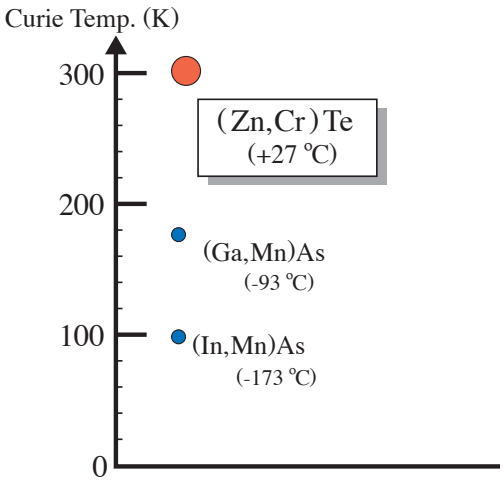
Success in Synthesis of a (Zn,Cr)Te Room-Temperature Ferromagnetic Semiconductor

The Nanoelectronics Research Institute (NeRI) of the National Institute of Advanced Industrial Science and Technology (AIST) has developed a (Zn,Cr)Te ferromagnetic semiconductor that functions at the highest temperatures seen to date. Thus far, scientists have only been able to produce ferromagnetic properties at temperatures below –100°C, but this research has significantly increased this temperature to +27°C (300K) (Fig.1). The research team also observed semiconductor-like electrical and optical properties that are vital for use in technology applications. (Zn,Cr)Te is a promising material for new semiconductor devices with magnetic memory functionality (spintronics device).



Curie Temperature of ferromagnetic semiconductors

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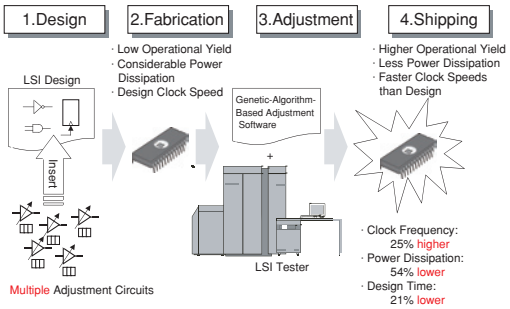
Reducing Power Dissipation of LSIs using Genetic Algorithms

The Advanced Semiconductor Research Center at the National Institute of Advanced Industrial Science and Technology (AIST) and the Association of Super-Advanced Electronics Technologies (ASET) are collaborating under the Semiconductor MIRAI Project. Together they have developed a Genetic-Algorithm-based method to adjust clock timing that allows enhanced up to 25% of working clock frequencies and reduced 54% of power consumption by high-speed LSIs operating at the GHz level, and also reduced 20% of design time on the design process for a high-speed memory DDR-SDRAM controller. Details of this research were presented at the 2003 Symposium on VLSI Circuits (12–14 June 2003).



Genetic-Algorithm-Based Adjustment

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