SFF-TA-1040

Specification for

Internal Low-Profile High-Speed Cable Interconnect

Rev 0.0.2 July 15, 2025

SECRETARIAT: SFF TWG
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ABSTRACT: This specification defines the internal low-profile high-speed cable interconnect: a shielded, board-to-board cable assembly and SMT board connector interface. The connector as shown has 74 or 124 contacts based on bandwidth needs. The cable-side connector is available in horizontal exit.

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FOREWORD

The development work on this specification was done by the SNIA SFF TWG, an industry group. Since its formation as the SFF Committee in August 1990, as well as since SFF's transition to SNIA in 2016, the membership has included a mix of companies which are leaders across the industry.

For those who wish to participate in the activities of the SFF TWG, the signup for membership can be found at https://www.snia.org/join.

REVISION HISTORY

Rev 0.0.1 *April 2, 2025*:
-Initial draft

Rev 0.0.2 *July 15, 2025*:
Added x16 connector variant
Made editorial changes

CONTENTS

FIGURES

TABLES

1. Scope

This specification defines the general description of this form factor, the fixed-side connector mechanical specification, the free-side connector mechanical specification, performance requirements, and the electrical interface. Additional informative information such as PCB layout is included in an appendix.

2. References and Conventions

2.1 Industry Documents

The following documents are relevant to this specification:

- ASME Y14.5 Dimensioning and Tolerancing
- EIA-364-1000 Environmental Test Methodology for Assessing the Performance of Electrical Connectors and Sockets Used in Controlled Environment Applications
- CopprLink Internal Cable Specification for PCIe Express 5.0, 6.0, and 7.0

2.2 Sources

The complete list of SFF documents which have been published, are currently being worked on, or that have been expired by the SFF Committee can be found at https://www.snia.org/sff/specifications. Suggestions for improvement of this specification are welcome and should be submitted to https://www.snia.org/feedback.

Other standards may be obtained from the organizations listed below:

Standard	Organization	Website
ASME	American Society of Mechanical Engineers (ASME)	https://www.asme.org
Electronic Industries Alliance (EIA)	Electronic Components Industry Association (ECIA)	https://www.ecianow.org/eia-technical-standards
PCIe	PCI-SIG	https://www.pcisig.com/specifications

2.3 Conventions

The following conventions are used throughout this document:

DEFINITIONS: Certain words and terms used in this standard have a specific meaning beyond the normal English meaning. These words and terms are defined either in the definitions or in the text where they first appear.

ORDER OF PRECEDENCE: If a conflict arises between text, tables, or figures, the order of precedence to resolve the conflicts is text; then tables; and finally figures. Not all tables or figures are fully described in the text. Tables show data format and values.

LISTS: Lists sequenced by lowercase or uppercase letters show no ordering relationship between the listed items.

EXAMPLE 1 - The following list shows no relationship between the named items:

a. red (i.e., one of the following colors):
    A. crimson; or
    B. pink;
b. blue; or
c. green.

Lists sequenced by numbers show an ordering relationship between the listed items.

EXAMPLE 2 -The following list shows an ordered relationship between the named items:

1. top;
2. middle; and
3. bottom.

Lists are associated with an introductory paragraph or phrase and are numbered relative to that paragraph or phrase (i.e., all lists begin with an a. or 1. entry).

DIMENSIONING CONVENTIONS: The dimensioning conventions are described in ASME-Y14.5, Geometric Dimensioning and Tolerancing. All dimensions are in millimeters, which are the controlling dimensional units (if inches are supplied, they are for guidance only).

NUMBERING 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

3. Keywords, Acronyms, and Definitions

For the purposes of this document, the following keywords, acronyms, and definitions apply.

3.1 Keywords

May: Indicates flexibility of choice with no implied preference.

May or may not: Indicates flexibility of choice with no implied preference.

Obsolete: Indicates that an item was defined in prior specifications but has been removed from this specification.

Optional: 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 implemented as defined by the specification. Describing a feature as optional in the text is an informational callout to assist the reader.

Prohibited: Describes a feature, function, or coded value that is defined in a referenced specification to which this SFF specification makes a reference, where the use of said feature, function, or coded value is not allowed for implementations of this specification.

Reserved: Where the term is used for a signal on a connector contact, the 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.

Restricted: Refers to features, bits, bytes, words, and fields that are set aside for other standardization purposes. If the context of the specification applies to the restricted designation, then the restricted bit, byte, word, or field shall be treated as a value whose definition is not in scope of this document, and is not interpreted by this specification.

Shall: Indicates a mandatory requirement. Designers are required to implement all such mandatory requirements to ensure interoperability with other products that conform to this specification.

Should: Indicates flexibility of choice with a strongly preferred alternative.

Vendor specific: Indicates something (e.g., a bit, field, code value) that is not defined by this specification. Specification of the referenced item is determined by the manufacturer and may be used differently in various implementations.

3.2 Acronyms and Abbreviations

IDC: Insulation Displacement Contact
IDT: Insulation Displacement Termination
PCB: Printed Circuit Board
PF: Press Fit
PTH: Plated Through Hole
RA: Right Angle
RAND: Reasonable and Non-Discriminatory
SMT: Surface Mount Technology

3.3 Definitions

Alignment guides: A term used to describe features that pre-align the two halves of a connector interface before electrical contact is established. Other common terms include: guide pins, guideposts, blind mating features, mating features, alignment features, and mating guides.

Basic (dimension): The theoretical exact size, profile, orientation, or location of a feature. It is used as the basis from which permissible variations are established by tolerances in notes or in feature control frames (GD&T).

Connector: Each half of an interface that, when joined together, establish electrical contact and mechanical retention between two components. In this specification, the term connector does not apply to any specific gender; it is used to describe the receptacle, the plug or the card edge, or the union of receptacle to plug or card edge. Other common terms include: connector interface, mating interface, and separable interface.

Contacts: A term used to describe connector terminals that make electrical connections across a separable interface.

Datum: A point, line, plane, etc. assumed to be exact for the purposes of computation or reference, as established from actual features, and from which the location or geometric relationship of either feature is established.

Fixed-side connector: A term used to describe a connector that is terminated to a PCB. An example is shown in Figure 3-1.

Free-side connector: A term used to describe connector terminals that make electrical connections across a separable interface (i.e. the cable end). An example is shown in Figure 3-1.

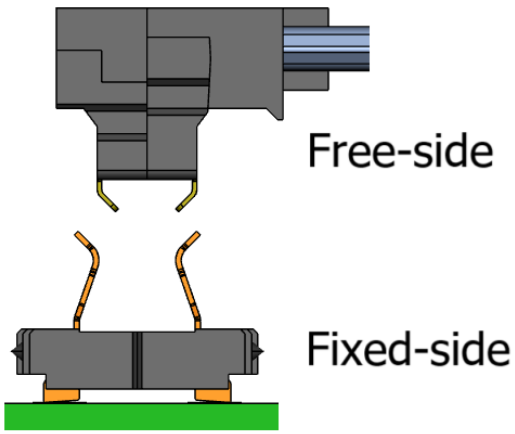


Figure 3-1 Plug and Receptacle Definition

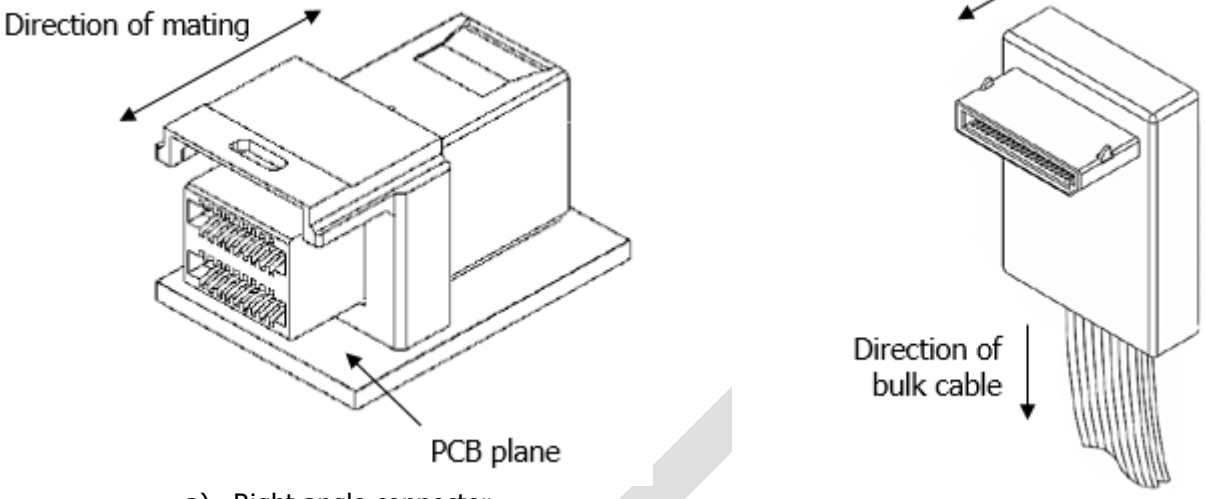
Plated through hole termination: A term used to describe a termination style in which rigid pins extend into or through the PCB. Pins are soldered to keep the connector or cage in place. Other common terms are through hole or PTH.

Press fit: A term used to describe a termination style in which collapsible pins penetrate the surface of a PCB. Upon insertion, the pins collapse to fit inside the PCB's plated through holes. The connector or cage is held in place by the interference fit between the collapsed pins and the PCB.

Reference (dimension): A dimension provided for information or convenience. It has no tolerance and is not to be used for inspection or conformance. It can be calculated from other tolerance dimensions or can be found elsewhere on the drawing with a tolerance. If removed, it would have no impact on the defined object or the ability or reproduce it.

Right Angle: A term used to describe either a connector design where the mating direction is parallel to the plane of the printed circuit board upon which the connector is mounted or a cable assembly design where the mating

direction is perpendicular to the bulk cable.



a) Right angle connector

b) Right angle cable assembly

Figure 3-2 Right Angle Connector and Cable Assembly

Straight: A term used to describe a connector design where the mating direction is parallel to the bulk cable.

Surface mount: A term used to describe a termination style in which solder tails sit on pads on the surface of a PCB and are then soldered to keep the connector or cage in place. Other common terms are surface mount technology or SMT.

Termination: A term used to describe a connector's non-separable attachment point such as a connector contact to a bulk cable or a cage to a PCB or solder tail to PCB. Common PCB terminations include: surface mount (SMT), plated through hole termination (PTH), and press fit (PF). Common cable terminations include insulation displacement contact (IDC), insulation displacement termination (IDT), wire slots, solder, welds, crimps, and brazes.

Vertical: A term used to describe a connector design where the mating direction is perpendicular to the printed circuit board upon which the connector is mounted.

Wipe: The distance a contact travels on the surface of its mating contact during the mating cycle as shown in Figure 3-3.

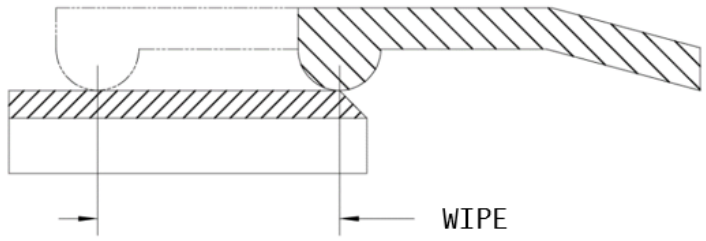


Figure 3-3 Wipe for a Continuous Contact

4. General Description

4.1 Configuration Overview/Descriptions

The connector system described in this document is made up of a fixed-side connector and a free-side connector. The free-side connector will have a horizontal (0°) cable exit and will have a pull tab.

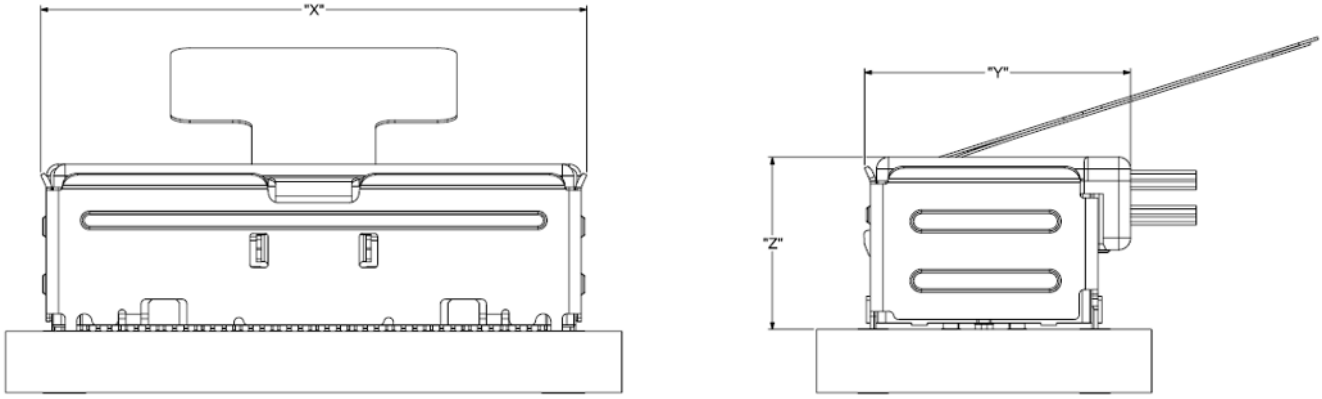


Figure 4-1: Overall dimensions for Connector/Cable Configurations

Table 4-1: Overall dimension values for Connector/Cable Configurations

Configuration	Description	Dim "X"	Dim "Y"	Dim "Z"
1	74-Pin Free-Side Horizontal (0°) Cable Exit with Pull-Tab	28.63	13.50	8.70
2	124-Pin Free-Side Horizontal ((0°) Cable Exit with Pull-Tab	49.65	13.50	8.70

4.1.1 Connector Configuration 1: 74-Pin Right Angle Cable Exit with Pull Tab

This configuration has the cables exiting the connector perpendicular to the direction of mating and parallel to the PCB. It includes a pull tab for unmating of the connector.

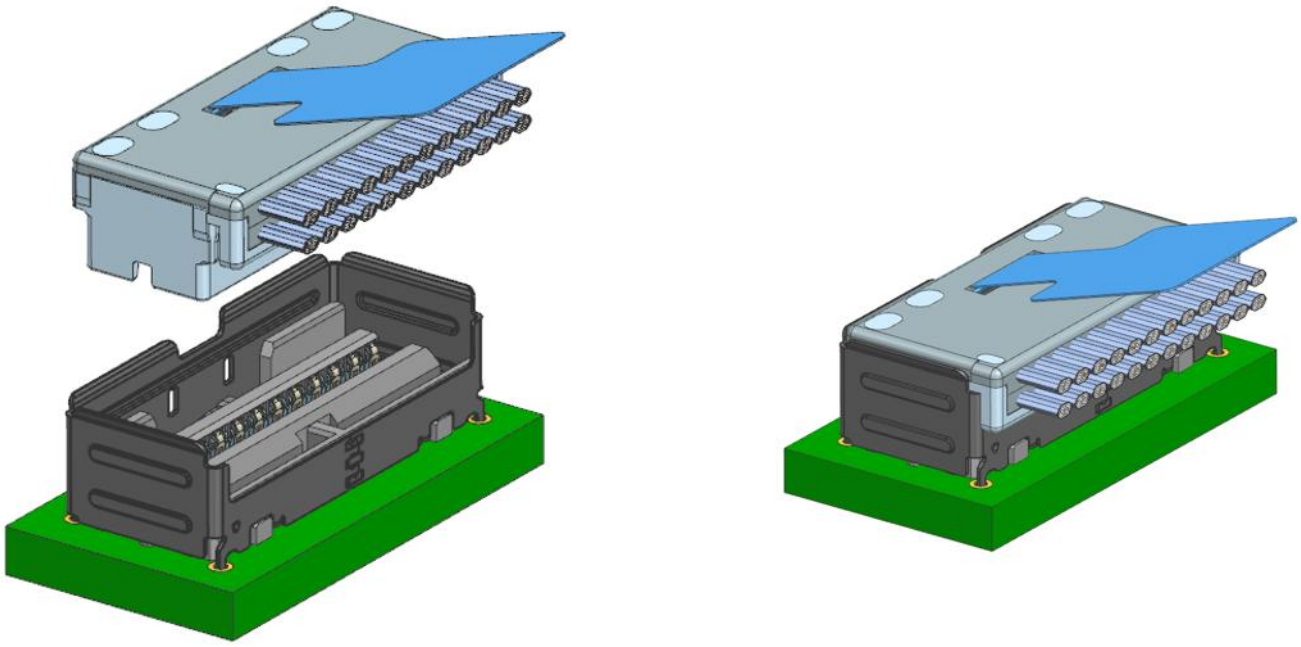


Figure 4-2: Configuration 1 - Unmated and Mated

4.1.2 Connector Configuration 1: 124-Pin Right Angle Cable Exit with Pull Tab

This configuration has the cables exiting the connector perpendicular to the direction of mating and parallel to the PCB. It includes a pull tab for unmating of the connector.

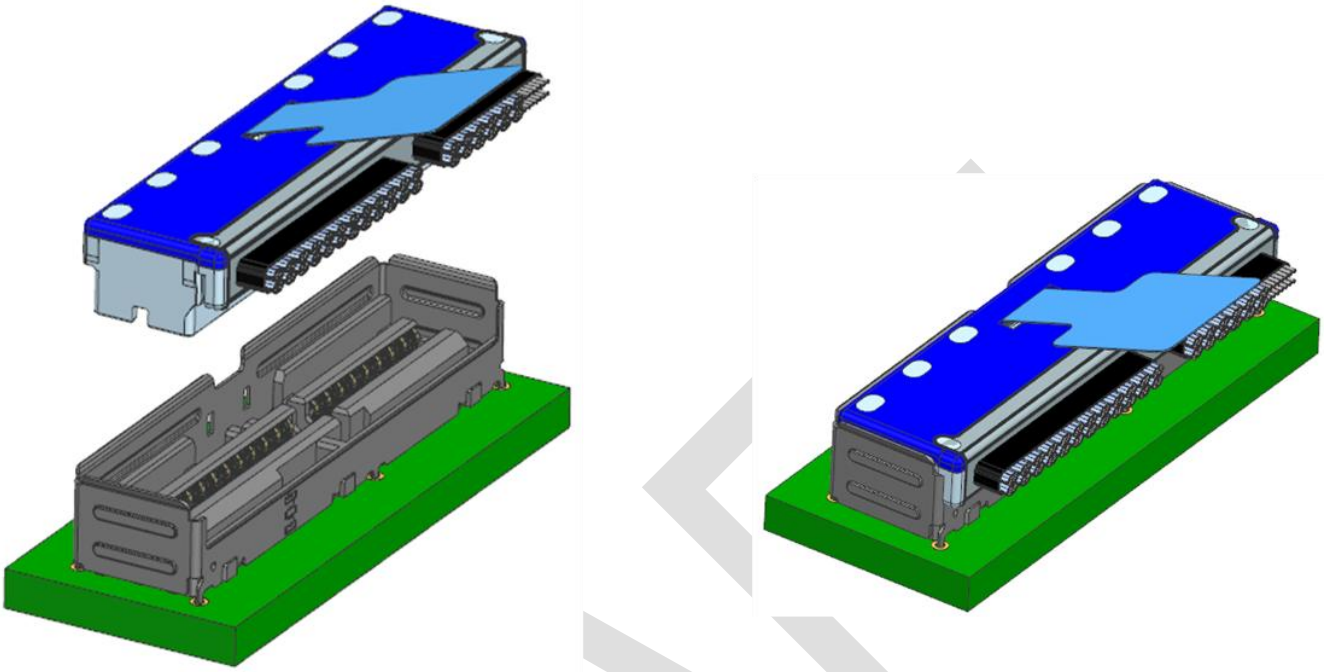


Figure 4-3: Configuration 2 - Unmated and Mated

4.2 Contact Numbering

The pins or electrical contacts in this connector are numbered as shown in Figure 4-4. Electrical assignments are captured in Table 4-2. Contacts labeled "S" denote signals that carry half of a high-speed differential pair. Ground contacts are labeled "GND".

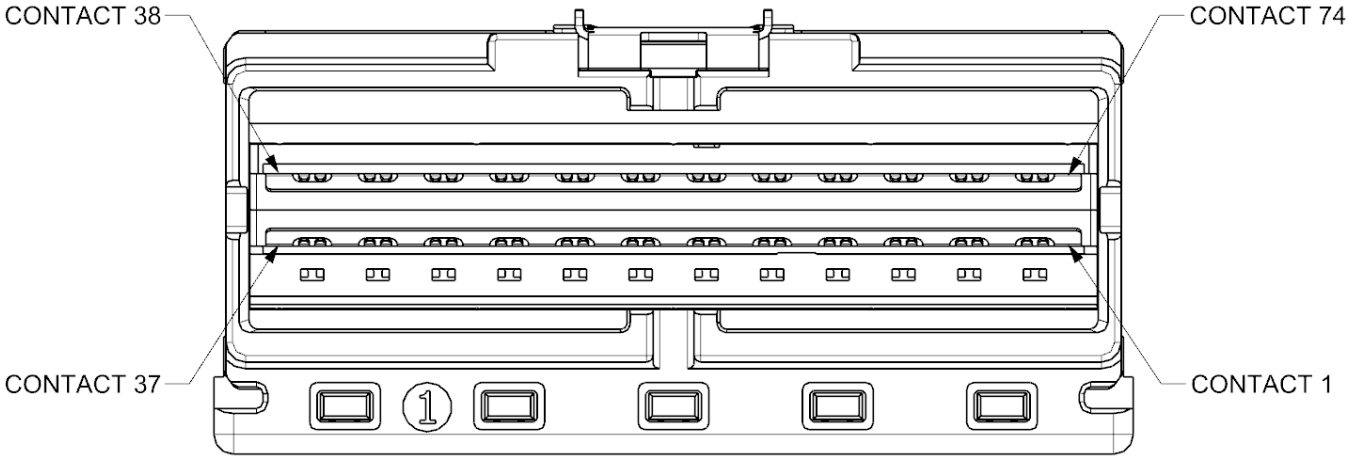


Figure 4-4: 72-Pin Free-Side Connector Contact Numbering

Table 4-2: 72-Pin Free-Side Connector Pinout

P1		P2	
CKT		CKT	
1	GND	38	GND
2	S	39	S
3	S	40	S
4	GND	41	GND
5	S	42	S
6	S	43	S
7	GND	44	GND
8	S	45	S
9	S	46	S
10	GND	47	GND
11	S	48	S
12	S	49	S
13	GND	50	GND
14	S	51	S
15	S	52	S
16	GND	53	GND
17	S	54	S
18	S	55	S
19	GND	56	GND
20	S	57	S
21	S	58	S
22	GND	59	GND
23	S	60	S
24	S	61	S
25	GND	62	GND
26	S	63	S
27	S	64	S
28	GND	65	GND
29	S	66	S
30	S	67	S
31	GND	68	GND
32	S	69	S
33	S	70	S
34	GND	71	GND
35	S	72	S
36	S	73	S
37	GND	74	GND

P1		P2	
CKT		CKT	
38	GND	1	GND
39	S	2	S
40	S	3	S
41	GND	4	GND
42	S	5	S
43	S	6	S
44	GND	7	GND
45	S	8	S
46	S	9	S
47	GND	10	GND
48	S	11	S
49	S	12	S
50	GND	13	GND
51	S	14	S
52	S	15	S
53	GND	16	GND
54	S	17	S
55	S	18	S
56	GND	19	GND
57	S	20	S
58	S	21	S
59	GND	22	GND
60	S	23	S
61	S	24	S
62	GND	25	GND
63	S	26	S
64	S	27	S
65	GND	28	GND
66	S	29	S
67	S	30	S
68	GND	31	GND
69	S	32	S
70	S	33	S
71	GND	34	GND
72	S	35	S
73	S	36	S
74	GND	37	GND

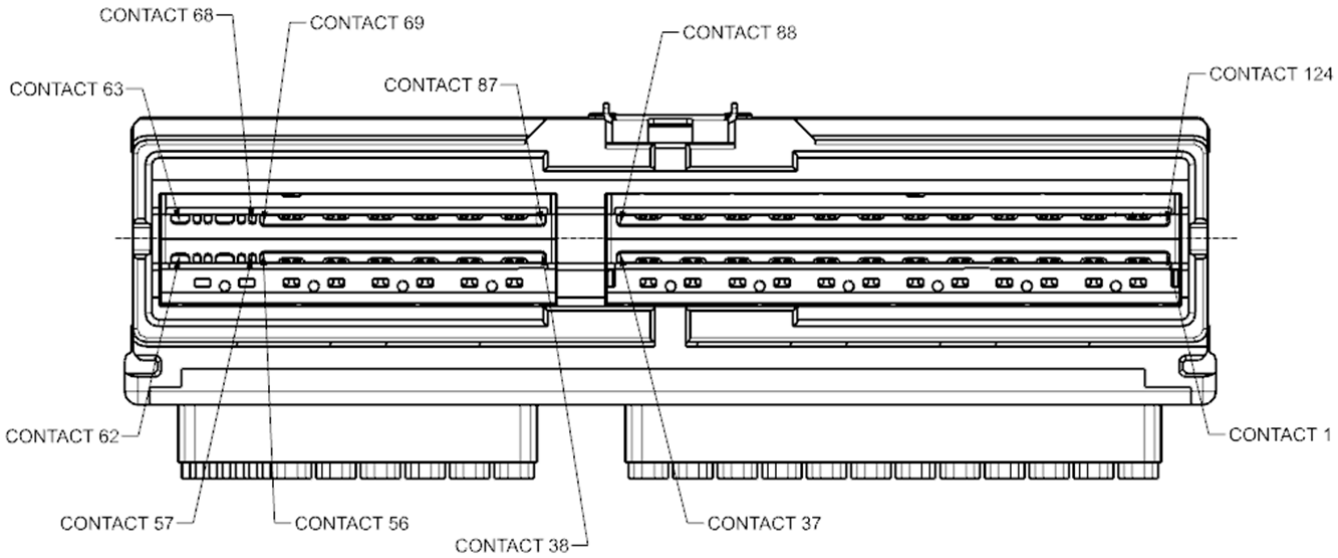


Figure 4-5: 124-Pin Free-Side Connector Contact Numbering

36DP & 12SE (SINGLE ENDED) PINOUT OPTION - 01

P1		P2	
CKT		CKT	
1	GND	88	GND
2	S-Tx	89	S-Tx
3	S-Tx	90	S-Tx
4	GND	91	GND
5	S-Tx	92	S-Tx
6	S-Tx	93	S-Tx
7	GND	94	GND
8	S-Tx	95	S-Tx
9	S-Tx	96	S-Tx
10	GND	97	GND
11	S-Tx	98	S-Tx
12	S-Tx	99	S-Tx
13	GND	100	GND
14	S-Tx	101	S-Tx
15	S-Tx	102	S-Tx
16	GND	103	GND
17	S-Tx	104	S-Tx
18	S-Tx	105	S-Tx
19	GND	106	GND
20	S-Tx	107	S-Tx
21	S-Tx	108	S-Tx
22	GND	109	GND
23	S-Tx	110	S-Tx
24	S-Tx	111	S-Tx
25	GND	112	GND
26	S-Tx	113	S-Tx
27	S-Tx	114	S-Tx
28	GND	115	GND
29	S-Tx	116	S-Tx
30	S-Tx	117	S-Tx
31	GND	118	GND
32	S-Tx	119	S-Tx
33	S-Tx	120	S-Tx
34	GND	121	GND
35	S-Tx	122	S-Tx
36	S-Tx	123	S-Tx
37	GND	124	GND

P1		P2	
CKT		CKT	
38	GND	69	GND
39	S-Tx	70	S-Tx
40	S-Tx	71	S-Tx
41	GND	72	GND
42	S-Tx	73	S-Tx
43	S-Tx	74	S-Tx
44	GND	75	GND
45	S-Tx	76	S-Tx
46	S-Tx	77	S-Tx
47	GND	78	GND
48	S-Tx	79	S-Tx
49	S-Tx	80	S-Tx
50	GND	81	GND
51	S-Tx	82	S-Tx
52	S-Tx	83	S-Tx
53	GND	84	GND
54	S-Tx	85	S-Tx
55	S-Tx	86	S-Tx
56	GND	87	GND
57	SE	68	SE
58	SE	67	SE
59	SE	66	SE
60	SE	65	SE
61	SE	64	SE
62	SE	63	SE

P1		P2	
CKT		CKT	
63	SE	62	SE
64	SE	61	SE
65	SE	60	SE
66	SE	59	SE
67	SE	58	SE
68	SE	57	SE
69	GND	38	GND
70	S-Tx	39	S-Tx
71	S-Tx	40	S-Tx
72	GND	41	GND
73	S-Tx	42	S-Tx
74	S-Tx	43	S-Tx
75	GND	44	GND
76	S-Tx	45	S-Tx
77	S-Tx	46	S-Tx
78	GND	47	GND
79	S-Tx	48	S-Tx
80	S-Tx	49	S-Tx
81	GND	50	GND
82	S-Tx	51	S-Tx
83	S-Tx	52	S-Tx
84	GND	53	GND
85	S-Tx	54	S-Tx
86	S-Tx	55	S-Tx
87	GND	56	GND

P1		P2	
CKT		CKT	
88	GND	1	GND
89	S-Tx	2	S-Tx
90	S-Tx	3	S-Tx
91	GND	4	GND
92	S-Tx	5	S-Tx
93	S-Tx	6	S-Tx
94	GND	7	GND
95	S-Tx	8	S-Tx
96	S-Tx	9	S-Tx
97	GND	10	GND
98	S-Tx	11	S-Tx
99	S-Tx	12	S-Tx
100	GND	13	GND
101	S-Tx	14	S-Tx
102	S-Tx	15	S-Tx
103	GND	16	GND
104	S-Tx	17	S-Tx
105	S-Tx	18	S-Tx
106	GND	19	GND
107	S-Tx	20	S-Tx
108	S-Tx	21	S-Tx
109	GND	22	GND
110	S-Tx	23	S-Tx
111	S-Tx	24	S-Tx
112	GND	25	GND
113	S-Tx	26	S-Tx
114	S-Tx	27	S-Tx
115	GND	28	GND
116	S-Tx	29	S-Tx
117	S-Tx	30	S-Tx
118	GND	31	GND
119	S-Tx	32	S-Tx
120	S-Tx	33	S-Tx
121	GND	34	GND
122	S-Tx	35	S-Tx
123	S-Tx	36	S-Tx
124	GND	37	GND

Figure 4-6: 124-Pin Free-Side Connector Recommended Pinout - Option 1

36DP & 12SE (SINGLE ENDED) PINOUT OPTION - 02

P1		P2	
CKT		CKT	
1	GND	124	GND
2	S-Tx	123	S-Tx
3	S-Tx	122	S-Tx
4	GND	121	GND
5	S-Tx	120	S-Tx
6	S-Tx	119	S-Tx
7	GND	118	GND
8	S-Tx	117	S-Tx
9	S-Tx	116	S-Tx
10	GND	115	GND
11	S-Tx	114	S-Tx
12	S-Tx	113	S-Tx
13	GND	112	GND
14	S-Tx	111	S-Tx
15	S-Tx	110	S-Tx
16	GND	109	GND
17	S-Tx	108	S-Tx
18	S-Tx	107	S-Tx
19	GND	106	GND
20	S-Tx	105	S-Tx
21	S-Tx	104	S-Tx
22	GND	103	GND
23	S-Tx	102	S-Tx
24	S-Tx	101	S-Tx
25	GND	100	GND
26	S-Tx	99	S-Tx
27	S-Tx	98	S-Tx
28	GND	97	GND
29	S-Tx	96	S-Tx
30	S-Tx	95	S-Tx
31	GND	94	GND
32	S-Tx	93	S-Tx
33	S-Tx	92	S-Tx
34	GND	91	GND
35	S-Tx	90	S-Tx
36	S-Tx	89	S-Tx
37	GND	88	GND

P1		P2	
CKT		CKT	
38	GND	87	GND
39	S-Tx	86	S-Tx
40	S-Tx	85	S-Tx
41	GND	84	GND
42	S-Tx	83	S-Tx
43	S-Tx	82	S-Tx
44	GND	81	GND
45	S-Tx	80	S-Tx
46	S-Tx	79	S-Tx
47	GND	78	GND
48	S-Tx	77	S-Tx
49	S-Tx	76	S-Tx
50	GND	75	GND
51	S-Tx	74	S-Tx
52	S-Tx	73	S-Tx
53	GND	72	GND
54	S-Tx	71	S-Tx
55	S-Tx	70	S-Tx
56	GND	69	GND
57	SE	68	SE
58	SE	67	SE
59	SE	66	SE
60	SE	65	SE
61	SE	64	SE
62	SE	63	SE

P1		P2	
CKT		CKT	
63	SE	62	SE
64	SE	61	SE
65	SE	60	SE
66	SE	59	SE
67	SE	58	SE
68	SE	57	SE
69	GND	56	GND
70	S-Tx	55	S-Tx
71	S-Tx	54	S-Tx
72	GND	53	GND
73	S-Tx	52	S-Tx
74	S-Tx	51	S-Tx
75	GND	50	GND
76	S-Tx	49	S-Tx
77	S-Tx	48	S-Tx
78	GND	47	GND
79	S-Tx	46	S-Tx
80	S-Tx	45	S-Tx
81	GND	44	GND
82	S-Tx	43	S-Tx
83	S-Tx	42	S-Tx
84	GND	41	GND
85	S-Tx	40	S-Tx
86	S-Tx	39	S-Tx
87	GND	38	GND

P1		P2	
CKT		CKT	
88	GND	37	GND
89	S-Tx	36	S-Tx
90	S-Tx	35	S-Tx
91	GND	34	GND
92	S-Tx	33	S-Tx
93	S-Tx	32	S-Tx
94	GND	31	GND
95	S-Tx	30	S-Tx
96	S-Tx	29	S-Tx
97	GND	28	GND
98	S-Tx	27	S-Tx
99	S-Tx	26	S-Tx
100	GND	25	GND
101	S-Tx	24	S-Tx
102	S-Tx	23	S-Tx
103	GND	22	GND
104	S-Tx	21	S-Tx
105	S-Tx	20	S-Tx
106	GND	19	GND
107	S-Tx	18	S-Tx
108	S-Tx	17	S-Tx
109	GND	16	GND
110	S-Tx	15	S-Tx
111	S-Tx	14	S-Tx
112	GND	13	GND
113	S-Tx	12	S-Tx
114	S-Tx	11	S-Tx
115	GND	10	GND
116	S-Tx	9	S-Tx
117	S-Tx	8	S-Tx
118	GND	7	GND
119	S-Tx	6	S-Tx
120	S-Tx	5	S-Tx
121	GND	4	GND
122	S-Tx	3	S-Tx
123	S-Tx	2	S-Tx
124	GND	1	GND

Figure 4-7: 124-Pin Free-Side Connector Recommended Pinout - Option 2

36DP & 12SE (SINGLE ENDED) PINOUT OPTION - 03

P1		P2	
CKT		CKT	
1	GND	37	GND
2	S-Tx	36	S-Tx
3	S-Tx	35	S-Tx
4	GND	34	GND
5	S-Tx	33	S-Tx
6	S-Tx	32	S-Tx
7	GND	31	GND
8	S-Tx	30	S-Tx
9	S-Tx	29	S-Tx
10	GND	28	GND
11	S-Tx	27	S-Tx
12	S-Tx	26	S-Tx
13	GND	25	GND
14	S-Tx	24	S-Tx
15	S-Tx	23	S-Tx
16	GND	22	GND
17	S-Tx	21	S-Tx
18	S-Tx	20	S-Tx
19	GND	19	GND
20	S-Tx	18	S-Tx
21	S-Tx	17	S-Tx
22	GND	16	GND
23	S-Tx	15	S-Tx
24	S-Tx	14	S-Tx
25	GND	13	GND
26	S-Tx	12	S-Tx
27	S-Tx	11	S-Tx
28	GND	10	GND
29	S-Tx	9	S-Tx
30	S-Tx	8	S-Tx
31	GND	7	GND
32	S-Tx	6	S-Tx
33	S-Tx	5	S-Tx
34	GND	4	GND
35	S-Tx	3	S-Tx
36	S-Tx	2	S-Tx
37	GND	1	GND

P1		P2	
CKT		CKT	
38	GND	56	GND
39	S-Tx	55	S-Tx
40	S-Tx	54	S-Tx
41	GND	53	GND
42	S-Tx	52	S-Tx
43	S-Tx	51	S-Tx
44	GND	50	GND
45	S-Tx	49	S-Tx
46	S-Tx	48	S-Tx
47	GND	47	GND
48	S-Tx	46	S-Tx
49	S-Tx	45	S-Tx
50	GND	44	GND
51	S-Tx	43	S-Tx
52	S-Tx	42	S-Tx
53	GND	41	GND
54	S-Tx	40	S-Tx
55	S-Tx	39	S-Tx
56	GND	38	GND
57	SE	57	SE
58	SE	58	SE
59	SE	59	SE
60	SE	60	SE
61	SE	61	SE
62	SE	62	SE

P1		P2	
CKT		CKT	
63	SE	63	SE
64	SE	64	SE
65	SE	65	SE
66	SE	66	SE
67	SE	67	SE
68	SE	68	SE
69	GND	87	GND
70	S-Tx	86	S-Tx
71	S-Tx	85	S-Tx
72	GND	84	GND
73	S-Tx	83	S-Tx
74	S-Tx	82	S-Tx
75	GND	81	GND
76	S-Tx	80	S-Tx
77	S-Tx	79	S-Tx
78	GND	78	GND
79	S-Tx	77	S-Tx
80	S-Tx	76	S-Tx
81	GND	75	GND
82	S-Tx	74	S-Tx
83	S-Tx	73	S-Tx
84	GND	72	GND
85	S-Tx	71	S-Tx
86	S-Tx	70	S-Tx
87	GND	69	GND

P1		P2	
CKT		CKT	
88	GND	124	GND
89	S-Tx	123	S-Tx
90	S-Tx	122	S-Tx
91	GND	121	GND
92	S-Tx	120	S-Tx
93	S-Tx	119	S-Tx
94	GND	118	GND
95	S-Tx	117	S-Tx
96	S-Tx	116	S-Tx
97	GND	115	GND
98	S-Tx	114	S-Tx
99	S-Tx	113	S-Tx
100	GND	112	GND
101	S-Tx	111	S-Tx
102	S-Tx	110	S-Tx
103	GND	109	GND
104	S-Tx	108	S-Tx
105	S-Tx	107	S-Tx
106	GND	106	GND
107	S-Tx	105	S-Tx
108	S-Tx	104	S-Tx
109	GND	103	GND
110	S-Tx	102	S-Tx
111	S-Tx	101	S-Tx
112	GND	100	GND
113	S-Tx	99	S-Tx
114	S-Tx	98	S-Tx
115	GND	97	GND
116	S-Tx	96	S-Tx
117	S-Tx	95	S-Tx
118	GND	94	GND
119	S-Tx	93	S-Tx
120	S-Tx	92	S-Tx
121	GND	91	GND
122	S-Tx	90	S-Tx
123	S-Tx	89	S-Tx
124	GND	88	GND

Figure 4-8: 124-Pin Free-Side Connector Recommended Pinout - Option 3

36DP & 12SE (SINGLE ENDED) PINOUT OPTION - 04

P1		P2	
CKT		CKT	
1	GND	1	GND
2	S-Tx	2	S-Tx
3	S-Tx	3	S-Tx
4	GND	4	GND
5	S-Tx	5	S-Tx
6	S-Tx	6	S-Tx
7	GND	7	GND
8	S-Tx	8	S-Tx
9	S-Tx	9	S-Tx
10	GND	10	GND
11	S-Tx	11	S-Tx
12	S-Tx	12	S-Tx
13	GND	13	GND
14	S-Tx	14	S-Tx
15	S-Tx	15	S-Tx
16	GND	16	GND
17	S-Tx	17	S-Tx
18	S-Tx	18	S-Tx
19	GND	19	GND
20	S-Tx	20	S-Tx
21	S-Tx	21	S-Tx
22	GND	22	GND
23	S-Tx	23	S-Tx
24	S-Tx	24	S-Tx
25	GND	25	GND
26	S-Tx	26	S-Tx
27	S-Tx	27	S-Tx
28	GND	28	GND
29	S-Tx	29	S-Tx
30	S-Tx	30	S-Tx
31	GND	31	GND
32	S-Tx	32	S-Tx
33	S-Tx	33	S-Tx
34	GND	34	GND
35	S-Tx	35	S-Tx
36	S-Tx	36	S-Tx
37	GND	37	GND

P1		P2	
CKT		CKT	
38	GND	38	GND
39	S-Tx	39	S-Tx
40	S-Tx	40	S-Tx
41	GND	41	GND
42	S-Tx	42	S-Tx
43	S-Tx	43	S-Tx
44	GND	44	GND
45	S-Tx	45	S-Tx
46	S-Tx	46	S-Tx
47	GND	47	GND
48	S-Tx	48	S-Tx
49	S-Tx	49	S-Tx
50	GND	50	GND
51	S-Tx	51	S-Tx
52	S-Tx	52	S-Tx
53	GND	53	GND
54	S-Tx	54	S-Tx
55	S-Tx	55	S-Tx
56	GND	56	GND
57	SE	57	SE
58	SE	58	SE
59	SE	59	SE
60	SE	60	SE
61	SE	61	SE
62	SE	62	SE

P1		P2	
CKT		CKT	
63	SE	63	SE
64	SE	64	SE
65	SE	65	SE
66	SE	66	SE
67	SE	67	SE
68	SE	68	SE
69	GND	69	GND
70	S-Tx	70	S-Tx
71	S-Tx	71	S-Tx
72	GND	72	GND
73	S-Tx	73	S-Tx
74	S-Tx	74	S-Tx
75	GND	75	GND
76	S-Tx	76	S-Tx
77	S-Tx	77	S-Tx
78	GND	78	GND
79	S-Tx	79	S-Tx
80	S-Tx	80	S-Tx
81	GND	81	GND
82	S-Tx	82	S-Tx
83	S-Tx	83	S-Tx
84	GND	84	GND
85	S-Tx	85	S-Tx
86	S-Tx	86	S-Tx
87	GND	87	GND

P1		P2	
CKT		CKT	
88	GND	88	GND
89	S-Tx	89	S-Tx
90	S-Tx	90	S-Tx
91	GND	91	GND
92	S-Tx	92	S-Tx
93	S-Tx	93	S-Tx
94	GND	94	GND
95	S-Tx	95	S-Tx
96	S-Tx	96	S-Tx
97	GND	97	GND
98	S-Tx	98	S-Tx
99	S-Tx	99	S-Tx
100	GND	100	GND
101	S-Tx	101	S-Tx
102	S-Tx	102	S-Tx
103	GND	103	GND
104	S-Tx	104	S-Tx
105	S-Tx	105	S-Tx
106	GND	106	GND
107	S-Tx	107	S-Tx
108	S-Tx	108	S-Tx
109	GND	109	GND
110	S-Tx	110	S-Tx
111	S-Tx	111	S-Tx
112	GND	112	GND
113	S-Tx	113	S-Tx
114	S-Tx	114	S-Tx
115	GND	115	GND
116	S-Tx	116	S-Tx
117	S-Tx	117	S-Tx
118	GND	118	GND
119	S-Tx	119	S-Tx
120	S-Tx	120	S-Tx
121	GND	121	GND
122	S-Tx	122	S-Tx
123	S-Tx	123	S-Tx
124	GND	124	GND

Figure 4-9: 124-Pin Free-Side Connector Recommended Pinout - Option 4

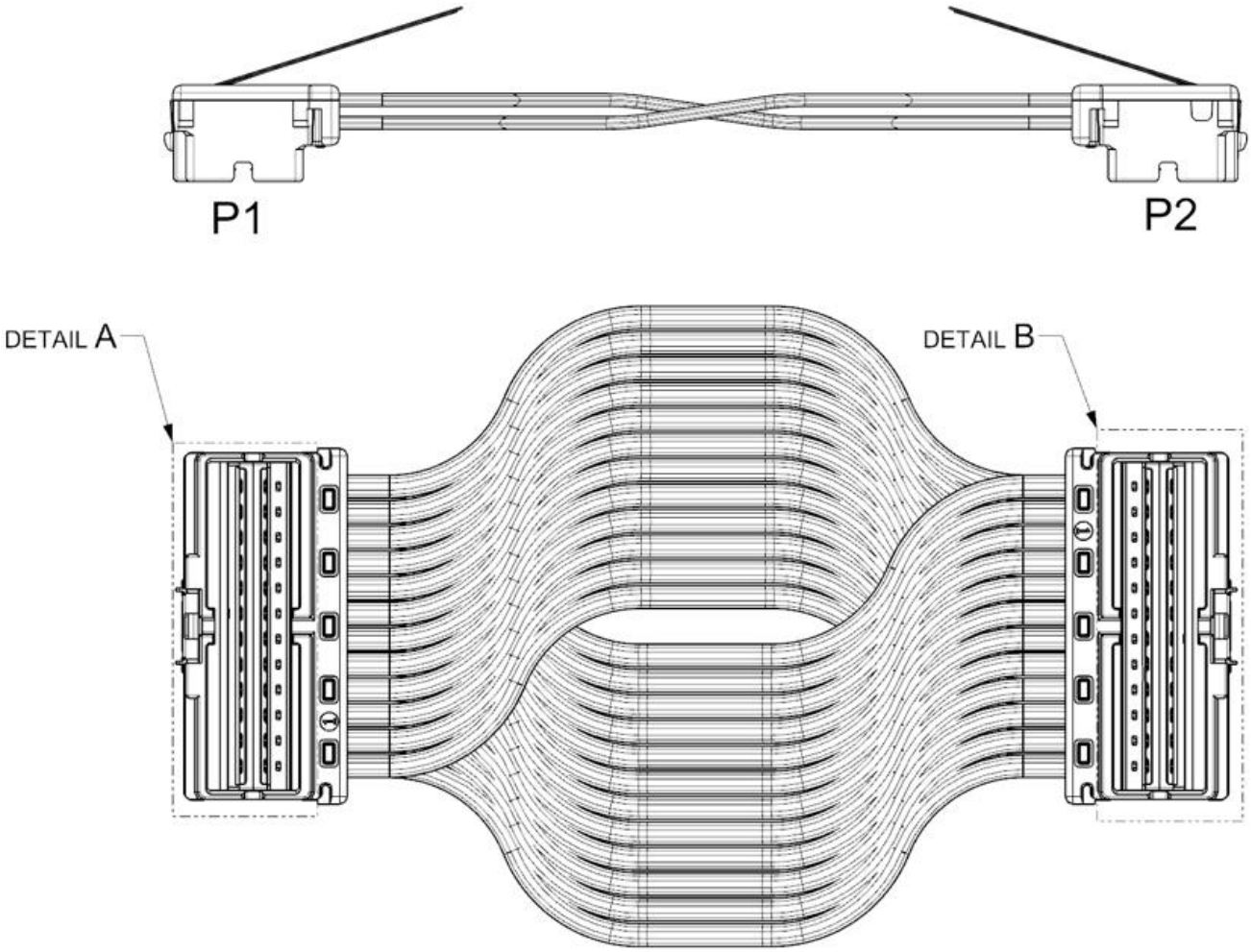


Figure 4-10: 72-Pin Cable Assembly Free-Side Connector Numbering

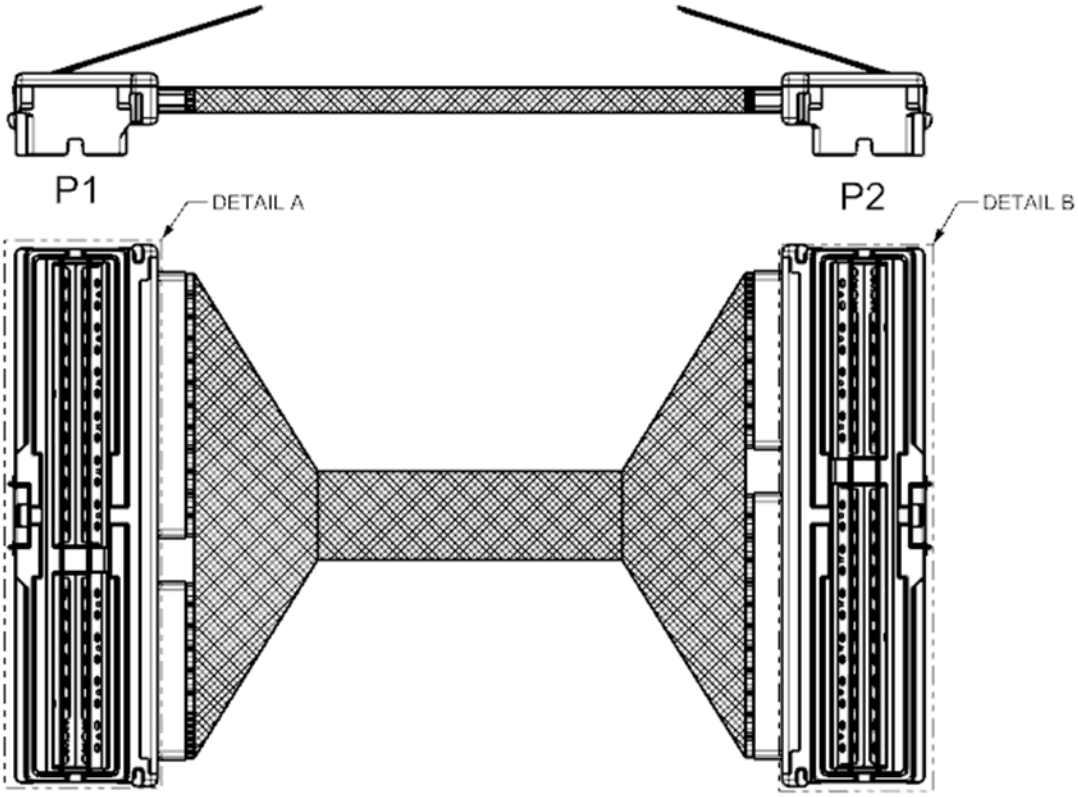


Figure 4-11: 124-Pin Cable Assembly Free-Side Connector Numbering

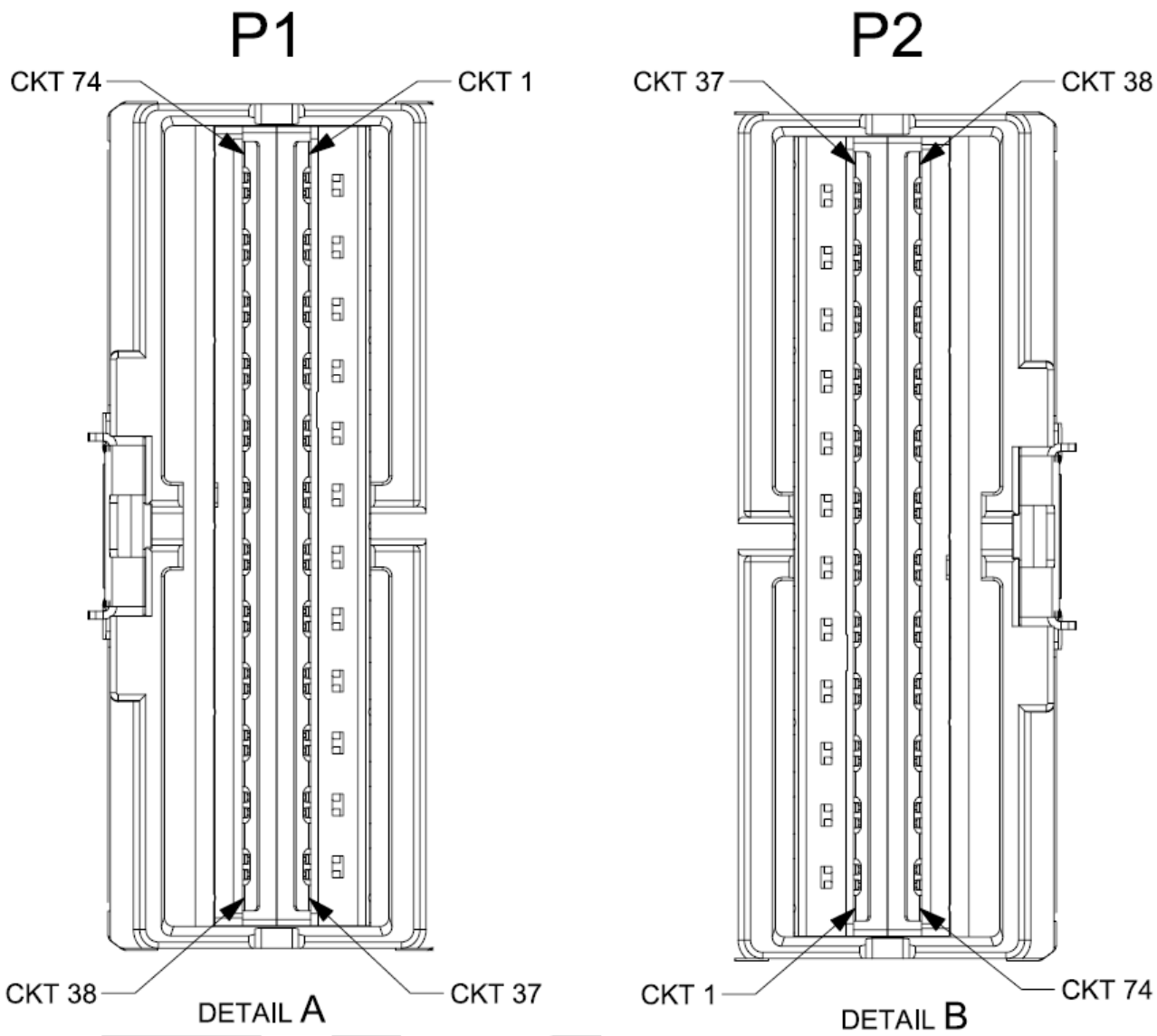


Figure 4-12: 72-Pin Cable Assembly Free-Side Connector Contact Numbering

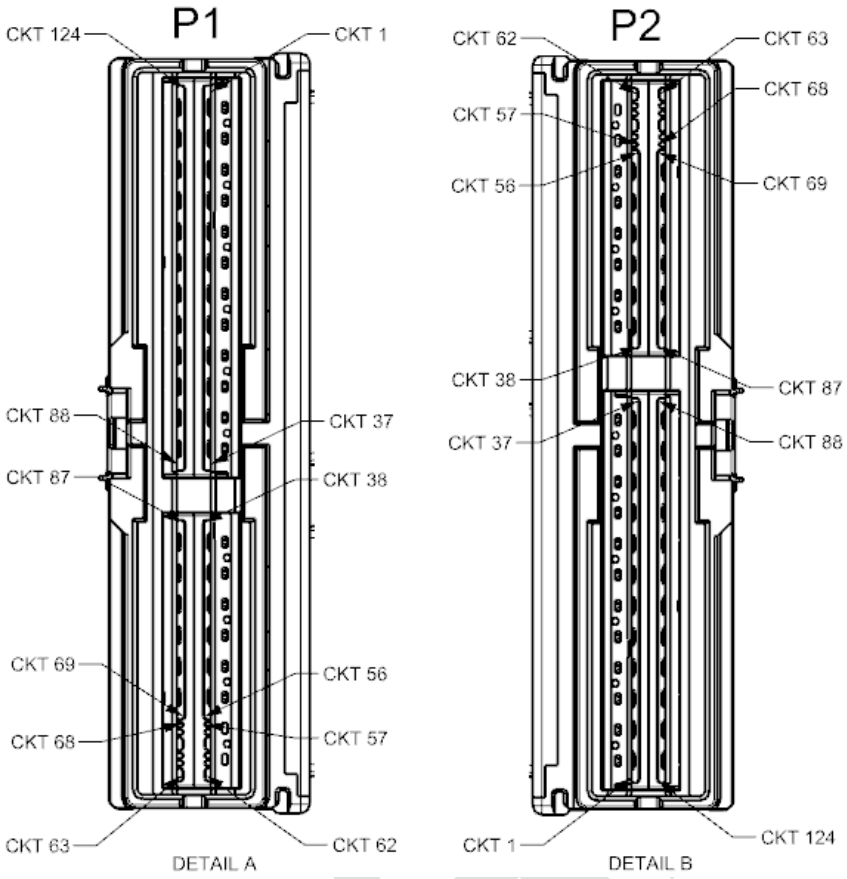


Figure 4-13: 124-Pin Cable Assembly Free-Side Connector Contact Numbering

5. Connector Mechanical Specification

5.1 Overview

5.1.1 Datums

The datums defined in Figure 5-1, and Figure 5-3 are used throughout the rest of the document to describe the dimensional requirements of the connector. Additional descriptions are provided in Table 5-1 and Table 5-2.

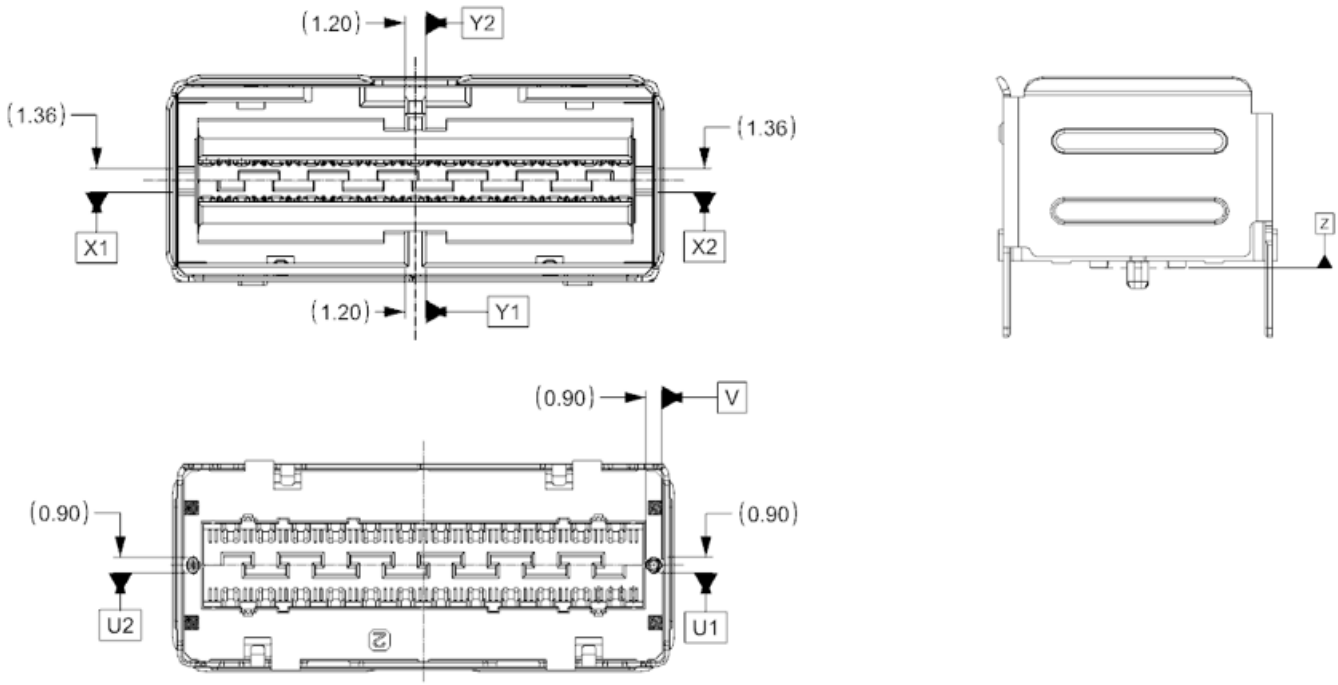


Figure 5-1 72-Pin Fixed-side Connector Datums

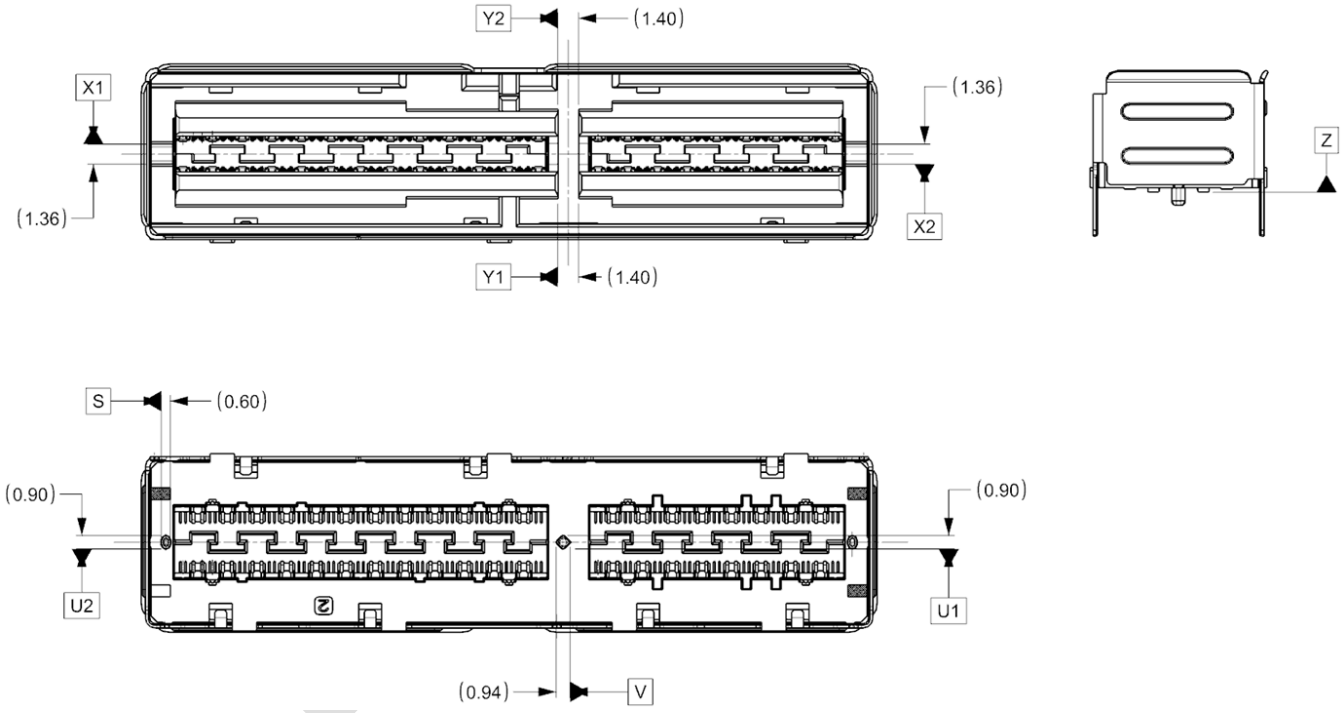


Figure 5-2: 124-Pin Fixed-side Connector Datums

Table 5-1 Fixed-side Connector Datum Descriptions

Datum	Description
X1-X2	Fixed-side centerline Y-direction mate side
Y1-Y2	Fixed-side centerline X-direction mate side
Z	Fixed-side housing (bottom)
U1-U2	Fixed-side centerline Y-direction PCB side

V	Fixed-side centerline X-direction PCB side

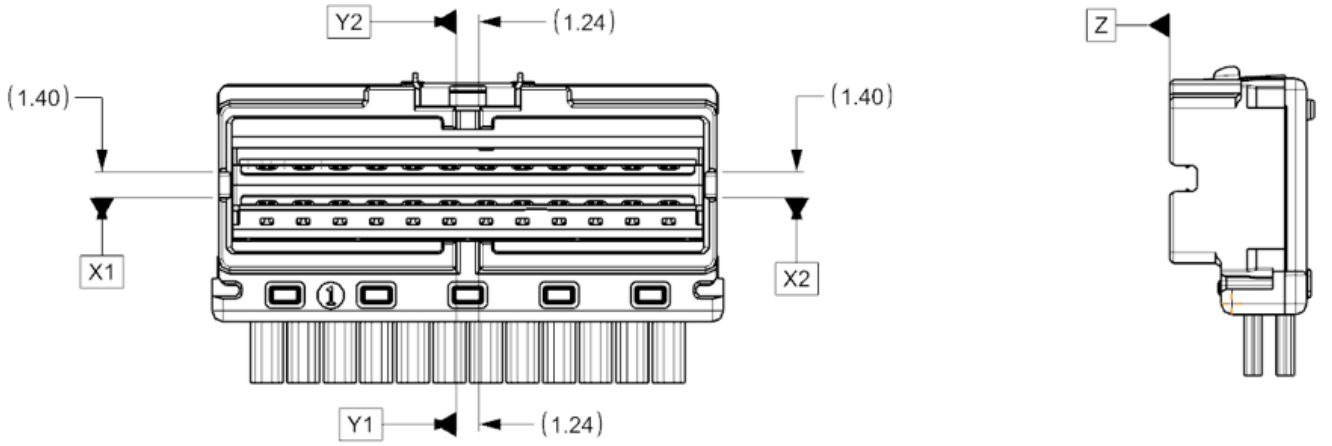


Figure 5-3: 72-Pin Free-side Connector Datums

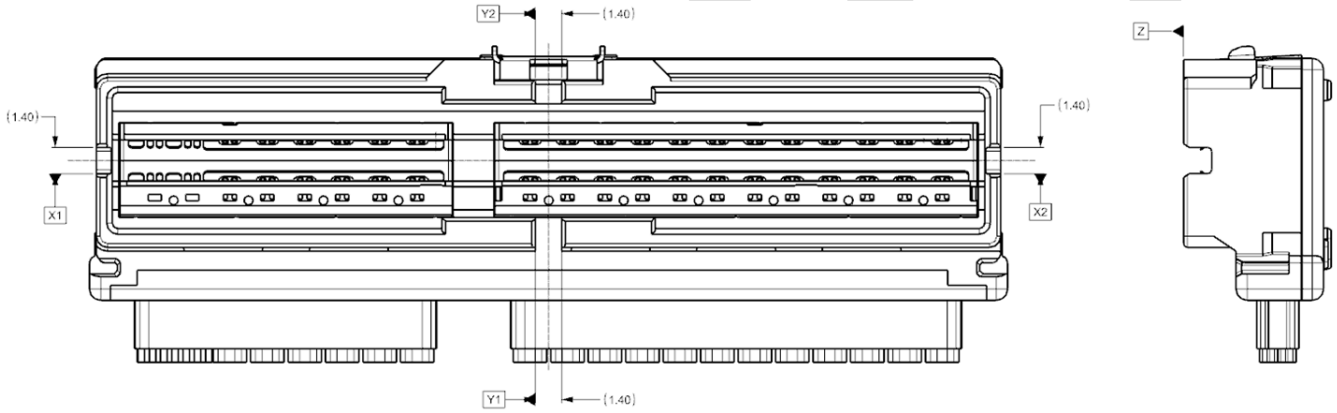


Figure 5-4: 124-Pin Free-side Connector Datums

Table 5-2: Free-side Connector Datums

Datum	Description
X1-X2	Fixed-side centerline Y-direction mate side
Y1-Y2	Fixed-side centerline X-direction mate side
Z	Fixed-side connector (bottom for staging)

5.2 Mechanical Description: Fixed-Side Connector

The fixed-side connector is comprised of insert molded terminals with plastic that are encased by a stainless steel cage with additional solder tails. The fixed-side connector is designed to mate to all free-side connector variants. The fixed-side connector cages are 0.25mm strip thickness which includes latch windows for the free-side cable connector and two passive latches on the sides. A vacuum cap is also included for pick-and-place equipment for placing the connector on the PCB and protecting the contacts during shipment and handling.

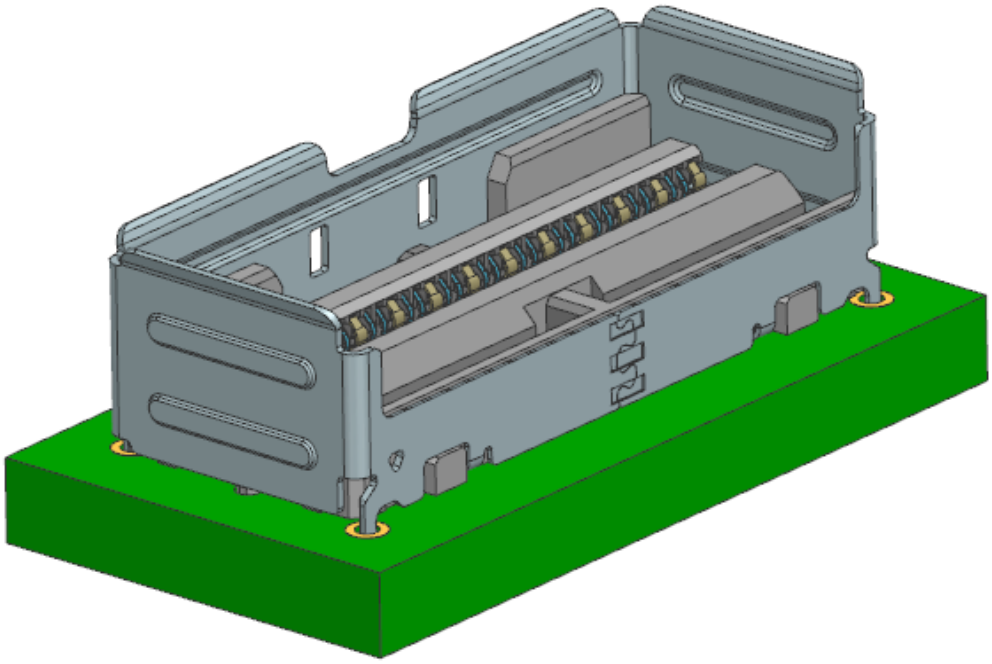


Figure 5-5: 72-Pin Fixed-side Connector without Vacuum cap

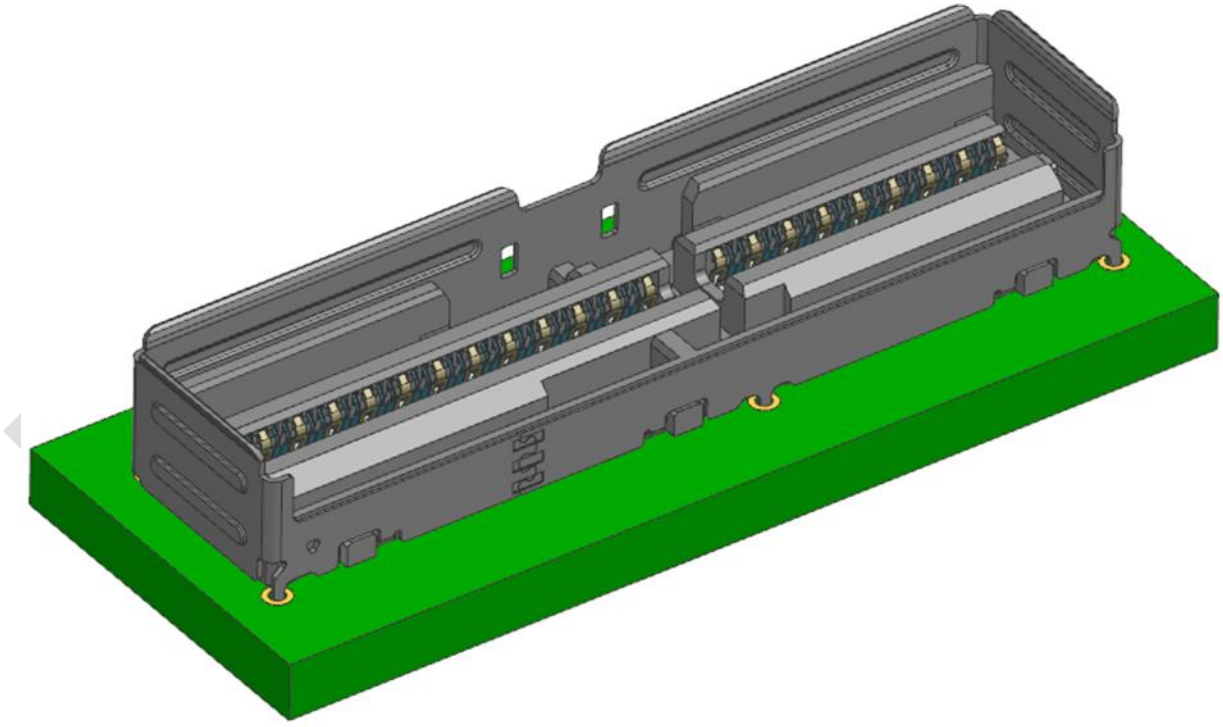


Figure 5-6: 124-Pin Fixed-side Connector without Vacuum cap

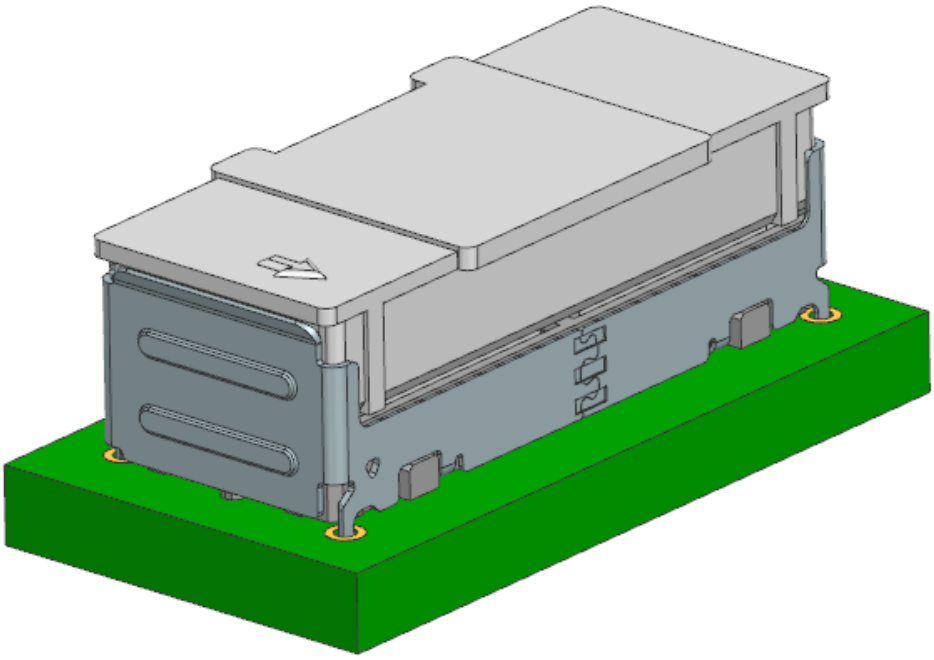


Figure 5-7: 72-Pin Fixed-side Connector with Vacuum Cap

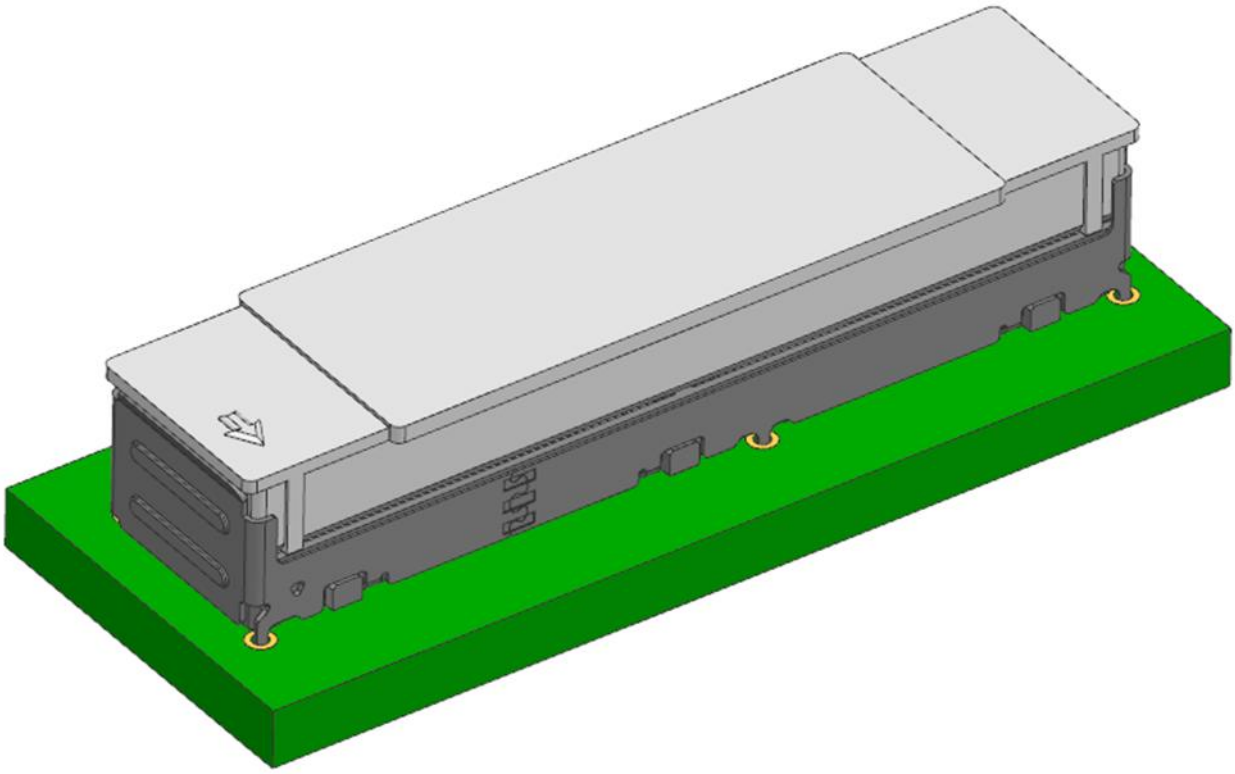


Figure 5-8: 124-Pin Fixed-side Connector with Vacuum Cap

The vacuum cap for the fixed-side connector is designed to fit only one way. It has an arrow on the top surface identifying the location of the contact 1 (refer to section 4.2 for contact numbering)

5.2.1 Mechanical Description: Fixed-Side Connector

Unless otherwise shown, the following tolerances shall apply to the figures:

a. Two & Three Place dimensions = +/- 0.05mm
b. Angular dimension = +/- 0.5°

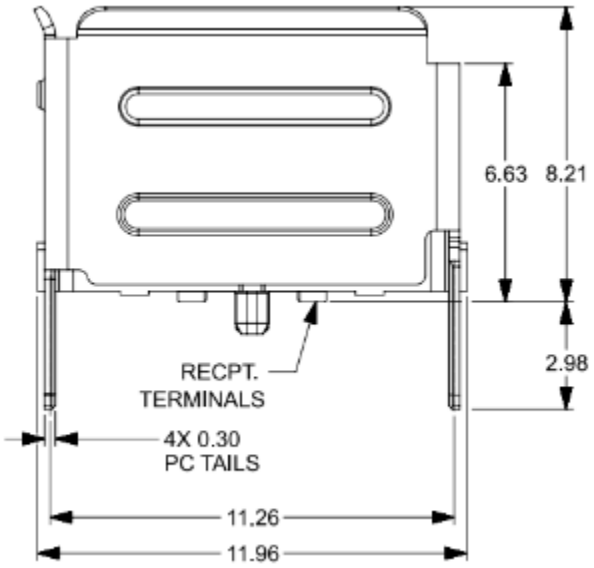


Figure 5-9: 72-Pin Profile View of Fixed-Side Connector Cage

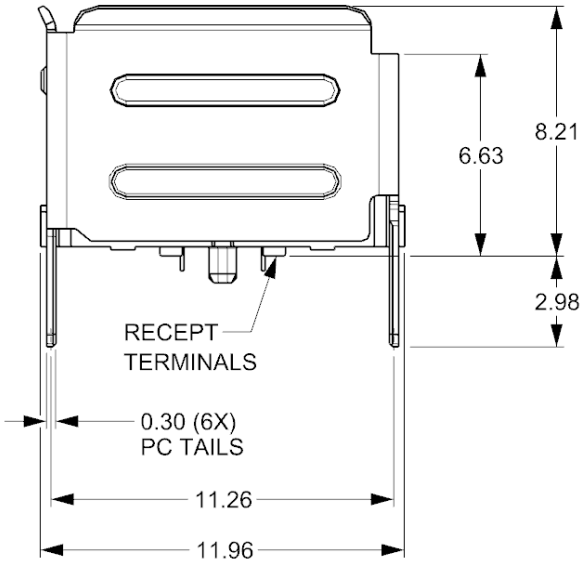


Figure 5-10: 124-Pin Profile View of Fixed-Side Connector Cage

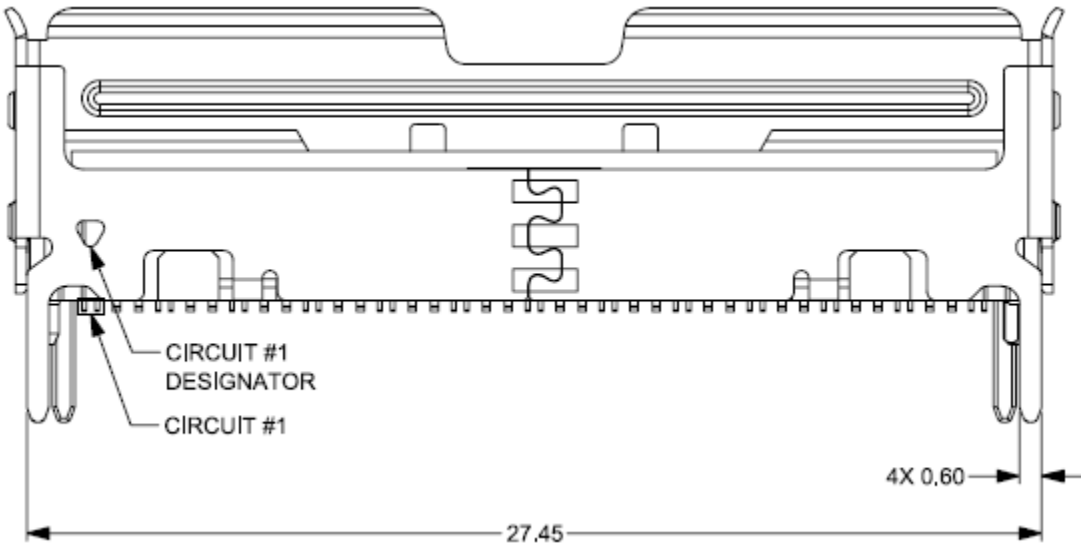


Figure 5-11: 72-Pin Front View of Fixed-Side Connector Cage

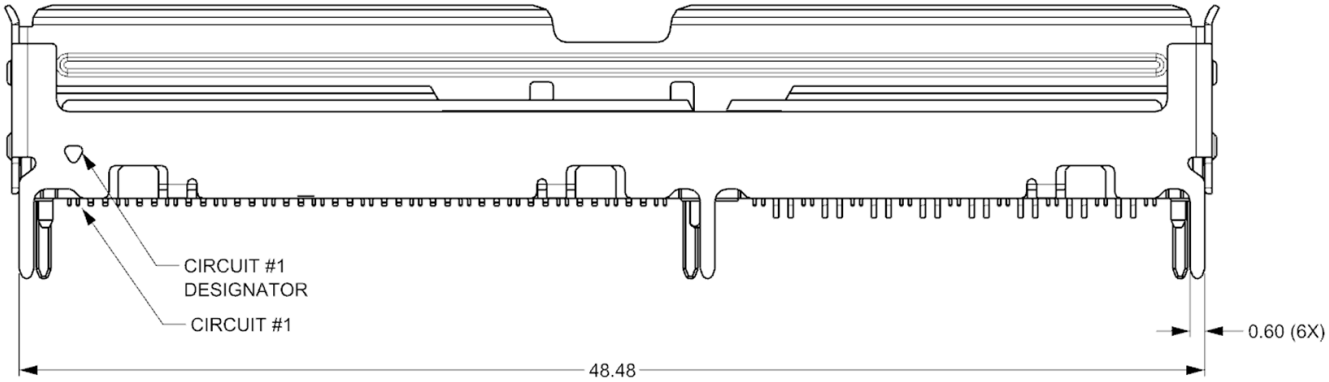


Figure 5-12: 124-Pin Front View of Fixed-Side Connector Cage

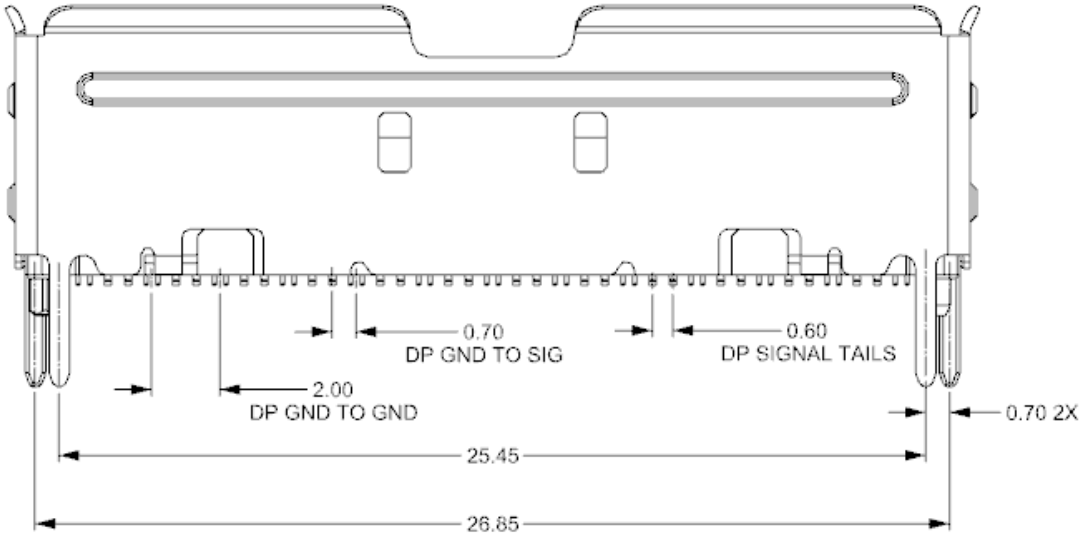


Figure 5-13: 72-Pin Back View of Fixed-Side Connector Cage

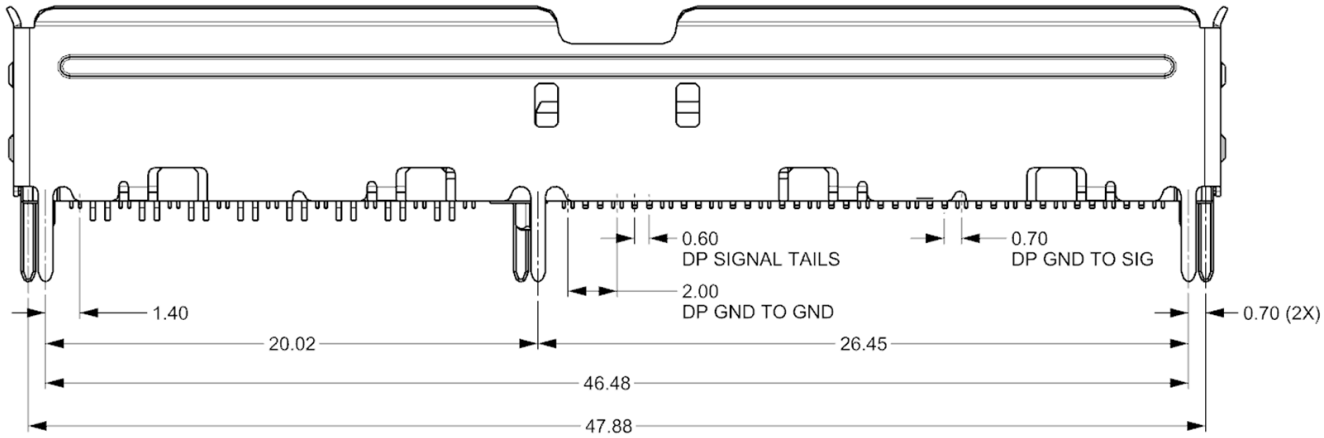


Figure 5-14: 124-Pin Back View of Fixed-Side Connector Cage

6. Free-Side Mechanical Specification

6.1 Overview

The free-side connector housing and cover are plastic. Twinax cable and single-ended ribbon cable are connected to the mating terminals inside the free-side connector.

6.2 Mechanical Description: Free-Side Connectors

Unless otherwise shown, the following tolerances shall apply to the figures:

a. Two & Three Place dimensions = +/- 0.05mm
b. Angular dimension = +/- 0.5º

6.2.1 Free-Side Variant 1: Horizontal (0º) Cable Exit with Pull-Tab

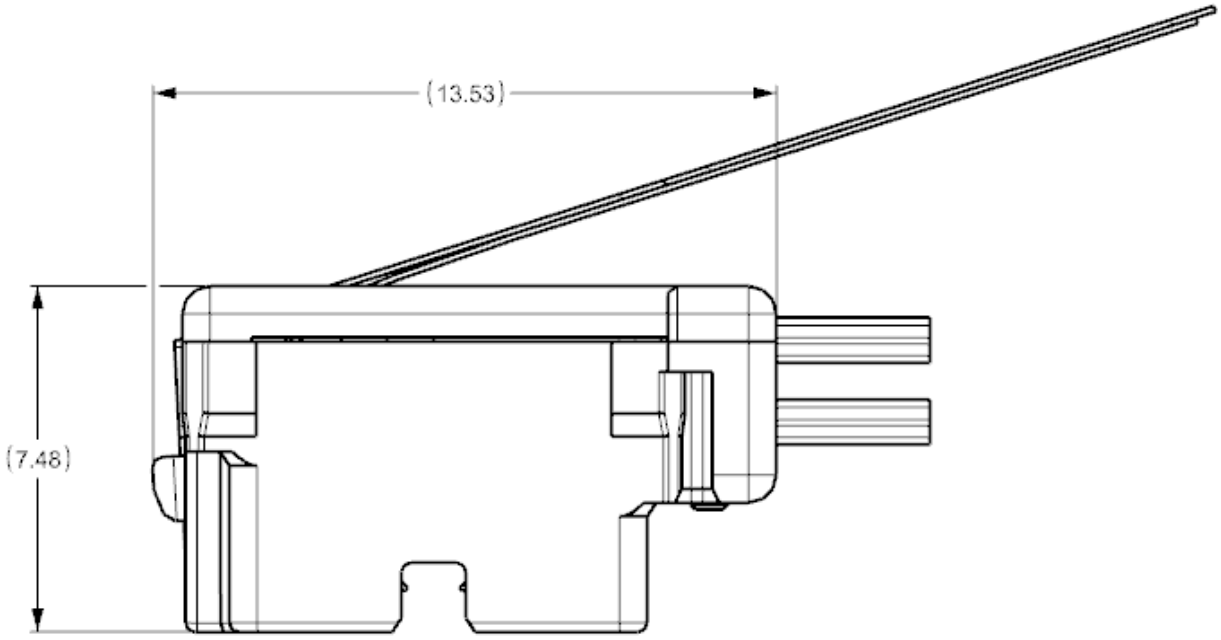


Figure 6-1: Profile View of Free-Side Connector with Right Angle Cable Exit & Pull Tab

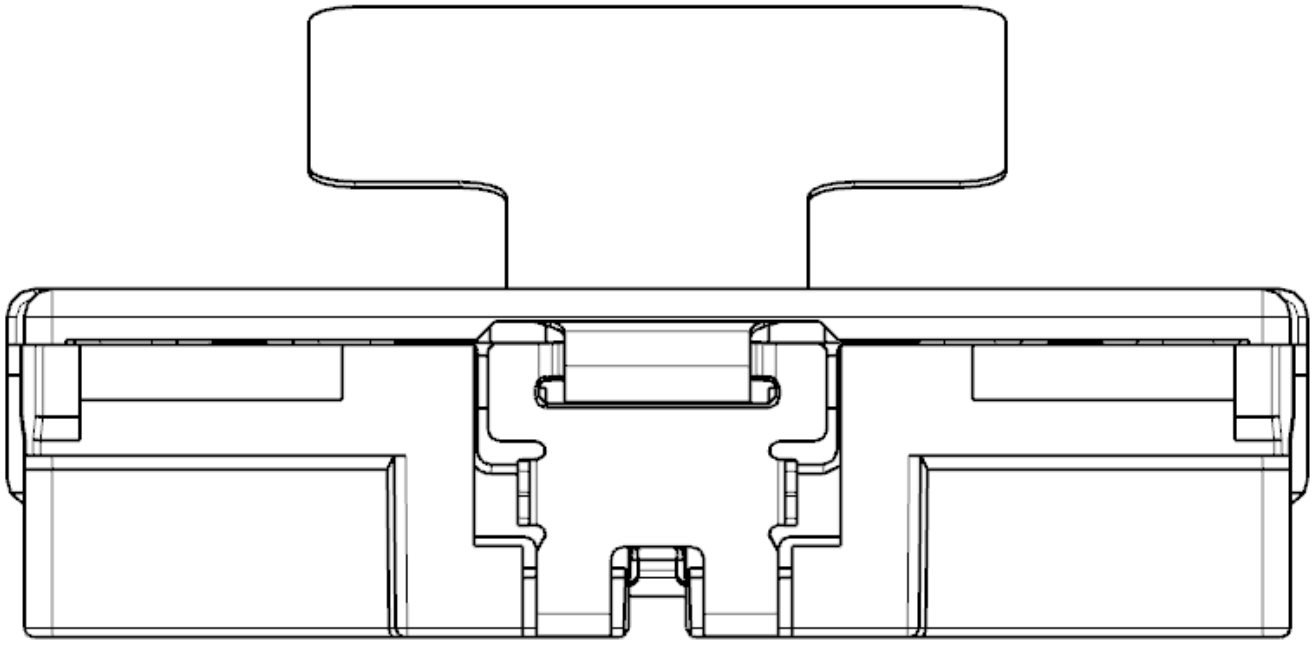


Figure 6-2: 72-Pin Right Angle Cable Exit & Pull-Tab

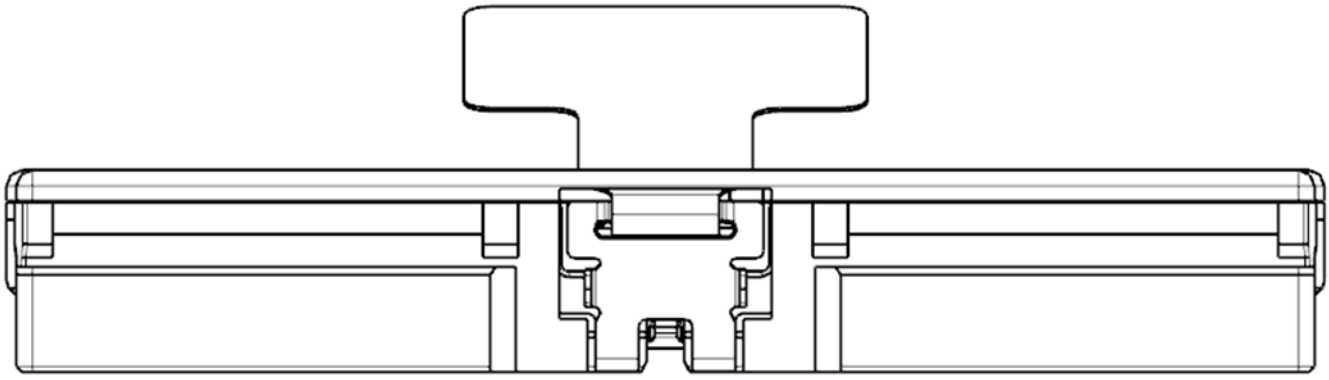


Figure 6-3: 124-Pin Right Angle Cable Exit & Pull-Tab

7. Dust Covers

7.1 Overview

The vacuum cap for the fixed-side connector is designed to fit only one way. It has an arrow on the top surface identifying the location of the contact #1 (refer to section 4.2 for contact numbering).

7.2 Dust Covers: Free-Side Connector

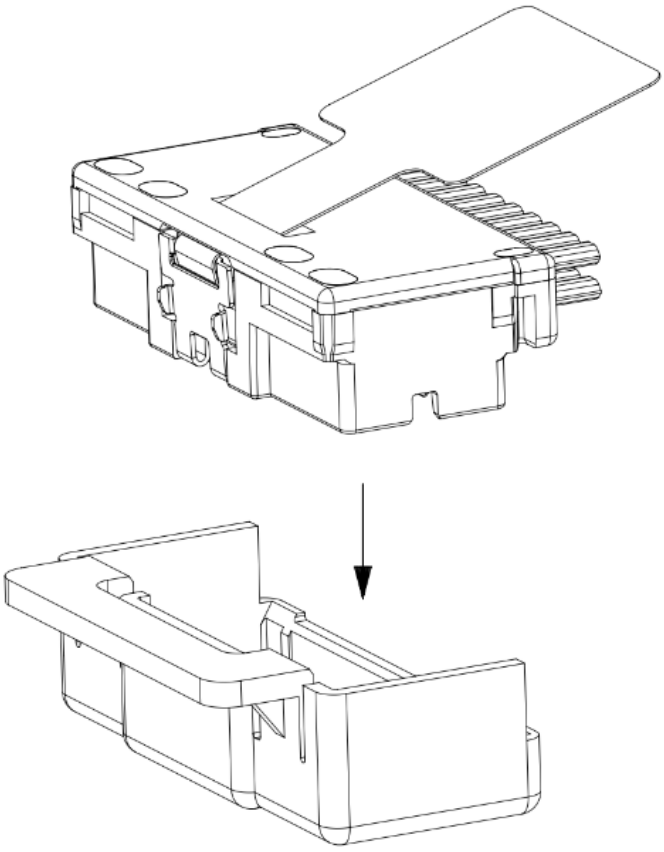


Figure 7-1: 72-Pin Free-Side Connector & Dust Cover Assembly Direction

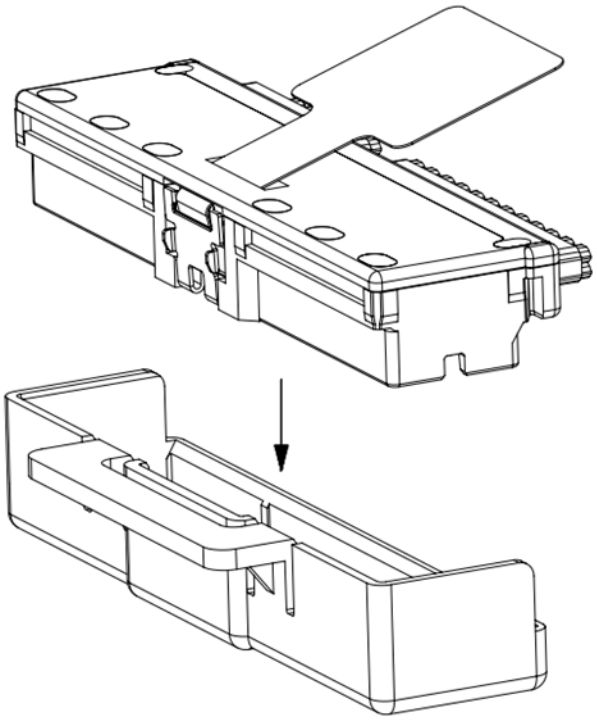


Figure 7-2: 124-Pin Free-Side Connector & Dust Cover Assembly Direction

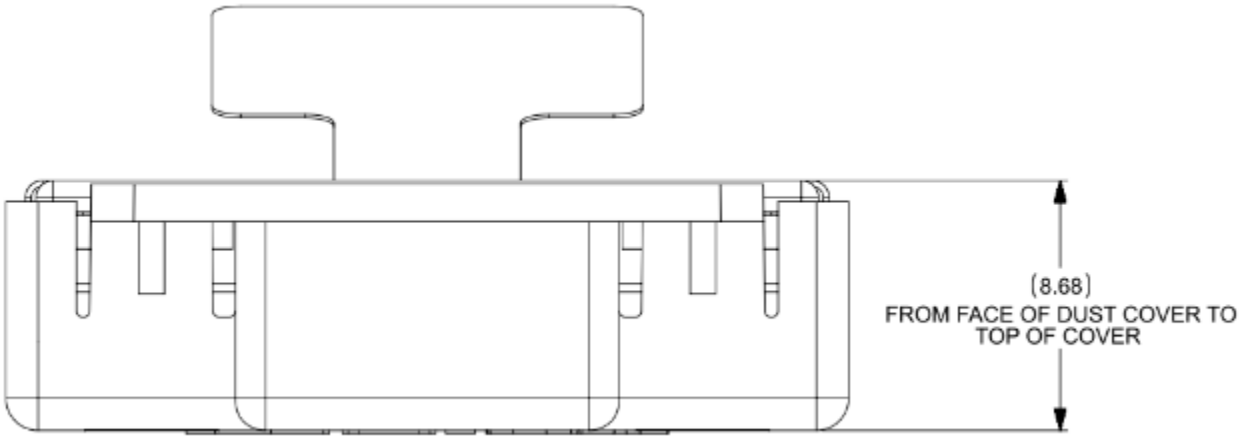


Figure 7-3: 72-Pin Top View of Free-Side Connector with Dust Cover Attached

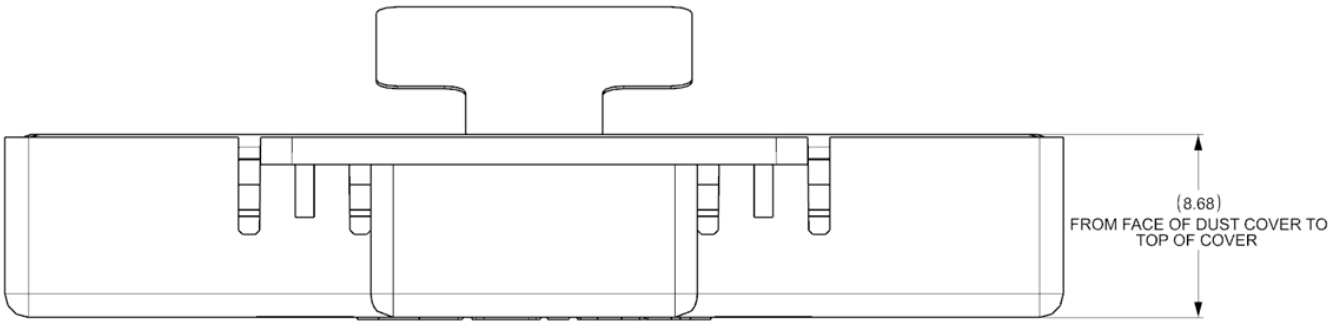


Figure 7-4: 124-Pin Top View of Free-Side Connector with Dust Cover Attached

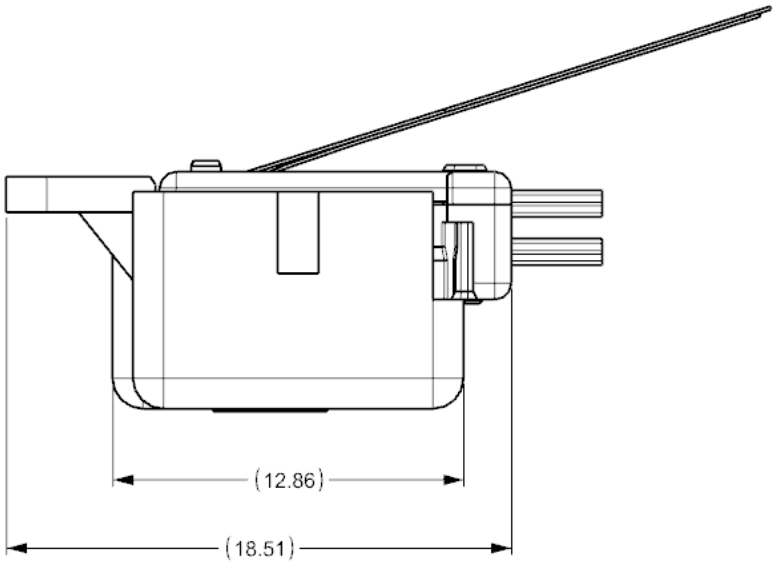


Figure 7-5: Profile View of Free-Side Connector with Dust Cover Attached

7.3 Dust Covers: Fixed-Side Connector

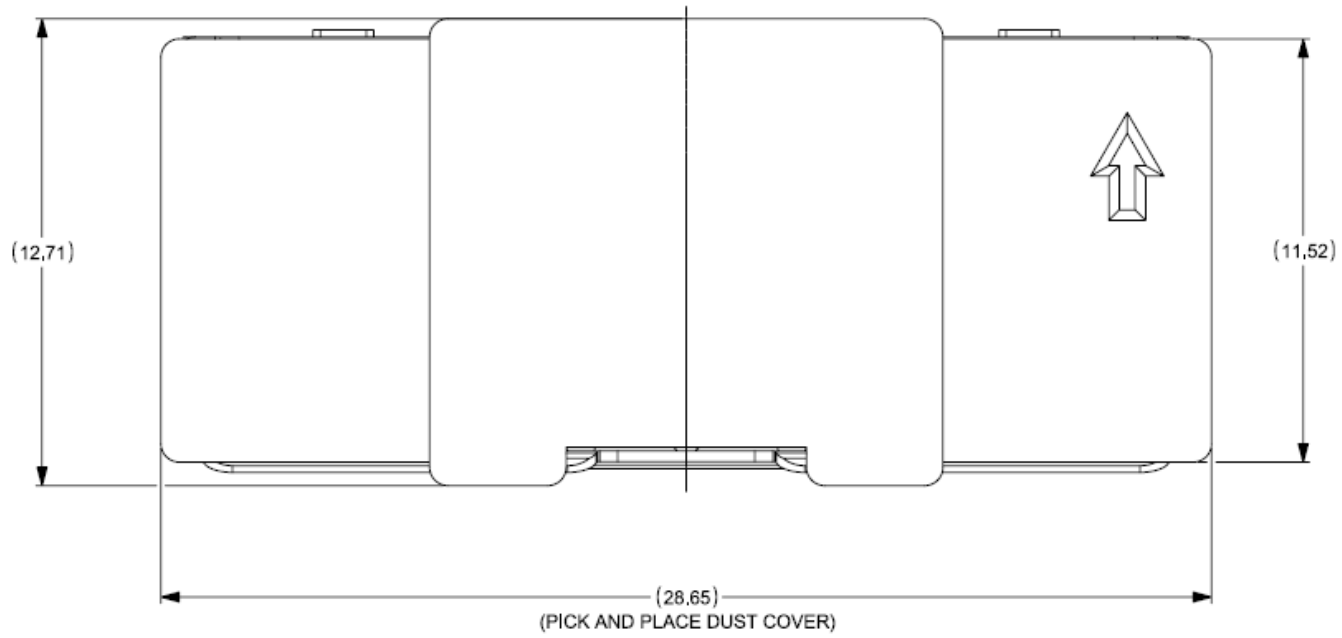


Figure 7-6: 72-Pin Top View of Fixed-Side Connector with Dust Cover

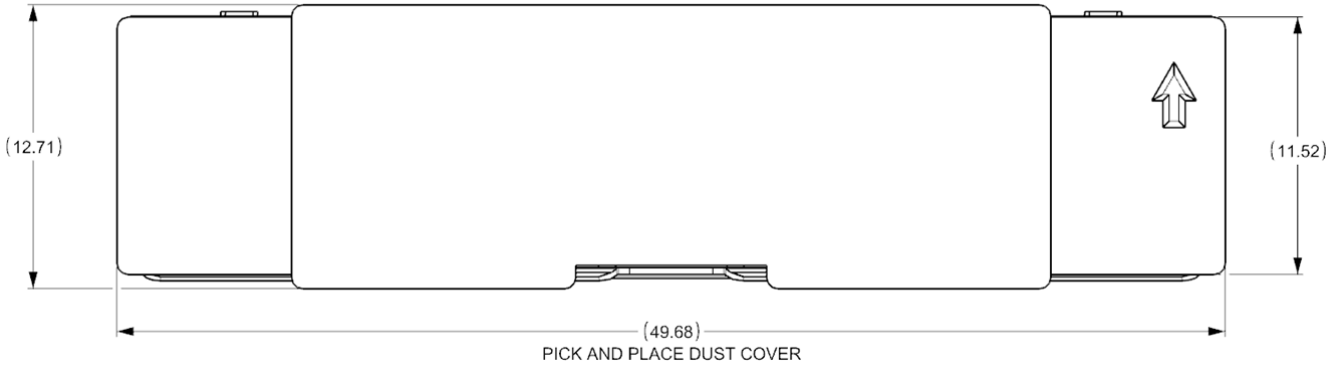


Figure 7-7: 124-Pin Top View of Fixed-Side Connector with Dust Cover

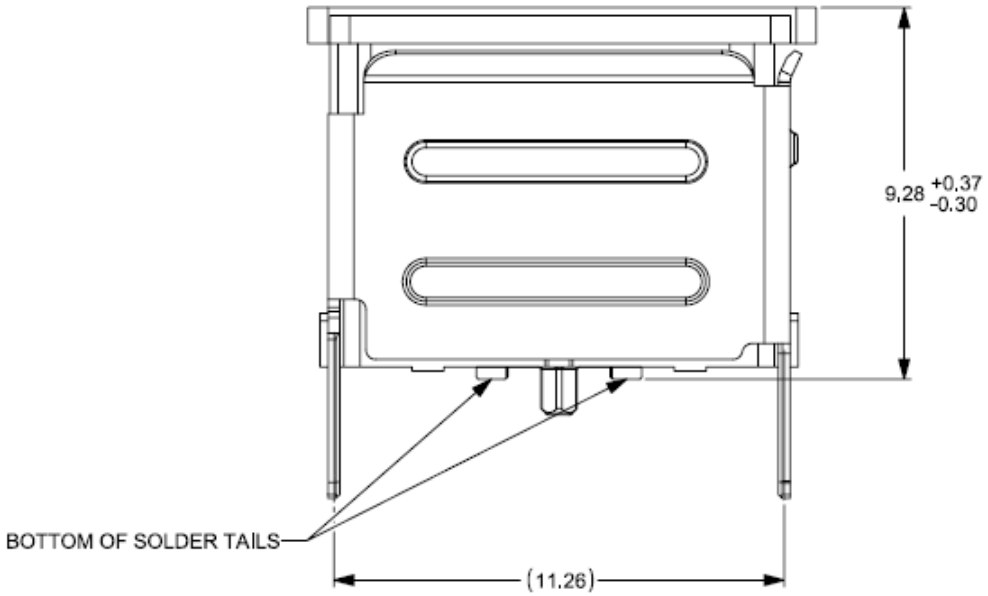


Figure 7-8: Profile View of Fixed-Side Connector with Dust Cover

8. Test Requirements and Methodologies (TS-1000, etc.)

8.1 Performance Tables

EIA-364-1000 (TS-1000) shall be used to define the test sequences and procedures for evaluating the connector system described in this document. Where multiple test options are available, the manufacturer shall select the appropriate option where not previously specified. The selected procedure should be noted when reporting data. If there are conflicting requirements or test procedures between EIA-364 procedures and those contained within this document, this document shall be considered the prevailing authority.

Unless otherwise specified, procedures for sample size, data, and collection to be followed as specified in EIA-364-1000. See EIA-364-1000 Annex B for objectives of tests and test groups.

Table 8-1 summarizes the performance criteria that are to be satisfied by the connector described in this document. Most performance criteria are validated by EIA-364-1000 testing, but this test suite leaves some test details to be determined. To ensure that testing is repeatable, these details are identified in Table 8-2. Finally, testing procedures used to validate any performance criteria not included in EIA-364-1000 are provided in Table 8-3.

Table 8-1 Form Factor Performance Requirements

Performance Parameters	Description/ Details	Requirement
Mechanical/ Physical Requirements		
Plating Type	Plating type on connector contacts	Precious
Surface Treatment	Surface treatment on connector contacts	Non-lubricated
Wipe length	Designed distance a contact traverses over a mating contact surface during mating and resting at a final position	Greater than 0.127mm
Rated Durability Cycles	The expected number of durability cycles a component is expected to encounter over the course of its life	Connector/ cage: 100 cycles
Latched Mating Force*	Amount of force needed to mate a module with a connector when latches are deactivated	45 N MAX
Latched Unmating Force*	Amount of forced needed to separate a module from a connector when latches are deactivated	45 N MAX
Latch Retention*	Amount of force the latching mechanism can withstand	65 N MIN
Environmental Requirements		
Field Life	The expected service life for a component	10 years
Field Temperature	The expected service temperature for a component	0°C - 65°C
Storage Temperature*	The expected storage temperature for a component when not in use	-40°C to +85°C
Storage Humidity*	The expected storage humidity for a component when not in use	80% Relative Humidity
Electrical Requirements		
Current*	Maximum current to which a contact is exposed in use	0.25A per contact pair MAX
Operating Rating Voltage	Maximum voltage to which a contact is exposed in use	29.9V DC per contact MAX
NOTE: Performance criteria denoted with stars (*) are not validated by EIA-364-1000 testing. Refer to **Table 8-3** for test procedures and pass/fail criteria.		

Table 8-2 describes the details necessary to perform the tests described in the EIA-364-1000 test sequences. Testing shall be done in accordance with EIA-364-1000 and the test procedures it identifies in such a way that the parameters/ requirements defined in Table 8-1 are met. Any information in this table supersedes EIA-364-1000.

Table 8-2 EIA-364-1000 Test Details

Test	Test Descriptions and Details	Pass/ Fail Criteria
Mechanical/ Physical Tests		
Durability (preconditioning)	EIA-364-09 To be tested with connector, cage, and module (Latches should not be locked)	No evidence of physical damage
Durability (see Note 1)	EIA-364-09 To be tested with connector, cage, and module (Latches should not be locked out per EIA-364-1000)	No visual damage to mating interface or latching mechanism
Environmental Tests		
Mixed Flowing Gas (see Note 2)	EIA-364-65 Class II See Table 4.1 in EIA-364-1000 for exposure times Test option Per EIA-364-1000: 4	No intermediate test criteria
Electrical Tests		
Low Level Contact Resistance (see Note 3)	EIA-364-23 20 mV DC MAX, 100 mA MAX To include wire termination or connector-to-board termination	10 mΩ MAX change from baseline
Dielectric Withstanding Voltage	EIA-364-20 Method B 300 VAC minimum for 1 minute Applied voltage may be product / application specific	No defect or breakdown between adjacent contacts -AND- 5 mA Max Leakage Current

NOTES:
1. If the durability requirement on the connector is greater than that of the module, modules may be replaced after their specified durability rating.
2. Test option, temperature, duration must be reported.
3. The first low level contact resistance reading in each test sequence is used to determine a baseline measurement. Subsequent measurements in each sequence are measured against this baseline.

Table 8-3 describes the testing procedures necessary to validate performance criteria not validated by EIA-364-1000 testing. The tests are to be performed in such a way that the parameters/ requirements defined in Table 8-1 are met.

Table 8-3 Additional Test Procedures

Test	Test Descriptions and Details	Pass/ Fail Criteria
Mechanical/ Physical Tests		
Latched Mating Force	EIA-364-13 To be tested with cage, connector, and module without heat sinks Latching mechanism deactivated (locked out)	Refer to Table 8-1 -AND- No physical damage to any components
Latched Unmating Force	EIA-364-13 To be tested with cage, connector, and module without heat sinks Latching mechanism deactivated (locked out)	
Latch Retention	EIA-364-13 To be tested with cage, connector, and module without heat sinks Latching mechanism engaged (not locked out)	
Environmental Tests		
Storage Temperature	EIA-364-32 Method A, Test Condition 1, Duration 4 Use min and max Field Temperatures listed in Table 8-1 for temperature range	Refer to Table 8-1
Storage Humidity	EIA-364-31	Refer to Table 8-1
Electrical Tests		
Current	EIA-364-70 Method 1, 30-degree temperature rise Contacts energized: 8 adjacent signal contacts within a single wafer	Refer to Table 8-1 for current magnitude
NOTES: .		

Appendix A. System Mechanical Specification (Informative)

A.1. Overview

A.2. PCB Layout

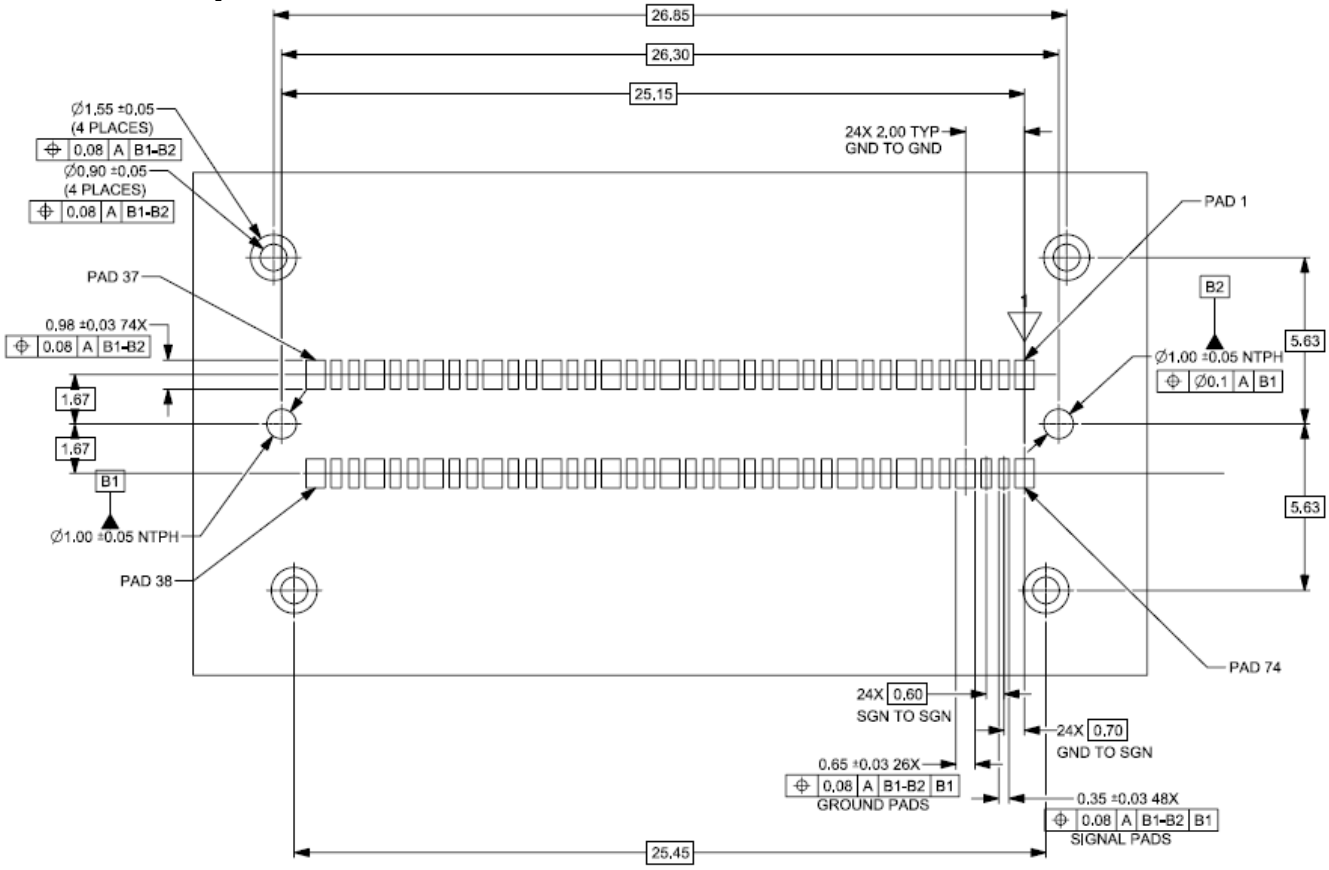


Figure A-1: PCB Layout for 72-Pin Fixed-Side Connector

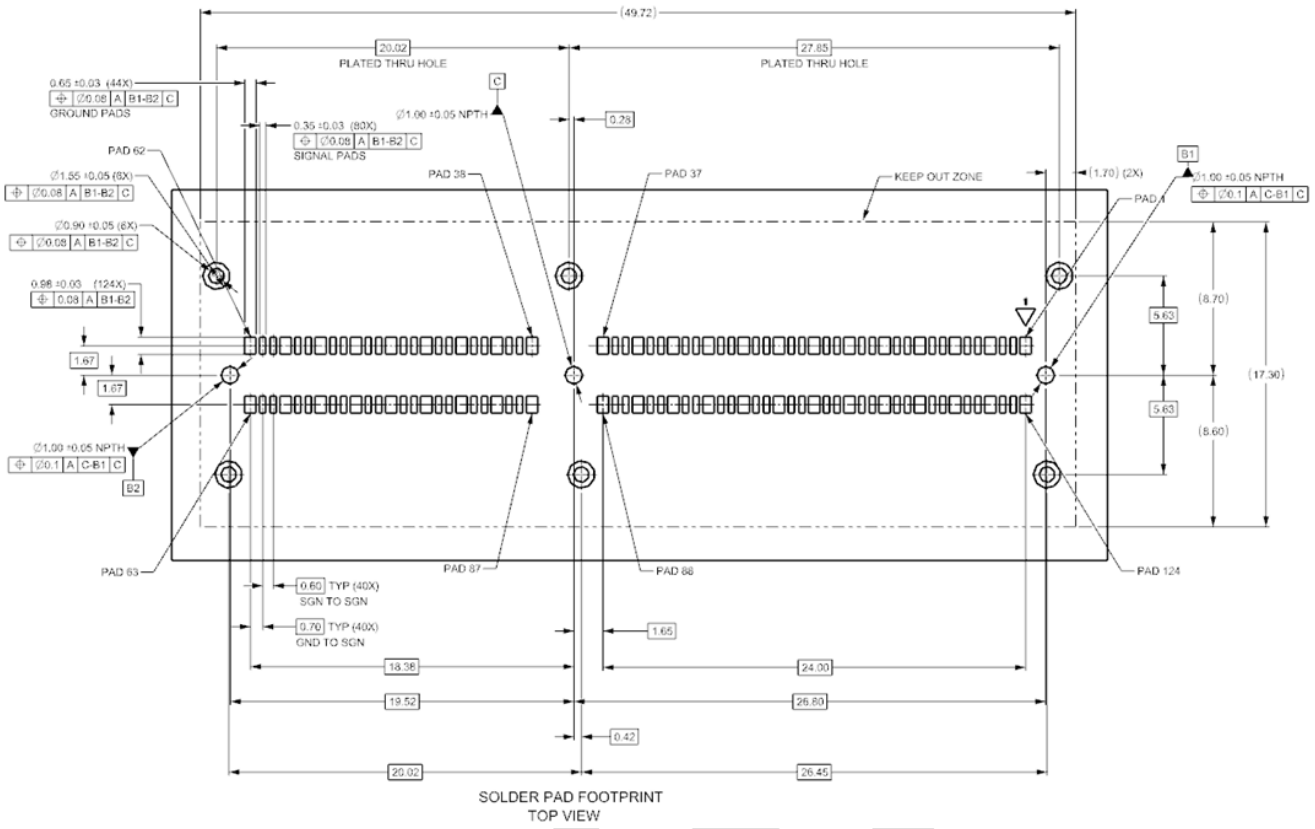


Figure A-2: PCB Layout for 124-Pin Fixed-Side Connector