

**DDR4 MINIATURE DUAL IN-LINE MEMORY MODULE (Mini DIMM) SOCKET**

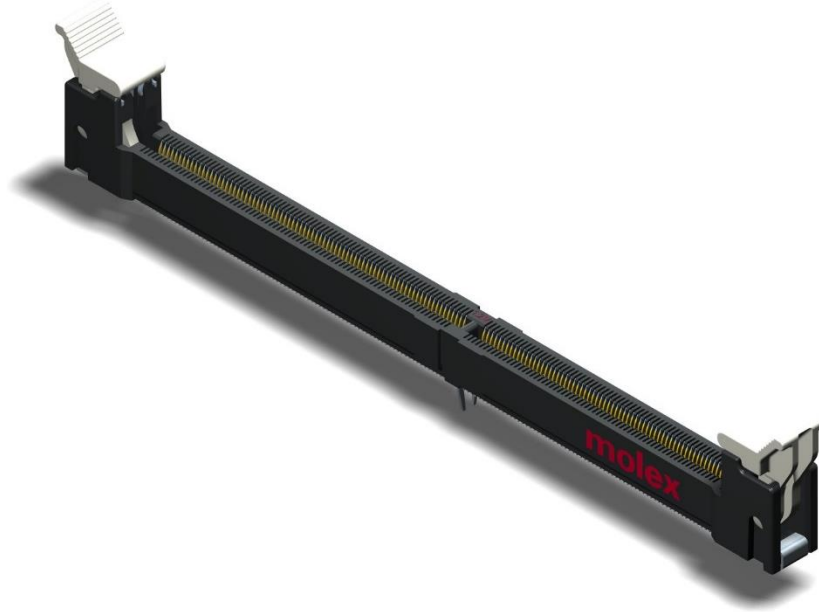


Figure 1: DDR4 Mini DIMM Vertical SMT 288CKT



Figure 2: DDR4 Mini DIMM 22.5° SMT 288CKT

**THIS APPLICATION GUIDELINE IS STRICTLY FOR THE CUSTOMER'S REFERENCE ONLY, WHICH MOLEX BELIEVES MAY PROVIDE USEFUL GENERAL PROCESSING GUIDELINES**

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DOCUMENT NUMBER: <b>AS-151105-0002</b>	CREATED / REVISED BY: <b>JA KEE MEW</b>	CHECKED BY: <b>CC TEH</b>	APPROVED BY: <b>SH LENI</b>

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## 1.0 SCOPE

This specification covers the processing guidelines and the requirements for the application of DDR4 Miniature Dual In-line Memory Module (Mini DIMM) 288-circuit socket connector with an SMT solder tail design in Data/Computing and Networking equipment. All dimensional values shown are in metric units. Any figure and illustration found in this document is for graphical representation only and is not drawn to scale.

The connectors are available in 288-circuit size with contact pitch size of 0.50mm. These connectors are designed to connect MO-214-compliant memory modules of 1.40mm thickness (daughter cards) with SO-021-compliant printed circuit boards (PCB).

When corresponding with Molex Personnel, kindly use the terminology provided in this document to facilitate your request for more information. Basic terms and features of this product are illustrated in Figures 3 and 4.

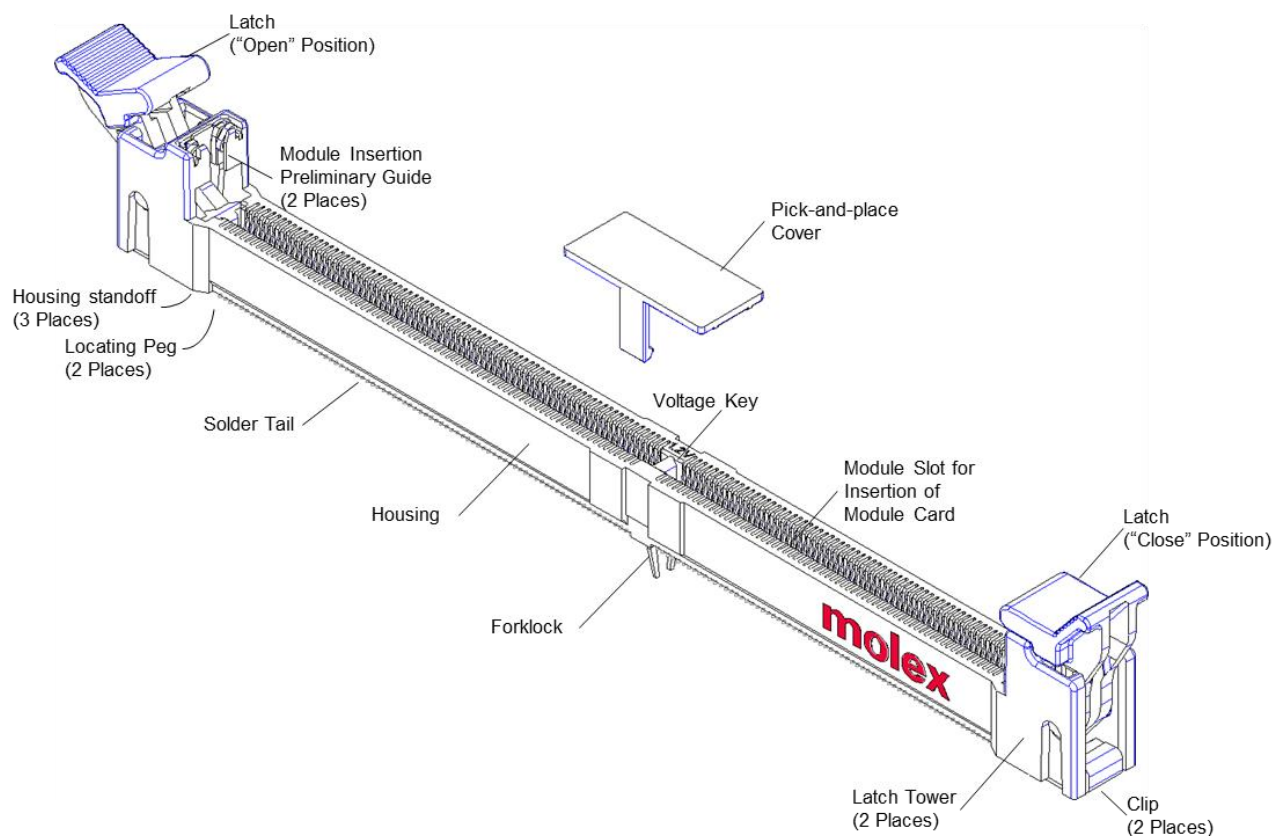


Figure 3: Terms and Features for DDR4 Mini DIMM Vertical SMT Connector

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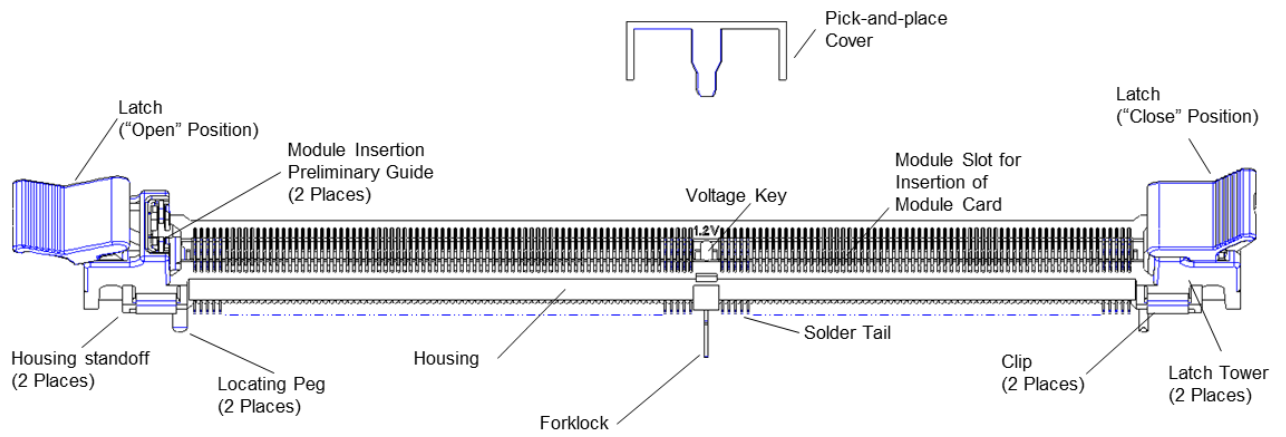


Figure 4: Terms and Feature for DDR4 Mini DIMM 22.5° SMT Connector

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## 2.0 PRODUCTION DESCRIPTIONS

### 2.1 PRODUCT DESCRIPTION AND SERIES NUMBER

**SERIES NUMBER**

151105

151134

**DESCRIPTION**

DDR4 MINI DIMM VERTICAL SMT 0.76Au 288CKT

DDR4 MINI DIMM 22.5 DEGREES SMT 0.76Au 288CKT

The above series number is shown for reference only. This application guideline shall apply to all products with part numbers that fall under the family of 151105 and 151134.

*This document is not intended to be the final process definition nor is it intended to constrain design.*

## 3.0 REFERENCE DOCUMENTS

### 3.1 DRAWINGS

Sales Drawings are available from the Molex service network. See the appropriate Sales Drawings for information on dimensions, materials, plating and markings, recommended module outlines and footprint specifications.

In the event of discrepancies between the information contained in the Sales Drawings and this document or any other technical documentation supplied, the Sales Drawings shall take precedence.

### 3.2 SPECIFICATIONS

Product specifications provide detailed information on the product performance requirements and testing methodology. All test data collected will be used to compile test reports for evaluation purposes. Copies of these specifications are available upon request from a local Molex representative.

## 4.0 PROCEDURE

### 4.1 GENERAL REQUIREMENTS

#### 4.1.1 PACKAGING FOR INCOMING CONNECTOR

The DDR4 Mini DIMM connectors shall be packed in trays. The stack of trays shall be taped at two ends. For further information on the packaging condition, please refer to the respective packaging specification as outlined in the sales drawings.

#### 4.1.2 CONNECTOR MATERIAL

The housing is made from high temperature thermoplastic. The contacts are made from copper alloy with gold-over-nickel plating on its contact area and tin-over-nickel on its solder tails. Fork-lock and clips are made from copper alloy and the latches are made from high temperature thermoplastic.

#### 4.1.3 FLOOR LIFE

The DDR4 Mini DIMM connector does not make use of any moisture-sensitive component. However, it is recommended to use the components as soon as the original package is opened. Any unused quantity should be re-packed for future use.

#### 4.1.4 PCB LAYOUT

The connector should be placed on a copper-defined pad which can be either coated with an organic protective coating (OSP) or with tin plating. The dimensions of the pad size can be found from the connector's sales drawing.

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Vias should not be placed in pads. A solder dam should be created using solder mask when a land goes to a via which is close to the pad. This will avoid wicking of the solder from the pad into the via.

#### 4.1.5 SOLDER PASTE REQUIREMENTS

A Lead-free solder paste should be used. For ease of use, a “No-Clean” paste is recommended but the connector is also capable of being used with a Water-Soluble (WS) solder paste.

#### 4.1.6 SOLDER PASTE DEPOSITION

The aperture of the stencil is dependent on the circuit pad size and stencil thickness. Aperture size using a stencil thickness of 0.125mm should be 100% of the pad size for all solder- tail pads. For the clip pad apertures, a cross-hatch pattern may be used if paste utilization is a concern. This has the effect of reducing the amount of paste to 50 to 65% of the area of the pad.

Where a different thickness of stencil is used it is advisable to vary the aperture sizes to maintain the correct amount of paste deposition to give good joints. It is not recommended to use a stencil thickness less than 0.125mm.

#### 4.1.7 PLACEMENT

The connector will be supplied in trays. The connector should only be handled by the housing to prevent any unintentional damage to the solder tails below the housing.

For ease of pick-up, the connector may have a removable pick-and-place cap fitted for vacuum pick-up and automated SMT machine placement. Care should be taken when removing this cap after placement to prevent any damage to the component housing.

In order to determine the correct nozzle selection, it is recommended that the customers consult their pick-and-place equipment suppliers to customize specific parameters to match their desired nozzle size for maximum ease of placement.

Connectors should be placed with enough pressure to ensure that the leads touch down on the copper pads. Prior to this operation, ensure that the pegs on either side of the connector are positioned within their respective peg-holes.

#### 4.1.8 SOLDER REFLOW

The PCB containing the connector should be reflowed using a reflow profile which is in compliance with the manufacturers’ data sheet for the paste used or as per product specification for the series. For Molex-recommended reflow profile, please refer to the respective product specification.

It is recommended that the soak time be long enough to allow temperature to stabilize over the whole area under the connector and the time above liquidus be long enough for total reflow.

This component is suitable for processing through the temperatures used in lead free processes but should not be subjected to temperatures in excess of 260°C.

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<small>TEMPLATE FILENAME: APPLICATION_SPEC(SIZE_A4)(V.2).DOC</small>			

It is recommended that the connector be clamped with a jig or held down with a weight during reflow to prevent any open solder and ensure a good joint.

Before putting the connectors into the reflow process, it is a good practice to ensure the latches are fully closed as shown in Figure 5.

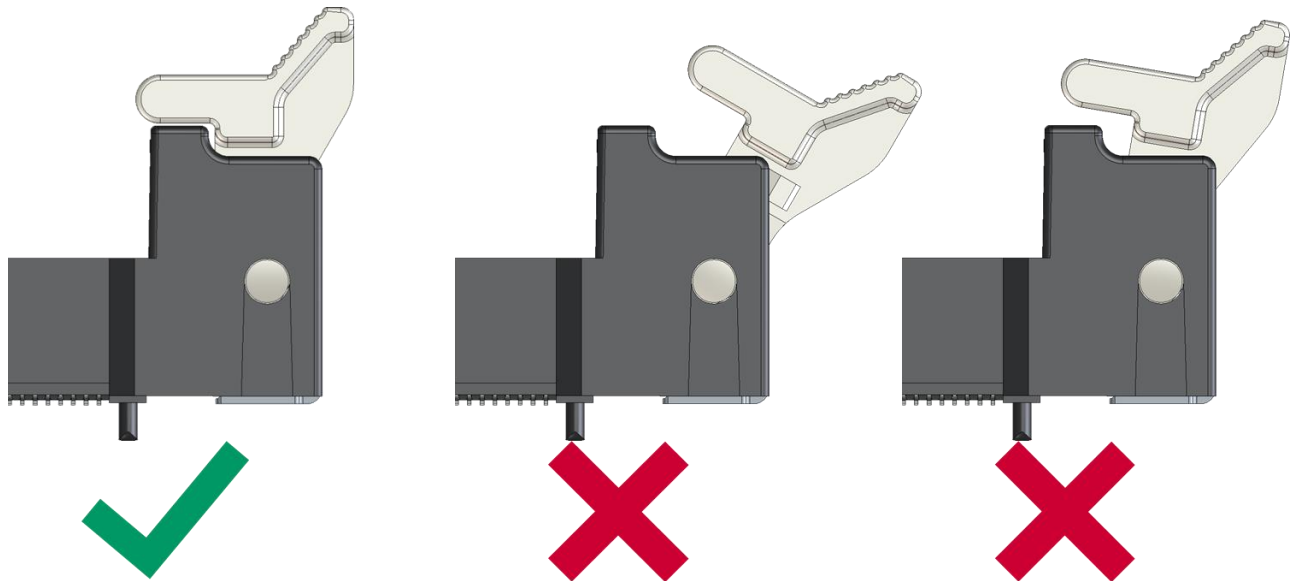


Figure 5: Ensure Latch is in "Close" Position

**4.1.9 TWO-PASS REFLOW**

Under normal conditions, this part is suitable for double-sided reflow applications.

**4.1.10 DISCOLORATION OF NATURAL-COLORED LATCHES**

The connectors may be using natural-colored components, e.g. the latches. The components may discolor or become yellowish. If discoloration is an appearance defect, it is recommended to purge with Nitrogen during the reflow process to minimize the discoloration.

**4.2 ASSEMBLY INSTRUCTIONS**

**4.2.1 POST-APPLICATION INSPECTION**

The connector may be examined visually for damage and cleanliness. The solder joints can be inspected both visually and by using X-ray equipment.

The final testing would probably be using electrical test equipment for both in-circuit and application testing. However, care should be taken such that the design of this equipment does not cause damage to the housing or the terminals.

**4.3 REMOVAL INSTRUCTIONS**

**4.3.1 REWORK AND REPAIR**

A hot-air rework station may be used to remove the connector from the board. Many of these stations are readily available and the choice of manufacturer is left to the discretion of the user. It is very important to use the correct nozzle in this operation to facilitate the rework process.

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Depending on the card thickness and stack-up, in some circumstances, it may be desirable to pre-heat in an oven at 100°C gradually and hold for 30 to 60 minutes to avoid thermal damage to the PCB. It is recommended to shield adjacent components, the component body and solder joints in particular, during the rework process to avoid overheating and melting of the joints.

### 4.3.2 CONNECTOR REMOVAL

Before commencing the repair, a rework clip which is similar to the original removable pick-up cap should be fitted to the connector. This allows vacuum pick-up once reflow has been achieved.

Soak time and temperature is dependent on the type of solder used and should conform to the solder paste manufacturer's guidelines.

Once full reflow has been achieved, the connector should be removed using the vacuum pick-up. This connector should now be discarded as it cannot be reused.

### 4.3.3 CONNECTOR REPLACEMENT

Before replacing with a new connector, the residual solder on the pads should be removed either using a vacuum scavenging system or by hand by a skilled operator. It is recommended that the pads be pasted again using a 0.125mm (5 mil) stencil.

Once the connector has been placed on the PCB, it should be reflowed. The rework clip should now be removed and the assembly inspected and retested as applicable.

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## 4.4 MODULE CARD MATING AND UNMATING INSTRUCTIONS

### 4.4.1 MODULE CARD MATING

The module card should be mated to the connector according to the following sequences (graphically represented in Figure 6):

- A. The latches of the connector must be fully opened.
- B. The keying feature of the module card must be aligned with the voltage key of the connector.
- C. The sides of the module card must slide along the module insertion preliminary guides and into the module slot. The latches are designed in such a way that upon correct insertion of the module card, they will rotate inwards to snap into the grooves located on the module card to secure it in place.
- D. Ensure that the module card is perpendicularly aligned to the connector before insertion as any misalignment may cause potential damage to the housing or contacts.
- E. The module card must be fully seated and the latches should be in “close” position.

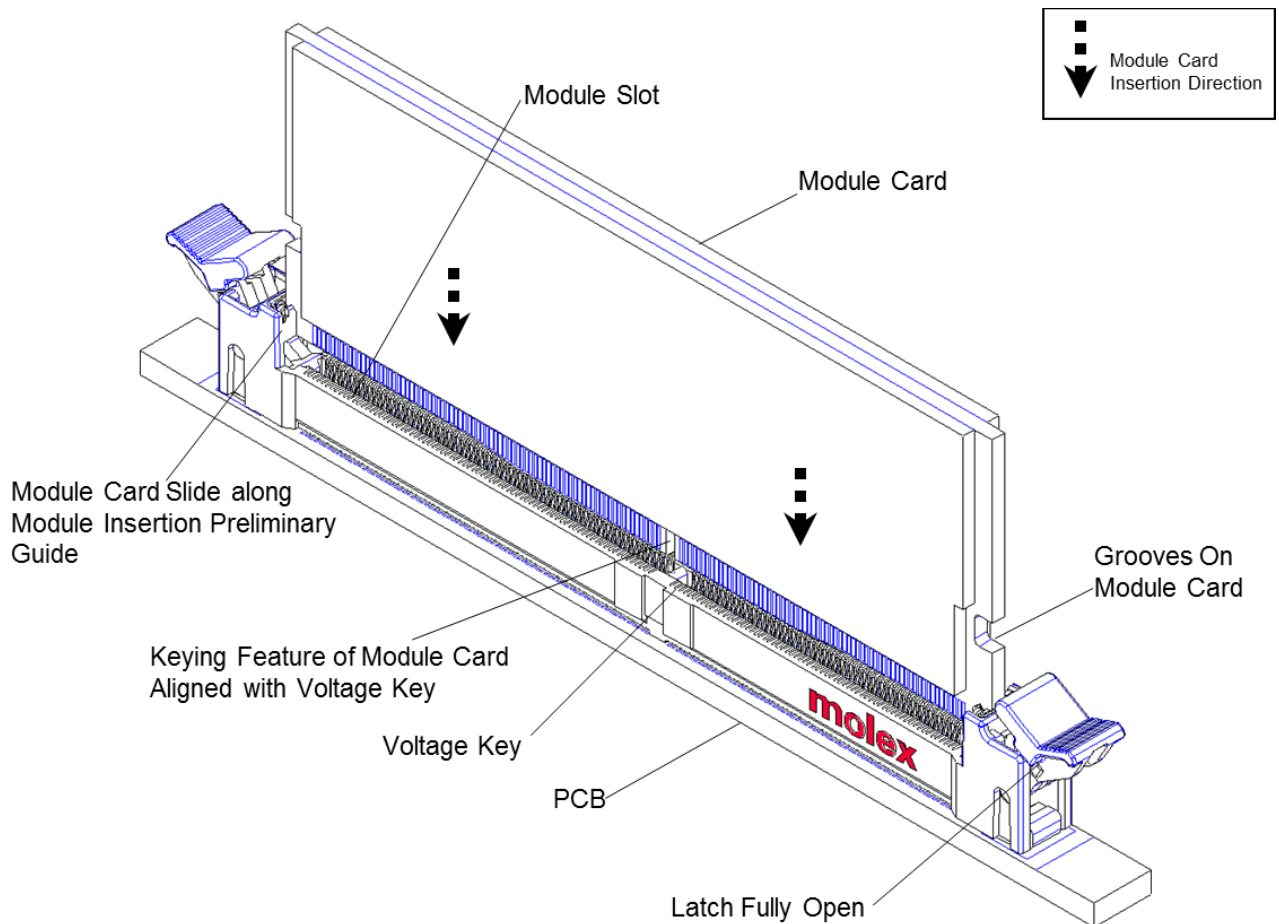


Figure 6: Graphical Representation of Proper Mating Layout

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## 4.4.2 MODULE CARD UNMATING

The module card should be unmated from the connector according to the following sequences (graphically represented in Figure 7):

- A. Both latches of the connector must be rotated away from the module card simultaneously. As the latches rotate, the module card will be ejected out from its seated slot. Upon opening the latches to their maximum position, the module card should be fully disengaged from the connector.
- B. The module card will be guided by the module insertion preliminary guides and slide out of the latch tower.

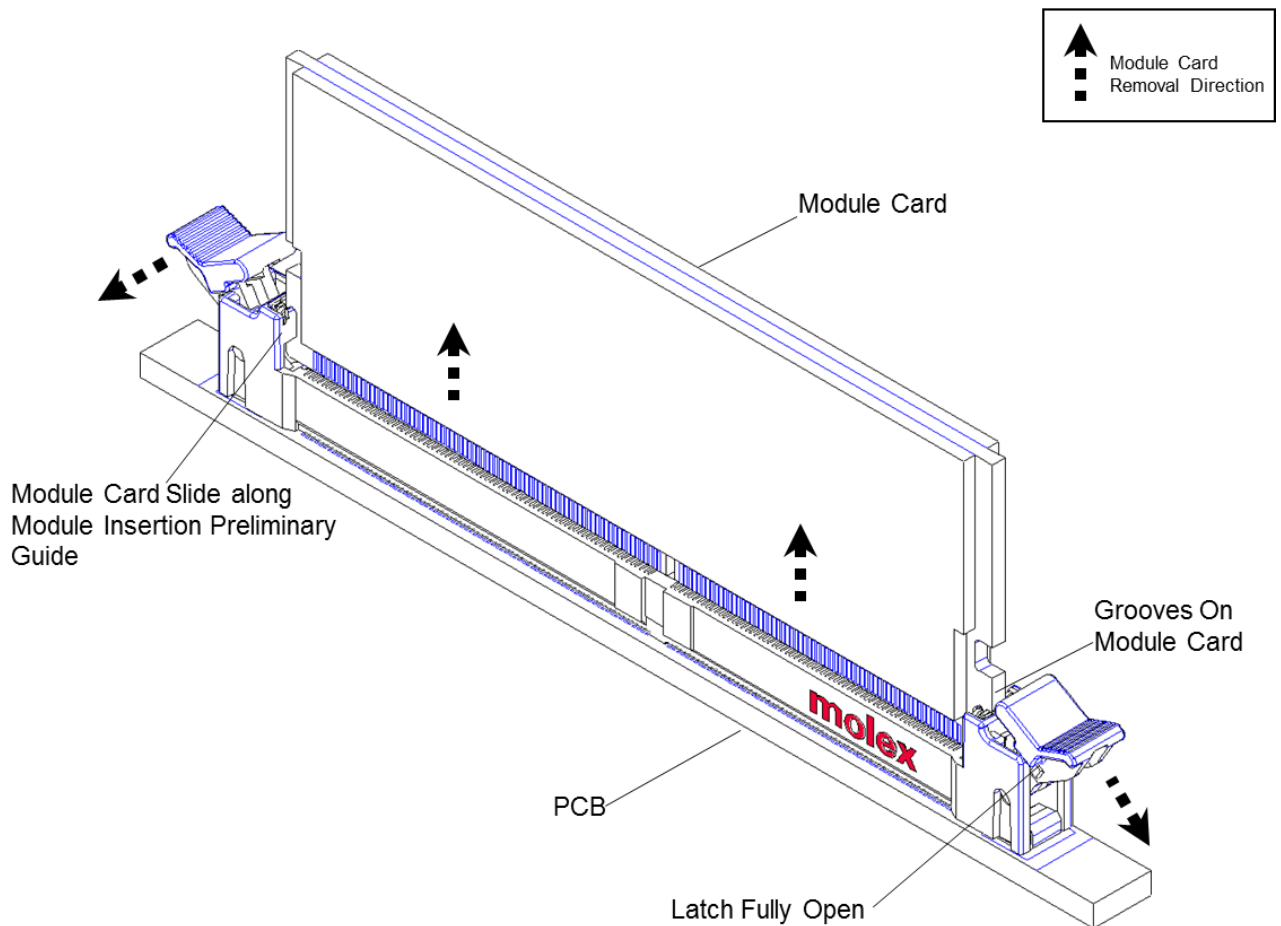


Figure 7: Graphical Representation of Proper Unmating Layout

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## 5.0 VISUAL INSPECTION

The following Figure 8 illustrates the correct application of a DDR4 Mini DIMM Vertical SMT 288ckts connector with the PCB and module card. Several key points listed below serve as a guide to ensure correct application of this connector.

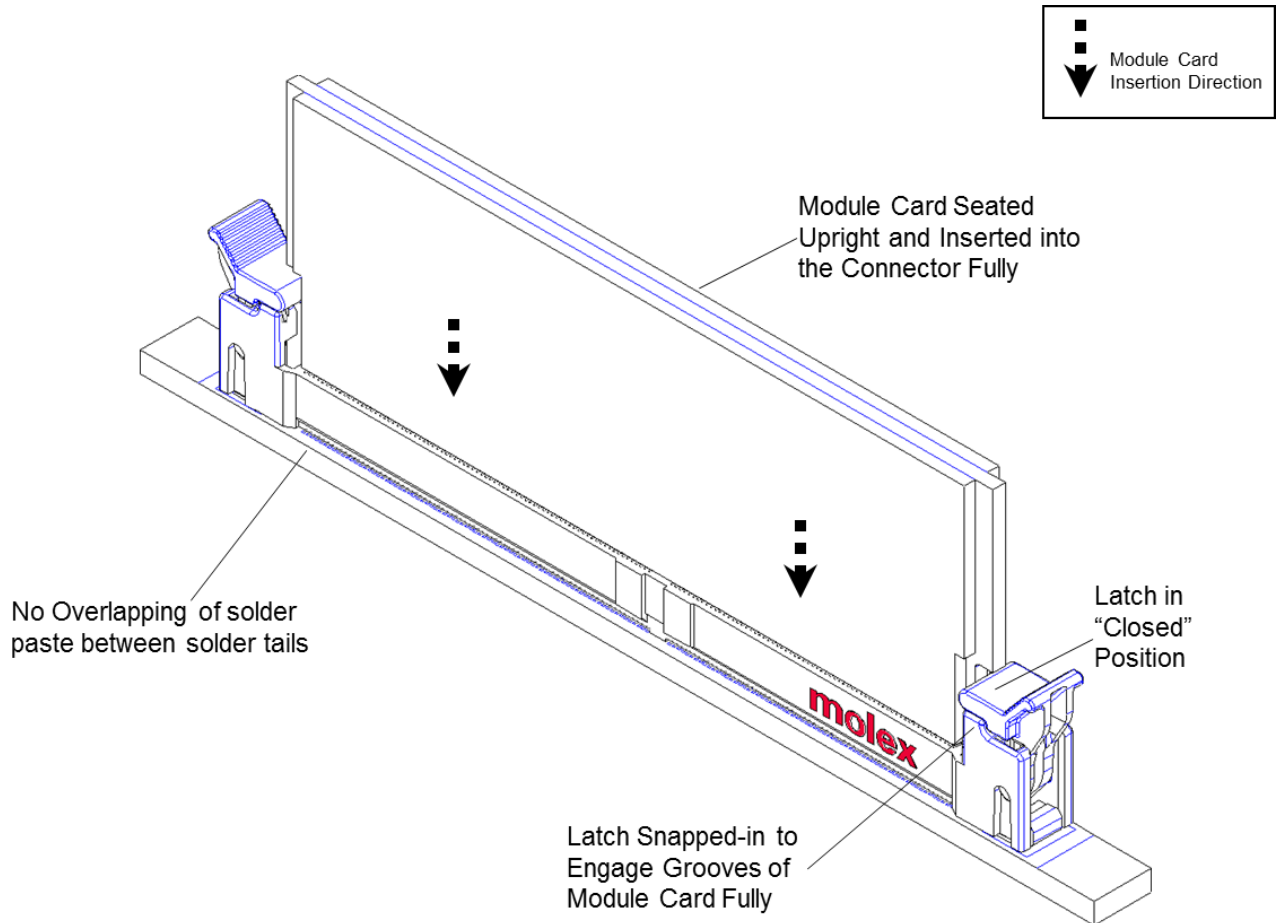


Figure 8: Correct Application of the DDR4 Mini DIMM Vertical SMT Connector, PCB and Module Card Assembly

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