 7 32/64-bit, Yocto Linux 64-bit, VxWork 64-bit	Windows 7/8.1, WES 7, WE8 Std, Linux , VxWorks (all support 32/64-bit)	Windows 10 64-bit, Yocto Linux 64-bit, VxWork 64-bit	Windows 10/8.1 64-bit, Windows 7 32/64-bit, WES 7 32/64-bit, Yocto Linux 64-bit, VxWorks 64-bit	Windows 7/8 64-bit, WES 7 32/64-bit, WES 8 Std. 32/64-bit, Yocto Linux 64-bit, VxWorks 32/64-bit QNX 32/64-bit
Form Factor & Compatibility	PICMG COM.0 R2.1, Type 6 Compact size: 95 x 95 mm	PICMG COM.0 R2.1, Type 6 Compact size: 95 x 95 mm	PICMG COM.0 R2.1, Type 6 Compact size: 95 x 95 mm	PICMG COM.0 R3.0, Type 6 Compact size: 95 x 95 mm	PICMG COM.0 R2.1, Type 6 Compact size: 95 x 95 mm	PICMG COM.0 R2.1, Type 6 Compact size: 95 x 95 mm

Notes:
- TPM, eMMC support by BOM option
- Optional -40°C to +85°C support: Standard product with 100% ETT screening available for selected CPU SKUs and std. 12V power supply only
- All specifications are subject to change without further notice.

COM Express Type 7 Basic

One of the most fundamental innovations of the COM Express® Type 7 pinout is the support of up to four 10GbE interfaces, essential for the next generation of edge node appliances. Type 7 modules are headless (no graphics), which is why they are also referred to as "Server Level COM Express". Since LAN PHY is are located on the carrier board, end users can choose between 10GbE Copper or Fiber solutions. Type 7 further supports up to 32 lanes of PCIe as well as NC-SI management interface. SoCs range from entry level Intel Atom® up to 16-core Xeon® processors that are available in extended operating temperature range of -40°C to +85°C

The range of applications for Type 7 modules is very broad : general purpose rugged embedded computer, mission critical server, SDN appliance, signal processing & data acquisition appliance, network test equipment, satellite gateway, in-flight entertainment system.

Server Level COM Express

- Processor (SoC) support from entry level Intel Atom® to high end up to 16-core Xeon® processors
- Processor power consumption in the range of 5 to 50 watts
- Maximum 4x 10GbE ports with optional Copper or Fiber PHYs on the carrier

- Up to 32 lanes of PCIe for high bandwidth downstream devices
- IEEE 1588 (clock sync.) for Industry 4.0
- SEMA/EAPI Embedded library supported
- Extreme Rugged versions support -40°C to +85°C
- Extended product long life supported

4x USB 3.0 Upgrade		2x PCIe	4x 10G-KR		16x PCIe			
LPC/ eSPI	GbE IEEE 1588	2x SATA	4x PCIe	4x USB 2.0	6x PCIe	4x PCIe	NC-SI	12V 5VSB

Product Name	Express-DN7	Express-BD7
Product Image	*Preliminary*	
SoC	Atom® C3808/C3708/C3508/C3308 (eTEMP) C3958/C3858/C3758/C3558/C3538/C3338 (formerly"Denverton-NS")	Xeon® D-1559/D-1539/D-1519 (eTEMP) D-1577/D-1548/D-1527 Pentium® D1508
Memory	48 GB DDR4 at 2400/2133 MHz (ECC / non-ECC)	32 GB DDR4 at 2400/2133 MHz (ECC / non-ECC)
BIOS Type	AMI Aptio V	AMI Aptio V
LAN	4x 10GBASE-KR (10G) Intel® i210/i211 (GbE) NC-SI	2x 10GBASE-KR (10G) Intel® i210/i211 (GbE) NC-SI
USB	2x USB 3.0, 2x USB 2.0	4x USB 3.0
Serial ATA	2x at 6Gb/s	2x at 6Gb/s
PCI Express	2x PCI Express x8 Gen3 (4 controllers), without GbE supported	PCI Express x16 Gen3 (or 2 x8 or 4 x4) PCI Express x8 Gen3 (2 controllers) PCI Express x8 Gen2 (2 controllers) w/o GbE
eMMC (opt.)	8/16/32GB	-
TPM (opt.)	Yes (TPM 2.0)	Yes (TPM 2.0)
Management Bus	I²C, SMBus	I²C, SMBus
Embedded Features	EAPI/SEMA, Backup BIOS, Debug/JTAG	EAPI/SEMA, Backup BIOS, Debug/JTAG
Power Supply	8.5-20 V / 5Vsb ±5% (ATX) 8.5-20V (AT)	8.5-20 V / 5Vsb ±5% (ATX) 8.5-20V (AT)
Operating Temperature	Standard: 0°C to +60°C Extreme Rugged: -40°C to +85°C (standard 12V input only)	Standard: 0°C to +60°C Extreme Rugged: -40°C to +85°C (standard 12V input only)
OS support	Windows Server 2016/2012 64-bit, Yocto Linux 64-bit, VxWorks 64-bit	Windows Server 2012 64-bit, Yocto Linux 64-bit, VxWorks 64-bit
Form Factor & Compatibility	PICMG COM.0 R3.0, Type 7 Basic size: 95 x 125 mm	PICMG COM.0 R3.0, Type 7 Basic size: 95 x 125 mm

The Type 7 Starter Kit Plus consists of a COM Express Type 7 module with ATX size Type 7 reference carrier board that offers one PCI Express x16 slot with proprietary pinout for a 10GbE adapter card that convert a 10GBASE-KR to 10GbE Optical Fiber or 10GbE Copper signal, one PCI Express x16 slot, two PCI Express x8 slots, Serial ATA, USB 3.0/2.0, GbE and Super I/O. In addition, an IPMI board management controller (miniBMC) located on the carrier board connects to the COM Express Type 7 module by NC-SI interface to support out-of-band management features. All necessary cables are included.

Notes:
- TPM, eMMC support by BOM option
- Optional -40°C to +85°C support: Standard product with 100% ETT screening available for selected CPU SKUs and std. 12V power supply only
- 10G, I/O and memory support dependent on SKUs for Express-DN7
- All specifications are subject to change without further notice.

COM Express Type 10 Mini

The COM Express® Type 10 Mini (84 x 55 mm, credit card size) module is intended for low power platforms (TDP 12W and below), capable of entry level processing with ultra-low power consumption, while supporting graphics and optimized I/O count for mobile applications. Type 10 modules are targeted at handheld devices (smart battery) for industrial, medical, transportation, and controllers for outdoor applications.

Best Mobility

- Soldered memory, soldered flash storage for space savings

- 12W and below (fanless) suitable for small handheld devices

- Wide range voltage input (4.75V-20V) for smart battery support

- 1x DDI (HDMI/DP), 1x eDP/LVDS, up to 4K, for human-machine interaction

- Optimized I/O for mobile applications (4 PCIe lanes, 2 USB 3.0, 6 USB 2.0), allows for wireless connection, touch screen support and feature expansion

- IEEE 1588 (clock sync.) for Industry 4.0

- USB OTG for mobile applications

The nanoX Starter Kit Plus consists of a COM Express® Type 10 core module and a reference carrier board that provides two PCIe Mini Card slots, 2 RJ-45 LAN ports, 2x USB 3.0, 2x USB 2.0, 1x USB client, 2x DB-9 COM, 1x SD card socket, and Mic/Line-in/Line-out. ADLINK also provides additional development tools including a verified 10.1" LVDS panel, smart battery, power supply, thermal solution and cabling accessories.

LPC/ eSPI	GbE IEEE 1588	2x SATA	Audio	2x USB 3.0 Upgrade	8x USB 2.0	4x PCIe	DDI 0	LVDS /eSP	12V 5VSB

Product Name	nanoX-AL	nanoX-BT
Product Image		
SoC	Atom® E3950/E3940/E3930 (eTEMP) Pentium® N4200 Celeron® N3350 (formerly "Apollo Lake")	Atom® E3845/3827/3826/3825/3815/3805 Celeron® N2930/J1900
Memory (soldered)	8GB DDR3L at 1866/1600 MHz (2/4/8GB)	4GB non-ECC DDR3L at 1333 MHz (2/4GB)
BIOS Type	AMI Aptio V	AMI Aptio IV
Boot Loader	Coreboot	Coreboot
Graphics Outputs	LVDS (or eDP 1.4) 1x DDI (DP/ HDMI)	LVDS (or eDP) 1x DDI (DP/ HDMI)
Graphics Features	DX 12 OpenGL 4.3, ES 3.0, OpenCL 2.0	DX 11, OpenGL 3.2, ES 2.0 OpenCL 1.1
LAN	Intel® i210/i211(IEEE 1588)	Intel® i210/i211
USB	2x USB 3.0, 6x USB 2.0 (USB OTG on USB 2.0 port 7 with Yocto Linux)	1x USB 3.0, 3x USB 2.0 (USB 2.0 client at port 7)
Serial ATA	2x at 6Gb/s	2x at 3Gb/s
PCI Express	4x PCIe x1 Gen2 (3 devices)	3x PCIe x1 Gen2 (4 PCIe x1 w/o GbE, opt.)
eMMC (opt.)	8/16/32GB	8/16/32GB
SD (opt.)	Yes	Yes
Audio	ALC262 (carrier board)	ALC262 (carrier board)
TPM (opt.)	Yes (TPM 2.0)	Yes (TPM 1.2)
Management Bus	I²C, SMBus	I²C, SMBus
Embedded Features	EAPI/SEMA, Backup BIOS, Debug/MIPI60	EAPI / SEMA Backup BIOS, Debug/JTAG
Power Supply	4.75-20 V / 5Vsb ±5% (ATX), 4.75-20V (AT)	5-14 V / 5Vsb ±5% (ATX), 5-14V (AT)
Operating Temperature	Standard: 0°C to +60°C Extreme Rugged: -40°C to +85°C (standard 12V input only)	Standard: 0°C to +60°C Extreme Rugged: -40°C to +85°C (standard 12V input only)
OS Support	Windows 10 64-bit, Yocto Linux 64-bit, VxWorks 64-bit	Windows 7/8, Yocto Linux, WES 7, WE8 Std., VxWorks (all 32/64-bit)
Form Factor & Compatibility	PICMG COM.0 R2.1, Type 10 Mini size: 84 x 55 mm	PICMG COM.0 R2.1, Type 10 Mini size: 84 x 55 mm

Notes:
- TPM, eMMC support by BOM option
- Optional -40°C to +85°C support: Standard product with 100% ETT screening available for selected CPU SKUs and std. 12V power supply only
- All specifications are subject to change without further notice.

SMARC

SMARC

SMARC® form factor is the only computer-on-module form factor that truly is capable of supporting both ARM and x86 designs. With 314-pins on a high speed MXM3 connector, SMARC can fully cover both typical x86 interfaces as well as typical ARM type low level signals.

Using ARM SoCs opens the possibility to leverage the product ecosystem of familiar devices such as tablet computers and smart phones. Alternative low power SoCs and CPUs, such as tablet oriented x86 devices and other RISC CPUs may be used as well.

The module power envelope is typically under 6W ad and the form factor is ideal for applications that mandate designs able to withstand extreme environmental conditions.

ARM/x86 Lowest Power

- ARM Cortex or x86 Atom® level based
- 314-pin MXM3 board-to-board connector supporting speeds up to PCIe Gen3
- Up to 3 display interfaces: Dual LVDS, eDP, DP, HDMI or MIPI DSI
- Camera support: 2x MIPI CSI
- PCIe, USB 3.0/2.0, SATA, 2x GbE, 4x UART, 5x I²C, 2x CAN, SPI/eSPI, 12x GPIO
- Uboot and Coreboot supported
- SEMA/EAPI Embedded Library supported
- 3.3 to 5V power input, with VDIO of 1.8V
- Extreme Rugged versions support operation from -40°C to +85°C

EXTREME RUGGED

2x MIPI CSI	2x MIPI DSI	HDMI / DP++	DP++	LVDS / eDP	VDD-in 3 to 5V
6x USB 2.0	2x USB 3.0	4x PCIe x1	SATA	2x GbE	
SDIO	12x GPIO	eSPI	SPI	4x I²C	4x UART	2x CAN	PS

314 pins

Modules	x86-based		ARM-based	
Product Name	LEC-AL	LEC-BTS/BT	LEC-iMX8	LEC-iMX6
Product Image				
CPU	Atom® E3900 Series or Pentium® N4200 or Celeron® N3350	Atom® E3800 Series SoC	NXP i.MX 8M Quad, QuadLite, Dual, up to 4x Cortex-A53 Processors	NXP i.MX6 Quad, Dual, DualLite and Solo Processors
Memory	Up to 8 GB DDR3L at 1867 MHz	Up to 4/8GB DDR3L at 1333/1066 MHz (ECC for LEC-BT)	Up to 32GB LPDDR4 at 3200 MHz	Up to 4GB DDR3L at 1066 MHz
Cache	L2: 2 MB	L2: 512kB to 2 MB	-	L2: 512kB to 1 MB
Boot Loader	AMI UEFI BIOS	AMI UEFI BIOS	U-Boot	U-Boot
Graphics Outputs	H.265(HEVC) 10-bit codec / VP9 10-bit decode Dual channel LVDS (18/24-bit) HDMI/DP++, DP++ 2x MIPI CSI camera	1x HDMI 1x LVDS Camera CSI 4L/1L	4K h.265/264, VP9 decode with HDR 1x HDMI 2.0a 1x MIPI-DSI (4-lane) 1x eDP	2D/3D graphics processor
LAN	Intel® i210IT MAC/PHY 1x GbE IEEE 1588	Intel® i210IT MAC/PHY 1x GbE	GbE MAC with Audio Video Bridging (AVB) and EEE capability	1x GbE
USB	1x USB 3.0 OTG 1x USB 3.0 host 1x USB 2.0 OTG 1x USB 2.0 host	1x USB 3.0 host 2x USB 2.0 host 1x USB 2.0 client	2x USB 3.0/2.0	2x USB 2.0 host 1x USB OTG
Serial ATA	1x SATA 6Gb/s	2x SATA 3Gb/s 1x SDIO/SD 1x eMMC	-	1x SATA 3Gb/s (Quad and Dual only) 1x SDIO/SD 1x eMMC
Audio	HDA	HDA	HDA	S/PDIF located on carrier
PCI Express	4x PCIe x1	3x PCIe x1	2x PCIe Gen3	1x PCIe x1
SEMA Support	Yes	Yes	Yes	Yes
Power Supply	5.0 V - 5.25 V DC ±5%	5.0 V - 5.25 V DC ±5%	5.0 V - 5.25 V DC ±5%	5.0 V - 5.25 V DC ±5%
Operating Temperature	0°C to +60°C -40°C to +85°C (opt.)	0°C to +60°C -40°C to +85°C (opt.)	0°C to +60°C -40°C to +85°C(opt.)	0°C to +60°C -40°C to +85°C(opt.)
OS Support	Windows 10 IOT Enterprise, Windows 10 IOT Core, Yocto Linux	Linux, VxWorks, Android, Windows 7/8, WEC7	(To be updated)	Linux, Android, WEC7, QNX
Form Factor & Compatibility	SMARC short size, 82 x 50 mm, SMARC specification v2.0	SMARC short size, 82 x 50 mm, SMARC specification v1.1	SMARC short size, 82 x 50 mm, SMARC specification v1.1	SMARC short size, 82 x 50 mm, SMARC specification v1.1

Note: All specifications are subject to change without further notice.

ETX
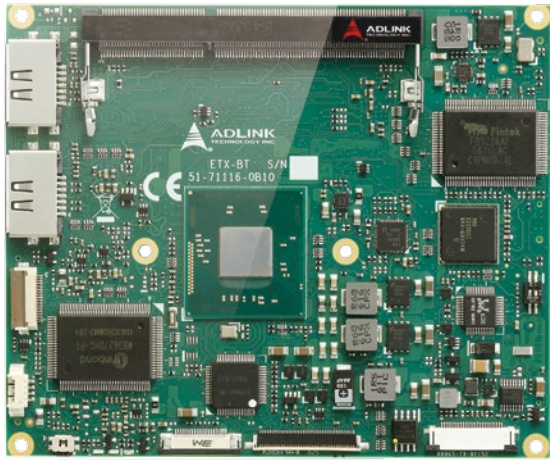
ETX®

ETX® is one of the earliest successful computer-on-module form factors. Today it is still widely used in applications such as industrial automation, transportation and medium and low level medical appliances. While high-end Intel® Core™ applications have mostly migrated to COM Express®, ETX is still very much alive in the lower power segment, mostly notably using Intel Atom® SoCs.

Specifically, for customers who are still heavily invested in ISA and PCI controllers or peripheral technology, the ETX form factor has stayed in demand through the years. ADLINK's current product planning will provide long term support for ETX well beyond 2025.
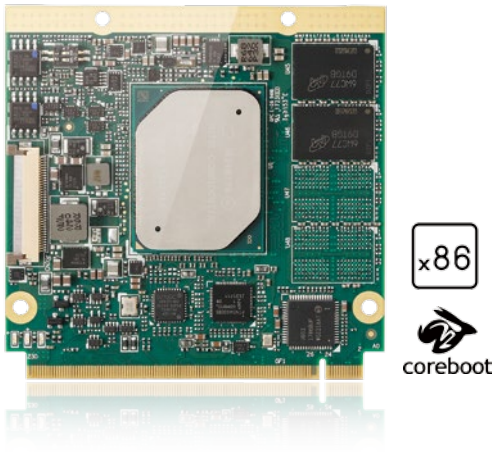
Product Name	ETX-BT
Product Image	

SoC	Atom® E3800 series Celeron® N2930/J1900
Memory	Up to 4GB DDR3L at 1333/1066MHz
Cache	L2: 512 kB to 2MB
BIOS Type	AMI Aptio EFI
TPM (opt.)	Atmel AT97SC3204
Graphics Outputs	Decode: H.264, MPEG2, MVC, VC-1, WMV9 and VP8 Encode: H.264, MPEG2 and MVC
Graphics Features	DirectX 11, OCL 1.1, OGL ES Halt/2.0/1.1, OGL 3.2
LAN	Intel® i211 MAC/PHY, supporting 10/100 Mbps (GbE via onboard connector)
USB	4X USB 2.0
PATA (IDE)	2x
SATA	2x SATA 3Gb/s
Audio	Integrated on E3800 SoC, Realtek ALC 262
SEMA Support	Yes
Power Supply	5V±5% / 5Vsb ±5% (ATX) 5V±5% (AT)
Operating Temperature	0°C to +60°C -40°C to +85°C (opt.)
OS Support	Windows 7/8 Linux, (WES7, WE8 Std., WEC7; Linux, VxWorks)
Form Factor & Compatibility	ETX 3.02 Size: 95 x 114 mm

Note: All specifications are subject to change without further notice.

CRT VGA	LVDS/ TTL			Audio Out	AUX-in	MIC	
IDE 0/1	SATA 0/1	ISA	PCI	10/100 LAN	4x USB 2.0		Vcc 5V
COM 1/2	PS/2 KB	PS/2 MS		LPT/Floppy	IrDA		

200 pins

Qseven

Qseven® is an off-the-shelf, multi-vendor, computer-on-module that integrates all the core components of a common x86 PC and is mounted onto an application specific carrier board. A single ruggedized 230-pin MXM connector provides the carrier board interface to carry all the I/O signals to and from the Qseven module.

The Qseven module provides all functional requirements for an embedded application. Such as graphics, sound, mass storage, PCIe, networking and multiple USB ports. Since its pinout is mostly x86 oriented, Qseven is commonly built around "Atom level" x86 silicon. The Qseven power envelope is typically between 6 and 12 watts.

Product Name	Q7-AL
Product Image	
SoC	Atom® E3900 Series or Pentium® N4200 or Celeron® N3350
Memory	Up to 8 GB LPDDR4 at 2400 MT/s
Cache	L2: 2 MB
BIOS Type	AMI UEFI BIOS
Integrated Graphics	9th Gen Intel® graphics core architecture with up to 18 execution units, supports three independent displays, 4k video (up to 4096 x 2160 @60fps)
Graphics Features	DirectX 12, OpenGL 4.2, OpenCL
Camera	2x MIPI CSI 2L/4L
LAN	Intel® i210IT MAC/PHY, 1x GbE, IEEE 1588
USB	2x USB 3.0 6x USB 2.0
Serial ATA	2x SATA 6Gb/s to carrier or 1x SATA 6Gb/s to carrier and 1x onboard SATA SSD
PCI Express	3x PCIe x1
eMMC (opt.)	Onboard eMMC 5.0 (4-64 GB)
Audio	HDA
SEMA Support	Yes
Power Supply	Module Input Voltage: 5.0V Power Pins: 12 pins, 6A at 5V Typical IO Voltage: 3.3V
Operating Temperature	0°C to 60°C -40°c to 85°C
OS Support	Windows 10 IOT Enterprise, Windows 10 IOT Core, Yocto Linux
Form Factor & Compatibility	Qseven 2.1, Size: 70 x 70 mm

Notes: All specifications are subject to change without further notice.

HDMI / DP++	LVDS / eDP	HDA / I²S	Vcc 5V / 5Vsb	
8x USB 2.0	3x USB 3.0	4x PCIe x1	2x SATA	GbE
SDIO	LPC / GPIO	SPI	I²C x2	UART	CAN

230 pins

Leading Computer-on-Modules
Most Robust, Best Support

To keep you ahead in this competitive world, ADLINK provides robust computer-on-module products that have passed Highly Accelerated Life Testing (HALT), making your products a compelling choice. Our modules integrate smoothly into your systems and function as you require and expect. We offer to customers local carrier board design services or carrier board design verification as needed. We also provide software, firmware, and BIOS adaptation services to suit your specific requirements. Quality technical support is critical to product development, and our customers get the benefits of ADLINK's local and global network of support centers in all major regions.

ADLINK's computer-on-module products are not only leading edge when it comes to quality and standardization, they're packed with design innovations and backed up by top-class production and manufacturing logistics that ensure timely delivery and distribution to you, as ordered, when needed. To ensure lifetime stability of your products, we provide EOL management that provides long production service durations.

We play a major role in the PICMG® consortium and SGeT, and have made significant contributions in defining COM Express®, SMARC® and Qseven® standards. With ADLINK as your partner in computer-on-module products, our commitment to lead the industry and produce the most robust products is backed by our comprehensive support network. Choose ADLINK computer-on-module products to ensure the success of your venture from start to finish.

| Leading Innovation | Expert Solutions | Robust Product | Comprehensive Support |

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Leading **EDGE COMPUTING**

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