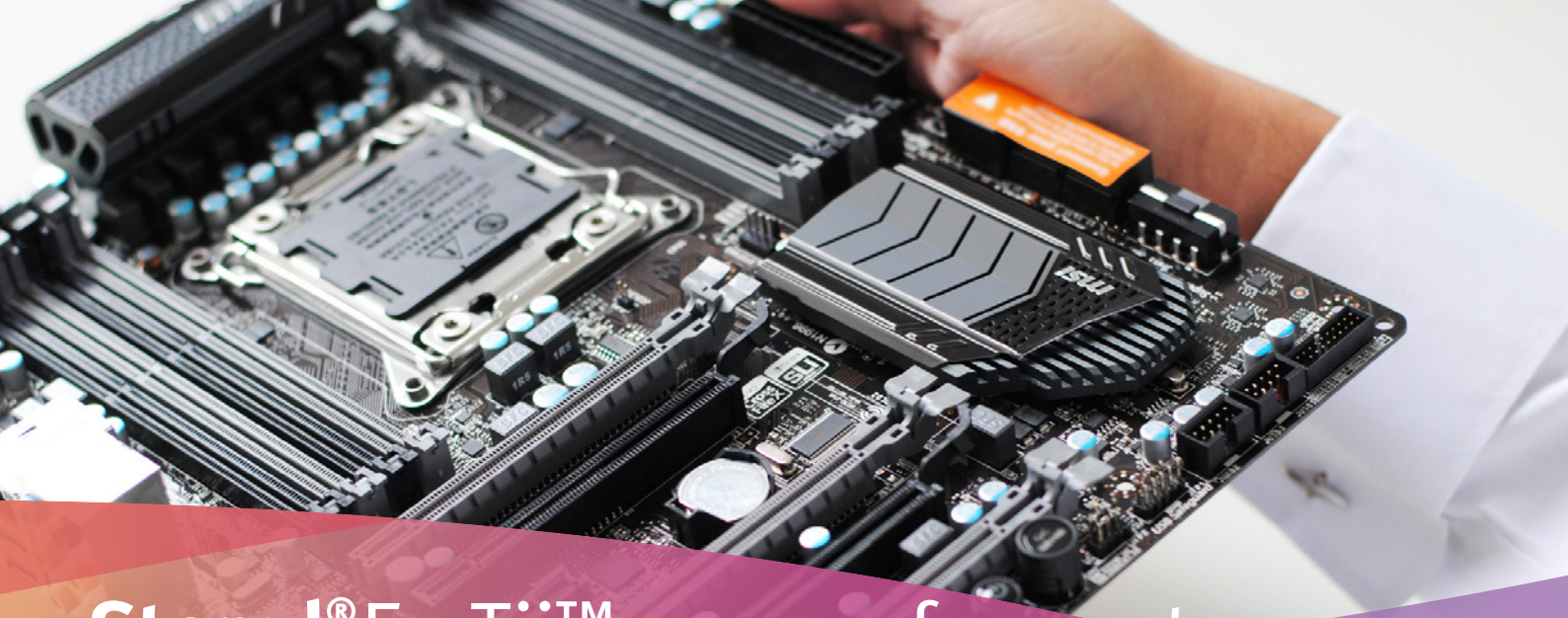


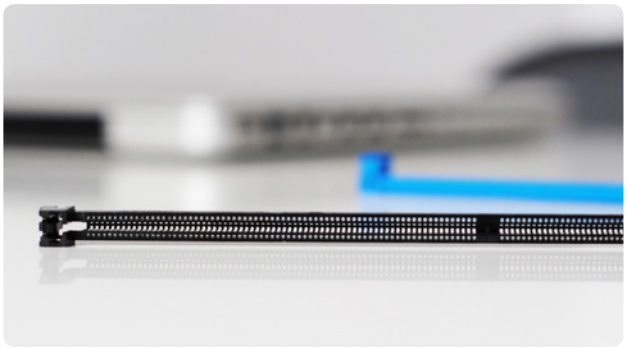
Stanyl® ForTii™ proven for next generation DDR-DIMM sockets

The performance requirements towards DDR-DIMM connectors are becoming stricter every day. Which is why the computing industry is increasingly turning to Stanyl® ForTii™ for DDR3 but also the upcoming DDR4 generations. This halogen-free material is proven to meet the stringent requirements for reflow soldering, while offering high flow (and thus design flexibility); extremely low warpage after reflow and leading mechanical strength. In the world of halogen free plastics it offers a unique blend of benefits that we believe no other material can match, outperforming all liquid crystal polymers (LCPs) and polyphthalamides (PPAs).

DDR3

The DDR3 is a well-established and mainstream interface technology for computer random access memory modules. The modules can transfer data at speeds of between 800 and 1600Mbps and operating frequencies of 400 to 800 MHz, which is twice the speed of the previous generation of modules, DDR2.

Major OEMs have started to use DDR-DIMM sockets in the latest generation of blade servers, which put a new and more challenging set of demands on components, owing to their new chassis design, thermal, power and airflow conditions. They require components with low height, for example, to compensate for the use of dual in-line memory modules incorporating a higher number of chips (high density DIMMs). Low component height and less “real estate” allow easy rework at lower temperature loads, create fewer heat traps, and provide better thermal airflow.



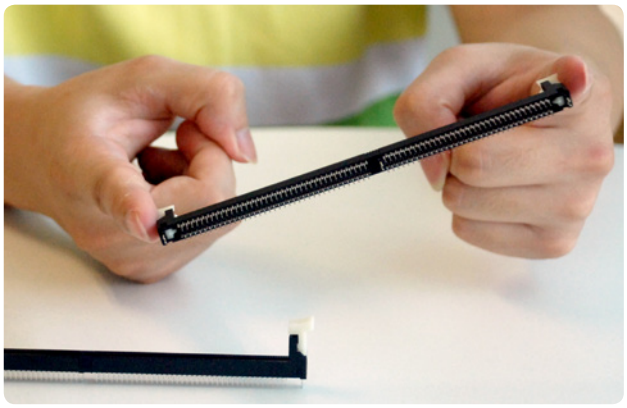
The new servers also need less PCB keep-out area, enabling higher component density due to reduced latch-actuation angles. In addition, specifiers demand plastics that are entirely free of flame retardants that are halogenated and/or contain red phosphorous. Furthermore, they want to use different colors for housings and latches, to provide DDR-DIMM socket differentiation.

Sockets made with Stanyl ForTii meet all these conditions. In addition, they are suitable for wave- and reflow soldering. The long form factor of the sockets, together with possible mismatch in coefficient of linear thermal expansion (CLTE) between FR4 (glass-reinforced epoxy laminate) PCBs and the housing material, presents a high risk of system warpage, making the challenge for any ULP (Ultra Low Profile) or VLP (Very Low Profile) socket material particularly severe. DSM's Stanyl ForTii has been selected for a new generation of ULP DDR3 sockets after tests were carried out on it alongside various liquid crystal polymers (LCPs) and polyphthalamides (PPAs).

Stanyl ForTii is part of a unique portfolio of high temperature materials with high flow. With this portfolio, combined with in-house technologies on halogen free flame retardants and solutions for lead-free soldering, DSM is contributing to finding a solution to the growing problem of e-waste, helping foster recycling initiatives and delivering environmental, health and safety improvements.

DDR4

JEDEC (the Joint Electron Devices Engineering Council) has signed off on a final DDR4 standard, and Intel has embedded DDR4 support in its latest Haswell-based server CPUs, major OEMs are preparing for a move from DDR3 (the current memory generation) to DDR4 by the first quarter of next year. DDR4 memories will first appear in servers, where OEMs are aggressively looking to lower power consumption while boosting performance. At the same time, DDR4 is far faster than anything that came before it. With 3.2 billion transfers per second, data transfer rates are double those of top-end DDR3 memory buses.



DDR4 will provide computers with significantly improved power management and increased speed and performance. With its Deep Power Down option combined with single memory chip refresh, rather than the entire module refresh in DDR3, DDR4 will also enable a 40-50 percent reduction in standby power. This significant power reduction will reduce heat in every device that has access to the memory.

Stanyl ForTii is very suitable for DDR4 connectors. The long form factor of the connectors, and the multi-cavity design of the injection mold, demanded a high flowing material. No halogen-free PPA can match the flow levels of Stanyl ForTii. To achieve good co-planarity of the connector on the FR4 printed circuit board (PCB), there also had to be a close match in CLTE (coefficient of linear thermal expansion) between the FR4 and the connector housing material; Stanyl ForTii provides this. In addition, it has a unique combination of high stiffness and high deflection temperature under load (HDT). As a result, warpage of Stanyl ForTii connectors after reflow soldering to PCBs is better than any LCP or PPA.

Finally, the pin spacing of 0.85mm in DDR4 connectors—which is 0.15 mm less than in DDR3 connectors—poses a real challenge in terms of pin retention forces. Connectors in Stanyl ForTii outperform all LCPs or LCP/PPS blends in pin retention force, maintaining the required level of at least 0.3 kgf after board assembly with reflow soldering.

The leading Taiwanese memory connector manufacturer LOTES Co, Ltd. has selected DSM's Stanyl ForTii H11 polyamide 4T for housings for a new range of DDR4 connectors. T/H type and also SMT, Single-latch, VLP, ULP and Press-fit types will meet OEM design needs in servers, desktops, complex base station and voice gateways. The housings are suitable for wave and infrared reflow soldering, and are available in various colors.

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