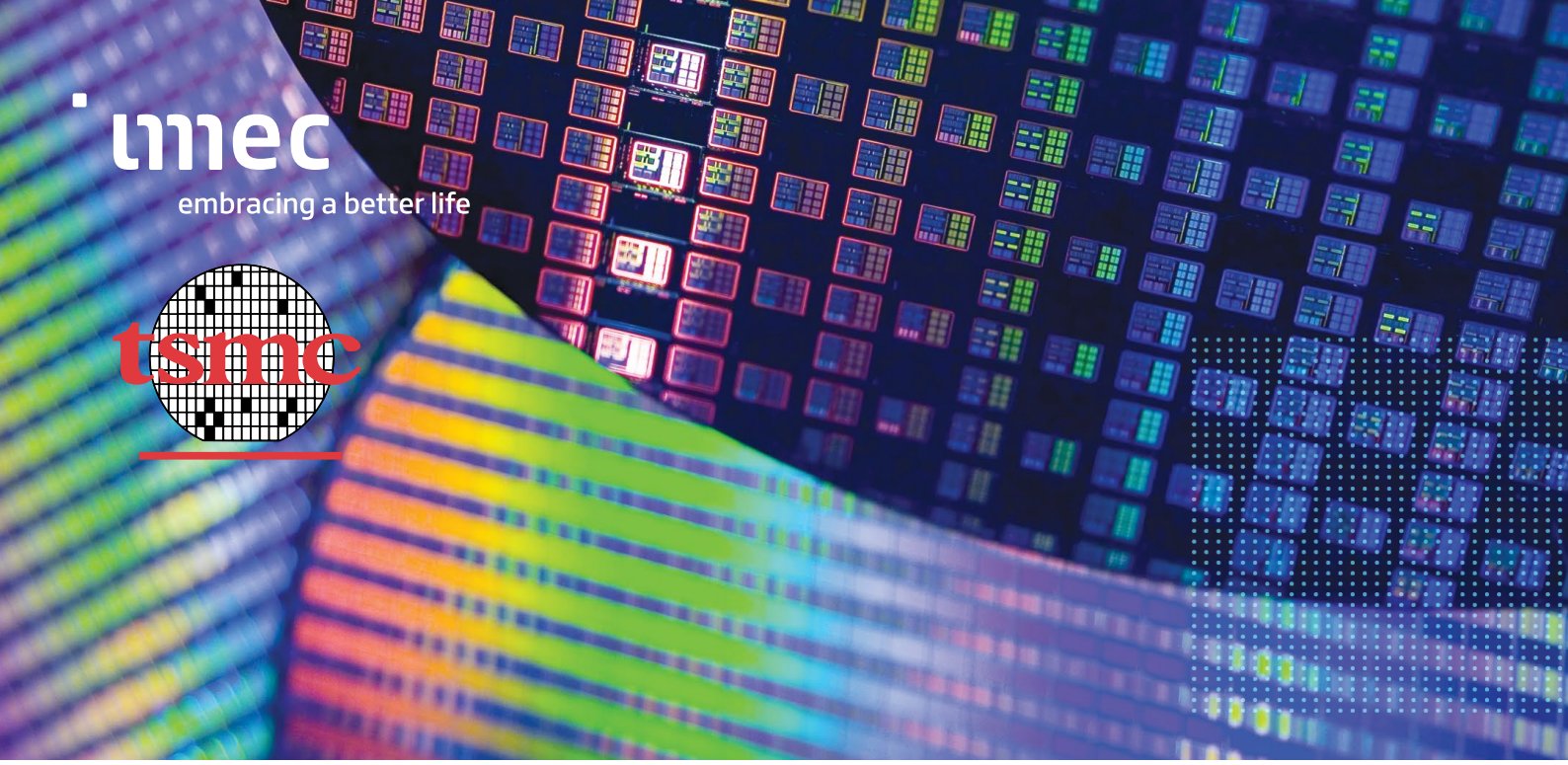

Comprehensive ASIC solutions enabled by TSMC technologies

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, and India with access to TSMC technologies – and also support our customers in other regions.

TSMC technologies provided by imec.IC-link

	Embedded NVM	RF	Logic	Analog	High Voltage	BCD-Power IC
3nm			✓			
4nm			✓			
5nm			✓			
7/6nm		✓	✓			
16/12nm	✓	✓	✓			
22nm	✓	✓	✓	✓		
28nm	✓	✓	✓	✓		
40nm	✓	✓	✓	✓	✓	
65/55nm	✓	✓	✓	✓	✓	
90/80nm	✓	✓	✓		✓	
0.13/0.11µm		✓	✓	✓	✓	✓
0.18/0.15µm	✓	✓	✓	✓	✓	✓
0.25µm	✓	✓	✓	✓	✓	✓

Technology highlights

3nm

N3 is a full-node advance from N5. FINFLEX in N3 extends power, performance and density.

5nm/4nm

5nm (FinFET) process technology is TSMC's second available extreme ultraviolet lithography (EUV) process optimized for mobile as well as high-performance computing applications. It offers lower power consumption, which is important for AI and 5G applications from edge to center requiring longer battery life and lower operating cost. N4 technology is an enhanced version of N5 and provides further improvement in performance, power and density.

7/6nm

TSMC's 7nm 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. 6nm technology leverages new capabilities in EUV to provide 18% higher logic density over N7 while staying design-rule-compatible with the proven N7 technology.

16/12nm

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. 12nm technology entered production in 2017 and drives gate density even further.

22nm

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

22nm 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.

28nm

TSMC's 28nm 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.

40nm

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

65/55nm

TSMC's 65nm LP process significantly reduces power consumption with its innovative power management technology. 55nm LP's introduction offers further enhanced PPA with a shrunken die size. A new addition to this family is 55nm 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.

90/80nm

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

0.13/0.11µm

TSMC's 0.13-µm SoC low-k copper technology integrates multiple world-class SoC CMOS transistor process platforms, ultra-small SRAM memory, 193nm 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.

0.18/0.15µm

0.18µm 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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