DDR4

Product Presentation

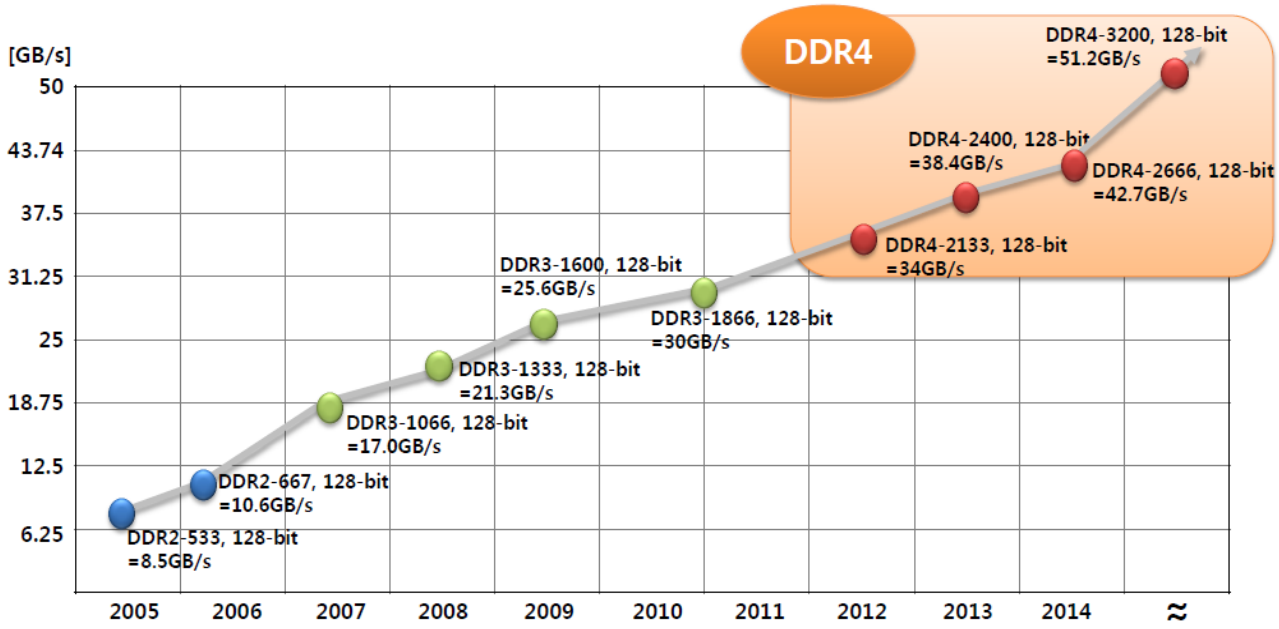
Amphenol Information Communications and Commercial Products

Storage & Server IO

Amphenol ICC

DDR4
Memory Module Sockets

- JEDEC specifications for DDR4 DIMM are progressing
- Intel plans to support DDR4 with the Grantley server platform (Haswell EP and EN processors) scheduled for 2014 release
- HIS iSuppli predicts:
  - By beginning of 2016 DDR4 will account for more than half of DRAM
  - Total DRAM module shipments is approximately 1.1billion units



DDR4
Memory Module Sockets

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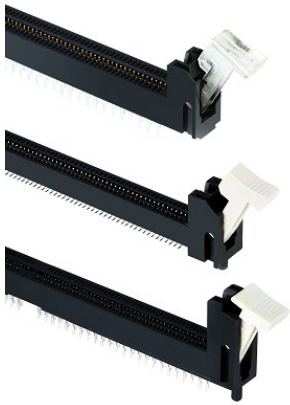
- Revised Module and Socket Outlines to increase DDR4 DIMM contact count from 284 to 288 are now released to public
  - MO-309C released Dec 2013
  - SO-016B (PTH) released Sep 2013
  - SO-017B (SMT) released Jan 2014
  - SO-019B (PF) released Jan 2014
- Proposed DDR4 Performance and Signal Integrity Specifications drafted by not finalized
  - Measured PTH on Raptor SI Test boards become available from Intel in January
  - Connector suppliers did not fully meet proposed requirements
  - Spec limits and differences needs to be addressed within JEDEC
  - Shock & Vibration test board to be specified by OEM/ODM
- JC11.14 TG Plans for Q1 2014 & Q2 2014
  - Create UDIMM/RDIMM/LRDIMM Performance Specification
  - Continue to coordinate with JC45.5 on electrical test boards, S-parameter specifications, combine electrical/mechanical test procedure to one document.
  - Measure 288 pin PF and SMT on Raptor SI Test boards
  - Continue to progress work on DDR4 SO-DIMM and mini-DIMM specifications

DDR4

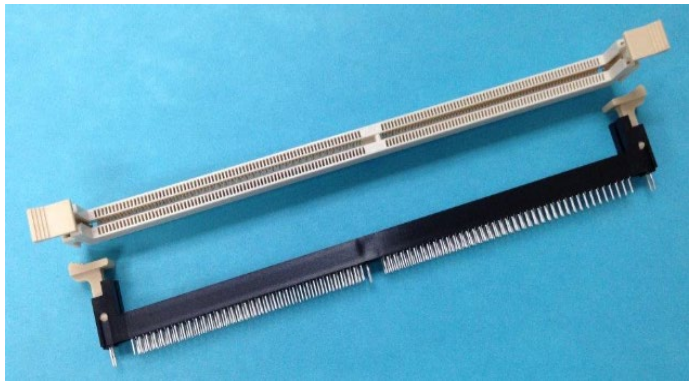
DDR4 DIMM Development Milestones

- Product documentation (available now)
  - Drawings & 3D models
  - Product specifications (GS-12-1092)
  - Signal Integrity report
- SMT, PTH and PF test results on JEDEC SI test boards (available now)
- Project Priorities & Project Timelines
  - Priority Ranking: **#1 PTH, #2 SMT, #3 PF**
  - PTH Solder
    - Samples (available now); mass production (available now)
    - Two auto line in MP for TH, full capacity can achieve 50Kpc/Day
  - SMT
    - Samples (available now); mass production (available now)
    - One auto machine for SMT, full capacity can achieve 25Kpc/Day, Ready for mass production – September, 2015
  - Press-Fit
    - Samples (available now);
    - One manual assembly line sited at Senai, Mass production – Q4,2015



DDR4
Features & Benefits

- Sockets provide mechanical voltage keying and end latches for module retention and ejection
- Low insertion-force design require less than 24 pounds force for module installation
- Available solder tail options support use on 1.6mm or 2.4mm thick motherboards
- Press-fit termination option supports use on 1.6mm (minimum) host PCBs
- Contact design protects against stubbing and supports high speed differential signaling at data rates extending to 6.4 Gb/s for DDR4
- Low contact resistance supports RDIMM modules
- Slim latch design optimizes airflow
- RoHS-Compliant and lead-free process



DDR4
Planned DDR4 DIMM Offering

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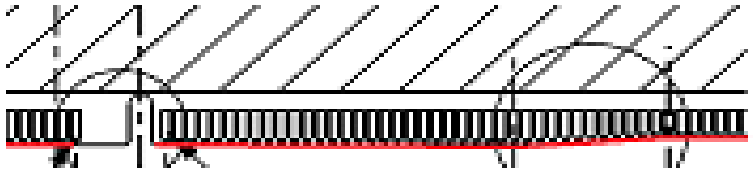
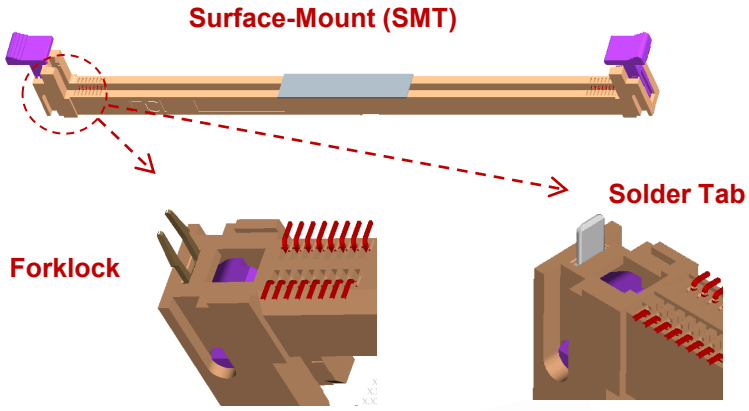
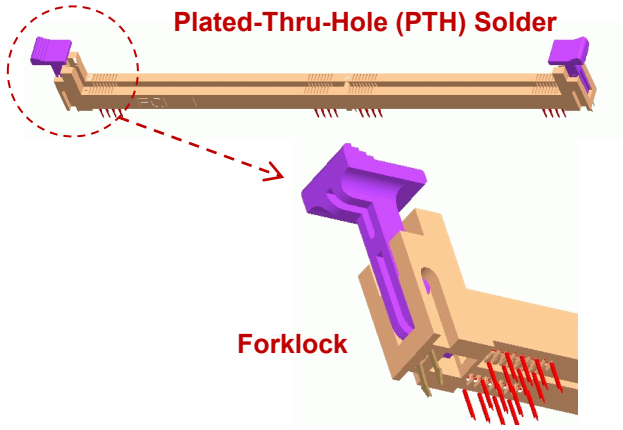
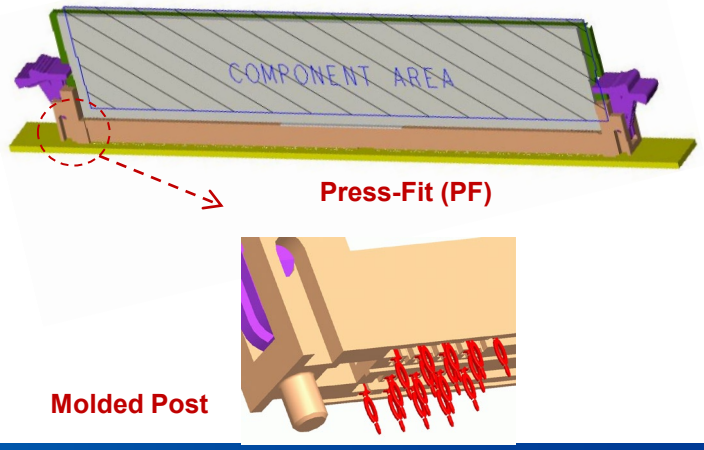
- 288 positions, 0.85mm contact pitch, 2.4mm module seating plane
  - P/N 10124677 – surface mount
  - P/N 10124632 – through-hole solder
  - P/N 10124806 – press fit
  - Accept modules per MO-309 – New card edge design for lower insertion force









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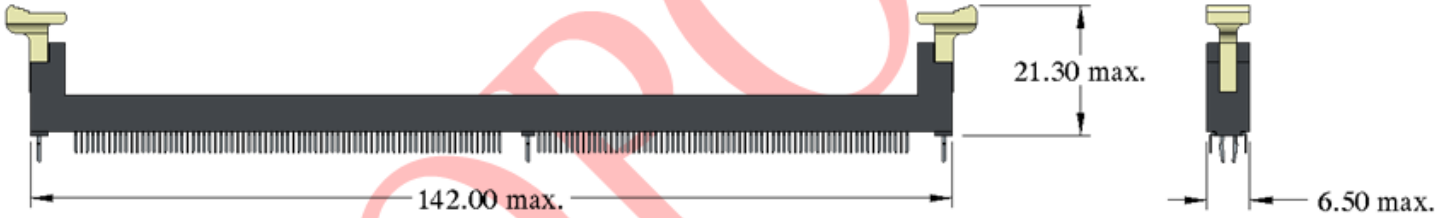


Figure 3-2 Plated Through Hole (PTH) Connector Socket Outline

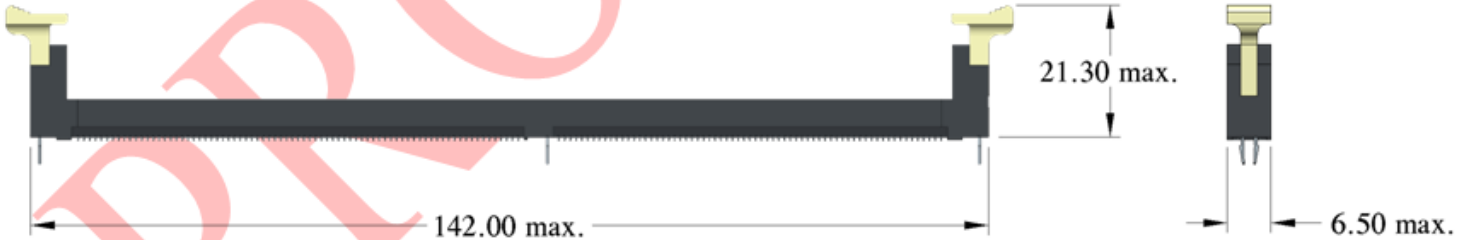


Figure 3-3 Surface Mount (SMT) Connector Socket Outline

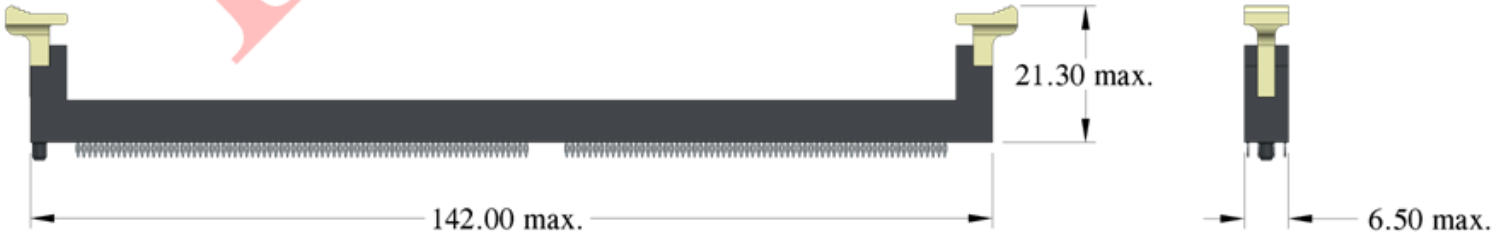
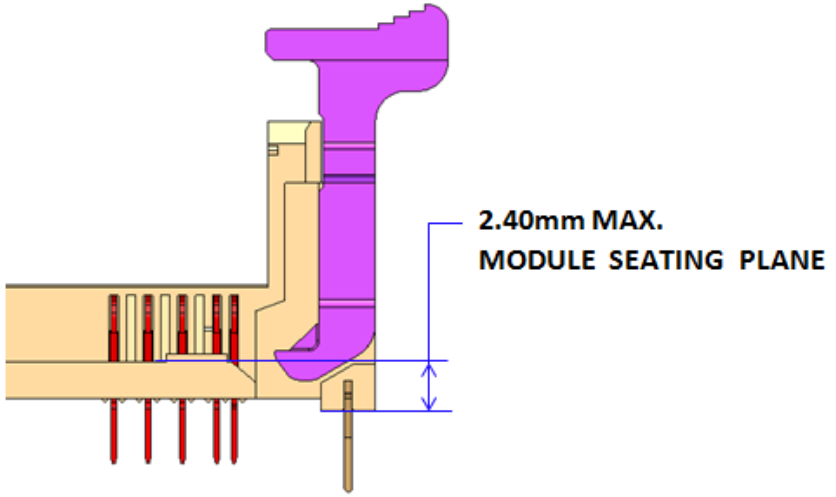


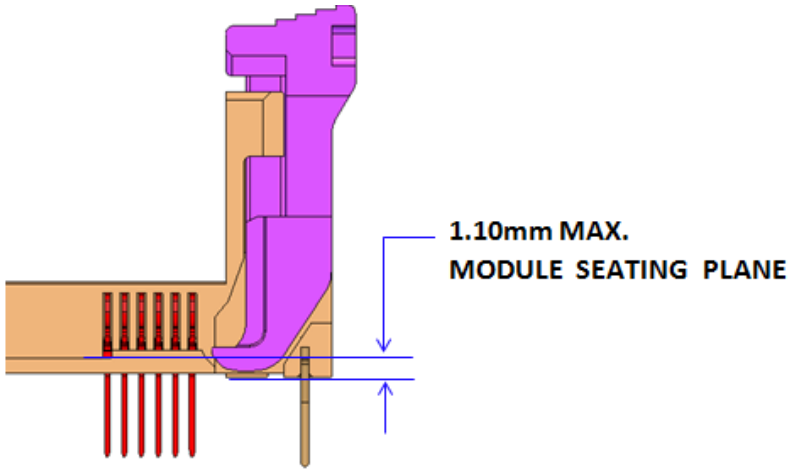
Figure 3-4 Pressfit (PF) Connector Socket Outline

DDR4

DDR4 TH Ultra Low Profile



Standard DDR4 with seating height of 2.4mm and Standard DIMM module



DDR4 ULP with seating height of 1.1mm and VLP DIMM module

- DDR4 ULP offers lower seating height and latch design. Coupled with low profile VLP DIMM module, the overall height can be reduced significantly by more than 13mm.
- Allows customer to improve on the air flow and address the needs for lower profile server design where space is a premium (1U server, micro server, space constraint industrial/communication application)

DDR4

DDR4 TH Ultra Low Profile

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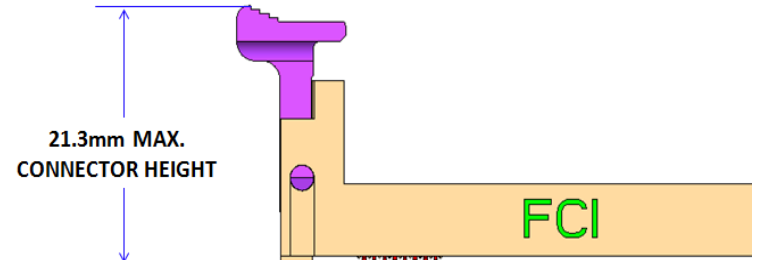
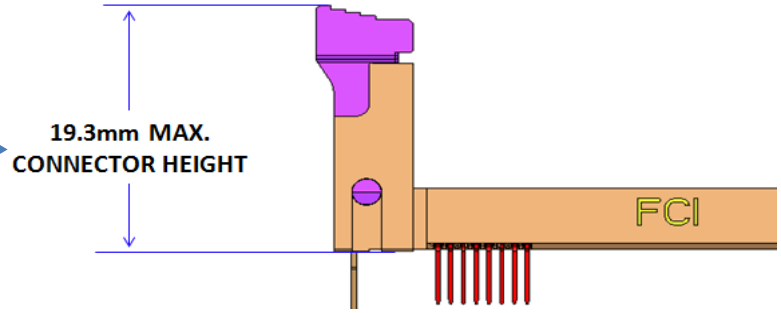
- Improving airflow while reducing the overall height profile

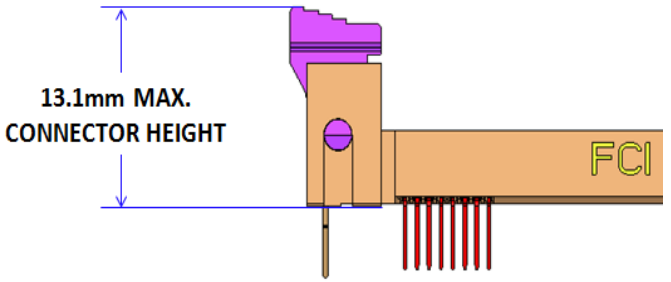
Std DDR4 TH: 21.3 CH, 2.4mm SH



DDR4 ULP TH: 19.3 CH, 1.1mm SH



DDR4 ULP TH: 13.1 CH, 1.1mm SH



*** CH = Connector Height(From PCB), SH = Seating Height**

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Thank You!