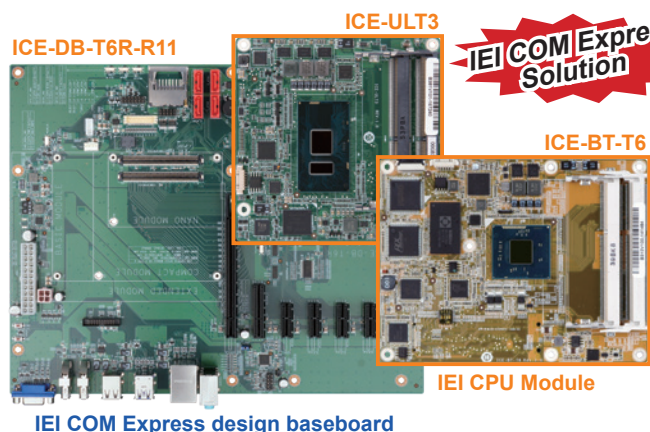


IEI COM Express Series

COM Express is a computer-on-module (COM) form factor series. It can be integrated in various customized applications. Each COM Express module integrates CPU, memory and common I/O of a PC/AT including USB, audio, graphics, and Ethernet. All I/O signals are mapped to two high density, low profile connectors on the bottom side of the module. The COM Express specification is hosted by PICMG. The ICE (IEI COM Express) modules provide complete performance range for users to choose. With the IEI COM Express baseboard design service, users can quickly enjoy the benefits of modulization and efficiency.



Transfer your ETX Module to IEI COM Express Solution

COM Express provides PCI Express, dual-channel LVDS, GbE, eight USB and four SATA ports for I/O expansion

Platform	ETX	COM Express Type 2 Basic Module
Size	95 mm x 114 mm	95 mm x 125 mm
VGA	Yes	Yes
LCD	TTL or LVDS	Up to 2x single LVDS or dual-channel LVDS
SDVO	N/A	Up to 2 SDVO (shared with PCIe x16)
Expansion	PCI & ISA	PCIe & PCI
Ethernet	10/100 Mbps	10/100/1000 Mbps
USB	Up to 4 ports	Up to 8 ports
SATA	Up to 2 Ports (ETX 3.0 only)	Up to 4 SATA
IDE	Up to 2 channels	Up to 1 channel

COM Express Pinout Types

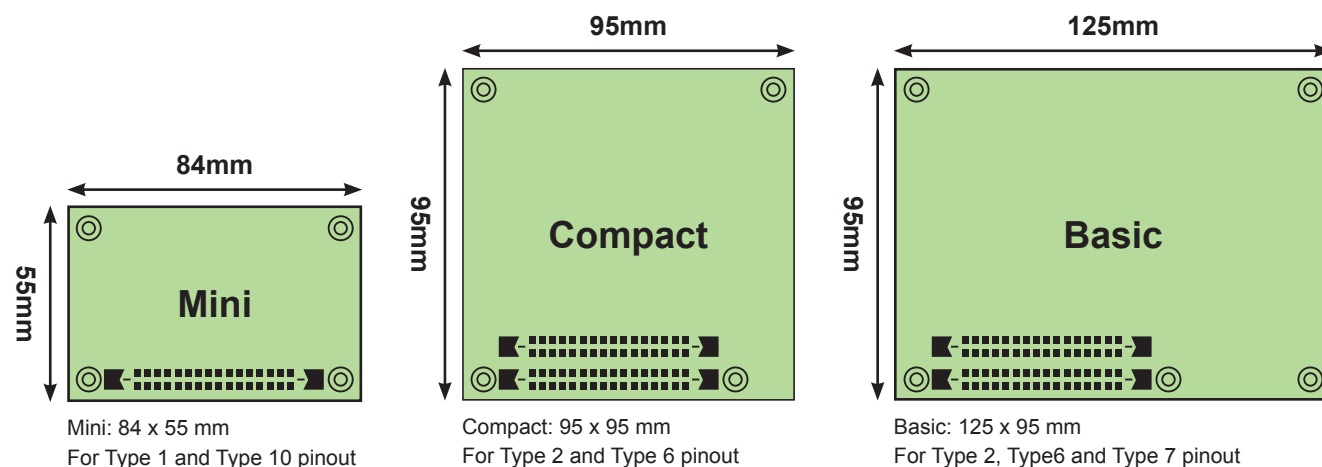
COM Express, a computer-on-module (COM) form factor, is a highly integrated and compact PC that can be used in a design application much like an integrated circuit component. Each COM Express Module COM integrates core CPU and memory functionality, the common I/O of a PC/AT, USB, audio, graphics (PEG), and Ethernet. All I/O signals are mapped to two high density, low profile connectors on the bottom side of the module.

Types

The COM Express specification is hosted by PICMG. There are seven different pinouts defined in the specification. The most common used pinouts are Type 6 and Type 10 in the revision 2.0 of the COM Express specification. The latest pinouts added in the revision 3.0 of the COM Express specification is Type 7.

Types	PCIe Lanes	PEG/SDVO	Display	SATA	1GbE/10GbE	PCI	IDE	USB 2.0	USB 3.1 Gen 1
Type 1	Up to 6	×	VGA, LVDS	4	1/0	×	×	8	×
Type 10	Up to 4	/1	DDI, LVDS	2	1/0	×	×	8	2
Type 2	Up to 22	1/2	VGA, LVDS, PEG, SDVO	4	1/0	✓	×	8	×
Type 6	Up to 24	1/	VGA, LVDS, PEG, 3 x DDI	4	1/0	×	×	8	4
Type 7	Up to 32	2	NA	2	1/4	×	×	4	4

The Specification Defines Three Module Sizes:



◆ Pinout Comparison of Type 10

Type 10 Pinout

B	LPC SMB I ² C	2 ports SATA	2 ports USB 3.1 Gen 1	Audio	8 ports USB 2.0	4 lanes PCIe x1	Reserve Pin	DDI		5VSB	12V	
A	GBE							LVDS A	Others	SPI	2 ports serial	12V

◆ Pinout Comparison of Type 6 and Type 7

Type 6 Pinout

D	4 ports USB 3.1 Gen 1/2.0	2 lanes PCIe x 1	DDI 1	DDI 2	DDI 3	PCIe x16					12V	
C												

B	LPC SMB I ² C	4 ports SATA	Audio	8 ports USB 2.0	6 lanes PCIe x1	LVDS B	VGA	5VSB	12V	
A	GBE					LVDS A	Others	SPI	2 ports serial TPM	12V

Type 7 Pinout

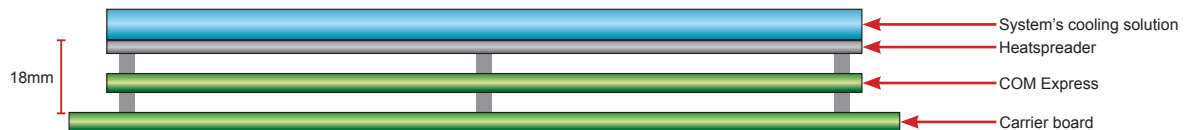
D	4 ports USB 3.1 Gen 1/2.0	2 lanes PCIe x 1	4 x 10GbE LAN			PCIe x16					12V	
C												

B	LPC/eSPI	2 ports SATA	2 lanes PCIe x1	Reserve Pin	4 ports USB 2.0	2 lanes PCIe x1	6 lanes PCIe x1	4 lanes PCIe x1	NCSI	5VSB	12V	
A	GBE								Others	SPI	2 ports serial TPM	12V

■ Installing the COM Express

◆ Thermal Design of COM Express

COM Express definition includes a heatspreader that acts as a thermal interface between the COM Express module and the system's cooling solution. The height of a COM Express module, including the heatspreader, has been defined as 18 mm and covers the complete area of the COM Express. All heat generating components are thermally conducted to the heatspreader in order to avoid hot spots.

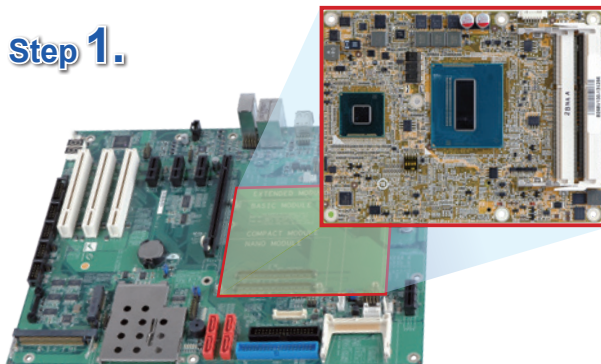


1. Installing the COM Express

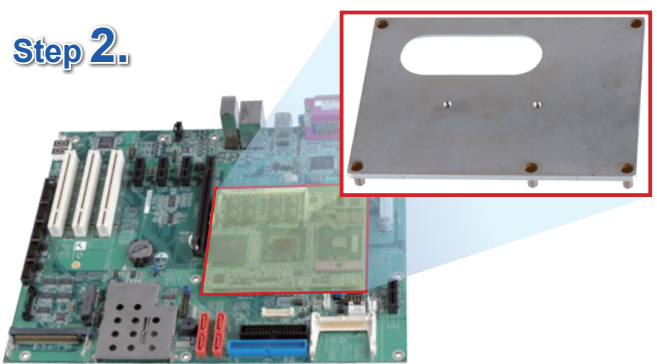
Firmly insert the COM Express into the COM Express socket.

2. Installing the heatspreader

A heatspreader must be installed on the COM Express. Thermal pads must be smeared on the lower side of the heatspreader before it is mounted on the COM Express. Heatspreaders are mounted on the CPU, Northbridge and Southbridge chipsets to ensure the operating temperature of these chips remain low.



▲ Installing the COM Express



▲ Installing the heatspreader

3. Installing the system's cooling solution

In addition to the heatspreader, COM Express needs another heatsink or other thermal solution to cool down the COM Express.

Before installing the system's cooling solution, make sure that you have properly applied thermal interface material to the heatspreader.

Operating Temperature

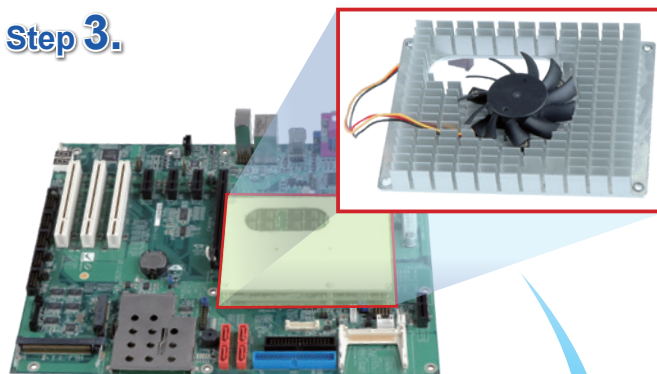
The maximum and minimum operating temperatures for the standard COM Express are listed below.

- Minimum Operating Temperature: 0°C (32°F)
- Maximum Operating Temperature: 60°C (140°F)

WARNING:

Never run the embedded module without the heat sink. The heatspreader plate shipped with the COM Express acts as a thermal interface between the module and the heat sink. The heat sink must be installed on the heatspreader plate to maintain proper operating temperatures. Make sure to maintain the heatspreader plate temperature under 60°C in operation.

Step 3.



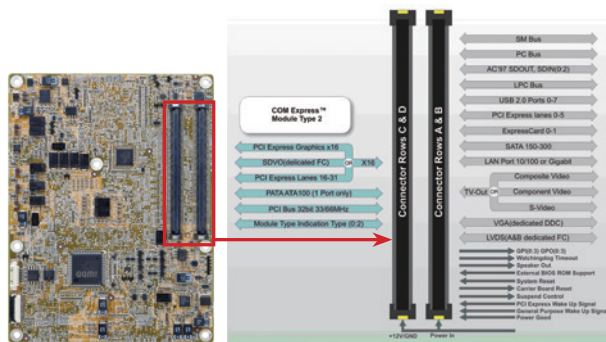
▲ Installing the system's cooling solution



Benefits

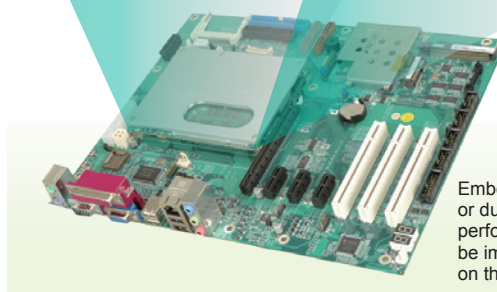
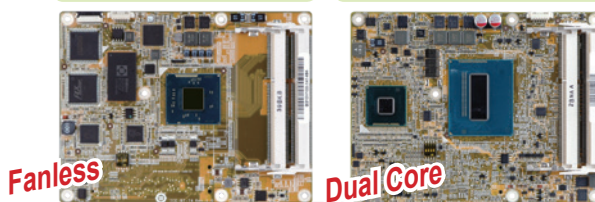
A: High Compatibility

- IEI ICE modules follow standard COM Express design guide and have high compatibility
- ICE modules are compatible with all baseboards compliant with COM Express specifications
- Complete performance level for customers' choice



Embedded Fanless

Performance Dual Core

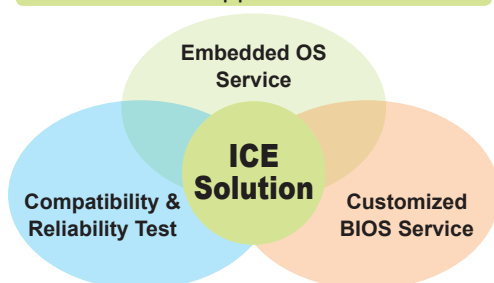


Embedded, single core, or dual core complete performance level could be immediately applied on the baseboard.

B: Strong Support

- With strong R&D resources, IEI provides customers innovative leading products and service to drive successful experience.
- IEI provides complete turnkey solutions from hardware, software and industrial BIOS design support.

R&D Support Service



R&D Support Team

ME & ID Team

- CNC, laser cutting
- Die-cast, punch-press
- Plastic hard-tooling
- Rapid prototyping
- NEMA4/IP65 enclosure
- Customization
- Accessories: VESA arm, rack mount, DIN-rail mount kit

SW Team

- BIOS: Phoenix/Award/AMI
- Windows® CE driver
- Digital Signage SW
- HMI SW

Intelligent Team

- Automobile devices SW, HW
- System integration
- Test and verification

Project Management Team

EE Team

- Schematic design
- Power circuit plan
- Layout design

DQV Team

- Product validation
- Environmental testing
- Compatibility testing
- Reliability testing/prediction

Medical Team

- Medical products SW, HW
- IC design, test and verification

Support Team

- EMC/Safety service (FCC, UL, CSA, CE...)
- Key parts/Component verification team