Siemens EDA

Engineer a smarter future faster
As a focused technology company, we empower our customers to transform their industries and markets, helping them to transform the everyday.

303,000 employees\(^1\)

€62.3 bn in revenue\(^2\)

€6.7 bn in net income\(^3\)

15.0% adjusted EBITA margin for the Industrial Businesses\(^2\)

---

1 As of September 30, 2021 | 2 For fiscal 2021 | 3 Continuing and discontinued operations
Siemens Digital Industries Software is a leader by any measure

**TOP RANKED**

#1

industrial software for the digital enterprise

**EXPANDING ECOSYSTEM**

220k+

Ecosystem developers

**REVENUE**

$4.2B

DI SW, 2020

>60%

Recurring revenue

**FORTUNE MAGAZINE**

Most admired

industrial company

**M&A INVESTMENT**

€11B

Since 2007
Siemens Digital Industries Software continues to expand its portfolio with huge investment to combine the real world with the virtual world.

> €11 billion investment

12,700 software engineers are shaping the digital transformation.
Siemens EDA is aggressively strengthening its portfolio with key acquisitions
Significant increase in R&D and M&A investments in select technologies
Siemens EDA

Engineer a smarter future faster…
What we do and what our customers do

EDA Industry
Provide the design software, hardware (tools), intellectual property (IP) and services to design and manufacture ICs, IC packages and PCBs.

Semiconductors
Designs and manufactures integrated circuits (ICs) that go into IC packages.

Electronics Industry
Apple
- iCloud
- iMessage
Google
- Drive
- Google Play
- YouTube
Microsoft
- Office 365
- Windows

IC Packaging
Design Systems and Ecosystems, increasingly design their own ICs, packages and boards…everything.

Systems PCB Industry
Designs and manufactures the PCBs that hold the ICs and other discrete components. PCBs go into chassis, ECUs, etc.

Advanced IC Packaging Industry
Creates the ceramic & plastic packages that surround the IC. IC packages go onto PCBs.
Next-generation systems design platform

- Digitally integrated & optimized
- Engineering productivity & efficiency
- Digital prototype-driven verification
- System-level model-based engineering
- Supply-chain resilience

Electronic Systems Design

Supply Chain Integration
- Manufacturing Handoff
- WIP Data Management
- Concurrent Design
- Analysis & Verification
- Physical Design
- IP Reuse
- System Definition
- Design Creation
- Ecosystem Collaboration

We can win in FY’22!
# Assuring IC integrity

Targeting critical hardware verification challenges

<table>
<thead>
<tr>
<th>Functional Correctness</th>
<th>Safety</th>
<th>Trust and Security</th>
<th>RISC-V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rigorous coverage-driven functional verification from block to chip, leveraging formal technology</td>
<td>Automated FMEDA flow requiring minimal fault simulation</td>
<td>Automated detection of RTL Trojans and hardware vulnerabilities to adversary attacks</td>
<td>Proof of compliance to instruction set architecture (ISA) with no gaps or inconsistencies</td>
</tr>
</tbody>
</table>

## OneSpin 360® Formal Platform

## OneSpin Solutions and Services
Siemens Embedded Solutions for RISC-V

**Toolchain Services**
- Offering
  - Toolchain customization and optimization services
  - Toolchain custom support services
- Unique value proposition
  - GCC and LLVM open source compiler framework expertise
  - Deep expertise in heterogeneous multi-core and accelerator offload
  - 20 years of OSS toolchain dev., upstreaming and support experience
- Areas of expertise
  - Super Computer / HPC Platform Enablement
  - Toolchains for RISC-V customized processors
  - High Performance Embedded Computing
  - Long term support for safety critical applications

**Embedded Linux®**
- Both pre-built enterprise and highly customizable variants available
- Software customization and optimization services
- Support for the full life cycle of the device
- Rich graphics enablement
- Broad processor support
- Security monitoring

**Flex OS**
- Source code based Embedded OS
- Highly customizable
- Aligned with latest semiconductor company provided LTS Kernels

**Omni OS**
- Enterprise-class Embedded OS
- Pre-built Debian distribution
- Civil infrastructure platform kernel
- Compatible with Debian package feeds
- Real-time

**Nucleus® Real Time Operating System**
- Deployed in over 3 billion units shipped
- Portable & configurable, provided with source code
- Highly scalable, from 32 bit microcontrollers to 64 bit multicore SoC’s
- Integrated with Embedded IoT Framework
- Advanced Multicore support: an IPC framework & hypervisor

**Nucleus ReadyStart**
- Extensive connectivity and middleware
- Integrated power management framework
- Process model
- Symmetric multi-processing
- Royalty free

**Nucleus SafetyCert**
- Certified to
  - IEC 61508 SIL3
  - IEC 62304 Class C
  - ISO 26262 Level D
  - DO-178C Level A artifacts
**Tessent™ Embedded Analytics - at the forefront of RISC-V support**
The first commercially available, standards-compliant and core independent RISC-V trace solution

### EA Trace Encoder Features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Standard RISC-V</th>
<th>Tessent Embedded Analytics Trace Encoder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trace</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Filters</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Counters</td>
<td>❌</td>
<td>✓</td>
</tr>
<tr>
<td>Timestamps</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Comparators</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>GPIO</td>
<td>❌</td>
<td>✓</td>
</tr>
<tr>
<td>Security</td>
<td>❌</td>
<td>✓</td>
</tr>
<tr>
<td>Data trace</td>
<td>❌</td>
<td>✓</td>
</tr>
<tr>
<td>Interval timer</td>
<td>❌</td>
<td>✓</td>
</tr>
<tr>
<td>Tiered throttling</td>
<td>❌</td>
<td>✓</td>
</tr>
<tr>
<td>Message interfaces</td>
<td>❌</td>
<td>✓</td>
</tr>
<tr>
<td>Fast profiling mode</td>
<td>❌</td>
<td>✓</td>
</tr>
<tr>
<td>Multiple retirement</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Implicit return mode</td>
<td>❌</td>
<td>✓</td>
</tr>
<tr>
<td>Whole system solution</td>
<td>❌</td>
<td>✓</td>
</tr>
<tr>
<td>Branch prediction</td>
<td>❌</td>
<td>✓</td>
</tr>
<tr>
<td>Cycle-accurate tracing</td>
<td>❌</td>
<td>✓</td>
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</tbody>
</table>
## Siemens EDA Solutions

### IC Design and Verification

<table>
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<th>Design Stage</th>
<th>Solutions</th>
<th>Services</th>
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</thead>
<tbody>
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<td>IC Architectural Design</td>
<td>C++ High-level Synthesis &amp; Verification</td>
<td>Methodology Services</td>
</tr>
<tr>
<td>IC Logic Design</td>
<td>RTL Development</td>
<td>Design Services</td>
</tr>
<tr>
<td>IC Logic Verification</td>
<td>Power Analysis &amp; Optimization</td>
<td>Managed Cloud Services</td>
</tr>
<tr>
<td>IC Physical Design</td>
<td>AMS Verification &amp; Coverage</td>
<td>Learning Services</td>
</tr>
<tr>
<td>IC Physical Verification</td>
<td>Scalable HW Verification</td>
<td></td>
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<tr>
<td>IC Manufacturing and Test</td>
<td>Digital Implementation</td>
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<tr>
<td>3D IC</td>
<td>Custom, Analog &amp; MEMS IC Design</td>
<td></td>
</tr>
<tr>
<td>DFT SSN</td>
<td>Power Analysis &amp; Optimization</td>
<td></td>
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<tr>
<td></td>
<td>Hardware/Software Validation</td>
<td></td>
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<tr>
<td></td>
<td>Power Analysis &amp; Optimization</td>
<td></td>
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<tr>
<td></td>
<td>Functional Safety</td>
<td></td>
</tr>
</tbody>
</table>

### IC Packaging

<table>
<thead>
<tr>
<th>IC Physical Verification</th>
<th>DFM Optimization</th>
<th>3D IC Packaging</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital Verification</td>
<td>DFM Optimization</td>
<td>Advanced Packaging Design to Mfg. Solution</td>
</tr>
<tr>
<td>Custom, Analog &amp; MEMS IC Design</td>
<td>Yield Management</td>
<td></td>
</tr>
<tr>
<td>Power Analysis &amp; Optimization</td>
<td>Functional Safety</td>
<td></td>
</tr>
<tr>
<td>Scalable HW Verification</td>
<td>Hardware-based cybersecurity</td>
<td></td>
</tr>
<tr>
<td>Functional Monitoring</td>
<td>Built-in Self-test</td>
<td></td>
</tr>
<tr>
<td>Power Integrity</td>
<td>Functional Safety</td>
<td></td>
</tr>
<tr>
<td>Power Integrity</td>
<td>Hardware-based cybersecurity</td>
<td></td>
</tr>
</tbody>
</table>

### Electronic Systems

<table>
<thead>
<tr>
<th>Electronic Systems Design</th>
<th>Electronic Systems Verification</th>
<th>Electronic Systems Manufacturing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Packaging Design to Mfg. Solution</td>
<td>Multi-PCB systems Design</td>
<td></td>
</tr>
<tr>
<td>Xcellerator as a Service for Electronics</td>
<td>Signal integrity</td>
<td></td>
</tr>
<tr>
<td>Supply chain</td>
<td>Power integrity</td>
<td></td>
</tr>
<tr>
<td>Supply chain</td>
<td>Thermal analysis</td>
<td></td>
</tr>
<tr>
<td>Supply chain</td>
<td>Mixed signal analysis</td>
<td></td>
</tr>
</tbody>
</table>

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To PLM and to analytics

Tessent

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