Industry Standard Module (ISM™) SPECIFICATION

Revision 1.0

August 25, 2009

IMPORTANT INFORMATION AND DISCLAIMERS

The Small Form Factor Special Interest Group, Inc. (SFF-SIG) does not make any warranties with regard to the Industry Standard Module (ISM) ™ specification ("Specification") and in particular, neither warrants nor represents that this specification nor any products made in conformance with it will work in the intended manner. Nor does the SFF-SIG assume responsibility for any errors that the Specification may contain or have any liabilities or obligations for damages including, but not limited to, special, incidental, indirect, punitive, or consequential damages whether arising from or in connection with the use of this specification in any way.

No representation or warranties are made that any product based in whole or part on this Specification will be free from defects or safe for use for its intended purposes. Any person making, using, or selling such product does so at his or her own risk.

THE USER OF THIS SPECIFICATION HEREBY EXPRESSLY ACKNOWLEDGES THAT THE SPECIFICATION IS PROVIDED "AS IS", AND THAT THE SFF-SIG MAKES NO REPRESENTATIONS, EXTENDS ANY WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, ORAL, OR WRITTEN, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE, OR WARRANTY OR REPRESENTATION THAT THE SPECIFICATION OR ANY PRODUCT OR TECHNOLOGY UTILIZING THE SPECIFICATION OR ANY SUBSET OF THE SPECIFICATION WILL BE FREE FROM ANY CLAIMS OF INFRINGEMENT OF ANY INTELLECTUAL PROPERTY, INCLUDING PATENTS, COPYRIGHT AND TRADE SECRETS NOR DOES THE SFF-SIG ASSUME ANY RESPONSIBILITIES WHATSOEVER WITH RESPECT TO THE SPECIFICATION OR SUCH PRODUCTS. THE SFF-SIG DISCLAIMS ALL LIABILITY, INCLUDING LIABILITY FOR INFRINGEMENT OF ANY PROPRIETARY RIGHTS RELATING TO USE OF INFORMATION IN THIS SPECIFICATION. NO LICENSE, EXPRESS OR IMPLIED BY ESTOPPEL, OR OTHERWISE, TO ANY INTELLECTUAL PROPERTY RIGHTS IS GRANTED HEREIN.

Designers must not rely upon the absence or characteristics of any features marked "reserved". The SFF-SIG reserves these for future definition and shall have no responsibility whatsoever for conflicts or incompatibilities arising from future changes to them.

All product names and trademarks, registered trademarks, or service marks are property of their respective owners.

Please send comments via electronic mail to *info@sff-sig.org*.
Copyright 2009 © Small Form Factor Special Interest Group, Inc.

Revision History

Revision	Issue Date	Comments
1.0	8/25/09	Initial Release

Table of Contents

Figures

1.0 Overview

This document is written for design engineers that understand the basics of small form factor single board computers. The Industry Standard Module (ISM) Specification defines a 90mm x 96mm size board describing a pure board outline and mounting hole locations without regard to bus expansion. ISM modules are small, easy-to-use, and scalable as they provide a powerful set of building blocks for a variety of different applications. Depending upon the interconnect technology, they can be stacked on top of each other to expand or customize system solutions. This reduces cost and bulk while increasing mounting and packaging options.

ISM is an umbrella concept to provide coherence to the many different boards that are available in this industry standard footprint. This concept includes:

1. Decoupling the form factor from its expansion interfaces.
2. Fitting all circuitry onboard without extending beyond the board outline.
3. Enabling flexible expansion bus and I/O connectorization.
4. Allowing form factor bus combinations that were previously undefined and unnamed.

ISM™ CPU boards can be used with x86, RISC, microcontroller or proprietary processor circuits. ISM boards can be standalone SBCs, stackable CPU boards, stackable I/O cards, and even computer-on-modules (COMs). This flexibility allows easy migration from SBCs to COMs and vice-versa, or from processor to processor, while preserving investments in mechanical designs.

ISM specifies only the board outline and mounting holes. Connector mounting locations, stacking conventions, stacking height, and power distribution are addressed in the each respective board or interconnect specification.

2.0 Organization Contact Information:

SFF-SIG
Small Form Factor Special Interest Group
2784 Homestead Road #269
Santa Clara, CA 95051 USA
Phone: +1-408-480-7900
Email: info@sff-sig.org
www.sff-sig.org

3.0 Industry Standard Module (ISM)

ISM™ is an abbreviation for Industry Standard Module™. It is a 90mm x 96mm form factor outline. The ISM Specification defines the board size, four fixed mounting holes, and flexible “expansion zones” for additional circuitry or I/O

and/or bus connectors. The fixed corner mounting holes allow re-use of enclosures without future modifications.

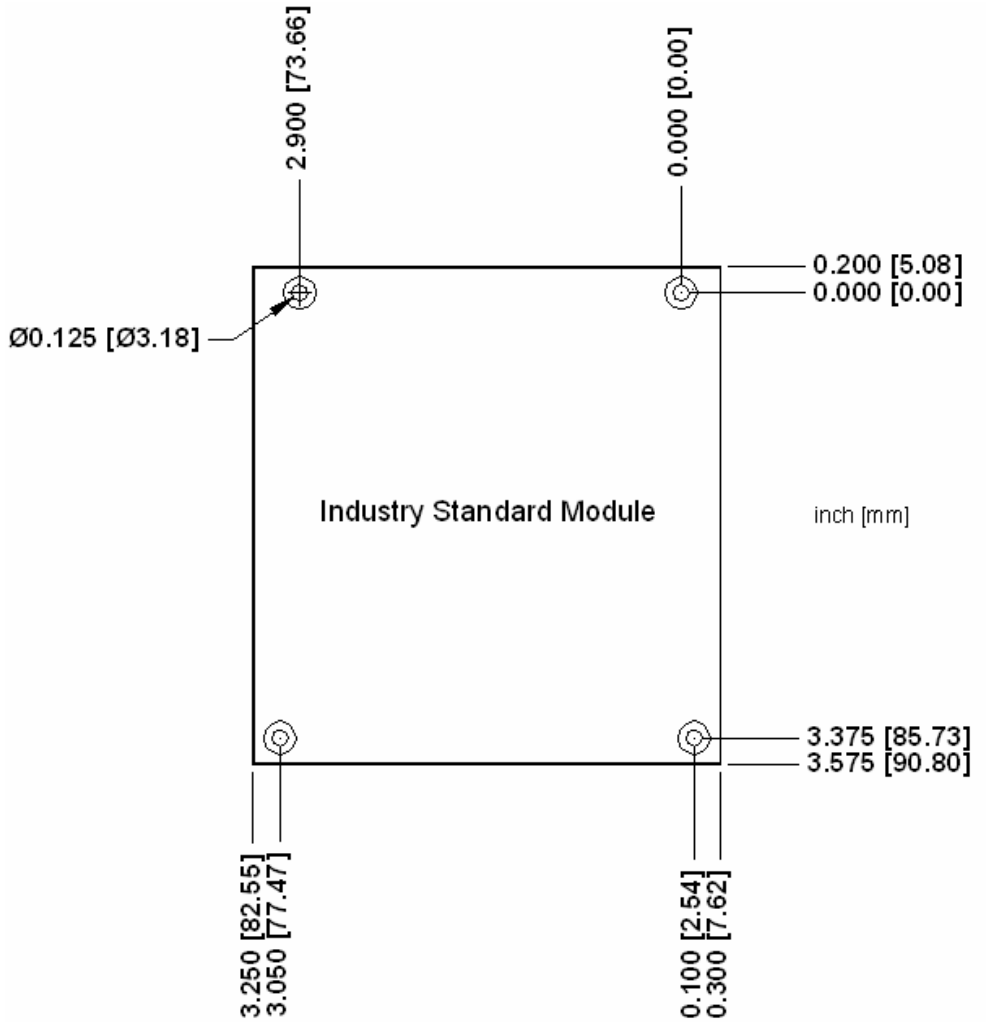

Figure 1: Physical Dimensions for an Industry Standard Module

All ISM modules maintain the same module physical dimensions and mounting holes while allowing expansion connectors of various size, location and I/O signals. This is important for efficiency and integration of standard packaging and mounting in OEM equipment so that system design and original equipment manufacturers can preserve their non recurring engineering (NRE) investment.

However, SBC manufacturers have struggled to fit modern CPU platforms onto traditional 90x96 mm modules without protruding beyond the allowed board outlines with “wings”, occupying space originally reserved for right-angle connector overhang with circuitry and vertical connectors. The ISM Specification allows, by definition, circuitry as well as bus and/or I/O connectors to be used

within these defined “expansion zones”. ISM also offers a choice of using right-angle connectors that overhang the board edges in place of the expansion zones.

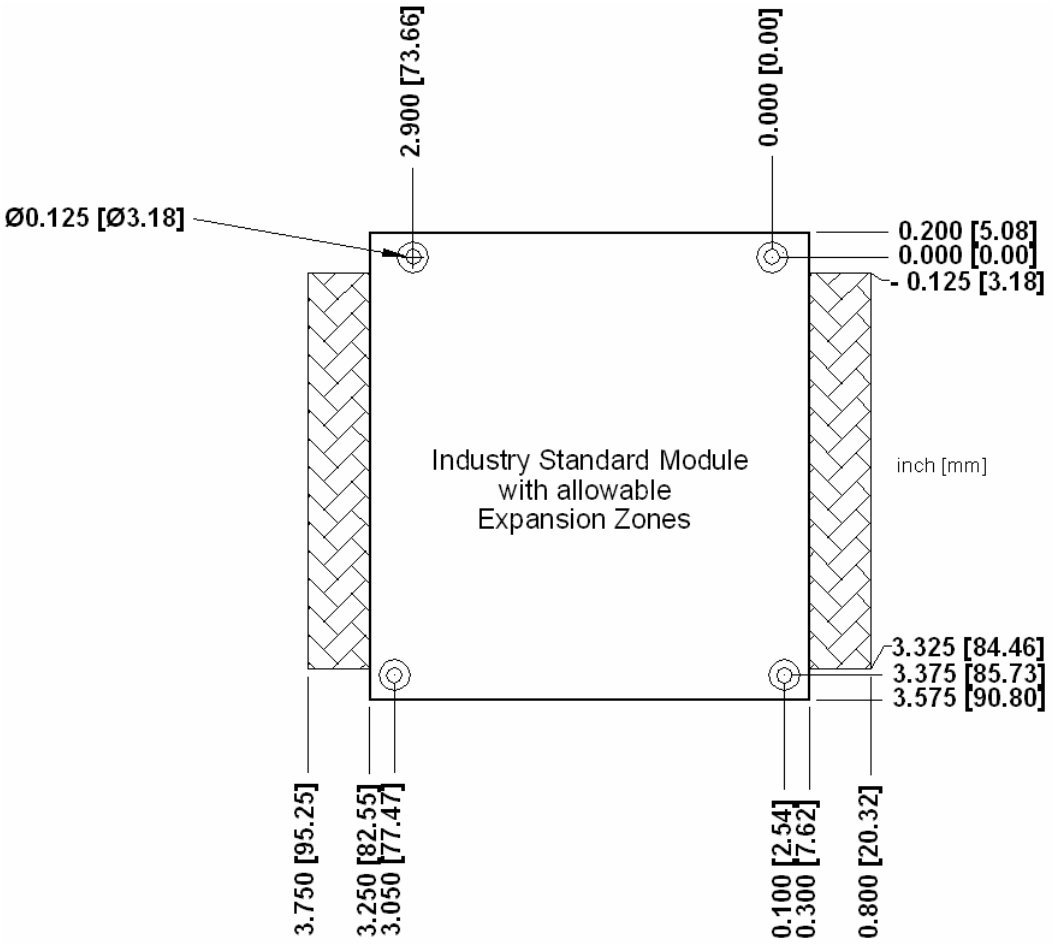

Figure 2: Dimensions for an Industry Standard Module with expansion zones

The tolerance for the dimensions for both Figure 1 and Figure 2 is ± 0.005 inches [± 0.13mm] from the reference hole on the ISM module.