Design Guide
for Intel ATX Motherboard
I/O Implementations

Version 1.1

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Version 1.1, March 1998

Revision History

Revision 1.0 to 1.1	
1.0	Initial issue
1.1	Core I/O implementation design updates

Contents

Figures

1. Overview

This design guide is intended to help chassis vendors and systems integrators in developing I/O shield solutions based on Intel ATX and microATX form factor motherboards. The guide shows several core designs of connector position layouts but does not provide design details. The designs are intended to be used as reference.

The ATX specification (V2.01, February 1996) and the microATX specification (V1.0, December 1997) describe a back panel I/O aperture, within which any number of different I/O connector configurations may be offered. Toward the back of the chassis, the specifications define a stacked I/O area that is 6.25 inches (158.75mm) wide by 1.75 inches (44.45mm) tall. This area allows the use of stacked connectors on the motherboard to maximize the amount of I/O space available.

To download copies of the following related documents, visit the Web sites listed below:

- *ATX Specification*, V2.01 (see *http://www.teleport.com/~atx*)
- *microATX Motherboard Interface Specification,* V1.0 (see *http://www.teleport.com/~microatx*)

2. Back Panel I/O Aperture Location and Size

Version 2.01 of the ATX Specification specifies the size, location, keepout zone, and other attributes of the I/O aperture. Figures 1 and 2 are taken from the ATX specification.

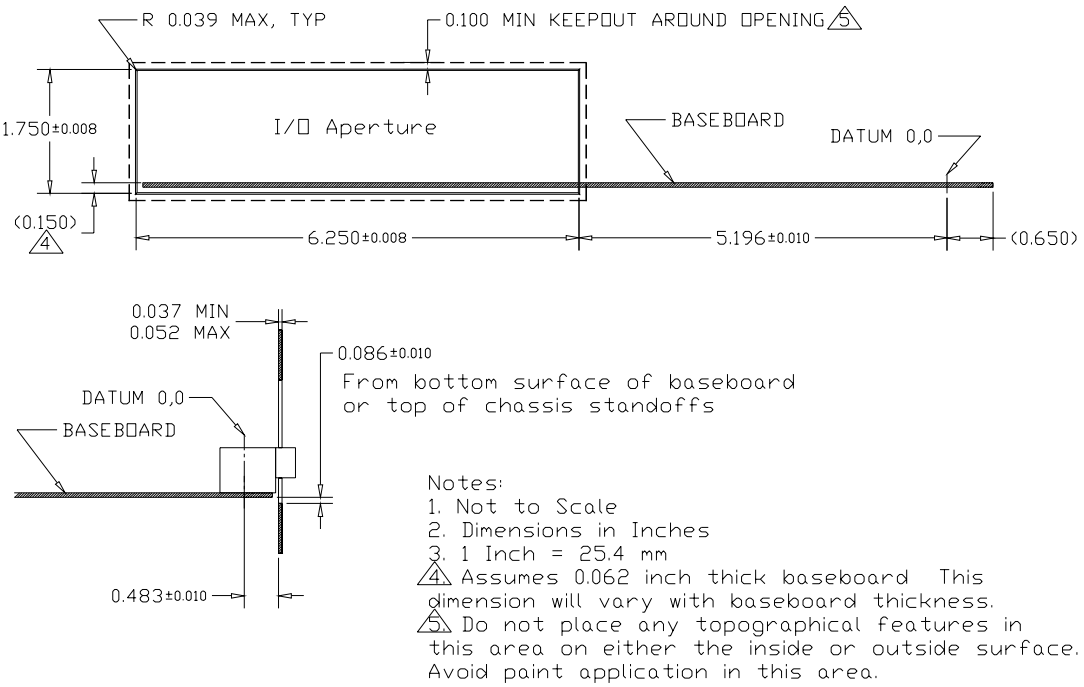

Figure 1: Chassis I/O Aperture Requirements (back and side view—Datum 0,0 on PBA)

Note: The term “baseboard” in Figure 1 means the same as “motherboard” used elsewhere in this document.

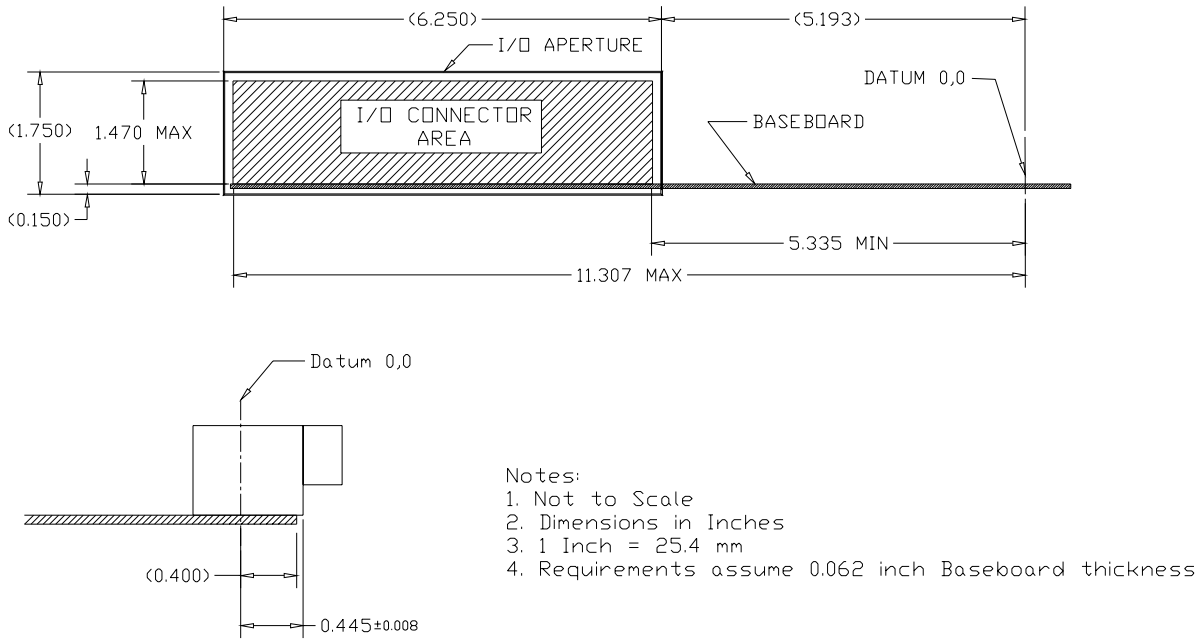

Figure 2: Motherboard I/O Connector Location Recommendation (back and side view—Datum 0,0 on PBA)

Note: The term “baseboard” in Figure 2 means the same as “motherboard” used elsewhere in this document.

3. Core I/O Shield Designs for Intel Motherboards

I/O shields for recent and current Intel motherboards are based on several core designs. Individual motherboards can use any connector subset from the core designs. This allows progressive tooling to be used to produce the widest range of shields by simply inserting or removing the required punches. For example, the tooling for core design #1 can be used to make a motherboard with all the connectors shown in Figure 3. A second motherboard without onboard audio can use the same tooling for core design #1 and simply remove the punches for the audio and MIDI ports.

Figures 3 through 8 show full-featured core designs used for recent and current I/O shields. The measurements shown indicate the centerline of each connector as measured from the reference point at the lower right edge of the I/O aperture. The letters used in the figures designate the following connectors:

Letter	Connector Description	Manufacturer's P/N
A	PS/2 Stacked Mouse/Keyboard (DIN)	AMP 84405-1, FOXCONN/HON HAI MH11067-D2, or equivalent
B	Stacked RJ-45/Dual Stack USB	AMP 97-8470-01-2 or equivalent
C	Stacked Parallel (25 Pin D-Sub)	AMP 787812-1, FOXCONN/HON HAI DM11356-R1, or equivalent
D	Serial (9 Pin D-Sub)	AMP 787650-4, FOXCONN/HON HAI DT10126-R9, or equivalent
E	VGA (High Density 15 Pin D-Sub)	FOXCONN/HON HAI DZ11A36-R9, FOXCONN/HON HAI DZ11A36-B9, or equivalent
F	MIDI/Game Port (15 Pin D-Sub) WITH 3 AUDIO	AMP 787877-1, FOXCONN/HON HAI DM11256-J2, or equivalent
G	PS/2 Mouse/Keyboard CIRCULAR DIN	AMP 749266-1, FOXCONN/HON HAI MH11067-H1, or equivalent
H	Parallel (25 Pin D-Sub)	FOXCONN/HON HAI DT11326-R9 or equivalent
I	Dual Stack USB	FOXCONN UB1112C-D1, MOLEX 87525-0001, or equivalent
J	RJ-45 - ENET/LED	AMP 569564-1 or equivalent
K	RCA Jack	HOSIDEN AMERICA CORP. JPJ1225-01-040, or equivalent
L	S-VIDEO Circular Din	AMP 786728-1, FOXCONN/HON HAI MH11047-H1, MOLEX 87220-1411, or equivalent
M	Stacked Serial (9 Pin D-Sub)	AMP 787904-1, FOXCONN/HON HAI DM10156-73 & DM10153-73, or equivalent
N	Stacked Parallel/Serial (25 Pin D-Sub/9 Pin D-Sub)	AMP 750433-1, FOXCONN/HON HAI DM11393-65 & DM 11396-65, or equivalent
O	RJ-45 - ENET/LED	AMP 406549-4 or equivalent
P	Stacked Audio	SMK ELECTRONICS LGA6507-0200 or equivalent
Q	Audio	FOXCONN/HON HAI JA1333L-102 or equivalent

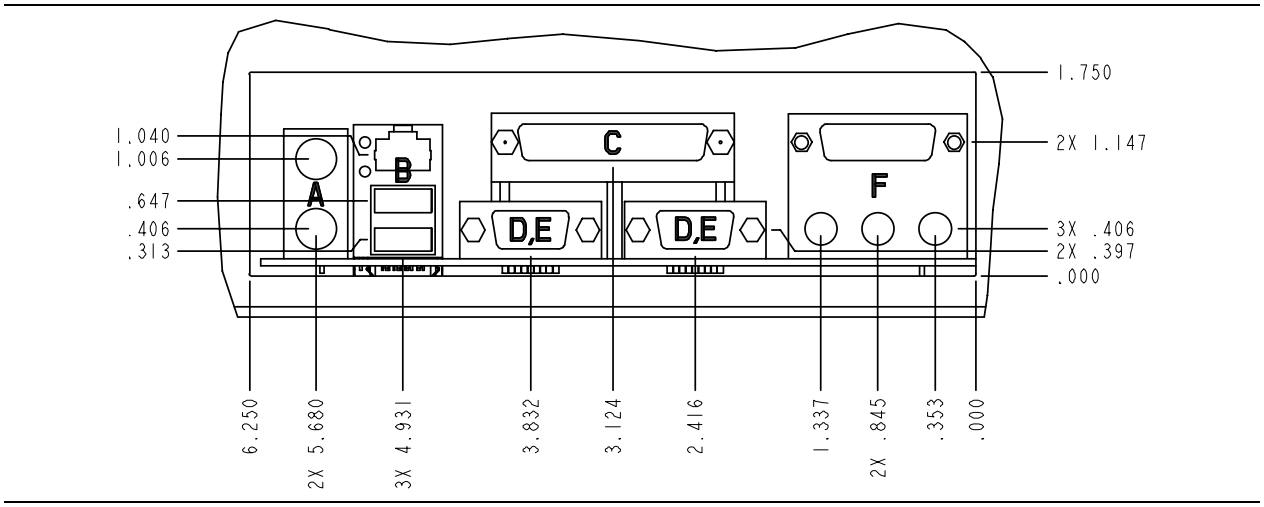

Figure 3: Core Design #1

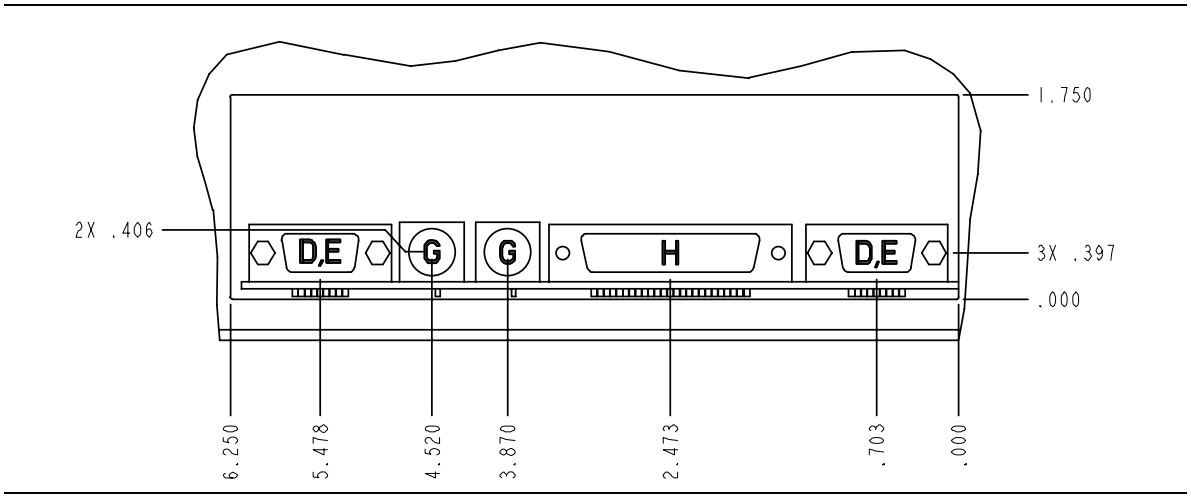

Figure 4: Core Design #2

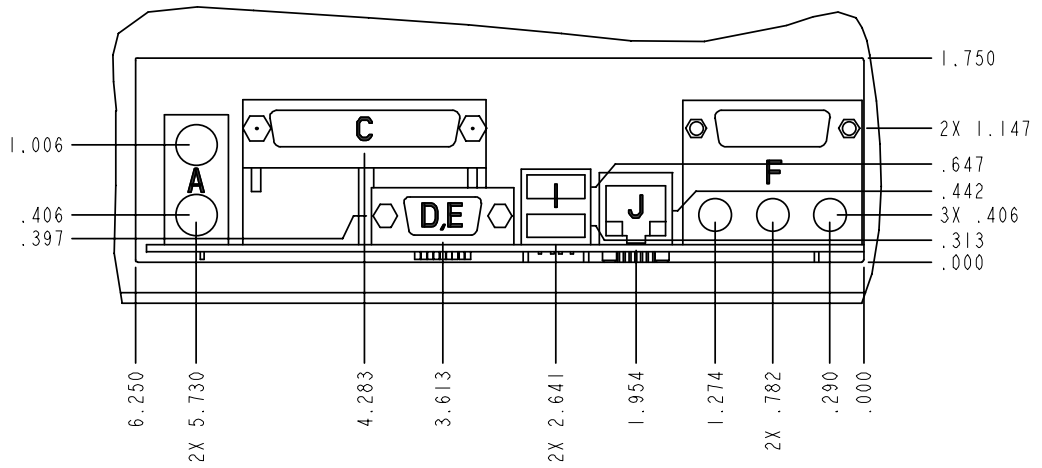

Figure 5: Core Design #3

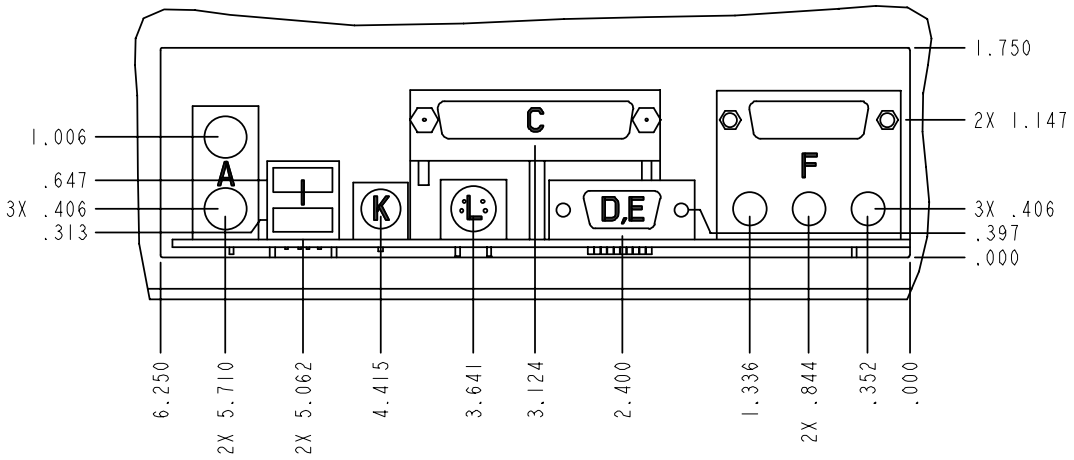

Figure 6: Core Design #4

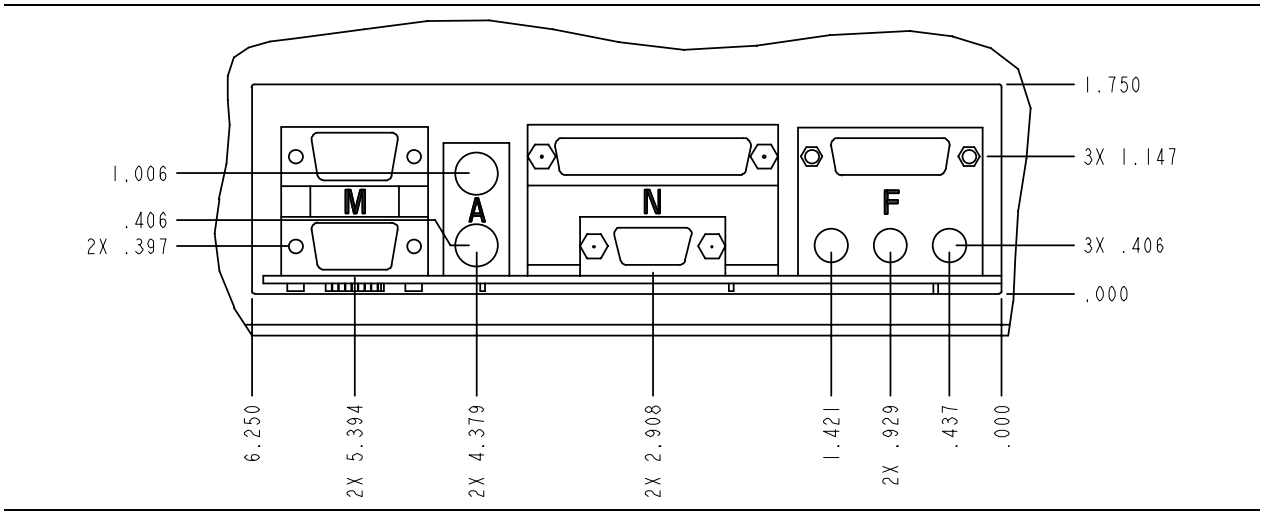

Figure 7: Core Design #5

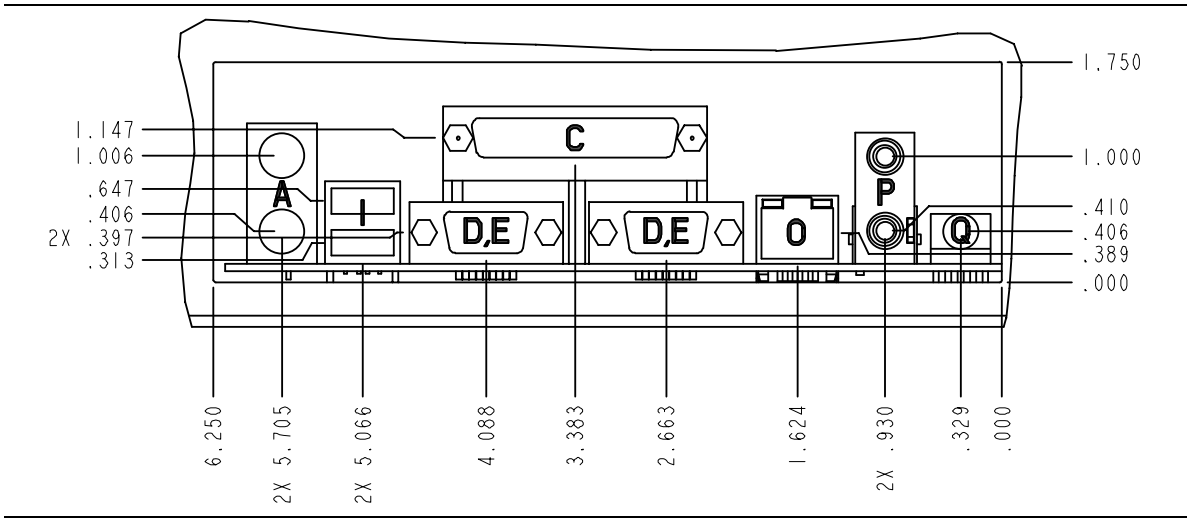

Figure 8: Core Design #6

4. Intel Motherboard Designs

The table below lists examples of Intel motherboards that use the various core designs. As you review the list, note that the connector placement of Core Design #1 has been adopted by the majority of these product development teams.

Intel Motherboard Design	Core Design Number
AL440LX	subset of Core Design #1
AN430TX	subset of Core Design #1
MA430VX	subset of Core Design #1
MP440BX	Core Design #1
MU440EX	subset of Core Design #1
PD440FX	subset of Core Design #1
SE440BX	subset of Core Design #1
TC430HX	subset of Core Design #1
TE430VX	subset of Core Design #1
VS440FX	subset of Core Design #1
Adv ML	Core Design #2
Performance/AU	Core Design #2
PR440FX	Core Design #3
AG430HX	Core Design #4
Advanced/ATX	Core Design #5
DK440LX	Core Design #6