This document was developed by the SFF Committee prior to it becoming the SFF TA (Technology Affiliate) TWG (Technical Working Group) of the SNIA (Storage Networking Industry Association) in 2016.

The information below should be used instead of the equivalent herein.

POINTS OF CONTACT: SFF TA TWG Chair Email: sff-chair@snia.org.
LOCATION OF SFF DOCUMENTS: http://www.snia.org/sff/specifications.

Suggestions for improvement of this specification are welcome and should be submitted to http://www.snia.org/feedback.

If you are interested in participating in the activities of the SFF TA TWG, additional information and the membership application can be found at: http://www.snia.org/sff.

SFF Committee documentation may be purchased in hard copy or electronic form.
SFF specifications are available at ftp://ftp.seagate.com/sff

SFF Committee

SFF-8086

Specification for

Mini Multilane 4X 10 Gb/s Common Elements Connector

Rev 2.6 August 31, 2018

Secretariat: SFF Committee

Abstract: This specification defines the physical interface and general performance requirements of the mating interface for the Mini Multilane Connector that is designed for use in high speed serial interconnect applications at speeds up to 10 Gb/s. One such use is as the Serial Attached SCSI Mini SAS 4i (wide compact internal connector) and Mini SAS 4X (wide compact external connector).

This specification provides a common reference for systems manufacturers, system integrators, and suppliers. This is an internal working specification of the SFF Committee, an industry ad hoc group. This is an internal working document of the SFF Committee, an industry ad hoc group.

This specification is made available for public review, and written comments are solicited from readers. Comments received by the members will be considered for inclusion in future revisions of this document.

The description of a connector in this specification does not assure that the specific component is actually available from connector suppliers. If such a connector is supplied it must comply with this specification to achieve interoperability between suppliers.

Support: This specification is supported by the identified member companies of the SFF Committee.

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EXPRESSION OF SUPPORT BY MANUFACTURERS

The following member companies of the SFF Committee voted in favor of this industry specification.

Amphenol	IBM
Applied Micro	Intel
Comax	LSI
Dell Computer	Molex
ENDL	Seagate
FCI	Shenzhen
Foxconn	Sun Microsystems
Fujitsu CPA	TE Connectivity
Hewlett Packard	Toshiba
HGST	Unisys
Hitachi Cable	

The following member companies of the SFF Committee voted to abstain on this industry specification.

Arista	JDS Uniphase
EMC	Maxtor
Emulex	Picolight
Finisar	Sumitomo
Infineon	Vitesse Semiconductor

The user's attention is called to the possibility that implementation to this Specification may require use of an invention covered by patent rights. By distribution of this Specification, no position is taken with respect to the validity of this claim or of any patent rights in connection therewith. Members of the SFF Committee, which advise that a patent exists, are required to provide a statement of willingness to grant a license under these rights on reasonable and non-discriminatory terms and conditions to applicants desiring to obtain such a license.

Change History:

April 16 2011: Editorial revision to incorporate 2011 titling and review content for consistency prior to being submitted for EIA standardization.

March 14 2013: Letter ballot for EIA-975 distributed for approval, and specification re-classified as Expired. Minor editing changes made as requested.

April 25, 2015: Revised/Updated Table 6-1 C08 between the contact pads on the Free (Plug) Paddle Card to reflect the larger gap approved and specified by later designs/manufacturing tolerances that maintain the integrity of the design.

Rev 2.6 (August 31, 2018)

- Document to be withdrawn from EIA; other than the changes to the header and cover page, no content or formatting changes have been made since Rev 2.5 of this document.

Foreword

The development work on this specification was done by the SFF Committee, an industry group. The membership of the committee since its formation in August 1990 has included a mix of companies which are leaders across the industry.

When 2 1/2" diameter disk drives were introduced, there was no commonality on external dimensions e.g. physical size, mounting locations, connector type, connector location, between vendors.

The first use of these disk drives was in specific applications such as laptop portable computers and system integrators worked individually with vendors to develop the packaging. The result was wide diversity, and incompatibility.

The problems faced by integrators, device suppliers, and component suppliers led to the formation of the SFF Committee as an industry ad hoc group to address the marketing and engineering considerations of the emerging new technology.

During the development of the form factor definitions, other activities were suggested because participants in the SFF Committee faced more problems than the physical form factors of disk drives. In November 1992, the charter was expanded to address any issues of general interest and concern to the storage industry. The SFF Committee became a forum for resolving industry issues that are either not addressed by the standards process or need an immediate solution.

Those companies which have agreed to support a specification are identified in the first pages of each SFF Specification. Industry consensus is not an essential requirement to publish an SFF Specification because it is recognized that in an emerging product area, there is room for more than one approach. By making the documentation on competing proposals available, an integrator can examine the alternatives available and select the product that is felt to be most suitable.

SFF Committee meetings are held during T10 weeks (see www.t10.org), and Specific Subject Working Groups are held at the convenience of the participants. Material presented at SFF Committee meetings becomes public domain, and there are no restrictions on the open mailing of material presented at committee meetings.

Most of the specifications developed by the SFF Committee have either been incorporated into standards or adopted as standards by EIA (Electronic Industries Association), ANSI (American National Standards Institute) and IEC (International Electrotechnical Commission).

If you are interested in participating or wish to follow the activities of the SFF Committee, the signup for membership and/or documentation can be found at:
www.sffcommittee.com/ie/join.html

The complete list of SFF Specifications which have been completed or are currently being worked on by the SFF Committee can be found at:
ftp://ftp.seagate.com/sff/SFF-8000.TXT

If you wish to know more about the SFF Committee, the principles which guide the activities can be found at:
ftp://ftp.seagate.com/sff/SFF-8032.TXT

Suggestions for improvement of this specification will be welcome. They should be sent to the SFF Committee, 14426 Black Walnut Ct, Saratoga, CA 95070.

SFF Committee --

Mini Multilane 4X Common Elements Connector

1. Scope

This specification defines the terminology and physical requirements for the mating interface and physical characteristics of the Mini Multilane Connector. The dimensions specified apply to the various sizes of the family, which covers a variety of circuit sizes, see SFF-8087 Mini Multilane Unshielded Connector and SFF-8088 Mini Multilane Shielded Connector.

Fibre Channel, SAS, and other standards define requirements on the characteristic impedance and ability to transmit multi-gigabit signals for cable assemblies and backplanes. When this connector is used in such an interconnect, it is subject to these requirements.

2. References

The SFF Committee activities support the requirements of the storage industry, and it is involved with several standards.

2.1 Industry Documents

The following interface standards and specifications are relevant to this Specification.

- T10/1601D SAS 1-1 (Serial Attached SCSI - 1.1)
- INCITS 352:2002 FC-PI Fibre Channel Physical Interface
- INCITS 404:200x FC-PI-2 Fibre Channel Physical Interface -2
- T11/1625D FC-PI-3 Fibre Channel Physical Interface -3
- IEEE 802.3z Gigabit Task Force
- InfiniBand IBTA Spec
- SFF-8410 High Speed Serial Testing for Copper Links
- INF-8074i SFP (Small Formfactor Pluggable) Transceiver
- SFF-8075 PCI Card Version of SFP Cage

2.2 SFF Specifications

There are several projects active within the SFF Committee. The complete list of specifications which have been completed or are still being worked on are listed in the specification at ftp://ftp.seagate.com/sff/SFF-8000.TXT

2.3 Sources

Those who join the SFF Committee as an Observer or Member receive electronic copies of the minutes and SFF specifications (http://www.sffcommittee.com/ie/join.html).

Copies of ANSI standards may be purchased from the InterNational Committee for Information Technology Standards (http://tinyurl.com/c4psg).

Copies of SFF, ASC T10 (SCSI), T11 (Fibre Channel) and T13 (ATA/SATA) standards and standards still in development are available on the HPE version of CD_Access (http://tinyurl.com/85fts).

CONTENTS

FIGURES

TABLES

3. General Description

The 0.8 mm connection system of the Mini Multilane Connector is based on industry-proven card edge style contacts, which mate with a single wipe, and are very difficult to damage.

The mating interfaces of paddle card to receptacle body and receptacle body to circuit board are common between SFF-8087 Mini Multilane 4X Unshielded Connector and SFF-8088 Mini Multilane 4X Shielded Connector.

The shell is mounted separately to the body so that the stress imposed by insertion and removal of the cable plug does not affect the signal/body solder joints.

This connector system was designed to satisfy the needs for gigabit serial data transmission applications where signals have rise times typically in the range of 100 ps over a nominal 100 ohm differential balanced copper link. Design goals were Minimization of crosstalk and Minimum transmission line impedance discontinuity across the connector interface at speeds of up to 10 Gb/s on both rows of contacts.

The transmission line impedance of the connector itself (not including the termination interface to the wire or board) matches the electrical bulk cable within the tolerances allowed for the bulk cable. This connection scheme may be used in multiple places within a cabling environment. Though it has been designed for a 100 ohm environment this connector will function acceptably at other impedance levels (to be optimized on a case by case basis).

This specification includes the Minimum lengths, widths and positional tolerances of the contacts.

The connector is of a straightforward construction that does not rely on advanced materials or processes, and is physically robust.

4. Definitions and Conventions

4.1 Definitions

For the purpose of this specification, the following definitions apply:

Advanced grounding contacts: Connector contacts that make first and break last and are capable of carrying power ground return currents and performing electrostatic discharge. Other terms sometimes used to describe these features are: grounding pins, ESD contacts, grounding contacts, static drain, and pre-grounding contacts.

Alignment guides: Connector features that preposition insulators prior to electrical contact. Other terms sometimes used to describe these features are: guide pins, guide posts, blind mating features, mating features, alignment features, and mating guides.

Board Termination Technologies: Surface mount single row, surface mount dual row, through hole, hybrid, and straddle mount.

Cable Termination: The attachment of wires to the termination side of a connector. Schemes commonly used in the industry are IDC (Insulation Displacement Contact), IDT (Insulation Displacement Termination), wire slots, solder, weld, crimp, braise, etc.

Contact mating sequence: Order of electrical contact during mating/unmating process. Other terms sometimes used to describe this feature are: contact sequencing, contact positioning, make first/break last, EMLB (early make late break) staggered contacts, and long pin / short pin.

Fixed: Used to describe the gender of the mating side of the connector that accepts its mate upon mating. This gender is frequently, but not always, associated with the common terminology "receptacle". Other terms commonly used are "female" and "socket connector". The term "fixed" is adopted from EIA standard terminology as the gender that most commonly exists on the fixed end of a connection, for example, on the board or bulkhead side. In this document "fixed" is specifically used to describe the mating side gender illustrated in Figure 4-1.

Free: Used to describe the gender of the mating side of the connector that penetrates its mate upon mating. This gender is frequently, but not always, associated with the common terminology "plug". Other terms commonly used are "male" and "pin connector". The term "free" is adopted from EIA standard terminology as the gender that most commonly exists on the free end of a connection, for example, on the cable side. In this document "free" is specifically used to describe the mating side gender illustrated in Figure 4-1.

Frontshell: That metallic part of a connector body that directly contacts the backshell or other shielding material that provides mechanical and shielding continuity between the connector and the cable. Other terms sometimes used to describe this part of a cable assembly are: housing, nosepiece, cowling, and metal shroud.

F**ree Board:** A connector that uses a free gender mating side and a termination side suitable for any of the printed circuit board termination technologies.

Fixed Board: A connector that uses a fixed gender mating side and a termination side suitable for any of the printed circuit board termination technologies.

Height: Distance from board surface to farthest overall connector feature.

MSA: Multiple Source Agreement

Mating side: The side of the connector that joins and separates from the mating side of a connector of opposite gender. Other terms commonly used in the industry are mating interface, separable interface and mating face.

Offset: An alignment shift from the centerline of the connector.

Optional: This term describes features that are not required by the SFF Specification. However, if any feature defined by the SFF Specification is implemented, it shall be done in the same way as defined by the Specification. Describing a feature as optional in the text is done to assist the reader. If there is a conflict between text and tables on a feature described as optional, the table shall be accepted as being correct.

Reserved: Where this term is used for defining the signal on a connector pin its actual function is set aside for future standardization. It is not available for vendor specific use. Where this term is used for bits, bytes, fields and code values; the bits, bytes, fields and code values are set aside for future standardization. The default value shall be zero. The originator is required to define a Reserved field or bit as zero, but the receiver should not check Reserved fields or bits for zero.

Right Angle: A connector design for use with printed circuit board assembly technology where the mating direction is parallel to the plane of the printed circuit board.

SFP: Small Formfactor Pluggable

Single row: A connector design for use with surface mount printed circuit board assembly technology where the termination side points are arranged in one line.

Single sided termination: A cable termination assembly style and a connector design style where only one side of the connector is accessible when attaching wires. This style frequently has IDC termination points that point in the same direction.

SMT: Surface Mount Technology

Straddle mount: A connector design style and a printed circuit board design style that uses surface mount termination points on both sides of the board. The connector is frequently centered between the top and bottom surfaces of the board.

Straight: A connector design for use with printed circuit board assembly technology where the mating direction is perpendicular to the plane of the printed circuit. board

Surface mount: A connector design and a printed circuit board design style where the connector termination points do not penetrate the printed circuit board and are subsequently soldered to the printed circuit board.

Termination side: The side of the connector opposite the mating side that is used for permanently attaching conductors to the connector. Due to pin numbering differences between mating side genders the termination side shall always be specified in conjunction with a mating side of a specific gender. Other terms commonly used in the industry are: back end, non-mating side, footprint, pc board side, and post side.

Through hole: A connector design and a printed circuit board design style where the connector termination points penetrates the printed circuit board and are subsequently soldered to the printed circuit board.

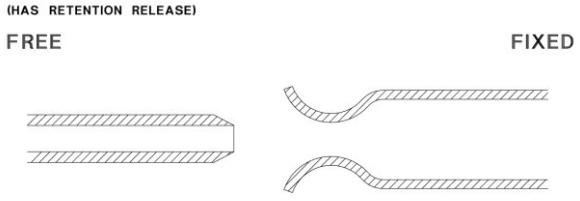

FIGURE 4-1 MATING SIDE GENDER DEFINITION

4.2 Conventions

The ISO convention of numbering is used i.e., the thousands and higher multiples are separated by a space and a period is used as the decimal point. This is equivalent to the English/American convention of a comma and a period.

American	French	ISO
0.6	0,6	0.6
1,000	1 000	1 000
1,323,462.9	1 323 462,9	1 323 462.9

5. Connector Description

5.1 Electrical and Mechanical Requirements

The electrical and low frequency performance requirements are defined in Table 5-1, and the mechanical requirements are listed in Table 5-2.

TABLE 5-1 ELECTRICAL REQUIREMENTS

Parameter	Test Conditions	Specifications
Current		0.5 A/contact
Voltage		30 V AC/contact
Temperature		-20C to +85C
Humidity		80% RH Maximum
Low level Contact resistance with conductor resistance - Initial	EIA 364-6: 320 mV DC, 10 mA	80 mohm Maximum
Insulation Resistance	EIA 364-21: 100 V DC	10e3 Mohm Minimum between adjacent contacts
Dielectric withstanding voltage	300 V/Minimum DC for 1 minute hold	No defect between adjacent contacts
Differential Impedance (Connector area)	EIA 364-108: Rise time: 50 ps (20-80%). Includes connector cable to connector interface and board termination pads and vias	90~110 ohm (distribution) 100 +/- 5 ohm (distribution of average value)
Within pair skew	EIA 364-103	5 ps maximum (By design)
Near-End Isolation	EIA 364-90: 50 MHz to 6 GHz	-40 dB (Frequencies up to 3 GHz)
Insertion Loss	EIA 364-101: 50 MHz to 6 GHZ	1.0 dB maximum (Frequencies up to 1.6 GHz)

TABLE 5-2 MECHANICAL REQUIREMENTS

Items	Conditions	Acceptance Limits
Durability	EIA 364-23	250 cycles
Mating Force	EIA 364-13: Measurement speed: 10 mm per minute maximum	Maximum of 55.5 N
Unmating Force	EIA 364-13: Measurement speed: 10 mm per minute maximum with retention latch disengaged	Maximum of 49.0 N

5.2 High Frequency Performance Requirements

The requirements for the high-speed performance are enabled by reference to SFF-8410 High Speed Serial Testing for Copper Links which defines testing methodology. The high-speed performance test methods of SFF-8410 constitute an essential part of this specification.

5.3 Test Criteria

The environmental test criteria are defined in Table 5-3.

TABLE 5-3 TEST CRITERIA

Items	Conditions	Acceptance Limits
Vibration, random	EIA 364-28, Test Condition VII, Condition D.	Subject mated specimens to 3.10 G's rms between 20-500 Hz for 15 minutes in each of 3 mutually perpendicular planes
Physical shock	EIA 364-27, Method H.	Subject mated specimens to 30 G's half-sine shock pulses of 11 milliseconds duration. 3 shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks.
Thermal shock	EIA 364-32C, condition I	-55C to +85C
Temperature life	EIA 364-17, Method A, Test Condition 2, Test Time Condition C	Subject mated specimens to 70C for 500 hours
Humidity temperature cycling	EIA 364-31 Method III.	Subject unmated specimens to 10 cycles (10 days) between 25C and 65C at 80-100% RH
Mixed flowing gas	EIA 364-65, Class IIA	Subject specimens to environmental Class IIA for 7 days unmated, and 7 days mated.
Thermal disturbance	EIA 364-32: Cycle the connector between 15 +/- 3C and 85 +/- 3C, as measured on the part. Ramps should be a Minimum of 2C per minute, and dwell times should ensure that the contacts reach the temperature extremes (a minimum of 5 minutes). Humidity is not controlled. Perform 10 such cycles.	

5.4 Test Results

Table 5-4 summarizes the performance requirements, which need to be achieved in order to pass the test criteria.

TABLE 5-4 PERFORMANCE REQUIREMENTS

Items	Insertion removal force	Contact resistance	Insulation resistance	Dielectric withstanding voltage	Appearance check
Condition	Satisfy Table 5-2	Resistance change should be 20 Mohm maximum	10e3 Mohm Minimum	Same as initial, there should be no defect	There should be no defect
Durability	Required	Required	Optional	Optional	Required
Vibration	Required	Required	Optional	Optional	Required
Physical shock	Required	Required	Optional	Optional	Required
Thermal shock	Optional	Optional	Required	Required	Required
Thermal disturbance	Required	Required	Optional	Optional	Required
Temperature life	Optional	Required	Optional	Optional	Required
Humidity-temperature cycling	Optional	Optional	Required	Required	Required
Mixed flowing gas	Optional	Required	Optional	Optional	Required

5.5 Connector Configurations

The Mini Multilane Series relies on a receiving body and paddle card, which are the primary elements to construct connectors.

The primary elements provide a flexible means to implement solutions for diverse applications e.g., direct board-to-board implementations can incorporate the plug into the side of one board and mate directly to a receiving body on the other.

Figure 5-1 is an example, which illustrates two styles of receiving bodies and how they become receptacles to receive the plug when encapsulated by the shell that is designed for an unshielded connector application.

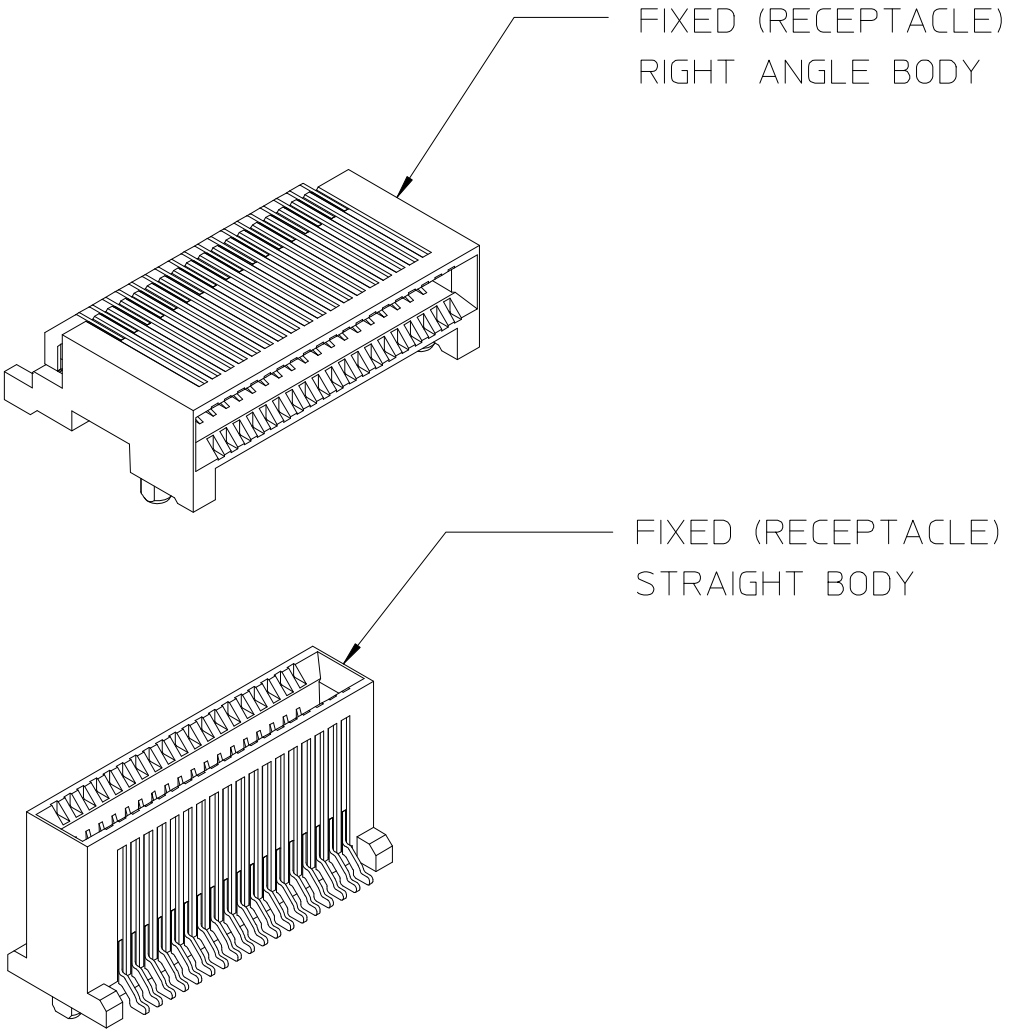

FIGURE 5-1 GENERAL VIEW OF FIXED (RECEPTACLE) CONFIGURATIONS

SFF-8087 defines the free (plug) cable connector that incorporates the paddle card and the shell, which is used to encapsulate the receiving body to form a complete receptacle for use in unshielded applications.

SFF-8088 defines the free (plug) cable connector that incorporates the paddle card and the shell, which is used to encapsulate the receiving body to form a complete receptacle for use in shielded applications.

The shell provides guidance and retention for the free (plug) cable connector, and absorbs the stress imposed by insertion and removal of the free (plug) cable connector. This protects the signal quality of the solder joints to the body.

6. Connector Dimensions

The dimensioning conventions are described in ANSI-Y14.5M, Dimensioning and tolerancing. All dimensions are in millimeters.

Dimension related requirements for the connector system addressed in this document are specified in the tables and figures in this clause.

6.1 Free (Plug) Paddle Card

TABLE 6-1 FREE (PLUG) PADDLE CARD

Designator	Description	26	36	50	68	Tolerance
A02	CL to First	4.60	6.60	9.40	13.00	Basic
A03	CL to Last	5.00	7.00	9.80	13.40	Basic
A14	Tail Pitch within Row	0.80	=	=	=	Basic
C01	Interface Width	11.60	15.60	21.20	28.40	+/- 0.10
C02	Pad Width	0.60	=	=	=	+/- 0.03
C03	Paddle Card Thickness	1.00	=	=	=	+/- 0.10
C04	End of Pad	3.05	=	=	=	+/- 0.10
C05	Third Mate	1.45	=	=	=	+/- 0.10
C06	Second Mate	1.05	=	=	=	+/- 0.10
C07	First Mate	0.55	=	=	=	+/- 0.10
C08	Gap Between Mating Levels	0.10	=	=	=	+/- 0.05
C09	Card Slot Chamfer x 45°	0.50	=	=	=	+/- 0.13
C10	Mating Chamfer x 45°	0.30	=	=	=	+/- 0.10
C11	Lead-in Flat	0.36	=	=	=	Reference

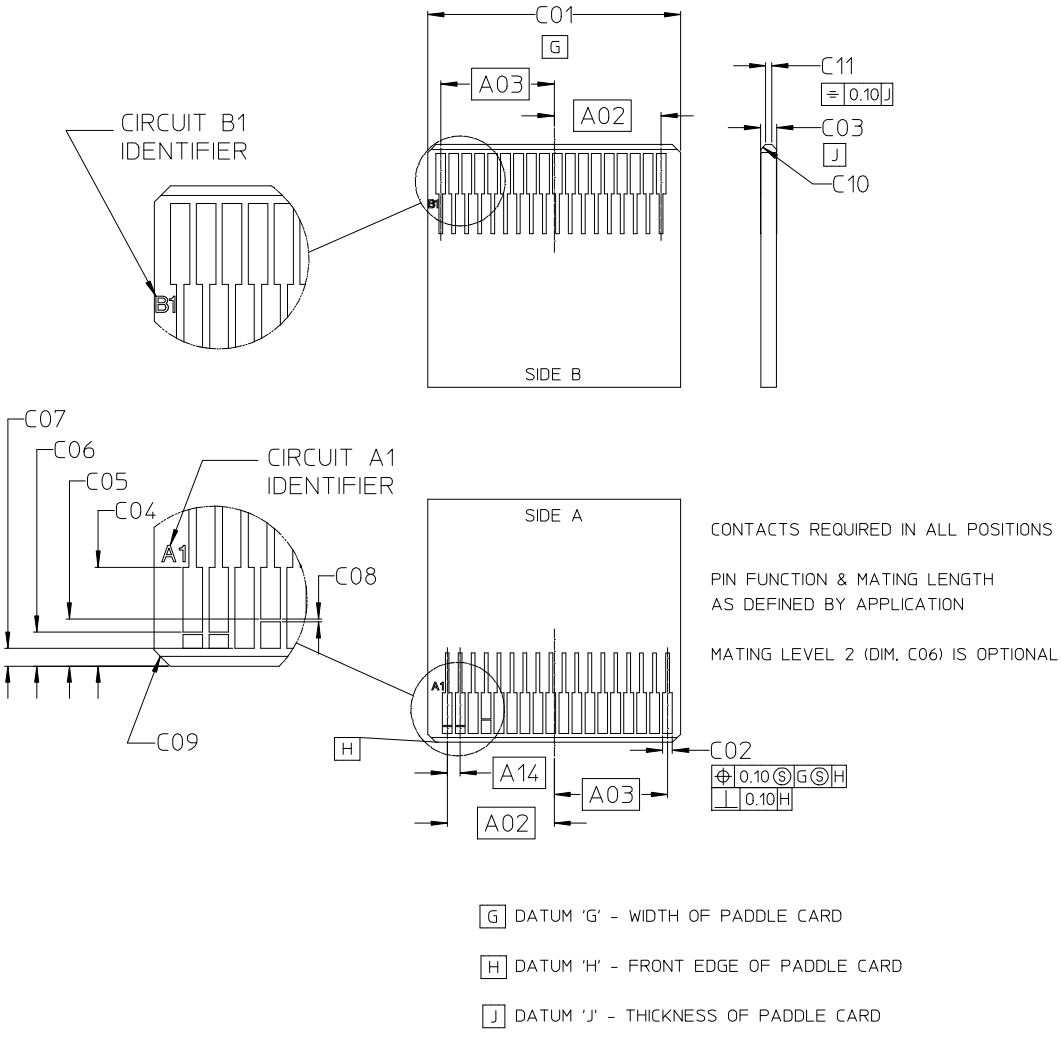

FIGURE 6-1 FREE (PLUG) PADDLE CARD

6.2 Fixed (Receptacle) Right Angle Connector

TABLE 6-2 FIXED (RECEPTACLE) RIGHT ANGLE CONNECTOR

Designator	Description	26	36	50	68	Tolerance
A01	First to Last	10.00	14.00	19.60	26.80	Basic
A02	CL to First	4.60	6.60	9.40	13.00	Basic
A03	CL to Last	5.00	7.00	9.80	13.40	Basic
A04	Connector Width	13.40	17.40	23.00	30.20	+/- 0.10
A05	OAL Connector Housing	11.50	=	=	=	+/- 0.13
A06	Card Slot Width	11.80	15.80	21.40	28.60	+/- 0.10
A07	PCB to Card Slot CL	3.50	=	=	=	+/- 0.10
A08	OAH Connector Housing	5.35	=	=	=	+/- 0.13
A09	Card Slot Height	1.14	=	=	=	Minimum
A10	Peg to Peg	12.00	16.00	21.60	28.80	Basic
A11	Peg Diameter	1.40	=	=	=	+/- 0.05
A13	Maximum Peg Flat	1.15	=	=	=	Maximum
A14	Tail Pitch within Row	0.80	=	=	=	+/- 0.13
A15	Tail Pitch Row to Row	0.40	=	=	=	+/- 0.13
A16	Peg CL to Contact CL	0.00	=	=	=	+/- 0.10
A17	Peg CL to Card Slot	3.22	=	=	=	+/- 0.13
A18	Peg CL to Row A	5.18	=	=	=	+/- 0.10
A19	Peg CL to Row B	7.69	=	=	=	+/- 0.10
A20	Peg CL to Front of Housing	2.90	=	=	=	+/- 0.08
A21	Peg Length	0.95	=	=	=	+/- 0.13
A22	Contact Gap	0.42	=	=	=	+/- 0.13
A23	Leg to Leg	10.73	14.73	20.33	27.53	+/- 0.10
A24	Height Under Connector	1.65	=	=	=	+/- 0.05
A25	Paddle Card Seating Location	1.93	=	=	=	Reference
A26	Contact Tolerance Zone	0.30	=	=	=	Maximum

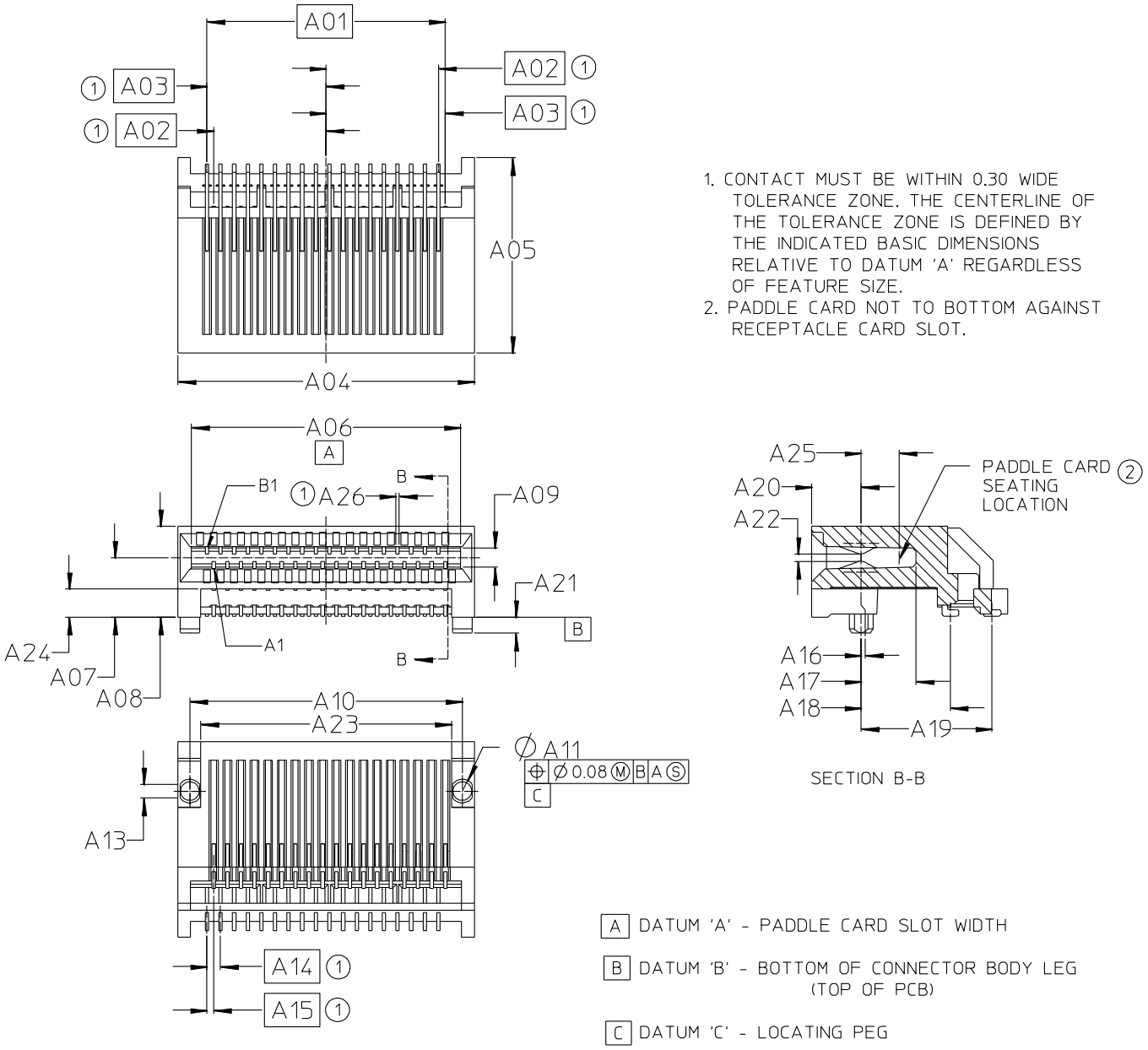

FIGURE 6-2 FIXED (RECEPTACLE) RIGHT ANGLE CONNECTOR

TABLE 6-3 FIXED (RECEPTACLE) RIGHT ANGLE CONNECTOR FOOTPRINT

Designator	Description	26	36	50	68	Tolerance
A01	First to Last	10.00	14.00	19.60	26.80	Basic
A02	CL to First	4.60	6.60	9.40	13.00	Basic
A03	CL to Last	5.00	7.00	9.80	13.40	Basic
A10	Peg to Peg	12.00	16.00	21.60	28.80	Basic
A14	Tail Pitch within Row	0.80	=	=	=	Basic
A15	Tail Pitch Row to Row	0.40	=	=	=	Basic
B01	Peg CL to Row A	5.18	=	=	=	Basic
B02	Row A to Row B	2.51	=	=	=	Basic
B03	Hole Diameter	1.55	=	=	=	+/- 0.05
B04	Peg CL to Edge of PCB	16.80	=	=	=	+/- 0.13
B05	Pad Length	1.80	=	=	=	+/- 0.03
B06	Pad Width	0.35	=	=	=	+/- 0.03
B07	Pad Radius	Full	=	=	=	+/- 0.13
B08	Connector Keep Out	13.90	17.90	23.50	30.70	+/- 0.13
B10	Plug Keep Out	8.85	=	=	=	+/- 0.13

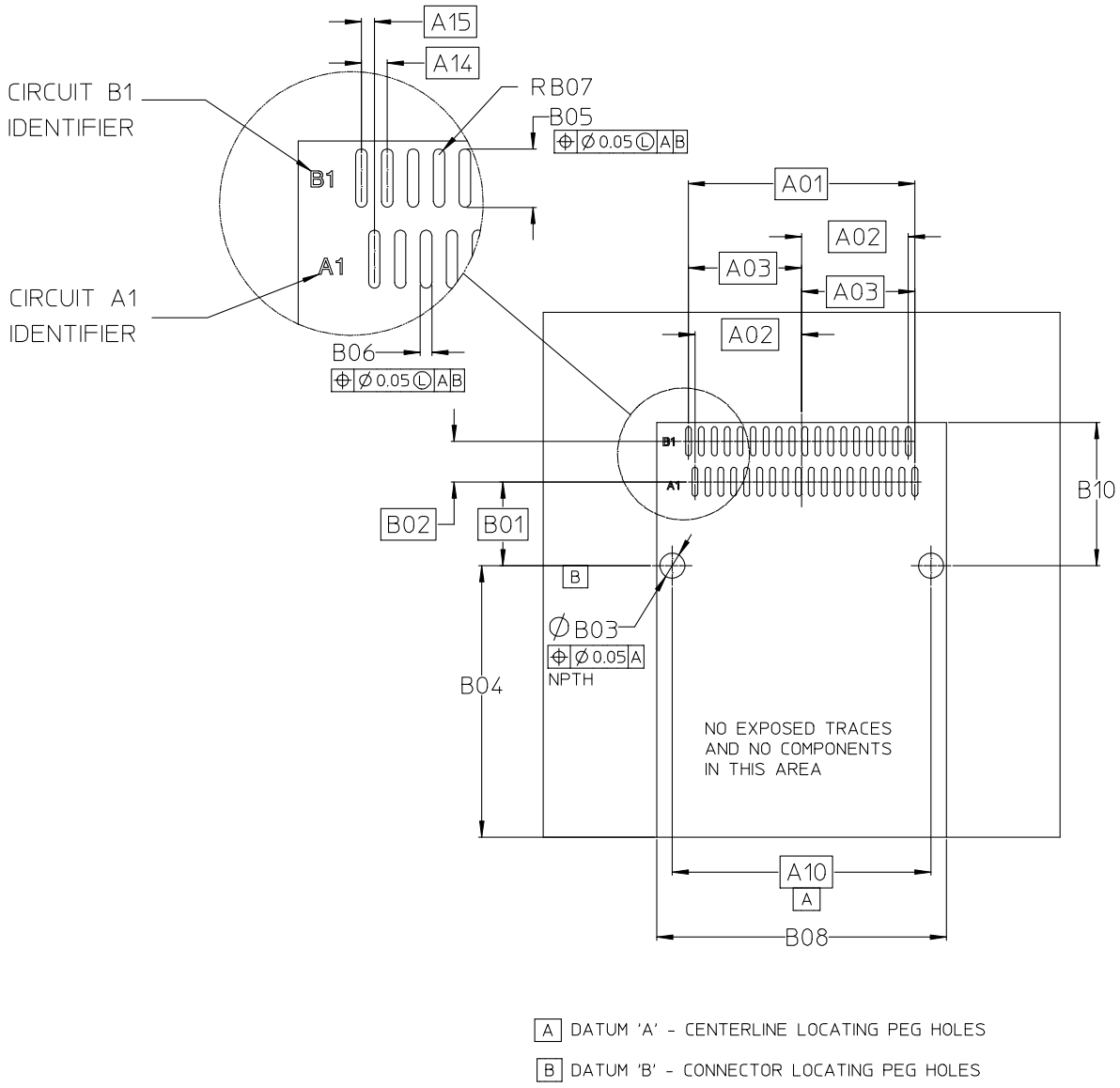

FIGURE 6-3 FIXED (RECEPTACLE) RIGHT ANGLE CONNECTOR FOOTPRINT

6.3 Fixed (Receptacle) Straight Connector

TABLE 6-4 FIXED (RECEPTACLE) STRAIGHT CONNECTOR

Designator	Description	26	36	50	68	Tolerance
A02	CL to First	4.60	6.60	9.40	13.00	Basic
A03	CL to Last	5.00	7.00	9.80	13.40	Basic
A04	Connector Width	13.40	17.40	23.00	30.20	+/- 0.10
A06	Card Slot Width	11.80	15.80	21.40	28.60	+/- 0.10
A09	Card Slot Height	1.14	=	=	=	Minimum
A10	Peg to Peg	12.00	16.00	21.60	28.80	Basic
A11	Peg Diameter	1.40	=	=	=	+/- 0.05
A13	Maximum Peg Flat	1.15	=	=	=	Maximum
A14	Tail Pitch within Row	0.80	=	=	=	+/- 0.13
A15	Tail Pitch Row to Row	0.40	=	=	=	+/- 0.13
A17	Peg CL to Card Slot	3.22	=	=	=	+/- 0.13
A22	Contact Gap	0.42	=	=	=	+/- 0.13
A25	Module Seating Location	1.93	=	=	=	Reference
A26	Contact Tolerance Zone	0.30	=	=	=	Maximum
H01	OAH Connector Housing	9.08	=	=	=	+/- 0.13
H02	Peg Length	0.83	=	=	=	+/- 0.13
H03	OAL Tail to Tail	9.60	13.60	19.20	26.40	+/- 0.13
H04	OAL Toe to Toe	7.01	=	=	=	+/- 0.25
H05	Peg CL to SMT Foot CL	2.91	=	=	=	+/- 0.13
H06	PCB to Bottom of Card Slot	2.80	=	=	=	+/- 0.13
H07	Housing Face to Card Slot	6.13	=	=	=	+/- 0.13
H08	OAW of Connector Housing	6.00	=	=	=	+/- 0.13
H09	Width of Mating Interface	3.70	=	=	=	+/- 0.08

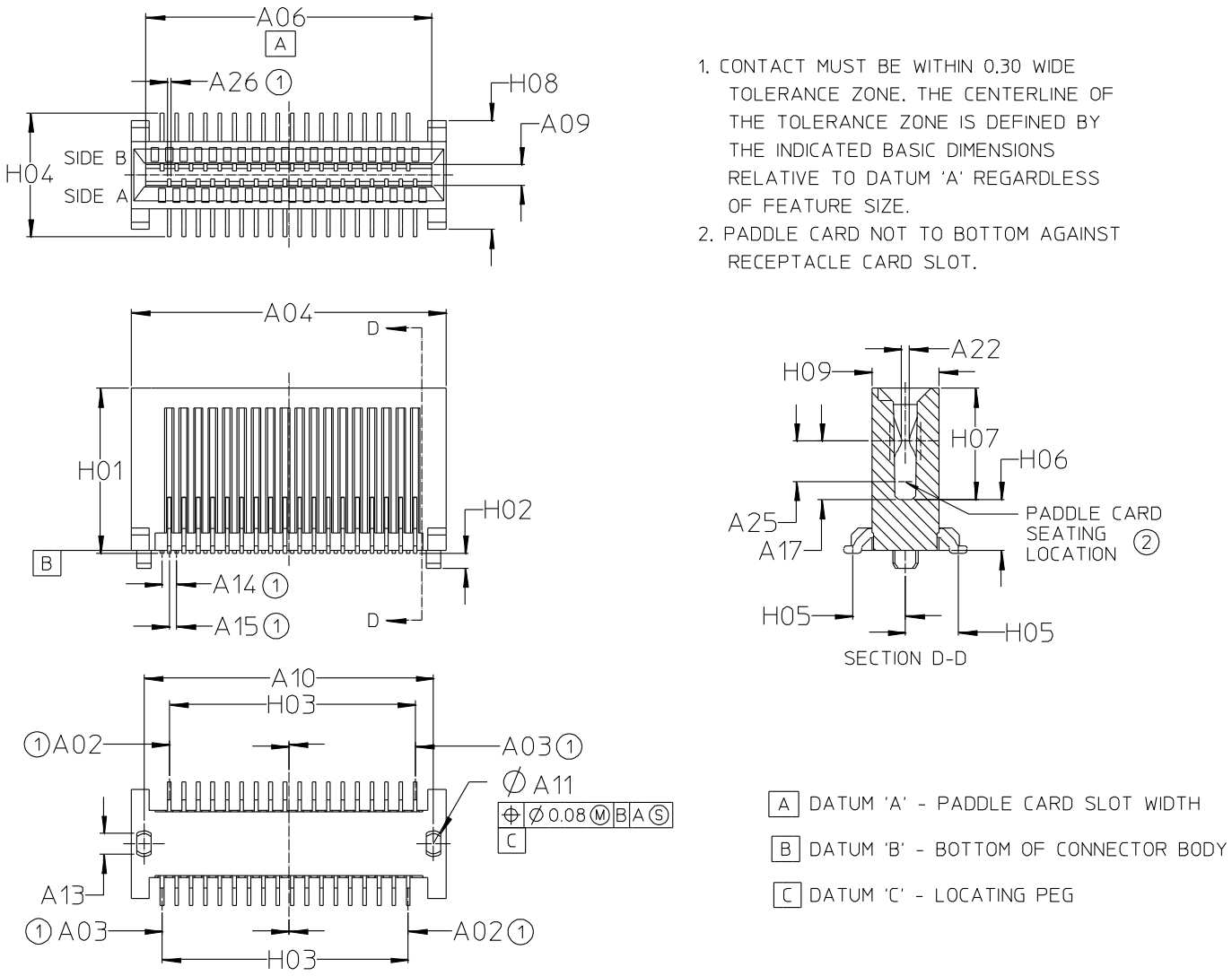

FIGURE 6-4 FIXED (RECEPTACLE) STRAIGHT CONNECTOR

TABLE 6-5 FIXED (RECEPTACLE) STRAIGHT CONNECTOR FOOTPRINT

Designator	Description	26	36	50	68	Tolerance
A02	CL to First	4.60	6.60	9.40	13.00	Basic
A03	CL to Last	5.00	7.00	9.80	13.40	Basic
A10	Peg to Peg	12.00	16.00	21.60	28.80	Basic
A14	Tail Pitch within Row	0.80	=	=	=	+/- 0.13
B03	Hole Diameter	1.55	=	=	=	+/- 0.05
B05	Pad Length	1.80	=	=	=	+/- 0.03
B06	Pad Width	0.35	=	=	=	+/- 0.03
B07	Pad Radius	Full	=	=	=	+/- 0.13
H03	OAL Tail to Tail	9.60	13.60	19.20	26.40	+/- 0.13
J02	Peg CL to Row CL	2.95	=	=	=	+/- 0.13
J03	Peg CL to Connector Keep Out	6.99	=	=	=	+/- 0.13
J04	Peg CL to Connector Keep Out	4.78	=	=	=	+/- 0.13
J05	Connector Keep Out	15.30	19.30	24.90	32.10	+/- 0.13

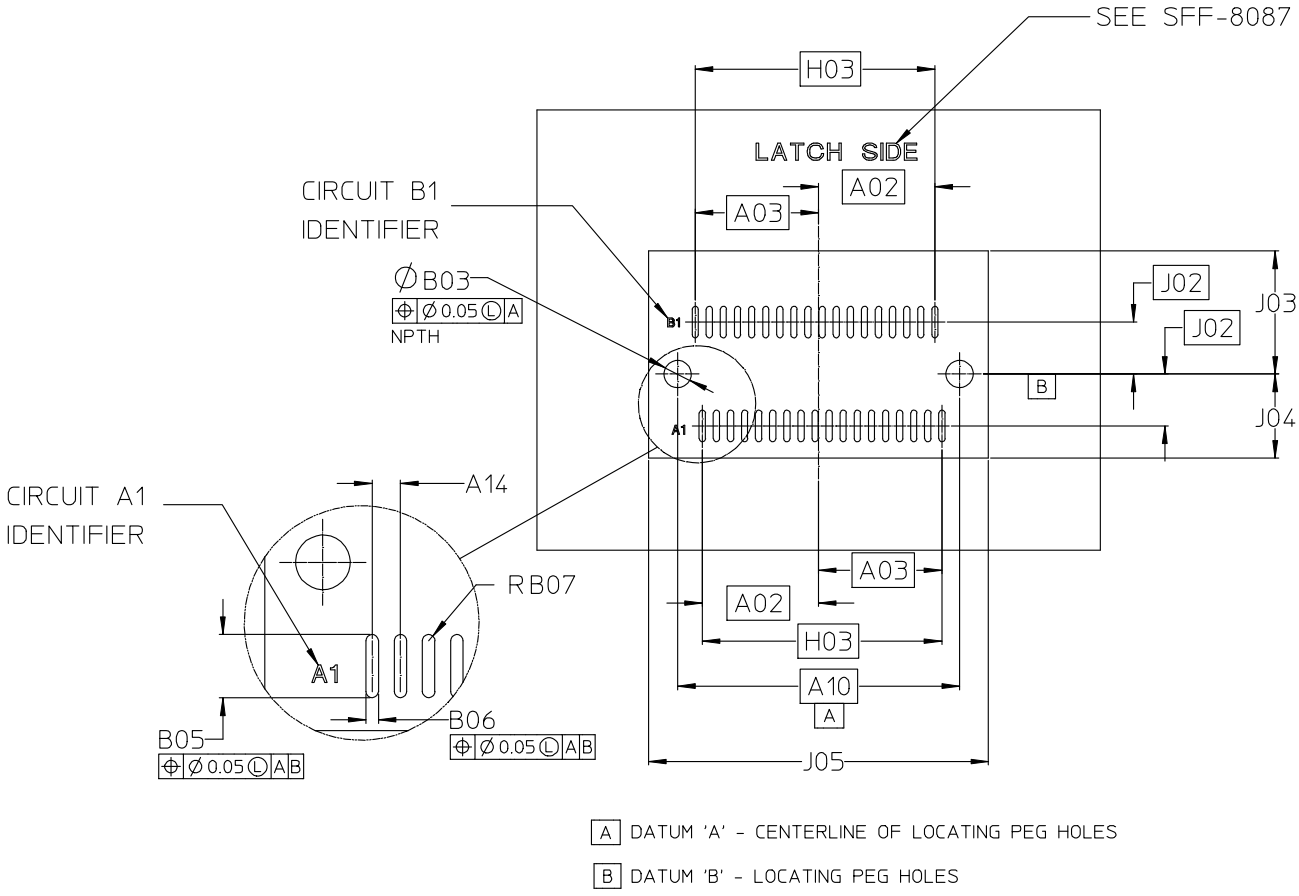

FIGURE 6-5 FIXED (RECEPTACLE) STRAIGHT CONNECTOR FOOTPRINT

6.4 Contact Numbering

The contact numbering is shown in Table 6-6 for the various sizes of connector. For location of contacts A1 and B1, see the figures above.

TABLE 6-6 CONTACT NUMBERING

26 Circuit		36 Circuit		50 Circuit		68 Circuit	
A1	B1	A1	B1	A1	B1	A1	B1
A2	B2	A2	B2	A2	B2	A2	B2
A3	B3	A3	B3	A3	B3	A3	B3
A4	B4	A4	B4	A4	B4	A4	B4
A5	B5	A5	B5	A5	B5	A5	B5
A6	B6	A6	B6	A6	B6	A6	B6
A7	B7	A7	B7	A7	B7	A7	B7
A8	B8	A8	B8	A8	B8	A8	B8
A9	B9	A9	B9	A9	B9	A9	B9
A10	B10	A10	B10	A10	B10	A10	B10
A11	B11	A11	B11	A11	B11	A11	B11
A12	B12	A12	B12	A12	B12	A12	B12
A13	B13	A13	B13	A13	B13	A13	B13
		A14	B14	A14	B14	A14	B14
		A15	B15	A15	B15	A15	B15
		A16	B16	A16	B16	A16	B16
		A17	B17	A17	B17	A17	B17
		A18	B18	A18	B18	A18	B18
				A19	B19	A19	B19
				A20	B20	A20	B20
				A21	B21	A21	B21
				A23	B23	A23	B23
				A24	B24	A24	B24
				A25	B25	A25	B25
						A26	B26
						A27	B27
						A28	B28
						A29	B29
						A30	B30
						A31	B31
						A32	B32
						A33	B33
						A34	B34