

Mini-ITX Addendum Version 1.1
To the microATX Motherboard
Interface Specification Version 1.2

April 2009

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Revision History

Revision Number	Description	Revision Date
1.1	Minor sentence structure corrections made. Title changed to: 'Mini-ITX Addendum Version 1.1 To the microATX Motherboard Interface Specification Version 1.2' to reflect full name of mATX document name.	Feb, 2009
1.0	Initial release.	Feb, 2009

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1 *Executive Summary*

The Mini-ITX addendum to the *microATX Motherboard Interface Specification* details the use of the Mini-ITX form factor standard, developed by Via Technologies Inc, for compatibility with Intel based platforms. This document defines only the specific features in Intel's Mini-ITX based platforms that differ from those of microATX and should be used in conjunction with the governing microATX specification.

A smaller motherboard layout offers system developers the ability to create new and innovative system designs. This smaller version of microATX allows and encourages developers to build within the sub 8 Liter chassis volume for a variety of new applications.

Described within this document are requirements and characteristics of a Mini-ITX motherboard, so that a motherboard may function and fit appropriately when paired with a **Mini-ITX** chassis. Beyond this, it does not detail processor, memory, graphics or other system features required to meet the Mini-ITX form factor. These items are left to system designers and integrators within the guidelines of the microATX specification.

Table 1. Mini-ITX Addendum Feature Summary

Feature	Benefit
170mm x 170mm motherboard size	Smaller board size enables a smaller system size
Standard microATX 1.2 or later I/O panel	I/O shield does not need to be retooled. Motherboard can be used in a ATX or in a microATX chassis
Same motherboard mounting holes as in microATX	Compatible with microATX chassis. No need to retool current chassis
Current processor and future processor technologies	Chassis will work for multi generation socketed processor technology

This addendum does NOT define:

- Specific power supply form factors
- Thermal design guidance to chassis vendors (covered in TASC guide listed in Reference Documents)

The Mini-ITX addendum to the microATX Specification is a public document intended for widespread application in many types of systems. It is available through a public website located at:

<http://www.formfactors.org>

1.1 Terminology

Term	Description
SFF (Small form factor)	8-19 liter chassis (IDC* definition)
Ultra SFF (uSFF)	4-8 liter chassis (IDC* definition)
Tiny PC	Less than 4 liter chassis (IDC* definition)

1.2 Reference Documents

The following reference documents are posted on the public web site at <http://www.formfactors.org>

Document
microATX Motherboard Interface Specification Version 1.2
SFX 12V Power Supply Design Guide
TFX 12V Power Supply Design Guide
Thermally Advantaged Small Chassis OR TASC [pronounced 'task'] (Thermal Design Guide)

1.3 Benefits to Users

Trends in the industry indicate that users require a smaller and lower cost solution for their PC needs. The smaller board size and lower height keep out zones enable a reduced sized chassis as it sits on the user's desk, is mounted on a display, or comes in any other innovative form factor. These changes also enable a PC to be designed into various aesthetic shapes and sizes.

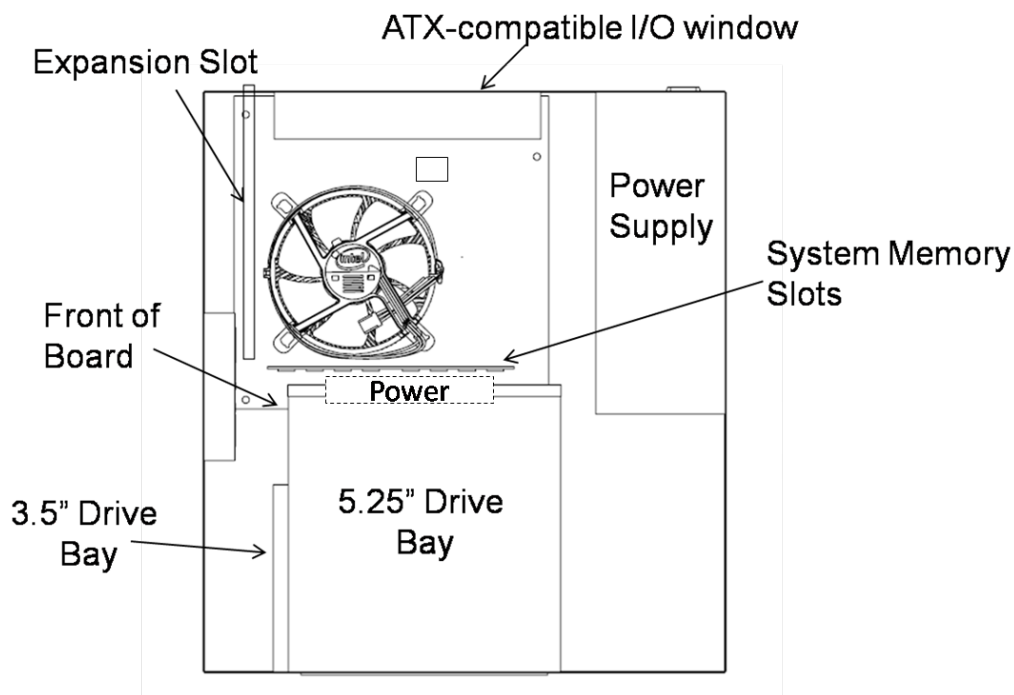
1.4 Benefits to Manufacturers

By manufacturing to this Mini-ITX specification, motherboard manufacturers and chassis manufacturers can guarantee a better compatibility between their products. They can also capitalize on the benefits of a reduction in total system costs because of a reduced system size. This specification allows chassis vendors to design their product targeting the soldered down, low power processors all the way up to high performance, multi-core processors. It eliminates the need for them to design targeted chassis for each platform.

2 *Layout*

This section describes the mechanical specification of the Mini-ITX form-factor motherboard. Size, mounting hole placement, connector placement, and component height constraints are specified. System components such as hard drives, disk drives, and power supplies are not specified, however it is generally recommended to consider what would facilitate assembly, as well as not place components such that they block fan inlets. An example layout is depicted in Figure 1.

Figure 1. Example Mini-ITX Layout



Note: Depicted system is approximately 8L with standard desktop components.

2.1 Board dimensions

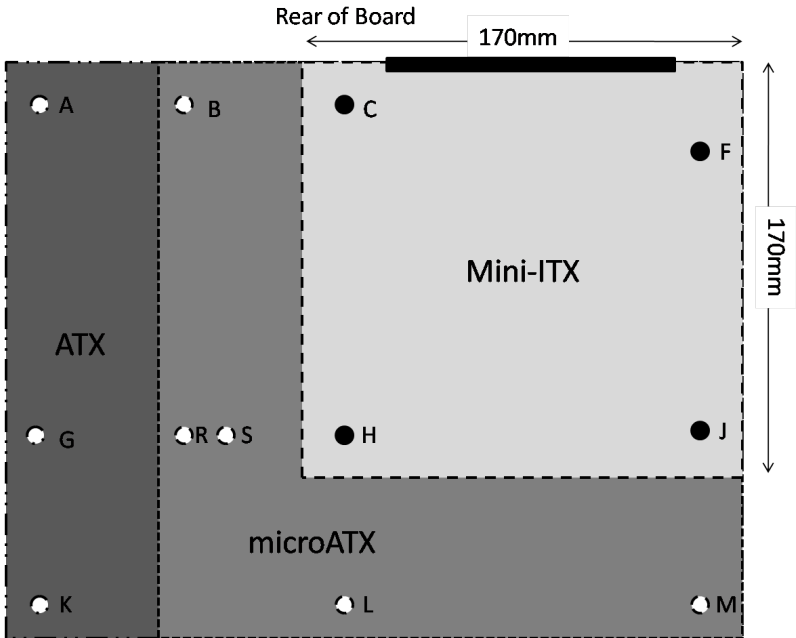
Table 2. Compares ATX, microATX, and Mini-ITX board dimensions

Dimension	ATX	microATX	Mini-ITX
Maximum width Allowable	305mm	244mm	170mm
Maximum depth Allowable	244mm	244mm	170mm

2.2 Mounting Hole Placement

Mini-ITX utilizes a subset of ATX mounting holes. To avoid damage to traces on motherboards, chassis standoffs in any locations not specified should be removable or not implemented at all. See Figure 2 for relative hole location compared to ATX and microATX motherboards.

Figure 2. ATX, microATX, and Mini-ITX Mounting Holes



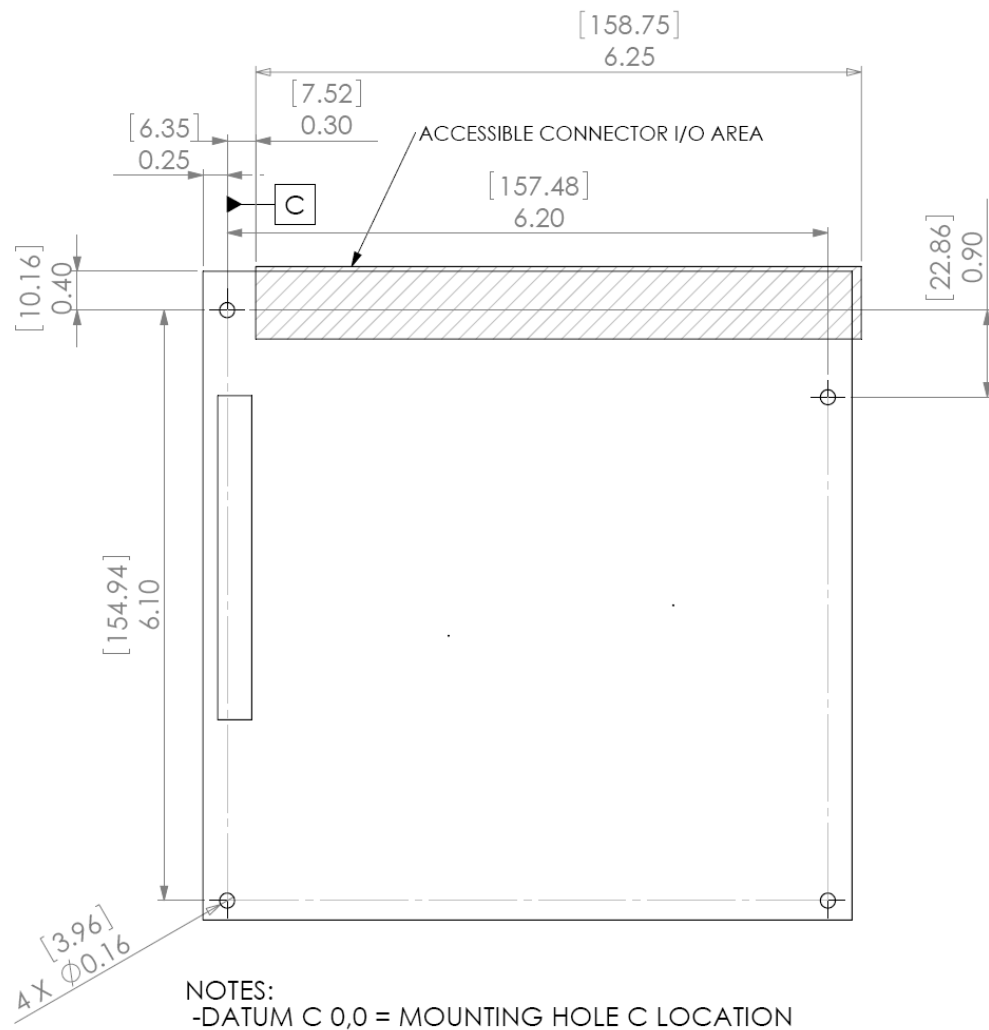
Not to scale

- NOTE:** Board is shown oriented with the rear of the board towards the top.
- NOTE:** The lighter portion indicates the approximate region of the Mini-ITX form factor.

Table 3. Motherboard Mounting Hole Locations

Form Factor	Mounting Hole Locations
Mini-ITX	C,F,H,J
microATX	B,C,F,H,J,L,M,R,S
ATX	A,C,F,G,H,J,K,L,M

Figure 3. Mini-ITX Board Diagram



2.3 Connector placement

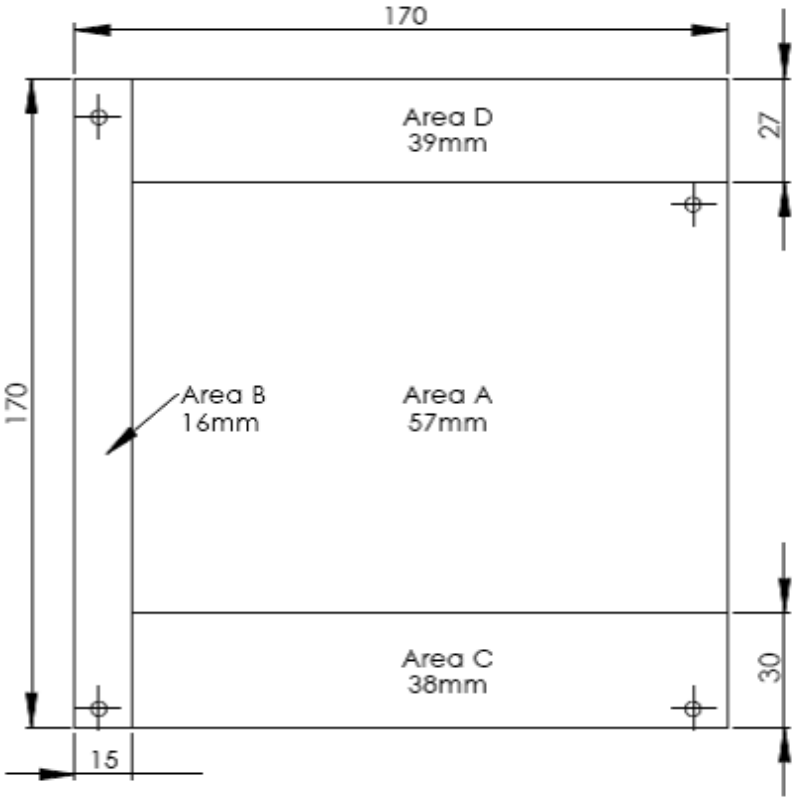
All connector locations as well as allowable placement area for I/O connectors on the back panel are described and can be found in the microATX interface specification.

2.4 Height Constraints

2.4.1 Primary (Component) Side Height Constraints

One major advantage of the Mini-ITX form factor is its backward-compatibility with the ATX specification. The Mini-ITX motherboard can be installed in any ATX chassis. Figure 4 shows the required **maximum component height constraints** for the components on the PC board. For full compliance with Mini-ITX, and to prevent interference with the chassis structure, power supply, or peripherals, the motherboard components should not exceed the height limit in each zone defined. Similarly, compliant power supplies, peripherals, and chassis features should not extend into the motherboard component area.

Figure 4. Mini-ITX Maximum Component Height Restrictions



Notes:

- All dimensions in the above figure are in millimeters (mm).
- The 57mm height restriction in Area A applies to the PC board component height. The actual height of the chassis should include any dynamic excursion considerations for shipping as well as needs to facilitate alternative cooling solutions or airflow considerations.
- For Intel boxed processor fan heat sink, it is strongly recommended not to place components between fan inlet and chassis side vent by leaving space between chassis wall and area A open.
- The component height requirement assumes a motherboard thickness of 1.57 mm (0.062”).

2.4.2 Secondary (Bottom/Solder) Side Height Constraints

No height restraints on secondary side are added or removed from what is specified in the microATX Motherboard Interface Specification.

3 *Power Supply Information*

Provided the very different needs of the platforms that fit in the small desktop form category, this specification does not attempt to define a standard for the power supply to match with the Mini-ITX motherboard specification. Instead it recommends that manufacturers consider using a:

- SFX, TFX or FlexATX are available power supply form factor for chassis greater than 5 liters
- External power adapter for chassis less than 5 liters

Refer to the microATX Motherboard interface Specification for information on power supply requirements.