DUAL-QUALITY 4:2 COMPRESSORS FOR UTILIZING IN DYNAMIC ACCURACY CONﬁGURABLE MULTIPLIERS

**Abstract**

In this paper, we propose four 4:2 compressors, which have the ﬂexibility of switching between the exact and approximate operating modes. In the approximate mode, these dual-quality compressors provide higher speeds and lower power consumptions at the cost of lower accuracy. Each of these compressors has its own level of accuracy in the approximate mode as well as different delays and power dissipations in the approximate and exact modes. Using these compressors in the structures of parallel multipliers provides conﬁgurable multipliers whose accuracies (as well as their powers and speeds) may change dynamically during the runtime. The efﬁciencies of these compressors in a 32-bit Dadda multiplier are evaluated in a 45-nm standard CMOS technology by comparing their parameters with those of the state-of-the-art approximate multipliers. The results of comparison indicate, on average, 46% and 68% lower delay and power consumption in the approximate mode. Also, the effectiveness of these compressors is assessed in some image processing applications.

**TOOLS:**

1. **XilinxISE 14.7**

**LANGUAGE:**

1. **VerilogHDL**