Safe Harbor for Forward-Looking Statements; Other Disclosures

This presentation contains forward-looking statements under the Private Securities Litigation Reform Act of 1995, including those relating to the Company’s expectations regarding business opportunities, the Company’s ability to deliver long-term, profitable growth, industry growth rates, timing of expected product launches, demand for existing and newly-acquired technologies, the growth opportunities of the various markets we serve, product and investment strategies, the long-term sustainability of the Company’s increased product revenue and cash generated from operating activities, the Company’s outlook and financial guidance for the fourth quarter of 2022 and related drivers, the Company’s ability to effectively manage supply chain shortages, risks and the potential adverse impacts related to, or arising from the Novel Coronavirus (COVID-19) and its variants, and the effects of ASC 606 on reported revenue, among other items.

Such forward-looking statements are based on current expectations, estimates and projections, management’s beliefs and certain assumptions made by the Company’s management. Actual results may differ materially. The Company’s business generally is subject to a number of risks which are described more fully in the Company’s periodic reports filed with the Securities and Exchange Commission, as well as the potential adverse impacts related to, or arising from, COVID-19 and its variants. The Company undertakes no obligation to update forward-looking statements to reflect events or circumstances after the date hereof.

Effective January 1, 2018, the Company adopted Accounting Standards Update No. 2014-09, Revenue from Contracts with Customers in ASC 606. The adoption of ASC 606 materially impacted the timing of revenue recognition for the Company’s fixed-fee intellectual property licensing arrangements. The adoption of ASC 606 did not have a material impact on the Company’s other revenue streams, net cash provided by operating activities, or its underlying financial position.

This presentation contains non-GAAP financial measures, including cost of product revenue, operating costs and expenses, interest and other income (expense), net and diluted net income (loss) per share. In computing these non-GAAP financial measures, stock-based compensation expenses, acquisition-related transaction costs and retention bonus expense, amortization expenses, depreciation expense on unused Electronic Design Automation (“EDA”) software licenses, expense on abandoned operating leases, restatement and shareholder activist costs, facility restoration costs, non-cash interest expense and certain other one-time adjustments were considered. The non-GAAP financial measures should not be considered a substitute for, or superior to, financial measures calculated in accordance with GAAP, and the financial results calculated in accordance with GAAP and reconciliations from these results should be carefully evaluated. Management believes the non-GAAP financial measures are appropriate for both its own assessment of, and to show investors, how the Company’s performance compares to other periods. Reconciliation from GAAP to non-GAAP results are made available and more fully described on our website as well as the back of this deck and in the earnings release.
Industry-leading chips and silicon IP making data faster and safer
Semiconductor Solutions Built on Innovation

Rambus Solutions

Chips
Memory Interface Chips

Silicon IP
Interface IP: Memory and SerDes PHYs and Controllers
Security IP: Secure Cores and Provisioning

Innovations
Foundational Patents and IP

Data Intensive Markets
Product Sales
Data Center
5G/Edge
IoT
Automotive
Government

IP Licenses
Patent Licenses
Amplified Market Opportunity

Increasing need for performance and security

**Annual growth in AI/ML models**
Largest over 1T parameters

Intel, OpenAI, Beijing Academy of AI

**Annual growth in # of hyperscale data centers**
2021: 700 to 2024: 1000+

Synergy Research Group

**Global annual cybercrime losses**

Cybersecurity Ventures
New Memory Architectures Driving TAM Expansion

Transition to DDR5

Classic Server

CPU

Memory

Memory

CPU

Memory

Memory

Memory Subsystem Expansion with CXL

CXL-Enabled Server

CPU

CPU

记忆

Memory

Data Center Disaggregation

Server Rack

IO

Compute

Memory

Storage

Accelerators

Pooled Compute

Pooled Memory

Pooled Storage

Shared Boot

Enhanced Security

Increasing bandwidth, capacity, efficiency and security
### Advancing the Data Center

Enabling next-generation data centers with *state-of-the-art* high-performance memory and interconnect solutions and hardware-level security

**Applications**

- Server Main Memory
- AI and Network Accelerators
- Smart NICs
- Network Storage
- Network Switches
- Memory Expansion and Pooling

<table>
<thead>
<tr>
<th>DDR5 &amp; 4</th>
<th>Memory Interface Chips</th>
</tr>
</thead>
<tbody>
<tr>
<td>HBM3 &amp; 2E</td>
<td>Memory Subsystems</td>
</tr>
<tr>
<td>GDDR6</td>
<td>Memory Subsystems</td>
</tr>
<tr>
<td>PCIe 6 &amp; 5</td>
<td>Interface Subsystems</td>
</tr>
<tr>
<td>CXL 3 &amp; 2</td>
<td>Interface Subsystems</td>
</tr>
<tr>
<td>Root of Trust</td>
<td>Secure Co-processors</td>
</tr>
<tr>
<td>MACsec &amp; IPsec</td>
<td>Protocol Engines</td>
</tr>
</tbody>
</table>
Rambus Memory Interface Chip Growth

- Strong market position on DDR4 and DDR5 platforms
- Announced DDR5 SPD Hub and Temperature Sensor
- First to sample Gen2 RCD at industry’s fastest data rate of 5600 MT/s
Product Leadership Driving Topline Growth

2018-2021

39% CAGR
Chip and Silicon IP*
combined revenue

Industry’s first and fastest DDR5 memory interface chips

Integrated PCIe6/5, CXL 2.0, HBM3/2E and GDDR6 PHY + Controller subsystems

Broadest portfolio of secure root of trust, protocol engine, and crypto accelerator cores

Experts in interconnect solutions critical for performance and utilization in emerging data center architectures

*Product and Contract and Other combined revenue
Financial Highlights

Chip & Silicon IP Revenue* ($M)

<table>
<thead>
<tr>
<th>Year</th>
<th>Chip &amp; Silicon IP</th>
<th>Discontinued Business</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>115</td>
<td>19</td>
</tr>
<tr>
<td>2020</td>
<td>162</td>
<td>144</td>
</tr>
<tr>
<td>2021</td>
<td>192</td>
<td>144</td>
</tr>
</tbody>
</table>

Pro Forma Operating Expenses ($M)

<table>
<thead>
<tr>
<th>Year</th>
<th>R&amp;D</th>
<th>SG&amp;A</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>80</td>
<td>69</td>
<td>149</td>
</tr>
<tr>
<td>2020</td>
<td>144</td>
<td>123</td>
<td>267</td>
</tr>
<tr>
<td>2021</td>
<td>192</td>
<td>120</td>
<td>312</td>
</tr>
</tbody>
</table>

Cash from Operations ($M) & FCF per Share ($)

<table>
<thead>
<tr>
<th>Year</th>
<th>Cash from Ops</th>
<th>FCF per Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>129</td>
<td>1.02</td>
</tr>
<tr>
<td>2020</td>
<td>185</td>
<td>1.26</td>
</tr>
<tr>
<td>2021</td>
<td>209</td>
<td>1.66</td>
</tr>
</tbody>
</table>

Cash Equivalents & Return of Capital ($M)

<table>
<thead>
<tr>
<th>Year</th>
<th>Cash Equivalents</th>
<th>Return of Capital</th>
<th>M&amp;A Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>408</td>
<td>67</td>
<td>97</td>
</tr>
<tr>
<td>2020</td>
<td>503</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>2021</td>
<td>486</td>
<td>67</td>
<td>97</td>
</tr>
</tbody>
</table>

*Includes Product and Contract & Other Revenue
Rambus Investment Summary

- Amplified data center market opportunity as memory relevance continues to grow
- Pioneer of industry-leading chips and silicon IP enabling critical performance improvements for data center and cloud
- Continued innovation feeds patent portfolio and product roadmap expansion
- Focus on strategic initiatives drives financial results and profitable growth
- Strong cash generation enables strategic initiatives and return of capital to shareholders
# Outstanding Cash Generation

<table>
<thead>
<tr>
<th>In Millions</th>
<th>ASC 606 Q3 2021</th>
<th>ASC 606 Q4 2021</th>
<th>ASC 606 Q1 2022</th>
<th>ASC 606 Q2 2022</th>
<th>ASC 606 Q3 2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue</td>
<td>$81.3</td>
<td>$91.8</td>
<td>$99.0</td>
<td>$121.1</td>
<td>$112.2</td>
</tr>
<tr>
<td>Total Operating Costs and Expenses&lt;sup&gt;1&lt;/sup&gt;</td>
<td>$62.8</td>
<td>$65.4</td>
<td>$74.9</td>
<td>$76.1</td>
<td>$77.9</td>
</tr>
<tr>
<td>Operating Income&lt;sup&gt;1&lt;/sup&gt;</td>
<td>$18.5</td>
<td>$26.4</td>
<td>$24.2</td>
<td>$45.0</td>
<td>$34.4</td>
</tr>
<tr>
<td>Cash from Operations</td>
<td>$46.0</td>
<td>$72.2</td>
<td>$42.6</td>
<td>$56.5</td>
<td>$80.0</td>
</tr>
</tbody>
</table>

- Balanced portfolio drives growth
- Strategic R&D investment to support growth initiatives
- Operating results under ASC 606 do not reflect significant cash flows from fixed-fee licensing arrangements
- Strong cash generation

<sup>1</sup>Please refer to reconciliations of non-GAAP financial measures included in this presentation and in our earnings release.
## Strong Balance Sheet Supports Strategic Initiatives

<table>
<thead>
<tr>
<th>In Millions</th>
<th>Q3 2021</th>
<th>Q4 2021</th>
<th>Q1 2022</th>
<th>Q2 2022</th>
<th>Q3 2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Cash &amp; Marketable Securities</td>
<td>$419.7</td>
<td>$485.6</td>
<td>$343.7</td>
<td>$351.6</td>
<td>$264.8</td>
</tr>
<tr>
<td><strong>Record cash from operations offset by accelerated share repurchase and convertible debt repayment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Assets</td>
<td>$1,202.7</td>
<td>$1,232.6</td>
<td>$1,060.9</td>
<td>$1,110.9</td>
<td>$969.1</td>
</tr>
<tr>
<td><strong>Strong balance sheet with minimal debt</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stockholders’ Equity</td>
<td>$847.8</td>
<td>$862.4</td>
<td>$793.1</td>
<td>$838.2</td>
<td>$749.9</td>
</tr>
<tr>
<td><strong>$180M and $212M contract assets in Q3 2022 and Q2 2022, respectively, related to ASC 606 adoption</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash from Operations</td>
<td>$46.0</td>
<td>$72.2</td>
<td>$42.6</td>
<td>$56.5</td>
<td>$80.0</td>
</tr>
<tr>
<td><strong>Sustained, predictable cash generation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Reconciliation of Non-GAAP Financial Measures

<table>
<thead>
<tr>
<th>Net Income (Loss) in Millions</th>
<th>Q3 2021 (ASC 606)</th>
<th>Q4 2021 (ASC 606)</th>
<th>Q1 2022 (ASC 606)</th>
<th>Q2 2022 (ASC 606)</th>
<th>Q3 2022 (ASC 606)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GAAP Net Income (Loss)</td>
<td>$4</td>
<td>$6</td>
<td>($66)</td>
<td>$35</td>
<td>$1</td>
</tr>
<tr>
<td>Adjustments:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stock-based compensation</td>
<td>$7</td>
<td>$6</td>
<td>$8</td>
<td>$9</td>
<td>$9</td>
</tr>
<tr>
<td>Acquisition-related costs and retention bonus expense</td>
<td>$2</td>
<td>$1</td>
<td>$3</td>
<td>$2</td>
<td>$2</td>
</tr>
<tr>
<td>Amortization of acquired intangible assets</td>
<td>$4</td>
<td>$4</td>
<td>$4</td>
<td>$4</td>
<td>$4</td>
</tr>
<tr>
<td>Non-cash interest expense</td>
<td>$2</td>
<td>$2</td>
<td>$1</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Expense on abandoned operating leases</td>
<td>$1</td>
<td>$1</td>
<td>$1</td>
<td>$1</td>
<td>$1</td>
</tr>
<tr>
<td>Gain on sale of equity security</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>($4)</td>
</tr>
<tr>
<td>Provision for income taxes</td>
<td>($4)</td>
<td>($5)</td>
<td>($6)</td>
<td>($8)</td>
<td>($6)</td>
</tr>
<tr>
<td>Change in fair value of earn-out liability</td>
<td>$0</td>
<td>$5</td>
<td>$1</td>
<td>($6)</td>
<td>$2</td>
</tr>
<tr>
<td>Loss on fair value adjustment of derivatives, net</td>
<td>$0</td>
<td>$0</td>
<td>$8</td>
<td>$0</td>
<td>$2</td>
</tr>
<tr>
<td>Loss on extinguishment of debt</td>
<td>$0</td>
<td>$0</td>
<td>$66</td>
<td>$0</td>
<td>$17</td>
</tr>
<tr>
<td>Non-GAAP Net Income</td>
<td>$16</td>
<td>$21</td>
<td>$20</td>
<td>$36</td>
<td>$28</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operating Income in Millions</th>
<th>Q3 2021 (ASC 606)</th>
<th>Q4 2021 (ASC 606)</th>
<th>Q1 2022 (ASC 606)</th>
<th>Q2 2022 (ASC 606)</th>
<th>Q3 2022 (ASC 606)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GAAP Operating Income</td>
<td>$5</td>
<td>$9</td>
<td>$8</td>
<td>$36</td>
<td>$17</td>
</tr>
<tr>
<td>Adjustments:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stock-based compensation</td>
<td>$7</td>
<td>$6</td>
<td>$8</td>
<td>$9</td>
<td>$9</td>
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<td>$3</td>
<td>$2</td>
<td>$2</td>
</tr>
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<td>$4</td>
<td>$4</td>
<td>$4</td>
<td>$4</td>
<td>$4</td>
</tr>
<tr>
<td>Expense on abandoned operating leases</td>
<td>$1</td>
<td>$1</td>
<td>$1</td>
<td>$1</td>
<td>$1</td>
</tr>
<tr>
<td>Change in fair value of earn-out liability</td>
<td>$0</td>
<td>$5</td>
<td>$1</td>
<td>($6)</td>
<td>$2</td>
</tr>
<tr>
<td>Non-GAAP Operating Income</td>
<td>$19</td>
<td>$26</td>
<td>$24</td>
<td>$45</td>
<td>$34</td>
</tr>
<tr>
<td>Depreciation</td>
<td>$5</td>
<td>$6</td>
<td>$6</td>
<td>$6</td>
<td>$7</td>
</tr>
<tr>
<td>Adjusted EBITDA</td>
<td>$24</td>
<td>$32</td>
<td>$30</td>
<td>$51</td>
<td>$41</td>
</tr>
</tbody>
</table>

Certain amounts may be off $1.0M due to rounding.
## Revenue and Licensing Billings

<table>
<thead>
<tr>
<th></th>
<th>Q1’21</th>
<th>Q2’21</th>
<th>Q3’21</th>
<th>Q4’21</th>
<th>FY 2021</th>
<th>Q1’22</th>
<th>Q2’22</th>
<th>Q3’22</th>
<th>YTD 2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Royalty Revenue</td>
<td>$28,859</td>
<td>$41,910</td>
<td>$33,044</td>
<td>$32,893</td>
<td>$136,706</td>
<td>$30,464</td>
<td>$48,038</td>
<td>$29,878</td>
<td>$108,380</td>
</tr>
<tr>
<td>Product Revenue</td>
<td>$30,781</td>
<td>$31,170</td>
<td>$36,710</td>
<td>$45,274</td>
<td>$143,935</td>
<td>$47,969</td>
<td>$53,302</td>
<td>$58,619</td>
<td>$159,890</td>
</tr>
<tr>
<td>Contract and Other Revenue</td>
<td>$10,742</td>
<td>$11,779</td>
<td>$11,528</td>
<td>$13,614</td>
<td>$47,663</td>
<td>$20,617</td>
<td>$19,792</td>
<td>$23,747</td>
<td>$64,156</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$70,382</td>
<td>$84,859</td>
<td>$81,282</td>
<td>$91,780</td>
<td>$328,304</td>
<td>$99,050</td>
<td>$121,132</td>
<td>$112,244</td>
<td>$332,426</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Q1’21</th>
<th>Q2’21</th>
<th>Q3’21</th>
<th>Q4’21</th>
<th>FY 2021</th>
<th>Q1’22</th>
<th>Q2’22</th>
<th>Q3’22</th>
<th>YTD 2022</th>
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<td>$41,910</td>
<td>$33,044</td>
<td>$32,893</td>
<td>$136,706</td>
<td>$30,464</td>
<td>$48,038</td>
<td>$29,878</td>
<td>$108,380</td>
</tr>
<tr>
<td>Licensing Billings¹</td>
<td>$63,506</td>
<td>$65,216</td>
<td>$66,105</td>
<td>$66,586</td>
<td>$261,413</td>
<td>$64,102</td>
<td>$66,104</td>
<td>$62,156</td>
<td>$192,362</td>
</tr>
<tr>
<td><strong>Delta</strong></td>
<td>$34,647</td>
<td>$23,306</td>
<td>$33,061</td>
<td>$33,693</td>
<td>$124,707</td>
<td>$33,638</td>
<td>$18,066</td>
<td>$32,278</td>
<td>$83,982</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Q1’21</th>
<th>Q2’21</th>
<th>Q3’21</th>
<th>Q4’21</th>
<th>FY 2021</th>
<th>Q1’22</th>
<th>Q2’22</th>
<th>Q3’22</th>
<th>YTD 2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASC 606 Interest Income²</td>
<td>$2,842</td>
<td>$2,382</td>
<td>$2,163</td>
<td>$1,907</td>
<td>$9,294</td>
<td>$1,827</td>
<td>$1,455</td>
<td>$1,248</td>
<td>$4,530</td>
</tr>
</tbody>
</table>

¹ Licensing billings is an operational metric that reflects amounts invoiced to our patent and technology licensing customers during the period, as adjusted for certain differences relating to advanced payments for variable licensing agreements.

² Interest income associated with the significant financing component of licensing agreements as a result of the adoption of ASC 606.
## GAAP to Non-GAAP Income Statement

<table>
<thead>
<tr>
<th>In $ Millions</th>
<th>GAAP Actual Q3'22</th>
<th>Non-GAAP Actual Q3'22</th>
<th>Delta to GAAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue</td>
<td>$112.2</td>
<td>$112.2</td>
<td>$-</td>
</tr>
<tr>
<td>Cost of revenue</td>
<td>27.0</td>
<td>23.3</td>
<td>(3.7)</td>
</tr>
<tr>
<td>Research and development</td>
<td>39.3</td>
<td>35.8</td>
<td>(3.5)</td>
</tr>
<tr>
<td>Sales, general and administrative</td>
<td>26.6</td>
<td>18.8</td>
<td>(7.9)</td>
</tr>
<tr>
<td>Change in fair value of earn-out liability</td>
<td>2.4</td>
<td>0.0</td>
<td>(2.4)</td>
</tr>
<tr>
<td>Total operating cost and expenses</td>
<td>95.3</td>
<td>77.9</td>
<td>(17.4)</td>
</tr>
<tr>
<td>Operating income</td>
<td>16.9</td>
<td>34.4</td>
<td>17.4</td>
</tr>
<tr>
<td>Interest and other income (expense), net</td>
<td>(13.5)</td>
<td>2.9</td>
<td>16.4</td>
</tr>
<tr>
<td>Income before income taxes</td>
<td>3.4</td>
<td>37.2</td>
<td>33.8</td>
</tr>
<tr>
<td>Provision for income taxes</td>
<td>2.5</td>
<td>8.9</td>
<td>6.4</td>
</tr>
<tr>
<td>Net income</td>
<td>$0.9</td>
<td>$28.3</td>
<td>$27.4</td>
</tr>
</tbody>
</table>

Certain amounts may be off $0.1M due to rounding.
Product Overview
Memory Interface Chips
Built for speed, power efficiency and reliability, the DDRn memory interface chips for RDIMM, LRDIMM and NVDIMM server modules deliver top-of-the-line performance and the capacity needed to meet the growing demands on enterprise and data center systems.

Industry-leading Performance
• Fully-compliant with the latest JEDEC standards
• Operational speeds up to 5600 MT/s

Enhanced Margin
• Wide margin I/O design with advanced programmability
• Exceed JEDEC reliability standards for ESD and EOS

Optimized Power
• Advanced power management
• Frequency-based, low-power optimization

Superior Debug and Serviceability
• Integrated tools for bring-up and debug
• Works out-of-the-box with no BIOS changes required
Memory Interface Chips

Enabling performance and capacity in server DIMMs

<table>
<thead>
<tr>
<th>DDR5</th>
<th>DDR4</th>
<th>NV</th>
<th>DDR3</th>
</tr>
</thead>
<tbody>
<tr>
<td>RCD, SPD Hub &amp; Temp. Sensor</td>
<td>RCD &amp; DB</td>
<td>DDR4 NVRCD</td>
<td>RCD &amp; DB</td>
</tr>
<tr>
<td>• Per JEDEC Direction</td>
<td>• JEDEC Compliant</td>
<td>• JEDEC Compliant</td>
<td>• JEDEC Compliant</td>
</tr>
<tr>
<td>• Speeds of 5600 MT/s</td>
<td>• Speeds up to 3200 MT/s</td>
<td>• Speeds up to 3200 MT/s</td>
<td>• Speeds up to 2133 MT/s</td>
</tr>
<tr>
<td>• Ongoing qualifications</td>
<td>• Multiple OEM qualifications</td>
<td>• Ongoing qualifications</td>
<td>• Multiple OEM qualifications</td>
</tr>
</tbody>
</table>

Available in Production

Smart tools for easy integration and reduced time to market

LabStation Platform and Buffer BIOS Integration Tool

Validated solutions with partners

Samsung SK hynix Micron

Data • Faster • Safer
Transition from DDR4 to DDR5 RDIMMs

- First generation DDR5 RDIMMs deliver double the bandwidth of DDR4 RDIMMs, and DDR5 will scale to 4X the bandwidth.

- Achieving this level of performance requires an expanded memory interface chipset for a “smarter RDIMM”.

- DDR5 RDIMM chipset expands with higher function SPD (I3C) Hub, Temperature Sensors (new) and PMIC (new).
DDR5 DIMM Chipset

Industry-leading Performance and Margin
- Compliant with latest JEDEC spec up to 5600 MT/s
- Wide margin IO design with advanced programmability
- Exceeds JEDEC reliability requirements

Optimized Power
- Frequency-based power optimization

Best-in-class Debug and Serviceability
- Integrated tools for bring-up and debug
- Works out of the box with default system BIOS

Use Cases
- Server (RCD, SPD Hub, Temp. Sensors): RDIMM, LRDIMM, NVDIMM
- Client (SPD Hub Only): UDIMM, SODIMM

DDR5 RDIMMs with Rambus Memory Interface chips: Registering Clock Driver, SPD Hub and Temperature Sensors
Silicon IP
Across a broad spectrum of applications spanning automotive, artificial intelligence (AI), Internet of Things (IoT), network edge, and data center, there is a common need to move more data faster. Rambus memory and SerDes IP deliver the performance needed by the most demanding applications to move the data at blinding fast speeds.

**HBM3/2E Memory Subsystem**
- Fully-integrate and silicon-proven PHY and controller
- Running at industry’s fastest data rate up to 8.4 Gbps
- Ideal for AI/ML training, graphics and networking applications

**GDDR6 Memory Subsystem**
- Fully-integrate and silicon-proven PHY and controller
- Running at industry’s fastest data rate up to 18.0 Gbps
- Ideal for AI/ML interference, automotive, graphics and networking applications

**PCIe 5/CXL 2 Interconnect Subsystem**
- Co-validated PHY and controller
- Incorporates industry-leading zero-latency IDE
- Multiple configurations to support broad range of applications
## Broad Interface IP Portfolio

<table>
<thead>
<tr>
<th>IP Products</th>
<th>Chip-to-Chip (SerDes) Interfaces</th>
<th>Memory Interfaces</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CXL</td>
<td>PCI Express</td>
</tr>
<tr>
<td>IP Products</td>
<td>2.0</td>
<td>3.0</td>
</tr>
<tr>
<td>PHY</td>
<td><img src="data" alt="R" /></td>
<td><img src="data" alt="R" /></td>
</tr>
<tr>
<td>Digital Controller</td>
<td><img src="data" alt="R" /></td>
<td><img src="data" alt="R" /></td>
</tr>
<tr>
<td>Availability</td>
<td>Now</td>
<td>Now</td>
</tr>
</tbody>
</table>

- Leader in high-performance memory interface IP solutions (PHYs and Controllers)
- Industry-leading portfolio of CXL and PCI Express IP
- Accelerating roadmap for next-generation IP solutions
Memory Interface Solutions

Memory PHY and digital controller solutions

**HBM3**
- 8.4 Gbps
- 1024-bit
- 2.5D design architecture

**HBM2E**
- 3.6 Gbps
- 1024-bit
- 2.5D design architecture

**GDDR6**
- 12-18 Gbps
- 2x 16-bit channels

**DDR4/3**
- 3200 Mbps
- x16 to x72-bits
- 1-4 Ranks
- DFI 4.0

Integrated tools for easy bring-up and characterization

- Easy-to-use PC Interface
- Interface to 3rd party software
- Pre-defined test scripts
- PHY control settings
- External instrument control
- System characteristics and analysis

**LabStation Platform**

Verification tools

**HBM3**
- 8.4 Gbps
- 1024-bit
- 2.5D design architecture

**HBM2E**
- 3.6 Gbps
- 1024-bit
- 2.5D design architecture

**GDDR6**
- 12-18 Gbps
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**DDR4/3**
- 3200 Mbps
- x16 to x72-bits
- 1-4 Ranks
- DFI 4.0

Data • Faster • Safer
High-Speed Interconnect Solutions

PHY and digital controller solutions

- PCIe 6
  - CXL 3*
  - 5nm
  - PCIe 6
  - CXL 3/2/1.1
  - PCIe 5/4/3/2

- PCIe 5
  - CXL 2
  - 7 & 12nm
  - PCIe 5
  - CXL 2/1.1
  - PCIe 4/3/2

- 32G
  - 7, 12 & 22nm
  - CEI-28/25/11
  - 40/10GbE
  - JESD204B/C
  - CPRI

- 28G
  - 12nm
  - CEI-28/25/11
  - 40/10GbE
  - FC28
  - XFI/XAUI

*CXL 3 PHY Only

Integrated tools for easy bring-up and characterization

- Easy-to-use PC Interface
- Interface to 3rd party software
- Pre-defined test scripts
- PHY control settings
- External instrument control
- System characteristics and analysis

Verification tools
Rambus secure silicon IP helps protect data at rest and in motion across a broad range of applications and throughout a device’s lifecycle. Securing electronic systems at their hardware foundation, our embedded security solutions span areas including root of trust, tamper resistance, content protection and trusted provisioning.

**Root of Trust Cores**
- Portfolio of solutions from fully-programmable secure co-processors to highly-compact state machines
- Provides hardware-based foundation for security
- Optimized for broad range of applications including AI/ML, automotive, IoT and defense

**MACsec Protocol Engines**
- Protects data in motion with robust Layer 2 security anchored in hardware
- Operates at full line-rate up to 800 Gbps supporting real-time applications
- Offers easy integration into networking SoCs and ASICs

**Provisioning and Key Management**
- Provision cryptographic information securely in untrusted environments
- Protects against cloning, reverse engineering, and counterfeiting
- Manufacturers can leverage securely provisioned keys and identities to enable supply chain integrity.
Security IP Portfolio

Our Silicon IP and Protocols secure data & assets managed by semiconductors, whether the data is at-rest or in-motion. We sell soft-IP RTL subsystems and software stacks.

- **Cryptography**
  - Standard & DPA Crypto Cores
  - Test Equipment
  - Crypto Cores & TRNG Cores
  - DPA Crypto Cores
  - DPA Workstation
  - Anti Counterfeiting Camouflage Cells

- **Data at Rest**
  - Roots of Trust Platform Security
  - Programmable Root of Trust
  - Fixed Function Root of Trust
  - Secure Application Development Kits

- **Data in Motion**
  - Protocol Engines Software Toolkits
  - MACsec Engines & Toolkits
  - IPsec, TLS/SSL Engines & Toolkits
  - High Speed Crypto Inline Memory Encrypt

- **Device Security**

- **Provisioning**
  - Appliances Key & Asset Injection
  - Infrastructure and Appliances for Key and Asset Injection

- **Key Management**
  - Platform Lifecycle Monitoring
  - Cloud Key Management and Device Lifecycle Monitoring

- **Supply Chain Security**

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Our Provisioning Solutions allow key & certificate provisioning in manufacturing, and identity/key lifecycle management via cloud KMS. We sell hardware, enterprise software and cloud services.
Key Areas of Focus for Rambus Labs

- Next-Gen Memory Architectures for Data Center
- Next-Gen Memory Interfaces
- Security for AI/ML and PQC
- Strategic Customer & Product Roadmap Support
Innovating to Meet Market Needs

Growing Patent Portfolio

- Fundamental R&D feeds product development
- Relevant portfolio regularly cited by major industry players
- Supports predictable licensing base and sustained cash generation

Industry Recognition of Rambus Patents

Source: Innography, patent citations

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~3000

Grants/Publications (pending) per Publication Year

Cumulative Pending and Granted Patents

Grants
Publications (pending)
Cumulative Pending and Granted Patents


0 500 1000 1500 2000 2500 3000 3500 4000


0 50 100 150 200 250 300 350 400


0 50 100 150 200 250 300 350 400

Source: Innography, patent citations