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Samsung plans to use BSPDN back power supply technology in 1.4nm process in 2027 – August 15, 2023

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According to ETNews, Jung Ki-tae Jung, Chief Technology Officer of Samsung Electronics Foundry Division, announced at a recent forum that “we plan to apply BSPDN to the 1.4nm process in 2027”.

Backside powered (BSPDN) technology is an innovative technology applied to advanced semiconductors to better tap the potential of the backside space of wafers, but it has not been implemented globally until now. This is also the first time that Samsung Electronics has disclosed its BSPDN development process.

Although the semiconductor industry no longer uses gate length and metal half-pitch to systematically name technology nodes, there is no doubt that the current process technology is also more advanced with smaller numbers.

With the continuous development of the semiconductor process miniaturization route, the distance between the circuits in the integrated circuit is also continuously narrowed, thereby causing interference to each other, and BSPDN technology can overcome this limitation because we can use the wafer Build the power supply route on the back to separate the circuit and power supply space.

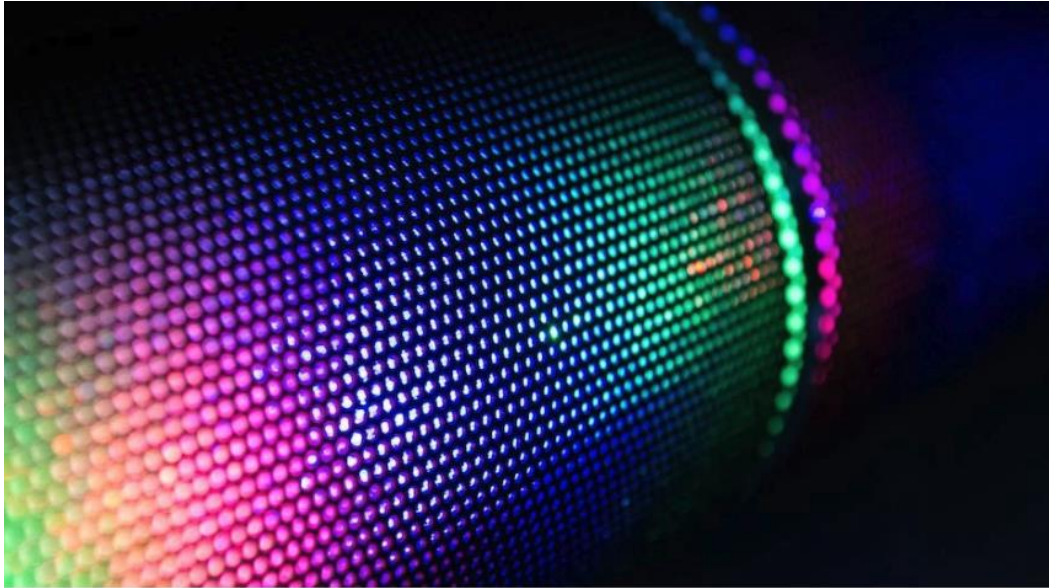


Image source Pexels

Not only Samsung Electronics, but manufacturers such as TSMC and Intel are also actively seeking technological breakthroughs, and currently Tokyo Electronics (TEL) in Japan and EV Group (EVG) in Austria are providing BSPDN implementation equipment.

At present, Intel's backside power supply technology is called PowerVia, which aims to reduce power consumption, improve efficiency and performance, and the next Intel 20A will be Intel's first node using PowerVia technology and RibbonFET full surround gate transistors. It will be ready in the first half of 2024 and will be applied to the Arrow Lake platform for future mass production (Note: There is a possibility of delay), and is currently starting Stepping (First Stepping) in the fab.

In addition, TSMC also plans to apply similar technologies in processes below 2nm, and the goal is expected to be achieved by 2026.

Samsung Electronics' BSPDN technology aims to be applied to the 1.4nm process in 2027, but it may be delayed according to market demand.

A Samsung Electronics official said: "The mass production time of semiconductors using backside power supply technology may change according to the customer's schedule." Samsung Electronics aims to mass produce the 2nm process in 2025, ahead of the 1.4nm process. It is said that Samsung is currently conducting a customer demand survey on the application of backside power supply technology.

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