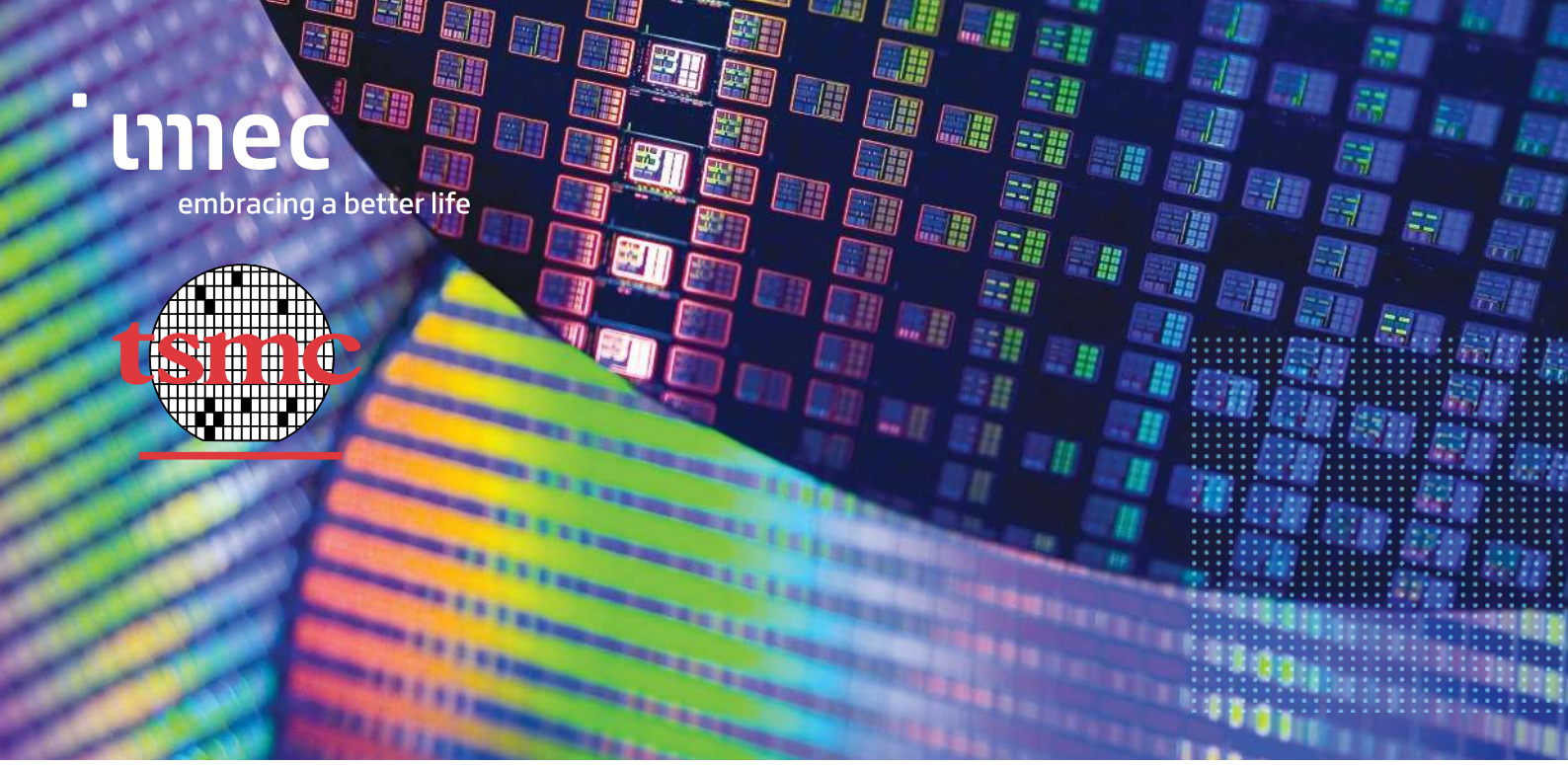

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tsmc

Comprehensive ASIC solutions enabled by TSMC technologies

Imec.IC-link, part of global R&D hub imec, connects innovators and entrepreneurs to the leaders in semiconductor technology. Our world-class experts and global network of trusted partners support you across the entire value chain. We give you a single point of contact to turn your ideas into reality.

Imec and semiconductor technology leader TSMC (Taiwan Semiconductor Manufacturing Company) have built a strong and reliable partnership over the years. As TSMC's Value Chain Aggregator (VCA) partner, imec helps system companies, ASIC companies and emerging start-ups to bring their chip-based **innovations to production**.

We provide our customers in Europe, North America, Brazil, India, Russia and China with access to TSMC technologies – and can also support our customers in other regions.

TSMC technologies provided by imec.IC-link

	Embedded NVM	RF	Logic	Analog	High Voltage	BCD-Power IC
5 nm			✓			
7/6 nm		✓	✓			
16/12 nm	✓	✓	✓			
22 nm	✓	✓	✓	✓		
28 nm	✓	✓	✓	✓		
40 nm	✓	✓	✓	✓	✓	
65/55 nm	✓	✓	✓	✓	✓	
90/80 nm	✓	✓	✓		✓	
0.13/0.11 µm		✓	✓	✓	✓	✓
0.18/0.15 µm	✓	✓	✓	✓	✓	✓
0.25 µm	✓	✓	✓	✓	✓	✓

Technology highlights

5 nm

The 5nm (FinFET) process technology is TSMC's second available Extreme Ultraviolet lithography (EUV) process optimized for mobile as well as high-performance computing applications. The smaller chip design lowers power consumption, an important metric to AI and 5G applications from edge to center for longer battery life and lower operating cost.

7/6 nm

TSMC's 7-nm FinFET is one of the most advanced technologies in production, aiming for a broad array of applications ranging from high- to mid-end mobile and customer applications, AI, networking, 5G infrastructure, GPU and high-performance computing. The 6-nm technology leverages new capabilities in EUV to provide 18% higher logic density over N7 while staying design-rule-compatible with the proven N7 technology.

16/12 nm

Introduced in 2013, this first FinFET technology by TSMC has been extended to next-generation Wireless Local Area Network (WLAN 802.11ax) and millimeter-wave (mmWave) applications, as well as to wireless connectivity applications such as smartphones using the 5G mobile network, radar and AR/VR. The 12-nm technology entered production in 2017 and drives gate density even further.

22 nm

22-nm ultra-low power (22ULP) technology was developed based on TSMC's 28-nm technology and aims for applications including image processing, digital TVs, set-top boxes, smartphones and consumer products.

22-nm ultra-low leakage (22ULL) features new ULL device and ULL SRAM (static random-access memory) and provides lower power consumption compared to 40ULP and 55ULP solutions.

28 nm

TSMC's 28-nm process uses High-k Metal Gate gate-last technology and supports a wide range of applications including Central Processing Units (CPUs), graphic processors (GPUs), high-speed networking chips, smartphones, application processors (APs), tablets, home entertainment, consumer electronics, automotive, and the Internet of Things.

40 nm

The 40-nm GP process technology aims for high-performance applications, including CPUs, graphic processors, game consoles, networks, FPGAs, and hard disk drives. The 40-nm LP and 40-nm enhanced LP processes target smartphones, digital televisions, set-top boxes, games and wireless connectivity applications. The 40-nm ULP process is suitable for the Internet of Things and wearable applications.

65/55 nm

TSMC's 65-nm LP process significantly reduces power consumption with its innovative power management technology. The 55-nm LP's introduction offers further enhanced PPA with a shrunken die size. A new addition to this family is the 55-nm enhanced Ultra Low Power (ULP) process providing lower leakage to extend battery life. 55ULP also integrates RF and Embedded Flash capabilities to enable customers' SoC designs with smaller form factors.

90/80 nm

The TSMC 90nm process has three technology flavours. TSMC's 90G technology aims for digital consumer, networking, HDD and FPGA applications. The 90LP technology is designed to serve mobile applications like cellular and WLAN. The 90GT technology serves more demanding applications like CPU and GPU.

0.13/0.11 µm

TSMC's 0.13-µm SoC low-k copper technology integrates multiple world-class SoC CMOS transistor process platforms, ultra-small SRAM memory, 193-nm lithography, and eight-layer low-k copper wire. Today, it's broadly applied in consumer electronics, computers, mobile computing, automotive electronics, IoT, and smart wearables.

0.18/0.15 µm

0.18-µm remains a workhorse technology. The proven, affordable and mature technology received a lot of additions and covers high-voltage (BCD), eFlash and automotive applications. Throughout the years, TSMC took the expertise they gained by developing advanced technologies back to 0.18, resulting in contemporary spice models and support for modern tools.

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