REINVENTING THE FUTURE OF DESKTOPS.

Let Samsung’s leading technology help you deliver powerful performance to PCs on the table.
Executive Summary

The PC's not dead. It's just gone high end

- Transform into high-performance computing
- Getting more stylish than ever

Build future desktops with Samsung’s cutting-edge technologies

- Bring high-performance computing to your desktop
- Create flexible design to meet user preference

▶ Read on to learn more ...
Transform into high-performance computing.

Applications, such as high-end gaming, 3D modeling, and high-definition video editing, are still running on desktops with the highest technical configurations.

Getting more stylish than ever.

Manufacturers today offer desktops in various styles and sizes to meet user demands. Desktops can now actually be placed on top of our desks.

Diversity of desktop design

1. Accenture, Internal research and analysis (2015)
Our Solution
For Desktop

Built to meet the full range of performance expectations from basic to ultimate rendering machines.

Envision the future of desktops with Samsung and hold the key to the next winning desktop that will excel in performance, capacity, and form factor creativity.
Bring high-performance computing to your desktop.

Be it memory, storage, or graphic card, Samsung provides manufacturers of high-end desktop systems with the power to deliver the performance they need.

Our DDR4 PC DRAM offers memory bandwidth twice that of DDR3, providing a base for high-performance computing.

Our SSDs, equipped with advanced V-NAND technology, offer fast and sufficient storage, swapping out conventional HDDs.

Through our cutting-edge 2xnmm 8Gb GDDR5, a seamless and advanced multimedia experience can be achieved with minimum dependency on system I/Os.
Creating flexible and intuitive design to meet user preference.

Our products are so small and thin that they provide plenty of flexibility for the designs of next-generation desktop form factors.

Our PC DRAM, armed with the most advanced 2xnm technology, provides twice the density and thus only requires half of the space to realize the same high performance as the previous generation.

Samsung’s industry-leading Panel DDI with USI-GF technology keeps your product thin, yet delivers superior performance with a high-speed interface.
Tailored for your business.

Explore products, solutions and resources that cater to your Desktop.
Featured Product Overview

- **PC DRAM**: Fast and energy-efficient
- **ClientSSD**: Setting new standards in speed and endurance
- **Mobile DRAM**: Highly power-efficient performance
- **Panel DDI/TCON**: Rich colors with efficiency in power, heat, and space
- **Graphic DRAM**: Supreme graphics at dashing speed

Desktop
When you need the right memory solution for your PC, you need the right expert. Samsung has been a leader in the DRAM market, with our DRAM being selected by most OEMs for many years. Embrace the cutting-edge Samsung DDR4 to take your PC to a new dimension of high speed and low energy performance.
PC DRAM

DDR4 has superior speed to DDR3.

Doubled bandwidth and faster recovery

DDR3 vs. DDR4 in Speed

<table>
<thead>
<tr>
<th>DDR3</th>
<th>DDR4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,600</td>
<td>3,200</td>
</tr>
</tbody>
</table>

DDR4 using 20nm processing technology provides up to 2,400 Mbps initial speeds, increasing to the JEDEC-defined speed of 3,200 Mbps. DDR4 bandwidth is double that of DDR3.

G.Skill’s 4th annual OC World Cup at Computex 2015

Samsung is the global market leader in DRAM. It has proven its state-of-the-art, world-leading DRAM technology by providing top of the class hardware at the Overclocking World Cup.

Prior to the tournament, G.Skill announced its “Highest Frequency Ripjaws 4 Series DDR4 3666MHz” memory kit featuring Samsung DDR4 4Gb IC, calling it the “first-of-its-kind top speed memory kit”.

Samsung
PC DRAM

DDR4 provides 2x bigger capacity.

The advancement in semiconductor component density technology has enabled Samsung to offer the bigger capacity. Samsung DDR4 UDIMM can achieve maximum capacity of 128GB which is 2x bigger than that of DDR3, 64GB. Ultra slim PCs can benefit from Samsung DRAM’s high density by using less number of DRAM components which leads to saved board space.
SURPASSING BOTH PERFORMANCE AND RELIABILITY.

When you look for the right storage for PC that runs with higher speed, Samsung is here to help. Samsung has a broad portfolio of SSDs to cater the best-fit solution for your needs. Samsung SSD outperforms HDD in every aspects, namely speed, endurance and power consumption.
Samsung has a wide range of products with different specifications that fit various needs of consumers.

### Featured Products

<table>
<thead>
<tr>
<th></th>
<th>Seq. Read</th>
<th>Seq. Write</th>
<th>Rand. Read</th>
<th>Rand. Write</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>CM871a</td>
<td>540</td>
<td>520</td>
<td>97</td>
<td>57</td>
<td>256</td>
</tr>
<tr>
<td>PM871a</td>
<td>540</td>
<td>520</td>
<td>97</td>
<td>90</td>
<td>1,000</td>
</tr>
<tr>
<td>PM951</td>
<td>1,050</td>
<td>560</td>
<td>250</td>
<td>144</td>
<td>512</td>
</tr>
<tr>
<td>SM951</td>
<td>2,150</td>
<td>1,550</td>
<td>300</td>
<td>100</td>
<td>512</td>
</tr>
</tbody>
</table>

(up to MB/s) (up to K IOPS) (up to GB) (up to MB/s)
Client SSD

Even the low-end SSD is faster than HDD.

Higher speed

Superb sensory performance and excellent feasibility vs. HDD

General HDD vs low-end SSD (CM871) (Booting and Multi-tasking)

The Samsung CM871 SSD delivers significantly enhanced speed with faster booting, file loading & copying, multi-tasking, installation and access times. This enables CM871 to improve both operational efficiency and workplace productivity.
Client SSD

Samsung SSD performs better than or almost equal to its competitors, achieving cost efficiency.

**Sequential read**

<table>
<thead>
<tr>
<th></th>
<th>A (256GB)</th>
<th>B (240GB)</th>
<th>Samsung PM871 (256GB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(MB/s)</td>
<td>517</td>
<td>545</td>
<td>538</td>
</tr>
</tbody>
</table>

**Random read**

<table>
<thead>
<tr>
<th></th>
<th>A (256 GB)</th>
<th>B (240 GB)</th>
<th>Samsung PM871 (256GB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(IOPS)</td>
<td>8,343</td>
<td>9,455</td>
<td>9,488</td>
</tr>
</tbody>
</table>

Designed to deliver outstanding read intensive performance, PM871 is capable of providing sustained performance that is superior to its competitors. Taking performance and cost-effectiveness into account, Samsung PM871 is widely recognized as the best SSD choice for the mainstream PC market.
Client SSD

NVMe performs faster in multi-tasking than other interfaces.

Faster speed in multi-tasking

The SM951 and PM951 leverage the advanced NVMe PCIe interface to significantly enhance performance to exceed the expectations of users today. SM951 and PM951 offer not only over 3.8x faster speed in multi-tasking compared to conventional SATA products, but also boasts reduced power consumption compared to its competitors, optimized to satisfy ultra-slim notebook PC's.

[Time spend on multi-tasking]

<table>
<thead>
<tr>
<th>Interface</th>
<th>Time (Sec.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SATA</td>
<td>7</td>
</tr>
<tr>
<td>AHCI</td>
<td>2.1</td>
</tr>
<tr>
<td>NVMe</td>
<td>1.8</td>
</tr>
</tbody>
</table>

[Test Condition] Application loading @ file copy & virus scan

3.8X faster
Client SSD

Fully exploiting the V-NAND technology, Samsung SSD helps sustain a high performance PCs and workstations.

Reliability & security features

Samsung V-NAND decreases its electric field as its cells are slightly larger, and employs CTF based insulators eliminating the risk of cell-to-cell interference. It provides less stress and more endurance, up to twice that of 2D planar NAND.

SSD protects itself from overheating by controlling CPU speed in relation to its core temperature, throttling back performance to prevent thermal shutdown.

- **V-NAND**
  - 2X improved endurance than planar NAND

- **Self-Encrypting Drive**
  - AES 256-bit hardware-based encryption
  - Samsung Self-Encrypting Drive (SED) security technology helps ensure constant data and file protection. The hardware-based encryption engine secures your data without the performance decline sometimes experienced with software-based encryption.

- **Dynamic Thermal Throttling**
  - controls CPU speed until SSD temperature normalizes

- **4.5X Lower Failure Rate**
  - than HDD
  - SSD provides 4.5 times improved average annual failure rate of 0.44% compared to HDD's 2.0%
Market demand is high for a graphic DRAM that seamlessly supports high-definition contents and graphic-intensive applications. Samsung is dedicated to deliver the ultra-fast, yet power efficient graphic memory products. Samsung graphic DRAM, born to boost GPU capabilities, delivers unprecedented graphic performance, giving your devices the ultimate desirability.
Graphic DRAM

GDDR5 provides 2.7 times faster data speed than GDDR3.

Faster speed and bandwidth

<table>
<thead>
<tr>
<th></th>
<th>GDDR3</th>
<th>GDDR5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data speed/Pin</td>
<td>2.6 Gb/s</td>
<td>7 Gb/s</td>
</tr>
</tbody>
</table>

2.7X Increase

Samsung GDDR5 can achieve data rate of up to 7Gb/s per pin which translates to 32GB/s for the complete memory chip. This is 2.7x faster than GDDR3’s 2.6Gb/s per pin and 10.4GB/s.
Samsung’s expertise in panel DDI empowers panels with rich color spectrums, along with strong efficiency in power, heat, and space.
Panel DDI/TCON

The world leader in Panel DDI technology, Samsung has been the pioneer of the 10-bit S-IC design since we began production in 2014. USI-T is the best interface solution for 10-bit technology.

High speed of USI-T
Panel DDI/TCON

USI-T enables simpler communication when compared to the previous mLVDS technology, which allows for a board space saving.

The USI-T processes data via a point-to-point method, whereas the mLVDS interface processes data via a multi-drop method. Therefore, the number of lines between the DDI and the TCON on the PCB can be significantly reduced. As a result, 30 ~ 40% space can be saved.
Rediscover the wonder of technology with our latest breakthroughs, products, and solution as we continue to push limits of innovation.
Leading the industry with technological innovation

Samsung's semiconductor business remains at the forefront of the market by constantly pushing the limits on innovation through sustained investment in R&D and corporate citizenship.

Technology Leader Making Global Contributions

1. Market Leadership
   - Samsung's semiconductor business has been the memory leader for over 20 years, and is rapidly moving to the head of the LSI market.

2. Technology Innovations
   - Samsung has made numerous technological innovations in the semiconductor industry since 1983, when we developed the world’s 1st 64Kb DRAM.

3. Company Capability
   - Samsung's semiconductor business never stops innovating within its comprehensive product portfolios, from semiconductors to end-products, and makes massive investments in R&D.

4. Corporate Citizenship
   - Samsung's semiconductor business puts great value in our social responsibilities toward customers and partners, and in maintaining a green planet.
Samsung's semiconductor business has held the 2nd largest global market share for over 12 years and it continues to grow its presence in the industry.

**Global semiconductor market share**

- **Company A**
  - 2009: 14.6%
  - 2010: 13.9%
  - 2011: 16.5%
  - 2012: 16.4%
  - 2013: 15.4%
  - 2014: 15.4%

- **Samsung**
  - 2009: 7.7%
  - 2010: 9.0%
  - 2011: 9.0%
  - 2012: 9.5%
  - 2013: 9.7%
  - 2014: 10.2%

- **Company B**
  - 2009: 2.8%
  - 2010: 2.7%
  - 2011: 3.2%
  - 2012: 4.4%
  - 2013: 5.5%
  - 2014: 5.7%

- **Company C**
  - 2009: 2.7%
  - 2010: 3.2%
  - 2011: 4.4%
  - 2012: 5.5%
  - 2013: 5.7%

- **Company D**
  - 2009: 2.7%
  - 2010: 3.2%
  - 2011: 4.4%
  - 2012: 5.5%
  - 2013: 5.7%
  - 2014: 5.7%

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1. Gartner
Samsung has been the leader of the total memory market for 22 years running since 1993.

Memory market leadership (2014)¹

- **Memory**: 35% for **22 years** since 1993
- **DRAM**: 41% for **23 years** since 1992
- **NAND Flash**: 31% for **13 years** since 2002

¹ Gartner
Market Leadership  |  System LSI business

Samsung's semiconductor business took the DDI market lead in 2003 and never looked back, expanding to a leadership position for smart cards, CIS and other products.

Market leadership in the LSI business (2014)

- **DDI**: 23% for 12 years since 2003
- **Smart Card**: 37%
- **Mobile CIS**: 27%
- **CIS**: 14%

1. Samsung Internal Forecast '15
Samsung has achieved numerous technological innovations in the memory field on an almost annual basis since first developing 64Kb DRAM in 1983.

*Note: 10nm-class denotes a process technology node somewhere between 10 and 19 nanometers*
Samsung system LSI has grown significantly since its inception in 2001, making several technological innovations for each of its products.
Samsung's semiconductor business offers nearly 25 memory and system LSI product portfolios that are essential in today's electronic appliances.
Samsung's semiconductor business operates in 18 international locations to better serve and collaborate with customers around the world.
Our global business experts and continued R&D investments position us to provide the market with cutting-edge technology to maintain our leadership position.

Global professionals as a core value

- 300,000+ talented employees in 80 countries around the world
- 36,900 Doctorate/Masters degrees
- 63,000 R&D Staff
- 1,700 Designers

Striving rigorously for innovation

- $14.6 B R&D investments in 2014

Leading patent holder

- Samsung
  - Number of patents 2015: Over 100,000 globally
  - No.2 in Europe (2,366)
  - No.2 in the US (5,072) since 2006

Net Sales: $209 Billion
Company Capabilities | Global recognition

Samsung has also been widely acclaimed for our reputability and innovative spirit.

Global recognition

7th TOP BRAND VALUE company
Interbrand

15th most REPUTABLE company
Forbes

13th TOP GLOBAL company
FORTUNE

5th most INNOVATIVE company
BCG

3rd top global INNOVATOR
THOMSON REUTERS
Corporation Citizenship of Samsung

Samsung constantly strives to resolve community challenges, protect nature, create safe and healthy workplaces and share growth with our employees, partners and customers.

Corporate citizenship of Samsung

- Social Contributions
  - Sharing and Volunteering to Foster New Hope

- Green Management
  - Green Management that Protects the Planet

- Health and Safety
  - Creating Safe and Healthy Workplaces

- Sharing Growth
  - Success Built on Helping and Dreaming Together
Samsung has initiated 5 key programs for social contributions to address the leading social issues around the globe, including education, healthcare and employment.

5 global social contribution activities

- **SMART School**
  - 384 schools under operation worldwide
  - Supporting the development of creative talents in a smart education environment
  - Resolving regional education gaps

- **Samsung Tech Institute**
  - 23 institutes under operation worldwide
  - Offering systematic vocational training & local employment
  - Laying the foundation for financial independence

- **Samsung Care Drive**
  - 8 programs under operation worldwide
  - Offering a Smart Healthcare System accessible anywhere at any time
  - Promoting better health and lifestyles of local citizens

- **Nanum Village**
  - 2 digital villages under operation in Africa
  - Providing healthcare and education support to low-income countries
  - Offering citizens the chance to contribute to local communities

- **Solve for Tomorrow**
  - +2,300 participants in the 2014 competition
  - Explored innovative ideas, putting them to practice in partnership with local communities
  - Resolved local pending issues using STEM\(^1\) skills

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1. STEM: Science, Technology, Engineering, Mathematics
Corporate Citizenship | Green management

Samsung has launched a wide range of innovative eco-conscious products in an effort to protect the environment for all of us.

Certified green products

100% of products achieved Good Eco-Product ratings

3,027 products certified green by global institutes

Globally recognized for the eco-friendliness of its products, Samsung received green certifications for a total of 3,027 product models from 11 nations including Korea, the US, China and European countries by the end of 2014.

Resource reuse and recycling (2014)

92% of waste recycled

19,403 tons of recycled plastics reused

354,599 tons of electronic waste recycled globally

37,594 mil. tons of water reused worldwide

Samsung reduces environmentally hazardous elements by reusing and recycling resources such as recycled plastic throughout the life cycle of products, from the manufacturing of parts and products, to their distribution, use and disposal.
Samsung promotes and complies with safety regulations to establish a proactive culture of safety, both inside and outside worksites.

### Health and safety management system

- Samsung complies with **OHSAS 18001**, a global standard for occupational health and safety management systems, in each of its workplaces around the world, striving to maintain on-site safety and protect employee health.

### Employee healthcare and safety enhancement

- **100% global certification** for all of Samsung’s health and safety management systems.
- **39,968 employees** participated in hands-on environmental and safety education programs in 2014.
- Program to teach emergency CPR.
- Samsung is committed to improving employee healthcare and safety by developing ergonomic adaptations in the workplace environment, prohibiting business trips to regions with a high risk of infectious disease and supporting employee medical checkups.

**CPR**: Cardiopulmonary Resuscitation
Corporate Citizenship | Sharing growth

Samsung has taken part in various shared-growth activities to create a mutually beneficial business ecosystem with its suppliers.

Samsung Electronics set up the mutual Growth Academy in June 2013 to provide comprehensive and systematic support for its primary and secondary suppliers.

Mutual Growth Fund for suppliers

Samsung created a supplier support fund of USD $1 billion, known as the ‘Mutual Growth Fund’ in collaboration with various financial institutes to support both primary and secondary suppliers.
ENABLING THE FUTURE OF LIFELOGGING.

Let’s Get Started...
Samsung as a trusted partner

About Samsung's semiconductor business

The component businesses of Samsung Electronics come together under the title Device Solutions. As a leading company in the global electronics industry, Samsung Electronics has one of the widest range of products for its key component businesses Memory and System LSI, which are core elements of the company's well-balanced business portfolio.

Samsung initiated its semiconductor operations in 1974, mostly developing and producing ICs and peripherals for consumer electronics. The pivotal turning point in our evolution into a leading semiconductor manufacturer was the successful development of the 64Kb DRAM in 1983.

Samsung achieved and has maintained its market leadership position in the memory industry since 1993. Along with its success in the memory sector, the company signaled a long commitment to logic and analog chip development in 2001 with the expansion of its System LSI organization and the opening of its SoC Research Lab. Since then, Samsung's System LSI Business has scaled significantly upward, and is now one of the major players in the sector and also the largest provider in many product categories.