

[Permalink](#)

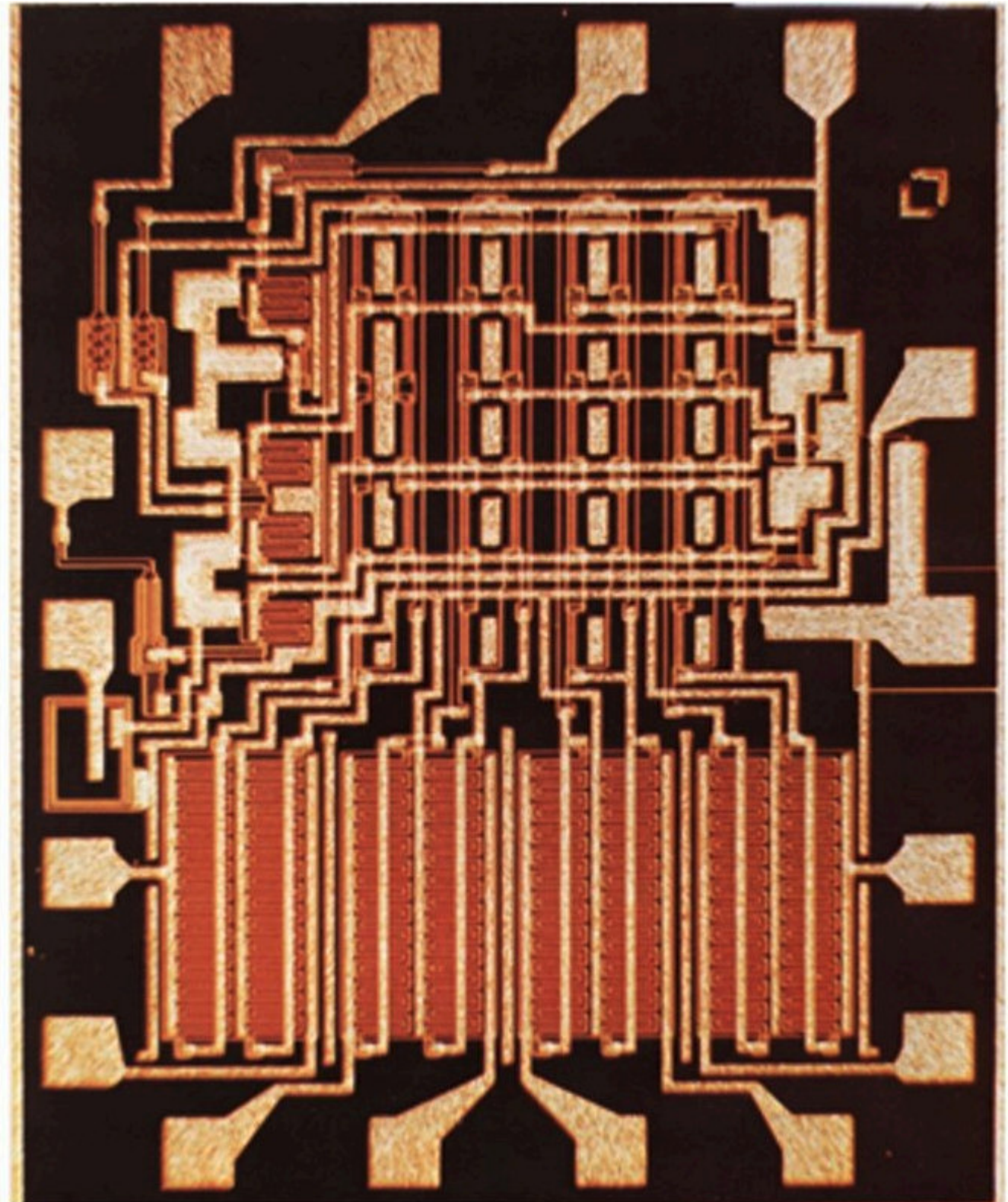


Image Source: [www.computerhistory.org \(https://www.computerhistory.org/siliconengine/silicon-gate-technology-developed-for-ics/\)](https://www.computerhistory.org/siliconengine/silicon-gate-technology-developed-for-ics/)

The Fairchild 3708, the first commercial silicon-gate integrated circuit designed by Federico Faggin in 1968

[Silicon Gate Technology](http://www.intel4004.com/sgate.htm) (<http://www.intel4004.com/sgate.htm>), invented in 1968 by [Federico Faggin](https://en.wikipedia.org/wiki/Federico_Faggin) (https://en.wikipedia.org/wiki/Federico_Faggin) and colleagues at [Fairchild Semiconductor](#) in Palo Alto, California, was the first process technology used to fabricate commercial [MOS](https://en.wikipedia.org/wiki/MOS_Technology) (https://en.wikipedia.org/wiki/MOS_Technology) (Metal Oxide Semiconductor) integrated circuits that was later widely adopted by the entire industry. Faggin also designed the first integrated circuit using a silicon gate, the [Fairchild 3708](http://www.computerhistory.org/semiconductor/timeline/1968-SGT.html) (<http://www.computerhistory.org/semiconductor/timeline/1968-SGT.html>). From the founding of Intel in July 1968 Robert Noyce and Gordon Moore adopted silicon gate technology, and within a few years it became the core technology for the fabrication of MOS integrated circuits worldwide.

"In February 1968, [Federico Faggin](https://en.wikipedia.org/wiki/Federico_Faggin) (https://en.wikipedia.org/wiki/Federico_Faggin) joined [Les Vadasz](https://en.wikipedia.org/wiki/Les_Vadasz) (https://en.wikipedia.org/wiki/Les_Vadasz)'s group and was put in charge of the development of a low-threshold-voltage, self-aligned gate MOS process technology. [Federico Faggin](https://en.wikipedia.org/wiki/Federico_Faggin) (https://en.wikipedia.org/wiki/Federico_Faggin)'s first task was to develop the precision etching solution for the amorphous silicon gate, and then he created the process architecture and the detailed processing steps to fabricate MOS ICs with [silicon gate](https://en.wikipedia.org/wiki/Silicon_gate) (https://en.wikipedia.org/wiki/Silicon_gate). He also invented the 'buried contacts,' a method to make direct contact between amorphous silicon and silicon junctions, without the use of metal, a technique that allowed a much higher circuit density, particularly for random logic circuits.

"After validating and characterizing the process using a test pattern he designed, [Federico Faggin](https://en.wikipedia.org/wiki/Federico_Faggin) (https://en.wikipedia.org/wiki/Federico_Faggin) made the first working MOS silicon gate transistors and test structures by April 1968. He then designed the first integrated circuit using silicon gate, the Fairchild 3708, an 8-bit analog multiplexer with decoding logic, that had the same functionality of the Fairchild 3705, a metal-gate production IC that Fairchild Semiconductor had difficulty making on account of its rather stringent specifications.... (Wikipedia article on Self-Aligned gate, accessed 12-02-2013).

Timeline Themes

[Computer & Calculator Industry](#)
[Technology / Engineering](#)
[Computer & Calculator Design / Architecture](#)

Related Entries

Last updated June 11th, 2025 Pacific Time © 2004–2025 Jeremy M. Norman | jnorman@jnorman.com

Fairchild Semiconductor:

[Kilby Conceives the Integrated Circuit](#)
[Robert Noyce Invents the First Practical Monolithic Integrated Circuit Concept](#)
[Gordon Moore Promulgates "Moore's Law"](#)
[From the Intel 4004 to the Intel 386, Landmark Products from the Early Years of Intel Corporation](#)
[Willard Boyle & George Smith Develop the CCD, a Sensor for Recording Images](#)
[Jerry Sanders and Colleagues from Fairchild Semiconductor Found AMD](#)
[Jean Hoerni Invents the "Planar" Manufacturing Process](#)