

3D Integrated Circuit Technology—A Historical Perspective on How We Got Here and Where We May Be Heading

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要旨

Much like the Field Effect Transistor (FET), first patented in 1925, “three-dimensional” IC prototypes were built long before the technology had any hope of commercial viability. The first known 3D circuit was built at least as early as 1967, but until as recently as 2007, few people were confident that 3D technology would take hold. The semiconductor industry has known many “great ideas” that have never made it to commercial success and were subsequently forgotten. What was different about 3D? In this seminar we will take a historical look at developments, both in the process technology and in the design concepts that propelled 3D research forward during its years as, well, a bit of a joke. Then, in the late 90’s – early 00’s there came the perfect storm of failed technology initiatives, which left 3D integration as the only candidate left standing to get more out of Moore. We will review the different types of 3D integration technology that have been developed, who the major players are and what issues and applications have driven the technology choices. Excitingly, we are on the verge of seeing major foundries open 3D fabrication lines, and within a few years, it will be as available as CMOS technology is today. We will explore some applications in micro- and nano-technology that may be enabled by these events.

