A Post-Silicon Clock Timing Adjustment Using Genetic Algorithms

Abstract

Eiichi Takahashi, Yuji Kasai, Masahiro Murakawa, and Tetsuya Higuchi
MIRAI Project, Advanced Semiconductor Research Center, National Institute of
Advanced Industrial Science and Technology (AIST)
Tsukuba Central 2, 1-1-1 Umezono, Tsukuba 305-8568, Japan

A post-silicon clock timing adjustment architecture utilizing genetic algorithms (GA) is proposed, which has three advantages: (1) enhanced clock frequency leading to improved operating yields, (2) lower power supply voltages while maintaining operating yield, and (3) reductions in design times. Experiments with two different developed LSI chips and a design experiment demonstrated these advantages with a clock frequency enhancement of 25% (max), a power supply voltage reduction of 33%, and 21% shorter design times.