

NUMBER: AS-001	CATEGORY: APPLICATION SPECIFICATION	AMPHENOL ARDENT CONCEPTS	
TITLE: 16 Pair SMT Mount micro-LinkOVER Connector		PAGE: Page 1 of 13	REVISION: 5
		GUARDIAN (VERIFIED BY): S. DIAZ	DATE: 2020-07-18
		APPROVED BY: S. DIAZ	
		CLASSIFICATION: UNRESTRICTED	

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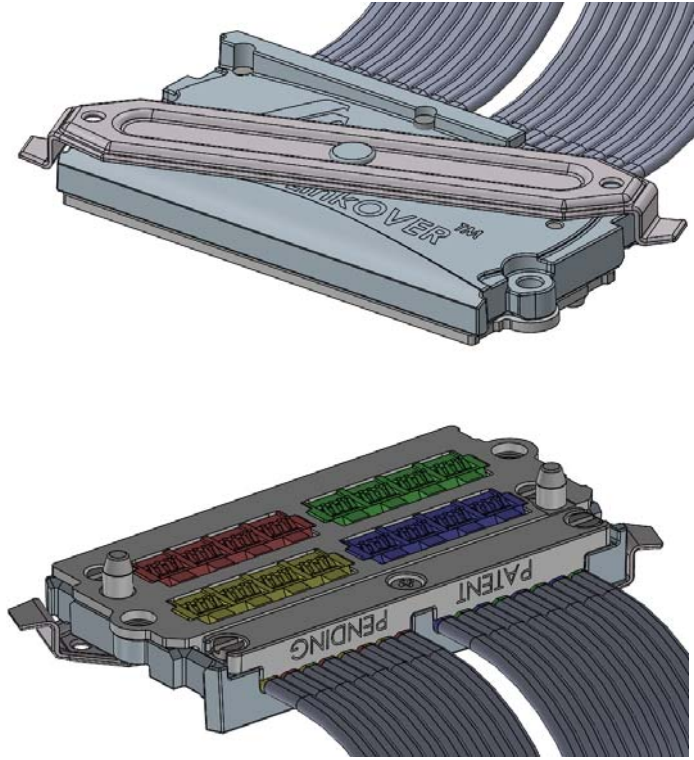


FIGURE 1: 16 PAIR SMT MOUNT micro-LinkOVER CONNECTOR

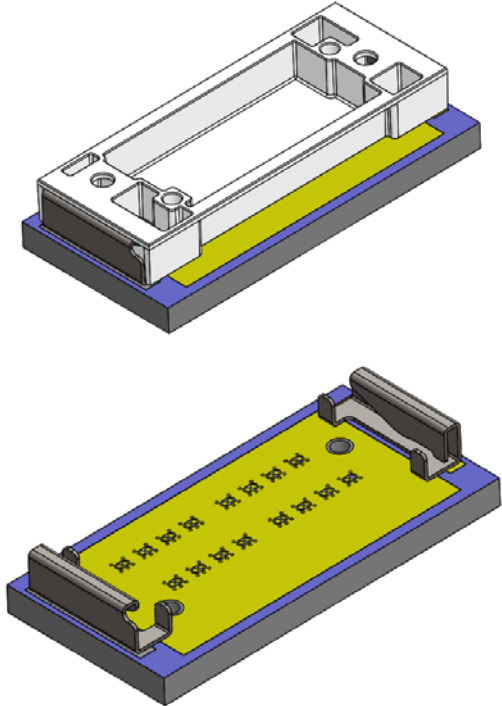


FIGURE 2: ANCHOR-CARRIER ASSEMBLY ON PCB, ANCHORS ON PCB

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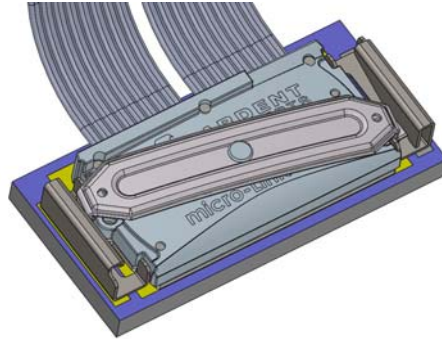


FIGURE 3: micro-LinkOVER CONNECTOR IN LOCKED POSITION

1.0 OBJECTIVE

This specification recommends a customer application of the micro-LinkOVER (micro-LO) connector. It is intended to provide general guidance for development of assembly processes. It should be acknowledged that no single process will work for every customer application and that customers will develop processes to meet their needs. However, if such processes should deviate extensively from the recommendation put forth in this document, Amphenol Ardent Concepts cannot guarantee good results.

2.0 SCOPE

This specification provides information and requirements regarding application of the micro-LO surface mount connector, anchor-carrier assembly, and anchors.

3.0 PCB DESIGN

3.1 BOARD LAYOUT

Refer to *mLO-FP-16X2-02* or the applicable Amphenol Ardent Concepts customer drawing for the specific connector footprint and outline. For SMT Mount applications, solder mask and solder areas must be included in the footprint.

CAUTION: It is critical that Board Manufacturers abide by the dowel hole size and positional tolerances specified in the footprint drawings. Any deviation may result in damaged connectors.

3.2 BOARD FIT INSPECTION

Customers can request guide plate samples to check its mechanical fit to the dowel holes in the PCB. The part number is *mLO-GP-16X2-01*. Please contact the factory before your board arrives to request samples of this part. To execute the fit test, install the guide plate in the right orientation, turn the PCB over, and check if the guide plate falls off.

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3.3 BOARD THICKNESS

The alignment posts of the connector are 2mm long, so a minimum board thickness of 2mm is required for single- or double-sided (belly-to-belly, B2B) mounting. There is no maximum board thickness requirement for either application.

4.0 PACKAGING

The anchors for the SMT Mount micro-LO connector are supplied as an assembly composed of a high temperature resistant plastic carrier and two anchors. The part number for this assembly is mLO-ANAC-S16X2-S-02. These assemblies are supplied in tape and reel packaging for either manual or automated placement onto the PCB. The micro-LO connector is supplied in tray packaging for manual assembly.

5.0 APPLICATION INFORMATION

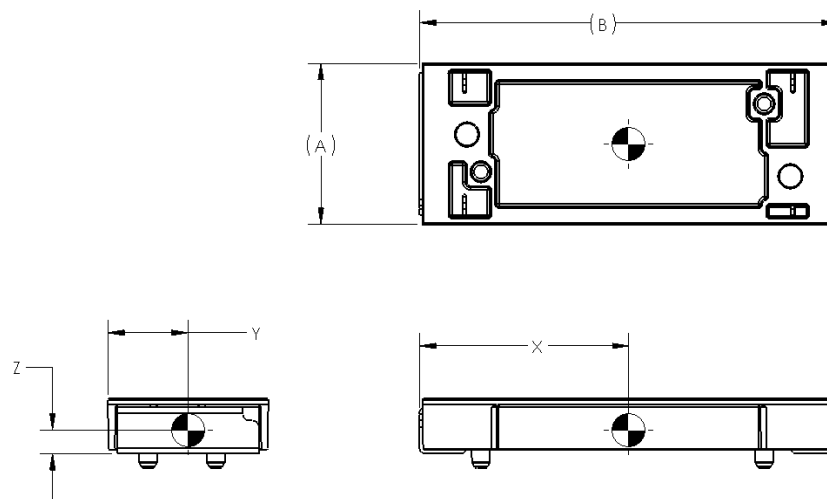
5.1 ANCHOR-CARRIER ASSEMBLY

5.1.1 VACUUM PICK-UP

Refer to *mLO-ANAC-S16X2-S-02* for more details.

The carrier component of the anchor-carrier assembly has a flat area at the bottom of a larger, central cavity for vacuum pick-up and placement with automated equipment.

5.1.2 CENTER OF GRAVITY AND MASS



Connector Number of Pairs	DIM X (mm)	DIM Y (mm)	DIM Z (mm)	DIM (A) (mm)	DIM (B) (mm)	Mass (grams)
16	16.99	6.49	1.90	13.03	34.0	1.09

FIGURE 4: CENTER OF GRAVITY LOCATION

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5.1.3 ALTERNATE PLACEMENT METHODS

If automated pick and place equipment is not available, the anchor-carrier assembly may be placed by hand or with mechanical grippers that grasp the outside of the carrier.

5.1.4 ANCHOR-CARRIER REGISTRATION AND SEATING

The anchor-carrier assembly features alignment posts to help with positioning on the board. Since the alignment posts are a clearance fit, minimal force will be required for seating. The connector should be seated with just enough force to embed the bottom surfaces of the anchors below the top surface of the solder paste. The carrier will automatically control the position of the two anchors provided the carrier alignment posts are in their alignment holes.

5.1.5 CONNECTOR FOOTPRINT SPACING

There are times when several connectors need to be placed on the board side by side and in rows to accommodate a larger number of pairs. In those cases, board real estate requires tight spacing between connectors and connector rows. **Figure 5** below defines the minimum centerline to centerline spacing in X and Y as well as the edge of the keep out zone required for an array of SMT mount 16 Pair micro-LO connectors.

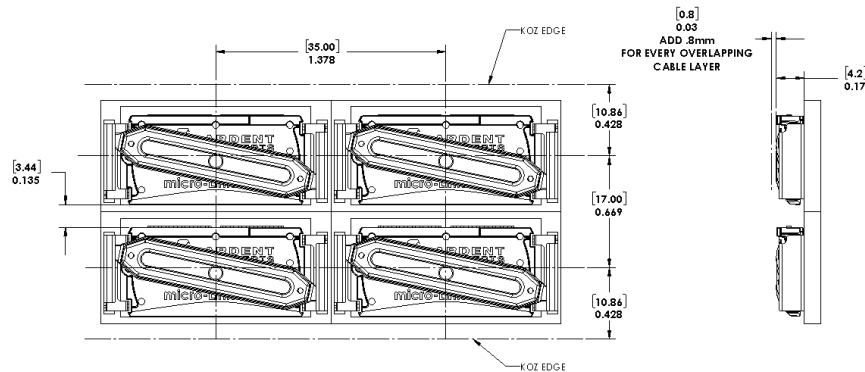


FIGURE 5: ARRAY SPACING AND KEEPOUT ZONES

5.1.6 SOLDER PASTE AND STENCIL REQUIREMENTS

- No-clean solder paste is recommended for ease of use.
- Recommended stencil thickness: 0.127mm (0.005 in).
- Recommended aperture shape and size: Use solder pad outline that matches the inside dimensions of the solder mask outline on *mLO-FP-16X2-02* or per the applicable customer drawing.
- Resultant solder paste volume should be approximately 3.122 mm³ per anchor.

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5.1.7 SOLDER REFLOW

- Temperatures shall be measured on the board surface, within or near the termination area.
- Soak time between 175°C and 217°C should be between 75 and 100 seconds.
- Time above 217°C should typically be between 60 and 90 seconds.
- Peak temperature should be between 230°C and 260°C.
- The maximum total cumulative time to ramp up, soak, and reflow shall be limited to 360 seconds.
- Nitrogen with less than or equal to 4,000ppm of O₂ can improve solderability but is optional.
- Maximum ramp rate should be less than 2.5°C per second.
- See **Figure 6** for an example of a lead-free solder reflow profile.

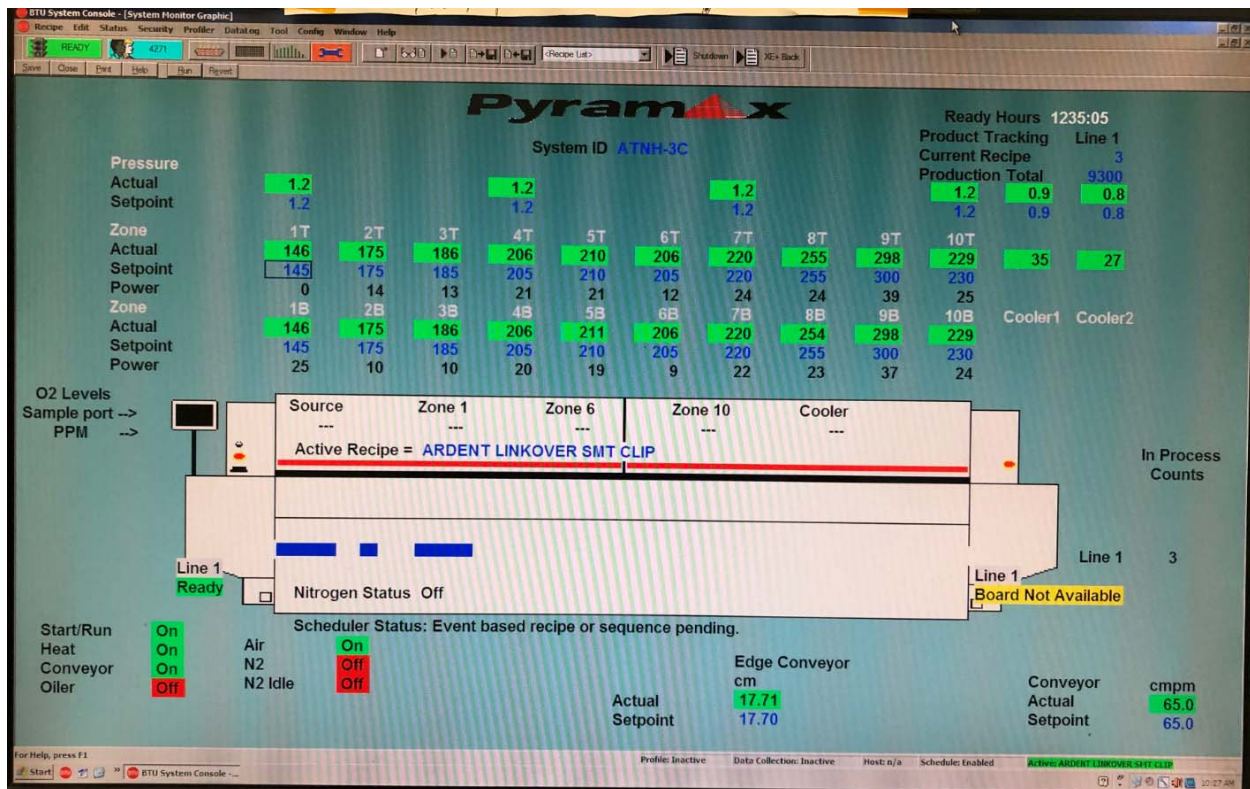


FIGURE 6: REFLOW PROFILE

5.1.8 INSPECTION

- Visually inspect the anchor-carrier assembly after reflow for damage and cleanliness. Solder or flux residue should not flow into signal pad area of the connector footprint.

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- If possible, solder joints should be inspected visually or by alternate methods such as X-ray to ensure that they are acceptable and maximum wetting has been achieved.

5.1.9 CLEANING

The anchor-carrier and board assembly can be washed with an appropriate cleaner to remove any flux residue or contaminants after reflow. **Figure 7** shows an example of flux residue that should be removed to prevent connection problems.



Figure 7: Example of resin on footprint after reflow. It is recommended to remove the residue with the appropriate cleaner to prevent connection problems.

5.2 CONNECTOR ASSEMBLY

The micro-LO connector assembly must be mechanically mated to the anchors after the anchor-carrier assembly has been soldered to the board.

5.2.1 TOOLING AND PROCEDURE

The micro-LO connector assembly procedure is described below and illustrated in **Figures 9-14**.

Step 1: Seat the carrier extraction tool, part number mLO-16X2-CE-02, on top of first carrier in the array. See **Figure 9**.

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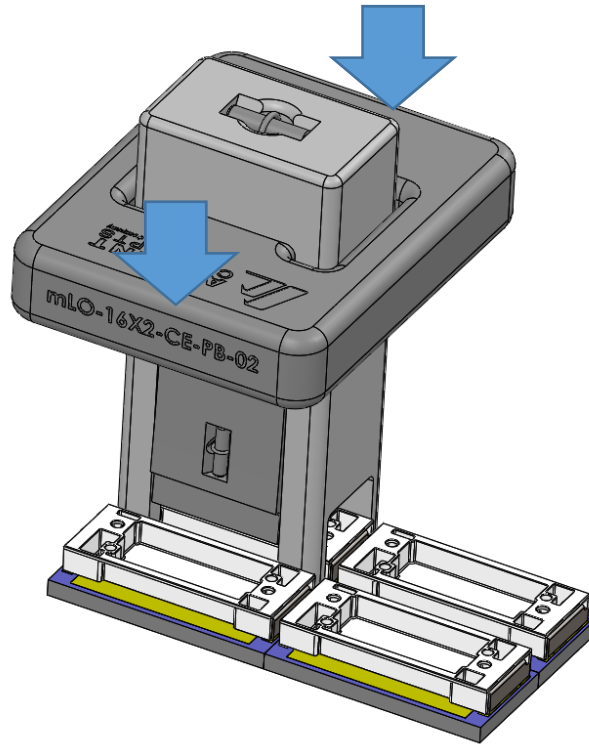


FIGURE 9: Using carrier extraction tool, part number mLO-16X2-CE-02

Center the tool over the first carrier to be removed. Push on the wings of the tool as indicated by the blue arrows. Slowly release the downward pressure on the tool. The tool will grip the sides of the carrier and lift it off the anchors. Set the carrier aside and move to the next carrier. Note: **Figure 10** below provides dimensions for the tool to help determine component keep outs.

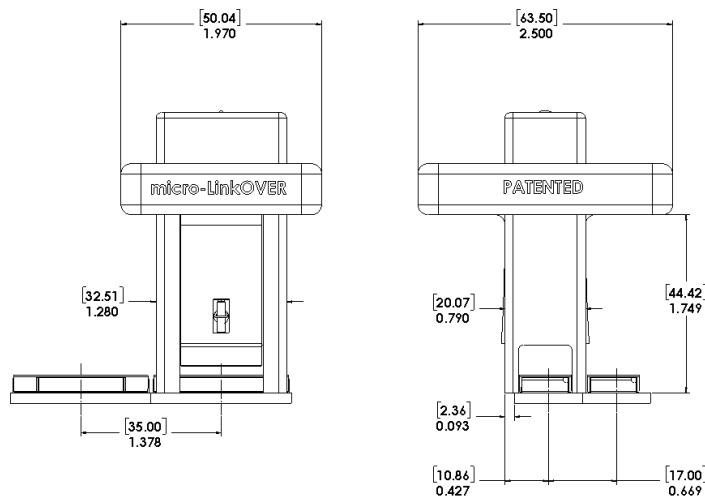


FIGURE 10: Carrier Extraction Tool Dimensions

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Step 2: Separate connector from shipping screws and cover

Figure 11 shows the connector as it is shipped. In this orientation, hold the connector by its sides with one hand and use the other hand to loosen the screws with a Philips #000 screw driver, in an alternating pattern, until the screws drop off.

The shipping cover may stick to the connector. If so, carefully pull the shipping cover downwards in the direction of the blue arrow in **Figure 11**. A smooth, fluid motion in the direction normal to the bottom of the connector is best.

The shipping cover and screws can be discarded or stored.

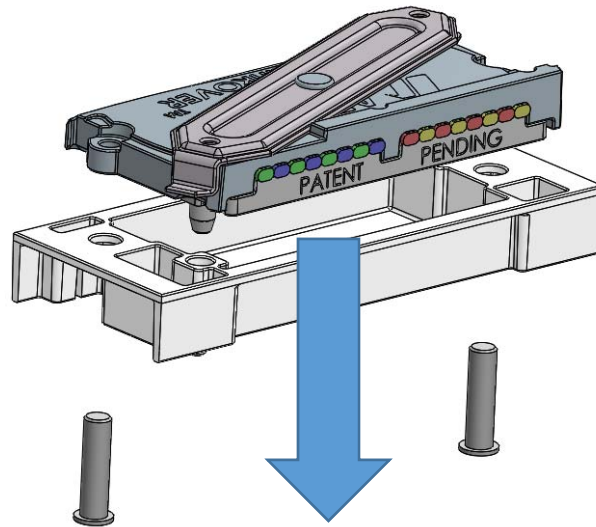


FIGURE 11: SEPARATING CONNECTOR FROM SHIPPING COVER AND SCREWS

Step 3: Install connector on PCB

NOTE: It is important to allow some slack in the cable bundle between the two footprints. Slack of ½" to 1 inch is recommended. For reference, the cable loss per inch at 28 GHz is -0.28 dB.

Manually align the connector with the anchors being sure the cables are exiting in the correct direction, as shown in **Figure 12** and **Figure 13**. The twinax cables typically exit away from the soldered-down or socketed integrated circuit (IC). If installing multiple connectors in rows, begin with the rows farthest away from the IC. The flat spring should be rotated to its furthest counterclockwise position. Align the anchor tabs with the tab slots in the connector and push the connector down until the alignment posts enter their corresponding holes on the board.

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CAUTION: Do not attempt to force the connector onto its footprint if the cable length will not allow it. Doing so will damage the connector. If the micro-LO connector end is installed first, and tension needs to be applied to the cable bundle, first ensure the flat spring is torqued properly, and then ensure the tension does not exceed 4 lbs (0.45 kg).

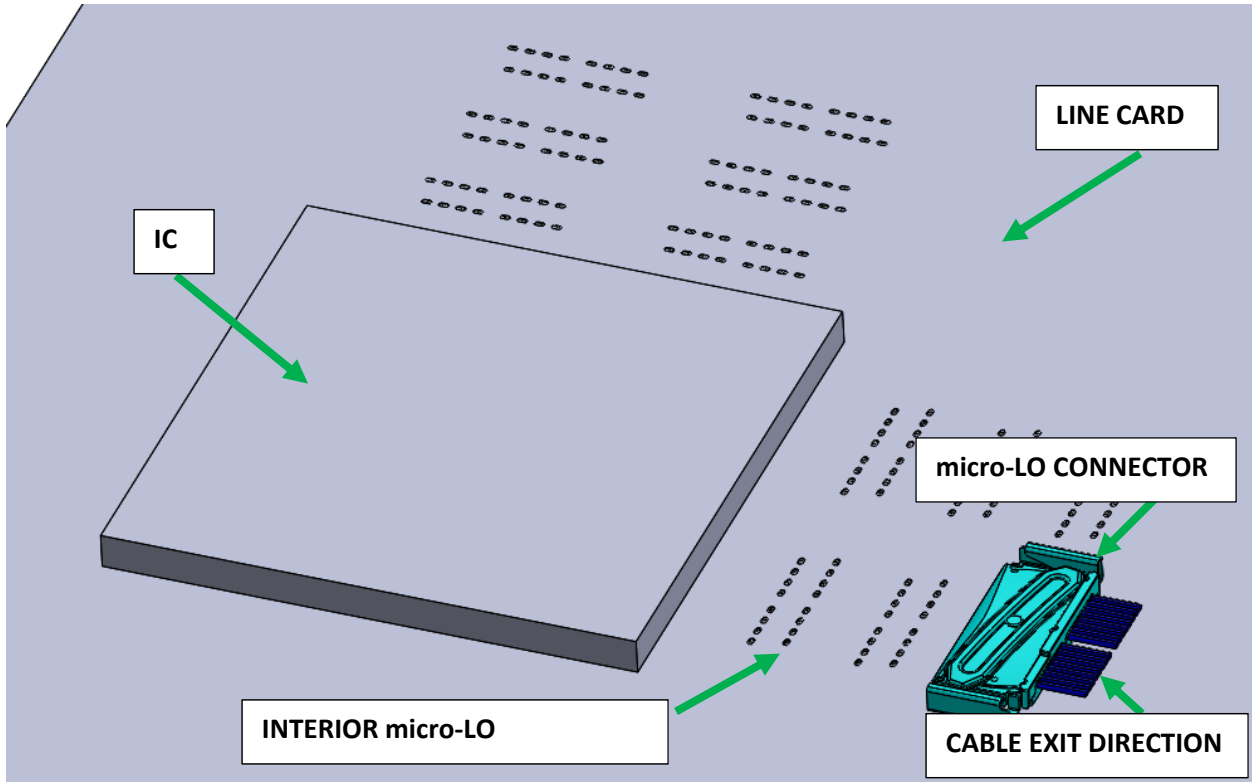


FIGURE 12: ORIENTATION OF INSTALLED CONNECTOR WITH RESPECT TO IC

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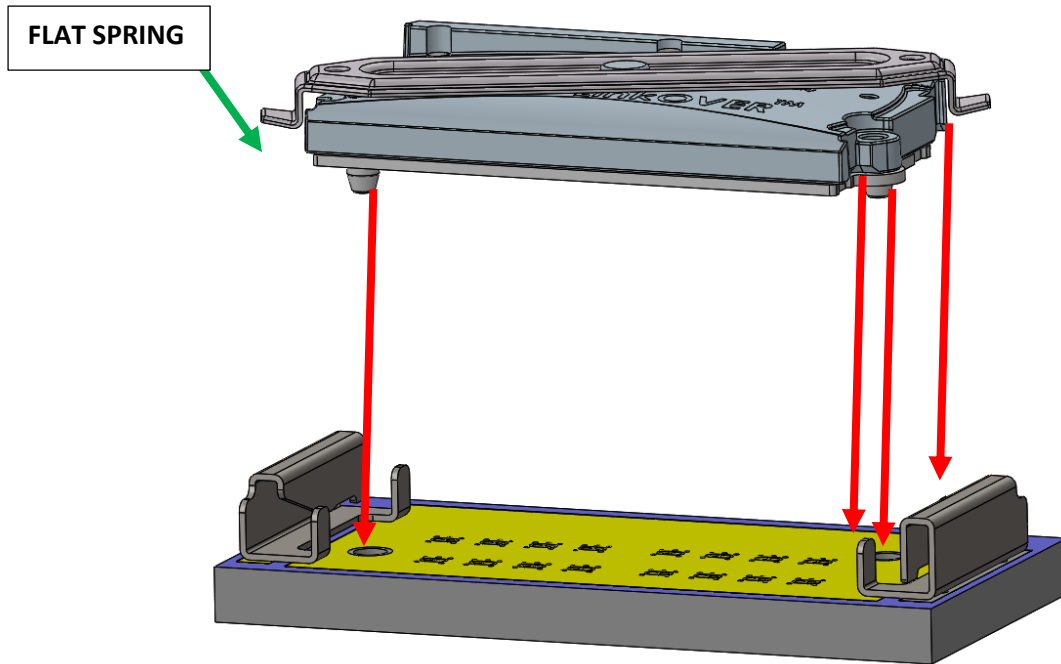


FIGURE 13: SEATING CONNECTOR ON SMT ANCHORS

The use of a special application tool, Amphenol Ardent Concepts part number mLO-IT-01, is recommended to ensure easy and full seating of the connector.

Grasp the installation tool, mLO-IT-01, by its handle and seat its opposite end as shown on **Figure 14**. The tool has two alignment posts that fit in the holes on the ends of the flat spring. Once seated, rotate the tool about 30° clockwise until the flat spring seats in its final position on the anchors.

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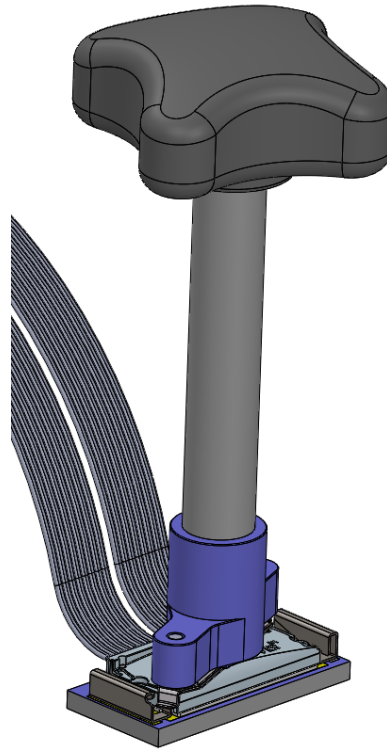


FIGURE 14: INSTALLATION TOOL SEATED ON TOP OF CONNECTOR

5.2.2 INSTALLATION TORQUE

The torque required to turn the handle is 2 in-lbs or less. Hand torque is adequate.

5.2.3 INSPECTION

Visually inspect the connector after it has been assembled to the board to ensure no damage has occurred during the installation process. As shown on **Figure 15**, the bottom surface of the connector should be flush with the board.

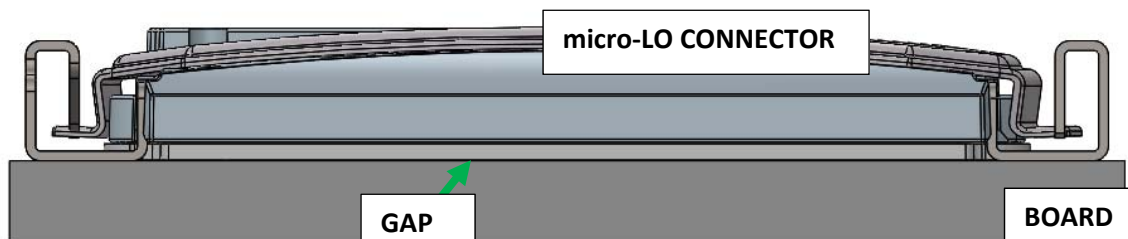


FIGURE 15: LITTLE OR NO GAP BETWEEN CONNECTOR AND BOARD.

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6.0 REFERENCE DOCUMENTS

- Amphenol Ardent Concepts 16 Pair SMT Mount micro-LinkOVER connector drawing, *mLO-S16X2-XXX-S-02*.
- Amphenol Ardent Concepts 16 Pair SMT Mount anchor-carrier assembly drawing, *mLO-ANAC-S16X2-S-02*.
- Amphenol Ardent Concepts 16 Pair SMT Mount footprint drawing, *mLO-FP-S16X2-02*.
- Amphenol Ardent Concepts 16 Pair SMT Mount Carrier Extractor drawing, *mLO-16X2-CE-02*.
- Amphenol Ardent Concepts 16 Pair SMT Mount Installation Tool drawing, *mLO-IT-01*.

Product drawings and specifications are available by accessing the Amphenol Ardent Concepts website.

7.0 REVISION RECORD

REV	PAGES	DESCRIPTION	ECN #	DATE
6	All	Update connector images to reflect component updates, added Installation Tool and Carrier Extractor documents to Reference Section	PDM Release	11/08/21
5	All	New connector density specification, introduced new carrier extraction tool	---	06/14/21
4	All	Added cautions about footprint dowel holes and cable slack	---	04/05/21
3	All	New product abbreviation, updated installation tool image	---	11/13/20
2	All	Add figure of PCB that needs cleaning	---	08/18/20
1	All	Preliminary Release	---	2020/07/18