Small Form Factor Special Interest Group

Advanced modular technologies enabling compact size design.

XR-DIMM™ Rugged Memory FAQ

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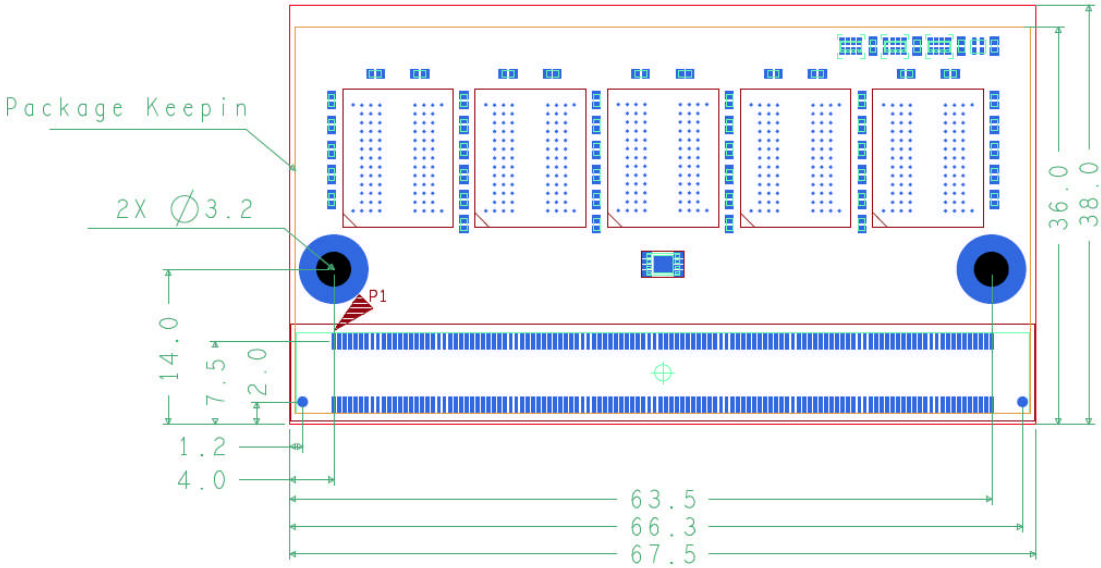
Q. What is SFF-SIG's XR-DIMM* rugged memory module?

A. The XR-DIMM (eXtreme Rugged Dual In-line Memory Module") Rugged Memory is a small form factor (38 x 67.5 mm) mezzanine DDR3 expansion memory module for use in embedded applications requiring exceptional resistance to shock and vibration as well as extended temperature operation.



The XR-DIMM pin definition closely resembles the DDR3 SO-DIMM pin definition to ease the implementation of CPU designs which may wish to utilize both expansion memory approaches for differing types of applications. The XR-DIMM pin definition also includes a SATA interface to enable the development of dual function modules containing both DDR3 memory and flash memory for a Solid State Disk (SSD) implementation.

Q. Why do we need another memory standard?

A. For years, designers of off-the-shelf embedded CPU boards (both SBCs and COMs) for use in rugged applications with significant resistance to shock and vibration have been faced with difficult design decisions for

* Formerly RS-DIMM

their main memory. Standard memory expansion interfaces such as DIMM and SODIMM memory are not designed for these rugged applications. Therefore, significant concern exists about the use of such standard memory expansion approaches.

The XR-DIMM approach provides for off-the-shelf, commercially available rugged memory expansion modules of varying capacities, allowing the CPU manufacturer to offer multiple memory size solutions to the OEM customer while maintaining a single CPU SKU. Space on the CPU board is limited to the connector and mounting hole locations. And upgrading memory capacity is as simple as swapping memory modules. Enhanced ruggedness is obtained through the use of a high performance 240-pin socket connector system and the use of standoffs with screw attachment firmly holding the CPU and memory module together. Product built to this specification will meet ANSI/VITA 47-2005 for both shock and vibration

Q. Is the XR-DIMM compatible with current JEDEC memory devices?

A. Not per se. To achieve ruggedness, a pin-and-socket connector system is used, similar to that use with various COM CPUs. However, the pin definition closely follows the SO-DIMM pin definition, albeit with more pins, so that a CPU originally designed with an SO-DIMM can be easily adapted to XR-DIMM operation.

Q. Which board form factors can XR-DIMM devices be used?

A. XR-DIMM device are suitable for any CPU having a width of 67.5mm or greater. This includes a larger number of industry-standard single board computers as well as other proprietary form factors.

Q. Will it support the legacy DDR2 devices?

A. No, and there are no current plans to retrofit XR-DIMM to DDR2 since most new designs of CPUs will be with DDR3. Our next step would most likely be using DDR4 technology.

Q. Why did you include a SATA interface?

A. Applications which incorporate an SSD, either by soldering flash to the CPU board or using one of the removable flash devices (such as SFF-SIG's MiniBlade™) use valuable board space for flash devices or device connectors. By incorporating flash on the memory module, no additional CPU board space is required for SSD support.

Q. What is included in the Specification?

A. The XR-DIMM Specification includes the board outline, location of mounting holes for positive attachment to the underlying CPU board, connector definition and placement, and pin definition.

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Q. Where can I get a copy of the Specification?

A. The Specification is available for download free of charge without registration from the Small Form Factor Special Interest Group's website. www.sff-sig.org

Q. Is there a reference design available?

A. Yes. Reference designs for unbuffered 9-chip and 18-chip DDR3 XR-DIMM devices will be made available on the SFF-SIG web site by the end of March, 2011. The designs will be available only to SFF-SIG members.

Q. Are products now available to evaluate?

A. XR-DIMM modules are available now for evaluation from Swissbit AG and will be available later this quarter from Virtium Technology. The connectors are available from Samtec (New Albany, IN).

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