

Near Speed-of-Light On-Chip Electrical Interconnect

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The propagation limits of electrical signals for systems built with conventional silicon processing are explored. Data transmission near the speed of light with an all-electrical system can be achieved by taking advantage of the inductance-dominated high-frequency regime of on-chip interconnect. In a 0.18 μm , 6-level Aluminum CMOS technology, an overall delay of 278ps for a 20mm long line corresponding to a propagation velocity of one half the speed of light in silicon dioxide has been demonstrated.