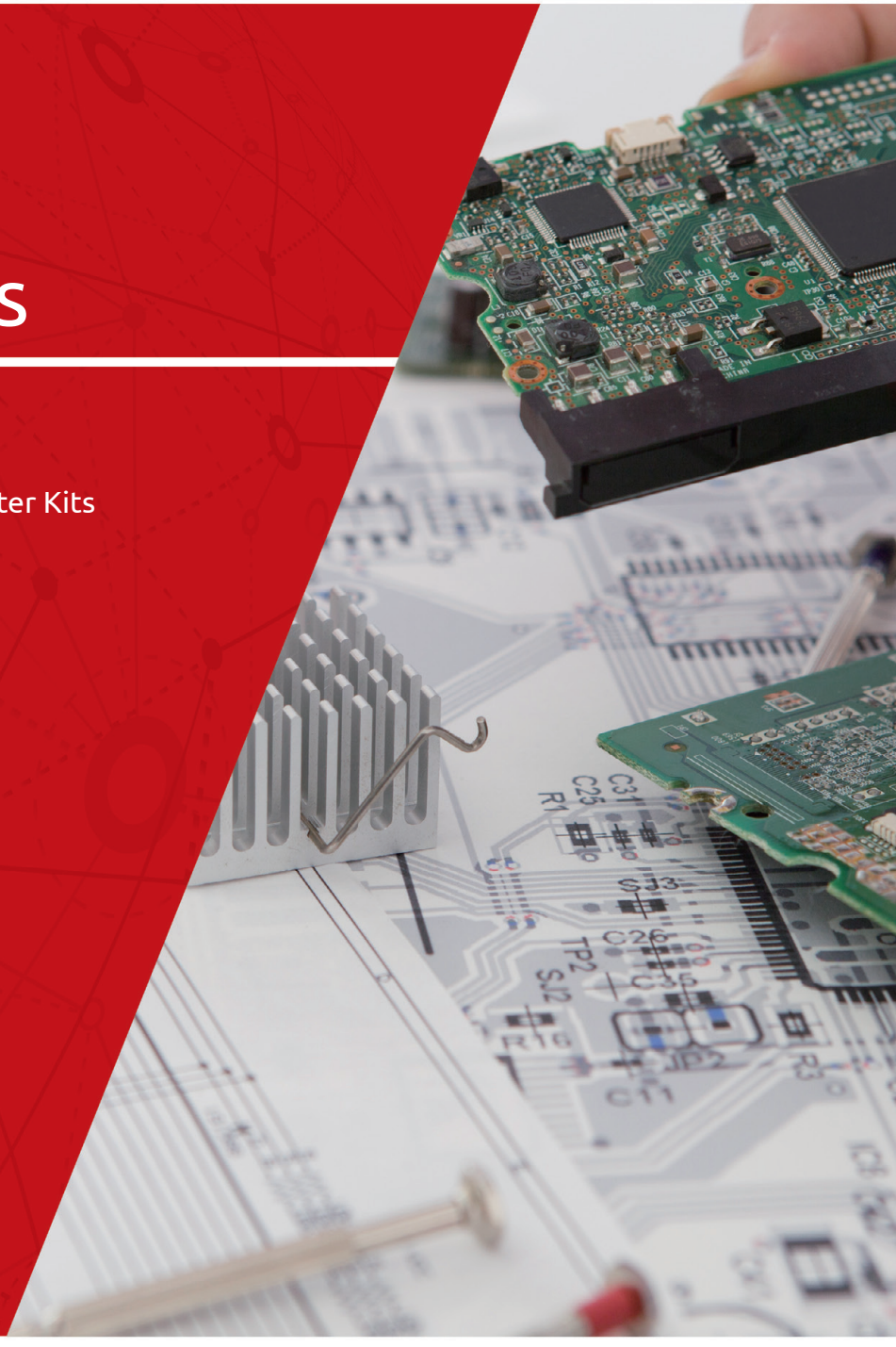
ADLINK
Leading EDGE COMPUTING

Embedded Building Blocks for IoT Edge Computing



COM Express

Type 7, 6, 10 and 2
Basic, Compact and Mini sizes
Modules, Carrier Boards and Starter Kits

www.adlinktech.com
2017

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Overview

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.

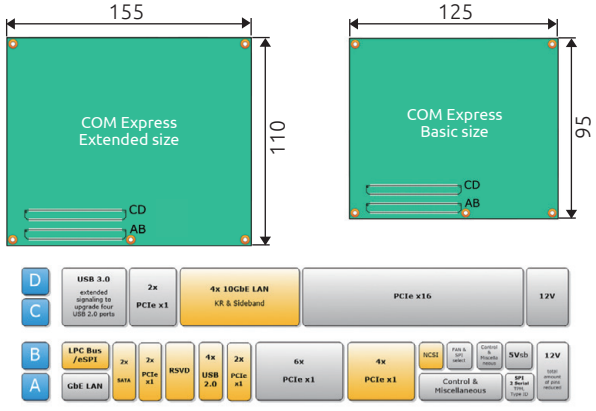
Types

Legacy interfaces such as PATA, PCI are supported by Type 2 modules. In contrast, Type 6 and 10 modules have PCI Express, USB 3.0, DDI (DisplayPort/HDMI/DVI) and eDP interfaces to allow development of products for novel applications. In addition, PEG lanes are supported by Type 6 to widen the range of possible uses by allowing connection to external graphics cards for graphic-oriented applications or FPGAs for vertical solutions. The new Type 7 module brings server class platforms to COM Express and supports up to four 10GbE for higher communications bandwidth and up to 32 PCIe lanes to provide more flexible configurations.

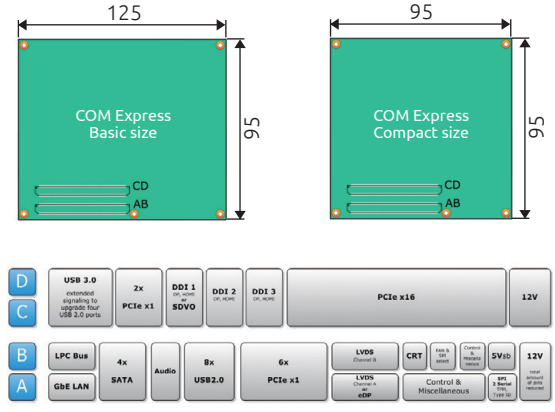
Size

Several sizes of COM Express module are defined by PICMG and can be paired with the desired pinout to meet the footprint requirements of the application. The Type 10 pinout, normally used for low power consumption platforms, is most suited to the Mini (84x55 mm) size to achieve a compact system. The Type 6 pinout is suitable for the Compact (95x95 mm) and Basic (125x95 mm) sizes that allow scalable applications. The Type 7 pinout is currently available on Basic size modules, but an Extended (155x110 mm) size may be an option in future.

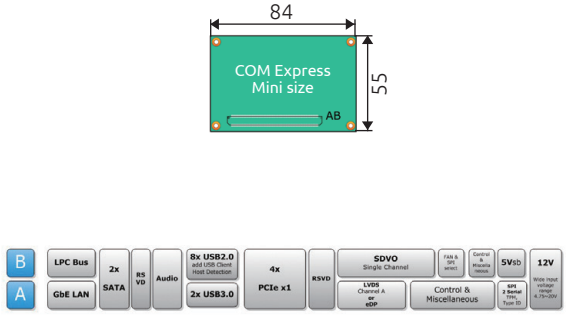
Type 7



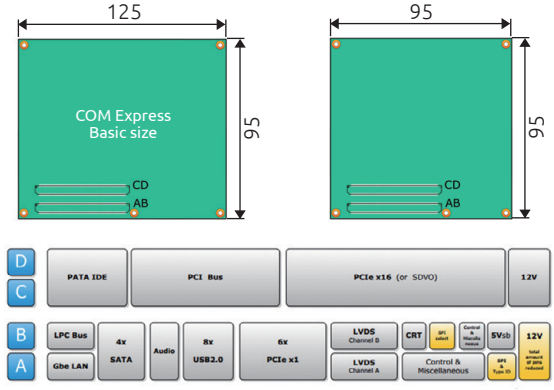
Type 6



Type 10



Type 2



Thermal Solutions

PICMG defines a heat spreader as an interface to transfer heat from a COM Express module to the system. ADLINK provides referenced passive (heat sink) and active cooling (heatsink with fan) solutions to help customer quickly achieve optimum performance and reliability during the system integration process.

New PICMG Standard

Type 7 is the newest pinout of the COM Express specification developed by the PCI Industrial Computer Manufacturers Group (PICMG), and is complementary to the existing Type 6 pin out. Whereas Type 6 is focused on graphics-oriented applications supporting audio and video interfaces, Type 7 is intended for headless platforms that don't require graphics support. Major advancements of the COM Express Type 7 pinout definition are support of up to four 10GbE-KR interfaces and up to 32 PCIe lanes, making it ideally suited for intensive parallel computing and server-grade applications requiring high data and network throughput such as those in IoT and Industry 4.0 solutions.

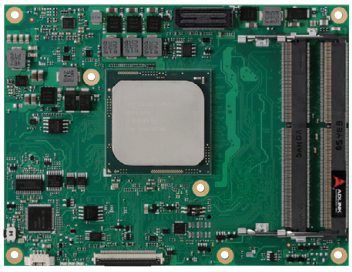
By 2020, it is expected that the data created and copied annually, much of it from IoT, cloud and big data applications, will reach 44 zettabytes. In order to minimize traffic between clients, central clouds and data centers, data should be processed as close as possible to its place of origin or inquiry location. This decentralized capacity to process data in real time and feed/get information from external device relies on higher CPU-core density, more PCIe lanes and 10Gigabit Ethernet.

Support for Server Grade Processors

Server grade platforms (up to 16 CPU cores) with mobile level TDP (below 45W) are ideal for decentralized applications and space-constrained systems. These platforms are headless and do not require graphics interface support, freeing up pins on the existing COM Express Type 6 definition to be used for server and networking-orientated applications.

Up to 32 PCIe Lanes

The Type 6 pinout supports a total of 24 PCIe lanes (PCIe x16 + PCIe x8). Type7 supports an additional 8 PCIe lanes for a total of 32 PCIe lanes. In the Type 7 definition, the 16 PCIe lanes can support up to four devices, as is the case with Type 6. The other two PCIe x8 lanes can support up to four devices. With support for up to 8 external devices, the Type 7 pinout enables the connection of an increased number of data acquistion cards for expanded information gathering capabilities. Another application of the increased number of PCIe lanes is connecting to PCIe based storage for improved read/write performance, thus enhancing the overall efficiency of the system. Finally, the PCIe lanes can support additional external GPGPU cards for co-processing in applications that require parallel computing.



Express-BD7

Bringing 10GbE to COM Express

In addition to GbE, the Type 7 pinout supports up to four 10GbE interfaces which are essential for the next generation of edge node appliances. On the module they are implemented as 10GbE-KR, i.e. as single backplane lanes according to IEEE 802.3, paragraph 49. The physical implementation of the 10GbE interfaces takes place on the carrier board itself to allow more flexibility in implementation. System integrators can select fiber or copper PHY on the carrier board and transmit data through either fiber or copper cable.

Software defined pins (SDP) are an added feature of the Type7 pinout. (two SDPs per 10GbE port) These pins can be configured as input or output by end-user with a typical application being hardware based precision timing protocol for real time applications.

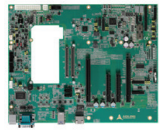
Network Controller Sideband Interface

The Network Controller Sideband Interface (NC-SI) defines a protocol for connection to the carrier board board management controller (BMC) which can be used for out-of-band remote management commonly found in server applications. Compared to traditional I2C or LPC bus, the NC-SI provides higher bandwidth between network controller and the carrier board BMC. This interface is defined by the Distributed Management Task Force (DMTF).

Type 7



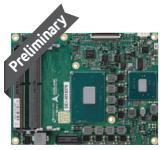
Product Name	Express-BD7
CPU	Intel® Xeon® Processor D SoC Xeon® D-1559 1.6/2.0GHz 18MB, 45W (12C) (eTEMP) Xeon® D-1539 1.6/2.2GHz 12MB, 35W (8C) (eTEMP) Xeon® D-1519 1.5/2.1GHz 6MB, 25W (4C) (eTEMP) Xeon® D-1577 1.3/2.1GHz 24MB, 45W (16C) Xeon® D-1548 2.0/2.6GHz 12MB, 45W (8C) Xeon® D-1527 2.2/2.7GHz 6MB, 35W (4C) Pentium® D-1508 2.2/2.6GHz 3MB, 25W (2C)
Main Chipset	-
Memory	Up to 32 GB ECC/non-ECC Dual Channel DDR4 at 2400/2133 MHz (depends on SKU)
Cache	Up to 18MB, dependent on SoC SKUs
BIOS Type	AMI Aptio EFI
TPM support (opt)	Infineon FW5.00 (TPM 2.0)
LAN	10G: 2x 10GBASE-KR GbE: Intel® i210/i211 NC-SI
USB	4x USB 3.0/2.0/1.1
Serial ATA	2x SATA 6Gb/s
PCI Express	16 PCI Express (Gen3) (1x16 or 2 x8 or 4 x4) 8 PCI Express (Gen3) (2 x4/x2/x1) Up to 8 PCI Express (Gen2) (2 x4/x2/x1) without GbE support (opt.)
Management Bus	I^2C, SMBus
SEMA Support	Yes
Power Supply	Std: 12V±5% / 5Vsb ±5% (ATX) 12V±5% (AT) Wide: 8.5-20 V / 5Vsb ±5% (ATX) 8.5-20V (AT)
Operating Temperature	0°C to +60°C -40°C to +85°C (opt.) (eTEMP SKU only)
OS support	Windows Server 2012 64-bit, Linux 64-bit
Form Factor & Compatibility	PICMG COM.0 R3.0, Type 7 Basic size: 95 x 125 mm (L x W)

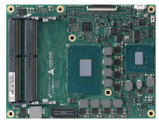


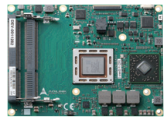
Product Name	Express-BASE7
Core module interface	PICMG COM Express Revision 3.0, Type 7
Dimensions	305 mm x 244 mm (ATX)
Expansion Busses	1 PCI Express x16 slot 2 PCI Express x8 slots
POST LEDs	Onboard diagnostics for BIOS POST
Secondary BIOS	SPI flash
Super I/O	Winbond WF83627DHG on LPC bus
Digital I/O	Extensive GPIO (through PCA9535)
Connectors	Two COM Express x 220-pin (Type 7)
SATA	2x SATA
10G LAN	Up to four 10GbE through 1 PCI Express x16 slot (routes 10GBASE-KR signals from COM Express module to 10GbE adapter card)
LAN	10/100/1000BASE-T compatible RJ-45 on I/O panel
NC-SI	NC-SI (a BMC located on carrier board that can communicate with ethernet controller for out-of-band management)
USB	4x USB 3.0/2.0/1.0
Serial Port	2x DB-9 connector (from Super I/O) 2x onboard 10-pin header (from COM Express module)
KB/Mouse	2x 6-pin mini DIN
Feature Connectors	SMBus, I^2C, module control signals
Miscellaneous	Reset button, Lid button, Sleep button, Power button, Power LED, HDD LED, Buzzer

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.

Type 6







Product Name	Express-KL/KLE	Express-SL/Express-SLE	Express-BE
CPU	7th Gen. Intel® Xeon® E3-1505M v6/ E3-1505L v6 Intel® Core™ i7-7820EQ i5-7440EQ/7442EQ,i3-7100E/7102E	6th Gen. Intel® Xeon® E3-1515M (GT4e) Intel® Xeon® E3-1505M/E3-1505L Intel® Core™ i7-6820EQ/6822EQ i5-6440EQ/6442EQ,i3-6100E/6102E Intel® Celeron® G3900E/3902E	AMD® R-Series APU RX-427BB/425BB/225FB
Main Chipset	Intel® CM238 (ECC) Intel® QM175/HM175 (non-ECC)	Intel® CM236 (ECC) Intel® QM170/HM170 (non-ECC)	AMD® A77E
Memory	Up to 32 GB ECC/non-ECC Dual Channel DDR4 at 2400/2133 MHz (Xeon/i3 with CM238 support ECC and non-ECC)	Up to 32 GB ECC/non-ECC Dual Channel DDR4 at 2133/1867 MHz (Xeon/i3 with CM236 support ECC and non-ECC)	Up to 16 GB non-ECC Dual Channel DDR3L at 1600/1333 MHz
BIOS Type	AMI EFI with Intel® AMT 11.0 support (No AMT support with HM175)	AMI EFI with Intel® AMT 11.0 support (No AMT support with HM170)	AMI EFI
TPM Support (opt)	Infineon SFW5.51 (TPM 2.0)	Atmel AT97SC3204 (TPM 2.0 by request)	Atmel AT97SC3204
Integrated Graphics	18/24-bit singl/dual LVDS, eDP 1.4(opt.) 3x DDI ports supporting DP/HDMI/DVI	18/24-bit singl/dual LVDS, eDP 1.3(opt.) 3x DDI ports supporting DP/HDMI/DVI	18/24-bit singl/dual LVDS 3x DDI ports supporting DP/HDMI/DVI (Up to 4 independent display)
Graphics Features	DirectX 12/11.2/11.1/11/10.1/10/9, OpenGL 4.4/4.3 and ES 2.0, OpenCL 2.1, 2.0/1.2 Note: support H.265(HEVC) 10-bit codec / VP9 10-bit decode	DirectX 12/11.2/11.1/11/10.1/10/9, OpenGL 4.4/4.3 and ES 2.0, OpenCL 2.1, 2.0/1.2 Note: support H.265(HEVC) 8-bit codec / VP8 8-bit codec	DirectX 11.1/10.1/10/9, OpenGL 4.2 and ES 2.0 OpenCL 1.2, OpenCV
LAN	Intel® I219LM/V, GbE	Intel® I219LM/V, GbE	Intel® i210LM, GbE
USB	4x USB 3.0/2.0/1.1, 4x USB 2.0/1.1	4x USB 3.0/2.0/1.1, 4x USB 2.0/1.1	4x USB 1.1/2.0/3.0, 4x USB 1.1/2.0
Serial ATA	4x SATA 6Gb/s	4x SATA 6Gb/s	4x SATA 6Gb/s
PCI Express	PCI Express x16 (Gen3) (1x16 or 2x8 or 1x8 plus 2x4) 8x PCI Express x1 (Gen3) (x4, x2, x1 available)	PCI Express x16 (Gen3) (1x16 or 2x8 or 1x8 plus 2x4) 8x PCI Express x1 (Gen3) (x4, x2, x1 available)	PCI Express x16 (Gen3) (1x16 or 2x8 or 1x8 plus 1x4) 7x PCI Express x1 (Gen3) (x4, x2, x1 available)
Audio	HDA integrated in PCH supporting ALC886	HDA integrated in PCH supporting ALC886	AMD Audio Coprocessor supporting ALC886
Management Bus	I²C, SMBus	I²C, SMBus	I²C, SMBus
SEMA Support	Yes	Yes	Yes
Power Supply	Std: 12V±5% / 5Vsb ±5% (ATX) / 12V±5% (AT) Wide: 8.5-20 V / 5Vsb ±5% (ATX) 8.5-20V (AT)	Std: 12V±5% / 5Vsb ±5% (ATX) / 12V±5% (AT) Wide: 8.5-20 V / 5Vsb ±5% (ATX) 8.5-20V (AT)	Std: 12V±5% / 5Vsb ±5% (ATX) / 12V±5% (AT) Wide: 8.5-20 V / 5Vsb ±5% (ATX) 8.5-20V (AT)
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
OS support	Windows 10, Linux 64-bit, VxWork 64-bit (plan) (Linux 64-bit, VxWork 64-bit (plan))	Windows 10/8.1 64-bit, Windows 7 32/ 64-bit, Linux 64-bit, VxWork 64-bit (WES 7 32/64-bit, Linux 64-bit, VxWork 64-bit)	Win 7/8, Linux, WES 7/8, Linux
FormFactor & Compatibillity	PICMG COM.0 R2.1, Type 6 Basic size: 95 x 125 mm (L x W)		

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.

Type 6







Product Name	cExpress-KL	cExpress-SL	cExpress-BL
CPU	7th Gen. Intel® Core™ i7-7600U/i5-7300U/i3-7100U Intel® Celeron® 3965U	6th Gen. Intel® Core™ i7-6600U/i5-6300U/i3-6100U Intel® Celeron® 3955U	5th Gen. Intel® Core™ i7-5650U/i5-5350U/i3-5010U Intel® Celeron® 3765U
Main Chipset	-	-	-
Memory	Up to 32 GB non-ECC Dual Channel DDR4 at 2133/1867 MHz	Up to 32 GB non-ECC Dual Channel DDR4 at 2133/1867 MHz	Up to 32 GB non-ECC Dual Channel DDR3L at 1600/1333 MHz
BIOS Type	AMI EFI with Intel® AMT 11.0 support	AMI EFI with Intel® AMT 11.0 support	AMI EFI with Intel® AMT 10.0 support
TPM Support (opt.)	Infineon FW5.51 (TPM 2.0)	Atmel AT97SC3204	Atmel AT97SC3204
Integrated Graphics	18/24-bit singl/dual LVDS, eDP 1.4(opt.) 2x DDI ports supporting DP/HDMI/DVI Note: VGA support in place of DDI 2(opt.)	18/24-bit singl/dual LVDS, eDP 1.3(opt.) 2x DDI ports supporting DP/HDMI/DVI	18/24-bit singl/dual LVDS, eDP (opt.) 2x DDI ports supporting DP/HDMI/DVI VGA
Graphics Features	DirectX 12/11.2/11.1/11/10.1/10/9 OpenGL 4.4/4.3 and ES 2.0 OpenCL 2.1, 2.0/1.2 Note: support H.265(HEVC) 10-bit codec / VP9 10-bit decode	DirectX 12/11.2/11.1/11/10.1/10/9 OpenGL 4.4/4.3 and ES 2.0 OpenCL 2.1, 2.0/1.2 Note: support H.265(HEVC) 8-bit codec / VP8 8-bit codec	DirectX 11.1/11.1+/10.1/10/9 OpenGL 4.2/4.0
LAN	Intel® i219LM/V, GbE	Intel® i219LM/V, GbE	Intel® I218LM/V, GbE
USB	4x USB 3.0/2.0/1.1 4x USB 2.0/1.1	4x USB 3.0/2.0/1.1 4x USB 2.0/1.1	2x USB 3.0/2.0/1.1 6x USB 2.0/1.1
Serial ATA	3x SATA 6Gb/s	3x SATA 6Gb/s (Core™ i7/i5/i3) 2x SATA 6Gb/s (Celeron®)	4x SATA 6Gb/s
PCI Express	5 PCIe x1 (Gen3) (x4, x2, x1 available) Note: Celeron only support Gen2 Note: Up to 6 PCIe x1 without GbE support (opt.)	5 PCIe x1 (Gen3) (x4, x2, x1 available) Note: Celeron only support Gen2 Note: Up to 6 PCIe x1 without GbE support (opt.)	4x PCIe x1 (Gen2) (x4, x2, x1 available) Note: Up to 5 PCIe x1 without GbE support (opt.)
Audio	HDA integrated in SOC supporting ALC886	HDA integrated in SOC supporting ALC886	HDA integrated in SOC supporting ALC886
Management Bus	I²C, SMBus	I²C, SMBus	I²C, SMBus
SEMA Support	Yes	Yes	Yes
Power Supply	Std:12V±5% / 5Vsb ±5% (ATX), 12V±5% (AT) Wide: 5-20 V / 5Vsb ±5% (ATX), 5-20V (AT)	Std:12V±5% / 5Vsb ±5% (ATX), 12V±5% (AT) Wide: 5-20 V / 5Vsb ±5% (ATX), 5-20V (AT)	Std:12V±5% / 5Vsb ±5% (ATX), 12V±5% (AT) Wide: 5-20 V / 5Vsb ±5% (ATX), 5-20V (AT)
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.)
OS support	Windows 10, Linux 64-bit, VxWork 64-bit (in planning) (Linux 64-bit, VxWork 64-bit, in planning)	Windows 10/8.1 64-bit, Windows 7 32/64-bit, Linux 64-bit, VxWork 64-bit (WES 7 32/64-bit, Linux 64-bit, VxWork 64-bit, in planning)	Win 7/8.1, WES 7, WE8 Std, Linux, VxWorks
Form Factor & Compatibility	PICMG COM.0 R2.1, Type 6 Compact size: 95 x 95 mm (L x W)		

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.

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Product Name	cExpress-AL	cExpress-BW	cExpress-BT
CPU	Intel® Atom™ E3950/E3940/E3930 Intel® Pentium® N4200 Intel® Celeron® N3350	Intel® Pentium® N3710 Intel® Celeron® N3160/N3060/N3010 Intel® Atom® x5-E8000 Future Intel® Atom™ Processor	Intel® Atom™ E3845/3827/3826/3825/3815/3805 Intel® Celeron® N2930/J1900
Main Chipset	-	-	-
Memory	Up to 8 GB non-ECC Dual channel DDR3L at 1867/1600 MHz	Up to 8 GB non-ECC Dual Channel DDR3L at 1600/1333 MHz	Up to 8 GB non-ECC Dual Channel DDR3L at 1333/1066 MHz
BIOS Type	AMI Aptio EFI	AMI Aptio EFI	AMI Aptio EFI
TPM Support (opt.)	Infineon FW5.51 (TPM 2.0)	ATMEL AT97SC3204	ATMEL AT97SC3204
Integrated Graphics	18/24-bit singl/dual LVDS, eDP (opt.) 2x DDI ports supporting DP/HDMI/DVI Note: VGA support in place of DDI 2(opt.)	eDP, 18/24-bit singl/dual LVDS (opt.) 3x DDI ports supporting DP/HDMI/DVI Note: DDI 3 muxed with eDP/LVDS	2x DDI ports supporting DP/HDMI/DVI VGA 18/24-bit singl/dual LVDS (opt.)
Graphics Features	DirectX 12/11.3/10/9.3 OpenGL 4.3, ES 3.0, OpenCL 2.0	DirectX 11.1, OpenGL 4.2, ES 3.0, OpenCL 1.2	DirectX 11, OpenGL 3.2, ES 2.0, OpenCL 1.1
LAN	Intel® i210/i211, GbE	Intel® i210/i211, GbE	Intel® i210/i211, GbE
USB	4x USB 3.0/2.0/1.1 4x USB 2.0/1.1	4x USB 3.0/2.0/1.1 4x USB 2.0/1.1	1x USB 3.0/2.0/1.1 6x USB 2.0/1.1
Serial ATA	2x SATA 6Gb/s	2x SATA 6Gb/s	2x SATA 3Gb/s
PCI Express	3 PCIe x1 (Gen2) (x2, x1 available) Note: Up to 5 PCIe x1 with PCIe switch (opt.)	3 PCIe x1 (Gen2) (x2, x1 available) Note: Up to 5 PCIe x1 with PCIe switch (opt.)	3 PCIe x1 (Gen2) (x2, x1 available) Note: Up to 4 PCIe x1 without GbE support (opt.)
Audio	HDA integrated in SOC supporting ALC886	HDA integrated in SOC supporting ALC886	HDA integrated in SOC supporting ALC886
Management Bus	I²C, SMBus	I²C, SMBus	I²C, SMBus
Onboard Storage	8GB/16GB/32GB (opt.)	8GB/16GB/32GB (opt.)	8GB/16GB/32GB (opt.)
SD Signal	Yes (BIOS selection)	Yes (opt.)	Yes (mini SD sockete on module)
SEMA Support	Yes	Yes	Yes
Power Supply	Std:12V±5% / 5Vsb ±5% (ATX), 12V±5% (AT) Wide: 4.75-20 V / 5Vsb ±5% (ATX), 4.75-20V (AT)	Std:12V±5% / 5Vsb ±5% (ATX), 12V±5% (AT) Wide: 5-20 V / 5Vsb ±5% (ATX), 5-20V (AT	Std:12V±5% / 5Vsb ±5% (ATX), 12V±5% (AT) Wide: 5-20 V / 5Vsb ±5% (ATX), 5-20V (AT)
Operating Temperature	0°C to +60°C -40°C to +85°C (opt.) (E39XX only)	0°C to +60°C	0°C to +60°C -40°C to +85°C (opt.) (E38XX only)
OS support	Windows 10, Linux 64-bit, VxWork 64-bit (in planning) (Linux 64-bit, VxWork 64-bit, in planning)	Win 7/8, WES 7, Linux, VxWorks	Win 7/8, Linux, WES 7, WE8 Std., VxWorks, QNX
Form Factor & Compatibility	PICMG COM.0 R2.1, Type 6 Compact size: 95 x 95 mm (L x W)		

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.

Type 10





Product Name	nanoX-AL	nanoX-BT
CPU	Intel® Atom™ E3950/E3940/E3930 Intel® Pentium® N4200 Intel® Celeron® N3350	Intel® Atom™ E3845/3827/3826/3825/3815/3805 Intel® Celeron® N2930/J1900
Main Chipset	-	-
Memory	Soldered memory, Up to 8GB non-ECC/ECC DDR3L at 1867/1600 MHz (4GB/8GB is opt. support)	Soldered memory, Up to 4GB non-ECC DDR3L at 1333 MHz
BIOS Type	AMI Aptio EFI	AMI Aptio EFI
TPM support (opt)	Infineon FW5.51 (TPM 2.0)	-
Integrated Graphics	18/24-bit single channel LVDS, eDP (opt.) 1x DDI ports supporting DP/ HDMI/DVI	18/24-bit single channel LVDS, eDP (opt.) 1x DDI ports supporting DP/ HDMI/DVI
Graphics Features	DirectX 12/11.3/10/9.3 OpenGL 4.3, ES 3.0, OpenCL 2.0	DirectX 11, OpenGL 3.2, ES 2.0 OpenCL 1.1
LAN	Intel® i210/i211, GbE	Intel® i210/i211, GbE
USB	2x USB 3.0/2.0/1.1 6x USB 2.0/1.1 Note: port 7 support USB client	1x USB 3.0/2.0/1.1 3x USB 2.0/1.1 1x USB 1.1/2.0 client
Serial ATA	2x SATA 6Gb/s	2x SATA 3Gb/s
PCI Express	4x PCIe x1 (Gen2) (x4, x2, x1 available)	3x PCIe x1 (Gen2) (up to 4 PCIe x1 without GbE, opt.)
Audio	HDA integrated in SoC supporting ALC262	HDA integrated in SoC supporting ALC262
Management Bus	I^2C, SMBus	I^2C, SMBus
Onboard Storage	8GB/16GB/32GB (opt.)	8GB/16GB/32GB (opt.)
SD Signal	Yes (opt.)	Yes (opt.)
SEMA Support	Yes	Yes
Power Supply	Std:12V±5% / 5Vsb ±5% (ATX), 12V±5% (AT) Wide: 5-20 V / 5Vsb ±5% (ATX), 5-20V (AT)	Std: 12V±5% / 5Vsb ±5% (ATX) or 12V±5% (AT) Wide: 5-14V / 5Vsb (ATX) or 5-14V (AT)
Operating Temperature	0°C to +60°C -40°C to +85°C (opt.) (E39XX only)	0°C to +60°C -40°C to +85°C (opt.) (E38XX only)
OS support	Windows 10, Linux 64-bit, VxWork 64-bit (in planning) (Linux 64-bit, VxWork 64-bit, in planning)	Win 7/8, Linux, WES 7, WE8 Std., VxWorks
Form Factor & Compatibility	PICMG COM.0 R2.1, Type 10 Mini size: 84 x 55 mm (L x W)	

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.

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Type 2

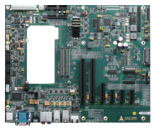


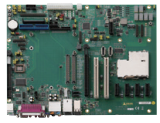


Product Name	Express-HL2	cExpress-BT2
CPU	4th Gen. Intel® Core™ i7-4860EQ/4700EQ, i5-4400E/4402E, i3-4100E/4102E Intel® Celeron® 2000E/2002E	Intel® Atom™ E3845/3827/3826/3825/3815/3805 Intel® Celeron® N2930/J1900
Main Chipset	Intel® QM87, Intel® HM86	-
Memory	Up to 16 GB non-ECC Dual Channel DDR3L at 1600/1333 MHz	Up to 8 GB non-ECC Dual Channel DDR3L at 1333/1066 MHz
BIOS Type	AMI EFI with Intel® AMT 9.0 support (no AMT support with HM86)	AMI Aptio EFI
TPM Support (opt.)	Atmel AT97SC3204	Atmel AT97SC3204
Integrated Graphics	18/24-bit single/dual channel LVDS, VGA	18/24-bit single/dual channel LVDS, VGA
Graphics Features	DirectX* 11/10.1/10/9, OpenGL 3.0	DirectX 11, OpenGL 3.2, ES 2.0, OpenCL 1.1
LAN	Intel i217LM/V, GbE	Intel® i210/i211, GbE
USB	8x USB 2.0/1.1	7x USB 2.0/1.1
Parallel ATA (IDE)	one channel, one device	one channel, one device
Serial ATA	4x SATA 6Gb/s (QM87) 3x SATA 6Gb/s (HM86) (port 0/2/3)	1x SATA 3Gb/s (up to 2x SATA 3Gb/s without PATA support)
PCI Express/PCI	PCI Express x16 (Gen3) (1x16 or 2x8 or 1x8 plus 2x4) 6x PCI Express x1 (Gen2) (x4, x2, x1 available); 1x PCI	2x PCI Express x1 (Gen2) (x2, x1 available); 1x PCI
Audio	HDA integrated in SoC supporting ALC880	HDA integrated in SoC supporting ALC880
Management Bus	I^2C, SMBus	I^2C, SMBus
Onboard Storage	-	8GB/16GB/32GB (opt.)
SEMA Support	Yes	Yes
Power Supply	Std: 12V±5% / 5Vsb ±5% (ATX) or 12V±5% (AT) Wide: 8.5-20 V / 5Vsb ±5% (ATX) or 8.5-20V (AT)	Std: 12V±5% / 5Vsb ±5% (ATX) or 12V±5% (AT) Wide: 5-20 V / 5Vsb ±5% (ATX) or 5-20V (AT)
Operating Temperature	0°C to +60°C -40°C to +85°C (opt.)	0°C to +60°C, -40°C to +85°C (opt.) (E38XX only)
OS support	Win 7/8, Linux, WES 7/8, Linux , VxWorks	Win 7/8, Linux, WES 7, WE8 Std.
Form Factor & Compatibility	PICMG COM.0 R2.1, Type 2 Basic size: 95 x 125 mm (L x W)	PICMG COM.0 R2.1, Type 2 Compact size: 95 x 95 mm (L x W)

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.

Reference Carrier Boards







	Express-BASE6	Express-BASE	miniBASE-10R
Core module interface	PICMG COM Express Revision 2.0, Type 6	PICMG COM Express Revision 2.0, Type 2	PICMG COM Express Revision 2.1, Type 10
Dimensions	305 mm x 244 mm (ATX)	305 mm x 244 mm (ATX)	150 mm x 142 mm
Expansion Busses	1 PCI Express x16 / SDVO slot 1 PCI Express x4 slot 3 PCI Express x1 slots	1 PCI Express x16 / SDVO slot 5x PCI Express x1 slots 2x 32-bit PCI v2.3 slots 1 ExpressCard slot	2x onboard mini PCIe card slot (one support mSATA)
POST LEDs	Onboard diagnostics for BIOS POST	Onboard diagnostics for BIOS POST	Onboard diagnostics for BIOS POST
Secondary BIOS	SPI flash	LPC & SPI flash	SPI flash
Audio Codec	Realtek ALC886 HDA	Realtek ALC880 HDA	Realtek ALC262 HDA
Super I/O	Winbond WF83627DHG on LPC bus	Winbond WF83627DHG on LPC bus	-
Digital I/O	Extensive GPIO (through PCA9535)	-	Extensive GPIO (through PCA9535)
Connectors	Two COM Express x 220-pin	Two COM Express x 220-pin	One COM Express x 220-pin
VGA	DB-15 connector	DB-15 connector	-
LVDS	Onboard 34-pin header	Onboard 34-pin header	Onboard 34-pin header
Digital Display Interface	3x DDI ports to HDMI/DVI/DP (through T6-DDI)	-	1x DisplayPort connector
Flat Panel Control	Onboard 8-pin header	-	-
Audio Interface	Mic/Line-in/Line-out on I/O panel S/PDIF on header/jack	Mic/Line-in/Line-out on I/O panel S/PDIF on header/jack	Mic/Line-in/Line-out on I/O panel S/PDIF on jack
PATA	-	1x 40-pin header	-
SATA	2x SATA, 2x eSATA	4x SATA	1x SATA
SD Card	-	-	1x onboard socket
LAN	10/100/1000BASE-T compatible RJ-45 on I/O panel	10/100/1000BASE-T compatible RJ-45 on I/O panel	2x 10/100/1000BASE-T compatible RJ-45 on I/O panel (one from COM Express module, one from Intel i210 controller on carrier board)
USB	4x USB 3.0/2.0/1.0 4x USB 2.0/1.0	6x USB 2.0/1.0 1x USB header 1x USB through ExpressCard	2x USB 3.0/2.0/1.0 2x USB 2.0/1.0 1x USB client
Serial Port	1x DB-9 connector (from Super I/O) 3x onboard 10-pin header (one from Super I/O, two from COM Express module)	1x DB-9 connector (from Super I/O) 1x onboard 10-pin header (one from Super I/O)	2x DB-9 connector (from COM Express module)
Parallel Port	-	1x DB-25	-
KB/Mouse	2x 6-pin mini DIN	2x 6-pin mini DIN	-
Feature Connectors	SMBus, I2C, module control signals	SMBus, I2C, module control signals	SMBus, I2C, module control signals
Miscellaneous	Reset button, Lid button, Sleep button, Power button, Power LED, HDD LED, Buzzer	Reset button, Lid button, Sleep button, Power button, Power LED, HDD LED	Reset button, Lid button, Sleep button, Power button, Power LED, HDD LED
Smart Battery Support	One 10-pin header for Smart Battery management communications (connects to ADLINK BattMan board)	One 10-pin header for Smart Battery management communications (connects to ADLINK BattMan board)	Integrated Smart Battery management system

Starter Kits



Product Name	COM Express Type 7 Starter Kit Plus

Standard items:
- Reference carrier board with power supply
- 10GbE adapter card (fiber or copper type)
- P16TO28 (PCIe x16 to two PCIe x8 adapter card)
- P8TO24 (PCIe x8 to two PCIe x4 adapter card)
- Necessary cabling and Debug Card (DB40)
- Live Linux with SEMA pre-installed on USB flash drive
- USB flash driver with
  - COM Express carrier design guide
  - Reference carrier board schematics, design guide and user manuals
  - Drivers, Libraries and BSPs

Optional items:
- COM Express Type 7 Module with CPU of your choice
- Memory of your choice
- Thermal Solution of your choice



Product Name	COM Express Type 6 Starter Kit Plus

Standard items:
- Reference carrier board with power supply
- Video Adapter Card (T6-DDI, 3 DisplayPort or HDMI)
- P16TO28 (PCIe x16 to two PCIe x8 adapter card)
- Necessary cabling and Debug Card (DB40)
- Live Linux with SEMA pre-installed on USB flash drive
- USB flash driver with
  - COM Express carrier design guide
  - Reference carrier board schematics, design guide and user manuals
  - Drivers, Libraries and BSPs

Optional items:
- COM Express Type 6 Module with CPU of your choice
- Memory of your choice
- hermal Solution of your choice



Product Name	COM Express Type 10 Starter Kit Plus

Standard items:
- Reference carrier board with power supply
- Necessary cabling and Debug Card (DB40)
- Live Linux with SEMA pre-installed on USB flash drive
- USB flash driver with
  - COM Express carrier design guide
  - Reference carrier board schematics, design guide and user manuals
  - Drivers, Libraries and BSPs

Optional items:
- COM Express Type 10 Module with CPU of your choice
- Memory of your choice
- Thermal Solution of your choice
- LVDS panel and cable
- Smart Battery



Product Name	COM Express Type 2 Starter Kit Plus

Standard items:
- Reference carrier board with power supply
- Necessary cabling and Debug Card (DB40)
- Live Linux with SEMA pre-installed on USB flash drive
- USB flash driver with
  - COM Express carrier design guide
  - Reference carrier board schematics, design guide and user manuals
  - Drivers, Libraries and BSPs

Optional items:
- COM Express Type 2 module with CPU of your choice
- Memory of your choice
- Thermal solution of your choice (heatspreader, heatsink) (please remove heatspreader, heatsink)

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