SFF-TA-1038

Specification for

Low-Profile High-Density Flexible Cable Connector

Rev 0.0.2 April 20, 2026.

SECRETARIAT: SFF TWG

This specification is made available for public review at http://www.snia.org/sff/specifications. Comments may be submitted at http://www.snia.org/feedback. Comments received will be considered for inclusion in future revisions of this specification.

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

ABSTRACT: This specification defines the mechanical specifications and general performance requirements for a Low-Profile High-Density Flexible Cable Connector that is designed for use in high-speed serial interconnect applications. Such use may be as a Standard (STD), Low-Profile (LP), or Low-Profile Dual-Exit (LPDE) receptacle and the Right-Angle (RA) and Reverse Right-Angle (RRA) cable plug combination intended for multiple generations of system or device internal high-speed applications.

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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 *January 7, 2026*:
- Initial DRAFT

Rev 0.0.2 *April 20, 2026*:
- Updated drawings with higher resolution pictures

Contents

Figures

Tables

1. Scope

This specification defines the general description of this form factor, the connector, and the mating plug mechanical specifications and some of the performance requirements. Additional informative details, such as the PCB layouts, are 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
- EIA-364-04 Normal Force Test Procedure for Electrical Connectors
- EIA-364-13 Mating and Unmating Forces Test Procedure for Electrical Connectors
- EIA-364-20 Withstanding Voltage Test Procedure for Electrical Connectors
- EIA-364-21 Insulation Resistance Test Procedure for Electrical Connectors
- EIA-364-23 Low Level Contact Resistance Test Procedure for Electrical Connectors
- EIA-364-27 Mechanical Shock Test Procedure for Electrical Connectors
- EIA-364-28 Vibration Test Procedure for Electrical Connectors and Sockets
- EIA-364-98 Housing Locking Mechanism Strength Test Procedure for Electrical Connectors
- SFF-9402 Reference Guide for Multi-Protocol Internal Cable Pinouts for SAS and/or PCIe

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 TWG 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
IEEE	Institute of Electrical and Electronics Engineers (IEEE)	https://ieeexplore.ieee.org/browse/standards/get-program/page/series?id=68
PCIe	PCI-SIG	https://www.pcisig.com/specifications
SAS and other ANSI standards	International Committee for Information Technology Standards (INCITS)	https://www.incits.org

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 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 the restricted designation, then the restricted bit, byte, word, or field shall be treated as a reserved bit, byte, word, or field (e.g., a restricted byte uses the same value as defined for a reserved byte).

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

AOC: Active Optical Cable
GND: Ground
EMLB: Early Mate Late Break
IDC: Insulation Displacement Contact
IDT: Insulation Displacement Termination
PCB: Printed Circuit Board
PF: Press Fit
PTH: Plated Through Hole
RA: Right-Angle
RRA: Reverse Right-Angle
SI: Signal Integrity
SMT: Surface Mount Technology
STR: Straight
VT: Vertical

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, guide posts, 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.

Contact mating sequence: A term used to describe the order of electrical contact established/ terminated during mating/un-mating. Other terms include: contact sequencing, contact positioning, mate first/break last, EMLB (early mate late break) staggered contacts, and long pin/short pin.

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 another feature is established.

Module: In this specification, module may refer to a plug assembly at the end of a copper (electrical) cable (passive or active), an active optical cable (AOC), an optical transceiver, or a loopback.

Plug: A term used to describe the connector that contains the penetrating contacts of the connector interface as shown in Figure 3-1. Plugs typically contain stationary contacts. Other common terms include male, pin connector, and card edge.

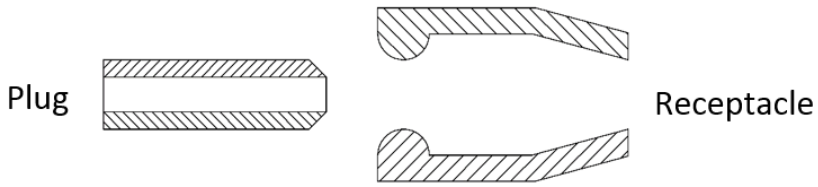


Figure 3-1 Plug and Receptacle Definition

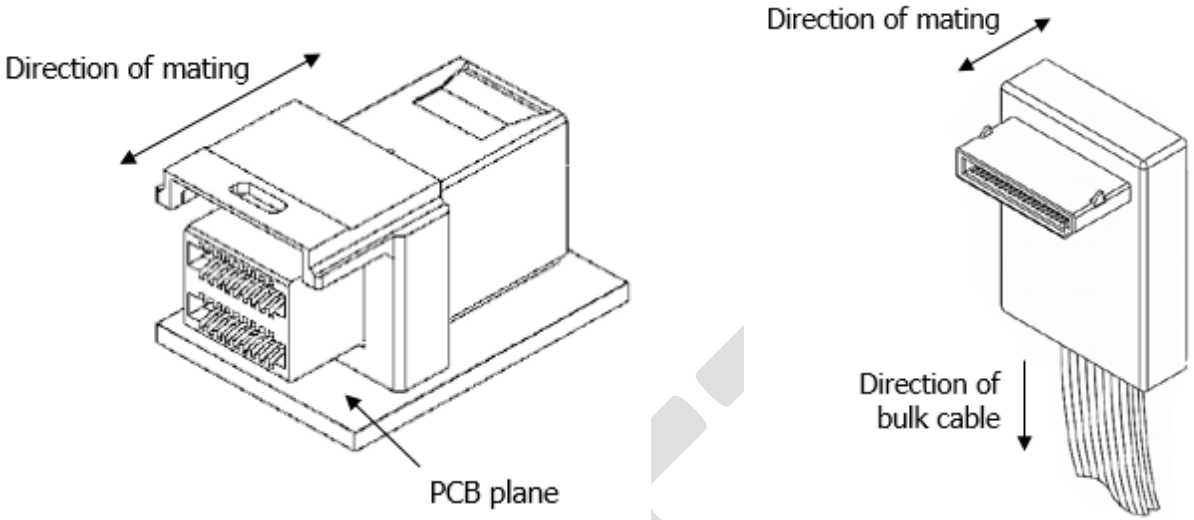
Plated through hole termination: A term used to describe a termination style in which rigid pins extend into or through the PCB. Pins are soldered to keep the connector or cage in place. Other common terms are through hole or PTH.

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.

Receptacle: A term used to describe the connector that contains the contacts that accept the plug contacts as shown in Figure 3-1. Receptacles typically contain spring contacts. Other common terms include female and socket connector.

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 to 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 connector solder tail to a 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.

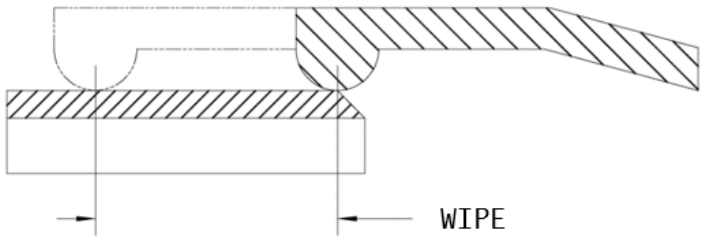


Figure 3-3 Wipe for a Continuous Contact

4. General Description

4.1 Configuration Overview/Descriptions

This specification details a connector system that includes several sizes of straight and right-angle plug connectors and the mating right-angle and vertical receptacle connectors with 74 contact positions. The receptacle connector comes with standard height (STD), low profile (LP) and low-profile double-exit (LPDE) configurations.

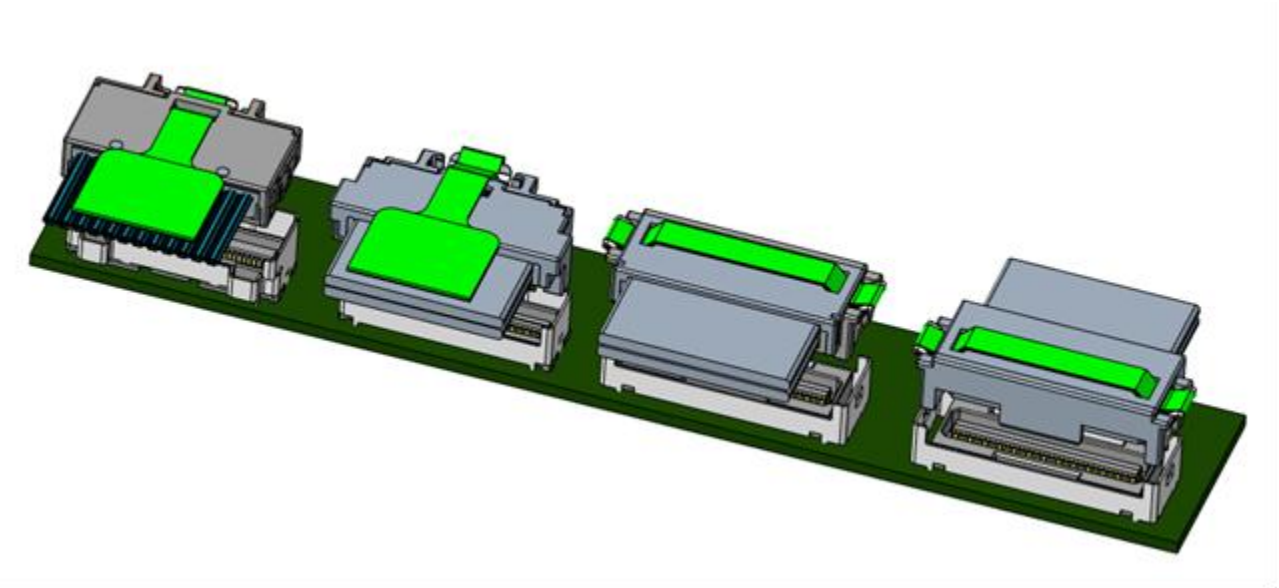


Figure 4-1 Connector Family Overview

4.1.1 Connector Configuration 1 – 74 Contact STD Connectors

This configuration is typically used for standard height x8 high speed lane applications with typical sidebands.

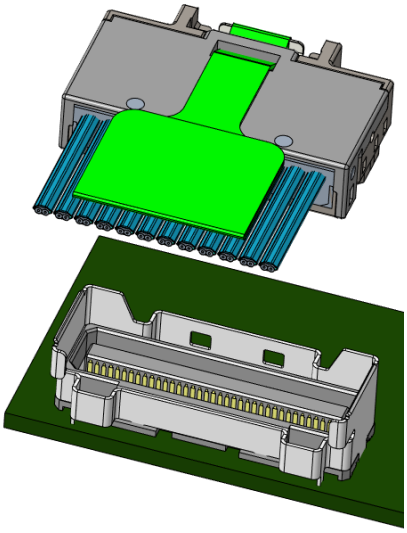


Figure 4-2 74 Contact STD Plug and Receptacle

4.1.2 Connector Configuration 2 – 74 Contact LP Connectors

This configuration is typically used for low profile x8 high speed lane applications with typical sidebands.

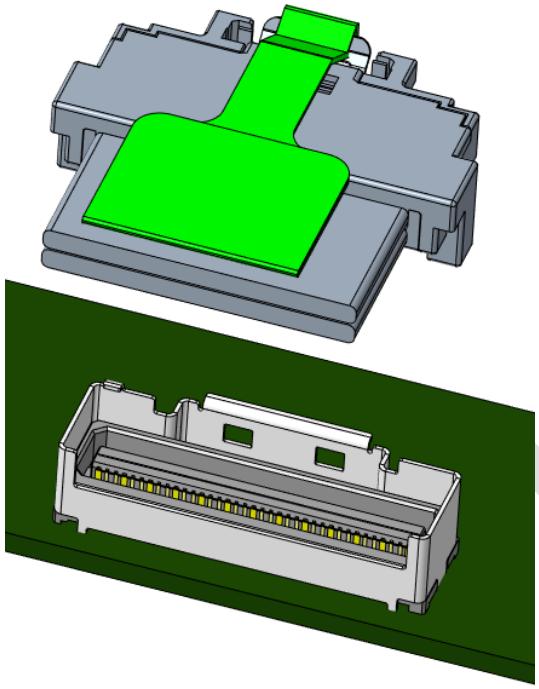


Figure 4-3 74 Contact LP Plug and Receptacle

4.1.3 Connector Configuration 3 – 74 Contact LPDE Connectors

This configuration is typically used for low profile double exit x8 high speed lane applications with some sidebands.

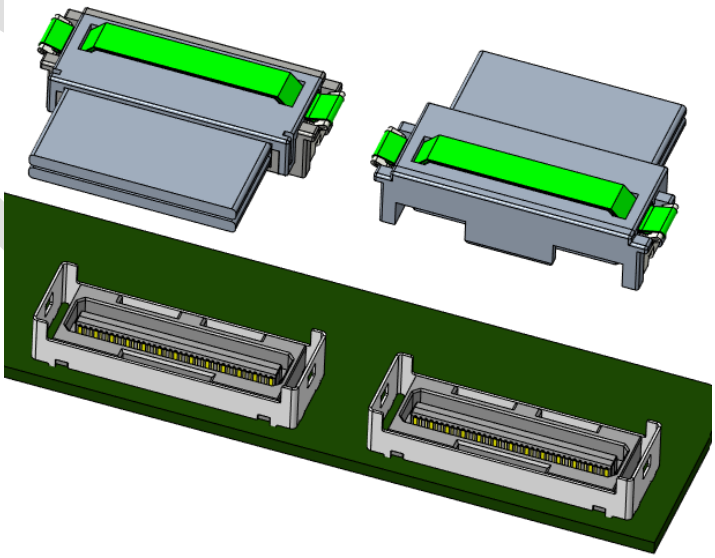


Figure 4-4 74 Contact LPDE Plug and Receptacle

4.2 Contact Numbering

The pins or electrical contacts in this connector are numbered as shown in Figure 4-5 and Figure 4-6.

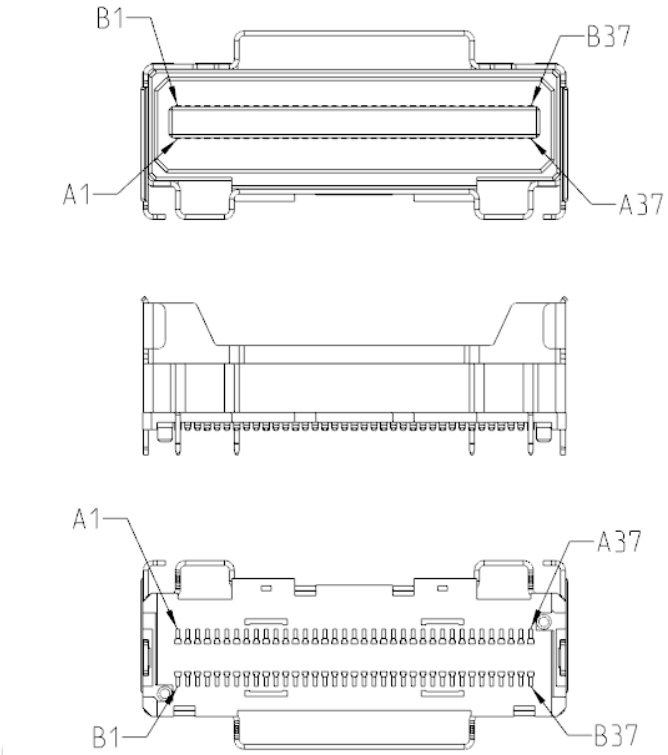


Figure 4-5 STD Receptacle Connector Contact Numbering

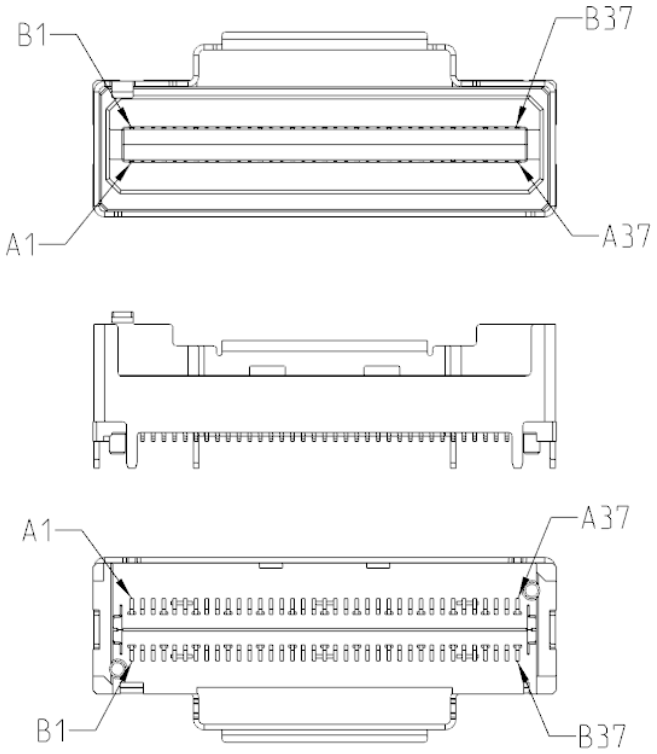


Figure 4-6 LP Receptacle Connector Contact Numbering

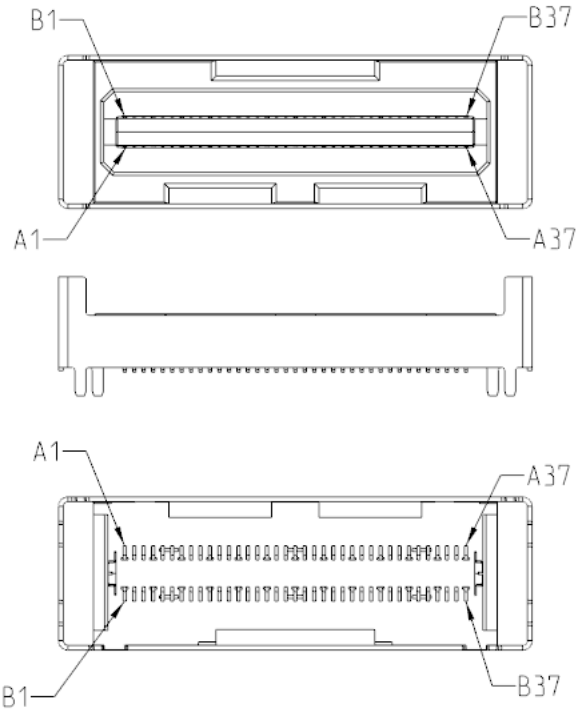


Figure 4-7 LPDE Receptacle Connector Contact Numbering

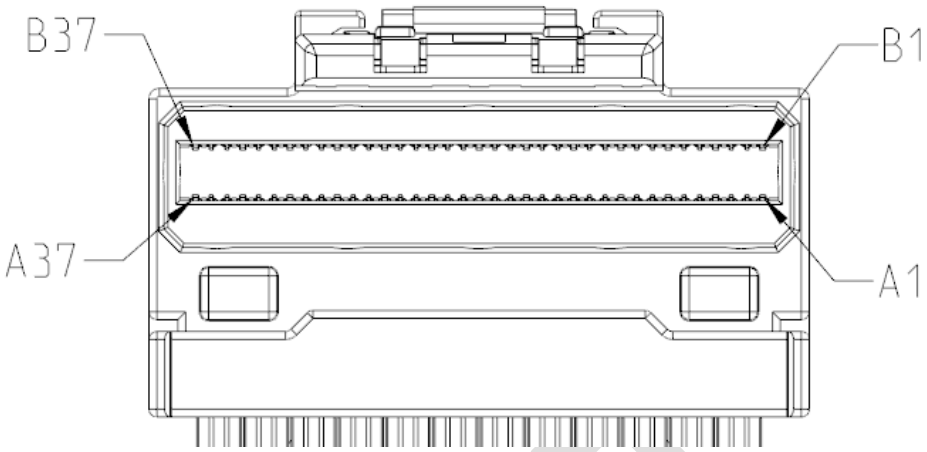


Figure 4-8 STR Plug Contact Numbering

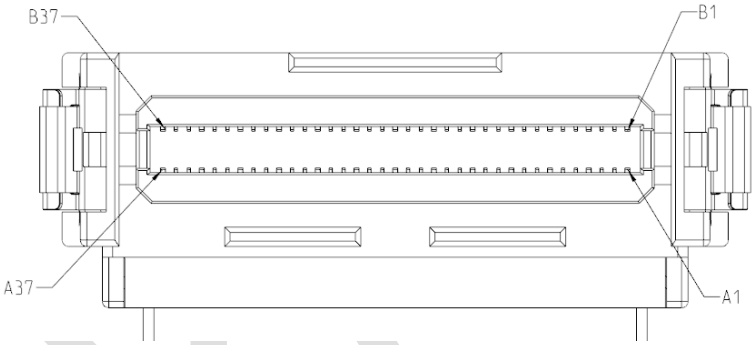


Figure 4-9 LP RA Plug Contact Numbering

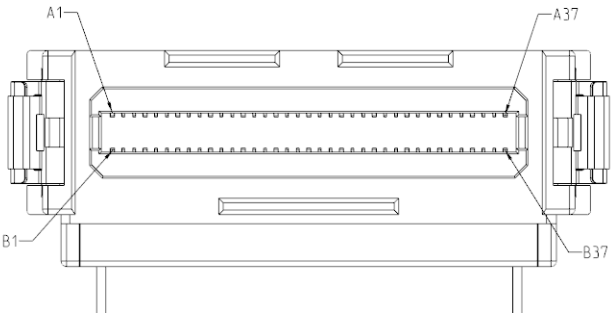


Figure 4-10 LP RRA Plug Contact Numbering

5. Connector Mechanical Specification

5.1 Overview

5.2 Mechanical Description:

5.2.1 74 Contacts STD Receptacle Connector

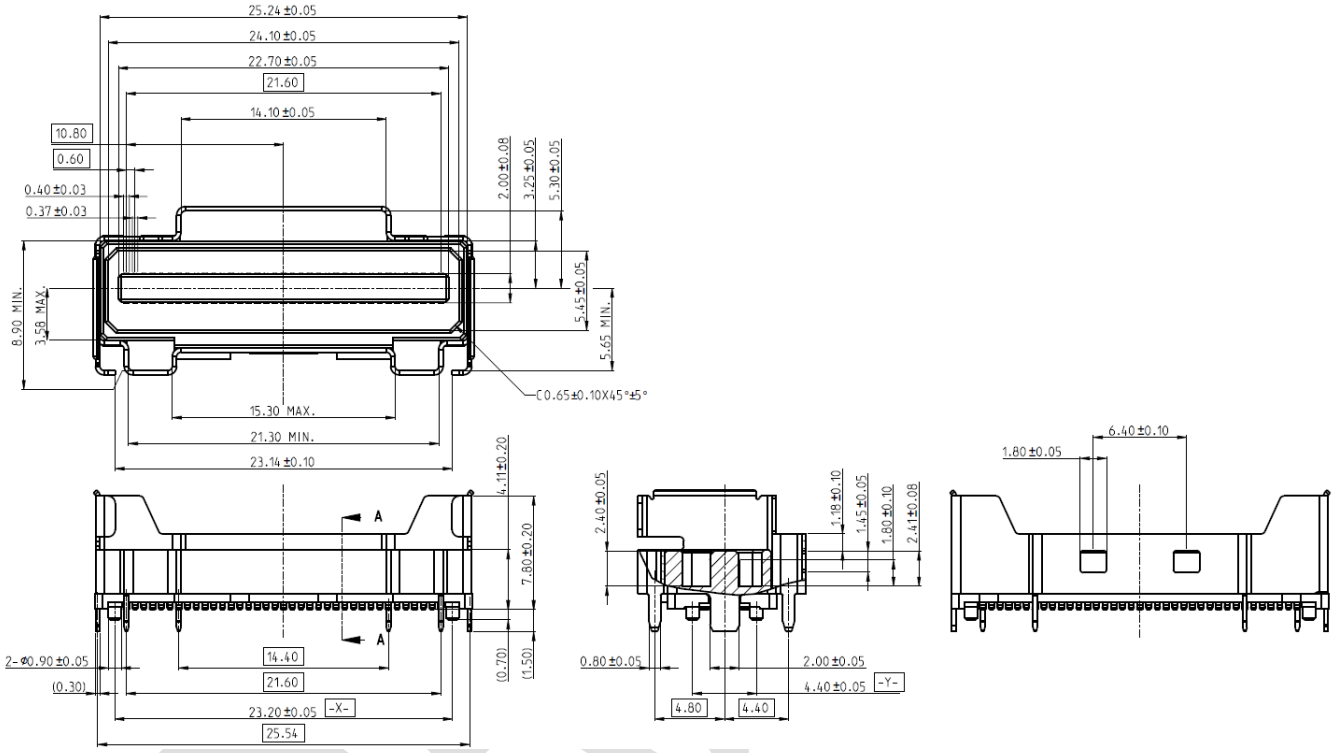


Figure 5-1 74 Contacts STD Connector

1

5.2.2 74 Contacts LP Receptacle Connector

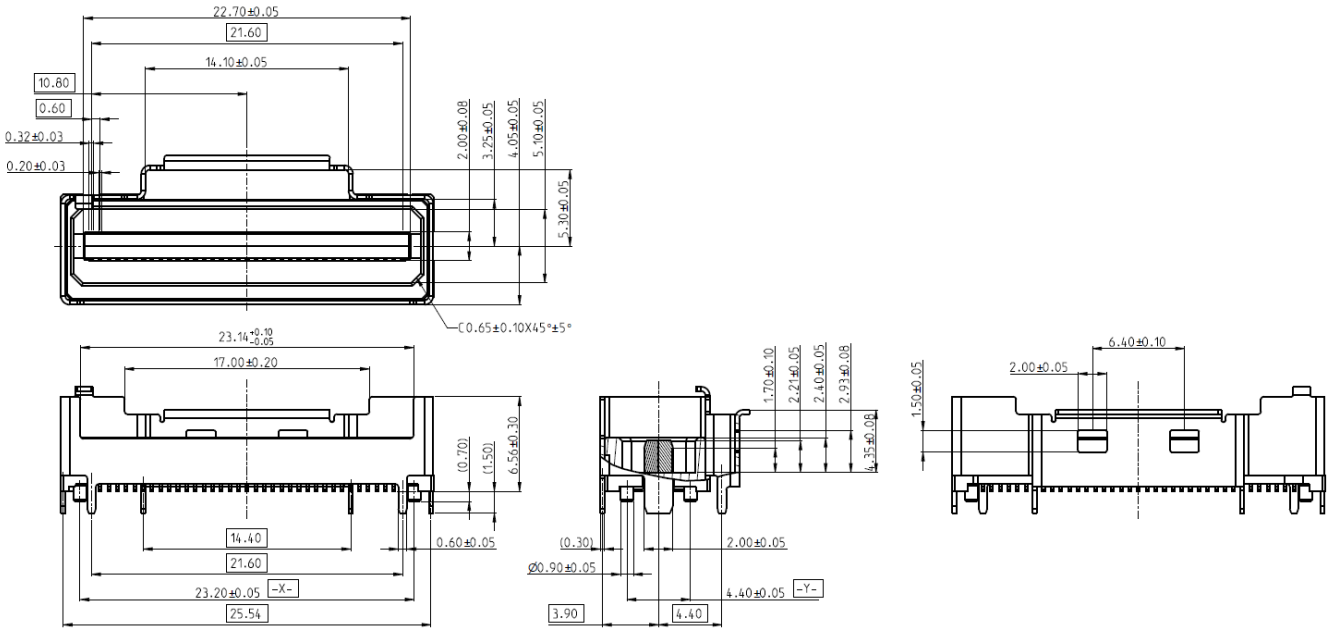


Figure 5-2 74 Contacts LP Connector

5.2.3 74 Contacts LPDE Receptacle Connector

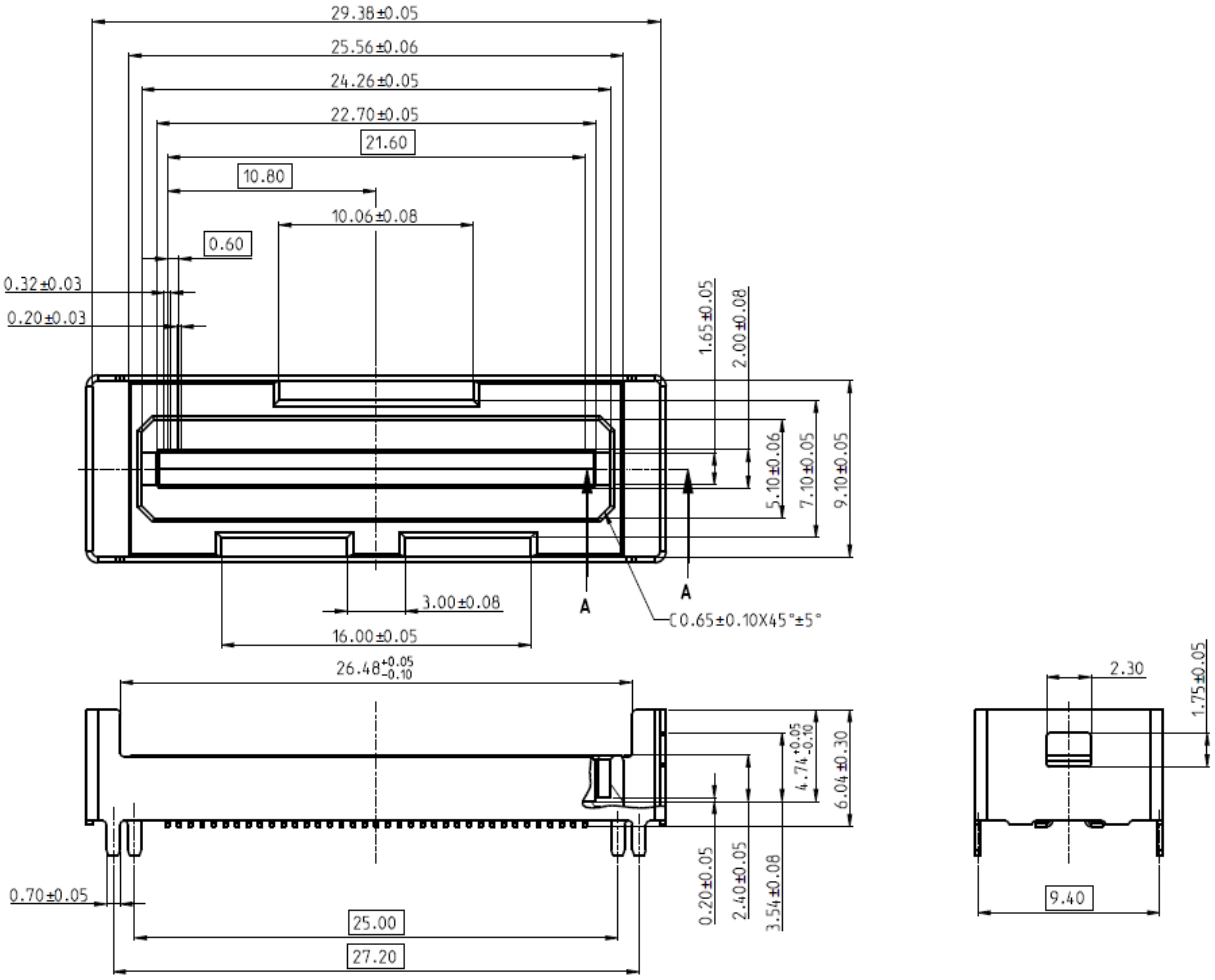


Figure 5-3 74 Contacts LPDE Connector

5.3 Out Locus of Connector Contacts

Figure 5-4 shows the outer locus of the connector contacts at the mating interface

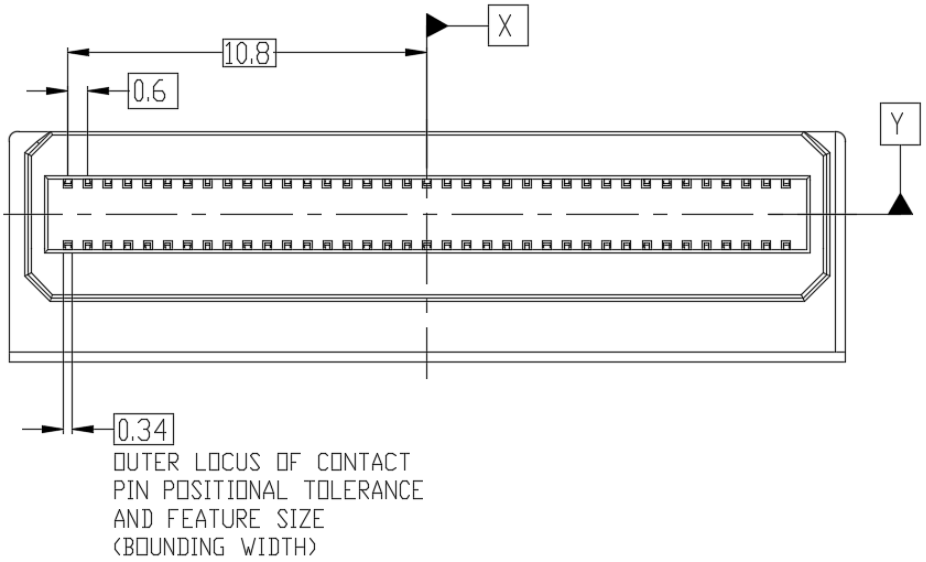


Figure 5-4 Out Locus of Mating Contact Pins

5.4 Out Locus of SMT Solder Leads

Figure 5-5 through Figure 5-7 show the outer locus of the flat surfaces of the SMT leads that are intended to mate with the applicable PCB footprint pads for receptacle each connector type.

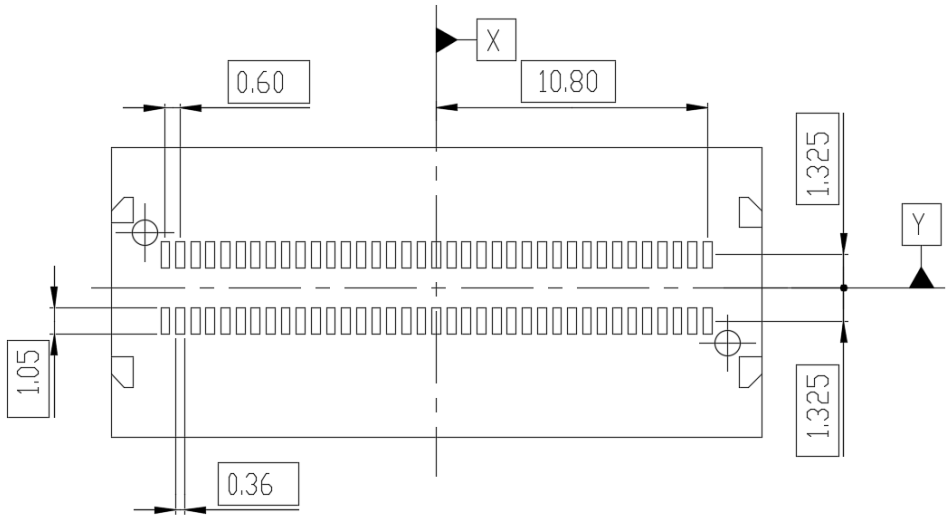


Figure 5-5 Outer Locus of STD Connector SMT Leads

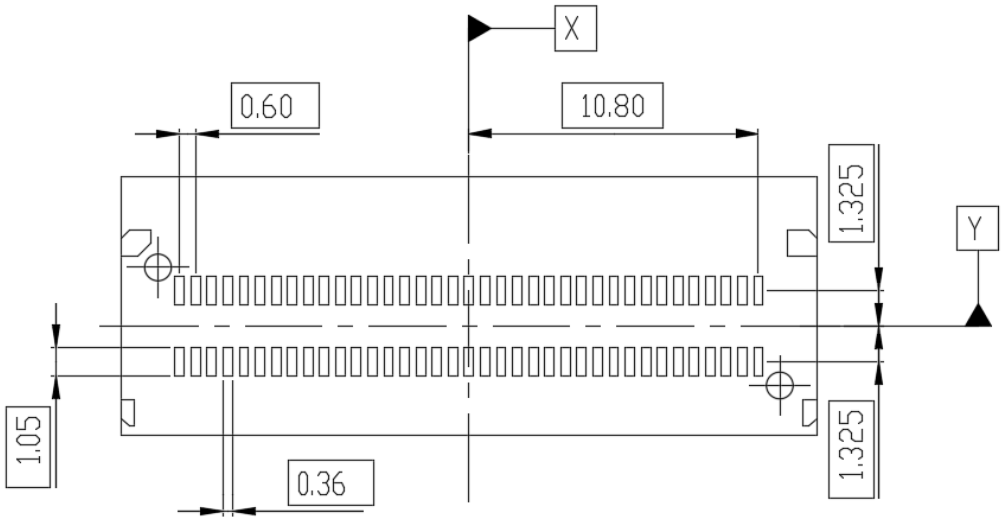


Figure 5-6 Outer Locus of LP Connector SMT Leads

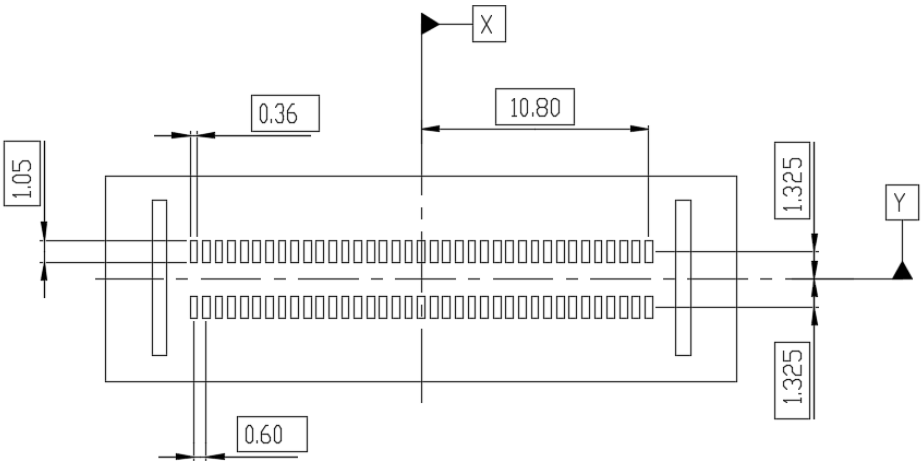


Figure 5-7 Outer Locus of LPDE Connector SMT Leads

6. Module Mechanical Specification

6.1 Overview

6.2 Mechanical Description: Plug Modules

6.2.1 74 Contacts STD Plug

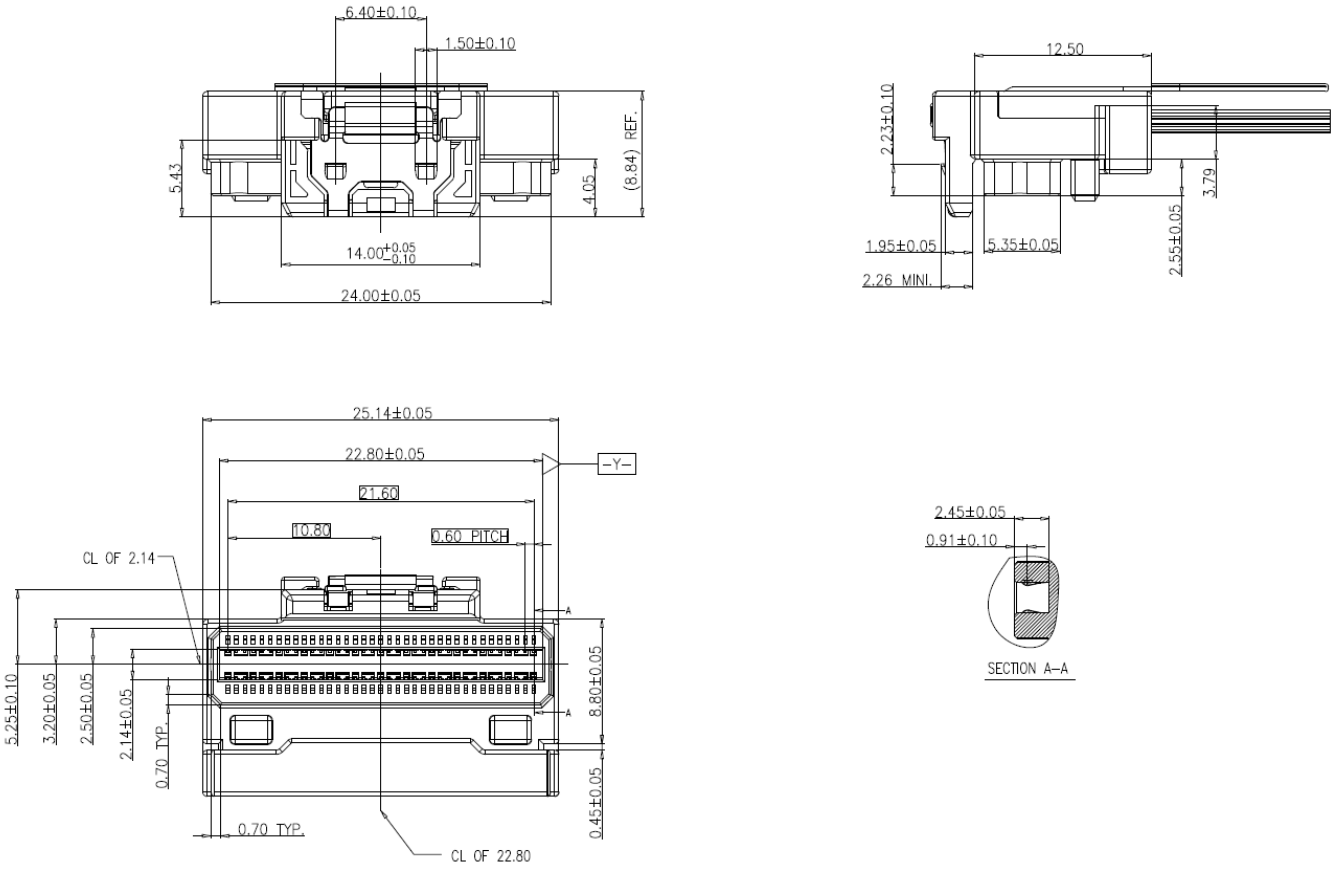


Figure 6-1 74 Contacts STD Plug

6.2.2 74 Contacts LP Plug

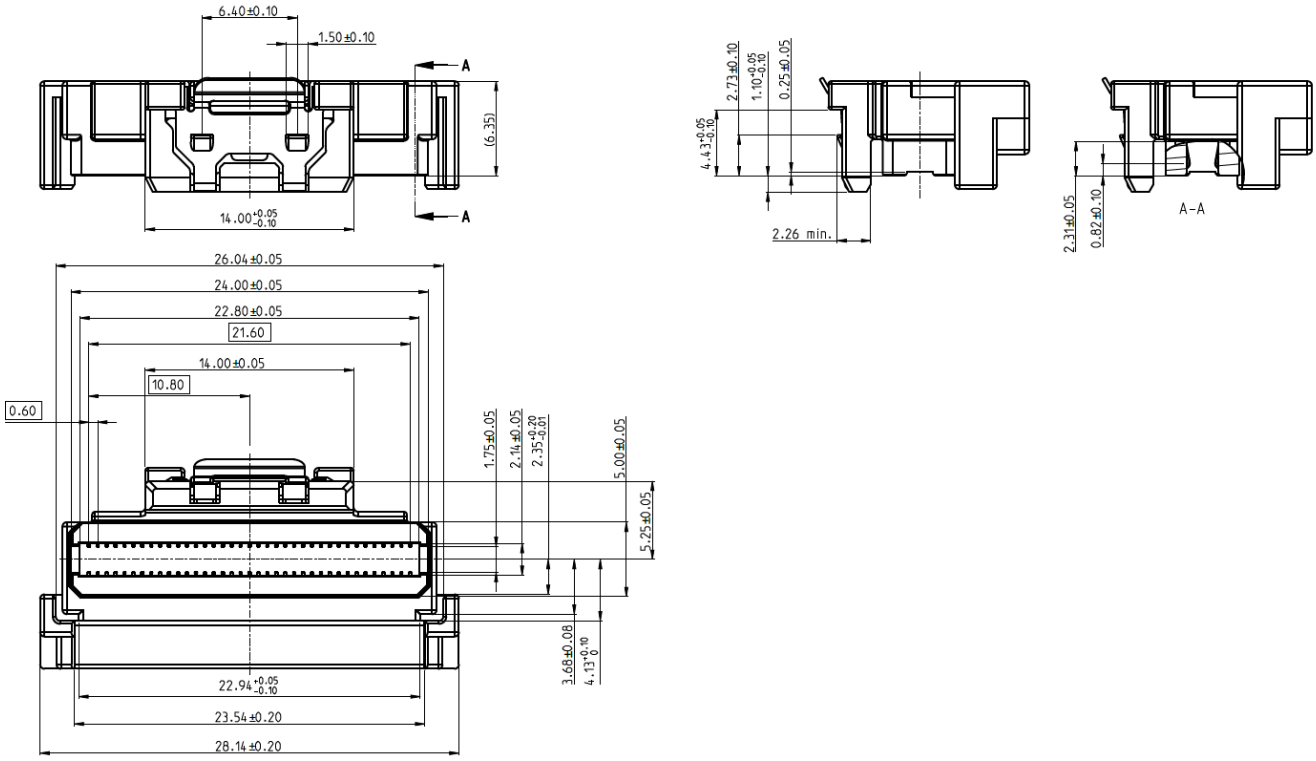


Figure 6-2 74 Contacts LP Plug

6.2.3 74 Contacts LPDE Plug

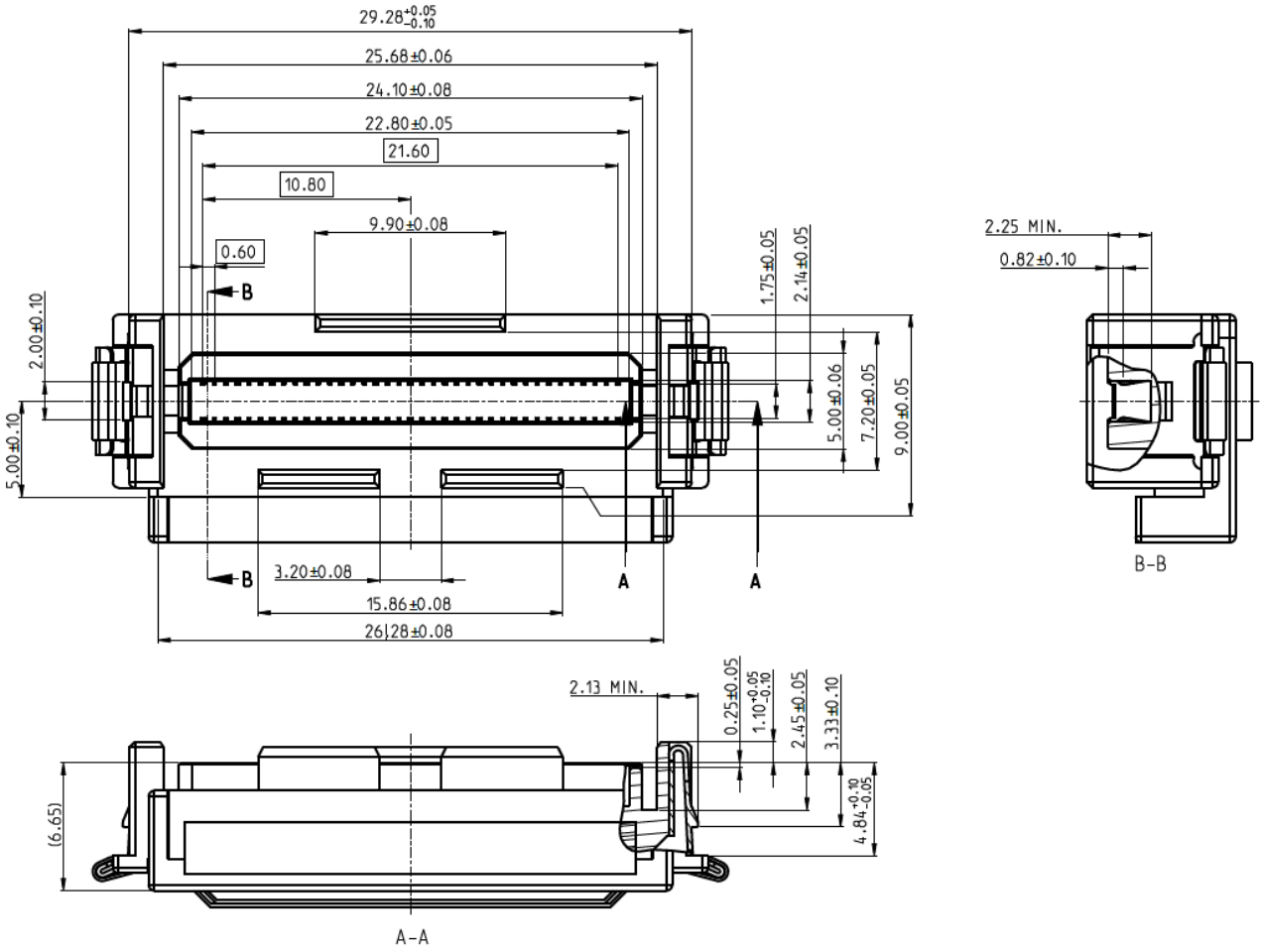


Figure 6-3 74 Contacts LPDE RA Plug

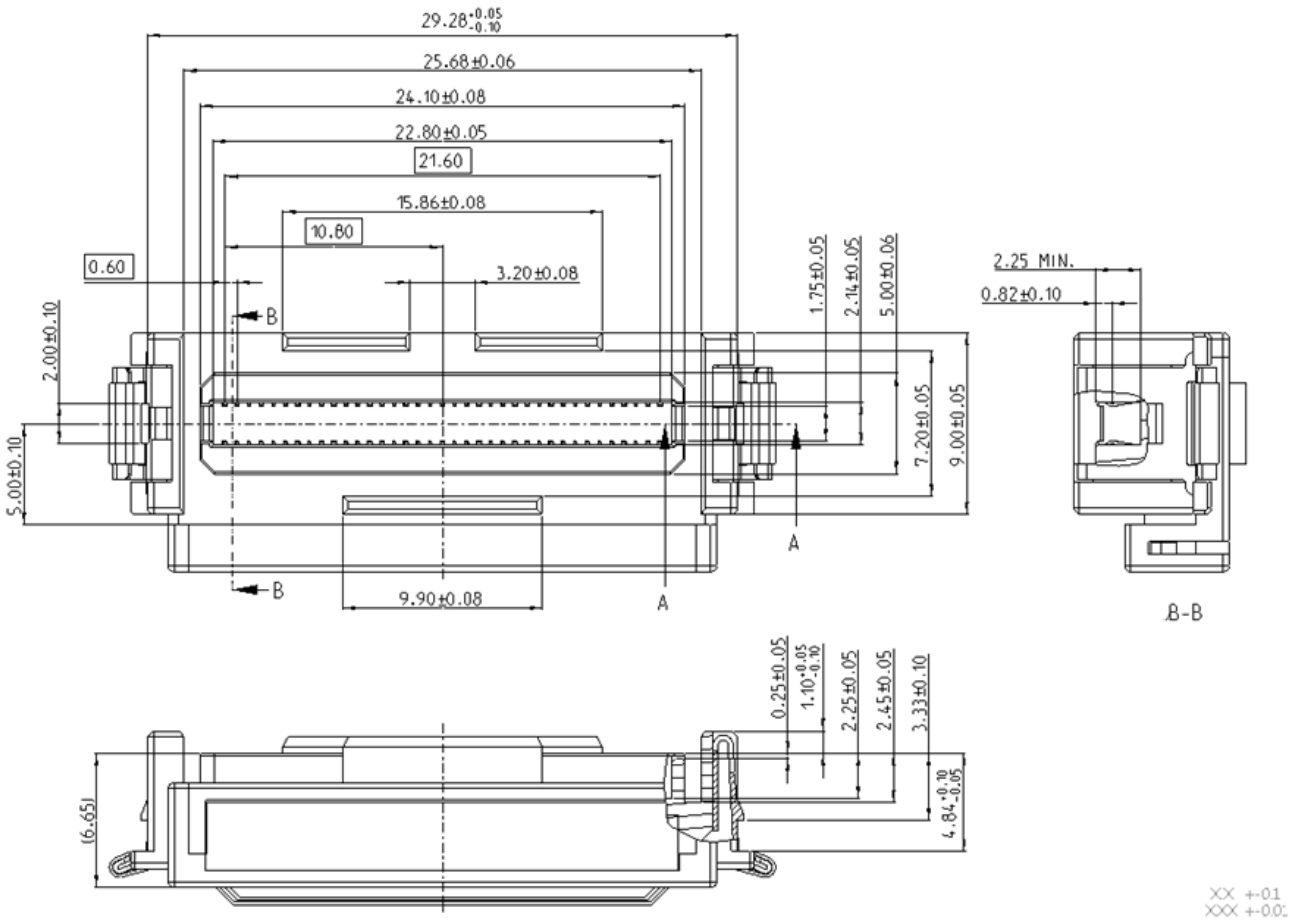


Figure 6-4 74 Contacts LPDE RRA Plug

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

7.1 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 7-1 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 7-2. Finally, testing procedures used to validate any performance criteria not included in EIA-364-1000 are provided in Table 7-3.

Table 7-1 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: 200 cycles Module: 200 cycles
Latched Mating Force*	Amount of force needed to mate a module with a connector when latches are deactivated	1.1 N/contact pair + 10 N MAX
Latched Unmating Force*	Amount of forced needed to separate a module from a connector when latches are deactivated	0.1 N/contact pair MIN
Latch Retention*	Amount of force the latching mechanism can withstand	50 N MIN
Wrenching Strength*	Amount of force in various directions the product can withstand while mated	25 N MIN for each axis direction
Environmental Requirements		
Field Life	The expected service life for a component	10 years
Field Temperature	The expected service temperature for a component	0°C to +65°C
Storage Temperature*	The expected storage temperature for a component when not in use	-20°C to +80°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	1.1A per contact MAX 1.1A per power contact MAX
Operating Rating Voltage	Maximum voltage to which a contact is exposed in use	29V DC per contact MAX
NOTE: Performance criteria denoted with stars (*) are not validated by EIA-364-1000 testing. Refer to Table 7-3 for test procedures and pass/fail criteria.		

Table 7-2 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 7-1 are met. Any information in this table supersedes EIA-364-1000.

Table 7-2 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 and module (Latches should be locked out)	No evidence of physical damage
Durability (see Note 1)	EIA-364-09 To be tested with connector and module (Latches should 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 IIA Duration: 7 days 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	20 mΩ MAX change from baseline
Dielectric Withstanding Voltage	EIA-364-20 Method B 300 VDC minimum for 1 minute Applied voltage may be product / application specific	No defect or breakdown between adjacent contacts -AND- 0.5 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 7-3 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 7-1 are met.

Table 7-3 Additional Test Procedures

Test (see Note 1)	Test Descriptions and Details	Pass/ Fail Criteria
Mechanical/ Physical Tests		
Latched Mating Force	EIA-364-13 To be tested with connector (with integrated latch shroud) and module (plug) without any heat sinks. Latching mechanism deactivated (locked out)	Refer to Table 7-1 -AND- No physical damage to any components
Latched Unmating Force	EIA-364-13 To be tested with connector (with integrated latch shroud) and module (plug) without any heat sinks. Latching mechanism deactivated (locked out)	
Latch Retention	EIA-364-13 To be tested with connector (with integrated latch shroud) and module (plug) without any heat sinks Latching mechanism engaged (not locked out)	
Wrenching Strength	Bend cable 90° at minimum bend radius. Pull 25 N Min in each of 4 axis directions for round cable. Pull 25 N Min in each of 2 axis directions for flat cable.	No damage to plug / cable assembly.
Environmental Tests		
Storage Temperature	EIA-364-32 Method A, Test Condition 1, Duration 4 Use min and max Field Temperatures listed in Table 7-1 for temperature range	Refer to Table 7-1
Storage Humidity	EIA-364-31	Refer to Table 7-1
Electrical Tests		
Current	EIA-364-70 Method 3, 30-degree temperature rise Contacts energized: Up to a maximum of 6 adjacent contacts per side, 12 contacts total	Refer to Table 7-1 for current magnitude
NOTES: 1. Requirements and tests specified that fall outside of EIA-364-1000 testing are listed in this table.		

Appendix A. System Mechanical Specification (Informative)

A.1 Overview

All material within this appendix, whether defined as normative or informative, is subject to IP disclosure and reasonable and non-discriminatory (RAND) terms by SNIA SFF TWG member companies.

A.2 Recommended PCB layout for STD Connector Footprints

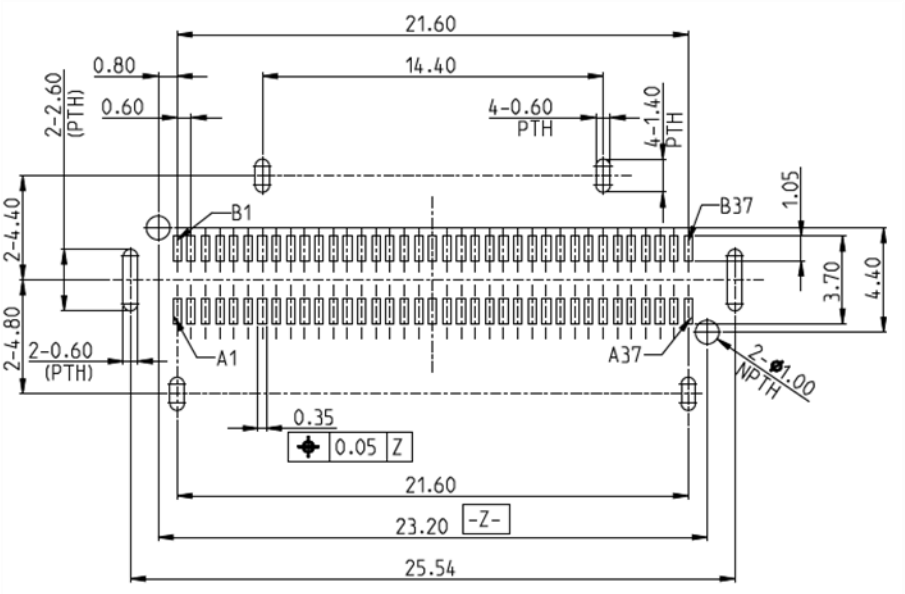


Figure A-1 Recommended Footprints for RA 38P/74P

A.3 Recommended PCB layout for LP Connector Footprints

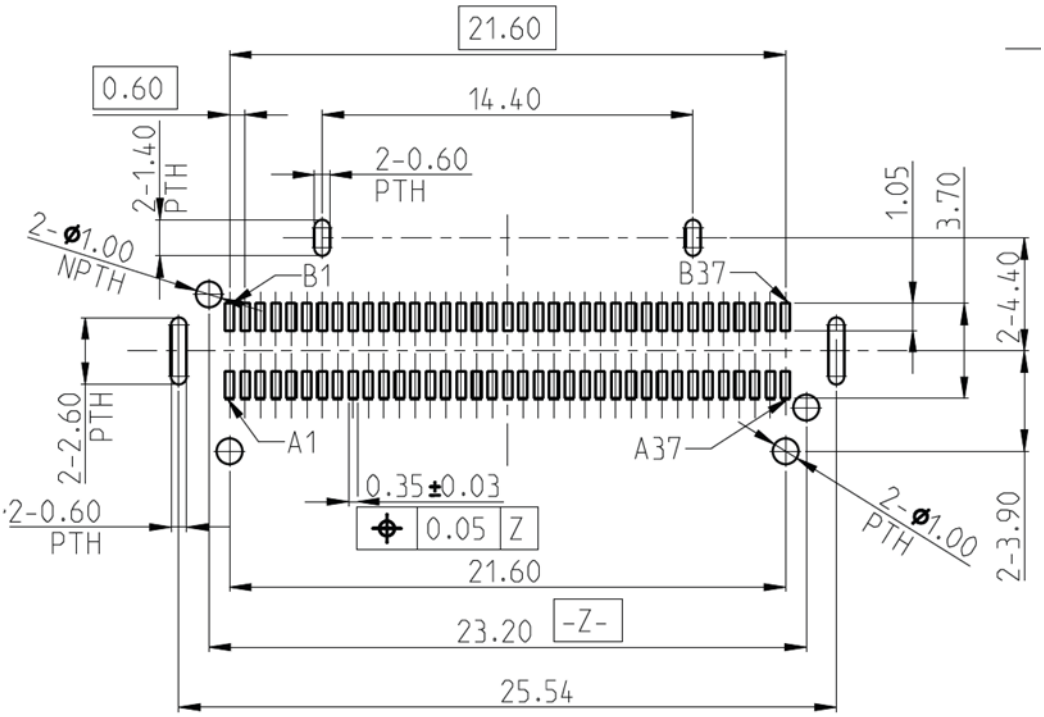


Figure A-2 Recommended Footprints for LP Connector

A.4 Recommended PCB layout for LPDE Connector Footprints

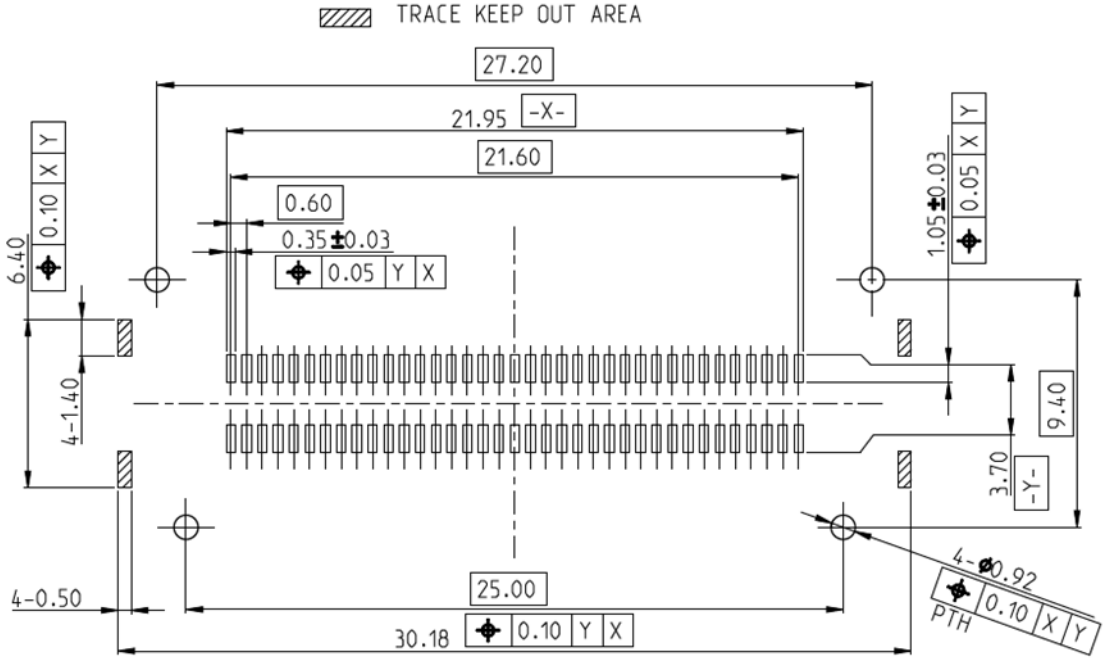


Figure A-3 Recommended Footprints for LPDE Connector