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SFF Committee

SFF-8642

Specification for

Mini Multilane 12X 10 Gb/s Shielded Connector (CXP10)

Rev 3.3

August 31, 2018

Secretariat: SFF Committee

Abstract: This specification defines the physical interface and general performance requirements for the Mini Multilane Shielded Integrated Connector, which is designed for use in high speed serial, interconnect applications at multigigabit speeds.

This specification provides a common reference for systems manufacturers, system integrators, and suppliers.

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 specification.

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.

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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 a claim or claims 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

Rev 2.8

- Title changed to reflect correct speed rating
- Editorial revision to use the current template
- Adopted simplified titles on figures and tables
- Revised Performance Requirements to current

Rev 2.9

- Front page modified per request of September 12 meeting

Rev 3.0

- Title change for commonality in style with QSFP

Rev 3.1

- Changed A20 from 20.00 +/- 0.05 to 20.10 +/- 0.05
- Changed D23 from 19.89 +/- 0.05 to 19.94 +/- 0.08

Rev 3.2

- A20 reverted from 20.10 +/- 0.05 to 20.00 +/- 0.05
- D23 reverted from 19.94 +/- 0.08 to 19.89 +/- 0.05

Rev 3.3 (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- Document to be withdrawn from EIA; other than the changes to the header and cover page, no content or formatting changes have been made since Rev 3.2 of this document.

Foreword

The development work on this specification done by the SFF Committee is being continued in the SNIA SFF TWG. Since its formation as the SFF Committee in August 1990, the membership 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 SFF Committee provided a forum for system integrators and vendors to define the form factor of disk drives.

During their definition, other activities were suggested because participants in SFF faced more challenges than the form factors. 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.

In July 2016, the SFF Committee transitioned to SNIA (Storage Networking Industry Association), as a TA (Technology Affiliate) TWG (Technical Work Group).

Industry consensus is not a requirement to publish a 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 meets during the T10 (see www.t10.org) and T11 (see www.t11.org) weeks, and SSWG (Specific Subject Working Groups) are held at the convenience of the participants. Material presented to SFF becomes public domain, and there are no restrictions on the open mailing of the presented material by Members.

Many of the specifications developed by SFF have either been incorporated into standards or adopted as standards by ANSI, EIA, JEDEC and SAE.

For those who wish to participate in the activities of the SFF TWG, the signup for membership can be found at:

<http://www.snia.org/sff/join>

The complete list of SFF Specifications which have been completed or are currently being worked on by the SFF Committee can be found at:

<http://www.snia.org/sff/specifications>

Suggestions for improvement of this specification will be welcome, they should be submitted to:

<http://www.snia.org/feedback>

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SFF Committee

Mini Multilane 12X 10 Gb/s Shielded Connector (CXP10)

1 Scope

This specification defines the plug, guide/strain relief shell, and latching requirements for the Mini Multilane Shielded Integrated Connector based upon the mating interface defined herein.

1.1 Application Specific Criteria

This connector is capable of meeting the interface requirements for the operation of Infiniband QDR (120G 12x10).

1.2 Copyright

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1.3 Disclaimer

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Suggestions for revisions should be directed to <http://www.snia.org/feedback/>

2 References

2.1 Industry Documents

The following interface standards are relevant to many SFF Specifications.

- EIA-364 Test Procedures
- SFF-8410 High Speed Serial Testing for Copper Links
- InfiniBand QDR Architecture Specification Volume 1.2, Annex 6

2.2 Sources

There are several projects active within the SFF TWG, and all specifications are available at www.snia.org/sff/specifications

Copies of ANSI standards may be purchased from the InterNational Committee for Information Technology Standards (<http://www.techstreet.com/incitsgate.tmpl>).

2.3 Conventions

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

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

2.4 Definitions

For the purpose of SFF Specifications, the following definitions apply:

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 specification "fixed" is specifically used to describe the mating side gender illustrated in Figure 2-1.

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 specification "free" is specifically used to describe the mating side gender illustrated in Figure 2-1.

Height: Distance from board surface to farthest overall connector feature

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.



Note: The fixed gender is used on the device side except in the case of wire termination.

FIGURE 2-1 MATING SIDE GENDER DEFINITION

Offset: An alignment shift from the center line of the connector

Optional: This term describes features which 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.

Press-fit: The connector's press-fit pins are pressed into the plated through holes in the PCB by applying mechanical force. The pins are sized to deform to create a lasting gas-tight electrical connection between the press-fit pin and the metalized hole. The press-fit pins ensure the mechanical stability and the electrical contact.

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

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.

3 General Description

The connector system is based upon a shielded integrated receptacle connector and guide shell. The host board footprint positioning holes contain the critical dimensions for locating the integrated receptacle pins and guide shell. The receptacle guide shell functions as the guide and strain relief for the free (plug) connector interface. This connector system provides positive retention along with ease of insertion and removal.

The configuration defined in this specification is an integrated right angle 84 position host board receptacle and it's mating cable plug connector.

Figure 3-1 illustrates an example of one configuration of a Shielded Integrated Connector.

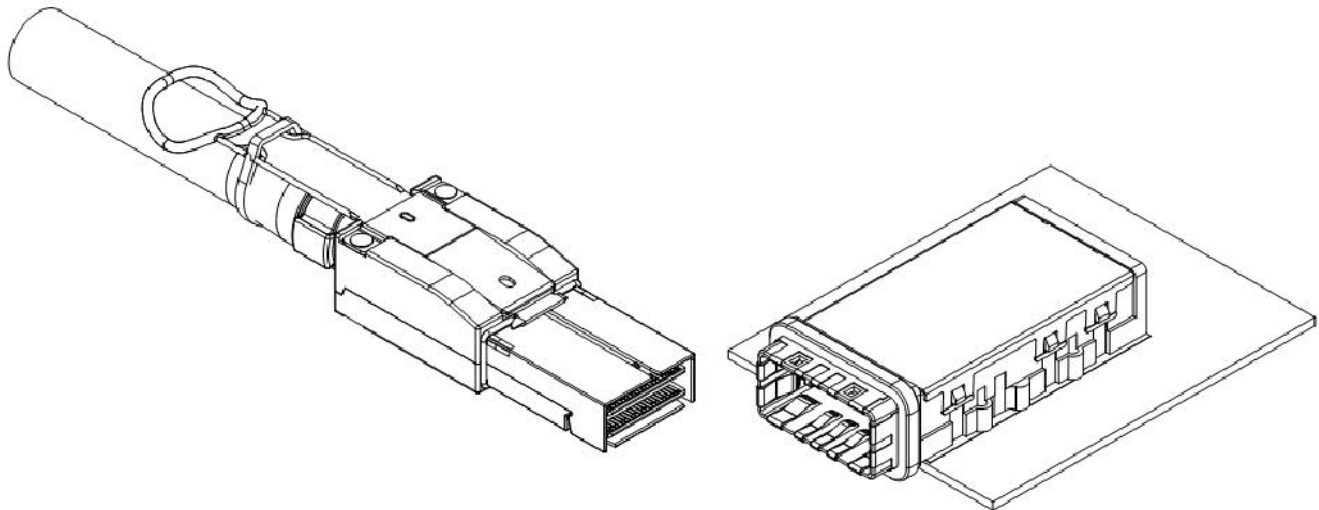


FIGURE 3-1 GENERAL VIEW OF A SHIELDED INTEGRATED CONNECTOR

4 Datums

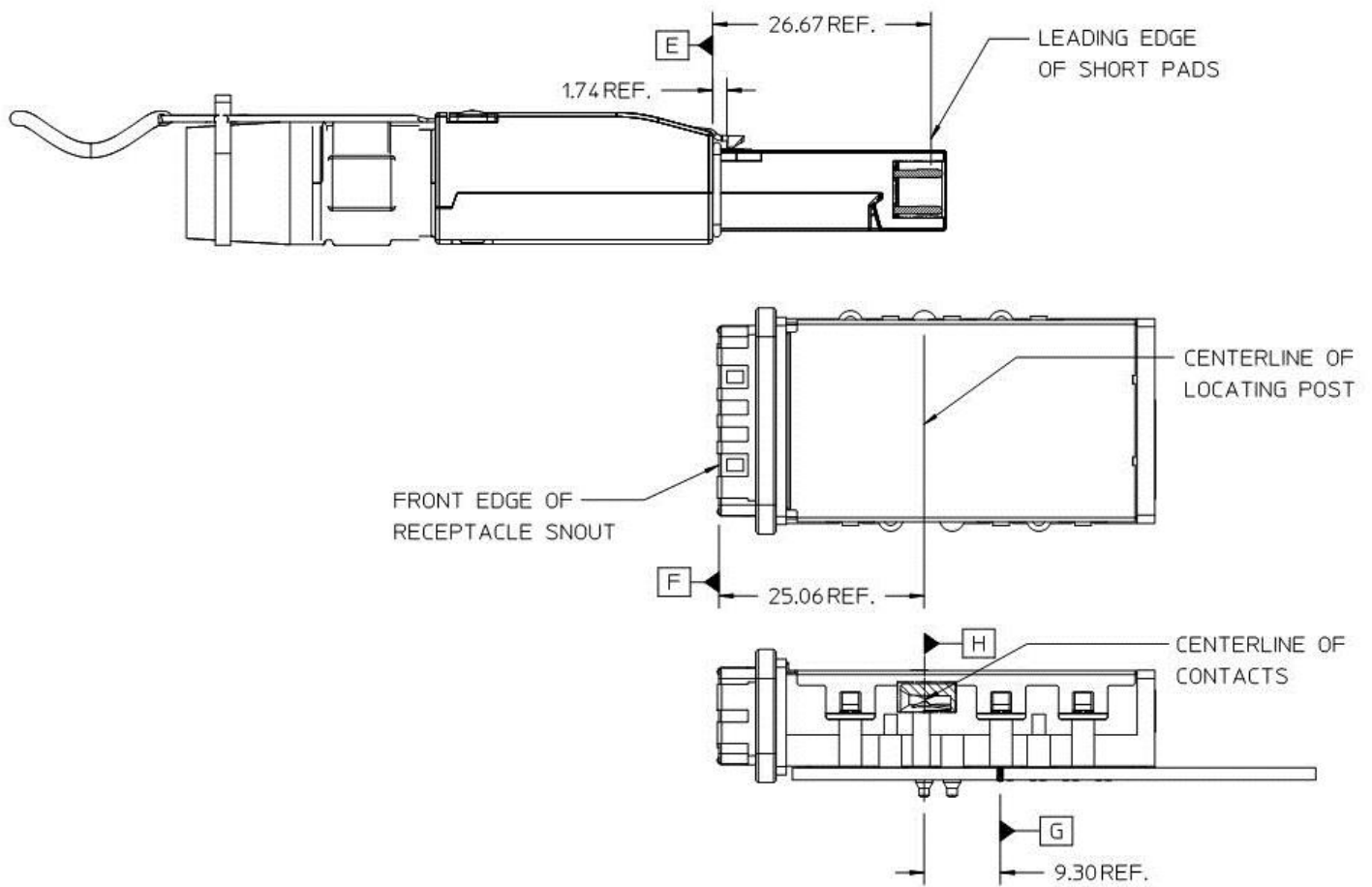


FIGURE 4-1 DEFINITION OF DATUMS

TABLE 4-1 DEFINITION OF DATUMS

Datum	Description
A	Width of Paddle Card
B	Top Surface of Paddle Card
C	Leading Edge of Short Signal Pad on Paddle Card
D	Width of Plug Snout
E	Body of Plug
F	Front Edge of Receptacle Snout (does not include EMI Fingers)
G	Centerline of First Row of Connector Compliant Tails
H	Centerline of Receptacle Contacts
J	Centerline of Outer Holes
K	Centerline of First Row of PCB Holes
L	Surface of PCB
M	Width of Receptacle Snout
N	Bottom of Die Cast Housing
P	Bottom of Plug Snout
X, Y	Reference 0, 0 on Host Board (application specific)

5 Shielded Connector Dimensional Requirements

5.1 Plug Paddle Card

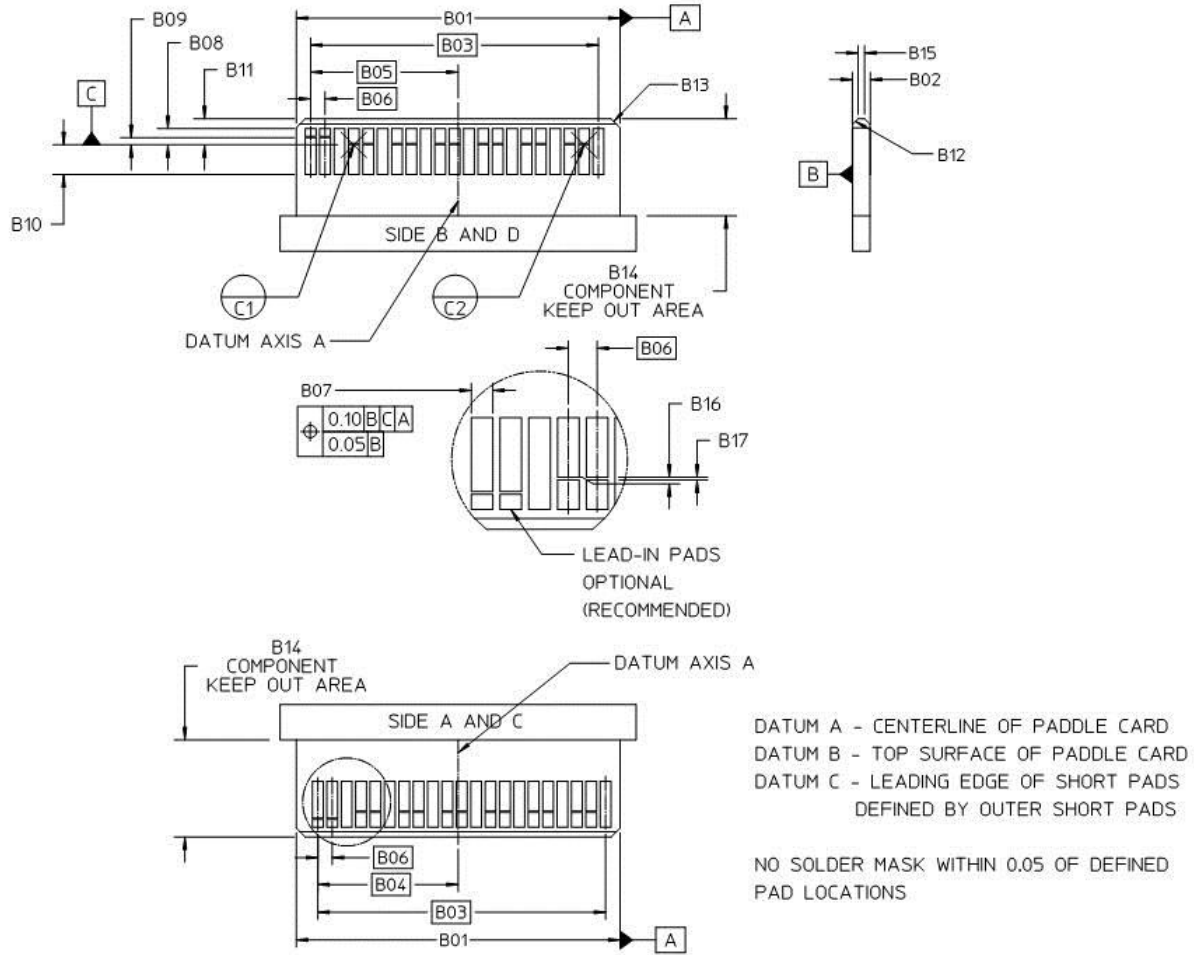
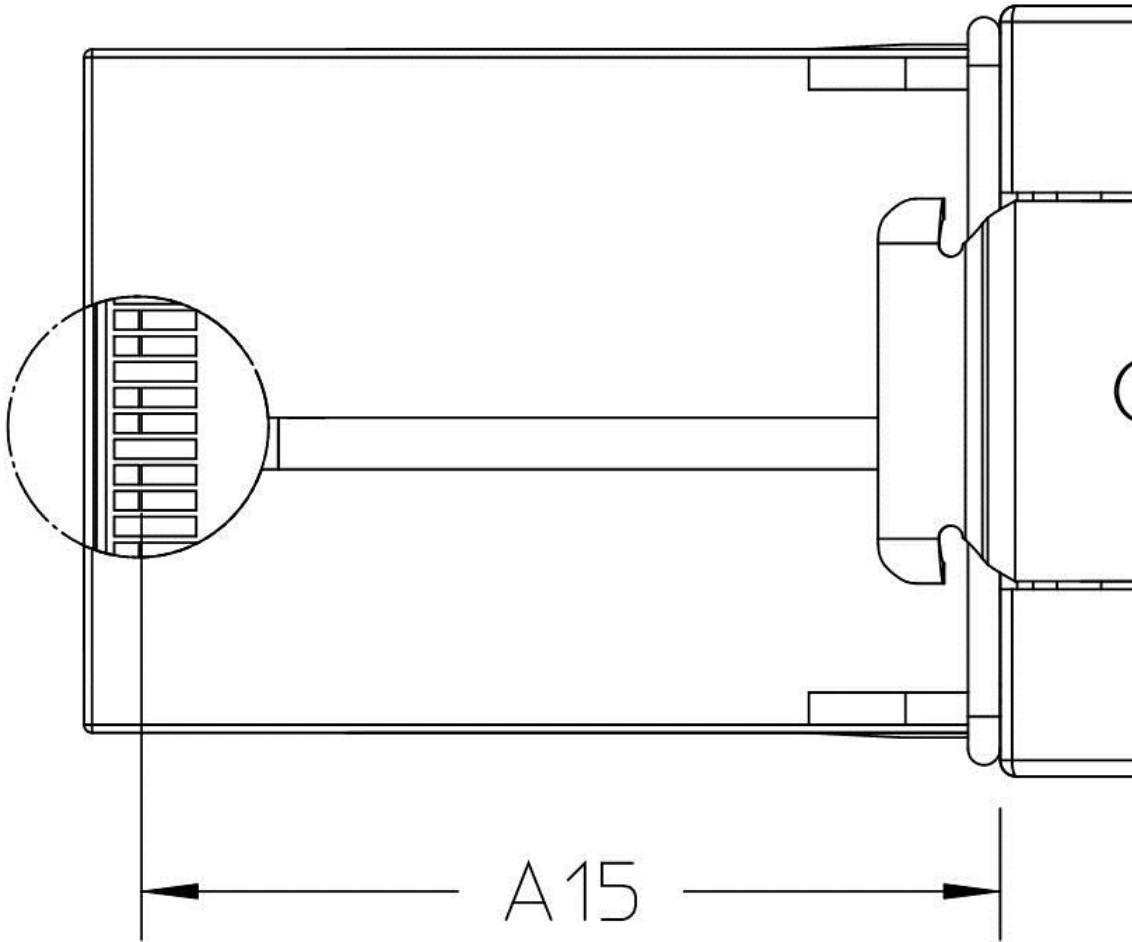


FIGURE 5-1 PLUG PADDLE CARD

TABLE 5-1 PLUG PADDLE CARD DIMENSIONS

Designator	Description	Dimension	Tolerance
B01	Paddle Card Width	18.00	0.10
B02	Paddle Card Thickness	1.00	0.10
B03	Overall Pad Centers	16.00	Basic
B04	Card Center to Outer Pad - Sides A& C	7.80	Basic
B05	Card Center to Outer Pad - Sides B& D	8.20	Basic
B06	Pad Center to Center (Pitch)	0.80	Basic
B07	Pad Width	0.60	0.03
B08	Front Pad Length	0.90	0.05
B09	Front Pad Spacing	0.40	0.05
B10	Pad Length	1.55	Min.
B11	Card Edge to Second Pad	1.45	0.10
B12	Lead-in Chamfer x 45 degrees	0.30	0.05
B13	Lead-in Chamfer x 45 degrees	0.50	0.05
B14	Component Keep Out Area	5.40	Min.
B15	Lead-in Flat	0.36	Ref
B16	Short Pad to Datum C	0.00	0.03
B17	Pad to Lead-in Pad	0.08	0.015

5.2 Free (Plug) Cable Connector



Location of Paddle Card/Contacts and Key Taper to Plug Housing
FIGURE 5-2 PLUG (1)

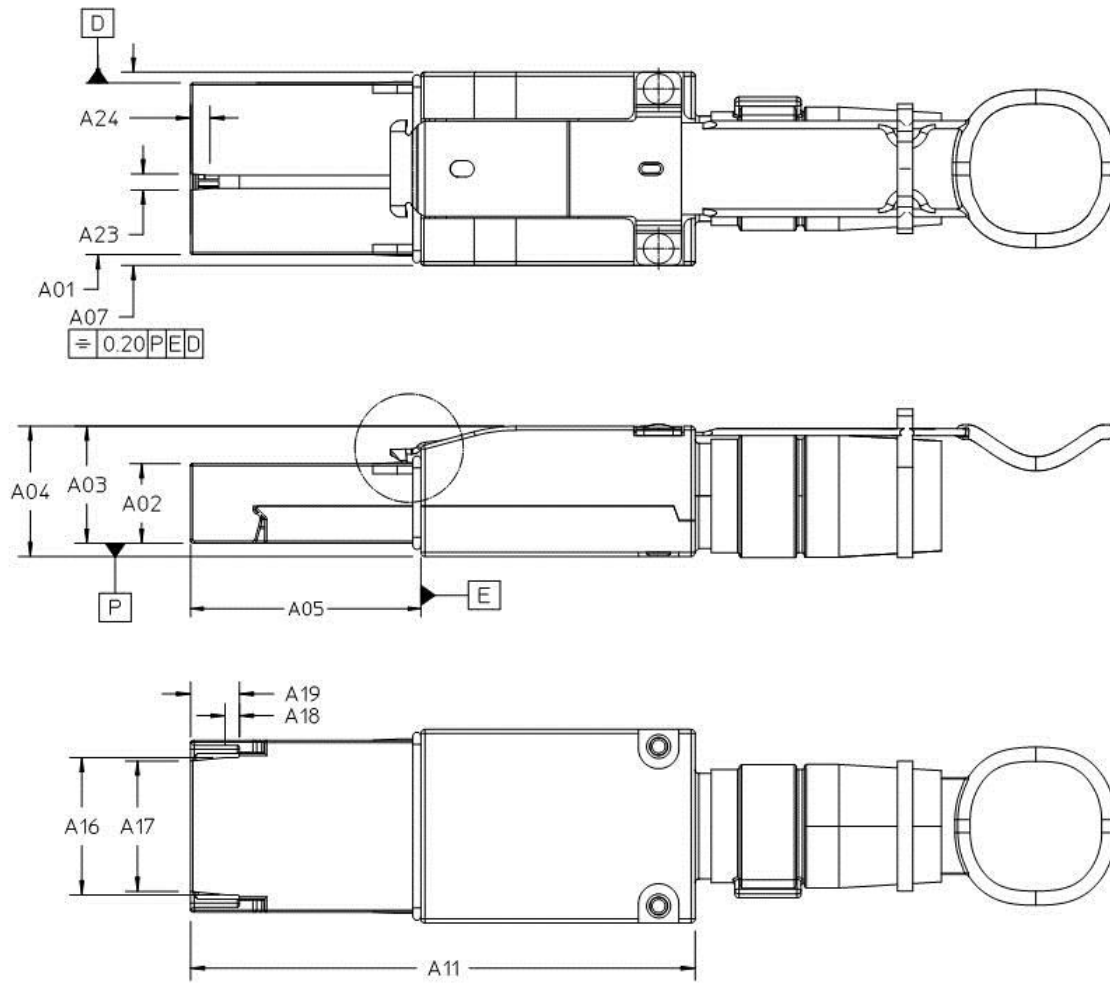


FIGURE 5-3 PLUG (2)

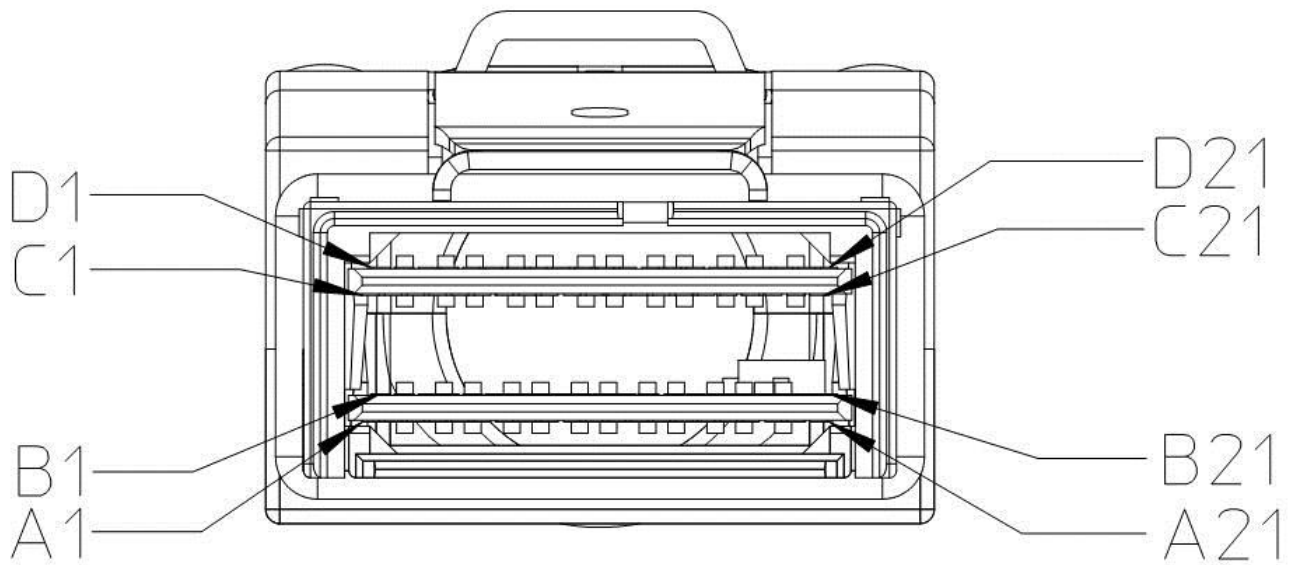
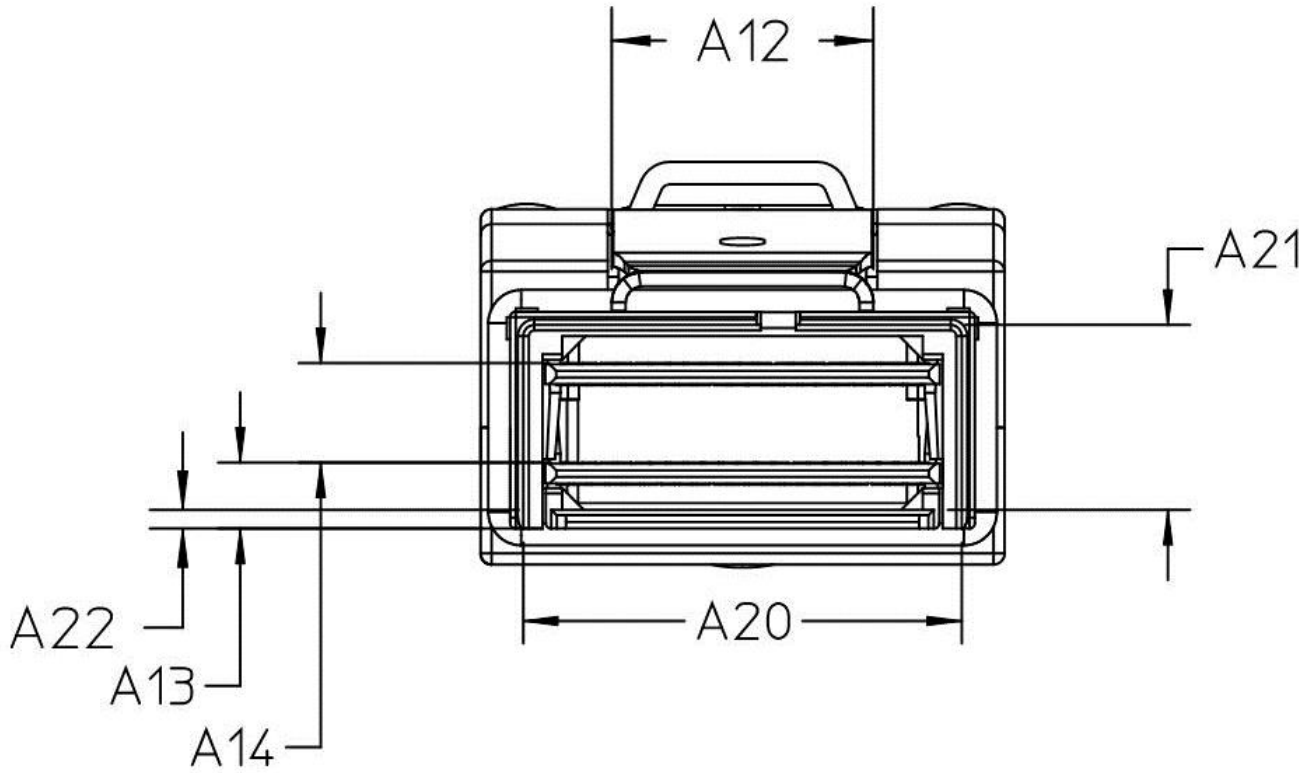
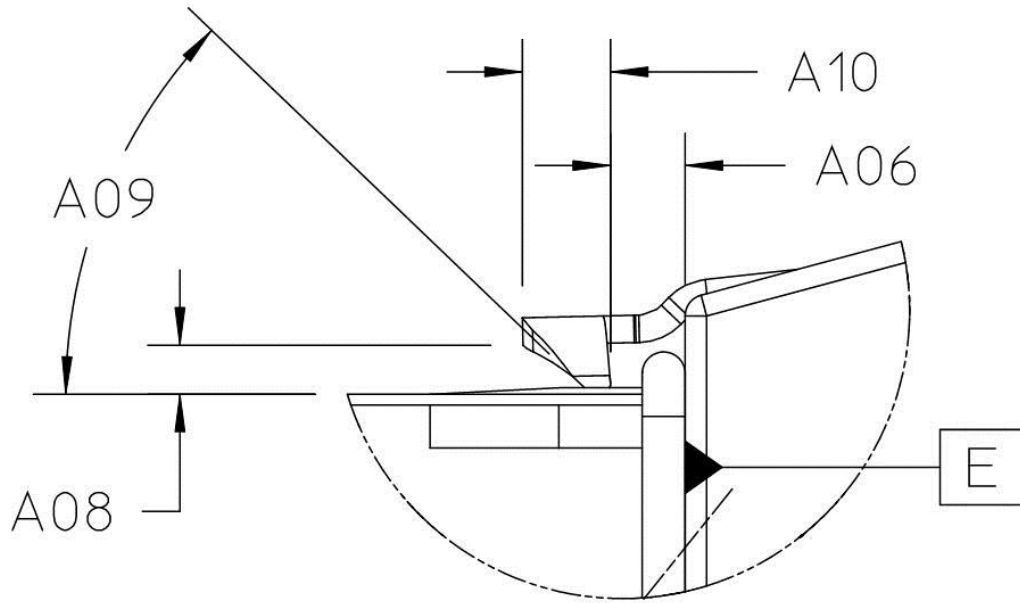


FIGURE 5-4 PLUG (3)

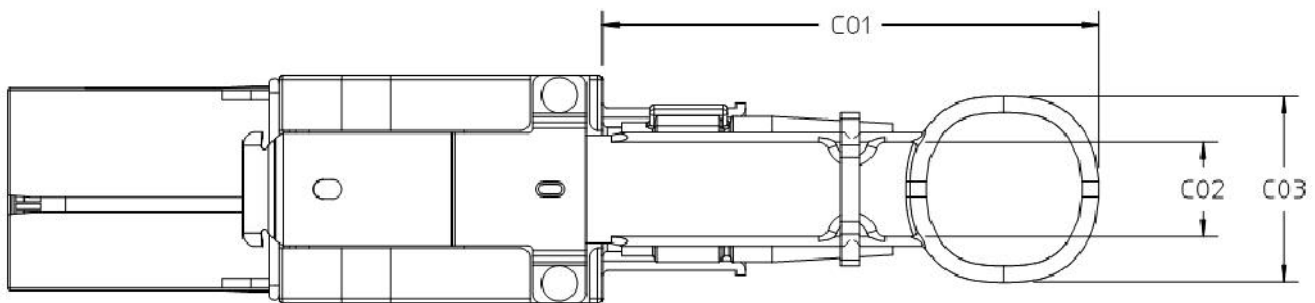


Latch Detail
FIGURE 5-5 PLUG (4)

TABLE 5-2 PLUG DIMENSIONS

Designator	Description	Dimension	Tolerance
A01	Snout Width	21.20	0.13
A02	Snout Thickness	9.81	0.13
A03	Snout Bottom to Plug Top	14.60	Max
A04	Plug Body Thickness	16.21	Max
A05	Snout Length	28.45	0.13
A06	Plug Body (Datum E) to Latch	1.74	0.13
A07	Body Width	24.05	Max
A08	Barb Lead-in Height	1.14	0.10
A09	Barb Lead-in Angle	45 degrees	1 degree
A10	Barb Length	2.05	0.10
A11	Plug Overall Length	62.00	Ref.
A12	Latch Width	11.90	0.10
A13	Bottom of Snout to Top of 1st Paddle Card	2.99	0.20
A14	Top of 1st Paddle Card to Top of 2nd Paddle Card	4.50	0.10
A15	Plug Body to Short Pad (Datum C)	26.67	0.20
A16	Tongue Width - Base	16.95	0.10
A17	Tongue Width - Tip	16.10	0.20
A18	Length of Tongue - Straight Section	1.80	0.10
A19	Length of Tongue	6.00	Min.
A20	Inside Width of Snout	20.00 20.10	0.05 0.05
A21	Inside Height of Snout	8.60	0.25
A22	Tongue Thickness	0.60	Ref.
A23	Orientation Key Lead-In Width	2.00	0.25
A24	Orientation Key Lead-In Length	2.40	0.25

5.3 Free (Plug) Cable Connector Pull Tab



This is one possible configuration, color may be specified by the application.

FIGURE 5-6 PLUG PULL TAB EXAMPLE

TABLE 5-3 PLUG PULL TAB EXAMPLE DIMENSIONS

Designator	Description	Dimension	Tolerance
C01	Pull Tab Length	50.00	Ref
C02	Pull Tab Width	9.91	Ref
C03	Pull Tab Hole Width	19.51	Ref

5.4 Fixed (Receptacle) Right Angle Connector

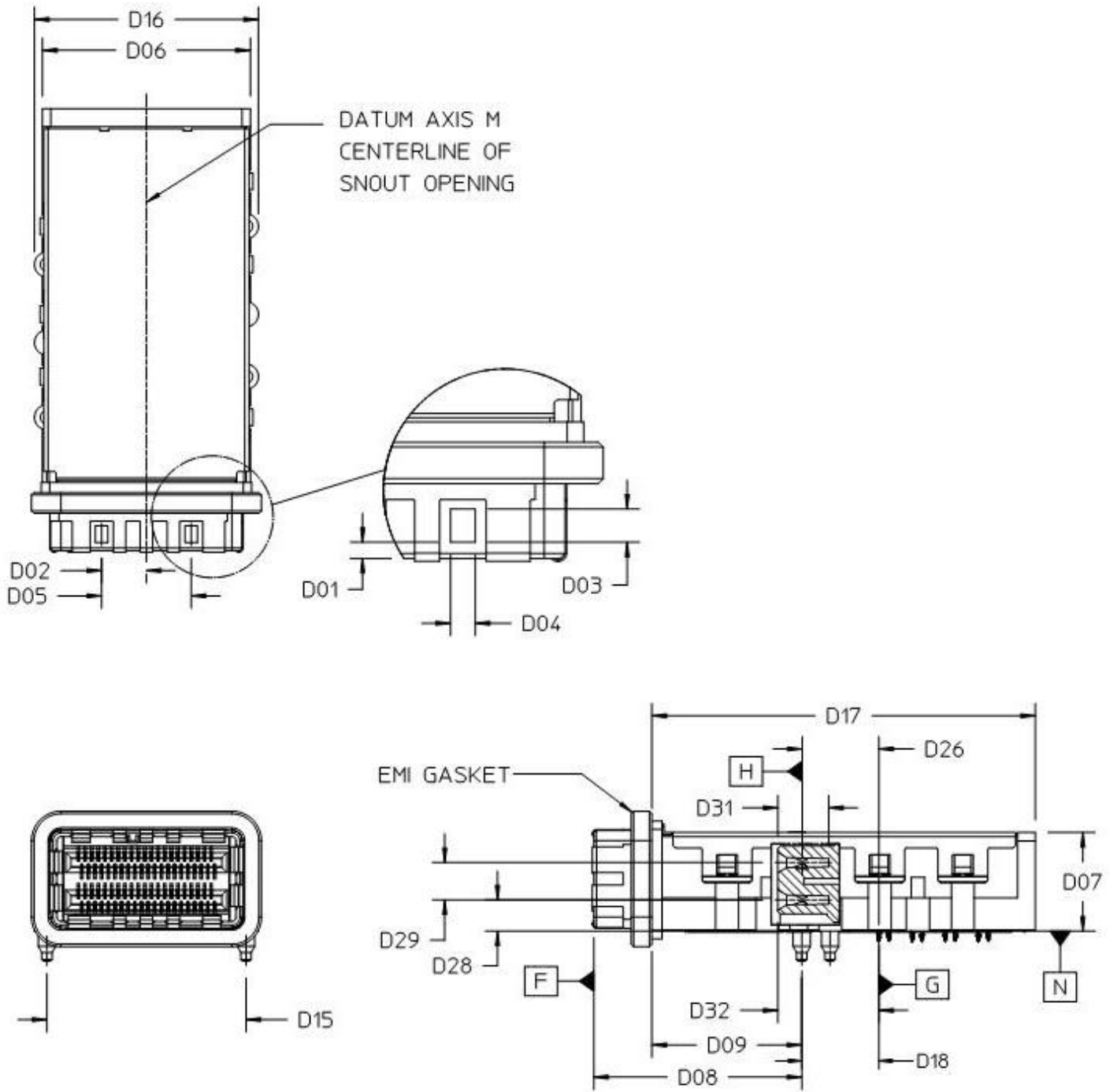


FIGURE 5-7 RECEPTACLE (1)

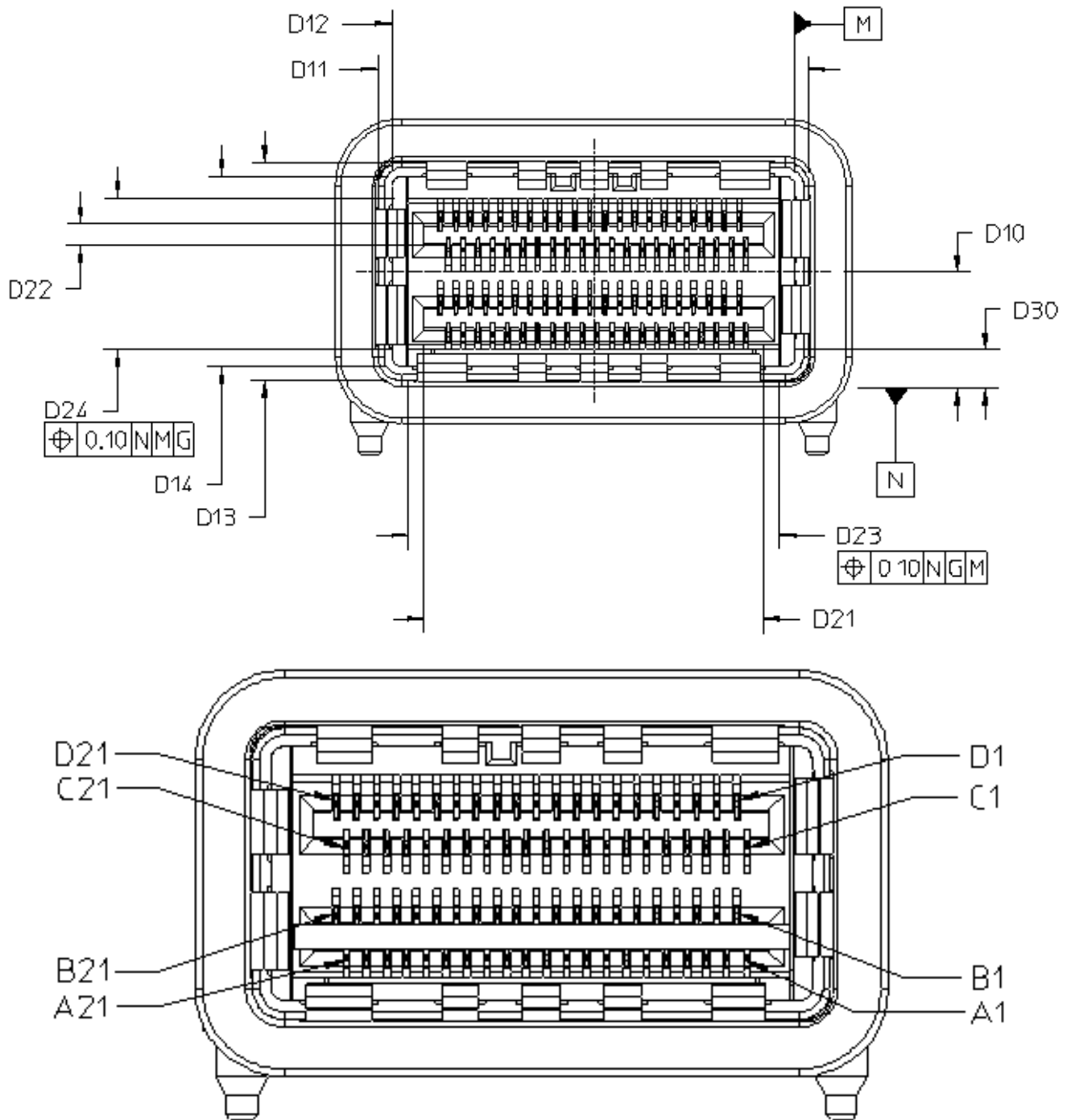


FIGURE 5-8 RECEPTACLE (2)

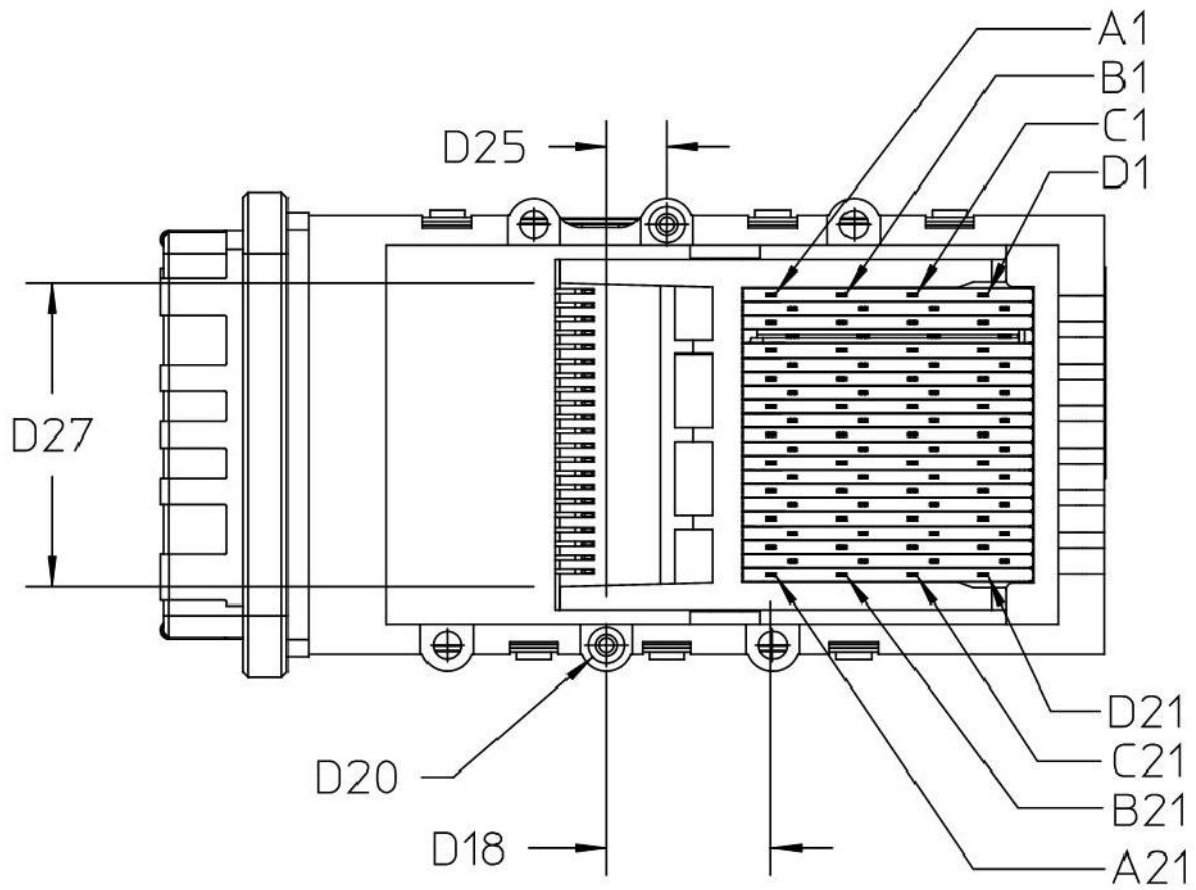


FIGURE 5-9 RECEPTACLE (3)

TABLE 5-4 RECEPTACLE DIMENSIONS

Designator	Description	Dimension	Tolerance
D01	Latch Hole from Face	0.97	0.05
D02	Latch Hole Centerline from Datum M	5.40	0.10
D03	Latch Hole Length	2.00	0.10
D04	Latch Hole Width	1.50	0.10
D05	Latch Hole to Hole	10.80	0.05
D06	Shell Width	25.05	0.25
D07	Shell Height	11.88	0.13
D08	Locating Post to Face	25.06	0.08
D09	Locating Post to EMI Shell Base	18.06	0.13
D10	Datum N to Snout Opening Centerline	6.29	0.08
D11	Snout Width	23.10	0.08
D12	Snout Opening Width	21.60	0.05
D13	Snout Height	11.70	0.08
D14	Snout Opening Height	10.20	0.05
D15	Peg Centerline to Peg Centerline	24.00	0.08
D16	Shell Width at Screw Attach Features	27.00	0.25
D17	EMI Shell Base to Back	46.22	0.25
D18	Connector Pins to Locating Post	9.30	0.05
D20	Peg Diameter	2.08	0.05
D21	Card Slot Width	18.20	0.05
D22	Card Slot Height	1.20	0.05
D23	Receptacle Body Width	19.89 19.94	0.05 0.08
D24	Receptacle Body Height	8.15	0.08
D25	Peg Centerline to Peg Centerline	3.41	0.05
D26	Contact C/L to 1st Row of Compliant Pins	9.25	0.10
D27	Housing Leg to Leg	17.35	0.05
D28	Datum N to Lower Card Slot Centerline	3.75	0.10
D29	Lower Card Slot to Upper Card Slot Centerline	4.50	0.10
D30	Datum N to Bottom of Receptacle Housing	2.10	0.10
D31	Card Slot Depth	6.13	0.08
D32	Datum G to Front of Receptacle Housing	12.17	0.10

5.5 Fixed (Receptacle) Right Angle Connector Footprint

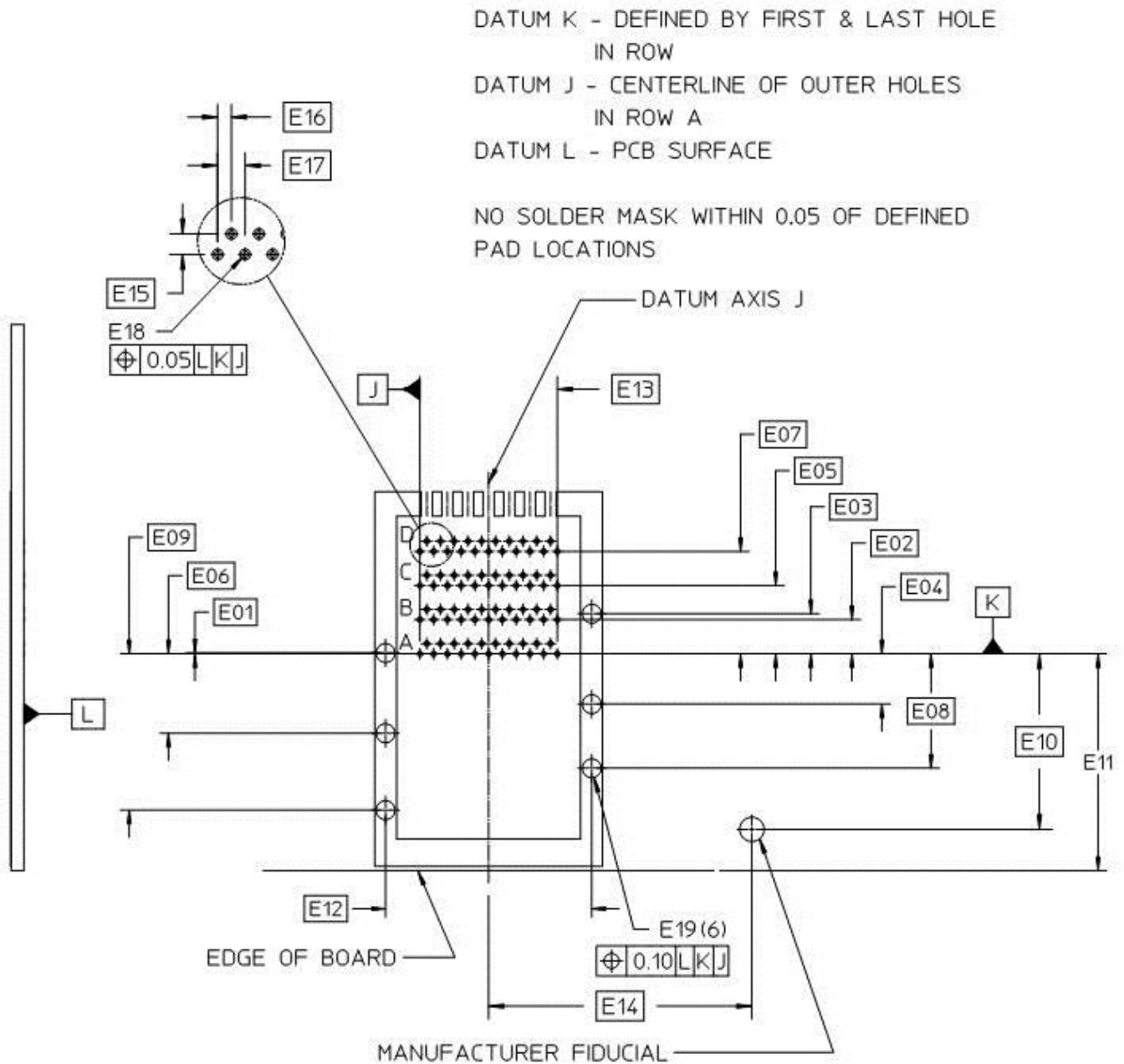


FIGURE 5-10 RECEPTACLE FOOTPRINT

TABLE 5-5 RECEPTACLE FOOTPRINT DIMENSIONS

Designator	Description	Dimension	Tolerance
E01	Shield Screw Hole to Datum K	0.10	Basic
E02	Row A (Datum K) to Row B	4.00	Basic
E03	Shield Screw Hole to Datum K	4.70	Basic
E04	Shield Post Hole to Datum K	5.89	Basic
E05	Row A (Datum K) to Row C	8.00	Basic
E06	Shield Post Hole to Datum K	9.30	Basic
E07	Row A (Datum K) to Row D	12.00	Basic
E08	Shield Screw Hole to Datum K	13.40	Basic
E09	Shield Screw Hole to Datum K	18.30	Basic
E10	Connector Datum to Manufacturer Fiducial	Basic	N/A
E11	Connector Datum to Card Edge	25.38	0.25
E12	Shield Mounting Hole to Mounting Hole	24.00	Basic
E13	Shield Pin Center to Center	16.00	Basic
E14	Connector Datum to Manufacturer Fiducial	Basic	N/A
E15	Within Row Pitch - Front to Back	1.20	Basic
E16	Within Row Horizontal Offset	0.80	Basic
E17	Within Row Pitch - Horizontal	1.60	Basic
E18	Contact Hole Diameter (finished PTH)	0.37	0.05
E19	Shield Mounting Hole Diameter (finished PTH)	2.20	0.05

5.6 Fixed (Receptacle) Right Angle Connector Ground Pad

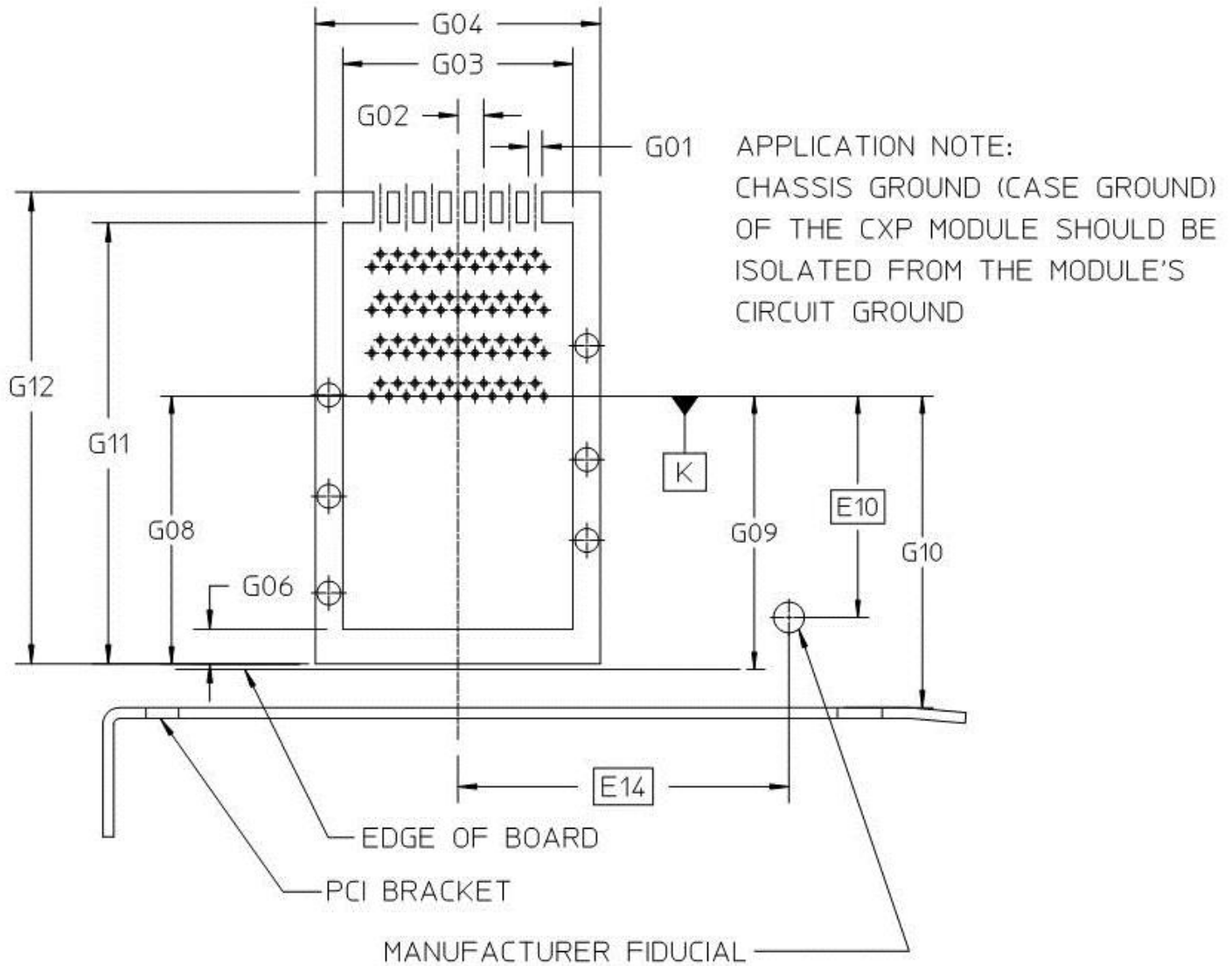
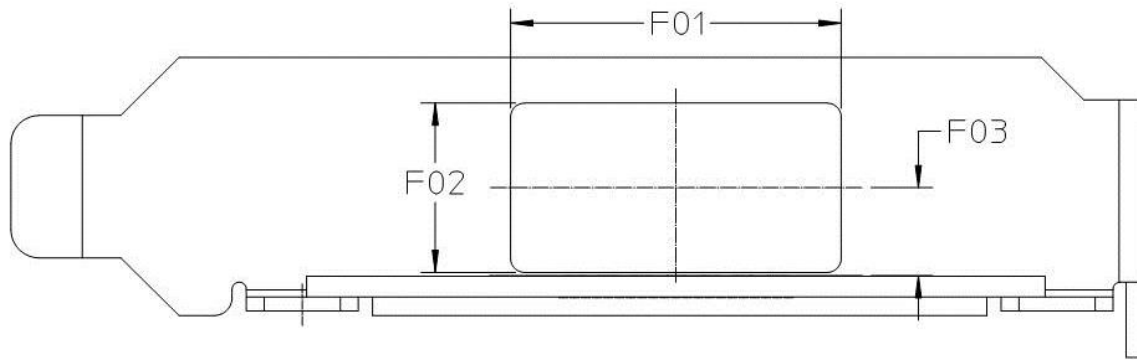


FIGURE 5-11 RECEPTACLE GROUND PAD

TABLE 5-6 RECEPTACLE GROUND PAD DIMENSIONS

Designator	Description	Dimension	Tolerance
G01	Ground Pad Alley Width	1.30	0.10
G02	Ground Pad Alley Spacing	2.40	0.10
G03	Ground Pad Inner Width	21.40	0.10
G04	Ground Pad Width	26.49	0.10
G05	Pad Center to Manufacturer Fiducial	Basic	N/A
G06	Ground Pad Width	3.21	0.10
G07	Connector Datum to Manufacturer Fiducial	Basic	N/A
G08	Connector Datum to Front Pad Edge	24.88	0.10
G09	Connector Datum to Card Edge	25.38	Ref
G10	Connector Datum to Bezel	28.96	0.25
G11	Ground Pad Edge to Inside Pad Edge	40.99	0.10
G12	Ground Pad Length	43.84	0.10

5.7 Fixed (Receptacle) Right Angle Connector Panel Cutout



(Low profile PCIe card bracket shown for reference)

FIGURE 5-12 RECEPTACLE PANEL CUTOUT

TABLE 5-7 RECEPTACLE PANEL CUTOUT DIMENSIONS

Designator	Description	Dimension	Tolerance
F01	Cutout Length	23.50	0.05
F02	Cutout Height	12.10	0.05
F03	Cutout Location from PCB Surface	6.29	0.05

5.8 Minimum Spacing For Receptacles

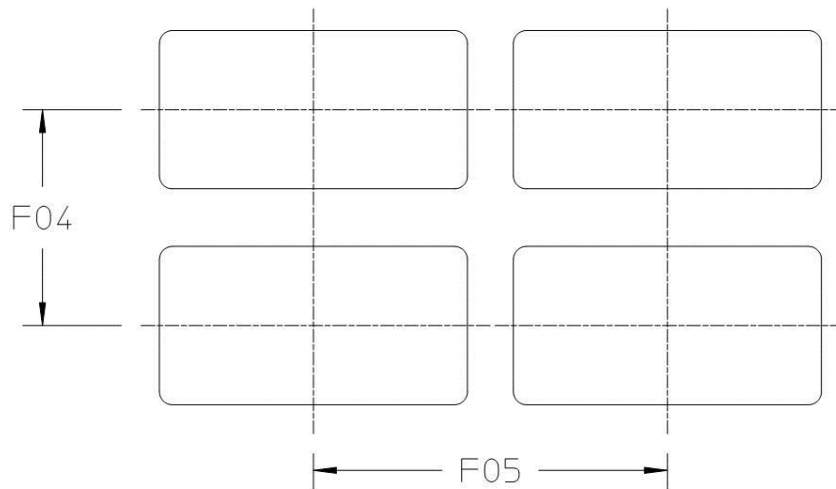


FIGURE 5-13 MINIMUM PORT SPACING - HORIZONTAL AND VERTICAL PITCH

TABLE 5-8 MINIMUM PORT SPACING DIMENSIONS

Designator	Description	Dimension	Tolerance
F04	Vertical Pitch	16.50	Min
F05	Horizontal Pitch (individual receptacles)	27.00	Min

5.9 Orientation Key

An orientation key is required to assure that the plug is inserted into the receptacle right side up.

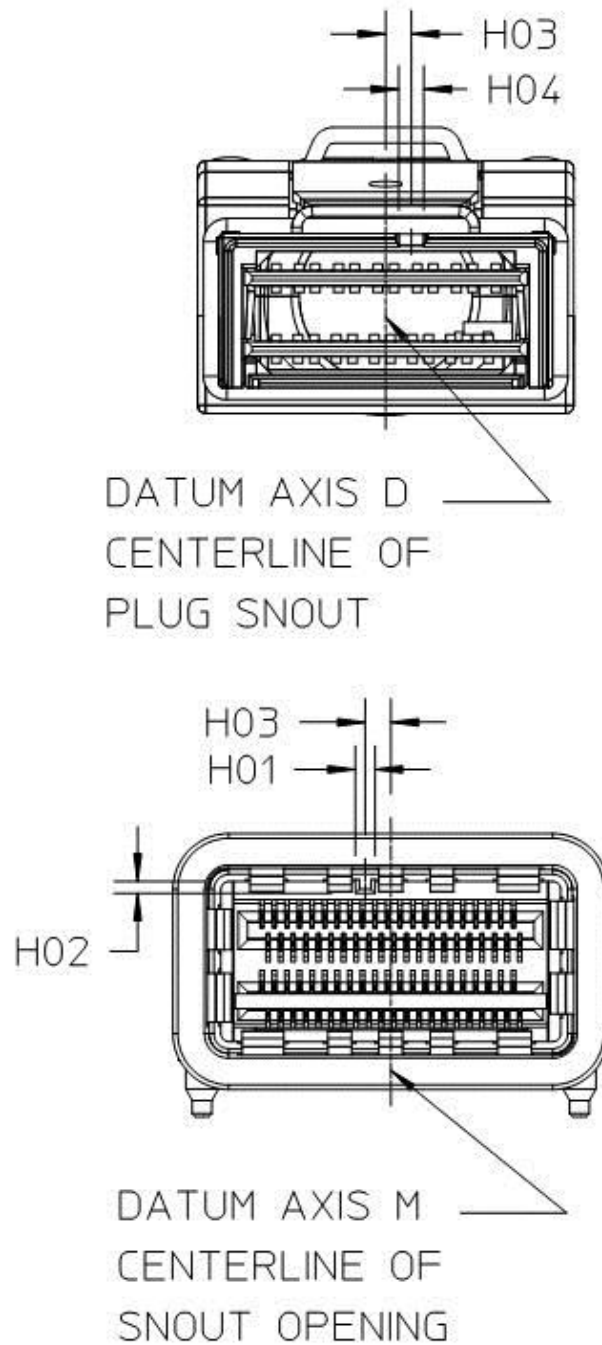


FIGURE 5-14 ORIENTATION KEY

TABLE 5-9 ORIENTATION KEY/KEYWAY DIMENSIONS

Designator	Description	Dimension	Tolerance
H01	Orientation Key Width	1.25	0.13
H02	Orientation Key Height	0.75	0.13
H03	Orientation Key Location	1.625	0.13
H04	Orientation Key Slot	1.60	0.13

5.10 Thermal Solution

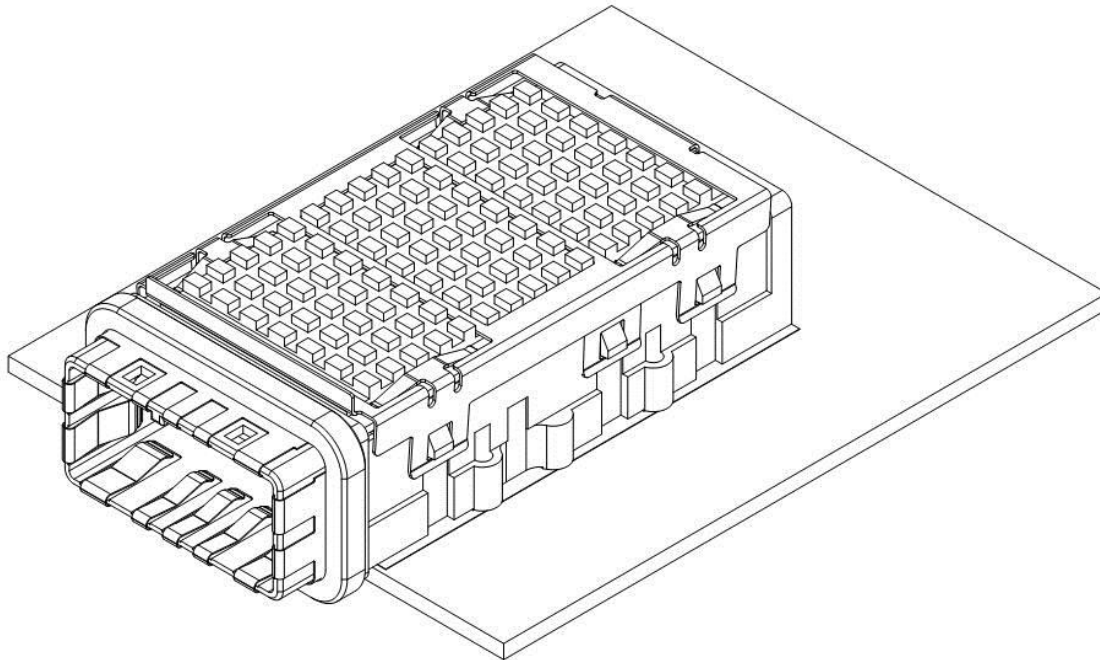


FIGURE 5-15 RECEPTACLE WITH OPTIONAL SPRING-LOADED HEAT SINK AND CLIP

5.11 Thermal Interface Definition for Plug on Plug

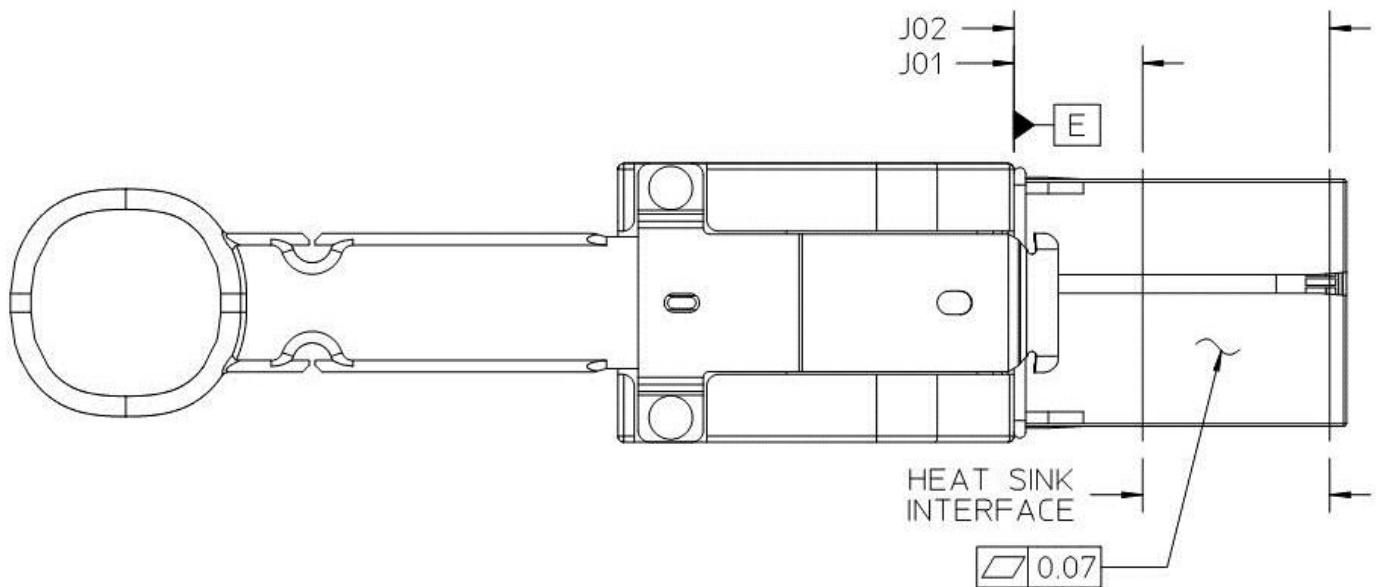


FIGURE 5-16 THERMAL INTERFACE DEFINITION FOR PLUG

TABLE 5-10 THERMAL INTERFACE DEFINITION FOR PLUG

Designator	Description	Dimension	Tolerance
J01	Plug Body to Heat Sink Interface Start	11.00	Max
J02	Plug Body to Heat Sink Interface End	27.00	Min

5.12 Heat Sink Configuration

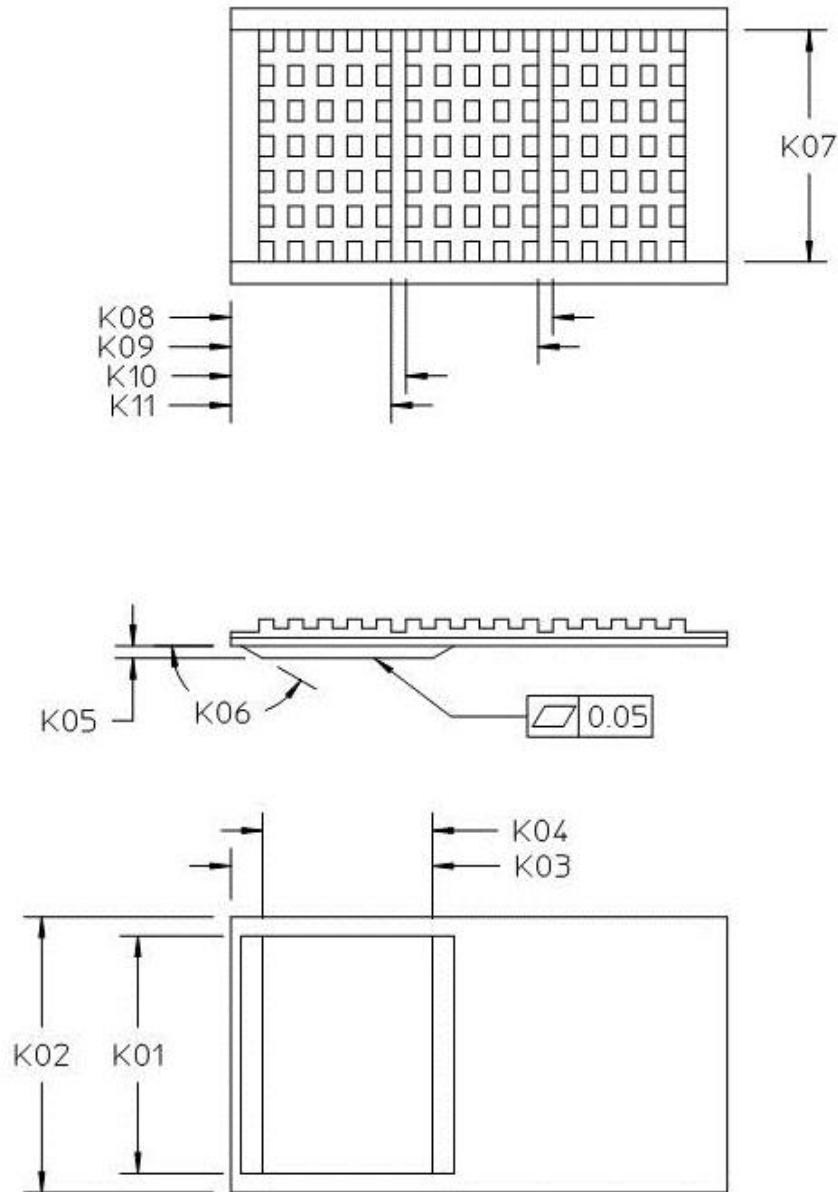


FIGURE 5-17 HEAT SINK THERMAL INTERFACE PROFILE FOR RECEPTACLE

TABLE 5-11 HEAT SINK THERMAL INTERFACE DIMENSIONS

Designator	Description	Dimension	Tolerance
K01	Heat Sink Pad Width	20.25	0.10
K02	Heat Sink Width	23.50	0.10
K03	Heat Sink Pad Back Edge	17.93	0.10
K04	Heat Sink Pad Length	14.46	0.10
K05	Heat Sink Pad Height	1.05	0.10
K06	Heat Sink Lead-In Angle	150.00	5.00
K07	Heat Sink Tower Width	19.75	0.10
K08	Heat Sink Clip Interface Zone	27.40	0.10
K09	Heat Sink Clip Interface Zone	26.15	0.10
K10	Heat Sink Clip Interface Zone	14.90	0.10
K11	Heat Sink Clip Interface Zone	13.65	0.10

5.13 Heat Sink Clip

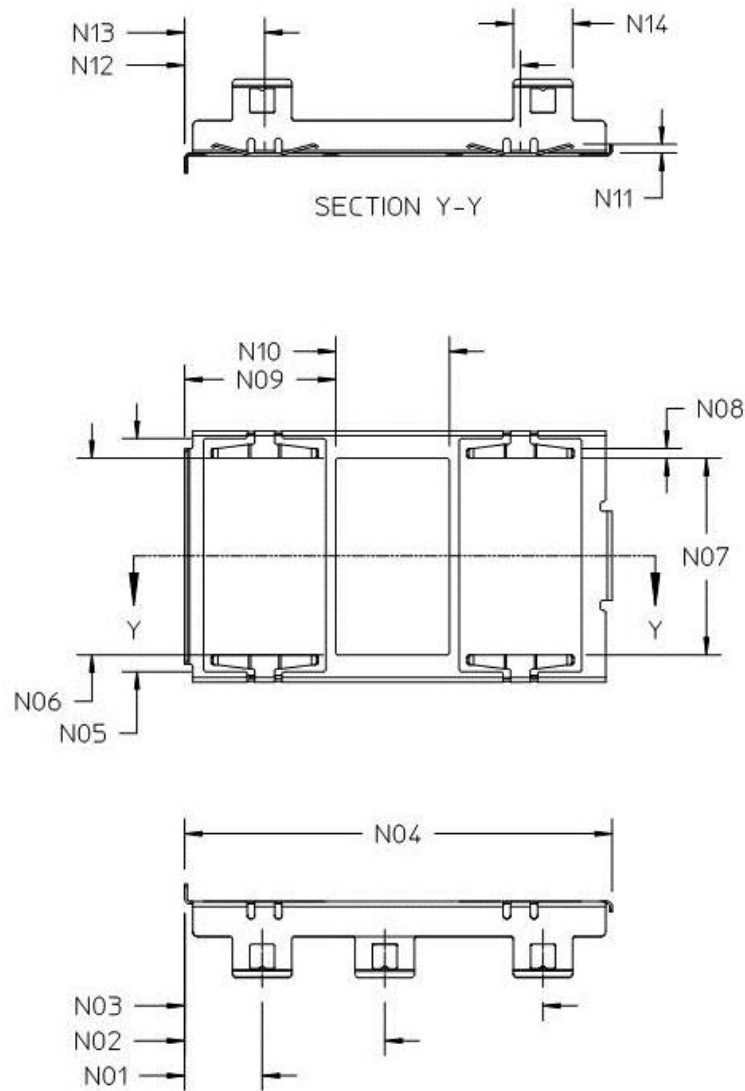


FIGURE 5-18 HEAT SINK CLIP

TABLE 5-12 HEAT SINK CLIP DIMENSIONS

Designator	Description	Dimension	Tolerance
N01	Heat Sink Clip Flange to Attach Point	7.84	0.10
N02	Heat Sink Clip Flange to Attach Point	20.25	0.10
N03	Heat Sink Clip Flange to Attach Point	36.25	0.10
N04	Heat Sink Clip Length	43.25	0.10
N05	Heat Sink Clip Cut Out Width	23.60	0.10
N06	Heat Sink Clip Cut Out Width	19.90	0.10
N07	Heat Sink Clip Finger to Finger	19.90	0.10
N08	Heat Sink Clip Finger Width	1.00	Ref
N09	Heat Sink Clip Cut Out Length	15.28	0.10
N10	Heat Sink Clip Cut Out Length	11.50	0.10
N11	Heat Sink Clip Finger Height	0.91	Ref
N12	Heat Sink Clip Finger Location	33.97	Ref
N13	Heat Sink Clip Finger Location	8.09	Ref
N14	Heat Sink Clip Attach Point Width	6.25	Max

5.14 Heat Sink Attach Points on Receptacle

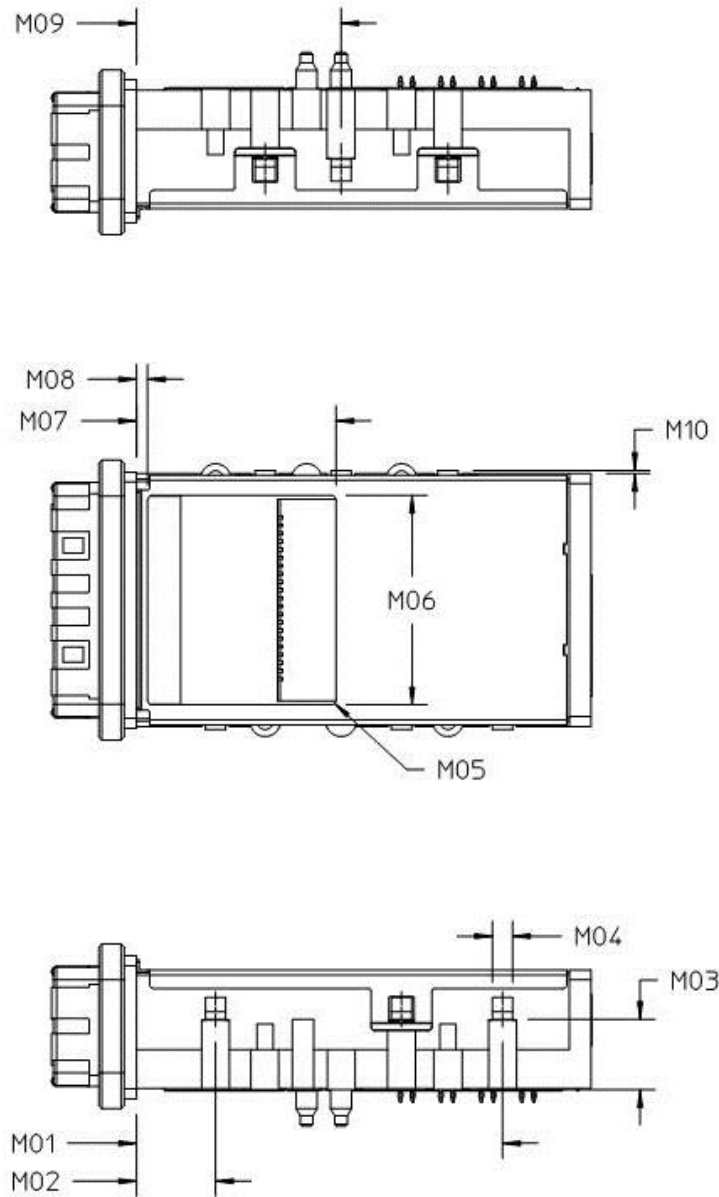


FIGURE 5-19 HEAT SINK ATTACH POINTS

TABLE 5-13 HEAT SINK ATTACH POINTS DIMENSIONS

Designator	Description	Dimension	Tolerance
M01	Flange to Heat Sink Attach Point	36.25	0.10
M02	Flange to Heat Sink Attach Point	7.84	0.10
M03	Heat Sink Attach Point Height	6.96	0.10
M04	Heat Sink Attach Point Width	2.00	0.10
M05	Heat Sink Cover Opening Radius	0.50	0.10
M06	Heat Sink Cover Opening Width	20.75	0.10
M07	Flange to Heat Sink Cover Opening	18.65	0.10
M08	Heat Sink Cover Opening Length	1.10	0.10
M09	Flange to Heat Sink Attach Point	20.25	0.10
M10	Height of Heat Sink Attach Feature	0.30	Min

5.15 Dust Cover for Receptacle Ports

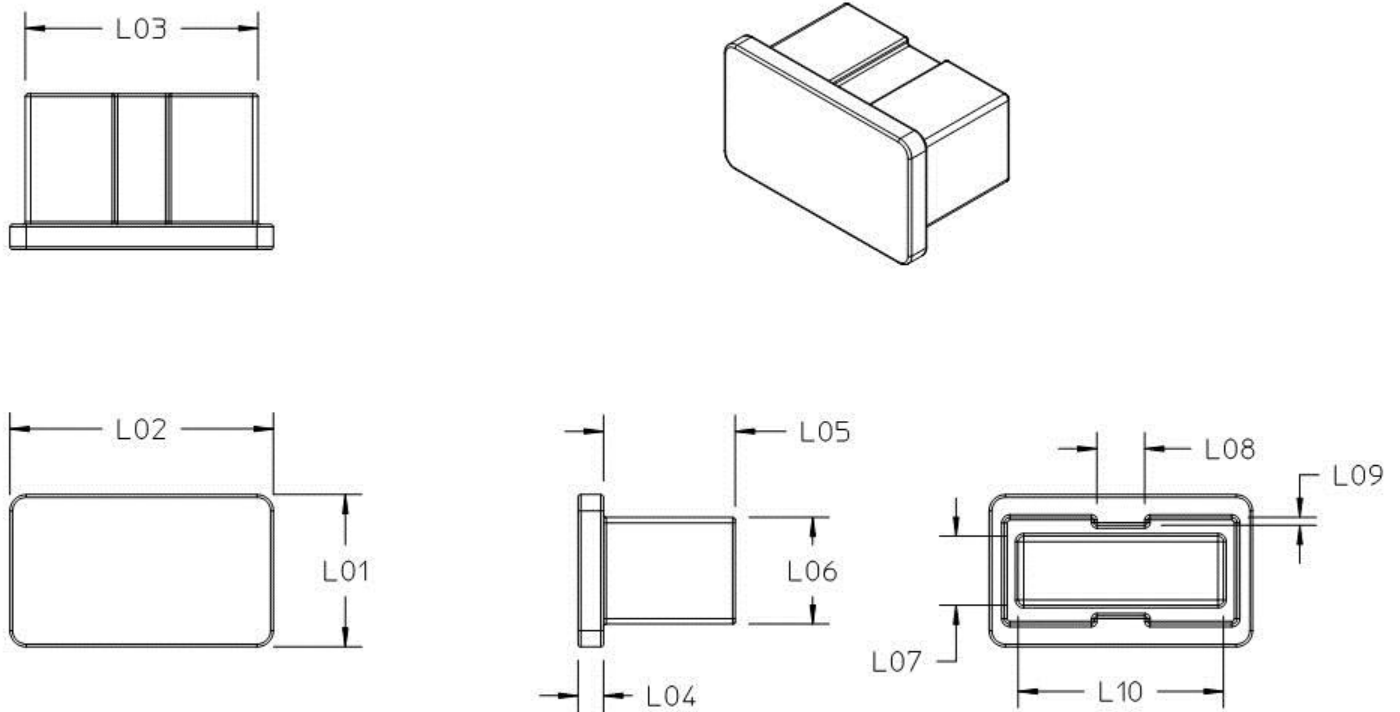


FIGURE 5-20 DUST COVER FOR RECEPTACLE PORTS

TABLE 5-14 DUST COVER FOR RECEPTACLE PORTS DIMENSIONS

Designator	Description	Dimension	Tolerance
L01	Front Height	14.00	Max
L02	Front Width	24.00	Max
L03	Body Width	21.20	0.10
L04	Front Thickness	2.00	Min
L05	Body Length	12.00	Max
L06	Body Height	9.81	0.10
L07	Body Inner Height	6.35	0.10
L08	Groove Width	4.35	0.10
L09	Groove Depth	0.73	Ref
L10	Body Inner Width	18.70	0.10

6 Performance Requirements

This specification conforms to the test sequences as defined in EIA-364 TS-1000.

TABLE 6-1 TS-1000 REQUIREMENTS

Description	Requirement
Rated Durability Cycles	250
Field Life (3, 5, 7, or 10 years)	10 year
Field Temperature (57, 60, 65, 75, or 85C)	65C degrees
Test Group 4 Option	1B
Plating Type (Precious / non-Precious)	Precious
Surface Treatment (Lubricated or non-Lubricated)	Manufacturer to specify

TABLE 6-2 ELECTRICAL REQUIREMENTS

Description	Requirement	Procedure
Current	0.5 A per contact	
Voltage	30 VDC per contact	
Low Level Contact Resistance	Baseline	EIA 364-23 20 mVDC, 10 mA
Insulation Resistance	1000 Megaohms minimum between adjacent contacts	100 VDC
Dielectric Withstanding Voltage	No defect or breakdown between adjacent contacts	300 VDC minimum for 1 minute

TABLE 6-3 MECHANICAL REQUIREMENTS

Description	Requirement	Procedure
Mating Force	150N maximum	EIA 364-13
Un-mating Force	50N maximum	EIA 364-13
Vibration	- No Damage - No discontinuity longer than 1 microsecond allowed. - 20 milliohms maximum change from initial (baseline) contact resistance	EIA 364-28
Mechanical Shock	- No Damage - 20 milliohms maximum change from initial (baseline) contact resistance	EIA 364-27

TABLE 6-4 ENVIRONMENTAL REQUIREMENTS

Description	Requirement	
Storage Temperature	-20C to +85C degrees	
Humidity	80 percent Relative Humidity	