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## The ultimate high-density memory interconnect for multi-processor server chipsets, Aerodynamic DDR3 DIMM sockets maximize air flow as well as space and cost savings, with low power consumption

Technology trends driving the use of multi-core processors for higher instruction and data bandwidth using Intel's QuickPath† architecture (particularly in high-density memory server applications) have brought about design challenges in implementing DDR3 DIMM interconnect interfaces on server chipsets.

These challenges range from the appropriate choice of the interconnect, its contact resistance and termination style, thermal and airflow characteristics, power consumption and delivery, its implementation at board level given space constraints that affect trace routings, down to the ease of using the socket.

Aerodynamic DDR3 DIMM sockets surpass these challenges and satisfy high-density memory interconnect interface requirements for mega-memory, multi-processor server platforms.

Aerodynamic DDR3 DIMM sockets feature very streamlined housing and latch designs to eliminate trapping of hot air around memory modules during operation. Ergonomically designed latches enable quick actuation and easy removal of high-density memory modules.

The sockets' low (2.40mm) seating plane optimizes vertical space for more flexible module design heights. Press-fit sockets feature smaller Eye-Of-Needle compliant pins than standard press-fit terminals to increase trace routing density between via holes on the PCB as well as to save valuable PCB real estate.

The low-level contact resistance of these sockets supports the use of Registered DIMM (RDIMM) modules for lower power consumption in blade servers.

All Low-Profile (LP) and Very-Low-Profile (VLP) SMT and Press-fit sockets are RoHS-compliant. SMT versions are lead-free.

For more information, visit our website at: www.molex.com/link/ddr3.html

## Aerodynamic DDR3 DIMM Sockets, Low Seating Plane (LSP), Low Level Contact Resistance (LLCR), Lead-free, 1.00mm Pitch, 240 circuits

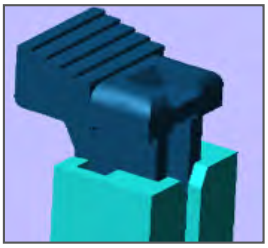
**78315** Very Low Profile, Press-fit *(Connector Height: 14.26mm)*

**78556** Low Profile, Press-fit *(Connector Height: 22.03mm)*

**78565** Low Profile, SMT, Halogen-free *(Connector Height: 21.34mm)*

**78603** Very Low Profile, SMT, Halogen-free *(Connector Height: 14.20mm)*

Aerodynamic DDR3 DIMM Sockets provide better airflow around memory modules during operation



Standard latch design

Ergonomically designed latch

**Streamlined housing and latch designs**

† QuickPath Interconnect is a high-speed, packetized, point-to-point interconnect used in Intel's next generation of microprocessors. QuickPath Interconnect and QPI are trademarks or registered trademarks of Intel Corporation.

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# Aerodynamic DDR3 DIMM Sockets, Low Seating Plane (LSP), Low Level Contact Resistance (LLCR), Lead-free, 1.00mm Pitch, 240 circuits

## Features and Benefits

| | |
|---|---|
| Aerodynamically designed socket housing and latches | Minimize trapping of hot air around high-density memory modules during operation |
| Low-level contact resistance (LLCR) of 10milliohms (maximum initial) | Supports the use of Registered DIMM (RDIMM) modules and reduces power consumption in blade servers |
| Reduced Eye-Of-Needle (EON) compliant-pin terminals | Free up valuable PCB real estate for higher-density trace routing on PCBs |
| Lower Seating Plane (LSP) of 2.40mm versus standard 3.30mm designs | Allows more vertical space for use of high-density DIMMs while maintaining the same design height;<br>Enables the use of very low-profile modules with seating heights below 2.80mm (maximum) in ATCA* blade systems |
| Ergonomically designed socket latches | For easier actuation and removal of memory module |
| Circuit number indicators on the socket interface with voltage key | Ensure correct module orientation and positioning |

## Specifications

**Reference Information**
Key Position: Center 1.5V
Packaging:
  Soft tray (78565-0001);
  Tray (others)
UL File No.: TBA
CSA File No.: TBA
Mates With:
  SO-014 modules (78565, 78603)
  SO-012 modules (78315, 78556)
Designed In: mm
RoHS: Yes
Halogen Free:
  Yes (SMT); No (Press-fit)
Glow Wire Compliant: No

**Electrical**
Voltage (max.):
  30V AC (RMS)/DC (78315, 78556)
  29V AC (RMS)/DC (78565, 78603)
Current (max.): 1.0A per pin
Low Level Contact Resistance:
  10 milliohms (max.) initial
Dielectric Withstanding Voltage:
  500V AC (1 minute)
Insulation Resistance: 1 megaohm

**Mechanical**
Module Insertion Force
  (with latches): 10.8 kgf max.
Terminal Retention Force (min.):
  Contact: 0.25kgf
  Fork lock: 1.36kgf (78565, 78603)
Durability: 25 cycles

**Physical**
Housing:
  Polyamide (PA), glass-filled, UL94-V0 (78315, 78556)
  LCP, glass-filled, UL94-V0 (78565, 78603)
Latches:
  Polyamide (PA), glass-filled, UL94-V0 (78315, 78556)
  Nylon, glass-filled, UL94-V0 (78565, 78603)
Terminal: Copper Alloy
Plating:
  Contact Area — 0.76µm (30µ'') Gold (Au)
  Solder Tail Area — 0.38 to1.52µm (15 to 60µ'') Matte Tin (Sn) for Series 78315, 78556
  2.54µm (100µ'') pure Matte Tin (Sn) for Series 78565, 78603
  Underplating — 1.27µm (50µ'') Nickel (Ni)
Recommended PCB Thickness:
Operating Temperature:
  -55 to +85°C

* The Advanced Telecom Computing Architecture (AdvancedTCA or ATCA) specifications, denoted PICMG † 3.X , are a series of PICMG specifications, targeted to requirements for the next generation of 'carrier grade' communications equipment. This series of specifications incorporates the latest trends in high-speed interconnect technologies, next-generation processors and improved reliability, manageability and serviceability.

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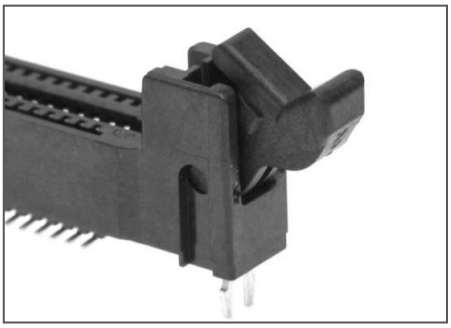
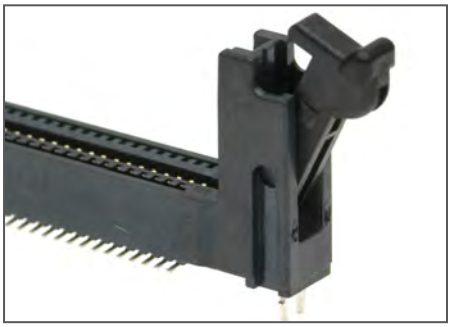
# Aerodynamic DDR3 DIMM Sockets, Low Seating Plane (LSP), Low Level Contact Resistance (LLCR), Lead-free, 1.00mm Pitch, 240 circuits

## Product Configuration

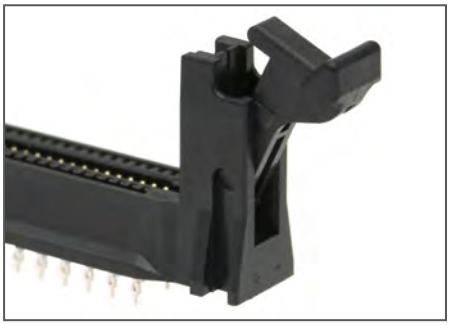
Very Low Profile, Press-fit DDR3 DIMM Socket (Series 78315)



Very Low Profile, SMT DDR3 DIMM Socket (Series 78603)



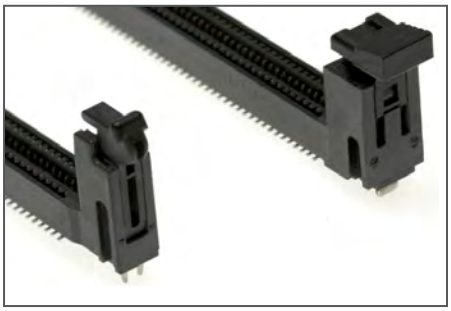
Low Profile, SMT DDR3 DIMM Socket (Series 78565)



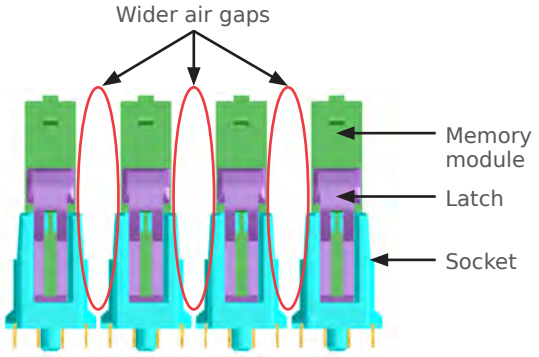
Low Profile, Press-fit DDR3 DIMM Socket (Series 78556) [Remark: This socket has a broad connector base to give it added stability when mounted]

## Product Features

- Unlike conventional (standard) sockets, the Aerodynamic DDR3 DIMM sockets come with a sleek housing and latch design to enhance airflow around operating memory modules

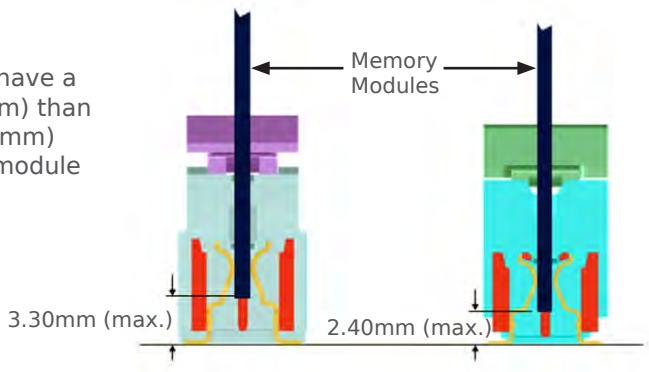


**Housing and latch design differences between an Aerodynamic and Standard SMT DDR3 DIMM socket (Picture on extreme left shows the Series 78556 Aerodynamic DDR3 DIMM connector)**




**Aerodynamic housing with its slim tower design allows more airflow between each memory module during operation**

- Aerodynamic DDR3 DIMMs have a lower seating plane (2.40mm) than the standard versions (3.30mm) for greater optimization of module height designs




**Comparison of Very Low Profile (VLP) DDR3 DIMMs' lower 2.40mm seating plane than standard DDR3 DIMM socket versions (3.30mm)**

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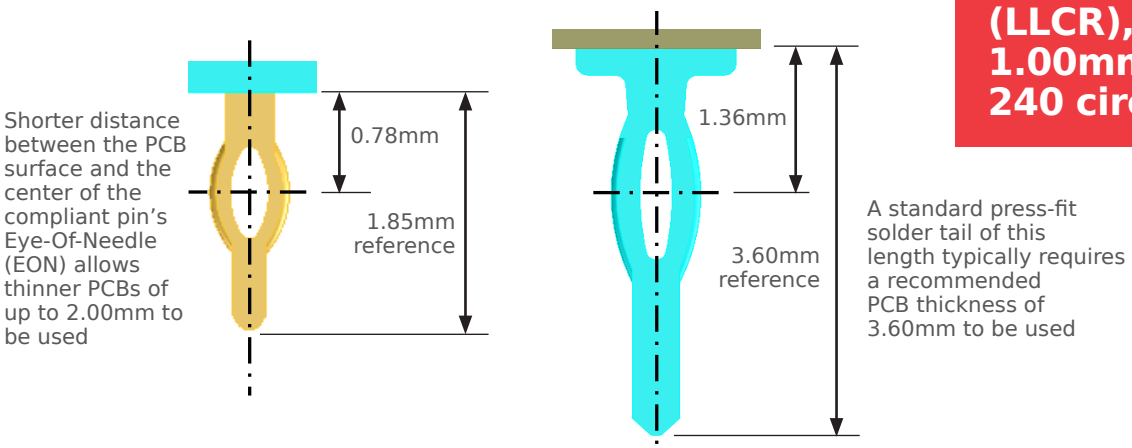
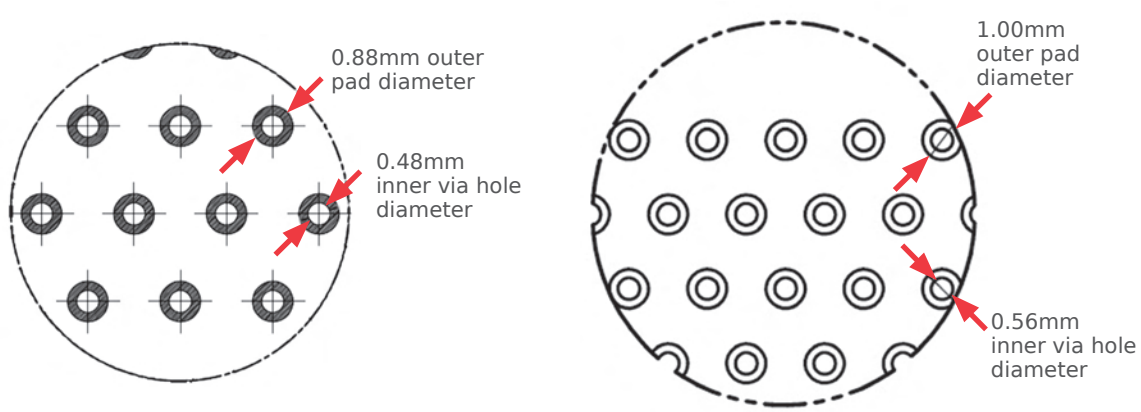
# Aerodynamic DDR3 DIMM Sockets, Low Seating Plane (LSP), Low Level Contact Resistance (LLCR), Lead-free, 1.00mm Pitch, 240 circuits

## Product Features

- Aerodynamic press-fit sockets feature smaller Eye-Of-Needle (EON) compliant pin size than standard press-fit terminals. Smaller via hole dimensions allow more traces to be routed between them

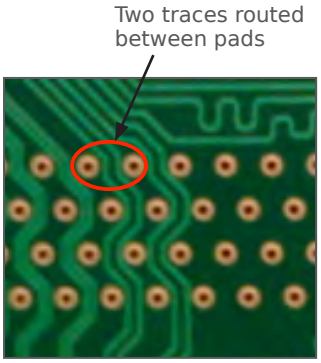



**The Aerodynamic DDR3 DIMM sockets feature smaller Eye-Of-Needle (left) than standard press-fit sizes (right)**

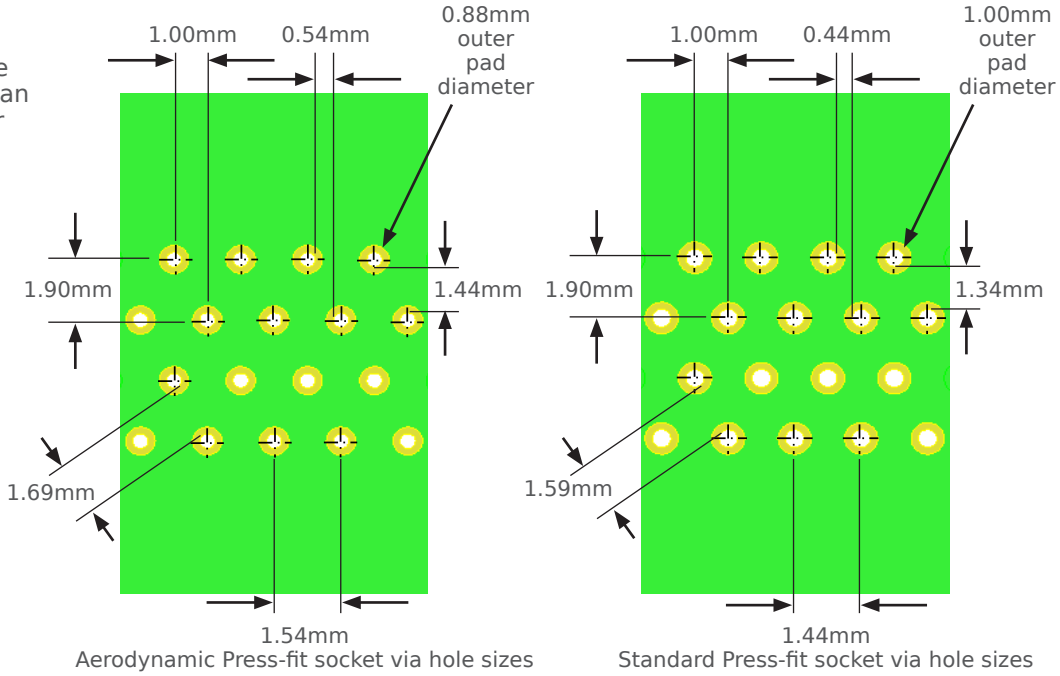



**The Aerodynamic DDR3 DIMM socket uses a smaller (0.48mm) via hole than that (0.56mm) of standard press-fit terminals**

- With a smaller compliant pin and via hole size, more valuable PCB real estate can be freed up to pack higher density traces on board




**Example of enhanced trace routing**




**Increased trace routing space between adjacent pads of the Aerodynamic compliant pin versus standard press-fit designs**

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# Aerodynamic DDR3 DIMM Sockets, Low Seating Plane (LSP), Low Level Contact Resistance (LLCR), Lead-free, 1.00mm Pitch, 240 circuits

## Applications

Data/Network/Telecom
- – Desktop PCs
- – Servers
- – Workstations
- – Routers
- – Switches
- – Storage systems
- – Base stations
- – Server farms
- – Voice gateways

Industrial
- – Programmable logic systems

Medical
- – Advanced imaging devices

Programmable logic control systems

Medical imaging devices

Servers, routers, switches, data centers and more

## Ordering Information

| Order No. | Configuration | Connector Height (mm) | Mounting Styles | Housing and Latch Colors |
|---|---|---|---|---|
| 78315-0001 | Very Low Profile | 14.26 | Press-fit | Black |
| 78315-0011 | | | | |
| 78315-0051 | | | | Blue |
| 78556-5001 | Low Profile | 22.03 | | Black |
| 78556-5051 | | | | Blue |
| 78556-5061 | | | | Natural |
| 78565-0001 | | 21.34 | SMT | Black |
| 78603-0001 | Very Low Profile | 14.20 | | |

**www.molex.com/link/ddr3.html**

Order No. 987650-8343 Printed in USA/KC/2012.12