APPLICATION GUIDELINE

1.0 SCOPE

2.0 PRODUCT DESCRIPTIONS
   2.1 PRODUCT DESCRIPTIONS AND PART NUMBERS

3.0 REFERENCE DOCUMENTS
   3.1 DRAWINGS
   3.2 SPECIFICATIONS

4.0 PROCEDURE
   4.1 GENERAL REQUIREMENTS
      4.1.1 PACKAGING FOR INCOMING CONNECTOR
      4.1.2 CONNECTOR MATERIAL
      4.1.3 FLOOR LIFE
      4.1.4 PCB LAYOUT
      4.1.5 SOLDER PASTE REQUIREMENTS
      4.1.6 SOLDER PASTE DEPOSITION
      4.1.7 PLACEMENT
      4.1.8 SOLDER REFLOW
      4.1.9 TWO PASS REFLOW
      4.1.10 CLEANING

   4.2 ASSEMBLY INSTRUCTIONS
      4.2.1 POST APPLICATION INSPECTION

   4.3 REWORK AND REPAIR INSTRUCTIONS

   4.4 MODULE CARD MATING AND UNMATING INSTRUCTIONS
      4.4.1 MODULE CARD MATING
      4.4.2 MODULE CARD UNMATING

5.0 VISUAL INSPECTION

THIS APPLICATION GUIDELINE IS STRICTLY FOR CUSTOMER'S REFERENCE ONLY WHICH MOLEX BELIEVES MAY PROVIDE USEFUL GENERAL PROCESSING GUIDELINES.
1.0 SCOPE

This specification covers the processing guidelines and the requirements for the application of DDR3 Dual In-Line Memory Module (DIMM) 240ckts connector with SMT solder tail design. All dimensional values shown are in metric units. Any figures and illustrations found in this document are for graphical representation only and are not drawn to scale.

The connectors are available in 240 pins types with contact spacing on 1.00 mm pitch centerline. These connectors are designed to connect memory module cards of 1.27 mm thickness (Daughter Card) to 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 Figure 1.
2.0 PRODUCT DESCRIPTIONS

2.1 PRODUCT DESCRIPTIONS AND PART NUMBERS

<table>
<thead>
<tr>
<th>SERIES NUMBER</th>
<th>DESCRIPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>78156</td>
<td>DDR3 DIMM, 1.00MM PITCH 240CKT VERTICAL SMT</td>
</tr>
</tbody>
</table>

The above series numbers are shown for reference only. This application specification applies to all products with part numbers that fall under the families of 78156.

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 any discrepancies between the information contained in the Sales Drawings and this specification or with any other technical documentation supplied, the Sales Drawings should 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

As the DDR3 DIMM 240ckts SMT Connectors contain certain moisture sensitive components, they will be sealed in 0.1mm thick plastic bags made from HDPE with desiccant material enclosed. A label indicated “moisture sensitive” will be affixed to the immediate package near the Product Package Label to indicate the presence of moisture.

4.1.2 CONNECTOR MATERIAL

The housing is made from liquid crystal polymer. The contacts are made from copper alloy with gold over nickel plating on its contact area and tin over nickel on its SMT solder tails. Forklocks are made from copper alloy and the latches are made from high temperature Nylon.

4.1.3 FLOOR LIFE

The recommended floor life of connectors is 24 hours at an ambient temperature of 30°C and a humidity level of 60% RH. For exposures at 35°C and more than 70% RH, floor life of 12 hours is preferred. It is advantageous to use the components within 24 hours from opening the sealed original package. Unused quantity should be vacuum sealed prior to storage for future use.

4.1.4 PCB LAYOUT

The connector can either be placed on a copper defined or solder mask defined pad of 2.10 x 0.70 mm and can be either coated with an organic protective coating or HASL.

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

Lead-free solder paste should be used. Rosin, mildly active (RMA) flux can be incorporated in the paste. For ease of use, a no-clean paste is recommended but the connector is capable of being used with either Water Soluble (WS) or Rosin based pastes.

4.1.6 SOLDER PASTE DEPOSITION

The aperture of the stencil is dependant on the circuit pad size and stencil thickness. The stencil thickness should not be less than 0.1 mm, with a preferred thickness of 0.15mm. The stencil aperture size of at least 90% of pad size should be used. When a thinner stencil is used, the apertures may have to be enlarged slightly to facilitate sufficient paste, in order to ensure a good joint.

4.1.7 PLACEMENT

The connector will be supplied in plastic trays. The connector should be only handled by the housing to prevent any unintentional damage to the protruding solder tails. Connectors should be placed with enough pressure to overcome the forklock insertion force into PCB so that the solder tails touch down on the copper pads. Where the placement machine is not capable of having the pressure set, a negative placement height can be selected or manual insertion can be used. In every case, care should be taken to ensure the forklocks are completely engaged and the leads pushed down onto the copper pads.

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 PS-78156-001.

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

Before putting the connectors into the reflow process, it is a good practice to ensure the latches are fully closed as shown below in Figure 2.

![Figure 2: Latch in Closed Position](image)

4.1.9 TWO PASS REFLOW

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

4.1.10 CLEANING

The connectors may be cleaned using a suitable cleaning agent to remove any residue or contaminants but care should be taken to ensure that it is completely dry before electrical testing.

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 REWORK AND REPAIR INSTRUCTIONS

It is recommended that a commercially available hot air rework station be used for the repair of this product. Many of these repair stations are readily available and the selected manufacturer is based on a matter of choice. It is very important that the correct nozzle be used for this operation.

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

For removal process, this connector should be removed manually. To avoid additional heat cycle, excessive solder should be removed from the site immediately after the connector is lifted off, while the board is still hot. A hand held, solder vacuum tool or solder wicking braid can be used. Both methods should be performed by qualified operators only. This is because damage to the board or pads is the greatest concern. After the removal, this connector should now be discarded as it cannot be reused.

Before replacing with a new connector, the residual solder on the pads should be removed using either a vacuum scavenging system or by hand from a skilled operator. Then the solder pads should be cleaned with alcohol and brush to ensure a clean surface. It is recommended that the pads be pasted again using a 0.15mm stencil. Once the new connector has been placed on the PCB, it should be reflowed.
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 sequence:

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 connectors 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 closed positions.

4.4.2  MODULE CARD UNMATING

Figure 3: Graphical Representation of Proper Mating Layout
The module card should be unmated from the connector according to the following sequence:

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 its 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.

5.0 VISUAL INSPECTION

The following figure illustrates the correct application of a DDR3 DIMM 240ckts SMT connector with the PCB and module card. Several key points listed below as a guide to ensure correct application of this connector.

Figure 4: Correct Application of the DDR3 DIMM 240ckts SMT Connector, PCB and Module Card Assembly