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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2025 Office of the Secretary Of Defense **Date:** March 2024

<b>Appropriation/Budget Activity</b> 0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide I BA 2: Applied Research</i>	<b>R-1 Program Element (Number/Name)</b> PE 0602669D8Z I <i>Microelectronics Commons</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
Total Program Element	0.000	65.062	0.000	0.000	-	0.000	0.000	0.000	0.000	-	Continuing	Continuing
825: <i>Microelectronics Research Maturation-Development</i>	0.000	65.062	0.000	0.000	-	0.000	0.000	0.000	0.000	-	Continuing	Continuing

**Note**

New Start (Y/N): No

FY 2023 funding of \$65.062 million was transferred from the Creating Helpful Incentives to Produce Semiconductors (CHIPS) for America Defense Fund to the FY 2023 Research, Development, Test and Evaluation, Defense-Wide appropriation for proper execution. The funds were appropriated by, and are transferred using special transfer authority provided by, section 102(b) of the CHIPS Act of 2022, division A of Public Law 117–167.

**A. Mission Description and Budget Item Justification**

This Program supports the Department's initiatives to Build Sustainable and Long-Term Advantage, Defend the Homeland, and Deter Aggression.

The Office of the Under Secretary of Defense for Research and Engineering (OUSDR&E) is executing the Microelectronics Commons (the Commons) activity pursuant to the Fiscal Year (FY) 2021 National Defense Authorization Act (NDAA) (Pub. L. 116-283), including the CHIPS for America Act, and funded through the CHIPS for America Defense Fund established by the CHIPS Act of 2022. The FY 2021 NDAA legislation significantly emphasizes solutions that promote the domestic on-shoring of capabilities to address economic and technology security concerns. Under FY 2021 NDAA Sec. 9903(b), the DOD is directed to establish a National Network for Microelectronics Research and Development (NNMRD) to enable the laboratory-to-fabrication transition of microelectronics innovations in the United States and to expand the global leadership in microelectronics of the United States. Specifically, the DOD is addressing a component of the NNMRD, the Commons, through a public-private partnership consisting of regional innovation hubs distributed across the U.S. to foster a pipeline of innovative ideas and talent residing in, for example, university labs and small business R&D teams.

**Background**

U.S. technological dominance in microelectronics materials, processes, devices, and architectural designs can only be sustained through the development of a robust domestic innovation ecosystem that fosters the rapid development and transition of novel concepts into commercially viable manufacturing processes. The U.S. innovation ecosystem has long been the driver of our nation's technology leadership throughout the world. U.S. R&D kick-started the enormous semiconductor industry and continues to lead the world in developing the next generation of disruptive technologies including new materials, devices, circuits, architectures, and design tools.

In recent years, the efficient domestic adoption of U.S. chip innovation has been threatened as emerging hardware technologies have become increasingly reliant on offshore sources for State of the Art (SOTA) manufacturing, prototyping, and investment. There are several significant hurdles that hardware startups face, including limited or expensive access to necessary facilities and design infrastructure, high costs of design intellectual property, limited expertise with hardware engineering, and

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high costs of prototyping. As a result, the number of U.S. hardware startups has dropped significantly and foreign investment in U.S.-based technology startups has enabled offshore fabrication and maturation of emerging technologies.

To address these needs, OUSD(R&E) is standing up the Commons as a public private partnership, consisting of regional innovation hubs distributed across the U.S. to foster a pipeline of innovative ideas and talent residing in university labs and small business R&D teams. The partnership will provide resources for and access to specialized lab equipment, technical expertise, and connections to existing or upgraded prototyping facilities. Fabrication facilities (fabs) will help mature promising technologies and demonstrate the manufacturing and economic benefits of these innovations for dual-use application for defense and commercial sectors.

The Commons will focus on critical, on-shore prototyping to transition innovation from universities, start-ups, and small companies to fabrication facilities (lab-to-fab transition). Key features are:

- Creates and connects “Lab-to-Fab” testing/prototyping hubs to form a network focused on maturing emerging microelectronics technologies
- Provides broad access to these prototyping hubs, potentially by augmenting facilities and enabling access to facilities within local semiconductor companies or FFRDCs.
- Facilitates microelectronics education and training of students at local colleges and universities and grows a talent pipeline to bolster local semiconductor economies and contribute more broadly to the growth of a domestic semiconductor workforce.

This program element focuses on the applied research activities of the Commons, including staffing at Commons hub facilities, early technology identification, preliminary microelectronics prototyping planning, and experimental tools.

This effort will includes early workforce development activities through the Commons network. Activities may span K-12, undergraduate, graduate and continuing education and may include, for example, establishment of PhD internships and post-doc training at Hub facilities and internships with Hub members.

<b>B. Program Change Summary (\$ in Millions)</b>	<b><u>FY 2023</u></b>	<b><u>FY 2024</u></b>	<b><u>FY 2025 Base</u></b>	<b><u>FY 2025 OCO</u></b>	<b><u>FY 2025 Total</u></b>
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	65.062	0.000	0.000	-	0.000
Total Adjustments	65.062	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Programmatic transfer from DoD	65.062	-	-	-	-
Appropriation 0403D					

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<b>Appropriation/Budget Activity</b> 0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide</i> / BA 2: <i>Applied Research</i>	<b>R-1 Program Element (Number/Name)</b> PE 0602669D8Z / <i>Microelectronics Commons</i>	

**Change Summary Explanation**

FY 2023 funding of \$65.062 million was transferred from the Creating Helpful Incentives to Produce Semiconductors (CHIPS) for America Defense Fund to the FY 2023 Research, Development, Test and Evaluation, Defense-Wide appropriation for proper execution. The funds were appropriated by, and are transferred using special transfer authority provided by, section 102(b) of the CHIPS Act of 2022, division A of Public Law 117–167.

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**Exhibit R-2A, RDT&E Project Justification:** PB 2025 Office of the Secretary Of Defense **Date:** March 2024

<b>Appropriation/Budget Activity</b> 0400 / 2	<b>R-1 Program Element (Number/Name)</b> PE 0602669D8Z / <i>Microelectronics Commons</i>	<b>Project (Number/Name)</b> 825 / <i>Microelectronics Research Maturation-Development</i>
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COST (\$ in Millions)	Prior Years	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total	FY 2026	FY 2027	FY 2028	FY 2029	Cost To Complete	Total Cost
<i>825: Microelectronics Research Maturation-Development</i>	0.000	65.062	0.000	0.000	-	0.000	0.000	0.000	0.000	-	Continuing	Continuing

**Note**

FY 2023 funding of \$65.062 million was transferred from the Creating Helpful Incentives to Produce Semiconductors (CHIPS) for America Defense Fund to the FY 2023 Research, Development, Test and Evaluation, Defense-Wide appropriation for proper execution. The funds were appropriated by, and are transferred using special transfer authority provided by, section 102(b) of the CHIPS Act of 2022, division A of Public Law 117–167.

**A. Mission Description and Budget Item Justification**

This project focuses on the applied research activities of the Commons including the early research and development of new microelectronics materials, processes, devices, and architectural designs. It seeks to answer how new models, science, and technology can be leveraged to create a different manufacturing paradigm based on proven process tools in agile microelectronics fabrication facilities (fabs). The project also supports the establishment of the Commons Hubs, which will be networks of regional capabilities organized in collaboration with the Commons Consortium Manager (CM) to address DOD and commercial needs and requirements. The Hubs may include existing facilities augmented to enhance intrinsic specializations in emerging areas of microelectronics. Each Hub will concentrate on one of six technical areas including: Secure Edge Computing, 5G/6G Technology, Artificial Intelligence Hardware, Quantum Technology, Electromagnetic Warfare, and Commercial Leap Ahead Technologies. Core Facilities (i.e., fabs) are integral parts of the Hubs network that will provide key fabrication capabilities that are required to demonstrate prototypes with the volume and characteristics required to ensure reduced risk for full manufacturing production. This effort also includes early workforce development activities through the Commons network. Activities may span K-12, undergraduate, graduate and continuing education and may include, for example, establishment of PhD internships and post-doc training at Hub facilities and internships with Hub members.

**B. Accomplishments/Planned Programs (\$ in Millions)**

<b>Title:</b> Microelectronics Research Maturation – Development	FY 2023	FY 2024	FY 2025
<b>Description:</b> This effort focuses on the identification of promising new microelectronics materials, processes, devices, and architectural designs with potential DOD applications, and early, applied research into these technologies. It will also support operation of regional Commons Hubs and initial selection and execution of Commons Projects in conjunction with activities funded by PEs 0603669D8Z and 0604669D8Z.	65.062	0.000	0.000
<b>FY 2024 Plans:</b> Select initial Commons Projects to be executed by the Hubs; advanced research efforts for new microelectronics technologies (materials, processes, devices, architectural designs, etc.) with potential DOD or dual-use applications • Execution of Hubs – access to prototyping capabilities and development of the semiconductor talent pipeline.			

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<b>Appropriation/Budget Activity</b> 0400 / 2	<b>R-1 Program Element (Number/Name)</b> PE 0602669D8Z / <i>Microelectronics Commons</i>	<b>Project (Number/Name)</b> 825 / <i>Microelectronics Research Maturation-Development</i>

<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>
<ul style="list-style-type: none"> <li>Facilitate transition of novel concepts matured in a laboratory environment into low-volume prototyping processes.</li> </ul> <p><b><i>FY 2025 Plans:</i></b></p> <ul style="list-style-type: none"> <li>Select the FY 2025 Commons Projects to be executed by the Hubs; advanced prototyping efforts for new microelectronics technologies with potential DOD or dual-use applications</li> <li>Execution of Hubs – access to prototyping capabilities and development of the semiconductor talent pipeline.</li> <li>Continue execution of FY 2024 Commons Projects; advanced prototyping efforts for new microelectronics technologies with potential DOD or dual-use applications</li> <li>Continue to facilitate transition of novel concepts matured in a laboratory environment into low-volume prototyping processes.</li> </ul> <p><b><i>FY 2024 to FY 2025 Increase/Decrease Statement:</i></b> Funding decrease starting in FY 2025 in PE 0602669D8Z / Project 825 is a result of reallocation of funds to increase Development activities across all Commons PEs: 0602669D8Z, 0603669D8Z, and 0604669D8Z.</p>			
<b>Accomplishments/Planned Programs Subtotals</b>	65.062	0.000	0.000

**C. Other Program Funding Summary (\$ in Millions)**

N/A

**Remarks**

N/A

**D. Acquisition Strategy**

N/A